

GEI Consultants

MassDEP RTN 3-24070

Supplemental Phase II Comprehensive Site Assessment

Amesbury Former MGP Site,
Amesbury, Massachusetts

Submitted to:
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Executive Summary

On behalf of Boston Gas Company d/b/a National Grid (National Grid), GEI Consultants, Inc. (GEI) prepared this Supplemental Phase II Comprehensive Site Assessment Report (Supplemental Phase II CSA Report) to address environmental conditions related to the former Manufactured Gas Plant (MGP) on Water Street located in Amesbury, Massachusetts (the Site). The Site is a Massachusetts Department of Environmental Protection (MassDEP) disposal site and is assigned Release Tracking Number (RTN) 3-24070.

The work documented in this Supplemental Phase II CSA Report was performed in accordance with the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000). GEI prepared this Supplemental Phase II CSA Report as a follow up to the July 2009 Phase II CSA Report and Phase III Remedial Action Plan (Phase II/III Report), in response to the discovery of residual coal tar in an adjacent wetland area in 2017, and subsequently in the Powwow River mudflats, and within the main Powwow River channel beyond the southeastern limits of the original Site boundary.

E.S.1. Source, Nature, and Extent of Contamination

GEI performed investigations at the Site between April 2017 and September 2024 on behalf of National Grid for this Supplemental Phase II CSA Report. The objectives of the investigations were to delineate the extent of MGP impacts within the wetland, mudflats, and Powwow River channel beyond the limits of the original Site boundary; evaluate whether various migration pathways existed and could contribute to movement of contaminants; evaluate potential human health and ecological risks; and support future remediation permitting and design. The supplemental Phase II CSA investigations included test pits; sediment cores; sediment probes; piezometer installation; sampling and testing wetland soil, sediment, sediment porewater, non-aqueous phase liquid (NAPL), and surface water; an ebullition survey; vertical hydraulic gradient evaluation; and NAPL and sediment mobility evaluations.

The key findings of this Supplemental Phase II CSA Report are as follows:

- The revised Site boundary now includes the former Amesbury MGP, downstream wetlands, mudflats, and portions of the main channel of the Powwow River, most of which is privately owned. Properties now within the Site include single-family residential properties along Oakland Street and River Street; multi-family residential properties at 24 Oak Street and 32 Macy Street; commercial/industrial properties at 34-40 Water Street, 7 Noel Street, and 58 Macy Street; two school properties at 8 Noel Street and 222 Main Street; a portion of the Northbound and Southbound lanes of Interstate 495 (I-495); and a portion of the onramp connecting Route 110 (Macy Street) to I-495 Southbound. Although property uses vary within the Site, there are no buildings within the Site.
- The former Amesbury MGP operated from sometime prior to 1899 and there is no evidence that it operated after January 1924, at which time it was purchased by the Haverhill Gas Light Company, a predecessor in interest to National Grid. It appears that releases of coal tar were discharged at the facility and beyond during its operation in the early 1900s. Coal tar appears to

have been released during MGP operations to the Powwow River, possibly via a former sluiceway that discharged to the nearby wetland and mudflats adjacent to the former MGP. From the likely discharge point, the tar accumulated in shallow sediments within the wetland and mudflats. Tar also likely flowed across the mudflats and accumulated at deeper intervals downstream within portions of the Powwow River channel. The Powwow River was dredged between approximately 1895 and 1900. In the approximately 100 years since these tar releases, the dredged river channel slowly filled back in with sediments naturally deposited in the river system. Redeposition of sediment in the Powwow River downstream of the mudflats likely remobilized some contaminants, resulting in continued presence of lower levels of contaminants in the shallow, more recently deposited sediment.

- The portion of the Powwow River within the Site is a large area which has historically been, and is currently, affected by the surrounding land uses. Aside from the former Amesbury MGP, several other sources of contamination upstream, within, or adjacent to the river have been identified that likely have affected conditions the river. These include releases associated with historical textile mills, a former industrial landfill, a former municipal landfill, former manufacturing facilities, stormwater point and non-point sources, and historical filling during river alterations.
- Constituents identified in soil, sediment, and sediment porewater at the Site include volatile organic compounds (VOCs) and polycyclic aromatic hydrocarbons (PAHs). Soil and sediment also contained petroleum hydrocarbons, metals, cyanide, polychlorinated biphenyls (PCBs), pesticides, and herbicides. The presence of BTEX compounds (benzene, toluene, ethylbenzene, xylene), PAHs, and petroleum hydrocarbons, are attributable, in part, to historical MGP operations and waste disposal practices.
- NAPL was observed in soil and sediment at the Site. NAPL was considered to be present if soil or sediment was tar saturated, tar coated, or contained tar blebs. Visual evidence of sheen or staining by itself was not considered NAPL unless the sheen was characterized as heavy and pervasive, suggesting the presence of tar. In some cases, the presence of NAPL in sediment represents a condition of Readily Apparent Harm (RAH), specifically in the downstream wetland and mudflats, and in two isolated areas of the river itself.
    - As documented in the 2009 Phase II/III Report, dense NAPL (DNAPL) was observed in soil in a narrow north-south band on the former MGP footprint across 39 Water Street and 39A Water Street.
    - NAPL was observed in sediments in the downstream wetland, primarily on 35 Oakland Street and 37 Oakland Street although it was also observed at 33R Oakland Street to the north. NAPL in sediments in the wetland was observed at depths ranging from about 0.2 to 2.5 feet.
    - NAPL was observed in sediments in the downstream mudflat on 39 and 41 Oakland Street. NAPL was observed in sediments in the mudflat at depths ranging from about 0.5 to 1 foot.
    - NAPL was observed in sediments in the river within a narrow band in the center of the river, primarily on 1 Field Street and 8 Noel Street on the northern side of the river and on various Oakland Street and Oak Street properties and 3 River Street on the southern side of the

river. NAPL was observed in sediments in the river generally from as shallow as about 1 or 2 feet up to about 8 or 9 feet below the sediment surface. In the downstream stretch of the river, overlying shallow sediments likely deposited after dredging do not have visible NAPL except for two locations at 1 Field Street where NAPL was observed at depths shallower than 1 foot.

- Contaminants were detected in sediment: 1) in the wetland and mudflats adjacent to the former MGP near Oakland Street where the release(s) likely historically occurred; 2) within the Powwow River both upstream and downstream of the mudflats; 3) and within a portion of the former Powwow River channel that was subsequently filled as part of construction of I-495.
    - In the wetland, Site contaminants in sediment were limited to the top 2.5 feet and were primarily within a narrow band parallel to and east of the wetland stream channel on the 33R, 35, and 37 Oakland Street properties.
    - In the mudflats, Site contaminants in sediment were limited to the top 2 feet and were primarily along and north of the mudflat stream channel on the 39 and 41 Oakland Street properties.
    - In the river, shallow sediments generally contained significantly lower total PAH concentrations compared to deeper sediments. Deeper sediments up to 3,500 feet downstream of the mudflats, within the main Powwow River channel, and within the Commonwealth of Massachusetts tidelands generally contained significantly higher total PAH concentrations. A clay or dense silt layer was encountered beneath much of the affected sediments in the Powwow River channel and appears to be acting as a confining layer. In the downstream stretch of the Powwow River, overlying shallow sediments likely deposited after dredging were not significantly contaminated with PAHs.
    - Within the former river channel that was filled during I-495 construction, the elevated PAHs and MGP-related impacts, such as sheen on sediments and staining, were observed from approximately 5 to 8 feet below the sediment surface. The overlying shallow material, which was backfilled as part of construction for I-495 did not contain significant PAH concentrations and did not have visible MGP-related impacts.
- In the river, PAH concentrations in shallow sediment porewater were generally 1 to 2 orders of magnitude lower than PAH concentrations in deeper porewater. Surface water within the river was not impacted by the MGP-related contaminants identified in sediment.
- Surface water in the wetland had detections of low concentrations of PAHs, specifically at 35 and 37 Oakland Street. The surface water detections generally corresponded to locations with shallow visual observations of coal tar (i.e., within the area of the RAH condition).
- Impacts within deeper sediment in the river are isolated and stable. There is no evidence of advective movement of NAPL to the sediment/water interface. There is no evidence of upward vertical migration of contaminants in porewater from deeper sediments to the overlying surface water. There is no evidence that ebullition-facilitated NAPL flux is occurring that would mobilize NAPL via gas bubbles from sediments to the overlying surface water.

- The revised Site boundary has been delineated based on the measured extent of COCs in environmental media and supplemented with visual and olfactory observations, local conditions considerations, forensics evaluations, and the Conceptual Site Model.
    - The northern Site boundary in the river portion is just upstream of the former Amesbury MGP footprint near 39 Water Street; and the northern Site boundary in the upland portion is on or adjacent to 34-40 Water Street.
    - The eastern Site boundary in the wetland and mudflat portion near Oakland Street is close to the toe of the slope where the former railroad embankment was located (current bike path); and the eastern Site boundary in the river portion generally coincides with the riverbanks and Mean High Water (MHW) although in some cases the Site boundary does not extend all the way to MHW.
    - The western Site boundary in the river generally coincides with the riverbanks and MHW although in some cases the Site boundary does not extend all the way to MHW.
    - The southern (downstream) Site boundary in the river coincides with the end of the filled channel beneath the I-495 highway up to but not including Route 110 (Macy Street) or the backwater of the Powwow River.

E.S.2. Human Health Risk Characterization

GEI prepared a Supplemental Method 3 Human Health Risk Characterization in accordance with 310 CMR 40.0900 of the MCP to evaluate exposure to wetland sediment and surface water, Powwow River mudflats and river sediment and surface water; and upland surface soil at 34-40 Water Street where the Site boundary has been expanded since the 2009 Phase II/III Report. Based on the Supplemental Method 3 Risk Characterization, GEI concluded the following:

Human Health Risk Characterization

For river sediment, GEI evaluated the following three separate river segments under current and future land use: Segment I (Water Street area), Segment II (Oakland Street / Oak Street area), and Segment III (River Street area).

There was significant risk to the following current and future receptors:

- Current resident due to potential exposure to surface sediment in a few isolated locations in Segments I and II of the river;
- Current resident at four properties (35, 37, and 41 Oakland Street and 4 Oakland Court) due to potential exposure to surface sediment in the wetland and/or mudflat;
- Current recreational visitor due to potential exposure to surface sediment in the mudflat;
- Current recreational visitor due to potential exposure to surface sediment in Segment II of the river;

- Future resident due to potential exposure to Segment-wide deep sediment at Segment II and Segment III of the river as well as deep sediment in multiple isolated locations in Segments I, II, and III of the river;
- Future recreational visitor due to potential exposure to Segment-wide deep sediment at Segment II and Segment III of the river, and Site-wide, including all three segments of the river;
- Future trespasser due to potential exposure to deep sediment in multiple isolated locations in Segments II and III of the river; and
- Future construction worker due to potential exposure to deep sediment in multiple isolated locations in Segments II and III of the river.

There is No Significant Risk (NSR) to a potential future resident from exposure to accessible upland surface soil located adjacent to the recreational path at 34-40 Water Street. There is also NSR to a future resident at 34-40 Water Street from potential residential exposure to river surface sediment. In addition, there is NSR to a future resident at 34-40 Water Street from cumulative exposure to upland surface soil as well as residential exposure to river surface sediment. However, there is significant risk to a resident at 34-40 Water Street from cumulative residential soil and sediment exposure as well as recreational exposure to Sitewide river surface sediment. This exposure scenario conservatively assumed a resident may contact river surface sediment in the vicinity of their property and may also contact Sitewide river surface sediment during recreational activities. A planned Activity and Use Limitation (AUL) at 34-40 Water Street will prohibit exposure to deeper upland soil (greater than 3 feet) and deeper river sediment (greater than 2 feet).

Safety Risk Characterization

- Based on observations and information collected during environmental investigations of the Site, a condition of NSR of harm to safety exists at the Site.

Public Welfare Characterization

Based on observations and information collected during environmental investigations of the Site, no community at or near the Site experiences adverse impacts to public welfare under current or anticipated future conditions. The RAH conditions at the Site will be remediated as these areas represent a substantial hazard. Average concentrations of COCs in upland surface soil at 34-40 Water Street are below Method 3 Ceiling Limits (M3CLs) and maximum concentrations of chemicals detected in groundwater at the upland portion of 34-40 Water Street are below M3CLs. Accordingly, a condition of NSR of harm to public welfare exists at the Site.

E.S.3. Environmental Risk Characterization

The Supplemental Stage I ES and Stage II ERC evaluated exposures to receptors within the revised Site boundary. The Supplemental Stage I ES concluded that there were current and potential future exposures to contaminants in sediment in all three areas of the expanded Site (i.e., wetland, mudflat, river). The exposures occur in areas exhibiting conditions of RAH as well as in other areas. For areas not exhibiting conditions of RAH, a Stage II ERC was performed to 1) provide a more thorough evaluation

whether there is risk of significant harm and 2) define approaches to determining extent and magnitude of risk of significant harm for the identified exposure pathways.

The Supplemental Stage II ERC Problem Formulation identified one assessment endpoint: benthic invertebrates in the Powwow River. This fauna is present in all three exposure areas and is the maximally exposed group to residual contamination in sediment. Because this community consists of a potentially large assemblage of species, it was evaluated using criteria protective of reasonably high sensitivity species and populations in the larger assemblage.

Based on the Supplemental Stage II ERC, GEI concluded the following:

Wetland Area

Most of the wetland area below MHW at 33R, 35, and 37 Oakland Street exhibits RAH and therefore presumptively poses significant risk of harm. The quantitative Stage II ERC also confirmed that these locations pose significant risk of harm based on an evaluation using a weight-of-evidence approach. Two locations above MHW and outside of the area exhibiting RAH also pose significant risk of harm based on the Stage II ERC. These locations are SS607 and 794 at 35 Oakland Street, both of which are only slightly above MHW.

Mudflat Area

A portion of the mudflat area at 39 and 41 Oakland Street exhibits RAH and therefore presumptively poses significant risk of harm. The quantitative Stage II ERC also confirmed that most of these locations pose significant risk of harm based on a weight-of-evidence approach. One location outside of the area exhibiting RAH also pose significant risk of harm based on the Stage II ERC. This location is 720 at 41 Oakland Street, just south of the area exhibiting RAH.

River Area

Several localized areas in the river area in the top 1 foot of sediment either exhibit RAH and therefore presumptively pose significant risk of harm, or were confirmed to pose significant risk of harm according to the quantitative Stage II ERC and a weight-of-evidence approach. Specifically:

- The river area around multiple locations on 39, 41, and 43 Oakland Street and 1 Field Street, immediately adjacent to and downstream of the mudflat area.
- Two river areas exhibiting RAH at locations 701 and 706 at 1 Field Street.
- Two river areas at location 817 and 852 at 3 River Street.

A condition of no significant risk of harm is present at all other locations within the river in the shallow river sediments (0-1 foot) based on the weight-of-evidence approach.

E.S.4. Conditions to be Addressed in Phase III Evaluation

Based on the results of the Supplemental Phase II CSA Report, and the human health and ecological risk characterizations, the following conditions will be addressed as part of the Phase III evaluation of remedial alternatives for the Site:

- The presence of MGP waste deposits on 35 and 37 Oakland Street;
- The condition of RAH and/or environmental risk in the much of the wetland and mudflat on 33R, 35, 37, 39, and 41 Oakland Street and in isolated areas of the river on 1 Field Street and 3 River Street;
- Significant human health risk for current and/or future residents along various portions of the Site;
- Significant human health risk for current recreational visitors at Oakland Street / Oakland Court parcels, 8 Noel Street, and river Segment II; and significant human health risk for future recreational visitors at all but river Segment I; and
- Significant human health risk for future trespasser and future construction worker at 28 Oak Street and 50 Macy Street.

1. Introduction

On behalf of Boston Gas Company d/b/a National Grid (National Grid), GEI Consultants, Inc. (GEI) prepared this Supplemental Phase II Comprehensive Site Assessment Report (Supplemental Phase II CSA Report) to address environmental conditions related to the former Manufactured Gas Plant (MGP) located on Water Street in Amesbury, Massachusetts (the Site; Figs. 1 and 2). The Site is a Massachusetts Department of Environmental Protection (MassDEP) disposal site and is assigned Release Tracking Number (RTN) 3-24070.

The work documented in this Supplemental Phase II CSA Report was performed in accordance with the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000). GEI prepared this Supplemental Phase II CSA Report as a follow up to the July 2009 Phase II CSA Report and Phase III Remedial Action Plan (Phase II/III Report), in response to the discovery of residual coal tar in an adjacent wetland area in 2017, and subsequently in the Powwow River mudflats, and within the main Powwow River channel beyond the southeastern limits of the original Site boundary. Fig. 2 shows the original Site boundary as it was defined prior to 2017 and the revised Site boundary that is established in this report based on supplemental Phase II CSA investigations performed between 2017 and 2024.

1.1. Purpose

This Supplemental Phase II CSA Report summarizes the supplemental investigations and analyses performed by GEI between 2017 and 2024 to meet the requirements set forth in 310 CMR 40.0835. This report documents updates to the Site boundary, the Conceptual Site Model, nature and extent of contamination, risk assessment findings, and conclusions of the investigations.

1.2. Transmittal Form

The original MassDEP Comprehensive Response Action Transmittal Form (BWSC108) was submitted electronically to MassDEP, and a copy is in Appendix A.

1.3. Public Involvement

As required by 310 CMR 40.1403(3)(e), letters were distributed to the Amesbury Chief Municipal Officer (Mayor) and Board of Health notifying them of the availability of the Supplemental Phase II CSA Report. Notification letters were also sent to the property owners for the properties not owned by National Grid because their properties are also within the limits of the Site, in accordance with 310 CMR 40.1406(1). Copies of the public notice letters are in Appendix B.

In addition, during the supplemental investigations to support this Supplemental Phase II CSA Report, in accordance with the MCP (310 CMR 40.1403(10)), National Grid provided notice of planned sampling and/or notice of sampling results to the property owners for the properties not owned by either National Grid or within Commonwealth of Massachusetts tidelands. Copies of the notifications were previously provided to MassDEP in Phase IV Status Reports submitted every 6 months.

1.4. Background

MassDEP issued a Notice of Responsibility (NOR) dated July 29, 2004, to National Grid for the Site based on a 120-day reporting condition that was identified during subsurface investigations for the Phase II CSA for the abutting former Bartley Machine and Manufacturing (Bartley) property at 34-40 Water Street (RTN 3-4108). The Phase II CSA was prepared by Environmental Science Services, Inc. (ESS) of Wellesley, Massachusetts on behalf of Bartley for RTN 3-4108. ESS inadvertently collected soil and groundwater samples on the National Grid property at 39 Water Street during its investigation of the Bartley property at 34-40 Water Street. The contaminants identified in these samples included polycyclic aromatic hydrocarbons (PAHs), benzene, toluene, ethylbenzene, and xylene (BTEX) compounds, and metals. MassDEP assigned RTN 3-24070 to the release on National Grid's property. National Grid submitted a Release Notification Form (RNF) to MassDEP on September 24, 2004.

A Phase II CSA and Phase III RAP were previously prepared for the Site (RTN 3-24070) in July 2009. The Phase II CSA was limited to the Site boundary known at the time, which included National Grid's property at 39 Water Street, a City of Amesbury property at 39A Water Street, and a small, subdivided wetland portion of a privately-owned property (33R Oakland Street). On October 18, 2016, GEI submitted a Phase III RAP Addendum and Phase IV Remedy Implementation Plan (RIP) on behalf of National Grid. The Phase IV remedy for the Site at 39 and 39A Water Street and 33R Oakland Street included excavating wetland soil and a small portion of upland soil, dredging sediment, restoring the wetlands, and implementing institutional controls. Construction associated with planned Phase IV remediation activities began in October 2016 and was completed in June 2017. However, in April 2017, while installing coir logs on the southeastern boundary of the work area, residual coal tar was observed in shallow wetland soil at the southeastern edge of the Site as known at that time. This area was beyond the designed and permitted limit of work.

Beginning in 2017, GEI performed supplemental investigations to evaluate the nature and extent of the residual coal tar observed beyond the limits of the original Site boundary. GEI, on behalf of National Grid, submitted semi-annual Phase IV Status Reports to MassDEP to provide regular updates on the progress of the supplemental investigations. As documented in Phase IV Status Report No. 5, submitted in July 2019, a condition representing Readily Apparent Harm (RAH) was identified in the wetland and Powwow River mudflat along Oakland Street based on the visible presence of tar over an area greater than 1,000 square feet in sediment within one foot of the sediment surface. The condition was observed beyond the limits of the original Site boundary and the original Phase IV remedial area. This condition represented RAH (310 CMR 0995(3)(b)(1)(c)) and a Substantial Hazard (310 CMR 40.0956(2)(b)). This condition invalidated the Temporary Solution recorded for the Site, and the Temporary Solution was retracted as part of Phase IV Status Report No. 5.

Due to observations of coal tar beyond the limits of the originally defined Site boundary, additional assessment was performed to establish a revised Site boundary. As part of this Supplemental Phase II CSA Report, the Site boundary was redrawn to reflect the extent of MGP-related impacts, including a larger portion of the Powwow River mudflats and channel.

1.5. Conceptual Site Model

This Supplemental Phase II CSA Report summarizes the supplemental investigation and analyses performed by GEI between 2017 and 2024 to meet the requirements set forth in 310 CMR 40.0835. This report documents updates to the Site boundary, the Conceptual Site Model, nature and extent of contamination, risk assessment findings, and conclusions of the investigations.

1.5.1. Site History Overview and Current Conditions

The former Amesbury MGP operated from sometime prior to 1899 and there is no evidence that it operated after January 1924, at which time it was purchased by the Haverhill Gas Light Company, a predecessor in interest to National Grid. After MGP operations ceased, portions of the former MGP footprint on 34-40 Water Street were used as a municipal landfill until 1952 by the City of Amesbury and an industrial landfill until the early 1960s by the Bailey Company. The National Grid-owned portion of the former MGP on 39 Water Street does not appear to have been used as a landfill. However, the fill materials placed onto the adjacent properties extend onto the National Grid property along the northern property boundary.

The revised Site now includes the former Amesbury MGP, downstream wetlands, mudflats, and portions of the main channel of the Powwow River, most of which is privately owned. Properties now within the Site include single--family residential properties along Oakland Street and River Street; multi-family residential properties at 24 Oak Street and 32 Macy Street; commercial/industrial properties at 34-40-Water Street, 7 Noel Street, and 58 Macy Street; two school properties at 8 Noel Street and 222 Main Street; a portion of the Northbound and Southbound lanes of Interstate 495 (I-495); and a portion of the onramp connecting Route 110 (Macy Street) to I-495 Southbound. These and other properties surrounding the Site are shown in a Site plan in Fig. 2. Although property uses vary within the Site, there are no buildings within the Site boundary.

1.5.2. Potential Sources of OHM

The former Amesbury MGP operated from sometime prior to 1899 and there is no evidence that it operated after January 1924. The MGP contained two gas holders, a retort, a purifier, coal shed, gas house, boiler room, and other support buildings. There is very little information regarding waste handling, storage, and disposal practices during the operation of the Amesbury MGP. During original Phase IV cleanup activities in November 2016, an approximately 12-foot by 12-foot-wood-sided subsurface container was encountered in the upland at 39 Water Street that may have served as a tar well, a subsurface vessel used to accumulate or store tar. The structure contained tar-saturated soil. The tar-saturated soil was removed and disposed off site in March 2017, during the original Phase IV cleanup activities. Some portions of the wood-sided container were left in place. However, prior to backfill, GEI visually confirmed that shallow coal tar saturated soils were removed and that resulting conditions were consistent with previously assessed conditions. The area was over-excavated vertically until cleaner material was encountered. Similarly, the sidewalls were exposed in locations where feasible and soil samples were observed from the sidewalls to confirm that tar-saturated soils were removed. The coal-tar impacted soil encountered in the wooden structure was considered Containerized Waste and was manifested appropriately.

It also appears that releases of coal tar were discharged at the facility and beyond during its operation in the early 1900s. According to the Amesbury Daily News (1914), oil from the gas works "in times past had been a nuisance" and "at times caused some trouble by leaking into the river". During the original Phase IV cleanup activities in April 2017, a small section of a potential open wooden conveyance structure (e.g., sluiceway) was discovered in the wetland adjacent to the former MGP, at the boundary between 33R and 35 Oakland Streets.

Coal tar appears to have been released during MGP operations to the Powwow River as a point source discharge, possibly via this former sluiceway that discharged to the nearby wetland and mudflat adjacent to the former MGP. From the likely discharge point, the tar accumulated in shallow sediments within the wetland and mudflat. Tar also likely flowed across the mudflat and accumulated at deeper intervals downstream within portions of the Powwow River channel.

The Powwow River was dredged between approximately 1895 and 1900. The dredging spanned almost the entire Powwow River tidewater in downtown Amesbury from upstream of the Back River down to the confluence with the Merrimack River. The dredged channel depth was 12 feet at Mean High Water (MHW) for much of the Powwow River except the final stretch (approximately 450 feet) to the Merrimack River. The dredging in that final stretch was ultimately completed (year unknown) but the depth was not documented.

The former Amesbury MGP operated for up to 25 years after the Powwow River was dredged. During MGP operations, tar appears to have flowed from the wetland, through the mudflat, out to the dredged river channel. The tar likely continued flowing downstream in the Powwow River since tar-saturated sediment (at depth only) has been observed to the downstream edge of 8 Noel Street and 3 River Street and other tar impacts such as sheen and staining in sediment (at depth only) have been observed in the portion of the river just upstream of the channelized bypass near I-495. In the approximately 100 years since these releases, the dredged river channel slowly filled back in with sediments naturally deposited in the river system. Redeposition of sediment in the Powwow River downstream of the mudflat likely remobilized some contaminants, resulting in continued presence of lower levels of contaminants in the shallow, more-recently deposited sediment. Similarly, some MGP residuals have also been detected in sediment upstream of the mudflat and slightly upstream of the former Amesbury MGP, and may be the result of reversed tidal flow during flood tide.

The portion of the Powwow River within the Site boundary is a large area which has historically been, and is currently, affected by the surrounding land uses. Several other sources of contamination upstream, within, or adjacent to the river have been identified that likely have affected conditions within the river. These include the following:

- Historical releases and operations at former Amesbury DPW facility (25 to 31 Water Street);
- Historical releases and operations at the former Bartley property, the former Bailey landfill, and the former Town of Amesbury landfill (34-40 Water Street);
- Historical releases and operations at the former Amesbury Metal Products Corporation (33-39 Oakland Street);
- Historical releases and operations at former Nathan Hale Furniture Company (24 Oak Street);

- Stormwater point and non-point source releases; and
- Historical filling during river alterations.

1.5.3. MGP Waste Distribution

MGP wastes (i.e., tar, clinker, and other residuals) were observed in sediment and subsurface soil within the former MGP footprint and in the downstream wetland. These wastes were sometimes distinct from contaminated sediment or soil and were observed as separate, distinct fragments or pieces. However, none of them were observed to be continuous layers of solid or semi-solid tar. The isolated, small pieces of tar observed at the Site did not comprise significant, continuous MGP waste deposits distinguishable from the sediment matrix. As a result, visible coal tar waste deposits, as defined by MassDEP, were not identified at the Site.

- Former MGP Footprint: As documented in the 2009 Phase II/III Report, visual evidence of MGP waste deposits on the former MGP footprint on Water Street included clinker and ash. Fill soil containing clinker and ash was observed in locations on the upland (filled) portion of the Site. There were no observations of continuous or isolated layers of MGP waste deposits of solid or semi-solid tar; only the fragments of clinker and ash in the fill soil matrix.
- Downstream Wetland, Mudflat, and River: Visual evidence of MGP waste deposits downstream of the former MGP footprint on Water Street, in the wetland on 35 Oakland Street and 37 Oakland Street, included small pieces of hardened, solid coal tar. The solid tar pieces were at depths ranging from about 0.2 to 1.2 feet. There were no observations of continuous or isolated layers of MGP waste deposits of solid or semi-solid tar at 35 Oakland Street and 37 Oakland Street; only these small pieces of solid tar. In addition, there were no observations of continuous or isolated layers of MGP waste deposits of solid or semi-solid tar anywhere else on the Site, including the wetland and mudflat on other nearby properties or in any portion of the river.

NAPL was observed in soil and sediment at the Site. NAPL was considered to be present if soil or sediment was tar saturated, tar coated, or contained tar blebs. Visual evidence of sheen or staining by itself was not considered NAPL unless the sheen was characterized as heavy and pervasive, suggesting the presence of tar.

- Former MGP Footprint: As documented in the 2009 Phase II/III Report, dense NAPL (DNAPL) was encountered in several monitoring wells in 2007 and 2008 in a narrow north-south band on the former MGP footprint across 39 Water Street and 39A Water Street. DNAPL monitoring and recovery were performed on a regular basis between 2008 and 2017. Ultimately, GEI concluded that continued active recovery of DNAPL was no longer warranted.
- Downstream Wetland, Mudflat, and River: Visual evidence of MGP-related impacts in sediment were categorized into five types of impacts: (1) staining, (2) sheen (3) blebs, coatings, lenses of tar, (4) solid tar, and (5) coal tar saturated. GEI distinguished between solid or semi-solid tar, which is immobile or has limited mobility, and NAPL-saturated sediment, which includes potentially mobile NAPL and lighter phase constituents.

- NAPL was observed in sediments in the downstream wetland, primarily on 35 Oakland Street and 37 Oakland Street, although it was also observed at 33R Oakland Street to the north. This area of NAPL in sediments was observed to be generally coincident with observed locations of small, isolated pieces of hardened, solid coal tar in the wetland. NAPL was observed in sediments in the wetland at depths ranging from about 0.2 to 2.5 feet.
- NAPL was observed in sediments in the downstream mudflat on 39 and 41 Oakland Street. NAPL in sediments in the mudflat was observed at depths ranging from about 0.5 to 1 foot.
- NAPL was observed in sediments in the river within a narrow band in the center of the river, primarily on 1 Field Street and 8 Noel Street on the northern side of the river and on the Oakland Street and Oak Street properties and 3 River Street on the southern side of the river. NAPL was not observed in sediments south of 8 Noel Street and 3 River Street. NAPL was observed in sediments in the river generally from as shallow as about 1 or 2 feet up to about 8 or 9 feet below the sediment surface. In the downstream stretch of the river, overlying shallow sediments likely deposited after dredging do not have visible NAPL except for two locations at 1 Field Street where NAPL was observed at depths shallower than 1 foot.

1.5.4. Soil COC Distribution

A small portion of the revised Site is within an upland on 34-40 Water Street. Some MGP residuals (coal tar) were observed at depths greater than 15 feet on the southernmost tip of 34-40 Water Street property beneath or adjacent to the bike path. The depth to DNAPL in a previous monitoring well was approximately 24 to 25 feet. Soil data were not collected at this depth interval but are expected to contain petroleum hydrocarbons and PAHs typical of MGP-related impacts. However, an evaluation of surficial soil was performed given the proximity of the bike path. Contaminants in upland shallow soil at 34-40 Water Street included PAHs, petroleum hydrocarbons, and metals. The contaminants detected were typical of urban fill and consistent with contaminants detected at the 34-40 Water Street property as part of numerous previous investigations by others. The results did not indicate that shallow soil was impacted by the former MGP.

1.5.5. Sediment COC Distribution

Contaminants were detected in sediment: 1) in the wetland and mudflat adjacent to the former MGP near Oakland Street where the release(s) likely historically occurred; 2) within the Powwow River both upstream and downstream of the mudflat; 3) and within a portion of the former Powwow River channel subsequently filled as part of construction of I-495.

- Wetland sediments: Shallow sediments in the wetland generally contained higher total PAH and benzo(a)pyrene concentrations compared to deeper sediments. In the wetland, MGP-related impacts were limited to the top 2.5 feet and were primarily within a narrow band parallel to and east of the wetland stream channel on the 33R, 35, and 37 Oakland Street properties. There was a sharp boundary to the east of the wetland stream channel, slightly into the upland, where PAH concentrations in sediment decreased significantly.
- Mudflat sediments: Shallow sediments in the mudflat generally contained higher total PAH and benzo(a)pyrene concentrations compared to deeper sediments. In the mudflat, MGP-related

impacts were limited to the top 2 feet and were primarily along and north of the mudflat stream channel on the 39 and 41 Oakland Street properties.

- River sediments: Shallow sediments in the river generally contained significantly lower total PAH and benzo(a)pyrene concentrations compared to deeper sediments. Sediment towards the edges of the river generally contained significantly lower total PAH concentrations (consistent with local conditions) compared to sediment in the channel at the center of the river. This was generally the case regardless of depth range. Deeper sediments up to 3,500 feet downstream of the mudflats, within the main Powwow River channel, and within the Commonwealth of Massachusetts tidelands generally contained significantly higher total PAH and benzo(a)pyrene concentrations. As described previously, a clay or dense silt layer was encountered beneath much of the affected sediment in the Powwow River channel and appears to be acting as a confining layer. In the downstream stretch of the Powwow River, overlying shallow sediment likely deposited after dredging were not significantly contaminated with PAHs.
- Former river channel sediments: Shallow sediments in the former river channel that was filled during I-495 construction contained significantly lower total PAH and benzo(a)pyrene concentrations compared to deeper sediments. Sediment within the filled portion of the former river channel (i.e., core 842) contained significantly higher total PAH concentrations compared to sediment towards the edge of the former river channel (i.e., core 838). Within the filled former river channel, the elevated PAHs and MGP-related impacts, such as sheen on sediments and staining, were observed from approximately 5 to 8 feet below the surface. The overlying shallow material was the "waste material" described in Section 3.1.2.5, which was backfilled as part of construction for I-495 and did not contain significant PAH concentrations and did not have visible MGP-related impacts.

1.5.6. Porewater COC Distribution

Sediment porewater in the river contained low levels of Site-related contaminants. The presence of contaminants in porewater coincided with depth intervals where similar contaminants were also detected in sediment. PAH concentrations in shallow porewater were 1 to 2 orders of magnitude lower than PAH concentrations in deeper porewater. PAH concentrations in deeper porewater were highest on 1 Field Street, 28 Oak Street, and 3 River Street where some of the highest total PAH concentrations in bulk sediment were also observed. PAH concentrations in deeper porewater decreased significantly farther downstream. VOCs, including benzene and naphthalene were detected in two sediment porewater samples, at 28 Oak Street and 21R River Street. VOC concentrations in the porewater samples were about four orders of magnitude below Method 1 GW-3 standards, which were developed to address the adverse ecological effects that could result from discharge of OHM to surface water (e.g., upward vertical migration of contaminants in porewater to surface water).

1.5.7. Surface Water COC Distribution

Based on the surface water analytical results, surface water within the Powwow River was not impacted by the MGP-related contaminants identified in sediment. No contaminants were detected above laboratory reporting limits in surface water samples collected from the Powwow River.

Surface water in the wetland had detections of low concentrations of PAHs, specifically at 35 and 37 Oakland Street. The surface water detections generally corresponded to locations with shallow visual observations of coal tar (i.e., within the area of the RAH condition). Detected concentrations of PAHs in wetland surface water were below available surface water quality criteria for the consumption of water and organisms. In addition, although not applicable to surface water in the Powwow River, detected concentrations of PAHs in wetland surface water were below GW-1 groundwater standards considered acceptable for COCs in drinking water.

1.5.8. Readily Apparent Harm

Per 310 CMR 40.0995(3)(b) readily apparent harm (RAH) is present when there is:

1. Visual evidence of stressed biota attributable to a site release.
2. The existence of OHM in surface water above Massachusetts Water Quality Standards (MWQS), which include USEPA Ambient Water Quality Criteria for constituents.
3. Presence of visible oil, tar or other non-aqueous phase hazardous material greater than 1,000 square feet within 1 foot of the surface in sediment; or greater than 2 acres within 3 feet of the ground surface in soil.

Based on our assessment of the extent of coal tar (NAPL) in the top 12 inches of sediment at the Site, GEI concluded that there is a condition representing RAH at the Site, particularly in the wetland on 35 Oakland Street and 37 Oakland Street and in the mudflat on 39 Oakland Street and 41 Oakland Street. Specifically, there is visible presence of tar over an area equal to or greater than 1,000 square feet in sediment within 1 foot of the sediment surface, which represents RAH (310 CMR 0995(3)(b)(1)(c)). A sheen on a sediment sample was considered an RAH condition if it was heavy and pervasive, suggesting the presence of tar. Slight or isolated sheen on sediments in the top 12 inches was not considered an RAH condition.

The presence of shallow coal tar in sediment representing an RAH condition is mostly limited to the wetland and Powwow River mudflats, however there are also two isolated locations downstream in the Powwow River channel at 1 Field Street where shallow coal tar in sediment representing an RAH condition was also observed. Although visible coal tar at 1 Field Street was generally not at the sediment surface, it was present at depths of 6 to 12 inches below the sediment surface.

1.5.9. Potential Exposure Pathways

Potential exposure pathways that were evaluated in the Supplemental Method 3 Risk Characterization include:

- Ingestion and dermal contact from sediment by a current and future resident, a current or future recreational visitor, a future construction worker, an emergency utility worker (in areas with existing utilities), and a current and future trespasser.
- Dermal contact and incidental ingestion of MGP waste deposits by a current and future resident, a future construction worker, and a current and future trespasser.

- Ingestion of and dermal contact with upland soil (34-40 Water Street) by a hypothetical current and future resident, a current or future recreational visitor, a future construction worker, an emergency utility worker (in areas with existing utilities), and a current and future trespasser.
- Ingestion of and dermal contact with wetland sediment and surface water by amphibians, birds, aquatic species, and benthic invertebrates.

There are no exposure pathways from surface water to potential users of the Site. No contaminants were detected above laboratory reporting limits in the Powwow River so the surface water in the river was not impacted by the MGP-related contaminants identified in sediment. Some contaminants were detected in surface water in the wetland but the concentrations were below water quality criteria for consumption of water and organisms.

There are no exposure pathways from groundwater to potential users of the Site. Groundwater is not pumped or used at the Site, nor pumped or used within 500 feet of the Site.

2. Site Location and Surrounding Land Use

2.1. Site Location and Description [40.0835(4)(a,b)]

The former Amesbury MGP is located near the intersection of Water and Chestnut Streets in Amesbury, Massachusetts (Fig. 1) at approximately 42°51'20" north latitude and 70°55'29" west longitude. The Universal Transverse Mercator (UTM) coordinates are 4,746,579mN and 342,740mE. As depicted in GEI's July 2009 Phase II/III Report, the Site originally included the National Grid property (39 Water Street), a portion of a City of Amesbury property (39A Water Street), and a small, subdivided wetland portion of a privately-owned property (33R Oakland Street) (Fig. 2). The Site was expanded in July 2015 to include a small upland portion of the abutting property at 34-40 Water Street after DNAPL as coal tar was encountered in a monitoring well (ESS-5; Fig. 2). Based on supplemental investigations performed between 2017 and 2024 (described in more detail in Section 4), the Site has expanded further to include 28 additional properties along the Powwow River, some upstream of the former MGP but most downstream of the former MGP. The portion of the Powwow River within the Site includes approximately 150 feet upstream and approximately 5,150 feet downstream, including a former channel of the Powwow River that was filled during the 1960s as part of the Interstate 495 construction (Fig. 2). The extent of the Site is summarized below and described in more detail in Section 7.9.

The Site now includes the former Amesbury MGP, downstream wetlands, mudflats, and portions of the main channel of the Powwow River, most of which is privately owned. Due to the freshwater influence and tidal nature of the Powwow River, property boundaries along the Powwow River extend to either:

- The thalweg of the river when the mean low water (MLW) line (defined as El. -2.84) is below the riverbed, which is the case for properties upstream of and including portions of 222 Main Street and 27 River Street (Fig. 2); or
- The MLW line when it is above the riverbed, which is the case for properties downstream from 222 Main Street and 27 River Street (Fig. 2). The portion of the Powwow River below MLW is tidelands owned by the Commonwealth of Massachusetts.

All elevations in this report are based on the National Geodetic Vertical Datum 1929 datum (NGVD29).

Properties now within the Site include single-family residential properties along Oakland Street and River Street; multi-family residential properties at 24 Oak Street and 32 Macy Street; commercial/industrial properties (and a children's daycare) at 34-40 Water Street, 7 Noel Street, and 58 Macy Street; an adult daycare facility at 8 Noel Street and a school at 222 Main Street; a portion of the Northbound and Southbound lanes of Interstate 495 (I-495); and a portion of the onramp connecting Route 110 (Macy Street) to I-495 Southbound. These and other properties surrounding the Site are shown in a Site plan in Fig. 2.

Although property uses vary within the Site, there are no buildings within the Site. As described above, the Site only includes undeveloped wetlands, mudflats, and portions of the main channel of the Powwow River. There are electric transmission lines with easements within the Site, including on most of

the properties on the western bank of the Powwow River; and there are sewer lines with easements within the Site at 1 Field Street.

Table 1-1 below summarizes the properties within the Site and their property use, although as described above there are no buildings within the Site.

Table 1-1. Land Uses of Properties within Site

Address (in order from upstream to downstream)	Property Use
34-40 Water Street	Industrial
1 Field Street	Undeveloped
39 Water Street	Undeveloped
39A Water Street	Undeveloped
33R Oakland Street	Residential
35 Oakland Street	Residential
37 Oakland Street	Residential
39 Oakland Street	Residential
41 Oakland Street	Residential
43 Oakland Street	Residential
4 Oakland Court	Residential
24 Oak Street	Residential
26 Oak Street	Undeveloped
28 Oak Street	Undeveloped
8 Noel Street	School
3 River Street	Residential
7 Noel Street	Commercial
7 River Street	Residential
11R River Street	Residential
38 Childs Avenue	Undeveloped
17R River Street	Residential
21R River Street	Residential
222 Main Street	School
23R River Street	Residential
27 River Street	Residential
33 River Street	Residential
50R Macy Street	Residential
32 Macy Street	Residential
51 River Street	Undeveloped
56 Macy Street	Residential
58 Macy Street	Commercial
Interstate I-495	Roadway

2.2. Surrounding Land Use

Most of the area surrounding the Site is commercial, industrial, or residential. The Site is abutted by the following properties or general land uses:

- To the north: Industrial and commercial buildings at 34-40 Water Street on the eastern side of the river and a residential neighborhood along Chase and Mill Streets on the western side of the river.
- To the east: A paved riverwalk (a former railroad) maintained by the City of Amesbury; residential neighborhood with primarily single-family homes along Oakland and Elm Streets; the Residences at Riverwalk at 1 River Court; another residential neighborhood with primarily single-family homes along River Court and River Street; and undeveloped land and a cemetery.
- To the south: Route 110 (Macy Street); a backwater of the Powwow River and associated wetlands; and other undeveloped land.
- To the west: Residential neighborhood with primarily single-family homes along Field Street; industrial and commercial buildings along Noel Street and Childs Avenue; a middle school building at 222 Main Street; and additional residences and commercial buildings along Route 110 (Macy Street).

2.3. Natural Resource Areas

Based on a review of the Massachusetts Geographic Information System (MassGIS) Natural Resources Map for the Site (Fig. 3), dated February 26, 2024, the environmental setting and potential sensitive receptors at and near the Site include:

- Residential Population: Because the Site is an urban area, GEI estimates greater than 1,000 residents live within ½ mile of the Site. The Site includes portions of residential properties; however, there are no residential (or other) buildings at the Site.
- On-Site Workers: There are no regular on-site workers.
- Institutions: There are no Institutions (as defined by the MCP; 310 CMR 40.0006) within 500 feet of the Site.
- Drinking Water Supplies: There are no known drinking water supplies (Zone II areas, Interim Wellhead Protection Areas, Zone A areas, Potentially Productive Aquifers, or private wells) or Sole Source Aquifers within 500 feet of the Site.
- Surface Waters and Wetlands: There are no certified vernal pools within a ½ mile radius of the Site. Vegetated wetlands, which are seasonally flooded, are present at the Site. The Site also includes a portion of the Powwow River. The Powwow River enters the Merrimack River about 3,000 feet from the southern portion of the Site.
- Fish Habitat: The Site includes a portion of the Powwow River. According to the Massachusetts Surface Water Quality Standards (314 CMR 4.00), the Powwow River (tidal portion) is designated

as a Class SB water and is a habitat for fish, other aquatic life, and wildlife and primary and secondary contact recreation. It is also designated as a restricted shell fishing area.

- Area of Critical Environmental Concern: According to the MassGIS map, the Site is not located in an Area of Critical Environmental Concern.
- Threatened or Endangered Species: According to the MassGIS map, there are no Natural Heritage and Endangered Species Program Estimated Habitats for Rare Wetlands Wildlife within 500 feet of the Site. According to the Massachusetts Natural Heritage Atlas, there are no priority habitats of rare species, estimated habitats of rare wildlife, or certified vernal pools within 500 feet of the Site.
- Protected Open Space: According to the MassGIS map, the Site is not Protected Open Space. However, there is Protected Open Space along the river at 38 Childs Avenue and 56 Macy Street. Although not Protected Open Space, a riverwalk maintained by the City of Amesbury runs along the northern boundary of the Site (on 34-40 Water Street) and a portion of the eastern boundary of the Site (on the Oakland Street and Oakland Court properties).

3. Site History [40.0835(4)(c)]

3.1. Site History

The history of the Site and surrounding area was developed using multiple sources and historical plans. Copies of historical plans are in Appendix C. Sources are referenced in Section 12.

3.1.1. Construction and Operation of the MGP

Amesbury Gas Company was incorporated in 1859. Throughout its existence it also operated as the Amesbury & Salisbury Gas Company and the Amesbury & Salisbury Gas Light Company. The initial MGP was constructed some time prior to 1890, and there is no evidence that it operated after January 1924. The two parcels on which the MGP were built (a portion of 34-40 Water Street, and 39 Water Street) were purchased by the Amesbury & Salisbury Gas Company in 1887 and 1900. A third parcel was purchased in 1913.

The first appearance of the Amesbury MGP in available reference plans was in an 1890 bird's eye view map of Amesbury that depicts a relatively small gasworks with a gasometer (Appendix C). The Amesbury MGP is not shown on the 1894 Sanborn Fire Insurance map (Sanborn map), although there is a note indicating there was about 175 feet to the [Amesbury] gas works at the end of Water Street. In the 1899 Sanborn map, the Amesbury gasworks is shown with an iron gasometer, a retort, a purifier, and MGP support buildings. The 1904 Sanborn map shows the Amesbury MGP expanded to include a second and new 110,000-cubic-foot holder below the top of the slope on 39 Water Street (Fig. 4). The first holder was depicted as a 32,000-cubic-foot brick gas holder in the 1904 and 1909 Sanborn maps although it was depicted as a 28,000-cubic-foot holder in the 1930 Sanborn map. No purifying structures were noted on the 1904 Sanborn map. No changes in the MGP were noted on the 1918 Sanborn map.

In 1924, when Haverhill Gas Light Company acquired a portion of the Amesbury MGP property, the property was connected to the Haverhill Gas Light Company gas distribution system by a high-pressure line. The 1930 Sanborn map shows the two iron gas holders labeled "not used." Most of the MGP structures were absent in the 1945 and 1958 Sanborn maps except a former MGP support building used to house a gas regulator, which occupied the northeastern corner of the National Grid property at 39 Water Street until 2005 when it was demolished.

The earliest information indicates that gas production at the Amesbury MGP was 5 million cubic feet (MMCF) of water gas in 1890, with production growing to 6, 10, and 20 MMCF in 1900, 1910, and 1920, respectively. The Amesbury MGP used the Lowe, Granger, Lowe Granger, and Tenney & Lowe processes to manufacture gas.

3.1.2. History Along the Lower Powwow River and Surrounding Area

3.1.2.1. Textile Mills and Carriage Factories (Late 1800s)

According to an 1872 map depicting the Amesbury and Salisbury mills, the area upstream of the Site was largely developed with several mill and manufacturing buildings. The largest were the textile making Salisbury Manufacturing Company (later the Hamilton Woolen Mill) to the north and west along Mill and Clay Streets; and the carriage manufacturing Cadieu & Biddle factory (later Biddle & Smart factory) to the north and east along Water Street (Appendix C). Near the Salisbury Manufacturing Company was the "Gas Works" at the corner of Mill and Currier Streets. This was a different MGP unaffiliated with the Amesbury MGP that is the subject of this report. The Boston and Maine Railroad Salisbury Branch (now the riverwalk) was to the east of the Site and beyond that were several streets with a mixture of businesses and residences. The area later occupied by the Amesbury MGP (not yet shown in 1872) on Water Street and areas downstream were largely undeveloped.

According to the 1885 Sanborn map, the area upstream of the Site appeared generally similar as in 1872 with many carriage manufacturing buildings (Appendix C). The Hamilton Woolen Company occupied mill buildings on both sides of the river upstream of the Site. The Biddle & Smart factory expanded to the 34-40 Water Street property. The area later occupied by the former Amesbury MGP (not yet shown in 1885) on Water Street and areas downstream were still largely undeveloped.

According to the 1889 Sanborn map and an 1890 bird's eye view map, the Hamilton Woolen Company and Biddle & Smart factory still occupied much of the area upstream of the Site (Appendix C). There was a very large coal bin constructed at the 34-40 Water Street property according to the 1889 Sanborn map. In the 1889 Sanborn map, the "Gas Works" (labeled as closed) was shown with its gas house with retorts and purifier along with a large gasometer (gas holder). A 5-inch diameter water pipe from a penstock, possibly to supply process water to the "Gas Works", is shown leading from the Powwow River to the gas house at the "Gas Works". The downstream Amesbury MGP on Water Street is shown on the 1890 map, but areas downstream were still largely undeveloped, although there was a carriage factory and leather company at 24 Oak Street. A small electric light plant was also being built at 24 Oak Street. The remainder of the downstream area was either undeveloped or farmland with some residences according to the 1890 map.

According to the 1894 and 1899 Sanborn maps, the Hamilton Woolen Company and Biddle & Smart factory still occupied much of the area upstream of the Site (Appendix C). There were large tenement buildings off Mill Street near Chase and Clay Streets that were associated with the Hamilton Woolen Company. The "Gas Works" (labeled as not used) was still shown with its gas house and gasometer. Alongside the Biddle & Smart factory (called Hassett & Hodge factory in 1899) was a large shoe factory (called A.N. Perry in 1894 and Chas. D. Pecker & Co. in 1899) at 34-40 Water Street. The areas downstream of the Amesbury MGP (now shown on the 1894 and 1899 Sanborn maps) were still largely undeveloped, although there were two carriage factories at 24 Oak Street. The small electric light plant (Amesbury Electric Light and Power) was completed at 24 Oak Street.

3.1.2.2. Powwow River Dredging (Late 1890s and Early 1900s)

There has been one reported dredging operation associated with the Powwow River, in the late 1800s and early 1900s. In 1885, the U.S. Army Corps of Engineers studied a proposed Powwow River dredging project that would support the manufacturing business in Amesbury. The proposed dredging plan spanned almost the entire Powwow River tidewater in downtown Amesbury from upstream of the Back River down to the confluence with the Merrimack River, according to a map showing proposed improvements dated January 24, 1885, and prepared by the U.S. Engineer Office, Corps of Engineers (Appendix C). The depth of the proposed dredge was 12 feet deep at MHW and the channel was to be 60 feet wide at bottom (Fig. 5). This depth corresponds to approximately El. -8 based on the current MHW of El. 4.8. The side slopes were to be 4-horizontal to 1-vertical (4H:1V), which was reportedly the observed slope of the banks of the then-existing channel. The estimated cost for this dredging alternative was $77,000.

According to the Amesbury Daily News, contractor bids for the dredging were opened on October 4, 1894. Only $30,000 was appropriated by Congress for the contract and it was reported that the river channel dredge cut would only be 25 feet wide. The contract completion date was set as December 31, 1895. Dredging likely began in the summer of 1895 according to the Amesbury Daily News, which provided a schedule update in March 1895.

The dredging operations were significantly extended in time to 1900, and apparently also in scope to a channel cut of at least 45 feet wide based on progress drawings from 1896 and 1899 prepared by the Corps of Engineers and obtained from the National Archives Map Division (Appendix C) and based on another update by the Amesbury Daily News in 1900. By 1896, it appears the full length of the river had been dredged to a width of 30 feet at bottom, and that on the lower reach on the west side of the river (from about the current river bypass down to the mouth of the river at the confluence with the Merrimack River), there was another 15 feet width remaining to be dredged. By 1899, it appears that the river had been dredged to a width of 45 feet at bottom (from upstream of the Back River down to about 58 Macy Street), and that on the lower reach of the west side of the river (from about 58 Macy Street to what is now I-495), there were still another 15 feet width remaining to be dredged.

According to the Amesbury Daily News, dredging operations in the Powwow River ceased in November 1900. At that time, the Powwow River was reported to be navigable from Biddle's Wharf (at the confluence of the Back River and Powwow River, just upstream of the Amesbury MGP) to within 450 feet of the confluence with the Merrimack River. Due to lack of congressional funding, the final 450 feet of the Powwow River was not dredged at that time. The channel depth was 12 feet at MHW for the whole length of the Powwow River except that final stretch to the Merrimack River. The final footprint of the dredge as of 1899 is shown in Fig. 5. According to the Amesbury Carriage Museum, the dredging in that final stretch was ultimately completed (year unknown) since there were subsequent reports of shipping along the river. For example, by 1909 the main commodity shipped up the Powwow River was reportedly coal. However, the depth of dredge in the final stretch was not documented.

3.1.2.3. Textile Mills and Carriage Factories (Early 1900s)

According to the 1904 and 1909 Sanborn maps and a 1910 bird's eye view map by Hamilton Woolen, the Hamilton Woolen Company and Biddle & Smart factory still occupied much of the area upstream of the

Site (Appendix C). The tenement buildings off Mill Street near Chase and Clay Streets were still present. The "Gas Works" (labeled as not used) was still shown with its gas house and gasometer. Near the tenements at the end of Mill Street was a very large coal pile with two trestles overhead that led to a coal hoist at the edge of the Powwow River. It is likely that barges docked in the Powwow River at the coal hoist to deliver their coal loads.

The Hassett & Hodge factory was still present at 34-40 Water Street and next to it the shoe factory was replaced by a carriage factory (Miller Brothers) and a wheel manufacturer (Carr Prescott Co. in 1904 and Merrimack Wheel Company in 1909). A new building appeared in 1909 at 33-39 Oakland Street, an automobile lamp manufacturer (Gray & Davis). The areas downstream of the Amesbury MGP at Water Street were still largely undeveloped, although there were still two carriage or automobile factories at 24 Oak Street. The small electric light plant (Amesbury Electric Light and Power) was still present at 24 Oak Street and beside it and immediately upstream (in 1904 only) was a large coal pile with a platform adjacent to the railroad tracks.

A 1914 bird's eye view map shows various mill and manufacturing buildings where they had been before (Appendix C). The areas downstream of the factories at 24 Oak Street were almost entirely undeveloped except for some residences.

According to information obtained from the Amesbury Carriage Museum, the textile mills largely went out of business in the 1910s, after which the buildings either sat vacant or were converted to retail or other businesses.

3.1.2.4. Other Industrial Activities (1920s to 1960s)

Various other industry (including carriage and later automobile parts manufacturing) continued throughout the 1900s. This industry included, but was not limited to:

- Brass foundry (1915 to 1920) and steam laundry (1930 to 1945) at 33 Mill Street.
- Plating, woodworking, metal machining, plastics manufacturing, shoe factory, and municipal operations at 25 to 31 Water Street (1920s to 1960s).
- Automobile body manufacturing, foundry operations, municipal and industrial landfill operations at 34-40 Water Street.
- Metal fabrication and later residential at 33-39 Oakland Street.
- Furniture making and later residential at 24 Oak Street.

3.1.2.5. Highway Construction (1960s)

The Powwow River was reconfigured in the mid-1960s as part of the construction of Interstate I-495 (Appendix C). A large river meander just upstream of the confluence with the Merrimack River was bypassed with a narrow manmade artificial channel that ran below the highway (Fig. 5). The cutoff river meander was partially filled to construct the southbound onramp of the highway. A portion of the original Powwow River meander still exists to the south of the highway, as a backwater that floods with the daily tides (Fig. 5).

The cutoff was constructed using a rock fill dike, which at its top was 20 feet wide. Behind the dike, the river meander was filled to sea level with "waste material" according to Massachusetts Department of Transportation records. The source of the waste material is unknown but may have been soil excavated as part of the highway project, such as soil from beneath the onramp or main highway. A narrow channel was constructed alongside the rock fill dike to drain the river meander and associated wetlands.

The artificial channel for the Powwow River relocation was also constructed with rock fill. The rock fill was used along the slopes of the channel. The channel is approximately 1,500 feet long, travels under Route 110 (Macy Street) and Interstate I-495 before rejoining the original Powwow River just upstream of the confluence with the Merrimack River (Fig. 5).

3.2. Chapter 91 Licensing Review

GEI reviewed MassDEP Chapter 91 licenses and plans provided by the MassDEP Waterways Bureau to understand if alterations have been made to the Powwow River that have a significant impact to the river configuration or that included the addition or removal of material or sediment that could affect contaminant conditions.

The Powwow River has been subject to at least 26 Chapter 91 licenses related to various structures in the tidelands or waterway. The locations of alterations are shown in Fig. 6. Several individual licenses reference a number of MHW or MLW elevations on various survey datums that were often not well defined. The MHW and MLW elevations presented in Fig. 6 were not relied upon by GEI in this report but were provided in Fig. 6 for completeness.

- Six of the licenses were for land near the confluence of the Powwow River with the Merrimack River and not within the Site. The licenses were between 1891 and 1978 and were related to utility or bridge construction across the Powwow River or wharf construction (Alliance Park).
- Five of the licenses were related to constructing transmission lines across the river. The licenses were issued between 1940 and 1959. The supports for the transmission lines were on land and not within the river channel. Specifically, transmission lines were constructed over the river from 24 and 26 Oak Street to 5 Field Street (1940); over the river from Mill Street to 31 Water Street (1949); and over the river from near 33 River Street to 50 Macy Street and from 24 and 26 Oak Street to 5 Field Street (1959).
- One of the licenses was related to constructing a two-barrel sewer siphon in 1976. This 185-foot siphon, consisting of a 16-inch pipe and a 12-inch pipe, runs under and across the Powwow River from 1 Field Street to 39 Water Street. The inlet structure is on the bank of the river on 39 Water Street and the outlet structure is near the bank of the river on 1 Field Street. Both structures are still visible today.
- One of the licenses was issued in 1989 and was related to reconstructing and maintaining the bridge at County Road across the Back River, near the intersection with Chestnut Street. The license noted that 570 cubic yards of sediment were planned to be dredged as part of the reconstruction project.

- Two of the licenses were related to the Hamilton Woolen factory on Mill Street, upstream of the Back River. One license in 1903 was to build a pile wharf, pile fender, and bulkhead into the Powwow River, and to fill behind the structures with solids (identified as "ashes and cinders"). The other license in 1916 was to construct a trestle drawbridge across the river over to near 21 Water Street, and to use "earth fill" behind the two concrete bridge abutments.
- One of the licenses was related to constructing a wood bulkhead in 1969 in the Powwow River and Back River at the City of Amesbury's Heritage Park at 31 Water Street.
- One of the licenses was related to excavating lead-contaminated soil primarily above MHW at 34-40 Water Street, formerly Bartley Machine (refer to Section 3.3.3 for additional information).

Based on the alterations made in the tidelands or waterway of the Powwow River, there are some activities that likely affected conditions in the river. Most notably, the addition of material upstream of the Site at the former Hamilton Woolen factory where ash and cinders were used as fill to construct land behind piers and wharves, and other material of unknown origin was used as fill behind bridge abutments. In addition, there is the active sewer line that runs under and across the Powwow River from 1 Field Street to 39 Water Street.

3.3. Nearby MassDEP Disposal Sites

GEI reviewed MassDEP disposal sites nearby the Site that could affect contaminant conditions in the river and Site. GEI evaluated MassDEP disposal sites within approximately 1/8-mile from the Site that also appeared to be within the stormwater catchment area for the Powwow River (Fig. 7). GEI identified 15 MassDEP disposal sites with 28 unique RTNs that warranted additional review (Fig. 8). A comprehensive summary of these nearby disposal sites is in Appendix D. GEI concluded that five of these disposal sites have the most potential to affect conditions within the river and Site. These five sites are summarized below, and additional information is in Appendix D.

3.3.1. Contaminated Fill, 25 Water Street (RTN 3-31886)

The site at 25 Water Street (RTN 3-31886) is on the east side of the Powwow River. As part of subsurface investigations performed at the site in 2013 by Higgins Environmental Associates, Inc. of Amesbury, Massachusetts (HEA), PAHs, arsenic, chromium, and lead were detected in shallow soil. HEA indicated the presence of anthropogenic materials (coal/ash, brick, clinkers, glass) in fill material.

Between June and September 2014, the top foot of soil at the site was excavated except for a 10-foot setback area along the Powwow River. Deeper samples in native soil contained lower metal concentrations than the overlying soil. HEA previously evaluated sediment and surface water conditions in the Powwow River adjacent to the site during investigations for a separate RTN (3-19634). Although HEA's analysis of river sediments only included a subset of metals identified in site soil, HEA concluded that sediment impacts were widespread in the Powwow River and could not be attributed to the site.

In March 2018, TRC Companies of Lowell, Massachusetts completed a Method 2 Risk Characterization and concluded that a condition of No Significant Risk existed. The site was closed with a Permanent Solution Statement with Conditions (no Activity and Use Limitation [AUL]).

Based on the potential for the contaminants in surface soil at the site to have migrated via surface runoff to the Powwow River and because this site is upstream from the Site, there is potential that PAH and metal contamination has affected sediment conditions in the Powwow River and the Site.

3.3.2. Former Amesbury Department of Public Works Facility, 31 Water Street (RTNs 3-19634 and 3-31842)

The former Amesbury Department of Public Works facility was at 31 Water Street and on the east side of the Powwow River (Fig. 8). The site is associated with a polychlorinated biphenyl (PCB) cleanup performed by the U.S. Environmental Protection Agency (EPA) in 2014-2015. PCBs were attributed by others to fill of unknown origin used as backfill in the 1960s during restoration of the bulkhead along the Back and Powwow Rivers. EPA removed the soil behind the bulkhead to depths ranging from 2 and 8 feet deep and removed limited sediment in front of the bulkhead. There is uncertainty regarding the location of the full extent of PCBs in sediment, and whether all PCBs from this site, including PCBs in the Powwow River, were remediated as part of EPA's removal efforts.

Based on the nature of contaminants in sediment and that this site is upstream of the Site, there is potential that PCB contamination in the sediment has affected conditions downstream in the Powwow River and at the Site.

3.3.3. Former Bartley Machine & Manufacturing, Inc., 34-40 Water Street (RTNs 3-04108 and 3-20198)

The former Bartley Machine & Manufacturing, Inc. facility was at 34-40 Water Street and on the east side of the Powwow River (Fig. 8). The site was used for manufacturing since at least the late 1800s, including carriage manufacturing, wheel manufacturing, auto body manufacturing, and foundry operations. The site was also the location of several structures and operations associated with the former Amesbury MGP (Fig. 4).

Portions of the site were historically used as landfills (both industrial and municipal). A former owner of the Bartley property, Bailey Company, used a portion of the 34-40 Water Street property adjacent to the Powwow River as an industrial landfill beginning in the late 1940s and ending in the early 1960s (Fig. 4). Fill material included household trash, discarded formed steel, felt material, and rubber. The filling on the 34-40 Water Street property extended up to the northern boundary of the National Grid property (39 Water Street). The fill material may extend approximately 50 feet onto the northern portion of the National Grid property. The Town of Amesbury landfill also operated approximately from the time the former Amesbury MGP ceased operations in 1924 until 1952. The Amesbury landfill was located north of the Bailey landfill (Fig. 4). The Amesbury landfill reportedly received brick, sand, ash, metal scrap, and other general debris. Even after 1952, the town reportedly continued to bring in gravel fill and grade the area on an annual basis through the late 1970s.

Elevated concentrations of lead (as high as 150,000 milligrams per kilogram [mg/kg]) were identified in soil and sediment along the banks of the Powwow River in 1998. In 2002, the area of lead-impacted soil, including some sediment below MHW, was excavated and removed from the site by HEA as part of a

Phase IV RIP. There is uncertainty regarding whether the full extent of lead in Powwow River sediment was remediated as part of HEA's removal efforts.

The MGP holder at 34-40 Water Street was addressed in 2004 and 2005 and consisted of diffusing ozone in recirculated tank water to degrade MGP contaminants in soil within the tank. HEA concluded that treatment of soil outside the holder was not necessary because impacts were at depth only (greater than 15 feet) and isolated. HEA submitted a Class A-4 Response Action Outcome (RAO; now referred to as a Permanent Solution Statement) with AUL in 2009 to achieve a Permanent Solution. During investigations by GEI in 2015 prior to Phase IV activities at the former Amesbury MGP at 39 Water Street, GEI identified DNAPL as coal tar in a monitoring well (ESS-5; Fig. 2) at 34-40 Water Street, which prompted GEI to expand the Site boundary for RTN 3-24070 to include a small sliver of 34-40 Water Street (Fig. 2). As part of subsequent evaluations and as documented in Phase IV Status Report No. 2, dated February 1, 2018, GEI concluded that continued active recovery of DNAPL at the Site was no longer warranted.

Based on the nature of contaminants in sediment and because this site is upstream as well as adjacent to the Site, there is potential that lead and possibly other contamination, including from the former landfills, has affected conditions in the Powwow River and the Site.

3.3.4. Former Amesbury Metal Products Corporation, 33-39 Oakland Street (RTNs 3-13096 and 3-34747)

The former Amesbury Metal Products Corporation was at 33-39 Oakland Street and on the east side of the Powwow River (Fig. 8). The former Amesbury Metal Products Corporation (or predecessor companies) fabricated metals from the late 1800s until around 1995. Numerous tanks containing chlorinated solvents and petroleum products were removed in 1995 prior to demolition. VOCs, heavy metals, and cyanide were identified in soil and groundwater in the western portion of the site, with trichloroethylene (TCE) concentrations in both soil and groundwater exceeding Upper Concentration Limits (now referred to Method 3 Ceiling Limits). MassDEP issued RTN 3-13096 to the release. Surface water from a flooded area adjacent to the Powwow River also contained chlorinated VOCs but Haley & Aldrich indicated at the time that they did not have enough information to determine whether VOCs detected in the surface water samples were attributable to the site.

Remedial activities were performed in 1996 and 1997. In 1997, Haley & Aldrich performed a Method 3 Risk Characterization and concluded there was No Significant Risk to human health, public welfare, safety, and the environment with the implementation of an AUL on rear portions of the parcels at 35 and 37 Oakland Street. The AUL permitted passive recreation, gardening and landscaping, and short-term deeper excavations.

Follow up sampling was performed in 1997 and 1999, both by Haley & Aldrich at the request of the City of Amesbury, and by MassDEP to support a Notice of Audit Finding (NOAF) and Notice of Noncompliance (NON) they subsequently issued in 2000. Haley & Aldrich reviewed the results and concluded that VOC concentrations had reduced over time, further supporting their conclusions that a condition of No Significant Risk had been achieved at the site.

Based on the potential for VOCs to have migrated to surface water in the Powwow River and because this site is adjacent to the Site, there is potential that VOCs related to this site have affected conditions in the Powwow River and the Site.

As part of Phase II investigations for the Amesbury Former MGP Site (RTN 3-24070), chlorinated VOCs have been detected in sediments, likely attributable to this upgradient site at 33-39 Oakland Street (refer to Section 8.2).

3.3.5. Former Nathan Hale Furniture Company, 2 River Street and 24 Oak Street (RTN 3-23167)

The former Nathan Hale Furniture Company was located at 2 River Street (sometimes referred to as 24 Oak Street) and on the east side of the Powwow River (Fig. 8). Soil contained chlorinated VOCs in an isolated and shallow area, which was reported to MassDEP who assigned RTN 3-23167 to the release. Soil was removed and post-excavation samples contained several PAHs, petroleum hydrocarbons, and heavy metals (e.g., arsenic, beryllium, copper, and lead). ATC Associates of Woburn, Massachusetts attributed the PAHs and metals in soil to coal and coal ash and concluded that those contaminants were exempt from reporting to MassDEP.

Based on the proximity of sediment to the riverbank and the presence of contamination in riverbank soil, it is possible the contaminants in surface soil at the site have migrated via surface runoff to the Powwow River. This site is adjacent to the Site and there is potential that PAH and metal contamination has affected conditions in the Powwow River and the Site.

4. Original Phase II Investigations and Phase IV Remedy at Former Amesbury MGP (RTN 3-24070)

4.1. 2007-2009 Phase II Investigations

GEI performed original Phase II field investigations at the former Amesbury MGP between 2007 and 2009. A comprehensive summary of these investigations was provided in GEI's Phase II/III Report submitted to MassDEP on August 5, 2009. The Phase II field investigations were conducted on the National Grid property at 39 Water Street and two adjacent properties at 39A Water Street and 33R Oakland Street. Phase II investigations included advancing soil borings, installing groundwater monitoring wells, and collecting soil, groundwater, sediment, and surface water samples.

Contaminants likely related, in part, to the historical use of the Site as a former MGP affected soil, groundwater, sediment, and surface water at the Site. Contaminants identified at the Site in the 2009 Phase II/III Report included BTEX compounds, chlorinated VOCs, PAHs, petroleum hydrocarbons, cyanide, arsenic, lead, and to a lesser extent, other metals. DNAPL as coal tar is also present.

The Phase II/III Report presented the findings of the Phase II investigation; the results of the Method 3 Risk Characterization; a detailed evaluation of Remedial Action Alternatives (RAAs) that would address the remedial objectives identified based on the results of the Method 3 Risk Characterization; and the selected RAA. In the 2009 Phase II/III Report, GEI recommended implementation of a remedy consisting of capping of the existing wetland and replicating it at an off-site location, excavating sediment from the Powwow River, removing DNAPL from wells, and implementing institutional controls.

4.2. 2016-2017 Phase IV Remedy

Following submission of the Phase II/III Report in 2009, additional consideration of federal and state wetland mitigation requirements and further analysis of data collected at the Site resulted in some modifications to the selected remedy. On October 18, 2016, GEI submitted a Phase III RAP Addendum and Phase IV RIP on behalf of National Grid. The revised alternative eliminated the wetland cap and off-site wetland replication in lieu of excavation and on-site wetland restoration.

Phase IV remediation activities began in October 2016 and were completed in June 2017. The Phase IV remediation included excavating wetland soil and a small portion of upland soil to a depth of approximately 3 feet, dredging sediment at the edge of the Powwow River to a depth of approximately 1 foot, transporting the soil and sediment off site for treatment or disposal, decommissioning of monitoring wells, backfilling, and restoring the wetlands. Phase IV remediation activities and response actions were performed at the National Grid property (39 Water Street), the City of Amesbury property (39A Water Street), and a small, subdivided portion of a privately owned property (33R Oakland Street). The extent of the Phase IV remediation activities completed in 2016-2017 is shown in Fig. 2.

DNAPL recovery, as warranted, was also part of the designed Phase IV remedy. However, GEI completed a DNAPL recoverability evaluation for the Site. Based on this evaluation and our understanding of DNAPL

conditions at the Site, GEI concluded that additional DNAPL monitoring and recovery at the Site was no longer necessary. The basis for this conclusion was included in Phase IV Status Report No. 2 submitted to MassDEP on February 2, 2018.

In April 2017, during Phase IV activities, previously unknown coal tar impacted soil was discovered while installing coir logs on the southeastern boundary of the work area, specifically at the edge the small, subdivided portion of the privately owned property (33R Oakland Street; Fig. 2). This area was beyond the designed and permitted limit of Phase IV work. Additional assessment of this area and other affected areas, including the Powwow River channel, mudflats, tidelands, and other areas were subsequently performed and documented in Phase IV Status Reports submitted to MassDEP between 2017 and 2024. A comprehensive summary of this additional assessment is provided in Section 5 of this Supplemental Phase II CSA Report.

5. Supplemental Phase II Investigations [40.0835(4)(d)]

GEI performed investigations at the Site between April 2017 and September 2024 on behalf of National Grid for this Supplemental Phase II CSA Report. The objectives of the investigations were to delineate the extent of MGP impacts within the wetlands, mudflats, and Powwow River channel beyond the limits of the original Site boundary; evaluate whether various migration pathways existed and could contribute to movement of contaminants; evaluate potential human health and ecological risks; and support future remediation permitting and design.

The supplemental Phase II CSA investigations included:

- Hand excavating test pits;
- Advancing sediment cores;
- Advancing sediment probes;
- Temporary piezometer installation;
- Sampling and testing wetland soil, sediment, sediment porewater, NAPL, and surface water;
- Performing an ebullition survey;
- Measuring vertical hydraulic gradient;
- NAPL and sediment mobility evaluations; and
- Performing bathymetric and land surveys.

A summary of the test pit and sediment core investigations is in Table 1. Copies of test pit and sediment core logs are in Appendices E and F, respectively. Figs. 9 and 10 show bathymetric surveys of the river performed in 2019, 2020, and 2024. Figs. 11 and 12 show locations of test pits, sediment cores, and surface water sampling locations. Visual observations at each test pit and sediment core location are summarized in Table 1. Chemical data is summarized in Tables 2 through 10. Laboratory data reports are in Appendices G through K.

Investigations were performed for the Site in the wetland on 33R Oakland Street, 35 Oakland Street, and 37 Oakland Street (Section 5.1); in the mudflats on 39 Oakland Street, 41 Oakland Street, 43 Oakland Street, and 4 Oakland Court (Section 5.2); within the Powwow River from upstream of the confluence with the Back River down to the backwater south of Interstate I-495 (Section 5.3); in an upland area on 34-40 Water Street (Section 5.4); and within the former river channel north of Interstate I-495 (Section 5.5).

5.1. Soil and Sediment Sampling

5.1.1. Former MGP Footprint (34-40 and 39 Water Street)

In November 2023, GEI hand-excavated five test pits (HA101 through HA105; Fig. 11) to depths between 1 and 3 feet in an upland portion of 34-40 Water Street near the former MGP footprint. During the investigation, GEI logged the lithology and physical observations of environmental impacts in each test pit (i.e., visual/olfactory evidence of contamination, if any). A total of 5 samples were analyzed for volatile petroleum hydrocarbons (VPH), extractable petroleum hydrocarbons (EPH), semi-volatile organic compounds (SVOCs), Resource Conservation and Recovery Act (RCRA) 8 metals, and physiologically available cyanide (PACN).

Visual observations at each test pit location are summarized in Table 1. Chemical data is summarized in Table 8. The laboratory data report is in Appendix J.

The results of the testing are discussed in Section 8.

No other supplemental Phase II CSA investigations were performed within the footprint of the former MGP or within the original Site boundary.

5.1.2. Wetland (Oakland Street)

Between April 2017 and September 2024, GEI hand excavated 129 test pits in the wetland on 33R Oakland Street, 35 Oakland Street, and 37 Oakland Street (1 through 7, 9 and 10, 12 through 14, 14B, 15 through 20, 24 through 31, 101 through 158, SS601 through SS618, SS608R through SS611R, SS625 through SS630, 793 through 795, 807 through 811, 839, 840, 883, 883R, and 890 through 893; Fig. 12). In March and July 2020, GEI observed TG&B Marine Services, Inc. (TG&B) of Monument Beach, Massachusetts advance four sediment cores in the wetland and mudflat on 37 Oakland Street (760, 791, 792, 796; Figs. 11 and 12). Test pits were hand excavated by GEI using hand tools and ranged in depth from approximately 1 to 3 feet. Sediment cores were advanced by TG&B using vibracore methods with the rig staged on a 14-foot catamaran-style boat by connecting two jon boats together via a steel A-frame and a sampling winch. TG&B used a 2 5/8-inch inner diameter core barrel with plastic liners to retain the sediment samples. Sediment cores ranged in depth from approximately 7 to 9.5 feet. During investigations, GEI logged the lithology and physical observations of environmental impacts (i.e., visual/olfactory evidence of contamination, if any).

Wetland soil and/or sediment samples were collected from 37 locations and submitted to ESS Laboratory of Cranston, Rhode Island (ESS) for laboratory analysis of PAHs and typically total organic carbon (TOC). At select locations, laboratory analyses of other parameters were performed for various objectives and are listed in Tables 2 and 9.

Visual observations at each investigation location are summarized in Table 1 and shown in Figs. 13 and 14. Chemical data is summarized in Table 2 (sediment data in all locations), Table 3 (sediment data in wetland only), and Table 9 (sediment disposal characterization data). Laboratory data reports are in Appendices G and H.

The results of the testing are discussed in Section 8.

5.1.3. Mudflats (Oakland Street)

Between August 2018 and July 2020, GEI hand excavated 15 test pits (159 through 162, 166 through 169, SS631 through SS635, SS637, and SS640; Fig. 12); and observed TG&B advance 21 sediment cores (664 through 672, 685, 686, 716 through 722, 746, 761, and 797; Figs. 11 and 12) in the mudflats on 39 Oakland Street, 41 Oakland Street, 43 Oakland Street, and 4 Oakland Court. Test pits by GEI ranged in depth from approximately 0.5 to 3 feet. Sediment cores by TG&B ranged in depth from approximately 3 to 10 feet. During investigations, GEI logged the lithology and physical observations of environmental impacts (i.e., visual/olfactory evidence of contamination, if any).

Sediment samples were collected from 30 locations and submitted to ESS for laboratory analysis of PAHs and typically TOC. At select locations, laboratory analyses of other parameters were performed for various objectives and are listed in Tables 2 and 9.

Visual observations at each investigation location are summarized in Table 1 and shown in Figs. 13 and 14. Chemical data is summarized in Table 2 (sediment data in all locations), Table 4 (sediment data in mudflat only), and Table 9 (sediment disposal characterization data). Laboratory data reports are in Appendices G and H.

The results of the testing are discussed in Section 8.

5.1.4. Powwow River

Between September 2019 and July 2024, GEI hand excavated 29 test pits (163 through 165, SS636, SS638, SS639, and SS641 through SS663; Figs. 11 and 12); and observed TG&B advance 189 sediment cores (673 through 684, 680R, 687 through 715, 692R, 723 through 745, 747 through 759, 762 through 790, 798 through 806, 812 through 836, 843 through 882, and 884 through 889; Figs. 11 and 12) within the Powwow River. Test pits by GEI were advanced to approximately 0.5 feet. Sediment cores by TG&B ranged in depth from approximately 1 to 11.2 feet. During investigations, GEI logged the lithology and physical observations of environmental impacts (i.e., visual/olfactory evidence of contamination, if any).

Sediment samples were collected from 164 locations and submitted to ESS for laboratory analysis of PAHs and typically TOC. At select locations, laboratory analyses of other parameters were performed for various objectives and are listed in Tables 2 and 9.

Visual observations at each investigation location are summarized in Table 1 and shown in Figs. 13 and 14. Chemical data is summarized in Table 2 (sediment data in all locations), Table 5 (sediment data in river only), and Table 9 (sediment disposal characterization data). Laboratory data reports are in Appendices G and H.

As further described in Section 6.3.4, ash and coal were pervasive in sediment in the river at the Site. This was visually observed by GEI and recorded on sediment core logs in Appendix F. In addition, quantitative microscopic analysis was performed on select samples at the upstream river Site boundary to quantifiably verify the presence of this debris. GEI submitted shallow sediment samples from

cores 859, 888, and 889 to MicroVision Laboratories of Chelmsford, Massachusetts (MicroVision) for microscopic analysis. MicroVision analyzed the samples using polarized light microscopy (PLM) followed by scanning electron microscopy (SEM) / energy dispersive X-ray spectroscopy (EDS) for coal, coal ash, and asphalt analysis. The laboratory report is in Appendix G.

The results of the testing are discussed in Section 8.

5.1.5. Former Powwow River Channel

In June and August 2023, GEI observed TG&B advance four sediment cores (837, 838, 841 and 842; Fig. 11) within the former Powwow River channel. As described in Section 3.1.2.5, the Powwow River was reconfigured in the mid-1960s as part of the construction of Interstate I-495. A segment of the river was filled and is now primarily wetland. These four sediment cores were advanced to evaluate conditions in the filled-in former channel. Sediment cores were advanced to depths between approximately 8 and 15 feet using vibracore methods. During investigations, GEI logged the lithology and physical observations of environmental impacts in each sediment core (i.e., visual/olfactory evidence of contamination, if any).

Samples from each core location were submitted to ESS for laboratory analysis of PAHs and TOC.

Visual observations at each sediment core location are summarized in Table 1 and shown in Figs. 13 and 14. Chemical data is summarized in Table 2 (sediment data in all locations) and Table 6 (sediment data in former river channel only). Laboratory data reports are in Appendix G.

The results of the testing are discussed in Section 8.

5.2. Sediment Porewater Sampling

GEI collected samples to evaluate the bioavailability of PAHs and VOCs through sediment porewater. The purpose of this evaluation was to understand whether freely dissolved PAHs and VOCs are available to migrate vertically in the presence of a vertical hydraulic gradient, as this could represent a potential migration pathway even in the absence of any physical disturbance of sediment.

Sample collection and sample processing are described below in Sections 5.2.1 and 5.2.2. The conclusions of this evaluation as they relate to potential migration in porewater via upward vertical migration are discussed in Section 7.3 and as they relate to the nature and extent of contamination in porewater are discussed in Section 8.5. Chemical data is summarized in Table 7.

5.2.1. Solid Phase Micro Extraction for Indirect Porewater Evaluation of PAHs

In August 2023, GEI collected 14 bulk sediment samples from seven sediment core locations (843, 844, 846, 851, 852, 853, and 854; Fig. 11). For each of the seven sediment cores, a sediment sample was collected from the interval with the highest indicators of hydrocarbon impact (NAPL, sheening, discoloration, or odor). A paired sample was collected from the 0- to 0.5-foot interval to represent overlying surficial exposures. The bulk sediment samples were submitted to SiREM of Guelph, Ontario (SiREM) for porewater analysis. Freely dissolved PAHs were measured using Solid Phase Micro Extraction

(SPME) using passive SP3™ samplers. Equilibration exposure period for fibers inserted into the bulk sediment samples was 30 days. The fibers were then submitted to Eurofins TestAmerica of Knoxville, Tennessee for extraction and quantification of the NOAA34 suite of PAHs (i.e., parent and alkylated PAHs). SiREM back-calculated the freely dissolved (porewater) PAH concentrations from reported concentrations in the extracts. In addition, 14 co-located bulk sediment samples were submitted to ESS for analysis of monocyclic aromatic hydrocarbons (MAHs) and PAHs to better be able to interpret the results of the porewater analysis. The SPME sampling and analysis is further described in Appendix L.

5.2.2. Temporary Piezometers for Direct Porewater Evaluation of VOCs

In July 2024, GEI observed TG&B install seven temporary piezometers in each of the same seven sediment core locations as described above in Section 5.2.1 to facilitate collection of porewater samples for VOCs analysis. The temporary piezometers (843R, 844R, 846R, 851R, 852R, 853R and 854R; Fig. 11) were installed using vibracore or direct push methods to drive PVC well points with 1-foot screens to depths between 3 and 4.5 feet below the sediment surface.

The target depth for the temporary piezometers was typically within the same depth interval as for the samples for PAHs described above in Section 5.2.1, i.e., intervals with the highest indicators of MGP impact (NAPL, sheening, discoloration, or odor), which ranged between 1 and 6 feet. However, this was not the case for temporary piezometers at 843R, 853R, and 854R:

- At temporary piezometers 843R and 854R, the target depth for the well screens were adjusted to be 1 foot deeper than the interval with the highest indicators of MGP impact to minimize the potential for the introduction of overlying surface water into the piezometer during sample collection.
- At temporary piezometer 853R, the target depth for the well screen was adjusted to be shallower than the interval from which the bulk sediment sample was collected. The target depth was adjusted because deeper porewater in sediment core 853 appeared not to have significant MGP impacts, since only a slight odor was observed in deeper sediments in this core.

Prior to porewater sampling, at least three volumes of water were removed from each temporary piezometer using a peristaltic pump to ensure surface water introduced to the well point during installation had been removed. Water quality parameters were monitored using a YSI meter during purging of each temporary piezometer and the parameters were compared to a surface water reading taken prior to piezometer installation to confirm that surface water did not appear to be entering the piezometer.

Once purging was complete, porewater samples were collected from each temporary piezometer using a peristaltic pump. The samples were field filtered using single-use, in-line ceramic filters intended to remove free-phase NAPL (if present) in sediment at the sampling locations. Porewater was allowed to run through the filter for 1 minute prior to sample collection to clear the filter exterior of ceramic dust. The porewater samples were submitted to ESS for laboratory analysis of VOCs.

5.3. NAPL Evaluation

GEI performed an investigation to evaluate the potential for movement of NAPL in sediment and identify areas where there is potential for NAPL to move to the sediment/water interface. It did not address NAPL transport due to potential ebullition or scour, which were evaluated separately as further discussed in Section 5.6 and 6.2.3, respectively.

Sample collection and sample processing are described below. The comprehensive report regarding the NAPL movement in sediment investigation and evaluation is in Appendix M.

Specific elements of the field investigation included:

- Collecting sediment cores and examining for the presence/absence of NAPL by visual logging and field screening;
- If and where NAPL was observed in sediment, collecting cores for laboratory analysis of potential NAPL movement;
- Cryogenically preserving (freezing) selected cores for shipment to Core Laboratories in Houston, Texas for laboratory analysis of potential NAPL mobility; and
- Collecting Site-specific hydraulic gradient data in the sediment by installing nested vibrating wire piezometer pairs at three core locations.

In August 2023, seven representative locations were included in this evaluation (849, 850, 851, 852, 853, 855, and 856; Fig. 11), corresponding to historical borings with NAPL impacts and located where National Grid had site access. Additional details regarding sample collection, handling, and processing are in Appendix M. Based on the visual observations and boring logs in the evaluation, the conditions at these locations were generally consistent with the locations included in the historical observations from nearby cores.

As part of the investigation, three nested pairs of Geokon 4500AL vibrating wire piezometers were installed at three locations upstream, midstream, and downstream, within the Powwow River (849, 851 and 856; Fig. 11). The nested system at each location consisted of a shallow and deep piezometer and was used to measure vertical gradients within and through the sediment under typical surface water elevations. The target depth for the deeper piezometer was to be installed at the base of the sediment column just above the underlying clay. The target depth for the shallow piezometer was to be installed about 1-2 feet below the sediment-water interface. GEI personnel periodically mobilized to the Site and downloaded the piezometer data directly from the data logger. Additional details regarding piezometer installation and monitoring are in Appendix M.

The preserved sediment cores were submitted to Core Laboratories in Houston, Texas (Core Lab) for laboratory analysis of potential NAPL mobility. Core Lab performed white (visible) light and ultraviolet (UV) light core photography over the entire core length to identify NAPL location(s) and saturation variability.

Where NAPL (fluorescence) was observed in core photography, mobility was evaluated for selected core samples. This included NAPL mobility via centrifuge (modified ASTM D425M) as well as final pore fluid saturation. Centrifuge testing was conducted at 100G for a duration of 1 hour. This procedure allowed for the evaluation of NAPL mobility under a hydraulic gradient significantly greater than any potential native gradient at the Site. If no measurable NAPL was eluted from the sample during the centrifuge test, then the NAPL was deemed immobile.

The conclusions of this evaluation as they relate to potential advective migration of NAPL via upward vertical migration are discussed in Section 7.3 and as they relate to the nature and extent of NAPL are discussed in Section 8.2.

5.4. Readily Apparent Harm Evaluation

Between April 2017 and September 2024, GEI performed several investigations within the Powwow River channel, mudflat, and wetland beyond the limit of the original Site boundary. As described in Section 5.1, investigations consisted primarily of test pits advanced by hand and sediment cores advanced by vibracore or direct push methods (Figs. 11 and 12). During each of these investigations, GEI also evaluated sediment conditions for the potential for RAH.

In addition, GEI also performed a focused sediment probe investigation between April and September 2019 in the mudflat on 39 Oakland Street, 41 Oakland Street, 43 Oakland Street, and 4 Oakland Court to evaluate for the potential for RAH. GEI completed 185 sediment probes by hand in the top 12 inches of sediment in the mudflat. The sediment probes were advanced to approximately 12 inches in depth and were evaluated for visual and olfactory evidence of contamination. GEI also noted whether the probing generated a sheen on surface water when the sediment was agitated. The sediment probe locations are shown on Fig. 15.

Based on our assessment of the extent of coal tar (NAPL) in the top 12 inches of sediment at the Site, GEI concluded that there is a condition representing RAH at the Site, particularly in the wetland on 35 Oakland Street and 37 Oakland Street and in the mudflat on 39 Oakland Street and 41 Oakland Street. Specifically, there is visible presence of tar over an area equal to or greater than 1,000 square feet in sediment within 1 foot of the sediment surface, which represents RAH (310 CMR 0995(3)(b)(1)(c)) and a Substantial Hazard (310 CMR 40.0956(2)(b)). A sheen on a sediment sample was considered an RAH condition if it was heavy and pervasive, suggesting the presence of tar. Slight or isolated sheen on sediments in the top 12 inches was not considered an RAH condition.

The presence of shallow coal tar in sediment representing an RAH condition was mostly limited to the wetland and Powwow River mudflats, however there were also two isolated locations downstream in the Powwow River channel at 1 Field Street where shallow coal tar in sediment representing an RAH condition was also observed. The areas where RAH was observed are shown in Figs. 15 and 16. Although visible coal tar at 1 Field Street was generally not at the sediment surface, it was present at depths of 6 to 12 inches below the sediment surface.

Given that this condition represents a Substantial Hazard (310 CMR 40.0956(2)(b)), this condition invalidated the Temporary Solution recorded for the Site, and as documented in Phase IV Status Report No. 5 dated July 31, 2019, the Temporary Solution for the Site was retracted.

5.5. Surface Water Sampling

Between September 2019 and July 2020, GEI collected eight surface water samples from the Powwow River (SW501 through SW503; and SW601 through SW605) and five surface water samples from the small stream in the wetland on 33R, 35, and 37 Oakland Street that discharges to the Powwow River mudflat (SW606 through SW610) to confirm that surface water conditions have not been impacted by Site contamination. The samples were analyzed for PAHs and EPH fractions.

The sample locations are shown on Figs. 11 and 12. Chemical data is summarized in Table 10. Laboratory data reports are in Appendix K.

The results of the testing are discussed in Section 8.

5.6. Ebullition Survey

On September 21 and 22, 2020, GEI completed a survey to evaluate the potential presence of ebullition-facilitated NAPL flux within the Powwow River. The purpose of the survey was to evaluate whether ebullition (i.e., bubbling) presented a potential pathway for NAPL or sheen to migrate up through contaminated sediment into the river. The study consisted of a visual inspection for bubbles and/or sheens on the water surface from a boat over the course of two days. The survey was performed both at low tide and high tide. The survey was conducted between upstream of the former Amesbury MGP site at 39 Water Street down to the Macy Street Bridge just upstream of I-495 (Fig. 17). The full description of the ebullition survey, including the Standard Operating Procedure (SOP) and field logs for the survey are in Appendix N.

NAPL or oil sheens on surface water were not observed in any locations within the entire study area. Bacterial/iron sheen was observed at several locations, which is consistent with bacterial sheen previously observed at the Site. Our observations identified slow to moderate ebullition in several locations of the river.

The conclusions of the ebullition survey as they relate to potential migration of NAPL via ebullition (i.e., ebullition-facilitated NAPL flux) are discussed in Section 7.3.

5.7. Investigation-Derived Waste Management

Between September 2019 and September 2024, excess soil and sediment cuttings, personal protective equipment, and other impacted solid waste generated during investigations were contained in 55-gallon drums. The drums were temporarily staged at a National Grid facility located at 7 North Hunt Road in Amesbury, Massachusetts. The drums were periodically transported to an appropriate treatment, storage, and disposal facility (TSDF) by Clean Harbors Environmental Services of Braintree, Massachusetts under waste manifests. Copies of the waste manifests are in Appendix O.

5.8. Summary of Sampling Approach

The sampling approach at the Site was primarily judgmental (biased) sampling. There were some systematic sampling transects that progressed downstream but those were performed to inform the design of the sampling program and judgmental sampling approach. According to MassDEP guidance, judgmental (biased) sampling is appropriate when the following is true:

- Soil contamination originated from a known source;
- Contamination is limited to a defined area;
- Clear area with highest concentrations; and
- Soil has not been significantly disturbed since release.

The former MGP and the potential open wooden conveyance structure (e.g., sluiceway) discovered in 2017 indicates contamination in the wetland, mudflat, and river is from a known source. That contamination is limited to a clearly defined area with highest concentrations. Specifically, shallow MGP-related contamination in sediment was mostly limited to the wetland and mudflat and deeper MGP-related contamination was present in the river and overlying shallow sediments are not significantly contaminated. The release(s) likely occurred between the early 1900s and 1924, which was while the MGP operated (between 1894 and 1924) but after the Powwow River had been dredged (by early 1900s). In the approximately 100 years since these tar releases, the dredged river channel slowly filled back in with sediments naturally deposited in the river system.

The 2024 MCP amendments (310 CMR 40.0904(4)) require justification that the sediment sampling approach used to collect data for the risk characterization provides a conservative estimate of exposures at the sediment exposure points. The sampling approach needs to consider the following:

- Site history and Conceptual Site Model
- Type, size, and depth of the water body
- Hydrologic regime
- Depositional patterns
- Receptors of concern

Sediment samples were collected in an iterative manner to define the nature and extent of contamination and develop and confirm the CSM. Samples were collected in surface sediments (e.g., 0-0.5 foot or 0-1 foot) and in deeper sediments (e.g., up to 8 to 10 feet) to develop and confirm the CSM. Samples were collected both upstream and downstream of the source due to the tidal nature of the river and they were collected along both the inside and outside curves of the river and along the center line of the river to evaluate areas of both sediment deposition and sediment erosion. Samples were collected in sediment at varying depths and both upstream and downstream to evaluate varying exposure pathways to human and environmental receptors.

6. Site Hydrogeological Characteristics [40.0835(4)(d)]

6.1. Topography

6.1.1. Former MGP Footprint (34-40 and 39 Water Street)

The former MGP footprint consists of historically developed land that is now woodlands and vegetated wetland. There are no structures except for a natural gas regulator valve pit located in the northeastern corner of the National Grid property at 39 Water Street. The majority of the former MGP footprint is approximately 20 feet lower in elevation than the adjacent property at 34-40 Water Street due to historical filling (Fig. 2). The 34-40 Water Street portion of the former MGP footprint is upland and is approximately 20 feet higher in elevation. A portion of this upland is the paved bike path.

6.1.2. Wetland (Oakland Street)

Topography in the wetland area near Oakland Street is generally flat with gentle upward slopes to the east towards the former railroad right of way and current bike path and to the west towards the Powwow River (Fig. 2). At the lowest point is a narrow stream channel that flows from the former Amesbury MGP footprint and area of previous remediation to the mudflat along the Powwow River. Based on topographic surveys conducted in and near the wetlands on 33R Oakland Street, 35 Oakland Street, and 37 Oakland Street, this area of the Site has a ground surface elevation that ranges from approximately El. 0 adjacent to the Powwow River up to El. 7.

6.1.3. Mudflat (Oakland Street)

Topography in the mudflat near Oakland Street is generally flat (Fig. 2). Based on topographic and bathymetric surveys conducted in and near the mudflat on 39 Oakland Street, 41 Oakland Street, 43 Oakland Street, and 4 Oakland Court, this area of the Site has a ground surface elevation that gradually slopes from approximately El. 0 adjacent to the Powwow River to El. 3 near the banks.

6.1.4. Powwow River

The portion of the Powwow River within the Site extends from just north of the former Amesbury MGP at 39 Water Street on the northern Site boundary to where the Powwow River bypass begins east of 58 Macy Street (Fig. 2). Based on bathymetric surveys performed on this portion of the Powwow River in 2019-2020 and in 2024 (Figs. 9 and 10), the elevation of the Powwow River bottom ranges from approximately El. -1.2 at the upstream, northern end of the river within the Site to approximately El. -3.8 at the downstream, southern end of the river within the Site. There are localized portions of the river bottom that are deeper, including at the portion of the channelized bypass that intersects the main river channel (up to El. -10.5).

6.1.5. Former Powwow River Channel

The former Powwow River channel is filled land that now contains a mixture of wetlands and upland, some of which is developed with the onramp connecting Route 110 (Macy Street) to I-495 Southbound. Based on the topographic survey conducted nearby, this area of the Site has a ground surface elevation that ranges from approximately El. 0 to El. 6 in the wetland portion of the filled channel and approximately El. 11 to El. 20 in the upland (highway onramp) portion of the filled channel.

6.2. Powwow River

6.2.1. River Characteristics

The Powwow River is an approximately 22.8-mile-long river that flows through several cities and towns in Massachusetts and New Hampshire, before the river's confluence with the Merrimack River. The Merrimack River eventually flows to the Atlantic Ocean, approximately 5 to 6 miles downstream of its confluence with the Powwow River, in Newburyport, Massachusetts (Fig. 1).

The length of the Powwow River that flows through Amesbury has been described as being divided into two sections (Upper and Lower). The Upper Powwow River is an approximately 6,000-foot section of the river, beginning at the state border between Massachusetts and New Hampshire, and ending as it flows into Lake Gardner (Fig. 1).

The Lower Powwow River begins at the base of the Lake Gardner Dam and ends at the Powwow River's confluence with the Merrimack River. From the base of Lake Gardner Dam, the river flows through "the "Upper Millyard" in downtown Amesbury and through a series of falls and rapids, dropping approximately 90 feet in elevation before flowing into a culvert running beneath Main Street and Market Street (Route 150). The culvert empties to the "Lower Millyard," just upstream of the Site (Fig. 1). This Lower Millyard portion of the Lower Powwow River is a freshwater tidal river system, also referred to as the Powwow River tidewater, extending approximately 8,500 feet before its confluence with the Merrimack River.

An approximately 5,300-foot length of the Lower Millyard Powwow River is within the Site (Fig. 2). This includes an approximately 150-foot length of river upstream of the former Amesbury MGP and an approximately 5,150-foot length of river downstream of the former Amesbury MGP, including a former channel of the Powwow River that was filled during the 1960s as part of the Interstate 495 construction.

As discussed in Section 3.1.2.2, dredging was performed within the Powwow River during the late 1800s and early 1900s to support the manufacturing business in Amesbury (Fig. 5). When dredging operations in the Powwow River initially ceased in November 1900, the Powwow River was reported to be navigable from Biddle's Wharf (at the confluence of the Back River and Powwow River, just upstream of the former Amesbury MGP) to within 450 feet of the confluence with the Merrimack River. Dredging in the final stretch was reportedly completed a few years later, since by 1909 there were records of shipping up the river.

As discussed in Section 3.1.2.5, the Powwow River was reconfigured in the mid-1960s as part of the construction of Interstate I-495. A large river meander just upstream of the confluence with the Merrimack River was bypassed with a narrow artificial channel that ran below the highway (Fig. 5).

The cutoff river meander was partially filled to construct the southbound onramp of the highway. A portion of the original Powwow River meander still exists to the south of the highway, as a backwater that floods with the daily tides (Fig. 5).

6.2.2. Surface Runoff and Stormwater Discharges

The Powwow River is a major tributary of the Merrimack River and has a watershed that includes approximately 58 square miles of land in New Hampshire and Massachusetts, according to the April 2022 Waterbody Assessment for Amesbury. Most of the Powwow River watershed consists of forested land and waterbodies, with urban development and impervious surfaces accounting for less than 20% of the watershed's land area, according to the same study.

The area surrounding the reach of the Powwow River within the Site is primarily urban. The reach of the river within the Site receives stormwater from the surrounding areas via overland flow directly to the Powwow River, overland flow to one of the Powwow River's tributaries, and from several stormwater outfalls on the banks of the Powwow River.

According to the December 2021 City of Amesbury Stormwater Management Plan, many stormwater outfalls discharge stormwater directly to the Powwow River and tributaries of the Powwow River, many of which are upstream of or within the Site. Of the outfalls identified in the Stormwater Management Plan, 10 outfalls discharge stormwater near the Site (Fig. 7):

- Two of the stormwater outfalls (OF 5-22 and OF 5-23) discharge stormwater from a residential neighborhood on the west side of the Powwow River.
- One stormwater outfall (OF 8-16A) discharges stormwater from the commercial area surrounding Noel Street on the west side of the Powwow River.
- Three stormwater outfalls (OF 5-26, OF 5-27 and OF 5-28) discharge stormwater from the commercial areas along Water Street and Chestnut Street on the east side of the Powwow River.
- Four stormwater outfalls (OF 5-29, OF 8-2, OF 8-3, OF 8-4 and OF 8-5) discharge stormwater from residential neighborhoods along the east side of the Powwow River.

6.2.3. Hydraulic Model

GEI developed a two-dimensional hydraulic model of surface water at the Site. The objective of the model was to develop an understanding of the physical characteristics of the Powwow River to understand the potential for sediment scouring and sediment transport. For this study, values for river velocity and shear stress were initially computed using the U.S. Army Corps of Engineers Hydrologic Engineering Center River Analysis System (HEC-RAS) Version 5.0.7 software to evaluate sediment scour. Sediment transport was subsequently computed using the sediment transport routines in the updated HEC-RAS Version 6.4.1 software. The results of the hydraulic modelling are presented in Appendix P. As further discussed in Appendix P, there is some potential for scouring of surficial sediment within the Powwow River.

The hydraulic model indicates the highest potential for sediment scour in the Powwow River at the Site is located at the first bend of the river, on 1 Field Street, where the river makes a sharp turn before flowing southwest (Fig. 2). The maximum erosion estimated from the model for the 10-year flow conditions in this very limited area was 4.2 feet. The model predicted less than 2 feet of erosion along the remainder of the river. The maximum deposition was 2.2 feet in downstream areas. The 10-year flow conditions were considered the most conservative flow conditions since in other flood events the river would spill over the banks of the river, and result in widespread sheet-like flow in the 100-year floodplain, as opposed to a higher velocity channel like flow.

While the mobilization of river sediment is considered possible in some locations within the Powwow River based on the modelling, actual sediment mobilization is less likely. Bathymetric surveys performed in 2019-2020 and 2024 generally showed little difference in sediment bed change over that 5-year period, which although during that time there were no storms that represented 10-year flow conditions, there were two storms that represented 2-year flow conditions and one storm that approached a 5-year flow condition. Locations where sediment bed change was greater than 1 foot (which for this study was considered the likely margin of error) included at the confluence of the Back River and Powwow River (outside the Site boundary) and at a few other isolated locations downstream, some of which were adjacent to areas with the greatest deposition indicating the thalweg of the river shifted slightly during the time period.

In addition, as described in the Conceptual Site Model for the Site (refer to Section 1.5), shallower sediments were naturally deposited over time after the coal tar had already migrated down the river. Cleaner, shallow sediments (approximately top 2 feet) suggest that to the extent erosion is occurring, sediments are generally being redeposited resulting in little net change in sediment bed thickness.

6.3. Geology

The Site is within the Merrimack Belt, a regional geologic terrane consisting of several bedrock units in northeastern Massachusetts. The bedrock beneath the Site has been mapped as part of the Newburyport Complex, a medium grained porphyritic granite (Kaye, 1980). The bedrock is overlain by glacial till deposited in the Wisconsin period, approximately 8,000 to 15,000 years ago. More recent native deposits include sand, silt, and peat. Filling over native material occurred near the Site in the late 1800s through the late 1970s.

Cross sections (subsurface profiles) showing geological strata and other Site features and information are presented in Figs. 18 through 23. Fig. 18 is a key that shows the 1) alignment of the two longitudinal subsurface profiles (A-A' and D-D') from upstream to downstream (i.e., profile from wetland and mudflat on Oakland Street down to the former filled river channel near Interstate I-495); and 2) transects of the 12 lateral subsurface profiles (B-B', C-C', E-E', F-F', G-G', H-H', I-I', J-J', K-K', L-L', M-M', and N-N') that cross the Powwow River at various locations.

6.3.1. Former MGP Footprint (34-40 and 39 Water Street)

The northern and central portions of the National Grid property at 39 Water Street contain deposits of fill, underlain by peat or organic soil. The 34-40 Water Street property contains significant deposits of fill

as that was a location of industrial and municipal landfilling. The southern and western portions of the National Grid property, the Town of Amesbury property at 39A Water Street, and the western portion of the 33R Oakland Street property are primarily wetland and contain surficial organic soil. Deposits containing peat, silt, and sand are present beneath the organic soil in the wetland.

6.3.2. Wetland (Oakland Street)

The sediment and soil layers encountered in the test pits and sediment cores observed by GEI in and near the wetlands on 33R Oakland Street, 35 Oakland Street, and 37 Oakland Street are summarized below, starting at the ground surface. Cross sections are in Fig. 19 (Profiles A-A' and B-B').

- Organic soil: Organic deposits consisting of fibrous organic soil and/or peat were encountered in most test pits and ranged in thickness from 0.25 to 3 feet. This layer was not fully penetrated at all locations where it was observed and so its thickness may be more than 3 feet. Organic soil and peat contained fibrous organics, roots, and brick fragments.
- Sand and silt: A sand and/or silt layer was typically encountered beneath the organic soil layer. However, the sand and/or silt layer was encountered at ground surface at many locations where organic deposits were not observed to be present. The sand and/or silt layer ranged in thickness from 0.25 to 9 feet. This layer was not fully penetrated at all locations where it was observed and so its thickness may be more than 9 feet. The sand and/or silt layer contained varying amounts of plant fibers, and brick and wood fragments.
- Clay or dense silt: A clay or dense silt layer was encountered in several locations, typically at depths between 3 and 6 feet below ground surface, however this material was observed in some locations as shallow as the ground surface.

6.3.3. Mudflats (Oakland Street)

The sediment and soil layers encountered in the test pits and sediment cores observed by GEI in the mudflat on Oakland Street are summarized below, starting at the ground surface. Cross sections are in Fig. 19 (Profiles A-A' and C-C').

- Organic soil: Organic deposits consisting of fibrous organic soil and varying amounts of fine sand were typically encountered in cores and test pits and ranged in thickness from 0.5 to 5 feet. Test pits typically terminated between 1 and 3 feet, within the organic deposits layer. The organic soil layer contained varying amounts of plant fibers, and glass and wood fragments.
- Sand: A gray to brown sand with varying amounts of gravel and silt was typically encountered beneath the organic soil layer and ranged in thickness from 1.25 to 8 feet. The sand layer contained varying amounts of plant fibers, and brick, coal, slag, and wood fragments.
- Organic soil: An organic soil layer was observed beneath the sand in two mudflat cores (668 and 746). The organic soil consisted of mostly low plastic fines and fine sand. The full thickness of this organic soil layer was not determined as the two cores where this layer was observed terminated within this layer.

- Clay or dense silt: A clay or dense silt was encountered beneath the sand layer in five mudflat cores (716, 719, 720, 760, and 761) and ranged in thickness from approximately 1.5 to 2 feet. However, the clay/dense silt layer was not fully penetrated and so its thickness may be more than 2 feet.

6.3.4. Powwow River

Observations of stratigraphy in the top several feet of sediment within the river are variable due to the depositional nature of the river itself and due to historical activities along the Powwow River, including past dredging, construction of I-495, and historical industry along the Powwow River. Cross sections are in Figs. 20 through 23 (Profiles D-D', E-E', F-F', G-G', H-H', I-I', J-J', K-K', L-L', and M-M').

A surficial layer comprised of organic soil and/or sand was observed in most cores performed within the river. The surficial layer of sediment was typically between 4 and 9 feet thick but was observed to be thinner or extend deeper at some locations. Debris including ash, brick, clinkers, ceramic, coal, and glass was observed throughout this layer, and was observed as deep as 9.5 feet below the sediment surface. Although ash and coal were pervasive in this layer at the Site, quantitative microscopic analysis was performed on the specific surface sediment samples at the upstream river Site boundary to verify the presence of this debris. Coal, coal ash, and wood ash (as well as asphalt) were all microscopically identified in these upstream samples.

A coarse- or medium-grained sand was typically observed in the top 2 feet of sediment in cores from upstream of the former Amesbury MGP down to the south side of 1 Field Street. A fine--grained sand or silt was typically observed in the top 2 feet of sediment in cores from the south side of 1 Field Street down to I-495.

The surficial organic soil and/or sand layer is underlain by a clay or dense silt layer. In general, the upper surface of this clay or dense silt layer ranges from approximately 4 to 9 feet below the sediment surface however, in some upstream areas of the Site (between 34-40 Water Street and 3 River Street) this layer has been observed as shallow as at the sediment surface. Downstream of 3 River Street, clay or dense silt was only encountered at depths at or deeper than 4.5 feet below the sediment surface. Additionally, the upper surface of the clay or dense silt layer was observed to typically be deeper near the centerline of the Powwow River and shallower in locations closer to the riverbanks, possibly as a result of historical dredging in the river.

According to a January 1885 Army Corps of Engineers map showing proposed improvements to the Powwow River, borings performed during the 1880s (prior to dredging operations) also encountered clay but typically at deeper depths between 6.5 and 12.3 feet below the sediment surface. Clay was encountered at shallower depths in borings performed in upstream portions of the Powwow River near 1 Field Street, and was observed at deeper depths or not at all in borings performed in downstream portions of the Powwow River. These borings were terminated at depths between 11 and 16 feet below the sediment surface. The January 1885 Army Corps of Engineers map with the historical boring information is in Appendix C.

Although the clay or dense silt layer was not encountered in every core or historical boring, it is likely continuous throughout the reach of the Powwow River within the Site.

6.3.5. Former Powwow River Channel

The sediment and soil layers encountered in the sediment cores observed by GEI in the former river channel are summarized below, starting at the ground surface. The cross section is in Fig. 23 (Profile N-N').

- Organic soil: An organic soil layer was typically encountered in cores and ranged in thickness from 1 to 3 feet. The organic soil contained varying amounts of plant fibers and wood debris.
- Sand: A gray sand was typically encountered beneath the organic soil layer and ranged in thickness from 2 to 4.5 feet. The sand contained plant fibers, and brick, clinker, and wood fragments.
- Clay or silt: A gray clay or silt layer with low to medium plastic fines with varying amounts of fine sand was typically encountered beneath the sand layer and ranged in thickness from 1.5 to 3.5 feet. The clay or silt layer was not fully penetrated and so its thickness may be more than 3.5 feet.

6.4. Hydrogeology

Investigations performed at the Site between 2017 and 2024 were mostly performed in the wetland, mudflat, river, and former river channel. These portions of the Site are within the tidal reach of the Powwow River and are often inundated with surface water.

In the wetland and mudflat portions, groundwater flow direction is towards the river. Although not part of recent investigations between 2017 and 2024, several monitoring wells were installed between 2004 and 2009 closer to the former Amesbury MGP footprint at 39 Water Street, 39A Water Street, and 33R Oakland Street. Groundwater elevations were measured between 2004 and 2009 with the shallowest depths to groundwater measured in the wetland. Shallow groundwater in this area flows toward the Powwow River.

Nested shallow and deep vibrating-wire piezometers were installed in August 2023 at three locations in the Powwow River (849, 851, and 856; Fig. 11) to measure hydraulic gradients through the sediment and the overlying surface water. Additional details regarding installation and results are discussed in Section 5.3 and Appendix M. Water level data was collected between August and December 2023; however, data from the nested piezometers at location 856 was not used because the shallow piezometer was not fully installed beneath the sediment surface.

Based on the hydraulic vertical gradient evaluation, GEI did not observe a consistent upward gradient that would cause upward migration. The vertical gradient oscillates with tidal fluctuation, so in any given day it is upward for a portion of the day and downward for a portion of the day. However, the average vertical gradient over the monitoring period was neutral at location 849 (-0.01 ft/ft) and downward at location 851 (0.13 ft/ft).

7. Environmental Fate and Transport of OHM [40.0835(4)(e)]

7.1. Identification of Site Contaminants

Samples of soil, sediment, porewater, and surface water were tested for some or all of the following analytes: VOCs, SVOCs, cyanide compounds, EPH ranges, VPH ranges, metals, PCBs, pesticides, and herbicides. Table 7-1 below summarizes the contaminants detected in samples by media.

Table 7-1. Site Contaminants

Analyte	Soil	Sediment	Porewater	Surface Water
VOCs: primarily BTEX	X[(a)]	X	X	NT
SVOCs: primarily PAHs	X	X	X	X
Cyanide compounds	X	X	NT	NT
EPH ranges	X[(a)]	X	NT	ND
VPH ranges	X[(a)]	NT	NT	NT
TPH	X	X	NT	NT
Metals	X	X	NT	NT
PCBs	X	X	NT	NT
Pesticides/Herbicides	X	X	NT	NT

Notes:
X = Identified as Site contaminant
ND = Analyte not detected
NT = Samples not tested for this analyte; not a contaminant of concern in this media
(a) = Primarily in samples collected from the wetland on 35 and 37 Oakland Street

7.2. Characteristics of Site Contaminants

The characteristics of the Site contaminants discussed in this section of the report include type of compound, chemical composition, physical and chemical properties, toxicological characteristics, and environmental fate and transport characteristics. Environmental fate and transport characteristics include mobility, stability, volatility, and bioaccumulation potential.

The primary chemical and physical properties of the contaminants that affect their fate and transport in Site media are: molecular weight, vapor pressure, water solubility, Henry's Law constant, specific gravity, water-carbon partition coefficient, and octanol-water partition coefficient. Sources of chemical, physical, and fate and transport characteristics were obtained from the literature, including the Agency for Toxic Substances and Disease Registry website (www.atsdr.org). Table 11 summarizes the chemical and physical properties of the Site contaminants discussed below.

The Site COCs are typically found in environmental media in groups, based on common sources and environmental fate and transport characteristics. PAHs, EPH, and VPH compounds are examples of these groups. Accordingly, the Site contaminants were grouped together for the discussion of environmental fate and transport characteristics.

7.2.1. SVOCs (Including PAHs)

In general, SVOCs have high molecular weights, low water solubilities, low vapor pressures, low Henry's Law constants, high carbon-water partition coefficients, and moderate to high octanol-water partition coefficients. These chemicals tend to sorb to soil or sediment rather than dissolve into groundwater and tend not to volatilize into soil gas or the atmosphere. The tendency to sorb to soil increases with an increase in the number of aromatic rings in the compound.

PAHs are a subgroup of SVOCs that are of concern at the Site because they can comprise up to 80 percent of tar, the most voluminous by-product of MGP processes. PAHs are compounds with two or more fused benzene rings. PAH sources can be generalized into two groups: (1) petrogenic and (2) pyrogenic. Petrogenic sources include petroleum product manufacturing, storage, and use. Pyrogenic sources include combustion by-products, including from MGP operations.

Tar is comprised primarily of PAHs, with lesser concentrations of other organic compounds. Tar has a wide range of physical properties, although it generally has high viscosity and interfacial tension. Tar is relatively insoluble in water, is not very volatile, tends to sorb to organic carbon and solids, and does not biodegrade rapidly. These properties indicate tar is not very mobile in the subsurface and tends to persist.

Although PAHs are discussed as a group and their concentrations are often expressed as total PAHs (defined in this report as the sum of 17 target PAH compounds), individual PAH compounds exhibit a wide range of physical and chemical properties that influence their distribution, mobility, and availability in environmental media. Lower molecular weight PAHs (i.e., the 2- to 4-ring PAHs) tend to degrade biologically (in most media) or photochemically (in surface water) and are more available to partition to porewater. These properties generally decrease with increasing molecular weight.

A study (Rockne et al., 2002) found that sediment characteristics also influence the distribution of PAHs. PAHs preferentially sorb to the low-density fraction and partition to the young detrital material present in sediment. This study suggests that sediment characteristics together with PAH properties can predict the ability of PAHs to desorb from sediment and the potential availability of PAHs to benthic organisms.

7.2.2. TPH, EPH, and VPH

TPH, EPH and VPH fractions include groups of petroleum hydrocarbons, classified by MassDEP to include compounds with 5 to 36 carbon atoms. TPH and EPH compounds include aliphatic and aromatic hydrocarbons, and 17 target PAHs.

Different types of petroleum hydrocarbons are detected and quantified using EPH analyses, including diesel/No. 2 fuel oil, No. 3 to No. 6 fuel oil, kerosene, aviation fuel, mineral oil dielectric fluid (MODF), and waste oil. Tar compounds are also detected and quantified using EPH analyses.

VPH compounds consist of lighter molecular weight petroleum hydrocarbons often associated with gasoline. However, other sources of VPH exist. Sources include petroleum product manufacturing, storage, and use. Additionally, many aromatic VPH compounds are used as solvents. Tar contains aromatic VPH compounds.

EPH compounds are divided into two aliphatic fractions (C_9-C_{18} and C_{19}-C_{36}) and one aromatic fraction (C_{11}-C_{22}). TPH is the summation of the concentrations of the three EPH fractions. In general, EPH compounds have a low solubility in water and a lower specific gravity than water. The C_9-C_{18} aliphatic fractions in EPH that tend to occur in diesel fuel have a low to moderate viscosity, moderate interfacial tension, are relatively insoluble in water, are slightly volatile, will sorb to sediment organic carbon and solids, and are moderately to highly biodegradable. In contrast, the C_{19}-C_{36} aliphatic fraction and the C_{11}-C_{22} aromatic fraction have higher viscosities, are insoluble, and are less biodegradable.

VPH compounds are divided into two aliphatic fractions (C_5-$C_{8\ and}$ C_9-C_{12}) and one aromatic fraction (C_9-C_{10}). The VPH target analytes are BTEX compounds, which are discussed with VOCs in Section 7.2.3, and naphthalene, which was discussed previously with PAHs in Section 7.2.1. Methyl-tert-butyl ether (MTBE) is also a VPH target analytes but that is not a contaminant of concern for an MGP site.

VPH compounds have low to moderate molecular weights, high water solubilities, high vapor pressures, moderate to high Henry's Law constants, low water-carbon partition coefficients, and low to moderate octanol-water partition coefficients. These factors indicate VPH compounds are mobile in the environment; they will dissolve in water and tend to migrate from water to air via vaporization. VPH compounds are typically not present in shallow sediment or surface soil and most VPH compounds do not build up to high levels in plants or animals.

7.2.3. BTEX

BTEX compounds are less dense than water and have slight to moderate solubilities in water. They tend to volatilize readily into the atmosphere. BTEX compounds are aromatic and have a tendency to adsorb to soil containing organic material when compared to these compounds' propensity for advection and dispersion transport through groundwater. BTEX compounds may also be bound and strongly chemically bonded in some instances within residual tar. The tendency to adsorb to soil slows the rate at which these compounds migrate in soil and groundwater.

7.2.4. Metals

Metals are naturally occurring elements, and natural sources of metals in the environment include erosion of geologic materials. Anthropogenic sources of metals include the use and storage of refined metals for paints, poisons, gasoline manufacturing and use, and other manufacturing processes. Because metals are conservative elements, they are also found in combustion by-products, such as clinker and ash. Metals found in Site media include antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, vanadium, and zinc.

Metals tend to be immobile in the environment because they have low solubilities and low soil/water partition coefficients, indicating that they prefer to stay in solid forms or sorb to soil and sediment. Metals are not degradable in the environment though they may undergo changes in valence state that can change their mobility and bioavailability. The physical and chemical conditions present at the Site influences how metals will migrate in the environment. The behavior of metals is influenced by environmental factors such as pH, oxidation/reduction potential, temperature, hydrostatic pressure, and the presence of complexing agents. For example, the presence of soil organic matter, as measured by

total organic carbon, represents a physical condition that may sorb heavy metals and prevent them from migrating. Metals with a greater affinity to bind with organic carbon or acid volatile sulfide in sediment tend to exhibit the least toxicity to benthic organisms. Metals that partition to the interstitial (pore) water exhibit the greatest sediment toxicity.

7.2.5. Cyanide

While simple cyanides are sometimes mobile in groundwater, coal gasification sites contain complex cyanides, usually ferro-cyanide and ferric-cyanide complexes. Complex cyanides are less likely to migrate in groundwater due to their low solubility and tendency to adsorb to soil. PAC represents the fraction of total cyanide that is potentially available to pose risk to human receptors based on biological and chemical exposure assumptions via ingestion. Free cyanide represents the fraction of total cyanide that is the most toxic to ecological receptors.

7.2.6. PCBs

PCBs have a high molecular weight, low vapor pressures, low Henry's Law constants, low solubilities, and higher specific gravities than water. PCBs bind strongly to soil and sediments and may remain there for long periods. They tend not to volatilize into soil gas or the atmosphere.

PCBs are very stable compounds and do not degrade readily in environmental media. PCBs can be present in groundwater at low concentrations or adhered to small particles of soil present in the water samples. PCBs were commercially produced as complex mixtures containing multiple congeners at different degrees of chlorination. The most significant risk from PCBs likely is their persistence in environmental media and high bioaccumulative properties in organisms.

7.2.7. Pesticides and Herbicides

Pesticide compounds generally consist of higher molecular weight petroleum hydrocarbons. These compounds have low-vapor pressures, low Henry's Law constants, low solubilities, and higher specific gravities than water. These compounds have a tendency to preferentially adsorb to soil rather than dissolve into groundwater and tend not to volatilize into soil gas or the atmosphere.

7.3. Existing and Potential Migration Pathways

The existing or potential migration pathways for the compounds detected in the media at the Site are soil gas, air, surface water, sediment, and the food chain.

Soil Gas and Air: Soil gas is a potential migration pathway because OHM present in soil may volatilize into soil gas, which can then emanate from the subsurface into ambient air. However, there are no structures at the Site; therefore, there is no indoor air migration pathway.

Surface Water: Site contaminants appear to have migrated from source areas to other areas of the Site via overland flow and surface water transport. OHM (coal tar) appears to have been released during MGP operations to the Powwow River as a point source discharge, possibly via the former sluiceway that discharged to the nearby wetland and mudflat adjacent to the former MGP. From the likely discharge

point, the tar accumulated in shallow sediments within the wetland and mudflat. Tar also likely flowed across the mudflat and accumulated at deeper intervals downstream within portions of the Powwow River channel. Tar appears to have flowed from the mudflat out to the dredged river channel and then it continued flowing downstream in the Powwow River; tar-saturated sediment (at depth only) has been observed to the downstream edge of 8 Noel Street and 3 River Street and other tar impacts such as sheen and staining in sediment (at depth only) has been observed to the portion of the river prior to its flow through the channelized bypass near I-495 (Fig. 13). The Powwow River was dredged between approximately 1895 and 1900. In the approximately 100 years since these tar releases, the dredged river channel slowly filled back in with sediments naturally deposited in the river system. Redeposition of sediment in the Powwow River downstream of the mudflat likely remobilized some contaminants, resulting in continued presence of lower levels of contaminants in the shallow, more recently deposited sediment. Similarly, some tar has also been detected in sediment upstream of the mudflat and slightly upstream of the former Amesbury MGP, and may be the result of reversed tidal flow that allowed flow upstream during flood tide.

Sediment: Sediment in the wetland and mudflat near Oakland Street and downstream for much of the length of the Powwow River was impacted with OHM in multiple locations. OHM was generally shallow (2 to 3 feet) in the wetland and mudflat and was generally deeper (up to 9 feet) in the Powwow River downstream of the mudflat.

Food Chain: The food chain could be a potential migration pathway because OHM present in wetland soil and sediment and river sediment may be taken up by organisms, particularly invertebrates. These organisms are prey, depending upon habitat, for other invertebrates, bottom-feeding finfish, birds, mammals, and other higher organisms. Therefore, the food chain for ecological populations may be a significant pathway. These pathways are further discussed in Section 9.2.

7.3.1. Ebullition-Facilitated NAPL Flux

Gas ebullition (i.e., bubbling) can mobilize NAPL (coal tar) from sediments to the overlying water column and create a contaminant migration pathway from sediment to surface water. Coal tar migration from sediment poses a potential human and ecological health risk because of the high concentrations of PAHs in the tar. Migration from sediment to the water surface increases the potential exposure of human and ecological receptors to tar that reaches the water surface. There are three conditions that are necessary for tar to migrate from the sediment to surface water: the sediment must contain liquid tar, the sediment must produce gas bubbles, and the gas must come into contact with the tar-impacted sediment. As discussed below, there is no evidence of ebullition-facilitated NAPL flux at the Site.

As described in Section 5.6, GEI performed a visual observation survey for evidence of gas ebullition from sediments on the surface water of the Powwow River. The full description of the ebullition survey is in Appendix N. The purpose of the study was to determine if ebullition from sediments presents a potential pathway for NAPL to be transported up through contaminated sediment into the Powwow River. Ebullition is ubiquitous in sediment environments and does not in itself represent a risk. The survey area was limited to areas where NAPL had been observed in sediment, where ebullition-facilitated NAPL flux could potentially occur.

The survey was based on visual observation of bubbles and sheens or NAPL blebs in areas that were uninterrupted by other sources of aeration. Gas bubbles observed at the surface can have multiple sources other than gas ebullition from sediments. Therefore, the term "apparent gas ebullition" is used to describe any visual evidence of gas bubbles and coincident sheens or NAPL blebs at the surface of the Powwow River. Gas bubble sources that can be falsely identified as gas ebullition from sediments can include, but are not limited to, aeration bubbles from sewers, outfalls, watercraft movement, construction, sampling, diving, biota, drilling, and any source of sediment scouring.

Apparent gas ebullition was observed alongside the river, typically closer to the river shoreline where the water depth was shallower than 4 to 5 inches, during the low tide. These locations were observed throughout the entire length of the survey area, more often on the eastern shoreline of the river. GEI's observations identified slow to moderate ebullition in several locations of the river.

NAPL or oil sheens on surface water were not observed in any locations within the entire study area. Bacterial/iron sheen was observed at multiple locations at the Site. Apparent gas ebullition with coincident sheen was only observed in two locations – in the mudflat and near the downstream terminus of the study area (Fig. 17). Each of the sheens was characterized as brittle. The sheen was cracked or would crack when agitated and did not coalesce around the agitation. This behavior is consistent with a bacterial sheen rather than a NAPL or oil sheen. The bacterial sheen observed was consistent with bacterial sheen previously observed at the Site.

Based on the results of the survey, there is no evidence of ebullition-facilitated NAPL flux at the Site.

7.3.2. Porewater Contaminant Mobility

Porewater (interstitial water) acts as the primary medium through which contaminants move within sediment. Contaminants dissolved in porewater can migrate through the sediment matrix, potentially reaching groundwater or overlying surface water. This movement is influenced by hydraulic gradient, sediment permeability, and the diffusion or advection processes within the porewater. The presence of contaminants in porewater often determines their bioavailability to benthic organisms. As discussed below, there does not appear to be any indication of upward vertical migration of contaminants in porewater from deeper sediments to the overlying surface water.

GEI sampled porewater in sediments of the Powwow River. For PAHs, the sampling was performed using SPME for an indirect evaluation in porewater. The SPME sampling and analysis were summarized in Section 5.2.1 and is further described in Appendix L. The pairwise comparison of subsurface and surface sediment under a range of contaminant conditions ranging from non-detect to very high concentrations of freely dissolved (porewater) PAHs do not indicate that upward vertical migration of mobile subsurface contamination to the surface is occurring at the Site. This absence of evidence of upward vertical migration suggests that the existing surface sediment deposits constitute an effective natural cap preventing exposure to the PAH contamination that remains in deeper sediment.

For VOCs, the sampling was performed using temporary piezometers for a direct evaluation in porewater. The piezometer sampling and porewater analysis were summarized in Section 5.2.2. VOCs were present in some porewater samples but at concentrations about four orders of magnitude below

Method 1 GW-3 standards, which are intended to address the adverse ecological effects that could result from discharge of OHM to surface water (e.g., upward vertical migration of contaminants in porewater to surface water).

As described in Section 6.4, the average vertical gradient was neutral to downward. Based on the results of the evaluation, there does not appear to be any indication of upward vertical migration of subsurface porewater contamination to the surface.

7.3.3. Advective NAPL Mobility

GEI evaluated the potential for NAPL movement in sediment to the sediment/water interface via advective flow of NAPL. The evaluation demonstrated that:

- The piezometer data over time indicated that the hydraulic gradient flows in a downward direction during times of rising and high tide, and upward direction during times of falling and low tide. The average hydraulic gradient at 849 is almost neutral (-0.01 ft/ft) and slightly downward at 851 (0.13 ft/ft). Therefore, the in-situ measured gradients are confirmed to be significantly less than the laboratory testing conditions described below and the tests are conservative.
- NAPL impacts in sediment were confirmed throughout the area identified from prior investigations with the exception of cores from location 853.
- NAPL impacts were observed as discrete, discontinuous lenses of either coal tar blebs or coal tar saturated sediment at depths ranging from approximately 2.5 to 6.5 feet depending on the core. No evidence of extensive, laterally continuous NAPL bodies was identified.
- Centrifuge testing was conducted at 100G for a duration of one hour, which is significantly greater than the in-situ hydraulic forces measured with the vibrating wire piezometers.
    - NAPL was eluted from each core during the centrifuge test, so a weight-of-evidence evaluation was conducted to evaluate if the NAPL would be mobile under in situ conditions using multiple lines of evidence.
    - Five of the six samples exhibited scores greater than 0, indicating that the NAPL is immobile. One sample from core 850, had a result of 0. Given the level of conservatism in the evaluation protocol (e.g., the centrifuge test applied a gradient approximately 50 times greater than in situ conditions), this result was also considered immobile.

Therefore, advective movement is not a likely migration pathway for NAPL to move to the sediment/water interface. Additional details supporting these conclusions are in Appendix M.

8. Nature and Extent of Contamination [40.0835(4)(f)]

8.1. Source of Contamination

A Source of OHM Contamination is defined in the MCP (310 CMR 40.0006) as:

> *(a) a point of discharge of OHM into the environment that may include, without limitation:*
>
> *1. leaking storage tanks, vessels, drums and other containers;*
>
> *2. dry wells or wastewater disposal systems that are not in compliance with regulations governing discharges from those systems; or*
>
> *(b) waste deposits, sludges, or impacted soil, sediment, or bedrock at or near a point of discharge or deposit of OHM into the environment containing sorbed OHM or NAPL that is contaminating surrounding environmental media via dissolution or volatilization processes; except that the downgradient leading edge of a plume of oil and/or hazardous material dissolved in and migrating with groundwater or as vapor-phase shall not, in and of itself, be considered a source of OHM Contamination.*

Based on these criteria, GEI identified sources of OHM at the Site and other contributors to contamination at the Site that are upstream, within, or adjacent to the river. Each of these sources or contributors is described in more detail below.

8.1.1. Source Areas of Contamination

The former Amesbury MGP operated from sometime prior to 1899 and there is no evidence that it operated after January 1924. The MGP contained two gas holders, a retort, a purifier, coal shed, gas house, boiler room, and other support buildings. The footprint of the MGP covered three separate properties: 39 Water Street currently owned by National Grid; and two parcels on what is now known as 34-40 Water Street currently owned by Water Street Commerce Center Condominium Trust.

There is very little information regarding waste handling, storage, and disposal practices during the operation of the Amesbury MGP. During original Phase IV cleanup activities in November 2016, an approximately 12-foot by 12-foot wood-sided subsurface container was encountered in the upland at 39 Water Street that may have served as a tar well, a subsurface vessel used to accumulate or store tar. The structure contained tar-saturated soil. The tar-saturated soil was removed and disposed off site in March 2017, during the original Phase IV cleanup activities. Some portions of the wood-sided container were left in place. However, prior to backfill, GEI visually confirmed that shallow coal tar saturated soils were removed and that resulting conditions were consistent with previously assessed conditions. The area was over-excavated vertically until cleaner material was encountered. Similarly, the sidewalls were exposed in locations where feasible and soil samples were observed from the sidewalls to confirm that tar-saturated soils were removed. The coal-tar impacted soil encountered in the wooden structure was considered Containerized Waste and was manifested appropriately.

It also appears that releases of coal tar were discharged at the facility and beyond during its operation in the early 1900s. According to the Amesbury Daily News (1914), oil from the gas works "in times past had been a nuisance" and "at times caused some trouble by leaking into the river". During the original Phase IV cleanup activities in April 2017, a small section of a potential open wooden conveyance structure (e.g., sluiceway) was discovered in the wetland adjacent to the former MGP, at the boundary between 33R and 35 Oakland Streets.

Coal tar appears to have been released during MGP operations to the Powwow River as a point source discharge, possibly via this former sluiceway that discharged to the nearby wetland and mudflat adjacent to the former MGP. From the likely discharge point, the tar accumulated in shallow sediments within the wetland and mudflat. Tar also likely flowed across the mudflat and accumulated at deeper intervals downstream within portions of the Powwow River channel.

The Powwow River was dredged between approximately 1895 and 1900. The dredging spanned almost the entire Powwow River tidewater in downtown Amesbury from upstream of the Back River down to the confluence with the Merrimack River. The dredged channel depth was 12 feet at MHW for much of the Powwow River except the final stretch (approximately 450 feet) to the Merrimack River. The dredging in that final stretch was ultimately completed (year unknown) but the depth was not documented.

The former Amesbury MGP operated for up to 25 years after the Powwow River was dredged. During MGP operations, tar appears to have flowed from the wetland, through the mudflat, out to the dredged river channel. The tar likely continued flowing downstream in the Powwow River since tar-saturated sediment (at depth only) has been observed to the downstream edge of 8 Noel Street and 3 River Street and other tar impacts such as sheen and staining in sediment (at depth only) have been observed in the portion of the river just upstream of the channelized bypass near I-495 (Fig. 13). In the approximately 100 years since these releases, the dredged river channel slowly filled back in with sediments naturally deposited in the river system. Redeposition of sediment in the Powwow River downstream of the mudflat likely remobilized some contaminants, resulting in continued presence of lower levels of contaminants in the shallow, more recently deposited sediment. Similarly, some MGP residuals have also been detected in sediment upstream of the mudflat and slightly upstream of the former Amesbury MGP, and may be the result of reversed tidal flow during flood tide.

Shallow MGP-related impacts in sediment were mostly limited to the wetland and mudflat. In this area, MGP-related impacts were limited to the top 2.5 feet and were primarily within a narrow band parallel to and east of the wetland stream channel on the 33R, 35, and 37 Oakland Street properties and in the mudflat on the 39, 41, and 43 Oakland Street and 4 Oakland Court properties. Although visible coal tar (NAPL) was not at the sediment surface, it was present at depths of 6 to 12 inches below the sediment surface.

Deeper MGP-related impacts, such as visible coal tar (NAPL), sheen on sediments, and staining were observed in the Powwow River downstream of the mudflat. In the river, coal tar (NAPL) impacts were generally observed at depths from as shallow as about 1 or 2 feet up to about 8 or 9 feet below the sediment surface. In the downstream stretch of the Powwow River, overlying shallow sediments deposited likely deposited after dredging were not significantly contaminated with PAHs.

Based on the investigations conducted, a clay or dense silt layer was encountered beneath much of the affected sediments in the Powwow River channel and appears to be acting as a confining layer. In general, the upper surface of this clay or dense silt layer ranged from approximately 4 to 8 feet below the sediment surface; however, it was observed as shallow as the sediment surface. Although the clay or dense silt layer was not encountered in every core, it is likely continuous throughout the reach of the Powwow River where coal tar (NAPL) impacts were encountered.

8.1.2. Other Contributions to Site Contamination

The Powwow River within the Site is a very large area and was and is affected by the surrounding land uses. Several other sources of contamination upstream, within, or adjacent to the river have been identified that likely have affected conditions in the river. These include the following:

- Historical releases and operations at former Amesbury DPW facility (25 to 31 Water Street): This property also was historically a facility associated with plating, woodworking, metal machining, plastics manufacturing, and shoe factory operations. PCBs in Powwow River sediment from this upstream disposal site may not have been fully remediated and may have migrated and affected downstream sediments. PAHs and heavy metals were historically present in surficial soil and may also have migrated via surface water runoff and affected sediment conditions in the Powwow River.
- Historical releases and operations at the former Bartley property, the former Bailey landfill, and the former Town of Amesbury landfill (34-40 Water Street): These properties have been industrial since the late 1800s and associated releases are tracked by MassDEP under RTNs 3-4108 and 3-20198. Chlorinated VOCs, PAHs, petroleum hydrocarbons, and heavy metals, particularly lead, were contaminants of concern at the site. Lead was excavated and removed, some from sediment below MHW, but there is uncertainty regarding whether the full extent of lead in the river sediment was remediated. Lead and possibly other contamination, including from the former landfills may have affected sediment conditions in the Powwow River.
- Historical releases and operations at the former Amesbury Metal Products Corporation (33-39 Oakland Street): This facility was used for metals fabrication from the late 1800s until around 1995. Storage and use of chemicals at this property included trichloroethylene (TCE), fuel oil, gasoline, crude oil, and electrical transformers, which were removed in 1995. Chlorinated VOCs, heavy metals, and cyanide in soil and groundwater were contaminants of concern at the site. VOCs may have migrated and affected sediment conditions in the wetland, mudflat, and the main channel of the Powwow River.
- Historical releases and operations at former Nathan Hale Furniture Company (24 Oak Street): This facility was associated with carriage and automobile factories and later furniture making and was also documented to store a large coal pile alongside the Powwow River. PAHs and heavy metals were historically present in surficial soil and may have migrated via surface runoff and affected sediment conditions in the Powwow River.
- Stormwater point and non-point source releases: The reach of the river within the Site receives stormwater from the surrounding areas via overland flow directly to the Powwow River, overland flow to one of the Powwow River's many tributaries, and from several stormwater outfalls on the banks of the Powwow River. There are 10 outfalls that discharge stormwater near

the Site, including four that drain primarily commercial areas and six that drain primarily residential areas.

- Historical filling during river alterations: There have been alterations to the waterway of the Powwow River documented through Chapter 91 licenses that likely affected conditions in the river. Most notably, the addition of material upstream of the Site at the former Hamilton Woolen factory where ash and cinders were used as fill to construct land behind piers and wharves, and other material of unknown origin was used as fill behind bridge abutments in the early 1900s. There may also be other alterations elsewhere along the waterway of the Powwow River that have also consisted of filling with material of unknown origin and quality.

8.2. Nature and Extent of MGP Waste and NAPL

The nature and extent of MGP wastes at the Site was developed using multiple lines of evidence, including 1) observations and measurements of NAPL in monitoring wells between 2008 and 2016/2017 prior to the original Phase IV remedy implementation; 2) visual observations of MGP waste deposits and NAPL in soil and sediment between 2017 and 2024; and 3) laboratory evaluation of cores in 2023, including visual and ultraviolet-light photograph analysis and centrifuge analysis.

8.2.1. MGP Waste Deposits Characterization

MGP wastes (i.e., tar, clinker, and other residuals) were observed in sediment and subsurface soil within the former MGP footprint and in the downstream wetland. These wastes were sometimes distinct from contaminated sediment or soil and were observed as separate, distinct fragments or pieces. However, none of them were observed to be continuous layers of solid or semi-solid tar. The isolated, small pieces of tar observed at the Site did not comprise significant, continuous MGP waste deposits distinguishable from the sediment matrix. As a result, visible coal tar waste deposits, as defined by MassDEP, were not identified at the Site.

8.2.1.1. Former MGP Footprint

Conditions on the former MGP footprint on Water Street (Figs. 2 and 4) are described here to provide a comprehensive description of MGP waste at the Site even though the former MGP footprint is not the focus of current Supplemental Phase II CSA Report. As documented in the 2009 Phase II/III Report, visual evidence of MGP waste on the former MGP footprint on Water Street included clinker and ash. Fill soil containing clinker and ash was observed in locations on the upland (filled) portion of the Site. There were no observations of continuous or isolated layers of MGP waste deposits of solid or semi-solid tar; only the fragments of clinker and ash in the fill soil matrix. The Amesbury MGP was relatively small and did not have a tar processing facility so this lack of a discrete solid or semi-solid tar waste layer is consistent with the lack of significant tar storage and processing.

8.2.1.2. Downstream Wetland, Mudflat, and River

Visual evidence of MGP waste deposits downstream of the former MGP footprint in the wetland on 35 Oakland Street and 37 Oakland Street (Figs. 13 and 14) included small pieces of hardened, solid coal tar (Table 1). These solid tar pieces were observed in only six of the 96 hand excavated test pits at

35 Oakland Street and 37 Oakland Street. The test pits included were 104, 144, 149, SS616, SS625, and SS629. The solid tar pieces were at depths ranging from about 0.2 to 1.2 feet. There were no observations of continuous or isolated layers of MGP waste deposits of solid or semi-solid tar at 35 Oakland Street and 37 Oakland Street; only these small pieces of solid tar. However, for the purposes of graphically presenting the locations of these MGP waste deposits, the lateral extent of these MGP waste deposits in the wetland are shown in Fig. 14.

In addition, there were no observations of continuous or isolated layers of MGP waste deposits of solid or semi-solid tar anywhere else on the Site, including the wetland and mudflat on other nearby properties or in any portion of the river.

8.2.2. NAPL Observations

NAPL, which does not meet the criteria for visible coal tar waste deposits (i.e., solid or semi-solid coal tar) as it is presented in the revised MCP, was observed in soil and sediments at the Site.

8.2.2.1. Former MGP Footprint

Conditions on the former MGP footprint on Water Street (Figs. 2 and 4) are described here to provide a comprehensive description of NAPL at the Site even though the former MGP footprint is not the focus of current Supplemental Phase II CSA Report. As documented in the 2009 Phase II/III Report, DNAPL was encountered in several monitoring wells in 2007 and 2008 in a narrow north-south band across 39 Water Street and 39A Water Street (Fig. 2). DNAPL monitoring and recovery were performed on a regular basis between 2008 and 2017 as part of Immediate Response Action (IRA) activities (2008-2010), Post-Temporary Solution response actions (2010-2017), and Phase IV remedial activities (2017). DNAPL was detected in one additional monitoring well (ESS-5) in 2015 at 34-40 Water Street (Fig. 2), generally within the same narrow north-south band. This monitoring well was added to the then-ongoing DNAPL monitoring and recovery program. The depth to DNAPL was approximately 24 to 25 feet and depth to groundwater was approximately 17 feet.

As part of subsequent evaluations and as documented in Phase IV Status Report No. 2, dated February 1, 2018, GEI concluded that continued active recovery of DNAPL at the Site was no longer warranted. Between 2008 and 2017, GEI recovered approximately 57.6 gallons of DNAPL as part of response actions. In all but one well less than 1 gallon of DNAPL was recovered in any given 3-month period, indicating that DNAPL with micro-scale mobility was infeasible to recover in all but that well based on the lines of evidence presented in MassDEP guidance. GEI evaluated DNAPL transmissivity in that well and concluded the DNAPL transmissivity was less than MassDEP's threshold to be considered feasible to recover. As a result, GEI concluded that continued active recovery of DNAPL at the Site was no longer warranted.

8.2.2.2. Downstream Wetland, Mudflat, and River

Visual evidence of MGP--related impacts in sediment were categorized into five types of impacts: (1) staining, (2) sheen, (3) blebs, coatings, lenses of tar, (4) solid tar, and (5) coal tar saturated (Table 1). NAPL was considered to be present if soil or sediment was tar saturated, tar coated, or contains tar blebs. Visual evidence of sheen or staining by itself was not considered NAPL unless the sheen was characterized as heavy and pervasive, suggesting the presence of tar.

The observed NAPL impacts at the Site are mapped on Figs. 13 and 14. GEI distinguished between solid or semi-solid tar, which is immobile or has limited mobility, and NAPL-saturated sediment, which includes potentially mobile NAPL and lighter phase constituents.

The extent of NAPL or tar-saturated sediments is shown in Figs. 13 and 14 and summarized below:

- NAPL was observed in sediments in the downstream wetland, primarily on 35 Oakland Street and 37 Oakland Street, although it was also observed at 33R Oakland Street to the north (Fig. 14). This area of NAPL in sediments was generally coincident with the observed locations of small, isolated pieces of hardened, solid coal tar in the wetland, also shown in Fig. 14. NAPL was observed in sediments in the wetland at depths ranging from about 0.2 to 2.5 feet.
- NAPL was observed in sediments in the downstream mudflat on 39 and 41 Oakland Street (Fig. 14). NAPL was observed in sediments in the mudflat is at depths ranging from about 0.5 to 1 foot.
- NAPL was observed in sediments in the river within a narrow band in the center of the river, primarily on 1 Field Street and 8 Noel Street on the northern side of the river and on the Oakland Street and Oak Street properties and 3 River Street on the southern side of the river. NAPL was not observed in sediments south of 8 Noel Street and 3 River Street (Fig. 13). NAPL was observed in sediments in the river generally from as shallow as about 1 or 2 feet up to about 8 or 9 feet below the sediment surface. In the downstream stretch of the river, overlying shallow sediments likely deposited after dredging do not have visible NAPL except for two locations (701 and 706 at 1 Field Street) where NAPL was observed at depths shallower than 1 foot.

8.3. Nature and Extent of COCs in Soil

8.3.1. COC Conditions in Upland Soil

The nature and extent of contamination in soil on the former MGP footprint (Water Street) was described in detail in the 2009 Phase II/III Report and is not repeated here. However, a small portion of the revised Site boundary is within an upland on 34-40 Water Street. Some MGP residuals (coal tar) were observed at depths greater than 15 feet on the southernmost tip of 34-40 Water Street property beneath or adjacent to the bike path. The Site was expanded onto 34-40 Water Street in 2015 after DNAPL was encountered in one additional monitoring well (ESS-5; Fig. 2). Soil sampling by others in 2001 identified petroleum hydrocarbons, PAHs, chlorinated VOCs, and heavy metals at depths of approximately 12 to 16 feet. These contaminants are consistent with the disposal site tracked by RTN 3-4108, assigned to the 34-40 Water Street property due to historical operations and uses including an industrial and later municipal landfill. The depth to DNAPL in ESS-5 was approximately 24 to 25 feet. Soil data were not collected at this depth interval but are expected to contain petroleum hydrocarbons and PAHs typical of MGP-related impacts.

The depth of MGP-related impacts on 34-40 Water Street (i.e., DNAPL in well ESS-5 at 24 to 25 feet) does not represent a current or future exposure because it is deeper than 15 feet. However, because this small portion of 34-40 Water Street is within the Site for RTN 3-24070, and an evaluation of surficial soil was also necessary given the proximity of the bike path.

In 2023, GEI collected shallow surface soil samples to evaluate whether there was shallow MGP-impacted soil (Fig. 11). Contaminants in upland shallow soil at 34-40 Water Street include PAHs, petroleum hydrocarbons, and metals (Table 8). The contaminants detected were typical of urban fill and consistent with contaminants detected at the 34-40 Water Street property as part of numerous previous investigations by others (refer to Section 3.3.2). The results did not indicate that shallow soil was impacted by the former MGP.

8.4. Nature and Extent of COCs in Sediment

Contamination in sediment in the wetland, mudflat, and river was characterized by laboratory analysis for VOCs, petroleum hydrocarbons, PAHs, PCBs, pesticides, herbicides, total cyanide, and metals. Sediment contained:

- Primarily PAHs and petroleum hydrocarbon contamination, consistent with MGP residuals.
- Low concentrations of cyanide, below reportable concentrations.
- Relatively low levels of metals, e.g., lead is below established background levels.
- Very low concentrations of other contaminants not associated with MGP operations including PCBs, pesticides, and herbicides.

Based on these results, the focus of the nature and extent of COCs in wetland, mudflat, and river sediment is PAHs. Total PAHs (based on the common 17 PAHs) in sediment were mapped to show spatial distribution. PAH toxicity is additive and so total PAHs can be a more descriptive measure of potential harm to ecological receptors. The spatial distribution of total PAHs in sediments in the wetland, mudflat, and river is shown in Figs. 24 through 29. PAH concentrations are presented for the following depth intervals: 0 to 1 foot; 0 to 2 feet; and greater than 2 feet. Total PAHs are graphically depicted using three concentration ranges:

1. Concentrations below local conditions (34.1 mg/kg; refer to Section 8.8 for additional information about local conditions);
2. Concentrations above local conditions (34.1 mg/kg) but below a No Significant Risk threshold to benthic invertebrates (104 mg/kg; refer to Section 9.2 for additional information about ecological risk); and
3. Concentrations above a No Significant Risk threshold to benthic invertebrates (104 mg/kg).

Benzo(a)pyrene concentrations in sediment were also mapped to show spatial distribution. Benzo(a)pyrene was selected to map because it serves as an indicator compound for other PAHs and it often poses the greatest risk to human health of the PAH compounds. The spatial distribution of benzo(a)pyrene in sediments in the wetland, mudflat, and river is shown in Figs. 30 through 33. Benzo(a)pyrene concentrations are presented for the following depth intervals: 0 to 2 feet and greater than 2 feet. Benzo(a)pyrene is graphically depicted using four concentration ranges:

1. Concentrations greater than non-detect up to 10 mg/kg;
2. Concentrations greater than 10 mg/kg up to 20 mg/kg;

3. Concentrations greater than 20 mg/kg up to 30 mg/kg; and
4. Concentrations greater than 30 mg/kg.

These ranges were selected based on human health risk screening that suggested that for benzo(a)pyrene alone, there could be potential risk to a recreational visitor at concentrations greater than 10 mg/kg and to residents at concentrations greater than 30 mg/kg. These ranges were selected as a comparative tool only; the actual comprehensive human health risk characterization considers a variety of other factors in evaluating if there is a condition of significant risk. Refer to Section 9.1 for the human health risk characterization.

Contaminants were detected in sediment 1) in the wetland and mudflat adjacent to the former MGP near Oakland Street where the release(s) likely historically occurred (Sections 8.4.1 and 8.4.2); 2) within the Powwow River both upstream and downstream of the mudflat (Section 8.4.3); 3) and within the former Powwow River channel subsequently filled as part of construction of I-495 (Section 8.4.4.).

8.4.1. COC Conditions in Wetland Sediment

Sediment exists at the Site below MHW and within the banks of a small wetland stream on 33R Oakland Street, 35 Oakland Street, and 37 Oakland Street. Contamination identified in wetland sediment extended slightly into the adjacent upland soil (as defined by MHW/bank) to the east towards the bike path. However, for the purposes of this discussion of nature and extent in the wetland, it is all referred to as sediment.

The spatial distribution of total PAHs and benzo(a)pyrene in sediment in the wetland is shown in Figs. 25, 27, 29, 31, and 33.

Shallow sediments in the wetland generally contained higher total PAH and benzo(a)pyrene concentrations compared to deeper sediments. For comparison, the maximum total PAHs and benzo(a)pyrene in each depth range in wetland sediments are summarized below:

- The maximum concentrations of total PAHs and benzo(a)pyrene from 0 to 1 foot were 7,084 mg/kg and 239 mg/kg, respectively.
- The maximum concentrations of total PAHs and benzo(a)pyrene from 1 to 2 feet were 2,695 mg/kg and 154 mg/kg, respectively.
- The maximum concentrations of total PAHs and benzo(a)pyrene greater than 2 feet were 1,106 mg/kg and 26.4 mg/kg, respectively.

In the wetland, MGP-related impacts was limited to the top 2.5 feet and was primarily within a narrow band parallel to and east of the wetland stream channel on the 33R, 35, and 37 Oakland Street properties. There was a sharp boundary to the east of the wetland stream channel, slightly into the upland, where PAH concentrations decreased significantly.

8.4.2. COC Conditions in Mudflat Sediment

The spatial distribution of total PAHs and benzo(a)pyrene in sediments in the mudflats is shown in Figs. 25, 27, 29, 31, and 33.

Shallow sediments in the mudflat generally contained higher total PAH and benzo(a)pyrene concentrations compared to deeper sediments. For comparison, the maximum total PAHs and benzo(a)pyrene in each depth range in mudflat sediments are summarized below:

- The maximum concentrations of total PAHs and benzo(a)pyrene from 0 to 1 foot were 740 mg/kg and 53.2 mg/kg, respectively.
- The maximum concentrations of total PAHs and benzo(a)pyrene from 1 to 2 feet were 1,088 mg/kg and 109 mg/kg, respectively.
- The maximum concentrations of total PAHs and benzo(a)pyrene greater than 2 feet were 2.85 mg/kg and 0.249 mg/kg, respectively.

In the mudflat, MGP--related impacts were limited to the top 2 feet and were primarily along and north of the mudflat stream channel on the 39 and 41 Oakland Street properties.

8.4.3. COC Conditions in Powwow River Sediment

The spatial distribution of total PAHs and benzo(a)pyrene in sediments in the river is shown in Figs. 24, 26, 28, 30, and 32.

Shallow sediments in the river generally contained significantly lower total PAH and benzo(a)pyrene concentrations compared to deeper sediments. For comparison, the maximum total PAHs and benzo(a)pyrene in each depth range in river sediments are summarized below:

- The maximum concentrations of total PAHs and benzo(a)pyrene from 0 to 1 foot were 1,211 mg/kg and 92.2 mg/kg, respectively.
- The maximum concentrations of total PAHs and benzo(a)pyrene from 1 to 2 feet were 2,695 mg/kg and 154 mg/kg, respectively.
- The maximum concentrations of total PAHs and benzo(a)pyrene greater than 2 feet were 77,992 mg/kg and 3,050 mg/kg, respectively.

Sediment towards the edges of the river generally contained significantly lower total PAH concentrations (consistent with local conditions) compared to sediment in the center of the river. This was generally the case regardless of depth range.

Deeper sediments up to 3,500 feet downstream of the mudflats, within the main Powwow River channel, and within the Commonwealth of Massachusetts tidelands generally contained significantly higher total PAH and benzo(a)pyrene concentrations. As described previously, a clay or dense silt layer was encountered beneath much of the affected sediments in the Powwow River channel and appears to be acting as a confining layer. In the downstream stretch of the Powwow River, overlying shallow sediments likely deposited after dredging were not significantly contaminated with PAHs.

8.4.4. COC Conditions in Former Powwow River Channel Sediment

The spatial distribution of total PAHs and benzo(a)pyrene in sediments in the former river channel is shown in Figs. 24, 26, 28, 30, and 32.

Shallow sediments in the former river channel contained significantly lower total PAH and benzo(a)pyrene concentrations compared to deeper sediments. For comparison, the maximum total PAHs and benzo(a)pyrene in each depth range in former river channel sediments are summarized below:

- The maximum concentrations of total PAHs and benzo(a)pyrene from 1 to 2 feet were 6.22 mg/kg and 0.767 mg/kg, respectively.
- The maximum concentrations of total PAHs and benzo(a)pyrene greater than 2 feet were 234 mg/kg and 20.2 mg/kg, respectively.

Sediment within the filled portion of the former river channel (i.e., core 842) contained significantly higher total PAH concentrations compared to sediment towards the edge of the former river channel (i.e., core 838). Within the filled former river channel, the elevated PAHs and MGP-related impacts, such as sheen on sediments and staining, were observed from approximately 5 to 8 feet below the surface. The overlying shallow material was the “waste material” described in Section 3.1.2.5, which was backfilled as part of construction for I-495 and did not contain significant PAH concentrations and did not have visible MGP-related impacts.

8.5. Nature and Extent of COCs in Porewater

For PAHs, porewater was evaluated in the depth interval with the highest indicators of MGP-impact (NAPL, sheening, discoloration, or odor), which ranged between 1 and 6 feet. A paired sample was collected from the 0- to 0.5-foot interval at each location to represent overlying surficial exposures.

- PAH concentrations in shallow porewater were 1 to 2 orders of magnitude lower than PAH concentrations in deeper porewater. The one exception was sediment core 853, where PAH concentrations were lower in deeper porewater. This deeper porewater appears not to have significant MGP impacts since only a slight odor was observed in deeper sediments in this core.
- PAH concentrations in shallow porewater ranged from 0.6 microgram per liter (ug/L) to 5.7 ug/L and PAH concentrations in deeper porewater (excluding 853) ranged from 15 ug/L to 339 ug/L.
- PAH concentrations in deeper porewater were highest on 1 Field Street, 28 Oak Street, and 3 River Street where some of the highest total PAH concentrations in bulk sediment were also observed. PAH concentrations in deeper porewater decreased significantly farther downstream.

For VOCs, porewater was typically evaluated in same depth interval as for PAHs, with the highest indicators of MGP-impact (NAPL, sheening, discoloration, or odor), which ranged between 1 and 6 feet. However, due to the sample collection methods, two of the porewater samples were collected 1 foot deeper to minimize introducing overlying surface water into the piezometer.

- VOCs were detected in two porewater samples, at 28 Oak Street and 21R River Street (Fig. 11). Specifically, naphthalene was detected in both samples and 1,2,4-trimethylbenzene, benzene, carbon disulfide, and ethylbenzene were detected in the sample from 21R River Street. Acetone was detected by the laboratory in another sample; however, acetone is a common laboratory contaminant and is not likely representative of subsurface conditions.
- VOC concentrations in the porewater samples were about four orders of magnitude below Method 1 GW-3 standards, which were developed to address the adverse ecological effects that could result from discharge of OHM to surface water (e.g., upward vertical migration of contaminants in porewater to surface water).

8.6. Nature and Extent of COCs in Surface Water

Between September 2019 and July 2020, GEI collected eight surface water samples from the Powwow River (SW501 through SW503; and SW601 through SW605) and five surface water samples from the small stream in the wetland on 33R, 35, and 37 Oakland Street that discharges to the Powwow River mudflat (SW606 through SW610) to confirm that surface water conditions have not been impacted by the Site contamination. The samples were analyzed for PAHs and EPH fractions.

Based on the surface water analytical results, surface water within the Powwow River was not impacted by the MGP-related contaminants identified in sediment. No contaminants were detected above laboratory reporting limits in surface water samples collected from the Powwow River. One surface water sample collected in the Powwow River prior to 2019 contained low concentrations of naphthalene and petroleum hydrocarbons. However, similar contaminants were detected in an upstream surface water sample also collected in the Powwow River.

Surface water in the wetland had detections of low concentrations of PAHs, specifically at 35 and 37 Oakland Street. The surface water detections generally corresponded to locations with shallow visual observations of coal tar (i.e., within the area of the RAH condition). Detected concentrations of PAHs in wetland surface water were below available EPA national recommended surface water quality criteria for the consumption of water and organisms (refer to Appendix R for additional information about the criteria). In addition, although not directly applicable to surface water in the Powwow River, detected concentrations of PAHs in wetland surface water were below GW-1 groundwater standards considered acceptable for COCs in drinking water.

8.7. Forensics Evaluation

GEI conducted extensive forensics evaluations of the sediment samples that we collected since the portion of the Powwow River within the Site is a large area which has historically been, and is currently, affected by the surrounding land uses. Aside from the former Amesbury MGP, several other sources of contamination upstream, within, or adjacent to the river have been identified that likely have affected conditions the river. These include releases associated with historical textile mills, a former industrial landfill, a former municipal landfill, former manufacturing facilities, stormwater point and non-point sources, and historical filling during river alterations.

GEI's objective was to evaluate whether PAH and saturated hydrocarbon fingerprinting could distinguish between MGP-related contamination and petroleum-related contamination or urban background in sediment in wetland, mudflat, and Powwow River. GEI evaluated key double ratios of select PAHs to attribute typical sources of PAHs in sediment: MGP-related tar-like materials (TLM), petrogenic fuel hydrocarbons, and typical urban background affected by multiple sources over time. The TLM may be further subdivided into specific MGP processes: carbureted water gas (CWG) and coal carbonization (CC)/coke oven (CO) processes that leave distinctive PAH patterns.

Due to the complexity and volume of data, advanced statistical techniques, including multivariate statistical analysis (MVSA), were also used to identify and explain similarities and trends in the data. Specifically, the MVSA was compared and contrasted with the double ratio analyses and other data analyses to scientifically evaluate the significance of these statistical results within the context of the established CSM, forensics analyses, and fate and transport factors.

GEI's complete forensics evaluation is in Appendix Q and our findings and conclusions are summarized below.

8.7.1. Methodology

Four double ratios of the concentrations of select PAHs were calculated. The relationship of the four double ratios provides information on the degree of weathering of the material and further corroboration of the source type of the hydrocarbon. Sample results can then be plotted on a graph, and different regions on the graph represent ratios characteristic for pyrogenic TLM, petrogenic (fuel) hydrocarbons, and urban background materials.

Based on the double ratio analysis, a tar source sample collected from monitoring well B101 in 2008 on the former Amesbury MGP footprint on 39 Water Street as part of the original Phase II CSA appeared to have a signature of a carbureted water-gas tar. This tar sample was used as the reference standard for the Site-wide double ratio analyses. Many other sediment samples in the wetland, mudflat, and river, appeared to have this signature.

The double ratio-based methods of PAH forensic analysis sufficiently identified the likely provenance of a substantial percentage of the samples for the Site. However, there remained additional uncertainty after evaluating the double ratio plots. Multivariate statistical analysis (MVSA) was selected as a robust mathematical technique to further refine the results from the double ratio-based forensic methods. MVSA consists of a wide variety of methodologies to analyze large datasets with multiple variables.

8.7.2. Conclusions

Of the 393 samples that were evaluated using forensic analyses, 87 samples either had no detectable concentrations of PAHs or the PAHs that were detected were at such low concentrations that the forensics analysis was unable to be performed. Of the remaining 306 samples with sufficient PAHs concentrations, the following findings in Table 8-1 were made regarding attribution to the former Amesbury MGP:

Table 8-1. Findings from Forensic Analysis

Forensics Signature	Number of Samples
Consistent with Amesbury MGP source[1]	150
Amesbury MGP source cannot be excluded	23
Urban background and/or inconsistent with Amesbury MGP source	132
Data absent or insufficient for evaluation	87

Notes:
(1) = Includes tar reference standard collected from former Amesbury MGP footprint

Appendix Q includes the diagnostic plots, a comprehensive table with the identified forensics signature for each sample, and figures showing the distribution of the forensics signatures upstream, downstream, and within the Site at three different depth intervals including surface (0 to 1 foot), near survey (1 to 2 foot), and subsurface (greater than 2 feet).

The forensics analysis demonstrated a reasonably reliable determination of whether PAHs found in sediment samples could be confidently considered to be 1) consistent with the CWG-based tar-like material from the former MGP or 2) associated with typical urban background or other sources unconnected with the MGP. In a few cases, the analysis did not allow for a conclusion with high confidence, and the presence of an MGP-related contribution could not be excluded.

Our key conclusions include:

- The PAHs found in all areas of the Site (i.e., wetland, mudflats, river, former river channel, upstream, downstream) were generally consistent with pyrogenic sources. There was very little indication of contributions from petrogenic sources.
- Most samples were highly weathered, with numerous samples consistent with the undifferentiated typical urban background. Other highly weathered samples did show signals of an ultimate source in CWG tars.
- Several samples, especially upstream and along the margins of the river, showed a clear signal of the retene marker typical of coal fines sources, which is common in urban regions formerly heated by coal.
- Relatively un-weathered PAHs clearly associated with CWG tars were found in deeper sediments in the river channel (including the former river channel). These samples frequently had high PAH concentrations. This would be expected, as deeper sediments are not conducive to rapid weathering and PAHs can remain for long periods of time.
- The distribution of tar-like materials likely originating from the MGP source were found throughout the wetland (mostly below MHW), in portions of the mudflat directly downstream from the wetland, and throughout the river channel (including former river channel) down to the I-495 interchange. Most of the CWG TLM was in the subsurface. Surface impacts identified as CWG were relatively few and mostly located nearer to the mudflat.
- Surface sediment PAHs in the river were mixed. Many samples, especially outside the center and towards the riverbank, had low PAH concentrations, and, where PAHs were present, were associated with urban background or other sources.

- The forensics evaluation allowed the definition of an upstream Site boundary. Samples from upstream of the boundary were, in most cases, assignable to either urban background or a non-CWG source. Two surface sediment samples with elevated PAHs (579 mg/kg at 787-S1 and 271 mg/kg at 859-S1) were not associated with the CWG source material, indicating that other significant contributors to PAHs in the river sediment existed.

GEI's complete forensics evaluation is in Appendix Q.

8.8. Background Levels and Local Conditions

8.8.1. Soil

All compounds detected in soil samples at the Site (34-40 Water Street) were considered in the risk characterizations (Section 9); none were excluded even if consistent with background levels.

8.8.2. Sediment

The Powwow River is an urban waterway and contains multiple discharge points to surface water, including storm drains, culverts, and outfalls. The locations of discharge points to the Powwow River, upstream and within the Site are shown in Fig. 7. Aside from the former Amesbury MGP, several other sources of contamination upstream, within, or adjacent to the river have been identified that likely have affected conditions of the river. The locations of nearby reported MassDEP disposal sites are shown in Fig. 8. These sources are potentially acting as separate or confounding sources of OHM to the Powwow River. GEI collected sediment samples from 12 locations in the upstream portion of the Powwow River to support the local conditions evaluation. GEI also used data from sediment samples collected from 10 locations, also in the upstream portion of the Powwow River, from an investigation by others completed in 2001 for RTN 3-19634 (refer to Sections 3.3.1 and 3.3.2). Samples were not collected immediately adjacent to or downstream of stormwater outfalls.

Sediment samples used to establish local conditions within the Powwow River were collected from shallow depths in the sediment, similar to the shallow sediment comparison data set within the Site. As discussed in detail in the Stage 1 Environmental Screening and Stage II Environmental Risk Characterization (Appendix S) and in accordance with MassDEP guidance, concentrations of some of the PAHs within the portion of the Powwow River within the Site may be attributable to sources other than the former Amesbury MGP.

As described in more detail in Appendix S, total PAH17 concentrations equal to or less than 34.1 mg/kg are consistent with the local conditions for sediment in the Powwow River. The value is likely conservative as several additional samples with elevated, but non-MGP related PAHs, were excluded from the calculation. This local conditions value was used in this Supplemental Phase II CSA Report in conjunction with other lines of evidence to delineate the revised Site boundary (Section 8.9) and in the Stage II Environmental Risk Characterization in conjunction with other lines of evidence to determine significant ecological risk (Section 9.2).

8.8.3. Porewater

Contaminant concentrations in sediment porewater within the river were generally very low or non-detect. Therefore, no potential local conditions were considered for porewater.

8.8.4. Surface Water

Contaminant concentrations in surface water were generally very low in the wetland and non-detect within the river. Therefore, no potential local conditions were considered for surface water.

8.9. Delineation of Site Boundary

The revised Site boundary showing the extent of COCs in soil, sediment, porewater (groundwater), and surface water is shown in Fig. 2. For reference, the original Site boundary as it existed prior to 2017 is also shown in Fig. 2. The revised Site boundary was established based on the following:

- Soil, sediment, porewater (groundwater), and surface water analytical results
- Visual and olfactory observations
- Local conditions considerations
- Forensics evaluations
- Conceptual Site Model

8.9.1. Original Site Boundary

In the 2009 Phase II/III Report, the Site boundary was established as:

- To the north and east coincident with the National Grid property (39 Water Street) property boundary. The northern and eastern extent of MGP-related contaminants associated with the Site was limited to the portion of the former Amesbury MGP that National Grid owned (39 Water Street) and did not extend onto the adjacent property at 34-40 Water Street where the other portion of the former Amesbury MGP was located. Because the former MGP was purchased in 1924 by the Haverhill Gas Light Company, a predecessor in interest to National Grid, National Grid's liability for the physical MGP did not extend onto 34-40 Water Street. The portion of the former Amesbury MGP at 34-40 Water Street was addressed by a different PRP under RTNs 3-4108 and 3-20198 (refer to Section 3.3.2).
- To the west extending approximately 80 feet into the Powwow River.
- To the south across to the City of Amesbury property (39A Water Street) and onto a small wetland portion of a private property (33R Oakland Street).
- The Site boundary has expanded significantly based on the significant assessment performed between 2017 and 2024. Delineation of the revised Site boundary is described below in Section 8.9.2 through 8.9.6.

8.9.2. 34-40 Water Street Upland Boundary

The revised Site boundary on the upland on 34-40 Water Street (Fig. 2) was delineated based on the presence of DNAPL encountered in a well in 2015. Although within the limits of a different disposal site addressed by others under RTNs 3-4108 and 3-20198, National Grid took responsibility for the DNAPL condition on this small portion for 34-40 Water Street since DNAPL had reportedly not been measured before in that well during investigations by others in the early 2000s and National Grid concluded its presence could have represented historical migration of DNAPL from 39 Water Street to 34-40 Water Street.

The small portion of the Site on 34-40 Water Street coincides with the delineation of MGP residuals by HEA under RTNs 3-4108 and 3-20198. That delineation relied on various monitoring wells and borings as documented in HEA's Response Action Outcome Statement and Supporting Information, dated December 18, 2009.

8.9.3. Oakland Street Wetland Boundary

The Site boundary in the wetland on 33R, 35, 37, and 39 Oakland Street (Fig. 2) was delineated based on sediment concentrations, forensics, and local conditions, and corroborated by the CSM.

Eastern Wetland Boundary

The Site boundary on the eastern edge of the wetland was delineated based on 1) sediment concentrations in samples from test pits SS628, 807, 808, 809, 810, 811, and 839, all of which were consistent with local conditions; and 2) forensic conclusions that PAHs in samples from these locations were consistent with urban background or some other source not attributable to the former MGP. The CSM suggests MGP-related impacts on the eastern edge of the wetland were generally limited to below MHW but where that is not the case, MGP-related impacts are limited to within the lower elevation portions of the abutting wetlands towards the toe of the slope where the former railroad embankment was located (current bike path). This is corroborated by sediment analytical sampling and hand auger field observations at 33R, 35, and 37 Oakland Street, which demonstrated that sediment was not impacted towards the toe of the slope (Figs. 25, 27, and 29).

Western Wetland Boundary

MGP-related impacts on the western edge of the wetland were delineated based on 1) sediment concentrations in samples from test pits SS601, SS602, SS605, SS613, SS614, and SS630, all of which were consistent with local conditions; and 2) forensic conclusions that PAHs in samples from these locations were consistent with urban background or some other source not attributable to the former MGP. The CSM suggests MGP-related impacts on the western edge of the wetland were limited to below MHW and so the wetland bank was a natural boundary that prevented contaminant migration from the wetland to upland areas. This is corroborated by sediment analytical sampling and hand auger field observations at 33R, 35, and 37 Oakland Street, which demonstrate that sediment is not impacted above the bank as it rises to the upland knoll on 35 and 37 Oakland Street (Figs. 25, 27, and 29). While the upland knoll on 35 and 37 Oakland Street is outside the extent of MGP-related impacts, this area is still

within the Site boundary due to its geography since it is situated between the wetlands and mudflat/river, both of which have MGP-related impacts.

8.9.4. Oakland Street Mudflat Boundary

The Site boundary in the mudflats on 39, 41, and 43 Oakland Street and 4 Oakland Court (Fig. 2) was delineated based on sediment concentrations, local conditions, and forensics, and corroborated by the CSM.

Eastern Mudflat Boundary

The Site boundary on the eastern edge of the mudflats was delineated based on sediment concentrations in samples from test pits SS623, SS634, and SS637, and cores 761 and 797, all of which were consistent with local conditions. Based on forensic conclusions, the PAHs in each of these samples except SS637 were attributable to the former MGP. The sample from test pit SS637 was consistent with urban background or some other source. Although most of the boundary samples on the eastern edge of the mudflats were attributable to the former MGP based on forensic evaluations, the PAH concentrations were consistent with local conditions. In addition, the CSM suggests MGP-related impacts on the eastern edge of the mudflats were limited to below MHW and so the riverbank was a natural boundary that prevented contaminant migration from the mudflats to upland areas. This is corroborated by sediment analytical sampling and hand auger field observations at 41 and 43 Oakland Street and 4 Oakland Court, which demonstrated that sediment was not impacted (Figs. 25, 27, and 29).

Northern Mudflat Boundary

MGP-related impacts on the northern edge of the mudflats were delineated based on 1) sediment concentrations in samples from test pit SS640 and cores 791 and 792, all of which were consistent with local conditions; and 2) forensic conclusions that PAHs in samples from these locations were consistent with urban background or some other source not attributable to the former MGP, or PAH concentrations were too low to evaluate forensics. The CSM suggests MGP-related impacts on the northern edge of the mudflats were limited to below MHW. This is corroborated by sediment analytical sampling and hand auger field observations at 37 Oakland Street, which demonstrated that sediment was not impacted above the bank as it rises to the upland knoll on 35 and 37 Oakland Street (Figs. 25, 27, and 29). While the upland knoll on 35 and 37 Oakland Street is outside the extent of MGP-related impacts, this area is still within the Site boundary due to its geography since it is situated between the wetland and mudflats/river, both of which have MGP-related impacts.

8.9.5. Powwow River Boundary

Riverbank Boundary

The Site boundary along the eastern and western riverbanks (Fig. 2) was delineated based on sediment concentrations, local conditions, and forensics, and corroborated by the CSM.

Except as noted below, the Site boundary along the riverbanks is coincident with MHW. The CSM suggests MGP-related impacts within the river were limited to below MHW and so the riverbank was a

natural boundary that prevented contaminant migration from the river to upland areas. Therefore, there is nowhere along the riverbanks where the Site boundary extends above MHW. This is generally corroborated by sediment analytical sampling since typically PAH concentrations along the riverbanks were consistent with local conditions (Figs. 24, 26, and 28).

The Site boundary along some portions of the river does not extend all the way to MHW. This is because sediment analytical sampling, forensics, and local conditions demonstrated that MGP-related impacts were more limited to the center of the river. These portions of the river where the Site boundary does not extend all the way to MHW include the following:

- 1 Field Street (western side of river): The Site boundary on 1 Field Street was based on cores, 689, 724, 730, 743, 744, 879, 880, 881, and 882, which had PAH concentrations consistent with local conditions and no visual evidence of MGP-related impacts. The forensics evaluation concluded that PAHs samples in all the cores, except for one at 882 were either consistent with urban background or some other source not attributable to the former MGP or too low to evaluate forensics. A sample from core 882 was possibly attributed to the former MGP.
- 24, 26, and 28 Oak Street (eastern side of river): The Site boundary on a portion of 24 Oak Street and on 26 and 28 Oak Street was based on test pits SS647 and SS648 and cores 745, 747, and 786, which had PAH concentrations consistent with local conditions and no visual evidence of MGP-related impacts. The forensics evaluation concluded that PAHs at SS647 were possibly attributed to the former MGP, at SS648 were definitively attributed to the former MGP; and at 745, 747, and 786 were either consistent with urban background or some other source not attributable to the former MGP or too low to evaluate forensics.
- 3 and 7 River Street (eastern side of river): The Site boundary on 3 and 7 River Street was based on cores 762 and 818, which had PAH concentrations consistent with local conditions and no visual evidence of MGP-related impacts. The forensics evaluation concluded that PAHs were either consistent with urban background or some other source not attributable to the former MGP or too low to evaluate forensics.
- 8 Noel Street (western side of river): The Site boundary on 8 Noel Street was based on core 798, which had PAH concentrations consistent with local conditions and no visual evidence of MGP-related impacts. The forensics evaluation concluded that PAHs in this location were possibly attributed to the former MGP.
- 27 River Street (eastern side of river): The Site boundary on 27 River Street was based on core 827, which had PAH concentrations consistent with local conditions and no visual evidence of MGP-related impacts. The forensics evaluation concluded that PAHs were too low to evaluate forensics.
- 51 River Street (eastern side of river): The Site boundary on 51 River Street was based on core 783, which had PAH concentrations consistent with local conditions and no visual evidence of MGP-related impacts. The forensics evaluation concluded that PAHs in this location were consistent with urban background or some other source not attributable to the former MGP, or PAHs were too low to evaluate forensics.

Downstream Boundary

The Site boundary at the downstream end of the river (Fig. 2) was delineated based on sediment concentrations and physical observations and corroborated by the CSM.

The Site boundary extends to the limits of the filled Powwow River (i.e., former river channel) that was disturbed during construction of the highway in the 1960s. Samples collected from cores 837, 838, 841, 842 were collected from depths that were coincident with both disturbed fill soil or sediment placed during channel filling and original deeper sediments in place prior to channel filling. No evidence of MGP-related impacts was observed or measured in the shallow soil or sediments comprising the filled material based on physical observations, chemical testing, and forensic analysis. However, evidence of MGP-related impacts was observed and measured in deeper sediments comprising the original, likely undisturbed sediments based on physical observations, chemical testing, and forensic analysis.

Additional samples were not collected in the filled channel downstream of 837, 838, 841, and 842, partially due to the complicating factor associated with accessing the active I-495 southbound onramp and the main I-495 northbound and southbound highway. Similar conditions in the original, likely undisturbed deeper sediments are expected along the remainder of the filled channel, or a portion thereof, beneath the I-495 southbound onramp and the I-495 highway.

Samples collected downstream of the filled channel at cores 804, 805, and 806, south of the I-495 highway in the current backwater of the lower Powwow River did not show evidence of former MGP-related impacts based on physical observations, chemical testing, and forensic analysis.

Therefore, the downstream portion of the Site extends to the end of the filled channel beneath the I-495 highway up to but not including Route 110 (Macy Street) or the backwater of the Powwow River.

Upstream Boundary

The Site boundary at the upstream end of the river (Fig. 2) was delineated based on sediment concentrations, local conditions, forensics, and physical observations, and corroborated by the CSM. The Site boundary is just upstream of the former Amesbury MGP footprint near 39 Water Street. The boundary crosses the river between 1 Field Street on the west and 34-40 Water Street on the east.

Sediment concentrations and the local conditions value were primary factors in determining the upstream Site boundary. Section 8.8.2 described that several upstream samples were used to establish local conditions within the Powwow River. The approach to evaluating and developing the local conditions value is described in more detail in Appendix S. Forensics and physical observations were secondary factors in determining the upstream Site boundary.

There is generally a sharp boundary between PAH concentrations below local conditions upstream of the Site boundary and PAH concentrations above local conditions downstream of the Site boundary. This is shown graphically in Figs. 24, 26, and 28. On the upstream side of the upstream Site boundary, there are only three locations where this is not the case (i.e., PAH concentrations are above local conditions upstream of the Site boundary); however, conditions in those three locations are not attributed to the former MGP, as described below:

- A shallow sediment sample from core 787 (0 to 0.3 feet), near the mouth of the Back River where it flows into the Powwow River, contained total PAHs at 579 mg/kg. The sample contained brick and glass fragments. According to forensics analysis, the PAHs were from a highly weathered tar-like material and hard to distinguish from urban background. The tar-like material is from a different source than the former MGP (possibly asphalt) and the PAHs are not attributed to the former MGP. It is also important to note that a deeper sample from this same core 787 (3.1 to 3.3 feet) was inconclusive with respect to the presence of an MGP fingerprint. However, the total PAH concentration (9.84 mg/kg) was well below the local conditions value and, therefore, it was excluded from the Site.
- Deeper sediment samples from core 857 (2 to 3 feet and 4 to 5 feet), downstream of the Back River, contained total PAHs at 171 mg/kg and 137 mg/kg, respectively. The samples contained sheen and petroleum staining, and brick, coal, and clinker fragments. According to forensics analysis, the PAHs were from a highly weathered pyrogenic material consistent with urban background and the PAHs not attributed to the former MGP.
- A shallow sediment sample from core 859 (0 to 1 foot), adjacent to the former Hamilton Woolen Mill (near Chase and Clay Streets) where coal was historically off loaded from barges, contained total PAHs at 271 mg/kg. The sample visually contained wood fragments; however, based on microscopic analysis this sample and/or others immediately adjacent to it (e.g., cores 888 and 889) contained coal, coal ash, and wood ash (as well as asphalt). Each of these debris components have been well established to contain high concentrations of PAHs. According to forensics analysis, this sample was a highly weathered mixture of petrogenic and pyrogenic material consistent with urban background and is not attributed to the former MGP.

8.9.6. Powwow River Channelized Bypass Boundary

The Site boundary at the head of the channelized river bypass on 58 Macy Street near the I-495 southbound onramp (Fig. 2) was delineated based on sediment concentrations and physical observations and corroborated by the CSM.

Based on physical observations at cores 802 and 803, shallow sediments in channelized bypass appeared consistent with material that would have been placed during construction of the Powwow River bypass, which occurred in the 1960s, well after operation and closure of the former MGP by 1924. Samples collected from 802 and 803 were collected from depths that were expected to be coincident with natural sediment in place prior to construction of the bypass. No evidence of MGP-related impacts was observed or measured in these sediments based on physical observations and chemical testing. Therefore, the channelized bypass was excluded from the Site.

9. Human Health and Environmental Risk Characterizations [40.0835(4)(g, h)]

The primary source of release(s) at the Site is attributed to former MGP operations. GEI prepared a Supplemental Method 3 Human Health Risk Characterization and Supplemental Stage I Environmental Screening (ES) and Stage II Environmental Risk Characterization (ERC) to evaluate risk to potential human and ecological receptors at the Site based on the analytical results of Site investigations conducted by GEI between 2017 and 2024. The Site originally included the National Grid property (39 Water Street), a portion of a City of Amesbury property (39A Water Street), and a small, subdivided wetland portion of a privately--owned property (33R Oakland Street). The Site was expanded in July 2015 to include a small portion of the abutting property at 34-40 Water Street after DNAPL as coal tar was encountered in a monitoring well. Based on supplemental investigations performed between 2017 and 2024, the Site has expanded further to include 28 additional properties along the Powwow River, some upstream of the former MGP but most downstream of the former MGP. The portion of the Powwow River within the Site includes approximately 150 feet upstream and approximately 5,150 feet downstream. The revised Site boundary includes the former Amesbury MGP on Water Street, downstream wetlands, mudflats, and portions of the main channel of the Powwow River, most of which is privately owned.

9.1. Summary of Supplemental Method 3 Human Health Risk Characterization

GEI prepared a Supplemental Method 3 Human Health Risk Characterization in accordance with 310 CMR 40.0900 of the MCP to evaluate exposure to wetland sediment and surface water, Powwow River mudflats and river sediment and surface water; and upland surface soil at 34-40 Water Street where the Site boundary has been expanded since the 2009 Phase II/III Report as described in Section 8.9. The Supplemental Method 3 Risk Characterization is in Appendix R.

Previously, in 2009, GEI prepared a Method 3 Risk Characterization for the original Site. Based on the results of the 2009 Method 3 Risk Characterization, GEI concluded that conditions at the original Site posed a significant risk to future commercial and construction workers at the National Grid property at 39 Water Street; current and future residents on the wetland portion of a residential property at 33R Oakland Street (and a Substantial Hazard); and future utility workers and passive recreational visitors across the original Site. Conditions also posed a significant risk to public welfare at the original Site due to the presence of DNAPL.

The current Supplemental Method 3 Risk Characterization evaluated exposures to receptors within the expanded Site boundary, as further described below.

9.1.1. Exposure Areas, Receptors, and Exposure Points

Current property use along the Powwow River within the Site includes residential, commercial, industrial, two schools, and undeveloped land. For river sediment, GEI evaluated the following three separate river segments under current and future land use: Segment I (Water Street area), Segment II

(Oakland Street / Oak Street area), and Segment III (River Street area). The segment locations are shown in Fig. RC-1 in Appendix R. GEI quantified risk for the following exposure areas based on current and potential future Site activities and use:

River Segment I Properties:

- 34-40 Water Street (Commercial/Industrial with Daycare owned by the Water Street Commerce Condominium Trust)
- 39 Water Street (Commercial - Haverhill Gas Light Co. [National Grid])
- 39A Water Street (City of Amesbury Property - Undeveloped Residential Lot)
- 33R Oakland Street (Residential)

River Segment II Properties:

- 35 Oakland Street (Residential)
- 37 Oakland Street (Residential)
- 39 Oakland Street (Residential)
- 41 Oakland Street (Residential)
- 43 Oakland Street (Residential)
- 4 Oakland Court (Residential)
- 24 Oak Street (Residential - Riverwalk Apartments)
- 26 Oak Street (Commercial - Massachusetts Electric [National Grid])
- 28 Oak Street (Commercial - Massachusetts Electric [National Grid]) (Split Between River Segment II and III)
- 1 Field Street (Not Residential - Undeveloped Lot) (Split Between River Segment I and II))

River Segment III Properties:

- 8 Noel Street (School - Possible redevelopment with increased use)
- 7 Noel Street (Commercial - River Lane Realty)
- 3 River Street (Residential - Zoned Industrial but has a house on the property)
- 7 River Street (City of Amesbury Property - Undeveloped Residential Lot)
- 11 River Street (Residential)
- 21R River Street (City of Amesbury - Undeveloped Residential Lot)
- 27 River Street (Residential)
- 33 River Street (Residential)
- 51 River Street (City of Amesbury - Undeveloped Residential Lot)

- 222 Main Street (School - Recreational Fields)
- 50 Macy Street (Commercial - Massachusetts Electric [National Grid])
- 58 Macy Street (Commercial - Rock Church Ministries)
- Commonwealth of Massachusetts tidelands - River (portion of Site in river below mean low water)

Additional Exposure Areas:

- Combined Oakland Street Residential Properties in wetland (33R, 35, 37 and 39 Oakland Street)
- Combined Oakland Street and Oakland Court Residential Properties in mudflat (39, 41, and 43 Oakland Street and 4 Oakland Court)
- River Sediment Segment I (Water Street area)
- River Sediment Segment II (Oakland Street / Oak Street area)
- River Sediment Segment III (River Street area)
- Site-wide Combined River Segments I, II, and III (all river sediment)
- Commonwealth of Massachusetts tidelands - Wetland (portion of Site in former river channel below mean low water)

GEI evaluated risk to the following current and future human receptors at the Site in consideration of current and future Site use and activities, where applicable:

- Current and future resident
- Current and future recreational visitor
- Current and future commercial worker
- Current and future trespasser
- Current and future emergency utility worker
- Future construction worker

GEI evaluated the following exposure points, where applicable:

- Wetland surface sediment (0 to 2 feet)
- Wetland deep sediment (greater than 2 feet)
- Mudflat surface sediment (0 to 2 feet)
- Mudflat deep sediment (greater than 2 feet)
- River surface sediment (0 to 2 feet)
- River deep sediment (greater than 2 feet)
- Upland surface soil (0 to 3 feet) at 34-40 Water Street

9.1.2. Conclusions

Based on the Supplemental Method 3 Risk Characterization, GEI concluded the following:

Hot Spot Evaluation

GEI conducted a hot spot evaluation on the surface sediment analytical data (0 to 2 feet) and the deep sediment analytical data (greater than 2 feet) for the wetlands, mudflats, and river. The maximum COC concentrations were compared to the average of the surrounding area (excluding the maximum detected concentration) to identify potential hot spots for individual properties as well as multiple properties comprising an exposure area for a receptor. When the average of the highest detected concentrations for a COC within a localized area is less than 100 times the average of the surrounding area, a hot spot is not present. Based on this hot spot evaluation, no hot spots exist in surface sediment or deep sediment exposure areas for the wetlands, mudflats, and river.

For surface soil analytical results at 34-40 Water Street, GEI did not identify any hot spots in soil.

Human Health Risk Characterization

There was significant risk to the following current and future receptors:

- Current resident due to potential exposure to surface sediment in a few isolated locations in Segments I and II of the river;
- Current resident at four properties (35, 37, and 41 Oakland Street and 4 Oakland Court) due to potential exposure to surface sediment in the wetland and/or mudflat;
- Current recreational visitor due to potential exposure to surface sediment in the mudflat;
- Current recreational visitor due to potential exposure to surface sediment in Segment II of the river;
- Future resident due to potential exposure to Segment-wide deep sediment at Segment II and Segment III of the river as well as deep sediment in multiple isolated locations in Segments I, II, and III of the river;
- Future recreational visitor due to potential exposure to Segment-wide deep sediment at Segment II and Segment III of the river, and Site-wide, including all three segments of the river;
- Future trespasser due to potential exposure to deep sediment in multiple isolated locations in Segments II and III of the river; and
- Future construction worker due to potential exposure to deep sediment in multiple isolated locations in Segments II and III of the river.

For properties where exposures to wetland, mudflat, and river sediment were added together, risk may be overestimated because adding these risks together results in a higher exposure frequency for the receptor.

There is NSR to a potential future resident from exposure to accessible upland surface soil located adjacent to the recreational path at 34-40 Water Street. There is also NSR to a future resident at 34-40 Water Street from potential residential exposure to river surface sediment. In addition, there is NSR to a future resident at 34-40 Water Street from cumulative exposure to upland surface soil as well as residential exposure to river surface sediment. However, there is significant risk to a resident at 34-40 Water Street from cumulative residential soil and sediment exposure as well as recreational exposure to Site-wide river surface sediment. This exposure scenario conservatively assumed a resident may contact river surface sediment in the vicinity of their property and may also contact Sitewide river surface sediment during recreational activities. A planned AUL at 34-40 Water Street will prohibit exposure to deeper upland soil (greater than 3 feet) and deeper river sediment (greater than 2 feet).

We concluded NSR for all other current and future exposure scenarios not identified above, including for the current trespasser and the utility worker.

Safety Risk Characterization

Based on observations and information collected during environmental investigations of the Site, a condition of NSR of harm to safety exists at the Site.

Public Welfare Risk Characterization

Based on observations and information collected during environmental investigations of the Site, no community at or near the Site experiences adverse impacts to public welfare under current or anticipated future conditions. The RAH conditions at the Site will be remediated as these areas represent a substantial hazard. The risk of harm to public welfare is also characterized by comparing COC concentrations to MCP Method 3 Ceiling Limits (M3CLs) for soil and groundwater. MassDEP M3CLs have only been established for soil and groundwater. Therefore, for most of the data collected from the Site in sediment, a comparison of COCs to M3CLs is not applicable. However, average concentrations of COCs in soil and groundwater do not exceed applicable M3CLs. Accordingly, a condition of NSR of harm to public welfare exists at the Site.

9.2. Summary of Supplemental Stage I Environmental Screening and Stage II Environmental Risk Characterization

GEI prepared a Supplemental Stage I ES and Stage II ERC in accordance with 310 CMR 40.0900 of the MCP to provide a comprehensive ecological risk characterization where the Site boundary has been expanded since the 2009 Phase II/III Report as described in Section 8.9. The Stage I ES and Stage II ERC are in Appendix S.

Previously, in 2009, GEI prepared a Stage I ES and partial Stage II ERC for the original Site. The results of the Stage I ES indicated ecological risk was probable due to elevated concentrations, primarily of MGP-related contaminants (PAHs). A comprehensive Stage II ERC was not warranted in 2009 because 1) potentially significant exposure pathways were present, and 2) environmental harm was readily apparent based on contaminant concentrations in comparison to background and risk limits. The recommendation from the 2009 Stage I ES was to move forward into remedial design rather than a

Stage II ERC. This conclusion was incorporated into the Phase IV RIP that was implemented in 2016 and 2017 within the original Site boundary. The remedy was limited to the former MGP footprint on Water Street and two other small adjacent parcels. The Supplemental Stage I ES and Stage II ERC evaluated exposures to receptors within the expanded Site boundary, which includes wetland, mudflat, and river environments.

The Supplemental Stage I ES concluded that there were current and potential future exposures to contaminants in sediment in all three areas of the expanded Site (i.e., wetland, mudflat, river). The exposures occur in areas exhibiting conditions of RAH as well as in other areas. For areas not exhibiting conditions of RAH, a Stage II ERC was performed to 1) provide a more thorough evaluation whether there is risk of significant harm; and 2) define approaches to determining extent and magnitude of risk of significant harm for the identified exposure pathways.

The Supplemental Stage II ERC Problem Formulation identified one assessment endpoint: benthic invertebrates in the Powwow River. This fauna is present in all three exposure areas and is the maximally exposed group to residual contamination in sediment. Because this community consists of a potentially large assemblage of species, it was evaluated using criteria protective of reasonably high sensitivity species and populations in the larger assemblage.

Based on the Supplemental Stage II ERC, we concluded:

Wetland Area

Most of the wetland area below MHW at 33R, 35, and 37 Oakland Street exhibits RAH and therefore presumptively poses significant risk of harm. The quantitative Stage II ERC also confirmed that these locations pose significant risk of harm based on an evaluation using a weight-of-evidence approach described in more detail in Appendix S. Two locations above MHW and outside of the area exhibiting RAH also pose significant risk of harm based on the Stage II ERC. These locations are SS607 and 794 at 35 Oakland Street, both of which are only slightly above MHW.

Mudflat Area

A portion of the mudflat area at 39 and 41 Oakland Street exhibits RAH and therefore presumptively poses significant risk of harm. The quantitative Stage II ERC also confirmed that most of these locations pose significant risk of harm based on a weight-of-evidence approach described in more detail in Appendix S. One location outside of the area exhibiting RAH also pose significant risk of harm based on the Stage II ERC. This location is 720 at 41 Oakland Street, just south of the area exhibiting RAH.

River Area

Several localized areas in the river area in the top one foot of sediment either exhibit RAH and therefore presumptively pose significant risk of harm, or were confirmed to pose significant risk of harm according to the quantitative Stage II ERC and a weight-of-evidence approach described in more detail in Appendix S. Specifically:

- The river area around multiple locations on 39, 41, and 43 Oakland Street and 1 Field Street, immediately adjacent to and downstream of the mudflat area
- Two river areas exhibiting RAH at locations 701 and 706 at 1 Field Street.
- Two river areas at location 817 and 852 at 3 River Street.

A condition of no significant risk of harm is present at all other locations within the river in the shallow river sediments (0-1 foot) based on the weight-of-evidence approach described in more detail in Appendix S.

GEI developed an environmental risk-based guideline for total PAHs as a remediation goal to help put contaminant concentrations at the Site into context. The guideline for total PAHs established for the Site is 104 mg/kg. The guideline was derived based on bioavailability (i.e., that fraction of total concentrations of a chemical in environmental media, such as sediment that are actually available for uptake by an organism). There is an increasing scientific and regulatory acknowledgement of the need to consider the bioavailability of sediment-bound contaminants in exposure assessments because the total concentrations of many chemicals overestimate the amount of actual exposure to an organism in the natural environment. Appendix S provides a more detailed description of the derivation of this guideline. Also, the guideline for PAHs is based on site-specific sediment characteristics and is dependent on TOC. GEI selected a TOC for a sandy substrate that best represents expected future (post remediation) conditions.

10. Summary and Conclusions [40.0835(4)(i)]

This Supplemental Phase II CSA Report meets the requirements presented in the MCP for a Phase II CSA (310 CMR 40.0830) and Method 3 Risk Characterization (310 CMR 40.0900). This Supplemental Phase II CSA Report addresses the release of former MGP-related constituents to the environment at the Site, particularly within the expanded Site boundary evaluated between 2017 and 2024. The conclusions of the Supplemental Phase II CSA, Supplemental Method 3 Human Health Risk Characterization, and Supplemental Stage I Environmental Screening and Stage II Environmental Risk Characterization are provided below.

10.1. Source, Nature, and Extent of Contamination

- The Site includes the former Amesbury MGP, downstream wetlands, mudflats, and portions of the main channel of the Powwow River, most of which is privately owned. Properties within the Site include single-family residential properties along Oakland Street and River Street; multi-family residential properties at 24 Oak Street and 32 Macy Street; commercial/industrial properties at 34-40 Water Street, 7 Noel Street, and 58 Macy Street; two school properties at 8 Noel Street and 222 Main Street; a portion of the Northbound and Southbound lanes of Interstate 495 (I-495); and a portion of the onramp connecting Route 110 (Macy Street) to I-495 Southbound. Although property uses vary within the Site, there are no buildings within the Site.
- The former Amesbury MGP operated from sometime prior to 1899 and there is no evidence that it operated after January 1924, at which time it was purchased by the Haverhill Gas Light Company, a predecessor in interest to National Grid. It appears that releases of coal tar were discharged at the facility and beyond during its operation in the early 1900s. Coal tar appears to have been released during MGP operations to the Powwow River as a point source discharge, possibly via a former sluiceway that discharged to the nearby wetland and mudflat adjacent to the former MGP. From the likely discharge point, the tar accumulated in shallow sediments within the wetland and mudflat. Tar also likely flowed across the mudflat and accumulated at deeper intervals downstream within portions of the Powwow River channel. The Powwow River was dredged between approximately 1895 and 1900. In the approximately 100 years since these tar releases, the dredged river channel slowly filled back in with sediments naturally deposited in the river system. Redeposition of sediment in the Powwow River downstream of the mudflat likely remobilized some contaminants, resulting in continued presence of lower levels of contaminants in the shallow, more recently deposited sediment.
- The portion of the Powwow River within the Site is a large area which has historically been, and is currently, affected by the surrounding land uses. Aside from the former Amesbury MGP, several other sources of contamination upstream, within, or adjacent to the river have been identified that likely have affected conditions the river. These include releases associated with historical textile mills, a former industrial landfill, a former municipal landfill, former manufacturing facilities, stormwater point and non-point sources, and historical filling during river alterations.

- Constituents identified in soil, sediment, and sediment porewater at the Site include VOCs and PAHs. Soil and sediment also contained petroleum hydrocarbons, metals, cyanide, PCBs, pesticides, and herbicides. The presence of DNAPL, BTEX compounds (benzene, toluene, ethylbenzene, xylene), PAHs, and petroleum hydrocarbons, are attributable, in part, to historical MGP operations and waste disposal practices.
- NAPL was observed in soil and sediment at the Site. NAPL was considered to be present if soil or sediment was tar-saturated, tar-coated, or contains tar blebs. Visual evidence of sheen or staining by itself was not considered NAPL unless the sheen was characterized as heavy and pervasive, suggesting the presence of tar. In some cases, the presence of NAPL in sediment represents a condition of Readily Apparent Harm (RAH), specifically in the downstream wetland and mudflat, and in two isolated areas of the river itself.
    - As documented in the 2009 Phase II/III Report, dense NAPL (DNAPL) was observed in soil in a narrow north-south band on the former MGP footprint across 39 Water Street and 39A Water Street.
    - NAPL was observed in sediments in the downstream wetland, primarily on 35 Oakland Street and 37 Oakland Street although it was also observed at 33R Oakland Street to the north. NAPL was observed in sediments in the wetland at depths ranging from about 0.2 to 2.5 feet.
    - NAPL was observed in sediments in the downstream mudflat on 39 and 41 Oakland Street. NAPL was observed in sediments in the mudflat at depths ranging from about 0.5 to 1 foot.
    - NAPL was observed in sediments in the river within a narrow band in the center of the river, primarily on 1 Field Street and 8 Noel Street on the northern side of the river and on various Oakland Street and Oak Street properties and 3 River Street on the southern side of the river. NAPL was observed in sediments in the river generally from as shallow as about 1 or 2 feet up to about 8 or 9 feet below the sediment surface. In the downstream stretch of the river, overlying shallow sediments likely deposited after dredging do not have visible NAPL except for two locations at 1 Field Street where NAPL was observed at depths shallower than 1 foot, representing RAH.
- Contaminants were detected in sediment 1) in the wetland and mudflat adjacent to the former MGP near Oakland Street where the release(s) likely historically occurred; 2) within the Powwow River both upstream and downstream of the mudflat; 3) and within a portion of the former Powwow River channel that was subsequently filled as part of construction of I-495.
    - In the wetland, Site contaminants in sediment were limited to the top 2.5 feet and were primarily within a narrow band parallel to and east of the wetland stream channel on the 33R, 35, and 37 Oakland Street properties.
    - In the mudflat, Site contaminants in sediment were limited to the top 2 feet and were primarily along and north of the mudflat stream channel on the 39 and 41 Oakland Street properties.
    - In the river, shallow sediments generally contained significantly lower total PAH concentrations compared to deeper sediments. Deeper sediments up to 3,500 feet downstream of the mudflats, within the main Powwow River channel, and within the

Commonwealth of Massachusetts tidelands generally contained significantly higher total PAH concentrations. A clay or dense silt layer was encountered beneath much of the affected sediments in the Powwow River channel and appears to be acting as a confining layer. In the downstream stretch of the Powwow River, overlying shallow sediments likely deposited after dredging were not significantly contaminated with PAHs.

- Within the former river channel that was filled during I-495 construction, the elevated PAHs and MGP-related impacts, such as sheen on sediments and staining, were observed from approximately 5 to 8 feet below the surface. The overlying shallow material, which was backfilled as part of construction for I-495 and did not contain significant PAH concentrations and did not have visible MGP-related impacts.

- In the river, PAH concentrations in shallow sediment porewater were generally 1 to 2 orders of magnitude lower than PAH concentrations in deeper porewater. Surface water within the river was not impacted by the MGP-related contaminants identified in sediment. Surface water in the wetland had detections of low concentrations of PAHs, specifically at 35 and 37 Oakland Street. The surface water detections generally corresponded to locations with shallow visual observations of coal tar (i.e., within the area of the RAH condition).
- MGP-impacts within deeper sediment in the river are isolated and stable. There is no evidence of advective movement of NAPL to the sediment/water interface. There is no evidence of upward vertical migration of contaminants in porewater from deeper sediments to the overlying surface water. There is no evidence that ebullition-facilitated NAPL flux is occurring that would mobilize NAPL via gas bubbles from sediments to the overlying surface water.
- The revised Site boundary has been delineated based on the measured extent of COCs in environmental media and supplemented with visual and olfactory observations, local conditions considerations, forensics evaluations, and the Conceptual Site Model.
  - The northern Site boundary in the river portion is just upstream of the former Amesbury MGP footprint near 39 Water Street; and the northern Site boundary in the upland portion is on or adjacent to 34-40 Water Street.
  - The eastern Site boundary in the wetland and mudflat portion near Oakland Street is close to the toe of the slope where the former railroad embankment was located (current bike path); and the eastern Site boundary in the river portion generally coincides with the riverbanks and MHW although in some cases the Site boundary does not extend all the way to MHW.
  - The western Site boundary in the river generally coincides with the riverbanks and MHW although in some cases the Site boundary does not extend all the way to MHW.
  - The southern (downstream) Site boundary in the river coincides with the end of the filled channel beneath the I-495 highway up to but not including Route 110 (Macy Street) or the backwater of the Powwow River.

10.2. Human Health Risk Characterization

GEI prepared a Supplemental Method 3 Human Health Risk Characterization in accordance with 310 CMR 40.0900 of the MCP to evaluate exposure to wetland sediment and surface water, Powwow River mudflats and river sediment and surface water; and upland surface soil at 34-40 Water Street where the Site boundary has been expanded since the 2009 Phase II/III Report. Based on the Supplemental Method 3 Risk Characterization, GEI concluded the following:

Human Health Risk Characterization

There was significant risk to the following current and future receptors:

- Current resident due to potential exposure to surface sediment in a few isolated locations in Segments I and II of the river;
- Current resident at four properties (35, 37, and 41 Oakland Street and 4 Oakland Court) due to potential exposure to surface sediment in the wetland and/or mudflat;
- Current recreational visitor due to potential exposure to surface sediment in the mudflat;
- Current recreational visitor due to potential exposure to surface sediment in Segment II of the river;
- Future resident due to potential exposure to Segment-wide deep sediment at Segment II and Segment III of the river as well as deep sediment in multiple isolated locations in Segments I, II, and III of the river;
- Future recreational visitor due to potential exposure to Segment-wide deep sediment at Segment II and Segment III of the river, and Site-wide, including all three segments of the river;
- Future trespasser due to potential exposure to deep sediment in multiple isolated locations in Segments II and III of the river; and
- Future construction worker due to potential exposure to deep sediment in multiple isolated locations in Segments II and III of the river.

There is NSR to a potential future resident from exposure to accessible upland surface soil located adjacent to the recreational path at 34-40 Water Street. There is also NSR to a future resident at 34-40 Water Street from potential residential exposure to river surface sediment. In addition, there is NSR to a future resident at 34-40 Water Street from cumulative exposure to upland surface soil as well as residential exposure to river surface sediment. However, there is significant risk to a resident at 34-40 Water Street from cumulative residential soil and sediment exposure as well as recreational exposure to Site-wide river surface sediment. This exposure scenario conservatively assumed a resident may contact river surface sediment in the vicinity of their property and may also contact Sitewide river surface sediment during recreational activities. A planned AUL at 34-40 Water Street will prohibit exposure to deeper upland soil (greater than 3 feet) and deeper river sediment (greater than 2 feet).

Safety Risk Characterization

Based on observations and information collected during environmental investigations of the Site, a condition of NSR of harm to safety exists at the Site.

Public Welfare Characterization

Based on observations and information collected during environmental investigations of the Site, no community at or near the Site experiences adverse impacts to public welfare under current or anticipated future conditions. The RAH conditions at the Site will be remediated as these areas represent a substantial hazard. Average concentrations of COCs in upland surface soil at 34-40 Water Street are below M3CLs and maximum concentrations of chemicals detected in groundwater at the upland portion of 34-40 Water Street are below M3CLs. Accordingly, a condition of NSR of harm to public welfare exists at the Site.

10.3. Environmental Risk Characterization

The Supplemental Stage I ES and Stage II ERC evaluated exposures to receptors within the expanded Site boundary. The Supplemental Stage I ES concluded that there were current and potential future exposures to contaminants in sediment in all three areas of the expanded Site (i.e., wetland, mudflat, river). The exposures occur in areas exhibiting conditions of RAH as well as in other areas. For areas not exhibiting conditions of RAH, a Stage II ERC was performed to 1) provide a more thorough evaluation whether there is risk of significant harm and 2) define approaches to determining extent and magnitude of risk of significant harm for the identified exposure pathways.

The Supplemental Stage II ERC Problem Formulation identified one assessment endpoint: benthic invertebrates in the Powwow River. This fauna is present in all three exposure areas and is the maximally exposed group to residual contamination in sediment. Because this community consists of a potentially large assemblage of species, it was evaluated using criteria protective of reasonably high sensitivity species and populations in the larger assemblage.

Based on the Supplemental Stage II ERC, GEI concluded the following:

Wetland Area

Most of the wetland area below MHW at 33R, 35, and 37 Oakland Street exhibits RAH and therefore presumptively poses significant risk of harm. The quantitative Stage II ERC also confirmed that these locations pose significant risk of harm based on an evaluation using a weight-of-evidence approach. Two locations above MHW and outside of the area exhibiting RAH also pose significant risk of harm based on the Stage II ERC. These locations are SS607 and 794 at 35 Oakland Street, both of which are only slightly above MHW.

Mudflat Area

A portion of the mudflat area at 39 and 41 Oakland Street exhibits RAH and therefore presumptively poses significant risk of harm. The quantitative Stage II ERC also confirmed that most of these locations

pose significant risk of harm based on a weight-of-evidence approach. One location outside of the area exhibiting RAH also pose significant risk of harm based on the Stage II ERC. This location is 720 at 41 Oakland Street, just south of the area exhibiting RAH.

River Area

Several localized areas in the river area in the top 1 foot of sediment either exhibit RAH and, therefore, presumptively pose significant risk of harm, or were confirmed to pose significant risk of harm according to the quantitative Stage II ERC and a weight-of-evidence approach. Specifically:

- The river area around multiple locations on 39, 41, and 43 Oakland Street and 1 Field Street, immediately adjacent to and downstream of the mudflat area
- Two river areas exhibiting RAH at locations 701 and 706 at 1 Field Street.
- Two river areas at location 817 and 852 at 3 River Street.

A condition of no significant risk of harm is present at all other locations within the river in the shallow river sediments (0-1 foot) based on the weight-of-evidence approach.

10.4. Conditions To Be Addressed in Phase III Evaluation

Based on the results of the Supplemental Phase II CSA Report, and the human health and ecological risk characterizations, the following conditions will be addressed as part of the Phase III evaluation of remedial alternatives for the Site:

- The presence of MGP waste deposits on 35 and 37 Oakland Street;
- The condition of RAH and/or environmental risk in the much of the wetland and mudflat on 33R, 35, 37, 39, and 41 Oakland Street and in isolated areas of the river on 1 Field Street and 3 River Street;
- Significant human health risk for current and/or future residents along various portions of the Site;
- Significant human health risk for current recreational visitors at Oakland Street / Oakland Court parcels, 8 Noel Street, and river Segment II; and significant human health risk for future recreational visitors at all but river Segment I; and
- Significant human health risk for future trespasser and future construction worker at 28 Oak Street and 50 Macy Street.

11. Limitations

This report was prepared for the use of National Grid, exclusively. National Grid may submit this report to MassDEP. Our conclusions are based on the information reported in this document. Additional information not available to GEI at the time this report was prepared and additional information obtained in the future may result in a modification of the findings of this investigation. This report has been prepared in accordance with generally accepted engineering and hydrogeological practices. No warranty, express or implied, is made.

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Tables

Table 1. Visual Oil or Tar in Wetland Soil and Sediment

Table 1. Sediment Chemical Testing Results – All Locations

Table 3. Sediment Chemical Testing Results – Wetland

Table 4. Sediment Chemical Testing Results – Mudflat

Table 5. Sediment Chemical Testing Results – River

Table 6. Sediment Chemical Testing Results – Former River Channel

Table 7. Porewater Chemical Testing Results – River

Table 8. Upland Soil Chemical Testing Results – 34-40 Water Street

Table 9. Sediment Disposal Characterization Testing Results – All Locations

Table 10. Surface Water Chemical Testing Results – Wetland and River

Table 11. Physical and Chemical Properties of Constituents of Concern

Table 1. Summary of Sample Visual Observations
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

Location ID	Property	Area	Date	Total Depth (feet)	Field Observations (feet)	Depth of Visual Oil/Tar Impacts (feet)	Readily Apparent Harm (RAH)
1	33R Oakland Street	Wetland	4/21/2017	1.5	No coal tar or sheen	NA	N
2	35 Oakland Street	Wetland	4/21/2017	1	Slight sheen on water within test pit	NA	N
3	35 Oakland Street	Wetland	4/21/2017	2	Black staining	0.7-2	N
4	33R Oakland Street	Wetland	4/21/2017	1.5	Black staining	0.7-1.5	N
5	35 Oakland Street	Wetland	4/21/2017	1.5	Black staining	0.7-1.5	N
6	35 Oakland Street	Wetland	4/21/2017	1.7	Black staining	0.7-1.7	N
7	33R Oakland Street	Wetland	4/21/2017	1.5	Black staining	0.5-1.5	N
9	35 Oakland Street	Wetland	4/21/2017	1.5	Black staining	1-1.5	N
10	35 Oakland Street	Wetland	4/25/2017	2	Black staining	0.3-0.6	N
12	35 Oakland Street	Wetland	4/21/2017	1.5	Black staining	0.5-1.5	N
13	35 Oakland Street	Wetland	4/21/2017	2	No coal tar or sheen	NA	N
14	35 Oakland Street	Wetland	4/21/2017	2	Sheen on water within test pit; coal tar saturated (in stratified seams)	0.7-1.7	Y
14B	35 Oakland Street	Wetland	4/25/2017	2	Slight sheen on water within test pit	NA	N
15	35 Oakland Street	Wetland	4/25/2017	2.2	No coal tar or sheen	NA	N
16	35 Oakland Street	Wetland	4/25/2017	2.2	Coal tar saturated	0.6-1.4	Y
17	33R Oakland Street	Wetland	4/25/2017	2	Black staining	0.6-1.3	N
18	33R Oakland Street	Wetland	4/25/2017	2.3	No coal tar or sheen	NA	N
19	35 Oakland Street	Wetland	4/25/2017	2	No coal tar or sheen	NA	N
20	33R Oakland Street	Wetland	4/25/2017	NM	No coal tar or sheen	NA	N
24	33R Oakland Street	Wetland	5/3/2017	1.3	Black staining, slight sheen on water within test pit	0.3-1	N
25	33R Oakland Street	Wetland	5/3/2017	2	Coal tar saturated and heavy sheen on water within test pit	0.5-1.3	Y
26	33R Oakland Street	Wetland	5/3/2017	1	Black staining	0.5-1	N
27	33R Oakland Street	Wetland	5/3/2017	1.3	No coal tar or sheen	NA	N
28	33R Oakland Street	Wetland	5/3/2017	2	No coal tar or sheen	NA	N
29	33R Oakland Street	Wetland	5/3/2017	1.3	Black staining	0.5-1.3	N
30	33R Oakland Street	Wetland	5/3/2017	1.8	No coal tar or sheen	NA	N
31	33R Oakland Street	Wetland	5/3/2017	2	No coal tar or sheen	NA	N
101	35 Oakland Street	Wetland	7/11/2017	2.1	Black staining	0.5-1.8	N
102	35 Oakland Street	Wetland	7/11/2017	1.4	No coal tar or sheen	NA	N
103	35 Oakland Street	Wetland	7/11/2017	2	Coal tar saturated	0.4-0.7	Y
104	35 Oakland Street	Wetland	7/11/2017	1.9	Coal tar saturated and solid coal tar	0.2-0.6	Y
105	35 Oakland Street	Wetland	7/11/2017	2	Coal tar saturated	0.5-0.8	Y
106	35 Oakland Street	Wetland	7/11/2017	2.1	Black staining	0.6-1.3	N
107	35 Oakland Street	Wetland	7/11/2017	1.9	Coal tar saturated	0.6-1.1	Y
108	35 Oakland Street	Wetland	7/11/2017	1.5	Black staining, slight sheen on water within test pit	1-1.3	N
109	35 Oakland Street	Wetland	7/11/2017	1.8	No coal tar or sheen	NA	N
110	35 Oakland Street	Wetland	7/11/2017	1.8	Coal tar saturated	0.7-1.2	Y
111	35 Oakland Street	Wetland	7/11/2017	2	No coal tar or sheen	NA	N
112	35 Oakland Street	Wetland	7/11/2017	2.1	No coal tar or sheen	NA	N
113	35 Oakland Street	Wetland	7/11/2017	2.2	Black staining	0.6-1.2	N
114	35 Oakland Street	Wetland	7/11/2017	2.1	No coal tar or sheen	NA	N
115	35 Oakland Street	Wetland	7/11/2017	2.1	Slight sheen on water within test pit	0.5-1	N
116	35 Oakland Street	Wetland	7/11/2017	2	No coal tar or sheen	NA	N
117	35 Oakland Street	Wetland	7/11/2017	2.1	No coal tar or sheen	NA	N
118	35 Oakland Street	Wetland	7/11/2017	1.9	No coal tar or sheen	NA	N
119	33R Oakland Street	Wetland	7/11/2017	1.4	No coal tar or sheen	NA	N
120	33R Oakland Street	Wetland	7/11/2017	1.9	Slight sheen on water within test pit	NA	N
121	33R Oakland Street	Wetland	7/11/2017	2	No coal tar or sheen	NA	N
122	33R Oakland Street	Wetland	7/11/2017	2.1	No coal tar or sheen	NA	N
123	33R Oakland Street	Wetland	7/11/2017	2	No coal tar or sheen	NA	N
124	33R Oakland Street	Wetland	7/11/2017	1.6	No coal tar or sheen	NA	N
125	33R Oakland Street	Wetland	7/11/2017	2	No coal tar or sheen	NA	N
126	35 Oakland Street	Wetland	7/17/2017	1.8	No coal tar or sheen	NA	N
127	35 Oakland Street	Wetland	7/17/2017	2	Coal saturated soil (seam)	1.7	N
128	35 Oakland Street	Wetland	7/17/2017	2	Slight sheen on water within test pit	NA	N
129	35 Oakland Street	Wetland	7/17/2017	2	No coal tar or sheen	NA	N
130	35 Oakland Street	Wetland	7/17/2017	2.1	No coal tar or sheen	NA	N
131	35 Oakland Street	Wetland	7/17/2017	2.3	No coal tar or sheen	NA	N
132	35 Oakland Street	Wetland	7/17/2017	2.5	No coal tar or sheen	NA	N
133	35 Oakland Street	Wetland	7/17/2017	2.4	No coal tar or sheen	NA	N
134	35 Oakland Street	Wetland	7/17/2017	2.4	No coal tar or sheen	NA	N
135	35 Oakland Street	Wetland	8/2/2017	2.2	No coal tar or sheen	NA	N
136	35 Oakland Street	Wetland	8/2/2017	2.3	No coal tar or sheen	NA	N
137	35 Oakland Street	Wetland	8/2/2017	2.1	Coal tar saturated	0.7-1.8	Y
138	35 Oakland Street	Wetland	8/2/2017	2.3	Black staining	0.4-1.2	N
139	33R Oakland Street	Wetland	8/2/2017	2.3	No coal tar or sheen	NA	N
140	33R Oakland Street	Wetland	8/2/2017	2.3	No coal tar or sheen	NA	N
141	35 Oakland Street	Wetland	8/2/2017	2.1	No coal tar or sheen	NA	N
142	35 Oakland Street	Wetland	8/2/2017	2.1	No coal tar or sheen	NA	N
143	35 Oakland Street	Wetland	8/2/2017	2.5	No coal tar or sheen	NA	N
144	35 Oakland Street	Wetland	8/2/2017	2.1	Small piece of solid coal tar	0.2-0.3	Y
145	35 Oakland Street	Wetland	8/2/2017	2	No coal tar or sheen	NA	N
146	35 Oakland Street	Wetland	8/2/2017	2.3	No coal tar or sheen	NA	N
147	33R Oakland Street	Wetland	8/2/2017	2.5	Coal tar saturated	0.7-1.3	Y
SS601	35 Oakland Street	Wetland	9/22/2017	2.4	No coal tar or sheen	NA	N
SS602	35 Oakland Street	Wetland	9/22/2017	2.4	No coal tar or sheen	NA	N
SS603	35 Oakland Street	Wetland	9/22/2017	2	Coal tar saturated	0-0.5	Y
SS604	35 Oakland Street	Wetland	9/22/2017	2.1	No coal tar or sheen	NA	N
SS605	35 Oakland Street	Wetland	9/22/2017	2.3	No coal tar or sheen	NA	N
SS606	33R Oakland Street	Wetland	9/22/2017	2.1	No coal tar or sheen	NA	N
SS607	35 Oakland Street	Wetland	9/22/2017	2	No coal tar or sheen	NA	N
SS608	35 Oakland Street	Wetland	10/5/2017	2.4	No coal tar or sheen	NA	N
SS609	35 Oakland Street	Wetland	10/5/2017	2.2	Black staining	0.3-0.6	N
SS610	35 Oakland Street	Wetland	10/5/2017	2.5	Black staining	1.2-1.7	N
SS611	35 Oakland Street	Wetland	10/5/2017	2.7	Black staining	0.8-1.2	N
SS608R	35 Oakland Street	Wetland	11/8/2017	2.4	No coal tar or sheen	NA	N
SS609R	35 Oakland Street	Wetland	11/8/2017	2.2	Black staining	0.8-1.1	N
SS610R	35 Oakland Street	Wetland	11/8/2017	2.5	Black staining	0.7-1.1	N
SS611R	35 Oakland Street	Wetland	11/8/2017	2.7	Black staining	0.8-1.2	N
148	37 Oakland Street	Wetland	5/18/2018	2.7	No coal tar or sheen	NA	N
149	37 Oakland Street	Wetland	5/18/2018	3	Two small pieces of solid coal tar	0.5	Y
150	37 Oakland Street	Wetland	5/18/2018	2.4	No coal tar or sheen	NA	N
151	37 Oakland Street	Wetland	5/18/2018	2.5	No coal tar or sheen	NA	N
152	37 Oakland Street	Wetland	5/18/2018	2.2	No coal tar or sheen	NA	N
153	37 Oakland Street	Wetland	5/18/2018	2.9	No coal tar or sheen	NA	N
154	37 Oakland Street	Wetland	5/18/2018	2.3	No coal tar or sheen	NA	N
155	37 Oakland Street	Wetland	5/18/2018	2	No coal tar or sheen	NA	N
156	37 Oakland Street	Wetland	5/18/2018	2.4	No coal tar or sheen	NA	N
157	37 Oakland Street	Wetland	5/18/2018	2.4	Coal tar saturated	0.2-1	Y
SS612	37 Oakland Street	Wetland	7/16/2018	2.8	No coal tar or sheen	NA	N
SS613	37 Oakland Street	Wetland	7/16/2018	2.7	No coal tar or sheen	NA	N
SS614	37 Oakland Street	Wetland	7/16/2018	2.4	No coal tar or sheen	NA	N
SS615	37 Oakland Street	Wetland	7/16/2018	2.4	No coal tar or sheen	NA	N
SS616	37 Oakland Street	Wetland	7/16/2018	2.8	Solid coal tar and heavy sheen	0.9-1.2	Y
SS617	37 Oakland Street	Wetland	7/16/2018	3.2	Coal tar saturated and heavy sheen	1-2.3	N
SS618	37 Oakland Street	Wetland	7/16/2018	2.5	Black staining and heavy sheen	0.9-1.8	Y
158 (SS624)	37 Oakland Street	Wetland	8/15/2018	2.4	No coal tar or sheen	NA	N
159	39 Oakland Street	Mudflat	8/15/2018	2	No coal tar or sheen	NA	N
160	39 Oakland Street	Mudflat	8/15/2018	1.9	No coal tar or sheen	NA	N
161	41 Oakland Street	Mudflat	8/15/2018	2.2	No coal tar or sheen	NA	N
162 (SS620)	41 Oakland Street	Mudflat	8/15/2018	2.5	No coal tar or sheen	NA	N
163 (SS619)	39 Oakland Street	River	8/15/2018	1.9	Sheen	0-1.9	N
164	39 Oakland Street	River	8/15/2018	1.7	Sheen	0-1.7	N
165 (SS621)	41 Oakland Street	River	8/15/2018	1.8	No coal tar or sheen	NA	N
166	39 Oakland Street	Mudflat	8/15/2018	2.3	No coal tar or sheen	NA	N
167	41 Oakland Street	Mudflat	8/15/2018	1.7	No coal tar or sheen	NA	N
168 (SS622)	39 Oakland Street	Mudflat	8/15/2018	1.8	No coal tar or sheen	NA	N

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Amesbury Former MGP
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Location ID	Property	Area	Date	Total Depth (feet)	Field Observations (feet)	Depth of Visual Oil/Tar Impacts (feet)	Readily Apparent Harm (RAH)
169 (SS623)	43 Oakland Street	Mudflat	8/15/2018	1.7	No coal tar or sheen	NA	N
SS625	35 Oakland Street	Wetland	12/17/2018	1.7	Solid coal tar pieces	0.3-0.5	Y
SS626	35 Oakland Street	Wetland	12/17/2018	2	No coal tar or sheen	NA	N
SS627	37 Oakland Street	Wetland	12/17/2018	1.5	No coal tar or sheen	NA	N
SS628	37 Oakland Street	Wetland	12/17/2018	1.7	No coal tar or sheen	NA	N
SS629	37 Oakland Street	Wetland	12/17/2018	1.9	Solid coal tar and heavy sheen	0.3	Y
SS630	37 Oakland Street	Wetland	12/17/2018	2	No coal tar or sheen	NA	N
SS631	39 Oakland Street	Mudflat	12/17/2018	1.5	Coal tar saturated and heavy sheen	0.5	Y
SS632	39 Oakland Street	Mudflat	12/17/2018	2	Black staining and sheen	0-0.7	N
SS633	39 Oakland Street	Mudflat	12/17/2018	0.5	No coal tar or sheen	NA	N
SS634	41 Oakland Street	Mudflat	12/17/2018	2	No coal tar or sheen	NA	N
SS635	41 Oakland Street	Mudflat	12/20/2018	0.5	No coal tar or sheen	NA	N
SS636	39 Oakland Street	River	12/20/2018	0.5	No coal tar or sheen	NA	N
SS637	4 Oakland Court	Mudflat	12/17/2018	0.5	No coal tar or sheen	NA	N
SS638	4 Oakland Court	River	12/20/2018	0.5	No coal tar or sheen	NA	N
SS639	37 Oakland Street	River	12/20/2018	0.5	No coal tar or sheen	NA	N
SS640	37 Oakland Street	Mudflat	12/17/2018	0.5	No coal tar or sheen	NA	N
SS641	Mill Street Extension	River	12/20/2018	0.5	No coal tar or sheen	NA	N
SS642	1 Field Street	River	12/20/2018	0.5	No coal tar or sheen	NA	N
SS643	35 Oakland Street	River	12/20/2018	0.5	No coal tar or sheen	NA	N
SS644	1 Field Street	River	12/20/2018	0.5	No coal tar or sheen	NA	N
SS645	Mill Street Extension	River	12/21/2018	0.5	No coal tar or sheen	NA	N
SS646	24 Oak Street	River	4/23/2019	0.5	No coal tar or sheen	NA	N
SS647	26 Oak Street	River	4/23/2019	0.5	No coal tar or sheen	NA	N
SS648	28 Oak Street	River	4/23/2019	0.5	No coal tar or sheen	NA	N
SS649	39 Oakland Street	River	4/23/2019	0.5	No coal tar or sheen	NA	N
SS650	39 Oakland Street	River	4/23/2019	0.5	No coal tar or sheen	NA	N
SS651	41 Oakland Street	River	4/23/2019	0.5	No coal tar or sheen	NA	N
SS652	41 Oakland Sreet	River	4/23/2019	0.5	No coal tar or sheen	NA	N
SS653	39 Oakland Street	River	4/23/2019	0.5	No coal tar or sheen	NA	N
SS654	39 Oakland Street	River	4/23/2019	0.5	No coal tar or sheen	NA	N
SS655	39 Oakland Street	River	4/23/2019	0.5	No coal tar or sheen	NA	N
SS656	39 Oakland Street	River	4/24/2019	0.5	No coal tar or sheen	NA	N
SS657	39 Oakland Street	River	4/24/2019	0.5	No coal tar or sheen	NA	N
SS658	41 Oakland Sreet	River	4/24/2019	0.5	No coal tar or sheen	NA	N
SS659	41 Oakland Street	River	4/24/2019	0.5	No coal tar or sheen	NA	N
SS660	41 Oakland Street	River	4/24/2019	0.5	No coal tar or sheen	NA	N
SS661	43 Oakland Street	River	4/24/2019	0.5	No coal tar or sheen	NA	N
SS662	3 River Street	River	4/24/2019	0.5	No coal tar or sheen	NA	N
SS663	3 River Street	River	4/24/2019	0.5	No coal tar or sheen	NA	N
664	39 Oakland Street	Mudflat	9/11/2019	3	No coal tar or sheen	NA	N
665	39 Oakland Street	Mudflat	9/10/2019	3.5	No coal tar or sheen	NA	N
666	39 Oakland Street	Mudflat	9/11/2019	5	No coal tar or sheen	NA	N
667	39 Oakland Street	Mudflat	9/11/2019	5	No coal tar or sheen	NA	N
668	39 Oakland Street	Mudflat	9/11/2019	5	No coal tar or sheen	NA	N
669	39 Oakland Street	Mudflat	9/23/2019	5.8	Black staining	2.9-3.1	N
670	39 Oakland Street	Mudflat	9/10/2019	4	No coal tar or sheen	NA	N
671	41 Oakland Street	Mudflat	9/23/2019	5.2	No coal tar or sheen	NA	N
672	39 Oakland Street	Mudflat	9/24/2019	6.8	No coal tar or sheen	NA	N
673	39 Oakland Street	River	9/12/2019	5	No coal tar or sheen	NA	N
674	39 Oakland Street	River	9/12/2019	4	No coal tar or sheen	NA	N
675	41 Oakland Street	River	9/24/2019	8	No coal tar or sheen	NA	N
676	39 Oakland Street	River	9/11/2019	3.8	No coal tar or sheen	NA	N
677	41 Oakland Street	River	9/11/2019	4.5	No coal tar or sheen	NA	N
678	41 Oakland Street	River	9/11/2019	5	No coal tar or sheen	NA	N
679	1 Field Street	River	9/11/2019	5	No coal tar or sheen	NA	N
680	1 Field Street	River	9/11/2019	5	Coal tar saturated	4.2-4.5	N
680R	1 Field Street	River	9/25/2019	9.3	Coal tar saturated (4.2-5), black staining (5-5.9)	4.2-5.9	N
681	24 Oak Street	River	9/12/2019	5	No coal tar or sheen	NA	N
682	24 Oak Street	River	9/12/2019	5	No coal tar or sheen	NA	N
683	1 Field Street	River	9/12/2019	5	No coal tar or sheen	NA	N
684	43 Oakland Street	River	9/12/2019	5	No coal tar or sheen	NA	N
685	37 Oakland Street	Mudflat	9/10/2019	3	No coal tar or sheen	NA	N
686	41 Oakland Street	Mudflat	9/10/2019	3.3	No coal tar or sheen	NA	N
687	37 Oakland Street	River	9/24/2019	7.7	Coal tar saturated	1.9-2.5	N
688	37 Oakland Street	River	9/23/2019	5.7	No coal tar or sheen	NA	N
689	1 Field Street	River	9/24/2019	4.2	No coal tar or sheen	NA	N
690	1 Field Street	River	9/25/2019	8.5	No coal tar or sheen	NA	N
691	4 Oakland Court	River	9/24/2019	6	Heavy sheen	1.9-4.5	N
692	1 Field Street	River	9/24/2019	8.1	Heavy sheen (1.8-3.5), coal tar saturated (3.5-4.8)	1.8-4.8	N
692R	1 Field Street	River	9/25/2020	9.5	Heavy sheen	1.8-3.5	N
693	24 Oak Street	River	9/25/2019	8.5	No coal tar or sheen	NA	N
694	1 Field Street	River	9/25/2019	9	Coal tar saturated	3-4.6	N
695	1 Field Street	River	9/25/2019	7	No coal tar or sheen	NA	N
696	37 Oakland Street	River	9/25/2019	9.2	No coal tar or sheen	NA	N
697	1 Field Street	River	9/25/2019	8.9	No coal tar or sheen	NA	N
698	1 Field Street	River	9/26/2019	8.3	No coal tar or sheen	NA	N
699	1 Field Street	River	9/26/2019	9.6	No coal tar or sheen	NA	N
700	24 Oak Street	River	9/26/2019	7.7	No coal tar or sheen	NA	N
701	1 Field Street	River	9/26/2019	9.1	Heavy sheen (0-1), black staining and heavy sheen (1-5)	0-5	Y
702	1 Field Street	River	9/26/2019	9.5	No coal tar or sheen	NA	N
703	1 Field Street	River	9/26/2019	9.7	Black staining and heavy sheen	5-5.9	N
704	4 Oakland Court	River	9/26/2019	6.4	No coal tar or sheen	NA	N
705	1 Field Street	River	9/27/2019	9	Black staining and heavy sheen	4-6.8	N
706	1 Field Street	River	9/27/2019	9.5	Heavy sheen	0-6.5	Y
707	8 Noel Street	River	9/27/2019	9.5	No coal tar or sheen	NA	N
708	8 Noel Street	River	9/27/2019	8.7	Coal tar saturated	5.4-6	N
709	28 Oak Street	River	9/27/2019	9.5	No coal tar or sheen	NA	N
710	39A Water Street	River	11/11/2019	7.8	Dark staining and slight sheen	2.3	N
711	1 Field Street	River	11/11/2019	9.1	No coal tar or sheen	NA	N
712	33R Oakland Street	River	11/11/2019	10	Slight sheen (0-2), sheen (2.4-3.1)	0-2, 2.4-3.1	N
713	33R Oakland Street	River	11/15/2019	9.6	Coal tar blebs	3, 3.6-4.2	N
714	35 Oakland Street	River	11/14/2019	10	No coal tar or sheen	NA	N
715	1 Field Street	River	11/15/2019	9.7	No coal tar or sheen	NA	N
716	37 Oakland Street	Mudflat	11/11/2019	10	No coal tar or sheen	NA	N
717	37 Oakland Street	Mudflat	11/11/2019	6.1	No coal tar or sheen	NA	N
718	39 Oakland Street	Mudflat	11/11/2019	9.1	No coal tar or sheen	NA	N
719	41 Oakland Street	Mudflat	11/11/2019	10	No coal tar or sheen	NA	N
720	41 Oakland Sreet	Mudflat	11/12/2019	9	Black staining	0.8	N
721	4 Oakland Court	Mudflat	11/12/2019	6.2	No coal tar or sheen	NA	N
722	4 Oakland Court	Mudflat	11/12/2019	5.4	No coal tar or sheen	NA	N
723	24 Oak Street	River	11/14/2019	8.9	No coal tar or sheen	NA	N
724	1 Field Street	River	11/12/2019	5.5	No coal tar or sheen	NA	N
725	24 Oak Street	River	11/14/2019	6.1	No coal tar or sheen	NA	N
726	1 Field Street	River	11/12/2019	8.2	No coal tar or sheen	NA	N
727	1 Field Street	River	11/14/2019	9.5	No coal tar or sheen	NA	N
728	1 Field Street	River	11/14/2019	8.9	Slight sheen (0-3.9), sheen (3.9-7.2)	0-7.2	N
729	1 Field Street	River	11/12/2019	8.1	Sheen	2.5-3.5	N
730	1 Field Street	River	11/14/2019	9.8	No coal tar or sheen	NA	N
731	28 Oak Street	River	11/15/2019	9.7	No coal tar or sheen	NA	N
733	28 Oak Street	River	11/15/2019	7.5	Coal tar blebs and heavy sheen (2.1-4), coal tar saturated (4-4.3)	2.1-4, 4-4.3	N
734	28 Oak Street	River	11/15/2019	8.1	Black staining (0-1.9), sheen and coal tar blebs (1.9-5.4)	0-5.4	N
735	28 Oak Street	River	11/15/2019	9.7	No coal tar or sheen	NA	N
736	8 Noel Street	River	11/15/2019	7.5	No coal tar or sheen	NA	N
737	3 River Street	River	11/15/2019	9.3	Heavy sheen and coal tar blebs	1.1-8.6	N
738	35 Water Street	River	2/4/2020	8.2	Slight sheen	1-1.5	N
739	1 Field Street	River	2/4/2020	9	Spotty slight sheen (1-3.3), sheen (7.7)	1-3.3, 7.7	N

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Location ID	Property	Area	Date	Total Depth (feet)	Field Observations (feet)	Depth of Visual Oil/Tar Impacts (feet)	Readily Apparent Harm (RAH)
740	39A Water Street	River	2/4/2020	9.5	Spotty slight sheen	0.5	N
741	33R Oakland Street	River	2/5/2020	9.5	No coal tar or sheen	NA	N
742	1 Field Street	River	2/4/2020	9.5	No coal tar or sheen	NA	N
743	1 Field Street	River	2/4/2020	8.9	No coal tar or sheen	NA	N
744	1 Field Street	River	2/5/2020	9.5	No coal tar or sheen	NA	N
745	24 Oak Street	River	2/4/2020	8.2	No coal tar or sheen	NA	N
746	37 Oakland Street	Mudflat	2/5/2020	7.8	No coal tar or sheen	NA	N
747	26 Oak Street	River	2/4/2020	9.5	No coal tar or sheen	NA	N
748	3 River Street	River	2/5/2020	9.5	Slight sheen	0-3.7	N
749	7 Noel Street	River	2/3/2020	9	No coal tar or sheen	NA	N
750	7 Noel Street	River	2/3/2020	8.5	No coal tar or sheen	NA	N
751	7 Noel Street	River	2/3/2020	9.5	No coal tar or sheen	NA	N
752	7 Noel Street	River	2/3/2020	9.5	No coal tar or sheen	NA	N
753	11 River Street	River	2/4/2020	9.6	No coal tar or sheen	NA	N
754	27 River Street	River	2/5/2020	9.5	Sheen	3.1-5.4	N
755	222 Main Street	River	2/4/2020	9.9	Slight sheen	0-2.1	N
756	27 River Street	River	2/5/2020	9.5	No coal tar or sheen	NA	N
757	35 Water Street	River	2/5/2020	8.7	Slight sheen (0-1.6), heavy sheen (1.6-3.6), slight sheen (3.6-4.1)	0-4.1	N
758	35 Water Street	River	2/5/2020	8.3	No coal tar or sheen	NA	N
759	33R Oakland Street	River	3/9/2020	9.6	No coal tar or sheen	NA	N
760	37 Oakland Street	Mudflat	3/9/2020	9.6	No coal tar or sheen	NA	N
761	4 Oakland Court	Mudflat	3/9/2020	9	No coal tar or sheen	NA	N
762	3 River Street	River	3/9/2020	6.5	No coal tar or sheen	NA	N
763	7 Noel Street	River	3/9/2020	9.6	No coal tar or sheen	NA	N
764	222 Main Street	River	3/9/2020	9.5	No coal tar or sheen	NA	N
765	222 Main Street	River	3/10/2020	9.6	No coal tar or sheen	NA	N
766	222 Main Street	River	3/10/2020	9.6	Sheen	3.3-5.1	N
767	33 River Street	River	3/10/2020	9.6	Sheen	3-3.6	N
768	50 Macy Street #R	River	3/10/2020	9.6	No coal tar or sheen	NA	N
769	50 Macy Street #R	River	3/11/2020	9.6	Sheen	5.6-7.1	N
770	33 River Street	River	3/10/2020	9.6	No coal tar or sheen	NA	N
771	35 Water Street	River	3/10/2020	9.6	No coal tar or sheen	NA	N
772	1 Field Street	River	3/10/2020	9.6	No coal tar or sheen	NA	N
773	3 River Street	River	3/10/2020	9.6	Sheen (3.5-6.2), black staining and sheen (6.2-6.6)	3.5-6.6	N
774	51 River Street	River	3/11/2020	9.6	Slight sheen (2.4) and (3)	2.4-3	N
775	51 River Street	River	3/11/2020	9.6	Slight sheen	3.8-5.1	N
776	Comm of MA Tidelands	River	3/11/2020	9.6	Slight sheen	0-1	N
777	Comm of MA Tidelands	River	3/11/2020	9.6	Sheen (2.3-3.7), slight sheen (5.8-6)	2.3-3.7, 5.8-6	N
778	Comm of MA Tidelands	River	3/11/2020	9.6	Sheen	2.7-3.1, 5.8-6.1	N
779	58 Macy Street	River	3/11/2020	9.6	No coal tar or sheen	NA	N
780	33 River Street	River	3/11/2020	9.6	Slight sheen	1.6-1.9, 2.7-3.1	N
781	51 River Street	River	3/11/2020	9.6	Slight sheen, coal tar coating on core liner	1.3-2.1	N
781R1	51 River Street	River	3/12/2020	9.6	Sheen	1.3-2.1	N
781R2	51 River Street	River	3/12/2020	9.6	No coal tar or sheen	NA	N
782	51 River Street	River	3/11/2020	9.6	No coal tar or sheen	NA	N
783	51 River Street	River	3/16/2020	9.6	No coal tar or sheen	NA	N
784	51 River Street	River	3/16/2020	9.6	No coal tar or sheen	NA	N
785	51 River Street	River	3/16/2020	8.1	No coal tar or sheen	NA	N
786	28 Oak Street	River	3/16/2020	9.6	No coal tar or sheen	NA	N
787	25 Water Street	River	7/6/2020	5	No coal tar or sheen	NA	N
788	25 Water Street	River	7/6/2020	8.5	No coal tar or sheen	NA	N
789	35 Water Street	River	7/6/2020	9.4	No coal tar or sheen	NA	N
790	35 Water Street	River	7/6/2020	9	No coal tar or sheen	NA	N
791	37 Oakland Street	Mudflat	7/8/2020	7	No coal tar or sheen	NA	N
792	37 Oakland Street	Mudflat	7/8/2020	7.2	No coal tar or sheen	NA	N
793	33R Oakland Street	Wetland	7/8/2020	2.2	No coal tar or sheen	NA	N
794	35 Oakland Street	Wetland	7/8/2020	2	No coal tar or sheen	NA	N
795	37 Oakland Street	Wetland	7/6/2020	2.6	No coal tar or sheen	NA	N
796	39 Oakland Street	Wetland	7/6/2020	8.7	No coal tar or sheen	NA	N
797	41 Oakland Street	Mudflat	7/8/2020	6.9	No coal tar or sheen	NA	N
798	8 Noel Street	River	7/7/2020	2.3	No coal tar or sheen	NA	N
799	11 River Street #R	River	7/7/2020	8	No coal tar or sheen	NA	N
800	33 River Street	River	7/7/2020	9	No coal tar or sheen	NA	N
801	51 Water Street	River	7/7/2020	9.1	No coal tar or sheen	NA	N
802	58 Macy Street	River	7/8/2020	7.4	No coal tar or sheen	NA	N
803	58 Macy Street	River	7/8/2020	7.1	No coal tar or sheen	NA	N
804	77 Macy Street	River	7/7/2020	8.5	No coal tar or sheen	NA	N
805	412 Main Street	River	7/7/2020	4	No coal tar or sheen	NA	N
806	392 Main Street	River	7/7/2020	1	No coal tar or sheen	NA	N
807	37 Oakland Street	Wetland	7/6/2020	2	No coal tar or sheen	NA	N
808	35 Oakland Street	Wetland	10/12/2022	3	No coal tar or sheen	NA	N
809	35 Oakland Street	Wetland	10/12/2022	3	No coal tar or sheen	NA	N
810	37 Oakland Street	Wetland	6/19/2023	2.5	No coal tar or sheen	NA	N
811	37 Oakland Street	Wetland	6/19/2023	2.5	No coal tar or sheen	NA	N
812	26 Oak Street	River	6/19/2023	5	No coal tar or sheen	NA	N
813	28 Oak Street	River	6/19/2023	5	No coal tar or sheen	NA	N
814	8 Noel Street	River	6/19/2023	5	No coal tar or sheen	NA	N
815	28 Oak Street	River	6/21/2023	10	No coal tar or sheen	NA	N
816	3 River Street	River	6/19/2023	4.7	No coal tar or sheen	NA	N
817	3 River Street	River	6/19/2023	5	No coal tar or sheen	NA	N
818	7 River Street	River	6/20/2023	10	No coal tar or sheen	NA	N
819	7 Noel Street	River	6/19/2023	4.8	No coal tar or sheen	NA	N
820	7 Noel Street	River	6/20/2023	5	No coal tar or sheen	NA	N
821	17R River Street	River	6/20/2023	5	No coal tar or sheen	NA	N
822	38 Childs Avenue	River	6/20/2023	5	No coal tar or sheen	NA	N
823	38 Childs Avenue	River	6/20/2023	5	Black staining and slight sheen	3.8-4.3	N
824	38 Childs Avenue	River	6/20/2023	5	Slight sheen	3.8-4.3	N
825	222 Main Street	River	6/20/2023	5	No coal tar or sheen	NA	N
826	27 River Street	River	6/20/2023	5	No coal tar or sheen	NA	N
827	27 River Street	River	6/20/2023	8.9	No coal tar or sheen	NA	N
828	33 River Street	River	6/21/2023	5	No coal tar or sheen	NA	N
829	27 River Street	River	6/20/2023	5	No coal tar or sheen	NA	N
830	33 River Street	River	6/21/2023	5	No coal tar or sheen	NA	N
831	Comm of MA Tidelands	River	6/21/2023	5	No coal tar or sheen	NA	N
832	Comm of MA Tidelands	River	6/21/2023	5	No coal tar or sheen	NA	N
833	Comm of MA Tidelands	River	6/21/2023	5	No coal tar or sheen	NA	N
834	51 River Street	River	6/21/2023	5	Black staining	2.2-2.3	N
835	51 River Street	River	6/21/2023	5	No coal tar or sheen	NA	N
836	Comm of MA Tidelands	River	6/21/2023	5	Sheen	2-2.5	N
837	Comm of MA Tidelands	Former River Channel	6/22/2023	8	No coal tar or sheen	NA	N
838	Comm of MA Tidelands	Former River Channel	6/22/2023	8.2	Black staining	5-6.3	N
839	33R Oakland Street	Wetland	8/17/2023	2.5	No coal tar or sheen	NA	N
840	33R Oakland Street	Wetland	8/17/2023	2.5	No coal tar or sheen	NA	N
841	Comm of MA Tidelands	Former River Channel	8/14/2023	15	Black staining (5-8.5) and sheen (6.5)	5-8.5	N
842	Comm of MA Tidelands	Former River Channel	8/14/2023	13	Black staining (4.5-5.7) and sheen (5.5)	4.5-5.7	N
843	1 Field Street	River	8/28/2023	10	Black staining (1.5-3.5) and sheen (1.5-5.5)	1.5-5.5	N
844	38 Childs Avenue	River	8/28/2023	10	Dark staining and sheen	3-3.5	N
845	222 Main Street	River	8/28/2023	3.5	No coal tar or sheen	NA	N
846	Comm of MA Tidelands	River	8/28/2023	10	No coal tar or sheen	NA	N
847	50 Macy Street #R	River	8/28/2023	3	Sheen	2-2.5	N
848	Comm of MA Tidelands	River	8/17/2023	3.5	Slight sheen (0-0.5), sheen (1.9-2)	0-0.5, 1.9-2	N
849	1 Field Street	River	8/16/2023	8	Coal tar blebs and heavy sheen	4	N
850	1 Field Street	River	8/17/2023	9.7	Heavy sheen	1.5-6.7	N
851	28 Oak Street	River	8/17/2023	8	Coal tar blebs and sheen (3-4), coal tar saturated (3.3), sheen (5.7-6.4)	3-6.4	N
852	3 River Street	River	8/31/2023	10	No coal tar or sheen	NA	N
853	51 River Street	River	8/17/2023	9.7	Black staining and slight sheen (0-3), heavy sheen (1.1-1.4)	0-3	N
854	39 Water Street	River	8/28/2023	5	Slight sheen	0-3	N

Table 1. Summary of Sample Visual Observations
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

Location ID	Property	Area	Date	Total Depth (feet)	Field Observations (feet)	Depth of Visual Oil/Tar Impacts (feet)	Readily Apparent Harm (RAH)
855	33R Oakland Street	River	8/30/2023	8.1	Slight sheen (0-8.1), heavy sheen and coal tar saturated (5.9-8.1)	0-8.1	N
856	37 Oakland Street	River	8/31/2023	10	Slight sheen (0-1.7, 2.4-3.8), coal tar saturated (in stratified seams) (4-4.7)	0-6.7	N
857	35 Water Street	River	11/2/2023	5.2	Sheen (2.5-5), petroleum stained (3.8)	2.5-5	N
858	35 Water Street	River	11/2/2023	5	Black staining	2.3-2.7	N
HA101	35 Water Street	Upland	11/2/2023	3	No coal tar or sheen	NA	N
HA102	35 Water Street	Upland	11/2/2023	1	No coal tar or sheen	NA	N
HA103	35 Water Street	Upland	11/2/2023	3	No coal tar or sheen	NA	N
HA104	35 Water Street	Upland	11/2/2023	1	No coal tar or sheen	NA	N
HA105	35 Water Street	Upland	11/2/2023	2	No coal tar or sheen	NA	N
859	1 Field Street	River	11/28/2023	5	No coal tar or sheen	NA	N
860	1 Field Street	River	11/28/2023	5	No coal tar or sheen	NA	N
861	1 Field Street	River	11/27/2023	5	No coal tar or sheen	NA	N
862	1 Field Street	River	11/27/2023	5	No coal tar or sheen	NA	N
863	35 Water Street	River	11/28/2023	5	No coal tar or sheen	NA	N
864	1 Field Street	River	11/28/2023	5	No coal tar or sheen	NA	N
865	39A Water Street	River	11/27/2023	5.2	Slight sheen	3.4-3.9	N
866	1 Field Street	River	11/27/2023	5.2	No coal tar or sheen	NA	N
867	1 Field Street	River	11/27/2023	5.2	No coal tar or sheen	NA	N
868	1 Field Street	River	11/27/2023	4.6	No coal tar or sheen	NA	N
869	1 Field Street	River	11/27/2023	5.7	Slight sheen	4.8-5.3	N
870	1 Field Street	River	11/27/2023	4.7	No coal tar or sheen	NA	N
871	3 River Street	River	7/23/2024	5.6	Slight sheen (1-1.8), strong sheen (1.8-3.7), black staining and coal tar coating (3.7-5)	1-5	N
872	3 River Street	River	7/23/2024	5.6	Slight sheen (0.7-2.5)	0.7-2.5	N
873	8 Noel Street	River	7/23/2024	5.6	No coal tar or sheen	NA	N
874	7 Noel Street	River	7/22/2024	5.3	No coal tar or sheen	NA	N
875	7 Noel Street	River	7/22/2024	5.4	No coal tar or sheen	NA	N
876	33 River Street	River	7/22/2024	5.5	Slight sheen (0-3)	0-3	N
877	33 River Street	River	7/22/2024	5.5	No coal tar or sheen	NA	N
878	33 River Street	River	7/22/2024	5.3	No coal tar or sheen	NA	N
879	1 Field Street	River	7/22/2024	5	No coal tar or sheen	NA	N
880	1 Field Street	River	7/23/2024	5.7	No coal tar or sheen	NA	N
881	1 Field Street	River	7/23/2024	5.7	No coal tar or sheen	NA	N
882	1 Field Street	River	7/23/2024	5.1	No coal tar or sheen	NA	N
883	37 Oakland Street	Wetland	7/22/2024	2	Sheen on surface water as it entered test pit	NA	N
883R	37 Oakland Street	Wetland	9/3/2024	2.5	No coal tar or sheen	NA	N
884	1 Field Street	River	7/22/2024	5.5	Sheen (0-2.2), strong sheen and blebs (2.2-5), coal tar coating (4.5-5)	0-5	N
885	1 Field Street	River	7/23/2024	5.4	Moderate sheen (1.8-3.5) that increased with depth, strong sheen (3.5-4.9)	1.8-4.9	N
886	1 Field Street	River	7/23/2024	5.7	Slight sheen (2-2.7), strong sheen (2.7-5) and silver/black staining (4-5)	2-5	N
887	1 Field Street	River	7/23/2024	5.2	No coal tar or sheen	NA	N
888	35 Water Street	River	7/22/2024	5	No coal tar or sheen	NA	N
889	1 Field Street	River	7/23/2024	6	No coal tar or sheen	NA	N
890	37 Oakland Street	Wetland	9/3/2024	2.5	No coal tar or sheen	NA	N
891	37 Oakland Street	Wetland	9/3/2024	2.5	Semi-solid coal tar seams (0-0.5), coal tar coating (0.5-1)	0-1	Y
892	37 Oakland Street	Wetland	9/3/2024	2.5	No coal tar or sheen	NA	N
893	37 Oakland Street	Wetland	9/3/2024	2.5	Coal tar coating (0-0.5), semi-solid coal tar seams (0.5-1.5)	0-1.5	Y

General Notes:
1. NA = Not Applicable.
2. NM = Not Measured.
3. Total Depth is the penetration of the sediment core and not the recovery of sediment sample.

Definitions:
Stain - discolored, unnatural. No iridescence.
Sheen - rainbow/iridescence on sediment surface (or porewater).
Coal tar blebs - tar droplets but not continuous layer or coating.
Coal tar saturated - continuous layer or coating on sediment (including pore space).

Table 2. Sediment Chemical Testing Results - All Locations
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

Sample Location:				**SS601**		**SS602**		**SS603**		**SS604**		**SS605**		**SS606**		**SS607**		**SS608**		**SS609**		**SS610**		**SS611**	
Sample ID:				**SS601-A**	**SS601-B**	**SS602-A**	**SS602-B**	**SS603-A**	**SS603-B**	**SS604-A**	**SS604-B**	**SS605-A**	**SS605-B**	**SS606-A**	**SS606-B**	**SS607-A**	**SS607-B**	**SS608R-A**	**SS608R-B**	**SS609R-A**	**SS609R-B**	**SS610R-A**	**SS610R-B**	**SS611R-A**	**SS611R-B**
Lab Sample ID:				1709743	1709743	1709743	1709743	1709743	1709743	1709743	1709743	1709743	1709743	1709743	1709743	1709743	1709743	1711281	1711281	1711281	1711281	1711281	1711281	1711281	1711281
Property:				35 Oakland St	35 Oakland St	35 Oakland St	35 Oakland St	35 Oakland St	35 Oakland St	35 Oakland St	35 Oakland St	35 Oakland St	35 Oakland St	33R Oakland St	33R Oakland St	35 Oakland St	35 Oakland St	35 Oakland St	35 Oakland St	35 Oakland St	35 Oakland St	35 Oakland St	35 Oakland St	35 Oakland St	35 Oakland St
Area:				Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland
Sample Date:				9/22/2017	9/22/2017	9/22/2017	9/22/2017	9/22/2017	9/22/2017	9/22/2017	9/22/2017	9/22/2017	9/22/2017	9/22/2017	9/22/2017	9/22/2017	9/22/2017	11/8/2017	11/8/2017	11/8/2017	11/8/2017	11/8/2017	11/8/2017	11/8/2017	11/8/2017
Soil/Sediment Type:				Organic Soil	Organic Silt	Organic Soil	Organic Silt	Sand	Organic Silt	Sand	Organic Silt	Sand/Clay	Clay	Organic Soil	Organic Soil	Organic Soil	Organic Soil	Organic Soil	Organic Soil	Organic Soil	Silty Sand/Organic Soil	Organic Soil	Silty Sand/Organic Soil	Organic Soil	Organic Soil
Sample Depth (feet):				0.7-1	2.4	0.5	2-2.4	0.6	1.2-1.8	0-0.3	1.5-2	0.5-1	1.8-2.3	0.5-1	1.8-2.1	0.5-1	1.7-2	0.2-0.6	2-2.3	0.7-1.2	1.7-2.1	0.3-1.2	1.7-2.1	0.3-0.8	2-2.4
Analyte	**Method**	**Units**	**S-1/GW-3**																						
Volatile Organic Compounds (VOCs)	8260	mg/kg																							
Benzene			40	< 0.190	< 0.463	< 0.602	< 0.544	< 0.180	< 0.550	< 0.561	< 0.441	< 0.304	< 0.310	< 1.87	< 0.878	< 1.17	< 1.60	< 0.703 C-	< 0.408	0.442	< 0.309	< 0.307 C-	< 0.352	< 0.718 C-	< 0.371
Ethylbenzene			500	< 0.190	< 0.463	< 0.602	< 0.544	< 0.180	< 0.550	< 0.561	< 0.441	< 0.304	< 0.310	< 1.87	< 0.878	< 1.17	< 1.60	< 0.703 C-	< 0.408	2.01	< 0.309	< 0.307 C-	< 0.352	< 0.718 C-	< 0.371
Toluene			500	< 0.190	< 0.463	< 0.602	< 0.544	< 0.180	< 0.550	< 0.561	< 0.441	< 0.304	< 0.310	< 1.87	< 0.878	< 1.17	< 1.60	< 0.703 C-	< 0.408	< 0.330	< 0.309	< 0.307 C-	< 0.352	< 0.718 C-	< 0.371
Xylene, o-			500	< 0.190	< 0.463	< 0.602	< 0.544	< 0.180	< 0.550	< 0.561	< 0.441	< 0.304	< 0.310	< 1.87	< 0.878	< 1.17	< 1.60	< 0.703 C-	< 0.408	< 0.330	< 0.309	< 0.307 C-	< 0.352	< 0.718 C-	< 0.371
Xylene p,m-			500	< 0.380	< 0.926	< 1.20	< 1.09	< 0.361	< 1.10	< 1.12	< 0.882	< 0.608	< 0.619	< 3.73	< 1.76	< 2.34	< 3.21	< 1.41 C-	< 0.816	< 0.660	< 0.618	< 0.614 C-	< 0.704	< 1.44 C-	< 0.741
Xylenes, Total			500	< 0.380	< 0.926	< 1.20	< 1.09	< 0.361	< 1.10	< 1.12	< 0.882	< 0.608	< 0.619	< 3.73	< 1.76	< 2.34	< 3.21	< 1.41 C-	< 0.816	< 0.660	< 0.618	< 0.614 C-	< 0.704	< 1.44 C-	< 0.741
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg																							
2-Methylnaphthalene			300	< 0.408	< 0.658	< 0.363	< 0.682	< 0.390	< 0.351	1.99	< 0.634	< 0.502	< 0.518	< 0.533	< 0.574	2.17	2.99	< 0.345	< 0.226	53.2	0.441	1.09	< 0.197	0.706	< 0.222
Acenaphthene			1,000	< 0.408	< 0.658	< 0.724	< 0.682	1.16	< 0.700	27.3	< 0.634	< 0.502	< 0.518	< 1.06	< 0.574	2.50	3.66	< 1.38	< 0.908	160	3.54	17.3	< 0.792	13.0	1.78
Acenaphthylene			10	< 0.408	< 0.658	< 0.724	< 0.682	0.390	< 0.700	5.08	< 0.634	< 0.502	< 0.518	< 0.533	< 0.574	1.76	1.30	1.19	< 0.908	8.61	< 0.788	9.12	< 0.792	2.32	< 0.889
Anthracene			1,000	< 0.408	< 0.658	< 0.724	< 0.682	2.20	0.799	23.2	< 0.634	< 0.502	< 0.518	< 1.06	< 0.574	4.92	3.28	1.91	< 0.908	40.1	< 0.788	45.0	< 0.792	10.5	1.82
Benzo(a)anthracene			20	< 0.408	1.59	< 0.724	< 0.682	3.91	1.93	**38.3**	< 0.634	< 0.502	< 0.518	< 1.06	< 0.574	10.3	6.78	9.41	< 0.908	**52.8**	< 0.788	**66.5**	< 0.792	14.5	2.47
Benzo(a)pyrene			2	< 0.205	1.66	< 0.363	< 0.342	**4.19**	1.94	**42.8**	0.788	< 0.252	< 0.260	1.53	< 0.288	**12.3**	**8.50**	**12.7**	< 0.455	**54.0**	0.591	**70.3**	< 0.397	**17.8**	**2.34**
Benzo(b)fluoranthene			20	< 0.408	1.31	< 0.724	< 0.682	3.42	1.40	**30.0**	< 0.634	< 0.502	< 0.518	1.75	< 0.574	10.4	7.39	5.66	< 0.908	**21.9**	< 0.788	**32.8**	< 0.792	10.3	1.04
Benzo(g,h,i)perylene			1,000	< 0.408	0.942	< 0.724	< 0.682	2.71	1.37	25.6	< 0.634	< 0.502	< 0.518	1.20	< 0.574	9.10	6.63	8.69	< 0.908	13.4	< 0.788	39.2	< 0.792	14.8	1.52
Benzo(k)fluoranthene			70	< 0.408	< 0.658	< 0.724	< 0.682	1.04	0.710	13.9	< 0.634	< 0.502	< 0.518	< 1.06	< 0.574	3.55	2.61	7.27	< 0.908	30.2	< 0.788	37.8	< 0.792	8.67	1.94
Chrysene			200	< 0.205	1.09	< 0.363	< 0.342	2.97	1.54	28.3	0.625	< 0.252	< 0.260	1.17	< 0.288	9.58	6.37	7.94	< 0.455	32.8	0.428	60.0	< 0.397	12.1	2.05
Dibenzo(a,h)anthracene			2	< 0.205	< 0.330	< 0.363	< 0.342	0.744	0.373	**7.06**	< 0.318	< 0.252	< 0.260	< 0.533	< 0.288	**2.73**	1.88	**3.06**	< 0.455	**5.88**	< 0.395	**17.2**	< 0.397	**5.06**	0.715
Fluoranthene			1,000	< 0.408	2.61	< 0.724	< 0.682	6.14	2.51	72.5	< 0.634	< 0.502	< 0.518	1.44	< 0.574	17.4	10.5	16.1	< 0.908	149	1.37	118	< 0.792	30.6	4.32
Fluorene			1,000	< 0.408	< 0.658	< 0.724	< 0.682	0.774	< 0.700	14.9	< 0.634	< 0.502	< 0.518	< 1.06	< 0.574	2.25	2.28	< 1.38	< 0.908	68.9	< 0.788	13.0	< 0.792	7.21	1.09
Indeno(1,2,3-cd)pyrene			20	< 0.408	0.661	< 0.724	< 0.682	1.98	0.900	18.2	< 0.634	< 0.502	< 0.518	< 1.06	< 0.574	6.93	4.79	6.59	< 0.908	11.9	< 0.788	**30.0**	< 0.792	10.8	1.24
Naphthalene			500	< 0.408	< 0.658	< 0.724	< 0.682	< 0.390	< 0.700	2.53	< 0.634	< 0.502	< 0.518	< 1.06	< 0.574	5.77	10.2	< 1.38	< 0.908	158	2.26	4.97	< 0.792	3.65	< 0.889
Phenanthrene			500	< 0.408	2.33	< 0.724	< 0.682	6.80	1.82	110	< 0.634	< 0.502	< 0.518	< 1.06	< 0.574	6.40	3.85	6.27	< 0.908	297	2.42	98.2	< 0.792	28.5	5.77
Pyrene			1,000	< 0.408	4.39	< 0.724	< 0.682	11.7	4.77	117	1.34	< 0.502	< 0.518	2.27	< 0.574	31.6	18.2	20.2	< 0.908	183	1.59	149	< 0.792	55.4	5.64
Total PAHs			NS	ND	16.6	ND	ND	50.1	20.1	579	2.75	ND	ND	9.36	ND	140	101	107	ND	1,341	12.6	809	ND	246	33.7
Petroleum Hydrocarbons	8015 Mod	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT		NT
TPH (C8-C40)			1,000																			**2,150**		**1,750**	
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg																							
C5 to C8 Aliphatic Hydrocarbons			100	< 9.4	< 23.2	< 29.8	< 27.0	< 8.3	< 23.7	< 27.9	< 22.1	< 15.1	< 15.2	< 92.8	< 42.7	< 60.2	< 83.4	< 72.9 C-	< 39.6	< 33.0	< 32.4	< 29.5	< 33.0	< 72.0	< 36.6
C9 to C12 Aliphatic Hydrocarbons			1,000	< 9.4	< 23.2	< 29.8	< 27.0	< 8.3	< 23.7	< 27.9	< 22.1	< 15.1	< 15.2	< 92.8	< 42.7	< 60.2	< 83.4	< 72.9 C-	< 39.6	34.8	< 32.4	< 29.5	< 33.0	< 72.0	< 36.6
C9 to C10 Aromatic Hydrocarbons			100	< 9.4	< 23.2	< 29.8	< 27.0	< 8.3	< 23.7	< 27.9	< 22.1	< 15.1	< 15.2	< 92.8	< 42.7	< 60.2	< 83.4	< 72.9	< 39.6	**152**	< 32.4	< 29.5	< 33.0	< 72.0	< 36.6
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg																							
C9 to C18 Aliphatic Hydrocarbons			1,000	< 19.8	< 29.3	< 32.8	< 31.3	< 17.5	< 32.0	< 33.0	< 28.3	< 22.8	< 23.1	< 39.8	< 36.2	< 33.3	< 35.5	< 62.0	90.0	97.6	< 35.5	< 64.5	< 36.8	< 132	< 39.8
C19 to C36 Aliphatic Hydrocarbons			3,000	< 19.8	< 29.3	< 32.8	< 31.3	< 17.5	< 32.0	38.2	65.4	< 22.8	< 23.1	55.6	< 36.2	93.2	46.3	< 62.0	112	168	< 35.5	98.1	< 36.8	240	< 39.8
C11 to C22 Aromatic Hydrocarbons			1,000	26.7	38.4	< 32.8	< 31.3	60.4	57.0	389	102	< 22.8	< 23.1	< 39.8	< 36.2	231	54.0	76.2	43.5	**4,660**	145	339	< 36.8	714	48.2
General Chemistry/Other																									
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	< 1.19	< 1.93	< 2.11	< 2.04	< 1.18	< 2.00	< 2.06	< 1.76	< 1.40	< 1.46	< 5.09	< 2.83	< 3.42	< 4.72	< 3.93	< 2.73	< 2.25	< 2.35	< 2.15	< 2.48	< 4.12	< 2.52
Total Cyanide	9014	mg/kg	30	< 1.15	< 1.85	< 2.05	< 2.03	< 1.15	< 2.12	< 2.14	< 1.78	< 1.38	< 1.54	< 5.11	< 2.64	< 3.63	< 4.60	< 3.92	< 2.57	< 2.14	< 2.29	< 2.19	< 2.31	< 4.25	< 2.48
Total Organic Carbon	LK	mg/kg	NS	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	79,700	NT	142,000	NT
Percent Solids	5035	%	NS	79	50	45	48	83	47	45	53	66	64	19	35	28	21	23	36	43	41	45	40	22	37

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 2. Sediment Chemical Testing Results - All Locations
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

Sample Location:				SS612	SS613	SS614	SS616	SS617	SS618	SS619	SS620	SS621	SS622	SS623	SS624	SS625	SS626	SS627	SS628	SS629	SS630	SS631	SS632	SS633	SS634	SS637
Sample ID:				SS612A	SS613B	SS614	SS616	SS617	SS618	SS619	SS620	SS621	SS622	SS623	SS624	SS625	SS626	SS627	SS628	SS629	SS630	SS631	SS632	SS633	SS634	SS637
Lab Sample ID:				1807384	1807384	1807384	1807384	1807384	1807384	F180046	F180046	F180046	F180046	F180046	F180046	F180070	F180070	F180070	F180070	F180070	F180070	F180070	F180070	F180070	F180070	F180070
Property:				37 Oakland St	37 Oakland St	37 Oakland St	37 Oakland St	37 Oakland St	37 Oakland St	39 Oakland St	41 Oakland St	41 Oakland St	39 Oakland St	43 Oakland St	37 Oakland St	35 Oakland St	35 Oakland St	37 Oakland St	37 Oakland St	37 Oakland St	37 Oakland St	39 Oakland St	39 Oakland St	39 Oakland St	41 Oakland St	4 Oakland Ct
Area:				Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	River	Mudflat	River	Mudflat	Mudflat	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat
Sample Date:				7/16/2018	7/16/2018	7/16/2018	7/16/2018	7/16/2018	7/16/2018	08/15/2018	08/15/2018	08/15/2018	08/15/2018	08/15/2018	08/15/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018
Soil/Sediment Type:				Clay/Organic Soil	Clay	Sandy Clay	Sandy clay w/ Organic Soil	Organic Soil	Organic Soil	Sandy Organic Soil	Sandy Organic Soil	Sandy Organic Soil	Sand w/Silt	Clayey Sand	Sandy Organic Soil	Sand w/Gravel	Sand w/Gravel	Sand w/Gravel	Sand w/Gravel	Organic Soil	Clayey Sand	Sand w/Gravel	Sand w/Silt	Silty Sand	Sand w/Gravel	Sand w/Silt&Gravel
Sample Depth (feet):				0.4-0.8	1.8-2.3	1.3-1.8	0.8-1.3	1-2.3	0.9-1.8	0-1.9	0-2.5	0-1.8	0-1.8	0-1.7	0-1.7	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5
Analyte	**Method**	**Units**	**S-1/GW-3**																							
Volatile Organic Compounds (VOCs)	8260	mg/kg														NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40	< 0.0957	< 0.129	< 0.108	0.274	1.20	< 0.627	< 0.361	< 0.475	< 0.418	< 0.21	< 0.376	< 0.46											
Ethylbenzene			500	< 0.0957	< 0.129	< 0.108	0.347	4.40	< 0.627	< 0.361	< 0.475	< 0.418	< 0.21	< 0.376	< 0.46											
Toluene			500	< 0.0957	< 0.129	< 0.108	< 0.193	< 0.562	< 0.627	< 0.361	< 0.475	< 0.418	< 0.21	< 0.376	< 0.46											
Xylene, o-			500	< 0.0957	< 0.129	< 0.108	< 0.193	0.708	< 0.627	< 0.361	< 0.475	< 0.418	< 0.21	< 0.376	< 0.46											
Xylene p,m-			500	< 0.191	< 0.258	< 0.217	< 0.386	< 1.12	< 1.25	< 0.723	< 0.951	< 0.836	< 0.42	< 0.752	< 0.921											
Xylenes, Total			500	< 0.191	< 0.258	< 0.217	< 0.386	< 1.12	< 1.25	< 0.723	< 0.951	< 0.836	< 0.42	< 0.752	< 0.921											
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg																								
2-Methylnaphthalene			300	< 0.428	< 0.498	< 0.430	22.2	206	< 1.25	0.704	0.028	0.584	0.089	0.061	1.43	0.0687	0.0442	0.323	0.0881	204	0.00369	0.224	0.134	0.0685	0.00472	0.0307
Acenaphthene			1,000	< 0.428	< 0.498	< 0.430	110	**1,230**	15.1	2.08	0.153	3.43	2.19	0.0225	8.18	0.109	0.015	0.113	0.0336	757	0.00545	0.839	2.43	1.30	0.0454	0.0719
Acenaphthylene			10	< 0.428	< 0.498	< 0.430	9.98	**99.8**	2.18	2.78	0.095	2.75	0.823	0.169	1.65	0.232	0.0884	1.38	1.11	**55.5**	0.0218	1.54	1.54	1.20	0.0438	0.0634
Anthracene			1,000	< 0.428	< 0.498	< 0.430	48.5	415	15.3	4.15	0.178	9.65	1.81	0.321	7.61	0.352	0.0847	1.84	1.13	940	0.0248	2.89	3.58	2.09	0.144	0.180
Benzo(a)anthracene			20	< 0.428	< 0.498	< 0.430	**45.2**	**509**	14.7	8.81	0.263	8.52	2.79	1.76	7.40	1.20	0.399	4.75	2.29	**218**	0.175	4.91	3.54	3.65	0.474	0.603
Benzo(a)pyrene			2	< 0.215	< 0.250	< 0.216	**52.7**	**649**	**14.5**	**9.62**	0.265	**9.74**	**3.27**	**2.08**	**7.24**	1.28	0.281	**4.12**	1.89	**239**	0.133	**4.83**	**4.34**	**4.45**	0.406	0.589
Benzo(b)fluoranthene			20	< 0.428	< 0.498	< 0.430	19.9	**317**	11.6	7.42	0.229	6.19	2.08	1.28	3.92	0.921	0.314	4.06	2.58	**107**	0.0836	4.34	2.50	2.40	0.267	0.474
Benzo(g,h,i)perylene			1,000	< 0.428	< 0.498	< 0.430	36.5	406	11.0	5.05	0.139	4.82	1.65	1.08	3.17	0.822	0.255	2.39	1.11	123	0.0581	3.05	2.52	2.48	0.163	0.372
Benzo(k)fluoranthene			70	< 0.428	< 0.498	< 0.430	34.3	**258**	4.27	7.65	0.204	6.51	2.04	1.23	4.69	1.01	0.344	4.30	2.14	**141**	0.109	4.14	2.84	3.05	0.368	0.512
Chrysene			200	< 0.215	< 0.250	< 0.216	35.4	**342**	12.1	9.26	0.277	8.81	2.45	1.77	5.73	1.31	0.457	4.69	2.46	**264**	0.149	5.82	3.35	3.18	0.441	0.668
Dibenzo(a,h)anthracene			2	< 0.215	< 0.250	< 0.216	**8.02**	**96**	**3.12**	1.43	0.041	1.31	0.419	0.32	0.822	0.179	0.0563	0.657	0.403	**22.7**	0.0196	0.824	0.509	0.478	0.06	0.0932
Fluoranthene			1,000	< 0.428	< 0.498	< 0.430	131	**1,500**	51.0	21.2	0.527	17.1	6.93	1.86	17.7	2.39	0.844	9.57	3.77	676	0.178	12.7	10.0	9.08	0.548	1.34
Fluorene			1,000	< 0.428	< 0.498	< 0.430	50.0	522	11.3	1.2	0.075	2.16	0.568	0.06	4.09	0.0822	0.0186	0.260	0.0329	265	0.00551	0.978	1.11	0.873	0.0158	0.0554
Indeno(1,2,3-cd)pyrene			20	< 0.428	< 0.498	< 0.430	**26.8**	**304**	7.9	6.23	0.170	5.64	1.92	1.05	3.68	0.726	0.238	2.60	1.33	**105**	0.0563	3.11	2.27	2.24	0.180	0.363
Naphthalene			500	< 0.428	< 0.498	< 0.430	58.4	475	2.12	1.04	0.034	0.792	0.155	0.089	4.07	0.0924	0.0539	0.545	0.122	**629**	0.00437	0.355	0.417	0.163	0.0075	0.0335
Phenanthrene			500	< 0.428	< 0.498	< 0.430	270	**2,940**	69.6	11.7	0.269	13.9	3.96	0.478	23.6	1.53	0.622	2.95	0.441	**1,360**	0.0435	7.91	8.82	7.21	0.0447	0.949
Pyrene			1,000	< 0.428	< 0.498	< 0.430	202	**2,380**	81.6	23	0.653	21.7	9.32	3.1	22.6	3.10	1.10	8.74	3.63	978	0.192	11.9	13.8	12.7	0.606	1.34
Total PAHs			NS	ND	ND	ND	1,161	12,649	327	123	3.60	124	42.5	16.7	128	15.4	5.22	53.3	24.6	7,084	1.26	70.4	63.7	56.6	3.82	7.74
Petroleum Hydrocarbons	8015 Mod	mg/kg		NT	NT	NT	NT	NT	NT							NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	
TPH (C8-C40)			1,000							**3,610**	272	**3,570**	774	481	666											20
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg								NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100	< 9.5	< 13.4	< 11.3	< 20.1	< 55.2	< 70.7																	
C9 to C12 Aliphatic Hydrocarbons			1,000	< 18.9	< 26.6	< 22.5	< 40.0	< 110	< 141																	
C9 to C10 Aromatic Hydrocarbons			100	< 9.1	< 12.8	< 10.8	< 19.2	**120**	< 67.6																	
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg								NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000	< 18.1	< 21.4	< 20.2	< 48.4	205	328																	
C19 to C36 Aliphatic Hydrocarbons			3,000	< 18.1	< 21.4	< 20.2	162	724	1,180																	
C11 to C22 Aromatic Hydrocarbons			1,000	< 18.1	< 21.4	< 20.2	404	**2,310**	**1,200**																	
General Chemistry/Other																										
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	< 1.18	< 1.45	< 1.29	< 1.62	< 3.20	< 3.86	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	< 1.20	< 1.35	< 1.20	< 1.54	< 3.31	< 3.60	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	NT	NT	NT	NT	NT	NT	NT	NT	76,700	NT	NT	17,600	109,000	33,000	284,000	148,000	42,700	39,900	103,000	29,100	91,200	74,700	98,300
Percent Solids	5035	%	NS	80	69	77	61	30	25	58	59	55	80	57	65	65	82	69	67	69	71	70	72	42	48	70

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 2. Sediment Chemical Testing Results - All Locations
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

			Sample Location:	SS638	SS639	SS640	SS642	SS643	SS644	SS645	SS646	SS647	SS648	SS649	SS650	SS651	SS652	SS653	SS654	SS655	SS656	SS657	SS658	SS659	SS660	SS661
			Sample ID:	SS638	SS639	SS640	SS642	SS643	SS644	SS645	SS646	SS647	SS648	SS649	SS650	SS651	SS652	SS653	SS654	SS655	SS656	SS657	SS658	SS659	SS660	SS661
			Lab Sample ID:	F180071	F180071	F180070	F180071	F180071	F180071	F180071	F190024	F190024	F190024	F190024	F190024	F190024	F190024	F190024	F190024	F190024	F190025	F190025	F190025	F190025	F190025	F190025
			Property:	4 Oakland Ct	37 Oakland St	37 Oakland St	1 Field St	35 Oakland St	1 Field St	Mill St Ext	24 Oak St	26 Oak St	28 Oak St	39 Oakland St	39 Oakland St	41 Oakland St	41 Oakland St	39 Oakland St	39 Oakland St	39 Oakland St	39 Oakland St	39 Oakland St	41 Oakland St	41 Oakland St	41 Oakland St	39 Oakland St
			Area:	River	River	Mudflat	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River
			Sample Date:	12/20/2018	12/20/2018	12/17/2018	12/20/2018	12/20/2018	12/20/2018	12/20/2018	4/23/2019	4/23/2019	4/23/2019	4/23/2019	4/23/2019	4/23/2019	4/23/2019	4/23/2019	4/23/2019	4/23/2019	4/23/2019	4/24/2019	4/24/2019	4/24/2019	4/24/2019	4/24/2019	4/24/2019
			Soil/Sediment Type:	Silty Sand w/Gravel	Silty Sand w/Gravel	Silty Sand w/Gravel	Sandy Organic Soil	Sandy Organic Soil	Sandy Organic Soil	Sand w/Silt	Silty Sand	Silty Clay	Silty Clay	Silty Clay	Sandy Organic Soil	Sandy Organic Soil	Sandy Organic Soil	Sandy Organic Soil	Sandy Organic Soil	Sandy Organic Soil	Sandy Organic Soil	Sandy Organic Soil	Sandy Organic Soil	Sandy Organic Soil	Sandy Organic Soil	Silty Clay
			Sample Depth (feet):	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5
Analyte	**Method**	**Units**	**S-1/GW-3**																						
Volatile Organic Compounds (VOCs)	8260	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40																						
Ethylbenzene			500																						
Toluene			500																						
Xylene, o-			500																						
Xylene p,m-			500																						
Xylenes, Total			500																						
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg																							
2-Methylnaphthalene			300	0.0111	0.166	0.0216	0.0197	0.0387	0.0438	0.0167	0.0502	0.0715	0.0396	0.116	0.185	0.209	0.256	0.274	0.107	0.386	0.0243	0.0228	2.26	0.222	0.141	0.115
Acenaphthene			1,000	0.0234	0.527	0.0247	0.0536	0.185	0.109	0.0219	0.0788	0.223	0.055	3.04	1.96	4.04	2.59	3.43	3.00	8.31	0.187	0.0278	41.0	3.08	1.57	1.27
Acenaphthylene			10	0.132	0.408	0.0673	0.259	0.198	0.365	0.0423	0.243	0.314	0.656	1.51	1.19	2.71	2.62	1.83	1.11	6.46	0.173	0.204	**19.4**	1.95	0.840	1.32
Anthracene			1,000	0.133	1.39	0.0800	0.302	0.404	0.499	0.0537	0.315	0.617	0.583	2.20	2.49	6.74	9.52	3.92	2.03	10.7	0.330	0.228	51.8	3.74	1.97	2.02
Benzo(a)anthracene			20	0.297	3.52	0.244	0.801	0.865	1.61	0.243	1.25	1.70	3.16	5.43	5.37	11.4	8.53	7.18	3.69	12.7	1.13	0.708	**72.7**	6.86	3.37	5.29
Benzo(a)pyrene			2	0.298	**3.37**	0.272	0.759	0.849	1.75	0.267	1.46	1.68	**3.88**	**6.63**	**6.03**	**15.3**	**10.6**	**7.95**	**4.11**	**16.3**	1.10	0.705	**92.2**	**8.97**	**4.49**	**6.80**
Benzo(b)fluoranthene			20	0.241	3.15	0.205	0.680	0.783	1.23	0.157	1.25	1.42	2.18	3.84	3.62	8.23	6.11	4.55	2.52	7.27	1.03	0.603	**43.9**	5.40	2.67	4.28
Benzo(g,h,i)perylene			1,000	0.192	2.02	0.175	0.446	0.500	0.965	0.157	0.882	0.937	2.14	3.72	3.27	7.44	5.66	4.24	2.27	8.55	0.603	0.374	43.9	4.82	2.43	3.63
Benzo(k)fluoranthene			70	0.276	2.93	0.214	0.685	0.716	1.30	0.189	1.16	1.30	2.62	4.44	4.10	8.16	5.90	5.03	2.60	10.7	0.886	0.559	49.7	5.51	3.01	4.31
Chrysene			200	0.341	3.51	0.232	0.800	0.878	1.67	0.238	1.39	1.62	3.29	4.70	4.64	9.73	8.39	5.67	2.94	12.9	1.13	0.678	50.6	6.02	3.20	4.64
Dibenzo(a,h)anthracene			2	0.0470	0.592	0.0397	0.120	0.137	0.248	0.0398	0.227	0.264	0.456	0.797	0.697	1.50	1.12	0.948	0.498	1.53	0.165	0.106	**7.94**	0.937	0.52	0.750
Fluoranthene			1,000	0.654	7.66	0.469	1.65	1.99	2.57	0.275	2.29	3.00	3.52	12.1	11.7	27.6	20.8	15.6	8.39	38.1	2.32	1.36	182	16.6	6.65	12.4
Fluorene			1,000	0.0325	0.495	0.0197	0.0549	0.141	0.112	0.0171	0.105	0.227	0.0677	0.563	0.897	2.30	1.58	1.89	1.52	3.94	0.0981	0.0656	22.7	1.61	0.869	0.688
Indeno(1,2,3-cd)pyrene			20	0.185	2.11	0.165	0.468	0.522	0.897	0.124	0.996	1.10	2.16	3.89	3.53	7.82	5.91	4.45	2.40	8.34	0.731	0.450	**45.9**	5.14	2.63	3.95
Naphthalene			500	0.0185	0.180	0.0369	0.043	0.0843	0.0805	0.0248	0.0755	0.134	0.0781	0.283	0.33	0.485	0.683	0.601	0.190	0.894	0.0429	0.0392	3.15	0.519	0.310	0.299
Phenanthrene			500	0.381	4.91	0.206	0.861	1.34	1.29	0.167	1.06	1.85	0.830	4.55	6.44	19.9	15.8	14.0	8.52	34.5	1.11	0.744	215	12.5	5.67	6.91
Pyrene			1,000	0.637	6.55	0.471	1.41	1.70	2.87	0.374	2.21	2.77	5.03	15.7	15.0	38.6	28.8	21.1	11.1	53.2	2.04	1.22	267	22.3	8.69	16.3
Total PAHs			NS	3.90	43.5	2.94	9.41	11.3	17.6	2.41	15.0	19.2	30.7	73.5	71.4	172	135	103	57.0	235	13.1	8.09	1,211	106	49.0	75.0
Petroleum Hydrocarbons	8015 Mod	mg/kg									NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000	167	565	76.8	324	252	513	95.7																
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100																						
C9 to C12 Aliphatic Hydrocarbons			1,000																						
C9 to C10 Aromatic Hydrocarbons			100																						
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000																						
C19 to C36 Aliphatic Hydrocarbons			3,000																						
C11 to C22 Aromatic Hydrocarbons			1,000																						
General Chemistry/Other																									
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	7,620	33,400	< 310	19,900	15,000	80,700	12,200	64,400	27,100	105,000	56,300	55,700	91,900	45,600	27,300	87,600	38,400	34,200	7,420	44,300	95,900	95,600	76,500
Percent Solids	5035	%	NS	80	65	82	69	73	45	72	39	66	47	48	46	43	65	60	57	71	71	77	75	35	44	43

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 2. Sediment Chemical Testing Results - All Locations
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

Sample Location:				**SS662**	**SS663**	**664**			**665**		**666**				**667**		**668**		**669**		**670**		**671**		**672**	
Sample ID:				**SS662**	**SS663**	**SS664-S2**	**SS664-S3**	**SS664-S4**	**SS665-S1**	**SS665-S2**	**SS666-S2**	**SS666-S3**	**SS666-S4**	**SS666-S5**	**SS667-S1**	**SS667-S2**	**SS668-S1**	**SS668-S2**	**SS669-S1**	**SS669-S3**	**SS670-S1**	**SS670-S2**	**SS671-S1**	**SS671-S2**	**SS672-S1**	**SS672-S3**
Lab Sample ID:				**F190025**	**F190025**	**F190041**	**F190041**	**F190041**	**F190041**	**F190041**	**F190041**	**F190041**	**F190041**	**F190041**	**F190041**	**F190041**	**F190041**	**F190040**	**F190046**	**F190046**	**F190040**	**F190040**	**F190046**	**F190046**	**F190048**	**F190048**
Property:				**3 River St**	**3 River St**	**39 Oakland St**	**39 Oakland St**	**39 Oakland St**	**39 Oakland St**	**39 Oakland St**	**39 Oakland St**	**39 Oakland St**	**39 Oakland St**	**39 Oakland St**	**39 Oakland St**	**39 Oakland St**	**39 Oakland St**	**39 Oakland St**	**39 Oakland St**	**39 Oakland St**	**39 Oakland St**	**39 Oakland St**	**41 Oakland St**	**41 Oakland St**	**39 Oakland St**	**39 Oakland St**
Area:				**River**	**River**	**Mudflat**	**Mudflat**	**Mudflat**	**Mudflat**	**Mudflat**	**Mudflat**	**Mudflat**	**Mudflat**	**Mudflat**	**Mudflat**	**Mudflat**	**Mudflat**	**Mudflat**	**Mudflat**	**Mudflat**	**Mudflat**	**Mudflat**	**Mudflat**	**Mudflat**	**Mudflat**	**Mudflat**
Sample Date:				**4/24/2019**	**4/24/2019**	**09/11/2019**	**09/11/2019**	**09/11/2019**	**09/10/2019**	**09/10/2019**	**09/11/2019**	**09/11/2019**	**09/11/2019**	**09/11/2019**	**09/11/2019**	**09/11/2019**	**09/11/2019**	**09/11/2019**	**09/23/2019**	**09/23/2019**	**09/10/2019**	**09/10/2019**	**09/23/2019**	**09/23/2019**	**09/24/2019**	**09/24/2019**
Soil/Sediment Type:				**Silty Sand**	**Silty Sand**	**Organic Soil**	**Organic Soil**	**Organic Soil**	**Silty Sand**	**Silty Sand**	**Organic Soil**	**Organic Soil**	**Organic Soil**	**Organic Soil**	**Silty Sand**	**Silty Sand**	**Organic Soil**	**Silty Sand**	**Silty Sand**	**Silty Sand**	**Organic Soil**	**Silty Sand**	**Silty Sand**	**Silty Sand**	**Organic Soil**	**Sand**
Sample Depth (feet):				**0-0.5**	**0-0.5**	**0.9-1.1**	**1.9-2.1**	**2.6-2.8**	**0-0.5**	**0.9-1.1**	**0.9-1.1**	**1.9-2.1**	**2.9-3.1**	**3.9-4**	**0-0.5**	**0.9-1.1**	**0-0.5**	**0.9-1.1**	**1.5-2.2**	**4.6-4.7**	**0-0.5**	**0.9-1.1**	**1.3-1.5**	**1.9-2.1**	**0-0.5**	**1.9-2.1**
Analyte	**Method**	**Units**	**S-1/GW-3**																							
Volatile Organic Compounds (VOCs)	8260	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40																							
Ethylbenzene			500																							
Toluene			500																							
Xylene, o-			500																							
Xylene p,m-			500																							
Xylenes, Total			500																							
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg																								
2-Methylnaphthalene			300	0.0673	0.0539	0.006	< 0.00523	0.00247	0.0864	0.0274	0.0254	< 0.00713	< 0.00565	< 0.00494	0.0619	0.158	0.228	0.961	0.414	< 0.00508	0.44	0.0848	0.672	< 0.00898	0.186	0.0413
Acenaphthene			1,000	0.0882	0.107	0.07	0.00291	0.02	0.97	0.555	0.00916	0.00394	< 0.00566	< 0.00495	0.87	0.0305	6.89	3.83	2.84	0.00386	9.57	0.47	1.28	0.00529	3.84	1.86
Acenaphthylene			10	0.467	0.306	0.0203	< 0.00523	0.00248	0.469	0.0855	0.101	0.00504	< 0.00567	< 0.00496	1.03	0.592	2.11	0.342	0.795	0.00831	5.29	0.299	**10.4**	0.0172	1.85	0.354
Anthracene			1,000	0.658	0.447	0.18	0.011	0.0321	1.54	0.8	0.148	0.00583	< 0.00568	< 0.00497	3.45	0.431	5.14	0.655	2.840	0.00504	10.7	0.707	19.4	0.00617	3.97	1.25
Benzo(a)anthracene			20	2.19	1.52	0.149	0.00383	0.0162	3.14	0.623	0.872	0.0116	< 0.00569	< 0.00498	4.76	2.56	9.22	1.32	3.02	0.00395	19.9	1.4	**47**	0.00638	9.19	1.74
Benzo(a)pyrene			2	**2.93**	1.70	0.12	0.003	0.0142	**3.03**	0.542	0.788	0.0132	< 0.00570	< 0.00499	**5.1**	**3.1**	**9.75**	1.26	**2.98**	0.0037	**21.5**	1.33	**77.2**	< 0.00898	**11.7**	1.72
Benzo(b)fluoranthene			20	1.94	1.33	0.0667	< 0.00523	0.00679	2.05	0.321	0.534	0.0104	< 0.00571	< 0.00500	2.5	1.78	5.13	0.904	1.95	0.00255	11.4	0.979	**29.2**	< 0.00898	6.24	1.3
Benzo(g,h,i)perylene			1,000	1.59	0.949	0.06	< 0.00523	0.0074	1.85	0.314	0.455	0.00758	< 0.00572	< 0.00501	2.6	1.96	5.01	0.748	1.69	< 0.00508	10.80	0.804	33	< 0.00898	6.06	1.01
Benzo(k)fluoranthene			70	1.90	1.35	0.0884	0.00298	0.012	2.40	0.46	0.60	0.00894	< 0.00573	< 0.00502	3.22	1.63	6.17	0.949	2.21	< 0.00509	12.30	1.07	35.6	< 0.00898	7.42	1.44
Chrysene			200	2.37	1.57	0.17	0.01	0.0249	3.07	0.628	0.868	0.0111	< 0.00574	< 0.00503	3.81	2.78	7.14	1.34	3.55	0.00466	14.60	1.45	45.2	0.00632	8.22	1.77
Dibenzo(a,h)anthracene			2	0.350	0.247	0.0111	< 0.00523	< 0.00458	0.389	0.0688	0.115	< 0.00713	< 0.00575	< 0.00504	0.491	0.477	0.946	0.17	0.349	< 0.00508	**2.070**	0.221	**5.57**	< 0.00898	1.02	0.245
Fluoranthene			1,000	3.22	2.88	0.359	0.0096	0.0382	8.46	2.44	1.06	0.0275	0.0029	< 0.00505	12.2	1.9	21	3.48	7.8	0.00948	44.2	2.69	105	0.03	18.7	3.93
Fluorene			1,000	0.113	0.114	0.042	< 0.00523	0.00762	0.588	0.452	0.029	0.00407	< 0.00565	< 0.00506	0.599	0.0902	2.73	1.13	1.47	0.00299	5.23	0.167	0.93	< 0.00898	0.929	0.714
Indeno(1,2,3-cd)pyrene			20	1.71	1.10	0.05	< 0.00523	0.00528	1.48	0.257	0.34	0.00675	< 0.00566	< 0.00507	2.07	1.14	3.98	0.616	1.6	< 0.00508	8.74	0.669	**30.2**	< 0.00898	5.66	1.08
Naphthalene			500	0.144	0.109	0.0104	< 0.00523	0.00394	0.179	0.0476	0.0371	0.00525	< 0.00567	< 0.00508	0.163	0.163	0.566	0.663	0.573	0.00561	0.973	0.12	1.95	0.00916	0.572	0.107
Phenanthrene			500	0.888	1.23	0.31	0.009	0.0489	4.25	3.48	0.16	0.028	0.00342	0.00272	9.28	0.496	19.1	1.34	10.4	0.0122	43.2	1.33	32.8	0.00492	11.2	5.3
Pyrene			1,000	4.33	2.87	0.461	0.0113	0.0522	9.34	2.72	1.42	0.0381	0.00347	< 0.00494	17.4	4.09	29.1	3.99	10.1	0.0125	63.7	3.18	158	0.027	25.4	4.05
Total PAHs			NS	25.0	17.9	2.17	0.062	0.293	43.3	13.8	7.56	0.187	0.00979	0.00272	69.6	23.3	134	23.7	54.6	0.0749	285	17.0	633	0.108	122	27.9
Petroleum Hydrocarbons	8015 Mod	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000																							
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100																							
C9 to C12 Aliphatic Hydrocarbons			1,000																							
C9 to C10 Aromatic Hydrocarbons			100																							
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000																							
C19 to C36 Aliphatic Hydrocarbons			3,000																							
C11 to C22 Aromatic Hydrocarbons			1,000																							
General Chemistry/Other																										
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	58,500	49,300	48400	24300	12,000	21,000	25,700	25,600	44,600	23,900	15,500	21,000	14,500	45,300	32,200	30,900	13,300	62,000	34700	36,900	20,800	68,500	9,360
Percent Solids	5035	%	NS	49	71	60	68	68	73	70	76	52	68	77	76	75	51	85	84	79	55	72	66	44	43	92

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 2. Sediment Chemical Testing Results - All Locations
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

Sample Location:				673		674	675	676	677				678		679			680				681			682	
Sample ID:				SS673-S2	SS673-S3	SS674-S4	SS675-S2	SS676-S2	SS677-S2	SS677-S3	SS677-S4A	SS677-S5A	SS678-S1	SS678-S4	SS679-S1	SS679-S4	SS679-S5	SS680-S1	SS680-S4	SS680-S5	SS680R-S1	SS681-S1	SS681-S3	SS681-S4	SS682-S2	SS682-S3
Lab Sample ID:				F190040	F190040	F190040	F190048	F190040	F190040	F190040	F190040	F190040	F190040	F190039	F190039	F190039	F190039	F190039	F190039	F190039	F190048	F190039	F190039	F190039	F190039	F190039
Property:				39 Oakland St	39 Oakland St	39 Oakland St	41 Oakland St	39 Oakland St	41 Oakland St	41 Oakland St	41 Oakland St	41 Oakland St	41 Oakland St	41 Oakland St	1 Field St	1 Field St	1 Field St	1 Field St	1 Field St	1 Field St	1 Field St	24 Oak St	24 Oak St	24 Oak St	24 Oak St	24 Oak St
Area:				River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River
Sample Date:				09/12/2019	09/12/2019	09/12/2019	09/24/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/25/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019
Soil/Sediment Type:				Silty Sand	Silty Sand	Silty Sand	Sand	Organic Soil	Silty Sand	Silty Sand	Silty Sand	Sand	Organic Soil	Organic Soil	Silty Sand	Organic Soil	Organic Soil	Silty Sand	Silty Sand	Silty Sand	Clay	Silty Sand	Organic Soil	Organic Soil	Organic Soil	Silty Sand
Sample Depth (feet):				2.4-2.6	3.7-3.8	2.9-3.1	1.9-2.1	1.9-2.1	0-1	1.4-1.6	2.6-2.8	3.9-4	0-0.5	4.4-4.6	0-0.5	2.9-3.1	3.9-4	0-0.5	2.9-3.1	4.4-4.5	5.1-5.3	0-0.5	1.9-2.1	3.1-3.2	2.4-2.6	3.9-4.1
Analyte	**Method**	**Units**	**S-1/GW-3**																							
Volatile Organic Compounds (VOCs)	8260	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40																							
Ethylbenzene			500																							
Toluene			500																							
Xylene, o-			500																							
Xylene p,m-			500																							
Xylenes, Total			500																							
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg																								
2-Methylnaphthalene			300	0.285	0.0572	0.567	1.3	0.14	0.975	0.0686	1.1	2.45	0.271	5.37	0.0458	9.25	0.254	0.0492	0.353	**964**	0.0271	0.641	9.54	0.995	2.35	0.246
Acenaphthene			1,000	3.37	0.739	8.26	8.62	0.66	4.72	6.45	17.3	19.0	3.67	309	0.086	62.5	0.512	0.141	15.6	**1430**	0.128	1.41	266	28.9	42	0.349
Acenaphthylene			10	1.2	0.0358	2.84	0.231	0.334	0.762	0.123	0.694	2.88	2.22	**18.7**	0.308	2.78	0.397	0.257	2.1	**45.4**	0.0115	0.526	**23.1**	1.03	6.8	0.298
Anthracene			1,000	7.25	0.374	12.3	18.0	1.24	20.1	0.691	6.53	42.2	5.38	201	0.485	30.7	1.07	0.495	5.54	595	0.065	2.94	191	10.1	78.8	0.837
Benzo(a)anthracene			20	10.2	0.66	16.7	**24.5**	2.32	**21.0**	0.659	2.93	**23.5**	9.33	**132**	2.66	17.6	3.13	1.25	9.02	**308**	0.0759	5.65	**162**	7.3	**42.7**	2.24
Benzo(a)pyrene			2	**9.11**	0.587	**12**	**23.1**	**2.05**	**14.6**	0.55	**2.72**	**20.5**	**10.7**	**106**	**2.42**	**11.9**	**3.11**	1.21	**10.1**	**278**	0.07	**4.95**	**154**	**6.4**	**39**	**2.43**
Benzo(b)fluoranthene			20	7.35	0.442	6.15	16.7	1.48	11.5	0.453	2.19	9.86	5.96	**49.5**	1.79	7.16	2.3	0.953	6.01	**120**	0.0339	4.11	**67.5**	3.58	**21.9**	1.19
Benzo(g,h,i)perylene			1,000	4.95	0.287	5.22	11.6	1.14	6.83	0.311	1.56	7.08	5.78	49.1	1.3	5.31	1.71	0.738	5.5	129	0.0341	2.71	69.7	2.9	17.2	1.28
Benzo(k)fluoranthene			70	7.24	0.47	6.79	17.9	1.63	12.3	0.45	2.14	11.9	6.63	**70.5**	1.79	7.14	2.27	0.95	6.62	**171**	0.0504	3.8	**98.4**	4.34	23.8	1.34
Chrysene			200	9.65	0.621	16.2	23.2	2.32	17.3	0.718	2.79	20.5	7.55	125	2.43	16.3	3.01	1.21	8.98	**293**	0.0633	5.20	152	6.5	40	1.99
Dibenzo(a,h)anthracene			2	1.49	0.0756	1.41	**3.14**	0.325	**2.25**	0.0833	0.429	1.77	1.23	**11.2**	0.415	1.73	0.477	0.206	1.29	**26.4**	0.00603	0.785	**13**	0.74	**3.9**	0.33
Fluoranthene			1,000	23.6	1.33	23.2	61.5	4.33	58.5	1.88	11.0	45.8	19.8	295	3.49	33.7	4.66	2.08	14.4	730	0.223	11.4	319	15.5	131	2.57
Fluorene			1,000	2.61	0.187	5.06	7.5	0.325	7.28	0.554	9.52	9.16	2.05	149	0.114	32.2	0.489	0.119	5.39	497	0.0652	1.41	113	9.55	26.1	0.23
Indeno(1,2,3-cd)pyrene			20	4.56	0.24	4.2	13	0.992	6.75	0.255	1.42	5.81	4.65	**39.3**	1.14	4.44	1.42	0.624	4.47	**99.5**	0.03	2.47	**46.1**	2.41	14.4	0.84
Naphthalene			500	0.745	0.109	0.841	2.55	0.166	0.815	0.153	4.72	10.3	0.531	10.2	0.0732	16.7	0.436	0.079	1.87	**1,990**	0.0105	1.65	29.8	2.99	5.01	0.21
Phenanthrene			500	23.9	1.23	32.5	62.3	2.65	55.7	2.03	27.2	66.4	18.3	**669**	1.01	99.6	3.1	1.24	19.3	**1,840**	0.467	11.3	493	34	198	1.2
Pyrene			1,000	24.2	1.29	35.7	52.2	4.8	46.3	2.1	11.5	67.2	26.8	421	3.9	49.5	4.74	2.26	17.7	**1,040**	0.319	10.5	488	22.1	185	4.41
Total PAHs			NS	142	8.74	190	347	26.9	288	17.5	106	366	131	2,661	23.5	409	33.1	13.9	134	10,556	1.69	71.5	2,695	159	878	22.0
Petroleum Hydrocarbons	8015 Mod	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000																							
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100																							
C9 to C12 Aliphatic Hydrocarbons			1,000																							
C9 to C10 Aromatic Hydrocarbons			100																							
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000																							
C19 to C36 Aliphatic Hydrocarbons			3,000																							
C11 to C22 Aromatic Hydrocarbons			1,000																							
General Chemistry/Other																										
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	38,900	86,500	26,300	41,100	43,400	12,500	57,000	13,300	29,100	43,500	87,400	22,500	117,000	73,000	37,400	30,600	137,000	2,530	47,800	79,300	40,500	47,100	89,800
Percent Solids	5035	%	NS	80	78	77	80	55	82	50	77	82	56	62	78	66	56	72	78	68	73	81	71	63	71	55

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 2. Sediment Chemical Testing Results - All Locations
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

Sample Location:				683			684		685	686	687			688	689	690	691		692		693		694		695
Sample ID:				SS683-S2	SS683-S4	SS683-S5	SS684-S2	SS684-S4	SS685-S3	SS686-S3	SS687-S1	SS687-S2	SS687-S4	SS688-S4	SS689-S2	SS690-S5	SS691-S3	SS691-S5	SS692-S4	SS692-S5	SS693-S3	SS693-S5	SS694-S4	SS694-S6	SS695-S6
Lab Sample ID:				F190039	F190039	F190039	F190039	F190039	F190050	F190050	F190046	F190046	F190046	F190046	F190048	F190048	F190048	F190048	F190048	F190048	F190048	F190048	F190048	F190048	F190048
Property:				1 Field St	1 Field St	1 Field St	43 Oakland St	43 Oakland St	37 Oakland St	41 Oakland St	37 Oakland St	37 Oakland St	37 Oakland St	37 Oakland St	1 Field St	1 Field St	4 Oakland Ct	4 Oakland Ct	1 Field St	1 Field St	24 Oak St	24 Oak St	1 Field St	1 Field St	1 Field St
Area:				River	River	River	River	River	Mudflat	Mudflat	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River
Sample Date:				09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/10/2019	09/10/2019	09/23/2019	09/23/2019	09/23/2019	09/23/2019	09/24/2019	09/25/2019	09/24/2019	09/24/2019	09/24/2019	09/24/2019	09/25/2019	09/25/2019	09/25/2019	09/25/2019	09/25/2019
Soil/Sediment Type:				Silty Sand	Organic Soil	Organic Soil	Organic Soil	Organic Soil	Silty Sand	Silty Sand	Organic Soil	Organic Soil	Sand	Organic Soil	Sandy Silt	Organic Soil	Silty Sand	Silty Sand	Silty Sand	Clay	Silty Sand	Clay	Sand	Clay	Organic Soil
Sample Depth (feet):				0.9-1.1	2.9-3.1	3.9-4.1	1.2-1.3	3.3-3.4	1.9-2.1	1.9-2.1	0-0.5	1.9-2.1	5.1-6.1	2.9-3.1	1.9-2.1	3.9-4.1	1.9-2.1	4.4-4.5	4.3-4.8	6.9-7	1.9-2.1	3.9-4.1	3.3-3.7	6.3-6.5	4.1-4.3
Analyte	**Method**	**Units**	**S-1/GW-3**																						
Volatile Organic Compounds (VOCs)	8260	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40																						
Ethylbenzene			500																						
Toluene			500																						
Xylene, o-			500																						
Xylene p,m-			500																						
Xylenes, Total			500																						
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg																							
2-Methylnaphthalene			300	0.6	0.135	0.402	0.0462	1.02	0.0757	0.0277	0.152	0.204	0.0645	< 0.00508	< 0.00692	0.273	0.727	5.68	**3,610**	0.171	0.401	< 0.00472	**1,630**	0.0713	< 0.00487
Acenaphthene			1,000	10.8	0.165	0.538	0.233	14.4	0.0637	0.0277	3.66	1.37	0.169	< 0.00509	< 0.00692	0.451	7.71	61	**3,250**	0.174	0.26	0.00365	**2,310**	0.0971	< 0.00487
Acenaphthylene			10	4.11	0.161	0.569	0.235	1.3	0.137	0.02	0.735	0.839	0.113	0.0082	0.00477	0.421	1.47	4.22	**145**	0.013	0.126	< 0.00472	**71.5**	< 0.00493	< 0.00487
Anthracene			1,000	13.3	0.357	1.4	0.304	8.54	0.625	0.118	2.69	2.44	0.387	< 0.00508	< 0.00692	4.08	5.4	37	**1,120**	0.0863	0.528	0.00667	**1,800**	< 0.00493	< 0.00487
Benzo(a)anthracene			20	19.8	1.33	4.04	0.776	5.97	1.96	0.252	3.89	5.8	0.561	< 0.00508	< 0.00692	10.7	9.02	**25.1**	**718**	0.0703	1.3	0.00559	**532**	< 0.00493	< 0.00487
Benzo(a)pyrene			2	**19.4**	1.37	**4.14**	0.838	**4.29**	1.33	0.147	**3.78**	**5.67**	0.45	< 0.00508	< 0.00692	**10.2**	**8.53**	**18.5**	**573**	0.0609	1.01	0.00535	**530**	< 0.00493	< 0.00487
Benzo(b)fluoranthene			20	8.27	0.738	2.29	0.67	2.67	0.85	0.124	2.8	4.58	0.312	< 0.00508	< 0.00692	8.83	5.8	6.98	**244**	0.0264	0.728	0.00342	**208**	< 0.00493	< 0.00487
Benzo(g,h,i)perylene			1,000	5.93	0.714	2.1	0.585	1.85	0.382	0.0603	2.12	3.13	0.182	< 0.00508	< 0.00692	5.18	4.75	4.78	155	0.0282	0.422	0.00259	240	< 0.00493	< 0.00487
Benzo(k)fluoranthene			70	8.06	0.843	2.57	0.668	3.08	1.23	0.159	2.97	4.66	0.359	< 0.00508	< 0.00692	8.27	6.52	8.02	**333**	0.0387	0.844	0.00386	**310**	< 0.00493	< 0.00487
Chrysene			200	13.8	1.28	3.66	0.897	5.98	1.74	0.26	3.9	5.79	0.502	< 0.00508	< 0.00692	11.4	9.97	25.5	**647**	0.0633	1.2	0.00665	**646**	< 0.00493	< 0.00487
Dibenzo(a,h)anthracene			2	1.48	0.179	0.601	0.136	0.565	0.175	0.0226	0.50	0.875	0.0582	< 0.00508	< 0.00692	1.31	1.10	1.53	**43.6**	0.00605	0.151	< 0.00472	**32.2**	< 0.00493	< 0.00487
Fluoranthene			1,000	34.1	1.64	4.89	1.52	14.1	2.1	0.478	9.51	11.9	1.05	0.00312	0.00828	17.7	21.6	42.6	**1,330**	0.143	1.92	0.0103	**1,250**	< 0.00493	0.00267
Fluorene			1,000	6.99	0.148	0.57	0.174	7.95	0.119	0.0446	1.83	0.974	0.177	< 0.00508	< 0.00692	0.578	3.63	31.4	**1,260**	0.092	0.285	0.00276	841	0.0296	< 0.00487
Indeno(1,2,3-cd)pyrene			20	4.92	0.481	1.55	0.465	1.57	0.468	0.0682	2.24	3.46	0.22	< 0.00508	< 0.00692	5.6	4.69	4.94	**152**	0.0252	0.471	0.00248	**206**	< 0.00493	< 0.00487
Naphthalene			500	1.42	0.138	0.388	0.0632	2.63	0.0941	0.038	0.302	0.374	0.0728	0.00338	0.0135	0.384	1.51	11.3	**5,300**	0.208	0.468	0.00278	**3,740**	0.147	0.008
Phenanthrene			500	44.2	0.855	3.52	0.846	30.7	0.669	0.251	9.95	7.67	1.11	0.00387	0.00389	6.93	21.2	113	**4,450**	0.473	1.64	0.0174	**3,460**	0.0146	< 0.00487
Pyrene			1,000	49.8	2.55	7.86	1.88	19.8	1.85	0.422	9.87	10.8	0.999	0.00373	0.00561	17.1	28.2	65.1	**1,920**	0.217	1.98	0.0159	**1,910**	0.00291	< 0.00487
Total PAHs			NS	247	13.1	41.1	10.3	126	13.9	2.52	60.9	70.5	6.78	0.0223	0.0361	109	142	467	25,251	1.90	13.7	0.0894	19,717	0.363	0.0107
Petroleum Hydrocarbons	8015 Mod	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000																						
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100																						
C9 to C12 Aliphatic Hydrocarbons			1,000																						
C9 to C10 Aromatic Hydrocarbons			100																						
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000																						
C19 to C36 Aliphatic Hydrocarbons			3,000																						
C11 to C22 Aromatic Hydrocarbons			1,000																						
General Chemistry/Other																									
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	61,000	42,500	19,600	73,400	58,300	50,000	35,000	54,700	47,200	16,700	8,380	30,500	75,600	73,800	70,600	133,000	2,590	40,300	3,140	172,000	3,190	16,600
Percent Solids	5035	%	NS	75	62	24	98	81	64	64	59	61	90	77	59	54	67	71	50	71	65	71	64	72	76

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 2. Sediment Chemical Testing Results - All Locations
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

Sample Location:				**696**		**697**	**698**	**699**	**700**		**701**		**702**	**703**	**704**		**705**			**706**			**707**	**708**		
Sample ID:				**SS696-S3**	**SS696-S5**	**SS697-S2**	**SS698-S4**	**SS699-S3**	**SS700-S2**	**SS700-S5**	**SS701-S2**	**SS701-S4**	**SS702-S3**	**SS703-S3**	**SS704-S2**	**SS704-S4**	**SS705-S1**	**SS705-S2**	**SS705-S3**	**SS706-S1**	**SS706-S2**	**SS706-S3**	**SS707-S3**	**SS708-S1**	**SS708-S2**	**SS708-S3**
Lab Sample ID:				**F190048**	**F190048**	**F190048**	**F190051**	**F190051**	**F190051**	**F190051**	**F190051**	**F190051**	**F190051**	**F190051**	**F190051**	**F190051**	**F190052**	**F190052**	**F190052**	**F190052**	**F190052**	**F190052**	**F190052**	**F190052**	**F190052**	**F190052**
Property:				**37 Oakland St**	**37 Oakland St**	**1 Field St**	**1 Field St**	**1 Field St**	**24 Oak St**	**24 Oak St**	**1 Field St**	**1 Field St**	**1 Field St**	**1 Field St**	**4 Oakland Ct**	**4 Oakland Ct**	**1 Field St**	**1 Field St**	**1 Field St**	**1 Field St**	**1 Field St**	**1 Field St**	**8 Noel St**	**8 Noel St**	**8 Noel St**	**8 Noel St**
Area:				**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**
Sample Date:				**09/25/2019**	**09/25/2019**	**09/25/2019**	**09/26/2019**	**09/26/2019**	**09/26/2019**	**09/26/2019**	**09/26/2019**	**09/26/2019**	**09/26/2019**	**09/26/2019**	**09/26/2019**	**09/26/2019**	**09/27/2019**	**09/27/2019**	**09/27/2019**	**09/27/2019**	**09/27/2019**	**09/27/2019**	**09/27/2019**	**09/27/2019**	**09/27/2019**	**09/27/2019**
Soil/Sediment Type:				**Organic Soil**	**Organic Soil**	**Sand**	**Organic Soil**	**Organic Soil**	**Organic Soil**	**Clay**	**Silty Sand**	**Clay**	**Organic Soil**	**Organic Soil**	**Organic Soil**	**Gravel**	**Silty Sand**	**Silty Sand**	**Silt**	**Organic Soil**	**Silt**	**Silt**	**Silty Sand**	**Silty Sand**	**Organic Soil**	**Clay**
Sample Depth (feet):				**1.9-2.1**	**3.9-4.1**	**0.9-1.1**	**2.9-3.1**	**2.9-3.1**	**1.9-2.1**	**4.9-5.1**	**1.9-2.1**	**5.1-5.3**	**3.9-4.1**	**5.9-6.1**	**0.9-1.1**	**2.9-3.1**	**0-0.5**	**4.9-5.1**	**7.1-7.2**	**0-0.5**	**4.3-4.4**	**6.3-6.5**	**3.9-4.1**	**0-0.5**	**5.4-5.6**	**6.4-6.5**
Analyte	**Method**	**Units**	**S-1/GW-3**																						
Volatile Organic Compounds (VOCs)	8260	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40																						
Ethylbenzene			500																						
Toluene			500																						
Xylene, o-			500																						
Xylene p,m-			500																						
Xylenes, Total			500																						
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg																							
2-Methylnaphthalene			300	0.385	13.2	3.22	0.112	7.84	2.18	0.00274	111	0.0174	6.1	170	1.96	< 0.00484	0.071	**1,560**	0.124	3.02	**5,080**	17.3	0.00382	0.124	**3,360**	0.128
Acenaphthene			1,000	3.11	204	19.3	1.25	258	10.4	0.00399	269	0.0684	46.2	287	20.9	0.00403	0.3	**2,200**	0.284	5.01	**7,630**	51.5	0.00779	0.446	**4,890**	0.242
Acenaphthylene			10	0.72	**14.7**	1.65	0.166	**22.2**	3.81	0.0273	**14.5**	0.0141	5.37	**14.4**	6.03	0.0124	0.262	**77.9**	0.020	0.466	**371**	0.854	0.009	0.306	**256**	0.00949
Anthracene			1,000	3.03	136	25.5	0.661	291	17.3	0.00901	128	0.044	39	122	32.5	0.00427	0.657	**1,200**	0.265	2.8	**4,230**	11.1	0.0116	0.86	**2,080**	0.0848
Benzo(a)anthracene			20	4.63	**111**	**34.4**	0.863	**167**	19.3	0.0183	**78.1**	0.0383	**38.7**	**72.1**	**52.4**	0.0058	1.65	**451**	0.0908	2.92	**1,970**	5.81	0.00849	1.65	**1,240**	0.0284
Benzo(a)pyrene			2	**4.6**	**61.6**	**30.4**	0.71	**155**	**14.8**	0.0112	**88.5**	0.0351	**41.6**	**61.7**	**53.2**	0.00822	1.61	**427**	0.0953	**3.01**	**1,960**	**5.73**	0.00925	1.71	**1,210**	0.02
Benzo(b)fluoranthene			20	3.3	**37.1**	**24.8**	0.457	**68.8**	7.28	0.00608	**41.4**	0.0176	**22.2**	**27.6**	**25**	0.00428	1.23	**176**	0.0392	1.98	**837**	3.19	0.0053	1.39	**468**	0.00741
Benzo(g,h,i)perylene			1,000	2.46	27.3	15.1	0.322	66.6	5.55	0.00528	43.6	0.0162	21.5	26.8	20.1	0.00416	0.929	182	0.0435	1.57	852	2.87	0.0065	1.01	507	0.00763
Benzo(k)fluoranthene			70	3.53	40.70	24.7	0.488	**97.2**	8.44	0.00803	50.8	0.024	27.7	37.3	24.8	0.00556	1.33	**258**	0.0571	2.27	**1,120**	3.78	0.00673	1.43	**735**	0.00962
Chrysene			200	4.95	118	31.9	0.914	159	21.3	0.0158	70.3	0.0364	39.6	69.9	54.9	0.00573	1.74	**478**	0.09	3.06	**2,110**	5.45	0.01	1.74	**1,420**	0.022
Dibenzo(a,h)anthracene			2	0.579	**5.7**	**4.01**	0.0872	**14.9**	1.8	< 0.00522	**8.03**	0.0036	**4.32**	**6.28**	**4.78**	< 0.00484	0.227	**45.4**	0.00886	0.351	**198**	0.677	< 0.00378	0.254	**121**	< 0.00456
Fluoranthene			1,000	9.81	280	87.5	1.64	370	30.4	0.0181	245	0.095	106	166	130	0.0113	3.09	**1,100**	0.206	6.62	**4,630**	14.2	0.0135	3.65	**2,790**	0.233
Fluorene			1,000	2.0	101	15	0.456	132	8.9	0.01	86.7	0.0337	22.3	99.6	16.7	0.00415	0.22	768	0.109	1.89	**2,850**	17.3	0.00481	0.352	**1,820**	0.129
Indeno(1,2,3-cd)pyrene			20	2.45	**25.9**	17.1	0.32	**62.2**	5.53	0.0047	**39.4**	0.0153	**20.6**	**25**	**20.7**	0.004	0.959	**167**	0.0409	1.59	**744**	2.75	0.00663	1.08	**444**	0.01
Naphthalene			500	1.1	115	8.1	0.239	30.9	2.66	< 0.00522	183	0.0155	16.5	272	3.95	< 0.00484	0.115	**3,090**	0.196	6.09	**9,480**	46.6	0.005	0.274	**9,250**	0.281
Phenanthrene			500	8.66	487	90	1.92	**900**	55.7	0.012	**568**	0.2	139	466	133	0.0136	2.43	**2,910**	0.52	9.46	**11,500**	53.2	0.0157	2.93	**7,810**	0.671
Pyrene			1,000	11.3	383	73	2.24	545	47.5	0.0752	368	0.139	144	244	139	0.0153	3.42	**1,590**	0.304	7.66	**6,910**	19.6	0.0179	3.44	**4,090**	0.36
Total PAHs			NS	66.6	2,161	506	12.8	3,348	263	0.223	2,393	0.827	741	2,168	740	0.102	20.2	16,680	2.50	59.8	62,472	262	0.143	22.6	42,491	2.24
Petroleum Hydrocarbons	8015 Mod	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000																							
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100																							
C9 to C12 Aliphatic Hydrocarbons			1,000																							
C9 to C10 Aromatic Hydrocarbons			100																							
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000																							
C19 to C36 Aliphatic Hydrocarbons			3,000																							
C11 to C22 Aromatic Hydrocarbons			1,000																							
General Chemistry/Other																										
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	54,600	91,600	70,800	14,800	158,000	63,700	4,110	205,000	2,270	101,000	112,000	172,000	8,680	7,800	295,000	2,440	31,700	212,000	91,500	4,760	18,600	110,000	4,800
Percent Solids	5035	%	NS	41	56	64	74	46	60	72	66	72	58	60	73	78	75	63	79	59	64	68	83	75	76	79

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 2. Sediment Chemical Testing Results - All Locations
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

			Sample Location:	709		710		711		712		713	714		715	716		717		718	719	720		721		722
			Sample ID:	SS709-S1	SS709-S3	SS710-S1	SS710-S2	SS711-S1	SS711-S2	SS712-S1	SS712-S2	SS713-S2	SS714-S3	SS714-S4	SS715-S2	SS716-S1	SS716-S2	SS717-S1	SS717-S3	SS718-S5	SS719-S1	SS720-S1	SS720-S2	SS721-S1	SS721-S2	SS722-S1
			Lab Sample ID:	F190052	F190052	F190056	F190056	F190056	F190056	F190056	F190056	F190058	F190059	F190059	F190058	F190056	F190056	F190056	F190056	F190056	F190056	F190057	F190057	F190057	F190057	F190057
			Property:	28 Oak Street	28 Oak Street	39A Water St	39A Water St	1 Field St	1 Field St	33R Oakland St	33R Oakland St	33R Oakland St	35 Oakland St	35 Oakland St	1 Field St	37 Oakland St	37 Oakland St	37 Oakland St	37 Oakland St	39 Oakland St	41 Oakland St	41 Oakland St	41 Oakland St	4 Oakland Ct	4 Oakland Ct	4 Oakland Ct
			Area:	River	River	River	River	River	River	River	River	River	River	River	River	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat
			Sample Date:	09/27/2019	9/27/2019	11/11/2019	11/11/2019	11/11/2019	11/11/2019	11/11/2019	11/11/2019	11/15/2019	11/14/2019	11/14/2019	11/15/2019	11/11/2019	11/11/2019	11/11/2019	11/11/2019	11/11/2019	11/11/2019	11/12/2019	11/12/2019	11/12/2019	11/12/2019	11/12/2019
			Soil/Sediment Type:	Organic Soil	Silty Sand	Silty Sand	Silty Sand	Organic Soil	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Organic Soil	Sand	Organic Soil	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Organic Soil	Silty Sand	Silty Sand	Silty Sand	Sand	Organic Soil
			Sample Depth (feet):	0-0.5	4.6-4.8	1.9-2.4	3-3.1	0-0.9	2-2.1	4.1-5.1	6.2-6.3	2.4-2.5	3.9-4	5.5-5.6	3.7-3.8	3-3.9	4.5-4.6	0-0.5	4.2-4.3	7.8-7.9	0-0.1	0.7-0.8	1.4-1.5	1-1.1	2.3-2.4	0.7-0.8
Analyte	**Method**	**Units**	**S-1/GW-3**																							
Volatile Organic Compounds (VOCs)	8260	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40																							
Ethylbenzene			500																							
Toluene			500																							
Xylene, o-			500																							
Xylene p,m-			500																							
Xylenes, Total			500																							
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg																								
2-Methylnaphthalene			300	0.103	0.00247	9.22	0.138	0.0588	< 0.0133	11.9	0.0275	0.052	110	0.15	0.00692	1.57	0.0176	0.00705	< 0.00527	< 0.00426	0.252	0.896	0.0167	0.954	0.00457	0.311
Acenaphthene			1,000	0.203	0.00492	330	0.306	0.249	0.00672	304	0.0641	1.45	346	0.15	0.0117	16.1	0.0237	0.171	< 0.00527	< 0.00426	3.44	2.9	0.0188	1.4	0.0051	0.751
Acenaphthylene			10	0.555	0.00471	**23**	0.167	0.34	0.0209	**22.3**	0.0191	0.255	**26.8**	0.167	0.0126	3.16	0.0453	0.0308	0.00965	0.00475	2.61	2.17	0.0346	**16.5**	0.0179	3.71
Anthracene			1,000	0.641	0.00267	200	0.432	0.709	0.00788	200	0.0722	0.648	195	0.299	0.00623	18.4	0.0428	0.0189	< 0.00527	< 0.00426	4.52	7.38	0.0435	40	0.015	6.87
Benzo(a)anthracene			20	2.39	0.00367	**143**	1.2	1.96	0.00935	**138**	0.178	1.35	**102**	0.95	0.00538	18.1	0.134	0.0503	< 0.00527	< 0.00426	8.16	11.4	0.108	**103**	0.0284	15.8
Benzo(a)pyrene			2	**3.09**	0.00351	**135**	1.27	**2.35**	0.00861	**143**	0.17000	1.07	**70.1**	1.07	< 0.0107	**13.8**	0.13000	0.072	< 0.00527	< 0.00426	**10.4**	**11.9**	0.09620	**109**	0.02520	**19**
Benzo(b)fluoranthene			20	1.9	< 0.00395	**63.2**	0.763	1.5	< 0.0133	**63.9**	0.114	0.83	**35**	0.6	< 0.0107	9.71	0.0716	0.0368	< 0.00527	< 0.00426	5.59	9.32	0.0722	**49**	0.0157	10.8
Benzo(g,h,i)perylene			1,000	1.83	0.00248	62.4	0.719	1.3	< 0.0133	58.4	0.0842	0.534	25.4	0.594	< 0.0107	7.49	0.0826	0.044	< 0.00527	< 0.00426	6.09	7.91	0.0467	52.4	0.0126	10.6
Benzo(k)fluoranthene			70	2.21	0.00231	**76.3**	0.832	1.54	< 0.0133	**87.4**	0.127	0.915	42.10	0.646	< 0.0107	9.47	0.0718	0.04	< 0.00527	< 0.00426	6.45	9.46	0.0896	**70.50**	0.0188	12.2
Chrysene			200	2.66	0.00411	137	1.19	2.06	0.00981	139	0.17	1.38	102	0.92	0.0067	19.7	0.135	0.0519	< 0.00527	< 0.00426	7.5	12.2	0.113	99.4	0.0299	16.4
Dibenzo(a,h)anthracene			2	0.375	< 0.00395	**14.5**	0.173	0.289	< 0.0133	**13.0**	0.0242	0.146	**8.38**	0.137	< 0.0107	**2.12**	0.0174	0.010	< 0.00527	< 0.00426	1.09	1.78	0.0145	**12.5**	< 0.00862	**2.05**
Fluoranthene			1,000	3.54	0.00591	310	2.17	3.16	0.0194	348	0.293	2.53	189	1.58	0.0175	35.5	0.121	0.0922	0.00311	0.00349	16.9	31.8	0.205	171	0.0521	26.1
Fluorene			1,000	0.174	0.00337	151	0.205	0.182	0.0129	147	0.0371	0.173	165	0.113	0.00706	12.6	0.0231	0.00866	< 0.00527	< 0.00426	1.43	2.6	0.0285	1.72	0.00754	0.948
Indeno(1,2,3-cd)pyrene			20	1.73	0.00	**55.5**	0.624	1.2	< 0.0133	**54.3**	0.09	0.565	**25.3**	0.51	< 0.0107	7.39	0.07	0.0333	< 0.00527	< 0.00426	5.63	8.07	0.05	**46.3**	0.01	9.84
Naphthalene			500	0.165	0.00317	19.8	0.175	0.093	< 0.0133	31.7	0.0427	0.0986	192	0.211	0.0109	2.52	0.0202	0.00824	< 0.00527	< 0.00426	0.62	1.68	0.0207	3.44	0.00537	0.704
Phenanthrene			500	1.42	0.0113	**665**	1.17	1.75	0.0155	**674**	0.203	2.08	**651**	0.582	0.0226	64.8	0.107	0.0201	< 0.00527	0.00416	12.7	19.9	0.0984	45.5	0.0298	14.4
Pyrene			1,000	4.57	0.0124	467	2.73	3.86	0.0253	530	0.316	2.58	278	2.23	0.0187	52.4	0.33	0.177	0.00454	0.00373	24.4	38	0.211	265	0.0602	35.6
Total PAHs			NS	27.6	0.0696	2,862	14.3	22.6	0.136	2,966	2.03	16.7	2,563	10.9	0.126	295	1.44	0.868	0.0173	0.0161	118	179	1.27	1,088	0.341	186
Petroleum Hydrocarbons	8015 Mod	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000																							
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100																							
C9 to C12 Aliphatic Hydrocarbons			1,000																							
C9 to C10 Aromatic Hydrocarbons			100																							
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000																							
C19 to C36 Aliphatic Hydrocarbons			3,000																							
C11 to C22 Aromatic Hydrocarbons			1,000																							
General Chemistry/Other																										
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	51,300	2,590	97,400	44,000	65,100	149,000	102,000	8,220	15,000	133,000	49,500	104,000	73,000	57,500	81,600	81,000	31,000	49,100	69,700	29,900	213,000	51,600	178,000
Percent Solids	5035	%	NS	41	83	69	58	54	29	54	83	79	55	53	40	65	48	56	65	80	52	57	64	67	48	70

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 2. Sediment Chemical Testing Results - All Locations
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

			Sample Location:	723	724	725	726	727		728	729		730		731	733	734		735			736	737	738	
			Sample ID:	SS723-S1	SS724-S3	SS725-S2	SS726-S2	SS727-S2	SS727-S3	SS728-S3	SS729-S3	SS729-S4	SS730-S2	SS730-S3	SS731-S2	SS733-S4	SS734-S1	SS734-S2	SS735-S2	SS735-S3	SS735-S4	SS736-S2	SS737-S1	SS738-S1	SS738-S2
			Lab Sample ID:	F190059	F190057	F190059	F190057	F190059	F190059	F190059	F190057	F190057	F190059	F190059	F190058	F190058	F190058	F190058	F190058	F190058	F190058	F190058	F190058	F200006	F200006
			Property:	24 Oak St	1 Field St	24 Oak St	1 Field St	1 Field St	1 Field St	1 Field St	1 Field St	1 Field St	1 Field St	1 Field St	28 Oak St	28 Oak Street	28 Oak Street	28 Oak Street	28 Oak Street	28 Oak Street	28 Oak Street	8 Noel St	3 River St	35 Water St	35 Water St
			Area:	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River
			Sample Date:	11/14/2019	11/12/2019	11/14/2019	11/12/2019	11/14/2019	11/14/2019	11/14/2019	11/12/2019	11/12/2019	11/14/2019	11/14/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019	2/4/2020	2/4/2020
			Soil/Sediment Type:	Silty Sand	Silty Sand	Clay	Silty Sand	Organic Soil	Organic Soil	Organic Soil	Sandy Silt	Organic Soil	Organic Soil	Clay	Organic Soil	Clay	Organic Soil	Clay	Silty Sand	Organic Soil	Clay	Clay	Organic Soil	Silty Sand	Organic Soil
			Sample Depth (feet):	1.4-1.5	4.7-4.8	2.8-2.9	1.4-1.5	1.9-2	5.3-5.4	5.4-5.6	3.9-4	5.9-6	2.5-2.6	4.8-4.9	3.8-3.9	5.4-5.6	4.9-5	6.1-6.2	3.3-3.4	6.7-6.8	7.8-7.9	3.9-4	8.5-8.6	1-1.5	3.5-3.6
Analyte	**Method**	**Units**	**S-1/GW-3**																						
Volatile Organic Compounds (VOCs)	8260	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40																						
Ethylbenzene			500																						
Toluene			500																						
Xylene, o-			500																						
Xylene p,m-			500																						
Xylenes, Total			500																						
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg																							
2-Methylnaphthalene			300	1.07	< 0.00481	< 0.00492	0.201	0.263	0.367	9.11	11.1	0.00368	< 0.00492	< 0.00486	3.09	0.0843	**1,390**	0.104	0.66	0.399	< 0.00429	0.0129	**912**	0.217	0.179
Acenaphthene			1,000	3.67	0.00695	0.00287	0.579	0.782	0.267	41.6	266	0.0143	0.00545	< 0.00486	8.5	0.691	**1,710**	0.276	8.3	0.457	0.00239	0.017	800	1.23	0.471
Acenaphthylene			10	2.54	0.0107	0.0182	0.843	0.863	0.513	5.31	**18.5**	0.0201	0.0258	< 0.00486	0.365	0.0467	**71.4**	0.00858	1.25	0.209	< 0.00429	0.00627	**45**	0.315	0.158
Anthracene			1,000	11.3	0.00981	0.00278	1.45	1.38	0.937	53	181	0.0281	0.0102	< 0.00486	4.29	0.514	704	0.083	6.44	0.947	0.0047	0.00678	352	1.28	0.652
Benzo(a)anthracene			20	19.2	0.0151	< 0.00492	4.65	3	3.39	**43.2**	**120**	0.0611	0.0147	< 0.00486	2.65	0.362	**462**	0.0176	8.72	2.17	0.00696	0.0062	**196**	2.25	1.67
Benzo(a)pyrene			2	**18**	0.0169	0.00294	**3.9**	**3.66**	**4.23**	**29.2**	**107**	0.05420	0.0182	< 0.00486	**2.38**	0.287	**447**	0.00841	**7.5**	1.96	0.00302	0.00578	**124**	**2.14**	1.67
Benzo(b)fluoranthene			20	11.3	0.00941	< 0.00492	3.17	2.95	2.32	16	**56.1**	0.0403	0.00888	< 0.00486	1.8	0.129	**187**	0.00444	5.89	1.07	0.00237	0.0034	**60.3**	1.65	1.02
Benzo(g,h,i)perylene			1,000	7.67	0.00848	< 0.00492	2.33	2.13	2.39	11.2	49.5	0.0275	0.0102	< 0.00486	1.34	0.128	214	0.0037	4.11	0.954	< 0.00429	0.00416	41.4	1.19	0.934
Benzo(k)fluoranthene			70	12.4	0.0117	< 0.00492	3.07	3.03	2.43	15.3	63.20	0.0462	0.01	< 0.00486	1.92	0.172	**254**	0.00513	5.92	1.1	0.00248	0.00376	**75.9**	1.74	1.13
Chrysene			200	18	0.0156	< 0.00492	4.73	3.54	3.4	42.8	116	0.0552	0.015	< 0.00486	2.95	0.356	**414**	0.0155	8.79	2.06	0.00727	0.00641	184	2.15	1.53
Dibenzo(a,h)anthracene			2	**2.13**	< 0.00481	< 0.00492	0.595	0.547	0.595	**3.28**	**11.0**	0.00724	< 0.00492	< 0.00486	0.348	0.0257	**40.1**	0.00487	1.05	0.239	< 0.00429	< 0.00534	**13.4**	0.317	0.24
Fluoranthene			1,000	27.7	0.0356	0.00247	8.62	6.54	4.13	69.4	289	0.128	0.0228	< 0.00486	6.87	0.765	975	0.18	22.7	2.62	0.0099	0.0108	349	5.16	2.71
Fluorene			1,000	4.11	0.00553	0.0042	0.544	0.786	0.354	29.8	118	0.012	0.00643	< 0.00486	5	0.359	664	0.116	2.76	0.321	< 0.00429	0.00637	345	0.807	0.158
Indeno(1,2,3-cd)pyrene			20	7.84	0.00806	< 0.00492	2.42	2.18	1.93	11	**47.8**	0.03	0.00851	< 0.00486	1.39	0.114	**195**	0.00	4.33	0.762	< 0.00429	0.00353	**41.7**	1.53	0.979
Naphthalene			500	1.41	< 0.00481	< 0.00492	0.283	0.328	0.448	10.2	34	0.00515	< 0.00492	< 0.00486	6.82	0.117	**2,510**	0.299	2.3	0.336	< 0.00429	0.027	**861**	0.337	0.177
Phenanthrene			500	29.4	0.0332	0.00418	4.66	4.52	1.85	166	**572**	0.0908	0.0162	< 0.00486	17.5	1.95	**2,880**	0.612	24.2	1.39	0.00838	0.0243	**1,180**	5.21	0.819
Pyrene			1,000	35.2	0.0553	0.00379	9.17	7.13	6.16	103	419	0.114	0.0347	0.00352	8.05	1.1	**1,430**	0.263	22.8	4.78	0.0224	0.0167	513	5.34	3.88
Total PAHs			NS	213	0.242	0.0414	51.2	43.6	35.7	659	2,479	0.740	0.207	0.00352	75.3	7.20	14,548	2.01	138	21.8	0.0699	0.161	6,094	32.9	18.4
Petroleum Hydrocarbons	8015 Mod	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000																						
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100																						
C9 to C12 Aliphatic Hydrocarbons			1,000																						
C9 to C10 Aromatic Hydrocarbons			100																						
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000																						
C19 to C36 Aliphatic Hydrocarbons			3,000																						
C11 to C22 Aromatic Hydrocarbons			1,000																						
General Chemistry/Other																									
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	202,000	10,800	2,060	76,400	81,100	55,100	92,800	81,700	1,270	11,400	3,260	109,000	1,230	79,800	1,750	248,000	52,800	9,850	12,100	116,000	39,600	45,100
Percent Solids	5035	%	NS	73	67	75	47	39	54	52	59	80	74	80	63	77	73	76	63	47	78	76	39	79	52

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 2. Sediment Chemical Testing Results - All Locations
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

Sample Location:				739			740		741		742	743	744		745	746		747	748		749		750	751	
Sample ID:				SS739-S1	SS739-S2	SS739-S3	SS740-S1	SS740-S2	SS741-S1	SS741-S3	SS742-S1	SS743-S2	SS744-S1	SS744-S2	SS745-S2	SS746-S1	SS746-S3	SS747-S2	SS748-S1	SS748-S3	SS749-S1	SS749-S2	SS750-S1	SS751-S1	SS751-S2
Lab Sample ID:				F200006	F200006	F200006	F200006	F200006	F200008	F200008	F200006	F200006	F200008	F200008	F200006	F200008	F200008	F200006	F200008	F200008	F200006	F200006	F200006	F200006	F200006
Property:				1 Field St	1 Field St	1 Field St	39A Water St	39A Water St	33R Oakland St	33R Oakland St	1 Field St	1 Field St	1 Field St	1 Field St	24 Oak St	37 Oakland St	37 Oakland St	28 Oak Street	3 River St	3 River St	7 Noel St	7 Noel St	7 Noel St	7 Noel St	7 Noel St
Area:				River	River	River	River	River	River	River	River	River	River	River	River	Mudflat	Mudflat	River	River	River	River	River	River	River	River
Sample Date:				2/4/2020	2/4/2020	2/4/2020	2/4/2020	2/4/2020	2/5/2020	2/5/2020	2/4/2020	2/4/2020	2/5/2020	2/5/2020	2/4/2020	2/5/2020	2/5/2020	2/4/2020	2/5/2020	2/5/2020	2/3/2020	2/3/2020	2/3/2020	2/3/2020	2/3/2020
Soil/Sediment Type:				Organic Soil	Organic Soil	Clay	Sand w/Silt	Organic Soil	Organic Soil	Sand w/Silt	Silty Sand	Silty Sand	Organic Soil	Sand	Silt w/Sand	Organic Soil	Clay	Silt	Organic Soil	Silt w/Gravel&Sand	Sandy Silt	Silt	Organic Soil	Organic Soil	Organic Soil
Sample Depth (feet):				1.3-1.5	7.6-7.8	8.7-9	0.5-1.7	4.2-4.5	0.9-1.1	4.9-5.1	0.9-1.1	4.9-5.1	1.9-2.1	3.9-4.1	3.7-3.9	1.9-2.1	4.6-5.1	6.5-6.7	2.5-2.7	5.5-5.7	4.1-4.3	8-8.2	0.8-1	2.1-2.3	4.2-4.4
Analyte	**Method**	**Units**	**S-1/GW-3**																					
Volatile Organic Compounds (VOCs)	8260	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40																					
Ethylbenzene			500																					
Toluene			500																					
Xylene, o-			500																					
Xylene p,m-			500																					
Xylenes, Total			500																					
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg																						
2-Methylnaphthalene			300	0.359	0.395	0.098	0.022	< 0.006	0.156	< 0.005	< 0.004	< 0.005	< 0.006	< 0.005	< 0.005	2.51	0.003	< 0.004	1.46	< 0.005	0.336	< 0.004	0.057	0.076	< 0.005
Acenaphthene			1,000	2.6	1.11	0.237	1.72	< 0.006	2.89	< 0.005	< 0.004	< 0.005	< 0.006	< 0.005	< 0.005	26.5	0.012	< 0.004	6.87	< 0.005	0.379	< 0.004	0.334	0.131	< 0.005
Acenaphthylene			10	0.39	0.496	0.167	0.085	< 0.006	0.613	< 0.005	< 0.004	< 0.005	< 0.006	< 0.005	< 0.005	5.99	0.003	0.00357	2.91	< 0.005	0.543	< 0.004	0.107	0.157	< 0.005
Anthracene			1,000	1.81	1.73	0.512	0.57	< 0.012	1.72	< 0.005	< 0.004	< 0.005	< 0.006	< 0.005	< 0.005	22.1	0.010	0.00649	13.9	< 0.005	0.952	< 0.004	0.982	0.286	< 0.005
Benzo(a)anthracene			20	3.09	3.99	1.92	0.529	< 0.012	3.89	< 0.005	< 0.004	< 0.005	0.006	< 0.005	< 0.005	**33.9**	0.013	0.0316	17.1	< 0.005	4.86	0.002	1.66	0.769	0.004
Benzo(a)pyrene			2	**2.73**	**3.88**	**2.42**	0.532	< 0.012	**3.71**	0.003	< 0.004	< 0.005	0.006	< 0.005	< 0.005	**25.1**	0.009	0.036	**12.7**	< 0.005	**4.43**	0.002	1.42	0.736	0.006
Benzo(b)fluoranthene			20	1.67	2.28	1.28	0.346	< 0.012	2.84	< 0.005	< 0.004	< 0.005	0.005	< 0.005	< 0.005	16	0.006	0.0221	7.2	< 0.005	2.85	< 0.004	1.03	0.581	0.006
Benzo(g,h,i)perylene			1,000	1.24	1.92	1.39	0.281	< 0.012	2.1	< 0.005	< 0.004	< 0.005	0.004	< 0.005	< 0.005	11.4	0.005	0.0183	5.39	< 0.005	2.19	< 0.004	0.682	0.42	0.004
Benzo(k)fluoranthene			70	1.92	2.44	1.44	0.369	< 0.012	3.08	< 0.005	< 0.004	< 0.005	0.004	< 0.005	< 0.005	18.8	0.007	0.0265	9.27	< 0.005	3.09	< 0.004	1.15	0.615	0.006
Chrysene			200	3.11	3.82	1.62	0.541	< 0.012	3.96	< 0.005	< 0.004	< 0.005	0.007	< 0.005	< 0.005	40	0.015	0.0363	18.6	< 0.005	4.61	0.002	1.37	0.869	0.005
Dibenzo(a,h)anthracene			2	0.323	0.545	0.323	0.071	< 0.012	0.602	< 0.005	< 0.004	< 0.005	< 0.006	< 0.005	< 0.005	**3.3**	< 0.004	0.00366	1.69	< 0.005	0.511	< 0.004	0.173	0.115	< 0.005
Fluoranthene			1,000	5.34	5.45	2.81	1.04	0.0127	8.66	0.003	0.004	<0.005	0.012	< 0.005	< 0.005	48.3	0.023	0.0577	29.8	< 0.005	8.03	0.004	3.75	1.58	0.005
Fluorene			1,000	1.34	0.829	0.205	0.784	< 0.012	0.715	< 0.005	< 0.004	< 0.005	< 0.006	< 0.005	< 0.005	19.6	0.009	< 0.004	7.14	< 0.005	0.501	< 0.004	0.525	0.233	< 0.005
Indeno(1,2,3-cd)pyrene			20	1.4	2.12	1.43	0.336	< 0.012	2.7	< 0.005	< 0.004	< 0.005	0.004	< 0.005	< 0.005	13.5	0.005	0.0172	6.57	< 0.005	2.6	< 0.004	0.901	0.505	0.004
Naphthalene			500	0.578	0.457	0.172	0.045	< 0.012	0.225	< 0.005	< 0.004	< 0.005	< 0.006	< 0.005	< 0.005	5.85	0.006	< 0.004	1.35	< 0.005	0.442	< 0.004	0.046	1.2	< 0.005
Phenanthrene			500	5.36	4.86	1.74	2.17	0.00966	6.80	0.003	< 0.004	< 0.005	0.008	< 0.005	< 0.005	65.7	0.039	0.0158	39.8	< 0.005	1.8	< 0.004	3.01	1.3	< 0.005
Pyrene			1,000	7.32	6.65	3.93	1.36	0.0112	8.56	0.004	0.004	<0.005	0.013	< 0.005	< 0.005	70.6	0.035	0.0869	42.3	< 0.005	14.7	0.006	3.07	1.67	0.008
Total PAHs			NS	40.6	43.0	21.7	10.8	0.0336	53.2	0.0120	0.00755	ND	0.0682	ND	ND	429	0.199	0.362	224	ND	52.8	0.0157	20.3	11.2	0.0468
Petroleum Hydrocarbons	8015 Mod	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000																					
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100																					
C9 to C12 Aliphatic Hydrocarbons			1,000																					
C9 to C10 Aromatic Hydrocarbons			100																					
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000																					
C19 to C36 Aliphatic Hydrocarbons			3,000																					
C11 to C22 Aromatic Hydrocarbons			1,000																					
General Chemistry/Other																								
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	67,100	124,000	35,100	23,600	162,000	23,100	1,190	3,710	8,370	31600	33,600	7,430	71,400	12,600	1,680	55,200	2,190	18,000	2,380	9,870	35,200	7,550
Percent Solids	5035	%	NS	62	65	64	66	30	64	76	79	69	59	77	79	52	80	79	55	85	72	89	73	68	73

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 2. Sediment Chemical Testing Results - All Locations
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

Sample Location:				752		753		754		755	756	757	758	759	760	761		762		763		764	765	766		
Sample ID:				SS752-S1	SS752-S2	SS753-S1	SS753-S2	SS754-S1	SS754-S2	SS755-S1	SS756-S1	SS757-S1	SS758-S1	SS759-S1	SS760-S2	SS761-S1	SS761-S2	SS762-S2	SS762-S3	SS763-S1	SS763-S2	SS764-S2	SS765-S2	SS766-S1	SS766-S2	SS766-S3
Lab Sample ID:				F200006	F200006	F200006	F200006	F200008	F200008	F200008	F200008	F200008	F200008	F200013	F200013	F200013	F200013	F200013	F200013	F200013	F200013	F200013	F200017	F200014	F200014	F200014
Property:				7 Noel St	7 Noel St	11 River Street	11 River Street	27 River Street	27 River Street	222 Main St	27 River Street	35 Water St	35 Water St	33R Oakland St	37 Oakland St	4 Oakland Ct	4 Oakland Ct	3 River St	3 River St	7 Noel St	7 Noel St	222 Main St	222 Main St	222 Main St	222 Main St	222 Main St
Area:				River	River	River	River	River	River	River	River	River	River	River	Wetland	Mudflat	Mudflat	River	River	River	River	River	River	River	River	River
Sample Date:				2/3/2020	2/3/2020	2/4/2020	2/4/2020	2/5/2020	2/5/2020	2/5/2020	2/5/2020	2/5/2020	2/5/2020	3/9/2020	3/9/2020	3/9/2020	3/9/2020	3/9/2020	3/9/2020	3/9/2020	3/9/2020	3/9/2020	3/13/2020	3/10/2020	3/10/2020	3/10/2020
Soil/Sediment Type:				Sandy Organic Soil	Sandy Organic Soil	Organic Soil	Silt w/Sand	Organic Soil	Clay	Sandy Organic Soil	Organic Soil	Organic Soil	Clay	Silty Sand	Sand	Sand w/Silt	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silt
Sample Depth (feet):				2.1-2.3	4.9-5.1	1.3-1.5	4.1-4.3	3.2-4.1	8.4-8.6	1.7-1.9	1.5-1.7	1.6-1.8	0.1-0.4	0-0.3	3.4-3.6	0.3-0.5	2.2-2.4	1.9-2.1	2.9-3	1.9-2.1	5-5.2	4.6-4.8	3.8-4	0.7-0.9	3.8-4	6.5-6.7
Analyte	**Method**	**Units**	**S-1/GW-3**																							
Volatile Organic Compounds (VOCs)	8260	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40																							
Ethylbenzene			500																							
Toluene			500																							
Xylene, o-			500																							
Xylene p,m-			500																							
Xylenes, Total			500																							
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg																								
2-Methylnaphthalene			300	0.573	0.085	1.3	< 0.005	4.42	0.027	0.036	0.080	0.125	0.004	0.029	0.132	0.083	0.009	< 0.007	< 0.006	0.751	< 0.005	< 0.007	< 0.007	0.0152	1.25	0.011
Acenaphthene			1,000	13	0.048	0.516	< 0.005	50.9	0.016	0.048	0.227	0.595	0.007	0.127	0.129	0.074	0.011	< 0.007	< 0.006	17.4	< 0.005	< 0.007	< 0.007	0.039	25.9	0.506
Acenaphthylene			10	1.61	0.056	0.354	< 0.005	5.11	0.026	0.041	0.205	0.368	0.016	0.273	0.074	0.982	0.028	< 0.007	< 0.006	2.61	< 0.005	< 0.007	0.006	0.049	1.39	0.024
Anthracene			1,000	8.38	0.2	1.7	< 0.005	47.4	0.065	0.125	0.449	1.45	0.030	0.361	0.610	0.454	0.068	< 0.007	< 0.006	17.9	< 0.005	< 0.007	0.004	0.122	6.61	0.274
Benzo(a)anthracene			20	12.5	0.675	2.85	< 0.005	**48.6**	0.249	0.377	0.970	3.54	0.131	1.07	2.23	2.08	0.287	< 0.007	< 0.006	**28.3**	< 0.005	< 0.007	< 0.007	0.442	5.37	0.192
Benzo(a)pyrene			2	**12.2**	0.636	**2.29**	< 0.005	**45.6**	0.232	0.349	0.908	**2.94**	0.118	1.17	1.85	**3.44**	0.249	< 0.007	< 0.006	**27.5**	< 0.005	< 0.007	< 0.007	0.457	**5.37**	0.147
Benzo(b)fluoranthene			20	7.21	0.462	1.42	< 0.005	**22.5**	0.169	0.255	0.696	2.41	0.091	0.901	1.11	2.01	0.166	< 0.007	< 0.006	11.1	< 0.005	< 0.007	< 0.007	0.327	4.12	0.066
Benzo(g,h,i)perylene			1,000	5.74	0.353	1.09	< 0.005	21.5	0.125	0.190	0.544	1.53	0.060	0.699	0.808	2.75	0.135	< 0.007	< 0.006	10.3	< 0.005	< 0.007	0.019	0.278	3.47	0.069
Benzo(k)fluoranthene			70	8	0.461	1.56	< 0.005	28.7	0.191	0.288	0.707	2.54	0.104	0.909	1.24	2.14	0.187	< 0.007	< 0.006	12.0	< 0.005	< 0.007	< 0.007	0.363	4.16	0.095
Chrysene			200	12.6	0.658	2.87	< 0.005	43.9	0.256	0.397	1.12	3.25	0.126	1.21	1.91	2.40	0.325	< 0.007	< 0.006	28.6	< 0.005	< 0.007	< 0.007	0.481	5.97	0.188
Dibenzo(a,h)anthracene			2	1.34	0.095	0.291	< 0.005	**4.94**	0.035	0.052	0.132	0.483	0.017	0.211	0.245	0.631	0.037	< 0.007	< 0.006	**3.09**	< 0.005	< 0.007	0.004	0.076	0.935	0.016
Fluoranthene			1,000	23.6	0.692	4.41	0.003	110	0.256	0.661	2.46	7.51	0.241	1.97	2.98	2.45	0.430	< 0.007	< 0.006	56.2	0.003	< 0.007	< 0.007	0.811	14.9	0.468
Fluorene			1,000	7.06	0.087	0.438	< 0.005	29.4	0.029	0.054	0.090	0.532	0.008	0.098	0.211	0.121	0.020	< 0.007	< 0.006	8.08	< 0.005	< 0.007	< 0.007	0.034	7.87	0.21
Indeno(1,2,3-cd)pyrene			20	6.53	0.401	1.24	< 0.005	**24.1**	0.152	0.230	0.631	2.07	0.075	0.856	0.862	2.98	0.145	< 0.007	< 0.006	12.0	< 0.005	< 0.007	0.013	0.317	4.17	0.078
Naphthalene			500	1.48	0.097	1.07	< 0.005	9.55	0.032	0.045	0.084	0.221	0.006	0.040	0.151	0.092	0.014	< 0.007	< 0.006	1.75	< 0.005	< 0.007	< 0.007	0.021	2.28	0.038
Phenanthrene			500	28.9	0.497	4.58	0.003	161	0.158	0.343	1.66	5.20	0.082	0.852	1.58	0.816	0.135	< 0.007	< 0.006	58.2	0.004	< 0.007	< 0.007	0.339	39.1	1.03
Pyrene			1,000	32.6	1.3	7.16	0.006	169	0.444	0.789	3.02	6.49	0.266	2.19	4.18	3.52	0.608	< 0.007	< 0.006	71.8	0.006	< 0.007	< 0.007	0.942	16.8	0.714
Total PAHs			NS	183	6.80	35.1	0.0116	827	2.46	4.28	14.0	41.3	1.38	13.0	20.3	27.0	2.85	ND	ND	368	0.0124	ND	0.0455	5.11	150	4.12
Petroleum Hydrocarbons	8015 Mod	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000																							
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100																							
C9 to C12 Aliphatic Hydrocarbons			1,000																							
C9 to C10 Aromatic Hydrocarbons			100																							
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000																							
C19 to C36 Aliphatic Hydrocarbons			3,000																							
C11 to C22 Aromatic Hydrocarbons			1,000																							
General Chemistry/Other																										
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	72,600	27,400	27,200	1,650	76,800	22,700	36,400	63,600	40,000	3,210	30,500	53,600	39,000	26,500	37,600	11,400	54,000	3,680	43,700	35,600	20,000	114,000	34,800
Percent Solids	5035	%	NS	55	62	68	79	45	65	53	44	80	76	61	72	79	66	59	75	63	82	55	60	61	46	62

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 2. Sediment Chemical Testing Results - All Locations
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

Sample Location:				767		768	769	770	771	772	774		775		776		777		778		779		780		781	
Sample ID:				SS767-S1	SS767-S2	SS768-S2	SS769-S1	SS770-S2	SS771-S1	SS772-S1	SS774-S2	SS774-S3	SS775-S2	SS775-S3	SS776-S1	SS776-S3	SS777-S2	SS777-S3	SS778-S2	SS778-S3	SS779-S1	SS779-S2	SS780-S1	SS780-S2	SS781-S1	SS781(R1)-S1
Lab Sample ID:				F200014	F200014	F200014	F200017	F200017	F200014	F200014	F200017	F200017	F200017	F200017	F200017	F200017	F200017	F200017	F200017	F200017	F200017	F200017	F200017	F200017	F200017	F200017
Property:				33 River St	33 River St	50 Macy St #R	50 Macy St #R	33 River St	35 Water St	1 Field St	51 Main St	51 Main St	51 Main St	51 Main St	Comm of MA Tidelands	Comm of MA Tidelands	Comm of MA Tidelands	Comm of MA Tidelands	Comm of MA Tidelands	Comm of MA Tidelands	58 Macy St	58 Macy St	33 River St	33 River St	51 Main St	51 Main St
Area:				River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River
Sample Date:				3/10/2020	3/10/2020	3/10/2020	3/13/2020	3/11/2020	3/10/2020	3/10/2020	3/13/2020	3/13/2020	3/13/2020	3/13/2020	3/13/2020	3/13/2020	3/13/2020	3/13/2020	3/11/2020	3/11/2020	3/11/2020	3/11/2020	3/11/2020	3/11/2020	3/11/2020	3/13/2020
Soil/Sediment Type:				Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Silt	Sand	Silty Sand	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Silt	Silt w/Sand	Silt	Sandy Silt	Silt	Silt w/Sand	Silt w/Sand	Sandy Silt	Sandy Silt	Organic Soil	Silty Sand
Sample Depth (feet):				3.3-3.5	6.4-6.6	4.4-4.6	5.7-5.9	4.3-4.5	0-0.2	0-0.2	2.4-2.6	5.6-5.8	3.8-4	6.2-6.4	0.8-1	5-5.2	5.8-6	7.5-7.7	5.7-5.9	6.9-7.1	1.1-1.3	3.8-4	1.5-1.7	4.3-4.6	1.9-2.1	3.6-3.8
Analyte	**Method**	**Units**	**S-1/GW-3**																							
Volatile Organic Compounds (VOCs)	8260	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40																							
Ethylbenzene			500																							
Toluene			500																							
Xylene, o-			500																							
Xylene p,m-			500																							
Xylenes, Total			500																							
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg																								
2-Methylnaphthalene			300	2.22	0.102	< 0.006	3.88	< 0.005	0.007	0.75	0.088	2.18	0.323	0.838	0.0486	< 0.005	3.18	< 0.005	5.2	< 0.005	< 0.006	< 0.005	0.86	< 0.005	0.101	0.075
Acenaphthene			1,000	6.4	0.303	< 0.006	88.5	< 0.005	0.142	3.78	0.123	38.1	5.43	0.54	0.0758	< 0.005	10.5	0.008	193	< 0.005	< 0.006	< 0.005	0.484	< 0.005	0.258	0.153
Acenaphthylene			10	1.78	0.090	0.005	**11.2**	< 0.005	0.044	0.261	0.049	2.79	0.617	0.371	0.0513	< 0.005	1.45	< 0.005	6.83	< 0.005	< 0.006	< 0.005	1.17	< 0.005	0.05	0.082
Anthracene			1,000	10.1	0.79	0.004	330	< 0.005	0.137	5.32	0.271	45.1	3.7	2.04	0.148	< 0.005	13.7	0.010	121	< 0.005	< 0.006	< 0.005	2.74	< 0.005	0.216	0.255
Benzo(a)anthracene			20	9.92	1.6	0.005	**469**	< 0.005	0.449	6.55	0.925	**42.3**	7.99	4.59	0.467	< 0.005	**27.3**	0.010	**71.5**	< 0.005	< 0.006	< 0.005	13.3	< 0.005	0.466	0.619
Benzo(a)pyrene			2	**6.5**	1.3	0.005	**496**	< 0.005	0.408	**6.18**	0.971	**40.1**	**9.14**	**3.72**	0.501	< 0.005	**13.1**	0.010	**77.3**	< 0.005	< 0.006	< 0.005	**16.4**	< 0.005	0.476	0.737
Benzo(b)fluoranthene			20	3.98	0.787	< 0.006	**110**	< 0.005	0.347	3.33	0.662	19.5	5.09	2.22	0.436	< 0.005	6.71	0.005	**40**	< 0.005	< 0.006	< 0.005	8.66	< 0.005	0.362	0.54
Benzo(g,h,i)perylene			1,000	3.4	0.604	< 0.006	76.9	0.008	0.252	3.18	0.548	19.5	5.4	1.92	0.463	< 0.005	4.43	0.007	51.2	0.003	< 0.006	< 0.005	9.48	< 0.005	0.358	1.15
Benzo(k)fluoranthene			70	4.33	0.935	0.004	**145**	< 0.005	0.369	3.52	0.782	25.4	6.41	2.54	0.405	< 0.005	8.6	0.007	52.2	< 0.005	< 0.006	< 0.005	10.5	< 0.005	0.371	0.583
Chrysene			200	10.2	1.42	0.005	**469**	< 0.005	0.445	5.53	0.957	40.1	7.72	4.73	0.594	< 0.005	25.1	0.012	67.5	< 0.005	< 0.006	< 0.005	13.5	< 0.005	0.646	0.699
Dibenzo(a,h)anthracene			2	1.08	0.204	< 0.006	**15**	0.003	0.077	0.954	0.152	**4.34**	1.12	0.589	0.118	< 0.005	1.71	< 0.005	**11.4**	< 0.005	< 0.006	< 0.005	1.89	< 0.005	0.132	0.232
Fluoranthene			1,000	21.7	2.2	0.009	**1,190**	0.003	0.971	12.4	1.53	109	17.2	5.47	0.963	< 0.005	40.8	0.034	209	0.004	0.003	< 0.005	11.4	< 0.005	0.824	1.11
Fluorene			1,000	6.12	0.334	< 0.006	51.1	< 0.005	0.044	2.21	0.155	26.6	1.28	0.676	0.102	< 0.005	6.87	0.005	104	< 0.005	< 0.006	< 0.005	0.734	< 0.005	0.494	0.16
Indeno(1,2,3-cd)pyrene			20	3.77	0.712	< 0.006	**95.4**	0.004	0.327	3.2	0.68	**22.2**	6.13	2.24	0.525	< 0.005	5.66	0.005	**58.4**	< 0.005	< 0.006	< 0.005	10.4	< 0.005	0.395	1.22
Naphthalene			500	1.45	0.102	< 0.006	16.9	< 0.005	0.015	1.25	0.134	6.03	0.542	0.818	0.049	< 0.005	4.03	< 0.005	8.91	< 0.005	< 0.006	< 0.005	1.47	< 0.005	0.080	0.127
Phenanthrene			500	36.1	2.26	0.008	**736**	< 0.005	0.467	14.6	0.987	160	15.3	5.71	0.648	< 0.005	63.3	0.055	497	0.006	< 0.006	< 0.005	6.21	< 0.005	1.95	0.805
Pyrene			1,000	32.3	3.19	0.0121	**1,520**	0.004	0.831	19.8	1.7	151	21.3	7.7	1.12	< 0.005	59.9	0.054	309	0.006	< 0.006	< 0.005	29.3	< 0.005	1.17	1.27
Total PAHs			NS	161	16.9	0.0568	5,824	0.0225	5.33	92.8	10.7	754	115	46.7	6.71	ND	296	0.221	1,883	0.0187	0.00313	ND	138	ND	8.35	9.82
Petroleum Hydrocarbons	8015 Mod	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000																							
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100																							
C9 to C12 Aliphatic Hydrocarbons			1,000																							
C9 to C10 Aromatic Hydrocarbons			100																							
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000																							
C19 to C36 Aliphatic Hydrocarbons			3,000																							
C11 to C22 Aromatic Hydrocarbons			1,000																							
General Chemistry/Other																										
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	68,300	60,700	19,100	80,900	15,300	9,640	107,000	32,100	86,200	170,000	37,400	19,700	2,810	80,000	762	178,000	2,450	23,300	13,300	78,900	17,700	34,200	38,900
Percent Solids	5035	%	NS	51	55	67	50	71	86	72	62	48	48	63	70	84	55	80	61	79	66	74	57	74	54	57

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 2. Sediment Chemical Testing Results - All Locations
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

Sample Location:				782	783		784		785		786	787		788	789	790		791	792	793		794		795	796
Sample ID:				SS782-S2	SS783-S1	SS783-S2	SS784-S1	SS784-S2	SS785-S1	SS785-S2	SS786-S2	SS787-S1	SS787-S2	SS788-S1	SS789-S1	SS790-S1	SS790-S2	SS791-S1	SS792-S1	SS793-S1	SS793-S2	SS794-S1	SS794-S2	SS795-S2	SS796-S1
Lab Sample ID:				F200017	F200019	F200019	F200019	F200019	F200019	F200019	F200019	F200037	F200037	F200033	F200033	F200033	F200033	F200036	F200036	F200036	F200036	F200036	F200036	F200033	F200033
Property:				51 Main St	51 Main St	51 Main St	51 Main St	51 Main St	51 Main St	51 Main St	28 Oak Street	25 Water St	25 Water St	25 Water Street	35 Water St	35 Water St	35 Water St	37 Oakland St	37 Oakland St	33R Oakland St	33R Oakland St	35 Oakland St	35 Oakland St	37 Oakland St	39 Oakland St
Area:				River	River	River	River	River	River	River	River	River	River	River	River	River	River	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland
Sample Date:				3/13/2020	3/16/2020	3/16/2020	3/16/2020	3/16/2020	3/16/2020	3/16/2020	3/16/2020	7/16/2020	7/16/2020	7/13/2020	7/13/2020	7/13/2020	7/13/2020	7/14/2020	7/14/2020	7/14/2020	7/14/2020	7/14/2020	7/14/2020	7/6/2020	7/6/2020
Soil/Sediment Type:				Sandy Silt	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Sand	Sandy Silt	Sand	Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Organic Soil	Organic Soil	Organic Soil	Organic Soil	Organic Soil	Sandy Silt
Sample Depth (feet):				6.6-6.8	0-1	4-4.2	0.5-0.7	4.5-4.7	1-1.2	4-4.2	3.6-3.8	0-0.3	3.1-3.3	0.7-0.8	0-0.5	1.7-1.8	4.3-4.5	4-5	4-5	0.4-0.6	2-2.2	0.8-1	1.8-2	2-2.2	0-0.5
Analyte	**Method**	**Units**	**S-1/GW-3**																						
Volatile Organic Compounds (VOCs)	8260	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40																						
Ethylbenzene			500																						
Toluene			500																						
Xylene, o-			500																						
Xylene p,m-			500																						
Xylenes, Total			500																						
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg																							
2-Methylnaphthalene			300	0.007	0.030	< 0.005	0.023	< 0.005	< 0.006	< 0.006	< 0.006	3.04	0.034	0.115	0.034	0.129	< 0.005	0.007	0.007	0.162	1.4	8.64	3.65	13.1	0.004
Acenaphthene			1,000	0.003	0.031	< 0.005	0.044	< 0.005	< 0.006	< 0.006	< 0.006	11.3	0.3	0.698	0.3	0.862	0.004	< 0.006	< 0.007	0.149	0.554	3.53	2.03	369	0.009
Acenaphthylene			10	< 0.006	0.036	< 0.005	0.063	< 0.005	< 0.006	< 0.006	< 0.006	1.79	0.158	0.506	0.158	0.849	< 0.005	0.003	0.005	0.723	2.93	**45.1**	**10.3**	6.07	< .0081
Anthracene			1,000	0.022	0.066	< 0.005	0.175	< 0.005	< 0.006	< 0.006	< 0.006	22.6	0.466	1.260	0.466	1.99	< 0.005	0.003	< 0.007	0.599	2.54	20.9	7.3	41.8	0.006
Benzo(a)anthracene			20	0.064	0.319	< 0.005	0.637	< 0.005	< 0.006	0.008	< 0.006	**40.9**	0.752	2.330	0.752	5.19	< 0.005	0.008	< 0.007	1.44	6.34	**122**	**23.4**	19.8	0.005
Benzo(a)pyrene			2	0.048	0.365	< 0.005	0.710	< 0.005	< 0.006	0.008	< 0.006	**36.8**	0.739	**2.170**	0.739	**5.01**	< 0.005	0.008	0.004	1.97	**10.1**	**181**	**35.8**	**26.4**	0.005
Benzo(b)fluoranthene			20	0.037	0.329	< 0.005	0.535	< 0.005	< 0.006	0.008	< 0.006	**32.7**	0.622	1.730	0.622	4.33	< 0.005	0.007	< 0.007	1.92	7.98	**99.9**	19.5	**20.2**	0.006
Benzo(g,h,i)perylene			1,000	0.020	0.261	0.003	0.487	0.004	< 0.006	0.008	< 0.006	19.3	0.409	1.230	0.409	2.78	< 0.005	0.005	0.004	1.43	7.48	93.7	19.4	17.2	0.005
Benzo(k)fluoranthene			70	0.048	0.329	< 0.005	0.527	< 0.005	< 0.006	0.008	< 0.006	28.5	0.609	1.840	0.609	4.29	< 0.005	0.006	< 0.007	1.74	8.01	**106**	22.3	19.4	0.006
Chrysene			200	0.064	0.441	< 0.005	0.682	< 0.005	< 0.006	0.010	< 0.006	38.2	0.759	2.530	0.759	5.30	< 0.005	0.0081	< 0.007	1.86	7.66	109	22.6	23.6	0.008
Dibenzo(a,h)anthracene			2	0.008	0.060	< 0.005	0.110	< 0.005	< 0.006	< 0.006	< 0.006	**6.35**	0.119	0.339	0.119	0.821	< 0.005	< 0.006	< 0.007	0.419	1.55	**22.3**	**4.52**	**3.63**	< .0081
Fluoranthene			1,000	0.108	0.659	0.0037	1.11	< 0.005	0.0056	0.021	< 0.006	108	1.550	4.770	1.55	11.3	0.004	0.015	< 0.007	3.02	9.59	99.10	30.5	61.5	0.024
Fluorene			1,000	0.007	0.041	< 0.005	0.052	< 0.005	< 0.006	< 0.006	< 0.006	9.38	0.115	0.737	0.115	0.745	< 0.005	0.006	0.006	0.163	0.874	4.94	2.4	86.3	0.005
Indeno(1,2,3-cd)pyrene			20	0.023	0.304	< 0.005	0.562	0.003	< 0.006	0.008	< 0.006	**22.2**	0.447	1.320	0.447	3.14	< 0.005	0.005	0.004	1.52	7.55	**91.6**	19.1	17.4	0.005
Naphthalene			500	0.010	0.036	< 0.005	0.034	< 0.005	< 0.006	< 0.006	< 0.006	7.12	0.056	0.203	0.056	0.236	0.005	0.010	0.008	0.296	3.42	23	10	49.8	0.006
Phenanthrene			500	0.049	0.280	< 0.005	0.406	< 0.005	< 0.006	0.008	< 0.006	101	1.21	4.180	1.21	3.42	0.003	0.012	0.007	1.22	3.74	19.1	7.23	253	0.014
Pyrene			1,000	0.092	0.765	0.004	1.29	0.003	0.004	0.020	< 0.006	90.2	1.5	5.220	1.5	10.5	0.004	0.016	0.003	3	11.3	145	42.8	78.2	0.024
Total PAHs			NS	0.608	4.35	0.0106	7.45	0.0104	0.0092	0.108	ND	579	9.84	31.2	9.84	60.9	0.0207	0.119	0.0475	21.6	93.0	1,195	283	1,106	0.130
Petroleum Hydrocarbons	8015 Mod	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000																						
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100																						
C9 to C12 Aliphatic Hydrocarbons			1,000																						
C9 to C10 Aromatic Hydrocarbons			100																						
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000																						
C19 to C36 Aliphatic Hydrocarbons			3,000																						
C11 to C22 Aromatic Hydrocarbons			1,000																						
General Chemistry/Other																									
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	28,500	41,700	19,900	36,500	9,450	26,400	31,100	36,100	130,000	247,000	50,100	7,610	55,000	17,100	45,500	29,200	233,000	233,000	274,000	297,000	130,000	61,800
Percent Solids	5035	%	NS	63	50	75	56	75	62	61	60	35	64	56	79	50	76	61	59	13	19	24	20	35	51

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 2. Sediment Chemical Testing Results - All Locations
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

			Sample Location:	797		798	799	800		801	802	803	804				805		806	807		808		809	
			Sample ID:	SS797-S1	SS797-S1D	SS798-S2	SS799-S1	SS800-S1	SS800-S2	SS801-S2	SS802-S1	SS803-S1	SS804-S1	SS804-S2	SS804-S2D	SS804-S3	SS805-S1	SS805-S3	SS806-S2	SS807-S1	SS807-S2	SS808-S1	SS808-S2	SS809-S1	SS809-S2
			Lab Sample ID:	F200036	F200036	F200035	F200035	F200035	F200035	F200035	F200036	F200036	F200035	F200035	F200035	F200035	F200035	F200035	F200035	F200036	F200036	F220065	F220065	F220065	F220065
			Property:	41 Oakland St	41 Oakland St	8 Noel St	11 River St #R	33 River St	33 River St	51 River St	58 Macy St	58 Macy St	77 Macy St	77 Macy St	77 Macy St	77 Macy St	412 Main St	412 Main St	392 Main St	37 Oakland St	37 Oakland St	35 Oakland St	35 Oakland St	35 Oakland St	35 Oakland St
			Area:	Mudflat	Mudflat	River	River	River	River	River	River	River	River	River	River	River	River	River	River	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland
			Sample Date:	7/14/2020	7/14/2020	7/13/2020	7/13/2020	7/7/2020	7/7/2020	7/7/2020	7/7/2020	7/7/2020	7/7/2020	7/7/2020	7/7/2020	7/7/2020	7/7/2020	7/7/2020	7/7/2020	7/8/2020	7/8/2020	10/12/2022	10/12/2022	10/12/2022	10/12/2022
			Soil/Sediment Type:	Sand w/Silt	Sand w/Silt	Sand	Silt w/Sand	Sandy Silt	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Sand	Silt w/Sand	Sand	Sand w/Silt&Gravel	Organic Soil	Organic Soil	Organic Soil	Organic Soil	Organic Soil	Organic Soil
			Sample Depth (feet):	0-1	0-1	1.8-2	0-0.5	1.4-1.6	3.3-3.5	4.4-4.6	6-6.2	6-6.2	0-1	3.8-4	3.8-4	7.1-7.3	0-1	3-3.2	0.8-1	0.4-0.6	1.8-2	0.8-1	1.8-2	0.8-1	1.8-2
Analyte	**Method**	**Units**	**S-1/GW-3**																						
Volatile Organic Compounds (VOCs)	8260	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40																						
Ethylbenzene			500																						
Toluene			500																						
Xylene, o-			500																						
Xylene p,m-			500																						
Xylenes, Total			500																						
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg																							
2-Methylnaphthalene			300	0.077	0.054	0.031	0.004	0.006	0.218	< 0.006	0.003	0.003	0.014	0.099	0.089	0.009	0.014	< 0.004	< 0.004	0.122	0.151	0.506	<0.0156	0.618	0.0222
Acenaphthene			1,000	0.282	0.179	0.017	< 0.007	< 0.005	0.374	< 0.006	< 0.005	< 0.005	0.020	0.062	0.054	0.004	0.008	< 0.004	< 0.004	0.037	0.132	0.270	<0.0156	0.212	0.00893
Acenaphthylene			10	0.534	0.274	0.123	0.005	< 0.005	0.45	< 0.006	< 0.005	< 0.005	0.113	0.346	0.29	0.057	0.054	< 0.004	< 0.004	0.157	0.185	0.766	<0.0156	0.540	0.0813
Anthracene			1,000	0.739	0.325	0.118	< 0.007	< 0.005	1.08	< 0.006	< 0.005	< 0.005	0.125	0.346	0.292	0.032	0.059	< 0.004	< 0.004	0.194	0.311	0.983	0.0102	0.772	0.209
Benzo(a)anthracene			20	1.43	0.608	0.366	0.008	0.003	2.42	< 0.006	< 0.005	< 0.005	0.338	0.621	0.523	0.135	0.218	< 0.004	< 0.004	0.654	0.847	2.89	0.0104	1.68	0.918
Benzo(a)pyrene			2	1.66	0.702	0.422	0.012	0.004	**3.12**	< 0.006	< 0.005	< 0.005	0.443	0.747	0.618	0.156	0.222	< 0.004	< 0.004	0.692	0.856	**2.94**	0.0118	2.00	0.657
Benzo(b)fluoranthene			20	1.16	0.539	0.324	0.007	0.004	1.63	< 0.006	< 0.005	< 0.005	0.447	0.652	0.578	0.098	0.172	< 0.004	< 0.004	0.643	0.850	2.58	0.0154	2.13	0.578
Benzo(g,h,i)perylene			1,000	0.957	0.458	0.24	0.007	0.003	1.79	< 0.006	< 0.005	< 0.005	0.298	0.502	0.415	0.080	0.115	< 0.004	< 0.004	0.433	0.512	1.71	0.0106	1.61	0.226
Benzo(k)fluoranthene			70	1.22	0.541	0.342	0.007	0.004	1.62	< 0.006	< 0.005	< 0.005	0.439	0.708	0.574	0.107	0.181	< 0.004	< 0.004	0.616	0.806	2.41	<0.0113	1.62	0.578
Chrysene			200	1.51	0.687	0.425	0.009	0.005	2.43	< 0.006	< 0.005	< 0.005	0.447	0.828	0.705	0.126	0.223	< 0.004	< 0.004	0.767	0.975	<0.0179	<0.0156	<0.0151	<0.00956
Dibenzo(a,h)anthracene			2	0.241	0.114	0.065	< 0.007	< 0.005	0.434	< 0.006	< 0.005	< 0.005	0.077	0.122	0.117	0.021	0.031	< 0.004	< 0.004	0.110	0.150	0.567	<0.0156	0.452	0.122
Fluoranthene			1,000	3.12	1.49	0.557	0.016	0.009	2.81	< 0.006	< 0.005	< 0.005	0.831	1.13	1.0	0.088	0.322	< 0.004	0.002	1.24	1.67	4.51	0.0368	3.46	1.12
Fluorene			1,000	0.224	0.102	0.03	0.004	0.003	0.485	< 0.006	0.003	0.002	0.035	0.115	0.101	0.008	0.015	< 0.004	< 0.004	0.042	0.154	0.375	0.00908	0.465	0.0456
Indeno(1,2,3-cd)pyrene			20	0.945	0.445	0.252	0.006	0.003	1.38	< 0.006	< 0.005	< 0.005	0.335	0.532	0.426	0.080	0.125	< 0.004	< 0.004	0.461	0.564	2.26	0.0141	2.07	0.356
Naphthalene			500	0.212	0.131	0.04	0.004	0.004	0.212	0.00326	0.003	0.003	0.02	0.098	0.090	0.011	0.018	< 0.004	0.002	0.126	0.153	1.53	0.00906	2.29	0.0374
Phenanthrene			500	1.39	0.454	0.188	0.007	0.010	3.08	< 0.006	0.003	0.003	0.256	0.608	0.542	0.045	0.111	0.003	0.003	0.594	0.873	1.51	0.0177	2.15	0.119
Pyrene			1,000	3.8	2.01	0.693	0.016	0.009	5.22	< 0.006	< 0.005	< 0.005	0.718	1.41	1.23	0.182	0.363	< 0.004	0.002	1.43	1.78	4.62	0.0336	3.33	1.0
Total PAHs			NS	19.5	9.11	4.23	0.111	0.0664	28.8	0.00326	0.013	0.0116	4.96	8.93	7.64	1.24	2.25	0.0025	0.0093	8.32	11.0	30.4	0.179	25.4	6.06
Petroleum Hydrocarbons	8015 Mod	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000																						
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100																						
C9 to C12 Aliphatic Hydrocarbons			1,000																						
C9 to C10 Aromatic Hydrocarbons			100																						
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000																						
C19 to C36 Aliphatic Hydrocarbons			3,000																						
C11 to C22 Aromatic Hydrocarbons			1,000																						
General Chemistry/Other																									
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	34,200	43,800	51,800	26,600	23,000	26,600	18,600	445	< 94.7	27,400	51,200	51,400	5,280	5,220	3,760	2,060	118,000	114,000	148,000	64,100	130,000	30,700
Percent Solids	5035	%	NS	63	64	56	53	74	64	69	82	82	63	51	NT	84	82	88	90	45	63	21	26	27	41

General Notes:

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2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
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5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
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9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 2. Sediment Chemical Testing Results - All Locations
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

Sample Location:				**810**		**811**		**815**		**817**	**818**		**819**	**820**	**823**		**824**	**827**		**829**	**837**			**838**		
Sample ID:				**810-S1**	**810-S2**	**811-S1**	**811-S2**	**815-S1**	**815-S3**	**817-S1**	**818-S1**	**818-S2**	**819-S1**	**820-S1**	**823-S1**	**823-S2**	**824-S1**	**827-S1**	**827-S2**	**829-S1**	**837-S1**	**837-S2**	**837-S3**	**838-S1**	**838-S2**	**838-S3**
Lab Sample ID:				**F230018**	**F230018**	**F230018**	**F230018**	**F230021**	**F230021**	**F230018**	**F230019**	**F230019**	**F230018**	**F230019**	**F230019**	**F230019**	**F230019**	**F230019**	**F230019**	**F230019**	**F230020**	**F230020**	**F230020**	**F230020**	**F230020**	**F230020**
Property:				**37 Oakland St**	**37 Oakland St**	**37 Oakland St**	**37 Oakland St**	**28 Oak Street**	**28 Oak Street**	**3 River St**	**7 River Street**	**7 River Street**	**7 Noel St**	**7 Noel St**	**38 Childs Ave**	**38 Childs Ave**	**38 Childs Ave**	**27 River St**	**27 River St**	**27 River St**	**Comm of MA Tidelands**	**Comm of MA Tidelands**	**Comm of MA Tidelands**	**Comm of MA Tidelands**	**Comm of MA Tidelands**	**Comm of MA Tidelands**
Area:				**Wetland**	**Wetland**	**Wetland**	**Wetland**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**Former River Channel**	**Former River Channel**	**Former River Channel**	**Former River Channel**	**Former River Channel**	**Former River Channel**
Sample Date:				**06/20/2023**	**06/20/2023**	**06/20/2023**	**06/20/2023**	**06/22/2023**	**06/22/2023**	**06/20/2023**	**06/22/2023**	**06/22/2023**	**06/20/2023**	**06/22/2023**	**06/22/2023**	**06/22/2023**	**06/22/2023**	**06/22/2023**	**06/22/2023**	**06/22/2023**	**06/22/2023**	**06/22/2023**	**06/22/2023**	**06/22/2023**	**06/22/2023**	**06/22/2023**
Soil/Sediment Type:				**Sand**	**Sand**	**Silty Sand**	**Silty Sand**	**Silty Sand**	**Organic Soil**	**Organic Soil**	**Organic Soil**	**Organic Soil**	**Silty Sand**	**Organic Soil**	**Organic Soil**	**Organic Soil**	**Organic Soil**	**Organic Soil**	**Organic Soil**	**Organic Soil**	**Organic Soil**	**Silty Sand**	**Clay**	**Organic Soil**	**Organic Soil**	**Organic Soil**
Sample Depth (feet):				**0.8-1**	**1.8-2**	**0.8-1**	**1.8-2**	**0-1**	**4-5**	**0-1**	**0-1**	**5-6**	**0-1**	**0-1**	**0-1**	**4-5**	**0-1**	**0-1**	**5-6**	**0-1**	**1-2**	**5.5-6.5**	**7-8**	**1-2**	**5.5-6.5**	**7-8**
Analyte	**Method**	**Units**	**S-1/GW-3**																							
Volatile Organic Compounds (VOCs)	8260	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40																							
Ethylbenzene			500																							
Toluene			500																							
Xylene, o-			500																							
Xylene p,m-			500																							
Xylenes, Total			500																							
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg																								
2-Methylnaphthalene			300	0.028	0.0137	0.0521	0.0074	0.0401	0.116	2.24	0.0436	0.00366	0.0431	0.0402	0.0918	8.2	0.0771	0.00547	0.00222	0.0693	0.00516	0.00279	0.0365	0.0461	0.0498	0.00833
Acenaphthene			1,000	0.0256	0.0112	0.0715	<0.00478	0.0949	0.0745	25.7	0.0229	<0.00609	0.0937	0.154	0.251	189	0.207	<0.00679	<0.00442	0.176	<0.00491	<0.00470	0.0232	0.0238	0.0584	<0.00562
Acenaphthylene			10	0.258	0.0657	0.212	0.0141	0.198	0.165	2.4	0.156	<0.00609	0.254	0.254	0.587	**21.3**	0.282	0.00381	<0.00442	0.425	0.00751	<0.00470	0.0662	0.122	0.128	0.00807
Anthracene			1,000	0.573	0.142	0.323	0.00824	0.494	0.322	7.66	0.168	<0.00609	0.338	0.589	1.5	121	0.692	<0.00679	<0.00442	0.604	0.0111	<0.00470	0.0842	0.122	0.173	0.0126
Benzo(a)anthracene			20	2.73	0.658	1.15	0.029	1.71	1.21	8.93	0.407	<0.00609	0.908	2.06	2.77	**120**	2.22	<0.00679	<0.00442	1.85	0.0354	0.00308	0.278	0.621	0.376	0.0512
Benzo(a)pyrene			2	**2.95**	0.704	1.34	0.0451	1.79	1.18	**10.2**	0.53	<0.00609	1.09	**2.46**	**3.5**	**136**	**2.28**	<0.00679	<0.00442	**2.34**	0.0344	0.00278	0.26	0.767	0.437	0.0534
Benzo(b)fluoranthene			20	2.13	0.536	1.02	0.0324	1.38	0.633	5.75	0.363	<0.00609	0.824	2.02	2.35	**59.5**	1.6	<0.00679	<0.00442	1.71	0.0244	<0.00470	0.15	0.362	0.314	0.0304
Benzo(g,h,i)perylene			1,000	1.69	0.399	0.775	0.0449	0.949	0.525	5.26	0.324	<0.00609	0.653	1.57	2.02	64.8	1.21	<0.00679	<0.00442	1.41	0.018	<0.00470	0.123	0.38	0.248	0.0269
Benzo(k)fluoranthene			70	2.19	0.533	1.02	0.0309	1.35	0.746	6.34	0.404	<0.00609	0.832	2	2.41	**75.9**	1.78	<0.00679	<0.00442	1.66	0.0285	0.00244	0.189	0.441	0.336	0.0348
Chrysene			200	2.47	0.625	1.18	0.0417	1.64	1.11	8.86	0.515	<0.00609	0.946	2.40	2.87	107	2.40	<0.00679	<0.00442	2.03	0.0281	0.004	0.290	0.551	0.449	0.0524
Dibenzo(a,h)anthracene			2	0.437	0.101	0.218	0.0101	0.296	0.142	1.24	0.0824	<0.00609	0.169	0.392	0.502	**13.2**	0.351	<0.00679	<0.00442	0.361	0.00489	<0.00470	0.0308	0.0881	0.0682	0.00679
Fluoranthene			1,000	4.54	1.3	2	0.042	2.7	0.985	21.8	0.492	0.00495	1.73	4.48	5.52	149	3.66	0.00429	<0.00442	3.3	0.0636	0.00759	0.55	0.822	0.658	0.0685
Fluorene			1,000	0.0652	0.0249	0.0663	0.00297	0.103	0.103	6.18	0.038	<0.00609	0.0661	0.12	0.219	139	0.209	0.00401	<0.00442	0.159	0.00519	0.00306	0.0804	0.0519	0.0762	0.00761
Indeno(1,2,3-cd)pyrene			20	2.2	0.527	1.01	0.0406	1.25	0.573	6.18	0.37	<0.00609	0.8	1.94	2.41	**70.4**	1.51	<0.00679	<0.00442	1.69	0.0215	<0.00470	0.138	0.385	0.297	0.0273
Naphthalene			500	0.123	0.0378	0.0755	0.00692	0.0678	0.133	6.37	0.0543	<0.00609	0.0776	0.0796	0.159	30.9	0.0966	0.00744	<0.00442	0.107	0.00556	<0.00470	0.051	0.0755	0.0605	0.00916
Phenanthrene			500	1.61	0.508	0.982	0.0306	1.06	0.6	27.7	0.234	0.00442	0.545	1.42	2.82	343	1.91	0.00658	0.00294	1.49	0.0174	0.00553	0.136	0.224	0.334	0.0224
Pyrene			1,000	4.01	1.11	1.91	0.0527	2.4	2.01	27.7	0.926	0.00341	1.54	3.81	5.75	221	3.4	0.00448	<0.00442	3.25	0.0793	0.00881	0.779	1.14	0.779	0.0953
Total PAHs			NS	28.0	7.30	13.4	0.440	17.5	10.6	181	5.13	0.0164	10.9	25.8	35.7	1,869	23.9	0.0361	0.0052	22.6	0.390	0.0401	3.27	6.22	4.84	0.515
Petroleum Hydrocarbons	8015 Mod	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000																							
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100																							
C9 to C12 Aliphatic Hydrocarbons			1,000																							
C9 to C10 Aromatic Hydrocarbons			100																							
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000																							
C19 to C36 Aliphatic Hydrocarbons			3,000																							
C11 to C22 Aromatic Hydrocarbons			1,000																							
General Chemistry/Other																										
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	43,400	22,300	10,300	50,800	14,600	13,700	44,400	47,400	22,000	17,800	38,900	40,900	70,500	16,900	33,900	7,610	32,400	1,860	701	3,620	4,340	49,000	21,400
Percent Solids	5035	%	NS	86	73	74	70	65	51	76	49	64	73	40	40	45	59	58	77	50	79	82	73	72	51	68

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 2. Sediment Chemical Testing Results - All Locations
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

Sample Location:				839		841			842			843		844			845		846			847		848		849
Sample ID:				839-S1	839-S2	841-S1	841-S2	841-S3	842-S1	842-S2	842-S3	843-S1	843-S2	844-S1	844-S2	844-S3	845-S1	845-S2	846-S1	846-S2	846-S3	847-S1	847-S2	848-S1	848-S2	849-(3.78-3.98)
Lab Sample ID:				F230027	F230027	F230025	F230025	F230025	F230024	F230024	F230024	F230029-10	F230029-11	F230029-12	F230029-13	F230029-14	F230029-01	F230029-02	F230029-05	F230029-06	F230029-07	F230029-03	F230029-04	F230026	F230026	F2400018-01
Property:				33R Oakland St	33R Oakland St	Comm of MA Tidelands	Comm of MA Tidelands	Comm of MA Tidelands	Comm of MA Tidelands	Comm of MA Tidelands	Comm of MA Tidelands	1 Field St	1 Field St	38 Childs Ave	38 Childs Ave	38 Childs Ave	222 Main St	222 Main St	Comm of MA Tidelands	Comm of MA Tidelands	Comm of MA Tidelands	50 Macy St #R	50 Macy St #R	Comm of MA Tidelands	Comm of MA Tidelands	1 Field St
Area:				Wetland	Wetland	Former River Channel	Former River Channel	Former River Channel	Former River Channel	Former River Channel	Former River Channel	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River
Sample Date:				8/18/2023	8/18/2023	8/15/2023	8/15/2023	8/15/2023	8/15/2023	8/15/2023	8/15/2023	08/29/2023	08/29/2023	08/29/2023	08/29/2023	08/29/2023	08/29/2023	08/29/2023	08/29/2023	08/29/2023	08/29/2023	08/29/2023	08/29/2023	8/18/2023	8/18/2023	8/16/2023
Soil/Sediment Type:				Sand	Sand	Silty Sand	Sandy Silt	Silt	Organic Soil	Sandy Silt	Clay	Silty Sand	Sandy Silt	Silty Sand	Silty Sand	Silty Sand	Organic Soil	Organic Soil	Sand	Silty Sand	Silty Sand	Sand	Organic Soil	Sand	Silty Sand	Silty Sand
Sample Depth (feet):				0-1	1-2	2.5-3.5	4.5-5.5	7.5-8.5	2.5-3.5	4.5-5.5	8.2-9.2	0-0.5	1-2	0-0.5	1-2	3-3.5	0-1	1-2	0-0.5	1-2	3.5-4.3	0-1	1-2	0-1	1-2	3.8-4
Analyte	**Method**	**Units**	**S-1/GW-3**																							
Volatile Organic Compounds (VOCs)	8260	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40																							
Ethylbenzene			500																							
Toluene			500																							
Xylene, o-			500																							
Xylene p,m-			500																							
Xylenes, Total			500																							
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg																								
2-Methylnaphthalene			300	0.181	0.265	<0.00403	<0.00455	1.31	<0.00388	0.198	1.14	0.469	1.17	0.177	0.153	2.04	0.0344	<0.00666	0.0408	0.0624	0.232	0.044	0.074	0.0363	0.0484	0.642
Acenaphthene			1,000	0.106	0.118	<0.00403	<0.00455	3.69	<0.00388	1.28	4.83	1.29	6.72	0.491	0.359	6.27	0.0201	<0.00666	0.0856	0.112	0.867	0.187	0.129	0.0663	0.0658	12.5
Acenaphthylene			10	0.7	0.592	0.0147	0.00284	1.72	<0.00388	0.602	4.51	0.594	2.14	0.502	0.603	4.1	0.104	<0.00666	0.403	0.333	1.23	0.201	0.306	0.164	0.17	2.25
Anthracene			1,000	0.608	0.638	0.0232	0.00254	4.64	<0.00388	1.75	10.8	3.44	4.14	1.16	1.03	8.73	0.11	<0.00666	0.447	0.419	1.7	0.455	0.781	0.241	0.187	9.98
Benzo(a)anthracene			20	1.4	1.54	0.195	0.00625	4.85	0.00437	2.24	19.5	7.76	6.39	2.52	2.65	16.7	0.348	0.00449	2.1	1.25	4.05	1.35	1.11	0.594	0.604	9.3
Benzo(a)pyrene			2	1.93	**2.02**	0.137	0.0116	**3.81**	0.0097	**2.12**	**20.2**	**8.52**	**7.51**	**2.84**	**3.04**	**20**	0.382	0.00515	**2.6**	1.54	**5.12**	1.57	1.34	0.661	0.856	**7.77**
Benzo(b)fluoranthene			20	1.7	1.79	0.0792	0.00527	2.55	0.00338	1.16	9.76	6.08	4.37	1.77	2.05	11.4	0.267	0.00488	1.63	1.07	3.29	1.12	0.916	0.461	0.475	3.91
Benzo(g,h,i)perylene			1,000	1.45	1.5	0.0396	0.00814	1.86	0.00516	1.04	7.93	4.84	3.91	1.47	1.73	10.6	0.223	0.0034	1.44	0.921	2.88	0.885	0.8	0.378	0.477	2.7
Benzo(k)fluoranthene			70	1.55	1.65	0.108	0.00683	2.63	0.00416	1.47	8.63	6.1	5.03	1.96	2.3	13.3	0.303	0.00424	1.77	1.17	3.36	1.19	0.968	0.502	0.548	4.68
Chrysene			200	1.85	2.00	0.165	0.0077	5.46	0.00516	2.46	20.6	7.92	6.57	2.33	2.88	17.7	0.423	0.0056	2.19	1.35	4.42	1.38	1.22	0.652	0.688	9.7
Dibenzo(a,h)anthracene			2	0.365	0.395	0.019	<0.00455	0.549	<0.00388	0.267	1.99	1.31	1.01	0.378	0.459	**2.61**	0.059	<0.00666	0.357	0.232	0.713	0.251	0.206	0.103	0.106	0.934
Fluoranthene			1,000	2.7	2.83	0.136	0.0108	7.8	0.00199	4.54	33.7	16.4	12.2	4.83	4.76	27.7	0.454	0.00833	2.69	2.16	6.5	2.47	2.25	1.1	1	16.4
Fluorene			1,000	0.166	0.226	<0.00403	<0.00455	2.81	<0.00388	0.861	3.64	1.25	2.77	0.384	0.353	2.81	0.0292	<0.00666	0.102	0.115	0.433	0.143	0.102	0.0794	0.0794	8.99
Indeno(1,2,3-cd)pyrene			20	1.76	1.83	0.0557	0.00848	2.21	0.00418	1.2	8.45	5.84	4.67	1.78	2.05	12.3	0.265	0.00398	1.68	1.11	3.34	1.1	0.928	0.445	0.533	3.12
Naphthalene			500	0.362	0.599	0.00275	<0.00455	0.907	<0.00388	0.287	1.66	1.13	2.88	0.276	0.227	2.93	0.0437	<0.00666	0.0749	0.101	0.458	0.0804	0.106	0.0552	0.0806	1.55
Phenanthrene			500	1.29	1.35	0.0126	0.00688	11.2	<0.00388	4.73	27.7	13.7	12.3	3.34	2.58	21.4	0.146	0.00344	0.852	0.979	3.83	1.36	1.03	0.47	0.672	52.6
Pyrene			1,000	2.8	2.75	0.125	0.0172	10.6	0.00266	6.18	48.7	14.6	14.7	5.13	4.92	35	0.912	0.0122	3.1	2.16	6.94	2.3	2.67	1.2	1.15	24.1
Total PAHs			NS	20.9	22.1	1.11	0.09	68.6	0.04	32.4	234	101	98.5	31.3	32.1	216	4.12	0.056	21.6	15.1	49.4	16.1	14.9	7.21	7.74	171
Petroleum Hydrocarbons	8015 Mod	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000																							
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100																							
C9 to C12 Aliphatic Hydrocarbons			1,000																							
C9 to C10 Aromatic Hydrocarbons			100																							
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000																							
C19 to C36 Aliphatic Hydrocarbons			3,000																							
C11 to C22 Aromatic Hydrocarbons			1,000																							
General Chemistry/Other																										
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	146,000	165,000	1,980	ND	40,700	529	69,100	49,600	86,300	72,800	26,700	32,200	106,000	49,200	50,100	29,500	31,700	124,000	32,200	45,200	34,300	7,080	30,000
Percent Solids	5035	%	NS	17	16	92	81	58	87	46	61	59	77	59	58	44	47	55	51	59	58	60	57	65	72	76

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 2. Sediment Chemical Testing Results - All Locations
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

Sample Location:				850	851			852			853			854		855	856	857				858			
Sample ID:				850-(4.45-4.65)	851-S1	851-(3.80-4.00)	851-S2	852-S1	852-S2	852-(3.55-3.75)	853-S1	853-S2	853-S3	854-S1	854-S2	855-(4.10-4.30)	856-(4.55-4.75)	857-S1	857-S2	857-S3	857-S4	858-S1	858-S2	858-S3	858-S4
Lab Sample ID:				F2400018-02	F230030-03	F2400018-03	F230030-04	F230030-01	F230030-02	F2400018-04	F230026	F230026	F230026	F230029-08	F230029-09	F2400018-05	F2400018-06	F230037-01	F230038-01	F230037-02	F230038-02	F230037-03	F230038-03	F230037-04	F230038-04
Property:				1 Field St	28 Oak Street	28 Oak Street	28 Oak Street	3 River St	3 River St	3 River St	51 River St	51 River St	51 River St	39 Water St	39 Water St	33R Oakland St	37 Oakland St	35 Water St	35 Water St	35 Water St	35 Water St	35 Water St	35 Water St	35 Water St	35 Water St
Area:				River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River
Sample Date:				8/17/2023	08/30/2023	8/29/2023	08/30/2023	08/30/2023	08/30/2023	8/29/2023	8/18/2023	8/18/2023	8/18/2023	08/29/2023	08/29/2023	8/31/23	8/31/2023	11/2/2023	11/2/2023	11/2/2023	11/2/2023	11/2/2023	11/2/2023	11/2/2023	11/2/2023
Soil/Sediment Type:				Sandy Silty	Sand	Sand w/Silt	Sand/Clay	Silty Sand	Silty Sand	Silty Sand	Sand	Sand	Silty Sand	Sand	Sand	Sand w/Silt	Silt w/Sand	Silty Sand	Silty Sand	Silty Sand	Sand w/ silt	Silty Sand	Silty Sand	Organic Soil	Sand w/ silt
Sample Depth (feet):				4.5-4.7	0-0.5	3.8-4	5.5-6	0-0.5	3.5-4	3.6-3.8	0-0.5	1-2	5.5-6	0-0.5	1.5-2	4.1-4.3	4.6-4.8	0-1	1-2	2-3	4-5	0-1	1-2	2-3	4-4.5
Analyte	**Method**	**Units**	**S-1/GW-3**																						
Volatile Organic Compounds (VOCs)	8260	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40																						
Ethylbenzene			500																						
Toluene			500																						
Xylene, o-			500																						
Xylene p,m-			500																						
Xylenes, Total			500																						
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg																							
2-Methylnaphthalene			300	7.35	0.0664	**5,800**	124	0.656	0.96	**1,660**	0.0227	0.0516	<0.00511	0.155	0.0471	8.66	44.4	0.116	0.0988	0.821	0.604	0.044	0.176	0.124	0.511
Acenaphthene			1,000	219	0.198	**9,260**	561	5.13	34.3	**3,240**	0.0379	0.0688	<0.00511	0.628	0.157	113	726	0.209	0.374	3.95	2.25	0.103	0.80	0.533	2.22
Acenaphthylene			10	**10.7**	0.443	**487**	**34**	1.36	2.21	**136**	0.0895	0.158	<0.00511	0.282	0.301	**13.4**	**43**	0.781	0.359	1.10	1.19	0.642	0.589	0.530	1.07
Anthracene			1,000	128	0.658	**4,020**	275	20	6.12	707	0.133	0.213	<0.00511	1.1	0.623	83.1	444	1.22	0.911	7.30	4.53	0.832	1.81	1.33	5.82
Benzo(a)anthracene			20	**95.9**	1.24	**2,700**	**141**	**26.2**	7.74	**707**	0.319	0.452	<0.00511	2.73	1.05	**59.8**	**255**	2.08	2.25	11.1	8.86	1.90	4.38	2.94	9.43
Benzo(a)pyrene			2	**95.2**	1.17	**3,050**	**133**	**24.6**	**8.93**	**802**	0.35	0.465	<0.00511	**2.47**	1.12	**58.8**	**258**	**2.02**	**2.32**	**9.91**	**10.0**	**2.07**	**4.45**	**3.02**	**9.38**
Benzo(b)fluoranthene			20	**49.8**	0.799	**1,320**	**58.5**	18.1	6.09	**345**	0.255	0.344	<0.00511	2.07	0.748	**30.1**	**112**	1.57	1.83	9.43	7.67	1.67	3.59	2.48	7.73
Benzo(g,h,i)perylene			1,000	42.5	0.573	**1,270**	55.4	11.8	4.78	338	0.194	0.261	<0.00511	1.26	0.589	23.5	115	1.11	1.33	6.38	6.16	1.20	2.46	1.69	5.68
Benzo(k)fluoranthene			70	56.7	0.934	**1,490**	**72.3**	16.4	6.1	**404**	0.274	0.363	<0.00511	2.03	0.837	33.4	**145**	1.49	1.94	6.97	7.08	1.60	3.58	2.32	6.85
Chrysene			200	90.8	1.19	2,220	130	23.6	8.42	431	0.352	0.550	<0.00511	2.75	1.05	59.3	243	2.06	2.35	11.0	9.28	1.95	4.39	3.05	9.15
Dibenzo(a,h)anthracene			2	**12.1**	0.174	**285**	**15.3**	**3.28**	1.26	**66.4**	0.0556	0.0726	<0.00511	0.422	0.174	**6.6**	**29.9**	0.321	0.382	1.75	1.77	0.344	0.737	0.506	1.47
Fluoranthene			1,000	226	2.44	**6,740**	321	66.1	15.8	**1,980**	0.572	0.747	<0.00511	5.52	1.95	135	671	4.22	5.19	32.7	25.2	3.59	9.10	5.45	30.7
Fluorene			1,000	82.3	0.253	**3,540**	188	6.45	7.77	1,000	0.0399	0.102	<0.00511	0.483	0.171	49.4	319	0.271	0.290	3.76	1.88	0.148	0.635	0.400	2.16
Indeno(1,2,3-cd)pyrene			20	**47.2**	0.739	**1,280**	**61.3**	15.7	5.76	**340**	0.238	0.31	<0.00511	1.73	0.748	**26.2**	**124**	1.35	1.63	7.79	7.09	1.46	3.07	2.11	6.77
Naphthalene			500	25.3	0.0976	**7,930**	171	0.743	3.57	**3,920**	0.0296	0.0505	<0.00511	0.339	0.078	23.2	228	0.126	0.122	1.55	1.25	0.0661	0.297	0.193	1.22
Phenanthrene			500	376	1.76	**16,200**	**838**	56.2	21.8	**4,860**	0.265	0.505	<0.00511	4.01	1.44	268	**1,410**	3.55	2.86	28.9	18.2	1.93	6.46	4.18	25.7
Pyrene			1,000	290	2.16	**10,400**	475	56.3	17.6	**2,850**	0.596	0.946	<0.00511	4.52	2.03	184	927	3.71	4.36	27.0	24.1	3.14	7.75	4.70	25.0
Total PAHs			NS	1,855	14.9	77,992	3,654	353	159	23,786	3.82	5.66	ND	32.5	13.1	1,175	6,094	26.2	28.6	171	137	22.7	54.3	35.6	151
Petroleum Hydrocarbons	8015 Mod	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000																						
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100																						
C9 to C12 Aliphatic Hydrocarbons			1,000																						
C9 to C10 Aromatic Hydrocarbons			100																						
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000																						
C19 to C36 Aliphatic Hydrocarbons			3,000																						
C11 to C22 Aromatic Hydrocarbons			1,000																						
General Chemistry/Other																									
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	112,000	17,500	317,000	45,500	15,700	95,600	472,000	24,500	27,800	9,490	25,800	9,370	163,000	112,000	22,200	22,500	47,400	67,500	51,000	12,200	20,900	91,600
Percent Solids	5035	%	NS	80	85	65	74	82	52	68	58	62	74	78	85	60	57	74	77	54	70	51	73	85	79

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 2. Sediment Chemical Testing Results - All Locations
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

			Sample Location:	859		860		861	862	869	871		872		873		874		875		876		877		878	
			Sample ID:	859-S1	859-S2	860-S1	860-S2	861-S1	862-S1	869-S1	871-S1	871-S2	872-S1	872-S2	873-S1	873-S2	874-S1	874-S2	875-S1	875-S2	876-S1	876-S2	877-S1	877-S2	878-S1	878-S2
			Lab Sample ID:	F230042-01	F230042-02	F230042-03	F230042-04	F230041-01	F230041-02	F230041-03	F240021-01	F240021-02	F240021-03	F240021-04	F240021-11	F240021-12	F240020-05	F240020-06	F240020-07	F240020-08	F240020-14	F240020-15	F240020-03	F240020-04	F240020-01	F240020-02
			Property:	1 Field St	1 Field St	1 Field St	1 Field St	1 Field St	1 Field St	1 Field St	3 River St	3 River St	3 River St	3 River St	8 Noel St	8 Noel St	7 Noel St	7 Noel St	7 Noel St	7 Noel St	33 River St	33 River St	33 River St	33 River St	33 River St	33 River St
			Area:	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River
			Sample Date:	11/28/2023	11/28/2023	11/28/2023	11/28/2023	11/27/2023	11/27/2023	11/27/2023	07/23/2024	07/23/2024	07/23/2024	07/23/2024	07/23/2024	07/23/2024	07/22/2024	07/22/2024	07/22/2024	07/22/2024	07/22/2024	07/22/2024	07/22/2024	07/22/2024	07/22/2024	07/22/2024
			Soil/Sediment Type:	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Organic Soil	Organic Soil	Silty Sand	Silty Sand	Sandy Silt	Silt w/Sand	Silty Sand	Silty Sand	Silt	Silty Sand w/Gravel	Silty Sand w/Gravel	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt
			Sample Depth (feet):	0-1	1-2	0-1	1-2	0-1	0-1	0-1	0-1	1-2	0-1	1-2	0-1	1-2	0-1	1-2	0-1	1-2	0-1	1-2	0-1	1-2	0-1	1-2
Analyte	**Method**	**Units**	**S-1/GW-3**																							
Volatile Organic Compounds (VOCs)	8260	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40																							
Ethylbenzene			500																							
Toluene			500																							
Xylene, o-			500																							
Xylene p,m-			500																							
Xylenes, Total			500																							
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg																								
2-Methylnaphthalene			300	2.46	0.0514	0.478	1.15	0.389	0.198	0.106	0.103	0.0836	0.763	3.64	0.0401	0.00821	0.0036	0.0128	0.00968	0.0329	0.0417	0.0666	0.0756	0.0570	0.0300	0.126
Acenaphthene			1,000	1.57	0.553	2.22	0.905	1.59	0.456	0.263	0.310	0.290	7.07	34.5	0.0361	<0.0109	0.0097	0.115	0.00941	0.0270	0.0919	0.162	0.0956	0.0503	0.0342	0.104
Acenaphthylene			10	2.95	0.0185	0.420	0.202	0.424	1.20	0.297	0.330	0.545	0.899	2.92	0.124	0.00685	0.0165	0.105	0.0218	0.1660	0.318	0.268	0.617	0.308	0.180	0.758
Anthracene			1,000	7.52	0.128	6.80	2.28	3.09	1.82	0.948	0.856	0.756	5.29	9.00	0.176	0.00652	0.0215	0.166	0.0238	0.1600	0.371	0.380	0.644	0.295	0.191	0.658
Benzo(a)anthracene			20	**27.6**	0.188	8.56	3.16	5.84	5.40	2.14	1.90	1.66	13.0	9.18	0.652	0.0212	0.0646	0.386	0.0847	0.4920	1.15	0.822	3.05	1.00	0.717	2.36
Benzo(a)pyrene			2	**36.5**	0.216	**5.62**	**2.87**	**6.06**	**6.17**	**2.37**	**2.22**	**2.66**	**12.3**	**11.5**	0.807	0.0232	0.0718	0.436	0.1070	0.6160	1.49	1.00	**3.27**	1.27	0.835	**3.11**
Benzo(b)fluoranthene			20	14.6	0.0941	3.63	1.74	4.66	4.92	1.76	1.63	1.70	10.4	7.96	0.477	0.0155	0.0604	0.385	0.1010	0.4170	1.09	0.740	2.12	0.851	0.531	2.09
Benzo(g,h,i)perylene			1,000	19.1	0.105	1.69	1.15	3.29	3.67	1.37	1.22	1.59	6.46	6.28	0.423	0.0130	0.0428	0.267	0.0704	0.3440	0.838	0.570	1.35	0.696	0.441	1.74
Benzo(k)fluoranthene			70	16.3	0.101	5.06	2.22	4.81	4.69	1.72	1.51	1.53	8.73	7.12	0.516	0.0141	0.0605	0.378	0.0930	0.4500	1.09	0.769	2.66	0.834	0.613	2.14
Chrysene			200	25.9	0.179	6.84	2.81	5.55	5.68	2.20	1.98	1.94	12.80	9.58	0.659	0.0250	0.0716	0.443	0.1170	0.5860	1.27	1.00	2.93	1.12	0.779	2.81
Dibenzo(a,h)anthracene			2	**4.51**	0.0259	0.88	0.452	0.977	1.11	0.361	0.336	0.417	**2.12**	1.85	0.112	<0.0109	0.0124	0.0745	0.0223	0.0945	0.234	0.160	0.528	0.197	0.120	0.439
Fluoranthene			1,000	26.0	0.255	20.0	4.83	11.4	9.37	4.92	4.14	2.82	28.5	23.7	0.835	0.0364	0.187	1.00	0.197	0.801	2.09	1.55	2.65	0.911	1.13	1.99
Fluorene			1,000	1.92	0.0793	1.94	1.10	1.59	0.426	0.287	0.283	0.169	2.67	9.65	0.0487	<0.0109	0.00636	0.0473	0.00937	0.0345	0.0805	0.0921	0.0900	0.0621	0.0410	0.132
Indeno(1,2,3-cd)pyrene			20	15.4	0.0849	2.54	1.42	4.16	4.25	1.57	1.40	1.63	8.24	7.05	0.452	0.0128	0.0487	0.309	0.0828	0.385	0.951	0.639	1.75	0.775	0.497	1.95
Naphthalene			500	2.99	0.070	0.602	1.82	0.650	0.266	0.181	0.226	0.141	2.01	17.3	0.0540	0.00754	0.00511	0.0196	0.00988	0.0389	0.0606	0.0790	0.123	0.0718	0.0657	0.173
Phenanthrene			500	9.05	0.319	10.6	4.92	9.32	4.10	2.68	3.16	1.55	23.3	42.2	0.410	0.0203	0.0457	0.294	0.0506	0.258	0.843	0.931	0.972	0.508	0.365	1.15
Pyrene			1,000	56.4	0.480	15.1	4.47	9.35	8.70	4.40	3.89	3.18	24.3	29.0	1.25	0.0777	0.163	0.861	0.184	0.962	2.15	1.93	2.75	2.04	1.44	5.00
Total PAHs			NS	271	2.95	93.0	37.5	73.2	62.4	27.6	25.5	22.7	169	232	7.07	0.288	0.89	5.3	1.2	5.9	14.2	11.2	25.7	11.0	8.0	26.7
Petroleum Hydrocarbons	8015 Mod	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000																							
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100																							
C9 to C12 Aliphatic Hydrocarbons			1,000																							
C9 to C10 Aromatic Hydrocarbons			100																							
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000																							
C19 to C36 Aliphatic Hydrocarbons			3,000																							
C11 to C22 Aromatic Hydrocarbons			1,000																							
General Chemistry/Other																										
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	48,600	34,500	47,400	27,500	92,500	92,500	26,600	15,600	58,100	61,500	54,100	13,600	133,000	1,650	22,900	79,500	9,380	20,200	43,600	56,800	17,100	48,800	43,800
Percent Solids	5035	%	NS	61	72	70	80	26	33	63	78	55	73	69	76	36	85	69	36	75	63	52	49	68	53	64

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 2. Sediment Chemical Testing Results - All Locations
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

Sample Location:				879		880		881		882		888			889		
Sample ID:				879-S1	879-S2	880-S1	880-S2	881-S1	881-S2	882-S1	882-S2	888-S1	888-S2	888-S3	889-S1	889-S2	889-S3
Lab Sample ID:				F240020-09	F240020-10	F240021-07	F240021-08	F240021-09	F240021-10	F240021-05	F240021-06	F240020-11	F240020-12	F240020-13	F240021-13	F240021-14	F240021-15
Property:				1 Field St	1 Field St	1 Field St	1 Field St	1 Field St	1 Field St	1 Field St	1 Field St	35 Water St	35 Water St	35 Water St	1 Field St	1 Field St	1 Field St
Area:				River	River	River	River	River	River	River	River	River	River	River	River	River	River
Sample Date:				07/22/2024	07/22/2024	07/23/2024	07/23/2024	07/23/2024	07/23/2024	07/23/2024	07/23/2024	07/22/2024	07/22/2024	07/22/2024	07/23/2024	07/23/2024	07/23/2024
Soil/Sediment Type:				Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Silt w/Sand	Sandy Silt	Silt w/Sand	Sandy Silt	Silty Sand	Silty Sand	Clay	Silty Sand	Silty Sand	Clay
Sample Depth (feet):				0-1	1-2	0-1	1-2	0-1	1-2	0-1	1-2	0-1	1-2	4-5	0-1	1-2	4-5
Analyte	**Method**	**Units**	**S-1/GW-3**														
Volatile Organic Compounds (VOCs)	8260	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40														
Ethylbenzene			500														
Toluene			500														
Xylene, o-			500														
Xylene p,m-			500														
Xylenes, Total			500														
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg															
2-Methylnaphthalene			300	0.0155	0.0066	0.0245	0.00577	0.00847	0.00386	0.127	0.0175	0.00925	0.00670	0.00343	0.248	0.00269	0.00360
Acenaphthene			1,000	0.0210	<0.00683	0.0385	<0.00690	0.00594	<0.00686	0.397	0.0498	0.0213	0.282	<0.00495	1.75	<0.00405	<0.00541
Acenaphthylene			10	0.0110	<0.00683	0.103	0.00700	0.0257	<0.00686	0.370	0.0428	0.101	<0.00736	<0.00495	0.0939	<0.00405	<0.00541
Anthracene			1,000	0.0629	<0.00683	0.147	<0.00690	0.0285	<0.00686	0.618	0.0805	0.135	<0.00736	<0.00495	1.44	<0.00405	<0.00541
Benzo(a)anthracene			20	0.0879	<0.00683	0.473	0.00489	0.0885	<0.00686	1.31	0.185	0.444	<0.00736	<0.00495	1.27	<0.00405	<0.00541
Benzo(a)pyrene			2	0.0477	<0.00683	0.573	0.00616	0.130	<0.00686	1.54	0.222	0.519	0.00426	<0.00495	0.780	<0.00405	<0.00541
Benzo(b)fluoranthene			20	0.0343	<0.00683	0.457	0.00507	0.0954	<0.00686	1.02	0.132	0.390	<0.00736	<0.00495	0.497	<0.00405	<0.00541
Benzo(g,h,i)perylene			1,000	0.0189	<0.00683	0.358	0.00459	0.0876	<0.00686	0.84	0.117	0.286	<0.00736	<0.00495	0.232	<0.00405	<0.00541
Benzo(k)fluoranthene			70	0.0418	<0.00683	0.480	0.00499	0.102	<0.00686	1.09	0.152	0.392	<0.00736	<0.00495	0.690	<0.00405	<0.00541
Chrysene			200	0.0801	0.00351	0.567	0.00712	0.119	<0.00686	1.52	0.202	0.466	<0.00736	<0.00495	1.10	<0.00405	0.00278
Dibenzo(a,h)anthracene			2	0.00713	<0.00683	0.104	<0.00690	0.0284	<0.00686	0.235	0.0345	0.0776	<0.00736	<0.00495	0.124	<0.00405	<0.00541
Fluoranthene			1,000	0.319	0.0121	0.926	0.0119	0.167	0.00665	2.30	0.328	0.905	0.00706	<0.00495	2.88	0.00223	0.00504
Fluorene			1,000	0.0157	<0.00683	0.0415	0.00430	0.00904	0.00354	0.242	0.0355	0.0243	0.00416	0.00254	0.398	0.00296	0.00327
Indeno(1,2,3-cd)pyrene			20	0.0221	<0.00683	0.413	0.00497	0.102	<0.00686	0.945	0.125	0.336	<0.00736	<0.00495	0.336	<0.00405	<0.00541
Naphthalene			500	0.0217	0.00826	0.0366	0.00626	0.0112	0.00440	0.187	0.0231	0.0173	0.0106	<0.00495	0.261	0.00283	0.00462
Phenanthrene			500	0.105	0.0088	0.398	0.0135	0.0540	0.00689	1.09	0.146	0.363	0.00650	0.00337	4.85	0.00475	0.00777
Pyrene			1,000	0.257	0.0114	0.913	0.0139	0.185	0.00636	3.05	0.414	0.850	0.00748	<0.00495	3.21	0.00272	0.00691
Total PAHs			NS	1.2	0.051	6.05	0.100	1.25	0.0317	16.9	2.31	5.3	0.33	0.00934	20.2	0.0182	0.0340
Petroleum Hydrocarbons	8015 Mod	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000														
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100														
C9 to C12 Aliphatic Hydrocarbons			1,000														
C9 to C10 Aromatic Hydrocarbons			100														
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000														
C19 to C36 Aliphatic Hydrocarbons			3,000														
C11 to C22 Aromatic Hydrocarbons			1,000														
General Chemistry/Other																	
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	62,000	64,100	76,200	46,600	44,900	33,300	56,500	62,400	6,450	49,900	4,280	63,200	4,320	<500
Percent Solids	5035	%	NS	49	58	48	56	52	59	47	52	88	52	78	63	87	79

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 3. Sediment Chermical Testing Results - Wetland
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

Sample Location:				**SS601**		**SS602**		**SS603**		**SS604**		**SS605**		**SS606**		**SS607**		**SS608**		**SS609**	
Sample ID:				**SS601-A**	**SS601-B**	**SS602-A**	**SS602-B**	**SS603-A**	**SS603-B**	**SS604-A**	**SS604-B**	**SS605-A**	**SS605-B**	**SS606-A**	**SS606-B**	**SS607-A**	**SS607-B**	**SS608R-A**	**SS608R-B**	**SS609R-A**	**SS609R-B**
Lab Sample ID:				**1709743**	**1709743**	**1709743**	**1709743**	**1709743**	**1709743**	**1709743**	**1709743**	**1709743**	**1709743**	**1709743**	**1709743**	**1709743**	**1709743**	**1711281**	**1711281**	**1711281**	**1711281**
Property:				**35 Oakland St**	**35 Oakland St**	**35 Oakland St**	**35 Oakland St**	**35 Oakland St**	**35 Oakland St**	**35 Oakland St**	**35 Oakland St**	**35 Oakland St**	**35 Oakland St**	**33R Oakland St**	**33R Oakland St**	**35 Oakland St**	**35 Oakland St**	**35 Oakland St**	**35 Oakland St**	**35 Oakland St**	**35 Oakland St**
Area:				**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**
Sample Date:				**9/22/2017**	**9/22/2017**	**9/22/2017**	**9/22/2017**	**9/22/2017**	**9/22/2017**	**9/22/2017**	**9/22/2017**	**9/22/2017**	**9/22/2017**	**9/22/2017**	**9/22/2017**	**9/22/2017**	**9/22/2017**	**11/8/2017**	**11/8/2017**	**11/8/2017**	**11/8/2017**
Soil/Sediment Type:				**Organics**	**Organic Silt**	**Organics**	**Organic Silt**	**Sand**	**Organic Silt**	**Sand**	**Organic Silt**	**Sand/Clay**	**Clay**	**Organics**	**Organics**	**Organics**	**Organics**	**Organics**	**Organics**	**Organics**	**Silty Sand/Organics**
Sample Depth (feet):				**0.7-1**	**2.4**	**0.5**	**2-2.4**	**0.6**	**1.2-1.8**	**0-0.3**	**1.5-2**	**0.5-1**	**1.8-2.3**	**0.5-1**	**1.8-2.1**	**0.5-1**	**1.7-2**	**0.2-0.6**	**2-2.3**	**0.7-1.2**	**1.7-2.1**
Analyte	**Method**	**Units**	**S-1/GW-3**																		
Volatile Organic Compounds (VOCs)	8260	mg/kg																			
Benzene			40	< 0.190	< 0.463	< 0.602	< 0.544	< 0.180	< 0.550	< 0.561	< 0.441	< 0.304	< 0.310	< 1.87	< 0.878	< 1.17	< 1.60	< 0.703 C-	< 0.408	0.442	< 0.309
Ethylbenzene			500	< 0.190	< 0.463	< 0.602	< 0.544	< 0.180	< 0.550	< 0.561	< 0.441	< 0.304	< 0.310	< 1.87	< 0.878	< 1.17	< 1.60	< 0.703 C-	< 0.408	2.01	< 0.309
Toluene			500	< 0.190	< 0.463	< 0.602	< 0.544	< 0.180	< 0.550	< 0.561	< 0.441	< 0.304	< 0.310	< 1.87	< 0.878	< 1.17	< 1.60	< 0.703 C-	< 0.408	< 0.330	< 0.309
Xylene, o-			500	< 0.190	< 0.463	< 0.602	< 0.544	< 0.180	< 0.550	< 0.561	< 0.441	< 0.304	< 0.310	< 1.87	< 0.878	< 1.17	< 1.60	< 0.703 C-	< 0.408	< 0.330	< 0.309
Xylene p,m-			500	< 0.380	< 0.926	< 1.20	< 1.09	< 0.361	< 1.10	< 1.12	< 0.882	< 0.608	< 0.619	< 3.73	< 1.76	< 2.34	< 3.21	< 1.41 C-	< 0.816	< 0.660	< 0.618
Xylenes, Total			500	< 0.380	< 0.926	< 1.20	< 1.09	< 0.361	< 1.10	< 1.12	< 0.882	< 0.608	< 0.619	< 3.73	< 1.76	< 2.34	< 3.21	< 1.41 C-	< 0.816	< 0.660	< 0.618
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg																			
2-Methylnaphthalene			300	< 0.408	< 0.658	< 0.363	< 0.682	< 0.390	< 0.351	1.99	< 0.634	< 0.502	< 0.518	< 0.533	< 0.574	2.17	2.99	< 0.345	< 0.226	53.2	0.441
Acenaphthene			1,000	< 0.408	< 0.658	< 0.724	< 0.682	1.16	< 0.700	27.3	< 0.634	< 0.502	< 0.518	< 1.06	< 0.574	2.50	3.66	< 1.38	< 0.908	160	3.54
Acenaphthylene			10	< 0.408	< 0.658	< 0.724	< 0.682	0.390	< 0.700	5.08	< 0.634	< 0.502	< 0.518	< 0.533	< 0.574	1.76	1.30	1.19	< 0.908	8.61	< 0.788
Anthracene			1,000	< 0.408	< 0.658	< 0.724	< 0.682	2.20	0.799	23.2	< 0.634	< 0.502	< 0.518	< 1.06	< 0.574	4.92	3.28	1.91	< 0.908	40.1	< 0.788
Benzo(a)anthracene			20	< 0.408	1.59	< 0.724	< 0.682	3.91	1.93	**38.3**	< 0.634	< 0.502	< 0.518	< 1.06	< 0.574	10.3	6.78	9.41	< 0.908	**52.8**	< 0.788
Benzo(a)pyrene			2	< 0.205	1.66	< 0.363	< 0.342	**4.19**	1.94	**42.8**	0.788	< 0.252	< 0.260	1.53	< 0.288	**12.3**	**8.50**	**12.7**	< 0.455	**54.0**	0.591
Benzo(b)fluoranthene			20	< 0.408	1.31	< 0.724	< 0.682	3.42	1.40	**30.0**	< 0.634	< 0.502	< 0.518	1.75	< 0.574	10.4	7.39	5.66	< 0.908	**21.9**	< 0.788
Benzo(g,h,i)perylene			1,000	< 0.408	0.942	< 0.724	< 0.682	2.71	1.37	25.6	< 0.634	< 0.502	< 0.518	1.20	< 0.574	9.10	6.63	8.69	< 0.908	13.4	< 0.788
Benzo(k)fluoranthene			70	< 0.408	< 0.658	< 0.724	< 0.682	1.04	0.710	13.9	< 0.634	< 0.502	< 0.518	< 1.06	< 0.574	3.55	2.61	7.27	< 0.908	30.2	< 0.788
Chrysene			200	< 0.205	1.09	< 0.363	< 0.342	2.97	1.54	28.3	0.625	< 0.252	< 0.260	1.17	< 0.288	9.58	6.37	7.94	< 0.455	32.8	0.428
Dibenzo(a,h)anthracene			2	< 0.205	< 0.330	< 0.363	< 0.342	0.744	0.373	**7.06**	< 0.318	< 0.252	< 0.260	< 0.533	< 0.288	**2.73**	1.88	**3.06**	< 0.455	**5.88**	< 0.395
Fluoranthene			1,000	< 0.408	2.61	< 0.724	< 0.682	6.14	2.51	72.5	< 0.634	< 0.502	< 0.518	1.44	< 0.574	17.4	10.5	16.1	< 0.908	149	1.37
Fluorene			1,000	< 0.408	< 0.658	< 0.724	< 0.682	0.774	< 0.700	14.9	< 0.634	< 0.502	< 0.518	< 1.06	< 0.574	2.25	2.28	< 1.38	< 0.908	68.9	< 0.788
Indeno(1,2,3-cd)pyrene			20	< 0.408	0.661	< 0.724	< 0.682	1.98	0.900	18.2	< 0.634	< 0.502	< 0.518	< 1.06	< 0.574	6.93	4.79	6.59	< 0.908	11.9	< 0.788
Naphthalene			500	< 0.408	< 0.658	< 0.724	< 0.682	< 0.390	< 0.700	2.53	< 0.634	< 0.502	< 0.518	< 1.06	< 0.574	5.77	10.2	< 1.38	< 0.908	158	2.26
Phenanthrene			500	< 0.408	2.33	< 0.724	< 0.682	6.80	1.82	110	< 0.634	< 0.502	< 0.518	< 1.06	< 0.574	6.40	3.85	6.27	< 0.908	297	2.42
Pyrene			1,000	< 0.408	4.39	< 0.724	< 0.682	11.7	4.77	117	1.34	< 0.502	< 0.518	2.27	< 0.574	31.6	18.2	20.2	< 0.908	183	1.59
Total PAHs			NS	ND	16.6	ND	ND	50.1	20.1	579	2.75	ND	ND	9.36	ND	140	101	107	ND	1,341	12.6
Petroleum Hydrocarbons	8015 Mod	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000																		
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg																			
C5 to C8 Aliphatic Hydrocarbons			100	< 9.4	< 23.2	< 29.8	< 27.0	< 8.3	< 23.7	< 27.9	< 22.1	< 15.1	< 15.2	< 92.8	< 42.7	< 60.2	< 83.4	< 72.9 C-	< 39.6	< 33.0	< 32.4
C9 to C12 Aliphatic Hydrocarbons			1,000	< 9.4	< 23.2	< 29.8	< 27.0	< 8.3	< 23.7	< 27.9	< 22.1	< 15.1	< 15.2	< 92.8	< 42.7	< 60.2	< 83.4	< 72.9 C-	< 39.6	34.8	< 32.4
C9 to C10 Aromatic Hydrocarbons			100	< 9.4	< 23.2	< 29.8	< 27.0	< 8.3	< 23.7	< 27.9	< 22.1	< 15.1	< 15.2	< 92.8	< 42.7	< 60.2	< 83.4	< 72.9	< 39.6	**152**	< 32.4
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg																			
C9 to C18 Aliphatic Hydrocarbons			1,000	< 19.8	< 29.3	< 32.8	< 31.3	< 17.5	< 32.0	< 33.0	< 28.3	< 22.8	< 23.1	< 39.8	< 36.2	< 33.3	< 35.5	< 62.0	90.0	97.6	< 35.5
C19 to C36 Aliphatic Hydrocarbons			3,000	< 19.8	< 29.3	< 32.8	< 31.3	< 17.5	< 32.0	38.2	65.4	< 22.8	< 23.1	55.6	< 36.2	93.2	46.3	< 62.0	112	168	< 35.5
C11 to C22 Aromatic Hydrocarbons			1,000	26.7	38.4	< 32.8	< 31.3	60.4	57.0	389	102	< 22.8	< 23.1	< 39.8	< 36.2	231	54.0	76.2	43.5	**4,660**	145
General Chemistry/Other																					
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	< 1.19	< 1.93	< 2.11	< 2.04	< 1.18	< 2.00	< 2.06	< 1.76	< 1.40	< 1.46	< 5.09	< 2.83	< 3.42	< 4.72	< 3.93	< 2.73	< 2.25	< 2.35
Total Cyanide	9014	mg/kg	30	< 1.15	< 1.85	< 2.05	< 2.03	< 1.15	< 2.12	< 2.14	< 1.78	< 1.38	< 1.54	< 5.11	< 2.64	< 3.63	< 4.60	< 3.92	< 2.57	< 2.14	< 2.29
Total Organic Carbon	LK	mg/kg	NS	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Percent Solids	5035	%	NS	79	50	45	48	83	47	45	53	66	64	19	35	28	21	23	36	43	41

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 3. Sediment Chermical Testing Results - Wetland
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

Sample Location:				**SS610**		**SS611**		**SS612**	**SS613**	**SS614**	**SS616**	**SS617**	**SS618**	**SS624**	**SS625**	**SS626**	**SS627**	**SS628**	**SS629**	**SS630**	**760**	**791**
Sample ID:				**SS610R-A**	**SS610R-B**	**SS611R-A**	**SS611R-B**	**SS612A**	**SS613B**	**SS614**	**SS616**	**SS617**	**SS618**	**SS624**	**SS625**	**SS626**	**SS627**	**SS628**	**SS629**	**SS630**	**SS760-S2**	**SS791-S1**
Lab Sample ID:				**1711281**	**1711281**	**1711281**	**1711281**	**1807384**	**1807384**	**1807384**	**1807384**	**1807384**	**1807384**	**F180046**	**F180070**	**F180070**	**F180070**	**F180070**	**F180070**	**F180070**	**F200013**	**F200036**
Property:				**35 Oakland St**	**35 Oakland St**	**35 Oakland St**	**35 Oakland St**	**37 Oakland St**	**37 Oakland St**	**37 Oakland St**	**37 Oakland St**	**37 Oakland St**	**37 Oakland St**	**37 Oakland St**	**35 Oakland St**	**35 Oakland St**	**37 Oakland St**	**37 Oakland St**	**37 Oakland St**	**37 Oakland St**	**37 Oakland St**	**37 Oakland St**
Area:				**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**
Sample Date:				**11/8/2017**	**11/8/2017**	**11/8/2017**	**11/8/2017**	**7/16/2018**	**7/16/2018**	**7/16/2018**	**7/16/2018**	**7/16/2018**	**7/16/2018**	**08/15/2018**	**12/17/2018**	**12/17/2018**	**12/17/2018**	**12/17/2018**	**12/17/2018**	**12/17/2018**	**3/9/2020**	**7/14/2020**
Soil/Sediment Type:				**Organics**	**Silty Sand/Organics**	**Organics**	**Organics**	**Clay/Organics**	**Clay**	**Sandy Clay**	**Sandy clay w/ organics**	**Organics**	**Organics**	**Organic Soil w/Sand**	**Sand w/Gravel**	**Sand w/Gravel**	**Sand w/Gravel**	**Sand w/Gravel**	**Organic Soil**	**Clayey Sand**	**Sand**	**Silty Sand**
Sample Depth (feet):				**0.3-1.2**	**1.7-2.1**	**0.3-0.8**	**2-2.4**	**0.4-0.8**	**1.8-2.3**	**1.3-1.8**	**0.8-1.3**	**1-2.3**	**0.9-1.8**	**0-1.7**	**0-0.5**	**0-0.5**	**0-0.5**	**0-0.5**	**0-0.5**	**0-0.5**	**3.4-3.6**	**4-5**
Analyte	**Method**	**Units**	**S-1/GW-3**																			
Volatile Organic Compounds (VOCs)	8260	mg/kg													NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40	< 0.307 C-	< 0.352	< 0.718 C-	< 0.371	< 0.0957	< 0.129	< 0.108	0.274	1.20	< 0.627	< 0.46								
Ethylbenzene			500	< 0.307 C-	< 0.352	< 0.718 C-	< 0.371	< 0.0957	< 0.129	< 0.108	0.347	4.40	< 0.627	< 0.46								
Toluene			500	< 0.307 C-	< 0.352	< 0.718 C-	< 0.371	< 0.0957	< 0.129	< 0.108	< 0.193	< 0.562	< 0.627	< 0.46								
Xylene, o-			500	< 0.307 C-	< 0.352	< 0.718 C-	< 0.371	< 0.0957	< 0.129	< 0.108	< 0.193	0.708	< 0.627	< 0.46								
Xylene p,m-			500	< 0.614 C-	< 0.704	< 1.44 C-	< 0.741	< 0.191	< 0.258	< 0.217	< 0.386	< 1.12	< 1.25	< 0.921								
Xylenes, Total			500	< 0.614 C-	< 0.704	< 1.44 C-	< 0.741	< 0.191	< 0.258	< 0.217	< 0.386	< 1.12	< 1.25	< 0.921								
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg																				
2-Methylnaphthalene			300	1.09	< 0.197	0.706	< 0.222	< 0.428	< 0.498	< 0.430	22.2	206	< 1.25	1.43	0.0687	0.0442	0.323	0.0881	204	0.00369	0.132	0.007
Acenaphthene			1,000	17.3	< 0.792	13.0	1.78	< 0.428	< 0.498	< 0.430	110	**1,230**	15.1	8.18	0.109	0.015	0.113	0.0336	757	0.00545	0.129	< 0.006
Acenaphthylene			10	9.12	< 0.792	2.32	< 0.889	< 0.428	< 0.498	< 0.430	9.98	**99.8**	2.18	1.65	0.232	0.0884	1.38	1.11	**55.5**	0.0218	0.074	0.003
Anthracene			1,000	45.0	< 0.792	10.5	1.82	< 0.428	< 0.498	< 0.430	48.5	415	15.3	7.61	0.352	0.0847	1.84	1.13	940	0.0248	0.610	0.003
Benzo(a)anthracene			20	**66.5**	< 0.792	14.5	2.47	< 0.428	< 0.498	< 0.430	**45.2**	**509**	14.7	7.40	1.20	0.399	4.75	2.29	**218**	0.175	2.23	0.008
Benzo(a)pyrene			2	**70.3**	< 0.397	**17.8**	**2.34**	< 0.215	< 0.250	< 0.216	**52.7**	**649**	**14.5**	**7.24**	1.28	0.281	**4.12**	1.89	**239**	0.133	1.85	0.008
Benzo(b)fluoranthene			20	**32.8**	< 0.792	10.3	1.04	< 0.428	< 0.498	< 0.430	19.9	**317**	11.6	3.92	0.921	0.314	4.06	2.58	**107**	0.0836	1.11	0.007
Benzo(g,h,i)perylene			1,000	39.2	< 0.792	14.8	1.52	< 0.428	< 0.498	< 0.430	36.5	406	11.0	3.17	0.822	0.255	2.39	1.11	123	0.0581	0.808	0.005
Benzo(k)fluoranthene			70	37.8	< 0.792	8.67	1.94	< 0.428	< 0.498	< 0.430	34.3	**258**	4.27	4.69	1.01	0.344	4.30	2.14	**141**	0.109	1.24	0.006
Chrysene			200	60.0	< 0.397	12.1	2.05	< 0.215	< 0.250	< 0.216	35.4	**342**	12.1	5.73	1.31	0.457	4.69	2.46	**264**	0.149	1.91	0.0081
Dibenzo(a,h)anthracene			2	**17.2**	< 0.397	**5.06**	0.715	< 0.215	< 0.250	< 0.216	**8.02**	**96**	**3.12**	0.822	0.179	0.0563	0.657	0.403	**22.7**	0.0196	0.245	< 0.006
Fluoranthene			1,000	118	< 0.792	30.6	4.32	< 0.428	< 0.498	< 0.430	131	**1,500**	51.0	17.7	2.39	0.844	9.57	3.77	676	0.178	2.98	0.015
Fluorene			1,000	13.0	< 0.792	7.21	1.09	< 0.428	< 0.498	< 0.430	50.0	522	11.3	4.09	0.0822	0.0186	0.260	0.0329	265	0.00551	0.211	0.006
Indeno(1,2,3-cd)pyrene			20	**30.0**	< 0.792	10.8	1.24	< 0.428	< 0.498	< 0.430	**26.8**	**304**	7.9	3.68	0.726	0.238	2.60	1.33	**105**	0.0563	0.862	0.005
Naphthalene			500	4.97	< 0.792	3.65	< 0.889	< 0.428	< 0.498	< 0.430	58.4	475	2.12	4.07	0.0924	0.0539	0.545	0.122	**629**	0.00437	0.151	0.010
Phenanthrene			500	98.2	< 0.792	28.5	5.77	< 0.428	< 0.498	< 0.430	270	**2,940**	69.6	23.6	1.53	0.622	2.95	0.441	**1,360**	0.0435	1.58	0.012
Pyrene			1,000	149	< 0.792	55.4	5.64	< 0.428	< 0.498	< 0.430	202	**2,380**	81.6	22.6	3.10	1.10	8.74	3.63	978	0.192	4.18	0.016
Total PAHs			NS	809	ND	246	33.7	ND	ND	ND	1,161	12,649	327	128	15.4	5.22	53.3	24.6	7,084	1.26	20.3	0.119
Petroleum Hydrocarbons	8015 Mod	mg/kg			NT		NT	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000	**2,150**		**1,750**								666								
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg												NT	NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100	< 29.5	< 33.0	< 72.0	< 36.6	< 9.5	< 13.4	< 11.3	< 20.1	< 55.2	< 70.7									
C9 to C12 Aliphatic Hydrocarbons			1,000	< 29.5	< 33.0	< 72.0	< 36.6	< 18.9	< 26.6	< 22.5	< 40.0	< 110	< 141									
C9 to C10 Aromatic Hydrocarbons			100	< 29.5	< 33.0	< 72.0	< 36.6	< 9.1	< 12.8	< 10.8	< 19.2	**120**	< 67.6									
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg												NT	NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000	< 64.5	< 36.8	< 132	< 39.8	< 18.1	< 21.4	< 20.2	< 48.4	205	328									
C19 to C36 Aliphatic Hydrocarbons			3,000	98.1	< 36.8	240	< 39.8	< 18.1	< 21.4	< 20.2	162	724	1,180									
C11 to C22 Aromatic Hydrocarbons			1,000	339	< 36.8	714	48.2	< 18.1	< 21.4	< 20.2	404	**2,310**	**1,200**									
General Chemistry/Other																						
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	< 2.15	< 2.48	< 4.12	< 2.52	< 1.18	< 1.45	< 1.29	< 1.62	< 3.20	< 3.86	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	< 2.19	< 2.31	< 4.25	< 2.48	< 1.20	< 1.35	< 1.20	< 1.54	< 3.31	< 3.60	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	79,700	NT	142,000	NT	NT	NT	NT	NT	NT	NT	17,600	109,000	33,000	284,000	148,000	42,700	39,900	53,600	45,500
Percent Solids	5035	%	NS	45	40	22	37	80	69	77	61	30	25	65	65	82	69	67	69	71	72	61

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 3. Sediment Chermical Testing Results - Wetland
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

			Sample Location:	**792**	**793**			**794**		**795**	**796**	**807**		**808**		**809**		**810**		**811**		**839**	
			Sample ID:	**SS792-S1**	**SS793-S1**	**SS793-S2**	**SS794-S1**	**SS794-S2**	**SS795-S2**	**SS796-S1**	**SS807-S1**	**SS807-S2**	**SS808-S1**	**SS808-S2**	**SS809-S1**	**SS809-S2**	**810-S1**	**810-S2**	**811-S1**	**811-S2**	**839-S1**	**839-S2**
			Lab Sample ID:	**F200036**	**F200036**	**F200036**	**F200036**	**F200036**	**F200033**	**F200033**	**F200036**	**F200036**	**F220065**	**F220065**	**F220065**	**F220065**	**F230018**	**F230018**	**F230018**	**F230018**	**F230027**	**F230027**
			Property:	**37 Oakland St**	**33R Oakland St**	**33R Oakland St**	**35 Oakland St**	**35 Oakland St**	**37 Oakland St**	**39 Oakland St**	**37 Oakland St**	**37 Oakland St**	**35 Oakland St**	**35 Oakland St**	**35 Oakland St**	**35 Oakland St**	**37 Oakland St**	**37 Oakland St**	**37 Oakland St**	**37 Oakland St**	**33R Oakland St**	**33R Oakland St**
			Area:	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**
			Sample Date:	**7/14/2020**	**7/14/2020**	**7/14/2020**	**7/14/2020**	**7/14/2020**	**7/6/2020**	**7/6/2020**	**7/8/2020**	**7/8/2020**	**10/12/2022**	**10/12/2022**	**10/12/2022**	**10/12/2022**	**06/20/2023**	**06/20/2023**	**06/20/2023**	**06/20/2023**	**8/18/2023**	**8/18/2023**
			Soil/Sediment Type:	**Silty Sand**	**Organic Soil**	**Organic Soil**	**Organic Soil**	**Organic Soil**	**Organic Soil**	**Sandy Silt**	**Organic Soil**	**Organic Soil**	**Organic Soil**	**Organic Soil**	**Organic Soil**	**Organic Soil**	**Sand**	**Sand**	**Silty Sand**	**Silty Sand**	**Sand**	**Sand**
			Sample Depth (feet):	**4-5**	**0.4-0.6**	**2-2.2**	**0.8-1**	**1.8-2**	**2-2.2**	**0-0.5**	**0.4-0.6**	**1.8-2**	**0.8-1**	**1.8-2**	**0.8-1**	**1.8-2**	**0.8-1**	**1.8-2**	**0.8-1**	**1.8-2**	**0-1**	**1-2**
Analyte	**Method**	**Units**	**S-1/GW-3**																			
Volatile Organic Compounds (VOCs)	8260	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40																			
Ethylbenzene			500																			
Toluene			500																			
Xylene, o-			500																			
Xylene p,m-			500																			
Xylenes, Total			500																			
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg																				
2-Methylnaphthalene			300	0.007	0.162	1.4	8.64	3.65	13.1	0.004	0.122	0.151	0.506	<0.0156	0.618	0.0222	0.028	0.0137	0.0521	0.0074	0.181	0.265
Acenaphthene			1,000	< 0.007	0.149	0.554	3.53	2.03	369	0.009	0.037	0.132	0.270	<0.0156	0.212	0.00893	0.0256	0.0112	0.0715	<0.00478	0.106	0.118
Acenaphthylene			10	0.005	0.723	2.93	**45.1**	**10.3**	6.07	< .0081	0.157	0.185	0.766	<0.0156	0.540	0.0813	0.258	0.0657	0.212	0.0141	0.7	0.592
Anthracene			1,000	< 0.007	0.599	2.54	20.9	7.3	41.8	0.006	0.194	0.311	0.983	0.0102	0.772	0.209	0.573	0.142	0.323	0.00824	0.608	0.638
Benzo(a)anthracene			20	< 0.007	1.44	6.34	**122**	**23.4**	19.8	0.005	0.654	0.847	2.89	0.0104	1.68	0.918	2.73	0.658	1.15	0.029	1.4	1.54
Benzo(a)pyrene			2	0.004	1.97	**10.1**	**181**	**35.8**	**26.4**	0.005	0.692	0.856	**2.94**	0.0118	2.00	0.657	**2.95**	0.704	1.34	0.0451	1.93	**2.02**
Benzo(b)fluoranthene			20	< 0.007	1.92	7.98	**99.9**	19.5	**20.2**	0.006	0.643	0.850	2.58	0.0154	2.13	0.578	2.13	0.536	1.02	0.0324	1.7	1.79
Benzo(g,h,i)perylene			1,000	0.004	1.43	7.48	93.7	19.4	17.2	0.005	0.433	0.512	1.71	0.0106	1.61	0.226	1.69	0.399	0.775	0.0449	1.45	1.5
Benzo(k)fluoranthene			70	< 0.007	1.74	8.01	**106**	22.3	19.4	0.006	0.616	0.806	2.41	<0.0113	1.62	0.578	2.19	0.533	1.02	0.0309	1.55	1.65
Chrysene			200	< 0.007	1.86	7.66	109	22.6	23.6	0.008	0.767	0.975	<0.0179	<0.0156	<0.0151	<0.00956	2.47	0.625	1.18	0.0417	1.85	2.00
Dibenzo(a,h)anthracene			2	< 0.007	0.419	1.55	**22.3**	**4.52**	**3.63**	< .0081	0.110	0.150	0.567	<0.0156	0.452	0.122	0.437	0.101	0.218	0.0101	0.365	0.395
Fluoranthene			1,000	< 0.007	3.02	9.59	99.10	30.5	61.5	0.024	1.24	1.67	4.51	0.0368	3.46	1.12	4.54	1.3	2	0.042	2.7	2.83
Fluorene			1,000	0.006	0.163	0.874	4.94	2.4	86.3	0.005	0.042	0.154	0.375	0.00908	0.465	0.0456	0.0652	0.0249	0.0663	0.00297	0.166	0.226
Indeno(1,2,3-cd)pyrene			20	0.004	1.52	7.55	**91.6**	19.1	17.4	0.005	0.461	0.564	2.26	0.0141	2.07	0.356	2.2	0.527	1.01	0.0406	1.76	1.83
Naphthalene			500	0.008	0.296	3.42	23	10	49.8	0.006	0.126	0.153	1.53	0.00906	2.29	0.0374	0.123	0.0378	0.0755	0.00692	0.362	0.599
Phenanthrene			500	0.007	1.22	3.74	19.1	7.23	253	0.014	0.594	0.873	1.51	0.0177	2.15	0.119	1.61	0.508	0.982	0.0306	1.29	1.35
Pyrene			1,000	0.003	3	11.3	145	42.8	78.2	0.024	1.43	1.78	4.62	0.0336	3.33	1.0	4.01	1.11	1.91	0.0527	2.8	2.75
Total PAHs			NS	0.0475	21.6	93.0	1,195	283	1,106	0.130	8.32	11.0	30.4	0.179	25.4	6.06	28.0	7.30	13.4	0.440	20.9	22.1
Petroleum Hydrocarbons	8015 Mod	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000																			
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100																			
C9 to C12 Aliphatic Hydrocarbons			1,000																			
C9 to C10 Aromatic Hydrocarbons			100																			
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000																			
C19 to C36 Aliphatic Hydrocarbons			3,000																			
C11 to C22 Aromatic Hydrocarbons			1,000																			
General Chemistry/Other																						
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	29,200	233,000	233,000	274,000	297,000	130,000	61,800	118,000	114,000	148,000	64,100	130,000	30,700	43,400	22,300	10,300	50,800	146,000	165,000
Percent Solids	5035	%	NS	59	13	19	24	20	35	51	45	63	21	26	27	41	86	73	74	70	17	16

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 4. Sediment Chemical Testing Results - Mudflat
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

			Sample Location:	SS620	SS622	SS623	SS631	SS632	SS633	SS634	SS637	SS640	664			665		666			
			Sample ID:	SS620	SS622	SS623	SS631	SS632	SS633	SS634	SS637	SS640	SS664-S2	SS664-S3	SS664-S4	SS665-S1	SS665-S2	SS666-S2	SS666-S3	SS666-S4	SS666-S5
			Lab Sample ID:	F180046	F180046	F180046	F180070	F180070	F180070	F180070	F180070	F180070	F190041	F190041	F190041	F190041	F190041	F190041	F190041	F190041	F190041
			Property:	41 Oakland St	39 Oakland St	43 Oakland St	39 Oakland St	39 Oakland St	39 Oakland St	41 Oakland St	4 Oakland Ct	37 Oakland St	39 Oakland St	39 Oakland St	39 Oakland St	39 Oakland St	39 Oakland St	39 Oakland St	39 Oakland St	39 Oakland St	39 Oakland St
			Area:	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat
			Sample Date:	08/15/2018	08/15/2018	08/15/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	09/11/2019	09/11/2019	09/11/2019	09/10/2019	09/10/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019
			Soil/Sediment Type:	Organic Soil w/Sand	Sand w/Silt	Clayey Sand	Sand w/Gravel	Sand w/Silt	Silty Sand	Sand w/Gravel	Sand w/Silt&Gravel	Silty Sand w/Gravel	Organics	Organics	Organics	Silty Sand	Silty Sand	Organics	Organics	Organics	Organics
			Sample Depth (feet):	0-2.5	0-1.8	0-1.7	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0.9-1.1	1.9-2.1	2.6-2.8	0-0.5	0.9-1.1	0.9-1.1	1.9-2.1	2.9-3.1	3.9-4
Analyte	**Method**	**Units**	**S-1/GW-3**																		
Volatile Organic Compounds (VOCs)	8260	mg/kg					NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40	< 0.475	< 0.21	< 0.376															
Ethylbenzene			500	< 0.475	< 0.21	< 0.376															
Toluene			500	< 0.475	< 0.21	< 0.376															
Xylene, o-			500	< 0.475	< 0.21	< 0.376															
Xylene p,m-			500	< 0.951	< 0.42	< 0.752															
Xylenes, Total			500	< 0.951	< 0.42	< 0.752															
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg																			
2-Methylnaphthalene			300	0.028	0.089	0.061	0.224	0.134	0.0685	0.00472	0.0307	0.0216	0.006	< 0.00523	0.00247	0.0864	0.0274	0.0254	< 0.00713	< 0.00565	< 0.00494
Acenaphthene			1,000	0.153	2.19	0.0225	0.839	2.43	1.30	0.0454	0.0719	0.0247	0.07	0.00291	0.02	0.97	0.555	0.00916	0.00394	< 0.00566	< 0.00495
Acenaphthylene			10	0.095	0.823	0.169	1.54	1.54	1.20	0.0438	0.0634	0.0673	0.0203	< 0.00523	0.00248	0.469	0.0855	0.101	0.00504	< 0.00567	< 0.00496
Anthracene			1,000	0.178	1.81	0.321	2.89	3.58	2.09	0.144	0.180	0.0800	0.18	0.011	0.0321	1.54	0.8	0.148	0.00583	< 0.00568	< 0.00497
Benzo(a)anthracene			20	0.263	2.79	1.76	4.91	3.54	3.65	0.474	0.603	0.244	0.149	0.00383	0.0162	3.14	0.623	0.872	0.0116	< 0.00569	< 0.00498
Benzo(a)pyrene			2	0.265	**3.27**	**2.08**	**4.83**	**4.34**	**4.45**	0.406	0.589	0.272	0.12	0.003	0.0142	**3.03**	0.542	0.788	0.0132	< 0.00570	< 0.00499
Benzo(b)fluoranthene			20	0.229	2.08	1.28	4.34	2.50	2.40	0.267	0.474	0.205	0.0667	< 0.00523	0.00679	2.05	0.321	0.534	0.0104	< 0.00571	< 0.00500
Benzo(g,h,i)perylene			1,000	0.139	1.65	1.08	3.05	2.52	2.48	0.163	0.372	0.175	0.06	< 0.00523	0.0074	1.85	0.314	0.455	0.00758	< 0.00572	< 0.00501
Benzo(k)fluoranthene			70	0.204	2.04	1.23	4.14	2.84	3.05	0.368	0.512	0.214	0.0884	0.00298	0.012	2.40	0.46	0.60	0.00894	< 0.00573	< 0.00502
Chrysene			200	0.277	2.45	1.77	5.82	3.35	3.18	0.441	0.668	0.232	0.17	0.01	0.0249	3.07	0.628	0.868	0.0111	< 0.00574	< 0.00503
Dibenzo(a,h)anthracene			2	0.041	0.419	0.32	0.824	0.509	0.478	0.06	0.0932	0.0397	0.0111	< 0.00523	< 0.00458	0.389	0.0688	0.115	< 0.00713	< 0.00575	< 0.00504
Fluoranthene			1,000	0.527	6.93	1.86	12.7	10.0	9.08	0.548	1.34	0.469	0.359	0.0096	0.0382	8.46	2.44	1.06	0.0275	0.0029	< 0.00505
Fluorene			1,000	0.075	0.568	0.06	0.978	1.11	0.873	0.0158	0.0554	0.0197	0.042	< 0.00523	0.00762	0.588	0.452	0.029	0.00407	< 0.00565	< 0.00506
Indeno(1,2,3-cd)pyrene			20	0.170	1.92	1.05	3.11	2.27	2.24	0.180	0.363	0.165	0.05	< 0.00523	0.00528	1.48	0.257	0.34	0.00675	< 0.00566	< 0.00507
Naphthalene			500	0.034	0.155	0.089	0.355	0.417	0.163	0.0075	0.0335	0.0369	0.0104	< 0.00523	0.00394	0.179	0.0476	0.0371	0.00525	< 0.00567	< 0.00508
Phenanthrene			500	0.269	3.96	0.478	7.91	8.82	7.21	0.0447	0.949	0.206	0.31	0.009	0.0489	4.25	3.48	0.16	0.028	0.00342	0.00272
Pyrene			1,000	0.653	9.32	3.1	11.9	13.8	12.7	0.606	1.34	0.471	0.461	0.0113	0.0522	9.34	2.72	1.42	0.0381	0.00347	< 0.00494
Total PAHs			NS	3.60	42.5	16.7	70.4	63.7	56.6	3.82	7.74	2.94	2.17	0.062	0.293	43.3	13.8	7.56	0.187	0.00979	0.00272
Petroleum Hydrocarbons	8015 Mod	mg/kg					NT	NT	NT	NT			NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000	272	774	481					20	76.8									
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100																		
C9 to C12 Aliphatic Hydrocarbons			1,000																		
C9 to C10 Aromatic Hydrocarbons			100																		
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000																		
C19 to C36 Aliphatic Hydrocarbons			3,000																		
C11 to C22 Aromatic Hydrocarbons			1,000																		
General Chemistry/Other																					
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	NT	NT	NT	103,000	29,100	91,200	74,700	98,300	< 310	48400	24300	12,000	21,000	25,700	25,600	44,600	23,900	15,500
Percent Solids	5035	%	NS	59	80	57	70	72	42	48	70	82	60	68	68	73	70	76	52	68	77

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 4. Sediment Chemical Testing Results - Mudflat
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

			Sample Location:	**667**		**668**		**669**		**670**		**671**		**672**		**685**	**686**	**716**		**717**	
			Sample ID:	**SS667-S1**	**SS667-S2**	**SS668-S1**	**SS668-S2**	**SS669-S1**	**SS669-S3**	**SS670-S1**	**SS670-S2**	**SS671-S1**	**SS671-S2**	**SS672-S1**	**SS672-S3**	**SS685-S3**	**SS686-S3**	**SS716-S1**	**SS716-S2**	**SS717-S1**	**SS717-S3**
			Lab Sample ID:	**F190041**	**F190041**	**F190041**	**F190040**	**F190046**	**F190046**	**F190040**	**F190040**	**F190046**	**F190046**	**F190048**	**F190048**	**F190050**	**F190050**	**F190056**	**F190056**	**F190056**	**F190056**
			Property:	**39 Oakland St**	**39 Oakland St**	**39 Oakland St**	**39 Oakland St**	**39 Oakland St**	**39 Oakland St**	**39 Oakland St**	**39 Oakland St**	**41 Oakland St**	**41 Oakland St**	**39 Oakland St**	**39 Oakland St**	**37 Oakland St**	**41 Oakland St**	**37 Oakland St**	**37 Oakland St**	**37 Oakland St**	**37 Oakland St**
			Area:	**Mudflat**	**Mudflat**	**Mudflat**	**Mudflat**	**Mudflat**	**Mudflat**	**Mudflat**	**Mudflat**	**Mudflat**	**Mudflat**	**Mudflat**	**Mudflat**	**Mudflat**	**Mudflat**	**Mudflat**	**Mudflat**	**Mudflat**	**Mudflat**
			Sample Date:	**09/11/2019**	**09/11/2019**	**09/11/2019**	**09/11/2019**	**09/23/2019**	**09/23/2019**	**09/10/2019**	**09/10/2019**	**09/23/2019**	**09/23/2019**	**09/24/2019**	**09/24/2019**	**09/10/2019**	**09/10/2019**	**11/11/2019**	**11/11/2019**	**11/11/2019**	**11/11/2019**
			Soil/Sediment Type:	**Silty Sand**	**Silty Sand**	**Organics**	**Silty Sand**	**Silty Sand**	**Silty Sand**	**Organics**	**Silty Sand**	**Silty Sand**	**Silty Sand**	**Organics**	**Sand**	**Silty Sand**	**Silty Sand**	**Silty Sand**	**Silty Sand**	**Silty Sand**	**Silty Sand**
			Sample Depth (feet):	**0-0.5**	**0.9-1.1**	**0-0.5**	**0.9-1.1**	**1.5-2.2**	**4.6-4.7**	**0-0.5**	**0.9-1.1**	**1.3-1.5**	**1.9-2.1**	**0-0.5**	**1.9-2.1**	**1.9-2.1**	**1.9-2.1**	**3-3.9**	**4.5-4.6**	**0-0.5**	**4.2-4.3**
Analyte	**Method**	**Units**	**S-1/GW-3**																		
Volatile Organic Compounds (VOCs)	8260	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40																		
Ethylbenzene			500																		
Toluene			500																		
Xylene, o-			500																		
Xylene p,m-			500																		
Xylenes, Total			500																		
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg																			
2-Methylnaphthalene			300	0.0619	0.158	0.228	0.961	0.414	< 0.00508	0.44	0.0848	0.672	< 0.00898	0.186	0.0413	0.0757	0.0277	1.57	0.0176	0.00705	< 0.00527
Acenaphthene			1,000	0.87	0.0305	6.89	3.83	2.84	0.00386	9.57	0.47	1.28	0.00529	3.84	1.86	0.0637	0.0277	16.1	0.0237	0.171	< 0.00527
Acenaphthylene			10	1.03	0.592	2.11	0.342	0.795	0.00831	5.29	0.299	**10.4**	0.0172	1.85	0.354	0.137	0.02	3.16	0.0453	0.0308	0.00965
Anthracene			1,000	3.45	0.431	5.14	0.655	2.840	0.00504	10.7	0.707	19.4	0.00617	3.97	1.25	0.625	0.118	18.4	0.0428	0.0189	< 0.00527
Benzo(a)anthracene			20	4.76	2.56	9.22	1.32	3.02	0.00395	19.9	1.4	**47**	0.00638	9.19	1.74	1.96	0.252	18.1	0.134	0.0503	< 0.00527
Benzo(a)pyrene			2	**5.1**	**3.1**	**9.75**	1.26	**2.98**	0.0037	**21.5**	1.33	**77.2**	< 0.00898	**11.7**	1.72	1.33	0.147	**13.8**	0.13000	0.072	< 0.00527
Benzo(b)fluoranthene			20	2.5	1.78	5.13	0.904	1.95	0.00255	11.4	0.979	**29.2**	< 0.00898	6.24	1.3	0.85	0.124	9.71	0.0716	0.0368	< 0.00527
Benzo(g,h,i)perylene			1,000	2.6	1.96	5.01	0.748	1.69	< 0.00508	10.80	0.804	33	< 0.00898	6.06	1.01	0.382	0.0603	7.49	0.0826	0.044	< 0.00527
Benzo(k)fluoranthene			70	3.22	1.63	6.17	0.949	2.21	< 0.00509	12.30	1.07	35.6	< 0.00898	7.42	1.44	1.23	0.159	9.47	0.0718	0.04	< 0.00527
Chrysene			200	3.81	2.78	7.14	1.34	3.55	0.00466	14.60	1.45	45.2	0.00632	8.22	1.77	1.74	0.26	19.7	0.135	0.0519	< 0.00527
Dibenzo(a,h)anthracene			2	0.491	0.477	0.946	0.17	0.349	< 0.00508	**2.070**	0.221	**5.57**	< 0.00898	1.02	0.245	0.175	0.0226	**2.12**	0.0174	0.010	< 0.00527
Fluoranthene			1,000	12.2	1.9	21	3.48	7.8	0.00948	44.2	2.69	105	0.03	18.7	3.93	2.1	0.478	35.5	0.121	0.0922	0.00311
Fluorene			1,000	0.599	0.0902	2.73	1.13	1.47	0.00299	5.23	0.167	0.93	< 0.00898	0.929	0.714	0.119	0.0446	12.6	0.0231	0.00866	< 0.00527
Indeno(1,2,3-cd)pyrene			20	2.07	1.14	3.98	0.616	1.6	< 0.00508	8.74	0.669	**30.2**	< 0.00898	5.66	1.08	0.468	0.0682	7.39	0.07	0.0333	< 0.00527
Naphthalene			500	0.163	0.163	0.566	0.663	0.573	0.00561	0.973	0.12	1.95	0.00916	0.572	0.107	0.0941	0.038	2.52	0.0202	0.00824	< 0.00527
Phenanthrene			500	9.28	0.496	19.1	1.34	10.4	0.0122	43.2	1.33	32.8	0.00492	11.2	5.3	0.669	0.251	64.8	0.107	0.0201	< 0.00527
Pyrene			1,000	17.4	4.09	29.1	3.99	10.1	0.0125	63.7	3.18	158	0.027	25.4	4.05	1.85	0.422	52.4	0.33	0.177	0.00454
Total PAHs			NS	69.6	23.3	134	23.7	54.6	0.0749	285	17.0	633	0.108	122	27.9	13.9	2.52	295	1.44	0.868	0.0173
Petroleum Hydrocarbons	8015 Mod	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000																		
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100																		
C9 to C12 Aliphatic Hydrocarbons			1,000																		
C9 to C10 Aromatic Hydrocarbons			100																		
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000																		
C19 to C36 Aliphatic Hydrocarbons			3,000																		
C11 to C22 Aromatic Hydrocarbons			1,000																		
General Chemistry/Other																					
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	21,000	14,500	45,300	32,200	30,900	13,300	62,000	34700	36,900	20,800	68,500	9,360	50,000	35,000	73,000	57,500	81,600	81,000
Percent Solids	5035	%	NS	76	75	51	85	84	79	55	72	66	44	43	92	64	64	65	48	56	65

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 4. Sediment Chemical Testing Results - Mudflat
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

			Sample Location:	718	719	720		721		722	746		761		797	
			Sample ID:	SS718-S5	SS719-S1	SS720-S1	SS720-S2	SS721-S1	SS721-S2	SS722-S1	SS746-S1	SS746-S3	SS761-S1	SS761-S2	SS797-S1	SS797-S1D
			Lab Sample ID:	F190056	F190056	F190057	F190057	F190057	F190057	F190057	F200008	F200008	F200013	F200013	F200036	F200036
			Property:	39 Oakland St	41 Oakland St	41 Oakland St	41 Oakland St	4 Oakland Ct	4 Oakland Ct	4 Oakland Ct	37 Oakland St	37 Oakland St	4 Oakland Ct	4 Oakland Ct	41 Oakland St	41 Oakland St
			Area:	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat
			Sample Date:	11/11/2019	11/11/2019	11/12/2019	11/12/2019	11/12/2019	11/12/2019	11/12/2019	2/5/2020	2/5/2020	3/9/2020	3/9/2020	7/14/2020	7/14/2020
			Soil/Sediment Type:	Silty Sand	Organics	Silty Sand	Silty Sand	Silty Sand	Sand	Organics	Organic Soil	Clay	Sand w/Silt	Silty Sand	Sand w/Silt	Sand w/Silt
			Sample Depth (feet):	7.8-7.9	0-0.1	0.7-0.8	1.4-1.5	1-1.1	2.3-2.4	0.7-0.8	1.9-2.1	4.6-5.1	0.3-0.5	2.2-2.4	0-1	0-1
Analyte	**Method**	**Units**	**S-1/GW-3**													
Volatile Organic Compounds (VOCs)	8260	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40													
Ethylbenzene			500													
Toluene			500													
Xylene, o-			500													
Xylene p,m-			500													
Xylenes, Total			500													
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg														
2-Methylnaphthalene			300	< 0.00426	0.252	0.896	0.0167	0.954	0.00457	0.311	2.51	0.003	0.083	0.009	0.077	0.054
Acenaphthene			1,000	< 0.00426	3.44	2.9	0.0188	1.4	0.0051	0.751	26.5	0.012	0.074	0.011	0.282	0.179
Acenaphthylene			10	0.00475	2.61	2.17	0.0346	**16.5**	0.0179	3.71	5.99	0.003	0.982	0.028	0.534	0.274
Anthracene			1,000	< 0.00426	4.52	7.38	0.0435	40	0.015	6.87	22.1	0.010	0.454	0.068	0.739	0.325
Benzo(a)anthracene			20	< 0.00426	8.16	11.4	0.108	**103**	0.0284	15.8	**33.9**	0.013	2.08	0.287	1.43	0.608
Benzo(a)pyrene			2	< 0.00426	**10.4**	**11.9**	0.09620	**109**	0.02520	**19**	**25.1**	0.009	**3.44**	0.249	1.66	0.702
Benzo(b)fluoranthene			20	< 0.00426	5.59	9.32	0.0722	**49**	0.0157	10.8	16	0.006	2.01	0.166	1.16	0.539
Benzo(g,h,i)perylene			1,000	< 0.00426	6.09	7.91	0.0467	52.4	0.0126	10.6	11.4	0.005	2.75	0.135	0.957	0.458
Benzo(k)fluoranthene			70	< 0.00426	6.45	9.46	0.0896	**70.50**	0.0188	12.2	18.8	0.007	2.14	0.187	1.22	0.541
Chrysene			200	< 0.00426	7.5	12.2	0.113	99.4	0.0299	16.4	40	0.015	2.40	0.325	1.51	0.687
Dibenzo(a,h)anthracene			2	< 0.00426	1.09	1.78	0.0145	**12.5**	< 0.00862	**2.05**	**3.3**	< 0.004	0.631	0.037	0.241	0.114
Fluoranthene			1,000	0.00349	16.9	31.8	0.205	171	0.0521	26.1	48.3	0.023	2.45	0.430	3.12	1.49
Fluorene			1,000	< 0.00426	1.43	2.6	0.0285	1.72	0.00754	0.948	19.6	0.009	0.121	0.020	0.224	0.102
Indeno(1,2,3-cd)pyrene			20	< 0.00426	5.63	8.07	0.05	**46.3**	0.01	9.84	13.5	0.005	2.98	0.145	0.945	0.445
Naphthalene			500	< 0.00426	0.62	1.68	0.0207	3.44	0.00537	0.704	5.85	0.006	0.092	0.014	0.212	0.131
Phenanthrene			500	0.00416	12.7	19.9	0.0984	45.5	0.0298	14.4	65.7	0.039	0.816	0.135	1.39	0.454
Pyrene			1,000	0.00373	24.4	38	0.211	265	0.0602	35.6	70.6	0.035	3.52	0.608	3.8	2.01
Total PAHs			NS	0.0161	118	179	1.27	1,088	0.341	186	429	0.199	27.0	2.85	19.5	9.11
Petroleum Hydrocarbons	8015 Mod	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000													
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100													
C9 to C12 Aliphatic Hydrocarbons			1,000													
C9 to C10 Aromatic Hydrocarbons			100													
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000													
C19 to C36 Aliphatic Hydrocarbons			3,000													
C11 to C22 Aromatic Hydrocarbons			1,000													
General Chemistry/Other																
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	31,000	49,100	69,700	29,900	213,000	51,600	178,000	71,400	12,600	39,000	26,500	34,200	43,800
Percent Solids	5035	%	NS	80	52	57	64	67	48	70	52	80	79	66	63	64

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 5. Sediment Chemical Testing Results - River
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

			Sample Location:	SS619	SS621	SS638	SS639	SS642	SS643	SS644	SS645	SS646	SS647	SS648	SS649	SS650	SS651	SS652	SS653	SS654	SS655	SS656	SS657
			Sample ID:	SS619	SS621	SS638	SS639	SS642	SS643	SS644	SS645	SS646	SS647	SS648	SS649	SS650	SS651	SS652	SS653	SS654	SS655	SS656	SS657
			Lab Sample ID:	F180046	F180046	F180071	F180071	F180071	F180071	F180071	F180071	F190024	F190024	F190024	F190024	F190024	F190024	F190024	F190024	F190024	F190024	F190025	F190025
			Property:	39 Oakland St	41 Oakland St	4 Oakland Ct	37 Oakland St	1 Field St	35 Oakland St	1 Field St	Mill St Ext	24 Oak St	26 Oak St	28 Oak St	39 Oakland St	39 Oakland St	41 Oakland St	41 Oakland St	39 Oakland St	39 Oakland St	39 Oakland St	39 Oakland St	39 Oakland St
			Area:	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River
			Sample Date:	08/15/2018	08/15/2018	12/20/2018	12/20/2018	12/20/2018	12/20/2018	12/20/2018	12/20/2018	4/23/2019	4/23/2019	4/23/2019	4/23/2019	4/23/2019	4/23/2019	4/23/2019	4/23/2019	4/23/2019	4/23/2019	4/24/2019	4/24/2019
			Soil/Sediment Type:	Sandy Organic Soil	Sandy Organic Soil	Silty Sand w/Gravel	Silty Sand w/Gravel	Sandy Organic Soil	Sandy Organic Soil	Sandy Organic Soil	Sand w/Silt	Silty Sand	Silty Clay	Silty Clay	Silty Clay	Sandy Organic Soil	Sandy Organic Soil	Sandy Organic Soil	Sandy Organic Soil	Sandy Organic Soil	Sandy Organic Soil	Sandy Organic Soil	Sandy Organic Soil
			Sample Depth (feet):	0-1.9	0-1.8	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5
Analyte	**Method**	**Units**	**S-1/GW-3**																				
Volatile Organic Compounds (VOCs)	8260	mg/kg				NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40	< 0.361	< 0.418																		
Ethylbenzene			500	< 0.361	< 0.418																		
Toluene			500	< 0.361	< 0.418																		
Xylene, o-			500	< 0.361	< 0.418																		
Xylene p,m-			500	< 0.723	< 0.836																		
Xylenes, Total			500	< 0.723	< 0.836																		
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg																					
2-Methylnaphthalene			300	0.704	0.584	0.0111	0.166	0.0197	0.0387	0.0438	0.0167	0.0502	0.0715	0.0396	0.116	0.185	0.209	0.256	0.274	0.107	0.386	0.0243	0.0228
Acenaphthene			1,000	2.08	3.43	0.0234	0.527	0.0536	0.185	0.109	0.0219	0.0788	0.223	0.055	3.04	1.96	4.04	2.59	3.43	3.00	8.31	0.187	0.0278
Acenaphthylene			10	2.78	2.75	0.132	0.408	0.259	0.198	0.365	0.0423	0.243	0.314	0.656	1.51	1.19	2.71	2.62	1.83	1.11	6.46	0.173	0.204
Anthracene			1,000	4.15	9.65	0.133	1.39	0.302	0.404	0.499	0.0537	0.315	0.617	0.583	2.20	2.49	6.74	9.52	3.92	2.03	10.7	0.330	0.228
Benzo(a)anthracene			20	8.81	8.52	0.297	3.52	0.801	0.865	1.61	0.243	1.25	1.70	3.16	5.43	5.37	11.4	8.53	7.18	3.69	12.7	1.13	0.708
Benzo(a)pyrene			2	**9.62**	**9.74**	0.298	**3.37**	0.759	0.849	1.75	0.267	1.46	1.68	**3.88**	**6.63**	**6.03**	**15.3**	**10.6**	**7.95**	**4.11**	**16.3**	1.10	0.705
Benzo(b)fluoranthene			20	7.42	6.19	0.241	3.15	0.680	0.783	1.23	0.157	1.25	1.42	2.18	3.84	3.62	8.23	6.11	4.55	2.52	7.27	1.03	0.603
Benzo(g,h,i)perylene			1,000	5.05	4.82	0.192	2.02	0.446	0.500	0.965	0.157	0.882	0.937	2.14	3.72	3.27	7.44	5.66	4.24	2.27	8.55	0.603	0.374
Benzo(k)fluoranthene			70	7.65	6.51	0.276	2.93	0.685	0.716	1.30	0.189	1.16	1.30	2.62	4.44	4.10	8.16	5.90	5.03	2.60	10.7	0.886	0.559
Chrysene			200	9.26	8.81	0.341	3.51	0.800	0.878	1.67	0.238	1.39	1.62	3.29	4.70	4.64	9.73	8.39	5.67	2.94	12.9	1.13	0.678
Dibenzo(a,h)anthracene			2	1.43	1.31	0.0470	0.592	0.120	0.137	0.248	0.0398	0.227	0.264	0.456	0.797	0.697	1.50	1.12	0.948	0.498	1.53	0.165	0.106
Fluoranthene			1,000	21.2	17.1	0.654	7.66	1.65	1.99	2.57	0.275	2.29	3.00	3.52	12.1	11.7	27.6	20.8	15.6	8.39	38.1	2.32	1.36
Fluorene			1,000	1.2	2.16	0.0325	0.495	0.0549	0.141	0.112	0.0171	0.105	0.227	0.0677	0.563	0.897	2.30	1.58	1.89	1.52	3.94	0.0981	0.0656
Indeno(1,2,3-cd)pyrene			20	6.23	5.64	0.185	2.11	0.468	0.522	0.897	0.124	0.996	1.10	2.16	3.89	3.53	7.82	5.91	4.45	2.40	8.34	0.731	0.450
Naphthalene			500	1.04	0.792	0.0185	0.180	0.043	0.0843	0.0805	0.0248	0.0755	0.134	0.0781	0.283	0.33	0.485	0.683	0.601	0.190	0.894	0.0429	0.0392
Phenanthrene			500	11.7	13.9	0.381	4.91	0.861	1.34	1.29	0.167	1.06	1.85	0.830	4.55	6.44	19.9	15.8	14.0	8.52	34.5	1.11	0.744
Pyrene			1,000	23	21.7	0.637	6.55	1.41	1.70	2.87	0.374	2.21	2.77	5.03	15.7	15.0	38.6	28.8	21.1	11.1	53.2	2.04	1.22
Total PAHs			NS	123	124	3.90	43.5	9.41	11.3	17.6	2.41	15.0	19.2	30.7	73.5	71.4	172	135	103	57.0	235	13.1	8.09
Petroleum Hydrocarbons	8015 Mod	mg/kg										NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000	**3,610**	**3,570**	167	565	324	252	513	95.7												
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100																				
C9 to C12 Aliphatic Hydrocarbons			1,000																				
C9 to C10 Aromatic Hydrocarbons			100																				
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000																				
C19 to C36 Aliphatic Hydrocarbons			3,000																				
C11 to C22 Aromatic Hydrocarbons			1,000																				
General Chemistry/Other																							
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	NT	76,700	7,620	33,400	19,900	15,000	80,700	12,200	64,400	27,100	105,000	56,300	55,700	91,900	45,600	27,300	87,600	38,400	34,200	7,420
Percent Solids	5035	**%**	NS	58	55	80	65	69	73	45	72	39	66	47	48	46	43	65	60	57	71	71	77

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 5. Sediment Chemical Testing Results - River
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

			Sample Location:	SS658	SS659	SS660	SS661	SS662	SS663	673		674	675	676	677				678		679		
			Sample ID:	SS658	SS659	SS660	SS661	SS662	SS663	SS673-S2	SS673-S3	SS674-S4	SS675-S2	SS676-S2	SS677-S2	SS677-S3	SS677-S4A	SS677-S5A	SS678-S1	SS678-S4	SS679-S1	SS679-S4	SS679-S5
			Lab Sample ID:	F190025	F190025	F190025	F190025	F190025	F190025	F190040	F190040	F190040	F190048	F190040	F190040	F190040	F190040	F190040	F190040	F190039	F190039	F190039	F190039
			Property:	41 Oakland St	41 Oakland St	41 Oakland St	39 Oakland St	3 River St	3 River St	39 Oakland St	39 Oakland St	39 Oakland St	41 Oakland St	39 Oakland St	41 Oakland St	41 Oakland St	41 Oakland St	41 Oakland St	41 Oakland St	41 Oakland St	1 Field St	1 Field St	1 Field St
			Area:	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River
			Sample Date:	4/24/2019	4/24/2019	4/24/2019	4/24/2019	4/24/2019	4/24/2019	09/12/2019	09/12/2019	09/12/2019	09/24/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019
			Soil/Sediment Type:	Sandy Organic Soil	Sandy Organic Soil	Sandy Organic Soil	Silty Clay	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Sand	Organic Soil	Silty Sand	Silty Sand	Silty Sand	Sand	Organic Soil	Organic Soil	Silty Sand	Organic Soil	Organic Soil
			Sample Depth (feet):	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	2.4-2.6	3.7-3.8	2.9-3.1	1.9-2.1	1.9-2.1	0-1	1.4-1.6	2.6-2.8	3.9-4	0-0.5	4.4-4.6	0-0.5	2.9-3.1	3.9-4
Analyte	**Method**	**Units**	**S-1/GW-3**																				
Volatile Organic Compounds (VOCs)	8260	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40																				
Ethylbenzene			500																				
Toluene			500																				
Xylene, o-			500																				
Xylene p,m-			500																				
Xylenes, Total			500																				
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg																					
2-Methylnaphthalene			300	2.26	0.222	0.141	0.115	0.0673	0.0539	0.285	0.0572	0.567	1.3	0.14	0.975	0.0686	1.1	2.45	0.271	5.37	0.0458	9.25	0.254
Acenaphthene			1,000	41.0	3.08	1.57	1.27	0.0882	0.107	3.37	0.739	8.26	8.62	0.66	4.72	6.45	17.3	19.0	3.67	309	0.086	62.5	0.512
Acenaphthylene			10	**19.4**	1.95	0.840	1.32	0.467	0.306	1.2	0.0358	2.84	0.231	0.334	0.762	0.123	0.694	2.88	2.22	**18.7**	0.308	2.78	0.397
Anthracene			1,000	51.8	3.74	1.97	2.02	0.658	0.447	7.25	0.374	12.3	18.0	1.24	20.1	0.691	6.53	42.2	5.38	201	0.485	30.7	1.07
Benzo(a)anthracene			20	**72.7**	6.86	3.37	5.29	2.19	1.52	10.2	0.66	16.7	**24.5**	2.32	**21.0**	0.659	2.93	**23.5**	9.33	**132**	2.66	17.6	3.13
Benzo(a)pyrene			2	**92.2**	**8.97**	**4.49**	**6.80**	**2.93**	1.70	**9.11**	0.587	**12**	**23.1**	**2.05**	**14.6**	0.55	**2.72**	**20.5**	**10.7**	**106**	**2.42**	**11.9**	**3.11**
Benzo(b)fluoranthene			20	**43.9**	5.40	2.67	4.28	1.94	1.33	7.35	0.442	6.15	16.7	1.48	11.5	0.453	2.19	9.86	5.96	**49.5**	1.79	7.16	2.3
Benzo(g,h,i)perylene			1,000	43.9	4.82	2.43	3.63	1.59	0.949	4.95	0.287	5.22	11.6	1.14	6.83	0.311	1.56	7.08	5.78	49.1	1.3	5.31	1.71
Benzo(k)fluoranthene			70	49.7	5.51	3.01	4.31	1.90	1.35	7.24	0.47	6.79	17.9	1.63	12.3	0.45	2.14	11.9	6.63	**70.5**	1.79	7.14	2.27
Chrysene			200	50.6	6.02	3.20	4.64	2.37	1.57	9.65	0.621	16.2	23.2	2.32	17.3	0.718	2.79	20.5	7.55	125	2.43	16.3	3.01
Dibenzo(a,h)anthracene			2	**7.94**	0.937	0.52	0.750	0.350	0.247	1.49	0.0756	1.41	**3.14**	0.325	**2.25**	0.0833	0.429	1.77	1.23	**11.2**	0.415	1.73	0.477
Fluoranthene			1,000	182	16.6	6.65	12.4	3.22	2.88	23.6	1.33	23.2	61.5	4.33	58.5	1.88	11.0	45.8	19.8	295	3.49	33.7	4.66
Fluorene			1,000	22.7	1.61	0.869	0.688	0.113	0.114	2.61	0.187	5.06	7.5	0.325	7.28	0.554	9.52	9.16	2.05	149	0.114	32.2	0.489
Indeno(1,2,3-cd)pyrene			20	**45.9**	5.14	2.63	3.95	1.71	1.10	4.56	0.24	4.2	13	0.992	6.75	0.255	1.42	5.81	4.65	**39.3**	1.14	4.44	1.42
Naphthalene			500	3.15	0.519	0.310	0.299	0.144	0.109	0.745	0.109	0.841	2.55	0.166	0.815	0.153	4.72	10.3	0.531	10.2	0.0732	16.7	0.436
Phenanthrene			500	215	12.5	5.67	6.91	0.888	1.23	23.9	1.23	32.5	62.3	2.65	55.7	2.03	27.2	66.4	18.3	**669**	1.01	99.6	3.1
Pyrene			1,000	267	22.3	8.69	16.3	4.33	2.87	24.2	1.29	35.7	52.2	4.8	46.3	2.1	11.5	67.2	26.8	421	3.9	49.5	4.74
Total PAHs			NS	1,211	106	49.0	75.0	25.0	17.9	142	8.74	190	347	26.9	288	17.5	106	366	131	2,661	23.5	409	33.1
Petroleum Hydrocarbons	8015 Mod	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000																				
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100																				
C9 to C12 Aliphatic Hydrocarbons			1,000																				
C9 to C10 Aromatic Hydrocarbons			100																				
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000																				
C19 to C36 Aliphatic Hydrocarbons			3,000																				
C11 to C22 Aromatic Hydrocarbons			1,000																				
General Chemistry/Other																							
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	44,300	95,900	95,600	76,500	58,500	49,300	38,900	86,500	26,300	41,100	43,400	12,500	57,000	13,300	29,100	43,500	87,400	22,500	117,000	73,000
Percent Solids	5035	**%**	NS	75	35	44	43	49	71	80	78	77	80	55	82	50	77	82	56	62	78	66	56

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 5. Sediment Chemical Testing Results - River
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

			Sample Location:	**680**				**681**			**682**		**683**			**684**		**687**			**688**	**689**	**690**
			Sample ID:	**SS680-S1**	**SS680-S4**	**SS680-S5**	**SS680R-S1**	**SS681-S1**	**SS681-S3**	**SS681-S4**	**SS682-S2**	**SS682-S3**	**SS683-S2**	**SS683-S4**	**SS683-S5**	**SS684-S2**	**SS684-S4**	**SS687-S1**	**SS687-S2**	**SS687-S4**	**SS688-S4**	**SS689-S2**	**SS690-S5**
			Lab Sample ID:	**F190039**	**F190039**	**F190039**	**F190048**	**F190039**	**F190039**	**F190039**	**F190039**	**F190039**	**F190039**	**F190039**	**F190039**	**F190039**	**F190039**	**F190046**	**F190046**	**F190046**	**F190046**	**F190048**	**F190048**
			Property:	**1 Field St**	**1 Field St**	**1 Field St**	**1 Field St**	**24 Oak St**	**24 Oak St**	**24 Oak St**	**24 Oak St**	**24 Oak St**	**1 Field St**	**1 Field St**	**1 Field St**	**43 Oakland St**	**43 Oakland St**	**37 Oakland St**	**37 Oakland St**	**37 Oakland St**	**37 Oakland St**	**1 Field St**	**1 Field St**
			Area:	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**
			Sample Date:	**09/11/2019**	**09/11/2019**	**09/11/2019**	**09/25/2019**	**09/12/2019**	**09/12/2019**	**09/12/2019**	**09/12/2019**	**09/12/2019**	**09/12/2019**	**09/12/2019**	**09/12/2019**	**09/12/2019**	**09/12/2019**	**09/23/2019**	**09/23/2019**	**09/23/2019**	**09/23/2019**	**09/24/2019**	**09/25/2019**
			Soil/Sediment Type:	**Silty Sand**	**Silty Sand**	**Silty Sand**	**Clay**	**Silty Sand**	**Organic Soil**	**Organic Soil**	**Organic Soil**	**Silty Sand**	**Silty Sand**	**Organic Soil**	**Organic Soil**	**Organic Soil**	**Organic Soil**	**Organic Soil**	**Organic Soil**	**Sand**	**Organic Soil**	**Sandy Silt**	**Organic Soil**
			Sample Depth (feet):	**0-0.5**	**2.9-3.1**	**4.4-4.5**	**5.1-5.3**	**0-0.5**	**1.9-2.1**	**3.1-3.2**	**2.4-2.6**	**3.9-4.1**	**0.9-1.1**	**2.9-3.1**	**3.9-4.1**	**1.2-1.3**	**3.3-3.4**	**0-0.5**	**1.9-2.1**	**5.1-6.1**	**2.9-3.1**	**1.9-2.1**	**3.9-4.1**
Analyte	**Method**	**Units**	**S-1/GW-3**																				
Volatile Organic Compounds (VOCs)	8260	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40																				
Ethylbenzene			500																				
Toluene			500																				
Xylene, o-			500																				
Xylene p,m-			500																				
Xylenes, Total			500																				
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg																					
2-Methylnaphthalene			300	0.0492	0.353	**964**	0.0271	0.641	9.54	0.995	2.35	0.246	0.6	0.135	0.402	0.0462	1.02	0.152	0.204	0.0645	< 0.00508	< 0.00692	0.273
Acenaphthene			1,000	0.141	15.6	**1430**	0.128	1.41	266	28.9	42	0.349	10.8	0.165	0.538	0.233	14.4	3.66	1.37	0.169	< 0.00509	< 0.00692	0.451
Acenaphthylene			10	0.257	2.1	**45.4**	0.0115	0.526	**23.1**	1.03	6.8	0.298	4.11	0.161	0.569	0.235	1.3	0.735	0.839	0.113	0.0082	0.00477	0.421
Anthracene			1,000	0.495	5.54	595	0.065	2.94	191	10.1	78.8	0.837	13.3	0.357	1.4	0.304	8.54	2.69	2.44	0.387	< 0.00508	< 0.00692	4.08
Benzo(a)anthracene			20	1.25	9.02	**308**	0.0759	5.65	**162**	7.3	**42.7**	2.24	19.8	1.33	4.04	0.776	5.97	3.89	5.8	0.561	< 0.00508	< 0.00692	10.7
Benzo(a)pyrene			2	1.21	**10.1**	**278**	0.07	**4.95**	**154**	**6.4**	**39**	**2.43**	**19.4**	1.37	**4.14**	0.838	**4.29**	**3.78**	**5.67**	0.45	< 0.00508	< 0.00692	**10.2**
Benzo(b)fluoranthene			20	0.953	6.01	**120**	0.0339	4.11	**67.5**	3.58	**21.9**	1.19	8.27	0.738	2.29	0.67	2.67	2.8	4.58	0.312	< 0.00508	< 0.00692	8.83
Benzo(g,h,i)perylene			1,000	0.738	5.5	129	0.0341	2.71	69.7	2.9	17.2	1.28	5.93	0.714	2.1	0.585	1.85	2.12	3.13	0.182	< 0.00508	< 0.00692	5.18
Benzo(k)fluoranthene			70	0.95	6.62	**171**	0.0504	3.8	**98.4**	4.34	23.8	1.34	8.06	0.843	2.57	0.668	3.08	2.97	4.66	0.359	< 0.00508	< 0.00692	8.27
Chrysene			200	1.21	8.98	**293**	0.0633	5.20	152	6.5	40	1.99	13.8	1.28	3.66	0.897	5.98	3.9	5.79	0.502	< 0.00508	< 0.00692	11.4
Dibenzo(a,h)anthracene			2	0.206	1.29	**26.4**	0.00603	0.785	**13**	0.74	**3.9**	0.33	1.48	0.179	0.601	0.136	0.565	0.50	0.875	0.0582	< 0.00508	< 0.00692	1.31
Fluoranthene			1,000	2.08	14.4	730	0.223	11.4	319	15.5	131	2.57	34.1	1.64	4.89	1.52	14.1	9.51	11.9	1.05	0.00312	0.00828	17.7
Fluorene			1,000	0.119	5.39	497	0.0652	1.41	113	9.55	26.1	0.23	6.99	0.148	0.57	0.174	7.95	1.83	0.974	0.177	< 0.00508	< 0.00692	0.578
Indeno(1,2,3-cd)pyrene			20	0.624	4.47	**99.5**	0.03	2.47	**46.1**	2.41	14.4	0.84	4.92	0.481	1.55	0.465	1.57	2.24	3.46	0.22	< 0.00508	< 0.00692	5.6
Naphthalene			500	0.079	1.87	**1,990**	0.0105	1.65	29.8	2.99	5.01	0.21	1.42	0.138	0.388	0.0632	2.63	0.302	0.374	0.0728	0.00338	0.0135	0.384
Phenanthrene			500	1.24	19.3	**1,840**	0.467	11.3	493	34	198	1.2	44.2	0.855	3.52	0.846	30.7	9.95	7.67	1.11	0.00387	0.00389	6.93
Pyrene			1,000	2.26	17.7	**1,040**	0.319	10.5	488	22.1	185	4.41	49.8	2.55	7.86	1.88	19.8	9.87	10.8	0.999	0.00373	0.00561	17.1
Total PAHs			NS	13.9	134	10,556	1.69	71.5	2,695	159	878	22.0	247	13.1	41.1	10.3	126	60.9	70.5	6.78	0.0223	0.0361	109
Petroleum Hydrocarbons	8015 Mod	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000																				
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100																				
C9 to C12 Aliphatic Hydrocarbons			1,000																				
C9 to C10 Aromatic Hydrocarbons			100																				
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000																				
C19 to C36 Aliphatic Hydrocarbons			3,000																				
C11 to C22 Aromatic Hydrocarbons			1,000																				
General Chemistry/Other																							
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	37,400	30,600	137,000	2,530	47,800	79,300	40,500	47,100	89,800	61,000	42,500	19,600	73,400	58,300	54,700	47,200	16,700	8,380	30,500	75,600
Percent Solids	5035	**%**	NS	72	78	68	73	81	71	63	71	55	75	62	24	98	81	59	61	90	77	59	54

General Notes:

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7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 5. Sediment Chemical Testing Results - River
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

Sample Location:				**691**		**692**		**693**		**694**		**695**	**696**		**697**	**698**	**699**	**700**		**701**		**702**	**703**
Sample ID:				**SS691-S3**	**SS691-S5**	**SS692-S4**	**SS692-S5**	**SS693-S3**	**SS693-S5**	**SS694-S4**	**SS694-S6**	**SS695-S6**	**SS696-S3**	**SS696-S5**	**SS697-S2**	**SS698-S4**	**SS699-S3**	**SS700-S2**	**SS700-S5**	**SS701-S2**	**SS701-S4**	**SS702-S3**	**SS703-S3**
Lab Sample ID:				**F190048**	**F190048**	**F190048**	**F190048**	**F190048**	**F190048**	**F190048**	**F190048**	**F190048**	**F190048**	**F190048**	**F190048**	**F190051**	**F190051**	**F190051**	**F190051**	**F190051**	**F190051**	**F190051**	**F190051**
Property:				**4 Oakland Ct**	**4 Oakland Ct**	**1 Field St**	**1 Field St**	**24 Oak St**	**24 Oak St**	**1 Field St**	**1 Field St**	**1 Field St**	**37 Oakland St**	**37 Oakland St**	**1 Field St**	**1 Field St**	**1 Field St**	**24 Oak St**	**24 Oak St**	**1 Field St**	**1 Field St**	**1 Field St**	**1 Field St**
Area:				**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**
Sample Date:				**09/24/2019**	**09/24/2019**	**09/24/2019**	**09/24/2019**	**09/25/2019**	**09/25/2019**	**09/25/2019**	**09/25/2019**	**09/25/2019**	**09/25/2019**	**09/25/2019**	**09/25/2019**	**09/26/2019**	**09/26/2019**	**09/26/2019**	**09/26/2019**	**09/26/2019**	**09/26/2019**	**09/26/2019**	**09/26/2019**
Soil/Sediment Type:				**Silty Sand**	**Silty Sand**	**Silty Sand**	**Clay**	**Silty Sand**	**Clay**	**Sand**	**Clay**	**Organic Soil**	**Organic Soil**	**Organic Soil**	**Sand**	**Organic Soil**	**Organic Soil**	**Organic Soil**	**Clay**	**Silty Sand**	**Clay**	**Organic Soil**	**Organic Soil**
Sample Depth (feet):				**1.9-2.1**	**4.4-4.5**	**4.3-4.8**	**6.9-7**	**1.9-2.1**	**3.9-4.1**	**3.3-3.7**	**6.3-6.5**	**4.1-4.3**	**1.9-2.1**	**3.9-4.1**	**0.9-1.1**	**2.9-3.1**	**2.9-3.1**	**1.9-2.1**	**4.9-5.1**	**1.9-2.1**	**5.1-5.3**	**3.9-4.1**	**5.9-6.1**
Analyte	**Method**	**Units**	**S-1/GW-3**																				
Volatile Organic Compounds (VOCs)	8260	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40																				
Ethylbenzene			500																				
Toluene			500																				
Xylene, o-			500																				
Xylene p,m-			500																				
Xylenes, Total			500																				
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg																					
2-Methylnaphthalene			300	0.727	5.68	**3,610**	0.171	0.401	< 0.00472	**1,630**	0.0713	< 0.00487	0.385	13.2	3.22	0.112	7.84	2.18	0.00274	111	0.0174	6.1	170
Acenaphthene			1,000	7.71	61	**3,250**	0.174	0.26	0.00365	**2,310**	0.0971	< 0.00487	3.11	204	19.3	1.25	258	10.4	0.00399	269	0.0684	46.2	287
Acenaphthylene			10	1.47	4.22	**145**	0.013	0.126	< 0.00472	**71.5**	< 0.00493	< 0.00487	0.72	**14.7**	1.65	0.166	**22.2**	3.81	0.0273	**14.5**	0.0141	5.37	**14.4**
Anthracene			1,000	5.4	37	**1,120**	0.0863	0.528	0.00667	**1,800**	< 0.00493	< 0.00487	3.03	136	25.5	0.661	291	17.3	0.00901	128	0.044	39	122
Benzo(a)anthracene			20	9.02	**25.1**	**718**	0.0703	1.3	0.00559	**532**	< 0.00493	< 0.00487	4.63	**111**	**34.4**	0.863	**167**	19.3	0.0183	**78.1**	0.0383	**38.7**	**72.1**
Benzo(a)pyrene			2	**8.53**	**18.5**	**573**	0.0609	1.01	0.00535	**530**	< 0.00493	< 0.00487	**4.6**	**61.6**	**30.4**	0.71	**155**	**14.8**	0.0112	**88.5**	0.0351	**41.6**	**61.7**
Benzo(b)fluoranthene			20	5.8	6.98	**244**	0.0264	0.728	0.00342	**208**	< 0.00493	< 0.00487	3.3	**37.1**	**24.8**	0.457	**68.8**	7.28	0.00608	**41.4**	0.0176	**22.2**	**27.6**
Benzo(g,h,i)perylene			1,000	4.75	4.78	155	0.0282	0.422	0.00259	240	< 0.00493	< 0.00487	2.46	27.3	15.1	0.322	66.6	5.55	0.00528	43.6	0.0162	21.5	26.8
Benzo(k)fluoranthene			70	6.52	8.02	**333**	0.0387	0.844	0.00386	**310**	< 0.00493	< 0.00487	3.53	40.70	24.7	0.488	**97.2**	8.44	0.00803	50.8	0.024	27.7	37.3
Chrysene			200	9.97	25.5	**647**	0.0633	1.2	0.00665	**646**	< 0.00493	< 0.00487	4.95	118	31.9	0.914	159	21.3	0.0158	70.3	0.0364	39.6	69.9
Dibenzo(a,h)anthracene			2	1.10	1.53	**43.6**	0.00605	0.151	< 0.00472	**32.2**	< 0.00493	< 0.00487	0.579	**5.7**	**4.01**	0.0872	**14.9**	1.8	< 0.00522	**8.03**	0.0036	**4.32**	**6.28**
Fluoranthene			1,000	21.6	42.6	**1,330**	0.143	1.92	0.0103	**1,250**	< 0.00493	0.00267	9.81	280	87.5	1.64	370	30.4	0.0181	245	0.095	106	166
Fluorene			1,000	3.63	31.4	**1,260**	0.092	0.285	0.00276	841	0.0296	< 0.00487	2.0	101	15	0.456	132	8.9	0.01	86.7	0.0337	22.3	99.6
Indeno(1,2,3-cd)pyrene			20	4.69	4.94	**152**	0.0252	0.471	0.00248	**206**	< 0.00493	< 0.00487	2.45	**25.9**	17.1	0.32	**62.2**	5.53	0.0047	**39.4**	0.0153	**20.6**	**25**
Naphthalene			500	1.51	11.3	**5,300**	0.208	0.468	0.00278	**3,740**	0.147	0.008	1.1	115	8.1	0.239	30.9	2.66	< 0.00522	183	0.0155	16.5	272
Phenanthrene			500	21.2	113	**4,450**	0.473	1.64	0.0174	**3,460**	0.0146	< 0.00487	8.66	487	90	1.92	**900**	55.7	0.012	**568**	0.2	139	466
Pyrene			1,000	28.2	65.1	**1,920**	0.217	1.98	0.0159	**1,910**	0.00291	< 0.00487	11.3	383	73	2.24	545	47.5	0.0752	368	0.139	144	244
Total PAHs			NS	142	467	25,251	1.90	13.7	0.0894	19,717	0.363	0.0107	66.6	2,161	506	12.8	3,348	263	0.223	2,393	0.827	741	2,168
Petroleum Hydrocarbons	8015 Mod	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000																				
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100																				
C9 to C12 Aliphatic Hydrocarbons			1,000																				
C9 to C10 Aromatic Hydrocarbons			100																				
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000																				
C19 to C36 Aliphatic Hydrocarbons			3,000																				
C11 to C22 Aromatic Hydrocarbons			1,000																				
General Chemistry/Other																							
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	73,800	70,600	133,000	2,590	40,300	3,140	172,000	3,190	16,600	54,600	91,600	70,800	14,800	158,000	63,700	4,110	205,000	2,270	101,000	112,000
Percent Solids	5035	**%**	NS	67	71	50	71	65	71	64	72	76	41	56	64	74	46	60	72	66	72	58	60

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 5. Sediment Chemical Testing Results - River
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

				Sample Location:	704		705			706			707	708			709		710		711		712	
				Sample ID:	SS704-S2	SS704-S4	SS705-S1	SS705-S2	SS705-S3	SS706-S1	SS706-S2	SS706-S3	SS707-S3	SS708-S1	SS708-S2	SS708-S3	SS709-S1	SS709-S3	SS710-S1	SS710-S2	SS711-S1	SS711-S2	SS712-S1	SS712-S2
				Lab Sample ID:	F190051	F190051	F190052	F190052	F190052	F190052	F190052	F190052	F190052	F190052	F190052	F190052	F190052	F190052	F190056	F190056	F190056	F190056	F190056	F190056
				Property:	4 Oakland Ct	4 Oakland Ct	1 Field St	1 Field St	1 Field St	1 Field St	1 Field St	1 Field St	8 Noel St	8 Noel St	8 Noel St	8 Noel St	28 Oak Street	28 Oak Street	39A Water St	39A Water St	1 Field St	1 Field St	33R Oakland St	33R Oakland St
				Area:	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River
				Sample Date:	09/26/2019	09/26/2019	09/27/2019	09/27/2019	09/27/2019	09/27/2019	09/27/2019	09/27/2019	09/27/2019	09/27/2019	09/27/2019	09/27/2019	09/27/2019	9/27/2019	11/11/2019	11/11/2019	11/11/2019	11/11/2019	11/11/2019	11/11/2019
				Soil/Sediment Type:	Organic Soil	Gravel	Silty Sand	Silty Sand	Silt	Organic Soil	Silt	Silt	Silty Sand	Silty Sand	Organic Soil	Clay	Organic Soil	Silty Sand	Silty Sand	Silty Sand	Organic Soil	Silty Sand	Silty Sand	Silty Sand
				Sample Depth (feet):	0.9-1.1	2.9-3.1	0-0.5	4.9-5.1	7.1-7.2	0-0.5	4.3-4.4	6.3-6.5	3.9-4.1	0-0.5	5.4-5.6	6.4-6.5	0-0.5	4.6-4.8	1.9-2.4	3-3.1	0-0.9	2-2.1	4.1-5.1	6.2-6.3
Analyte	**Method**	**Units**	**S-1/GW-3**																					
Volatile Organic Compounds (VOCs)	8260	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40																					
Ethylbenzene			500																					
Toluene			500																					
Xylene, o-			500																					
Xylene p,m-			500																					
Xylenes, Total			500																					
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg																						
2-Methylnaphthalene			300	1.96	< 0.00484	0.071	**1,560**	0.124	3.02	**5,080**	17.3	0.00382	0.124	**3,360**	0.128	0.103	0.00247	9.22	0.138	0.0588	< 0.0133	11.9	0.0275
Acenaphthene			1,000	20.9	0.00403	0.3	**2,200**	0.284	5.01	**7,630**	51.5	0.00779	0.446	**4,890**	0.242	0.203	0.00492	330	0.306	0.249	0.00672	304	0.0641
Acenaphthylene			10	6.03	0.0124	0.262	**77.9**	0.020	0.466	**371**	0.854	0.009	0.306	**256**	0.00949	0.555	0.00471	**23**	0.167	0.34	0.0209	**22.3**	0.0191
Anthracene			1,000	32.5	0.00427	0.657	**1,200**	0.265	2.8	**4,230**	11.1	0.0116	0.86	**2,080**	0.0848	0.641	0.00267	200	0.432	0.709	0.00788	200	0.0722
Benzo(a)anthracene			20	**52.4**	0.0058	1.65	**451**	0.0908	2.92	**1,970**	5.81	0.00849	1.65	**1,240**	0.0284	2.39	0.00367	**143**	1.2	1.96	0.00935	**138**	0.178
Benzo(a)pyrene			2	**53.2**	0.00822	1.61	**427**	0.0953	**3.01**	**1,960**	**5.73**	0.00925	1.71	**1,210**	0.02	**3.09**	0.00351	**135**	1.27	**2.35**	0.00861	**143**	0.17000
Benzo(b)fluoranthene			20	**25**	0.00428	1.23	**176**	0.0392	1.98	**837**	3.19	0.0053	1.39	**468**	0.00741	1.9	< 0.00395	**63.2**	0.763	1.5	< 0.0133	**63.9**	0.114
Benzo(g,h,i)perylene			1,000	20.1	0.00416	0.929	182	0.0435	1.57	852	2.87	0.0065	1.01	507	0.00763	1.83	0.00248	62.4	0.719	1.3	< 0.0133	58.4	0.0842
Benzo(k)fluoranthene			70	24.8	0.00556	1.33	**258**	0.0571	2.27	**1,120**	3.78	0.00673	1.43	**735**	0.00962	2.21	0.00231	**76.3**	0.832	1.54	< 0.0133	**87.4**	0.127
Chrysene			200	54.9	0.00573	1.74	**478**	0.09	3.06	**2,110**	5.45	0.01	1.74	**1,420**	0.022	2.66	0.00411	137	1.19	2.06	0.00981	139	0.17
Dibenzo(a,h)anthracene			2	**4.78**	< 0.00484	0.227	**45.4**	0.00886	0.351	**198**	0.677	< 0.00378	0.254	**121**	< 0.00456	0.375	< 0.00395	**14.5**	0.173	0.289	< 0.0133	**13.0**	0.0242
Fluoranthene			1,000	130	0.0113	3.09	**1,100**	0.206	6.62	**4,630**	14.2	0.0135	3.65	**2,790**	0.233	3.54	0.00591	310	2.17	3.16	0.0194	348	0.293
Fluorene			1,000	16.7	0.00415	0.22	768	0.109	1.89	**2,850**	17.3	0.00481	0.352	**1,820**	0.129	0.174	0.00337	151	0.205	0.182	0.0129	147	0.0371
Indeno(1,2,3-cd)pyrene			20	**20.7**	0.004	0.959	**167**	0.0409	1.59	**744**	2.75	0.00663	1.08	**444**	0.01	1.73	0.00	**55.5**	0.624	1.2	< 0.0133	**54.3**	0.09
Naphthalene			500	3.95	< 0.00484	0.115	**3,090**	0.196	6.09	**9,480**	46.6	0.005	0.274	**9,250**	0.281	0.165	0.00317	19.8	0.175	0.093	< 0.0133	31.7	0.0427
Phenanthrene			500	133	0.0136	2.43	**2,910**	0.52	9.46	**11,500**	53.2	0.0157	2.93	**7,810**	0.671	1.42	0.0113	**665**	1.17	1.75	0.0155	**674**	0.203
Pyrene			1,000	139	0.0153	3.42	**1,590**	0.304	7.66	**6,910**	19.6	0.0179	3.44	**4,090**	0.36	4.57	0.0124	467	2.73	3.86	0.0253	530	0.316
Total PAHs			NS	740	0.102	20.2	16,680	2.50	59.8	62,472	262	0.143	22.6	42,491	2.24	27.6	0.0696	2,862	14.3	22.6	0.136	2,966	2.03
Petroleum Hydrocarbons	8015 Mod	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000																					
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100																					
C9 to C12 Aliphatic Hydrocarbons			1,000																					
C9 to C10 Aromatic Hydrocarbons			100																					
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000																					
C19 to C36 Aliphatic Hydrocarbons			3,000																					
C11 to C22 Aromatic Hydrocarbons			1,000																					
General Chemistry/Other																								
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	**NT**	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	172,000	8,680	7,800	295,000	2,440	31,700	212,000	91,500	4,760	18,600	110,000	4,800	51,300	2,590	97,400	44,000	65,100	149,000	102,000	8,220
Percent Solids	5035	**%**	NS	73	78	75	63	79	59	64	68	83	75	76	79	41	83	69	58	54	29	54	83

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 5. Sediment Chemical Testing Results - River
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

			Sample Location:	**713**	**714**		**715**	**723**	**724**	**725**	**726**	**727**		**728**	**729**		**730**		**731**	**733**	**734**	
			Sample ID:	**SS713-S2**	**SS714-S3**	**SS714-S4**	**SS715-S2**	**SS723-S1**	**SS724-S3**	**SS725-S2**	**SS726-S2**	**SS727-S2**	**SS727-S3**	**SS728-S3**	**SS729-S3**	**SS729-S4**	**SS730-S2**	**SS730-S3**	**SS731-S2**	**SS733-S4**	**SS734-S1**	**SS734-S2**
			Lab Sample ID:	**F190058**	**F190059**	**F190059**	**F190058**	**F190059**	**F190057**	**F190059**	**F190057**	**F190059**	**F190059**	**F190059**	**F190057**	**F190057**	**F190059**	**F190059**	**F190058**	**F190058**	**F190058**	**F190058**
			Property:	**33R Oakland St**	**35 Oakland St**	**35 Oakland St**	**1 Field St**	**24 Oak St**	**1 Field St**	**24 Oak St**	**1 Field St**	**1 Field St**	**1 Field St**	**1 Field St**	**1 Field St**	**1 Field St**	**1 Field St**	**1 Field St**	**28 Oak St**	**28 Oak Street**	**28 Oak Street**	**28 Oak Street**
			Area:	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**
			Sample Date:	**11/15/2019**	**11/14/2019**	**11/14/2019**	**11/15/2019**	**11/14/2019**	**11/12/2019**	**11/14/2019**	**11/12/2019**	**11/14/2019**	**11/14/2019**	**11/14/2019**	**11/12/2019**	**11/12/2019**	**11/14/2019**	**11/14/2019**	**11/15/2019**	**11/15/2019**	**11/15/2019**	**11/15/2019**
			Soil/Sediment Type:	**Silty Sand**	**Organic Soil**	**Sand**	**Organic Soil**	**Silty Sand**	**Silty Sand**	**Clay**	**Silty Sand**	**Organic Soil**	**Organic Soil**	**Organic Soil**	**Sandy Silt**	**Organic Soil**	**Organic Soil**	**Clay**	**Organic Soil**	**Clay**	**Organic Soil**	**Clay**
			Sample Depth (feet):	**2.4-2.5**	**3.9-4**	**5.5-5.6**	**3.7-3.8**	**1.4-1.5**	**4.7-4.8**	**2.8-2.9**	**1.4-1.5**	**1.9-2**	**5.3-5.4**	**5.4-5.6**	**3.9-4**	**5.9-6**	**2.5-2.6**	**4.8-4.9**	**3.8-3.9**	**5.4-5.6**	**4.9-5**	**6.1-6.2**
Analyte	**Method**	**Units**	**S-1/GW-3**																			
Volatile Organic Compounds (VOCs)	8260	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40																			
Ethylbenzene			500																			
Toluene			500																			
Xylene, o-			500																			
Xylene p,m-			500																			
Xylenes, Total			500																			
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg																				
2-Methylnaphthalene			300	0.052	110	0.15	0.00692	1.07	< 0.00481	< 0.00492	0.201	0.263	0.367	9.11	11.1	0.00368	< 0.00492	< 0.00486	3.09	0.0843	**1,390**	0.104
Acenaphthene			1,000	1.45	346	0.15	0.0117	3.67	0.00695	0.00287	0.579	0.782	0.267	41.6	266	0.0143	0.00545	< 0.00486	8.5	0.691	**1,710**	0.276
Acenaphthylene			10	0.255	**26.8**	0.167	0.0126	2.54	0.0107	0.0182	0.843	0.863	0.513	5.31	**18.5**	0.0201	0.0258	< 0.00486	0.365	0.0467	**71.4**	0.00858
Anthracene			1,000	0.648	195	0.299	0.00623	11.3	0.00981	0.00278	1.45	1.38	0.937	53	181	0.0281	0.0102	< 0.00486	4.29	0.514	704	0.083
Benzo(a)anthracene			20	1.35	**102**	0.95	0.00538	19.2	0.0151	< 0.00492	4.65	3	3.39	**43.2**	**120**	0.0611	0.0147	< 0.00486	2.65	0.362	**462**	0.0176
Benzo(a)pyrene			2	1.07	**70.1**	1.07	< 0.0107	**18**	0.0169	0.00294	**3.9**	**3.66**	**4.23**	**29.2**	**107**	0.05420	0.0182	< 0.00486	**2.38**	0.287	**447**	0.00841
Benzo(b)fluoranthene			20	0.83	**35**	0.6	< 0.0107	11.3	0.00941	< 0.00492	3.17	2.95	2.32	16	**56.1**	0.0403	0.00888	< 0.00486	1.8	0.129	**187**	0.00444
Benzo(g,h,i)perylene			1,000	0.534	25.4	0.594	< 0.0107	7.67	0.00848	< 0.00492	2.33	2.13	2.39	11.2	49.5	0.0275	0.0102	< 0.00486	1.34	0.128	214	0.0037
Benzo(k)fluoranthene			70	0.915	42.10	0.646	< 0.0107	12.4	0.0117	< 0.00492	3.07	3.03	2.43	15.3	63.20	0.0462	0.01	< 0.00486	1.92	0.172	**254**	0.00513
Chrysene			200	1.38	102	0.92	0.0067	18	0.0156	< 0.00492	4.73	3.54	3.4	42.8	116	0.0552	0.015	< 0.00486	2.95	0.356	**414**	0.0155
Dibenzo(a,h)anthracene			2	0.146	**8.38**	0.137	< 0.0107	**2.13**	< 0.00481	< 0.00492	0.595	0.547	0.595	**3.28**	**11.0**	0.00724	< 0.00492	< 0.00486	0.348	0.0257	**40.1**	0.00487
Fluoranthene			1,000	2.53	189	1.58	0.0175	27.7	0.0356	0.00247	8.62	6.54	4.13	69.4	289	0.128	0.0228	< 0.00486	6.87	0.765	975	0.18
Fluorene			1,000	0.173	165	0.113	0.00706	4.11	0.00553	0.0042	0.544	0.786	0.354	29.8	118	0.012	0.00643	< 0.00486	5	0.359	664	0.116
Indeno(1,2,3-cd)pyrene			20	0.565	**25.3**	0.51	< 0.0107	7.84	0.00806	< 0.00492	2.42	2.18	1.93	11	**47.8**	0.03	0.00851	< 0.00486	1.39	0.114	**195**	0.00
Naphthalene			500	0.0986	192	0.211	0.0109	1.41	< 0.00481	< 0.00492	0.283	0.328	0.448	10.2	34	0.00515	< 0.00492	< 0.00486	6.82	0.117	**2,510**	0.299
Phenanthrene			500	2.08	**651**	0.582	0.0226	29.4	0.0332	0.00418	4.66	4.52	1.85	166	**572**	0.0908	0.0162	< 0.00486	17.5	1.95	**2,880**	0.612
Pyrene			1,000	2.58	278	2.23	0.0187	35.2	0.0553	0.00379	9.17	7.13	6.16	103	419	0.114	0.0347	0.00352	8.05	1.1	**1,430**	0.263
Total PAHs			NS	16.7	2,563	10.9	0.126	213	0.242	0.0414	51.2	43.6	35.7	659	2,479	0.740	0.207	0.00352	75.3	7.20	14,548	2.01
Petroleum Hydrocarbons	8015 Mod	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000																			
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100																			
C9 to C12 Aliphatic Hydrocarbons			1,000																			
C9 to C10 Aromatic Hydrocarbons			100																			
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000																			
C19 to C36 Aliphatic Hydrocarbons			3,000																			
C11 to C22 Aromatic Hydrocarbons			1,000																			
General Chemistry/Other																						
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	15,000	133,000	49,500	104,000	202,000	10,800	2,060	76,400	81,100	55,100	92,800	81,700	1,270	11,400	3,260	109,000	1,230	79,800	1,750
Percent Solids	5035	**%**	NS	79	55	53	40	73	67	75	47	39	54	52	59	80	74	80	63	77	73	76

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
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8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 5. Sediment Chemical Testing Results - River
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

Sample Location:				**735**			**736**	**737**	**738**		**739**			**740**		**741**		**742**	**743**	**744**		**745**	**747**
Sample ID:				**SS735-S2**	**SS735-S3**	**SS735-S4**	**SS736-S2**	**SS737-S1**	**SS738-S1**	**SS738-S2**	**SS739-S1**	**SS739-S2**	**SS739-S3**	**SS740-S1**	**SS740-S2**	**SS741-S1**	**SS741-S3**	**SS742-S1**	**SS743-S2**	**SS744-S1**	**SS744-S2**	**SS745-S2**	**SS747-S2**
Lab Sample ID:				**F190058**	**F190058**	**F190058**	**F190058**	**F190058**	**F200006**	**F200006**	**F200006**	**F200006**	**F200006**	**F200006**	**F200006**	**F200008**	**F200008**	**F200006**	**F200006**	**F200008**	**F200008**	**F200006**	**F200006**
Property:				**28 Oak Street**	**28 Oak Street**	**28 Oak Street**	**8 Noel St**	**3 River St**	**35 Water St**	**35 Water St**	**1 Field St**	**1 Field St**	**1 Field St**	**39A Water St**	**39A Water St**	**33R Oakland St**	**33R Oakland St**	**1 Field St**	**1 Field St**	**1 Field St**	**1 Field St**	**24 Oak St**	**26 Oak Street**
Area:				**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**
Sample Date:				**11/15/2019**	**11/15/2019**	**11/15/2019**	**11/15/2019**	**11/15/2019**	**2/4/2020**	**2/4/2020**	**2/4/2020**	**2/4/2020**	**2/4/2020**	**2/4/2020**	**2/4/2020**	**2/5/2020**	**2/5/2020**	**2/4/2020**	**2/4/2020**	**2/5/2020**	**2/5/2020**	**2/4/2020**	**2/4/2020**
Soil/Sediment Type:				**Silty Sand**	**Organic Soil**	**Clay**	**Clay**	**Organic Soil**	**Silty Sand**	**Organic Soil**	**Organic Soil**	**Organic Soil**	**Clay**	**Sand w/Silt**	**Organic Soil**	**Organic Soil**	**Sand w/Silt**	**Silty Sand**	**Silty Sand**	**Organic Soil**	**Sand**	**Silt w/Sand**	**Silt**
Sample Depth (feet):				**3.3-3.4**	**6.7-6.8**	**7.8-7.9**	**3.9-4**	**8.5-8.6**	**1-1.5**	**3.5-3.6**	**1.3-1.5**	**7.6-7.8**	**8.7-9**	**0.5-1.7**	**4.2-4.5**	**0.9-1.1**	**4.9-5.1**	**0.9-1.1**	**4.9-5.1**	**1.9-2.1**	**3.9-4.1**	**3.7-3.9**	**6.5-6.7**
Analyte	**Method**	**Units**	**S-1/GW-3**																				
Volatile Organic Compounds (VOCs)	8260	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40																				
Ethylbenzene			500																				
Toluene			500																				
Xylene, o-			500																				
Xylene p,m-			500																				
Xylenes, Total			500																				
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg																					
2-Methylnaphthalene			300	0.66	0.399	< 0.00429	0.0129	**912**	0.217	0.179	0.359	0.395	0.098	0.022	< 0.006	0.156	< 0.005	< 0.004	< 0.005	< 0.006	< 0.005	< 0.005	< 0.004
Acenaphthene			1,000	8.3	0.457	0.00239	0.017	800	1.23	0.471	2.6	1.11	0.237	1.72	< 0.006	2.89	< 0.005	< 0.004	< 0.005	< 0.006	< 0.005	< 0.005	< 0.004
Acenaphthylene			10	1.25	0.209	< 0.00429	0.00627	**45**	0.315	0.158	0.39	0.496	0.167	0.085	< 0.006	0.613	< 0.005	< 0.004	< 0.005	< 0.006	< 0.005	< 0.005	0.00357
Anthracene			1,000	6.44	0.947	0.0047	0.00678	352	1.28	0.652	1.81	1.73	0.512	0.57	< 0.012	1.72	< 0.005	< 0.004	< 0.005	< 0.006	< 0.005	< 0.005	0.00649
Benzo(a)anthracene			20	8.72	2.17	0.00696	0.0062	**196**	2.25	1.67	3.09	3.99	1.92	0.529	< 0.012	3.89	< 0.005	< 0.004	< 0.005	0.006	< 0.005	< 0.005	0.0316
Benzo(a)pyrene			2	**7.5**	1.96	0.00302	0.00578	**124**	**2.14**	1.67	**2.73**	**3.88**	**2.42**	0.532	< 0.012	**3.71**	0.003	< 0.004	< 0.005	0.006	< 0.005	< 0.005	0.036
Benzo(b)fluoranthene			20	5.89	1.07	0.00237	0.0034	**60.3**	1.65	1.02	1.67	2.28	1.28	0.346	< 0.012	2.84	< 0.005	< 0.004	< 0.005	0.005	< 0.005	< 0.005	0.0221
Benzo(g,h,i)perylene			1,000	4.11	0.954	< 0.00429	0.00416	41.4	1.19	0.934	1.24	1.92	1.39	0.281	< 0.012	2.1	< 0.005	< 0.004	< 0.005	0.004	< 0.005	< 0.005	0.0183
Benzo(k)fluoranthene			70	5.92	1.1	0.00248	0.00376	**75.9**	1.74	1.13	1.92	2.44	1.44	0.369	< 0.012	3.08	< 0.005	< 0.004	< 0.005	0.004	< 0.005	< 0.005	0.0265
Chrysene			200	8.79	2.06	0.00727	0.00641	184	2.15	1.53	3.11	3.82	1.62	0.541	< 0.012	3.96	< 0.005	< 0.004	< 0.005	0.007	< 0.005	< 0.005	0.0363
Dibenzo(a,h)anthracene			2	1.05	0.239	< 0.00429	< 0.00534	**13.4**	0.317	0.24	0.323	0.545	0.323	0.071	< 0.012	0.602	< 0.005	< 0.004	< 0.005	< 0.006	< 0.005	< 0.005	0.00366
Fluoranthene			1,000	22.7	2.62	0.0099	0.0108	349	5.16	2.71	5.34	5.45	2.81	1.04	0.0127	8.66	0.003	0.004	<0.005	0.012	< 0.005	< 0.005	0.0577
Fluorene			1,000	2.76	0.321	< 0.00429	0.00637	345	0.807	0.158	1.34	0.829	0.205	0.784	< 0.012	0.715	< 0.005	< 0.004	< 0.005	< 0.006	< 0.005	< 0.005	< 0.004
Indeno(1,2,3-cd)pyrene			20	4.33	0.762	< 0.00429	0.00353	**41.7**	1.53	0.979	1.4	2.12	1.43	0.336	< 0.012	2.7	< 0.005	< 0.004	< 0.005	0.004	< 0.005	< 0.005	0.0172
Naphthalene			500	2.3	0.336	< 0.00429	0.027	**861**	0.337	0.177	0.578	0.457	0.172	0.045	< 0.012	0.225	< 0.005	< 0.004	< 0.005	< 0.006	< 0.005	< 0.005	< 0.004
Phenanthrene			500	24.2	1.39	0.00838	0.0243	**1,180**	5.21	0.819	5.36	4.86	1.74	2.17	0.00966	6.80	0.003	< 0.004	< 0.005	0.008	< 0.005	< 0.005	0.0158
Pyrene			1,000	22.8	4.78	0.0224	0.0167	513	5.34	3.88	7.32	6.65	3.93	1.36	0.0112	8.56	0.004	0.004	<0.005	0.013	< 0.005	< 0.005	0.0869
Total PAHs			NS	138	21.8	0.0699	0.161	6,094	32.9	18.4	40.6	43.0	21.7	10.8	0.0336	53.2	0.0120	0.00755	ND	0.0682	ND	ND	0.362
Petroleum Hydrocarbons	8015 Mod	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000																				
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100																				
C9 to C12 Aliphatic Hydrocarbons			1,000																				
C9 to C10 Aromatic Hydrocarbons			100																				
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000																				
C19 to C36 Aliphatic Hydrocarbons			3,000																				
C11 to C22 Aromatic Hydrocarbons			1,000																				
General Chemistry/Other																							
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	248,000	52,800	9,850	12,100	116,000	39,600	45,100	67,100	124,000	35,100	23,600	162,000	23,100	1,190	3,710	8,370	31600	33,600	7,430	1,680
Percent Solids	5035	**%**	NS	63	47	78	76	39	79	52	62	65	64	66	30	64	76	79	69	59	77	79	79

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 5. Sediment Chemical Testing Results - River
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

			Sample Location:	**748**		**749**		**750**	**751**		**752**		**753**		**754**		**755**	**756**	**757**	**758**	**759**	**762**	
			Sample ID:	**SS748-S1**	**SS748-S3**	**SS749-S1**	**SS749-S2**	**SS750-S1**	**SS751-S1**	**SS751-S2**	**SS752-S1**	**SS752-S2**	**SS753-S1**	**SS753-S2**	**SS754-S1**	**SS754-S2**	**SS755-S1**	**SS756-S1**	**SS757-S1**	**SS758-S1**	**SS759-S1**	**SS762-S2**	**SS762-S3**
			Lab Sample ID:	**F200008**	**F200008**	**F200006**	**F200006**	**F200006**	**F200006**	**F200006**	**F200006**	**F200006**	**F200006**	**F200006**	**F200008**	**F200008**	**F200008**	**F200008**	**F200008**	**F200008**	**F200013**	**F200013**	**F200013**
			Property:	**3 River St**	**3 River St**	**7 Noel St**	**7 Noel St**	**7 Noel St**	**7 Noel St**	**7 Noel St**	**7 Noel St**	**7 Noel St**	**11 River Street**	**11 River Street**	**27 River Street**	**27 River Street**	**222 Main St**	**27 River Street**	**35 Water St**	**35 Water St**	**33R Oakland St**	**3 River St**	**3 River St**
			Area:	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**
			Sample Date:	**2/5/2020**	**2/5/2020**	**2/3/2020**	**2/3/2020**	**2/3/2020**	**2/3/2020**	**2/3/2020**	**2/3/2020**	**2/3/2020**	**2/4/2020**	**2/4/2020**	**2/5/2020**	**2/5/2020**	**2/5/2020**	**2/5/2020**	**2/5/2020**	**2/5/2020**	**3/9/2020**	**3/9/2020**	**3/9/2020**
			Soil/Sediment Type:	**Organic Soil**	**Silt w/Gravel&Sand**	**Sandy Silt**	**Silt**	**Organic Soil**	**Organic Soil**	**Organic Soil**	**Sandy Organic Soil**	**Sandy Organic Soil**	**Organic Soil**	**Silt w/Sand**	**Organic Soil**	**Clay**	**Sandy Organic Soil**	**Organic Soil**	**Organic Soil**	**Clay**	**Sand w/Silt**	**Silty Sand**	**Silty Sand**
			Sample Depth (feet):	**2.5-2.7**	**5.5-5.7**	**4.1-4.3**	**8-8.2**	**0.8-1**	**2.1-2.3**	**4.2-4.4**	**2.1-2.3**	**4.9-5.1**	**1.3-1.5**	**4.1-4.3**	**3.2-4.1**	**8.4-8.6**	**1.7-1.9**	**1.5-1.7**	**1.6-1.8**	**0.1-0.4**	**0-0.3**	**1.9-2.1**	**2.9-3**
Analyte	**Method**	**Units**	**S-1/GW-3**																				
Volatile Organic Compounds (VOCs)	8260	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40																				
Ethylbenzene			500																				
Toluene			500																				
Xylene, o-			500																				
Xylene p,m-			500																				
Xylenes, Total			500																				
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg																					
2-Methylnaphthalene			300	1.46	< 0.005	0.336	< 0.004	0.057	0.076	< 0.005	0.573	0.085	1.3	< 0.005	4.42	0.027	0.036	0.080	0.125	0.004	0.029	< 0.007	< 0.006
Acenaphthene			1,000	6.87	< 0.005	0.379	< 0.004	0.334	0.131	< 0.005	13	0.048	0.516	< 0.005	50.9	0.016	0.048	0.227	0.595	0.007	0.127	< 0.007	< 0.006
Acenaphthylene			10	2.91	< 0.005	0.543	< 0.004	0.107	0.157	< 0.005	1.61	0.056	0.354	< 0.005	5.11	0.026	0.041	0.205	0.368	0.016	0.273	< 0.007	< 0.006
Anthracene			1,000	13.9	< 0.005	0.952	< 0.004	0.982	0.286	< 0.005	8.38	0.2	1.7	< 0.005	47.4	0.065	0.125	0.449	1.45	0.030	0.361	< 0.007	< 0.006
Benzo(a)anthracene			20	17.1	< 0.005	4.86	0.002	1.66	0.769	0.004	12.5	0.675	2.85	< 0.005	**48.6**	0.249	0.377	0.970	3.54	0.131	1.07	< 0.007	< 0.006
Benzo(a)pyrene			2	**12.7**	< 0.005	**4.43**	0.002	1.42	0.736	0.006	**12.2**	0.636	**2.29**	< 0.005	**45.6**	0.232	0.349	0.908	**2.94**	0.118	1.17	< 0.007	< 0.006
Benzo(b)fluoranthene			20	7.2	< 0.005	2.85	< 0.004	1.03	0.581	0.006	7.21	0.462	1.42	< 0.005	**22.5**	0.169	0.255	0.696	2.41	0.091	0.901	< 0.007	< 0.006
Benzo(g,h,i)perylene			1,000	5.39	< 0.005	2.19	< 0.004	0.682	0.42	0.004	5.74	0.353	1.09	< 0.005	21.5	0.125	0.190	0.544	1.53	0.060	0.699	< 0.007	< 0.006
Benzo(k)fluoranthene			70	9.27	< 0.005	3.09	< 0.004	1.15	0.615	0.006	8	0.461	1.56	< 0.005	28.7	0.191	0.288	0.707	2.54	0.104	0.909	< 0.007	< 0.006
Chrysene			200	18.6	< 0.005	4.61	0.002	1.37	0.869	0.005	12.6	0.658	2.87	< 0.005	43.9	0.256	0.397	1.12	3.25	0.126	1.21	< 0.007	< 0.006
Dibenzo(a,h)anthracene			2	1.69	< 0.005	0.511	< 0.004	0.173	0.115	< 0.005	1.34	0.095	0.291	< 0.005	**4.94**	0.035	0.052	0.132	0.483	0.017	0.211	< 0.007	< 0.006
Fluoranthene			1,000	29.8	< 0.005	8.03	0.004	3.75	1.58	0.005	23.6	0.692	4.41	0.003	110	0.256	0.661	2.46	7.51	0.241	1.97	< 0.007	< 0.006
Fluorene			1,000	7.14	< 0.005	0.501	< 0.004	0.525	0.233	< 0.005	7.06	0.087	0.438	< 0.005	29.4	0.029	0.054	0.090	0.532	0.008	0.098	< 0.007	< 0.006
Indeno(1,2,3-cd)pyrene			20	6.57	< 0.005	2.6	< 0.004	0.901	0.505	0.004	6.53	0.401	1.24	< 0.005	**24.1**	0.152	0.230	0.631	2.07	0.075	0.856	< 0.007	< 0.006
Naphthalene			500	1.35	< 0.005	0.442	< 0.004	0.046	1.2	< 0.005	1.48	0.097	1.07	< 0.005	9.55	0.032	0.045	0.084	0.221	0.006	0.040	< 0.007	< 0.006
Phenanthrene			500	39.8	< 0.005	1.8	< 0.004	3.01	1.3	< 0.005	28.9	0.497	4.58	0.003	161	0.158	0.343	1.66	5.20	0.082	0.852	< 0.007	< 0.006
Pyrene			1,000	42.3	< 0.005	14.7	0.006	3.07	1.67	0.008	32.6	1.3	7.16	0.006	169	0.444	0.789	3.02	6.49	0.266	2.19	< 0.007	< 0.006
Total PAHs			NS	224	ND	52.8	0.0157	20.3	11.2	0.0468	183	6.80	35.1	0.0116	827	2.46	4.28	14.0	41.3	1.38	13.0	ND	ND
Petroleum Hydrocarbons	8015 Mod	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000																				
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100																				
C9 to C12 Aliphatic Hydrocarbons			1,000																				
C9 to C10 Aromatic Hydrocarbons			100																				
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000																				
C19 to C36 Aliphatic Hydrocarbons			3,000																				
C11 to C22 Aromatic Hydrocarbons			1,000																				
General Chemistry/Other																							
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	55,200	2,190	18,000	2,380	9,870	35,200	7,550	72,600	27,400	27,200	1,650	76,800	22,700	36,400	63,600	40,000	3,210	30,500	37,600	11,400
Percent Solids	5035	**%**	NS	55	85	72	89	73	68	73	55	62	68	79	45	65	53	44	80	76	61	59	75

General Notes:

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2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

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Table 5. Sediment Chemical Testing Results - River
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

			Sample Location:	763		764	765	766			767		768	769	770	771	772	774		775		776	
			Sample ID:	SS763-S1	SS763-S2	SS764-S2	SS765-S2	SS766-S1	SS766-S2	SS766-S3	SS767-S1	SS767-S2	SS768-S2	SS769-S1	SS770-S2	SS771-S1	SS772-S1	SS774-S2	SS774-S3	SS775-S2	SS775-S3	SS776-S1	SS776-S3
			Lab Sample ID:	F200013	F200013	F200013	F200017	F200014	F200014	F200014	F200014	F200014	F200014	F200017	F200017	F200014	F200014	F200017	F200017	F200017	F200017	F200017	F200017
			Property:	7 Noel St	7 Noel St	222 Main St	222 Main St	222 Main St	222 Main St	222 Main St	33 River St	33 River St	50 Macy St #R	50 Macy St #R	33 River St	35 Water St	1 Field St	51 Main St	51 Main St	51 Main St	51 Main St	Comm of MA Tidelands	Comm of MA Tidelands
			Area:	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River
			Sample Date:	3/9/2020	3/9/2020	3/9/2020	3/13/2020	3/10/2020	3/10/2020	3/10/2020	3/10/2020	3/10/2020	3/10/2020	3/13/2020	3/11/2020	3/10/2020	3/10/2020	3/13/2020	3/13/2020	3/13/2020	3/13/2020	3/13/2020	3/13/2020
			Soil/Sediment Type:	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Silt	Sand	Silty Sand	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Sandy Silt	Silt
			Sample Depth (feet):	1.9-2.1	5-5.2	4.6-4.8	3.8-4	0.7-0.9	3.8-4	6.5-6.7	3.3-3.5	6.4-6.6	4.4-4.6	5.7-5.9	4.3-4.5	0-0.2	0-0.2	2.4-2.6	5.6-5.8	3.8-4	6.2-6.4	0.8-1	5-5.2
Analyte	**Method**	**Units**	**S-1/GW-3**																				
Volatile Organic Compounds (VOCs)	8260	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40																				
Ethylbenzene			500																				
Toluene			500																				
Xylene, o-			500																				
Xylene p,m-			500																				
Xylenes, Total			500																				
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg																					
2-Methylnaphthalene			300	0.751	< 0.005	< 0.007	< 0.007	0.0152	1.25	0.011	2.22	0.102	< 0.006	3.88	< 0.005	0.007	0.75	0.088	2.18	0.323	0.838	0.0486	< 0.005
Acenaphthene			1,000	17.4	< 0.005	< 0.007	< 0.007	0.039	25.9	0.506	6.4	0.303	< 0.006	88.5	< 0.005	0.142	3.78	0.123	38.1	5.43	0.54	0.0758	< 0.005
Acenaphthylene			10	2.61	< 0.005	< 0.007	0.006	0.049	1.39	0.024	1.78	0.090	0.005	**11.2**	< 0.005	0.044	0.261	0.049	2.79	0.617	0.371	0.0513	< 0.005
Anthracene			1,000	17.9	< 0.005	< 0.007	0.004	0.122	6.61	0.274	10.1	0.79	0.004	330	< 0.005	0.137	5.32	0.271	45.1	3.7	2.04	0.148	< 0.005
Benzo(a)anthracene			20	**28.3**	< 0.005	< 0.007	< 0.007	0.442	5.37	0.192	9.92	1.6	0.005	**469**	< 0.005	0.449	6.55	0.925	**42.3**	7.99	4.59	0.467	< 0.005
Benzo(a)pyrene			2	**27.5**	< 0.005	< 0.007	< 0.007	0.457	**5.37**	0.147	**6.5**	1.3	0.005	**496**	< 0.005	0.408	**6.18**	0.971	**40.1**	**9.14**	**3.72**	0.501	< 0.005
Benzo(b)fluoranthene			20	11.1	< 0.005	< 0.007	< 0.007	0.327	4.12	0.066	3.98	0.787	< 0.006	**110**	< 0.005	0.347	3.33	0.662	19.5	5.09	2.22	0.436	< 0.005
Benzo(g,h,i)perylene			1,000	10.3	< 0.005	< 0.007	0.019	0.278	3.47	0.069	3.4	0.604	< 0.006	76.9	0.008	0.252	3.18	0.548	19.5	5.4	1.92	0.463	< 0.005
Benzo(k)fluoranthene			70	12.0	< 0.005	< 0.007	< 0.007	0.363	4.16	0.095	4.33	0.935	0.004	**145**	< 0.005	0.369	3.52	0.782	25.4	6.41	2.54	0.405	< 0.005
Chrysene			200	28.6	< 0.005	< 0.007	< 0.007	0.481	5.97	0.188	10.2	1.42	0.005	**469**	< 0.005	0.445	5.53	0.957	40.1	7.72	4.73	0.594	< 0.005
Dibenzo(a,h)anthracene			2	**3.09**	< 0.005	< 0.007	0.004	0.076	0.935	0.016	1.08	0.204	< 0.006	**15**	0.003	0.077	0.954	0.152	**4.34**	1.12	0.589	0.118	< 0.005
Fluoranthene			1,000	56.2	0.003	< 0.007	< 0.007	0.811	14.9	0.468	21.7	2.2	0.009	**1,190**	0.003	0.971	12.4	1.53	109	17.2	5.47	0.963	< 0.005
Fluorene			1,000	8.08	< 0.005	< 0.007	< 0.007	0.034	7.87	0.21	6.12	0.334	< 0.006	51.1	< 0.005	0.044	2.21	0.155	26.6	1.28	0.676	0.102	< 0.005
Indeno(1,2,3-cd)pyrene			20	12.0	< 0.005	< 0.007	0.013	0.317	4.17	0.078	3.77	0.712	< 0.006	**95.4**	0.004	0.327	3.2	0.68	**22.2**	6.13	2.24	0.525	< 0.005
Naphthalene			500	1.75	< 0.005	< 0.007	< 0.007	0.021	2.28	0.038	1.45	0.102	< 0.006	16.9	< 0.005	0.015	1.25	0.134	6.03	0.542	0.818	0.049	< 0.005
Phenanthrene			500	58.2	0.004	< 0.007	< 0.007	0.339	39.1	1.03	36.1	2.26	0.008	**736**	< 0.005	0.467	14.6	0.987	160	15.3	5.71	0.648	< 0.005
Pyrene			1,000	71.8	0.006	< 0.007	< 0.007	0.942	16.8	0.714	32.3	3.19	0.0121	**1,520**	0.004	0.831	19.8	1.7	151	21.3	7.7	1.12	< 0.005
Total PAHs			NS	368	0.0124	ND	0.0455	5.11	150	4.12	161	16.9	0.0568	5,824	0.0225	5.33	92.8	10.7	754	115	46.7	6.71	ND
Petroleum Hydrocarbons	8015 Mod	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000																				
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100																				
C9 to C12 Aliphatic Hydrocarbons			1,000																				
C9 to C10 Aromatic Hydrocarbons			100																				
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000																				
C19 to C36 Aliphatic Hydrocarbons			3,000																				
C11 to C22 Aromatic Hydrocarbons			1,000																				
General Chemistry/Other																							
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	54,000	3,680	43,700	35,600	20,000	114,000	34,800	68,300	60,700	19,100	80,900	15,300	9,640	107,000	32,100	86,200	170,000	37,400	19,700	2,810
Percent Solids	5035	**%**	NS	63	82	55	60	61	46	62	51	55	67	50	71	86	72	62	48	48	63	70	84

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 5. Sediment Chemical Testing Results - River
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

			Sample Location:	777		778		779		780		781		782	783		784		785		786	787	
			Sample ID:	SS777-S2	SS777-S3	SS778-S2	SS778-S3	SS779-S1	SS779-S2	SS780-S1	SS780-S2	SS781-S1	SS781(R1)-S1	SS782-S2	SS783-S1	SS783-S2	SS784-S1	SS784-S2	SS785-S1	SS785-S2	SS786-S2	SS787-S1	SS787-S2
			Lab Sample ID:	F200017	F200017	F200017	F200017	F200017	F200017	F200017	F200017	F200017	F200017	F200017	F200019	F200019	F200019	F200019	F200019	F200019	F200019	F200037	F200037
			Property:	Comm of MA Tidelands	Comm of MA Tidelands	Comm of MA Tidelands	Comm of MA Tidelands	58 Macy St	58 Macy St	33 River St	33 River St	51 Main St	51 Main St	51 Main St	51 Main St	51 Main St	51 Main St	51 Main St	51 Main St	51 Main St	28 Oak Street	25 Water St	25 Water St
			Area:	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River
			Sample Date:	3/13/2020	3/13/2020	3/11/2020	3/11/2020	3/11/2020	3/11/2020	3/11/2020	3/11/2020	3/11/2020	3/13/2020	3/13/2020	3/16/2020	3/16/2020	3/16/2020	3/16/2020	3/16/2020	3/16/2020	3/16/2020	7/16/2020	7/16/2020
			Soil/Sediment Type:	Silt w/Sand	Silt	Sandy Silt	Silt	Silt wSand	Silt w/Sand	Sandy Silt	Sandy Silt	Organic Soil	Silty Sand	Sandy Silt	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Sand	Sandy Silt
			Sample Depth (feet):	5.8-6	7.5-7.7	5.7-5.9	6.9-7.1	1.1-1.3	3.8-4	1.5-1.7	4.3-4.6	1.9-2.1	3.6-3.8	6.6-6.8	0-1	4-4.2	0.5-0.7	4.5-4.7	1-1.2	4-4.2	3.6-3.8	0-0.3	3.1-3.3
Analyte	**Method**	**Units**	**S-1/GW-3**																					
Volatile Organic Compounds (VOCs)	8260	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40																					
Ethylbenzene			500																					
Toluene			500																					
Xylene, o-			500																					
Xylene p,m-			500																					
Xylenes, Total			500																					
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg																						
2-Methylnaphthalene			300	3.18	< 0.005	5.2	< 0.005	< 0.006	< 0.005	0.86	< 0.005	0.101	0.075	0.007	0.030	< 0.005	0.023	< 0.005	< 0.006	< 0.006	< 0.006	3.04	0.034
Acenaphthene			1,000	10.5	0.008	193	< 0.005	< 0.006	< 0.005	0.484	< 0.005	0.258	0.153	0.003	0.031	< 0.005	0.044	< 0.005	< 0.006	< 0.006	< 0.006	11.3	0.3
Acenaphthylene			10	1.45	< 0.005	6.83	< 0.005	< 0.006	< 0.005	1.17	< 0.005	0.05	0.082	< 0.006	0.036	< 0.005	0.063	< 0.005	< 0.006	< 0.006	< 0.006	1.79	0.158
Anthracene			1,000	13.7	0.010	121	< 0.005	< 0.006	< 0.005	2.74	< 0.005	0.216	0.255	0.022	0.066	< 0.005	0.175	< 0.005	< 0.006	< 0.006	< 0.006	22.6	0.466
Benzo(a)anthracene			20	**27.3**	0.010	**71.5**	< 0.005	< 0.006	< 0.005	13.3	< 0.005	0.466	0.619	0.064	0.319	< 0.005	0.637	< 0.005	< 0.006	0.008	< 0.006	**40.9**	0.752
Benzo(a)pyrene			2	**13.1**	0.010	**77.3**	< 0.005	< 0.006	< 0.005	**16.4**	< 0.005	0.476	0.737	0.048	0.365	< 0.005	0.710	< 0.005	< 0.006	0.008	< 0.006	**36.8**	0.739
Benzo(b)fluoranthene			20	6.71	0.005	**40**	< 0.005	< 0.006	< 0.005	8.66	< 0.005	0.362	0.54	0.037	0.329	< 0.005	0.535	< 0.005	< 0.006	0.008	< 0.006	**32.7**	0.622
Benzo(g,h,i)perylene			1,000	4.43	0.007	51.2	0.003	< 0.006	< 0.005	9.48	< 0.005	0.358	1.15	0.020	0.261	0.003	0.487	0.004	< 0.006	0.008	< 0.006	19.3	0.409
Benzo(k)fluoranthene			70	8.6	0.007	52.2	< 0.005	< 0.006	< 0.005	10.5	< 0.005	0.371	0.583	0.048	0.329	< 0.005	0.527	< 0.005	< 0.006	0.008	< 0.006	28.5	0.609
Chrysene			200	25.1	0.012	67.5	< 0.005	< 0.006	< 0.005	13.5	< 0.005	0.646	0.699	0.064	0.441	< 0.005	0.682	< 0.005	< 0.006	0.010	< 0.006	38.2	0.759
Dibenzo(a,h)anthracene			2	1.71	< 0.005	**11.4**	< 0.005	< 0.006	< 0.005	1.89	< 0.005	0.132	0.232	0.008	0.060	< 0.005	0.110	< 0.005	< 0.006	< 0.006	< 0.006	**6.35**	0.119
Fluoranthene			1,000	40.8	0.034	209	0.004	0.003	< 0.005	11.4	< 0.005	0.824	1.11	0.108	0.659	0.0037	1.11	< 0.005	0.0056	0.021	< 0.006	108	1.550
Fluorene			1,000	6.87	0.005	104	< 0.005	< 0.006	< 0.005	0.734	< 0.005	0.494	0.16	0.007	0.041	< 0.005	0.052	< 0.005	< 0.006	< 0.006	< 0.006	9.38	0.115
Indeno(1,2,3-cd)pyrene			20	5.66	0.005	**58.4**	< 0.005	< 0.006	< 0.005	10.4	< 0.005	0.395	1.22	0.023	0.304	< 0.005	0.562	0.003	< 0.006	0.008	< 0.006	**22.2**	0.447
Naphthalene			500	4.03	< 0.005	8.91	< 0.005	< 0.006	< 0.005	1.47	< 0.005	0.080	0.127	0.010	0.036	< 0.005	0.034	< 0.005	< 0.006	< 0.006	< 0.006	7.12	0.056
Phenanthrene			500	63.3	0.055	497	0.006	< 0.006	< 0.005	6.21	< 0.005	1.95	0.805	0.049	0.280	< 0.005	0.406	< 0.005	< 0.006	0.008	< 0.006	101	1.21
Pyrene			1,000	59.9	0.054	309	0.006	< 0.006	< 0.005	29.3	< 0.005	1.17	1.27	0.092	0.765	0.004	1.29	0.003	0.004	0.020	< 0.006	90.2	1.5
Total PAHs			NS	296	0.221	1,883	0.0187	0.00313	ND	138	ND	8.35	9.82	0.608	4.35	0.0106	7.45	0.0104	0.0092	0.108	ND	579	9.84
Petroleum Hydrocarbons	8015 Mod	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000																					
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100																					
C9 to C12 Aliphatic Hydrocarbons			1,000																					
C9 to C10 Aromatic Hydrocarbons			100																					
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000																					
C19 to C36 Aliphatic Hydrocarbons			3,000																					
C11 to C22 Aromatic Hydrocarbons			1,000																					
General Chemistry/Other																								
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	80,000	762	178,000	2,450	23,300	13,300	78,900	17,700	34,200	38,900	28,500	41,700	19,900	36,500	9,450	26,400	31,100	36,100	130,000	247,000
Percent Solids	5035	**%**	NS	55	80	61	79	66	74	57	74	54	57	63	50	75	56	75	62	61	60	35	64

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 5. Sediment Chemical Testing Results - River
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

			Sample Location:	788	789	790		798	799	800		801	802	803	804				805		806	815	
			Sample ID:	SS788-S1	SS789-S1	SS790-S1	SS790-S2	SS798-S2	SS799-S1	SS800-S1	SS800-S2	SS801-S2	SS802-S1	SS803-S1	SS804-S1	SS804-S2	SS804-S2D	SS804-S3	SS805-S1	SS805-S3	SS806-S2	815-S1	815-S3
			Lab Sample ID:	F200033	F200033	F200033	F200033	F200035	F200035	F200035	F200035	F200035	F200036	F200036	F200035	F200035	F200035	F200035	F200035	F200035	F200035	F230021	F230021
			Property:	25 Water Street	35 Water St	35 Water St	35 Water St	8 Noel St	11 River St #R	33 River St	33 River St	51 River St	58 Macy St	58 Macy St	77 Macy St	77 Macy St	77 Macy St	77 Macy St	412 Main St	412 Main St	392 Main St	28 Oak Street	28 Oak Street
			Area:	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River
			Sample Date:	7/13/2020	7/13/2020	7/13/2020	7/13/2020	7/13/2020	7/13/2020	7/7/2020	7/7/2020	7/7/2020	7/7/2020	7/7/2020	7/7/2020	7/7/2020	7/7/2020	7/7/2020	7/7/2020	7/7/2020	7/7/2020	06/22/2023	06/22/2023
			Soil/Sediment Type:	Sand	Sand	Silty Sand	Silty Sand	Sand	Silt w/Sand	Sandy Silt	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Sand	Silt w/Sand	Sand	Sand w/Silt&Gravel	Silty Sand	Organic Soil
			Sample Depth (feet):	0.7-0.8	0-0.5	1.7-1.8	4.3-4.5	1.8-2	0-0.5	1.4-1.6	3.3-3.5	4.4-4.6	6-6.2	6-6.2	0-1	3.8-4	3.8-4	7.1-7.3	0-1	3-3.2	0.8-1	0-1	4-5
Analyte	**Method**	**Units**	**S-1/GW-3**																					
Volatile Organic Compounds (VOCs)	8260	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40																					
Ethylbenzene			500																					
Toluene			500																					
Xylene, o-			500																					
Xylene p,m-			500																					
Xylenes, Total			500																					
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg																						
2-Methylnaphthalene			300	0.115	0.034	0.129	< 0.005	0.031	0.004	0.006	0.218	< 0.006	0.003	0.003	0.014	0.099	0.089	0.009	0.014	< 0.004	< 0.004	0.0401	0.116
Acenaphthene			1,000	0.698	0.3	0.862	0.004	0.017	< 0.007	< 0.005	0.374	< 0.006	< 0.005	< 0.005	0.020	0.062	0.054	0.004	0.008	< 0.004	< 0.004	0.0949	0.0745
Acenaphthylene			10	0.506	0.158	0.849	< 0.005	0.123	0.005	< 0.005	0.45	< 0.006	< 0.005	< 0.005	0.113	0.346	0.29	0.057	0.054	< 0.004	< 0.004	0.198	0.165
Anthracene			1,000	1.260	0.466	1.99	< 0.005	0.118	< 0.007	< 0.005	1.08	< 0.006	< 0.005	< 0.005	0.125	0.346	0.292	0.032	0.059	< 0.004	< 0.004	0.494	0.322
Benzo(a)anthracene			20	2.330	0.752	5.19	< 0.005	0.366	0.008	0.003	2.42	< 0.006	< 0.005	< 0.005	0.338	0.621	0.523	0.135	0.218	< 0.004	< 0.004	1.71	1.21
Benzo(a)pyrene			2	**2.170**	0.739	**5.01**	< 0.005	0.422	0.012	0.004	**3.12**	< 0.006	< 0.005	< 0.005	0.443	0.747	0.618	0.156	0.222	< 0.004	< 0.004	1.79	1.18
Benzo(b)fluoranthene			20	1.730	0.622	4.33	< 0.005	0.324	0.007	0.004	1.63	< 0.006	< 0.005	< 0.005	0.447	0.652	0.578	0.098	0.172	< 0.004	< 0.004	1.38	0.633
Benzo(g,h,i)perylene			1,000	1.230	0.409	2.78	< 0.005	0.24	0.007	0.003	1.79	< 0.006	< 0.005	< 0.005	0.298	0.502	0.415	0.080	0.115	< 0.004	< 0.004	0.949	0.525
Benzo(k)fluoranthene			70	1.840	0.609	4.29	< 0.005	0.342	0.007	0.004	1.62	< 0.006	< 0.005	< 0.005	0.439	0.708	0.574	0.107	0.181	< 0.004	< 0.004	1.35	0.746
Chrysene			200	2.530	0.759	5.30	< 0.005	0.425	0.009	0.005	2.43	< 0.006	< 0.005	< 0.005	0.447	0.828	0.705	0.126	0.223	< 0.004	< 0.004	1.64	1.11
Dibenzo(a,h)anthracene			2	0.339	0.119	0.821	< 0.005	0.065	< 0.007	< 0.005	0.434	< 0.006	< 0.005	< 0.005	0.077	0.122	0.117	0.021	0.031	< 0.004	< 0.004	0.296	0.142
Fluoranthene			1,000	4.770	1.55	11.3	0.004	0.557	0.016	0.009	2.81	< 0.006	< 0.005	< 0.005	0.831	1.13	1.0	0.088	0.322	< 0.004	0.002	2.7	0.985
Fluorene			1,000	0.737	0.115	0.745	< 0.005	0.03	0.004	0.003	0.485	< 0.006	0.003	0.002	0.035	0.115	0.101	0.008	0.015	< 0.004	< 0.004	0.103	0.103
Indeno(1,2,3-cd)pyrene			20	1.320	0.447	3.14	< 0.005	0.252	0.006	0.003	1.38	< 0.006	< 0.005	< 0.005	0.335	0.532	0.426	0.080	0.125	< 0.004	< 0.004	1.25	0.573
Naphthalene			500	0.203	0.056	0.236	0.005	0.04	0.004	0.004	0.212	0.00326	0.003	0.003	0.02	0.098	0.090	0.011	0.018	< 0.004	0.002	0.0678	0.133
Phenanthrene			500	4.180	1.21	3.42	0.003	0.188	0.007	0.010	3.08	< 0.006	0.003	0.003	0.256	0.608	0.542	0.045	0.111	0.003	0.003	1.06	0.6
Pyrene			1,000	5.220	1.5	10.5	0.004	0.693	0.016	0.009	5.22	< 0.006	< 0.005	< 0.005	0.718	1.41	1.23	0.182	0.363	< 0.004	0.002	2.4	2.01
Total PAHs			NS	31.2	9.84	60.9	0.0207	4.23	0.111	0.0664	28.8	0.00326	0.013	0.0116	4.96	8.93	7.64	1.24	2.25	0.0025	0.0093	17.5	10.6
Petroleum Hydrocarbons	8015 Mod	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000																					
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100																					
C9 to C12 Aliphatic Hydrocarbons			1,000																					
C9 to C10 Aromatic Hydrocarbons			100																					
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000																					
C19 to C36 Aliphatic Hydrocarbons			3,000																					
C11 to C22 Aromatic Hydrocarbons			1,000																					
General Chemistry/Other																								
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	50,100	7,610	55,000	17,100	51,800	26,600	23,000	26,600	18,600	445	< 94.7	27,400	51,200	51,400	5,280	5,220	3,760	2,060	14,600	13,700
Percent Solids	5035	%	NS	56	79	50	76	56	53	74	64	69	82	82	63	51	NT	84	82	88	90	65	51

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 5. Sediment Chemical Testing Results - River
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

			Sample Location:	817	818		819	820	823		824	827		829	843		844			845	
			Sample ID:	817-S1	818-S1	818-S2	819-S1	820-S1	823-S1	823-S2	824-S1	827-S1	827-S2	829-S1	843-S1	843-S2	844-S1	844-S2	844-S3	845-S1	845-S2
			Lab Sample ID:	F230018	F230019	F230019	F230018	F230019	F230019	F230019	F230019	F230019	F230019	F230019	F230029-10	F230029-11	F230029-12	F230029-13	F230029-14	F230029-01	F230029-02
			Property:	3 River St	7 River Street	7 River Street	7 Noel St	7 Noel St	38 Childs Ave	38 Childs Ave	21 River St #R	27 River St	27 River St	27 River St	1 Field St	1 Field St	38 Childs Ave	38 Childs Ave	38 Childs Ave	222 Main St	222 Main St
			Area:	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River
			Sample Date:	06/20/2023	06/22/2023	06/22/2023	06/20/2023	06/22/2023	06/22/2023	06/22/2023	06/22/2023	06/22/2023	06/22/2023	06/22/2023	08/29/2023	08/29/2023	08/29/2023	08/29/2023	08/29/2023	08/29/2023	08/29/2023
			Soil/Sediment Type:	Organic Soil	Organic Soil	Organic Soil	Silty Sand	Organic Soil	Organic Soil	Organic Soil	Organic Soil	Organic Soil	Organic Soil	Organic Soil	Silty Sand	Sandy Silt	Silty Sand	Silty Sand	Silty Sand	Organic Soil	Organic Soil
			Sample Depth (feet):	0-1	0-1	5-6	0-1	0-1	0-1	4-5	0-1	0-1	5-6	0-1	0-0.5	1-2	0-0.5	1-2	3-3.5	0-1	1-2
Analyte	**Method**	**Units**	**S-1/GW-3**																		
Volatile Organic Compounds (VOCs)	8260	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40																		
Ethylbenzene			500																		
Toluene			500																		
Xylene, o-			500																		
Xylene p,m-			500																		
Xylenes, Total			500																		
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg																			
2-Methylnaphthalene			300	2.24	0.0436	0.00366	0.0431	0.0402	0.0918	8.2	0.0771	0.00547	0.00222	0.0693	0.469	1.17	0.177	0.153	2.04	0.0344	<0.00666
Acenaphthene			1,000	25.7	0.0229	<0.00609	0.0937	0.154	0.251	189	0.207	<0.00679	<0.00442	0.176	1.29	6.72	0.491	0.359	6.27	0.0201	<0.00666
Acenaphthylene			10	2.4	0.156	<0.00609	0.254	0.254	0.587	**21.3**	0.282	0.00381	<0.00442	0.425	0.594	2.14	0.502	0.603	4.1	0.104	<0.00666
Anthracene			1,000	7.66	0.168	<0.00609	0.338	0.589	1.5	121	0.692	<0.00679	<0.00442	0.604	3.44	4.14	1.16	1.03	8.73	0.11	<0.00666
Benzo(a)anthracene			20	8.93	0.407	<0.00609	0.908	2.06	2.77	**120**	2.22	<0.00679	<0.00442	1.85	7.76	6.39	2.52	2.65	16.7	0.348	0.00449
Benzo(a)pyrene			2	**10.2**	0.53	<0.00609	1.09	**2.46**	**3.5**	**136**	**2.28**	<0.00679	<0.00442	**2.34**	**8.52**	**7.51**	**2.84**	**3.04**	**20**	0.382	0.00515
Benzo(b)fluoranthene			20	5.75	0.363	<0.00609	0.824	2.02	2.35	**59.5**	1.6	<0.00679	<0.00442	1.71	6.08	4.37	1.77	2.05	11.4	0.267	0.00488
Benzo(g,h,i)perylene			1,000	5.26	0.324	<0.00609	0.653	1.57	2.02	64.8	1.21	<0.00679	<0.00442	1.41	4.84	3.91	1.47	1.73	10.6	0.223	0.0034
Benzo(k)fluoranthene			70	6.34	0.404	<0.00609	0.832	2	2.41	**75.9**	1.78	<0.00679	<0.00442	1.66	6.1	5.03	1.96	2.3	13.3	0.303	0.00424
Chrysene			200	8.86	0.515	<0.00609	0.946	2.40	2.87	107	2.40	<0.00679	<0.00442	2.03	7.92	6.57	2.33	2.88	17.7	0.423	0.0056
Dibenzo(a,h)anthracene			2	1.24	0.0824	<0.00609	0.169	0.392	0.502	**13.2**	0.351	<0.00679	<0.00442	0.361	1.31	1.01	0.378	0.459	**2.61**	0.059	<0.00666
Fluoranthene			1,000	21.8	0.492	0.00495	1.73	4.48	5.52	149	3.66	0.00429	<0.00442	3.3	16.4	12.2	4.83	4.76	27.7	0.454	0.00833
Fluorene			1,000	6.18	0.038	<0.00609	0.0661	0.12	0.219	139	0.209	0.00401	<0.00442	0.159	1.25	2.77	0.384	0.353	2.81	0.0292	<0.00666
Indeno(1,2,3-cd)pyrene			20	6.18	0.37	<0.00609	0.8	1.94	2.41	**70.4**	1.51	<0.00679	<0.00442	1.69	5.84	4.67	1.78	2.05	12.3	0.265	0.00398
Naphthalene			500	6.37	0.0543	<0.00609	0.0776	0.0796	0.159	30.9	0.0966	0.00744	<0.00442	0.107	1.13	2.88	0.276	0.227	2.93	0.0437	<0.00666
Phenanthrene			500	27.7	0.234	0.00442	0.545	1.42	2.82	343	1.91	0.00658	0.00294	1.49	13.7	12.3	3.34	2.58	21.4	0.146	0.00344
Pyrene			1,000	27.7	0.926	0.00341	1.54	3.81	5.75	221	3.4	0.00448	<0.00442	3.25	14.6	14.7	5.13	4.92	35	0.912	0.0122
Total PAHs			NS	181	5.13	0.0164	10.9	25.8	35.7	1,869	23.9	0.0361	0.0052	22.6	101	98.5	31.3	32.1	216	4.12	0.056
Petroleum Hydrocarbons	8015 Mod	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000																		
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100																		
C9 to C12 Aliphatic Hydrocarbons			1,000																		
C9 to C10 Aromatic Hydrocarbons			100																		
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000																		
C19 to C36 Aliphatic Hydrocarbons			3,000																		
C11 to C22 Aromatic Hydrocarbons			1,000																		
General Chemistry/Other																					
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	44,400	47,400	22,000	17,800	38,900	40,900	70,500	16,900	33,900	7,610	32,400	86,300	72,800	26,700	32,200	106,000	49,200	50,100
Percent Solids	5035	%	NS	76	49	64	73	40	40	45	59	58	77	50	59	77	59	58	44	47	55

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 5. Sediment Chemical Testing Results - River
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

			Sample Location:	846			847		848		849	850	851			852			853			854	
			Sample ID:	846-S1	846-S2	846-S3	847-S1	847-S2	848-S1	848-S2	849-(3.78-3.98)	850-(4.45-4.65)	851-S1	851-(3.80-4.00)	851-S2	852-S1	852-S2	852-(3.55-3.75)	853-S1	853-S2	853-S3	854-S1	854-S2
			Lab Sample ID:	F230029-05	F230029-06	F230029-07	F230029-03	F230029-04	F230026	F230026	F2400018-01	F2400018-02	F230030-03	F2400018-03	F230030-04	F230030-01	F230030-02	F2400018-04	F230026	F230026	F230026	F230029-08	F230029-09
			Property:	Comm of MA Tidelands	Comm of MA Tidelands	Comm of MA Tidelands	50 Macy St #R	50 Macy St #R	Comm of MA Tidelands	Comm of MA Tidelands	1 Field St	1 Field St	28 Oak Street	28 Oak Street	28 Oak Street	3 River St	3 River St	3 River St	51 River St	51 River St	51 River St	39 Water St	39 Water St
			Area:	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River
			Sample Date:	08/29/2023	08/29/2023	08/29/2023	08/29/2023	08/29/2023	8/18/2023	8/18/2023	8/16/2023	8/17/2023	08/30/2023	8/29/2023	08/30/2023	08/30/2023	08/30/2023	8/29/2023	8/18/2023	8/18/2023	8/18/2023	08/29/2023	08/29/2023
			Soil/Sediment Type:	Sand	Silty Sand	Silty Sand	Sand	Organic Soil	Sand	Silty Sand	Silty Sand	Sandy Silt	Sand	Sand w/Silt	Sand w/Silt	Silty Sand	Silty Sand	Silty Sand	Sand	Sand	Silty Sand	Sand	Sand
			Sample Depth (feet):	0-0.5	1-2	3.5-4.3	0-1	1-2	0-1	1-2	3.8-4	4.5-4.7	0-0.5	3.8-4	5.5-6	0-0.5	3.5-4	3.6-3.8	0-0.5	1-2	5.5-6	0-0.5	1.5-2
Analyte	**Method**	**Units**	**S-1/GW-3**																				
Volatile Organic Compounds (VOCs)	8260	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40																				
Ethylbenzene			500																				
Toluene			500																				
Xylene, o-			500																				
Xylene p,m-			500																				
Xylenes, Total			500																				
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg																					
2-Methylnaphthalene			300	0.0408	0.0624	0.232	0.044	0.074	0.0363	0.0484	0.642	7.35	0.0664	**5,800**	124	0.656	0.96	**1,660**	0.0227	0.0516	<0.00511	0.155	0.0471
Acenaphthene			1,000	0.0856	0.112	0.867	0.187	0.129	0.0663	0.0658	12.5	219	0.198	**9,260**	561	5.13	34.3	**3,240**	0.0379	0.0688	<0.00511	0.628	0.157
Acenaphthylene			10	0.403	0.333	1.23	0.201	0.306	0.164	0.17	2.25	**10.7**	0.443	**487**	**34**	1.36	2.21	**136**	0.0895	0.158	<0.00511	0.282	0.301
Anthracene			1,000	0.447	0.419	1.7	0.455	0.781	0.241	0.187	9.98	128	0.658	**4,020**	275	20	6.12	707	0.133	0.213	<0.00511	1.1	0.623
Benzo(a)anthracene			20	2.1	1.25	4.05	1.35	1.11	0.594	0.604	9.3	**95.9**	1.24	**2,700**	**141**	**26.2**	7.74	**707**	0.319	0.452	<0.00511	2.73	1.05
Benzo(a)pyrene			2	**2.6**	1.54	**5.12**	1.57	1.34	0.661	0.856	**7.77**	**95.2**	1.17	**3,050**	**133**	**24.6**	**8.93**	**802**	0.35	0.465	<0.00511	**2.47**	1.12
Benzo(b)fluoranthene			20	1.63	1.07	3.29	1.12	0.916	0.461	0.475	3.91	**49.8**	0.799	**1,320**	**58.5**	18.1	6.09	**345**	0.255	0.344	<0.00511	2.07	0.748
Benzo(g,h,i)perylene			1,000	1.44	0.921	2.88	0.885	0.8	0.378	0.477	2.7	42.5	0.573	**1,270**	55.4	11.8	4.78	338	0.194	0.261	<0.00511	1.26	0.589
Benzo(k)fluoranthene			70	1.77	1.17	3.36	1.19	0.968	0.502	0.548	4.68	56.7	0.934	**1,490**	**72.3**	16.4	6.1	**404**	0.274	0.363	<0.00511	2.03	0.837
Chrysene			200	2.19	1.35	4.42	1.38	1.22	0.652	0.688	9.7	90.8	1.19	2,220	130	23.6	8.42	431	0.352	0.550	<0.00511	2.75	1.05
Dibenzo(a,h)anthracene			2	0.357	0.232	0.713	0.251	0.206	0.103	0.106	0.934	**12.1**	0.174	**285**	**15.3**	**3.28**	1.26	**66.4**	0.0556	0.0726	<0.00511	0.422	0.174
Fluoranthene			1,000	2.69	2.16	6.5	2.47	2.25	1.1	1	16.4	226	2.44	**6,740**	321	66.1	15.8	**1,980**	0.572	0.747	<0.00511	5.52	1.95
Fluorene			1,000	0.102	0.115	0.433	0.143	0.102	0.0794	0.0794	8.99	82.3	0.253	**3,540**	188	6.45	7.77	1,000	0.0399	0.102	<0.00511	0.483	0.171
Indeno(1,2,3-cd)pyrene			20	1.68	1.11	3.34	1.1	0.928	0.445	0.533	3.12	**47.2**	0.739	**1,280**	**61.3**	15.7	5.76	**340**	0.238	0.31	<0.00511	1.73	0.748
Naphthalene			500	0.0749	0.101	0.458	0.0804	0.106	0.0552	0.0806	1.55	25.3	0.0976	**7,930**	171	0.743	3.57	**3,920**	0.0296	0.0505	<0.00511	0.339	0.078
Phenanthrene			500	0.852	0.979	3.83	1.36	1.03	0.47	0.672	52.6	376	1.76	**16,200**	**838**	56.2	21.8	**4,860**	0.265	0.505	<0.00511	4.01	1.44
Pyrene			1,000	3.1	2.16	6.94	2.3	2.67	1.2	1.15	24.1	290	2.16	**10,400**	475	56.3	17.6	**2,850**	0.596	0.946	<0.00511	4.52	2.03
Total PAHs			NS	21.6	15.1	49.4	16.1	14.9	7.21	7.74	171	1,855	14.9	77,992	3,654	353	159	23,786	3.82	5.66	ND	32.5	13.1
Petroleum Hydrocarbons	8015 Mod	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000																				
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100																				
C9 to C12 Aliphatic Hydrocarbons			1,000																				
C9 to C10 Aromatic Hydrocarbons			100																				
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000																				
C19 to C36 Aliphatic Hydrocarbons			3,000																				
C11 to C22 Aromatic Hydrocarbons			1,000																				
General Chemistry/Other																							
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	29,500	31,700	124,000	32,200	45,200	34,300	7,080	30,000	112,000	17,500	317,000	45,500	15,700	95,600	472,000	24,500	27,800	9,490	25,800	9,370
Percent Solids	5035	**%**	NS	51	59	58	60	57	65	72	76	80	85	65	74	82	52	68	58	62	74	78	85

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 5. Sediment Chemical Testing Results - River
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

			Sample Location:	855	856	857				858				859		860		861	862	869	871	
			Sample ID:	855-(4.10-4.30)	856-(4.55-4.75)	857-S1	857-S2	857-S3	857-S4	858-S1	858-S2	858-S3	858-S4	859-S1	859-S2	860-S1	860-S2	861-S1	862-S1	869-S1	871-S1	871-S2
			Lab Sample ID:	F2400018-05	F2400018-06	F230037-01	F230038-01	F230037-02	F230038-02	F230037-03	F230038-03	F230037-04	F230038-04	F230042-01	F230042-02	F230042-03	F230042-04	F230041-01	F230041-02	F230041-03	F240021-01	F240021-02
			Property:	33R Oakland St	37 Oakland St	35 Water St	35 Water St	35 Water St	35 Water St	35 Water St	35 Water St	35 Water St	35 Water St	1 Field St	1 Field St	1 Field St	1 Field St	1 Field St	1 Field St	1 Field St	3 River St	3 River St
			Area:	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River
			Sample Date:	8/31/23	8/31/2023	11/2/2023	11/2/2023	11/2/2023	11/2/2023	11/2/2023	11/2/2023	11/2/2023	11/2/2023	11/28/2023	11/28/2023	11/28/2023	11/28/2023	11/27/2023	11/27/2023	11/27/2023	07/23/2024	07/23/2024
			Soil/Sediment Type:	Sand w/Silt	Silt w/Sand	Silty Sand	Silty Sand	Silty Sand	Sand w/ silt	Silty Sand	Silty Sand	Organic Soil	Sand w/ silt	Silty Sand	Silty Sand	Silty Sand	Silty Sand	Organic Soil	Organic Soil	Silty Sand	Silty Sand	Sandy Silt
			Sample Depth (feet):	4.1-4.3	4.6-4.8	0-1	1-2	2-3	4-5	0-1	1-2	2-3	4-4.5	0-1	1-2	0-1	1-2	0-1	0-1	0-1	0-1	1-2
Analyte	**Method**	**Units**	**S-1/GW-3**																			
Volatile Organic Compounds (VOCs)	8260	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40																			
Ethylbenzene			500																			
Toluene			500																			
Xylene, o-			500																			
Xylene p,m-			500																			
Xylenes, Total			500																			
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg																				
2-Methylnaphthalene			300	8.66	44.4	0.116	0.0988	0.821	0.604	0.044	0.176	0.124	0.511	2.46	0.0514	0.478	1.15	0.389	0.198	0.106	0.103	0.0836
Acenaphthene			1,000	113	726	0.209	0.374	3.95	2.25	0.103	0.80	0.533	2.22	1.57	0.553	2.22	0.905	1.59	0.456	0.263	0.310	0.290
Acenaphthylene			10	**13.4**	**43**	0.781	0.359	1.10	1.19	0.642	0.589	0.530	1.07	2.95	0.0185	0.420	0.202	0.424	1.20	0.297	0.330	0.545
Anthracene			1,000	83.1	444	1.22	0.911	7.30	4.53	0.832	1.81	1.33	5.82	7.52	0.128	6.80	2.28	3.09	1.82	0.948	0.856	0.756
Benzo(a)anthracene			20	**59.8**	**255**	2.08	2.25	11.1	8.86	1.90	4.38	2.94	9.43	**27.6**	0.188	8.56	3.16	5.84	5.40	2.14	1.90	1.66
Benzo(a)pyrene			2	**58.8**	**258**	**2.02**	**2.32**	**9.91**	**10.0**	**2.07**	**4.45**	**3.02**	**9.38**	**36.5**	0.216	**5.62**	**2.87**	**6.06**	**6.17**	**2.37**	**2.22**	**2.66**
Benzo(b)fluoranthene			20	**30.1**	**112**	1.57	1.83	9.43	7.67	1.67	3.59	2.48	7.73	14.6	0.0941	3.63	1.74	4.66	4.92	1.76	1.63	1.70
Benzo(g,h,i)perylene			1,000	23.5	115	1.11	1.33	6.38	6.16	1.20	2.46	1.69	5.68	19.1	0.105	1.69	1.15	3.29	3.67	1.37	1.22	1.59
Benzo(k)fluoranthene			70	33.4	**145**	1.49	1.94	6.97	7.08	1.60	3.58	2.32	6.85	16.3	0.101	5.06	2.22	4.81	4.69	1.72	1.51	1.53
Chrysene			200	59.3	243	2.06	2.35	11.0	9.28	1.95	4.39	3.05	9.15	25.9	0.179	6.84	2.81	5.55	5.68	2.20	1.98	1.94
Dibenzo(a,h)anthracene			2	**6.6**	**29.9**	0.321	0.382	1.75	1.77	0.344	0.737	0.506	1.47	**4.51**	0.0259	0.88	0.452	0.977	1.11	0.361	0.336	0.417
Fluoranthene			1,000	135	671	4.22	5.19	32.7	25.2	3.59	9.10	5.45	30.7	26.0	0.255	20.0	4.83	11.4	9.37	4.92	4.14	2.82
Fluorene			1,000	49.4	319	0.271	0.290	3.76	1.88	0.148	0.635	0.400	2.16	1.92	0.0793	1.94	1.10	1.59	0.426	0.287	0.283	0.169
Indeno(1,2,3-cd)pyrene			20	**26.2**	**124**	1.35	1.63	7.79	7.09	1.46	3.07	2.11	6.77	15.4	0.0849	2.54	1.42	4.16	4.25	1.57	1.40	1.63
Naphthalene			500	23.2	228	0.126	0.122	1.55	1.25	0.0661	0.297	0.193	1.22	2.99	0.070	0.602	1.82	0.650	0.266	0.181	0.226	0.141
Phenanthrene			500	268	**1,410**	3.55	2.86	28.9	18.2	1.93	6.46	4.18	25.7	9.05	0.319	10.6	4.92	9.32	4.10	2.68	3.16	1.55
Pyrene			1,000	184	927	3.71	4.36	27.0	24.1	3.14	7.75	4.70	25.0	56.4	0.480	15.1	4.47	9.35	8.70	4.40	3.89	3.18
Total PAHs			NS	1,175	6,094	26.2	28.6	171	137	22.7	54.3	35.6	151	271	2.95	93.0	37.5	73.2	62.4	27.6	25.5	22.7
Petroleum Hydrocarbons	8015 Mod	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000																			
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100																			
C9 to C12 Aliphatic Hydrocarbons			1,000																			
C9 to C10 Aromatic Hydrocarbons			100																			
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000																			
C19 to C36 Aliphatic Hydrocarbons			3,000																			
C11 to C22 Aromatic Hydrocarbons			1,000																			
General Chemistry/Other																						
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	163,000	112,000	22,200	22,500	47,400	67,500	51,000	12,200	20,900	91,600	48,600	34,500	47,400	27,500	92,500	92,500	26,600	15,600	58,100
Percent Solids	5035	%	NS	60	57	74	77	54	70	51	73	85	79	61	72	70	80	26	33	63	78	55

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 5. Sediment Chemical Testing Results - River
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

			Sample Location:	**872**		**873**		**874**		**875**		**876**		**877**		**878**		**879**		**880**		**881**	
			Sample ID:	**872-S1**	**872-S2**	**873-S1**	**873-S2**	**874-S1**	**874-S2**	**875-S1**	**875-S2**	**876-S1**	**876-S2**	**877-S1**	**877-S2**	**878-S1**	**878-S2**	**879-S1**	**879-S2**	**880-S1**	**880-S2**	**881-S1**	**881-S2**
			Lab Sample ID:	**F240021-03**	**F240021-04**	**F240021-11**	**F240021-12**	**F240020-05**	**F240020-06**	**F240020-07**	**F240020-08**	**F240020-14**	**F240020-15**	**F240020-03**	**F240020-04**	**F240020-01**	**F240020-02**	**F240020-09**	**F240020-10**	**F240021-07**	**F240021-08**	**F240021-09**	**F240021-10**
			Property:	**3 River St**	**3 River St**	**8 Noel St**	**8 Noel St**	**7 Noel St**	**7 Noel St**	**7 Noel St**	**7 Noel St**	**33 River St**	**33 River St**	**33 River St**	**33 River St**	**33 River St**	**33 River St**	**1 Field St**	**1 Field St**	**1 Field St**	**1 Field St**	**1 Field St**	**1 Field St**
			Area:	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**
			Sample Date:	**07/23/2024**	**07/23/2024**	**07/23/2024**	**07/23/2024**	**07/22/2024**	**07/22/2024**	**07/22/2024**	**07/22/2024**	**07/22/2024**	**07/22/2024**	**07/22/2024**	**07/22/2024**	**07/22/2024**	**07/22/2024**	**07/22/2024**	**07/22/2024**	**07/23/2024**	**07/23/2024**	**07/23/2024**	**07/23/2024**
			Soil/Sediment Type:	**Silt w/Sand**	**Silty Sand**	**Silty Sand**	**Silt**	**Silty Sand w/Gravel**	**Silty Sand w/Gravel**	**Sandy Silt**	**Sandy Silt**	**Sandy Silt**	**Sandy Silt**	**Sandy Silt**	**Sandy Silt**	**Sandy Silt**	**Sandy Silt**	**Sandy Silt**	**Sandy Silt**	**Sandy Silt**	**Sandy Silt**	**Silt w/Sand**	**Sandy Silt**
			Sample Depth (feet):	**0-1**	**1-2**	**0-1**	**1-2**	**0-1**	**1-2**	**0-1**	**1-2**	**0-1**	**1-2**	**0-1**	**1-2**	**0-1**	**1-2**	**0-1**	**1-2**	**0-1**	**1-2**	**0-1**	**1-2**
Analyte	**Method**	**Units**	**S-1/GW-3**																				
Volatile Organic Compounds (VOCs)	8260	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40																				
Ethylbenzene			500																				
Toluene			500																				
Xylene, o-			500																				
Xylene p,m-			500																				
Xylenes, Total			500																				
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg																					
2-Methylnaphthalene			300	0.763	3.64	0.0401	0.00821	0.0036	0.0128	0.00968	0.0329	0.0417	0.0666	0.0756	0.0570	0.0300	0.126	0.0155	0.0066	0.0245	0.00577	0.00847	0.00386
Acenaphthene			1,000	7.07	34.5	0.0361	<0.0109	0.0097	0.115	0.00941	0.0270	0.0919	0.162	0.0956	0.0503	0.0342	0.104	0.0210	<0.00683	0.0385	<0.00690	0.00594	<0.00686
Acenaphthylene			10	0.899	2.92	0.124	0.00685	0.0165	0.105	0.0218	0.1660	0.318	0.268	0.617	0.308	0.180	0.758	0.0110	<0.00683	0.103	0.00700	0.0257	<0.00686
Anthracene			1,000	5.29	9.00	0.176	0.00652	0.0215	0.166	0.0238	0.1600	0.371	0.380	0.644	0.295	0.191	0.658	0.0629	<0.00683	0.147	<0.00690	0.0285	<0.00686
Benzo(a)anthracene			20	13.0	9.18	0.652	0.0212	0.0646	0.386	0.0847	0.4920	1.15	0.822	3.05	1.00	0.717	2.36	0.0879	<0.00683	0.473	0.00489	0.0885	<0.00686
Benzo(a)pyrene			2	**12.3**	**11.5**	0.807	0.0232	0.0718	0.436	0.1070	0.6160	1.49	1.00	**3.27**	1.27	0.835	**3.11**	0.0477	<0.00683	0.573	0.00616	0.130	<0.00686
Benzo(b)fluoranthene			20	10.4	7.96	0.477	0.0155	0.0604	0.385	0.1010	0.4170	1.09	0.740	2.12	0.851	0.531	2.09	0.0343	<0.00683	0.457	0.00507	0.0954	<0.00686
Benzo(g,h,i)perylene			1,000	6.46	6.28	0.423	0.0130	0.0428	0.267	0.0704	0.3440	0.838	0.570	1.35	0.696	0.441	1.74	0.0189	<0.00683	0.358	0.00459	0.0876	<0.00686
Benzo(k)fluoranthene			70	8.73	7.12	0.516	0.0141	0.0605	0.378	0.0930	0.4500	1.09	0.769	2.66	0.834	0.613	2.14	0.0418	<0.00683	0.480	0.00499	0.102	<0.00686
Chrysene			200	12.80	9.58	0.659	0.0250	0.0716	0.443	0.1170	0.5860	1.27	1.00	2.93	1.12	0.779	2.81	0.0801	0.00351	0.567	0.00712	0.119	<0.00686
Dibenzo(a,h)anthracene			2	**2.12**	1.85	0.112	<0.0109	0.0124	0.0745	0.0223	0.0945	0.234	0.160	0.528	0.197	0.120	0.439	0.00713	<0.00683	0.104	<0.00690	0.0284	<0.00686
Fluoranthene			1,000	28.5	23.7	0.835	0.0364	0.187	1.00	0.197	0.801	2.09	1.55	2.65	0.911	1.13	1.99	0.319	0.0121	0.926	0.0119	0.167	0.00665
Fluorene			1,000	2.67	9.65	0.0487	<0.0109	0.00636	0.0473	0.00937	0.0345	0.0805	0.0921	0.0900	0.0621	0.0410	0.132	0.0157	<0.00683	0.0415	0.00430	0.00904	0.00354
Indeno(1,2,3-cd)pyrene			20	8.24	7.05	0.452	0.0128	0.0487	0.309	0.0828	0.385	0.951	0.639	1.75	0.775	0.497	1.95	0.0221	<0.00683	0.413	0.00497	0.102	<0.00686
Naphthalene			500	2.01	17.3	0.0540	0.00754	0.00511	0.0196	0.00988	0.0389	0.0606	0.0790	0.123	0.0718	0.0657	0.173	0.0217	0.00826	0.0366	0.00626	0.0112	0.00440
Phenanthrene			500	23.3	42.2	0.410	0.0203	0.0457	0.294	0.0506	0.258	0.843	0.931	0.972	0.508	0.365	1.15	0.105	0.0088	0.398	0.0135	0.0540	0.00689
Pyrene			1,000	24.3	29.0	1.25	0.0777	0.163	0.861	0.184	0.962	2.15	1.93	2.75	2.04	1.44	5.00	0.257	0.0114	0.913	0.0139	0.185	0.00636
Total PAHs			NS	169	232	7.07	0.288	0.89	5.3	1.2	5.9	14.2	11.2	25.7	11.0	8.0	26.7	1.2	0.1	6.05	0.100	1.25	0.0317
Petroleum Hydrocarbons	8015 Mod	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000																				
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100																				
C9 to C12 Aliphatic Hydrocarbons			1,000																				
C9 to C10 Aromatic Hydrocarbons			100																				
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000																				
C19 to C36 Aliphatic Hydrocarbons			3,000																				
C11 to C22 Aromatic Hydrocarbons			1,000																				
General Chemistry/Other																							
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	61,500	54,100	13,600	133,000	1,650	22,900	79,500	9,380	20,200	43,600	56,800	17,100	48,800	43,800	62,000	64,100	76,200	46,600	44,900	33,300
Percent Solids	5035	**%**	NS	73	69	76	36	85	69	36	75	63	52	49	68	53	64	49	58	48	56	52	59

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 5. Sediment Chemical Testing Results - River
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

			Sample Location:	**882**		**888**			**889**		
			Sample ID:	**882-S1**	**882-S2**	**888-S1**	**888-S2**	**888-S3**	**889-S1**	**889-S2**	**889-S3**
			Lab Sample ID:	**F240021-05**	**F240021-06**	**F240020-11**	**F240020-12**	**F240020-13**	**F240021-13**	**F240021-14**	**F240021-15**
			Property:	**1 Field St**	**1 Field St**	**35 Water St**	**35 Water St**	**35 Water St**	**1 Field St**	**1 Field St**	**1 Field St**
			Area:	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**
			Sample Date:	**07/23/2024**	**07/23/2024**	**07/22/2024**	**07/22/2024**	**07/22/2024**	**07/23/2024**	**07/23/2024**	**07/23/2024**
			Soil/Sediment Type:	**Silt w/Sand**	**Sandy Silt**	**Silty Sand**	**Silty Sand**	**Clay**	**Silty Sand**	**Silty Sand**	**Clay**
			Sample Depth (feet):	**0-1**	**1-2**	**0-1**	**1-2**	**4-5**	**0-1**	**1-2**	**4-5**
Analyte	**Method**	**Units**	**S-1/GW-3**								
Volatile Organic Compounds (VOCs)	8260	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40								
Ethylbenzene			500								
Toluene			500								
Xylene, o-			500								
Xylene p,m-			500								
Xylenes, Total			500								
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg									
2-Methylnaphthalene			300	0.127	0.0175	0.00925	0.00670	0.00343	0.248	0.00269	0.00360
Acenaphthene			1,000	0.397	0.0498	0.0213	0.282	<0.00495	1.75	<0.00405	<0.00541
Acenaphthylene			10	0.370	0.0428	0.101	<0.00736	<0.00495	0.0939	<0.00405	<0.00541
Anthracene			1,000	0.618	0.0805	0.135	<0.00736	<0.00495	1.44	<0.00405	<0.00541
Benzo(a)anthracene			20	1.31	0.185	0.444	<0.00736	<0.00495	1.27	<0.00405	<0.00541
Benzo(a)pyrene			2	1.54	0.222	0.519	0.00426	<0.00495	0.780	<0.00405	<0.00541
Benzo(b)fluoranthene			20	1.02	0.132	0.390	<0.00736	<0.00495	0.497	<0.00405	<0.00541
Benzo(g,h,i)perylene			1,000	0.84	0.117	0.286	<0.00736	<0.00495	0.232	<0.00405	<0.00541
Benzo(k)fluoranthene			70	1.09	0.152	0.392	<0.00736	<0.00495	0.690	<0.00405	<0.00541
Chrysene			200	1.52	0.202	0.466	<0.00736	<0.00495	1.10	<0.00405	0.00278
Dibenzo(a,h)anthracene			2	0.235	0.0345	0.0776	<0.00736	<0.00495	0.124	<0.00405	<0.00541
Fluoranthene			1,000	2.30	0.328	0.905	0.00706	<0.00495	2.88	0.00223	0.00504
Fluorene			1,000	0.242	0.0355	0.0243	0.00416	0.00254	0.398	0.00296	0.00327
Indeno(1,2,3-cd)pyrene			20	0.945	0.125	0.336	<0.00736	<0.00495	0.336	<0.00405	<0.00541
Naphthalene			500	0.187	0.0231	0.0173	0.0106	<0.00495	0.261	0.00283	0.00462
Phenanthrene			500	1.09	0.146	0.363	0.00650	0.00337	4.85	0.00475	0.00777
Pyrene			1,000	3.05	0.414	0.850	0.00748	<0.00495	3.21	0.00272	0.00691
Total PAHs			NS	16.9	2.31	5.3	0.33	0.00934	20.2	0.0182	0.0340
Petroleum Hydrocarbons	8015 Mod	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000								
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100								
C9 to C12 Aliphatic Hydrocarbons			1,000								
C9 to C10 Aromatic Hydrocarbons			100								
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000								
C19 to C36 Aliphatic Hydrocarbons			3,000								
C11 to C22 Aromatic Hydrocarbons			1,000								
General Chemistry/Other											
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	56,500	62,400	6,450	49,900	4,280	63,200	4,320	<500
Percent Solids	5035	**%**	NS	47	52	88	52	78	63	87	79

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 6. Sediment Chemical Testing Results - Former River Channel
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

Sample Location:				**837**			**838**			**841**			**842**		
Sample ID:				**837-S1**	**837-S2**	**837-S3**	**838-S1**	**838-S2**	**838-S3**	**841-S1**	**841-S2**	**841-S3**	**842-S1**	**842-S2**	**842-S3**
Lab Sample ID:				**F230020**	**F230020**	**F230020**	**F230020**	**F230020**	**F230020**	**F230025**	**F230025**	**F230025**	**F230024**	**F230024**	**F230024**
Property:				**Comm of MA Tidelands**	**Comm of MA Tidelands**	**Comm of MA Tidelands**	**Comm of MA Tidelands**	**Comm of MA Tidelands**	**Comm of MA Tidelands**	**Comm of MA Tidelands**	**Comm of MA Tidelands**	**Comm of MA Tidelands**	**Comm of MA Tidelands**	**Comm of MA Tidelands**	**Comm of MA Tidelands**
Area:				**Former River Channel**	**Former River Channel**	**Former River Channel**	**Former River Channel**	**Former River Channel**	**Former River Channel**	**Former River Channel**	**Former River Channel**	**Former River Channel**	**Former River Channel**	**Former River Channel**	**Former River Channel**
Sample Date:				**06/22/2023**	**06/22/2023**	**06/22/2023**	**06/22/2023**	**06/22/2023**	**06/22/2023**	**8/15/2023**	**8/15/2023**	**8/15/2023**	**8/15/2023**	**8/15/2023**	**8/15/2023**
Soil/Sediment Type:				**Organic Soil**	**Silty Sand**	**Clay**	**Organic Soil**	**Organic Soil**	**Organic Soil**	**Silty Sand**	**Sandy Silt**	**Silt**	**Organic Soil**	**Sandy Silt**	**Clay**
Sample Depth (feet):				**1-2**	**5.5-6.5**	**7-8**	**1-2**	**5.5-6.5**	**7-8**	**2.5-3.5**	**4.5-5.5**	**7.5-8.5**	**2.5-3.5**	**4.5-5.5**	**8.2-9.2**
Analyte	**Method**	**Units**	**S-1/GW-3**												
Volatile Organic Compounds (VOCs)	8260	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Benzene			40												
Ethylbenzene			500												
Toluene			500												
Xylene, o-			500												
Xylene p,m-			500												
Xylenes, Total			500												
Semivolatile Organic Compounds (SVOCs)	8270	mg/kg													
2-Methylnaphthalene			300	0.00516	0.00279	0.0365	0.0461	0.0498	0.00833	<0.00403	<0.00455	1.31	<0.00388	0.198	1.14
Acenaphthene			1,000	<0.00491	<0.00470	0.0232	0.0238	0.0584	<0.00562	<0.00403	<0.00455	3.69	<0.00388	1.28	4.83
Acenaphthylene			10	0.00751	<0.00470	0.0662	0.122	0.128	0.00807	0.0147	0.00284	1.72	<0.00388	0.602	4.51
Anthracene			1,000	0.0111	<0.00470	0.0842	0.122	0.173	0.0126	0.0232	0.00254	4.64	<0.00388	1.75	10.8
Benzo(a)anthracene			20	0.0354	0.00308	0.278	0.621	0.376	0.0512	0.195	0.00625	4.85	0.00437	2.24	19.5
Benzo(a)pyrene			2	0.0344	0.00278	0.26	0.767	0.437	0.0534	0.137	0.0116	**3.81**	0.0097	**2.12**	**20.2**
Benzo(b)fluoranthene			20	0.0244	<0.00470	0.15	0.362	0.314	0.0304	0.0792	0.00527	2.55	0.00338	1.16	9.76
Benzo(g,h,i)perylene			1,000	0.018	<0.00470	0.123	0.38	0.248	0.0269	0.0396	0.00814	1.86	0.00516	1.04	7.93
Benzo(k)fluoranthene			70	0.0285	0.00244	0.189	0.441	0.336	0.0348	0.108	0.00683	2.63	0.00416	1.47	8.63
Chrysene			200	0.0281	0.004	0.290	0.551	0.449	0.0524	0.165	0.0077	5.46	0.00516	2.46	20.6
Dibenzo(a,h)anthracene			2	0.00489	<0.00470	0.0308	0.0881	0.0682	0.00679	0.019	<0.00455	0.549	<0.00388	0.267	1.99
Fluoranthene			1,000	0.0636	0.00759	0.55	0.822	0.658	0.0685	0.136	0.0108	7.8	0.00199	4.54	33.7
Fluorene			1,000	0.00519	0.00306	0.0804	0.0519	0.0762	0.00761	<0.00403	<0.00455	2.81	<0.00388	0.861	3.64
Indeno(1,2,3-cd)pyrene			20	0.0215	<0.00470	0.138	0.385	0.297	0.0273	0.0557	0.00848	2.21	0.00418	1.2	8.45
Naphthalene			500	0.00556	<0.00470	0.051	0.0755	0.0605	0.00916	0.00275	<0.00455	0.907	<0.00388	0.287	1.66
Phenanthrene			500	0.0174	0.00553	0.136	0.224	0.334	0.0224	0.0126	0.00688	11.2	<0.00388	4.73	27.7
Pyrene			1,000	0.0793	0.00881	0.779	1.14	0.779	0.0953	0.125	0.0172	10.6	0.00266	6.18	48.7
Total PAHs			NS	0.390	0.0401	3.27	6.22	4.84	0.515	1.11	0.09	68.6	0.04	32.4	234
Petroleum Hydrocarbons	8015 Mod	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH (C8-C40)			1,000												
Volatile Petroleum Hydrocarbons (VPH)	MA VPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C5 to C8 Aliphatic Hydrocarbons			100												
C9 to C12 Aliphatic Hydrocarbons			1,000												
C9 to C10 Aromatic Hydrocarbons			100												
Extractable Petroleum Hydrocarbons (EPH)	MA EPH	mg/kg		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C9 to C18 Aliphatic Hydrocarbons			1,000												
C19 to C36 Aliphatic Hydrocarbons			3,000												
C11 to C22 Aromatic Hydrocarbons			1,000												
General Chemistry/Other															
Physiologically Available Cyanide (PAC)	MA PAC	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	1,860	701	3,620	4,340	49,000	21,400	1,980	ND	40,700	529	69,100	49,600
Percent Solids	5035	%	NS	79	82	73	72	51	68	92	81	58	87	46	61

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g., S-1/GW-3), where identified, are cited from the MCP.
5. NS = No standard or criteria has been established for this analyte.
6. Values in bold exceed S-1/GW-3 standards. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.
7. mg/kg = milligrams per kilogram.
8. Samples SS619 and higher were analyzed for parent and alkylated mono- and poly-cyclic aromatic hydrocarbons (MAHs and PAHs) and saturated hydrocarbons by GC/FID. Only the standard 17 PAHs are summarized on this table. Refer to the laboratory data report for the full results.
9. Chrysene includes its isomer triphenylene.
10. NT = Not tested.

Qualifying Notes:

C- The result has a low bias due to surrogate recovery below lower control limits.

Table 7. Porewater Chemical Testing Results - River
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

Sample Location:				**843**			**844**			**846**			**851**			**852**			**853**			**854**		
Sample ID:				**843-S1**	**843-S2**	**843R**	**844-S1**	**844-S3**	**844R**	**846-S1**	**846-S3**	**846R**	**851-S1**	**851-S2**	**851R**	**852-S1**	**852-S2**	**852R**	**853-S1**	**853-S3**	**853R**	**854-S1**	**854-S2**	**854R**
Lab Sample ID:				**Si-06718-051523**	**Si-06718-051523**	**24G1024-01**	**Si-06718-051523**	**Si-06718-051523**	**24G0971-03**	**Si-06718-051523**	**Si-06718-051523**	**24G0971-01**	**Si-06718-051523**	**Si-06718-051523**	**24G1024-03**	**Si-06718-051523**	**Si-06718-051523**	**24G1024-02**	**Si-06718-051523**	**Si-06718-051523**	**24G0971-04**	**Si-06718-051523**	**Si-06718-051523**	**24G0971-02**
Property:				**1 Field St**	**1 Field St**	**1 Field St**	**38 Childs Ave**	**38 Childs Ave**	**38 Childs Ave**	**Comm of MA Tidelands**	**Comm of MA Tidelands**	**Comm of MA Tidelands**	**28 Oak St**	**28 Oak St**	**28 Oak St**	**3 River St**	**3 River St**	**3 River St**	**51 River St**	**51 River St**	**51 River St**	**39 Water St**	**39 Water St**	**39 Water St**
Area:				**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**
Sample Date:				**8/28/2023**	**8/28/2023**	**7/25/2024**	**8/28/2023**	**8/28/2023**	**7/24/2024**	**8/28/2023**	**8/28/2023**	**7/24/2024**	**8/29/2023**	**8/29/2023**	**7/25/2024**	**8/29/2023**	**8/29/2023**	**7/25/2024**	**8/17/2023**	**8/17/2023**	**7/24/2024**	**8/28/2023**	**8/28/2023**	**7/24/2024**
Screen Interval (feet):				**0.5-1[a]**	**1-2[a]**	**2-3**	**0.5-1[a]**	**3-3.5[a]**	**3-4**	**0.5-1[a]**	**3.5-4.75[a]**	**3.5-4.5**	**0.5-1[a]**	**3.5-4[a]**	**3.5-4.5**	**0.5-1[a]**	**3.5-4[a]**	**3.5-4.5**	**0.5-1[a]**	**5.5-6[a]**	**2-3**	**0.5-1[a]**	**1.5-2[a]**	**2-3**
Analyte	**Method**	**Units**	**GW-3**																					
Volatile Organic Compounds (VOCs)	8260D	ug/L		NT	NT		NT	NT		NT	NT		NT	NT		NT	NT		NT	NT		NT	NT	
Acetone			50,000			<10.0			<10.0			35.7			<10.0			<10.0			<10.0			<10.0
Naphthalene			20,000			<1.0			1.2			<1.0			1.6			<1.0			<1.0			<1.0
1,2,4-Trimethylbenzene			NS			<1.0			<1.0			<1.0			1.4			<1.0			<1.0			<1.0
Benzene			10,000			<1.0			<1.0			<1.0			1.2			<1.0			<1.0			<1.0
Carbon Disulfide			NS			<1.0			<1.0			<1.0			5.6			<1.0			<1.0			<1.0
Ethylbenzene			5,000			<1.0			<1.0			<1.0			2.7			<1.0			<1.0			<1.0
Polycyclic Aromatic Hydrocarbons (PAHs)	[b]	ug/L				NT			NT			NT		NT[c]	NT			NT			NT			NT
Total PAH_{34}			NS	1.3	203		2.6	70		0.6	15		2.4			5.7	339		4.2	0.01		3.0	27	

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
4. Method 1 Standards (e.g. GW-3), where identified, are cited from the MCP.
5. ug/L= micrograms per liter.

Footnotes:

(a) Depth interval for bulk sediment sample that was then processed via SPME using SP3TM samplers.
(b) Total PAH_{34} = sum of $NOAA_{34}$ parent and alkylated freely dissolved PAHs in interstitial water (porewater), as measured via Solid Phase Micro Extraction (SPME) using passive SP3TM samplers.
(c) Fiber saturated; could not be extracted or analyzed.

Table 8. Upland Soil Chemical Testing Results - 34-40 Water Street
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

				Location:	HA101		HA102		HA103		HA104		HA105	
				Sample ID:	HA 101- comp	HA101-grab	HA 102- comp	HA102-grab	HA 103- comp	HA103-grab	HA 104- comp	HA104-grab	HA 105- comp	HA106-grab
				Lab Sample ID:	23K0140-01	23K0140-02	23K0140-03	23K0140-04	23K0140-05	23K0140-06	23K0140-07	23K0140-08	23K0140-09	23K0140-10
				Sample Date:	11/2/2023		11/2/2023		11/2/2023		11/2/2023		11/2/2023	
				Sample Depth (feet):	0-3	1.5	0-1	0.5	0-3	1.5	0-1	0.5	0-2	1
Analyte	**Method**	**Units**	**S-1/GW-3**											
Volatile Petroleum Hydrocarbons (VPH)	8260B	mg/kg			NT		NT		NT		NT		NT	
C5-C8 Aliphatics			100			23.1		64		<21.3		<21.6		<30.7
C9-C12 Aliphatics			1000			<24.7		<56.4		<42.5		<43.0		<61.0
C9-C10 Aromatics			100			<11.9		<27.1		<20.4		<20.7		<29.3
Benzene			40			0.30		<0.54		<0.41		<0.41		<0.59
Semi-Volatile Organic Compounds (SVOCs)	8270	mg/kg				NT		NT		NT		NT		NT
1,1-Biphenyl			200		0.101		<0.063		<0.028		<0.028		<0.030	
Acenaphthylene			10		1.10		<0.634		0.439		<0.279		<0.296	
Anthracene			1,000		2.10		1.04		0.678		0.309		<0.296	
Benzo(a)anthracene			20		8.64		5.35		3.16		1.64		0.701	
Benzo(a)pyrene			2		**9.13**		**6.65**		**3.70**		**2.03**		0.740	
Benzo(b)fluoranthene			20		9.15		7.72		4.08		2.29		0.691	
Benzo(g,h,i)perylene			1,000		9.94		4.84		2.16		1.58		0.514	
Benzo(k)fluoranthene			70		7.73		5.69		3.04		1.68		0.572	
Chrysene			200		9.18		7.57		3.87		2.17		0.708	
Dibenzo(a,h)anthracene			2		1.42		1.09		0.572		0.352		<0.296	
Fluoranthene			1,000		18.9		16.2		4.42		4.81		1.36	
Fluorene			1,000		0.580		<0.634		<0.280		<0.279		<0.296	
Indeno(1,2,3-cd)Pyrene			20		9.03		5.08		2.50		1.75		0.555	
Naphthalene			500		0.735		<0.634		<0.280		<0.279		<0.296	
Phenanthrene			500		8.66		8.31		1.76		2.13		0.748	
Pyrene			1,000		24.7		16.0		5.57		4.26		1.31	
Total SVOCs			NS		121		85.5		35.9		25.0		7.90	
Extractable Petroleum Hydrocarbons (EPH)	MADEP-EPH	mg/kg				NT		NT		NT		NT		NT
C9-C18 Aliphatics			1,000		<16.8		<18.4		<17.4		<17.8		<18.2	
C19-C36 Aliphatics			3,000		52		24.1		21.2		<17.8		<18.2	
C11-C22 Aromatics			1,000		135		110		74.9		56.1		33.6	
Total Metals		mg/kg				NT		NT		NT		NT		NT
Arsenic	6010C		20		15.2		8.75		19.0		12.7		**21.0**	
Barium	6010C		1,000		75.6		151.0		129.0		110.0		124.0	
Cadmium	6010C		80		1.11		<0.47		1.43		1.22		1.26	
Chromium	6010C		100		23.7		49.1		44.1		36.9		38.1	
Lead	6010C		200		**204**		58.5		**243**		**338**		183	
Mercury	7471B		20		7.32		3.04		0.652		0.250		0.386	
Selenium	6010C		400		<4.56		<4.74		<4.34		4.21		<4.26	
Silver	6010C		100		<0.46		<0.47		0.67		0.042		2.46	
General Chemistry														
Physiologically Available Cyanide (PACN)	9014	mg/kg	30		<1.13	NT	<1.20	NT	<1.12	NT	<1.17	NT	<1.07	NT
Solids, Total	2540G	%	NS		89	89	83	83	89	89	86	86	85	85

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. ND = Not detected.
4. NT = The sample was not tested for this analyte.
5. mg/kg = milligrams per kilogram.
6. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
7. Method 1 S-1/GW-3 standards, where identified, are cited from the MCP.
8. NS = No standard or criteria has been established for this analyte.
9. Values in bold exceed applicable Method 1 standard.

Table 9. Sediment Disposal Characterization Testing Results
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

				Sample Location:	SS610	SS611	664	669	692		773	766	874		877		883		883R			884	
				Sample ID:	SS610R-LT	SS611R-LT	SS664-S1	SS669-S1	SS692R-S1	SS692-S4	SS773-S1	SS766-S2	874-0-0.5'	874-0-2'	877-0-0.5'	877-0-2'	883-0-0.5'	883-0-2'	883R-0-0.5'	883R-0.5-1.5'	883R-1.5-2.5'	884-0-0.5'	884-0-2'
				Lab Sample ID:	17I1282-1	17I1282-2	19I0437-1	19I0742-1	19I0860-2	19I0860-1	20C0331-1	20C0331-2	24G0835-06	24G0835-05	24G0835-04	24G0835-03	24G0835-02	24G0835-01	24I0052-01	24I0052-02	24I0052-03	24G0835-08	24G0835-07
				Property:	35 Oakland St	35 Oakland St	39 Oakland St	39 Oakland St	1 Field St	1 Field St	3 River St	222 Main St	7 Noel St	7 Noel St	33 River St	33 River St	37 Oakland St	37 Oakland St	37 Oakland St	37 Oakland St	37 Oakland St	1 Field St	1 Field St
				Area:	Wetland	Wetland	Mudflat	Mudflat	River	River	River	River	River	River	River	River	Wetland	Wetland	Wetland	Wetland	Wetland	River	River
				Sample Date:	11/8/2017	11/8/2017	9/11/2019	9/23/2019	9/25/2019	9/24/2019	3/10/2020	3/10/2020	7/22/2024	7/22/2024	7/22/2024	7/22/2024	7/22/2024	7/22/2024	9/3/2024	9/3/2024	9/3/2024	7/22/2024	7/22/2024
				Sample Depth (feet):	0-1.1	0-1.2	0-0.5	1.5-2.2	4.3-4.8	4.3-4.8	6.2-6.6	3.8-4	0-0.5	0-2	0-0.5	0-2	0-0.5	0-2	0-0.5	0.5-1.5	1.5-2.5	0-0.5	0-2
Analyte	**Method**	**Units**	**S-1/GW-3**	**ESMI Acceptance Criteria**																			
Volatile Organic Compounds (VOCs)	8260B	mg/kg							NT					NT		NT		NT					NT
Acetone			400	NS	< 0.851	< 1.08	0.190	0.0779		< 2.96	<2.27	0.197	0.0688		0.0623		0.0900		NT	NT	NT	0.0675	
2-Butanone			400	NS	< 0.851	< 1.08	0.0223	0.0110		< 2.96	<2.27	0.0269	<0.0331		<0.0597		<0.0616		NT	NT	NT	<0.0309	
1,1-Dichloroethylene			500	NS	< 0.851	< 1.08	< 0.0062	< 0.0032		< 2.96	<2.27	<0.0040	<0.0331		<0.0597		0.0411		NT	NT	NT	<0.0309	
cis-1,2-Dichloroethylene			100	NS	< 0.851	< 1.08	< 0.0062	0.0059		< 2.96	<2.27	<0.0040	<0.0331		<0.0597		81.9		NT	NT	NT	<0.0309	
trans-1,2-Dichloroethylene			500	NS	< 0.851	< 1.08	< 0.0062	< 0.0032		< 2.96	<2.27	<0.0040	<0.0331		<0.0597		0.295		NT	NT	NT	<0.0309	
n-Butylbenzene			NS	NS	< 0.851	< 1.08	< 0.0062	0.0058		3.90	0.985	<0.0040	<0.0033		<0.0060		<0.0062		NT	NT	NT	<0.0031	
sec-Butylbenzene			NS	NS	< 0.851	< 1.08	< 0.0062	0.0059		< 0.593	<0.454	<0.0040	<0.0033		<0.0060		<0.0062		NT	NT	NT	<0.0031	
Ethylbenzene			40	NS	< 0.851	< 1.08	< 0.0062	< 0.0032		37.7	2.62	<0.0040	<0.0033		<0.0060		<0.0062		NT	NT	NT	<0.0031	
Isopropylbenzene			NS	NS	< 0.851	< 1.08	< 0.0062	< 0.0032		6.60	1.02	<0.0040	<0.0033		<0.0060		<0.0062		NT	NT	NT	<0.0031	
4-Isopropyltoluene			NS	NS	< 0.851	< 1.08	< 0.0062	< 0.0032		5.02	1.14	<0.0040	<0.0033		<0.0060		<0.0062		NT	NT	NT	<0.0031	
Naphthalene			500	NS	< 0.851	44.5	< 0.0062	< 0.0032		**1,470**	84.8	4.76	<0.0033		<0.0060		<0.0062		NT	NT	NT	0.438	
n-Propylbenzene			NS	NS	< 0.851	< 1.08	< 0.0062	< 0.0032		1.90	<0.454	<0.0040	<0.0033		<0.0060		<0.0062		NT	NT	NT	<0.0031	
Toluene			500	NS	< 0.851	< 1.08	< 0.0062	< 0.0032		0.901	<0.454	<0.0040	<0.0033		<0.0060		<0.0062		NT	NT	NT	<0.0031	
1,2,4-Trimethylbenzene			NS	NS	< 0.851	< 1.08	< 0.0062	< 0.0032		25.6	5.66	0.0190	<0.0033		<0.0060		<0.0062		NT	NT	NT	<0.0031	
1,3,5-Trimethylbenzene			NS	NS	< 0.851	< 1.08	< 0.0062	< 0.0032		5.79	1.48	0.0075	<0.0033		<0.0060		<0.0062		NT	NT	NT	<0.0031	
Vinyl Chloride			0.3	NS	< 0.851	< 1.08	0.0196	< 0.0032		< 0.593	<0.454	<0.0080	<0.0066		<0.0119		13.2		4.52	3.89	4.07	<0.0062	
o-Xylene			500	NS	< 0.851	< 1.08	< 0.0062	< 0.0032		14.6	0.831	<0.0040	<0.0033		<0.0060		<0.0062		NT	NT	NT	<0.0031	
m,p-Xylene			500	NS	< 1.70	< 2.15	< 0.0124	< 0.0065		11.1	<0.908	<0.0080	<0.0066		<0.0119		<0.0123		NT	NT	NT	<0.0062	
Total Xylenes			500	NS	< 1.70	< 2.15	< 0.0124	< 0.00646		25.8	<0.908	<0.00797	<0.0066		<0.0119		<0.0123		NT	NT	NT	<0.0062	
Total VOCs			NS	NS	ND	44.5	0.232	0.107		1,609	98.5	5.01	0.0688		0.0623		95.5		4.52	3.89	4.07	0.506	
TCLP VOCs	1311/8260B	mg/L			NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT		NT		NT	NT
Vinyl Chloride			NS	0.2													<0.100		0.264		<0.100		
Semi-Volatile Organic Compounds (SVOCs)	8270	mg/kg							NT				NT		NT		NT		NT	NT	NT	NT	
Acenaphthene			1,000	NS	47.3	55.9	2.20	1.20		**2,430**	48.6	42.3		<0.306		<0.386		<0.532					<0.385
Acenaphthylene			10	NS	8.97	5.66	1.19	< 0.651		**77.1**	4.94	4.83		<0.306		<0.386		<0.532					<0.385
Anthracene			1,000	NS	86.6	42.3	3.22	1.33		794	33.0	31.2		<0.306		<0.386		<0.532					0.492
Benzo(a)anthracene			20	NS	**88.7**	**50.8**	4.58	1.56		**569**	**21.8**	**27.8**		<0.306		<0.386		<0.532					0.670
Benzo(a)pyrene			2	NS	**92.4**	**56.5**	4.75	1.47		**382**	**17.1**	**31.0**		<0.306		<0.386		<0.532					0.612
Benzo(b)fluoranthene			20	NS	**43.5**	**28.3**	2.27	1.10		**201**	10.2	17.9		<0.306		<0.386		<0.532					0.502
Benzo(g,h,i)perylene			1,000	NS	69.0	15.6	2.67	0.793		172	8.13	14.5		<0.306		<0.386		<0.532					<0.385
Benzo(k)fluoranthene			70	NS	50.2	29.8	3.13	1.03		**212**	8.44	13.6		<0.306		<0.386		<0.532					0.480
1,1-Biphenyl			200	NS	< 5.67	< 0.666	0.754	< 0.651		< 4.94	<0.693	<0.581		<0.031		<0.039		<0.053					<0.039
Bis(2-Ethylhexyl)phthalate			100	NS	< 5.67	< 0.666	0.754	< 0.651		< 4.94	<0.693	<0.581		1.09		0.521		<0.532					0.494
Butylbenzylphthalate			NS	NS	1.35	< 0.666	< 0.613	< 0.651		< 4.94	<0.693	<0.581		<0.306		<0.386		<0.532					<0.385
Chrysene			200	NS	72.0	41.2	3.27	1.57		480	21.4	24.5		<0.306		<0.386		<0.532					0.635
Dibenzo(a,h)anthracene			2	NS	**11.2**	**6.56**	0.561	< 0.327		**55.3**	**2.46**	3.73		<0.306		<0.386		<0.532					<0.385
Dibenzofuran			NS	NS	2.76	2.35	< 0.613	< 0.651		68.2	2.47	2.46		<0.306		<0.386		<0.532					<0.385
Fluoranthene			1,000	NS	173	110	9.38	3.79		1,070	41.5	58.1		0.376		<0.386		<0.532					1.33
Fluorene			1,000	NS	35.2	26.4	1.57	0.779		1,100	29.8	23.9		<0.306		<0.386		<0.532					<0.385
Indeno(1,2,3-cd)Pyrene			20	NS	**50.1**	11.9	2.18	0.691		**98.1**	6.75	11.5		<0.306		<0.386		<0.532					<0.385
2-Methylnaphthalene			300	NS	2.67	4.20	< 0.613	< 0.651		**2,540**	8.54	1.52		<0.306		<0.386		<0.532					<0.385
Naphthalene			500	NS	9.87	16.2	< 0.613	< 0.651		**3,090**	46.8	5.17		<0.306		<0.386		<0.532					<0.385
Phenanthrene			500	NS	220	145	10.0	5.45		**3,140**	97.2	104		<0.306		<0.386		<0.532					1.14
Phenol			20	NS	< 5.67	< 0.666	0.754	< 0.651		< 4.94	<0.693	<0.581		<0.306		<0.386		<0.532					<0.385
Pyrene			1,000	NS	267	167	12.2	5.39		**1,470**	58.7	80.9		0.397		<0.386		0.607					1.53
Total SVOCs			NS	NS	1,332	816	65.4	26.2		17,949	468	498.91		1.86		0.521		0.607					7.89
Extractable Petroleum Hydrocarbons (EPH)	MADEP-EPH	mg/kg								NT			NT		NT		NT		NT	NT	NT	NT	
C9-C18 Aliphatics			1,000	NS	< 70.5	< 72.0	< 80.0	568	844		196	129		<18.4		<23.5		<31.3					<23.0
C19-C36 Aliphatics			3,000	NS	109	184	318	1,220	878		289	453		22.9		<23.5		<31.3					<23.0
C11-C22 Aromatics			1,000	NS	414	438	303	730	**1,450**		777	909		19.5		<23.7		<31.6					<23.2
Acenaphthene			1,000	NS	29.3	58.5	2.56	2.15	725		NT	NT		0.041		<0.013		<0.017					0.133
Acenaphthylene			10	NS	4.46	3.82	1.27	0.243	8.43		NT	NT		0.037		0.020		<0.017					0.033
Anthracene			1,000	NS	47.1	37.3	4.23	2.09	152		NT	NT		0.078		0.028		0.068					0.160
Benzo(a)anthracene			20	NS	**34.1**	**28.8**	6.97	2.32	**72.9**		NT	NT		0.179		0.102		0.129					0.187
Benzo(a)pyrene			2	NS	**38.8**	**32.2**	**7.96**	**2.00**	**48.7**		NT	NT		0.160		0.140		0.213					0.221
Benzo(b)fluoranthene			20	NS	**29.3**	**23.8**	6.67	2.41	**38.0**		NT	NT		0.158		0.07		0.072					0.154
Benzo(g,h,i)perylene			1,000	NS	18.2	15.2	4.69	1.14	19.3		NT	NT		0.098		0.070		0.143					0.131
Benzo(k)fluoranthene			70	NS	6.85	8.45	2.19	0.844	11.3		NT	NT		0.141		0.109		0.155					0.175
Chrysene			200	NS	30.7	25.0	5.60	2.13	70.1		NT	NT		0.176		0.119		0.116					0.199
Dibenzo(a,h)anthracene			2	NS	**4.99**	**4.75**	1.01	0.265	**5.93**		NT	NT		0.046		0.035		0.054					0.055
Fluoranthene			1,000	NS	114	108	22.0	5.98	143		NT	NT		0.542		0.154		0.417					0.474
Fluorene			1,000	NS	23.0	27.8	1.70	1.35	162		NT	NT		0.032		<0.013		<0.017					0.067
Indeno(1,2,3-cd)Pyrene			20	NS	18.2	15.3	4.36	1.17	17.5		NT	NT		0.087		0.069		0.103					0.108
2-Methylnaphthalene			300	NS	1.43	4.03	0.214	0.123	244		NT	NT		<0.010		<0.013		<0.017					0.041
Naphthalene			500	NS	5.01	11.6	0.606	0.235	175		NT	NT		0.018		0.023		<0.017					0.111
Phenanthrene			500	NS	132	134	19.4	11.8	928		NT	NT		0.261 B		0.076 B		0.158 B					0.433 B
Pyrene			1,000	NS	115	109	31.8	9.88	227		NT	NT		0.370		0.201		0.476					0.436
Polychlorinated Biphenyl (PCB) Congeners	8082	mg/kg							NT				NT		NT		NT		NT	NT	NT	NT	
BZ#8			NS	NS	0.00386	< 0.00093	0.00148	0.00340	< 0.00254		<0.00054	0.00200		<0.00032		0.00493		<0.00054					0.00233
BZ#18			NS	NS	0.00467	0.00143	< 0.00049	0.0182	< 0.00254		<0.00054	<0.00047		0.00045		0.0138		<0.00054					<0.00041
BZ#28			NS	NS	0.00449	0.00194	0.00341	0.0372	< 0.00254		<0.00054	<0.00047		0.00055		0.0200		<0.00054					0.00401
BZ#44			NS	NS	0.00229	0.00108	0.0201	0.0213	< 0.00254		<0.00054	0.00404		0.00057		0.00685		<0.00054					0.00492
BZ#52			NS	NS	0.00801	0.00204	0.0446	0.0367	< 0.00254		<0.00054	0.0107		0.00114		0.00998		<0.00054					0.0115
BZ#66			NS	NS	0.00279	0.00145	< 0.00049	0.0254	< 0.00254		<0.00054	<0.00047		<0.00032		0.00834		<0.00054					0.00415
BZ#101			NS	NS	0.00649	0.00555	0.0332	0.0343	< 0.00254		0.00298	0.00708		0.00163		0.00712		<0.00054					0.00982
BZ#105			NS	NS	0.00165	< 0.00093	0.00265	0.00601	< 0.00254		<0.00054	0.00139		0.00057		0.00105		<0.00054					0.00261
BZ#118			NS	NS	0.00433	0.00206	0.0260	0.0223	< 0.00254		0.00106	0.00558		0.00111		0.00368		<0.00054					0.00565

Table 9. Sediment Disposal Characterization Testing Results
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

Sample Location:					**SS610**	**SS611**	**664**	**669**	**692**		**773**	**766**	**874**		**877**		**883**		**883R**			**884**	
Sample ID:					**SS610R-LT**	**SS611R-LT**	**SS664-S1**	**SS669-S1**	**SS692R-S1**	**SS692-S4**	**SS773-S1**	**SS766-S2**	**874-0-0.5'**	**874-0-2'**	**877-0-0.5'**	**877-0-2'**	**883-0-0.5'**	**883-0-2'**	**883R-0-0.5'**	**883R-0.5-1.5'**	**883R-1.5-2.5'**	**884-0-0.5'**	**884-0-2'**
Lab Sample ID:					**1711282-1**	**1711282-2**	**19I0437-1**	**19I0742-1**	**19I0860-2**	**19I0860-1**	**20C0331-1**	**20C0331-2**	**24G0835-06**	**24G0835-05**	**24G0835-04**	**24G0835-03**	**24G0835-02**	**24G0835-01**	**24I0052-01**	**24I0052-02**	**24I0052-03**	**24G0835-08**	**24G0835-07**
Property:					**35 Oakland St**	**35 Oakland St**	**39 Oakland St**	**39 Oakland St**	**1 Field St**	**1 Field St**	**3 River St**	**222 Main St**	**7 Noel St**	**7 Noel St**	**33 River St**	**33 River St**	**37 Oakland St**	**37 Oakland St**	**37 Oakland St**	**37 Oakland St**	**37 Oakland St**	**1 Field St**	**1 Field St**
Area:					**Wetland**	**Wetland**	**Mudflat**	**Mudflat**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**River**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**River**	**River**
Sample Date:					**11/8/2017**	**11/8/2017**	**9/11/2019**	**9/23/2019**	**9/25/2019**	**9/24/2019**	**3/10/2020**	**3/10/2020**	**7/22/2024**	**7/22/2024**	**7/22/2024**	**7/22/2024**	**7/22/2024**	**7/22/2024**	**9/3/2024**	**9/3/2024**	**9/3/2024**	**7/22/2024**	**7/22/2024**
Sample Depth (feet):					**0-1.1**	**0-1.2**	**0-0.5**	**1.5-2.2**	**4.3-4.8**	**4.3-4.8**	**6.2-6.6**	**3.8-4**	**0-0.5**	**0-2**	**0-0.5**	**0-2**	**0-0.5**	**0-2**	**0-0.5**	**0.5-1.5**	**1.5-2.5**	**0-0.5**	**0-2**
Analyte	**Method**	**Units**	**S-1/GW-3**	**ESMI Acceptance Criteria**																			
BZ#128			NS	NS	0.00246	< 0.00093	0.00479	0.00526	< 0.00254		<0.00054	0.00098		<0.00032		0.00078		<0.00054					0.00139
BZ#138			NS	NS	0.00591	0.00234	0.0323	0.0255	< 0.00254		0.00182	0.00700		0.00161		0.00361		<0.00054					0.00679
BZ#153			NS	NS	0.00717	0.00297	0.0330	0.0228	< 0.00254		0.00303	0.00526		0.00225		0.00419		<0.00054					0.00576
BZ#170			NS	NS	0.00108	< 0.00093	0.00336	0.00296	< 0.00254		<0.00054	0.00119		0.00113		0.00081		<0.00054					0.00114
BZ#180			NS	NS	0.00299	< 0.00093	0.00390	0.00644	< 0.00254		0.00085	0.00213		0.00249		0.00139		<0.00054					0.00209
BZ#187			NS	NS	0.00130	< 0.00093	0.0236	0.00243	< 0.00254		0.00087	0.00181		0.00147		0.00098		<0.00054					0.00212
BZ#195			NS	NS	< 0.0078	< 0.00093	< 0.00049	0.00055	< 0.00254		<0.00054	0.00126		0.00041		<0.00041		<0.00054					<0.00041
BZ#206			NS	NS	< 0.0078	< 0.00093	< 0.00049	0.00100	< 0.00254		<0.00054	0.0147		0.00058		0.00109		<0.00054					<0.00041
BZ#209			NS	NS	< 0.0078	< 0.00093	< 0.00049	0.00057	< 0.00254		<0.00054	0.0256		<0.00032		0.00130		<0.00054					<0.00041
Total PCBs			1	<50	0.0595	0.0209	0.2324	0.2723	ND		0.01061	0.09072		0.016		0.090		ND					0.064
Total Petroleum Hydrocarbons (TPH)	8100M	mg/kg							NT				NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH			1,000	400,000	2,150	1,750	388	2,790		103,000	6,030	5,380											
Organochlorine Pesticides	8081D	mg/kg							NT				NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
alpha-BHC			NS	NS	< 0.0070	0.0115	<0.0046	< 0.0032	< 0.0430		<0.0053	<0.0043											
4,4'-DDD			10	NS	< 0.0070	< 0.0084	0.0108	0.0248	< 0.0430		0.0064	0.0081											
4,4'-DDT			7	NS	< 0.0070	0.0242	< 0.0046	0.0181	< 0.0430		<0.0053	<0.0043											
Dieldrin			0.09	NS	< 0.0070	< 0.0084	<0.0046	0.0034	< 0.0430		<0.0053	<0.0043											
gamma-Chlordane			6	NS	< 0.0070	0.0269	< 0.0046	< 0.0032	< 0.0430		<0.0053	<0.0043											
Chlorinated Herbicides	8151A	mg/kg							NT				NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
2,4,5-T			NS	NS	< 0.027	0.039	0.029	< 0.012	< 0.033		<0.019	<0.016											
2,4,5-TP (Silvex)			NS	NS	0.036	< 0.031	< 0.016	< 0.012	< 0.033		<0.019	<0.016											
2,4-DB			NS	NS	< 0.136	0.184	0.114	0.114	< 0.165		<0.093	<0.016											
Dicamba			NS	NS	0.051	0.064	< 0.016	< 0.012	< 0.033		0.063	0.060											
Dichlorprop			NS	NS	< 0.134	< 0.155	< 0.081	0.563	< 0.163		<0.092	<0.016											
Total Metals		mg/kg							NT				NT		NT		NT		NT	NT	NT	NT	
Arsenic	6010C		20	11	**41.1**	**70.6**	13.6	9.44	11.1		**25.4**	11.1		6.61		8.59		10.9					12.2
Barium	6010C		1,000	1,000	73.0	107	36.4	40.9	64.9		89.6	118		13.5		36.6		50.6					44.8
Cadmium	6010C		80	33	7.46	2.88	1.24	2.39	0.38		2.16	3.41		<0.58		0.81		<1.01					<0.67
Chromium	6010C		100	1,000	**254**	**196**	**120**	**166**	24.6		**120**	**179**		14.4		62.7		34.6					48.5
Coppper	3010C		NS	NS	509	398	156	297	169		374	266		11.0		35.6		36.7					38.5
Lead	6010C		200	400	**310**	**350**	86.2	145	**268**		**367**	**339**		17.4		43.3		33.2					70.5
Mercury	7471B		20	6	0.991	1.46	0.289	0.320	0.814		2.53	6.45		0.034		0.508		0.100					0.316
Nickel	6010C		700	NS	90.5	70.7	105	95.8	13.2		18.4	19.0		9.46		10.1		17.4					14.5
Selenium	6010C/6020A		400	180	3.71	3.82	< 0.40	0.28	0.62		<1.93	<1.92		<5.80		<7.65		<10.1					<6.73
Silver	6010C		100	89	11.2	10.5	4.62	4.65	3.71		5.21	1.22		<0.58		<0.77		<1.01					<0.67
Zinc	6010C		1,000	NS	535	518	152	282	182		334	342		36.3		96.9		71.8					81.5
TCLP Metals	1311/6010C	mg/L			NT	NT				NT			NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Chromium			NS	5			< 0.020	0.351	NT		<0.020	<0.020											
Lead			NS	5			NT	0.020	0.642		0.673	0.801											
Mercury			NS	0.2			NT	NT	NT		NT	<0.00050											
General Chemistry																							
Corrosivity (pH)	9045	S.U.	NS	2.0 - 12.5	5.88	6.11	5.95	6.50	5.83	NT	6.44	6.24	NT	6.64	NT	6.92	NT	5.81	NT	NT	NT	NT	6.88
Conductivity	9050A	umhos/cm	NS	NS	NT	NT	456	298	149	NT	144	104	NT	91	NT	100	NT	235	NT	NT	NT	NT	98
Flashpoint	1010	deg F	NS	> 140	NT	NT	> 200	> 200	> 200	NT	>200	>200	NT	>200	NT	>200	NT	>200	NT	NT	NT	NT	>200
Percent Volatile Solids	2540G/D2974	%	NS	NS	24	27	11.1	4.2	16.3	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Reactive Cyanide	7.3.3.2	mg/kg	NS	Non-reactive	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	NT	<2.0	<2.0	NT	<2.0	NT	<2.0	NT	<2.0	NT	NT	NT	NT	<2.0
Reactive Sulfide	7.3.4.1	mg/kg	NS	Non-reactive	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	NT	<2.0	<2.0	NT	<2.0	NT	<2.0	NT	<2.0	NT	NT	NT	NT	<2.0
Sulfur, Total	D4239	%	NS	NS	0.13	0.23	2390	2,970	NT	2,590	3,450	3,580	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Sulfate	9038	mg/kg	NS	NS	NT	NT	449	< 65	NT	< 103	228	103	NT	<60	NT	<77	NT	<100	NT	NT	NT	NT	<78
Sulfide	9030B	mg/kg	NS	NS	NT	NT	< 0.9	< 0.7	NT	< 1.0	<1.0	<0.9	NT	<0.6	NT	<0.8	NT	<1.0	NT	NT	NT	NT	<0.8
Total Cyanide	9014	mg/kg	30	NS	< 2.81	< 3.11	1.95	10.2	< 1.73	NT	2.41	3.65	NT	<1.09	NT	<1.41	NT	<1.84	NT	NT	NT	NT	<1.55
Total Organic Carbon	LK	mg/kg	NS	NS	79,700	142,000	47,800	35,000	NT	133,000	134,000	179,000	NT	10,000	NT	31,500	NT	59,000	NT	NT	NT	NT	22,300
Solids, Total	2540G	%	NS	NS	35	30	57	76	57	48	50	58	85	84	56	64	63	49	64	59	57	80	65

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. The metals analysis for samples SS64-S1, SS69-S1, and SS692R-S1 was performed after the samples were air dried (Total Solids = 100%).
4. TCLP = Toxicity Characteristic Leaching Procedure.
5. ND = Not detected.
6. NT = The sample was not tested for this analyte.
7. mg/kg = milligrams per kilogram.
8. mg/L= milligrams per liter
9. S.U. = standard units.
10. umhos/cm = micromhos per centimeter.
11. deg F = degrees Fahrenheit.
12. Soil samples for VOCs were preserved in the field with methanol and/or deionized water.
13. For samples analyzed by low and high level VOC methods, the highest detected value or lowest reporting limit (if both results were non-detect) for each analyte is shown here.
14. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
15. Method 1 S-1/GW-3 standards, where identified, are cited from the MCP.
16. NS = No standard or criteria has been established for this analyte.
17. Values in bold exceed Method 1 standard. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.

Qualifying Notes:

B The reported result is attributed to sampling or laboratory contamination.

Table 9. Sediment Disposal Characterization Testing Results
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

				Sample Location:	**885**		**886**		**887**		**890**			**891**			**892**			**893**		
				Sample ID:	**885-0-0.5'**	**885-0-2'**	**886-0-0.5'**	**886-0-2'**	**887-0-0.5'**	**887-0-2'**	**890-0-0.5'**	**890-0.5-1.5'**	**890-1.5-2.5'**	**891-0-0.5'**	**891-0.5-1.5'**	**891-1.5-2.5'**	**892-0-0.5'**	**892-0.5-1.5'**	**892-1.5-2.5'**	**893-0-0.5'**	**893-0.5-1.5'**	**893-1.5-2.5'**
				Lab Sample ID:	**24G0906-04**	**24G0906-03**	**24G0906-02**	**24G0906-01**	**24G0906-06**	**24G0906-05**	**24I0052-04**	**24I0052-05**	**24I0052-06**	**24I0052-07**	**24I0052-08**	**24I0052-09**	**24I0052-10**	**24I0052-11**	**24I0052-12**	**24I0052-13**	**24I0052-14**	**24I0052-15**
				Property:	**1 Field St**	**1 Field St**	**1 Field St**	**1 Field St**	**1 Field St**	**1 Field St**	**37 Oakland St**	**37 Oakland St**	**37 Oakland St**	**37 Oakland St**	**37 Oakland St**	**37 Oakland St**	**37 Oakland St**	**37 Oakland St**	**37 Oakland St**	**37 Oakland St**	**37 Oakland St**	**37 Oakland St**
				Area:	**River**	**River**	**River**	**River**	**River**	**River**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**
				Sample Date:	**7/23/2024**	**7/23/2024**	**7/23/2024**	**7/23/2024**	**7/23/2024**	**7/23/2024**	**9/3/2024**	**9/3/2024**	**9/3/2024**	**9/3/2024**	**9/3/2024**	**9/3/2024**	**9/3/2024**	**9/3/2024**	**9/3/2024**	**9/3/2024**	**9/3/2024**	**9/3/2024**
				Sample Depth (feet):	**0-0.5**	**0-2**	**0-0.5**	**0-2**	**0-0.5**	**0-2**	**0-0.5**	**0.5-1.5**	**1.5-2.5**	**0-0.5**	**0.5-1.5**	**1.5-2.5**	**0-0.5**	**0.5-1.5**	**1.5-2.5**	**0-0.5**	**0.5-1.5**	**1.5-2.5**
Analyte	**Method**	**Units**	**S-1/GW-3**	**ESMI Acceptance Criteria**																		
Volatile Organic Compounds (VOCs)	8260B	mg/kg				NT		NT		NT												
Acetone			400	NS	0.0858		0.0368		0.170		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
2-Butanone			400	NS	<0.0457		<0.0274		<0.0982		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
1,1-Dichloroethylene			500	NS	<0.0457		<0.0274		<0.0982		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
cis-1,2-Dichloroethylene			100	NS	<0.0457		<0.0274		<0.0982		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
trans-1,2-Dichloroethylene			500	NS	<0.0457		<0.0274		<0.0982		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
n-Butylbenzene			NS	NS	<0.0046		<0.0027		<0.0098		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
sec-Butylbenzene			NS	NS	<0.0046		<0.0027		<0.0098		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Ethylbenzene			40	NS	<0.0046		<0.0027		<0.0098		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Isopropylbenzene			NS	NS	<0.0046		<0.0027		<0.0098		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
4-Isopropyltoluene			NS	NS	<0.0046		<0.0027		<0.0098		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Naphthalene			500	NS	<0.0046		<0.0027		<0.0098		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
n-Propylbenzene			NS	NS	<0.0046		<0.0027		<0.0098		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Toluene			500	NS	<0.0046		<0.0027		<0.0098		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
1,2,4-Trimethylbenzene			NS	NS	<0.0046		<0.0027		<0.0098		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
1,3,5-Trimethylbenzene			NS	NS	<0.0046		<0.0027		<0.0098		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Vinyl Chloride			0.3	NS	<0.0091		<0.0055		<0.0196		<0.0213	0.0120	<0.0160	<0.0393	<0.0211	<0.0167	<0.0065	<0.0077	0.0258	<0.0299	0.0603	<0.0093
o-Xylene			500	NS	<0.0046		<0.0027		<0.0098		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
m,p-Xylene			500	NS	<0.0091		<0.0055		<0.0196		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Xylenes			500	NS	<0.0091		<0.0055		<0.0196		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total VOCs			NS	NS	0.0858		0.0368		0.170		ND	0.0120	ND	ND	ND	ND	ND	ND	0.0258	ND	0.0603	ND
TCLP VOCs	1311/8260B	mg/L			NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Vinyl Chloride			NS	0.2																		
Semi-Volatile Organic Compounds (SVOCs)	8270	mg/kg			NT		NT		NT		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Acenaphthene			1,000	NS		<0.467		1.06		<0.555												
Acenaphthylene			10	NS		<0.467		<0.379		<0.555												
Anthracene			1,000	NS		0.842		2.13		1.00												
Benzo(a)anthracene			20	NS		2.57		4.15		2.12												
Benzo(a)pyrene			2	NS		**2.56**		**3.91**		**2.01**												
Benzo(b)fluoranthene			20	NS		2.09		3.28		1.74												
Benzo(g,h,i)perylene			1,000	NS		1.11		1.64		0.853												
Benzo(k)fluoranthene			70	NS		2.10		3.05		1.54												
1,1-Biphenyl			200	NS		<0.047		0.084		<0.055												
Bis(2-Ethylhexyl)phthalate			100	NS		3.60		1.47		5.76												
Butylbenzylphthalate			NS	NS		<0.467		0.652		<0.555												
Chrysene			200	NS		2.50		3.91		1.99												
Dibenzo(a,h)anthracene			2	NS		<0.467		0.456		<0.555												
Dibenzofuran			NS	NS		<0.467		0.542		<0.55												
Fluoranthene			1,000	NS		5.15		8.61		4.80												
Fluorene			1,000	NS		<0.467		0.983		<0.555												
Indeno(1,2,3-cd)Pyrene			20	NS		1.26		1.91		0.974												
2-Methylnaphthalene			300	NS		<0.467		<0.379		<0.555												
Naphthalene			500	NS		<0.467		0.622		<0.555												
Phenanthrene			500	NS		2.98		7.58		3.71												
Phenol			20	NS		<0.467		0.437		<0.555												
Pyrene			1,000	NS		6.63		10.2		5.67												
Total SVOCs			NS	NS		33.39		56.68		32.17												
Extractable Petroleum Hydrocarbons (EPH)	MADEP-EPH	mg/kg			NT		NT		NT		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
C9-C18 Aliphatics			1,000	NS		<28.4		<23.0		<32.6												
C19-C36 Aliphatics			3,000	NS		59.7		88.1		56.8												
C11-C22 Aromatics			1,000	NS		81.1		106		95.6												
Acenaphthene			1,000	NS		0.343		0.329		0.318												
Acenaphthylene			10	NS		0.056		0.215		0.134												
Anthracene			1,000	NS		0.648		0.868		0.784												
Benzo(a)anthracene			20	NS		1.62		2.96		2.44												
Benzo(a)pyrene			2	NS		1.46		**2.67**		**2.39**												
Benzo(b)fluoranthene			20	NS		1.14		1.85		1.94												
Benzo(g,h,i)perylene			1,000	NS		0.946		1.55		1.56												
Benzo(k)fluoranthene			70	NS		1.02		1.87		1.63												
Chrysene			200	NS		1.52		2.59		2.30												
Dibenzo(a,h)anthracene			2	NS		0.433		0.663		0.691												
Fluoranthene			1,000	NS		3.05		5.08		4.25												
Fluorene			1,000	NS		0.248		0.318		0.324												
Indeno(1,2,3-cd)Pyrene			20	NS		0.796		1.34		1.32												
2-Methylnaphthalene			300	NS		0.056		0.079		0.080												
Naphthalene			500	NS		0.074		0.148		0.204												
Phenanthrene			500	NS		2.72		3.00		3.14												
Pyrene			1,000	NS		3.61		5.71		4.08												
Polychlorinated Biphenyl (PCB) Congeners	8082	mg/kg			NT		NT		NT		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
BZ#8			NS	NS		0.00550		0.00060		<0.00057												
BZ#18			NS	NS		0.0262		0.00214		0.00117												
BZ#28			NS	NS		0.0424		0.00732		0.00224												
BZ#44			NS	NS		0.0322		0.00557		0.00229												
BZ#52			NS	NS		0.0558		0.0153		0.00511												
BZ#66			NS	NS		0.0327		0.00524		<0.00057												
BZ#101			NS	NS		0.0550		0.0199		0.00636												
BZ#105			NS	NS		0.00907		0.00312		0.00196												
BZ#118			NS	NS		0.0300		0.00786		0.00459												

Table 9. Sediment Disposal Characterization Testing Results
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

Sample Location:					**885**		**886**		**887**		**890**			**891**			**892**			**893**		
Sample ID:					**885-0-0.5'**	**885-0-2'**	**886-0-0.5'**	**886-0-2'**	**887-0-0.5'**	**887-0-2'**	**890-0-0.5'**	**890-0.5-1.5'**	**890-1.5-2.5'**	**891-0-0.5'**	**891-0.5-1.5'**	**891-1.5-2.5'**	**892-0-0.5'**	**892-0.5-1.5'**	**892-1.5-2.5'**	**893-0-0.5'**	**893-0.5-1.5'**	**893-1.5-2.5'**
Lab Sample ID:					**24G0906-04**	**24G0906-03**	**24G0906-02**	**24G0906-01**	**24G0906-06**	**24G0906-05**	**24I0052-04**	**24I0052-05**	**24I0052-06**	**24I0052-07**	**24I0052-08**	**24I0052-09**	**24I0052-10**	**24I0052-11**	**24I0052-12**	**24I0052-13**	**24I0052-14**	**24I0052-15**
Property:					**1 Field St**	**1 Field St**	**1 Field St**	**1 Field St**	**1 Field St**	**1 Field St**	**37 Oakland St**	**37 Oakland St**	**37 Oakland St**	**37 Oakland St**	**37 Oakland St**	**37 Oakland St**	**37 Oakland St**	**37 Oakland St**	**37 Oakland St**	**37 Oakland St**	**37 Oakland St**	**37 Oakland St**
Area:					**River**	**River**	**River**	**River**	**River**	**River**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**	**Wetland**
Sample Date:					**7/23/2024**	**7/23/2024**	**7/23/2024**	**7/23/2024**	**7/23/2024**	**7/23/2024**	**9/3/2024**	**9/3/2024**	**9/3/2024**	**9/3/2024**	**9/3/2024**	**9/3/2024**	**9/3/2024**	**9/3/2024**	**9/3/2024**	**9/3/2024**	**9/3/2024**	**9/3/2024**
Sample Depth (feet):					**0-0.5**	**0-2**	**0-0.5**	**0-2**	**0-0.5**	**0-2**	**0-0.5**	**0.5-1.5**	**1.5-2.5**	**0-0.5**	**0.5-1.5**	**1.5-2.5**	**0-0.5**	**0.5-1.5**	**1.5-2.5**	**0-0.5**	**0.5-1.5**	**1.5-2.5**
Analyte	**Method**	**Units**	**S-1/GW-3**	**ESMI Acceptance Criteria**																		
BZ#128			NS	NS		0.00556		0.00256		0.00132												
BZ#138			NS	NS		0.0361		0.0133		0.0045												
BZ#153			NS	NS		0.0254		0.00882		0.00467												
BZ#170			NS	NS		0.00382		0.00307		0.00095												
BZ#180			NS	NS		0.00664		0.00336		0.00189												
BZ#187			NS	NS		0.00478		0.00246		0.00099												
BZ#195			NS	NS		0.00057		<0.00040		<0.00057												
BZ#206			NS	NS		0.00433		0.00104		0.00061												
BZ#209			NS	NS		0.00548		<0.00040		<0.00057												
Total PCBs			1	<50		0.382		0.102		0.039												
Total Petroleum Hydrocarbons (TPH)	8100M	mg/kg			NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
TPH			1,000	400,000																		
Organochlorine Pesticides	8081D	mg/kg			NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
alpha-BHC			NS	NS																		
4,4'-DDD			10	NS																		
4,4'-DDT			7	NS																		
Dieldrin			0.09	NS																		
gamma-Chlordane			6	NS																		
Chlorinated Herbicides	8151A	mg/kg			NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
2,4,5-T			NS	NS																		
2,4,5-TP (Silvex)			NS	NS																		
2,4-DB			NS	NS																		
Dicamba			NS	NS																		
Dichlorprop			NS	NS																		
Total Metals		mg/kg			NT		NT		NT		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Arsenic	6010C		20	11		11.7		11.3		16.9												
Barium	6010C		1,000	1,000		76.5		49.5		69.3												
Cadmium	6010C		80	33		2.28		1.02		1.08												
Chromium	6010C		100	1,000		**227**		31.1		46.5												
Coppper	3010C		NS	NS		163		66.7		95.8												
Lead	6010C		200	400		**274**		**202**		179												
Mercury	7471B		20	6		1.27		0.728		0.759												
Nickel	6010C		700	NS		19.5		15.4		19.9												
Selenium	6010C/6020A		400	180		<9.16		<7.25		<10.3												
Silver	6010C		100	89		3.16		<0.72		<1.03												
Zinc	6010C		1,000	NS		236		125		242												
TCLP Metals	1311/6010C	mg/L			NT		NT		NT		NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Chromium			NS	5		NT		NT		NT												
Lead			NS	5		0.22		0.47		0.11												
Mercury			NS	0.2		NT		NT		NT												
General Chemistry																						
Corrosivity (pH)	9045	S.U.	NS	2.0 - 12.5	NT	6.57	NT	6.95	NT	6.50	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Conductivity	9050A	umhos/cm	NS	NS	NT	81	NT	67	NT	118	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Flashpoint	1010	deg F	NS	> 140	NT	>200	NT	> 200	NT	>200	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Percent Volatile Solids	2540G/D2974	%	NS	NS	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Reactive Cyanide	7.3.3.2	mg/kg	NS	Non-reactive	NT	<2.0	NT	<2.0	NT	<2.0	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Reactive Sulfide	7.3.4.1	mg/kg	NS	Non-reactive	NT	<2.0	NT	<2.0	NT	<2.0	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Sulfur, Total	D4239	%	NS	NS	NT	NT	NT	1,110	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Sulfate	9038	mg/kg	NS	NS	NT	93	NT	194	NT	<109	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Sulfide	9030B	mg/kg	NS	NS	NT	<0.9	NT	<0.8	NT	<1.1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Cyanide	9014	mg/kg	30	NS	NT	<1.70	NT	<1.43	NT	<2.03	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Total Organic Carbon	LK	mg/kg	NS	NS	NT	53,500	NT	47,600	NT	62,000	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Solids, Total	2540G	%	NS	NS	71	54	74	67	34	46	49	69	74	51	49	54	72	80	52	34	55	58

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. The metals analysis for samples SS64-S1, SS69-S1, and SS692R-S1 was performed after the samples were air dried (Total Solids = 100%).
4. TCLP = Toxicity Characteristic Leaching Procedure.
5. ND = Not detected.
6. NT = The sample was not tested for this analyte.
7. mg/kg = milligrams per kilogram.
8. mg/L= milligrams per liter
9. S.U. = standard units.
10. umhos/cm = micromhos per centimeter.
11. deg F = degrees Fahrenheit.
12. Soil samples for VOCs were preserved in the field with methanol and/or deionized water.
13. For samples analyzed by low and high level VOC methods, the highest detected value or lowest reporting limit (if both results were non-detect) for each analyte is shown here.
14. MCP = 310 CMR 40.0000 Massachusetts Contingency Plan with revisions effective March 1, 2024.
15. Method 1 S-1/GW-3 standards, where identified, are cited from the MCP.
16. NS = No standard or criteria has been established for this analyte.
17. Values in bold exceed Method 1 standard. However, comparison to these standards is for reference only since the standards only apply to soil and the samples in the table are sediment.

Qualifying Notes:

B The reported result is attributed to sampling or laboratory contamination.

Table 10. Surface Water Chemical Testing Results
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

		Sample Location:	SW501	SW502	SW503	SW601	SW602	SW603	SW604	SW605	SW606	SW607	SW608	SW609	SW610
		Sample ID:	SW501	SW502	SW503	SW601	SW602	SW603	SW604	SW605	SW606	SW607	SW608	SW609	SW610
		Lab Sample ID:	19I0164-01	19I0164-02	19I0164-03	20G0197-05	20G0197-04	20G0197-03	20G0197-02	20G0197-01	20G0165-05	20G0165-04	20G0165-03	20G0165-02	20G0165-01
		Property:	39 Water St	39 Oakland St	1 Field St	Mill St Ext	35 Oakland St	7 Noel St	50 Macy St	58 Macy St	33R Oakland St	35 Oakland St	35 Oakland St	37 Oakland St	37 Oakland St
		Area:	River	River	River	River	River	River	River	River	Wetland	Wetland	Wetland	Wetland	Wetland
		Sample Date	9/5/2019	9/5/2019	9/5/2019	7/7/2020	7/7/2020	7/7/2020	7/7/2020	7/7/2020	7/6/2020	7/6/2020	7/6/2020	7/6/2020	7/6/2020
Analyte	**Method**	**Units**													
Polyaromatic Aromatic Hydrocarbons (PAH)	8270D SIM	ug/L													
2-Methylnaphthalene			< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	0.97	0.78	0.88	1.3
Acenaphthene			< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	4.82	4.50	5.26	8.13
Anthracene			< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	0.22	0.25	0.28	0.43
Chrysene			< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05
Fluoranthene			< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	0.22	0.27	0.31	0.52
Fluorene			< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	1.28	1.23	1.46	2.17
Naphthalene			< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	8.80	5.65	5.84	9.07
Phenanthrene			< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	1.68	1.77	2.14	3.42
Pyrene			< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	0.28	0.36	0.4	0.67
Extractable Petroleum Hydrocarbons (EPH)	MADEP-EPH	ug/L													
C9-C18 Aliphatics			< 93	< 93	< 93	< 93	< 93	< 93	< 95	< 93	< 93	< 93	< 93	< 95	< 93
C19-C36 Aliphatics			< 93	< 93	< 93	< 93	< 93	< 93	< 95	< 93	< 93	< 93	< 93	< 95	< 93
C11-C22 Aromatics			< 93.5	< 93.5	< 93.5	< 93.5	< 93.5	< 93.5	< 95.2	< 93.5	< 93.5	< 93.5	< 93.5	<93.5	< 93.5

General Notes:

1. In general, analytes detected in at least one sample are reported here.
   For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. ug/L= micrograms per liter.

Table 11. Physical and Chemical Properties of Constituents of Concern
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP
Amesbury, Massachusetts

Contaminant	Molecular Weight (g/mol)	Vapor Pressure (mmHg @25°C)	Solubility in Water (µg/L @25°C)	Henry's Law (atm-m^3/mol @25°C)	K_{oc}	Log K_{ow}
Volatile Organic Compounds (VOCs)						
Acetone	58	232	1.00×10^{9}	1.43×10^{-3}	2.36	-0.24
Benzene	78	95	1.78×10^{6}	5.5×10^{-3}	83	2.13
2-Butanone (MEK)	72	90.6	2.23×10^{8}	2.33×10^{-3}	4.51	0.29
Ethylbenzene	106	10	1.61×10^{5}	3.43×10^{-3}	580	3.13
Isopropylbenzene	120	4.5	61.3	1.15×10^{-2}	1.38×10^{3}	3.66
4-Isopropyltoluene	134	1.46	23.4	1.10×10^{-2}	NA	4.10
n-Propylbenzene	120	3.42	52.2	1.05×10^{-2}	1.54×10^{3}	3.69
Toluene	92	28	5.35×10^{5}	6.68×10^{-3}	270	2.79
1,2,4-Trimethylbenzene	120	2.1	57	6.16×10^{-3}	1.30×10^{3}	3.63
1,3,5-Trimethylbenzene	120	2.48	48.2	8.77×10^{-3}	1.25×10^{3}	3.42
Vinyl chloride	62	2,600	8.80×10^{3}	5.60×10^{-2}	56	1.46
Xylenes (total)	106	6	1.71×10^{5}	5.27×10^{-3}	300	3.33
Semi-volatile Organic Compounds (SVOCs)						
Acenaphthene	154	2.3×10^{-3}	3.42×10^{3}	2.41×10^{-4}	4.6×10^{3}	3.98
Acenaphthylene	154	2.9×10^{-2}	3.93×10^{3}	1.54×10^{-3}	2.5×10^{3}	4.07
Anthracene	178	1.7×10^{-5}	1.29×10^{3}	8.6×10^{-5}	1.4×10^{4}	4.45
Benzo(a)anthracene	228	5×10^{-9}	10	1×10^{-6}	2×10^{5}	5.61
Benzo(a)pyrene	252	5×10^{-9}	3.8	4.9×10^{-7}	5.5×10^{6}	6.06
Benzo(b)fluoranthene	252	5×10^{-7}	14	1.22×10^{-5}	5.5×10^{5}	6.06
Benzo(g,h,i)perylene	276	1×10^{-10}	0.26	1.44×10^{-7}	1.6×10^{6}	6.51
Benzo(k)fluoranthene	252	9.59×10^{-11}	0.8	3.87×10^{-5}	5.5×10^{5}	6.06
1,1-Biphenyl	154	5.0×10^{-3}	4.00×10^{-4}	3.08×10^{-4}	8.6×10^{3}	4.01
Bis(2-ethylhexyl)phthalate	391	7.23×10^{-8}	1.3×10^{3}	3.00×10^{-7}	1.0×10^{5}	5.11
Chrysene	228	6.3×10^{-9}	6	1.05×10^{-6}	2×10^{5}	5.61
Dibenzo(a,h)anthracene	278	1×10^{-10}	0.5	7.3×10^{-8}	3.3×10^{6}	6.84
Dibenzofuran	168	NA	NA	NA	NA	NA
Fluoranthene	202	5×10^{-6}	265	6.5×10^{-6}	3.8×10^{4}	4.9
Fluorene	166	6.3×10^{-5}	1.9×10^{3}	1.17×10^{-4}	7.3×10^{3}	4.18
Indeno(1,2,3-cd)pyrene	276	1.0×10^{-9}	0.53	6.95×10^{-8}	1.6×10^{6}	6.58
2-Methylnaphthalene	142	3.18×10^{-4}	2.6×10^{4}	2.9×10^{-4}	720	3.86
Naphthalene	128	8.2×10^{-2}	3.1×10^{4}	1.18×10^{-3}	1.3×10^{3}	3.29
Phenanthrene	178	9.6×10^{-4}	816	3.93×10^{-5}	1.4×10^{4}	4.45
Phenol	94	0.341	9.3×10^{7}	1.3×10^{-6}	0.91	1.46
Pyrene	202	2.5×10^{-6}	160	5.1×10^{-6}	3.8×10^{4}	4.88
Volatile Petroleum Hydrocarbons (VPH)						
C_5-C_8 Aliphatics	93	0.1	1.1×10^{4}	54	2.3×10^{3}	<3
C_9-C_{12} Aliphatics	149	8.7×10^{-4}	0.07	1.59	1.5×10^{5}	NA
C_9-C_{10} Aromatics	120	2.9×10^{-3}	5.1×10^{4}	0.33	1.8×10^{3}	<3
Extractable Petroleum Hydrcarbons (EPH)						
C_9-C_{18} Aliphatics	170	1.4×10^{-4}	10	69	6.8×10^{5}	>3
C_{19}-C_{36} Aliphatics	Immobile					
C_{11}-C_{22} Aromatics	150	3.2×10^{-3}	5.8×10^{3}	0.03	5.0×10^{3}	NA
Polychlorinated Biphenyls						
PCB Aroclors	257 to 453	7.7×10^{-5} to 6.7×10^{-3}	2.7×10^{-6} to 5.9×10^{-3}	2.9×10^{-4} to 4.6×10^{-3}	NA	4.7 to 6.8
Pesticides						
alpha-BHC	291	3.52×10^{-5}	2.0×10^{3}	2.74×10^{-4}	2.81×10^{3}	3.80
gamma-Chlordane	410	5.03×10^{-5}	56	1.99×10^{-3}	6.75×10^{4}	6.22
4,4'-DDD	320	1.35×10^{-6}	90	2.70×10^{-4}	1.18×10^{5}	6.02
4,4'-DDT	354	1.60×10^{-7}	5.5	3.40×10^{-4}	1.69×10^{5}	6.91
Dieldrin	381	5.89×10^{-6}	195	4.09×10^{-4}	2.01×10^{4}	5.40
Metals						
Arsenic	74	NA	Insoluble	NA	NA	NA
Barium	137	NA	Insoluble	NA	NA	0.23
Cadmium	112	NA	Insoluble	NA	NA	NA
Chromium	52	NA	Insoluble	NA	NA	NA
Copper	64	NA	Insoluble	NA	NA	NA
Lead	207	NA	Insoluble	NA	NA	NA
Mercury	201	2.0×10^{-3}	3.10×10^{-2}	0.467	52	NA
Nickel	59	NA	Insoluble	NA	NA	NA
Selenium	79	NA	Insoluble	NA	NA	NA
Silver	107	NA	Insoluble	NA	NA	NA
Zinc	65	NA	Insoluble	NA	NA	NA
Cyanide	26	NA	1×10^{9}	1.9×10^{3}	8.9	1.1

General Note:
1. NA = Parameter not available.
2. Henry's Law constant. At constant temperature and pressure, the ratio of the partial pressure of a gas above a liquid to its molal solubility in the liquid. A measure of the partitioning between the gas phase and the solute (i.e., water) phase for specified compound. Indicates potential for volatilization from water (high K_H indicates preferential partitioning to air rather than water).
3. K_{ow}: Octanol-water partition coefficient. The ratio of the amount of a substance that will dissolve in octanol versus the amount that will dissolve in water. The higher the octanol/water partition coefficient the greater the tendency of a substance to be stored in soil organic matter or fatty tissues.
4. K_{oc}: Organic carbon partition coefficient. Measure of the tendency for organic substances to be adsorbed by soil and sediment.

References:

1. "Characterizing Risks posed by Petroleum Contaminated Sites: Implementation of MADEP VPH/EPH Approach," DEP, October 2002.
2. "Background Documentation for the Development of the MCP Numerical Standards," Table 3-1, DEP, 1994.
3. "Handbook of RCRA Groundwater Monitoring Constituents, Chemical Physical Properties (40 CFR Part 264, Appendix 9)," USEPA, 1992.
4. Agency for Toxic Substances and Disease Registry Toxicological Profiles, https://www.atsdr.cdc.gov.
5. Gustafson, J.B., et. al., Selection of Representative TPH Fractions Based on Fate and Transport Considerations, Total Petroleum Hydrocarbon Working Group Series, Volume 3, 1997
6. The Risk Assessment Information System (RAIS) Toxicity and Properties. https://rais.ornl.gov/cgi-bin/tools/TOX_search?select=chem_spef

Figures

Figure 1. Site Location Map

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Figure 3. MassGIS Map

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Figure 5. Historical River Channel Footprints

Figure 6. Licensed Waterfront Structures

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Figure 10. Bathymetric Survey Plan – 2024

Figure 11. River Sampling Locations

Figure 12. Wetland and Mudflat Sampling Locations

Figure 13. Visual Oil or Tar – River

Figure 14. Visual Oil or Tar – Wetland and Mudflat

Figure 15. Readily Apparent Harm in Wetland, Mudflat, and River

Figure 16. Readily Apparent Harm in Wetland and Mudflat

Figure 17. Visual Observations of Ebullition and Sheen for the Powwow River

Figure 18. Subsurface Profile Longitudinal Alignment and Lateral Transects

Figure 19. Subsurface Longitudinal Profile A-A' (Wetland and Mudflat) and Subsurface Lateral Profiles B-B' (Wetland) and C-C' (Mudflat)

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Figure 21. Subsurface Longitudinal Profile D-D' (2 of 2) (River)

Figure 22. Subsurface Lateral Profiles E-E' (River), F-F' (River), G-G' (River), and H-H' (River)

Figure 23. Subsurface Lateral Profiles I-I' (River), J-J' (River), K-K' (River), L-L' (River), M-M' (River), and N-N' (Former River Channel)

Figure 24. Total PAH Concentrations in River Sediment (0-1 foot)

Figure 25. Total PAH Concentrations in Wetland and Mudflat Sediment (0-1 foot)

Figure 26. Total PAH Concentrations in River Sediment (0-2 feet)

Figure 27. Total PAH Concentrations in Wetland and Mudflat Sediment (0-2 feet)

Figure 28. Total PAH Concentrations in River Sediment (>2 feet)

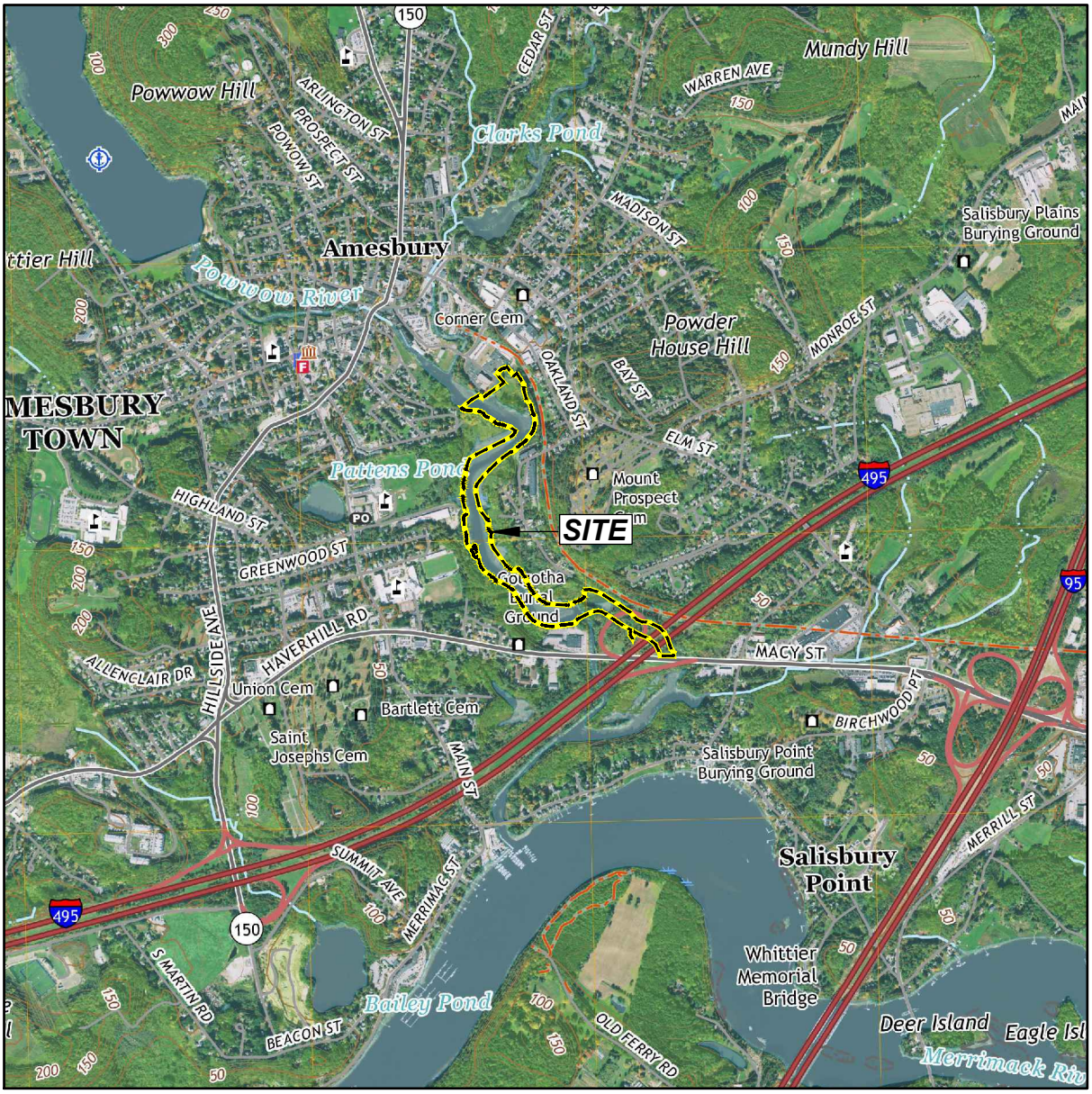
Figure 29. Total PAH Concentrations in Wetland and Mudflat Sediment (>2 feet)

Figure 30. Total Benzo(a)pyrene Concentrations in River Sediment (0-2 feet)

Figure 31. Total Benzo(a)pyrene Concentrations in Wetland and Mudflat Sediment (0-2 feet)

Figure 32. Total Benzo(a)pyrene Concentrations in River Sediment (>2 feet)

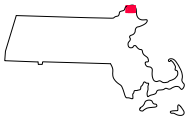
Figure 33. Total Benzo(a)pyrene Concentrations in Wetland and Mudflat Sediment (>2 feet)



0 1000 2000 4000 6000

SCALE, FEET

This Image is from U.S.G.S. Topographic 7.5 Minute Series
Newburyport West, MA-NH Quadrangle, 2021.
Datum is North American Vertical Datum of 1988 (NAVD88).
Contour Interval is 10 Feet.



MASSACHUSETTS
QUADRANGLE LOCATION

Supplemental Phase II Comprehensive Site Assessment Amesbury Former MGP Site Amesbury, Massachusetts	GEI Consultants	SITE LOCATION MAP
Boston Gas Company d|b|a National Grid Waltham, Massachusetts	Project 1804576	October 2025 Fig. 1

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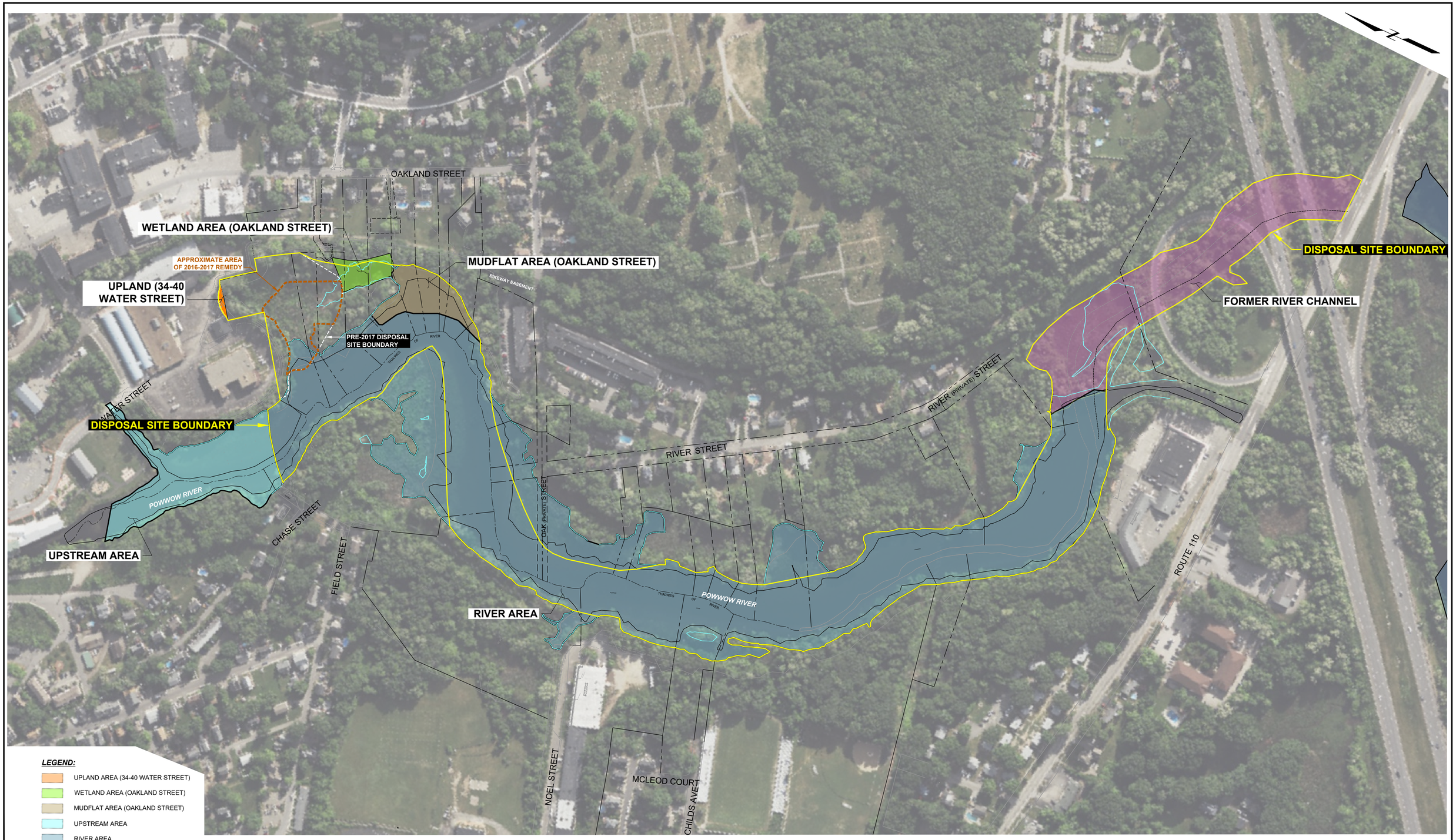


LEGEND:

- UPLAND AREA (34-40 WATER STREET)
- WETLAND AREA (OAKLAND STREET)
- MUDFLAT AREA (OAKLAND STREET)
- UPSTREAM AREA
- RIVER AREA
- FORMER RIVER CHANNEL AREA

NOTES:

1. MICROSOFT BING IMAGE 2023.
2. PARCEL BOUNDARIES, THALWEG OF RIVER, AND MEAN HIGH WATER LINE PROVIDED BY HAYNER/SWANSON, INC., 2025.

0 150 300
Approximate Scale, Feet

Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP Site
Amesbury, Massachusetts

Boston Gas Company d|b|a National Grid
Waltham, Massachusetts

GEI Consultants

SITE PLAN

Project 1804576 | October 2025 | Fig. 2

---- B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\Ph II CSA Supplemental\1804576-35.dwg - 10/28/2025

MassDEP - Bureau of Waste Site Cleanup

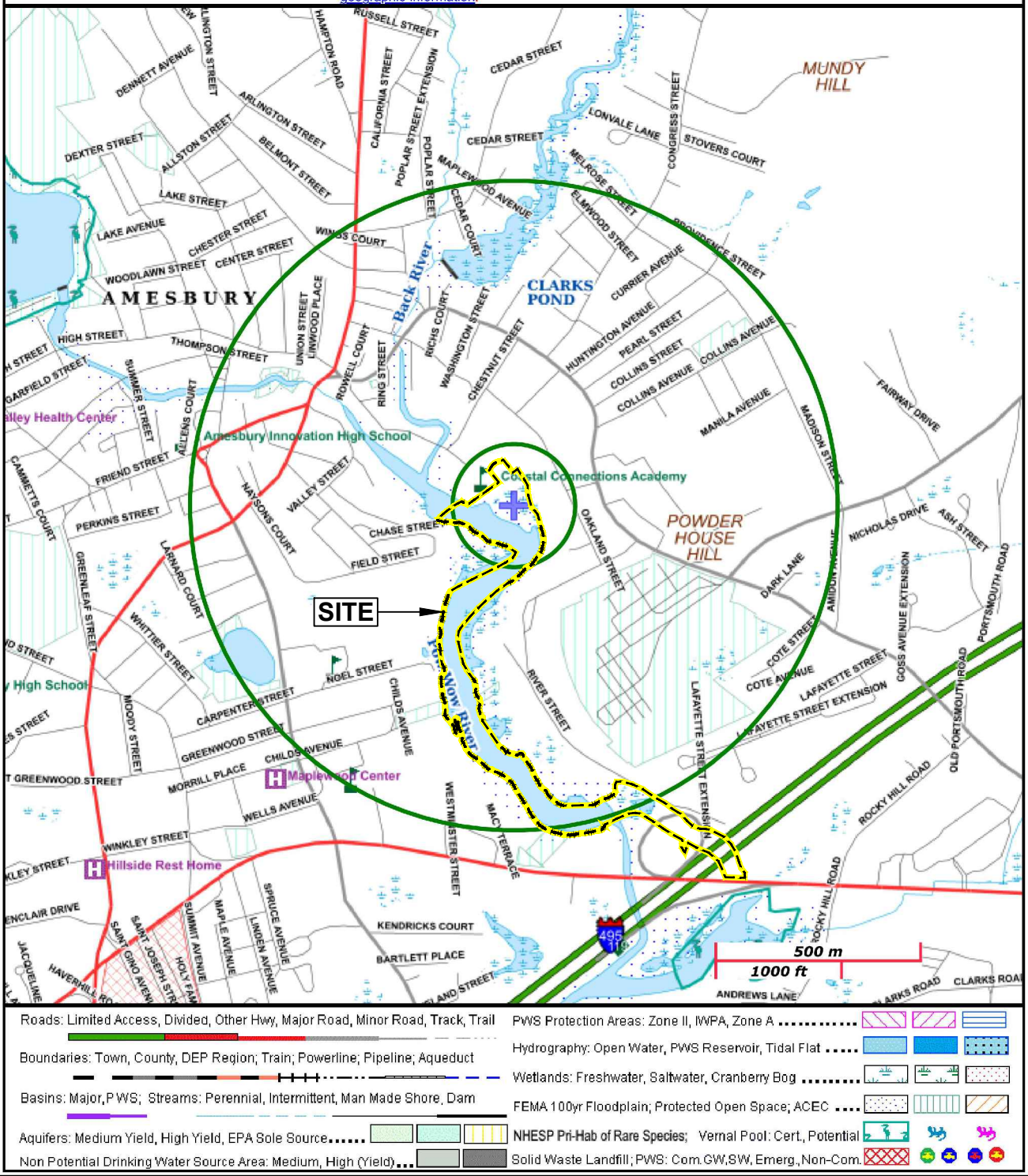
Phase 1 Site Assessment Map: 500 feet & 0.5 Mile Radii

Site Information:

39 WATER STREET AMESBURY, MA
3-000024070
NAD83 UTM Meters:
4746508mN , 342757mE (Zone: 19)
February 26, 2024

The information shown is the best available at the date of printing. However, it may be incomplete. The responsible party and LSP are ultimately responsible for ascertaining the true conditions surrounding the site. Metadata for data layers shown on this map can be found at: https://www.mass.gov/orgs/massgis-bureau-of-geographic-information.

MassDEP
Commonwealth of Massachusetts
Department of Environmental Protection



Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP Site
Amesbury, Massachusetts

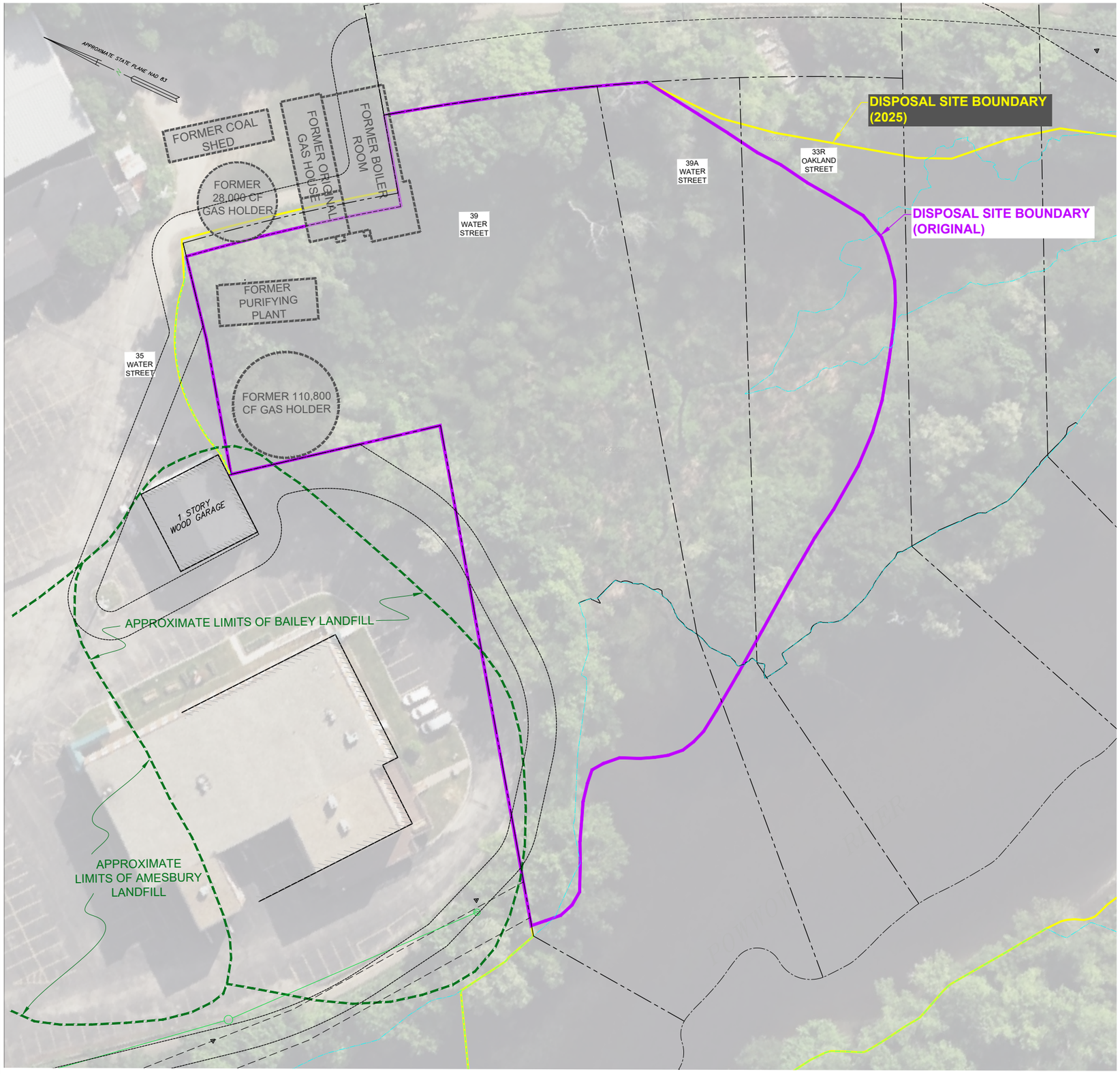
Boston Gas Company d|b|a National Grid
Waltham, Massachusetts

GEI Consultants

MASSGIS MAP

Project 1804576 | October 2025 | Fig. 3

B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\Ph II CSA Supplemental\1804576-03



LEGEND:

- HISTORICAL MGP STRUCTURE
- DISPOSAL SITE BOUNDARY
- PRE-2017 DISPOSAL SITE BOUNDARY, DASHED WHERE INFERRED
- SEWER LINE/MANHOLE
- DRAIN LINE/MANHOLE
- CATCH BASIN
- FLARED END/INVERT
- GAS LINE/GATE
- OVERHEAD WIRE
- LIGHT POLE
- UTILITY POLE
- GUY WIRE
- SIGN
- POST
- BOLLARD POST
- CHAIN LINK FENCE
- GUARDRAIL/GUIDERAIL
- TREE LINE
- BUILDING
- 100-YEAR FLOOD ELEVATION
- ASSESSOR MAP AND LOT
- BOUNDARY OF BORDERING VEGETATED WETLAND
- MEAN ANNUAL HIGH WATER FLAG
- BANK/BANK FLAG
- BUFFER ZONE
- RIVERFRONT AREA
- MINOR CONTOUR
- MAJOR CONTOUR
- SPOT ELEVATION
- EDGE OF WATER
- THREAD OF THE RIVER
- LINE OF CHANGE IN VEGETATION
- BITUMINOUS CONCRETE
- CONCRETE
- CORRUGATED METAL PIPE
- EDGE OF PAVEMENT
- OBSERVATION PIPE
- REINFORCED CONCRETE PIPE
- TOP OF PIPE ELEVATION
- STONE BOUND
- IRON PIN/IRON PIPE
- IRON ROD
- PK NAIL
- FOUND
- CATCH BASIN

NOTES:

1. PARCEL BOUNDARIES PROVIDED BY HAYNER/SWANSON, INC., 2025.
2. APPROXIMATE LIMITS OF BAILEY AND AMESBURY LANDFILLS ARE FROM HALEY AND ALDRICH'S PHASE I - LIMITED SITE INVESTIGATION PREPARED FOR BARTLEY MACHINE AND MANUFACTURING COMPANY, JULY 30, 1993.
3. HISTORICAL MGP STRUCTURES FROM 1930 SANBORN FIRE INSURANCE MAP.

0 30 60
SCALE, FEET

Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP Site
Amesbury, Massachusetts

Boston Gas Company d|b|a National Grid
Waltham, Massachusetts

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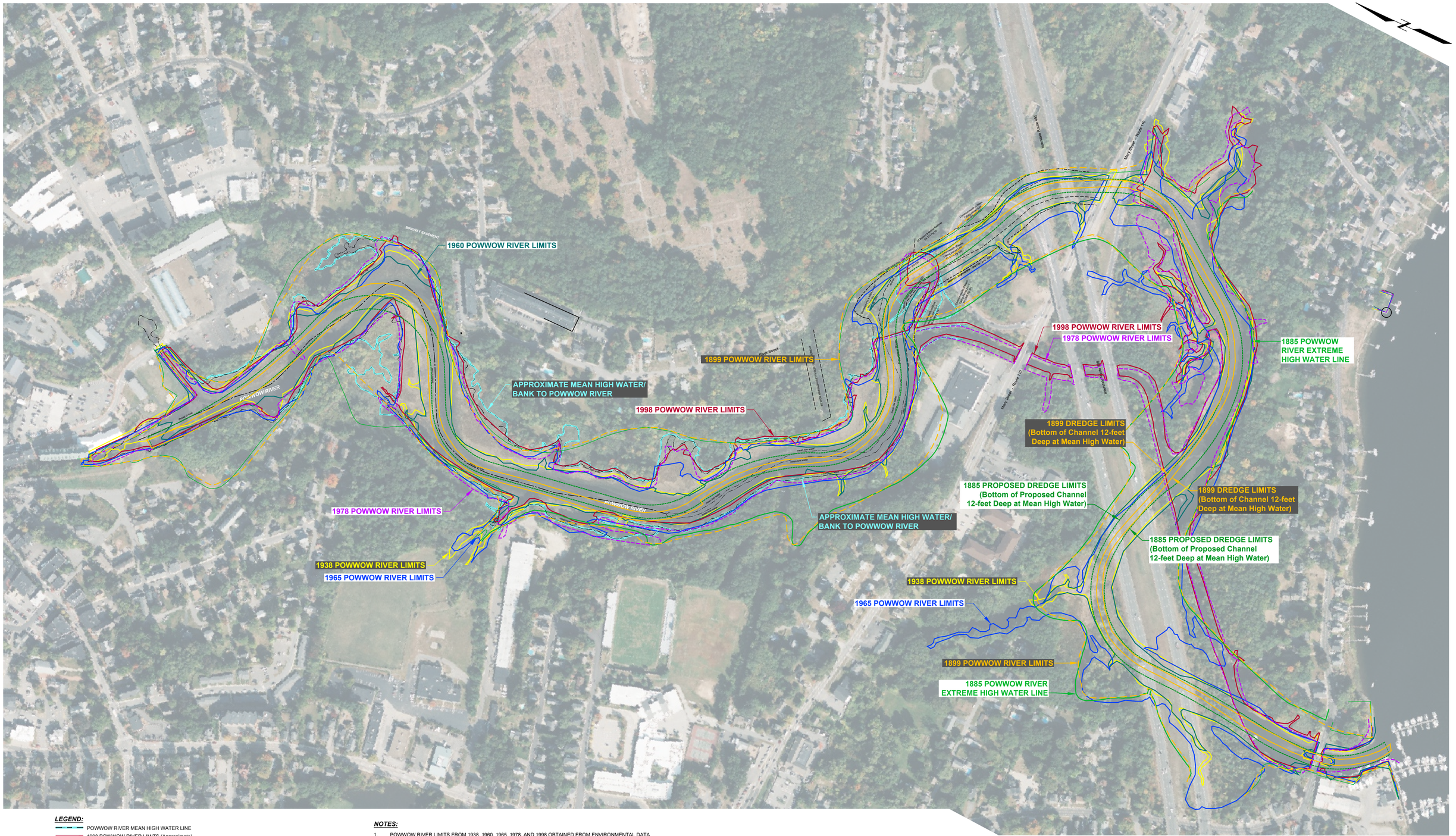
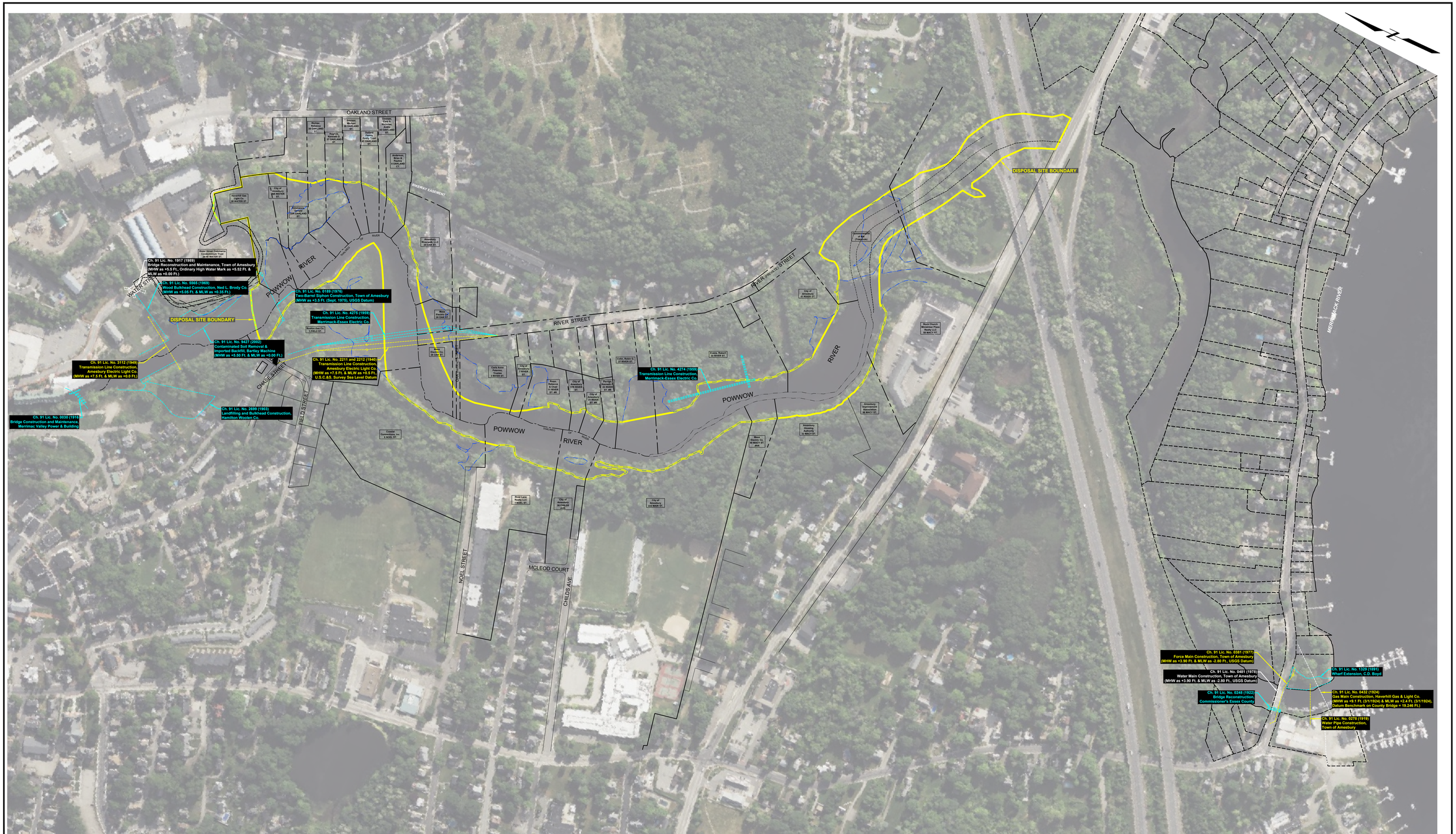
HISTORICAL MGP FOOTPRINT

Project 1804576 | October 2025 | Fig. 4

B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\Ph II CSA Supplemental\1804576-37


1960 POWWOW RIVER LIMITS
1899 POWWOW RIVER LIMITS
APPROXIMATE MEAN HIGH WATER/
BANK TO POWWOW RIVER
1998 POWWOW RIVER LIMITS
1978 POWWOW RIVER LIMITS
1938 POWWOW RIVER LIMITS
1965 POWWOW RIVER LIMITS
1998 POWWOW RIVER LIMITS
1978 POWWOW RIVER LIMITS
1885 POWWOW
RIVER EXTREME
HIGH WATER LINE
1899 DREDGE LIMITS
(Bottom of Channel 12-feet
Deep at Mean High Water)
1885 PROPOSED DREDGE LIMITS
(Bottom of Proposed Channel
12-feet Deep at Mean High Water)
APPROXIMATE MEAN HIGH WATER/
BANK TO POWWOW RIVER
1899 DREDGE LIMITS
(Bottom of Channel 12-feet
Deep at Mean High Water)
1885 PROPOSED DREDGE LIMITS
(Bottom of Proposed Channel
12-feet Deep at Mean High Water)
1938 POWWOW RIVER LIMITS
1965 POWWOW RIVER LIMITS
1899 POWWOW RIVER LIMITS
1885 POWWOW RIVER
EXTREME HIGH WATER LINE
POWWOW RIVER
POWWOW RIVER
BIKEWAY EASEMENT
Macy Street - Route 110
Macy Street - Route 110
Water Street
Water Street
Water Street



NOTES:

1. FOOTPRINTS FOR STRUCTURES LICENSED UNDER MASSACHUSETTS CHAPTER 91 WERE TAKEN FROM PLANS AND LICENSES OBTAINED FROM MASSDEP IN 2022 AND 2023.
2. LOCATIONS OF ALL STRUCTURES ARE APPROXIMATE.
3. MICROSOFT BING IMAGE 2021.
4. PARCEL BOUNDARIES, THALWEG OF RIVER, AND MEAN HIGH WATER LINE BY HAYNER/SWANSON, 2025.

0 200 400
Approximate Scale, Feet

Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP Site
Amesbury, Massachusetts

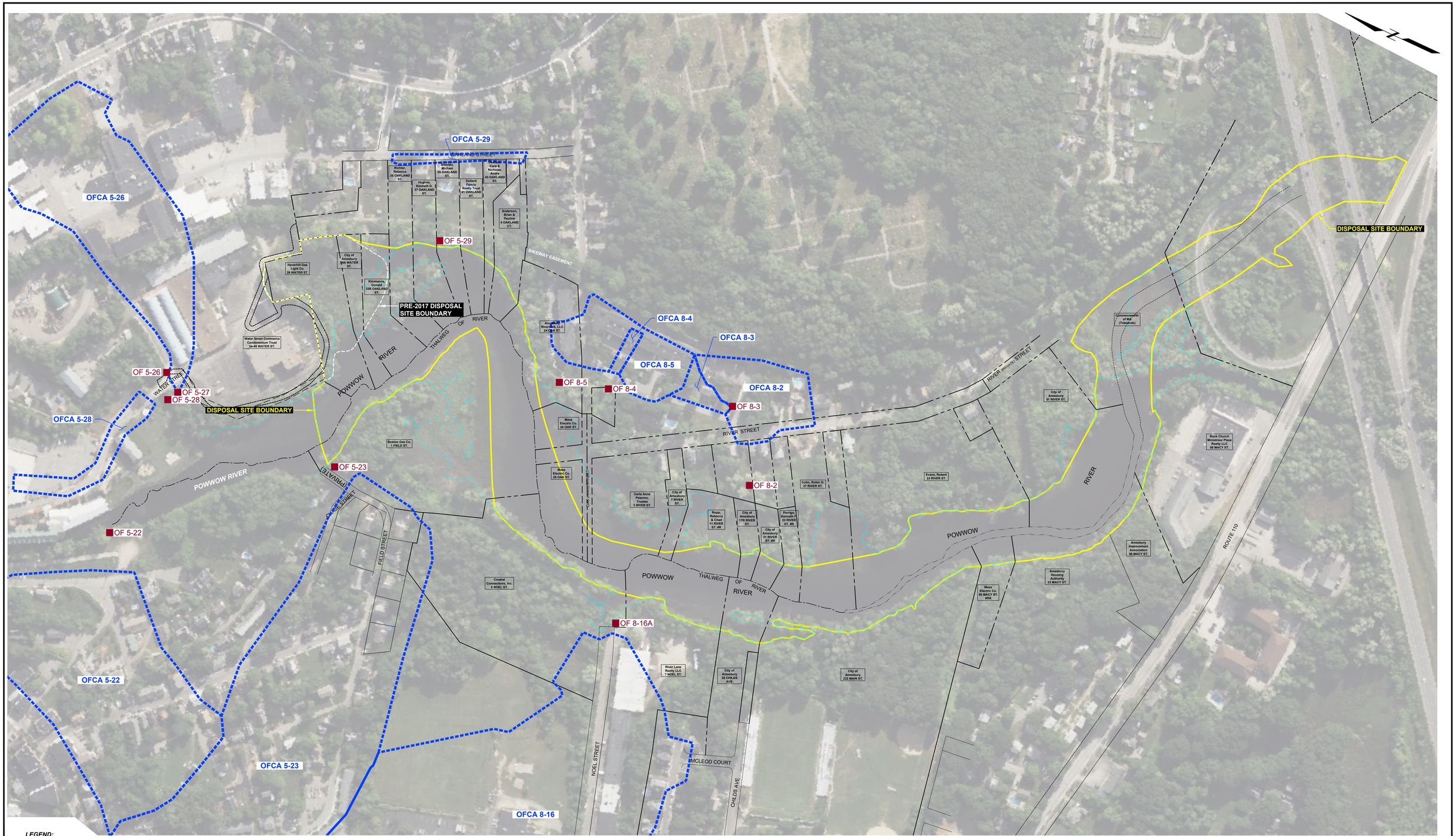
Boston Gas Company d|b|a National Grid
Waltham, Massachusetts

GEI Consultants

LICENSED
WATERFRONT STRUCTURES

Project 1804576 | October 2025 | Fig. 6

---- B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\Ph II CSA Supplemental\1804576-06.dwg - 9/15/2025



LEGEND:

- OF — STORMWATER OUTFALL
- OFCA — STORMWATER OUTFALL CATCHMENT AREA

NOTES:

1. OUTFALLS AND CATCHMENT AREAS FROM 2021 IDDE PLAN.
2. MICROSOFT BING IMAGE 2022.
3. PARCEL BOUNDARIES PROVIDED BY HAYNER/SWANSON, 2025.

0 150 300
Approximate Scale, Feet

Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP Site
Amesbury, Massachusetts

Boston Gas Company d|b|a National Grid
Waltham, Massachusetts

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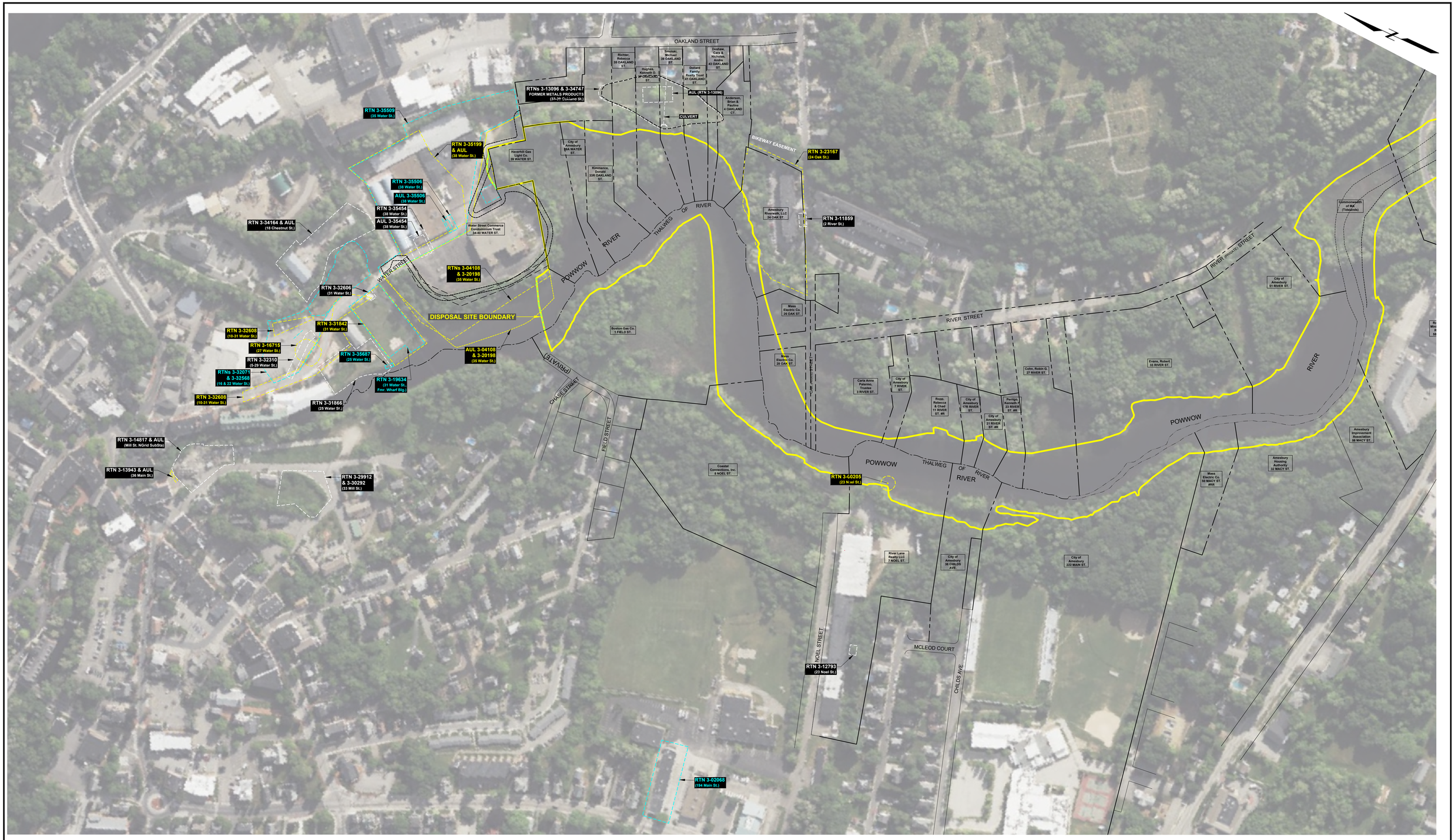
STORMWATER OUTFALLS AND CATCHMENT AREAS

Project 1804576 | October 2025 | Fig. 7

---- B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\Ph II CSA Supplemental\1804576-07.dwg - 6/27/2025



NOTES:

1. DISPOSAL SITE BOUNDARIES ARE APPROXIMATE AND ARE TAKEN FROM VARIOUS REPORTS OBTAINED THROUGH MASSDEP's ONLINE SITE DATABASE.
2. MICROSOFT BING IMAGE 2022.
3. PARCEL BOUNDARIES, THALWEG OF RIVER, AND MEAN HIGH WATER LINE BY HAYNER/SWANSON, 2025.

0 150 300
Approximate Scale, Feet

Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP Site
Amesbury, Massachusetts

Boston Gas Company d|b|a National Grid
Waltham, Massachusetts

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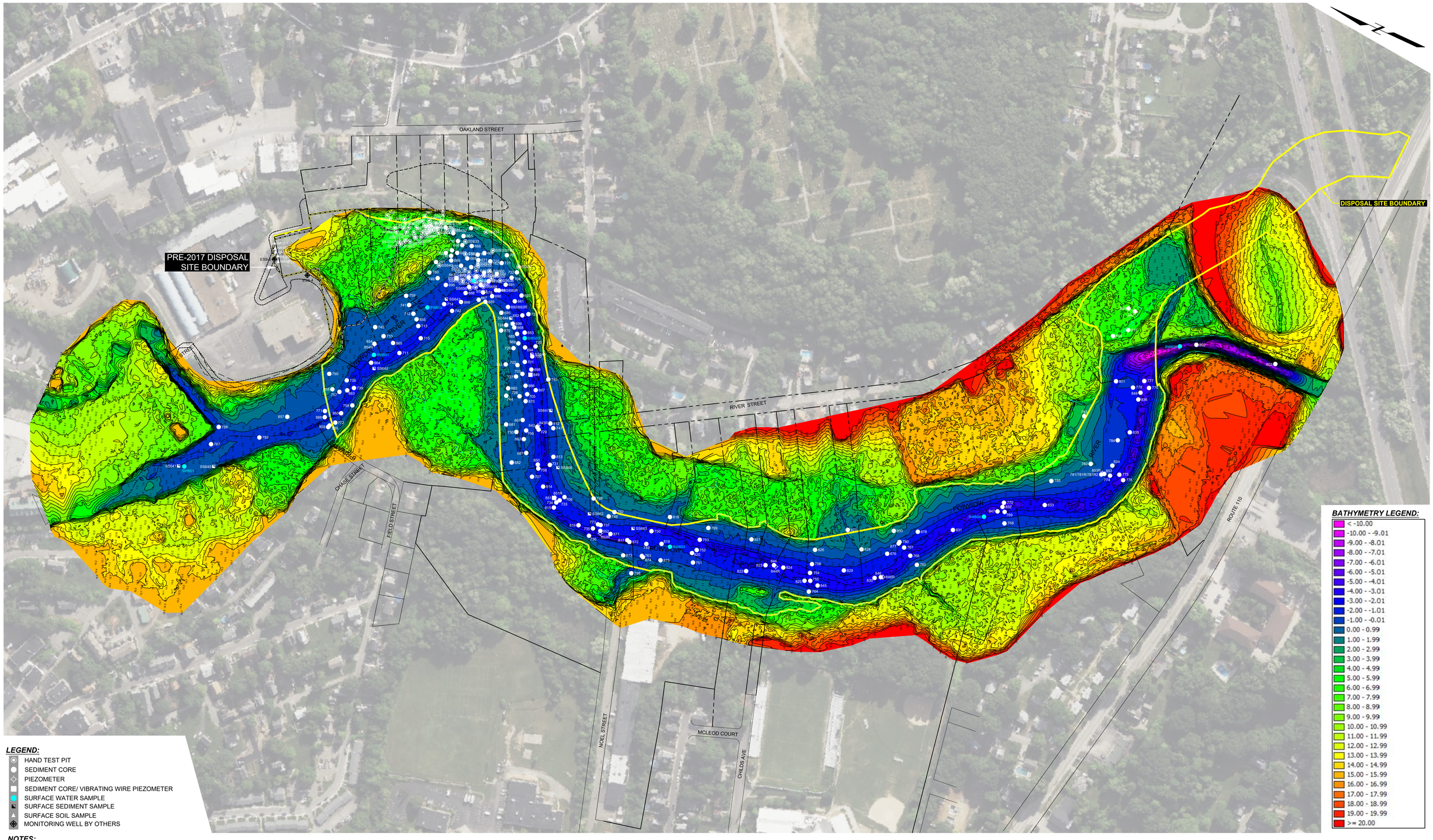
NEARBY MASSDEP DISPOSAL SITES

Project 1804576 | October 2025 | Fig. 8

---- B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\Ph II CSA Supplemental\1804576-06.dwg - 9/15/2025



LEGEND:

- HAND TEST PIT
- SEDIMENT CORE
- PIEZOMETER
- SEDIMENT CORE/ VIBRATING WIRE PIEZOMETER
- SURFACE WATER SAMPLE
- SURFACE SEDIMENT SAMPLE
- SURFACE SOIL SAMPLE
- MONITORING WELL BY OTHERS

NOTES:

1. BATHYMETRIC SURVEY PERFORMED BY STEELE ASSOCIATES MARINE CONSULTANTS, LLC IN NOVEMBER 2019 AND SEPTEMBER 2020.
2. MICROSOFT BING IMAGE 2022.
3. PARCEL BOUNDARIES, THALWEG OF RIVER AND MEAN HIGH WATER LINE BY HAYNER/SWANSON, 2025.
4. HAND TEST PIT, SURFACE SAMPLE, AND SEDIMENT SAMPLE LOCATIONS ARE APPROXIMATE.

0 150 300
SCALE: 1" = 150'

Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP Site
Amesbury, Massachusetts

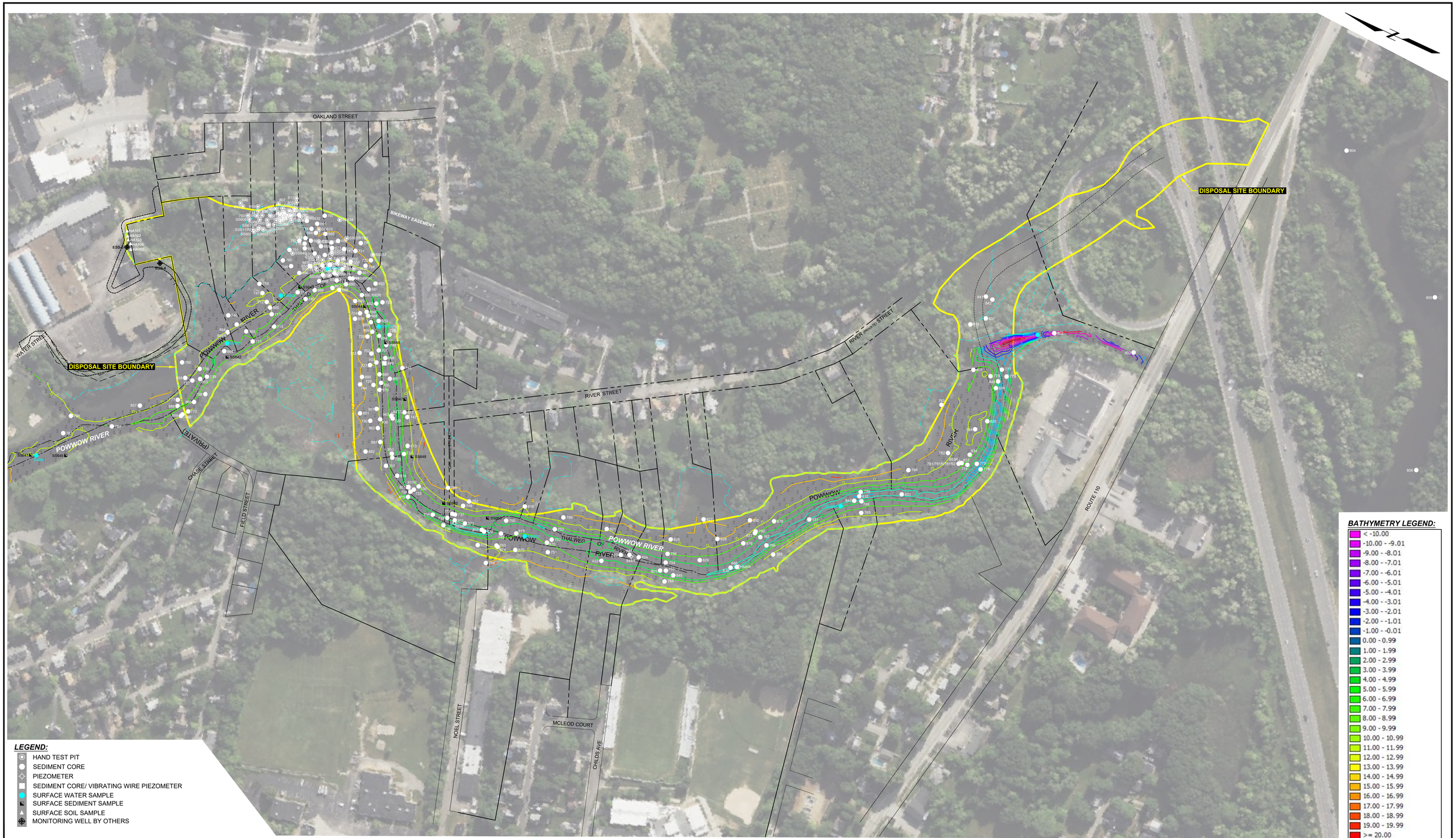
Boston Gas Company d|b|a National Grid
Waltham, Massachusetts

GEI Consultants

BATHYMETRIC SURVEY PLAN
(2019-2020)

Project 1804576 | October 2025 | Fig. 9

---- B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\Ph II CSA Supplemental\1804576-31 Bathy 2020.dwg - 7/3/2025



NOTES:

1. 2024 BATHYMETRY FROM *"SINGLE BEAM BATHYMETRY SURVEY CONTOUR MAP, POWWOW RIVER AMESBURY, MA,"* PREPARED BY STEELE ASSOCIATES MARINE CONSULTANTS, LLC. DATED 05/21/2024.
2. MICROSOFT BING IMAGE 2021.
3. PARCEL BOUNDARIES, THALWEG OF RIVER AND MEAN HIGH WATER LINE BY HAYNER/SWANSON, 2025.
4. HAND TEST PIT, SURFACE SAMPLE, AND SEDIMENT SAMPLE LOCATIONS ARE APPROXIMATE.

0 150 300
Approximate Scale, Feet

Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP Site
Amesbury, Massachusetts

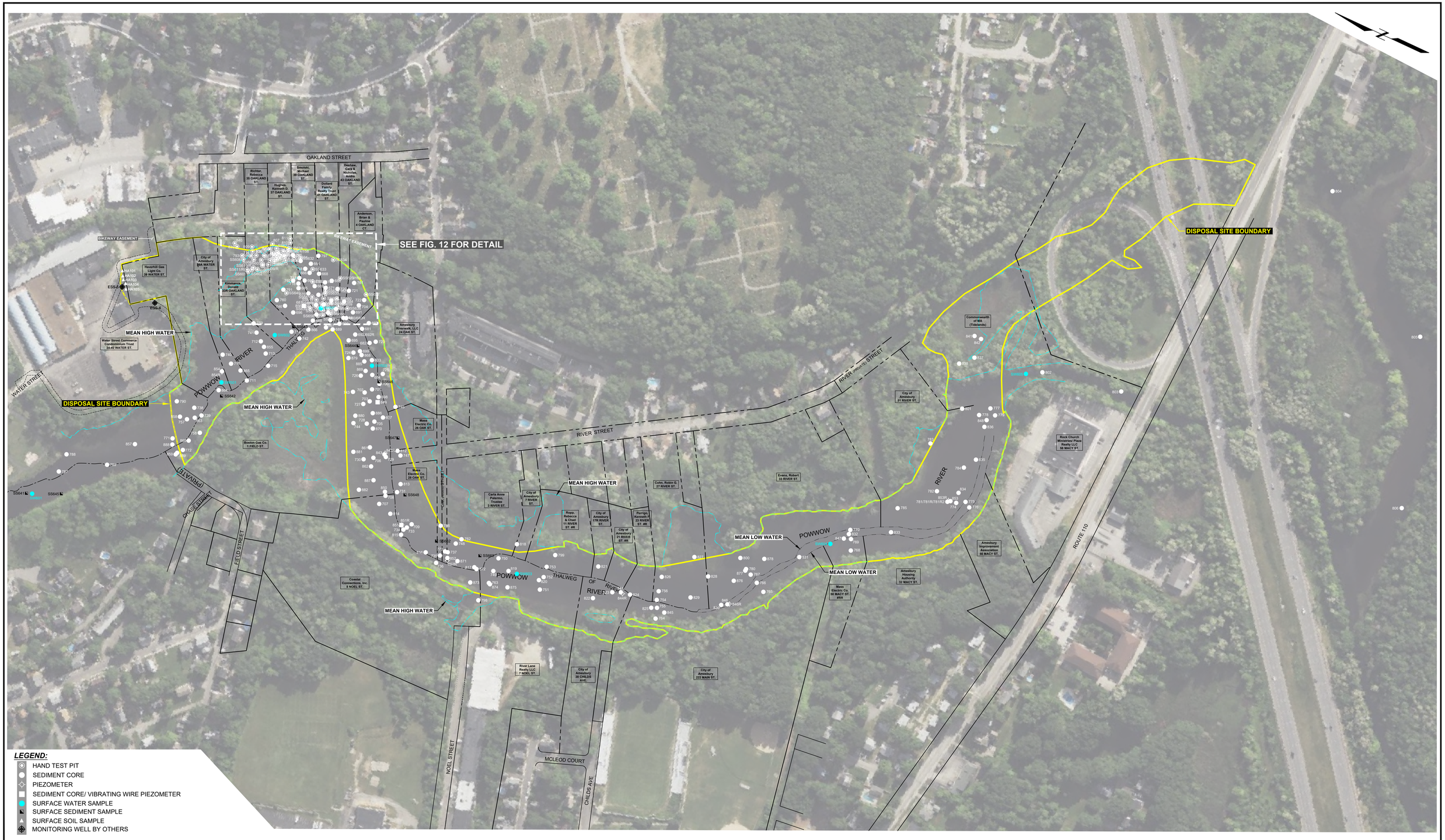
Boston Gas Company d|b|a National Grid
Waltham, Massachusetts

GEI Consultants

BATHYMETRIC SURVEY PLAN
(2024)

Project 1804576 | October 2025 | Fig. 10

---- B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\Ph II CSA Supplemental\1804576-33 Bathy 2024.dwg - 7/3/2025


OAKLAND STREET
BIKEWAY EASEMENT
SEE FIG. 12 FOR DETAIL
DISPOSAL SITE BOUNDARY
MEAN HIGH WATER
MEAN LOW WATER
THALWEG OF RIVER
POWWOW RIVER
WATER STREET
RIVER STREET
PRIVATE DRIVE
FIELD STREET
NOEL STREET
MCLEOD COURT
CHILDS AVE
ROUTE 110
Richter, Rebecca 35 OAKLAND ST.
Smolski, Michael 39 OAKLAND ST.
Declaire, Carl & Nicholas Andris 43 OAKLAND ST.
Hughes, Kenneth D. 37 OAKLAND ST.
Dolland Family Realty Trust 41 OAKLAND ST.
Anderson, Brian & Pauline 4 OAKLAND CT.
Haverhill Gas Light Co. 39 WATER ST.
City of Amesbury 36A WATER ST.
Kinmance, Donald 33R OAKLAND ST.
Water Street Commerce Condominium Trust 34-46 WATER ST.
Amesbury Riverwalk, LLC 24 OAK ST.
Mass Electric Co. 26 OAK ST.
Boston Gas Co. 1 FIELD ST.
Mass Electric Co. 28 OAK ST.
Carla Anne Palermo, Trustee 3 RIVER ST.
City of Amesbury 7 RIVER ST.
Ropp, Rebecca & Chad 11 RIVER ST. #R
City of Amesbury 17R RIVER ST.
Perrigo, Kenneth P. 23 RIVER ST. #R
City of Amesbury 21 RIVER ST. #R
Evans, Robert 33 RIVER ST.
Cohn, Robin G. 27 RIVER ST.
Coastal Connections, Inc. 8 NOEL ST.
River Lane Realty LLC 7 NOEL ST.
City of Amesbury 36 CHILDS AVE.
City of Amesbury 222 Main ST.
Commonwealth of MA (Tidelands)
City of Amesbury 61 RIVER ST.
Rock Church Ministries/ Plaza Realty LLC 58 MACY ST.
Amesbury Improvement Association 56 MACY ST.
Amesbury Housing Authority 32 MACY ST.
Mass Electric Co. 50 MACY ST. #RR
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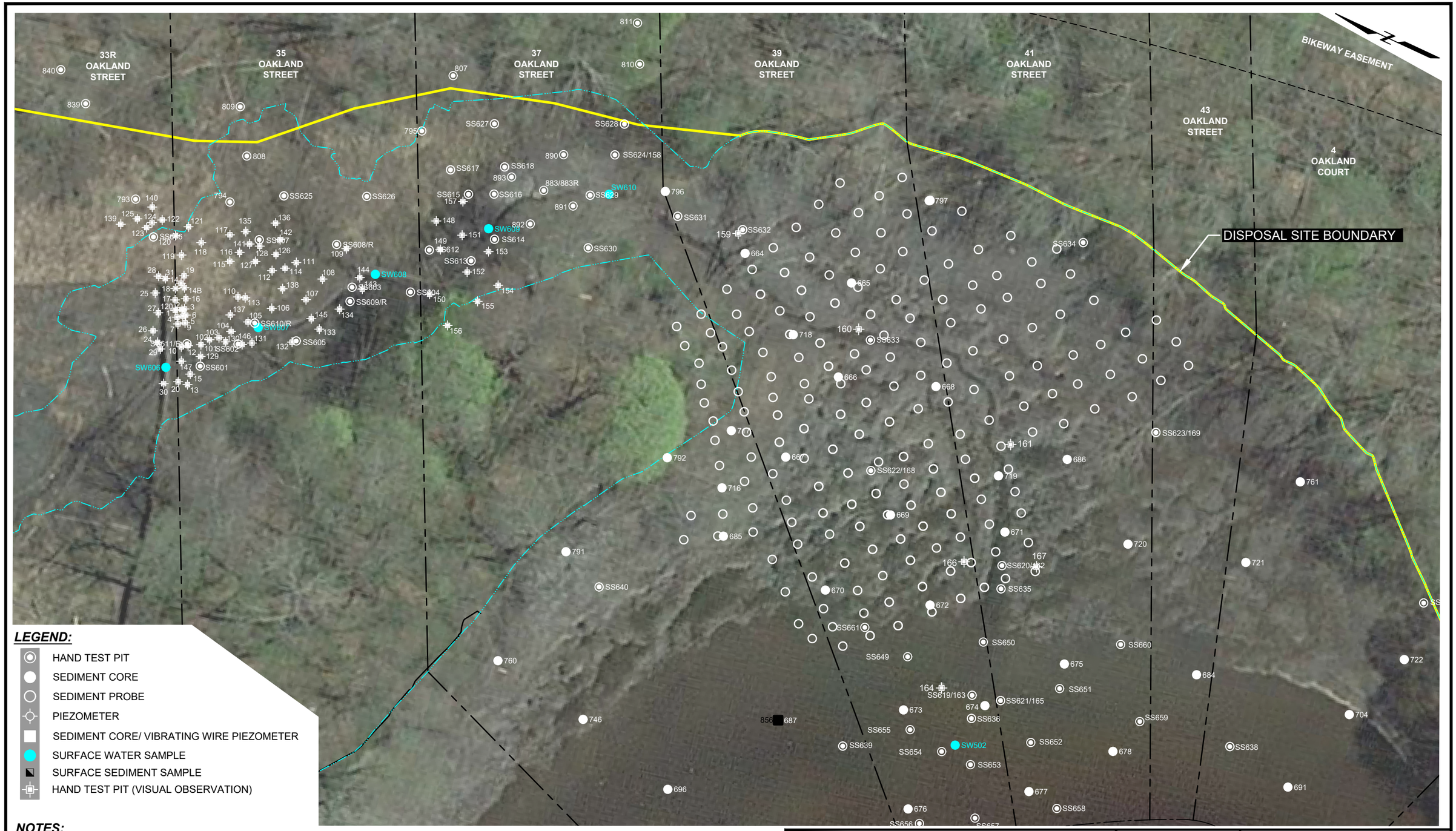


LEGEND:

- HAND TEST PIT
- SEDIMENT CORE
- SEDIMENT PROBE
- PIEZOMETER
- SEDIMENT CORE/ VIBRATING WIRE PIEZOMETER
- SURFACE WATER SAMPLE
- SURFACE SEDIMENT SAMPLE
- HAND TEST PIT (VISUAL OBSERVATION)

NOTES:

1. GOOGLE EARTH IMAGE DATED 5/04/2018.
2. HAND TEST PIT, SURFACE SAMPLE, AND SEDIMENT SAMPLE LOCATIONS ARE APPROXIMATE.
3. PARCEL BOUNDARIES, THALWEG OF RIVER AND MEAN HIGH WATER LINE BY HAYNER/SWANSON, 2025.

0 30 60

Approximate Scale, Feet

Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP Site
Amesbury, Massachusetts

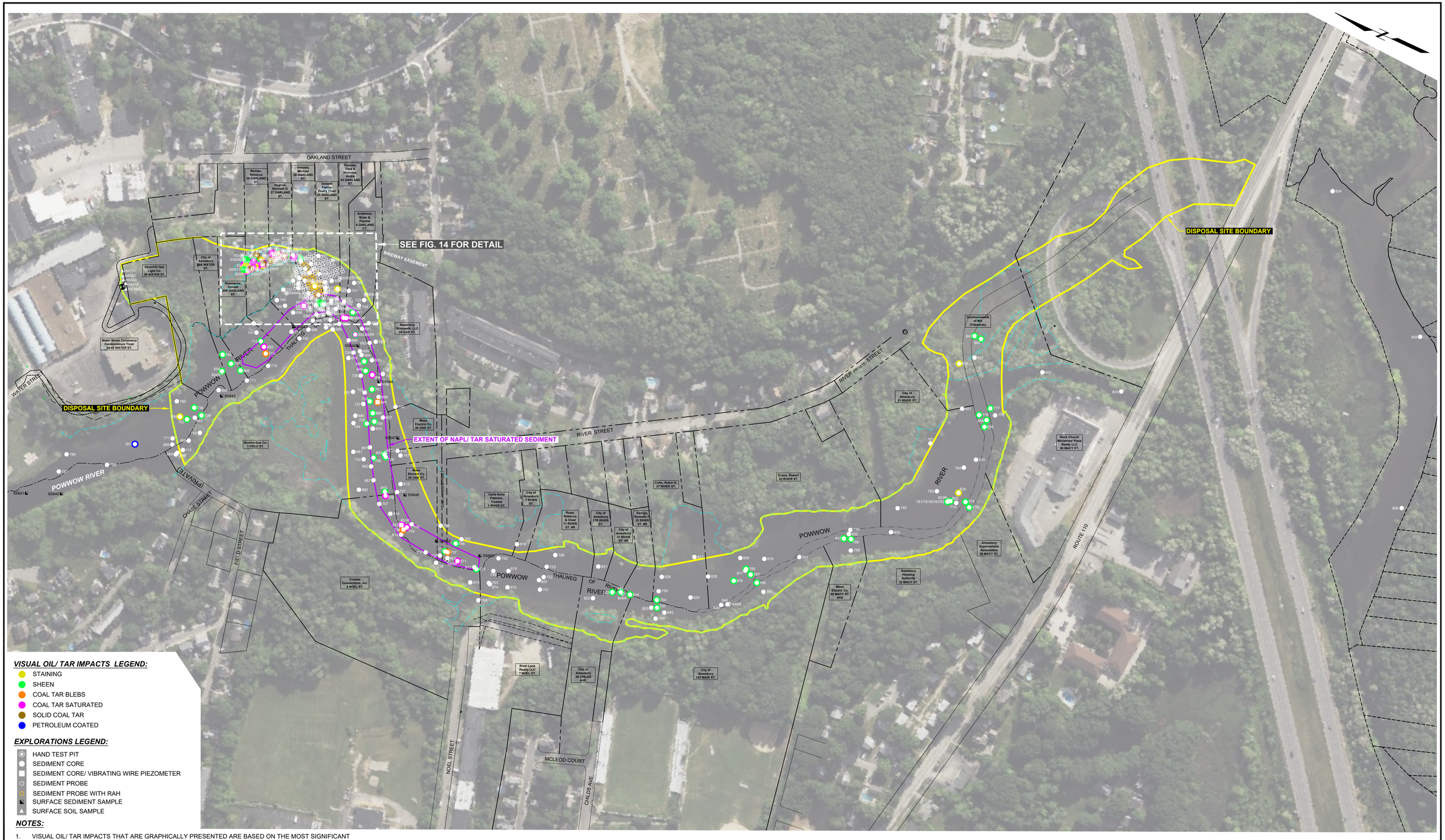
Boston Gas Company d|b|a National Grid
Waltham, Massachusetts

GEI Consultants

WETLAND AND MUDFLAT SAMPLING LOCATIONS

Project 1804576 | October 2025 | Fig. 12

---- B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\Ph II CSA Supplemental\1804576-14.dwg - 6/27/2025


SEE FIG. 14 FOR DETAIL
DISPOSAL SITE BOUNDARY
DISPOSAL SITE BOUNDARY
EXTENT OF NAPL/ TAR SATURATED SEDIMENT
OAKLAND STREET
RIVER STREET
WATER STREET
POWWOW RIVER
THALWEG OF RIVER
POWWOW
BIKEWAY EASEMENT
PRIVATE
CHASE STREET
FIELD STREET
NOEL STREET
MCLEOD COURT
CHILDS AVE
ROUTE 110
Richter, Rebecca 35 OAKLAND ST.
Smolski, Michael 39 OAKLAND ST.
Hughes, Kenneth D. 37 OAKLAND ST.
Dolland Family Realty Trust 41 OAKLAND ST.
Deschene, Cara & Nicholas; Andris 43 OAKLAND ST.
Anderson, Brian & Pauline 4 OAKLAND CT.
Haverhill Gas Light Co. 39 WATER ST.
City of Amesbury 39A WATER ST.
Kinmance, Donald 33R OAKLAND ST.
Water Street Commerce Condominium Trust 34-46 WATER ST.
Amesbury Riverwalk, LLC 24 OAK ST.
Mass Electric Co. 26 OAK ST.
Mass Electric Co. 28 OAK ST.
Boston Gas Co. 1 FIELD ST.
Coastal Connections, Inc. 6 NOEL ST.
Carla Anne Palermo, Trustee 3 RIVER ST.
City of Amesbury 7 RIVER ST.
Repp, Rebecca & Chad 11 RIVER ST. #R
City of Amesbury 17R RIVER ST.
Perrigo, Kenneth P. 23 RIVER ST. #R
City of Amesbury 21 RIVER ST. #R
Cohn, Robin G. 27 RIVER ST.
Evans, Robert 33 RIVER ST.
River Lane Realty LLC 7 NOEL ST.
City of Amesbury 36 CHILDS AVE.
City of Amesbury 222 MAIN ST.
City of Amesbury 91 RIVER ST.
Commonwealth of Mass (Tidelands)
Rock Church Ministries/ Plaza Realty LLC 58 MACY ST.
Amesbury Improvement Association 66 MACY ST.
Amesbury Housing Authority 32 MACY ST.
Mass Electric Co. 50 MACY ST. #NS
781/781R/781R2
853/853R
946/946R
SS641
SS642
SS643
SS644
SS645
SS646
SS647
SS648
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SS650
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SS680

EXTENT OF NAPL/ TAR SATURATED SEDIMENT

EXTENT OF SOLID/ SEMI-SOLID TAR WASTE SEDIMENTS

DISPOSAL SITE BOUNDARY

33R OAKLAND STREET

35 OAKLAND STREET

37 OAKLAND STREET

39 OAKLAND STREET

41 OAKLAND STREET

43 OAKLAND STREET

4 OAKLAND COURT

BIKEWAY EASEMENT

STONE HW

VISUAL OIL/ TAR IMPACTS LEGEND:

- STAINING
- SHEEN
- COAL TAR BLEBS
- COAL TAR SATURATED
- SOLID COAL TAR

EXPLORATION LEGEND:

- HAND TEST PIT
- SEDIMENT CORE
- SEDIMENT PROBE
- SEDIMENT PROBE WITH RAH
- PIEZOMETER
- SEDIMENT CORE/ VIBRATING WIRE PIEZOMETER
- SURFACE WATER SAMPLE
- SURFACE SEDIMENT SAMPLE
- HAND TEST PIT (VISUAL OBSERVATION)

NOTES:

1. VISUAL OIL/ TAR IMPACTS THAT ARE GRAPHICALLY PRESENTED ARE BASED ON THE MOST SIGNIFICANT IMPACT OBSERVED IN THE INVESTIGATION LOCATION. OTHER IMPACTS MAY ALSO HAVE BEEN OBSERVED IN THAT INVESTIGATION LOCATION. REFER TO TABLE 1 AND CORE/ TEST PIT LOGS FOR COMPLETE OBSERVATIONS.
2. GOOGLE EARTH IMAGE DATED 5/04/2018.
3. HAND TEST PIT, SURFACE SAMPLE, AND SEDIMENT SAMPLE LOCATIONS ARE APPROXIMATE.
4. PARCEL BOUNDARIES, THALWEG OF RIVER AND MEAN HIGH WATER LINE BY HAYNER/SWANSON, 2025.

0 30 60

Approximate Scale, Feet

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Amesbury Former MGP Site
Amesbury, Massachusetts

Boston Gas Company d|b|a National Grid
Waltham, Massachusetts

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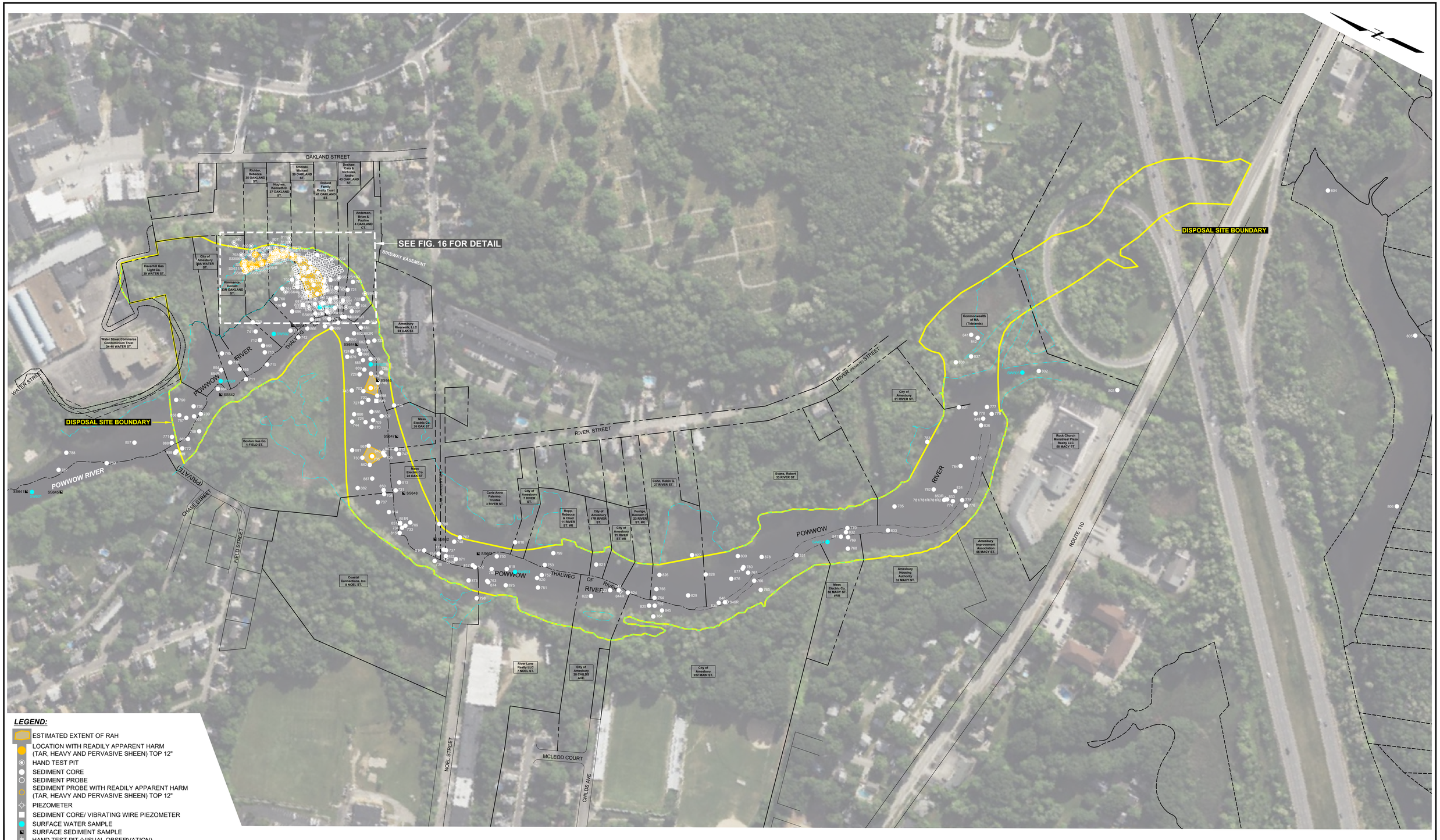
VISUAL OIL OR TAR - WETLAND AND MUDFLAT

October 2025 Fig. 14

---- B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\Ph II CSA Supplemental\1804576-30 VO-Tar wt-mdfl.dwg - 6/27/2025



LEGEND:

- ESTIMATED EXTENT OF RAH
- LOCATION WITH READILY APPARENT HARM (TAR, HEAVY AND PERVASIVE SHEEN) TOP 12"
- HAND TEST PIT
- SEDIMENT CORE
- SEDIMENT PROBE
- SEDIMENT PROBE WITH READILY APPARENT HARM (TAR, HEAVY AND PERVASIVE SHEEN) TOP 12"
- PIEZOMETER
- SEDIMENT CORE/ VIBRATING WIRE PIEZOMETER
- SURFACE WATER SAMPLE
- SURFACE SEDIMENT SAMPLE
- HAND TEST PIT (VISUAL OBSERVATION)

NOTES:

1. MICROSOFT BING IMAGE 2021.
2. PARCEL BOUNDARIES, THALWEG OF RIVER AND MEAN HIGH WATER LINE BY HAYNER/SWANSON, 2025.
3. HAND TEST PIT, SURFACE SAMPLE, AND SEDIMENT SAMPLE LOCATIONS ARE APPROXIMATE.

0 150 300
Approximate Scale, Feet

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Amesbury Former MGP Site
Amesbury, Massachusetts

Boston Gas Company d|b|a National Grid
Waltham, Massachusetts

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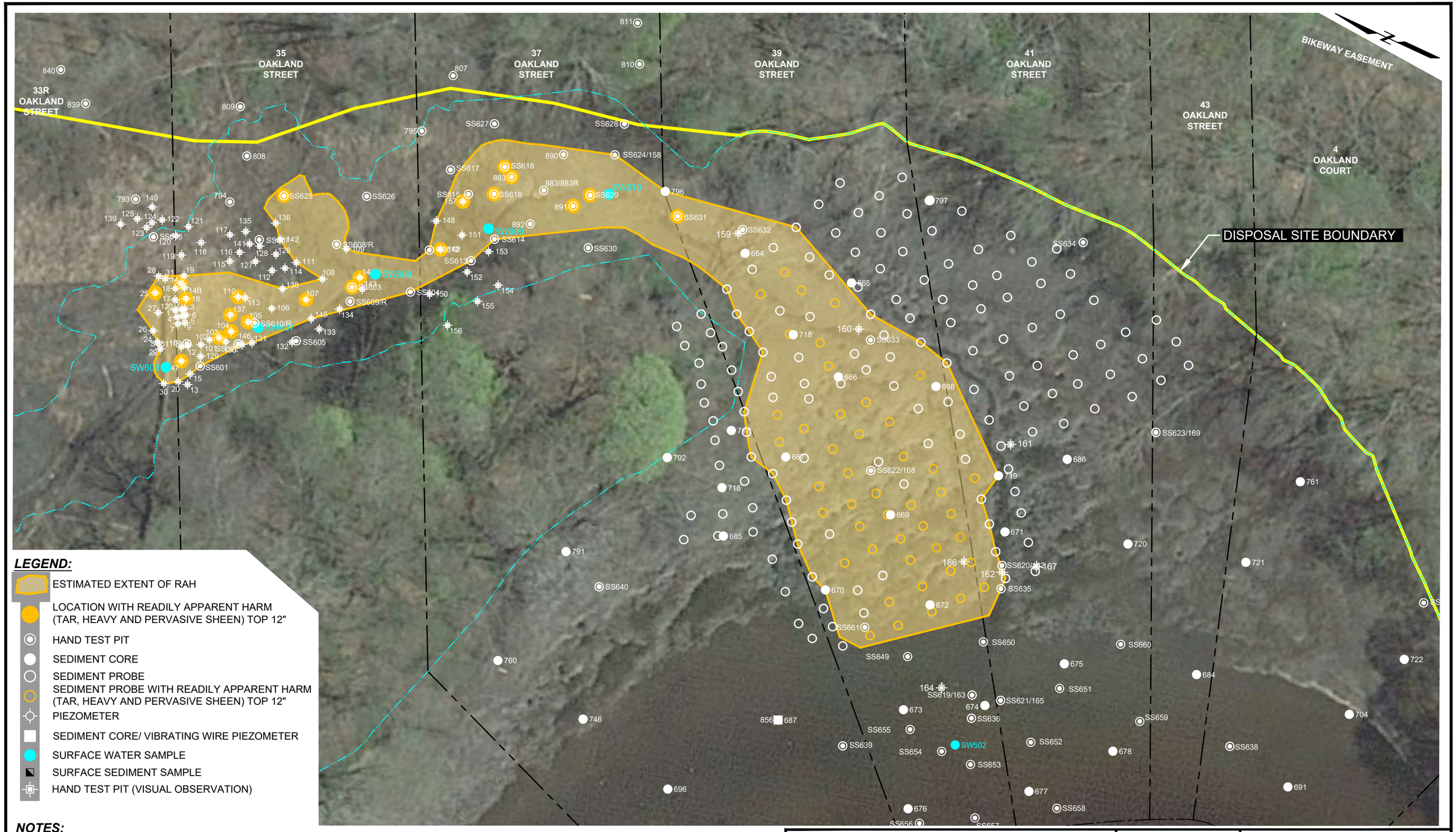
READILY APPARENT HARM IN WETLAND, MUDFLAT, AND RIVER

Project 1804576 | October 2025 | Fig. 15

---- B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\Ph II CSA Supplemental\1804576-25 RAH river.dwg - 6/30/2025



LEGEND:

- ESTIMATED EXTENT OF RAH
- LOCATION WITH READILY APPARENT HARM (TAR, HEAVY AND PERVASIVE SHEEN) TOP 12"
- HAND TEST PIT
- SEDIMENT CORE
- SEDIMENT PROBE
- SEDIMENT PROBE WITH READILY APPARENT HARM (TAR, HEAVY AND PERVASIVE SHEEN) TOP 12"
- PIEZOMETER
- SEDIMENT CORE/ VIBRATING WIRE PIEZOMETER
- SURFACE WATER SAMPLE
- SURFACE SEDIMENT SAMPLE
- HAND TEST PIT (VISUAL OBSERVATION)

NOTES:

1. GOOGLE EARTH IMAGE DATED 5/04/2018.
2. HAND TEST PIT, SURFACE SAMPLE, AND SEDIMENT SAMPLE LOCATIONS ARE APPROXIMATE.
3. PARCEL BOUNDARIES, THALWEG OF RIVER AND MEAN HIGH WATER LINE BY HAYNER/SWANSON, 2025.

0 30 60

Approximate Scale, Feet

Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP Site
Amesbury, Massachusetts

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READILY APPARENT HARM IN WETLAND AND MUDFLAT

October 2025 Fig. 16

---- B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\Ph II CSA Supplemental\1804576-26 RAH wt-mdfl.dwg - 9/15/2025



SOURCE:
1. AERIAL PHOTO FROM NEARMAP, DATED APRIL 22, 2024.

NOTE:
1. THE NUMBERS SHOWN ABOVE THE OBSERVATION LOCATIONS INDICATE THE ORDER OF OBSERVATIONS. LOCATIONS 1 TO 50 WERE OBSERVED ON 9/21/2020 AND LOCATION 51 TO 86 WERE OBSERVED ON 9/22/2020

0 200 400

SCALE: 1" = 200'

Supplemental Phase II Comprehensive Site Assessment
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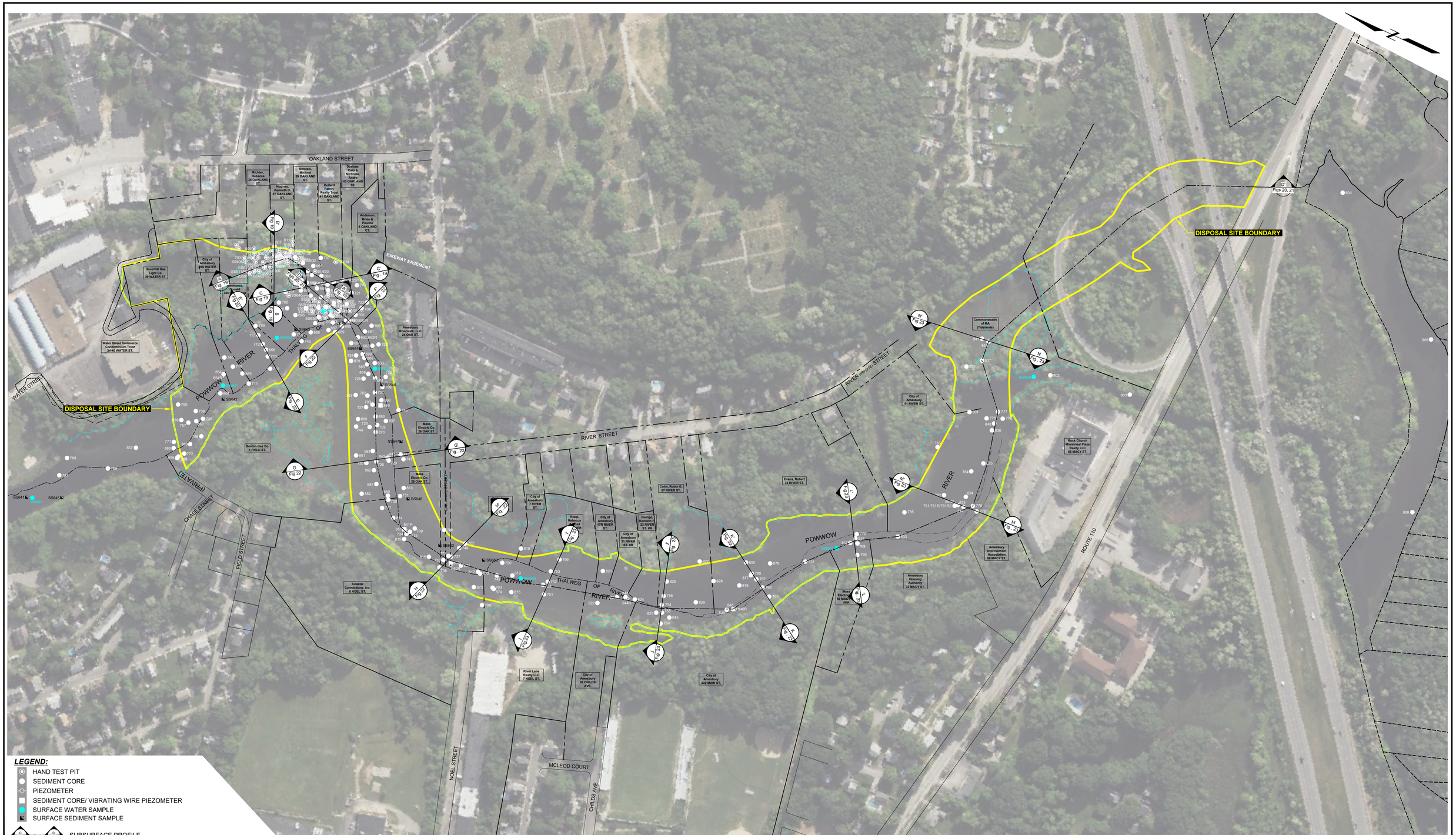
VISUAL OBSERVATIONS OF EBULLITION AND SHEEN FOR THE POWWOW RIVER

October 2025 Fig. 17

B:\Working\NATIONAL GRID\1804576 Amesbury MGP\05_GIS\1804576-PH II CSA-FIGS.aprx



NOTES:

1. MICROSOFT BING IMAGE 2021.
2. PARCEL BOUNDARIES, THALWEG OF RIVER, AND MEAN HIGH WATER LINE BY HAYNER/SWANSON, 2025.
3. HAND TEST PIT, SURFACE SAMPLE, AND SEDIMENT SAMPLE LOCATIONS ARE APPROXIMATE.

0 150 300
Approximate Scale, Feet

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Amesbury Former MGP Site
Amesbury, Massachusetts

Boston Gas Company d|b|a National Grid
Waltham, Massachusetts

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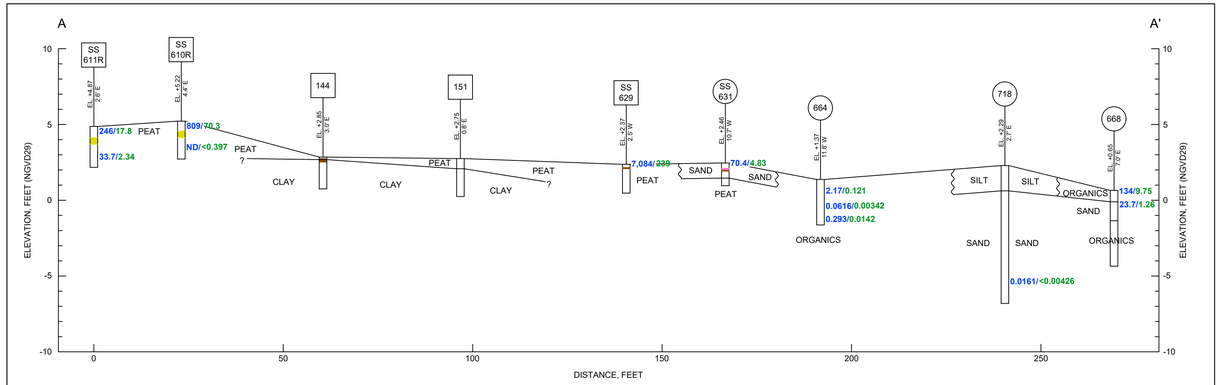
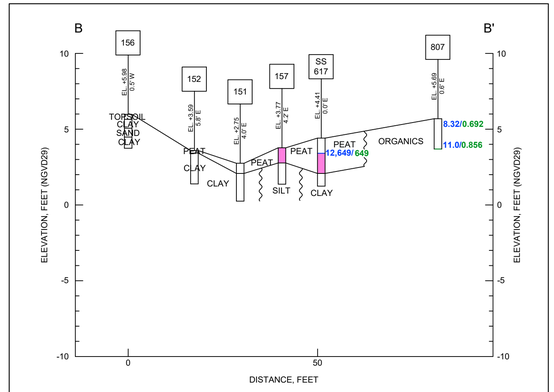
SUBSURFACE PROFILE
LONGITUDINAL ALIGNMENT
AND LATERAL TRANSECTS

Project 1804576 | October 2025 | Fig. 18

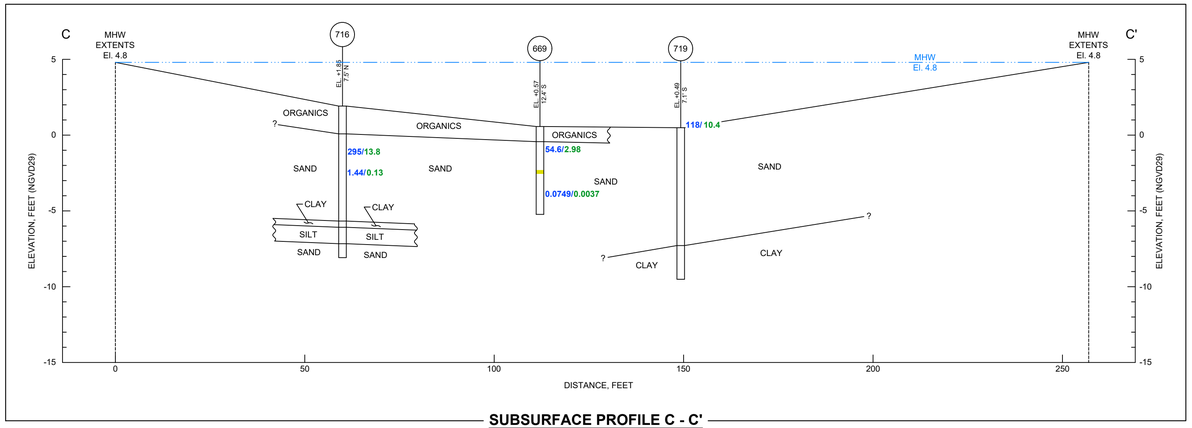
---- B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\Ph II CSA Supplemental\1804576-27.dwg - 7/2/2025



SUBSURFACE PROFILE A - A'



SUBSURFACE PROFILE B - B'



SUBSURFACE PROFILE C - C'

LEGEND:

719 — SEDIMENT CORE NUMBER

144 — HAND TEST PIT NUMBER

EL. +0.49 / 55' E — ELEVATION OF GROUND SURFACE AND OFFSET OF BORING FROM PROFILE LINE

EXISTING GROUND SURFACE

STRATUM BOUNDARY

VISUAL OIL/ TAR IMPACTS LEGEND:

- STAINING
- SHEEN
- COAL TAR BLEBS
- COAL TAR SATURATED
- SOLID COAL TAR

CONTAMINANT CONCENTRATION LEGEND:

BENZO(a)PYRENE (µg/kg)	B(a)P = 17.8
TOTAL PAHs (µg/kg)	TPAH = 33.7

HORIZONTAL SCALE, FEET
0 20 40
0 5 10
VERTICAL SCALE, FEET
NOTE: 4x VERTICAL EXAGGERATION

Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP Site
Amesbury, Massachusetts

Boston Gas Company d|b|a National Grid
Waltham, Massachusetts

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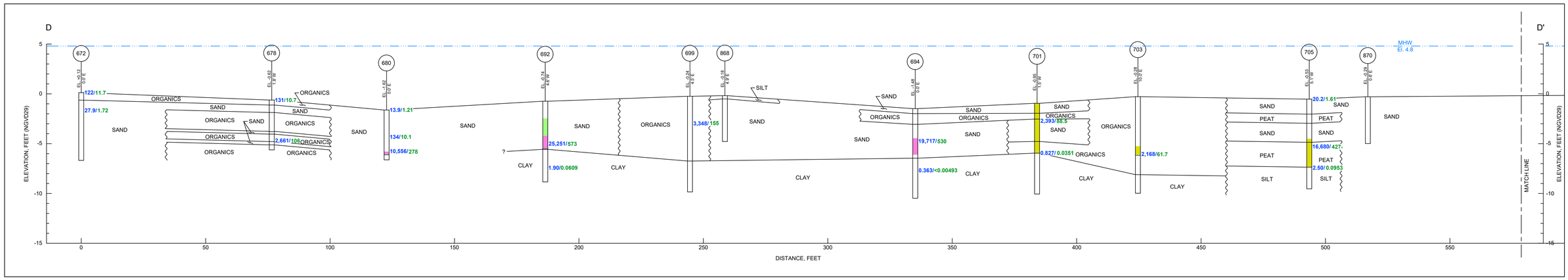
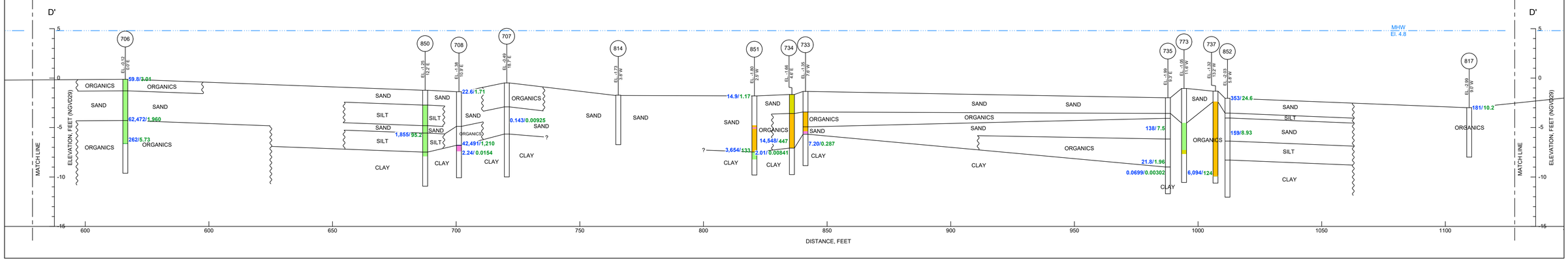
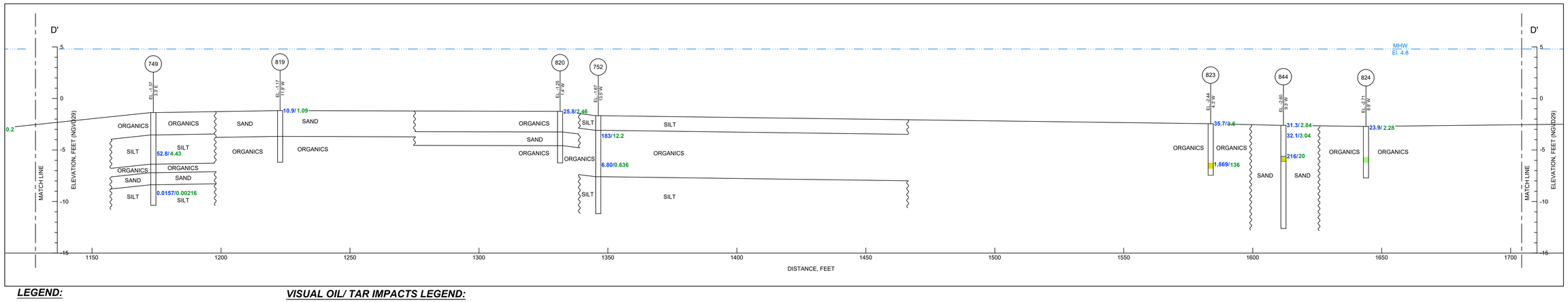
SUBSURFACE PROFILES
A-A', B-B', and C-C'

Project 1804576 | October 2025 | Fig. 19







LEGEND:

719 — SEDIMENT CORE NUMBER

144 — HAND TEST PIT NUMBER

EL. +0.49 / 55' E — ELEVATION OF GROUND SURFACE AND OFFSET OF BORING FROM PROFILE LINE

EXISTING GROUND SURFACE

STRATUM BOUNDARY

VISUAL OIL/ TAR IMPACTS LEGEND:

- STAINING
- SHEEN
- COAL TAR BLEBS
- SOLID COAL TAR
- COAL TAR SATURATED

NAPL CONCENTRATION LEGEND:

BENZO(a)PYRENE **B(a)P = 17.8**

TOTAL PAHs **TPAH = 33.7**

HORIZONTAL SCALE, FEET
0 20 40
0 5 10
VERTICAL SCALE, FEET
NOTE: 4x VERTICAL EXAGGERATION

Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP Site
Amesbury, Massachusetts

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SUBSURFACE PROFILE D-D'
(1 of 2)

Project 1804576 | October 2025 | Fig. 20

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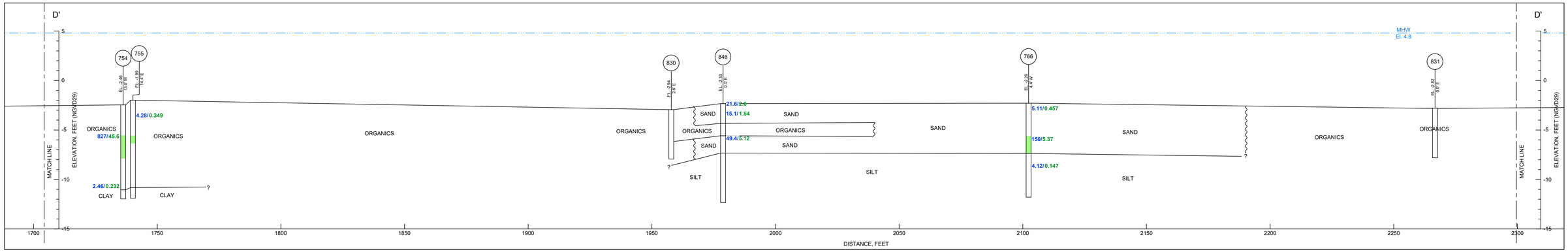

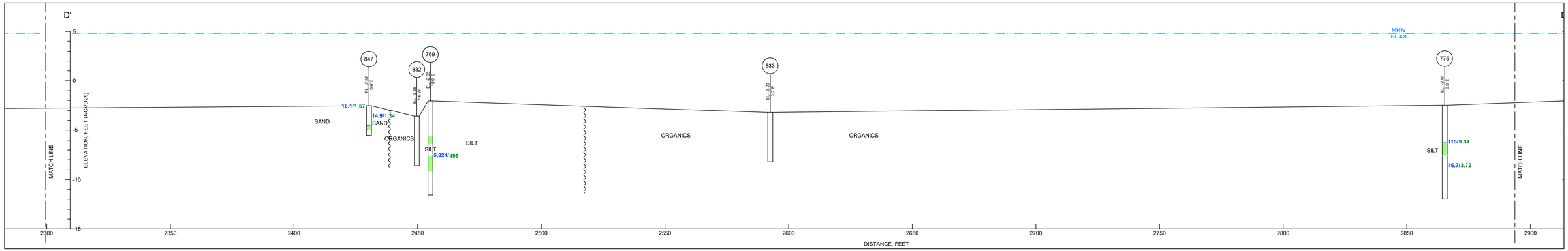

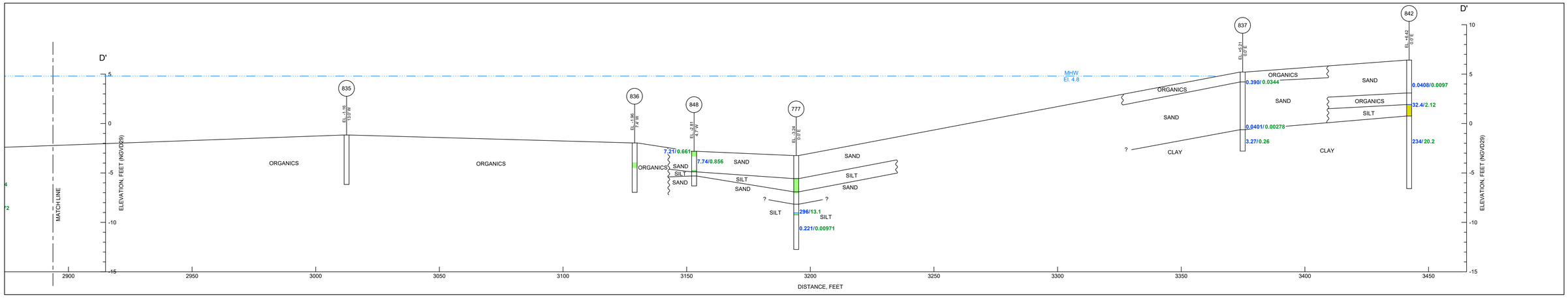

LEGEND:

719 — SEDIMENT CORE NUMBER

144 — HAND TEST PIT NUMBER

EL. +0.49 / 55' E — ELEVATION OF GROUND SURFACE AND OFFSET OF BORING FROM PROFILE LINE

EXISTING GROUND SURFACE

STRATUM BOUNDARY

VISUAL OIL/ TAR IMPACTS LEGEND:

- STAINING
- SHEEN
- COAL TAR BLEBS
- SOLID COAL TAR
- COAL TAR SATURATED

NAPL CONCENTRATION LEGEND:

BENZO(a)PYRENE **B(a)P = 17.8**

TOTAL PAHs **TPAH = 33.7**

HORIZONTAL SCALE, FEET
0 20 40
0 5 10
VERTICAL SCALE, FEET
NOTE: 4x VERTICAL EXAGGERATION

Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP Site
Amesbury, Massachusetts

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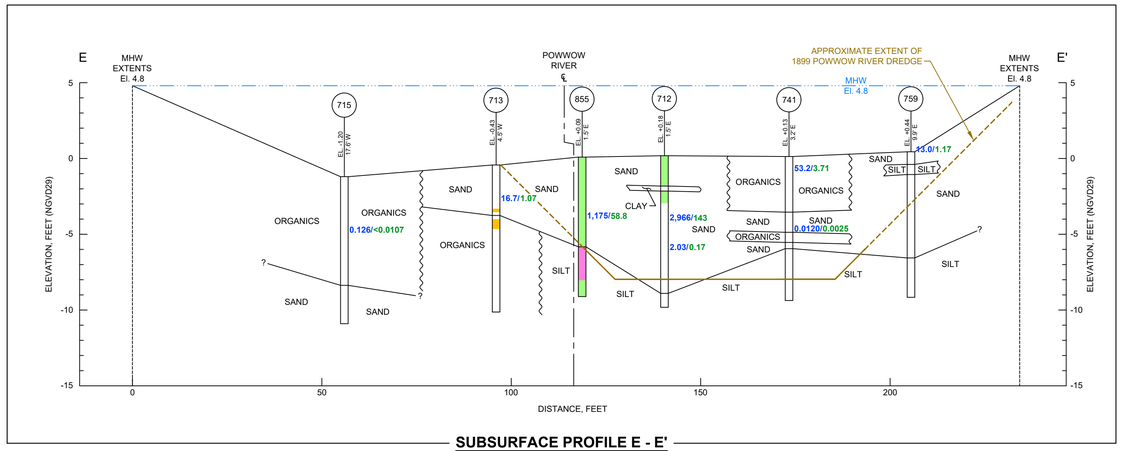
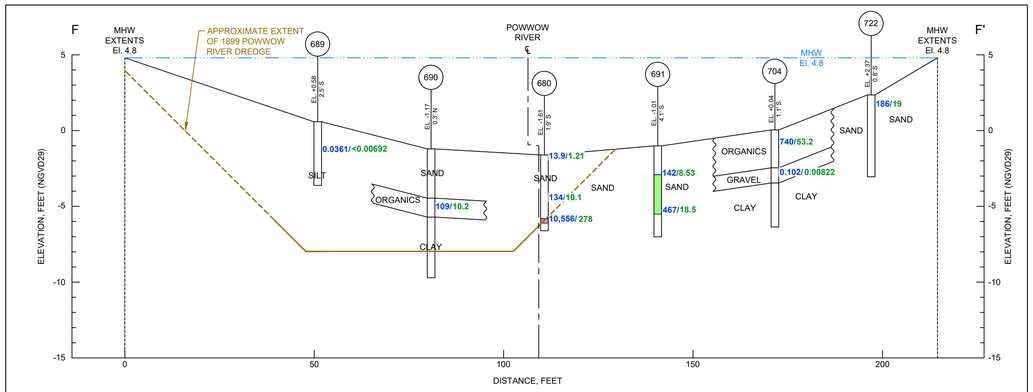
SUBSURFACE PROFILE D-D'
(2 of 2)

Project 1804576 | October 2025 | Fig. 21

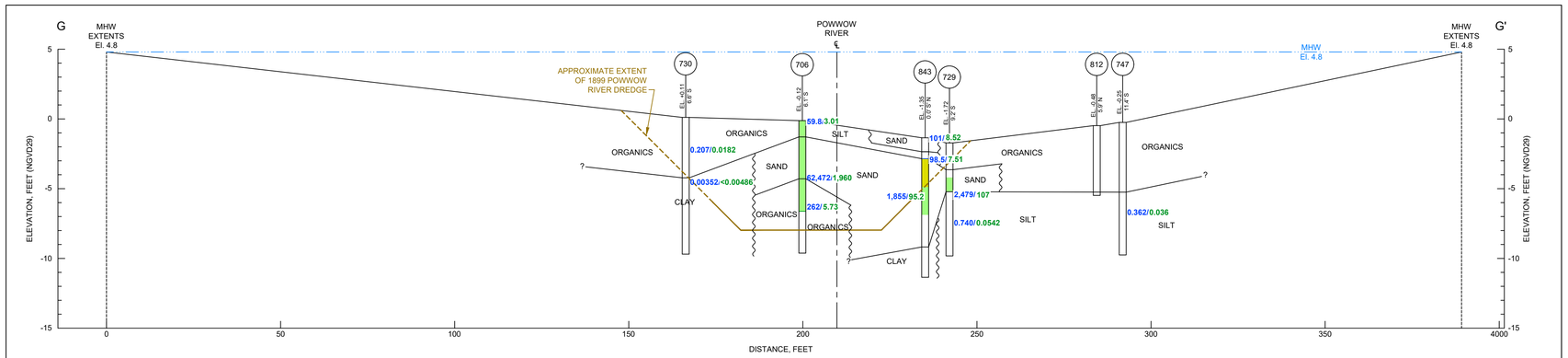
CLINGEN, PAUL B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\Ph II CSA Supplemental\1804576-12.dwg - 10/22/2025



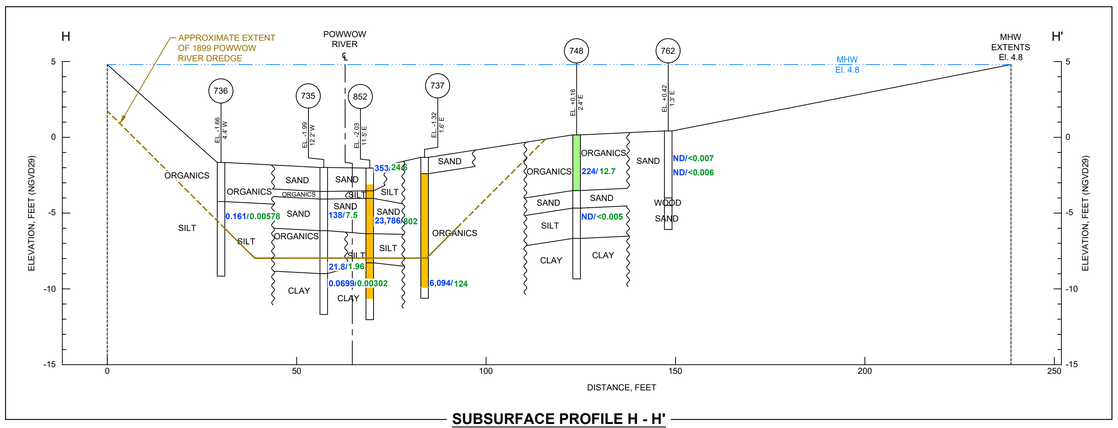
SUBSURFACE PROFILE E - E'



SUBSURFACE PROFILE F - F'



SUBSURFACE PROFILE G - G'



SUBSURFACE PROFILE H - H'

LEGEND:

719 — SEDIMENT CORE NUMBER

144 — HAND TEST PIT NUMBER

EL. +0.49 / 55' E — ELEVATION OF GROUND SURFACE AND OFFSET OF BORING FROM PROFILE LINE

EXISTING GROUND SURFACE

STRATUM BOUNDARY

VISUAL OIL/ TAR IMPACTS LEGEND:

- STAINING
- SHEEN
- COAL TAR BLEBS
- SOLID COAL TAR
- COAL TAR SATURATED

NAPL CONCENTRATION LEGEND:

BENZO(a)PYRENE **B(a)P = 17.8**

TOTAL PAHs **TPAH = 33.7**

HORIZONTAL SCALE, FEET
0 20 40
0 5 10
VERTICAL SCALE, FEET
NOTE: 4x VERTICAL EXAGGERATION

Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP Site
Amesbury, Massachusetts

Boston Gas Company d|b|a National Grid
Waltham, Massachusetts

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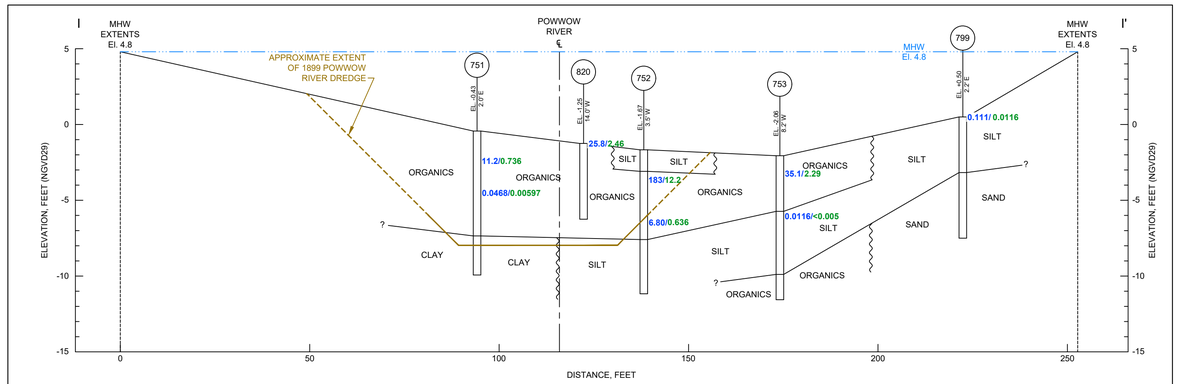
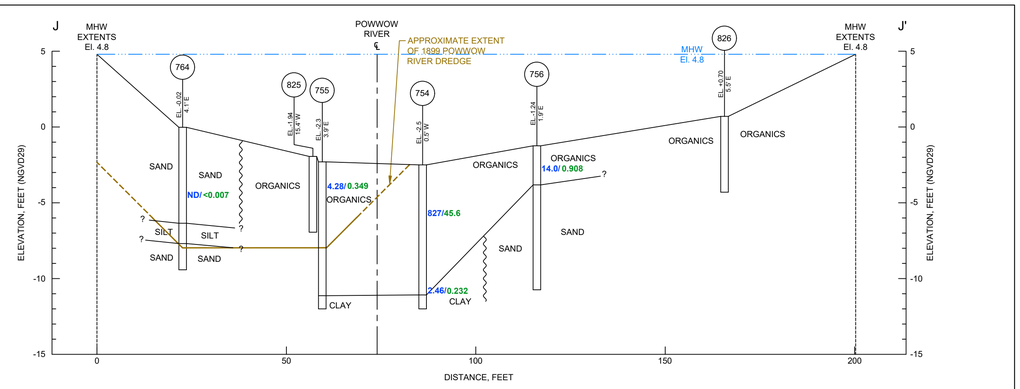
SUBSURFACE PROFILES
E-E', F-F', G-G', and H-H'

Project 1804576 | October 2025 | Fig. 22

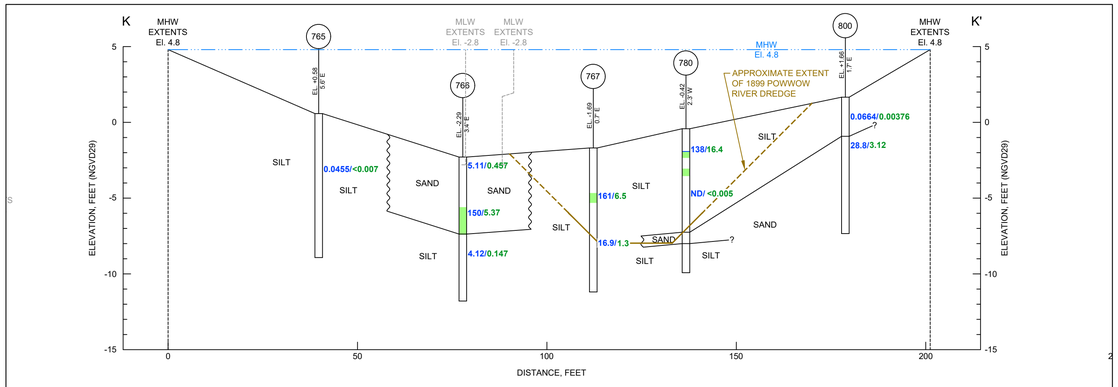
CLINGEN, PAUL B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\Ph II CSA Supplemental\1804576-12.dwg - 10/22/2025



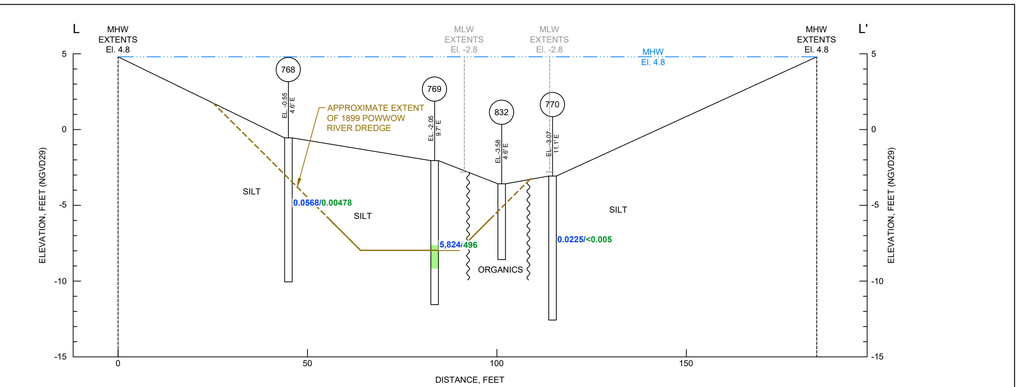
SUBSURFACE PROFILE I - I'



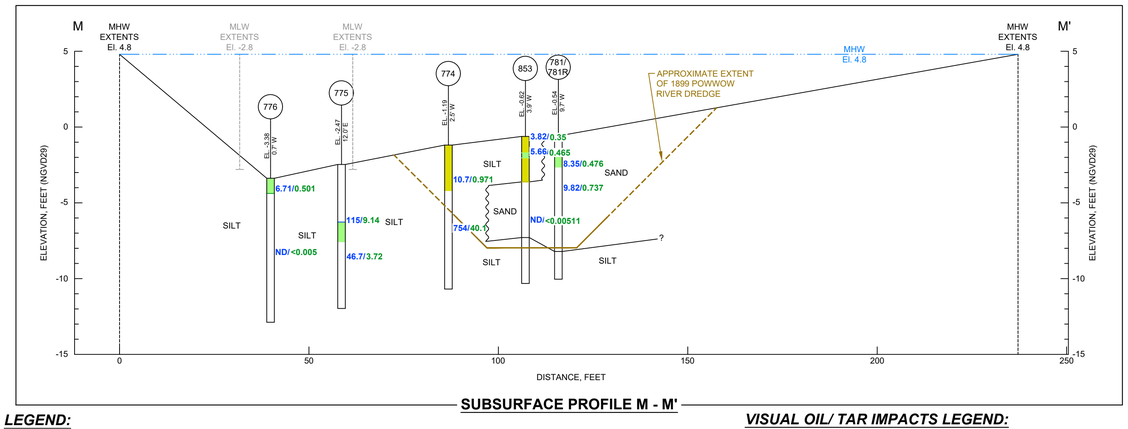
SUBSURFACE PROFILE J - J'



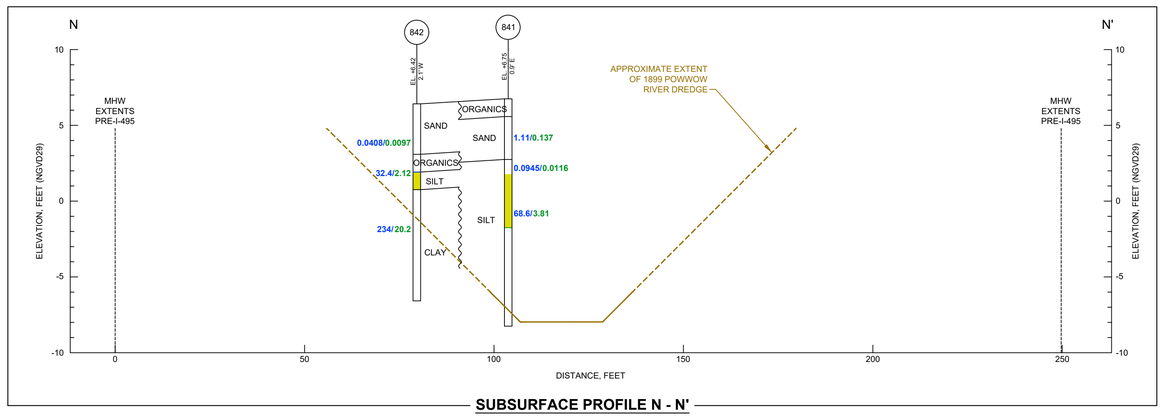
SUBSURFACE PROFILE K - K'



SUBSURFACE PROFILE L - L'



SUBSURFACE PROFILE M - M'



SUBSURFACE PROFILE N - N'

LEGEND:

719 — SEDIMENT CORE NUMBER

144 — HAND TEST PIT NUMBER

EL. +0.49 / 55' E — ELEVATION OF GROUND SURFACE AND OFFSET OF BORING FROM PROFILE LINE

EXISTING GROUND SURFACE

STRATUM BOUNDARY

VISUAL OIL/ TAR IMPACTS LEGEND:

- STAINING
- SHEEN
- COAL TAR BLEBS
- SOLID COAL TAR
- COAL TAR SATURATED

NAPL CONCENTRATION LEGEND:

BENZO(a)PYRENE **B(a)P = 17.8**

TOTAL PAHs **TPAH = 33.7**

HORIZONTAL SCALE, FEET
0 20 40
0 5 10
VERTICAL SCALE, FEET
NOTE: 4x VERTICAL EXAGGERATION

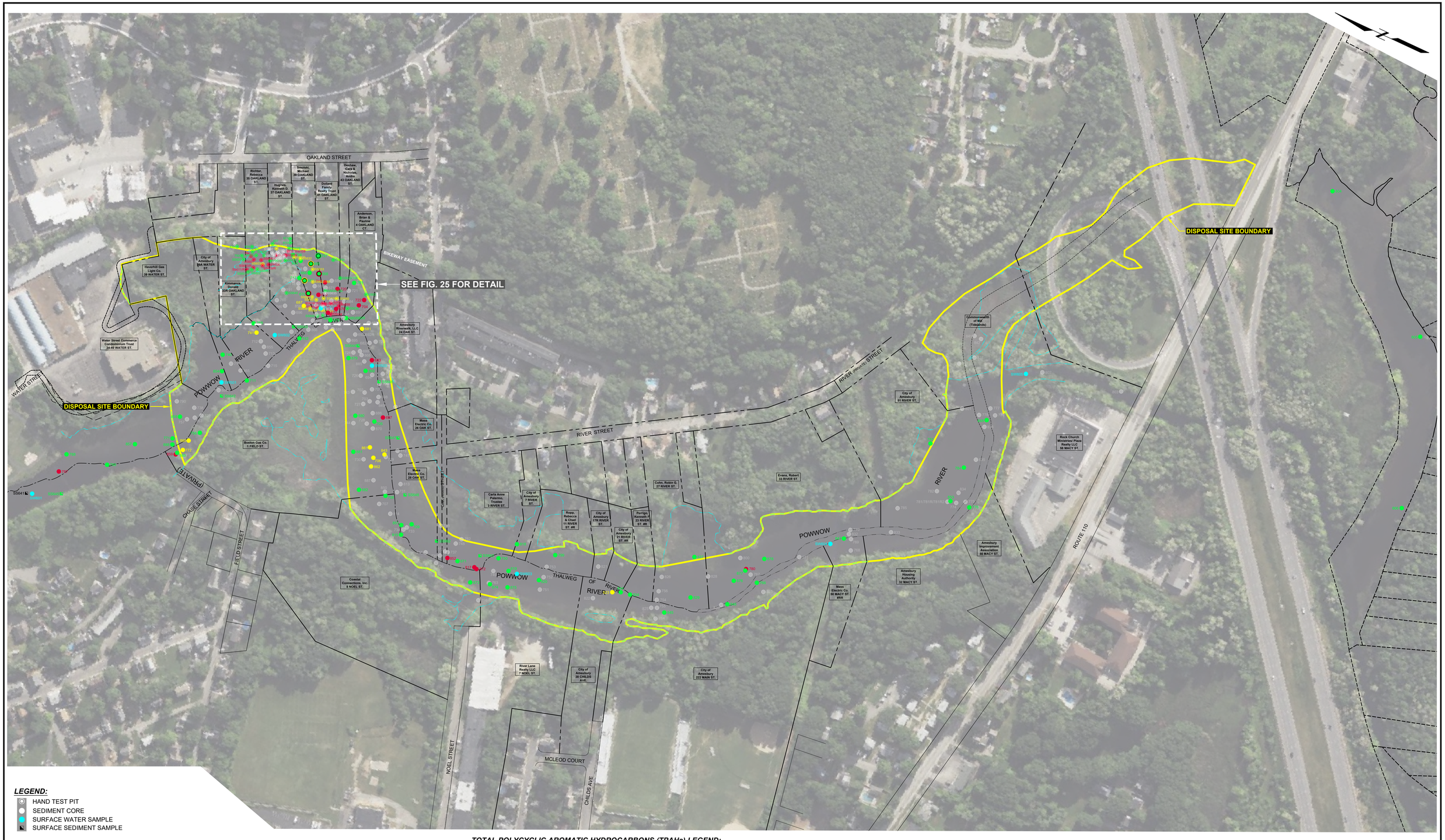
Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP Site
Amesbury, Massachusetts

Boston Gas Company d|b|a National Grid
Waltham, Massachusetts

GEI Consultants

SUBSURFACE PROFILES
I-I', J-J', K-K', L-L', M-M' and N-N'

Project 1804576 | October 2025 | Fig. 23



LEGEND:

- HAND TEST PIT
- SEDIMENT CORE
- SURFACE WATER SAMPLE
- SURFACE SEDIMENT SAMPLE

NOTES:

1. MICROSOFT BING IMAGE 2021.
2. PARCEL BOUNDARIES, THALWEG OF RIVER AND MEAN HIGH WATER LINE BY HAYNER/SWANSON, 2025.
3. HAND TEST PIT, SURFACE SAMPLE, AND SEDIMENT SAMPLE LOCATIONS ARE APPROXIMATE.

TOTAL POLYCYCLIC AROMATIC HYDROCARBONS (TPAHs) LEGEND:

- ND to ≤34 mg/kg
- >34 to ≤104 mg/kg
- >104 mg/kg
- WHERE MORE THAN ONE SAMPLE WAS COLLECTED THE OUTERMOST RING INDICATES THE SHALLOWEST SAMPLE, THE INNERMOST RING INDICATES DEEPEST SAMPLE
- SAMPLE NOT SUBMITTED FOR LABORATORY ANALYSIS

0 150 300
Approximate Scale, Feet

Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP Site
Amesbury, Massachusetts

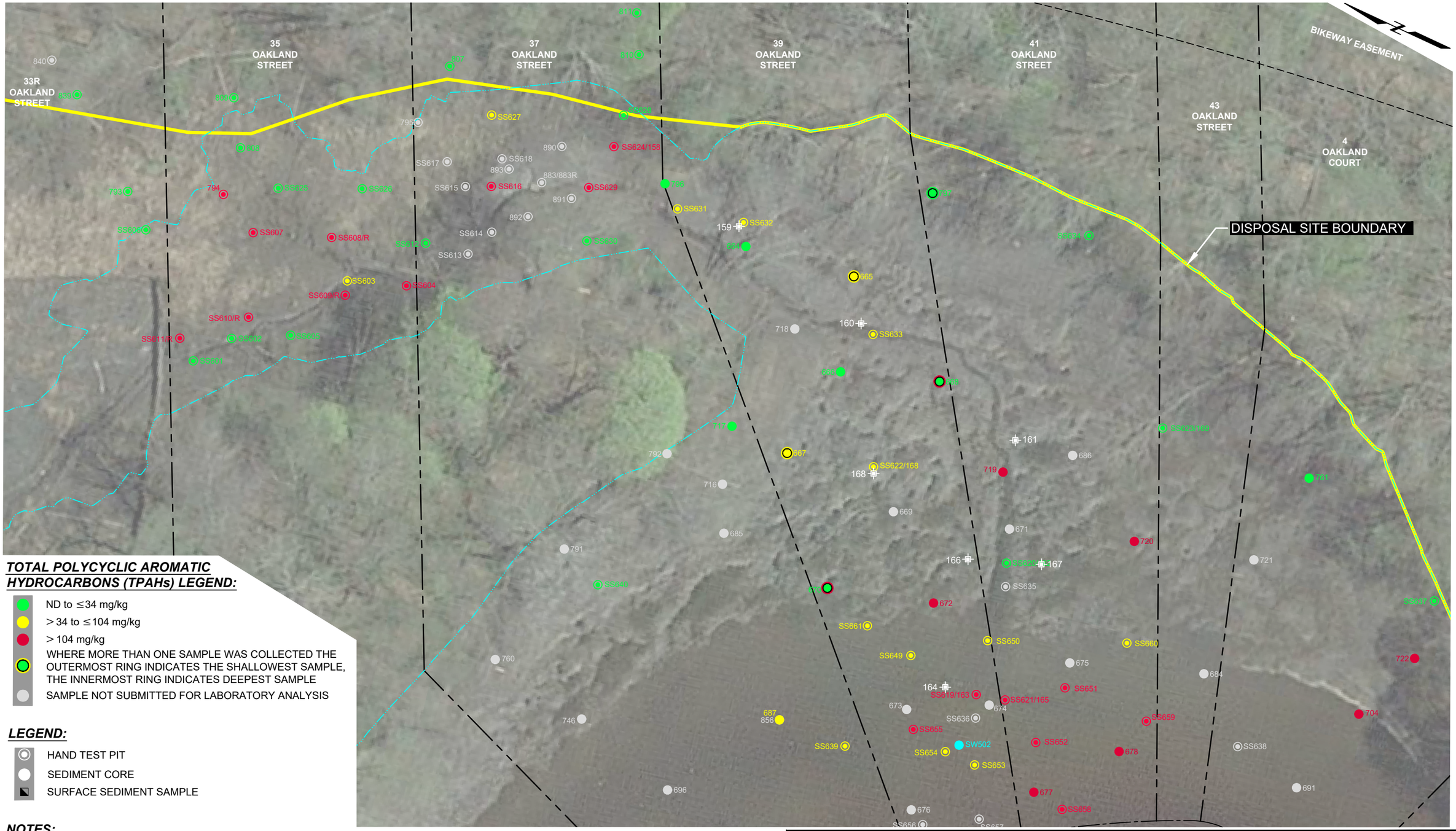
Boston Gas Company d|b|a National Grid
Waltham, Massachusetts

GEI Consultants

TOTAL POLYCYCLIC AROMATIC HYDROCARBONS (TPAHs) CONCENTRATIONS IN RIVER SEDIMENT (0 to 1 Foot)

Project 1804576 | October 2025 | Fig. 24

---- B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\Ph II CSA Supplemental\1804576-15 TPAH 0-1 river.dwg - 6/30/2025



NOTES:

1. GOOGLE EARTH IMAGE DATED 5/04/2018.
2. HAND TEST PIT, SURFACE SAMPLE, AND SEDIMENT SAMPLE LOCATIONS ARE APPROXIMATE.
3. PARCEL BOUNDARIES, THALWEG OF RIVER AND MEAN HIGH WATER LINE BY HAYNER/SWANSON, 2025.

0 30 60
Approximate Scale, Feet

Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP Site
Amesbury, Massachusetts

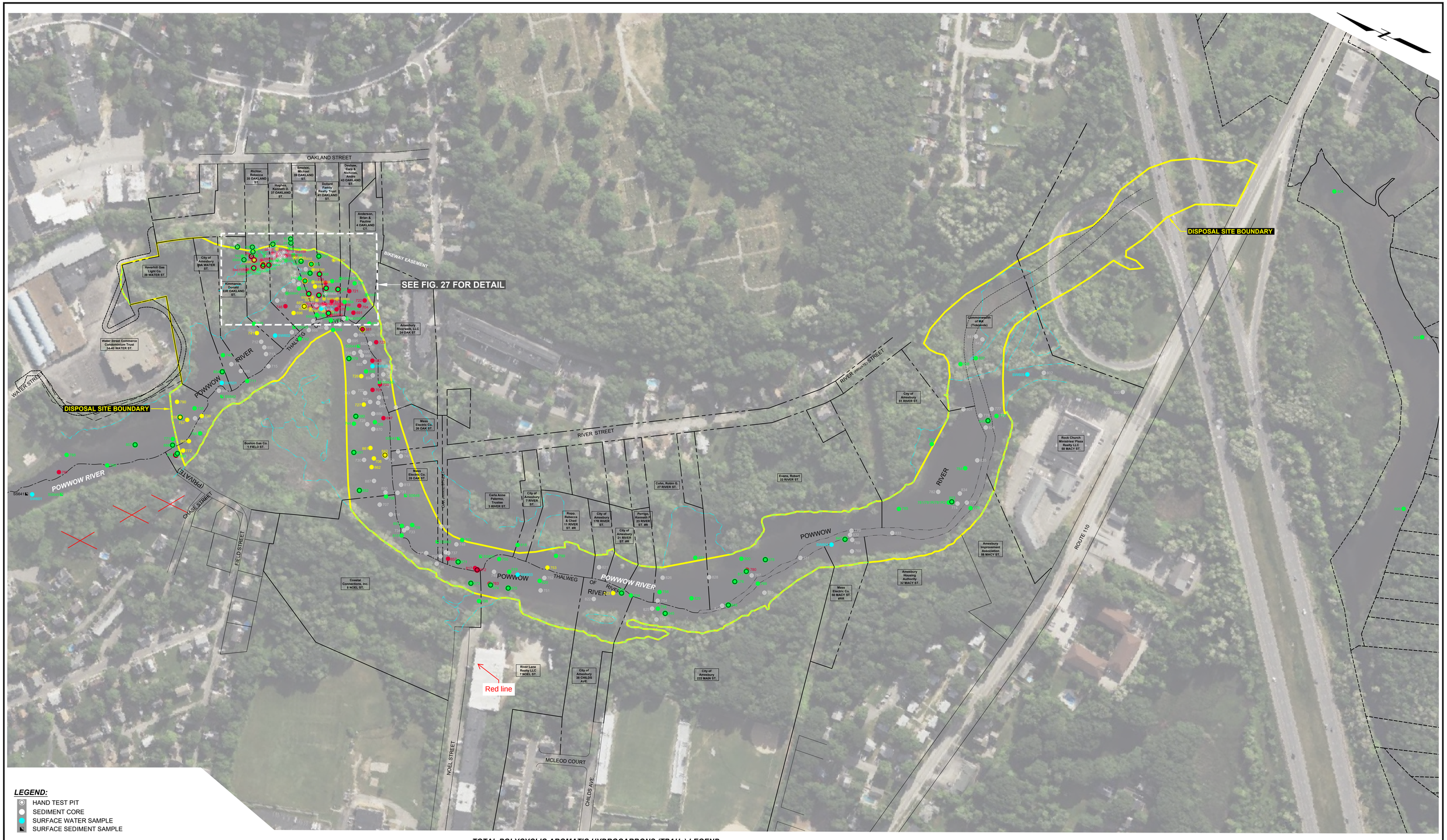
Boston Gas Company d|b|a National Grid
Waltham, Massachusetts

GEI Consultants

TOTAL POLYCYCLIC AROMATIC HYDROCARBONS (TPAHs) CONCENTRATIONS IN WETLAND AND MUDFLAT SEDIMENT (0 to 1 FOOT)

Project 1804576 | October 2025 | Fig. 25

---- B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\Ph II CSA Supplemental\1804576-20 TPAH 0-1 wt-mdfl.dwg - 6/30/2025



LEGEND:

- HAND TEST PIT
- SEDIMENT CORE
- SURFACE WATER SAMPLE
- SURFACE SEDIMENT SAMPLE

NOTES:

1. MICROSOFT BING IMAGE 2021.
2. PARCEL BOUNDARIES, THALWEG OF RIVER AND MEAN HIGH WATER LINE BY HAYNER/SWANSON, 2025.
3. HAND TEST PIT, SURFACE SAMPLE, AND SEDIMENT SAMPLE LOCATIONS ARE APPROXIMATE.

TOTAL POLYCYCLIC AROMATIC HYDROCARBONS (TPAHs) LEGEND:

- ND to ≤34 mg/kg
- >34 to ≤104 mg/kg
- >104 mg/kg
- WHERE MORE THAN ONE SAMPLE WAS COLLECTED THE OUTERMOST RING INDICATES THE SHALLOWEST SAMPLE, THE INNERMOST RING INDICATES DEEPEST SAMPLE
- SAMPLE NOT SUBMITTED FOR LABORATORY ANALYSIS

0 150 300
Approximate Scale, Feet

Supplemental Phase II Comprehensive Site Assessment Amesbury Former MGP Site Amesbury, Massachusetts	GEI Consultants	TOTAL POLYCYCLIC AROMATIC HYDROCARBONS (TPAHs) CONCENTRATIONS IN RIVER SEDIMENT (0 to 2 Feet)
Boston Gas Company d|b|a National Grid Waltham, Massachusetts	Project 1804576	October 2025 Fig. 26

---- B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\Ph II CSA Supplemental\1804576-16 TPAH 0-2 river.dwg - 6/30/2025

33R OAKLAND STREET
35 OAKLAND STREET
37 OAKLAND STREET
39 OAKLAND STREET
41 OAKLAND STREET
43 OAKLAND STREET
4 OAKLAND COURT
BIKEWAY EASEMENT
DISPOSAL SITE BOUNDARY
N

TOTAL POLYCYCLIC AROMATIC HYDROCARBONS (TPAHs) LEGEND:

- ND to ≤34 mg/kg
- >34 to ≤104 mg/kg
- >104 mg/kg
- WHERE MORE THAN ONE SAMPLE WAS COLLECTED THE OUTERMOST RING INDICATES THE SHALLOWEST SAMPLE, THE INNERMOST RING INDICATES DEEPEST SAMPLE
- SAMPLE NOT SUBMITTED FOR LABORATORY ANALYSIS

LEGEND:

- HAND TEST PIT
- SEDIMENT CORE
- SURFACE SEDIMENT SAMPLE

NOTES:

1. GOOGLE EARTH IMAGE DATED 5/04/2018.
2. HAND TEST PIT, SURFACE SAMPLE, AND SEDIMENT SAMPLE LOCATIONS ARE APPROXIMATE.
3. PARCEL BOUNDARIES, THALWEG OF RIVER AND MEAN HIGH WATER LINE BY HAYNER/SWANSON, 2025.

0 30 60
Approximate Scale, Feet

Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP Site
Amesbury, Massachusetts

Boston Gas Company d|b|a National Grid
Waltham, Massachusetts

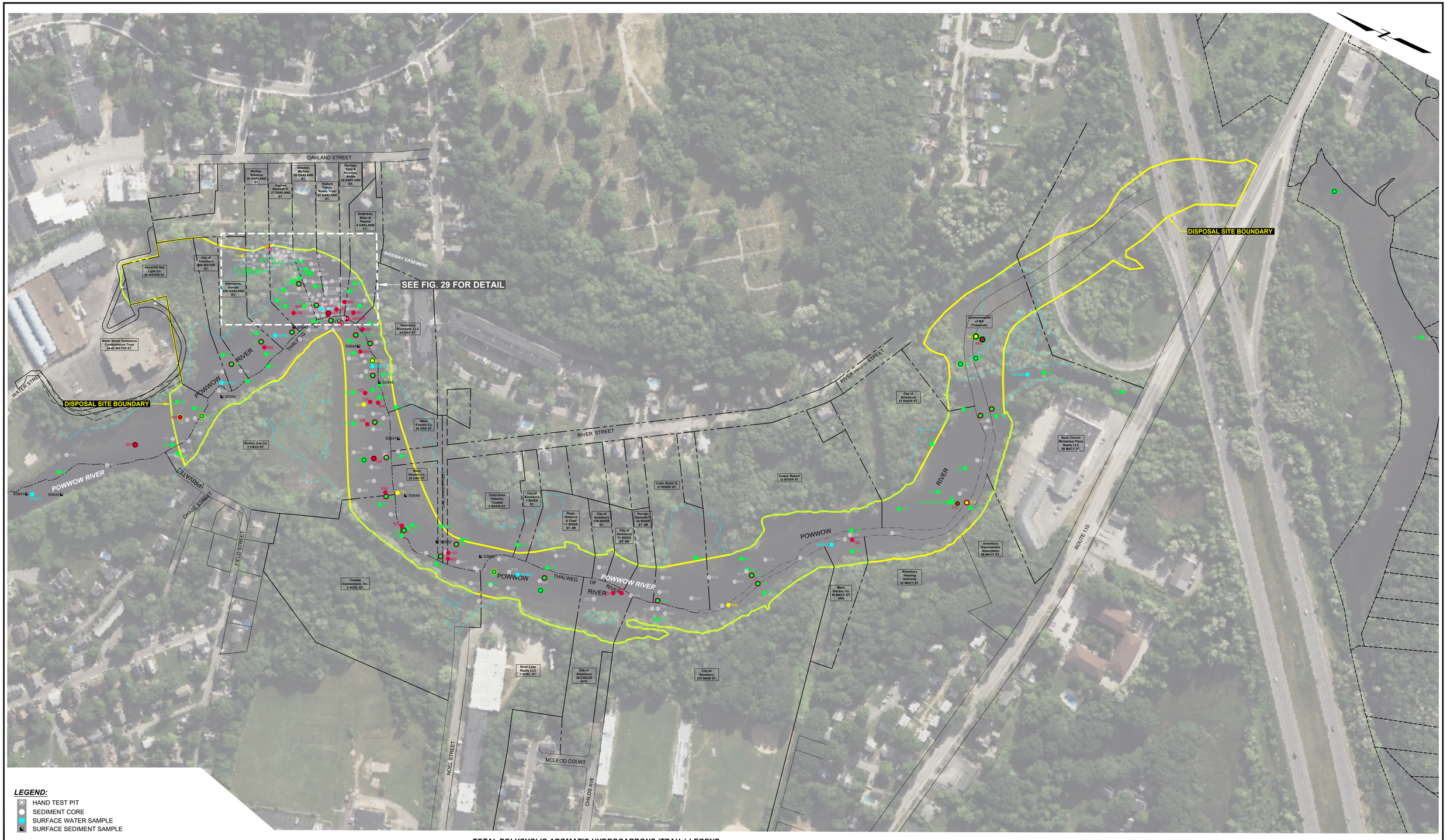
GEI Consultants

Project 1804576

TOTAL POLYCYCLIC AROMATIC HYDROCARBONS (TPAHs) CONCENTRATIONS IN WETLAND AND MUDFLAT SEDIMENT (0 to 2 FEET)

October 2025 Fig. 27

---- B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\Ph II CSA Supplemental\1804576-21 TPAH 0-2 wt-mdfl.dwg - 9/13/2024



LEGEND:

- HAND TEST PIT
- SEDIMENT CORE
- SURFACE WATER SAMPLE
- SURFACE SEDIMENT SAMPLE

NOTES:

1. MICROSOFT BING IMAGE 2021.
2. PARCEL BOUNDARIES, THALWEG OF RIVER AND MEAN HIGH WATER LINE BY HAYNER/SWANSON, 2025.
3. HAND TEST PIT, SURFACE SAMPLE, AND SEDIMENT SAMPLE LOCATIONS ARE APPROXIMATE.

TOTAL POLYCYCLIC AROMATIC HYDROCARBONS (TPAHs) LEGEND:

- ND to ≤34 mg/kg
- >34 to ≤104 mg/kg
- >104 mg/kg
- WHERE MORE THAN ONE SAMPLE WAS COLLECTED THE OUTERMOST RING INDICATES THE SHALLOWEST SAMPLE, THE INNERMOST RING INDICATES DEEPEST SAMPLE
- SAMPLE NOT SUBMITTED FOR LABORATORY ANALYSIS

0 150 300
Approximate Scale, Feet

Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP Site
Amesbury, Massachusetts

Boston Gas Company d|b|a National Grid
Waltham, Massachusetts

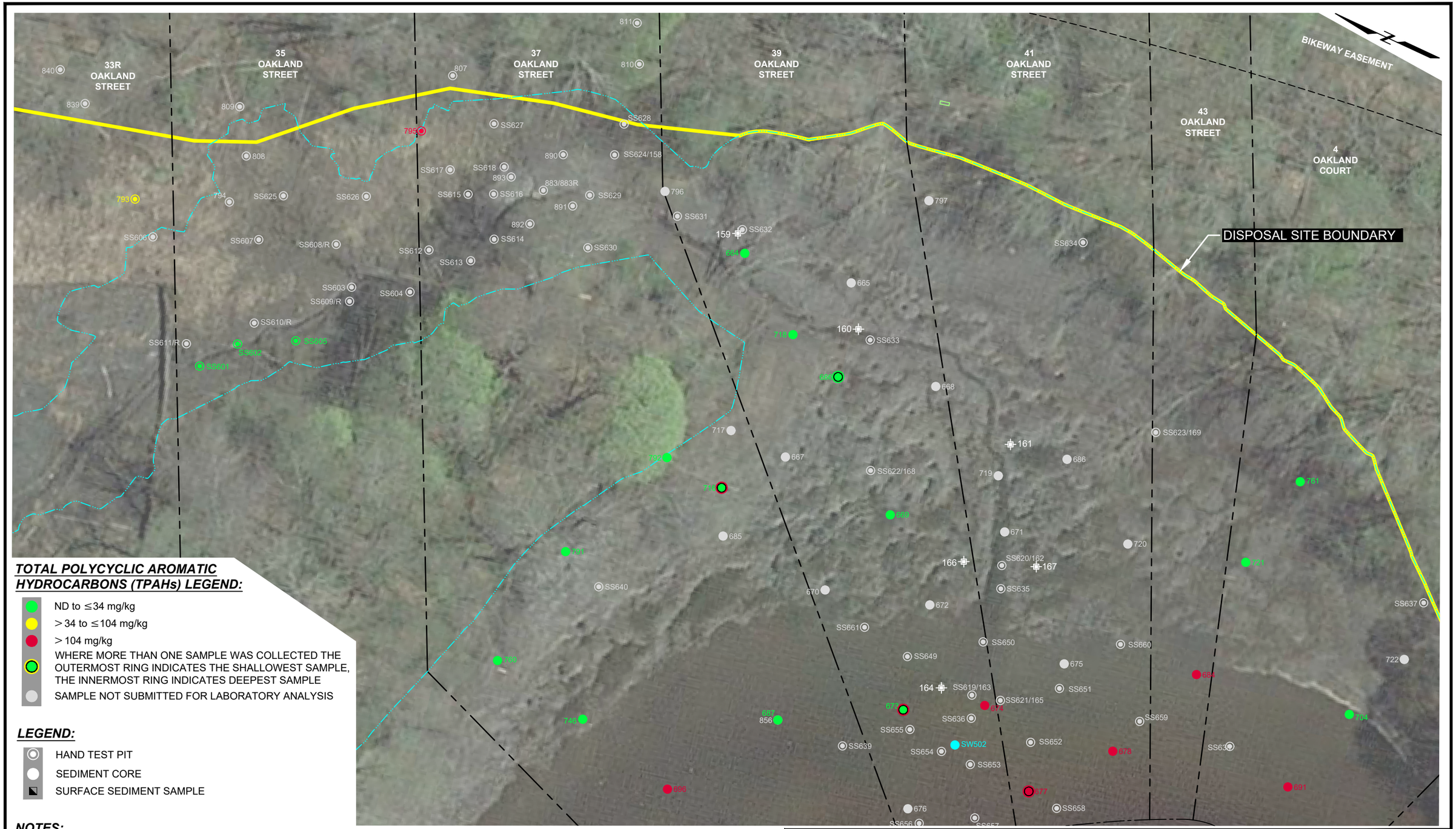
GEI Consultants

Project 1804576

TOTAL POLYCYCLIC AROMATIC HYDROCARBONS (TPAHs) CONCENTRATIONS IN RIVER SEDIMENT (Deeper than 2 Feet)

October 2025 Fig. 28

---- B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\Ph II CSA Supplemental\1804576-17 TPAH 2+ river.dwg - 6/30/2025



TOTAL POLYCYCLIC AROMATIC HYDROCARBONS (TPAHs) LEGEND:

- ND to ≤34 mg/kg
- > 34 to ≤104 mg/kg
- > 104 mg/kg
- WHERE MORE THAN ONE SAMPLE WAS COLLECTED THE OUTERMOST RING INDICATES THE SHALLOWEST SAMPLE, THE INNERMOST RING INDICATES DEEPEST SAMPLE
- SAMPLE NOT SUBMITTED FOR LABORATORY ANALYSIS

LEGEND:

- HAND TEST PIT
- SEDIMENT CORE
- SURFACE SEDIMENT SAMPLE

NOTES:

1. GOOGLE EARTH IMAGE DATED 5/04/2018.
2. HAND TEST PIT, SURFACE SAMPLE, AND SEDIMENT SAMPLE LOCATIONS ARE APPROXIMATE.
3. PARCEL BOUNDARIES, THALWEG OF RIVER AND MEAN HIGH WATER LINE BY HAYNER/SWANSON, 2025.

0 30 60
Approximate Scale, Feet

Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP Site
Amesbury, Massachusetts

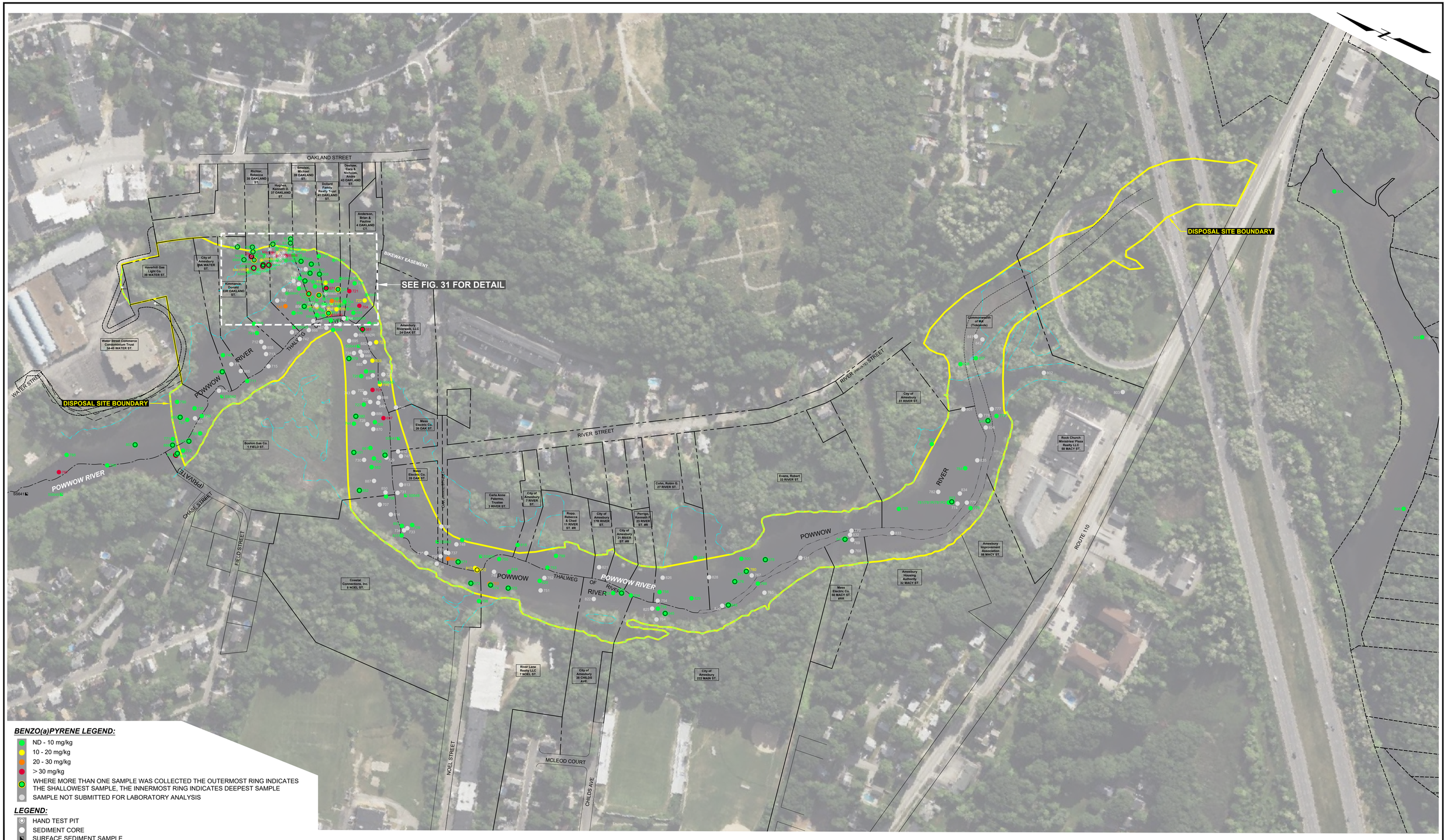
Boston Gas Company d|b|a National Grid
Waltham, Massachusetts

GEI Consultants

TOTAL POLYCYCLIC AROMATIC HYDROCARBONS (TPAHs) CONCENTRATIONS IN WETLAND AND MUDFLAT SEDIMENT (DEEPER THAN 2 FEET)

Project 1804576 | October 2025 | Fig. 29

---- B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\Ph II CSA Supplemental\1804576-22 TPAH 2+ wt-mdfl.dwg - 6/30/2025



BENZO(a)PYRENE LEGEND:

- ND - 10 mg/kg
- 10 - 20 mg/kg
- 20 - 30 mg/kg
- > 30 mg/kg
- WHERE MORE THAN ONE SAMPLE WAS COLLECTED THE OUTERMOST RING INDICATES THE SHALLOWEST SAMPLE, THE INNERMOST RING INDICATES DEEPEST SAMPLE
- SAMPLE NOT SUBMITTED FOR LABORATORY ANALYSIS

LEGEND:

- HAND TEST PIT
- SEDIMENT CORE
- SURFACE SEDIMENT SAMPLE

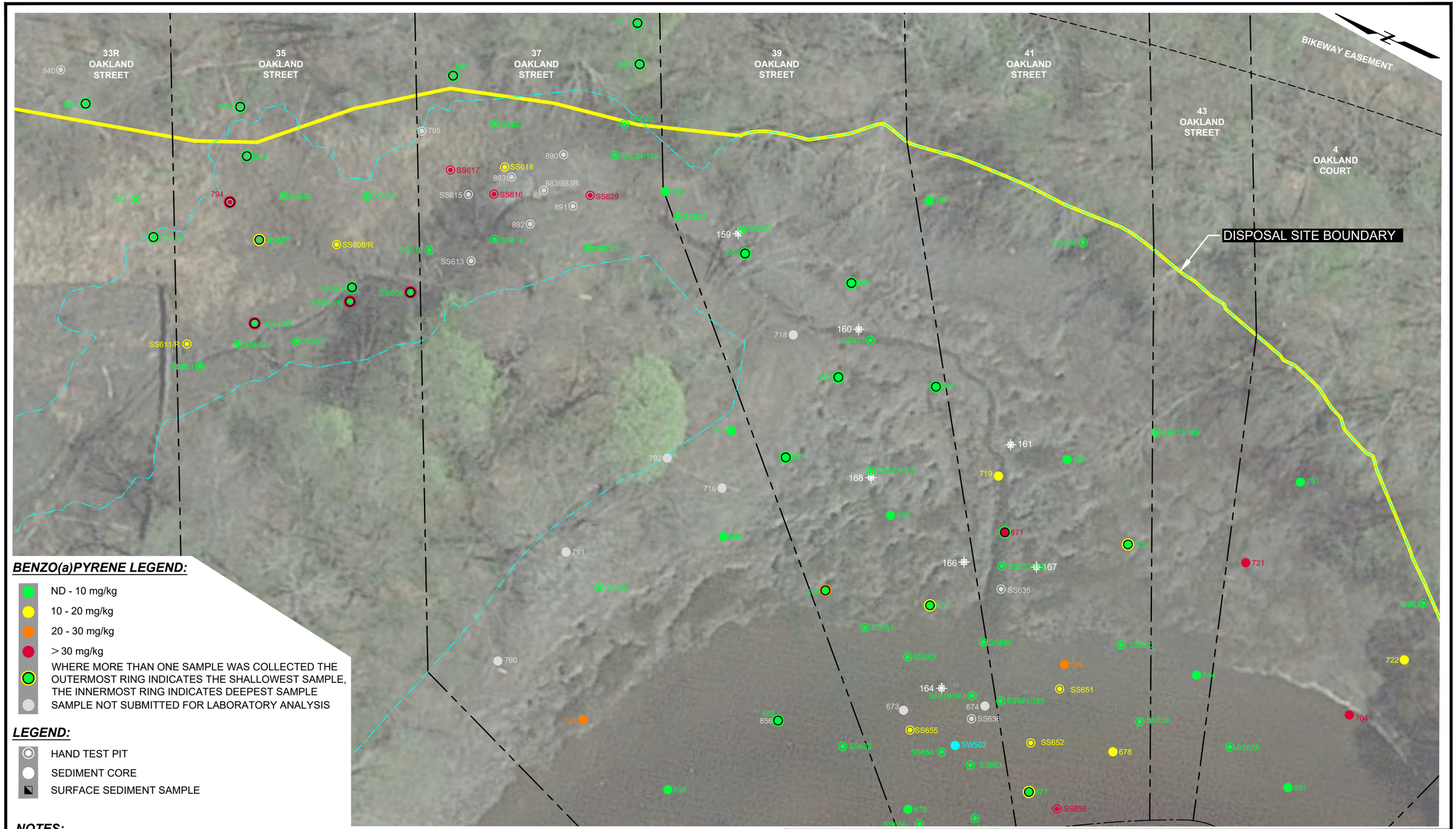
NOTES:

1. MICROSOFT BING IMAGE 2021.
2. PARCEL BOUNDARIES, THALWEG OF RIVER AND MEAN HIGH WATER LINE BY HAYNER/SWANSON, 2025.
3. HAND TEST PIT, SURFACE SAMPLE, AND SEDIMENT SAMPLE LOCATIONS ARE APPROXIMATE.

0 150 300
Approximate Scale, Feet

Supplemental Phase II Comprehensive Site Assessment Amesbury Former MGP Site Amesbury, Massachusetts	GEI Consultants	BENZO(a)PYRENE CONCENTRATIONS IN RIVER SEDIMENT (0 to 2 Feet)
Boston Gas Company d|b|a National Grid Waltham, Massachusetts	Project 1804576	October 2025 Fig. 30

---- B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\Ph II CSA Supplemental\1804576-18 TBaP 0-2 river.dwg - 7/8/2025



BENZO(a)PYRENE LEGEND:

- ND - 10 mg/kg
- 10 - 20 mg/kg
- 20 - 30 mg/kg
- > 30 mg/kg
- WHERE MORE THAN ONE SAMPLE WAS COLLECTED THE OUTERMOST RING INDICATES THE SHALLOWEST SAMPLE, THE INNERMOST RING INDICATES DEEPEST SAMPLE
- SAMPLE NOT SUBMITTED FOR LABORATORY ANALYSIS

LEGEND:

- HAND TEST PIT
- SEDIMENT CORE
- SURFACE SEDIMENT SAMPLE

NOTES:

1. GOOGLE EARTH IMAGE DATED 5/04/2018.
2. HAND TEST PIT, SURFACE SAMPLE, AND SEDIMENT SAMPLE LOCATIONS ARE APPROXIMATE.
3. PARCEL BOUNDARIES, THALWEG OF RIVER AND MEAN HIGH WATER LINE BY HAYNER/SWANSON, 2025.

0 30 60
Approximate Scale, Feet

Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP Site
Amesbury, Massachusetts

Boston Gas Company d|b|a National Grid
Waltham, Massachusetts

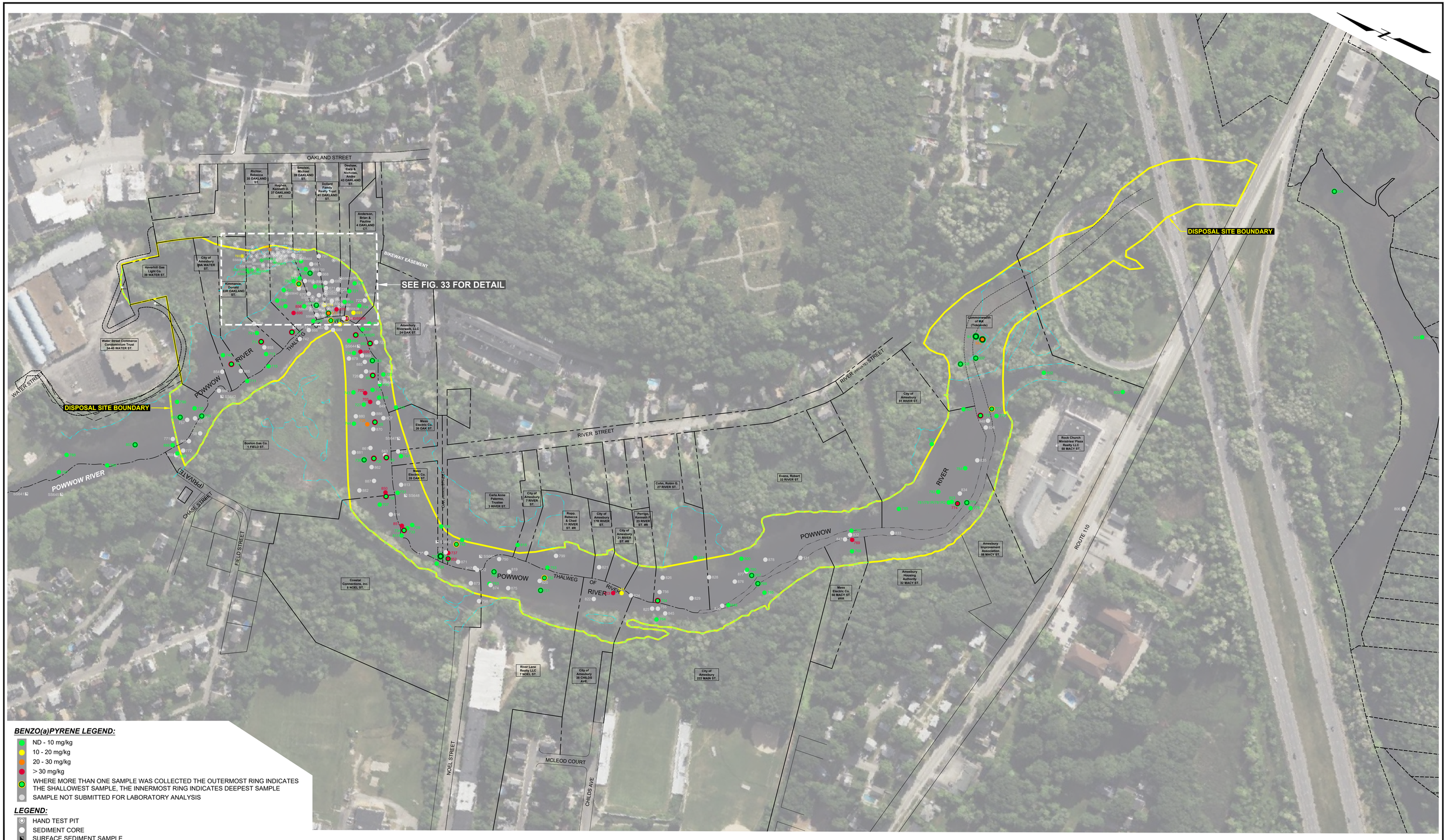
GEI Consultants

Project 1804576

BENZO(a)PYRENE CONCENTRATIONS IN WETLAND AND MUDFLAT SEDIMENT (0 - 2 FEET)

October 2025 Fig. 31

---- B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\Ph II CSA Supplemental\1804576-23 TBaP 0-2 wt-mdfl.dwg - 6/30/2025



BENZO(a)PYRENE LEGEND:

- ND - 10 mg/kg
- 10 - 20 mg/kg
- 20 - 30 mg/kg
- > 30 mg/kg
- WHERE MORE THAN ONE SAMPLE WAS COLLECTED THE OUTERMOST RING INDICATES THE SHALLOWEST SAMPLE, THE INNERMOST RING INDICATES DEEPEST SAMPLE
- SAMPLE NOT SUBMITTED FOR LABORATORY ANALYSIS

LEGEND:

- HAND TEST PIT
- SEDIMENT CORE
- SURFACE SEDIMENT SAMPLE

NOTES:

1. MICROSOFT BING IMAGE 2021.
2. PARCEL BOUNDARIES, THALWEG OF RIVER AND MEAN HIGH WATER LINE BY HAYNER/SWANSON, 2025.
3. HAND TEST PIT, SURFACE SAMPLE, AND SEDIMENT SAMPLE LOCATIONS ARE APPROXIMATE.

0 150 300
Approximate Scale, Feet

Supplemental Phase II Comprehensive Site Assessment Amesbury Former MGP Site Amesbury, Massachusetts	GEI Consultants	BENZO(a)PYRENE CONCENTRATIONS IN RIVER SEDIMENT (Deeper than 2 Feet)
Boston Gas Company d|b|a National Grid Waltham, Massachusetts	Project 1804576	October 2025 Fig. 32

---- B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\Ph II CSA Supplemental\1804576-19 TBaP 2+ river.dwg - 6/30/2025

33R OAKLAND STREET
35 OAKLAND STREET
37 OAKLAND STREET
39 OAKLAND STREET
41 OAKLAND STREET
43 OAKLAND STREET
4 OAKLAND COURT
BIKEWAY EASEMENT
DISPOSAL SITE BOUNDARY
N

BENZO(a)PYRENE LEGEND:

- ND - 10 mg/kg
- 10 - 20 mg/kg
- 20 - 30 mg/kg
- > 30 mg/kg
- WHERE MORE THAN ONE SAMPLE WAS COLLECTED THE OUTERMOST RING INDICATES THE SHALLOWEST SAMPLE, THE INNERMOST RING INDICATES DEEPEST SAMPLE
- SAMPLE NOT SUBMITTED FOR LABORATORY ANALYSIS

LEGEND:

- HAND TEST PIT
- SEDIMENT CORE
- SURFACE SEDIMENT SAMPLE

NOTES:

1. GOOGLE EARTH IMAGE DATED 5/04/2018.
2. HAND TEST PIT, SURFACE SAMPLE, AND SEDIMENT SAMPLE LOCATIONS ARE APPROXIMATE.
3. PARCEL BOUNDARIES, THALWEG OF RIVER AND MEAN HIGH WATER LINE BY HAYNER/SWANSON, 2025.

0 30 60
Approximate Scale, Feet

Supplemental Phase II Comprehensive Site Assessment
Amesbury Former MGP Site
Amesbury, Massachusetts

Boston Gas Company d|b|a National Grid
Waltham, Massachusetts

GEI Consultants

Project 1804576

BENZO(a)PYRENE CONCENTRATIONS IN WETLAND AND MUDFLAT SEDIMENT (Deeper than 2 Feet)

October 2025 Fig. 33

---- B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\Ph II CSA Supplemental\1804576-24 TBaP 2+ wt-mdfl.dwg - 9/16/2025

Appendix A MassDEP Transmittal Form

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC 108

Release Tracking Number
3 - 24070

COMPREHENSIVE RESPONSE ACTION TRANSMITTAL FORM & PHASE I COMPLETION STATEMENT

Pursuant to 310 CMR 40.0484 (Subpart D) and 40.0800 (Subpart H)

A. SITE LOCATION:

1. Site Name: KEYSPAN PROPERTY MAP 54 PARCEL 219

2. Street Address: WATER ST

3. City/Town: AMESBURY 4. ZIP Code: 019130000

☑ 5. Check here if the disposal site that is the source of the release is Tier Classified. Check the current Tier Classification Category:

☐ a. Tier I ☐ b. Tier ID ☑ c. Tier II

B. THIS FORM IS BEING USED TO: (check all that apply)

☐ 1. Submit a **Phase I Completion Statement,** pursuant to 310 CMR 40.0484.

☐ 2. Submit a **Revised Phase I Completion Statement,** pursuant to 310 CMR 40.0484.

☐ 3. Submit a **Phase II Scope of Work,** pursuant to 310 CMR 40.0834.

☐ 4. Submit an **interim Phase II Report.** This report does not satisfy the response action deadline requirements in 310 CMR 40.0500.

☑ 5. Submit a **final Phase II Report and Completion Statement,** pursuant to 310 CMR 40.0836.

☐ 6. Submit a **Revised Phase II Report and Completion Statement,** pursuant to 310 CMR 40.0836.

☐ 7. Submit a **Phase III Remedial Action Plan and Completion Statement,** pursuant to 310 CMR 40.0862.

☐ 8. Submit a **Revised Phase III Remedial Action Plan and Completion Statement,** pursuant to 310 CMR 40.0862.

☐ 9. Submit a **Phase IV Remedy Implementation Plan,** pursuant to 310 CMR 40.0874.

☐ 10. Submit a **Modified Phase IV Remedy Implementation Plan,** pursuant to 310 CMR 40.0874.

☐ 11. Submit an **As-Built Construction Report,** pursuant to 310 CMR 40.0875.

☐ 12. Submit a **Phase IV Status Report,** pursuant to 310 CMR 40.0877.

☐ 13. Submit a **Phase IV Completion Statement,** pursuant to 310 CMR 40.0878 and 40.0879.

Specify the outcome of Phase IV activities: (check one)

☐ a. Phase V Operation, Maintenance or Monitoring of the Comprehensive Remedial Action is necessary to achieve a Permanent or Temporary Solution.

☐ b. The requirements of a Permanent Solution have been met. A completed Permanent Solution Statement and Report (BWSC104) will be submitted to DEP.

☐ c. The requirements of a Temporary Solution have been met. A completed Temporary Solution Statement and Report (BWSC104) will be submitted to DEP.

B. THIS FORM IS BEING USED TO (cont.): (check all that apply)

☐ 14. Submit a **Revised Phase IV Completion Statement,** pursuant to 310 CMR 40.0878 and 40.0879.

☐ 15. Submit a **Phase V Status Report,** pursuant to 310 CMR 40.0892.

☐ 16. Submit a **Remedial Monitoring Report.** (This report can only be submitted through eDEP.)

a. Type of Report: (check one) ☐ i. Initial Report ☐ ii. Interim Report ☐ iii. Final Report

b. Frequency of Submittal: (check all that apply)

☐ i. A Remedial Monitoring Report(s) submitted monthly to address an Imminent Hazard.

☐ ii. A Remedial Monitoring Report(s) submitted monthly to address a Condition of Substantial Release Migration.

☐ iii. A Remedial Monitoring Report(s) submitted every six months, concurrent with a Status Report.

☐ iv. A Remedial Monitoring Report(s) submitted, concurrent with a Status Report.

c. Status of Site: (check one) ☐ i. Phase IV ☐ ii. Phase V ☐ iii. Remedy Operation Status ☐ iv. Temporary Solution

d. Number of Remedial Systems and/or Monitoring Programs: _____

A separate BWSC108A, CRA Remedial Monitoring Report, must be filled out for each Remedial System and/or Monitoring Program addressed by this transmittal form.

☐ 17. Submit a **Remedy Operation Status,** pursuant to 310 CMR 40.0893.

☐ 18. Submit a **Status Report to maintain a Remedy Operation Status,** pursuant to 310 CMR 40.0893(2).

☐ 19. Submit a **Transfer and/or a Modification of Persons Maintaining a Remedy Operation Status (ROS),** pursuant to 310 CMR 40.0893(5) (check one, or both, if applicable).

☐ a. Submit a Transfer of Persons Maintaining an ROS (the transferee should be the person listed in Section D, "Person Undertaking Response Actions").

☐ b. Submit a Modification of Persons Maintaining an ROS (the primary representative should be the person listed in Section D, "Person Undertaking Response Actions").

c. Number of Persons Maintaining an ROS not including the primary representative: _____

☐ 20. Submit a **Termination of a Remedy Operation Status,** pursuant to 310 CMR 40.0893(6).(check one)

☐ a. Submit a notice indicating ROS performance standards have not been met. A plan and timetable pursuant to 310 CMR 40.0893(6)(b) for resuming the ROS are attached.

☐ b. Submit a notice of Termination of ROS.

☐ 21. Submit a **Phase V Completion Statement,** pursuant to 310 CMR 40.0894.

Specify the outcome of Phase V activities: (check one)

☐ a. The requirements of a Permanent Solution have been met. A completed Permanent Solution Statement and Report (BWSC104) will be submitted to DEP.

☐ b. The requirements for a Temporary Solution have been met. A completed Temporary Solution Statement and Report (BWSC104) will be submitted to DEP.

☐ 22. Submit a **Revised Phase V Completion Statement,** pursuant to 310 CMR 40.0894.

☐ 23. Submit a **Temporary Solution Status Report,** pursuant to 310 CMR 40.0898.

☐ 24. Submit a **Plan for the Application of Remedial Additives** near a sensitive receptor, pursuant to 310 CMR 40.0046(3).

a. Status of Site: (check one)

☐ i. Phase IV ☐ ii. Phase V ☐ iii. Remedy Operation Status ☐ iv. Temporary Solution

C. LSP SIGNATURE AND STAMP:

I attest under the pains and penalties of perjury that I have personally examined and am familiar with this transmittal form, including any and all documents accompanying this submittal. In my professional opinion and judgment based upon application of (i) the standard of care in 309 CMR 4.02(1), (ii) the applicable provisions of 309 CMR 4.02(2) and (3), and 309 CMR 4.03(2), and (iii) the provisions of 309 CMR 4.03(3), to the best of my knowledge, information and belief,

> *if Section B indicates that a* ***Phase I, Phase II, Phase III, Phase IV or Phase V Completion Statement*** *and/or a* ***Termination of a Remedy Operation Status*** *is being submitted*, the response action(s) that is (are) the subject of this submittal (i) has (have) been developed and implemented in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, and (iii) comply(ies) with the identified provisions of all orders, permits, and approvals identified in this submittal;

> *if Section B indicates that a* ***Phase II Scope of Work*** *or a* ***Phase IV Remedy Implementation Plan*** *is being submitted,* the response action(s) that is (are) the subject of this submittal (i) has (have) been developed in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, and (iii) comply(ies) with the identified provisions of all orders, permits, and approvals identified in this submittal;

> *if Section B indicates that an* ***As-Built Construction Report,*** *a* ***Remedy Operation Status,*** *a* ***Phase IV, Phase V or Temporary Solution Status Report,*** *a* ***Status Report to Maintain a Remedy Operation Status,*** *a* ***Transfer or Modification of Persons Maintaining a Remedy Operation Status*** *and/or a* ***Remedial Monitoring Report*** *is being submitted,* the response action(s) that is (are) the subject of this submittal (i) is (are) being implemented in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, and (iii) comply(ies) with the identified provisions of all orders, permits, and approvals identified in this submittal.

I am aware that significant penalties may result, including, but not limited to, possible fines and imprisonment, if I submit information which I know to be false, inaccurate or materially incomplete.

1. LSP#: 6581

2. First Name: JAMES R 3. Last Name: ASH

4. Telephone: 7817214018 5. Ext.: 6. Email: jash@geiconsultants.com

7. Signature: JAMES R ASH

8. Date: 11/3/2025
(mm/dd/yyyy)

9. LSP Stamp:



COMPREHENSIVE RESPONSE ACTION TRANSMITTAL FORM & PHASE I COMPLETION STATEMENT

Pursuant to 310 CMR 40.0484 (Subpart D) and 40.0800 (Subpart H)

D. PERSON UNDERTAKING RESPONSE ACTIONS:

1. Check all that apply: ☐ a. change in contact name ☐ b. change of address ☑ c. change in the person undertaking response actions

2. Name of Organization: BOSTON GAS COMPANY

3. Contact First Name: AARON 4. Last Name: TOWNSLEY

5. Street: 170 DATA DRIVE 6. Title: MANAGER NE SITE INV & REM

7. City/Town: WALTHAM 8. State: MA 9. ZIP Code: 024512222

10. Telephone: 7819063985 11. Ext: 12. Email: aaron.townsley@nationalgrid.com

E. RELATIONSHIP TO SITE OF PERSON UNDERTAKING RESPONSE ACTIONS: ☐ Check here to change relationship

☑ 1. RP or PRP ☑ a. Owner ☐ b. Operator ☐ c. Generator ☐ d. Transporter

☐ e. Other RP or PRP Specify:

☐ 2. Fiduciary, Secured Lender or Municipality with Exempt Status (as defined by M.G.L. c. 21E, s. 2)

☐ 3. Agency or Public Utility on a Right of Way (as defined by M.G.L. c. 21E, s. 5(j))

☐ 4. Any Other Person Undertaking Response Actions Specify Relationship:

F. REQUIRED ATTACHMENT AND SUBMITTALS:

☐ 1. Check here if the Response Action(s) on which this opinion is based, if any, are (were) subject to any order(s), permit(s) and/or approval(s) issued by DEP or EPA. If the box is checked, you MUST attach a statement identifying the applicable provisions thereof.

☑ 2. Check here to certify that the Chief Municipal Officer and the Local Board of Health have been notified of the submittal of any Phase Reports to DEP.

☐ 3. Check here to certify that the Chief Municipal Officer and the Local Board of Health have been notified of the availability of a Phase III Remedial Action Plan.

☐ 4. Check here to certify that the Chief Municipal Officer and the Local Board of Health have been notified of the availability of a Phase IV Remedy Implementation Plan.

☐ 5. Check here to certify that the Chief Municipal Officer and the Local Board of Health have been notified of any field work involving the implementation of a Phase IV Remedial Action.

☐ 6. If submitting a Transfer of a Remedy Operation Status (as per 310 CMR 40.0893(5)), check here to certify that a statement detailing the compliance history for the person making this submittal (transferee) is attached.

☐ 7. If submitting a Modification of a Remedy Operation Status (as per 310 CMR 40.0893(5)), check here to certify that a statement detailing the compliance history for each new person making this submittal is attached.

☐ 8. Check here if any non-updatable information provided on this form is incorrect, e.g. Release Address/Location Aid. Send corrections to: BWSC.eDEP@Mass.Gov.

☑ 9. Check here to certify that the LSP Opinion containing the material facts, data including, but not limited to: pressure measurements, maps, graphs, or diagrams, and other information is attached.

G. CERTIFICATION OF PERSON UNDERTAKING RESPONSE ACTIONS:

1. I, AARON TOWNSLEY, attest under the pains and penalties of perjury (i) that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this transmittal form, (ii) that, based on my inquiry of those individuals immediately responsible for obtaining the information, the material information contained in this submittal is, to the best of my knowledge and belief, true, accurate and complete, and (iii) that I am fully authorized to make this attestation on behalf of the entity legally responsible for this submittal. I/the person or entity on whose behalf this submittal is made am/is aware that there are significant penalties, including, but not limited to, possible fines and imprisonment, for willfully submitting false, inaccurate, or incomplete information.

>*if Section B indicates that this is a* **Modification of a Remedy Operation Status (ROS),** I attest under the pains and penalties of perjury that I am fully authorized to act on behalf of all persons performing response actions under the ROS as stated in 310 CMR 40.0893(5)(d) to receive oral and written correspondence from MassDEP with respect to performance of response actions under the ROS, and to receive a statement of fee amount as per 4.03(3).

I understand that any material received by the Primary Representative from MassDEP shall be deemed received by all the persons performing response actions under the ROS, and I am aware that there are significant penalties, including, but not limited to, possible fines and imprisonment, for willfully submitting false, inaccurate or incomplete information.

2. By: AARON TOWNSLEY (Signature)

3. Title: MANAGER NE SITE INV & REM

4. For: BOSTON GAS COMPANY (Name of person or entity recorded in Section D)

5. Date: 10/30/2025 (mm/dd/yyyy)

☐ 6. Check here if the address of the person providing certification is different from address recorded in Section D.

7. Street:

8. City/Town: 9. State: 10. ZIP Code:

11. Telephone: 12. Ext.: 13. Email:

YOU ARE SUBJECT TO AN ANNUAL COMPLIANCE ASSURANCE FEE OF UP TO $10,000 PER BILLABLE YEAR FOR THIS DISPOSAL SITE. YOU MUST LEGIBLY COMPLETE ALL RELEVANT SECTIONS OF THIS FORM OR DEP MAY RETURN THE DOCUMENT AS INCOMPLETE. IF YOU SUBMIT AN INCOMPLETE FORM, YOU MAY BE PENALIZED FOR MISSING A REQUIRED DEADLINE.

Date Stamp (DEP USE ONLY:)

Received by DEP on 11/3/2025 10:32:46 AM

Appendix B Public Notice Letters

October 30, 2025
Project No. 1804576

Mayor Kassandra Gove
Amesbury City Hall
62 Friend Street
Amesbury, MA 01913

Re: Supplemental Phase II Comprehensive Site Assessment Report
Former Amesbury Manufactured Gas Plant
Amesbury, Massachusetts
MassDEP RTN 3-24070

Dear Mayor Gove:

GEI Consultants, Inc., on behalf of Boston Gas Company d/b/a National Grid (National Grid), is hereby notifying your office that a Supplemental Phase II Comprehensive Site Assessment (CSA) Report has been prepared for the above-mentioned site. The Supplemental Phase II CSA Report was prepared to meet the requirements presented in the Massachusetts Contingency Plan (MCP) for a Phase II CSA (310 CMR 40.0830). This notification is made in fulfillment of the public notice requirements of the MCP (310 CMR 40.1403(3)(e)). In addition, because the City of Amesbury is also the owner of properties within the Site, this notification is also made in fulfillment of the public notice requirements of the MCP (310 CMR 40.1406(1)). Specifically, your properties at 39A Water Street, 7 River Street, 38 Childs Avenue, 17R River Street, 21R River Street, 222 Main Street, and 51 River Street, are within the Site.

The purpose of the Supplemental Phase II CSA was to determine the extent of Manufactured Gas Plant ("MGP") residuals within the Powwow River and to summarize the additional investigations and analyses performed by GEI on behalf of National Grid since 2017. The findings and conclusions from the Supplemental Phase II CSA are attached in the Executive Summary from the report. The Site boundary is shown in Fig. 1. The Site includes the former Amesbury MGP at 39 Water Street, downstream wetlands, mudflats, and the main channel of the Powwow River, most of which is privately owned. Although property uses vary within the Site, there are no buildings within the Site boundary.

The information in the Supplemental Phase II CSA Report is being used to design, permit, and implement an environmental remedy within the river. In addition, on October 30, 2025, the complete Supplemental Phase II CSA Report was submitted electronically to MassDEP via eDEP, MassDEP's online filing system, and is available online through the eDEP File Viewer at https://eeaonline.eea.state.ma.us/portal/dep/wastesite/ searchable by Release Tracking Number 3-0024070.

Individuals and public offices may request additional public involvement activities under 310 CMR 40.1400. If you have questions concerning this letter, please contact Kenneth Lento at National Grid at 781.663.3123 or Jim Ash at GEI at 781.721.4018.

Sincerely,

GEI CONSULTANTS, INC.

Ryan S. Hoffman, P.G., LSP
Vice President

James R. Ash, P.E., LSP
Senior Vice President

RSH:jam
B:\Working\NATIONAL GRID\1804576 Amesbury MGP\01_ADMIN\Phase II CSA Suppl\App B - Public Notice Letters\Public Notice Letters_Mayor&BOH.docx

Attachments

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 39 Water Street

2. City/Town: Amesbury 3. ZIP Code: 01913-0000

4. Assessor's Parcel ID: Map 54 Parcel 219

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: City of Amesbury

2. Address of Property For Which This Notice is Being Provided: (property owned by person named in B1)

a. Street Address: 39A Water Street, 7 River Street, 38 Childs Avenue, 17R River Street, 21R River Street, 222 Main Street, and 51 River Street

b. City/Town: Amesbury c. ZIP Code: 01913-0000

3. Assessor's Parcel ID: Map 54 Parcel 220; Map 65 Parcels 25 and 54; Map 66 Parcels 2, 7, 9, and 16

C. THIS NOTICE IS BEING GIVEN : (check one)

- [x] 1. Upon Completion of a Phase II Comprehensive Site Assessment.
- [ ] 2. Upon Submittal of a Permanent or Temporary Solution Statement (i.e., Site Closure Report).
- [ ] 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY : (check all that apply)

AFFECTED ENVIRONMENTAL MEDIA	PRINCIPAL CHEMICAL(S) PRESENT
[ ] 1. Soil	
[ ] 2. Groundwater	
[ ] 3. Surface Water	
[x] 4. Sediment	PAHs
[ ] 5. Indoor Air	
[ ] 6. Soil Gas	
[ ] 7. Other: (specify)	

E. ATTACHMENTS PROVIDED WITH THIS NOTICE, AS REQUIRED BY 310 CMR 40.1406:

- [x] 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous Material is or is likely to be Present.
- [x] 2. A Copy of the Phase II Comprehensive Site Assessment or Permanent or Temporary Solution Statement Conclusions.
- [ ] 3. Specify the category of Solution that applies to the Disposal Site.
  - [ ] 1. Permanent Solution with No Conditions.
  - [ ] 2. Permanent Solution with Conditions.
    - [ ] i. An Activity and Use Limitation has been implemented.
    - [ ] ii. An Activity and Use Limitation has not been implemented.
  - [ ] 3. Temporary Solution.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

F. CONTACT INFORMATION RELATING TO THE PARTY PROVIDING THIS NOTICE:

1. Name of Organization: Boston Gas Company d/b/a National Grid
2. Contact First Name: Ken
3. Last Name: Lento
4. Street: 170 Data Drive
5. Title: Project Manager
6. City/Town: Waltham
7. State: MA
8. ZIP Code: 02451-2222
9. Telephone: (781) 663-3123
10. Email: kenneth.lento@nationalgrid.com

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** that when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

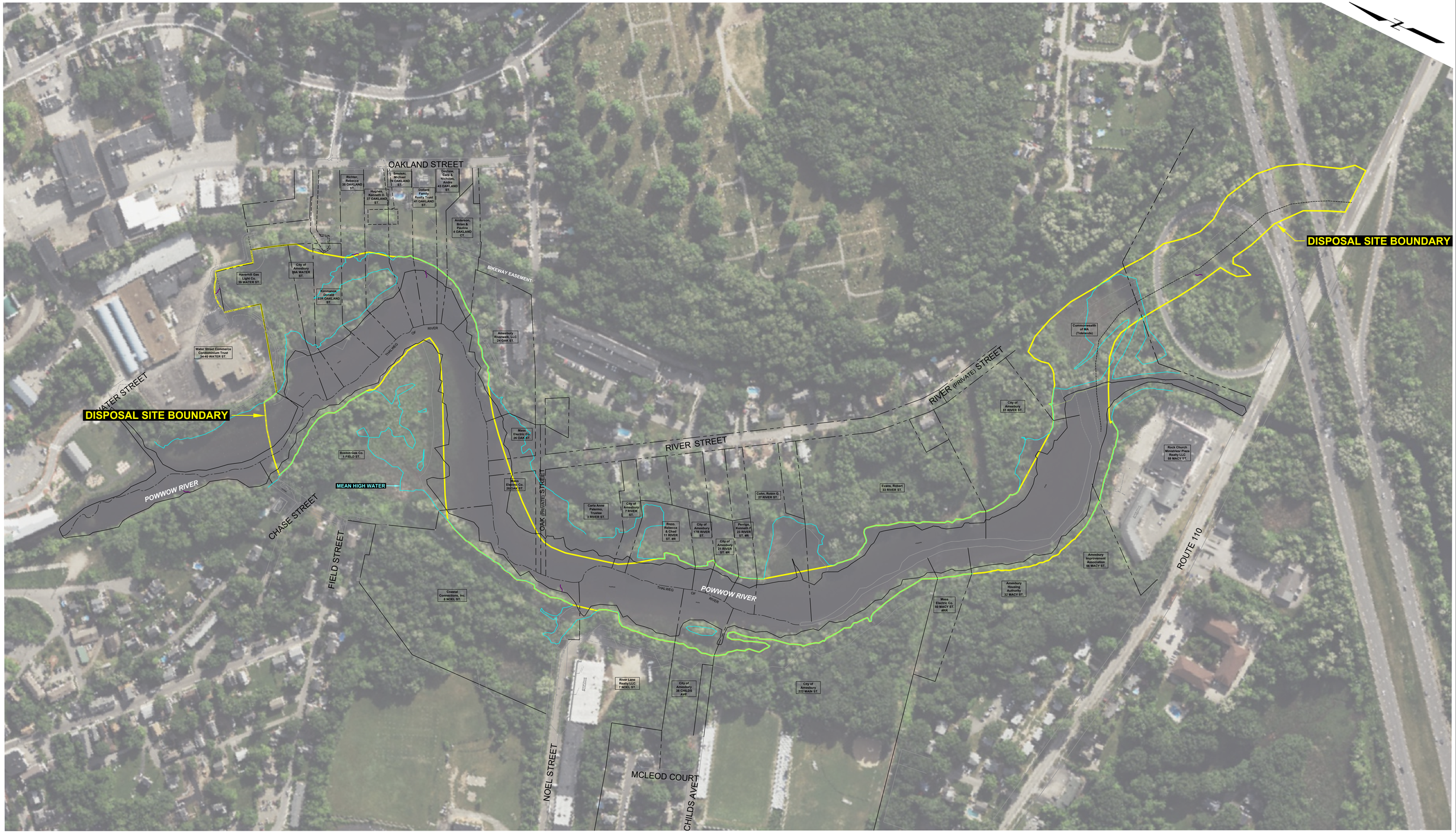
The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report **(Section E).** These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup.

For more information regarding this notice, you may contact the party listed in **Section F** of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.



NOTES:

1. MICROSOFT BING IMAGE 2023.
2. PARCEL BOUNDARIES, THALWEG OF RIVER, AND MEAN HIGH WATER LINE PROVIDED BY HAYNER/SWANSON, INC., 2025.

0 150 300
Approximate Scale, Feet

Amesbury Former MGP Site Amesbury, Massachusetts	GEI Consultants	SITE PLAN
Boston Gas Company d|b|a National Grid Waltham, Massachusetts	Project 1804576	October 2025 Fig. 1

---- B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\Ph II CSA Supplemental\1804576-38.dwg - 10/28/2025

October 30, 2025
Project No. 1804576

Chairperson Ann McKay
Amesbury Board of Health
39 South Hunt Road
Amesbury, MA 01913

Re: Supplemental Phase II Comprehensive Site Assessment Report
Former Amesbury Manufactured Gas Plant
Amesbury, Massachusetts
MassDEP RTN 3-24070

Dear Chairman McKay:

GEI Consultants, Inc., on behalf of Boston Gas Company d/b/a National Grid (National Grid), is hereby notifying your office that a Supplemental Phase II Comprehensive Site Assessment (CSA) Report has been prepared for the above-mentioned site. The Supplemental Phase II CSA Report was prepared to meet the requirements presented in the Massachusetts Contingency Plan (MCP) for a Phase II CSA (310 CMR 40.0830). This notification is made in fulfillment of the public notice requirements of the MCP (310 CMR 40.1403(3)(e)). In addition, because the City of Amesbury is also the owner of properties within the Site, this notification is also made in fulfillment of the public notice requirements of the MCP (310 CMR 40.1406(1)). Specifically, your properties at 39A Water Street, 7 River Street, 38 Childs Avenue, 17R River Street, 21R River Street, 222 Main Street, and 51 River Street, are within the Site.

The purpose of the Supplemental Phase II CSA was to determine the extent of Manufactured Gas Plant ("MGP") residuals within the Powwow River and to summarize the additional investigations and analyses performed by GEI on behalf of National Grid since 2017. The findings and conclusions from the Supplemental Phase II CSA are attached in the Executive Summary from the report. The Site boundary is shown in Fig. 1. The Site includes the former Amesbury MGP at 39 Water Street, downstream wetlands, mudflats, and the main channel of the Powwow River, most of which is privately owned. Although property uses vary within the Site, there are no buildings within the Site boundary.

The information in the Supplemental Phase II CSA Report is being used to design, permit, and implement an environmental remedy within the river. In addition, on October 30, 2025, the complete Supplemental Phase II CSA Report was submitted electronically to MassDEP via eDEP, MassDEP's online filing system, and is available online through the eDEP File Viewer at https://eeaonline.eea.state.ma.us/portal/dep/wastesite/ searchable by Release Tracking Number 3-0024070.

Individuals and public offices may request additional public involvement activities under 310 CMR 40.1400. If you have questions concerning this letter, please contact Kenneth Lento at National Grid at 781.663.3123 or Jim Ash at GEI at 781.721.4018.

Sincerely,

GEI CONSULTANTS, INC.

Ryan S. Hoffman, P.G., LSP
Vice President

James R. Ash, P.E., LSP
Senior Vice President

RSH:jam
B:\Working\NATIONAL GRID\1804576 Amesbury MGP\01_ADMIN\Phase II CSA Suppl\App B - Public Notice Letters\Public Notice Letters_Mayor&BOH.docx

Attachments

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 39 Water Street

2. City/Town: Amesbury 3. ZIP Code: 01913-0000

4. Assessor's Parcel ID: Map 54 Parcel 219

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: City of Amesbury

2. Address of Property For Which This Notice is Being Provided: (property owned by person named in B1)

a. Street Address: 39A Water Street, 7 River Street, 38 Childs Avenue, 17R River Street, 21R River Street, 222 Main Street, and 51 River Street

b. City/Town: Amesbury c. ZIP Code: 01913-0000

3. Assessor's Parcel ID: Map 54 Parcel 220; Map 65 Parcels 25 and 54; Map 66 Parcels 2, 7, 9, and 16

C. THIS NOTICE IS BEING GIVEN : (check one)

- [x] 1. Upon Completion of a Phase II Comprehensive Site Assessment.
- [ ] 2. Upon Submittal of a Permanent or Temporary Solution Statement (i.e., Site Closure Report).
- [ ] 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY : (check all that apply)

AFFECTED ENVIRONMENTAL MEDIA	PRINCIPAL CHEMICAL(S) PRESENT
[ ] 1. Soil	
[ ] 2. Groundwater	
[ ] 3. Surface Water	
[x] 4. Sediment	PAHs
[ ] 5. Indoor Air	
[ ] 6. Soil Gas	
[ ] 7. Other: (specify)	

E. ATTACHMENTS PROVIDED WITH THIS NOTICE, AS REQUIRED BY 310 CMR 40.1406:

- [x] 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous Material is or is likely to be Present.
- [x] 2. A Copy of the Phase II Comprehensive Site Assessment or Permanent or Temporary Solution Statement Conclusions.
- [ ] 3. Specify the category of Solution that applies to the Disposal Site.
  - [ ] 1. Permanent Solution with No Conditions.
  - [ ] 2. Permanent Solution with Conditions.
    - [ ] i. An Activity and Use Limitation has been implemented.
    - [ ] ii. An Activity and Use Limitation has not been implemented.
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Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

F. CONTACT INFORMATION RELATING TO THE PARTY PROVIDING THIS NOTICE:

1. Name of Organization: Boston Gas Company d/b/a National Grid
2. Contact First Name: Ken
3. Last Name: Lento
4. Street: 170 Data Drive
5. Title: Project Manager
6. City/Town: Waltham
7. State: MA
8. ZIP Code: 02451-2222
9. Telephone: (781) 663-3123
10. Email: kenneth.lento@nationalgrid.com

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

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ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

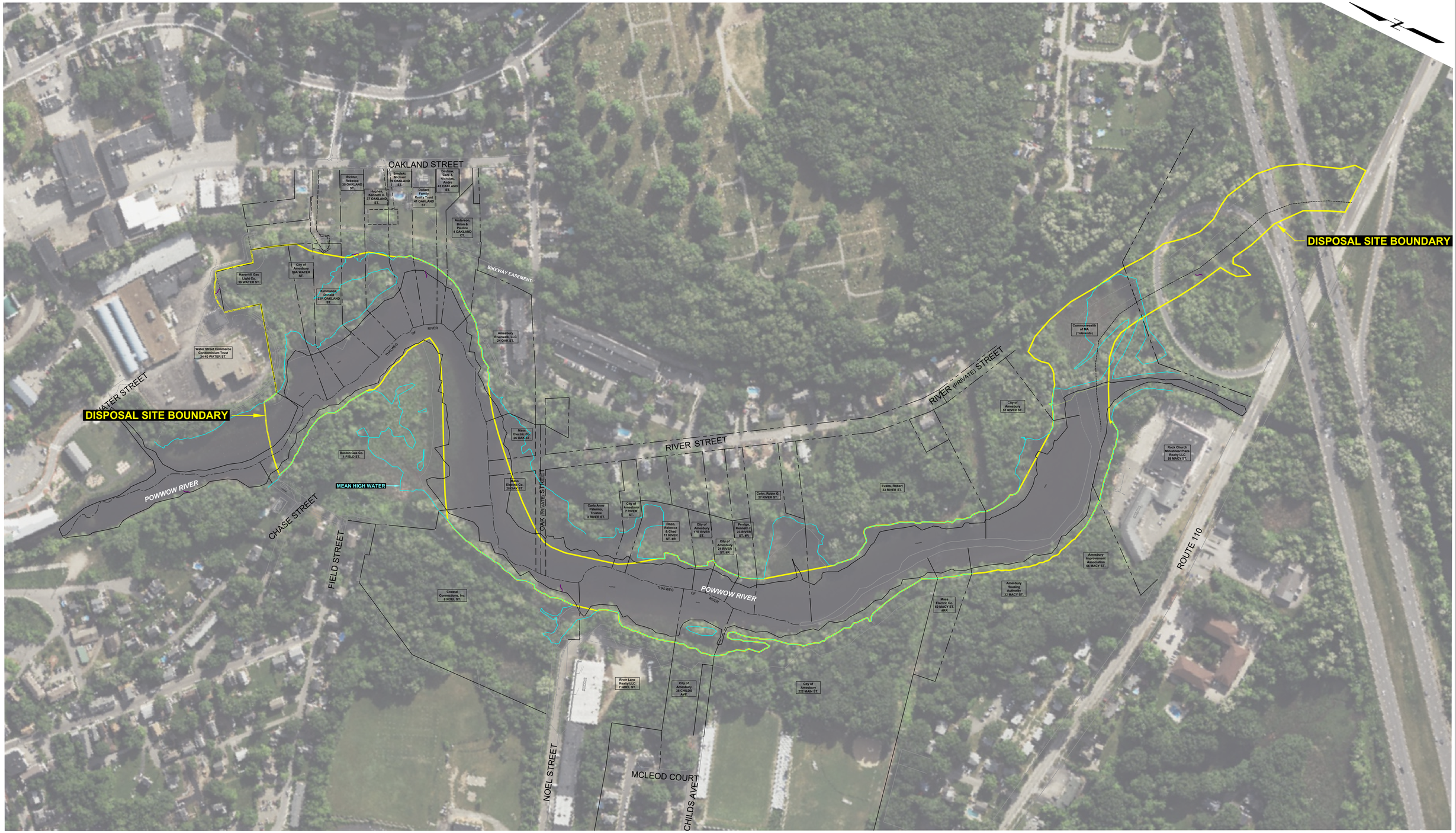
The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report **(Section E).** These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup.

For more information regarding this notice, you may contact the party listed in **Section F** of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.



NOTES:

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2. PARCEL BOUNDARIES, THALWEG OF RIVER, AND MEAN HIGH WATER LINE PROVIDED BY HAYNER/SWANSON, INC., 2025.

0 150 300
Approximate Scale, Feet

Amesbury Former MGP Site Amesbury, Massachusetts	GEI Consultants	SITE PLAN
Boston Gas Company d|b|a National Grid Waltham, Massachusetts	Project 1804576	October 2025 Fig. 1

---- B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\Ph II CSA Supplemental\1804576-38.dwg - 10/28/2025

October 30, 2025
Project No. 1804576

Water Street Commerce Center Condominium Trust
34-40 Water Street
Amesbury, MA 01913

Re: Supplemental Phase II Comprehensive Site Assessment Report
Former Amesbury Manufactured Gas Plant,
Amesbury, Massachusetts
MassDEP RTN 3-24070

Dear Water Street Commerce Center Condominium Trust:

GEI Consultants, Inc., on behalf of Boston Gas Company d/b/a National Grid (National Grid), is hereby notifying your office that a Supplemental Phase II Comprehensive Site Assessment (CSA) Report has been prepared for the above-mentioned site. The Supplemental Phase II CSA Report was prepared to meet the requirements presented in the Massachusetts Contingency Plan (MCP) for a Phase II CSA (310 CMR 40.0830). Because you are the owner of a property within the Site, this notification is made in fulfillment of the public notice requirements of the MCP (310 CMR 40.1406(1)). Specifically, your property at 34-40 Water Street is within the Site.

The purpose of the Supplemental Phase II CSA was to determine the extent of Manufactured Gas Plant ("MGP") residuals within the Powwow River and to summarize the additional investigations and analyses performed by GEI on behalf of National Grid since 2017. The findings and conclusions from the Supplemental Phase II CSA are attached in the Executive Summary from the report. The Site boundary is shown in Fig. 1. The Site includes the former Amesbury MGP at 39 Water Street, downstream wetlands, mudflats, and the main channel of the Powwow River, most of which is privately owned. Although property uses vary within the Site, there are no buildings within the Site boundary.

The information in the Supplemental Phase II CSA Report is being used to design, permit, and implement an environmental remedy within the river. In addition, on October 30, 2025, the complete Supplemental Phase II CSA Report was submitted electronically to MassDEP via eDEP, MassDEP's online filing system, and is available online through the eDEP File Viewer at https://eeaonline.eea.state.ma.us/portal/dep/wastesite/ searchable by Release Tracking Number 3-0024070.

Individuals and public offices may request additional public involvement activities under 310 CMR 40.1400. If you have questions concerning this letter, please contact Ken Lento at National Grid at 617.791.2627 or Jim Ash at GEI at 781.721.4018.

Sincerely,

GEI CONSULTANTS, INC.

Ryan S. Hoffman, P.G., LSP
Vice President

James R. Ash, P.E., LSP
Senior Vice President

RSH:jam
B:\Working\NATIONAL GRID\1804576 Amesbury MGP\01_ADMIN\Phase II CSA Suppl\App B - Public Notice Letters\Public Notice Letters_Property Owners.docx

Attachments

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 39 Water Street

2. City/Town: Amesbury 3. ZIP Code: 01913-0000

4. Assessor's Parcel ID: Map 54 Parcel 219

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Water Street Commerce Center Condominium Trust

2. Address of Property For Which This Notice is Being Provided: (property owned by person named in B1)

a. Street Address: 35 Water Street

b. City/Town: Amesbury c. ZIP Code: 01913-0000

3. Assessor's Parcel ID: Map 53 Parcel 97

C. THIS NOTICE IS BEING GIVEN : (check one)

- [x] 1. Upon Completion of a Phase II Comprehensive Site Assessment.
- [ ] 2. Upon Submittal of a Permanent or Temporary Solution Statement (i.e., Site Closure Report).
- [ ] 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY : (check all that apply)

AFFECTED ENVIRONMENTAL MEDIA	PRINCIPAL CHEMICAL(S) PRESENT
[ ] 1. Soil	
[ ] 2. Groundwater	
[ ] 3. Surface Water	
[x] 4. Sediment	PAHs
[ ] 5. Indoor Air	
[ ] 6. Soil Gas	
[ ] 7. Other: (specify)	

E. ATTACHMENTS PROVIDED WITH THIS NOTICE, AS REQUIRED BY 310 CMR 40.1406:

- [x] 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous Material is or is likely to be Present.
- [x] 2. A Copy of the Phase II Comprehensive Site Assessment or Permanent or Temporary Solution Statement Conclusions.
- [ ] 3. Specify the category of Solution that applies to the Disposal Site.
  - [ ] 1. Permanent Solution with No Conditions.
  - [ ] 2. Permanent Solution with Conditions.
    - [ ] i. An Activity and Use Limitation has been implemented.
    - [ ] ii. An Activity and Use Limitation has not been implemented.
  - [ ] 3. Temporary Solution.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

F. CONTACT INFORMATION RELATING TO THE PARTY PROVIDING THIS NOTICE:

1. Name of Organization: Boston Gas Company d/b/a National Grid
2. Contact First Name: Ken
3. Last Name: Lento
4. Street: 170 Data Drive
5. Title: Project Manager
6. City/Town: Waltham
7. State: MA
8. ZIP Code: 02451-2222
9. Telephone: (781) 663-3123
10. Email: kenneth.lento@nationalgrid.com

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** that when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

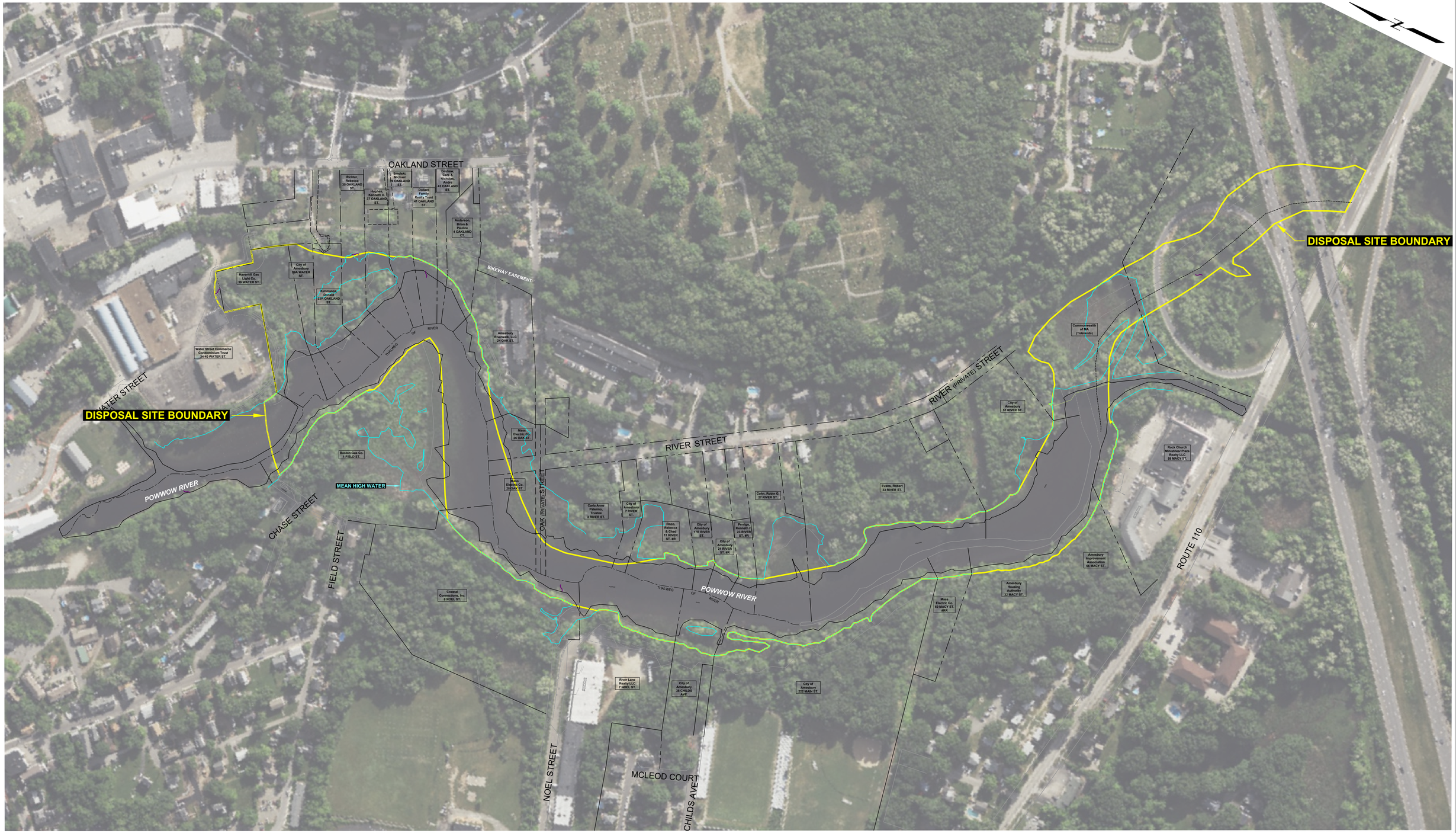
The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report **(Section E).** These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup.

For more information regarding this notice, you may contact the party listed in **Section F** of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.



NOTES:

1. MICROSOFT BING IMAGE 2023.
2. PARCEL BOUNDARIES, THALWEG OF RIVER, AND MEAN HIGH WATER LINE PROVIDED BY HAYNER/SWANSON, INC., 2025.

0 150 300
Approximate Scale, Feet

Amesbury Former MGP Site Amesbury, Massachusetts	GEI Consultants	SITE PLAN
Boston Gas Company d|b|a National Grid Waltham, Massachusetts	Project 1804576	October 2025 Fig. 1

---- B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\Ph II CSA Supplemental\1804576-38.dwg - 10/28/2025

October 30, 2025
Project No. 1804576

Boston Gas Company
National Grid Property Tax Department
170 Data Drive
Waltham, MA 02451

Re: Supplemental Phase II Comprehensive Site Assessment Report
Former Amesbury Manufactured Gas Plant,
Amesbury, Massachusetts
MassDEP RTN 3-24070

Dear Boston Gas Company:

GEI Consultants, Inc., on behalf of Boston Gas Company d/b/a National Grid (National Grid), is hereby notifying your office that a Supplemental Phase II Comprehensive Site Assessment (CSA) Report has been prepared for the above-mentioned site. The Supplemental Phase II CSA Report was prepared to meet the requirements presented in the Massachusetts Contingency Plan (MCP) for a Phase II CSA (310 CMR 40.0830). Because you are the owner of a property within the Site, this notification is made in fulfillment of the public notice requirements of the MCP (310 CMR 40.1406(1)). Specifically, your property at 1 Field Street is within the Site.

The purpose of the Supplemental Phase II CSA was to determine the extent of Manufactured Gas Plant ("MGP") residuals within the Powwow River and to summarize the additional investigations and analyses performed by GEI on behalf of National Grid since 2017. The findings and conclusions from the Supplemental Phase II CSA are attached in the Executive Summary from the report. The Site boundary is shown in Fig. 1. The Site includes the former Amesbury MGP at 39 Water Street, downstream wetlands, mudflats, and the main channel of the Powwow River, most of which is privately owned. Although property uses vary within the Site, there are no buildings within the Site boundary.

The information in the Supplemental Phase II CSA Report is being used to design, permit, and implement an environmental remedy within the river. In addition, on October 30, 2025, the complete Supplemental Phase II CSA Report was submitted electronically to MassDEP via eDEP, MassDEP's online filing system, and is available online through the eDEP File Viewer at https://eeaonline.eea.state.ma.us/portal/dep/wastesite/ searchable by Release Tracking Number 3-0024070.

Individuals and public offices may request additional public involvement activities under 310 CMR 40.1400. If you have questions concerning this letter, please contact Ken Lento at National Grid at 617.791.2627 or Jim Ash at GEI at 781.721.4018.

Sincerely,

GEI CONSULTANTS, INC.

Ryan S. Hoffman, P.G., LSP
Vice President

James R. Ash, P.E., LSP
Senior Vice President

RSH:jam
B:\Working\NATIONAL GRID\1804576 Amesbury MGP\01_ADMIN\Phase II CSA Suppl\App B - Public Notice Letters\Public Notice Letters_Property Owners.docx

Attachments

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 39 Water Street

2. City/Town: Amesbury 3. ZIP Code: 01913-0000

4. Assessor's Parcel ID: Map 54 Parcel 219

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Boston Gas Company

2. Address of Property For Which This Notice is Being Provided: (property owned by person named in B1)

a. Street Address: 1 Field Street

b. City/Town: Amesbury c. ZIP Code: 01913-0000

3. Assessor's Parcel ID: Map 53 Parcel 127

C. THIS NOTICE IS BEING GIVEN : (check one)

- [x] 1. Upon Completion of a Phase II Comprehensive Site Assessment.
- [ ] 2. Upon Submittal of a Permanent or Temporary Solution Statement (i.e., Site Closure Report).
- [ ] 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY : (check all that apply)

AFFECTED ENVIRONMENTAL MEDIA	PRINCIPAL CHEMICAL(S) PRESENT
[ ] 1. Soil	
[ ] 2. Groundwater	
[ ] 3. Surface Water	
[x] 4. Sediment	PAHs
[ ] 5. Indoor Air	
[ ] 6. Soil Gas	
[ ] 7. Other: (specify)	

E. ATTACHMENTS PROVIDED WITH THIS NOTICE, AS REQUIRED BY 310 CMR 40.1406:

- [x] 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous Material is or is likely to be Present.
- [x] 2. A Copy of the Phase II Comprehensive Site Assessment or Permanent or Temporary Solution Statement Conclusions.
- [ ] 3. Specify the category of Solution that applies to the Disposal Site.
  - [ ] 1. Permanent Solution with No Conditions.
  - [ ] 2. Permanent Solution with Conditions.
    - [ ] i. An Activity and Use Limitation has been implemented.
    - [ ] ii. An Activity and Use Limitation has not been implemented.
  - [ ] 3. Temporary Solution.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

F. CONTACT INFORMATION RELATING TO THE PARTY PROVIDING THIS NOTICE:

1. Name of Organization: Boston Gas Company d/b/a National Grid
2. Contact First Name: Ken
3. Last Name: Lento
4. Street: 170 Data Drive
5. Title: Project Manager
6. City/Town: Waltham
7. State: MA
8. ZIP Code: 02451-2222
9. Telephone: (781) 663-3123
10. Email: kenneth.lento@nationalgrid.com

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** that when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report **(Section E).** These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup.

For more information regarding this notice, you may contact the party listed in **Section F** of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

October 30, 2025
Project No. 1804576

Donald Kimmence and Dawn Deporter
13620 Robin Ridge Drive
Baton Rouge, LA 70810

Re: Supplemental Phase II Comprehensive Site Assessment Report
Former Amesbury Manufactured Gas Plant,
Amesbury, Massachusetts
MassDEP RTN 3-24070

Dear Donald Kimmence and Dawn Deporter:

GEI Consultants, Inc., on behalf of Boston Gas Company d/b/a National Grid (National Grid), is hereby notifying your office that a Supplemental Phase II Comprehensive Site Assessment (CSA) Report has been prepared for the above-mentioned site. The Supplemental Phase II CSA Report was prepared to meet the requirements presented in the Massachusetts Contingency Plan (MCP) for a Phase II CSA (310 CMR 40.0830). Because you are the owner of a property within the Site, this notification is made in fulfillment of the public notice requirements of the MCP (310 CMR 40.1406(1)). Specifically, your property at 33R Oakland Street is within the Site.

The purpose of the Supplemental Phase II CSA was to determine the extent of Manufactured Gas Plant ("MGP") residuals within the Powwow River and to summarize the additional investigations and analyses performed by GEI on behalf of National Grid since 2017. The findings and conclusions from the Supplemental Phase II CSA are attached in the Executive Summary from the report. The Site boundary is shown in Fig. 1. The Site includes the former Amesbury MGP at 39 Water Street, downstream wetlands, mudflats, and the main channel of the Powwow River, most of which is privately owned. Although property uses vary within the Site, there are no buildings within the Site boundary.

The information in the Supplemental Phase II CSA Report is being used to design, permit, and implement an environmental remedy within the river. In addition, on October 30, 2025, the complete Supplemental Phase II CSA Report was submitted electronically to MassDEP via eDEP, MassDEP's online filing system, and is available online through the eDEP File Viewer at https://eeaonline.eea.state.ma.us/portal/dep/wastesite/ searchable by Release Tracking Number 3-0024070.

Individuals and public offices may request additional public involvement activities under 310 CMR 40.1400. If you have questions concerning this letter, please contact Ken Lento at National Grid at 617.791.2627 or Jim Ash at GEI at 781.721.4018.

Sincerely,

GEI CONSULTANTS, INC.

Ryan S. Hoffman, P.G., LSP
Vice President

James R. Ash, P.E., LSP
Senior Vice President

RSH:jam
B:\Working\NATIONAL GRID\1804576 Amesbury MGP\01_ADMIN\Phase II CSA Suppl\App B - Public Notice Letters\Public Notice Letters_Property Owners.docx

Attachments

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 39 Water Street

2. City/Town: Amesbury 3. ZIP Code: 01913-0000

4. Assessor's Parcel ID: Map 54 Parcel 219

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Donald Kimmence and Dawn Deporter

2. Address of Property For Which This Notice is Being Provided: (property owned by person named in B1)

a. Street Address: 33R Oakland Street

b. City/Town: Amesbury c. ZIP Code: 01913-0000

3. Assessor's Parcel ID: Map 54 Parcel 222Z

C. THIS NOTICE IS BEING GIVEN : (check one)

- [x] 1. Upon Completion of a Phase II Comprehensive Site Assessment.
- [ ] 2. Upon Submittal of a Permanent or Temporary Solution Statement (i.e., Site Closure Report).
- [ ] 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY : (check all that apply)

AFFECTED ENVIRONMENTAL MEDIA	PRINCIPAL CHEMICAL(S) PRESENT
[ ] 1. Soil	
[ ] 2. Groundwater	
[ ] 3. Surface Water	
[x] 4. Sediment	PAHs
[ ] 5. Indoor Air	
[ ] 6. Soil Gas	
[ ] 7. Other: (specify)	

E. ATTACHMENTS PROVIDED WITH THIS NOTICE, AS REQUIRED BY 310 CMR 40.1406:

- [x] 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous Material is or is likely to be Present.
- [x] 2. A Copy of the Phase II Comprehensive Site Assessment or Permanent or Temporary Solution Statement Conclusions.
- [ ] 3. Specify the category of Solution that applies to the Disposal Site.
  - [ ] 1. Permanent Solution with No Conditions.
  - [ ] 2. Permanent Solution with Conditions.
    - [ ] i. An Activity and Use Limitation has been implemented.
    - [ ] ii. An Activity and Use Limitation has not been implemented.
  - [ ] 3. Temporary Solution.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

F. CONTACT INFORMATION RELATING TO THE PARTY PROVIDING THIS NOTICE:

1. Name of Organization: Boston Gas Company d/b/a National Grid
2. Contact First Name: Ken
3. Last Name: Lento
4. Street: 170 Data Drive
5. Title: Project Manager
6. City/Town: Waltham
7. State: MA
8. ZIP Code: 02451-2222
9. Telephone: (781) 663-3123
10. Email: kenneth.lento@nationalgrid.com

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** that when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report **(Section E).** These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup.

For more information regarding this notice, you may contact the party listed in **Section F** of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

October 30, 2025
Project No. 1804576

Rebecca Richter
35 Oakland Street
Amesbury, MA 01913

Re: Supplemental Phase II Comprehensive Site Assessment Report
Former Amesbury Manufactured Gas Plant,
Amesbury, Massachusetts
MassDEP RTN 3-24070

Dear Rebecca Richter:

GEI Consultants, Inc., on behalf of Boston Gas Company d/b/a National Grid (National Grid), is hereby notifying your office that a Supplemental Phase II Comprehensive Site Assessment (CSA) Report has been prepared for the above-mentioned site. The Supplemental Phase II CSA Report was prepared to meet the requirements presented in the Massachusetts Contingency Plan (MCP) for a Phase II CSA (310 CMR 40.0830). Because you are the owner of a property within the Site, this notification is made in fulfillment of the public notice requirements of the MCP (310 CMR 40.1406(1)). Specifically, your property at 35 Oakland Street is within the Site.

The purpose of the Supplemental Phase II CSA was to determine the extent of Manufactured Gas Plant ("MGP") residuals within the Powwow River and to summarize the additional investigations and analyses performed by GEI on behalf of National Grid since 2017. The findings and conclusions from the Supplemental Phase II CSA are attached in the Executive Summary from the report. The Site boundary is shown in Fig. 1. The Site includes the former Amesbury MGP at 39 Water Street, downstream wetlands, mudflats, and the main channel of the Powwow River, most of which is privately owned. Although property uses vary within the Site, there are no buildings within the Site boundary.

The information in the Supplemental Phase II CSA Report is being used to design, permit, and implement an environmental remedy within the river. In addition, on October 30, 2025, the complete Supplemental Phase II CSA Report was submitted electronically to MassDEP via eDEP, MassDEP's online filing system, and is available online through the eDEP File Viewer at https://eeaonline.eea.state.ma.us/portal/dep/wastesite/ searchable by Release Tracking Number 3-0024070.

Individuals and public offices may request additional public involvement activities under 310 CMR 40.1400. If you have questions concerning this letter, please contact Ken Lento at National Grid at 617.791.2627 or Jim Ash at GEI at 781.721.4018.

Sincerely,

GEI CONSULTANTS, INC.

Ryan S. Hoffman, P.G., LSP
Vice President

James R. Ash, P.E., LSP
Senior Vice President

RSH:jam
B:\Working\NATIONAL GRID\1804576 Amesbury MGP\01_ADMIN\Phase II CSA Suppl\App B - Public Notice Letters\Public Notice Letters_Property Owners.docx

Attachments

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 39 Water Street

2. City/Town: Amesbury 3. ZIP Code: 01913-0000

4. Assessor's Parcel ID: Map 54 Parcel 219

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Rebecca Richter

2. Address of Property For Which This Notice is Being Provided: (property owned by person named in B1)

a. Street Address: 35 Oakland Street

b. City/Town: Amesbury c. ZIP Code: 01913-0000

3. Assessor's Parcel ID: Map 54 Parcel 222B

C. THIS NOTICE IS BEING GIVEN : (check one)

- [x] 1. Upon Completion of a Phase II Comprehensive Site Assessment.
- [ ] 2. Upon Submittal of a Permanent or Temporary Solution Statement (i.e., Site Closure Report).
- [ ] 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY : (check all that apply)

AFFECTED ENVIRONMENTAL MEDIA	PRINCIPAL CHEMICAL(S) PRESENT
[ ] 1. Soil	
[ ] 2. Groundwater	
[ ] 3. Surface Water	
[x] 4. Sediment	PAHs
[ ] 5. Indoor Air	
[ ] 6. Soil Gas	
[ ] 7. Other: (specify)	

E. ATTACHMENTS PROVIDED WITH THIS NOTICE, AS REQUIRED BY 310 CMR 40.1406:

- [x] 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous Material is or is likely to be Present.
- [x] 2. A Copy of the Phase II Comprehensive Site Assessment or Permanent or Temporary Solution Statement Conclusions.
- [ ] 3. Specify the category of Solution that applies to the Disposal Site.
  - [ ] 1. Permanent Solution with No Conditions.
  - [ ] 2. Permanent Solution with Conditions.
    - [ ] i. An Activity and Use Limitation has been implemented.
    - [ ] ii. An Activity and Use Limitation has not been implemented.
  - [ ] 3. Temporary Solution.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

F. CONTACT INFORMATION RELATING TO THE PARTY PROVIDING THIS NOTICE:

1. Name of Organization: Boston Gas Company d/b/a National Grid
2. Contact First Name: Ken
3. Last Name: Lento
4. Street: 170 Data Drive
5. Title: Project Manager
6. City/Town: Waltham
7. State: MA
8. ZIP Code: 02451-2222
9. Telephone: (781) 663-3123
10. Email: kenneth.lento@nationalgrid.com

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** that when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report **(Section E).** These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup.

For more information regarding this notice, you may contact the party listed in **Section F** of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

October 30, 2025
Project No. 1804576

Kenneth Hughes
37 Oakland Street
Amesbury, MA 01913

Re: Supplemental Phase II Comprehensive Site Assessment Report
Former Amesbury Manufactured Gas Plant,
Amesbury, Massachusetts
MassDEP RTN 3-24070

Dear Kenneth Hughes:

GEI Consultants, Inc., on behalf of Boston Gas Company d/b/a National Grid (National Grid), is hereby notifying your office that a Supplemental Phase II Comprehensive Site Assessment (CSA) Report has been prepared for the above-mentioned site. The Supplemental Phase II CSA Report was prepared to meet the requirements presented in the Massachusetts Contingency Plan (MCP) for a Phase II CSA (310 CMR 40.0830). Because you are the owner of a property within the Site, this notification is made in fulfillment of the public notice requirements of the MCP (310 CMR 40.1406(1)). Specifically, your property at 37 Oakland Street is within the Site.

The purpose of the Supplemental Phase II CSA was to determine the extent of Manufactured Gas Plant ("MGP") residuals within the Powwow River and to summarize the additional investigations and analyses performed by GEI on behalf of National Grid since 2017. The findings and conclusions from the Supplemental Phase II CSA are attached in the Executive Summary from the report. The Site boundary is shown in Fig. 1. The Site includes the former Amesbury MGP at 39 Water Street, downstream wetlands, mudflats, and the main channel of the Powwow River, most of which is privately owned. Although property uses vary within the Site, there are no buildings within the Site boundary.

The information in the Supplemental Phase II CSA Report is being used to design, permit, and implement an environmental remedy within the river. In addition, on October 30, 2025, the complete Supplemental Phase II CSA Report was submitted electronically to MassDEP via eDEP, MassDEP's online filing system, and is available online through the eDEP File Viewer at https://eeaonline.eea.state.ma.us/portal/dep/wastesite/ searchable by Release Tracking Number 3-0024070.

Individuals and public offices may request additional public involvement activities under 310 CMR 40.1400. If you have questions concerning this letter, please contact Ken Lento at National Grid at 617.791.2627 or Jim Ash at GEI at 781.721.4018.

Sincerely,

GEI CONSULTANTS, INC.

Ryan S. Hoffman, P.G., LSP
Vice President

James R. Ash, P.E., LSP
Senior Vice President

RSH:jam
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Attachments

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 39 Water Street

2. City/Town: Amesbury 3. ZIP Code: 01913-0000

4. Assessor's Parcel ID: Map 54 Parcel 219

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Kenneth Hughes

2. Address of Property For Which This Notice is Being Provided: (property owned by person named in B1)

a. Street Address: 37Oakland Street

b. City/Town: Amesbury c. ZIP Code: 01913-0000

3. Assessor's Parcel ID: Map 54 Parcel 222

C. THIS NOTICE IS BEING GIVEN : (check one)

- [x] 1. Upon Completion of a Phase II Comprehensive Site Assessment.
- [ ] 2. Upon Submittal of a Permanent or Temporary Solution Statement (i.e., Site Closure Report).
- [ ] 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY : (check all that apply)

AFFECTED ENVIRONMENTAL MEDIA	PRINCIPAL CHEMICAL(S) PRESENT
[ ] 1. Soil	
[ ] 2. Groundwater	
[ ] 3. Surface Water	
[x] 4. Sediment	PAHs
[ ] 5. Indoor Air	
[ ] 6. Soil Gas	
[ ] 7. Other: (specify)	

E. ATTACHMENTS PROVIDED WITH THIS NOTICE, AS REQUIRED BY 310 CMR 40.1406:

- [x] 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous Material is or is likely to be Present.
- [x] 2. A Copy of the Phase II Comprehensive Site Assessment or Permanent or Temporary Solution Statement Conclusions.
- [ ] 3. Specify the category of Solution that applies to the Disposal Site.
  - [ ] 1. Permanent Solution with No Conditions.
  - [ ] 2. Permanent Solution with Conditions.
    - [ ] i. An Activity and Use Limitation has been implemented.
    - [ ] ii. An Activity and Use Limitation has not been implemented.
  - [ ] 3. Temporary Solution.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

F. CONTACT INFORMATION RELATING TO THE PARTY PROVIDING THIS NOTICE:

1. Name of Organization: Boston Gas Company d/b/a National Grid
2. Contact First Name: Ken
3. Last Name: Lento
4. Street: 170 Data Drive
5. Title: Project Manager
6. City/Town: Waltham
7. State: MA
8. ZIP Code: 02451-2222
9. Telephone: (781) 663-3123
10. Email: kenneth.lento@nationalgrid.com

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** that when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report **(Section E).** These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup.

For more information regarding this notice, you may contact the party listed in **Section F** of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

October 30, 2025
Project No. 1804576

Michael Smolski
39 Oakland Street
Amesbury, MA 01913

Re: Supplemental Phase II Comprehensive Site Assessment Report
Former Amesbury Manufactured Gas Plant,
Amesbury, Massachusetts
MassDEP RTN 3-24070

Dear Michael Smolski:

GEI Consultants, Inc., on behalf of Boston Gas Company d/b/a National Grid (National Grid), is hereby notifying your office that a Supplemental Phase II Comprehensive Site Assessment (CSA) Report has been prepared for the above-mentioned site. The Supplemental Phase II CSA Report was prepared to meet the requirements presented in the Massachusetts Contingency Plan (MCP) for a Phase II CSA (310 CMR 40.0830). Because you are the owner of a property within the Site, this notification is made in fulfillment of the public notice requirements of the MCP (310 CMR 40.1406(1)). Specifically, your property at 39 Oakland Street is within the Site.

The purpose of the Supplemental Phase II CSA was to determine the extent of Manufactured Gas Plant ("MGP") residuals within the Powwow River and to summarize the additional investigations and analyses performed by GEI on behalf of National Grid since 2017. The findings and conclusions from the Supplemental Phase II CSA are attached in the Executive Summary from the report. The Site boundary is shown in Fig. 1. The Site includes the former Amesbury MGP at 39 Water Street, downstream wetlands, mudflats, and the main channel of the Powwow River, most of which is privately owned. Although property uses vary within the Site, there are no buildings within the Site boundary.

The information in the Supplemental Phase II CSA Report is being used to design, permit, and implement an environmental remedy within the river. In addition, on October 30, 2025, the complete Supplemental Phase II CSA Report was submitted electronically to MassDEP via eDEP, MassDEP's online filing system, and is available online through the eDEP File Viewer at https://eeaonline.eea.state.ma.us/portal/dep/wastesite/ searchable by Release Tracking Number 3-0024070.

Individuals and public offices may request additional public involvement activities under 310 CMR 40.1400. If you have questions concerning this letter, please contact Ken Lento at National Grid at 617.791.2627 or Jim Ash at GEI at 781.721.4018.

Sincerely,

GEI CONSULTANTS, INC.

Ryan S. Hoffman, P.G., LSP
Vice President

James R. Ash, P.E., LSP
Senior Vice President

RSH:jam
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Attachments

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 39 Water Street

2. City/Town: Amesbury 3. ZIP Code: 01913-0000

4. Assessor's Parcel ID: Map 54 Parcel 219

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Michael Smolski

2. Address of Property For Which This Notice is Being Provided: (property owned by person named in B1)

a. Street Address: 39 Oakland Street

b. City/Town: Amesbury c. ZIP Code: 01913-0000

3. Assessor's Parcel ID: Map 54 Parcel 222D

C. THIS NOTICE IS BEING GIVEN : (check one)

- [x] 1. Upon Completion of a Phase II Comprehensive Site Assessment.
- [ ] 2. Upon Submittal of a Permanent or Temporary Solution Statement (i.e., Site Closure Report).
- [ ] 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY : (check all that apply)

AFFECTED ENVIRONMENTAL MEDIA	PRINCIPAL CHEMICAL(S) PRESENT
[ ] 1. Soil	
[ ] 2. Groundwater	
[ ] 3. Surface Water	
[x] 4. Sediment	PAHs
[ ] 5. Indoor Air	
[ ] 6. Soil Gas	
[ ] 7. Other: (specify)	

E. ATTACHMENTS PROVIDED WITH THIS NOTICE, AS REQUIRED BY 310 CMR 40.1406:

- [x] 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous Material is or is likely to be Present.
- [x] 2. A Copy of the Phase II Comprehensive Site Assessment or Permanent or Temporary Solution Statement Conclusions.
- [ ] 3. Specify the category of Solution that applies to the Disposal Site.
  - [ ] 1. Permanent Solution with No Conditions.
  - [ ] 2. Permanent Solution with Conditions.
    - [ ] i. An Activity and Use Limitation has been implemented.
    - [ ] ii. An Activity and Use Limitation has not been implemented.
  - [ ] 3. Temporary Solution.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

F. CONTACT INFORMATION RELATING TO THE PARTY PROVIDING THIS NOTICE:

1. Name of Organization: Boston Gas Company d/b/a National Grid
2. Contact First Name: Ken
3. Last Name: Lento
4. Street: 170 Data Drive
5. Title: Project Manager
6. City/Town: Waltham
7. State: MA
8. ZIP Code: 02451-2222
9. Telephone: (781) 663-3123
10. Email: kenneth.lento@nationalgrid.com

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** that when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report **(Section E).** These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup.

For more information regarding this notice, you may contact the party listed in **Section F** of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

October 30, 2025
Project No. 1804576

Dollard Family Realty Trust
41 Oakland Street
Amesbury, MA 01913

Re: Supplemental Phase II Comprehensive Site Assessment Report
Former Amesbury Manufactured Gas Plant,
Amesbury, Massachusetts
MassDEP RTN 3-24070

Dear Dollard Family Realty Trust:

GEI Consultants, Inc., on behalf of Boston Gas Company d/b/a National Grid (National Grid), is hereby notifying your office that a Supplemental Phase II Comprehensive Site Assessment (CSA) Report has been prepared for the above-mentioned site. The Supplemental Phase II CSA Report was prepared to meet the requirements presented in the Massachusetts Contingency Plan (MCP) for a Phase II CSA (310 CMR 40.0830). Because you are the owner of a property within the Site, this notification is made in fulfillment of the public notice requirements of the MCP (310 CMR 40.1406(1)). Specifically, your property at 41 Oakland Street is within the Site.

The purpose of the Supplemental Phase II CSA was to determine the extent of Manufactured Gas Plant ("MGP") residuals within the Powwow River and to summarize the additional investigations and analyses performed by GEI on behalf of National Grid since 2017. The findings and conclusions from the Supplemental Phase II CSA are attached in the Executive Summary from the report. The Site boundary is shown in Fig. 1. The Site includes the former Amesbury MGP at 39 Water Street, downstream wetlands, mudflats, and the main channel of the Powwow River, most of which is privately owned. Although property uses vary within the Site, there are no buildings within the Site boundary.

The information in the Supplemental Phase II CSA Report is being used to design, permit, and implement an environmental remedy within the river. In addition, on October 30, 2025, the complete Supplemental Phase II CSA Report was submitted electronically to MassDEP via eDEP, MassDEP's online filing system, and is available online through the eDEP File Viewer at https://eeaonline.eea.state.ma.us/portal/dep/wastesite/ searchable by Release Tracking Number 3-0024070.

Individuals and public offices may request additional public involvement activities under 310 CMR 40.1400. If you have questions concerning this letter, please contact Ken Lento at National Grid at 617.791.2627 or Jim Ash at GEI at 781.721.4018.

Sincerely,

GEI CONSULTANTS, INC.

Ryan S. Hoffman, P.G., LSP
Vice President

James R. Ash, P.E., LSP
Senior Vice President

RSH:jam
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Attachments

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 39 Water Street

2. City/Town: Amesbury 3. ZIP Code: 01913-0000

4. Assessor's Parcel ID: Map 54 Parcel 219

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Dollard Family Realty Trust

2. Address of Property For Which This Notice is Being Provided: (property owned by person named in B1)

a. Street Address: 41 Oakland Street

b. City/Town: Amesbury c. ZIP Code: 01913-0000

3. Assessor's Parcel ID: Map 54 Parcel 222E

C. THIS NOTICE IS BEING GIVEN : (check one)

- [x] 1. Upon Completion of a Phase II Comprehensive Site Assessment.
- [ ] 2. Upon Submittal of a Permanent or Temporary Solution Statement (i.e., Site Closure Report).
- [ ] 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY : (check all that apply)

AFFECTED ENVIRONMENTAL MEDIA	PRINCIPAL CHEMICAL(S) PRESENT
[ ] 1. Soil	
[ ] 2. Groundwater	
[ ] 3. Surface Water	
[x] 4. Sediment	PAHs
[ ] 5. Indoor Air	
[ ] 6. Soil Gas	
[ ] 7. Other: (specify)	

E. ATTACHMENTS PROVIDED WITH THIS NOTICE, AS REQUIRED BY 310 CMR 40.1406:

- [x] 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous Material is or is likely to be Present.
- [x] 2. A Copy of the Phase II Comprehensive Site Assessment or Permanent or Temporary Solution Statement Conclusions.
- [ ] 3. Specify the category of Solution that applies to the Disposal Site.
  - [ ] 1. Permanent Solution with No Conditions.
  - [ ] 2. Permanent Solution with Conditions.
    - [ ] i. An Activity and Use Limitation has been implemented.
    - [ ] ii. An Activity and Use Limitation has not been implemented.
  - [ ] 3. Temporary Solution.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

F. CONTACT INFORMATION RELATING TO THE PARTY PROVIDING THIS NOTICE:

1. Name of Organization: Boston Gas Company d/b/a National Grid
2. Contact First Name: Ken
3. Last Name: Lento
4. Street: 170 Data Drive
5. Title: Project Manager
6. City/Town: Waltham
7. State: MA
8. ZIP Code: 02451-2222
9. Telephone: (781) 663-3123
10. Email: kenneth.lento@nationalgrid.com

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** that when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report **(Section E).** These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup.

For more information regarding this notice, you may contact the party listed in **Section F** of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

October 30, 2025
Project No. 1804576

Cara Deshaw and Andre Nicholas
43 Oakland Street
Amesbury, MA 01913

Re: Supplemental Phase II Comprehensive Site Assessment Report
Former Amesbury Manufactured Gas Plant,
Amesbury, Massachusetts
MassDEP RTN 3-24070

Dear Cara Deshaw and Andre Nicholas:

GEI Consultants, Inc., on behalf of Boston Gas Company d/b/a National Grid (National Grid), is hereby notifying your office that a Supplemental Phase II Comprehensive Site Assessment (CSA) Report has been prepared for the above-mentioned site. The Supplemental Phase II CSA Report was prepared to meet the requirements presented in the Massachusetts Contingency Plan (MCP) for a Phase II CSA (310 CMR 40.0830). Because you are the owner of a property within the Site, this notification is made in fulfillment of the public notice requirements of the MCP (310 CMR 40.1406(1)). Specifically, your property at 43 Oakland Street is within the Site.

The purpose of the Supplemental Phase II CSA was to determine the extent of Manufactured Gas Plant ("MGP") residuals within the Powwow River and to summarize the additional investigations and analyses performed by GEI on behalf of National Grid since 2017. The findings and conclusions from the Supplemental Phase II CSA are attached in the Executive Summary from the report. The Site boundary is shown in Fig. 1. The Site includes the former Amesbury MGP at 39 Water Street, downstream wetlands, mudflats, and the main channel of the Powwow River, most of which is privately owned. Although property uses vary within the Site, there are no buildings within the Site boundary.

The information in the Supplemental Phase II CSA Report is being used to design, permit, and implement an environmental remedy within the river. In addition, on October 30, 2025, the complete Supplemental Phase II CSA Report was submitted electronically to MassDEP via eDEP, MassDEP's online filing system, and is available online through the eDEP File Viewer at https://eeaonline.eea.state.ma.us/portal/dep/wastesite/ searchable by Release Tracking Number 3-0024070.

Individuals and public offices may request additional public involvement activities under 310 CMR 40.1400. If you have questions concerning this letter, please contact Ken Lento at National Grid at 617.791.2627 or Jim Ash at GEI at 781.721.4018.

Sincerely,

GEI CONSULTANTS, INC.

Ryan S. Hoffman, P.G., LSP
Vice President

James R. Ash, P.E., LSP
Senior Vice President

RSH:jam
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Attachments

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 39 Water Street

2. City/Town: Amesbury 3. ZIP Code: 01913-0000

4. Assessor's Parcel ID: Map 54 Parcel 219

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Cara Deshaw and Andre Nicholas

2. Address of Property For Which This Notice is Being Provided: (property owned by person named in B1)

a. Street Address: 43 Oakland Street

b. City/Town: Amesbury c. ZIP Code: 01913-0000

3. Assessor's Parcel ID: Map 54 Parcel 222F

C. THIS NOTICE IS BEING GIVEN : (check one)

- [x] 1. Upon Completion of a Phase II Comprehensive Site Assessment.
- [ ] 2. Upon Submittal of a Permanent or Temporary Solution Statement (i.e., Site Closure Report).
- [ ] 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY : (check all that apply)

AFFECTED ENVIRONMENTAL MEDIA	PRINCIPAL CHEMICAL(S) PRESENT
[ ] 1. Soil	
[ ] 2. Groundwater	
[ ] 3. Surface Water	
[x] 4. Sediment	PAHs
[ ] 5. Indoor Air	
[ ] 6. Soil Gas	
[ ] 7. Other: (specify)	

E. ATTACHMENTS PROVIDED WITH THIS NOTICE, AS REQUIRED BY 310 CMR 40.1406:

- [x] 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous Material is or is likely to be Present.
- [x] 2. A Copy of the Phase II Comprehensive Site Assessment or Permanent or Temporary Solution Statement Conclusions.
- [ ] 3. Specify the category of Solution that applies to the Disposal Site.
  - [ ] 1. Permanent Solution with No Conditions.
  - [ ] 2. Permanent Solution with Conditions.
    - [ ] i. An Activity and Use Limitation has been implemented.
    - [ ] ii. An Activity and Use Limitation has not been implemented.
  - [ ] 3. Temporary Solution.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

F. CONTACT INFORMATION RELATING TO THE PARTY PROVIDING THIS NOTICE:

1. Name of Organization: Boston Gas Company d/b/a National Grid
2. Contact First Name: Ken
3. Last Name: Lento
4. Street: 170 Data Drive
5. Title: Project Manager
6. City/Town: Waltham
7. State: MA
8. ZIP Code: 02451-2222
9. Telephone: (781) 663-3123
10. Email: kenneth.lento@nationalgrid.com

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** that when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report **(Section E).** These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup.

For more information regarding this notice, you may contact the party listed in **Section F** of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

October 30, 2025
Project No. 1804576

Brian and Pauline Anderson
4 Oakland Court
Amesbury, MA 01913

Re: Supplemental Phase II Comprehensive Site Assessment Report
Former Amesbury Manufactured Gas Plant,
Amesbury, Massachusetts
MassDEP RTN 3-24070

Dear Brian and Pauline Anderson:

GEI Consultants, Inc., on behalf of Boston Gas Company d/b/a National Grid (National Grid), is hereby notifying your office that a Supplemental Phase II Comprehensive Site Assessment (CSA) Report has been prepared for the above-mentioned site. The Supplemental Phase II CSA Report was prepared to meet the requirements presented in the Massachusetts Contingency Plan (MCP) for a Phase II CSA (310 CMR 40.0830). Because you are the owner of a property within the Site, this notification is made in fulfillment of the public notice requirements of the MCP (310 CMR 40.1406(1)). Specifically, your property at 4 Oakland Court is within the Site.

The purpose of the Supplemental Phase II CSA was to determine the extent of Manufactured Gas Plant ("MGP") residuals within the Powwow River and to summarize the additional investigations and analyses performed by GEI on behalf of National Grid since 2017. The findings and conclusions from the Supplemental Phase II CSA are attached in the Executive Summary from the report. The Site boundary is shown in Fig. 1. The Site includes the former Amesbury MGP at 39 Water Street, downstream wetlands, mudflats, and the main channel of the Powwow River, most of which is privately owned. Although property uses vary within the Site, there are no buildings within the Site boundary.

The information in the Supplemental Phase II CSA Report is being used to design, permit, and implement an environmental remedy within the river. In addition, on October 30, 2025, the complete Supplemental Phase II CSA Report was submitted electronically to MassDEP via eDEP, MassDEP's online filing system, and is available online through the eDEP File Viewer at https://eeaonline.eea.state.ma.us/portal/dep/wastesite/ searchable by Release Tracking Number 3-0024070.

Individuals and public offices may request additional public involvement activities under 310 CMR 40.1400. If you have questions concerning this letter, please contact Ken Lento at National Grid at 617.791.2627 or Jim Ash at GEI at 781.721.4018.

Sincerely,

GEI CONSULTANTS, INC.

Ryan S. Hoffman, P.G., LSP
Vice President

James R. Ash, P.E., LSP
Senior Vice President

RSH:jam
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Attachments

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 39 Water Street

2. City/Town: Amesbury 3. ZIP Code: 01913-0000

4. Assessor's Parcel ID: Map 54 Parcel 219

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Brian and Pauline Anderson

2. Address of Property For Which This Notice is Being Provided: (property owned by person named in B1)

a. Street Address: 4 Oakland Court

b. City/Town: Amesbury c. ZIP Code: 01913-0000

3. Assessor's Parcel ID: Map 54 Parcel 222G

C. THIS NOTICE IS BEING GIVEN : (check one)

- [x] 1. Upon Completion of a Phase II Comprehensive Site Assessment.
- [ ] 2. Upon Submittal of a Permanent or Temporary Solution Statement (i.e., Site Closure Report).
- [ ] 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY : (check all that apply)

AFFECTED ENVIRONMENTAL MEDIA	PRINCIPAL CHEMICAL(S) PRESENT
[ ] 1. Soil	
[ ] 2. Groundwater	
[ ] 3. Surface Water	
[x] 4. Sediment	PAHs
[ ] 5. Indoor Air	
[ ] 6. Soil Gas	
[ ] 7. Other: (specify)	

E. ATTACHMENTS PROVIDED WITH THIS NOTICE, AS REQUIRED BY 310 CMR 40.1406:

- [x] 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous Material is or is likely to be Present.
- [x] 2. A Copy of the Phase II Comprehensive Site Assessment or Permanent or Temporary Solution Statement Conclusions.
- [ ] 3. Specify the category of Solution that applies to the Disposal Site.
  - [ ] 1. Permanent Solution with No Conditions.
  - [ ] 2. Permanent Solution with Conditions.
    - [ ] i. An Activity and Use Limitation has been implemented.
    - [ ] ii. An Activity and Use Limitation has not been implemented.
  - [ ] 3. Temporary Solution.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

F. CONTACT INFORMATION RELATING TO THE PARTY PROVIDING THIS NOTICE:

1. Name of Organization: Boston Gas Company d/b/a National Grid
2. Contact First Name: Ken
3. Last Name: Lento
4. Street: 170 Data Drive
5. Title: Project Manager
6. City/Town: Waltham
7. State: MA
8. ZIP Code: 02451-2222
9. Telephone: (781) 663-3123
10. Email: kenneth.lento@nationalgrid.com

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** that when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report **(Section E).** These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup.

For more information regarding this notice, you may contact the party listed in **Section F** of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

October 30, 2025
Project No. 1804576

Amesbury Riverwalk LLC
PO Box 503
Reading, MA 01867

Re: Supplemental Phase II Comprehensive Site Assessment Report
Former Amesbury Manufactured Gas Plant,
Amesbury, Massachusetts
MassDEP RTN 3-24070

Dear Amesbury Riverwalk LLC:

GEI Consultants, Inc., on behalf of Boston Gas Company d/b/a National Grid (National Grid), is hereby notifying your office that a Supplemental Phase II Comprehensive Site Assessment (CSA) Report has been prepared for the above-mentioned site. The Supplemental Phase II CSA Report was prepared to meet the requirements presented in the Massachusetts Contingency Plan (MCP) for a Phase II CSA (310 CMR 40.0830). Because you are the owner of a property within the Site, this notification is made in fulfillment of the public notice requirements of the MCP (310 CMR 40.1406(1)). Specifically, your property at 24 Oak Street is within the Site.

The purpose of the Supplemental Phase II CSA was to determine the extent of Manufactured Gas Plant ("MGP") residuals within the Powwow River and to summarize the additional investigations and analyses performed by GEI on behalf of National Grid since 2017. The findings and conclusions from the Supplemental Phase II CSA are attached in the Executive Summary from the report. The Site boundary is shown in Fig. 1. The Site includes the former Amesbury MGP at 39 Water Street, downstream wetlands, mudflats, and the main channel of the Powwow River, most of which is privately owned. Although property uses vary within the Site, there are no buildings within the Site boundary.

The information in the Supplemental Phase II CSA Report is being used to design, permit, and implement an environmental remedy within the river. In addition, on October 30, 2025, the complete Supplemental Phase II CSA Report was submitted electronically to MassDEP via eDEP, MassDEP's online filing system, and is available online through the eDEP File Viewer at https://eeaonline.eea.state.ma.us/portal/dep/wastesite/ searchable by Release Tracking Number 3-0024070.

Individuals and public offices may request additional public involvement activities under 310 CMR 40.1400. If you have questions concerning this letter, please contact Ken Lento at National Grid at 617.791.2627 or Jim Ash at GEI at 781.721.4018.

Sincerely,

GEI CONSULTANTS, INC.

Ryan S. Hoffman, P.G., LSP
Vice President

James R. Ash, P.E., LSP
Senior Vice President

RSH:jam
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Attachments

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 39 Water Street

2. City/Town: Amesbury 3. ZIP Code: 01913-0000

4. Assessor's Parcel ID: Map 54 Parcel 219

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Amesbury Riverwalk LLC

2. Address of Property For Which This Notice is Being Provided: (property owned by person named in B1)

a. Street Address: 24 Oak Street

b. City/Town: Amesbury c. ZIP Code: 01913-0000

3. Assessor's Parcel ID: Map 66 Parcel 33

C. THIS NOTICE IS BEING GIVEN : (check one)

- [x] 1. Upon Completion of a Phase II Comprehensive Site Assessment.
- [ ] 2. Upon Submittal of a Permanent or Temporary Solution Statement (i.e., Site Closure Report).
- [ ] 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY : (check all that apply)

AFFECTED ENVIRONMENTAL MEDIA	PRINCIPAL CHEMICAL(S) PRESENT
[ ] 1. Soil	
[ ] 2. Groundwater	
[ ] 3. Surface Water	
[x] 4. Sediment	PAHs
[ ] 5. Indoor Air	
[ ] 6. Soil Gas	
[ ] 7. Other: (specify)	

E. ATTACHMENTS PROVIDED WITH THIS NOTICE, AS REQUIRED BY 310 CMR 40.1406:

- [x] 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous Material is or is likely to be Present.
- [x] 2. A Copy of the Phase II Comprehensive Site Assessment or Permanent or Temporary Solution Statement Conclusions.
- [ ] 3. Specify the category of Solution that applies to the Disposal Site.
  - [ ] 1. Permanent Solution with No Conditions.
  - [ ] 2. Permanent Solution with Conditions.
    - [ ] i. An Activity and Use Limitation has been implemented.
    - [ ] ii. An Activity and Use Limitation has not been implemented.
  - [ ] 3. Temporary Solution.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

F. CONTACT INFORMATION RELATING TO THE PARTY PROVIDING THIS NOTICE:

1. Name of Organization: Boston Gas Company d/b/a National Grid
2. Contact First Name: Ken
3. Last Name: Lento
4. Street: 170 Data Drive
5. Title: Project Manager
6. City/Town: Waltham
7. State: MA
8. ZIP Code: 02451-2222
9. Telephone: (781) 663-3123
10. Email: kenneth.lento@nationalgrid.com

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** that when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report **(Section E).** These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup.

For more information regarding this notice, you may contact the party listed in **Section F** of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

October 30, 2025
Project No. 1804576

Amesbury Riverwalk LLC
1 River Court
Amesbury, MA 01913

Re: Supplemental Phase II Comprehensive Site Assessment Report
Former Amesbury Manufactured Gas Plant,
Amesbury, Massachusetts
MassDEP RTN 3-24070

Dear Amesbury Riverwalk LLC:

GEI Consultants, Inc., on behalf of Boston Gas Company d/b/a National Grid (National Grid), is hereby notifying your office that a Supplemental Phase II Comprehensive Site Assessment (CSA) Report has been prepared for the above-mentioned site. The Supplemental Phase II CSA Report was prepared to meet the requirements presented in the Massachusetts Contingency Plan (MCP) for a Phase II CSA (310 CMR 40.0830). Because you are the owner of a property within the Site, this notification is made in fulfillment of the public notice requirements of the MCP (310 CMR 40.1406(1)). Specifically, your property at 24 Oak Street is within the Site.

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Sincerely,

GEI CONSULTANTS, INC.

Ryan S. Hoffman, P.G., LSP
Vice President

James R. Ash, P.E., LSP
Senior Vice President

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Attachments

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 39 Water Street

2. City/Town: Amesbury 3. ZIP Code: 01913-0000

4. Assessor's Parcel ID: Map 54 Parcel 219

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Amesbury Riverwalk LLC

2. Address of Property For Which This Notice is Being Provided: (property owned by person named in B1)

a. Street Address: 24 Oak Street

b. City/Town: Amesbury c. ZIP Code: 01913-0000

3. Assessor's Parcel ID: Map 66 Parcel 33

C. THIS NOTICE IS BEING GIVEN : (check one)

- [x] 1. Upon Completion of a Phase II Comprehensive Site Assessment.
- [ ] 2. Upon Submittal of a Permanent or Temporary Solution Statement (i.e., Site Closure Report).
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D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY : (check all that apply)

AFFECTED ENVIRONMENTAL MEDIA	PRINCIPAL CHEMICAL(S) PRESENT
[ ] 1. Soil	
[ ] 2. Groundwater	
[ ] 3. Surface Water	
[x] 4. Sediment	PAHs
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[ ] 6. Soil Gas	
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E. ATTACHMENTS PROVIDED WITH THIS NOTICE, AS REQUIRED BY 310 CMR 40.1406:

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- [x] 2. A Copy of the Phase II Comprehensive Site Assessment or Permanent or Temporary Solution Statement Conclusions.
- [ ] 3. Specify the category of Solution that applies to the Disposal Site.
  - [ ] 1. Permanent Solution with No Conditions.
  - [ ] 2. Permanent Solution with Conditions.
    - [ ] i. An Activity and Use Limitation has been implemented.
    - [ ] ii. An Activity and Use Limitation has not been implemented.
  - [ ] 3. Temporary Solution.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

F. CONTACT INFORMATION RELATING TO THE PARTY PROVIDING THIS NOTICE:

1. Name of Organization: Boston Gas Company d/b/a National Grid
2. Contact First Name: Ken
3. Last Name: Lento
4. Street: 170 Data Drive
5. Title: Project Manager
6. City/Town: Waltham
7. State: MA
8. ZIP Code: 02451-2222
9. Telephone: (781) 663-3123
10. Email: kenneth.lento@nationalgrid.com

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** that when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report **(Section E).** These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup.

For more information regarding this notice, you may contact the party listed in **Section F** of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

October 30, 2025
Project No. 1804576

Mass Electric Co.
National Grid Property Tax Department
170 Data Drive
Waltham, MA 02451

Re: Supplemental Phase II Comprehensive Site Assessment Report
Former Amesbury Manufactured Gas Plant,
Amesbury, Massachusetts
MassDEP RTN 3-24070

Dear Mass Electric Co.:

GEI Consultants, Inc., on behalf of Boston Gas Company d/b/a National Grid (National Grid), is hereby notifying your office that a Supplemental Phase II Comprehensive Site Assessment (CSA) Report has been prepared for the above-mentioned site. The Supplemental Phase II CSA Report was prepared to meet the requirements presented in the Massachusetts Contingency Plan (MCP) for a Phase II CSA (310 CMR 40.0830). Because you are the owner of a property within the Site, this notification is made in fulfillment of the public notice requirements of the MCP (310 CMR 40.1406(1)). Specifically, your property at 26 Oak Street is within the Site.

The purpose of the Supplemental Phase II CSA was to determine the extent of Manufactured Gas Plant ("MGP") residuals within the Powwow River and to summarize the additional investigations and analyses performed by GEI on behalf of National Grid since 2017. The findings and conclusions from the Supplemental Phase II CSA are attached in the Executive Summary from the report. The Site boundary is shown in Fig. 1. The Site includes the former Amesbury MGP at 39 Water Street, downstream wetlands, mudflats, and the main channel of the Powwow River, most of which is privately owned. Although property uses vary within the Site, there are no buildings within the Site boundary.

The information in the Supplemental Phase II CSA Report is being used to design, permit, and implement an environmental remedy within the river. In addition, on October 30, 2025, the complete Supplemental Phase II CSA Report was submitted electronically to MassDEP via eDEP, MassDEP's online filing system, and is available online through the eDEP File Viewer at https://eeaonline.eea.state.ma.us/portal/dep/wastesite/ searchable by Release Tracking Number 3-0024070.

Individuals and public offices may request additional public involvement activities under 310 CMR 40.1400. If you have questions concerning this letter, please contact Ken Lento at National Grid at 617.791.2627 or Jim Ash at GEI at 781.721.4018.

Sincerely,

GEI CONSULTANTS, INC.

Ryan S. Hoffman, P.G., LSP
Vice President

James R. Ash, P.E., LSP
Senior Vice President

RSH:jam
B:\Working\NATIONAL GRID\1804576 Amesbury MGP\01_ADMIN\Phase II CSA Suppl\App B - Public Notice Letters\Public Notice Letters_Property Owners.docx

Attachments

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 39 Water Street

2. City/Town: Amesbury 3. ZIP Code: 01913-0000

4. Assessor's Parcel ID: Map 54 Parcel 219

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Mass Electric Co.

2. Address of Property For Which This Notice is Being Provided: (property owned by person named in B1)

a. Street Address: 26 Oak Street

b. City/Town: Amesbury c. ZIP Code: 01913-0000

3. Assessor's Parcel ID: Map 66 Parcel 32

C. THIS NOTICE IS BEING GIVEN : (check one)

- [x] 1. Upon Completion of a Phase II Comprehensive Site Assessment.
- [ ] 2. Upon Submittal of a Permanent or Temporary Solution Statement (i.e., Site Closure Report).
- [ ] 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY : (check all that apply)

AFFECTED ENVIRONMENTAL MEDIA	PRINCIPAL CHEMICAL(S) PRESENT
[ ] 1. Soil	
[ ] 2. Groundwater	
[ ] 3. Surface Water	
[x] 4. Sediment	PAHs
[ ] 5. Indoor Air	
[ ] 6. Soil Gas	
[ ] 7. Other: (specify)	

E. ATTACHMENTS PROVIDED WITH THIS NOTICE, AS REQUIRED BY 310 CMR 40.1406:

- [x] 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous Material is or is likely to be Present.
- [x] 2. A Copy of the Phase II Comprehensive Site Assessment or Permanent or Temporary Solution Statement Conclusions.
- [ ] 3. Specify the category of Solution that applies to the Disposal Site.
  - [ ] 1. Permanent Solution with No Conditions.
  - [ ] 2. Permanent Solution with Conditions.
    - [ ] i. An Activity and Use Limitation has been implemented.
    - [ ] ii. An Activity and Use Limitation has not been implemented.
  - [ ] 3. Temporary Solution.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

F. CONTACT INFORMATION RELATING TO THE PARTY PROVIDING THIS NOTICE:

1. Name of Organization: Boston Gas Company d/b/a National Grid
2. Contact First Name: Ken
3. Last Name: Lento
4. Street: 170 Data Drive
5. Title: Project Manager
6. City/Town: Waltham
7. State: MA
8. ZIP Code: 02451-2222
9. Telephone: (781) 663-3123
10. Email: kenneth.lento@nationalgrid.com

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** that when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report **(Section E).** These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup.

For more information regarding this notice, you may contact the party listed in **Section F** of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

October 30, 2025
Project No. 1804576

Mass Electric Co.
National Grid Property Tax Department
170 Data Drive
Waltham, MA 02451

Re: Supplemental Phase II Comprehensive Site Assessment Report
Former Amesbury Manufactured Gas Plant,
Amesbury, Massachusetts
MassDEP RTN 3-24070

Dear Mass Electric Co.:

GEI Consultants, Inc., on behalf of Boston Gas Company d/b/a National Grid (National Grid), is hereby notifying your office that a Supplemental Phase II Comprehensive Site Assessment (CSA) Report has been prepared for the above-mentioned site. The Supplemental Phase II CSA Report was prepared to meet the requirements presented in the Massachusetts Contingency Plan (MCP) for a Phase II CSA (310 CMR 40.0830). Because you are the owner of a property within the Site, this notification is made in fulfillment of the public notice requirements of the MCP (310 CMR 40.1406(1)). Specifically, your property at 28 Oak Street is within the Site.

The purpose of the Supplemental Phase II CSA was to determine the extent of Manufactured Gas Plant ("MGP") residuals within the Powwow River and to summarize the additional investigations and analyses performed by GEI on behalf of National Grid since 2017. The findings and conclusions from the Supplemental Phase II CSA are attached in the Executive Summary from the report. The Site boundary is shown in Fig. 1. The Site includes the former Amesbury MGP at 39 Water Street, downstream wetlands, mudflats, and the main channel of the Powwow River, most of which is privately owned. Although property uses vary within the Site, there are no buildings within the Site boundary.

The information in the Supplemental Phase II CSA Report is being used to design, permit, and implement an environmental remedy within the river. In addition, on October 30, 2025, the complete Supplemental Phase II CSA Report was submitted electronically to MassDEP via eDEP, MassDEP's online filing system, and is available online through the eDEP File Viewer at https://eeaonline.eea.state.ma.us/portal/dep/wastesite/ searchable by Release Tracking Number 3-0024070.

Individuals and public offices may request additional public involvement activities under 310 CMR 40.1400. If you have questions concerning this letter, please contact Ken Lento at National Grid at 617.791.2627 or Jim Ash at GEI at 781.721.4018.

Sincerely,

GEI CONSULTANTS, INC.

Ryan S. Hoffman, P.G., LSP
Vice President

James R. Ash, P.E., LSP
Senior Vice President

RSH:jam
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Attachments

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 39 Water Street

2. City/Town: Amesbury 3. ZIP Code: 01913-0000

4. Assessor's Parcel ID: Map 54 Parcel 219

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Mass Electric Co.

2. Address of Property For Which This Notice is Being Provided: (property owned by person named in B1)

a. Street Address: 28 Oak Street

b. City/Town: Amesbury c. ZIP Code: 01913-0000

3. Assessor's Parcel ID: Map 66 Parcel 53

C. THIS NOTICE IS BEING GIVEN : (check one)

- [x] 1. Upon Completion of a Phase II Comprehensive Site Assessment.
- [ ] 2. Upon Submittal of a Permanent or Temporary Solution Statement (i.e., Site Closure Report).
- [ ] 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY : (check all that apply)

AFFECTED ENVIRONMENTAL MEDIA	PRINCIPAL CHEMICAL(S) PRESENT
[ ] 1. Soil	
[ ] 2. Groundwater	
[ ] 3. Surface Water	
[x] 4. Sediment	PAHs
[ ] 5. Indoor Air	
[ ] 6. Soil Gas	
[ ] 7. Other: (specify)	

E. ATTACHMENTS PROVIDED WITH THIS NOTICE, AS REQUIRED BY 310 CMR 40.1406:

- [x] 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous Material is or is likely to be Present.
- [x] 2. A Copy of the Phase II Comprehensive Site Assessment or Permanent or Temporary Solution Statement Conclusions.
- [ ] 3. Specify the category of Solution that applies to the Disposal Site.
  - [ ] 1. Permanent Solution with No Conditions.
  - [ ] 2. Permanent Solution with Conditions.
    - [ ] i. An Activity and Use Limitation has been implemented.
    - [ ] ii. An Activity and Use Limitation has not been implemented.
  - [ ] 3. Temporary Solution.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

F. CONTACT INFORMATION RELATING TO THE PARTY PROVIDING THIS NOTICE:

1. Name of Organization: Boston Gas Company d/b/a National Grid
2. Contact First Name: Ken
3. Last Name: Lento
4. Street: 170 Data Drive
5. Title: Project Manager
6. City/Town: Waltham
7. State: MA
8. ZIP Code: 02451-2222
9. Telephone: (781) 663-3123
10. Email: kenneth.lento@nationalgrid.com

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** that when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report **(Section E).** These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup.

For more information regarding this notice, you may contact the party listed in **Section F** of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

October 30, 2025
Project No. 1804576

Coastal Connections, Inc.
4 Noel Street
Amesbury, MA 01913

Re: Supplemental Phase II Comprehensive Site Assessment Report
Former Amesbury Manufactured Gas Plant,
Amesbury, Massachusetts
MassDEP RTN 3-24070

Dear Coastal Connections, Inc.:

GEI Consultants, Inc., on behalf of Boston Gas Company d/b/a National Grid (National Grid), is hereby notifying your office that a Supplemental Phase II Comprehensive Site Assessment (CSA) Report has been prepared for the above-mentioned site. The Supplemental Phase II CSA Report was prepared to meet the requirements presented in the Massachusetts Contingency Plan (MCP) for a Phase II CSA (310 CMR 40.0830). Because you are the owner of a property within the Site, this notification is made in fulfillment of the public notice requirements of the MCP (310 CMR 40.1406(1)). Specifically, your property at 8 Noel Street is within the Site.

The purpose of the Supplemental Phase II CSA was to determine the extent of Manufactured Gas Plant ("MGP") residuals within the Powwow River and to summarize the additional investigations and analyses performed by GEI on behalf of National Grid since 2017. The findings and conclusions from the Supplemental Phase II CSA are attached in the Executive Summary from the report. The Site boundary is shown in Fig. 1. The Site includes the former Amesbury MGP at 39 Water Street, downstream wetlands, mudflats, and the main channel of the Powwow River, most of which is privately owned. Although property uses vary within the Site, there are no buildings within the Site boundary.

The information in the Supplemental Phase II CSA Report is being used to design, permit, and implement an environmental remedy within the river. In addition, on October 30, 2025, the complete Supplemental Phase II CSA Report was submitted electronically to MassDEP via eDEP, MassDEP's online filing system, and is available online through the eDEP File Viewer at https://eeaonline.eea.state.ma.us/portal/dep/wastesite/ searchable by Release Tracking Number 3-0024070.

Individuals and public offices may request additional public involvement activities under 310 CMR 40.1400. If you have questions concerning this letter, please contact Ken Lento at National Grid at 617.791.2627 or Jim Ash at GEI at 781.721.4018.

Sincerely,

GEI CONSULTANTS, INC.

Ryan S. Hoffman, P.G., LSP
Vice President

James R. Ash, P.E., LSP
Senior Vice President

RSH:jam
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Attachments

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 39 Water Street

2. City/Town: Amesbury 3. ZIP Code: 01913-0000

4. Assessor's Parcel ID: Map 54 Parcel 219

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Coastal Connections, Inc.

2. Address of Property For Which This Notice is Being Provided: (property owned by person named in B1)

a. Street Address: 8 Noel Street

b. City/Town: Amesbury c. ZIP Code: 01913-0000

3. Assessor's Parcel ID: Map 65 Parcel 87

C. THIS NOTICE IS BEING GIVEN : (check one)

- [x] 1. Upon Completion of a Phase II Comprehensive Site Assessment.
- [ ] 2. Upon Submittal of a Permanent or Temporary Solution Statement (i.e., Site Closure Report).
- [ ] 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY : (check all that apply)

AFFECTED ENVIRONMENTAL MEDIA	PRINCIPAL CHEMICAL(S) PRESENT
[ ] 1. Soil	
[ ] 2. Groundwater	
[ ] 3. Surface Water	
[x] 4. Sediment	PAHs
[ ] 5. Indoor Air	
[ ] 6. Soil Gas	
[ ] 7. Other: (specify)	

E. ATTACHMENTS PROVIDED WITH THIS NOTICE, AS REQUIRED BY 310 CMR 40.1406:

- [x] 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous Material is or is likely to be Present.
- [x] 2. A Copy of the Phase II Comprehensive Site Assessment or Permanent or Temporary Solution Statement Conclusions.
- [ ] 3. Specify the category of Solution that applies to the Disposal Site.
  - [ ] 1. Permanent Solution with No Conditions.
  - [ ] 2. Permanent Solution with Conditions.
    - [ ] i. An Activity and Use Limitation has been implemented.
    - [ ] ii. An Activity and Use Limitation has not been implemented.
  - [ ] 3. Temporary Solution.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

F. CONTACT INFORMATION RELATING TO THE PARTY PROVIDING THIS NOTICE:

1. Name of Organization: Boston Gas Company d/b/a National Grid
2. Contact First Name: Ken
3. Last Name: Lento
4. Street: 170 Data Drive
5. Title: Project Manager
6. City/Town: Waltham
7. State: MA
8. ZIP Code: 02451-2222
9. Telephone: (781) 663-3123
10. Email: kenneth.lento@nationalgrid.com

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** that when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report **(Section E).** These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup.

For more information regarding this notice, you may contact the party listed in **Section F** of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

October 30, 2025
Project No. 1804576

Carla Anne Palermo
6 River Street
Amesbury, MA 01913

Re: Supplemental Phase II Comprehensive Site Assessment Report
Former Amesbury Manufactured Gas Plant,
Amesbury, Massachusetts
MassDEP RTN 3-24070

Dear Carla Anne Palermo:

GEI Consultants, Inc., on behalf of Boston Gas Company d/b/a National Grid (National Grid), is hereby notifying your office that a Supplemental Phase II Comprehensive Site Assessment (CSA) Report has been prepared for the above-mentioned site. The Supplemental Phase II CSA Report was prepared to meet the requirements presented in the Massachusetts Contingency Plan (MCP) for a Phase II CSA (310 CMR 40.0830). Because you are the owner of a property within the Site, this notification is made in fulfillment of the public notice requirements of the MCP (310 CMR 40.1406(1)). Specifically, your property at 3 River Street is within the Site.

The purpose of the Supplemental Phase II CSA was to determine the extent of Manufactured Gas Plant ("MGP") residuals within the Powwow River and to summarize the additional investigations and analyses performed by GEI on behalf of National Grid since 2017. The findings and conclusions from the Supplemental Phase II CSA are attached in the Executive Summary from the report. The Site boundary is shown in Fig. 1. The Site includes the former Amesbury MGP at 39 Water Street, downstream wetlands, mudflats, and the main channel of the Powwow River, most of which is privately owned. Although property uses vary within the Site, there are no buildings within the Site boundary.

The information in the Supplemental Phase II CSA Report is being used to design, permit, and implement an environmental remedy within the river. In addition, on October 30, 2025, the complete Supplemental Phase II CSA Report was submitted electronically to MassDEP via eDEP, MassDEP's online filing system, and is available online through the eDEP File Viewer at https://eeaonline.eea.state.ma.us/portal/dep/wastesite/ searchable by Release Tracking Number 3-0024070.

Individuals and public offices may request additional public involvement activities under 310 CMR 40.1400. If you have questions concerning this letter, please contact Ken Lento at National Grid at 617.791.2627 or Jim Ash at GEI at 781.721.4018.

Sincerely,

GEI CONSULTANTS, INC.

Ryan S. Hoffman, P.G., LSP
Vice President

James R. Ash, P.E., LSP
Senior Vice President

RSH:jam
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Attachments

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 39 Water Street

2. City/Town: Amesbury 3. ZIP Code: 01913-0000

4. Assessor's Parcel ID: Map 54 Parcel 219

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Carla Anne Palermo

2. Address of Property For Which This Notice is Being Provided: (property owned by person named in B1)

a. Street Address: 3 River Street

b. City/Town: Amesbury c. ZIP Code: 01913-0000

3. Assessor's Parcel ID: Map 6 Parcel 1

C. THIS NOTICE IS BEING GIVEN : (check one)

- [x] 1. Upon Completion of a Phase II Comprehensive Site Assessment.
- [ ] 2. Upon Submittal of a Permanent or Temporary Solution Statement (i.e., Site Closure Report).
- [ ] 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY : (check all that apply)

AFFECTED ENVIRONMENTAL MEDIA	PRINCIPAL CHEMICAL(S) PRESENT
[ ] 1. Soil	
[ ] 2. Groundwater	
[ ] 3. Surface Water	
[x] 4. Sediment	PAHs
[ ] 5. Indoor Air	
[ ] 6. Soil Gas	
[ ] 7. Other: (specify)	

E. ATTACHMENTS PROVIDED WITH THIS NOTICE, AS REQUIRED BY 310 CMR 40.1406:

- [x] 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous Material is or is likely to be Present.
- [x] 2. A Copy of the Phase II Comprehensive Site Assessment or Permanent or Temporary Solution Statement Conclusions.
- [ ] 3. Specify the category of Solution that applies to the Disposal Site.
  - [ ] 1. Permanent Solution with No Conditions.
  - [ ] 2. Permanent Solution with Conditions.
    - [ ] i. An Activity and Use Limitation has been implemented.
    - [ ] ii. An Activity and Use Limitation has not been implemented.
  - [ ] 3. Temporary Solution.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

F. CONTACT INFORMATION RELATING TO THE PARTY PROVIDING THIS NOTICE:

1. Name of Organization: Boston Gas Company d/b/a National Grid
2. Contact First Name: Ken
3. Last Name: Lento
4. Street: 170 Data Drive
5. Title: Project Manager
6. City/Town: Waltham
7. State: MA
8. ZIP Code: 02451-2222
9. Telephone: (781) 663-3123
10. Email: kenneth.lento@nationalgrid.com

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** that when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report **(Section E).** These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup.

For more information regarding this notice, you may contact the party listed in **Section F** of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

October 30, 2025
Project No. 1804576

River Lane Realty, LLC
23 Noel Street
Amesbury, MA 01913

Re: Supplemental Phase II Comprehensive Site Assessment Report
Former Amesbury Manufactured Gas Plant,
Amesbury, Massachusetts
MassDEP RTN 3-24070

Dear River Lane Realty, LLC:

GEI Consultants, Inc., on behalf of Boston Gas Company d/b/a National Grid (National Grid), is hereby notifying your office that a Supplemental Phase II Comprehensive Site Assessment (CSA) Report has been prepared for the above-mentioned site. The Supplemental Phase II CSA Report was prepared to meet the requirements presented in the Massachusetts Contingency Plan (MCP) for a Phase II CSA (310 CMR 40.0830). Because you are the owner of a property within the Site, this notification is made in fulfillment of the public notice requirements of the MCP (310 CMR 40.1406(1)). Specifically, your property at 7 Noel Street is within the Site.

The purpose of the Supplemental Phase II CSA was to determine the extent of Manufactured Gas Plant ("MGP") residuals within the Powwow River and to summarize the additional investigations and analyses performed by GEI on behalf of National Grid since 2017. The findings and conclusions from the Supplemental Phase II CSA are attached in the Executive Summary from the report. The Site boundary is shown in Fig. 1. The Site includes the former Amesbury MGP at 39 Water Street, downstream wetlands, mudflats, and the main channel of the Powwow River, most of which is privately owned. Although property uses vary within the Site, there are no buildings within the Site boundary.

The information in the Supplemental Phase II CSA Report is being used to design, permit, and implement an environmental remedy within the river. In addition, on October 30, 2025, the complete Supplemental Phase II CSA Report was submitted electronically to MassDEP via eDEP, MassDEP's online filing system, and is available online through the eDEP File Viewer at https://eeaonline.eea.state.ma.us/portal/dep/wastesite/ searchable by Release Tracking Number 3-0024070.

Individuals and public offices may request additional public involvement activities under 310 CMR 40.1400. If you have questions concerning this letter, please contact Ken Lento at National Grid at 617.791.2627 or Jim Ash at GEI at 781.721.4018.

Sincerely,

GEI CONSULTANTS, INC.

Ryan S. Hoffman, P.G., LSP
Vice President

James R. Ash, P.E., LSP
Senior Vice President

RSH:jam
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Attachments

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 39 Water Street

2. City/Town: Amesbury 3. ZIP Code: 01913-0000

4. Assessor's Parcel ID: Map 54 Parcel 219

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: River Lane Realty, LLC

2. Address of Property For Which This Notice is Being Provided: (property owned by person named in B1)

a. Street Address: 7 Noel Street

b. City/Town: Amesbury c. ZIP Code: 01913-0000

3. Assessor's Parcel ID: Map 65 Parcel 82

C. THIS NOTICE IS BEING GIVEN : (check one)

- [x] 1. Upon Completion of a Phase II Comprehensive Site Assessment.
- [ ] 2. Upon Submittal of a Permanent or Temporary Solution Statement (i.e., Site Closure Report).
- [ ] 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY : (check all that apply)

AFFECTED ENVIRONMENTAL MEDIA	PRINCIPAL CHEMICAL(S) PRESENT
[ ] 1. Soil	
[ ] 2. Groundwater	
[ ] 3. Surface Water	
[x] 4. Sediment	PAHs
[ ] 5. Indoor Air	
[ ] 6. Soil Gas	
[ ] 7. Other: (specify)	

E. ATTACHMENTS PROVIDED WITH THIS NOTICE, AS REQUIRED BY 310 CMR 40.1406:

- [x] 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous Material is or is likely to be Present.
- [x] 2. A Copy of the Phase II Comprehensive Site Assessment or Permanent or Temporary Solution Statement Conclusions.
- [ ] 3. Specify the category of Solution that applies to the Disposal Site.
  - [ ] 1. Permanent Solution with No Conditions.
  - [ ] 2. Permanent Solution with Conditions.
    - [ ] i. An Activity and Use Limitation has been implemented.
    - [ ] ii. An Activity and Use Limitation has not been implemented.
  - [ ] 3. Temporary Solution.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

F. CONTACT INFORMATION RELATING TO THE PARTY PROVIDING THIS NOTICE:

1. Name of Organization: Boston Gas Company d/b/a National Grid
2. Contact First Name: Ken
3. Last Name: Lento
4. Street: 170 Data Drive
5. Title: Project Manager
6. City/Town: Waltham
7. State: MA
8. ZIP Code: 02451-2222
9. Telephone: (781) 663-3123
10. Email: kenneth.lento@nationalgrid.com

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** that when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report **(Section E).** These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup.

For more information regarding this notice, you may contact the party listed in **Section F** of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

October 30, 2025
Project No. 1804576

Rebecca and Chad Ropp
11 River Street
Amesbury, MA 01913

Re: Supplemental Phase II Comprehensive Site Assessment Report
Former Amesbury Manufactured Gas Plant,
Amesbury, Massachusetts
MassDEP RTN 3-24070

Dear Rebecca and Chad Ropp:

GEI Consultants, Inc., on behalf of Boston Gas Company d/b/a National Grid (National Grid), is hereby notifying your office that a Supplemental Phase II Comprehensive Site Assessment (CSA) Report has been prepared for the above-mentioned site. The Supplemental Phase II CSA Report was prepared to meet the requirements presented in the Massachusetts Contingency Plan (MCP) for a Phase II CSA (310 CMR 40.0830). Because you are the owner of a property within the Site, this notification is made in fulfillment of the public notice requirements of the MCP (310 CMR 40.1406(1)). Specifically, your property at 11R River Street is within the Site.

The purpose of the Supplemental Phase II CSA was to determine the extent of Manufactured Gas Plant ("MGP") residuals within the Powwow River and to summarize the additional investigations and analyses performed by GEI on behalf of National Grid since 2017. The findings and conclusions from the Supplemental Phase II CSA are attached in the Executive Summary from the report. The Site boundary is shown in Fig. 1. The Site includes the former Amesbury MGP at 39 Water Street, downstream wetlands, mudflats, and the main channel of the Powwow River, most of which is privately owned. Although property uses vary within the Site, there are no buildings within the Site boundary.

The information in the Supplemental Phase II CSA Report is being used to design, permit, and implement an environmental remedy within the river. In addition, on October 30, 2025, the complete Supplemental Phase II CSA Report was submitted electronically to MassDEP via eDEP, MassDEP's online filing system, and is available online through the eDEP File Viewer at https://eeaonline.eea.state.ma.us/portal/dep/wastesite/ searchable by Release Tracking Number 3-0024070.

Individuals and public offices may request additional public involvement activities under 310 CMR 40.1400. If you have questions concerning this letter, please contact Ken Lento at National Grid at 617.791.2627 or Jim Ash at GEI at 781.721.4018.

Sincerely,

GEI CONSULTANTS, INC.

Ryan S. Hoffman, P.G., LSP
Vice President

James R. Ash, P.E., LSP
Senior Vice President

RSH:jam
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Attachments

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 39 Water Street

2. City/Town: Amesbury 3. ZIP Code: 01913-0000

4. Assessor's Parcel ID: Map 54 Parcel 219

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Rebecca and Chad Ropp

2. Address of Property For Which This Notice is Being Provided: (property owned by person named in B1)

a. Street Address: 11R River Street

b. City/Town: Amesbury c. ZIP Code: 01913-0000

3. Assessor's Parcel ID: Map 66 Parcel 5

C. THIS NOTICE IS BEING GIVEN : (check one)

- [x] 1. Upon Completion of a Phase II Comprehensive Site Assessment.
- [ ] 2. Upon Submittal of a Permanent or Temporary Solution Statement (i.e., Site Closure Report).
- [ ] 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY : (check all that apply)

AFFECTED ENVIRONMENTAL MEDIA	PRINCIPAL CHEMICAL(S) PRESENT
[ ] 1. Soil	
[ ] 2. Groundwater	
[ ] 3. Surface Water	
[x] 4. Sediment	PAHs
[ ] 5. Indoor Air	
[ ] 6. Soil Gas	
[ ] 7. Other: (specify)	

E. ATTACHMENTS PROVIDED WITH THIS NOTICE, AS REQUIRED BY 310 CMR 40.1406:

- [x] 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous Material is or is likely to be Present.
- [x] 2. A Copy of the Phase II Comprehensive Site Assessment or Permanent or Temporary Solution Statement Conclusions.
- [ ] 3. Specify the category of Solution that applies to the Disposal Site.
  - [ ] 1. Permanent Solution with No Conditions.
  - [ ] 2. Permanent Solution with Conditions.
    - [ ] i. An Activity and Use Limitation has been implemented.
    - [ ] ii. An Activity and Use Limitation has not been implemented.
  - [ ] 3. Temporary Solution.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

F. CONTACT INFORMATION RELATING TO THE PARTY PROVIDING THIS NOTICE:

1. Name of Organization: Boston Gas Company d/b/a National Grid
2. Contact First Name: Ken
3. Last Name: Lento
4. Street: 170 Data Drive
5. Title: Project Manager
6. City/Town: Waltham
7. State: MA
8. ZIP Code: 02451-2222
9. Telephone: (781) 663-3123
10. Email: kenneth.lento@nationalgrid.com

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** that when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report **(Section E).** These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup.

For more information regarding this notice, you may contact the party listed in **Section F** of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

October 30, 2025
Project No. 1804576

Kenneth Perrigo
23 River Street
Amesbury, MA 01913

Re: Supplemental Phase II Comprehensive Site Assessment Report
Former Amesbury Manufactured Gas Plant,
Amesbury, Massachusetts
MassDEP RTN 3-24070

Dear Kenneth Perrigo:

GEI Consultants, Inc., on behalf of Boston Gas Company d/b/a National Grid (National Grid), is hereby notifying your office that a Supplemental Phase II Comprehensive Site Assessment (CSA) Report has been prepared for the above-mentioned site. The Supplemental Phase II CSA Report was prepared to meet the requirements presented in the Massachusetts Contingency Plan (MCP) for a Phase II CSA (310 CMR 40.0830). Because you are the owner of a property within the Site, this notification is made in fulfillment of the public notice requirements of the MCP (310 CMR 40.1406(1)). Specifically, your property at 23R River Street is within the Site.

The purpose of the Supplemental Phase II CSA was to determine the extent of Manufactured Gas Plant ("MGP") residuals within the Powwow River and to summarize the additional investigations and analyses performed by GEI on behalf of National Grid since 2017. The findings and conclusions from the Supplemental Phase II CSA are attached in the Executive Summary from the report. The Site boundary is shown in Fig. 1. The Site includes the former Amesbury MGP at 39 Water Street, downstream wetlands, mudflats, and the main channel of the Powwow River, most of which is privately owned. Although property uses vary within the Site, there are no buildings within the Site boundary.

The information in the Supplemental Phase II CSA Report is being used to design, permit, and implement an environmental remedy within the river. In addition, on October 30, 2025, the complete Supplemental Phase II CSA Report was submitted electronically to MassDEP via eDEP, MassDEP's online filing system, and is available online through the eDEP File Viewer at https://eeaonline.eea.state.ma.us/portal/dep/wastesite/ searchable by Release Tracking Number 3-0024070.

Individuals and public offices may request additional public involvement activities under 310 CMR 40.1400. If you have questions concerning this letter, please contact Ken Lento at National Grid at 617.791.2627 or Jim Ash at GEI at 781.721.4018.

Sincerely,

GEI CONSULTANTS, INC.

Ryan S. Hoffman, P.G., LSP
Vice President

James R. Ash, P.E., LSP
Senior Vice President

RSH:jam
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Attachments

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 39 Water Street

2. City/Town: Amesbury 3. ZIP Code: 01913-0000

4. Assessor's Parcel ID: Map 54 Parcel 219

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Kenneth Perrigo

2. Address of Property For Which This Notice is Being Provided: (property owned by person named in B1)

a. Street Address: 23R River Street

b. City/Town: Amesbury c. ZIP Code: 01913-0000

3. Assessor's Parcel ID: Map 66 Parcel 10A

C. THIS NOTICE IS BEING GIVEN : (check one)

- [x] 1. Upon Completion of a Phase II Comprehensive Site Assessment.
- [ ] 2. Upon Submittal of a Permanent or Temporary Solution Statement (i.e., Site Closure Report).
- [ ] 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY : (check all that apply)

AFFECTED ENVIRONMENTAL MEDIA	PRINCIPAL CHEMICAL(S) PRESENT
[ ] 1. Soil	
[ ] 2. Groundwater	
[ ] 3. Surface Water	
[x] 4. Sediment	PAHs
[ ] 5. Indoor Air	
[ ] 6. Soil Gas	
[ ] 7. Other: (specify)	

E. ATTACHMENTS PROVIDED WITH THIS NOTICE, AS REQUIRED BY 310 CMR 40.1406:

- [x] 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous Material is or is likely to be Present.
- [x] 2. A Copy of the Phase II Comprehensive Site Assessment or Permanent or Temporary Solution Statement Conclusions.
- [ ] 3. Specify the category of Solution that applies to the Disposal Site.
  - [ ] 1. Permanent Solution with No Conditions.
  - [ ] 2. Permanent Solution with Conditions.
    - [ ] i. An Activity and Use Limitation has been implemented.
    - [ ] ii. An Activity and Use Limitation has not been implemented.
  - [ ] 3. Temporary Solution.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

F. CONTACT INFORMATION RELATING TO THE PARTY PROVIDING THIS NOTICE:

1. Name of Organization: Boston Gas Company d/b/a National Grid
2. Contact First Name: Ken
3. Last Name: Lento
4. Street: 170 Data Drive
5. Title: Project Manager
6. City/Town: Waltham
7. State: MA
8. ZIP Code: 02451-2222
9. Telephone: (781) 663-3123
10. Email: kenneth.lento@nationalgrid.com

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** that when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report **(Section E).** These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup.

For more information regarding this notice, you may contact the party listed in **Section F** of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

October 30, 2025
Project No. 1804576

Robin Cohn
27 River Street
Amesbury, MA 01913

Re: Supplemental Phase II Comprehensive Site Assessment Report
Former Amesbury Manufactured Gas Plant,
Amesbury, Massachusetts
MassDEP RTN 3-24070

Dear Robin Cohn:

GEI Consultants, Inc., on behalf of Boston Gas Company d/b/a National Grid (National Grid), is hereby notifying your office that a Supplemental Phase II Comprehensive Site Assessment (CSA) Report has been prepared for the above-mentioned site. The Supplemental Phase II CSA Report was prepared to meet the requirements presented in the Massachusetts Contingency Plan (MCP) for a Phase II CSA (310 CMR 40.0830). Because you are the owner of a property within the Site, this notification is made in fulfillment of the public notice requirements of the MCP (310 CMR 40.1406(1)). Specifically, your property at 27 River Street is within the Site.

The purpose of the Supplemental Phase II CSA was to determine the extent of Manufactured Gas Plant ("MGP") residuals within the Powwow River and to summarize the additional investigations and analyses performed by GEI on behalf of National Grid since 2017. The findings and conclusions from the Supplemental Phase II CSA are attached in the Executive Summary from the report. The Site boundary is shown in Fig. 1. The Site includes the former Amesbury MGP at 39 Water Street, downstream wetlands, mudflats, and the main channel of the Powwow River, most of which is privately owned. Although property uses vary within the Site, there are no buildings within the Site boundary.

The information in the Supplemental Phase II CSA Report is being used to design, permit, and implement an environmental remedy within the river. In addition, on October 30, 2025, the complete Supplemental Phase II CSA Report was submitted electronically to MassDEP via eDEP, MassDEP's online filing system, and is available online through the eDEP File Viewer at https://eeaonline.eea.state.ma.us/portal/dep/wastesite/ searchable by Release Tracking Number 3-0024070.

Individuals and public offices may request additional public involvement activities under 310 CMR 40.1400. If you have questions concerning this letter, please contact Ken Lento at National Grid at 617.791.2627 or Jim Ash at GEI at 781.721.4018.

Sincerely,

GEI CONSULTANTS, INC.

Ryan S. Hoffman, P.G., LSP
Vice President

James R. Ash, P.E., LSP
Senior Vice President

RSH:jam
B:\Working\NATIONAL GRID\1804576 Amesbury MGP\01_ADMIN\Phase II CSA Suppl\App B - Public Notice Letters\Public Notice Letters_Property Owners.docx

Attachments

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 39 Water Street

2. City/Town: Amesbury 3. ZIP Code: 01913-0000

4. Assessor's Parcel ID: Map 54 Parcel 219

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Robin Cohn

2. Address of Property For Which This Notice is Being Provided: (property owned by person named in B1)

a. Street Address: 22 River Street

b. City/Town: Amesbury c. ZIP Code: 01913-0000

3. Assessor's Parcel ID: Map 66 Parcel 12

C. THIS NOTICE IS BEING GIVEN : (check one)

- [x] 1. Upon Completion of a Phase II Comprehensive Site Assessment.
- [ ] 2. Upon Submittal of a Permanent or Temporary Solution Statement (i.e., Site Closure Report).
- [ ] 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY : (check all that apply)

AFFECTED ENVIRONMENTAL MEDIA	PRINCIPAL CHEMICAL(S) PRESENT
[ ] 1. Soil	
[ ] 2. Groundwater	
[ ] 3. Surface Water	
[x] 4. Sediment	PAHs
[ ] 5. Indoor Air	
[ ] 6. Soil Gas	
[ ] 7. Other: (specify)	

E. ATTACHMENTS PROVIDED WITH THIS NOTICE, AS REQUIRED BY 310 CMR 40.1406:

- [x] 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous Material is or is likely to be Present.
- [x] 2. A Copy of the Phase II Comprehensive Site Assessment or Permanent or Temporary Solution Statement Conclusions.
- [ ] 3. Specify the category of Solution that applies to the Disposal Site.
  - [ ] 1. Permanent Solution with No Conditions.
  - [ ] 2. Permanent Solution with Conditions.
    - [ ] i. An Activity and Use Limitation has been implemented.
    - [ ] ii. An Activity and Use Limitation has not been implemented.
  - [ ] 3. Temporary Solution.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

F. CONTACT INFORMATION RELATING TO THE PARTY PROVIDING THIS NOTICE:

1. Name of Organization: Boston Gas Company d/b/a National Grid
2. Contact First Name: Ken
3. Last Name: Lento
4. Street: 170 Data Drive
5. Title: Project Manager
6. City/Town: Waltham
7. State: MA
8. ZIP Code: 02451-2222
9. Telephone: (781) 663-3123
10. Email: kenneth.lento@nationalgrid.com

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** that when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report **(Section E).** These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup.

For more information regarding this notice, you may contact the party listed in **Section F** of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

October 30, 2025
Project No. 1804576

Robert Evans
33 River Street
Amesbury, MA 01913

Re: Supplemental Phase II Comprehensive Site Assessment Report
Former Amesbury Manufactured Gas Plant,
Amesbury, Massachusetts
MassDEP RTN 3-24070

Dear Robert Evans:

GEI Consultants, Inc., on behalf of Boston Gas Company d/b/a National Grid (National Grid), is hereby notifying your office that a Supplemental Phase II Comprehensive Site Assessment (CSA) Report has been prepared for the above-mentioned site. The Supplemental Phase II CSA Report was prepared to meet the requirements presented in the Massachusetts Contingency Plan (MCP) for a Phase II CSA (310 CMR 40.0830). Because you are the owner of a property within the Site, this notification is made in fulfillment of the public notice requirements of the MCP (310 CMR 40.1406(1)). Specifically, your property at 33 River Street is within the Site.

The purpose of the Supplemental Phase II CSA was to determine the extent of Manufactured Gas Plant ("MGP") residuals within the Powwow River and to summarize the additional investigations and analyses performed by GEI on behalf of National Grid since 2017. The findings and conclusions from the Supplemental Phase II CSA are attached in the Executive Summary from the report. The Site boundary is shown in Fig. 1. The Site includes the former Amesbury MGP at 39 Water Street, downstream wetlands, mudflats, and the main channel of the Powwow River, most of which is privately owned. Although property uses vary within the Site, there are no buildings within the Site boundary.

The information in the Supplemental Phase II CSA Report is being used to design, permit, and implement an environmental remedy within the river. In addition, on October 30, 2025, the complete Supplemental Phase II CSA Report was submitted electronically to MassDEP via eDEP, MassDEP's online filing system, and is available online through the eDEP File Viewer at https://eeaonline.eea.state.ma.us/portal/dep/wastesite/ searchable by Release Tracking Number 3-0024070.

Individuals and public offices may request additional public involvement activities under 310 CMR 40.1400. If you have questions concerning this letter, please contact Ken Lento at National Grid at 617.791.2627 or Jim Ash at GEI at 781.721.4018.

Sincerely,

GEI CONSULTANTS, INC.

Ryan S. Hoffman, P.G., LSP
Vice President

James R. Ash, P.E., LSP
Senior Vice President

RSH:jam
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Attachments

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 39 Water Street

2. City/Town: Amesbury 3. ZIP Code: 01913-0000

4. Assessor's Parcel ID: Map 54 Parcel 219

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Robert Evans

2. Address of Property For Which This Notice is Being Provided: (property owned by person named in B1)

a. Street Address: 33 River Street

b. City/Town: Amesbury c. ZIP Code: 01913-0000

3. Assessor's Parcel ID: Map 66 Parcel 14

C. THIS NOTICE IS BEING GIVEN : (check one)

- [x] 1. Upon Completion of a Phase II Comprehensive Site Assessment.
- [ ] 2. Upon Submittal of a Permanent or Temporary Solution Statement (i.e., Site Closure Report).
- [ ] 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY : (check all that apply)

AFFECTED ENVIRONMENTAL MEDIA	PRINCIPAL CHEMICAL(S) PRESENT
[ ] 1. Soil	
[ ] 2. Groundwater	
[ ] 3. Surface Water	
[x] 4. Sediment	PAHs
[ ] 5. Indoor Air	
[ ] 6. Soil Gas	
[ ] 7. Other: (specify)	

E. ATTACHMENTS PROVIDED WITH THIS NOTICE, AS REQUIRED BY 310 CMR 40.1406:

- [x] 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous Material is or is likely to be Present.
- [x] 2. A Copy of the Phase II Comprehensive Site Assessment or Permanent or Temporary Solution Statement Conclusions.
- [ ] 3. Specify the category of Solution that applies to the Disposal Site.
  - [ ] 1. Permanent Solution with No Conditions.
  - [ ] 2. Permanent Solution with Conditions.
    - [ ] i. An Activity and Use Limitation has been implemented.
    - [ ] ii. An Activity and Use Limitation has not been implemented.
  - [ ] 3. Temporary Solution.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

F. CONTACT INFORMATION RELATING TO THE PARTY PROVIDING THIS NOTICE:

1. Name of Organization: Boston Gas Company d/b/a National Grid
2. Contact First Name: Ken
3. Last Name: Lento
4. Street: 170 Data Drive
5. Title: Project Manager
6. City/Town: Waltham
7. State: MA
8. ZIP Code: 02451-2222
9. Telephone: (781) 663-3123
10. Email: kenneth.lento@nationalgrid.com

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** that when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report **(Section E).** These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup.

For more information regarding this notice, you may contact the party listed in **Section F** of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

October 30, 2025
Project No. 1804576

Mass Electric Co.
National Grid Property Tax Department
170 Data Drive
Waltham, MA 02451

Re: Supplemental Phase II Comprehensive Site Assessment Report
Former Amesbury Manufactured Gas Plant,
Amesbury, Massachusetts
MassDEP RTN 3-24070

Dear Mass Electric Co.:

GEI Consultants, Inc., on behalf of Boston Gas Company d/b/a National Grid (National Grid), is hereby notifying your office that a Supplemental Phase II Comprehensive Site Assessment (CSA) Report has been prepared for the above-mentioned site. The Supplemental Phase II CSA Report was prepared to meet the requirements presented in the Massachusetts Contingency Plan (MCP) for a Phase II CSA (310 CMR 40.0830). Because you are the owner of a property within the Site, this notification is made in fulfillment of the public notice requirements of the MCP (310 CMR 40.1406(1)). Specifically, your property at 50R Macy Street is within the Site.

The purpose of the Supplemental Phase II CSA was to determine the extent of Manufactured Gas Plant ("MGP") residuals within the Powwow River and to summarize the additional investigations and analyses performed by GEI on behalf of National Grid since 2017. The findings and conclusions from the Supplemental Phase II CSA are attached in the Executive Summary from the report. The Site boundary is shown in Fig. 1. The Site includes the former Amesbury MGP at 39 Water Street, downstream wetlands, mudflats, and the main channel of the Powwow River, most of which is privately owned. Although property uses vary within the Site, there are no buildings within the Site boundary.

The information in the Supplemental Phase II CSA Report is being used to design, permit, and implement an environmental remedy within the river. In addition, on October 30, 2025, the complete Supplemental Phase II CSA Report was submitted electronically to MassDEP via eDEP, MassDEP's online filing system, and is available online through the eDEP File Viewer at https://eeaonline.eea.state.ma.us/portal/dep/wastesite/ searchable by Release Tracking Number 3-0024070.

Individuals and public offices may request additional public involvement activities under 310 CMR 40.1400. If you have questions concerning this letter, please contact Ken Lento at National Grid at 617.791.2627 or Jim Ash at GEI at 781.721.4018.

Sincerely,

GEI CONSULTANTS, INC.

Ryan S. Hoffman, P.G., LSP
Vice President

James R. Ash, P.E., LSP
Senior Vice President

RSH:jam
B:\Working\NATIONAL GRID\1804576 Amesbury MGP\01_ADMIN\Phase II CSA Suppl\App B - Public Notice Letters\Public Notice Letters_Property Owners.docx

Attachments

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 39 Water Street

2. City/Town: Amesbury 3. ZIP Code: 01913-0000

4. Assessor's Parcel ID: Map 54 Parcel 219

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Mass Electric Co.

2. Address of Property For Which This Notice is Being Provided: (property owned by person named in B1)

a. Street Address: 50R Macy Street

b. City/Town: Amesbury c. ZIP Code: 01913-0000

3. Assessor's Parcel ID: Map 66 Parcel 17

C. THIS NOTICE IS BEING GIVEN : (check one)

- [x] 1. Upon Completion of a Phase II Comprehensive Site Assessment.
- [ ] 2. Upon Submittal of a Permanent or Temporary Solution Statement (i.e., Site Closure Report).
- [ ] 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY : (check all that apply)

AFFECTED ENVIRONMENTAL MEDIA	PRINCIPAL CHEMICAL(S) PRESENT
[ ] 1. Soil	
[ ] 2. Groundwater	
[ ] 3. Surface Water	
[x] 4. Sediment	PAHs
[ ] 5. Indoor Air	
[ ] 6. Soil Gas	
[ ] 7. Other: (specify)	

E. ATTACHMENTS PROVIDED WITH THIS NOTICE, AS REQUIRED BY 310 CMR 40.1406:

- [x] 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous Material is or is likely to be Present.
- [x] 2. A Copy of the Phase II Comprehensive Site Assessment or Permanent or Temporary Solution Statement Conclusions.
- [ ] 3. Specify the category of Solution that applies to the Disposal Site.
  - [ ] 1. Permanent Solution with No Conditions.
  - [ ] 2. Permanent Solution with Conditions.
    - [ ] i. An Activity and Use Limitation has been implemented.
    - [ ] ii. An Activity and Use Limitation has not been implemented.
  - [ ] 3. Temporary Solution.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

F. CONTACT INFORMATION RELATING TO THE PARTY PROVIDING THIS NOTICE:

1. Name of Organization: Boston Gas Company d/b/a National Grid
2. Contact First Name: Ken
3. Last Name: Lento
4. Street: 170 Data Drive
5. Title: Project Manager
6. City/Town: Waltham
7. State: MA
8. ZIP Code: 02451-2222
9. Telephone: (781) 663-3123
10. Email: kenneth.lento@nationalgrid.com

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** that when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report **(Section E).** These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup.

For more information regarding this notice, you may contact the party listed in **Section F** of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

October 30, 2025
Project No. 1804576

Amesbury Housing Authority
180 Main Street
Amesbury, MA 01913

Re: Supplemental Phase II Comprehensive Site Assessment Report
Former Amesbury Manufactured Gas Plant,
Amesbury, Massachusetts
MassDEP RTN 3-24070

Dear Amesbury Housing Authority:

GEI Consultants, Inc., on behalf of Boston Gas Company d/b/a National Grid (National Grid), is hereby notifying your office that a Supplemental Phase II Comprehensive Site Assessment (CSA) Report has been prepared for the above-mentioned site. The Supplemental Phase II CSA Report was prepared to meet the requirements presented in the Massachusetts Contingency Plan (MCP) for a Phase II CSA (310 CMR 40.0830). Because you are the owner of a property within the Site, this notification is made in fulfillment of the public notice requirements of the MCP (310 CMR 40.1406(1)). Specifically, your property at 32 Macy Street is within the Site.

The purpose of the Supplemental Phase II CSA was to determine the extent of Manufactured Gas Plant ("MGP") residuals within the Powwow River and to summarize the additional investigations and analyses performed by GEI on behalf of National Grid since 2017. The findings and conclusions from the Supplemental Phase II CSA are attached in the Executive Summary from the report. The Site boundary is shown in Fig. 1. The Site includes the former Amesbury MGP at 39 Water Street, downstream wetlands, mudflats, and the main channel of the Powwow River, most of which is privately owned. Although property uses vary within the Site, there are no buildings within the Site boundary.

The information in the Supplemental Phase II CSA Report is being used to design, permit, and implement an environmental remedy within the river. In addition, on October 30, 2025, the complete Supplemental Phase II CSA Report was submitted electronically to MassDEP via eDEP, MassDEP's online filing system, and is available online through the eDEP File Viewer at https://eeaonline.eea.state.ma.us/portal/dep/wastesite/ searchable by Release Tracking Number 3-0024070.

Individuals and public offices may request additional public involvement activities under 310 CMR 40.1400. If you have questions concerning this letter, please contact Ken Lento at National Grid at 617.791.2627 or Jim Ash at GEI at 781.721.4018.

Sincerely,

GEI CONSULTANTS, INC.

Ryan S. Hoffman, P.G., LSP
Vice President

James R. Ash, P.E., LSP
Senior Vice President

RSH:jam
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Attachments

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 39 Water Street

2. City/Town: Amesbury 3. ZIP Code: 01913-0000

4. Assessor's Parcel ID: Map 54 Parcel 219

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Amesbury Housing Authority

2. Address of Property For Which This Notice is Being Provided: (property owned by person named in B1)

a. Street Address: 32 Macy Street

b. City/Town: Amesbury c. ZIP Code: 01913-0000

3. Assessor's Parcel ID: Map 77 Parcel 78

C. THIS NOTICE IS BEING GIVEN : (check one)

- [x] 1. Upon Completion of a Phase II Comprehensive Site Assessment.
- [ ] 2. Upon Submittal of a Permanent or Temporary Solution Statement (i.e., Site Closure Report).
- [ ] 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY : (check all that apply)

AFFECTED ENVIRONMENTAL MEDIA	PRINCIPAL CHEMICAL(S) PRESENT
[ ] 1. Soil	
[ ] 2. Groundwater	
[ ] 3. Surface Water	
[x] 4. Sediment	PAHs
[ ] 5. Indoor Air	
[ ] 6. Soil Gas	
[ ] 7. Other: (specify)	

E. ATTACHMENTS PROVIDED WITH THIS NOTICE, AS REQUIRED BY 310 CMR 40.1406:

- [x] 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous Material is or is likely to be Present.
- [x] 2. A Copy of the Phase II Comprehensive Site Assessment or Permanent or Temporary Solution Statement Conclusions.
- [ ] 3. Specify the category of Solution that applies to the Disposal Site.
  - [ ] 1. Permanent Solution with No Conditions.
  - [ ] 2. Permanent Solution with Conditions.
    - [ ] i. An Activity and Use Limitation has been implemented.
    - [ ] ii. An Activity and Use Limitation has not been implemented.
  - [ ] 3. Temporary Solution.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

F. CONTACT INFORMATION RELATING TO THE PARTY PROVIDING THIS NOTICE:

1. Name of Organization: Boston Gas Company d/b/a National Grid
2. Contact First Name: Ken
3. Last Name: Lento
4. Street: 170 Data Drive
5. Title: Project Manager
6. City/Town: Waltham
7. State: MA
8. ZIP Code: 02451-2222
9. Telephone: (781) 663-3123
10. Email: kenneth.lento@nationalgrid.com

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** that when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report **(Section E).** These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup.

For more information regarding this notice, you may contact the party listed in **Section F** of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

October 30, 2025
Project No. 1804576

Amesbury Improvement Association
c/o Anne Ferguson
1 River Court, Apt #307
Amesbury, MA 01913

Re: Supplemental Phase II Comprehensive Site Assessment Report
Former Amesbury Manufactured Gas Plant,
Amesbury, Massachusetts
MassDEP RTN 3-24070

Dear Amesbury Improvement Association:

GEI Consultants, Inc., on behalf of Boston Gas Company d/b/a National Grid (National Grid), is hereby notifying your office that a Supplemental Phase II Comprehensive Site Assessment (CSA) Report has been prepared for the above-mentioned site. The Supplemental Phase II CSA Report was prepared to meet the requirements presented in the Massachusetts Contingency Plan (MCP) for a Phase II CSA (310 CMR 40.0830). Because you are the owner of a property within the Site, this notification is made in fulfillment of the public notice requirements of the MCP (310 CMR 40.1406(1)). Specifically, your property at 56 Macy Street is within the Site.

The purpose of the Supplemental Phase II CSA was to determine the extent of Manufactured Gas Plant ("MGP") residuals within the Powwow River and to summarize the additional investigations and analyses performed by GEI on behalf of National Grid since 2017. The findings and conclusions from the Supplemental Phase II CSA are attached in the Executive Summary from the report. The Site boundary is shown in Fig. 1. The Site includes the former Amesbury MGP at 39 Water Street, downstream wetlands, mudflats, and the main channel of the Powwow River, most of which is privately owned. Although property uses vary within the Site, there are no buildings within the Site boundary.

The information in the Supplemental Phase II CSA Report is being used to design, permit, and implement an environmental remedy within the river. In addition, on October 30, 2025, the complete Supplemental Phase II CSA Report was submitted electronically to MassDEP via eDEP, MassDEP's online filing system, and is available online through the eDEP File Viewer at https://eeaonline.eea.state.ma.us/portal/dep/wastesite/ searchable by Release Tracking Number 3-0024070.

Individuals and public offices may request additional public involvement activities under 310 CMR 40.1400. If you have questions concerning this letter, please contact Ken Lento at National Grid at 617.791.2627 or Jim Ash at GEI at 781.721.4018.

Sincerely,

GEI CONSULTANTS, INC.

Ryan S. Hoffman, P.G., LSP
Vice President

James R. Ash, P.E., LSP
Senior Vice President

RSH:jam
B:\Working\NATIONAL GRID\1804576 Amesbury MGP\01_ADMIN\Phase II CSA Suppl\App B - Public Notice Letters\Public Notice Letters_Property Owners.docx

Attachments

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 39 Water Street

2. City/Town: Amesbury 3. ZIP Code: 01913-0000

4. Assessor's Parcel ID: Map 54 Parcel 219

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Amesbury Improvement Association

2. Address of Property For Which This Notice is Being Provided: (property owned by person named in B1)

a. Street Address: 56 Macy Street

b. City/Town: Amesbury c. ZIP Code: 01913-0000

3. Assessor's Parcel ID: Map 78 Parcel 2

C. THIS NOTICE IS BEING GIVEN : (check one)

- [x] 1. Upon Completion of a Phase II Comprehensive Site Assessment.
- [ ] 2. Upon Submittal of a Permanent or Temporary Solution Statement (i.e., Site Closure Report).
- [ ] 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY : (check all that apply)

AFFECTED ENVIRONMENTAL MEDIA	PRINCIPAL CHEMICAL(S) PRESENT
[ ] 1. Soil	
[ ] 2. Groundwater	
[ ] 3. Surface Water	
[x] 4. Sediment	PAHs
[ ] 5. Indoor Air	
[ ] 6. Soil Gas	
[ ] 7. Other: (specify)	

E. ATTACHMENTS PROVIDED WITH THIS NOTICE, AS REQUIRED BY 310 CMR 40.1406:

- [x] 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous Material is or is likely to be Present.
- [x] 2. A Copy of the Phase II Comprehensive Site Assessment or Permanent or Temporary Solution Statement Conclusions.
- [ ] 3. Specify the category of Solution that applies to the Disposal Site.
  - [ ] 1. Permanent Solution with No Conditions.
  - [ ] 2. Permanent Solution with Conditions.
    - [ ] i. An Activity and Use Limitation has been implemented.
    - [ ] ii. An Activity and Use Limitation has not been implemented.
  - [ ] 3. Temporary Solution.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

F. CONTACT INFORMATION RELATING TO THE PARTY PROVIDING THIS NOTICE:

1. Name of Organization: Boston Gas Company d/b/a National Grid
2. Contact First Name: Ken
3. Last Name: Lento
4. Street: 170 Data Drive
5. Title: Project Manager
6. City/Town: Waltham
7. State: MA
8. ZIP Code: 02451-2222
9. Telephone: (781) 663-3123
10. Email: kenneth.lento@nationalgrid.com

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** that when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report **(Section E).** These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup.

For more information regarding this notice, you may contact the party listed in **Section F** of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

October 30, 2025
Project No. 1804576

Amesbury Plaza Condominium Trust
c/o Wayne P. Capolupo, Trustee; Steven M. Capolupo, Trustee; Regina MacDonald, Trustee
98 Elm Street, Ste. 100
Salisbury, MA 01952

Re: Supplemental Phase II Comprehensive Site Assessment Report
Former Amesbury Manufactured Gas Plant,
Amesbury, Massachusetts
MassDEP RTN 3-24070

Dear Amesbury Plaza Condominium Trust:

GEI Consultants, Inc., on behalf of Boston Gas Company d/b/a National Grid (National Grid), is hereby notifying your office that a Supplemental Phase II Comprehensive Site Assessment (CSA) Report has been prepared for the above-mentioned site. The Supplemental Phase II CSA Report was prepared to meet the requirements presented in the Massachusetts Contingency Plan (MCP) for a Phase II CSA (310 CMR 40.0830). Because you are the owner of a property within the Site, this notification is made in fulfillment of the public notice requirements of the MCP (310 CMR 40.1406(1)). Specifically, your property at 58 Macy Street is within the Site.

The purpose of the Supplemental Phase II CSA was to determine the extent of Manufactured Gas Plant ("MGP") residuals within the Powwow River and to summarize the additional investigations and analyses performed by GEI on behalf of National Grid since 2017. The findings and conclusions from the Supplemental Phase II CSA are attached in the Executive Summary from the report. The Site boundary is shown in Fig. 1. The Site includes the former Amesbury MGP at 39 Water Street, downstream wetlands, mudflats, and the main channel of the Powwow River, most of which is privately owned. Although property uses vary within the Site, there are no buildings within the Site boundary.

The information in the Supplemental Phase II CSA Report is being used to design, permit, and implement an environmental remedy within the river. In addition, on October 30, 2025, the complete Supplemental Phase II CSA Report was submitted electronically to MassDEP via eDEP, MassDEP's online filing system, and is available online through the eDEP File Viewer at https://eeaonline.eea.state.ma.us/portal/dep/wastesite/ searchable by Release Tracking Number 3-0024070.

Individuals and public offices may request additional public involvement activities under 310 CMR 40.1400. If you have questions concerning this letter, please contact Ken Lento at National Grid at 617.791.2627 or Jim Ash at GEI at 781.721.4018.

Sincerely,

GEI CONSULTANTS, INC.

Ryan S. Hoffman, P.G., LSP
Vice President

James R. Ash, P.E., LSP
Senior Vice President

RSH:jam
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Attachments

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 39 Water Street

2. City/Town: Amesbury 3. ZIP Code: 01913-0000

4. Assessor's Parcel ID: Map 54 Parcel 219

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Amesbury Plaza Condominium Trust

2. Address of Property For Which This Notice is Being Provided: (property owned by person named in B1)

a. Street Address: 58 Macy Street

b. City/Town: Amesbury c. ZIP Code: 01913-0000

3. Assessor's Parcel ID: Map 78 Parcel 1

C. THIS NOTICE IS BEING GIVEN : (check one)

- [x] 1. Upon Completion of a Phase II Comprehensive Site Assessment.
- [ ] 2. Upon Submittal of a Permanent or Temporary Solution Statement (i.e., Site Closure Report).
- [ ] 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY : (check all that apply)

AFFECTED ENVIRONMENTAL MEDIA	PRINCIPAL CHEMICAL(S) PRESENT
[ ] 1. Soil	
[ ] 2. Groundwater	
[ ] 3. Surface Water	
[x] 4. Sediment	PAHs
[ ] 5. Indoor Air	
[ ] 6. Soil Gas	
[ ] 7. Other: (specify)	

E. ATTACHMENTS PROVIDED WITH THIS NOTICE, AS REQUIRED BY 310 CMR 40.1406:

- [x] 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous Material is or is likely to be Present.
- [x] 2. A Copy of the Phase II Comprehensive Site Assessment or Permanent or Temporary Solution Statement Conclusions.
- [ ] 3. Specify the category of Solution that applies to the Disposal Site.
  - [ ] 1. Permanent Solution with No Conditions.
  - [ ] 2. Permanent Solution with Conditions.
    - [ ] i. An Activity and Use Limitation has been implemented.
    - [ ] ii. An Activity and Use Limitation has not been implemented.
  - [ ] 3. Temporary Solution.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

F. CONTACT INFORMATION RELATING TO THE PARTY PROVIDING THIS NOTICE:

1. Name of Organization: Boston Gas Company d/b/a National Grid
2. Contact First Name: Ken
3. Last Name: Lento
4. Street: 170 Data Drive
5. Title: Project Manager
6. City/Town: Waltham
7. State: MA
8. ZIP Code: 02451-2222
9. Telephone: (781) 663-3123
10. Email: kenneth.lento@nationalgrid.com

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** that when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report **(Section E).** These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup.

For more information regarding this notice, you may contact the party listed in **Section F** of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

October 30, 2025
Project No. 1804576

MassDOT
Office of Real Estate and Economic Development
10 Park Plaza
Boston, MA 02116

Re: Supplemental Phase II Comprehensive Site Assessment Report
Former Amesbury Manufactured Gas Plant,
Amesbury, Massachusetts
MassDEP RTN 3-24070

Dear MassDOT:

GEI Consultants, Inc., on behalf of Boston Gas Company d/b/a National Grid (National Grid), is hereby notifying your office that a Supplemental Phase II Comprehensive Site Assessment (CSA) Report has been prepared for the above-mentioned site. The Supplemental Phase II CSA Report was prepared to meet the requirements presented in the Massachusetts Contingency Plan (MCP) for a Phase II CSA (310 CMR 40.0830). Because you are the owner of a property within the Site, this notification is made in fulfillment of the public notice requirements of the MCP (310 CMR 40.1406(1)). Specifically, your property at I-495 Southbound Onramp and I-495 Highway is within the Site.

The purpose of the Supplemental Phase II CSA was to determine the extent of Manufactured Gas Plant ("MGP") residuals within the Powwow River and to summarize the additional investigations and analyses performed by GEI on behalf of National Grid since 2017. The findings and conclusions from the Supplemental Phase II CSA are attached in the Executive Summary from the report. The Site boundary is shown in Fig. 1. The Site includes the former Amesbury MGP at 39 Water Street, downstream wetlands, mudflats, and the main channel of the Powwow River, most of which is privately owned. Although property uses vary within the Site, there are no buildings within the Site boundary.

The information in the Supplemental Phase II CSA Report is being used to design, permit, and implement an environmental remedy within the river. In addition, on October 30, 2025, the complete Supplemental Phase II CSA Report was submitted electronically to MassDEP via eDEP, MassDEP's online filing system, and is available online through the eDEP File Viewer at https://eeaonline.eea.state.ma.us/portal/dep/wastesite/ searchable by Release Tracking Number 3-0024070.

Individuals and public offices may request additional public involvement activities under 310 CMR 40.1400. If you have questions concerning this letter, please contact Ken Lento at National Grid at 617.791.2627 or Jim Ash at GEI at 781.721.4018.

Sincerely,

GEI CONSULTANTS, INC.

Ryan S. Hoffman, P.G., LSP
Vice President

James R. Ash, P.E., LSP
Senior Vice President

RSH:jam
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Attachments

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

A. DISPOSAL SITE ADDRESS: (associated with Release Tracking Number provided above)

1. Street Address: 39 Water Street

2. City/Town: Amesbury 3. ZIP Code: 01913-0000

4. Assessor's Parcel ID: Map 54 Parcel 219

B. THIS NOTICE IS BEING PROVIDED TO THE FOLLOWING PROPERTY OWNER:

1. Name of Property Owner: Massachusetts Department of Transportation

2. Address of Property For Which This Notice is Being Provided: (property owned by person named in B1)

a. Street Address: I-495 Southbound Onramp and I-495 Highway

b. City/Town: Amesbury c. ZIP Code: 01913-0000

3. Assessor's Parcel ID:

C. THIS NOTICE IS BEING GIVEN : (check one)

- [x] 1. Upon Completion of a Phase II Comprehensive Site Assessment.
- [ ] 2. Upon Submittal of a Permanent or Temporary Solution Statement (i.e., Site Closure Report).
- [ ] 3. Upon Completion of Additional Investigation showing that Oil or Hazardous Material is not Present at the Property.

D. DESCRIPTION OF OIL AND/OR HAZARDOUS MATERIAL PRESENT OR LIKELY TO BE PRESENT AT THE PROPERTY : (check all that apply)

AFFECTED ENVIRONMENTAL MEDIA	PRINCIPAL CHEMICAL(S) PRESENT
[ ] 1. Soil	
[ ] 2. Groundwater	
[ ] 3. Surface Water	
[x] 4. Sediment	PAHs
[ ] 5. Indoor Air	
[ ] 6. Soil Gas	
[ ] 7. Other: (specify)	

E. ATTACHMENTS PROVIDED WITH THIS NOTICE, AS REQUIRED BY 310 CMR 40.1406:

- [x] 1. A Copy of the Map Showing or a Description Describing the Area where the Oil and/or Hazardous Material is or is likely to be Present.
- [x] 2. A Copy of the Phase II Comprehensive Site Assessment or Permanent or Temporary Solution Statement Conclusions.
- [ ] 3. Specify the category of Solution that applies to the Disposal Site.
  - [ ] 1. Permanent Solution with No Conditions.
  - [ ] 2. Permanent Solution with Conditions.
    - [ ] i. An Activity and Use Limitation has been implemented.
    - [ ] ii. An Activity and Use Limitation has not been implemented.
  - [ ] 3. Temporary Solution.

Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup

BWSC122

This notice is related to:
Release Tracking Number

3 - 24070

INFORMATIONAL NOTICE TO PROPERTY OWNERS

As Required by 310 CMR 40.1406 of the Massachusetts Contingency Plan (MCP)

F. CONTACT INFORMATION RELATING TO THE PARTY PROVIDING THIS NOTICE:

1. Name of Organization: Boston Gas Company d/b/a National Grid
2. Contact First Name: Ken
3. Last Name: Lento
4. Street: 170 Data Drive
5. Title: Project Manager
6. City/Town: Waltham
7. State: MA
8. ZIP Code: 02451-2222
9. Telephone: (781) 663-3123
10. Email: kenneth.lento@nationalgrid.com

MASSACHUSETTS REGULATIONS THAT REQUIRE THIS NOTICE

This notice is being provided pursuant to the Massachusetts Contingency Plan and the notification requirement at 310 CMR 40.1406. The Massachusetts Contingency Plan is a state regulation that specifies requirements for parties who are taking actions to address releases of chemicals (oil or hazardous material) to the environment.

THE PERSON(S) PROVIDING THIS NOTICE

This notice has been sent to you by the party(ies) who is/are addressing a release of oil or hazardous material to the environment at the location listed in **Section A** on the reverse side of this form.

PURPOSE OF THIS NOTICE

Parties who are taking actions to respond to releases of oil or hazardous material to the environment are required by state regulations (referred to above) to notify the owners of property where the oil or hazardous material is or is likely to be present. These same parties are also required to notify property owners upon completion of actions to address the oil or hazardous material, or if additional investigations show that the oil or hazardous material is not present at a property. **Section C** on the reverse side of this form indicates the circumstance under which you are receiving this notice at this time.

INFORMATION RELATED TO YOUR PROPERTY

Section D on the reverse side of this form indicates the type(s) of oil or hazardous material that is or is likely to be present at your property, and the environmental medium (e.g., soil or groundwater) where it is or is likely to be present. **Please note** that when an investigation indicates that the oil or hazardous material is or is likely to be present at your property, this does not mean that the oil or hazardous material is posing a health risk to you. Parties who are taking actions to address oil and hazardous material releases are required by state regulations to adequately investigate these releases and take necessary actions to ensure that affected properties meet standards that are protective of human health and the environment.

ATTACHED MAP OR DESCRIPTION AND REPORT CONCLUSIONS

The party providing this notice to you is required to attach a map or description that indicates the boundaries of the area where the oil or hazardous material is or is likely to be present, and the conclusions of the site investigation or closure report **(Section E).** These attachments should give you additional information about the nature and location of the oil or hazardous material with respect to your property.

FOR MORE INFORMATION

Information about the general process for addressing releases of oil or hazardous material under the Massachusetts Contingency Plan and related public involvement opportunities may be found at http://www.mass.gov/eea/agencies/massdep/cleanup.

For more information regarding this notice, you may contact the party listed in **Section F** of this form. Information about the disposal site identified in **Section A** is also available in files at the Massachusetts Department of Environmental Protection.

See http://public.dep.state.ma.us/SearchableSites2/Search.aspx to view site-specific files on-line or http://mass.gov/eea/agencies/massdep/about/contacts/conduct-a-file-review.html if you would like to make an appointment to see these files in person. Please reference the **Release Tracking Number** listed in the upper right hand corner on the reverse side of this form when making file review appointments.

Appendix C Historical Plans

C.1. Sanborn Maps

C.2. Dredge Plans

C.3. Aerial Photographs

C.4. Highway Construction Plans

C.1. Sanborn Maps



Amesbury & Salisbury Mills Subscribers Business Directory.

Manufacturers.

Merchants and Dealers.

Miscellaneous.

Physicians and Dentists.



WINTER
POWER
HIGH ST
POND ST
UNION ST
MARKET
MARKET SQ
MAIN ST
MILL ST
CURRIER
AUBIN ST
WATER ST
R.R. AVE.
ELM ST
CLARK ST

8 SHEETS. **1**

SANBORN MAP & PUBLISHING CO., LIMITED
117 & 119 Broadway
NEW YORK

Population 10,000.
No Steam & 3 Hand Engines
2 Independent Hose Carts
Water Facilities- Good. Gas Here.
Prevailing Winds WEST.

AMESBURY (and) SALISBURY.

JULY, 1885. Mass.

SCALE 50 FT TO AN INCH.

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NOTE

Water Supply: HO DOUBLE HYDS. SUPPLIED BY A RESERVOIR. CAPACITY: 1,900,000 GALS. AT AN ELEVATION OF 249' ABOVE THE MARKET SQUARE. WATER IS PUMPED FROM 36" 2" DRIVEN WELLS. BY A DOUBLE WORTHINGTON PUMP, WHICH CAN PUMP DIRECTLY INTO THE MAINS. 8 MILES OF PIPE & 90 GATES, ALSO A NUMBER OF HYDS FED BY THE MILL PUMPS.

KEY

FIRE WALL B.M. AB. ROOF
FRAME PARTITION
OPENING & IRON DOOR
WINDOWS - SHUTTERS
STABLE
WINDOW IN 1ST STORY
BLDGS. COLORED YELLOW ARE FRAME
RED - BRICK
BLUE - STONE
GREY - IRON
BROWN - ADOBE.
GREEN - SPECIALS
MARKED (C) ARE CLOTH LINED
(1) (2) (3) INDICATE RELATIVE HEIGHTS
ALTERNATE STREET NOS ARE ACTUAL
CONSECUTIVE - ARBITRARY
BROKEN LINE N.C.A.H. BLDG - WOOD CORNICE
SOLID - METAL

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" Block 4
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" Soap Factory 3
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Episcopal Church 6
Excelsior Block 4

F
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First Baptist Church 3
Folger, D. J., Carriage M'f'y 5
" N. H., " " 6
Francis & Smith, " " 4
Free Will Baptist Church 6

G
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H
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P
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Powow River Grist Mill ..... 3 & 7
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R
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" S., " " 7

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T
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Touff, A. W., & Co., Planing Mill 3

U
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W
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" E. B., Harness M'f'y 3
Walker, H., Shoe M'f'y ..... 3 & 7
Webster Building 7
Wells, F. H., Carriage M'f'y 3

MARKET

CALIFORNIA

E. S. FELTCH (late) Co.
CARRIAGE FAC.
BLDGS EXAMINED AT 9 A.M.
POWER: STEAM.
HEAT: STEAM. LIGHT: KEROS IN OFF @ 8 P.M. ONLY.
FUEL: SHAVINGS.
10 HAVE BLOWER FOR SHAVINGS.
36 HAND GRENADES.
30 BUCKETS.

At Amesbury Ferry. 1/4 mile So. of P.O.

DAVID LANE.
PLANING & WOOD WORK.
Not in operation.

MAIN ST.

KENDRICKS LANE.

Clark's Pond.

Powow River.

Patton's Pond.

Vacant Hill.

No exposure.

C. F. PETTINGELL (late) Co.
FOUNDRY.
NO LIGHT.
HEAT: STEAM.
POWER: "
FUEL: COAL & WOOD.
24 HAND GRENADES.

C. F. PETTINGELL (late) Co.
MACH. SHOP.

W. I. ATWOOD (late) Co.
NICKEL PLATE WORKS.

LOCKE & JEWELL.
CARRIAGE M'F'G & CARRIAGE WOOD W'K.
WATCHMAN UNTIL 10 P.M.
HEAT & POWER: STEAM.
FUEL: COAL & SHAVINGS.
LIGHT: KEROS. SAFETY LAMPS.
28 HAND GRENADES.
9 CASKS.
2 BLOWERS.
6 PAILS ATTD. TO PLANER.

MECHANICS ROW.

MAIN

Scale of Feet.

JULY 1885
AMESBURY AND SALISBURY
MASS.

SEE SHEET HAMILTON WOOLEN CO.

SEE SHEET HIGH

SEE SHEET NO. 4

SEE SHEET NO. 2.

SEE SHEET MILL

SEE SHEET NO. 6

SEE SHEET NO. 7

SEE SHEET 13

SEE SHEET NO. 5

SEE SHEET NO. 4

SEE THIS SHEET

MAIN

MARKET

Market Sq.

CLARK

FRUIT PL.

ELM

WATER

HAMILTON

WOOLEN

MILL

RAIL ROAD AV.

PROSPECT

STARK, (ARBITRARY)

POWOW

Back River

Powwow River

Back

Vacant Field

11

12

13

14 Vacant

15

16

17

NO. 1 Weaving Cotton

NO. 2 Weaving Cotton

NO. 3. CO.

NO. 4 Weaving Cotton

NO. 5 Weaving Cotton

NO. 6

NO. 7

NO. 8

ARCADE BLDG

BANK BLDG

UNIVERSALIST CHURCH

FIRST BAPTIST CHURCH AS TO EAVES

PUBLIC SCHOOL

Powell's Block

Union Block

Masonic Hall

Hibernian Hall

Foster Cales, Carriage Fac.

John S. Poyen & Co. Carriage & Wheare Findings

Chas. W. Long Carriage Fac'y

G. J. Hunt, Carriage Fac'y

E. W. Osgood Mach. Shop

Fire Dept

Dodge & Wade Powow Riv. Grist Mill.

Fowler's Commercial Hotel

Hiram Walker

Biddle Smart Co. Carriage Mf'y

G. W. Osgood, Carriage Mf'y

Chas. Wing & Co.

Wooden Bridge

Boardman

To be coal bin

1½ Coal Bin.

No exposure

JULY 1885
AMESBURY AND SALISBURY
MASS.

Clark's Pond.

GREEN

SPRING

CONGRESS

STREET.

ELM

CHESTNUT

AVENUE

WASHINGTON

CEMETERY.

PUBLIC SCHOOL.

CARRIAGE

PRIVATE WAY

10

26

27

30

29

28

31

T. W. LANE
CARRIAGE REPOSITORY.

J. H. CLARK & CO.
CARRIAGE MF'Y.

F. A. BABCOCK & CO.
CARRIAGE REPOSITORY

A. N. PARRY
CARRIAGE MF'Y.

JOHN HUME
CARRIAGE MF'Y.

OSGOOD MORRILL
CARRIAGE MF'Y.

D. J. FOLGER
CARRIAGE MF'Y.

C. H. DENNETT
CARRIAGE MF'Y.

N. H. FOLGER
CARRIAGE MF'Y.

J. H. CLARK & CO.
REPOSITORY.

BIDDLE SMART & CO.
CARRIAGE MF'Y.

Freight Depot.

Passenger Depot.

Platform L.

Store Ho.

Platform M.

Scattered Lumber.

AMESBURY BRANCH OF BOSTON & MAINE R.R. EASTERN DIV.

Garden.

Scale of Feet.

Map Division

SEE SHEET NO. 3.

SEE SHEET No 8.

MILL

SHEET

Powow River

B. Vacant Swamp

34

CLAY

BELOW

HAMILTON WOOLEN COMPANY'S TENEMENTS.

35

SEE HAMILTON WOOLEN COMPANY'S TENEMENTS.

CHASE

JULY 1885
AMESBURY AND SALISBURY MASS.

A. 40' AUBURN ST.

GEO. V. MARDEN CARRIAGE FACY.

AMERICAN HO.

GAS HO.

Iron Gasometer

32

33

34

HAMILTON WOOLEN COMPANY'S TENEMENTS

MILL

CURRIERS

CLAY

AUBURN

Vacant.

SEE ABOVE

37

36

MAIN

EPISCOPAL CHURCH

HORTON ST.

SEE SHEET No 8.

38

39

MAYSON

COURT

LINCOLN

DRIVE

Scale of Feet.

(52116) 9 SHEETS.

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1

NOTE.

WATER SUPPLY: 120 DOUBLE HYDTS. SUPPLIED BY A RESERVOIR CAP. 1000,000 GALLS. AT AN ELEVATION OF 246' ABOVE THE MARKET SQ. WATER IS PUMPED FROM 36 2" DRIVEN WELLS BY A DOUBLE FRONTINGTON PUMP WHICH CAN PUMP DIRECTLY INTO THE MAINS. 9 MILES OF PIPE & 30 GATES. FLDS N. NUMBER OF HYDTS. FED BY THE MILL PUMPS.

SANBORN MAP & PUBLISHING CO., LIMITED
117 & 119 Broadway
NEW YORK

Population 10,000
No Steam & 3 Hand Engines
2 Independent Hose Carts
Water Facilities See Note.
Prevailing Winds W.

AMESBURY
MASS.
JAN. 1889

SCALE 50 FT. TO AN INCH.

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KEY

FIRE WALL 6 IN. AB. ROOF
" " 12 " " "
" " 18 " " "
FRAME PARTITION
STEAM BOILER
OPENING & IRON DOOR
WINDOWS - SHUTTERS
STABLE
WINDOW IN 1ST STORY
" 1ST & 2ND "
" 2ND & 4TH "
BLDGS COLORED YELLOW ARE FRAME
" " RED " BRICK
" " BLUE " STONE
" " GREY " IRON
" " BROWN " ADOBE
" " GREEN " SPECIALS
MARKED (54) ARE CLOTH LINED
(5) (19) INDICATE RELATIVE HEIGHTS
ALTERNATE STREET NO'S ARE ACTUAL CONSECUTIVE " " ARBITRARY
BROKEN LINE NEAR BLDG-WOOD CORNICE
SOLID " " METAL

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California	near Market 3
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Chestnut	3
Clark	7
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" Lane	7
Clay	6
Congress	5
Corliss	3
Curriers	6
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"	33-43 *2
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"	45-62 5
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"	26-35 5
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" Place	4
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"	9-75 *6
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"	2-40 *3
"	41-88 2
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Orchard	4
Pleasant	8
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"	" Powow 9
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SPECIALS.

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American Hotel	6
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" R. R. Depot	3
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Bartlett & Bagley's Block	7
" Block	4
Boddis Block	6
" Smith & Carriage M'f'y	3 & 6
Boardman, A. F., Carriage M'f'y	3
" Soap Factory	3
Briggs Carriage Co.	3
Brown, McClure & Co., Iron W. H.	9
Chase, H. F., Carriage Works	9
Chesley, Shiels & Co., Car'ge M'f'y	3
Clark Block	3
" J. H., & Co., Carriage M'f'y	6
" S., Jr., Carriage M'f'y	7
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Currier & Currier, Carriage Wks.	9
" & N., Carriage Works	9
" Cameron & Co., Carriage M'f'y	9
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Dodge & Wade, Grist Mill	7
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Drummond, Taylor & Co., Carriage M'f'y	9
Ellis Car Company	9
" W. G. & Son, Carriage M'f'y	9
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First Baptist Church	3
Folger & Drummond, Car'ge Fac.	3
" N. H., Carriage Fact.	3
Francis & Smith, Carriage Fact.	4
Free-will Baptist Church	4
Gas Works	6
Hamilton Woolen Co.	3 & 4
" " " Tenem'ts	6
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Hollander, F. & Co., Car'ge M'f'y	6
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" T. W., " "	6
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Pettingill, C. F., Machine Shop	1
Powow River Grist Mill	9
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" C., & Son, Carriage Fact.	3
" S. " " "	3
" " " " Repository	3
" " Jr., Carriage Fact.	3
St. Joseph's Faith Church & School	8
Taylor, J. & W., Shoe Shop	7
Thurston, G. E., Smith Shop	6
Town Hall	3
Turner Block	6
Tuxbury Bros., Carriage M'f'y	3
Union Block	3
Wadleigh Block	6
" E. B., Harness Shop	3
Walton, E., Carriage M'f'y	6
Webster Block	6
Wells & Spofford, Carriage Fact.	9
Wing, C., & Co., Carriage Warehs.	9

* Indicates only one side of Street shown.

SEE SHEET No 6.

SEE SHEET No 6.

3

JAN. 1889
AMESBURY
MASS.

MAIN
MARKET
ELM
WATER
MILL
HAMILTON
WOOLEN
CLARK
FRUIT PL.
RAIL ROAD
AV.
ROWELL'S COURT.
Market Sq.
Powow River
Back River

SEE SHEET No. 2.
SEE SHEET No. 4.
SEE SHEET No. 6.
SEE SHEET No. 7.
SEE SHEET No. 9.

11
12
13
14
15

Arcade Bldg 1835-36-37
Bank Bldg 2035
Milly Drugs Market & Bank 2s
Universalist Church 2s
First Baptist Church. 45 to Eaves.
Public School
Chesley, Shields & Co. Carriage Fac.
B.F. Lewis, Carriage Fac.
Jno. S. Poyen & Co. Carriage Hardw. Findings Store Rm. 1,2,3.
Powow River Grist Mill Dodge & Wade.
Chas. W. Long & Co. Carriage Fac.
Maxfield & Currier Lumber Yard.
S. Rowell & Son Repository.
Folger & Drummond Carriage Fac.
Biddle, Smart & Co. Carriage Fac.
N.H. Folger Carriage Fac.
Fire Depy. 1 Hand Eng. 1 Hose Cart
Chinese Laundry
Presso'r Station
Freight Ho.
Store Ho.
Coal Bin
Wood Piles
Scale of Feet.
0 50 100 150

5

JAN. 1889
AMESBURY
MASS.

Clarks Pond.

GREEN

SPRING

CONGRESS

HUNTINGTON AV.

ELM

CHESTNUT

WASHINGTON

CARRIAGE AV.

10

26

27

29

28

30

T.W. LANE
CARRIAGE REPOSITORY.

F.A. BABCOCK CO.
CARRIAGE MFY.
BEING BUILT.
TO HAVE SPRINKLERS. 5000 GALLS. TANK ON ROOF 30000 GALLS. CAST. IN BRS. FIRE PUMPS. TO HAVE WATCHMAN & CLOCK.

PUBLIC SCHOOL

Wood Working.

Dry Kilns

Bl. Sm, Trimng, Painting

F.A. BABCOCK CO.

Repository.

Bl. Sm.

Trimng. Painting & Varnishing

Repository. 1st Painting 2d Trimng. & Varnishing 3d

THE HUME CARRIAGE CO.

F. HOLLANDER & CO. CARRIAGE MFY.

JNO. H. CLARK & CO. CARRIAGE MFY.
WATCHMAN & CLOCK. KEROSENE LIGHTS IN Bl. Sm. & WOOD SHOPS. TANK OF 5000 GALLS. AUTOMATIC SPRINKLERS IN ALL ROOMS BUT THE REPOSITY. HEAT: STEAM. FIVE PAILS. FIRE PAILS.

Repository 1.2.3.

Storage 1.2.3.

Painting & Bl. Sm. 1st Wood Shop & Painting 2d Trimng & Varnishing 3d

OSGOOD MORRILL CARRIAGE MFY.
HEAT: STEAM. NO FIRE APP. NEWS ON Bl. SM. SHOP.

Repository.

Painting 1.2.3.

Storing Coats 1.2.

DRUMMOND, TAYLOR CARRIAGE MFY.
NO WATCHMAN. HEAT: STEAM. NO LIGHTS. NO FIRE PAILS. HANG & BENNISS.

Repository. 1st Painting 2d Trimng. & Varnishing 3d

G.D. OSGOOD CARRIAGE MFY.

Bl. Sm. & Wood Work 1st Painting 2d

Bl. Sm. Wood Work 1st

Bl. Sm.

Boards

J.A. LANE
BODY MAKING 2d

Garden

Tenement

Barn

Stable

Office

Paint Shop

Iron Sheds

Freight Ho.

Off. & Store Ho.

Store Ho.

PLATFORM.

AMESBURY BR. B. & M. R.R.

SEE SHEET No. 3.

SEE SHEET No. 8.

SEE SHEET No. 9.

SEE SHEET X.

SEE SHEET W.

SEE SHEET V.

SEE SHEET U.

Map Division

Scale of Feet.
50 40 30 20 10 0 50 100 150

6

JAN. 1889
AMESBURY
MASS.

Powow River.

MILL

CLAY

CHASE

TENEMTS.

AUBURN ST.

HAMILTON

WOOLEN

AUBURN

MAIN

CURRIERS

GEO. W. MARDEN CARRIAGE FAC.

AMERICAN Ho.

Gas Ho.

Iron Gasometer

Wood Waste Ho.

Carriage Ho.

Repository

Tenements

Dwg.

Stable

Market

Grocery

Bakery

Tailor

Hotel

Bank

Dentist

Barber Shop

Tenant

Shed

Office

Store

Paint Shop & Rooms

Dining Sal.

Jewelry

Drug

Clo.

Wagon Shed

Blacksmith

Laundry

Wagon Ho.

Store & Pnd.

Store & Tenement

Iron & Repairing

Painting

Trimming & Hanging

Varnishing

Tenements

Episc. Church

M.E. Church

Mayson Ct.

Lincoln

Court

Washington Sq.

Sparhawk St.

Main Division

Exposure of Paint

Scale of Feet.

SEE SHEET No 8.

SEE ABOVE.

SEE BELOW.

SEE SHEET No 1.

9

JAN. 1889

AMESBURY

MASS.

SEE SHEET NO.5

VACANT

vacant

1 Mile E. of P.O.

AMES'BURY BRANCH

BRIDGE OF B.&M.R.R. (EASTERN DIV.)

OAK ST.

4" W.P.

ELECTRIC LIGHT PLANT BEING BUILT

ELECTRIC LIGHT CO.

AMESBURY PATENT FLOOR CO.

ELECTRIC MACHY 1st

PLANING MILL 1st & WELLS & SPOFFORD CARRIAGE BODY & GEAR MAKRS 2½ & 3

LUMBER SHED

STORAGE BATTERY

STORE HO.

BROWN, MC. CLURE & CO. IRON W. HO.

WILL BE REMOVED

THE ELLIS CAR CO. STREET CAR FAC.

FUEL; COAL & SHAVINGS
ELECTRIC LIGHTS, POWER, HEAT; STEAM, 1 NIGHT ENGINEER RUNS TILL MIDNIGHT WATCHMAN AFTER MIDNIGHT, FIRE PAILS & CASKS, HOSE CART & 300' OF 2½" HOSE.

PRINTING 1st WOOD WORK & PAINTING 2d

ELEV.

FOR HEATING

BL. SM. BAST

2 S.B.

200' TO 2 STY FR. DWG

LUMBER W. HO. BL. SM. BAST WOOD SHOP 2d

3 S.B.

BEING BUILT

Bank

Swamp

P O W O W River

SEE SHEET NO.8

G. D. DOW, CARRIAGE FAC.

REPOSITY

BARN

BUILDING EXAMINED AT 9 P.M. KEROSENE LIGHTS IN BL. SM. SHOP, HEAT; STOVES, IRON FIRE PAILS & CASKS, NO WOOD WORK

H. F. CHASE, CARRIAGE FAC.

ELEV. & STAIRS

REPOSITY 1st TRIMMING, VARNISHING & HANGING UP 2d LEAD RM & STORING GEARS 3d

BL. SM.

IRON SHED

31

ED. WALTON, CARRIAGE MFY

150' TO BR. GDS WKS

REPOSITY 1st TRIMMING, VARNISHING & HANGING UP 2d PAINTING 3d

BL. SM.

A1.

A2.

A3.

A4.

160' TO FR. LOCOMOTIVE HO.

45' TO FR. DWG

28

J. PANING

BB.

AA.

IR. CH. 40'

ESSEX LEATHER CO. PATENT LEATHER MFY (BEING BUILT)

SHED

CC.

DD.

CARRIAGE AVE.

EXPOSURE

NO EXPOSURE

51

THOMPSON

WHITEHALL — 8" W.P. — S'R'D

4" W.P. FROM MILL POND

50

CURRIER & CURRIER CARRIAGE FAC.

BL. SM. WOOD SHOP 2S

PRINTING 1st & 2d

PLATFORM 2d

NEW HO.

SEE SHEET NO. 8

vacant

SEE SHEET NO.5

PLATFORM

Store Ho.

BIDDLE, SMART AND CO. CARRIAGE MFY

OFF. & REPOSITORY 1st STORE ABOVE

SHIPPING

A. N. CURRIER, CARRIAGE MFG

FOR HEATING

IN BASY

BEING BUILT

SHIPPING

200' TO GAS WORKS

1 NIGHT WATCHMAN, STEAM HEAT & POWER, LIGHTS GAS IN 1st FLOOR OF FAC'Y FUEL; COAL, HAND GRENADES, FIRE PAILS 3 DOZ BARRELS, 3 D. HYD'S & 1 HOSE 2½" HOSE.

BL. SM. 1st PRINTING 2d TRIMMING & VARNISHING 3d PRINTING & HANGING UP 4th

H. & 250' HOSE ATT.

No. 3 River

SEE SHEET

31

E.

F.

Coal Bin

SHED

WOOD PILES

SEE BACK

No. 4

POWOW ST.

VAC.

WOOD SHOP 1st PAINTING 2d

HANGING UP & STORE 4TH

STORE HO.

STORE HO.

3 TRIMMING 1st PAINTING 2d & 3d

PLATFORM 2d

REPOSITORY

BL. SM.

IRON HO. 1st PAINTS 2d

REPOSITORY

G. W. OSGOOD'S CARRIAGE M'F'Y

HEAT; STOVES, LIGHT; KEROSENE OIL VERY SELDOM USED. HAND GRENADES, FIRE PAILS & BARRELS, BUILDINGS EXAMINED AT 9 P.M.

SEE SHEET 21

STARK

PROSPECT ST.

16

17

EXPOSURE

NO EXPOSURE

Mad Division

Scale of Feet.

50 40 30 20 10 0 50 100 150



DRAWN & PUBLISHED BY GEO. E. MORRIS, BROCKTON, MASS.

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THE BURLEIGH, LITH. EST. TROY, N.Y.

1 The Biddle & Smart Co., Carriage Mfrs.
2 Briggs Carriage Co., Carriage, Wagon, & Street Car
3 Briggs Car Co. Manufacturers.
4 W. G. Ellis & Co., Carriage Mfrs.
5 Ellis Car Co., Street Car Mfrs.
6 Amesbury Carriage Co., Carriage Mfrs.
7 John H. Clark & Co., " "
8 Folger & Drummond, " "
9 A. N. Parry & Co., " "
10 S. R. Bailey & Co., Carriage & Sleigh Mfrs.
10 Chas. W. Long & Co., " Mfrs.
11 E. S. Fitch & Co., " "
12 G. W. Marden & Co., " "
13 Currier Carriage Co., " "
14 Hume Carriage Co., " "
15 R. Drummond & Son, " "
16 Osgood Morrill, " "
17 S. Rowell & Son, " "
18 N. H. Folger, " "

19 J. T. Clarkson, Carriage Mfr.
20 Dennett & Clark, " "
21 Miller Bros., " "
22 T. W. Lane, " "
23 Hagan & Connor, " "
24 G. W. Osgood, " "
25 Jacob A. Rowell, " "
26 F. D. Parry, " "
27 Locke & Jewell, " "
28 Geo. W. Ellison, " "
29 J. P. Eaton & Sons, " "
30 Herbert P. Chase. " "
31 W. S. Eaton, " "
32 John L. Davis, " "
33 John S. Poyen & Co., Carriage Manfr's Supplies.
34 Chas. Wing & Co., " " "
35 Brown, McClure & Co., Iron, Steel &c.
36 Spofford & Smart, Carriage Woodwork Mfrs.
37 Currier, Cameron & Co., " " "

38 Kendall & Lunt, Carriage Woodwork Mfrs.
39 Francis & Smith " " "
37 F. S. Merrill, Carriage Wheel Mfr.
8 Atwood Bros., Mfg. Co., Carriage Lamps & Mountings, Silver Platers &c.
40 Titus & Walker, Gold, Silver & Nickel Platers.
37 C. B. Aldrich, Dash Stitcher.
41 Moody & Merrill, Saw Plaining & Turning Mill.
42 A. L. Walsh Mf'g Co.
43 Hamilton Mfg. Co.
43 Geo. H. Briggs, Insurance, Carriage Umbrella Mfr.
44 Geo. E. Batchelder, Attorney
45 Jacob T. Choate, Lawyer
46 J. Q. Adams, M. D.
46 J. W. Rand, M. D.
47 John A. Douglas, M. D.
48 H. Cooper, M. D.
49 A. W. Colby, Architect, 58 Main St.
50 Chas. A. Nayson, Druggist.
51 C. L. & J. W. Allen, Hardware & Groceries.

AMESBURY. MASS.

52 Geo. C. Dearborn, Groceries.
53 E. L. Bartlett, "
54 E. E. Sanborn, "
55 Geo. H. Sweet, "
44 N. E. Collins, Clothing &c.
56 Economy Clothing Co., W. J. Murphy, Manager.
42 H. Livingston, Clothing & Gents Furnishings.
50 H. G. Hudson, Jeweler.
57 Harvey B. Locke, Watchmaker & Jeweler.
54 Samuel J. Brown, Boots & Shoes.
58 I.F.Littlefield, Stoves & Tinware.
59 John F.Johnson, Books & Stationery, 34 Main St.
60 B. F. Fifield, & Co., Furniture &c.
61 S. C. Patten, "
61 T. D. Nelson & Co., Paints Oils &c.
62 Dennett & Stearns. Painters.
32 M. Keenan & Co., Dry Goods and Notions.
60 J. F. Woodman, Meat & Provisions.
49 Burbank Bros., " "
63 T. E. Boutelle, Fruit &c.

64 S. M. Weare, Fruit &c. 87 Main St.
65 C. A. Skeels, Fish Market.
66 E. P. True, Ice Dealer, 10 Congress St.
67 H. H. Bean, Coal, Wood, Lime & Cement.
68 E. H. Alexander, Coal Office.
69 Maxfield & Currier, Lumber.
70 Geo. F. Pike, Contractor & Builder.
71 Smith & Maney, Carpenters & Builders.
73 Andrew Wilson, Roofer.
73 R. E. Harmon & Co., Plumbers.
71 O. Boardman, Soap Mfr.,
74 H. L. Bailey, Laundry.
75 Geo. Wendall, Barber.
40 C. F. O' Neil, "
42 E. H. Hoyt, "
76 Congregational Church.
77 Baptist Church.
78 Free Will Baptist Church.
79 St. James Episcopal Church.

80 St. Josephs Catholic Church and Schools.
81 Methodist Church.
82 Friends Meeting House.
44 Opera House.
83 Post Office, B. L. Fifield, P. M. Bahan's Block.
84 Powow National Bank.
49 Amesbury National Bank.
57 Amesbury Daily & The Villager.
49 Amesbury News.
44 Newburyport Daily News Office.
85 High School.
50 American House, A. C. Fowler.
86 American House Livery, M. T. Bird.
87 Mechanics Hotel, C. M. Ferry.
88 Waterworks Pump Station, Bailey Osgood, Engineer.
89 Reservoir, Powow Hill.
90 M. D. F. Steere's Residence.
91 Frank Stinson, "
92 W. C. Biddle, "

200A
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12 SHEETS
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41154

AMESBURY

ESSEX COUNTY

MASSACHUSETTS

Sanborn-Perris MAP Co. Limited

115 Broadway New York

Scale 50 Ft. to an Inch

Aug. 1894

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Population 11000. Prev. Winds West.

Water Facilities. Good. Gravity System. Reservoir, 1,800,000 Galls. cap'y 3/5 mile N.W. of Square. elev. 260' above Square. Water pumped from driven wells by Worthington Duplex Pumping Engine, which also pumps direct into mains. 14 Miles of Water Pipes. 4" to 10" Diam. 140 Double Hydrants. Fire Pressure at Market Square, 120 lbs per Sq. Inch.

There is also an independent system of pipes and hydrants connected with the mill pumps.

Fire Department. Volunteer. 1 Chief, 4 Assistants, 75 Call men. Gamewell Fire Alarm System. 15 Boxes. 4 Hose Ho's. 10 Horses. 2 Hand Engines. 1 Hook & Ladder Truck. 4 Independent Hose Wagons. 6000' 2½" Cotton Hose, in good order.

Town is patrol by nightwatchmen. 6 Babcock Extinguishers.

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*** Indicates only one side of Street shown.**

6

Aug. 1894
AMESBURY
MASS.

MAIN
MARKET
MARKET SQUARE.
FRIEND ST.
MILL
WOOLEN
CO.
CLARK
ELM
HAMILTON
WATER
RING
RAILROAD AV.
River.
POWOW
Black
River.
WASHINGTON ST.

ARCADE BLDG.
BANK BLDG.
UNIVERSALIST CHURCH 2d
MARKET ST. BAPT CHURCH.
HASSETT AND HODGE Carriage Fac.
J. H. SHIELDS 2nd Co. Carriage Fac.
LOCKWOOD 2nd BROWN 2nd HENDALL 3rd LUNT Carriage Fac'ts. No 6.
CHAS. WING Co. No 17.
No 3½
No 5.
No 4.
A. UNION BLK. C.
HOWELL'S BLK.
CHAS. W. LONG Carriage Fac.
CHAS. N. DENNETT 2nd Co. Carriage Fac.
SAMUEL ROWELL 2nd SON Carriage Fac.
FOLGER 2nd DRUMMOND Carriage Fac.
N. H. FOLGER Carriage Fac.
BIDDLE SMART Co. Carriage Fac.
MAXFIELD 2nd CURRIER LUMBER YARD
BOARDMAN'S SOAP FAC.
Passg'r Station
Railroad Bridge
Wooden Bridge

Scale of Feet.
50 40 30 20 10 0 50 100 150

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AMESBURY
MASS.

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MILL
6" W.P.
4001
4002
4003
4004
4006
Tenem't.
Gas Holder
Tank
Gasometer
30
31
32
33
37
40
P. J. SMITH
Carriage Manufy.
Storage bet. Trimming & Hanging-up 1st
Painting 2d
Platf.
B.Sm. 1st Painting 2d
Repository.
No watchman fire fails. Heat; stoves. No lights.
B.Sm.
Shed
Harness
Meat
Milly
Variety
Grs.
Fruit
D. & Barber
Dry Goods abv.
B&S.
Clo.
Dining Rm.
D.G.
Bank
Hotel Pittsfield
Tenem't.
Meat.
Undertkr.
Fish.
Livery
Barber.
Wines.
Vac. S.
Drugs
Jewelry
Bakery
Laundry
Confy.
Fruit
Carriage Ho.
Stable
Hotel
American Ho.
Livery.
Vac. S.
Harness
Bakery
Mill's
Laundry.
Barber.
Tenements
Gro.
Tenement
Store
Tenem't.
Meat.
Vac. S.
Meat.
Tenem't.
Tenement
Tenem't.
Tenem't.
Tenem't.

AUG. 1894
AMESBURY
MASS.

Vacant.

Cemetery.

OAK ST.

B. & M. R.R.

½ Mile S.E. of Market Sq.

AMESBURY ELECTRIC LIGHT AND POWER CO.

G.W. ENGLAND Mach. Shop. 1st

Planing Mill 1st & 2nd

MOODY & TRUE SHAFFORD & SMART Carriage Body & Gear. Makers 3rd

Storage

File & Nailing

Iron W. Ho.

Lumber Shed

Shed

Storage 1st & 2nd Wood Work 3rd FIRE PAILS.

NIGHT WATCHMAN & CLOCK. GRINNELL AUTO. SPRINKLERS THROUGHOUT A.B.C. & F. FIRE PAILS. 3 HOSE WITH HOSE ATTD AS SHOWN. HEAT & POWER: STEAM. LIGHTS: ELEC.

Ruins of Fire

Storage of Electric Cars

38' to 2 Small Fr. Dwgs.

River.

Powow

D.H. Hose

D.H. 100' 2½" Hose

D.H. 100' 2½" HOSE

5

H. F. CHASE. Carriage Fac.
NO WATCHMAN. FIRE PAILS. HEAT: STOVES. LIGHTS: KEROS. OIL. NO WOOD WORK.

Repository 1st Trimming & Varnishg 2nd Lead Rm. 3rd

Bl. Sm.

ELE

31

E.D. WALTON Carriage Fac.
FIRE PAILS. HEAT: STOVES. LIGHTS: KEROS. OIL.

Bl. Smi.

Repository 1st Trimming & Varnishg 2nd Painting 3rd

Japaning

Drying 2nd

Bk. Ch. 40'

Tamping & Carrying 1st Drying 2nd

ESSEX LEATHER Co. Patent Leather Mfy
WATCHMAN: CLOCK. HEAT & POWER: STEAM. LIGHTS: ELEC. FIRE PAILS.

28

CARRIAGE AV.

53'

Cattle Shed 280' long.

Agricultural Hall

Grand Stand

Fair Grounds

61

MILLER BROS. Carriage Mfy
HEAT: STOVES. PEARL: COAL. LIGHTS: KEROS. NO HOSE. PAILS IN BUILDING. NO WATCHMAN.

Body & Stock Rm 1st Body Rm. 2nd

Bl. Sm.

Off.

60

HILLS

MARKET

4" W.P. from Mill Pumps

Freight Shed

B. & M. R.R.

Bridge 3rd

A. Repository 1st & Store Ho.

BIDDLE SMART CO. CARRIAGE FAC.

NIGHT WATCHMAN. DISCH. CLOCK: GRINNELL AUTO. SPRINKLERS. 6th FLOOR. FIRE PAILS WELL DISTRIBUTED. 3 PLYHOTS. & 400' 2½" HOSE. HEAT & POWER: STEAM. LIGHTS: GAS.

B. Repository 1st Store Rms Abv

Bl. Sm. 1st Painting 2nd Trimming & Varnishing 3rd Painting & Hanging up 4th

Engine

C. Shipping

Horse Shed

D

F. Engine

Wheel Mfg. 1st Painting & Coloring 3rd Sticking & Storage 4th Mfg. 5th

H. Shipping

A.N. PERRY SHOE FAC.
NIGHT WATCHMAN & CLOCK. GRINNELL. AUTO. SPRINKLERS & FIRE PAILS THROUGHOUT. HEAT & POWER: STEAM. LIGHTS: GAS.

Abt. 175' to Gas Wks.

D.H. 250' Hose Attd.

14

Black River.

Coal Shed

Dry Ho.

BIDDLE SMART CO.

Scale of Feet.
50 40 30 20 10 0 50 100 150

Hanging up & Trimming 1st Painting & Varnishg 2nd

Bl. Sm. 1st Wood Wk 2nd Painting 3rd

Body Rm.

Inoky Kes.

E.S. FELTCH & CO. Carriage Fac.
NO WATCHMAN. HEAT & POWER: STEAM. LIGHTS: ELEC. FUEL: SHAVINGS. FIRE PAILS.

Boxing Carriages

Repository No. 1

Repository No. 2

Repository No. 3

Bl. Sm.

3

CALIFORNIA

VACANT

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AMESBURY
MASS.

Powow River.

HAMILTON WOOLEN Co's

CLAY

MILL

CHASE

TENEMENTS.

AUBURN

HORTON ST.

ROCKY HILL ROAD.

COLLINS

COLLINS AV.

ELM

THOMPSON

WHITE HALL ROAD.

MERRIMAC ST

BEACON ST.

Merrimac River.

Pond.

VACANT

NO EXPOSURE.

34 35 36 37 62 63 64 50 51

2 Tenements

SHEDS

D.E. GALE CARRIGE M'F'Y.

GEO. M. BRYANT CARRIAGE FACTORY.

DAVID TRUE M'F'Y CARRIAGE JACKS.

AT AMESBURY FERRY.
1¼ Miles S. of P.O.

MERRIMAC HAT CO.
M'F'Y FUR & WOOL HATS.

1½ Miles S. of Amesbury P.O.

Scale of Feet

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INSURANCE MAPS of AMESBURY

ESSEX COUNTY

MASSACHUSETTS

SANBORN-PERRIS MAP CO. LIMITED
115 BROADWAY, NEW YORK

Scale 50 Ft to an Inch

JUNE 1899

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Population 11,500. Prev. Winds, West.

WATER FACILITIES, Gravity system of water works, Reservoir capacity 1000000 Galls, located 3/5 Mile N.W. of Square at an elevation of 260 ft. above same. Water pumped from driven wells by Worthington Duplex Pumping Engine, which also pumps direct to mains. 17 Miles of Water Pipes, 4" to 12" diam. 141 D'ble Hydrants. Fire pressure at Market Square 120 lbs per Sq. Inch.

FIRE DEPARTMENT, Volunteer, 1 Chief, 2 Assistants. 70 Call Men. Gamewell Fire Alarm System. 17 Boxes. 4 Hose Houses. 10 Horses. 2 Hand Engines. 1 Hook & Ladder Truck. 4 Independ't Hose Carts. 7000 ft 2½" Cotton Hose in good order. 8 Babcock Extinguishers.

Town is patrolled by nightwatchman.



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* Indicates only one side of Street shown.

Map Division
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JUNE 1899
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MASS.

2
ELM
3
WASHINGTON
CHESTNUT
MORRILL
CARRIAGE AV.
4
7
14
28
29
30
31
Cemetery.
SCHOOL
T. W. LANE CARRIAGE FAC.
S. R. BAILEY & CO. CARRIAGE FAC.
S. R. BAILEY & CO'S
A. G. LEWIS & CO. M'F'R'S CHILDREN'S UNDERWEAR
WALKER CARRIAGE CO.
ATWOOD BROS. M'F'G CO. M'F'R CARRIAGE LAMPS AND MOUNTINGS
L. HOLLANDER CARRIAGE FAC.
GARY & DAVIS M'F'R CARRIAGE LAMPS
A. N. PARRY & CO. CARRIAGE SUPPLIES
GEO. W. OSGOOD'S CARRIAGE REPOSITORY
HUME CARRIAGE CO.
OSGOOD MORRILL CARRIAGE FAC.
J. S. POYEN & CO. CARRIAGE FAC.
JOHN H. SHIELDS & CO. CARRIAGE FAC.
JOHN H. CLARK & CO. CARRIAGE FAC.
HASSETT & HODGE CARRIAGE FAC.
BIDDLE & SHARRART CO.
CHAS. D. PECKER & CO. SHOE FAC.
Freight Shed
Lumber Shed
Dry Ho.
Coal Shed.
Store Ho.
Repos'y & Store Ho.
Shipping
Black River.
GAS WORKS.
Scale of Feet.
50 40 30 20 10 0 50 100 150
Map Division

JUNE 1899 AMESBURY MASS.

7

8

6

9

15

14

12

4

3

MAIN

MARKET

MARKET SQUARE

FRIEND ST.

MARKET

ELM

CLARK ST.

MILL

WOOLEN

HAMILTON

WATER

RING

POWOW River

Black River

RAILROAD AV.

ARCADE BLDG.

BANK BLDG.

UNIVERSALIST CHURCH 2.

MARKET ST. BAPTIST CHURCH.

SCHOOL HO

MASONIC HALL 3.

PASSR. STATION.

C. F. WORTHERN CARRIAGE FAC.

W. H. RAND & CO. CARRIAGE FAC.

JAMES DRUMMOND CARRIAGE FAC.

CHAS. N. DENNETT & CO. CARRIAGE FAC.

BRYANT CARRIAGE FAC. BURBANK

BIDDLE & SMART CO. CARRIAGE FAC.

N. H. FOLGER CARRIAGE FAC.

D. C. MAYFIELD & CO. LUMBER YARD.

ATWOOD BROS MFG. Co.

Map Division

WASHINGTON ST.

Scale of Feet.

JUNE 1899
AMESBURY
MASS.

7
8
9
10
11
12
32
33
37
40
12
CLAY ST.
MILL
MILL
MAIN
MAIN
FRIEND
AUBURN
ST.
HORTON
CURRIER ST.
WEBSTER BLK
CLARK'S BLOCK
CLARK'S LANE
TURNER'S BLK
GREEN BLOCK
BARTLETT & BAGLEY'S BLK
CLARK'S BLOCK
FRIEND ST. AVE.
FRIEND ST. COURT
DRIVE
ORDWAY CT.
NAYSON CT.
HAMILTON COURT
POWELL'S LANE
POND ST.
HUNTINGTON SQUARE
SCHOOL
BIRD AND SCHOFIELD, CARRIAGE MANUF'Y
Mc WITCHMAN, FIRE PAILS. HEAT STOVES, NO LIGHTS.
AMERICAN HO.
(CLOSED)
LIVERY
CARRIAGE HO.
CHAPEL
CONGR'GL. CHURCH
1ST M.E. CHURCH
TOWN HALL
ARMORY
SCHOOL HO.
H.&L. TRUCK & HOSE HO.
GASOMETER
Tenem't.
Meat.
Variety
Drugs
Jewelry
Hardware
Bakery
Tobacco
Fish
Livery
Tailor
Repository
Laundry
Barber
Tenants
Vac.
Vac. S.
Shed
Stable
Chinese Laundry
Bl. Sm.
Tenements
Scale of Feet.
Map Division

9

12

JUNE 1899
AMESBURY
MASS.

MILL

HORTON ST.

HIGH SCHOOL
½ Mile S. of P.O.

Vacant

Vacant

Vacant

Vacant

Vacant beyond

Vacant beyond

Vacant

Vacant

Detached Dwgs. beyond.

2 Fr. Dw'gs. beyond.

½ Mile S. of P.O.

Formerly
GEO. M. BRYANT,
CARRIAGE FAC.

THOMPSON

AUBURN

HAMILTON

CLAY

TENEMENTS.

WOOLEN ST.

CHASE

FIELD

WHITEHALL RD.

GREENWOOD

E. GREENWOOD

MAIN

WHITTIER AVE.

POWOW River.

No exposure.

No exposure.

Scale of Feet.

50 40 30 20 10 0 50 100 150

Map Division
Library of Congress

34

35

36

46

47

48

49

50

51

62

10

14

JUNE 1899
AMESBURY
MASS.

Vacant.

Cemetery.

OAK

4" W. Pipe

R. & M. R. R.

½ Mile S.E. of Market Square.

Iron W. Ho.

AMESBURY ELECTRIC LIGHT & POWER CO.

3 Engs. 3 Dynamos

Knowles Pump

F. S. MERRILL CARRIAGE WHEEL MAK'S. 1st & 2d.

J. N. LEITCH CARRIAGE BODY & GEAR MAKING 3d.

Storage 1st & 2d Wood Wk. 3d FIRE PAILS.

Storage of Lumber.

NIGHT WATCHMAN AND CLOCK. GRINNELL AUTOMATIC SPRINKLERS THROUGHOUT "A" & "D" AND "F" FIRE PAILS. DOUBLE HYDRANTS WITH HOSE ATTACHED AS SHOWN. HEAT AND POWER: STEAM. ELECTRIC LIGHTS. KNOWLES PUMP AS SHOWN, CAPACITY: 500 GALLONS PER MINUTE. SPRINKLERS CONNECTED WITH CITY WATER AND PUMP. PUMP SUPPLIED FROM RIVER. HYDRANTS CONNECTED WITH CITY WATER AND PUMP.

LUNT, SMITH & CO. CARRIAGE BODY & GEAR MAK'S.

POWER: ELECTRIC. HEAT: STEAM. FROM ELECTRIC LIGHT PLANT. FIRE PAILS THROUGHOUT. LIGHTS: KEROSENE. NIGHT WATCHMAN AND CLOCK.

Powow River.

3

31

H. F. CHASE, CARRIAGE FAC.

NO WATCHMAN. FIRE PAILS. HEAT: STOVES. LIGHTS: KEROSENE. OIL. NO WOOD WORK.

Repository 1st Trimming & Varnishing 2d Painting 3d

Bl. Sm.

CONNOR CARRIAGE CO. CARRIAGE FAC.

FIRE PAILS. HEAT: STOVES. LIGHTS: KEROSENE OIL.

Repository 1st Trimming & Varnishing 2d Painting 3d

Bl. Sm.

Vacant.

Formerly ESSEX LEATHER CO. PATENT LEATHER MF'Y.

Vac.

28

CARRIAGE AV.

AT AMESBURY FERRY, ½ Miles South of P.O.

MERRIMAC

Box Shop Wood Wk. 1st Paper Boxes 2d

Store Ho.

Paint Shop

Machine Shop 1st Shipping 2d Stock Rm. attic

Falling 1st Trimming & Office 2d Stock Rm. attic

Sizing Rm.

Bl. Sm.

Store Ho.

Gas Holder

Eng.

Falling & Blocking 1st Press Rm. & Finishing 2d Fur & Wool Carding 3d Fur & Wool Mixing 4th

Dye Rm.

MERRIMAC HAT CO. MF'Y. FUR & WOOL HATS.

POWER AND HEAT: STEAM. FUEL: COAL. LIGHTS: GAS. NIGHT AND SUNDRY WATCHMAN. AMERICAN CLOCK. FIRE PAILS. HAND AND BARRELS THROUGHOUT. THE WATER TANKS AS SHOWN IN "K" WITH ½" Y.P. CONNECTED WITH 50' "R" HOSE ON EACH FLOOR. STEAM JET IN EACH ROOM OF MAIN BUILDING.

Vacant.

Pond.

Scale of Feet.

50 40 30 20 10 0 50 100 150

Merrimac River.

Cattle Shed, 200' Long

Agricultural Hall

Grand Stand

FAIR GROUNDS.

MARKET

HILLS

MILLER BRO'S. CARRIAGE MF'Y. (CLOSED)

HEAT: STOVES. LIGHTS: KEROSENE. FUEL: COAL. NO WASTE PAILS IN BUILDING. NO WATCHMAN.

Body & Stock Rm. 1st Body 2d

Bl. Sm.

Vacant

60

61

59

CALIFORNIA

E. S. FELTCH CARRIAGE FAC. & CO.

NO WATCHMAN. HEAT AND POWER: STEAM. LIGHTS: KEROSENE OIL. FIRE PAILS. SPRINKLERS. FIRE PAILS.

Hanging Up Trimming 1st Varnishing & Painting 2d & 3d

Wood Shop 1, 2 & 3d

Painting 3d Storage 4th

Sizing Carriages

Repository No. 1

Repository No. 2

Repository No. 3

3

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15 Sheets (6872)

INSURANCE MAPS of AMESBURY

ESSEX COUNTY MASSACHUSETTS

Sanborn Map Company

SCALE 50 FT. TO AN INCH

11 BROADWAY, NEW YORK

MARCH 1904

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Population 11,500, Prevailing Winds, W.

WATER FACILITIES: Gravity system of Water Works through mains owned and maintained by Powow Hill Water Co. Two pumping stations equipped with Worthington Duplex Pump at each, which draw from driven wells, equipped with Air Compressor. Water is pumped to a series of three reservoirs ⅝ miles N.W. of Market Sq. the highest elevation 260ft. above grade at Square, Capacities, 1,800,000, 1,000,000 and 1,000,000 gallons respectively. 17 miles of mains 4" to 12" in diameter 142 hydrants. Normal pressure 55 lbs. per sq. in. from lower reservoir, but a fire pressure of 120 lbs. may be obtained by opening gate of higher level basin.

FIRE DEPT: Volunteer. One chief, two assistants, 55 call men, 10 horses. One Amoskeag second class steam fire engine. One Hook and Ladder Truck. Four independent Hose Carts. 4,000 ft. 2½" cotton hose in good condition. 15 Babcock fire extinguishers. Gamewell fire alarm system. 22 boxes. Town is patrolled by night police.

KEY

FIRE WALL 6IN. ABV ROOF. METAL CORNICE.
FIRE WALL 12 IN. ABV ROOF. WOOD CORNICE.
FIRE WALL 18 IN. ABV ROOF.
FRAME PARTITION.
OPENING WITH IRON DOOR.
" " "STANDARD" IRON DOOR
WINDOWS & IRON SHUTTERS
WINDOW - 1ST STORY.
WINDOWS 1ST & 3RD STORIES.
" 2ND & 4TH "
STABLE
BUILDINGS COLORED YELLOW ARE FRAME
" " RED BRICK
" " BLUE STONE
" " GRAY IRON
" " BROWN ADOBE
" " GREEN SPECIALS
(5) (2) INDICATE RELATIVE HEIGHTS.
FIRE STATION, AS SHOWN ON KEY MAP.
ALTERNATE STREET NUMBERS ARE ACTUAL.
CONSECUTIVE STREET NOS. ARE ARBITRARY.

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* Indicates only one side of Street shown.

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MARSTON ST.

OAKLAND

6" W. Pipe.

1 Buffing.

Storage 1 (1R. 2L.)

GRAY & DAVIS. MFY CARRIAGE LAMPS.

No Watchman. Power: Elec. Heat: Steam. Fuel: Coal. Lights: Gas from Gas Mach. Fire Pails and Extinguishers.

RAISED 4'

PLATFORM

NO EXPOSURE.

9

31

BOSTON & MAINE R.R.

53

ST. NO NAME.

A.

B.

C.

CEDAR

CEDAR CT.

1 3 5 7 9

6

R. H. MORRILL WOOD SAWING

ELEC. POWER

FULL OF CORD WOOD.

4

STREET NO NAME.

Shed. A.2

LIBBY LUMBER & BUILDING CO.

PARTIALLY BURNED.

NO ROOF.

Grain Storage 1st 2d Lumber

PLATFORM

L. P. 101.

Shed.

Tenements 2½

Tenements 1½ S.S.

Lumber Storage.

A.

Clark's Pond

NO EXPOSURE.

ALBION ST.

5

CUSHING

6" W. Pipe.

MAR. 1904 AMESBURY MASS.

10

ALBION ST.

6" W. Pipe.

SPRING

D.H.

ELM

8" W. Pipe

WASHINGTON ST.

RICH'S AV.

8

Gro.

Scale of Feet.

50 40 30 20 10 0 50 100 150

MaP Division

MAR. 1904
AMESBURY
MASS.

HAMILTON WOOLEN CO.
MUTUAL RISK.

HIGH

MARKET SQUARE

MARKET

POND

POWOW

RIVER

HAMILTON CT.

FRIEND

MILL

MAIN

AUBIN

CURRIER

ELM ST.

WATER ST.

LINWOOD PL.

UNION ST.

CLARK'S LANE

WADLEIGH'S CT.

FULLER BLK.

GREENE BLK.

WEBSTER BLK.

CLARK BLOCK

BARTLETT & BAGLEY BLK.

WILMAN BLDG.

PATTEN BLK.

AMERICAN HO.

W. S. EATON CARRIAGE MF'Y

FREE BAPTIST CHURCH

CONGREGATL CHURCH

TOWN HALL
Offs & Police Station 1st

ARMORY

RUINS

GAS HOLDER

Scale of Feet.

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MAR. 1904
AMESBURY
MASS.

8

PAGE'S CT.

FRUIT PL.

CLARK

CHURCH PL.

RAILROAD

ELM

MARKET

WASHINGTON AV.

RICH'S AV.

RING ST.

HAMILTON

WATER

MILL

Back River.

Powow River.

Amesbury Branch.

Boston & Maine R. R.

THE CURRIER-CAMERON CO.
Carriage Body Mfy.
Wood Working, 1, 2, 3 & 4.

E. P. SANDERSON CO.,
Iron & Steel Work, 1st
THE CURRIER-CAMERON CO.
Lumber Storage, 2nd
Leather " 3rd

J. T. CLARKSON & CO.,
CARRIAGE MANF'Y.
Bl. Sm., 1st
Wood Work'g & Trimming, 2nd
Paint Shop, 3rd

AMESBURY FILE WKS

KLEIN CARRIAGE MFG CO.,
Bl. Sm., 1st
Repos'y, 2nd
Paint Shop, 3rd
Trimm'g, 4th

MARKET ST. BAPT. CHURCH.
45' TO EAVES
FURN. HEAT. LIGHTS. GAS.

School Ho.
HEAT: STOVES. NO LIGHT.

UNIVERSALIST CHURCH, 2nd

ROWELL BLK.

BANK BLDG.

ARCADE BLDG.

Passenger Station.

THE CURRIER-CAMERON CO.
Carriage Body Mfy.
Wood Working, 1, 2, 3 & 4.

Former'ly CURRAN, BURKE & CO., CARRIAGE FAC'Y.

Paint Shop.

Cabinet Shop.

Shed.

Marble Works.

Market.

SCOTT GRAIN CO.
POWOW RIVER GRIST MILL.
NO WATCHMAN. POWER & LIGHTS: ELECT.
HEAT: STOVE. 1 EXTGR. F. PAILS.

Hardw.

Grain Stge.
1 ROLLER MILL
1 CORN CRACKER

Off. & Hay Stge.

Lumber Shed.

Coal Shed.

D. C. MAXFIELD,
LUMBER YARD.

W. H. RAND & CO.,
CARRIAGE MFY.
Bl. Sm. & Paint Shop, 1st
Painting & Trimming, 2nd
Repository, 3rd

Store Ho.

Boarding

Steam Laundry

Bl. Sm.

Shed.

FOLGER & DRUMMOND CARRIAGE MFY.
Lead Rim, 1st
Bl. Sm., 1st
Painting & Storage, 2nd
Repository, 3rd & 4th
Trimming & Varnishing, 5th

Freight Ho.
Platform.

Ruins of Fire.

N. H. FOLGER,
CARRIAGE MFY.

BIDDLE & SMART CO., CARRIAGE MANUF'Y.

A. F. WALKER CO.

Lumber Sheds

Wagon Shed.

WOOLEN CO.
Mutual Risk.
For Report, See Sheet No. 7

Weaving, on all floors

Storage

Wool Storage

Engine

Boiler

Oil Stge.

Shed.

Stores.

Fruit.

Barber.

Tailor Shop.

Bank. (For Savings).

Nat'l Bank.

Hall, 2nd

Rest., 1st

Paints

Furnit.

Undertaker.

Livery

Repos'y.

Coal & Wood.

Cabinet Shop.

Clothier.

Clothier Laundry.

Market.

Furnit.

Rest., Jack Sm., B.

Exp. Off.

Tob.

Baggage

Books.

2 Pianos.

Oils.

Std. Dft. Drugs.

Lunch Rm.

Weaving, 1, 2, 3, Yarn Dyr. No. 7

Engine & Boilers

Elect. Motors

Vac.

No. 32 Storage.

The Chas. Wing Co. Carriage Harness & Fittings Fy. No. 17.

Wheel No.

Stge.

Weaving, 1, 2, 3 & 4.

Cloth Rm. B

Storage, 4th

Shed.

Wool Storage

Waste No.

Lumber

Sheds

Dry Kiln

Scale of Feet.
50 40 30 20 10 0 50 100 150

Mar. 1904
AMESBURY
MASS.

WASHINGTON

CHESTNUT

MORRILL

ELM

SPRING ST.

PEARL ST.

COLLINS ST.

OAKLAND

CARRIAGE AV.

ST.

Back River

B. & M. R.R. AMESBURY BRANCH

Freight Sh.

Freight Shed

Lumber Shed

Cemetery

AMESBURY BUILDING CORP'N.
COMPOSITE RISK.

G.W. ENGLAND
Mach. Shop 2d

ATWOOD Mf'G CO.
Metal Lamp Mf'y 2d

S.R. BAILEY & CO.
Carriage Mf'y

H.P. WELLS.
Carriage Shop 2d

A.L. LEWIS CO.
Muslin Underwear Mf'y

BIRD & SCHOFIELD.
CARRIAGE MF'Y.

HASSETT & HODGE CARRIAGE MF'Y.

MILLER BRO'S
CARRIAGES IN THE WHITE.

CARR PRESCOTT CO.
WHEEL MF'G 2d

R.N. PARRY & CO.
CARRIAGE FINISHING BAS.

LAMBERT HOLLANDER.
CARRIAGE MF'Y.

JOHN H. CLARK & CO.
CARRIAGE MF'Y.

THE SHIELDS CARRIAGE CO.
TRIMMING & FINISHING AUTOMOBILE BODIES.

GEO. W. OSGOOD.
CARRIAGE MF'G.

C.F. WORTHEN.
CARRIAGE WORK.

L. HOLLANDER
Bl. Sm.

HUME CARRIAGE CO.

T.W. LANE.
CARRIAGE MF'Y.

THE CONNOR CARRIAGE CO.

OSGOOD MORRILL.
CARRIAGE MF'Y

W.R. WOODWARD.
ELEC. MOTOR

THE FOX, FEUERHERM & MENTZ LEATHER CO.
PATENT & FANCY LEATHER MF'Y.

AMESBURY & SALISBURY GAS LIGHT CO.

E.H. ALEXANDER
COAL & WOOD.
Coal Shed.

Locomotive Ho.

TURN TABLE

SCHOOL

Cemetery.

Scale of Feet.
50 40 30 20 10 0 50 100 150

Map Division
1955
Library of Congress

13

Powow River

MAR. 1904
AMESBURY
MASS.

8

MILL ST.

17

TRESTLE

TRESTLE

Soft Coal Pile

34

CURRIER ST.

4" W. Pipe

D.H. (PRIVATE)

H A M I L T O N W O O L E N C O ' S

7

MILL

50'

CLAY

C E N T

40'

35

CHASE

62

30'

FIELD

27'

45'

6" W. Pipe AUBIN

D.H.

HORTON ST.

12

16

23

Powow River

IR. BRIDGE 12'

8" W. Pipe MAIN

137'

PIER

R. H. MORRILL, COAL & WOOD WHARF.

Lumber.

Coal Shed.

Wood Shed.

WHARF

Lumber.

SOLID

AT AMESBURY FERRY
One Mile S. of P.O.

MERRIMAC

3

W. N. AMES & CO. COAL WHARF.

2½ Storage.

Storage.

Coal Shed.

Coal Shed

TRESTLE

WHARF

SOLID

Merrimack River

Scale of Feet.

50 40 30 20 10 0 50 100 150

AT AMESBURY FERRY.
1¼ Miles S. of Amesbury P.O.

MERRIMAC

1

2

Paint Shop.

Store Ho.

Machine Shop 1st Shipping 2nd Rms. attic.

Stock

Fulling 1st Off. & Finishing

Blocking, Stiffening & Moulding Rm

Fulling 1st, Dyeing, Finishing 2nd, Wool Washing 4th

Dye Rm.

Drug Rm.

Store Ho. Q.

10" Suction Pipe

MERRIMAC HAT CO. M'F'Y WOOL HATS.

NIGHT AND SUNDAY WATCHMAN AND AMERICAN CLOCK 15 STATIONS. POWER, AND HEAT: STEAM: FUEL: COAL. LIGHTS: GAS AND ELEC. GRINNELL AUTOMATIC SPRINKLERS (A.S.) WET SYSTEM. SUPPLIED BY TOWN WATER, 65 LBS. PRESSURE. 5½ INCH AND KNOWLES PUMP 16"x9"x12" CAPY. 750 GALLS PER MINUTE WHICH DRAWS FROM RIVER AND ALSO [illegible] AS SHOWN. FIRE PAILS [illegible] STEAM JET IN EACH ROOM OF [illegible] V.P. AND HOSE AS SHOWN.

Merrimack River

Pond

45'

55' E.

53'

59

61

67

69

Box.

12

15

MAR. 1904
AMESBURY
MASS.

ELM
OAKLAND
OAK
PEARL
COLLINS ST.
COLLINS CT.
MAIN
ELM

J.N. LANE. CARRIAGE M'F'Y.
NO WATCHMAN. FIRE PAILS. NO POWER. HEAT: STOVES. NO LIGHTS.

Repository for Painting & Varnishing &c.

Bl. Sm. Trimm'g

Horse Shed

3½ Storage

Vac. Bl. Sm.

Platform

Bl. Sm. & Wheelwright

54

55

63

64

65

9

10

HOWARTH & ROGERS CO.
Wood working 2d

Bl. Sm. 1st

Storage 1, 2 & 3d

AMESBURY ELEC. LIGHT, HEAT & POWER CO.

Engs. & Generators

Coal Pile

Platform

Lumber Shed

BOSTON & AMESBURY MF'G. CO.
AUTOMOBILE M'F'Y.
Mach. Shop 3d

Shed

BROWN & WALES CO.
Iron & Steel Mare Ho.

HOWARTH & ROGERS CO.
CARRIAGE BODY M'F'Y.
NO WATCHMAN.
FIRE PAILS THROUGHOUT.
HEAT: STEAM FROM ELEC. LIGHT PLANT.
POWER: ELECTRIC.
LIGHTS:

Lumber Storage

NO WATCHMAN
HEAT: STEAM.
POWER BY SHAFT FROM ELEC. LIGHT PLANT.
LIGHTS: ELEC.
GRINNELL AUTOM. SPRINKLERS (WET).
SUPPLIED BY TOWN WATER @ 51 LBS. PRESS. AND KNOWLES F. PUMP (CAP'Y: 500 GALS. PER. MIN. WHICH DRAWS FROM RIVER.
HYDS. SUPPLIED BY TOWN WATER AND PUMP.

H. LOWELL & SON. BOAT SHOP.

Lumber Storage

Storage 2

Shed 2

STEPHEN LOWELL BOAT SHOP.

At Amesbury Ferry.
1½ Miles S. of Amesbury P.O.

BOSTON & MAINE R.R. AMESBURY BRANCH.

Powow River.

Merrimack River.

RIVER

Scale of Feet.
50 40 30 20 10 0 50 100 150

Map Division
Library of Congress

12 SHEETS
(1296)

INSURANCE MAPS of AMESBURY

ESSEX COUNTY

MASSACHUSETTS

Sanborn Map Company

SCALE 50 FT. TO AN INCH

11 BROADWAY, NEW YORK

APRIL 1909

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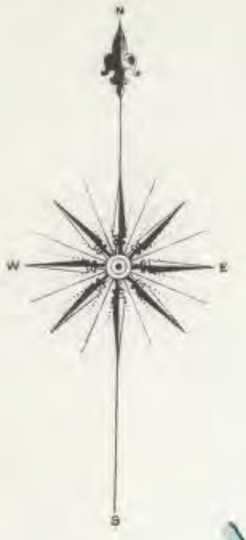
JUL 27 1909







Population 10000 Prevailing Winds West

WATER FACILITIES

Gravity system; Water works owned by town and constructed 1884. Supply taken from six driven wells; three located at Powow Pumping Station and three at Market St. Pumping Station and pumped by three Worthington pumps of one million gallons capacity each per 24 hours, to a series of three reservoirs located ¾ of a mile N.W. of P.O. The largest has a capacity of 1,800000 gallons & an elevation of 280 ft. above street at P.O.; remaining two have a capacity of one million gallons each and elevation of 128 ft. Average pressure from lower reservoirs about 55 lbs per sq. inch. A fire pressure of about 120 lbs. per sq. inch may be obtained by opening gate of higher level basin. 19 miles of pipe from 4" to 12" diameter, 143 hydrants. Daily consumption about 350000 gallons.

FIRE DEPARTMENT

Volunteer; one chief, two assistants and 50 call men. Six horses. One 2d class Amoskeag steam fire engine. One hook & ladder truck. Three hose wagons. One combination hook & ladder truck, chemical & hose wagon. 7000-2½" hose in good condition. Gamewell fire alarm system, 29 boxes; also whistle alarm.

Street lighting: electric. Main St. paved only.

INDEX.

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*** Indicates only one side of Street shown.**

Map Division

APRIL 1909
AMESBURY
MASS.

ROCKY HILL Rd

MILL

CURRIER ST.

HORTON ST.

CLAY

AUBIN

MAIN

CLARK'S LANE

HAMILTON

WOOLEN

CHASE

FIELD

TENEMENTS

COMPANY'S

PRIVATES

S. CLIFFORD TRUE.

AT AMESBURY FERRY
Located 1 Mile S. of P.O.

H. LOWELL & SON.
BOAT SHOP.
PRINTING H. WOOD WORKING ROOM

SAML TRUE.
BOAT BUILDING
GASOL. ENG.
5 BBL GASOL TANK

FRANK MORRILL
BOAT BUILDING

TRESTLE
HOISTING ENG.

POWOW River

Merrimac River

Scale of Feet.

Map Division
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APRIL 1909
AMESBURY
MASS.

HAMILTON WOOLEN CO.
Mutual Risk.
3 night watchmen & clocks-40 stations hourly rounds. 3 firemen on duty at night. Sunday & yard watchman. Power water & steam. Heat: steam - fuel: coal - lights: elec. Grinnell Auto Sprinklers as shown - wet system except where otherwise noted. Supplied by town water - 90 lbs. pressure - Stiles & Jenks pumps. Sprinkler heads spaced 8'x10'. Fire pails throughout.

HAMILTON WOOLEN CO.

HIGH

POND

POWOW ST.

UNION ST.

LINWOOD PL.

MARKET ST.

MARKET SQ.

ELM ST.

WATER ST.

POWOW

River

FRIEND

HAMILTON

MILL

MAIN

CURRIER

AUBIN

CLARK'S LANE

WADLEIGH'S CT

FRIEND CT

HAMILTON CT

LONGS CT

ORDWAY CT

DRIVE

CLARK BLOCK

BARTLETT & BAGLEY'S BLOCK

WILMAN BLDG

WEBSTER BLK. GREENE BLK. FULLER BLDG

PATTEN BLK.

COTTON SPINNING 1st CARDING & SPINNING 2d, 3d & 4th & CO.

COTTON STORAGE

STORAGE

STORE HO

DYE HO

DRESSING & FINISHING

STORAGE OF FINISHED GOODS

DYE SHOP 1st MACHINE SHOP 2d CARPET 3d ROLL & KETTLEEN SHOP 4th

SPINNING 1st, 2d, 3d & 4th WARPING & SPOOLING 5th

SPINNING 1st, 2d, 3d & 4th CARDING & SPINNING 5th

SPINNING 1st, 2d, 3d & 4th DRESSING & FINISHING

SPINNING 1st, 2d, 3d & 4th

SPINNING 1st, 2d, 3d & 4th WARPING & SPOOLING 5th

SPINNING 1st, 2d, 3d & 4th

SPINNING 1st, 2d, 3d & 4th

SPINNING 1st, 2d, 3d & 4

11
PAGES CT.
9
FRUIT PL.
11
THE CURRIER-CAMERON CO.
AUTOMOBILE BODIES
WOOD WORKING 1, 2, 3 & 4TH
THE CURRIER-CAMERON CO.
LUMBER STORAGE 2D
AMESBURY GARAGE 1ST
PUBLIC GARAGE
MACHINE SHOP 3D
ELM
12
ELM
APRIL 1909
AMESBURY
MASS.
RICHS AV.
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10
13
AMESBURY FILE WORKS
CLARK
Ruins
BASEMENT STANDING
RAILROAD
SCOTT GRAIN CO.
POWOW RIVER GRIST MILL
GRAIN STORAGE
ONE ROLLER MILL
ONE CORN CRACKER
AV.
CHURCH PL.
MARKET ST. BAPTIST CHURCH
45' TO EAVES
SCHOOL HO.
VACANT
MARKET
2
12
BANK BLDG
National Bank
ROWELL BLK
ELM
RING ST.
MARKET SQ.
PASSENGER STATION
UNION BLK
HOSE No 3
CARRIAGE MFY
FOLGER & DRUMMOND, CARRIAGE MFY
LEAD RM 1ST
PAINTING & STORAGE 2D OFFICE & HORSTORY 3D
PAINTING & PAINTER TRIMMING & VARNISHING 4TH
WOOD WORKING & PAINTER TRIMMING 5TH
AMESBURY STEAM LAUNDRY
BIRD & SCHOFIELD
14
R.H. MORRILL
STORE No
PLANING MILL
GRINDING & POLISHING 1ST
MACH. SHOP 2D
BUFFING 3D
LAMP RM 4TH
PACKING & STORAGE 5TH
ATWOOD, CASTLE CO.
MFGR OF AUTOMOBILE LAMPS
TIMBER TRESTLE
B. & M. R.R. (AMESBURY BRANCH)
Back River
HOLDEN BRIDGE
ARCADE BLDG
HAMILTON Mutual Risk
WOOLEN CO.
WATER
MILL
MAIN ST.
POWOW River
AMESBURY BRASS & IRON FOUNDRY
BIDDLE AUTOMOBILE BODIES
SMART CO.
A.E. WALKER C
8
9
Scale of Feet.
50 40 30 20 10 0 50 100 150

14

APRIL 1909
AMESBURY
MASS.

THE BIDDLE & SMART CO.
NIGHT WATCHMAN - PORTABLE CLOCK, 6 STATIONS - HOURLY ROUNDS. - HEAT STEAM. - FUEL COAL. - POWER & LIGHTS ELECTRIC. - INTERNATIONAL AUTO. SPRINKLERS THROUT OUT 8'x10' DRY SYSTEM, BST. & 1st. FLOORS & WET SYSTEM 2d, 3d & 4th. - AUTO. SPRINKLER FED BY 6" CITY MAIN ALSO 41,500 GAL. WATER TANK ELEV'D 15' ABOVE HIGHEST SPRINKLER WATER PAILS IN PAINT SHOP - WATER PRESSURE 55 LBS. AUTO. FIRE ALARM.

AMESBURY BUILDING CORP'N
Composite Risk
NIGHT WATCHMAN - ECO MAGNETO CLOCK (3 STATIONS) - HEAT STEAM & (3) AUTOSTUNTWINN (SYSTEM) POWER STEAM & ELECTRIC - FUEL COAL - LIGHTS ELECTRIC. - GRINNELL AUTO SPRINK'S THROUT - WET SYSTEM - SUPPLIED BY TOWN WATER 55 LBS. PRESSURE & FAIRB. DUPLEX PUMP 14" & 8" WHICH DRIVE FROM TOWN SYSTEM & 28,000 GAL. RESERVOIR - FIRE PAILS & CHEMICAL EXTERS. - 100' 2½" HOSE

S. R. BAILEY & CO.
LIGHT CARRIAGE M'F'Y. 1, 2 & 4th
MACHINE SHOP 1st
OFFICE, REPOSITORY & GEAR RM. 2d
TRIMMING & TRIMMING SHED 3d
PAINT & TRIMMING SHED 4th
PAINT SHOP 4th

S. R. BAILEY & CO. 1st.
H. P. WELLS. CARRIAGE WORKS 2d.
AMESBURY METAL BODY CO. 3d.
A. L. LEWIS CO.
MUSLIN UNDERWEAR M'F'G 4th.

AMESBURY METAL BODY CO.
AUTOMOBILE M'F'G
OFF. & FOUNDRY 1st
MACHINE SHOP 2d
METAL WORKING 2d
OFF'S & MACHINE SHOP 3d
ASSEMBLING 4th

AMESBURY METAL BODY CO.

LAMBERT HOLLANDER
HEAVY CARRIAGE & AUTOMOBILE BODY M'F'Y.
OFF. REPOSITORY & MUSEUM 1st
PAINTING & TRIMMING 2d
PAINTING & STORAGE 3d
BLACK SMITH 1st

JOHN H. CLARK CARRIAGE CO.
NO WATCHMAN - HEAT STEAM. - POWER ELECTRIC - LIGHTS GAS & ELECTRIC. - GRINNELL AUTO. SPRINKLERS - WET SYSTEM 8'x10' IN M'F'Y SUPPLIED BY TOWN SYSTEM 55 LBS. PRESSURE & TANK 5000 GALS. CAP'Y. - FIRE PAILS THROUT. -
BLACK SMITH 1st.
PAINT & WOOD SHOPS 2d
PAINT & TRIM SHOPS 3d

THE SHIELDS CARRIAGE CO.
TRIMMING & FINISHING AUTOMOBILE BODIES
NO WATCHMAN. - HEAT STEAM - POWER ELECTRIC - LIGHTS GAS & ELECTRIC. - FUEL COAL. - FIRE PAILS & CASKS THROUT. -
REPOSITORY & OFF. 1st
PAINT SHOP 2d
PAINT & TRIM SHOPS 3d

T. W. LANE
CARRIAGE M'F'Y.
OFF. & REPOSITORY 1st
STORAGE 2d
PAINT SHOP & STORAGE 3d
BLACK SMITH 1st
PAINT SHOP 2d
PAINT & TRIM SHOP 3d

SCHOOL
HEAT STOVE. - NO LIGHTS. -

NO WATCHMAN - HEAT STEAM - FUEL COAL - LIGHTS GAS & ELECTRIC - NATIONAL AUTO. SPRINKLERS THROUT - WET SYSTEM 10'x10' FED BY 6" CITY MAIN (SINGLE SUPPLY.) PRESSURE 55 LBS. -

HASSETT & HODGE
CARRIAGE M'F'Y.
BL. SM. & STOCK R'M'S 1st
BODY SHOP 2d
TRIM SHOP 3d
GEAR STORAGE & LEAD RM. 4th
OFF. & REPOSITORY 1st
PAINT SHOP 2d
PAINT SHOP & HANGING UP 3d
STORAGE 4th

NIGHT WATCHMAN - BUERK CLOCK 5 STATIONS - HEAT STEAM - POWER ELECTRIC - LIGHTS GAS - GRINNELL AUTO. SPRINKLERS THROUT - WET SYSTEM 10'x10' SUPPLIED BY TOWN WATER & TANK IN TOWER 5000 GALS. CAP'Y. ELEV'D 20' ABV. HIGHEST SPRINKLER - FIRE PAILS THRO'OUT. - HYD. & 100' 2½" HOSE 1st.

THE BIDDLE & SMART CO. 1, 4 & 5th
BLACK SMITH 1st.
METAL SHOP 4th
BODY SHOP 5th
MERRIMAC WHEEL CO. 2 & 3

NIGHT WATCHMAN - WATCHMANS CLOCK 5 STATIONS. - HEAT & POWER STEAM LIGHTS ELECTRIC & GAS - GRINNELL AUTO. SPRINKLERS THROUT WET SYSTEM - SUPPLIED BY TOWN WATER & 5000 GAL TANK. SPRINKLERS 8'x10'. - TOWN WATER PRESSURE 55 LBS. - FIRE PAILS THROUT.

THE ATLANTIC CO.
STORAGE 1st. VAC. 2d & 3d.

THE ATLANTIC CO. MOTOR BOAT M'F'Y
OFFICE & REPOSITORY 1st
HULL
BODY
SHED
LUMBER STORAGE
OPEN HEAD SPRINKLERS ON RIDGE.
REPOSITORY
FACTORY
VAC. 1st. UPHOLSTERING 2d
NIGHT WATCHMAN - NO CLOCK - HEAT STEAM - POWER & LIGHTS ELECTRIC - FUEL COAL - THERMOSTATT AUTO. SPRINKLERS. - WET SYSTEM 6'x10' FED BY 6" CITY MAIN & 30000 GAL. W. T. ELEV'D 20' ABOVE HIGHEST SPRINKLER - FIRE PAILS DISTRIBUTED.

MARITON & WELLS
WOOD WORKING SHOP
STORAGE

W. R. WOODWARD
ELECTRIC MOTOR.
DASH STITCHING M'F'Y
BODY SHOP 2d

J. A. LANE
CARRIAGE BODY SHOP 2d
POWER HAND -
NO LIGHTS.

LUMBER STORAGE

GAS HOLDER CAPACY 10,000 CU. FT.
GAS HOLDER INCLOSED IN BR. CAPACY 50,000 CU. FT.
AMESBURY & SALISBURY GAS LIGHT CO.
NO FIRE APP. -
GENERATION No.
PURIFIERS
COAL SHED
GROUND

E. H. ALEXANDER
COAL & WOOD
COAL SHED
WHARF

THE SHIELDS CARRIAGE CO.
STORAGE 1st, 2d & 3d
SHED
COAL BIN
SECTION No.
TURN TABLE
LOCOMOTIVE No.

VACANT

Back River
FREIGHT HO.
FREIGHT SHED
PLATFORM
B. & M. R. R. AMESBURY BRANCH.
PLUM
WASHINGTON
CHESTNUT
MORRILL
OAKLAND (CARRIAGE AV.)
ELM
COLLINS ST.
COLLINS CT.
LUMBER STORAGE
OPEN
WALK
CURB
TANK
SHED
D.H.
5" W. PIPE
6" W. PIPE
8" W. PIPE
Scale of Feet.
50 40 30 20 10 0 50 100 150

10
12
13
14
15
16
28
29
30
31

Map Division
1955
Library of Congress

15

APRIL 1909
AMESBURY
MASS.

ATLANTIC AV
ELM
MARSTON
OAKLAND
OAK
MAIN
MERRIMAC
Merrimac River
POWOW River
B & M R R
AMESBURY BRANCH

J N LANE CARRIAGE WKS
NO WATCHMAN - NO LIGHTS
HAND POWER - HEAT: STOVES
NO FIRE APPARATUS

GRAY & DAVIS
AUTOMOBILE LAMPS MF'Y.
NO WATCHMAN - POWER: ELEC: HEAT: STEAM
LIGHTS: ELEC: & GAS: - GRINNELL AUTO SPRINKLERS -
WET SYSTEM - SPACED 8' NO APART - SUPPLIED BY
6" CITY MAIN OF 65 LBS PRESSURE & 1000 GAL.
W.T. ELEV. 25' ABOVE HIGHEST SPRINKLER -
THERMOSTATIC FIRE ALARM - FIRE EXTGRS DIST'D.

1000 GAL. GASOL. TANK 4' UNDER GRADE
1000 GAL. W. TOWER STEEL FR. ELEV'D 42'

AMESBURY LIGHT CO.
2 MEN ON DUTY, DAY & NIGHTS -
V.P. WITH HOSE REELS AS SHOWN -

HOWARD & ROGERS CO.
AUTOMOBILE BODY MF'Y.
WOOD WORKING 1ST & 2ND MACHINE SHOP 3RD
2 V.P. & 50' R. HOSE
AUTO. EX. 42X82

HOWARD & ROGERS CO
NO WATCHMAN - POWER ELEC: LIGHTS: ELECTRIC -
HEAT: STEAM FROM AMESBURY LIGHT CO. -
GRINNELL AUTO SPRINKLERS - WET SYSTEM -
HEADS SPACED 10' X 10' SUPPLIED BY A CITY MAIN
OF 50 LBS PRESSURE - BUCKETS OF WATER DISTRIBUTED 4 D.H.

GRAVES & CONDON
AUTOMOBILE MF'Y.

THE ATLANTIC CO.
MOTOR BOAT W. HO.

R. H. MORRILL & SOLID PATON WHARF
LUMBER STORAGE
COAL SHED
WOOD SHED
COAL YARD
LUMBER STORAGE
OFFICE
TRESTLE
HOISTING ENG. HO.

W. N. AMES & CO. COAL YARD
COAL SHED
COAL SHED
STONE HO.
TRESTLE
PIER
POWOW RIVER BRIDGE
HOSE HO. NO. 4
ONE HORSE WAGON

FT. AMESBURY FERRY
Located 1 Mile S. of P.O.

Scale of Feet.
50 40 30 20 10 0 50 100 150

Map Division
1905
Library of Congress



HAMILTON WOOLEN CO.

(COTTON MILL)

Amesbury, Mass.

Surveyed Dec. 15, 1910.

Scale 1 in = 60ft.

Surveyed & Drawn by A.L. Milton
Traced by H.L. Crane.

See N.B. 533 p. 33



Hughes & Bailey, Publishers, 39-43 Gold St., New York. Copyright 1914.

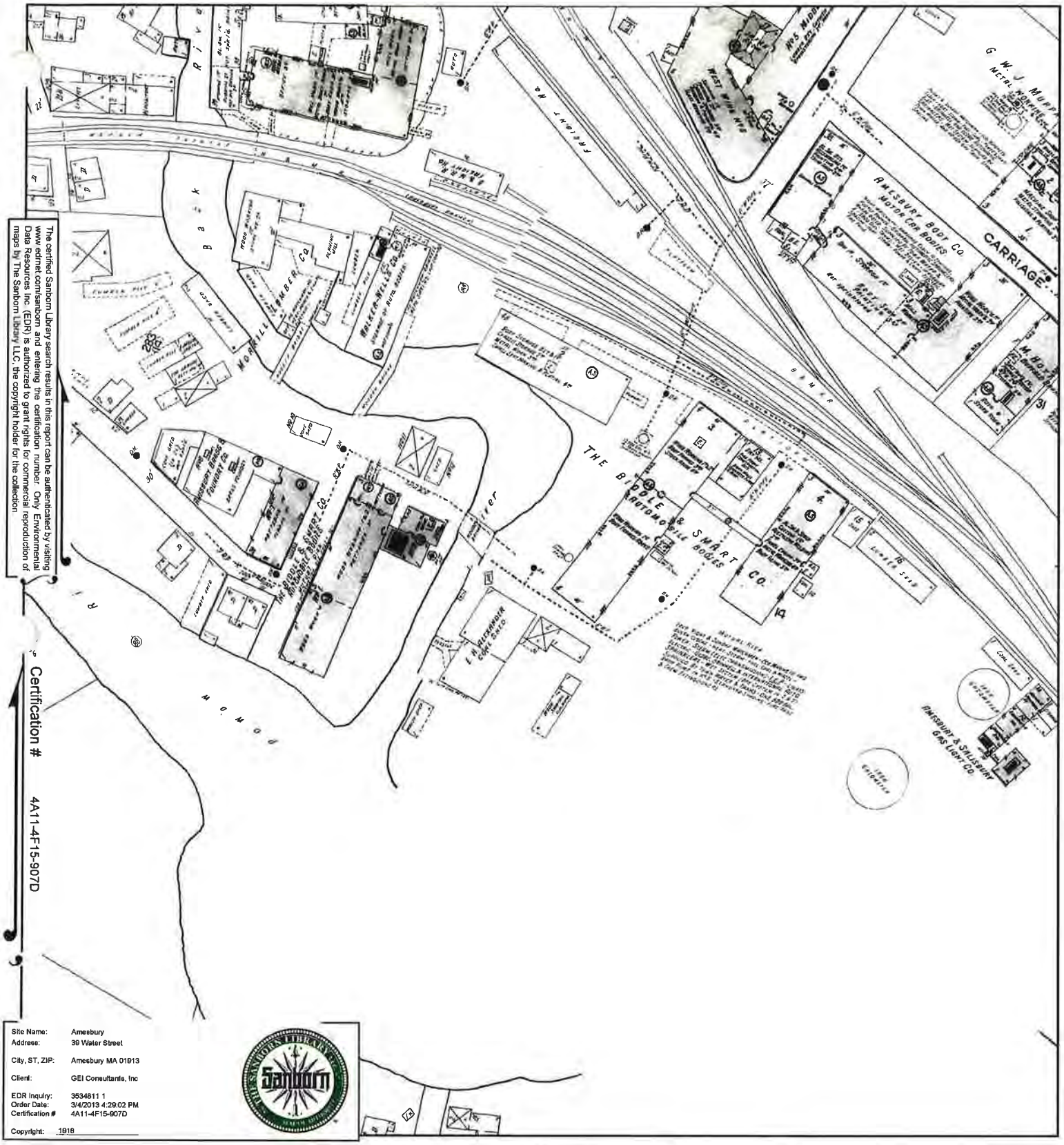
AERO-VIEW OF AMESBURY MASSACHUSETTS 1914

Amesbury Electric Light Co. Harland A. Sawyer, Mgr. 34 Market St.
Amesbury Electric Shoe Repairing Co. Dealers in Shoes and Rubbers. Morris Trabach, Prop. 8 Water St.
Amesbury Sent Glass Co. Carriage Ave.
Ames, W. N. & Co. Coal. Merrimac St.
Amesbury Publishing Co. 12 Market Sqr.
Bean, H. H. Coal, Wood, Lime, Cement and Drain Pipe. 13 Railroad Ave.
Biddle & Smart Co., The. Coach Builders. Railroad Ave.
Blakeslee, Clarence D. Pharmacist. 42 Main St.
Boyle, William E. Pharmacist. 88 Main St.
Briggs Carriage Co. Automobile Bodies and Tops. Cedar St.
Briggs, Geo. L. Real Estate and Insurance. 109 Main St.
Brochu, A. Meats, Groceries and Bakery. 64 Friend St.
Carr, W. E. Wholesale Ice Cream and Retail Confectionery. Rocky Hill Crystal Spring Water. 69 Main St.
Charron's Studio. High Class Portraiture. 22 Market St.
Connor's Market. Groceries and Meats. J. T. Brodner. 39 Friend St.
Cote, Rev. J. H. Pastor Sacred Heart Church. French Parish. 67 Friend St.
Cote Contracting Co. Contractors and Builders. 207 Elm St.
Currier Brothers. Jewelers and Opticians. 112 Main St.
Essex Hotel. Mrs. J. H. Jennings. Main St.
Fuller, W. E. & Co. Clothiers. Cor. Main and Friend Sts.
Gammon, C. W. Meats and Provisions. 109 Elm St.
Goddard, C. W. Furniture and Piano Mover, Teaming. 2 Merrill Place.
Gordon, J. H. Agent. American Express Co.
Gowen, William M. Druggist and Apothecary. 16 Market Sqr.
Heath, Leon J. Practical Electrician. 34 Market St.
Hill's Owl Lunch. Thos. F. Hill, Prop. 34 Elm St.
Hodge & Graves Co. Mfrs. of patent "Luxury" Folding seats for Automobiles. Near Railroad Station.
Holtzdge & Merrill, Inc. Motor Car Bodies. Carriage Hill.
Howes & Allen. Books, Stationery, Periodicals and Daily Papers. 14 Main St.
Kivilie, A. M. Dry and Fancy Goods. 89 Main St.
Kimball, G. L. Reliable Footwear. 21 Market St.
Lane, T. W. Carriages. Chestnut St.
Lee, Rev. D. F. Pastor St. Joseph's Church. Main Cor. School Sts.
Leslie, Herbert G., M. D. 58 Main St.
Locke, Harvey B. Jeweler. 14 Market Sqr.
Lowell, H. & Son. Builders of Fishing Dories. 459 Main St.
Locke, R. H. Lake Gardner Ice. Whitehall Road. Res. 6 Wells Ave.
Lunt Shoe Shop. 61 Main St.
Lynch, Paul., D. D. S. Dentist. Fuller Block. Main St.
Lynes, T. F. Postmaster.
Merrimac Hat Co. Inc. 1856. Merrimac St.
Merrill, F. S. Patent and Common Wheels. Cedar St.
Miller Bros., Inc. Automobile Bodies. Chestnut St.
Morrill, Frank E. High Power Launches, Skiffs and Dories. 467 Main St.
Munro's Department Store. A. Munro, Jr., Prop. 15 Main St.
New York Cloak Co. Women's and Children's Garments. 43 Main St.
O'Donnell, Joseph. Undertaker, Hack, Livery and Boarding Stables. Main St., Near American House.
Patterson, J. Wesley. Florist. Dealer in Slate Burial Vaults. Funeral Designs. Bay St.
Peabody, Fred W. Pianos, Musical Merchandise, Talking Machines, Sewing Machines. 16 Main St.
Peltier, Arthur, Fancy Groceries, Meats and Provisions. 115 Main St.
Pettingill, Chas. I. Attorney at Law. Wilman Block.
Porter's Lunch Room. Sam'l L. Porter, Prop. 24 Main St.
Powow River National Bank. Porter Sargent, Cashier. 1 Market St.
Public Library E. A. Brown, Librarian. Main St.
Reddy, Anthony W. Attorney at Law. 44 Main St.
Reed, M. E. Plumbing and Heating. 44 Elm St.
Roche, Thomas N. Physician. 134 Main St.
Ryan, J. H. Dentist. Wilman Block.
Sargent, M. Perry. Settlement of Estates and all Probate Matters. Commissioner for Maine and N. H. 44 Main St.
Scribner, E. L. Genealogist, Clerk of Springer Corporation, 1913. 15 Lincoln Court.
Scott Grain Co., The. Powow Grist Mills. B. R. Ave., Near Elm St.
Shields Carriage Co., The. Mfrs. Automobile Bodies. Carriage Ave.
Solari & Co. Foreign and Domestic Fruits and Confectionery. 12 Market St.
True, H. F. Carpenter and Builder. 255 Elm St.
Titcomb, E. F. Mason, Contractor and General Jobbing. 6 East Greenwood St.
Walker-Wells Co. Automobile Bodies and Seats. Near R. R. Ave.
Wells, Chas. H. Upholstering and General Repair Work. Mattresses made over to order. Carpet laying and cleaning. Awnings and window shades. 71½ School St.
Wet Wash Laundry, John A. Lawson, Prop. South Hampton Road. Phone, 237-X.
White Cash Market. F. C. Boardman, Prop. 2 Market Sqr.
Wing Co., The Chas. Chas A. Steere Sec'y Water St.
Woodman, E. L. Meats & Provisions. Cor. Elm and Water Sts.

73-693112

G3764
A4A3
1914
.H8
Fow62

1918 Certified Sanborn Map



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Certification # 4A11-4F15-907D

Site Name:	Amesbury
Address:	38 Water Street
City, ST, ZIP:	Amesbury MA 01913
Client:	GEI Consultants, Inc
EDR Inquiry:	3534811.1
Order Date:	3/4/2013 4:29:02 PM
Certification #	4A11-4F15-907D
Copyright:	1918

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Outlined areas indicate map sheets within the collection.



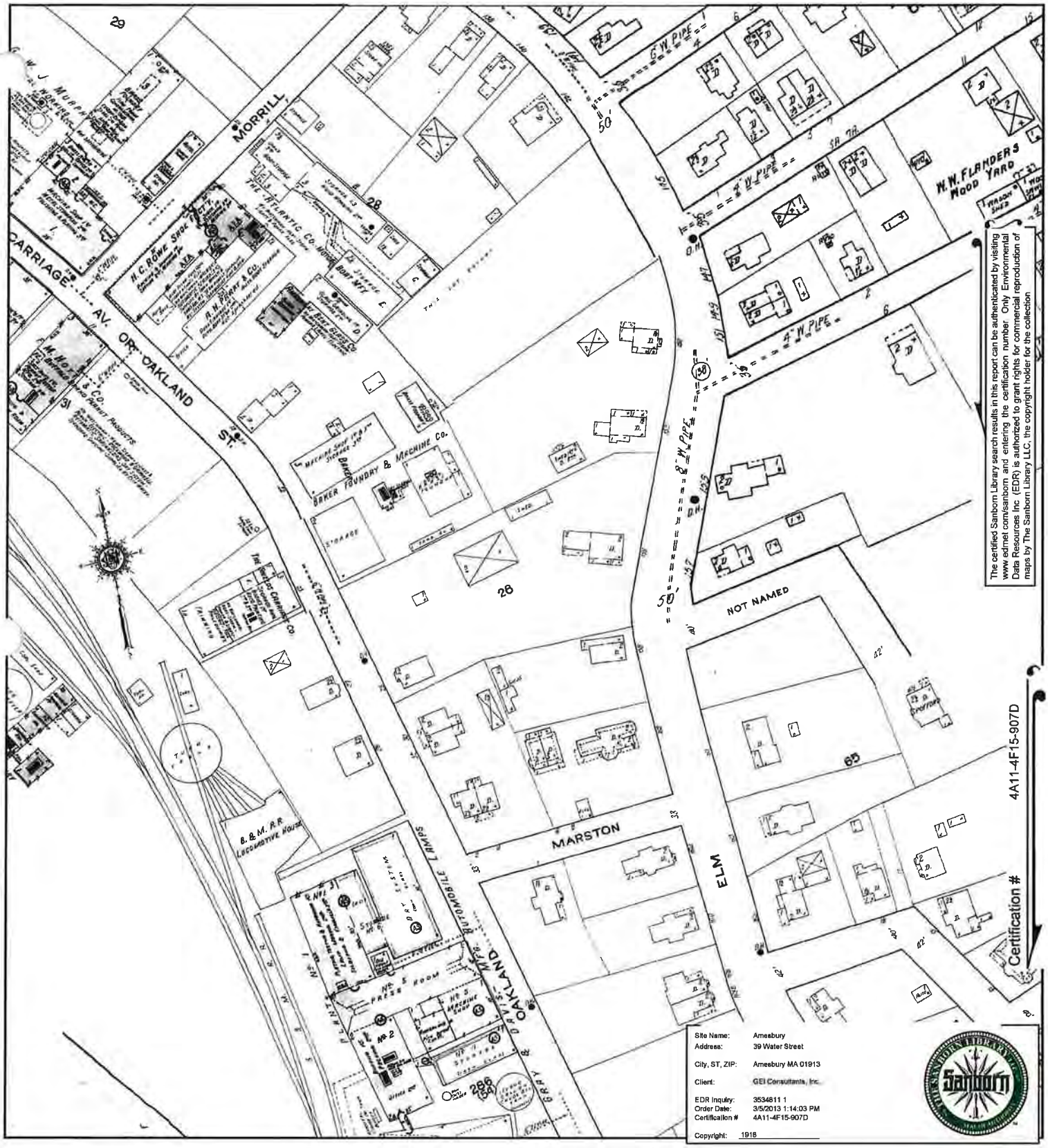


Volume 1, Sheet 10
Volume 1, Sheet 8
Volume 1, Sheet 7
Volume 1, Sheet 4

0 Feet 150 300 600

N

1918 Certified Sanborn Map



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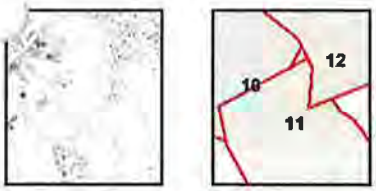
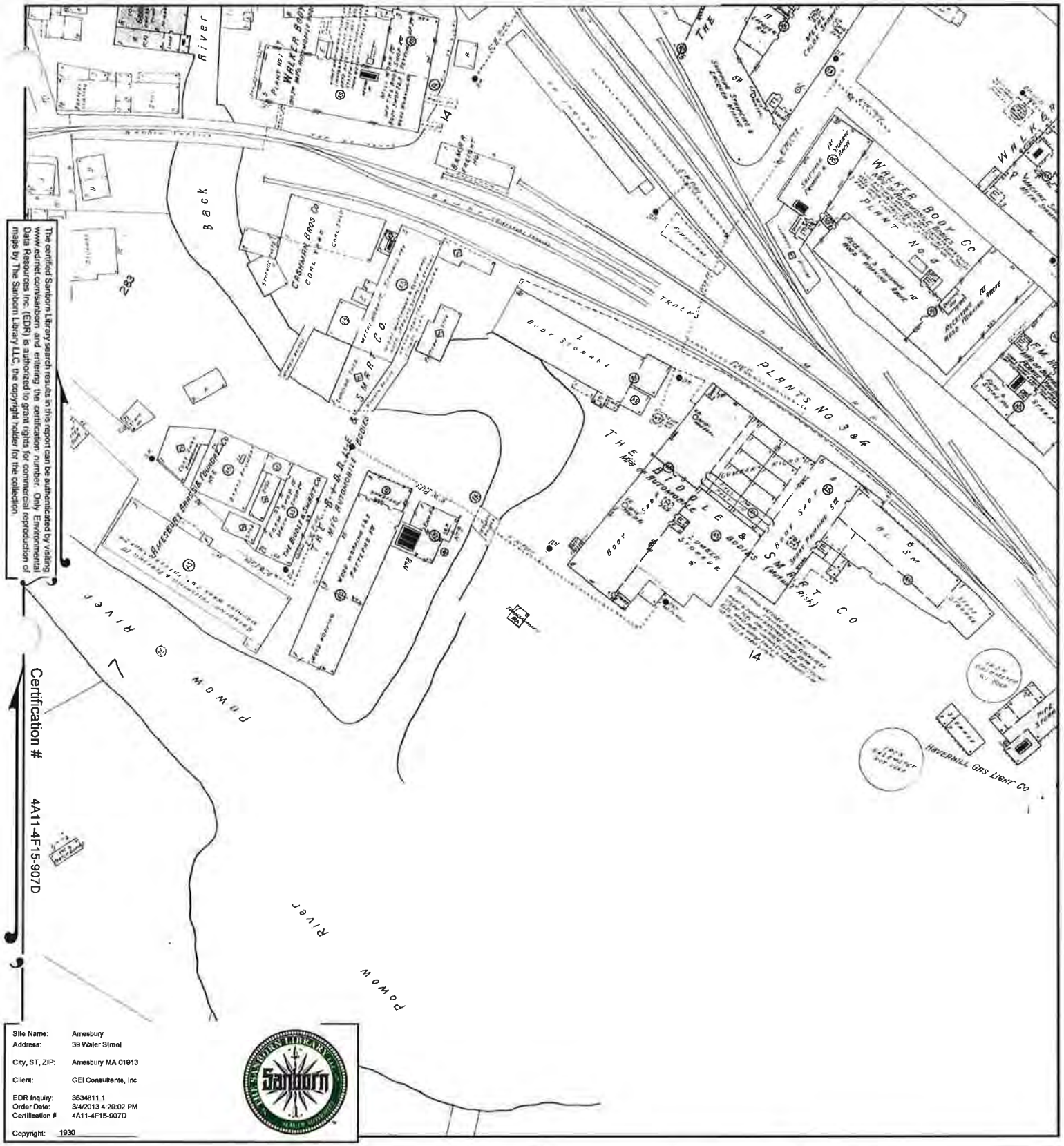
Outlined areas indicate map sheets within the collection.



Volume 1, Sheet 10
Volume 1, Sheet 11
Volume 1, Sheet 12

1930 Certified Sanborn Map



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Certification #	4A11-4F15-907D
Copyright:	1930

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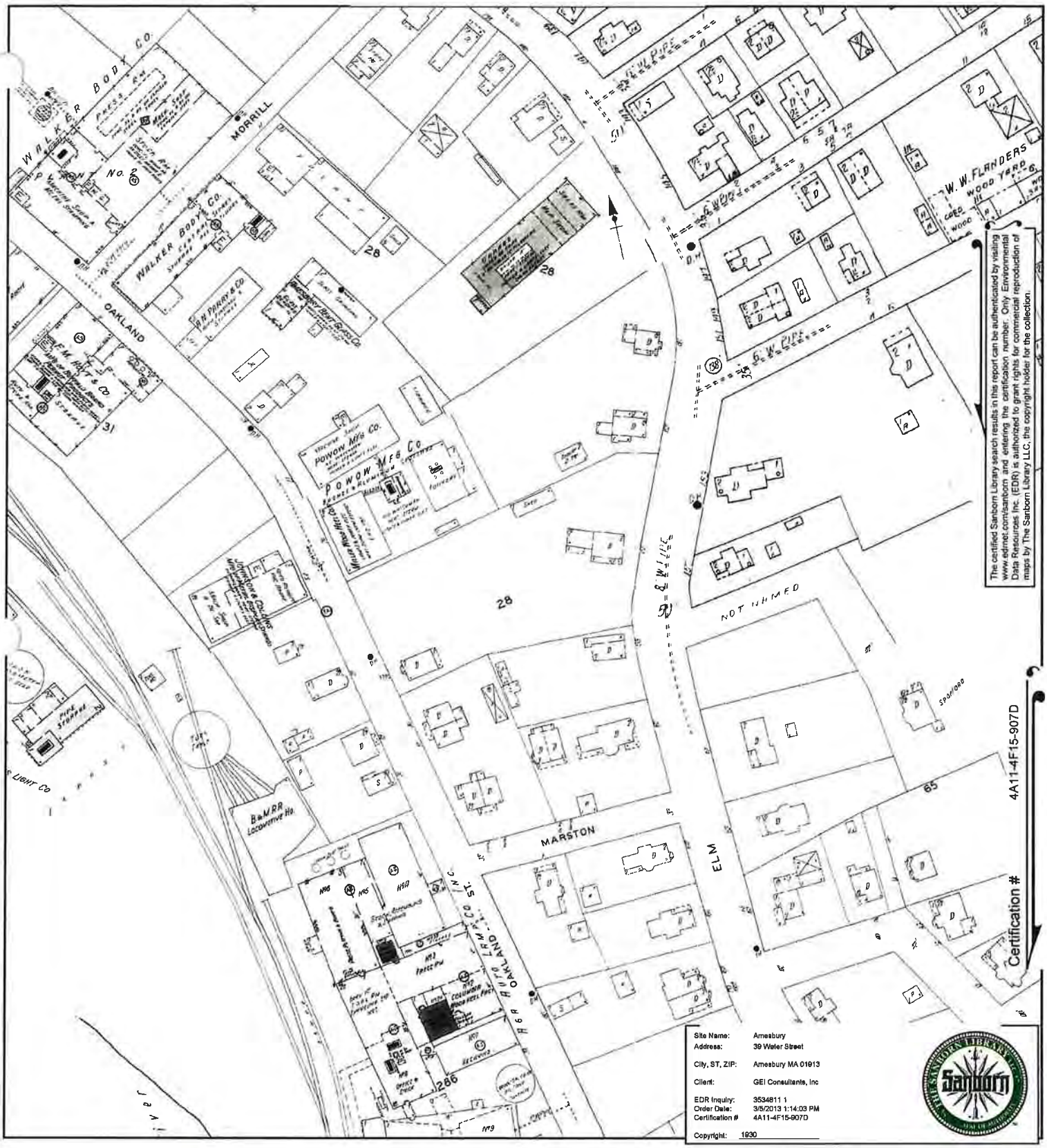
Volume 1, Sheet 10
Volume 1, Sheet 7

0 Feet 150 300 600

N

1930 Certified Sanborn Map



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Volume 1, Sheet 10
Volume 1, Sheet 11
Volume 1. Sheet 12

0 Feet 150 300 600

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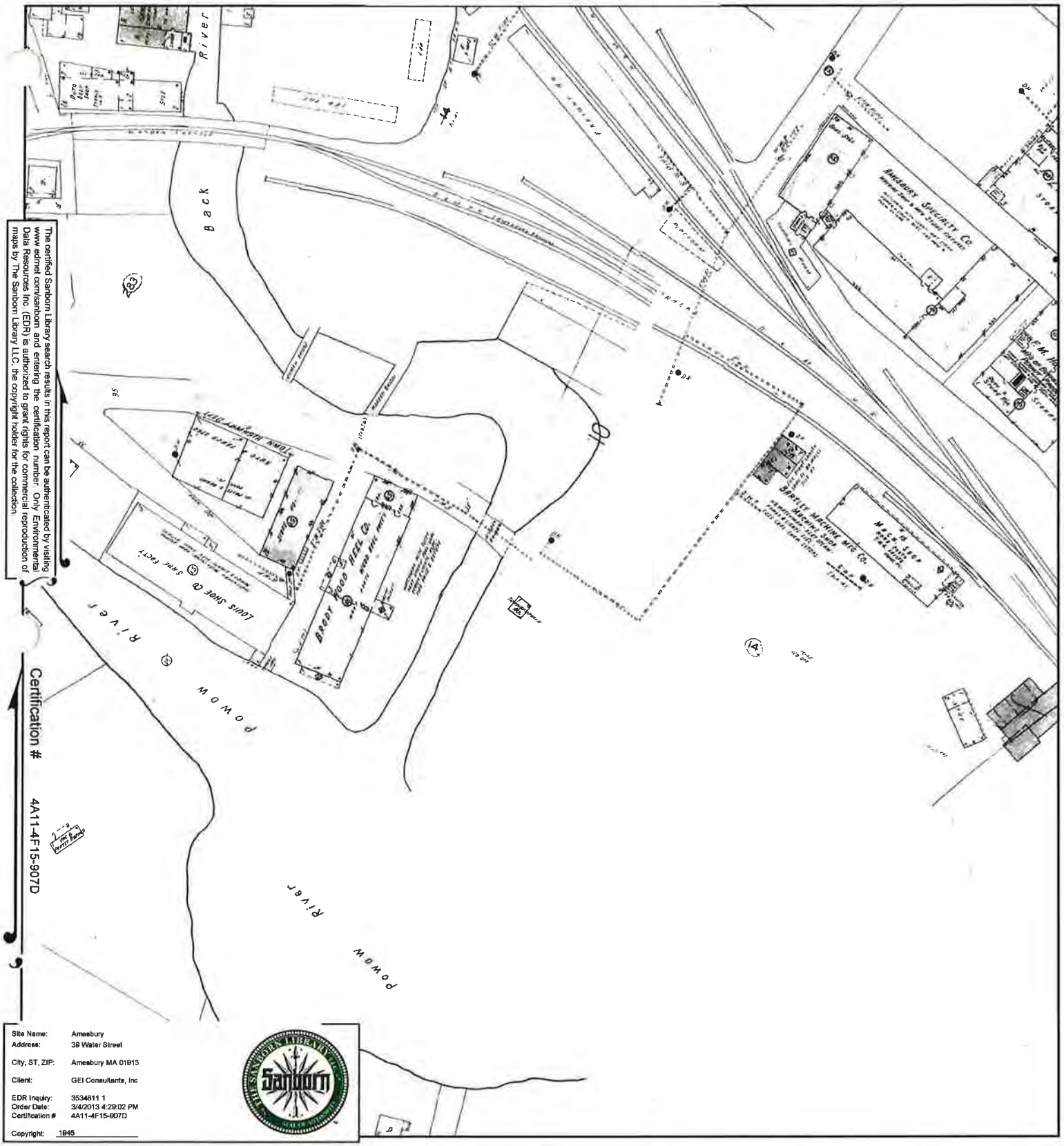
1945 Certified Sanborn Map



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City, ST, ZIP:	Amesbury MA 01913
Client:	GEI Consultants, Inc
EDR Inquiry:	3534811 1
Order Date:	3/4/2013 4:29:02 PM
Certification #	4A11-4F15-907D
Copyright:	1945

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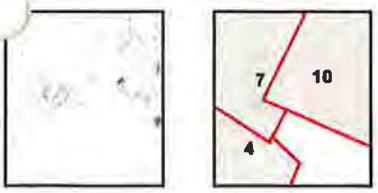
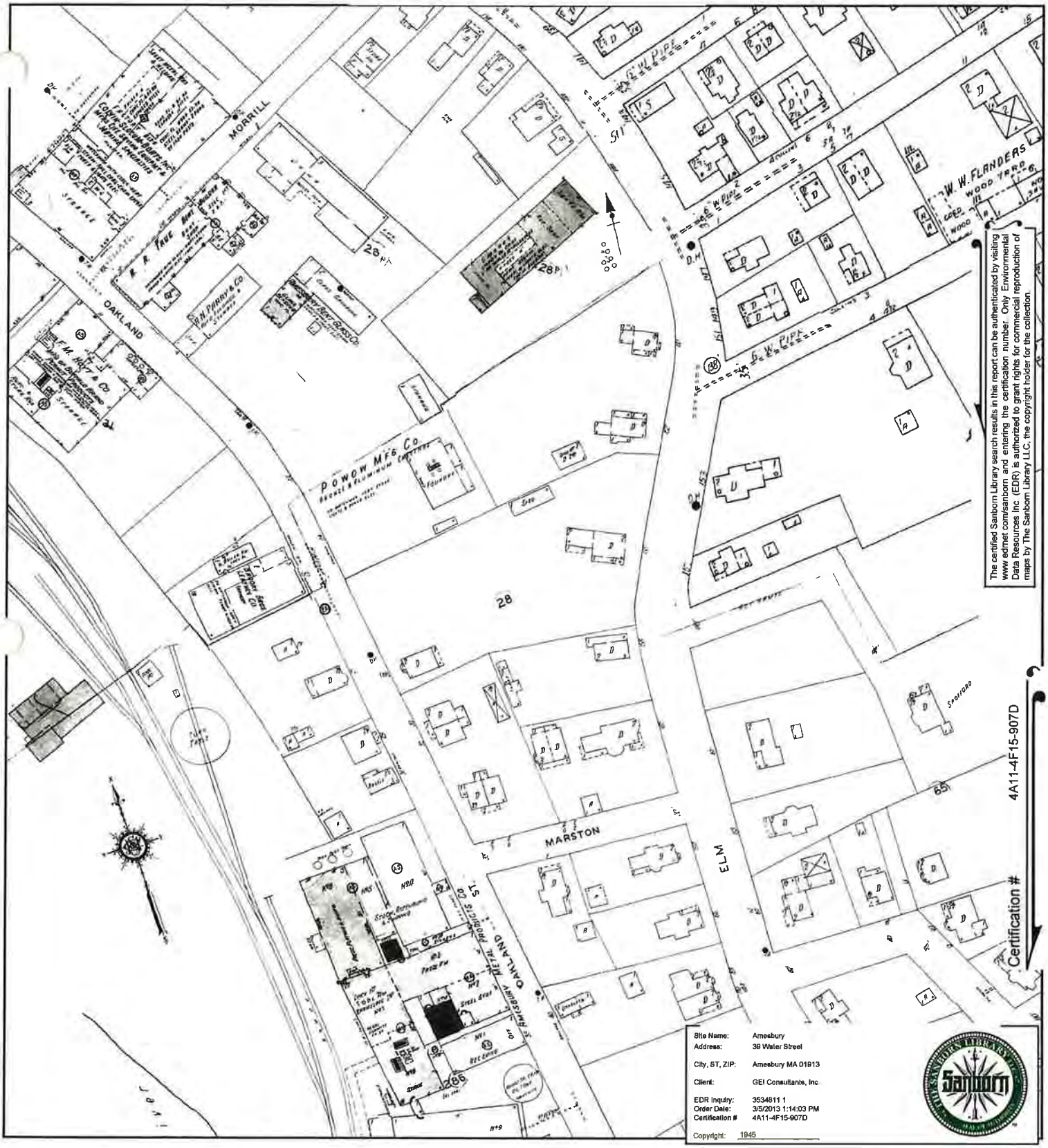


Volume 1, Sheet 7
Volume 1, Sheet 10
Volume 1, Sheet 4

0 Feet 150 300 600

N

1945 Certified Sanborn Map



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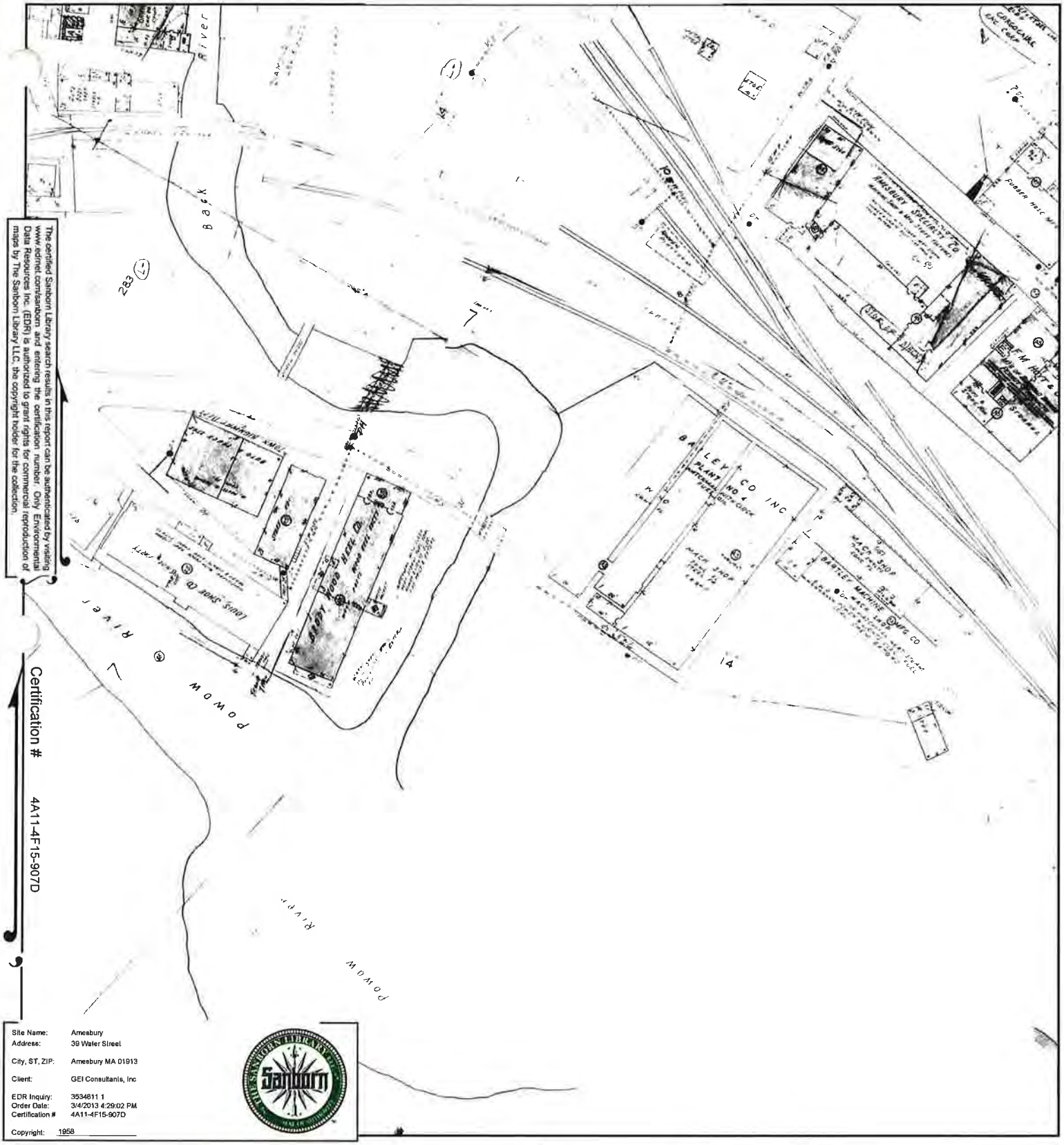
Volume 1, Sheet 12

1958 Certified Sanborn Map



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Volume 1, Sheet 7
Volume 1, Sheet 10

0 Feet 150 300 600

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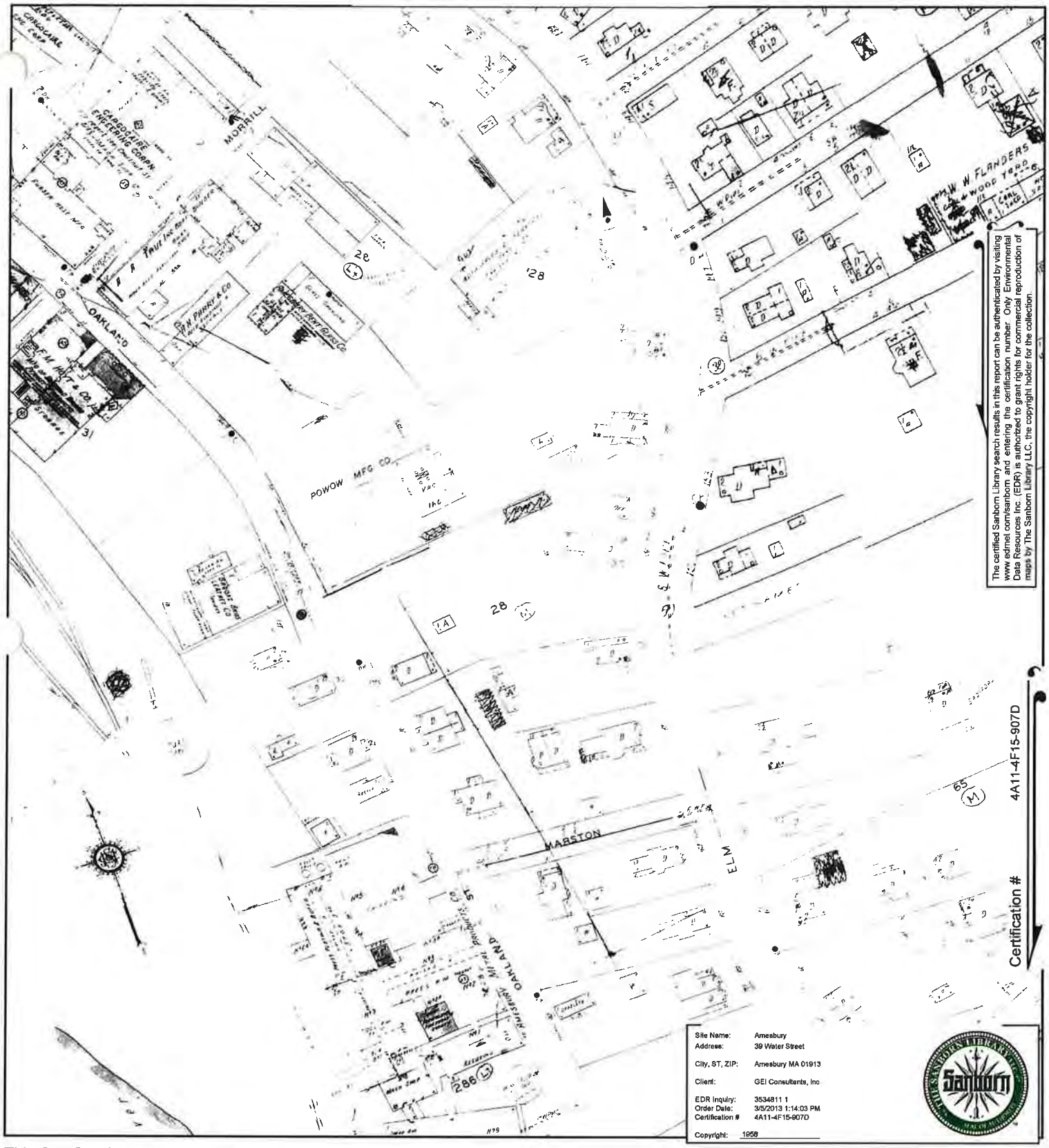
1958 Certified Sanborn Map



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Certification # 4A11-4F15-907D

This Certified Sanborn Map combines the following sheets.
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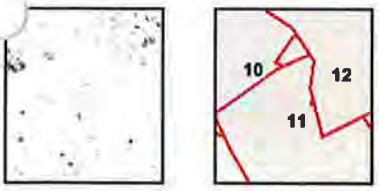

Volume 1, Sheet 10
Volume 1, Sheet 11
Volume 1, Sheet 12

0 Feet 150 300 600

N

1964 OFFICIAL HIGHWAY MAP OF MASSACHUSETTS

Legend

PRINCIPAL THROUGH HIGHWAYS
- Multilane Toll Road
- Multilane Divided — Access Fully Controlled
- Multilane Divided — Access Partially Controlled
- Multilane Divided
- Multilane Undivided
- 2 lane, Access Fully Controlled
- 2 lane, Paved

OTHER THROUGH HIGHWAYS
- Multilane Divided
- Multilane Undivided
- 2 lane, Paved

OTHER HIGHWAYS
- Paved
- Dustless
- Other all Weather

Route Numbers — U.S. (3) State (128) Interstate (93)
State Boundaries
County Boundaries
Township Boundaries
Airports — Commercial; Military; Other
State Police Barracks
Points of Interest
Recreational Areas — Day use only; Campsites
Schools and Colleges
Local Mileages
Accumulated Mileages — 4 4

Population Breakdown

Under 1,000	5,000-10,000	25,000-50,000	75,000-100,000
1,000-5,000	10,000-25,000	50,000-75,000	Over 100,000

Scale of Miles

0 5 10 15 20 25

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Lithographed in Massachusetts, U.S.A.

Map prepared by The National Survey, Chester, Vermont

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RECREATIONAL FACILITIES

STATE FORESTS	Map Location	Year Round Camping	Seasonal Camping	Picnicking	Fishing
Bash Bish Falls, Mt. Washington	A5	●			
Beartown, Great Barrington	A5	●	●		●
Brimfield	E5	●			●
Campbell Falls, Southfield	B5	●			
Chester-Blandford	C5	●			●
D.A.R. Goshen	C4	●	●		●
Douglas	G5	●	●		●
Erving	E3	●	●		●
Freetown, Fall River	K6				
Granville	C5		●		●
Harold Parker, No. Reading	K3	●	●		●
Leominster	G4				●
Lowell-Dracut	J3				
Mass. Fed. Wom. Clubs, Petersham	F4		●		
Mohawk Trail, Charlemont	C3	●	●	●	●
Monroe	C3		●		
Mt. Grace, Warwick	E3		●		
Myles Standish, So. Carver	M6	●	●	●	
October Mt., Washington	B4				●
Otter River, Winchendon	F3		●	●	●
Pittsfield	A4		●	●	●
Sandisfield	B5	●	●		●
Savoy Mt., No. Adams	B3	●	●	●	●
Shawme-Crowell, Sandwich	M7			●	
Spencer	G5		●		●
Tolland, Otis	B5	●	●	●	
Warren Manning, Billerica	J3				●
Willard Brook, Townsend	G3		●	●	●
Windsor	B3		●	●	●

STATE PARKS	Map Location	Year Round Camping	Seasonal Camping	Picnicking	Fishing
Clarksburg	B3	●	●	●	●
Cochituate, Wayland	J4	●	●		●
Demarest-Lloyd, So. Dartmouth	L8	●	●		●
Dighton Rock, Berkley	K6				
Hopkinton	H5	●	●		
J. A. Skinner, So. Hadley	D4				
J. C. Robinson, Agawam	D5				●
Quinsigamond, Worcester	H4	●	●		●
R. C. Nickerson, Brewster	O7	●	●	●	●
Wahconah Falls, Dalton	B4	●	●		
Watson Pond State Park	K6				●
Whitehall, Hopkinton	H5		●		

BEACHES	Map Location
Ft. Phoenix, Fairhaven	L7
Horseneck Beach, Westport	K8
Lynn Beach	L4
Nantasket Beach	L4
Provincetown	O5
Revere Beach	L4
Salisbury Beach	L2
Scusset Beach, Sandwich	M6

STATE BIRD
Chickadee

STATE FLOWER
Mayflower

INDEX TO CITIES, TOWNS & LOCALITIES

Abington L5
Acoaxet K8
Acton J4
Acushnet L7
Adams B3
Adamsville D3
Agawam D5
Alford A5
Allerton L4
Amesbury L2
Amherst D4
Andover K3
Annisquam M3
Arlington K4
Asbury Grove L3
Ashburnham G3
Ashby G1
Ashfield C3
Ashland J5
Ashley Falls A5
Assinippi L5
Assonet K6
Athol F3
Attleboro K6
Auburn G5
Avon K5
Ayer H3
Ayers Village K2
Baldwinsville F3
Ballardvale K3
Bancroft B4
Barnstable N7
Barre F4
Barre Plains F4
Barrowsville K6
Beaver Meadow D3
Becket B4
Bedford J4
Belchertown E4
Bellingham J5
Belmont K4
Berkley K6
Berlin H4
Bernardston D3
Beverly L3
Billerica J3
Blackstone H5
Blandford C5
Bolton H4
Bondsville E5
Boston K4
Bourne M7
Boxborough H4
Boxford K3
Boylston H4
Bradford K3
Braintree L5
Brant Rock M5
Brewster O6
Bridgewater L6
Briggs Corner K6
Briggsville B3
Brimfield E5
Brockton K5
Brookfield F5
Brookline K4
Buckland C3
Burlington K4
Buzzards Bay M7
Byfield L3
Cambridge K4
Canton K5
Carlisle J3
Carver L6
Cedarville M6
Centerville N7
Central Village K7
Charlemont C3
Charlton G5
Chatham P7
Chartley K6
Chelmsford J3
Chelsea K4
Cheshire B3
Chester C4
Chesterfield C4
Chicopee D5
Chilmark M8
City Mills J5
Cliftondale K4
Clarksburg B3
Clinton H4
Cochituate J4
Cohasset L5
Coldbrook Springs F4
Cold Hill D4
Collinsville J3
Colrain D3
Concord J4
Conway D3
Cordaville H4
Cotuit N7
Cummaquid N7
Cumminglon C4
Cuttyhunk L8
Dalton B4
Danvers L3
Dartmouth L7
Dedham K5
Deerfield D3
Dell C3
Dennis O7
Dennis Port O7
Dighton K6
Dorchester K4
Douglas M5
Dover J5
Dracut J3
Dudley G5
Dunstable J3
Duxbury M5
Dwight E4
East Bridgewater L5
East Brookfield F5
East Longmeadow E5
Eastham P6
Easthampton D4
Easton K5
Edgartown N8
Enrelmoor A5
Ellisville M6
Enfield E3
Erving E3
Essex L3
Everett K4
Fairhaven L7
Fall River K7
Falmouth M7
Farley E3
Farmersville M5
Feeding Hills D5
Fentonville E5
Fiskdale F5
Fitchburg G3
Florence D4
Florida B3
Forestdale M7
Forest Hill K4
Foxboro Village K3
Foxborough K5
Framingham J4
Franklin J5
Freetown K7
Gardner G3
Gates Crossing H4
Gay Head L8
Georgetown K3
Gibbs Crossing E5
Gilbertville F4
Gill D3
Gloucester H4
Goshen C4
Gosnold M8
Grafton M5
Granby D5
Granville C5
Great Barrington A5
Greenfield D3
Green Harbor M5
Grisworldville D3
Groton H3
Groveland K3
Hadley D4
Halifax L6
Hamilton L3
Hampden E5
Hancock A3
Hanover L5
Hanson L5
Hardwick F4
Hartsville B5
Harvard H4
Harwich O7
Hatfield D4
Haverhill K2
Hawley C3
Hayden Row H5
Haydenville D4
Heath C3
Hingham L5
Hinsdale B4
Hixville K7
Hockanum D4
Hodges Village G5
Holbrook K5
Holden G4
Holland F5
Hoolliston J5
Holyoke D5
Hopedale H5
Hopkinton H5
Housatonic A5
Hubbardston F4
Hudson H4
Hull L4
Humarock M5
Huntington C5
Hyannis N7
Ingleside D5
Indian Orchard D5
Ipswich L3
Ironstone H5
Jamaica Plain K4
Kingston L6
Konkapot A5
Lakeville L6
Lancaster H4
Lanesborough A3
Lanesville M3
Larnesville G5
Lawrence K3
Lebanon Mills J6
Lee B4
Leeds D4
Leicester G5
Lenox A4
Leominster G3
Leverett E4
Lexington K4
Leyden D3
Lincoln J4
Lithia C4
Littleton H3
Locks Village E4
Longmeadow D5
Loudville D4
Lowell J3
Ludlow E5
Lunenburg H3
Lynn L4
Lynnfield K3
Magnolia M3
Malden K4
Manchaug H5
Manchester L3
Manomet M6
Mansfield K5
Marion L7
Marlborough H4
Marshfield M5
Marstons Mills N7
Mashpee M7
Mattapoisett L7
Maynard J4
Medfield J5
Medford K4
Medway J5
Melrose K4
Mendon H5
Menemsha L8
Merrimac K2
Methuen K3
Middleborough L6
Middlefield C4
Middleton L3
Milford H5
Millbury G5
Millers Falls E3
Millis J5
Mill River A5
Millville H5
Millwood L3
Milton K5
Monroe C3
Monson E5
Montague D3
Monterey B5
Montgomery C5
Monument Beach M7
Mount Washington A5
Myricks K6
Nahant L4
Nantasket L4
Nantucket O8
Natick J4
Needham J4
New Ashford A3
New Bedford L7
New Boston B5
New Braintree F4
New Marlborough B5
New Salem E4
Newbury L2
Newburyport L2
Newton K4
Nichewaug F4
Nobscot J4
Norfolk J5
North Adams B3
North Andover K3
North Attleborough J6
North Brookfield F5
North Reading K3
Northampton D4
Northborough H4
Northbridge H5
Northfield E3
Norton K6
Norwell L5
Norwich Bridge C5
Norwood K5
Oak Bluffs M8
Oakham F4
Ocean Grove K7
Old Furnace F4
Old Town J6
Onset M7
Orange E3
Orleans P6
Osterville M7
Otis B5
Otter River F3
Oxford G5
Palmer E5
Paxton G4
Peabody L3
Pelham E4
Pembroke L5
Pepperell H3
Peru B4
Petersham F4
Phillipston F3
Pigeon Cove M3
Pinehurst K3
Pittsfield B4
Plainfield C3
Plainville J6
Plymouth M6
Plympton L6
Pocasset M7
Ponkapoag K5
Princeton G4
Provincetown O5
Quinapoxet G4
Quincy L5
Randolph K5
Raynham K6
Reading K3
Rehoboth K6
Revere L4
Richmond A4
Ringville C4
Rochdale G5
Rockland L5
Rockport M3
Rowe C3
Rowley L3
Roxbury K4
Royalston F3
Russell C5
Rutland G4
Sagamore M6
Salem L3
Salisbury L2
Sandersdale F5
Sandisfield B5
Sandwich N7
Sankaty Head P8
Saugus K4
Savoy B3
Saxonville J4
Scituate M5
Seekonk J6
Sharon K5
Shawsheen Village K3
Sheffield A5
Shelburne D3
Shelburne Falls D3
Sherborn J4
Shirley H3
Shrewsbury H4
Shutesbury E4
Silver Lake P8
Sixteen Acres E5
Somerset K6
Somerville K4
South Hadley D5
Southampton C5
Southborough H4
Southbridge F5
Southfield B5
Southwick D5
Spencer F5
Springfield D5
Spruce Corner C3
Squantum L4
Sterling H4
Still River H4
Stockbridge A4
Stoneham K4
Stoughton K5
Stow J4
Sturbridge F5
Sudbury J4
Sunderland D4
Sutton G5
Swampscott L4
Swansea K7
Swift River C4
Tatnuck G4
Taunton K6
Tealtuck M7
Templeton F3
Tenneyville E5
Tewksbury K3
Three Rivers E5
Tisbury M8
Tolland C5
Topsfield L3
Touisset K7
Townsend H3
Trement L6
Truro O6
Tyllsonville F3
Turners Falls D3
Tyngsborough J3
Tyringham B5
Unionville J5
Upton H5
Uxbridge H5
Val Duesenville A5
Vineyard Haven M8
Wakefield K4
Wales F5
Walpole J5
Waltham J4
Wamesit J3
Wakusit Village M7
Ware F5
Wareham L7
Warren F5
Warwick E3
Washington B4
Watertown K4
Waterville F3
Wayland J4
Webster G5
Wellesley J4
Wellfleet O6
Wendell E3
Wenham L3
West Boylston G4
West Bridgewater K6
West Brookfield F5
West Newbury L2
West Springfield D5
West Stockbridge A4
West Tisbury M8
Westborough H4
Westfield D5
Westford J3
Westhampton C4
Westminster G3
Weston J4
Westport K7
Westville K6
Westwood K5
Weymouth L5
Whately D4
Wheelwright F4
White Valley F4
Whitinsville H5
Whitman L5
Wilbraham E5
Williamsburg D4
Williamstown B3
Williamsville F4
Wilmington K3
Winchendon F3
Winchester K4
Windsor B3
Winthrop L4
Woburn K4
Woods Hole M7
Woodville H5
Worcester G4
Woronoco C5
Worthington C4
Wrentham J5
Yarmouth O7
Zoar C3

MILEAGE TABLE

HOW TO USE THE MILEAGE TABLE

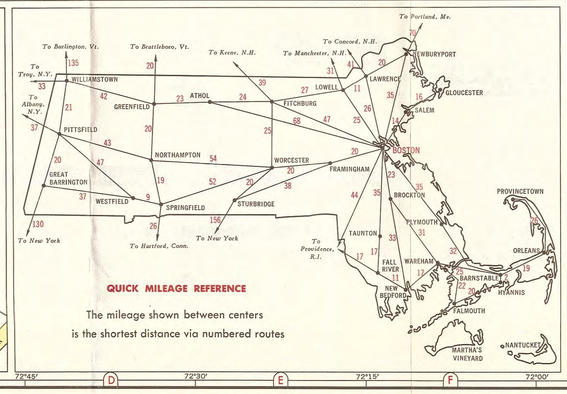
Follow down the vertical column under the first town in alphabetical order to where the horizontal column against the other town intersects it. The figure in the square is the distance between the two points.

APPROXIMATE DISTANCES BETWEEN POINTS IN MASSACHUSETTS

	AMHERST	ATTLEBORO	BOSTON	BOURNE	BROCKTON	CONCORD	FALL RIVER	FITCHBURG	FRAMINGHAM	GARDNER	GREAT BARRINGTON	GREENFIELD	HAVERHILL	HOLYOKE	HYANNIS	LAWRENCE	LENOX	LOWELL	NANTUCKET	NEW BEDFORD	NEWBURYPORT	NORTH ADAMS	NORTHAMPTON	PITTSFIELD	PLYMOUTH	PROVINCETOWN	QUINCY	SALEM	SPRINGFIELD	TAUNTON	WALTHAM	WESTFIELD	WILLIAMSTOWN	WINCHENDON	WORCESTER
AMHERST		71	91	81	91	72	84	52	64	33	74	36	74	13	122	92	64	31	141	84	103	70	26	13	102	135	96	95	74	41	93	19	31	68	39
ATTLEBORO	71		41	81	31	46	31	73	31	67	87	89	84	83	81	69	15	78	77	39	109	96	97	84	39	77	39	38	39	30	36	52	100	99	66	77
BOSTON	91	41		66	26	21	46	49	21	63	106	106	36	103	70	26	53	89	93	54	36	116	117	104	46	97	29	7	19	51	16	72	120	119	86	97
BOURNE	81	81	66		40	70	36	103	70	93	96	96	70	93	52	60	93	79	27	28	70	106	107	94	80	31	69	73	59	41	56	82	110	109	96	107
BROCKTON	91	31	26	40		36	21	77	36	67	96	96	46	93	60	36	63	79	67	28	46	106	107	94	46	67	13	19	29	21	6	62	110	109	76	87
CONCORD	72	46	21	70	36		56	28	15	42	85	85	15	82	91	15	42	10	112	64	15	95	96	83	25	112	43	28	40	30	30	41	89	88	55	66
FALL RIVER	84	31	46	36	21	56		93	56	83	116	116	66	113	72	46	83	99	47	8	66	126	127	114	66	87	33	39	49	41	26	82	130	129	96	107
FITCHBURG	52	73	49	103	77	28	93		38	10	58	58	28	55	113	28	25	18	134	86	28	68	69	56	48	134	65	50	62	63	52	63	62	61	28	39
FRAMINGHAM	64	31	21	70	36	15	56	38		28	71	71	28	68	91	28	38	23	112	64	28	81	82	69	31	112	43	28	40	30	16	41	89	88	55	66
GARDNER	33	67	63	93	67	42	83	10	28		68	68	38	65	123	38	35	28	144	96	38	78	79	66	58	144	75	60	72	73	62	73	72	71	38	49
GREAT BARRINGTON	74	87	106	96	96	85	116	58	71	68		37	97	9	155	97	33	81	177	119	71	37	38	25	101	130	100	99	78	76	99	37	9	30	41
GREENFIELD	36	89	106	96	96	85	116	58	71	68	37		97	28	155	97	33	81	177	119	71	37	38	25	101	130	100	99	78	76	99	37	28	30	41
HAVERHILL	74	84	36	70	46	15	66	28	28	38	97	97		94	88	18	65	46	109	66	18	98	99	86	58	109	65	50	62	63	52	63	62	61	28	39
HOLYOKE	13	83	103	93	93	82	113	55	68	65	9	28	94		152	94	30	78	174	116	68	34	35	22	98	127	97	96	75	73	96	34	6	27	38
HYANNIS	122	81	70	52	60	91	72	113	91	123	155	155	88	152		88	123	109	79	76	88	164	165	152	94	165	123	108	120	121	110	121	160	159	126	137
LAWRENCE	92	69	26	60	36	28	46	28	28	38	97	97	18	94	88		65	46	109	66	18	98	99	86	58	109	65	50	62	63	52	63	62	61	28	39
LENOX	64	15	53	93	63	42	83	25	38	35	33	33	65	30	123	65		28	144	96	38	78	79	66	58	144	75	60	72	73	62	73	72	71	38	49
LOWELL	31	78	89	79	79	10	99	18	23	28	81	81	46	78	109	46	28		130	82	46	82	83	70	42	130	59	44	56	57	46	57	76	75	42	53
NANTUCKET	141	77	93	27	67	112	47	134	112	144	177	177	109	174	79	109	144	130		68	109	185	186	173	87	186	144	129	141	142	131	142	181	180	147	158
NEW BEDFORD	84	39	54	28	28	64	8	86	64	96	119	119	66	116	76	66	96	82	68		66	126	127	114	66	87	33	39	49	41	26	82	130	129	96	107
NEWBURYPORT	103	109	36	70	46	15	66	28	28	38	71	71	18	68	88	18	38	46	109	66		98	99	86	58	109	65	50	62	63	52	63	62	61	28	39
NORTH ADAMS	70	96	116	106	106	95	126	68	81	78	37	37	98	34	164	98	78	82	185	126	98		25	12	108	137	107	106	85	83	106	44	25	37	48
NORTHAMPTON	26	97	117	107	107	96	127	69	82	79	38	38	99	35	165	99	79	83	186	127	99	25		13	109	138	108	107	86	84	107	45	26	38	49
PITTSFIELD	13	84	104	94	94	83	114	56	69	66	25	25	86	22	152	86	66	70	173	114	86	12	13		96	125	95	94	73	71	94	32	13	25	36
PLYMOUTH	102	39	46	80	46	25	66	48	31	58	101	101	58	98	94	58	58	42	87	66	58	108	109	96		109	37	42	52	53	42	53	92	91	58	69
PROVINCETOWN	135	77	97	31	67	112	87	134	112	144	130	130	109	127	165	109	144	130	186	126	109	137	138	125	109		144	129	141	142	131	142	181	180	147	158
QUINCY	96	39	19	69	19	43	33	65	43	75	100	100	65	97	123	65	75	59	144	87	65	107	108	95	37	144		15	27	28	17	28	97	96	63	74
SALEM	95	38	7	73	29	28	39	50	28	60	99	99	50	96	108	50	60	44	129	87	50	106	107	94	42	129	15		26	27	16	27	96	95	62	73
SPRINGFIELD	74	39	19	59	29	40	49	62	40	72	78	78	62	75	120	62	72	56	141	49	62	85	86	73	52	141	27	26		41	30	41	76	75	42	53
TAUNTON	41	30	51	41	21	30	41	63	30	73	76	76	63	73	121	63	73	57	142	41	63	83	84	71	53	142	28	27	41		29	40	74	73	40	51
WALTHAM	93	36	16	56	6	30	26	52	16	62	99	99	52	96	110	52	62	46	131	82	52	106	107	94	42	131	17	16	30	29		30	96	95	62	73
WESTFIELD	19	83	103	93	93	82	113	55	68	65	37	28	94	6	160	94	34	78	181	116	68	44	45	32	92	181	97	96	76	40	96		36	47	38	49
WILLIAMSTOWN	31	99	119	109	109	88	129	62	88	72	9	30	63	27	159	63	72	76	180	129	63	25	26	13	91	180	96	95	75	74	95	36		36	47	58
WINCHENDON	68	66	86	96	76	55	96	28	55	71	30	30	61	38	126	61	71	75	147	96	61	37	38	25	91	147	63	62	42	40	62	47	36		36	47
WORCESTER	39	77	97	107	87	66	107	39	66	49	41	41	39	38	137	39	49	53	158	107	39	48	49	36	69	158	74	73	53	51	73	49	58	47	36	

QUICK MILEAGE REFERENCE

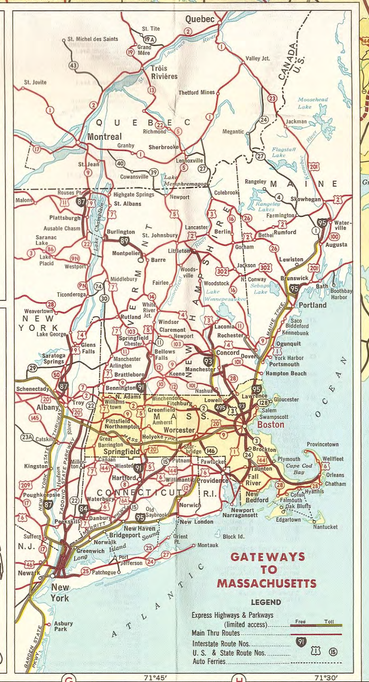
The mileage shown between centers is the shortest distance via numbered routes



GATEWAYS TO MASSACHUSETTS

LEGEND

Express Highways & Parkways (limited access) — Free / Toll
Main Thru Routes — Free 90 / Toll 90
Interstate Route Nos. — 93
U. S. & State Route Nos. — 3 (6)
Auto Ferries





BOSTON AND VICINITY

Scale of Miles

Prepared by THE NATIONAL SURVEY, CHESTER, VT
Lithographed in U.S.A.

SPRINGFIELD AND VICINITY

Prepared by The National Survey, Chester, Vermont

NEW BEDFORD

Prepared by The National Survey, Chester, Vermont

WORCESTER

Prepared by The National Survey, Chester, Vermont

FALL RIVER

Prepared by The National Survey, Chester, Vermont

LOWELL

Prepared by The National Survey, Chester, Vermont

LAWRENCE

Prepared by The National Survey, Chester, Vermont

HAVERHILL

Prepared by The National Survey, Chester, Vermont

DOWNTOWN BOSTON

Legend

City Routes C1
One Way Streets C1
U. S. and State Routes . . 93 1A
Freedom Trail . . . . . .

Scale of Miles

POINTS OF INTEREST

1. Boston Massacre Site
2. Boston Tea Party
3. Boston Museum of Science
4. City Hall
5. Coop's Hill Burying Ground
6. Court House
7. Custom House
8. Faneuil Hall
9. Franklin's Birthplace Site
10. Hatch Memorial Shell
11. Kings Chapel
12. Massachusetts Dept. of Public Works
13. Massachusetts General Hospital
14. Massachusetts Institute of Technology
15. New England Medical Center
16. Old Corner Book Store
17. Old Granary Burying Ground
18. Old North Church
19. Old State House
20. Old South Meeting House
21. Paul Revere's House
22. Post Revere Statue
23. Post Office
24. Public Library
25. State House

Prepared by The National Survey, Chester, Vt.

ROUTE 128 EXIT NUMBERS

The following Exit Numbers for new Route 128 have been established and signs bearing these numbers are posted along this route at each exit. Except where otherwise noted, directions outlined herein are correct for both Northbound and Southbound traffic.
Exit Numbers are shown on Boston and Vicinity map.

Exit Number	Leading to:—
9	**Route 127A (E. Main St. and Bass Ave.)**
	Bass Rock
	Gloucester Ctr.
	Long Beach
	Rocky Neck
	Gloucester
	State Fish Pier
10	**Route 127 (Eastern Ave.)**
	Rockport
	Annisquam
	Pigeon Cove
	Gloucester Ctr.
11	**Route 127 (Grant Circle)**
	Riverdale
	Annisquam
	Lanesville
	Pigeon Cove
12	**Crafts Road, Gloucester**
13	**Essex Junction**
	Essex Rd., Gloucester
	Wingaersheek Beach
14	**Route 133 (Essex Ave.)**
	West Gloucester
	Essex
	Ipswich
	Newburyport
15	**School Street, Manchester**
	Manchester
	Magnolia
16	**Pine Street, Manchester**
	Manchester
	West Manchester
17	**Grapevine Road, Wenham**
	Beverly Farms
	Manchester
	Trebbs Crossing
18	**Route 22 (Essex Street)**
	Wenham
	Essex
19	**Brimbal Ave., Beverly**
20N	**Route 1A (Dodge St.)**
	Wenham
	Hamilton
20S	**Route 1A (Dodge St.)**
21	**Trask Lane**
	128 SOUTHBOUND
22	**Route 62 (Elliott St.)**
	Danvers
	Danversport
	Beverly
	Marblehead
	Swampscott
	128 NORTHBOUND
22E	**Route 62 (Elliott St.)**
	Danversport
	Marblehead
	Beverly
	Swampscott
22W	**Route 62 (Elliott St.)**
23N	**Route 35 (High St.)**
	Danvers
23S	**Route 35 (High St.)**
	Danvers
	Salem
24	**Endicott Street, Danvers**
	Danvers
	Salem
25N	**Route 114 (Andover St.)**
	Danvers
	Lawrence
	Methuen
	Haverhill
25S	**Route 114 (Andover St.)**
	Peabody
	Salem
	Marblehead
	Swampscott
26	**Lowell Street, Peabody**
	Lynnfield
	Peabody
27	**Summit Street**
28	**Forest Street**
29	**For Future Use**
	128 SOUTHBOUND
30	**Route 1 Newburyport Turnpike**
	So. Lynnfield
	Saugus
	Malden
	Salisbury
	Maldon
	Portsmouth, N. H.
	Everett
	Portland, Maine
	Boston
	128 NORTHBOUND
30S	**Route 1 Newburyport Turnpike**
	So. Lynnfield
	Saugus
	Malden
30N	**Route 1 Newburyport Turnpike**
	So. Lynnfield
	Saugus
	Maldon
	Everett
	Boston
	Newburyport
	Salisbury
	Portland, N. H.
	Portland, Maine
31	**Walnut St., Lynnfield**
	Lynnfield Center
	Lynn-Nahant
32	**Charles Ave., Wakefield**
	Salem St., Wakefield
33	**Main St., Lynnfield**
	Lynnfield Center
	Wakefield
34	**Route 129, Wakefield**
	Reading
	North Reading
	Wakefield
	Melrose
35	**North Ave. Wakefield**
	Reading
	Wakefield
	Andover
	Lawrence
36N	**Route 28 (So. Main St.)**
	Reading
	Salem, N. H.
	Andover
	Lawrence
	Methuen
36S	**Route 28 (So. Main St.)**
	Stoneham
	Somerville
	Medford
37N	**Route 93, Reading**
	Wilmington
	Medford
37S	**Route 93, Reading**
	Wilmington
	Medford
38	**Washington St., Woburn**
39N	**Route 38 (Main St.)**
	Wilmington
	Dracut
	Tewksbury
	Pelham, N. H.
39S	**Route 38 (Main St.)**
	Woburn
	Medford
	Winchester
40	**Route 3, Burlington**
	Burlington
	Woburn
	Winchester
41N	**Route 3A (Cambridge St.)**
	Burlington
	Billerica
	Chelmsford
	Nashua, N. H.
41S	**Route 3 (Cambridge St.)**
	Winchester
	Arlington
	Cambridge
42	**Middlesex T'pk., Burlington**
43	**Route 2, Burlington**
	Lowell
	Nashua, N. H.
44N	**Routes 4 & 225 (Bedford St.)**
	Bedford
	Carlisle
	Lexington
44S	**Routes 4 & 225 (Bedford St.)**
	Lexington
	E. Lexington
45W	**Route 2A (Marrett Road)**
45E	**Route 2A (Marrett Road)**
	Lexington
46W	**Route 2 (Concord T'pk.)**
	Concord
	Littleton
	Ayer
	Fitchburg
46E	**Route 2 (Concord T'pk.)**
	Concord
	Lincoln
	Cambridge
	128 SOUTHBOUND
47	**Trapelo Road, Waltham**
	Lincoln
	Belmont
	Middlesex County Sanatorium
	Metropolitan State Hospital
	Walter Fernald State School
	MacLean Hospital
	128 NORTHBOUND
47E	**Trapelo Rd., Waltham**
	Belmont
	Lincoln
	128 SOUTHBOUND
48W	**Winter Street, Waltham**
	Local Traffic
48E	**Winter Street, Waltham**
	Local Traffic
	128 NORTHBOUND
48	**Winter St. (Weston St.)**
	Weston
	Waltham
	Wayland
	Sudbury

ROUTE 3 (NORTH) EXITS

Exit Number	Leading to:—
25N	**Route 128 North**
	Woburn
	Boston
	To Route 1 North
	North Shore
	Gloucester
25S	**Route 128 South**
	Mass. Turnpike
	Newton
	Waltham
	To Route 9
	South Shore
	Nantasket
	Cape Cod
26	**Route 62**
	Bedford
	Burlington
	Wilmington
27	**Concord Road**
	So. Billerica
	Billerica
	Bedford
	Concord
28	**Middlesex Cove Road**
	Billerica
	No. Billerica
	Carlisle
	House of Correction
29	**Route 129**
	No. Billerica
	Chelmsford
	Chelmsford
30E	**Route 495**
	Lowell
	Andover, I-93
30W	**Route 495**
	Chelmsford
	Littleton, Route 2
	ROUTE 3 NORTHBOUND
31E	**Route 110**
	Lowell
	Lawrence
	Haverhill
31W	**Route 110**
	Chelmsford
	Littleton
	Ayer
	ROUTE 3 SOUTHBOUND
31	**Route 110**
	Chelmsford
	Littleton
	Lowell
	Lowell
	Lawrence
	Haverhill
32	**Route 40**
	No. Chelmsford
	Chelmsford
	Westford
33	**Route 40**
	No. Chelmsford
	Groton
	Forge Village
34	**Townsend Road**
	Westford
	Ayer
	Nashua, N. H.
	Manchester, N. H.

SOUTHEAST EXPRESSWAY ROUTE 3 (SOUTH) EXITS

Exit Number	Leading to:—
15	**Mass. Avenue**
	Roxbury
16	**Boston Street**
	Southampton Street
	Dorchester
	Edward Everett Square
17	**Cannon Road**
	Kosciusko Circle
	So. Boston
	Edward Everett Square
	S. E. EXPRESSWAY—NORTHBOUND
18	**Morrissey Boulevard**
	Local Traffic
19	**Freemont Street**
	Yacht Club
	Logan Airport
20	**Route 3**
	Neponset Circle
	Hallet Street
	Neponset
	Quincy
21N	**Adams Avenue**
	Dorchester
	Milton Lower Mills
	Neponset
	S. E. EXPRESSWAY—SOUTHBOUND
21S	**Granite Avenue, (Route 3)**
22	**East Milton**
	Squantum Street
	Willard Street
	East Milton
	ROUTE 3—SOUTHBOUND
23	**Bryant Avenue**
	Milton
24	**Furnace Brook Parkway**
	West Quincy
	Quincy
25	**Route 128 North**
	To Rtes. 37-28-24-138-9
	Mass. Turnpike
	Brockton
	Boston
	Fall River
	New Bedford
	Canton
	Dedham
	Wellesley

ROUTE 6 MID-CAPE HIGHWAY EXITS

Exit Number	Leading to:—
1	**Route 6A (Sagamore)**
	Sandwich
	Barnstable
	Orleans
	Provincetown
	via Shore Road
2	**Route 130**
	Sandwich
	Forestdale
	Mashpee
	Falmouth
	Shawme-Crowell State Forest

ROUTE 24 EXITS

Exit Number	Leading to:—
25N	**Route 128 North**
	To Rtes. 138-1-9-20
	Mass. Turnpike
	Canton
	Dedham
	Needham
	Wellesley
	No. Shore
25S	**Route 128 South**
	To Rtes. 28-37-3
	Quincy
	Braintree
	Hingham
	Nantasket
	So. Shore
26W	**Route 139**
	Stoughton
	Canton
26E	**Route 139**
	Randolph
	Holbrook
27W	**Central Street**
	Stoughton
	Canton
27E	**Central Street**
	Pond
	Montello
28W	**Route 27**
	Stoughton
	Sharon
28E	**Route 27**
	Stoughton
	Whitman

ROUTE 2 EXITS

Exit Number	Leading to:—
3	**Quaker Meeting House Rd.**
	E. Sandwich
4	**Route 6A**
	E. Sandwich
	So. Sandwich
5	**Route 149**
	W. Barnstable
	Barnstable Hills
	Hyannis
	Centerville
6W	**Shoot Flying Hill Rd.**
	Centerville
	Osterville
	Craigville Beach
6S	**Route 132**
	To Route 28
	Hyannis
	W. Yarmouth
6N	**Route 132**
	To Route 6A
	W. Barnstable
	Barnstable
7	**Willow Street**
	Yarmouth
	W. Yarmouth
	Bass River
	Yarmouthport
8	**Union Street**
	Yarmouth
	So. Yarmouth
	Route 28
9	**Route 134**
	All Points in Dennis
	W. Harwich
10	**Route 124**
	Harwich
	Harwichport
	Brewster
11	**Route 137**
	Brewster
	So. Orleans
	Chatham
12	**Route 6A Orleans**
	Orleans
	Brewster
13S	**Rtes. 6A-28 (Traffic Circle)**
	Orleans
	Chatham
13N	**Service Road**
	Rock Harbor

GENERAL INFORMATION

MASSACHUSETTS WEATHERLAND FOR ALL

Chapter 272, Section 98 of the General Laws, (Ter. Ed.), as amended, guarantees full and equal accommodations, advantages, facilities and privileges of any place of public accommodation, resort or amusement to all persons, regardless of religion, color or race.

MAINTENANCE AND SNOW AND ICE CONTROL

In order to provide safe roads for the traveling public it is necessary for the Maintenance Division of the Department of Public Works to have men and equipment working on the traveled way from time to time. Drivers are requested to use special care when approaching work crews.

The Engineering Division also has men working on the traveled way. These men are doing precision work with costly equipment, so please use care in passing.

In accordance with the recommendation of the American Association of State Highway Officials all Department-owned trucks working on snow and ice control display a flashing amber identification light. Drivers of motor vehicles should use extreme caution when approaching these trucks.

Chapter 270 of the General Laws prohibits the disposal of rubbish on a public highway and provides a fine of not more than $50.00 and possible suspension of automobile driving license and registration.

PLEASE CO-OPERATE AND KEEP OUR ROADSIDES CLEAN

This map is issued for free distribution during the construction season in order to give the traveling public information as to the location of construction that will interfere with travel. Additional copies may be obtained from the Department of Public Works, 100 Nashua St., Boston 14, Massachusetts.

THE MASSACHUSETTS TURNPIKE

FULL LENGTH TOLL $2.45	West Stockbridge	Lee	Westfield	West Springfield	Springfield	Chicopee	Ludlow	Palmer	Sturbridge	Auburn	Millbury	Framingham	Natick	Weston
Interchange No.'s	★	1	2	3	4	5	6	7	8	9	10	11	12	13	14
West Stockbridge	1	★	.25	.80	.90	.95	1.00	1.10	1.25	1.55	1.80	1.90	2.20	2.30	2.45
Lee	2	.25	★	.55	.65	.70	.75	.85	1.00	1.30	1.55	1.65	1.95	2.05	2.20
Westfield	3	.80	.55	★	.10	.15	.20	.30	.45	.75	1.00	1.10	1.40	1.50	1.65
West Springfield	4	.90	.65	.10	★	.10	.10	.20	.35	.65	.90	1.00	1.30	1.40	1.55
Chicopee	5	.95	.70	.15	.10	★	.10	.15	.30	.60	.85	.95	1.25	1.35	1.50
Springfield Spar	6	1.00	.75	.20	.10	.10	★	.10	.25	.55	.80	.90	1.20	1.30	1.45
Ludlow	7	1.10	.85	.30	.20	.15	.10	★	.15	.45	.70	.80	1.10	1.20	1.35
Palmer	8	1.25	1.00	.45	.35	.30	.25	.15	★	.30	.55	.65	.95	1.05	.20
Sturbridge	9	1.55	1.30	.75	.65	.60	.55	.45	.30	★	.25	.35	.65	.75	1.00
Auburn	10	1.80	1.55	1.00	.90	.85	.80	.70	.55	.25	★	.10	.40	.50	.65
Millbury	11	1.90	1.65	1.10	1.00	.95	.90	.80	.65	.35	.10	★	.30	.40	.55
Framingham	12	2.20	1.95	1.40	1.30	1.25	1.20	1.10	.95	.65	.40	.30	★	.10	.25
Natick	13	2.30	2.05	1.50	1.40	1.35	1.30	1.20	1.05	.75	.50	.40	.10	★	.15
Weston	14	2.45	2.20	1.65	1.55	1.50	1.45	1.35	1.20	1.00	.65	.55	.25	.15	★

Interchange No.'s	LOCATED ON TURNPIKE AT:	Miles from Interchange to Interchange	Miles from Junction New York State Line
1	Massachusetts Route 41 in West Stockbridge		2.9
2	U.S. Route 20 in East Lee, 12 Miles South of Pittsfield	9.0	11.9
3	U.S. Route 202 and Massachusetts Route 10, two miles north of Westfield	28.1	40.2
4	U.S. Route 5, five miles north of Springfield	5.3	45.5
5	Massachusetts Route 33 in Chicopee	3.3	48.8
6	Springfield connector at Burnett Road in Chicopee	1.8	50.6
7	Massachusetts Route 21 in Ludlow	3.9	54.5
8	Massachusetts Route 32 in Palmer	7.8	62.3
9	Junction of U.S. Route 20 and Mass. routes 15 and 131 in Sturbridge	15.1	77.4
10	Massachusetts route 12 in Auburn	12.3	89.7
11	Massachusetts route 122 in Millbury	6.2	95.9
12	Massachusetts route 9 two miles west of Framingham Center	15.0	11.09
13	Massachusetts route 30 at Speen St. near Framingham-Natick town line.	5.4	11.63
14	Massachusetts route 128 one-half mile south of route 30 in Weston	7.0	12.33

INTERSTATE ROUTE 93 EXITS

Exit Number	Leading to:—
21	**Rts. 28 at Roosevelt Rotary**
	Fellsway West Everett-Revere
	Winchester Somerville
	Medford Ctr. Boston
22	**Rts. 28 (For No. Bound Traffic Only)**
	Mystic Valley Parkway
23	**Mt. Vernon St. (For So. Bound Traffic Only)**
	Winchester Highlands
	So. Stoneham
24	**Montvale Ave.**
	Maple St.
	Stoneham-Woburn
25N	**Rte. 28**
	So. Lynnfield
	No. Shore
	N. N. & Maine
25S	**Rte. 128**
	Northern Mass. Tpke.
	Providence, R. I.
	So. Shore
26	**Rte. 129 (Lowell St.)**
	Reading
	Wilmington
	Wakefield-Chelmsford
27	**Lowell St.**
	Reading
	Wilmington
28	**Rte. 62**
	No. Reading
	Wilmington
29	**Rte. 125**
	Andover
	Haverhill
30	**Dascomb Rd.**
	Tewksbury
31	**Rte. 133**
	Andover
	No. Tewksbury
32N	**Rte. 110 (when opened)**
	Lawrence-Haverhill
	Merrimac-Amesbury
	N. H. & Maine
32S	**Rte. 1R-495**
	No. Tewksbury
	Lowell
33	**Rte. 38**
	So. Lawrence
34	**Rte. 110-Rte. 113 West**
	Lawrence
	Dracut
	Lowell
35	**Pelham St.**
36	**Rte. 113 East**
	Methuen
	Haverhill



Welcome to *Massachusetts*

The friendly people of Massachusetts are delighted to welcome you to their state—to its historic shrines, its natural beauties, its year-round vacation resorts, and its varied places of culture and interest.

Whether you have come for business or pleasure, let this map guide you to your destination. When you have ended your visit, may it serve as a reminder to visit us soon again.

ENDICOTT PEABODY
Governor

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS



James D. Fitzgerald, Commissioner

ASSOCIATE COMMISSIONERS



John D. Warner



Anthony C. Rosselli



Francis W. Sargent



Donald R. Dwight



Daniel S. Horgan, Chief Engineer

COVER PICTURE — "Autumn Scene" on Mohawk Trail, Route 2, Florida, Massachusetts. Courtesy of "Mohawk Trail Association".

MASSACHUSETTS

1964 OFFICIAL HIGHWAY MAP

For Reference
Not to be taken
from this library

THE COMMONWEALTH OF MASSACHUSETTS

To Visiting Motorists — Greetings

The Authorities of Massachusetts extend a cordial welcome to non-resident motorists, and hope that they will enjoy touring over our highways.

Information relative to the requirements of the Motor Vehicle Laws of Massachusetts may be obtained directly at the office of the Registrar of Motor Vehicles, 100 Nashua Street, Boston, or at any of the branch offices of the Registry of Motor Vehicles.

NON-RESIDENT PRIVILEGES—The privileges of a non-resident to operate his motor vehicle in Massachusetts are on a fully reciprocal basis. Massachusetts grants him the same privileges that his state grants to Massachusetts residents. A non-resident loses all his non-resident privileges, (1) if such non-resident uses a legal residence in this state, (2) at the end of the period allowed by his state to Massachusetts residents and (3) if his right to operate in Massachusetts is suspended by the Registrar of Motor Vehicles. If he uses a vehicle in his employment or business here it must be registered here.

COMPULSORY LIABILITY INSURANCE—Massachusetts has a compulsory motor vehicle liability insurance law. A Massachusetts resident cannot register his motor vehicle unless he has liability insurance coverage. Non-residents must have insurance of the Massachusetts type, covering any person operating with the owner's express or implied consent, after operation in Massachusetts for more than 30 days in the aggregate in any one year.

SPEED LAW—"No person operating a motor vehicle shall run it at a rate of speed greater than is reasonable and proper, having regard to traffic and the use of the way and safety of the public. Every person operating a motor vehicle shall slow down upon approaching a pedestrian." Many Massachusetts highways have special speed restrictions which are effective when the road is posted. Advisory speed signs are used in connection with standard yellow warning signs to indicate the advisory safe speed around a curve or through a hazardous location.

PASSING—Keep within the marked lanes, using the right lane except when passing. DO NOT CROSS SOLID BARRIER LINES. Where the road is unmarked keep on the right of the middle of the traveled part of the highway whenever there is not an unobstructed view of the road for at least four hundred feet.

SCHOOL BUS STOP LAW—"Whenever approaching a vehicle which displays a sign bearing the words "SCHOOL BUS" and is equipped with front and rear blinker lights which are flashing, and which has been stopped to allow passengers to alight from or board the same, a person operating a motor vehicle shall, except when approaching from the opposite direction on a divided highway, bring his vehicle to a full stop before reaching said school bus and shall not thereafter proceed until such school bus resumes motion or until such person is signaled by the driver of the school bus to proceed or the blinker lights are no longer flashing."

Before entering a junction of ways an operator shall slow down and keep to the right of the center line and when turning left or leaving the intersection shall keep to the right of the center line of the street being entered. When turning right an operator shall do so from the lane nearest the righthand or edge of roadway.

Every person operating a motor vehicle upon approaching a railroad crossing at grade shall reduce the speed of the vehicle to a reasonable and proper rate and shall proceed cautiously over the crossing.

RIGHT OF WAY AT INTERSECTIONS—A driver of a vehicle approaching an intersection shall grant the right of way to a vehicle which has already entered the intersection, or to a vehicle entering from his right at approximately the same instant. "Intersection" as used in this law, means the area included within the extensions of the lateral curb or boundary lines of the intersecting ways.

STOP SIGNS—Every operator approaching an intersection where a stop sign or flashing red light faces him must stop before entering the intersection, unless otherwise directed by a signal or an officer. The second or third vehicle in line need stop only once.

HAND SIGNALS—Signals of intention to stop or turn are required, and may be given by a suitable device or by the hand signals.

NIGHT DRIVING—Regulations require that at night, a motorist tilt his headlamps to the low beam (often called "dimming");

WHEN APPROACHING WITHIN 500 FEET OF AN ONCOMING VEHICLE, OR WHEN DRIVING ON WELL-LIGHTED HIGHWAYS.

Night driving will be far safer and more comfortable if all motorists will obey these simple rules.

ACCIDENT REPORTS—Every operator must report in writing to the Registrar if he is involved in an accident resulting in personal injury or death, or damage to any one vehicle or other property in excess of $200.00.

1968 OFFICIAL HIGHWAY MAP OF MASSACHUSETTS

Legend

PRINCIPAL THROUGH HIGHWAYS
- Multilane Toll Road
- Multilane Divided
- Access Fully Controlled
- Access Partially Controlled
- Multilane Divided
- Multilane Undivided
- 2 lane, Access Fully Controlled
- 2 lane, Paved

OTHER THROUGH HIGHWAYS
- Multilane Divided
- Multilane Undivided
- 2 lane, Paved

OTHER HIGHWAYS
- Paved
- Dustless
- Other all Weather

Route Numbers: U. S. (93) State (9) Interstate (95)

- State Boundaries
- County Boundaries
- Township Boundaries
- Airports: Commercial, Military
- State Police Barracks
- Metropolitan Police Stations
- Points of Interest
- Recreational Areas: Day use only, Campsites
- Schools and Colleges
- Local Mileages
- Accumulated Mileages

Population Breakdown

Under 1,000	○	5,000-10,000	⊗	25,000-50,000	⊠	75,000-100,000	⊞
1,000-5,000	⊖	10,000-25,000	⊛	50,000-75,000	⊡	Over 100,000	⊜

Scale of Miles

0 5 10 15 20 25

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COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS
EDWARD J. RIBBS, P.E. Commissioner
Associate Commissioners
JOHN D. WARNER — CHARLES A. BISBEE, JR.
ROBERT S. FOSTER, P.E. — PETER E. DONADIO
DANIEL S. HORGAN, P.E. Chief Engineer

RECREATIONAL FACILITIES

STATE FORESTS	Map Location	Tent Sites	Trailer Sites	Swimming
Bash Bish Falls, Mt. Washington	A5			
Beartown, Great Barrington	A5	●	●	●
Brimfield	E5		●	
Campbell Falls, Southfield	B5		●	
Chester-Blandford	C5		●	
D.A.R. Goshen	F4	●	●	●
Douglas	G5	●	●	●
East Mt., Great Barrington	A5			
Erving	F3	●	●	●
Freetown, Fall River	K6		●	
Granville	C5		●	●
Harold Parker, No. Reading	K3	●	●	●
Hawley	C3			

STATE FORESTS	Map Location	Tent Sites	Trailer Sites	Swimming
Leominster	L4			
Lowell-Dracut	L3	●	●	●
Mass. Fed. Wam. Clubs, Petersham	F4		●	
Mohawk Trail, Charlemont	D4	●	●	●
Monroe	C3		●	
Mt. Grace, Warwick	K3		●	
Myles Standish, So. Carver	M6	●	●	●
October Mt., Washington	B4		●	●
Otter River, Wischendon	F3	●	●	●
Pittsfield	K6		●	
Sandisfield	B5	●	●	●
Savoy Mt., No. Adams	B3	●	●	●
Shawme-Crowell, Sandwich	M7			

STATE FORESTS	Map Location	Tent Sites	Trailer Sites	Swimming
Spencer	G5	●	●	●
Tolland, Otis	B5	●	●	●
Warren Manning, Billerica	J3			
Whitehall, Hopkinton	H5	●	●	
Willard Brook, Townsend	G3		●	●
Windsor	B3	●	●	●

STATE PARKS	Map Location	Tent Sites	Trailer Sites	Swimming
Ames-Nowell State Park	K5		●	●
Ashland	J5	●	●	●
B. W. Palmer, Ipswich	L3		●	
Buffumville Pond, Oxford	G5			
Clarksburg	B3	●	●	●
Cochituate, Wayland	J4		●	●

STATE PARKS	Map Location	Tent Sites	Trailer Sites	Swimming
Demarest-Lloyd, So. Dartmouth	L8	●		●
Dighton Rock, Berkley	K6		●	
Holland Pond, Holland	F5		●	
Hopkinton	H5	●		
J. A. Skinner, So. Hadley	D4			
J. C. Robinson, Agawam	D5		●	
Ludlow	E5			
Quinsigamond, Worcester	H4	●		●
R. C. Nickerson, Brewster	O7	●	●	
Rutland	G4	●	●	
Veterans' Memorial, Chicopee	D5			
Wahconah Falls, Dalton	B4			
Watson Pond State Park	K6	●		

BEACHES	Map Location	Bath Houses	Swimming
Ft. Phoenix, Fairhaven	L7		●
Horseneck Beach, Westport	K8		●
Lynn Beach	L4		●
Nantasket Beach	L4		●
Provincetown	O5		
Revere Beach	L4		●
Salisbury Beach	L2		●
Scusset Beach, Sandwich	M6		

PUBLIC BOAT ACCESS ▲

STATE BIRD
Chickadee

STATE FLOWER
Mayflower

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Auburn H5
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Boxborough H4
Boxford K3
Boylston H4
Bradford K3
Braintree L5
Brant Rock M5
Brewster O6
Bridgewater L6
Briggs Corner K6
Brimfield E5
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Brookline K4
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Charlton G5
Chatham F7
Chartley K6
Chelmsford J3
Chelsea K4
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Chesterfield C4
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Gill D3
Gleasondale H4
Gloucester M3
Goshen C4
Granold M8
Grafton H5
Granby D5
Granville C5
Great Barrington A5
Greendale D3
Green Harbor M5
Grinnelsville D3
Groton H3
Groveland K3
Hadley D4
Halifax L6
Hamilton L3
Hampden E5
Hancock A3
Hanover L5
Hanson L5
Hardwick F4
Hartsville B5
Harvard H4
Harwich O7
Hatfield D4
Haverhill K2
Hawley C3
Hayden Row H5
Haydenville D4
Heath C3
Hingham L5
Hinsdale B4
Hixville K7
Hockanum D4
Hodges Village G5
Holbrook K5
Holden G4
Holland F5
Hollister J5
Holyoke D5
Hopedale H5
Hopkinton H5
Housatonic A5
Hubbardston F4
Hudson H4
Hull L4
Humarock M5
Huntington C5
Hyannis N7
Ingleside D5
Indian Orchard D5
Ipswich L3
Irontstone H5
Jamaica Plain K4
Kingston L6
Lakeville L6
Lancaster H4
Lanesborough A3
Lanesville M3
Larnedville G5
Lawrence K3
Lebanon Mills J6
Lee B4
Leeds D4
Leicester G5
Lenox A4
Leominster G3
Leverett E4
Lexington K4
Leyden D3
Lincoln J4
Lithia C4
Littleton H3
Locke Village E4
Longmeadow D5
Louisville E4
Lowell J3
Ludlow E5
Lunenburg H3
Lynn L4
Lynnfield K3
Magnolia M3
Malden K4
Manchaug H5
Manchester L3
Mansonet M6
Mansfield K5
Marville G4
Marblehead L4
Marion L7
Marlborough H4
Marshfield M5
Marstons Mills N7
Mashpee M7
Mattapoisett L7
Maynard J4
Medfield J5
Medford K4
Medway J5
Melrose K4
Mendon H5
Menemsha L8
Merrimac K2
Methuen K3
Middleborough L6
Middlefield C4
Middleton L3
Mill Dell H5
Millbury G5
Millers Falls E3
Millis J5
Mill River A5
Millville H5
Millwood L3
Milton K5
Mr. Toe C3
Monponsett E5
Montague D3
Monterey B5
Montgomery C5
Mooreville B5
Monument Beach M7
Mount Washington A5
Myricks K6
Nahant L4
Nantasket L4
Nantucket O8
Natick J4
Needham J4
New Ashford A3
New Bedford L7
New Boston B5
New Braintree F4
New Marlborough B5
New Salem E4
Newbury L2
Newburyport L2
Newton K4
Nichewaug F4
Nobscot J4
Norfolk J5
North Adams B3
North Andover K3
North Attleborough J6
North Brookfield F5
North Reading K3
Northampton D4
Northborough H4
Northbridge H5
Northfield E3
Norton K6
Norwell L5
Norwich Bridge C5
Norwood K5
Oak Bluffs M8
Oakham F4
Ocean Grove K7
Old Furnace F4
Old Town J6
Onset M7
Orange E3
Orleans P6
Osterville N7
Otis B5
Otter River F3
Oxford G5
Palmer E5
Paxton G4
Peabody L3
Pelham E4
Pembroke L5
Pepperell N3
Peru B4
Petersham F4
Phillipston F3
Pigeon Cove M3
Pinehurst K3
Pittsfield B4
Plainfield C3
Plainville J6
Plymouth M6
Plympton L6
Pocasset M7
Ponkapoag K5
Princeton G4
Provincetown O5
Quinapoxet G4
Quincy L5
Randolph K5
Raynham K6
Reading K3
Rehoboth K6
Revere L4
Richmond A4
Ringville C4
Rochdale C5
Rochester L7
Rockland L5
Rockport M3
Rowe C3
Rowley L3
Roxbury K4
Royalston F3
Russell C5
Rutland G4
Sagamore M6
Salem L3
Salisbury L2
Sandersdale F5
Sandisfield B5
Sandwich N7
Sankaty Head P8
Saugus K4
Savoy B3
Saxonville J4
Scituate K5
Seekonk J6
Sharon K5
Shawsheen Village K3
Sheffield A5
Shelburne B3
Sheldonville J5
Sherborn J5
Shirley H3
Shrewsbury H4
Shutesbury E4
Siasconset P8
Sisteen Acres E5
Somerset K6
Somerville K4
South Hadley D5
Southampton C5
Southborough H4
Southbridge F5
Southfield B5
Southwick D5
Spencer F3
Springfield D5
Spruce Corner C3
Squantum L4
Sterling H4
Still River H4
Stockbridge A4
Stoneham K4
Stoughton K5
Stow J4
Sturbridge F5
Sudbury J4
Sunderland D4
Sutton G5
Swampscott L4
Swansea K7
Swift River C4
Tatnuck G4
Taunton K6
Teaticket M7
Templeton F3
Tennesyille E5
Tewksbury K3
Three Rivers E5
Tisbury M8
Tolland D3
Topsfield L3
Touisset K7
Townsend H3
Tremont L6
Truro O6
Tyngsville F3
Turners Falls D3
Tyngsborough J3
Tyringham B5
Uxbridge J5
Upton H5
Uxbridge H5
Van Dusenville A5
Vineyard Haven M8
Wakefield K4
Wales F5
Walpole J5
Waltham J4
Wamesit J3
Wapoquit Village M7
Ware F5
Wareham L7
Warren F5
Warwick E3
Washington B4
Watertown K4
Waterville F3
Wayland J4
Webster G5
Wellesley J4
Wellfleet O6
Wendell E3
Wenham L3
West Boylston G4
West Bridgewater K6
West Brookfield F5
West Newbury L2
West Springfield D5
West Stockbridge A4
West Tisbury M8
Westborough H4
Westfield D5
Westford J3
Westminster G3
Weston J4
Westport K7
Westville K6
Westwood K5
Weymouth L5
Whately D4
Wheelwright F4
White Valley F4
Whitinsville H5
Whitman L5
Wilbraham E5
Williamsburg D4
Williamstown B3
Williamsville F4
Wilmington K3
Winchendon F3
Winchester K4
Windsor B3
Winthrop L4
Woburn K4
Woods Hole M7
Woodville H5
Worcester G4
Woronoco C5
Worthington F4
Wrentham J5
Yarmouth O7
Zoar C3

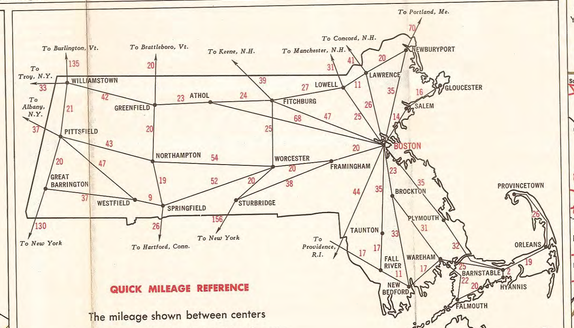
MILEAGE TABLE

APPROXIMATE DISTANCES BETWEEN POINTS IN MASSACHUSETTS

	BARNSTABLE	BOSTON	BROCKTON	CONCORD	FALL RIVER	FALMOUTH	FITCHBURG	FRAMINGHAM	GARDNER	GLOUCESTER	GREAT BARRINGTON	HAVERHILL	HOLYOKE	HYANNIS	LAWRENCE	LOWELL	LYNN	MIDDLEBOROUGH	NEW BEDFORD	NEWBURYPORT	NORTH ADAMS	NORTHAMPTON	ATTLEBOROUGH	PITTSFIELD	PLYMOUTH	PROVINCETOWN	QUINCY	SALEM	SPRINGFIELD	TAUNTON	WAREHAM	WESTFIELD	WILLIAMSTOWN	WINCHENDON	WORCESTER
BARNSTABLE	0	74	38	96	71	41	141	91	159	104	211	109	169	17	104	126	84	57	74	141	211	169	57	204	52	124	84	141	169	41	204	169	159	141
BOSTON	74	0	36	21	54	77	49	22	67	31	139	36	97	91	31	27	6	33	70	68	139	97	33	132	126	50	9	68	97	33	132	97	67	49
BROCKTON	38	36	0	57	35	41	85	55	103	68	175	73	133	55	68	90	48	21	38	105	175	133	21	168	90	88	48	105	133	5	168	133	103	85
CONCORD	96	21	57	0	75	98	28	15	46	52	160	57	118	112	52	6	27	54	91	89	160	118	54	153	147	71	30	89	118	54	153	118	46	28
FALL RIVER	71	54	35	75	0	41	119	73	137	86	209	91	151	54	86	108	66	14	37	123	209	151	14	186	108	123	66	123	151	30	186	151	137	119
FALMOUTH	41	77	41	98	41	0	142	92	160	105	212	110	170	58	105	127	85	55	78	142	212	170	55	205	53	125	85	142	170	45	205	170	160	142
FITCHBURG	141	49	85	28	119	142	0	43	18	80	188	85	146	140	80	34	55	82	119	117	188	146	82	181	175	99	58	117	146	82	181	146	18	56
FRAMINGHAM	91	22	55	15	73	92	43	0	61	47	155	52	113	107	47	21	28	52	89	84	155	113	52	148	142	66	25	84	113	52	148	113	61	43
GARDNER	159	67	103	46	137	160	18	61	0	98	206	103	164	158	98	52	73	100	137	135	206	164	100	199	193	117	76	135	164	100	199	164	0	74
GLOUCESTER	104	31	68	52	86	105	80	47	98	0	172	25	130	121	25	46	33	65	102	50	172	130	65	165	159	83	42	50	130	65	165	130	98	80
GREAT BARRINGTON	211	139	175	160	209	212	188	155	206	172	0	177	42	213	177	154	145	187	224	222	42	42	187	35	47	221	180	222	42	187	35	42	206	188
HAVERHILL	109	36	73	57	91	110	85	52	103	25	177	0	135	126	30	51	38	70	107	55	177	135	70	170	164	88	47	55	135	70	170	135	103	85
HOLYOKE	169	97	133	118	151	170	146	113	164	130	42	135	0	171	135	112	103	145	182	180	42	42	145	77	47	179	138	180	42	145	77	42	164	146
HYANNIS	17	91	55	112	54	58	140	107	158	121	213	126	171	0	121	142	100	73	90	158	213	171	73	206	54	141	100	158	171	57	206	171	158	140
LAWRENCE	104	31	68	52	86	105	80	47	98	25	177	30	135	121	0	46	33	65	102	50	177	135	65	170	164	83	42	50	135	65	170	135	98	80
LOWELL	126	27	90	6	108	127	34	21	52	46	154	51	112	142	46	0	27	54	91	89	154	112	54	147	141	65	30	89	112	54	147	112	52	34
LYNN	84	6	48	27	66	85	55	28	73	33	145	38	103	100	33	27	0	33	70	68	145	103	33	138	132	56	15	68	103	33	138	103	73	55
MIDDLEBOROUGH	57	33	21	54	14	55	82	52	100	65	187	70	145	73	65	54	33	0	37	102	187	145	0	178	102	88	48	102	145	16	178	145	100	82
NEW BEDFORD	74	70	38	91	37	78	119	89	137	102	224	107	182	90	102	91	70	37	0	139	224	182	37	215	139	125	85	139	182	53	215	182	137	119
NEWBURYPORT	141	68	105	89	123	142	117	84	135	50	222	55	180	158	50	89	68	102	139	0	222	180	102	213	207	131	90	0	180	102	213	180	135	117
NORTH ADAMS	211	139	175	160	209	212	188	155	206	172	42	177	42	213	177	154	145	187	224	222	0	42	187	35	47	221	180	222	42	187	35	42	206	188
NORTHAMPTON	169	97	133	118	151	170	146	113	164	130	42	135	42	171	135	112	103	145	182	180	42	0	145	77	47	179	138	180	42	145	77	42	164	146
ATTLEBOROUGH	57	33	21	54	14	55	82	52	100	65	187	70	145	73	65	54	33	0	37	102	187	145	0	178	102	88	48	102	145	16	178	145	100	82
PITTSFIELD	204	132	168	153	186	205	181	148	199	165	35	170	77	206	170	147	138	178	215	213	35	77	178	0	82	214	173	213	77	178	0	77	199	181
PLYMOUTH	52	126	90	147	108	53	175	142	193	159	47	164	47	54	164	141	132	102	139	207	47	47	102	82	0	168	127	207	47	102	82	47	193	175
PROVINCETOWN	124	50	88	71	123	125	99	66	117	83	221	88	179	141	83	65	56	88	125	131	221	179	88	214	168	0	59	131	179	88	214	179	117	99
QUINCY	84	9	48	30	66	85	58	25	76	42	180	47	138	100	42	30	15	48	85	90	180	138	48	173	127	59	0	90	138	48	173	138	76	58
SALEM	141	68	105	89	123	142	117	84	135	50	222	55	180	158	50	89	68	102	139	0	222	180	102	213	207	131	90	0	180	102	213	180	135	117
SPRINGFIELD	169	97	133	118	151	170	146	113	164	130	42	135	42	171	135	112	103	145	182	180	42	42	145	77	47	179	138	180	0	145	77	42	164	146
TAUNTON	41	33	5	54	30	45	82	52	100	65	187	70	145	57	65	54	33	16	53	102	187	145	16	178	102	88	48	102	145	0	178	145	100	82
WAREHAM	204	132	168	153	186	205	181	148	199	165	35	170	77	206	170	147	138	178	215	213	35	77	178	0	82	214	173	213	77	178	0	77	199	181
WESTFIELD	169	97	133	118	151	170	146	113	164	130	42	135	42	171	135	112	103	145	182	180	42	42	145	77	47	179	138	180	42	145	77	0	164	146
WILLIAMSTOWN	159	67	103	46	137	160	18	61	0	98	206	103	164	158	98	52	73	100	137	135	206	164	100	199	193	117	76	135	164	100	199	164	0	74
WINCHENDON	141	49	85	28	119	142	0	43	18	80	188	85	146	140	80	34	55	82	119	117	188	146	82	181	175	99	58	117	146	82	181	146	18	0
WORCESTER	141	49	85	28	119	142	56	43	74	80	188	85	146	140	80	34	55	82	119	117	188	146	82	181	175	99	58	117	146	82	181	146	74	56

HOW TO USE THE MILEAGE TABLE

Follow down the vertical column under the first town in alphabetical order to where the horizontal column against the other town intersects it. The figure in the square is the distance between the two points.



QUICK MILEAGE REFERENCE

The mileage shown between centers is the shortest distance via numbered routes


Quebec
St. Michel des Saints
Trois Rivières
Valley Jct.
St. Jovite
Montreal
Granby
St. Albans
Plattsburgh
Burlington
Barre
Middlebury
Rutland
Bennington
Troy
Albany
Schenectady
Saratoga Springs
Glens Falls
Lake Placid
Watertown
Syracuse
Utica
Rochester
Buffalo
Niagara Falls
Lake Ontario
Lake Erie
Jamestown
Warren
Oil City
Erie
Pittsburgh
Johnstown
Altoona
Harrisburg
Scranton
Wilkes-Barre
Allentown
Easton
Reading
Lancaster
Trenton
Philadelphia
Wilmington
Dover
Baltimore
Washington
Richmond
Norfolk
Roanoke
Charleston
Huntington
Columbus
Cincinnati
Dayton
Cleveland
Akron
Canton
Youngstown
Toledo
Detroit
Lansing
Grand Rapids
Kalamazoo
Battle Creek
Jackson
Ann Arbor
Flint
Saginaw
Bay City
Port Huron
Sarnia
Windsor
Chicago
Gary
South Bend
Fort Wayne
Indianapolis
Evansville
Louisville
Lexington
Frankfort
Knoxville
Nashville
Memphis
Jackson
Meridian
Birmingham
Montgomery
Mobile
New Orleans
Baton Rouge
Shreveport
Dallas
Fort Worth
Houston
Austin
San Antonio
Corpus Christi
Laredo
Monterrey
Mexico City
Guadalajara
Tampico
Veracruz
Merida
Campeche
Villahermosa
Oaxaca
Acapulco
Puebla
Tuxtla Gutierrez
Tapachula
Guatemala City
Belize
Tegucigalpa
San Salvador
Managua
San Jose
Panama City
Colon
Kingston
Port-au-Prince
Santo Domingo
San Juan
Caracas
Maracaibo
Barranquilla
Cartagena
Medellin
Bogota
Cali
Quito
Guayaquil
Lima
Trujillo
Chiclayo
Iquitos
Arequipa
Cuzco
Puno
La Paz
Santa Cruz
Cochabamba
Oruro
Potosi
Sucre
Asuncion
Encarnacion
Corrientes
Resistencia
Formosa
Rosario
Santa Fe
Cordoba
Mendoza
San Juan
Buenos Aires
La Plata
Mar del Plata
Bahia Blanca
Neuquen
Bariloche
Comodoro Rivadavia
Rio Gallegos
Ushuaia
Punta Arenas
Puerto Montt
Valdivia
Concepcion
Temuco
Osorno
Valparaiso
Santiago
Talca
Chillan
Antofagasta
Iquique
Arica
Tacna
Montevideo
Salto
Paysandu
Fray Bentos
Colonia
Porto Alegre
Florianopolis
Curitiba
Ponta Grossa
Sao Paulo
Santos
Campinas
Sorocaba
Ribeirao Preto
Uberaba
Belo Horizonte
Rio de Janeiro
Vitoria
Salvador
Aracaju
Maceio
Recife
Joao Pessoa
Natal
Fortaleza
Sobral
Teresina
Parnaiba
Sao Luis
Belem
Macapa
Manaus
Boa Vista
Georgetown
Paramaribo
Cayenne
Fernando de Noronha
Trinidad
Port of Spain
Barbados
Bridgetown
Castries
Kingstown
St. George's
Roseau
Basseterre
Charlestown
St. John's
Antigua
Pointe-a-Pitre
Basse-Terre
Marigot
Philipsburg
Gustavia
Road Town
Charlotte Amalie
Christiansted
Frederiksted
Fajardo
Ponce
Mayaguez
Aguadilla
Arecibo
Bayamo
Holguin
Santiago de Cuba
Guantanamo
Camaguey
Ciego de Avila
Sancti Spiritus
Cienfuegos
Santa Clara
Matanzas
Havana
Pinar del Rio
Isla de Juventud
Nassau
Freeport
Grand Bahama
Andros
Eleuthera
San Salvador
Cat Island
Exuma
Long Island
Crooked Island
Great Inagua
Mayaguana
Grand Turk
Cockburn Town
Providenciales
Kingston
Montego Bay
Negril
Mandeville
Spanish Town
Port Antonio
Ocho Rios
Falmouth
Black River
Savanna-la-Mar
Lucea
Port Maria
Morant Bay
Port Royal
Portland
Hanover
Westmoreland
St. Elizabeth
Manchester
St. Ann
St. Mary
St. Thomas
St. Andrew
St. Catherine
Clarendon
St. James
Trelawny
St. Johnsbury
Lancaster
Berlin
Littleton
Woodsville
Claremont
Concord
Laconia
Rochester
Dover
Portsmouth
Hampton Beach
Gloucester
Lawrence
Lowell
Nashua
Manchester
Keene
Brattleboro
Bellows Falls
Springfield
Chester
Ludlow
Worcester
Framingham
Natick
Boston
Providence
Pawtucket
Woonsocket
Newport
Block Island
Montauk
Orient
Greenport
Riverhead
Patchogue
Babylon
Hempstead
Jamaica
Flushing
Brooklyn
Manhattan
Bronx
Yonkers
White Plains
New Rochelle
Mount Vernon
New Haven
Bridgeport
Norwalk
Stamford
Greenwich
Danbury
Waterbury
Hartford
New London
Norwich
Willimantic
Putnam
Torrington
Meriden
Middletown
Wallingford
Milford
Derby
Ansonia
Shelton
Stratford
Fairfield
Westport
Norwalk
Darien
New Canaan
Port Chester
Rye
Mamaroneck
Larchmont
New Rochelle
Pelham
Mount Vernon
Yonkers
Tuckahoe
Scarsdale
Hastings
Dobbs Ferry
Irvington
Tarrytown
Sleepy Hollow
Ossining
Peekskill
Cortlandt
Haverstraw
Nyack
Suffern
Monsey
Spring Valley
Nanuet
New City
Pearl River
Orangeburg
Tappan
Piermont
Sparkill
Grand Island
Niagara Falls
Lockport
Batavia
Geneva
Canandaigua
Rochester
Hornell
Corning
Elmira
Ithaca
Cortland
Binghamton
Endicott
Johnson City
Owego
Oneonta
Cooperstown
Herkimer
Little Falls
Rome
Oneida
Syracuse
Auburn
Fulton
Oswego
Watertown
Ogdensburg
Massena
Malone
Plattsburgh
Saranac Lake
Tupper Lake
Potsdam
Canton
Gouverneur
Carthage
Lowville
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Lockport
Niagara Falls
Grand Island
Tonawanda
Buffalo
Hamburg
Orchard Park
Lackawanna
Angola
Dunkirk
Fredonia
Westfield
Ripley
Silver Creek
Irving
Hamburg
Eden
Evans
Brocton
Fredonia
Dunkirk
Jamestown
Salamanca
Olean
Bradford
Wellsville
Hornell
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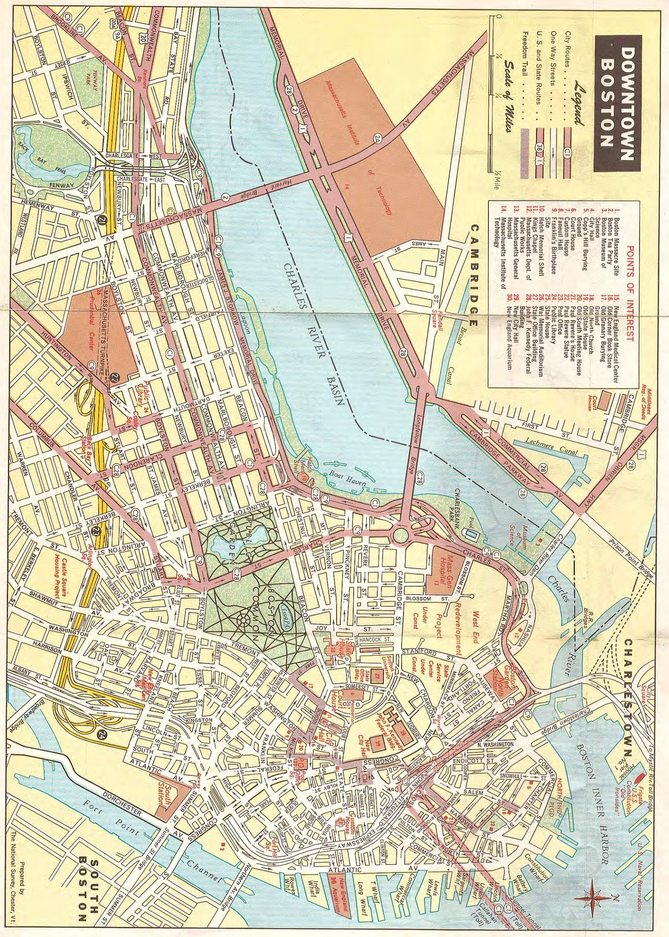
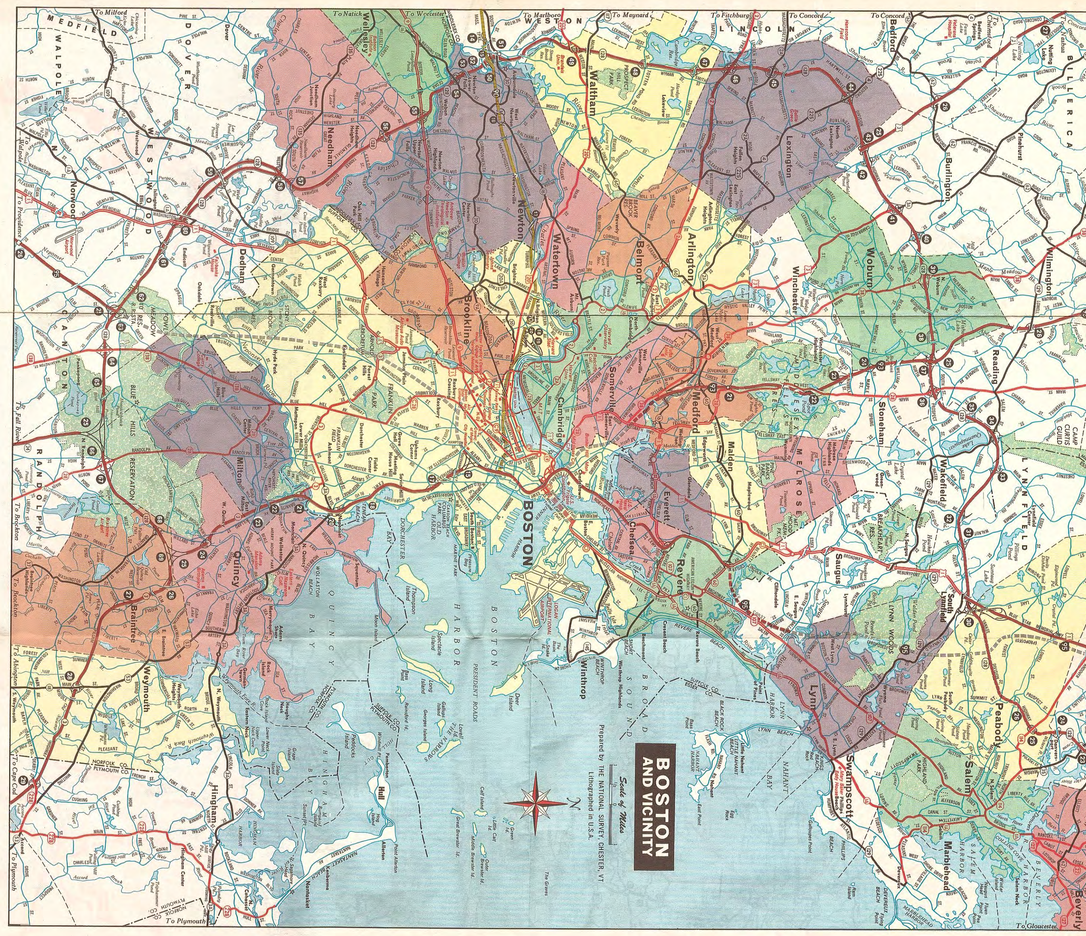
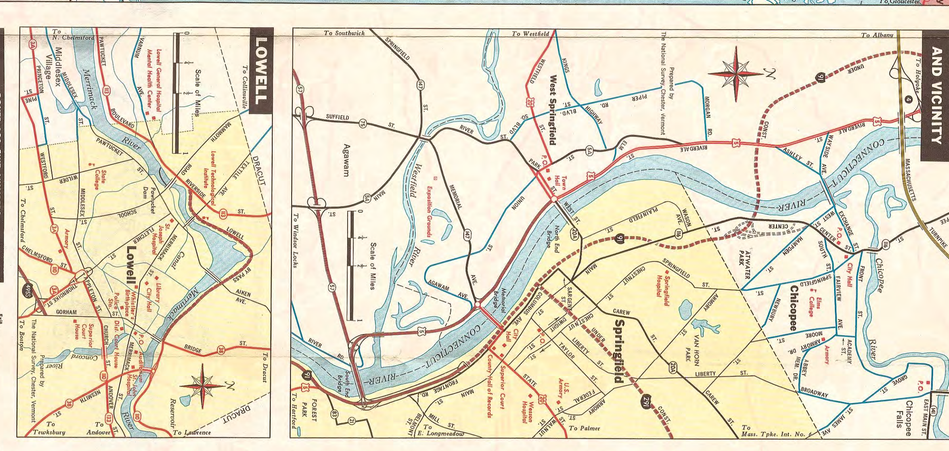
Johnson City
Owego









THE COMMONWEALTH OF MASSACHUSETTS
TO VISITING MOTORISTS — GREETINGS

The Authorities of Massachusetts extend a cordial welcome to non-resident motorists, and hope that they will enjoy touring over our highways.

Information relative to the requirements of the Motor Vehicle Laws of Massachusetts may be obtained directly at the office of the Registrar of Motor Vehicles, 100 Nashua Street, Boston, or at any of the branch offices of the Registry of Motor Vehicles.

NON-RESIDENT PRIVILEGES—The privileges of a non-resident to operate his motor vehicle in Massachusetts are on a fully reciprocal basis. Massachusetts grants him the same privileges that his state grants to Massachusetts residents. A non-resident loses all his non-resident privileges, (1) if such non-resident uses a legal residence in this state, (2) at the end of the period allowed by his state to Massachusetts residents and (3) if his right to operate in Massachusetts is suspended by the Registrar of Motor Vehicles. If he uses a vehicle in his employment or business here it must be registered here.

COMPULSORY LIABILITY INSURANCE—Massachusetts has a compulsory motor vehicle liability insurance law. A Massachusetts resident cannot register his motor vehicle unless he has liability insurance coverage. Non-residents must have insurance as the Massachusetts type, covering any person operating with the owner's express or implied consent, after operation in Massachusetts for more than 30 days in the aggregate in any one year.

SPEED LAW—"No person operating a motor vehicle shall run it at a rate of speed greater than is reasonable and proper, having regard to traffic and the use of the way and safety of the public. Every person operating a motor vehicle shall slow down upon approaching a pedestrian." Many Massachusetts highways have special speed restrictions which are effective when the road is posted. Advisory speed signs are used in connection with standard yellow warning signs to indicate the advisory safe speed around a curve or through a hazardous location.

PASSING—Keep within the marked lanes, using the right lane except when passing. DO NOT CROSS SOLID PAINTED BARRIER LINES. Where the road is unmarked keep on the right of the middle of the traveled part of the highway whenever there is not an unobstructed view of the road for at least four hundred feet.

SCHOOL BUS STOP LAW—"When approaching a vehicle which displays a sign bearing the words "SCHOOL BUS" or "CAMP BUS" and is equipped with front and rear blinker lights which are flashing, and which has been stopped to allow passengers to alight from or board the same, a person operating a motor vehicle shall, except when approaching from the opposite direction on a divided highway, bring his vehicle to a full stop before reaching said school bus and shall not thereafter proceed until such school bus resumes motion or until such person is signaled by the driver of the school bus to proceed or the blinker lights are no longer flashing."

Before entering a junction of ways an operator shall slow down and keep to the right of the center line and when turning left or leaving the intersection shall keep to the right of the center line of the street being entered. When turning right an operator shall do so from the lane nearest the right-hand or edge of roadway.

Every person operating a motor vehicle upon approaching a railroad crossing at grade shall reduce the speed of the vehicle to a reasonable and proper rate and shall proceed cautiously over the crossing.

RIGHT OF WAY AT INTERSECTION—A driver of a vehicle approaching an intersection shall grant the right of way to a vehicle which has already entered the intersection, or to a vehicle entering from his right at approximately the same instant. "Intersection" as used in this law, means the area included within the extensions of the lateral curb or boundary lines of the intersecting ways.

STOP SIGNS—Every operator approaching an intersection where a stop sign or flashing red light faces him must stop before entering the intersection, unless directed by a signal or an officer. The second or third vehicle in line

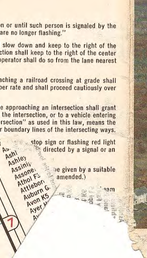
HAND SIGNALS—Signals of intention, [illegible] be given by a suitable device or by the hand signals, [illegible] amended.)

NIGHT DRIVING—Regulations require [illegible] (often called "dimming"):

WHEN APPROACHING WITHIN 500 FEET [illegible]
WELL-LIGHTED HIGHWAYS.

Night driving will be far safer and more com[illegible]

ACCIDENT REPORTS—Every operator must repo[illegible] involved in an accident resulting in personal injury, of such report must be sent to the police departmen[illegible] where the accident occurred.



Official
HIGHWAY MAP
1968

For Reference
Not to be taken
from this library

MASSACHUSETTS

WELCOME TO MASSACHUSETTS

JOHN A. VOLPE
Governor

On behalf of the people of Massachusetts, I am pleased and honored to welcome you to our great Commonwealth.

This latest edition of our official highway map is designed to help you share with us the many recreational, cultural, educational and scientific advantages which Massachusetts offers, as well as the great historic monuments and landmarks we so proudly preserve and cherish.

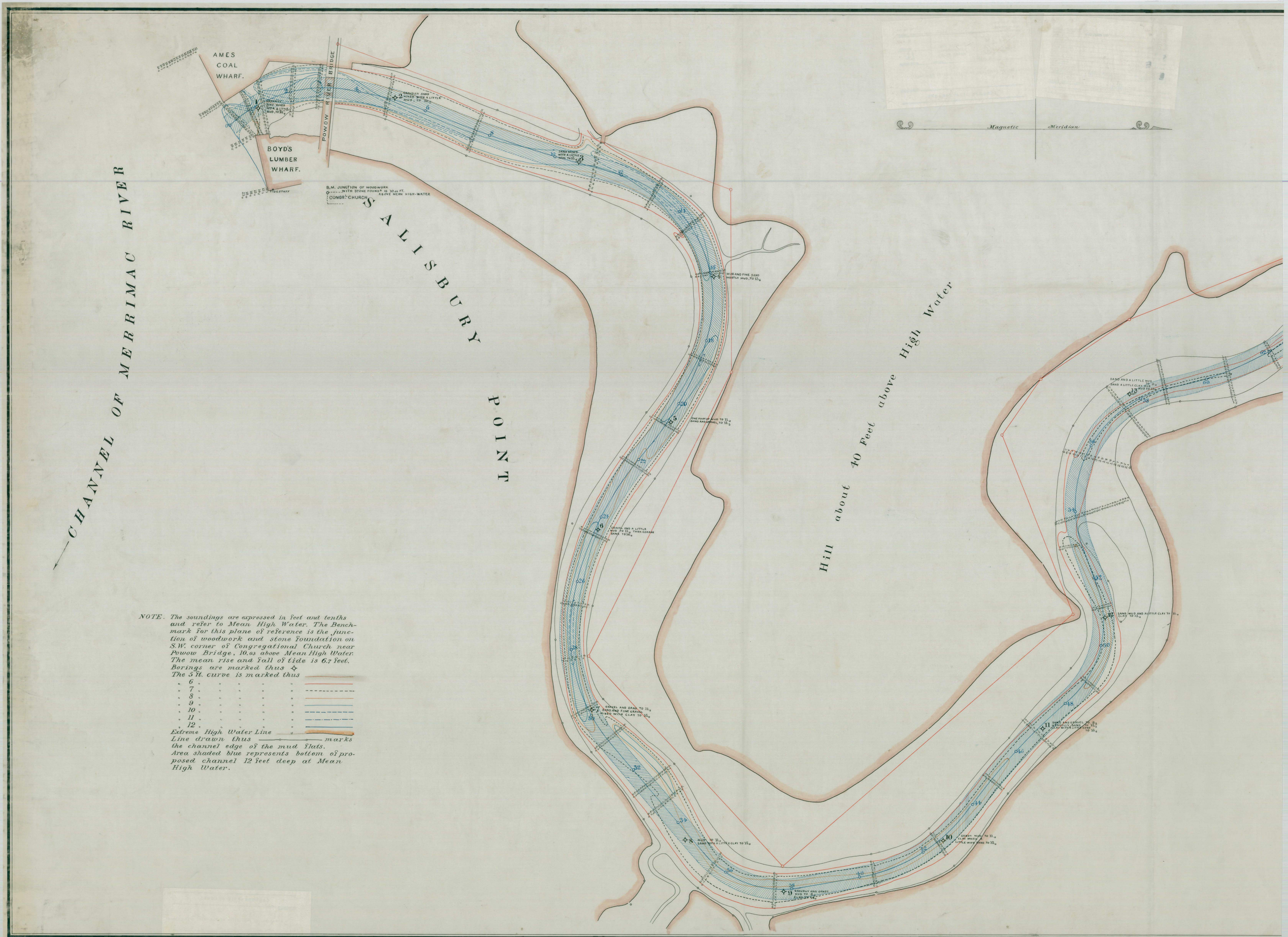
Through the past three hundred years, Bay State men and women have helped to carve this Nation from the wilderness, and have played a major role in nurturing the great democracy whose fruits we now enjoy.

Today Massachusetts continues to make history. An integral part of our present program for progress is exemplified in our highway network, which is expanded and modernized every year to accommodate your travel through our area. These highways and their facilities have been designed for safety, as well as convenience, and I know that your responsible driving will assure you a safe visit to our State.

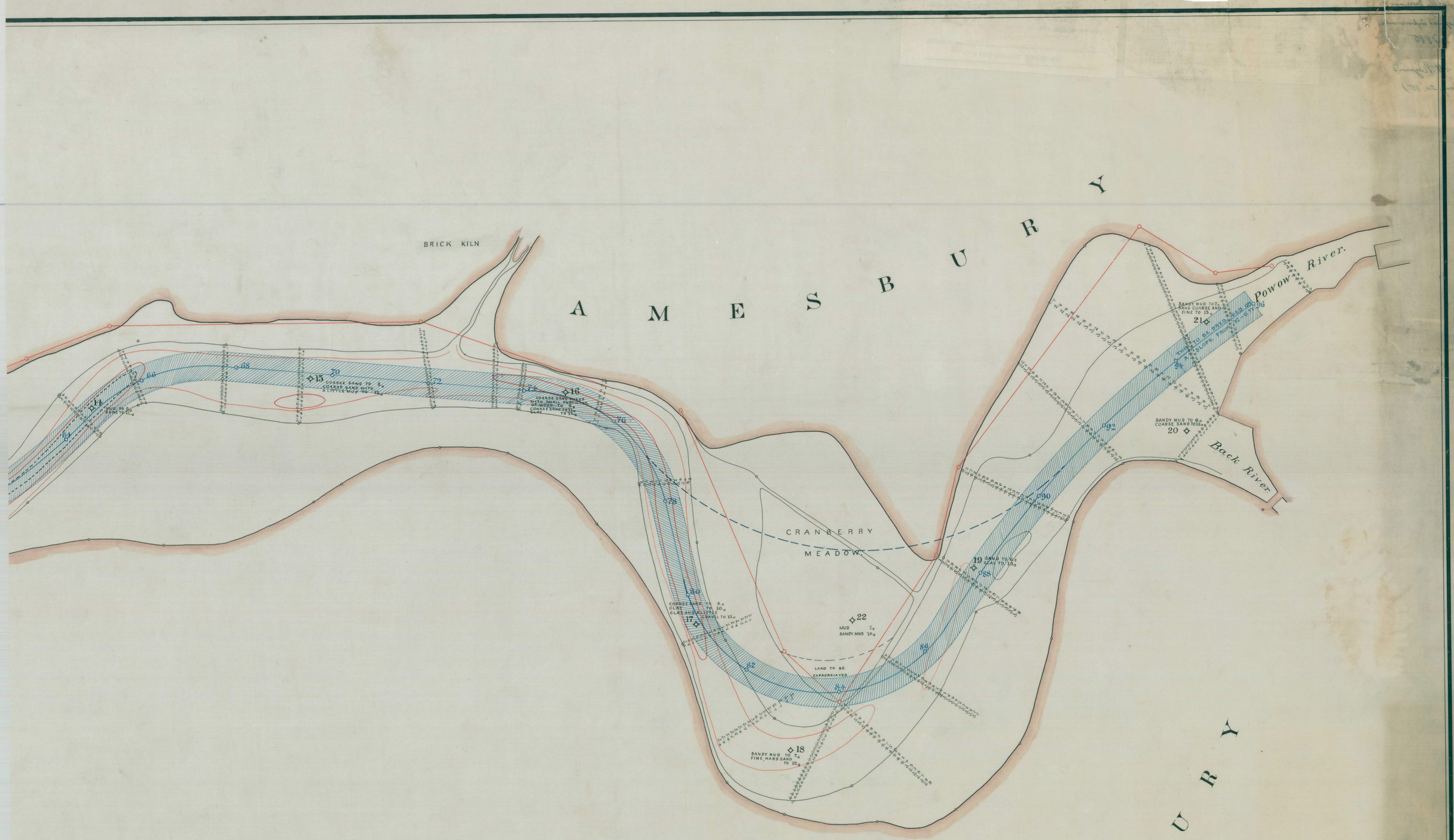
We hope that you enjoy a pleasant and informative stay in Massachusetts, and that your visit will leave you with memories which will bring you back soon and often to "the land of the Bean and the Cod".

ISSUED BY
MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS · BOSTON, MASS. 02114
FOR FREE DISTRIBUTION ONLY

C.2. Dredge Plans



NOTE. The soundings are expressed in feet and tenths and refer to Mean High Water. The Benchmark for this plane of reference is the junction of woodwork and stone foundation on S.W. corner of Congregational Church near Powow Bridge, 10.03 above Mean High Water. The mean rise and fall of tide is 6.7 feet.
Borings are marked thus ✧
The 5 ft. curve is marked thus
" 6 " " " " "
" 7 " " " " "
" 8 " " " " "
" 9 " " " " "
" 10 " " " " "
" 11 " " " " "
" 12 " " " " "
Extreme High Water Line
Line drawn thus marks the channel edge of the mud flats.
Area shaded blue represents bottom of proposed channel 12 feet deep at Mean High Water.



Map of

POWOW RIVER, MASS.

SHOWING PROPOSED IMPROVEMENTS

Survey made under directions of

Major CHAS. W. RAYMOND, Corps of Engineers, U.S.A.

by Sophus Haagensen, Assistant Engineer,

aided by Lawrence Bradford, C.E.

JANUARY, 1885.

SCALE 1 : 1000

U.S. Engineer Office,
Boston, Mass. January 24. 1885.
Respectfully transmitted to the Chief of Engineers with letter of this date.

Chas. W. Raymond
Major of Engineers

POWOW RIVER

MASSACHUSETTS

TO ACCOMPANY PROJECT OF

AUGUST 23, 1894

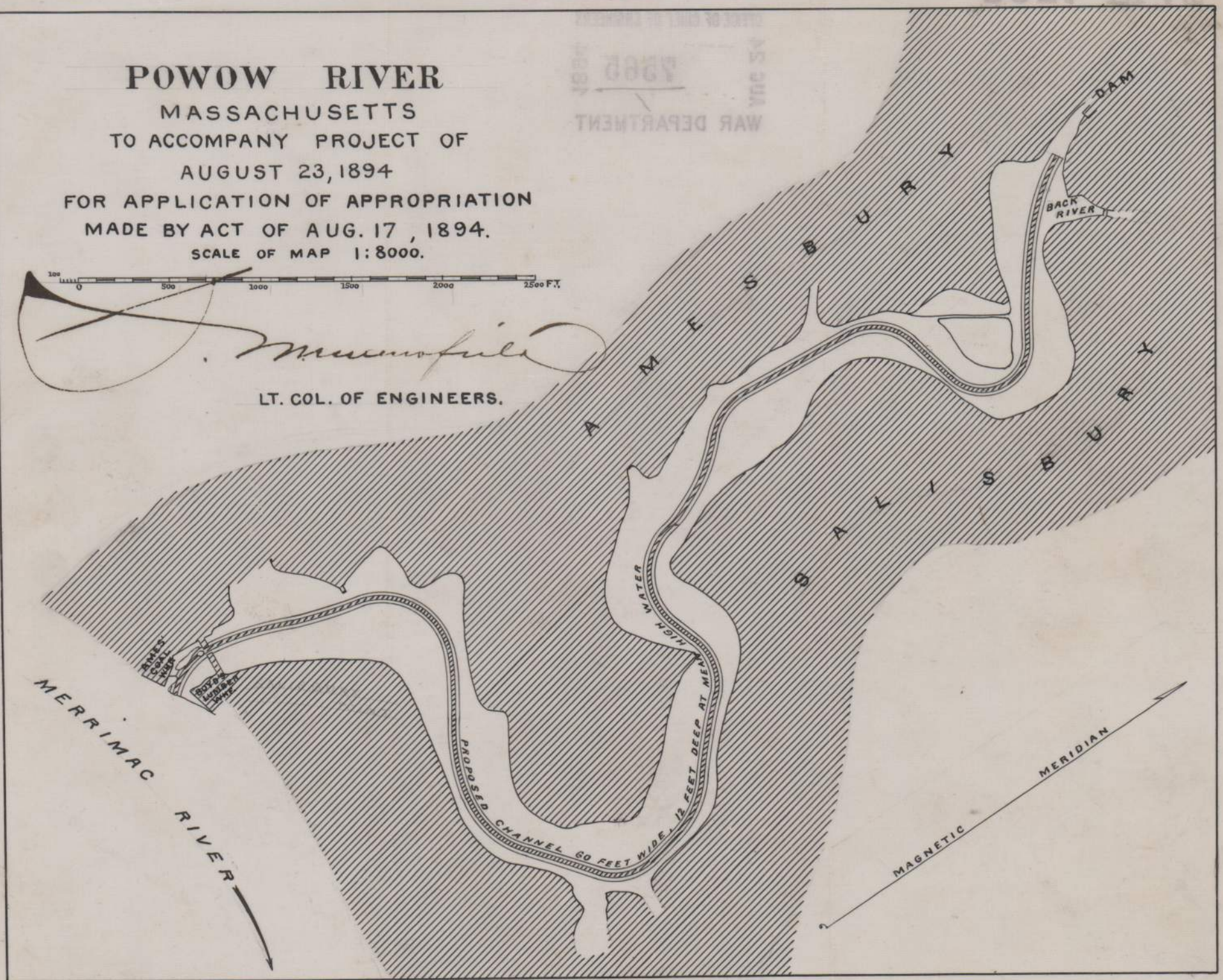
FOR APPLICATION OF APPROPRIATION

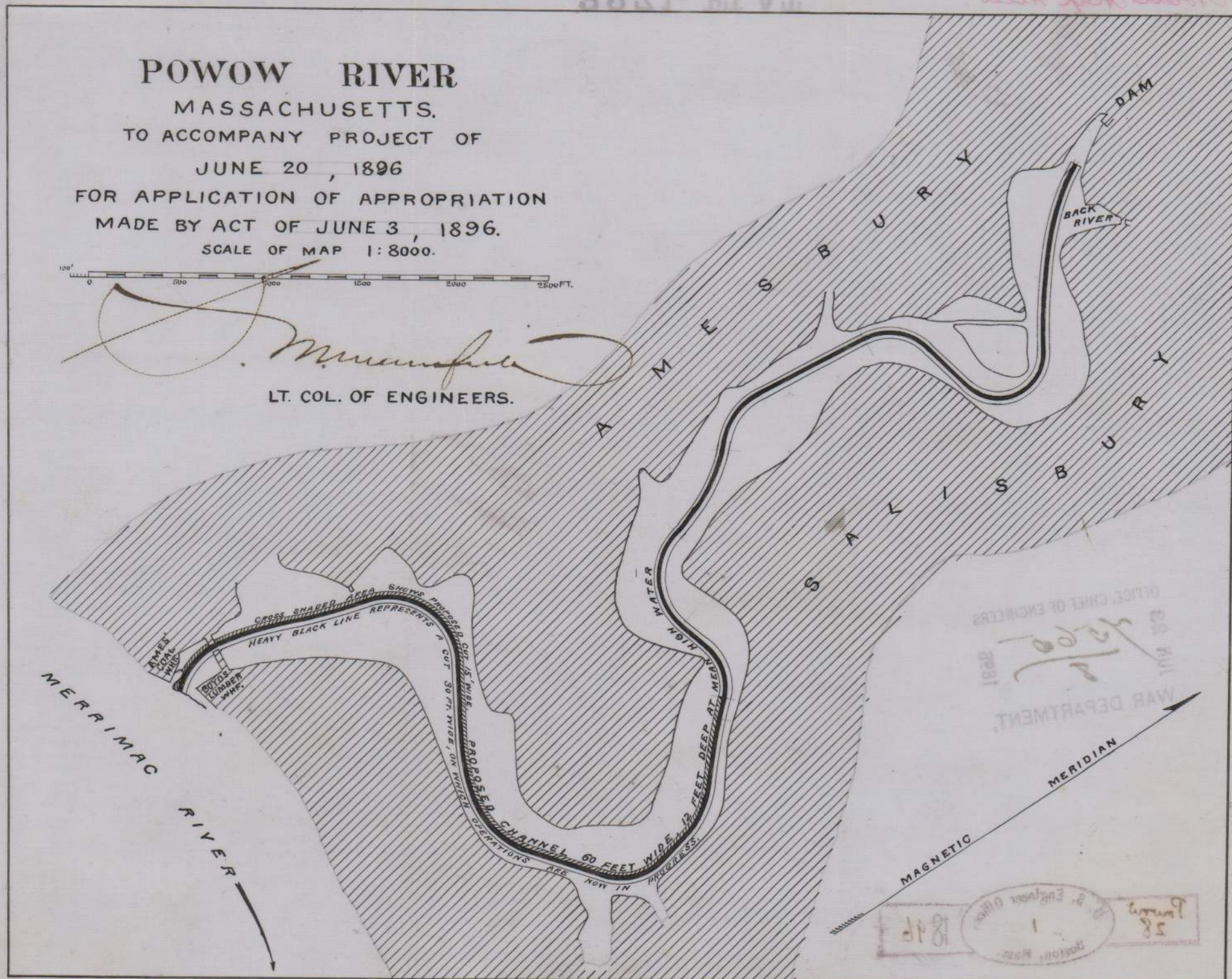
MADE BY ACT OF AUG. 17, 1894.

SCALE OF MAP 1:8000.

100 0 500 1000 1500 2000 2500 F.T.

LT. COL. OF ENGINEERS.




POWOW RIVER
MASSACHUSETTS.
TO ACCOMPANY PROJECT OF
JUNE 20, 1896
FOR APPLICATION OF APPROPRIATION
MADE BY ACT OF JUNE 3, 1896.
SCALE OF MAP 1:8000.
100'
0
500
1000
1500
2000
2500 FT.
LT. COL. OF ENGINEERS.
AMESBURY
SALISBURY
DAM
BACK RIVER
HIGH WATER
CROSS SHADED AREA SHOWS PROPOSED CUT 15' WIDE.
HEAVY BLACK LINE REPRESENTS A CUT 30 FT. WIDE, ON WHICH OPERATIONS ARE NOW IN PROGRESS.
PROPOSED CHANNEL 60 FEET WIDE, 12 FEET DEEP AT MEAN
AMES' COAL WHF.
BOYDS LUMBER WHF.
MERRIMAC RIVER
MAGNETIC MERIDIAN

POWOW RIVER

MASSACHUSETTS.

TO ACCOMPANY PROJECT OF

MARCH 14, 1899.

FOR APPLICATION OF APPROPRIATION

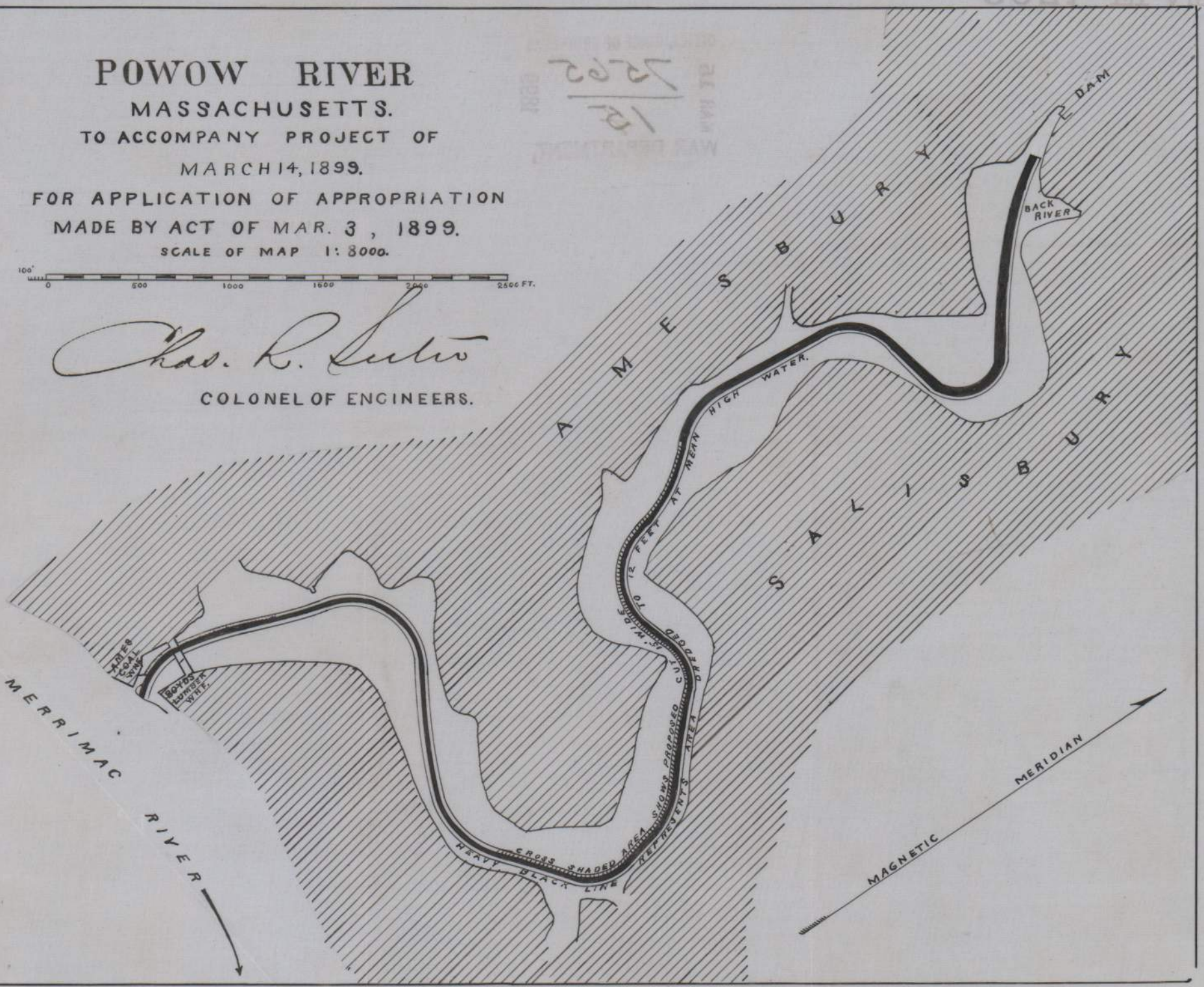
MADE BY ACT OF MAR. 3, 1899.

SCALE OF MAP 1: 8000.

100' 0 500 1000 1500 2000 2500 FT.

Chas. R. Suter

COLONEL OF ENGINEERS.



C.3. Aerial Photographs

Macy Street

Macy Street

Amesbury, MA 01913

Inquiry Number: 6050551.1

April 28, 2020

The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

04/28/20

Site Name:

Macy Street
Macy Street
Amesbury, MA 01913
EDR Inquiry # 6050551.1

Client Name:

GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801
Contact: Ryan Hoffman

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

Search Results:

Year	Scale	Details	Source
2016	1"=625'	Flight Year: 2016	USDA/NAIP
2012	1"=625'	Flight Year: 2012	USDA/NAIP
2008	1"=625'	Flight Year: 2008	USDA/NAIP
1998	1"=625'	Acquisition Date: April 11, 1998	USGS/DOQQ
1992	1"=625'	Flight Date: April 29, 1992	USGS
1986	1"=625'	Flight Date: April 01, 1986	USDA
1978	1"=625'	Flight Date: January 23, 1978	USGS
1965	1"=625'	Flight Date: April 04, 1965	USGS
1960	1"=625'	Flight Date: May 01, 1960	USGS
1953	1"=625'	Flight Date: May 03, 1953	USGS
1938	1"=625'	Flight Date: November 01, 1938	USGS

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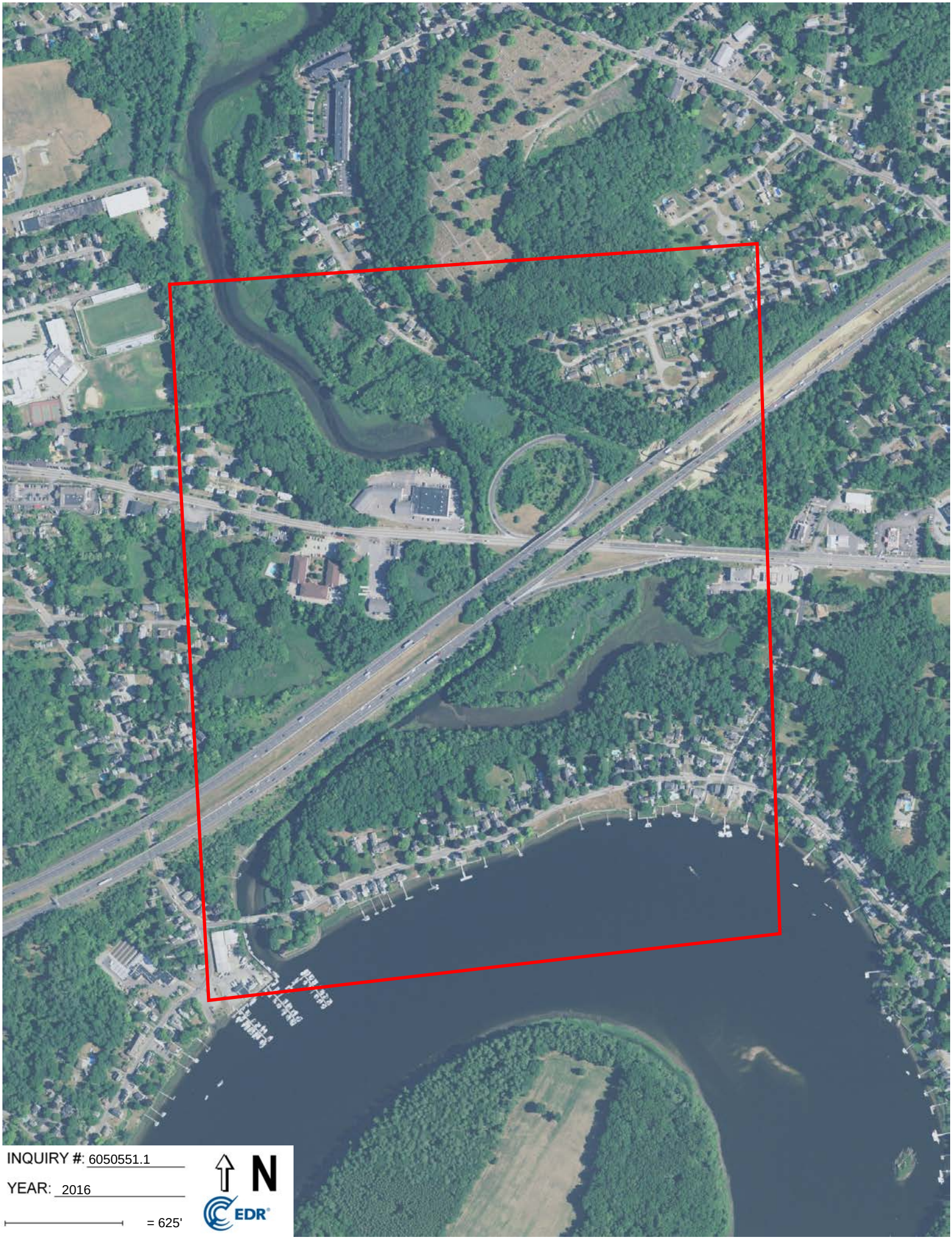
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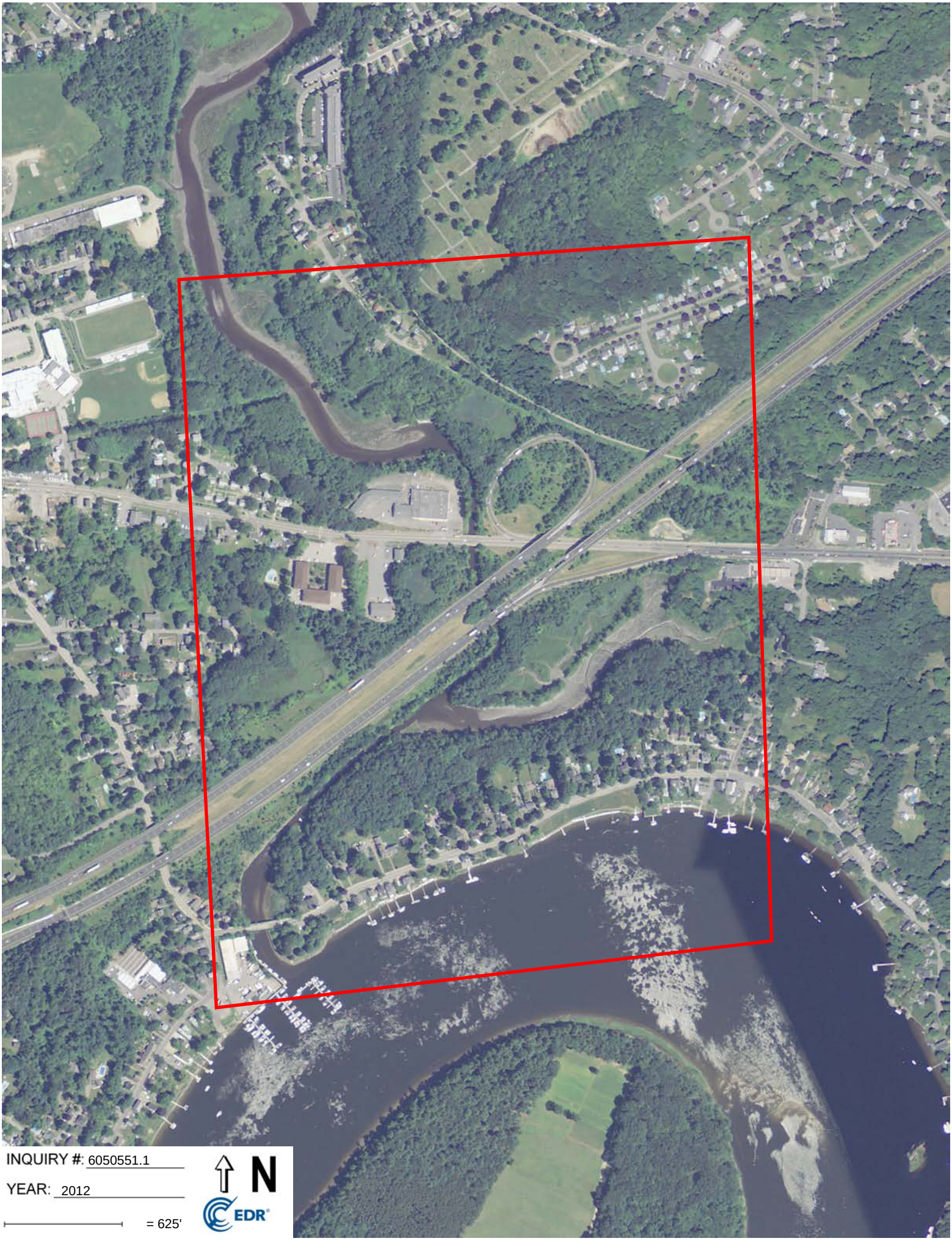
EDR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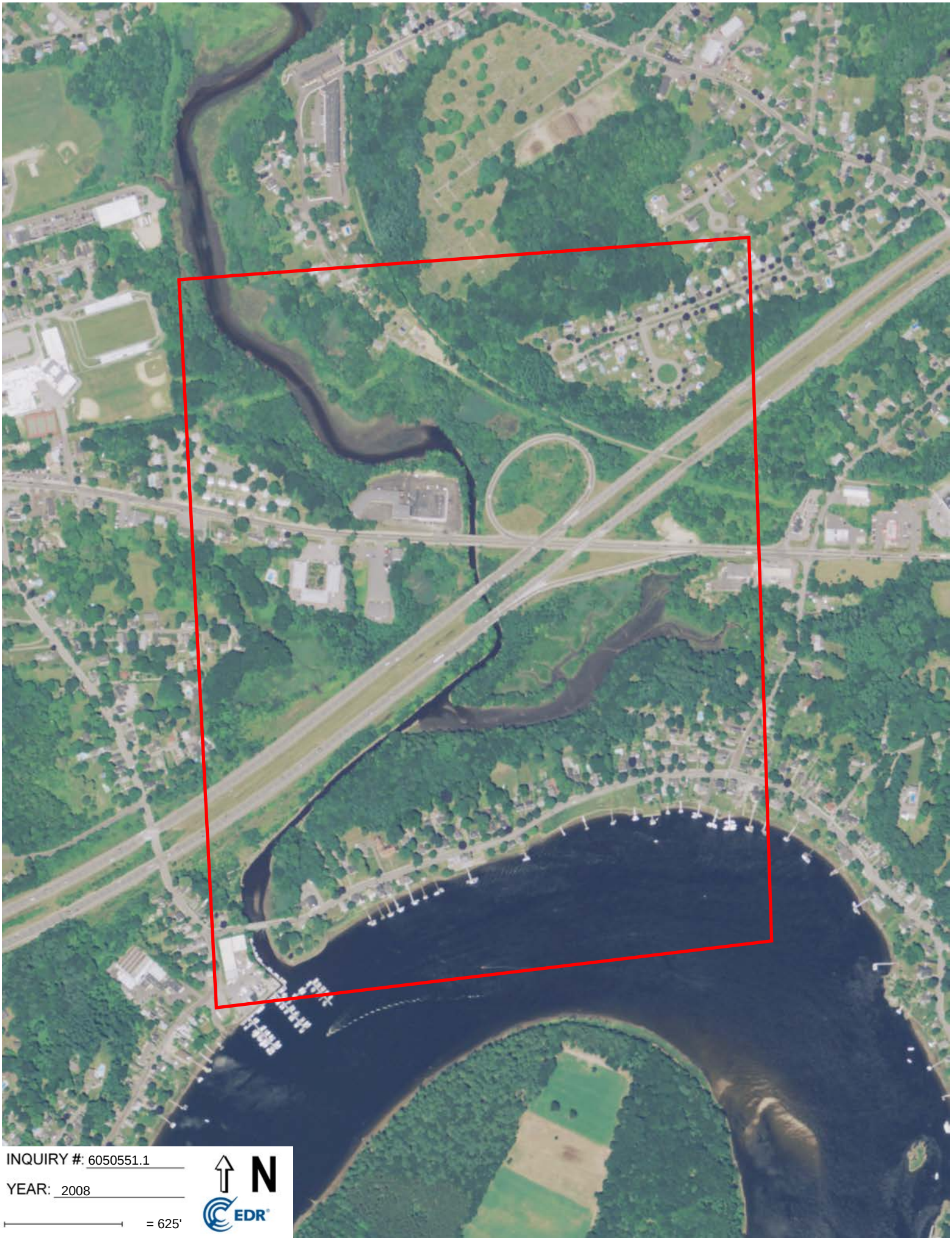
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YEAR: 1998
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YEAR: 1992
= 625'
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EDR


INQUIRY #: 6050551.1
YEAR: 1986
= 625'
N
EDR



INQUIRY #: 6050551.1

YEAR: 1978

= 625'

N

EDR



INQUIRY #: 6050551.1

YEAR: 1965

= 625'

N

EDR


INQUIRY #: 6050551.1
YEAR: 1960
= 625'
N
EDR



INQUIRY #: 6050551.1

YEAR: 1953

= 625'

N

EDR



INQUIRY #: 6050551.1

YEAR: 1938

= 625'

N

EDR

Powwow River

35 Water Street

Amesbury, MA 01913

Inquiry Number: 7263447.1

February 27, 2023

The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

02/27/23

Site Name:

Powwow River
35 Water Street
Amesbury, MA 01913
EDR Inquiry # 7263447.1

Client Name:

GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801
Contact: Ryan Hoffman

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Search Results:

Year	*Scale*	*Details*	*Source*
2018	1"=625'	Flight Year: 2018	USDA/NAIP
2014	1"=625'	Flight Year: 2014	USDA/NAIP
2010	1"=625'	Flight Year: 2010	USDA/NAIP
2006	1"=625'	Flight Year: 2006	USDA/NAIP
1998	1"=625'	Acquisition Date: January 01, 1998	USGS/DOQQ
1995	1"=625'	Acquisition Date: January 01, 1995	USGS/DOQQ
1992	1"=625'	Acquisition Date: January 01, 1992	USGS/DOQQ
1986	1"=625'	Flight Date: April 01, 1986	USDA
1978	1"=625'	Flight Date: January 23, 1978	USGS
1973	1"=625'	Flight Date: April 16, 1973	USGS
1965	1"=625'	Flight Date: April 04, 1965	USGS
1960	1"=625'	Flight Date: May 01, 1960	USGS
1953	1"=625'	Flight Date: May 03, 1953	USGS
1938	1"=625'	Flight Date: November 01, 1938	USGS

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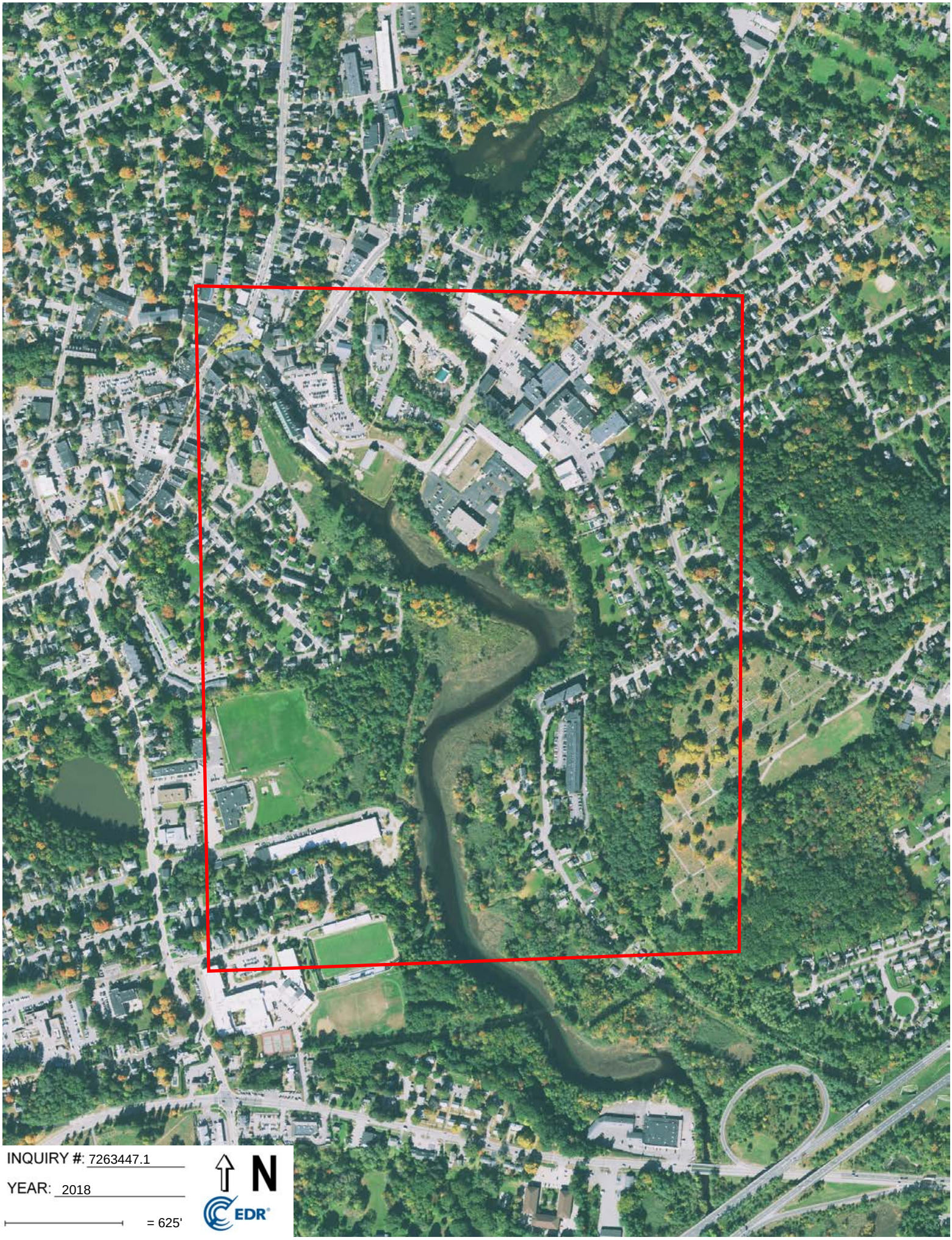
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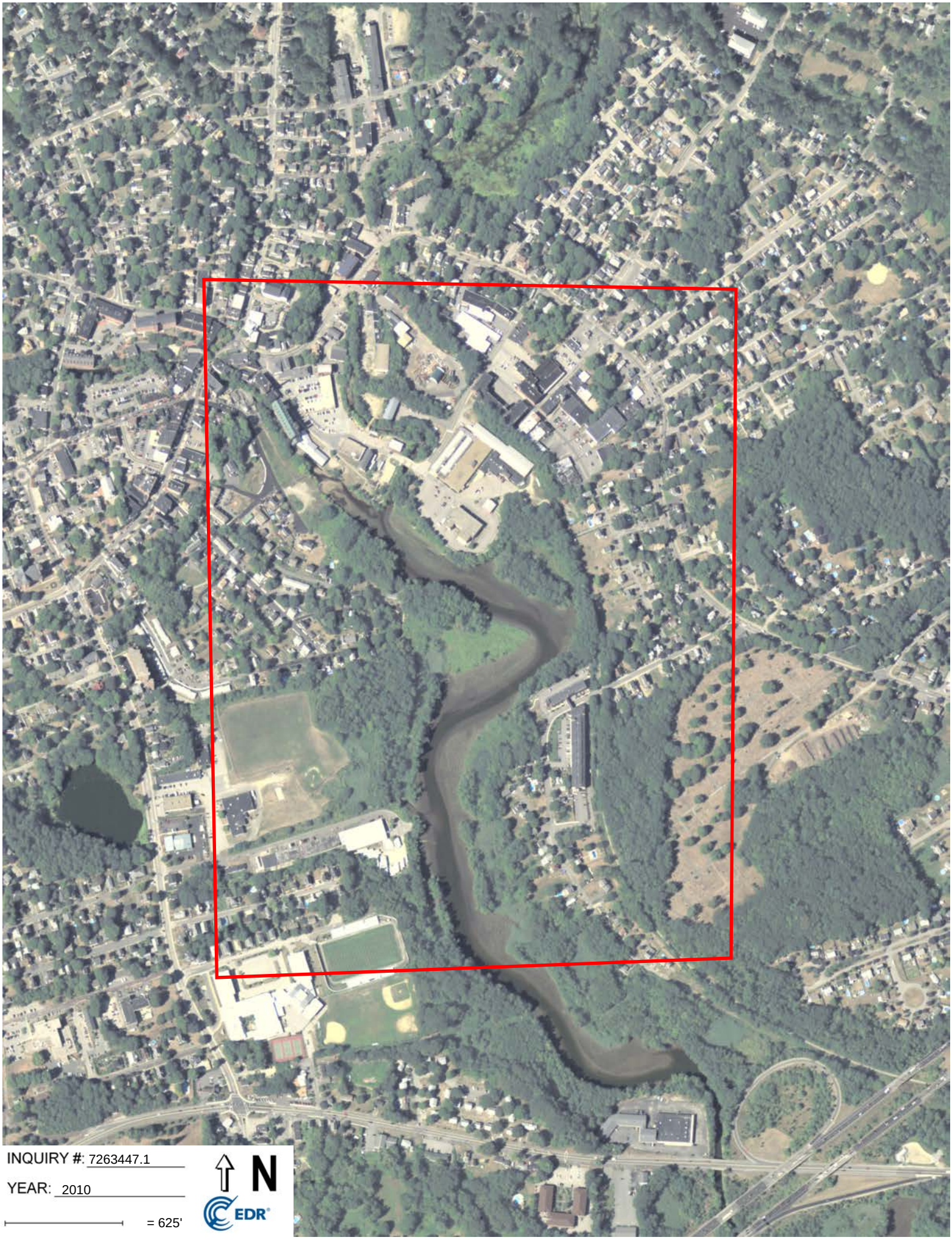
EDR


INQUIRY #: 7263447.1
YEAR: 2014
= 625'
N
EDR


INQUIRY #: 7263447.1
YEAR: 2010
= 625'
N
EDR


INQUIRY #: 7263447.1
YEAR: 2006
= 625'
N
EDR


INQUIRY #: 7263447.1
YEAR: 1998
= 625'
N
EDR


INQUIRY #: 7263447.1
YEAR: 1995
= 625'
N
EDR


INQUIRY #: 7263447.1
YEAR: 1992
= 625'
N
EDR
Subject boundary not shown because it exceeds image extent or


INQUIRY #: 7263447.1
YEAR: 1986
= 625'
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EDR



INQUIRY #: 7263447.1

YEAR: 1978

= 625'

N

EDR



INQUIRY #: 7263447.1

YEAR: 1973

= 625'

N

EDR

Subject boundary not shown because it exceeds image extent or


INQUIRY #: 7263447.1
YEAR: 1965
= 625'
N
EDR


INQUIRY #: 7263447.1
YEAR: 1960
= 625'
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EDR


INQUIRY #: 7263447.1
YEAR: 1953
= 625'
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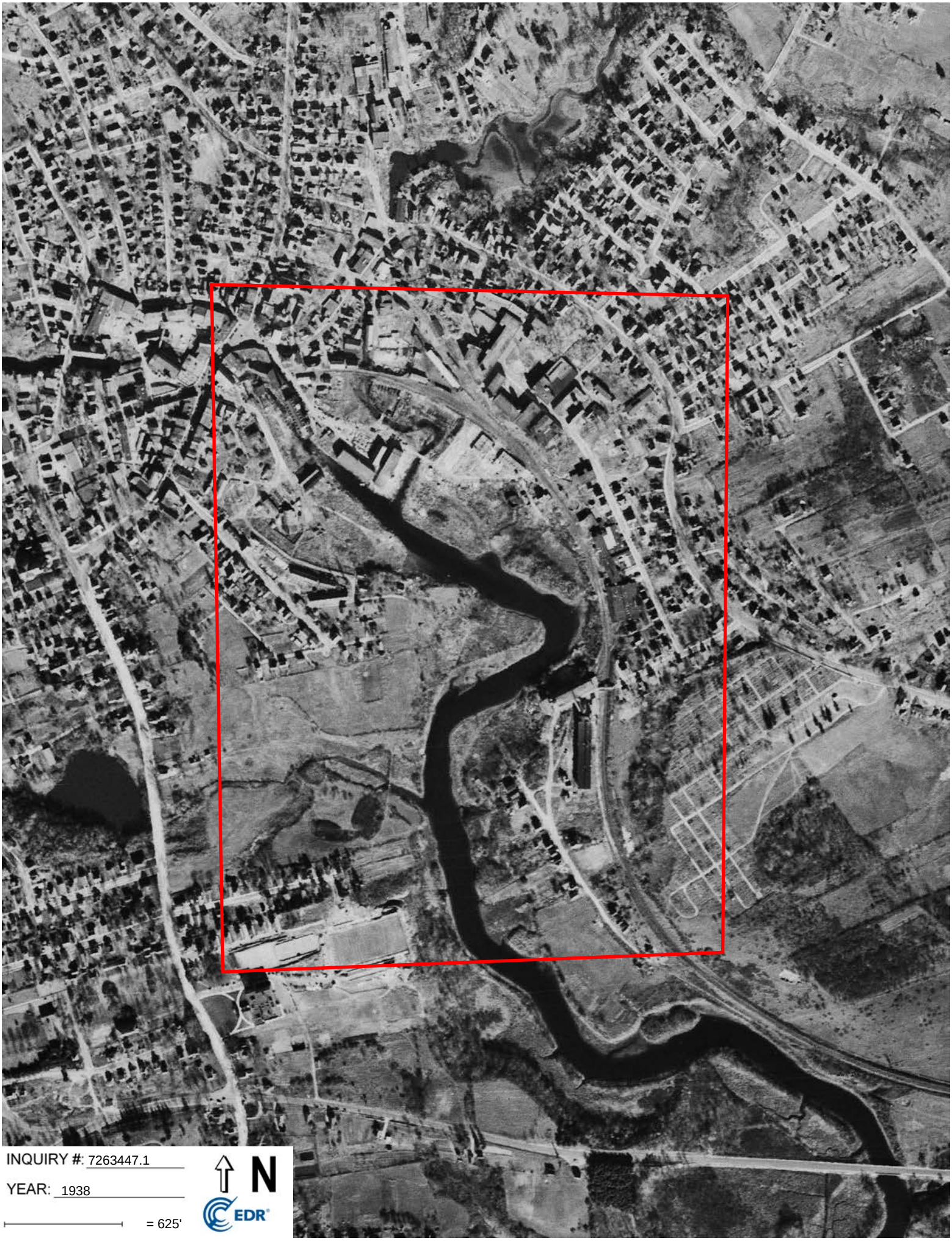
EDR


INQUIRY #: 7263447.1
YEAR: 1938
= 625'
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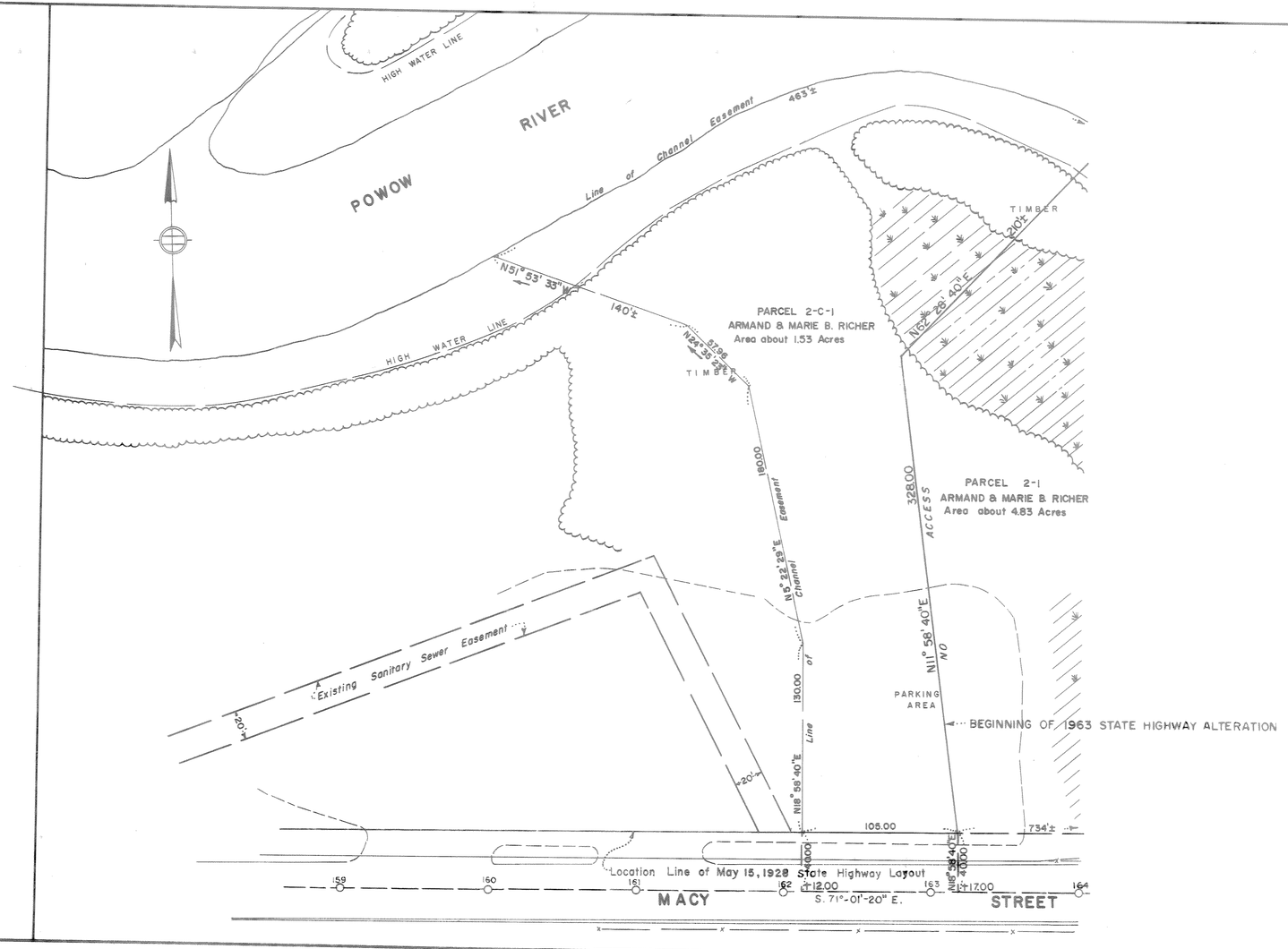
EDR

C.4. Highway Construction Plans

TWO SHEETS (LAYOUT NO. 5331) 44/100



PLAN BOOK 100 PLAN 44 (2 Plns)

ESSEX REGISTRY OF DEEDS, SO. DIST.
SALEM, MASS.

Received May 29, 1963
with Taking of Easements;
Mass. Dept. Public Works Rec B 5066 P 101

ATTEST: Leo H. Jones
Register of Deeds

A TRUE COPY-ATTEST
Edith I. Cronin
SECRETARY
DEPARTMENT OF PUBLIC WORKS
COMMONWEALTH OF MASSACHUSETTS

J.A.S.

COMMONWEALTH OF MASSACHUSETTS
JOSEPH A. SMITH
4207
REGISTERED PROFESSIONAL ENGINEER

This certifies that the location of the highway has been altered as shown on this plan and that said highway as altered was laid out and taken charge of as a Limited Access State Highway by the Department of Public Works on May 14, 1963 in accordance with Chapter 81 of the General Laws as amended by Section 7-C inserted by Chapter 397 of the Acts of 1948.

Joseph A. Vaccaro
George C. Thompson
Department of Public Works

The Commonwealth of Massachusetts
PLAN OF LAND
in the Town of

AMESBURY
ESSEX COUNTY

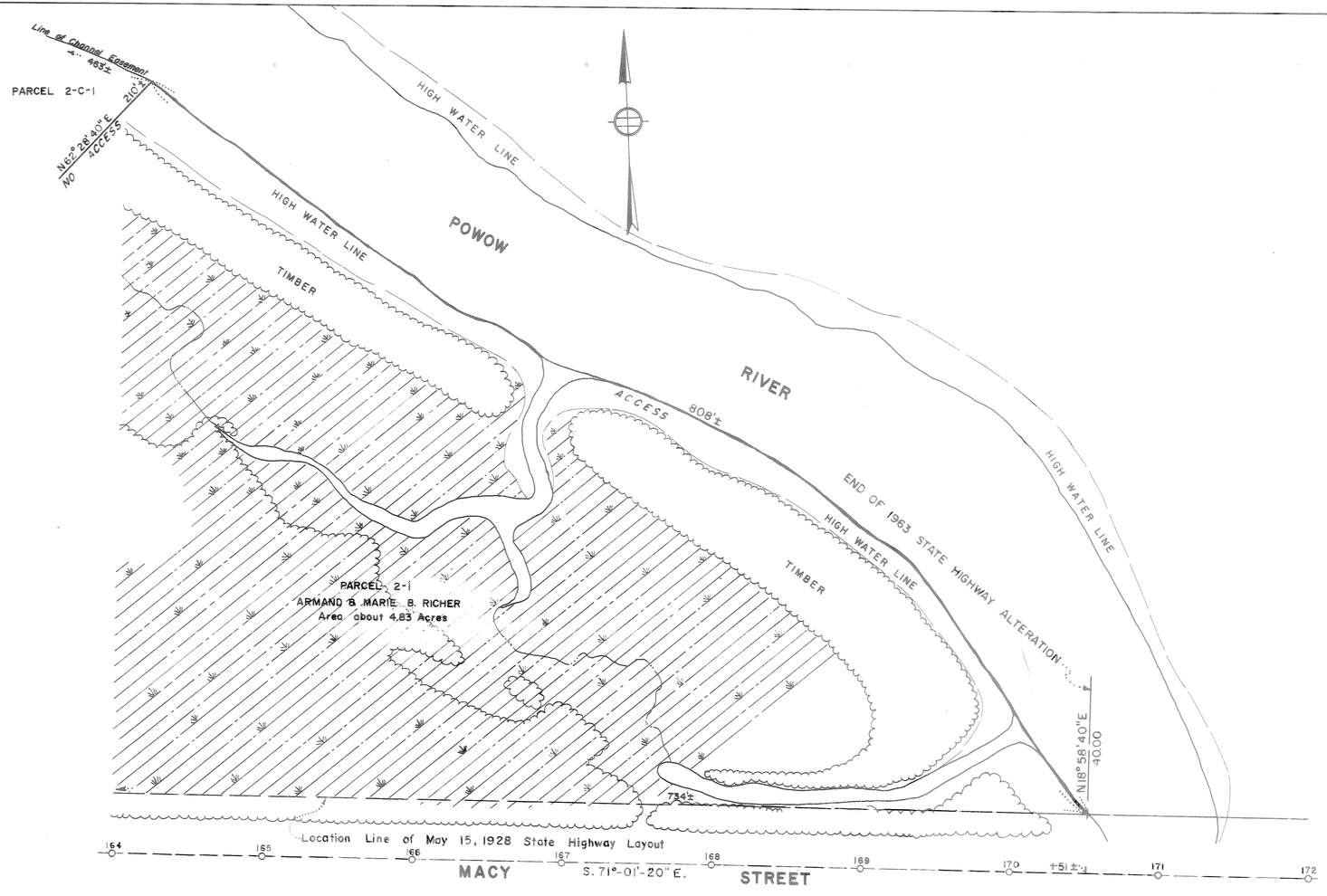
Altered and laid out as a State Highway by the Department of Public Works
MAY 14, 1963
Scale: 40 feet to the inch

E. J. McCarthy
Chief Engineer

Layout No. 5331

AMESBURY - 1963 ALTERATION - SHEET 2 OF 2 SHEETS
(LIMITED ACCESS)

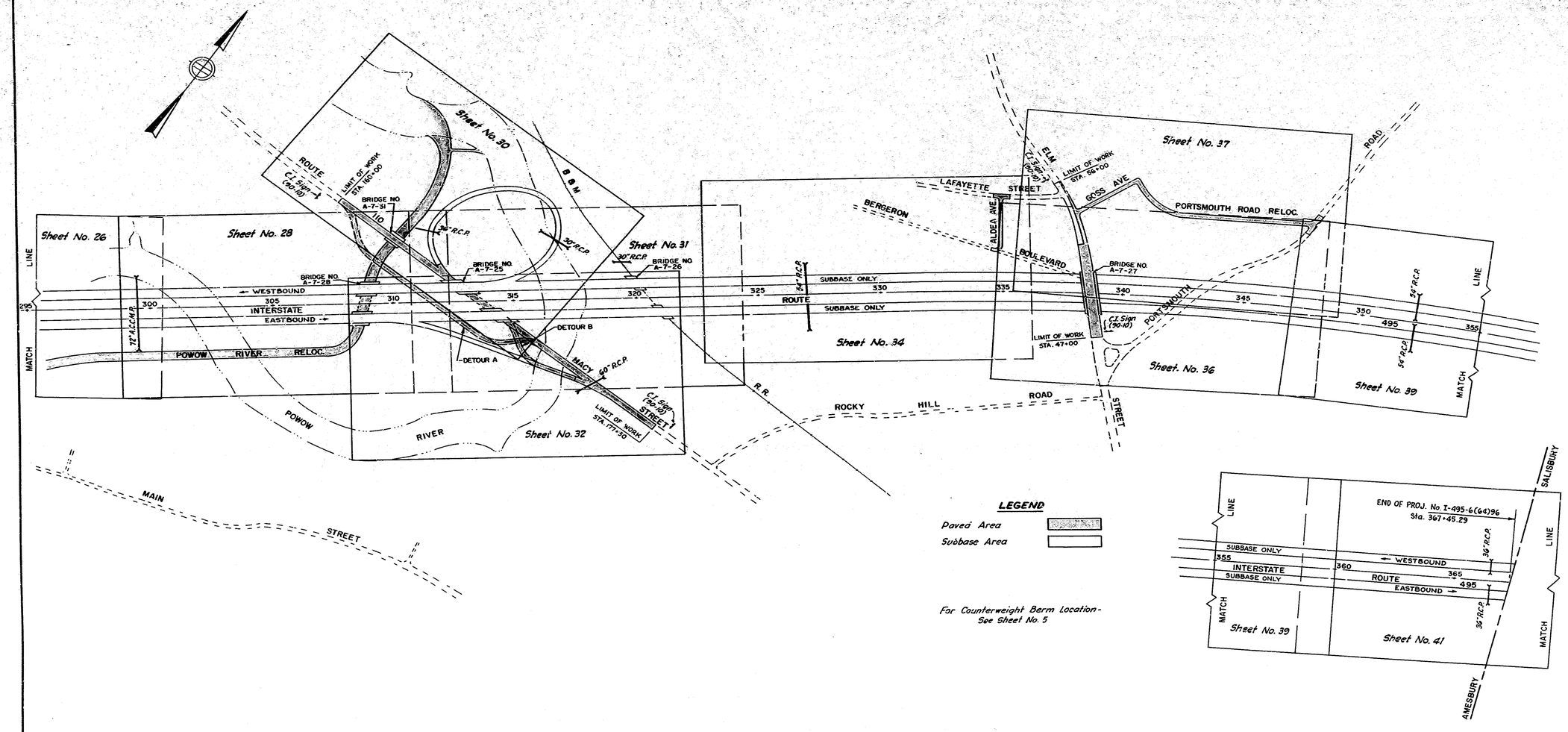
44/100



AMESBURY

INTERSTATE ROUTE 495 E & W

PUB. RD. DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
1	MASS.	I-495-6(64)96		4	522



FILE NO. 5222L

0 1 2 3
3" SCALE

AMESBURY

INTERSTATE ROUTE 495 E & W

PUB. RD. DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
1	MASS.	I-495-6(64)96		30	522

5221

HIGHWAY GUARD TYPE C3S
160+25 to 162+10 Rt. Macy St.

DRAINAGE DETAILS
See Below

WATER SUPPLY ALTERATIONS
By Others

To be filled to Elev. 0.00 with Waste Material

RIVER

POWOW

CHANNEL

HIGH WATER LINE

Exist. Top of Slope

Prop. Rock Fill

Prop. Top of Slope

Channel Excav.

Easement

Exist. Line of Channel

TIMBER

Prop. Thick Fill

Prop. Rock Fill

RIVER RELOCATION

Prop. Top of Slope

Line of Easement

Chain Link Fence

ACCESS LOCATION LINE

Prop. Top of Slope

Begin Prop. Subbase End Gravel Foundation

200' Min.

End 105

Inv. 6.36

Foodliner

24" Sewer

Line of Easement

PARKING AREA

Bit. Parking Lot

LIMIT OF WORK

Prop. S.M.H. #6
162+00-36' Rt.
Inv. 5.85
Rim 17.2

Exist. C.B.C.I. (Abandon) R.R. Fac.

Bit. Conc. Berm

(By Others) Prop. 6"x8" Increaser

(By Owners) Prop. 6" Gate & Gate Box

Prop. Bit. Conc. Pavement - Type I-I

Exist. 6" C.I. Water Main

Prop. Grav. Curb

MACY STREET

Prop. VA-3 Granite Curb

Exist. Bit. Conc. Walk

Exist. S.M.H. Adjust To Line, Elev. to Grade. Prop. Inv. 5.46 Exist. Inv. 4.79

For Macy St. Detours - See Sheet No. 54

24" Sewer

Line of Easement

BRIDGE NO. A-7-35

Prop. Rock Fill

Note: See Bridge Sheets for Rip-Rap under Bridge No. A-7-35

Prop. S.M.H. #5
163+25-36' Rt.
Inv. 8.35
Rim 16.4

CONT. ON SHEET NO. 28

Prop. 8" C.I. Water

Prop. 8" C.I. Sewer

Exist. S.M.H. (Abandon) Rck Fac.

Prop. 280'-10" C.I. Sew. Sewer

Exist. C.B.C.I. (Abandon) R.R. Fac.

Exist. S.M.H. (Abandon) R.R. Fac.

Prop. S.M.H. #4
163+80-16' Rt.
Inv. 8.57
Rim 14.73

Prop. S.M.H. #3
166+65-16' Rt.
Inv. 9.71
Rim 15.32

Portable Barrier Fence

Prop. Edging

Exist. Guard Rail

Exist. Bit. Mac. Pavement

Prop. 280'-10" C.I. Sew. Sewer

Exist. C.B.C.I. (Abandon) R.R. Fac.

BRIDGE NO. A-7-25

Exist. S.M.H. (Abandon) R.R. Fac.

STA. 318+61.11 ℄ ROUTE I-495

STA. 167+20.74 ℄ MACY STREET

Prop. Bit. Conc. Walk

Exist. Gran. Curb Rem.

Prop. C.B. Concord Frame & Grate

EASTBOUND ROADWAY

WESTBOUND ROADWAY

Proposed Subbase

Future Granite Rubble Block Paving

Prop. S.M.H. #2
163+50-16' Rt.
Inv. 10.85
Rim 16.74

D.I. Type C (2 Thimbles)

Prop. Top of Slope

Prop. Bot. of Slope

Prop. G. Ditch (Paved) (Rawy Earth)

Prop. G. Ditch (Paved)

140'-30" R.C.P.

INVERT End +25

End +30

Inv. 10.0

Inv. 10.2

Inv. 10.4

Inv. 10.6

Inv. 10.8

Inv. 11.0

Inv. 11.2

Inv. 11.4

Inv. 11.6

Inv. 11.8

Inv. 12.0

Inv. 12.2

Inv. 12.4

Inv. 12.6

Inv. 12.8

Inv. 13.0

Inv. 13.2

Inv. 13.4

Inv. 13.6

Inv. 13.8

Inv.

AMESBURY

INTERSTATE ROUTE 495 E & W

PUB. HWY. DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
1	MASS.	I-495-6(84)96		68	522

FILE NO. 5222

BOSTON & MAINE R.R.

STATE HIGHWAY LOCATION

ACCESS LINE

RAMP E-2

HIGH WATER LINE

POWOW RIVER RELOCATION

LINE OF CHANNEL EASEMENT

STATE HIGHWAY NO 110

ACCESS

FOODLINER

MACY STREET

R=400.00'
Δ=32°45'19"
T=119.37'
L=368.30'

R=180.00'
Δ=149°27'07"
T=349.10'
L=450.67'

R=800.00'
Δ=16°06'55"
T=113.55'
L=225.00'

R=180.00'
Δ=107°56'23"
T=248.97'
L=338.02'

R=1000.00'
Δ=3°37'47"
T=31.65'
L=63.35'

Sta. 162+64.00 Macy St =
Sta. 33+41.29 Powow River Reloc.

Sta. 313+61.11 T.=495
Sta. 167+20.74 Macy St.

S 88° 11' 38" E
2067.83'

N 51° 44' 09" E
3442.71'

HOR. SCALE IN FEET
0 40 100 200

3" SCALE
0 1 2 3

Appendix D Nearby MassDEP Disposal Sites

Nearby MassDEP Disposal Sites

1. 23 Noel Street – Abandoned PCE Drum (RTN 3-00205)

The site at 23 Noel Street (RTN 3-00205) is adjacent to the west side of the Powwow River. In August 1988, three full drums were discovered along the bank of the river. The Department of Environmental Quality Engineering (DEQE; now referred to as MassDEP) was contacted to investigate the drums. DEQE noted during their investigation that the drums were observed to be in poor condition and posed a threat of release to the environment. During their investigation, DEQE verbally notified the property owner of their responsibility for the threat of release.

The drums were removed from the riverbank and their contents tested prior to disposal. In September 1988, Northeast Solvents transported the drums for disposal. According to the Hazardous Waste Manifest, one drum contained waste flammable liquid and another drum contained waste perchloroethylene (PCE). The third drum contained non-regulated material.

Between 1989 and 1991, MassDEP listed the disposal site identified by RTN 3-00205 as a Location To Be Investigated (LTBI) as a suspected place of oil or hazardous material contamination. However, in August 1996, MassDEP indicated that the disposal site met the criteria used to identify locations that do not need further evaluation.

Given the proximity of these drums to the Powwow River, there is the potential that river sediments may have been impacted from a possible release. However, based on MassDEP's response actions and conclusions, the possibility of a release is unlikely.

2. Bartley Machine & Manufacturing, Inc., 34-40 Water Street (RTNs 3-04108 and 3-20198)

The former Bartley Machine & Manufacturing, Inc. (Bartley) facility was located at 34-40 Water Street. The site was used for manufacturing since at least the late 1800s, including carriage manufacturing, wheel manufacturing, auto body manufacturing, and foundry operations. The site was also the location of several structures and operations associated with the former Amesbury MGP.

Portions of the site were historically used as landfills (both industrial and municipal). A former owner of the Bartley property, Bailey Company, used a portion of the 34-40 Water Street property adjacent to the Powwow River as an industrial landfill beginning in the late 1940s and ending in the early 1960s. Fill material included household trash, discarded formed steel, felt material, and rubber. The filling on the 34-40 Water Street property extended up to the northern boundary of the National Grid property (39 Water Street, Lot 219). The fill material may extend approximately 50 feet onto the northern portion of the National Grid property. The Town of Amesbury landfill also operated approximately from the time the former Amesbury MGP ceased operations in 1924 until 1952. The Amesbury landfill was located north of the Bailey landfill. The Amesbury landfill reportedly received brick, sand, ash, metal scrap, and other general debris. Even after 1952, the town reportedly continued to bring in gravel fill and grade the area on an annual basis through the late 1970s.

Four underground storage tanks (USTs) were removed from the site in October 1991. The USTs were previously used to store oil. Staining was observed on the soil during excavations to remove the USTs. MassDEP was notified of the release in October 1991. The USTs were reportedly in good condition upon removal, and so there was uncertainty whether the petroleum-stained soil was associated with the USTs or with the historical use of that area as a landfill. In November 1992, MassDEP issued RTN 3-04108 to the entire Bartley property at 34-40 Water Street in response to the suspected UST petroleum release.

Haley & Aldrich of Boston, Massachusetts (Haley & Aldrich) submitted a Phase I Limited Site Investigation (LSI) report to MassDEP on behalf of Bartley in July 1993. The Phase I LSI report documented that the portions of the site were historically used as landfills (both industrial and municipal) and the location of components of the former MGP. The Phase I investigation focused on the former UST areas, the former landfills, and the location of components of the former MGP.

Vanasse Hangen Brustlin, Inc. of Watertown, Massachusetts (VHB) conducted an environmental assessment in December 1995 and January 1996 for a proposed children's center. During this investigation, VHB identified greater than 18 inches of light non-aqueous phase liquid (LNAPL) resembling fuel oil in several monitoring wells, and elevated concentrations of lead along the banks of the Powwow River. VHB conducted a subsurface investigation in 1998 and 1999 to further define the contamination at the site, including lead in the soil. Lead concentrations as high as 150,000 milligrams per kilogram (mg/kg) exceeded the applicable reportable concentration and MassDEP was notified on September 25, 2000. MassDEP assigned RTN 3-20198 to this release, which was later linked to RTN 3-04108.

In 2001, Environmental Science Services, Inc. of Wellesley, Massachusetts (ESS) conducted a Phase II investigation in the lead impacted area, the former UST area, the landfill area, and the MGP area. ESS summarized their findings in an April 2002 Phase II CSA report, in which they concluded that the sources of the contamination were numerous historical releases from equipment, USTs, and various activities as a result of its use as an industrial site, landfill, and MGP.

The area of lead-impacted soil associated with various historical uses and operations (RTN 3-20198) was excavated and removed from the 34-40 Water Street site as part of a Phase IV RIP in 2002 performed by Higgins Environmental Associates of Amesbury, Massachusetts (HEA). This included some areas below mean high water, which would be defined as sediment within the Powwow River. The post-remediation lead concentrations at the edge of the excavation were generally less than the cleanup standard of 200 mg/kg, although there were two locations in sediment in the river slightly below mean high water that had higher lead concentrations (210 and 320 mg/kg). HEA did not collect samples further out in the river towards the center line to confirm the lateral extent of remaining lead in sediment.

The MGP holder was addressed in 2004 and 2005, and consisted of diffusing ozone in recirculated tank water to degrade MGP contaminants in soil within the tank. HEA concluded that treatment of soil outside the holder was not necessary because impacts were at depth only (greater than 15 feet) and isolated. HEA submitted a Class A-4 RAO (with AUL) in 2009 to achieve a Permanent Solution. During investigations by GEI in 2015 prior to Phase IV activities at the former Amesbury MGP, GEI identified DNAPL as coal tar in a monitoring well at 34-40 Water Street that prompted GEI to expand the disposal site boundary for RTN 3-24070 to include a small sliver of 34-40 Water Street. As part of subsequent evaluations and as documented in Phase IV Status Report No. 2, dated February 1, 2018, GEI concluded that continued active recovery of DNAPL at the Site was no longer warranted.

The 34-40 Water Street property abuts the Site along the Powwow River to the north, and the disposal site for RTNs 3-04108 and 3-20198 is primarily on an upland portion of the 34-40 Water Street property. Contaminants related to lead on the portion of the 34-40 Water Street site closest to the Property, on and below the banks of the Powwow River, was cleaned up through a removal of contaminated material. There is uncertainty regarding whether the full extent of lead in Powwow River sediment was remediated as part of HEA's removal efforts. Based on the nature of contaminants in sediment and because this site is upstream as well as adjacent to the Site, there is potential that lead and possibly other contamination, including from the former landfills, has affected conditions in the Powwow River.

3. The Harbor Schools, 194 Main Street (RTN 3-02068) – Imported Contaminated Fill

The site at 194 Main Street (RTN 3-02068) is approximately 900 feet west of the Powwow River. In July 1988, approximately 1,500 cubic yards of fill originating from the Charlestown Naval Shipyard was imported to the site. An environmental study performed at a parcel within the shipyard identified several contaminants in soil at the shipyard including lead, volatile organic compounds (VOCs) and polychlorinated biphenyls (PCBs). However, it was not clear whether fill from the shipyard and transported to the site was impacted.

Between 1988 and 1995, Environmental Systems Engineering Co. of Fremont, New Hampshire (ESE) performed subsurface investigations at the site. Lead, cadmium and semi-volatile organic compounds (SVOCs) in soil and groundwater were detected, but in August 1995 after completing a preliminary risk assessment, the site was closed with a Class A-2 RAO (now referred to as a Permanent Solution Statement).

Given the low concentrations of contaminants in soil, and the distance between the site and the Powwow River, contamination from this release is unlikely to have affected conditions within the Powwow River.

4. Former Nathan Hale Furniture Company, 2 River Street and 24 Oak Street (RTNs 3-11859 and 3-23167)

4.1 RTN 3-11859 – Leaking No. 2 Fuel Oil UST

The site identified by RTN 3-11859 is on a portion of the former Nathan Hale Furniture Company site, which is located at 2 River Street (sometimes referred to as 24 Oak Street). In November 1994, a 10,000-gallon UST containing No. 2 fuel oil failed a tank tightness test. Mabbett & Associates Inc. of Bedford, Massachusetts (M&A) notified MassDEP of the tank failure and an Immediate Response Action (IRA) was initiated in December 1994. Response actions included the disposal of approximately 600 gallons of product removed from the UST, the removal and disposal of the tank, and the disposal of approximately 200 cubic yards of petroleum impacted soil.

M&A installed three monitoring wells to investigate whether the UST had impacted groundwater. Two of the monitoring wells were installed upgradient of or within the source area and one well was installed downgradient approximately 80 feet from the source area. M&A collected groundwater samples from

each monitoring well for analysis of VOCs, polycyclic aromatic hydrocarbons (PAHs) and TPH. Concentrations in the samples were all below detection limits.

After completing remediation activities and post-remedial monitoring, M&A concluded that the site had achieved a condition of No Significant Risk based on a Method 1 Risk Characterization. The site was closed with a Class A-2 RAO (now referred to as a Permanent Solution Statement) in July 1995.

Given the low concentrations of residual contamination, and the distance between the site and the Powwow River, contamination from this release is unlikely to have affected conditions in the Powwow River.

4.2 RTN 3-23167 – PAHs and Metals in Fill

The site identified by RTN 3-23167 is on a portion of the former Nathan Hale Furniture Company site at 24 Oak Street (sometimes referred to as 2 River Street). In May 1993, approximately 5 gallons of solvents were released to the ground surface. An approximately 25-square-foot area was impacted to a depth of ¼ inch. Contaminated soil was removed from the site, and confirmatory samples detected no chlorinated VOCs but did detect several PAHs. The presence of the PAHs was attributed to historical deposition of coal or coal ash at the site.

In 2000 and 2003, ATC Associates Inc. (ATC) performed subsurface investigations at the site to evaluate the presence of coal and coal ash in soil and groundwater. Results of the investigation detected C11-C22 aromatic hydrocarbons, PAH compounds, arsenic, beryllium, copper, and lead at concentrations above RCS-1 reportable concentrations in soil. Groundwater was not encountered during the investigations. Based on the site history, and presence of coal and coal ash in soil, ATC concluded that PAHs and metals were attributable to coal and coal ash and were, therefore, exempt from reporting to MassDEP under the MCP. However, ATC reported the C11-C22 aromatic hydrocarbons to MassDEP, who assigned RTN 3-23167.

In January 2004, ATC completed a Method 3 Risk Characterization and concluded there was a condition of No Significant Risk. Receptors included a recreational user of the river that could be exposed to surficial soil contaminated with petroleum hydrocarbons, PAHs, and metals along the riverbank that could erode into the river. ATC closed the site in April 2004 with a Class B-1 RAO.

Due to the presence of petroleum hydrocarbons and PAHs in the riverbank soil, the Method 3 Risk Characterization performed by ATC concluded that “the potential exists that the site may have served as a source for certain constituents to the sediments of the Powwow River immediately adjacent to the site” but there was “no data indicating that the Powwow River had been impacted. No sediment samples were collected as part of the assessment.

Based on the proximity of sediment to the riverbank and the presence of contamination in riverbank soil, it is possible the contaminants in surface soil at the site have migrated via surface runoff to the Powwow River.

5. Transformer, 23 Noel Street (3-12793) – PCB Release

The site at 23 Noel Street (3-12793) is adjacent to the west side of the Powwow River. In August 1995, approximately 9.5 gallons of mineral oil dielectric fluid (MODF) containing PCBs was released from a Massachusetts Electric Company (MECO) owned transformer that failed. The spill impacted two

adjacent transformers, the platform on which they were mounted, a concrete pad, and surrounding vegetation and soil.

Following discovery of the release, MECO notified MassDEP of the release and the New England Power Service Company (NEPSCO) initiated IRA activities. Following assessment of the release, MECO contacted Clean Harbors, Inc. to complete remedial actions. Remedial actions included removal of impacted brush, vegetation, and debris from within the fenced area of the transformer, and the use of an alkaline detergent and water solution to clean the concrete pad.

MECO collected post-remediation confirmatory soil and wipe samples from the impacted areas. Residual PCBs were detected in two soil samples at concentrations of 0.3 mg/kg and 1.3 mg/kg. PCBs were also detected in the wipe sample at a concentration of 8.4 micrograms per 100 cubic centimeters (µg/cm2).

Ransom Environmental Consultants, Inc. of Newburyport, Massachusetts (Ransom) concluded that the site had achieved a condition of No Significant Risk based on a Method 1 Risk Characterization. The site was closed with a Class A-2 RAO (now referred to as a Permanent Solution Statement) in August 1995.

Given the low concentrations of residual contamination, and the limited area impacted, contamination from this release is unlikely to have affected conditions within the Powwow River.

6. Former Amesbury Metal Products Corporation, 33-39 Oakland Street (RTNs 3-13096 and 3-34747)

The former Amesbury Metal Products Corporation was at 33-39 Oakland Street. Historical figures show that the former building also extended onto 41 and 43 Oakland Street. The former Amesbury Metal Products Corporation (or predecessor companies) fabricated metals from the late 1800s until around 1995. Operations reportedly included plating, soldering, buffing, stamping, painting, and degreasing of fabricated metal parts. Ransom decommissioned and decontaminated the building in 1995 prior to demolition. Ransom removed one degreaser tank (containing trichloroethylene [TCE]), one solvent storage tank (containing TCE), three USTs (containing No. 2 fuel oil, gasoline, and crude oil), one aboveground storage tank (AST) (containing fuel oil), and eight electrical transformers. Ransom concluded that these potential sources of contamination had been properly removed but that a Phase I site investigation should be conducted to evaluate whether a release of OHM had occurred to the environment.

Haley & Aldrich conducted a subsurface investigation in 1995, as part of an environmental due diligence assessment. Haley & Aldrich encountered VOCs, heavy metals, and cyanide in soil and groundwater above reportable concentrations in the western portion of the site. Haley & Aldrich concluded that a Condition of Substantial Release Migration (SRM) was present based on the elevated contaminant concentrations and the groundwater flow direction towards the nearby Powwow River. On October 30, 1995, MassDEP was notified of the condition and they issued RTN 3-13096 to the release. MassDEP also approved an IRA consisting of a two-phase extraction pilot test to evaluate the feasibility of removing chlorinated VOCs from soil and groundwater.

Haley & Aldrich submitted a Phase I Report to the DEP on December 5, 1996. Haley & Aldrich found that TCE exceeded the Upper Concentration Limit (now referred to as Method 3 Ceiling Limit) in both soil and groundwater. According to Haley & Aldrich's Phase I Report, there was a floor drain near the TCE

degreaser that was used for the discharge of flood water, rainwater, and cooling water to a drywell on the western side of the former building. Haley & Aldrich concluded that possible spillage and discharge of TCE to this floor drain was a potential source of VOCs in soil and groundwater.

Haley & Aldrich also collected two surface water samples from a flooded area adjacent to the Powwow River in October 1996. TCE and cis-1,2-dichloroethylene (cis-1,2-DCE) were detected above laboratory reporting limits. One of the sampling locations was collected near the mouth of a culvert that was reportedly connected to the municipal sewer on Oakland Street. Haley & Aldrich reported that there were several upstream properties that used and stored OHM and that had documented soil and groundwater contamination with chlorinated VOCs. The river is tidally influenced and at the time of sampling was flooded so it was not possible to determine the direction of river flow, according to Haley & Aldrich. Haley & Aldrich indicated at that time that they did not have enough information to determine whether VOCs detected in the surface water samples were attributable to the site.

After evaluating data from the two-phase pilot test, Haley & Aldrich concluded that the technology was effective at removing VOCs from soil and groundwater. They proceeded with full-scale operation of the extraction system in October 1996 and operated it until June 1997. Haley & Aldrich collected confirmatory soil and groundwater samples and concluded that the IRA successfully met the remedial goal, which was to reduce average soil and groundwater concentrations to below the Upper Concentration Limits (now referred to as Method 3 Ceiling Limits).

Haley & Aldrich prepared a Method 3 Risk Characterization in 1997 to evaluate risks at the site. At the time, the anticipated future use of the parcels at 33-39 Oakland Street was for single-family homes, which now currently occupy these parcels. Haley & Aldrich concluded there was No Significant Risk to human health, public welfare, safety, and the environment with the implementation of an AUL on rear portions of the parcels at 35 and 37 Oakland Street. The AUL permitted passive recreation, gardening and landscaping and short-term deeper excavations. The AUL prohibited construction of any buildings without a vapor barrier and venting system, withdrawal of groundwater, and long-term excavation. Haley & Aldrich submitted a Class A-3 RAO to MassDEP on October 14, 1997.

Follow up sampling was performed in 1997 and 1999, both by Haley & Aldrich at the request of the City of Amesbury, and by MassDEP to support a Notice of Audit Finding (NOAF) and Notice of Noncompliance (NON) they subsequently issued in 2000. Haley & Aldrich reviewed the results and concluded that VOC concentrations had reduced over time, further supporting their conclusions that a condition of No Significant Risk had been achieved at the site.

In 2018, MassDEP performed indoor air sampling at 39 Oakland Street, which detected chlorinated VOCs in indoor air at concentrations that posed an Imminent Hazard and constituted a 2-hour reporting condition. MassDEP issued RTN 3-34747 to the release and performed assessment and remedial activities, which appear to have been completed in late 2022 according to MassDEP. The remedial activities include sub-slab depressurization systems in several of the houses along Oakland Street.

The former Amesbury Metals Products Corporation abuts the Site to the east. Based on the potential for VOCs to have migrated to surface water in the Powwow River and because the site is upstream from the disposal Site, there is potential that contamination related to the site has affected conditions at the Site.

As part of Phase II investigations for the Amesbury Former MGP Site (RTN 3-24070), chlorinated VOCs have been detected in sediments, likely attributable to this upgradient site at 33-39 Oakland Street.

7. Former Control Technology, 36 Main Street (RTN 3-13943) – Petroleum Impacted Soil

The site at 36 Main Street (3-13943) is adjacent to the west side of the Powwow River. In January 1996, an environmental site assessment performed at the former Control Technology property by New England Environmental Technologies (NEET) identified concentrations of TPH and arsenic above MassDEP reportable concentrations in soil. In April 1996, Corporate Environmental Engineering of Worcester, Massachusetts (CEE) was contracted by Old Newbury Crafters to identify the limits of TPH and arsenic contaminated soil. The site also extended onto an electrical substation, Amesbury Substation No. 5, owned by Massachusetts Electric Company.

CEE identified a small area of arsenic and TPH contaminated soil on the south side of the site. They performed a Method 1 Risk Characterization for TPH and determined that an AUL was necessary to maintain a condition of No Significant Risk. In June 1997, an AUL was recorded for the site and CEE submitted a Class B-2 RAO (now referred to as a Permanent Solution Statement). The AUL was only implemented on the 36 Main Street property and not the Amesbury Substation No. 5 property.

In May 2003, BSC Group (BSC) performed a limited subsurface investigation as part of a real estate transaction to confirm previously documented concentrations of petroleum hydrocarbons within the AUL area. BSC submitted four soil samples collected from two test pits within the AUL area for EPH and TPH analysis. TPH concentrations within the soil samples were similar to concentrations reported by NEET in 1996.

BSC performed a Method 1 Risk Characterization using EPH/VPH Method 1 Standards and concluded that an AUL was no longer necessary to maintain a condition of No Significant Risk. The AUL was terminated based on the risk characterization and in June 2004, BSC submitted a Class B-1 RAO to MassDEP, which superseded the June 1997 RAO submitted by CEE in June 1997.

Given the low concentrations of residual contamination and the limited area impacted, contamination from this release is unlikely to have affected conditions within the Powwow River.

8. Amesbury Substation No. 5, Mill Street (RTN 3-14817) – Petroleum Impacted Soil

The site at the Amesbury Substation No. 5 along Mill Street (RTN 3-14817) is adjacent to the west side of the Powwow River. In January 1996, an environmental site assessment performed at the abutting 36 Main Street property by NEET identified concentrations of TPH and arsenic above MassDEP reportable concentrations in soil on the 36 Main Street property (refer to RTN 3-13943 above). A subsequent subsurface investigation at the 36 Main Street site indicated that the Amesbury Substation No. 5 property had also been impacted by the oil and arsenic release. As owner of the Amesbury Substation No. 5 property, MECO reported the release to MassDEP who assigned RTN 3-14817.

In September 1997, TRC Environmental Corporation of Lowell, Massachusetts (TRC) implemented an Initial Site Investigation at the Amesbury Substation No. 5 property, independent of the 36 Main Street investigation associated with RTN 3-13943, to document contamination in soil or groundwater located on the Amesbury Substation No. 5 property.

Soil samples from the Amesbury Substation No. 5 property were analyzed for VPH, EPH, PAHs, and arsenic. VPH, PAHs, and arsenic were detected in soil; however, only arsenic was detected at concentrations above MCP Method 1 standards. A groundwater sample from a downgradient monitoring well installed on the bank of the Powwow River was analyzed for VPH, EPH, PAHs, and arsenic. EPH fractions were detected in the groundwater sample below the MCP Method 1 standards.

TRC performed a Method 3 Risk Characterization for the Amesbury Substation No. 5 property. TRC concluded that the site posed a condition of No Significant Risk for commercial use but not for a future residential use. An AUL was recorded to prohibit residential use. In December 1997, TRC submitted a Class B-2 RAO (now referred to as a Permanent Solution Statement).

Given the low concentrations of residual contamination, the results of downgradient groundwater testing, and the limited area impacted, contamination from this release is unlikely to have affected conditions within the Powwow River.

9. Heritage Park (Former Amesbury DPW Facility), 25, 27, and 31 Water Street (RTNs 3-16715, 3-19634, 3-31842, 3-31886, 3-32606, and 3-35687)

The property at 31 Water Street is adjacent to the east side of the Powwow River. The property is currently a public park (Heritage Park) but has historically had several industrial uses including carriage manufacturing, possibly gold and silver plating, woodworking, wooden heel manufacturing, metal machining, plastics manufacturing, and most recently municipal operations as the DPW facility.

9.1 RTN 3-16715 – Heating Oil UST

The site identified by RTN 3-16715 is listed with an address of 27 Water Street. While removing an approximately 1,000-gallon No. 2 heating oil UST in April 1998, ENPRO, Inc. of Newburyport, Massachusetts (ENPRO) measured jar headspace readings of up to 450 parts per million (ppm) within the UST grave. MassDEP was notified of the condition and they assigned RTN 3-16715 and approved IRA assessment activities.

On behalf of the City of Amesbury, HEA performed investigations to evaluate the extent of contamination associated with the UST release. HEA installed soil borings and monitoring wells and collected soil and groundwater samples for petroleum hydrocarbons. VPH fractions C9-C10 aromatics were detected in above Method 1 S-1 standards and EPH fraction C9-C18 aliphatics, VPH fractions C5-C8 aliphatics and C9--C10 aromatics, total xylenes were detected in groundwater above Method 1 GW-2/GW-3 standards.

Due to the proximity of the disposal site to the Powwow River, HEA collected surface water and sediment samples to determine if the release impacted the river. Sediment and surface water samples were also analyzed for petroleum hydrocarbons. Detections within sediment and surface water from the Powwow River were interpreted as being consistent with Local Conditions and were not attributed to the releases of petroleum from the disposal site.

In September 2001, HEA determined that since several petroleum compounds within soil and groundwater at the disposal site exceeded applicable Method 1 Risk Characterization standards, a condition of No Significant Risk did not exist at the disposal site, and that additional response actions

were warranted. In June 2006, HEA performed an MCP Phase III evaluation for the disposal site and determined that a Class C-1 RAO (now referred to as a Temporary Solution) was necessary for the disposal site. The site still does not have a Permanent Solution.

In 2015, a RAM was performed under the oversight of VHB for various improvements to Water Street, including at 27 Water Street. The work generally included excavation for street lighting fixtures and associated electrical conduits, brick walkways, sidewalks, landscaped areas, and storm drainage structures. A total of 1,553.7 tons of soil were removed during the RAM, of which 933.83 tons were from the 27 Water Street property.

Given the concentrations of residual petroleum impacts to soil and groundwater, and the distance to the Site, it is unlikely that the release has affected conditions in the Powwow River.

9.2 RTN 3-19634 – Petroleum and PCB Impacted Fill

The site identified as RTN 3-19634 is listed with an address of 31 Water Street. In 1999, as part of an initial environmental assessment as part of a Brownfields project with EPA, Roy F. Weston, Inc. (Weston) documented the presence of several petroleum compounds, lead, beryllium, and PCBs in soil above Method 1 S-1 standards.

Additional assessment activities were performed by HEA, which included the collection of soil, surface water, and sediment samples. Soil samples collected by HEA detected several petroleum compounds, lead, and beryllium above Method 1 S-1 standards. PCBs were not detected above laboratory reporting limits in soil samples submitted by HEA.

In surface water samples collected by HEA, methyl tertiary butyl ether (MTBE) was detected above laboratory reporting limits in one upstream sample, but the results of laboratory analysis in other surface water samples were not detected. HEA also submitted sediment samples from test pits dug within the Back River and Powwow River to evaluate potential impacts from the site on river sediment. Several petroleum hydrocarbons and lead were detected in sediment samples submitted both upstream and downstream of the site. HEA indicated that glass, coal, clinkers, and debris were observed in test pits.

In June 2010, HEA performed a Method 1 Risk Characterization and concluded that a condition of No Significant Risk existed at the site. HEA concluded that remedial actions were not necessary and the site was closed with a Class B-1 RAO (now referred to as a Permanent Solution).

The PCBs were identified in soil (by Weston but not HEA) on an upland portion of the site. Based on the location and nature of contaminants in soil, it is unlikely that contamination in the soil has affected conditions at the Site. However, as described below (refer to Section 9.3), the full extent of PCBs in sediment adjacent to this soil was not determined as part of EPA's removal's efforts and there is potential for remaining PCBs to be in sediment.

9.3 RTN 3-31842 – Contaminated Fill

The site identified as RTN 3-31842 is listed with an address of 31 Water Street. During soil assessment activities performed by HEA in October 2013, PCBs, VOCs, TPH, SVOCs, arsenic, cadmium, chromium, lead, and nickel were detected above reportable concentrations. PCBs detected in surficial soil (0-1 foot) were greater than the Imminent Hazard (IH) level of 10 mg/kg. The conditions were reported to MassDEP, and MassDEP approved additional assessment to evaluate PCBs.

HEA completed additional assessment activities in November 2013 and they identified PCBs in surficial soil across the site. In February 2014, they submitted an IRA Plan to remove PCB impacted soil from 0-1 foot below grade across most of the site. As part of IRA activities between May and August 2014, approximately 1,887 tons of PCB impacted soil was excavated from surficial soil at the site ranging from 0.5 to 3 feet deep. HEA collected confirmatory soil samples and concluded that, except in two areas where soil was to be removed by EPA, the average PCBs were less than Method 1 standards.

A narrow strip of land at 31 Water Street bordering the Back and Powwow Rivers was not included in the IRA Plan, as the EPA was assisting in assessment and remediation of this portion of the site in 2014 and 2015 as part of a Brownfields project. According to Weston, who managed the work on behalf of EPA, PCBs were detected primarily in soil at concentrations in some cases above 50 mg/kg. PCBs were previously attributed by others to fill of unknown origin used as backfill in the 1960s during restoration of the bulkhead along the Back and Powwow Rivers. Because PCBs in soil were identified greater than 50 mg/kg, the release was also regulated under the Toxic Substances Control Act (TSCA).

EPA removed the soil behind the bulkhead to depths ranging from 2 and 8 feet deep, and removed sediment in two small areas in front of the bulkhead from the Powwow River to 2 feet deep. Approximately 1,500 tons of PCB impacted soil was excavated and disposed of off site. A new sheet pile was installed along the banks of the rivers and the excavations were backfilled behind the sheet pile walls with imported material. The post-remediation PCB concentrations in sediment in the Powwow River were less than the cleanup standard of 1 mg/kg but those samples were collected at the base of the excavation. Weston did not collect samples further out in the river to confirm the lateral extent of remaining PCBs in sediment, if any.

EPA concluded it achieved the project goal of a “clean closure” per MassDEP regulations for the planned use of the site as a public park. However, EPA indicated that MassDEP was the lead regulatory authority for the site and would make the final determination of the site’s status per the MCP in coordination with the City of Amesbury. There is uncertainty regarding the location of the full extent of PCBs in sediment, and whether all PCBs from this site, including PCBs in the Powwow River, were remediated as part of EPA’s removal efforts. Based on the nature of contaminants in sediment and that this site is upstream of the Site, there is potential that PCB contamination in the sediment has affected conditions downstream at the Site.

In March 2018, TRC Environmental Corporation (TRC) completed a Method 1 Risk Characterization and concluded that a condition of No Significant Risk existed. The site was closed with a Permanent Solution Statement with Conditions (no AUL).

9.4 RTN 3-31886 – Contaminated Fill

The site identified as RTN 3-31886 is listed with an address of 25 Water Street. As part of subsurface investigations performed at the site in 2013 by HEA, PAHs, arsenic, chromium, and lead were detected in shallow soil. HEA indicated the presence of anthropogenic materials (coal/ash, brick, clinkers, glass) in fill material. Samples collected by HEA below the fill did not contain metals or PAHs above Method 1 standards.

Between June and September 2014, the top foot of soil at the site was excavated except for a 10-foot setback area along the Powwow River under a Release Abatement Measure (RAM) Plan. Additional soil was excavated from select area of the site down to approximately 5 feet deep for the installation of a

stormwater retention basin and utility corridors. Approximately 1,950 tons of soil were excavated and disposed of off-site as part of RAM activities.

To evaluate the potential migration of contaminants identified in the subsurface, HEA collected samples from native soil identified beneath the fill layer. Additionally, VHB collected deeper samples of native soil which contained lower metals concentrations than the overlying soil. HEA previously evaluated sediment and surface water conditions in the Powwow River adjacent to the site during investigations for a separate RTN (3-19634). Although HEA's analysis of river sediments only included a subset of metals identified in site soil, HEA concluded that sediment impacts were widespread in the Powwow River and cannot be attributed to the site.

In March 2018, TRC completed a Method 2 Risk Characterization and concluded that a condition of No Significant Risk existed. The site was closed with a Permanent Solution Statement with Conditions (no AUL).

Based on the potential for the contaminants in surface soil at the site to have migrated via surface runoff to the Powwow River and because this site is upstream from the disposal Site, there is potential that PAH and metal contamination has affected sediment conditions in the Powwow River at the disposal Site.

9.5 RTN 3-32606 – Petroleum Release from UST

The site identified as RTN 3-32606 is listed with an address of 31 Water Street. In 2014, during IRA response actions under RTN 3-31842 (refer to Section 9.3), a UST was discovered but initially left in place due to the risk that removing the tank posed to the structural integrity of Water Street. However, it was subsequently removed. During removal, McPhail Associates measured an elevated jar headspace reading triggering a 72-hour release reporting condition. Soil surrounding the UST was removed under RTN 3-31842.

In 2015, McPhail performed additional assessment and concluded there was no remaining contaminated soil within the disposal site acting as a continuing source of groundwater contamination. In December 2017, TRC Environmental Corporation (TRC) closed the site with a Permanent Solution Statement, which indicated that a condition of No Significant Risk had been achieved.

Based on the limited extent of impacts to soil and groundwater, it is unlikely that contamination associated with this release has affected conditions in the Powwow River.

9.6 RTN 3-35687 – PCBs in Soil Stockpile

The site identified as RTN 3-35687 is listed with an address of 25 Water Street. During redevelopment activities for Heritage Park in 2018, PCBs were detected in a soil stockpile generated from an excavation of the riverwalk embankment area along the Powwow River. In 2019, the PCB contaminated soil was removed from the embankment in a section approximately 40 feet long, 15 feet wide, up to 6 feet deep, and the area was reconstructed with large rock (rip rap with average size of 12 inches) underlain by 6 inches of gravel borrow. The PCB contamination was limited to soil and did not extend to sediment in the Powwow River. In June 2020, a Permanent Solution Statement was achieved. It is unlikely that the release has affected conditions in the Powwow River.

10. Former Gas Works / Former Brass Foundry, 33 Mill Street (RTNs 3-29912 and 3-30292)

The site at 33 Mill Street (3-29912) is approximately 150 feet to the west of the Powwow River. The site is currently vacant but has had several historical uses including use as a "Gas Works", or MGP that appears to have been associated with a nearby carriage or other manufacturing factory (1880 to 1909), a woolen mill operation (prior to 1912), a brass foundry (1915 to 1920), and steam laundry (1930 to 1945).

According to Bradburne, Briller, & Johnson, LLC of Amesbury Massachusetts (BB&J), a Phase I ESA prepared by Simmons Environmental Services, Inc. of Salisbury, Massachusetts reported that the MGP was:

> *"located on the eastern central portion of the property during sometime before 1885 and sometime before 1899. During that time, as depicted on Sanborn Maps, the northern portion of the former Gas House building was labeled as "retorts" (i.e., distilling or decomposing chamber used with heat) and the southern portion of the former building was labeled as "purifying" (i.e., a purifier used to prepare the gas for distribution before it is held inside a gas holding tank). An iron "gasometer" (i.e., gas holding tank) was located on the southern portion of the Site. An above-ground storage tank (AST) containing petroleum oil was also depicted on the Sanborn Maps between 1885 and 1904 located to the north of the former MGP building."*

During an ASTM Phase II ESA in December 2010, BB&J identified VOCs, SVOCs, metals, and TPH in soil and groundwater. The release was reported to MassDEP in March 2011, and they assigned RTN 3-29912. In September 2011, BB&J identified arsenic, chromium, and lead in shallow soil less than six inches deep, which was considered a potential Imminent Hazard. BBJ notified MassDEP, and they assigned RTN 3-30292, which was subsequently linked to RTN 3-29912.

BB&J submitted a Phase I ISI to MassDEP in December 2011. BB&J concluded that contaminants released at the site were suspected to be associated with historical operations on the property as a brass foundry, possible leakage of petroleum oil from a former on-site AST, and as an MGP including storage of manufactured gas within the gas holding tank and coal tar remnants associated with the production of manufactured gas. Specifically, releases were suspected to be associated with the possible on-site storage of by-products of brass production (metals) during the time of brass foundry operations and the storage of manufactured gas and by products generated from operations as a MGP (metals, VOCs, SVOCs).

Clean Soils Environmental, LTD of Ipswich, Massachusetts (CSE) submitted a Phase II CSA to MassDEP in September 2016. CSE identified remnants of the former gas retort house foundation, piping (associated with the hydraulic main, retorts, and condensers), and the 40-foot-diameter, circular brick structure identified as the former MGP gas holder. The interior of the brick gasholder was observed to contain water with a petroleum sheen, bricks, wood, coal tar, and naphthalene or tar odors, which CSE concluded was a likely on-going source.

Previous reports concluded that soil and groundwater have been impacted with coal tar and petroleum products at the site, mostly near the former gas holder and around former MGP structures. According to OHI Engineering, Inc. of Mansfield, Massachusetts (OHI), the contaminants have remained near former

MGP structures due to the silt and clay in the subsurface, which reportedly limited contaminant migration with groundwater flow. DNAPL as coal tar was initially observed in groundwater during development of one monitoring well outside the perimeter of the gas holder.

In 2019, OHI oversaw a Release Abatement Measure (RAM) included removing surficial soil across the site, primarily to depths of 1 to 1.5 feet but in several locations to 2 or 3 feet where elevated arsenic or lead or urban fill and coal ash was present. The RAM also included removing soil to depths of approximately 3.5 feet within a former MGP holder with the objective of "providing stability to the top three feet of the former gas holder" to support future vehicle loads and limit settling. OHI performed a test pit to approximately 5 or 6 feet and reported the soil was stained but did not produce a sheen. During the 2016 Phase II CSA investigation, CSE had reported tar inside the gas holder from a test pit at a depth of 4 feet. OHI did not observe these conditions and concluded that an excavation of 3 feet was adequate. As part of RAM activities, approximately 560 tons of soil was removed from the site for off-site disposal. The former gas holder was backfilled as follows polyethylene sheeting, geotextile fabric, 2 feet of structural fill, 1 foot of common borrow, and 3 inches of loam.

After RAM activities were complete, OHI installed two monitoring wells on Mill Street and Valley Street, downgradient of the site. OHI observed debris (brick, ash) in shallow soil and a clay layer at about 10 to 15 feet deep. Low levels of BTEX and naphthalene were detected in the wells but at concentrations below Method 1 GW-2 and GW-3 standards.

OHI performed a Method 3 Risk Characterization and concluded that a condition of No Significant Risk existed. A Stage I Environmental Risk Characterization performed for the site concluded that a Stage II was not required. In July 2020, OHI closed the site with a Permanent Solution Statement with Conditions (no AUL).

The CSM for the site indicates that contamination is confined to the site by a layer of silt and clay. However, there is uncertainty whether the former gas holder remains an ongoing source since only the top few feet of its contents were removed. Based on its proximity and groundwater flow direction, it is possible that contaminants from the former MGP via groundwater migration have impacted the Powwow River. However, downgradient wells between the former MGP and the river contained only low levels of VOCs. There is also uncertainty regarding waste disposal practices of the former MGP and whether there were possible discharges to the river. It is also possible that contaminants from the former MGP via direct discharge have impacted the Powwow River.

11. Former Amesbury DPW Salt Shed and Former Biddle & Smart Carriage Factory, 22 Water Street (RTN 3-32071) – Metals and VOCs in Soil

The site at 22 Water Street (3-32071) is adjacent to the west side of the Back River, and approximately 300 feet to the northeast of the Powwow River. The site is currently vacant, some of which is paved and some of which is vegetated with grass. The site was formerly used by the Amesbury DPW as a salt shed and prior to that was the former Biddle & Smart Carriage Factory.

As part of an ASTM Phase II performed by HEA in December 2014, several VOCs, lead, nickel and zinc were detected in soil and VOCs and selenium in groundwater above reportable concentrations. MassDEP was notified of the release and they assigned RTN 3-32071.

HEA submitted a Phase I Initial Site Investigation (ISI) for the site in March 2015 and attributed the contaminants in soil to background conditions associated with the presence of coal or coal ash, or to historical use of the site. Based on a Method 1 Risk Characterization, HEA indicated a condition of No Significant Risk did not exist at the site.

In 2015, a RAM was performed under the oversight of VHB for various improvements to Water Street, including at 22 Water Street. The work generally included excavation for street lighting fixtures and associated electrical conduits, brick walkways, sidewalks, landscaped areas, and storm drainage structures. A total of 1,553.7 tons of soil were removed during the RAM, of which 619.87 tons were from the 22 Water Street property.

Ransom performed a Method 3 Risk Characterization and concluded that a condition of No Significant Risk existed at the site. Their risk characterization included the adjacent disposal site at 16 Water Street (tracked by RTN 3-32568; refer to Section 12). Ransom submitted a Permanent Solution Statement with Conditions (no AUL) for RTNs 3-32071 and 3-32568 in November 2018.

Given the concentrations of residual petroleum impacts to soil and groundwater, and the distance to the Site, it is unlikely that the release has affected conditions in the Powwow River.

12. City Parking Lot (Former Residences), 16 Water Street (RTN 3-32568) – Metals and VOCs in Soil

The site at 16 Water Street (3-32568) is adjacent to the west side of the Back River, and approximately 250 feet to the northeast of the Powwow River. The site is currently a paved municipal parking lot. The site was formerly residences.

In July 2014, VHB performed a limited subsurface investigation in advance of the installation of a new natural gas main along Water Street. VHB identified VOCs and lead in soil above reportable concentrations. MassDEP was notified of the release and they assigned RTN 3-32568.

The natural gas main project along Water Street was completed as a Utility Release Abatement Measure (URAM). Approximately 128 cubic yards of lead-impacted soil was disposed of off-site during the URAM.

Ransom performed a Method 3 Risk Characterization and concluded that a condition of No Significant Risk existed at the site. Their risk characterization included the adjacent disposal site at 22 Water Street (tracked by RTN 3-32071; refer to Section 11). Ransom attributed contaminants to Historic Fill and Anthropogenic Background. Ransom submitted a Permanent Solution Statement with Conditions (no AUL) for RTNs 3-32071 and 3-32568 in November 2018.

Given the nature of contamination and distance to the Site, it is unlikely that the release has affected conditions in the Powwow River.

13. Roadway Utility Installation, 5-31 Water Street (RTNs 3-32310 and 3-32608

13.1 RTN 3-32310 – Metals and VOCs in Soil

In July 2014, VOCs and lead were detected in soil along a proposed gas main utility corridor between 5 Water Street and 29 Water Street (RTN 3-32310). The proposed gas main was nearby two closed disposal sites: a historic release of gasoline and diesel fuel from former USTs at 27 Water Street (RTN 3-16715; refer to Section 9.1) and a historical release of PAHs and heavy metals at 31 Water Street (RTN 3-19634; refer to Section 9.2).

Coneco Engineers & Scientists, Inc. of Chelmsford, Massachusetts (Coneco), on behalf of Boston Gas Company d/b/a National Grid (National Grid), identified contaminants in soil greater than reportable concentrations and in August 2014 MassDEP was notified of the condition. MassDEP approved Utility-Related Abatement Measure (URAM) activities associated with the proposed gas main replacement. The URAM activities were performed between August and October 2014. In December 2014, Coneco prepared a URAM Completion Statement describing the management of soil associated with installation of the gas main.

Based on the distance to the Site, it is unlikely that contaminants from the site have affected conditions in the Powwow River.

13.2 RTN 3-32608 – Metals and VOCs in Soil

In November 2014, VOCs and metals were detected in soil along a proposed underground sewer and storm drain utility corridor between 10 Water Street and 31 Water Street (RTN 3-32608),. In December 2014, URAM activities associated were performed the proposed sewer and storm drain utility installation and in August 2015, a URAM Completion Statement was submitted to MassDEP.

Based on the distance to the Site, it is unlikely that contaminants from the site have affected conditions in the Powwow River.

14. German AutoSport, 18 Chestnut Street (RTN 3-34164) – Historic Fill

The site at 18 Chestnut Street (3-34164) is adjacent to Back River, which flows to the Powwow River. Between October 2016 and March 2017, Ransom completed an ASTM Phase I ESA and ASTM Phase II Limited Subsurface Investigation (LSI). Investigations included the advancement of soil borings and installation of groundwater monitoring wells.

Soil samples collected during the investigation contained arsenic and lead above reportable concentrations. MassDEP was notified of the condition and they assigned RTN 3-34164. Ransom observed urban fill in borings from the surface to approximately 15 feet deep. Ransom indicated that urban fill impacted with lead and arsenic were located throughout the site with no clearly recognizable distribution pattern. Ransom also indicated that the abutting Back River was filled in along the southern edge of the site between 1945 and 1958 with imported fill of unknown origin.

Ransom performed a Method 3 Risk Characterization and concluded that a condition of No Significant Risk existed under current conditions. However, to prevent potential residential exposures to lead and arsenic impacted soil in the future, AUL was recorded, prohibiting unrestricted residential use. In September 2017, Ransom closed the site with a Permanent Solution Statement with Conditions.

Based on the proximity of the site to the Back River, it is possible that contamination associated with this release has impacted sediments in the Powwow River.

15. Former Bartley Site, 34, 36, 38 and 40 Water Street and 17 Chestnut Street (RTNs 3-35199, 3-35454, 3-35506, and 3-35509)

15.1 RTN 3-35199 – Chlorinated VOC Release

The site is at 34, 36, 38 and 40 Water Street and 17 Chestnut Street (RTN 3-35199). During a Phase I ESA performed by Ransom Consulting, Inc. (Ransom), they identified an abutting property at 1-9 Oakland Street (former Durasol Corporation disposal site) that had elevated concentrations of chlorinated VOCs tetrachloroethylene (PCE), TCE, and related degradation byproducts in shallow soil, groundwater, and sub-slab soil vapor.

Between March and September 2018, Ransom performed field investigations at the site including sampling sub-slab vapor and indoor air at 17 Chestnut Street, advancing soil borings, and installing monitoring wells across the site. TCE and vinyl chloride were detected in groundwater samples collected by Ransom above their corresponding RCGW-2 Reportable Concentrations. In September 2018, MassDEP was notified of the condition and they assigned RTN 3-35199 to the release.

Between 2018 and 2020, Ransom performed field investigations at the site including advancing additional soil borings, installing additional overburden monitoring wells, performing a geophysical survey, and collecting sub-slab soil vapor, indoor air, soil and groundwater samples for chemical analysis. The investigations completed by Ransom indicated that a complete vapor intrusion pathway existed at portions of the site. The concentrations of chlorinated VOCs detected in sub-slab soil vapor samples collected beneath buildings at the site were above their Commercial/Industrial Sub-Slab Soil Gas Screening Values.

In 2018 and 2019, RAMs were conducted at the site including installing sub-slab depressurization systems (SSDSs) to mitigate the identified vapor intrusion pathway. Post-installation indoor sampling confirmed the effectiveness of the SSDSs. In May 2021, a Permanent Solution Statement with Conditions was achieved for the site indicating that additional response actions beyond continued operation and maintenance of the SSDSs were not warranted at the site. An AUL was implemented to require that the SSDSs continue operating.

The disposal site boundary for RTN 3-35199 is located on an upland portion of the site. It is unlikely that contamination related to this site has affected conditions in the Powwow River.

15.2 RTN 3-35454 – Fuel Oil Release

The site is at 38 Water Street (RTN 3-35434) abuts the Property across the Powwow River to the north. As part of the same due diligence environmental assessment described above for RTN 3-35199, between

March and September 2018, Ransom performed field investigations at the site. In October 2018, LNAPL was identified in a monitoring well (MW203) at a thickness of approximately 5.79 feet. MassDEP was notified of the condition and they assigned 3-35454 to the release.

The monitoring well with LNAPL was near the former boiler room of a former structure located on the site. Three fuel oil USTs that formerly serviced the buildings at 34-38 Water Street were removed in 1991, and the feed and fill lines were capped. During tank removal in 1991, evidence of a petroleum release from the USTs was not observed. However, in 2018, Ransom concluded the suspected source of LNAPL and impacts to soil and groundwater was associated with the former feed lines.

In January 2020, approximately 615 tons of petroleum impacted soil from below and adjacent to the former boiler room and the abandoned feed line were transported off-site for recycling. Replacement monitoring wells were installed and monitored for LNAPL following excavation activities. LNAPL was observed in one replacement monitoring well at a thickness between 0.5 inch and 6 inches.

Ransom performed LNAPL transmissivity assessments to determine if further recoverability of LNAPL was feasible. Based on the results of the transmissivity assessments, Ransom concluded that LNAPL only had microscale mobility and further recovery of LNAPL was infeasible. Ransom also performed a Method 1 Risk Characterization and concluded that a condition of No Significant Risk existed for soil and groundwater conditions associated with the petroleum release.

In November 2020, Ransom submitted a Permanent Solution Statement with Conditions and implemented an AUL to manage the potential for future exposure to LNAPL.

The disposal site boundary for RTN 3-35454 is located on an upland portion of the site. It is unlikely that contamination related to this site has affected conditions in the Powwow River.

15.3 RTN 3-35506 – Fuel Oil Release

The site is at 38 Water Street (RTN 3-35506). As part of the same due diligence environmental assessment described above for RTN 3-35199, between March and September 2018, Ransom performed field investigations at the site. In March 2019, LNAPL was identified in a monitoring well (MW301) at a thickness of approximately 0.60 feet. MassDEP was notified of the condition and they assigned 3-35506 to the release.

Ransom could not identify the source of LNAPL and petroleum impacts in soil and groundwater, however Ransom indicated that based on conditions there were no ongoing sources of petroleum contamination.

Ransom attempted recovery of LNAPL in MW301 using pumps and bailers, however attempts were unsuccessful due to the LNAPL's high viscosity. Ransom concluded that since the LNAPL was not recoverable using a variety of recovery methods and it only had microscale mobility, further recovery of LNAPL was infeasible. Ransom also performed a Method 1 Risk Characterization and concluded that a condition of No Significant Risk existed for soil and groundwater conditions associated with the petroleum release.

In November 2020, Ransom submitted a Permanent Solution Statement with Conditions and implemented an AUL to manage the potential for future exposure to LNAPL.

The disposal site boundary for RTN 3-35506 is located on an upland portion of the site. It is unlikely that contamination related to this site has affected conditions in the Powwow River.

15.4 RTN 3-35509 – Metals and PAHs in Soil

The site is at 34, 36, 38 and 40 Water Street and 17 Chestnut Street (RTN 3-35509). As part of the same due diligence environmental assessment described above in for RTN 3-35199, between March and September 2018, Ransom performed field investigations at the site. Urban fill soil containing elevated concentrations of metals and PAHs was identified that exceeded their RCS-1 standards. In March 2019, MassDEP was notified of the condition and they assigned RTN 3-35509 to the release.

Ransom performed a site-specific background assessment to evaluate the concentrations of metals and PAHs in soil at the site with respect to concentrations of these same contaminants in urban fill soil at other surrounding properties. Ransom determined that the concentrations of PAHs, arsenic and lead in urban fill soil at the site were representative of background conditions for the urban environment in the surrounding properties.

In March 2020, a Permanent Solution Statement with Conditions was achieved for the site indicating that the metals and PAHs in soil were consistent with Historic Fill and considered Anthropogenic Background. The PSS recommended that to be protective of future residents, Best Management Practices (BMPs) for urban gardening as specified by MassDEP should be applied to the site.

The disposal site boundary for RTN 3-35509 is located on an upland portion of the site. In addition, the potential for the urban fill contaminants to migrate with groundwater flow is low. Therefore, it is unlikely that contamination related to this site has affected conditions in the Powwow River.

Appendix E Test Pit Logs

TEST PIT LOG

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Project	Amesbury Former MGP			**PG.** 1 **OF** 1	
City/Town	Amesbury, MA			**Location**	33R Oakland Street
Client	National Grid				
Contractor	NA			**Ground El.**	NM
Equipment/Reach	Posthole Digger			**Datum**	NA
Operator	National Grid	**GEI Rep**	P. Scordato	**GEI Proj. No.**	1804576
Weather	Partly Cloudy ~85		B. Fong-Murdock	**Date**	7/8/2020

Depth (ft)	Sample No. and Type	Sample Depth (ft)	Soil Description
1	S1 PID= 0.0 ppm	0.4-0.6'	ORGANIC SOIL (OL) (0-2.2'): ~100% nonplastic fines, brown, wet, contains plant fibers.
2	S2 PID= 0.8 ppm	2-2.2'	
3			Bottom of test pit at 2.2'.
4			
5			
6			
7			
8			

Notes:
Environmental samples collected from S1(0.4-0.6'), and S2(2-2.2').
PID = Photoionization detector
PPM = parts per million

Pit Dimensions (ft)

length	0.7
width	0.7
depth	2.2

GEI Consultants

TEST PIT LOG

794

Project	Amesbury Former MGP			**PG.** 1 **OF** 1	
City/Town	Amesbury, MA			**Location**	35 Oakland Street
Client	National Grid				
Contractor	NA			**Ground El.**	NM
Equipment/Reach	Posthole Digger			**Datum**	NA
Operator	National Grid	**GEI Rep**	P. Scordato	**GEI Proj. No.**	1804576
Weather	Partly Cloudy ~85		B. Fong-Murdock	**Date**	7/8/2020

Depth (ft)	Sample No. and Type	Sample Depth (ft)	Soil Description
1	S1 PID= 2.5 ppm	0.8-1'	ORGANIC SOIL (OL) (0-2'): ~100% nonplastic fines, brown, moist, contains plant fibers, leaves, hydrogen sulfide-like odor and wood fragments.
2	S2 PID=0.9 ppm	1.8-2'	
3			Bottom of test pit at 2'.
4			
5			
6			
7			
8			

Notes:
Environmental samples collected from S1(0.8-1'), and S2(1.8-2').
PID = Photoionization detector
PPM = parts per million

Pit Dimensions (ft)

length	0.7
width	0.7
depth	2

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TEST PIT LOG

795

Project	Amesbury Former MGP			**PG.** 1 **OF** 1	
City/Town	Amesbury, MA			**Location**	37 Oakland Street
Client	National Grid				
Contractor	NA			**Ground El.**	NM
Equipment/Reach	Posthole Digger			**Datum**	NA
Operator	National Grid	**GEI Rep**	P. Scordato	**GEI Proj. No.**	1804576
Weather	Partly Cloudy ~80		B. Fong-Murdock	**Date**	7/6/2020

Depth (ft)	Sample No. and Type	Sample Depth (ft)	Soil Description
1	S1 PID= 0.5 ppm	0.5-0.7'	ORGANIC SOIL (OL) (0-2.6'): ~60% nonplastic fines, ~40% fine to medium sand, dark brown, wet, plant roots and fibers,brick fragments, petroleum-like and napthalene-like odor from 2.0-2.5'.
2	S2 PID= 4.6 ppm	2-2.2'	
3			Bottom of test pit at 2.6'.
4			
5			
6			
7			
8			

Notes:
Environmental sample collected from S2(2-2.2').
PID = Photoionization detector
PPM = parts per million

Pit Dimensions (ft)

length	0.7
width	0.7
depth	2.6

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TEST PIT LOG

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Project	Amesbury Former MGP			**PG.** 1 **OF** 1	
City/Town	Amesbury, MA			**Location**	37 Oakland Street
Client	National Grid				
Contractor	NA			**Ground El.**	NM
Equipment/Reach	Posthole Digger			**Datum**	NA
Operator	National Grid	**GEI Rep**	P. Scordato	**GEI Proj. No.**	1804576
Weather	Partly Cloudy ~80		B. Fong-Murdock	**Date**	7/6/2020

Depth (ft)	Sample No. and Type	Sample Depth (ft)	Soil Description
1	S1 PID= 0.3 ppm	0.4-0.6'	ORGANIC SOIL (OL) (0-2'): ~100% nonplastic fines, dark brown, moist, contains plant fibers and wood fragments. Becomes more silty and gray with depth.
2	S2 PID= 0.5 ppm	1.8-2'	
3			Bottom of test pit at 2'.
4			
5			
6			
7			
8			

Notes:
Environmental samples collected from S1(0.4-0.6'), and S2(1.8-2').
PID = Photoionization detector
PPM = parts per million

Pit Dimensions (ft)

length	0.7
width	0.7
depth	2

GEI Consultants

TEST PIT LOG

808

Project	Amesbury Former MGP			**PG.** 1 **OF** 1	
City/Town	Amesbury, MA			**Location**	35 Oakland Street
Client	National Grid				
Contractor	NA			**Ground El.**	NM
Equipment/Reach	Shovel/Hand Auger			**Datum**	NA
Operator	National Grid	**GEI Rep**	J. Smalley	**GEI Proj. No.**	1804576
Weather	Clear ~60		D. Miller	**Date**	10/12/2022

Depth (ft)	Sample No. and Type	Sample Depth (ft)	Soil Description
1	S1 PID= 0.0 ppm	0.8-1.0'	ORGANIC SOIL (OL) (0-1.5'): ~80% nonplastic fines, dark brown, moist, contains plant fibers and wood fragments. Becomes more silty and gray with depth.
2	S2 PID= 0.0 ppm	1.8-2.0'	
3			ORGANIC SOIL (OL) (1.5-3'): ~60% nonplastic fines, ~40% fine sand, dark brown, moist, contains plant fibers and wood fragments.
4			Bottom of testpit at 3'.
5			
6			
7			
8			

Notes:
Environmental samples collected from S1(0.8-1'), and S2(1.8-2').
PID = Photoionization detector
PPM = parts per million

Pit Dimensions (ft)

length	1
width	1
depth	3

GEI Consultants

TEST PIT LOG

809

Project	Amesbury Former MGP			**PG.** 1 **OF** 1	
City/Town	Amesbury, MA			**Location**	35 Oakland Street
Client	National Grid				
Contractor	NA			**Ground El.**	NM
Equipment/Reach	Shovel/Hand Auger			**Datum**	NA
Operator	National Grid	**GEI Rep**	J. Smalley	**GEI Proj. No.**	1804576
Weather	Clear ~60		D. Miller	**Date**	10/12/2022

Depth (ft)	Sample No. and Type	Sample Depth (ft)	Soil Description
1	S1 PID= 0.0 ppm	0.8-1.0'	ORGANIC SOIL (OL) (0-1.5'): ~80% nonplastic fines, dark brown, moist, contains plant fibers and wood fragments. Becomes more silty and gray with depth.
2	S2 PID= 0.0 ppm	1.8-2.0'	
3			ORGANIC SOIL (OL) (1.5-3'): ~60% nonplastic fines, ~40% fine sand, dark brown, moist, contains plant fibers and wood fragments.
4			Bottom of test pit at 3'.
5			
6			
7			
8			

Notes:
Environmental samples collected from S1(0.8-1'), and S2(1.8-2').
PID = Photoionization detector
PPM = parts per million

Pit Dimensions (ft)

length	1
width	1
depth	3

GEI Consultants

TEST PIT LOG

810

Project	Amesbury Former MGP			**PG.**	1 **OF** 1
City/Town	Amesbury, MA			**Location**	37 Oakland Street
Client	National Grid				
Contractor	NA			**Ground El.**	NM
Equipment/Reach	Shovel/Hand Auger			**Datum**	NA
Operator	National Grid	**GEI Rep**	J. Smalley	**GEI Proj. No.**	1804576
Weather	Clouds ~65		D. Miller	**Date**	6/19/2023

Depth (ft)	Sample No. and Type	Sample Depth (ft)	Soil Description
1	S1 PID= 0.0 ppm	0.1-1.0'	WIDELY GRADED SAND WITH GRAVEL (SW-SM) (0-2'): ~80% fine to coarse sand, ~15% subrounded gravel up to 3/4", ~5% nonplastic fines, dark brown, moist, contains brick fragments.
2	S2 PID= 0.0 ppm	1.0-2.0'	
	S3 PID= 0.0 ppm	2.0-2.5'	NARROWLY GRADED SILTY SAND (SM) (2-2.5'): ~60% fine sand, ~30% nonplastic fines, ~10% subrounded gravel up to 1/2", gray, wet.
3			Bottom of test pit at 2.5'.
4			
5			
6			
7			
8			

Notes:
Environmental samples collected from S1(0.8-1'), and S2(1.8-2').
PID = Photoionization detector
PPM = parts per million

Pit Dimensions (ft)

length	1
width	1
depth	2.5

GEI Consultants

TEST PIT LOG

811

Project	Amesbury Former MGP			**PG.** 1 **OF** 1	
City/Town	Amesbury, MA			**Location**	37 Oakland Street
Client	National Grid				
Contractor	NA			**Ground El.**	NM
Equipment/Reach	Shovel/Hand Auger			**Datum**	NA
Operator	National Grid	**GEI Rep**	J. Smalley	**GEI Proj. No.**	1804576
Weather	Clouds ~65		D. Miller	**Date**	6/19/2023

Depth (ft)	Sample No. and Type	Sample Depth (ft)	Soil Description
1	S1 PID= 0.0 ppm	0.0-1.0'	SILTY SAND SAND WITH GRAVEL (SM) (0-2'): ~70% fine to coarse sand, ~15% subrounded gravel up to 3/4", ~15% non-plastic fines, dark brown, moist, contains roots/fibers
2	S2 PID= 0.0 ppm	1.0-2.0'	
	S3 PID= 0.0 ppm	2.0-2.5	NARROWLY GRADED SILTY SAND (SM) (2-2.5'): ~60% fine sand, ~30% non-plastic fines, ~10% subrounded gravel up to 1/2", gray, wet.
3			Bottom of test pit at 2.5'. Groundwater observed at 2.0' below ground surface.
4			
5			
6			
7			
8			

Notes:
Environmental samples collected from S1(0.8-1'), and S2(1.8-2').
PID = Photoionization detector
PPM = parts per million

Pit Dimensions (ft)

length	1
width	1
depth	2.5

GEI Consultants

TEST PIT LOG

839

Project	Amesbury Former MGP			**PG.**	1 **OF** 1
City/Town	Amesbury, MA			**Location**	33R Oakland Street
Client	National Grid				
Contractor	NA			**Ground El.**	NM
Equipment/Reach	Shovel/Hand Auger			**Datum**	NA
Operator	National Grid	**GEI Rep**	J. Smalley	**GEI Proj. No.**	1804576
Weather	Clouds ~70		D. Miller	**Date**	8/17/2023

Depth (ft)	Sample No. and Type	Sample Depth (ft)	Soil Description
1	S1 PID = 58.5 ppm	0-1.0'	SILTY SAND (SM) (0-2'): ~60% mostly fine sand, ~40% non-plastic fines, brown, wet. Contains brick, ceramic, glass.
2	S2 PID = 12.8 ppm	1.0-2.0'	
3			Bottom of test pit at 2'.
4			
5			
6			
7			
8			

Notes:
Environmental samples collected from S1(0-1'), and S2(1-2').
PID = Photoionization detector
PPM = parts per million

Pit Dimensions (ft)

length	1
width	1
depth	3

GEI Consultants

TEST PIT LOG

840

Project	Amesbury Former MGP			**PG.** 1 **OF** 1	
City/Town	Amesbury, MA			**Location**	33R Oakland Street
Client	National Grid				
Contractor	NA			**Ground El.**	NM
Equipment/Reach	Shovel/Hand Auger			**Datum**	NA
Operator	National Grid	**GEI Rep**	J. Smalley	**GEI Proj. No.**	1804576
Weather	Clouds ~70		D. Miller	**Date**	8/17/2023

Depth (ft)	Sample No. and Type	Sample Depth (ft)	Soil Description
1	S1 PID = 18.3 ppm	0.1-1.0'	WIDELY GRADED SAND WITH GRAVEL (SW-SM) (0-2'): ~80% fine to coarse sand, ~15% subrounded gravel up to 3/4", ~5% nonplastic fines, dark brown, moist, contains brick fragments.
2	S2 PID = 20.2 ppm	1.0-2.0'	NARROWLY GRADED SILTY SAND (SM) (2-2.5'): ~60% fine sand, ~30% nonplastic fines, ~10% subrounded gravel up to 1/2", gray, wet.
3			Bottom of test pit at 2.5'.
4			
5			
6			
7			
8			

Notes:
PID = Photoionization detector
PPM = parts per million

Pit Dimensions (ft)

length	1
width	1
depth	3

GEI Consultants

TEST PIT LOG

HA101

Project	Amesbury Former MGP			**PG.**	1 **OF** 1
City/Town	Amesbury, MA			**Location**	35 Water St
Client	National Grid				
Contractor	NA			**Ground El.**	NM
Equipment/Reach	Shovel/Hand Auger			**Datum**	NA
Operator	National Grid	**GEI Rep**	J. Smalley	**GEI Proj. No.**	1804576
Weather	Clear ~40		D. Miller	**Date**	11/2/2023
			N. Troccolo		

Depth (ft)	Sample No. and Type	Sample Depth (ft)	Soil Description
	S1 PID = 0.1 ppm S2	0-0.25'	SILTY SAND WITH GRAVEL (SM) (0-0.25'): ~70% fine to coarse sand, ~15% nonplastic fines, ~15% subangular to subrounded gravel up to 2", brown, dry, contains roots.
	PID = 0.1 ppm	0.25-2.0'	SILTY SAND SAND WITH GRAVEL (SM) (0.25-2.0'): ~70% fine to coarse sand, ~15% subrounded gravel up to 2", ~15% nonplastic fines, brown, dry, contains glass, brick, and asphalt shingles.
1			
2	S3 PID = 0.1 ppm	2.0-2.5'	SILTY SAND WITH GRAVEL (SM) (2-2.5'"):~60% fine to coarse sand,~25% nonplastic fines, ~15% subrounded to subangular gravel, brown, dry, contains slag and coal.
	S4 PID = 0.1 ppm	2.5-3.0'	SILTY SAND WITH GRAVEL (SM) (2.5-3.0'): similar to S3, contains more slag and coal
3			
			Bottom of test pit at 3'.
4			
5			
6			
7			
8			

Notes:
Composite environmental sample collected from 0-3' and discrete environmental sample collected at 1.5'.
PID = Photoionization detector
PPM = parts per million

Pit Dimensions (ft)

length	~1
width	~1
depth	3

TEST PIT LOG

HA102

Project	Amesbury Former MGP			**PG.**	1 **OF** 1
City/Town	Amesbury, MA			**Location**	35 Water St
Client	National Grid				
Contractor	NA			**Ground El.**	NM
Equipment/Reach	Shovel/Hand Auger			**Datum**	NA
Operator	National Grid	**GEI Rep**	N. Troccolo	**GEI Proj. No.**	1804576
Weather	Clear ~40		D. Miller	**Date**	11/2/2023

Depth (ft)	Sample No. and Type	Sample Depth (ft)	Soil Description
1	S1 PID = 0.5 ppm	0-1.0	SILTY SAND WITH GRAVEL (SM) (0-1'): ~70% fine to coarse sand, ~15% nonplastic fines, ~15% subangular to subrounded gravel up to 2", brown, dry, contains roots in top 6", brick (whole) at 6".
2			Bottom of test pit at 1'.
3			
4			
5			
6			
7			
8			

Notes:
Composite environmental sample collected from 0-1' and discrete environmental sample collected at 0.5'.
PID = Photoionization detector
PPM = parts per million

Pit Dimensions (ft)

length	~1
width	~1
depth	1

TEST PIT LOG

HA103

Project	Amesbury Former MGP			**PG.** 1 **OF** 1	
City/Town	Amesbury, MA			**Location**	35 Water St
Client	National Grid				
Contractor	NA			**Ground El.**	NM
Equipment/Reach	Shovel/Hand Auger			**Datum**	NA
Operator	National Grid	**GEI Rep**	J. Smalley	**GEI Proj. No.**	1804576
Weather	Clear ~40		D. Miller	**Date**	11/2/2023
			N. Troccolo		

Depth (ft)	Sample No. and Type	Sample Depth (ft)	Soil Description
1	S1 PID = 0.0 ppm	0-2.25'	SILTY SAND WITH GRAVEL (SM) (0-2.25'): ~70% fine to coarse sand, ~15% nonplastic fines, ~15% subangular to subrounded gravel up to 2", brown, dry, contains roots up to 18", concrete pieces up to 4", rusty 'L-bracket' approximately 1.5'X1.5' at 1'.
2			
3	S2 PID = 0.0 ppm	2.25-3.0'	SILTY SAND WITH GRAVEL (SM) (2.25-3.0'):~60% fine to coarse sand,~25% nonplastic fines, ~15% subrounded to subangular gravel, brown, dry, contains glass, brick, clinker.
4			Bottom of test pit at 3'
5			
6			
7			
8			

Notes:
Composite environmental sample collected from 0-3' and discrete environmental sample collected at 1.5'.
PID = Photoionization detector
PPM = parts per million

Pit Dimensions (ft)

length	~1
width	~1
depth	3

TEST PIT LOG

HA104

Project	Amesbury Former MGP			**PG.** 1 **OF** 1	
City/Town	Amesbury, MA			**Location**	35 Water St
Client	National Grid				
Contractor	NA			**Ground El.**	NM
Equipment/Reach	Shovel/Hand Auger			**Datum**	NA
Operator	National Grid	**GEI Rep**	N. Troccolo	**GEI Proj. No.**	1804576
Weather	Clear ~40		D. Miller	**Date**	11/2/2023

Depth (ft)	Sample No. and Type	Sample Depth (ft)	Soil Description
1	S1 PID: 0.0 ppm	0-1'	SILTY SAND WITH GRAVEL (SM) (0-1'): ~70% fine to coarse sand, ~15% nonplastic fines, ~15% subangular to subrounded gravel up to 2", brown, dry, roots throughout. Contains brick piece (1"x1"3") at 6", timber (6"x1"x2"), glass, ceramic, slag, and unknown rock with attached wire at 1'.
2			Bottom of test pit at 1'.
3			
4			
5			
6			
7			
8			

Notes:
Composite environmental sample collected from 0-1' and discrete environmental sample collected at 0.5'.
PID = Photoionization detector
PPM = parts per million

Pit Dimensions (ft)

length	~1
width	~1
depth	1

TEST PIT LOG

HA105

Project	Amesbury Former MGP			**PG.** 1 **OF** 1	
City/Town	Amesbury, MA			**Location**	35 Water St
Client	National Grid				
Contractor	NA			**Ground El.**	NM
Equipment/Reach	Shovel/Hand Auger			**Datum**	NA
Operator	National Grid	**GEI Rep**	N. Troccolo	**GEI Proj. No.**	1804576
Weather	Clear ~40		D. Miller	**Date**	11/2/2023

Depth (ft)	Sample No. and Type	Sample Depth (ft)	Soil Description
1	S1 PID = 0.0 ppm	0-0.33'	SILTY SAND (SM) (0-0.33'): ~70% fine to coarse sand, ~20% non-plastic fines, ~10% subangular to subrounded gravel, brown, dry, roots throughout.
	S2 PID = 0.0 ppm	0.33-0.66'	WIDELY GRADED SAND WITH SILT (SW-SM) (0.33-0.66'): ~80% fine to coarse sand, ~10% non-plastic fines, ~10% subrounded to subangular gravel, brown, dry, contains brick pieces up to 1", glass shards.
2	S3 PID = 0.2 ppm	0.66-2.0'	SILTY SAND WITH GRAVEL (SM) (0.66-2.0'): ~70% fine to coarse sand, ~15% non-plastic fines, ~15% subrounded to subangular gravel, brown, dry, contains slag, glass, boulder at 1.5'.
3			Refusal at 2'. Large boulders at test pit bottom.
4			
5			
6			
7			
8			

Notes:
Composite environmental sample collected from 0-2' and discrete environmental sample collected at 1.0'.
PID = Photoionization detector
PPM = parts per million

Pit Dimensions (ft)

length	~1
width	~1
depth	2

TEST PIT LOG

883

Project	Amesbury Former MGP			**PG.** 1 **OF** 1	
City/Town	Amesbury, MA			**Location**	37 Oakland Street
Client	National Grid				
Contractor	NA			**Ground El.**	NM
Equipment/Reach	Shovel			**Datum**	NA
Operator	National Grid	**GEI Rep**	D. Miller	**GEI Proj. No.**	1804576
Weather	Clear ~70		S. Weikle	**Date**	7/22/2024

Depth (ft)	Sample No. and Type	Sample Depth (ft)	Soil Description
1	S1 PID = 1065 ppm	0-2.0'	SANDY SILT (ML) (0-2'): ~60% nonplastic fines, ~30% fine sand, ~10% subangular/subrounded gravel up to 0.5", light to dark brown, moist to wet, contains organics, roots, sheen on water surface, one 6" subangular cobble.
2			
3			Bottom of testpit at 2'.
4			
5			
6			
7			
8			

Notes:
Sample collected for WQC from 0-2'. VOC grab collected at 0.5'.
PID = Photoionization detector
PPM = parts per million

Pit Dimensions (ft)

length	~1
width	~1
depth	2

TEST PIT LOG

883R

Project	Amesbury Former MGP			**PG.**	1 **OF** 1
City/Town	Amesbury, MA			**Location**	37 Oakland Street
Client	National Grid				
Contractor	NA			**Ground El.**	NM
Equipment/Reach	Shovel			**Datum**	NA
Operator	National Grid	**GEI Rep**	D. Miller	**GEI Proj. No.**	1804576
Weather	Clear ~72		C. DeMayo	**Date**	9/3/2024

Depth (ft)	Sample No. and Type	Sample Depth (ft)	Soil Description
	S1 PID = 291.1 ppm	0-0.5'	SANDY SILT (ML) (0-0.5'): ~50% nonplastic fines, ~50% fine sand, gray/brown, wet. Contains decaying vegetation, organic-like odor.
1	S2 PID = 263.2 ppm	0.5-1.5'	SANDY SILT (ML) (0.5-1.5'): ~80 nonplastic fines, ~20% fine sand, brown, wet. Contains decaying vegetation, organic-like odor.
2	S3 PID = 383.5 ppm	1.5-2.5'	SANDY SILT (ML) (1.5-2.5'): ~80 nonplastic fines, ~20% fine sand, brown, wet. Contains decaying vegetation, organic-like odor.
3			Bottom of testpit at 2.5'.
4			
5			
6			
7			
8			

Notes:
Sample collected for WQC from 0-0.5', 0.5-1.5' and 1.5-2.5'.
PID = Photoionization detector
PPM = parts per million

Pit Dimensions (ft)

length	~1
width	~1
depth	2.5

TEST PIT LOG

890

Project	Amesbury Former MGP			**PG.** 1 **OF** 1	
City/Town	Amesbury, MA			**Location**	37 Oakland Street
Client	National Grid				
Contractor	NA			**Ground El.**	NM
Equipment/Reach	Shovel			**Datum**	NA
Operator	National Grid	**GEI Rep**	D. Miller	**GEI Proj. No.**	1804576
Weather	Clear ~72		C. DeMayo	**Date**	9/3/2024

Depth (ft)	Sample No. and Type	Sample Depth (ft)	Soil Description
	S1 PID = 0.3 ppm	0-0.5'	SANDY SILT (ML) (0-1.5'): ~80 nonplastic fines, ~20% fine sand, dark brown, wet. Contains organic-like odor, decaying vegetation.
1	S2 PID = 0.0 ppm	0.5-1.5'	SANDY SILT (ML) (0.5-1.5'): ~60% nonplastic fines, ~40% fine to medium sand, gray/brown, wet. Contains decaying vegetation, and one brick fragment.
2	S3 PID = 0.2 ppm	1.5-2.5'	SANDY SILT (ML) (1.5-2.5') ~60% fine to medium sand, ~40% nonplastic fines, gray/brown, wet.
3			Bottom of testpit at 2.5'.
4			
5			
6			
7			
8			

Notes:
Sample collected for WQC from 0-0.5', 0.5-1.5' and 1.5-2.5'.
PID = Photoionization detector
PPM = parts per million

Pit Dimensions (ft)

length	~1
width	~1
depth	2.5

TEST PIT LOG

891

Project	Amesbury Former MGP			**PG.**	1 **OF** 1
City/Town	Amesbury, MA			**Location**	37 Oakland Street
Client	National Grid				
Contractor	NA			**Ground El.**	NM
Equipment/Reach	Shovel			**Datum**	NA
Operator	National Grid	**GEI Rep**	D. Miller	**GEI Proj. No.**	1804576
Weather	Clear ~72		C. DeMayo	**Date**	9/3/2024

Depth (ft)	Sample No. and Type	Sample Depth (ft)	Soil Description
	S1 PID = 27.0 ppm	0-0.5'	SANDY SILT (ML) (0-0.5'): ~80% nonplastic fines, ~20% fine sand, dark brown/black, wet. Contains decaying vegetation/roots, strong naphthalene-like odor, semi-solid coal tar seams.
1	S2 PID = 6.9 ppm	0.5-1.5'	SANDY SILT (ML) (0.5-1.5'): ~60% nonplastic fines, 40% fine to medium sand, brown, wet. Contains slight naphthalene-like odor, vegetation. Viscous coal tar coating from 0.5-1.0'.
2	S3 PID =3.5 ppm	1.5-2.5'	SANDY SILT (ML) (1.5-2.5'): ~80% nonplastic fines, ~20% fine sand, brown, wet. Contains decaying vegetation, organic-like odor.
3			Bottom of testpit at 2.5'.
4			
5			
6			
7			
8			

Notes:
Sample collected for WQC from 0-0.5', 0.5-1.5' and 1.5-2.5'.
PID = Photoionization detector
PPM = parts per million

Pit Dimensions (ft)

length	~1
width	~1
depth	2.5

TEST PIT LOG

892

Project	Amesbury Former MGP			**PG.**	1 **OF** 1
City/Town	Amesbury, MA			**Location**	37 Oakland Street
Client	National Grid				
Contractor	NA			**Ground El.**	NM
Equipment/Reach	Shovel			**Datum**	NA
Operator	National Grid	**GEI Rep**	D. Miller	**GEI Proj. No.**	1804576
Weather	Clear ~72		C. DeMayo	**Date**	9/3/2024

Depth (ft)	Sample No. and Type	Sample Depth (ft)	Soil Description
	S1 PID = 0.5 ppm	0-0.5'	SANDY SILT (ML) (0-0.5'): ~50% nonplastic fines, ~50% fine to medium sand, gray/brown, wet. Contains decaying vegetation.
1	S2 PID = 0.4 ppm	0.5-1.5'	SANDY SILT (ML) (0.5-1.5'): ~80% nonplastic fines, 20% fine sand, light gray, wet. Contains minimal decaying vegetation, seams of brown sandy material similar to 0.0-0.05'. Contained one brick fragment.
2	S3 PID =0.2 ppm	1.5-2.5'	SANDY SILT (ML) (1.5-2.5'): ~50% nonplastic fines, ~50% fine to medium sand, gray/brown, wet. Contains decaying vegetation.
3			Bottom of testpit at 2.5'.
4			
5			
6			
7			
8			

Notes:
Sample collected for WQC from 0-0.5', 0.5-1.5' and 1.5-2.5'.
PID = Photoionization detector
PPM = parts per million

Pit Dimensions (ft)

length	~1
width	~1
depth	2.5

TEST PIT LOG

893

Project	Amesbury Former MGP			**PG.**	1 **OF** 1
City/Town	Amesbury, MA			**Location**	37 Oakland Street
Client	National Grid				
Contractor	NA			**Ground El.**	NM
Equipment/Reach	Shovel			**Datum**	NA
Operator	National Grid	**GEI Rep**	D. Miller	**GEI Proj. No.**	1804576
Weather	Clear ~72		C. DeMayo	**Date**	9/3/2024

Depth (ft)	Sample No. and Type	Sample Depth (ft)	Soil Description
	S1 PID = 1.2 ppm	0-0.5'	SANDY SILT (ML) (0-0.5): ~80% nonplastic fines, ~20% fine sand, brown, wet. Contains decaying vegetation/roots, slight napthalene-like odor, viscous coal tar coating
1	S2 PID = 28.7 ppm	0.5-1.5'	SANDY SILT (ML) (0.5-1.5'): ~60% nonplastic fines, ~40% fine to coarse sand, brown/black, wet. Contains decaying vegetation, semi-solid coal tar seams, strong napthalene-like odor.
2	S3 PID = 5.1 ppm	1.5-2.5'	SANDY SILT (ML) (1.5-2.5'): ~80% nonplastic fines, ~20% fine sand, gray/brown, wet. Contains decaying vegetation, slight napthalene-like odor.
3			Bottom of testpit at 2.5'.
4			
5			
6			
7			
8			

Notes:
Sample collected for WQC from 0-0.5', 0.5-1.5' and 1.5-2.5'.
PID = Photoionization detector
PPM = parts per million

Pit Dimensions (ft)

length	~1
width	~1
depth	2.5

Appendix F Sediment Core Logs

BORING INFORMATION

LOCATION: Mudflat

GROUND SURFACE EL. (ft): NM

VERTICAL DATUM: NM

TOTAL DEPTH (ft): 3.0

LOGGED BY: B. Fong-Murdock

DATE START/END: 9/11/2019 - 9/11/2019

DRILLING COMPANY: TG & B

DRILLER NAME: Jeff / Matt

RIG TYPE: 14-foot catamaran-style platform

BORING

664

DRILLING INFORMATION

HAMMER TYPE: Post driver

AUGER I.D./O.D.: NA / NA

DRILLING METHOD: Push/hammer

WATER LEVEL DEPTHS (ft): Not measured

CASING I.D./O.D.: NA / NA

DRILL ROD O.D.: NM

CORE BARREL TYPE: Core-tube

CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:

Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation
= Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer

S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger

Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter

NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 3	36/32	NA	(0-12") PID = 27.7 ppm (11-13") PID = 79.3 ppm (23-25") PID = 65.6 ppm (31-32") PID = 80.6 ppm	ORGANICS	(0-32") SANDY ORGANIC SOIL (OL): ~75% low plastic fines, ~25% fine to medium sand, brown, wet. Contains plant fibers.
	5							End of boring at 3'. Refusal.
	10							

NOTES: Environmental samples collected from S1(0-12"), S2(10-13"), S3(223-25") and S4(31-34").

PROJECT NAME: Amesbury Former MGP

CLIENT: National Grid

CITY/STATE: Amesbury, Massachusetts

GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Mudflat

GROUND SURFACE EL. (ft): NM | **DATE START/END:** 9/10/2019 - 9/12/2019

VERTICAL DATUM: NM | **DRILLING COMPANY:** TG & B

TOTAL DEPTH (ft): 3.5 | **DRILLER NAME:** Jeff / Matt

LOGGED BY: B. Fong-Murdock | **RIG TYPE:** 14-foot catamaran-style platform

BORING

665

DRILLING INFORMATION

HAMMER TYPE: NA | **CASING I.D./O.D.:** NA / NA | **CORE BARREL TYPE:** Core-tube

AUGER I.D./O.D.: NA / NA | **DRILL ROD O.D.:** NM | **CORE BARREL I.D./O.D.** 2.625 inch / 2.75 inch

DRILLING METHOD: Vibracore

WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:

Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer

S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger

Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter

NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 1.2	14/12	NA	(0-6") PID = 3.7 ppm (11-13") PID = 6.7 ppm	SAND	(0-6") SILTY SAND (SM): ~55% fine to medium sand, ~40% low plastic to nonplastic fines, gray, wet. Contains glass fragments from and plant fibers. (6-14") SILTY SAND (SM): ~65% fine to coarse sand, ~30% nonplastic fines, ~5% gravel, black.
		2	1.2 to 3.5	28/28	NA	(23-25") PID = 2.7 ppm (35-37") PID = 2.1 ppm (41-42") PID = 2.4 ppm	ORG.	(14-28") ORGANIC SOIL WITH SAND (OL): 85% low plastic fines, 15% fine sand, brown, wet. Contains plant fibers.
							SAND	(28-42") SILTY SAND (SM): ~80% fine to medium sand, 20% low plastic fines, brown, wet. Contains plant fibers.
	5							End of boring at 3.5'. Refusal.
	10							

NOTES: Environmental samples: S1(0-6"),S2(10-13"), S3(23-25"), S4(35-37") & S5(41-42"). Drive No. 1 completed on 9/10/19 encountered refusal at 14" below ground surface (bgs). Drive No. 2 performed on 9/12/19 starting at 14" bgs after clearing obstruction.

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Mudflat

GROUND SURFACE EL. (ft): NM | **DATE START/END:** 9/11/2019 - 9/11/2019

VERTICAL DATUM: NM | **DRILLING COMPANY:** TG & B

TOTAL DEPTH (ft): 5.0 | **DRILLER NAME:** Jeff / Matt

LOGGED BY: B. Fong-Murdock | **RIG TYPE:** 14-foot catamaran-style platform

BORING

666

DRILLING INFORMATION

HAMMER TYPE: Post driver | **CASING I.D./O.D.:** NA / NA | **CORE BARREL TYPE:** Core-tube

AUGER I.D./O.D.: NA / NA | **DRILL ROD O.D.:** NM | **CORE BARREL I.D./O.D.** 2.625 inch / 2.75 inch

DRILLING METHOD: Push/hammer

WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:

Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer

S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger

Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter

NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5	60/50	NA	(0-12") PID = 0.6 ppm (11-13") PID = 1.3 ppm (23-25") PID = 1.3 ppm (35-37") PID = 1.5 ppm (47-49") PID = 1.3 ppm	ORGANICS	(0-24") ORGANIC SOIL WITH SAND (OL): ~85% low plastic fines, ~15% fine to coarse sand, brown, wet. Contains plant fibers. (24-50") ORGANIC SOILD WITH SAND (OL): ~90% low plastic fines, ~10% fine sand, brown, wet.
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1(0-12"), S2(11-13"), S3(23-25"), S4(35-37") and S5(47-49").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Mudflat

GROUND SURFACE EL. (ft): NM | **DATE START/END:** 9/11/2019 - 9/11/2019

VERTICAL DATUM: NM | **DRILLING COMPANY:** TG & B

TOTAL DEPTH (ft): 5.0 | **DRILLER NAME:** Jeff / Matt

LOGGED BY: B. Fong-Murdock | **RIG TYPE:** 14-foot catamaran-style platform

BORING

667

DRILLING INFORMATION

HAMMER TYPE: Post driver | **CASING I.D./O.D.:** NA / NA | **CORE BARREL TYPE:** Core-tube

AUGER I.D./O.D.: NA / NA | **DRILL ROD O.D.:** NM | **CORE BARREL I.D./O.D.** 2.625 inch / 2.75 inch

DRILLING METHOD: Push/hammer

WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:

Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer

S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger

Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter

NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5	60/52	NA	(0-6") PID = 0.6 ppm (11-13") PID = 0.9 ppm (23-25") PID = 2.9 ppm	SAND	(0-52") SILTY SAND (SM): ~85% fine to medium sand, 15% low plastic fines, dark brown, wet. Contains plant fibers.
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1(0-6"), S2(11-13") and S3(23-25").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Mudflat
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.0
LOGGED BY: B. Fong-Murdock
DATE START/END: 9/11/2019 - 9/11/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Jeff / Matt
RIG TYPE: 14-foot catamaran-style platform

BORING 668

DRILLING INFORMATION

HAMMER TYPE: Post driver
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Push/hammer
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5	60/52	NA	(0-6") PID = 1.2 ppm (11-13") PID = 11.3 ppm (24-26") PID = 1.9 ppm	ORG.	(0-9") ORGANIC SOIL WITH SAND (OL): ~80% low plastic fines, ~20% fine sand, dark brown, wet. Contains plant fibers.
							SAND	(9-24") SILTY SAND (SM): ~70% fine to coarse sand, 30% low plastic fines, dark brown, wet. Contains plant fibers.
							ORGANICS	(24-52") ORGANIC SOIL WITH SAND (OL): ~80% low plastic fines, 20% fine sand, brown, wet. Contains plant fibers.
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1(0-6"), S2(11-13") and S3(24-26").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Mudflat
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.8
LOGGED BY: C. Saledas
DATE START/END: 9/23/2019 - 9/23/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark / Jeff
RIG TYPE: 14-foot catamaran-style platform

BORING 669

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5.8	70/56	NA		ORG.	(0-12") ORGANIC SOIL WITH SAND (OL): ~75% low plastic fines, 25% fine to coarse sand, dark brown. Contains plant fibers.
						(18-26") PID = 44.7 ppm	SAND	(12-35") SILTY SAND (SM): ~75% medium to coarse sand, ~15% low plastic fines, ~10% subangular gravel up to 0.75", dark brown, wet. Contains slight to strong petroleum-like odor, plant fibers, and wood fragments.
						(35-37") PID = 10.6 ppm		(35-56") SILTY SAND (SM): ~75% medium to coarse sand, ~15% low plastic fines, ~10% subangular gravel up to 0.75", dark brown, wet. Contains strong petroleum-like odor, black staining from 35-37", plant fibers, and wood fragments.
	5					(55-56") PID = 2.1 ppm		
								End of boring at 5.8'. Refusal.
	10							

NOTES: Environmental samples collected from S1(18-26"), S2(35-37") and S3(55-56").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Mudflat
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 4.0
LOGGED BY: B. Fong-Murdock
DATE START/END: 9/10/2019 - 9/10/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Jeff / Matt
RIG TYPE: 14-foot catamaran-style platform

BORING 670

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 4	48/37	NA	(0-6") PID = 0.1 ppm (8-9") PID = 28 ppm (11-13") PID = 2.4 ppm (23-25") PID = 0.5 ppm	ORG.	(0-9") ORGANIC SOIL (OL): ~95% low plastic fines, 5% fine to medium sand, dark brown to gray, wet. Contains petroleum-like odor from 8-9" and plant fibers.
							SAND	(9-37") SILTY SAND (SM): ~80% fine to medium sand, 20% nonplastic fines, dark brown, wet.
	5							End of boring at 4'. Refusal.
	10							

NOTES: Environmental samples collected from S1(0-6"), S2(11-13") and S3(23-25").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Mudflat
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.2
LOGGED BY: C. Saledas
DATE START/END: 9/23/2019 - 9/23/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark / Jeff
RIG TYPE: 14-foot catamaran-style platform

BORING 671

PAGE 1 of 1

DRILLING INFORMATION

HAMMER TYPE: Post driver
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Push/hammer
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5.2	62/52	NA		ORGANICS	(0-17") ORGANIC SOIL WITH SAND (OL): ~80% low plastic fines, 20% fine to coarse sand, dark brown, wet. Contains slight petroleum-like odor from 8-17", glass fragments, and plant fibers.
						(16-18") PID = 52.3 ppm	SAND	(17-24") SILTY SAND (SM): ~70% fine sand, ~30% slightly plastic fines, gray/brown, wet. Contains plant fibers (24-36") SILTY SAND (SM): ~80% fine sand, ~20% slightly plastic fines, gray/brown, wet. Contains wood chips.
						(23-25") PID - 1.0 ppm		
						(35-37") PID = 0.6 ppm		(36-40") WIDELY GRADED SAND WITH SILT (SW-SM): ~85% medium to coarse sand, ~10% slightly plastic fines, ~5% subangular gravel u;p to 0.5", gray/brown, wet. (40-52") SILT WITH SAND (ML): ~85% low plastic fines, ~15% fine sand, gray/brown, wet.
	5							End of boring at 5.2'. Refusal.
	10							

NOTES: Environmental samples collected from S1(16-18"), S2(23-25") and S3(35-37").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Mudflat
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 6.8
LOGGED BY: C. Saledas
DATE START/END: 9/24/2019 - 9/24/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark / Jeff
RIG TYPE: 14-foot catamaran-style platform

BORING

672

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 6.8	82/72	NA	(0-6") PID = 0.5 ppm	ORG.	(0-9") ORGANIC SOIL WITH SAND (OL): ~85% low plastic fines, ~15% fine sand, dark brown, wet. Contains plant fibers.
						(11-13") PID = 19.4 ppm	SAND	(9-24") WIDELY GRADED SAND WITH SILT (SW-SM): ~80% fine to coarse sand, ~10% nonplastic fines, ~10% subrounded gravel up to 2", brown to dark brown, wet. Contains petroleum-like odor, brick fragments, and plant fibers.
						(22-24") PID = 27.2 ppm		(24-32") SILTY SAND (SM): ~85% fine sand, ~15% slightly plastic fines, brown/red, wet. Contains plant fibers.
						(35-37") PID = 14.7 ppm		(32-72") WIDELY GRADED SAND WITH SILT (SW-SM): ~85% fine to medium sand, ~10% slightly plastic fines, 5% subangular gravel up to 0.5", gray/brown, wet.
	5					(47-49") PID = 27.3 ppm		
						(59-61") PID = 24.0 ppm		
						(71-72") PID = 8.2 ppm		
								End of boring at 6.8'. Refusal.
	10							

NOTES: Environmental samples collected from S1(0-6"), S2(11-13"), S3(22-24")-S4(35-37"), S5(47-49"), S6(59-61") and S7(71-72").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.0
LOGGED BY: B. Fong-Murdock
DATE START/END: 9/12/2019 - 9/12/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Jeff / Matt
RIG TYPE: 14-foot catamaran-style platform

BORING 673

DRILLING INFORMATION

HAMMER TYPE: Post driver
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Push/hammer
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5	60/45	NA	(0-6") PID = 0.7 ppm	ORG.	(0-8") ORGANIC SOIL (OL): ~90% low plastic fines, ~10% fine sand, black, wet. Contains plant fibers.
							SAND	(8-45") SILTY SAND (SM): ~70% fine to coarse sand, ~30% low plastic fines, dark brown. Contains slight petroleum-like odor from 24-45", black staining from 24-34", and plant fibers.
						(29-31) PID = 28.8 ppm		
						(44-45") PID = 2.1 ppm		
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1(0-6"), S2(29-31") and S3(44-45").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 4.0
LOGGED BY: B. Fong-Murdock
DATE START/END: 9/12/2019 - 9/12/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Jeff / Matt
RIG TYPE: 14-foot catamaran-style platform

BORING

674

DRILLING INFORMATION

HAMMER TYPE: Post driver
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Push/hammer
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 4	48/36	NA	(0-6") PID = 1.9 ppm (11-13") PID = 22.3 ppm (22-24") PID = 32.4 ppm (35-36") PID = 4.6 ppm	ORG.	(0-9") ORGANIC SOIL (OL): ~90% low plastic fines, ~10% fine sand, black, wet. Contains plant fibers.
							SAND	(9-36") SILTY SAND (SM): ~75% fine to medium sand, ~25% low plastic fines, dark brown, wet. Contains petroleum-like odor from 9-24" and plant fibers.
	5							End of boring at 4'. Refusal.
	10							

NOTES: Environmental samples collected from S1(0-6"), S2(11-13"), S3(22-24") and S4(35-36").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 8.0
LOGGED BY: C. Saledas
DATE START/END: 9/24/2019 - 9/24/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark / Jeff
RIG TYPE: 14-foot catamaran-style platform

BORING 675

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 8	96/87	NA	(1-12") PID = 28.1 ppm	ORGANICS	(0-18") ORGANIC SOIL WITH SAND (OL): ~75% low plastic fines, ~25% fine sand, dark brown to black, wet. Contains petroleum-like odor from 12-18" and plant fibers.
						(23-25") PID = 17.4 ppm	ORGSAND	(18-22") SILTY SAND (SM): ~65% fine sand, ~35% slightly plastic fines, gray/brown, wet. Contains plant fibers.
								(22-26") WIDELY GRADED SAND (SW): ~90% fine to medium sand, ~5% slightly plastic fines, ~5% subangular gravel up to 0.5", light brown, wet.
						(35-37") PID = 14.1 ppm	SILT	(26-30") ORGANIC SOIL WITH SAND (OL): ~75% low plastic fines, ~25% fine sand, dark brown, wet.
						(47-49") PID = 10.5 ppm		(30-58") SILT WITH SAND (ML): ~85% medium sand, ~10% nonplastic fines, ~5% subangular gravel up to 0.5" gray/brown, wet. Contains wood chips.
	5						ORANICS	(58-78") ORGANIC SOIL WITH SAND (OL): ~65% low plastic fines, ~35% fine sand, brown, wet. Contains plant fibers.
						(86-87") PID = 1.2 ppm	SAND	(78-87") NARROWLY GRADED SAND (SP): ~95% coarse sand, ~5% nonplastic fines, gray, wet. Contains plant fibers.
	10							End of boring at 8'. Refusal.

NOTES: Environmental samples collected from S1(11-12"), S2(23-25"), S3(35-37"), S4(47-49") and S5(86-87").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 3.8
LOGGED BY: B. Fong-Murdock
DATE START/END: 9/11/2019 - 9/11/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Jeff / Matt
RIG TYPE: 14-foot catamaran-style platform

BORING 676

DRILLING INFORMATION

HAMMER TYPE: Post driver
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Push/hammer
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 1	12/12	NA		SAND	(0-24") SILTY SAND (SM): ~65% fine to coarse sand, ~30% nonplastic fines, ~5% subrounded gravel up to 1", dark brown, wet. Contains organic-like odor, trash, and plant fibers.
		2	1 to 3.8	34/34	NA	(10-12") PID = 14.0 ppm (23-25") PID = 4.0 ppm	ORG.	(24-25") ORGANIC SOIL (OL): ~90% low plastic fines, ~10% fine to medium sand, gray/brown, wet. Contains plant fibers.
							SAND	(25-45") SILTY SAND (SM): ~75% fine to coarse sand, ~15% nonplastic fines, ~10% subrounded gravel up to 2", dark brown, wet. Contains plant fibers.
	5							End of boring at 3.8'. Refusal.
	10							

NOTES: Environmental samples collected from S1(10-12") and S2(23-25"). Drive No. 1 encountered refusal at 12" below ground surface (bgs). Drive No. 2 performed on 9/12/19 starting at 12" bgs after clearing obstruction.

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 4.5
LOGGED BY: B. Fong-Murdock
DATE START/END: 9/11/2019 - 9/11/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Jeff / Matt
RIG TYPE: 14-foot catamaran-style platform

BORING

677

PAGE 1 of 1

DRILLING INFORMATION

HAMMER TYPE: Post driver
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Push/hammer
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 4.5	54/48	NA	S1(0-12") PID = 0.7 ppm (11-13") PID = 1.5 ppm (17-19") PID = 2.4 ppm (29-31") PID = 21.9 ppm (31-33") PID = 70.4 ppm (41-43") PID = 27.7 ppm (47-48") PID = 25.4 ppm	SAND	(0-24") SILTY SAND (SM): ~70% fine to medium sand, ~30% low plastic fines, dark brown, wet. Contains plant fibers.
							SAND	(24-25") ORGANIC SOIL WITH SAND (OL): ~80% low plastic fines, ~20% fine to medium sand, brown, wet. Contains plant fibers. (25-33") SILTY SAND (SM): ~70% fine to medium sand, ~30% low plastic fines, dark brown, wet. Contains slight petroleum-like odor increasing with depth and plant fibers. (33-48") NARROWLY GRADED SAND WITH GRAVEL (SP): ~65% coarse sand, ~30% subrounded gravel up to 0.5", ~5% nonplastic fines, black, wet. Contains petroleum-like odor and plant fibers.
	5							End of boring at 4.5'. Refusal.
	10							

NOTES: Environmental samples collected from S1(0-12"), S2(11-13"), S3(17-19"), S4(29-31"), S4a(31-33"), S5(41-43") and S5a(47-48").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.0
LOGGED BY: B. Fong-Murdock
DATE START/END: 9/11/2019 - 9/11/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Jeff / Matt
RIG TYPE: 14-foot catamaran-style platform

BORING 678

DRILLING INFORMATION

HAMMER TYPE: Post driver
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Push/hammer
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5	60/54	NA	(0-6") PID = 0.6 ppm	ORG.	(0-6") ORGANIC SOIL WITH SAND (OL): ~85% low plastic fines, ~15% fine to medium sand, dark brown, wet. Contains plant fibers.
						(11-13") PID = 3.8 ppm	SAND	(6-15") SILTY SAND (SM): ~70% fine to medium sand, ~30% low plastic fines. Contains plant fibers.
								(15-18") ORGANIC SOIL WITH SAND (OL): Similar to S1 (0-6").
						(23-25") PID = 89.0 ppm	SAND	(18-38") SILTY SAND (SM): ~70% fine to medium sand, ~30% low plastic fines. Contains petroleum-like odor and plant fibers.
							SAND	(38-41") ORGANIC SOIL WITH SAND (OL): ~85% low plastic fines, ~15% fine to medium sand, dark brown, wet. Contains petroleum-like odor and plant fibers.
								(41-50") Similar to S3 (18-38").
						(53-54") PID = 41.5 ppm	ORG.	(50-54") ORGANIC SOIL WITH SAND (OL): ~85% low plastic fines, ~15% fine to medium sand, dark brown, wet. Contains naphthalene-like odor, plant fibers and glass.
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1(0-6"), S2(11-13"), S3(23-25") and S4(53-54").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.0
LOGGED BY: B. Fong-Murdock
DATE START/END: 9/11/2019 - 9/11/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Jeff / Matt
RIG TYPE: 14-foot catamaran-style platform

BORING 679

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5	60/54	NA	(0-6") PID = 1.6 ppm (11-13") PID = 6.3 ppm (23-25") PID = 17.0 ppm (35-37") PID = 30.5 ppm (47-48") PID = 1.6 ppm	SAND	(0-6") SILTY SAND (SM): ~80% fine to coarse sand, ~20% nonplastic fines, dark brown, wet. Contains plant fibers.
							ORGANICS	(9-23") ORGANIC SOIL WITH SAND (OL): ~90% low plastic fines, ~10% fine to medium sand, dark brown, wet. Contains plant fibers. (23-36") ORGANIC SOIL WITH SAND (OL): ~80% low plastic fines, ~20% fine to medium sand, dark brown, wet. Contains slight petroleum-like odor from 23-47", and plant fibers. (36-54") ORGANIC SOIL WITH SAND (OL): ~90% low plastic fines, ~10% fine sand, brown, wet. Contains slight petroleum-like odor from 36-48" and plant fibers.
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1(0-6"), S2(11-13"), S3(23-25"), S4(35-37") and S5(47-48").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.0
LOGGED BY: B. Fong-Murdock
DATE START/END: 9/11/2019 - 9/11/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Jeff / Matt
RIG TYPE: 14-foot catamaran-style platform

BORING

680

DRILLING INFORMATION

HAMMER TYPE: Post driver
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Push/hammer
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5	60/54	NA	(0-6") PID = 2.9 ppm	SAND	(0-12") SILTY SAND (SM): ~80% fine to coarse sand, ~20% low plastic fines, dark brown, wet. Contains plant fibers.
						(11-13") PID = 6.3 ppm		(12-24") SILTY SAND (SM): ~70% fine to medium sand, ~30% low plastic fines, dark brown, wet. Contains plant fibers.
						(23-25") PID = 9.2 ppm		(24-50") SILTY SAND (SM): ~80% fine to coarse sand, ~20% low plastic fines, dark brown, wet. Contains slight petroleum-like odor from 36-50", glass from 36-50", and plant fibers.
						(35-37") PID = 20.9 ppm		
						(53-54") PID = 126.9 ppm		(50-54") SILTY SAND (SM): ~80% fine to coarse sand, ~20% low plastic fines, dark brown, coal tar-like saturated. Contains strong naphthalene-like odor, plant fibers and glass.
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1(0-6"), S2(11-13"), S3(23-25"), S4(35-37") and S5(53-54").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.3
LOGGED BY: C. Saledas
DATE START/END: 9/25/2019 - 9/25/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark / Jeff
RIG TYPE: 14-foot catamaran-style platform

BORING
680R

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.3	112/96	NA		SAND	(0-24") SILTY SAND (SM): ~80% fine to coarse sand, ~20% low plastic fines, dark brown, wet. Contains plant fibers.
								(24-50") SILTY SAND (SM): ~80% fine to coarse sand, ~20% low plastic fines, dark brown, wet. Contains slight petroleum-like odor, glass, and plant fibers.
	5							(50-60") SILTY SAND (SM): ~80% fine to coarse sand, ~20% low plastic fines, dark brown, saturated with coal tar. Contains strong napthalene-like odor, glass, and plant fibers.
						(61-63") PID = 1.0 ppm	CLAY	(60-71") LEAN CLAY (CL): ~95% medium plastic fines, ~5% fine sand, gray, wet. Contains coal tar staining and naphthalene-like odor.
						(71-73") PID = 3.8 ppm		(71-96") LEAN CLAY (CL): ~95% plastic fines, ~5% fine sand, gray, wet.
						(95-96") PID = 0.7 ppm		
	10							End of boring at 9.3'. Refusal.

NOTES: Environmental samples collected from S1(62"), S2(72") and S3(96"). Boring completed adjacent to 680 completed on 9/11/2019.

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.0
LOGGED BY: B. Fong-Murdock
DATE START/END: 9/12/2019 - 9/12/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Jeff / Matt
RIG TYPE: 14-foot catamaran-style platform

BORING

681

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5	60/38	NA	(0-6") PID = 2.0 ppm (11-13") PID = 0.5 ppm (23-25") PID = 21.5 ppm (37-38") PID = 1.7 ppm	SAND	(0-23") SILTY SAND (SM): ~75% fine to coarse sand, ~25% low plastic fines, dark brown, wet. Contains petroleum-like odor and plant fibers.
							ORGANICS	(23-38") ORGANIC SOIL WITH SAND (OL): ~80% low plastic fines, ~20% fine sand, dark brown to black, wet. Contains naphthalene-like odor from 23-29" and plant fibers.
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1(0-6"), S2(11-13"), S3(23-25") and S4(37-38).

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.0
LOGGED BY: B. Fong-Murdock
DATE START/END: 9/12/2019 - 9/12/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Jeff / Matt
RIG TYPE: 14-foot catamaran-style platform

BORING

682

DRILLING INFORMATION

HAMMER TYPE: Post driver
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Push/hammer
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5	60/48	NA	(0-6") PID = 0.7 ppm	SAND	(0-12") SILTY SAND (SM) ~70% fine to medium sand, ~30% low plastic fines, dark brown, wet. Contains plant fibers.
							ORGANICS	(12-42") ORGANIC SOIL (OL): ~85% low plastic fines, ~15% fine sand, brown, wet. Contains petroleum-like odor from 29-36" and plant fibers.
						(29-31") PID = 16.2 ppm		
						(47-48") PID = 1.6 ppm	SAND	(42-48") SILTY SAND (SM) ~60% fine to medium sand, ~40% low plastic fines, dark brown, wet. Contains plant fibers.
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1(0-6"), S2(29-31) and S3(47-48").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River

GROUND SURFACE EL. (ft): NM | **DATE START/END:** 9/12/2019 - 9/12/2019

VERTICAL DATUM: NM | **DRILLING COMPANY:** TG & B

TOTAL DEPTH (ft): 5.0 | **DRILLER NAME:** Jeff / Matt

LOGGED BY: B. Fong-Murdock | **RIG TYPE:** 14-foot catamaran-style platform

BORING

683

DRILLING INFORMATION

HAMMER TYPE: Post driver | **CASING I.D./O.D.:** NA / NA | **CORE BARREL TYPE:** Core-tube

AUGER I.D./O.D.: NA / NA | **DRILL ROD O.D.:** NM | **CORE BARREL I.D./O.D.** 2.625 inch / 2.75 inch

DRILLING METHOD: Push/hammer

WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:

Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer

S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger

Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter

NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5	60/47	NA	(0-6") PID = 0.9 ppm (11-13") PID = 17.2 ppm (23-25") PID = 4.8 ppm (35-37") PID = 1.8 ppm (46-47") PID = 1.0 ppm	SAND	(0-13") SILTY SAND (SM): ~85% fine to medium sand, ~15% low plastic fines, dark brown, wet. Contains petroleum-like odor from 6-13" and plant fibers.
							ORGANICS	(13-47") SANDY ORGANIC SOIL (OL): ~70% low plastic fines, ~30% fine sand, brown, wet. Contains plant fibers.
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1(0-6"), S2(11"-13), S3(23-25), S4(35-37") and S5(46-47").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.0
LOGGED BY: B. Fong-Murdock
DATE START/END: 9/12/2019 - 9/12/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Jeff / Matt
RIG TYPE: 14-foot catamaran-style platform

BORING 684

DRILLING INFORMATION

HAMMER TYPE: Post driver
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Push/hammer
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5	60/41	NA	(0-6") PID = 1.2 ppm (14-16") PID = 32.0 ppm (23-25") PID = 21.0 ppm (40-41") PID = 7.1 ppm	ORGANICS	(0-14") ORGANIC SOIL (OL): ~90% low plastic fines, ~10% fine sand, dark brown, wet. Contains plant fibers. (14-41") ORGANIC SOIL WITH SAND (OL): ~75% low plastic fines, ~25% fine to medium sand, dark brown, wet. Contains petroleum-like odor from 14-39", naphthalene-like odor from 39-41", and plant fibers throughout.
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1(0-6"), S2(14-16"), S3(23-25") and S4(40-41").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River

GROUND SURFACE EL. (ft): NM | **DATE START/END:** 9/10/2019 - 9/10/2019

VERTICAL DATUM: NM | **DRILLING COMPANY:** TG & B

TOTAL DEPTH (ft): 3.0 | **DRILLER NAME:** Jeff / Matt

LOGGED BY: B. Fong-Murdock | **RIG TYPE:** 14-foot catamaran-style platform

BORING 685

DRILLING INFORMATION

HAMMER TYPE: NA | **CASING I.D./O.D.:** NA / NA | **CORE BARREL TYPE:** Core-tube

AUGER I.D./O.D.: NA / NA | **DRILL ROD O.D.:** NM | **CORE BARREL I.D./O.D.** 2.625 inch / 2.75 inch

DRILLING METHOD: Vibracore

WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:

Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer

S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger

Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter

NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 3	36/36	NA	(0-6) PID = 1.3 ppm (11-13") PID = 0.6 ppm (23-25") PID = 0.5 ppm	ORG.	(0-9") ORGANIC SOIL WITH SAND (OL): ~70% low plastic fines, ~25% fine sand, ~5% subrounded gravel up to 1", dark brown, wet. Contains plant fibers.
							SAND	(9-36") SILTY SAND (SM): ~70% fine to medium sand, ~25% low plastic fines, ~5% subrounded gravel up to 0.25", dark brown, wet. Contains plant fibers.
	5							End of boring at 3'. Refusal.
	10							

NOTES: Environmental samples collected from S1(0-6"), S2(11-13") and S3(23-25").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Mudflat

GROUND SURFACE EL. (ft): NM | **DATE START/END:** 9/10/2019 - 9/10/2019

VERTICAL DATUM: NM | **DRILLING COMPANY:** TG & B

TOTAL DEPTH (ft): 3.3 | **DRILLER NAME:** Jeff / Matt

LOGGED BY: B. Fong-Murdock | **RIG TYPE:** 14-foot catamaran-style platform

BORING

686

PAGE 1 of 1

DRILLING INFORMATION

HAMMER TYPE: NA | **CASING I.D./O.D.:** NA / NA | **CORE BARREL TYPE:** Core-tube

AUGER I.D./O.D.: NA / NA | **DRILL ROD O.D.:** NM | **CORE BARREL I.D./O.D.** 2.625 inch / 2.75 inch

DRILLING METHOD: Vibracore

WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:

Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer

S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger

Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter

NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 3.3	39/39	NA	(0-6") PID = 0.5 ppm (11-13") PID = 0.9 ppm (23-25") PID = 0.8 ppm	ORG.	(0-9") ORGANIC SOIL WITH SAND (OL): ~75% low plastic fines, ~25% fine sand, dark brown, wet. Contains plant fibers.
							SAND	(9-30") SILTY SAND (SM): ~60% fine to medium sand, ~40% low plastic fines, dark brown, wet. Contains plant fibers.
							PEAT	(30-39") PEAT (PT).
	5							End of boring at 3.3'. Refusal.
	10							

NOTES: Environmental samples collected from S1(0-6"), S2(11-13") and S3(23-25").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 7.7
LOGGED BY: C. Saledas
DATE START/END: 9/24/2019 - 9/24/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark / Jeff
RIG TYPE: 14-foot catamaran-style platform

BORING

687

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 7.7	92/82	NA	(0-6") PID = 9.1 ppm	ORGANICS	(0-23") ORGANIC SOIL WITH SAND (OL): ~80% low plastic fines, ~20% fine to medium sand, dark brown, wet. Contains petroleum-like odor and plant fibers.
						(24-26") PID = 81.3 ppm		(23-60") ORGANIC SOIL WITH SAND (OL): ~80% low plastic fines, ~20% fine to medium sand, dark brown, wet. Petroleum saturated from 23-30". Contains petroleum-like odor and plant fibers.
	5					(56-58") PID = 41.2 ppm	SAND	(60-72") NARROWLY GRADED SAND WITH SILT (SP-SM): ~85% medium sand, ~10% nonplastic fines, ~5% subrounded gravel up to 0.5", grayish brown, wet. Contains slight petroleum-like odor.
						(72-74") PID = 14.7 ppm		(72-82") WIDELY GRADED SAND (SW): ~95% coarse sand, ~5% nonplastic fines, grayish brown, wet. Contains brick fragments.
						(81-82") PID = 9.8 ppm		
	10							End of boring at 7.7'. Refusal.

NOTES: Environmental samples collected from S1(0-6"), S2(24-26"), S3(56-58"), S4(72-74") and S5(81-82").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.7
LOGGED BY: C. Saledas
DATE START/END: 9/23/2019 - 9/23/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark / Jeff
RIG TYPE: 14-foot catamaran-style platform

BORING

688

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5.7	68/54	NA	(0-6") PID = 0.8 ppm (11-13") PID = 0.2 ppm (23-25") PID = 0.1 ppm (35-37") PID = 0.5 ppm (47-49") PID = 0.2 ppm	ORGANICS	(0-54") ORGANIC SOIL WITH SAND (OL): ~80% low plastic fines, ~20% fine to medium sand, brownish gray, wet. Contains plant fibers and interbedded sand lenses.
	5							End of boring at 5.7'. Refusal.
	10							

NOTES: Environmental samples collected from S1(0-6"), S2(11-13"), S3(23-25"), S4(35-37") and S5(47-49").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 4.2
LOGGED BY: C. Saledas
DATE START/END: 9/24/2019 - 9/24/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark / Jeff
RIG TYPE: 14-foot catamaran-style platform

BORING

689

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 4.2	50/43	NA	(11-13") PID = 14.1 ppm (23-25") PID = 0.6 ppm (35-37") PID = 14.1 ppm	SILT	(0-43") SANDY SILT (ML): ~70% nonplastic fines, ~30% fine sand, reddish brown to grayish brown, wet. Contains organic-like odor and plant fibers.
	5							End of boring at 4.2'. Refusal.
	10							

NOTES: Environmental samples collected from S1(11-13"), S2(23-25") and S3(35-37").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 8.5
LOGGED BY: C. Saledas
DATE START/END: 9/25/2019 - 9/25/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark / Jeff
RIG TYPE: 14-foot catamaran-style platform

BORING 690

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
	5	1	0 to 8.5	102/78	NA	(0-6") PID = 14.6 ppm (11-13") PID = 15.4 ppm (23-25") PID = 5.7 ppm (35-37") PID = 1.1 ppm (47-49") PID = 1.3 ppm (77-78") PID = 0.0 ppm	SAND	(0-39") SILTY SAND (SM): ~65% medium sand, ~35% nonplastic fines, brown, wet. Contains slight petroleum-like odor and brick fragments.
							ORGANICS	(39-54") SANDY ORGANIC SOIL (OL): ~ 65% low plastic fines, ~35% fine to medium sand, brown, wet. Contains slight petroleum-like odor and plant fibers.
							CLAY	(54-78") LEAN CLAY (CL): ~95% medium plastic fines, ~5% fine sand, gray, wet.
	10							End of boring at 8.5'. Refusal.

NOTES: Environmental samples collected from S1(0-6"), S2(11-13"), S3(23-25"), S4(35-37"), S5(47-49") and S6(77-78").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 6.0
LOGGED BY: C. Saledas
DATE START/END: 9/24/2019 - 9/24/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark / Jeff
RIG TYPE: 14-foot catamaran-style platform

BORING

691

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
	5	1	0 to 6	72/54	NA	(0-6") PID = 2.2 ppm (11-13") PID = 16.7 ppm (23-25") PID = 58.3 ppm (41-43") PID = 24.1 ppm (53-54") PID = 28.9 ppm	SAND	(0-23") NARROWLY GRADED SAND (SP): ~90% medium to coarse sand, ~5% subrounded gravel up to 0.5", ~5% nonplastic fines, gray to black, wet. Contains petroleum-like odor and trash. (23-54") SILTY SAND (SM): ~75% fine sand, ~20% nonplastic fines, ~5% subrounded gravel up to 0.5", gray to black, wet. Contains sheen, petroleum-like odor from 23-41" and 50-54", and naphthalene -like odor from 41-50".
	10							End of boring at 6'. Refusal.

NOTES: Environmental samples collected from S1(0-6"), S2(11-13"), S3(23-25"), S4(41-43") and S5(53-54").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 8.1
LOGGED BY: C. Saledas
DATE START/END: 9/24/2019 - 9/24/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark / Jeff
RIG TYPE: 14-foot catamaran-style platform

BORING

692

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 8.1	97/84	NA	(11-13") PID = 9.0 ppm (23-25") PID = 42.8 ppm (35-37") PID = 80.3 ppm (51-58") PID = 117.0 ppm (83-84") PID = 19.6 ppm	SAND	(0-21") NARROWLY GRADED SAND WITH SILT (SP-SM): ~85% medium sand, ~10% nonplastic fines, ~5% subrounded gravel up to 0.5", gray to black, wet. Contains slight petroleum-like odor, trash and wood fragments. (21-42") WIDELY GRADED SAND WITH SILT AND GRAVEL (SP-SM): ~75% medium to coarse sand, ~15% subrounded gravel up to 1", ~10% nonplastic fines, black, wet. Contains naphthalene-like odor, sheen, and wood fragments. (42-58") SILTY SAND (SM): ~70% fine sand, ~30% nonplastic fines, black, wet. Contains naphthalene-like odor increasing with depth and plant fibers.
	5						CLAY	(58-84") LEAN CLAY (CL) ~95% medium plastic fines, ~5% fine sand, gray, wet.
	10							End of boring at 8.1'. Refusal.

NOTES: Environmental samples collected from S1(11-13"), S2(23-25"), S3(35-37"), S4(51-58") and S5(83-84").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: C. Saledas
DATE START/END: 9/25/2019 - 9/25/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark / Jeff
RIG TYPE: 14-foot catamaran-style platform

BORING
692R

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/99	NA		SAND	(0-21") NARROWLY GRADED SAND WITH SILT (SP-SM): ~85% medium sand, ~10% nonplastic fines, ~5% subrounded gravel up to 0.5", gray to black, wet. Contains slight petroleum-like odor, trash, and wood fragments.
								(21-42") NARROWLY GRADED SAND WITH SILT AND GRAVEL (SP-SM): ~75% medium to coarse sand, ~15% subrounded gravel up to 1", ~10% nonplastic fines, black, wet. Contains napthalene-like odor, sheen, and wood fragments.
								(42-58") SILTY SAND (SM): ~70% fine sand, ~30% nonplastic fines, black, wet. Contains naphthalene-like odor and plant fibers.
	5						CLAY	(58-99") LEAN CLAY (CL) ~95% medium plastic fines, ~5% fine sand, gray, wet.
	10							End of boring at 9.5'. Refusal.

NOTES: No environmental samples taken.

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River

GROUND SURFACE EL. (ft): NM | **DATE START/END:** 9/25/2019 - 9/25/2019

VERTICAL DATUM: NM | **DRILLING COMPANY:** TG & B

TOTAL DEPTH (ft): 8.5 | **DRILLER NAME:** Mark / Jeff

LOGGED BY: C. Saledas | **RIG TYPE:** 14-foot catamaran-style platform

BORING 693

DRILLING INFORMATION

HAMMER TYPE: NA | **CASING I.D./O.D.:** NA / NA | **CORE BARREL TYPE:** Core-tube

AUGER I.D./O.D.: NA / NA | **DRILL ROD O.D.:** NM | **CORE BARREL I.D./O.D.** 2.625 inch / 2.75 inch

DRILLING METHOD: Vibracore

WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:

Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer

S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger

Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter

NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 8.5	102/72	NA	(0-6") PID = 2.8 ppm (11-13") PID = 13.9 ppm (23-25") PID = 1.9 ppm (35-37") PID = 0.6 ppm (47-49") PID = 0.2 ppm (71-72") PID = 0.2 ppm	SAND	(0-6") NARROWLY GRADED SAND (SP): ~90% medium sand, ~5% nonplastic fines, ~5% subrounded gravel up to 0.5", black, wet. Contains slight petroleum-like odor. (6-46") SILTY SAND (SM): ~70% fine to medium sand, ~20% nonplastic fines, ~10% subrounded gravel up to 0.5", gray to black, wet. Contains slight petroleum-like odor, plant fibers, and glass.
	5						CLAY	(46-72") LEAN CLAY (CL): ~95% medium plastic fines, ~5% fine sand, gray, wet.
	10							End of boring at 8.5'. Refusal.

NOTES: Environmental samples collected from S1(0-6"), S2(11-13"), S3(23-25"), S4(35-37"), S5(47-49") and S6(71-72").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.0
LOGGED BY: C. Saledas
DATE START/END: 9/25/2019 - 9/25/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark / Jeff
RIG TYPE: 14-foot catamaran-style platform

BORING 694

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9	108/78	NA	(0-6") PID = 77.3 ppm	ORG. SAND	(0-6") WIDELY GRADED SAND WITH SILT (SW-SM): ~90% fine to coarse sand, 10% low plastic fines, brown. Contains slight petroleum-like odor and plant fibers.
						(11-13") PID = 75.6 ppm		(6-19") SANDY ORGANIC SOIL (OL): ~70% low plastic fines, ~30% fine sand, brown. Contains slight petroleum-like odor.
						(23-25") PID = 85.1 ppm	SAND	(19-36") WIDELY GRADED SAND WITH SILT (SW-SM): Similar to (0-6").
						(40-44") PID = 91.2 ppm		(36-55") WIDELY GRADED SAND WITH SILT (SW-SM): ~85% fine to coarse sand, ~15% nonplastic fines, black, wet. Contains strong napthalene-like odor, coal tar saturated, clinkers, shells, wood fragments, and ash.
	5					(55-57") PID 118.0 = ppm	CLAY	(55-78") LEAN CLAY (CL): ~95% medium plastic fines, ~5% fine sand, gray.
						(76-78") PID = 4.7 ppm		
	10							End of boring at 9'. Refusal.

NOTES: Environmental samples collected from S1(0-6"), S2(11-13"), S3(23-25"), S4(40-44"), S5(55-57") and S6(76-78").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 7.0
LOGGED BY: C. Saledas
DATE START/END: 9/25/2019 - 9/25/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark / Jeff
RIG TYPE: 14-foot catamaran-style platform

BORING

695

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 7	84/72	NA	(0-6") PID = 6.9 ppm	ORG.	(0-9") ORGANIC SOIL WITH SAND (OL): ~75% low plastic fines, ~25% fine sand, dark brown, wet. Contains organic-like odor and plant fibers.
						(11-13") PID = 1.1 ppm	SAND	(9-30") SILTY SAND (SM): ~80% fine to coarse sand, ~15% nonplastic fines, ~5% subrounded gravel up to 0.5", gray to brown, wet. Contains plant fibers and wood fragments.
						(23-25") PID = 0.4 ppm		(30-42") SANDY SILT (ML): ~65% nonplastic fines, ~35% fine sand, gray to brown, wet. Contains plant fibers.
						(35-37") PID = 0.2 ppm		(42-72") SILTY SAND (SM): ~85% medium sand, ~10% nonplastic fines, ~5% subangular gravel up to 0.5", gray to brown, wet. Contains wood chips.
	5					(47-49") PID = 0.3 ppm		
						(59-61") PID = 0.2 ppm		
						(71-72") PID = 0.2 ppm		
								End of boring at 7'. Refusal.
	10							

NOTES: Environmental samples collected from S1(0-6"), S2(11-13"), S3(23-25"), S4(35-37"), S5(47-49"), S6(59-61") and S7(71-72").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.2
LOGGED BY: C. Saledas
DATE START/END: 9/25/2019 - 9/25/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark / Jeff
RIG TYPE: 14-foot catamaran-style platform

BORING 696

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
	5	1	0 to 9.2	110/78	NA	(0-6") PID = 0.5 ppm (11-13") PID = 0.7 ppm (23-25") PID = 124.0 ppm (35-37") PID = 17.6 ppm (47-49") PID = 13.0 ppm (59-61") PID = 17.4 ppm (77-78") PID = 5.8 ppm	ORGANICS	(0-70") ORGANIC SOIL WITH SAND (OL): ~75% low plastic fines, ~20% fine sand, ~5% subrounded gravel up to 0.5", gray to brown, wet. Contains slight petroleum-like odor from 0-35" and slight naphthalene-like odor from 35-70", plant fibers, and wood fragments.
							SAND	(70-78") NARROWLY GRADED SAND (SP) ~90% medium sand, ~5% subrounded gravel up to 0.5", ~5% nonplastic fines, brown, wet. Contains brick fragments.
	10							End of boring at 9.2'. Refusal.

NOTES: Environmental samples collected from S1(0-6"), S2(11-13"), S3(23-25"), S4(35-37"), S5(47-49"), S6(55-61") and S7(77-78").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 8.9
LOGGED BY: C. Saledas
DATE START/END: 9/25/2019 - 9/25/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark / Jeff
RIG TYPE: 14-foot catamaran-style platform

BORING 697

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 8.9	107/75	NA	(0-6") PID = 0.2 ppm (11-13") PID = 49.8 ppm (23-26") PID = 2.0 ppm (35-37") PID = 1.1 ppm (47-49") PID = 0.9 ppm (74-75") PID = 0.7 ppm	SAND	(0-15") NARROWLY GRADED SAND WITH SILT (SP-SM): ~85% medium sand, ~10% nonplastic fines, ~5% subrounded gravel up to 0.5", brownish black, wet. Contains petroleum-like odor, some plant fibers, glass.
							SILT	(15-52") SANDY SILT (ML): ~65% nonplastic fines, ~35% fine sand, grayish brown, wet. Contains plant fibers.
	5						CLAY	(52-69") LEAN CLAY WITH SAND (CL): ~75% medium plastic fines, ~25% fine sand, gray, wet.
							SAND	(69-75") SILTY SAND (SM): ~70% fine sand, ~30% nonplastic fines, dark gray, wet.
	10							End of boring at 8.9'. Refusal.

NOTES: Environmental samples collected from S1(0-6"), S2(11-13"), S3(23-25"), S4(35-37"), S5(47-49") and S6(74-75").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 8.3
LOGGED BY: B. Fong-Murdock
DATE START/END: 9/26/2019 - 9/26/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark / Jeff
RIG TYPE: 14-foot catamaran-style platform

BORING 698

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 8.3	100/74	NA	(0-6") PID = 3.7 ppm	SAND	(0-22") SILTY SAND (SM): ~70% fine to medium sand, ~30% low plastic fines, dark brown, wet. Contains plant fibers, glass and trash.
						(23-25") PID = 19.5 ppm		(22-34") SILTY SAND (SM): ~85% medium to coarse sand, ~15% low plastic fines, dark brown, wet. Contains plant fibers, brick fragments and glass.
						(31-33") PID = 8.4 ppm		
						(35-37") PID = 1.3 ppm	ORGANICS	(34-53") ORGANIC SOIL WITH SAND (OL): ~80% low plastic fines, ~20% fine to medium sand, brown, wet. Contains plant fibers.
	5						CLAY	(53-74") LEAN CLAY WITH SAND (CL): ~80% medium plastic fines, ~20% fine to medium sand, gray, wet.
						(73-74") PID = 0.1 ppm		
								End of boring at 8.3'. Refusal.
	10							

NOTES: Environmental samples collected from S1(0-6"), S2(23-25"), S3(31-33"), S4(35-37") and S5(73-74").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.6
LOGGED BY: B. Fong-Murdock
DATE START/END: 9/26/2019 - 9/26/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark / Jeff
RIG TYPE: 14-foot catamaran-style platform

BORING 699

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.6	115/109	NA	(0-6") PID = 4.1 ppm (11-13") PID = 8.5 ppm (35-37") PID = 10.8 ppm (47-49") PID = 1.0 ppm (49-51") PID = 0.3 ppm (108-109") PID = 0.0 ppm	ORGANICS	(0-78") SANDY ORGANIC SOIL (OL): ~70% low plastic fines, ~30% fine to coarse sand, dark brown, wet. Contains slight petroleum-like odor from 0-47" and plant fibers.
	5						CLAY	(78-109") LEAN CLAY (CL): ~95% medium plastic fines, ~5% fine to coarse sand, gray, wet.
	10							End of boring at 9.6'. Refusal.

NOTES: Environmental samples collected from S1(0-6"), S2(11-13"), S3(35-37"), S4(47-49"), S5(49-51") and S6(108-109").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 7.7
LOGGED BY: B. Fong-Murdock
DATE START/END: 9/26/2019 - 9/26/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark / Jeff
RIG TYPE: 14-foot catamaran-style platform

BORING 700

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 7.7	92/82	NA	(0-6") PID = 2.5 ppm	SAND	(0-12") SILTY SAND (SM): ~70% medium to coarse sand, ~30% low plastic fines, dark brown, wet. Contains plant fibers, glass, brick fragments and trash.
						(23-25") PID = 4.6 ppm	ORGANICS	(12-59") ORGANIC SOIL WITH SAND (OL): ~75% low plastic fines, ~25% fine to medium sand, brown to dark brown, wet. Contains naphthalene-like odor and petroleum-like odor from 23-25", and plant fibers.
						(35-37") PID = 0.0 ppm		
						(47-49") PID = 0.3 ppm		
	5					(59-61") PID = 0.0 ppm	CLAY	(59-82") LEAN CLAY (CL): ~95% medium plastic fines, ~5% fine to medium sand, gray, wet.
						(80-82") PID = 0.0 ppm		
								End of boring at 7.7'. Refusal.
	10							

NOTES: Environmental samples collected from S1(0-6"), S2(23-25"), S3(35-37"), S4(47-49"), S5(59-61") and S6(80-82").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.1
LOGGED BY: B. Fong-Murdock
DATE START/END: 9/26/2019 - 9/26/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark / Jeff
RIG TYPE: 14-foot catamaran-style platform

BORING 701

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.1	109/85	NA	(0-6") PID = 11.2 ppm	SAND	(0-12") SILTY SAND (SM): ~75% fine to coarse sand, ~25% low plastic fines, dark brown, wet. Contains naphthalene-like and petroleum-like odor, heavy sheen, glass, brick fragments and plant fibers.
							ORG.	(12-19") ORGANIC SOIL WITH SAND (OL): ~75% low plastic fines, ~25% fine sand, brown, wet. Contains naphthalene-like odor, black staining and sheen.
						(23-25") PID = 60.6 ppm	SAND	(19-46") SILTY SAND (SM): ~75% medium to coarse sand, 25% low plastic fines, dark brown, wet. Contains naphthalene-like odor, black staining, sheen, and plant fibers.
							ORGANICS	(46-60") ORGANIC SOIL WITH SAND (OL): Similar to 12-19".
	5					(58-60") PID = 5.4 ppm (61-63") PID = 0.1 ppm	CLAY	(60-85") LEAN CLAY (CL): ~95% medium plastic fines, ~5% fine to medium sand, gray, wet.
						(84-85") PID = 0.1 ppm		
	10							End of boring at 9.1'. Refusal.

NOTES: Environmental samples collected from S1(0-6"), S2(23-25"), S3(58-60"), S4(61-63") and S5(84-85").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: B. Fong-Murdock
DATE START/END: 9/26/2019 - 9/26/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark / Jeff
RIG TYPE: 14-foot catamaran-style platform

BORING 702

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/108	NA	(0-6") PID = 0.2 ppm (23-25") PID = 25.6 ppm (47-49") PID = 8.6 ppm (71-73") PID = 1.5 ppm (92-94") PID = 0.8 ppm (107-108") PID = 0.1 ppm	ORGANICS	(0-94") SANDY ORGANIC SILT (OL): ~70% low plastic fines, ~30% fine to medium sand, dark brown, wet. Contains petroleum-like odor from 23-47", and plant fibers.
	5						CLAY	(94-108") LEAN CLAY (CL): ~95% medium plastic fines, ~5% fine to medium sand, gray, wet.
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental samples collected from S1(0-6"), S2(23-25"), S3(47-49"), S4(71-73"), S5(92-94") and S6(107-108").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.7
LOGGED BY: B. Fong-Murdock
DATE START/END: 9/26/2019 - 9/26/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark / Jeff
RIG TYPE: 14-foot catamaran-style platform

BORING 703

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.7	116/107	NA	(0-6") PID = 0.1 ppm (23-25") PID = 33.1 ppm (71-73") PID = 35.0 ppm (94-96") PID = 1.3 ppm (106-107") PID = 0.1 ppm	ORGANICS	(0-94") ORGANIC SOIL WITH SAND (OL): ~75% low plastic fines, ~25% fine to coarse sand, dark brown, wet. Contains petroleum-like odor from 12-60", naphthalene-like odor from 60-71", plant fibers, brick fragments and shells.
	5						CLAY	(94-107") LEAN CLAY (CL): ~95% medium plastic fines, ~5% fine to medium sand, gray, wet.
	10							End of boring at 9.7'. Refusal.

NOTES: Environmental samples collected from S1(0-6"), S2(23-25"), S3(71-73"), S4(94-96") and S5(106-107").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 6.4
LOGGED BY: B. Fong-Murdock
DATE START/END: 9/26/2019 - 9/26/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark / Jeff
RIG TYPE: 14-foot catamaran-style platform

BORING 704

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 6.4	77/48	NA	(0-6") PID = 25.4 ppm (11-13") PID = 7.8 ppm (23-25") PID = 0.4 ppm (35-37") PID = 0.1 ppm (47-48") PID = 0.0 ppm	ORGANICS	(0-30") SANDY ORGANIC SOIL (OL): ~60% low plastic fines, ~30% fine to coarse sand, ~10% subrounded gravel up to 2", dark brown, wet. Contains slight petroleum-like odor from 0-23", plant fibers, glass and trash .
							GRAVEL	(30-42") SILTY GRAVEL WITH SAND (GM): ~45% fine to coarse gravel, ~35% fine to coarse sand, ~20% nonplastic fines, gray, wet. Contains wood fragments.
	5						CLAY	(42-48") LEAN CLAY (CL): ~95% medium plastic fines, ~5% fine sand, gray , wet.
								End of boring at 6.4'. Refusal.
	10							

NOTES: Environmental samples collected from S1(0-6"), S2(11-13"), S3(23-25"), S4(35-37") and S5(47-48").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.0
LOGGED BY: B. Fong-Murdock
DATE START/END: 9/27/2019 - 9/27/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark / Jeff
RIG TYPE: 14-foot catamaran-style platform

BORING 705

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9	108/86	NA	(0-6") PID = 0.4 ppm	SAND	(0-18") SILTY SAND (SM): ~70% fine to medium sand, 30% low plastic fines, dark brown, wet. Contains plant fibers and brick fragments.
							PEAT	(18-29") PEAT (PT).
							SAND	(29-52") SILTY SAND (SM): ~70% fine to medium sand, 30% low plastic fines, dark brown, wet. Contains black staining, sheen and naphthalene-like odor from 48-52". Contains plant fibers and brick fragments throughout.
	5					(59-61") PID = 71.2 ppm	PEAT	(52-82") PEAT (PT): ~90% peat,~10% fine sand, black, wet. Contains strong napthalene-like odor and wood chips.
						(85-86") PID = 0.8 ppm	SILT	(82-86") ELASTIC SILT (ML): ~95% low plastic fines, ~5% fine sand, gray, wet.
	10							End of boring at 9.0'. Refusal.

NOTES: Environmental samples collected from S1(0-6"), S2(59-61") and S3(85-86").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: B. Fong-Murdock
DATE START/END: 9/27/2019 - 9/27/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark / Jeff
RIG TYPE: 14-foot catamaran-style platform

BORING 706

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/78	NA	(0-6") PID = 14.4 ppm	ORGANICS	(0-14") ORGANIC SOIL (OL): ~90% low plastic fines. ~10% fine to medium sand, dark brown, wet. Contains heavy sheen, slight naphthalene-like odor, and plant fibers.
							SAND	(14-50") SILTY SAND (SM): ~70% fine to medium sand, ~30% low plastic fines, dark brown, wet. Contains sheen, slight naphthalene-like odor, and brick fragments.
	5					(51-53") PID = 52.4 ppm (76-78") PID = 28.9 ppm	ORGANICS	(50-78") ORGANIC SOIL (OL): ~90% low plastic fines. ~10% fine to medium sand, dark brown, wet. Contains sheen, strong naphthalene-like odor, and plant fibers.
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental samples collected from S1(0-6"), S2(51-53") and S3(76-78").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: B. Fong-Murdock
DATE START/END: 9/27/2019 - 9/27/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark / Jeff
RIG TYPE: 14-foot catamaran-style platform

BORING 707

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/108	NA	(0-6") PID = 1.9 ppm	ORGANICS	(0-29") ORGANIC SOIL (OL): ~90% low plastic fines, ~10% fine to medium sand, dark brown, wet. Contains slight petroleum-like odor from 23-25", and plant fibers.
						(23-25") PID = 4.1 ppm	SAND	(29-62") SILTY SAND (SM): ~70% widely graded sand, ~30% low plastic fines, brown, wet. Contains slight petroleum-like odor.
	5					(47-49") PID = 0.5 ppm	CLAY	(62-108") LEAN CLAY (CL): ~95% medium plastic fines, ~5% fine sand, gray, wet.
						(71-73") PID = 0.1 ppm		
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental samples collected from S1(0-6"), S2(23-25"), S3(47-49") and S4(71-73").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 8.7
LOGGED BY: B. Fong-Murdock
DATE START/END: 9/27/2019 - 9/27/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark / Jeff
RIG TYPE: 14-foot catamaran-style platform

BORING 708

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 8.7	104/79	NA	(0-6") PID = 13.6 ppm	SAND	(0-42") SILTY SAND (SM): ~70% fine to coarse sand, ~30% low plastic fines, dark brown, wet. Contains plant fibers, wood fragments and brick fragments.
	5					(65-67") PID = 111.0 ppm	ORGANICS	(42-72") SANDY ORGANIC SOIL (OL): ~70% low plastic fines, ~30% fine to medium sand, dark brown, wet. Contains petroleum-like odor from 42-48", naphthalene-like odor from 48-72", coal tar saturated from 65-72", and plant fibers.
						(77-78") PID = 26.0 ppm	CLAY	(72-79") LEAN CLAY (CL): ~95% medium plastic fines, ~5% fine to medium sand, gray, wet. Contains slight petroleum-like odor.
	10							End of boring at 8.7'. Refusal.

NOTES: Environmental samples collected from S1(0-6"), S2(65-67") and S3(77-78").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: B. Fong-Murdock
DATE START/END: 9/27/2019 - 9/27/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark / Jeff
RIG TYPE: 14-foot catamaran-style platform

BORING 709

PAGE 1 of 1

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/102	NA	(0-6") PID = 9.9 ppm (23-25") PID = 1.2 ppm (55-57") PID = 0.0 ppm (67-69") PID = 0.0 ppm	ORGANICS	(0-50") ORGANIC SOIL WITH SAND (OL): ~80% low plastic fines, ~20% fine to medium sand, dark brown, wet. Contains very slight petroleum-like odor, plant fibers and wood fragments.
	5						SAND	(50-61") SILTY SAND (SM): ~75% fine to coarse sand, ~20% low plastic fines, ~5% subangular gravel up to 2", dark brown, wet.
							CLAY	(61-102") LEAN CLAY (CL): ~95% plastic fines, ~5% fine sand, gray, wet.
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental samples collected from S1(0-6"), S2(23-25"), S3(55-57") and S4(67-69").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 7.8
LOGGED BY: B. Fong-Murdock
DATE START/END: 11/11/2019 - 11/11/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 710

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
	5	1	0 to 7.8	94/63	NA	S1(1.9-2.4') PID = 62.1 ppm S2(3.0-3.1') PID = 0.3 ppm (23-29") PID = 62.1 ppm (36-38") PID = 0.3 ppm	SAND	(0-19") NARROWLY GRADED SAND WITH SILT (SP-SM): ~85% fine to medium sand, ~10% nonplastic fines, ~5% subrounded gravel up to 0.5", dark brown. Contains petroleum-like odor throughout, strong petroleum-like odor from 12-17", brick, and wood fragments. (19-23") NARROWLY GRADED SAND WITH SILT (SP-SM): ~80% coarse sand, ~15% nonplastic fines, ~5% subrounded gravel up to 0.75", dark brown to black. Contains strong petroleum- like odor and plant fibers. (23-63") SILTY SAND (SM): ~65% fine sand, ~25% nonplastic fines, ~10% subrounded gravel up to 0.75", brown to dark brown. Contains strong petroleum-like odor and dark brown soil at 27" and 33", slight sheen on soil at 27", plant fibers throughout, and wood fragment layer from 44-49".
	10							End of boring at 7.8'. Refusal.

NOTES: Environmental samples collected from S1(23-29") and S2(36-37").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.1
LOGGED BY: B. Fong-Murdock
DATE START/END: 11/11/2019 - 11/11/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 711

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.1	109/96	NA	(0-11") PID = 2.8 ppm	SAND	(0-11") SILTY SAND (SM): ~65% fine sand, ~30% nonplastic fines, ~5% subrounded gravel up to 0.75", dark brown, wet. Contains petroleum-like odor.
	5					(24-25") PID = 0.0 ppm	ORGANICS	(11-96") SANDY ORGANIC SOIL (OL): ~70% fine to coarse sand, ~25% nonplastic fines, ~5% subrounded gravel up to 0.75", brown/red, moist. Contains organic-like odor and plant fibers.
	10							End of boring at 9.1'. Refusal.

NOTES: Environmental samples collected from S1(0-11") and S2(24-25").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 10.0
LOGGED BY: B. Fong-Murdock
DATE START/END: 11/11/2019 - 11/11/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 712

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 10	120/118	NA		SAND	(0-24") SILTY SAND (SM): ~70% fine sand, ~30% nonplastic fines, gray to brown. Contains petroleum-like odor, sheen plant fibers, glass, and wood fragments.
							CLAY	(24-28") LEAN CLAY (CL): ~100% plastic fines, gray. Contains slight petroleum-like odor and some black staining on exterior of casing.
						(49-61") PID = 5.8 ppm	SAND	(28-61") SILTY SAND (SM): ~80% fine to medium sand, ~15% nonplastic fines, ~5% subrounded gravel up to 0.5", gray-brown. Contains naphthalene-like and petroleum-like odors, sheen on water from 29-37", brick fragments, and coal and wood fragments.
	5					(74-76") PID = 0.0 ppm		(61-89") SILTY SAND (SM): ~80% medium to coarse sand, ~15% nonplastic fines, ~5% subrounded gravel up to 0.75", light brown.
								(89-109") SILTY SAND (SM): ~70% fine to coarse sand, ~25% nonplastic fines, ~5% subrounded gravel up to 0.5", gray to red-brown. Contains organic-like odor, plant fibers, and wood fragments.
							SILT	(109-118") SANDY SILT (ML): ~65% nonplastic fines, ~35% fine sand, gray.
	10							End of boring at 10'.

NOTES: Environmental samples collected from S1(49-61") and S2(74-76").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.6
LOGGED BY: B. Fong-Murdock
DATE START/END: 11/15/2019 - 11/15/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 713

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.6	115/104	NA	(1-3") PID = 8.9 ppm	SAND	(0-40") SILTY SAND (SM): ~75% fine to coarse sand, ~15% nonplastic fines, ~10% subrounded and subangular gravel up to 1.5", brown. Contains petroleum-like odor from 0-26", naphthalene-like odor from 26-40", coal tar blebs at 36", plant fibers, and brick fragments.
						(29-31") PID = 68.4 ppm		
						(47-49") PID = 30.9 ppm	ORGANICs	(40-104") SANDY ORGANIC SOIL (OL): ~60% medium plastic fines, ~35% fine to medium sand, ~5% subrounded gravel up to 0.5", dark brown to black. Contains naphthalene-like odor, coal-tar blebs from 43-50", and plant fibers.
	5							
						(88-90") PID = 0.1 ppm		
	10							End of boring at 9.6'. Refusal.

NOTES: Environmental samples collected from S1(1-3"), S2(29-31"), S3(47-49") and S4(88-90").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 10.0
LOGGED BY: B. Fong-Murdock
DATE START/END: 11/14/2019 - 11/14/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 714

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 10	120/114	NA	(5-6") PID = 1.2 ppm	SAND	(0-28") WIDELY GRADED SAND WITH SILT (SW-SM): ~80% fine to coarse sand, ~10% nonplastic fines, ~5% subrounded to subangular gravel up to 1", brown, moist. Contains petroleum-like odor, plant fibers, and brick fragments.
						(26-27") PID = 5.1 ppm	ORGANICS	(28-70") SANDY ORGANIC SOIL (OL): ~70% medium plastic fines, ~25% fine to medium sand, ~5% subrounded gravel up to 0.5", dark brown to black. Contains naphthalene -like odor from 36-47" and plant fibers.
	5					(47-48") PID = 15.0 ppm		
						(66-67") PID = 0.0 ppm	SAND	(70-114") SILTY SAND (SM): ~60% fine sand, ~40% nonplastic fines, gray to brown, moist. Contains some organic fibers.
						(78-79") PID = 0.0 ppm		
	10							End of boring at 10'. Refusal.

NOTES: Environmental samples collected from S1(5-6"), S2(26-28"), S3(47-48"), S4(66-67") and S5(78-79").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.7
LOGGED BY: B. Fong-Murdock
DATE START/END: 11/15/2019 - 11/15/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 715

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.7	116/107	NA	(1-3") PID = 0.2 ppm	ORGANICS	(0-86") SANDY ORGANIC SOIL (OL): ~65% medium plastic fines, ~30% fine sand, ~5% subrounded gravel up to 0.5", brown. Contains organic-like odor and plant fibers.
	5					(44-46") PID = 0.0 ppm		
						(97-99") PID = 0.1 ppm	SAND	(86-107") SILTY SAND (SM): ~70% fine sand, ~30% medium plastic fines, gray-brown. Contains plant fibers.
	10							End of boring at 9.7'. Refusal.

NOTES: Environmental samples collected from S1(1-3"), S2(44-46") and S3(97-99").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 10.0
LOGGED BY: B. Fong-Murdock
DATE START/END: 11/11/2019 - 11/11/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 716

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 10	120/109	NA		ORGANICS	(0-22") SANDY ORGANIC SOIL (OL): ~65% medium plastic fines, ~30% fine sand, ~5% subrounded gravel up to 0.5", brown. Contains organic-like odor and plant fibers.
						(36-46") PID = 2.7 ppm	SAND	(22-47") SILTY SAND (SM): ~65% fine sand, ~35% nonplastic fines, gray-brown, coarse sand layer from 38-39". Contains petroleum-like and naphthalene-like odor, brick, and coal fragments.
	5					(54-55") PID = 0.1 ppm		(47-68") SILTY SAND (SM): ~60% fine sand, ~35% nonplastic fines, ~5% subrounded gravel up to 0.75", red-brown to gray, dense, pockets of fine sand throughout. Contains organic-like odor and plant fibers.
							CLAY	(68-73") LEAN CLAY (CL): ~100% plastic fines, gray, dense.
							SAND	(73-95") SILTY SAND (SM): ~60% fine sand, ~35% nonplastic fines, ~5% subrounded gravel up to 0.75", red-brown to gray, dense. Contains organic-like odor and plant fibers.
							SILT	(95-109"): SANDY SILT (ML): ~70% nonplastic fines, ~30% fine to medium sand, gray, dense.
	10							End of boring at 10'.

NOTES: Environmental samples collected from S1(36-46") and S2(54-55").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 6.1
LOGGED BY: B. Fong-Murdock
DATE START/END: 11/11/2019 - 11/11/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 717

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
	5	1	0 to 6.1	73/61	NA	(0-6") PID = 0.1 ppm (29-30") PID = 0.1 ppm (50-52") PID = 27.2	SAND	(0-61") SILTY SAND (SM): ~65% fine sand, ~30% nonplastic fines, ~5% subrounded gravel up to 1", gray to brown. Contains plant fibers from 0-10" and wood fragments at 34".
	10							End of boring at 6.1'. Refusal.

NOTES: Environmental samples collected from S1(0-6"), S2(29-30") and S3(50-52").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.1
LOGGED BY: B. Fong-Murdock
DATE START/END: 11/11/2019 - 11/11/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 718

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.1	109/98	NA	(1-2") PID = 0.0 ppm	SILT	(0-20") SANDY SILT (ML): ~60% nonplastic fines, ~35% fine sand, ~5% subrounded gravel up to 0.5", gray-brown. Contains organic-like odor and plant fibers.
						(25-26") PID = 0.0 ppm	SAND	(20-61") SILTY SAND (SM): ~65% fine sand, ~30% nonplastic fines, ~5% subrounded gravel up to 1", gray-brown, interbedded layers of coarse sand throughout.
						(47-48") PID = 0.0 ppm		
	5							
						(71-72") PID = 0.0 ppm		(61-74") NARROWLY GRADED SAND WITH SILT(SP-SM): ~80% medium sand, ~10% nonplastic fines, ~10% subrounded gravel up to 0.75", gray-brown. Contains organic-like odor, wood fragments. (74-98") WIDELY GRADED SAND WITH SILT (SW-SM): ~85% sand, ~10% nonplastic fines, ~5% subrounded gravel up to 0.5", gray-brown. Contains plant fibers.
						(94-95") PID = 30.4 ppm		
	10							End of boring at 9.1'. Refusal.

NOTES: Environmental samples collected from S1(1-2"), S2(25-26"), S3(47-48"), S4(71-72") and S5(94-95").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 10.0
LOGGED BY: B. Fong-Murdock
DATE START/END: 11/11/2019 - 11/11/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 719

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 10	120/109	NA	(0-1") PID = 0.0 ppm	SAND	(0-23") SILTY SAND (SM): ~70% medium to fine sand, 30% nonplastic fines, gray-brown. Contains slight petroleum-like odor from (0-3") and plant fibers.
						(31-33") PID = 0.0 ppm		(23-34") SILTY SAND (SM): ~75% medium sand, ~20% nonplastic fines, ~5% subrounded gravel up to 0.75". Contains plant fibers and wood fragments.
						(41-43") PID = 0.1 ppm		(34-66") SILTY SAND (SM): ~65% fine sand, ~30% nonplastic fines, ~5% subrounded gravel up to 0.75", gray to gray brown, intermittent sand layers. Contains plant fibers.
	5							(66-92") WIDELY GRADED SAND WITH SILT (SW-SM): ~80% sand, ~10% nonplastic fines, ~10% subrounded and subangular gravel up to 0.75", gray-brown.
						(80-82") PID = 0.0 ppm		
						(98-99") PID = 0.0 ppm	CLAY	(92-109"): LEAN CLAY (CL): ~100% plastic fines, gray, dense.
	10							End of boring at 10'.

NOTES: Environmental samples collected from S1(0-1"), S2(31-33"), S3(41-43"), S4(80-82") and S5(98-99").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.0
LOGGED BY: B. Fong-Murdock
DATE START/END: 11/12/2019 - 11/12/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 720

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9	108/108	NA	(8-10") PID = 12.3 ppm (17-18") PID = 0.1 ppm (35-36") PID = 0.0 ppm (53-54") PID = 0.0 ppm (71-72") PID = 0.0 ppm (86-88") PID = 0.0 ppm	SAND	(0-34") SILTY SAND (SM): ~70% fine sand, ~25% nonplastic fines, ~5% subrounded gravel up to 0.75", light brown-gray. Contains strong petroleum-like odor, black stained soil at 9.6", plant fibers from 24-34", and wood fragments. (34-73") SILTY SAND (SM): ~60% fine sand, ~35% nonplastic fines, ~5% subrounded gravel up to 1", gray to gray-brown. Contains organic-like odor and interbedded layers or organic material from 37-49". (73-86") SILTY SAND (SM): ~85% medium to coarse sand, ~15% nonplastic fines, gray. Contains plant fibers.
	5						CLAY	(86-108") LEAN CLAY (CL): ~100% plastic fines, gray, dense. Contains interbedded layers of coarse sand throughout.
	10							End of boring at 9'. Refusal.

NOTES: Environmental samples collected from S1(8-10"), S2(17-18"), S3(35-36"), S4(53-54"), S5(71-72") and S6(86-88").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 6.2
LOGGED BY: B. Fong-Murdock
DATE START/END: 11/12/2019 - 11/12/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 721

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
	5	1	0 to 6.2	74/66	NA	(12-13") PID = 2.7 ppm (28-29") PID = 0.1 ppm (43-44") PID = 0.1 ppm (62-64") PID = 0.0 ppm	SAND	(0-14") SILTY SAND (SM): ~70% fine sand, ~20% nonplastic fines, ~10% subrounded gravel up to 0.75", gray-brown. Contains slight petroleum-like odor from 12-14" and coal fragments throughout. (14-66") SILTY SAND (SM): ~60% fine sand, ~35% nonplastic fines, ~5% subrounded gravel up to 0.5", brown to gray. Contains organic-like odor, plant fibers, and wood fragments.
	10							End of boring at 6.2'. Refusal.

NOTES: Environmental samples collected from S1(12-13"), S2(28-29"), S3(43-44") and S4(62-64").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.4
LOGGED BY: B. Fong-Murdock
DATE START/END: 11/12/2019 - 11/12/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 722

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5.4	65/53	NA	(8-10") PID = 0.1 ppm (25-26") PID = 0.0 ppm (47-48") PID = 0.0 ppm	SAND	(0-18") SILTY SAND (SM): ~75% fine to coarse sand, ~15% nonplastic fines, ~10% subrounded and subangular gravel up to 0.75", brown. Contains brick, coal, and wood fragments. (18-37") SILTY SAND (SM): ~65% fine sand, ~30% nonplastic fines, ~5% subrounded gravel up tp 0.5". Contains plant fibers, coal fragments, and wood fragments. (37-43") NARROWLY GRADED SAND WITH SILT (SP-SM): ~85% fine to medium sand, ~10% nonplastic fines, ~5% subrounded gravel up to 0.5", gray. Contains wood fragments. (43-53") NARROWLY GRADED SAND WITH SILT (SP-SM): ~80% medium to coarse sand, ~10% nonplastic fines, ~10% subrounded gravel up to 0.5", gray-brown. Contains brick and wood fragments.
	5							End of boring at 5.4'. Refusal.
	10							

NOTES: Environmental samples collected from S1(8-10"), S2(25-26") and S3(47-48").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.9
LOGGED BY: B. Fong-Murdock
DATE START/END: 11/14/2019 - 11/14/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 723

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.9	119/107	NA	(17-18") PID = 0.0 ppm	SAND	(0-26") SILTY SAND (SM) ~70% fine to coarse sand, ~20% low plastic fines, ~10% subangular gravel up to 0.5", dark brown, wet. Contains brick fragments and plant fibers.
						(30-31") PID = 0.0 ppm	CLAY	(26-104") LEAN CLAY (CL): ~90% medium plastic fines, ~10% fine sand, gray, moist.
	5							
	10							End of boring at 8.9'. Refusal.

NOTES: Environmental samples collected from S1(17-18") and S2(30-31").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.5
LOGGED BY: B. Fong-Murdock
DATE START/END: 11/12/2019 - 11/12/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 724

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5.5	66/60	NA	(7-8") PID = 3.1 ppm	SILT	(0-28") SANDY SILT (ML): ~65% nonplastic fines, ~30% fine sand, ~5% subrounded gravel up to 0.5", gray-brown. Contains slight petroleum-like odor from 0-12", plant fibers, and wood fragments.
						(29-30") PID = 0.1 ppm	SAND	(28-44") SILTY SAND (SM): ~65% fine sand, ~30% nonplastic fines, ~5% subrounded gravel up to 0.5", gray-brown. Contains slight organic-like odor.
	5					(50-52") PID = 0.3 ppm		(44-60") WIDELY GRADED SAND WITH SILT (SW-SM): ~85% medium to coarse sand, ~10% nonplastic fines, ~5% subrounded gravel up to 1", brown. Contains plant fibers and coal fragments.
								End of boring at 5.5'. Refusal.
	10							

NOTES: Environmental samples collected from S1(7-8"), S2(29-30"), and S3(50-52").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 6.0
LOGGED BY: B. Fong-Murdock
DATE START/END: 11/14/2019 - 11/14/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 724R

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 6	72/72	NA	(7-8") PID = 3.1 ppm	SILT	(0-27") SANDY SILT (ML): ~65% nonplastic fines, ~35% fine to medium sand, black, wet. Contains plant fibers.
						(29-30") PID = 0.1 ppm	ORGANICS	(27-67") SANDY ORGANIC SOIL (OL): ~60% low plastic fines, ~35% fine to medium sand, ~5% subrounded gravel up to 0.5", dark brown, moist. Contains plant fibers.
	5					(50-51") PID = 0.3 ppm		
						(67-68") PID = 0.0 ppm	CLAY	(67-72") LEAN CLAY (CL): ~80% medium plastic fines, ~20% fine to medium sand, gray, moist.
								End of boring at 6.0'. Refusal.
	10							

NOTES: Environmental samples collected from S1(7-8"), S2(29-30"), S3(50-51") and S4(67-68").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 6.1
LOGGED BY: B. Fong-Murdock
DATE START/END: 11/14/2019 - 11/14/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 725

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
	5	1	0 to 6.1	73/58	NA	(7-8") PID = 0.0 ppm (34-35") PID = 0.0 ppm	CLAY	(0-58") LEAN CLAY (CL): ~95% medium plastic fines, ~5% fine sand, gray, moist.
	10							End of boring at 4.8'. Refusal.

NOTES: Environmental samples collected from S1(7-8") and S2(34-35").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 8.2
LOGGED BY: B. Fong-Murdock
DATE START/END: 11/12/2019 - 11/12/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 726

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 8.2	98/85	NA	(1-2") PID = 0.0 ppm (17-18") PID = 8.7 ppm (41-42") PID = 0.6 ppm (61-62") PID = 0.1 ppm (83-84") PID = 0.0 ppm	SAND	(0-68") SILTY SAND (SM): ~65% fine sand, ~30% nonplastic fines, ~5% subrounded gravel up to 0.75", brown. Contains plant fibers, coal fragments, and wood fragments.
	5							(68-76") SILTY SAND (SM): ~75% fine to coarse sand, ~15% nonplastic fines, ~10% subrounded gravel up to 0.75", gray-brown. Contains wood fragments.
							CLAY	(76-85") LEAN CLAY (CL): ~100% plastic fines, gray, dense.
								End of boring at 8.2'. Refusal.
	10							

NOTES: Environmental samples collected from S1(1-2"), S2(17-18"), S3(41-42"), S4(61-62") and S5(83-84").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: B. Fong-Murdock
DATE START/END: 11/14/2019 - 11/14/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 726R

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/104	NA	(4-5") PID = 0.1 ppm	ORGANICS	(0-38") SANDY ORGANIC SOIL (OL): ~65% low plastic fines, ~30% fine sand, ~5% subrounded gravel up to 0.5", dark brown to black. Contains plant fibers.
	5					(38-39") PID = 0.5 ppm		(38-39") SANDY ORGANIC SOIL (OL): ~65% low plastic fines, ~30% fine sand, black. Contains petroleum-like odor and plant fibers. (39-65") Similar to 0-38".
						(64-65") PID = 0.1 ppm (72-73") PID = 0.0 ppm	CLAY	(65-104") LEAN CLAY (CL): ~95% medium plastic fines, ~5% fine sand, gray, moist.
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental samples collected from S1(4-5"), S2(38-39"), S3(64-65") and S4(72-73").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: B. Fong-Murdock
DATE START/END: 11/14/2019 - 11/14/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 727

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/114	NA	(1-2") PID = 0.0 ppm (23-24") PID = 12.3 ppm (64-65") PID = 0.0 ppm (82-83") PID = 0.1 ppm (84-85") PID = 0.0 ppm	ORGANICS	(0-88") ORGANIC SOIL WITH SAND (OL): ~75% low plastic fines, ~25% fine to medium sand, dark brown, wet. Contains petroleum-like odor from 23-25", plant fibers, brick fragments, and wood fragments.
	5						SILT	(88-114") SANDY SILT (ML): ~75% non-plastic fines, ~25% fine sand, gray, moist.
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental samples collected from S1(1-2"), S2(23-24"), S3(64-65"), S4(82-83") and S5(84-85").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 10.0
LOGGED BY: B. Fong-Murdock
DATE START/END: 11/14/2019 - 11/14/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 728

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 10	120/107		(1-2") PID = 0.4 ppm (26-27") PID = 2.1 ppm (65-66") PID = 4.8 ppm (97-98") PID = 0.0 ppm	ORGANICS	(0-86") ORGANIC SOIL WITH SAND (OL): ~75% low plastic fines, ~25% fine to medium sand, dark brown to black, wet. Contains petroleum-like odor from 0-47", naphthalene-like odor from 47-86", sheen from 0-86", plant fibers, brick fragments, and wood fragments.
	5						SILT	(86-107") SANDY SILT (ML): ~70% nonplastic fines, ~30% fine sand, gray.
	10							End of boring at 10'. Refusal.

NOTES: Environmental samples collected from S1(1-2"), S2(26-27"), S3(65-66") and S4(97-98").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 8.1
LOGGED BY: B. Fong-Murdock
DATE START/END: 11/12/2019 - 11/12/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 729

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 8.1	97/72	NA	(6-7") PID = 0.5 ppm	ORGANICS	(0-23") SANDY ORGANIC SOIL (OL): ~60% nonplastic fines, ~35% fine to medium sand, ~5% subrounded gravel up to 0.75", brown-gray. Contains slight petroleum-like odor, plant fibers, shells, and wood fragments.
						(30-31") PID = 2.0 ppm	SAND	(23-42") WIDELY GRADED SAND WITH SILT (SW-SM): ~80% medium to coarse sand, ~10% nonplastic fines, ~10% subrounded gravel up to 0.5", brown-gray. Contains slight petroleum-like odor from 23-30".
						(47-48") PID = 5.2 ppm	SILT	(42-61") SANDY SILT (ML): ~50% nonplastic fines, ~45% fine sand, ~5% subrounded gravel up to 0.75", brown-gray. Contains slight naphthalene-like odor.
	5					(71-72") PID = 0.0 ppm		(61-72") SANDY SILT (ML): ~70% nonplastic fines, ~30% fine sand, gray.
								End of boring at 8.1'. Refusal.
	10							

NOTES: Environmental samples collected from S1(6-7"), S2(30-31"), S3(47-48") and S4(71-72").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.8
LOGGED BY: B. Fong-Murdock
DATE START/END: 11/14/2019 - 11/14/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 730

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.8	118/118	NA	(5-6") PID = 0.8 ppm (30-31") PID = 0.0 ppm	ORGANICS	(0-52") SANDY ORGANIC SAND (OL): ~65% medium plastic fines, ~25% fine to medium sand, ~10% subrounded gravel up to 0.5", brown to dark brown. Contains brick fragments and plant fibers.
	5					(58-59") PID = 0.0 ppm	CLAY	(52-118") LEAN CLAY (CL): ~95% medium plastic fines, ~5% noplastic fines, gray, moist.
	10							End of boring at 9.8'. Refusal.

NOTES: Environmental samples collected from S1(5-6"), S2(30-31.") and S3(58-59").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.7
LOGGED BY: B. Fong-Murdock
DATE START/END: 11/15/2019 - 11/15/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 731

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.7	116/115	NA	(1-3") PID = 0.1 ppm	SAND	(0-8") SILTY SAND (SM): ~70% medium sand, ~30% nonplastic fines, brown. Contains slight petroleum-like odor and plant fibers.
							ORG.	(8-18") ORGANIC SOIL (OL): ~75% medium plastic fines, ~20% fine sand, ~5% subrounded gravel up to 0.5", brown. Contains organic-like odor and plant fibers.
							SAND	(18-32") SILTY SAND (SM): ~70% medium to coarse sand, ~25% nonplastic fines, ~5% subrounded gravel up to 0.5", brown. Contains slight petroleum-like odors, brick fragments, and glass fragments.
							ORGANICS	(32-50") ORGANIC SOIL WITH SAND (OL): ~75% medium plastic fines, ~25% fine sand, brown. Contains slight petroleum-like odor, slight organic-like odor, and plant fibers.
						(44-46") PID = 0.6 ppm		
	5							(50-88") SANDY ORGANIC SOIL (OL): ~60% medium plastic fines, ~35% fine sand, ~5% subrounded gravel up to 0.5", brown to gray. Contains slight organic-like odor and wood fragments.
						(97-99") PID = 0.0 ppm	SILT	(88-115") SANDY SILT (ML): ~60% nonplastic fines, ~40% fine sand, gray.
	10							End of boring at 9.7'. Refusal.

NOTES: Environmental samples collected from S1(1-3"), S2(44-46") and S3(97-99").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 7.5
LOGGED BY: B. Fong-Murdock
DATE START/END: 11/15/2019 - 11/15/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING

733

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 7.5	90/74	NA	(6-8") PID = 0.2 ppm	SAND	(0-14") SILTY SAND (SM): ~70% fine to coarse sand, ~25% nonplastic fines, ~5% subrounded gravel up to 0.75", brown to dark brown. Contains brick fragments, shells, and plant fibers.
								(14-25") SILTY SAND (SM): ~70% fine to coarse sand, ~25% nonplastic fines, ~5% subrounded gravel up to 0.75", dark brown to black. Contains slight petroleum-like odor, brick fragments, shells, and plant fibers.
						(33-36") PID = 19.7 ppm	ORGANICS	(25-43") SANDY ORGANIC SOIL (OL): ~60% medium plastic fines, ~25% fine sand, ~5% subrounded gravel up to 0.5", dark brown to black. Contains naphthalene -like odor, sheen, coal tar blebs, wood fragments, and pieces of rubber.
						(47-49") PID = 21.4 ppm	SAND	(43-52") SILTY SAND (SM): ~75% medium to coarse sand, ~20% nonplastic fines, ~5% subrounded gravel up to 0.75", brown to black. Contains strong naphthalene -like odor, coal tar blebs from 43-48", coal tar saturated from 48-52", and wood fragments.
	5					(65-67") PID = 0.1 ppm	CLAY	(52-74") LEAN CLAY (CL): ~80% medium plastic fines, ~20% fine sand, gray, dense.
								End of boring at 7.5'. Refusal.
	10							

NOTES: Environmental samples collected from S1(6-8"), S2(33-36"), S3(47-49") and S4(65-67").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 8.1
LOGGED BY: B. Fong-Murdock
DATE START/END: 11/15/2019 - 11/15/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 734

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 8.1	97/80	NA		SAND	(0-23") SILTY SAND (SM): ~70% sand, ~30% nonplastic fines, brown to dark brown. Contains naphthalene-like odor, black staining, and wood fragments.
							ORGANICS	(23-65") SANDY ORGANIC SOIL (OL): ~55% medium plastic fines, ~40% fine sand, ~5% subrounded gravel up to 0.75", dark brown to black. Contains strong naphthalene-like odor, sheen, coal tar blebs, plant fibers, and wood fragments.
	5					(59-60") PID = 67.8 ppm (73-74") PID = 10.6 ppm	CLAY	(65-80") LEAN CLAY (CL): ~90% plastic fines, ~10% fine sand, gray, wet.
	10							End of boring at 8.1'. Refusal.

NOTES: Environmental samples collected from S1(59-60") and S2(73-74").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.7
LOGGED BY: B. Fong-Murdock
DATE START/END: 11/15/2019 - 11/15/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 735

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.7	116/109	NA	(2-5") PID = 2.1 ppm	SAND	(0-19") SILTY SAND (SM): ~70% fine to medium sand, ~25% nonplastic fines, ~5% subrounded gravel up to 0.5", brown. Contains plant fibers and wood fragments.
							ORG	(19-25") SANDY ORGANIC SOIL (OL): ~70% medium plastic fines, ~30% fine sand, brown. Contains organic-like odor and plant fibers.
						(40-41") PID = 5.8 ppm	SAND	(25-50") SILTY SAND (SM): ~75% sand, ~20% medium plastic fines, ~5% subrounded gravel up to 1", brown-gray. Contains slight petroleum-like odor, slight organic-like odor, brick fragments, and wood fragments.
	5						ORGANICS	(50-84") SANDY ORGANIC SOIL (OL): ~55% medium plastic fines, ~40% fine sand, ~5% subangular gravel up to 1.5", brown-gray. Contains organic-like odor and plant fibers.
						(80-82") PID = 0.2 ppm		
						(94-95") PID = 0.0 ppm	CLAY	(84-109") LEAN CLAY (CL): ~70% medium plastic fines, ~15% nonplastic fines, ~10% fine sand. Contains plant fibers from 84-90".
	10							End of boring at 9.7'. Refusal.

NOTES: Environmental samples collected from S2(40-41"), S3(80-82"), and S4(94-95").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 7.5
LOGGED BY: B. Fong-Murdock
DATE START/END: 11/15/2019 - 11/15/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 736

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 7.5	90/90	NA	(2-4") PID = 0.3 ppm	ORGANICS	(0-31") SANDY ORGANIC SOIL (OL): ~65% low plastic fines, ~35% fine sand, red-brown. Contains slight petroleum-like odor, plant fibers, and wood fragments.
	5					(47-48") PID = 0.0 ppm	SILT	(31-90") SILT WITH SAND (ML): ~80% nonplastic fines, ~20% fine sand, gray.
						(88-89") PID = 0.0 ppm		End of boring at 7.5'. Refusal.
	10							

NOTES: Environmental samples collected from S1(2-4"), S2(47-48"), and S3(88-89").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.3
LOGGED BY: B. Fong-Murdock
DATE START/END: 11/15/2019 - 11/15/2019
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 737

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.3	112/103	NA	(102-103") PID = 47.3 ppm	SAND	(0-13") NARROWLY GRADED SAND WITH SILT (SP-SM): ~85% fine sand, ~10% nonplastic fines, ~5% subrounded gravel up to 0.75", gray-brown. Contains strong naphthalene-like odor, brick fragments, and wood fragments.
	5						ORGANICS	(13-103") ORGANIC SOIL WITH SAND (OL): ~75% medium plastic fines, ~25% fine sand, dark brown to black. Contains strong naphthalene-like odor, sheen, coal tar blebs, and wood fragments.
	10							End of boring at 9.3'. Refusal.

NOTES: Environmental sample collected from S1(102-103").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 8.2
LOGGED BY: B. Fong-Murdock
DATE START/END: 2/4/2020 - 2/4/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING

738

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 8.2	98/83	NA	(12-18") PID = 8.9 ppm	SAND	(0-31") SILTY SAND (SM): ~75% fine to coarse sand, ~15% nonplastic fines, ~10% subrounded gravel up to 0.25", dark brown, moist to wet. Contains petroleum-like odor and sheen from (12-18") and brick fragments.
						(42-44") PID = 0.1 ppm	ORGANICS	(31-66") ORGANIC SOIL WITH SAND (OL): ~75% medium plastic fines, ~25% fine to medium sand, brown, moist. Contains brick, plant fibers, shells.
	5						CLAY	(66-83") LEAN CLAY (CL): ~95% medium plastic fines, ~5% fine sand, gray, moist.
								End of boring at 8.2'. Refusal.
	10							

NOTES: Environmental samples collected from S1(12-18") and S2(42-44").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.0
LOGGED BY: B. Fong-Murdock
DATE START/END: 2/4/2020 - 2/4/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 739

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9	108/108	NA	(16-18") PID = 89.6 ppm	SAND	(0-12") SILTY SAND (SM): ~75% fine to coarse sand, ~25% nonplastic fines, dark brown to black, wet. Contains slight petroleum-like odor, wood fragments, plant fibers, brick, and trash.
							ORGANICS	(12-40") ORGANIC SOIL (OL): ~85% medium plastic fines, ~10% fine to coarse sand, ~5% subrounded gravel up to 0.5", dark brown. Contains petroleum-like odor, spots of sheen, trash, brick, wood, and plant fibers.
	5						VOID	(40-79") VOID FILLED WITH WATER.
						(91-93") PID= 1.7 ppm	ORGANIC	(79-104") ORGANIC SOIL (OL): ~85% medium plastic fines, ~10% fine to coase sand, ~5% subrounded gravel up to 0.5", dark brown. Contains petroleum-like odor, sheen at 92", trash, brick, wood, shells, and plant fibers.
						(104-108") PID= 0.1 ppm	CLAY	(104-108") LEAN CLAY: ~95% medium plastic fines, ~5% fine to coarse sand.
	10							End of boring at 9.0'. Refusal.

NOTES: Environmental samples collected from S1(16-18"), S2(91-93") and S3(104-108").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: B. Fong-Murdock
DATE START/END: 2/4/2020 - 2/4/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Jeff / Matt
RIG TYPE: 14-foot catamaran-style platform

BORING 740

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/110	NA	(6-20") PID = 0.8 ppm	SAND	(0-34") SILTY SAND (SM): ~85% fine to medium sand, ~15% nonplastic fines, tan, moist. Contains slight petroleum-like odor, a spot of sheen at 6", plant fibers, and wood fragments.
							ORGANICS	(34-66") ORGANIC SOIL WITH SAND (OL): ~75% medium plastic fines, ~15% fine sand, dark brown, moist. Contains plant fibers (increasing towards 66") and fabric at 64".
	5					(50-54") PID= 0.0 ppm		
						(74-78") PID= 0.0 ppm	SILT	(66-110") ELASTIC SILT WITH SAND (MH): ~75% low to medium plastic fines, ~15% fine sand, gray, moist.
	10							End of boring at 9.5'.

NOTES: Environmental samples collected from S1(6-20"), S2(50-54") and S3(74-78").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: P. Scordato
DATE START/END: 2/5/2020 - 2/5/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 741

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/114	NA	(11-13") PID = 63.9 ppm, Qp= 0 T/ft^2, Sv= 0.04 kg/cm^2 (35-37") PID= 0.4 ppm, Qp= 0.5 T/ft^2, Sv= 0.075 (53-55") PID= 0.3 ppm, Qp= 0 T/ft^2, Sv= 0.05 kg/cm^2 Qp= 0 T/ft^2, Sv= 0.07 kg/cm^2	ORGANICS	(0-25") ORGANIC SOIL WITH SAND (OL): ~80% low plastic fines, ~20% fine to medium sand, dark brown, moist. Contains slight petroleum-like odor and sheen from 11-14", and plant fibers. (25-44") SANDY ORGANIC SOIL (OL): ~50% nonplastic fines, ~50% fine to coarse sand, brown to light brown, moist. Contains plant fibers and interbedded layers of organic soil and sand (thicknesses vary from 0.1-1").
	5						SAND	(44-60") SILTY SAND (SM): ~75% fine to coarse sand, ~15% nonplastic fines, ~10% subangular gravel, light brown, moist.
							SAND/ORG.	(60-68") ORGANIC SOIL WITH SAND AND GRAVEL (OL): ~60% nonplastic fines, ~20% fine to coarse sand, ~20% subangular to subrounded gravel, brown, moist. Contains plant fibers.
								(68"-73") WIDELY GRADED SAND WITH GRAVEL (SW): ~80% fine to coarse sand, ~20% subangular gravel up to 2", light brown, moist.
							SILT	(73-114") SILT WITH SAND (ML): ~85% nonplastic fines, ~15% fine sand, gray, moist.
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental samples collected from S1(11-13"), S2(35-37") and S3(53-55").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: B. Fong-Murdock
DATE START/END: 2/4/2020 - 2/4/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 742

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/114	NA	(59-61") PID = 0.0 ppm	ORGANICS	(0-52") ORGANIC SOIL (OL): ~90% medium plastic fines, ~10% fine sand, brown, moist. Contains plant fibers and wood fragments.
	5						SAND	(52-72") SILTY SAND (SM): ~60% fine sand, ~40% nonplastic to low plastic fines, dark gray, moist.
							ORGANICS	(72-91") ORGANIC SOIL (OL): Similar to (0-52").
							SAND	(91-114") SILTY SAND (SM): ~75% fine to medium sand, ~25% nonplastic fines, tan, moist. Contains wood fragments and plant fibers.
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental sample collected from S1(59-61").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 8.9
LOGGED BY: B. Fong-Murdock
DATE START/END: 2/4/2020 - 2/4/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 743

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 8.9	107/104	NA	S1(23-25") PID = 0.1 ppm	ORGANICS	(0-42") ORGANIC SOIL WITH SAND (OL): ~85% low plastic fines, ~10% fine sand, ~5% subrounded gravel up to 0.25", brown, moist. Contains plant fibers and wood fragments.
	5					S2(59-61") PID = 0.0 ppm	SAND	(42-76") WIDELY GRADED SAND WITH SILT (SW-SM): ~75% fine to coarse sand, ~20% nonplastic fines, ~5% subrounded gravel up to 0.25", tan, moist. Contains plant fibers and wood fragments.
						S3(83-85") PID = 0.0 ppm	SILT	(76-85") ELASTIC SILT WITH SAND (MH): ~80% medium plastic fines, ~20% fine sand, gray, moist.
	10							End of boring at 8.9'. Refusal.

NOTES: Environmental samples collected from S1(23-25"), S2(59-61") and S3(83-85").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: P. Scordato
DATE START/END: 2/5/2020 - 2/5/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING

744

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/108	NA	(23-25") PID = 0.0 ppm, Qp= 0 T/ft^2, Sv= 0.04 kg/cm^2	ORGANICS	(0-44") ORGANIC SOIL WITH SAND (OL): ~85% nonplastic fines, ~15% fine to medium sand, brown, moist. Contains plant fibers, wood fragments, layer of peat from (25"-27").
	5					(47-49") PID = 0.0 ppm, Qp= 0.5 T/ft^2, Sv= 0.0 ppm, Qp=0.5 T/ft^2, Sv= 0.1 kg/cm^2	SAND	(40-71") WIDELY GRADED SAND WITH SILT (SW-SM): ~80% fine to coarse sand, ~10% subangular to subrounded gravel up to 0.5", 10% nonplastic fines, brown. Contains wood fragments and plant fibers.
						(74-76") PID = 0.1 ppm, Qp= 2.0 T/ft^2, Sv= 0.3 kg/cm^2	SILT	(71-104") SILT (ML): ~90% low plastic fines, ~10% fine sand, gray, moist. Contains some bluish color.
								(104-108") SILT (ML): ~90% low plastic fines, ~10% fine sand, gray, moist. Contains light brown to bluish-gray color at about 90 inches and more elastic than above layer.
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental samples collected from S1(23-25"), S2(47-49") and S3(74-76").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 8.2
LOGGED BY: P. Scordato
DATE START/END: 2/4/2020 - 2/4/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING

745

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 8.2	98/94	NA	(0-2") PID = 6.1 ppm	ORGANICS	(0-40") ORGANIC SOIL WITH SAND (OL): ~85% low plastic fines, ~15% fine to medium sand, brown, moist. Contains slight petroleum-like odor from 0-7", plant fibers, and roots.
	5					(44-47") PID = 0.0 ppm	SILT	(40-71") SILT WITH SAND (ML): ~80% nonplastic fines, ~20% fine to medium sand, gray to dark, moist.
						(83-85") PID = 0.0 ppm		(71-94") ELASTIC SILT (MH): ~95% medium plastic fines, ~5% fine sand, gray with reddish streaking, moist.
	10							End of boring at 8.2'. Refusal.

NOTES: Environmental samples collected from S1(0-2"), S2(44-47") and S3(83-85").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 7.8
LOGGED BY: P. Scordato
DATE START/END: 2/5/2020 - 2/5/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 746

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 7.8	94/84	NA	(23-25") PID = 3.9 ppm, Qp= 0 T/ft^2, Sv= 0.06 kg/cm^2 (44-47") PID = 0.1 ppm, Qp= 1.5 T/ft^2, Sv= 0.1 kg/cm^2 (55-61") PID = 0.4 ppm, Qp= 0.75 T/ft^2, Sv= 0.3 kg/cm^2	ORGANICS	(0-38") ORGANIC SOIL WITH SAND (OL): ~80% nonplastic fines, ~20% fine to coarse sand, brown, wet. Contains slight petroleum-like odor from 0-31".
							SAND	(38-50") SILTY SAND (SM): ~75% fine to medium sand, ~20% nonplastic fines, ~5% subrounded gravel up to 0.25", brown, wet. Contains plant fibers and wood fragments.
	5						CLAY	(50-71") LEAN CLAY WITH SAND (CL): ~70% medium plastic fines, ~20% fine to coarse sand, ~10% subrounded to subangular gravel up to 0.25", bluish gray, wet. Contains plant fibers and wood fragments.
							ORGANICS	(71"-84") ORGANIC SOIL WITH SAND (OL): ~85% nonplastic fines, ~15% fine to coarse sand, brown to gray, moist.
	10							End of boring at 7.8'. Refusal.

NOTES: Environmental samples collected from S1(23-25"), S2(44-47") and S3(55-61").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: P. Scordato
DATE START/END: 2/4/2020 - 2/4/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 747

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/108	NA	(42-44") PID = 0.0 ppm	ORGANICS	(0-60") ORGANIC SOIL WITH SAND (OL): ~80% low plastic fines, ~20% fine to medium sand, brown, moist. Contains plant fibers and wood fragments.
	5					(78-80") PID = 0.0 ppm	SILT	(60-108") ELASTIC SILT WITH SAND (MH): ~85% medium plastic fines, ~15% fine to medium sand, gray, moist.
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental samples collected from S1(42-44") and S2(78-80").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: P. Scordato
DATE START/END: 2/5/2020 - 2/5/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 748

PAGE 1 of 1

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
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LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/114	NA	(30-32") PID = 2.6 ppm, Qp= 0 T/ft^2, Sv= 0.08 kg/cm^2	ORGANICS	(0-44") ORGANIC SOIL (OL): ~90% nonplastic fines, ~10% fine to medium sand, brown, moist. Contains slight petroleum-like and naphthalene-like odor, sheen, plant fibers, and wood fragments.
						(52-54") PID = 0.0 ppm, Qp= 0 T/ft^2, Sv= 0.125 kg/cm^2	SAND	(44-58") WIDELY GRADED SAND WITH GRAVEL (SW): ~80% fine to coarse sand, ~20% subangular to subrounded gravel up to 1", light brown, moist. Contains petroleum-like odor from 44-46" and plant fibers.
	5					(66-68") PID = 0.0 ppm, Qp= 1.5 T/ft^2, Sv= 0.1 kg/cm^2	SILT	(58-82") SANDY SILTY (ML): ~60% nonplastic fines, ~30% fine to coarse sand, ~10% subangular to subrounded gravel up to 3", gray, moist.
						(104-106") Grain Size Sample, Qp= 0.75 T/ft^2, Sv= 0.5 kg/cm^2	CLAY	(82-114") LEAN CLAY (CL): ~100% medium plastic fines, gray with reddish oxidation tint from 96-114".
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental samples collected from S1(30-32"), S2(52-54"), S3(66-68") and S4(104-106").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.0
LOGGED BY: P. Scordato
DATE START/END: 2/3/2020 - 2/3/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 749

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9	108/102	NA		ORGANICS	(0-26") ORGANIC SOIL WITH SAND (OL): ~80% low plastic fines, ~20% fine to coarse sand, brown, moist. Contains plant fibers, brick, wood fragments and shells.
							SILT	(26-60") SANDY SILT (ML): ~70% nonplastic fines, ~30% fine to coarse sand, brown, moist. Contains slight petroleum-like odor, plant fibers, brick, and glass.
	5					(49-51") PID = 0.5 ppm	ORG.	(60-70") ORGANIC SOIL (OL): ~90% low plastic fines, 10% nonplastic fines, brown, moist.
							SAND	(70-84") SILTY SAND (SM): ~60% fine to coarse sand, ~30% nonplastic fines, ~10% gravel, brown, moist. Contains brick and plant fibers.
							SILT	(84-102") GRAVELLY SILT (ML): ~60% nonplastic fines, ~35% subangular gravel up to 1", ~5% fine to coarse sand, gray, slightly moist.
						(96-98") PID = 0.0 ppm		
	10							End of boring at 9.0'. Refusal.

NOTES: Environmental samples collected from S1(49-51") and S2(96-98").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 8.5
LOGGED BY: P. Scordato
DATE START/END: 2/3/2020 - 2/3/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 750

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 8.5	102/86	NA	(10-12") PID = 0.0 ppm	ORGANICS	(0-22") ORGANIC SOIL (OL): ~90% nonplastic fines, ~5% fine to coarse sand, ~5% subangular gravel, black to brown, wet. Contains slight petroleum-like odor and hydrogen-sulfide like odor, wood fragments, plant fibers, shells, and glass.
						(24-26") PID = 0.0 ppm	SILT	(22-60") SILT (ML): ~90% low plastic fines, ~10% fine sand, gray, moist. Contains plant fibers.
	5							(60-86") GRAVELLY SILT WITH SAND (ML): ~60% nonplastic fines, ~20% subangular gravel, ~20% fine to coarse sand, gray.
								End of boring at 8.5'. Refusal.
	10							

NOTES: Environmental samples collected from S1(10-12") and S2(24-26").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: P. Scordato
DATE START/END: 2/3/2020 - 2/3/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 751

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/108	NA	(25-28") PID = 2.5 ppm (50-53") PID = 0.2 ppm (88-90") PID = 0.1 ppm	ORGANICS	(0-83") ORGANIC SOIL WITH SAND (OL): ~85% nonplastic fines, ~15% fine to coarse sand, black to brown, wet. Contains slight petroleum-like odor from 25-47", fabric material, darker peat material from 47-83", and plant fibers.
	5						CLAY	(83-108") LEAN CLAY WITH SAND: ~85% medium plastic fines, ~15% fine sand, gray. First ~9" of this layer is nonplastic.
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental samples collected from S1(25-28"), S2(50-53") and S3(88-90").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: P. Scordato
DATE START/END: 2/3/2020 - 2/3/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 752

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/114	NA		SILT	(0-17") SANDY SILT WITH GRAVEL (ML): ~60% nonplastic fines, ~25% fine to coarse sand, ~15% subangular gravel, brown, moist. Contains slight naphthalene-like odor and brick.
						(25-28") PID = 5.1 ppm	ORGANICS	(17-71") SANDY ORGANIC SOIL (OL): ~70% nonplastic fines, ~25% fine to coarse sand, ~5% subangular gravel, brown, moist. Contains naphthalene-like odor, brick, and plant fibers.
	5					(59-61") PID = 0.2 ppm		
						(80-83") PID = 0.5 ppm	SILT	(71-78") SANDY SILT (ML): ~60% nonplastic fines, ~35% fine to coarse sand, ~5% subangular gravel, light brown. Contains brick. (78-114") SILT WITH SAND (ML): ~80% nonplastic fines, ~20% fine sand, gray, moist.
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental samples collected from S1(25-28"), S2(59-61") and S3(80-83").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.6
LOGGED BY: B. Fong-Murdock
DATE START/END: 2/4/2020 - 2/4/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 753

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.6	115/115	NA	(16-18") PID = 1.1 ppm	ORGANICS	(0-44") ORGANIC SOIL WITH SAND (OL): ~75% low plastic fines, ~25% fine to coarse sand, brown, moist. Contains very light petroleum-like odor, plant fibers, and wood.
	5					(49-52") PID = 0.0 ppm	SILT	(44-94") ELASTIC SILT WITH SAND(MH): ~85% low plastic fines, ~15% fine sand, gray, moist.
							ORGANICS	(94-115") ORGANIC SOIL WITH SAND (OL): Similar to (0-44").
	10							End of boring at 9.6'. Refusal.

NOTES: Environmental samples collected from S1(16-18") and S2(49-52").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: P. Scordato
DATE START/END: 2/5/2020 - 2/5/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 754

PAGE 1 of 1

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/114	NA	(47-49") PID = 7.2 ppm, Qp= 0 T/ft^2, Sv= 0.04 kg/cm^2	ORGANICS	(0-103") ORGANIC SOIL WITH SAND (OL): ~85% nonplastic fines, ~15% fine to medium sand, brown, wet. Contains petroleum-like odor from 0-74", sheen from 37-65", wood fragments, and plant fibers. Becomes more sandy from 98-103" and contains peat from 48-55".
	5					(101-103") PID = 0.2 ppm, Qp= 0, Sv= 0.1 kg/cm^2	CLAY	(103-114") LEAN CLAY (CL): ~100% medium plastic fines, gray, wet.
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental samples collected from S1(47-49") and S2(101-103").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.9
LOGGED BY: P. Scordato
DATE START/END: 2/4/2020 - 2/4/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING

755

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.9	119/114	NA	(20-23") PID = 0.1 ppm, Qp= 0.0 T/ft^2, Sv= 0.03 kg/cm^2 (38-41") PID = 3.2 ppm, Qp= 0.25 T/ft^2, Sv= 0.1 kg/cm^2 (70-72") PID = 5.7 ppm, Qp= 0.5 T/ft^2, Sv= 0.1 kg/cm^2	ORGANICS	(0-106") SANDY ORGANIC SOIL (OL): ~70% nonplastic fines, ~30% fine to coarse sand, brown, moist. Contains petroleum-like odor and sheen from (0-25"), hydrogen sulfide-like odor at 25", wood fragments, and plant fibers. Becomes more sandy towards the bottom.
	5						CLAY	(106-114") LEAN CLAY (CL): ~100% medium plastic fines, gray, moist.
	10							End of boring at 9.9'. Refusal.

NOTES: Environmental samples collected from S1(20-23"), S2(38-41") and S3(70-72").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: P. Scordato
DATE START/END: 2/5/2020 - 2/5/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 756

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/114	NA	(18-20") PID = 38.3 ppm, Qp= 0 T/ft^2, Sv= 0.04 kg/cm^2	ORGANICS	(0-31") ORGANIC SOIL WITH SAND (OL): ~80% nonplastic fines, ~20% fine to medium sand, brown, moist. Contains slight petroleum-like odor, plant fibers, and wood fragments.
	5					(43-46") PID = 0.3 ppm, Qp= 0, Sv= 0.05 kg/cm^2 (60-65") PID = 0.1 ppm, Qp= 0 T/ft^2, Sv= 0.05 kg/cm^2	SAND	(31-114") SILTY SAND (SM): ~75% fine to coarse sand, ~20% nonplastic fines, ~5% subangular to subrounded gravel up to 1", light brown, wet. Contains plant fibers, wood fragments, and brick.
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental samples collected from S1(18-20"), S2(43-46") and S3(60-65").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 8.7
LOGGED BY: P. Scordato
DATE START/END: 2/5/2020 - 2/5/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING

757

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
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S = Split Spoon Sample
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HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 8.7	104/92	NA	(19-22") PID = 16.6 ppm, Qp= 0.25 T/ft^2, Sv= 0.1 kg/cm^2 (42-47") PID = 0.6 ppm, Qp= 0 T/ft^2, Sv= 0.05 kg/cm^2 (68-71") PID = 0.2 ppm, Qp= 0, Sv= 0.05 kg/cm^2	ORGANICS	(0-92") ORGANIC SOIL WITH SAND (OL): ~70% nonplastic fines, ~25% fine to coarse sand, ~5% subangular gravel up to 0.25", brown to black, wet. Contains petroleum-like odor and sheen from 0-49", black staining, wood fragments, and plant fibers. Strongest petroleum-like odor, sheen, and black staining from 19-43". Petroleum-like odor and sheen diminishes from 43-49".
	5							
	10							End of boring at 8.7'. Refusal.

NOTES: Environmental samples collected from S1(19-22"), S2(42-47") and S3(68-71").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 8.3
LOGGED BY: P. Scordato
DATE START/END: 2/5/2020 - 2/5/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING

758

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
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S = Split Spoon Sample
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SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 8.3	100/94	NA	(1-4") PID = 0.0 ppm, Qp= 0 T/ft^2, Sv= 0.05 kg/cm^2 (52-56") PID = 0.0 ppm, Qp= 0 T/ft^2, Sv= 0.225 kg/cm^2 (91-93") PID = 0.0 ppm, Qp= 0 T/ft^2, Sv= 0.1 kg/cm^2	CLAY	(0-6") LEAN CLAY WITH GRAVEL (CL): ~80% medium to high plastic fines, ~20% subangular gravel up to 0.25", gray, wet. (6-94") LEAN CLAY (CL): ~100% medium to high plastic fines, gray, wet.
	5							End of boring at 8.3'. Refusal.
	10							

NOTES: Environmental samples collected from S1(1-4"), S2(52-56") and S3(91-93").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.6
LOGGED BY: P. Scordato
DATE START/END: 3/9/2020 - 3/9/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 759

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.6	115/113	NA	(0-4") PID = 4.0 ppm	SAND	(0-10") SILTY SAND (SM): ~80% fine to coarse sand, ~20% nonplastic fines, brown, moist. Contains slight petroleum-like odor, brick and plant fibers.
							SILT	(10-18") ELASTIC SILT (MH): ~70% low plastic fines, ~30% fine sand, gray, moist.
							SAND	(18-36") SILTY SAND (SM): ~80% fine to coarse sand, ~15% nonplastic fines, ~5% subangular gravel up to 0.5", brown, moist. Contains brick and plant fibers
								(36-46") SILTY SAND (SM): ~70% fine sand, ~30% nonplastic fines, gray, moist.
						(50-52") PID = 41.9 ppm		(46-84") SILTY SAND (SM): ~80% fine to coarse sand, ~20% nonplastic fines, light brown, moist. Contains brick, plant fibers, and wood fragments.
	5						SILT	(84-114") SANDY SILT (ML): ~60% nonplastic fines, ~40% fine sand, gray, moist.
						(92-94") PID = 16.2 ppm		
	10							End of boring at 9.6'. Refusal.

NOTES: Environmental samples collected from S1(0-4"), S2(50-52") and S3(92-94").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: P. Scordato
DATE START/END: 3/9/2020 - 3/9/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 760

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/108	NA	(0-4") PID = 0.2 ppm	SAND	(0-19") SILTY SAND (SM): ~70% fine to medium sand, ~25% nonplastic fines, ~5% subangular gravel up to 0.25", brown, moist. Contains plant fibers.
								(19-76") WIDELY GRADED SAND (SW): ~90% fine to coarse sand, ~5% nonplastic fines, ~5% subangular gravel up to 1.75", brown, moist. Contains wood and brick fragments.
						(41-43") PID = 0.3 ppm		
	5					(72-76") PID = 1.4 ppm		
								(76-94") SILTY SAND (SM): ~70% fine to medium sand, ~30% nonplastic fines, brown, moist. Contains plant fibers.
							SILT	(94-108") SANDY SILT (ML): ~60% nonplastic fines, ~40% fine sand, gray, moist.
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental samples collected from S1(0-4"), S2(41-43") and S3(72-76").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Mudflat
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.0
LOGGED BY: P. Scordato
DATE START/END: 3/9/2020 - 3/9/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 761

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9	108/101	NA	(4-6") PID = 19.6 ppm	SAND	(0-16") WIDELY GRADED SAND WITH SILT AND GRAVEL (SW-SM): ~50% fine to coarse sand, ~40% subangular to subrounded gravel up to 1.25", ~10% nonplastic fines, brown, moist. Contains brick and slag fragments. (16-37") SILTY SAND (SM): ~60% fine to coarse sand, ~40% nonplastic fines, brown, moist. Contains plant fibers.
						(28-30") PID = 4.5 ppm		
	5					(37-82") SILTY SAND (SM): ~75% fine to coarse sand, ~15% nonplastic fines, ~10% subrounded gravel up to 1.25", light brown, moist. Contains brick, plant fibers, and wood fragments. (61-64") PID = 2.6 ppm (65-67") PID = 1.9 ppm		
							CLAY	(82-101") LEAN CLAY (CL): ~95% medium plastic fines, ~5% fine sand, gray, moist.
	10							End of boring at 9.0'. Refusal.

NOTES: Environmental samples collected from S1(4-6"), S2(28-30"), S3(61-64") and S4(65-67").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 6.5
LOGGED BY: P. Scordato
DATE START/END: 3/9/2020 - 3/9/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING

762

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 6.5	78/66	NA	(0-4") PID = 0.4 ppm (23-25") PID = 0.5 ppm (35-37") PID = 0.3 ppm	SAND	(0-53") SILTY SAND (SM): ~60% fine to medium sand, ~40% nonplastic fines, brown to light brown, moist. Contains plant fibers and wood fragments.
	5						WOOD	(53-59") WOOD: Solid piece of wood, orange, moist.
							SAND	(59-66") WIDELY GRADED SAND WITH SILT (SW-SM): ~90% fine to coarse sand, ~10% nonplastic fines, gray, moist. Contains wood fragments.
	10							End of boring at 6.5'. Refusal.

NOTES: Environmental samples collected from S1(0-4"), S2(23-25") and S3(35-37").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: P. Scordato
DATE START/END: 3/9/2020 - 3/9/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 763

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/113	NA	(0-13") Qp= 0.0 T/ft^2, Sv= 0.4 kg/cm^2 (13-18") Qp= 0.0 T/ft^2, Sv= .15 kg/cm^2 (18-47") Qp= 0.25 T/ft^2, Sv= 3.0 kg/cm^2 (22-24") PID = 9.0 ppm, Qp= 0.0 T/ft^2, Sv= .4 kg/cm^2 (47-113") Qp= 1.0 T/ft^2, Sv= 3.0 kg/cm^2 (60-62") PID = 0.8 ppm, Qp= 0.25 T/ft^2, Sv= 3.0 kg/cm^2 (88-90") PID = 0.9 ppm, Qp= 1.0 T/ft^2, Sv= 3.0 kg/cm^2	SAND	(0-13") SILTY SAND (SM): ~60% fine to medium sand, ~40% nonplastic fines, brown, moist. Contains slight petroleum-like odor, and plant fibers. (13-19") WIDELY GRADED SAND WITH SILT (SW-SM): ~85% fine to coarse sand, ~10% nonplastic fines, ~5% subrounded gravel up to 0.5", gray to brown, moist. Contains slight petroleum-like odor. (19-47") SILTY SAND (SM): ~70% fine to medium sand, ~25% nonplastic fines, 5% subrounded gravel up to 0.5", brown to gray, moist. Contains petroleum-like odor 19-24", plant fibers, and wood fragments.
	5						SILT	(47"-113") SANDY SILT (ML): ~70% nonplastic fines, ~25% fine sand, ~5% subrounded gravel up to 0.75", gray, moist.
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental samples collected from S1(22-24"), S2(60-62") and S3(88-90").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River

GROUND SURFACE EL. (ft): NM | **DATE START/END:** 3/9/2020 - 3/9/2020

VERTICAL DATUM: NM | **DRILLING COMPANY:** TG & B

TOTAL DEPTH (ft): 9.4 | **DRILLER NAME:** Mark/Matt/Jim

LOGGED BY: P. Scordato | **RIG TYPE:** 14-foot catamaran-style platform

BORING 764

DRILLING INFORMATION

HAMMER TYPE: NA | **CASING I.D./O.D.:** NA / NA | **CORE BARREL TYPE:** Core-tube

AUGER I.D./O.D.: NA / NA | **DRILL ROD O.D.:** NM | **CORE BARREL I.D./O.D.** 2.625 inch / 2.75 inch

DRILLING METHOD: Vibracore

WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:

Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer

S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger

Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter

NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.4	113/96	NA	(2-5") PID = 1.4 ppm, Qp= 0.5 T/ft^2, Sv= 1.0 kg/cm^2	SAND	(0-16")SILTY SAND WITH GRAVEL GRAVEL (SM): ~70% fine to coarse sand, ~15% nonplastic fines, ~15% subrounded gravel up to 1.25", brown, moist. Contains plant fibers.
						(16-76") Qp= 0.25 T/ft^2, Sv= 1.0 kg/cm^2		(16-76") SILTY SAND (SM): ~70% fine sand, ~30% non-plastic fines, brown, moist. Contains plant fibers and wood fragments.
	5					(55-58") PID = 0.7 ppm		
						(76-96") Qp= 1.25 T/ft^2, Sv= 1.5 kg/cm^2	SILT	(76-92") SANDY SILT (ML): ~60% nonplastic fines, ~40% fine to medium sand, grayish brown, moist.
						(86-89") PID = 0.5 ppm, Qp= 1.25 T/ft^2, Sv= 1.5 kg/cm^2	SAND	(92-96") NARROWLY GRADED SAND (SP): ~95% fine to medium sand, ~5% nonplastic fines, light gray, moist.
	10							End of boring at 9.4'. Refusal.

NOTES: Environmental samples collected from S1(2-5"), S2(55-58") and S3(86-89").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: P. Scordato
DATE START/END: 3/10/2020 - 3/10/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 765

PAGE 1 of 1

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/104	NA	(6-8") PID = 0.2 ppm, Qp= 0.5 T/ft^2, Sv= 0.5 kg/cm^2	SILT	(0-91") SILT WITH SAND (ML): ~75% nonplastic fines, ~25% fine to medium sand, light brown to brown. Contains plant fibers and wood fragments.
	5					(46-48") PID = 0.1 ppm		
						(98-100") PID = 0.1 ppm, Qp= 0.25 T/ft^2, Sv= 1.5 kg/cm^2		(91"-104") SILT (ML): ~95% low plastic fines, ~5% fine sand, gray, moist.
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental samples collected from S1(6-8"), S2(46-48") and S3(98-100").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: P. Scordato
DATE START/END: 3/10/2020 - 3/10/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 766

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/104	NA	(8-10") PID = 3.2 ppm (46-48") PID = 26.4 ppm	SAND	(0-61") SILTY SAND (SM): ~60% fine to coarse sand, ~40% nonplastic fines, brown to dark brown, moist. Contains naphthalene-like odor from 25-61", sheen from 41-61", brick fragments, and plant fibers.
	5					(78-80") PID = 1.1 ppm (88-90") PID = 0.7 ppm	SILT	(61-104") SILT WITH SAND (ML):~80% nonplastic fines, ~20% fine to medium sand, brown to gray, moist. Contains plant fibers and wood fragments.
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental samples collected from S1(8-10"), S2(46-48"), S3(78-80") and S4(88-90").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: P. Scordato
DATE START/END: 3/10/2020 - 3/10/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING

767

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/113	NA	(0-96") Qp= 0.0 T/ft^2, Sv= 0.5 kg/cm^2	SILT	(0-96") SANDY SILT (ML): ~75% nonplastic fines, ~25% fine to coarse sand, brown to light brown, moist. Contains slight petroleum-like odor from 0-24" and from 36-43", sheen from 36-43", plant fibers, and wood fragments.
	5					(40-42") PID = 3.2 ppm		
						(77-79") PID = 0.5 ppm		
						(101-103") PID = 0.0 ppm, Qp= 1.25 T/ft^2, Sv= 0.1 kg/cm^2		(96-113") SILT (ML): ~95% nonplastic fines, ~5% fine sand, gray, moist.
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental samples collected from S1(40-42"), S2(77-79") and S3(101-103").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: P. Scordato
DATE START/END: 3/10/2020 - 3/10/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 768

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/113	NA	(7-9") PID = 0.8 ppm, Qp= 1.0 T/ft^2, Sv= 0.5 kg/cm^2 (53-55") PID = 0.0 ppm (94-96") PID = 0.0 ppm	SILT	(0-113") SANDY SILT (ML): ~70% nonplastic fines, ~30% fine to medium sand, brown, moist. Contains plant fibers and wood fragments.
	5							
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental samples collected from S1(7-9"), S2(53-55") and S3(94-96").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: P. Scordato
DATE START/END: 3/11/2020 - 3/11/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING

769

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/113	NA	(0-85") Qp= 1.25 T/ft^2, Sv= 0.5 kg/cm^2	SILT	(0-85") SANDY SILT (ML): ~60% nonplastic fines, ~40% fine to medium sand, brown to gray, moist. Contains slight petroleum-like odor from 61-85", brick, plant fibers, and wood fragments.
	5					(68-70") PID = 3.6 ppm		
						(85-111") Qp= 2.25 T/ft^2, Sv= 2.5 kg/cm^2		(85-112") SILT WITH SAND (ML): ~85% nonplastic fines, ~15% fine sand, gray, moist.
						(94-96") PID = 0.2 ppm		
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental samples collected from S1(68-70") and S2(94-96").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: P. Scordato
DATE START/END: 3/10/2020 - 3/10/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING

770

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/112	NA	(12-14") PID = 0.1 ppm, (0-64") Qp1.0 T/ft^2, Sv= 1.0 kg/cm^2		(0-64") SANDY SILT (ML): ~60% nonplastic fines, ~40% fine to coarse sand, brown to light brown, moist. Contains wood fragments and plant fibers.
	5					(52-54") PID = 0.0 ppm Qp= 0.0 T/ft^2, Sv= 0.5 kg/cm^2	SILT	(64-112") SILT (ML): ~95% nonplastic fines, ~5% fine sand, gray, moist.
						(108-110") PID = 0.0 ppm		
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental samples collected from S1(12-14"), S2(52-54") and S3(108-110").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: P. Scordato
DATE START/END: 3/10/2020 - 3/10/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 771

PAGE 1 of 1

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/113	NA	(0-2") PID = 1.1 ppm, (0-20") Qp= 0.0 T/ft^2, Sv= 0.2 kg/cm^2	SAND	(0-20") WIDELY GRADED SAND WITH SILT (SW-SM): ~80% fine to coarse sand, ~10% nonplastic fines, ~10% subangular to subrounded gravel up to 1.25", dark brown, moist. Contains brick and wood fragments.
						(31-33") PID = 0.0 ppm, (20-41") Qp= 0.75 T/ft^2, Sv= 1 kg/cm^2	SILT	(20-41") SANDY SILT (SM): ~70% nonplastic fines, ~25% fine to coarse sand, ~5% subrounded gravel, increasing gravel toward the bottom, brown to light brown, moist. Contains wood fragments and plant fibers.
	5					(60-62") PID = 0.0 ppm, (41-113") Qp= 0.75 T/ft^2, Sv= 1 kg/cm^2	CLAY	(41-113") LEAN CLAY (CL): ~95% low to medium plastic fines, ~5% fine sand, orangish gray, moist.
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental samples collected from S1(0-2"), S2(31-33") and S3(60-62").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: P. Scordato
DATE START/END: 3/10/2020 - 3/10/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING

772

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/113	NA	(0-2") PID = 7.7 ppm, (0-21") Qp= 0.0 T/ft^2, Sv= 0.3 kg/cm^2 (18-20") PID = 0.1 ppm (21-113") Qp= 0.25 T/ft^2, Sv= 2.0 kg/cm^2 (28-30") PID = 0.0 ppm	SAND	(0"-20") SILTY SAND (SM): ~70% fine to coarse sand, ~25% nonplastic fines, ~5% subangular to subrounded gravel up to 2", brown, moist. Contains petroleum-like odor that decreases with depth, brick, and wood fragments.
	5						CLAY	(20-113") LEAN CLAY (CL): ~95% low to medium plastic fines, ~5% fine sand, gray, moist.
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental samples collected from S1(0-2"), S2(18-20") and S3(28-30").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: P. Scordato
DATE START/END: 3/10/2020 - 3/10/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 773

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
	5	1	0 to 9.5	114/112	NA	(74-76") PID = 31.2	SAND	(0- 112") SILTY SAND (SM): ~60% fine to coarse sand, ~40% nonplastic fines, brown, moist. Contains petroleum-like odor from 24-112", sheen from 42-43" and 74-79", black staining from 74-79", brick, plant fibers, and wood fragments.
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental sample collected from S1(74-76").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: P. Scordato
DATE START/END: 3/11/2020 - 3/11/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 774

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/112	NA	(0-14") PID = 0.1 ppm (29-31") PID = 26.9 ppm (67-69") PID = 6.5 ppm (95-97") PID = 0.2 ppm	SILT	(0-112") SANDY SILT (ML): ~70% nonplastic fines, ~30% fine to coarse sand, brown, moist. Contains petroleum-like odor from 29-89", sheen at 29" and 36", brick, plant fibers, and wood fragments.
	5							
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental samples collected from S1(0-14"), S2(29-31"), S3(67-69") and S4(95-97").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: P. Scordato
DATE START/END: 3/11/2020 - 3/11/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING

775

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
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HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/112	NA	(0-104") Qp= 0.0 T/ft^2 (12-14") PID = 5.2 ppm (46-48") PID = 20.4 ppm (74-76") PID = 2.4 ppm (104-112") Qp= 0.75 T/ft^2 (107-109") PID = 0.1 ppm	SILT	(0-104") SANDY SILT (ML): ~75% nonplastic fines, ~25% fine to medium sand, brown to light brown, moist. Contains slight petroleum-like odor from 0-80", slight sheen from 46-61", brick, plant fibers, and wood fragments. (104-112") SILT (ML): ~90% nonplastic fines, ~10% fine sand, gray, moist.
	5							
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental samples collected from S1(12-14"), S2(46-48"), S3(74-76") and S4(107-109").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: P. Scordato
DATE START/END: 3/11/2020 - 3/11/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 776

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/104	NA	(0-54") Qp= 1.0 T/ft^2, Sv= 0.5 kg/cm^2 (10-12") PID = 93.9 ppm (31-33") PID = 0.2 ppm		(0-54") SANDY SILT (ML): ~60% nonplastic fines, ~35% fine to coarse sand, ~5% subrounded gravel up to 2", light brown, moist. Contains slight petroleum-like odor from 0-12", slight sheen from 9-12", plant fibers, and wood fragments.
	5					(54-104") Qp= 0.5 T/ft^2, Sv= 2.0 kg/cm^2 (60-62") PID = 0.3 ppm	SILT	(54-104") SILT (ML): ~95% nonplastic fines, ~5% fine sand, gray, moist.
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental samples collected from S1(10-12"), S2(31-33") and S3(60-62").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: P. Scordato
DATE START/END: 3/11/2020 - 3/11/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 777

PAGE 1 of 1

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/100	NA		SAND	(0"-28") SILTY SAND (SM): ~70% fine to medium sand, ~30% nonplastic fines, light brown, moist. Contains plant fibers and wood fragments.
						(35-37") PID = 76.3 ppm	SILT	(28-44") SILT WITH SAND (ML): ~75% nonplastic fines, ~25% fine sand, brown, moist. Contains petroleum-like odor, sheen from 34-44", and wood fragments
							SAND	(44-59") SILTY SAND (SM): ~70% fine to medium sand, ~30% nonplastic fines, light brown, moist. Contains petroleum-like odor, plant fibers and wood fragments.
	5					(70-72") PID = 17.5 ppm	SILT	(59-80") SILT WITH SAND (ML): ~85% nonplastic fines, ~15% fine sand, brown, moist. Contains petroleum-like odor, sheen from 70-72", and plant fibers.
						(90-92") PID = 0.6 ppm		(80-100") SILT (ML): ~90% nonplastic fines, ~10% fine sand, gray, moist.
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental samples collected from S1(35-37"), S2(70-72") and S3(90-92").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: P. Scordato
DATE START/END: 3/11/2020 - 3/11/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 778

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/98	NA		SAND	(0-20") SILTY SAND (SM): ~60% fine to medium sand, ~40% nonplastic fines, brown, moist. Contains plant fibers.
						(29-31") PID = 0.5 ppm	SILT	(20-42") SILT WITH SAND (ML): ~80% nonplastic fines, ~20% fine to medium sand, brown, moist. Contains petroleum-like odor, sheen from 32-37", and plant fibers.
							SAND	(42-58") SILTY SAND (SM): ~75% fine to medium sand, ~25% nonplastic fines, light brown, moist. Contains plant fibers.
	5					(68-71") PID = 27.8 ppm	SILT	(58-82") SANDY SILT (ML): ~70% nonplastic fines, ~30% fine to medium sand, brown, moist. Contains naphthalene-like odor, sheen from 70-73", brick fragments, and plant fibers.
						(83-85") PID = 0.5 ppm		(82-98") SILT (ML): ~90% low plastic fines, ~10% fine sand, gray, moist.
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental samples collected from S1(29-31"), S2(68-71") and S3(83-85").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: P. Scordato
DATE START/END: 3/11/2020 - 3/11/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING

779

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
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SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/113	NA	(13-16") PID = 0.3 ppm (46-48") PID = 0.1 ppm (98-100") PID = 0.2 ppm	SILT	(0-59") SILT WITH SAND (ML): ~80% nonplastic fines, ~20% fine to medium sand, brown, moist. Contains plant fibers and wood fragments.
	5						SAND	(59-79") WIDELY GRADED SAND WITH SILT (SW-SM): ~90% fine to coarse sand, ~10% nonplastic fines, light brown to gray, moist. Contains plant fibers and wood fragments.
							SILT	(79-83") SILT (ML): ~90% nonplastic fines, ~10% fine sand, gray, moist.
							SAND	(83-95") WIDELY GRADED SAND WITH GRAVEL (SM): ~65% fine to coarse sand, ~30% subangular to subrounded up to 0.25", ~5% nonplastic fines, gray, moist.
							SILT	(95-113") SILT (ML): ~90% nonplastic fines, ~10% fine sand, gray, moist.
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental samples collected from S1(13-16"), S2(46-48") and S3(98-100").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: P. Scordato
DATE START/END: 3/11/2020 - 3/11/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 780

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/114	NA	(18-20") PID = 5.3 ppm (52-54") PID = 1.6 ppm (77-79") PID = 6.1 ppm	SILT	(0-82") SANDY SILT (ML): ~0% nonplastic fines, ~40% fine to coarse sand, brown to light brown, moist. Contains sheen from 18-23" and 32-37", brick, plant fibers, and wood fragments.
	5						SAND	(82-91") WIDELY GRADED SAND (SW): ~95% fine to coarse sand, ~5% subrounded to subangular gravel up to 0.25", moist. Contains plant fibers and wood fragments.
							SILT	(91-114") SILT WITH SAND (ML): ~80% nonplastic fines, ~20% fine sand, moist. Contains plant fibers and wood fragments.
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental samples collected from S1(18-20"), S2(52-54") and S3(77-79"). Depths can not be relied upon.

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: P. Scordato
DATE START/END: 3/11/2020 - 3/11/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING

781

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
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S = Split Spoon Sample
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HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/25	NA	(23-25") PID = 56.9 ppm	SILT	(0-25") SILT (ML): ~90% nonplastic fines, ~10% fine sand, brown, moist. Contains sheen, petroleum-like odor, plant fibers and wood fragments. Coal tar coating on core tube.
	5							
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental sample collected from S1(23-25").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: B. Fong-Murdock
DATE START/END: 3/12/2020 - 3/12/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING

781R1

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/113	NA	(16-25") PID = 39.1 ppm (43-45") PID = 0.0 ppm (94-96") PID = 0.0 ppm	SAND	(25-92") SILTY SAND (SM): ~65% fine to medium sand, ~35% nonplastic fines, brown to dark brown, moist. Contains petroleum-like odor, sheen from 15-25", and plant fibers.
	5						SILT	(92-113") SILT (ML): ~95% nonplastic fines, ~5% fine sand, gray, moist.
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental samples collected from S1(16-18"), S2(43-45") and S3(94-96").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: B. Fong-Murdock
DATE START/END: 3/12/2020 - 3/12/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING
781R2
PAGE 1 of 1

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
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HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/113	NA	(5-7") PID = 29.7 ppm (40-42") PID = 0.0 ppm (72-74") PID = 0.0 ppm	SAND	(0-113") SILTY SAND (SM): ~70% fine to coarse sand, ~25% nonplastic fines, ~5% subrounded gravel up to 0.25", brown to dark brown, moist. Contains slight petroleum-like odor from 5-10" and plant fibers.
	5							
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental samples collected from S1(5-7"), S2(40-42") and S3(72-74").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: P. Scordato
DATE START/END: 3/11/2020 - 3/11/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING

782

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
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Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/48	NA	(17-19") PID = 0.2 ppm	SILT	(0-30") SILT (ML): ~90% nonplastic fines, ~10% fine sand, brown, moist. Contains plant fibers and wood fragments.
	5						VOID	(30-72") VOID
						(79-81") PID = 4.3 ppm	SILT	(72-89") SANDY SILT (ML): ~70% nonplastic fines, ~30% fine to coarse sand, brown, moist. Contains slight petroleum-like odor, plant fibers, brick, and wood fragments.
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental samples collected from S1(17-19") and S2(79-81").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: B. Fong-Murdock
DATE START/END: 3/16/2020 - 3/16/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 783

PAGE 1 of 1

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
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S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/100	NA	(0-12") PID = 0.1 ppm (48-50") PID = 0.0 ppm	SAND	(0-100") SILTY SAND (SM): ~65% fine to medium sand, ~30% nonplastic fines, ~5% subrounded gravel up to 0.25", brown, moist. Contains slight petroleum-like odor from 0-12" and plant fibers.
	5							
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental samples collected from S1(0-12") and S2(48-50").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: B. Fong-Murdock
DATE START/END: 3/16/2020 - 3/16/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 784

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
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S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/113	NA	(6-8") PID = 2.1 ppm	SAND	(0-79") SILTY SAND (SM): ~65% fine to medium sand, ~30% low plastic fines, ~5% subrounded gravel up to 0.25", brown, moist. Contains slight petroleum-like odor from 0-31" and plant fibers
	5					(54-56") PID = 0.0 ppm		
						(85-87") PID = 0.0 ppm	SILT	(79-113") SILT WITH SAND (ML): ~75% nonplastic fines, ~25% fine sand, brown to dark gray, moist.
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental samples collected from S1(6-8"), S2(54-56") and S3(85-87").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 8.1
LOGGED BY: B. Fong-Murdock
DATE START/END: 3/16/2020 - 3/16/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 785

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 8.1	97/92	NA	(12-14") PID = 0.0 ppm (48-50") PID = 0.0 ppm	SAND	(0-92") SILTY SAND (SM): ~65% fine to medium sand, ~30% low to nonplastic fines, ~5% subrounded gravel up to 0.25", brown, moist. Contains plant fibers and wood fragments.
	5							
								End of boring at 8.1'. Refusal.
	10							

NOTES: Environmental samples collected from S1(12-14") and S2(48-50").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.5
LOGGED BY: B. Fong-Murdock
DATE START/END: 3/16/2020 - 3/16/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Mark/Matt/Jim
RIG TYPE: 14-foot catamaran-style platform

BORING 786

PAGE 1 of 1

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.5	114/110	NA	(6-8") PID = 0.0 ppm (43-45") PID = 0.0 ppm	SAND	(0-65") SILTY SAND (SM): ~70% fine to medium sand, ~25% low to nonplastic fines, ~5% subrounded gravel up to 0.5", brown, moist. Contains plant fibers.
	5						CLAY	(65-110") LEAN CLAY (CL): ~95% medium plastic fines, ~5% fine sand, gray, moist.
	10							End of boring at 9.5'. Refusal.

NOTES: Environmental samples collected from S1(6-8") and S2(43-45").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.0
LOGGED BY: P. Scordato
DATE START/END: 7/6/2020 - 7/6/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Jeff/Jake/Ben
RIG TYPE: 14-foot catamaran-style platform

BORING 787

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): 4.5
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5	60/54	NA	(0-4") PID = 8.9 ppm	SAND	(0"-30") WIDELY GRADED SAND WITH SILT AND GRAVEL (SW-SM): ~70% fine to coarse sand, ~20% subangular to subrounded gravel up to 2", ~10% non-plastic fines, dark brown, moist. Contains petroleum-like odor from 0-6", brick fragments, and glass.
							SILT	(30-54") SANDY SILT (ML): ~50% nonplastic fines, ~50% fine to coarse sand, gray, moist. Contains brick fragments.
						(37-39") PID = 4.8 ppm		
	5							End of boring at 5.0'. Refusal.
	10							

NOTES: Environmental samples collected from S1(0-4") and S2(37-39").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Plumbush Creek
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 8.5
LOGGED BY: P. Scordato
DATE START/END: 7/6/2020 - 7/6/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Jeff/Jake/Ben
RIG TYPE: 14-foot catamaran-style platform

BORING 788

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): 4.5
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 8.5	102/94	NA	(8-10") PID = 279.3 ppm	SAND	(0-35") WIDELY GRADED SAND WITH SILT AND GRAVEL (SW-SM): ~70% fine to coarse sand, ~20% subangular up to 1", ~10% nonplastic fines, dark brown, moist. Contains petroleum-like odor from 0-34", brick, wood fragments, and glass.
	5					(49-51") PID = 0.2 ppm	SILT	(35-94") SANDY SILT (ML): ~60% nonplastic fines, ~40% fine sand, gray, moist. Contains brick fragments. 3" well graded sand layer at bottom.
	10							End of boring at 8.5'. Refusal.

NOTES: Environmental samples collected from S1(8-10") and S2(49-51").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.4
LOGGED BY: P. Scordato
DATE START/END: 7/6/2020 - 7/6/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Jeff/Jake/Ben
RIG TYPE: 14-foot catamaran-style platform

BORING 789

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): 1.9

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.4	113/97	NA	(0-6") PID = 60.1 ppm	SAND	(0-92") WIDELY GRADED SAND WITH SILT (SW-SM): ~80% fine to coarse sand, ~20% nonplastic fines, dark brown to gray, moist. Contains slight petroleum-like odor from 0-20", glass, and brick fragments.
	5					(64-66") PID = 2.1 ppm		
							CLAY	(92-97") LEAN CLAY (CL): ~95% medium plastic fines, ~5% fine sand, gray, moist.
	10							End of boring at 9.4'. Refusal.

NOTES: Environmental samples collected from S1(0-6") and S2(64-66").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.0
LOGGED BY: P. Scordato
DATE START/END: 7/6/2020 - 7/6/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Jeff/Jake/Ben
RIG TYPE: 14-foot catamaran-style platform

BORING 790

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): 2.9

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9	108/101	NA	(20-22") PID = 112.6 ppm (52-54") PID = 0.3 ppm	SAND	(0-96") SILTY SAND (SM): ~75% medium to coarse sand, ~20% nonplastic fines, ~5% subangular to subrounded gravel up to 0.75", dark brown to light brown, moist. Contains petroleum-like odor from 2-26" and plant fibers.
	5						GRAVEL	(96-101") WIDELY GRADED GRAVEL (GW): ~80% subrounded to subangular gravel up to 1.25", ~15% fine to coarse sand, ~5% nonplastic fines, gray, moist.
	10							End of boring at 9.0'. Refusal.

NOTES: Environmental samples collected from S1(20-22") and S2(52-54").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 7.0
LOGGED BY: P. Scordato
DATE START/END: 7/8/2020 - 7/8/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Jeff/Jake/Ben
RIG TYPE: 14-foot catamaran-style platform

BORING 791

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): 2.5

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
	5	1	0 to 7	84/77	NA	(48-60") PID = 0.0 ppm	SAND	(0-77") SILTY SAND (SM): ~70% fine to coarse sand, ~30% nonplastic fines, brown to light brown, moist. Contains brick fragments, plant fibers, and wood fragments.
	10							End of boring at 7.0'. Refusal.

NOTES: Environmental sample collected from S1(48-60").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 7.2
LOGGED BY: P. Scordato
DATE START/END: 7/8/2020 - 7/8/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Jeff/Jake/Ben
RIG TYPE: 14-foot catamaran-style platform

BORING

792

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): 2.2

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
	5	1	0 to 7.2	86/79	NA	(48-60") PID = 21.9 ppm	SAND	(0-79") SILTY SAND (SM): ~60% fine sand interbedded with layers of medium to coarse sand, ~40% nonplastic fines, gray to brown, moist. Contains plant debris from 0-24", brick fragments, and plant fibers.
	10							End of boring at 7.2'. Refusal.

NOTES: Environmental sample collected from S1(48-60").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Mudflat

GROUND SURFACE EL. (ft): NM | **DATE START/END:** 7/6/2020 - 7/6/2020

VERTICAL DATUM: NM | **DRILLING COMPANY:** TG & B

TOTAL DEPTH (ft): 8.7 | **DRILLER NAME:** Jeff/Jake/Ben

LOGGED BY: P. Scordato | **RIG TYPE:** 14-foot catamaran-style platform

BORING 796

DRILLING INFORMATION

HAMMER TYPE: NA | **CASING I.D./O.D.:** NA / NA | **CORE BARREL TYPE:** Core-tube

AUGER I.D./O.D.: NA / NA | **DRILL ROD O.D.:** NM | **CORE BARREL I.D./O.D.** 2.625 inch / 2.75 inch

DRILLING METHOD: Vibracore

WATER LEVEL DEPTHS (ft): 1.4

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 8.7	104/101	NA	(0-6") PID = 1.2 ppm	SILT	(0-62") SANDY SILT (ML): ~70% nonplastic fines, ~30% fine to medium sand, brown, moist. Contains plant fibers and wood fragments. Interbedded with fine to medium sand.
	5						SAND	(62"-101") WIDELY GRADED SAND WITH SILT (SW-SM): ~85% fine to coarse sand, ~10% nonplastic fines, ~5% subangular gravel up to 2", light brown, moist. Contains plant fibers and wood fragments.
	10							End of boring at 8.7'. Refusal.

NOTES: Environmental sample collected from S1(0-6").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Mudflat

GROUND SURFACE EL. (ft): NM | **DATE START/END:** 7/8/2020 - 7/8/2020

VERTICAL DATUM: NM | **DRILLING COMPANY:** TG & B

TOTAL DEPTH (ft): 6.9 | **DRILLER NAME:** Jeff/Jake/Ben

LOGGED BY: P. Scordato | **RIG TYPE:** 14-foot catamaran-style platform

BORING 797

DRILLING INFORMATION

HAMMER TYPE: NA | **CASING I.D./O.D.:** NA / NA | **CORE BARREL TYPE:** Core-tube

AUGER I.D./O.D.: NA / NA | **DRILL ROD O.D.:** NM | **CORE BARREL I.D./O.D.** 2.625 inch / 2.75 inch

DRILLING METHOD: Vibracore

WATER LEVEL DEPTHS (ft): 1.5

ABBREVIATIONS:

Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer

S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger

Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter

NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 6.9	83/78	NA	(0-12") PID = 31.8 ppm	SAND	(0-48") WIDELY GRADED SAND WITH SILT (SW-SM): ~85% fine to coarse sand, ~15% nonplastic fines, light brown, moist. Contains black staining, petroleum-like odor from 0-12", and wood fragments.
	5							(48-78") SILTY SAND (SM): ~50% fine to medium sand, ~50% nonplastic fines, brown, moist. Contains plant fibers.
	10							End of boring at 6.9'. Refusal.

NOTES: Environmental sample collected from S1(0-12"). Field duplicae sample collected (S1D).

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Noel Street Tributary
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 2.3
LOGGED BY: P. Scordato
DATE START/END: 7/7/2020 - 7/7/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Jeff/Jake/Ben
RIG TYPE: 14-foot catamaran-style platform

BORING

798

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): 2.3

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 2.3	28/24	NA	(0-6") PID = 0.5 ppm (22-24") PID = 2.0 ppm	SAND	(0-13") WIDELY GRADED SAND WITH SILT (SW-SM): ~85% fine to coarse sand, ~10% nonplastic fines, light brown, ~5% subrounded gravel up to 1.5", moist. Contains petroleum-like odor.
							SILT	(13-24") SILT WITH SAND (ML): ~75% nonplastic fines, ~25% fine sand, brown, moist. Contains petroleum-like odor and plant fibers.
								End of boring at 2.3'. Refusal.
	5							
	10							

NOTES: Environmental samples collected from S1(0-6") and S2(22-24").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 8.0
LOGGED BY: P. Scordato
DATE START/END: 7/7/2020 - 7/7/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Jeff/Jake/Ben
RIG TYPE: 14-foot catamaran-style platform

BORING 799

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): 2.1

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 8	96/94	NA	(0-6") PID = 4.7 ppm (17-19") PID = 0.0 ppm	SILT	(0-48") SILT WITH SAND (ML): ~75% nonplastic fines, ~25% fine sand, brown, moist. Contains petroluem-like odor from 0-6" and plant fibers.
	5						SAND	(48-78") SILTY SAND (SM): ~75% fine to medium sand, ~25% nonplastic fines, light brown, moist. Contains wood fragments.
	10							End of boring at 8.0'. Refusal.

NOTES: Environmental samples collected from S1(0-6") and S2(17-19").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.0
LOGGED BY: P. Scordato
DATE START/END: 7/7/2020 - 7/7/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Jeff/Jake/Ben
RIG TYPE: 14-foot catamaran-style platform

BORING 800

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): 1.5

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9	108/102	NA	(17-19") PID = 0.4 ppm	SILT	(0-31") SANDY SILT (ML): ~70% nonplastic fines, ~30% fine sand, dark brown, moist. Contains petroleum-like odor from 0-23", plant fibers, and wood fragments.
	5					(40-42") PID = 0.0 ppm	SAND	(31-102") SILTY SAND (SM): ~70% fine to coarse sand, ~30% nonplastic fines, brown, moist. Contains brick fragments, plant fibers, and wood fragments.
	10							End of boring at 9.0'. Refusal.

NOTES: Environmental samples collected from S1(17-19") and S2(40-42").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.1
LOGGED BY: P. Scordato
DATE START/END: 7/7/2020 - 7/7/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Jeff/Jake/Ben
RIG TYPE: 14-foot catamaran-style platform

BORING 801

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): 2.2

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.1	109/108	NA	(0-6") PID = 3.0 ppm	SAND	(0-61") SILTY SAND (SM): ~70% fine sand, ~30% nonplastic fines, brown, moist. Contains petroleum-like odor from 0-6" and plant fibers.
	5					(53-55") PID = 0.1 ppm		(61-107") SILTY SAND (SM): ~70% coarse sand, ~30% nonplastic fines, brown, moist. Contains plant fibers from 61-80".
							CLAY	(107-108") LEAN CLAY (CL): ~95% medium plasic fines, ~5% fine sand, gray, moist.
	10							End of boring at 9.1'. Refusal.

NOTES: Environmental samples collected from S1(0-6") and S2(53-55").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 7.4
LOGGED BY: P. Scordato
DATE START/END: 7/8/2020 - 7/8/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Jeff/Jake/Ben
RIG TYPE: 14-foot catamaran-style platform

BORING 802

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): 6

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 7.4	89/84	NA		SILT	(0-35") SILT (ML): ~60% non to low plastic fines, ~40% fine sand, reddish brown, moist.
							SAND	(35-73") SILTY SAND (SM): ~70% fine sand, 30% nonplastic fines, tan, dry.
	5					(72-74") PID = 0.0 ppm	CLAY	(73"-84") LEAN CLAY (CL): ~95% low to medium plastic fines, gray, moist.
								End of boring at 7.4'. Refusal.
	10							

NOTES: Environmental sample collected from S1(72-74").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River - Bypass
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 7.1
LOGGED BY: P. Scordato
DATE START/END: 7/8/2020 - 7/8/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Jeff/Jake/Ben
RIG TYPE: 14-foot catamaran-style platform

BORING 803

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): 4.9
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
	5	1	0 to 7.1	85/82	NA	(72-74") PID = 0.0 ppm	SAND	(0-83") SILTY SAND (SM): ~60% fine sand, 40% non to low plastic fines, light brown to gray, moist. 3" of coarse sand at top.
	10							End of boring at 7.1'. Refusal.

NOTES: Environmental sample collected from S1(72-74").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River - Backwater South of I-495
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 8.5
LOGGED BY: P. Scordato
DATE START/END: 7/7/2020 - 7/7/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Jeff/Jake/Ben
RIG TYPE: 14-foot catamaran-style platform

BORING 804

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): 4.1
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
	5	1	0 to 8.5	102/96	NA	(0-12") PID = 0.4 ppm (46-48") PID = 10.8 ppm (85-87") PID = 2.8 ppm	SAND	(0-77") SILTY SAND (SM): ~70% fine to medium sand, 25% non to low plastic fines, ~5% subangular gravel up to 0.5", light brown to black to gray, moist. Contains brick fragments, plant fibers, and leaves. Black organic soil at 25-31" and 40-49". (77-96") WIDELY GRADED SAND (SM): ~95% fine to coarse sand, ~5% nonplastic fines, gray, wet. Contains brick fragments.
	10							End of boring at 8.5'. Refusal.

NOTES: Environmental samples collected from S1(0-12"), S2(46-48") and S3(85-87").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River - Backwater South of I-495
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 4.0
LOGGED BY: P. Scordato
DATE START/END: 7/7/2020 - 7/7/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Jeff/Jake/Ben
RIG TYPE: 14-foot catamaran-style platform

BORING 805

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): 4
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 4	48/40	NA	(0-12") PID = 2.7 ppm	SILT	(0-17") SILT WITH SAND (ML): ~60% nonplastic fines, ~40% fine sand, brown, moist. Contains plant fibers from 0-4".
						(18-20") PID = 6.0 ppm	SAND	(17-40") WIDELY GRADED SAND WITH SILT (SW-SM): ~70% fine to coarse sand, ~15% subangular to subrounded gravel up to 1.5", ~15% nonplastic fines, light brown, moist.
						(36-38") PID = 0.1 ppm		
	5							End of boring at 4'. Refusal.
	10							

NOTES: Environmental samples collected from S1(0-12"), S2(18-20") and S3(36-38").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River - Backwater South of I-495
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 1.0
LOGGED BY: P. Scordato
DATE START/END: 7/7/2020 - 7/7/2020
DRILLING COMPANY: TG & B
DRILLER NAME: Jeff/Jake/Ben
RIG TYPE: 14-foot catamaran-style platform

BORING 806

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 1	12/12	NA	(0-4") PID = 0.6 ppm (10-12") PID = 0.3 ppm	SAND	(0-12") WIDELY GRADED SAND WITH SILT AND GRAVEL (SW-SM): ~60% fine to coarse sand, ~30% subangular to subrounded gravel up to 1", ~10% nonplastic fines, brown to light brown, moist.
	5							End of boring at 1.0'. Refusal.
	10							

NOTES: Environmental samples collected from S1(0-4") and S2(10-12"). Penetration assumed (not recorded).

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.0
LOGGED BY: J. Smalley, D. Miller
DATE START/END: 6/19/2023 - 6/19/2023
DRILLING COMPANY: TG & B
DRILLER NAME:
RIG TYPE: 14-foot catamaran-style platform

BORING 812

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Direct Push
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5	60/55	NA	(0-55") PID = 0.0 ppm	ORGANICS	(0-55") ORGANIC SOIL WITH SAND (OL): ~85% low plastic fines, ~15% fine sand, brown, wet. Contains plant fibers.
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1(0-12"), S2(12-24").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.0
LOGGED BY: J. Smalley, D. Miller
DATE START/END: 6/19/2023 - 6/19/2023
DRILLING COMPANY: TG & B
DRILLER NAME:
RIG TYPE: 14-foot catamaran-style platform

BORING 813

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Direct Push
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5	60/53	NA	(0-40") PID = 0.0 ppm	ORGANICS	(0-40") ORGANIC SOIL WITH SAND (OL): ~85% low plastic fines, ~15% fine sand, brown, wet. Contains plant fibers.
						(40-53") PID = 0.0 ppm		(40-53") SANDY ORGANIC SOIL (OL): ~65% low plastic fines, ~35% fine to coarse sand, brown/gray, wet. Contains plant fibers.
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1(0-12"), S2(12-24").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River

GROUND SURFACE EL. (ft): NM | **DATE START/END:** 6/19/2023 - 6/19/2023

VERTICAL DATUM: NM | **DRILLING COMPANY:** TG & B

TOTAL DEPTH (ft): 5.0 | **DRILLER NAME:**

LOGGED BY: J. Smalley, D. Miller | **RIG TYPE:** 14-foot catamaran-style platform

BORING

814

DRILLING INFORMATION

HAMMER TYPE: NA | **CASING I.D./O.D.:** NA / NA | **CORE BARREL TYPE:** Core-tube

AUGER I.D./O.D.: NA / NA | **DRILL ROD O.D.:** NM | **CORE BARREL I.D./O.D.** 2.625 inch / 2.75 inch

DRILLING METHOD: Direct Push

WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:

Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer

S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger

Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter

NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5	60/50	NA	(0-50") PID = 7.9 ppm	SAND	(0-50") SILTY SAND (SM): ~55% fine to coarse sand, ~45% low plastic fines, dark brown, wet. Contains naphthalene-like odor, brick fragments, and plant fibers.
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1(0-12"), S2(12-24").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 10.0
LOGGED BY: J. Smalley, D. Miller
DATE START/END: 6/21/2023 - 6/21/2023
DRILLING COMPANY: TG & B
DRILLER NAME:
RIG TYPE: 14-foot catamaran-style platform

BORING 815

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Direct Push
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 10	120/90	NA	(0-12") PID = 0.8 ppm	SAND	(0-12") SILTY SAND (SM): ~55% fine to coarse sand, ~45% low plastic fines, gray/dark brown, wet. Contains plant fibers and brick fragments.
						(12-26") PID = 31.0 ppm	ORGANICS	(12-26") ORGANIC SOIL WITH SAND (OL): ~85% low plastic fines, ~15% fine sand, dark brown, wet. Contains slight naphthalene-like odor and plant fibers.
						(26-32") PID = 195.0 ppm		(26-32") SANDY ORGANIC SOIL (OL): ~60% low plastic fines, ~35% sand, ~5% subangular to 0.5", dark brown/black, wet. Contains petroleum-like odor, clinkers, and plant fibers.
						(32-48) PID = 7.1 ppm		(32-48") ORGANIC SOIL WITH SAND (OL): Similar to (12-26").
						(48-72") PID = 2.1 ppm		(48-72") SANDY ORGANIC SOIL (OL): ~70% low plastic fines, ~30% fine sand, dark brown, wet. Contains plant fibers.
	5							
						(72-87") PID = 0.6 ppm	SAND	(72-87") SILTY SAND (SM): ~55% sand, ~40% low plastic fines, ~5% subangular to 0.5", gray/brown, wet. Contains plant fibers.
						(87-90") PID = 0.0 ppm	CLAY	(87-90") LEAN CLAY (CL): ~90% medium plastic fines, ~10% fine sand, light gray, wet. Contains plant fibers.
	10							End of boring at 10'.

NOTES: Environmental samples collected from S1(0-12"), S2(12-24"), S3(48-60").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 4.7
LOGGED BY: J. Smalley, D. Miller
DATE START/END: 6/19/2023 - 6/19/2023
DRILLING COMPANY: TG & B
DRILLER NAME:
RIG TYPE: 14-foot catamaran-style platform

BORING 816

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Direct Push
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 4.7	56/43	NA	(0-8") PID = 0.0 ppm (8-30") PID = 50.2 ppm (30-43") PID = 56.8 ppm	SAND	(0-8") SILTY SAND (SM): ~60% fine to coarse sand, ~40% nonplastic fines, dark brown, wet. Contains plant fibers, wood, and shells.
							ORGANICS	(8-30") ORGANIC SOIL WITH SAND (OL): ~80% low plastic fines, ~15% fine sand, 5% subrounded gravel up to 0.5", dark brown/gray, wet. Contains slight naphthalene-like odor, plant fibers, and wood debris at 24".
							SAND	(30-43") SILTY SAND (SM): ~75% fine to coarse sand, ~15% nonplastic fines, 10% subangular gravel to 0.5", dark brown/black, wet. Contains slight naphthalene-like odor, brick, and wood fragments.
	5							End of boring at 4.7'. Refusal
	10							

NOTES: Environmental samples collected from S1(0-12"), S2(12-24").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.0
LOGGED BY: J. Smalley, D. Miller
DATE START/END: 6/19/2023 - 6/19/2023
DRILLING COMPANY: TG & B
DRILLER NAME:
RIG TYPE: 14-foot catamaran-style platform

BORING 817

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Direct Push
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5	60/42	NA	(0-42") PID = 238.8 ppm	ORGANICS	(0-42") SANDY ORGANIC SOIL (OL): ~50% low plastic fines, ~45% fine to coarse sand, 5% subangular to 1", dark brown/black, wet. Contains naphthalene-like odor, brick, and wood fragments.
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1(0-12"), S2(12-24").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 10.0
LOGGED BY: J. Smalley, D. Miller
DATE START/END: 6/20/2023 - 6/20/2023
DRILLING COMPANY: TG & B
DRILLER NAME:
RIG TYPE: 14-foot catamaran-style platform

BORING

818

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Direct Push
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 10	120/95	NA	(0-70") PID = 1.7 ppm	ORGANICS	(0-70") ORGANIC SOIL WITH SAND (OL): ~85% low plastic fines, ~15% fine to medium sand, dark brown, wet. Contains hydrogen sulfide-like odor and plant fibers.
	5					(70-95") PID = 0.0 ppm		(70-95") SANDY ORGANIC SOIL (OL): ~60% low plastic fines, ~40% fine to medium sand, brown, wet. Contains hydrogen sulfide-like odor and plant fibers.
	10							End of boring at 10'.

NOTES: Environmental samples collected from S1(0-12"), S2(60-72").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.0
LOGGED BY: J. Smalley, D. Miller
DATE START/END: 6/19/2023 - 6/19/2023
DRILLING COMPANY: TG & B
DRILLER NAME:
RIG TYPE: 14-foot catamaran-style platform

BORING 819

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Direct Push
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5	60/53	NA	(0-30") PID = 0.0 ppm	SAND	(0-30") SILTY SAND (SM): ~70% fine to coarse sand, ~30% low plastic fines, dark gray/black, wet. Contains slight petroleum-like odor and wood fragments.
						(30-53") PID = 0.0 ppm	ORGANICS	(30-53") SANDY ORGANIC SOIL (OL): ~70% low plastic fines, ~30% fine to coarse sand, gray/brown, wet. Contains slight petroleum-like odor, brick fragment, and plant fibers.
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1(0-12"), S2(12-24").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.0
LOGGED BY: J. Smalley, D. Miller
DATE START/END: 6/20/2023 - 6/20/2023
DRILLING COMPANY: TG & B
DRILLER NAME:
RIG TYPE: 14-foot catamaran-style platform

BORING 820

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Direct Push
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5	60/50	NA	(0-24") PID = 0.4 ppm	ORGANICS	(0-24") SANDY ORGANIC SOIL (OL): ~60% low plastic fines, ~40% fine to coarse sand, dark gray, wet. Contains slight petroleum-like odor and wood fragments.
						(24-40") PID = 21.2 ppm	SAND	(24-40") SILTY SAND (SM): ~75% sand, ~25% nonplastic fines, dark gray, wet. Contains naphthalene-like odor, brick, and ceramic fragments.
						(40-46") PID = 5.2 ppm	ORG	(40-46") ORGANIC SOIL WITH SAND (OL): ~85% low plastic fines, ~15% fine sand, dark gray/brown, wet. Contains naphthalene-like odor and plant fibers.
						(46-52") PID = 8.7 ppm	SAND	(46-50") SILTY SAND (SM): Similar to S2 (24-40").
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1(0-12"), S2(12-24").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.0
LOGGED BY: J. Smalley, D. Miller
DATE START/END: 6/20/2023 - 6/20/2023
DRILLING COMPANY: TG & B
DRILLER NAME:
RIG TYPE: 14-foot catamaran-style platform

BORING 821

PAGE 1 of 1

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Direct Push
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5	60/53	NA	(0-40") PID = 4.6 ppm	ORGANICS	(0-40") ORGANIC SOIL WITH SAND (OL): ~80% low plastic fines, ~20% fine sand, brown/gray, wet. Contains petroleum-like odor and plant fibers.
						(40-53") PID = 0.2 ppm		(40-53") SANDY ORGANIC SOIL (OL): ~60% low plastic fines, ~40% fine sand, gray, wet. Contains slight petroleum-like odor and plant fibers.
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1(0-12"), S2(12-24").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.0
LOGGED BY: J. Smalley, D. Miller
DATE START/END: 6/20/2023 - 6/20/2023
DRILLING COMPANY: TG & B
DRILLER NAME:
RIG TYPE: 14-foot catamaran-style platform

BORING

822

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Direct Push
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5	60/46	NA	(0-8") PID = 1.1 ppm (8-46") PID = 0.4 ppm	ORGANICS	(0-8") SANDY ORGANIC SOIL (OL): ~60% low plastic fines, ~40% fine to coarse sand, dark gray, very wet. Contains petroleum-like odor, wood debris, and plant fibers. (8-46") ORGANIC SOIL WITH SAND (OL): ~85% low plastic fines, ~15% fine to medium sand, black/dark brown, wet. Contains slight petroleum-like odor and plant fibers.
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1(0-12"), S2(12-24").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.0
LOGGED BY: J. Smalley, D. Miller
DATE START/END: 6/20/2023 - 6/20/2023
DRILLING COMPANY: TG & B
DRILLER NAME:
RIG TYPE: 14-foot catamaran-style platform

BORING 823

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Direct Push
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5	60/52	NA	(0-12") PID = 0.4 ppm (12-46") PID = 13.2 ppm (46-52") PID = 16.9 ppm	ORGANICS	(0-12") ORGANIC SOIL WITH SAND (OL): ~75% low plastic fines, ~25% fine to coarse sand, dark gray/dark brown, wet. Contains slight petroleum-like odor, wood fragments, and plant fibers. (12-46") ORGANIC SOIL WITH SAND (OL): ~85% low plastic fines, ~15% fine sand, gray/dark gray/dark brown, wet. Contains slight petroleum-like odor and plant fibers. (46-52") ORGANIC SOIL WITH SAND (OL): ~75% low plastic fines, ~25% fine to coarse sand, dark gray to dark brown to black, wet. Contains petroleum-like odors, black staining, slight sheen, wood fragments, and plant fibers.
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1(0-12"), S2(48-60").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.0
LOGGED BY: J. Smalley, D. Miller
DATE START/END: 6/20/2023 - 6/20/2023
DRILLING COMPANY: TG & B
DRILLER NAME:
RIG TYPE: 14-foot catamaran-style platform

BORING

824

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Direct Push
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5	60/52	NA	(0-46") PID = 9.8 ppm	ORGANICS	(0-46") ORGANIC SOIL WITH SAND (OL): ~80% low plastic fines, ~20% fine sand, dark gray/ brown, wet. Contains slight petroleum-like odor, plant fibers, brick, and wood fragments.
						(46-52") PID = 34.4 ppm		(46-52") SANDY ORGANIC SOIL (OL): ~70% low plastic fines, ~30% fine sand, dark gray, wet. Contains slight petroleum-like odor, slight sheen throughout, and brick fragments.
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1(0-12"), S2(48-60").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.0
LOGGED BY: J. Smalley, D. Miller
DATE START/END: 6/20/2023 - 6/20/2023
DRILLING COMPANY: TG & B
DRILLER NAME:
RIG TYPE: 14-foot catamaran-style platform

BORING 825

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Direct Push
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5	60/49	NA	(0-25") PID = 3.5 ppm	ORGANICS	(0-25") ORGANIC SOIL WITH SAND (OL): ~85% low plastic fines, ~15% fine sand, dark gray/ brown, wet. Contains hydrogen sulfide-like odor and plant fibers.
						(25-49") PID = 0.2 ppm		(25-49") ORGANIC SOIL WITH SAND (OL): ~70% low plastic fines, ~30% fine sand, dark gray, wet. Contains hydrogen sulfide-like odor and plant fibers.
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1(0-12"), S2(12-24").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.0
LOGGED BY: J. Smalley, D. Miller
DATE START/END: 6/20/2023 - 6/20/2023
DRILLING COMPANY: TG & B
DRILLER NAME:
RIG TYPE: 14-foot catamaran-style platform

BORING

826

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Direct Push
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5	60/49	NA	(0-49") PID = 0.0 ppm	ORGANICS	(0-49") ORGANIC SOIL WITH SAND (OL): ~80% low plastic fines, ~20% fine sand, gray/ brown, wet. Contains hydrogen sulfide-like odor and plant fibers.
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1(0-12"), S2(12-24").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 8.9
LOGGED BY: J. Smalley, D. Miller
DATE START/END: 6/20/2023 - 6/20/2023
DRILLING COMPANY: TG & B
DRILLER NAME:
RIG TYPE: 14-foot catamaran-style platform

BORING

827

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Direct Push
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 8.9	107/84	NA	(0-48") PID = 0.0 ppm	ORGANICS	(0-48") ORGANIC SOIL WITH SAND (OL): ~85% low plastic fines, ~15% fine to coarse sand, gray/brown, wet. Contains plant fibers.
	5					(48-72") PID = 0.0 ppm		(48"-72") SANDY ORGANIC SOIL (OL): ~70% low plastic fines, ~30% fine to coarse sand, gray, wet. Contains plant fibers.
						(72-84") PID = 0.0 ppm	LEAN CLAY	(72"-84") LEAN CLAY (CL): ~90% medium plastic fines, ~10% fine to coarse sand, gray, wet. Contains wood chunk at 84".
	10							End of boring at 8.9'. Refusal

NOTES: Environmental samples collected from S1(0-12"), S2(60-72").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.0
LOGGED BY: J. Smalley, D. Miller
DATE START/END: 6/21/2023 - 6/21/2023
DRILLING COMPANY: TG & B
DRILLER NAME:
RIG TYPE: 14-foot catamaran-style platform

BORING

828

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Direct Push
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5	60/48	NA	(0-32") PID = 0.3 ppm	ORGANICS	(0-32") SANDY ORGANIC SOIL (OL): ~70% low plastic fines, ~30% fine sand, dark gray, wet. Contains plant fibers and wood debris.
						(32-48") PID = 0.1 ppm		(32-48") SANDY ORGANIC SOIL (OL): ~55% low plastic fines, ~45% fine sand, gray, wet. Contains wood debris, brick and coal fragments.
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1(0-12"), S2(12-24").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.0
LOGGED BY: J. Smalley, D. Miller
DATE START/END: 6/20/2023 - 6/20/2023
DRILLING COMPANY: TG & B
DRILLER NAME:
RIG TYPE: 14-foot catamaran-style platform

BORING 829

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Direct Push
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5	60/52	NA	(0-40") PID = 31.7 ppm	ORGANICS	(0-40") ORGANIC SOIL WITH SAND (OL): ~85% low plastic fines, ~15% fine sand, dark gray/brown, wet. Contains slight petroleum-like odor and plant fibers.
						(40-52") PID = 2.0 ppm		(40-52") SANDY ORGANIC SOIL (OL): ~55% low plastic fines, ~45% fine sand, gray, wet. Contains slight petroleum-like odor and plant fibers.
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1(0-12").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.0
LOGGED BY: J. Smalley, D. Miller
DATE START/END: 6/21/2023 - 6/21/2023
DRILLING COMPANY: TG & B
DRILLER NAME:
RIG TYPE: 14-foot catamaran-style platform

BORING

830

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Direct Push
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5	60/50	NA	(0-50") PID=25.3 ppm (24-26") PID=299.8 ppm	ORGANICS	(0-50") ORGANIC SOIL WITH SAND (OL): ~85% low plastic fines, ~15% fine sand, dark brown, wet. Contains slight petroleum-like odor, clinkers, wood debris, and plant fibers.
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1(0-12"), S2(12-24").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.0
LOGGED BY: J. Smalley, D. Miller
DATE START/END: 6/21/2023 - 6/21/2023
DRILLING COMPANY: TG & B
DRILLER NAME:
RIG TYPE: 14-foot catamaran-style platform

BORING

831

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Direct Push
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5	60/47	NA	(0-47") PID = 4.6 ppm	ORGANICS	(0-47") ORGANIC SOIL WITH SAND (OL): ~85% low plastic fines, ~15% fine sand, dark brown, wet. Contains hydrogen sulfide-like odor, plastic fragments, wood debris, and plant fibers.
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1(0-12"), S2(12-24").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.0
LOGGED BY: J. Smalley, D. Miller
DATE START/END: 6/21/2023 - 6/21/2023
DRILLING COMPANY: TG & B
DRILLER NAME:
RIG TYPE: 14-foot catamaran-style platform

BORING

832

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Direct Push
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5	60/48	NA	(0-48") PID = 2.0 ppm	ORGANICS	(0-48") ORGANIC SOIL WITH SAND (OL): ~85% low plastic fines, ~15% fine sand, dark brown, wet, organic odor. Contains hydrogen sulfide-like odor, wood fragments, and plant fibers.
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1(0-12"), S2(12-24").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.0
LOGGED BY: J. Smalley, D. Miller
DATE START/END: 6/21/2023 - 6/21/2023
DRILLING COMPANY: TG & B
DRILLER NAME:
RIG TYPE: 14-foot catamaran-style platform

BORING

833

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Direct Push
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5	60/48	NA	(0-40") PID = 36.6 ppm	ORGANICS	(0-40") ORGANIC SOIL WITH SAND (OL): ~80% low plastic fines, ~20% fine sand, dark brown, wet. Contains petroleum-like odor from 20-24", clinkers from 19-21", and plant fibers.
						(40-48") PID = 2.0 ppm		(40-48") SANDY ORGANIC SOIL (OL): ~70% low plastic fines, ~30% fine sand, gray/dark brown, wet. Contains plant fibers.
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1(0-12"), S2(12-24").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.0
LOGGED BY: J. Smalley, D. Miller
DATE START/END: 6/21/2023 - 6/21/2023
DRILLING COMPANY: TG & B
DRILLER NAME:
RIG TYPE: 14-foot catamaran-style platform

BORING 834

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Direct Push
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5	60/48	NA	(0-48") PID = 18.2 ppm (26-28") PID = 98.2 ppm	ORGANICS	(0-48") ORGANIC SOIL WITH SAND (OL): ~85% low plastic fines, ~15% fine sand, dark brown, wet. Contains petroleum-like odor, black streaking from (26-28"), plastic fragments from (19-21"), and plant fibers.
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1(0-12"), S2(12-24").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.0
LOGGED BY: J. Smalley, D. Miller
DATE START/END: 6/21/2023 - 6/21/2023
DRILLING COMPANY: TG & B
DRILLER NAME:
RIG TYPE: 14-foot catamaran-style platform

BORING

835

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Direct Push
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5	60/49	NA	(0-12") PID = 1.0 ppm (12-30") PID = 8.0 ppm (30-49") PID = 44.9 ppm	ORGANICS	(0-12") ORGANIC SOIL WITH SAND (OL): ~85% low plastic fines, ~15% fine sand, dark brown, wet. Contains hydrogen sulfide-like odor and plant fibers. (12-30") ORGANIC SOIL WITH SAND (OL): ~75% nonplastic fines, ~25% fine and, gray/brown streaks, wet. Contains plant fibers and wood fragments. (30-49") ORGANIC SOIL WITH SAND (OL): Similar to (0-12").
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1(0-12"), S2(12-24").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.0
LOGGED BY: J. Smalley, D. Miller
DATE START/END: 6/21/2023 - 6/21/2023
DRILLING COMPANY: TG & B
DRILLER NAME:
RIG TYPE: 14-foot catamaran-style platform

BORING

836

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Direct Push
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5	60/50	NA	(0-32") PID = 1.6 ppm (24-30") PID = 61.0 ppm (32-50") PID = 32.3 ppm	ORGANICS	(0-32") ORGANIC SOIL WITH SAND (OL): ~85% low plastic fines, ~15% fine sand, dark brown, wet. Contains petroleum-like odor, sheen from (24-30"), clinkers, wood debris, and plant fibers. (32-50") ORGANIC SOIL WITH SAND (OL): ~75% nonplastic fines, ~25% fine sand, gray/blackish, wet. Contains slight petroleum-like odor and plant fibers.
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1(0-12"), S2(12-24"). The PID screening sample from 24-30" is a discrete measurement where sheen was observed within the organic soil layer from 0-32".

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Former River Footprint
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 8.0
LOGGED BY: J. Smalley, D. Miller
DATE START/END: 6/22/2023 - 6/22/2023
DRILLING COMPANY: TG & B
DRILLER NAME:
RIG TYPE: 14-foot catamaran-style platform

BORING 837

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Direct Push
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 8	96/87	NA	(0-12") PID = 0.0 ppm	ORG.	(0-12") ORGANIC SOIL WITH SAND (OL): ~75% low plastic fines, ~25% fine sand, dark brown, wet. Contains hydrogen sulfide-like odor and wood/plant debris.
						(12-70") PID = 2.2 ppm	SAND	(12-70") SILTY SAND (OL): ~55% fine to medium sand, ~40% nonplastic fines, ~5% subangular gravel up to 0.5", gray, wet. Contains plant fibers, wood fragments, and clinkers.
	5					(70-87") PID = 2.2 ppm	CLAY	(70-87") LEAN CLAY (CL): ~90% medium plastic fines, ~10% fine sand, gray, wet.
								End of boring at 8'. Refusal
	10							

NOTES: Environmental samples collected from S1(0-12"), S2(66-78"), S3(84-96").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Former River Footprint

GROUND SURFACE EL. (ft): NM | **DATE START/END:** 6/22/2023 - 6/22/2023

VERTICAL DATUM: NM | **DRILLING COMPANY:** TG & B

TOTAL DEPTH (ft): 8.2 | **DRILLER NAME:**

LOGGED BY: J. Smalley, D. Miller | **RIG TYPE:** 14-foot catamaran-style platform

BORING 838

DRILLING INFORMATION

HAMMER TYPE: NA | **CASING I.D./O.D.:** NA / NA | **CORE BARREL TYPE:** Core-tube

AUGER I.D./O.D.: NA / NA | **DRILL ROD O.D.:** NM | **CORE BARREL I.D./O.D.** 2.625 inch / 2.75 inch

DRILLING METHOD: Direct Push

WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:

Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer

S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger

Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter

NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 8.2	98/91	NA	(0-12") PID = 0.0 ppm	ORGANICS	(0-12") ORGANIC SOIL WITH SAND (OL): ~80% low plastic fines, ~20% fine sand, dark brown/gray, wet. Contains plant fibers
						(12-36") PID = 1.1 ppm		(12-36") SANDY ORGANIC SOIL (OL): ~70% low plastic fines, ~30% sand, gray/dark brown, wet. Contains plant fibers.
						(36-60") PID = 0.4 ppm	SAND	(36-60") SILTY SAND (SM): ~55% fine sand, ~45% nonplastic fines, gray, moist. Contains plant fibers.
	5					(60-75") PID = 1.0 ppm	ORGANICS	(60-75") ORGANIC SOIL WITH SAND (OL): ~80% low plastic fines, ~20% fine sand, dark brown/gray, wet. Contains petroleum-like odor, black staining, and plant fibers.
						(75-91") PID = 9.2 ppm		(75-91") SANDY ORGANIC SOIL (OL): ~60% nonplastic fines, ~40% sand fine to medium, dark gray/dark brown, moist. Contains plant fibers.
	10							End of boring at 8.2'. Refusal

NOTES: Environmental samples collected from S1(0-12"), S2(66-78"), S3(84-96").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Former River Footprint
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 15.0
LOGGED BY: C.Niziak
DATE START/END: 8/14/2023 - 8/14/2023
DRILLING COMPANY: TG& B
DRILLER NAME:
RIG TYPE: 14-foot catamaran-style platform

BORING 841

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Direct Push
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 15	180/102	NA	(0-14") PID = 0.1 ppm	ORG.	(0-14") ORGANIC SOIL WITH SAND (OL): ~75% nonplastic fines, ~25% fine sand, brown, wet. Contains wood and plant fragments.
						(14-38") PID = 0.6 ppm	SAND	(14-38") SILTY SAND (SM): ~80% fine to coarse sand, ~20% nonplastic fines, gray, moist. Contains plant fibers.
						(38-48") PID = 0.3 ppm		(38-48") SILTY SAND (SM): ~75% fine to coarse sand, ~20% nonplastic fines, ~5% gravel up to 0.5", gray, moist. Contains brick fragments.
						(48-60") PID= 1.5 ppm	SILT	(48-60") SANDY SILT (ML): ~50% fine sand, ~50% low plastic fines, dark gray, moist.
	5					(60-102") PID = 38.8 ppm		(60-102") SANDY ELASTIC SILT (MH): ~70% low to medium plastic sand, ~30% fine sand, dark gray/dark brown, moist. Contains plant fibers, wood debris, black staining, sheen at 78", and petroleum-like odor increasing with depth.
						(78-102") PID = 218.7 ppm (78") PID = 108.2 ppm		
	10							
								End of boring at 15'

NOTES: Environmental samples collected from S1 (30- 42"), S2 (54- 66"), S3 (90-102").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Former River Footprint
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 13.0
LOGGED BY: C.Niziak
DATE START/END: 8/14/2023 - 8/14/2023
DRILLING COMPANY: TG & B
DRILLER NAME:
RIG TYPE: 14-foot catamaran-style platform

BORING 842

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Direct Push
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Depth (ft)	Pen./ Rec. (in)	Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 13	156/110	NA	(0-14") PID = 0.2 ppm	SAND	(0-14") SILTY SAND (SM): ~70% fine to coarse sand, ~25% nonplastic fines, ~5% subangular gravel up to 1", gray, moist. Contains brick and plant fragments.
						(14-30") PID = 0.5 ppm		(14-30") NARROWLY GRADED SAND (SP): ~90% fine sand, ~5% nonplastic fines, ~5% subangular gravel up to 0.5", gray, moist.
						(30-40") PID = 2.2 ppm		(30-40") SILTY SAND (SM): ~70% fine sand, ~30% nonplastic fines, gray, moist. Contains plant fibers.
						(40-54") PID = 1.3 ppm	ORG.	(40-54") SANDY ORGANIC SOIL (OL): ~70% fine sand, ~30% low plastic fines, gray, wet. Contains plant fibers.
	5					(54-68") PID = 7.9 ppm	SILT	(54-68") SANDY SILT (ML): ~50% low plastic fines, ~50% fine sand, dark brown, wet. Contains naphthalene-like odor and sheen at 66".
						(68-110") PID = 9.2 ppm (68") PID = 6.8 ppm	LEAN CLAY	(68-110") LEAN CLAY (CL): ~60% medium plastic fines, ~40% fine sand, dark gray, moist. Contains petroleum-like odor and plant fibers.
	10							
								End of boring at 13'.

NOTES: Environmental samples collected from S1 (30-42"), S2 (54-66", S3 (98-110").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION:

GROUND SURFACE EL. (ft): NM | **DATE START/END:** 8/28/2023 - 8/28/2023

VERTICAL DATUM: NM | **DRILLING COMPANY:** TG & B

TOTAL DEPTH (ft): 10.0 | **DRILLER NAME:**

LOGGED BY: C.Niziak | **RIG TYPE:** 14-foot catamaran-style platform

BORING 843

DRILLING INFORMATION

HAMMER TYPE: NA | **CASING I.D./O.D.:** NA / NA | **CORE BARREL TYPE:** Core-tube

AUGER I.D./O.D.: NA / NA | **DRILL ROD O.D.:** NM | **CORE BARREL I.D./O.D.** 2.625 inch / 2.75 inch

DRILLING METHOD: Direct Push

WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:

Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer

S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger

Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter

NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 10	120/112	NA	(0-6") PID = 0 ppm	SAND	(0-6") SILTY SAND (SM): ~70% fine sand, ~30% nonplastic fine, dark brown, wet. Contains plant fragments and shells.
						(6-12") PID = 1.0 ppm		(6-12") WIDELY GRADED SAND WITH SILT (SW-SM): ~90% fine to coarse sand, ~10% nonplastic fines, brown, wet. Contains brick.
						(12-18") PID = 1.2 ppm	SILT	(12-18") SANDY SILT (ML): ~70% low plastic fines, ~30% fine sand, dark brown, wet.
						(18-42") PID = 4.7 ppm	SAND	(18-42") WIDELY GRADED SAND WITH SILT (SW-SM): Similar to 6-12". Contains naphthalene-like odor, sheen throughout, black staining, clinkers, and plant debris. Impacts increase with depth.
	5					(42-94") PID = 14.8 ppm		(42-94") SILTY SAND (SM): ~60% fine sand, ~40% nonplastic fines, brown, moist. Contains sheen and black staining from 42-66", coal fragments, and plant fibers.
						(94-112") PID = 0.9 ppm	CLAY	(94-112") LEAN CLAY WITH SAND (CL): ~80% medium plastic fines, ~20% fine sand, gray, moist.
	10							End of boring at 10'.

NOTES: Environmental samples collected from S1 (0-6"), S2 (12-24"), S3 (42-48").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 10.0
LOGGED BY: C.Niziak
DATE START/END: 8/28/2023 - 8/28/2023
DRILLING COMPANY: TG & B
DRILLER NAME:
RIG TYPE: 14-foot catamaran-style platform

BORING

844

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Direct Push
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 10	120/110	NA	(0-12") PID = 4.5 ppm	SAND	(0-12") SILTY SAND (SM): ~70% fine sand, ~30% nonplastic fines, dark brown, wet. Contains slight naphthalene-like odor and plant debris.
						(12-74") PID = 68.4 ppm		(12-74") SILTY SAND (SM): ~60% fine sand, ~40% low plastic fines, brown, moist. Contains moderate naphthalene-like odor, sheen from 36-42", clinkers, plant fibers.
	5							
						(74-110") PID = 8.4 ppm		(74-110") SILTY SAND (SM): ~80% fine to medium sand, ~20% nonplastic fines, brown/gray, moist. Contains fibers and wood debris.
	10							End of boring at 10'

NOTES: Environmental smaples collected from S1 (0-6"), S2 (12-24"), S3 (36-42").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION:

GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 3.5
LOGGED BY: C.Niziak

DATE START/END: 8/28/2023 - 8/28/2023
DRILLING COMPANY: TG & B
DRILLER NAME:
RIG TYPE: 14-foot catamaran-style platform

BORING

845

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Direct Push
WATER LEVEL DEPTHS (ft): Not measured

CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM

CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 3.5	42/36	NA	(0-3") PID = 55.5 ppm (3-36") PID = 2.8 ppm	SAND	(0-3") SILTY SAND (SM): ~70% fine sand, ~30% nonplastic fines, dark brown, wet. Contains slight naphthalene-like odor and plant fragments. (3-36") SILTY SAND (SM): ~80% fine sand, ~20% low plastic fines, brown, moist. Contains plant fibers.
	5							End of boring at 3.5 ft
	10							

NOTES: Environmental samples collected from S1 (0-12"), S2 (12-24").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 10.0
LOGGED BY: C.Niziak
DATE START/END: 8/28/2023 - 8/28/2023
DRILLING COMPANY: TG & B
DRILLER NAME:
RIG TYPE: 14-foot catamaran-style platform

BORING

846

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Direct Push
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 10	120/108	NA	(0-12") PID = 0.6 ppm	SAND	(0-12") SILTY SAND (SM): ~70% fine sand, ~30% nonplastic fines, dark brown, wet. Contains slight naphthalene-like odor and wood debris.
						(12-24") PID = 0.7 ppm		(12-24") SILTY SAND (SM): ~80% fine sand, ~20% nonplastic fines, gray/brown, wet. Contains plant fibers.
						(24-39") PID = 0.0 ppm	ORGANICS	(24-39") SANDY ORGANIC SOIL (OH/OL): ~60% fine sand, ~40% low plastic fines, brown, moist. Contains naphthalene-like odor and clinkers from 36-39", and plant fibers.
						(39-60") PID = 77.2 ppm	SAND	(39-60") SILTY SAND (SM): ~70% fine sand, ~30% low plastic fines, brown, wet. Contains moderate naphthalene-like odor, clinkers, and wood fragments.
	5					(60-108") PID = 0.2 ppm	SILT	(60-108") ELASTIC SAND WITH SILT (MH): ~80% medium plastic fines, ~20% fine sand, gray, moist.
	10							End of boring at 10'

NOTES: Environmental samples collected from S1 (0-6"), S2 (12-24"), S3 (42-51").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 3.0
LOGGED BY: C.Niziak
DATE START/END: 8/28/2023 - 8/28/2023
DRILLING COMPANY: TG & B
DRILLER NAME:
RIG TYPE: 14-foot catamaran-style platform

BORING

847

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Direct Push
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 3	36/30	NA	(0-4") PID = 65.7 ppm (4-30") PID = 104.4 ppm	SAND	(0-4") SILTY SAND (SM): ~70% fine sand, ~30% nonplastic fines, dark brown, wet. Contains wood fragments and plant fibers. (4-30") SILTY SAND (SM) ~80% fine sand, ~20% low plastic fines, brown, moist. Contains moderate naphthalene-like odor, sheen from (24-30"), wood fragments, and plant fibers.
	5							End of boring at 3'
	10							

NOTES: Environmental samples collected from S1 (0-12"), S2 (12-24").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 3.5
LOGGED BY: C.Niziak
DATE START/END: 8/17/2023 - 8/17/2023
DRILLING COMPANY: TG & B
DRILLER NAME:
RIG TYPE: 14-foot catamaran-style platform

BORING

848

PAGE 1 of 1

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Direct Push
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 3.5	42/36	NA	(0-6") PID = 9.0 ppm (6-25") PID = 20.9 ppm (25-30") PID = 9.2 ppm (30-36") PID = 11.8 ppm	SAND	(0-6") SILTY SAND (SM): ~60% fine to coarse sand, ~40% nonplastic fines, brown, wet. Contains slight naphthalene-like odor, sheen, and plant fibers. (6-25") SILTY SAND (SM): ~70% fine to medium sand, ~30% nonplastic fines, light brown. Contains sheen from (23-24").
							SILT	(25-30") SANDY SILT (ML): ~70% nonplastic fines, ~30% fine sand, gray.
							SAND	(30-36") SILTY SAND (SM): ~70% fine sand, ~30% nonplastic fines, brown. Contains plant fibers.
								End of boring at 3.5'.
	5							
	10							

NOTES: Environmental samples collected from S1 (0-12"), S2 (12-24").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 8.0
LOGGED BY: C.Niziak
DATE START/END: 8/16/2023 - 8/16/2023
DRILLING COMPANY: TG & B
DRILLER NAME:
RIG TYPE: 14-foot catamaran-style platform

BORING

849

PAGE 1 of 1

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Direct Push
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 8	96/72	NA	(0-12") PID = 54.5 ppm	SAND	(0-12") SILTY SAND (SM): ~70% fine tp coarse, ~30% nonplastic fines, black/dark grey, wet. Contains moderate naphthalene-like odor and plant fibers.
						(12-48") PID = 62.5 ppm	SAND	(12-48") SILTY SAND (SM): ~85% fine to coarse sand, ~15% nonplastic fines, black/dark grey, wet. Contains brick, ceramic, coal, napthalene-like odor, wet, and black throughout. Contains glass, blebs and sheen at 48".
	5					(48-72") PID = 1.7 ppm	ORGANICS	(48-72") SANDY SILT (ML): ~60% low plastic fines, ~40% fine sand, grey/brown, wet. Contains organic fibers. 65-67" similar to 12-48".
	10							End of boring at 8'. Refusal

NOTES:

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 9.7
LOGGED BY: C.Niziak
DATE START/END: 8/17/2023 - 8/17/2023
DRILLING COMPANY: TG & B
DRILLER NAME:
RIG TYPE: 14-foot catamaran-style platform

BORING

850

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Direct Push
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.7	116/104	NA		SAND	(0-18") SILTY SAND (SM): ~70% fine to coarse sand, ~30% nonplastic fines, gray/brown, wet. Contains brick and coal-like fragments
							SILT	(18-29") SANDY SILT (ML): ~60% low plastic fines, ~40% fine sand, dark brown, wet. Contains strong naphthalene-like odor, heavy sheen, and plant fibers. (29-60") SANDY SILT (SM): ~75% fine to coarse sand, ~20% nonplastic fines, ~5% subangular gravel up to 1", dark gray, wet. Contains strong naphthalene-like odor, heavy sheen, clinkers, coal-like fragments, brick, and wood fragments.
	5						ORGANICS	(60-98") SANDY ORGANIC SOIL (OL/OH): ~60% mostly fine sand, ~40% low plastic fines, dark gray, wet. Contains strong naphthalene-like odor, heavy sheen from 60-80", coal-like fragments, brick, and wood fragments.
							SAND	(98-104") SILTY SAND (SM): ~60% fine to medium sand, ~40% low plastic fines, light brown.
	10							End of boring at 9.7'. Refusal

NOTES:

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 8.0
LOGGED BY: C.Niziak
DATE START/END: 8/17/2023 - 8/17/2023
DRILLING COMPANY: TG & B
DRILLER NAME:
RIG TYPE: 14-foot catamaran-style platform

BORING 851

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Direct Push
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 8	96/77		(0-19") PID = 3.1 ppm	SAND	(0-19") WIDELY GRADED SAND WITH SILT (SW-SM): ~90% fine to coarse sand, ~10% nonplastic fines, dark brown, wet. Contains slight naphthalene-like odor, clinkers, brick fragments, wood debris, and plant fibers.
						(19-36") PID = 27.9 ppm		(19-36") SILTY SAND (SM): ~60% fine sand, ~40% nonplastic fines, dark brown, wet. Contains moderate naphthalene-like odor and plant fibers.
	5					(36-68") PID = 75.1 ppm (39") PID = 259.1 ppm		(36-68") WIDELY GRADED SAND WITH SILT (SW-SM): Similar to (0-19"). Contains naphthalene-like odor, coal blebs from 36-68", coal tar saturated at 39", and sheen throughout.
						(68-77") PID = 210.8	CLAY	(68-77") LEAN CLAY (CL): ~90% medium plastic fines, ~10% fine sand, gray, moist. Moderate naphthalene-like odor and sheen.
	10							End of boring at 8'. Refusal

NOTES: Environmental samples collected from S1 (0-6"), S2 (66-72").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION:

GROUND SURFACE EL. (ft): NM | **DATE START/END:** 8/31/2023 - 8/31/2023

VERTICAL DATUM: NM | **DRILLING COMPANY:** TG & B

TOTAL DEPTH (ft): 10.0 | **DRILLER NAME:**

LOGGED BY: C.Niziak | **RIG TYPE:** 14-foot catamaran-style platform

BORING

852

PAGE 1 of 1

DRILLING INFORMATION

HAMMER TYPE: NA | **CASING I.D./O.D.:** NA / NA | **CORE BARREL TYPE:** Core-tube

AUGER I.D./O.D.: NA / NA | **DRILL ROD O.D.:** NM | **CORE BARREL I.D./O.D.** 2.625 inch / 2.75 inch

DRILLING METHOD: Direct Push

WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:

Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer

S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger

Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter

NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 10	120/100	NA	(0-18") PID = 0.2 ppm	SAND	(0-18") SILTY SAND (SM): ~80% fine to coarse sand, ~20% nonplastic fines, gray/brown, wet. Contains slight naphthalene-like odor at 12", brick, and coal-like fragments.
						(18-24") PID = 2.9 ppm	SILT	(18-24") SANDY SILT (ML): ~ 60% low plastic fines, ~40% fine sand, dark brown, moist. Contains moderate naphthalene-like odor and plant fibers
						(24-52") PID = 36.6 ppm	SAND	(24-52") SILTY SAND (SM): ~70% fine to coarse sand, ~30% nonplastic fines, brown, moist. Contains slight naphthalene-like odor increase with depth, brick, coal-like fragments, clinkers from 33-52", and wood debris.
	5					(52-75") PID = 3.6 ppm (42-52") PID = 66.1 ppm	SILT	(52-75") SANDY SILT (ML): Similar to (18-24"). Contains slight naphthalene-like odor, wood fragments, and plant fibers.
						(75-100") PID = 5.4 ppm	CLAY	(75-100") SANDY ELASTIC SILT (MH): ~90% medium plastic fines, ~10% fine sand, gray, moist.
	10							End of boring at 10'

NOTES: Environmental samples collected from S1 (0-6"), S2 (42-48").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION:

GROUND SURFACE EL. (ft): NM | **DATE START/END:** 8/17/2023 - 8/17/2023

VERTICAL DATUM: NM | **DRILLING COMPANY:** TG & B

TOTAL DEPTH (ft): 9.7 | **DRILLER NAME:**

LOGGED BY: C.Niziak | **RIG TYPE:** 14-foot catamaran-style platform

BORING

853

PAGE 1 of 1

DRILLING INFORMATION

HAMMER TYPE: NA | **CASING I.D./O.D.:** NA / NA | **CORE BARREL TYPE:** Core-tube

AUGER I.D./O.D.: NA / NA | **DRILL ROD O.D.:** NM | **CORE BARREL I.D./O.D.** 2.625 inch / 2.75 inch

DRILLING METHOD: Direct Push

WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:

Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer

S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger

Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter

NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.7	116/98	NA	(0-36") PID = 117.7 ppm (13-17") PID = 40.5 ppm	SILT	(0-36") SANDY SILT (ML): ~60% low plastic fines, ~40% fine sand, dark gray, wet. Contains slight naphthalene-like odor, black staining, sheen, wood fragments, and plant fibers throughout. Strong naphthalene-like odor from 12-17" and wood shavings from 18-20".
	5					(36-80") PID = 0.8 ppm	SAND	(36-80") SILTY SAND (SM): ~70% fine to coarse sand, ~30% nonplastic fines, dark gray, moist. Contains slight naphthalene-like odor, wood fragments, and plant fibers.
						(80-98") PID = 0.5 ppm	SILT	(80-98") SANDY ELASTIC SILT (MH): ~70% medium plastic fine, ~30% fine sand, brown, moist. Contains wood fragments and plant fibers.
	10							End of boring at 9.7'. Refusal.

NOTES: Environmental samples collected from S1 (0-6"), S2 (12-24"), S3 (66-72").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.0
LOGGED BY: C.Niziak
DATE START/END: 8/28/2023 - 8/28/2023
DRILLING COMPANY: TG& B
DRILLER NAME:
RIG TYPE: 14-foot catamaran-style platform

BORING 854

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Direct Push
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5	60/50	NA	(0-36") PID = 0.2 ppm	SAND	(0-36") WIDLEY GRADED SAND WITH SILT (SW-SM): ~90% fine to coarse sand, ~10% nonplastic fines, grey/brown, wet. Contains moderate naphthalene-like odor, slight sheen, clinkers, brick, wood fragments, and plant fibers. 18-22" ~70% low plastic fines, ~30% fine sand, brown, wet.
						(36-50") PID = 0.0 ppm		(36-50") NARROWLY GRADED SAND WITH SILT (SP-SM): ~90% medium to coarse sand, ~10% nonplastic fines, brown, wet. Contains coal-like and wood fragments.
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1 (0-6"), S2 (18-24").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION:

GROUND SURFACE EL. (ft): NM | **DATE START/END:** 8/30/2023 - 8/30/2023

VERTICAL DATUM: NM | **DRILLING COMPANY:** TG & B

TOTAL DEPTH (ft): 9.2 | **DRILLER NAME:**

LOGGED BY: C.Niziak | **RIG TYPE:** 14-foot catamaran-style platform

BORING 855

DRILLING INFORMATION

HAMMER TYPE: NA | **CASING I.D./O.D.:** NA / NA | **CORE BARREL TYPE:** Core-tube

AUGER I.D./O.D.: NA / NA | **DRILL ROD O.D.:** NM | **CORE BARREL I.D./O.D.** 2.625 inch / 2.75 inch

DRILLING METHOD: Direct Push

WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:

Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer

S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger

Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter

NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 9.2	110/97	NA	(0-60") PID = 36.0 ppm	SAND	(0-60") WIDELY GRADED SAND WITH SILT (SP-SM): ~90% fine to medium sand, ~10% nonplastic fines, gray/brown, wet. Contains strong naphthalene-like odor, slight sheen, clinkers, coal-like frements, brick, and plant fibers.
	5					(60-71") PID = 79.6 ppm		(60-71") WIDELY GRADED SAND WITH SILT (SW-SM): ~90% fine to coarse sand, ~10% nonplastic fines, dark brown, wet. Contains slight sheen, coal-like fragments, and plant fibers.
						(71-97") PID = 193.5 ppm	SILT	(71-97") ELASTIC SILT WITH SAND (MH): ~70% low to medium plastic fines, ~30% fine sand, brown, wet. Contains strong naphthalene-like odor, heavy sheen, coal tar saturated, wood fragments, and plant fibers.
	10							End of boring at 9.2'. Refusal

NOTES:

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION:

GROUND SURFACE EL. (ft): NM | **DATE START/END:** 8/31/2023 - 8/31/2023

VERTICAL DATUM: NM | **DRILLING COMPANY:** TG & B

TOTAL DEPTH (ft): 11.2 | **DRILLER NAME:**

LOGGED BY: C.Niziak | **RIG TYPE:** 14-foot catamaran-style platform

BORING 856

DRILLING INFORMATION

HAMMER TYPE: NA | **CASING I.D./O.D.:** NA / NA | **CORE BARREL TYPE:** Core-tube

AUGER I.D./O.D.: NA / NA | **DRILL ROD O.D.:** NM | **CORE BARREL I.D./O.D.** 2.625 inch / 2.75 inch

DRILLING METHOD: Direct Push

WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:

Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer

S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger

Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter

NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 11.2	134/96	NA	(0-20") PID = 24.9 ppm	SAND	(0-20") SILTY SAND (SM): ~80% fine to medium coarse sand, ~20% nonplastic fines, brown, wet. Contains moderate naphthalene-like odor, slight sheen, clinkers, and plant fibers.
						(20-29") PID = 58.3 ppm	ORG.	(20-29") ORGANIC SOIL WITH SAND (OL): ~60% nonplastic fines, ~40% fine sand, brown, wet. Contains clinkers and plant fibers.
						(29-45") PID = 163.9 ppm	SAND	(29-45") SILTY SAND (SM): Similar to (0-20").
	5						SILT	(45-80") SILT WITH SAND (MH): ~60% low plastic fines, ~40% fine sand, dark brown, moist. Contains strong naphthalene-like odor from 45-76" and coal tar saturated in stratified seams from 48-65".
						(80-96") PID = 24.1 ppm	SAND	(80-96") SILTY SAND (SM): ~60% fine sand, ~40% nonplastic fines, brown/gray, moist. Coarse sand from 80-84".
	10							End of boring at 11.2'

NOTES:

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.1
LOGGED BY: D. Miller, N. Troccolo
DATE START/END: 11/2/2023 - 11/2/2023
DRILLING COMPANY: TG & B
DRILLER NAME:
RIG TYPE: 14-foot catamaran-style platform

BORING

857

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Direct Push
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5.1	61/60	NA	(0-8") PID = 3.6 ppm (8-18") PID = 14.6 ppm (18-30") PID = 85.2 ppm (30-36") PID = 118.6 ppm (36-60") PID = ppm	SAND	(0-8") SILTY SAND (SM) :~60% fine sand, ~40% nonplastic fines, wet, brown. Contains plant fibers. (8-18") SILTY SAND (SM) :~80% fine to coarse sand, ~20% nonplastic fines, wet, gray/brown. Contains slight naphthalene-like odor, coal, plant fibers, brick, and wood debris. (18-30") SILTY SAND (SM) :~60% fine sand, ~40% nonplastic fines, wet, dark brown. Contains plant fibers.
	5						ORGANICS	(30-36") ORGANIC SOIL WITH SAND (OL) :~80% low plastic fines, ~20% fine sand, wet, gray/brown. Contains black streaking and plant fibers. (36-60") NARROWLY GRADED SAND WITH SILT (SP-SM) :~90% fine to coarse sand, ~10% nonplastic fines, wet, black and brown. Contains strong napthalene-like odor, sheening vein of petroleum stained soil at 46", blebs, coal, brick, clinker, and wood debris.
								End of boring at 5.1'
	10							

NOTES: Environmental samples collected from S1 (0-12"), S2 (12-24"), S3 (24-36"), S4 (48-60").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.0
LOGGED BY: D. Miller, N. Troccolo
DATE START/END: 11/2/2023 - 11/2/2023
DRILLING COMPANY: TG & B
DRILLER NAME:
RIG TYPE: 14-foot catamaran-style platform

BORING

858

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Direct Push
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		1	0 to 5	60/54	NA	(0-18") PID = 0.1 ppm	SAND	(0-18") SILTY SAND (SM) :~80% fine to coarse sand, ~20% nonplastic fines, wet, gray/brown. Contains coal, plant fibers, brick, and wood debris.
						(18-28") PID = 6.6 ppm		(18-28") SILTY SAND (SM) :~60% fine sand, ~40% nonplastic fines, wet, dark brown. Contains plant fibers.
						(28-32") PID = 7.0 ppm	ORG.	(28-32") ORGANIC SOIL WITH SAND (OL) :~80% low plastic fines, ~20% fine sand, wet, gray/brown. Contains black streaking and plant fibers.
						(32-60") PID = 9.7 ppm	SAND	(32-54") NARROWLY GRADED SAND WITH SILT (SP-SM) :~90% fine to coarse sand, ~10% nonplastic fines, wet, black and brown. Contains slight naphthalene-like odor increasing with depth, strong with more debris from 46-54", coal, brick, clinker, wood debris.
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1 (0-12"), S2 (12-24"), S3 (24-36"), S4 (48-54").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.0
LOGGED BY: N.Troccolo
DATE START/END: 11/28/2023 - 11/28/2023
DRILLING COMPANY: TG & B
DRILLER NAME: Jake
RIG TYPE: 14-foot catamaran-style platform

BORING 859

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 5	60/47	NA	(0-26") PID = 0.6 ppm	SAND	(0-26") SILTY SAND (SM): ~65% fine to medium sand,~25% nonplastic fines, ~10% subrounded gravel up to 0.25", brown, wet. Contains wood debris
						(26-28") PID = 0.6 ppm (28-47") PID = 0.0 ppm		(26-28") SILTY SAND (SM): ~65% fine to coarse sand, ~25% nonplastic fines, ~10% gravel up to 0.25", brown, wet.
							CLAY	(28-47") LEAN CLAY (CL):~90% medium plastic fines, ~10% fine sand, gray, wet.
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1(0-12") and S2(12-24").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.0
LOGGED BY: N.Troccolo
DATE START/END: 11/28/2023 - 11/28/2023
DRILLING COMPANY: TG & B
DRILLER NAME: Jake
RIG TYPE: 14-foot catamaran-style platform

BORING 860

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 5	60/56	NA	(0-12") PID=0.6 ppm	SAND	(0-12") SILTY SAND (SM): ~70% fine to coarse sand, ~20% nonplastic fines, ~10% gravel up to 0.75", brown, wet. Contains brick and glass.
						(12-23") PID=0.1 ppm		(12-23") SILTY SAND WITH GRAVEL (SM): ~65% fine to coarse sand, ~15% nonplastic fines, ~20% subrounded gravel up to 1", brown, wet. Contains brick.
						(23-40") PID=0.0 ppm		(23-40") SILTY SAND WITH GRAVEL (SM): ~60% fine to coarse sand, ~20% nonplastic fines, ~20% subrounded gravel up to 1", brown, wet. Contains brick.
						(40-56") PID=0.0 ppm	CLAY	(40-56") LEAN CLAY (CL): ~90% medium plastic fines, ~10% fine sand, gray, wet.
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1(0-12") and S2(12-24").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.0
LOGGED BY: J. Smalley
DATE START/END: 11/27/2023 - 11/27/2023
DRILLING COMPANY: TG & B
DRILLER NAME: Jake
RIG TYPE: 14-foot catamaran-style platform

BORING

861

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 5	60/47	NA	(0-23") PID = 0.4 ppm	ORGANICS	(0-23") ORGANIC SOIL (OL): ~80% nonplastic fines, ~20% fine sand, brown, wet. Contains decaying plant matter, brick, and glass.
						(23-47") PID = 3.5 ppm	SAND	(23-47") SILTY SAND (SM): ~70% fine to coarse sand, ~20% nonplastic fines, ~10% subrounded gravel up to 0.75", brown, wet. Contains roots, fibers, brick, and shells.
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1(0-12").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.0
LOGGED BY: J. Smalley
DATE START/END: 11/27/2023 - 11/27/2023
DRILLING COMPANY: TG & B
DRILLER NAME: Jake
RIG TYPE: 14-foot catamaran-style platform

BORING 862

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 5	60/48	NA	(0-33") PID = 0.2 ppm	ORGANICS	(0-33") ORGANIC SOIL (OL): ~80% nonplastic fines, ~20% fine sand, brown, wet. Contains decaying plant matter and roots.
						(33-48") PID = 0.1 ppm	SAND	(33-48") SILTY SAND (SM): ~70% fine to coarse sand, ~20% nonplastic fines, ~10% subrounded gravel up to 0.75", brown, wet. Contains roots and fibers.
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1(0-12") and S2(12-24").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.0
LOGGED BY: N.Troccolo
DATE START/END: 11/28/2023 - 11/28/2023
DRILLING COMPANY: TG & B
DRILLER NAME: Jake
RIG TYPE: 14-foot catamaran-style platform

BORING

863

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 5	60/47	NA	(0-22") PID = 3.4 ppm	SAND	(0-22") SILTY SAND (SM) ~75% fine to coarse sand, ~20% nonplastic fines, ~5% subrounded gravel up to 0.75", brown, wet. Contains decaying plant matter, glass and brick.
						(22-47") PID = 0.7 ppm		(22-47") SILTY SAND (SM): ~60% fine to medium sand, ~35% nonplastic fines, ~5% subrounded gravel up to 0.5", brown, wet.
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1(0-12") and S2(12-24").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.0
LOGGED BY: N.Troccolo
DATE START/END: 11/28/2023 - 11/28/2023
DRILLING COMPANY: TG & B
DRILLER NAME: Jake
RIG TYPE: 14-foot catamaran-style platform

BORING 864

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 5	60/46	NA	(0-12") PID = 2.6 ppm (12-46") PID =4.4 ppm	SAND	(0-12") SILTY SAND (SM) ~65% fine to medium sand, ~35% nonplastic fines, brown, (12-46") SILTY SAND (SM): ~70% fine to coarse sand, ~25% nonplastic fines, ~5% subrounded gravel up to 0.5", brow, wet. Slight petroleum-like odor.
	5							End of boring at 5'.
	10							

NOTES: Environmental samples collected from S1(0-12") and S2(12-24").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.2
LOGGED BY: J. Smalley
DATE START/END: 11/27/2023 - 11/27/2023
DRILLING COMPANY: TG & B
DRILLER NAME: Jake
RIG TYPE: 14-foot catamaran-style platform

BORING

865

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
	5	S1	0 to 5.2	62/47	NA	(0-47") PID = 13.5 ppm	SAND	(0-24") SILTY SAND (SM): ~75% fine to coarse sand, ~25% nonplastic fines, brown, wet. (24-27") SILT (ML) ~90% nonplastic fines, ~10% fine sand, brown, wet. (27-47") SILTY SAND (SM) ~75% fine to coarse sand, ~25% nonplastic fines, brown, wet. Contains brick. Slight sheen and slight petroleum-like odor from 41-47".
								End of boring at 5.2'.
	10							

NOTES: Environmental samples collected from S1(0-12") and S2(12-24").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.2
LOGGED BY: J. Smalley
DATE START/END: 11/27/2023 - 11/27/2023
DRILLING COMPANY: TG & B
DRILLER NAME: Jake
RIG TYPE: 14-foot catamaran-style platform

BORING

866

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
	5	S1	0 to 5.2	62/58	NA	(0-58") PID = 0.1 ppm	SABD	0-58") SILTY SAND (SM): ~60% fine sand, ~40% nonplastic fines, brown, wet. Contains fibers.
								End of boring at 5.2'.
	10							

NOTES: Environmental samples collected from S1(0-12") and S2(12-24").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.2
LOGGED BY: J. Smalley
DATE START/END: 11/27/2023 - 11/27/2023
DRILLING COMPANY: TG & B
DRILLER NAME: Jake
RIG TYPE: 14-foot catamaran-style platform

BORING

867

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
	5	S1	0 to 5.2	62/59	NA	(0-59") PID = 0.0 ppm	SAND	(0-59") SILTY SAND (SM): ~60% fine sand, ~40% nonplastic fines, brown, wet. Contains fibers.
	10							End of boring at 5.2'.

NOTES: Environmental samples collected from S1(0-12") and S2(12-24").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 4.6
LOGGED BY: J. Smalley
DATE START/END: 11/27/2023 - 11/27/2023
DRILLING COMPANY: TG & B
DRILLER NAME: Jake
RIG TYPE: 14-foot catamaran-style platform

BORING

868

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 4.6	55/46	NA		SILT	(0-4") SILT (ML): ~90% nonplastic fines, ~10% fine sand, brown, wet. Contains wood and roots.
							SAND	(4-46") SILTY SAND (SM): ~75% fine to coarse sand, ~10% subrounded gravel up to 0.75", brown, wet. Contains brick, wood, and slight petroleum-like odor.
	5							End of boring at 4.6'.
	10							

NOTES: Environmental samples collected from S1(0-12") and S2(12-24").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.7
LOGGED BY: N.Troccolo
DATE START/END: 11/27/2023 - 11/27/2023
DRILLING COMPANY: TG & B
DRILLER NAME: Jake
RIG TYPE: 14-foot catamaran-style platform

BORING 869

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 5.7	68/64	NA	(0-22") PID = 0.2 ppm	SAND	(0-22") SILTY SAND (SM): ~60% fine to coarse sand, ~40% nonplastic fines, brown, wet. Contains roots.
						(22-30") PID = 13.1 ppm	SILT	(22-30") SANDY SILT (ML): ~75% nonplastic fines, ~25% fine sand, brown, wet.
						(30-58") PID = 54.5 ppm	SAND	(30-58") SILTY SAND (SM): ~50% fine to coarse sand, ~35% nonplastic fines, ~15% subrounded gravel up to 0.5", brown, wet. Contains slight petroleum-like odor.
	5					(58-64") PID = 12.0 ppm	SILT	(58-64") SANDY SILT (ML): ~70% nonplastic fines, ~30% fine sand, brown, wet. Contains slight sheen and slight petroleum-like odor.
								End of boring at 5.7'.
	10							

NOTES: Environmental samples collected from S1(0-12") and S2(12-24").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 4.7
LOGGED BY: J. Smalley
DATE START/END: 11/27/2023 - 11/27/2023
DRILLING COMPANY: TG & B
DRILLER NAME: Jake
RIG TYPE: 14-foot catamaran-style platform

BORING

870

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 4.7	56/56	NA		SAND	(0-15") SILTY SAND (SM): ~60% fine sand, ~40% nonplastic fines, brown, wet. Contains roots. (15-56") SILTY SAND (SM): ~75% fine to coarse sand, ~15% nonplastic fines, ~10% subrounded gravel up to 0.5", brown, wet. Contains brick and decaying plant matter.
	5							End of boring at 4.7'.
	10							

NOTES: Environmental samples collected from S1(0-12") and S2(12-24").

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.6
LOGGED BY: D. Miller
DATE START/END: 7/23/2024 - 7/23/2024
DRILLING COMPANY: TG & B
DRILLER NAME: Ben Avakian
RIG TYPE: 14-foot catamaran-style platform

BORING 871

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 5.6	67/60	NA	(0-12") PID = 0.3 ppm	SAND	(0-12") SILTY SAND (SM) : ~85% fine to medium sand, ~15% nonplastic fines, gray/brown, wet. Contains decaying plant matter.
						(12-22") PID = 0.8 ppm	SILT	(12-22") SANDY SILT (ML): ~70% nonplastic fines, ~30% medium to fine sand, dark brown with some black discoloration, wet. Contains slight naphthalene-like odor, slight sheen, decaying plant matter.
						(22-44") PID = 10.90 ppm	SAND	(22-44") WIDELY GRADED SAND (SW): ~95% fine to coarse sand, ~5% nonplastic fines, gray/brown, wet. Contains strong rainbow sheen, moderate napthalene-like odor, fused ash, coal fragments, wood debris, and clinkers.
	5					(44-60") PID = 146.6 ppm	SILT	(44-60") SANDY SILT (ML): ~70% lowplastic fines, ~30% medium to fine sand, mottled gray/brown with black staining, wet. Contains strong napthalene-like odor and coal-tar coating on material.
								End of boring at 5.6'.
	10							

NOTES: Environmental samples collected from S1(0-1') and S2(1-2').

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.6
LOGGED BY: D. Miller
DATE START/END: 7/23/2024 - 7/23/2024
DRILLING COMPANY: TG & B
DRILLER NAME: Ben Avakian
RIG TYPE: 14-foot catamaran-style platform

BORING

872

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 5.6	67/60	NA	(0-8") PID = 9.3 ppm	SILT	(0-8") SILT WITH SAND (ML): ~80% nonplastic fines, 20% fine sand, dark-brown, wet. Contains organic-like odor, slight sheen, decaying plant matter and shells.
						(8-30") PID = 14.4 ppm	SAND	(8-30") SILTY SAND (SM): ~60% fine to coarse sand, ~35% nonplastic fines, ~5% subangular gravel up to 0.5", gray/brown, wet. Contains slight sheen, moderate napthalene-like odor, brick, coal, clinkers, glass, and decaying plant matter.
						(30-38") PID = 27.0 ppm	SILT	(30-38") SANDY SILT (ML): ~70% nonplastic fines, ~30% medium to fine sand, gray/brown, moist. Contains slight napthalene-like odor, decaying plant matter.
						(38-44") PID = 5.8 ppm	SAND	(38-44") SILTY SAND (SM): ~80% fine to coarse sand, 15% nonplastic fines, ~5% subangular gravel up to 0.5", gray/brown, moist. Contains brick fragmens.
	5					(44-60") PID = 5.8 ppm	SILT	(44-60") SANDY SILT (ML): ~70% nonplastic fines, 30% medium to fine sand, mottled gray/brown. Contains moderate organic-like odor, decaying plant matter.
								End of boring at 5.6'.
	10							

NOTES: Environmental samples collected from S1(0-1') and S2(1-2').

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.6
LOGGED BY: D. Miller
DATE START/END: 7/23/2024 - 7/23/2024
DRILLING COMPANY: TG & B
DRILLER NAME: Ben Avakian
RIG TYPE: 14-foot catamaran-style platform

BORING 873

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 5.6	67/60	NA	(0-17") PID = 9.9 ppm	SAND	(0-17") SILTY SAND (SM): ~70% fine to coarse sand, ~30% nonplastic fines, gray, wet. Contains slight organic-like odor, decaying plant matter in top 6" and brick fragments.
						(17-60") PID = 2.6 ppm	SILT	(17-60") SILT (ML): ~90% lowplastic fines, ~10% fine sand, brown except 54-60" (dark gray). Contains strong organic odor, dense decaying plant matter except 54-60", and ~2" diamater tree branch from 22-24".
	5							
								End of boring at 5.6'.
	10							

NOTES: Environmental samples collected from S1(0-1') and S2(1-2').

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.3
LOGGED BY: D. Miller
DATE START/END: 7/22/2024 - 7/22/2024
DRILLING COMPANY: TG & B
DRILLER NAME: Ben Avakain
RIG TYPE: 14-foot catamaran-style platform

BORING 874

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 5.3	64/54	NA	(0-24") PID = 0.0 ppm	SAND	(0-24") SILTY SAND WITH GRAVEL (SM): ~70% fine to coarse sand, ~15% nonplastic fines, ~15% subangular/subrounded gravel to 1", gray/brown, moist except for wet top 6". Contains some brick fragments.
						(24-52") PID = 0.6 ppm	SILT	(24-34") SANDY SILT (ML): ~60% nonplastic fines, ~40% medium to fine sand, gray/brown. 34-40" is 70% fine sand and 30% nonplastic fines, light gray, and 40-52" is brown, dense. Contains decaying plant matter, peat-like odor.
							SAND	(34-52") SILTY SAND (SM): ~70% fine sand, ~30% nonplastic fines, light gray/brown color.
	5							End of boring at 5.3'.
	10							

NOTES: Environmental samples collected from S1(0-1') and S2(1-2').

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.4
LOGGED BY: D. Miller
DATE START/END: 7/22/2024 - 7/22/2024
DRILLING COMPANY: TG & B
DRILLER NAME: Ben Avakian
RIG TYPE: 14-foot catamaran-style platform

BORING

875

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch
WATER LEVEL DEPTHS (ft): Not measured

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 5.4	65/60	NA	(0-20") PID = 14.2 ppm	SILT	(0-20") SANDY SILT (ML): ~70% nonplastic fines, ~30% medium to fine sand, dark brown, wet. Contains slight organic-like odor, dense decaying plant matter.
						(20-60") PID = 3.2 ppm	CLAY	(20-60") LEAN CLAY (CL): ~90% medium plastic fines, ~10% fine sand, light gray with some orange/brown mottling.
	5							End of boring at 5.4'
	10							

NOTES: Environmental samples collected from S1(0-1') and S2(1-2').

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.5
LOGGED BY: D. Miller
DATE START/END: 7/22/2024 - 7/22/2024
DRILLING COMPANY: TG & B
DRILLER NAME: Ben Avakian
RIG TYPE: 14-foot catamaran-style platform

BORING 876

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 5.5	66/60	NA	(0-36") PID = 1.4 ppm	SILT	(0-36") SANDY SILT (ML): ~70% nonplastic fines, 30% medium to fine sand, gray/brown, wet/moist. Contains slight naphthalene-like odor, slight sheen, decaying plant matter and plastic at 20".
						(36-48") PID = 1.5 ppm	SAND	(36-38") SILTY SAND (SM): ~80% fine to coarse sand, ~15% nonplastic fines, ~5% subangular gravel, gray/brown, moist. Contains brick and coal fragments.
						(48-60") PID = 1.0 ppm	SILT	(48-60") SANDY SILT (ML): ~60% nonplastic fines, ~40% fine sand, mottled gray/brown, moist. Contains decaying plant matter.
	5							End of boring at 5.5'.
	10							

NOTES: Environmental samples collected from S1(0-1') and S2(1-2').

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.5
LOGGED BY: D. Miller
DATE START/END: 7/22/2024 - 7/22/2024
DRILLING COMPANY: TG & B
DRILLER NAME: Ben Avakain
RIG TYPE: 14-foot catamaran-style platform

BORING

877

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE: Core-tube
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 5.5	66/60	NA	(0-22") PID = 1.1 ppm	SILT	(0-22") SANDY SILT (ML): ~70% nonplastic fines, ~30% medium to fine sand, gray/brown, top 8" is wet and mucky. Contains decaying plant matter.
						(22-32") PID = 0.6 ppm	SAND	(22-32") SILTY SAND (SM): ~70% fine to coarse sand, ~25% nonplastic fines, ~5% subangular gravel up to 0.5", gray/brown, moist. Contains brick and coal.
						(32-60") PID = 0.0 ppm	SILT	(32-60") SANDY SILT (ML): ~60% nonplastic fines, ~40% fine to medium sand, mottled brown/gray, moist. Contains organic-like odor, decaying plant matter.
	5							End of boring at 5.5'.
	10							

NOTES: Environmental samples collected from S1(0-1') and S2(1-2')

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.3
LOGGED BY: D. Miller
DATE START/END: 7/22/2024 - 7/22/2024
DRILLING COMPANY: TG & B
DRILLER NAME: Ben Avakain
RIG TYPE: 14-foot catamaran-style platform

BORING

878

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE:
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
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SC = Sonic Core
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HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 5.3	64/54	NA	(0-20") PID = 7.7 ppm	SILT	(0-20") SANDY SILT (ML): ~70% nonplastic fines, ~30% medium to fine sand, gray/brown, wet for top 1' then moist. Contains organic-like odor, decaying plant matter.
						(20-30") PID = 6.0 ppm	SAND	(20-30") SILTY SAND (SM): ~70% fine to coarse sand, ~25% nonplastic fines, ~5% subangular gravel up to 0.5", gray/brown, moist. Contains brick and wood.
						(30-54") PID = 6.7 ppm	SILT	(30-54") SANDY SILT (ML): ~60% nonplastic fines, ~40% fine to medium sand, mottled brown/gray, moist. Contains dense decaying plant matter from 30-42".
	5							End of boring at 5.3'.
	10							

NOTES: Environmental samples collected from S1(0-1') and S2(1-2').

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.0
LOGGED BY: D. Miller
DATE START/END: 7/22/2024 - 7/22/2024
DRILLING COMPANY: TG & B
DRILLER NAME: Ben Avakain
RIG TYPE: 14-foot catamaran-style platform

BORING

879

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE:
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
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S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 5	60/55	NA	(0-55") PID = 1.0 ppm	SILT	(0-55") SANDY SILT (ML): ~60% nonplastic fines , ~40% medium to fine sand, gray/brown with some black discoloration spotting, wet. Contains decaying plant matter and wood debris. Contains 0.5"-thick seams of fine to coarse sand.
	5							End of boring at 5.0'.
	10							

NOTES: Environmental samples collected from S1(0-1') and S2(1-2').

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.7
LOGGED BY: D. Miller
DATE START/END: 7/23/2024 - 7/23/2024
DRILLING COMPANY: TG & B
DRILLER NAME: Ben Avakain
RIG TYPE: 14-foot catamaran-style platform

BORING 880

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE:
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 5.7	68/60	NA	(0-12") PID = 0.0 ppm	SILT	(0-12") SANDY SILT (ML): ~80% nonplastic fines, ~20% fine sand, brown, wet. Contains organic-like odor, decaying plant matter.
						(12-48") PID = 0.0 ppm		(12-48") SANDY SILT (ML): ~70% nonplastic fines, ~30% fine sand, gray/brown, wet. Contains dense decaying plant matter, more dense than 0-12".
	5					(48-60") PID = 0.0 ppm	SAND	(48-60") SILTY SAND (SM): ~70% fine to coarse sand, ~30% nonplastic fines, gray, moist.
								End of boring at 5.7'.
	10							

NOTES: Environmental samples collected from S1(0-1') and S2(1-2').

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.7
LOGGED BY: D. Miller
DATE START/END: 7/23/2024 - 7/23/2024
DRILLING COMPANY: TG & B
DRILLER NAME: Ben Avakain
RIG TYPE: 14-foot catamaran-style platform

BORING 881

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE:
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 5.7	68/60	NA	(0-10") PID = 0.0 (10-37") PID = 0.0	SILT	(0-10") SILT WITH SAND (ML): ~80% nonplastic fines, ~20% fine sand, brown, wet. Contains organic-like odor, wood chips, decaying plant matter. (10-37") SANDY SILT (ML): ~70% nonplastic fines, ~30% fine sand, light brown/gray, moist. Contains seams of sandy material, decaying plant matter some brick and coal fragments.
	5					(37-60") PID = 0.0	SAND	(37-60") SILTY SAND (SM): ~70% fine to coarse sand, ~30% nonplastic fines, gray, moist.
								End of boring at 5.7'.
	10							

NOTES: Environmental samples collected from S1(0-1') and S2(1-2').

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.1
LOGGED BY: D. Miller
DATE START/END: 7/23/2024 - 7/23/2024
DRILLING COMPANY: TG & B
DRILLER NAME: Ben Avakain
RIG TYPE: 14-foot catamaran-style platform

BORING 882

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE:
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 5.1	61/60	NA	(0-10") PID = 1.3 ppm (10-51") PID = 2.5 ppm	SILT	(0-18") SILT WITH SAND (ML): ~80% nonplastic fines, ~20% fine sand, dark brown, wet. Contains organic-like odor, decaying plant matter. (18-51") SANDY SILT (ML): ~70% nonplastic fines, ~30% fine sand, moist. Contains decaying plant matter (more dense than 0-18").
	5					(51-60") PID = 3.6 ppm	SAND	(51-60") SILTY SAND (SM): ~70% fine to coarse sand, ~30% nonplastic fines, brown/gray, moist. Contains wood fragments.
								End of boring at 5.1'.
	10							

NOTES: Environmental samples collected from S1(0-1') and S2(1-2').

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.5
LOGGED BY: D. Miller
DATE START/END: 7/22/2024 - 7/22/2024
DRILLING COMPANY: TG & B
DRILLER NAME: Ben Avakain
RIG TYPE: 14-foot catamaran-style platform

BORING 884

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE:
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 5.5	66/60	NA	(0-16") PID = 9.0 ppm (16-26") PID = 10.7 ppm (26-60") PID = 124.4 ppm	SAND	(0-16") SILTY SAND (SM): ~70% fine to medium sand, ~30% nonplastic fines, dark gray/brown, wet. Contains moderate naphthalene-like odor, sheen, brick and coal fragments, clinker at 16".
							SILT	(16-26") SANDY SILT (ML): ~70% nonplastic fines, ~30% fine sand, brown, wet. Contains rainbow sheen, moderate naphthalene-like odor, brick and decaying plant matter.
							SAND	(26-60") : ~WIDELY GRADED SAND WIH GRAVEL (SW): ~80% fine to coarse sand, ~15% subangular gravel to 0.5", ~5% nonplastic fines, black/brown, wet. Contains strong naphthalene-like odor, strong sheen, blebs, coal tar coating from 54-60", coal, brick, clinkers, wood.
	5							End of boring at 5.5'.
	10							

NOTES:

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.4
LOGGED BY: D. Miller
DATE START/END: 7/23/2024 - 7/23/2024
DRILLING COMPANY: TG & B
DRILLER NAME: Ben Avakain
RIG TYPE: 14-foot catamaran-style platform

BORING 885

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE:
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 5.4	65/59	NA	(0-12") PID = 4.8 ppm	SAND	(0-12") SILTY SAND (SM): ~80% fine to coarse sand, ~20% nonplastic fines, gray/brown, wet. Contains slight naphthalene-like odor, coal fragments and clinkers.
						(12-22") PID = 19.9 ppm	SILT	(12-22") SANDY SILT (ML): ~80% lowplastic fines, ~20% fine sand, dark gray, black streaks, wet. Contains slight naphthalene-like odor, decaying plant matter.
						(22-42") PID = 23.6 ppm	SAND	(22-42") SILTY SAND (SM): ~80% fine to coarse sand, ~20% nonplastic fines, black/gray, wet. Contains moderate naphthalene-like odor, moderate sheen that increases with depth, coal fragments, clinkers, brick fragments, decaying plant matter.
	5					(42-59") PID = 84.0 ppm	SILT	(42-59") SANDY SILT (ML): ~90% lowplastic fines, ~10% fine sand, dark gray, wet. Contains strong sheen, strong naphthalene-like odor, dense decaying plant matter.
								End of boring at 5.4'.
	10							

NOTES:

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.7
LOGGED BY: D. Miller
DATE START/END: 7/23/2024 - 7/23/2024
DRILLING COMPANY: TG & B
DRILLER NAME: Ben Avakain
RIG TYPE: 14-foot catamaran-style platform

BORING 886

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE:
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 5.7	68/60	NA	(0-24") PID = 5.1 ppm	SAND	(0-24") SILTY SAND (SM): ~80% fine to medium sand, ~20% nonplastic fines, gray/brown, wet. Contains brick fragments, coal fragments, shells, decaying plant matter.
						(24-32") PID = 16.8 ppm	SILT	(24-32") SILT WITH SAND (ML) ~80% nonplastic fines, ~20% medium to fine sand, gray/brown. Contains slight naphthalene-like odor, slight sheen, some decaying plant matter, 1" diameter branch.
						(32-60") PID = 55.1 ppm	SAND	(32-60") SILTY SAND (SM): ~80% fine sand, ~20% nonplastic fines, gray/brown with shiny black staining from (48-60"), wet. Contains strong naphthalene-like odor, strong sheen, coal fragments, brick fragments, wood debris, and clinkers.
	5							
								End of boring at 5.7'
	10							

NOTES:

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.2
LOGGED BY: D. Miller
DATE START/END: 7/23/2024 - 7/23/2024
DRILLING COMPANY: TG & B
DRILLER NAME: Ben Avakain
RIG TYPE: 14-foot catamaran-style platform

BORING 887

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE:
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 5.2	62/53	NA	(0-26") PID = 5.7 ppm	SILT	(0-26") SILT WITH SAND (ML): ~90% nonplastic fines, ~10% fine sand, gray/brown, very wet. Contains organic-like odor, signifigant leaf litter.
						(26-48") PID = 7.6 ppm	SAND	(26-48") SANDY SILT (ML): ~60% nonplastic fines, ~40% medium to fine sand, gray/brown. Contains organic-like odor, wet (26-30"), moist (30-48"), 1" diamater wood fragment, decaying woody plant matter.
	5					(48-51") PID = 4.8 ppm		(48-51") SILTY SAND (SM): ~80% fine to coarse sand, ~20% nonplastic fines, gray, moist.
								End of boring at 5.2'
	10							

NOTES:

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 5.0
LOGGED BY: D. Miller
DATE START/END: 7/22/2024 - 7/22/2024
DRILLING COMPANY: TG & B
DRILLER NAME: Ben Avakain
RIG TYPE: 14-foot catamaran-style platform

BORING 888

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE:
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 5	60/60	NA	(0-12") PID = 0.0 ppm (12-32") PID = 0.0 ppm (32-40") PID = 0.0 ppm (40-60") PID = 0.0 ppm	SAND	(0-12") SILTY SAND (SM): ~80% fine to coarse sand, ~15% nonplastic fines, ~5% subangular gravel to 0.5", dark gray/brown, wet. Contains brick fragments, glass, coal fragments, shells, decaying plant matter. (12-32") SILTY SAND (SM): ~60% fine sand, ~40% nonplastic fines, gray/brown, moist. Contains dense decaying plant matter. (32-40") SILTY SAND (SM): ~70% fine to coarse sand, ~30% nonplastic fines, gray/brown, moist. Contains woody decaying plant matter, 3" x 1" piece of gravel.
	5						CLAY	(40-60") LEAN CLAY (CL): ~100% nonplastic fines, gray, moist. End of boring at 5.0'.
	10							

NOTES:

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

BORING INFORMATION

LOCATION: Powwow River
GROUND SURFACE EL. (ft): NM
VERTICAL DATUM: NM
TOTAL DEPTH (ft): 6.0
LOGGED BY: D. Miller
DATE START/END: 7/23/2024 - 7/23/2024
DRILLING COMPANY: TG & B
DRILLER NAME: Ben Avakain
RIG TYPE: 14-foot catamaran-style platform

BORING 889

DRILLING INFORMATION

HAMMER TYPE: NA
AUGER I.D./O.D.: NA / NA
DRILLING METHOD: Vibracore
WATER LEVEL DEPTHS (ft): Not measured
CASING I.D./O.D.: NA / NA
DRILL ROD O.D.: NM
CORE BARREL TYPE:
CORE BARREL I.D./O.D. 2.625 inch / 2.75 inch

ABBREVIATIONS:
Pen. = Penetration Length
Rec. = Recovery Length
RQD = Rock Quality Designation = Length of Sound Cores>4 in / Pen.,%
WOR = Weight of Rods
WOH = Weight of Hammer
S = Split Spoon Sample
C = Core Sample
U = Undisturbed Sample
SC = Sonic Core
DP = Direct Push Sample
HSA = Hollow-Stem Auger
Qp = Pocket Penetrometer Strength
Sv = Pocket Torvane Shear Strength
LL = Liquid Limit
PI = Plasticity Index
PID = Photoionization Detector
I.D./O.D. = Inside Diameter/Outside Diameter
NA, NM = Not Applicable, Not Measured
Blows per 6 in.: 140-lb hammer falling 30 inches to drive a 2-inch-O.D. split spoon sampler.

Elev. (ft)	Depth (ft)	Sample Information: Sample No.	Sample Information: Depth (ft)	Sample Information: Pen./ Rec. (in)	Sample Information: Blows per 6 in. or RQD	Drilling Remarks/ Field Test Data	Layer Name	Soil and Rock Description
		S1	0 to 6	72/65	NA	(0-24") PID = 3.9 ppm	SAND	(0-24") SILTY SAND (SM): ~80% fine to coarse sand, ~15% nonplastic fines, ~5% subangular gravel to 1", gray/brown, wet. Contains brick fragments, coal fragments, fused ash debris, 0.5" diamater wood branch at 6".
	5					(24-65") PID = 3.3 ppm	CLAY	(24-65") LEAN CLAY (CL): ~100% low/medium plastic fines, gray, wet, some brown mottling throughout.
	10							End of boring at 6.0'.

NOTES: Environmental samples collected from S1(0-1'), S2(1-2'), S3(4-5'). First try on 7/22 hit refusal at 2.8'. Redrilled on 7/23.

PROJECT NAME: Amesbury Former MGP
CLIENT: National Grid
CITY/STATE: Amesbury, Massachusetts
GEI PROJECT NUMBER: 1804576

GEI Consultants

GEI WOBURN STD 1-LOCATION-LAYER NAME BORING LOGS - 8.16.24.GPJ 9/4/24

Appendix G Laboratory Data Reports – Wetland Soil and Sediment

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury (044752)
ESS Laboratory Work Order Number: 1709743

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 4:49 pm, Oct 11, 2017

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1709743

SAMPLE RECEIPT

The following samples were received on September 26, 2017 for the analyses specified on the enclosed Chain of Custody Record.

To achieve CAM compliance for MCP data, ESS Laboratory has reviewed all QA/QC Requirements and Performance Standards listed in each method. Holding times and preservation have also been reviewed. All CAM requirements have been performed and achieved unless noted in the project narrative.

Each method has been set-up in the laboratory to reach required MCP standards. The methods for aqueous VOA and Soil Methanol VOA have known limitations for certain analytes. The regulatory standards may not be achieved due to these limitations. In addition, for all methods, matrix interferences, dilutions, and %Solids may elevate method reporting limits above regulatory standards. ESS Laboratory can provide, upon request, a Limit Checker (regulatory standard comparison spreadsheet) electronic deliverable which will highlight these exceedances.

Revision 1 October 6, 2017: This report has been revised to include changes to VOC analysis.

Revision 2 October 11, 2017 : This report has been revised to include changes to SVOC analysis.

Lab Number	Sample Name	Matrix	Analysis
1709743-01	044752-SS601-A	Soil	8260B, 8270D, 9014, EPH8270, MA PAC, MADEP-EPH, MADEP-VPH
1709743-02	044752-SS601-B	Soil	8260B, 8270D, 9014, EPH8270, MA PAC, MADEP-EPH, MADEP-VPH
1709743-03	044752-SS602-A	Soil	8260B, 8270D, 9014, EPH8270, MA PAC, MADEP-EPH, MADEP-VPH
1709743-04	044752-SS602-B	Soil	8260B, 8270D, 9014, EPH8270, MA PAC, MADEP-EPH, MADEP-VPH
1709743-05	044752-SS603-A	Soil	8260B, 8270D, 9014, EPH8270, MA PAC, MADEP-EPH, MADEP-VPH
1709743-06	044752-SS603-B	Soil	8260B, 8270D, 9014, EPH8270, MA PAC, MADEP-EPH, MADEP-VPH
1709743-07	044752-SS604-A	Soil	8260B, 8270D, 9014, EPH8270, MA PAC, MADEP-EPH, MADEP-VPH
1709743-08	044752-SS604-B	Soil	8260B, 8270D, 9014, EPH8270, MA PAC, MADEP-EPH, MADEP-VPH
1709743-09	044752-SS605-A	Soil	8260B, 8270D, 9014, EPH8270, MA PAC, MADEP-EPH, MADEP-VPH
1709743-10	044752-SS605-B	Soil	8260B, 8270D, 9014, EPH8270, MA PAC, MADEP-EPH, MADEP-VPH

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1709743

1709743-11	044752-SS606-A	Soil	8260B, 8270D, 9014, EPH8270, MA PAC, MADEP-EPH, MADEP-VPH
1709743-12	044752-SS606-B	Soil	8260B, 8270D, 9014, EPH8270, MA PAC, MADEP-EPH, MADEP-VPH
1709743-13	044752-SS607-A	Soil	8260B, 8270D, 9014, EPH8270, MA PAC, MADEP-EPH, MADEP-VPH
1709743-14	044752-SS607-B	Soil	8260B, 8270D, 9014, EPH8270, MA PAC, MADEP-EPH, MADEP-VPH

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury ESS Laboratory Work Order: 1709743

PROJECT NARRATIVE

5035/8260B Volatile Organic Compounds / Methanol

1709743-01 **Surrogate recovery(ies) above upper control limit (S+).**
1,2-Dichloroethane-d4 (132% @ 70-130%)

8270D Semi-Volatile Organic Compounds

C7I0430-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (118% @ 80-120%)

C7I0479-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (99% @ 80-120%)

C7I0479-CCV1 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
2,4-Dinitrotoluene (21% @ 20%), Di-n-octylphthalate (22% @ 20%)

MADEP-EPH Extractable Petroleum Hydrocarbons

C7I0478-CCV4 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
Benzo(a)pyrene (25% @ 20%), Benzo(b)fluoranthene (28% @ 20%)

CI72816-BSD1 **Blank Spike recovery is below lower control limit (B-).**
Decane (C10) (38% @ 40-140%)

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1709743

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1709743

MassDEP Analytical Protocol Certification Form

MADEP RTN: _____

This form provides certification for the following data set: **1709743-01 through 1709743-14**

Matrices: ( ) Ground Water/Surface Water (X) Soil/Sediment ( ) Drinking Water ( ) Air ( ) Other:_____

CAM Protocol (check all that apply below):

( ) 8260 VOC CAM II A	( ) 7470/7471 Hg CAM III B	(X) MassDEP VPH (GC/PID/FID) CAM IV A	( ) 8082 PCB CAM V A	(X) 9014 Total Cyanide/PAC CAM VI A	( ) 6860 Perchlorate CAM VIII B
(X) 8270 SVOC CAM II B	( ) 7010 Metals CAM III C	( ) MassDEP VPH (GC/MS) CAM IV B	( ) 8081 Pesticides CAM V C	( ) 7196 Hex Cr CAM VI B	( ) MassDEP APH CAM IX A
( ) 6010 Metals CAM III A	( ) 6020 Metals CAM III D	(X) MassDEP EPH CAM IV B	( ) 8151 Herbicides CAM V C	( ) Explosives CAM VIII A	( ) TO-15 VOC CAM IX B

Affirmative responses to questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	Yes (X) No ( )
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	Yes (X) No ( )
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	Yes (X) No ( )
D	Does the laboratory report comply with all the reporting requirements specified in the CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	Yes (X) No ( )
E	VPH, EPH, APH and TO-15 only: a. Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	Yes (X) No ( )
	b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	Yes ( ) No ( )
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	Yes (X) No ( )

Responses to Questions G, H and I below are required for '"Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocols(s)?	Yes (X) No ( )*
	***Data User Note:** Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.*	
H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	Yes ( ) No (X)*
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	Yes (X) No ( )*

****All negative responses must be addressed in an attached laboratory narrative.***

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature: _____ Date: October 03, 2017

Printed Name: Laurel Stoddard Position: Laboratory Director

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS601-A
Date Sampled: 09/22/17 08:24
Percent Solids: 79
Initial Volume: 27.7
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.190)		8260B		1	09/28/17 14:27	C7I0470	CI72830
Ethylbenzene	ND (0.190)		8260B		1	09/28/17 14:27	C7I0470	CI72830
Toluene	ND (0.190)		8260B		1	09/28/17 14:27	C7I0470	CI72830
Xylene O	ND (0.190)		8260B		1	09/28/17 14:27	C7I0470	CI72830
Xylene P,M	ND (0.380)		8260B		1	09/28/17 14:27	C7I0470	CI72830
Xylenes (Total)	ND (0.380)		8260B		1	09/28/17 14:27		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*132 %*	*S+*	*70-130*
Surrogate: 4-Bromofluorobenzene	*122 %*		*70-130*
Surrogate: Dibromofluoromethane	*124 %*		*70-130*
Surrogate: Toluene-d8	*115 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS601-A
Date Sampled: 09/22/17 08:24
Percent Solids: 79
Initial Volume: 15.5
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/28/17 12:50

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	ND (0.408)		8270D		1	09/29/17 14:39	C7I0480	CI72717
Acenaphthene	ND (0.408)		8270D		1	09/29/17 14:39	C7I0480	CI72717
Acenaphthylene	ND (0.408)		8270D		1	09/29/17 14:39	C7I0480	CI72717
Anthracene	ND (0.408)		8270D		1	09/29/17 14:39	C7I0480	CI72717
Benzo(a)anthracene	ND (0.408)		8270D		1	09/29/17 14:39	C7I0480	CI72717
Benzo(a)pyrene	ND (0.205)		8270D		1	09/29/17 14:39	C7I0480	CI72717
Benzo(b)fluoranthene	ND (0.408)		8270D		1	09/29/17 14:39	C7I0480	CI72717
Benzo(g,h,i)perylene	ND (0.408)		8270D		1	09/29/17 14:39	C7I0480	CI72717
Benzo(k)fluoranthene	ND (0.408)		8270D		1	09/29/17 14:39	C7I0480	CI72717
Chrysene	ND (0.205)		8270D		1	09/29/17 14:39	C7I0480	CI72717
Dibenzo(a,h)Anthracene	ND (0.205)		8270D		1	09/29/17 14:39	C7I0480	CI72717
Fluoranthene	ND (0.408)		8270D		1	09/29/17 14:39	C7I0480	CI72717
Fluorene	ND (0.408)		8270D		1	09/29/17 14:39	C7I0480	CI72717
Indeno(1,2,3-cd)Pyrene	ND (0.408)		8270D		1	09/29/17 14:39	C7I0480	CI72717
Naphthalene	ND (0.408)		8270D		1	09/29/17 14:39	C7I0480	CI72717
Phenanthrene	ND (0.408)		8270D		1	09/29/17 14:39	C7I0480	CI72717
Pyrene	ND (0.408)		8270D		1	09/29/17 14:39	C7I0480	CI72717

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichlorobenzene-d4	*57 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*71 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*59 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*61 %*		*30-130*
Surrogate: 2-Fluorophenol	*56 %*		*30-130*
Surrogate: Nitrobenzene-d5	*60 %*		*30-130*
Surrogate: Phenol-d6	*61 %*		*30-130*
Surrogate: p-Terphenyl-d14	*72 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS601-A
Date Sampled: 09/22/17 08:24
Percent Solids: 79

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Cyanide (PAC)	ND (1.19)		MA PAC		1	EEM	10/02/17 12:00	mg/kg dry	CJ70214
Total Cyanide	ND (1.15)		9014		1	EEM	09/28/17 11:50	mg/kg dry	CI72818

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS601-A
Date Sampled: 09/22/17 08:24
Percent Solids: 79
Initial Volume: 24
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-01
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 9/28/17 13:45

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (19.8)		MADEP-EPH		1	ZLC	09/28/17 22:25	C7I0465	CI72816
C19-C36 Aliphatics1	ND (19.8)		MADEP-EPH		1	ZLC	09/28/17 22:25	C7I0465	CI72816
C11-C22 Unadjusted Aromatics1	**26.7** (19.8)		EPH8270		1	VSC	09/28/17 20:24	C7I0478	CI72816
C11-C22 Aromatics1,2	**26.7** (19.8)		EPH8270			VSC	09/28/17 20:24		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*72 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*100 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*95 %*		*40-140*
Surrogate: O-Terphenyl	*87 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS601-A
Date Sampled: 09/22/17 08:24
Percent Solids: 79
Initial Volume: 28
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

MADEP-VPH Volatile Petroleum Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
C9-C10 Aromatics	ND (9.4)		MADEP-VPH		1	09/27/17 15:15	C7I0439	CI72729
C5-C8 Aliphatics1,2	ND (9.4)		MADEP-VPH		1	09/27/17 15:15		[CALC]
C9-C12 Aliphatics2,3	ND (9.4)		MADEP-VPH		1	09/27/17 15:15		[CALC]
1:1 Methanol/Soil Ratio %D	**87** (N/A)		MADEP-VPH			09/29/17 10:39		CI72729
Preservative:	**MeOH - covered**		MADEP-VPH					CI72729

	%Recovery	Qualifier	Limits
Surrogate: 2,5-Dibromotoluene - FID	*111 %*		*70-130*
Surrogate: 2,5-Dibromotoluene - PID	*109 %*		*70-130*
Surrogate: Trifluorotoluene - FID	*115 %*		*70-130*
Surrogate: Trifluorotoluene - PID	*113 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS601-B
Date Sampled: 09/22/17 08:55
Percent Solids: 50
Initial Volume: 22.5
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.463)		8260B		1	09/28/17 13:34	C7I0470	CI72830
Ethylbenzene	ND (0.463)		8260B		1	09/28/17 13:34	C7I0470	CI72830
Toluene	ND (0.463)		8260B		1	09/28/17 13:34	C7I0470	CI72830
Xylene O	ND (0.463)		8260B		1	09/28/17 13:34	C7I0470	CI72830
Xylene P,M	ND (0.926)		8260B		1	09/28/17 13:34	C7I0470	CI72830
Xylenes (Total)	ND (0.926)		8260B		1	09/28/17 13:34		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*108 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*80 %*		*70-130*
Surrogate: Dibromofluoromethane	*101 %*		*70-130*
Surrogate: Toluene-d8	*85 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS601-B
Date Sampled: 09/22/17 08:55
Percent Solids: 50
Initial Volume: 15.1
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/28/17 12:50

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	ND (0.658)		8270D		1	09/29/17 15:14	C7I0480	CI72717
Acenaphthene	ND (0.658)		8270D		1	09/29/17 15:14	C7I0480	CI72717
Acenaphthylene	ND (0.658)		8270D		1	09/29/17 15:14	C7I0480	CI72717
Anthracene	ND (0.658)		8270D		1	09/29/17 15:14	C7I0480	CI72717
Benzo(a)anthracene	**1.59** (0.658)		8270D		1	09/29/17 15:14	C7I0480	CI72717
Benzo(a)pyrene	**1.66** (0.330)		8270D		1	09/29/17 15:14	C7I0480	CI72717
Benzo(b)fluoranthene	**1.31** (0.658)		8270D		1	09/29/17 15:14	C7I0480	CI72717
Benzo(g,h,i)perylene	**0.942** (0.658)		8270D		1	09/29/17 15:14	C7I0480	CI72717
Benzo(k)fluoranthene	ND (0.658)		8270D		1	09/29/17 15:14	C7I0480	CI72717
Chrysene	**1.09** (0.330)		8270D		1	09/29/17 15:14	C7I0480	CI72717
Dibenzo(a,h)Anthracene	ND (0.330)		8270D		1	09/29/17 15:14	C7I0480	CI72717
Fluoranthene	**2.61** (0.658)		8270D		1	09/29/17 15:14	C7I0480	CI72717
Fluorene	ND (0.658)		8270D		1	09/29/17 15:14	C7I0480	CI72717
Indeno(1,2,3-cd)Pyrene	**0.661** (0.658)		8270D		1	09/29/17 15:14	C7I0480	CI72717
Naphthalene	ND (0.658)		8270D		1	09/29/17 15:14	C7I0480	CI72717
Phenanthrene	**2.33** (0.658)		8270D		1	09/29/17 15:14	C7I0480	CI72717
Pyrene	**4.39** (0.658)		8270D		1	09/29/17 15:14	C7I0480	CI72717

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*61 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*79 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*65 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*64 %*		*30-130*
Surrogate: 2-Fluorophenol	*62 %*		*30-130*
Surrogate: Nitrobenzene-d5	*64 %*		*30-130*
Surrogate: Phenol-d6	*67 %*		*30-130*
Surrogate: p-Terphenyl-d14	*85 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS601-B
Date Sampled: 09/22/17 08:55
Percent Solids: 50

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Cyanide (PAC)	ND (1.93)		MA PAC		1	EEM	10/02/17 12:00	mg/kg dry	CJ70214
Total Cyanide	ND (1.85)		9014		1	EEM	09/28/17 11:50	mg/kg dry	CI72818

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS601-B
Date Sampled: 09/22/17 08:55
Percent Solids: 50
Initial Volume: 25.5
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-02
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 9/28/17 13:45

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (29.3)		MADEP-EPH		1	ZLC	09/28/17 23:12	C7I0465	CI72816
C19-C36 Aliphatics1	ND (29.3)		MADEP-EPH		1	ZLC	09/28/17 23:12	C7I0465	CI72816
C11-C22 Unadjusted Aromatics1	**40.6** (29.3)		EPH8270		1	VSC	09/28/17 21:00	C7I0478	CI72816
C11-C22 Aromatics1,2	**38.4** (29.3)		EPH8270			VSC	09/28/17 21:00		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*79 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*103 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*94 %*		*40-140*
Surrogate: O-Terphenyl	*94 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS601-B
Date Sampled: 09/22/17 08:55
Percent Solids: 50
Initial Volume: 22.5
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

MADEP-VPH Volatile Petroleum Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
C9-C10 Aromatics	ND (23.2)		MADEP-VPH		1	09/27/17 15:49	C7I0439	CI72729
C5-C8 Aliphatics1,2	ND (23.2)		MADEP-VPH		1	09/27/17 15:49		[CALC]
C9-C12 Aliphatics2,3	ND (23.2)		MADEP-VPH		1	09/27/17 15:49		[CALC]
1:1 Methanol/Soil Ratio %D	**50** (N/A)		MADEP-VPH			09/29/17 10:39		CI72729
Preservative:	**MeOH - covered**		MADEP-VPH					CI72729

	%Recovery	Qualifier	Limits
Surrogate: 2,5-Dibromotoluene - FID	*111 %*		*70-130*
Surrogate: 2,5-Dibromotoluene - PID	*109 %*		*70-130*
Surrogate: Trifluorotoluene - FID	*90 %*		*70-130*
Surrogate: Trifluorotoluene - PID	*89 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS602-A
Date Sampled: 09/22/17 09:30
Percent Solids: 45
Initial Volume: 18.3
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.602)		8260B		1	09/27/17 15:24	C7I0443	CI72734
Ethylbenzene	ND (0.602)		8260B		1	09/27/17 15:24	C7I0443	CI72734
Toluene	ND (0.602)		8260B		1	09/27/17 15:24	C7I0443	CI72734
Xylene O	ND (0.602)		8260B		1	09/27/17 15:24	C7I0443	CI72734
Xylene P,M	ND (1.20)		8260B		1	09/27/17 15:24	C7I0443	CI72734
Xylenes (Total)	ND (1.20)		8260B		1	09/27/17 15:24		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*104 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*85 %*		*70-130*
Surrogate: Dibromofluoromethane	*98 %*		*70-130*
Surrogate: Toluene-d8	*93 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS602-A
Date Sampled: 09/22/17 09:30
Percent Solids: 45
Initial Volume: 15.2
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/28/17 12:50

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	ND (0.363)		8270D		1	09/29/17 16:58	C7I0480	CI72717
Acenaphthene	ND (0.724)		8270D		1	09/29/17 16:58	C7I0480	CI72717
Acenaphthylene	ND (0.724)		8270D		1	09/29/17 16:58	C7I0480	CI72717
Anthracene	ND (0.724)		8270D		1	09/29/17 16:58	C7I0480	CI72717
Benzo(a)anthracene	ND (0.724)		8270D		1	09/29/17 16:58	C7I0480	CI72717
Benzo(a)pyrene	ND (0.363)		8270D		1	09/29/17 16:58	C7I0480	CI72717
Benzo(b)fluoranthene	ND (0.724)		8270D		1	09/29/17 16:58	C7I0480	CI72717
Benzo(g,h,i)perylene	ND (0.724)		8270D		1	09/29/17 16:58	C7I0480	CI72717
Benzo(k)fluoranthene	ND (0.724)		8270D		1	09/29/17 16:58	C7I0480	CI72717
Chrysene	ND (0.363)		8270D		1	09/29/17 16:58	C7I0480	CI72717
Dibenzo(a,h)Anthracene	ND (0.363)		8270D		1	09/29/17 16:58	C7I0480	CI72717
Fluoranthene	ND (0.724)		8270D		1	09/29/17 16:58	C7I0480	CI72717
Fluorene	ND (0.724)		8270D		1	09/29/17 16:58	C7I0480	CI72717
Indeno(1,2,3-cd)Pyrene	ND (0.724)		8270D		1	09/29/17 16:58	C7I0480	CI72717
Naphthalene	ND (0.724)		8270D		1	09/29/17 16:58	C7I0480	CI72717
Phenanthrene	ND (0.724)		8270D		1	09/29/17 16:58	C7I0480	CI72717
Pyrene	ND (0.724)		8270D		1	09/29/17 16:58	C7I0480	CI72717

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*56 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*73 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*61 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*60 %*		*30-130*
Surrogate: 2-Fluorophenol	*57 %*		*30-130*
Surrogate: Nitrobenzene-d5	*59 %*		*30-130*
Surrogate: Phenol-d6	*62 %*		*30-130*
Surrogate: p-Terphenyl-d14	*85 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS602-A
Date Sampled: 09/22/17 09:30
Percent Solids: 45

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Cyanide (PAC)	ND (2.11)		MA PAC		1	EEM	10/02/17 12:00	mg/kg dry	CJ70214
Total Cyanide	ND (2.05)		9014		1	EEM	09/28/17 11:50	mg/kg dry	CI72818

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS602-A
Date Sampled: 09/22/17 09:30
Percent Solids: 45
Initial Volume: 25.2
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-03
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 9/28/17 13:45

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (32.8)		MADEP-EPH		1	ZLC	09/28/17 23:59	C7I0465	CI72816
C19-C36 Aliphatics1	ND (32.8)		MADEP-EPH		1	ZLC	09/28/17 23:59	C7I0465	CI72816
C11-C22 Unadjusted Aromatics1	ND (32.8)		EPH8270		1	VSC	09/28/17 21:37	C7I0478	CI72816
C11-C22 Aromatics1,2	ND (32.8)		EPH8270			VSC	09/28/17 21:37		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*76 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*96 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*90 %*		*40-140*
Surrogate: O-Terphenyl	*83 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS602-A
Date Sampled: 09/22/17 09:30
Percent Solids: 45
Initial Volume: 18.6
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

MADEP-VPH Volatile Petroleum Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
C9-C10 Aromatics	ND (29.8)		MADEP-VPH		1	09/27/17 16:22	C7I0439	CI72729
C5-C8 Aliphatics1,2	ND (29.8)		MADEP-VPH		1	09/27/17 16:22		[CALC]
C9-C12 Aliphatics2,3	ND (29.8)		MADEP-VPH		1	09/27/17 16:22		[CALC]
1:1 Methanol/Soil Ratio %D	**24** (N/A)		MADEP-VPH			09/29/17 10:39		CI72729
Preservative:	**MeOH - covered**		MADEP-VPH					CI72729

	%Recovery	Qualifier	Limits
Surrogate: 2,5-Dibromotoluene - FID	*113 %*		*70-130*
Surrogate: 2,5-Dibromotoluene - PID	*111 %*		*70-130*
Surrogate: Trifluorotoluene - FID	*95 %*		*70-130*
Surrogate: Trifluorotoluene - PID	*95 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS602-B
Date Sampled: 09/22/17 09:45
Percent Solids: 48
Initial Volume: 19.2
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.544)		8260B		1	09/27/17 15:50	C7I0443	CI72734
Ethylbenzene	ND (0.544)		8260B		1	09/27/17 15:50	C7I0443	CI72734
Toluene	ND (0.544)		8260B		1	09/27/17 15:50	C7I0443	CI72734
Xylene O	ND (0.544)		8260B		1	09/27/17 15:50	C7I0443	CI72734
Xylene P,M	ND (1.09)		8260B		1	09/27/17 15:50	C7I0443	CI72734
Xylenes (Total)	ND (1.09)		8260B		1	09/27/17 15:50		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*108 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*90 %*		*70-130*
Surrogate: Dibromofluoromethane	*99 %*		*70-130*
Surrogate: Toluene-d8	*97 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS602-B
Date Sampled: 09/22/17 09:45
Percent Solids: 48
Initial Volume: 15.3
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/28/17 12:50

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	ND (0.682)		8270D		1	09/29/17 16:23	C7I0480	CI72717
Acenaphthene	ND (0.682)		8270D		1	09/29/17 16:23	C7I0480	CI72717
Acenaphthylene	ND (0.682)		8270D		1	09/29/17 16:23	C7I0480	CI72717
Anthracene	ND (0.682)		8270D		1	09/29/17 16:23	C7I0480	CI72717
Benzo(a)anthracene	ND (0.682)		8270D		1	09/29/17 16:23	C7I0480	CI72717
Benzo(a)pyrene	ND (0.342)		8270D		1	09/29/17 16:23	C7I0480	CI72717
Benzo(b)fluoranthene	ND (0.682)		8270D		1	09/29/17 16:23	C7I0480	CI72717
Benzo(g,h,i)perylene	ND (0.682)		8270D		1	09/29/17 16:23	C7I0480	CI72717
Benzo(k)fluoranthene	ND (0.682)		8270D		1	09/29/17 16:23	C7I0480	CI72717
Chrysene	ND (0.342)		8270D		1	09/29/17 16:23	C7I0480	CI72717
Dibenzo(a,h)Anthracene	ND (0.342)		8270D		1	09/29/17 16:23	C7I0480	CI72717
Fluoranthene	ND (0.682)		8270D		1	09/29/17 16:23	C7I0480	CI72717
Fluorene	ND (0.682)		8270D		1	09/29/17 16:23	C7I0480	CI72717
Indeno(1,2,3-cd)Pyrene	ND (0.682)		8270D		1	09/29/17 16:23	C7I0480	CI72717
Naphthalene	ND (0.682)		8270D		1	09/29/17 16:23	C7I0480	CI72717
Phenanthrene	ND (0.682)		8270D		1	09/29/17 16:23	C7I0480	CI72717
Pyrene	ND (0.682)		8270D		1	09/29/17 16:23	C7I0480	CI72717

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*78 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*90 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*78 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*79 %*		*30-130*
Surrogate: 2-Fluorophenol	*77 %*		*30-130*
Surrogate: Nitrobenzene-d5	*81 %*		*30-130*
Surrogate: Phenol-d6	*78 %*		*30-130*
Surrogate: p-Terphenyl-d14	*107 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS602-B
Date Sampled: 09/22/17 09:45
Percent Solids: 48

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-04
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Cyanide (PAC)	ND (2.04)		MA PAC		1	EEM	10/02/17 12:00	mg/kg dry	CJ70214
Total Cyanide	ND (2.03)		9014		1	EEM	09/29/17 13:00	mg/kg dry	CI72918

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS602-B
Date Sampled: 09/22/17 09:45
Percent Solids: 48
Initial Volume: 25
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-04
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 9/28/17 13:45

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (31.3)		MADEP-EPH		1	ZLC	09/29/17 0:47	C7I0465	CI72816
C19-C36 Aliphatics1	ND (31.3)		MADEP-EPH		1	ZLC	09/29/17 0:47	C7I0465	CI72816
C11-C22 Unadjusted Aromatics1	ND (31.3)		EPH8270		1	VSC	09/28/17 22:13	C7I0478	CI72816
C11-C22 Aromatics1,2	ND (31.3)		EPH8270			VSC	09/28/17 22:13		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*58 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*91 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*79 %*		*40-140*
Surrogate: O-Terphenyl	*66 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS602-B
Date Sampled: 09/22/17 09:45
Percent Solids: 48
Initial Volume: 19.5
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

MADEP-VPH Volatile Petroleum Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
C9-C10 Aromatics	ND (27.0)		MADEP-VPH		1	09/27/17 16:55	C7I0439	CI72729
C5-C8 Aliphatics1,2	ND (27.0)		MADEP-VPH		1	09/27/17 16:55		[CALC]
C9-C12 Aliphatics2,3	ND (27.0)		MADEP-VPH		1	09/27/17 16:55		[CALC]
1:1 Methanol/Soil Ratio %D	**30** (N/A)		MADEP-VPH			09/29/17 10:39		CI72729
Preservative:	**MeOH - covered**		MADEP-VPH					CI72729

	%Recovery	Qualifier	Limits
Surrogate: 2,5-Dibromotoluene - FID	*113 %*		*70-130*
Surrogate: 2,5-Dibromotoluene - PID	*111 %*		*70-130*
Surrogate: Trifluorotoluene - FID	*104 %*		*70-130*
Surrogate: Trifluorotoluene - PID	*104 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS603-A
Date Sampled: 09/22/17 10:24
Percent Solids: 83
Initial Volume: 26.2
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.180)		8260B		1	09/27/17 16:17	C7I0443	CI72734
Ethylbenzene	ND (0.180)		8260B		1	09/27/17 16:17	C7I0443	CI72734
Toluene	ND (0.180)		8260B		1	09/27/17 16:17	C7I0443	CI72734
Xylene O	ND (0.180)		8260B		1	09/27/17 16:17	C7I0443	CI72734
Xylene P,M	ND (0.361)		8260B		1	09/27/17 16:17	C7I0443	CI72734
Xylenes (Total)	ND (0.361)		8260B		1	09/27/17 16:17		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*103 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*92 %*		*70-130*
Surrogate: Dibromofluoromethane	*97 %*		*70-130*
Surrogate: Toluene-d8	*90 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS603-A
Date Sampled: 09/22/17 10:24
Percent Solids: 83
Initial Volume: 15.5
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/28/17 16:40

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	ND (0.390)		8270D		1	09/29/17 17:33	C7I0480	CI72815
Acenaphthene	**1.16** (0.390)		8270D		1	09/29/17 17:33	C7I0480	CI72815
Acenaphthylene	**0.390** (0.390)		8270D		1	09/29/17 17:33	C7I0480	CI72815
Anthracene	**2.20** (0.390)		8270D		1	09/29/17 17:33	C7I0480	CI72815
Benzo(a)anthracene	**3.91** (0.390)		8270D		1	09/29/17 17:33	C7I0480	CI72815
Benzo(a)pyrene	**4.19** (0.195)		8270D		1	09/29/17 17:33	C7I0480	CI72815
Benzo(b)fluoranthene	**3.42** (0.390)		8270D		1	09/29/17 17:33	C7I0480	CI72815
Benzo(g,h,i)perylene	**2.71** (0.390)		8270D		1	09/29/17 17:33	C7I0480	CI72815
Benzo(k)fluoranthene	**1.04** (0.390)		8270D		1	09/29/17 17:33	C7I0480	CI72815
Chrysene	**2.97** (0.195)		8270D		1	09/29/17 17:33	C7I0480	CI72815
Dibenzo(a,h)Anthracene	**0.744** (0.195)		8270D		1	09/29/17 17:33	C7I0480	CI72815
Fluoranthene	**6.14** (0.390)		8270D		1	09/29/17 17:33	C7I0480	CI72815
Fluorene	**0.774** (0.390)		8270D		1	09/29/17 17:33	C7I0480	CI72815
Indeno(1,2,3-cd)Pyrene	**1.98** (0.390)		8270D		1	09/29/17 17:33	C7I0480	CI72815
Naphthalene	ND (0.390)		8270D		1	09/29/17 17:33	C7I0480	CI72815
Phenanthrene	**6.80** (0.390)		8270D		1	09/29/17 17:33	C7I0480	CI72815
Pyrene	**11.7** (3.90)		8270D		10	10/02/17 17:21	C7I0480	CI72815

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*72 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*88 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*75 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*75 %*		*30-130*
Surrogate: 2-Fluorophenol	*71 %*		*30-130*
Surrogate: Nitrobenzene-d5	*73 %*		*30-130*
Surrogate: Phenol-d6	*77 %*		*30-130*
Surrogate: p-Terphenyl-d14	*100 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS603-A
Date Sampled: 09/22/17 10:24
Percent Solids: 83

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-05
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Cyanide (PAC)	ND (1.18)		MA PAC		1	EEM	10/02/17 12:00	mg/kg dry	CJ70214
Total Cyanide	ND (1.15)		9014		1	EEM	09/29/17 13:00	mg/kg dry	CI72918

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS603-A
Date Sampled: 09/22/17 10:24
Percent Solids: 83
Initial Volume: 25.9
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-05
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 9/28/17 13:45

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (17.5)		MADEP-EPH		1	ZLC	09/29/17 1:34	C7I0465	CI72816
C19-C36 Aliphatics1	ND (17.5)		MADEP-EPH		1	ZLC	09/29/17 1:34	C7I0465	CI72816
C11-C22 Unadjusted Aromatics1	**99.7** (17.5)		EPH8270		1	VSC	09/28/17 22:50	C7I0478	CI72816
C11-C22 Aromatics1,2	**60.4** (17.5)		EPH8270			IBM	09/29/17 18:12		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*62 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*103 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*96 %*		*40-140*
Surrogate: O-Terphenyl	*86 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS603-A
Date Sampled: 09/22/17 10:24
Percent Solids: 83
Initial Volume: 29.2
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

MADEP-VPH Volatile Petroleum Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
C9-C10 Aromatics	ND (8.3)		MADEP-VPH		1	09/27/17 17:28	C7I0439	CI72729
C5-C8 Aliphatics1,2	ND (8.3)		MADEP-VPH		1	09/27/17 17:28		[CALC]
C9-C12 Aliphatics2,3	ND (8.3)		MADEP-VPH		1	09/27/17 17:28		[CALC]
1:1 Methanol/Soil Ratio %D	**95** (N/A)		MADEP-VPH			09/29/17 10:39		CI72729
Preservative:	**MeOH - covered**		MADEP-VPH					CI72729

	%Recovery	Qualifier	Limits
Surrogate: 2,5-Dibromotoluene - FID	*112 %*		*70-130*
Surrogate: 2,5-Dibromotoluene - PID	*110 %*		*70-130*
Surrogate: Trifluorotoluene - FID	*99 %*		*70-130*
Surrogate: Trifluorotoluene - PID	*99 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS603-B
Date Sampled: 09/22/17 10:30
Percent Solids: 47
Initial Volume: 19.7
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.550)		8260B		1	09/27/17 16:44	C7I0443	CI72734
Ethylbenzene	ND (0.550)		8260B		1	09/27/17 16:44	C7I0443	CI72734
Toluene	ND (0.550)		8260B		1	09/27/17 16:44	C7I0443	CI72734
Xylene O	ND (0.550)		8260B		1	09/27/17 16:44	C7I0443	CI72734
Xylene P,M	ND (1.10)		8260B		1	09/27/17 16:44	C7I0443	CI72734
Xylenes (Total)	ND (1.10)		8260B		1	09/27/17 16:44		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*108 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*85 %*		*70-130*
Surrogate: Dibromofluoromethane	*98 %*		*70-130*
Surrogate: Toluene-d8	*92 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS603-B
Date Sampled: 09/22/17 10:30
Percent Solids: 47
Initial Volume: 15.2
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/28/17 16:40

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	ND (0.351)		8270D		1	09/29/17 18:08	C7I0480	CI72815
Acenaphthene	ND (0.700)		8270D		1	09/29/17 18:08	C7I0480	CI72815
Acenaphthylene	ND (0.700)		8270D		1	09/29/17 18:08	C7I0480	CI72815
Anthracene	**0.799** (0.700)		8270D		1	09/29/17 18:08	C7I0480	CI72815
Benzo(a)anthracene	**1.93** (0.700)		8270D		1	09/29/17 18:08	C7I0480	CI72815
Benzo(a)pyrene	**1.94** (0.351)		8270D		1	09/29/17 18:08	C7I0480	CI72815
Benzo(b)fluoranthene	**1.40** (0.700)		8270D		1	09/29/17 18:08	C7I0480	CI72815
Benzo(g,h,i)perylene	**1.37** (0.700)		8270D		1	09/29/17 18:08	C7I0480	CI72815
Benzo(k)fluoranthene	**0.710** (0.700)		8270D		1	09/29/17 18:08	C7I0480	CI72815
Chrysene	**1.54** (0.351)		8270D		1	09/29/17 18:08	C7I0480	CI72815
Dibenzo(a,h)Anthracene	**0.373** (0.351)		8270D		1	09/29/17 18:08	C7I0480	CI72815
Fluoranthene	**2.51** (0.700)		8270D		1	09/29/17 18:08	C7I0480	CI72815
Fluorene	ND (0.700)		8270D		1	09/29/17 18:08	C7I0480	CI72815
Indeno(1,2,3-cd)Pyrene	**0.900** (0.700)		8270D		1	09/29/17 18:08	C7I0480	CI72815
Naphthalene	ND (0.700)		8270D		1	09/29/17 18:08	C7I0480	CI72815
Phenanthrene	**1.82** (0.700)		8270D		1	09/29/17 18:08	C7I0480	CI72815
Pyrene	**4.77** (0.700)		8270D		1	09/29/17 18:08	C7I0480	CI72815

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*62 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*80 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*64 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*63 %*		*30-130*
Surrogate: 2-Fluorophenol	*61 %*		*30-130*
Surrogate: Nitrobenzene-d5	*63 %*		*30-130*
Surrogate: Phenol-d6	*64 %*		*30-130*
Surrogate: p-Terphenyl-d14	*83 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS603-B
Date Sampled: 09/22/17 10:30
Percent Solids: 47

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-06
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Cyanide (PAC)	ND (2.00)		MA PAC		1	EEM	10/02/17 12:00	mg/kg dry	CJ70214
Total Cyanide	ND (2.12)		9014		1	EEM	09/29/17 13:00	mg/kg dry	CI72918

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS603-B
Date Sampled: 09/22/17 10:30
Percent Solids: 47
Initial Volume: 25
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-06
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 9/28/17 13:45

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (32.0)		MADEP-EPH		1	ZLC	09/29/17 2:21	C7I0465	CI72816
C19-C36 Aliphatics1	ND (32.0)		MADEP-EPH		1	ZLC	09/29/17 2:21	C7I0465	CI72816
C11-C22 Unadjusted Aromatics1	**59.2** (32.0)		EPH8270		1	VSC	09/28/17 23:26	C7I0478	CI72816
C11-C22 Aromatics1,2	**57.0** (32.0)		EPH8270			VSC	09/28/17 23:26		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*68 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*104 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*98 %*		*40-140*
Surrogate: O-Terphenyl	*83 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS603-B
Date Sampled: 09/22/17 10:30
Percent Solids: 47
Initial Volume: 25.8
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

MADEP-VPH Volatile Petroleum Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
C9-C10 Aromatics	ND (23.7)		MADEP-VPH		1	09/27/17 18:01	C7I0439	CI72729
C5-C8 Aliphatics1,2	ND (23.7)		MADEP-VPH		1	09/27/17 18:01		[CALC]
C9-C12 Aliphatics2,3	ND (23.7)		MADEP-VPH		1	09/27/17 18:01		[CALC]
1:1 Methanol/Soil Ratio %D	**72** (N/A)		MADEP-VPH			09/29/17 10:39		CI72729
Preservative:	**MeOH - covered**		MADEP-VPH					CI72729

	%Recovery	Qualifier	Limits
Surrogate: 2,5-Dibromotoluene - FID	*112 %*		*70-130*
Surrogate: 2,5-Dibromotoluene - PID	*109 %*		*70-130*
Surrogate: Trifluorotoluene - FID	*110 %*		*70-130*
Surrogate: Trifluorotoluene - PID	*111 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS604-A
Date Sampled: 09/22/17 11:15
Percent Solids: 45
Initial Volume: 21.6
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-07
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.561)		8260B		1	09/27/17 17:10	C7I0443	CI72734
Ethylbenzene	ND (0.561)		8260B		1	09/27/17 17:10	C7I0443	CI72734
Toluene	ND (0.561)		8260B		1	09/27/17 17:10	C7I0443	CI72734
Xylene O	ND (0.561)		8260B		1	09/27/17 17:10	C7I0443	CI72734
Xylene P,M	ND (1.12)		8260B		1	09/27/17 17:10	C7I0443	CI72734
Xylenes (Total)	ND (1.12)		8260B		1	09/27/17 17:10		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*120 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*91 %*		*70-130*
Surrogate: Dibromofluoromethane	*109 %*		*70-130*
Surrogate: Toluene-d8	*98 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS604-A
Date Sampled: 09/22/17 11:15
Percent Solids: 45
Initial Volume: 15.2
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-07
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/28/17 16:40

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	**1.99** (0.370)		8270D		1	09/29/17 18:42	C7I0480	CI72815
Acenaphthene	**27.3** (7.38)		8270D		10	10/02/17 17:56	C7I0480	CI72815
Acenaphthylene	**5.08** (0.738)		8270D		1	09/29/17 18:42	C7I0480	CI72815
Anthracene	**23.2** (7.38)		8270D		10	10/02/17 17:56	C7I0480	CI72815
Benzo(a)anthracene	**38.3** (7.38)		8270D		10	10/02/17 17:56	C7I0480	CI72815
Benzo(a)pyrene	**42.8** (3.70)		8270D		10	10/02/17 17:56	C7I0480	CI72815
Benzo(b)fluoranthene	**30.0** (7.38)		8270D		10	10/02/17 17:56	C7I0480	CI72815
Benzo(g,h,i)perylene	**25.6** (7.38)		8270D		10	10/02/17 17:56	C7I0480	CI72815
Benzo(k)fluoranthene	**13.9** (7.38)		8270D		10	10/02/17 17:56	C7I0480	CI72815
Chrysene	**28.3** (3.70)		8270D		10	10/02/17 17:56	C7I0480	CI72815
Dibenzo(a,h)Anthracene	**7.06** (0.370)		8270D		1	09/29/17 18:42	C7I0480	CI72815
Fluoranthene	**72.5** (7.38)		8270D		10	10/02/17 17:56	C7I0480	CI72815
Fluorene	**14.9** (0.738)		8270D		1	09/29/17 18:42	C7I0480	CI72815
Indeno(1,2,3-cd)Pyrene	**18.2** (7.38)		8270D		10	10/02/17 17:56	C7I0480	CI72815
Naphthalene	**2.53** (0.738)		8270D		1	09/29/17 18:42	C7I0480	CI72815
Phenanthrene	**110** (7.38)		8270D		10	10/02/17 17:56	C7I0480	CI72815
Pyrene	**117** (7.38)		8270D		10	10/02/17 17:56	C7I0480	CI72815

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*63 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*89 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*64 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*63 %*		*30-130*
Surrogate: 2-Fluorophenol	*58 %*		*30-130*
Surrogate: Nitrobenzene-d5	*62 %*		*30-130*
Surrogate: Phenol-d6	*66 %*		*30-130*
Surrogate: p-Terphenyl-d14	*93 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS604-A
Date Sampled: 09/22/17 11:15
Percent Solids: 45

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-07
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Cyanide (PAC)	ND (2.06)		MA PAC		1	EEM	10/02/17 12:00	mg/kg dry	CJ70214
Total Cyanide	ND (2.14)		9014		1	EEM	09/29/17 13:00	mg/kg dry	CI72918

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS604-A
Date Sampled: 09/22/17 11:15
Percent Solids: 45
Initial Volume: 25.5
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-07
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 9/28/17 13:45

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (33.0)		MADEP-EPH		1	ZLC	09/29/17 3:09	C7I0465	CI72816
C19-C36 Aliphatics1	**38.2** (33.0)		MADEP-EPH		1	ZLC	09/29/17 3:09	C7I0465	CI72816
C11-C22 Unadjusted Aromatics1	**682** (33.0)		EPH8270		1	VSC	09/29/17 0:03	C7I0478	CI72816
C11-C22 Aromatics1,2	**389** (33.0)		EPH8270			VSC	09/29/17 19:25		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*58 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*95 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*92 %*		*40-140*
Surrogate: O-Terphenyl	*70 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS604-A
Date Sampled: 09/22/17 11:15
Percent Solids: 45
Initial Volume: 21.9
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-07
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

MADEP-VPH Volatile Petroleum Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
C9-C10 Aromatics	ND (27.9)		MADEP-VPH		1	09/27/17 18:34	C7I0439	CI72729
C5-C8 Aliphatics1,2	ND (27.9)		MADEP-VPH		1	09/27/17 18:34		[CALC]
C9-C12 Aliphatics2,3	ND (27.9)		MADEP-VPH		1	09/27/17 18:34		[CALC]
1:1 Methanol/Soil Ratio %D	**46** (N/A)		MADEP-VPH			09/29/17 10:39		CI72729
Preservative:	**MeOH - covered**		MADEP-VPH					CI72729

	%Recovery	Qualifier	Limits
Surrogate: 2,5-Dibromotoluene - FID	*113 %*		*70-130*
Surrogate: 2,5-Dibromotoluene - PID	*112 %*		*70-130*
Surrogate: Trifluorotoluene - FID	*110 %*		*70-130*
Surrogate: Trifluorotoluene - PID	*110 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS604-B
Date Sampled: 09/22/17 11:25
Percent Solids: 53
Initial Volume: 21.9
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-08
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.441)		8260B		1	09/27/17 17:36	C7I0443	CI72734
Ethylbenzene	ND (0.441)		8260B		1	09/27/17 17:36	C7I0443	CI72734
Toluene	ND (0.441)		8260B		1	09/27/17 17:36	C7I0443	CI72734
Xylene O	ND (0.441)		8260B		1	09/27/17 17:36	C7I0443	CI72734
Xylene P,M	ND (0.882)		8260B		1	09/27/17 17:36	C7I0443	CI72734
Xylenes (Total)	ND (0.882)		8260B		1	09/27/17 17:36		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*122 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*93 %*		*70-130*
Surrogate: Dibromofluoromethane	*110 %*		*70-130*
Surrogate: Toluene-d8	*98 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS604-B
Date Sampled: 09/22/17 11:25
Percent Solids: 53
Initial Volume: 15
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-08
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/28/17 16:40

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	ND (0.634)		8270D		1	09/29/17 19:17	C7I0480	CI72815
Acenaphthene	ND (0.634)		8270D		1	09/29/17 19:17	C7I0480	CI72815
Acenaphthylene	ND (0.634)		8270D		1	09/29/17 19:17	C7I0480	CI72815
Anthracene	ND (0.634)		8270D		1	09/29/17 19:17	C7I0480	CI72815
Benzo(a)anthracene	ND (0.634)		8270D		1	09/29/17 19:17	C7I0480	CI72815
Benzo(a)pyrene	**0.788** (0.318)		8270D		1	09/29/17 19:17	C7I0480	CI72815
Benzo(b)fluoranthene	ND (0.634)		8270D		1	09/29/17 19:17	C7I0480	CI72815
Benzo(g,h,i)perylene	ND (0.634)		8270D		1	09/29/17 19:17	C7I0480	CI72815
Benzo(k)fluoranthene	ND (0.634)		8270D		1	09/29/17 19:17	C7I0480	CI72815
Chrysene	**0.625** (0.318)		8270D		1	09/29/17 19:17	C7I0480	CI72815
Dibenzo(a,h)Anthracene	ND (0.318)		8270D		1	09/29/17 19:17	C7I0480	CI72815
Fluoranthene	ND (0.634)		8270D		1	09/29/17 19:17	C7I0480	CI72815
Fluorene	ND (0.634)		8270D		1	09/29/17 19:17	C7I0480	CI72815
Indeno(1,2,3-cd)Pyrene	ND (0.634)		8270D		1	09/29/17 19:17	C7I0480	CI72815
Naphthalene	ND (0.634)		8270D		1	09/29/17 19:17	C7I0480	CI72815
Phenanthrene	ND (0.634)		8270D		1	09/29/17 19:17	C7I0480	CI72815
Pyrene	**1.34** (0.634)		8270D		1	09/29/17 19:17	C7I0480	CI72815

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*63 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*79 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*65 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*61 %*		*30-130*
Surrogate: 2-Fluorophenol	*61 %*		*30-130*
Surrogate: Nitrobenzene-d5	*63 %*		*30-130*
Surrogate: Phenol-d6	*67 %*		*30-130*
Surrogate: p-Terphenyl-d14	*98 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS604-B
Date Sampled: 09/22/17 11:25
Percent Solids: 53

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-08
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Cyanide (PAC)	ND (1.76)		MA PAC		1	EEM	10/02/17 12:00	mg/kg dry	CJ70214
Total Cyanide	ND (1.78)		9014		1	EEM	09/29/17 13:00	mg/kg dry	CI72918

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS604-B
Date Sampled: 09/22/17 11:25
Percent Solids: 53
Initial Volume: 25.2
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-08
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 9/28/17 13:45

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (28.3)		MADEP-EPH		1	ZLC	09/29/17 3:56	C7I0465	CI72816
C19-C36 Aliphatics1	**65.4** (28.3)		MADEP-EPH		1	ZLC	09/29/17 3:56	C7I0465	CI72816
C11-C22 Unadjusted Aromatics1	**104** (28.3)		EPH8270		1	VSC	09/29/17 0:39	C7I0478	CI72816
C11-C22 Aromatics1,2	**102** (28.3)		EPH8270			VSC	09/29/17 0:39		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*73 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*106 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*98 %*		*40-140*
Surrogate: O-Terphenyl	*83 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS604-B
Date Sampled: 09/22/17 11:25
Percent Solids: 53
Initial Volume: 21.8
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-08
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

MADEP-VPH Volatile Petroleum Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
C9-C10 Aromatics	ND (22.1)		MADEP-VPH		1	09/27/17 19:07	C7I0439	CI72729
C5-C8 Aliphatics1,2	ND (22.1)		MADEP-VPH		1	09/27/17 19:07		[CALC]
C9-C12 Aliphatics2,3	ND (22.1)		MADEP-VPH		1	09/27/17 19:07		[CALC]
1:1 Methanol/Soil Ratio %D	**45** (N/A)		MADEP-VPH			09/29/17 10:39		CI72729
Preservative:	**MeOH - covered**		MADEP-VPH					CI72729

	%Recovery	Qualifier	Limits
Surrogate: 2,5-Dibromotoluene - FID	*111 %*		*70-130*
Surrogate: 2,5-Dibromotoluene - PID	*109 %*		*70-130*
Surrogate: Trifluorotoluene - FID	*108 %*		*70-130*
Surrogate: Trifluorotoluene - PID	*109 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS605-A
Date Sampled: 09/22/17 11:58
Percent Solids: 66
Initial Volume: 22.7
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-09
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.304)		8260B		1	09/27/17 18:03	C7I0443	CI72734
Ethylbenzene	ND (0.304)		8260B		1	09/27/17 18:03	C7I0443	CI72734
Toluene	ND (0.304)		8260B		1	09/27/17 18:03	C7I0443	CI72734
Xylene O	ND (0.304)		8260B		1	09/27/17 18:03	C7I0443	CI72734
Xylene P,M	ND (0.608)		8260B		1	09/27/17 18:03	C7I0443	CI72734
Xylenes (Total)	ND (0.608)		8260B		1	09/27/17 18:03		[CALC]

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichloroethane-d4	*127 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*102 %*		*70-130*
Surrogate: Dibromofluoromethane	*119 %*		*70-130*
Surrogate: Toluene-d8	*111 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS605-A
Date Sampled: 09/22/17 11:58
Percent Solids: 66
Initial Volume: 15.1
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-09
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/28/17 16:40

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	ND (0.502)		8270D		1	09/29/17 19:51	C7I0480	CI72815
Acenaphthene	ND (0.502)		8270D		1	09/29/17 19:51	C7I0480	CI72815
Acenaphthylene	ND (0.502)		8270D		1	09/29/17 19:51	C7I0480	CI72815
Anthracene	ND (0.502)		8270D		1	09/29/17 19:51	C7I0480	CI72815
Benzo(a)anthracene	ND (0.502)		8270D		1	09/29/17 19:51	C7I0480	CI72815
Benzo(a)pyrene	ND (0.252)		8270D		1	09/29/17 19:51	C7I0480	CI72815
Benzo(b)fluoranthene	ND (0.502)		8270D		1	09/29/17 19:51	C7I0480	CI72815
Benzo(g,h,i)perylene	ND (0.502)		8270D		1	09/29/17 19:51	C7I0480	CI72815
Benzo(k)fluoranthene	ND (0.502)		8270D		1	09/29/17 19:51	C7I0480	CI72815
Chrysene	ND (0.252)		8270D		1	09/29/17 19:51	C7I0480	CI72815
Dibenzo(a,h)Anthracene	ND (0.252)		8270D		1	09/29/17 19:51	C7I0480	CI72815
Fluoranthene	ND (0.502)		8270D		1	09/29/17 19:51	C7I0480	CI72815
Fluorene	ND (0.502)		8270D		1	09/29/17 19:51	C7I0480	CI72815
Indeno(1,2,3-cd)Pyrene	ND (0.502)		8270D		1	09/29/17 19:51	C7I0480	CI72815
Naphthalene	ND (0.502)		8270D		1	09/29/17 19:51	C7I0480	CI72815
Phenanthrene	ND (0.502)		8270D		1	09/29/17 19:51	C7I0480	CI72815
Pyrene	ND (0.502)		8270D		1	09/29/17 19:51	C7I0480	CI72815

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*68 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*81 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*69 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*70 %*		*30-130*
Surrogate: 2-Fluorophenol	*65 %*		*30-130*
Surrogate: Nitrobenzene-d5	*69 %*		*30-130*
Surrogate: Phenol-d6	*70 %*		*30-130*
Surrogate: p-Terphenyl-d14	*85 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS605-A
Date Sampled: 09/22/17 11:58
Percent Solids: 66

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-09
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Cyanide (PAC)	ND (1.40)		MA PAC		1	EEM	10/02/17 12:00	mg/kg dry	CJ70214
Total Cyanide	ND (1.38)		9014		1	EEM	09/29/17 13:00	mg/kg dry	CI72918

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS605-A
Date Sampled: 09/22/17 11:58
Percent Solids: 66
Initial Volume: 25
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-09
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 9/28/17 13:45

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (22.8)		MADEP-EPH		1	ZLC	09/29/17 4:43	C7I0465	CI72816
C19-C36 Aliphatics1	ND (22.8)		MADEP-EPH		1	ZLC	09/29/17 4:43	C7I0465	CI72816
C11-C22 Unadjusted Aromatics1	ND (22.8)		EPH8270		1	VSC	09/29/17 1:16	C7I0478	CI72816
C11-C22 Aromatics1,2	ND (22.8)		EPH8270			VSC	09/29/17 1:16		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*71 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*100 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*92 %*		*40-140*
Surrogate: O-Terphenyl	*83 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS605-A
Date Sampled: 09/22/17 11:58
Percent Solids: 66
Initial Volume: 22.8
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-09
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

MADEP-VPH Volatile Petroleum Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
C9-C10 Aromatics	ND (15.1)		MADEP-VPH		1	09/27/17 19:40	C7I0439	CI72729
C5-C8 Aliphatics1,2	ND (15.1)		MADEP-VPH		1	09/27/17 19:40		[CALC]
C9-C12 Aliphatics2,3	ND (15.1)		MADEP-VPH		1	09/27/17 19:40		[CALC]
1:1 Methanol/Soil Ratio %D	**52** (N/A)		MADEP-VPH			09/29/17 10:39		CI72729
Preservative:	**MeOH - covered**		MADEP-VPH					CI72729

	%Recovery	Qualifier	Limits
Surrogate: 2,5-Dibromotoluene - FID	*109 %*		*70-130*
Surrogate: 2,5-Dibromotoluene - PID	*107 %*		*70-130*
Surrogate: Trifluorotoluene - FID	*107 %*		*70-130*
Surrogate: Trifluorotoluene - PID	*107 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS605-B
Date Sampled: 09/22/17 12:15
Percent Solids: 64
Initial Volume: 23.9
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-10
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.310)		8260B		1	09/27/17 18:29	C7I0443	CI72734
Ethylbenzene	ND (0.310)		8260B		1	09/27/17 18:29	C7I0443	CI72734
Toluene	ND (0.310)		8260B		1	09/27/17 18:29	C7I0443	CI72734
Xylene O	ND (0.310)		8260B		1	09/27/17 18:29	C7I0443	CI72734
Xylene P,M	ND (0.619)		8260B		1	09/27/17 18:29	C7I0443	CI72734
Xylenes (Total)	ND (0.619)		8260B		1	09/27/17 18:29		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*117 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*102 %*		*70-130*
Surrogate: Dibromofluoromethane	*111 %*		*70-130*
Surrogate: Toluene-d8	*103 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS605-B
Date Sampled: 09/22/17 12:15
Percent Solids: 64
Initial Volume: 15.1
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-10
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/28/17 16:40

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	ND (0.518)		8270D		1	09/29/17 20:26	C7I0480	CI72815
Acenaphthene	ND (0.518)		8270D		1	09/29/17 20:26	C7I0480	CI72815
Acenaphthylene	ND (0.518)		8270D		1	09/29/17 20:26	C7I0480	CI72815
Anthracene	ND (0.518)		8270D		1	09/29/17 20:26	C7I0480	CI72815
Benzo(a)anthracene	ND (0.518)		8270D		1	09/29/17 20:26	C7I0480	CI72815
Benzo(a)pyrene	ND (0.260)		8270D		1	09/29/17 20:26	C7I0480	CI72815
Benzo(b)fluoranthene	ND (0.518)		8270D		1	09/29/17 20:26	C7I0480	CI72815
Benzo(g,h,i)perylene	ND (0.518)		8270D		1	09/29/17 20:26	C7I0480	CI72815
Benzo(k)fluoranthene	ND (0.518)		8270D		1	09/29/17 20:26	C7I0480	CI72815
Chrysene	ND (0.260)		8270D		1	09/29/17 20:26	C7I0480	CI72815
Dibenzo(a,h)Anthracene	ND (0.260)		8270D		1	09/29/17 20:26	C7I0480	CI72815
Fluoranthene	ND (0.518)		8270D		1	09/29/17 20:26	C7I0480	CI72815
Fluorene	ND (0.518)		8270D		1	09/29/17 20:26	C7I0480	CI72815
Indeno(1,2,3-cd)Pyrene	ND (0.518)		8270D		1	09/29/17 20:26	C7I0480	CI72815
Naphthalene	ND (0.518)		8270D		1	09/29/17 20:26	C7I0480	CI72815
Phenanthrene	ND (0.518)		8270D		1	09/29/17 20:26	C7I0480	CI72815
Pyrene	ND (0.518)		8270D		1	09/29/17 20:26	C7I0480	CI72815

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*70 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*81 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*72 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*68 %*		*30-130*
Surrogate: 2-Fluorophenol	*68 %*		*30-130*
Surrogate: Nitrobenzene-d5	*69 %*		*30-130*
Surrogate: Phenol-d6	*71 %*		*30-130*
Surrogate: p-Terphenyl-d14	*97 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS605-B
Date Sampled: 09/22/17 12:15
Percent Solids: 64

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-10
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Cyanide (PAC)	ND (1.46)		MA PAC		1	EEM	10/02/17 12:00	mg/kg dry	CJ70214
Total Cyanide	ND (1.54)		9014		1	EEM	09/29/17 13:00	mg/kg dry	CI72918

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS605-B
Date Sampled: 09/22/17 12:15
Percent Solids: 64
Initial Volume: 25.4
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-10
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 9/28/17 13:45

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (23.1)		MADEP-EPH		1	ZLC	09/29/17 5:31	C7I0465	CI72816
C19-C36 Aliphatics1	ND (23.1)		MADEP-EPH		1	ZLC	09/29/17 5:31	C7I0465	CI72816
C11-C22 Unadjusted Aromatics1	ND (23.1)		EPH8270		1	VSC	09/29/17 1:52	C7I0478	CI72816
C11-C22 Aromatics1,2	ND (23.1)		EPH8270			VSC	09/29/17 1:52		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*70 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*96 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*99 %*		*40-140*
Surrogate: O-Terphenyl	*82 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS605-B
Date Sampled: 09/22/17 12:15
Percent Solids: 64
Initial Volume: 24.7
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-10
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

MADEP-VPH Volatile Petroleum Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
C9-C10 Aromatics	ND (15.2)		MADEP-VPH		1	09/27/17 20:13	C7I0439	CI72729
C5-C8 Aliphatics1,2	ND (15.2)		MADEP-VPH		1	09/27/17 20:13		[CALC]
C9-C12 Aliphatics2,3	ND (15.2)		MADEP-VPH		1	09/27/17 20:13		[CALC]
1:1 Methanol/Soil Ratio %D	**65** (N/A)		MADEP-VPH			09/29/17 10:39		CI72729
Preservative:	**MeOH - covered**		MADEP-VPH					CI72729

	%Recovery	Qualifier	Limits
Surrogate: 2,5-Dibromotoluene - FID	*111 %*		*70-130*
Surrogate: 2,5-Dibromotoluene - PID	*109 %*		*70-130*
Surrogate: Trifluorotoluene - FID	*106 %*		*70-130*
Surrogate: Trifluorotoluene - PID	*106 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS606-A
Date Sampled: 09/22/17 12:40
Percent Solids: 19
Initial Volume: 16.2
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-11
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (1.87)		8260B		1	09/27/17 18:56	C7I0443	CI72734
Ethylbenzene	ND (1.87)		8260B		1	09/27/17 18:56	C7I0443	CI72734
Toluene	ND (1.87)		8260B		1	09/27/17 18:56	C7I0443	CI72734
Xylene O	ND (1.87)		8260B		1	09/27/17 18:56	C7I0443	CI72734
Xylene P,M	ND (3.73)		8260B		1	09/27/17 18:56	C7I0443	CI72734
Xylenes (Total)	ND (3.73)		8260B		1	09/27/17 18:56		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*98 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*78 %*		*70-130*
Surrogate: Dibromofluoromethane	*94 %*		*70-130*
Surrogate: Toluene-d8	*86 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS606-A
Date Sampled: 09/22/17 12:40
Percent Solids: 19
Initial Volume: 25.2
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-11
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/28/17 16:40

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	ND (0.533)		8270D		1	09/29/17 21:01	C7I0480	CI72815
Acenaphthene	ND (1.06)		8270D		1	09/29/17 21:01	C7I0480	CI72815
Acenaphthylene	ND (0.533)		8270D		1	09/29/17 21:01	C7I0480	CI72815
Anthracene	ND (1.06)		8270D		1	09/29/17 21:01	C7I0480	CI72815
Benzo(a)anthracene	ND (1.06)		8270D		1	09/29/17 21:01	C7I0480	CI72815
Benzo(a)pyrene	**1.53** (0.533)		8270D		1	09/29/17 21:01	C7I0480	CI72815
Benzo(b)fluoranthene	**1.75** (1.06)		8270D		1	09/29/17 21:01	C7I0480	CI72815
Benzo(g,h,i)perylene	**1.20** (1.06)		8270D		1	09/29/17 21:01	C7I0480	CI72815
Benzo(k)fluoranthene	ND (1.06)		8270D		1	09/29/17 21:01	C7I0480	CI72815
Chrysene	**1.17** (0.533)		8270D		1	09/29/17 21:01	C7I0480	CI72815
Dibenzo(a,h)Anthracene	ND (0.533)		8270D		1	09/29/17 21:01	C7I0480	CI72815
Fluoranthene	**1.44** (1.06)		8270D		1	09/29/17 21:01	C7I0480	CI72815
Fluorene	ND (1.06)		8270D		1	09/29/17 21:01	C7I0480	CI72815
Indeno(1,2,3-cd)Pyrene	ND (1.06)		8270D		1	09/29/17 21:01	C7I0480	CI72815
Naphthalene	ND (1.06)		8270D		1	09/29/17 21:01	C7I0480	CI72815
Phenanthrene	ND (1.06)		8270D		1	09/29/17 21:01	C7I0480	CI72815
Pyrene	**2.27** (1.06)		8270D		1	09/29/17 21:01	C7I0480	CI72815

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*66 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*91 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*74 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*67 %*		*30-130*
Surrogate: 2-Fluorophenol	*67 %*		*30-130*
Surrogate: Nitrobenzene-d5	*66 %*		*30-130*
Surrogate: Phenol-d6	*78 %*		*30-130*
Surrogate: p-Terphenyl-d14	*105 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS606-A
Date Sampled: 09/22/17 12:40
Percent Solids: 19

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-11
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Cyanide (PAC)	ND (5.09)		MA PAC		1	EEM	10/02/17 12:00	mg/kg dry	CJ70214
Total Cyanide	ND (5.11)		9014		1	EEM	09/29/17 13:00	mg/kg dry	CI72918

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS606-A
Date Sampled: 09/22/17 12:40
Percent Solids: 19
Initial Volume: 50.6
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-11
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 9/28/17 13:45

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (39.8)		MADEP-EPH		1	ZLC	09/29/17 6:18	C7I0465	CI72816
C19-C36 Aliphatics1	**55.6** (39.8)		MADEP-EPH		1	ZLC	09/29/17 6:18	C7I0465	CI72816
C11-C22 Unadjusted Aromatics1	ND (39.8)		EPH8270		1	VSC	09/29/17 5:54	C7I0478	CI72816
C11-C22 Aromatics1,2	ND (39.8)		EPH8270			VSC	09/29/17 5:54		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*71 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*98 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*96 %*		*40-140*
Surrogate: O-Terphenyl	*80 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS606-A
Date Sampled: 09/22/17 12:40
Percent Solids: 19
Initial Volume: 16.4
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-11
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

MADEP-VPH Volatile Petroleum Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
C9-C10 Aromatics	ND (92.8)		MADEP-VPH		1	09/27/17 20:46	C7I0439	CI72729
C5-C8 Aliphatics1,2	ND (92.8)		MADEP-VPH		1	09/27/17 20:46		[CALC]
C9-C12 Aliphatics2,3	ND (92.8)		MADEP-VPH		1	09/27/17 20:46		[CALC]
1:1 Methanol/Soil Ratio %D	**9** (N/A)		MADEP-VPH			09/29/17 10:39		CI72729
Preservative:	**MeOH - covered**		MADEP-VPH					CI72729

	%Recovery	Qualifier	Limits
Surrogate: 2,5-Dibromotoluene - FID	*111 %*		*70-130*
Surrogate: 2,5-Dibromotoluene - PID	*108 %*		*70-130*
Surrogate: Trifluorotoluene - FID	*94 %*		*70-130*
Surrogate: Trifluorotoluene - PID	*95 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS606-B
Date Sampled: 09/22/17 12:45
Percent Solids: 35
Initial Volume: 17.4
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-12
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.878)		8260B		1	09/27/17 19:22	C7I0443	CI72734
Ethylbenzene	ND (0.878)		8260B		1	09/27/17 19:22	C7I0443	CI72734
Toluene	ND (0.878)		8260B		1	09/27/17 19:22	C7I0443	CI72734
Xylene O	ND (0.878)		8260B		1	09/27/17 19:22	C7I0443	CI72734
Xylene P,M	ND (1.76)		8260B		1	09/27/17 19:22	C7I0443	CI72734
Xylenes (Total)	ND (1.76)		8260B		1	09/27/17 19:22		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*98 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*76 %*		*70-130*
Surrogate: Dibromofluoromethane	*92 %*		*70-130*
Surrogate: Toluene-d8	*82 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS606-B
Date Sampled: 09/22/17 12:45
Percent Solids: 35
Initial Volume: 25.2
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-12
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/28/17 16:40

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	ND (0.574)		8270D		1	09/29/17 21:35	C7I0480	CI72815
Acenaphthene	ND (0.574)		8270D		1	09/29/17 21:35	C7I0480	CI72815
Acenaphthylene	ND (0.574)		8270D		1	09/29/17 21:35	C7I0480	CI72815
Anthracene	ND (0.574)		8270D		1	09/29/17 21:35	C7I0480	CI72815
Benzo(a)anthracene	ND (0.574)		8270D		1	09/29/17 21:35	C7I0480	CI72815
Benzo(a)pyrene	ND (0.288)		8270D		1	09/29/17 21:35	C7I0480	CI72815
Benzo(b)fluoranthene	ND (0.574)		8270D		1	09/29/17 21:35	C7I0480	CI72815
Benzo(g,h,i)perylene	ND (0.574)		8270D		1	09/29/17 21:35	C7I0480	CI72815
Benzo(k)fluoranthene	ND (0.574)		8270D		1	09/29/17 21:35	C7I0480	CI72815
Chrysene	ND (0.288)		8270D		1	09/29/17 21:35	C7I0480	CI72815
Dibenzo(a,h)Anthracene	ND (0.288)		8270D		1	09/29/17 21:35	C7I0480	CI72815
Fluoranthene	ND (0.574)		8270D		1	09/29/17 21:35	C7I0480	CI72815
Fluorene	ND (0.574)		8270D		1	09/29/17 21:35	C7I0480	CI72815
Indeno(1,2,3-cd)Pyrene	ND (0.574)		8270D		1	09/29/17 21:35	C7I0480	CI72815
Naphthalene	ND (0.574)		8270D		1	09/29/17 21:35	C7I0480	CI72815
Phenanthrene	ND (0.574)		8270D		1	09/29/17 21:35	C7I0480	CI72815
Pyrene	ND (0.574)		8270D		1	09/29/17 21:35	C7I0480	CI72815

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*64 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*85 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*69 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*66 %*		*30-130*
Surrogate: 2-Fluorophenol	*63 %*		*30-130*
Surrogate: Nitrobenzene-d5	*65 %*		*30-130*
Surrogate: Phenol-d6	*71 %*		*30-130*
Surrogate: p-Terphenyl-d14	*94 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS606-B
Date Sampled: 09/22/17 12:45
Percent Solids: 35

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-12
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Cyanide (PAC)	ND (2.83)		MA PAC		1	EEM	10/02/17 12:00	mg/kg dry	CJ70214
Total Cyanide	ND (2.64)		9014		1	EEM	09/29/17 13:00	mg/kg dry	CI72918

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS606-B
Date Sampled: 09/22/17 12:45
Percent Solids: 35
Initial Volume: 30
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-12
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 9/28/17 13:45

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (36.2)		MADEP-EPH		1	ZLC	10/02/17 18:04	C7J0028	CI72816
C19-C36 Aliphatics1	ND (36.2)		MADEP-EPH		1	ZLC	10/02/17 18:04	C7J0028	CI72816
C11-C22 Unadjusted Aromatics1	ND (36.2)		EPH8270		1	ZLC	10/02/17 18:55	C7J0009	CI72816
C11-C22 Aromatics1,2	ND (36.2)		EPH8270			ZLC	10/02/17 18:55		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*88 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*85 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*95 %*		*40-140*
Surrogate: O-Terphenyl	*81 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS606-B
Date Sampled: 09/22/17 12:45
Percent Solids: 35
Initial Volume: 18.3
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-12
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

MADEP-VPH Volatile Petroleum Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
C9-C10 Aromatics	ND (42.7)		MADEP-VPH		1	09/27/17 21:19	C7I0439	CI72729
C5-C8 Aliphatics1,2	ND (42.7)		MADEP-VPH		1	09/27/17 21:19		[CALC]
C9-C12 Aliphatics2,3	ND (42.7)		MADEP-VPH		1	09/27/17 21:19		[CALC]
1:1 Methanol/Soil Ratio %D	**22** (N/A)		MADEP-VPH			09/29/17 10:39		CI72729
Preservative:	**MeOH - covered**		MADEP-VPH					CI72729

	%Recovery	Qualifier	Limits
Surrogate: 2,5-Dibromotoluene - FID	*111 %*		*70-130*
Surrogate: 2,5-Dibromotoluene - PID	*109 %*		*70-130*
Surrogate: Trifluorotoluene - FID	*94 %*		*70-130*
Surrogate: Trifluorotoluene - PID	*94 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS607-A
Date Sampled: 09/22/17 13:05
Percent Solids: 28
Initial Volume: 17
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-13
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (1.17)		8260B		1	09/27/17 19:49	C7I0443	CI72734
Ethylbenzene	ND (1.17)		8260B		1	09/27/17 19:49	C7I0443	CI72734
Toluene	ND (1.17)		8260B		1	09/27/17 19:49	C7I0443	CI72734
Xylene O	ND (1.17)		8260B		1	09/27/17 19:49	C7I0443	CI72734
Xylene P,M	ND (2.34)		8260B		1	09/27/17 19:49	C7I0443	CI72734
Xylenes (Total)	ND (2.34)		8260B		1	09/27/17 19:49		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*109 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*74 %*		*70-130*
Surrogate: Dibromofluoromethane	*105 %*		*70-130*
Surrogate: Toluene-d8	*85 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS607-A
Date Sampled: 09/22/17 13:05
Percent Solids: 28
Initial Volume: 25
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-13
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/28/17 16:40

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	**2.17** (0.364)		8270D		1	09/29/17 22:10	C7I0480	CI72815
Acenaphthene	**2.50** (0.726)		8270D		1	09/29/17 22:10	C7I0480	CI72815
Acenaphthylene	**1.76** (0.726)		8270D		1	09/29/17 22:10	C7I0480	CI72815
Anthracene	**4.92** (0.726)		8270D		1	09/29/17 22:10	C7I0480	CI72815
Benzo(a)anthracene	**10.3** (0.726)		8270D		1	09/29/17 22:10	C7I0480	CI72815
Benzo(a)pyrene	**12.3** (0.364)		8270D		1	09/29/17 22:10	C7I0480	CI72815
Benzo(b)fluoranthene	**10.4** (0.726)		8270D		1	09/29/17 22:10	C7I0480	CI72815
Benzo(g,h,i)perylene	**9.10** (0.726)		8270D		1	09/29/17 22:10	C7I0480	CI72815
Benzo(k)fluoranthene	**3.55** (0.726)		8270D		1	09/29/17 22:10	C7I0480	CI72815
Chrysene	**9.58** (0.364)		8270D		1	09/29/17 22:10	C7I0480	CI72815
Dibenzo(a,h)Anthracene	**2.73** (0.364)		8270D		1	09/29/17 22:10	C7I0480	CI72815
Fluoranthene	**17.4** (0.726)		8270D		1	09/29/17 22:10	C7I0480	CI72815
Fluorene	**2.25** (0.726)		8270D		1	09/29/17 22:10	C7I0480	CI72815
Indeno(1,2,3-cd)Pyrene	**6.93** (0.726)		8270D		1	09/29/17 22:10	C7I0480	CI72815
Naphthalene	**5.77** (0.726)		8270D		1	09/29/17 22:10	C7I0480	CI72815
Phenanthrene	**6.40** (0.726)		8270D		1	09/29/17 22:10	C7I0480	CI72815
Pyrene	**31.6** (7.26)		8270D		10	10/02/17 19:06	C7I0480	CI72815

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*57 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*86 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*62 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*59 %*		*30-130*
Surrogate: 2-Fluorophenol	*58 %*		*30-130*
Surrogate: Nitrobenzene-d5	*61 %*		*30-130*
Surrogate: Phenol-d6	*65 %*		*30-130*
Surrogate: p-Terphenyl-d14	*88 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS607-A
Date Sampled: 09/22/17 13:05
Percent Solids: 28

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-13
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Cyanide (PAC)	ND (3.42)		MA PAC		1	EEM	10/02/17 12:00	mg/kg dry	CJ70214
Total Cyanide	ND (3.63)		9014		1	EEM	09/29/17 13:00	mg/kg dry	CI72918

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS607-A
Date Sampled: 09/22/17 13:05
Percent Solids: 28
Initial Volume: 40.9
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-13
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 9/28/17 13:45

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (33.3)		MADEP-EPH		1	ZLC	09/29/17 12:35	C7I0465	CI72816
C19-C36 Aliphatics1	**93.2** (33.3)		MADEP-EPH		1	ZLC	09/29/17 12:35	C7I0465	CI72816
C11-C22 Unadjusted Aromatics1	**333** (33.3)		EPH8270		1	VSC	09/29/17 6:30	C7I0478	CI72816
C11-C22 Aromatics1,2	**231** (33.3)		EPH8270			IBM	09/29/17 20:02		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*80 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*96 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*95 %*		*40-140*
Surrogate: O-Terphenyl	*85 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS607-A
Date Sampled: 09/22/17 13:05
Percent Solids: 28
Initial Volume: 16.1
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-13
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

MADEP-VPH Volatile Petroleum Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
C9-C10 Aromatics	ND (60.2)		MADEP-VPH		1	09/27/17 21:52	C7I0439	CI72729
C5-C8 Aliphatics1,2	ND (60.2)		MADEP-VPH		1	09/27/17 21:52		[CALC]
C9-C12 Aliphatics2,3	ND (60.2)		MADEP-VPH		1	09/27/17 21:52		[CALC]
1:1 Methanol/Soil Ratio %D	**7** (N/A)		MADEP-VPH			09/29/17 10:39		CI72729
Preservative:	**MeOH - covered**		MADEP-VPH					CI72729

	%Recovery	Qualifier	Limits
Surrogate: 2,5-Dibromotoluene - FID	*110 %*		*70-130*
Surrogate: 2,5-Dibromotoluene - PID	*108 %*		*70-130*
Surrogate: Trifluorotoluene - FID	*85 %*		*70-130*
Surrogate: Trifluorotoluene - PID	*85 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS607-B
Date Sampled: 09/22/17 13:15
Percent Solids: 21
Initial Volume: 17.1
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-14
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (1.60)		8260B		1	09/27/17 20:15	C7I0443	CI72734
Ethylbenzene	ND (1.60)		8260B		1	09/27/17 20:15	C7I0443	CI72734
Toluene	ND (1.60)		8260B		1	09/27/17 20:15	C7I0443	CI72734
Xylene O	ND (1.60)		8260B		1	09/27/17 20:15	C7I0443	CI72734
Xylene P,M	ND (3.21)		8260B		1	09/27/17 20:15	C7I0443	CI72734
Xylenes (Total)	ND (3.21)		8260B		1	09/27/17 20:15		[CALC]

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichloroethane-d4	*105 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*72 %*		*70-130*
Surrogate: Dibromofluoromethane	*99 %*		*70-130*
Surrogate: Toluene-d8	*80 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS607-B
Date Sampled: 09/22/17 13:15
Percent Solids: 21
Initial Volume: 25.5
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-14
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 9/28/17 16:40

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	**2.99** (0.472)		8270D		1	09/29/17 22:44	C7I0480	CI72815
Acenaphthene	**3.66** (0.941)		8270D		1	09/29/17 22:44	C7I0480	CI72815
Acenaphthylene	**1.30** (0.941)		8270D		1	09/29/17 22:44	C7I0480	CI72815
Anthracene	**3.28** (0.941)		8270D		1	09/29/17 22:44	C7I0480	CI72815
Benzo(a)anthracene	**6.78** (0.941)		8270D		1	09/29/17 22:44	C7I0480	CI72815
Benzo(a)pyrene	**8.50** (0.472)		8270D		1	09/29/17 22:44	C7I0480	CI72815
Benzo(b)fluoranthene	**7.39** (0.941)		8270D		1	09/29/17 22:44	C7I0480	CI72815
Benzo(g,h,i)perylene	**6.63** (0.941)		8270D		1	09/29/17 22:44	C7I0480	CI72815
Benzo(k)fluoranthene	**2.61** (0.941)		8270D		1	09/29/17 22:44	C7I0480	CI72815
Chrysene	**6.37** (0.472)		8270D		1	09/29/17 22:44	C7I0480	CI72815
Dibenzo(a,h)Anthracene	**1.88** (0.472)		8270D		1	09/29/17 22:44	C7I0480	CI72815
Fluoranthene	**10.5** (0.941)		8270D		1	09/29/17 22:44	C7I0480	CI72815
Fluorene	**2.28** (0.941)		8270D		1	09/29/17 22:44	C7I0480	CI72815
Indeno(1,2,3-cd)Pyrene	**4.79** (0.941)		8270D		1	09/29/17 22:44	C7I0480	CI72815
Naphthalene	**10.2** (0.941)		8270D		1	09/29/17 22:44	C7I0480	CI72815
Phenanthrene	**3.85** (0.941)		8270D		1	09/29/17 22:44	C7I0480	CI72815
Pyrene	**18.2** (0.941)		8270D		1	09/29/17 22:44	C7I0480	CI72815

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*58 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*83 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*66 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*61 %*		*30-130*
Surrogate: 2-Fluorophenol	*60 %*		*30-130*
Surrogate: Nitrobenzene-d5	*60 %*		*30-130*
Surrogate: Phenol-d6	*71 %*		*30-130*
Surrogate: p-Terphenyl-d14	*84 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS607-B
Date Sampled: 09/22/17 13:15
Percent Solids: 21

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-14
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Cyanide (PAC)	ND (4.72)		MA PAC		1	EEM	10/02/17 12:00	mg/kg dry	CJ70214
Total Cyanide	ND (4.60)		9014		1	EEM	09/29/17 13:00	mg/kg dry	CI72918

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS607-B
Date Sampled: 09/22/17 13:15
Percent Solids: 21
Initial Volume: 50.8
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-14
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 9/28/17 13:45

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (35.5)		MADEP-EPH		1	ZLC	09/29/17 13:23	C7I0465	CI72816
C19-C36 Aliphatics1	**46.3** (35.5)		MADEP-EPH		1	ZLC	09/29/17 13:23	C7I0465	CI72816
C11-C22 Unadjusted Aromatics1	**60.1** (35.5)		EPH8270		1	VSC	09/29/17 7:07	C7I0478	CI72816
C11-C22 Aromatics1,2	**54.0** (35.5)		EPH8270			VSC	09/29/17 7:07		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*70 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*91 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*87 %*		*40-140*
Surrogate: O-Terphenyl	*79 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS607-B
Date Sampled: 09/22/17 13:15
Percent Solids: 21
Initial Volume: 15.9
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1709743
ESS Laboratory Sample ID: 1709743-14
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK

MADEP-VPH Volatile Petroleum Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
C9-C10 Aromatics	ND (83.4)		MADEP-VPH		1	09/27/17 22:25	C7I0439	CI72729
C5-C8 Aliphatics1,2	ND (83.4)		MADEP-VPH		1	09/27/17 22:25		[CALC]
C9-C12 Aliphatics2,3	ND (83.4)		MADEP-VPH		1	09/27/17 22:25		[CALC]
1:1 Methanol/Soil Ratio %D	**6** (N/A)		MADEP-VPH			09/29/17 10:39		CI72729
Preservative:	**MeOH - covered**		MADEP-VPH					CI72729

	%Recovery	Qualifier	Limits
Surrogate: 2,5-Dibromotoluene - FID	*113 %*		*70-130*
Surrogate: 2,5-Dibromotoluene - PID	*110 %*		*70-130*
Surrogate: Trifluorotoluene - FID	*130 %*		*70-130*
Surrogate: Trifluorotoluene - PID	*129 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1709743

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch CI72734 - 5035										
Blank										
Benzene	ND	0.200	mg/kg wet							
Ethylbenzene	ND	0.200	mg/kg wet							
Toluene	ND	0.200	mg/kg wet							
Xylene O	ND	0.200	mg/kg wet							
Xylene P,M	ND	0.400	mg/kg wet							
Xylenes (Total)	ND	0.400	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*5.49*		mg/kg wet	*5.000*		*110*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*4.81*		mg/kg wet	*5.000*		*96*	*70-130*			
Surrogate: Dibromofluoromethane	*5.38*		mg/kg wet	*5.000*		*108*	*70-130*			
Surrogate: Toluene-d8	*4.90*		mg/kg wet	*5.000*		*98*	*70-130*			
LCS										
Benzene	2.03	0.200	mg/kg wet	2.000		101	70-130			
Ethylbenzene	2.12	0.200	mg/kg wet	2.000		106	70-130			
Toluene	1.89	0.200	mg/kg wet	2.000		95	70-130			
Xylene O	2.06	0.200	mg/kg wet	2.000		103	70-130			
Xylene P,M	4.14	0.400	mg/kg wet	4.000		104	70-130			
Xylenes (Total)	6.20	0.400	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*5.17*		mg/kg wet	*5.000*		*103*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*5.31*		mg/kg wet	*5.000*		*106*	*70-130*			
Surrogate: Dibromofluoromethane	*5.08*		mg/kg wet	*5.000*		*102*	*70-130*			
Surrogate: Toluene-d8	*5.09*		mg/kg wet	*5.000*		*102*	*70-130*			
LCS Dup										
Benzene	2.08	0.200	mg/kg wet	2.000		104	70-130	3	20	
Ethylbenzene	2.15	0.200	mg/kg wet	2.000		108	70-130	2	20	
Toluene	1.89	0.200	mg/kg wet	2.000		94	70-130	0.3	20	
Xylene O	2.16	0.200	mg/kg wet	2.000		108	70-130	5	20	
Xylene P,M	4.20	0.400	mg/kg wet	4.000		105	70-130	1	20	
Xylenes (Total)	6.36	0.400	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*5.11*		mg/kg wet	*5.000*		*102*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*5.38*		mg/kg wet	*5.000*		*108*	*70-130*			
Surrogate: Dibromofluoromethane	*5.06*		mg/kg wet	*5.000*		*101*	*70-130*			
Surrogate: Toluene-d8	*5.20*		mg/kg wet	*5.000*		*104*	*70-130*			
Batch CI72830 - 5035										
Blank										
Benzene	ND	0.200	mg/kg wet							
Ethylbenzene	ND	0.200	mg/kg wet							
Toluene	ND	0.200	mg/kg wet							
Xylene O	ND	0.200	mg/kg wet							
Xylene P,M	ND	0.400	mg/kg wet							
Xylenes (Total)	ND	0.400	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*5.65*		mg/kg wet	*5.000*		*113*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*4.76*		mg/kg wet	*5.000*		*95*	*70-130*			
Surrogate: Dibromofluoromethane	*5.51*		mg/kg wet	*5.000*		*110*	*70-130*			
Surrogate: Toluene-d8	*4.77*		mg/kg wet	*5.000*		*95*	*70-130*			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1709743

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch CI72830 - 5035										
LCS										
Benzene	2.16	0.200	mg/kg wet	2.000		108	70-130			
Ethylbenzene	2.08	0.200	mg/kg wet	2.000		104	70-130			
Toluene	1.98	0.200	mg/kg wet	2.000		99	70-130			
Xylene O	2.09	0.200	mg/kg wet	2.000		105	70-130			
Xylene P,M	4.14	0.400	mg/kg wet	4.000		103	70-130			
Xylenes (Total)	6.23	0.400	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*5.29*		mg/kg wet	*5.000*		*106*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*5.11*		mg/kg wet	*5.000*		*102*	*70-130*			
Surrogate: Dibromofluoromethane	*5.42*		mg/kg wet	*5.000*		*108*	*70-130*			
Surrogate: Toluene-d8	*5.05*		mg/kg wet	*5.000*		*101*	*70-130*			
LCS Dup										
Benzene	2.09	0.200	mg/kg wet	2.000		105	70-130	3	20	
Ethylbenzene	2.07	0.200	mg/kg wet	2.000		103	70-130	0.4	20	
Toluene	1.86	0.200	mg/kg wet	2.000		93	70-130	6	20	
Xylene O	2.10	0.200	mg/kg wet	2.000		105	70-130	0.1	20	
Xylene P,M	4.11	0.400	mg/kg wet	4.000		103	70-130	0.6	20	
Xylenes (Total)	6.21	0.400	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*5.20*		mg/kg wet	*5.000*		*104*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*5.34*		mg/kg wet	*5.000*		*107*	*70-130*			
Surrogate: Dibromofluoromethane	*5.24*		mg/kg wet	*5.000*		*105*	*70-130*			
Surrogate: Toluene-d8	*5.20*		mg/kg wet	*5.000*		*104*	*70-130*			
8270D Semi-Volatile Organic Compounds										
Batch CI72717 - 3546										
Blank										
2-Methylnaphthalene	ND	0.167	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Benzo(a)anthracene	ND	0.333	mg/kg wet							
Benzo(a)pyrene	ND	0.167	mg/kg wet							
Benzo(b)fluoranthene	ND	0.333	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.333	mg/kg wet							
Benzo(k)fluoranthene	ND	0.333	mg/kg wet							
Chrysene	ND	0.167	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.167	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.333	mg/kg wet							
Naphthalene	ND	0.333	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	*2.35*		mg/kg wet	*3.333*		*70*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*3.72*		mg/kg wet	*5.000*		*74*	*30-130*			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1709743

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CI72717 - 3546										
Surrogate: 2-Chlorophenol-d4	*3.61*		mg/kg wet	*5.000*		*72*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.52*		mg/kg wet	*3.333*		*76*	*30-130*			
Surrogate: 2-Fluorophenol	*3.57*		mg/kg wet	*5.000*		*71*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.37*		mg/kg wet	*3.333*		*71*	*30-130*			
Surrogate: Phenol-d6	*3.70*		mg/kg wet	*5.000*		*74*	*30-130*			
Surrogate: p-Terphenyl-d14	*3.24*		mg/kg wet	*3.333*		*97*	*30-130*			
LCS										
2-Methylnaphthalene	2.57	0.333	mg/kg wet	3.333		77	40-140			
Acenaphthene	2.69	0.333	mg/kg wet	3.333		81	40-140			
Acenaphthylene	2.83	0.333	mg/kg wet	3.333		85	40-140			
Anthracene	2.89	0.333	mg/kg wet	3.333		87	40-140			
Benzo(a)anthracene	3.00	0.333	mg/kg wet	3.333		90	40-140			
Benzo(a)pyrene	3.06	0.167	mg/kg wet	3.333		92	40-140			
Benzo(b)fluoranthene	3.24	0.333	mg/kg wet	3.333		97	40-140			
Benzo(g,h,i)perylene	2.96	0.333	mg/kg wet	3.333		89	40-140			
Benzo(k)fluoranthene	3.02	0.333	mg/kg wet	3.333		90	40-140			
Chrysene	3.00	0.167	mg/kg wet	3.333		90	40-140			
Dibenzo(a,h)Anthracene	3.00	0.167	mg/kg wet	3.333		90	40-140			
Fluoranthene	3.24	0.333	mg/kg wet	3.333		97	40-140			
Fluorene	2.99	0.333	mg/kg wet	3.333		90	40-140			
Indeno(1,2,3-cd)Pyrene	2.97	0.333	mg/kg wet	3.333		89	40-140			
Naphthalene	2.69	0.333	mg/kg wet	3.333		81	40-140			
Phenanthrene	2.74	0.333	mg/kg wet	3.333		82	40-140			
Pyrene	2.89	0.333	mg/kg wet	3.333		87	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	*2.47*		mg/kg wet	*3.333*		*74*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.14*		mg/kg wet	*5.000*		*83*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.80*		mg/kg wet	*5.000*		*76*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.67*		mg/kg wet	*3.333*		*80*	*30-130*			
Surrogate: 2-Fluorophenol	*3.73*		mg/kg wet	*5.000*		*75*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.56*		mg/kg wet	*3.333*		*77*	*30-130*			
Surrogate: Phenol-d6	*3.91*		mg/kg wet	*5.000*		*78*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.97*		mg/kg wet	*3.333*		*89*	*30-130*			
LCS Dup										
2-Methylnaphthalene	2.62	0.333	mg/kg wet	3.333		79	40-140	2	30	
Acenaphthene	2.66	0.333	mg/kg wet	3.333		80	40-140	1	30	
Acenaphthylene	2.93	0.333	mg/kg wet	3.333		88	40-140	3	30	
Anthracene	2.91	0.333	mg/kg wet	3.333		87	40-140	0.6	30	
Benzo(a)anthracene	3.01	0.333	mg/kg wet	3.333		90	40-140	0.2	30	
Benzo(a)pyrene	3.10	0.167	mg/kg wet	3.333		93	40-140	1	30	
Benzo(b)fluoranthene	3.00	0.333	mg/kg wet	3.333		90	40-140	8	30	
Benzo(g,h,i)perylene	3.01	0.333	mg/kg wet	3.333		90	40-140	2	30	
Benzo(k)fluoranthene	3.25	0.333	mg/kg wet	3.333		98	40-140	8	30	
Chrysene	3.01	0.167	mg/kg wet	3.333		90	40-140	0.4	30	
Dibenzo(a,h)Anthracene	3.06	0.167	mg/kg wet	3.333		92	40-140	2	30	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1709743

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CI72717 - 3546										
Fluoranthene	3.21	0.333	mg/kg wet	3.333		96	40-140	0.8	30	
Fluorene	3.00	0.333	mg/kg wet	3.333		90	40-140	0.3	30	
Indeno(1,2,3-cd)Pyrene	3.01	0.333	mg/kg wet	3.333		90	40-140	2	30	
Naphthalene	2.72	0.333	mg/kg wet	3.333		82	40-140	1	30	
Phenanthrene	2.77	0.333	mg/kg wet	3.333		83	40-140	1	30	
Pyrene	2.96	0.333	mg/kg wet	3.333		89	40-140	2	30	
Surrogate: 1,2-Dichlorobenzene-d4	*2.57*		mg/kg wet	*3.333*		*77*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.23*		mg/kg wet	*5.000*		*85*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.89*		mg/kg wet	*5.000*		*78*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.77*		mg/kg wet	*3.333*		*83*	*30-130*			
Surrogate: 2-Fluorophenol	*3.82*		mg/kg wet	*5.000*		*76*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.65*		mg/kg wet	*3.333*		*79*	*30-130*			
Surrogate: Phenol-d6	*3.97*		mg/kg wet	*5.000*		*79*	*30-130*			
Surrogate: p-Terphenyl-d14	*3.08*		mg/kg wet	*3.333*		*92*	*30-130*			
Batch CI72815 - 3546										
Blank										
2-Methylnaphthalene	ND	0.167	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.167	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Benzo(a)anthracene	ND	0.333	mg/kg wet							
Benzo(a)pyrene	ND	0.167	mg/kg wet							
Benzo(b)fluoranthene	ND	0.333	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.333	mg/kg wet							
Benzo(k)fluoranthene	ND	0.333	mg/kg wet							
Chrysene	ND	0.167	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.167	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.333	mg/kg wet							
Naphthalene	ND	0.333	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	*1.72*		mg/kg wet	*3.333*		*52*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*2.35*		mg/kg wet	*5.000*		*47*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*2.63*		mg/kg wet	*5.000*		*53*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*1.80*		mg/kg wet	*3.333*		*54*	*30-130*			
Surrogate: 2-Fluorophenol	*2.58*		mg/kg wet	*5.000*		*52*	*30-130*			
Surrogate: Nitrobenzene-d5	*1.70*		mg/kg wet	*3.333*		*51*	*30-130*			
Surrogate: Phenol-d6	*2.70*		mg/kg wet	*5.000*		*54*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.01*		mg/kg wet	*3.333*		*60*	*30-130*			
LCS										
2-Methylnaphthalene	2.96	0.333	mg/kg wet	3.333		89	40-140			
Acenaphthene	2.87	0.333	mg/kg wet	3.333		86	40-140			
Acenaphthylene	3.10	0.333	mg/kg wet	3.333		93	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1709743

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CI72815 - 3546										
Anthracene	2.93	0.333	mg/kg wet	3.333		88	40-140			
Benzo(a)anthracene	2.91	0.333	mg/kg wet	3.333		87	40-140			
Benzo(a)pyrene	3.01	0.167	mg/kg wet	3.333		90	40-140			
Benzo(b)fluoranthene	3.13	0.333	mg/kg wet	3.333		94	40-140			
Benzo(g,h,i)perylene	2.88	0.333	mg/kg wet	3.333		86	40-140			
Benzo(k)fluoranthene	3.05	0.333	mg/kg wet	3.333		92	40-140			
Chrysene	2.91	0.167	mg/kg wet	3.333		87	40-140			
Dibenzo(a,h)Anthracene	2.92	0.167	mg/kg wet	3.333		88	40-140			
Fluoranthene	3.07	0.333	mg/kg wet	3.333		92	40-140			
Fluorene	3.18	0.333	mg/kg wet	3.333		96	40-140			
Indeno(1,2,3-cd)Pyrene	2.88	0.333	mg/kg wet	3.333		86	40-140			
Naphthalene	2.96	0.333	mg/kg wet	3.333		89	40-140			
Phenanthrene	2.82	0.333	mg/kg wet	3.333		85	40-140			
Pyrene	2.98	0.333	mg/kg wet	3.333		90	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	*2.89*		mg/kg wet	*3.333*		*87*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.60*		mg/kg wet	*5.000*		*92*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*4.50*		mg/kg wet	*5.000*		*90*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*3.07*		mg/kg wet	*3.333*		*92*	*30-130*			
Surrogate: 2-Fluorophenol	*4.36*		mg/kg wet	*5.000*		*87*	*30-130*			
Surrogate: Nitrobenzene-d5	*3.02*		mg/kg wet	*3.333*		*91*	*30-130*			
Surrogate: Phenol-d6	*4.56*		mg/kg wet	*5.000*		*91*	*30-130*			
Surrogate: p-Terphenyl-d14	*3.33*		mg/kg wet	*3.333*		*100*	*30-130*			
LCS Dup										
2-Methylnaphthalene	3.04	0.333	mg/kg wet	3.333		91	40-140	3	30	
Acenaphthene	3.03	0.333	mg/kg wet	3.333		91	40-140	5	30	
Acenaphthylene	3.18	0.333	mg/kg wet	3.333		95	40-140	2	30	
Anthracene	3.04	0.333	mg/kg wet	3.333		91	40-140	3	30	
Benzo(a)anthracene	3.04	0.333	mg/kg wet	3.333		91	40-140	4	30	
Benzo(a)pyrene	3.13	0.167	mg/kg wet	3.333		94	40-140	4	30	
Benzo(b)fluoranthene	3.25	0.333	mg/kg wet	3.333		97	40-140	4	30	
Benzo(g,h,i)perylene	3.06	0.333	mg/kg wet	3.333		92	40-140	6	30	
Benzo(k)fluoranthene	3.13	0.333	mg/kg wet	3.333		94	40-140	3	30	
Chrysene	3.01	0.167	mg/kg wet	3.333		90	40-140	4	30	
Dibenzo(a,h)Anthracene	3.10	0.167	mg/kg wet	3.333		93	40-140	6	30	
Fluoranthene	3.13	0.333	mg/kg wet	3.333		94	40-140	2	30	
Fluorene	3.29	0.333	mg/kg wet	3.333		99	40-140	3	30	
Indeno(1,2,3-cd)Pyrene	3.07	0.333	mg/kg wet	3.333		92	40-140	6	30	
Naphthalene	3.07	0.333	mg/kg wet	3.333		92	40-140	4	30	
Phenanthrene	2.91	0.333	mg/kg wet	3.333		87	40-140	3	30	
Pyrene	3.05	0.333	mg/kg wet	3.333		92	40-140	2	30	
Surrogate: 1,2-Dichlorobenzene-d4	*2.86*		mg/kg wet	*3.333*		*86*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.63*		mg/kg wet	*5.000*		*93*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*4.51*		mg/kg wet	*5.000*		*90*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*3.12*		mg/kg wet	*3.333*		*94*	*30-130*			
Surrogate: 2-Fluorophenol	*4.35*		mg/kg wet	*5.000*		*87*	*30-130*			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1709743

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CI72815 - 3546										
Surrogate: Nitrobenzene-d5	*3.00*		mg/kg wet	*3.333*		*90*	*30-130*			
Surrogate: Phenol-d6	*4.56*		mg/kg wet	*5.000*		*91*	*30-130*			
Surrogate: p-Terphenyl-d14	*3.28*		mg/kg wet	*3.333*		*98*	*30-130*			
Classical Chemistry										
Batch CI72818 - TCN Prep										
Blank										
Total Cyanide	ND	1.00	mg/kg wet							
LCS										
Total Cyanide	4.96	1.00	mg/kg wet	5.015		99	90-110			
Reference										
Total Cyanide	50.7	4.97	mg/kg wet	48.40		105	36.1577-206.612			
Reference										
Total Cyanide	49.4	4.94	mg/kg wet	48.40		102	36.1577-206.612			
Batch CI72918 - TCN Prep										
Blank										
Total Cyanide	ND	1.00	mg/kg wet							
LCS										
Total Cyanide	5.06	1.00	mg/kg wet	5.015		101	90-110			
Reference										
Total Cyanide	48.4	4.85	mg/kg wet	48.40		100	36.1577-206.612			
Reference										
Total Cyanide	50.1	4.88	mg/kg wet	48.40		104	36.1577-206.612			
Batch CJ70214 - TCN Prep										
Blank										
Cyanide (PAC)	ND	1.00	mg/kg wet							
LCS										
Cyanide (PAC)	4.96	1.00	mg/kg wet	5.015		99	80-120			
LCS										
Cyanide (PAC)	19.8	1.00	mg/kg wet	20.06		99	80-120			
LCS Dup										
Cyanide (PAC)	19.9	1.00	mg/kg wet	20.06		99	80-120	0.5	20	
Reference										
Cyanide (PAC)	3.34	1.00	mg/kg wet	65.40		5	0-10			
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch CI72816 - 3546										
Blank										

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1709743

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch CI72816 - 3546										
C19-C36 Aliphatics1	ND	15.0	mg/kg wet							
C9-C18 Aliphatics1	ND	15.0	mg/kg wet							
Decane (C10)	ND	0.5	mg/kg wet							
Docosane (C22)	ND	0.5	mg/kg wet							
Dodecane (C12)	ND	0.5	mg/kg wet							
Eicosane (C20)	ND	0.5	mg/kg wet							
Hexacosane (C26)	ND	0.5	mg/kg wet							
Hexadecane (C16)	ND	0.5	mg/kg wet							
Hexatriacontane (C36)	ND	0.5	mg/kg wet							
Nonadecane (C19)	ND	0.5	mg/kg wet							
Nonane (C9)	ND	0.5	mg/kg wet							
Octacosane (C28)	ND	0.5	mg/kg wet							
Octadecane (C18)	ND	0.5	mg/kg wet							
Tetracosane (C24)	ND	0.5	mg/kg wet							
Tetradecane (C14)	ND	0.5	mg/kg wet							
Triacontane (C30)	ND	0.5	mg/kg wet							
Surrogate: 1-Chlorooctadecane	*1.71*		mg/kg wet	*2.000*		*86*	*40-140*			
Blank										
2-Methylnaphthalene	ND	0.20	mg/kg wet							
Acenaphthene	ND	0.40	mg/kg wet							
Acenaphthylene	ND	0.20	mg/kg wet							
Anthracene	ND	0.40	mg/kg wet							
Benzo(a)anthracene	ND	0.40	mg/kg wet							
Benzo(a)pyrene	ND	0.40	mg/kg wet							
Benzo(b)fluoranthene	ND	0.40	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.40	mg/kg wet							
Benzo(k)fluoranthene	ND	0.40	mg/kg wet							
C11-C22 Aromatics1,2	ND	15.0	mg/kg wet							
C11-C22 Unadjusted Aromatics1	ND	15.0	mg/kg wet							
Chrysene	ND	0.40	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.20	mg/kg wet							
Fluoranthene	ND	0.40	mg/kg wet							
Fluorene	ND	0.40	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.40	mg/kg wet							
Naphthalene	ND	0.40	mg/kg wet							
Phenanthrene	ND	0.40	mg/kg wet							
Pyrene	ND	0.40	mg/kg wet							
Surrogate: 2-Bromonaphthalene	*1.95*		mg/kg wet	*2.000*		*98*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*1.87*		mg/kg wet	*2.000*		*93*	*40-140*			
Surrogate: O-Terphenyl	*1.97*		mg/kg wet	*2.000*		*98*	*40-140*			
LCS										
C19-C36 Aliphatics1	14.5	15.0	mg/kg wet	16.00		91	40-140			
C9-C18 Aliphatics1	7.8	15.0	mg/kg wet	12.00		65	40-140			
Decane (C10)	0.9	0.5	mg/kg wet	2.000		46	40-140			

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch CI72816 - 3546										
Docosane (C22)	1.6	0.5	mg/kg wet	2.000		82	40-140			
Dodecane (C12)	1.0	0.5	mg/kg wet	2.000		51	40-140			
Eicosane (C20)	1.5	0.5	mg/kg wet	2.000		73	40-140			
Hexacosane (C26)	1.5	0.5	mg/kg wet	2.000		74	40-140			
Hexadecane (C16)	1.4	0.5	mg/kg wet	2.000		68	40-140			
Hexatriacontane (C36)	1.5	0.5	mg/kg wet	2.000		77	40-140			
Nonadecane (C19)	1.5	0.5	mg/kg wet	2.000		75	40-140			
Nonane (C9)	0.7	0.5	mg/kg wet	2.000		36	30-140			
Octacosane (C28)	1.5	0.5	mg/kg wet	2.000		74	40-140			
Octadecane (C18)	1.4	0.5	mg/kg wet	2.000		70	40-140			
Tetracosane (C24)	1.5	0.5	mg/kg wet	2.000		74	40-140			
Tetradecane (C14)	1.1	0.5	mg/kg wet	2.000		57	40-140			
Triacontane (C30)	1.5	0.5	mg/kg wet	2.000		75	40-140			
Surrogate: 1-Chlorooctadecane	*1.61*		mg/kg wet	*2.000*		*81*	*40-140*			
LCS										
2-Methylnaphthalene	1.25	0.20	mg/kg wet	2.000		63	40-140			
Acenaphthene	1.54	0.40	mg/kg wet	2.000		77	40-140			
Acenaphthylene	1.55	0.20	mg/kg wet	2.000		78	40-140			
Anthracene	1.80	0.40	mg/kg wet	2.000		90	40-140			
Benzo(a)anthracene	1.92	0.40	mg/kg wet	2.000		96	40-140			
Benzo(a)pyrene	1.96	0.40	mg/kg wet	2.000		98	40-140			
Benzo(b)fluoranthene	1.96	0.40	mg/kg wet	2.000		98	40-140			
Benzo(g,h,i)perylene	1.90	0.40	mg/kg wet	2.000		95	40-140			
Benzo(k)fluoranthene	1.98	0.40	mg/kg wet	2.000		99	40-140			
C11-C22 Aromatics1,2	ND	15.0	mg/kg wet							
C11-C22 Unadjusted Aromatics1	34.7	15.0	mg/kg wet	34.00		102	40-140			
Chrysene	1.86	0.40	mg/kg wet	2.000		93	40-140			
Dibenzo(a,h)Anthracene	2.05	0.20	mg/kg wet	2.000		103	40-140			
Fluoranthene	1.76	0.40	mg/kg wet	2.000		88	40-140			
Fluorene	1.67	0.40	mg/kg wet	2.000		84	40-140			
Indeno(1,2,3-cd)Pyrene	1.83	0.40	mg/kg wet	2.000		91	40-140			
Naphthalene	1.32	0.40	mg/kg wet	2.000		66	40-140			
Phenanthrene	1.74	0.40	mg/kg wet	2.000		87	40-140			
Pyrene	1.75	0.40	mg/kg wet	2.000		87	40-140			
Surrogate: 2-Bromonaphthalene	*1.96*		mg/kg wet	*2.000*		*98*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*1.87*		mg/kg wet	*2.000*		*93*	*40-140*			
Surrogate: O-Terphenyl	*1.86*		mg/kg wet	*2.000*		*93*	*40-140*			
LCS										
2-Methylnaphthalene Breakthrough	0.0		%				0-5			
Naphthalene Breakthrough	0.0		%				0-5			
LCS Dup										
C19-C36 Aliphatics1	12.9	15.0	mg/kg wet	16.00		81	40-140	12	25	
C9-C18 Aliphatics1	7.0	15.0	mg/kg wet	12.00		58	40-140	11	25	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
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ESS Laboratory Work Order: 1709743

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch CI72816 - 3546										
Decane (C10)	0.8	0.5	mg/kg wet	2.000		38	40-140	18	25	B-
Docosane (C22)	1.3	0.5	mg/kg wet	2.000		67	40-140	21	25	
Dodecane (C12)	0.9	0.5	mg/kg wet	2.000		43	40-140	18	25	
Eicosane (C20)	1.3	0.5	mg/kg wet	2.000		66	40-140	11	25	
Hexacosane (C26)	1.3	0.5	mg/kg wet	2.000		66	40-140	11	25	
Hexadecane (C16)	1.2	0.5	mg/kg wet	2.000		62	40-140	10	25	
Hexatriacontane (C36)	1.4	0.5	mg/kg wet	2.000		69	40-140	11	25	
Nonadecane (C19)	1.3	0.5	mg/kg wet	2.000		67	40-140	10	25	
Nonane (C9)	0.6	0.5	mg/kg wet	2.000		31	30-140	15	25	
Octacosane (C28)	1.3	0.5	mg/kg wet	2.000		67	40-140	9	25	
Octadecane (C18)	1.3	0.5	mg/kg wet	2.000		63	40-140	10	25	
Tetracosane (C24)	1.3	0.5	mg/kg wet	2.000		67	40-140	11	25	
Tetradecane (C14)	1.0	0.5	mg/kg wet	2.000		51	40-140	11	25	
Triacontane (C30)	1.3	0.5	mg/kg wet	2.000		67	40-140	11	25	
Surrogate: 1-Chlorooctadecane	*1.45*		mg/kg wet	*2.000*		*73*	*40-140*			
LCS Dup										
2-Methylnaphthalene	1.14	0.20	mg/kg wet	2.000		57	40-140	9	30	
Acenaphthene	1.53	0.40	mg/kg wet	2.000		77	40-140	0.3	30	
Acenaphthylene	1.49	0.20	mg/kg wet	2.000		74	40-140	4	30	
Anthracene	1.80	0.40	mg/kg wet	2.000		90	40-140	0.07	30	
Benzo(a)anthracene	1.88	0.40	mg/kg wet	2.000		94	40-140	2	30	
Benzo(a)pyrene	1.77	0.40	mg/kg wet	2.000		89	40-140	10	30	
Benzo(b)fluoranthene	1.89	0.40	mg/kg wet	2.000		95	40-140	3	30	
Benzo(g,h,i)perylene	1.73	0.40	mg/kg wet	2.000		87	40-140	10	30	
Benzo(k)fluoranthene	1.81	0.40	mg/kg wet	2.000		90	40-140	9	30	
C11-C22 Aromatics1,2	5.04	15.0	mg/kg wet							
C11-C22 Unadjusted Aromatics1	33.0	15.0	mg/kg wet	34.00		97	40-140	5	25	
Chrysene	1.78	0.40	mg/kg wet	2.000		89	40-140	4	30	
Dibenzo(a,h)Anthracene	1.72	0.20	mg/kg wet	2.000		86	40-140	18	30	
Fluoranthene	1.71	0.40	mg/kg wet	2.000		86	40-140	3	30	
Fluorene	1.65	0.40	mg/kg wet	2.000		83	40-140	1	30	
Indeno(1,2,3-cd)Pyrene	1.57	0.40	mg/kg wet	2.000		79	40-140	15	30	
Naphthalene	1.11	0.40	mg/kg wet	2.000		56	40-140	17	30	
Phenanthrene	1.69	0.40	mg/kg wet	2.000		84	40-140	3	30	
Pyrene	1.72	0.40	mg/kg wet	2.000		86	40-140	2	30	
Surrogate: 2-Bromonaphthalene	*1.99*		mg/kg wet	*2.000*		*100*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*1.70*		mg/kg wet	*2.000*		*85*	*40-140*			
Surrogate: O-Terphenyl	*1.80*		mg/kg wet	*2.000*		*90*	*40-140*			
LCS Dup										
2-Methylnaphthalene Breakthrough	0.0		%				0-5		200	
Naphthalene Breakthrough	0.0		%				0-5		200	
MADEP-VPH Volatile Petroleum Hydrocarbon										

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier

MADEP-VPH Volatile Petroleum Hydrocarbon

Batch CI72729 - 5035

Blank

1,2,4-Trimethylbenzene	ND	0.2	mg/kg wet							
2,2,4-Trimethylpentane	ND	5.0	mg/kg wet							
2-Methylpentane	ND	5.0	mg/kg wet							
Benzene	ND	0.2	mg/kg wet							
C5-C8 Aliphatics1,2	ND	10.0	mg/kg wet							
C5-C8 Unadjusted Aliphatics	ND	10.0	mg/kg wet							
C9-C10 Aromatics	ND	10.0	mg/kg wet							
C9-C12 Aliphatics2,3	ND	10.0	mg/kg wet							
C9-C12 Unadjusted Aliphatics	ND	10.0	mg/kg wet							
Ethylbenzene	ND	0.2	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.05	mg/kg wet							
Naphthalene	ND	0.2	mg/kg wet							
n-Butylcyclohexane	ND	5.0	mg/kg wet							
n-Decane	ND	5.0	mg/kg wet							
Nonane (C9)	ND	5.0	mg/kg wet							
Pentane	ND	5.0	mg/kg wet							
Toluene	ND	0.2	mg/kg wet							
Xylene O	ND	0.2	mg/kg wet							
Xylene P,M	ND	0.4	mg/kg wet							
Surrogate: 2,5-Dibromotoluene - FID	*5.65*		mg/kg wet	*5.000*		*113*	*70-130*			
Surrogate: 2,5-Dibromotoluene - PID	*5.54*		mg/kg wet	*5.000*		*111*	*70-130*			
Surrogate: Trifluorotoluene - FID	*4.96*		mg/kg wet	*5.333*		*93*	*70-130*			
Surrogate: Trifluorotoluene - PID	*4.98*		mg/kg wet	*5.333*		*93*	*70-130*			

LCS

1,2,4-Trimethylbenzene	9.6	0.2	mg/kg wet	10.00		96	70-130			
2,2,4-Trimethylpentane	15.3	5.0	mg/kg wet	15.00		102	70-130			
2-Methylpentane	15.6	5.0	mg/kg wet	15.00		104	70-130			
Benzene	4.9	0.2	mg/kg wet	5.000		98	70-130			
C5-C8 Aliphatics1,2	8.80	10.0	mg/kg wet							
C5-C8 Unadjusted Aliphatics	42.7	10.0	mg/kg wet	40.00		107	70-130			
C9-C10 Aromatics	9.3	10.0	mg/kg wet	10.00		93	70-130			
C9-C12 Aliphatics2,3	ND	10.0	mg/kg wet							
C9-C12 Unadjusted Aliphatics	27.3	10.0	mg/kg wet	30.00		91	70-130			
Ethylbenzene	5.0	0.2	mg/kg wet	5.000		100	70-130			
Methyl tert-Butyl Ether	14.6	0.05	mg/kg wet	15.00		98	70-130			
Naphthalene	9.8	0.2	mg/kg wet	10.00		98	70-130			
n-Butylcyclohexane	9.3	5.0	mg/kg wet	10.00		93	70-130			
n-Decane	10.1	5.0	mg/kg wet	10.00		101	70-130			
Nonane (C9)	8.7	5.0	mg/kg wet	10.00		87	30-130			
Pentane	11.2	5.0	mg/kg wet	10.00		112	70-130			
Toluene	14.3	0.2	mg/kg wet	15.00		96	70-130			
Xylene O	9.6	0.2	mg/kg wet	10.00		96	70-130			
Xylene P,M	19.4	0.4	mg/kg wet	20.00		97	70-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1709743

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-VPH Volatile Petroleum Hydrocarbon										
Batch CI72729 - 5035										
Surrogate: 2,5-Dibromotoluene - FID	*6.18*		mg/kg wet	*5.000*		*124*	*70-130*			
Surrogate: 2,5-Dibromotoluene - PID	*6.09*		mg/kg wet	*5.000*		*122*	*70-130*			
Surrogate: Trifluorotoluene - FID	*5.10*		mg/kg wet	*5.333*		*96*	*70-130*			
Surrogate: Trifluorotoluene - PID	*5.15*		mg/kg wet	*5.333*		*97*	*70-130*			
LCS Dup										
1,2,4-Trimethylbenzene	9.4	0.2	mg/kg wet	10.00		94	70-130	2	25	
2,2,4-Trimethylpentane	15.0	5.0	mg/kg wet	15.00		100	70-130	2	25	
2-Methylpentane	15.2	5.0	mg/kg wet	15.00		101	70-130	2	25	
Benzene	4.8	0.2	mg/kg wet	5.000		96	70-130	2	25	
C5-C8 Aliphatics1,2	8.60	10.0	mg/kg wet							
C5-C8 Unadjusted Aliphatics	41.8	10.0	mg/kg wet	40.00		104	70-130	2	25	
C9-C10 Aromatics	9.2	10.0	mg/kg wet	10.00		92	70-130	2	25	
C9-C12 Aliphatics2,3	ND	10.0	mg/kg wet							
C9-C12 Unadjusted Aliphatics	26.3	10.0	mg/kg wet	30.00		88	70-130	4	25	
Ethylbenzene	4.9	0.2	mg/kg wet	5.000		98	70-130	2	25	
Methyl tert-Butyl Ether	14.4	0.05	mg/kg wet	15.00		96	70-130	2	25	
Naphthalene	9.7	0.2	mg/kg wet	10.00		97	70-130	1	25	
n-Butylcyclohexane	9.0	5.0	mg/kg wet	10.00		90	70-130	3	25	
n-Decane	9.8	5.0	mg/kg wet	10.00		98	70-130	3	25	
Nonane (C9)	8.4	5.0	mg/kg wet	10.00		84	30-130	4	25	
Pentane	10.9	5.0	mg/kg wet	10.00		109	70-130	3	25	
Toluene	14.0	0.2	mg/kg wet	15.00		93	70-130	2	25	
Xylene O	9.4	0.2	mg/kg wet	10.00		94	70-130	2	25	
Xylene P,M	19.0	0.4	mg/kg wet	20.00		95	70-130	2	25	
Surrogate: 2,5-Dibromotoluene - FID	*5.99*		mg/kg wet	*5.000*		*120*	*70-130*			
Surrogate: 2,5-Dibromotoluene - PID	*5.92*		mg/kg wet	*5.000*		*118*	*70-130*			
Surrogate: Trifluorotoluene - FID	*5.07*		mg/kg wet	*5.333*		*95*	*70-130*			
Surrogate: Trifluorotoluene - PID	*5.10*		mg/kg wet	*5.333*		*96*	*70-130*			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1709743

Notes and Definitions

Z-04	MeOH - covered
U	Analyte included in the analysis, but not detected
S+	Surrogate recovery(ies) above upper control limit (S+).
Q	Calibration required quadratic regression (Q).
D	Diluted.
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
B-	Blank Spike recovery is below lower control limit (B-).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1709743

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

Shipped/Delivered Via: ESS Courier

ESS Project ID: 1709743
Date Received: 9/26/2017
Project Due Date: 10/3/2017
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 2.9 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / (NA)
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? (Yes) / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? (Yes) / No / NA
13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	167356	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
01	167384	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
01	167398	Yes	NA	Yes	2 oz. Jar - Unpres	NP	
01	167628	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
02	167355	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
02	167382	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
02	167397	Yes	NA	Yes	2 oz. Jar - Unpres	NP	
02	167627	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
03	167354	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
03	167380	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
03	167396	Yes	NA	Yes	2 oz. Jar - Unpres	NP	
03	167626	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
04	167353	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
04	167378	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
04	167395	Yes	NA	Yes	2 oz. Jar - Unpres	NP	
04	167625	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
05	167352	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
05	167376	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
05	167394	Yes	NA	Yes	2 oz. Jar - Unpres	NP	
05	167624	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
06	167351	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
06	167374	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
06	167393	Yes	NA	Yes	2 oz. Jar - Unpres	NP	
06	167623	Yes	NA	Yes	VOA Vial - Methanol	MeOH	

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

ESS Project ID: 1709743

Date Received: 9/26/2017

07	167350	Yes	NA	Yes	VOA Vial - Methanol	MeOH
07	167372	Yes	NA	Yes	8 oz. Jar - Unpres	NP
07	167392	Yes	NA	Yes	2 oz. Jar - Unpres	NP
07	167622	Yes	NA	Yes	VOA Vial - Methanol	MeOH
08	167349	Yes	NA	Yes	VOA Vial - Methanol	MeOH
08	167370	Yes	NA	Yes	8 oz. Jar - Unpres	NP
08	167391	Yes	NA	Yes	2 oz. Jar - Unpres	NP
08	167621	Yes	NA	Yes	VOA Vial - Methanol	MeOH
09	167348	Yes	NA	Yes	VOA Vial - Methanol	MeOH
09	167368	Yes	NA	Yes	8 oz. Jar - Unpres	NP
09	167390	Yes	NA	Yes	2 oz. Jar - Unpres	NP
09	167620	Yes	NA	Yes	VOA Vial - Methanol	MeOH
10	167347	Yes	NA	Yes	VOA Vial - Methanol	MeOH
10	167366	Yes	NA	Yes	8 oz. Jar - Unpres	NP
10	167389	Yes	NA	Yes	2 oz. Jar - Unpres	NP
10	167619	Yes	NA	Yes	VOA Vial - Methanol	MeOH
11	167346	Yes	NA	Yes	VOA Vial - Methanol	MeOH
11	167364	Yes	NA	Yes	8 oz. Jar - Unpres	NP
11	167388	Yes	NA	Yes	2 oz. Jar - Unpres	NP
11	167618	Yes	NA	Yes	VOA Vial - Methanol	MeOH
12	167345	Yes	NA	Yes	VOA Vial - Methanol	MeOH
12	167362	Yes	NA	Yes	8 oz. Jar - Unpres	NP
12	167387	Yes	NA	Yes	2 oz. Jar - Unpres	NP
12	167617	Yes	NA	Yes	VOA Vial - Methanol	MeOH
13	167344	Yes	NA	Yes	VOA Vial - Methanol	MeOH
13	167360	Yes	NA	Yes	8 oz. Jar - Unpres	NP
13	167386	Yes	NA	Yes	2 oz. Jar - Unpres	NP
13	167616	Yes	NA	Yes	VOA Vial - Methanol	MeOH
14	167343	Yes	NA	Yes	VOA Vial - Methanol	MeOH
14	167358	Yes	NA	Yes	8 oz. Jar - Unpres	NP
14	167385	Yes	NA	Yes	2 oz. Jar - Unpres	NP
14	167615	Yes	NA	Yes	VOA Vial - Methanol	MeOH

2nd Review

Are barcode labels on correct containers? (Yes) No

Completed By: _____ Date & Time: 9/26/17 2214

Reviewed By: _____ Date & Time: 9/26/17 2234

Delivered By: _____ 9/26/17 2234

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 1709743

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury
Project Location: Amesbury, MA
Project Number: 044752
Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY REQUIRED -- YES NO

If Yes, Are MCP Analytical Methods Required?	**YES**	NO	NA
Are Drinking Water Samples Submitted?	YES	**NO**	NA
If Yes, Have Drinking Water Sampling Requirements Been Met?	YES	NO	**NA**

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Preservative	Preservative						Sample Specific Remarks
							MeOH	MeOH						
							Analysis							
							VOC BTEX by method 8620 High	VPH (MADEP) ranges	PAH 8270	% Solids	EPH (MADEP) ranges	TCN 9014	PAC (MADEP)	
1	044752-SS601-A	9/22/2017	824	Soil	4	LT	X	X	X	X	X	X	X	
2	044752-SS601-B	9/22/2017	855	Soil	4	LT	X	X	X	X	X	X	X	
3	044752-SS602-A	9/22/2017	930	Soil	4	LT	X	X	X	X	X	X	X	
4	044752-SS602-B	9/22/2017	945	Soil	4	LT	X	X	X	X	X	X	X	
5	044752-SS603-A	9/22/2017	1024	Soil	4	LT	X	X	X	X	X	X	X	
6	044752-SS603-B	9/22/2017	1030	Soil	4	LT	X	X	X	X	X	X	X	
7	044752-SS604-A	9/22/2017	1115	Soil	4	LT	X	X	X	X	X	X	X	
8	044752-SS604-B	9/22/2017	1125	Soil	4	LT	X	X	X	X	X	X	X	
9	044752-SS605-A	9/22/2017	1158	Soil	4	LT	X	X	X	X	X	X	X	
10	044752-SS605-B	9/22/2017	1215	Soil	4	LT	X	X	X	X	X	X	X	
11	044752-SS606-A	9/22/2017	1240	Soil	4	LT	X	X	X	X	X	X	X	
12	044752-SS606-B	9/22/2017	1245	Soil	4	LT	X	X	X	X	X	X	X	

Sample Handling

Samples Field Filtered: YES NO **NA**

Sampled Shipped With Ice: **YES** NO

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

	Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1	Jessica Walsh	9-22-17	1700	1. GEI Sample Fridge
2	2. GEI Sample Fridge	9-26-17	1630	2. Jessica Walsh
3	Jessica Walsh	9-26-17	1635	3. [illegible] 9-26-17 1635
4	[illegible]	9-26	19:34	4. [illegible] 9/26/17 2137 9-26-17 19:34

temp 2.9 ice [illegible] 9-26-17 19:34

Turnaround Time (Business days):

Normal ____ Other ____
10-Day ____ 7-Day ____
5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

analysis updated per R.H. mkm 9/28/17

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 1709743

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury

Project Location: Amesbury, MA

Project Number: 044752

Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY REQUIRED -- YES NO

If Yes, Are MCP Analytical Methods Required?	**YES**	NO	NA
Are Drinking Water Samples Submitted?	YES	**NO**	NA
If Yes, Have Drinking Water Sampling Requirements Been Met?	YES	NO	**NA**

Preservative

MeOH	MeOH						

Analysis

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	VOC ~~BTEX~~ by method 8620 High	VPH (MADEP) ranges	~~PAH~~ 8270	% Solids	EPH (MADEP) ranges	TCN 9014	PAC (MADEP)		Sample Specific Remarks
13	044752-SS607-A	9/22/2017	1305	Soil	4	LT	X	X	X	X	X	X	X		
14	044752-SS607-B	9/22/2017	1315	Soil	4	LT	X	X	X	X	X	X	X		

Sample Handling

Samples Field Filtered: YES NO **NA**

Sampled Shipped With Ice: **YES** NO

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

	Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1	[signature]	9-22-17	1700	1. GEI Sample Fridge
2	2. GEI Sample Fridge	9-26-17	1630	2. [signature]
3	3. [signature]	9-26-17	1635	3. [signature] 9-26-17 1635
4	4. [signature]	9-26	14:34	4. [signature] 9/26/17 2137 / 9-26-17 14:34

Turnaround Time (Business days):

Normal ____ Other ____

10-Day ____ 7-Day ____

5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

analysis updated per R.H. mkm 9/28/17

temp 2.9 ice [signature] 9-26-17 14:34

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 1709743

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury
Project Location: Amesbury, MA
Project Number: 044752
Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY REQUIRED -- YES NO

If Yes, Are MCP Analytical Methods Required? **YES** NO NA

Are Drinking Water Samples Submitted? YES **NO** NA

If Yes, Have Drinking Water Sampling Requirements Been Met? YES NO **NA**

Sample Handling

Samples Field Filtered: YES NO **NA**

Sampled Shipped With Ice: **YES** NO

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Preservative	Preservative						Sample Specific Remarks
							MeOH	MeOH						
							Analysis							
							VOC BTEX by method 8620 High	VPH (MADEP)	PAH 8270	% Solids	EPH (MADEP)	TCN 9014	PAC (MADEP)	
1	044752-SS601-A	9/22/2017	824	Soil	4	LT	X	X	X	X	X	X	X	
2	044752-SS601-B	9/22/2017	855	Soil	4	LT	X	X	X	X	X	X	X	
3	044752-SS602-A	9/22/2017	930	Soil	4	LT	X	X	X	X	X	X	X	
4	044752-SS602-B	9/22/2017	945	Soil	4	LT	X	X	X	X	X	X	X	
5	044752-SS603-A	9/22/2017	1024	Soil	4	LT	X	X	X	X	X	X	X	
6	044752-SS603-B	9/22/2017	1030	Soil	4	LT	X	X	X	X	X	X	X	
7	044752-SS604-A	9/22/2017	1115	Soil	4	LT	X	X	X	X	X	X	X	
8	044752-SS604-B	9/22/2017	1125	Soil	4	LT	X	X	X	X	X	X	X	
9	044752-SS605-A	9/22/2017	1158	Soil	4	LT	X	X	X	X	X	X	X	
10	044752-SS605-B	9/22/2017	1215	Soil	4	LT	X	X	X	X	X	X	X	
11	044752-SS606-A	9/22/2017	1240	Soil	4	LT	X	X	X	X	X	X	X	
12	044752-SS606-B	9/22/2017	1245	Soil	4	LT	X	X	X	X	X	X	X	

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

	Date	Time		
Relinquished by sampler: (signature) 1.	9-22-17	1700	Received by: (signature) 1. GEI Sample Fridge	
Relinquished by: (signature) 2. GEI Sample Fridge	9-26-17	1630	Received by: (signature) 2.	
Relinquished by: (signature) 3.	9-26-17	1635	Received by: (signature) 3.	9-26-17 1635
Relinquished by: (signature) 4.	9-26	19:34	Received by: (signature) 4.	9/26/17 2137 9-26-17 19:34

temp 2.9 ice 9-26-17 19:34

Turnaround Time (Business days):

Normal ____ Other ____

10-Day ____ 7-Day ____

5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 1709743

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury

Project Location: Amesbury, MA

Project Number: 044752

Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY REQUIRED -- YES NO

If Yes, Are MCP Analytical Methods Required?	**YES**	NO	NA
Are Drinking Water Samples Submitted?	YES	**NO**	NA
If Yes, Have Drinking Water Sampling Requirements Been Met?	YES	NO	**NA**

Preservative

MeOH	MeOH						

Analysis

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	VOC BTEX by method 8620 High	VPH (MADEP)	PAH 8270	% Solids	EPH (MADEP)	TCN 9014	PAC (MADEP)		Sample Specific Remarks
13	044752-SS607-A	9/22/2017	1305	Soil	4	LT	X	X	X	X	X	X	X		
14	044752-SS607-B	9/22/2017	1315	Soil	4	LT	X	X	X	X	X	X	X		

Sample Handling

Samples Field Filtered: YES NO **NA**

Sampled Shipped With Ice: **YES** NO

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

	Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1	[signature]	9-22-17	1700	1. GEI Sample Fridge
2	Relinquished by: (signature) 2. GEI Sample Fridge	9-26-17	1630	Received by: (signature) 2. [signature]
3	Relinquished by: (signature) [signature]	9-26-17	1635	Received by: (signature) 3. [signature] 9-26-17 1635
4	Relinquished by: (signature) [signature]	9-26	14:34	Received by: (signature) 9/26/17 2137 4. [signature] 9-26-17 14:34

Turnaround Time (Business days):

Normal ____ Other ____

10-Day ____ 7-Day ____

5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

temp 2.9 ice [signature] 9-26-17 14:34

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury (044752)
ESS Laboratory Work Order Number: 1711281

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 3:00 pm, Nov 22, 2017

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1711281

SAMPLE RECEIPT

The following samples were received on November 09, 2017 for the analyses specified on the enclosed Chain of Custody Record.

To achieve CAM compliance for MCP data, ESS Laboratory has reviewed all QA/QC Requirements and Performance Standards listed in each method. Holding times and preservation have also been reviewed. All CAM requirements have been performed and achieved unless noted in the project narrative.

Each method has been set-up in the laboratory to reach required MCP standards. The methods for aqueous VOA and Soil Methanol VOA have known limitations for certain analytes. The regulatory standards may not be achieved due to these limitations. In addition, for all methods, matrix interferences, dilutions, and %Solids may elevate method reporting limits above regulatory standards. ESS Laboratory can provide, upon request, a Limit Checker (regulatory standard comparison spreadsheet) electronic deliverable which will highlight these exceedances.

Question I: All samples for VOA, SVOA, EPH and VPH were analyzed for a subset of the required MCP list per the client's request.

Lab Number	Sample Name	Matrix	Analysis
1711281-01	044752-SS608R-A	Soil	8260B, 8270D, 9014, EPH8270, MA PAC, MADEP-EPH, MADEP-VPH
1711281-02	044752-SS608R-B	Soil	8260B, 8270D, 9014, EPH8270, MA PAC, MADEP-EPH, MADEP-VPH
1711281-03	044752-SS609R-A	Soil	8260B, 8270D, 9014, EPH8270, MA PAC, MADEP-EPH, MADEP-VPH
1711281-04	044752-SS609R-B	Soil	8260B, 8270D, 9014, EPH8270, MA PAC, MADEP-EPH, MADEP-VPH
1711281-05	044752-SS610R-A	Soil	8260B, 8270D, 9014, EPH8270, MA PAC, MADEP-EPH, MADEP-VPH
1711281-06	044752-SS610R-B	Soil	8260B, 8270D, 9014, EPH8270, MA PAC, MADEP-EPH, MADEP-VPH
1711281-07	044752-SS611R-A	Soil	8260B, 8270D, 9014, EPH8270, MA PAC, MADEP-EPH, MADEP-VPH
1711281-08	044752-SS611R-B	Soil	8260B, 8270D, 9014, EPH8270, MA PAC, MADEP-EPH, MADEP-VPH

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury ESS Laboratory Work Order: 1711281

PROJECT NARRATIVE

5035/8260B Volatile Organic Compounds / Methanol

1711281-01 **Surrogate recovery(ies) outside of criteria. Reextraction/Reanalysis confirms results (SC).**
4-Bromofluorobenzene (62% @ 70-130%)

1711281-01RE1 **Surrogate recovery(ies) outside of criteria. Reextraction/Reanalysis confirms results (SC).**
4-Bromofluorobenzene (59% @ 70-130%), Toluene-d8 (68% @ 70-130%)

1711281-03 **Surrogate recovery(ies) outside of criteria due to matrix (UCM/coelution/matrix is present) (SM).**
4-Bromofluorobenzene (59% @ 70-130%)

1711281-05 **Surrogate recovery(ies) outside of criteria. Reextraction/Reanalysis confirms results (SC).**
4-Bromofluorobenzene (60% @ 70-130%), Toluene-d8 (67% @ 70-130%)

1711281-05RE1 **Surrogate recovery(ies) outside of criteria. Reextraction/Reanalysis confirms results (SC).**
4-Bromofluorobenzene (54% @ 70-130%), Toluene-d8 (62% @ 70-130%)

1711281-07 **Surrogate recovery(ies) outside of criteria. Reextraction/Reanalysis confirms results (SC).**
4-Bromofluorobenzene (65% @ 70-130%)

1711281-07RE1 **Surrogate recovery(ies) outside of criteria. Reextraction/Reanalysis confirms results (SC).**
4-Bromofluorobenzene (64% @ 70-130%)

MADEP-EPH Extractable Petroleum Hydrocarbons

1711281-03 **Surrogate recovery(ies) diluted below the MRL (SD).**
2-Bromonaphthalene (341% @ 40-140%), 2-Fluorobiphenyl (289% @ 40-140%), O-Terphenyl (498% @ 40-140%)

MADEP-VPH Volatile Petroleum Hydrocarbon

1711281-01 **Surrogate recovery(ies) outside of criteria. Reextraction/Reanalysis confirms results (SC).**
Trifluorotoluene - FID (69% @ 70-130%)

1711281-01RE1 **Surrogate recovery(ies) outside of criteria. Reextraction/Reanalysis confirms results (SC).**
Trifluorotoluene - FID (65% @ 70-130%), Trifluorotoluene - PID (69% @ 70-130%)

1711281-03 **Surrogate recovery(ies) outside of criteria due to matrix (UCM/coelution/matrix is present) (SM).**
Trifluorotoluene - FID (56% @ 70-130%), Trifluorotoluene - PID (60% @ 70-130%)

C7K0209-CCV1 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
Pentane (28% @ 25%)

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury ESS Laboratory Work Order: 1711281

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1711281

MassDEP Analytical Protocol Certification Form

MADEP RTN: _____

This form provides certification for the following data set: **1711281-01 through 1711281-08**

Matrices: ( ) Ground Water/Surface Water (X) Soil/Sediment ( ) Drinking Water ( ) Air ( ) Other:_____

CAM Protocol (check all that apply below):

(X) 8260 VOC CAM II A	( ) 7470/7471 Hg CAM III B	(X) MassDEP VPH (GC/PID/FID) CAM IV A	( ) 8082 PCB CAM V A	(X) 9014 Total Cyanide/PAC CAM VI A	( ) 6860 Perchlorate CAM VIII B
(X) 8270 SVOC CAM II B	( ) 7010 Metals CAM III C	( ) MassDEP VPH (GC/MS) CAM IV B	( ) 8081 Pesticides CAM V C	( ) 7196 Hex Cr CAM VI B	( ) MassDEP APH CAM IX A
( ) 6010 Metals CAM III A	( ) 6020 Metals CAM III D	(X) MassDEP EPH CAM IV B	( ) 8151 Herbicides CAM V C	( ) Explosives CAM VIII A	( ) TO-15 VOC CAM IX B

Affirmative responses to questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	Yes (X) No ( )
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	Yes (X) No ( )
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	Yes (X) No ( )
D	Does the laboratory report comply with all the reporting requirements specified in the CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	Yes (X) No ( )
E	VPH, EPH, APH and TO-15 only: a. Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	Yes (X) No ( )
	b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	Yes ( ) No ( )
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	Yes (X) No ( )

Responses to Questions G, H and I below are required for '"Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocols(s)?	Yes ( ) No (X)*
	***Data User Note:** Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.*	
H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	Yes ( ) No (X)*
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	Yes ( ) No (X)*

All negative responses must be addressed in an attached laboratory narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature: Laurel Stoddard Date: November 22, 2017

Printed Name: Laurel Stoddard Position: Laboratory Director

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS608R-A
Date Sampled: 11/08/17 08:15
Percent Solids: 23
Initial Volume: 17
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.703)		8260B		2	11/14/17 16:43	C7K0232	CK71435
Ethylbenzene	ND (0.703)		8260B		2	11/14/17 16:43	C7K0232	CK71435
Toluene	ND (0.703)		8260B		2	11/14/17 16:43	C7K0232	CK71435
Xylene O	ND (0.703)		8260B		2	11/14/17 16:43	C7K0232	CK71435
Xylene P,M	ND (1.41)		8260B		2	11/14/17 16:43	C7K0232	CK71435
Xylenes (Total)	ND (1.41)		8260B		1	11/14/17 16:43		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*93 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*62 %*	*SC*	*70-130*
Surrogate: Dibromofluoromethane	*89 %*		*70-130*
Surrogate: Toluene-d8	*77 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS608R-A
Date Sampled: 11/08/17 08:15
Percent Solids: 23
Initial Volume: 15.4
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/10/17 12:46

8270D Polynuclear Aromatic Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	ND (0.345)		8270D		1	11/10/17 23:46	C7K0171	CK71007
Acenaphthene	ND (1.38)		8270D		1	11/10/17 23:46	C7K0171	CK71007
Acenaphthylene	**1.19** (0.694)		8270D		1	11/10/17 23:46	C7K0171	CK71007
Anthracene	**1.91** (1.38)		8270D		1	11/10/17 23:46	C7K0171	CK71007
Benzo(a)anthracene	**9.41** (1.38)		8270D		1	11/10/17 23:46	C7K0171	CK71007
Benzo(a)pyrene	**12.7** (0.694)		8270D		1	11/10/17 23:46	C7K0171	CK71007
Benzo(b)fluoranthene	**5.66** (1.38)		8270D		1	11/10/17 23:46	C7K0171	CK71007
Benzo(g,h,i)perylene	**8.69** (1.38)		8270D		1	11/10/17 23:46	C7K0171	CK71007
Benzo(k)fluoranthene	**7.27** (1.38)		8270D		1	11/10/17 23:46	C7K0171	CK71007
Chrysene	**7.94** (0.694)		8270D		1	11/10/17 23:46	C7K0171	CK71007
Dibenzo(a,h)Anthracene	**3.06** (0.694)		8270D		1	11/10/17 23:46	C7K0171	CK71007
Fluoranthene	**16.1** (1.38)		8270D		1	11/10/17 23:46	C7K0171	CK71007
Fluorene	ND (1.38)		8270D		1	11/10/17 23:46	C7K0171	CK71007
Indeno(1,2,3-cd)Pyrene	**6.59** (1.38)		8270D		1	11/10/17 23:46	C7K0171	CK71007
Naphthalene	ND (1.38)		8270D		1	11/10/17 23:46	C7K0171	CK71007
Phenanthrene	**6.27** (1.38)		8270D		1	11/10/17 23:46	C7K0171	CK71007
Pyrene	**20.2** (1.38)		8270D		1	11/10/17 23:46	C7K0171	CK71007

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*70 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*79 %*		*30-130*
Surrogate: Nitrobenzene-d5	*71 %*		*30-130*
Surrogate: p-Terphenyl-d14	*86 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS608R-A
Date Sampled: 11/08/17 08:15
Percent Solids: 23

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Cyanide (PAC)	ND (3.93)		MA PAC		1	EEM	11/15/17 10:30	mg/kg dry	CK71514
Total Cyanide	ND (3.92)		9014		1	EEM	11/14/17 12:20	mg/kg dry	CK71415

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS608R-A
Date Sampled: 11/08/17 08:15
Percent Solids: 23
Initial Volume: 25.8
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-01
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 11/10/17 14:30

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (62.0)		MADEP-EPH		1	ZLC	11/13/17 17:18	C7K0200	CK71010
C19-C36 Aliphatics1	ND (62.0)		MADEP-EPH		1	ZLC	11/13/17 17:18	C7K0200	CK71010
C11-C22 Unadjusted Aromatics1	**183** (62.0)		EPH8270		1	ZLC	11/16/17 14:44	C7K0266	CK71010
C11-C22 Aromatics1,2	**76.2** (62.0)		EPH8270			ZLC	11/20/17 22:36		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*66 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*98 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*112 %*		*40-140*
Surrogate: O-Terphenyl	*79 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS608R-A
Date Sampled: 11/08/17 08:15
Percent Solids: 23
Initial Volume: 15.9
Final Volume: 15
Extraction Method: 5030B

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC

MADEP-VPH Volatile Petroleum Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
C9-C10 Aromatics	ND (72.9)		MADEP-VPH		1	11/14/17 0:12	C7K0209	CK71334
C5-C8 Aliphatics1,2	ND (72.9)		MADEP-VPH		1	11/14/17 0:12		[CALC]
C9-C12 Aliphatics2,3	ND (72.9)		MADEP-VPH		1	11/14/17 0:12		[CALC]
1:1 Methanol/Soil Ratio %D	**6** (N/A)		MADEP-VPH			11/13/17 7:40		CK71334
Preservative:	**MeOH - covered**		MADEP-VPH					CK71334

	%Recovery	Qualifier	Limits
Surrogate: 2,5-Dibromotoluene - FID	*109 %*		*70-130*
Surrogate: 2,5-Dibromotoluene - PID	*115 %*		*70-130*
Surrogate: Trifluorotoluene - FID	*69 %*	*SC*	*70-130*
Surrogate: Trifluorotoluene - PID	*73 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS608R-A
Date Sampled: 11/08/17 08:15
Percent Solids: 23
Initial Volume: 17
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-01RE1
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.703)		8260B		2	11/15/17 14:07	C7K0262	CK71528
Ethylbenzene	ND (0.703)		8260B		2	11/15/17 14:07	C7K0262	CK71528
Toluene	ND (0.703)		8260B		2	11/15/17 14:07	C7K0262	CK71528
Xylene O	ND (0.703)		8260B		2	11/15/17 14:07	C7K0262	CK71528
Xylene P,M	ND (1.41)		8260B		2	11/15/17 14:07	C7K0262	CK71528
Xylenes (Total)	ND (1.41)		8260B		1	11/15/17 14:07		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*85 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*59 %*	*SC*	*70-130*
Surrogate: Dibromofluoromethane	*81 %*		*70-130*
Surrogate: Toluene-d8	*68 %*	*SC*	*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS608R-A
Date Sampled: 11/08/17 08:15
Percent Solids: 23
Initial Volume: 15.9
Final Volume: 15
Extraction Method: 5030B

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-01RE1
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC

MADEP-VPH Volatile Petroleum Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
C9-C10 Aromatics	ND (72.9)		MADEP-VPH		1	11/14/17 17:54	C7K0236	CK71438
C5-C8 Aliphatics1,2	ND (72.9)		MADEP-VPH		1	11/14/17 17:54		[CALC]
C9-C12 Aliphatics2,3	ND (72.9)		MADEP-VPH		1	11/14/17 17:54		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 2,5-Dibromotoluene - FID	*117 %*		*70-130*
Surrogate: 2,5-Dibromotoluene - PID	*123 %*		*70-130*
Surrogate: Trifluorotoluene - FID	*65 %*	*SC*	*70-130*
Surrogate: Trifluorotoluene - PID	*69 %*	*SC*	*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS608R-B
Date Sampled: 11/08/17 08:30
Percent Solids: 36
Initial Volume: 17.9
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.408)		8260B		2	11/14/17 17:10	C7K0232	CK71435
Ethylbenzene	ND (0.408)		8260B		2	11/14/17 17:10	C7K0232	CK71435
Toluene	ND (0.408)		8260B		2	11/14/17 17:10	C7K0232	CK71435
Xylene O	ND (0.408)		8260B		2	11/14/17 17:10	C7K0232	CK71435
Xylene P,M	ND (0.816)		8260B		2	11/14/17 17:10	C7K0232	CK71435
Xylenes (Total)	ND (0.816)		8260B		1	11/14/17 17:10		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*91 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*76 %*		*70-130*
Surrogate: Dibromofluoromethane	*91 %*		*70-130*
Surrogate: Toluene-d8	*87 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS608R-B
Date Sampled: 11/08/17 08:30
Percent Solids: 36
Initial Volume: 15.2
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/10/17 12:46

8270D Polynuclear Aromatic Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	ND (0.226)		8270D		1	11/11/17 0:21	C7K0171	CK71007
Acenaphthene	ND (0.908)		8270D		1	11/11/17 0:21	C7K0171	CK71007
Acenaphthylene	ND (0.908)		8270D		1	11/11/17 0:21	C7K0171	CK71007
Anthracene	ND (0.908)		8270D		1	11/11/17 0:21	C7K0171	CK71007
Benzo(a)anthracene	ND (0.908)		8270D		1	11/11/17 0:21	C7K0171	CK71007
Benzo(a)pyrene	ND (0.455)		8270D		1	11/11/17 0:21	C7K0171	CK71007
Benzo(b)fluoranthene	ND (0.908)		8270D		1	11/11/17 0:21	C7K0171	CK71007
Benzo(g,h,i)perylene	ND (0.908)		8270D		1	11/11/17 0:21	C7K0171	CK71007
Benzo(k)fluoranthene	ND (0.908)		8270D		1	11/11/17 0:21	C7K0171	CK71007
Chrysene	ND (0.455)		8270D		1	11/11/17 0:21	C7K0171	CK71007
Dibenzo(a,h)Anthracene	ND (0.455)		8270D		1	11/11/17 0:21	C7K0171	CK71007
Fluoranthene	ND (0.908)		8270D		1	11/11/17 0:21	C7K0171	CK71007
Fluorene	ND (0.908)		8270D		1	11/11/17 0:21	C7K0171	CK71007
Indeno(1,2,3-cd)Pyrene	ND (0.908)		8270D		1	11/11/17 0:21	C7K0171	CK71007
Naphthalene	ND (0.908)		8270D		1	11/11/17 0:21	C7K0171	CK71007
Phenanthrene	ND (0.908)		8270D		1	11/11/17 0:21	C7K0171	CK71007
Pyrene	ND (0.908)		8270D		1	11/11/17 0:21	C7K0171	CK71007

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*76 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*89 %*		*30-130*
Surrogate: Nitrobenzene-d5	*79 %*		*30-130*
Surrogate: p-Terphenyl-d14	*85 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS608R-B
Date Sampled: 11/08/17 08:30
Percent Solids: 36

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Cyanide (PAC)	ND (2.73)		MA PAC		1	EEM	11/15/17 10:30	mg/kg dry	CK71514
Total Cyanide	ND (2.57)		9014		1	EEM	11/14/17 12:20	mg/kg dry	CK71415

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS608R-B
Date Sampled: 11/08/17 08:30
Percent Solids: 36
Initial Volume: 25.4
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-02
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 11/10/17 14:30

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	**90.0** (40.8)		MADEP-EPH		1	ZLC	11/13/17 18:05	C7K0200	CK71010
C19-C36 Aliphatics1	**112** (40.8)		MADEP-EPH		1	ZLC	11/13/17 18:05	C7K0200	CK71010
C11-C22 Unadjusted Aromatics1	**53.9** (40.8)		EPH8270		1	ZLC	11/16/17 0:29	C7K0266	CK71010
C11-C22 Aromatics1,2	**43.5** (40.8)		EPH8270			ZLC	11/16/17 0:29		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*74 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*82 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*109 %*		*40-140*
Surrogate: O-Terphenyl	*78 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS608R-B
Date Sampled: 11/08/17 08:30
Percent Solids: 36
Initial Volume: 18.9
Final Volume: 15
Extraction Method: 5030B

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC

MADEP-VPH Volatile Petroleum Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
C9-C10 Aromatics	ND (39.6)		MADEP-VPH		1	11/14/17 0:47	C7K0209	CK71334
C5-C8 Aliphatics1,2	ND (39.6)		MADEP-VPH		1	11/14/17 0:47		[CALC]
C9-C12 Aliphatics2,3	ND (39.6)		MADEP-VPH		1	11/14/17 0:47		[CALC]
1:1 Methanol/Soil Ratio %D	**26** (N/A)		MADEP-VPH			11/13/17 7:40		CK71334
Preservative:	**MeOH - covered**		MADEP-VPH					CK71334

	%Recovery	Qualifier	Limits
Surrogate: 2,5-Dibromotoluene - FID	*107 %*		*70-130*
Surrogate: 2,5-Dibromotoluene - PID	*113 %*		*70-130*
Surrogate: Trifluorotoluene - FID	*78 %*		*70-130*
Surrogate: Trifluorotoluene - PID	*83 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS609R-A
Date Sampled: 11/08/17 09:00
Percent Solids: 43
Initial Volume: 17.9
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**0.442** (0.330)		8260B		2	11/14/17 20:41	C7K0232	CK71435
Ethylbenzene	**2.01** (0.330)		8260B		2	11/14/17 20:41	C7K0232	CK71435
Toluene	ND (0.330)		8260B		2	11/14/17 20:41	C7K0232	CK71435
Xylene O	ND (0.330)		8260B		2	11/14/17 20:41	C7K0232	CK71435
Xylene P,M	ND (0.660)		8260B		2	11/14/17 20:41	C7K0232	CK71435
Xylenes (Total)	ND (0.660)		8260B		1	11/14/17 20:41		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*82 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*59 %*	*SM*	*70-130*
Surrogate: Dibromofluoromethane	*81 %*		*70-130*
Surrogate: Toluene-d8	*73 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS609R-A
Date Sampled: 11/08/17 09:00
Percent Solids: 43
Initial Volume: 15.5
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/10/17 12:46

8270D Polynuclear Aromatic Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	**53.2** (7.54)		8270D		10	11/13/17 23:53	C7K0171	CK71007
Acenaphthene	**160** (7.54)		8270D		10	11/13/17 23:53	C7K0171	CK71007
Acenaphthylene	**8.61** (0.754)		8270D		1	11/11/17 0:55	C7K0171	CK71007
Anthracene	**40.1** (7.54)		8270D		10	11/13/17 23:53	C7K0171	CK71007
Benzo(a)anthracene	**52.8** (7.54)		8270D		10	11/13/17 23:53	C7K0171	CK71007
Benzo(a)pyrene	**54.0** (3.78)		8270D		10	11/13/17 23:53	C7K0171	CK71007
Benzo(b)fluoranthene	**21.9** (7.54)		8270D		10	11/13/17 23:53	C7K0171	CK71007
Benzo(g,h,i)perylene	**13.4** (0.754)		8270D		1	11/11/17 0:55	C7K0171	CK71007
Benzo(k)fluoranthene	**30.2** (7.54)		8270D		10	11/13/17 23:53	C7K0171	CK71007
Chrysene	**32.8** (3.78)		8270D		10	11/13/17 23:53	C7K0171	CK71007
Dibenzo(a,h)Anthracene	**5.88** (0.378)		8270D		1	11/11/17 0:55	C7K0171	CK71007
Fluoranthene	**149** (7.54)		8270D		10	11/13/17 23:53	C7K0171	CK71007
Fluorene	**68.9** (7.54)		8270D		10	11/13/17 23:53	C7K0171	CK71007
Indeno(1,2,3-cd)Pyrene	**11.9** (0.754)		8270D		1	11/11/17 0:55	C7K0171	CK71007
Naphthalene	**158** (7.54)		8270D		10	11/13/17 23:53	C7K0171	CK71007
Phenanthrene	**297** (75.4)		8270D		100	11/15/17 0:01	C7K0171	CK71007
Pyrene	**183** (7.54)		8270D		10	11/13/17 23:53	C7K0171	CK71007

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*66 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*70 %*		*30-130*
Surrogate: Nitrobenzene-d5	*73 %*		*30-130*
Surrogate: p-Terphenyl-d14	*78 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS609R-A
Date Sampled: 11/08/17 09:00
Percent Solids: 43

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Cyanide (PAC)	ND (2.25)		MA PAC		1	EEM	11/15/17 10:30	mg/kg dry	CK71514
Total Cyanide	ND (2.14)		9014		1	EEM	11/14/17 12:20	mg/kg dry	CK71415

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS609R-A
Date Sampled: 11/08/17 09:00
Percent Solids: 43
Initial Volume: 25
Final Volume: 2
Extraction Method: 3546

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-03
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 11/10/17 14:30

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	**97.6** (70.2)		MADEP-EPH		1	ZLC	11/13/17 18:53	C7K0200	CK71010
C19-C36 Aliphatics1	**168** (70.2)		MADEP-EPH		1	ZLC	11/13/17 18:53	C7K0200	CK71010
C11-C22 Unadjusted Aromatics1	**13900** (3510)		EPH8270		50	ZLC	11/20/17 23:50	C7K0345	CK71010
C11-C22 Aromatics1,2	**4660** (3510)		EPH8270			IBM	11/21/17 14:27		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*44 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*341 %*	*SD*	*40-140*
Surrogate: 2-Fluorobiphenyl	*289 %*	*SD*	*40-140*
Surrogate: O-Terphenyl	*498 %*	*SD*	*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS609R-A
Date Sampled: 11/08/17 09:00
Percent Solids: 43
Initial Volume: 17.9
Final Volume: 15
Extraction Method: 5030B

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC

MADEP-VPH Volatile Petroleum Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
C9-C10 Aromatics	**152** (33.0)		MADEP-VPH		1	11/14/17 1:21	C7K0209	CK71334
C5-C8 Aliphatics1,2	ND (33.0)		MADEP-VPH		1	11/14/17 1:21		[CALC]
C9-C12 Aliphatics2,3	**34.8** (33.0)		MADEP-VPH		1	11/14/17 1:21		[CALC]
1:1 Methanol/Soil Ratio %D	**19** (N/A)		MADEP-VPH			11/13/17 7:40		CK71334
Preservative:	**MeOH - covered**		MADEP-VPH					CK71334

	%Recovery	Qualifier	Limits
Surrogate: 2,5-Dibromotoluene - FID	*106 %*		*70-130*
Surrogate: 2,5-Dibromotoluene - PID	*105 %*		*70-130*
Surrogate: Trifluorotoluene - FID	*56 %*	*SM*	*70-130*
Surrogate: Trifluorotoluene - PID	*60 %*	*SM*	*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS609R-B
Date Sampled: 11/08/17 09:15
Percent Solids: 41
Initial Volume: 21.6
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.309)		8260B		2	11/14/17 17:36	C7K0232	CK71435
Ethylbenzene	ND (0.309)		8260B		2	11/14/17 17:36	C7K0232	CK71435
Toluene	ND (0.309)		8260B		2	11/14/17 17:36	C7K0232	CK71435
Xylene O	ND (0.309)		8260B		2	11/14/17 17:36	C7K0232	CK71435
Xylene P,M	ND (0.618)		8260B		2	11/14/17 17:36	C7K0232	CK71435
Xylenes (Total)	ND (0.618)		8260B		1	11/14/17 17:36		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*109 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*85 %*		*70-130*
Surrogate: Dibromofluoromethane	*109 %*		*70-130*
Surrogate: Toluene-d8	*100 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS609R-B
Date Sampled: 11/08/17 09:15
Percent Solids: 41
Initial Volume: 15.3
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/10/17 12:46

8270D Polynuclear Aromatic Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	**0.441** (0.197)		8270D		1	11/11/17 1:29	C7K0171	CK71007
Acenaphthene	**3.54** (0.788)		8270D		1	11/11/17 1:29	C7K0171	CK71007
Acenaphthylene	ND (0.788)		8270D		1	11/11/17 1:29	C7K0171	CK71007
Anthracene	ND (0.788)		8270D		1	11/11/17 1:29	C7K0171	CK71007
Benzo(a)anthracene	ND (0.788)		8270D		1	11/11/17 1:29	C7K0171	CK71007
Benzo(a)pyrene	**0.591** (0.395)		8270D		1	11/11/17 1:29	C7K0171	CK71007
Benzo(b)fluoranthene	ND (0.788)		8270D		1	11/11/17 1:29	C7K0171	CK71007
Benzo(g,h,i)perylene	ND (0.788)		8270D		1	11/11/17 1:29	C7K0171	CK71007
Benzo(k)fluoranthene	ND (0.788)		8270D		1	11/11/17 1:29	C7K0171	CK71007
Chrysene	**0.428** (0.395)		8270D		1	11/11/17 1:29	C7K0171	CK71007
Dibenzo(a,h)Anthracene	ND (0.395)		8270D		1	11/11/17 1:29	C7K0171	CK71007
Fluoranthene	**1.37** (0.788)		8270D		1	11/11/17 1:29	C7K0171	CK71007
Fluorene	ND (0.788)		8270D		1	11/11/17 1:29	C7K0171	CK71007
Indeno(1,2,3-cd)Pyrene	ND (0.788)		8270D		1	11/11/17 1:29	C7K0171	CK71007
Naphthalene	**2.26** (0.788)		8270D		1	11/11/17 1:29	C7K0171	CK71007
Phenanthrene	**2.42** (0.788)		8270D		1	11/11/17 1:29	C7K0171	CK71007
Pyrene	**1.59** (0.788)		8270D		1	11/11/17 1:29	C7K0171	CK71007

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*71 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*87 %*		*30-130*
Surrogate: Nitrobenzene-d5	*75 %*		*30-130*
Surrogate: p-Terphenyl-d14	*88 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS609R-B
Date Sampled: 11/08/17 09:15
Percent Solids: 41

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-04
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Cyanide (PAC)	ND (2.35)		MA PAC		1	EEM	11/15/17 10:30	mg/kg dry	CK71514
Total Cyanide	ND (2.29)		9014		1	EEM	11/14/17 12:20	mg/kg dry	CK71415

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS609R-B
Date Sampled: 11/08/17 09:15
Percent Solids: 41
Initial Volume: 25.5
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-04
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 11/10/17 14:30

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (35.5)		MADEP-EPH		1	ZLC	11/13/17 19:40	C7K0200	CK71010
C19-C36 Aliphatics1	ND (35.5)		MADEP-EPH		1	ZLC	11/13/17 19:40	C7K0200	CK71010
C11-C22 Unadjusted Aromatics1	**359** (35.5)		EPH8270		1	ZLC	11/16/17 15:52	C7K0266	CK71010
C11-C22 Aromatics1,2	**145** (35.5)		EPH8270			ZLC	11/21/17 0:26		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*67 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*93 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*104 %*		*40-140*
Surrogate: O-Terphenyl	*76 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS609R-B
Date Sampled: 11/08/17 09:15
Percent Solids: 41
Initial Volume: 19.8
Final Volume: 15
Extraction Method: 5030B

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC

MADEP-VPH Volatile Petroleum Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
C9-C10 Aromatics	ND (32.4)		MADEP-VPH		1	11/14/17 18:29	C7K0236	CK71438
C5-C8 Aliphatics1,2	ND (32.4)		MADEP-VPH		1	11/14/17 18:29		[CALC]
C9-C12 Aliphatics2,3	ND (32.4)		MADEP-VPH		1	11/14/17 18:29		[CALC]
1:1 Methanol/Soil Ratio %D	**32** (N/A)		MADEP-VPH			11/16/17 13:02		CK71438
Preservative:	**MeOH - covered**		MADEP-VPH					CK71438

	%Recovery	Qualifier	Limits
Surrogate: 2,5-Dibromotoluene - FID	*112 %*		*70-130*
Surrogate: 2,5-Dibromotoluene - PID	*121 %*		*70-130*
Surrogate: Trifluorotoluene - FID	*89 %*		*70-130*
Surrogate: Trifluorotoluene - PID	*95 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS610R-A
Date Sampled: 11/08/17 09:30
Percent Solids: 45
Initial Volume: 18
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.307)		8260B		2	11/15/17 14:34	C7K0262	CK71528
Ethylbenzene	ND (0.307)		8260B		2	11/15/17 14:34	C7K0262	CK71528
Toluene	ND (0.307)		8260B		2	11/15/17 14:34	C7K0262	CK71528
Xylene O	ND (0.307)		8260B		2	11/15/17 14:34	C7K0262	CK71528
Xylene P,M	ND (0.614)		8260B		2	11/15/17 14:34	C7K0262	CK71528
Xylenes (Total)	ND (0.614)		8260B		1	11/15/17 14:34		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*83 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*60 %*	*SC*	*70-130*
Surrogate: Dibromofluoromethane	*81 %*		*70-130*
Surrogate: Toluene-d8	*67 %*	*SC*	*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS610R-A
Date Sampled: 11/08/17 09:30
Percent Solids: 45
Initial Volume: 15.4
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/10/17 12:46

8270D Polynuclear Aromatic Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	**1.09** (0.180)		8270D		1	11/10/17 21:12	C7K0191	CK71007
Acenaphthene	**17.3** (0.720)		8270D		1	11/10/17 21:12	C7K0191	CK71007
Acenaphthylene	**9.12** (0.720)		8270D		1	11/10/17 21:12	C7K0191	CK71007
Anthracene	**45.0** (7.20)		8270D		10	11/14/17 0:27	C7K0191	CK71007
Benzo(a)anthracene	**66.5** (7.20)		8270D		10	11/14/17 0:27	C7K0191	CK71007
Benzo(a)pyrene	**70.3** (3.61)		8270D		10	11/14/17 0:27	C7K0191	CK71007
Benzo(b)fluoranthene	**32.8** (7.20)		8270D		10	11/14/17 0:27	C7K0191	CK71007
Benzo(g,h,i)perylene	**39.2** (7.20)		8270D		10	11/14/17 0:27	C7K0191	CK71007
Benzo(k)fluoranthene	**37.8** (7.20)		8270D		10	11/14/17 0:27	C7K0191	CK71007
Chrysene	**60.0** (3.61)		8270D		10	11/14/17 0:27	C7K0191	CK71007
Dibenzo(a,h)Anthracene	**17.2** (0.361)		8270D		1	11/10/17 21:12	C7K0191	CK71007
Fluoranthene	**118** (7.20)		8270D		10	11/14/17 0:27	C7K0191	CK71007
Fluorene	**13.0** (0.720)		8270D		1	11/10/17 21:12	C7K0191	CK71007
Indeno(1,2,3-cd)Pyrene	**30.0** (7.20)		8270D		10	11/14/17 0:27	C7K0191	CK71007
Naphthalene	**4.97** (0.720)		8270D		1	11/10/17 21:12	C7K0191	CK71007
Phenanthrene	**98.2** (7.20)		8270D		10	11/14/17 0:27	C7K0191	CK71007
Pyrene	**149** (7.20)		8270D		10	11/14/17 0:27	C7K0191	CK71007

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichlorobenzene-d4	*65 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*74 %*		*30-130*
Surrogate: Nitrobenzene-d5	*68 %*		*30-130*
Surrogate: p-Terphenyl-d14	*95 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS610R-A
Date Sampled: 11/08/17 09:30
Percent Solids: 45

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-05
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Cyanide (PAC)	ND (2.15)		MA PAC		1	EEM	11/15/17 10:30	mg/kg dry	CK71514
Total Cyanide	ND (2.19)		9014		1	EEM	11/14/17 12:20	mg/kg dry	CK71415

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS610R-A
Date Sampled: 11/08/17 09:30
Percent Solids: 45
Initial Volume: 25.8
Final Volume: 2
Extraction Method: 3546

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-05
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 11/10/17 14:30

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (64.5)		MADEP-EPH		1	ZLC	11/13/17 20:28	C7K0200	CK71010
C19-C36 Aliphatics1	**98.1** (64.5)		MADEP-EPH		1	ZLC	11/13/17 20:28	C7K0200	CK71010
C11-C22 Unadjusted Aromatics1	**847** (64.5)		EPH8270		1	ZLC	11/16/17 16:26	C7K0266	CK71010
C11-C22 Aromatics1,2	**339** (64.5)		EPH8270			ZLC	11/21/17 1:03		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*56 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*92 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*105 %*		*40-140*
Surrogate: O-Terphenyl	*61 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS610R-A
Date Sampled: 11/08/17 09:30
Percent Solids: 45
Initial Volume: 19.3
Final Volume: 15
Extraction Method: 5030B

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC

MADEP-VPH Volatile Petroleum Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
C9-C10 Aromatics	ND (29.5)		MADEP-VPH		1	11/14/17 19:37	C7K0236	CK71438
C5-C8 Aliphatics1,2	ND (29.5)		MADEP-VPH		1	11/14/17 19:37		[CALC]
C9-C12 Aliphatics2,3	ND (29.5)		MADEP-VPH		1	11/14/17 19:37		[CALC]
1:1 Methanol/Soil Ratio %D	**29** (N/A)		MADEP-VPH			11/16/17 13:02		CK71438
Preservative:	**MeOH - covered**		MADEP-VPH					CK71438

	%Recovery	Qualifier	Limits
Surrogate: 2,5-Dibromotoluene - FID	*122 %*		*70-130*
Surrogate: 2,5-Dibromotoluene - PID	*128 %*		*70-130*
Surrogate: Trifluorotoluene - FID	*76 %*		*70-130*
Surrogate: Trifluorotoluene - PID	*81 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS610R-A
Date Sampled: 11/08/17 09:30
Percent Solids: 45
Initial Volume: 18
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-05RE1
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.307)		8260B		2	11/16/17 12:18	C7K0279	CK71627
Ethylbenzene	ND (0.307)		8260B		2	11/16/17 12:18	C7K0279	CK71627
Toluene	ND (0.307)		8260B		2	11/16/17 12:18	C7K0279	CK71627
Xylene O	ND (0.307)		8260B		2	11/16/17 12:18	C7K0279	CK71627
Xylene P,M	ND (0.614)		8260B		2	11/16/17 12:18	C7K0279	CK71627
Xylenes (Total)	ND (0.614)		8260B		1	11/16/17 12:18		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*77 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*54 %*	*SC*	*70-130*
Surrogate: Dibromofluoromethane	*75 %*		*70-130*
Surrogate: Toluene-d8	*62 %*	*SC*	*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS610R-B
Date Sampled: 11/08/17 09:45
Percent Solids: 40
Initial Volume: 18.9
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.352)		8260B		2	11/14/17 18:29	C7K0232	CK71435
Ethylbenzene	ND (0.352)		8260B		2	11/14/17 18:29	C7K0232	CK71435
Toluene	ND (0.352)		8260B		2	11/14/17 18:29	C7K0232	CK71435
Xylene O	ND (0.352)		8260B		2	11/14/17 18:29	C7K0232	CK71435
Xylene P,M	ND (0.704)		8260B		2	11/14/17 18:29	C7K0232	CK71435
Xylenes (Total)	ND (0.704)		8260B		1	11/14/17 18:29		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*95 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*75 %*		*70-130*
Surrogate: Dibromofluoromethane	*94 %*		*70-130*
Surrogate: Toluene-d8	*87 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS610R-B
Date Sampled: 11/08/17 09:45
Percent Solids: 40
Initial Volume: 15.9
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/10/17 12:46

8270D Polynuclear Aromatic Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	ND (0.197)		8270D		1	11/10/17 21:47	C7K0191	CK71007
Acenaphthene	ND (0.792)		8270D		1	11/10/17 21:47	C7K0191	CK71007
Acenaphthylene	ND (0.792)		8270D		1	11/10/17 21:47	C7K0191	CK71007
Anthracene	ND (0.792)		8270D		1	11/10/17 21:47	C7K0191	CK71007
Benzo(a)anthracene	ND (0.792)		8270D		1	11/10/17 21:47	C7K0191	CK71007
Benzo(a)pyrene	ND (0.397)		8270D		1	11/10/17 21:47	C7K0191	CK71007
Benzo(b)fluoranthene	ND (0.792)		8270D		1	11/10/17 21:47	C7K0191	CK71007
Benzo(g,h,i)perylene	ND (0.792)		8270D		1	11/10/17 21:47	C7K0191	CK71007
Benzo(k)fluoranthene	ND (0.792)		8270D		1	11/10/17 21:47	C7K0191	CK71007
Chrysene	ND (0.397)		8270D		1	11/10/17 21:47	C7K0191	CK71007
Dibenzo(a,h)Anthracene	ND (0.397)		8270D		1	11/10/17 21:47	C7K0191	CK71007
Fluoranthene	ND (0.792)		8270D		1	11/10/17 21:47	C7K0191	CK71007
Fluorene	ND (0.792)		8270D		1	11/10/17 21:47	C7K0191	CK71007
Indeno(1,2,3-cd)Pyrene	ND (0.792)		8270D		1	11/10/17 21:47	C7K0191	CK71007
Naphthalene	ND (0.792)		8270D		1	11/10/17 21:47	C7K0191	CK71007
Phenanthrene	ND (0.792)		8270D		1	11/10/17 21:47	C7K0191	CK71007
Pyrene	ND (0.792)		8270D		1	11/10/17 21:47	C7K0191	CK71007

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*81 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*88 %*		*30-130*
Surrogate: Nitrobenzene-d5	*83 %*		*30-130*
Surrogate: p-Terphenyl-d14	*108 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS610R-B
Date Sampled: 11/08/17 09:45
Percent Solids: 40

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-06
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Cyanide (PAC)	ND (2.48)		MA PAC		1	EEM	11/15/17 10:30	mg/kg dry	CK71514
Total Cyanide	ND (2.31)		9014		1	EEM	11/14/17 12:20	mg/kg dry	CK71415

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS610R-B
Date Sampled: 11/08/17 09:45
Percent Solids: 40
Initial Volume: 25.7
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-06
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 11/10/17 14:30

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (36.8)		MADEP-EPH		1	ZLC	11/13/17 21:15	C7K0200	CK71010
C19-C36 Aliphatics1	ND (36.8)		MADEP-EPH		1	ZLC	11/13/17 21:15	C7K0200	CK71010
C11-C22 Unadjusted Aromatics1	ND (36.8)		EPH8270		1	ZLC	11/16/17 1:03	C7K0266	CK71010
C11-C22 Aromatics1,2	ND (36.8)		EPH8270			ZLC	11/16/17 1:03		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*65 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*91 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*97 %*		*40-140*
Surrogate: O-Terphenyl	*82 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS610R-B
Date Sampled: 11/08/17 09:45
Percent Solids: 40
Initial Volume: 21.2
Final Volume: 15
Extraction Method: 5030B

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC

MADEP-VPH Volatile Petroleum Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
C9-C10 Aromatics	ND (33.0)		MADEP-VPH		1	11/14/17 20:11	C7K0236	CK71438
C5-C8 Aliphatics1,2	ND (33.0)		MADEP-VPH		1	11/14/17 20:11		[CALC]
C9-C12 Aliphatics2,3	ND (33.0)		MADEP-VPH		1	11/14/17 20:11		[CALC]
1:1 Methanol/Soil Ratio %D	**41** (N/A)		MADEP-VPH			11/16/17 13:02		CK71438
Preservative:	**MeOH - covered**		MADEP-VPH					CK71438

	%Recovery	Qualifier	Limits
Surrogate: 2,5-Dibromotoluene - FID	*112 %*		*70-130*
Surrogate: 2,5-Dibromotoluene - PID	*117 %*		*70-130*
Surrogate: Trifluorotoluene - FID	*76 %*		*70-130*
Surrogate: Trifluorotoluene - PID	*81 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS611R-A
Date Sampled: 11/08/17 10:15
Percent Solids: 22
Initial Volume: 18.3
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-07
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.718)		8260B		2	11/14/17 18:56	C7K0232	CK71435
Ethylbenzene	ND (0.718)		8260B		2	11/14/17 18:56	C7K0232	CK71435
Toluene	ND (0.718)		8260B		2	11/14/17 18:56	C7K0232	CK71435
Xylene O	ND (0.718)		8260B		2	11/14/17 18:56	C7K0232	CK71435
Xylene P,M	ND (1.44)		8260B		2	11/14/17 18:56	C7K0232	CK71435
Xylenes (Total)	ND (1.44)		8260B		1	11/14/17 18:56		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*89 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*65 %*	*SC*	*70-130*
Surrogate: Dibromofluoromethane	*88 %*		*70-130*
Surrogate: Toluene-d8	*79 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS611R-A
Date Sampled: 11/08/17 10:15
Percent Solids: 22
Initial Volume: 15.7
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-07
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/10/17 12:46

8270D Polynuclear Aromatic Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	**0.706** (0.356)		8270D		1	11/10/17 22:22	C7K0191	CK71007
Acenaphthene	**13.0** (1.43)		8270D		1	11/10/17 22:22	C7K0191	CK71007
Acenaphthylene	**2.32** (1.43)		8270D		1	11/10/17 22:22	C7K0191	CK71007
Anthracene	**10.5** (1.43)		8270D		1	11/10/17 22:22	C7K0191	CK71007
Benzo(a)anthracene	**14.5** (1.43)		8270D		1	11/10/17 22:22	C7K0191	CK71007
Benzo(a)pyrene	**17.8** (0.717)		8270D		1	11/10/17 22:22	C7K0191	CK71007
Benzo(b)fluoranthene	**10.3** (1.43)		8270D		1	11/10/17 22:22	C7K0191	CK71007
Benzo(g,h,i)perylene	**14.8** (1.43)		8270D		1	11/10/17 22:22	C7K0191	CK71007
Benzo(k)fluoranthene	**8.67** (1.43)		8270D		1	11/10/17 22:22	C7K0191	CK71007
Chrysene	**12.1** (0.717)		8270D		1	11/10/17 22:22	C7K0191	CK71007
Dibenzo(a,h)Anthracene	**5.06** (0.717)		8270D		1	11/10/17 22:22	C7K0191	CK71007
Fluoranthene	**30.6** (1.43)		8270D		1	11/10/17 22:22	C7K0191	CK71007
Fluorene	**7.21** (1.43)		8270D		1	11/10/17 22:22	C7K0191	CK71007
Indeno(1,2,3-cd)Pyrene	**10.8** (1.43)		8270D		1	11/10/17 22:22	C7K0191	CK71007
Naphthalene	**3.65** (1.43)		8270D		1	11/10/17 22:22	C7K0191	CK71007
Phenanthrene	**28.5** (1.43)		8270D		1	11/10/17 22:22	C7K0191	CK71007
Pyrene	**55.4** (14.3)		8270D		10	11/14/17 1:01	C7K0191	CK71007

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichlorobenzene-d4	*68 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*78 %*		*30-130*
Surrogate: Nitrobenzene-d5	*73 %*		*30-130*
Surrogate: p-Terphenyl-d14	*100 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS611R-A
Date Sampled: 11/08/17 10:15
Percent Solids: 22

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-07
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Cyanide (PAC)	ND (4.12)		MA PAC		1	EEM	11/15/17 10:30	mg/kg dry	CK71514
Total Cyanide	ND (4.25)		9014		1	EEM	11/14/17 12:20	mg/kg dry	CK71415

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS611R-A
Date Sampled: 11/08/17 10:15
Percent Solids: 22
Initial Volume: 25.6
Final Volume: 2
Extraction Method: 3546

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-07
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 11/10/17 14:30

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (132)		MADEP-EPH		1	ZLC	11/14/17 22:07	C7K0200	CK71010
C19-C36 Aliphatics1	**240** (132)		MADEP-EPH		1	ZLC	11/14/17 22:07	C7K0200	CK71010
C11-C22 Unadjusted Aromatics1	**1950** (132)		EPH8270		1	ZLC	11/16/17 1:38	C7K0266	CK71010
C11-C22 Aromatics1,2	**714** (132)		EPH8270			ZLC	11/16/17 14:09		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*59 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*88 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*96 %*		*40-140*
Surrogate: O-Terphenyl	*60 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS611R-A
Date Sampled: 11/08/17 10:15
Percent Solids: 22
Initial Volume: 18.2
Final Volume: 15
Extraction Method: 5030B

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-07
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC

MADEP-VPH Volatile Petroleum Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
C9-C10 Aromatics	ND (72.0)		MADEP-VPH		1	11/14/17 20:46	C7K0236	CK71438
C5-C8 Aliphatics1,2	ND (72.0)		MADEP-VPH		1	11/14/17 20:46		[CALC]
C9-C12 Aliphatics2,3	ND (72.0)		MADEP-VPH		1	11/14/17 20:46		[CALC]
1:1 Methanol/Soil Ratio %D	**21** (N/A)		MADEP-VPH			11/16/17 13:02		CK71438
Preservative:	**MeOH - covered**		MADEP-VPH					CK71438

	%Recovery	Qualifier	Limits
Surrogate: 2,5-Dibromotoluene - FID	*118 %*		*70-130*
Surrogate: 2,5-Dibromotoluene - PID	*123 %*		*70-130*
Surrogate: Trifluorotoluene - FID	*83 %*		*70-130*
Surrogate: Trifluorotoluene - PID	*88 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS611R-A
Date Sampled: 11/08/17 10:15
Percent Solids: 22
Initial Volume: 18.3
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-07RE1
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.718)		8260B		2	11/15/17 15:00	C7K0262	CK71528
Ethylbenzene	ND (0.718)		8260B		2	11/15/17 15:00	C7K0262	CK71528
Toluene	ND (0.718)		8260B		2	11/15/17 15:00	C7K0262	CK71528
Xylene O	ND (0.718)		8260B		2	11/15/17 15:00	C7K0262	CK71528
Xylene P,M	ND (1.44)		8260B		2	11/15/17 15:00	C7K0262	CK71528
Xylenes (Total)	ND (1.44)		8260B		1	11/15/17 15:00		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*100 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*64 %*	*SC*	*70-130*
Surrogate: Dibromofluoromethane	*94 %*		*70-130*
Surrogate: Toluene-d8	*79 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS611R-B
Date Sampled: 11/08/17 10:30
Percent Solids: 37
Initial Volume: 20.3
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-08
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.371)		8260B		2	11/14/17 19:22	C7K0232	CK71435
Ethylbenzene	ND (0.371)		8260B		2	11/14/17 19:22	C7K0232	CK71435
Toluene	ND (0.371)		8260B		2	11/14/17 19:22	C7K0232	CK71435
Xylene O	ND (0.371)		8260B		2	11/14/17 19:22	C7K0232	CK71435
Xylene P,M	ND (0.741)		8260B		2	11/14/17 19:22	C7K0232	CK71435
Xylenes (Total)	ND (0.741)		8260B		1	11/14/17 19:22		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*106 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*79 %*		*70-130*
Surrogate: Dibromofluoromethane	*100 %*		*70-130*
Surrogate: Toluene-d8	*93 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS611R-B
Date Sampled: 11/08/17 10:30
Percent Solids: 37
Initial Volume: 15.2
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-08
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/10/17 12:46

8270D Polynuclear Aromatic Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	ND (0.222)		8270D		1	11/10/17 22:57	C7K0191	CK71007
Acenaphthene	**1.78** (0.889)		8270D		1	11/10/17 22:57	C7K0191	CK71007
Acenaphthylene	ND (0.889)		8270D		1	11/10/17 22:57	C7K0191	CK71007
Anthracene	**1.82** (0.889)		8270D		1	11/10/17 22:57	C7K0191	CK71007
Benzo(a)anthracene	**2.47** (0.889)		8270D		1	11/10/17 22:57	C7K0191	CK71007
Benzo(a)pyrene	**2.34** (0.446)		8270D		1	11/10/17 22:57	C7K0191	CK71007
Benzo(b)fluoranthene	**1.04** (0.889)		8270D		1	11/10/17 22:57	C7K0191	CK71007
Benzo(g,h,i)perylene	**1.52** (0.889)		8270D		1	11/10/17 22:57	C7K0191	CK71007
Benzo(k)fluoranthene	**1.94** (0.889)		8270D		1	11/10/17 22:57	C7K0191	CK71007
Chrysene	**2.05** (0.446)		8270D		1	11/10/17 22:57	C7K0191	CK71007
Dibenzo(a,h)Anthracene	**0.715** (0.446)		8270D		1	11/10/17 22:57	C7K0191	CK71007
Fluoranthene	**4.32** (0.889)		8270D		1	11/10/17 22:57	C7K0191	CK71007
Fluorene	**1.09** (0.889)		8270D		1	11/10/17 22:57	C7K0191	CK71007
Indeno(1,2,3-cd)Pyrene	**1.24** (0.889)		8270D		1	11/10/17 22:57	C7K0191	CK71007
Naphthalene	ND (0.889)		8270D		1	11/10/17 22:57	C7K0191	CK71007
Phenanthrene	**5.77** (0.889)		8270D		1	11/10/17 22:57	C7K0191	CK71007
Pyrene	**5.64** (0.889)		8270D		1	11/10/17 22:57	C7K0191	CK71007

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*67 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*77 %*		*30-130*
Surrogate: Nitrobenzene-d5	*71 %*		*30-130*
Surrogate: p-Terphenyl-d14	*89 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS611R-B
Date Sampled: 11/08/17 10:30
Percent Solids: 37

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-08
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Cyanide (PAC)	ND (2.52)		MA PAC		1	EEM	11/15/17 10:30	mg/kg dry	CK71514
Total Cyanide	ND (2.48)		9014		1	EEM	11/14/17 12:20	mg/kg dry	CK71415

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS611R-B
Date Sampled: 11/08/17 10:30
Percent Solids: 37
Initial Volume: 25.5
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-08
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 11/10/17 14:30

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (39.8)		MADEP-EPH		1	ZLC	11/13/17 22:51	C7K0200	CK71010
C19-C36 Aliphatics1	ND (39.8)		MADEP-EPH		1	ZLC	11/13/17 22:51	C7K0200	CK71010
C11-C22 Unadjusted Aromatics1	**53.1** (39.8)		EPH8270		1	ZLC	11/16/17 17:00	C7K0266	CK71010
C11-C22 Aromatics1,2	**48.2** (39.8)		EPH8270			ZLC	11/16/17 17:00		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*68 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*92 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*104 %*		*40-140*
Surrogate: O-Terphenyl	*81 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS611R-B
Date Sampled: 11/08/17 10:30
Percent Solids: 37
Initial Volume: 20.8
Final Volume: 15
Extraction Method: 5030B

ESS Laboratory Work Order: 1711281
ESS Laboratory Sample ID: 1711281-08
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC

MADEP-VPH Volatile Petroleum Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
C9-C10 Aromatics	ND (36.6)		MADEP-VPH		1	11/14/17 21:20	C7K0236	CK71438
C5-C8 Aliphatics1,2	ND (36.6)		MADEP-VPH		1	11/14/17 21:20		[CALC]
C9-C12 Aliphatics2,3	ND (36.6)		MADEP-VPH		1	11/14/17 21:20		[CALC]
1:1 Methanol/Soil Ratio %D	**39** (N/A)		MADEP-VPH			11/16/17 13:02		CK71438
Preservative:	**MeOH - covered**		MADEP-VPH					CK71438

	%Recovery	Qualifier	Limits
Surrogate: 2,5-Dibromotoluene - FID	*122 %*		*70-130*
Surrogate: 2,5-Dibromotoluene - PID	*126 %*		*70-130*
Surrogate: Trifluorotoluene - FID	*72 %*		*70-130*
Surrogate: Trifluorotoluene - PID	*77 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1711281

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch CK71435 - 5035										
Blank										
Benzene	ND	0.100	mg/kg wet							
Ethylbenzene	ND	0.100	mg/kg wet							
Toluene	ND	0.100	mg/kg wet							
Xylene O	ND	0.100	mg/kg wet							
Xylene P,M	ND	0.200	mg/kg wet							
Xylenes (Total)	ND	0.200	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*5.06*		mg/kg wet	*5.000*		*101*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*4.47*		mg/kg wet	*5.000*		*89*	*70-130*			
Surrogate: Dibromofluoromethane	*4.99*		mg/kg wet	*5.000*		*100*	*70-130*			
Surrogate: Toluene-d8	*4.84*		mg/kg wet	*5.000*		*97*	*70-130*			
LCS										
Benzene	2.03	0.100	mg/kg wet	2.000		102	70-130			
Ethylbenzene	1.90	0.100	mg/kg wet	2.000		95	70-130			
Toluene	1.90	0.100	mg/kg wet	2.000		95	70-130			
Xylene O	1.94	0.100	mg/kg wet	2.000		97	70-130			
Xylene P,M	3.85	0.200	mg/kg wet	4.000		96	70-130			
Xylenes (Total)	5.79	0.200	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*4.81*		mg/kg wet	*5.000*		*96*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*4.63*		mg/kg wet	*5.000*		*93*	*70-130*			
Surrogate: Dibromofluoromethane	*4.90*		mg/kg wet	*5.000*		*98*	*70-130*			
Surrogate: Toluene-d8	*4.97*		mg/kg wet	*5.000*		*99*	*70-130*			
LCS Dup										
Benzene	2.04	0.100	mg/kg wet	2.000		102	70-130	0.5	25	
Ethylbenzene	1.87	0.100	mg/kg wet	2.000		93	70-130	2	25	
Toluene	1.92	0.100	mg/kg wet	2.000		96	70-130	0.9	25	
Xylene O	1.89	0.100	mg/kg wet	2.000		94	70-130	2	25	
Xylene P,M	3.80	0.200	mg/kg wet	4.000		95	70-130	1	25	
Xylenes (Total)	5.69	0.200	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*4.85*		mg/kg wet	*5.000*		*97*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*4.67*		mg/kg wet	*5.000*		*93*	*70-130*			
Surrogate: Dibromofluoromethane	*4.93*		mg/kg wet	*5.000*		*99*	*70-130*			
Surrogate: Toluene-d8	*5.07*		mg/kg wet	*5.000*		*101*	*70-130*			
Batch CK71528 - 5035										
Blank										
Benzene	ND	0.100	mg/kg wet							
Ethylbenzene	ND	0.100	mg/kg wet							
Toluene	ND	0.100	mg/kg wet							
Xylene O	ND	0.100	mg/kg wet							
Xylene P,M	ND	0.200	mg/kg wet							
Xylenes (Total)	ND	0.200	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*4.98*		mg/kg wet	*5.000*		*100*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*4.39*		mg/kg wet	*5.000*		*88*	*70-130*			
Surrogate: Dibromofluoromethane	*5.06*		mg/kg wet	*5.000*		*101*	*70-130*			
Surrogate: Toluene-d8	*4.83*		mg/kg wet	*5.000*		*97*	*70-130*			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1711281

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch CK71528 - 5035										
LCS										
Benzene	1.94	0.100	mg/kg wet	2.000		97	70-130			
Ethylbenzene	1.84	0.100	mg/kg wet	2.000		92	70-130			
Toluene	1.82	0.100	mg/kg wet	2.000		91	70-130			
Xylene O	1.96	0.100	mg/kg wet	2.000		98	70-130			
Xylene P,M	3.81	0.200	mg/kg wet	4.000		95	70-130			
Xylenes (Total)	5.78	0.200	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*4.76*		mg/kg wet	*5.000*		*95*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*4.55*		mg/kg wet	*5.000*		*91*	*70-130*			
Surrogate: Dibromofluoromethane	*4.83*		mg/kg wet	*5.000*		*97*	*70-130*			
Surrogate: Toluene-d8	*4.96*		mg/kg wet	*5.000*		*99*	*70-130*			
LCS Dup										
Benzene	2.02	0.100	mg/kg wet	2.000		101	70-130	4	25	
Ethylbenzene	1.82	0.100	mg/kg wet	2.000		91	70-130	1	25	
Toluene	1.85	0.100	mg/kg wet	2.000		92	70-130	1	25	
Xylene O	1.87	0.100	mg/kg wet	2.000		94	70-130	5	25	
Xylene P,M	3.76	0.200	mg/kg wet	4.000		94	70-130	1	25	
Xylenes (Total)	5.63	0.200	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*4.64*		mg/kg wet	*5.000*		*93*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*4.56*		mg/kg wet	*5.000*		*91*	*70-130*			
Surrogate: Dibromofluoromethane	*4.89*		mg/kg wet	*5.000*		*98*	*70-130*			
Surrogate: Toluene-d8	*4.94*		mg/kg wet	*5.000*		*99*	*70-130*			
Batch CK71627 - 5035										
Blank										
Benzene	ND	0.100	mg/kg wet							
Ethylbenzene	ND	0.100	mg/kg wet							
Toluene	ND	0.100	mg/kg wet							
Xylene O	ND	0.100	mg/kg wet							
Xylene P,M	ND	0.200	mg/kg wet							
Xylenes (Total)	ND	0.200	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*4.83*		mg/kg wet	*5.000*		*97*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*4.24*		mg/kg wet	*5.000*		*85*	*70-130*			
Surrogate: Dibromofluoromethane	*4.72*		mg/kg wet	*5.000*		*94*	*70-130*			
Surrogate: Toluene-d8	*4.59*		mg/kg wet	*5.000*		*92*	*70-130*			
LCS										
Benzene	1.97	0.100	mg/kg wet	2.000		98	70-130			
Ethylbenzene	1.88	0.100	mg/kg wet	2.000		94	70-130			
Toluene	1.88	0.100	mg/kg wet	2.000		94	70-130			
Xylene O	1.90	0.100	mg/kg wet	2.000		95	70-130			
Xylene P,M	3.82	0.200	mg/kg wet	4.000		96	70-130			
Xylenes (Total)	5.73	0.200	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*4.99*		mg/kg wet	*5.000*		*100*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*4.70*		mg/kg wet	*5.000*		*94*	*70-130*			
Surrogate: Dibromofluoromethane	*4.93*		mg/kg wet	*5.000*		*99*	*70-130*			
Surrogate: Toluene-d8	*5.10*		mg/kg wet	*5.000*		*102*	*70-130*			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1711281

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch CK71627 - 5035										
LCS Dup										
Benzene	1.99	0.100	mg/kg wet	2.000		100	70-130	1	25	
Ethylbenzene	1.84	0.100	mg/kg wet	2.000		92	70-130	2	25	
Toluene	1.89	0.100	mg/kg wet	2.000		94	70-130	0.4	25	
Xylene O	1.89	0.100	mg/kg wet	2.000		94	70-130	0.9	25	
Xylene P,M	3.86	0.200	mg/kg wet	4.000		96	70-130	0.8	25	
Xylenes (Total)	5.74	0.200	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*5.09*		mg/kg wet	*5.000*		*102*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*4.78*		mg/kg wet	*5.000*		*96*	*70-130*			
Surrogate: Dibromofluoromethane	*4.94*		mg/kg wet	*5.000*		*99*	*70-130*			
Surrogate: Toluene-d8	*5.04*		mg/kg wet	*5.000*		*101*	*70-130*			
8270D Polynuclear Aromatic Hydrocarbons										
Batch CK71007 - 3546										
Blank										
2-Methylnaphthalene	ND	0.083	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.167	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Benzo(a)anthracene	ND	0.137	mg/kg wet							
Benzo(a)pyrene	ND	0.167	mg/kg wet							
Benzo(b)fluoranthene	ND	0.333	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.333	mg/kg wet							
Benzo(k)fluoranthene	ND	0.333	mg/kg wet							
Chrysene	ND	0.167	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.167	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.333	mg/kg wet							
Naphthalene	ND	0.333	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	*2.36*		mg/kg wet	*3.333*		*71*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.70*		mg/kg wet	*3.333*		*81*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.46*		mg/kg wet	*3.333*		*74*	*30-130*			
Surrogate: p-Terphenyl-d14	*3.87*		mg/kg wet	*3.333*		*116*	*30-130*			
LCS										
2-Methylnaphthalene	2.58	0.333	mg/kg wet	3.333		77	40-140			
Acenaphthene	2.78	0.333	mg/kg wet	3.333		83	40-140			
Acenaphthylene	2.90	0.333	mg/kg wet	3.333		87	40-140			
Anthracene	2.98	0.333	mg/kg wet	3.333		90	40-140			
Benzo(a)anthracene	3.08	0.333	mg/kg wet	3.333		92	40-140			
Benzo(a)pyrene	3.23	0.167	mg/kg wet	3.333		97	40-140			
Benzo(b)fluoranthene	3.08	0.333	mg/kg wet	3.333		92	40-140			

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Polynuclear Aromatic Hydrocarbons										
Batch CK71007 - 3546										
Benzo(g,h,i)perylene	3.56	0.333	mg/kg wet	3.333		107	40-140			
Benzo(k)fluoranthene	2.89	0.333	mg/kg wet	3.333		87	40-140			
Chrysene	2.96	0.167	mg/kg wet	3.333		89	40-140			
Dibenzo(a,h)Anthracene	3.44	0.167	mg/kg wet	3.333		103	40-140			
Fluoranthene	2.92	0.333	mg/kg wet	3.333		87	40-140			
Fluorene	3.15	0.333	mg/kg wet	3.333		94	40-140			
Indeno(1,2,3-cd)Pyrene	3.43	0.333	mg/kg wet	3.333		103	40-140			
Naphthalene	2.63	0.333	mg/kg wet	3.333		79	40-140			
Phenanthrene	2.86	0.333	mg/kg wet	3.333		86	40-140			
Pyrene	2.61	0.333	mg/kg wet	3.333		78	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	*2.45*		mg/kg wet	*3.333*		*73*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*3.06*		mg/kg wet	*3.333*		*92*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.85*		mg/kg wet	*3.333*		*86*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.77*		mg/kg wet	*3.333*		*83*	*30-130*			
LCS Dup										
2-Methylnaphthalene	2.59	0.333	mg/kg wet	3.333		78	40-140	0.5	30	
Acenaphthene	2.74	0.333	mg/kg wet	3.333		82	40-140	1	30	
Acenaphthylene	2.88	0.333	mg/kg wet	3.333		86	40-140	0.8	30	
Anthracene	2.92	0.333	mg/kg wet	3.333		88	40-140	2	30	
Benzo(a)anthracene	2.98	0.333	mg/kg wet	3.333		90	40-140	3	30	
Benzo(a)pyrene	3.00	0.167	mg/kg wet	3.333		90	40-140	7	30	
Benzo(b)fluoranthene	2.92	0.333	mg/kg wet	3.333		88	40-140	5	30	
Benzo(g,h,i)perylene	3.28	0.333	mg/kg wet	3.333		98	40-140	8	30	
Benzo(k)fluoranthene	2.68	0.333	mg/kg wet	3.333		80	40-140	7	30	
Chrysene	2.87	0.167	mg/kg wet	3.333		86	40-140	3	30	
Dibenzo(a,h)Anthracene	3.18	0.167	mg/kg wet	3.333		96	40-140	8	30	
Fluoranthene	3.19	0.333	mg/kg wet	3.333		96	40-140	9	30	
Fluorene	3.06	0.333	mg/kg wet	3.333		92	40-140	3	30	
Indeno(1,2,3-cd)Pyrene	3.17	0.333	mg/kg wet	3.333		95	40-140	8	30	
Naphthalene	2.88	0.333	mg/kg wet	3.333		86	40-140	9	30	
Phenanthrene	2.78	0.333	mg/kg wet	3.333		84	40-140	3	30	
Pyrene	2.76	0.333	mg/kg wet	3.333		83	40-140	6	30	
Surrogate: 1,2-Dichlorobenzene-d4	*2.70*		mg/kg wet	*3.333*		*81*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*3.00*		mg/kg wet	*3.333*		*90*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.71*		mg/kg wet	*3.333*		*81*	*30-130*			
Surrogate: p-Terphenyl-d14	*3.04*		mg/kg wet	*3.333*		*91*	*30-130*			
Classical Chemistry										
Batch CK71415 - TCN Prep										
Blank										
Total Cyanide	ND	1.00	mg/kg wet							
LCS										
Total Cyanide	5.09	1.00	mg/kg wet	5.015		102	90-110			
Reference										

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Classical Chemistry										
Batch CK71415 - TCN Prep										
Total Cyanide	51.2	4.98	mg/kg wet	48.40		106	36.1577-206.612			
Reference										
Total Cyanide	51.3	4.96	mg/kg wet	48.40		106	36.1577-206.612			
Batch CK71514 - TCN Prep										
Blank										
Cyanide (PAC)	ND	1.00	mg/kg wet							
LCS										
Cyanide (PAC)	5.09	1.00	mg/kg wet	5.015		101	80-120			
LCS										
Cyanide (PAC)	19.9	1.00	mg/kg wet	20.06		99	80-120			
LCS Dup										
Cyanide (PAC)	19.8	1.00	mg/kg wet	20.06		99	80-120	0.5	20	
Reference										
Cyanide (PAC)	3.51	1.00	mg/kg wet	65.40		5	0-10			
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch CK71010 - 3546										
Blank										
C19-C36 Aliphatics1	ND	15.0	mg/kg wet							
C9-C18 Aliphatics1	ND	15.0	mg/kg wet							
Decane (C10)	ND	0.5	mg/kg wet							
Docosane (C22)	ND	0.5	mg/kg wet							
Dodecane (C12)	ND	0.5	mg/kg wet							
Eicosane (C20)	ND	0.5	mg/kg wet							
Hexacosane (C26)	ND	0.5	mg/kg wet							
Hexadecane (C16)	ND	0.5	mg/kg wet							
Hexatriacontane (C36)	ND	0.5	mg/kg wet							
Nonadecane (C19)	ND	0.5	mg/kg wet							
Nonane (C9)	ND	0.5	mg/kg wet							
Octacosane (C28)	ND	0.5	mg/kg wet							
Octadecane (C18)	ND	0.5	mg/kg wet							
Tetracosane (C24)	ND	0.5	mg/kg wet							
Tetradecane (C14)	ND	0.5	mg/kg wet							
Triacontane (C30)	ND	0.5	mg/kg wet							
Surrogate: 1-Chlorooctadecane	*1.58*		mg/kg wet	*2.000*		*79*	*40-140*			
Blank										
2-Methylnaphthalene	ND	0.20	mg/kg wet							
Acenaphthene	ND	0.40	mg/kg wet							
Acenaphthylene	ND	0.20	mg/kg wet							
Anthracene	ND	0.40	mg/kg wet							
Benzo(a)anthracene	ND	0.40	mg/kg wet							

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Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch CK71010 - 3546										
Benzo(a)pyrene	ND	0.40	mg/kg wet							
Benzo(b)fluoranthene	ND	0.40	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.40	mg/kg wet							
Benzo(k)fluoranthene	ND	0.40	mg/kg wet							
C11-C22 Aromatics1,2	ND	15.0	mg/kg wet							
C11-C22 Unadjusted Aromatics1	ND	15.0	mg/kg wet							
Chrysene	ND	0.40	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.20	mg/kg wet							
Fluoranthene	ND	0.40	mg/kg wet							
Fluorene	ND	0.40	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.40	mg/kg wet							
Naphthalene	ND	0.40	mg/kg wet							
Phenanthrene	ND	0.40	mg/kg wet							
Pyrene	ND	0.40	mg/kg wet							
Surrogate: 2-Bromonaphthalene	*1.71*		mg/kg wet	*2.000*		*85*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*1.98*		mg/kg wet	*2.000*		*99*	*40-140*			
Surrogate: O-Terphenyl	*1.83*		mg/kg wet	*2.000*		*91*	*40-140*			
LCS										
C19-C36 Aliphatics1	14.2	15.0	mg/kg wet	16.00		89	40-140			
C9-C18 Aliphatics1	7.9	15.0	mg/kg wet	12.00		65	40-140			
Decane (C10)	0.8	0.5	mg/kg wet	2.000		41	40-140			
Docosane (C22)	1.6	0.5	mg/kg wet	2.000		81	40-140			
Dodecane (C12)	0.8	0.5	mg/kg wet	2.000		41	40-140			
Eicosane (C20)	1.5	0.5	mg/kg wet	2.000		74	40-140			
Hexacosane (C26)	1.5	0.5	mg/kg wet	2.000		74	40-140			
Hexadecane (C16)	1.3	0.5	mg/kg wet	2.000		66	40-140			
Hexatriacontane (C36)	1.5	0.5	mg/kg wet	2.000		73	40-140			
Nonadecane (C19)	1.5	0.5	mg/kg wet	2.000		75	40-140			
Nonane (C9)	0.6	0.5	mg/kg wet	2.000		32	30-140			
Octacosane (C28)	1.5	0.5	mg/kg wet	2.000		74	40-140			
Octadecane (C18)	1.4	0.5	mg/kg wet	2.000		70	40-140			
Tetracosane (C24)	1.5	0.5	mg/kg wet	2.000		74	40-140			
Tetradecane (C14)	1.1	0.5	mg/kg wet	2.000		55	40-140			
Triacontane (C30)	1.5	0.5	mg/kg wet	2.000		73	40-140			
Surrogate: 1-Chlorooctadecane	*1.63*		mg/kg wet	*2.000*		*81*	*40-140*			
LCS										
2-Methylnaphthalene	1.21	0.20	mg/kg wet	2.000		60	40-140			
Acenaphthene	1.37	0.40	mg/kg wet	2.000		68	40-140			
Acenaphthylene	1.36	0.20	mg/kg wet	2.000		68	40-140			
Anthracene	1.52	0.40	mg/kg wet	2.000		76	40-140			
Benzo(a)anthracene	1.45	0.40	mg/kg wet	2.000		73	40-140			
Benzo(a)pyrene	1.29	0.40	mg/kg wet	2.000		65	40-140			
Benzo(b)fluoranthene	1.48	0.40	mg/kg wet	2.000		74	40-140			
Benzo(g,h,i)perylene	1.42	0.40	mg/kg wet	2.000		71	40-140			

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch CK71010 - 3546										
Benzo(k)fluoranthene	1.50	0.40	mg/kg wet	2.000		75	40-140			
C11-C22 Aromatics1,2	ND	15.0	mg/kg wet							
C11-C22 Unadjusted Aromatics1	27.8	15.0	mg/kg wet	34.00		82	40-140			
Chrysene	1.42	0.40	mg/kg wet	2.000		71	40-140			
Dibenzo(a,h)Anthracene	1.31	0.20	mg/kg wet	2.000		66	40-140			
Fluoranthene	1.51	0.40	mg/kg wet	2.000		75	40-140			
Fluorene	1.50	0.40	mg/kg wet	2.000		75	40-140			
Indeno(1,2,3-cd)Pyrene	1.48	0.40	mg/kg wet	2.000		74	40-140			
Naphthalene	1.17	0.40	mg/kg wet	2.000		59	40-140			
Phenanthrene	1.48	0.40	mg/kg wet	2.000		74	40-140			
Pyrene	1.54	0.40	mg/kg wet	2.000		77	40-140			
Surrogate: 2-Bromonaphthalene	*1.66*		mg/kg wet	*2.000*		*83*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*1.97*		mg/kg wet	*2.000*		*99*	*40-140*			
Surrogate: O-Terphenyl	*1.77*		mg/kg wet	*2.000*		*89*	*40-140*			
LCS										
2-Methylnaphthalene Breakthrough	0.0		%				0-5			
Naphthalene Breakthrough	0.0		%				0-5			
LCS Dup										
C19-C36 Aliphatics1	13.0	15.0	mg/kg wet	16.00		82	40-140	9	25	
C9-C18 Aliphatics1	7.0	15.0	mg/kg wet	12.00		58	40-140	11	25	
Decane (C10)	0.8	0.5	mg/kg wet	2.000		41	40-140	0.5	25	
Docosane (C22)	1.4	0.5	mg/kg wet	2.000		70	40-140	15	25	
Dodecane (C12)	0.8	0.5	mg/kg wet	2.000		40	40-140	3	25	
Eicosane (C20)	1.3	0.5	mg/kg wet	2.000		66	40-140	11	25	
Hexacosane (C26)	1.3	0.5	mg/kg wet	2.000		64	40-140	14	25	
Hexadecane (C16)	1.1	0.5	mg/kg wet	2.000		57	40-140	14	25	
Hexatriacontane (C36)	1.3	0.5	mg/kg wet	2.000		63	40-140	15	25	
Nonadecane (C19)	1.3	0.5	mg/kg wet	2.000		66	40-140	13	25	
Nonane (C9)	0.6	0.5	mg/kg wet	2.000		32	30-140	0.3	25	
Octacosane (C28)	1.3	0.5	mg/kg wet	2.000		64	40-140	14	25	
Octadecane (C18)	1.2	0.5	mg/kg wet	2.000		61	40-140	14	25	
Tetracosane (C24)	1.3	0.5	mg/kg wet	2.000		64	40-140	14	25	
Tetradecane (C14)	1.0	0.5	mg/kg wet	2.000		50	40-140	8	25	
Triacontane (C30)	1.3	0.5	mg/kg wet	2.000		63	40-140	15	25	
Surrogate: 1-Chlorooctadecane	*1.39*		mg/kg wet	*2.000*		*69*	*40-140*			
LCS Dup										
2-Methylnaphthalene	1.24	0.20	mg/kg wet	2.000		62	40-140	3	30	
Acenaphthene	1.37	0.40	mg/kg wet	2.000		68	40-140	0.3	30	
Acenaphthylene	1.37	0.20	mg/kg wet	2.000		69	40-140	0.7	30	
Anthracene	1.53	0.40	mg/kg wet	2.000		77	40-140	1	30	
Benzo(a)anthracene	1.47	0.40	mg/kg wet	2.000		73	40-140	1	30	
Benzo(a)pyrene	1.35	0.40	mg/kg wet	2.000		68	40-140	5	30	
Benzo(b)fluoranthene	1.52	0.40	mg/kg wet	2.000		76	40-140	3	30	

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch CK71010 - 3546										
Benzo(g,h,i)perylene	1.47	0.40	mg/kg wet	2.000		74	40-140	4	30	
Benzo(k)fluoranthene	1.48	0.40	mg/kg wet	2.000		74	40-140	1	30	
C11-C22 Aromatics1,2	ND	15.0	mg/kg wet							
C11-C22 Unadjusted Aromatics1	27.5	15.0	mg/kg wet	34.00		81	40-140	1	25	
Chrysene	1.44	0.40	mg/kg wet	2.000		72	40-140	2	30	
Dibenzo(a,h)Anthracene	1.34	0.20	mg/kg wet	2.000		67	40-140	2	30	
Fluoranthene	1.53	0.40	mg/kg wet	2.000		77	40-140	2	30	
Fluorene	1.48	0.40	mg/kg wet	2.000		74	40-140	1	30	
Indeno(1,2,3-cd)Pyrene	1.52	0.40	mg/kg wet	2.000		76	40-140	2	30	
Naphthalene	1.25	0.40	mg/kg wet	2.000		63	40-140	7	30	
Phenanthrene	1.53	0.40	mg/kg wet	2.000		77	40-140	3	30	
Pyrene	1.53	0.40	mg/kg wet	2.000		76	40-140	0.6	30	
Surrogate: 2-Bromonaphthalene	*1.67*		mg/kg wet	*2.000*		*84*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*2.02*		mg/kg wet	*2.000*		*101*	*40-140*			
Surrogate: O-Terphenyl	*1.72*		mg/kg wet	*2.000*		*86*	*40-140*			
LCS Dup										
2-Methylnaphthalene Breakthrough	0.0		%				0-5		200	
Naphthalene Breakthrough	0.0		%				0-5		200	
MADEP-VPH Volatile Petroleum Hydrocarbon										
Batch CK71334 - 5030B										
Blank										
1,2,4-Trimethylbenzene	ND	0.2	mg/kg wet							
2,2,4-Trimethylpentane	ND	5.0	mg/kg wet							
2-Methylpentane	ND	5.0	mg/kg wet							
Benzene	ND	0.2	mg/kg wet							
C5-C8 Aliphatics1,2	ND	10.0	mg/kg wet							
C5-C8 Unadjusted Aliphatics	ND	10.0	mg/kg wet							
C9-C10 Aromatics	ND	10.0	mg/kg wet							
C9-C12 Aliphatics2,3	ND	10.0	mg/kg wet							
C9-C12 Unadjusted Aliphatics	ND	10.0	mg/kg wet							
Ethylbenzene	ND	0.2	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.05	mg/kg wet							
Naphthalene	ND	0.2	mg/kg wet							
n-Butylcyclohexane	ND	5.0	mg/kg wet							
n-Decane	ND	5.0	mg/kg wet							
Nonane (C9)	ND	5.0	mg/kg wet							
Pentane	ND	5.0	mg/kg wet							
Toluene	ND	0.2	mg/kg wet							
Xylene O	ND	0.2	mg/kg wet							
Xylene P,M	ND	0.4	mg/kg wet							
Surrogate: 2,5-Dibromotoluene - FID	*5.55*		mg/kg wet	*5.000*		*111*	*70-130*			
Surrogate: 2,5-Dibromotoluene - PID	*5.85*		mg/kg wet	*5.000*		*117*	*70-130*			

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Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-VPH Volatile Petroleum Hydrocarbon										
Batch CK71334 - 5030B										
Surrogate: Trifluorotoluene - FID	*4.69*		mg/kg wet	*5.333*		*88*	*70-130*			
Surrogate: Trifluorotoluene - PID	*4.95*		mg/kg wet	*5.333*		*93*	*70-130*			
LCS										
1,2,4-Trimethylbenzene	8.9	0.2	mg/kg wet	10.00		89	70-130			
2,2,4-Trimethylpentane	12.1	5.0	mg/kg wet	15.00		80	70-130			
2-Methylpentane	12.3	5.0	mg/kg wet	15.00		82	70-130			
Benzene	4.7	0.2	mg/kg wet	5.000		94	70-130			
C5-C8 Aliphatics1,2	ND	10.0	mg/kg wet							
C5-C8 Unadjusted Aliphatics	33.4	10.0	mg/kg wet	40.00		83	70-130			
C9-C10 Aromatics	8.8	10.0	mg/kg wet	10.00		88	70-130			
C9-C12 Aliphatics2,3	ND	10.0	mg/kg wet							
C9-C12 Unadjusted Aliphatics	22.2	10.0	mg/kg wet	30.00		74	70-130			
Ethylbenzene	4.7	0.2	mg/kg wet	5.000		94	70-130			
Methyl tert-Butyl Ether	14.5	0.05	mg/kg wet	15.00		97	70-130			
Naphthalene	10.2	0.2	mg/kg wet	10.00		102	70-130			
n-Butylcyclohexane	7.4	5.0	mg/kg wet	10.00		74	70-130			
n-Decane	7.7	5.0	mg/kg wet	10.00		77	70-130			
Nonane (C9)	7.0	5.0	mg/kg wet	10.00		70	30-130			
Pentane	9.0	5.0	mg/kg wet	10.00		90	70-130			
Toluene	13.4	0.2	mg/kg wet	15.00		90	70-130			
Xylene O	9.2	0.2	mg/kg wet	10.00		92	70-130			
Xylene P,M	18.3	0.4	mg/kg wet	20.00		92	70-130			
Surrogate: 2,5-Dibromotoluene - FID	*6.12*		mg/kg wet	*5.000*		*122*	*70-130*			
Surrogate: 2,5-Dibromotoluene - PID	*6.44*		mg/kg wet	*5.000*		*129*	*70-130*			
Surrogate: Trifluorotoluene - FID	*4.84*		mg/kg wet	*5.333*		*91*	*70-130*			
Surrogate: Trifluorotoluene - PID	*5.09*		mg/kg wet	*5.333*		*95*	*70-130*			
LCS Dup										
1,2,4-Trimethylbenzene	9.1	0.2	mg/kg wet	10.00		91	70-130	2	25	
2,2,4-Trimethylpentane	12.7	5.0	mg/kg wet	15.00		85	70-130	5	25	
2-Methylpentane	12.4	5.0	mg/kg wet	15.00		83	70-130	1	25	
Benzene	4.8	0.2	mg/kg wet	5.000		96	70-130	2	25	
C5-C8 Aliphatics1,2	ND	10.0	mg/kg wet							
C5-C8 Unadjusted Aliphatics	34.5	10.0	mg/kg wet	40.00		86	70-130	3	25	
C9-C10 Aromatics	9.0	10.0	mg/kg wet	10.00		90	70-130	2	25	
C9-C12 Aliphatics2,3	ND	10.0	mg/kg wet							
C9-C12 Unadjusted Aliphatics	25.7	10.0	mg/kg wet	30.00		86	70-130	15	25	
Ethylbenzene	4.9	0.2	mg/kg wet	5.000		97	70-130	3	25	
Methyl tert-Butyl Ether	15.1	0.05	mg/kg wet	15.00		101	70-130	4	25	
Naphthalene	11.2	0.2	mg/kg wet	10.00		112	70-130	9	25	
n-Butylcyclohexane	8.2	5.0	mg/kg wet	10.00		82	70-130	10	25	
n-Decane	9.2	5.0	mg/kg wet	10.00		92	70-130	18	25	
Nonane (C9)	8.1	5.0	mg/kg wet	10.00		81	30-130	14	25	
Pentane	9.3	5.0	mg/kg wet	10.00		93	70-130	4	25	
Toluene	13.9	0.2	mg/kg wet	15.00		93	70-130	4	25	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1711281

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-VPH Volatile Petroleum Hydrocarbon										
Batch CK71334 - 5030B										
Xylene O	9.3	0.2	mg/kg wet	10.00		93	70-130	2	25	
Xylene P,M	18.7	0.4	mg/kg wet	20.00		94	70-130	2	25	
Surrogate: 2,5-Dibromotoluene - FID	*5.78*		mg/kg wet	*5.000*		*116*	*70-130*			
Surrogate: 2,5-Dibromotoluene - PID	*6.07*		mg/kg wet	*5.000*		*121*	*70-130*			
Surrogate: Trifluorotoluene - FID	*4.84*		mg/kg wet	*5.333*		*91*	*70-130*			
Surrogate: Trifluorotoluene - PID	*5.09*		mg/kg wet	*5.333*		*96*	*70-130*			
Batch CK71438 - 5030B										
Blank										
1,2,4-Trimethylbenzene	ND	0.2	mg/kg wet							
2,2,4-Trimethylpentane	ND	5.0	mg/kg wet							
2-Methylpentane	ND	5.0	mg/kg wet							
Benzene	ND	0.2	mg/kg wet							
C5-C8 Aliphatics1,2	ND	10.0	mg/kg wet							
C5-C8 Unadjusted Aliphatics	ND	10.0	mg/kg wet							
C9-C10 Aromatics	ND	10.0	mg/kg wet							
C9-C12 Aliphatics2,3	ND	10.0	mg/kg wet							
C9-C12 Unadjusted Aliphatics	ND	10.0	mg/kg wet							
Ethylbenzene	ND	0.2	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.05	mg/kg wet							
Naphthalene	ND	0.2	mg/kg wet							
n-Butylcyclohexane	ND	5.0	mg/kg wet							
n-Decane	ND	5.0	mg/kg wet							
Nonane (C9)	ND	5.0	mg/kg wet							
Pentane	ND	5.0	mg/kg wet							
Toluene	ND	0.2	mg/kg wet							
Xylene O	ND	0.2	mg/kg wet							
Xylene P,M	ND	0.4	mg/kg wet							
Surrogate: 2,5-Dibromotoluene - FID	*6.13*		mg/kg wet	*5.000*		*123*	*70-130*			
Surrogate: 2,5-Dibromotoluene - PID	*6.42*		mg/kg wet	*5.000*		*128*	*70-130*			
Surrogate: Trifluorotoluene - FID	*4.72*		mg/kg wet	*5.333*		*89*	*70-130*			
Surrogate: Trifluorotoluene - PID	*4.94*		mg/kg wet	*5.333*		*93*	*70-130*			
LCS										
1,2,4-Trimethylbenzene	9.2	0.2	mg/kg wet	10.00		92	70-130			
2,2,4-Trimethylpentane	12.4	5.0	mg/kg wet	15.00		83	70-130			
2-Methylpentane	12.3	5.0	mg/kg wet	15.00		82	70-130			
Benzene	4.8	0.2	mg/kg wet	5.000		96	70-130			
C5-C8 Aliphatics1,2	ND	10.0	mg/kg wet							
C5-C8 Unadjusted Aliphatics	33.7	10.0	mg/kg wet	40.00		84	70-130			
C9-C10 Aromatics	9.0	10.0	mg/kg wet	10.00		90	70-130			
C9-C12 Aliphatics2,3	ND	10.0	mg/kg wet							
C9-C12 Unadjusted Aliphatics	22.3	10.0	mg/kg wet	30.00		74	70-130			
Ethylbenzene	4.8	0.2	mg/kg wet	5.000		97	70-130			
Methyl tert-Butyl Ether	15.3	0.05	mg/kg wet	15.00		102	70-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1711281

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-VPH Volatile Petroleum Hydrocarbon										
Batch CK71438 - 5030B										
Naphthalene	10.4	0.2	mg/kg wet	10.00		104	70-130			
n-Butylcyclohexane	7.3	5.0	mg/kg wet	10.00		73	70-130			
n-Decane	7.9	5.0	mg/kg wet	10.00		79	70-130			
Nonane (C9)	7.1	5.0	mg/kg wet	10.00		71	30-130			
Pentane	8.9	5.0	mg/kg wet	10.00		89	70-130			
Toluene	14.0	0.2	mg/kg wet	15.00		93	70-130			
Xylene O	9.3	0.2	mg/kg wet	10.00		93	70-130			
Xylene P,M	18.6	0.4	mg/kg wet	20.00		93	70-130			
Surrogate: 2,5-Dibromotoluene - FID	*5.60*		mg/kg wet	*5.000*		*112*	*70-130*			
Surrogate: 2,5-Dibromotoluene - PID	*5.92*		mg/kg wet	*5.000*		*118*	*70-130*			
Surrogate: Trifluorotoluene - FID	*4.94*		mg/kg wet	*5.333*		*93*	*70-130*			
Surrogate: Trifluorotoluene - PID	*5.21*		mg/kg wet	*5.333*		*98*	*70-130*			
LCS Dup										
1,2,4-Trimethylbenzene	9.3	0.2	mg/kg wet	10.00		93	70-130	1	25	
2,2,4-Trimethylpentane	12.4	5.0	mg/kg wet	15.00		83	70-130	0.07	25	
2-Methylpentane	12.2	5.0	mg/kg wet	15.00		81	70-130	0.9	25	
Benzene	4.8	0.2	mg/kg wet	5.000		97	70-130	0.9	25	
C5-C8 Aliphatics1,2	ND	10.0	mg/kg wet							
C5-C8 Unadjusted Aliphatics	33.9	10.0	mg/kg wet	40.00		85	70-130	0.5	25	
C9-C10 Aromatics	9.1	10.0	mg/kg wet	10.00		91	70-130	1	25	
C9-C12 Aliphatics2,3	ND	10.0	mg/kg wet							
C9-C12 Unadjusted Aliphatics	25.5	10.0	mg/kg wet	30.00		85	70-130	13	25	
Ethylbenzene	4.9	0.2	mg/kg wet	5.000		98	70-130	1	25	
Methyl tert-Butyl Ether	15.4	0.05	mg/kg wet	15.00		103	70-130	0.7	25	
Naphthalene	11.5	0.2	mg/kg wet	10.00		115	70-130	10	25	
n-Butylcyclohexane	8.0	5.0	mg/kg wet	10.00		80	70-130	10	25	
n-Decane	9.3	5.0	mg/kg wet	10.00		93	70-130	16	25	
Nonane (C9)	7.9	5.0	mg/kg wet	10.00		79	30-130	12	25	
Pentane	9.2	5.0	mg/kg wet	10.00		92	70-130	3	25	
Toluene	14.1	0.2	mg/kg wet	15.00		94	70-130	0.9	25	
Xylene O	9.4	0.2	mg/kg wet	10.00		94	70-130	1	25	
Xylene P,M	18.9	0.4	mg/kg wet	20.00		95	70-130	1	25	
Surrogate: 2,5-Dibromotoluene - FID	*5.88*		mg/kg wet	*5.000*		*118*	*70-130*			
Surrogate: 2,5-Dibromotoluene - PID	*6.23*		mg/kg wet	*5.000*		*125*	*70-130*			
Surrogate: Trifluorotoluene - FID	*4.92*		mg/kg wet	*5.333*		*92*	*70-130*			
Surrogate: Trifluorotoluene - PID	*5.18*		mg/kg wet	*5.333*		*97*	*70-130*			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1711281

Notes and Definitions

Z-04	MeOH - covered
U	Analyte included in the analysis, but not detected
SM	Surrogate recovery(ies) outside of criteria due to matrix (UCM/coelution/matrix is present) (SM).
SD	Surrogate recovery(ies) diluted below the MRL (SD).
SC	Surrogate recovery(ies) outside of criteria. Reextraction/Reanalysis confirms results (SC).
D	Diluted.
CD-	Continuing Calibration %Diff/Drift is below control limit (CD-).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1711281

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

Shipped/Delivered Via: ESS Courier

ESS Project ID: 1711281
Date Received: 11/9/2017
Project Due Date: 11/16/2017
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 1.1 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? No
7. Is COC complete and correct? No
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / (NA)
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? (Yes) / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? (Yes) / No / NA

13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

COC = 4 containers ; rec'd 5 at 11/9/17

14. Was there a need to contact Project Manager? (Yes) / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	180679	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
01	180680	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
01	180695	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
01	180696	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
01	181258	Yes	NA	Yes	2 oz. Jar - Unpres	NP	
02	180677	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
02	180678	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
02	180693	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
02	180694	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
02	181257	Yes	NA	Yes	2 oz. Jar - Unpres	NP	
03	180675	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
03	180676	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
03	180691	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
03	180692	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
03	181256	Yes	NA	Yes	2 oz. Jar - Unpres	NP	
04	180673	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
04	180674	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
04	180689	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
04	180690	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
04	181255	Yes	NA	Yes	2 oz. Jar - Unpres	NP	
05	180671	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
05	180672	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
05	180687	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
05	180688	Yes	NA	Yes	VOA Vial - Methanol	MeOH	

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

ESS Project ID: 1711281

Date Received: 11/9/2017

05	181254	Yes	NA	Yes	2 oz. Jar - Unpres	NP
06	180669	Yes	NA	Yes	8 oz. Jar - Unpres	NP
06	180670	Yes	NA	Yes	8 oz. Jar - Unpres	NP
06	180685	Yes	NA	Yes	VOA Vial - Methanol	MeOH
06	180686	Yes	NA	Yes	VOA Vial - Methanol	MeOH
06	181253	Yes	NA	Yes	2 oz. Jar - Unpres	NP
07	180667	Yes	NA	Yes	8 oz. Jar - Unpres	NP
07	180668	Yes	NA	Yes	8 oz. Jar - Unpres	NP
07	180683	Yes	NA	Yes	VOA Vial - Methanol	MeOH
07	180684	Yes	NA	Yes	VOA Vial - Methanol	MeOH
07	181252	Yes	NA	Yes	2 oz. Jar - Unpres	NP
08	180665	Yes	NA	Yes	8 oz. Jar - Unpres	NP
08	180666	Yes	NA	Yes	8 oz. Jar - Unpres	NP
08	180681	Yes	NA	Yes	VOA Vial - Methanol	MeOH
08	180682	Yes	NA	Yes	VOA Vial - Methanol	MeOH
08	181251	Yes	NA	Yes	2 oz. Jar - Unpres	NP

2nd Review

Are barcode labels on correct containers? (Yes) / No

Completed By: [signature] Date & Time: 11/9/17 2240

Reviewed By: [signature] Date & Time: 11/10/17 0004

Delivered By: [signature] 11/10/17 0004

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 1711281

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury

Project Location: Amesbury, MA

Project Number: 044752

Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY REQUIRED -- YES NO

If Yes, Are MCP Analytical Methods Required? **YES** NO NA

Are Drinking Water Samples Submitted? YES **NO** NA

If Yes, Have Drinking Water Sampling Requirements Been Met? YES NO **NA**

Sample Handling

Samples Field Filtered: YES NO **NA**

Sampled Shipped With Ice: **YES** NO

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Preservative	Preservative	VOC BTEX by method 8620 High	VPH fractions only (MADEP)	PAHs 8270	EPH fractions only (MADEP)	TCN 9014	PACN (MADEP)	% Solids		Sample Specific Remarks
							MeOH	MeOH	Analysis								
1	044752-SS608R-A	11/8/2017	815	Soil	4	LLT			X	X	X	X	X	X	X		
2	044752-SS608R-B	11/8/2017	830	Soil	4	LLT			X	X	X	X	X	X	X		
3	044752-SS609R-A	11/8/2017	900	Soil	4	LLT			X	X	X	X	X	X	X		
4	044752-SS609R-B	11/8/2017	915	Soil	4	LLT			X	X	X	X	X	X	X		
5	044752-SS610R-A	11/8/2017	930	Soil	4	LLT			X	X	X	X	X	X	X		
6	044752-SS610R-B	11/8/2017	945	Soil	4	LLT			X	X	X	X	X	X	X		
7	044752-SS611R-A	11/8/2017	1015	Soil	4	LLT			X	X	X	X	X	X	X		
8	044752-SS611R-B	11/8/2017	1030	Soil	4	LLT			X	X	X	X	X	X	X		

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1. Lauren J Tobey	11/8/17	1325	1. GEI Sample Fridge
Relinquished by: (signature) 2. GEI Sample Fridge	Date: 11/9/17	Time: 1157	Received by: (signature) 2.
Relinquished by: (signature) 3.	Date: 11/9/17	Time: 1157	Received by: (signature) 3.
Relinquished by: (signature) 4.	Date: 11/9/17	Time: 20:19	Received by: (signature) 4. 11/10/17 0201

Turnaround Time (Business days):

Normal ____ Other ____

10-Day ____ 7-Day ____

5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

Special pricing - see Tim Byrne

ICE TEMP: 1.1

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury (044752-2)
ESS Laboratory Work Order Number: 1807384

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 5:15 pm, Jul 24, 2018

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1807384

SAMPLE RECEIPT

The following samples were received on July 17, 2018 for the analyses specified on the enclosed Chain of Custody Record.

To achieve CAM compliance for MCP data, ESS Laboratory has reviewed all QA/QC Requirements and Performance Standards listed in each method. Holding times and preservation have also been reviewed. All CAM requirements have been performed and achieved unless noted in the project narrative.

Each method has been set-up in the laboratory to reach required MCP standards. The methods for aqueous VOA and Soil Methanol VOA have known limitations for certain analytes. The regulatory standards may not be achieved due to these limitations. In addition, for all methods, matrix interferences, dilutions, and %Solids may elevate method reporting limits above regulatory standards. ESS Laboratory can provide, upon request, a Limit Checker (regulatory standard comparison spreadsheet) electronic deliverable which will highlight these exceedances.

Question I: All samples for VOA, VPH and EPH were analyzed for a subset of the required MCP list per the client's request.

Low Level VOA vials were frozen by ESS Laboratory on 7/17/18 @ 16:45.

Lab Number	Sample Name	Matrix	Analysis
1807384-01	044752-SS612A	Soil	8260B, 8270D, 9014, EPH8270, MA PAC, MADEP-EPH, MA-VPH-2.1
1807384-02	044752-SS613B	Soil	8260B, 8270D, 9014, EPH8270, MA PAC, MADEP-EPH, MA-VPH-2.1
1807384-03	044752-SS614	Soil	8260B, 8270D, 9014, EPH8270, MA PAC, MADEP-EPH, MA-VPH-2.1
1807384-04	044752-SS616	Soil	8260B, 8270D, 9014, EPH8270, MA PAC, MADEP-EPH, MA-VPH-2.1
1807384-05	044752-SS617	Soil	8260B, 8270D, 9014, EPH8270, MA PAC, MADEP-EPH, MA-VPH-2.1
1807384-06	044752-SS618	Soil	8260B, 8270D, 9014, EPH8270, MA PAC, MADEP-EPH, MA-VPH-2.1

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1807384

PROJECT NARRATIVE

5035/8260B Volatile Organic Compounds / Methanol

1807384-04 **Surrogate recovery(ies) outside of criteria. Reextraction/Reanalysis confirms results (SC).**
1,2-Dichloroethane-d4 (69% @ 70-130%), 4-Bromofluorobenzene (60% @ 70-130%), Toluene-d8 (66% @ 70-130%)

1807384-06 **Surrogate recovery(ies) outside of criteria. Reextraction/Reanalysis confirms results (SC).**
4-Bromofluorobenzene (68% @ 70-130%)

8270D Polynuclear Aromatic Hydrocarbons

C8G0305-CCV1 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
p-Terphenyl-d14 (24% @ 20%), Pyrene (22% @ 20%)

C8G0330-CCV1 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
Fluoranthene (23% @ 20%)

MADEP-EPH Extractable Petroleum Hydrocarbons

1807384-04 **Elevated Method Reporting Limits due to sample matrix (EL).**

C8G0327-CCV4 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
Benzo(k)fluoranthene (23% @ 20%)

MADEP-VPH Volatile Petroleum Hydrocarbon

1807384-04 **Surrogate recovery(ies) outside of criteria. Reextraction/Reanalysis confirms results (SC).**
Trifluorotoluene - FID (54% @ 70-130%), Trifluorotoluene - PID (55% @ 70-130%)

1807384-05 **Surrogate recovery(ies) outside of criteria. Reextraction/Reanalysis confirms results (SC).**
Trifluorotoluene - FID (69% @ 70-130%)

1807384-06 **Surrogate recovery(ies) outside of criteria. Reextraction/Reanalysis confirms results (SC).**
Trifluorotoluene - FID (55% @ 70-130%), Trifluorotoluene - PID (57% @ 70-130%)

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1807384

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 04-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1807384

MassDEP Analytical Protocol Certification Form

MADEP RTN: _____

This form provides certification for the following data set: **1807384-01 through 1807384-06**

Matrices: ( ) Ground Water/Surface Water (X) Soil/Sediment ( ) Drinking Water ( ) Air ( ) Other:_____

CAM Protocol (check all that apply below):

(X) 8260 VOC CAM II A	( ) 7470/7471 Hg CAM III B	(X) MassDEP VPH (GC/PID/FID) CAM IV A	( ) 8082 PCB CAM V A	(X) 9014 Total Cyanide/PAC CAM VI A	( ) 6860 Perchlorate CAM VIII B
(X) 8270 SVOC CAM II B	( ) 7010 Metals CAM III C	( ) MassDEP VPH (GC/MS) CAM IV C	( ) 8081 Pesticides CAM V B	( ) 7196 Hex Cr CAM VI B	( ) MassDEP APH CAM IX A
( ) 6010 Metals CAM III A	( ) 6020 Metals CAM III D	(X) MassDEP EPH CAM IV B	( ) 8151 Herbicides CAM V C	( ) Explosives CAM VIII A	( ) TO-15 VOC CAM IX B

Affirmative responses to questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	Yes (X) No ( )
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	Yes (X) No ( )
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	Yes (X) No ( )
D	Does the laboratory report comply with all the reporting requirements specified in the CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	Yes (X) No ( )
E	VPH, EPH, APH and TO-15 only: a. Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	Yes (X) No ( )
	b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	Yes ( ) No ( )
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	Yes (X) No ( )

Responses to Questions G, H and I below are required for '"Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocols(s)?	Yes ( ) No (X)*
	***Data User Note:** Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.*	
H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	Yes ( ) No (X)*
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	Yes ( ) No (X)*

All negative responses must be addressed in an attached laboratory narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature: Laurel Stoddard Date: July 24, 2018

Printed Name: Laurel Stoddard Position: Laboratory Director

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS612A
Date Sampled: 07/16/18 08:15
Percent Solids: 80
Initial Volume: 26.6
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1807384
ESS Laboratory Sample ID: 1807384-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.0957)		8260B		1	07/19/18 12:31	C8G0342	CG81924
Ethylbenzene	ND (0.0957)		8260B		1	07/19/18 12:31	C8G0342	CG81924
Toluene	ND (0.0957)		8260B		1	07/19/18 12:31	C8G0342	CG81924
Xylene O	ND (0.0957)		8260B		1	07/19/18 12:31	C8G0342	CG81924
Xylene P,M	ND (0.191)		8260B		1	07/19/18 12:31	C8G0342	CG81924
Xylenes (Total)	ND (0.191)		8260B		1	07/19/18 12:31		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*115 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*114 %*		*70-130*
Surrogate: Dibromofluoromethane	*113 %*		*70-130*
Surrogate: Toluene-d8	*114 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS612A
Date Sampled: 07/16/18 08:15
Percent Solids: 80
Initial Volume: 14.6
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1807384
ESS Laboratory Sample ID: 1807384-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: IBM
Prepared: 7/18/18 11:08

8270D Polynuclear Aromatic Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	ND (0.428)		8270D		1	07/19/18 11:25	C8G0330	CG81807
Acenaphthene	ND (0.428)		8270D		1	07/19/18 11:25	C8G0330	CG81807
Acenaphthylene	ND (0.428)		8270D		1	07/19/18 11:25	C8G0330	CG81807
Anthracene	ND (0.428)		8270D		1	07/19/18 11:25	C8G0330	CG81807
Benzo(a)anthracene	ND (0.428)		8270D		1	07/19/18 11:25	C8G0330	CG81807
Benzo(a)pyrene	ND (0.215)		8270D		1	07/19/18 11:25	C8G0330	CG81807
Benzo(b)fluoranthene	ND (0.428)		8270D		1	07/19/18 11:25	C8G0330	CG81807
Benzo(g,h,i)perylene	ND (0.428)		8270D		1	07/19/18 11:25	C8G0330	CG81807
Benzo(k)fluoranthene	ND (0.428)		8270D		1	07/19/18 11:25	C8G0330	CG81807
Chrysene	ND (0.215)		8270D		1	07/19/18 11:25	C8G0330	CG81807
Dibenzo(a,h)Anthracene	ND (0.215)		8270D		1	07/19/18 11:25	C8G0330	CG81807
Fluoranthene	ND (0.428)		8270D		1	07/19/18 11:25	C8G0330	CG81807
Fluorene	ND (0.428)		8270D		1	07/19/18 11:25	C8G0330	CG81807
Indeno(1,2,3-cd)Pyrene	ND (0.428)		8270D		1	07/19/18 11:25	C8G0330	CG81807
Naphthalene	ND (0.428)		8270D		1	07/19/18 11:25	C8G0330	CG81807
Phenanthrene	ND (0.428)		8270D		1	07/19/18 11:25	C8G0330	CG81807
Pyrene	ND (0.428)		8270D		1	07/19/18 11:25	C8G0330	CG81807

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*75 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*81 %*		*30-130*
Surrogate: Nitrobenzene-d5	*87 %*		*30-130*
Surrogate: p-Terphenyl-d14	*79 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS612A
Date Sampled: 07/16/18 08:15
Percent Solids: 80

ESS Laboratory Work Order: 1807384
ESS Laboratory Sample ID: 1807384-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Cyanide (PAC)	ND (1.18)		MA PAC		1	EEM	07/20/18 11:55	mg/kg dry	CG82020
Total Cyanide	ND (1.20)		9014		1	EEM	07/19/18 14:10	mg/kg dry	CG81919

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS612A
Date Sampled: 07/16/18 08:15
Percent Solids: 80
Initial Volume: 25.9
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1807384
ESS Laboratory Sample ID: 1807384-01
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 7/17/18 17:25

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (18.1)		MADEP-EPH		1	SMR	07/18/18 23:24	C8G0334	CG81608
C19-C36 Aliphatics1	ND (18.1)		MADEP-EPH		1	SMR	07/18/18 23:24	C8G0334	CG81608
C11-C22 Unadjusted Aromatics1	ND (18.1)		EPH8270		1	VSC	07/18/18 22:25	C8G0308	CG81608
C11-C22 Aromatics1,2	ND (18.1)		EPH8270			VSC	07/18/18 22:25		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*61 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*111 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*96 %*		*40-140*
Surrogate: O-Terphenyl	*67 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS612A
Date Sampled: 07/16/18 08:15
Percent Solids: 80
Initial Volume: 28.5
Final Volume: 15
Extraction Method: 5030B
Column Type: Restek RTX-502.2 - 3µ film thickness 0.53mm X 105m

ESS Laboratory Work Order: 1807384
ESS Laboratory Sample ID: 1807384-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Trap Type: Supelco K Vocarb 3000 Trap

MADEP-VPH Volatile Petroleum Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
C9-C10 Aromatics	ND (9.1)		MA-VPH-2.1		1	07/19/18 18:01	C8G0319	CG81818
C5-C8 Aliphatics1,2	ND (9.5)		MA-VPH-2.1		1	07/19/18 18:01		[CALC]
C9-C12 Aliphatics2,3	ND (18.9)		MA-VPH-2.1		1	07/19/18 18:01		[CALC]
1:1 Methanol/Soil Ratio %D	**90** (N/A)		MA-VPH-2.1			07/19/18 7:40		CG81818
Preservative:	**MeOH - covered**		MA-VPH-2.1					CG81818

	%Recovery	Qualifier	Limits
Surrogate: 2,5-Dibromotoluene - FID	*78 %*		*70-130*
Surrogate: 2,5-Dibromotoluene - PID	*78 %*		*70-130*
Surrogate: Trifluorotoluene - FID	*90 %*		*70-130*
Surrogate: Trifluorotoluene - PID	*91 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS613B
Date Sampled: 07/16/18 09:20
Percent Solids: 69
Initial Volume: 26.2
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1807384
ESS Laboratory Sample ID: 1807384-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.129)		8260B		1	07/19/18 12:58	C8G0342	CG81924
Ethylbenzene	ND (0.129)		8260B		1	07/19/18 12:58	C8G0342	CG81924
Toluene	ND (0.129)		8260B		1	07/19/18 12:58	C8G0342	CG81924
Xylene O	ND (0.129)		8260B		1	07/19/18 12:58	C8G0342	CG81924
Xylene P,M	ND (0.258)		8260B		1	07/19/18 12:58	C8G0342	CG81924
Xylenes (Total)	ND (0.258)		8260B		1	07/19/18 12:58		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*113 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*102 %*		*70-130*
Surrogate: Dibromofluoromethane	*110 %*		*70-130*
Surrogate: Toluene-d8	*109 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS613B
Date Sampled: 07/16/18 09:20
Percent Solids: 69
Initial Volume: 14.6
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1807384
ESS Laboratory Sample ID: 1807384-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: IBM
Prepared: 7/18/18 11:08

8270D Polynuclear Aromatic Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	ND (0.498)		8270D		1	07/19/18 12:01	C8G0330	CG81807
Acenaphthene	ND (0.498)		8270D		1	07/19/18 12:01	C8G0330	CG81807
Acenaphthylene	ND (0.498)		8270D		1	07/19/18 12:01	C8G0330	CG81807
Anthracene	ND (0.498)		8270D		1	07/19/18 12:01	C8G0330	CG81807
Benzo(a)anthracene	ND (0.498)		8270D		1	07/19/18 12:01	C8G0330	CG81807
Benzo(a)pyrene	ND (0.250)		8270D		1	07/19/18 12:01	C8G0330	CG81807
Benzo(b)fluoranthene	ND (0.498)		8270D		1	07/19/18 12:01	C8G0330	CG81807
Benzo(g,h,i)perylene	ND (0.498)		8270D		1	07/19/18 12:01	C8G0330	CG81807
Benzo(k)fluoranthene	ND (0.498)		8270D		1	07/19/18 12:01	C8G0330	CG81807
Chrysene	ND (0.250)		8270D		1	07/19/18 12:01	C8G0330	CG81807
Dibenzo(a,h)Anthracene	ND (0.250)		8270D		1	07/19/18 12:01	C8G0330	CG81807
Fluoranthene	ND (0.498)		8270D		1	07/19/18 12:01	C8G0330	CG81807
Fluorene	ND (0.498)		8270D		1	07/19/18 12:01	C8G0330	CG81807
Indeno(1,2,3-cd)Pyrene	ND (0.498)		8270D		1	07/19/18 12:01	C8G0330	CG81807
Naphthalene	ND (0.498)		8270D		1	07/19/18 12:01	C8G0330	CG81807
Phenanthrene	ND (0.498)		8270D		1	07/19/18 12:01	C8G0330	CG81807
Pyrene	ND (0.498)		8270D		1	07/19/18 12:01	C8G0330	CG81807

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichlorobenzene-d4	*73 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*74 %*		*30-130*
Surrogate: Nitrobenzene-d5	*82 %*		*30-130*
Surrogate: p-Terphenyl-d14	*76 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS613B
Date Sampled: 07/16/18 09:20
Percent Solids: 69

ESS Laboratory Work Order: 1807384
ESS Laboratory Sample ID: 1807384-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Cyanide (PAC)	ND (1.45)		MA PAC		1	EEM	07/20/18 11:55	mg/kg dry	CG82020
Total Cyanide	ND (1.35)		9014		1	EEM	07/19/18 14:10	mg/kg dry	CG81919

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS613B
Date Sampled: 07/16/18 09:20
Percent Solids: 69
Initial Volume: 25.5
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1807384
ESS Laboratory Sample ID: 1807384-02
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 7/17/18 17:25

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (21.4)		MADEP-EPH		1	SMR	07/19/18 0:12	C8G0334	CG81608
C19-C36 Aliphatics1	ND (21.4)		MADEP-EPH		1	SMR	07/19/18 0:12	C8G0334	CG81608
C11-C22 Unadjusted Aromatics1	ND (21.4)		EPH8270		1	VSC	07/19/18 9:24	C8G0308	CG81608
C11-C22 Aromatics1,2	ND (21.4)		EPH8270			VSC	07/19/18 9:24		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*74 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*108 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*94 %*		*40-140*
Surrogate: O-Terphenyl	*79 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS613B
Date Sampled: 07/16/18 09:20
Percent Solids: 69
Initial Volume: 26.5
Final Volume: 15
Extraction Method: 5030B
Column Type: Restek RTX-502.2 - 3µ film thickness 0.53mm X 105m

ESS Laboratory Work Order: 1807384
ESS Laboratory Sample ID: 1807384-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Trap Type: Supelco K Vocarb 3000 Trap

MADEP-VPH Volatile Petroleum Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
C9-C10 Aromatics	ND (12.8)		MA-VPH-2.1		1	07/19/18 15:48	C8G0319	CG81818
C5-C8 Aliphatics1,2	ND (13.4)		MA-VPH-2.1		1	07/19/18 15:48		[CALC]
C9-C12 Aliphatics2,3	ND (26.6)		MA-VPH-2.1		1	07/19/18 15:48		[CALC]
1:1 Methanol/Soil Ratio %D	**77** (N/A)		MA-VPH-2.1			07/19/18 7:40		CG81818
Preservative:	**MeOH - covered**		MA-VPH-2.1					CG81818

	%Recovery	Qualifier	Limits
Surrogate: 2,5-Dibromotoluene - FID	*79 %*		*70-130*
Surrogate: 2,5-Dibromotoluene - PID	*78 %*		*70-130*
Surrogate: Trifluorotoluene - FID	*99 %*		*70-130*
Surrogate: Trifluorotoluene - PID	*101 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS614
Date Sampled: 07/16/18 09:50
Percent Solids: 77
Initial Volume: 24.9
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1807384
ESS Laboratory Sample ID: 1807384-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.108)		8260B		1	07/19/18 13:24	C8G0342	CG81924
Ethylbenzene	ND (0.108)		8260B		1	07/19/18 13:24	C8G0342	CG81924
Toluene	ND (0.108)		8260B		1	07/19/18 13:24	C8G0342	CG81924
Xylene O	ND (0.108)		8260B		1	07/19/18 13:24	C8G0342	CG81924
Xylene P,M	ND (0.217)		8260B		1	07/19/18 13:24	C8G0342	CG81924
Xylenes (Total)	ND (0.217)		8260B		1	07/19/18 13:24		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*114 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*100 %*		*70-130*
Surrogate: Dibromofluoromethane	*109 %*		*70-130*
Surrogate: Toluene-d8	*107 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS614
Date Sampled: 07/16/18 09:50
Percent Solids: 77
Initial Volume: 15.1
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1807384
ESS Laboratory Sample ID: 1807384-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: IBM
Prepared: 7/18/18 11:08

8270D Polynuclear Aromatic Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	ND (0.430)		8270D		1	07/19/18 12:36	C8G0330	CG81807
Acenaphthene	ND (0.430)		8270D		1	07/19/18 12:36	C8G0330	CG81807
Acenaphthylene	ND (0.430)		8270D		1	07/19/18 12:36	C8G0330	CG81807
Anthracene	ND (0.430)		8270D		1	07/19/18 12:36	C8G0330	CG81807
Benzo(a)anthracene	ND (0.430)		8270D		1	07/19/18 12:36	C8G0330	CG81807
Benzo(a)pyrene	ND (0.216)		8270D		1	07/19/18 12:36	C8G0330	CG81807
Benzo(b)fluoranthene	ND (0.430)		8270D		1	07/19/18 12:36	C8G0330	CG81807
Benzo(g,h,i)perylene	ND (0.430)		8270D		1	07/19/18 12:36	C8G0330	CG81807
Benzo(k)fluoranthene	ND (0.430)		8270D		1	07/19/18 12:36	C8G0330	CG81807
Chrysene	ND (0.216)		8270D		1	07/19/18 12:36	C8G0330	CG81807
Dibenzo(a,h)Anthracene	ND (0.216)		8270D		1	07/19/18 12:36	C8G0330	CG81807
Fluoranthene	ND (0.430)		8270D		1	07/19/18 12:36	C8G0330	CG81807
Fluorene	ND (0.430)		8270D		1	07/19/18 12:36	C8G0330	CG81807
Indeno(1,2,3-cd)Pyrene	ND (0.430)		8270D		1	07/19/18 12:36	C8G0330	CG81807
Naphthalene	ND (0.430)		8270D		1	07/19/18 12:36	C8G0330	CG81807
Phenanthrene	ND (0.430)		8270D		1	07/19/18 12:36	C8G0330	CG81807
Pyrene	ND (0.430)		8270D		1	07/19/18 12:36	C8G0330	CG81807

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*79 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*83 %*		*30-130*
Surrogate: Nitrobenzene-d5	*91 %*		*30-130*
Surrogate: p-Terphenyl-d14	*80 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS614
Date Sampled: 07/16/18 09:50
Percent Solids: 77

ESS Laboratory Work Order: 1807384
ESS Laboratory Sample ID: 1807384-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Cyanide (PAC)	ND (1.29)		MA PAC		1	EEM	07/20/18 11:55	mg/kg dry	CG82020
Total Cyanide	ND (1.20)		9014		1	EEM	07/19/18 14:10	mg/kg dry	CG81919

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS614
Date Sampled: 07/16/18 09:50
Percent Solids: 77
Initial Volume: 24.2
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1807384
ESS Laboratory Sample ID: 1807384-03
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 7/17/18 17:25

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (20.2)		MADEP-EPH		1	SMR	07/19/18 0:59	C8G0334	CG81608
C19-C36 Aliphatics1	ND (20.2)		MADEP-EPH		1	SMR	07/19/18 0:59	C8G0334	CG81608
C11-C22 Unadjusted Aromatics1	ND (20.2)		EPH8270		1	VSC	07/18/18 23:39	C8G0308	CG81608
C11-C22 Aromatics1,2	ND (20.2)		EPH8270			VSC	07/18/18 23:39		[CALC]

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1-Chlorooctadecane	*78 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*103 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*96 %*		*40-140*
Surrogate: O-Terphenyl	*76 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS614
Date Sampled: 07/16/18 09:50
Percent Solids: 77
Initial Volume: 25
Final Volume: 15
Extraction Method: 5030B
Column Type: Restek RTX-502.2 - 3µ film thickness 0.53mm X 105m

ESS Laboratory Work Order: 1807384
ESS Laboratory Sample ID: 1807384-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Trap Type: Supelco K Vocarb 3000 Trap

MADEP-VPH Volatile Petroleum Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
C9-C10 Aromatics	ND (10.8)		MA-VPH-2.1		1	07/19/18 16:22	C8G0319	CG81818
C5-C8 Aliphatics1,2	ND (11.3)		MA-VPH-2.1		1	07/19/18 16:22		[CALC]
C9-C12 Aliphatics2,3	ND (22.5)		MA-VPH-2.1		1	07/19/18 16:22		[CALC]
1:1 Methanol/Soil Ratio %D	**67** (N/A)		MA-VPH-2.1			07/19/18 7:40		CG81818
Preservative:	**MeOH - covered**		MA-VPH-2.1					CG81818

	%Recovery	Qualifier	Limits
Surrogate: 2,5-Dibromotoluene - FID	*83 %*		*70-130*
Surrogate: 2,5-Dibromotoluene - PID	*81 %*		*70-130*
Surrogate: Trifluorotoluene - FID	*97 %*		*70-130*
Surrogate: Trifluorotoluene - PID	*99 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS616
Date Sampled: 07/16/18 11:05
Percent Solids: 61
Initial Volume: 19.4
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1807384
ESS Laboratory Sample ID: 1807384-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**0.274** (0.193)		8260B		1	07/19/18 15:10	C8G0342	CG81924
Ethylbenzene	**0.347** (0.193)		8260B		1	07/19/18 15:10	C8G0342	CG81924
Toluene	ND (0.193)		8260B		1	07/19/18 15:10	C8G0342	CG81924
Xylene O	ND (0.193)		8260B		1	07/19/18 15:10	C8G0342	CG81924
Xylene P,M	ND (0.386)		8260B		1	07/19/18 15:10	C8G0342	CG81924
Xylenes (Total)	ND (0.386)		8260B		1	07/19/18 15:10		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*69 %*	*SC*	*70-130*
Surrogate: 4-Bromofluorobenzene	*60 %*	*SC*	*70-130*
Surrogate: Dibromofluoromethane	*70 %*		*70-130*
Surrogate: Toluene-d8	*66 %*	*SC*	*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS616
Date Sampled: 07/16/18 11:05
Percent Solids: 61
Initial Volume: 14.5
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1807384
ESS Laboratory Sample ID: 1807384-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: IBM
Prepared: 7/18/18 11:08

8270D Polynuclear Aromatic Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	**22.2** (5.69)		8270D		10	07/20/18 12:17	C8G0330	CG81807
Acenaphthene	**110** (5.69)		8270D		10	07/20/18 12:17	C8G0330	CG81807
Acenaphthylene	**9.98** (0.569)		8270D		1	07/19/18 13:11	C8G0330	CG81807
Anthracene	**48.5** (5.69)		8270D		10	07/20/18 12:17	C8G0330	CG81807
Benzo(a)anthracene	**45.2** (5.69)		8270D		10	07/20/18 12:17	C8G0330	CG81807
Benzo(a)pyrene	**52.7** (2.85)		8270D		10	07/20/18 12:17	C8G0330	CG81807
Benzo(b)fluoranthene	**19.9** (5.69)		8270D		10	07/20/18 12:17	C8G0330	CG81807
Benzo(g,h,i)perylene	**36.5** (5.69)		8270D		10	07/20/18 12:17	C8G0330	CG81807
Benzo(k)fluoranthene	**34.3** (5.69)		8270D		10	07/20/18 12:17	C8G0330	CG81807
Chrysene	**35.4** (2.85)		8270D		10	07/20/18 12:17	C8G0330	CG81807
Dibenzo(a,h)Anthracene	**8.02** (2.85)		8270D		10	07/20/18 12:17	C8G0330	CG81807
Fluoranthene	**131** (5.69)		8270D		10	07/20/18 12:17	C8G0330	CG81807
Fluorene	**50.0** (5.69)		8270D		10	07/20/18 12:17	C8G0330	CG81807
Indeno(1,2,3-cd)Pyrene	**26.8** (5.69)		8270D		10	07/20/18 12:17	C8G0330	CG81807
Naphthalene	**58.4** (5.69)		8270D		10	07/20/18 12:17	C8G0330	CG81807
Phenanthrene	**270** (56.9)		8270D		100	07/20/18 10:35	C8G0330	CG81807
Pyrene	**202** (56.9)		8270D		100	07/20/18 10:35	C8G0330	CG81807

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*64 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*67 %*		*30-130*
Surrogate: Nitrobenzene-d5	*78 %*		*30-130*
Surrogate: p-Terphenyl-d14	*69 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS616
Date Sampled: 07/16/18 11:05
Percent Solids: 61

ESS Laboratory Work Order: 1807384
ESS Laboratory Sample ID: 1807384-04
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Cyanide (PAC)	ND (1.62)		MA PAC		1	EEM	07/20/18 11:55	mg/kg dry	CG82020
Total Cyanide	ND (1.54)		9014		1	EEM	07/19/18 14:10	mg/kg dry	CG81919

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS616
Date Sampled: 07/16/18 11:05
Percent Solids: 61
Initial Volume: 25.6
Final Volume: 2
Extraction Method: 3546

ESS Laboratory Work Order: 1807384
ESS Laboratory Sample ID: 1807384-04
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 7/17/18 17:25

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (48.4)		MADEP-EPH		1	SMR	07/19/18 1:47	C8G0334	CG81608
C19-C36 Aliphatics1	**162** (48.4)		MADEP-EPH		1	SMR	07/19/18 1:47	C8G0334	CG81608
C11-C22 Unadjusted Aromatics1	**968** (242)		EPH8270		5	ZLC	07/19/18 11:40	C8G0327	CG81608
C11-C22 Aromatics1,2	**404** (242)		EPH8270			ZLC	07/19/18 11:40		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*66 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*97 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*87 %*		*40-140*
Surrogate: O-Terphenyl	*80 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS616
Date Sampled: 07/16/18 11:05
Percent Solids: 61
Initial Volume: 19.5
Final Volume: 15
Extraction Method: 5030B
Column Type: Restek RTX-502.2 - 3µ film thickness 0.53mm X 105m

ESS Laboratory Work Order: 1807384
ESS Laboratory Sample ID: 1807384-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Trap Type: Supelco K Vocarb 3000 Trap

MADEP-VPH Volatile Petroleum Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
C9-C10 Aromatics	ND (19.2)		MA-VPH-2.1		1	07/19/18 19:08	C8G0319	CG81818
C5-C8 Aliphatics1,2	ND (20.1)		MA-VPH-2.1		1	07/19/18 19:08		[CALC]
C9-C12 Aliphatics2,3	ND (40.0)		MA-VPH-2.1		1	07/19/18 19:08		[CALC]
1:1 Methanol/Soil Ratio %D	**30** (N/A)		MA-VPH-2.1			07/24/18 15:34		CG81818
Preservative:	**MeOH - covered**		MA-VPH-2.1					CG81818

	%Recovery	Qualifier	Limits
Surrogate: 2,5-Dibromotoluene - FID	*107 %*		*70-130*
Surrogate: 2,5-Dibromotoluene - PID	*98 %*		*70-130*
Surrogate: Trifluorotoluene - FID	*54 %*	*SC*	*70-130*
Surrogate: Trifluorotoluene - PID	*55 %*	*SC*	*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS617
Date Sampled: 07/16/18 11:15
Percent Solids: 30
Initial Volume: 15.5
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1807384
ESS Laboratory Sample ID: 1807384-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**1.20** (0.562)		8260B		1	07/19/18 15:37	C8G0342	CG81924
Ethylbenzene	**4.40** (0.562)		8260B		1	07/19/18 15:37	C8G0342	CG81924
Toluene	ND (0.562)		8260B		1	07/19/18 15:37	C8G0342	CG81924
Xylene O	**0.708** (0.562)		8260B		1	07/19/18 15:37	C8G0342	CG81924
Xylene P,M	ND (1.12)		8260B		1	07/19/18 15:37	C8G0342	CG81924
Xylenes (Total)	ND (1.12)		8260B		1	07/19/18 15:37		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*84 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*79 %*		*70-130*
Surrogate: Dibromofluoromethane	*86 %*		*70-130*
Surrogate: Toluene-d8	*87 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS617
Date Sampled: 07/16/18 11:15
Percent Solids: 30
Initial Volume: 15.3
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1807384
ESS Laboratory Sample ID: 1807384-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: IBM
Prepared: 7/18/18 11:08

8270D Polynuclear Aromatic Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	**206** (22.0)		8270D		20	07/20/18 12:52	C8G0330	CG81807
Acenaphthene	**1230** (220)		8270D		200	07/20/18 11:09	C8G0330	CG81807
Acenaphthylene	**99.8** (22.0)		8270D		20	07/20/18 12:52	C8G0330	CG81807
Anthracene	**415** (22.0)		8270D		20	07/20/18 12:52	C8G0330	CG81807
Benzo(a)anthracene	**509** (22.0)		8270D		20	07/20/18 12:52	C8G0330	CG81807
Benzo(a)pyrene	**649** (110)		8270D		200	07/20/18 11:09	C8G0330	CG81807
Benzo(b)fluoranthene	**317** (22.0)		8270D		20	07/20/18 12:52	C8G0330	CG81807
Benzo(g,h,i)perylene	**406** (22.0)		8270D		20	07/20/18 12:52	C8G0330	CG81807
Benzo(k)fluoranthene	**258** (22.0)		8270D		20	07/20/18 12:52	C8G0330	CG81807
Chrysene	**342** (11.0)		8270D		20	07/20/18 12:52	C8G0330	CG81807
Dibenzo(a,h)Anthracene	**96.0** (11.0)		8270D		20	07/20/18 12:52	C8G0330	CG81807
Fluoranthene	**1500** (220)		8270D		200	07/20/18 11:09	C8G0330	CG81807
Fluorene	**522** (22.0)		8270D		20	07/20/18 12:52	C8G0330	CG81807
Indeno(1,2,3-cd)Pyrene	**304** (22.0)		8270D		20	07/20/18 12:52	C8G0330	CG81807
Naphthalene	**475** (22.0)		8270D		20	07/20/18 12:52	C8G0330	CG81807
Phenanthrene	**2940** (220)		8270D		200	07/20/18 11:09	C8G0330	CG81807
Pyrene	**2380** (220)		8270D		200	07/20/18 11:09	C8G0330	CG81807

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*45 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*46 %*		*30-130*
Surrogate: Nitrobenzene-d5	*56 %*		*30-130*
Surrogate: p-Terphenyl-d14	*45 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS617
Date Sampled: 07/16/18 11:15
Percent Solids: 30

ESS Laboratory Work Order: 1807384
ESS Laboratory Sample ID: 1807384-05
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Cyanide (PAC)	ND (3.20)		MA PAC		1	EEM	07/20/18 11:55	mg/kg dry	CG82020
Total Cyanide	ND (3.31)		9014		1	EEM	07/19/18 14:10	mg/kg dry	CG81919

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS617
Date Sampled: 07/16/18 11:15
Percent Solids: 30
Initial Volume: 24.2
Final Volume: 2
Extraction Method: 3546

ESS Laboratory Work Order: 1807384
ESS Laboratory Sample ID: 1807384-05
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 7/17/18 17:25

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	**205** (104)		MADEP-EPH		1	SMR	07/19/18 2:35	C8G0334	CG81608
C19-C36 Aliphatics1	**724** (104)		MADEP-EPH		1	SMR	07/19/18 2:35	C8G0334	CG81608
C11-C22 Unadjusted Aromatics1	**5010** (522)		EPH8270		5	ZLC	07/19/18 13:49	C8G0327	CG81608
C11-C22 Aromatics1,2	**2310** (522)		EPH8270			ZLC	07/19/18 13:49		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*58 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*109 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*116 %*		*40-140*
Surrogate: O-Terphenyl	*74 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS617
Date Sampled: 07/16/18 11:15
Percent Solids: 30
Initial Volume: 17.3
Final Volume: 15
Extraction Method: 5030B
Column Type: Restek RTX-502.2 - 3µ film thickness 0.53mm X 105m

ESS Laboratory Work Order: 1807384
ESS Laboratory Sample ID: 1807384-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Trap Type: Supelco K Vocarb 3000 Trap

MADEP-VPH Volatile Petroleum Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
C9-C10 Aromatics	**120** (52.8)		MA-VPH-2.1		1	07/19/18 19:41	C8G0319	CG81818
C5-C8 Aliphatics1,2	ND (55.2)		MA-VPH-2.1		1	07/19/18 19:41		[CALC]
C9-C12 Aliphatics2,3	ND (110)		MA-VPH-2.1		1	07/19/18 19:41		[CALC]
1:1 Methanol/Soil Ratio %D	**15** (N/A)		MA-VPH-2.1			07/24/18 15:34		CG81818
Preservative:	**MeOH - covered**		MA-VPH-2.1					CG81818

	%Recovery	Qualifier	Limits
Surrogate: 2,5-Dibromotoluene - FID	*84 %*		*70-130*
Surrogate: 2,5-Dibromotoluene - PID	*84 %*		*70-130*
Surrogate: Trifluorotoluene - FID	*69 %*	*SC*	*70-130*
Surrogate: Trifluorotoluene - PID	*70 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS618
Date Sampled: 07/16/18 11:25
Percent Solids: 25
Initial Volume: 17.7
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1807384
ESS Laboratory Sample ID: 1807384-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.627)		8260B		1	07/19/18 13:51	C8G0342	CG81924
Ethylbenzene	ND (0.627)		8260B		1	07/19/18 13:51	C8G0342	CG81924
Toluene	ND (0.627)		8260B		1	07/19/18 13:51	C8G0342	CG81924
Xylene O	ND (0.627)		8260B		1	07/19/18 13:51	C8G0342	CG81924
Xylene P,M	ND (1.25)		8260B		1	07/19/18 13:51	C8G0342	CG81924
Xylenes (Total)	ND (1.25)		8260B		1	07/19/18 13:51		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*105 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*68 %*	*SC*	*70-130*
Surrogate: Dibromofluoromethane	*99 %*		*70-130*
Surrogate: Toluene-d8	*79 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS618
Date Sampled: 07/16/18 11:25
Percent Solids: 25
Initial Volume: 15.7
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1807384
ESS Laboratory Sample ID: 1807384-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: IBM
Prepared: 7/18/18 11:08

8270D Polynuclear Aromatic Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	ND (1.25)		8270D		1	07/19/18 13:45	C8G0330	CG81807
Acenaphthene	**15.1** (1.25)		8270D		1	07/19/18 13:45	C8G0330	CG81807
Acenaphthylene	**2.18** (1.25)		8270D		1	07/19/18 13:45	C8G0330	CG81807
Anthracene	**15.3** (1.25)		8270D		1	07/19/18 13:45	C8G0330	CG81807
Benzo(a)anthracene	**14.7** (1.25)		8270D		1	07/19/18 13:45	C8G0330	CG81807
Benzo(a)pyrene	**14.5** (0.627)		8270D		1	07/19/18 13:45	C8G0330	CG81807
Benzo(b)fluoranthene	**11.6** (1.25)		8270D		1	07/19/18 13:45	C8G0330	CG81807
Benzo(g,h,i)perylene	**11.0** (1.25)		8270D		1	07/19/18 13:45	C8G0330	CG81807
Benzo(k)fluoranthene	**4.27** (1.25)		8270D		1	07/19/18 13:45	C8G0330	CG81807
Chrysene	**12.1** (0.627)		8270D		1	07/19/18 13:45	C8G0330	CG81807
Dibenzo(a,h)Anthracene	**3.12** (0.627)		8270D		1	07/19/18 13:45	C8G0330	CG81807
Fluoranthene	**51.0** (12.5)		8270D		10	07/20/18 11:43	C8G0330	CG81807
Fluorene	**11.3** (1.25)		8270D		1	07/19/18 13:45	C8G0330	CG81807
Indeno(1,2,3-cd)Pyrene	**7.91** (1.25)		8270D		1	07/19/18 13:45	C8G0330	CG81807
Naphthalene	**2.12** (1.25)		8270D		1	07/19/18 13:45	C8G0330	CG81807
Phenanthrene	**69.6** (12.5)		8270D		10	07/20/18 11:43	C8G0330	CG81807
Pyrene	**81.6** (12.5)		8270D		10	07/20/18 11:43	C8G0330	CG81807

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*71 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*79 %*		*30-130*
Surrogate: Nitrobenzene-d5	*87 %*		*30-130*
Surrogate: p-Terphenyl-d14	*76 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS618
Date Sampled: 07/16/18 11:25
Percent Solids: 25

ESS Laboratory Work Order: 1807384
ESS Laboratory Sample ID: 1807384-06
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Cyanide (PAC)	ND (3.86)		MA PAC		1	EEM	07/20/18 11:55	mg/kg dry	CG82020
Total Cyanide	ND (3.60)		9014		1	EEM	07/19/18 14:10	mg/kg dry	CG81919

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS618
Date Sampled: 07/16/18 11:25
Percent Solids: 25
Initial Volume: 25.2
Final Volume: 2
Extraction Method: 3546

ESS Laboratory Work Order: 1807384
ESS Laboratory Sample ID: 1807384-06
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 7/17/18 17:25

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	**328** (117)		MADEP-EPH		1	SMR	07/19/18 3:23	C8G0334	CG81608
C19-C36 Aliphatics1	**1180** (117)		MADEP-EPH		1	SMR	07/19/18 3:23	C8G0334	CG81608
C11-C22 Unadjusted Aromatics1	**1700** (585)		EPH8270		5	ZLC	07/19/18 15:36	C8G0327	CG81608
C11-C22 Aromatics1,2	**1200** (585)		EPH8270			ZLC	07/19/18 15:36		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*67 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*112 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*108 %*		*40-140*
Surrogate: O-Terphenyl	*89 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS618
Date Sampled: 07/16/18 11:25
Percent Solids: 25
Initial Volume: 15.4
Final Volume: 15
Extraction Method: 5030B
Column Type: Restek RTX-502.2 - 3µ film thickness 0.53mm X 105m

ESS Laboratory Work Order: 1807384
ESS Laboratory Sample ID: 1807384-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Trap Type: Supelco K Vocarb 3000 Trap

MADEP-VPH Volatile Petroleum Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
C9-C10 Aromatics	ND (67.6)		MA-VPH-2.1		1	07/19/18 18:34	C8G0319	CG81818
C5-C8 Aliphatics1,2	ND (70.7)		MA-VPH-2.1		1	07/19/18 18:34		[CALC]
C9-C12 Aliphatics2,3	ND (141)		MA-VPH-2.1		1	07/19/18 18:34		[CALC]
1:1 Methanol/Soil Ratio %D	**3** (N/A)		MA-VPH-2.1			07/24/18 15:34		CG81818
Preservative:	**MeOH - covered**		MA-VPH-2.1					CG81818

	%Recovery	Qualifier	Limits
Surrogate: 2,5-Dibromotoluene - FID	*77 %*		*70-130*
Surrogate: 2,5-Dibromotoluene - PID	*77 %*		*70-130*
Surrogate: Trifluorotoluene - FID	*55 %*	*SC*	*70-130*
Surrogate: Trifluorotoluene - PID	*57 %*	*SC*	*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1807384

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch CG81924 - 5035										
Blank										
Benzene	ND	0.100	mg/kg wet							
Ethylbenzene	ND	0.100	mg/kg wet							
Toluene	ND	0.100	mg/kg wet							
Xylene O	ND	0.100	mg/kg wet							
Xylene P,M	ND	0.200	mg/kg wet							
Xylenes (Total)	ND	0.200	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*5.23*		mg/kg wet	*5.000*		*105*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*4.94*		mg/kg wet	*5.000*		*99*	*70-130*			
Surrogate: Dibromofluoromethane	*4.82*		mg/kg wet	*5.000*		*96*	*70-130*			
Surrogate: Toluene-d8	*4.93*		mg/kg wet	*5.000*		*99*	*70-130*			
LCS										
Benzene	1.92	0.100	mg/kg wet	2.000		96	70-130			
Ethylbenzene	1.92	0.100	mg/kg wet	2.000		96	70-130			
Toluene	1.99	0.100	mg/kg wet	2.000		100	70-130			
Xylene O	1.96	0.100	mg/kg wet	2.000		98	70-130			
Xylene P,M	4.06	0.200	mg/kg wet	4.000		101	70-130			
Xylenes (Total)	6.02	0.200	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*4.68*		mg/kg wet	*5.000*		*94*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*4.87*		mg/kg wet	*5.000*		*97*	*70-130*			
Surrogate: Dibromofluoromethane	*4.70*		mg/kg wet	*5.000*		*94*	*70-130*			
Surrogate: Toluene-d8	*4.74*		mg/kg wet	*5.000*		*95*	*70-130*			
LCS Dup										
Benzene	1.99	0.100	mg/kg wet	2.000		100	70-130	4	25	
Ethylbenzene	2.02	0.100	mg/kg wet	2.000		101	70-130	5	25	
Toluene	1.89	0.100	mg/kg wet	2.000		95	70-130	5	25	
Xylene O	2.06	0.100	mg/kg wet	2.000		103	70-130	5	25	
Xylene P,M	4.28	0.200	mg/kg wet	4.000		107	70-130	5	25	
Xylenes (Total)	6.34	0.200	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*4.85*		mg/kg wet	*5.000*		*97*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*5.12*		mg/kg wet	*5.000*		*102*	*70-130*			
Surrogate: Dibromofluoromethane	*4.73*		mg/kg wet	*5.000*		*95*	*70-130*			
Surrogate: Toluene-d8	*5.06*		mg/kg wet	*5.000*		*101*	*70-130*			
8270D Polynuclear Aromatic Hydrocarbons										
Batch CG81807 - 3546										
Blank										
2-Methylnaphthalene	ND	0.333	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Benzo(a)anthracene	ND	0.333	mg/kg wet							
Benzo(a)pyrene	ND	0.167	mg/kg wet							
Benzo(b)fluoranthene	ND	0.333	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1807384

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Polynuclear Aromatic Hydrocarbons										
Batch CG81807 - 3546										
Benzo(g,h,i)perylene	ND	0.333	mg/kg wet							
Benzo(k)fluoranthene	ND	0.333	mg/kg wet							
Chrysene	ND	0.167	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.167	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.333	mg/kg wet							
Naphthalene	ND	0.333	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	*2.15*		mg/kg wet	*3.333*		*65*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.32*		mg/kg wet	*3.333*		*69*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.31*		mg/kg wet	*3.333*		*69*	*30-130*			
Surrogate: p-Terphenyl-d14	*3.12*		mg/kg wet	*3.333*		*94*	*30-130*			
LCS										
2-Methylnaphthalene	1.81	0.333	mg/kg wet	3.333		54	40-140			
Acenaphthene	2.03	0.333	mg/kg wet	3.333		61	40-140			
Acenaphthylene	1.95	0.333	mg/kg wet	3.333		59	40-140			
Anthracene	2.28	0.333	mg/kg wet	3.333		68	40-140			
Benzo(a)anthracene	2.23	0.333	mg/kg wet	3.333		67	40-140			
Benzo(a)pyrene	2.31	0.167	mg/kg wet	3.333		69	40-140			
Benzo(b)fluoranthene	2.10	0.333	mg/kg wet	3.333		63	40-140			
Benzo(g,h,i)perylene	2.52	0.333	mg/kg wet	3.333		75	40-140			
Benzo(k)fluoranthene	2.61	0.333	mg/kg wet	3.333		78	40-140			
Chrysene	2.31	0.167	mg/kg wet	3.333		69	40-140			
Dibenzo(a,h)Anthracene	2.50	0.167	mg/kg wet	3.333		75	40-140			
Fluoranthene	2.18	0.333	mg/kg wet	3.333		65	40-140			
Fluorene	2.00	0.333	mg/kg wet	3.333		60	40-140			
Indeno(1,2,3-cd)Pyrene	2.50	0.333	mg/kg wet	3.333		75	40-140			
Naphthalene	1.99	0.333	mg/kg wet	3.333		60	40-140			
Phenanthrene	2.26	0.333	mg/kg wet	3.333		68	40-140			
Pyrene	2.49	0.333	mg/kg wet	3.333		75	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	*2.09*		mg/kg wet	*3.333*		*63*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.48*		mg/kg wet	*3.333*		*75*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.30*		mg/kg wet	*3.333*		*69*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.84*		mg/kg wet	*3.333*		*85*	*30-130*			
LCS Dup										
2-Methylnaphthalene	1.63	0.333	mg/kg wet	3.333		49	40-140	10	30	
Acenaphthene	1.86	0.333	mg/kg wet	3.333		56	40-140	9	30	
Acenaphthylene	1.77	0.333	mg/kg wet	3.333		53	40-140	10	30	
Anthracene	2.20	0.333	mg/kg wet	3.333		66	40-140	4	30	
Benzo(a)anthracene	2.27	0.333	mg/kg wet	3.333		68	40-140	2	30	
Benzo(a)pyrene	2.32	0.167	mg/kg wet	3.333		70	40-140	0.6	30	
Benzo(b)fluoranthene	2.16	0.333	mg/kg wet	3.333		65	40-140	3	30	
Benzo(g,h,i)perylene	2.54	0.333	mg/kg wet	3.333		76	40-140	1	30	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1807384

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Polynuclear Aromatic Hydrocarbons										
Batch CG81807 - 3546										
Benzo(k)fluoranthene	2.54	0.333	mg/kg wet	3.333		76	40-140	3	30	
Chrysene	2.34	0.167	mg/kg wet	3.333		70	40-140	2	30	
Dibenzo(a,h)Anthracene	2.51	0.167	mg/kg wet	3.333		75	40-140	0.4	30	
Fluoranthene	2.12	0.333	mg/kg wet	3.333		64	40-140	3	30	
Fluorene	1.85	0.333	mg/kg wet	3.333		56	40-140	8	30	
Indeno(1,2,3-cd)Pyrene	2.53	0.333	mg/kg wet	3.333		76	40-140	1	30	
Naphthalene	1.82	0.333	mg/kg wet	3.333		55	40-140	9	30	
Phenanthrene	2.17	0.333	mg/kg wet	3.333		65	40-140	4	30	
Pyrene	2.50	0.333	mg/kg wet	3.333		75	40-140	0.5	30	
Surrogate: 1,2-Dichlorobenzene-d4	*1.85*		mg/kg wet	*3.333*		*56*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.20*		mg/kg wet	*3.333*		*66*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.06*		mg/kg wet	*3.333*		*62*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.76*		mg/kg wet	*3.333*		*83*	*30-130*			
Classical Chemistry										
Batch CG81919 - TCN Prep										
Blank										
Total Cyanide	ND	1.00	mg/kg wet							
LCS										
Total Cyanide	4.91	1.00	mg/kg wet	5.015		98	90-110			
Reference										
Total Cyanide	49.6	4.93	mg/kg wet	48.40		102	36.1577-206.612			
Reference										
Total Cyanide	49.8	4.90	mg/kg wet	48.40		103	36.1577-206.612			
Batch CG82020 - TCN Prep										
Blank										
Cyanide (PAC)	ND	1.00	mg/kg wet							
LCS										
Cyanide (PAC)	5.03	1.00	mg/kg wet	5.015		100	80-120			
LCS										
Cyanide (PAC)	19.9	1.00	mg/kg wet	20.06		99	80-120			
LCS Dup										
Cyanide (PAC)	20.0	1.00	mg/kg wet	20.06		99	80-120	0.3	20	
Reference										
Cyanide (PAC)	3.02	1.00	mg/kg wet	70.85		4	0-10			
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch CG81608 - 3546										
Blank										
C19-C36 Aliphatics1	ND	15.0	mg/kg wet							
C9-C18 Aliphatics1	ND	15.0	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1807384

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch CG81608 - 3546										
Decane (C10)	ND	0.5	mg/kg wet							
Docosane (C22)	ND	0.5	mg/kg wet							
Dodecane (C12)	ND	0.5	mg/kg wet							
Eicosane (C20)	ND	0.5	mg/kg wet							
Hexacosane (C26)	ND	0.5	mg/kg wet							
Hexadecane (C16)	ND	0.5	mg/kg wet							
Hexatriacontane (C36)	ND	0.5	mg/kg wet							
Nonadecane (C19)	ND	0.5	mg/kg wet							
Nonane (C9)	ND	0.5	mg/kg wet							
Octacosane (C28)	ND	0.5	mg/kg wet							
Octadecane (C18)	ND	0.5	mg/kg wet							
Tetracosane (C24)	ND	0.5	mg/kg wet							
Tetradecane (C14)	ND	0.5	mg/kg wet							
Triacontane (C30)	ND	0.5	mg/kg wet							
Surrogate: 1-Chlorooctadecane	*1.65*		mg/kg wet	*2.000*		*83*	*40-140*			
Blank										
2-Methylnaphthalene	ND	0.20	mg/kg wet							
Acenaphthene	ND	0.40	mg/kg wet							
Acenaphthylene	ND	0.20	mg/kg wet							
Anthracene	ND	0.40	mg/kg wet							
Benzo(a)anthracene	ND	0.40	mg/kg wet							
Benzo(a)pyrene	ND	0.40	mg/kg wet							
Benzo(b)fluoranthene	ND	0.40	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.40	mg/kg wet							
Benzo(k)fluoranthene	ND	0.40	mg/kg wet							
C11-C22 Aromatics1,2	ND	15.0	mg/kg wet							
C11-C22 Unadjusted Aromatics1	ND	15.0	mg/kg wet							
Chrysene	ND	0.40	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.20	mg/kg wet							
Fluoranthene	ND	0.40	mg/kg wet							
Fluorene	ND	0.40	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.40	mg/kg wet							
Naphthalene	ND	0.40	mg/kg wet							
Phenanthrene	ND	0.40	mg/kg wet							
Pyrene	ND	0.40	mg/kg wet							
Surrogate: 2-Bromonaphthalene	*1.92*		mg/kg wet	*2.000*		*96*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*1.74*		mg/kg wet	*2.000*		*87*	*40-140*			
Surrogate: O-Terphenyl	*1.67*		mg/kg wet	*2.000*		*84*	*40-140*			
LCS										
C19-C36 Aliphatics1	15.7	15.0	mg/kg wet	16.00		98	40-140			
C9-C18 Aliphatics1	8.8	15.0	mg/kg wet	12.00		73	40-140			
Decane (C10)	1.0	0.5	mg/kg wet	2.000		52	40-140			
Docosane (C22)	1.7	0.5	mg/kg wet	2.000		83	40-140			
Dodecane (C12)	1.0	0.5	mg/kg wet	2.000		49	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1807384

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch CG81608 - 3546										
Eicosane (C20)	1.6	0.5	mg/kg wet	2.000		81	40-140			
Hexacosane (C26)	1.6	0.5	mg/kg wet	2.000		81	40-140			
Hexadecane (C16)	1.5	0.5	mg/kg wet	2.000		77	40-140			
Hexatriacontane (C36)	1.5	0.5	mg/kg wet	2.000		77	40-140			
Nonadecane (C19)	1.6	0.5	mg/kg wet	2.000		82	40-140			
Nonane (C9)	0.9	0.5	mg/kg wet	2.000		43	30-140			
Octacosane (C28)	1.6	0.5	mg/kg wet	2.000		80	40-140			
Octadecane (C18)	1.6	0.5	mg/kg wet	2.000		79	40-140			
Tetracosane (C24)	1.7	0.5	mg/kg wet	2.000		83	40-140			
Tetradecane (C14)	1.3	0.5	mg/kg wet	2.000		65	40-140			
Triacontane (C30)	1.6	0.5	mg/kg wet	2.000		79	40-140			
Surrogate: 1-Chlorooctadecane	*1.65*		mg/kg wet	*2.000*		*83*	*40-140*			
LCS										
2-Methylnaphthalene	1.41	0.20	mg/kg wet	2.000		70	40-140			
Acenaphthene	1.44	0.40	mg/kg wet	2.000		72	40-140			
Acenaphthylene	1.52	0.20	mg/kg wet	2.000		76	40-140			
Anthracene	1.69	0.40	mg/kg wet	2.000		84	40-140			
Benzo(a)anthracene	1.76	0.40	mg/kg wet	2.000		88	40-140			
Benzo(a)pyrene	1.61	0.40	mg/kg wet	2.000		80	40-140			
Benzo(b)fluoranthene	1.68	0.40	mg/kg wet	2.000		84	40-140			
Benzo(g,h,i)perylene	1.44	0.40	mg/kg wet	2.000		72	40-140			
Benzo(k)fluoranthene	1.76	0.40	mg/kg wet	2.000		88	40-140			
C11-C22 Aromatics1,2	ND	15.0	mg/kg wet							
C11-C22 Unadjusted Aromatics1	31.6	15.0	mg/kg wet	34.00		93	40-140			
Chrysene	1.71	0.40	mg/kg wet	2.000		86	40-140			
Dibenzo(a,h)Anthracene	1.52	0.20	mg/kg wet	2.000		76	40-140			
Fluoranthene	1.62	0.40	mg/kg wet	2.000		81	40-140			
Fluorene	1.57	0.40	mg/kg wet	2.000		79	40-140			
Indeno(1,2,3-cd)Pyrene	1.47	0.40	mg/kg wet	2.000		73	40-140			
Naphthalene	1.30	0.40	mg/kg wet	2.000		65	40-140			
Phenanthrene	1.60	0.40	mg/kg wet	2.000		80	40-140			
Pyrene	1.60	0.40	mg/kg wet	2.000		80	40-140			
Surrogate: 2-Bromonaphthalene	*1.96*		mg/kg wet	*2.000*		*98*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*1.77*		mg/kg wet	*2.000*		*88*	*40-140*			
Surrogate: O-Terphenyl	*1.68*		mg/kg wet	*2.000*		*84*	*40-140*			
LCS										
2-Methylnaphthalene Breakthrough	0.0		%				0-5			
Naphthalene Breakthrough	0.0		%				0-5			
LCS Dup										
C19-C36 Aliphatics1	15.9	15.0	mg/kg wet	16.00		100	40-140	1	25	
C9-C18 Aliphatics1	8.5	15.0	mg/kg wet	12.00		71	40-140	3	25	
Decane (C10)	1.0	0.5	mg/kg wet	2.000		49	40-140	7	25	
Docosane (C22)	1.7	0.5	mg/kg wet	2.000		83	40-140	0.6	25	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1807384

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch CG81608 - 3546										
Dodecane (C12)	0.9	0.5	mg/kg wet	2.000		46	40-140	8	25	
Eicosane (C20)	1.6	0.5	mg/kg wet	2.000		81	40-140	0.3	25	
Hexacosane (C26)	1.6	0.5	mg/kg wet	2.000		81	40-140	0.1	25	
Hexadecane (C16)	1.5	0.5	mg/kg wet	2.000		74	40-140	4	25	
Hexatriacontane (C36)	1.5	0.5	mg/kg wet	2.000		77	40-140	0.3	25	
Nonadecane (C19)	1.6	0.5	mg/kg wet	2.000		82	40-140	0.3	25	
Nonane (C9)	0.8	0.5	mg/kg wet	2.000		40	30-140	6	25	
Octacosane (C28)	1.6	0.5	mg/kg wet	2.000		81	40-140	0.4	25	
Octadecane (C18)	1.6	0.5	mg/kg wet	2.000		79	40-140	0.4	25	
Tetracosane (C24)	1.7	0.5	mg/kg wet	2.000		83	40-140	0.3	25	
Tetradecane (C14)	1.2	0.5	mg/kg wet	2.000		58	40-140	10	25	
Triacontane (C30)	1.6	0.5	mg/kg wet	2.000		79	40-140	0.2	25	
Surrogate: 1-Chlorooctadecane	*1.66*		mg/kg wet	*2.000*		*83*	*40-140*			
LCS Dup										
2-Methylnaphthalene	1.33	0.20	mg/kg wet	2.000		66	40-140	6	30	
Acenaphthene	1.34	0.40	mg/kg wet	2.000		67	40-140	8	30	
Acenaphthylene	1.41	0.20	mg/kg wet	2.000		71	40-140	7	30	
Anthracene	1.60	0.40	mg/kg wet	2.000		80	40-140	6	30	
Benzo(a)anthracene	1.62	0.40	mg/kg wet	2.000		81	40-140	8	30	
Benzo(a)pyrene	1.59	0.40	mg/kg wet	2.000		79	40-140	1	30	
Benzo(b)fluoranthene	1.59	0.40	mg/kg wet	2.000		80	40-140	5	30	
Benzo(g,h,i)perylene	1.35	0.40	mg/kg wet	2.000		68	40-140	6	30	
Benzo(k)fluoranthene	1.72	0.40	mg/kg wet	2.000		86	40-140	2	30	
C11-C22 Aromatics1,2	ND	15.0	mg/kg wet							
C11-C22 Unadjusted Aromatics1	27.6	15.0	mg/kg wet	34.00		81	40-140	13	25	
Chrysene	1.60	0.40	mg/kg wet	2.000		80	40-140	7	30	
Dibenzo(a,h)Anthracene	1.52	0.20	mg/kg wet	2.000		76	40-140	0.1	30	
Fluoranthene	1.54	0.40	mg/kg wet	2.000		77	40-140	5	30	
Fluorene	1.46	0.40	mg/kg wet	2.000		73	40-140	8	30	
Indeno(1,2,3-cd)Pyrene	1.52	0.40	mg/kg wet	2.000		76	40-140	3	30	
Naphthalene	1.22	0.40	mg/kg wet	2.000		61	40-140	7	30	
Phenanthrene	1.41	0.40	mg/kg wet	2.000		71	40-140	12	30	
Pyrene	1.46	0.40	mg/kg wet	2.000		73	40-140	9	30	
Surrogate: 2-Bromonaphthalene	*1.89*		mg/kg wet	*2.000*		*95*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*1.75*		mg/kg wet	*2.000*		*87*	*40-140*			
Surrogate: O-Terphenyl	*1.58*		mg/kg wet	*2.000*		*79*	*40-140*			
LCS Dup										
2-Methylnaphthalene Breakthrough	0.0		%				0-5		200	
Naphthalene Breakthrough	0.0		%				0-5		200	
MADEP-VPH Volatile Petroleum Hydrocarbon										
Batch CG81818 - 5030B										
Blank										

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1807384

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-VPH Volatile Petroleum Hydrocarbon										
Batch CG81818 - 5030B										
1,2,4-Trimethylbenzene	ND	0.2	mg/kg wet							
2,2,4-Trimethylpentane	ND	5.0	mg/kg wet							
2-Methylpentane	ND	5.0	mg/kg wet							
Benzene	ND	0.2	mg/kg wet							
C5-C8 Aliphatics1,2	ND	10.4	mg/kg wet							
C5-C8 Unadjusted Aliphatics	ND	10.0	mg/kg wet							
C9-C10 Aromatics	ND	10.0	mg/kg wet							
C9-C12 Aliphatics2,3	ND	20.8	mg/kg wet							
C9-C12 Unadjusted Aliphatics	ND	10.0	mg/kg wet							
Ethylbenzene	ND	0.2	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.05	mg/kg wet							
Naphthalene	ND	0.2	mg/kg wet							
n-Butylcyclohexane	ND	5.0	mg/kg wet							
n-Decane	ND	5.0	mg/kg wet							
Nonane (C9)	ND	5.0	mg/kg wet							
Pentane	ND	5.0	mg/kg wet							
Toluene	ND	0.2	mg/kg wet							
Xylene O	ND	0.2	mg/kg wet							
Xylene P,M	ND	0.4	mg/kg wet							
Surrogate: 2,5-Dibromotoluene - FID	*4020*		ug/L	*5000*		*80*	*70-130*			
Surrogate: 2,5-Dibromotoluene - PID	*3970*		ug/L	*5000*		*79*	*70-130*			
Surrogate: Trifluorotoluene - FID	*4.43*		mg/kg wet	*5.333*		*83*	*70-130*			
Surrogate: Trifluorotoluene - PID	*4.52*		mg/kg wet	*5.333*		*85*	*70-130*			
LCS										
1,2,4-Trimethylbenzene	8.9	0.2	mg/kg wet	10.00		89	70-130			
2,2,4-Trimethylpentane	15.9	5.0	mg/kg wet	15.00		106	70-130			
2-Methylpentane	17.2	5.0	mg/kg wet	15.00		115	70-130			
Benzene	5.1	0.2	mg/kg wet	5.000		102	70-130			
C5-C8 Aliphatics1,2	10.3	10.4	mg/kg wet							
C5-C8 Unadjusted Aliphatics	46.6	10.0	mg/kg wet	40.00		117	70-130			
C9-C10 Aromatics	9.0	10.0	mg/kg wet	10.00		90	70-130			
C9-C12 Aliphatics2,3	ND	20.8	mg/kg wet							
C9-C12 Unadjusted Aliphatics	25.5	10.0	mg/kg wet	30.00		85	70-130			
Ethylbenzene	5.0	0.2	mg/kg wet	5.000		100	70-130			
Methyl tert-Butyl Ether	15.8	0.05	mg/kg wet	15.00		105	70-130			
Naphthalene	7.3	0.2	mg/kg wet	10.00		73	70-130			
n-Butylcyclohexane	8.3	5.0	mg/kg wet	10.00		83	70-130			
n-Decane	9.6	5.0	mg/kg wet	10.00		96	70-130			
Nonane (C9)	8.5	5.0	mg/kg wet	10.00		85	30-130			
Pentane	12.9	5.0	mg/kg wet	10.00		129	70-130			
Toluene	15.5	0.2	mg/kg wet	15.00		103	70-130			
Xylene O	9.4	0.2	mg/kg wet	10.00		94	70-130			
Xylene P,M	19.4	0.4	mg/kg wet	20.00		97	70-130			
Surrogate: 2,5-Dibromotoluene - FID	*4260*		ug/L	*5000*		*85*	*70-130*			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1807384

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-VPH Volatile Petroleum Hydrocarbon										
Batch CG81818 - 5030B										
Surrogate: 2,5-Dibromotoluene - PID	*4270*		ug/L	*5000*		*85*	*70-130*			
Surrogate: Trifluorotoluene - FID	*4.64*		mg/kg wet	*5.333*		*87*	*70-130*			
Surrogate: Trifluorotoluene - PID	*4.77*		mg/kg wet	*5.333*		*89*	*70-130*			
LCS Dup										
1,2,4-Trimethylbenzene	8.7	0.2	mg/kg wet	10.00		87	70-130	2	25	
2,2,4-Trimethylpentane	14.4	5.0	mg/kg wet	15.00		96	70-130	10	25	
2-Methylpentane	15.7	5.0	mg/kg wet	15.00		104	70-130	9	25	
Benzene	5.0	0.2	mg/kg wet	5.000		100	70-130	2	25	
C5-C8 Aliphatics1,2	6.30	10.4	mg/kg wet							
C5-C8 Unadjusted Aliphatics	42.4	10.0	mg/kg wet	40.00		106	70-130	10	25	
C9-C10 Aromatics	8.7	10.0	mg/kg wet	10.00		87	70-130	2	25	
C9-C12 Aliphatics2,3	ND	20.8	mg/kg wet							
C9-C12 Unadjusted Aliphatics	24.6	10.0	mg/kg wet	30.00		82	70-130	4	25	
Ethylbenzene	4.8	0.2	mg/kg wet	5.000		97	70-130	3	25	
Methyl tert-Butyl Ether	16.0	0.05	mg/kg wet	15.00		107	70-130	2	25	
Naphthalene	7.4	0.2	mg/kg wet	10.00		74	70-130	2	25	
n-Butylcyclohexane	8.0	5.0	mg/kg wet	10.00		80	70-130	4	25	
n-Decane	9.5	5.0	mg/kg wet	10.00		95	70-130	2	25	
Nonane (C9)	9.1	5.0	mg/kg wet	10.00		91	30-130	7	25	
Pentane	11.7	5.0	mg/kg wet	10.00		117	70-130	10	25	
Toluene	15.1	0.2	mg/kg wet	15.00		100	70-130	3	25	
Xylene O	9.2	0.2	mg/kg wet	10.00		92	70-130	2	25	
Xylene P,M	18.8	0.4	mg/kg wet	20.00		94	70-130	3	25	
Surrogate: 2,5-Dibromotoluene - FID	*4180*		ug/L	*5000*		*84*	*70-130*			
Surrogate: 2,5-Dibromotoluene - PID	*4090*		ug/L	*5000*		*82*	*70-130*			
Surrogate: Trifluorotoluene - FID	*4.40*		mg/kg wet	*5.333*		*83*	*70-130*			
Surrogate: Trifluorotoluene - PID	*4.53*		mg/kg wet	*5.333*		*85*	*70-130*			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1807384

Notes and Definitions

Z-04	MeOH - covered
U	Analyte included in the analysis, but not detected
SC	Surrogate recovery(ies) outside of criteria. Reextraction/Reanalysis confirms results (SC).
EL	Elevated Method Reporting Limits due to sample matrix (EL).
D	Diluted.
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1807384

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

Shipped/Delivered Via: ESS Courier

ESS Project ID: 1807384
Date Received: 7/17/2018
Project Due Date: 7/24/2018
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 1.6 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / (NA)
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? (Yes) / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? (Yes) / No / NA

13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: 7/17/18 Time: 1645 By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / No
    Who was contacted: Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	247363	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
01	247364	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
01	247375	Yes	NA	Yes	VOA Vial - Other	Other	
01	247376	Yes	NA	Yes	VOA Vial - Other	Other	
01	247387	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
01	247388	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
01	247394	Yes	NA	Yes	2 oz. Jar - Unpres	NP	
02	247361	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
02	247362	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
02	247373	Yes	NA	Yes	VOA Vial - Other	Other	
02	247374	Yes	NA	Yes	VOA Vial - Other	Other	
02	247385	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
02	247386	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
02	247393	Yes	NA	Yes	2 oz. Jar - Unpres	NP	
03	247359	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
03	247360	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
03	247371	Yes	NA	Yes	VOA Vial - Other	Other	
03	247372	Yes	NA	Yes	VOA Vial - Other	Other	
03	247383	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
03	247384	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
03	247392	Yes	NA	Yes	2 oz. Jar - Unpres	NP	
04	247357	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
04	247358	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
04	247369	Yes	NA	Yes	VOA Vial - Other	Other	

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

ESS Project ID: 1807384
Date Received: 7/17/2018

04	247370	Yes	NA	Yes	VOA Vial - Other	Other
04	247381	Yes	NA	Yes	8 oz. Jar - Unpres	NP
04	247382	Yes	NA	Yes	8 oz. Jar - Unpres	NP
04	247391	Yes	NA	Yes	2 oz. Jar - Unpres	NP
05	247355	Yes	NA	Yes	VOA Vial - Methanol	MeOH
05	247356	Yes	NA	Yes	VOA Vial - Methanol	MeOH
05	247367	Yes	NA	Yes	VOA Vial - Other	Other
05	247368	Yes	NA	Yes	VOA Vial - Other	Other
05	247379	Yes	NA	Yes	8 oz. Jar - Unpres	NP
05	247380	Yes	NA	Yes	8 oz. Jar - Unpres	NP
05	247390	Yes	NA	Yes	2 oz. Jar - Unpres	NP
06	247353	Yes	NA	Yes	VOA Vial - Methanol	MeOH
06	247354	Yes	NA	Yes	VOA Vial - Methanol	MeOH
06	247365	Yes	NA	Yes	VOA Vial - Other	Other
06	247366	Yes	NA	Yes	VOA Vial - Other	Other
06	247377	Yes	NA	Yes	8 oz. Jar - Unpres	NP
06	247378	Yes	NA	Yes	8 oz. Jar - Unpres	NP
06	247389	Yes	NA	Yes	2 oz. Jar - Unpres	NP

2nd Review

Are barcode labels on correct containers? (Yes / No)
Are all necessary stickers attached? Yes / No

Completed By: _____ Date & Time: 7/17/18 1546

Reviewed By: _____ Date & Time: 7/17/18 1640

Delivered By: _____ 7/17/18 1640

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only): 1807384

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP
Project Location: Amesbury MA
Project Number: 044752-2
Project Manager: RHoffman
Send Report to: RHoffman@GEIConsultants.com
Send EDD to: labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY REQUIRED: YES NO

If Yes, Are MCP Analytical Methods Required? (YES) NO NA
If Yes, Are Drinking Water Samples Submitted? YES NO (NA)
If Yes, Have You Met Minimum Field QC Requirements? (YES) NO NA

Sample Handling

Samples Field Filtered: YES NO (NA)
Sampled Shipped With Ice: YES (NO)

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Preservative	Analysis: TCL	PAH	Cn	PAC	EPH	VOA low	VOA High	VPH	% Solids	Sample Specific Remarks
							NA						DI	MeOH	MeOH	NA	
1	044752-SS612A	7/16/18	0815	S	7	LLT				2		1	2	1	1	1	
2	044752-SS613B		0920														
3	044752-SS614		0950														
4	044752-SS616		1105														
5	044752-SS617		1115														
6	044752-SS618		1125														

MCP Level Needed: GEI requires the most stringent Method 1 MCP standard be met for all analytes whenever possible.

	Date	Time	
Relinquished by sampler: (signature) 1.	7/16/18	1400	Received by: (signature) 1. GEI Fridge
Relinquished by: (signature) 2. GEI Fridge	7-17-18	1246	Received by: (signature) 2.
Relinquished by: (signature) 3.	7-17-18	1246	Received by: (signature) 3.
Relinquished by: (signature) 4.	7/17/18	15:05	Received by: (signature) 4. 7/17/18 1521

Ice temp: 1.6

Turnaround Time (Business days):

Normal X Other ____
10-Day ____ 7-Day ____
5-Day ____ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: 22J0430

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 2:21 pm, Oct 28, 2022

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 22J0430

SAMPLE RECEIPT

The following samples were received on October 13, 2022 for the analyses specified on the enclosed Chain of Custody Record.

To achieve CAM compliance for MCP data, ESS Laboratory has reviewed all QA/QC Requirements and Performance Standards listed in each method. Holding times and preservation have also been reviewed. All CAM requirements have been performed and achieved unless noted in the project narrative.

Each method has been set-up in the laboratory to reach required MCP standards. The methods for aqueous VOA and Soil Methanol VOA have known limitations for certain analytes. The regulatory standards may not be achieved due to these limitations. In addition, for all methods, matrix interferences, dilutions, and %Solids may elevate method reporting limits above regulatory standards. ESS Laboratory can provide, upon request, a Limit Checker (regulatory standard comparison spreadsheet) electronic deliverable which will highlight these exceedances.

Lab Number	Sample Name	Matrix	Analysis
22J0430-01	1804576-55808-S1	Soil	LK
22J0430-02	1804576-55808-S2	Soil	LK
22J0430-03	1804576-55809-S1	Soil	LK
22J0430-04	1804576-55809-S2	Soil	LK

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 22J0430

PROJECT NARRATIVE

No unusual observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 22J0430

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-55808-S1
Date Sampled: 10/12/22 12:00
Percent Solids: 13

ESS Laboratory Work Order: 22J0430
ESS Laboratory Sample ID: 22J0430-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**153000** (93.5)		LK		1	CCP	10/20/22 9:46	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-55808-S2
Date Sampled: 10/12/22 12:15
Percent Solids: 24

ESS Laboratory Work Order: 22J0430
ESS Laboratory Sample ID: 22J0430-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**71200** (94.2)		LK		1	CCP	10/20/22 10:57	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-55809-S1
Date Sampled: 10/12/22 12:45
Percent Solids: 23

ESS Laboratory Work Order: 22J0430
ESS Laboratory Sample ID: 22J0430-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**160000** (94.3)		LK		1	CCP	10/20/22 11:47	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-55809-S2
Date Sampled: 10/12/22 13:00
Percent Solids: 33

ESS Laboratory Work Order: 22J0430
ESS Laboratory Sample ID: 22J0430-04
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**68300** (98.1)		LK		1	CCP	10/20/22 12:04	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 22J0430

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Classical Chemistry										
Batch DJ21853 - General Preparation										
Blank										
Total Organic Carbon (1)	ND	100	mg/kg							
Total Organic Carbon (2)	ND	100	mg/kg							
LCS										
Total Organic Carbon (1)	9630	100	mg/kg	10000		96	80-120			
Total Organic Carbon (2)	9440	100	mg/kg	10000		94	80-120			
LCS Dup										
Total Organic Carbon (1)	9710	100	mg/kg	10000		97	80-120	0.9	25	
Total Organic Carbon (2)	9760	100	mg/kg	10000		98	80-120	3	25	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 22J0430

Notes and Definitions

U	Analyte included in the analysis, but not detected
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probable Number
TNTC	Too numerous to Count
CFU	Colony Forming Units

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 22J0430

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

Shipped/Delivered Via: ESS Courier

ESS Project ID: 22J0430
Date Received: 10/13/2022
Project Due Date: 10/20/2022
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 1.5 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA
13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By/Acid Lot#:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Resolution:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1	352795	Yes	N/A	Yes	4 oz. Jar	NP	
2	352796	Yes	N/A	Yes	4 oz. Jar	NP	
3	352797	Yes	N/A	Yes	4 oz. Jar	NP	
4	352798	Yes	N/A	Yes	4 oz. Jar	NP	

2nd Review
Were all containers scanned into storage/lab? Initials TB
Are barcode labels on correct containers? Yes / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: Taylor Davis Date & Time: 10/13/22 1841.
Reviewed By: DD Date & Time: 10/13/22 2026

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 22J0430 ~~22-0430~~ 10/13/22 JD

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000

Project Information

Project Name: Amesbury Former MGP
Project Number: 1804576
Send Report to: Ryan Hoffman
labdata@geiconsultants.com

Project Location: Amesbury, MA
Project Manager: Ryan Hoffman
781-721-4091 rhoffman@geiconsultants.com

ML - 10/28/22

MCP PRESUMPTIVE CERTAINTY AND MCP ANALYTICAL METHODS REQUIRED: (YES) NO

STATE AND FEDERAL REGULATORY REQUIREMENTS/REPORT LIMITS

State/Federal Program: (MA) 401WQC Other _____ NH RI CT NY ME

MA MCP Criteria are (Method 1 S-1) and GW-2/GW-3. Circle if GW-1 is required.

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Preservative	Analysis: Parent and Alkylated MAHs* PAHs 8270**	Analysis: TOCs by Lloyd-Kahn
							None		None
1	1804576-SS[illegible]-S1	10/12/22	1200	Soil	2	JES		X	X
2	1804576-SS[illegible]-S2	10/12/22	1215	Soil	2	JES		X	X
3	1804576-SS809-S1	10/12/22	1245	Soil	2	DJM		X	X
4	1804576-SS809-S2	10/12/22	1300	Soil	2	DJM		X	X

Sample Handling

Samples Field Filtered: YES NO (NA)

Sampled Shipped With Ice: (YES) NO

Sample Specific Remarks

	Date	Time	
Relinquished by sampler: (signature) 1. Davis Mills	10/12/2022	15:00	Received by: (signature) 1. GEI Sample Fridge
Relinquished by sampler: (signature) 2. GEI Sample Fridge	10/13/22	1237	Received by: (signature) 2.
Relinquished by: (signature) 3.	10/13/22	1237	Received by: (signature) 3.
Relinquished by: (signature) 4.	10/13/22	17:57	Received by: (signature) 4.
Relinquished by: (signature) 5.	Date :	Time:	Received by: (signature) 5.

Turnaround Time (Business days):

5-Day X 4-Day ____ 3-Day ____
2-Day ____ 1-Day ____ Other ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

** Parent and Alkylated MAHs and PAHs (34) by GC/MS/SIM/SCAN

Sample Matrix Abbreviations: SO = Soil GW = Groundwater SW = Surface Water SD = Sediment CO = Concrete PC = Paint Chip CLK = Caulk

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (044752)
ESS Laboratory Work Order Number: F180046

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 5:16 pm, Sep 10, 2018

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses
ESS Laboratory - Cranston, RI — Organics by 8260, WET CHEM

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F180046

SAMPLE RECEIPT

The following samples were received on August 23, 2018 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F180046-01	044752-SS619	Soil	8015 Mod, 8260B, 8270 Mod
F180046-02	044752-SS620	Soil	8015 Mod, 8260B, 8270 Mod
F180046-03	044752-SS621	Soil	8015 Mod, 8260B, 8270 Mod, 9060, LK
F180046-04	044752-SS622	Soil	8015 Mod, 8260B, 8270 Mod
F180046-05	044752-SS623	Soil	8015 Mod, 8260B, 8270 Mod
F180046-06	044752-SS624	Soil	8015 Mod, 8260B, 8270 Mod, 9060, LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F180046

PROJECT NARRATIVE

8270D (SIM) Semi-Volatile Organic Compounds

F180046-01	**Present in Method Blank (B).**
	Benzene
F180046-02	**Present in Method Blank (B).**
	Benzene
F180046-03	**Present in Method Blank (B).**
	Benzene
F180046-04	**Present in Method Blank (B).**
	Benzene
F180046-05	**Present in Method Blank (B).**
	Benzene
FH82701-DUP2	**Present in Method Blank (B).**
	Benzene
FH82701-DUP2	**Relative percent difference for duplicate is outside of criteria (D+).**

Classical Chemistry

F180046-03	**The non-homogeneity of the sample resulted in elevated RSD.**

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F180046

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS619
Date Sampled: 08/15/18 11:00
Percent Solids: 58
Initial Volume: 15.658
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-01
Sample Matrix: Soil
Units: mg/Kg dry
Analyst: NL
Prepared: 8/27/18 12:38

Saturated Hydrocarbons by GC/FID

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C-8	J **0.173** (0.219)	0.109	8015 Mod		1	NL	08/29/18 18:27	F8I0002	FH82701
C-9	**0.447** (0.219)	0.109	8015 Mod		1	NL	08/29/18 18:27	F8I0002	FH82701
C-10	**1.50** (0.219)	0.109	8015 Mod		1	NL	08/29/18 18:27	F8I0002	FH82701
C-11	**0.526** (0.219)	0.109	8015 Mod		1	NL	08/29/18 18:27	F8I0002	FH82701
C-12	**1.59** (0.219)	0.109	8015 Mod		1	NL	08/29/18 18:27	F8I0002	FH82701
C-13	**0.326** (0.219)	0.109	8015 Mod		1	NL	08/29/18 18:27	F8I0002	FH82701
2,6,10-trimethyldodecane (1380)	**2.39** (0.219)	0.109	8015 Mod		1	NL	08/29/18 18:27	F8I0002	FH82701
C-14	**0.980** (0.219)	0.109	8015 Mod		1	NL	08/29/18 18:27	F8I0002	FH82701
2,6,10-trimethyltridecane (1470)	**3.06** (0.219)	0.109	8015 Mod		1	NL	08/29/18 18:27	F8I0002	FH82701
C-15	J **0.160** (0.219)	0.109	8015 Mod		1	NL	08/29/18 18:27	F8I0002	FH82701
C-16	ND (0.219)	0.109	8015 Mod		1	NL	08/29/18 18:27	F8I0002	FH82701
2,6,10-trimethylpentadecane (1650)	**3.17** (0.219)	0.109	8015 Mod		1	NL	08/29/18 18:27	F8I0002	FH82701
C-17	**0.413** (0.219)	0.109	8015 Mod		1	NL	08/29/18 18:27	F8I0002	FH82701
Pristane	**3.39** (0.219)	0.109	8015 Mod		1	NL	08/29/18 18:27	F8I0002	FH82701
C-18	**0.253** (0.219)	0.109	8015 Mod		1	NL	08/29/18 18:27	F8I0002	FH82701
Phytane	**3.85** (0.219)	0.109	8015 Mod		1	NL	08/29/18 18:27	F8I0002	FH82701
C-19	ND (0.219)	0.109	8015 Mod		1	NL	08/29/18 18:27	F8I0002	FH82701
C-20	ND (0.219)	0.109	8015 Mod		1	NL	08/29/18 18:27	F8I0002	FH82701
C-21	**0.690** (0.219)	0.109	8015 Mod		1	NL	08/29/18 18:27	F8I0002	FH82701
C-22	ND (0.219)	0.109	8015 Mod		1	NL	08/29/18 18:27	F8I0002	FH82701
C-23	**1.74** (0.219)	0.109	8015 Mod		1	NL	08/29/18 18:27	F8I0002	FH82701
C-24	ND (0.219)	0.109	8015 Mod		1	NL	08/29/18 18:27	F8I0002	FH82701
C-25	**2.15** (0.219)	0.109	8015 Mod		1	NL	08/29/18 18:27	F8I0002	FH82701
C-26	ND (0.219)	0.109	8015 Mod		1	NL	08/29/18 18:27	F8I0002	FH82701
C-27	ND (0.219)	0.109	8015 Mod		1	NL	08/29/18 18:27	F8I0002	FH82701
C-28	ND (0.219)	0.109	8015 Mod		1	NL	08/29/18 18:27	F8I0002	FH82701
C-29	ND (0.219)	0.109	8015 Mod		1	NL	08/29/18 18:27	F8I0002	FH82701
C-30	ND (0.219)	0.109	8015 Mod		1	NL	08/29/18 18:27	F8I0002	FH82701
C-31	ND (0.219)	0.109	8015 Mod		1	NL	08/29/18 18:27	F8I0002	FH82701
C-32	ND (0.219)	0.109	8015 Mod		1	NL	08/29/18 18:27	F8I0002	FH82701
C-33	**7.05** (0.219)	0.109	8015 Mod		1	NL	08/29/18 18:27	F8I0002	FH82701
C-34	ND (0.219)	0.109	8015 Mod		1	NL	08/29/18 18:27	F8I0002	FH82701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS619
Date Sampled: 08/15/18 11:00
Percent Solids: 58
Initial Volume: 15.658
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-01
Sample Matrix: Soil
Units: mg/Kg dry
Analyst: NL
Prepared: 8/27/18 12:38

Saturated Hydrocarbons by GC/FID

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C-35	ND (0.219)	0.109	8015 Mod		1	NL	08/29/18 18:27	F8I0002	FH82701
C-36	ND (0.219)	0.109	8015 Mod		1	NL	08/29/18 18:27	F8I0002	FH82701
C-37	ND (0.219)	0.109	8015 Mod		1	NL	08/29/18 18:27	F8I0002	FH82701
C-38	**1.96** (0.219)	0.109	8015 Mod		1	NL	08/29/18 18:27	F8I0002	FH82701
C-39	ND (0.219)	0.109	8015 Mod		1	NL	08/29/18 18:27	F8I0002	FH82701
C-40	ND (0.219)	0.109	8015 Mod		1	NL	08/29/18 18:27	F8I0002	FH82701
TPH (C8-C40)	**3610** (0.219)	0.109	8015 Mod		1	NL	08/29/18 18:27	F8I0002	FH82701

	%Recovery	Qualifier	Limits
Surrogate: o-Terphenyl	*70 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS619
Date Sampled: 08/15/18 11:00
Percent Solids: 58
Initial Volume: 15.658
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/27/18 12:38

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **149** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
C1-Benzene	**543** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
C2-Benzenes	**565** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
C3-Benzenes	**494** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
C4-Benzenes	**460** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
C5-Benzenes	**342** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
Methylcyclohexane	**108** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
Toluene	**855** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
Ethylbenzene	**141** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
m,p-Xylene	**720** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
Styrene	**194** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
o-Xylene	**142** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
Isopropylbenzene	**17.9** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
n-Propylbenzene	**69.0** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
1,3,5-Trimethylbenzene	**141** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
1,2,3-Trimethylbenzene	**106** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
1,2,4-Trimethylbenzene	**409** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
t-Butylbenzene	ND (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
sec-Butylbenzene	**14.8** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
p-Isopropyltoluene	**49.7** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
n-Butylbenzene	**99.2** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
trans-Decalin	**728** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
cis-Decalin	**118** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
C1-Decalins	**1740** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
C2-Decalins	**1450** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
C3-Decalins	**909** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
C4-Decalins	**1350** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
Benzo(b)thiophene	**85.8** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
C1-Benzo(b)thiophenes	**95.5** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
C2-Benzo(b)thiophenes	**200** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
C3-Benzo(b)thiophenes	**382** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
C4-Benzo(b)thiophenes	**210** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS619
Date Sampled: 08/15/18 11:00
Percent Solids: 58
Initial Volume: 15.658
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/27/18 12:38

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**1040** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
2-Methylnaphthalene	**704** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
1-Methylnaphthalene	**445** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
C1-Naphthalenes	**654** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
C2-Naphthalenes	**1510** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
C3-Naphthalenes	**2050** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
C4-Naphthalenes	**1480** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
Biphenyl	**222** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
Acenaphthylene	**2780** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
Acenaphthene	**2080** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
Dibenzofuran	**524** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
Fluorene	**1200** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
C1-Fluorenes	**1100** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
C2-Fluorenes	**1510** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
C3-Fluorenes	**1780** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
Dibenzothiophene	**1060** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
C1-Dibenzothiophenes	**1550** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
C2-Dibenzothiophenes	**2080** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
C3-Dibenzothiophenes	**1870** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
C4-Dibenzothiophenes	**1000** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
Phenanthrene	**11700** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
Anthracene	**4150** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
C1-Phenanthrenes/Anthracenes	**7220** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
C2-Phenanthrenes/Anthracenes	**5260** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
C3-Phenanthrenes/Anthracenes	**2810** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
C4-Phenanthrenes/Anthracenes	**1270** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
Retene	**189** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
Benzo(b)naphtho(2,1-d)thiophene	**1450** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
C0-Benzonaphthothiophenes	**2700** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
C1-Benzonaphthothiophenes	**1760** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
C2-Benzonaphthothiophenes	**1450** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
C3-Benzonaphthothiophenes	**1020** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS619
Date Sampled: 08/15/18 11:00
Percent Solids: 58
Initial Volume: 15.658
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/27/18 12:38

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**480** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
Fluoranthene	**21200** (43.8)	21.9	8270 Mod		20	08/29/18 6:53	F8H0005	FH82701
Pyrene	**23000** (43.8)	21.9	8270 Mod		20	08/29/18 6:53	F8H0005	FH82701
C1-Fluoranthenes/Pyrenes	**11100** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
C2-Fluoranthenes/Pyrenes	**4360** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
C3-Fluoranthenes/Pyrenes	**2070** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
Benzo(b)fluorene	**1440** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
Benzo(c)fluorene	**566** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
2-Methylpyrene	**1420** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
4-Methylpyrene	**1290** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
1-Methylpyrene	**1110** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
Benz(a)anthracene	**8810** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
Chrysene/triphenylene	**9260** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
C1-Benzo(a)anthracenes/Chrysenes	**4520** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
C2-Benzo(a)anthracenes/Chrysenes	**2430** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
C3-Benzo(a)anthracenes/Chrysenes	**1250** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
C4-Benzo(a)anthracenes/Chrysenes	**661** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
Benzo(b)fluoranthene	**7420** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
Benzo(j/k)fluoranthene	**7650** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
Benzo(e)pyrene	**6200** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
Benzo(a)pyrene	**9620** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
Perylene	**2050** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
Indeno(1,2,3-cd)pyrene	**6230** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
Dibenzo(a,h)anthracene	**1430** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
Benzo(g,h,i)perylene	**5050** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
Coronene	**1320** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
Tetramethyl lead	ND (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
Trimethylethyl lead	ND (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
Dimethyldiethyl lead	ND (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
Methyltriethyl lead	ND (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
Tetraethyl lead	ND (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
Carbazole	**493** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS619
Date Sampled: 08/15/18 11:00
Percent Solids: 58
Initial Volume: 15.658
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/27/18 12:38

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**281** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
2,3,5-Trimethylnaphthene	**135** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
4-Methyldibenzothiophene	**546** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
2/3-Methyldibenzothiophene	**504** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
1-Methyldibenzothiophene	**196** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
3-Methylphenanthrene	**1660** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
2-Methylphenanthrene	**1950** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
2-Methylanthracene	**821** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
4/9-Methylphenanthrene	**1810** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701
1-Methylphenanthrene	**982** (10.9)	5.47	8270 Mod		5	08/29/18 18:54	F8H0005	FH82701

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*66 %*		*50-120*
Surrogate: Naphthalene-d8	*72 %*		*50-120*
Surrogate: Phenanthrene-d10	*75 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS619
Date Sampled: 08/15/18 11:00
Percent Solids: 58
Initial Volume: 23.8
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.361)		8260B		1	08/27/18 12:40	C8H0485	CH82731
Ethylbenzene	ND (0.361)		8260B		1	08/27/18 12:40	C8H0485	CH82731
Toluene	ND (0.361)		8260B		1	08/27/18 12:40	C8H0485	CH82731
Xylene O	ND (0.361)		8260B		1	08/27/18 12:40	C8H0485	CH82731
Xylene P,M	ND (0.723)		8260B		1	08/27/18 12:40	C8H0485	CH82731
Xylenes (Total)	ND (0.723)		8260B		200	08/27/18 12:40		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*124 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*117 %*		*70-130*
Surrogate: Dibromofluoromethane	*124 %*		*70-130*
Surrogate: Toluene-d8	*115 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS620
Date Sampled: 08/15/18 12:20
Percent Solids: 59
Initial Volume: 15.492
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-02
Sample Matrix: Soil
Units: mg/Kg dry
Analyst: NL
Prepared: 8/27/18 12:38

Saturated Hydrocarbons by GC/FID

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C-8	ND (0.218)	0.109	8015 Mod		1	NL	08/29/18 11:43	F8I0002	FH82701
C-9	ND (0.218)	0.109	8015 Mod		1	NL	08/29/18 11:43	F8I0002	FH82701
C-10	ND (0.218)	0.109	8015 Mod		1	NL	08/29/18 11:43	F8I0002	FH82701
C-11	ND (0.218)	0.109	8015 Mod		1	NL	08/29/18 11:43	F8I0002	FH82701
C-12	ND (0.218)	0.109	8015 Mod		1	NL	08/29/18 11:43	F8I0002	FH82701
C-13	ND (0.218)	0.109	8015 Mod		1	NL	08/29/18 11:43	F8I0002	FH82701
2,6,10-trimethyldodecane (1380)	ND (0.218)	0.109	8015 Mod		1	NL	08/29/18 11:43	F8I0002	FH82701
C-14	ND (0.218)	0.109	8015 Mod		1	NL	08/29/18 11:43	F8I0002	FH82701
2,6,10-trimethyltridecane (1470)	**J 0.126** (0.218)	0.109	8015 Mod		1	NL	08/29/18 11:43	F8I0002	FH82701
C-15	ND (0.218)	0.109	8015 Mod		1	NL	08/29/18 11:43	F8I0002	FH82701
C-16	ND (0.218)	0.109	8015 Mod		1	NL	08/29/18 11:43	F8I0002	FH82701
2,6,10-trimethylpentadecane (1650)	**J 0.111** (0.218)	0.109	8015 Mod		1	NL	08/29/18 11:43	F8I0002	FH82701
C-17	**J 0.155** (0.218)	0.109	8015 Mod		1	NL	08/29/18 11:43	F8I0002	FH82701
Pristane	**J 0.160** (0.218)	0.109	8015 Mod		1	NL	08/29/18 11:43	F8I0002	FH82701
C-18	ND (0.218)	0.109	8015 Mod		1	NL	08/29/18 11:43	F8I0002	FH82701
Phytane	**J 0.140** (0.218)	0.109	8015 Mod		1	NL	08/29/18 11:43	F8I0002	FH82701
C-19	ND (0.218)	0.109	8015 Mod		1	NL	08/29/18 11:43	F8I0002	FH82701
C-20	ND (0.218)	0.109	8015 Mod		1	NL	08/29/18 11:43	F8I0002	FH82701
C-21	ND (0.218)	0.109	8015 Mod		1	NL	08/29/18 11:43	F8I0002	FH82701
C-22	ND (0.218)	0.109	8015 Mod		1	NL	08/29/18 11:43	F8I0002	FH82701
C-23	**0.239** (0.218)	0.109	8015 Mod		1	NL	08/29/18 11:43	F8I0002	FH82701
C-24	**J 0.124** (0.218)	0.109	8015 Mod		1	NL	08/29/18 11:43	F8I0002	FH82701
C-25	**1.68** (0.218)	0.109	8015 Mod		1	NL	08/29/18 11:43	F8I0002	FH82701
C-26	**J 0.215** (0.218)	0.109	8015 Mod		1	NL	08/29/18 11:43	F8I0002	FH82701
C-27	**4.20** (0.218)	0.109	8015 Mod		1	NL	08/29/18 11:43	F8I0002	FH82701
C-28	**2.60** (0.218)	0.109	8015 Mod		1	NL	08/29/18 11:43	F8I0002	FH82701
C-29	**1.10** (0.218)	0.109	8015 Mod		1	NL	08/29/18 11:43	F8I0002	FH82701
C-30	**1.46** (0.218)	0.109	8015 Mod		1	NL	08/29/18 11:43	F8I0002	FH82701
C-31	**0.960** (0.218)	0.109	8015 Mod		1	NL	08/29/18 11:43	F8I0002	FH82701
C-32	**0.722** (0.218)	0.109	8015 Mod		1	NL	08/29/18 11:43	F8I0002	FH82701
C-33	**0.481** (0.218)	0.109	8015 Mod		1	NL	08/29/18 11:43	F8I0002	FH82701
C-34	**3.91** (0.218)	0.109	8015 Mod		1	NL	08/29/18 11:43	F8I0002	FH82701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS620
Date Sampled: 08/15/18 12:20
Percent Solids: 59
Initial Volume: 15.492
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-02
Sample Matrix: Soil
Units: mg/Kg dry
Analyst: NL
Prepared: 8/27/18 12:38

Saturated Hydrocarbons by GC/FID

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C-35	**1.41** (0.218)	0.109	8015 Mod		1	NL	08/29/18 11:43	F8I0002	FH82701
C-36	ND (0.218)	0.109	8015 Mod		1	NL	08/29/18 11:43	F8I0002	FH82701
C-37	**J 0.187** (0.218)	0.109	8015 Mod		1	NL	08/29/18 11:43	F8I0002	FH82701
C-38	**J 0.165** (0.218)	0.109	8015 Mod		1	NL	08/29/18 11:43	F8I0002	FH82701
C-39	ND (0.218)	0.109	8015 Mod		1	NL	08/29/18 11:43	F8I0002	FH82701
C-40	ND (0.218)	0.109	8015 Mod		1	NL	08/29/18 11:43	F8I0002	FH82701
TPH (C8-C40)	**272** (0.218)	0.109	8015 Mod		1	NL	08/29/18 11:43	F8I0002	FH82701

	%Recovery	Qualifier	Limits
Surrogate: o-Terphenyl	67 %		50-120

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS620
Date Sampled: 08/15/18 12:20
Percent Solids: 59
Initial Volume: 15.492
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/27/18 12:38

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **23.2** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
C1-Benzene	**135** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
C2-Benzenes	**56.3** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
C3-Benzenes	**31.4** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
C4-Benzenes	**49.4** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
C5-Benzenes	**24.7** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
Methylcyclohexane	**4.40** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
Toluene	**211** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
Ethylbenzene	**6.44** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
m,p-Xylene	**80.0** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
Styrene	**14.0** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
o-Xylene	**7.31** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
Isopropylbenzene	J **1.61** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
n-Propylbenzene	**4.94** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
1,3,5-Trimethylbenzene	**7.83** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
1,2,3-Trimethylbenzene	**9.06** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
1,2,4-Trimethylbenzene	**14.8** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
t-Butylbenzene	ND (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
sec-Butylbenzene	ND (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
p-Isopropyltoluene	**85.9** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
n-Butylbenzene	**9.39** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
trans-Decalin	**30.8** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
cis-Decalin	**3.41** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
C1-Decalins	**53.5** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
C2-Decalins	**36.2** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
C3-Decalins	**29.3** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
C4-Decalins	**49.0** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
Benzo(b)thiophene	**2.98** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
C1-Benzo(b)thiophenes	**6.52** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
C2-Benzo(b)thiophenes	**11.3** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
C3-Benzo(b)thiophenes	**9.61** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
C4-Benzo(b)thiophenes	**4.62** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS620
Date Sampled: 08/15/18 12:20
Percent Solids: 59
Initial Volume: 15.492
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/27/18 12:38

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**34.4** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
2-Methylnaphthalene	**28.4** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
1-Methylnaphthalene	**18.5** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
C1-Naphthalenes	**27.0** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
C2-Naphthalenes	**79.6** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
C3-Naphthalenes	**86.3** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
C4-Naphthalenes	**55.6** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
Biphenyl	**9.91** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
Acenaphthylene	**94.5** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
Acenaphthene	**153** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
Dibenzofuran	**16.7** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
Fluorene	**75.3** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
C1-Fluorenes	**44.8** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
C2-Fluorenes	**52.5** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
C3-Fluorenes	**55.2** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
Dibenzothiophene	**87.6** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
C1-Dibenzothiophenes	**46.3** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
C2-Dibenzothiophenes	**52.4** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
C3-Dibenzothiophenes	**48.2** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
C4-Dibenzothiophenes	**33.0** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
Phenanthrene	**269** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
Anthracene	**178** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
C1-Phenanthrenes/Anthracenes	**58.0** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
C2-Phenanthrenes/Anthracenes	**197** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
C3-Phenanthrenes/Anthracenes	**134** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
C4-Phenanthrenes/Anthracenes	**126** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
Retene	**341** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
Benzo(b)naphtho(2,1-d)thiophene	**40.4** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
C0-Benzonaphthothiophenes	**82.2** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
C1-Benzonaphthothiophenes	**61.4** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
C2-Benzonaphthothiophenes	**53.5** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
C3-Benzonaphthothiophenes	**42.4** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS620
Date Sampled: 08/15/18 12:20
Percent Solids: 59
Initial Volume: 15.492
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/27/18 12:38

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**19.3** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
Fluoranthene	**527** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
Pyrene	**653** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
C1-Fluoranthenes/Pyrenes	**383** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
C2-Fluoranthenes/Pyrenes	**174** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
C3-Fluoranthenes/Pyrenes	**81.9** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
Benzo(b)fluorene	**43.0** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
Benzo(c)fluorene	**20.5** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
2-Methylpyrene	**49.9** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
4-Methylpyrene	**51.9** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
1-Methylpyrene	**40.9** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
Benz(a)anthracene	**263** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
Chrysene/triphenylene	**277** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
C1-Benzo(a)anthracenes/Chrysenes	**176** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
C2-Benzo(a)anthracenes/Chrysenes	**117** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
C3-Benzo(a)anthracenes/Chrysenes	**55.6** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
C4-Benzo(a)anthracenes/Chrysenes	**35.5** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
Benzo(b)fluoranthene	**229** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
Benzo(j/k)fluoranthene	**204** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
Benzo(e)pyrene	**191** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
Benzo(a)pyrene	**265** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
Perylene	**168** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
Indeno(1,2,3-cd)pyrene	**170** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
Dibenzo(a,h)anthracene	**41.3** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
Benzo(g,h,i)perylene	**139** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
Coronene	**34.4** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
Tetramethyl lead	ND (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
Trimethylethyl lead	ND (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
Dimethyldiethyl lead	ND (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
Methyltriethyl lead	ND (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
Tetraethyl lead	ND (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
Carbazole	**8.06** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS620
Date Sampled: 08/15/18 12:20
Percent Solids: 59
Initial Volume: 15.492
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/27/18 12:38

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**16.3** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
2,3,5-Trimethylnaphthene	**5.17** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
4-Methyldibenzothiophene	**15.8** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
2/3-Methyldibenzothiophene	**16.4** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
1-Methyldibenzothiophene	**5.41** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
3-Methylphenanthrene	**56.3** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
2-Methylphenanthrene	**53.3** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
2-Methylanthracene	**35.3** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
4/9-Methylphenanthrene	**66.8** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701
1-Methylphenanthrene	**33.9** (2.18)	1.09	8270 Mod		1	08/29/18 14:53	F8H0005	FH82701

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*68 %*		*50-120*
Surrogate: Naphthalene-d8	*71 %*		*50-120*
Surrogate: Phenanthrene-d10	*73 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS620
Date Sampled: 08/15/18 12:20
Percent Solids: 51
Initial Volume: 20.6
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.475)		8260B		1	08/27/18 13:07	C8H0485	CH82731
Ethylbenzene	ND (0.475)		8260B		1	08/27/18 13:07	C8H0485	CH82731
Toluene	ND (0.475)		8260B		1	08/27/18 13:07	C8H0485	CH82731
Xylene O	ND (0.475)		8260B		1	08/27/18 13:07	C8H0485	CH82731
Xylene P,M	ND (0.951)		8260B		1	08/27/18 13:07	C8H0485	CH82731
Xylenes (Total)	ND (0.951)		8260B		200	08/27/18 13:07		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*127 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*126 %*		*70-130*
Surrogate: Dibromofluoromethane	*130 %*		*70-130*
Surrogate: Toluene-d8	*118 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS621
Date Sampled: 08/15/18 12:45
Percent Solids: 55
Initial Volume: 15.749
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-03
Sample Matrix: Soil
Units: mg/Kg dry
Analyst: NL
Prepared: 8/27/18 12:38

Saturated Hydrocarbons by GC/FID

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C-8	ND (0.229)	0.115	8015 Mod		1	NL	08/29/18 15:44	F8I0002	FH82701
C-9	**0.261** (0.229)	0.115	8015 Mod		1	NL	08/29/18 15:44	F8I0002	FH82701
C-10	**1.23** (0.229)	0.115	8015 Mod		1	NL	08/29/18 15:44	F8I0002	FH82701
C-11	**0.665** (0.229)	0.115	8015 Mod		1	NL	08/29/18 15:44	F8I0002	FH82701
C-12	**1.22** (0.229)	0.115	8015 Mod		1	NL	08/29/18 15:44	F8I0002	FH82701
C-13	**0.346** (0.229)	0.115	8015 Mod		1	NL	08/29/18 15:44	F8I0002	FH82701
2,6,10-trimethyldodecane (1380)	**2.59** (0.229)	0.115	8015 Mod		1	NL	08/29/18 15:44	F8I0002	FH82701
C-14	**1.14** (0.229)	0.115	8015 Mod		1	NL	08/29/18 15:44	F8I0002	FH82701
2,6,10-trimethyltridecane (1470)	**3.71** (0.229)	0.115	8015 Mod		1	NL	08/29/18 15:44	F8I0002	FH82701
C-15	**0.308** (0.229)	0.115	8015 Mod		1	NL	08/29/18 15:44	F8I0002	FH82701
C-16	J **0.200** (0.229)	0.115	8015 Mod		1	NL	08/29/18 15:44	F8I0002	FH82701
2,6,10-trimethylpentadecane (1650)	**3.36** (0.229)	0.115	8015 Mod		1	NL	08/29/18 15:44	F8I0002	FH82701
C-17	J **0.220** (0.229)	0.115	8015 Mod		1	NL	08/29/18 15:44	F8I0002	FH82701
Pristane	**4.30** (0.229)	0.115	8015 Mod		1	NL	08/29/18 15:44	F8I0002	FH82701
C-18	**0.243** (0.229)	0.115	8015 Mod		1	NL	08/29/18 15:44	F8I0002	FH82701
Phytane	**3.73** (0.229)	0.115	8015 Mod		1	NL	08/29/18 15:44	F8I0002	FH82701
C-19	**0.484** (0.229)	0.115	8015 Mod		1	NL	08/29/18 15:44	F8I0002	FH82701
C-20	ND (0.229)	0.115	8015 Mod		1	NL	08/29/18 15:44	F8I0002	FH82701
C-21	**0.428** (0.229)	0.115	8015 Mod		1	NL	08/29/18 15:44	F8I0002	FH82701
C-22	**0.818** (0.229)	0.115	8015 Mod		1	NL	08/29/18 15:44	F8I0002	FH82701
C-23	**0.588** (0.229)	0.115	8015 Mod		1	NL	08/29/18 15:44	F8I0002	FH82701
C-24	**0.576** (0.229)	0.115	8015 Mod		1	NL	08/29/18 15:44	F8I0002	FH82701
C-25	ND (0.229)	0.115	8015 Mod		1	NL	08/29/18 15:44	F8I0002	FH82701
C-26	**0.539** (0.229)	0.115	8015 Mod		1	NL	08/29/18 15:44	F8I0002	FH82701
C-27	**2.24** (0.229)	0.115	8015 Mod		1	NL	08/29/18 15:44	F8I0002	FH82701
C-28	ND (0.229)	0.115	8015 Mod		1	NL	08/29/18 15:44	F8I0002	FH82701
C-29	**1.68** (0.229)	0.115	8015 Mod		1	NL	08/29/18 15:44	F8I0002	FH82701
C-30	**1.15** (0.229)	0.115	8015 Mod		1	NL	08/29/18 15:44	F8I0002	FH82701
C-31	**2.14** (0.229)	0.115	8015 Mod		1	NL	08/29/18 15:44	F8I0002	FH82701
C-32	**1.26** (0.229)	0.115	8015 Mod		1	NL	08/29/18 15:44	F8I0002	FH82701
C-33	**0.955** (0.229)	0.115	8015 Mod		1	NL	08/29/18 15:44	F8I0002	FH82701
C-34	**5.89** (0.229)	0.115	8015 Mod		1	NL	08/29/18 15:44	F8I0002	FH82701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS621
Date Sampled: 08/15/18 12:45
Percent Solids: 55
Initial Volume: 15.749
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-03
Sample Matrix: Soil
Units: mg/Kg dry
Analyst: NL
Prepared: 8/27/18 12:38

Saturated Hydrocarbons by GC/FID

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C-35	ND (0.229)	0.115	8015 Mod		1	NL	08/29/18 15:44	F8I0002	FH82701
C-36	ND (0.229)	0.115	8015 Mod		1	NL	08/29/18 15:44	F8I0002	FH82701
C-37	ND (0.229)	0.115	8015 Mod		1	NL	08/29/18 15:44	F8I0002	FH82701
C-38	ND (0.229)	0.115	8015 Mod		1	NL	08/29/18 15:44	F8I0002	FH82701
C-39	ND (0.229)	0.115	8015 Mod		1	NL	08/29/18 15:44	F8I0002	FH82701
C-40	ND (0.229)	0.115	8015 Mod		1	NL	08/29/18 15:44	F8I0002	FH82701
TPH (C8-C40)	**3570** (0.229)	0.115	8015 Mod		1	NL	08/29/18 15:44	F8I0002	FH82701

	%Recovery	Qualifier	Limits
Surrogate: o-Terphenyl	*65 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
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Client Sample ID: 044752-SS621
Date Sampled: 08/15/18 12:45
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Initial Volume: 15.749
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/27/18 12:38

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**B 224** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
C1-Benzene	**644** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
C2-Benzenes	**593** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
C3-Benzenes	**307** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
C4-Benzenes	**392** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
C5-Benzenes	**366** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
Methylcyclohexane	**37.0** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
Toluene	**1020** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
Ethylbenzene	**141** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
m,p-Xylene	**778** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
Styrene	**235** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
o-Xylene	**106** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
Isopropylbenzene	**14.8** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
n-Propylbenzene	**52.2** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
1,3,5-Trimethylbenzene	**74.3** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
1,2,3-Trimethylbenzene	**65.6** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
1,2,4-Trimethylbenzene	**196** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
t-Butylbenzene	ND (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
sec-Butylbenzene	**11.5** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
p-Isopropyltoluene	**40.6** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
n-Butylbenzene	**89.9** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
trans-Decalin	**1360** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
cis-Decalin	**183** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
C1-Decalins	**2110** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
C2-Decalins	**1110** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
C3-Decalins	**749** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
C4-Decalins	**1270** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
Benzo(b)thiophene	**53.3** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
C1-Benzo(b)thiophenes	**87.3** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
C2-Benzo(b)thiophenes	**239** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
C3-Benzo(b)thiophenes	**425** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
C4-Benzo(b)thiophenes	**180** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS621
Date Sampled: 08/15/18 12:45
Percent Solids: 55
Initial Volume: 15.749
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/27/18 12:38

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**792** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
2-Methylnaphthalene	**584** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
1-Methylnaphthalene	**694** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
C1-Naphthalenes	**728** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
C2-Naphthalenes	**2940** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
C3-Naphthalenes	**3190** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
C4-Naphthalenes	**1970** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
Biphenyl	**265** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
Acenaphthylene	**2750** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
Acenaphthene	**3430** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
Dibenzofuran	**267** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
Fluorene	**2160** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
C1-Fluorenes	**1660** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
C2-Fluorenes	**1900** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
C3-Fluorenes	**1540** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
Dibenzothiophene	**1280** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
C1-Dibenzothiophenes	**1680** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
C2-Dibenzothiophenes	**1830** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
C3-Dibenzothiophenes	**1360** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
C4-Dibenzothiophenes	**607** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
Phenanthrene	**13900** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
Anthracene	**9650** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
C1-Phenanthrenes/Anthracenes	**9560** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
C2-Phenanthrenes/Anthracenes	**5850** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
C3-Phenanthrenes/Anthracenes	**2580** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
C4-Phenanthrenes/Anthracenes	**1000** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
Retene	**195** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
Benzo(b)naphtho(2,1-d)thiophene	**1520** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
C0-Benzonaphthothiophenes	**2880** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
C1-Benzonaphthothiophenes	**1450** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
C2-Benzonaphthothiophenes	**1000** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
C3-Benzonaphthothiophenes	**716** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS621
Date Sampled: 08/15/18 12:45
Percent Solids: 55
Initial Volume: 15.749
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/27/18 12:38

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**288** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
Fluoranthene	**17100** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
Pyrene	**21700** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
C1-Fluoranthenes/Pyrenes	**11300** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
C2-Fluoranthenes/Pyrenes	**3640** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
C3-Fluoranthenes/Pyrenes	**1400** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
Benzo(b)fluorene	**1390** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
Benzo(c)fluorene	**565** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
2-Methylpyrene	**1470** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
4-Methylpyrene	**1440** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
1-Methylpyrene	**1360** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
Benz(a)anthracene	**8520** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
Chrysene/triphenylene	**8810** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
C1-Benzo(a)anthracenes/Chrysenes	**3910** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
C2-Benzo(a)anthracenes/Chrysenes	**1940** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
C3-Benzo(a)anthracenes/Chrysenes	**840** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
C4-Benzo(a)anthracenes/Chrysenes	**418** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
Benzo(b)fluoranthene	**6190** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
Benzo(j/k)fluoranthene	**6510** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
Benzo(e)pyrene	**5620** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
Benzo(a)pyrene	**9740** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
Perylene	**1870** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
Indeno(1,2,3-cd)pyrene	**5640** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
Dibenzo(a,h)anthracene	**1310** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
Benzo(g,h,i)perylene	**4820** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
Coronene	**1330** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
Tetramethyl lead	ND (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
Trimethylethyl lead	ND (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
Dimethyldiethyl lead	ND (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
Methyltriethyl lead	ND (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
Tetraethyl lead	ND (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
Carbazole	**324** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS621
Date Sampled: 08/15/18 12:45
Percent Solids: 55
Initial Volume: 15.749
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/27/18 12:38

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**569** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
2,3,5-Trimethylnaphthene	**231** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
4-Methyldibenzothiophene	**645** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
2/3-Methyldibenzothiophene	**554** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
1-Methyldibenzothiophene	**187** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
3-Methylphenanthrene	**2090** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
2-Methylphenanthrene	**2350** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
2-Methylanthracene	**1160** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
4/9-Methylphenanthrene	**2330** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701
1-Methylphenanthrene	**1550** (11.5)	5.74	8270 Mod		5	08/29/18 21:34	F8H0005	FH82701

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*65 %*		*50-120*
Surrogate: Naphthalene-d8	*68 %*		*50-120*
Surrogate: Phenanthrene-d10	*72 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS621
Date Sampled: 08/15/18 12:45
Percent Solids: 54
Initial Volume: 22.1
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.418)		8260B		1	08/27/18 13:34	C8H0485	CH82731
Ethylbenzene	ND (0.418)		8260B		1	08/27/18 13:34	C8H0485	CH82731
Toluene	ND (0.418)		8260B		1	08/27/18 13:34	C8H0485	CH82731
Xylene O	ND (0.418)		8260B		1	08/27/18 13:34	C8H0485	CH82731
Xylene P,M	ND (0.836)		8260B		1	08/27/18 13:34	C8H0485	CH82731
Xylenes (Total)	ND (0.836)		8260B		200	08/27/18 13:34		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*110 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*90 %*		*70-130*
Surrogate: Dibromofluoromethane	*108 %*		*70-130*
Surrogate: Toluene-d8	*90 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS621
Date Sampled: 08/15/18 12:45
Percent Solids: 54

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Black Carbon (Average)	**16400** (329)		9060		1	CCP	08/29/18 18:39	mg/kg	[CALC]
Total Organic Carbon (Average)	**76700** (381)		LK		1	CCP	08/29/18 16:35	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS622
Date Sampled: 08/15/18 12:55
Percent Solids: 80
Initial Volume: 15.099
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-04
Sample Matrix: Soil
Units: mg/Kg dry
Analyst: NL
Prepared: 8/27/18 12:38

Saturated Hydrocarbons by GC/FID

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C-8	ND (0.166)	0.083	8015 Mod		1	NL	08/29/18 17:07	F8I0002	FH82701
C-9	ND (0.166)	0.083	8015 Mod		1	NL	08/29/18 17:07	F8I0002	FH82701
C-10	**0.178** (0.166)	0.083	8015 Mod		1	NL	08/29/18 17:07	F8I0002	FH82701
C-11	**J 0.114** (0.166)	0.083	8015 Mod		1	NL	08/29/18 17:07	F8I0002	FH82701
C-12	**0.210** (0.166)	0.083	8015 Mod		1	NL	08/29/18 17:07	F8I0002	FH82701
C-13	ND (0.166)	0.083	8015 Mod		1	NL	08/29/18 17:07	F8I0002	FH82701
2,6,10-trimethyldodecane (1380)	**0.210** (0.166)	0.083	8015 Mod		1	NL	08/29/18 17:07	F8I0002	FH82701
C-14	**0.234** (0.166)	0.083	8015 Mod		1	NL	08/29/18 17:07	F8I0002	FH82701
2,6,10-trimethyltridecane (1470)	**0.326** (0.166)	0.083	8015 Mod		1	NL	08/29/18 17:07	F8I0002	FH82701
C-15	ND (0.166)	0.083	8015 Mod		1	NL	08/29/18 17:07	F8I0002	FH82701
C-16	ND (0.166)	0.083	8015 Mod		1	NL	08/29/18 17:07	F8I0002	FH82701
2,6,10-trimethylpentadecane (1650)	**0.390** (0.166)	0.083	8015 Mod		1	NL	08/29/18 17:07	F8I0002	FH82701
C-17	**J 0.110** (0.166)	0.083	8015 Mod		1	NL	08/29/18 17:07	F8I0002	FH82701
Pristane	**0.367** (0.166)	0.083	8015 Mod		1	NL	08/29/18 17:07	F8I0002	FH82701
C-18	**J 0.130** (0.166)	0.083	8015 Mod		1	NL	08/29/18 17:07	F8I0002	FH82701
Phytane	**0.423** (0.166)	0.083	8015 Mod		1	NL	08/29/18 17:07	F8I0002	FH82701
C-19	**0.205** (0.166)	0.083	8015 Mod		1	NL	08/29/18 17:07	F8I0002	FH82701
C-20	ND (0.166)	0.083	8015 Mod		1	NL	08/29/18 17:07	F8I0002	FH82701
C-21	ND (0.166)	0.083	8015 Mod		1	NL	08/29/18 17:07	F8I0002	FH82701
C-22	ND (0.166)	0.083	8015 Mod		1	NL	08/29/18 17:07	F8I0002	FH82701
C-23	ND (0.166)	0.083	8015 Mod		1	NL	08/29/18 17:07	F8I0002	FH82701
C-24	ND (0.166)	0.083	8015 Mod		1	NL	08/29/18 17:07	F8I0002	FH82701
C-25	ND (0.166)	0.083	8015 Mod		1	NL	08/29/18 17:07	F8I0002	FH82701
C-26	**J 0.143** (0.166)	0.083	8015 Mod		1	NL	08/29/18 17:07	F8I0002	FH82701
C-27	**0.363** (0.166)	0.083	8015 Mod		1	NL	08/29/18 17:07	F8I0002	FH82701
C-28	**J 0.157** (0.166)	0.083	8015 Mod		1	NL	08/29/18 17:07	F8I0002	FH82701
C-29	**0.471** (0.166)	0.083	8015 Mod		1	NL	08/29/18 17:07	F8I0002	FH82701
C-30	ND (0.166)	0.083	8015 Mod		1	NL	08/29/18 17:07	F8I0002	FH82701
C-31	**0.841** (0.166)	0.083	8015 Mod		1	NL	08/29/18 17:07	F8I0002	FH82701
C-32	**J 0.086** (0.166)	0.083	8015 Mod		1	NL	08/29/18 17:07	F8I0002	FH82701
C-33	**0.256** (0.166)	0.083	8015 Mod		1	NL	08/29/18 17:07	F8I0002	FH82701
C-34	**0.682** (0.166)	0.083	8015 Mod		1	NL	08/29/18 17:07	F8I0002	FH82701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS622
Date Sampled: 08/15/18 12:55
Percent Solids: 80
Initial Volume: 15.099
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-04
Sample Matrix: Soil
Units: mg/Kg dry
Analyst: NL
Prepared: 8/27/18 12:38

Saturated Hydrocarbons by GC/FID

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C-35	ND (0.166)	0.083	8015 Mod		1	NL	08/29/18 17:07	F8I0002	FH82701
C-36	ND (0.166)	0.083	8015 Mod		1	NL	08/29/18 17:07	F8I0002	FH82701
C-37	ND (0.166)	0.083	8015 Mod		1	NL	08/29/18 17:07	F8I0002	FH82701
C-38	ND (0.166)	0.083	8015 Mod		1	NL	08/29/18 17:07	F8I0002	FH82701
C-39	ND (0.166)	0.083	8015 Mod		1	NL	08/29/18 17:07	F8I0002	FH82701
C-40	ND (0.166)	0.083	8015 Mod		1	NL	08/29/18 17:07	F8I0002	FH82701
TPH (C8-C40)	**774** (0.166)	0.083	8015 Mod		1	NL	08/29/18 17:07	F8I0002	FH82701

	%Recovery	Qualifier	Limits
Surrogate: o-Terphenyl	*74 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS622
Date Sampled: 08/15/18 12:55
Percent Solids: 80
Initial Volume: 15.099
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/27/18 12:38

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **111** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
C1-Benzene	**59.7** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
C2-Benzenes	**75.1** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
C3-Benzenes	**17.7** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
C4-Benzenes	ND (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
C5-Benzenes	ND (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
Methylcyclohexane	**8.71** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
Toluene	**98.9** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
Ethylbenzene	**18.2** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
m,p-Xylene	**117** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
Styrene	**77.2** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
o-Xylene	**12.0** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
Isopropylbenzene	ND (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
n-Propylbenzene	**12.8** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
1,3,5-Trimethylbenzene	**11.4** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
1,2,3-Trimethylbenzene	**14.1** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
1,2,4-Trimethylbenzene	**33.3** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
t-Butylbenzene	**6.70** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
sec-Butylbenzene	ND (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
p-Isopropyltoluene	**8.61** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
n-Butylbenzene	**26.3** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
trans-Decalin	**164** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
cis-Decalin	**28.5** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
C1-Decalins	**107** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
C2-Decalins	**24.2** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
C3-Decalins	**10.4** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
C4-Decalins	**8.38** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
Benzo(b)thiophene	**15.6** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
C1-Benzo(b)thiophenes	**8.14** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
C2-Benzo(b)thiophenes	J **3.62** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
C3-Benzo(b)thiophenes	J **5.89** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
C4-Benzo(b)thiophenes	**6.86** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS622
Date Sampled: 08/15/18 12:55
Percent Solids: 80
Initial Volume: 15.099
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/27/18 12:38

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**155** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
2-Methylnaphthalene	**88.6** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
1-Methylnaphthalene	**49.6** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
C1-Naphthalenes	**51.5** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
C2-Naphthalenes	**20.1** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
C3-Naphthalenes	**60.8** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
C4-Naphthalenes	**29.8** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
Biphenyl	**44.8** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
Acenaphthylene	**823** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
Acenaphthene	**2190** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
Dibenzofuran	**60.9** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
Fluorene	**568** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
C1-Fluorenes	**74.1** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
C2-Fluorenes	**41.0** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
C3-Fluorenes	**17.7** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
Dibenzothiophene	**882** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
C1-Dibenzothiophenes	ND (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
C2-Dibenzothiophenes	**49.8** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
C3-Dibenzothiophenes	**8.87** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
C4-Dibenzothiophenes	**11.7** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
Phenanthrene	**3960** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
Anthracene	**1810** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
C1-Phenanthrenes/Anthracenes	**209** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
C2-Phenanthrenes/Anthracenes	**7.90** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
C3-Phenanthrenes/Anthracenes	**73.1** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
C4-Phenanthrenes/Anthracenes	**7.93** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
Retene	**53.3** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
Benzo(b)naphtho(2,1-d)thiophene	**487** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
C0-Benzonaphthothiophenes	**484** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
C1-Benzonaphthothiophenes	**45.8** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
C2-Benzonaphthothiophenes	**21.2** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
C3-Benzonaphthothiophenes	**27.2** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS622
Date Sampled: 08/15/18 12:55
Percent Solids: 80
Initial Volume: 15.099
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/27/18 12:38

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**9.75** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
Fluoranthene	**6930** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
Pyrene	**9320** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
C1-Fluoranthenes/Pyrenes	**623** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
C2-Fluoranthenes/Pyrenes	**7.92** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
C3-Fluoranthenes/Pyrenes	**J 3.82** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
Benzo(b)fluorene	ND (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
Benzo(c)fluorene	ND (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
2-Methylpyrene	**305** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
4-Methylpyrene	**197** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
1-Methylpyrene	**284** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
Benz(a)anthracene	**2790** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
Chrysene/triphenylene	**2450** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
C1-Benzo(a)anthracenes/Chrysenes	**72.9** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
C2-Benzo(a)anthracenes/Chrysenes	**21.4** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
C3-Benzo(a)anthracenes/Chrysenes	**J 6.62** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
C4-Benzo(a)anthracenes/Chrysenes	**J 6.42** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
Benzo(b)fluoranthene	**2080** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
Benzo(j/k)fluoranthene	**2040** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
Benzo(e)pyrene	**1810** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
Benzo(a)pyrene	**3270** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
Perylene	**646** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
Indeno(1,2,3-cd)pyrene	**1920** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
Dibenzo(a,h)anthracene	**419** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
Benzo(g,h,i)perylene	**1650** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
Coronene	**436** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
Tetramethyl lead	ND (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
Trimethylethyl lead	ND (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
Dimethyldiethyl lead	ND (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
Methyltriethyl lead	ND (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
Tetraethyl lead	ND (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
Carbazole	**71.2** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS622
Date Sampled: 08/15/18 12:55
Percent Solids: 80
Initial Volume: 15.099
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/27/18 12:38

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**48.2** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
2,3,5-Trimethylnaphthene	**13.0** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
4-Methyldibenzothiophene	**167** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
2/3-Methyldibenzothiophene	**172** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
1-Methyldibenzothiophene	**51.6** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
3-Methylphenanthrene	**376** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
2-Methylphenanthrene	**348** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
2-Methylanthracene	**209** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
4/9-Methylphenanthrene	**236** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701
1-Methylphenanthrene	**249** (6.66)	3.33	8270 Mod		4	08/29/18 22:54	F8H0005	FH82701

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*75 %*		*50-120*
Surrogate: Naphthalene-d8	*77 %*		*50-120*
Surrogate: Phenanthrene-d10	*87 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS622
Date Sampled: 08/15/18 12:55
Percent Solids: 77
Initial Volume: 26
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.210)		8260B		1	08/27/18 14:01	C8H0485	CH82731
Ethylbenzene	ND (0.210)		8260B		1	08/27/18 14:01	C8H0485	CH82731
Toluene	ND (0.210)		8260B		1	08/27/18 14:01	C8H0485	CH82731
Xylene O	ND (0.210)		8260B		1	08/27/18 14:01	C8H0485	CH82731
Xylene P,M	ND (0.420)		8260B		1	08/27/18 14:01	C8H0485	CH82731
Xylenes (Total)	ND (0.420)		8260B		200	08/27/18 14:01		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*103 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*95 %*		*70-130*
Surrogate: Dibromofluoromethane	*102 %*		*70-130*
Surrogate: Toluene-d8	*92 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS623
Date Sampled: 08/15/18 12:55
Percent Solids: 57
Initial Volume: 14.541
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-05
Sample Matrix: Soil
Units: mg/Kg dry
Analyst: NL
Prepared: 8/27/18 12:38

Saturated Hydrocarbons by GC/FID

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C-8	ND (0.240)	0.120	8015 Mod		1	NL	08/29/18 13:03	F8I0002	FH82701
C-9	ND (0.240)	0.120	8015 Mod		1	NL	08/29/18 13:03	F8I0002	FH82701
C-10	ND (0.240)	0.120	8015 Mod		1	NL	08/29/18 13:03	F8I0002	FH82701
C-11	ND (0.240)	0.120	8015 Mod		1	NL	08/29/18 13:03	F8I0002	FH82701
C-12	ND (0.240)	0.120	8015 Mod		1	NL	08/29/18 13:03	F8I0002	FH82701
C-13	ND (0.240)	0.120	8015 Mod		1	NL	08/29/18 13:03	F8I0002	FH82701
2,6,10-trimethyldodecane (1380)	ND (0.240)	0.120	8015 Mod		1	NL	08/29/18 13:03	F8I0002	FH82701
C-14	ND (0.240)	0.120	8015 Mod		1	NL	08/29/18 13:03	F8I0002	FH82701
2,6,10-trimethyltridecane (1470)	ND (0.240)	0.120	8015 Mod		1	NL	08/29/18 13:03	F8I0002	FH82701
C-15	ND (0.240)	0.120	8015 Mod		1	NL	08/29/18 13:03	F8I0002	FH82701
C-16	ND (0.240)	0.120	8015 Mod		1	NL	08/29/18 13:03	F8I0002	FH82701
2,6,10-trimethylpentadecane (1650)	ND (0.240)	0.120	8015 Mod		1	NL	08/29/18 13:03	F8I0002	FH82701
C-17	**0.249** (0.240)	0.120	8015 Mod		1	NL	08/29/18 13:03	F8I0002	FH82701
Pristane	ND (0.240)	0.120	8015 Mod		1	NL	08/29/18 13:03	F8I0002	FH82701
C-18	**J 0.122** (0.240)	0.120	8015 Mod		1	NL	08/29/18 13:03	F8I0002	FH82701
Phytane	ND (0.240)	0.120	8015 Mod		1	NL	08/29/18 13:03	F8I0002	FH82701
C-19	**J 0.216** (0.240)	0.120	8015 Mod		1	NL	08/29/18 13:03	F8I0002	FH82701
C-20	**J 0.148** (0.240)	0.120	8015 Mod		1	NL	08/29/18 13:03	F8I0002	FH82701
C-21	**0.300** (0.240)	0.120	8015 Mod		1	NL	08/29/18 13:03	F8I0002	FH82701
C-22	**J 0.165** (0.240)	0.120	8015 Mod		1	NL	08/29/18 13:03	F8I0002	FH82701
C-23	**0.495** (0.240)	0.120	8015 Mod		1	NL	08/29/18 13:03	F8I0002	FH82701
C-24	**0.361** (0.240)	0.120	8015 Mod		1	NL	08/29/18 13:03	F8I0002	FH82701
C-25	**2.22** (0.240)	0.120	8015 Mod		1	NL	08/29/18 13:03	F8I0002	FH82701
C-26	**0.360** (0.240)	0.120	8015 Mod		1	NL	08/29/18 13:03	F8I0002	FH82701
C-27	**4.14** (0.240)	0.120	8015 Mod		1	NL	08/29/18 13:03	F8I0002	FH82701
C-28	**0.597** (0.240)	0.120	8015 Mod		1	NL	08/29/18 13:03	F8I0002	FH82701
C-29	**2.87** (0.240)	0.120	8015 Mod		1	NL	08/29/18 13:03	F8I0002	FH82701
C-30	**0.283** (0.240)	0.120	8015 Mod		1	NL	08/29/18 13:03	F8I0002	FH82701
C-31	**2.61** (0.240)	0.120	8015 Mod		1	NL	08/29/18 13:03	F8I0002	FH82701
C-32	**1.01** (0.240)	0.120	8015 Mod		1	NL	08/29/18 13:03	F8I0002	FH82701
C-33	**1.31** (0.240)	0.120	8015 Mod		1	NL	08/29/18 13:03	F8I0002	FH82701
C-34	**3.60** (0.240)	0.120	8015 Mod		1	NL	08/29/18 13:03	F8I0002	FH82701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS623
Date Sampled: 08/15/18 12:55
Percent Solids: 57
Initial Volume: 14.541
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-05
Sample Matrix: Soil
Units: mg/Kg dry
Analyst: NL
Prepared: 8/27/18 12:38

Saturated Hydrocarbons by GC/FID

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C-35	ND (0.240)	0.120	8015 Mod		1	NL	08/29/18 13:03	F8I0002	FH82701
C-36	ND (0.240)	0.120	8015 Mod		1	NL	08/29/18 13:03	F8I0002	FH82701
C-37	**1.10** (0.240)	0.120	8015 Mod		1	NL	08/29/18 13:03	F8I0002	FH82701
C-38	ND (0.240)	0.120	8015 Mod		1	NL	08/29/18 13:03	F8I0002	FH82701
C-39	ND (0.240)	0.120	8015 Mod		1	NL	08/29/18 13:03	F8I0002	FH82701
C-40	ND (0.240)	0.120	8015 Mod		1	NL	08/29/18 13:03	F8I0002	FH82701
TPH (C8-C40)	**481** (0.240)	0.120	8015 Mod		1	NL	08/29/18 13:03	F8I0002	FH82701

	%Recovery	Qualifier	Limits
Surrogate: o-Terphenyl	*74 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS623
Date Sampled: 08/15/18 12:55
Percent Solids: 57
Initial Volume: 14.541
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/27/18 12:38

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **45.5** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
C1-Benzene	**145** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
C2-Benzenes	**84.1** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
C3-Benzenes	**24.6** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
C4-Benzenes	**18.9** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
C5-Benzenes	**13.0** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
Methylcyclohexane	**3.40** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
Toluene	**229** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
Ethylbenzene	**10.5** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
m,p-Xylene	**116** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
Styrene	**51.4** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
o-Xylene	**9.06** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
Isopropylbenzene	ND (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
n-Propylbenzene	**4.02** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
1,3,5-Trimethylbenzene	**8.00** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
1,2,3-Trimethylbenzene	**4.66** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
1,2,4-Trimethylbenzene	**9.05** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
t-Butylbenzene	ND (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
sec-Butylbenzene	ND (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
p-Isopropyltoluene	**20.1** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
n-Butylbenzene	**6.78** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
trans-Decalin	J **1.97** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
cis-Decalin	ND (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
C1-Decalins	**10.9** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
C2-Decalins	**23.0** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
C3-Decalins	**16.5** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
C4-Decalins	**20.3** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
Benzo(b)thiophene	**3.40** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
C1-Benzo(b)thiophenes	**4.35** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
C2-Benzo(b)thiophenes	**8.46** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
C3-Benzo(b)thiophenes	**5.20** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
C4-Benzo(b)thiophenes	**3.42** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS623
Date Sampled: 08/15/18 12:55
Percent Solids: 57
Initial Volume: 14.541
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/27/18 12:38

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**88.5** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
2-Methylnaphthalene	**61.1** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
1-Methylnaphthalene	**21.3** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
C1-Naphthalenes	**47.3** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
C2-Naphthalenes	**79.3** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
C3-Naphthalenes	**74.8** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
C4-Naphthalenes	**83.1** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
Biphenyl	**28.8** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
Acenaphthylene	**169** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
Acenaphthene	**22.5** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
Dibenzofuran	**35.2** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
Fluorene	**61.1** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
C1-Fluorenes	**95.7** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
C2-Fluorenes	**186** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
C3-Fluorenes	**187** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
Dibenzothiophene	**25.3** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
C1-Dibenzothiophenes	**58.1** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
C2-Dibenzothiophenes	**109** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
C3-Dibenzothiophenes	**79.9** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
C4-Dibenzothiophenes	**52.8** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
Phenanthrene	**478** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
Anthracene	**321** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
C1-Phenanthrenes/Anthracenes	**833** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
C2-Phenanthrenes/Anthracenes	**951** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
C3-Phenanthrenes/Anthracenes	**568** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
C4-Phenanthrenes/Anthracenes	**266** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
Retene	**224** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
Benzo(b)naphtho(2,1-d)thiophene	**106** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
C0-Benzonaphthothiophenes	**240** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
C1-Benzonaphthothiophenes	**217** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
C2-Benzonaphthothiophenes	**146** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
C3-Benzonaphthothiophenes	**96.4** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS623
Date Sampled: 08/15/18 12:55
Percent Solids: 57
Initial Volume: 14.541
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/27/18 12:38

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**22.7** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
Fluoranthene	**1860** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
Pyrene	**3100** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
C1-Fluoranthenes/Pyrenes	**3090** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
C2-Fluoranthenes/Pyrenes	**1250** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
C3-Fluoranthenes/Pyrenes	**565** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
Benzo(b)fluorene	**327** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
Benzo(c)fluorene	**135** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
2-Methylpyrene	**444** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
4-Methylpyrene	**468** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
1-Methylpyrene	**363** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
Benz(a)anthracene	**1760** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
Chrysene/triphenylene	**1770** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
C1-Benzo(a)anthracenes/Chrysenes	**1490** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
C2-Benzo(a)anthracenes/Chrysenes	**800** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
C3-Benzo(a)anthracenes/Chrysenes	**361** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
C4-Benzo(a)anthracenes/Chrysenes	**157** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
Benzo(b)fluoranthene	**1280** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
Benzo(j/k)fluoranthene	**1230** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
Benzo(e)pyrene	**1550** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
Benzo(a)pyrene	**2080** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
Perylene	**616** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
Indeno(1,2,3-cd)pyrene	**1050** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
Dibenzo(a,h)anthracene	**322** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
Benzo(g,h,i)perylene	**1080** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
Coronene	**237** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
Tetramethyl lead	ND (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
Trimethylethyl lead	ND (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
Dimethyldiethyl lead	ND (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
Methyltriethyl lead	ND (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
Tetraethyl lead	ND (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
Carbazole	**15.0** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS623
Date Sampled: 08/15/18 12:55
Percent Solids: 57
Initial Volume: 14.541
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/27/18 12:38

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**28.4** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
2,3,5-Trimethylnaphthene	**5.45** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
4-Methyldibenzothiophene	**14.0** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
2/3-Methyldibenzothiophene	**20.6** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
1-Methyldibenzothiophene	**6.05** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
3-Methylphenanthrene	**149** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
2-Methylphenanthrene	**167** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
2-Methylanthracene	**199** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
4/9-Methylphenanthrene	**226** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701
1-Methylphenanthrene	**93.6** (2.40)	1.20	8270 Mod		1	08/29/18 16:13	F8H0005	FH82701

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*73 %*		*50-120*
Surrogate: Naphthalene-d8	*79 %*		*50-120*
Surrogate: Phenanthrene-d10	*83 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS623
Date Sampled: 08/15/18 12:55
Percent Solids: 56
Initial Volume: 24.1
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.376)		8260B		1	08/27/18 14:27	C8H0485	CH82731
Ethylbenzene	ND (0.376)		8260B		1	08/27/18 14:27	C8H0485	CH82731
Toluene	ND (0.376)		8260B		1	08/27/18 14:27	C8H0485	CH82731
Xylene O	ND (0.376)		8260B		1	08/27/18 14:27	C8H0485	CH82731
Xylene P,M	ND (0.752)		8260B		1	08/27/18 14:27	C8H0485	CH82731
Xylenes (Total)	ND (0.752)		8260B		200	08/27/18 14:27		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*107 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*94 %*		*70-130*
Surrogate: Dibromofluoromethane	*107 %*		*70-130*
Surrogate: Toluene-d8	*98 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS624
Date Sampled: 08/15/18 13:25
Percent Solids: 65
Initial Volume: 15.07
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-06
Sample Matrix: Soil
Units: mg/Kg dry
Analyst: NL
Prepared: 8/27/18 12:38

Saturated Hydrocarbons by GC/FID

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C-8	ND (0.204)	0.102	8015 Mod		1	NL	08/29/18 14:23	F8I0002	FH82701
C-9	ND (0.204)	0.102	8015 Mod		1	NL	08/29/18 14:23	F8I0002	FH82701
C-10	ND (0.204)	0.102	8015 Mod		1	NL	08/29/18 14:23	F8I0002	FH82701
C-11	ND (0.204)	0.102	8015 Mod		1	NL	08/29/18 14:23	F8I0002	FH82701
C-12	ND (0.204)	0.102	8015 Mod		1	NL	08/29/18 14:23	F8I0002	FH82701
C-13	ND (0.204)	0.102	8015 Mod		1	NL	08/29/18 14:23	F8I0002	FH82701
2,6,10-trimethyldodecane (1380)	ND (0.204)	0.102	8015 Mod		1	NL	08/29/18 14:23	F8I0002	FH82701
C-14	ND (0.204)	0.102	8015 Mod		1	NL	08/29/18 14:23	F8I0002	FH82701
2,6,10-trimethyltridecane (1470)	**0.544** (0.204)	0.102	8015 Mod		1	NL	08/29/18 14:23	F8I0002	FH82701
C-15	ND (0.204)	0.102	8015 Mod		1	NL	08/29/18 14:23	F8I0002	FH82701
C-16	ND (0.204)	0.102	8015 Mod		1	NL	08/29/18 14:23	F8I0002	FH82701
2,6,10-trimethylpentadecane (1650)	**0.900** (0.204)	0.102	8015 Mod		1	NL	08/29/18 14:23	F8I0002	FH82701
C-17	**J 0.144** (0.204)	0.102	8015 Mod		1	NL	08/29/18 14:23	F8I0002	FH82701
Pristane	**J 0.113** (0.204)	0.102	8015 Mod		1	NL	08/29/18 14:23	F8I0002	FH82701
C-18	**J 0.178** (0.204)	0.102	8015 Mod		1	NL	08/29/18 14:23	F8I0002	FH82701
Phytane	ND (0.204)	0.102	8015 Mod		1	NL	08/29/18 14:23	F8I0002	FH82701
C-19	**0.283** (0.204)	0.102	8015 Mod		1	NL	08/29/18 14:23	F8I0002	FH82701
C-20	**J 0.108** (0.204)	0.102	8015 Mod		1	NL	08/29/18 14:23	F8I0002	FH82701
C-21	**0.381** (0.204)	0.102	8015 Mod		1	NL	08/29/18 14:23	F8I0002	FH82701
C-22	**J 0.189** (0.204)	0.102	8015 Mod		1	NL	08/29/18 14:23	F8I0002	FH82701
C-23	**0.569** (0.204)	0.102	8015 Mod		1	NL	08/29/18 14:23	F8I0002	FH82701
C-24	**0.206** (0.204)	0.102	8015 Mod		1	NL	08/29/18 14:23	F8I0002	FH82701
C-25	**2.11** (0.204)	0.102	8015 Mod		1	NL	08/29/18 14:23	F8I0002	FH82701
C-26	**0.655** (0.204)	0.102	8015 Mod		1	NL	08/29/18 14:23	F8I0002	FH82701
C-27	**4.39** (0.204)	0.102	8015 Mod		1	NL	08/29/18 14:23	F8I0002	FH82701
C-28	**0.328** (0.204)	0.102	8015 Mod		1	NL	08/29/18 14:23	F8I0002	FH82701
C-29	**2.52** (0.204)	0.102	8015 Mod		1	NL	08/29/18 14:23	F8I0002	FH82701
C-30	**0.408** (0.204)	0.102	8015 Mod		1	NL	08/29/18 14:23	F8I0002	FH82701
C-31	**2.19** (0.204)	0.102	8015 Mod		1	NL	08/29/18 14:23	F8I0002	FH82701
C-32	**0.915** (0.204)	0.102	8015 Mod		1	NL	08/29/18 14:23	F8I0002	FH82701
C-33	**0.893** (0.204)	0.102	8015 Mod		1	NL	08/29/18 14:23	F8I0002	FH82701
C-34	**5.29** (0.204)	0.102	8015 Mod		1	NL	08/29/18 14:23	F8I0002	FH82701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS624
Date Sampled: 08/15/18 13:25
Percent Solids: 65
Initial Volume: 15.07
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-06
Sample Matrix: Soil
Units: mg/Kg dry
Analyst: NL
Prepared: 8/27/18 12:38

Saturated Hydrocarbons by GC/FID

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C-35	**2.24** (0.204)	0.102	8015 Mod		1	NL	08/29/18 14:23	F8I0002	FH82701
C-36	ND (0.204)	0.102	8015 Mod		1	NL	08/29/18 14:23	F8I0002	FH82701
C-37	**1.65** (0.204)	0.102	8015 Mod		1	NL	08/29/18 14:23	F8I0002	FH82701
C-38	ND (0.204)	0.102	8015 Mod		1	NL	08/29/18 14:23	F8I0002	FH82701
C-39	ND (0.204)	0.102	8015 Mod		1	NL	08/29/18 14:23	F8I0002	FH82701
C-40	ND (0.204)	0.102	8015 Mod		1	NL	08/29/18 14:23	F8I0002	FH82701
TPH (C8-C40)	**666** (0.204)	0.102	8015 Mod		1	NL	08/29/18 14:23	F8I0002	FH82701

	%Recovery	Qualifier	Limits
Surrogate: o-Terphenyl	*75 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS624
Date Sampled: 08/15/18 13:25
Percent Solids: 65
Initial Volume: 15.07
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/27/18 12:38

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**156** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
C1-Benzene	**466** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
C2-Benzenes	**242** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
C3-Benzenes	**31.8** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
C4-Benzenes	**39.9** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
C5-Benzenes	**22.1** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
Methylcyclohexane	**J 1.17** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
Toluene	**727** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
Ethylbenzene	**215** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
m,p-Xylene	**214** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
Styrene	**45.0** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
o-Xylene	**28.4** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
Isopropylbenzene	**J 1.15** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
n-Propylbenzene	**6.00** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
1,3,5-Trimethylbenzene	**6.07** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
1,2,3-Trimethylbenzene	**6.04** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
1,2,4-Trimethylbenzene	**8.83** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
t-Butylbenzene	ND (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
sec-Butylbenzene	ND (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
p-Isopropyltoluene	**46.3** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
n-Butylbenzene	**17.8** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
trans-Decalin	**4.40** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
cis-Decalin	ND (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
C1-Decalins	**14.5** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
C2-Decalins	**26.3** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
C3-Decalins	**17.7** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
C4-Decalins	**33.9** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
Benzo(b)thiophene	**378** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
C1-Benzo(b)thiophenes	**166** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
C2-Benzo(b)thiophenes	**214** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
C3-Benzo(b)thiophenes	**127** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
C4-Benzo(b)thiophenes	**35.7** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS624
Date Sampled: 08/15/18 13:25
Percent Solids: 65
Initial Volume: 15.07
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/27/18 12:38

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**4070** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
2-Methylnaphthalene	**1430** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
1-Methylnaphthalene	**1180** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
C1-Naphthalenes	**1480** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
C2-Naphthalenes	**1930** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
C3-Naphthalenes	**1380** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
C4-Naphthalenes	**558** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
Biphenyl	**884** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
Acenaphthylene	**1650** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
Acenaphthene	**8180** (40.7)	20.4	8270 Mod		20	08/30/18 8:48	F8H0005	FH82701
Dibenzofuran	**659** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
Fluorene	**4090** (40.7)	20.4	8270 Mod		20	08/30/18 8:48	F8H0005	FH82701
C1-Fluorenes	**1320** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
C2-Fluorenes	**766** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
C3-Fluorenes	**360** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
Dibenzothiophene	**2740** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
C1-Dibenzothiophenes	**1270** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
C2-Dibenzothiophenes	**627** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
C3-Dibenzothiophenes	**312** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
C4-Dibenzothiophenes	**108** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
Phenanthrene	**23600** (40.7)	20.4	8270 Mod		20	08/30/18 8:48	F8H0005	FH82701
Anthracene	**7610** (40.7)	20.4	8270 Mod		20	08/30/18 8:48	F8H0005	FH82701
C1-Phenanthrenes/Anthracenes	**8220** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
C2-Phenanthrenes/Anthracenes	**3080** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
C3-Phenanthrenes/Anthracenes	**988** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
C4-Phenanthrenes/Anthracenes	**365** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
Retene	**244** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
Benzo(b)naphtho(2,1-d)thiophene	**1090** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
C0-Benzonaphthothiophenes	**2410** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
C1-Benzonaphthothiophenes	**854** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
C2-Benzonaphthothiophenes	**338** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
C3-Benzonaphthothiophenes	**171** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS624
Date Sampled: 08/15/18 13:25
Percent Solids: 65
Initial Volume: 15.07
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/27/18 12:38

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**33.4** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
Fluoranthene	**17700** (40.7)	20.4	8270 Mod		20	08/30/18 8:48	F8H0005	FH82701
Pyrene	**22600** (40.7)	20.4	8270 Mod		20	08/30/18 8:48	F8H0005	FH82701
C1-Fluoranthenes/Pyrenes	**9100** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
C2-Fluoranthenes/Pyrenes	**2140** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
C3-Fluoranthenes/Pyrenes	**754** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
Benzo(b)fluorene	**1460** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
Benzo(c)fluorene	**500** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
2-Methylpyrene	**1130** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
4-Methylpyrene	**911** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
1-Methylpyrene	**1000** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
Benz(a)anthracene	**7400** (40.7)	20.4	8270 Mod		20	08/30/18 8:48	F8H0005	FH82701
Chrysene/triphenylene	**5730** (40.7)	20.4	8270 Mod		20	08/30/18 8:48	F8H0005	FH82701
C1-Benzo(a)anthracenes/Chrysenes	**2450** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
C2-Benzo(a)anthracenes/Chrysenes	**998** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
C3-Benzo(a)anthracenes/Chrysenes	**435** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
C4-Benzo(a)anthracenes/Chrysenes	**253** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
Benzo(b)fluoranthene	**3920** (40.7)	20.4	8270 Mod		20	08/30/18 8:48	F8H0005	FH82701
Benzo(j/k)fluoranthene	**4690** (40.7)	20.4	8270 Mod		20	08/30/18 8:48	F8H0005	FH82701
Benzo(e)pyrene	**3670** (40.7)	20.4	8270 Mod		20	08/30/18 8:48	F8H0005	FH82701
Benzo(a)pyrene	**7240** (40.7)	20.4	8270 Mod		20	08/30/18 8:48	F8H0005	FH82701
Perylene	**1210** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
Indeno(1,2,3-cd)pyrene	**3680** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
Dibenzo(a,h)anthracene	**822** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
Benzo(g,h,i)perylene	**3170** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
Coronene	**915** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
Tetramethyl lead	ND (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
Trimethylethyl lead	ND (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
Dimethyldiethyl lead	ND (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
Methyltriethyl lead	ND (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
Tetraethyl lead	ND (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
Carbazole	**136** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS624
Date Sampled: 08/15/18 13:25
Percent Solids: 65
Initial Volume: 15.07
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/27/18 12:38

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**446** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
2,3,5-Trimethylnaphthene	**116** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
4-Methyldibenzothiophene	**389** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
2/3-Methyldibenzothiophene	**440** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
1-Methyldibenzothiophene	**140** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
3-Methylphenanthrene	**1970** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
2-Methylphenanthrene	**2170** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
2-Methylanthracene	**1290** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
4/9-Methylphenanthrene	**1680** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701
1-Methylphenanthrene	**1120** (2.04)	1.02	8270 Mod		1	08/29/18 17:34	F8H0005	FH82701

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*77 %*		*50-120*
Surrogate: Naphthalene-d8	*85 %*		*50-120*
Surrogate: Phenanthrene-d10	*88 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS624
Date Sampled: 08/15/18 13:25
Percent Solids: 59
Initial Volume: 16.1
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (0.460)		8260B		1	08/27/18 14:54	C8H0485	CH82731
Ethylbenzene	ND (0.460)		8260B		1	08/27/18 14:54	C8H0485	CH82731
Toluene	ND (0.460)		8260B		1	08/27/18 14:54	C8H0485	CH82731
Xylene O	ND (0.460)		8260B		1	08/27/18 14:54	C8H0485	CH82731
Xylene P,M	ND (0.921)		8260B		1	08/27/18 14:54	C8H0485	CH82731
Xylenes (Total)	ND (0.921)		8260B		200	08/27/18 14:54		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*130 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*111 %*		*70-130*
Surrogate: Dibromofluoromethane	*130 %*		*70-130*
Surrogate: Toluene-d8	*110 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 044752-SS624
Date Sampled: 08/15/18 13:25
Percent Solids: 59

ESS Laboratory Work Order: F180046
ESS Laboratory Sample ID: F180046-06
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Black Carbon (Average)	**4110** (320)		9060		1	CCP	08/29/18 19:56	mg/kg	[CALC]
Total Organic Carbon (Average)	**17600** (276)		LK		1	CCP	08/29/18 19:54	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F180046

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch CH82731 - 5035										
Blank										
Benzene	ND	0.200	mg/kg wet							
Ethylbenzene	ND	0.200	mg/kg wet							
Toluene	ND	0.200	mg/kg wet							
Xylene O	ND	0.200	mg/kg wet							
Xylene P,M	ND	0.400	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*4.85*		mg/kg wet	*5.000*		*97*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*4.84*		mg/kg wet	*5.000*		*97*	*70-130*			
Surrogate: Dibromofluoromethane	*4.99*		mg/kg wet	*5.000*		*100*	*70-130*			
Surrogate: Toluene-d8	*4.76*		mg/kg wet	*5.000*		*95*	*70-130*			
LCS										
Benzene	2.26	0.200	mg/kg wet	2.000		113	70-130			
Ethylbenzene	2.11	0.200	mg/kg wet	2.000		106	70-130			
Toluene	2.26	0.200	mg/kg wet	2.000		113	70-130			
Xylene O	2.15	0.200	mg/kg wet	2.000		107	70-130			
Xylene P,M	4.21	0.400	mg/kg wet	4.000		105	70-130			
Surrogate: 1,2-Dichloroethane-d4	*4.91*		mg/kg wet	*5.000*		*98*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*5.06*		mg/kg wet	*5.000*		*101*	*70-130*			
Surrogate: Dibromofluoromethane	*5.19*		mg/kg wet	*5.000*		*104*	*70-130*			
Surrogate: Toluene-d8	*4.85*		mg/kg wet	*5.000*		*97*	*70-130*			
LCS Dup										
Benzene	2.18	0.200	mg/kg wet	2.000		109	70-130	4	20	
Ethylbenzene	1.95	0.200	mg/kg wet	2.000		98	70-130	8	20	
Toluene	2.15	0.200	mg/kg wet	2.000		107	70-130	5	20	
Xylene O	1.96	0.200	mg/kg wet	2.000		98	70-130	9	20	
Xylene P,M	3.98	0.400	mg/kg wet	4.000		99	70-130	6	20	
Surrogate: 1,2-Dichloroethane-d4	*4.48*		mg/kg wet	*5.000*		*90*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*4.69*		mg/kg wet	*5.000*		*94*	*70-130*			
Surrogate: Dibromofluoromethane	*4.93*		mg/kg wet	*5.000*		*99*	*70-130*			
Surrogate: Toluene-d8	*4.53*		mg/kg wet	*5.000*		*91*	*70-130*			
Classical Chemistry										
Batch CH82856 - General Preparation										
Blank										
Black Carbon (1)	ND	100	mg/kg							
Black Carbon (2)	ND	100	mg/kg							
Total Organic Carbon (1)	ND	100	mg/kg							
Total Organic Carbon (2)	ND	100	mg/kg							
Total Organic Carbon (3)	ND	100	mg/kg							
Total Organic Carbon (4)	ND	100	mg/kg							
LCS										
Total Organic Carbon (1)	9970	100	mg/kg	10000		100	80-120			
Total Organic Carbon (2)	9850	100	mg/kg	10000		98	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F180046

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Classical Chemistry										
Batch CH82856 - General Preparation										
LCS										
Black Carbon (1)	9970	100	mg/kg	10000		100	80-120			
Black Carbon (2)	9850	100	mg/kg	10000		98	80-120			
LCS Dup										
Black Carbon (1)	9820	100	mg/kg	10000		98	80-120	2	200	
Black Carbon (2)	9840	100	mg/kg	10000		98	80-120	0.1	200	
Reference										
Total Organic Carbon (1)	1.5		%	1.560		96	0-200			
Total Organic Carbon (2)	1.5		%	1.560		98	0-200			

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Saturated Hydrocarbons by GC/FID										
Batch FH82701 - 3570										
Blank										
2,6,10-trimethyldodecane (1380)	ND	0.143	mg/Kg wet							
2,6,10-trimethylpentadecane (1650)	ND	0.143	mg/Kg wet							
2,6,10-trimethyltridecane (1470)	ND	0.143	mg/Kg wet							
C-10	ND	0.143	mg/Kg wet							
C-11	ND	0.143	mg/Kg wet							
C-12	ND	0.143	mg/Kg wet							
C-13	ND	0.143	mg/Kg wet							
C-14	ND	0.143	mg/Kg wet							
C-15	ND	0.143	mg/Kg wet							
C-16	ND	0.143	mg/Kg wet							
C-17	ND	0.143	mg/Kg wet							
C-18	ND	0.143	mg/Kg wet							
C-19	ND	0.143	mg/Kg wet							
C-20	ND	0.143	mg/Kg wet							
C-21	ND	0.143	mg/Kg wet							
C-22	ND	0.143	mg/Kg wet							
C-23	ND	0.143	mg/Kg wet							
C-24	ND	0.143	mg/Kg wet							
C-25	ND	0.143	mg/Kg wet							
C-26	ND	0.143	mg/Kg wet							
C-27	ND	0.143	mg/Kg wet							
C-28	ND	0.143	mg/Kg wet							
C-29	ND	0.143	mg/Kg wet							
C-30	ND	0.143	mg/Kg wet							
C-31	ND	0.143	mg/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F180046

Quality Control Data

Saturated Hydrocarbons by GC/FID

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch FH82701 - 3570										
C-32	ND	0.143	mg/Kg wet							
C-33	ND	0.143	mg/Kg wet							
C-34	ND	0.143	mg/Kg wet							
C-35	ND	0.143	mg/Kg wet							
C-36	ND	0.143	mg/Kg wet							
C-37	ND	0.143	mg/Kg wet							
C-38	ND	0.143	mg/Kg wet							
C-39	ND	0.143	mg/Kg wet							
C-40	ND	0.143	mg/Kg wet							
C-8	ND	0.143	mg/Kg wet							
C-9	ND	0.143	mg/Kg wet							
Phytane	ND	0.143	mg/Kg wet							
Pristane	ND	0.143	mg/Kg wet							
TPH (C8-C40)	ND	0.143	mg/Kg wet							
Surrogate: o-Terphenyl	*2.73*		mg/Kg wet	*3.571*		*76*	*50-120*			
LCS										
C-10	2.91	0.143	mg/Kg wet	3.571		81	60-130			
C-11	3.03	0.143	mg/Kg wet	3.571		85	60-130			
C-12	3.15	0.143	mg/Kg wet	3.571		88	60-130			
C-13	3.05	0.143	mg/Kg wet	3.571		85	60-130			
C-14	3.02	0.143	mg/Kg wet	3.571		85	60-130			
C-15	2.98	0.143	mg/Kg wet	3.571		84	60-130			
C-16	2.98	0.143	mg/Kg wet	3.571		84	60-130			
C-17	2.95	0.143	mg/Kg wet	3.571		83	60-130			
C-18	2.90	0.143	mg/Kg wet	3.571		81	60-130			
C-19	2.93	0.143	mg/Kg wet	3.571		82	60-130			
C-20	2.93	0.143	mg/Kg wet	3.571		82	60-130			
C-21	2.91	0.143	mg/Kg wet	3.571		82	60-130			
C-22	2.91	0.143	mg/Kg wet	3.571		81	60-130			
C-23	2.90	0.143	mg/Kg wet	3.571		81	60-130			
C-24	2.89	0.143	mg/Kg wet	3.571		81	60-130			
C-25	2.96	0.143	mg/Kg wet	3.571		83	60-130			
C-26	2.89	0.143	mg/Kg wet	3.571		81	60-130			
C-27	2.88	0.143	mg/Kg wet	3.571		81	60-130			
C-28	2.76	0.143	mg/Kg wet	3.571		77	60-130			
C-29	2.87	0.143	mg/Kg wet	3.571		80	60-130			
C-30	2.86	0.143	mg/Kg wet	3.571		80	60-130			
C-31	2.87	0.143	mg/Kg wet	3.571		80	60-130			
C-32	2.87	0.143	mg/Kg wet	3.571		80	60-130			
C-33	2.86	0.143	mg/Kg wet	3.571		80	60-130			
C-34	2.87	0.143	mg/Kg wet	3.571		80	60-130			
C-35	2.87	0.143	mg/Kg wet	3.571		80	60-130			
C-36	2.87	0.143	mg/Kg wet	3.571		80	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F180046

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Saturated Hydrocarbons by GC/FID										
Batch FH82701 - 3570										
C-37	2.87	0.143	mg/Kg wet	3.571		80	60-130			
C-38	2.89	0.143	mg/Kg wet	3.571		81	60-130			
C-39	2.89	0.143	mg/Kg wet	3.571		81	60-130			
C-40	2.90	0.143	mg/Kg wet	3.571		81	60-130			
C-8	2.95	0.143	mg/Kg wet	3.571		82	60-130			
C-9	2.85	0.143	mg/Kg wet	3.571		80	60-130			
Phytane	2.95	0.143	mg/Kg wet	3.571		83	60-130			
Pristane	3.00	0.143	mg/Kg wet	3.571		84	60-130			
Surrogate: o-Terphenyl	*3.07*		mg/Kg wet	*3.571*		*86*	*50-120*			
Duplicate **Source: F180046-01**										
2,6,10-trimethyldodecane (1380)	3.05	0.243	mg/Kg dry		2.39			24	50	
2,6,10-trimethylpentadecane (1650)	3.61	0.243	mg/Kg dry		3.17			13	50	
2,6,10-trimethyltridecane (1470)	3.32	0.243	mg/Kg dry		3.06			8	50	
C-10	1.66	0.243	mg/Kg dry		1.50			10	50	
C-11	0.570	0.243	mg/Kg dry		0.526			8	50	
C-12	1.91	0.243	mg/Kg dry		1.59			18	50	
C-13	0.414	0.243	mg/Kg dry		0.326			24	50	
C-14	ND	0.243	mg/Kg dry		0.980				50	
C-15	ND	0.243	mg/Kg dry		0.160				50	
C-16	ND	0.243	mg/Kg dry		ND				50	
C-17	0.435	0.243	mg/Kg dry		0.413			5	50	
C-18	0.277	0.243	mg/Kg dry		0.253			9	50	
C-19	ND	0.243	mg/Kg dry		ND				50	
C-20	ND	0.243	mg/Kg dry		ND				50	
C-21	0.798	0.243	mg/Kg dry		0.690			14	50	
C-22	ND	0.243	mg/Kg dry		ND				50	
C-23	2.12	0.243	mg/Kg dry		1.74			20	50	
C-24	ND	0.243	mg/Kg dry		ND				50	
C-25	2.79	0.243	mg/Kg dry		2.15			26	50	
C-26	ND	0.243	mg/Kg dry		ND				50	
C-27	ND	0.243	mg/Kg dry		ND				50	
C-28	ND	0.243	mg/Kg dry		ND				50	
C-29	ND	0.243	mg/Kg dry		ND				50	
C-30	ND	0.243	mg/Kg dry		ND				50	
C-31	ND	0.243	mg/Kg dry		ND				50	
C-32	ND	0.243	mg/Kg dry		ND				50	
C-33	10.0	0.243	mg/Kg dry		7.05			35	50	
C-34	ND	0.243	mg/Kg dry		ND				50	
C-35	ND	0.243	mg/Kg dry		ND				50	
C-36	ND	0.243	mg/Kg dry		ND				50	
C-37	ND	0.243	mg/Kg dry		ND				50	
C-38	3.14	0.243	mg/Kg dry		1.96			46	50	
C-39	ND	0.243	mg/Kg dry		ND				50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F180046

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Saturated Hydrocarbons by GC/FID										
Batch FH82701 - 3570										
C-40	ND	0.243	mg/Kg dry		ND				50	
C-8	0.192	0.243	mg/Kg dry		0.173			10	50	J
C-9	0.439	0.243	mg/Kg dry		0.447			2	50	
Phytane	4.28	0.243	mg/Kg dry		3.85			11	50	
Pristane	4.03	0.243	mg/Kg dry		3.39			17	50	
TPH (C8-C40)	4210	0.243	mg/Kg dry		3610			15	50	
Surrogate: o-Terphenyl	*8.51*		mg/Kg dry	*12.13*		*70*	*50-120*			
8270D (SIM) Semi-Volatile Organic Compounds										
Batch FH82701 - 3570										
Blank										
1,2,3-Trimethylbenzene	ND	1.43	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	1.43	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	1.43	ug/Kg wet							
1-Methyldibenzothiophene	ND	1.43	ug/Kg wet							
1-Methylnaphthalene	ND	1.43	ug/Kg wet							
1-Methylphenanthrene	ND	1.43	ug/Kg wet							
1-Methylpyrene	ND	1.43	ug/Kg wet							
2,3,5-Trimethylnaphthene	ND	1.43	ug/Kg wet							
2,6,10-trimethyldodecane (1380)	ND	1.43	ug/Kg wet							
2,6,10-trimethylpentadecane (1650)	ND	1.43	ug/Kg wet							
2,6,10-trimethyltridecane (1470)	ND	1.43	ug/Kg wet							
2,6-Dimethylnaphthalene	ND	1.43	ug/Kg wet							
2/3-Methyldibenzothiophene	ND	1.43	ug/Kg wet							
2-Methylanthracene	ND	1.43	ug/Kg wet							
2-Methylnaphthalene	ND	1.43	ug/Kg wet							
2-Methylphenanthrene	ND	1.43	ug/Kg wet							
2-Methylpyrene	ND	1.43	ug/Kg wet							
3-Methylphenanthrene	ND	1.43	ug/Kg wet							
4/9-Methylphenanthrene	ND	1.43	ug/Kg wet							
4-Methyldibenzothiophene	ND	1.43	ug/Kg wet							
4-Methylpyrene	ND	1.43	ug/Kg wet							
Acenaphthene	ND	1.43	ug/Kg wet							
Acenaphthylene	ND	1.43	ug/Kg wet							
Anthracene	ND	1.43	ug/Kg wet							
Benz(a)anthracene	ND	1.43	ug/Kg wet							
Benzene	3.22	1.43	ug/Kg wet							
Benzo(a)pyrene	ND	1.43	ug/Kg wet							
Benzo(b)fluoranthene	ND	1.43	ug/Kg wet							
Benzo(b)fluorene	ND	1.43	ug/Kg wet							
Benzo(b)naphtho(2,1-d)thiophene	ND	1.43	ug/Kg wet							
Benzo(b)thiophene	ND	1.43	ug/Kg wet							
Benzo(c)fluorene	ND	1.43	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D (SIM) Semi-Volatile Organic Compounds										
Batch FH82701 - 3570										
Benzo(e)pyrene	ND	1.43	ug/Kg wet							
Benzo(g,h,i)perylene	ND	1.43	ug/Kg wet							
Benzo(j/k)fluoranthene	ND	1.43	ug/Kg wet							
Biphenyl	ND	1.43	ug/Kg wet							
C0-Benzonaphthothiophenes	ND	1.43	ug/Kg wet							
C-17	2.39	1.43	ug/Kg wet							
C-18	ND	1.43	ug/Kg wet							
C1-Benzene	ND	1.43	ug/Kg wet							
C1-Benzo(a)anthracenes/Chrysenes	ND	1.43	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	1.43	ug/Kg wet							
C1-Benzonaphthothiophenes	ND	1.43	ug/Kg wet							
C1-Decalins	ND	1.43	ug/Kg wet							
C1-Dibenzothiophenes	ND	1.43	ug/Kg wet							
C1-Fluoranthenes/Pyrenes	ND	1.43	ug/Kg wet							
C1-Fluorenes	ND	1.43	ug/Kg wet							
C1-Naphthalenes	ND	1.43	ug/Kg wet							
C1-Phenanthrenes/Anthracenes	ND	1.43	ug/Kg wet							
C2-Benzenes	ND	1.43	ug/Kg wet							
C2-Benzo(a)anthracenes/Chrysenes	ND	1.43	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	1.43	ug/Kg wet							
C2-Benzonaphthothiophenes	ND	1.43	ug/Kg wet							
C2-Decalins	ND	1.43	ug/Kg wet							
C2-Dibenzothiophenes	ND	1.43	ug/Kg wet							
C2-Fluoranthenes/Pyrenes	ND	1.43	ug/Kg wet							
C2-Fluorenes	ND	1.43	ug/Kg wet							
C2-Naphthalenes	ND	1.43	ug/Kg wet							
C2-Phenanthrenes/Anthracenes	ND	1.43	ug/Kg wet							
C3-Benzenes	ND	1.43	ug/Kg wet							
C3-Benzo(a)anthracenes/Chrysenes	ND	1.43	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	1.43	ug/Kg wet							
C3-Benzonaphthothiophenes	ND	1.43	ug/Kg wet							
C3-Decalins	ND	1.43	ug/Kg wet							
C3-Dibenzothiophenes	ND	1.43	ug/Kg wet							
C3-Fluoranthenes/Pyrenes	ND	1.43	ug/Kg wet							
C3-Fluorenes	ND	1.43	ug/Kg wet							
C3-Naphthalenes	ND	1.43	ug/Kg wet							
C3-Phenanthrenes/Anthracenes	ND	1.43	ug/Kg wet							
C4-Benzenes	ND	1.43	ug/Kg wet							
C4-Benzo(a)anthracenes/Chrysenes	ND	1.43	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	1.43	ug/Kg wet							
C4-Benzonaphthothiophenes	ND	1.43	ug/Kg wet							
C4-Decalins	ND	1.43	ug/Kg wet							
C4-Dibenzothiophenes	ND	1.43	ug/Kg wet							
C4-Naphthalenes	ND	1.43	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D (SIM) Semi-Volatile Organic Compounds										
Batch FH82701 - 3570										
C4-Phenanthrenes/Anthracenes	ND	1.43	ug/Kg wet							
C5-Benzenes	ND	1.43	ug/Kg wet							
Carbazole	ND	1.43	ug/Kg wet							
Chrysene/triphenylene	ND	1.43	ug/Kg wet							
cis-Decalin	ND	1.43	ug/Kg wet							
Coronene	ND	1.43	ug/Kg wet							
Dibenzo(a,h)anthracene	ND	1.43	ug/Kg wet							
Dibenzofuran	ND	1.43	ug/Kg wet							
Dibenzothiophene	ND	1.43	ug/Kg wet							
Dimethyldiethyl lead	ND	1.43	ug/Kg wet							
Ethylbenzene	ND	1.43	ug/Kg wet							
Fluoranthene	ND	1.43	ug/Kg wet							
Fluorene	ND	1.43	ug/Kg wet							
Indeno(1,2,3-cd)pyrene	ND	1.43	ug/Kg wet							
Isopropylbenzene	ND	1.43	ug/Kg wet							
m,p-Xylene	ND	1.43	ug/Kg wet							
Methylcyclohexane	ND	1.43	ug/Kg wet							
Methyltriethyl lead	ND	1.43	ug/Kg wet							
Naphthalene	ND	1.43	ug/Kg wet							
n-Butylbenzene	ND	1.43	ug/Kg wet							
n-Propylbenzene	ND	1.43	ug/Kg wet							
o-Xylene	ND	1.43	ug/Kg wet							
Perylene	ND	1.43	ug/Kg wet							
Phenanthrene	ND	1.43	ug/Kg wet							
Phytane	ND	1.43	ug/Kg wet							
p-Isopropyltoluene	ND	1.43	ug/Kg wet							
Pristane	2.41	1.43	ug/Kg wet							
Pyrene	ND	1.43	ug/Kg wet							
Retene	ND	1.43	ug/Kg wet							
sec-Butylbenzene	ND	1.43	ug/Kg wet							
Styrene	ND	1.43	ug/Kg wet							
t-Butylbenzene	ND	1.43	ug/Kg wet							
Tetraethyl lead	ND	1.43	ug/Kg wet							
Tetramethyl lead	ND	1.43	ug/Kg wet							
Toluene	ND	1.43	ug/Kg wet							
trans-Decalin	ND	1.43	ug/Kg wet							
Trimethylethyl lead	ND	1.43	ug/Kg wet							
Surrogate: Naphthalene-d8	*118*		ug/Kg wet	*142.9*		*82*	*50-120*			
Surrogate: Phenanthrene-d10	*125*		ug/Kg wet	*142.9*		*87*	*50-120*			
Surrogate: Toluene-D8	*119*		ug/Kg wet	*142.9*		*83*	*50-120*			
LCS										
1,2,3-Trimethylbenzene	125	1.43	ug/Kg wet	142.9		88	60-130			
1,2,4-Trimethylbenzene	124	1.43	ug/Kg wet	142.9		87	60-130			
1,3,5-Trimethylbenzene	127	1.43	ug/Kg wet	142.9		89	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
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Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FH82701 - 3570

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
1-Methylnaphthalene	126	1.43	ug/Kg wet	142.9		88	60-130			
2-Methylnaphthalene	125	1.43	ug/Kg wet	142.9		87	60-130			
Acenaphthene	137	1.43	ug/Kg wet	142.9		96	60-130			
Acenaphthylene	133	1.43	ug/Kg wet	142.9		93	60-130			
Anthracene	140	1.43	ug/Kg wet	142.9		98	60-130			
Benz(a)anthracene	149	1.43	ug/Kg wet	142.9		104	60-130			
Benzene	113	1.43	ug/Kg wet	142.9		79	60-130			
Benzo(a)pyrene	144	1.43	ug/Kg wet	142.9		100	60-130			
Benzo(b)fluoranthene	154	1.43	ug/Kg wet	142.9		108	60-130			
Benzo(b)naphtho(2,1-d)thiophene	154	1.43	ug/Kg wet	142.9		108	60-130			
Benzo(b)thiophene	129	1.43	ug/Kg wet	142.9		90	60-130			
Benzo(e)pyrene	138	1.43	ug/Kg wet	142.9		96	60-130			
Benzo(g,h,i)perylene	124	1.43	ug/Kg wet	142.9		87	60-130			
Benzo(j/k)fluoranthene	139	1.43	ug/Kg wet	142.9		97	60-130			
Biphenyl	128	1.43	ug/Kg wet	142.9		89	60-130			
Chrysene/triphenylene	138	1.43	ug/Kg wet	142.9		97	60-130			
cis-Decalin	133	1.43	ug/Kg wet	142.9		93	60-130			
Coronene	124	1.43	ug/Kg wet	142.9		87	60-130			
Dibenzo(a,h)anthracene	144	1.43	ug/Kg wet	142.9		101	60-130			
Dibenzofuran	136	1.43	ug/Kg wet	142.9		95	60-130			
Dibenzothiophene	134	1.43	ug/Kg wet	142.9		94	60-130			
Ethylbenzene	120	1.43	ug/Kg wet	142.9		84	60-130			
Fluoranthene	153	1.43	ug/Kg wet	142.9		107	60-130			
Fluorene	140	1.43	ug/Kg wet	142.9		98	60-130			
Indeno(1,2,3-cd)pyrene	153	1.43	ug/Kg wet	142.9		107	60-130			
Isopropylbenzene	131	1.43	ug/Kg wet	142.9		92	60-130			
m,p-Xylene	110	1.43	ug/Kg wet	142.9		77	60-130			
Methylcyclohexane	92.1	1.43	ug/Kg wet	142.9		65	60-130			
Naphthalene	116	1.43	ug/Kg wet	142.9		81	60-130			
n-Butylbenzene	122	1.43	ug/Kg wet	142.9		85	60-130			
n-Propylbenzene	121	1.43	ug/Kg wet	142.9		85	60-130			
o-Xylene	119	1.43	ug/Kg wet	142.9		83	60-130			
Perylene	139	1.43	ug/Kg wet	142.9		97	60-130			
Phenanthrene	138	1.43	ug/Kg wet	142.9		96	60-130			
Phytane	139	1.43	ug/Kg wet	142.9		97	60-130			
p-Isopropyltoluene	134	1.43	ug/Kg wet	142.9		94	60-130			
Pristane	143	1.43	ug/Kg wet	142.9		100	60-130			
Pyrene	151	1.43	ug/Kg wet	142.9		105	60-130			
Retene	164	1.43	ug/Kg wet	142.9		115	60-130			
sec-Butylbenzene	132	1.43	ug/Kg wet	142.9		92	60-130			
Styrene	125	1.43	ug/Kg wet	142.9		87	60-130			
t-Butylbenzene	134	1.43	ug/Kg wet	142.9		94	60-130			
Tetraethyl lead	159	1.43	ug/Kg wet	142.9		111	60-130			
Toluene	138	1.43	ug/Kg wet	142.9		96	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F180046

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D (SIM) Semi-Volatile Organic Compounds										
Batch FH82701 - 3570										
trans-Decalin	127	1.43	ug/Kg wet	142.9		89	60-130			
Surrogate: Naphthalene-d8	*133*		ug/Kg wet	*142.9*		*93*	*50-120*			
Surrogate: Phenanthrene-d10	*148*		ug/Kg wet	*142.9*		*104*	*50-120*			
Surrogate: Toluene-D8	*137*		ug/Kg wet	*142.9*		*96*	*50-120*			
Duplicate Source: F180046-01										**D+**
1,2,3-Trimethylbenzene	112	12.1	ug/Kg dry		106			6	50	
1,2,4-Trimethylbenzene	484	12.1	ug/Kg dry		409			17	50	
1,3,5-Trimethylbenzene	171	12.1	ug/Kg dry		141			19	50	
1-Methyldibenzothiophene	288	12.1	ug/Kg dry		196			38	50	
1-Methylnaphthalene	420	12.1	ug/Kg dry		445			6	50	
1-Methylphenanthrene	1480	12.1	ug/Kg dry		982			40	50	
1-Methylpyrene	2020	12.1	ug/Kg dry		1110			58	50	
2,3,5-Trimethylnaphthene	157	12.1	ug/Kg dry		135			15	50	
2,6,10-trimethyldodecane (1380)	1690	12.1	ug/Kg dry		1470			14	50	
2,6,10-trimethylpentadecane (1650)	2120	12.1	ug/Kg dry		1700			22	50	
2,6,10-trimethyltridecane (1470)	2280	12.1	ug/Kg dry		1960			15	50	
2,6-Dimethylnaphthalene	316	12.1	ug/Kg dry		281			12	50	
2/3-Methyldibenzothiophene	814	12.1	ug/Kg dry		504			47	50	
2-Methylanthracene	1330	12.1	ug/Kg dry		821			48	50	
2-Methylnaphthalene	779	12.1	ug/Kg dry		704			10	50	
2-Methylphenanthrene	3070	12.1	ug/Kg dry		1950			45	50	
2-Methylpyrene	2360	12.1	ug/Kg dry		1420			50	50	
3-Methylphenanthrene	2590	12.1	ug/Kg dry		1660			44	50	
4/9-Methylphenanthrene	2620	12.1	ug/Kg dry		1810			36	50	
4-Methyldibenzothiophene	917	12.1	ug/Kg dry		546			51	50	
4-Methylpyrene	2150	12.1	ug/Kg dry		1290			50	50	
Acenaphthene	2300	12.1	ug/Kg dry		2080			10	50	
Acenaphthylene	4430	12.1	ug/Kg dry		2780			46	50	
Anthracene	10500	12.1	ug/Kg dry		4150			87	50	
Benz(a)anthracene	15700	12.1	ug/Kg dry		8810			56	50	
Benzene	192	12.1	ug/Kg dry		149			25	50	B
Benzo(a)pyrene	18100	12.1	ug/Kg dry		9620			61	50	
Benzo(b)fluoranthene	11700	12.1	ug/Kg dry		7420			45	50	
Benzo(b)fluorene	2580	12.1	ug/Kg dry		1440			57	50	
Benzo(b)naphtho(2,1-d)thiophene	2880	12.1	ug/Kg dry		1450			66	50	
Benzo(b)thiophene	109	12.1	ug/Kg dry		85.8			24	50	
Benzo(c)fluorene	755	12.1	ug/Kg dry		566			29	50	
Benzo(e)pyrene	10500	12.1	ug/Kg dry		6200			51	50	
Benzo(g,h,i)perylene	9070	12.1	ug/Kg dry		5050			57	50	
Benzo(j/k)fluoranthene	12700	12.1	ug/Kg dry		7650			49	50	
Biphenyl	285	12.1	ug/Kg dry		222			25	50	
C0-Benzonaphthothiophenes	5380	12.1	ug/Kg dry		2700			66	50	
C-17	352	12.1	ug/Kg dry		285			21	50	
C-18	363	12.1	ug/Kg dry		313			15	50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
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ESS Laboratory Work Order: F180046

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D (SIM) Semi-Volatile Organic Compounds										
Batch FH82701 - 3570										
C1-Benzene	636	12.1	ug/Kg dry		543			16	50	
C1-Benzo(a)anthracenes/Chrysenes	6320	12.1	ug/Kg dry		4520			33	50	
C1-Benzo(b)thiophenes	106	12.1	ug/Kg dry		95.5			10	50	
C1-Benzonaphthothiophenes	2630	12.1	ug/Kg dry		1760			39	50	
C1-Decalins	2060	12.1	ug/Kg dry		1740			17	50	
C1-Dibenzothiophenes	2440	12.1	ug/Kg dry		1550			45	50	
C1-Fluoranthenes/Pyrenes	17500	12.1	ug/Kg dry		11100			45	50	
C1-Fluorenes	1400	12.1	ug/Kg dry		1100			24	50	
C1-Naphthalenes	685	12.1	ug/Kg dry		654			5	50	
C1-Phenanthrenes/Anthracenes	11100	12.1	ug/Kg dry		7220			42	50	
C2-Benzenes	657	12.1	ug/Kg dry		565			15	50	
C2-Benzo(a)anthracenes/Chrysenes	3050	12.1	ug/Kg dry		2430			23	50	
C2-Benzo(b)thiophenes	230	12.1	ug/Kg dry		200			14	50	
C2-Benzonaphthothiophenes	1900	12.1	ug/Kg dry		1450			27	50	
C2-Decalins	1600	12.1	ug/Kg dry		1450			10	50	
C2-Dibenzothiophenes	2870	12.1	ug/Kg dry		2080			32	50	
C2-Fluoranthenes/Pyrenes	5410	12.1	ug/Kg dry		4360			22	50	
C2-Fluorenes	1880	12.1	ug/Kg dry		1510			22	50	
C2-Naphthalenes	1670	12.1	ug/Kg dry		1510			10	50	
C2-Phenanthrenes/Anthracenes	6700	12.1	ug/Kg dry		5260			24	50	
C3-Benzenes	586	12.1	ug/Kg dry		494			17	50	
C3-Benzo(a)anthracenes/Chrysenes	1480	12.1	ug/Kg dry		1250			18	50	
C3-Benzo(b)thiophenes	443	12.1	ug/Kg dry		382			15	50	
C3-Benzonaphthothiophenes	1320	12.1	ug/Kg dry		1020			26	50	
C3-Decalins	1080	12.1	ug/Kg dry		909			17	50	
C3-Dibenzothiophenes	2290	12.1	ug/Kg dry		1870			21	50	
C3-Fluoranthenes/Pyrenes	2600	12.1	ug/Kg dry		2070			23	50	
C3-Fluorenes	1950	12.1	ug/Kg dry		1780			9	50	
C3-Naphthalenes	2300	12.1	ug/Kg dry		2050			11	50	
C3-Phenanthrenes/Anthracenes	3310	12.1	ug/Kg dry		2810			16	50	
C4-Benzenes	520	12.1	ug/Kg dry		460			12	50	
C4-Benzo(a)anthracenes/Chrysenes	820	12.1	ug/Kg dry		661			22	50	
C4-Benzo(b)thiophenes	245	12.1	ug/Kg dry		210			15	50	
C4-Benzonaphthothiophenes	527	12.1	ug/Kg dry		480			9	50	
C4-Decalins	1600	12.1	ug/Kg dry		1350			17	50	
C4-Dibenzothiophenes	1200	12.1	ug/Kg dry		1000			18	50	
C4-Naphthalenes	1720	12.1	ug/Kg dry		1480			15	50	
C4-Phenanthrenes/Anthracenes	1560	12.1	ug/Kg dry		1270			21	50	
C5-Benzenes	386	12.1	ug/Kg dry		342			12	50	
Carbazole	516	12.1	ug/Kg dry		493			5	50	
Chrysene/triphenylene	15400	12.1	ug/Kg dry		9260			50	50	
cis-Decalin	134	12.1	ug/Kg dry		118			13	50	
Coronene	2510	12.1	ug/Kg dry		1320			62	50	
Dibenzo(a,h)anthracene	2410	12.1	ug/Kg dry		1430			51	50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F180046

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D (SIM) Semi-Volatile Organic Compounds										
Batch FH82701 - 3570										
Dibenzofuran	483	12.1	ug/Kg dry		524			8	50	
Dibenzothiophene	1600	12.1	ug/Kg dry		1060			40	50	
Dimethyldiethyl lead	ND	12.1	ug/Kg dry		ND				50	
Ethylbenzene	149	12.1	ug/Kg dry		141			5	50	
Fluoranthene	34900	48.5	ug/Kg dry		21200			49	50	
Fluorene	1440	12.1	ug/Kg dry		1200			18	50	
Indeno(1,2,3-cd)pyrene	10800	12.1	ug/Kg dry		6230			53	50	
Isopropylbenzene	17.8	12.1	ug/Kg dry		17.9			0.4	50	
m,p-Xylene	860	12.1	ug/Kg dry		720			18	50	
Methylcyclohexane	82.7	12.1	ug/Kg dry		108			26	50	
Methyltriethyl lead	ND	12.1	ug/Kg dry		ND				50	
Naphthalene	1210	12.1	ug/Kg dry		1040			15	50	
n-Butylbenzene	113	12.1	ug/Kg dry		99.2			13	50	
n-Propylbenzene	83.3	12.1	ug/Kg dry		69.0			19	50	
o-Xylene	148	12.1	ug/Kg dry		142			4	50	
Perylene	3500	12.1	ug/Kg dry		2050			53	50	
Phenanthrene	16800	12.1	ug/Kg dry		11700			36	50	
Phytane	4730	12.1	ug/Kg dry		3800			22	50	
p-Isopropyltoluene	54.4	12.1	ug/Kg dry		49.7			9	50	
Pristane	5070	12.1	ug/Kg dry		4080			22	50	
Pyrene	42300	48.5	ug/Kg dry		23000			59	50	
Retene	235	12.1	ug/Kg dry		189			22	50	
sec-Butylbenzene	15.9	12.1	ug/Kg dry		14.8			7	50	
Styrene	248	12.1	ug/Kg dry		194			24	50	
t-Butylbenzene	ND	12.1	ug/Kg dry		ND				50	
Tetraethyl lead	ND	12.1	ug/Kg dry		ND				50	
Tetramethyl lead	ND	12.1	ug/Kg dry		ND				50	
Toluene	995	12.1	ug/Kg dry		855			15	50	
trans-Decalin	859	12.1	ug/Kg dry		728			16	50	
Trimethylethyl lead	ND	12.1	ug/Kg dry		ND				50	
Surrogate: Naphthalene-d8	*377*		ug/Kg dry	*485.2*		*78*	*50-120*			
Surrogate: Phenanthrene-d10	*387*		ug/Kg dry	*485.2*		*80*	*50-120*			
Surrogate: Toluene-D8	*360*		ug/Kg dry	*485.2*		*74*	*50-120*			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F180046

Notes and Definitions

X*	The non-homogeneity of the sample resulted in elevated RSD.
U	Analyte included in the analysis, but not detected
J	Reported between MDL and MRL
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F180046

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) F180046

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 044752

Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY REQUIRED -- YES NO

If Yes, Are MCP Analytical Methods Required? **YES** NO NA

Are Drinking Water Samples Submitted? YES **NO** NA

If Yes, Have Drinking Water Sampling Requirements Been Met? YES NO **NA**

Preservative

MeOH	None	None					

Analysis

Sample Handling

Samples Field Filtered: YES NO (NA)

Sampled Shipped With Ice: (YES) NO

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	VOCs by method 8620	TPH 8015M*	Parent and Alkylated MAHs & PAHs 8270**	TOC by Lloyd-Kahn	Black carbon by Lloyd Kahn				Sample Specific Remarks
1	044752-SS619	8/15/2018	1100	Soil	5	BFM/CS	x	x	x	x	x				
2	044752-SS620	8/15/2018	1220	Soil	5	BFM/CS	x	x	x	x	x				
3	044752-SS621	8/15/2018	1245	Soil	5	BFM/CS	x	x	x	x	x				
4	044752-SS622	8/15/2018	1255	Soil	5	BFM/CS	x	x	x	x	x				
5	044752-SS623	8/15/2018	1255	Soil	5	BFM/CS	x	x	x	x	x				
6	044752-SS624	8/15/2018	1325	Soil	5	BFM/CS	x	x	x	x	x				

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

	Date:	Time:	
Relinquished by sampler: (signature) 1. per verbal request Brian Fong. Murdock	8-15-18	1600	Received by: (signature) 1. GEI Sample Fridge
Relinquished by: (signature) 2. GEI Sample Fridge	8-23-18	1255	Received by: (signature) 2.
Relinquished by: (signature) 3.	8-23-18	1255	Received by: (signature) 3.
Relinquished by: (signature) 4.	8/23/18	16:06	Received by: (signature) 4. 8/23/18 1748

Ice temp: 4.9

Turnaround Time (Business days):

Normal ___x___ Other _____

10-Day _____ 7-Day _____

5-Day _____ 3-Day _____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

*Hydrocarbon Characterization by GC/FID Fingerprint, n-Alkanes, Isoprenoids

**Parent and Alkylated MAHs & PAHs (+ add'l compounds including carbazole) by GC/MS/SIM/SCAN

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only)

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 044752

Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY REQUIRED -- YES NO

If Yes, Are MCP Analytical Methods Required? YES NO NA

Are Drinking Water Samples Submitted? YES NO NA

If Yes, Have Drinking Water Sampling Requirements Been Met? YES NO NA

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Preservative: MeOH	Preservative: None	Preservative: None	Analysis: VOCs by method 8620 BTEX only RSH 8/24	Analysis: TPH 8015M*	Analysis: Parent and Alkylated MAHs & PAHs 8270**	Analysis: TOC by Lloyd-Kahn	Analysis: Black carbon by Lloyd Kahn	Sample Specific Remarks
	044752-SS619	8/15/2018	1100	Soil	5	BFM/CS				x	x	x	x	x	
	044752-SS620	8/15/2018	1220	Soil	5	BFM/CS				x	x	x	x	x	
	044752-SS621	8/15/2018	1245	Soil	5	BFM/CS				x	x	x	x	x	
	044752-SS622	8/15/2018	1255	Soil	5	BFM/CS				x	x	x	x	x	
	044752-SS623	8/15/2018	1255	Soil	5	BFM/CS				x	x	x	x	x	
	044752-SS624	8/15/2018	1325	Soil	5	BFM/CS				x	x	x	x	x	

Sample Handling

Samples Field Filtered: YES NO NA

Sampled Shipped With Ice: YES NO

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

Relinquished by: (signature)	Date:	Time:	Received by: (signature)
1. per verbal request Brian Fong-Murdock	8-15-18	1600	1. GEI Sample Fridge
2. GEI Sample Fridge	8-23-18	1255	2.
3.	8-23-18	1255	3.
4.			4.

Turnaround Time (Business days):

Normal ___x___ Other _____

10-Day _____ 7-Day _____

5-Day _____ 3-Day _____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

*Hydrocarbon Characterization by GC/FID Fingerprint, n-Alkanes, Isoprenoids

**Parent and Alkylated MAHs & PAHs (+ add'l compounds including carbazole) by GC/MS/SIM/SCAN

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

Shipped/Delivered Via: ESS Courier

ESS Project ID: F180046
Date Received: 8/23/2018
Project Due Date: 8/30/2018
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 4.9 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA
13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01		Yes	NA	Yes	VOA Vial - Methanol	MeOH	
01		Yes	NA	Yes	VOA Vial - Methanol	MeOH	
01		Yes	NA	Yes	2 oz. Jar - Unpres	NP	
01		Yes	NA	Yes	8 oz. Jar - Unpres	NP	
01		Yes	NA	Yes	8 oz. Jar - Unpres	NP	
02		Yes	NA	Yes	VOA Vial - Methanol	MeOH	
02		Yes	NA	Yes	VOA Vial - Methanol	MeOH	
02		Yes	NA	Yes	2 oz. Jar - Unpres	NP	
02		Yes	NA	Yes	8 oz. Jar - Unpres	NP	
02		Yes	NA	Yes	8 oz. Jar - Unpres	NP	
03		Yes	NA	Yes	VOA Vial - Methanol	MeOH	
03		Yes	NA	Yes	VOA Vial - Methanol	MeOH	
03		Yes	NA	Yes	2 oz. Jar - Unpres	NP	
03		Yes	NA	Yes	8 oz. Jar - Unpres	NP	
03		Yes	NA	Yes	8 oz. Jar - Unpres	NP	
04		Yes	NA	Yes	VOA Vial - Methanol	MeOH	
04		Yes	NA	Yes	VOA Vial - Methanol	MeOH	
04		Yes	NA	Yes	2 oz. Jar - Unpres	NP	
04		Yes	NA	Yes	8 oz. Jar - Unpres	NP	
04		Yes	NA	Yes	8 oz. Jar - Unpres	NP	
05		Yes	NA	Yes	VOA Vial - Methanol	MeOH	
05		Yes	NA	Yes	VOA Vial - Methanol	MeOH	
05		Yes	NA	Yes	2 oz. Jar - Unpres	NP	
05		Yes	NA	Yes	8 oz. Jar - Unpres	NP	

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

ESS Project ID: F180046

Date Received: 8/23/2018

05	Yes	NA	Yes	8 oz. Jar - Unpres	NP
06	Yes	NA	Yes	VOA Vial - Methanol	MeOH
06	Yes	NA	Yes	VOA Vial - Methanol	MeOH
06	Yes	NA	Yes	2 oz. Jar - Unpres	NP
06	Yes	NA	Yes	8 oz. Jar - Unpres	NP
06	Yes	NA	Yes	8 oz. Jar - Unpres	NP

2nd Review

Are barcode labels on correct containers? Yes / No

Are all necessary stickers attached? Yes / No

Completed By: _____ Date & Time: 8/23/18 1820

Reviewed By: _____ Date & Time: 8/23/18 1840

Delivered By: _____ 8/23/18 1840

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (044752)
ESS Laboratory Work Order Number: F180070

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 1:50 pm, Jan 02, 2019

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses

ESS Laboratory - Cranston, RI	TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F180070

SAMPLE RECEIPT

The following samples were received on December 19, 2018 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F180070-01	1804576-SS625	Soil	8270 Mod, LK
F180070-02	1804576-SS626	Soil	8270 Mod, LK
F180070-03	1804576-SS627	Soil	8270 Mod, LK
F180070-04	1804576-SS628	Soil	8270 Mod, LK
F180070-05	1804576-SS629	Soil	8270 Mod, LK
F180070-06	1804576-SS630	Soil	8270 Mod, LK
F180070-07	1804576-SS631	Soil	8270 Mod, LK
F180070-08	1804576-SS632	Soil	8270 Mod, LK
F180070-09	1804576-SS633	Soil	8270 Mod, LK
F180070-10	1804576-SS634	Soil	8270 Mod, LK
F180070-11	1804576-SS637	Soil	8015 Mod, 8270 Mod, LK
F180070-12	1804576-SS640	Soil	8015 Mod, 8270 Mod, LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F180070

PROJECT NARRATIVE

8270D (SIM) Semi-Volatile Organic Compounds

F180070-01 **Present in Method Blank (B).**
Benzene

F180070-02 **Present in Method Blank (B).**
Benzene

F180070-03 **Present in Method Blank (B).**
Benzene

F180070-04 **Present in Method Blank (B).**
Benzene

F180070-05 **Present in Method Blank (B).**
Benzene

F180070-06 **Present in Method Blank (B).**
Benzene

F180070-07 **Present in Method Blank (B).**
Benzene

F180070-09 **Present in Method Blank (B).**
Benzene

F180070-10 **Present in Method Blank (B).**
Benzene

F180070-11 **Present in Method Blank (B).**
Benzene

F180070-12 **Present in Method Blank (B).**
Benzene

FL81902-DUP4 **Relative percent difference for duplicate is outside of criteria (D+).**

Saturated Hydrocarbons by GC/FID

FL81902-DUP3 **Relative percent difference for duplicate is outside of criteria (D+).**
C-29 (51% @ 50%), C-31 (54% @ 50%)

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F180070

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS625
Date Sampled: 12/17/18 09:50
Percent Solids: 65
Initial Volume: 9.59
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **28.0** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
C1-Benzene	**17.2** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
C2-Benzenes	**30.9** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
C3-Benzenes	**36.2** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
C4-Benzenes	**36.4** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
C5-Benzenes	**25.7** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
Methylcyclohexane	**41.6** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
Toluene	**27.5** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
Ethylbenzene	**10.1** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
m,p-Xylene	**34.0** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
Styrene	**22.6** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
o-Xylene	**15.2** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
Isopropylbenzene	J **3.19** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
n-Propylbenzene	**11.4** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
1,3,5-Trimethylbenzene	**15.3** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
1,2,3-Trimethylbenzene	**9.99** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
1,2,4-Trimethylbenzene	**16.9** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
t-Butylbenzene	ND (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
sec-Butylbenzene	J **1.64** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
p-Isopropyltoluene	**6.22** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
n-Butylbenzene	**42.9** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
trans-Decalin	**6.12** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
cis-Decalin	ND (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
C1-Decalins	**11.1** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
C2-Decalins	**12.5** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
C3-Decalins	**7.67** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
C4-Decalins	ND (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
Benzo(b)thiophene	**3.99** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
C1-Benzo(b)thiophenes	**684** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
C2-Benzo(b)thiophenes	**9.30** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
C3-Benzo(b)thiophenes	**8.03** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
C4-Benzo(b)thiophenes	**3.43** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS625
Date Sampled: 12/17/18 09:50
Percent Solids: 65
Initial Volume: 9.59
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**92.4** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
2-Methylnaphthalene	**68.7** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
1-Methylnaphthalene	**55.9** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
C1-Naphthalenes	**79.6** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
C2-Naphthalenes	**105** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
C3-Naphthalenes	**88.7** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
C4-Naphthalenes	**52.2** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
Biphenyl	**18.1** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
Acenaphthylene	**232** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
Acenaphthene	**109** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
Dibenzofuran	**45.9** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
Fluorene	**82.2** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
C1-Fluorenes	**56.5** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
C2-Fluorenes	**89.5** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
C3-Fluorenes	**166** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
Dibenzothiophene	**71.3** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
C1-Dibenzothiophenes	**91.5** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
C2-Dibenzothiophenes	**82.9** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
C3-Dibenzothiophenes	**49.1** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
C4-Dibenzothiophenes	**29.2** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
Phenanthrene	**1530** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
Anthracene	**352** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
C1-Phenanthrenes/Anthracenes	**853** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
C2-Phenanthrenes/Anthracenes	**418** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
C3-Phenanthrenes/Anthracenes	**154** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
C4-Phenanthrenes/Anthracenes	**48.7** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
Retene	**26.6** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
Benzo(b)naphtho(2,1-d)thiophene	**162** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
C0-Benzonaphthothiophenes	**292** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
C1-Benzonaphthothiophenes	**163** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
C2-Benzonaphthothiophenes	**95.8** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
C3-Benzonaphthothiophenes	**54.4** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS625
Date Sampled: 12/17/18 09:50
Percent Solids: 65
Initial Volume: 9.59
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**18.1** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
Fluoranthene	**2390** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
Pyrene	**3100** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
C1-Fluoranthenes/Pyrenes	**1080** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
C2-Fluoranthenes/Pyrenes	**664** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
C3-Fluoranthenes/Pyrenes	**256** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
Benzo(b)fluorene	**64.2** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
Benzo(c)fluorene	**49.2** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
2-Methylpyrene	**174** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
4-Methylpyrene	**153** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
1-Methylpyrene	**151** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
Benz(a)anthracene	**1200** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
Chrysene/triphenylene	**1310** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
C1-Benzo(a)anthracenes/Chrysenes	**561** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
C2-Benzo(a)anthracenes/Chrysenes	**275** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
C3-Benzo(a)anthracenes/Chrysenes	**127** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
C4-Benzo(a)anthracenes/Chrysenes	**60.4** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
Benzo(b)fluoranthene	**921** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
Benzo(j/k)fluoranthene	**1010** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
Benzo(e)pyrene	**949** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
Benzo(a)pyrene	**1280** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
Perylene	**259** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
Indeno(1,2,3-cd)pyrene	**726** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
Dibenzo(a,h)anthracene	**179** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
Benzo(g,h,i)perylene	**822** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
Coronene	**213** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
Tetramethyl lead	ND (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
Trimethylethyl lead	ND (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
Dimethyldiethyl lead	ND (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
Methyltriethyl lead	ND (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
Tetraethyl lead	ND (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
Carbazole	**68.8** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS625
Date Sampled: 12/17/18 09:50
Percent Solids: 65
Initial Volume: 9.59
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**23.0** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
2,3,5-Trimethylnaphthene	**7.56** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
4-Methyldibenzothiophene	**34.0** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
2/3-Methyldibenzothiophene	**30.3** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
1-Methyldibenzothiophene	**9.58** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
3-Methylphenanthrene	**189** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
2-Methylphenanthrene	**228** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
2-Methylanthracene	**79.0** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
4/9-Methylphenanthrene	**202** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902
1-Methylphenanthrene	**148** (3.23)	1.61	8270 Mod		1	12/20/18 15:58	F8L0008	FL81902

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*76 %*		*50-120*
Surrogate: Naphthalene-d8	*78 %*		*50-120*
Surrogate: Phenanthrene-d10	*76 %*		*50-120*
Surrogate: Perylene-d12	*76 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS625
Date Sampled: 12/17/18 09:50
Percent Solids: 65

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**109000** (419)		LK		1	CCP	12/20/18 18:59	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS626
Date Sampled: 12/17/18 10:03
Percent Solids: 82
Initial Volume: 10.12
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **18.6** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
C1-Benzene	**13.2** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
C2-Benzenes	**19.9** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
C3-Benzenes	**18.8** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
C4-Benzenes	**13.5** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
C5-Benzenes	**11.1** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
Methylcyclohexane	**36.9** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
Toluene	**20.7** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
Ethylbenzene	**3.94** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
m,p-Xylene	**21.7** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
Styrene	**8.26** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
o-Xylene	**13.1** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
Isopropylbenzene	J **2.29** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
n-Propylbenzene	**3.23** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
1,3,5-Trimethylbenzene	**7.08** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
1,2,3-Trimethylbenzene	**5.05** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
1,2,4-Trimethylbenzene	**10.1** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
t-Butylbenzene	ND (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
sec-Butylbenzene	J **1.47** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
p-Isopropyltoluene	J **1.90** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
n-Butylbenzene	**4.39** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
trans-Decalin	**4.57** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
cis-Decalin	ND (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
C1-Decalins	**7.13** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
C2-Decalins	**7.50** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
C3-Decalins	**4.29** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
C4-Decalins	ND (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
Benzo(b)thiophene	J **1.79** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
C1-Benzo(b)thiophenes	**3680** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
C2-Benzo(b)thiophenes	**4.70** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
C3-Benzo(b)thiophenes	**5.32** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
C4-Benzo(b)thiophenes	J **1.80** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS626
Date Sampled: 12/17/18 10:03
Percent Solids: 82
Initial Volume: 10.12
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**53.9** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
2-Methylnaphthalene	**44.2** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
1-Methylnaphthalene	**31.5** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
C1-Naphthalenes	**49.2** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
C2-Naphthalenes	**62.9** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
C3-Naphthalenes	**68.7** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
C4-Naphthalenes	**37.1** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
Biphenyl	**9.48** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
Acenaphthylene	**88.4** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
Acenaphthene	**15.0** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
Dibenzofuran	**19.1** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
Fluorene	**18.6** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
C1-Fluorenes	**21.8** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
C2-Fluorenes	**45.3** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
C3-Fluorenes	**87.0** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
Dibenzothiophene	**26.7** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
C1-Dibenzothiophenes	**43.6** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
C2-Dibenzothiophenes	**33.7** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
C3-Dibenzothiophenes	**18.0** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
C4-Dibenzothiophenes	**11.0** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
Phenanthrene	**622** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
Anthracene	**84.7** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
C1-Phenanthrenes/Anthracenes	**366** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
C2-Phenanthrenes/Anthracenes	**159** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
C3-Phenanthrenes/Anthracenes	**56.7** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
C4-Phenanthrenes/Anthracenes	**19.8** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
Retene	**5.80** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
Benzo(b)naphtho(2,1-d)thiophene	**51.3** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
C0-Benzonaphthothiophenes	**94.1** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
C1-Benzonaphthothiophenes	**56.8** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
C2-Benzonaphthothiophenes	**46.9** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
C3-Benzonaphthothiophenes	**20.8** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS626
Date Sampled: 12/17/18 10:03
Percent Solids: 82
Initial Volume: 10.12
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**7.67** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
Fluoranthene	**844** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
Pyrene	**1100** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
C1-Fluoranthenes/Pyrenes	**347** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
C2-Fluoranthenes/Pyrenes	**240** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
C3-Fluoranthenes/Pyrenes	**103** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
Benzo(b)fluorene	**16.2** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
Benzo(c)fluorene	**10.9** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
2-Methylpyrene	**61.4** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
4-Methylpyrene	**54.0** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
1-Methylpyrene	**43.4** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
Benz(a)anthracene	**399** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
Chrysene/triphenylene	**457** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
C1-Benzo(a)anthracenes/Chrysenes	**189** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
C2-Benzo(a)anthracenes/Chrysenes	**85.6** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
C3-Benzo(a)anthracenes/Chrysenes	**40.5** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
C4-Benzo(a)anthracenes/Chrysenes	**27.5** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
Benzo(b)fluoranthene	**314** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
Benzo(j/k)fluoranthene	**344** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
Benzo(e)pyrene	**298** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
Benzo(a)pyrene	**281** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
Perylene	**64.9** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
Indeno(1,2,3-cd)pyrene	**238** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
Dibenzo(a,h)anthracene	**56.3** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
Benzo(g,h,i)perylene	**255** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
Coronene	**74.6** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
Tetramethyl lead	ND (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
Trimethylethyl lead	ND (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
Dimethyldiethyl lead	ND (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
Methyltriethyl lead	ND (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
Tetraethyl lead	ND (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
Carbazole	**19.8** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS626
Date Sampled: 12/17/18 10:03
Percent Solids: 82
Initial Volume: 10.12
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**12.9** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
2,3,5-Trimethylnaphthene	**5.51** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
4-Methyldibenzothiophene	**15.5** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
2/3-Methyldibenzothiophene	**13.5** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
1-Methyldibenzothiophene	**4.64** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
3-Methylphenanthrene	**86.9** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
2-Methylphenanthrene	**103** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
2-Methylanthracene	**18.4** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
4/9-Methylphenanthrene	**79.7** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902
1-Methylphenanthrene	**64.2** (2.41)	1.21	8270 Mod		1	12/19/18 18:11	F8L0008	FL81902

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*64 %*		*50-120*
Surrogate: Naphthalene-d8	*64 %*		*50-120*
Surrogate: Phenanthrene-d10	*61 %*		*50-120*
Surrogate: Perylene-d12	*58 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS626
Date Sampled: 12/17/18 10:03
Percent Solids: 82

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**33000** (309)		LK		1	CCP	12/20/18 19:49	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS627
Date Sampled: 12/17/18 10:15
Percent Solids: 69
Initial Volume: 9.88
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**B 89.4** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
C1-Benzene	**60.1** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
C2-Benzenes	**94.5** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
C3-Benzenes	**100** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
C4-Benzenes	**72.1** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
C5-Benzenes	**50.8** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
Methylcyclohexane	**190** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
Toluene	**92.6** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
Ethylbenzene	**21.4** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
m,p-Xylene	**103** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
Styrene	**67.0** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
o-Xylene	**53.3** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
Isopropylbenzene	**J 9.65** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
n-Propylbenzene	**15.0** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
1,3,5-Trimethylbenzene	**44.0** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
1,2,3-Trimethylbenzene	**29.7** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
1,2,4-Trimethylbenzene	**53.8** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
t-Butylbenzene	ND (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
sec-Butylbenzene	ND (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
p-Isopropyltoluene	**J 11.2** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
n-Butylbenzene	**16.2** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
trans-Decalin	**30.1** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
cis-Decalin	ND (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
C1-Decalins	**49.9** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
C2-Decalins	**52.1** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
C3-Decalins	**40.1** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
C4-Decalins	**42.8** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
Benzo(b)thiophene	**37.5** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
C1-Benzo(b)thiophenes	**615** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
C2-Benzo(b)thiophenes	**29.9** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
C3-Benzo(b)thiophenes	**25.6** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
C4-Benzo(b)thiophenes	**J 11.3** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS627
Date Sampled: 12/17/18 10:15
Percent Solids: 69
Initial Volume: 9.88
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**545** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
2-Methylnaphthalene	**323** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
1-Methylnaphthalene	**245** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
C1-Naphthalenes	**365** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
C2-Naphthalenes	**417** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
C3-Naphthalenes	**363** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
C4-Naphthalenes	**232** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
Biphenyl	**96.1** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
Acenaphthylene	**1380** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
Acenaphthene	**113** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
Dibenzofuran	**365** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
Fluorene	**260** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
C1-Fluorenes	**164** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
C2-Fluorenes	**260** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
C3-Fluorenes	**428** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
Dibenzothiophene	**182** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
C1-Dibenzothiophenes	**205** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
C2-Dibenzothiophenes	**232** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
C3-Dibenzothiophenes	**140** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
C4-Dibenzothiophenes	**70.8** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
Phenanthrene	**2950** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
Anthracene	**1840** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
C1-Phenanthrenes/Anthracenes	**1950** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
C2-Phenanthrenes/Anthracenes	**1400** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
C3-Phenanthrenes/Anthracenes	**595** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
C4-Phenanthrenes/Anthracenes	**203** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
Retene	**59.2** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
Benzo(b)naphtho(2,1-d)thiophene	**664** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
C0-Benzonaphthothiophenes	**1200** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
C1-Benzonaphthothiophenes	**578** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
C2-Benzonaphthothiophenes	**313** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
C3-Benzonaphthothiophenes	**195** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS627
Date Sampled: 12/17/18 10:15
Percent Solids: 69
Initial Volume: 9.88
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**71.6** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
Fluoranthene	**9570** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
Pyrene	**8740** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
C1-Fluoranthenes/Pyrenes	**3200** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
C2-Fluoranthenes/Pyrenes	**2380** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
C3-Fluoranthenes/Pyrenes	**1070** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
Benzo(b)fluorene	**252** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
Benzo(c)fluorene	**127** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
2-Methylpyrene	**480** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
4-Methylpyrene	**366** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
1-Methylpyrene	**246** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
Benz(a)anthracene	**4750** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
Chrysene/triphenylene	**4690** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
C1-Benzo(a)anthracenes/Chrysenes	**1840** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
C2-Benzo(a)anthracenes/Chrysenes	**877** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
C3-Benzo(a)anthracenes/Chrysenes	**537** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
C4-Benzo(a)anthracenes/Chrysenes	**285** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
Benzo(b)fluoranthene	**4060** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
Benzo(j/k)fluoranthene	**4300** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
Benzo(e)pyrene	**3090** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
Benzo(a)pyrene	**4120** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
Perylene	**1110** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
Indeno(1,2,3-cd)pyrene	**2600** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
Dibenzo(a,h)anthracene	**657** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
Benzo(g,h,i)perylene	**2390** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
Coronene	**593** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
Tetramethyl lead	ND (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
Trimethylethyl lead	ND (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
Dimethyldiethyl lead	ND (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
Methyltriethyl lead	ND (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
Tetraethyl lead	ND (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
Carbazole	**333** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS627
Date Sampled: 12/17/18 10:15
Percent Solids: 69
Initial Volume: 9.88
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**98.5** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
2,3,5-Trimethylnaphthene	**29.4** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
4-Methyldibenzothiophene	**68.1** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
2/3-Methyldibenzothiophene	**69.3** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
1-Methyldibenzothiophene	**22.1** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
3-Methylphenanthrene	**362** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
2-Methylphenanthrene	**502** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
2-Methylanthracene	**328** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
4/9-Methylphenanthrene	**458** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902
1-Methylphenanthrene	**277** (14.7)	7.35	8270 Mod		5	12/19/18 19:33	F8L0008	FL81902

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*76 %*		*50-120*
Surrogate: Naphthalene-d8	*75 %*		*50-120*
Surrogate: Phenanthrene-d10	*74 %*		*50-120*
Surrogate: Perylene-d12	*76 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS627
Date Sampled: 12/17/18 10:15
Percent Solids: 69

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**284000** (450)		LK		1	CCP	12/20/18 15:57	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS628
Date Sampled: 12/17/18 10:30
Percent Solids: 67
Initial Volume: 8.64
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **29.2** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
C1-Benzene	**15.9** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
C2-Benzenes	**38.8** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
C3-Benzenes	**37.4** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
C4-Benzenes	**27.9** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
C5-Benzenes	**15.7** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
Methylcyclohexane	**57.4** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
Toluene	**25.3** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
Ethylbenzene	**7.38** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
m,p-Xylene	**46.7** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
Styrene	**38.2** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
o-Xylene	**20.4** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
Isopropylbenzene	**4.06** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
n-Propylbenzene	**6.08** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
1,3,5-Trimethylbenzene	**12.5** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
1,2,3-Trimethylbenzene	**12.2** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
1,2,4-Trimethylbenzene	**23.2** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
t-Butylbenzene	ND (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
sec-Butylbenzene	J **2.34** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
p-Isopropyltoluene	**4.74** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
n-Butylbenzene	**5.53** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
trans-Decalin	**10.1** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
cis-Decalin	ND (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
C1-Decalins	ND (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
C2-Decalins	ND (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
C3-Decalins	ND (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
C4-Decalins	ND (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
Benzo(b)thiophene	**14.3** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
C1-Benzo(b)thiophenes	**98.8** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
C2-Benzo(b)thiophenes	**10.6** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
C3-Benzo(b)thiophenes	**8.38** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
C4-Benzo(b)thiophenes	**4.31** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS628
Date Sampled: 12/17/18 10:30
Percent Solids: 67
Initial Volume: 8.64
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**122** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
2-Methylnaphthalene	**88.1** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
1-Methylnaphthalene	**56.4** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
C1-Naphthalenes	**94.6** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
C2-Naphthalenes	**111** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
C3-Naphthalenes	**114** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
C4-Naphthalenes	**118** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
Biphenyl	**23.0** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
Acenaphthylene	**1110** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
Acenaphthene	**33.6** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
Dibenzofuran	**66.2** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
Fluorene	**32.9** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
C1-Fluorenes	**56.8** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
C2-Fluorenes	**129** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
C3-Fluorenes	**215** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
Dibenzothiophene	**33.5** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
C1-Dibenzothiophenes	**74.6** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
C2-Dibenzothiophenes	**126** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
C3-Dibenzothiophenes	**85.6** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
C4-Dibenzothiophenes	**51.2** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
Phenanthrene	**441** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
Anthracene	**1130** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
C1-Phenanthrenes/Anthracenes	**742** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
C2-Phenanthrenes/Anthracenes	**811** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
C3-Phenanthrenes/Anthracenes	**401** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
C4-Phenanthrenes/Anthracenes	**132** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
Retene	ND (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
Benzo(b)naphtho(2,1-d)thiophene	**452** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
C0-Benzonaphthothiophenes	**789** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
C1-Benzonaphthothiophenes	**440** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
C2-Benzonaphthothiophenes	**237** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
C3-Benzonaphthothiophenes	**103** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS628
Date Sampled: 12/17/18 10:30
Percent Solids: 67
Initial Volume: 8.64
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**26.4** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
Fluoranthene	**3770** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
Pyrene	**3630** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
C1-Fluoranthenes/Pyrenes	**1740** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
C2-Fluoranthenes/Pyrenes	**1590** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
C3-Fluoranthenes/Pyrenes	**898** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
Benzo(b)fluorene	**88.4** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
Benzo(c)fluorene	**40.0** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
2-Methylpyrene	**284** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
4-Methylpyrene	**243** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
1-Methylpyrene	**134** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
Benz(a)anthracene	**2290** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
Chrysene/triphenylene	**2460** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
C1-Benzo(a)anthracenes/Chrysenes	**1260** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
C2-Benzo(a)anthracenes/Chrysenes	**666** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
C3-Benzo(a)anthracenes/Chrysenes	**400** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
C4-Benzo(a)anthracenes/Chrysenes	**235** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
Benzo(b)fluoranthene	**2580** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
Benzo(j/k)fluoranthene	**2140** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
Benzo(e)pyrene	**1710** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
Benzo(a)pyrene	**1890** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
Perylene	**493** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
Indeno(1,2,3-cd)pyrene	**1330** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
Dibenzo(a,h)anthracene	**403** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
Benzo(g,h,i)perylene	**1110** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
Coronene	**255** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
Tetramethyl lead	ND (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
Trimethylethyl lead	ND (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
Dimethyldiethyl lead	ND (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
Methyltriethyl lead	ND (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
Tetraethyl lead	ND (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
Carbazole	**156** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS628
Date Sampled: 12/17/18 10:30
Percent Solids: 67
Initial Volume: 8.64
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**22.6** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
2,3,5-Trimethylnaphthene	**9.10** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
4-Methyldibenzothiophene	**24.8** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
2/3-Methyldibenzothiophene	**25.1** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
1-Methyldibenzothiophene	**5.24** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
3-Methylphenanthrene	**95.3** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
2-Methylphenanthrene	**131** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
2-Methylanthracene	**197** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
4/9-Methylphenanthrene	**224** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902
1-Methylphenanthrene	**85.1** (3.45)	1.73	8270 Mod		1	12/19/18 20:55	F8L0008	FL81902

	%Recovery	*Qualifier*	*Limits*
Surrogate: Toluene-D8	*53 %*		*50-120*
Surrogate: Naphthalene-d8	*53 %*		*50-120*
Surrogate: Phenanthrene-d10	*51 %*		*50-120*
Surrogate: Perylene-d12	*54 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS628
Date Sampled: 12/17/18 10:30
Percent Solids: 67

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-04
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**148000** (383)		LK		1	CCP	12/20/18 19:49	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS629
Date Sampled: 12/17/18 11:50
Percent Solids: 69
Initial Volume: 2.42
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **719** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
C1-Benzene	**383** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
C2-Benzenes	**1390** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
C3-Benzenes	**1110** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
C4-Benzenes	**1430** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
C5-Benzenes	**463** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
Methylcyclohexane	ND (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
Toluene	**619** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
Ethylbenzene	**2270** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
m,p-Xylene	**602** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
Styrene	**1070** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
o-Xylene	**140** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
Isopropylbenzene	**69.2** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
n-Propylbenzene	**68.7** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
1,3,5-Trimethylbenzene	**156** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
1,2,3-Trimethylbenzene	**173** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
1,2,4-Trimethylbenzene	**380** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
t-Butylbenzene	ND (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
sec-Butylbenzene	ND (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
p-Isopropyltoluene	**164** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
n-Butylbenzene	**301** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
trans-Decalin	**177** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
cis-Decalin	**70.2** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
C1-Decalins	**899** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
C2-Decalins	**1690** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
C3-Decalins	**1720** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
C4-Decalins	**2110** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
Benzo(b)thiophene	**31600** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
C1-Benzo(b)thiophenes	**19100** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
C2-Benzo(b)thiophenes	**14100** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
C3-Benzo(b)thiophenes	**5660** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
C4-Benzo(b)thiophenes	**1380** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS629
Date Sampled: 12/17/18 11:50
Percent Solids: 69
Initial Volume: 2.42
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**629000** (1200)	598	8270 Mod		100	12/20/18 14:35	F8L0008	FL81902
2-Methylnaphthalene	**204000** (1200)	598	8270 Mod		100	12/20/18 14:35	F8L0008	FL81902
1-Methylnaphthalene	**122000** (1200)	598	8270 Mod		100	12/20/18 14:35	F8L0008	FL81902
C1-Naphthalenes	**214000** (1200)	598	8270 Mod		100	12/20/18 14:35	F8L0008	FL81902
C2-Naphthalenes	**111000** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
C3-Naphthalenes	**24200** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
C4-Naphthalenes	**7280** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
Biphenyl	**89200** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
Acenaphthylene	**55500** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
Acenaphthene	**757000** (1200)	598	8270 Mod		100	12/20/18 14:35	F8L0008	FL81902
Dibenzofuran	**30100** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
Fluorene	**265000** (1200)	598	8270 Mod		100	12/20/18 14:35	F8L0008	FL81902
C1-Fluorenes	**31100** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
C2-Fluorenes	**9780** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
C3-Fluorenes	**5930** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
Dibenzothiophene	**202000** (1200)	598	8270 Mod		100	12/20/18 14:35	F8L0008	FL81902
C1-Dibenzothiophenes	**54000** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
C2-Dibenzothiophenes	**16700** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
C3-Dibenzothiophenes	**5640** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
C4-Dibenzothiophenes	**2120** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
Phenanthrene	**1360000** (1200)	598	8270 Mod		100	12/20/18 14:35	F8L0008	FL81902
Anthracene	**940000** (1200)	598	8270 Mod		100	12/20/18 14:35	F8L0008	FL81902
C1-Phenanthrenes/Anthracenes	**175000** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
C2-Phenanthrenes/Anthracenes	**28900** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
C3-Phenanthrenes/Anthracenes	**6180** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
C4-Phenanthrenes/Anthracenes	**2780** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
Retene	**2350** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
Benzo(b)naphtho(2,1-d)thiophene	**49200** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
C0-Benzonaphthothiophenes	**94500** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
C1-Benzonaphthothiophenes	**18700** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
C2-Benzonaphthothiophenes	**4860** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
C3-Benzonaphthothiophenes	**4510** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS629
Date Sampled: 12/17/18 11:50
Percent Solids: 69
Initial Volume: 2.42
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**565** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
Fluoranthene	**676000** (1200)	598	8270 Mod		100	12/20/18 14:35	F8L0008	FL81902
Pyrene	**978000** (1200)	598	8270 Mod		100	12/20/18 14:35	F8L0008	FL81902
C1-Fluoranthenes/Pyrenes	**208000** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
C2-Fluoranthenes/Pyrenes	**22500** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
C3-Fluoranthenes/Pyrenes	**3760** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
Benzo(b)fluorene	**31000** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
Benzo(c)fluorene	**11700** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
2-Methylpyrene	**25100** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
4-Methylpyrene	**22000** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
1-Methylpyrene	**28100** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
Benz(a)anthracene	**218000** (1200)	598	8270 Mod		100	12/20/18 14:35	F8L0008	FL81902
Chrysene/triphenylene	**264000** (1200)	598	8270 Mod		100	12/20/18 14:35	F8L0008	FL81902
C1-Benzo(a)anthracenes/Chrysenes	**36000** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
C2-Benzo(a)anthracenes/Chrysenes	**8060** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
C3-Benzo(a)anthracenes/Chrysenes	**1700** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
C4-Benzo(a)anthracenes/Chrysenes	**3430** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
Benzo(b)fluoranthene	**107000** (1200)	598	8270 Mod		100	12/20/18 14:35	F8L0008	FL81902
Benzo(j/k)fluoranthene	**141000** (1200)	598	8270 Mod		100	12/20/18 14:35	F8L0008	FL81902
Benzo(e)pyrene	**124000** (1200)	598	8270 Mod		100	12/20/18 14:35	F8L0008	FL81902
Benzo(a)pyrene	**239000** (1200)	598	8270 Mod		100	12/20/18 14:35	F8L0008	FL81902
Perylene	**37600** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
Indeno(1,2,3-cd)pyrene	**105000** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
Dibenzo(a,h)anthracene	**22700** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
Benzo(g,h,i)perylene	**123000** (1200)	598	8270 Mod		100	12/20/18 14:35	F8L0008	FL81902
Coronene	**41600** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
Tetramethyl lead	ND (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
Trimethylethyl lead	ND (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
Dimethyldiethyl lead	ND (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
Methyltriethyl lead	ND (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
Tetraethyl lead	ND (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
Carbazole	**21100** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS629
Date Sampled: 12/17/18 11:50
Percent Solids: 69
Initial Volume: 2.42
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**18600** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
2,3,5-Trimethylnaphthene	**1170** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
4-Methyldibenzothiophene	**19000** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
2/3-Methyldibenzothiophene	**20000** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
1-Methyldibenzothiophene	**5680** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
3-Methylphenanthrene	**44300** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
2-Methylphenanthrene	**47000** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
2-Methylanthracene	**24500** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
4/9-Methylphenanthrene	**30700** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902
1-Methylphenanthrene	**26700** (59.8)	29.9	8270 Mod		5	12/20/18 10:29	F8L0008	FL81902

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*84 %*		*50-120*
Surrogate: Naphthalene-d8	*85 %*		*50-120*
Surrogate: Phenanthrene-d10	*77 %*		*50-120*
Surrogate: Perylene-d12	*95 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS629
Date Sampled: 12/17/18 11:50
Percent Solids: 69

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-05
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**42700** (427)		LK		1	CCP	12/20/18 19:57	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS630
Date Sampled: 12/17/18 10:45
Percent Solids: 71
Initial Volume: 9.22
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **5.50** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
C1-Benzene	**5.24** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
C2-Benzenes	**3.52** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
C3-Benzenes	J **2.36** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
C4-Benzenes	**4.09** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
C5-Benzenes	ND (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
Methylcyclohexane	ND (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
Toluene	**8.54** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
Ethylbenzene	ND (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
m,p-Xylene	**3.63** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
Styrene	**5.58** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
o-Xylene	ND (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
Isopropylbenzene	ND (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
n-Propylbenzene	ND (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
1,3,5-Trimethylbenzene	ND (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
1,2,3-Trimethylbenzene	ND (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
1,2,4-Trimethylbenzene	ND (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
t-Butylbenzene	ND (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
sec-Butylbenzene	ND (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
p-Isopropyltoluene	ND (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
n-Butylbenzene	ND (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
trans-Decalin	ND (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
cis-Decalin	ND (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
C1-Decalins	ND (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
C2-Decalins	ND (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
C3-Decalins	ND (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
C4-Decalins	ND (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
Benzo(b)thiophene	ND (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
C1-Benzo(b)thiophenes	**66.3** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
C2-Benzo(b)thiophenes	J **2.29** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
C3-Benzo(b)thiophenes	J **1.89** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
C4-Benzo(b)thiophenes	ND (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS630
Date Sampled: 12/17/18 10:45
Percent Solids: 71
Initial Volume: 9.22
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**4.37** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
2-Methylnaphthalene	**3.69** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
1-Methylnaphthalene	J **2.88** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
C1-Naphthalenes	**4.32** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
C2-Naphthalenes	**9.68** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
C3-Naphthalenes	**13.5** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
C4-Naphthalenes	**16.3** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
Biphenyl	J **1.81** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
Acenaphthylene	**21.8** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
Acenaphthene	**5.45** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
Dibenzofuran	J **1.63** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
Fluorene	**5.51** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
C1-Fluorenes	**10.4** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
C2-Fluorenes	**24.9** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
C3-Fluorenes	**21.8** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
Dibenzothiophene	J **2.80** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
C1-Dibenzothiophenes	**10.1** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
C2-Dibenzothiophenes	**17.5** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
C3-Dibenzothiophenes	**11.1** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
C4-Dibenzothiophenes	**7.02** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
Phenanthrene	**43.5** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
Anthracene	**24.8** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
C1-Phenanthrenes/Anthracenes	**158** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
C2-Phenanthrenes/Anthracenes	**171** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
C3-Phenanthrenes/Anthracenes	**89.8** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
C4-Phenanthrenes/Anthracenes	**71.0** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
Retene	**219** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
Benzo(b)naphtho(2,1-d)thiophene	**14.5** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
C0-Benzonaphthothiophenes	**34.2** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
C1-Benzonaphthothiophenes	**34.7** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
C2-Benzonaphthothiophenes	**23.9** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
C3-Benzonaphthothiophenes	**11.7** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS630
Date Sampled: 12/17/18 10:45
Percent Solids: 71
Initial Volume: 9.22
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	J **2.66** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
Fluoranthene	**178** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
Pyrene	**192** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
C1-Fluoranthenes/Pyrenes	**279** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
C2-Fluoranthenes/Pyrenes	**164** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
C3-Fluoranthenes/Pyrenes	**75.2** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
Benzo(b)fluorene	**34.1** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
Benzo(c)fluorene	**14.0** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
2-Methylpyrene	**35.4** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
4-Methylpyrene	**29.9** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
1-Methylpyrene	**23.1** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
Benz(a)anthracene	**175** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
Chrysene/triphenylene	**149** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
C1-Benzo(a)anthracenes/Chrysenes	**154** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
C2-Benzo(a)anthracenes/Chrysenes	**94.4** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
C3-Benzo(a)anthracenes/Chrysenes	**50.9** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
C4-Benzo(a)anthracenes/Chrysenes	**24.6** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
Benzo(b)fluoranthene	**83.6** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
Benzo(j/k)fluoranthene	**109** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
Benzo(e)pyrene	**83.2** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
Benzo(a)pyrene	**133** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
Perylene	**140** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
Indeno(1,2,3-cd)pyrene	**56.3** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
Dibenzo(a,h)anthracene	**19.6** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
Benzo(g,h,i)perylene	**58.1** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
Coronene	**13.5** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
Tetramethyl lead	ND (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
Trimethylethyl lead	ND (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
Dimethyldiethyl lead	ND (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
Methyltriethyl lead	ND (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
Tetraethyl lead	ND (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
Carbazole	**3.72** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS630
Date Sampled: 12/17/18 10:45
Percent Solids: 71
Initial Volume: 9.22
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	ND (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
2,3,5-Trimethylnaphthene	ND (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
4-Methyldibenzothiophene	**J 2.48** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
2/3-Methyldibenzothiophene	**J 2.95** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
1-Methyldibenzothiophene	ND (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
3-Methylphenanthrene	**23.0** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
2-Methylphenanthrene	**39.2** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
2-Methylanthracene	**39.7** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
4/9-Methylphenanthrene	**34.1** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902
1-Methylphenanthrene	**21.7** (3.08)	1.54	8270 Mod		1	12/19/18 22:16	F8L0008	FL81902

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*89 %*		*50-120*
Surrogate: Naphthalene-d8	*82 %*		*50-120*
Surrogate: Phenanthrene-d10	*83 %*		*50-120*
Surrogate: Perylene-d12	*83 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS630
Date Sampled: 12/17/18 10:45
Percent Solids: 71

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-06
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**39900** (294)		LK		1	CCP	12/20/18 16:47	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS631
Date Sampled: 12/17/18 12:50
Percent Solids: 70
Initial Volume: 6.78
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **88.4** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
C1-Benzene	**134** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
C2-Benzenes	**524** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
C3-Benzenes	**288** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
C4-Benzenes	**463** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
C5-Benzenes	**349** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
Methylcyclohexane	**76.1** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
Toluene	**209** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
Ethylbenzene	**100** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
m,p-Xylene	**862** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
Styrene	**159** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
o-Xylene	**87.1** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
Isopropylbenzene	J **13.8** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
n-Propylbenzene	**51.3** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
1,3,5-Trimethylbenzene	**64.2** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
1,2,3-Trimethylbenzene	**65.1** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
1,2,4-Trimethylbenzene	**183** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
t-Butylbenzene	ND (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
sec-Butylbenzene	J **20.4** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
p-Isopropyltoluene	**26.1** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
n-Butylbenzene	**96.7** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
trans-Decalin	**1510** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
cis-Decalin	**138** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
C1-Decalins	**2550** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
C2-Decalins	**973** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
C3-Decalins	**277** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
C4-Decalins	**385** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
Benzo(b)thiophene	**46.0** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
C1-Benzo(b)thiophenes	**729** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
C2-Benzo(b)thiophenes	**198** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
C3-Benzo(b)thiophenes	**274** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
C4-Benzo(b)thiophenes	**181** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS631
Date Sampled: 12/17/18 12:50
Percent Solids: 70
Initial Volume: 6.78
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**355** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
2-Methylnaphthalene	**224** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
1-Methylnaphthalene	**268** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
C1-Naphthalenes	**326** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
C2-Naphthalenes	**1180** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
C3-Naphthalenes	**2580** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
C4-Naphthalenes	**1890** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
Biphenyl	**52.5** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
Acenaphthylene	**1540** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
Acenaphthene	**839** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
Dibenzofuran	**289** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
Fluorene	**978** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
C1-Fluorenes	**1180** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
C2-Fluorenes	**1530** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
C3-Fluorenes	**1630** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
Dibenzothiophene	**991** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
C1-Dibenzothiophenes	**1350** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
C2-Dibenzothiophenes	**1810** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
C3-Dibenzothiophenes	**1580** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
C4-Dibenzothiophenes	**793** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
Phenanthrene	**7910** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
Anthracene	**2890** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
C1-Phenanthrenes/Anthracenes	**6350** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
C2-Phenanthrenes/Anthracenes	**4720** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
C3-Phenanthrenes/Anthracenes	**2600** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
C4-Phenanthrenes/Anthracenes	**1040** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
Retene	**106** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
Benzo(b)naphtho(2,1-d)thiophene	**963** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
C0-Benzonaphthothiophenes	**1730** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
C1-Benzonaphthothiophenes	**1510** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
C2-Benzonaphthothiophenes	**1290** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
C3-Benzonaphthothiophenes	**789** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS631
Date Sampled: 12/17/18 12:50
Percent Solids: 70
Initial Volume: 6.78
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**314** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
Fluoranthene	**12700** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
Pyrene	**11900** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
C1-Fluoranthenes/Pyrenes	**6070** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
C2-Fluoranthenes/Pyrenes	**3650** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
C3-Fluoranthenes/Pyrenes	**1790** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
Benzo(b)fluorene	**630** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
Benzo(c)fluorene	**349** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
2-Methylpyrene	**793** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
4-Methylpyrene	**750** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
1-Methylpyrene	**566** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
Benz(a)anthracene	**4910** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
Chrysene/triphenylene	**5820** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
C1-Benzo(a)anthracenes/Chrysenes	**3340** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
C2-Benzo(a)anthracenes/Chrysenes	**1930** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
C3-Benzo(a)anthracenes/Chrysenes	**1060** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
C4-Benzo(a)anthracenes/Chrysenes	**494** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
Benzo(b)fluoranthene	**4340** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
Benzo(j/k)fluoranthene	**4140** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
Benzo(e)pyrene	**3570** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
Benzo(a)pyrene	**4830** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
Perylene	**1160** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
Indeno(1,2,3-cd)pyrene	**3110** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
Dibenzo(a,h)anthracene	**824** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
Benzo(g,h,i)perylene	**3050** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
Coronene	**778** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
Tetramethyl lead	ND (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
Trimethylethyl lead	ND (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
Dimethyldiethyl lead	ND (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
Methyltriethyl lead	ND (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
Tetraethyl lead	ND (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
Carbazole	**418** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS631
Date Sampled: 12/17/18 12:50
Percent Solids: 70
Initial Volume: 6.78
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**154** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
2,3,5-Trimethylnaphthene	**173** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
4-Methyldibenzothiophene	**535** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
2/3-Methyldibenzothiophene	**436** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
1-Methyldibenzothiophene	**196** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
3-Methylphenanthrene	**1470** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
2-Methylphenanthrene	**1340** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
2-Methylanthracene	**618** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
4/9-Methylphenanthrene	**1680** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902
1-Methylphenanthrene	**1160** (21.0)	10.5	8270 Mod		5	12/19/18 23:38	F8L0008	FL81902

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*72 %*		*50-120*
Surrogate: Naphthalene-d8	*71 %*		*50-120*
Surrogate: Phenanthrene-d10	*69 %*		*50-120*
Surrogate: Perylene-d12	*74 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS631
Date Sampled: 12/17/18 12:50
Percent Solids: 70

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-07
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**103000** (373)		LK		1	CCP	12/20/18 17:03	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS632
Date Sampled: 12/17/18 13:45
Percent Solids: 72
Initial Volume: 10.08
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**73.4** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
C1-Benzene	**55.7** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
C2-Benzenes	**136** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
C3-Benzenes	**24.8** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
C4-Benzenes	**26.8** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
C5-Benzenes	**14.4** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
Methylcyclohexane	**J 2.66** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
Toluene	**88.0** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
Ethylbenzene	**18.2** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
m,p-Xylene	**234** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
Styrene	**59.4** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
o-Xylene	**6.27** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
Isopropylbenzene	ND (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
n-Propylbenzene	**5.93** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
1,3,5-Trimethylbenzene	**4.08** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
1,2,3-Trimethylbenzene	**6.09** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
1,2,4-Trimethylbenzene	**8.76** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
t-Butylbenzene	ND (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
sec-Butylbenzene	ND (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
p-Isopropyltoluene	**16.0** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
n-Butylbenzene	**9.67** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
trans-Decalin	**8.50** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
cis-Decalin	ND (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
C1-Decalins	**21.2** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
C2-Decalins	**31.3** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
C3-Decalins	**29.1** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
C4-Decalins	**51.2** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
Benzo(b)thiophene	**42.5** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
C1-Benzo(b)thiophenes	**85.8** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
C2-Benzo(b)thiophenes	**71.0** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
C3-Benzo(b)thiophenes	**45.2** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
C4-Benzo(b)thiophenes	**8.65** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS632
Date Sampled: 12/17/18 13:45
Percent Solids: 72
Initial Volume: 10.08
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**417** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
2-Methylnaphthalene	**134** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
1-Methylnaphthalene	**93.5** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
C1-Naphthalenes	**147** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
C2-Naphthalenes	**370** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
C3-Naphthalenes	**192** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
C4-Naphthalenes	**66.4** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
Biphenyl	**94.0** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
Acenaphthylene	**1540** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
Acenaphthene	**2430** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
Dibenzofuran	**121** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
Fluorene	**1110** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
C1-Fluorenes	**282** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
C2-Fluorenes	**124** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
C3-Fluorenes	**158** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
Dibenzothiophene	**1160** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
C1-Dibenzothiophenes	**570** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
C2-Dibenzothiophenes	**225** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
C3-Dibenzothiophenes	**112** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
C4-Dibenzothiophenes	**73.7** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
Phenanthrene	**8820** (13.7)	6.86	8270 Mod		5	12/20/18 1:00	F8L0008	FL81902
Anthracene	**3580** (13.7)	6.86	8270 Mod		5	12/20/18 1:00	F8L0008	FL81902
C1-Phenanthrenes/Anthracenes	**2230** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
C2-Phenanthrenes/Anthracenes	**457** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
C3-Phenanthrenes/Anthracenes	**127** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
C4-Phenanthrenes/Anthracenes	**62.9** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
Retene	**39.8** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
Benzo(b)naphtho(2,1-d)thiophene	**757** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
C0-Benzonaphthothiophenes	**1480** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
C1-Benzonaphthothiophenes	**422** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
C2-Benzonaphthothiophenes	**313** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
C3-Benzonaphthothiophenes	**313** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS632
Date Sampled: 12/17/18 13:45
Percent Solids: 72
Initial Volume: 10.08
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**174** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
Fluoranthene	**10000** (13.7)	6.86	8270 Mod		5	12/20/18 1:00	F8L0008	FL81902
Pyrene	**13800** (13.7)	6.86	8270 Mod		5	12/20/18 1:00	F8L0008	FL81902
C1-Fluoranthenes/Pyrenes	**3390** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
C2-Fluoranthenes/Pyrenes	**630** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
C3-Fluoranthenes/Pyrenes	**173** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
Benzo(b)fluorene	**461** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
Benzo(c)fluorene	**182** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
2-Methylpyrene	**458** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
4-Methylpyrene	**407** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
1-Methylpyrene	**481** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
Benz(a)anthracene	**3540** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
Chrysene/triphenylene	**3350** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
C1-Benzo(a)anthracenes/Chrysenes	**842** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
C2-Benzo(a)anthracenes/Chrysenes	**281** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
C3-Benzo(a)anthracenes/Chrysenes	**148** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
C4-Benzo(a)anthracenes/Chrysenes	**135** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
Benzo(b)fluoranthene	**2500** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
Benzo(j/k)fluoranthene	**2840** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
Benzo(e)pyrene	**2640** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
Benzo(a)pyrene	**4340** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
Perylene	**807** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
Indeno(1,2,3-cd)pyrene	**2270** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
Dibenzo(a,h)anthracene	**509** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
Benzo(g,h,i)perylene	**2520** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
Coronene	**833** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
Tetramethyl lead	ND (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
Trimethylethyl lead	ND (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
Dimethyldiethyl lead	ND (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
Methyltriethyl lead	ND (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
Tetraethyl lead	ND (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
Carbazole	**98.1** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS632
Date Sampled: 12/17/18 13:45
Percent Solids: 72
Initial Volume: 10.08
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**75.9** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
2,3,5-Trimethylnaphthene	**12.6** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
4-Methyldibenzothiophene	**205** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
2/3-Methyldibenzothiophene	**206** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
1-Methyldibenzothiophene	**62.7** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
3-Methylphenanthrene	**535** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
2-Methylphenanthrene	**583** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
2-Methylanthracene	**284** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
4/9-Methylphenanthrene	**480** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902
1-Methylphenanthrene	**342** (2.74)	1.37	8270 Mod		1	12/21/18 0:14	F8L0008	FL81902

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*70 %*		*50-120*
Surrogate: Naphthalene-d8	*73 %*		*50-120*
Surrogate: Phenanthrene-d10	*71 %*		*50-120*
Surrogate: Perylene-d12	*69 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS632
Date Sampled: 12/17/18 13:45
Percent Solids: 72

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-08
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**29100** (336)		LK		1	CCP	12/20/18 20:06	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS633
Date Sampled: 12/17/18 13:55
Percent Solids: 42
Initial Volume: 10.02
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **46.5** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
C1-Benzene	**66.0** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
C2-Benzenes	**78.0** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
C3-Benzenes	**28.5** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
C4-Benzenes	**30.5** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
C5-Benzenes	**18.6** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
Methylcyclohexane	**6.83** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
Toluene	**105** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
Ethylbenzene	**12.9** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
m,p-Xylene	**123** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
Styrene	**39.5** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
o-Xylene	**9.91** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
Isopropylbenzene	ND (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
n-Propylbenzene	**8.67** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
1,3,5-Trimethylbenzene	**6.56** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
1,2,3-Trimethylbenzene	**7.94** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
1,2,4-Trimethylbenzene	**12.6** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
t-Butylbenzene	ND (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
sec-Butylbenzene	ND (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
p-Isopropyltoluene	**6.63** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
n-Butylbenzene	**24.7** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
trans-Decalin	**4.78** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
cis-Decalin	ND (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
C1-Decalins	**13.9** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
C2-Decalins	**22.9** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
C3-Decalins	**14.2** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
C4-Decalins	**19.7** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
Benzo(b)thiophene	**16.4** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
C1-Benzo(b)thiophenes	**50.2** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
C2-Benzo(b)thiophenes	**45.2** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
C3-Benzo(b)thiophenes	**36.5** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
C4-Benzo(b)thiophenes	**11.0** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS633
Date Sampled: 12/17/18 13:55
Percent Solids: 42
Initial Volume: 10.02
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**163** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
2-Methylnaphthalene	**68.5** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
1-Methylnaphthalene	**60.7** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
C1-Naphthalenes	**82.9** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
C2-Naphthalenes	**255** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
C3-Naphthalenes	**148** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
C4-Naphthalenes	**58.1** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
Biphenyl	**54.4** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
Acenaphthylene	**1200** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
Acenaphthene	**1300** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
Dibenzofuran	**74.9** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
Fluorene	**873** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
C1-Fluorenes	**239** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
C2-Fluorenes	**110** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
C3-Fluorenes	**127** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
Dibenzothiophene	**997** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
C1-Dibenzothiophenes	**455** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
C2-Dibenzothiophenes	**198** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
C3-Dibenzothiophenes	**91.3** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
C4-Dibenzothiophenes	**40.8** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
Phenanthrene	**7210** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
Anthracene	**2090** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
C1-Phenanthrenes/Anthracenes	**1900** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
C2-Phenanthrenes/Anthracenes	**441** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
C3-Phenanthrenes/Anthracenes	**123** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
C4-Phenanthrenes/Anthracenes	**51.9** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
Retene	**34.5** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
Benzo(b)naphtho(2,1-d)thiophene	**663** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
C0-Benzonaphthothiophenes	**1290** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
C1-Benzonaphthothiophenes	**368** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
C2-Benzonaphthothiophenes	**182** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
C3-Benzonaphthothiophenes	**180** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS633
Date Sampled: 12/17/18 13:55
Percent Solids: 42
Initial Volume: 10.02
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**75.0** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
Fluoranthene	**9080** (23.6)	11.8	8270 Mod		5	12/20/18 2:19	F8L0008	FL81902
Pyrene	**12700** (23.6)	11.8	8270 Mod		5	12/20/18 2:19	F8L0008	FL81902
C1-Fluoranthenes/Pyrenes	**3220** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
C2-Fluoranthenes/Pyrenes	**629** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
C3-Fluoranthenes/Pyrenes	**184** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
Benzo(b)fluorene	**409** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
Benzo(c)fluorene	**195** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
2-Methylpyrene	**436** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
4-Methylpyrene	**390** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
1-Methylpyrene	**460** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
Benz(a)anthracene	**3650** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
Chrysene/triphenylene	**3180** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
C1-Benzo(a)anthracenes/Chrysenes	**846** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
C2-Benzo(a)anthracenes/Chrysenes	**279** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
C3-Benzo(a)anthracenes/Chrysenes	**122** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
C4-Benzo(a)anthracenes/Chrysenes	**116** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
Benzo(b)fluoranthene	**2400** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
Benzo(j/k)fluoranthene	**3050** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
Benzo(e)pyrene	**2650** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
Benzo(a)pyrene	**4450** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
Perylene	**766** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
Indeno(1,2,3-cd)pyrene	**2240** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
Dibenzo(a,h)anthracene	**478** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
Benzo(g,h,i)perylene	**2480** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
Coronene	**749** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
Tetramethyl lead	ND (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
Trimethylethyl lead	ND (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
Dimethyldiethyl lead	ND (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
Methyltriethyl lead	ND (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
Tetraethyl lead	ND (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
Carbazole	**69.7** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS633
Date Sampled: 12/17/18 13:55
Percent Solids: 42
Initial Volume: 10.02
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**56.7** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
2,3,5-Trimethylnaphthene	**9.26** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
4-Methyldibenzothiophene	**162** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
2/3-Methyldibenzothiophene	**162** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
1-Methyldibenzothiophene	**53.5** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
3-Methylphenanthrene	**460** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
2-Methylphenanthrene	**486** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
2-Methylanthracene	**237** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
4/9-Methylphenanthrene	**405** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902
1-Methylphenanthrene	**297** (4.73)	2.36	8270 Mod		1	12/21/18 1:37	F8L0008	FL81902

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*75 %*		*50-120*
Surrogate: Naphthalene-d8	*79 %*		*50-120*
Surrogate: Phenanthrene-d10	*81 %*		*50-120*
Surrogate: Perylene-d12	*79 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS633
Date Sampled: 12/17/18 13:55
Percent Solids: 42

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-09
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**91200** (494)		LK		1	CCP	12/20/18 18:10	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS634
Date Sampled: 12/17/18 12:20
Percent Solids: 48
Initial Volume: 9.4
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **15.3** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
C1-Benzene	**28.6** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
C2-Benzenes	**16.3** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
C3-Benzenes	**9.67** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
C4-Benzenes	**22.0** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
C5-Benzenes	**9.44** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
Methylcyclohexane	ND (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
Toluene	**45.2** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
Ethylbenzene	J **2.65** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
m,p-Xylene	**23.8** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
Styrene	**19.9** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
o-Xylene	ND (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
Isopropylbenzene	ND (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
n-Propylbenzene	ND (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
1,3,5-Trimethylbenzene	ND (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
1,2,3-Trimethylbenzene	ND (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
1,2,4-Trimethylbenzene	J **3.41** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
t-Butylbenzene	ND (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
sec-Butylbenzene	ND (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
p-Isopropyltoluene	**12.0** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
n-Butylbenzene	**10.8** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
trans-Decalin	**8.28** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
cis-Decalin	ND (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
C1-Decalins	**9.46** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
C2-Decalins	**6.95** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
C3-Decalins	ND (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
C4-Decalins	ND (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
Benzo(b)thiophene	ND (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
C1-Benzo(b)thiophenes	**70.1** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
C2-Benzo(b)thiophenes	**11.0** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
C3-Benzo(b)thiophenes	**12.5** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
C4-Benzo(b)thiophenes	**6.11** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS634
Date Sampled: 12/17/18 12:20
Percent Solids: 48
Initial Volume: 9.4
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**7.50** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
2-Methylnaphthalene	**4.72** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
1-Methylnaphthalene	**J 3.35** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
C1-Naphthalenes	**5.57** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
C2-Naphthalenes	**37.7** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
C3-Naphthalenes	**72.5** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
C4-Naphthalenes	**52.0** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
Biphenyl	**J 2.82** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
Acenaphthylene	**43.8** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
Acenaphthene	**45.4** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
Dibenzofuran	**J 4.08** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
Fluorene	**15.8** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
C1-Fluorenes	**47.8** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
C2-Fluorenes	**50.6** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
C3-Fluorenes	**26.5** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
Dibenzothiophene	**41.9** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
C1-Dibenzothiophenes	**36.0** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
C2-Dibenzothiophenes	**39.7** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
C3-Dibenzothiophenes	**25.7** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
C4-Dibenzothiophenes	**46.2** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
Phenanthrene	**44.7** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
Anthracene	**144** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
C1-Phenanthrenes/Anthracenes	**246** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
C2-Phenanthrenes/Anthracenes	**191** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
C3-Phenanthrenes/Anthracenes	**120** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
C4-Phenanthrenes/Anthracenes	**138** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
Retene	**471** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
Benzo(b)naphtho(2,1-d)thiophene	**64.3** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
C0-Benzonaphthothiophenes	**129** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
C1-Benzonaphthothiophenes	**80.5** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
C2-Benzonaphthothiophenes	**46.0** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
C3-Benzonaphthothiophenes	**20.5** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS634
Date Sampled: 12/17/18 12:20
Percent Solids: 48
Initial Volume: 9.4
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**6.91** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
Fluoranthene	**548** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
Pyrene	**606** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
C1-Fluoranthenes/Pyrenes	**550** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
C2-Fluoranthenes/Pyrenes	**232** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
C3-Fluoranthenes/Pyrenes	**95.7** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
Benzo(b)fluorene	**94.3** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
Benzo(c)fluorene	**32.2** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
2-Methylpyrene	**61.9** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
4-Methylpyrene	**46.8** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
1-Methylpyrene	**41.3** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
Benz(a)anthracene	**474** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
Chrysene/triphenylene	**441** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
C1-Benzo(a)anthracenes/Chrysenes	**286** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
C2-Benzo(a)anthracenes/Chrysenes	**146** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
C3-Benzo(a)anthracenes/Chrysenes	**85.0** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
C4-Benzo(a)anthracenes/Chrysenes	**39.2** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
Benzo(b)fluoranthene	**267** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
Benzo(j/k)fluoranthene	**368** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
Benzo(e)pyrene	**237** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
Benzo(a)pyrene	**406** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
Perylene	**147** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
Indeno(1,2,3-cd)pyrene	**180** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
Dibenzo(a,h)anthracene	**60.0** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
Benzo(g,h,i)perylene	**163** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
Coronene	**38.1** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
Tetramethyl lead	ND (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
Trimethylethyl lead	ND (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
Dimethyldiethyl lead	ND (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
Methyltriethyl lead	ND (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
Tetraethyl lead	ND (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
Carbazole	**7.25** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS634
Date Sampled: 12/17/18 12:20
Percent Solids: 48
Initial Volume: 9.4
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	J **3.95** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
2,3,5-Trimethylnaphthene	**5.57** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
4-Methyldibenzothiophene	**10.4** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
2/3-Methyldibenzothiophene	**11.8** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
1-Methyldibenzothiophene	**6.04** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
3-Methylphenanthrene	**55.2** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
2-Methylphenanthrene	**40.4** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
2-Methylanthracene	**59.6** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
4/9-Methylphenanthrene	**65.3** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902
1-Methylphenanthrene	**19.9** (4.41)	2.20	8270 Mod		1	12/20/18 3:40	F8L0008	FL81902

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*82 %*		*50-120*
Surrogate: Naphthalene-d8	*79 %*		*50-120*
Surrogate: Phenanthrene-d10	*78 %*		*50-120*
Surrogate: Perylene-d12	*78 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS634
Date Sampled: 12/17/18 12:20
Percent Solids: 48

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-10
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**74700** (419)		LK		1	CCP	12/20/18 18:26	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS637
Date Sampled: 12/17/18 12:35
Percent Solids: 70
Initial Volume: 9.51
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-11
Sample Matrix: Soil
Units: mg/Kg dry
Analyst: NL
Prepared: 12/19/18 8:30

Saturated Hydrocarbons by GC/FID

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C-8	ND (0.300)	0.150	8015 Mod		1	NL	12/20/18 1:15	F8L0009	FL81902
C-9	ND (0.300)	0.150	8015 Mod		1	NL	12/20/18 1:15	F8L0009	FL81902
C-10	ND (0.300)	0.150	8015 Mod		1	NL	12/20/18 1:15	F8L0009	FL81902
C-11	ND (0.300)	0.150	8015 Mod		1	NL	12/20/18 1:15	F8L0009	FL81902
C-12	ND (0.300)	0.150	8015 Mod		1	NL	12/20/18 1:15	F8L0009	FL81902
C-13	ND (0.300)	0.150	8015 Mod		1	NL	12/20/18 1:15	F8L0009	FL81902
2,6,10-trimethyldodecane (1380)	ND (0.300)	0.150	8015 Mod		1	NL	12/20/18 1:15	F8L0009	FL81902
C-14	ND (0.300)	0.150	8015 Mod		1	NL	12/20/18 1:15	F8L0009	FL81902
2,6,10-trimethyltridecane (1470)	ND (0.300)	0.150	8015 Mod		1	NL	12/20/18 1:15	F8L0009	FL81902
C-15	ND (0.300)	0.150	8015 Mod		1	NL	12/20/18 1:15	F8L0009	FL81902
C-16	ND (0.300)	0.150	8015 Mod		1	NL	12/20/18 1:15	F8L0009	FL81902
2,6,10-trimethylpentadecane (1650)	ND (0.300)	0.150	8015 Mod		1	NL	12/20/18 1:15	F8L0009	FL81902
C-17	ND (0.300)	0.150	8015 Mod		1	NL	12/20/18 1:15	F8L0009	FL81902
Pristane	ND (0.300)	0.150	8015 Mod		1	NL	12/20/18 1:15	F8L0009	FL81902
C-18	ND (0.300)	0.150	8015 Mod		1	NL	12/20/18 1:15	F8L0009	FL81902
Phytane	ND (0.300)	0.150	8015 Mod		1	NL	12/20/18 1:15	F8L0009	FL81902
C-19	ND (0.300)	0.150	8015 Mod		1	NL	12/20/18 1:15	F8L0009	FL81902
C-20	ND (0.300)	0.150	8015 Mod		1	NL	12/20/18 1:15	F8L0009	FL81902
C-21	ND (0.300)	0.150	8015 Mod		1	NL	12/20/18 1:15	F8L0009	FL81902
C-22	ND (0.300)	0.150	8015 Mod		1	NL	12/20/18 1:15	F8L0009	FL81902
C-23	ND (0.300)	0.150	8015 Mod		1	NL	12/20/18 1:15	F8L0009	FL81902
C-24	ND (0.300)	0.150	8015 Mod		1	NL	12/20/18 1:15	F8L0009	FL81902
C-25	ND (0.300)	0.150	8015 Mod		1	NL	12/20/18 1:15	F8L0009	FL81902
C-26	ND (0.300)	0.150	8015 Mod		1	NL	12/20/18 1:15	F8L0009	FL81902
C-27	**J 0.230** (0.300)	0.150	8015 Mod		1	NL	12/20/18 1:15	F8L0009	FL81902
C-28	ND (0.300)	0.150	8015 Mod		1	NL	12/20/18 1:15	F8L0009	FL81902
C-29	ND (0.300)	0.150	8015 Mod		1	NL	12/20/18 1:15	F8L0009	FL81902
C-30	ND (0.300)	0.150	8015 Mod		1	NL	12/20/18 1:15	F8L0009	FL81902
C-31	ND (0.300)	0.150	8015 Mod		1	NL	12/20/18 1:15	F8L0009	FL81902
C-32	ND (0.300)	0.150	8015 Mod		1	NL	12/20/18 1:15	F8L0009	FL81902
C-33	ND (0.300)	0.150	8015 Mod		1	NL	12/20/18 1:15	F8L0009	FL81902
C-34	ND (0.300)	0.150	8015 Mod		1	NL	12/20/18 1:15	F8L0009	FL81902

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS637
Date Sampled: 12/17/18 12:35
Percent Solids: 70
Initial Volume: 9.51
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-11
Sample Matrix: Soil
Units: mg/Kg dry
Analyst: NL
Prepared: 12/19/18 8:30

Saturated Hydrocarbons by GC/FID

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C-35	ND (0.300)	0.150	8015 Mod		1	NL	12/20/18 1:15	F8L0009	FL81902
C-36	ND (0.300)	0.150	8015 Mod		1	NL	12/20/18 1:15	F8L0009	FL81902
C-37	ND (0.300)	0.150	8015 Mod		1	NL	12/20/18 1:15	F8L0009	FL81902
C-38	ND (0.300)	0.150	8015 Mod		1	NL	12/20/18 1:15	F8L0009	FL81902
C-39	ND (0.300)	0.150	8015 Mod		1	NL	12/20/18 1:15	F8L0009	FL81902
C-40	ND (0.300)	0.150	8015 Mod		1	NL	12/20/18 1:15	F8L0009	FL81902
TPH (C8-C40)	**20.0** (0.300)	0.150	8015 Mod		1	NL	12/20/18 1:15	F8L0009	FL81902

	%Recovery	Qualifier	Limits
Surrogate: o-Terphenyl	*85 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS637
Date Sampled: 12/17/18 12:35
Percent Solids: 70
Initial Volume: 9.51
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **7.02** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
C1-Benzene	**10.4** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
C2-Benzenes	**12.9** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
C3-Benzenes	**18.8** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
C4-Benzenes	**10.6** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
C5-Benzenes	**7.15** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
Methylcyclohexane	**75.9** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
Toluene	**16.5** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
Ethylbenzene	J **2.20** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
m,p-Xylene	**16.0** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
Styrene	**6.15** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
o-Xylene	**6.17** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
Isopropylbenzene	ND (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
n-Propylbenzene	ND (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
1,3,5-Trimethylbenzene	**18.4** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
1,2,3-Trimethylbenzene	J **2.95** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
1,2,4-Trimethylbenzene	**7.21** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
t-Butylbenzene	ND (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
sec-Butylbenzene	ND (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
p-Isopropyltoluene	ND (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
n-Butylbenzene	**3.60** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
trans-Decalin	**6.78** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
cis-Decalin	ND (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
C1-Decalins	**9.97** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
C2-Decalins	**11.5** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
C3-Decalins	**5.52** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
C4-Decalins	ND (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
Benzo(b)thiophene	ND (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
C1-Benzo(b)thiophenes	**47.6** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
C2-Benzo(b)thiophenes	**5.38** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
C3-Benzo(b)thiophenes	**5.35** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
C4-Benzo(b)thiophenes	J **2.79** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS637
Date Sampled: 12/17/18 12:35
Percent Solids: 70
Initial Volume: 9.51
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**33.5** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
2-Methylnaphthalene	**30.7** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
1-Methylnaphthalene	**28.5** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
C1-Naphthalenes	**38.6** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
C2-Naphthalenes	**67.8** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
C3-Naphthalenes	**63.6** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
C4-Naphthalenes	**36.6** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
Biphenyl	**13.6** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
Acenaphthylene	**63.4** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
Acenaphthene	**71.9** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
Dibenzofuran	**28.6** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
Fluorene	**55.4** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
C1-Fluorenes	**43.0** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
C2-Fluorenes	**68.5** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
C3-Fluorenes	**105** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
Dibenzothiophene	**50.5** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
C1-Dibenzothiophenes	**73.5** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
C2-Dibenzothiophenes	**71.9** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
C3-Dibenzothiophenes	**40.0** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
C4-Dibenzothiophenes	**14.1** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
Phenanthrene	**949** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
Anthracene	**180** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
C1-Phenanthrenes/Anthracenes	**546** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
C2-Phenanthrenes/Anthracenes	**287** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
C3-Phenanthrenes/Anthracenes	**101** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
C4-Phenanthrenes/Anthracenes	**30.2** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
Retene	**7.13** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
Benzo(b)naphtho(2,1-d)thiophene	**93.2** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
C0-Benzonaphthothiophenes	**166** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
C1-Benzonaphthothiophenes	**104** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
C2-Benzonaphthothiophenes	**68.0** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
C3-Benzonaphthothiophenes	**33.6** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS637
Date Sampled: 12/17/18 12:35
Percent Solids: 70
Initial Volume: 9.51
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**9.97** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
Fluoranthene	**1340** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
Pyrene	**1340** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
C1-Fluoranthenes/Pyrenes	**499** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
C2-Fluoranthenes/Pyrenes	**330** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
C3-Fluoranthenes/Pyrenes	**155** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
Benzo(b)fluorene	**31.1** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
Benzo(c)fluorene	**24.1** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
2-Methylpyrene	**74.9** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
4-Methylpyrene	**64.1** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
1-Methylpyrene	**56.5** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
Benz(a)anthracene	**603** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
Chrysene/triphenylene	**668** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
C1-Benzo(a)anthracenes/Chrysenes	**291** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
C2-Benzo(a)anthracenes/Chrysenes	**150** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
C3-Benzo(a)anthracenes/Chrysenes	**73.2** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
C4-Benzo(a)anthracenes/Chrysenes	**35.0** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
Benzo(b)fluoranthene	**474** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
Benzo(j/k)fluoranthene	**512** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
Benzo(e)pyrene	**426** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
Benzo(a)pyrene	**589** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
Perylene	**143** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
Indeno(1,2,3-cd)pyrene	**363** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
Dibenzo(a,h)anthracene	**93.2** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
Benzo(g,h,i)perylene	**372** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
Coronene	**92.1** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
Tetramethyl lead	ND (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
Trimethylethyl lead	ND (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
Dimethyldiethyl lead	ND (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
Methyltriethyl lead	ND (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
Tetraethyl lead	ND (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
Carbazole	**57.4** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS637
Date Sampled: 12/17/18 12:35
Percent Solids: 70
Initial Volume: 9.51
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**15.8** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
2,3,5-Trimethylnaphthene	**4.74** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
4-Methyldibenzothiophene	**29.2** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
2/3-Methyldibenzothiophene	**23.9** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
1-Methyldibenzothiophene	**8.26** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
3-Methylphenanthrene	**128** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
2-Methylphenanthrene	**159** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
2-Methylanthracene	**42.5** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
4/9-Methylphenanthrene	**118** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902
1-Methylphenanthrene	**91.0** (3.00)	1.50	8270 Mod		1	12/20/18 5:01	F8L0008	FL81902

	%Recovery	*Qualifier*	*Limits*
Surrogate: Toluene-D8	*82 %*		*50-120*
Surrogate: Naphthalene-d8	*79 %*		*50-120*
Surrogate: Phenanthrene-d10	*80 %*		*50-120*
Surrogate: Perylene-d12	*78 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS637
Date Sampled: 12/17/18 12:35
Percent Solids: 70

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-11
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**98300** (463)		LK		1	CCP	12/20/18 18:43	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS640
Date Sampled: 12/17/18 12:05
Percent Solids: 82
Initial Volume: 10.11
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-12
Sample Matrix: Soil
Units: mg/Kg dry
Analyst: NL
Prepared: 12/19/18 15:00

Saturated Hydrocarbons by GC/FID

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C-8	ND (0.243)	0.121	8015 Mod		1	NL	12/20/18 10:35	F8L0009	FL81902
C-9	ND (0.243)	0.121	8015 Mod		1	NL	12/20/18 10:35	F8L0009	FL81902
C-10	ND (0.243)	0.121	8015 Mod		1	NL	12/20/18 10:35	F8L0009	FL81902
C-11	ND (0.243)	0.121	8015 Mod		1	NL	12/20/18 10:35	F8L0009	FL81902
C-12	ND (0.243)	0.121	8015 Mod		1	NL	12/20/18 10:35	F8L0009	FL81902
C-13	ND (0.243)	0.121	8015 Mod		1	NL	12/20/18 10:35	F8L0009	FL81902
2,6,10-trimethyldodecane (1380)	ND (0.243)	0.121	8015 Mod		1	NL	12/20/18 10:35	F8L0009	FL81902
C-14	ND (0.243)	0.121	8015 Mod		1	NL	12/20/18 10:35	F8L0009	FL81902
2,6,10-trimethyltridecane (1470)	ND (0.243)	0.121	8015 Mod		1	NL	12/20/18 10:35	F8L0009	FL81902
C-15	ND (0.243)	0.121	8015 Mod		1	NL	12/20/18 10:35	F8L0009	FL81902
C-16	ND (0.243)	0.121	8015 Mod		1	NL	12/20/18 10:35	F8L0009	FL81902
2,6,10-trimethylpentadecane (1650)	ND (0.243)	0.121	8015 Mod		1	NL	12/20/18 10:35	F8L0009	FL81902
C-17	ND (0.243)	0.121	8015 Mod		1	NL	12/20/18 10:35	F8L0009	FL81902
Pristane	ND (0.243)	0.121	8015 Mod		1	NL	12/20/18 10:35	F8L0009	FL81902
C-18	ND (0.243)	0.121	8015 Mod		1	NL	12/20/18 10:35	F8L0009	FL81902
Phytane	ND (0.243)	0.121	8015 Mod		1	NL	12/20/18 10:35	F8L0009	FL81902
C-19	ND (0.243)	0.121	8015 Mod		1	NL	12/20/18 10:35	F8L0009	FL81902
C-20	ND (0.243)	0.121	8015 Mod		1	NL	12/20/18 10:35	F8L0009	FL81902
C-21	ND (0.243)	0.121	8015 Mod		1	NL	12/20/18 10:35	F8L0009	FL81902
C-22	ND (0.243)	0.121	8015 Mod		1	NL	12/20/18 10:35	F8L0009	FL81902
C-23	ND (0.243)	0.121	8015 Mod		1	NL	12/20/18 10:35	F8L0009	FL81902
C-24	J **0.188** (0.243)	0.121	8015 Mod		1	NL	12/20/18 10:35	F8L0009	FL81902
C-25	**0.825** (0.243)	0.121	8015 Mod		1	NL	12/20/18 10:35	F8L0009	FL81902
C-26	J **0.136** (0.243)	0.121	8015 Mod		1	NL	12/20/18 10:35	F8L0009	FL81902
C-27	**1.61** (0.243)	0.121	8015 Mod		1	NL	12/20/18 10:35	F8L0009	FL81902
C-28	**0.294** (0.243)	0.121	8015 Mod		1	NL	12/20/18 10:35	F8L0009	FL81902
C-29	**0.777** (0.243)	0.121	8015 Mod		1	NL	12/20/18 10:35	F8L0009	FL81902
C-30	J **0.191** (0.243)	0.121	8015 Mod		1	NL	12/20/18 10:35	F8L0009	FL81902
C-31	**0.663** (0.243)	0.121	8015 Mod		1	NL	12/20/18 10:35	F8L0009	FL81902
C-32	ND (0.243)	0.121	8015 Mod		1	NL	12/20/18 10:35	F8L0009	FL81902
C-33	**0.271** (0.243)	0.121	8015 Mod		1	NL	12/20/18 10:35	F8L0009	FL81902
C-34	ND (0.243)	0.121	8015 Mod		1	NL	12/20/18 10:35	F8L0009	FL81902

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS640
Date Sampled: 12/17/18 12:05
Percent Solids: 82
Initial Volume: 10.11
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-12
Sample Matrix: Soil
Units: mg/Kg dry
Analyst: NL
Prepared: 12/19/18 15:00

Saturated Hydrocarbons by GC/FID

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C-35	**0.439** (0.243)	0.121	8015 Mod		1	NL	12/20/18 10:35	F8L0009	FL81902
C-36	ND (0.243)	0.121	8015 Mod		1	NL	12/20/18 10:35	F8L0009	FL81902
C-37	**J 0.153** (0.243)	0.121	8015 Mod		1	NL	12/20/18 10:35	F8L0009	FL81902
C-38	ND (0.243)	0.121	8015 Mod		1	NL	12/20/18 10:35	F8L0009	FL81902
C-39	ND (0.243)	0.121	8015 Mod		1	NL	12/20/18 10:35	F8L0009	FL81902
C-40	**J 0.135** (0.243)	0.121	8015 Mod		1	NL	12/20/18 10:35	F8L0009	FL81902
TPH (C8-C40)	**76.8** (0.243)	0.121	8015 Mod		1	NL	12/20/18 10:35	F8L0009	FL81902

	%Recovery	Qualifier	Limits
Surrogate: o-Terphenyl	*73 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS640
Date Sampled: 12/17/18 12:05
Percent Solids: 82
Initial Volume: 10.11
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **5.23** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
C1-Benzene	**12.4** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
C2-Benzenes	**16.3** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
C3-Benzenes	**7.52** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
C4-Benzenes	**9.27** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
C5-Benzenes	**3.35** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
Methylcyclohexane	**2.68** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
Toluene	**19.8** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
Ethylbenzene	**3.21** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
m,p-Xylene	**23.9** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
Styrene	**2.86** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
o-Xylene	ND (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
Isopropylbenzene	ND (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
n-Propylbenzene	J **1.31** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
1,3,5-Trimethylbenzene	J **1.72** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
1,2,3-Trimethylbenzene	J **1.54** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
1,2,4-Trimethylbenzene	J **2.04** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
t-Butylbenzene	ND (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
sec-Butylbenzene	ND (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
p-Isopropyltoluene	**12.9** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
n-Butylbenzene	J **2.35** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
trans-Decalin	ND (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
cis-Decalin	ND (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
C1-Decalins	ND (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
C2-Decalins	ND (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
C3-Decalins	ND (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
C4-Decalins	ND (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
Benzo(b)thiophene	J **1.22** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
C1-Benzo(b)thiophenes	**17.3** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
C2-Benzo(b)thiophenes	**2.54** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
C3-Benzo(b)thiophenes	J **2.06** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
C4-Benzo(b)thiophenes	ND (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS640
Date Sampled: 12/17/18 12:05
Percent Solids: 82
Initial Volume: 10.11
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**36.9** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
2-Methylnaphthalene	**21.6** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
1-Methylnaphthalene	**11.8** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
C1-Naphthalenes	**22.5** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
C2-Naphthalenes	**24.8** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
C3-Naphthalenes	**19.0** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
C4-Naphthalenes	**11.4** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
Biphenyl	**8.91** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
Acenaphthylene	**67.3** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
Acenaphthene	**24.7** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
Dibenzofuran	**12.4** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
Fluorene	**19.7** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
C1-Fluorenes	**14.1** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
C2-Fluorenes	**16.9** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
C3-Fluorenes	**19.1** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
Dibenzothiophene	**11.2** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
C1-Dibenzothiophenes	**10.8** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
C2-Dibenzothiophenes	**10.7** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
C3-Dibenzothiophenes	**6.53** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
C4-Dibenzothiophenes	**3.98** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
Phenanthrene	**206** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
Anthracene	**80.0** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
C1-Phenanthrenes/Anthracenes	**122** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
C2-Phenanthrenes/Anthracenes	**68.3** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
C3-Phenanthrenes/Anthracenes	**32.2** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
C4-Phenanthrenes/Anthracenes	**21.0** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
Retene	**51.8** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
Benzo(b)naphtho(2,1-d)thiophene	**21.7** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
C0-Benzonaphthothiophenes	**45.7** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
C1-Benzonaphthothiophenes	**23.2** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
C2-Benzonaphthothiophenes	**14.3** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
C3-Benzonaphthothiophenes	**9.75** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS640
Date Sampled: 12/17/18 12:05
Percent Solids: 82
Initial Volume: 10.11
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**3.41** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
Fluoranthene	**469** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
Pyrene	**471** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
C1-Fluoranthenes/Pyrenes	**201** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
C2-Fluoranthenes/Pyrenes	**95.7** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
C3-Fluoranthenes/Pyrenes	**42.7** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
Benzo(b)fluorene	**19.8** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
Benzo(c)fluorene	**10.5** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
2-Methylpyrene	**28.4** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
4-Methylpyrene	**26.1** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
1-Methylpyrene	**18.2** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
Benz(a)anthracene	**244** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
Chrysene/triphenylene	**232** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
C1-Benzo(a)anthracenes/Chrysenes	**116** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
C2-Benzo(a)anthracenes/Chrysenes	**65.3** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
C3-Benzo(a)anthracenes/Chrysenes	**28.5** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
C4-Benzo(a)anthracenes/Chrysenes	**16.8** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
Benzo(b)fluoranthene	**205** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
Benzo(j/k)fluoranthene	**214** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
Benzo(e)pyrene	**199** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
Benzo(a)pyrene	**272** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
Perylene	**476** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
Indeno(1,2,3-cd)pyrene	**165** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
Dibenzo(a,h)anthracene	**39.7** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
Benzo(g,h,i)perylene	**175** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
Coronene	**43.3** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
Tetramethyl lead	ND (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
Trimethylethyl lead	ND (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
Dimethyldiethyl lead	ND (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
Methyltriethyl lead	ND (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
Tetraethyl lead	ND (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
Carbazole	**16.5** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS640
Date Sampled: 12/17/18 12:05
Percent Solids: 82
Initial Volume: 10.11
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 12/19/18 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**5.74** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
2,3,5-Trimethylnaphthene	**J 1.39** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
4-Methyldibenzothiophene	**2.99** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
2/3-Methyldibenzothiophene	**3.38** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
1-Methyldibenzothiophene	**J 1.53** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
3-Methylphenanthrene	**23.6** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
2-Methylphenanthrene	**29.7** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
2-Methylanthracene	**17.9** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
4/9-Methylphenanthrene	**27.9** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902
1-Methylphenanthrene	**19.0** (2.43)	1.21	8270 Mod		1	12/20/18 11:51	F8L0008	FL81902

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*76 %*		*50-120*
Surrogate: Naphthalene-d8	*71 %*		*50-120*
Surrogate: Phenanthrene-d10	*73 %*		*50-120*
Surrogate: Perylene-d12	*73 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS640
Date Sampled: 12/17/18 12:05
Percent Solids: 82

ESS Laboratory Work Order: F180070
ESS Laboratory Sample ID: F180070-12
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	ND (310)		LK		1	CCP	12/20/18 14:17	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F180070

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Classical Chemistry										
Batch CL81850 - General Preparation										
Blank										
Total Organic Carbon (1)	ND	100	mg/kg							
Total Organic Carbon (2)	ND	100	mg/kg							
Total Organic Carbon (3)	ND	100	mg/kg							
Total Organic Carbon (4)	ND	100	mg/kg							
LCS										
Total Organic Carbon (1)	10600	100	mg/kg	10000		106	80-120			
Total Organic Carbon (2)	10400	100	mg/kg	10000		104	80-120			
LCS Dup										
Total Organic Carbon (1)	9830	100	mg/kg	10000		98	80-120	8	20	
Total Organic Carbon (2)	9700	100	mg/kg	10000		97	80-120	7	20	

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Saturated Hydrocarbons by GC/FID										
Batch FL81902 - 3570										
Blank										
2,6,10-trimethyldodecane (1380)	ND	0.200	mg/Kg wet							
2,6,10-trimethylpentadecane (1650)	ND	0.200	mg/Kg wet							
2,6,10-trimethyltridecane (1470)	ND	0.200	mg/Kg wet							
C-10	ND	0.200	mg/Kg wet							
C-11	ND	0.200	mg/Kg wet							
C-12	ND	0.200	mg/Kg wet							
C-13	ND	0.200	mg/Kg wet							
C-14	ND	0.200	mg/Kg wet							
C-15	ND	0.200	mg/Kg wet							
C-16	ND	0.200	mg/Kg wet							
C-17	ND	0.200	mg/Kg wet							
C-18	ND	0.200	mg/Kg wet							
C-19	ND	0.200	mg/Kg wet							
C-20	ND	0.200	mg/Kg wet							
C-21	ND	0.200	mg/Kg wet							
C-22	ND	0.200	mg/Kg wet							
C-23	ND	0.200	mg/Kg wet							
C-24	ND	0.200	mg/Kg wet							
C-25	ND	0.200	mg/Kg wet							
C-26	ND	0.200	mg/Kg wet							
C-27	ND	0.200	mg/Kg wet							
C-28	ND	0.200	mg/Kg wet							
C-29	ND	0.200	mg/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F180070

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Saturated Hydrocarbons by GC/FID										
Batch FL81902 - 3570										
C-30	ND	0.200	mg/Kg wet							
C-31	ND	0.200	mg/Kg wet							
C-32	ND	0.200	mg/Kg wet							
C-33	ND	0.200	mg/Kg wet							
C-34	ND	0.200	mg/Kg wet							
C-35	ND	0.200	mg/Kg wet							
C-36	ND	0.200	mg/Kg wet							
C-37	ND	0.200	mg/Kg wet							
C-38	ND	0.200	mg/Kg wet							
C-39	ND	0.200	mg/Kg wet							
C-40	ND	0.200	mg/Kg wet							
C-8	ND	0.200	mg/Kg wet							
C-9	ND	0.200	mg/Kg wet							
Phytane	ND	0.200	mg/Kg wet							
Pristane	ND	0.200	mg/Kg wet							
TPH (C8-C40)	ND	0.200	mg/Kg wet							
Surrogate: o-Terphenyl	*4.14*		mg/Kg wet	*5.000*		*83*	*50-120*			
LCS										
C-10	4.09	0.200	mg/Kg wet	5.000		82	60-130			
C-11	4.22	0.200	mg/Kg wet	5.000		84	60-130			
C-12	4.33	0.200	mg/Kg wet	5.000		87	60-130			
C-13	4.24	0.200	mg/Kg wet	5.000		85	60-130			
C-14	4.20	0.200	mg/Kg wet	5.000		84	60-130			
C-15	4.13	0.200	mg/Kg wet	5.000		83	60-130			
C-16	4.20	0.200	mg/Kg wet	5.000		84	60-130			
C-17	4.10	0.200	mg/Kg wet	5.000		82	60-130			
C-18	4.05	0.200	mg/Kg wet	5.000		81	60-130			
C-19	4.14	0.200	mg/Kg wet	5.000		83	60-130			
C-20	4.14	0.200	mg/Kg wet	5.000		83	60-130			
C-21	4.13	0.200	mg/Kg wet	5.000		83	60-130			
C-22	4.12	0.200	mg/Kg wet	5.000		82	60-130			
C-23	4.12	0.200	mg/Kg wet	5.000		82	60-130			
C-24	4.12	0.200	mg/Kg wet	5.000		82	60-130			
C-25	4.36	0.200	mg/Kg wet	5.000		87	60-130			
C-26	4.13	0.200	mg/Kg wet	5.000		83	60-130			
C-27	4.13	0.200	mg/Kg wet	5.000		83	60-130			
C-28	3.91	0.200	mg/Kg wet	5.000		78	60-130			
C-29	4.13	0.200	mg/Kg wet	5.000		83	60-130			
C-30	4.12	0.200	mg/Kg wet	5.000		82	60-130			
C-31	4.14	0.200	mg/Kg wet	5.000		83	60-130			
C-32	4.15	0.200	mg/Kg wet	5.000		83	60-130			
C-33	4.15	0.200	mg/Kg wet	5.000		83	60-130			
C-34	4.16	0.200	mg/Kg wet	5.000		83	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F180070

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Saturated Hydrocarbons by GC/FID										
Batch FL81902 - 3570										
C-35	4.18	0.200	mg/Kg wet	5.000		84	60-130			
C-36	4.18	0.200	mg/Kg wet	5.000		84	60-130			
C-37	4.17	0.200	mg/Kg wet	5.000		83	60-130			
C-38	4.22	0.200	mg/Kg wet	5.000		84	60-130			
C-39	4.24	0.200	mg/Kg wet	5.000		85	60-130			
C-40	4.28	0.200	mg/Kg wet	5.000		86	60-130			
C-8	4.08	0.200	mg/Kg wet	5.000		82	60-130			
C-9	3.96	0.200	mg/Kg wet	5.000		79	60-130			
Phytane	4.15	0.200	mg/Kg wet	5.000		83	60-130			
Pristane	4.28	0.200	mg/Kg wet	5.000		86	60-130			
Surrogate: o-Terphenyl	*4.19*		mg/Kg wet	*5.000*		*84*	*50-120*			
Duplicate **Source: F180070-12**										
2,6,10-trimethyldodecane (1380)	ND	0.240	mg/Kg dry		ND				50	
2,6,10-trimethylpentadecane (1650)	ND	0.240	mg/Kg dry		ND				50	
2,6,10-trimethyltridecane (1470)	ND	0.240	mg/Kg dry		ND				50	
C-10	ND	0.240	mg/Kg dry		ND				50	
C-11	ND	0.240	mg/Kg dry		ND				50	
C-12	ND	0.240	mg/Kg dry		ND				50	
C-13	ND	0.240	mg/Kg dry		ND				50	
C-14	ND	0.240	mg/Kg dry		ND				50	
C-15	ND	0.240	mg/Kg dry		ND				50	
C-16	ND	0.240	mg/Kg dry		ND				50	
C-17	ND	0.240	mg/Kg dry		ND				50	
C-18	ND	0.240	mg/Kg dry		ND				50	
C-19	ND	0.240	mg/Kg dry		ND				50	
C-20	ND	0.240	mg/Kg dry		ND				50	
C-21	ND	0.240	mg/Kg dry		ND				50	
C-22	ND	0.240	mg/Kg dry		ND				50	
C-23	ND	0.240	mg/Kg dry		ND				50	
C-24	0.166	0.240	mg/Kg dry		0.188			13	50	J
C-25	0.661	0.240	mg/Kg dry		0.825			22	50	
C-26	ND	0.240	mg/Kg dry		0.136				50	
C-27	1.39	0.240	mg/Kg dry		1.61			14	50	
C-28	0.479	0.240	mg/Kg dry		0.294			48	50	
C-29	0.459	0.240	mg/Kg dry		0.777			51	50	D+
C-30	0.293	0.240	mg/Kg dry		0.191			42	50	
C-31	0.380	0.240	mg/Kg dry		0.663			54	50	D+
C-32	ND	0.240	mg/Kg dry		ND				50	
C-33	0.353	0.240	mg/Kg dry		0.271			26	50	
C-34	ND	0.240	mg/Kg dry		ND				50	
C-35	0.380	0.240	mg/Kg dry		0.439			14	50	
C-36	ND	0.240	mg/Kg dry		ND				50	
C-37	0.124	0.240	mg/Kg dry		0.153			21	50	J

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F180070

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Saturated Hydrocarbons by GC/FID										
Batch FL81902 - 3570										
C-38	ND	0.240	mg/Kg dry		ND				50	
C-39	ND	0.240	mg/Kg dry		ND				50	
C-40	0.159	0.240	mg/Kg dry		0.135			16	50	J
C-8	ND	0.240	mg/Kg dry		ND				50	
C-9	ND	0.240	mg/Kg dry		ND				50	
Phytane	ND	0.240	mg/Kg dry		ND				50	
Pristane	ND	0.240	mg/Kg dry		ND				50	
TPH (C8-C40)	85.6	0.240	mg/Kg dry		76.8			11	50	
Surrogate: o-Terphenyl	*4.54*		mg/Kg dry	*5.999*		*76*	*50-120*			
8270D (SIM) Semi-Volatile Organic Compounds										
Batch FL81902 - 3570										
Blank										
1,2,3-Trimethylbenzene	ND	2.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	2.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	2.00	ug/Kg wet							
1-Methyldibenzothiophene	ND	2.00	ug/Kg wet							
1-Methylnaphthalene	ND	2.00	ug/Kg wet							
1-Methylphenanthrene	ND	2.00	ug/Kg wet							
1-Methylpyrene	ND	2.00	ug/Kg wet							
2,3,5-Trimethylnaphthene	ND	2.00	ug/Kg wet							
2,6-Dimethylnaphthalene	ND	2.00	ug/Kg wet							
2/3-Methyldibenzothiophene	ND	2.00	ug/Kg wet							
2-Methylanthracene	ND	2.00	ug/Kg wet							
2-Methylnaphthalene	ND	2.00	ug/Kg wet							
2-Methylphenanthrene	ND	2.00	ug/Kg wet							
2-Methylpyrene	ND	2.00	ug/Kg wet							
3-Methylphenanthrene	ND	2.00	ug/Kg wet							
4/9-Methylphenanthrene	ND	2.00	ug/Kg wet							
4-Methyldibenzothiophene	ND	2.00	ug/Kg wet							
4-Methylpyrene	ND	2.00	ug/Kg wet							
Acenaphthene	ND	2.00	ug/Kg wet							
Acenaphthylene	ND	2.00	ug/Kg wet							
Anthracene	ND	2.00	ug/Kg wet							
Benz(a)anthracene	ND	2.00	ug/Kg wet							
Benzene	2.65	2.00	ug/Kg wet							
Benzo(a)pyrene	ND	2.00	ug/Kg wet							
Benzo(b)fluoranthene	ND	2.00	ug/Kg wet							
Benzo(b)fluorene	ND	2.00	ug/Kg wet							
Benzo(b)naphtho(2,1-d)thiophene	ND	2.00	ug/Kg wet							
Benzo(b)thiophene	ND	2.00	ug/Kg wet							
Benzo(c)fluorene	ND	2.00	ug/Kg wet							
Benzo(e)pyrene	ND	2.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F180070

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D (SIM) Semi-Volatile Organic Compounds										
Batch FL81902 - 3570										
Benzo(g,h,i)perylene	ND	2.00	ug/Kg wet							
Benzo(j/k)fluoranthene	ND	2.00	ug/Kg wet							
Biphenyl	ND	2.00	ug/Kg wet							
C0-Benzonaphthothiophenes	ND	2.00	ug/Kg wet							
C1-Benzene	ND	2.00	ug/Kg wet							
C1-Benzo(a)anthracenes/Chrysenes	ND	2.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	2.00	ug/Kg wet							
C1-Benzonaphthothiophenes	ND	2.00	ug/Kg wet							
C1-Decalins	ND	2.00	ug/Kg wet							
C1-Dibenzothiophenes	ND	2.00	ug/Kg wet							
C1-Fluoranthenes/Pyrenes	ND	2.00	ug/Kg wet							
C1-Fluorenes	ND	2.00	ug/Kg wet							
C1-Naphthalenes	ND	2.00	ug/Kg wet							
C1-Phenanthrenes/Anthracenes	ND	2.00	ug/Kg wet							
C2-Benzenes	ND	2.00	ug/Kg wet							
C2-Benzo(a)anthracenes/Chrysenes	ND	2.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	2.00	ug/Kg wet							
C2-Benzonaphthothiophenes	ND	2.00	ug/Kg wet							
C2-Decalins	ND	2.00	ug/Kg wet							
C2-Dibenzothiophenes	ND	2.00	ug/Kg wet							
C2-Fluoranthenes/Pyrenes	ND	2.00	ug/Kg wet							
C2-Fluorenes	ND	2.00	ug/Kg wet							
C2-Naphthalenes	ND	2.00	ug/Kg wet							
C2-Phenanthrenes/Anthracenes	ND	2.00	ug/Kg wet							
C3-Benzenes	ND	2.00	ug/Kg wet							
C3-Benzo(a)anthracenes/Chrysenes	ND	2.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	2.00	ug/Kg wet							
C3-Benzonaphthothiophenes	ND	2.00	ug/Kg wet							
C3-Decalins	ND	2.00	ug/Kg wet							
C3-Dibenzothiophenes	ND	2.00	ug/Kg wet							
C3-Fluoranthenes/Pyrenes	ND	2.00	ug/Kg wet							
C3-Fluorenes	ND	2.00	ug/Kg wet							
C3-Naphthalenes	ND	2.00	ug/Kg wet							
C3-Phenanthrenes/Anthracenes	ND	2.00	ug/Kg wet							
C4-Benzenes	ND	2.00	ug/Kg wet							
C4-Benzo(a)anthracenes/Chrysenes	ND	2.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	2.00	ug/Kg wet							
C4-Benzonaphthothiophenes	ND	2.00	ug/Kg wet							
C4-Decalins	ND	2.00	ug/Kg wet							
C4-Dibenzothiophenes	ND	2.00	ug/Kg wet							
C4-Naphthalenes	ND	2.00	ug/Kg wet							
C4-Phenanthrenes/Anthracenes	ND	2.00	ug/Kg wet							
C5-Benzenes	ND	2.00	ug/Kg wet							
Carbazole	ND	2.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F180070

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D (SIM) Semi-Volatile Organic Compounds										
Batch FL81902 - 3570										
Chrysene/triphenylene	ND	2.00	ug/Kg wet							
cis-Decalin	ND	2.00	ug/Kg wet							
Coronene	ND	2.00	ug/Kg wet							
Dibenzo(a,h)anthracene	ND	2.00	ug/Kg wet							
Dibenzofuran	ND	2.00	ug/Kg wet							
Dibenzothiophene	ND	2.00	ug/Kg wet							
Dimethyldiethyl lead	ND	2.00	ug/Kg wet							
Ethylbenzene	ND	2.00	ug/Kg wet							
Fluoranthene	ND	2.00	ug/Kg wet							
Fluorene	ND	2.00	ug/Kg wet							
Indeno(1,2,3-cd)pyrene	ND	2.00	ug/Kg wet							
Isopropylbenzene	ND	2.00	ug/Kg wet							
m,p-Xylene	ND	2.00	ug/Kg wet							
Methylcyclohexane	ND	2.00	ug/Kg wet							
Methyltriethyl lead	ND	2.00	ug/Kg wet							
Naphthalene	ND	2.00	ug/Kg wet							
n-Butylbenzene	ND	2.00	ug/Kg wet							
n-Propylbenzene	ND	2.00	ug/Kg wet							
o-Xylene	ND	2.00	ug/Kg wet							
Perylene	ND	2.00	ug/Kg wet							
Phenanthrene	ND	2.00	ug/Kg wet							
p-Isopropyltoluene	ND	2.00	ug/Kg wet							
Pyrene	ND	2.00	ug/Kg wet							
Retene	ND	2.00	ug/Kg wet							
sec-Butylbenzene	ND	2.00	ug/Kg wet							
Styrene	ND	2.00	ug/Kg wet							
t-Butylbenzene	ND	2.00	ug/Kg wet							
Tetraethyl lead	ND	2.00	ug/Kg wet							
Tetramethyl lead	ND	2.00	ug/Kg wet							
Toluene	ND	2.00	ug/Kg wet							
trans-Decalin	ND	2.00	ug/Kg wet							
Trimethylethyl lead	ND	2.00	ug/Kg wet							
Surrogate: Naphthalene-d8	*167*		ug/Kg wet	*200.0*		*83*	*50-120*			
Surrogate: Phenanthrene-d10	*161*		ug/Kg wet	*200.0*		*80*	*50-120*			
Surrogate: Toluene-D8	*193*		ug/Kg wet	*200.0*		*97*	*50-120*			
LCS										
1,2,3-Trimethylbenzene	189	2.00	ug/Kg wet	200.0		94	60-130			
1,2,4-Trimethylbenzene	188	2.00	ug/Kg wet	200.0		94	60-130			
1,3,5-Trimethylbenzene	187	2.00	ug/Kg wet	200.0		93	60-130			
1-Methylnaphthalene	177	2.00	ug/Kg wet	200.0		88	60-130			
2-Methylnaphthalene	175	2.00	ug/Kg wet	200.0		87	60-130			
Acenaphthene	178	2.00	ug/Kg wet	200.0		89	60-130			
Acenaphthylene	179	2.00	ug/Kg wet	200.0		90	60-130			
Anthracene	174	2.00	ug/Kg wet	200.0		87	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F180070

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch FL81902 - 3570										
Benz(a)anthracene	159	2.00	ug/Kg wet	200.0		79	60-130			
Benzene	164	2.00	ug/Kg wet	200.0		82	60-130			
Benzo(a)pyrene	152	2.00	ug/Kg wet	200.0		76	60-130			
Benzo(b)fluoranthene	151	2.00	ug/Kg wet	200.0		75	60-130			
Benzo(b)naphtho(2,1-d)thiophene	164	2.00	ug/Kg wet	200.0		82	60-130			
Benzo(b)thiophene	178	2.00	ug/Kg wet	200.0		89	60-130			
Benzo(e)pyrene	157	2.00	ug/Kg wet	200.0		79	60-130			
Benzo(g,h,i)perylene	157	2.00	ug/Kg wet	200.0		78	60-130			
Benzo(j/k)fluoranthene	159	2.00	ug/Kg wet	200.0		80	60-130			
Biphenyl	173	2.00	ug/Kg wet	200.0		87	60-130			
Chrysene/triphenylene	165	2.00	ug/Kg wet	200.0		83	60-130			
cis-Decalin	186	2.00	ug/Kg wet	200.0		93	60-130			
Coronene	161	2.00	ug/Kg wet	200.0		81	60-130			
Dibenzo(a,h)anthracene	149	2.00	ug/Kg wet	200.0		75	60-130			
Dibenzofuran	174	2.00	ug/Kg wet	200.0		87	60-130			
Dibenzothiophene	174	2.00	ug/Kg wet	200.0		87	60-130			
Ethylbenzene	186	2.00	ug/Kg wet	200.0		93	60-130			
Fluoranthene	173	2.00	ug/Kg wet	200.0		87	60-130			
Fluorene	172	2.00	ug/Kg wet	200.0		86	60-130			
Indeno(1,2,3-cd)pyrene	141	2.00	ug/Kg wet	200.0		70	60-130			
Isopropylbenzene	188	2.00	ug/Kg wet	200.0		94	60-130			
m,p-Xylene	183	2.00	ug/Kg wet	200.0		91	60-130			
Methylcyclohexane	133	2.00	ug/Kg wet	200.0		67	60-130			
Naphthalene	180	2.00	ug/Kg wet	200.0		90	60-130			
n-Butylbenzene	184	2.00	ug/Kg wet	200.0		92	60-130			
n-Propylbenzene	184	2.00	ug/Kg wet	200.0		92	60-130			
o-Xylene	187	2.00	ug/Kg wet	200.0		93	60-130			
Perylene	153	2.00	ug/Kg wet	200.0		77	60-130			
Phenanthrene	178	2.00	ug/Kg wet	200.0		89	60-130			
p-Isopropyltoluene	191	2.00	ug/Kg wet	200.0		95	60-130			
Pyrene	172	2.00	ug/Kg wet	200.0		86	60-130			
Retene	160	2.00	ug/Kg wet	200.0		80	60-130			
sec-Butylbenzene	188	2.00	ug/Kg wet	200.0		94	60-130			
Styrene	181	2.00	ug/Kg wet	200.0		90	60-130			
t-Butylbenzene	188	2.00	ug/Kg wet	200.0		94	60-130			
Tetraethyl lead	145	2.00	ug/Kg wet	200.0		72	60-130			
Toluene	189	2.00	ug/Kg wet	200.0		95	60-130			
trans-Decalin	188	2.00	ug/Kg wet	200.0		94	60-130			
Surrogate: Naphthalene-d8	*182*		ug/Kg wet	*200.0*		*91*	*50-120*			
Surrogate: Phenanthrene-d10	*177*		ug/Kg wet	*200.0*		*89*	*50-120*			
Surrogate: Toluene-D8	*194*		ug/Kg wet	*200.0*		*97*	*50-120*			
Duplicate **Source: F180070-12**										**D+**
1,2,3-Trimethylbenzene	ND	2.40	ug/Kg dry		1.54				50	
1,2,4-Trimethylbenzene	1.21	2.40	ug/Kg dry		2.04			51	50	J

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F180070

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch FL81902 - 3570										
1,3,5-Trimethylbenzene	1.36	2.40	ug/Kg dry		1.72			24	50	J
1-Methyldibenzothiophene	ND	2.40	ug/Kg dry		1.53				50	
1-Methylnaphthalene	4.92	2.40	ug/Kg dry		11.8			82	50	
1-Methylphenanthrene	4.23	2.40	ug/Kg dry		19.0			127	50	
1-Methylpyrene	6.47	2.40	ug/Kg dry		18.2			95	50	
2,3,5-Trimethylnaphthene	ND	2.40	ug/Kg dry		1.39				50	
2,6-Dimethylnaphthalene	2.74	2.40	ug/Kg dry		5.74			71	50	
2/3-Methyldibenzothiophene	ND	2.40	ug/Kg dry		3.38				50	
2-Methylanthracene	4.26	2.40	ug/Kg dry		17.9			123	50	
2-Methylnaphthalene	10.3	2.40	ug/Kg dry		21.6			71	50	
2-Methylphenanthrene	6.85	2.40	ug/Kg dry		29.7			125	50	
2-Methylpyrene	9.44	2.40	ug/Kg dry		28.4			100	50	
3-Methylphenanthrene	5.70	2.40	ug/Kg dry		23.6			122	50	
4/9-Methylphenanthrene	6.02	2.40	ug/Kg dry		27.9			129	50	
4-Methyldibenzothiophene	ND	2.40	ug/Kg dry		2.99				50	
4-Methylpyrene	11.0	2.40	ug/Kg dry		26.1			81	50	
Acenaphthene	7.82	2.40	ug/Kg dry		24.7			104	50	
Acenaphthylene	28.9	2.40	ug/Kg dry		67.3			80	50	
Anthracene	18.0	2.40	ug/Kg dry		80.0			126	50	
Benz(a)anthracene	51.8	2.40	ug/Kg dry		244			130	50	
Benzene	4.07	2.40	ug/Kg dry		5.23			25	50	
Benzo(a)pyrene	71.5	2.40	ug/Kg dry		272			117	50	
Benzo(b)fluoranthene	49.5	2.40	ug/Kg dry		205			122	50	
Benzo(b)fluorene	5.07	2.40	ug/Kg dry		19.8			118	50	
Benzo(b)naphtho(2,1-d)thiophene	4.45	2.40	ug/Kg dry		21.7			132	50	
Benzo(b)thiophene	ND	2.40	ug/Kg dry		1.22				50	
Benzo(c)fluorene	1.89	2.40	ug/Kg dry		10.5			139	50	J
Benzo(e)pyrene	68.2	2.40	ug/Kg dry		199			98	50	
Benzo(g,h,i)perylene	53.8	2.40	ug/Kg dry		175			106	50	
Benzo(j/k)fluoranthene	51.7	2.40	ug/Kg dry		214			122	50	
Biphenyl	4.77	2.40	ug/Kg dry		8.91			61	50	
C0-Benzonaphthothiophenes	9.52	2.40	ug/Kg dry		45.7			131	50	
C1-Benzene	37.5	2.40	ug/Kg dry		12.4			100	50	
C1-Benzo(a)anthracenes/Chrysenes	50.5	2.40	ug/Kg dry		116			79	50	
C1-Benzo(b)thiophenes	14.4	2.40	ug/Kg dry		17.3			19	50	
C1-Benzonaphthothiophenes	8.93	2.40	ug/Kg dry		23.2			89	50	
C1-Decalins	ND	2.40	ug/Kg dry		ND				50	
C1-Dibenzothiophenes	3.65	2.40	ug/Kg dry		10.8			99	50	
C1-Fluoranthenes/Pyrenes	64.2	2.40	ug/Kg dry		201			103	50	
C1-Fluorenes	5.22	2.40	ug/Kg dry		14.1			92	50	
C1-Naphthalenes	9.93	2.40	ug/Kg dry		22.5			78	50	
C1-Phenanthrenes/Anthracenes	28.0	2.40	ug/Kg dry		122			125	50	
C2-Benzenes	5.24	2.40	ug/Kg dry		16.3			103	50	
C2-Benzo(a)anthracenes/Chrysenes	34.1	2.40	ug/Kg dry		65.3			63	50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F180070

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D (SIM) Semi-Volatile Organic Compounds										
Batch FL81902 - 3570										
C2-Benzo(b)thiophenes	1.81	2.40	ug/Kg dry		2.54			33	50	J
C2-Benzonaphthothiophenes	7.13	2.40	ug/Kg dry		14.3			67	50	
C2-Decalins	ND	2.40	ug/Kg dry		ND				50	
C2-Dibenzothiophenes	4.30	2.40	ug/Kg dry		10.7			85	50	
C2-Fluoranthenes/Pyrenes	36.0	2.40	ug/Kg dry		95.7			91	50	
C2-Fluorenes	6.75	2.40	ug/Kg dry		16.9			86	50	
C2-Naphthalenes	12.4	2.40	ug/Kg dry		24.8			67	50	
C2-Phenanthrenes/Anthracenes	26.1	2.40	ug/Kg dry		68.3			89	50	
C3-Benzenes	5.64	2.40	ug/Kg dry		7.52			29	50	
C3-Benzo(a)anthracenes/Chrysenes	16.4	2.40	ug/Kg dry		28.5			54	50	
C3-Benzo(b)thiophenes	1.28	2.40	ug/Kg dry		2.06			47	50	J
C3-Benzonaphthothiophenes	4.62	2.40	ug/Kg dry		9.75			71	50	
C3-Decalins	ND	2.40	ug/Kg dry		ND				50	
C3-Dibenzothiophenes	4.09	2.40	ug/Kg dry		6.53			46	50	
C3-Fluoranthenes/Pyrenes	20.0	2.40	ug/Kg dry		42.7			72	50	
C3-Fluorenes	6.78	2.40	ug/Kg dry		19.1			95	50	
C3-Naphthalenes	8.09	2.40	ug/Kg dry		19.0			81	50	
C3-Phenanthrenes/Anthracenes	25.0	2.40	ug/Kg dry		32.2			25	50	
C4-Benzenes	8.60	2.40	ug/Kg dry		9.27			8	50	
C4-Benzo(a)anthracenes/Chrysenes	7.33	2.40	ug/Kg dry		16.8			79	50	
C4-Benzo(b)thiophenes	ND	2.40	ug/Kg dry		ND				50	
C4-Benzonaphthothiophenes	1.31	2.40	ug/Kg dry		3.41			89	50	J
C4-Decalins	ND	2.40	ug/Kg dry		ND				50	
C4-Dibenzothiophenes	2.82	2.40	ug/Kg dry		3.98			34	50	
C4-Naphthalenes	3.77	2.40	ug/Kg dry		11.4			101	50	
C4-Phenanthrenes/Anthracenes	48.2	2.40	ug/Kg dry		21.0			79	50	
C5-Benzenes	3.12	2.40	ug/Kg dry		3.35			7	50	
Carbazole	2.23	2.40	ug/Kg dry		16.5			152	50	J
Chrysene/triphenylene	59.0	2.40	ug/Kg dry		232			119	50	
cis-Decalin	ND	2.40	ug/Kg dry		ND				50	
Coronene	12.6	2.40	ug/Kg dry		43.3			110	50	
Dibenzo(a,h)anthracene	13.4	2.40	ug/Kg dry		39.7			99	50	
Dibenzofuran	3.25	2.40	ug/Kg dry		12.4			117	50	
Dibenzothiophene	2.99	2.40	ug/Kg dry		11.2			116	50	
Dimethyldiethyl lead	ND	2.40	ug/Kg dry		ND				50	
Ethylbenzene	1.67	2.40	ug/Kg dry		3.21			63	50	J
Fluoranthene	60.8	2.40	ug/Kg dry		469			154	50	
Fluorene	5.66	2.40	ug/Kg dry		19.7			111	50	
Indeno(1,2,3-cd)pyrene	42.5	2.40	ug/Kg dry		165			118	50	
Isopropylbenzene	ND	2.40	ug/Kg dry		ND				50	
m,p-Xylene	7.06	2.40	ug/Kg dry		23.9			109	50	
Methylcyclohexane	1.65	2.40	ug/Kg dry		2.68			47	50	J
Methyltriethyl lead	ND	2.40	ug/Kg dry		ND				50	
Naphthalene	12.4	2.40	ug/Kg dry		36.9			99	50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F180070

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D (SIM) Semi-Volatile Organic Compounds										
Batch FL81902 - 3570										
n-Butylbenzene	2.01	2.40	ug/Kg dry		2.35			16	50	J
n-Propylbenzene	ND	2.40	ug/Kg dry		1.31				50	
o-Xylene	ND	2.40	ug/Kg dry		ND				50	
Perylene	222	2.40	ug/Kg dry		476			73	50	
Phenanthrene	38.7	2.40	ug/Kg dry		206			137	50	
p-Isopropyltoluene	10.4	2.40	ug/Kg dry		12.9			22	50	
Pyrene	75.5	2.40	ug/Kg dry		471			145	50	
Retene	200	2.40	ug/Kg dry		51.8			118	50	
sec-Butylbenzene	ND	2.40	ug/Kg dry		ND				50	
Styrene	2.83	2.40	ug/Kg dry		2.86			1	50	
t-Butylbenzene	ND	2.40	ug/Kg dry		ND				50	
Tetraethyl lead	ND	2.40	ug/Kg dry		ND				50	
Tetramethyl lead	ND	2.40	ug/Kg dry		ND				50	
Toluene	58.6	2.40	ug/Kg dry		19.8			99	50	
trans-Decalin	ND	2.40	ug/Kg dry		ND				50	
Trimethylethyl lead	ND	2.40	ug/Kg dry		ND				50	
Surrogate: Naphthalene-d8	*172*		ug/Kg dry	*240.0*		*72*	*50-120*			
Surrogate: Phenanthrene-d10	*180*		ug/Kg dry	*240.0*		*75*	*50-120*			
Surrogate: Toluene-D8	*180*		ug/Kg dry	*240.0*		*75*	*50-120*			

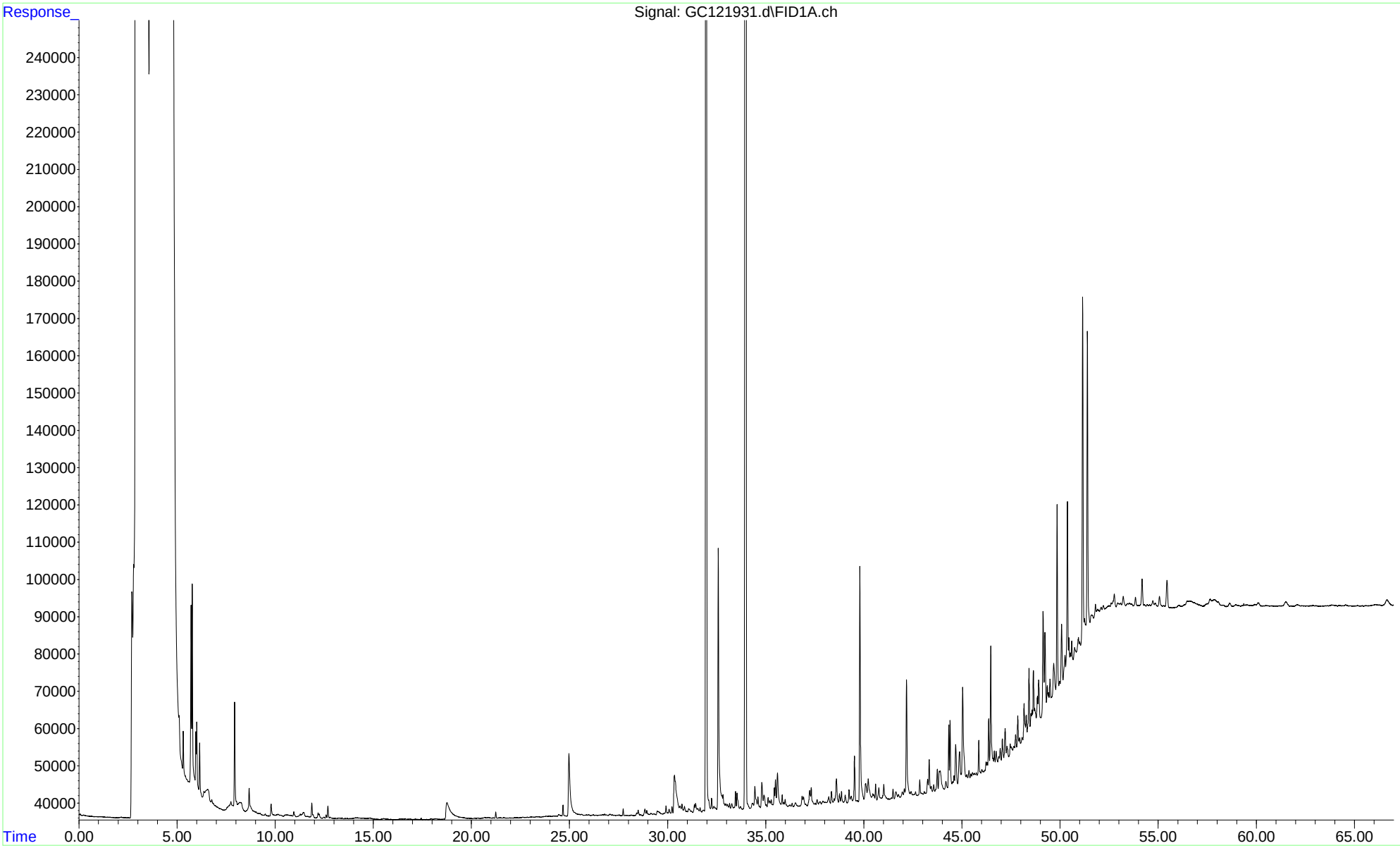
GEI Consultants

F180070

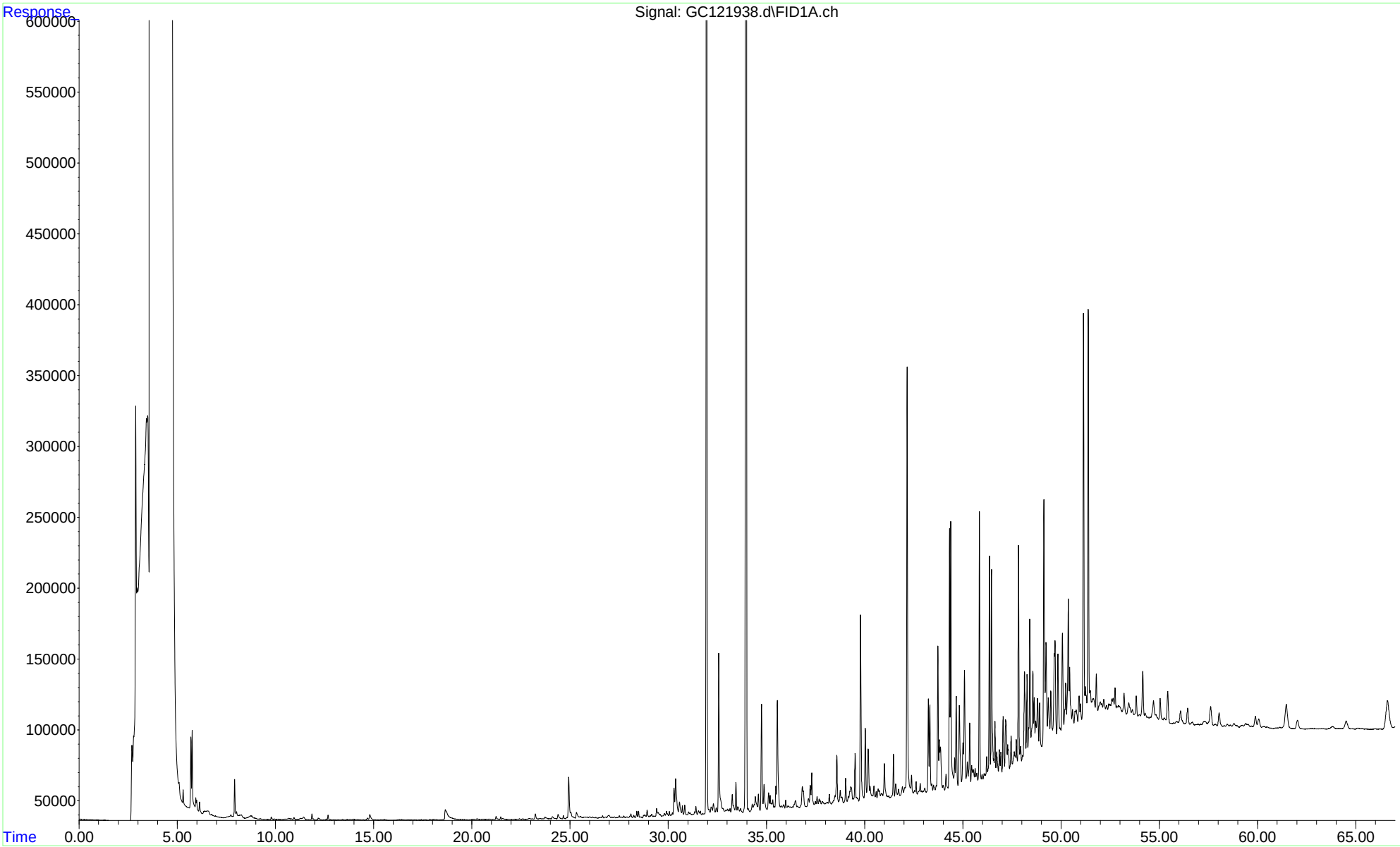
Amesbury Former MGP (1804576)

GC-FID Chromatograms

File :Q:\SVOA\GC12_GN\Data\GN1218\121918\GC121931.d
Operator : NL
Acquired : 20 Dec 2018 1:15 am using AcqMethod GC12-DATA-ACQUISITION-4.M
Instrument : SVOA-GC12
Sample Name: F180070-11
Misc Info :
Vial Number: 11



File :Q:\SVOA\GC12_GN\Data\GN1218\121918\GC121938.d
Operator : NL
Acquired : 20 Dec 2018 10:35 am using AcqMethod GC12-DATA-ACQUISITION-4.M
Instrument : SVOA-GC12
Sample Name: F180070-12
Misc Info :
Vial Number: 17



Quality Control Results

Quantitation Report (QT Reviewed)

Data Path : Q:\SVOA\GC12_GN\Data\GN1218\121918\
Data File : GC121922.d
Signal(s) : FID1A.ch
Acq On : 19 Dec 2018 1:17 pm
Operator : NL
Sample : F8L0009-CCV1
Misc : F8J2903
InstName : SVOA-GC12
ALS Vial : 3 Sample Multiplier: 1

Integration File: events.e
Quant Time: Dec 21 10:31:36 2018
Quant Method : Q:\SVOA\GC12_GN\Data\GN1218\121918\SHC12AA.M
Quant Title : n-C8 - n-C40 normal alkanes w/ isoprenoids
QLast Update : Thu Dec 20 08:48:56 2018
Response via : Initial Calibration
Integrator: ChemStation

Volume Inj. : 1.0
Signal Phase : Rtx-5
Signal Info : 0.32

	Compound	R.T.	Response	Conc Units
	Internal Standards			
1) I	5a-Androstane	33.968	59780606	50.000 µg/mLm
	System Monitoring Compounds			
2) S	o-Terphenyl	31.956	32487972	23.876 µg/mLm
Spiked Amount	25.000 Range 50 - 120		Recovery =	95.50%
	Target Compounds			
3)	C-8	8.745	26013658	25.727 µg/mLm
4)	C-9	11.323	27082203	23.439 µg/mLm
5)	C-10	13.887	27629651	24.161 µg/mLm
6)	C-11	16.335	27637632	24.783 µg/mLm
7)	C-12	18.645	27958064	24.607 µg/mLm
8) J1	C-13	20.822	27953503	24.594 µg/mLm
10) J1	C-14	22.872	28457044	24.499 µg/mLm
12)	C-15	24.810	28778157	24.419 µg/mLm
13) J1	C-16	26.649	29245964	24.432 µg/mLm
15)	C-17	28.396	28782392	24.265 µg/mLm
16)	Pristane	28.501	30217364	24.673 µg/mLm
17)	C-18	30.056	28775146	23.607 µg/mLm
18)	Phytane	30.217	26430223	24.203 µg/mLm
19)	C-19	31.642	29202384	24.138 µg/mLm
20)	C-20	33.153	29172050	23.775 µg/mLm
21)	C-21	34.601	29426361	24.004 µg/mLm
22)	C-22	35.988	29452094	23.168 µg/mLm
23)	C-23	37.319	29492512	23.686 µg/mLm
24)	C-24	38.597	29444371	23.804 µg/mLm
25)	C-25	39.829	29475651	23.991 µg/mLm
26)	C-26	41.014	29739852	23.801 µg/mLm
27)	C-27	42.159	28916805	23.620 µg/mLm
28)	C-28	43.265	30070059	22.564 µg/mLm
29)	C-29	44.333	29774568	23.605 µg/mLm
30)	C-30	45.366	30251729	23.622 µg/mLm
31)	C-31	46.368	29756771	23.632 µg/mLm
32)	C-32	47.338	29320334	23.700 µg/mLm
33)	C-33	48.280	29049011	23.665 µg/mLm
34)	C-34	49.192	29815859	23.766 µg/mLm
35)	C-35	50.081	29065337	23.945 µg/mLm
36)	C-36	50.948	32384114	24.031 µg/mLm
37)	C-37	51.811	28862493	23.807 µg/mLm
38)	C-38	52.773	30838925	24.789 µg/mLm
39)	C-39	53.854	29208334	24.135 µg/mLm
40)	C-40	55.079	28968927	25.598 µg/mLm

SemiQuant Compounds - Not Calibrated on this Instrument

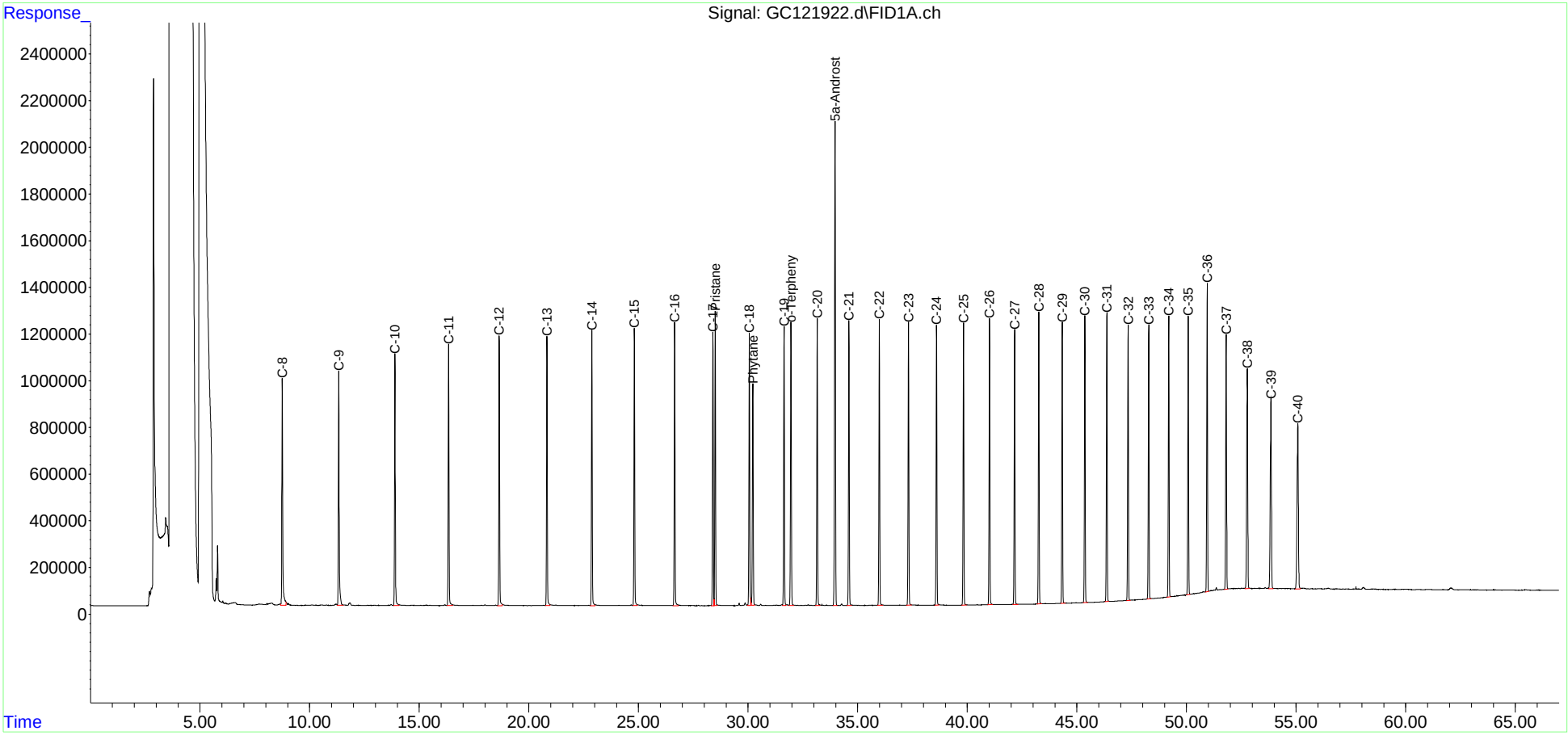
(f)=RT Delta > 1/2 Window (m)=manual int.

Quantitation Report (QT Reviewed)

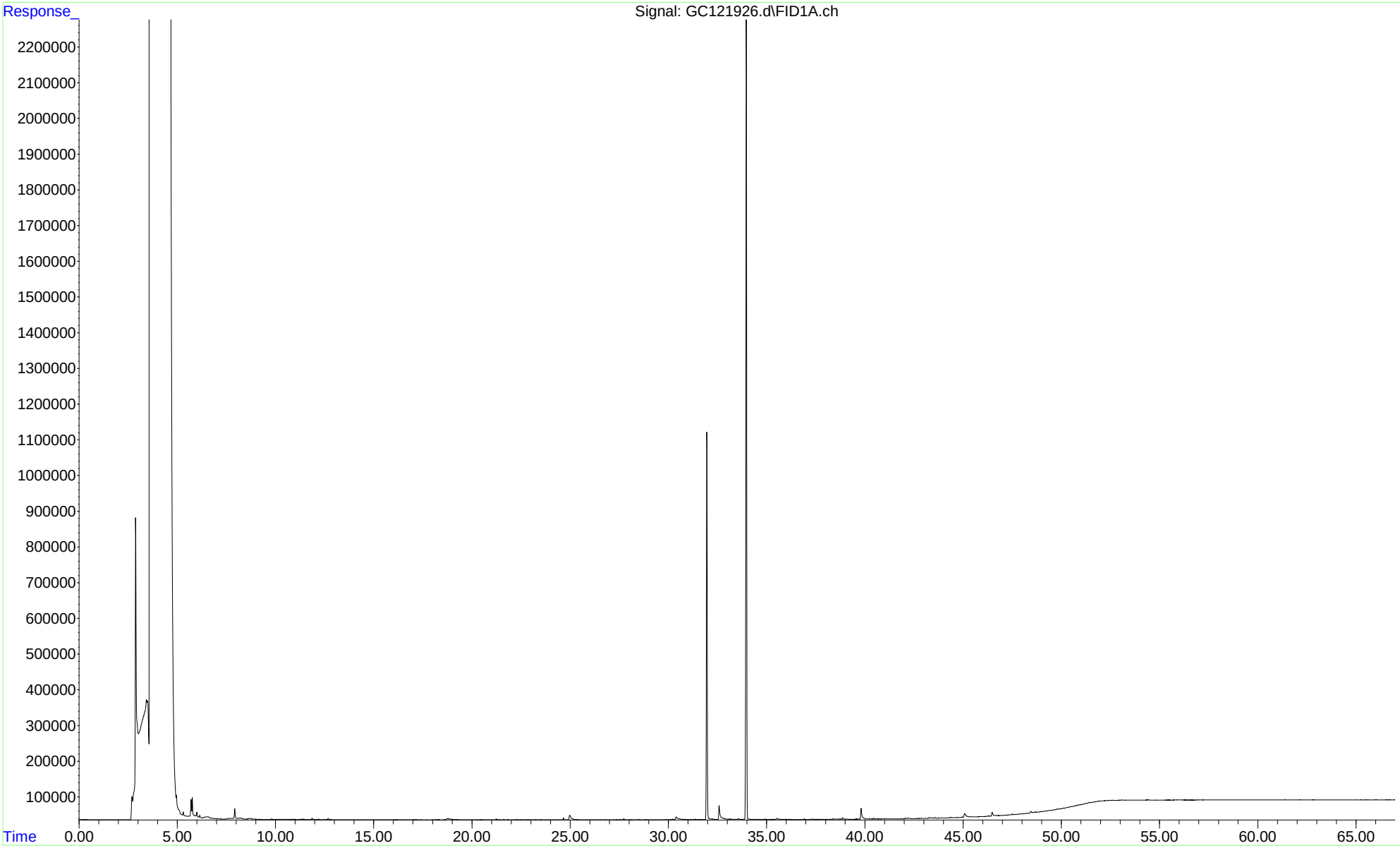
Data Path : Q:\SVOA\GC12_GN\Data\GN1218\121918\
Data File : GC121922.d
Signal(s) : FID1A.ch
Acq On : 19 Dec 2018 1:17 pm
Operator : NL
Sample : F8L0009-CCV1
Misc : F8J2903
InstName : SVOA-GC12
ALS Vial : 3 Sample Multiplier: 1

Integration File: events.e
Quant Time: Dec 21 10:31:36 2018
Quant Method : Q:\SVOA\GC12_GN\Data\GN1218\121918\SHC12AA.M
Quant Title : n-C8 - n-C40 normal alkanes w/ isoprenoids
QLast Update : Thu Dec 20 08:48:56 2018
Response via : Initial Calibration
Integrator: ChemStation

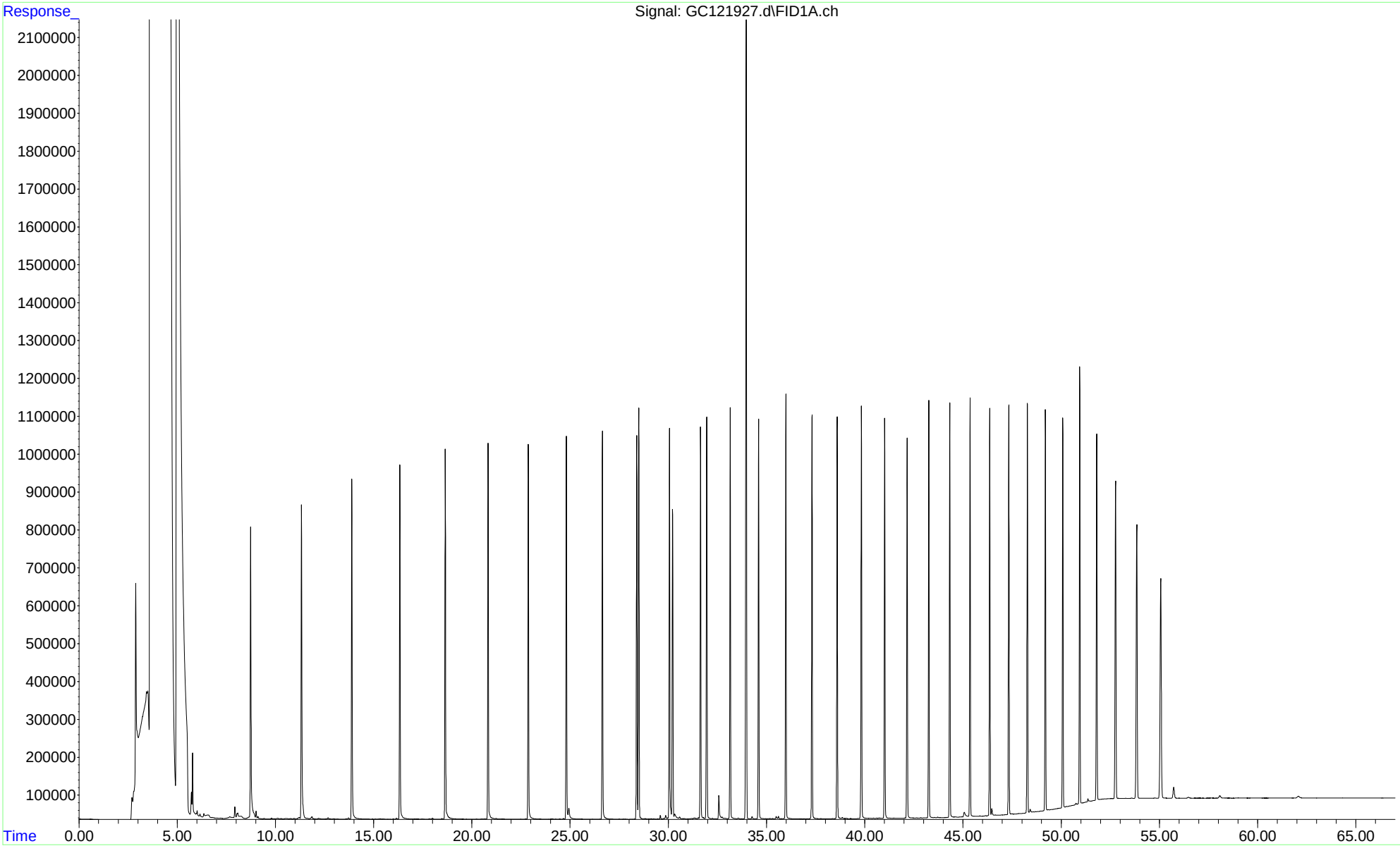
Volume Inj. : 1.0
Signal Phase : Rtx-5
Signal Info : 0.32



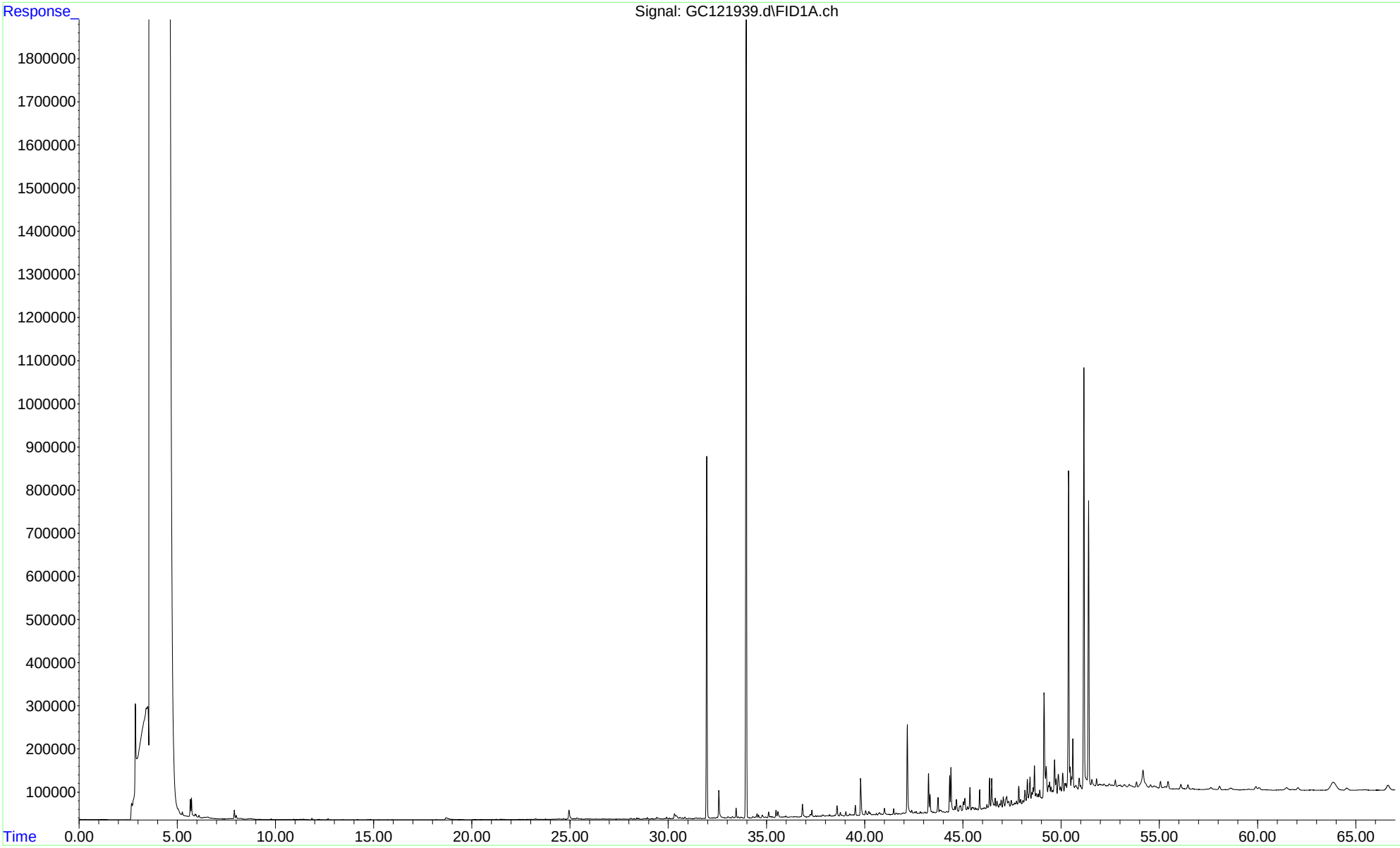
File :Q:\SVOA\GC12_GN\Data\GN1218\121918\GC121926.d
Operator : NL
Acquired : 19 Dec 2018 6:36 pm using AcqMethod GC12-DATA-ACQUISITION-4.M
Instrument : SVOA-GC12
Sample Name: FL81902-BLK1
Misc Info :
Vial Number: 6



File :Q:\SVOA\GC12_GN\Data\GN1218\121918\GC121927.d
Operator : NL
Acquired : 19 Dec 2018 7:56 pm using AcqMethod GC12-DATA-ACQUISITION-4.M
Instrument : SVOA-GC12
Sample Name: FL81902-BS1
Misc Info :
Vial Number: 7



File :Q:\SVOA\GC12_GN\Data\GN1218\121918\GC121939.d
Operator : NL
Acquired : 20 Dec 2018 11:56 am using AcqMethod GC12-DATA-ACQUISITION-4.M
Instrument : SVOA-GC12
Sample Name: F180070-12DUP
Misc Info :
Vial Number: 18



CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F180070

Notes and Definitions

U	Analyte included in the analysis, but not detected
J	Reported between MDL and MRL
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F180070

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Chain-of-Custody Record

Laboratory: ESS | Laboratory Job # (Lab use only): FR60070 / 181245

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP
Project Number: 1804576
Project Location: Amesbury, MA
Project Manager: Ryan Hoffman
Send Report to: Ryan Hoffman
Send EDD to: labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY REQUIRED — YES NO

If Yes, Are MCP Analytical Methods Required?	YES	NO	NA
Are Drinking Water Samples Submitted?	YES	NO	NA
If Yes, Have Drinking Water Sampling Requirements Been Met?	YES	NO	NA

Preservative: None | None | None

Sample Handling: Samples Field Filtered — YES NO NA; Sampled Shipped With Ice — YES NO

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Analysis: TPH 8015M*	Parent and Alkylated MAHs & PAHs 8270**	TOC by Lloyd-Kahn	Sample Specific Remarks
1	1804576-SS625	12/17/2018	9:50	Soil/Sed	2	LLT		x	x	
2	1804576-SS626	12/17/2018	10:03	Soil/Sed	2	LLT		x	x	
3	1804576-SS627	12/17/2018	10:15	Soil/Sed	2	LLT		x	x	
4	1804576-SS628	12/17/2018	10:30	Soil/Sed	2	LLT		x	x	
5	1804576-SS629	12/17/2018	11:50	Soil/Sed	2	LLT		x	x	
6	1804576-SS630	12/17/2018	10:45	Soil/Sed	2	LLT		x	x	
7	1804576-SS631	12/17/2018	12:50	Soil/Sed	2	LLT		x	x	
8	1804576-SS632	12/17/2018	13:45	Soil/Sed	1	LLT		x	x	
9	1804576-SS633	12/17/2018	13:55	Soil/Sed	1	LLT		x	x	
10	1804576-SS634	12/17/2018	12:20	Soil/Sed	3	LLT		x	x	
11	1804576-SS637	12/17/2018	12:35	Soil/Sed	3	LLT	x	x	x	
12	1804576-SS640	12/17/2018	12:05	Soil/Sed	3	LLT	x	x	x	

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

	Relinquished by: (signature)	Date:	Time:	Received by: (signature)
1.		12/17/2018	16:00	1. GEI Sample Fridge
2.	GEI Sample Fridge	12/18	1230	2.
3.		12/18	1330	3.
4.		12/18/18	15:20	4. 12/18/18 1700

Ice temp: 2.8

Turnaround Time (Business days)
Normal ___x___ Other _by ~1/7/19__
10-Day _____ 7-Day _____
5-Day _____ 3-Day _____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:
*Hydrocarbon Characterization by GC/FID Fingerprint, n-Alkanes, Isoprenoids
**Parent and Alkylated MAHs & PAHs (34) by GC/MS/SIM/SCAN

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI

Shipped/Delivered Via: ESS Courier

ESS Project ID: F180070
Date Received: 12/18/2018
Project Due Date: 12/27/2018
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 2.8 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / (No)
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1		Yes	NA	Yes	8oz Jar - Unpres	NP	
2		Yes	NA	Yes	8oz Jar - Unpres	NP	
3		Yes	NA	Yes	8oz Jar - Unpres	NP	
4		Yes	NA	Yes	8oz Jar - Unpres	NP	
5		Yes	NA	Yes	8oz Jar - Unpres	NP	
6		Yes	NA	Yes	8oz Jar - Unpres	NP	
7		Yes	NA	Yes	8oz Jar - Unpres	NP	
8		Yes	NA	Yes	8oz Jar - Unpres	NP	
9		Yes	NA	Yes	8oz Jar - Unpres	NP	
10		Yes	NA	Yes	8oz Jar - Unpres	NP	
10		Yes	NA	Yes	8oz Jar - Unpres	NP	
11		Yes	NA	Yes	8oz Jar - Unpres	NP	
11		Yes	NA	Yes	8oz Jar - Unpres	NP	
12		Yes	NA	Yes	8oz Jar - Unpres	NP	
12		Yes	NA	Yes	8oz Jar - Unpres	NP	

2nd Review
Are barcode labels on correct containers? Yes / No
Are all necessary stickers attached? Yes / No

Completed By: Date & Time: 12/18/18 1901

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI

ESS Project ID: F180070

Date Received: 12/18/2018

Reviewed By: [signature]

Date & Time: 121918 @ 1100

Delivered By: [signature]

1/2/2019

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (044752)
ESS Laboratory Work Order Number: F180071

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 11:01 am, Jan 04, 2019

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses
ESS Laboratory - Cranston, RI TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F180071

SAMPLE RECEIPT

The following samples were received on December 26, 2018 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F180071-01	1804576-SS638	Soil	8015 Mod, 8270 Mod, LK
F180071-02	1804576-SS639	Soil	8015 Mod, 8270 Mod, LK
F180071-03	1804576-SS642	Soil	8015 Mod, 8270 Mod, LK
F180071-04	1804576-SS643	Soil	8015 Mod, 8270 Mod, LK
F180071-05	1804576-SS644	Soil	8015 Mod, 8270 Mod, LK
F180071-06	1804576-SS645	Soil	8015 Mod, 8270 Mod, LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F180071

PROJECT NARRATIVE

8270D (SIM) Semi-Volatile Organic Compounds

F180071-06	**Present in Method Blank (B).**
	Benzene
FL82601-BS2	**Blank Spike recovery is below lower control limit (B-).**
	Methylcyclohexane (59% @ 60-130%)
FL82601-DUP2	**Relative percent difference for duplicate is outside of criteria (D+).**

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

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Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F180071

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS638
Date Sampled: 12/20/18 13:50
Percent Solids: 80
Initial Volume: 10.35
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-01
Sample Matrix: Soil
Units: mg/Kg dry
Analyst: NL
Prepared: 12/26/18 11:45

Saturated Hydrocarbons by GC/FID

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C-8	ND (0.242)	0.121	8015 Mod		1	NL	12/27/18 17:35	F8L0010	FL82601
C-9	ND (0.242)	0.121	8015 Mod		1	NL	12/27/18 17:35	F8L0010	FL82601
C-10	ND (0.242)	0.121	8015 Mod		1	NL	12/27/18 17:35	F8L0010	FL82601
C-11	ND (0.242)	0.121	8015 Mod		1	NL	12/27/18 17:35	F8L0010	FL82601
C-12	ND (0.242)	0.121	8015 Mod		1	NL	12/27/18 17:35	F8L0010	FL82601
C-13	ND (0.242)	0.121	8015 Mod		1	NL	12/27/18 17:35	F8L0010	FL82601
2,6,10-trimethyldodecane (1380)	ND (0.242)	0.121	8015 Mod		1	NL	12/27/18 17:35	F8L0010	FL82601
C-14	ND (0.242)	0.121	8015 Mod		1	NL	12/27/18 17:35	F8L0010	FL82601
2,6,10-trimethyltridecane (1470)	ND (0.242)	0.121	8015 Mod		1	NL	12/27/18 17:35	F8L0010	FL82601
C-15	ND (0.242)	0.121	8015 Mod		1	NL	12/27/18 17:35	F8L0010	FL82601
C-16	ND (0.242)	0.121	8015 Mod		1	NL	12/27/18 17:35	F8L0010	FL82601
2,6,10-trimethylpentadecane (1650)	ND (0.242)	0.121	8015 Mod		1	NL	12/27/18 17:35	F8L0010	FL82601
C-17	ND (0.242)	0.121	8015 Mod		1	NL	12/27/18 17:35	F8L0010	FL82601
Pristane	ND (0.242)	0.121	8015 Mod		1	NL	12/27/18 17:35	F8L0010	FL82601
C-18	ND (0.242)	0.121	8015 Mod		1	NL	12/27/18 17:35	F8L0010	FL82601
Phytane	ND (0.242)	0.121	8015 Mod		1	NL	12/27/18 17:35	F8L0010	FL82601
C-19	ND (0.242)	0.121	8015 Mod		1	NL	12/27/18 17:35	F8L0010	FL82601
C-20	ND (0.242)	0.121	8015 Mod		1	NL	12/27/18 17:35	F8L0010	FL82601
C-21	ND (0.242)	0.121	8015 Mod		1	NL	12/27/18 17:35	F8L0010	FL82601
C-22	ND (0.242)	0.121	8015 Mod		1	NL	12/27/18 17:35	F8L0010	FL82601
C-23	ND (0.242)	0.121	8015 Mod		1	NL	12/27/18 17:35	F8L0010	FL82601
C-24	ND (0.242)	0.121	8015 Mod		1	NL	12/27/18 17:35	F8L0010	FL82601
C-25	ND (0.242)	0.121	8015 Mod		1	NL	12/27/18 17:35	F8L0010	FL82601
C-26	ND (0.242)	0.121	8015 Mod		1	NL	12/27/18 17:35	F8L0010	FL82601
C-27	**J 0.233** (0.242)	0.121	8015 Mod		1	NL	12/27/18 17:35	F8L0010	FL82601
C-28	ND (0.242)	0.121	8015 Mod		1	NL	12/27/18 17:35	F8L0010	FL82601
C-29	ND (0.242)	0.121	8015 Mod		1	NL	12/27/18 17:35	F8L0010	FL82601
C-30	ND (0.242)	0.121	8015 Mod		1	NL	12/27/18 17:35	F8L0010	FL82601
C-31	**J 0.150** (0.242)	0.121	8015 Mod		1	NL	12/27/18 17:35	F8L0010	FL82601
C-32	ND (0.242)	0.121	8015 Mod		1	NL	12/27/18 17:35	F8L0010	FL82601
C-33	ND (0.242)	0.121	8015 Mod		1	NL	12/27/18 17:35	F8L0010	FL82601
C-34	ND (0.242)	0.121	8015 Mod		1	NL	12/27/18 17:35	F8L0010	FL82601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS638
Date Sampled: 12/20/18 13:50
Percent Solids: 80
Initial Volume: 10.35
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-01
Sample Matrix: Soil
Units: mg/Kg dry
Analyst: NL
Prepared: 12/26/18 11:45

Saturated Hydrocarbons by GC/FID

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C-35	ND (0.242)	0.121	8015 Mod		1	NL	12/27/18 17:35	F8L0010	FL82601
C-36	ND (0.242)	0.121	8015 Mod		1	NL	12/27/18 17:35	F8L0010	FL82601
C-37	ND (0.242)	0.121	8015 Mod		1	NL	12/27/18 17:35	F8L0010	FL82601
C-38	ND (0.242)	0.121	8015 Mod		1	NL	12/27/18 17:35	F8L0010	FL82601
C-39	ND (0.242)	0.121	8015 Mod		1	NL	12/27/18 17:35	F8L0010	FL82601
C-40	ND (0.242)	0.121	8015 Mod		1	NL	12/27/18 17:35	F8L0010	FL82601
TPH (C8-C40)	**167** (7.97)	0.121	8015 Mod		1	NL	12/27/18 17:35	F8L0010	FL82601

	%Recovery	Qualifier	Limits
Surrogate: o-Terphenyl	*84 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS638
Date Sampled: 12/20/18 13:50
Percent Solids: 80
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Extraction Method: 3570

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 12/26/18 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**22.3** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
C1-Benzene	**33.2** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
C2-Benzenes	**18.7** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
C3-Benzenes	**7.54** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
C4-Benzenes	**6.64** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
C5-Benzenes	**3.95** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
Methylcyclohexane	ND (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
Toluene	**53.7** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
Ethylbenzene	**3.80** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
m,p-Xylene	**28.8** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
Styrene	**15.5** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
o-Xylene	**J 2.32** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
Isopropylbenzene	ND (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
n-Propylbenzene	**J 2.24** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
1,3,5-Trimethylbenzene	ND (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
1,2,3-Trimethylbenzene	**J 1.89** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
1,2,4-Trimethylbenzene	**J 2.38** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
t-Butylbenzene	ND (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
sec-Butylbenzene	ND (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
p-Isopropyltoluene	**J 2.08** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
n-Butylbenzene	**3.04** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
trans-Decalin	ND (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
cis-Decalin	ND (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
C1-Decalins	ND (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
C2-Decalins	ND (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
C3-Decalins	ND (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
C4-Decalins	ND (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
Benzo(b)thiophene	**J 1.40** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
C1-Benzo(b)thiophenes	**6.37** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
C2-Benzo(b)thiophenes	**6.13** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
C3-Benzo(b)thiophenes	**5.72** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
C4-Benzo(b)thiophenes	**4.28** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS638
Date Sampled: 12/20/18 13:50
Percent Solids: 80
Initial Volume: 10.35
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 12/26/18 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**18.5** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
2-Methylnaphthalene	**11.1** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
1-Methylnaphthalene	**9.95** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
C1-Naphthalenes	**13.6** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
C2-Naphthalenes	**35.0** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
C3-Naphthalenes	**36.0** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
C4-Naphthalenes	**21.6** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
Biphenyl	**5.47** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
Acenaphthylene	**132** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
Acenaphthene	**23.4** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
Dibenzofuran	**17.3** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
Fluorene	**32.5** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
C1-Fluorenes	**29.8** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
C2-Fluorenes	**32.9** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
C3-Fluorenes	**38.7** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
Dibenzothiophene	**30.9** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
C1-Dibenzothiophenes	**44.6** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
C2-Dibenzothiophenes	**51.8** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
C3-Dibenzothiophenes	**34.2** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
C4-Dibenzothiophenes	**17.1** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
Phenanthrene	**381** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
Anthracene	**133** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
C1-Phenanthrenes/Anthracenes	**260** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
C2-Phenanthrenes/Anthracenes	**144** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
C3-Phenanthrenes/Anthracenes	**55.4** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
C4-Phenanthrenes/Anthracenes	**18.4** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
Retene	**7.41** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
Benzo(b)naphtho(2,1-d)thiophene	**50.1** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
C0-Benzonaphthothiophenes	**91.8** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
C1-Benzonaphthothiophenes	**67.0** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
C2-Benzonaphthothiophenes	**58.4** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
C3-Benzonaphthothiophenes	**49.3** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS638
Date Sampled: 12/20/18 13:50
Percent Solids: 80
Initial Volume: 10.35
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 12/26/18 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**27.2** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
Fluoranthene	**654** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
Pyrene	**637** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
C1-Fluoranthenes/Pyrenes	**318** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
C2-Fluoranthenes/Pyrenes	**174** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
C3-Fluoranthenes/Pyrenes	**73.6** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
Benzo(b)fluorene	**28.1** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
Benzo(c)fluorene	**13.4** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
2-Methylpyrene	**45.5** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
4-Methylpyrene	**44.1** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
1-Methylpyrene	**35.1** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
Benz(a)anthracene	**297** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
Chrysene/triphenylene	**341** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
C1-Benzo(a)anthracenes/Chrysenes	**160** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
C2-Benzo(a)anthracenes/Chrysenes	**82.4** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
C3-Benzo(a)anthracenes/Chrysenes	**45.8** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
C4-Benzo(a)anthracenes/Chrysenes	**21.1** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
Benzo(b)fluoranthene	**241** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
Benzo(j/k)fluoranthene	**276** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
Benzo(e)pyrene	**223** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
Benzo(a)pyrene	**298** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
Perylene	**70.1** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
Indeno(1,2,3-cd)pyrene	**185** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
Dibenzo(a,h)anthracene	**47.0** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
Benzo(g,h,i)perylene	**192** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
Coronene	**46.9** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
Tetramethyl lead	ND (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
Trimethylethyl lead	ND (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
Dimethyldiethyl lead	ND (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
Methyltriethyl lead	ND (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
Tetraethyl lead	ND (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
Carbazole	**21.5** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS638
Date Sampled: 12/20/18 13:50
Percent Solids: 80
Initial Volume: 10.35
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 12/26/18 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**10.2** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
2,3,5-Trimethylnaphthene	**2.93** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
4-Methyldibenzothiophene	**16.7** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
2/3-Methyldibenzothiophene	**14.5** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
1-Methyldibenzothiophene	**7.13** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
3-Methylphenanthrene	**57.2** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
2-Methylphenanthrene	**67.1** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
2-Methylanthracene	**26.1** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
4/9-Methylphenanthrene	**58.7** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601
1-Methylphenanthrene	**44.9** (2.42)	1.21	8270 Mod		1	12/27/18 15:29	F8L0011	FL82601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*89 %*		*50-120*
Surrogate: Naphthalene-d8	*81 %*		*50-120*
Surrogate: Phenanthrene-d10	*83 %*		*50-120*
Surrogate: Perylene-d12	*75 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS638
Date Sampled: 12/20/18 13:50
Percent Solids: 80

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**7620** (285)		LK		1	CCP	12/27/18 15:02	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS639
Date Sampled: 12/20/18 13:30
Percent Solids: 65
Initial Volume: 10.2
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-02
Sample Matrix: Soil
Units: mg/Kg dry
Analyst: NL
Prepared: 12/26/18 11:45

Saturated Hydrocarbons by GC/FID

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C-8	ND (0.300)	0.150	8015 Mod		1	NL	12/27/18 18:56	F8L0010	FL82601
C-9	ND (0.300)	0.150	8015 Mod		1	NL	12/27/18 18:56	F8L0010	FL82601
C-10	ND (0.300)	0.150	8015 Mod		1	NL	12/27/18 18:56	F8L0010	FL82601
C-11	ND (0.300)	0.150	8015 Mod		1	NL	12/27/18 18:56	F8L0010	FL82601
C-12	ND (0.300)	0.150	8015 Mod		1	NL	12/27/18 18:56	F8L0010	FL82601
C-13	ND (0.300)	0.150	8015 Mod		1	NL	12/27/18 18:56	F8L0010	FL82601
2,6,10-trimethyldodecane (1380)	ND (0.300)	0.150	8015 Mod		1	NL	12/27/18 18:56	F8L0010	FL82601
C-14	ND (0.300)	0.150	8015 Mod		1	NL	12/27/18 18:56	F8L0010	FL82601
2,6,10-trimethyltridecane (1470)	ND (0.300)	0.150	8015 Mod		1	NL	12/27/18 18:56	F8L0010	FL82601
C-15	ND (0.300)	0.150	8015 Mod		1	NL	12/27/18 18:56	F8L0010	FL82601
C-16	ND (0.300)	0.150	8015 Mod		1	NL	12/27/18 18:56	F8L0010	FL82601
2,6,10-trimethylpentadecane (1650)	ND (0.300)	0.150	8015 Mod		1	NL	12/27/18 18:56	F8L0010	FL82601
C-17	ND (0.300)	0.150	8015 Mod		1	NL	12/27/18 18:56	F8L0010	FL82601
Pristane	ND (0.300)	0.150	8015 Mod		1	NL	12/27/18 18:56	F8L0010	FL82601
C-18	ND (0.300)	0.150	8015 Mod		1	NL	12/27/18 18:56	F8L0010	FL82601
Phytane	ND (0.300)	0.150	8015 Mod		1	NL	12/27/18 18:56	F8L0010	FL82601
C-19	J **0.170** (0.300)	0.150	8015 Mod		1	NL	12/27/18 18:56	F8L0010	FL82601
C-20	ND (0.300)	0.150	8015 Mod		1	NL	12/27/18 18:56	F8L0010	FL82601
C-21	ND (0.300)	0.150	8015 Mod		1	NL	12/27/18 18:56	F8L0010	FL82601
C-22	ND (0.300)	0.150	8015 Mod		1	NL	12/27/18 18:56	F8L0010	FL82601
C-23	**0.563** (0.300)	0.150	8015 Mod		1	NL	12/27/18 18:56	F8L0010	FL82601
C-24	ND (0.300)	0.150	8015 Mod		1	NL	12/27/18 18:56	F8L0010	FL82601
C-25	J **0.241** (0.300)	0.150	8015 Mod		1	NL	12/27/18 18:56	F8L0010	FL82601
C-26	ND (0.300)	0.150	8015 Mod		1	NL	12/27/18 18:56	F8L0010	FL82601
C-27	**1.21** (0.300)	0.150	8015 Mod		1	NL	12/27/18 18:56	F8L0010	FL82601
C-28	J **0.258** (0.300)	0.150	8015 Mod		1	NL	12/27/18 18:56	F8L0010	FL82601
C-29	ND (0.300)	0.150	8015 Mod		1	NL	12/27/18 18:56	F8L0010	FL82601
C-30	**0.352** (0.300)	0.150	8015 Mod		1	NL	12/27/18 18:56	F8L0010	FL82601
C-31	**0.766** (0.300)	0.150	8015 Mod		1	NL	12/27/18 18:56	F8L0010	FL82601
C-32	ND (0.300)	0.150	8015 Mod		1	NL	12/27/18 18:56	F8L0010	FL82601
C-33	**0.658** (0.300)	0.150	8015 Mod		1	NL	12/27/18 18:56	F8L0010	FL82601
C-34	ND (0.300)	0.150	8015 Mod		1	NL	12/27/18 18:56	F8L0010	FL82601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS639
Date Sampled: 12/20/18 13:30
Percent Solids: 65
Initial Volume: 10.2
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-02
Sample Matrix: Soil
Units: mg/Kg dry
Analyst: NL
Prepared: 12/26/18 11:45

Saturated Hydrocarbons by GC/FID

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C-35	**1.69** (0.300)	0.150	8015 Mod		1	NL	12/27/18 18:56	F8L0010	FL82601
C-36	ND (0.300)	0.150	8015 Mod		1	NL	12/27/18 18:56	F8L0010	FL82601
C-37	**0.915** (0.300)	0.150	8015 Mod		1	NL	12/27/18 18:56	F8L0010	FL82601
C-38	ND (0.300)	0.150	8015 Mod		1	NL	12/27/18 18:56	F8L0010	FL82601
C-39	ND (0.300)	0.150	8015 Mod		1	NL	12/27/18 18:56	F8L0010	FL82601
C-40	ND (0.300)	0.150	8015 Mod		1	NL	12/27/18 18:56	F8L0010	FL82601
TPH (C8-C40)	**565** (9.88)	0.150	8015 Mod		1	NL	12/27/18 18:56	F8L0010	FL82601

	%Recovery	Qualifier	Limits
Surrogate: o-Terphenyl	*82 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS639
Date Sampled: 12/20/18 13:30
Percent Solids: 65
Initial Volume: 10.2
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 12/26/18 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**100** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
C1-Benzene	**61.4** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
C2-Benzenes	**77.5** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
C3-Benzenes	**24.1** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
C4-Benzenes	**24.0** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
C5-Benzenes	**14.1** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
Methylcyclohexane	**3.36** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
Toluene	**99.6** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
Ethylbenzene	**13.9** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
m,p-Xylene	**126** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
Styrene	**59.6** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
o-Xylene	**8.39** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
Isopropylbenzene	**4.20** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
n-Propylbenzene	**10.5** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
1,3,5-Trimethylbenzene	**3.61** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
1,2,3-Trimethylbenzene	**5.79** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
1,2,4-Trimethylbenzene	**8.54** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
t-Butylbenzene	ND (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
sec-Butylbenzene	ND (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
p-Isopropyltoluene	**5.81** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
n-Butylbenzene	**16.4** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
trans-Decalin	**J 2.63** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
cis-Decalin	ND (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
C1-Decalins	**7.71** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
C2-Decalins	**9.97** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
C3-Decalins	**7.85** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
C4-Decalins	ND (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
Benzo(b)thiophene	**10.3** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
C1-Benzo(b)thiophenes	**44.1** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
C2-Benzo(b)thiophenes	**27.9** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
C3-Benzo(b)thiophenes	**18.9** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
C4-Benzo(b)thiophenes	**11.2** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS639
Date Sampled: 12/20/18 13:30
Percent Solids: 65
Initial Volume: 10.2
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 12/26/18 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**180** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
2-Methylnaphthalene	**166** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
1-Methylnaphthalene	**132** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
C1-Naphthalenes	**194** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
C2-Naphthalenes	**241** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
C3-Naphthalenes	**177** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
C4-Naphthalenes	**91.4** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
Biphenyl	**52.7** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
Acenaphthylene	**408** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
Acenaphthene	**527** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
Dibenzofuran	**437** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
Fluorene	**495** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
C1-Fluorenes	**137** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
C2-Fluorenes	**167** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
C3-Fluorenes	**332** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
Dibenzothiophene	**361** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
C1-Dibenzothiophenes	**220** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
C2-Dibenzothiophenes	**181** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
C3-Dibenzothiophenes	**119** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
C4-Dibenzothiophenes	**55.5** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
Phenanthrene	**4910** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
Anthracene	**1390** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
C1-Phenanthrenes/Anthracenes	**1590** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
C2-Phenanthrenes/Anthracenes	**740** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
C3-Phenanthrenes/Anthracenes	**303** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
C4-Phenanthrenes/Anthracenes	**111** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
Retene	**33.5** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
Benzo(b)naphtho(2,1-d)thiophene	**553** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
C0-Benzonaphthothiophenes	**1010** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
C1-Benzonaphthothiophenes	**417** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
C2-Benzonaphthothiophenes	**283** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
C3-Benzonaphthothiophenes	**210** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS639
Date Sampled: 12/20/18 13:30
Percent Solids: 65
Initial Volume: 10.2
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 12/26/18 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**124** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
Fluoranthene	**7660** (15.0)	7.49	8270 Mod		5	12/27/18 5:56	F8L0011	FL82601
Pyrene	**6550** (15.0)	7.49	8270 Mod		5	12/27/18 5:56	F8L0011	FL82601
C1-Fluoranthenes/Pyrenes	**1910** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
C2-Fluoranthenes/Pyrenes	**1820** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
C3-Fluoranthenes/Pyrenes	**641** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
Benzo(b)fluorene	**135** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
Benzo(c)fluorene	**81.3** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
2-Methylpyrene	**301** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
4-Methylpyrene	**221** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
1-Methylpyrene	**181** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
Benz(a)anthracene	**3520** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
Chrysene/triphenylene	**3510** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
C1-Benzo(a)anthracenes/Chrysenes	**1280** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
C2-Benzo(a)anthracenes/Chrysenes	**625** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
C3-Benzo(a)anthracenes/Chrysenes	**377** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
C4-Benzo(a)anthracenes/Chrysenes	**196** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
Benzo(b)fluoranthene	**3150** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
Benzo(j/k)fluoranthene	**2930** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
Benzo(e)pyrene	**2410** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
Benzo(a)pyrene	**3370** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
Perylene	**925** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
Indeno(1,2,3-cd)pyrene	**2110** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
Dibenzo(a,h)anthracene	**592** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
Benzo(g,h,i)perylene	**2020** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
Coronene	**472** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
Tetramethyl lead	ND (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
Trimethylethyl lead	ND (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
Dimethyldiethyl lead	ND (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
Methyltriethyl lead	ND (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
Tetraethyl lead	ND (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
Carbazole	**744** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS639
Date Sampled: 12/20/18 13:30
Percent Solids: 65
Initial Volume: 10.2
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 12/26/18 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**64.1** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
2,3,5-Trimethylnaphthene	**16.1** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
4-Methyldibenzothiophene	**57.9** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
2/3-Methyldibenzothiophene	**77.1** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
1-Methyldibenzothiophene	**30.1** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
3-Methylphenanthrene	**344** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
2-Methylphenanthrene	**445** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
2-Methylanthracene	**218** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
4/9-Methylphenanthrene	**327** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601
1-Methylphenanthrene	**241** (3.00)	1.50	8270 Mod		1	12/27/18 16:50	F8L0011	FL82601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*84 %*		*50-120*
Surrogate: Naphthalene-d8	*83 %*		*50-120*
Surrogate: Phenanthrene-d10	*79 %*		*50-120*
Surrogate: Perylene-d12	*80 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS639
Date Sampled: 12/20/18 13:30
Percent Solids: 65

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**33400** (350)		LK		1	CCP	12/27/18 15:37	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS642
Date Sampled: 12/20/18 13:00
Percent Solids: 69
Initial Volume: 10.66
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-03
Sample Matrix: Soil
Units: mg/Kg dry
Analyst: NL
Prepared: 12/26/18 11:45

Saturated Hydrocarbons by GC/FID

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C-8	ND (0.273)	0.136	8015 Mod		1	NL	12/27/18 20:17	F8L0010	FL82601
C-9	ND (0.273)	0.136	8015 Mod		1	NL	12/27/18 20:17	F8L0010	FL82601
C-10	ND (0.273)	0.136	8015 Mod		1	NL	12/27/18 20:17	F8L0010	FL82601
C-11	ND (0.273)	0.136	8015 Mod		1	NL	12/27/18 20:17	F8L0010	FL82601
C-12	ND (0.273)	0.136	8015 Mod		1	NL	12/27/18 20:17	F8L0010	FL82601
C-13	ND (0.273)	0.136	8015 Mod		1	NL	12/27/18 20:17	F8L0010	FL82601
2,6,10-trimethyldodecane (1380)	ND (0.273)	0.136	8015 Mod		1	NL	12/27/18 20:17	F8L0010	FL82601
C-14	ND (0.273)	0.136	8015 Mod		1	NL	12/27/18 20:17	F8L0010	FL82601
2,6,10-trimethyltridecane (1470)	ND (0.273)	0.136	8015 Mod		1	NL	12/27/18 20:17	F8L0010	FL82601
C-15	ND (0.273)	0.136	8015 Mod		1	NL	12/27/18 20:17	F8L0010	FL82601
C-16	ND (0.273)	0.136	8015 Mod		1	NL	12/27/18 20:17	F8L0010	FL82601
2,6,10-trimethylpentadecane (1650)	ND (0.273)	0.136	8015 Mod		1	NL	12/27/18 20:17	F8L0010	FL82601
C-17	ND (0.273)	0.136	8015 Mod		1	NL	12/27/18 20:17	F8L0010	FL82601
Pristane	ND (0.273)	0.136	8015 Mod		1	NL	12/27/18 20:17	F8L0010	FL82601
C-18	ND (0.273)	0.136	8015 Mod		1	NL	12/27/18 20:17	F8L0010	FL82601
Phytane	ND (0.273)	0.136	8015 Mod		1	NL	12/27/18 20:17	F8L0010	FL82601
C-19	ND (0.273)	0.136	8015 Mod		1	NL	12/27/18 20:17	F8L0010	FL82601
C-20	ND (0.273)	0.136	8015 Mod		1	NL	12/27/18 20:17	F8L0010	FL82601
C-21	ND (0.273)	0.136	8015 Mod		1	NL	12/27/18 20:17	F8L0010	FL82601
C-22	ND (0.273)	0.136	8015 Mod		1	NL	12/27/18 20:17	F8L0010	FL82601
C-23	ND (0.273)	0.136	8015 Mod		1	NL	12/27/18 20:17	F8L0010	FL82601
C-24	ND (0.273)	0.136	8015 Mod		1	NL	12/27/18 20:17	F8L0010	FL82601
C-25	ND (0.273)	0.136	8015 Mod		1	NL	12/27/18 20:17	F8L0010	FL82601
C-26	ND (0.273)	0.136	8015 Mod		1	NL	12/27/18 20:17	F8L0010	FL82601
C-27	**0.796** (0.273)	0.136	8015 Mod		1	NL	12/27/18 20:17	F8L0010	FL82601
C-28	ND (0.273)	0.136	8015 Mod		1	NL	12/27/18 20:17	F8L0010	FL82601
C-29	**J 0.160** (0.273)	0.136	8015 Mod		1	NL	12/27/18 20:17	F8L0010	FL82601
C-30	ND (0.273)	0.136	8015 Mod		1	NL	12/27/18 20:17	F8L0010	FL82601
C-31	**J 0.224** (0.273)	0.136	8015 Mod		1	NL	12/27/18 20:17	F8L0010	FL82601
C-32	ND (0.273)	0.136	8015 Mod		1	NL	12/27/18 20:17	F8L0010	FL82601
C-33	**J 0.242** (0.273)	0.136	8015 Mod		1	NL	12/27/18 20:17	F8L0010	FL82601
C-34	ND (0.273)	0.136	8015 Mod		1	NL	12/27/18 20:17	F8L0010	FL82601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS642
Date Sampled: 12/20/18 13:00
Percent Solids: 69
Initial Volume: 10.66
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-03
Sample Matrix: Soil
Units: mg/Kg dry
Analyst: NL
Prepared: 12/26/18 11:45

Saturated Hydrocarbons by GC/FID

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C-35	**0.358** (0.273)	0.136	8015 Mod		1	NL	12/27/18 20:17	F8L0010	FL82601
C-36	ND (0.273)	0.136	8015 Mod		1	NL	12/27/18 20:17	F8L0010	FL82601
C-37	**J 0.226** (0.273)	0.136	8015 Mod		1	NL	12/27/18 20:17	F8L0010	FL82601
C-38	ND (0.273)	0.136	8015 Mod		1	NL	12/27/18 20:17	F8L0010	FL82601
C-39	ND (0.273)	0.136	8015 Mod		1	NL	12/27/18 20:17	F8L0010	FL82601
C-40	ND (0.273)	0.136	8015 Mod		1	NL	12/27/18 20:17	F8L0010	FL82601
TPH (C8-C40)	**324** (9.00)	0.136	8015 Mod		1	NL	12/27/18 20:17	F8L0010	FL82601

	%Recovery	Qualifier	Limits
Surrogate: o-Terphenyl	*84 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS642
Date Sampled: 12/20/18 13:00
Percent Solids: 69
Initial Volume: 10.66
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 12/26/18 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**45.2** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
C1-Benzene	**24.2** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
C2-Benzenes	**28.4** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
C3-Benzenes	**15.7** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
C4-Benzenes	**19.4** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
C5-Benzenes	**14.6** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
Methylcyclohexane	**J 1.88** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
Toluene	**39.9** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
Ethylbenzene	**8.04** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
m,p-Xylene	**40.8** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
Styrene	**20.0** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
o-Xylene	**3.48** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
Isopropylbenzene	ND (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
n-Propylbenzene	**11.6** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
1,3,5-Trimethylbenzene	**J 1.78** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
1,2,3-Trimethylbenzene	**3.02** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
1,2,4-Trimethylbenzene	**4.22** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
t-Butylbenzene	ND (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
sec-Butylbenzene	ND (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
p-Isopropyltoluene	**2.80** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
n-Butylbenzene	**29.9** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
trans-Decalin	**J 1.42** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
cis-Decalin	ND (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
C1-Decalins	**5.31** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
C2-Decalins	**7.88** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
C3-Decalins	ND (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
C4-Decalins	ND (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
Benzo(b)thiophene	**5.38** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
C1-Benzo(b)thiophenes	**18.3** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
C2-Benzo(b)thiophenes	**13.9** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
C3-Benzo(b)thiophenes	**10.5** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
C4-Benzo(b)thiophenes	**7.18** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS642
Date Sampled: 12/20/18 13:00
Percent Solids: 69
Initial Volume: 10.66
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 12/26/18 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**43.0** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
2-Methylnaphthalene	**19.7** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
1-Methylnaphthalene	**16.1** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
C1-Naphthalenes	**23.2** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
C2-Naphthalenes	**44.8** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
C3-Naphthalenes	**50.3** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
C4-Naphthalenes	**31.4** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
Biphenyl	**8.07** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
Acenaphthylene	**259** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
Acenaphthene	**53.6** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
Dibenzofuran	**35.6** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
Fluorene	**54.9** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
C1-Fluorenes	**40.1** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
C2-Fluorenes	**51.5** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
C3-Fluorenes	**78.1** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
Dibenzothiophene	**53.5** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
C1-Dibenzothiophenes	**62.6** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
C2-Dibenzothiophenes	**62.8** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
C3-Dibenzothiophenes	**45.1** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
C4-Dibenzothiophenes	**22.8** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
Phenanthrene	**861** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
Anthracene	**302** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
C1-Phenanthrenes/Anthracenes	**426** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
C2-Phenanthrenes/Anthracenes	**227** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
C3-Phenanthrenes/Anthracenes	**91.2** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
C4-Phenanthrenes/Anthracenes	**29.5** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
Retene	**13.5** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
Benzo(b)naphtho(2,1-d)thiophene	**121** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
C0-Benzonaphthothiophenes	**224** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
C1-Benzonaphthothiophenes	**121** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
C2-Benzonaphthothiophenes	**96.9** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
C3-Benzonaphthothiophenes	**83.8** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS642
Date Sampled: 12/20/18 13:00
Percent Solids: 69
Initial Volume: 10.66
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 12/26/18 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**54.4** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
Fluoranthene	**1650** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
Pyrene	**1410** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
C1-Fluoranthenes/Pyrenes	**593** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
C2-Fluoranthenes/Pyrenes	**393** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
C3-Fluoranthenes/Pyrenes	**160** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
Benzo(b)fluorene	**60.5** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
Benzo(c)fluorene	**30.4** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
2-Methylpyrene	**80.6** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
4-Methylpyrene	**66.2** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
1-Methylpyrene	**52.2** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
Benz(a)anthracene	**801** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
Chrysene/triphenylene	**800** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
C1-Benzo(a)anthracenes/Chrysenes	**329** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
C2-Benzo(a)anthracenes/Chrysenes	**172** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
C3-Benzo(a)anthracenes/Chrysenes	**99.8** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
C4-Benzo(a)anthracenes/Chrysenes	**58.7** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
Benzo(b)fluoranthene	**680** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
Benzo(j/k)fluoranthene	**685** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
Benzo(e)pyrene	**549** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
Benzo(a)pyrene	**759** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
Perylene	**201** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
Indeno(1,2,3-cd)pyrene	**468** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
Dibenzo(a,h)anthracene	**120** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
Benzo(g,h,i)perylene	**446** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
Coronene	**111** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
Tetramethyl lead	ND (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
Trimethylethyl lead	ND (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
Dimethyldiethyl lead	ND (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
Methyltriethyl lead	ND (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
Tetraethyl lead	ND (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
Carbazole	**79.0** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS642
Date Sampled: 12/20/18 13:00
Percent Solids: 69
Initial Volume: 10.66
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 12/26/18 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**11.0** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
2,3,5-Trimethylnaphthene	**4.02** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
4-Methyldibenzothiophene	**18.6** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
2/3-Methyldibenzothiophene	**19.9** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
1-Methyldibenzothiophene	**11.1** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
3-Methylphenanthrene	**91.2** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
2-Methylphenanthrene	**114** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
2-Methylanthracene	**57.7** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
4/9-Methylphenanthrene	**89.8** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601
1-Methylphenanthrene	**66.8** (2.73)	1.36	8270 Mod		1	12/27/18 18:13	F8L0011	FL82601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*87 %*		*50-120*
Surrogate: Naphthalene-d8	*82 %*		*50-120*
Surrogate: Phenanthrene-d10	*84 %*		*50-120*
Surrogate: Perylene-d12	*80 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS642
Date Sampled: 12/20/18 13:00
Percent Solids: 69

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**19900** (348)		LK		1	CCP	12/27/18 22:37	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS643
Date Sampled: 12/20/18 13:15
Percent Solids: 73
Initial Volume: 10.92
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-04
Sample Matrix: Soil
Units: mg/Kg dry
Analyst: NL
Prepared: 12/26/18 11:45

Saturated Hydrocarbons by GC/FID

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C-8	ND (0.250)	0.125	8015 Mod		1	NL	12/28/18 11:13	F8L0010	FL82601
C-9	ND (0.250)	0.125	8015 Mod		1	NL	12/28/18 11:13	F8L0010	FL82601
C-10	ND (0.250)	0.125	8015 Mod		1	NL	12/28/18 11:13	F8L0010	FL82601
C-11	ND (0.250)	0.125	8015 Mod		1	NL	12/28/18 11:13	F8L0010	FL82601
C-12	ND (0.250)	0.125	8015 Mod		1	NL	12/28/18 11:13	F8L0010	FL82601
C-13	ND (0.250)	0.125	8015 Mod		1	NL	12/28/18 11:13	F8L0010	FL82601
2,6,10-trimethyldodecane (1380)	ND (0.250)	0.125	8015 Mod		1	NL	12/28/18 11:13	F8L0010	FL82601
C-14	ND (0.250)	0.125	8015 Mod		1	NL	12/28/18 11:13	F8L0010	FL82601
2,6,10-trimethyltridecane (1470)	ND (0.250)	0.125	8015 Mod		1	NL	12/28/18 11:13	F8L0010	FL82601
C-15	ND (0.250)	0.125	8015 Mod		1	NL	12/28/18 11:13	F8L0010	FL82601
C-16	ND (0.250)	0.125	8015 Mod		1	NL	12/28/18 11:13	F8L0010	FL82601
2,6,10-trimethylpentadecane (1650)	ND (0.250)	0.125	8015 Mod		1	NL	12/28/18 11:13	F8L0010	FL82601
C-17	ND (0.250)	0.125	8015 Mod		1	NL	12/28/18 11:13	F8L0010	FL82601
Pristane	ND (0.250)	0.125	8015 Mod		1	NL	12/28/18 11:13	F8L0010	FL82601
C-18	ND (0.250)	0.125	8015 Mod		1	NL	12/28/18 11:13	F8L0010	FL82601
Phytane	ND (0.250)	0.125	8015 Mod		1	NL	12/28/18 11:13	F8L0010	FL82601
C-19	ND (0.250)	0.125	8015 Mod		1	NL	12/28/18 11:13	F8L0010	FL82601
C-20	ND (0.250)	0.125	8015 Mod		1	NL	12/28/18 11:13	F8L0010	FL82601
C-21	ND (0.250)	0.125	8015 Mod		1	NL	12/28/18 11:13	F8L0010	FL82601
C-22	ND (0.250)	0.125	8015 Mod		1	NL	12/28/18 11:13	F8L0010	FL82601
C-23	ND (0.250)	0.125	8015 Mod		1	NL	12/28/18 11:13	F8L0010	FL82601
C-24	ND (0.250)	0.125	8015 Mod		1	NL	12/28/18 11:13	F8L0010	FL82601
C-25	ND (0.250)	0.125	8015 Mod		1	NL	12/28/18 11:13	F8L0010	FL82601
C-26	ND (0.250)	0.125	8015 Mod		1	NL	12/28/18 11:13	F8L0010	FL82601
C-27	**0.451** (0.250)	0.125	8015 Mod		1	NL	12/28/18 11:13	F8L0010	FL82601
C-28	ND (0.250)	0.125	8015 Mod		1	NL	12/28/18 11:13	F8L0010	FL82601
C-29	J **0.175** (0.250)	0.125	8015 Mod		1	NL	12/28/18 11:13	F8L0010	FL82601
C-30	ND (0.250)	0.125	8015 Mod		1	NL	12/28/18 11:13	F8L0010	FL82601
C-31	**0.279** (0.250)	0.125	8015 Mod		1	NL	12/28/18 11:13	F8L0010	FL82601
C-32	ND (0.250)	0.125	8015 Mod		1	NL	12/28/18 11:13	F8L0010	FL82601
C-33	ND (0.250)	0.125	8015 Mod		1	NL	12/28/18 11:13	F8L0010	FL82601
C-34	ND (0.250)	0.125	8015 Mod		1	NL	12/28/18 11:13	F8L0010	FL82601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS643
Date Sampled: 12/20/18 13:15
Percent Solids: 73
Initial Volume: 10.92
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-04
Sample Matrix: Soil
Units: mg/Kg dry
Analyst: NL
Prepared: 12/26/18 11:45

Saturated Hydrocarbons by GC/FID

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C-35	ND (0.250)	0.125	8015 Mod		1	NL	12/28/18 11:13	F8L0010	FL82601
C-36	ND (0.250)	0.125	8015 Mod		1	NL	12/28/18 11:13	F8L0010	FL82601
C-37	ND (0.250)	0.125	8015 Mod		1	NL	12/28/18 11:13	F8L0010	FL82601
C-38	ND (0.250)	0.125	8015 Mod		1	NL	12/28/18 11:13	F8L0010	FL82601
C-39	ND (0.250)	0.125	8015 Mod		1	NL	12/28/18 11:13	F8L0010	FL82601
C-40	ND (0.250)	0.125	8015 Mod		1	NL	12/28/18 11:13	F8L0010	FL82601
TPH (C8-C40)	**252** (8.27)	0.125	8015 Mod		1	NL	12/28/18 11:13	F8L0010	FL82601

	%Recovery	Qualifier	Limits
Surrogate: o-Terphenyl	*84 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS643
Date Sampled: 12/20/18 13:15
Percent Solids: 73
Initial Volume: 10.92
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Extraction Method: 3570

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 12/26/18 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**27.2** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
C1-Benzene	**14.8** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
C2-Benzenes	**16.4** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
C3-Benzenes	**13.0** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
C4-Benzenes	**13.1** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
C5-Benzenes	**6.53** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
Methylcyclohexane	**J 1.60** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
Toluene	**25.2** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
Ethylbenzene	**4.68** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
m,p-Xylene	**22.6** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
Styrene	**20.5** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
o-Xylene	**2.75** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
Isopropylbenzene	ND (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
n-Propylbenzene	**3.45** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
1,3,5-Trimethylbenzene	**J 1.29** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
1,2,3-Trimethylbenzene	**2.91** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
1,2,4-Trimethylbenzene	**3.67** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
t-Butylbenzene	ND (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
sec-Butylbenzene	ND (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
p-Isopropyltoluene	**4.93** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
n-Butylbenzene	**5.53** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
trans-Decalin	**J 2.50** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
cis-Decalin	ND (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
C1-Decalins	**6.69** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
C2-Decalins	**7.23** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
C3-Decalins	ND (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
C4-Decalins	ND (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
Benzo(b)thiophene	**3.89** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
C1-Benzo(b)thiophenes	**8.88** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
C2-Benzo(b)thiophenes	**13.2** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
C3-Benzo(b)thiophenes	**12.2** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
C4-Benzo(b)thiophenes	**5.93** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS643
Date Sampled: 12/20/18 13:15
Percent Solids: 73
Initial Volume: 10.92
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 12/26/18 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**84.3** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
2-Methylnaphthalene	**38.7** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
1-Methylnaphthalene	**32.2** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
C1-Naphthalenes	**46.3** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
C2-Naphthalenes	**51.7** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
C3-Naphthalenes	**45.9** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
C4-Naphthalenes	**26.6** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
Biphenyl	**15.3** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
Acenaphthylene	**198** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
Acenaphthene	**185** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
Dibenzofuran	**83.0** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
Fluorene	**141** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
C1-Fluorenes	**47.9** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
C2-Fluorenes	**45.9** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
C3-Fluorenes	**101** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
Dibenzothiophene	**78.3** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
C1-Dibenzothiophenes	**58.6** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
C2-Dibenzothiophenes	**59.2** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
C3-Dibenzothiophenes	**51.4** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
C4-Dibenzothiophenes	**27.9** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
Phenanthrene	**1340** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
Anthracene	**404** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
C1-Phenanthrenes/Anthracenes	**437** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
C2-Phenanthrenes/Anthracenes	**209** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
C3-Phenanthrenes/Anthracenes	**88.7** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
C4-Phenanthrenes/Anthracenes	**30.2** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
Retene	**11.0** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
Benzo(b)naphtho(2,1-d)thiophene	**121** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
C0-Benzonaphthothiophenes	**220** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
C1-Benzonaphthothiophenes	**110** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
C2-Benzonaphthothiophenes	**97.0** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
C3-Benzonaphthothiophenes	**85.5** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS643
Date Sampled: 12/20/18 13:15
Percent Solids: 73
Initial Volume: 10.92
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 12/26/18 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**54.2** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
Fluoranthene	**1990** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
Pyrene	**1700** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
C1-Fluoranthenes/Pyrenes	**618** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
C2-Fluoranthenes/Pyrenes	**399** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
C3-Fluoranthenes/Pyrenes	**161** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
Benzo(b)fluorene	**67.8** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
Benzo(c)fluorene	**35.3** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
2-Methylpyrene	**85.9** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
4-Methylpyrene	**69.8** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
1-Methylpyrene	**54.7** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
Benz(a)anthracene	**865** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
Chrysene/triphenylene	**878** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
C1-Benzo(a)anthracenes/Chrysenes	**343** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
C2-Benzo(a)anthracenes/Chrysenes	**180** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
C3-Benzo(a)anthracenes/Chrysenes	**96.2** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
C4-Benzo(a)anthracenes/Chrysenes	**51.1** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
Benzo(b)fluoranthene	**783** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
Benzo(j/k)fluoranthene	**716** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
Benzo(e)pyrene	**597** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
Benzo(a)pyrene	**849** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
Perylene	**219** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
Indeno(1,2,3-cd)pyrene	**522** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
Dibenzo(a,h)anthracene	**137** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
Benzo(g,h,i)perylene	**500** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
Coronene	**122** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
Tetramethyl lead	ND (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
Trimethylethyl lead	ND (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
Dimethyldiethyl lead	ND (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
Methyltriethyl lead	ND (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
Tetraethyl lead	ND (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
Carbazole	**171** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS643
Date Sampled: 12/20/18 13:15
Percent Solids: 73
Initial Volume: 10.92
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 12/26/18 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**11.4** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
2,3,5-Trimethylnaphthene	**2.99** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
4-Methyldibenzothiophene	**17.4** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
2/3-Methyldibenzothiophene	**18.7** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
1-Methyldibenzothiophene	**10.7** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
3-Methylphenanthrene	**94.9** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
2-Methylphenanthrene	**117** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
2-Methylanthracene	**58.6** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
4/9-Methylphenanthrene	**89.1** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601
1-Methylphenanthrene	**67.3** (2.50)	1.25	8270 Mod		1	12/27/18 19:36	F8L0011	FL82601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*86 %*		*50-120*
Surrogate: Naphthalene-d8	*83 %*		*50-120*
Surrogate: Phenanthrene-d10	*85 %*		*50-120*
Surrogate: Perylene-d12	*81 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS643
Date Sampled: 12/20/18 13:15
Percent Solids: 73

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-04
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**15000** (402)		LK		1	CCP	12/27/18 17:00	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS644
Date Sampled: 12/20/18 14:00
Percent Solids: 45
Initial Volume: 10.5
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-05
Sample Matrix: Soil
Units: mg/Kg dry
Analyst: NL
Prepared: 12/26/18 11:45

Saturated Hydrocarbons by GC/FID

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C-8	ND (0.424)	0.212	8015 Mod		1	NL	12/27/18 23:00	F8L0010	FL82601
C-9	ND (0.424)	0.212	8015 Mod		1	NL	12/27/18 23:00	F8L0010	FL82601
C-10	ND (0.424)	0.212	8015 Mod		1	NL	12/27/18 23:00	F8L0010	FL82601
C-11	ND (0.424)	0.212	8015 Mod		1	NL	12/27/18 23:00	F8L0010	FL82601
C-12	ND (0.424)	0.212	8015 Mod		1	NL	12/27/18 23:00	F8L0010	FL82601
C-13	ND (0.424)	0.212	8015 Mod		1	NL	12/27/18 23:00	F8L0010	FL82601
2,6,10-trimethyldodecane (1380)	ND (0.424)	0.212	8015 Mod		1	NL	12/27/18 23:00	F8L0010	FL82601
C-14	ND (0.424)	0.212	8015 Mod		1	NL	12/27/18 23:00	F8L0010	FL82601
2,6,10-trimethyltridecane (1470)	ND (0.424)	0.212	8015 Mod		1	NL	12/27/18 23:00	F8L0010	FL82601
C-15	ND (0.424)	0.212	8015 Mod		1	NL	12/27/18 23:00	F8L0010	FL82601
C-16	ND (0.424)	0.212	8015 Mod		1	NL	12/27/18 23:00	F8L0010	FL82601
2,6,10-trimethylpentadecane (1650)	ND (0.424)	0.212	8015 Mod		1	NL	12/27/18 23:00	F8L0010	FL82601
C-17	ND (0.424)	0.212	8015 Mod		1	NL	12/27/18 23:00	F8L0010	FL82601
Pristane	ND (0.424)	0.212	8015 Mod		1	NL	12/27/18 23:00	F8L0010	FL82601
C-18	ND (0.424)	0.212	8015 Mod		1	NL	12/27/18 23:00	F8L0010	FL82601
Phytane	ND (0.424)	0.212	8015 Mod		1	NL	12/27/18 23:00	F8L0010	FL82601
C-19	ND (0.424)	0.212	8015 Mod		1	NL	12/27/18 23:00	F8L0010	FL82601
C-20	ND (0.424)	0.212	8015 Mod		1	NL	12/27/18 23:00	F8L0010	FL82601
C-21	ND (0.424)	0.212	8015 Mod		1	NL	12/27/18 23:00	F8L0010	FL82601
C-22	ND (0.424)	0.212	8015 Mod		1	NL	12/27/18 23:00	F8L0010	FL82601
C-23	J **0.294** (0.424)	0.212	8015 Mod		1	NL	12/27/18 23:00	F8L0010	FL82601
C-24	J **0.288** (0.424)	0.212	8015 Mod		1	NL	12/27/18 23:00	F8L0010	FL82601
C-25	**1.39** (0.424)	0.212	8015 Mod		1	NL	12/27/18 23:00	F8L0010	FL82601
C-26	J **0.294** (0.424)	0.212	8015 Mod		1	NL	12/27/18 23:00	F8L0010	FL82601
C-27	**2.04** (0.424)	0.212	8015 Mod		1	NL	12/27/18 23:00	F8L0010	FL82601
C-28	ND (0.424)	0.212	8015 Mod		1	NL	12/27/18 23:00	F8L0010	FL82601
C-29	**1.10** (0.424)	0.212	8015 Mod		1	NL	12/27/18 23:00	F8L0010	FL82601
C-30	J **0.272** (0.424)	0.212	8015 Mod		1	NL	12/27/18 23:00	F8L0010	FL82601
C-31	**0.936** (0.424)	0.212	8015 Mod		1	NL	12/27/18 23:00	F8L0010	FL82601
C-32	ND (0.424)	0.212	8015 Mod		1	NL	12/27/18 23:00	F8L0010	FL82601
C-33	J **0.325** (0.424)	0.212	8015 Mod		1	NL	12/27/18 23:00	F8L0010	FL82601
C-34	ND (0.424)	0.212	8015 Mod		1	NL	12/27/18 23:00	F8L0010	FL82601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS644
Date Sampled: 12/20/18 14:00
Percent Solids: 45
Initial Volume: 10.5
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-05
Sample Matrix: Soil
Units: mg/Kg dry
Analyst: NL
Prepared: 12/26/18 11:45

Saturated Hydrocarbons by GC/FID

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C-35	**2.03** (0.424)	0.212	8015 Mod		1	NL	12/27/18 23:00	F8L0010	FL82601
C-36	ND (0.424)	0.212	8015 Mod		1	NL	12/27/18 23:00	F8L0010	FL82601
C-37	**0.565** (0.424)	0.212	8015 Mod		1	NL	12/27/18 23:00	F8L0010	FL82601
C-38	ND (0.424)	0.212	8015 Mod		1	NL	12/27/18 23:00	F8L0010	FL82601
C-39	ND (0.424)	0.212	8015 Mod		1	NL	12/27/18 23:00	F8L0010	FL82601
C-40	ND (0.424)	0.212	8015 Mod		1	NL	12/27/18 23:00	F8L0010	FL82601
TPH (C8-C40)	**513** (14.0)	0.212	8015 Mod		1	NL	12/27/18 23:00	F8L0010	FL82601

	%Recovery	Qualifier	Limits
Surrogate: o-Terphenyl	*83 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS644
Date Sampled: 12/20/18 14:00
Percent Solids: 45
Initial Volume: 10.5
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 12/26/18 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**32.6** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
C1-Benzene	**57.0** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
C2-Benzenes	**88.2** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
C3-Benzenes	**46.1** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
C4-Benzenes	**33.9** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
C5-Benzenes	**26.5** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
Methylcyclohexane	**4.78** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
Toluene	**95.2** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
Ethylbenzene	**30.1** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
m,p-Xylene	**134** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
Styrene	**107** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
o-Xylene	**9.52** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
Isopropylbenzene	**58.0** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
n-Propylbenzene	**7.28** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
1,3,5-Trimethylbenzene	**5.05** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
1,2,3-Trimethylbenzene	**7.71** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
1,2,4-Trimethylbenzene	**9.54** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
t-Butylbenzene	ND (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
sec-Butylbenzene	ND (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
p-Isopropyltoluene	**8.74** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
n-Butylbenzene	**8.77** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
trans-Decalin	**36.5** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
cis-Decalin	**J 2.60** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
C1-Decalins	**41.0** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
C2-Decalins	**27.6** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
C3-Decalins	**22.8** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
C4-Decalins	**38.0** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
Benzo(b)thiophene	**J 4.00** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
C1-Benzo(b)thiophenes	**21.5** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
C2-Benzo(b)thiophenes	**25.0** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
C3-Benzo(b)thiophenes	**17.7** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
C4-Benzo(b)thiophenes	**11.3** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS644
Date Sampled: 12/20/18 14:00
Percent Solids: 45
Initial Volume: 10.5
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 12/26/18 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**80.5** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
2-Methylnaphthalene	**43.8** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
1-Methylnaphthalene	**28.2** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
C1-Naphthalenes	**46.8** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
C2-Naphthalenes	**85.6** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
C3-Naphthalenes	**87.1** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
C4-Naphthalenes	**70.0** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
Biphenyl	**19.6** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
Acenaphthylene	**365** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
Acenaphthene	**109** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
Dibenzofuran	**53.3** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
Fluorene	**112** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
C1-Fluorenes	**88.4** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
C2-Fluorenes	**124** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
C3-Fluorenes	**153** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
Dibenzothiophene	**75.1** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
C1-Dibenzothiophenes	**101** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
C2-Dibenzothiophenes	**127** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
C3-Dibenzothiophenes	**94.9** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
C4-Dibenzothiophenes	**53.9** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
Phenanthrene	**1290** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
Anthracene	**499** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
C1-Phenanthrenes/Anthracenes	**921** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
C2-Phenanthrenes/Anthracenes	**592** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
C3-Phenanthrenes/Anthracenes	**263** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
C4-Phenanthrenes/Anthracenes	**102** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
Retene	**66.8** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
Benzo(b)naphtho(2,1-d)thiophene	**201** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
C0-Benzonaphthothiophenes	**385** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
C1-Benzonaphthothiophenes	**251** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
C2-Benzonaphthothiophenes	**188** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
C3-Benzonaphthothiophenes	**135** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS644
Date Sampled: 12/20/18 14:00
Percent Solids: 45
Initial Volume: 10.5
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 12/26/18 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**66.9** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
Fluoranthene	**2570** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
Pyrene	**2870** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
C1-Fluoranthenes/Pyrenes	**1800** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
C2-Fluoranthenes/Pyrenes	**876** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
C3-Fluoranthenes/Pyrenes	**342** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
Benzo(b)fluorene	**214** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
Benzo(c)fluorene	**86.4** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
2-Methylpyrene	**245** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
4-Methylpyrene	**226** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
1-Methylpyrene	**188** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
Benz(a)anthracene	**1610** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
Chrysene/triphenylene	**1670** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
C1-Benzo(a)anthracenes/Chrysenes	**924** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
C2-Benzo(a)anthracenes/Chrysenes	**508** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
C3-Benzo(a)anthracenes/Chrysenes	**252** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
C4-Benzo(a)anthracenes/Chrysenes	**133** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
Benzo(b)fluoranthene	**1230** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
Benzo(j/k)fluoranthene	**1300** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
Benzo(e)pyrene	**1210** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
Benzo(a)pyrene	**1750** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
Perylene	**378** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
Indeno(1,2,3-cd)pyrene	**897** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
Dibenzo(a,h)anthracene	**248** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
Benzo(g,h,i)perylene	**965** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
Coronene	**236** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
Tetramethyl lead	ND (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
Trimethylethyl lead	ND (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
Dimethyldiethyl lead	ND (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
Methyltriethyl lead	ND (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
Tetraethyl lead	ND (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
Carbazole	**126** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS644
Date Sampled: 12/20/18 14:00
Percent Solids: 45
Initial Volume: 10.5
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 12/26/18 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**20.1** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
2,3,5-Trimethylnaphthene	**5.82** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
4-Methyldibenzothiophene	**30.5** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
2/3-Methyldibenzothiophene	**30.5** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
1-Methyldibenzothiophene	**17.5** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
3-Methylphenanthrene	**173** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
2-Methylphenanthrene	**217** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
2-Methylanthracene	**159** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
4/9-Methylphenanthrene	**213** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601
1-Methylphenanthrene	**137** (4.24)	2.12	8270 Mod		1	12/27/18 20:57	F8L0011	FL82601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*84 %*		*50-120*
Surrogate: Naphthalene-d8	*80 %*		*50-120*
Surrogate: Phenanthrene-d10	*82 %*		*50-120*
Surrogate: Perylene-d12	*79 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS644
Date Sampled: 12/20/18 14:00
Percent Solids: 45

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-05
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**80700** (400)		LK		1	CCP	12/27/18 17:15	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS645
Date Sampled: 12/21/18 08:30
Percent Solids: 72
Initial Volume: 10.32
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-06
Sample Matrix: Soil
Units: mg/Kg dry
Analyst: NL
Prepared: 12/26/18 11:45

Saturated Hydrocarbons by GC/FID

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C-8	ND (0.268)	0.134	8015 Mod		1	NL	12/27/18 14:54	F8L0010	FL82601
C-9	ND (0.268)	0.134	8015 Mod		1	NL	12/27/18 14:54	F8L0010	FL82601
C-10	ND (0.268)	0.134	8015 Mod		1	NL	12/27/18 14:54	F8L0010	FL82601
C-11	ND (0.268)	0.134	8015 Mod		1	NL	12/27/18 14:54	F8L0010	FL82601
C-12	ND (0.268)	0.134	8015 Mod		1	NL	12/27/18 14:54	F8L0010	FL82601
C-13	ND (0.268)	0.134	8015 Mod		1	NL	12/27/18 14:54	F8L0010	FL82601
2,6,10-trimethyldodecane (1380)	ND (0.268)	0.134	8015 Mod		1	NL	12/27/18 14:54	F8L0010	FL82601
C-14	ND (0.268)	0.134	8015 Mod		1	NL	12/27/18 14:54	F8L0010	FL82601
2,6,10-trimethyltridecane (1470)	ND (0.268)	0.134	8015 Mod		1	NL	12/27/18 14:54	F8L0010	FL82601
C-15	ND (0.268)	0.134	8015 Mod		1	NL	12/27/18 14:54	F8L0010	FL82601
C-16	ND (0.268)	0.134	8015 Mod		1	NL	12/27/18 14:54	F8L0010	FL82601
2,6,10-trimethylpentadecane (1650)	ND (0.268)	0.134	8015 Mod		1	NL	12/27/18 14:54	F8L0010	FL82601
C-17	ND (0.268)	0.134	8015 Mod		1	NL	12/27/18 14:54	F8L0010	FL82601
Pristane	ND (0.268)	0.134	8015 Mod		1	NL	12/27/18 14:54	F8L0010	FL82601
C-18	ND (0.268)	0.134	8015 Mod		1	NL	12/27/18 14:54	F8L0010	FL82601
Phytane	ND (0.268)	0.134	8015 Mod		1	NL	12/27/18 14:54	F8L0010	FL82601
C-19	ND (0.268)	0.134	8015 Mod		1	NL	12/27/18 14:54	F8L0010	FL82601
C-20	ND (0.268)	0.134	8015 Mod		1	NL	12/27/18 14:54	F8L0010	FL82601
C-21	ND (0.268)	0.134	8015 Mod		1	NL	12/27/18 14:54	F8L0010	FL82601
C-22	ND (0.268)	0.134	8015 Mod		1	NL	12/27/18 14:54	F8L0010	FL82601
C-23	ND (0.268)	0.134	8015 Mod		1	NL	12/27/18 14:54	F8L0010	FL82601
C-24	**0.606** (0.268)	0.134	8015 Mod		1	NL	12/27/18 14:54	F8L0010	FL82601
C-25	**1.45** (0.268)	0.134	8015 Mod		1	NL	12/27/18 14:54	F8L0010	FL82601
C-26	ND (0.268)	0.134	8015 Mod		1	NL	12/27/18 14:54	F8L0010	FL82601
C-27	**1.24** (0.268)	0.134	8015 Mod		1	NL	12/27/18 14:54	F8L0010	FL82601
C-28	ND (0.268)	0.134	8015 Mod		1	NL	12/27/18 14:54	F8L0010	FL82601
C-29	**0.371** (0.268)	0.134	8015 Mod		1	NL	12/27/18 14:54	F8L0010	FL82601
C-30	ND (0.268)	0.134	8015 Mod		1	NL	12/27/18 14:54	F8L0010	FL82601
C-31	**0.315** (0.268)	0.134	8015 Mod		1	NL	12/27/18 14:54	F8L0010	FL82601
C-32	ND (0.268)	0.134	8015 Mod		1	NL	12/27/18 14:54	F8L0010	FL82601
C-33	**J 0.200** (0.268)	0.134	8015 Mod		1	NL	12/27/18 14:54	F8L0010	FL82601
C-34	ND (0.268)	0.134	8015 Mod		1	NL	12/27/18 14:54	F8L0010	FL82601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS645
Date Sampled: 12/21/18 08:30
Percent Solids: 72
Initial Volume: 10.32
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-06
Sample Matrix: Soil
Units: mg/Kg dry
Analyst: NL
Prepared: 12/26/18 11:45

Saturated Hydrocarbons by GC/FID

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C-35	**0.388** (0.268)	0.134	8015 Mod		1	NL	12/27/18 14:54	F8L0010	FL82601
C-36	ND (0.268)	0.134	8015 Mod		1	NL	12/27/18 14:54	F8L0010	FL82601
C-37	ND (0.268)	0.134	8015 Mod		1	NL	12/27/18 14:54	F8L0010	FL82601
C-38	ND (0.268)	0.134	8015 Mod		1	NL	12/27/18 14:54	F8L0010	FL82601
C-39	ND (0.268)	0.134	8015 Mod		1	NL	12/27/18 14:54	F8L0010	FL82601
C-40	ND (0.268)	0.134	8015 Mod		1	NL	12/27/18 14:54	F8L0010	FL82601
TPH (C8-C40)	**95.7** (8.84)	0.134	8015 Mod		1	NL	12/27/18 14:54	F8L0010	FL82601

	%Recovery	*Qualifier*	*Limits*
Surrogate: o-Terphenyl	*77 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS645
Date Sampled: 12/21/18 08:30
Percent Solids: 72
Initial Volume: 10.32
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 12/26/18 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **14.6** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
C1-Benzene	**6.17** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
C2-Benzenes	**7.03** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
C3-Benzenes	**6.54** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
C4-Benzenes	**7.63** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
C5-Benzenes	ND (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
Methylcyclohexane	ND (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
Toluene	**9.86** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
Ethylbenzene	**3.75** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
m,p-Xylene	**6.66** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
Styrene	**6.12** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
o-Xylene	ND (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
Isopropylbenzene	ND (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
n-Propylbenzene	J **1.58** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
1,3,5-Trimethylbenzene	ND (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
1,2,3-Trimethylbenzene	ND (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
1,2,4-Trimethylbenzene	J **2.12** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
t-Butylbenzene	ND (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
sec-Butylbenzene	ND (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
p-Isopropyltoluene	**3.41** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
n-Butylbenzene	**8.01** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
trans-Decalin	ND (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
cis-Decalin	ND (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
C1-Decalins	ND (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
C2-Decalins	ND (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
C3-Decalins	ND (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
C4-Decalins	ND (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
Benzo(b)thiophene	ND (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
C1-Benzo(b)thiophenes	J **1.53** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
C2-Benzo(b)thiophenes	J **1.46** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
C3-Benzo(b)thiophenes	J **1.76** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
C4-Benzo(b)thiophenes	ND (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS645
Date Sampled: 12/21/18 08:30
Percent Solids: 72
Initial Volume: 10.32
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 12/26/18 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**24.8** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
2-Methylnaphthalene	**16.7** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
1-Methylnaphthalene	**11.8** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
C1-Naphthalenes	**18.9** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
C2-Naphthalenes	**24.9** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
C3-Naphthalenes	**17.2** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
C4-Naphthalenes	**10.4** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
Biphenyl	**9.39** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
Acenaphthylene	**42.3** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
Acenaphthene	**21.9** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
Dibenzofuran	**9.70** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
Fluorene	**17.1** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
C1-Fluorenes	**14.1** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
C2-Fluorenes	**15.6** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
C3-Fluorenes	**16.0** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
Dibenzothiophene	**7.20** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
C1-Dibenzothiophenes	**8.28** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
C2-Dibenzothiophenes	**10.7** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
C3-Dibenzothiophenes	**8.49** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
C4-Dibenzothiophenes	**15.6** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
Phenanthrene	**167** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
Anthracene	**53.7** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
C1-Phenanthrenes/Anthracenes	**140** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
C2-Phenanthrenes/Anthracenes	**99.7** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
C3-Phenanthrenes/Anthracenes	**54.8** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
C4-Phenanthrenes/Anthracenes	**47.9** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
Retene	**129** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
Benzo(b)naphtho(2,1-d)thiophene	**15.4** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
C0-Benzonaphthothiophenes	**40.8** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
C1-Benzonaphthothiophenes	**29.4** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
C2-Benzonaphthothiophenes	**19.6** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
C3-Benzonaphthothiophenes	**14.2** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS645
Date Sampled: 12/21/18 08:30
Percent Solids: 72
Initial Volume: 10.32
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 12/26/18 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**5.17** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
Fluoranthene	**275** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
Pyrene	**374** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
C1-Fluoranthenes/Pyrenes	**291** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
C2-Fluoranthenes/Pyrenes	**141** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
C3-Fluoranthenes/Pyrenes	**57.9** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
Benzo(b)fluorene	**23.5** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
Benzo(c)fluorene	**13.1** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
2-Methylpyrene	**43.4** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
4-Methylpyrene	**43.4** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
1-Methylpyrene	**33.0** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
Benz(a)anthracene	**243** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
Chrysene/triphenylene	**238** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
C1-Benzo(a)anthracenes/Chrysenes	**180** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
C2-Benzo(a)anthracenes/Chrysenes	**98.8** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
C3-Benzo(a)anthracenes/Chrysenes	**46.4** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
C4-Benzo(a)anthracenes/Chrysenes	**23.6** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
Benzo(b)fluoranthene	**157** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
Benzo(j/k)fluoranthene	**189** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
Benzo(e)pyrene	**206** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
Benzo(a)pyrene	**267** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
Perylene	**81.6** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
Indeno(1,2,3-cd)pyrene	**124** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
Dibenzo(a,h)anthracene	**39.8** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
Benzo(g,h,i)perylene	**157** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
Coronene	**37.0** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
Tetramethyl lead	ND (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
Trimethylethyl lead	ND (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
Dimethyldiethyl lead	ND (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
Methyltriethyl lead	ND (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
Tetraethyl lead	ND (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
Carbazole	**12.4** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS645
Date Sampled: 12/21/18 08:30
Percent Solids: 72
Initial Volume: 10.32
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 12/26/18 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**4.49** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
2,3,5-Trimethylnaphthene	**J 1.39** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
4-Methyldibenzothiophene	**J 2.11** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
2/3-Methyldibenzothiophene	**J 2.41** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
1-Methyldibenzothiophene	ND (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
3-Methylphenanthrene	**25.6** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
2-Methylphenanthrene	**32.9** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
2-Methylanthracene	**20.4** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
4/9-Methylphenanthrene	**33.7** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601
1-Methylphenanthrene	**23.8** (2.68)	1.34	8270 Mod		1	12/27/18 1:49	F8L0011	FL82601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*83 %*		*50-120*
Surrogate: Naphthalene-d8	*74 %*		*50-120*
Surrogate: Phenanthrene-d10	*76 %*		*50-120*
Surrogate: Perylene-d12	*75 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS645
Date Sampled: 12/21/18 08:30
Percent Solids: 72

ESS Laboratory Work Order: F180071
ESS Laboratory Sample ID: F180071-06
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**12200** (388)		LK		1	CCP	12/27/18 17:32	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F180071

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Classical Chemistry										
Batch CL82636 - General Preparation										
Blank										
Total Organic Carbon (1)	ND	100	mg/kg							
Total Organic Carbon (2)	ND	100	mg/kg							
LCS										
Total Organic Carbon (1)	9690	100	mg/kg	10000		97	80-120			
Total Organic Carbon (2)	9930	100	mg/kg	10000		99	80-120			
LCS Dup										
Total Organic Carbon (1)	9440	100	mg/kg	10000		94	80-120	3	20	
Total Organic Carbon (2)	11300	100	mg/kg	10000		113	80-120	13	20	
Reference										
Total Organic Carbon (1)	1.6		%	1.560		100	0-200			
Total Organic Carbon (2)	1.4		%	1.560		93	0-200			

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Saturated Hydrocarbons by GC/FID										
Batch FL82601 - 3570										
Blank										
2,6,10-trimethyldodecane (1380)	ND	0.200	mg/Kg wet							
2,6,10-trimethylpentadecane (1650)	ND	0.200	mg/Kg wet							
2,6,10-trimethyltridecane (1470)	ND	0.200	mg/Kg wet							
C-10	ND	0.200	mg/Kg wet							
C-11	ND	0.200	mg/Kg wet							
C-12	ND	0.200	mg/Kg wet							
C-13	ND	0.200	mg/Kg wet							
C-14	ND	0.200	mg/Kg wet							
C-15	ND	0.200	mg/Kg wet							
C-16	ND	0.200	mg/Kg wet							
C-17	ND	0.200	mg/Kg wet							
C-18	ND	0.200	mg/Kg wet							
C-19	ND	0.200	mg/Kg wet							
C-20	ND	0.200	mg/Kg wet							
C-21	ND	0.200	mg/Kg wet							
C-22	ND	0.200	mg/Kg wet							
C-23	ND	0.200	mg/Kg wet							
C-24	ND	0.200	mg/Kg wet							
C-25	ND	0.200	mg/Kg wet							
C-26	ND	0.200	mg/Kg wet							
C-27	ND	0.200	mg/Kg wet							
C-28	ND	0.200	mg/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F180071

Quality Control Data

Saturated Hydrocarbons by GC/FID

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch FL82601 - 3570										
C-29	ND	0.200	mg/Kg wet							
C-30	ND	0.200	mg/Kg wet							
C-31	ND	0.200	mg/Kg wet							
C-32	ND	0.200	mg/Kg wet							
C-33	ND	0.200	mg/Kg wet							
C-34	ND	0.200	mg/Kg wet							
C-35	ND	0.200	mg/Kg wet							
C-36	ND	0.200	mg/Kg wet							
C-37	ND	0.200	mg/Kg wet							
C-38	ND	0.200	mg/Kg wet							
C-39	ND	0.200	mg/Kg wet							
C-40	ND	0.200	mg/Kg wet							
C-8	ND	0.200	mg/Kg wet							
C-9	ND	0.200	mg/Kg wet							
Phytane	ND	0.200	mg/Kg wet							
Pristane	ND	0.200	mg/Kg wet							
TPH (C8-C40)	4.63	6.60	mg/Kg wet							J
Surrogate: o-Terphenyl	*4.49*		mg/Kg wet	*5.000*		*90*	*50-120*			
LCS										
C-10	4.06	0.200	mg/Kg wet	5.000		81	60-130			
C-11	4.20	0.200	mg/Kg wet	5.000		84	60-130			
C-12	4.34	0.200	mg/Kg wet	5.000		87	60-130			
C-13	4.20	0.200	mg/Kg wet	5.000		84	60-130			
C-14	4.18	0.200	mg/Kg wet	5.000		84	60-130			
C-15	4.09	0.200	mg/Kg wet	5.000		82	60-130			
C-16	4.16	0.200	mg/Kg wet	5.000		83	60-130			
C-17	4.05	0.200	mg/Kg wet	5.000		81	60-130			
C-18	4.01	0.200	mg/Kg wet	5.000		80	60-130			
C-19	4.09	0.200	mg/Kg wet	5.000		82	60-130			
C-20	4.10	0.200	mg/Kg wet	5.000		82	60-130			
C-21	4.09	0.200	mg/Kg wet	5.000		82	60-130			
C-22	4.09	0.200	mg/Kg wet	5.000		82	60-130			
C-23	4.08	0.200	mg/Kg wet	5.000		82	60-130			
C-24	4.07	0.200	mg/Kg wet	5.000		81	60-130			
C-25	4.10	0.200	mg/Kg wet	5.000		82	60-130			
C-26	4.08	0.200	mg/Kg wet	5.000		82	60-130			
C-27	4.07	0.200	mg/Kg wet	5.000		81	60-130			
C-28	3.88	0.200	mg/Kg wet	5.000		78	60-130			
C-29	4.07	0.200	mg/Kg wet	5.000		81	60-130			
C-30	4.08	0.200	mg/Kg wet	5.000		82	60-130			
C-31	4.07	0.200	mg/Kg wet	5.000		81	60-130			
C-32	4.08	0.200	mg/Kg wet	5.000		82	60-130			
C-33	4.09	0.200	mg/Kg wet	5.000		82	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F180071

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Saturated Hydrocarbons by GC/FID										
Batch FL82601 - 3570										
C-34	4.11	0.200	mg/Kg wet	5.000		82	60-130			
C-35	4.13	0.200	mg/Kg wet	5.000		83	60-130			
C-36	4.15	0.200	mg/Kg wet	5.000		83	60-130			
C-37	4.15	0.200	mg/Kg wet	5.000		83	60-130			
C-38	4.20	0.200	mg/Kg wet	5.000		84	60-130			
C-39	4.23	0.200	mg/Kg wet	5.000		85	60-130			
C-40	4.24	0.200	mg/Kg wet	5.000		85	60-130			
C-8	3.95	0.200	mg/Kg wet	5.000		79	60-130			
C-9	3.89	0.200	mg/Kg wet	5.000		78	60-130			
Phytane	4.14	0.200	mg/Kg wet	5.000		83	60-130			
Pristane	4.26	0.200	mg/Kg wet	5.000		85	60-130			
Surrogate: o-Terphenyl	*4.39*		mg/Kg wet	*5.000*		*88*	*50-120*			
Duplicate **Source: F180071-06**										
2,6,10-trimethyldodecane (1380)	ND	0.263	mg/Kg dry		ND				50	
2,6,10-trimethylpentadecane (1650)	ND	0.263	mg/Kg dry		ND				50	
2,6,10-trimethyltridecane (1470)	ND	0.263	mg/Kg dry		ND				50	
C-10	ND	0.263	mg/Kg dry		ND				50	
C-11	ND	0.263	mg/Kg dry		ND				50	
C-12	ND	0.263	mg/Kg dry		ND				50	
C-13	ND	0.263	mg/Kg dry		ND				50	
C-14	ND	0.263	mg/Kg dry		ND				50	
C-15	ND	0.263	mg/Kg dry		ND				50	
C-16	ND	0.263	mg/Kg dry		ND				50	
C-17	ND	0.263	mg/Kg dry		ND				50	
C-18	ND	0.263	mg/Kg dry		ND				50	
C-19	ND	0.263	mg/Kg dry		ND				50	
C-20	ND	0.263	mg/Kg dry		ND				50	
C-21	ND	0.263	mg/Kg dry		ND				50	
C-22	ND	0.263	mg/Kg dry		ND				50	
C-23	ND	0.263	mg/Kg dry		ND				50	
C-24	0.582	0.263	mg/Kg dry		0.606			4	50	
C-25	1.13	0.263	mg/Kg dry		1.45			25	50	
C-26	ND	0.263	mg/Kg dry		ND				50	
C-27	1.38	0.263	mg/Kg dry		1.24			11	50	
C-28	ND	0.263	mg/Kg dry		ND				50	
C-29	0.474	0.263	mg/Kg dry		0.371			24	50	
C-30	ND	0.263	mg/Kg dry		ND				50	
C-31	0.328	0.263	mg/Kg dry		0.315			4	50	
C-32	ND	0.263	mg/Kg dry		ND				50	
C-33	0.197	0.263	mg/Kg dry		0.200			1	50	J
C-34	ND	0.263	mg/Kg dry		ND				50	
C-35	0.304	0.263	mg/Kg dry		0.388			24	50	
C-36	ND	0.263	mg/Kg dry		ND				50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F180071

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Saturated Hydrocarbons by GC/FID										
Batch FL82601 - 3570										
C-37	ND	0.263	mg/Kg dry		ND				50	
C-38	ND	0.263	mg/Kg dry		ND				50	
C-39	ND	0.263	mg/Kg dry		ND				50	
C-40	ND	0.263	mg/Kg dry		ND				50	
C-8	ND	0.263	mg/Kg dry		ND				50	
C-9	ND	0.263	mg/Kg dry		ND				50	
Phytane	ND	0.263	mg/Kg dry		ND				50	
Pristane	ND	0.263	mg/Kg dry		ND				50	
TPH (C8-C40)	88.5	8.69	mg/Kg dry		95.7			8	50	
Surrogate: o-Terphenyl	*4.85*		mg/Kg dry	*6.582*		*74*	*50-120*			
8270D (SIM) Semi-Volatile Organic Compounds										
Batch FL82601 - 3570										
Blank										
1,2,3-Trimethylbenzene	ND	2.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	2.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	2.00	ug/Kg wet							
1-Methyldibenzothiophene	ND	2.00	ug/Kg wet							
1-Methylnaphthalene	ND	2.00	ug/Kg wet							
1-Methylphenanthrene	ND	2.00	ug/Kg wet							
1-Methylpyrene	ND	2.00	ug/Kg wet							
2,3,5-Trimethylnaphthene	ND	2.00	ug/Kg wet							
2,6-Dimethylnaphthalene	ND	2.00	ug/Kg wet							
2/3-Methyldibenzothiophene	ND	2.00	ug/Kg wet							
2-Methylanthracene	ND	2.00	ug/Kg wet							
2-Methylnaphthalene	ND	2.00	ug/Kg wet							
2-Methylphenanthrene	ND	2.00	ug/Kg wet							
2-Methylpyrene	ND	2.00	ug/Kg wet							
3-Methylphenanthrene	ND	2.00	ug/Kg wet							
4/9-Methylphenanthrene	ND	2.00	ug/Kg wet							
4-Methyldibenzothiophene	ND	2.00	ug/Kg wet							
4-Methylpyrene	ND	2.00	ug/Kg wet							
Acenaphthene	ND	2.00	ug/Kg wet							
Acenaphthylene	ND	2.00	ug/Kg wet							
Anthracene	ND	2.00	ug/Kg wet							
Benz(a)anthracene	ND	2.00	ug/Kg wet							
Benzene	1.88	2.00	ug/Kg wet							J
Benzo(a)pyrene	ND	2.00	ug/Kg wet							
Benzo(b)fluoranthene	ND	2.00	ug/Kg wet							
Benzo(b)fluorene	ND	2.00	ug/Kg wet							
Benzo(b)naphtho(2,1-d)thiophene	ND	2.00	ug/Kg wet							
Benzo(b)thiophene	ND	2.00	ug/Kg wet							
Benzo(c)fluorene	ND	2.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F180071

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D (SIM) Semi-Volatile Organic Compounds										
Batch FL82601 - 3570										
Benzo(e)pyrene	ND	2.00	ug/Kg wet							
Benzo(g,h,i)perylene	ND	2.00	ug/Kg wet							
Benzo(j/k)fluoranthene	ND	2.00	ug/Kg wet							
Biphenyl	ND	2.00	ug/Kg wet							
C0-Benzonaphthothiophenes	ND	2.00	ug/Kg wet							
C1-Benzene	ND	2.00	ug/Kg wet							
C1-Benzo(a)anthracenes/Chrysenes	ND	2.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	2.00	ug/Kg wet							
C1-Benzonaphthothiophenes	ND	2.00	ug/Kg wet							
C1-Decalins	ND	2.00	ug/Kg wet							
C1-Dibenzothiophenes	ND	2.00	ug/Kg wet							
C1-Fluoranthenes/Pyrenes	ND	2.00	ug/Kg wet							
C1-Fluorenes	ND	2.00	ug/Kg wet							
C1-Naphthalenes	ND	2.00	ug/Kg wet							
C1-Phenanthrenes/Anthracenes	ND	2.00	ug/Kg wet							
C2-Benzenes	ND	2.00	ug/Kg wet							
C2-Benzo(a)anthracenes/Chrysenes	ND	2.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	2.00	ug/Kg wet							
C2-Benzonaphthothiophenes	ND	2.00	ug/Kg wet							
C2-Decalins	ND	2.00	ug/Kg wet							
C2-Dibenzothiophenes	ND	2.00	ug/Kg wet							
C2-Fluoranthenes/Pyrenes	ND	2.00	ug/Kg wet							
C2-Fluorenes	ND	2.00	ug/Kg wet							
C2-Naphthalenes	ND	2.00	ug/Kg wet							
C2-Phenanthrenes/Anthracenes	ND	2.00	ug/Kg wet							
C3-Benzenes	ND	2.00	ug/Kg wet							
C3-Benzo(a)anthracenes/Chrysenes	ND	2.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	2.00	ug/Kg wet							
C3-Benzonaphthothiophenes	ND	2.00	ug/Kg wet							
C3-Decalins	ND	2.00	ug/Kg wet							
C3-Dibenzothiophenes	ND	2.00	ug/Kg wet							
C3-Fluoranthenes/Pyrenes	ND	2.00	ug/Kg wet							
C3-Fluorenes	ND	2.00	ug/Kg wet							
C3-Naphthalenes	ND	2.00	ug/Kg wet							
C3-Phenanthrenes/Anthracenes	ND	2.00	ug/Kg wet							
C4-Benzenes	ND	2.00	ug/Kg wet							
C4-Benzo(a)anthracenes/Chrysenes	ND	2.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	2.00	ug/Kg wet							
C4-Benzonaphthothiophenes	ND	2.00	ug/Kg wet							
C4-Decalins	ND	2.00	ug/Kg wet							
C4-Dibenzothiophenes	ND	2.00	ug/Kg wet							
C4-Naphthalenes	ND	2.00	ug/Kg wet							
C4-Phenanthrenes/Anthracenes	ND	2.00	ug/Kg wet							
C5-Benzenes	ND	2.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F180071

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D (SIM) Semi-Volatile Organic Compounds										
Batch FL82601 - 3570										
Carbazole	ND	2.00	ug/Kg wet							
Chrysene/triphenylene	ND	2.00	ug/Kg wet							
cis-Decalin	ND	2.00	ug/Kg wet							
Coronene	ND	2.00	ug/Kg wet							
Dibenzo(a,h)anthracene	ND	2.00	ug/Kg wet							
Dibenzofuran	ND	2.00	ug/Kg wet							
Dibenzothiophene	ND	2.00	ug/Kg wet							
Dimethyldiethyl lead	ND	2.00	ug/Kg wet							
Ethylbenzene	ND	2.00	ug/Kg wet							
Fluoranthene	ND	2.00	ug/Kg wet							
Fluorene	ND	2.00	ug/Kg wet							
Indeno(1,2,3-cd)pyrene	ND	2.00	ug/Kg wet							
Isopropylbenzene	ND	2.00	ug/Kg wet							
m,p-Xylene	ND	2.00	ug/Kg wet							
Methylcyclohexane	ND	2.00	ug/Kg wet							
Methyltriethyl lead	ND	2.00	ug/Kg wet							
Naphthalene	ND	2.00	ug/Kg wet							
n-Butylbenzene	ND	2.00	ug/Kg wet							
n-Propylbenzene	ND	2.00	ug/Kg wet							
o-Xylene	ND	2.00	ug/Kg wet							
Perylene	ND	2.00	ug/Kg wet							
Phenanthrene	ND	2.00	ug/Kg wet							
p-Isopropyltoluene	ND	2.00	ug/Kg wet							
Pyrene	ND	2.00	ug/Kg wet							
Retene	ND	2.00	ug/Kg wet							
sec-Butylbenzene	ND	2.00	ug/Kg wet							
Styrene	ND	2.00	ug/Kg wet							
t-Butylbenzene	ND	2.00	ug/Kg wet							
Tetraethyl lead	ND	2.00	ug/Kg wet							
Tetramethyl lead	ND	2.00	ug/Kg wet							
Toluene	ND	2.00	ug/Kg wet							
trans-Decalin	ND	2.00	ug/Kg wet							
Trimethylethyl lead	ND	2.00	ug/Kg wet							
Surrogate: Naphthalene-d8	*171*		ug/Kg wet	*200.0*		*86*	*50-120*			
Surrogate: Phenanthrene-d10	*166*		ug/Kg wet	*200.0*		*83*	*50-120*			
Surrogate: Toluene-D8	*221*		ug/Kg wet	*200.0*		*110*	*50-120*			
LCS										
1,2,3-Trimethylbenzene	175	2.00	ug/Kg wet	200.0		88	60-130			
1,2,4-Trimethylbenzene	174	2.00	ug/Kg wet	200.0		87	60-130			
1,3,5-Trimethylbenzene	172	2.00	ug/Kg wet	200.0		86	60-130			
1-Methylnaphthalene	157	2.00	ug/Kg wet	200.0		79	60-130			
2-Methylnaphthalene	152	2.00	ug/Kg wet	200.0		76	60-130			
Acenaphthene	163	2.00	ug/Kg wet	200.0		81	60-130			
Acenaphthylene	161	2.00	ug/Kg wet	200.0		81	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F180071

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch FL82601 - 3570										
Anthracene	151	2.00	ug/Kg wet	200.0		75	60-130			
Benz(a)anthracene	139	2.00	ug/Kg wet	200.0		70	60-130			
Benzene	154	2.00	ug/Kg wet	200.0		77	60-130			
Benzo(a)pyrene	142	2.00	ug/Kg wet	200.0		71	60-130			
Benzo(b)fluoranthene	138	2.00	ug/Kg wet	200.0		69	60-130			
Benzo(b)naphtho(2,1-d)thiophene	148	2.00	ug/Kg wet	200.0		74	60-130			
Benzo(b)thiophene	155	2.00	ug/Kg wet	200.0		78	60-130			
Benzo(e)pyrene	149	2.00	ug/Kg wet	200.0		74	60-130			
Benzo(g,h,i)perylene	138	2.00	ug/Kg wet	200.0		69	60-130			
Benzo(j/k)fluoranthene	154	2.00	ug/Kg wet	200.0		77	60-130			
Biphenyl	152	2.00	ug/Kg wet	200.0		76	60-130			
Chrysene/triphenylene	150	2.00	ug/Kg wet	200.0		75	60-130			
cis-Decalin	168	2.00	ug/Kg wet	200.0		84	60-130			
Coronene	136	2.00	ug/Kg wet	200.0		68	60-130			
Dibenzo(a,h)anthracene	126	2.00	ug/Kg wet	200.0		63	60-130			
Dibenzofuran	154	2.00	ug/Kg wet	200.0		77	60-130			
Dibenzothiophene	156	2.00	ug/Kg wet	200.0		78	60-130			
Ethylbenzene	172	2.00	ug/Kg wet	200.0		86	60-130			
Fluoranthene	158	2.00	ug/Kg wet	200.0		79	60-130			
Fluorene	155	2.00	ug/Kg wet	200.0		77	60-130			
Indeno(1,2,3-cd)pyrene	128	2.00	ug/Kg wet	200.0		64	60-130			
Isopropylbenzene	173	2.00	ug/Kg wet	200.0		87	60-130			
m,p-Xylene	172	2.00	ug/Kg wet	200.0		86	60-130			
Methylcyclohexane	118	2.00	ug/Kg wet	200.0		59	60-130			B-
Naphthalene	159	2.00	ug/Kg wet	200.0		80	60-130			
n-Butylbenzene	167	2.00	ug/Kg wet	200.0		83	60-130			
n-Propylbenzene	168	2.00	ug/Kg wet	200.0		84	60-130			
o-Xylene	173	2.00	ug/Kg wet	200.0		86	60-130			
Perylene	145	2.00	ug/Kg wet	200.0		73	60-130			
Phenanthrene	159	2.00	ug/Kg wet	200.0		79	60-130			
p-Isopropyltoluene	175	2.00	ug/Kg wet	200.0		88	60-130			
Pyrene	158	2.00	ug/Kg wet	200.0		79	60-130			
Retene	150	2.00	ug/Kg wet	200.0		75	60-130			
sec-Butylbenzene	173	2.00	ug/Kg wet	200.0		86	60-130			
Styrene	154	2.00	ug/Kg wet	200.0		77	60-130			
t-Butylbenzene	174	2.00	ug/Kg wet	200.0		87	60-130			
Tetraethyl lead	137	2.00	ug/Kg wet	200.0		69	60-130			
Toluene	177	2.00	ug/Kg wet	200.0		89	60-130			
trans-Decalin	172	2.00	ug/Kg wet	200.0		86	60-130			
Surrogate: Naphthalene-d8	*167*		ug/Kg wet	*200.0*		*84*	*50-120*			
Surrogate: Phenanthrene-d10	*168*		ug/Kg wet	*200.0*		*84*	*50-120*			
Surrogate: Toluene-D8	*187*		ug/Kg wet	*200.0*		*93*	*50-120*			
Duplicate **Source: F180071-06**										**D+**
1,2,3-Trimethylbenzene	ND	2.63	ug/Kg dry		ND				50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F180071

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D (SIM) Semi-Volatile Organic Compounds										
Batch FL82601 - 3570										
1,2,4-Trimethylbenzene	2.29	2.63	ug/Kg dry		2.12			8	50	J
1,3,5-Trimethylbenzene	ND	2.63	ug/Kg dry		ND				50	
1-Methyldibenzothiophene	ND	2.63	ug/Kg dry		ND				50	
1-Methylnaphthalene	7.72	2.63	ug/Kg dry		11.8			42	50	
1-Methylphenanthrene	10.6	2.63	ug/Kg dry		23.8			77	50	
1-Methylpyrene	18.4	2.63	ug/Kg dry		33.0			57	50	
2,3,5-Trimethylnaphthene	ND	2.63	ug/Kg dry		1.39				50	
2,6-Dimethylnaphthalene	2.58	2.63	ug/Kg dry		4.49			54	50	J
2/3-Methyldibenzothiophene	1.61	2.63	ug/Kg dry		2.41			40	50	J
2-Methylanthracene	9.08	2.63	ug/Kg dry		20.4			77	50	
2-Methylnaphthalene	14.8	2.63	ug/Kg dry		16.7			12	50	
2-Methylphenanthrene	13.6	2.63	ug/Kg dry		32.9			83	50	
2-Methylpyrene	23.1	2.63	ug/Kg dry		43.4			61	50	
3-Methylphenanthrene	10.3	2.63	ug/Kg dry		25.6			85	50	
4/9-Methylphenanthrene	16.9	2.63	ug/Kg dry		33.7			66	50	
4-Methyldibenzothiophene	ND	2.63	ug/Kg dry		2.11				50	
4-Methylpyrene	25.2	2.63	ug/Kg dry		43.4			53	50	
Acenaphthene	6.62	2.63	ug/Kg dry		21.9			107	50	
Acenaphthylene	25.8	2.63	ug/Kg dry		42.3			48	50	
Anthracene	22.7	2.63	ug/Kg dry		53.7			81	50	
Benz(a)anthracene	125	2.63	ug/Kg dry		243			64	50	
Benzene	5.42	2.63	ug/Kg dry		14.6			91	50	
Benzo(a)pyrene	146	2.63	ug/Kg dry		267			58	50	
Benzo(b)fluoranthene	86.4	2.63	ug/Kg dry		157			58	50	
Benzo(b)fluorene	12.0	2.63	ug/Kg dry		23.5			64	50	
Benzo(b)naphtho(2,1-d)thiophene	8.06	2.63	ug/Kg dry		15.4			62	50	
Benzo(b)thiophene	ND	2.63	ug/Kg dry		ND				50	
Benzo(c)fluorene	5.17	2.63	ug/Kg dry		13.1			87	50	
Benzo(e)pyrene	119	2.63	ug/Kg dry		206			54	50	
Benzo(g,h,i)perylene	92.8	2.63	ug/Kg dry		157			52	50	
Benzo(j/k)fluoranthene	105	2.63	ug/Kg dry		189			58	50	
Biphenyl	6.69	2.63	ug/Kg dry		9.39			34	50	
C0-Benzonaphthothiophenes	20.7	2.63	ug/Kg dry		40.8			66	50	
C1-Benzene	4.02	2.63	ug/Kg dry		6.17			42	50	
C1-Benzo(a)anthracenes/Chrysenes	100	2.63	ug/Kg dry		180			57	50	
C1-Benzo(b)thiophenes	ND	2.63	ug/Kg dry		1.53				50	
C1-Benzonaphthothiophenes	17.2	2.63	ug/Kg dry		29.4			52	50	
C1-Decalins	ND	2.63	ug/Kg dry		ND				50	
C1-Dibenzothiophenes	4.28	2.63	ug/Kg dry		8.28			64	50	
C1-Fluoranthenes/Pyrenes	151	2.63	ug/Kg dry		291			63	50	
C1-Fluorenes	6.86	2.63	ug/Kg dry		14.1			69	50	
C1-Naphthalenes	14.5	2.63	ug/Kg dry		18.9			26	50	
C1-Phenanthrenes/Anthracenes	62.0	2.63	ug/Kg dry		140			77	50	
C2-Benzenes	6.77	2.63	ug/Kg dry		7.03			4	50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F180071

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D (SIM) Semi-Volatile Organic Compounds										
Batch FL82601 - 3570										
C2-Benzo(a)anthracenes/Chrysenes	60.1	2.63	ug/Kg dry		98.8			49	50	
C2-Benzo(b)thiophenes	1.40	2.63	ug/Kg dry		1.46			4	50	J
C2-Benzonaphthothiophenes	12.8	2.63	ug/Kg dry		19.6			42	50	
C2-Decalins	ND	2.63	ug/Kg dry		ND				50	
C2-Dibenzothiophenes	6.27	2.63	ug/Kg dry		10.7			52	50	
C2-Fluoranthenes/Pyrenes	79.3	2.63	ug/Kg dry		141			56	50	
C2-Fluorenes	9.22	2.63	ug/Kg dry		15.6			51	50	
C2-Naphthalenes	13.0	2.63	ug/Kg dry		24.9			62	50	
C2-Phenanthrenes/Anthracenes	54.3	2.63	ug/Kg dry		99.7			59	50	
C3-Benzenes	5.88	2.63	ug/Kg dry		6.54			10	50	
C3-Benzo(a)anthracenes/Chrysenes	31.0	2.63	ug/Kg dry		46.4			40	50	
C3-Benzo(b)thiophenes	1.59	2.63	ug/Kg dry		1.76			10	50	J
C3-Benzonaphthothiophenes	9.47	2.63	ug/Kg dry		14.2			40	50	
C3-Decalins	ND	2.63	ug/Kg dry		ND				50	
C3-Dibenzothiophenes	5.64	2.63	ug/Kg dry		8.49			40	50	
C3-Fluoranthenes/Pyrenes	36.5	2.63	ug/Kg dry		57.9			45	50	
C3-Fluorenes	9.82	2.63	ug/Kg dry		16.0			48	50	
C3-Naphthalenes	8.79	2.63	ug/Kg dry		17.2			65	50	
C3-Phenanthrenes/Anthracenes	31.5	2.63	ug/Kg dry		54.8			54	50	
C4-Benzenes	5.35	2.63	ug/Kg dry		7.63			35	50	
C4-Benzo(a)anthracenes/Chrysenes	15.4	2.63	ug/Kg dry		23.6			42	50	
C4-Benzo(b)thiophenes	ND	2.63	ug/Kg dry		ND				50	
C4-Benzonaphthothiophenes	3.73	2.63	ug/Kg dry		5.17			32	50	
C4-Decalins	ND	2.63	ug/Kg dry		ND				50	
C4-Dibenzothiophenes	6.87	2.63	ug/Kg dry		15.6			78	50	
C4-Naphthalenes	5.77	2.63	ug/Kg dry		10.4			57	50	
C4-Phenanthrenes/Anthracenes	27.8	2.63	ug/Kg dry		47.9			53	50	
C5-Benzenes	ND	2.63	ug/Kg dry		ND				50	
Carbazole	2.56	2.63	ug/Kg dry		12.4			132	50	J
Chrysene/triphenylene	128	2.63	ug/Kg dry		238			60	50	
cis-Decalin	ND	2.63	ug/Kg dry		ND				50	
Coronene	21.8	2.63	ug/Kg dry		37.0			52	50	
Dibenzo(a,h)anthracene	23.3	2.63	ug/Kg dry		39.8			52	50	
Dibenzofuran	3.74	2.63	ug/Kg dry		9.70			89	50	
Dibenzothiophene	2.31	2.63	ug/Kg dry		7.20			103	50	J
Dimethyldiethyl lead	ND	2.63	ug/Kg dry		ND				50	
Ethylbenzene	3.51	2.63	ug/Kg dry		3.75			7	50	
Fluoranthene	127	2.63	ug/Kg dry		275			74	50	
Fluorene	5.03	2.63	ug/Kg dry		17.1			109	50	
Indeno(1,2,3-cd)pyrene	73.5	2.63	ug/Kg dry		124			51	50	
Isopropylbenzene	ND	2.63	ug/Kg dry		ND				50	
m,p-Xylene	7.50	2.63	ug/Kg dry		6.66			12	50	
Methylcyclohexane	1.52	2.63	ug/Kg dry		ND				50	J
Methyltriethyl lead	ND	2.63	ug/Kg dry		ND				50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F180071

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D (SIM) Semi-Volatile Organic Compounds										
Batch FL82601 - 3570										
Naphthalene	27.7	2.63	ug/Kg dry		24.8			11	50	
n-Butylbenzene	2.27	2.63	ug/Kg dry		8.01			112	50	J
n-Propylbenzene	ND	2.63	ug/Kg dry		1.58				50	
o-Xylene	ND	2.63	ug/Kg dry		ND				50	
Perylene	50.3	2.63	ug/Kg dry		81.6			48	50	
Phenanthrene	55.1	2.63	ug/Kg dry		167			101	50	
p-Isopropyltoluene	2.45	2.63	ug/Kg dry		3.41			33	50	J
Pyrene	185	2.63	ug/Kg dry		374			68	50	
Retene	71.2	2.63	ug/Kg dry		129			58	50	
sec-Butylbenzene	ND	2.63	ug/Kg dry		ND				50	
Styrene	3.54	2.63	ug/Kg dry		6.12			53	50	
t-Butylbenzene	ND	2.63	ug/Kg dry		ND				50	
Tetraethyl lead	ND	2.63	ug/Kg dry		ND				50	
Tetramethyl lead	ND	2.63	ug/Kg dry		ND				50	
Toluene	6.56	2.63	ug/Kg dry		9.86			40	50	
trans-Decalin	ND	2.63	ug/Kg dry		ND				50	
Trimethylethyl lead	ND	2.63	ug/Kg dry		ND				50	
Surrogate: Naphthalene-d8	*184*		ug/Kg dry	*263.3*		*70*	*50-120*			
Surrogate: Phenanthrene-d10	*192*		ug/Kg dry	*263.3*		*73*	*50-120*			
Surrogate: Toluene-D8	*211*		ug/Kg dry	*263.3*		*80*	*50-120*			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F180071

Notes and Definitions

U	Analyte included in the analysis, but not detected
J	Reported between MDL and MRL
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
B-	Blank Spike recovery is below lower control limit (B-).
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F180071

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job #: (Lab use only) 18120 | F18007J1

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Number: 1804576

Project Location: Amesbury, MA

Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY REQUIRED — YES / NO

If Yes, Are MCP Analytical Methods Required?	**YES**	NO	NA
Are Drinking Water Samples Submitted?	YES	**NO**	NA
If Yes, Have Drinking Water Sampling Requirements Been Met?	YES	NO	**NA**

Preservative: None | None | None

Sample Handling: Samples Field Filtered — YES NO **NA**; Sampled Shipped With Ice — **YES** NO

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	TPH 8015M*	Parent and Alkylated MAHs & PAHs 8270**	TOC by Lloyd-Kahn 2540
1	1804576-SS638	12/20/2018	1350	Soil/Sed	1	AMW	x	x	x
2	1804576-SS639	12/20/2018	1330	Soil/Sed	1	AMW	x	x	x
3	1804576-SS642	12/20/2018	1300	Soil/Sed	1	AMW	x	x	x
4	1804576-SS643	12/20/2018	1315	Soil/Sed	1	AMW	x	x	x
5	1804576-SS644	12/20/2018	1400	Soil/Sed	1	AMW	x	x	x
6	1804576-SS645	12/21/2018	0830	Soil/Sed	1	CWS	x	x	x

Sample Specific Remarks

MCP Level Needed: GEI requires that within the specified method, the most stringent Method 1 MCP standard be met for all analytes wherever possible.

Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1.	12/21/2018	1030	1. GEI Sample Fridge
Relinquished by: (signature) 2. GEI Sample Fridge	Date: 12/21/18	Time: 1240	Received by: (signature) 2.
Relinquished by: (signature) 3.	Date: 12/21/18	Time: 1240	Received by: (signature) 3.
Relinquished by: (signature) 4.	Date: 12/21/18	Time: 15:46	Received by: (signature) 4. 12/21/18 1605

Ice temp: 2.3

Turnaround Time (Business days)*

Normal ___x___ Other _by ~1/11/19_

10-Day _____ 7-Day _____

5-Day _____ 3-Day _____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

*Hydrocarbon Characterization by GC/FID Fingerprint, n-Alkanes, Isoprenoids

**Parent and Alkylated MAHs & PAHs (34) by GC/MS/SIM/SCAN

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI

Shipped/Delivered Via: ESS Courier

ESS Project ID: F180071
Date Received: 12/21/2018
Project Due Date: 1/2/2019
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 2.3 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / (NA)
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / (No)
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1		Yes	NA	Yes	8oz Jar - Unpres	NP	
2		Yes	NA	Yes	8oz Jar - Unpres	NP	
3		Yes	NA	Yes	8oz Jar - Unpres	NP	
4		Yes	NA	Yes	8oz Jar - Unpres	NP	
5		Yes	NA	Yes	8oz Jar - Unpres	NP	
6		Yes	NA	Yes	8oz Jar - Unpres	NP	

2nd Review
Are barcode labels on correct containers? Yes / No
Are all necessary stickers attached? Yes / No

Completed By: Date & Time: 12/21/18 1855
Reviewed By: Date & Time: 12/21/18 1900
Delivered By:

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: F190024

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 11:39 am, May 02, 2019

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses

ESS Laboratory - Cranston, RI	TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190024

SAMPLE RECEIPT

The following samples were received on April 25, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F190024-01	1804576-SS646	Soil	8270 Mod, TOC-LK
F190024-02	1804576-SS647	Soil	8270 Mod, TOC-LK
F190024-03	1804576-SS648	Soil	8270 Mod, TOC-LK
F190024-04	1804576-SS649	Soil	8270 Mod, TOC-LK
F190024-05	1804576-SS650	Soil	8270 Mod, TOC-LK
F190024-06	1804576-SS651	Soil	8270 Mod, TOC-LK
F190024-07	1804576-SS652	Soil	8270 Mod, TOC-LK
F190024-08	1804576-SS653	Soil	8270 Mod, TOC-LK
F190024-09	1804576-SS654	Soil	8270 Mod, TOC-LK
F190024-10	1804576-SS655	Soil	8270 Mod, TOC-LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190024

PROJECT NARRATIVE

8270D (SIM) Semi-Volatile Organic Compounds

F9D0016-CCV2	**Continuing Calibration %Diff/Drift is above control limit (CD+).**
F9D0016-CCV2	**Exceedances do not affect Sample Results**
F9D0017-CCV2	**Continuing Calibration %Diff/Drift is below control limit (CD-).**
	Coronene (30% @ 25%)
FD92601-BS2	**Blank Spike recovery is below lower control limit (B-).**
	Methylcyclohexane (57% @ 60-130%)
FD92601-DUP2	**Relative percent difference for duplicate is outside of criteria (D+).**

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190024

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS646
Date Sampled: 04/23/19 09:55
Percent Solids: 39
Initial Volume: 7.88
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**85.2** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
C1-Benzene	**99.6** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
C2-Benzenes	**128** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
C3-Benzenes	**33.3** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
C4-Benzenes	**35.0** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
C5-Benzenes	**22.0** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
Methylcyclohexane	**7.81** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
Toluene	**156** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
Ethylbenzene	**16.7** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
m,p-Xylene	**230** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
Styrene	**24.7** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
o-Xylene	**13.6** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
Isopropylbenzene	ND (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
n-Propylbenzene	**14.3** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
1,3,5-Trimethylbenzene	**7.29** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
1,2,3-Trimethylbenzene	**9.16** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
1,2,4-Trimethylbenzene	**11.1** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
t-Butylbenzene	ND (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
sec-Butylbenzene	ND (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
p-Isopropyltoluene	**9.95** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
n-Butylbenzene	**43.0** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
trans-Decalin	**J 4.44** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
cis-Decalin	**J 5.50** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
C1-Decalins	**10.2** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
C2-Decalins	**11.3** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
C3-Decalins	ND (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
C4-Decalins	ND (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
Benzo(b)thiophene	**J 5.70** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
C1-Benzo(b)thiophenes	**20.1** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
C2-Benzo(b)thiophenes	**33.1** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
C3-Benzo(b)thiophenes	**23.0** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
C4-Benzo(b)thiophenes	**9.45** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS646
Date Sampled: 04/23/19 09:55
Percent Solids: 39
Initial Volume: 7.88
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**75.5** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
2-Methylnaphthalene	**50.2** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
1-Methylnaphthalene	**40.3** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
C1-Naphthalenes	**54.8** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
C2-Naphthalenes	**85.8** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
C3-Naphthalenes	**60.7** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
C4-Naphthalenes	**36.6** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
Biphenyl	**24.6** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
Acenaphthylene	**243** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
Acenaphthene	**78.8** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
Dibenzofuran	**52.5** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
Fluorene	**105** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
C1-Fluorenes	**54.0** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
C2-Fluorenes	**63.2** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
C3-Fluorenes	**144** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
Dibenzothiophene	**77.2** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
C1-Dibenzothiophenes	**80.8** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
C2-Dibenzothiophenes	**81.8** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
C3-Dibenzothiophenes	**59.6** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
C4-Dibenzothiophenes	**35.7** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
Phenanthrene	**1060** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
Anthracene	**315** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
C1-Phenanthrenes/Anthracenes	**539** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
C2-Phenanthrenes/Anthracenes	**294** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
C3-Phenanthrenes/Anthracenes	**133** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
C4-Phenanthrenes/Anthracenes	**43.5** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
Retene	**96.0** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
Benzo(b)naphtho(2,1-d)thiophene	**196** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
C0-Benzonaphthothiophenes	**353** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
C1-Benzonaphthothiophenes	**187** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
C2-Benzonaphthothiophenes	**147** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
C3-Benzonaphthothiophenes	**120** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS646
Date Sampled: 04/23/19 09:55
Percent Solids: 39
Initial Volume: 7.88
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**66.7** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
Fluoranthene	**2290** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
Pyrene	**2210** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
C1-Fluoranthenes/Pyrenes	**1010** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
C2-Fluoranthenes/Pyrenes	**587** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
C3-Fluoranthenes/Pyrenes	**261** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
Benzo(b)fluorene	**113** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
Benzo(c)fluorene	**47.7** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
2-Methylpyrene	**134** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
4-Methylpyrene	**121** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
1-Methylpyrene	**97.3** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
Benz(a)anthracene	**1250** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
Chrysene/triphenylene	**1390** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
C1-Benzo(a)anthracenes/Chrysenes	**634** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
C2-Benzo(a)anthracenes/Chrysenes	**335** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
C3-Benzo(a)anthracenes/Chrysenes	**173** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
C4-Benzo(a)anthracenes/Chrysenes	**99.5** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
Benzo(b)fluoranthene	**1250** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
Benzo(j/k)fluoranthene	**1160** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
Benzo(e)pyrene	**1030** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
Benzo(a)pyrene	**1460** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
Perylene	**357** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
Indeno(1,2,3-cd)pyrene	**996** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
Dibenzo(a,h)anthracene	**227** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
Benzo(g,h,i)perylene	**882** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
Coronene	**257** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
Tetramethyl lead	ND (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
Trimethylethyl lead	ND (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
Dimethyldiethyl lead	ND (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
Methyltriethyl lead	ND (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
Tetraethyl lead	ND (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
Carbazole	**150** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS646
Date Sampled: 04/23/19 09:55
Percent Solids: 39
Initial Volume: 7.88
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**33.6** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
2,3,5-Trimethylnaphthene	**J 4.05** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
4-Methyldibenzothiophene	**25.0** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
2/3-Methyldibenzothiophene	**25.1** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
1-Methyldibenzothiophene	**12.9** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
3-Methylphenanthrene	**118** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
2-Methylphenanthrene	**136** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
2-Methylanthracene	**63.5** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
4/9-Methylphenanthrene	**122** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601
1-Methylphenanthrene	**83.8** (6.53)	3.27	8270 Mod		1	04/28/19 4:49	F9D0016	FD92601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*78 %*		*50-120*
Surrogate: Naphthalene-d8	*67 %*		*50-120*
Surrogate: Phenanthrene-d10	*80 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS646
Date Sampled: 04/23/19 09:55
Percent Solids: 39

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**64400** (291)		TOC-LK		1	CCP	04/30/19 14:17	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS647
Date Sampled: 04/23/19 10:05
Percent Solids: 66
Initial Volume: 10.45
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**33.1** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
C1-Benzene	**61.9** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
C2-Benzenes	**263** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
C3-Benzenes	**18.6** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
C4-Benzenes	**21.0** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
C5-Benzenes	**11.0** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
Methylcyclohexane	**6.36** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
Toluene	**101** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
Ethylbenzene	**6.19** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
m,p-Xylene	**513** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
Styrene	**23.7** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
o-Xylene	**7.38** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
Isopropylbenzene	ND (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
n-Propylbenzene	**4.64** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
1,3,5-Trimethylbenzene	**3.20** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
1,2,3-Trimethylbenzene	**6.59** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
1,2,4-Trimethylbenzene	**5.89** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
t-Butylbenzene	ND (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
sec-Butylbenzene	ND (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
p-Isopropyltoluene	**14.4** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
n-Butylbenzene	**8.56** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
trans-Decalin	**J 2.38** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
cis-Decalin	**2.96** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
C1-Decalins	**6.43** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
C2-Decalins	**10.6** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
C3-Decalins	**8.99** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
C4-Decalins	ND (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
Benzo(b)thiophene	**5.10** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
C1-Benzo(b)thiophenes	**12.2** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
C2-Benzo(b)thiophenes	**20.6** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
C3-Benzo(b)thiophenes	**17.9** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
C4-Benzo(b)thiophenes	**9.09** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS647
Date Sampled: 04/23/19 10:05
Percent Solids: 66
Initial Volume: 10.45
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**134** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
2-Methylnaphthalene	**71.5** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
1-Methylnaphthalene	**57.8** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
C1-Naphthalenes	**80.5** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
C2-Naphthalenes	**115** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
C3-Naphthalenes	**98.7** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
C4-Naphthalenes	**49.3** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
Biphenyl	**22.0** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
Acenaphthylene	**314** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
Acenaphthene	**223** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
Dibenzofuran	**116** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
Fluorene	**227** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
C1-Fluorenes	**74.3** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
C2-Fluorenes	**72.6** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
C3-Fluorenes	**137** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
Dibenzothiophene	**125** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
C1-Dibenzothiophenes	**105** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
C2-Dibenzothiophenes	**110** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
C3-Dibenzothiophenes	**69.8** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
C4-Dibenzothiophenes	**36.4** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
Phenanthrene	**1850** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
Anthracene	**617** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
C1-Phenanthrenes/Anthracenes	**817** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
C2-Phenanthrenes/Anthracenes	**399** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
C3-Phenanthrenes/Anthracenes	**170** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
C4-Phenanthrenes/Anthracenes	**61.4** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
Retene	**28.2** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
Benzo(b)naphtho(2,1-d)thiophene	**237** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
C0-Benzonaphthothiophenes	**432** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
C1-Benzonaphthothiophenes	**220** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
C2-Benzonaphthothiophenes	**159** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
C3-Benzonaphthothiophenes	**146** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS647
Date Sampled: 04/23/19 10:05
Percent Solids: 66
Initial Volume: 10.45
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**93.9** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
Fluoranthene	**3000** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
Pyrene	**2770** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
C1-Fluoranthenes/Pyrenes	**1210** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
C2-Fluoranthenes/Pyrenes	**737** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
C3-Fluoranthenes/Pyrenes	**288** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
Benzo(b)fluorene	**136** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
Benzo(c)fluorene	**66.6** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
2-Methylpyrene	**164** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
4-Methylpyrene	**138** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
1-Methylpyrene	**120** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
Benz(a)anthracene	**1700** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
Chrysene/triphenylene	**1620** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
C1-Benzo(a)anthracenes/Chrysenes	**758** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
C2-Benzo(a)anthracenes/Chrysenes	**583** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
C3-Benzo(a)anthracenes/Chrysenes	**215** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
C4-Benzo(a)anthracenes/Chrysenes	**118** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
Benzo(b)fluoranthene	**1420** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
Benzo(j/k)fluoranthene	**1300** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
Benzo(e)pyrene	**1110** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
Benzo(a)pyrene	**1680** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
Perylene	**400** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
Indeno(1,2,3-cd)pyrene	**1100** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
Dibenzo(a,h)anthracene	**264** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
Benzo(g,h,i)perylene	**937** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
Coronene	**256** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
Tetramethyl lead	ND (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
Trimethylethyl lead	ND (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
Dimethyldiethyl lead	ND (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
Methyltriethyl lead	ND (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
Tetraethyl lead	ND (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
Carbazole	**228** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS647
Date Sampled: 04/23/19 10:05
Percent Solids: 66
Initial Volume: 10.45
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**29.1** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
2,3,5-Trimethylnaphthene	**7.69** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
4-Methyldibenzothiophene	**32.9** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
2/3-Methyldibenzothiophene	**35.1** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
1-Methyldibenzothiophene	**13.9** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
3-Methylphenanthrene	**180** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
2-Methylphenanthrene	**210** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
2-Methylanthracene	**102** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
4/9-Methylphenanthrene	**178** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601
1-Methylphenanthrene	**127** (2.91)	1.45	8270 Mod		1	04/28/19 6:14	F9D0016	FD92601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*59 %*		*50-120*
Surrogate: Naphthalene-d8	*67 %*		*50-120*
Surrogate: Phenanthrene-d10	*70 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS647
Date Sampled: 04/23/19 10:05
Percent Solids: 66

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**27100** (185)		TOC-LK		1	CCP	04/30/19 14:50	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS648
Date Sampled: 04/23/19 10:15
Percent Solids: 47
Initial Volume: 6.65
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**59.8** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
C1-Benzene	**69.1** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
C2-Benzenes	**79.5** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
C3-Benzenes	**27.2** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
C4-Benzenes	**36.5** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
C5-Benzenes	**21.4** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
Methylcyclohexane	**J 6.13** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
Toluene	**107** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
Ethylbenzene	**10.8** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
m,p-Xylene	**123** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
Styrene	**41.0** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
o-Xylene	**6.83** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
Isopropylbenzene	ND (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
n-Propylbenzene	**11.4** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
1,3,5-Trimethylbenzene	**J 5.52** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
1,2,3-Trimethylbenzene	**J 5.79** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
1,2,4-Trimethylbenzene	**J 5.57** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
t-Butylbenzene	ND (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
sec-Butylbenzene	ND (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
p-Isopropyltoluene	**9.81** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
n-Butylbenzene	**54.8** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
trans-Decalin	ND (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
cis-Decalin	**J 5.25** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
C1-Decalins	**6.68** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
C2-Decalins	**12.3** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
C3-Decalins	ND (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
C4-Decalins	ND (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
Benzo(b)thiophene	**J 4.12** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
C1-Benzo(b)thiophenes	**13.7** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
C2-Benzo(b)thiophenes	**32.3** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
C3-Benzo(b)thiophenes	**26.0** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
C4-Benzo(b)thiophenes	**11.7** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS648
Date Sampled: 04/23/19 10:15
Percent Solids: 47
Initial Volume: 6.65
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**78.1** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
2-Methylnaphthalene	**39.6** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
1-Methylnaphthalene	**20.9** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
C1-Naphthalenes	**37.6** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
C2-Naphthalenes	**76.6** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
C3-Naphthalenes	**67.4** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
C4-Naphthalenes	**52.6** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
Biphenyl	**21.6** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
Acenaphthylene	**656** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
Acenaphthene	**55.0** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
Dibenzofuran	**16.7** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
Fluorene	**67.7** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
C1-Fluorenes	**91.8** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
C2-Fluorenes	**130** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
C3-Fluorenes	**148** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
Dibenzothiophene	**63.0** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
C1-Dibenzothiophenes	**154** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
C2-Dibenzothiophenes	**198** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
C3-Dibenzothiophenes	**146** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
C4-Dibenzothiophenes	**73.5** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
Phenanthrene	**830** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
Anthracene	**583** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
C1-Phenanthrenes/Anthracenes	**1070** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
C2-Phenanthrenes/Anthracenes	**704** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
C3-Phenanthrenes/Anthracenes	**304** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
C4-Phenanthrenes/Anthracenes	**144** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
Retene	**210** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
Benzo(b)naphtho(2,1-d)thiophene	**429** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
C0-Benzonaphthothiophenes	**764** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
C1-Benzonaphthothiophenes	**456** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
C2-Benzonaphthothiophenes	**233** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
C3-Benzonaphthothiophenes	**150** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS648
Date Sampled: 04/23/19 10:15
Percent Solids: 47
Initial Volume: 6.65
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**49.8** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
Fluoranthene	**3520** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
Pyrene	**5030** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
C1-Fluoranthenes/Pyrenes	**3110** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
C2-Fluoranthenes/Pyrenes	**1110** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
C3-Fluoranthenes/Pyrenes	**413** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
Benzo(b)fluorene	**343** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
Benzo(c)fluorene	**119** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
2-Methylpyrene	**462** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
4-Methylpyrene	**435** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
1-Methylpyrene	**405** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
Benz(a)anthracene	**3160** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
Chrysene/triphenylene	**3290** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
C1-Benzo(a)anthracenes/Chrysenes	**1630** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
C2-Benzo(a)anthracenes/Chrysenes	**626** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
C3-Benzo(a)anthracenes/Chrysenes	**206** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
C4-Benzo(a)anthracenes/Chrysenes	**129** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
Benzo(b)fluoranthene	**2180** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
Benzo(j/k)fluoranthene	**2620** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
Benzo(e)pyrene	**2460** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
Benzo(a)pyrene	**3880** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
Perylene	**758** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
Indeno(1,2,3-cd)pyrene	**2160** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
Dibenzo(a,h)anthracene	**456** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
Benzo(g,h,i)perylene	**2140** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
Coronene	**637** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
Tetramethyl lead	ND (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
Trimethylethyl lead	ND (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
Dimethyldiethyl lead	ND (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
Methyltriethyl lead	ND (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
Tetraethyl lead	ND (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
Carbazole	**56.7** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS648
Date Sampled: 04/23/19 10:15
Percent Solids: 47
Initial Volume: 6.65
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**22.4** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
2,3,5-Trimethylnaphthene	**J 3.62** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
4-Methyldibenzothiophene	**61.3** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
2/3-Methyldibenzothiophene	**48.7** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
1-Methyldibenzothiophene	**21.4** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
3-Methylphenanthrene	**203** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
2-Methylphenanthrene	**156** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
2-Methylanthracene	**155** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
4/9-Methylphenanthrene	**271** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601
1-Methylphenanthrene	**173** (6.35)	3.18	8270 Mod		1	04/28/19 7:38	F9D0016	FD92601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*70 %*		*50-120*
Surrogate: Naphthalene-d8	*78 %*		*50-120*
Surrogate: Phenanthrene-d10	*86 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS648
Date Sampled: 04/23/19 10:15
Percent Solids: 47

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**105000** (458)		TOC-LK		1	CCP	04/30/19 15:57	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS649
Date Sampled: 04/23/19 12:50
Percent Solids: 48
Initial Volume: 7.53
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**98.6** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
C1-Benzene	**101** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
C2-Benzenes	**165** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
C3-Benzenes	**41.4** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
C4-Benzenes	**41.8** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
C5-Benzenes	**28.7** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
Methylcyclohexane	**9.58** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
Toluene	**163** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
Ethylbenzene	**20.6** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
m,p-Xylene	**294** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
Styrene	**59.8** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
o-Xylene	**16.8** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
Isopropylbenzene	ND (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
n-Propylbenzene	**10.0** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
1,3,5-Trimethylbenzene	**7.29** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
1,2,3-Trimethylbenzene	**12.8** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
1,2,4-Trimethylbenzene	**17.1** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
t-Butylbenzene	ND (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
sec-Butylbenzene	ND (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
p-Isopropyltoluene	**9.66** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
n-Butylbenzene	**19.2** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
trans-Decalin	**64.8** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
cis-Decalin	**8.45** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
C1-Decalins	**78.4** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
C2-Decalins	**52.1** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
C3-Decalins	**38.0** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
C4-Decalins	**66.9** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
Benzo(b)thiophene	**26.8** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
C1-Benzo(b)thiophenes	**56.8** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
C2-Benzo(b)thiophenes	**73.8** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
C3-Benzo(b)thiophenes	**55.6** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
C4-Benzo(b)thiophenes	**19.1** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS649
Date Sampled: 04/23/19 12:50
Percent Solids: 48
Initial Volume: 7.53
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**283** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
2-Methylnaphthalene	**116** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
1-Methylnaphthalene	**91.4** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
C1-Naphthalenes	**128** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
C2-Naphthalenes	**309** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
C3-Naphthalenes	**197** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
C4-Naphthalenes	**85.3** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
Biphenyl	**76.1** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
Acenaphthylene	**1510** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
Acenaphthene	**3040** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
Dibenzofuran	**88.8** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
Fluorene	**563** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
C1-Fluorenes	**247** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
C2-Fluorenes	**150** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
C3-Fluorenes	**230** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
Dibenzothiophene	**1030** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
C1-Dibenzothiophenes	**475** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
C2-Dibenzothiophenes	**254** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
C3-Dibenzothiophenes	**139** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
C4-Dibenzothiophenes	**76.7** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
Phenanthrene	**4550** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
Anthracene	**2200** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
C1-Phenanthrenes/Anthracenes	**2080** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
C2-Phenanthrenes/Anthracenes	**679** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
C3-Phenanthrenes/Anthracenes	**250** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
C4-Phenanthrenes/Anthracenes	**109** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
Retene	**45.6** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
Benzo(b)naphtho(2,1-d)thiophene	**919** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
C0-Benzonaphthothiophenes	**1780** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
C1-Benzonaphthothiophenes	**593** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
C2-Benzonaphthothiophenes	**306** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
C3-Benzonaphthothiophenes	**284** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS649
Date Sampled: 04/23/19 12:50
Percent Solids: 48
Initial Volume: 7.53
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**129** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
Fluoranthene	**12100** (110)	55.2	8270 Mod		20	04/29/19 13:58	F9D0016	FD92601
Pyrene	**15700** (110)	55.2	8270 Mod		20	04/29/19 13:58	F9D0016	FD92601
C1-Fluoranthenes/Pyrenes	**4130** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
C2-Fluoranthenes/Pyrenes	**1160** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
C3-Fluoranthenes/Pyrenes	**419** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
Benzo(b)fluorene	**529** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
Benzo(c)fluorene	**212** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
2-Methylpyrene	**571** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
4-Methylpyrene	**501** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
1-Methylpyrene	**565** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
Benz(a)anthracene	**5430** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
Chrysene/triphenylene	**4700** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
C1-Benzo(a)anthracenes/Chrysenes	**1580** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
C2-Benzo(a)anthracenes/Chrysenes	**600** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
C3-Benzo(a)anthracenes/Chrysenes	**283** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
C4-Benzo(a)anthracenes/Chrysenes	**223** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
Benzo(b)fluoranthene	**3840** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
Benzo(j/k)fluoranthene	**4440** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
Benzo(e)pyrene	**3880** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
Benzo(a)pyrene	**6630** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
Perylene	**1220** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
Indeno(1,2,3-cd)pyrene	**3890** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
Dibenzo(a,h)anthracene	**797** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
Benzo(g,h,i)perylene	**3720** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
Coronene	**1220** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
Tetramethyl lead	ND (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
Trimethylethyl lead	ND (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
Dimethyldiethyl lead	ND (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
Methyltriethyl lead	ND (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
Tetraethyl lead	ND (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
Carbazole	**181** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS649
Date Sampled: 04/23/19 12:50
Percent Solids: 48
Initial Volume: 7.53
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**64.5** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
2,3,5-Trimethylnaphthene	**13.5** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
4-Methyldibenzothiophene	**170** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
2/3-Methyldibenzothiophene	**160** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
1-Methyldibenzothiophene	**57.0** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
3-Methylphenanthrene	**489** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
2-Methylphenanthrene	**472** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
2-Methylanthracene	**261** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
4/9-Methylphenanthrene	**470** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601
1-Methylphenanthrene	**331** (5.52)	2.76	8270 Mod		1	04/28/19 9:03	F9D0016	FD92601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*65 %*		*50-120*
Surrogate: Naphthalene-d8	*76 %*		*50-120*
Surrogate: Phenanthrene-d10	*80 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS649
Date Sampled: 04/23/19 12:50
Percent Solids: 48

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-04
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**56300** (156)		TOC-LK		1	CCP	04/30/19 16:13	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS650
Date Sampled: 04/23/19 12:55
Percent Solids: 46
Initial Volume: 8.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**60.7** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
C1-Benzene	**123** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
C2-Benzenes	**149** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
C3-Benzenes	**34.2** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
C4-Benzenes	**38.0** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
C5-Benzenes	**22.8** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
Methylcyclohexane	**5.47** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
Toluene	**198** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
Ethylbenzene	**31.0** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
m,p-Xylene	**240** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
Styrene	**47.3** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
o-Xylene	**14.0** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
Isopropylbenzene	ND (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
n-Propylbenzene	**7.22** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
1,3,5-Trimethylbenzene	**J 5.17** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
1,2,3-Trimethylbenzene	**8.37** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
1,2,4-Trimethylbenzene	**11.4** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
t-Butylbenzene	ND (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
sec-Butylbenzene	ND (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
p-Isopropyltoluene	**9.47** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
n-Butylbenzene	**33.1** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
trans-Decalin	**9.82** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
cis-Decalin	ND (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
C1-Decalins	**17.3** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
C2-Decalins	**20.4** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
C3-Decalins	**18.8** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
C4-Decalins	**27.9** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
Benzo(b)thiophene	**31.9** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
C1-Benzo(b)thiophenes	**46.4** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
C2-Benzo(b)thiophenes	**65.1** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
C3-Benzo(b)thiophenes	**37.9** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
C4-Benzo(b)thiophenes	**16.4** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS650
Date Sampled: 04/23/19 12:55
Percent Solids: 46
Initial Volume: 8.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**330** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
2-Methylnaphthalene	**185** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
1-Methylnaphthalene	**188** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
C1-Naphthalenes	**232** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
C2-Naphthalenes	**349** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
C3-Naphthalenes	**167** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
C4-Naphthalenes	**64.9** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
Biphenyl	**70.7** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
Acenaphthylene	**1190** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
Acenaphthene	**1960** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
Dibenzofuran	**105** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
Fluorene	**897** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
C1-Fluorenes	**247** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
C2-Fluorenes	**140** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
C3-Fluorenes	**168** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
Dibenzothiophene	**877** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
C1-Dibenzothiophenes	**513** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
C2-Dibenzothiophenes	**239** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
C3-Dibenzothiophenes	**120** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
C4-Dibenzothiophenes	**57.6** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
Phenanthrene	**6440** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
Anthracene	**2490** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
C1-Phenanthrenes/Anthracenes	**2360** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
C2-Phenanthrenes/Anthracenes	**665** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
C3-Phenanthrenes/Anthracenes	**205** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
C4-Phenanthrenes/Anthracenes	**90.9** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
Retene	**90.2** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
Benzo(b)naphtho(2,1-d)thiophene	**908** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
C0-Benzonaphthothiophenes	**1790** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
C1-Benzonaphthothiophenes	**541** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
C2-Benzonaphthothiophenes	**253** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
C3-Benzonaphthothiophenes	**221** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS650
Date Sampled: 04/23/19 12:55
Percent Solids: 46
Initial Volume: 8.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**96.2** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
Fluoranthene	**11700** (105)	52.5	8270 Mod		20	04/29/19 15:22	F9D0016	FD92601
Pyrene	**15000** (105)	52.5	8270 Mod		20	04/29/19 15:22	F9D0016	FD92601
C1-Fluoranthenes/Pyrenes	**4340** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
C2-Fluoranthenes/Pyrenes	**988** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
C3-Fluoranthenes/Pyrenes	**359** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
Benzo(b)fluorene	**624** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
Benzo(c)fluorene	**242** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
2-Methylpyrene	**561** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
4-Methylpyrene	**480** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
1-Methylpyrene	**529** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
Benz(a)anthracene	**5370** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
Chrysene/triphenylene	**4640** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
C1-Benzo(a)anthracenes/Chrysenes	**1490** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
C2-Benzo(a)anthracenes/Chrysenes	**546** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
C3-Benzo(a)anthracenes/Chrysenes	**248** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
C4-Benzo(a)anthracenes/Chrysenes	**184** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
Benzo(b)fluoranthene	**3620** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
Benzo(j/k)fluoranthene	**4100** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
Benzo(e)pyrene	**3470** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
Benzo(a)pyrene	**6030** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
Perylene	**1120** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
Indeno(1,2,3-cd)pyrene	**3530** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
Dibenzo(a,h)anthracene	**697** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
Benzo(g,h,i)perylene	**3270** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
Coronene	**1070** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
Tetramethyl lead	ND (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
Trimethylethyl lead	ND (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
Dimethyldiethyl lead	ND (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
Methyltriethyl lead	ND (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
Tetraethyl lead	ND (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
Carbazole	**115** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS650
Date Sampled: 04/23/19 12:55
Percent Solids: 46
Initial Volume: 8.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**77.6** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
2,3,5-Trimethylnaphthene	**9.40** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
4-Methyldibenzothiophene	**179** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
2/3-Methyldibenzothiophene	**178** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
1-Methyldibenzothiophene	**61.2** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
3-Methylphenanthrene	**527** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
2-Methylphenanthrene	**619** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
2-Methylanthracene	**318** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
4/9-Methylphenanthrene	**506** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601
1-Methylphenanthrene	**351** (5.25)	2.63	8270 Mod		1	04/28/19 10:29	F9D0016	FD92601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*74 %*		*50-120*
Surrogate: Naphthalene-d8	*80 %*		*50-120*
Surrogate: Phenanthrene-d10	*88 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS650
Date Sampled: 04/23/19 12:55
Percent Solids: 46

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-05
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**55700** (262)		TOC-LK		1	CCP	04/30/19 16:30	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS651
Date Sampled: 04/23/19 13:55
Percent Solids: 43
Initial Volume: 7.46
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**87.9** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
C1-Benzene	**96.4** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
C2-Benzenes	**193** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
C3-Benzenes	**49.0** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
C4-Benzenes	**43.6** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
C5-Benzenes	**24.5** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
Methylcyclohexane	**9.01** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
Toluene	**147** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
Ethylbenzene	**38.6** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
m,p-Xylene	**324** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
Styrene	**79.9** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
o-Xylene	**18.7** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
Isopropylbenzene	ND (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
n-Propylbenzene	**11.2** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
1,3,5-Trimethylbenzene	**9.63** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
1,2,3-Trimethylbenzene	**11.6** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
1,2,4-Trimethylbenzene	**20.8** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
t-Butylbenzene	ND (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
sec-Butylbenzene	ND (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
p-Isopropyltoluene	**11.2** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
n-Butylbenzene	**25.3** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
trans-Decalin	**12.4** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
cis-Decalin	ND (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
C1-Decalins	**22.8** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
C2-Decalins	**32.3** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
C3-Decalins	**27.1** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
C4-Decalins	**43.4** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
Benzo(b)thiophene	**54.7** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
C1-Benzo(b)thiophenes	**68.9** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
C2-Benzo(b)thiophenes	**119** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
C3-Benzo(b)thiophenes	**121** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
C4-Benzo(b)thiophenes	**25.6** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS651
Date Sampled: 04/23/19 13:55
Percent Solids: 43
Initial Volume: 7.46
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**485** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
2-Methylnaphthalene	**209** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
1-Methylnaphthalene	**182** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
C1-Naphthalenes	**244** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
C2-Naphthalenes	**688** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
C3-Naphthalenes	**465** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
C4-Naphthalenes	**136** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
Biphenyl	**153** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
Acenaphthylene	**2710** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
Acenaphthene	**4040** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
Dibenzofuran	**206** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
Fluorene	**2300** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
C1-Fluorenes	**659** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
C2-Fluorenes	**306** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
C3-Fluorenes	**355** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
Dibenzothiophene	**2490** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
C1-Dibenzothiophenes	**1470** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
C2-Dibenzothiophenes	**598** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
C3-Dibenzothiophenes	**237** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
C4-Dibenzothiophenes	**104** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
Phenanthrene	**19900** (124)	62.0	8270 Mod		20	04/29/19 16:46	F9D0016	FD92601
Anthracene	**6740** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
C1-Phenanthrenes/Anthracenes	**5750** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
C2-Phenanthrenes/Anthracenes	**1350** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
C3-Phenanthrenes/Anthracenes	**373** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
C4-Phenanthrenes/Anthracenes	**167** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
Retene	**178** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
Benzo(b)naphtho(2,1-d)thiophene	**2160** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
C0-Benzonaphthothiophenes	**4260** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
C1-Benzonaphthothiophenes	**1300** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
C2-Benzonaphthothiophenes	**524** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
C3-Benzonaphthothiophenes	**459** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS651
Date Sampled: 04/23/19 13:55
Percent Solids: 43
Initial Volume: 7.46
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**160** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
Fluoranthene	**27600** (124)	62.0	8270 Mod		20	04/29/19 16:46	F9D0016	FD92601
Pyrene	**38600** (124)	62.0	8270 Mod		20	04/29/19 16:46	F9D0016	FD92601
C1-Fluoranthenes/Pyrenes	**9870** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
C2-Fluoranthenes/Pyrenes	**2100** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
C3-Fluoranthenes/Pyrenes	**607** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
Benzo(b)fluorene	**1240** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
Benzo(c)fluorene	**576** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
2-Methylpyrene	**1330** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
4-Methylpyrene	**1170** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
1-Methylpyrene	**1350** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
Benz(a)anthracene	**11400** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
Chrysene/triphenylene	**9730** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
C1-Benzo(a)anthracenes/Chrysenes	**3150** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
C2-Benzo(a)anthracenes/Chrysenes	**1020** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
C3-Benzo(a)anthracenes/Chrysenes	**410** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
C4-Benzo(a)anthracenes/Chrysenes	**366** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
Benzo(b)fluoranthene	**8230** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
Benzo(j/k)fluoranthene	**8160** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
Benzo(e)pyrene	**7630** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
Benzo(a)pyrene	**15300** (124)	62.0	8270 Mod		20	04/29/19 16:46	F9D0016	FD92601
Perylene	**2470** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
Indeno(1,2,3-cd)pyrene	**7820** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
Dibenzo(a,h)anthracene	**1500** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
Benzo(g,h,i)perylene	**7440** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
Coronene	**2580** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
Tetramethyl lead	ND (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
Trimethylethyl lead	ND (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
Dimethyldiethyl lead	ND (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
Methyltriethyl lead	ND (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
Tetraethyl lead	ND (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
Carbazole	**211** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS651
Date Sampled: 04/23/19 13:55
Percent Solids: 43
Initial Volume: 7.46
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**135** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
2,3,5-Trimethylnaphthene	**25.1** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
4-Methyldibenzothiophene	**526** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
2/3-Methyldibenzothiophene	**505** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
1-Methyldibenzothiophene	**164** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
3-Methylphenanthrene	**1370** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
2-Methylphenanthrene	**1460** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
2-Methylanthracene	**752** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
4/9-Methylphenanthrene	**1250** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601
1-Methylphenanthrene	**899** (6.20)	3.10	8270 Mod		1	04/28/19 16:11	F9D0016	FD92601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*69 %*		*50-120*
Surrogate: Naphthalene-d8	*78 %*		*50-120*
Surrogate: Phenanthrene-d10	*82 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS651
Date Sampled: 04/23/19 13:55
Percent Solids: 43

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-06
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**91900** (264)		TOC-LK		1	CCP	04/30/19 16:47	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS652
Date Sampled: 04/23/19 13:10
Percent Solids: 65
Initial Volume: 9.56
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**147** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
C1-Benzene	**73.0** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
C2-Benzenes	**117** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
C3-Benzenes	**30.6** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
C4-Benzenes	**28.4** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
C5-Benzenes	**20.5** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
Methylcyclohexane	**3.84** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
Toluene	**115** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
Ethylbenzene	**29.8** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
m,p-Xylene	**196** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
Styrene	**77.3** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
o-Xylene	**9.14** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
Isopropylbenzene	ND (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
n-Propylbenzene	**10.1** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
1,3,5-Trimethylbenzene	**4.58** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
1,2,3-Trimethylbenzene	**7.59** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
1,2,4-Trimethylbenzene	**12.6** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
t-Butylbenzene	ND (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
sec-Butylbenzene	ND (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
p-Isopropyltoluene	**8.19** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
n-Butylbenzene	**25.2** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
trans-Decalin	**9.86** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
cis-Decalin	**J 1.74** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
C1-Decalins	**20.2** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
C2-Decalins	**25.7** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
C3-Decalins	**23.1** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
C4-Decalins	**46.6** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
Benzo(b)thiophene	**62.8** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
C1-Benzo(b)thiophenes	**53.9** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
C2-Benzo(b)thiophenes	**74.3** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
C3-Benzo(b)thiophenes	**53.0** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
C4-Benzo(b)thiophenes	**17.2** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS652
Date Sampled: 04/23/19 13:10
Percent Solids: 65
Initial Volume: 9.56
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**683** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
2-Methylnaphthalene	**256** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
1-Methylnaphthalene	**186** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
C1-Naphthalenes	**274** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
C2-Naphthalenes	**501** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
C3-Naphthalenes	**266** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
C4-Naphthalenes	**81.1** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
Biphenyl	**164** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
Acenaphthylene	**2620** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
Acenaphthene	**2590** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
Dibenzofuran	**158** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
Fluorene	**1580** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
C1-Fluorenes	**413** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
C2-Fluorenes	**184** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
C3-Fluorenes	**269** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
Dibenzothiophene	**1860** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
C1-Dibenzothiophenes	**994** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
C2-Dibenzothiophenes	**377** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
C3-Dibenzothiophenes	**147** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
C4-Dibenzothiophenes	**70.8** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
Phenanthrene	**15800** (64.0)	32.0	8270 Mod		20	04/29/19 18:09	F9D0016	FD92601
Anthracene	**9520** (64.0)	32.0	8270 Mod		20	04/29/19 18:09	F9D0016	FD92601
C1-Phenanthrenes/Anthracenes	**3920** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
C2-Phenanthrenes/Anthracenes	**817** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
C3-Phenanthrenes/Anthracenes	**217** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
C4-Phenanthrenes/Anthracenes	**91.6** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
Retene	**65.1** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
Benzo(b)naphtho(2,1-d)thiophene	**1590** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
C0-Benzonaphthothiophenes	**3110** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
C1-Benzonaphthothiophenes	**824** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
C2-Benzonaphthothiophenes	**311** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
C3-Benzonaphthothiophenes	**315** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS652
Date Sampled: 04/23/19 13:10
Percent Solids: 65
Initial Volume: 9.56
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**120** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
Fluoranthene	**20800** (64.0)	32.0	8270 Mod		20	04/29/19 18:09	F9D0016	FD92601
Pyrene	**28800** (64.0)	32.0	8270 Mod		20	04/29/19 18:09	F9D0016	FD92601
C1-Fluoranthenes/Pyrenes	**6780** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
C2-Fluoranthenes/Pyrenes	**1290** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
C3-Fluoranthenes/Pyrenes	**359** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
Benzo(b)fluorene	**946** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
Benzo(c)fluorene	**367** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
2-Methylpyrene	**936** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
4-Methylpyrene	**794** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
1-Methylpyrene	**970** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
Benz(a)anthracene	**8530** (64.0)	32.0	8270 Mod		20	04/29/19 18:09	F9D0016	FD92601
Chrysene/triphenylene	**8390** (64.0)	32.0	8270 Mod		20	04/29/19 18:09	F9D0016	FD92601
C1-Benzo(a)anthracenes/Chrysenes	**2000** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
C2-Benzo(a)anthracenes/Chrysenes	**571** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
C3-Benzo(a)anthracenes/Chrysenes	**219** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
C4-Benzo(a)anthracenes/Chrysenes	**248** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
Benzo(b)fluoranthene	**6110** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
Benzo(j/k)fluoranthene	**5900** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
Benzo(e)pyrene	**5630** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
Benzo(a)pyrene	**10600** (64.0)	32.0	8270 Mod		20	04/29/19 18:09	F9D0016	FD92601
Perylene	**1790** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
Indeno(1,2,3-cd)pyrene	**5910** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
Dibenzo(a,h)anthracene	**1120** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
Benzo(g,h,i)perylene	**5660** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
Coronene	**1930** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
Tetramethyl lead	ND (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
Trimethylethyl lead	ND (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
Dimethyldiethyl lead	ND (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
Methyltriethyl lead	ND (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
Tetraethyl lead	ND (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
Carbazole	**274** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS652
Date Sampled: 04/23/19 13:10
Percent Solids: 65
Initial Volume: 9.56
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**110** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
2,3,5-Trimethylnaphthene	**16.2** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
4-Methyldibenzothiophene	**355** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
2/3-Methyldibenzothiophene	**360** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
1-Methyldibenzothiophene	**108** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
3-Methylphenanthrene	**931** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
2-Methylphenanthrene	**1050** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
2-Methylanthracene	**495** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
4/9-Methylphenanthrene	**804** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601
1-Methylphenanthrene	**617** (3.20)	1.60	8270 Mod		1	04/28/19 17:38	F9D0016	FD92601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*57 %*		*50-120*
Surrogate: Naphthalene-d8	*66 %*		*50-120*
Surrogate: Phenanthrene-d10	*69 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS652
Date Sampled: 04/23/19 13:10
Percent Solids: 65

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-07
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**45600** (233)		TOC-LK		1	CCP	04/30/19 17:03	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS653
Date Sampled: 04/23/19 13:15
Percent Solids: 60
Initial Volume: 7.59
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**119** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
C1-Benzene	**75.3** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
C2-Benzenes	**158** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
C3-Benzenes	**53.7** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
C4-Benzenes	**37.0** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
C5-Benzenes	**19.1** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
Methylcyclohexane	**4.78** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
Toluene	**117** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
Ethylbenzene	**31.6** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
m,p-Xylene	**267** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
Styrene	**65.4** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
o-Xylene	**18.5** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
Isopropylbenzene	J **4.12** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
n-Propylbenzene	**12.2** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
1,3,5-Trimethylbenzene	**15.0** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
1,2,3-Trimethylbenzene	**14.0** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
1,2,4-Trimethylbenzene	**27.5** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
t-Butylbenzene	ND (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
sec-Butylbenzene	ND (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
p-Isopropyltoluene	**11.6** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
n-Butylbenzene	**23.9** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
trans-Decalin	**13.8** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
cis-Decalin	ND (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
C1-Decalins	**21.5** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
C2-Decalins	**25.4** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
C3-Decalins	**21.9** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
C4-Decalins	**33.9** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
Benzo(b)thiophene	**46.7** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
C1-Benzo(b)thiophenes	**53.4** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
C2-Benzo(b)thiophenes	**109** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
C3-Benzo(b)thiophenes	**83.8** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
C4-Benzo(b)thiophenes	**23.3** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS653
Date Sampled: 04/23/19 13:15
Percent Solids: 60
Initial Volume: 7.59
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**601** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
2-Methylnaphthalene	**274** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
1-Methylnaphthalene	**264** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
C1-Naphthalenes	**330** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
C2-Naphthalenes	**706** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
C3-Naphthalenes	**407** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
C4-Naphthalenes	**109** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
Biphenyl	**157** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
Acenaphthylene	**1830** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
Acenaphthene	**3430** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
Dibenzofuran	**291** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
Fluorene	**1890** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
C1-Fluorenes	**522** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
C2-Fluorenes	**243** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
C3-Fluorenes	**254** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
Dibenzothiophene	**1800** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
C1-Dibenzothiophenes	**1150** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
C2-Dibenzothiophenes	**477** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
C3-Dibenzothiophenes	**171** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
C4-Dibenzothiophenes	**73.5** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
Phenanthrene	**14000** (87.9)	44.0	8270 Mod		20	04/29/19 19:32	F9D0016	FD92601
Anthracene	**3920** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
C1-Phenanthrenes/Anthracenes	**4400** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
C2-Phenanthrenes/Anthracenes	**1020** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
C3-Phenanthrenes/Anthracenes	**259** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
C4-Phenanthrenes/Anthracenes	**102** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
Retene	**63.0** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
Benzo(b)naphtho(2,1-d)thiophene	**1300** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
C0-Benzonaphthothiophenes	**2620** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
C1-Benzonaphthothiophenes	**881** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
C2-Benzonaphthothiophenes	**344** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
C3-Benzonaphthothiophenes	**273** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS653
Date Sampled: 04/23/19 13:15
Percent Solids: 60
Initial Volume: 7.59
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**100** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
Fluoranthene	**15600** (87.9)	44.0	8270 Mod		20	04/29/19 19:32	F9D0016	FD92601
Pyrene	**21100** (87.9)	44.0	8270 Mod		20	04/29/19 19:32	F9D0016	FD92601
C1-Fluoranthenes/Pyrenes	**6400** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
C2-Fluoranthenes/Pyrenes	**1410** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
C3-Fluoranthenes/Pyrenes	**407** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
Benzo(b)fluorene	**789** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
Benzo(c)fluorene	**363** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
2-Methylpyrene	**868** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
4-Methylpyrene	**761** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
1-Methylpyrene	**863** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
Benz(a)anthracene	**7180** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
Chrysene/triphenylene	**5670** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
C1-Benzo(a)anthracenes/Chrysenes	**2090** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
C2-Benzo(a)anthracenes/Chrysenes	**682** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
C3-Benzo(a)anthracenes/Chrysenes	**249** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
C4-Benzo(a)anthracenes/Chrysenes	**204** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
Benzo(b)fluoranthene	**4550** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
Benzo(j/k)fluoranthene	**5030** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
Benzo(e)pyrene	**4430** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
Benzo(a)pyrene	**7950** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
Perylene	**1400** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
Indeno(1,2,3-cd)pyrene	**4450** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
Dibenzo(a,h)anthracene	**948** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
Benzo(g,h,i)perylene	**4240** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
Coronene	**1420** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
Tetramethyl lead	ND (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
Trimethylethyl lead	ND (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
Dimethyldiethyl lead	ND (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
Methyltriethyl lead	ND (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
Tetraethyl lead	ND (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
Carbazole	**320** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS653
Date Sampled: 04/23/19 13:15
Percent Solids: 60
Initial Volume: 7.59
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**156** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
2,3,5-Trimethylnaphthene	**22.6** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
4-Methyldibenzothiophene	**400** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
2/3-Methyldibenzothiophene	**410** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
1-Methyldibenzothiophene	**132** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
3-Methylphenanthrene	**1020** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
2-Methylphenanthrene	**1180** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
2-Methylanthracene	**543** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
4/9-Methylphenanthrene	**928** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601
1-Methylphenanthrene	**654** (4.40)	2.20	8270 Mod		1	04/28/19 19:04	F9D0016	FD92601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*67 %*		*50-120*
Surrogate: Naphthalene-d8	*75 %*		*50-120*
Surrogate: Phenanthrene-d10	*79 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS653
Date Sampled: 04/23/19 13:15
Percent Solids: 60

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-08
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**27300** (312)		TOC-LK		1	CCP	04/30/19 17:53	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS654
Date Sampled: 04/23/19 13:20
Percent Solids: 57
Initial Volume: 8.85
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**99.8** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
C1-Benzene	**62.8** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
C2-Benzenes	**83.3** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
C3-Benzenes	**30.2** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
C4-Benzenes	**29.5** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
C5-Benzenes	**19.3** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
Methylcyclohexane	**6.42** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
Toluene	**108** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
Ethylbenzene	**17.4** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
m,p-Xylene	**175** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
Styrene	**41.7** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
o-Xylene	**9.91** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
Isopropylbenzene	ND (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
n-Propylbenzene	**8.84** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
1,3,5-Trimethylbenzene	**4.42** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
1,2,3-Trimethylbenzene	**7.63** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
1,2,4-Trimethylbenzene	**12.0** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
t-Butylbenzene	ND (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
sec-Butylbenzene	ND (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
p-Isopropyltoluene	**5.37** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
n-Butylbenzene	**16.1** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
trans-Decalin	**13.1** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
cis-Decalin	**J 2.38** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
C1-Decalins	**24.8** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
C2-Decalins	**28.4** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
C3-Decalins	**21.9** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
C4-Decalins	**33.1** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
Benzo(b)thiophene	**15.8** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
C1-Benzo(b)thiophenes	**40.1** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
C2-Benzo(b)thiophenes	**86.9** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
C3-Benzo(b)thiophenes	**52.2** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
C4-Benzo(b)thiophenes	**17.0** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS654
Date Sampled: 04/23/19 13:20
Percent Solids: 57
Initial Volume: 8.85
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**190** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
2-Methylnaphthalene	**107** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
1-Methylnaphthalene	**169** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
C1-Naphthalenes	**169** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
C2-Naphthalenes	**562** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
C3-Naphthalenes	**237** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
C4-Naphthalenes	**70.0** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
Biphenyl	**90.7** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
Acenaphthylene	**1110** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
Acenaphthene	**3000** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
Dibenzofuran	**145** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
Fluorene	**1520** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
C1-Fluorenes	**284** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
C2-Fluorenes	**116** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
C3-Fluorenes	**170** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
Dibenzothiophene	**1340** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
C1-Dibenzothiophenes	**556** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
C2-Dibenzothiophenes	**231** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
C3-Dibenzothiophenes	**114** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
C4-Dibenzothiophenes	**56.8** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
Phenanthrene	**8520** (79.1)	39.5	8270 Mod		20	04/29/19 20:56	F9D0016	FD92601
Anthracene	**2030** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
C1-Phenanthrenes/Anthracenes	**2060** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
C2-Phenanthrenes/Anthracenes	**514** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
C3-Phenanthrenes/Anthracenes	**161** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
C4-Phenanthrenes/Anthracenes	**69.2** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
Retene	**42.7** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
Benzo(b)naphtho(2,1-d)thiophene	**649** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
C0-Benzonaphthothiophenes	**1290** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
C1-Benzonaphthothiophenes	**438** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
C2-Benzonaphthothiophenes	**238** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
C3-Benzonaphthothiophenes	**230** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS654
Date Sampled: 04/23/19 13:20
Percent Solids: 57
Initial Volume: 8.85
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**117** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
Fluoranthene	**8390** (79.1)	39.5	8270 Mod		20	04/29/19 20:56	F9D0016	FD92601
Pyrene	**11100** (79.1)	39.5	8270 Mod		20	04/29/19 20:56	F9D0016	FD92601
C1-Fluoranthenes/Pyrenes	**3000** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
C2-Fluoranthenes/Pyrenes	**795** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
C3-Fluoranthenes/Pyrenes	**271** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
Benzo(b)fluorene	**353** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
Benzo(c)fluorene	**171** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
2-Methylpyrene	**420** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
4-Methylpyrene	**356** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
1-Methylpyrene	**411** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
Benz(a)anthracene	**3690** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
Chrysene/triphenylene	**2940** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
C1-Benzo(a)anthracenes/Chrysenes	**1030** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
C2-Benzo(a)anthracenes/Chrysenes	**389** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
C3-Benzo(a)anthracenes/Chrysenes	**192** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
C4-Benzo(a)anthracenes/Chrysenes	**150** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
Benzo(b)fluoranthene	**2520** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
Benzo(j/k)fluoranthene	**2600** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
Benzo(e)pyrene	**2350** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
Benzo(a)pyrene	**4110** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
Perylene	**736** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
Indeno(1,2,3-cd)pyrene	**2400** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
Dibenzo(a,h)anthracene	**498** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
Benzo(g,h,i)perylene	**2270** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
Coronene	**751** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
Tetramethyl lead	ND (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
Trimethylethyl lead	ND (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
Dimethyldiethyl lead	ND (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
Methyltriethyl lead	ND (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
Tetraethyl lead	ND (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
Carbazole	**119** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS654
Date Sampled: 04/23/19 13:20
Percent Solids: 57
Initial Volume: 8.85
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**106** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
2,3,5-Trimethylnaphthene	**13.2** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
4-Methyldibenzothiophene	**192** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
2/3-Methyldibenzothiophene	**193** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
1-Methyldibenzothiophene	**67.7** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
3-Methylphenanthrene	**501** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
2-Methylphenanthrene	**547** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
2-Methylanthracene	**241** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
4/9-Methylphenanthrene	**441** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601
1-Methylphenanthrene	**318** (3.95)	1.98	8270 Mod		1	04/28/19 20:31	F9D0016	FD92601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*61 %*		*50-120*
Surrogate: Naphthalene-d8	*72 %*		*50-120*
Surrogate: Phenanthrene-d10	*78 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS654
Date Sampled: 04/23/19 13:20
Percent Solids: 57

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-09
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**87600** (233)		TOC-LK		1	CCP	04/30/19 18:09	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS655
Date Sampled: 04/23/19 13:25
Percent Solids: 71
Initial Volume: 8.2
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**136** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
C1-Benzene	**77.0** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
C2-Benzenes	**126** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
C3-Benzenes	**43.2** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
C4-Benzenes	**46.1** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
C5-Benzenes	**31.3** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
Methylcyclohexane	**9.77** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
Toluene	**118** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
Ethylbenzene	**24.2** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
m,p-Xylene	**211** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
Styrene	**107** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
o-Xylene	**14.2** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
Isopropylbenzene	ND (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
n-Propylbenzene	**8.83** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
1,3,5-Trimethylbenzene	**10.0** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
1,2,3-Trimethylbenzene	**10.2** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
1,2,4-Trimethylbenzene	**21.2** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
t-Butylbenzene	ND (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
sec-Butylbenzene	ND (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
p-Isopropyltoluene	**9.14** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
n-Butylbenzene	**19.4** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
trans-Decalin	**33.7** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
cis-Decalin	**9.03** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
C1-Decalins	**65.2** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
C2-Decalins	**157** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
C3-Decalins	**119** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
C4-Decalins	**106** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
Benzo(b)thiophene	**78.3** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
C1-Benzo(b)thiophenes	**84.9** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
C2-Benzo(b)thiophenes	**186** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
C3-Benzo(b)thiophenes	**99.9** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
C4-Benzo(b)thiophenes	**27.0** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS655
Date Sampled: 04/23/19 13:25
Percent Solids: 71
Initial Volume: 8.2
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**894** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
2-Methylnaphthalene	**386** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
1-Methylnaphthalene	**392** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
C1-Naphthalenes	**479** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
C2-Naphthalenes	**1150** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
C3-Naphthalenes	**561** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
C4-Naphthalenes	**146** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
Biphenyl	**400** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
Acenaphthylene	**6460** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
Acenaphthene	**8310** (68.5)	34.3	8270 Mod		20	04/29/19 22:19	F9D0016	FD92601
Dibenzofuran	**337** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
Fluorene	**3940** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
C1-Fluorenes	**909** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
C2-Fluorenes	**326** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
C3-Fluorenes	**487** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
Dibenzothiophene	**5050** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
C1-Dibenzothiophenes	**2040** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
C2-Dibenzothiophenes	**604** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
C3-Dibenzothiophenes	**200** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
C4-Dibenzothiophenes	**86.5** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
Phenanthrene	**34500** (68.5)	34.3	8270 Mod		20	04/29/19 22:19	F9D0016	FD92601
Anthracene	**10700** (68.5)	34.3	8270 Mod		20	04/29/19 22:19	F9D0016	FD92601
C1-Phenanthrenes/Anthracenes	**6850** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
C2-Phenanthrenes/Anthracenes	**1230** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
C3-Phenanthrenes/Anthracenes	**293** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
C4-Phenanthrenes/Anthracenes	**140** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
Retene	**127** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
Benzo(b)naphtho(2,1-d)thiophene	**2570** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
C0-Benzonaphthothiophenes	**5170** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
C1-Benzonaphthothiophenes	**1220** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
C2-Benzonaphthothiophenes	**367** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
C3-Benzonaphthothiophenes	**387** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS655
Date Sampled: 04/23/19 13:25
Percent Solids: 71
Initial Volume: 8.2
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**99.4** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
Fluoranthene	**38100** (68.5)	34.3	8270 Mod		20	04/29/19 22:19	F9D0016	FD92601
Pyrene	**53200** (68.5)	34.3	8270 Mod		20	04/29/19 22:19	F9D0016	FD92601
C1-Fluoranthenes/Pyrenes	**10600** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
C2-Fluoranthenes/Pyrenes	**1660** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
C3-Fluoranthenes/Pyrenes	**416** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
Benzo(b)fluorene	**1490** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
Benzo(c)fluorene	**628** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
2-Methylpyrene	**1430** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
4-Methylpyrene	**1220** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
1-Methylpyrene	**1530** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
Benz(a)anthracene	**12700** (68.5)	34.3	8270 Mod		20	04/29/19 22:19	F9D0016	FD92601
Chrysene/triphenylene	**12900** (68.5)	34.3	8270 Mod		20	04/29/19 22:19	F9D0016	FD92601
C1-Benzo(a)anthracenes/Chrysenes	**2660** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
C2-Benzo(a)anthracenes/Chrysenes	**1170** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
C3-Benzo(a)anthracenes/Chrysenes	**290** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
C4-Benzo(a)anthracenes/Chrysenes	**349** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
Benzo(b)fluoranthene	**7270** (68.5)	34.3	8270 Mod		20	04/29/19 22:19	F9D0016	FD92601
Benzo(j/k)fluoranthene	**10700** (68.5)	34.3	8270 Mod		20	04/29/19 22:19	F9D0016	FD92601
Benzo(e)pyrene	**9110** (68.5)	34.3	8270 Mod		20	04/29/19 22:19	F9D0016	FD92601
Benzo(a)pyrene	**16300** (68.5)	34.3	8270 Mod		20	04/29/19 22:19	F9D0016	FD92601
Perylene	**2350** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
Indeno(1,2,3-cd)pyrene	**8340** (68.5)	34.3	8270 Mod		20	04/29/19 22:19	F9D0016	FD92601
Dibenzo(a,h)anthracene	**1530** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
Benzo(g,h,i)perylene	**8550** (68.5)	34.3	8270 Mod		20	04/29/19 22:19	F9D0016	FD92601
Coronene	**2920** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
Tetramethyl lead	ND (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
Trimethylethyl lead	ND (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
Dimethyldiethyl lead	ND (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
Methyltriethyl lead	ND (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
Tetraethyl lead	ND (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
Carbazole	**220** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS655
Date Sampled: 04/23/19 13:25
Percent Solids: 71
Initial Volume: 8.2
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 4/26/19 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**201** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
2,3,5-Trimethylnaphthene	**34.4** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
4-Methyldibenzothiophene	**724** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
2/3-Methyldibenzothiophene	**755** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
1-Methyldibenzothiophene	**214** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
3-Methylphenanthrene	**1790** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
2-Methylphenanthrene	**1870** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
2-Methylanthracene	**745** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
4/9-Methylphenanthrene	**1300** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601
1-Methylphenanthrene	**1080** (3.43)	1.71	8270 Mod		1	04/28/19 21:56	F9D0016	FD92601

	%Recovery	*Qualifier*	*Limits*
Surrogate: Toluene-D8	*67 %*		*50-120*
Surrogate: Naphthalene-d8	*78 %*		*50-120*
Surrogate: Phenanthrene-d10	*80 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS655
Date Sampled: 04/23/19 13:25
Percent Solids: 71

ESS Laboratory Work Order: F190024
ESS Laboratory Sample ID: F190024-10
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**38400** (255)		TOC-LK		1	CCP	04/30/19 18:18	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190024

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Classical Chemistry										
Batch CD92645 - General Preparation										
Blank										
Total Organic Carbon (1)	ND	100	mg/kg							
Total Organic Carbon (2)	ND	100	mg/kg							
LCS										
Total Organic Carbon (1)	9760	100	mg/kg	10000		98	80-120			
Total Organic Carbon (2)	9170	100	mg/kg	10000		92	80-120			
LCS Dup										
Total Organic Carbon (1)	9390	100	mg/kg	10000		94	80-120	4	20	
Total Organic Carbon (2)	9340	100	mg/kg	10000		93	80-120	2	20	

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D (SIM) Semi-Volatile Organic Compounds										
Batch FD92601 - 3570										
Blank										
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylphenanthrene	ND	4.00	ug/Kg wet							
1-Methylpyrene	ND	4.00	ug/Kg wet							
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet							
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet							
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet							
2-Methylanthracene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
2-Methylphenanthrene	ND	4.00	ug/Kg wet							
2-Methylpyrene	ND	4.00	ug/Kg wet							
3-Methylphenanthrene	ND	4.00	ug/Kg wet							
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet							
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet							
4-Methylpyrene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Anthracene	ND	4.00	ug/Kg wet							
Benz(a)anthracene	ND	4.00	ug/Kg wet							
Benzene	ND	4.00	ug/Kg wet							
Benzo(a)pyrene	ND	4.00	ug/Kg wet							
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190024

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D (SIM) Semi-Volatile Organic Compounds										
Batch FD92601 - 3570										
Benzo(b)fluorene	ND	4.00	ug/Kg wet							
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
Benzo(c)fluorene	ND	4.00	ug/Kg wet							
Benzo(e)pyrene	ND	4.00	ug/Kg wet							
Benzo(g,h,i)perylene	2.29	4.00	ug/Kg wet							J
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet							
C1-Benzene	ND	4.00	ug/Kg wet							
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet							
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet							
C1-Fluorenes	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet							
C2-Benzenes	ND	4.00	ug/Kg wet							
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet							
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet							
C2-Fluorenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet							
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet							
C3-Fluorenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190024

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D (SIM) Semi-Volatile Organic Compounds										
Batch FD92601 - 3570										
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Carbazole	ND	4.00	ug/Kg wet							
Chrysene/triphenylene	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
Coronene	ND	4.00	ug/Kg wet							
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Dibenzothiophene	ND	4.00	ug/Kg wet							
Dimethyldiethyl lead	ND	4.00	ug/Kg wet							
Ethylbenzene	ND	4.00	ug/Kg wet							
Fluoranthene	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Methyltriethyl lead	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
o-Xylene	ND	4.00	ug/Kg wet							
Perylene	ND	4.00	ug/Kg wet							
Phenanthrene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
Pyrene	ND	4.00	ug/Kg wet							
Retene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
Styrene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
Tetraethyl lead	ND	4.00	ug/Kg wet							
Tetramethyl lead	ND	4.00	ug/Kg wet							
Toluene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
Trimethylethyl lead	ND	4.00	ug/Kg wet							
Surrogate: Naphthalene-d8	*323*		ug/Kg wet	*400.0*		*81*	*50-120*			
Surrogate: Phenanthrene-d10	*340*		ug/Kg wet	*400.0*		*85*	*50-120*			
Surrogate: Toluene-D8	*335*		ug/Kg wet	*400.0*		*84*	*50-120*			
LCS										
1,2,3-Trimethylbenzene	310	4.00	ug/Kg wet	400.0		78	60-130			
1,2,4-Trimethylbenzene	320	4.00	ug/Kg wet	400.0		80	60-130			
1,3,5-Trimethylbenzene	319	4.00	ug/Kg wet	400.0		80	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190024

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FD92601 - 3570

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
1-Methylnaphthalene	350	4.00	ug/Kg wet	400.0		88	60-130			
2-Methylnaphthalene	322	4.00	ug/Kg wet	400.0		81	60-130			
Acenaphthene	336	4.00	ug/Kg wet	400.0		84	60-130			
Acenaphthylene	347	4.00	ug/Kg wet	400.0		87	60-130			
Anthracene	341	4.00	ug/Kg wet	400.0		85	60-130			
Benz(a)anthracene	369	4.00	ug/Kg wet	400.0		92	60-130			
Benzene	308	4.00	ug/Kg wet	400.0		77	60-130			
Benzo(a)pyrene	367	4.00	ug/Kg wet	400.0		92	60-130			
Benzo(b)fluoranthene	322	4.00	ug/Kg wet	400.0		80	60-130			
Benzo(b)naphtho(2,1-d)thiophene	363	4.00	ug/Kg wet	400.0		91	60-130			
Benzo(b)thiophene	292	4.00	ug/Kg wet	400.0		73	60-130			
Benzo(e)pyrene	353	4.00	ug/Kg wet	400.0		88	60-130			
Benzo(g,h,i)perylene	351	4.00	ug/Kg wet	400.0		88	60-130			
Benzo(j/k)fluoranthene	394	4.00	ug/Kg wet	400.0		98	60-130			
Biphenyl	318	4.00	ug/Kg wet	400.0		79	60-130			
Chrysene/triphenylene	373	4.00	ug/Kg wet	400.0		93	60-130			
cis-Decalin	322	4.00	ug/Kg wet	400.0		81	60-130			
Coronene	319	4.00	ug/Kg wet	400.0		80	60-130			
Dibenzo(a,h)anthracene	357	4.00	ug/Kg wet	400.0		89	60-130			
Dibenzofuran	324	4.00	ug/Kg wet	400.0		81	60-130			
Dibenzothiophene	346	4.00	ug/Kg wet	400.0		87	60-130			
Ethylbenzene	341	4.00	ug/Kg wet	400.0		85	60-130			
Fluoranthene	383	4.00	ug/Kg wet	400.0		96	60-130			
Fluorene	343	4.00	ug/Kg wet	400.0		86	60-130			
Indeno(1,2,3-cd)pyrene	299	4.00	ug/Kg wet	400.0		75	60-130			
Isopropylbenzene	336	4.00	ug/Kg wet	400.0		84	60-130			
m,p-Xylene	345	4.00	ug/Kg wet	400.0		86	60-130			
Methylcyclohexane	229	4.00	ug/Kg wet	400.0		57	60-130			B-
Naphthalene	294	4.00	ug/Kg wet	400.0		73	60-130			
n-Butylbenzene	308	4.00	ug/Kg wet	400.0		77	60-130			
n-Propylbenzene	334	4.00	ug/Kg wet	400.0		83	60-130			
o-Xylene	341	4.00	ug/Kg wet	400.0		85	60-130			
Perylene	354	4.00	ug/Kg wet	400.0		88	60-130			
Phenanthrene	345	4.00	ug/Kg wet	400.0		86	60-130			
p-Isopropyltoluene	304	4.00	ug/Kg wet	400.0		76	60-130			
Pyrene	384	4.00	ug/Kg wet	400.0		96	60-130			
Retene	425	4.00	ug/Kg wet	400.0		106	60-130			
sec-Butylbenzene	315	4.00	ug/Kg wet	400.0		79	60-130			
Styrene	351	4.00	ug/Kg wet	400.0		88	60-130			
t-Butylbenzene	324	4.00	ug/Kg wet	400.0		81	60-130			
Tetraethyl lead	330	4.00	ug/Kg wet	400.0		82	60-130			
Toluene	340	4.00	ug/Kg wet	400.0		85	60-130			
trans-Decalin	311	4.00	ug/Kg wet	400.0		78	60-130			
Surrogate: Naphthalene-d8	*291*		ug/Kg wet	*400.0*		*73*	*50-120*			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190024

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D (SIM) Semi-Volatile Organic Compounds										
Batch FD92601 - 3570										
Surrogate: Phenanthrene-d10	*331*		ug/Kg wet	*400.0*		*83*	*50-120*			
Surrogate: Toluene-D8	*333*		ug/Kg wet	*400.0*		*83*	*50-120*			
Duplicate **Source: F190024-10**										**D+**
1,2,3-Trimethylbenzene	11.1	3.91	ug/Kg dry		10.2			9	50	
1,2,4-Trimethylbenzene	25.4	3.91	ug/Kg dry		21.2			18	50	
1,3,5-Trimethylbenzene	10.6	3.91	ug/Kg dry		10.0			6	50	
1-Methyldibenzothiophene	106	3.91	ug/Kg dry		214			68	50	
1-Methylnaphthalene	185	3.91	ug/Kg dry		392			72	50	
1-Methylphenanthrene	608	3.91	ug/Kg dry		1080			56	50	
1-Methylpyrene	732	3.91	ug/Kg dry		1530			71	50	
2,3,5-Trimethylnaphthene	25.1	3.91	ug/Kg dry		34.4			31	50	
2,6-Dimethylnaphthalene	88.4	3.91	ug/Kg dry		201			78	50	
2/3-Methyldibenzothiophene	332	3.91	ug/Kg dry		755			78	50	
2-Methylanthracene	476	3.91	ug/Kg dry		745			44	50	
2-Methylnaphthalene	211	3.91	ug/Kg dry		386			59	50	
2-Methylphenanthrene	1020	3.91	ug/Kg dry		1870			59	50	
2-Methylpyrene	748	3.91	ug/Kg dry		1430			63	50	
3-Methylphenanthrene	986	3.91	ug/Kg dry		1790			58	50	
4/9-Methylphenanthrene	791	3.91	ug/Kg dry		1300			48	50	
4-Methyldibenzothiophene	323	3.91	ug/Kg dry		724			77	50	
4-Methylpyrene	639	3.91	ug/Kg dry		1220			63	50	
Acenaphthene	4550	3.91	ug/Kg dry		8310			59	50	
Acenaphthylene	1800	3.91	ug/Kg dry		6460			113	50	
Anthracene	5270	3.91	ug/Kg dry		10700			68	50	
Benz(a)anthracene	6790	3.91	ug/Kg dry		12700			61	50	
Benzene	87.7	3.91	ug/Kg dry		136			43	50	
Benzo(a)pyrene	7750	3.91	ug/Kg dry		16300			71	50	
Benzo(b)fluoranthene	4870	3.91	ug/Kg dry		7270			40	50	
Benzo(b)fluorene	769	3.91	ug/Kg dry		1490			64	50	
Benzo(b)naphtho(2,1-d)thiophene	1200	3.91	ug/Kg dry		2570			73	50	
Benzo(b)thiophene	34.4	3.91	ug/Kg dry		78.3			78	50	
Benzo(c)fluorene	293	3.91	ug/Kg dry		628			73	50	
Benzo(e)pyrene	4410	3.91	ug/Kg dry		9110			70	50	
Benzo(g,h,i)perylene	4390	3.91	ug/Kg dry		8550			64	50	
Benzo(j/k)fluoranthene	4810	3.91	ug/Kg dry		10700			76	50	
Biphenyl	141	3.91	ug/Kg dry		400			96	50	
C0-Benzonaphthothiophenes	2380	3.91	ug/Kg dry		5170			74	50	
C1-Benzene	75.1	3.91	ug/Kg dry		77.0			2	50	
C1-Benzo(a)anthracenes/Chrysenes	1960	3.91	ug/Kg dry		2660			31	50	
C1-Benzo(b)thiophenes	67.8	3.91	ug/Kg dry		84.9			22	50	
C1-Benzonaphthothiophenes	712	3.91	ug/Kg dry		1220			52	50	
C1-Decalins	42.2	3.91	ug/Kg dry		65.2			43	50	
C1-Dibenzothiophenes	935	3.91	ug/Kg dry		2040			74	50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190024

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FD92601 - 3570

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
C1-Fluoranthenes/Pyrenes	5630	3.91	ug/Kg dry		10600			61	50	
C1-Fluorenes	778	3.91	ug/Kg dry		909			16	50	
C1-Naphthalenes	248	3.91	ug/Kg dry		479			64	50	
C1-Phenanthrenes/Anthracenes	3900	3.91	ug/Kg dry		6850			55	50	
C2-Benzenes	132	3.91	ug/Kg dry		126			4	50	
C2-Benzo(a)anthracenes/Chrysenes	2200	3.91	ug/Kg dry		1170			61	50	
C2-Benzo(b)thiophenes	112	3.91	ug/Kg dry		186			50	50	
C2-Benzonaphthothiophenes	308	3.91	ug/Kg dry		367			17	50	
C2-Decalins	46.8	3.91	ug/Kg dry		157			108	50	
C2-Dibenzothiophenes	344	3.91	ug/Kg dry		604			55	50	
C2-Fluoranthenes/Pyrenes	1460	3.91	ug/Kg dry		1660			12	50	
C2-Fluorenes	245	3.91	ug/Kg dry		326			28	50	
C2-Naphthalenes	575	3.91	ug/Kg dry		1150			66	50	
C2-Phenanthrenes/Anthracenes	933	3.91	ug/Kg dry		1230			28	50	
C3-Benzenes	50.2	3.91	ug/Kg dry		43.2			15	50	
C3-Benzo(a)anthracenes/Chrysenes	363	3.91	ug/Kg dry		290			22	50	
C3-Benzo(b)thiophenes	73.4	3.91	ug/Kg dry		99.9			31	50	
C3-Benzonaphthothiophenes	272	3.91	ug/Kg dry		387			35	50	
C3-Decalins	38.0	3.91	ug/Kg dry		119			103	50	
C3-Dibenzothiophenes	152	3.91	ug/Kg dry		200			27	50	
C3-Fluoranthenes/Pyrenes	480	3.91	ug/Kg dry		416			14	50	
C3-Fluorenes	327	3.91	ug/Kg dry		487			39	50	
C3-Naphthalenes	375	3.91	ug/Kg dry		561			40	50	
C3-Phenanthrenes/Anthracenes	309	3.91	ug/Kg dry		293			5	50	
C4-Benzenes	42.9	3.91	ug/Kg dry		46.1			7	50	
C4-Benzo(a)anthracenes/Chrysenes	244	3.91	ug/Kg dry		349			35	50	
C4-Benzo(b)thiophenes	22.6	3.91	ug/Kg dry		27.0			18	50	
C4-Benzonaphthothiophenes	104	3.91	ug/Kg dry		99.4			5	50	
C4-Decalins	61.3	3.91	ug/Kg dry		106			54	50	
C4-Dibenzothiophenes	76.7	3.91	ug/Kg dry		86.5			12	50	
C4-Naphthalenes	117	3.91	ug/Kg dry		146			22	50	
C4-Phenanthrenes/Anthracenes	148	3.91	ug/Kg dry		140			5	50	
C5-Benzenes	27.9	3.91	ug/Kg dry		31.3			11	50	
Carbazole	463	3.91	ug/Kg dry		220			71	50	
Chrysene/triphenylene	6330	3.91	ug/Kg dry		12900			68	50	
cis-Decalin	3.48	3.91	ug/Kg dry		9.03			89	50	J
Coronene	1500	3.91	ug/Kg dry		2920			64	50	
Dibenzo(a,h)anthracene	924	3.91	ug/Kg dry		1530			49	50	
Dibenzofuran	299	3.91	ug/Kg dry		337			12	50	
Dibenzothiophene	2890	3.91	ug/Kg dry		5050			54	50	
Dimethyldiethyl lead	ND	3.91	ug/Kg dry		ND				50	
Ethylbenzene	20.5	3.91	ug/Kg dry		24.2			17	50	
Fluoranthene	19200	78.3	ug/Kg dry		38100			66	50	
Fluorene	2100	3.91	ug/Kg dry		3940			61	50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190024

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D (SIM) Semi-Volatile Organic Compounds										
Batch FD92601 - 3570										
Indeno(1,2,3-cd)pyrene	4680	3.91	ug/Kg dry		8340			56	50	
Isopropylbenzene	ND	3.91	ug/Kg dry		ND				50	
m,p-Xylene	226	3.91	ug/Kg dry		211			7	50	
Methylcyclohexane	7.61	3.91	ug/Kg dry		9.77			25	50	
Methyltriethyl lead	ND	3.91	ug/Kg dry		ND				50	
Naphthalene	425	3.91	ug/Kg dry		894			71	50	
n-Butylbenzene	19.3	3.91	ug/Kg dry		19.4			0.5	50	
n-Propylbenzene	8.58	3.91	ug/Kg dry		8.83			3	50	
o-Xylene	14.6	3.91	ug/Kg dry		14.2			3	50	
Perylene	1410	3.91	ug/Kg dry		2350			50	50	
Phenanthrene	17400	78.3	ug/Kg dry		34500			66	50	
p-Isopropyltoluene	9.59	3.91	ug/Kg dry		9.14			5	50	
Pyrene	24400	78.3	ug/Kg dry		53200			74	50	
Retene	159	3.91	ug/Kg dry		127			22	50	
sec-Butylbenzene	ND	3.91	ug/Kg dry		ND				50	
Styrene	62.4	3.91	ug/Kg dry		107			52	50	
t-Butylbenzene	ND	3.91	ug/Kg dry		ND				50	
Tetraethyl lead	ND	3.91	ug/Kg dry		ND				50	
Tetramethyl lead	ND	3.91	ug/Kg dry		ND				50	
Toluene	113	3.91	ug/Kg dry		118			5	50	
trans-Decalin	31.3	3.91	ug/Kg dry		33.7			7	50	
Trimethylethyl lead	ND	3.91	ug/Kg dry		ND				50	
Surrogate: Naphthalene-d8	*304*		ug/Kg dry	*391.3*		*78*	*50-120*			
Surrogate: Phenanthrene-d10	*328*		ug/Kg dry	*391.3*		*84*	*50-120*			
Surrogate: Toluene-D8	*249*		ug/Kg dry	*391.3*		*64*	*50-120*			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F190024

Notes and Definitions

U	Analyte included in the analysis, but not detected
J	Reported between MDL and MRL
EX	Exceedances do not affect Sample Results
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
CD-	Continuing Calibration %Diff/Drift is below control limit (CD-).
B-	Blank Spike recovery is below lower control limit (B-).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190024

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) F190024

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

Preservative: None | None | ~~None~~

Sample Handling

Samples Field Filtered: YES NO **NA**

Sampled Shipped With Ice: **YES** NO

MCP PRESUMPTIVE CERTAINTY REQUIRED **YES** NO

If Yes, Are MCP Analytical Methods Required? **YES** NO NA

Are Drinking Water Samples Submitted? YES **NO** NA

If Yes, Have Drinking Water Sampling Requirements Been Met? YES NO **NA**

Analysis

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Parent and Alkylated MAHs & PAHs 8270**	TOC by Lloyd-Kahn							Sample Specific Remarks
1	1804576-SS646	4/23/2019	0955	Soil/Sed	1	CWS	x	x							
2	1804576-SS647	4/23/2019	1005	Soil/Sed	1	CWS	x	x							
3	1804576-SS648	4/23/2019	1015	Soil/Sed	1	CWS	x	x							
4	1804576-SS649	4/23/2019	1250	Soil/Sed	1	CWS	x	x							
5	1804576-SS650	4/23/2019	1255	Soil/Sed	1	CWS	x	x							
6	1804576-SS651	4/23/2019	1355	Soil/Sed	1	CWS	x	x							
7	1804576-SS652	4/23/2019	1310	Soil/Sed	1	CWS	x	x							
8	1804576-SS653	4/23/2019	1315	Soil/Sed	1	CWS	x	x							
9	1804576-SS654	4/23/2019	1320	Soil/Sed	1	CWS	x	x							
10	1804576-SS655	4/23/2019	1325	Soil/Sed	1	CWS	x	x							

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1. [signature] for Christos Saledas	4/23/2019	1600	1. GEI Sample Fridge
2. GEI Sample Fridge	4/25/19	1418	2. [signature]
3. [signature]	4/25/19	1418	3. [signature]
4. [signature]	4/25/19	17:06	4. [signature] 4/25/19 17:45

Turnaround Time (Business days):

Normal __x__ Other __

10-Day ____ 7-Day ____

5-Day ____ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

**Parent and Alkylated MAHs & PAHs (34) by GC/MS/SIM/SCAN

Ice temp: 1.1

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

Shipped/Delivered Via: ESS Courier

ESS Project ID: F190024
Date Received: 4/26/2019
Project Due Date: 5/3/2019
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 1.1 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. Were labs informed about short holds & rushes? Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA
13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	338350	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
02	338349	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
03	338348	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
04	338347	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
05	338346	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
06	338345	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
07	338344	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
08	338343	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
09	338352	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
10	338351	Yes	NA	Yes	8 oz. Jar - Unpres	NP	

2nd Review

Were all containers scanned into storage/lab? Initials
Are barcode labels on correct containers? Yes / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By:
Reviewed
Date & Time: 4/26/19 9:44

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

ESS Project ID: F190024

Date Received: 4/26/2019

By: Norman [signature]

Date & Time: 4/26/19 @ 11:13

Delivered By: Norman [signature] 4/26/19 @ 11:13

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: F190025

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 4:12 pm, May 29, 2019

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses
ESS Laboratory - Cranston, RI TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190025

SAMPLE RECEIPT

The following samples were received on April 25, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F190025-01	1804576-SS656	Soil	8270 Mod, TOC-LK
F190025-02	1804576-SS657	Soil	8270 Mod, TOC-LK
F190025-03	1804576-SS658	Soil	8270 Mod, TOC-LK
F190025-04	1804576-SS659	Soil	8270 Mod, TOC-LK
F190025-05	1804576-SS660	Soil	8270 Mod, TOC-LK
F190025-06	1804576-SS661	Soil	8270 Mod, TOC-LK
F190025-07	1804576-SS662	Soil	8270 Mod, TOC-LK
F190025-08	1804576-SS663	Soil	8270 Mod, TOC-LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190025

PROJECT NARRATIVE

8270D (SIM) Semi-Volatile Organic Compounds

FE90601-DUP2 **Relative percent difference for duplicate is outside of criteria (D+).**
Benzo(c)fluorene (51% @ 50%), C1-Benzo(b)thiophenes (170% @ 50%), C1-Decalins (51% @ 50%), C4-Decalins (77% @ 50%), Dibenzofuran (55% @ 50%), trans-Decalin (61% @ 50%)

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190025

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS656
Date Sampled: 04/24/19 10:50
Percent Solids: 71
Initial Volume: 8.56
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 5/6/19 11:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**60.6** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
C1-Benzene	**51.7** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
C2-Benzenes	**56.3** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
C3-Benzenes	**14.9** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
C4-Benzenes	**14.4** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
C5-Benzenes	**8.96** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
Methylcyclohexane	**7.18** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
Toluene	**83.0** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
Ethylbenzene	**8.02** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
m,p-Xylene	**100** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
Styrene	**12.2** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
o-Xylene	**6.02** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
Isopropylbenzene	ND (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
n-Propylbenzene	**7.39** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
1,3,5-Trimethylbenzene	**5.07** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
1,2,3-Trimethylbenzene	**J 2.67** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
1,2,4-Trimethylbenzene	**6.04** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
t-Butylbenzene	ND (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
sec-Butylbenzene	ND (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
p-Isopropyltoluene	**3.68** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
n-Butylbenzene	**14.1** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
trans-Decalin	**J 2.56** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
cis-Decalin	ND (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
C1-Decalins	**4.69** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
C2-Decalins	**8.08** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
C3-Decalins	**4.83** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
C4-Decalins	**12.8** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
Benzo(b)thiophene	**J 2.90** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
C1-Benzo(b)thiophenes	**5.84** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
C2-Benzo(b)thiophenes	**10.1** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
C3-Benzo(b)thiophenes	**6.11** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
C4-Benzo(b)thiophenes	**5.17** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS656
Date Sampled: 04/24/19 10:50
Percent Solids: 71
Initial Volume: 8.56
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 5/6/19 11:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**42.9** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
2-Methylnaphthalene	**24.3** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
1-Methylnaphthalene	**37.5** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
C1-Naphthalenes	**38.3** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
C2-Naphthalenes	**80.1** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
C3-Naphthalenes	**57.1** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
C4-Naphthalenes	**33.4** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
Biphenyl	**10.8** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
Acenaphthylene	**173** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
Acenaphthene	**187** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
Dibenzofuran	**42.9** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
Fluorene	**98.1** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
C1-Fluorenes	**53.5** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
C2-Fluorenes	**53.9** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
C3-Fluorenes	**96.5** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
Dibenzothiophene	**76.9** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
C1-Dibenzothiophenes	**80.7** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
C2-Dibenzothiophenes	**83.0** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
C3-Dibenzothiophenes	**54.9** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
C4-Dibenzothiophenes	**27.0** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
Phenanthrene	**1110** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
Anthracene	**330** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
C1-Phenanthrenes/Anthracenes	**562** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
C2-Phenanthrenes/Anthracenes	**294** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
C3-Phenanthrenes/Anthracenes	**112** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
C4-Phenanthrenes/Anthracenes	**37.1** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
Retene	**26.4** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
Benzo(b)naphtho(2,1-d)thiophene	**182** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
C0-Benzonaphthothiophenes	**319** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
C1-Benzonaphthothiophenes	**159** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
C2-Benzonaphthothiophenes	**133** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
C3-Benzonaphthothiophenes	**110** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS656
Date Sampled: 04/24/19 10:50
Percent Solids: 71
Initial Volume: 8.56
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 5/6/19 11:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**64.5** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
Fluoranthene	**2320** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
Pyrene	**2040** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
C1-Fluoranthenes/Pyrenes	**821** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
C2-Fluoranthenes/Pyrenes	**517** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
C3-Fluoranthenes/Pyrenes	**200** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
Benzo(b)fluorene	**81.8** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
Benzo(c)fluorene	**38.6** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
2-Methylpyrene	**121** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
4-Methylpyrene	**95.5** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
1-Methylpyrene	**76.5** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
Benz(a)anthracene	**1130** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
Chrysene/triphenylene	**1130** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
C1-Benzo(a)anthracenes/Chrysenes	**476** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
C2-Benzo(a)anthracenes/Chrysenes	**247** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
C3-Benzo(a)anthracenes/Chrysenes	**135** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
C4-Benzo(a)anthracenes/Chrysenes	**69.5** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
Benzo(b)fluoranthene	**1030** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
Benzo(j/k)fluoranthene	**886** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
Benzo(e)pyrene	**759** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
Benzo(a)pyrene	**1100** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
Perylene	**273** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
Indeno(1,2,3-cd)pyrene	**731** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
Dibenzo(a,h)anthracene	**165** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
Benzo(g,h,i)perylene	**603** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
Coronene	**137** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
Tetramethyl lead	ND (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
Trimethylethyl lead	ND (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
Dimethyldiethyl lead	ND (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
Methyltriethyl lead	ND (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
Tetraethyl lead	ND (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
Carbazole	**126** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS656
Date Sampled: 04/24/19 10:50
Percent Solids: 71
Initial Volume: 8.56
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 5/6/19 11:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**26.8** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
2,3,5-Trimethylnaphthene	**4.23** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
4-Methyldibenzothiophene	**28.5** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
2/3-Methyldibenzothiophene	**27.7** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
1-Methyldibenzothiophene	**9.80** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
3-Methylphenanthrene	**126** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
2-Methylphenanthrene	**157** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
2-Methylanthracene	**61.9** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
4/9-Methylphenanthrene	**119** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601
1-Methylphenanthrene	**88.6** (3.29)	1.65	8270 Mod		1	05/09/19 15:03	F9E0002	FE90601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*82 %*		*50-120*
Surrogate: Naphthalene-d8	*84 %*		*50-120*
Surrogate: Phenanthrene-d10	*94 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS656
Date Sampled: 04/24/19 10:50
Percent Solids: N/A

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**34200** (270)		TOC-LK		1	CCP	04/30/19 18:43	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS657
Date Sampled: 04/24/19 10:55
Percent Solids: 77
Initial Volume: 8.21
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 5/6/19 11:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**17.8** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
C1-Benzene	**28.5** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
C2-Benzenes	**11.7** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
C3-Benzenes	**30.3** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
C4-Benzenes	**25.4** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
C5-Benzenes	**17.7** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
Methylcyclohexane	**24.9** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
Toluene	**44.0** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
Ethylbenzene	**3.80** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
m,p-Xylene	**16.8** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
Styrene	**12.9** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
o-Xylene	**J 2.81** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
Isopropylbenzene	ND (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
n-Propylbenzene	**J 2.31** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
1,3,5-Trimethylbenzene	**39.0** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
1,2,3-Trimethylbenzene	**4.79** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
1,2,4-Trimethylbenzene	**4.49** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
t-Butylbenzene	ND (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
sec-Butylbenzene	**J 1.81** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
p-Isopropyltoluene	**3.64** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
n-Butylbenzene	**4.56** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
trans-Decalin	**12.9** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
cis-Decalin	ND (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
C1-Decalins	**13.0** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
C2-Decalins	**11.0** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
C3-Decalins	**6.88** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
C4-Decalins	**15.2** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
Benzo(b)thiophene	**J 2.78** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
C1-Benzo(b)thiophenes	**J 3.06** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
C2-Benzo(b)thiophenes	**7.03** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
C3-Benzo(b)thiophenes	**6.25** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
C4-Benzo(b)thiophenes	**3.87** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS657
Date Sampled: 04/24/19 10:55
Percent Solids: 77
Initial Volume: 8.21
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 5/6/19 11:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**39.2** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
2-Methylnaphthalene	**22.8** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
1-Methylnaphthalene	**38.7** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
C1-Naphthalenes	**37.9** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
C2-Naphthalenes	**153** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
C3-Naphthalenes	**99.5** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
C4-Naphthalenes	**36.0** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
Biphenyl	**11.6** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
Acenaphthylene	**204** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
Acenaphthene	**27.8** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
Dibenzofuran	**29.9** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
Fluorene	**65.6** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
C1-Fluorenes	**65.2** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
C2-Fluorenes	**97.1** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
C3-Fluorenes	**92.8** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
Dibenzothiophene	**54.1** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
C1-Dibenzothiophenes	**94.0** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
C2-Dibenzothiophenes	**85.4** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
C3-Dibenzothiophenes	**50.0** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
C4-Dibenzothiophenes	**25.5** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
Phenanthrene	**744** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
Anthracene	**228** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
C1-Phenanthrenes/Anthracenes	**529** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
C2-Phenanthrenes/Anthracenes	**283** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
C3-Phenanthrenes/Anthracenes	**101** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
C4-Phenanthrenes/Anthracenes	**35.9** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
Retene	**30.5** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
Benzo(b)naphtho(2,1-d)thiophene	**99.6** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
C0-Benzonaphthothiophenes	**177** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
C1-Benzonaphthothiophenes	**127** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
C2-Benzonaphthothiophenes	**122** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
C3-Benzonaphthothiophenes	**118** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS657
Date Sampled: 04/24/19 10:55
Percent Solids: 77
Initial Volume: 8.21
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 5/6/19 11:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**79.8** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
Fluoranthene	**1360** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
Pyrene	**1220** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
C1-Fluoranthenes/Pyrenes	**603** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
C2-Fluoranthenes/Pyrenes	**362** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
C3-Fluoranthenes/Pyrenes	**177** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
Benzo(b)fluorene	**57.4** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
Benzo(c)fluorene	**30.0** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
2-Methylpyrene	**85.4** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
4-Methylpyrene	**74.4** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
1-Methylpyrene	**56.7** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
Benz(a)anthracene	**708** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
Chrysene/triphenylene	**678** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
C1-Benzo(a)anthracenes/Chrysenes	**361** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
C2-Benzo(a)anthracenes/Chrysenes	**200** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
C3-Benzo(a)anthracenes/Chrysenes	**128** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
C4-Benzo(a)anthracenes/Chrysenes	**71.1** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
Benzo(b)fluoranthene	**603** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
Benzo(j/k)fluoranthene	**559** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
Benzo(e)pyrene	**476** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
Benzo(a)pyrene	**705** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
Perylene	**166** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
Indeno(1,2,3-cd)pyrene	**450** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
Dibenzo(a,h)anthracene	**106** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
Benzo(g,h,i)perylene	**374** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
Coronene	**83.7** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
Tetramethyl lead	ND (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
Trimethylethyl lead	ND (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
Dimethyldiethyl lead	ND (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
Methyltriethyl lead	ND (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
Tetraethyl lead	ND (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
Carbazole	**53.3** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS657
Date Sampled: 04/24/19 10:55
Percent Solids: 77
Initial Volume: 8.21
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 5/6/19 11:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**53.9** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
2,3,5-Trimethylnaphthene	**6.76** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
4-Methyldibenzothiophene	**41.5** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
2/3-Methyldibenzothiophene	**34.0** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
1-Methyldibenzothiophene	**8.19** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
3-Methylphenanthrene	**130** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
2-Methylphenanthrene	**173** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
2-Methylanthracene	**46.2** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
4/9-Methylphenanthrene	**101** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601
1-Methylphenanthrene	**78.4** (3.16)	1.58	8270 Mod		1	05/09/19 16:26	F9E0002	FE90601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*82 %*		*50-120*
Surrogate: Naphthalene-d8	*82 %*		*50-120*
Surrogate: Phenanthrene-d10	*93 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS657
Date Sampled: 04/24/19 10:55
Percent Solids: N/A

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**7420** (142)		TOC-LK		1	CCP	04/30/19 18:59	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS658
Date Sampled: 04/24/19 11:00
Percent Solids: 75
Initial Volume: 7.28
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 5/6/19 11:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**235** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
C1-Benzene	**225** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
C2-Benzenes	**198** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
C3-Benzenes	**99.2** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
C4-Benzenes	**100** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
C5-Benzenes	**J 50.0** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
Methylcyclohexane	ND (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
Toluene	**347** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
Ethylbenzene	**112** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
m,p-Xylene	**248** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
Styrene	**328** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
o-Xylene	ND (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
Isopropylbenzene	ND (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
n-Propylbenzene	ND (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
1,3,5-Trimethylbenzene	ND (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
1,2,3-Trimethylbenzene	ND (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
1,2,4-Trimethylbenzene	ND (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
t-Butylbenzene	ND (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
sec-Butylbenzene	ND (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
p-Isopropyltoluene	ND (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
n-Butylbenzene	ND (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
trans-Decalin	**J 62.1** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
cis-Decalin	ND (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
C1-Decalins	**128** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
C2-Decalins	**163** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
C3-Decalins	**131** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
C4-Decalins	**133** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
Benzo(b)thiophene	**250** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
C1-Benzo(b)thiophenes	**262** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
C2-Benzo(b)thiophenes	**674** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
C3-Benzo(b)thiophenes	**438** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
C4-Benzo(b)thiophenes	**101** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS658
Date Sampled: 04/24/19 11:00
Percent Solids: 75
Initial Volume: 7.28
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 5/6/19 11:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**3150** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
2-Methylnaphthalene	**2260** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
1-Methylnaphthalene	**2210** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
C1-Naphthalenes	**2800** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
C2-Naphthalenes	**6210** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
C3-Naphthalenes	**2400** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
C4-Naphthalenes	**538** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
Biphenyl	**2590** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
Acenaphthylene	**19400** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
Acenaphthene	**41000** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
Dibenzofuran	**1580** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
Fluorene	**22700** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
C1-Fluorenes	**4840** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
C2-Fluorenes	**1340** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
C3-Fluorenes	**1020** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
Dibenzothiophene	**25600** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
C1-Dibenzothiophenes	**10300** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
C2-Dibenzothiophenes	**3270** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
C3-Dibenzothiophenes	**980** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
C4-Dibenzothiophenes	**339** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
Phenanthrene	**215000** (1470)	736	8270 Mod		400	05/09/19 20:36	F9E0002	FE90601
Anthracene	**51800** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
C1-Phenanthrenes/Anthracenes	**39200** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
C2-Phenanthrenes/Anthracenes	**5980** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
C3-Phenanthrenes/Anthracenes	**988** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
C4-Phenanthrenes/Anthracenes	**482** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
Retene	**79.0** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
Benzo(b)naphtho(2,1-d)thiophene	**11900** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
C0-Benzonaphthothiophenes	**23600** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
C1-Benzonaphthothiophenes	**5670** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
C2-Benzonaphthothiophenes	**1810** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
C3-Benzonaphthothiophenes	**1770** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS658
Date Sampled: 04/24/19 11:00
Percent Solids: 75
Initial Volume: 7.28
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 5/6/19 11:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**455** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
Fluoranthene	**182000** (1470)	736	8270 Mod		400	05/09/19 20:36	F9E0002	FE90601
Pyrene	**267000** (1470)	736	8270 Mod		400	05/09/19 20:36	F9E0002	FE90601
C1-Fluoranthenes/Pyrenes	**61800** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
C2-Fluoranthenes/Pyrenes	**6730** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
C3-Fluoranthenes/Pyrenes	**1380** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
Benzo(b)fluorene	**7890** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
Benzo(c)fluorene	**3620** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
2-Methylpyrene	**8130** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
4-Methylpyrene	**7240** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
1-Methylpyrene	**8800** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
Benz(a)anthracene	**72700** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
Chrysene/triphenylene	**50600** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
C1-Benzo(a)anthracenes/Chrysenes	**12900** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
C2-Benzo(a)anthracenes/Chrysenes	**3150** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
C3-Benzo(a)anthracenes/Chrysenes	**815** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
C4-Benzo(a)anthracenes/Chrysenes	**1280** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
Benzo(b)fluoranthene	**43700** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
Benzo(j/k)fluoranthene	**49700** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
Benzo(e)pyrene	**45600** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
Benzo(a)pyrene	**92200** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
Perylene	**13700** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
Indeno(1,2,3-cd)pyrene	**45900** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
Dibenzo(a,h)anthracene	**7940** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
Benzo(g,h,i)perylene	**43900** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
Coronene	**12700** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
Tetramethyl lead	ND (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
Trimethylethyl lead	ND (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
Dimethyldiethyl lead	ND (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
Methyltriethyl lead	ND (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
Tetraethyl lead	ND (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
Carbazole	**486** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS658
Date Sampled: 04/24/19 11:00
Percent Solids: 75
Initial Volume: 7.28
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 5/6/19 11:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**1110** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
2,3,5-Trimethylnaphthene	**147** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
4-Methyldibenzothiophene	**3640** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
2/3-Methyldibenzothiophene	**3770** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
1-Methyldibenzothiophene	**1090** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
3-Methylphenanthrene	**9650** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
2-Methylphenanthrene	**10700** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
2-Methylanthracene	**4630** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
4/9-Methylphenanthrene	**8160** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601
1-Methylphenanthrene	**5930** (73.6)	36.8	8270 Mod		20	05/09/19 19:12	F9E0002	FE90601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*92 %*		*50-120*
Surrogate: Naphthalene-d8	*90 %*		*50-120*
Surrogate: Phenanthrene-d10	*101 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS658
Date Sampled: 04/24/19 11:00
Percent Solids: N/A

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**44300** (279)		TOC-LK		1	CCP	04/30/19 19:41	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS659
Date Sampled: 04/24/19 09:20
Percent Solids: 35
Initial Volume: 7.5
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 5/6/19 11:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**203** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
C1-Benzene	**338** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
C2-Benzenes	**535** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
C3-Benzenes	**69.2** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
C4-Benzenes	**54.7** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
C5-Benzenes	**32.4** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
Methylcyclohexane	**20.9** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
Toluene	**537** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
Ethylbenzene	**45.9** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
m,p-Xylene	**1010** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
Styrene	**70.6** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
o-Xylene	**38.6** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
Isopropylbenzene	**J 4.41** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
n-Propylbenzene	**30.4** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
1,3,5-Trimethylbenzene	**16.1** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
1,2,3-Trimethylbenzene	**19.9** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
1,2,4-Trimethylbenzene	**31.6** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
t-Butylbenzene	ND (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
sec-Butylbenzene	ND (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
p-Isopropyltoluene	**29.6** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
n-Butylbenzene	**49.3** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
trans-Decalin	**12.4** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
cis-Decalin	ND (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
C1-Decalins	**28.8** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
C2-Decalins	**35.6** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
C3-Decalins	**25.6** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
C4-Decalins	**35.2** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
Benzo(b)thiophene	**47.7** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
C1-Benzo(b)thiophenes	**42.2** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
C2-Benzo(b)thiophenes	**108** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
C3-Benzo(b)thiophenes	**57.5** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
C4-Benzo(b)thiophenes	**13.5** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS659
Date Sampled: 04/24/19 09:20
Percent Solids: 35
Initial Volume: 7.5
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 5/6/19 11:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**519** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
2-Methylnaphthalene	**222** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
1-Methylnaphthalene	**266** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
C1-Naphthalenes	**299** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
C2-Naphthalenes	**834** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
C3-Naphthalenes	**332** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
C4-Naphthalenes	**114** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
Biphenyl	**133** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
Acenaphthylene	**1950** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
Acenaphthene	**3080** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
Dibenzofuran	**193** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
Fluorene	**1610** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
C1-Fluorenes	**412** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
C2-Fluorenes	**157** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
C3-Fluorenes	**308** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
Dibenzothiophene	**1650** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
C1-Dibenzothiophenes	**802** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
C2-Dibenzothiophenes	**383** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
C3-Dibenzothiophenes	**175** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
C4-Dibenzothiophenes	**93.2** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
Phenanthrene	**12500** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
Anthracene	**3740** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
C1-Phenanthrenes/Anthracenes	**3250** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
C2-Phenanthrenes/Anthracenes	**852** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
C3-Phenanthrenes/Anthracenes	**273** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
C4-Phenanthrenes/Anthracenes	**93.5** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
Retene	**180** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
Benzo(b)naphtho(2,1-d)thiophene	**1180** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
C0-Benzonaphthothiophenes	**2290** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
C1-Benzonaphthothiophenes	**753** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
C2-Benzonaphthothiophenes	**425** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
C3-Benzonaphthothiophenes	**385** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS659
Date Sampled: 04/24/19 09:20
Percent Solids: 35
Initial Volume: 7.5
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 5/6/19 11:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**166** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
Fluoranthene	**16600** (154)	76.9	8270 Mod		20	05/09/19 23:22	F9E0002	FE90601
Pyrene	**22300** (154)	76.9	8270 Mod		20	05/09/19 23:22	F9E0002	FE90601
C1-Fluoranthenes/Pyrenes	**5810** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
C2-Fluoranthenes/Pyrenes	**1370** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
C3-Fluoranthenes/Pyrenes	**470** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
Benzo(b)fluorene	**712** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
Benzo(c)fluorene	**345** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
2-Methylpyrene	**772** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
4-Methylpyrene	**717** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
1-Methylpyrene	**752** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
Benz(a)anthracene	**6860** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
Chrysene/triphenylene	**6020** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
C1-Benzo(a)anthracenes/Chrysenes	**1910** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
C2-Benzo(a)anthracenes/Chrysenes	**692** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
C3-Benzo(a)anthracenes/Chrysenes	**296** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
C4-Benzo(a)anthracenes/Chrysenes	**232** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
Benzo(b)fluoranthene	**5400** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
Benzo(j/k)fluoranthene	**5510** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
Benzo(e)pyrene	**5090** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
Benzo(a)pyrene	**8970** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
Perylene	**1700** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
Indeno(1,2,3-cd)pyrene	**5140** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
Dibenzo(a,h)anthracene	**937** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
Benzo(g,h,i)perylene	**4820** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
Coronene	**1330** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
Tetramethyl lead	ND (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
Trimethylethyl lead	ND (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
Dimethyldiethyl lead	ND (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
Methyltriethyl lead	ND (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
Tetraethyl lead	ND (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
Carbazole	**197** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS659
Date Sampled: 04/24/19 09:20
Percent Solids: 35
Initial Volume: 7.5
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 5/6/19 11:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**250** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
2,3,5-Trimethylnaphthene	**21.1** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
4-Methyldibenzothiophene	**283** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
2/3-Methyldibenzothiophene	**281** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
1-Methyldibenzothiophene	**88.9** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
3-Methylphenanthrene	**755** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
2-Methylphenanthrene	**862** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
2-Methylanthracene	**380** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
4/9-Methylphenanthrene	**725** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601
1-Methylphenanthrene	**491** (7.69)	3.84	8270 Mod		1	05/09/19 21:59	F9E0002	FE90601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*81 %*		*50-120*
Surrogate: Naphthalene-d8	*85 %*		*50-120*
Surrogate: Phenanthrene-d10	*94 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS659
Date Sampled: 04/24/19 09:20
Percent Solids: N/A

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-04
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**95900** (310)		TOC-LK		1	CCP	04/30/19 20:06	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS660
Date Sampled: 04/24/19 09:15
Percent Solids: 44
Initial Volume: 7.12
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 5/6/19 11:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**124** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
C1-Benzene	**183** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
C2-Benzenes	**408** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
C3-Benzenes	**61.0** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
C4-Benzenes	**47.6** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
C5-Benzenes	**26.8** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
Methylcyclohexane	**36.0** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
Toluene	**291** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
Ethylbenzene	**35.2** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
m,p-Xylene	**771** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
Styrene	**40.9** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
o-Xylene	**27.4** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
Isopropylbenzene	**6.81** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
n-Propylbenzene	**24.4** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
1,3,5-Trimethylbenzene	**15.1** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
1,2,3-Trimethylbenzene	**17.1** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
1,2,4-Trimethylbenzene	**29.6** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
t-Butylbenzene	ND (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
sec-Butylbenzene	ND (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
p-Isopropyltoluene	**25.7** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
n-Butylbenzene	**43.0** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
trans-Decalin	**19.4** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
cis-Decalin	**J 3.46** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
C1-Decalins	**40.6** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
C2-Decalins	**34.9** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
C3-Decalins	**26.0** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
C4-Decalins	**32.4** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
Benzo(b)thiophene	**31.7** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
C1-Benzo(b)thiophenes	**25.8** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
C2-Benzo(b)thiophenes	**62.9** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
C3-Benzo(b)thiophenes	**31.0** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
C4-Benzo(b)thiophenes	**8.08** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS660
Date Sampled: 04/24/19 09:15
Percent Solids: 44
Initial Volume: 7.12
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 5/6/19 11:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**310** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
2-Methylnaphthalene	**141** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
1-Methylnaphthalene	**138** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
C1-Naphthalenes	**173** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
C2-Naphthalenes	**408** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
C3-Naphthalenes	**204** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
C4-Naphthalenes	**89.6** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
Biphenyl	**74.3** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
Acenaphthylene	**840** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
Acenaphthene	**1570** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
Dibenzofuran	**117** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
Fluorene	**869** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
C1-Fluorenes	**202** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
C2-Fluorenes	**90.9** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
C3-Fluorenes	**209** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
Dibenzothiophene	**852** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
C1-Dibenzothiophenes	**373** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
C2-Dibenzothiophenes	**213** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
C3-Dibenzothiophenes	**115** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
C4-Dibenzothiophenes	**66.5** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
Phenanthrene	**5670** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
Anthracene	**1970** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
C1-Phenanthrenes/Anthracenes	**1570** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
C2-Phenanthrenes/Anthracenes	**559** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
C3-Phenanthrenes/Anthracenes	**206** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
C4-Phenanthrenes/Anthracenes	**96.2** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
Retene	**135** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
Benzo(b)naphtho(2,1-d)thiophene	**589** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
C0-Benzonaphthothiophenes	**1130** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
C1-Benzonaphthothiophenes	**449** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
C2-Benzonaphthothiophenes	**282** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
C3-Benzonaphthothiophenes	**245** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS660
Date Sampled: 04/24/19 09:15
Percent Solids: 44
Initial Volume: 7.12
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 5/6/19 11:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**116** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
Fluoranthene	**6650** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
Pyrene	**8690** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
C1-Fluoranthenes/Pyrenes	**2890** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
C2-Fluoranthenes/Pyrenes	**927** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
C3-Fluoranthenes/Pyrenes	**349** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
Benzo(b)fluorene	**334** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
Benzo(c)fluorene	**161** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
2-Methylpyrene	**400** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
4-Methylpyrene	**376** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
1-Methylpyrene	**372** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
Benz(a)anthracene	**3370** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
Chrysene/triphenylene	**3200** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
C1-Benzo(a)anthracenes/Chrysenes	**1190** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
C2-Benzo(a)anthracenes/Chrysenes	**1110** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
C3-Benzo(a)anthracenes/Chrysenes	**248** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
C4-Benzo(a)anthracenes/Chrysenes	**158** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
Benzo(b)fluoranthene	**2670** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
Benzo(j/k)fluoranthene	**3010** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
Benzo(e)pyrene	**2670** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
Benzo(a)pyrene	**4490** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
Perylene	**886** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
Indeno(1,2,3-cd)pyrene	**2630** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
Dibenzo(a,h)anthracene	**520** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
Benzo(g,h,i)perylene	**2430** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
Coronene	**645** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
Tetramethyl lead	ND (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
Trimethylethyl lead	ND (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
Dimethyldiethyl lead	ND (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
Methyltriethyl lead	ND (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
Tetraethyl lead	ND (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
Carbazole	**114** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS660
Date Sampled: 04/24/19 09:15
Percent Solids: 44
Initial Volume: 7.12
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 5/6/19 11:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**107** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
2,3,5-Trimethylnaphthene	**11.1** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
4-Methyldibenzothiophene	**133** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
2/3-Methyldibenzothiophene	**129** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
1-Methyldibenzothiophene	**42.1** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
3-Methylphenanthrene	**362** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
2-Methylphenanthrene	**398** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
2-Methylanthracene	**194** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
4/9-Methylphenanthrene	**365** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601
1-Methylphenanthrene	**248** (6.38)	3.19	8270 Mod		1	05/10/19 11:25	F9E0002	FE90601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*84 %*		*50-120*
Surrogate: Naphthalene-d8	*88 %*		*50-120*
Surrogate: Phenanthrene-d10	*98 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS660
Date Sampled: 04/24/19 09:15
Percent Solids: N/A

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-05
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**95600** (266)		TOC-LK		1	CCP	04/30/19 20:22	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS661
Date Sampled: 04/24/19 09:05
Percent Solids: 43
Initial Volume: 7.18
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 5/6/19 11:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**221** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
C1-Benzene	**264** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
C2-Benzenes	**315** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
C3-Benzenes	**70.8** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
C4-Benzenes	**64.7** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
C5-Benzenes	**47.9** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
Methylcyclohexane	**25.7** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
Toluene	**423** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
Ethylbenzene	**52.7** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
m,p-Xylene	**561** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
Styrene	**58.0** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
o-Xylene	**30.9** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
Isopropylbenzene	**J 3.57** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
n-Propylbenzene	**55.1** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
1,3,5-Trimethylbenzene	**14.4** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
1,2,3-Trimethylbenzene	**16.3** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
1,2,4-Trimethylbenzene	**26.1** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
t-Butylbenzene	ND (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
sec-Butylbenzene	ND (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
p-Isopropyltoluene	**18.6** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
n-Butylbenzene	**127** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
trans-Decalin	**9.17** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
cis-Decalin	ND (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
C1-Decalins	**16.6** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
C2-Decalins	**30.4** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
C3-Decalins	**17.5** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
C4-Decalins	**38.2** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
Benzo(b)thiophene	**27.9** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
C1-Benzo(b)thiophenes	**22.1** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
C2-Benzo(b)thiophenes	**46.4** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
C3-Benzo(b)thiophenes	**26.8** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
C4-Benzo(b)thiophenes	**8.99** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS661
Date Sampled: 04/24/19 09:05
Percent Solids: 43
Initial Volume: 7.18
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 5/6/19 11:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**299** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
2-Methylnaphthalene	**115** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
1-Methylnaphthalene	**74.7** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
C1-Naphthalenes	**119** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
C2-Naphthalenes	**320** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
C3-Naphthalenes	**162** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
C4-Naphthalenes	**74.8** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
Biphenyl	**76.9** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
Acenaphthylene	**1320** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
Acenaphthene	**1270** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
Dibenzofuran	**96.1** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
Fluorene	**688** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
C1-Fluorenes	**221** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
C2-Fluorenes	**102** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
C3-Fluorenes	**278** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
Dibenzothiophene	**854** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
C1-Dibenzothiophenes	**491** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
C2-Dibenzothiophenes	**250** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
C3-Dibenzothiophenes	**135** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
C4-Dibenzothiophenes	**72.3** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
Phenanthrene	**6910** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
Anthracene	**2020** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
C1-Phenanthrenes/Anthracenes	**2200** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
C2-Phenanthrenes/Anthracenes	**640** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
C3-Phenanthrenes/Anthracenes	**223** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
C4-Phenanthrenes/Anthracenes	**98.1** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
Retene	**85.4** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
Benzo(b)naphtho(2,1-d)thiophene	**893** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
C0-Benzonaphthothiophenes	**1720** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
C1-Benzonaphthothiophenes	**550** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
C2-Benzonaphthothiophenes	**326** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
C3-Benzonaphthothiophenes	**302** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS661
Date Sampled: 04/24/19 09:05
Percent Solids: 43
Initial Volume: 7.18
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 5/6/19 11:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**142** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
Fluoranthene	**12400** (128)	64.2	8270 Mod		20	05/10/19 15:36	F9E0002	FE90601
Pyrene	**16300** (128)	64.2	8270 Mod		20	05/10/19 15:36	F9E0002	FE90601
C1-Fluoranthenes/Pyrenes	**4130** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
C2-Fluoranthenes/Pyrenes	**1110** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
C3-Fluoranthenes/Pyrenes	**400** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
Benzo(b)fluorene	**524** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
Benzo(c)fluorene	**240** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
2-Methylpyrene	**566** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
4-Methylpyrene	**502** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
1-Methylpyrene	**553** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
Benz(a)anthracene	**5290** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
Chrysene/triphenylene	**4640** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
C1-Benzo(a)anthracenes/Chrysenes	**1420** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
C2-Benzo(a)anthracenes/Chrysenes	**557** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
C3-Benzo(a)anthracenes/Chrysenes	**254** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
C4-Benzo(a)anthracenes/Chrysenes	**211** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
Benzo(b)fluoranthene	**4280** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
Benzo(j/k)fluoranthene	**4310** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
Benzo(e)pyrene	**3980** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
Benzo(a)pyrene	**6800** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
Perylene	**1290** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
Indeno(1,2,3-cd)pyrene	**3950** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
Dibenzo(a,h)anthracene	**750** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
Benzo(g,h,i)perylene	**3630** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
Coronene	**985** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
Tetramethyl lead	ND (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
Trimethylethyl lead	ND (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
Dimethyldiethyl lead	ND (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
Methyltriethyl lead	ND (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
Tetraethyl lead	ND (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
Carbazole	**168** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS661
Date Sampled: 04/24/19 09:05
Percent Solids: 43
Initial Volume: 7.18
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 5/6/19 11:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**125** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
2,3,5-Trimethylnaphthene	**9.40** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
4-Methyldibenzothiophene	**175** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
2/3-Methyldibenzothiophene	**177** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
1-Methyldibenzothiophene	**53.4** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
3-Methylphenanthrene	**518** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
2-Methylphenanthrene	**562** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
2-Methylanthracene	**240** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
4/9-Methylphenanthrene	**492** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601
1-Methylphenanthrene	**322** (6.42)	3.21	8270 Mod		1	05/10/19 14:12	F9E0002	FE90601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*69 %*		*50-120*
Surrogate: Naphthalene-d8	*73 %*		*50-120*
Surrogate: Phenanthrene-d10	*81 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS661
Date Sampled: 04/24/19 09:05
Percent Solids: N/A

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-06
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**76500** (263)		TOC-LK		1	CCP	04/30/19 20:39	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS662
Date Sampled: 04/23/19 10:25
Percent Solids: 49
Initial Volume: 7.13
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 5/6/19 11:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**217** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
C1-Benzene	**271** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
C2-Benzenes	**300** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
C3-Benzenes	**48.6** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
C4-Benzenes	**40.3** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
C5-Benzenes	**24.7** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
Methylcyclohexane	**8.07** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
Toluene	**432** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
Ethylbenzene	**27.6** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
m,p-Xylene	**567** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
Styrene	**61.4** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
o-Xylene	**23.7** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
Isopropylbenzene	ND (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
n-Propylbenzene	**24.9** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
1,3,5-Trimethylbenzene	**7.80** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
1,2,3-Trimethylbenzene	**17.2** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
1,2,4-Trimethylbenzene	**19.7** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
t-Butylbenzene	ND (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
sec-Butylbenzene	ND (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
p-Isopropyltoluene	**17.9** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
n-Butylbenzene	**38.0** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
trans-Decalin	**15.3** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
cis-Decalin	ND (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
C1-Decalins	**33.9** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
C2-Decalins	**53.8** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
C3-Decalins	**53.7** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
C4-Decalins	**92.3** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
Benzo(b)thiophene	**8.06** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
C1-Benzo(b)thiophenes	**22.0** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
C2-Benzo(b)thiophenes	**31.8** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
C3-Benzo(b)thiophenes	**18.1** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
C4-Benzo(b)thiophenes	**10.4** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS662
Date Sampled: 04/23/19 10:25
Percent Solids: 49
Initial Volume: 7.13
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 5/6/19 11:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**144** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
2-Methylnaphthalene	**67.3** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
1-Methylnaphthalene	**33.4** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
C1-Naphthalenes	**63.0** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
C2-Naphthalenes	**164** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
C3-Naphthalenes	**106** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
C4-Naphthalenes	**83.6** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
Biphenyl	**43.3** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
Acenaphthylene	**467** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
Acenaphthene	**88.2** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
Dibenzofuran	**41.0** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
Fluorene	**113** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
C1-Fluorenes	**86.2** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
C2-Fluorenes	**100** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
C3-Fluorenes	**192** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
Dibenzothiophene	**81.8** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
C1-Dibenzothiophenes	**143** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
C2-Dibenzothiophenes	**185** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
C3-Dibenzothiophenes	**159** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
C4-Dibenzothiophenes	**89.9** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
Phenanthrene	**888** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
Anthracene	**658** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
C1-Phenanthrenes/Anthracenes	**870** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
C2-Phenanthrenes/Anthracenes	**538** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
C3-Phenanthrenes/Anthracenes	**247** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
C4-Phenanthrenes/Anthracenes	**126** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
Retene	**102** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
Benzo(b)naphtho(2,1-d)thiophene	**300** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
C0-Benzonaphthothiophenes	**550** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
C1-Benzonaphthothiophenes	**315** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
C2-Benzonaphthothiophenes	**243** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
C3-Benzonaphthothiophenes	**179** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS662
Date Sampled: 04/23/19 10:25
Percent Solids: 49
Initial Volume: 7.13
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 5/6/19 11:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**94.9** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
Fluoranthene	**3220** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
Pyrene	**4330** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
C1-Fluoranthenes/Pyrenes	**2200** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
C2-Fluoranthenes/Pyrenes	**771** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
C3-Fluoranthenes/Pyrenes	**305** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
Benzo(b)fluorene	**277** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
Benzo(c)fluorene	**85.0** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
2-Methylpyrene	**305** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
4-Methylpyrene	**291** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
1-Methylpyrene	**263** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
Benz(a)anthracene	**2190** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
Chrysene/triphenylene	**2370** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
C1-Benzo(a)anthracenes/Chrysenes	**1000** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
C2-Benzo(a)anthracenes/Chrysenes	**424** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
C3-Benzo(a)anthracenes/Chrysenes	**196** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
C4-Benzo(a)anthracenes/Chrysenes	**122** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
Benzo(b)fluoranthene	**1940** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
Benzo(j/k)fluoranthene	**1900** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
Benzo(e)pyrene	**1880** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
Benzo(a)pyrene	**2930** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
Perylene	**625** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
Indeno(1,2,3-cd)pyrene	**1710** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
Dibenzo(a,h)anthracene	**350** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
Benzo(g,h,i)perylene	**1590** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
Coronene	**402** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
Tetramethyl lead	ND (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
Trimethylethyl lead	ND (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
Dimethyldiethyl lead	ND (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
Methyltriethyl lead	ND (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
Tetraethyl lead	ND (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
Carbazole	**80.3** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS662
Date Sampled: 04/23/19 10:25
Percent Solids: 49
Initial Volume: 7.13
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 5/6/19 11:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**82.6** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
2,3,5-Trimethylnaphthene	**6.81** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
4-Methyldibenzothiophene	**56.4** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
2/3-Methyldibenzothiophene	**41.9** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
1-Methyldibenzothiophene	**17.8** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
3-Methylphenanthrene	**171** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
2-Methylphenanthrene	**189** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
2-Methylanthracene	**130** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
4/9-Methylphenanthrene	**221** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601
1-Methylphenanthrene	**135** (5.69)	2.84	8270 Mod		1	05/10/19 16:59	F9E0002	FE90601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*79 %*		*50-120*
Surrogate: Naphthalene-d8	*82 %*		*50-120*
Surrogate: Phenanthrene-d10	*92 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS662
Date Sampled: 04/23/19 10:25
Percent Solids: N/A

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-07
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**58500** (289)		TOC-LK		1	CCP	04/30/19 20:55	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS663
Date Sampled: 04/23/19 10:30
Percent Solids: 71
Initial Volume: 6.68
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 5/6/19 11:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**124** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
C1-Benzene	**90.1** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
C2-Benzenes	**103** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
C3-Benzenes	**28.9** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
C4-Benzenes	**21.9** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
C5-Benzenes	**13.9** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
Methylcyclohexane	**5.24** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
Toluene	**145** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
Ethylbenzene	**18.3** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
m,p-Xylene	**183** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
Styrene	**22.5** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
o-Xylene	**12.7** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
Isopropylbenzene	ND (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
n-Propylbenzene	**13.5** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
1,3,5-Trimethylbenzene	**5.17** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
1,2,3-Trimethylbenzene	**8.21** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
1,2,4-Trimethylbenzene	**11.8** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
t-Butylbenzene	ND (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
sec-Butylbenzene	ND (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
p-Isopropyltoluene	**5.98** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
n-Butylbenzene	**19.7** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
trans-Decalin	**J 3.38** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
cis-Decalin	ND (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
C1-Decalins	**7.42** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
C2-Decalins	**12.1** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
C3-Decalins	**7.79** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
C4-Decalins	**13.6** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
Benzo(b)thiophene	**6.55** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
C1-Benzo(b)thiophenes	**183** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
C2-Benzo(b)thiophenes	**18.7** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
C3-Benzo(b)thiophenes	**11.5** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
C4-Benzo(b)thiophenes	**6.05** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS663
Date Sampled: 04/23/19 10:30
Percent Solids: 71
Initial Volume: 6.68
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 5/6/19 11:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**109** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
2-Methylnaphthalene	**53.9** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
1-Methylnaphthalene	**35.5** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
C1-Naphthalenes	**56.7** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
C2-Naphthalenes	**130** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
C3-Naphthalenes	**96.2** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
C4-Naphthalenes	**48.6** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
Biphenyl	**24.1** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
Acenaphthylene	**306** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
Acenaphthene	**107** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
Dibenzofuran	**52.5** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
Fluorene	**114** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
C1-Fluorenes	**63.6** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
C2-Fluorenes	**39.2** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
C3-Fluorenes	**132** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
Dibenzothiophene	**103** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
C1-Dibenzothiophenes	**123** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
C2-Dibenzothiophenes	**127** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
C3-Dibenzothiophenes	**81.7** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
C4-Dibenzothiophenes	**40.8** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
Phenanthrene	**1230** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
Anthracene	**447** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
C1-Phenanthrenes/Anthracenes	**710** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
C2-Phenanthrenes/Anthracenes	**386** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
C3-Phenanthrenes/Anthracenes	**146** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
C4-Phenanthrenes/Anthracenes	**57.6** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
Retene	**32.0** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
Benzo(b)naphtho(2,1-d)thiophene	**226** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
C0-Benzonaphthothiophenes	**414** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
C1-Benzonaphthothiophenes	**215** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
C2-Benzonaphthothiophenes	**158** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
C3-Benzonaphthothiophenes	**122** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS663
Date Sampled: 04/23/19 10:30
Percent Solids: 71
Initial Volume: 6.68
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 5/6/19 11:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**64.7** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
Fluoranthene	**2880** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
Pyrene	**2870** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
C1-Fluoranthenes/Pyrenes	**1190** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
C2-Fluoranthenes/Pyrenes	**613** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
C3-Fluoranthenes/Pyrenes	**256** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
Benzo(b)fluorene	**118** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
Benzo(c)fluorene	**56.8** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
2-Methylpyrene	**173** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
4-Methylpyrene	**149** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
1-Methylpyrene	**126** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
Benz(a)anthracene	**1520** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
Chrysene/triphenylene	**1570** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
C1-Benzo(a)anthracenes/Chrysenes	**629** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
C2-Benzo(a)anthracenes/Chrysenes	**291** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
C3-Benzo(a)anthracenes/Chrysenes	**152** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
C4-Benzo(a)anthracenes/Chrysenes	**81.3** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
Benzo(b)fluoranthene	**1330** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
Benzo(j/k)fluoranthene	**1350** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
Benzo(e)pyrene	**1140** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
Benzo(a)pyrene	**1700** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
Perylene	**416** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
Indeno(1,2,3-cd)pyrene	**1100** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
Dibenzo(a,h)anthracene	**247** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
Benzo(g,h,i)perylene	**949** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
Coronene	**228** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
Tetramethyl lead	ND (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
Trimethylethyl lead	ND (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
Dimethyldiethyl lead	ND (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
Methyltriethyl lead	ND (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
Tetraethyl lead	ND (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
Carbazole	**101** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS663
Date Sampled: 04/23/19 10:30
Percent Solids: 71
Initial Volume: 6.68
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 5/6/19 11:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6-Dimethylnaphthalene	**48.0** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
2,3,5-Trimethylnaphthene	**6.18** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
4-Methyldibenzothiophene	**41.4** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
2/3-Methyldibenzothiophene	**40.6** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
1-Methyldibenzothiophene	**16.6** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
3-Methylphenanthrene	**143** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
2-Methylphenanthrene	**184** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
2-Methylanthracene	**85.4** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
4/9-Methylphenanthrene	**151** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601
1-Methylphenanthrene	**118** (4.24)	2.12	8270 Mod		1	05/10/19 19:46	F9E0002	FE90601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*78 %*		*50-120*
Surrogate: Naphthalene-d8	*83 %*		*50-120*
Surrogate: Phenanthrene-d10	*93 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS663
Date Sampled: 04/23/19 10:30
Percent Solids: N/A

ESS Laboratory Work Order: F190025
ESS Laboratory Sample ID: F190025-08
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**49300** (259)		TOC-LK		1	CCP	04/30/19 21:45	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190025

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Classical Chemistry										
Batch CD92645 - General Preparation										
Blank										
Total Organic Carbon (1)	ND	100	mg/kg							
Total Organic Carbon (2)	ND	100	mg/kg							
LCS										
Total Organic Carbon (1)	9760	100	mg/kg	10000		98	80-120			
Total Organic Carbon (2)	9170	100	mg/kg	10000		92	80-120			
LCS Dup										
Total Organic Carbon (1)	9390	100	mg/kg	10000		94	80-120	4	20	
Total Organic Carbon (2)	9340	100	mg/kg	10000		93	80-120	2	20	

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D (SIM) Semi-Volatile Organic Compounds										
Batch FE90601 - 3570										
Blank										
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylphenanthrene	ND	4.00	ug/Kg wet							
1-Methylpyrene	ND	4.00	ug/Kg wet							
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet							
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet							
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet							
2-Methylanthracene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
2-Methylphenanthrene	ND	4.00	ug/Kg wet							
2-Methylpyrene	ND	4.00	ug/Kg wet							
3-Methylphenanthrene	ND	4.00	ug/Kg wet							
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet							
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet							
4-Methylpyrene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Anthracene	ND	4.00	ug/Kg wet							
Benz(a)anthracene	ND	4.00	ug/Kg wet							
Benzene	2.66	4.00	ug/Kg wet							J
Benzo(a)pyrene	ND	4.00	ug/Kg wet							
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190025

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D (SIM) Semi-Volatile Organic Compounds										
Batch FE90601 - 3570										
Benzo(b)fluorene	ND	4.00	ug/Kg wet							
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
Benzo(c)fluorene	ND	4.00	ug/Kg wet							
Benzo(e)pyrene	ND	4.00	ug/Kg wet							
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet							
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet							
C1-Benzene	ND	4.00	ug/Kg wet							
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet							
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet							
C1-Fluorenes	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet							
C2-Benzenes	ND	4.00	ug/Kg wet							
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet							
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet							
C2-Fluorenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet							
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet							
C3-Fluorenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190025

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D (SIM) Semi-Volatile Organic Compounds										
Batch FE90601 - 3570										
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Carbazole	ND	4.00	ug/Kg wet							
Chrysene/triphenylene	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
Coronene	ND	4.00	ug/Kg wet							
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Dibenzothiophene	ND	4.00	ug/Kg wet							
Dimethyldiethyl lead	ND	4.00	ug/Kg wet							
Ethylbenzene	ND	4.00	ug/Kg wet							
Fluoranthene	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Methyltriethyl lead	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
o-Xylene	ND	4.00	ug/Kg wet							
Perylene	ND	4.00	ug/Kg wet							
Phenanthrene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
Pyrene	ND	4.00	ug/Kg wet							
Retene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
Styrene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
Tetraethyl lead	ND	4.00	ug/Kg wet							
Tetramethyl lead	ND	4.00	ug/Kg wet							
Toluene	2.10	4.00	ug/Kg wet							J
trans-Decalin	ND	4.00	ug/Kg wet							
Trimethylethyl lead	ND	4.00	ug/Kg wet							
Surrogate: Naphthalene-d8	*360*		ug/Kg wet	*400.0*		*90*	*50-120*			
Surrogate: Phenanthrene-d10	*417*		ug/Kg wet	*400.0*		*104*	*50-120*			
Surrogate: Toluene-D8	*390*		ug/Kg wet	*400.0*		*98*	*50-120*			
LCS										
1,2,3-Trimethylbenzene	400	4.00	ug/Kg wet	400.0		100	60-130			
1,2,4-Trimethylbenzene	400	4.00	ug/Kg wet	400.0		100	60-130			
1,3,5-Trimethylbenzene	391	4.00	ug/Kg wet	400.0		98	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190025

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D (SIM) Semi-Volatile Organic Compounds										
Batch FE90601 - 3570										
1-Methylnaphthalene	394	4.00	ug/Kg wet	400.0		98	60-130			
2-Methylnaphthalene	395	4.00	ug/Kg wet	400.0		99	60-130			
Acenaphthene	414	4.00	ug/Kg wet	400.0		104	60-130			
Acenaphthylene	399	4.00	ug/Kg wet	400.0		100	60-130			
Anthracene	397	4.00	ug/Kg wet	400.0		99	60-130			
Benz(a)anthracene	461	4.00	ug/Kg wet	400.0		115	60-130			
Benzene	351	4.00	ug/Kg wet	400.0		88	60-130			
Benzo(a)pyrene	452	4.00	ug/Kg wet	400.0		113	60-130			
Benzo(b)fluoranthene	471	4.00	ug/Kg wet	400.0		118	60-130			
Benzo(b)naphtho(2,1-d)thiophene	435	4.00	ug/Kg wet	400.0		109	60-130			
Benzo(b)thiophene	389	4.00	ug/Kg wet	400.0		97	60-130			
Benzo(e)pyrene	444	4.00	ug/Kg wet	400.0		111	60-130			
Benzo(g,h,i)perylene	415	4.00	ug/Kg wet	400.0		104	60-130			
Benzo(j/k)fluoranthene	445	4.00	ug/Kg wet	400.0		111	60-130			
Biphenyl	406	4.00	ug/Kg wet	400.0		101	60-130			
Chrysene/triphenylene	444	4.00	ug/Kg wet	400.0		111	60-130			
cis-Decalin	395	4.00	ug/Kg wet	400.0		99	60-130			
Coronene	373	4.00	ug/Kg wet	400.0		93	60-130			
Dibenzo(a,h)anthracene	434	4.00	ug/Kg wet	400.0		109	60-130			
Dibenzofuran	395	4.00	ug/Kg wet	400.0		99	60-130			
Dibenzothiophene	427	4.00	ug/Kg wet	400.0		107	60-130			
Ethylbenzene	399	4.00	ug/Kg wet	400.0		100	60-130			
Fluoranthene	459	4.00	ug/Kg wet	400.0		115	60-130			
Fluorene	409	4.00	ug/Kg wet	400.0		102	60-130			
Indeno(1,2,3-cd)pyrene	456	4.00	ug/Kg wet	400.0		114	60-130			
Isopropylbenzene	395	4.00	ug/Kg wet	400.0		99	60-130			
m,p-Xylene	395	4.00	ug/Kg wet	400.0		99	60-130			
Methylcyclohexane	243	4.00	ug/Kg wet	400.0		61	60-130			
Naphthalene	427	4.00	ug/Kg wet	400.0		107	60-130			
n-Butylbenzene	407	4.00	ug/Kg wet	400.0		102	60-130			
n-Propylbenzene	402	4.00	ug/Kg wet	400.0		100	60-130			
o-Xylene	403	4.00	ug/Kg wet	400.0		101	60-130			
Perylene	441	4.00	ug/Kg wet	400.0		110	60-130			
Phenanthrene	431	4.00	ug/Kg wet	400.0		108	60-130			
p-Isopropyltoluene	418	4.00	ug/Kg wet	400.0		105	60-130			
Pyrene	453	4.00	ug/Kg wet	400.0		113	60-130			
Retene	437	4.00	ug/Kg wet	400.0		109	60-130			
sec-Butylbenzene	399	4.00	ug/Kg wet	400.0		100	60-130			
Styrene	366	4.00	ug/Kg wet	400.0		92	60-130			
t-Butylbenzene	409	4.00	ug/Kg wet	400.0		102	60-130			
Tetraethyl lead	430	4.00	ug/Kg wet	400.0		108	60-130			
Toluene	395	4.00	ug/Kg wet	400.0		99	60-130			
trans-Decalin	383	4.00	ug/Kg wet	400.0		96	60-130			
Surrogate: Naphthalene-d8	*381*		ug/Kg wet	*400.0*		*95*	*50-120*			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190025

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D (SIM) Semi-Volatile Organic Compounds										
Batch FE90601 - 3570										
Surrogate: Phenanthrene-d10	*435*		ug/Kg wet	*400.0*		*109*	*50-120*			
Surrogate: Toluene-D8	*393*		ug/Kg wet	*400.0*		*98*	*50-120*			
Duplicate **Source: F190025-08**										
1,2,3-Trimethylbenzene	8.72	4.49	ug/Kg dry		8.21			6	50	
1,2,4-Trimethylbenzene	9.92	4.49	ug/Kg dry		11.8			17	50	
1,3,5-Trimethylbenzene	5.04	4.49	ug/Kg dry		5.17			2	50	
1-Methyldibenzothiophene	12.6	4.49	ug/Kg dry		16.6			27	50	
1-Methylnaphthalene	24.1	4.49	ug/Kg dry		35.5			38	50	
1-Methylphenanthrene	81.3	4.49	ug/Kg dry		118			36	50	
1-Methylpyrene	84.1	4.49	ug/Kg dry		126			40	50	
2,3,5-Trimethylnaphthene	5.77	4.49	ug/Kg dry		6.18			7	50	
2,6-Dimethylnaphthalene	48.3	4.49	ug/Kg dry		48.0			0.6	50	
2/3-Methyldibenzothiophene	28.2	4.49	ug/Kg dry		40.6			36	50	
2-Methylanthracene	63.4	4.49	ug/Kg dry		85.4			30	50	
2-Methylnaphthalene	32.5	4.49	ug/Kg dry		53.9			50	50	
2-Methylphenanthrene	145	4.49	ug/Kg dry		184			24	50	
2-Methylpyrene	112	4.49	ug/Kg dry		173			43	50	
3-Methylphenanthrene	118	4.49	ug/Kg dry		143			19	50	
4/9-Methylphenanthrene	127	4.49	ug/Kg dry		151			17	50	
4-Methyldibenzothiophene	31.2	4.49	ug/Kg dry		41.4			28	50	
4-Methylpyrene	100	4.49	ug/Kg dry		149			40	50	
Acenaphthene	74.8	4.49	ug/Kg dry		107			35	50	
Acenaphthylene	221	4.49	ug/Kg dry		306			32	50	
Anthracene	308	4.49	ug/Kg dry		447			37	50	
Benz(a)anthracene	910	4.49	ug/Kg dry		1520			50	50	
Benzene	162	4.49	ug/Kg dry		124			26	50	
Benzo(a)pyrene	1050	4.49	ug/Kg dry		1700			47	50	
Benzo(b)fluoranthene	833	4.49	ug/Kg dry		1330			46	50	
Benzo(b)fluorene	81.0	4.49	ug/Kg dry		118			37	50	
Benzo(b)naphtho(2,1-d)thiophene	150	4.49	ug/Kg dry		226			40	50	
Benzo(b)thiophene	6.05	4.49	ug/Kg dry		6.55			8	50	
Benzo(c)fluorene	33.6	4.49	ug/Kg dry		56.8			51	50	D+
Benzo(e)pyrene	721	4.49	ug/Kg dry		1140			45	50	
Benzo(g,h,i)perylene	583	4.49	ug/Kg dry		949			48	50	
Benzo(j/k)fluoranthene	843	4.49	ug/Kg dry		1350			46	50	
Biphenyl	24.0	4.49	ug/Kg dry		24.1			0.6	50	
C0-Benzonaphthothiophenes	269	4.49	ug/Kg dry		414			42	50	
C1-Benzene	113	4.49	ug/Kg dry		90.1			22	50	
C1-Benzo(a)anthracenes/Chrysenes	434	4.49	ug/Kg dry		629			37	50	
C1-Benzo(b)thiophenes	14.8	4.49	ug/Kg dry		183			170	50	D+
C1-Benzonaphthothiophenes	160	4.49	ug/Kg dry		215			29	50	
C1-Decalins	12.5	4.49	ug/Kg dry		7.42			51	50	D+
C1-Dibenzothiophenes	89.0	4.49	ug/Kg dry		123			32	50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190025

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch FE90601 - 3570										
C1-Fluoranthenes/Pyrenes	783	4.49	ug/Kg dry		1190			42	50	
C1-Fluorenes	50.4	4.49	ug/Kg dry		63.6			23	50	
C1-Naphthalenes	35.7	4.49	ug/Kg dry		56.7			45	50	
C1-Phenanthrenes/Anthracenes	639	4.49	ug/Kg dry		710			10	50	
C2-Benzenes	127	4.49	ug/Kg dry		103			21	50	
C2-Benzo(a)anthracenes/Chrysenes	234	4.49	ug/Kg dry		291			21	50	
C2-Benzo(b)thiophenes	18.0	4.49	ug/Kg dry		18.7			4	50	
C2-Benzonaphthothiophenes	161	4.49	ug/Kg dry		158			2	50	
C2-Decalins	15.0	4.49	ug/Kg dry		12.1			21	50	
C2-Dibenzothiophenes	86.4	4.49	ug/Kg dry		127			38	50	
C2-Fluoranthenes/Pyrenes	438	4.49	ug/Kg dry		613			33	50	
C2-Fluorenes	43.0	4.49	ug/Kg dry		39.2			9	50	
C2-Naphthalenes	102	4.49	ug/Kg dry		130			24	50	
C2-Phenanthrenes/Anthracenes	278	4.49	ug/Kg dry		386			33	50	
C3-Benzenes	28.8	4.49	ug/Kg dry		28.9			0.5	50	
C3-Benzo(a)anthracenes/Chrysenes	138	4.49	ug/Kg dry		152			9	50	
C3-Benzo(b)thiophenes	10.7	4.49	ug/Kg dry		11.5			7	50	
C3-Benzonaphthothiophenes	142	4.49	ug/Kg dry		122			15	50	
C3-Decalins	12.8	4.49	ug/Kg dry		7.79			48	50	
C3-Dibenzothiophenes	60.9	4.49	ug/Kg dry		81.7			29	50	
C3-Fluoranthenes/Pyrenes	207	4.49	ug/Kg dry		256			21	50	
C3-Fluorenes	110	4.49	ug/Kg dry		132			18	50	
C3-Naphthalenes	75.3	4.49	ug/Kg dry		96.2			24	50	
C3-Phenanthrenes/Anthracenes	119	4.49	ug/Kg dry		146			21	50	
C4-Benzenes	23.5	4.49	ug/Kg dry		21.9			7	50	
C4-Benzo(a)anthracenes/Chrysenes	84.6	4.49	ug/Kg dry		81.3			4	50	
C4-Benzo(b)thiophenes	5.30	4.49	ug/Kg dry		6.05			13	50	
C4-Benzonaphthothiophenes	79.9	4.49	ug/Kg dry		64.7			21	50	
C4-Decalins	30.7	4.49	ug/Kg dry		13.6			77	50	D+
C4-Dibenzothiophenes	46.3	4.49	ug/Kg dry		40.8			12	50	
C4-Naphthalenes	41.0	4.49	ug/Kg dry		48.6			17	50	
C4-Phenanthrenes/Anthracenes	53.7	4.49	ug/Kg dry		57.6			7	50	
C5-Benzenes	14.2	4.49	ug/Kg dry		13.9			3	50	
Carbazole	72.5	4.49	ug/Kg dry		101			33	50	
Chrysene/triphenylene	964	4.49	ug/Kg dry		1570			48	50	
cis-Decalin	ND	4.49	ug/Kg dry		ND				50	
Coronene	142	4.49	ug/Kg dry		228			46	50	
Dibenzo(a,h)anthracene	152	4.49	ug/Kg dry		247			48	50	
Dibenzofuran	29.7	4.49	ug/Kg dry		52.5			55	50	D+
Dibenzothiophene	75.0	4.49	ug/Kg dry		103			32	50	
Dimethyldiethyl lead	ND	4.49	ug/Kg dry		ND				50	
Ethylbenzene	17.7	4.49	ug/Kg dry		18.3			4	50	
Fluoranthene	1820	4.49	ug/Kg dry		2880			45	50	
Fluorene	75.2	4.49	ug/Kg dry		114			41	50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190025

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D (SIM) Semi-Volatile Organic Compounds										
Batch FE90601 - 3570										
Indeno(1,2,3-cd)pyrene	677	4.49	ug/Kg dry		1100			48	50	
Isopropylbenzene	ND	4.49	ug/Kg dry		ND				50	
m,p-Xylene	227	4.49	ug/Kg dry		183			22	50	
Methylcyclohexane	5.47	4.49	ug/Kg dry		5.24			4	50	
Methyltriethyl lead	ND	4.49	ug/Kg dry		ND				50	
Naphthalene	70.9	4.49	ug/Kg dry		109			43	50	
n-Butylbenzene	21.1	4.49	ug/Kg dry		19.7			7	50	
n-Propylbenzene	14.7	4.49	ug/Kg dry		13.5			9	50	
o-Xylene	13.8	4.49	ug/Kg dry		12.7			8	50	
Perylene	271	4.49	ug/Kg dry		416			42	50	
Phenanthrene	832	4.49	ug/Kg dry		1230			39	50	
p-Isopropyltoluene	8.00	4.49	ug/Kg dry		5.98			29	50	
Pyrene	1840	4.49	ug/Kg dry		2870			44	50	
Retene	37.0	4.49	ug/Kg dry		32.0			15	50	
sec-Butylbenzene	ND	4.49	ug/Kg dry		ND				50	
Styrene	25.8	4.49	ug/Kg dry		22.5			14	50	
t-Butylbenzene	ND	4.49	ug/Kg dry		ND				50	
Tetraethyl lead	ND	4.49	ug/Kg dry		ND				50	
Tetramethyl lead	ND	4.49	ug/Kg dry		ND				50	
Toluene	182	4.49	ug/Kg dry		145			23	50	
trans-Decalin	6.32	4.49	ug/Kg dry		3.38			61	50	D+
Trimethylethyl lead	ND	4.49	ug/Kg dry		ND				50	
Surrogate: Naphthalene-d8	*373*		ug/Kg dry	*448.6*		*83*	*50-120*			
Surrogate: Phenanthrene-d10	*423*		ug/Kg dry	*448.6*		*94*	*50-120*			
Surrogate: Toluene-D8	*341*		ug/Kg dry	*448.6*		*76*	*50-120*			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F190025

Notes and Definitions

U	Analyte included in the analysis, but not detected
J	Reported between MDL and MRL
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190025

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) F1900255

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

Preservative

None | None | None

Sample Handling

Samples Field Filtered: YES NO (NA)

Sampled Shipped With Ice: (YES) NO

MCP PRESUMPTIVE CERTAINTY REQUIRED -- (YES) NO

If Yes, Are MCP Analytical Methods Required? (YES) NO NA

Are Drinking Water Samples Submitted? YES (NO) NA

If Yes, Have Drinking Water Sampling Requirements Been Met? YES NO (NA)

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Analysis: Parent and Alkylated MAHs & PAHs 8270**	Analysis: TOC by Lloyd-Kahn	Sample Specific Remarks
1	1804576-SS656	4/24/2019	1050	Soil/Sed	1	CWS	x	x	HOLD
2	1804576-SS657	4/24/2019	1055	Soil/Sed	1	CWS	x	x	HOLD
3	1804576-SS658	4/24/2019	1100	Soil/Sed	1	CWS	x	x	HOLD
4	1804576-SS659	4/24/2019	0920	Soil/Sed	1	CWS	x	x	HOLD
5	1804576-SS660	4/24/2019	0915	Soil/Sed	1	CWS	x	x	HOLD
6	1804576-SS661	4/24/2019	0905	Soil/Sed	1	CWS	x	x	HOLD
7	1804576-SS662	4/23/2019	1025	Soil/Sed	1	CWS	x	x	HOLD
8	1804576-SS663	4/23/2019	1030	Soil/Sed	1	CWS	x	x	HOLD

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1. Will Reglock for Christos Saledas	4/24/2019	1600	1. GEI Sample Fridge
Relinquished by: (signature)	Date:	Time:	Received by: (signature)
2. GEI Sample Fridge	4/25/19	1418	2. Molly Mee
Relinquished by: (signature)	Date:	Time:	Received by: (signature)
3. Molly Mee	4/25/19	1418	3.
Relinquished by: (signature)	Date:	Time:	Received by: (signature)
4.	4/25/19	17:06	4. 4/26/19 17:45

Turnaround Time (Business days):

Normal ___x___ Other ___

10-Day _____ 7-Day _____

5-Day _____ 3-Day _____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

**Parent and Alkylated MAHs & PAHs (34) by GC/MS/SIM/SCAN

ice temp.: 1.1

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

Shipped/Delivered Via: ESS Courier

ESS Project ID: F190025
Date Received: 4/26/2019
Project Due Date: 5/26/2019
Days for Project: Hold

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 1.1 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. Were labs informed about short holds & rushes? Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA
13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

Sample 2 label says "47" time corresponds to correct "57" Sample

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Ryan Hoffman Date: 4/26/19 Time: 11:30 By: DGSc.

Client contacted to confirm analysis and discrepancy between COC and sample container.

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	338350	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
02	338349	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
03	338348	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
04	338347	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
05	338346	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
06	338345	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
07	338344	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
08	338343	Yes	NA	Yes	8 oz. Jar - Unpres	NP	

2nd Review

Initials

	Yes / No
Were all containers scanned into storage/lab?	
Are barcode labels on correct containers?	Yes / No / NA
Are all Flashpoint stickers attached/container ID # circled?	Yes / No / NA
Are all Hex Chrome stickers attached?	Yes / No / NA
Are all QC stickers attached?	Yes / No / NA
Are VOA stickers attached if bubbles noted?	Yes / No / NA

Completed By: Date & Time: 4/26/19 9:44

Reviewed By: Date & Time: 4/26/19 @ 11:15

Delivered

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

ESS Project ID: F190025

Date Received: 4/26/2019

By: [signature] 4/26/19 @ 11:15

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (044752)
ESS Laboratory Work Order Number: F190039

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 2:05 pm, Sep 30, 2019

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses

ESS Laboratory - Cranston, RI	Black Carbon

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190039

SAMPLE RECEIPT

The following samples were received on September 13, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F190039-01	1804576-SS-678-S4	Sediment	8270 Mod, TOC-LK
F190039-02	1804576-SS-679-S1	Sediment	8270 Mod, TOC-LK
F190039-03	1804576-SS-679-S4	Sediment	8270 Mod, TOC-LK
F190039-04	1804576-SS-679-S5	Sediment	8270 Mod, TOC-LK
F190039-05	1804576-SS-680-S1	Sediment	8270 Mod, TOC-LK
F190039-06	1804576-SS-680-S4	Sediment	8270 Mod, TOC-LK
F190039-07	1804576-SS-680-S5	Sediment	8270 Mod, TOC-LK
F190039-08	1804576-SS-681-S1	Sediment	8270 Mod, TOC-LK
F190039-09	1804576-SS-681-S3	Sediment	8270 Mod, TOC-LK
F190039-10	1804576-SS-681-S4	Sediment	8270 Mod, TOC-LK
F190039-11	1804576-SS-682-S2	Sediment	8270 Mod, TOC-LK
F190039-12	1804576-SS-682-S3	Sediment	8270 Mod, TOC-LK
F190039-13	1804576-SS-683-S2	Sediment	8270 Mod, TOC-LK
F190039-14	1804576-SS-683-S4	Sediment	8270 Mod, TOC-LK
F190039-15	1804576-SS-683-S5	Sediment	8270 Mod, TOC-LK
F190039-16	1804576-SS-684-S2	Sediment	8270 Mod, TOC-LK
F190039-17	1804576-SS-684-S4	Sediment	8270 Mod, TOC-LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190039

PROJECT NARRATIVE

8270D (SIM) Semi-Volatile Organic Compounds

F190039-01	**Surrogate recovery(ies) outside of criteria due to matrix (UCM/coelution/matrix is present) (SM).**
	Perylene-d12 (155% @ 50-120%)
F190039-02	**Present in Method Blank (B).**
	C-18 , Phytane
F190039-07	**Surrogate recovery(ies) outside of criteria due to matrix (UCM/coelution/matrix is present) (SM).**
	Perylene-d12 (213% @ 50-120%)
F190039-09	**Surrogate recovery(ies) outside of criteria due to matrix (UCM/coelution/matrix is present) (SM).**
	Perylene-d12 (146% @ 50-120%)
F190039-12	**Present in Method Blank (B).**
	C-18
F190039-14	**Present in Method Blank (B).**
	C-18
FI91601-BS2	**Blank Spike recovery is below lower control limit (B-).**
	Methylcyclohexane (49% @ 60-130%)

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190039

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-678-S4
Date Sampled: 09/11/19 13:23
Percent Solids: 62
Initial Volume: 5.92
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-01
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**239** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
C1-Benzene	**503** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
C2-Benzenes	**393** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
C3-Benzenes	**421** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
C4-Benzenes	**2610** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
C5-Benzenes	**3140** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
Methylcyclohexane	**31.6** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
Toluene	**848** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
Ethylbenzene	**356** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
m,p-Xylene	**436** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
Styrene	**919** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
o-Xylene	**63.0** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
Isopropylbenzene	**J 23.1** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
n-Propylbenzene	**33.8** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
1,3,5-Trimethylbenzene	**137** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
1,2,3-Trimethylbenzene	**75.7** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
1,2,4-Trimethylbenzene	**212** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
t-Butylbenzene	ND (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
sec-Butylbenzene	**J 16.4** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
p-Isopropyltoluene	**105** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
n-Butylbenzene	ND (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
trans-Decalin	**180** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
cis-Decalin	**41.9** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
C1-Decalins	**639** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
C2-Decalins	**1170** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
C3-Decalins	**1330** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
C4-Decalins	**2380** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
Benzo(b)thiophene	**341** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
C1-Benzo(b)thiophenes	**2150** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
C2-Benzo(b)thiophenes	**10300** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
C3-Benzo(b)thiophenes	**8750** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
C4-Benzo(b)thiophenes	**2670** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-678-S4
Date Sampled: 09/11/19 13:23
Percent Solids: 62
Initial Volume: 5.92
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-01
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**10200** (549)	275	8270 Mod		100	09/20/19 22:31	F9I0007	FI91601
2-Methylnaphthalene	**5370** (549)	275	8270 Mod		100	09/20/19 22:31	F9I0007	FI91601
1-Methylnaphthalene	**80900** (549)	275	8270 Mod		100	09/20/19 22:31	F9I0007	FI91601
C1-Naphthalenes	**52900** (549)	275	8270 Mod		100	09/20/19 22:31	F9I0007	FI91601
C2-Naphthalenes	**182000** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
C3-Naphthalenes	**95900** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
C4-Naphthalenes	**29000** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
Biphenyl	**2730** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
Acenaphthylene	**18700** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
Acenaphthene	**309000** (549)	275	8270 Mod		100	09/20/19 22:31	F9I0007	FI91601
Dibenzofuran	**13300** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
Fluorene	**149000** (549)	275	8270 Mod		100	09/20/19 22:31	F9I0007	FI91601
C1-Fluorenes	**69400** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
C2-Fluorenes	**43400** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
C3-Fluorenes	**16200** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
Dibenzothiophene	**51900** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
C1-Dibenzothiophenes	**46000** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
C2-Dibenzothiophenes	**29800** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
C3-Dibenzothiophenes	**13300** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
C4-Dibenzothiophenes	**4550** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
Phenanthrene	**669000** (549)	275	8270 Mod		100	09/20/19 22:31	F9I0007	FI91601
Anthracene	**201000** (549)	275	8270 Mod		100	09/20/19 22:31	F9I0007	FI91601
C1-Phenanthrenes/Anthracenes	**313000** (549)	275	8270 Mod		100	09/20/19 22:31	F9I0007	FI91601
C2-Phenanthrenes/Anthracenes	**102000** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
C3-Phenanthrenes/Anthracenes	**28300** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
C4-Phenanthrenes/Anthracenes	**7460** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
Retene	**1030** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
Benzo(b)naphtho(2,1-d)thiophene	**17100** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
C0-Benzonaphthothiophenes	**30600** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
C1-Benzonaphthothiophenes	**18800** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
C2-Benzonaphthothiophenes	**8640** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
C3-Benzonaphthothiophenes	**4360** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-678-S4
Date Sampled: 09/11/19 13:23
Percent Solids: 62
Initial Volume: 5.92
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-01
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**938** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
Fluoranthene	**295000** (549)	275	8270 Mod		100	09/20/19 22:31	F9I0007	FI91601
Pyrene	**421000** (549)	275	8270 Mod		100	09/20/19 22:31	F9I0007	FI91601
C1-Fluoranthenes/Pyrenes	**193000** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
C2-Fluoranthenes/Pyrenes	**51100** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
C3-Fluoranthenes/Pyrenes	**14500** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
Benzo(b)fluorene	**22500** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
Benzo(c)fluorene	**7510** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
2-Methylpyrene	**23900** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
4-Methylpyrene	**22100** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
1-Methylpyrene	**26200** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
Benz(a)anthracene	**132000** (549)	275	8270 Mod		100	09/20/19 22:31	F9I0007	FI91601
Chrysene/triphenylene	**125000** (549)	275	8270 Mod		100	09/20/19 22:31	F9I0007	FI91601
C1-Benzo(a)anthracenes/Chrysenes	**62700** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
C2-Benzo(a)anthracenes/Chrysenes	**24800** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
C3-Benzo(a)anthracenes/Chrysenes	**7280** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
C4-Benzo(a)anthracenes/Chrysenes	**2650** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
Benzo(b)fluoranthene	**49500** (549)	275	8270 Mod		100	09/20/19 22:31	F9I0007	FI91601
Benzo(j/k)fluoranthene	**70500** (549)	275	8270 Mod		100	09/20/19 22:31	F9I0007	FI91601
Benzo(e)pyrene	**61100** (549)	275	8270 Mod		100	09/20/19 22:31	F9I0007	FI91601
Benzo(a)pyrene	**106000** (549)	275	8270 Mod		100	09/20/19 22:31	F9I0007	FI91601
Perylene	**16900** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
Indeno(1,2,3-cd)pyrene	**39300** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
Dibenzo(a,h)anthracene	**11200** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
Benzo(g,h,i)perylene	**49100** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
Coronene	**14700** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
Tetramethyl lead	ND (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
Trimethylethyl lead	ND (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
Dimethyldiethyl lead	ND (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
Methyltriethyl lead	ND (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
Tetraethyl lead	ND (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
2,6,10-trimethyldodecane (1380)	**2580** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-678-S4
Date Sampled: 09/11/19 13:23
Percent Solids: 62
Initial Volume: 5.92
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-01
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**5110** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
2,6,10-trimethylpentadecane (1650)	**9510** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
C-17	ND (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
Pristane	**20600** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
C-18	ND (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
Phytane	**21200** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
Carbazole	**419** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
2,6-Dimethylnaphthalene	**34400** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
2,3,5-Trimethylnaphthene	**6370** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
4-Methyldibenzothiophene	**19000** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
2/3-Methyldibenzothiophene	**15700** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
1-Methyldibenzothiophene	**4470** (27.5)	13.7	8270 Mod		5	09/19/19 21:54	F9I0007	FI91601
3-Methylphenanthrene	**72500** (549)	275	8270 Mod		100	09/20/19 22:31	F9I0007	FI91601
2-Methylphenanthrene	**78300** (549)	275	8270 Mod		100	09/20/19 22:31	F9I0007	FI91601
2-Methylanthracene	**31200** (549)	275	8270 Mod		100	09/20/19 22:31	F9I0007	FI91601
4/9-Methylphenanthrene	**68800** (549)	275	8270 Mod		100	09/20/19 22:31	F9I0007	FI91601
1-Methylphenanthrene	**50000** (549)	275	8270 Mod		100	09/20/19 22:31	F9I0007	FI91601

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*80 %*		*50-120*
Surrogate: Perylene-d12	*155 %*	*SM*	*50-120*
Surrogate: Phenanthrene-d10	*80 %*		*50-120*
Surrogate: Toluene-D8	*69 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-678-S4
Date Sampled: 09/11/19 13:23
Percent Solids: 62

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-01
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**87400** (118)		TOC-LK		1	CCP	09/19/19 15:40	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-679-S1
Date Sampled: 09/11/19 14:35
Percent Solids: 78
Initial Volume: 6.2
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-02
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**24.2** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C1-Benzene	**27.6** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C2-Benzenes	**68.2** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C3-Benzenes	**17.0** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C4-Benzenes	**13.5** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C5-Benzenes	ND (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
Methylcyclohexane	**44.3** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
Toluene	**53.4** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
Ethylbenzene	**6.04** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
m,p-Xylene	**139** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
Styrene	**24.1** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
o-Xylene	**4.88** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
Isopropylbenzene	ND (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
n-Propylbenzene	**J 4.05** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
1,3,5-Trimethylbenzene	**22.3** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
1,2,3-Trimethylbenzene	**5.66** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
1,2,4-Trimethylbenzene	**9.78** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
t-Butylbenzene	ND (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
sec-Butylbenzene	ND (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
p-Isopropyltoluene	**17.0** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
n-Butylbenzene	**6.13** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
trans-Decalin	**4.75** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
cis-Decalin	ND (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C1-Decalins	**12.8** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C2-Decalins	**21.6** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C3-Decalins	**13.7** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C4-Decalins	ND (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
Benzo(b)thiophene	**4.88** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C1-Benzo(b)thiophenes	**6.73** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C2-Benzo(b)thiophenes	**10.1** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C3-Benzo(b)thiophenes	**8.67** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C4-Benzo(b)thiophenes	**8.24** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-679-S1
Date Sampled: 09/11/19 14:35
Percent Solids: 78
Initial Volume: 6.2
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-02
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**73.2** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
2-Methylnaphthalene	**45.8** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
1-Methylnaphthalene	**36.6** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C1-Naphthalenes	**51.2** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C2-Naphthalenes	**93.9** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C3-Naphthalenes	**98.6** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C4-Naphthalenes	**85.3** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
Biphenyl	**17.0** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
Acenaphthylene	**308** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
Acenaphthene	**86.0** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
Dibenzofuran	**54.1** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
Fluorene	**114** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C1-Fluorenes	**95.0** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C2-Fluorenes	**109** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C3-Fluorenes	**181** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
Dibenzothiophene	**85.3** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C1-Dibenzothiophenes	**176** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C2-Dibenzothiophenes	**249** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C3-Dibenzothiophenes	**147** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C4-Dibenzothiophenes	**62.5** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
Phenanthrene	**1010** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
Anthracene	**485** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C1-Phenanthrenes/Anthracenes	**1290** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C2-Phenanthrenes/Anthracenes	**991** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C3-Phenanthrenes/Anthracenes	**378** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C4-Phenanthrenes/Anthracenes	**120** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
Retene	**32.1** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
Benzo(b)naphtho(2,1-d)thiophene	**321** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C0-Benzonaphthothiophenes	**604** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C1-Benzonaphthothiophenes	**406** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C2-Benzonaphthothiophenes	**243** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C3-Benzonaphthothiophenes	**152** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-679-S1
Date Sampled: 09/11/19 14:35
Percent Solids: 78
Initial Volume: 6.2
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-02
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**76.5** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
Fluoranthene	**3490** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
Pyrene	**3900** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C1-Fluoranthenes/Pyrenes	**2080** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C2-Fluoranthenes/Pyrenes	**1300** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C3-Fluoranthenes/Pyrenes	**565** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
Benzo(b)fluorene	**122** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
Benzo(c)fluorene	**65.6** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
2-Methylpyrene	**370** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
4-Methylpyrene	**317** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
1-Methylpyrene	**266** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
Benz(a)anthracene	**2660** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
Chrysene/triphenylene	**2430** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C1-Benzo(a)anthracenes/Chrysenes	**1490** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C2-Benzo(a)anthracenes/Chrysenes	**682** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C3-Benzo(a)anthracenes/Chrysenes	**279** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C4-Benzo(a)anthracenes/Chrysenes	**159** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
Benzo(b)fluoranthene	**1790** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
Benzo(j/k)fluoranthene	**1790** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
Benzo(e)pyrene	**1560** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
Benzo(a)pyrene	**2420** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
Perylene	**550** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
Indeno(1,2,3-cd)pyrene	**1140** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
Dibenzo(a,h)anthracene	**415** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
Benzo(g,h,i)perylene	**1300** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
Coronene	**324** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
Tetramethyl lead	ND (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
Trimethylethyl lead	ND (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
Dimethyldiethyl lead	ND (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
Methyltriethyl lead	ND (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
Tetraethyl lead	ND (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
2,6,10-trimethyldodecane (1380)	**21.3** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-679-S1
Date Sampled: 09/11/19 14:35
Percent Solids: 78
Initial Volume: 6.2
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-02
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**50.5** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
2,6,10-trimethylpentadecane (1650)	**27.8** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C-17	**123** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
Pristane	**77.7** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
C-18	**B 83.1** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
Phytane	**B 71.4** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
Carbazole	**70.5** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
2,6-Dimethylnaphthalene	**24.9** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
2,3,5-Trimethylnaphthene	**7.15** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
4-Methyldibenzothiophene	**68.0** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
2/3-Methyldibenzothiophene	**58.1** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
1-Methyldibenzothiophene	**19.2** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
3-Methylphenanthrene	**254** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
2-Methylphenanthrene	**297** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
2-Methylanthracene	**180** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
4/9-Methylphenanthrene	**324** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601
1-Methylphenanthrene	**209** (4.14)	2.07	8270 Mod		1	09/19/19 23:15	F9I0007	FI91601

	%Recovery	*Qualifier*	*Limits*
Surrogate: Naphthalene-d8	*73 %*		*50-120*
Surrogate: Perylene-d12	*80 %*		*50-120*
Surrogate: Phenanthrene-d10	*79 %*		*50-120*
Surrogate: Toluene-D8	*62 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-679-S1
Date Sampled: 09/11/19 14:35
Percent Solids: 78

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-02
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**22500** (109)		TOC-LK		1	CCP	09/19/19 16:46	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-679-S4
Date Sampled: 09/11/19 14:49
Percent Solids: 66
Initial Volume: 5.42
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-03
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**55.7** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
C1-Benzene	**205** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
C2-Benzenes	**287** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
C3-Benzenes	**645** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
C4-Benzenes	**2380** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
C5-Benzenes	**1600** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
Methylcyclohexane	**42.6** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
Toluene	**331** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
Ethylbenzene	**279** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
m,p-Xylene	**343** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
Styrene	**118** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
o-Xylene	**46.8** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
Isopropylbenzene	**43.5** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
n-Propylbenzene	**63.4** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
1,3,5-Trimethylbenzene	**144** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
1,2,3-Trimethylbenzene	**82.3** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
1,2,4-Trimethylbenzene	**347** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
t-Butylbenzene	ND (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
sec-Butylbenzene	**14.8** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
p-Isopropyltoluene	**169** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
n-Butylbenzene	ND (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
trans-Decalin	**57.6** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
cis-Decalin	**22.2** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
C1-Decalins	**266** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
C2-Decalins	**620** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
C3-Decalins	**618** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
C4-Decalins	**1220** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
Benzo(b)thiophene	**264** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
C1-Benzo(b)thiophenes	**966** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
C2-Benzo(b)thiophenes	**2020** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
C3-Benzo(b)thiophenes	**1210** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
C4-Benzo(b)thiophenes	**342** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-679-S4
Date Sampled: 09/11/19 14:49
Percent Solids: 66
Initial Volume: 5.42
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-03
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**16700** (112)	55.8	8270 Mod		20	09/20/19 23:54	F9I0007	FI91601
2-Methylnaphthalene	**9250** (112)	55.8	8270 Mod		20	09/20/19 23:54	F9I0007	FI91601
1-Methylnaphthalene	**45600** (112)	55.8	8270 Mod		20	09/20/19 23:54	F9I0007	FI91601
C1-Naphthalenes	**32900** (112)	55.8	8270 Mod		20	09/20/19 23:54	F9I0007	FI91601
C2-Naphthalenes	**67800** (112)	55.8	8270 Mod		20	09/20/19 23:54	F9I0007	FI91601
C3-Naphthalenes	**28500** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
C4-Naphthalenes	**7980** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
Biphenyl	**3010** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
Acenaphthylene	**2780** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
Acenaphthene	**62500** (112)	55.8	8270 Mod		20	09/20/19 23:54	F9I0007	FI91601
Dibenzofuran	**3760** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
Fluorene	**32200** (112)	55.8	8270 Mod		20	09/20/19 23:54	F9I0007	FI91601
C1-Fluorenes	**17100** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
C2-Fluorenes	**11000** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
C3-Fluorenes	**4410** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
Dibenzothiophene	**4930** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
C1-Dibenzothiophenes	**5880** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
C2-Dibenzothiophenes	**4270** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
C3-Dibenzothiophenes	**2080** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
C4-Dibenzothiophenes	**683** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
Phenanthrene	**99600** (112)	55.8	8270 Mod		20	09/20/19 23:54	F9I0007	FI91601
Anthracene	**30700** (112)	55.8	8270 Mod		20	09/20/19 23:54	F9I0007	FI91601
C1-Phenanthrenes/Anthracenes	**63400** (112)	55.8	8270 Mod		20	09/20/19 23:54	F9I0007	FI91601
C2-Phenanthrenes/Anthracenes	**24300** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
C3-Phenanthrenes/Anthracenes	**7140** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
C4-Phenanthrenes/Anthracenes	**2020** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
Retene	**918** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
Benzo(b)naphtho(2,1-d)thiophene	**1840** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
C0-Benzonaphthothiophenes	**3260** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
C1-Benzonaphthothiophenes	**2700** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
C2-Benzonaphthothiophenes	**1470** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
C3-Benzonaphthothiophenes	**714** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-679-S4
Date Sampled: 09/11/19 14:49
Percent Solids: 66
Initial Volume: 5.42
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-03
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**158** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
Fluoranthene	**33700** (112)	55.8	8270 Mod		20	09/20/19 23:54	F9I0007	FI91601
Pyrene	**49500** (112)	55.8	8270 Mod		20	09/20/19 23:54	F9I0007	FI91601
C1-Fluoranthenes/Pyrenes	**33300** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
C2-Fluoranthenes/Pyrenes	**11000** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
C3-Fluoranthenes/Pyrenes	**3500** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
Benzo(b)fluorene	**3820** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
Benzo(c)fluorene	**1340** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
2-Methylpyrene	**4350** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
4-Methylpyrene	**3930** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
1-Methylpyrene	**4230** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
Benz(a)anthracene	**17600** (112)	55.8	8270 Mod		20	09/20/19 23:54	F9I0007	FI91601
Chrysene/triphenylene	**16300** (112)	55.8	8270 Mod		20	09/20/19 23:54	F9I0007	FI91601
C1-Benzo(a)anthracenes/Chrysenes	**12800** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
C2-Benzo(a)anthracenes/Chrysenes	**6010** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
C3-Benzo(a)anthracenes/Chrysenes	**1990** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
C4-Benzo(a)anthracenes/Chrysenes	**671** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
Benzo(b)fluoranthene	**7160** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
Benzo(j/k)fluoranthene	**7140** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
Benzo(e)pyrene	**7100** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
Benzo(a)pyrene	**11900** (112)	55.8	8270 Mod		20	09/20/19 23:54	F9I0007	FI91601
Perylene	**2360** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
Indeno(1,2,3-cd)pyrene	**4440** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
Dibenzo(a,h)anthracene	**1730** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
Benzo(g,h,i)perylene	**5310** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
Coronene	**1370** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
Tetramethyl lead	ND (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
Trimethylethyl lead	ND (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
Dimethyldiethyl lead	ND (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
Methyltriethyl lead	ND (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
Tetraethyl lead	ND (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
2,6,10-trimethyldodecane (1380)	**504** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-679-S4
Date Sampled: 09/11/19 14:49
Percent Solids: 66
Initial Volume: 5.42
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-03
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**1180** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
2,6,10-trimethylpentadecane (1650)	**1190** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
C-17	**519** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
Pristane	**2100** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
C-18	**446** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
Phytane	**2150** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
Carbazole	**117** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
2,6-Dimethylnaphthalene	**15500** (112)	55.8	8270 Mod		20	09/20/19 23:54	F9I0007	FI91601
2,3,5-Trimethylnaphthene	**1690** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
4-Methyldibenzothiophene	**2390** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
2/3-Methyldibenzothiophene	**1950** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
1-Methyldibenzothiophene	**488** (5.58)	2.79	8270 Mod		1	09/20/19 0:37	F9I0007	FI91601
3-Methylphenanthrene	**14900** (112)	55.8	8270 Mod		20	09/20/19 23:54	F9I0007	FI91601
2-Methylphenanthrene	**15700** (112)	55.8	8270 Mod		20	09/20/19 23:54	F9I0007	FI91601
2-Methylanthracene	**6550** (112)	55.8	8270 Mod		20	09/20/19 23:54	F9I0007	FI91601
4/9-Methylphenanthrene	**14000** (112)	55.8	8270 Mod		20	09/20/19 23:54	F9I0007	FI91601
1-Methylphenanthrene	**10300** (112)	55.8	8270 Mod		20	09/20/19 23:54	F9I0007	FI91601

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*75 %*		*50-120*
Surrogate: Perylene-d12	*96 %*		*50-120*
Surrogate: Phenanthrene-d10	*76 %*		*50-120*
Surrogate: Toluene-D8	*61 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-679-S4
Date Sampled: 09/11/19 14:49
Percent Solids: 66

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-03
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**117000** (117)		TOC-LK		1	CCP	09/19/19 17:03	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-679-S5
Date Sampled: 09/11/19 14:53
Percent Solids: 56
Initial Volume: 5.23
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-04
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**32.8** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C1-Benzene	**243** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C2-Benzenes	**99.0** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C3-Benzenes	**58.9** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C4-Benzenes	**49.9** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C5-Benzenes	**20.8** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
Methylcyclohexane	**39.8** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
Toluene	**394** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
Ethylbenzene	**19.3** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
m,p-Xylene	**193** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
Styrene	**45.5** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
o-Xylene	**15.7** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
Isopropylbenzene	**J 3.64** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
n-Propylbenzene	**9.12** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
1,3,5-Trimethylbenzene	**54.9** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
1,2,3-Trimethylbenzene	**12.4** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
1,2,4-Trimethylbenzene	**44.5** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
t-Butylbenzene	ND (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
sec-Butylbenzene	ND (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
p-Isopropyltoluene	**50.2** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
n-Butylbenzene	ND (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
trans-Decalin	**9.44** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
cis-Decalin	ND (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C1-Decalins	**39.2** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C2-Decalins	**66.1** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C3-Decalins	**51.4** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C4-Decalins	**61.9** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
Benzo(b)thiophene	**15.3** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C1-Benzo(b)thiophenes	**22.6** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C2-Benzo(b)thiophenes	**34.0** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C3-Benzo(b)thiophenes	**18.9** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C4-Benzo(b)thiophenes	**15.5** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-679-S5
Date Sampled: 09/11/19 14:53
Percent Solids: 56
Initial Volume: 5.23
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-04
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**436** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
2-Methylnaphthalene	**254** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
1-Methylnaphthalene	**263** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C1-Naphthalenes	**314** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C2-Naphthalenes	**517** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C3-Naphthalenes	**366** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C4-Naphthalenes	**184** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
Biphenyl	**89.7** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
Acenaphthylene	**397** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
Acenaphthene	**512** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
Dibenzofuran	**243** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
Fluorene	**489** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C1-Fluorenes	**301** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C2-Fluorenes	**332** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C3-Fluorenes	**322** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
Dibenzothiophene	**207** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C1-Dibenzothiophenes	**215** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C2-Dibenzothiophenes	**216** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C3-Dibenzothiophenes	**147** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C4-Dibenzothiophenes	**91.0** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
Phenanthrene	**3100** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
Anthracene	**1070** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C1-Phenanthrenes/Anthracenes	**2030** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C2-Phenanthrenes/Anthracenes	**1270** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C3-Phenanthrenes/Anthracenes	**619** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C4-Phenanthrenes/Anthracenes	**296** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
Retene	**256** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
Benzo(b)naphtho(2,1-d)thiophene	**315** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C0-Benzonaphthothiophenes	**647** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C1-Benzonaphthothiophenes	**481** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C2-Benzonaphthothiophenes	**333** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C3-Benzonaphthothiophenes	**200** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-679-S5
Date Sampled: 09/11/19 14:53
Percent Solids: 56
Initial Volume: 5.23
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-04
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**57.9** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
Fluoranthene	**4660** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
Pyrene	**4740** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C1-Fluoranthenes/Pyrenes	**3420** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C2-Fluoranthenes/Pyrenes	**1540** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C3-Fluoranthenes/Pyrenes	**650** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
Benzo(b)fluorene	**416** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
Benzo(c)fluorene	**199** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
2-Methylpyrene	**444** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
4-Methylpyrene	**417** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
1-Methylpyrene	**323** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
Benz(a)anthracene	**3130** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
Chrysene/triphenylene	**3010** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C1-Benzo(a)anthracenes/Chrysenes	**2120** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C2-Benzo(a)anthracenes/Chrysenes	**1200** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C3-Benzo(a)anthracenes/Chrysenes	**628** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C4-Benzo(a)anthracenes/Chrysenes	**319** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
Benzo(b)fluoranthene	**2300** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
Benzo(j/k)fluoranthene	**2270** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
Benzo(e)pyrene	**2120** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
Benzo(a)pyrene	**3110** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
Perylene	**942** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
Indeno(1,2,3-cd)pyrene	**1420** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
Dibenzo(a,h)anthracene	**477** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
Benzo(g,h,i)perylene	**1710** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
Coronene	**414** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
Tetramethyl lead	ND (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
Trimethylethyl lead	ND (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
Dimethyldiethyl lead	ND (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
Methyltriethyl lead	ND (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
Tetraethyl lead	ND (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
2,6,10-trimethyldodecane (1380)	**43.5** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-679-S5
Date Sampled: 09/11/19 14:53
Percent Solids: 56
Initial Volume: 5.23
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-04
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**155** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
2,6,10-trimethylpentadecane (1650)	**108** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C-17	**348** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
Pristane	**238** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
C-18	**196** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
Phytane	**217** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
Carbazole	**235** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
2,6-Dimethylnaphthalene	**127** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
2,3,5-Trimethylnaphthene	**30.0** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
4-Methyldibenzothiophene	**59.5** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
2/3-Methyldibenzothiophene	**69.9** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
1-Methyldibenzothiophene	**16.9** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
3-Methylphenanthrene	**425** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
2-Methylphenanthrene	**546** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
2-Methylanthracene	**320** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
4/9-Methylphenanthrene	**449** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601
1-Methylphenanthrene	**263** (6.79)	3.39	8270 Mod		1	09/20/19 1:57	F9I0007	FI91601

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*85 %*		*50-120*
Surrogate: Perylene-d12	*91 %*		*50-120*
Surrogate: Phenanthrene-d10	*91 %*		*50-120*
Surrogate: Toluene-D8	*74 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-679-S5
Date Sampled: 09/11/19 14:53
Percent Solids: 56

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-04
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**73000** (119)		TOC-LK		1	CCP	09/19/19 17:19	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-680-S1
Date Sampled: 09/11/19 17:20
Percent Solids: 72
Initial Volume: 9.11
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-05
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**48.9** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C1-Benzene	**47.7** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C2-Benzenes	**38.1** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C3-Benzenes	**14.7** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C4-Benzenes	**13.3** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C5-Benzenes	**6.24** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
Methylcyclohexane	**5.37** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
Toluene	**81.8** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
Ethylbenzene	**12.6** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
m,p-Xylene	**74.3** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
Styrene	**45.9** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
o-Xylene	**6.48** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
Isopropylbenzene	J **2.29** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
n-Propylbenzene	**6.74** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
1,3,5-Trimethylbenzene	ND (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
1,2,3-Trimethylbenzene	**4.01** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
1,2,4-Trimethylbenzene	**9.04** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
t-Butylbenzene	ND (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
sec-Butylbenzene	ND (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
p-Isopropyltoluene	**4.09** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
n-Butylbenzene	**9.11** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
trans-Decalin	**12.3** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
cis-Decalin	ND (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C1-Decalins	**34.6** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C2-Decalins	**32.2** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C3-Decalins	**31.3** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C4-Decalins	**63.2** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
Benzo(b)thiophene	**3.89** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C1-Benzo(b)thiophenes	**7.48** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C2-Benzo(b)thiophenes	**13.9** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C3-Benzo(b)thiophenes	**11.5** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C4-Benzo(b)thiophenes	**7.38** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-680-S1
Date Sampled: 09/11/19 17:20
Percent Solids: 72
Initial Volume: 9.11
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-05
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**78.9** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
2-Methylnaphthalene	**49.2** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
1-Methylnaphthalene	**37.1** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C1-Naphthalenes	**53.1** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C2-Naphthalenes	**103** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C3-Naphthalenes	**112** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C4-Naphthalenes	**69.9** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
Biphenyl	**24.7** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
Acenaphthylene	**257** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
Acenaphthene	**141** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
Dibenzofuran	**58.5** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
Fluorene	**119** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C1-Fluorenes	**97.5** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C2-Fluorenes	**86.8** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C3-Fluorenes	**151** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
Dibenzothiophene	**98.8** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C1-Dibenzothiophenes	**104** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C2-Dibenzothiophenes	**114** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C3-Dibenzothiophenes	**82.1** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C4-Dibenzothiophenes	**50.3** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
Phenanthrene	**1240** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
Anthracene	**495** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C1-Phenanthrenes/Anthracenes	**740** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C2-Phenanthrenes/Anthracenes	**389** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C3-Phenanthrenes/Anthracenes	**172** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C4-Phenanthrenes/Anthracenes	**66.0** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
Retene	**39.7** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
Benzo(b)naphtho(2,1-d)thiophene	**161** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C0-Benzonaphthothiophenes	**300** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C1-Benzonaphthothiophenes	**178** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C2-Benzonaphthothiophenes	**138** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C3-Benzonaphthothiophenes	**109** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-680-S1
Date Sampled: 09/11/19 17:20
Percent Solids: 72
Initial Volume: 9.11
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-05
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**56.5** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
Fluoranthene	**2080** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
Pyrene	**2260** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C1-Fluoranthenes/Pyrenes	**1040** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C2-Fluoranthenes/Pyrenes	**602** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C3-Fluoranthenes/Pyrenes	**242** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
Benzo(b)fluorene	**99.9** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
Benzo(c)fluorene	**45.5** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
2-Methylpyrene	**163** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
4-Methylpyrene	**144** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
1-Methylpyrene	**121** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
Benz(a)anthracene	**1250** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
Chrysene/triphenylene	**1210** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C1-Benzo(a)anthracenes/Chrysenes	**612** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C2-Benzo(a)anthracenes/Chrysenes	**303** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C3-Benzo(a)anthracenes/Chrysenes	**141** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C4-Benzo(a)anthracenes/Chrysenes	**89.4** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
Benzo(b)fluoranthene	**953** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
Benzo(j/k)fluoranthene	**950** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
Benzo(e)pyrene	**855** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
Benzo(a)pyrene	**1210** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
Perylene	**290** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
Indeno(1,2,3-cd)pyrene	**624** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
Dibenzo(a,h)anthracene	**206** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
Benzo(g,h,i)perylene	**738** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
Coronene	**188** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
Tetramethyl lead	ND (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
Trimethylethyl lead	ND (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
Dimethyldiethyl lead	ND (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
Methyltriethyl lead	ND (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
Tetraethyl lead	ND (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
2,6,10-trimethyldodecane (1380)	**43.9** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-680-S1
Date Sampled: 09/11/19 17:20
Percent Solids: 72
Initial Volume: 9.11
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-05
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**81.3** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
2,6,10-trimethylpentadecane (1650)	**50.1** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C-17	**116** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
Pristane	**139** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
C-18	**94.9** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
Phytane	**128** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
Carbazole	**129** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
2,6-Dimethylnaphthalene	**24.9** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
2,3,5-Trimethylnaphthene	**7.72** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
4-Methyldibenzothiophene	**36.2** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
2/3-Methyldibenzothiophene	**35.2** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
1-Methyldibenzothiophene	**13.2** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
3-Methylphenanthrene	**155** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
2-Methylphenanthrene	**186** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
2-Methylanthracene	**98.9** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
4/9-Methylphenanthrene	**163** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601
1-Methylphenanthrene	**115** (3.03)	1.52	8270 Mod		1	09/20/19 3:19	F9I0007	FI91601

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*66 %*		*50-120*
Surrogate: Perylene-d12	*67 %*		*50-120*
Surrogate: Phenanthrene-d10	*66 %*		*50-120*
Surrogate: Toluene-D8	*57 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-680-S1
Date Sampled: 09/11/19 17:20
Percent Solids: 72

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-05
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**37400** (115)		TOC-LK		1	CCP	09/19/19 17:36	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-680-S4
Date Sampled: 09/11/19 17:33
Percent Solids: 78
Initial Volume: 7.56
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-06
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**20.7** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C1-Benzene	J **15.7** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C2-Benzenes	**36.2** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C3-Benzenes	**161** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C4-Benzenes	**443** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C5-Benzenes	**267** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
Methylcyclohexane	ND (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
Toluene	**72.7** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
Ethylbenzene	**33.5** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
m,p-Xylene	**88.2** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
Styrene	**99.6** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
o-Xylene	J **15.3** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
Isopropylbenzene	**50.8** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
n-Propylbenzene	**34.5** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
1,3,5-Trimethylbenzene	**107** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
1,2,3-Trimethylbenzene	**69.7** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
1,2,4-Trimethylbenzene	**83.6** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
t-Butylbenzene	ND (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
sec-Butylbenzene	J **12.6** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
p-Isopropyltoluene	J **10.4** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
n-Butylbenzene	ND (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
trans-Decalin	**89.2** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
cis-Decalin	**17.5** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C1-Decalins	**439** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C2-Decalins	**734** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C3-Decalins	**637** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C4-Decalins	**943** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
Benzo(b)thiophene	**76.4** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C1-Benzo(b)thiophenes	**626** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C2-Benzo(b)thiophenes	**682** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C3-Benzo(b)thiophenes	**355** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C4-Benzo(b)thiophenes	**176** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-680-S4
Date Sampled: 09/11/19 17:33
Percent Solids: 78
Initial Volume: 7.56
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-06
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**1870** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
2-Methylnaphthalene	**353** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
1-Methylnaphthalene	**8780** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C1-Naphthalenes	**5450** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C2-Naphthalenes	**5390** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C3-Naphthalenes	**2590** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C4-Naphthalenes	**1400** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
Biphenyl	**135** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
Acenaphthylene	**2100** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
Acenaphthene	**15600** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
Dibenzofuran	**412** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
Fluorene	**5390** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C1-Fluorenes	**1420** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C2-Fluorenes	**1180** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C3-Fluorenes	**1020** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
Dibenzothiophene	**1980** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C1-Dibenzothiophenes	**1510** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C2-Dibenzothiophenes	**1660** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C3-Dibenzothiophenes	**1330** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C4-Dibenzothiophenes	**693** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
Phenanthrene	**19300** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
Anthracene	**5540** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C1-Phenanthrenes/Anthracenes	**7120** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C2-Phenanthrenes/Anthracenes	**3510** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C3-Phenanthrenes/Anthracenes	**1510** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C4-Phenanthrenes/Anthracenes	**1810** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
Retene	**345** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
Benzo(b)naphtho(2,1-d)thiophene	**1240** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C0-Benzonaphthothiophenes	**2330** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C1-Benzonaphthothiophenes	**1410** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C2-Benzonaphthothiophenes	**884** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C3-Benzonaphthothiophenes	**619** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-680-S4
Date Sampled: 09/11/19 17:33
Percent Solids: 78
Initial Volume: 7.56
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-06
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**212** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
Fluoranthene	**14400** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
Pyrene	**17700** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C1-Fluoranthenes/Pyrenes	**9230** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C2-Fluoranthenes/Pyrenes	**2690** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C3-Fluoranthenes/Pyrenes	**944** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
Benzo(b)fluorene	**1180** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
Benzo(c)fluorene	**453** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
2-Methylpyrene	**1250** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
4-Methylpyrene	**1120** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
1-Methylpyrene	**1110** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
Benz(a)anthracene	**9020** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
Chrysene/triphenylene	**8980** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C1-Benzo(a)anthracenes/Chrysenes	**3900** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C2-Benzo(a)anthracenes/Chrysenes	**1530** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C3-Benzo(a)anthracenes/Chrysenes	**601** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C4-Benzo(a)anthracenes/Chrysenes	**324** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
Benzo(b)fluoranthene	**6010** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
Benzo(j/k)fluoranthene	**6620** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
Benzo(e)pyrene	**5970** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
Benzo(a)pyrene	**10100** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
Perylene	**1840** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
Indeno(1,2,3-cd)pyrene	**4470** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
Dibenzo(a,h)anthracene	**1290** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
Benzo(g,h,i)perylene	**5500** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
Coronene	**1560** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
Tetramethyl lead	ND (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
Trimethylethyl lead	ND (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
Dimethyldiethyl lead	ND (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
Methyltriethyl lead	ND (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
Tetraethyl lead	ND (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
2,6,10-trimethyldodecane (1380)	**1410** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-680-S4
Date Sampled: 09/11/19 17:33
Percent Solids: 78
Initial Volume: 7.56
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-06
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**1780** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
2,6,10-trimethylpentadecane (1650)	**1830** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C-17	**154** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
Pristane	**3850** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
C-18	**190** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
Phytane	**3250** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
Carbazole	**214** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
2,6-Dimethylnaphthalene	**1040** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
2,3,5-Trimethylnaphthene	**174** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
4-Methyldibenzothiophene	**565** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
2/3-Methyldibenzothiophene	**502** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
1-Methyldibenzothiophene	**192** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
3-Methylphenanthrene	**1550** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
2-Methylphenanthrene	**1840** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
2-Methylanthracene	**818** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
4/9-Methylphenanthrene	**1600** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601
1-Methylphenanthrene	**1190** (17.1)	8.53	8270 Mod		5	09/20/19 4:40	F9I0007	FI91601

	%Recovery	*Qualifier*	*Limits*
Surrogate: Naphthalene-d8	*65 %*		*50-120*
Surrogate: Perylene-d12	*79 %*		*50-120*
Surrogate: Phenanthrene-d10	*71 %*		*50-120*
Surrogate: Toluene-D8	*62 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-680-S4
Date Sampled: 09/11/19 17:33
Percent Solids: 78

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-06
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**30600** (109)		TOC-LK		1	CCP	09/19/19 17:53	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-680-S5
Date Sampled: 09/11/19 17:37
Percent Solids: 68
Initial Volume: 4.65
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-07
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**205** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
C1-Benzene	**238** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
C2-Benzenes	**2840** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
C3-Benzenes	**11500** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
C4-Benzenes	**21200** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
C5-Benzenes	**7100** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
Methylcyclohexane	**41.8** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
Toluene	**455** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
Ethylbenzene	**4840** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
m,p-Xylene	**1140** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
Styrene	**1540** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
o-Xylene	**1070** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
Isopropylbenzene	**1570** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
n-Propylbenzene	**578** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
1,3,5-Trimethylbenzene	**2430** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
1,2,3-Trimethylbenzene	**3290** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
1,2,4-Trimethylbenzene	**8090** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
t-Butylbenzene	ND (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
sec-Butylbenzene	**94.0** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
p-Isopropyltoluene	**2810** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
n-Butylbenzene	ND (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
trans-Decalin	**221** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
cis-Decalin	**63.9** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
C1-Decalins	**1140** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
C2-Decalins	**2690** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
C3-Decalins	**2910** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
C4-Decalins	**5330** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
Benzo(b)thiophene	**23800** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
C1-Benzo(b)thiophenes	**24600** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
C2-Benzo(b)thiophenes	**21500** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
C3-Benzo(b)thiophenes	**9560** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
C4-Benzo(b)thiophenes	**2160** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-680-S5
Date Sampled: 09/11/19 17:37
Percent Solids: 68
Initial Volume: 4.65
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-07
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**1990000** (12700)	6330	8270 Mod		2000	09/21/19 2:39	F9I0007	FI91601
2-Methylnaphthalene	**964000** (633)	316	8270 Mod		100	09/21/19 1:17	F9I0007	FI91601
1-Methylnaphthalene	**594000** (633)	316	8270 Mod		100	09/21/19 1:17	F9I0007	FI91601
C1-Naphthalenes	**949000** (633)	316	8270 Mod		100	09/21/19 1:17	F9I0007	FI91601
C2-Naphthalenes	**468000** (633)	316	8270 Mod		100	09/21/19 1:17	F9I0007	FI91601
C3-Naphthalenes	**131000** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
C4-Naphthalenes	**33200** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
Biphenyl	**257000** (633)	316	8270 Mod		100	09/21/19 1:17	F9I0007	FI91601
Acenaphthylene	**45400** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
Acenaphthene	**1430000** (12700)	6330	8270 Mod		2000	09/21/19 2:39	F9I0007	FI91601
Dibenzofuran	**50100** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
Fluorene	**497000** (633)	316	8270 Mod		100	09/21/19 1:17	F9I0007	FI91601
C1-Fluorenes	**115000** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
C2-Fluorenes	**57300** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
C3-Fluorenes	**21200** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
Dibenzothiophene	**139000** (633)	316	8270 Mod		100	09/21/19 1:17	F9I0007	FI91601
C1-Dibenzothiophenes	**66600** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
C2-Dibenzothiophenes	**34300** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
C3-Dibenzothiophenes	**13100** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
C4-Dibenzothiophenes	**4340** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
Phenanthrene	**1840000** (12700)	6330	8270 Mod		2000	09/21/19 2:39	F9I0007	FI91601
Anthracene	**595000** (633)	316	8270 Mod		100	09/21/19 1:17	F9I0007	FI91601
C1-Phenanthrenes/Anthracenes	**531000** (633)	316	8270 Mod		100	09/21/19 1:17	F9I0007	FI91601
C2-Phenanthrenes/Anthracenes	**130000** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
C3-Phenanthrenes/Anthracenes	**32300** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
C4-Phenanthrenes/Anthracenes	**8810** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
Retene	**1740** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
Benzo(b)naphtho(2,1-d)thiophene	**28600** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
C0-Benzonaphthothiophenes	**52500** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
C1-Benzonaphthothiophenes	**24100** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
C2-Benzonaphthothiophenes	**9280** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
C3-Benzonaphthothiophenes	**6850** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-680-S5
Date Sampled: 09/11/19 17:37
Percent Solids: 68
Initial Volume: 4.65
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-07
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**1060** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
Fluoranthene	**730000** (633)	316	8270 Mod		100	09/21/19 1:17	F9I0007	FI91601
Pyrene	**1040000** (633)	316	8270 Mod		100	09/21/19 1:17	F9I0007	FI91601
C1-Fluoranthenes/Pyrenes	**388000** (633)	316	8270 Mod		100	09/21/19 1:17	F9I0007	FI91601
C2-Fluoranthenes/Pyrenes	**75900** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
C3-Fluoranthenes/Pyrenes	**16800** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
Benzo(b)fluorene	**39000** (633)	316	8270 Mod		100	09/21/19 1:17	F9I0007	FI91601
Benzo(c)fluorene	**27400** (633)	316	8270 Mod		100	09/21/19 1:17	F9I0007	FI91601
2-Methylpyrene	**50400** (633)	316	8270 Mod		100	09/21/19 1:17	F9I0007	FI91601
4-Methylpyrene	**45300** (633)	316	8270 Mod		100	09/21/19 1:17	F9I0007	FI91601
1-Methylpyrene	**49500** (633)	316	8270 Mod		100	09/21/19 1:17	F9I0007	FI91601
Benz(a)anthracene	**308000** (633)	316	8270 Mod		100	09/21/19 1:17	F9I0007	FI91601
Chrysene/triphenylene	**293000** (633)	316	8270 Mod		100	09/21/19 1:17	F9I0007	FI91601
C1-Benzo(a)anthracenes/Chrysenes	**100000** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
C2-Benzo(a)anthracenes/Chrysenes	**33700** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
C3-Benzo(a)anthracenes/Chrysenes	**8770** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
C4-Benzo(a)anthracenes/Chrysenes	**3760** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
Benzo(b)fluoranthene	**120000** (633)	316	8270 Mod		100	09/21/19 1:17	F9I0007	FI91601
Benzo(j/k)fluoranthene	**171000** (633)	316	8270 Mod		100	09/21/19 1:17	F9I0007	FI91601
Benzo(e)pyrene	**148000** (633)	316	8270 Mod		100	09/21/19 1:17	F9I0007	FI91601
Benzo(a)pyrene	**278000** (633)	316	8270 Mod		100	09/21/19 1:17	F9I0007	FI91601
Perylene	**41400** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
Indeno(1,2,3-cd)pyrene	**99500** (633)	316	8270 Mod		100	09/21/19 1:17	F9I0007	FI91601
Dibenzo(a,h)anthracene	**26400** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
Benzo(g,h,i)perylene	**129000** (633)	316	8270 Mod		100	09/21/19 1:17	F9I0007	FI91601
Coronene	**32800** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
Tetramethyl lead	ND (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
Trimethylethyl lead	ND (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
Dimethyldiethyl lead	ND (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
Methyltriethyl lead	ND (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
Tetraethyl lead	ND (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
2,6,10-trimethyldodecane (1380)	**3370** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-680-S5
Date Sampled: 09/11/19 17:37
Percent Solids: 68
Initial Volume: 4.65
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-07
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**6910** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
2,6,10-trimethylpentadecane (1650)	**8030** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
C-17	**810** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
Pristane	**14700** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
C-18	**910** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
Phytane	**13600** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
Carbazole	**8990** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
2,6-Dimethylnaphthalene	**85500** (633)	316	8270 Mod		100	09/21/19 1:17	F9I0007	FI91601
2,3,5-Trimethylnaphthene	**7240** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
4-Methyldibenzothiophene	**27600** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
2/3-Methyldibenzothiophene	**24000** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
1-Methyldibenzothiophene	**5820** (31.6)	15.8	8270 Mod		5	09/20/19 6:00	F9I0007	FI91601
3-Methylphenanthrene	**131000** (633)	316	8270 Mod		100	09/21/19 1:17	F9I0007	FI91601
2-Methylphenanthrene	**141000** (633)	316	8270 Mod		100	09/21/19 1:17	F9I0007	FI91601
2-Methylanthracene	**55100** (633)	316	8270 Mod		100	09/21/19 1:17	F9I0007	FI91601
4/9-Methylphenanthrene	**103000** (633)	316	8270 Mod		100	09/21/19 1:17	F9I0007	FI91601
1-Methylphenanthrene	**84100** (633)	316	8270 Mod		100	09/21/19 1:17	F9I0007	FI91601

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*74 %*		*50-120*
Surrogate: Perylene-d12	*213 %*	*SM*	*50-120*
Surrogate: Phenanthrene-d10	*82 %*		*50-120*
Surrogate: Toluene-D8	*72 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-680-S5
Date Sampled: 09/11/19 17:37
Percent Solids: 68

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-07
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**137000** (117)		TOC-LK		1	CCP	09/19/19 18:43	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-681-S1
Date Sampled: 09/12/19 11:45
Percent Solids: 81
Initial Volume: 6.19
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-08
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C1-Benzene	**J 14.9** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C2-Benzenes	**40.3** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C3-Benzenes	**J 18.3** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C4-Benzenes	ND (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C5-Benzenes	ND (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
Methylcyclohexane	**32.4** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
Toluene	**76.7** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
Ethylbenzene	**21.8** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
m,p-Xylene	**109** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
Styrene	**78.3** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
o-Xylene	**20.4** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
Isopropylbenzene	ND (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
n-Propylbenzene	**J 11.2** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
1,3,5-Trimethylbenzene	**55.3** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
1,2,3-Trimethylbenzene	**J 14.0** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
1,2,4-Trimethylbenzene	**24.1** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
t-Butylbenzene	ND (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
sec-Butylbenzene	ND (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
p-Isopropyltoluene	ND (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
n-Butylbenzene	ND (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
trans-Decalin	**48.2** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
cis-Decalin	ND (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C1-Decalins	**148** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C2-Decalins	**134** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C3-Decalins	**72.2** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C4-Decalins	**185** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
Benzo(b)thiophene	**61.8** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C1-Benzo(b)thiophenes	**47.5** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C2-Benzo(b)thiophenes	**68.1** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C3-Benzo(b)thiophenes	**45.5** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C4-Benzo(b)thiophenes	**27.7** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-681-S1
Date Sampled: 09/12/19 11:45
Percent Solids: 81
Initial Volume: 6.19
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-08
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**1650** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
2-Methylnaphthalene	**641** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
1-Methylnaphthalene	**457** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C1-Naphthalenes	**661** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C2-Naphthalenes	**658** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C3-Naphthalenes	**569** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C4-Naphthalenes	**304** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
Biphenyl	**189** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
Acenaphthylene	**526** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
Acenaphthene	**1410** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
Dibenzofuran	**1200** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
Fluorene	**1410** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C1-Fluorenes	**447** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C2-Fluorenes	**451** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C3-Fluorenes	**708** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
Dibenzothiophene	**743** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C1-Dibenzothiophenes	**488** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C2-Dibenzothiophenes	**425** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C3-Dibenzothiophenes	**321** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C4-Dibenzothiophenes	**175** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
Phenanthrene	**11300** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
Anthracene	**2940** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C1-Phenanthrenes/Anthracenes	**4030** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C2-Phenanthrenes/Anthracenes	**1870** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C3-Phenanthrenes/Anthracenes	**691** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C4-Phenanthrenes/Anthracenes	**264** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
Retene	**62.2** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
Benzo(b)naphtho(2,1-d)thiophene	**678** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C0-Benzonaphthothiophenes	**1300** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C1-Benzonaphthothiophenes	**721** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C2-Benzonaphthothiophenes	**541** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C3-Benzonaphthothiophenes	**449** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-681-S1
Date Sampled: 09/12/19 11:45
Percent Solids: 81
Initial Volume: 6.19
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-08
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**235** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
Fluoranthene	**11400** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
Pyrene	**10500** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C1-Fluoranthenes/Pyrenes	**4350** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C2-Fluoranthenes/Pyrenes	**2360** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C3-Fluoranthenes/Pyrenes	**965** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
Benzo(b)fluorene	**444** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
Benzo(c)fluorene	**205** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
2-Methylpyrene	**624** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
4-Methylpyrene	**499** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
1-Methylpyrene	**418** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
Benz(a)anthracene	**5650** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
Chrysene/triphenylene	**5200** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C1-Benzo(a)anthracenes/Chrysenes	**2440** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C2-Benzo(a)anthracenes/Chrysenes	**1240** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C3-Benzo(a)anthracenes/Chrysenes	**635** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C4-Benzo(a)anthracenes/Chrysenes	**453** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
Benzo(b)fluoranthene	**4110** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
Benzo(j/k)fluoranthene	**3800** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
Benzo(e)pyrene	**3250** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
Benzo(a)pyrene	**4950** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
Perylene	**1170** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
Indeno(1,2,3-cd)pyrene	**2470** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
Dibenzo(a,h)anthracene	**785** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
Benzo(g,h,i)perylene	**2710** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
Coronene	**675** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
Tetramethyl lead	ND (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
Trimethylethyl lead	ND (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
Dimethyldiethyl lead	ND (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
Methyltriethyl lead	ND (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
Tetraethyl lead	ND (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
2,6,10-trimethyldodecane (1380)	**94.0** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-681-S1
Date Sampled: 09/12/19 11:45
Percent Solids: 81
Initial Volume: 6.19
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-08
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**161** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
2,6,10-trimethylpentadecane (1650)	**107** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C-17	**170** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
Pristane	**287** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
C-18	**163** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
Phytane	**327** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
Carbazole	**1540** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
2,6-Dimethylnaphthalene	**143** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
2,3,5-Trimethylnaphthene	**47.4** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
4-Methyldibenzothiophene	**137** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
2/3-Methyldibenzothiophene	**164** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
1-Methyldibenzothiophene	**65.8** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
3-Methylphenanthrene	**889** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
2-Methylphenanthrene	**1140** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
2-Methylanthracene	**486** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
4/9-Methylphenanthrene	**774** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601
1-Methylphenanthrene	**627** (20.0)	10.0	8270 Mod		5	09/20/19 7:21	F9I0007	FI91601

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*76 %*		*50-120*
Surrogate: Perylene-d12	*92 %*		*50-120*
Surrogate: Phenanthrene-d10	*88 %*		*50-120*
Surrogate: Toluene-D8	*75 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-681-S1
Date Sampled: 09/12/19 11:45
Percent Solids: 81

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-08
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**47800** (103)		TOC-LK		1	CCP	09/19/19 19:01	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-681-S3
Date Sampled: 09/12/19 11:54
Percent Solids: 71
Initial Volume: 5.06
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-09
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**208** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
C1-Benzene	**211** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
C2-Benzenes	**314** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
C3-Benzenes	**919** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
C4-Benzenes	**2600** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
C5-Benzenes	**1390** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
Methylcyclohexane	**33.6** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
Toluene	**419** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
Ethylbenzene	**323** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
m,p-Xylene	**365** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
Styrene	**652** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
o-Xylene	**92.6** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
Isopropylbenzene	**100** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
n-Propylbenzene	**64.6** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
1,3,5-Trimethylbenzene	**322** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
1,2,3-Trimethylbenzene	**308** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
1,2,4-Trimethylbenzene	**621** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
t-Butylbenzene	ND (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
sec-Butylbenzene	**J 17.9** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
p-Isopropyltoluene	**167** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
n-Butylbenzene	ND (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
trans-Decalin	**248** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
cis-Decalin	**50.9** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
C1-Decalins	**974** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
C2-Decalins	**1740** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
C3-Decalins	**1620** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
C4-Decalins	**2600** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
Benzo(b)thiophene	**1100** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
C1-Benzo(b)thiophenes	**3570** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
C2-Benzo(b)thiophenes	**6160** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
C3-Benzo(b)thiophenes	**4680** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
C4-Benzo(b)thiophenes	**1720** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-681-S3
Date Sampled: 09/12/19 11:54
Percent Solids: 71
Initial Volume: 5.06
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-09
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**29800** (560)	280	8270 Mod		100	09/21/19 4:01	F9I0006	FI91601
2-Methylnaphthalene	**9540** (560)	280	8270 Mod		100	09/21/19 4:01	F9I0006	FI91601
1-Methylnaphthalene	**101000** (560)	280	8270 Mod		100	09/21/19 4:01	F9I0006	FI91601
C1-Naphthalenes	**66100** (560)	280	8270 Mod		100	09/21/19 4:01	F9I0006	FI91601
C2-Naphthalenes	**82700** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
C3-Naphthalenes	**30900** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
C4-Naphthalenes	**10500** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
Biphenyl	**3290** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
Acenaphthylene	**23100** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
Acenaphthene	**266000** (560)	280	8270 Mod		100	09/21/19 4:01	F9I0006	FI91601
Dibenzofuran	**9720** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
Fluorene	**113000** (560)	280	8270 Mod		100	09/21/19 4:01	F9I0006	FI91601
C1-Fluorenes	**28600** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
C2-Fluorenes	**16400** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
C3-Fluorenes	**8000** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
Dibenzothiophene	**33800** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
C1-Dibenzothiophenes	**26800** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
C2-Dibenzothiophenes	**18100** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
C3-Dibenzothiophenes	**8400** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
C4-Dibenzothiophenes	**2800** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
Phenanthrene	**493000** (560)	280	8270 Mod		100	09/21/19 4:01	F9I0006	FI91601
Anthracene	**191000** (560)	280	8270 Mod		100	09/21/19 4:01	F9I0006	FI91601
C1-Phenanthrenes/Anthracenes	**148000** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
C2-Phenanthrenes/Anthracenes	**49400** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
C3-Phenanthrenes/Anthracenes	**13000** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
C4-Phenanthrenes/Anthracenes	**4140** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
Retene	**1300** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
Benzo(b)naphtho(2,1-d)thiophene	**17100** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
C0-Benzonaphthothiophenes	**31700** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
C1-Benzonaphthothiophenes	**14600** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
C2-Benzonaphthothiophenes	**5760** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
C3-Benzonaphthothiophenes	**3820** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-681-S3
Date Sampled: 09/12/19 11:54
Percent Solids: 71
Initial Volume: 5.06
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-09
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**765** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
Fluoranthene	**319000** (560)	280	8270 Mod		100	09/21/19 4:01	F9I0006	FI91601
Pyrene	**488000** (560)	280	8270 Mod		100	09/21/19 4:01	F9I0006	FI91601
C1-Fluoranthenes/Pyrenes	**168000** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
C2-Fluoranthenes/Pyrenes	**32600** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
C3-Fluoranthenes/Pyrenes	**7010** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
Benzo(b)fluorene	**20400** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
Benzo(c)fluorene	**8500** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
2-Methylpyrene	**22400** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
4-Methylpyrene	**19800** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
1-Methylpyrene	**22200** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
Benz(a)anthracene	**162000** (560)	280	8270 Mod		100	09/21/19 4:01	F9I0006	FI91601
Chrysene/triphenylene	**152000** (560)	280	8270 Mod		100	09/21/19 4:01	F9I0006	FI91601
C1-Benzo(a)anthracenes/Chrysenes	**48400** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
C2-Benzo(a)anthracenes/Chrysenes	**14500** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
C3-Benzo(a)anthracenes/Chrysenes	**3750** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
C4-Benzo(a)anthracenes/Chrysenes	**2100** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
Benzo(b)fluoranthene	**67500** (560)	280	8270 Mod		100	09/21/19 4:01	F9I0006	FI91601
Benzo(j/k)fluoranthene	**98400** (560)	280	8270 Mod		100	09/21/19 4:01	F9I0006	FI91601
Benzo(e)pyrene	**86600** (560)	280	8270 Mod		100	09/21/19 4:01	F9I0006	FI91601
Benzo(a)pyrene	**154000** (560)	280	8270 Mod		100	09/21/19 4:01	F9I0006	FI91601
Perylene	**20600** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
Indeno(1,2,3-cd)pyrene	**46100** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
Dibenzo(a,h)anthracene	**13000** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
Benzo(g,h,i)perylene	**69700** (560)	280	8270 Mod		100	09/21/19 4:01	F9I0006	FI91601
Coronene	**20100** (560)	280	8270 Mod		100	09/21/19 4:01	F9I0006	FI91601
Tetramethyl lead	ND (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
Trimethylethyl lead	ND (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
Dimethyldiethyl lead	ND (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
Methyltriethyl lead	ND (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
Tetraethyl lead	ND (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
2,6,10-trimethyldodecane (1380)	**3300** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-681-S3
Date Sampled: 09/12/19 11:54
Percent Solids: 71
Initial Volume: 5.06
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-09
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**4770** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
2,6,10-trimethylpentadecane (1650)	**5440** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
C-17	ND (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
Pristane	**12100** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
C-18	ND (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
Phytane	**11400** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
Carbazole	**630** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
2,6-Dimethylnaphthalene	**15500** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
2,3,5-Trimethylnaphthene	**1910** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
4-Methyldibenzothiophene	**10800** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
2/3-Methyldibenzothiophene	**9500** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
1-Methyldibenzothiophene	**2690** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
3-Methylphenanthrene	**33900** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
2-Methylphenanthrene	**38300** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
2-Methylanthracene	**19300** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
4/9-Methylphenanthrene	**31200** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601
1-Methylphenanthrene	**24200** (28.0)	14.0	8270 Mod		5	09/18/19 21:52	F9I0006	FI91601

	%Recovery	*Qualifier*	*Limits*
Surrogate: Naphthalene-d8	*77 %*		*50-120*
Surrogate: Perylene-d12	*146 %*	*SM*	*50-120*
Surrogate: Phenanthrene-d10	*84 %*		*50-120*
Surrogate: Toluene-D8	*65 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-681-S3
Date Sampled: 09/12/19 11:54
Percent Solids: 71

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-09
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**79300** (121)		TOC-LK		1	CCP	09/19/19 19:07	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-681-S4
Date Sampled: 09/12/19 11:58
Percent Solids: 63
Initial Volume: 5.81
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-10
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**23.9** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
C1-Benzene	**150** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
C2-Benzenes	**124** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
C3-Benzenes	**210** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
C4-Benzenes	**394** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
C5-Benzenes	**198** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
Methylcyclohexane	**44.8** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
Toluene	**246** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
Ethylbenzene	**33.7** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
m,p-Xylene	**209** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
Styrene	**58.3** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
o-Xylene	**42.0** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
Isopropylbenzene	**10.5** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
n-Propylbenzene	**13.3** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
1,3,5-Trimethylbenzene	**64.3** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
1,2,3-Trimethylbenzene	**35.7** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
1,2,4-Trimethylbenzene	**174** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
t-Butylbenzene	ND (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
sec-Butylbenzene	**J 3.89** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
p-Isopropyltoluene	**31.4** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
n-Butylbenzene	ND (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
trans-Decalin	**18.6** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
cis-Decalin	**J 4.68** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
C1-Decalins	**79.0** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
C2-Decalins	**152** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
C3-Decalins	**134** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
C4-Decalins	**247** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
Benzo(b)thiophene	**349** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
C1-Benzo(b)thiophenes	**387** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
C2-Benzo(b)thiophenes	**617** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
C3-Benzo(b)thiophenes	**272** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
C4-Benzo(b)thiophenes	**78.6** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-681-S4
Date Sampled: 09/12/19 11:58
Percent Solids: 63
Initial Volume: 5.81
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-10
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**2990** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
2-Methylnaphthalene	**995** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
1-Methylnaphthalene	**7650** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
C1-Naphthalenes	**5160** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
C2-Naphthalenes	**9850** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
C3-Naphthalenes	**3730** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
C4-Naphthalenes	**991** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
Biphenyl	**227** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
Acenaphthylene	**1030** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
Acenaphthene	**28900** (110)	55.0	8270 Mod		20	09/21/19 10:51	F9I0006	FI91601
Dibenzofuran	**851** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
Fluorene	**9550** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
C1-Fluorenes	**2790** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
C2-Fluorenes	**1420** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
C3-Fluorenes	**691** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
Dibenzothiophene	**2620** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
C1-Dibenzothiophenes	**1670** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
C2-Dibenzothiophenes	**966** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
C3-Dibenzothiophenes	**422** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
C4-Dibenzothiophenes	**151** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
Phenanthrene	**34000** (110)	55.0	8270 Mod		20	09/21/19 10:51	F9I0006	FI91601
Anthracene	**10100** (110)	55.0	8270 Mod		20	09/21/19 10:51	F9I0006	FI91601
C1-Phenanthrenes/Anthracenes	**11600** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
C2-Phenanthrenes/Anthracenes	**3910** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
C3-Phenanthrenes/Anthracenes	**1110** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
C4-Phenanthrenes/Anthracenes	**397** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
Retene	**150** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
Benzo(b)naphtho(2,1-d)thiophene	**903** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
C0-Benzonaphthothiophenes	**1670** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
C1-Benzonaphthothiophenes	**902** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
C2-Benzonaphthothiophenes	**446** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
C3-Benzonaphthothiophenes	**270** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-681-S4
Date Sampled: 09/12/19 11:58
Percent Solids: 63
Initial Volume: 5.81
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-10
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**73.6** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
Fluoranthene	**15500** (110)	55.0	8270 Mod		20	09/21/19 10:51	F9I0006	FI91601
Pyrene	**22100** (110)	55.0	8270 Mod		20	09/21/19 10:51	F9I0006	FI91601
C1-Fluoranthenes/Pyrenes	**9890** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
C2-Fluoranthenes/Pyrenes	**2490** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
C3-Fluoranthenes/Pyrenes	**810** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
Benzo(b)fluorene	**1200** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
Benzo(c)fluorene	**498** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
2-Methylpyrene	**1330** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
4-Methylpyrene	**1160** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
1-Methylpyrene	**1230** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
Benz(a)anthracene	**7300** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
Chrysene/triphenylene	**6500** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
C1-Benzo(a)anthracenes/Chrysenes	**3610** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
C2-Benzo(a)anthracenes/Chrysenes	**1500** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
C3-Benzo(a)anthracenes/Chrysenes	**614** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
C4-Benzo(a)anthracenes/Chrysenes	**341** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
Benzo(b)fluoranthene	**3580** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
Benzo(j/k)fluoranthene	**4340** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
Benzo(e)pyrene	**3800** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
Benzo(a)pyrene	**6400** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
Perylene	**1390** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
Indeno(1,2,3-cd)pyrene	**2410** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
Dibenzo(a,h)anthracene	**744** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
Benzo(g,h,i)perylene	**2900** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
Coronene	**891** (110)	55.0	8270 Mod		20	09/21/19 10:51	F9I0006	FI91601
Tetramethyl lead	ND (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
Trimethylethyl lead	ND (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
Dimethyldiethyl lead	ND (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
Methyltriethyl lead	ND (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
Tetraethyl lead	ND (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
2,6,10-trimethyldodecane (1380)	**127** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-681-S4
Date Sampled: 09/12/19 11:58
Percent Solids: 63
Initial Volume: 5.81
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-10
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**296** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
2,6,10-trimethylpentadecane (1650)	**280** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
C-17	**260** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
Pristane	**529** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
C-18	**118** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
Phytane	**501** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
Carbazole	**202** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
2,6-Dimethylnaphthalene	**1810** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
2,3,5-Trimethylnaphthene	**238** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
4-Methyldibenzothiophene	**693** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
2/3-Methyldibenzothiophene	**600** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
1-Methyldibenzothiophene	**153** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
3-Methylphenanthrene	**2810** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
2-Methylphenanthrene	**3120** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
2-Methylanthracene	**1330** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
4/9-Methylphenanthrene	**2460** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601
1-Methylphenanthrene	**1770** (5.50)	2.75	8270 Mod		1	09/18/19 23:13	F9I0006	FI91601

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*85 %*		*50-120*
Surrogate: Perylene-d12	*85 %*		*50-120*
Surrogate: Phenanthrene-d10	*89 %*		*50-120*
Surrogate: Toluene-D8	*68 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-681-S4
Date Sampled: 09/12/19 11:58
Percent Solids: 63

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-10
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**40500** (107)		TOC-LK		1	CCP	09/19/19 19:32	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-682-S2
Date Sampled: 09/12/19 13:05
Percent Solids: 71
Initial Volume: 5.83
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-11
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**40.3** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
C1-Benzene	**144** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
C2-Benzenes	**173** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
C3-Benzenes	**245** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
C4-Benzenes	**876** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
C5-Benzenes	**725** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
Methylcyclohexane	**J 23.1** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
Toluene	**262** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
Ethylbenzene	**122** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
m,p-Xylene	**276** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
Styrene	**350** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
o-Xylene	**30.9** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
Isopropylbenzene	**J 21.3** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
n-Propylbenzene	**35.4** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
1,3,5-Trimethylbenzene	**107** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
1,2,3-Trimethylbenzene	**57.1** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
1,2,4-Trimethylbenzene	**171** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
t-Butylbenzene	ND (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
sec-Butylbenzene	**J 17.4** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
p-Isopropyltoluene	**43.2** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
n-Butylbenzene	ND (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
trans-Decalin	**213** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
cis-Decalin	**J 22.1** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
C1-Decalins	**659** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
C2-Decalins	**935** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
C3-Decalins	**865** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
C4-Decalins	**1600** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
Benzo(b)thiophene	**106** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
C1-Benzo(b)thiophenes	**277** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
C2-Benzo(b)thiophenes	**943** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
C3-Benzo(b)thiophenes	**914** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
C4-Benzo(b)thiophenes	**368** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-682-S2
Date Sampled: 09/12/19 13:05
Percent Solids: 71
Initial Volume: 5.83
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-11
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**5010** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
2-Methylnaphthalene	**2350** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
1-Methylnaphthalene	**11800** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
C1-Naphthalenes	**8510** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
C2-Naphthalenes	**28000** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
C3-Naphthalenes	**17600** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
C4-Naphthalenes	**6580** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
Biphenyl	**1260** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
Acenaphthylene	**6800** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
Acenaphthene	**42000** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
Dibenzofuran	**1950** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
Fluorene	**26100** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
C1-Fluorenes	**14300** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
C2-Fluorenes	**9150** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
C3-Fluorenes	**3900** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
Dibenzothiophene	**8600** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
C1-Dibenzothiophenes	**7510** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
C2-Dibenzothiophenes	**5600** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
C3-Dibenzothiophenes	**2690** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
C4-Dibenzothiophenes	**905** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
Phenanthrene	**198000** (484)	242	8270 Mod		100	09/21/19 5:23	F9I0006	FI91601
Anthracene	**78800** (484)	242	8270 Mod		100	09/21/19 5:23	F9I0006	FI91601
C1-Phenanthrenes/Anthracenes	**64200** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
C2-Phenanthrenes/Anthracenes	**24300** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
C3-Phenanthrenes/Anthracenes	**6710** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
C4-Phenanthrenes/Anthracenes	**1990** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
Retene	**642** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
Benzo(b)naphtho(2,1-d)thiophene	**4390** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
C0-Benzonaphthothiophenes	**7970** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
C1-Benzonaphthothiophenes	**4030** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
C2-Benzonaphthothiophenes	**1860** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
C3-Benzonaphthothiophenes	**1310** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-682-S2
Date Sampled: 09/12/19 13:05
Percent Solids: 71
Initial Volume: 5.83
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-11
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**264** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
Fluoranthene	**131000** (484)	242	8270 Mod		100	09/21/19 5:23	F9I0006	FI91601
Pyrene	**185000** (484)	242	8270 Mod		100	09/21/19 5:23	F9I0006	FI91601
C1-Fluoranthenes/Pyrenes	**58100** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
C2-Fluoranthenes/Pyrenes	**13200** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
C3-Fluoranthenes/Pyrenes	**3600** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
Benzo(b)fluorene	**7090** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
Benzo(c)fluorene	**3130** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
2-Methylpyrene	**7300** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
4-Methylpyrene	**6820** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
1-Methylpyrene	**7440** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
Benz(a)anthracene	**42700** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
Chrysene/triphenylene	**40000** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
C1-Benzo(a)anthracenes/Chrysenes	**17400** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
C2-Benzo(a)anthracenes/Chrysenes	**6200** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
C3-Benzo(a)anthracenes/Chrysenes	**1900** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
C4-Benzo(a)anthracenes/Chrysenes	**794** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
Benzo(b)fluoranthene	**21900** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
Benzo(j/k)fluoranthene	**23800** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
Benzo(e)pyrene	**21500** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
Benzo(a)pyrene	**39000** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
Perylene	**6630** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
Indeno(1,2,3-cd)pyrene	**14400** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
Dibenzo(a,h)anthracene	**3900** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
Benzo(g,h,i)perylene	**17200** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
Coronene	**8320** (484)	242	8270 Mod		100	09/21/19 5:23	F9I0006	FI91601
Tetramethyl lead	ND (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
Trimethylethyl lead	ND (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
Dimethyldiethyl lead	ND (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
Methyltriethyl lead	ND (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
Tetraethyl lead	ND (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
2,6,10-trimethyldodecane (1380)	**1030** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-682-S2
Date Sampled: 09/12/19 13:05
Percent Solids: 71
Initial Volume: 5.83
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-11
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**1770** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
2,6,10-trimethylpentadecane (1650)	**2230** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
C-17	**340** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
Pristane	**5050** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
C-18	**326** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
Phytane	**4650** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
Carbazole	**157** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
2,6-Dimethylnaphthalene	**5670** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
2,3,5-Trimethylnaphthene	**1080** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
4-Methyldibenzothiophene	**3290** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
2/3-Methyldibenzothiophene	**2650** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
1-Methyldibenzothiophene	**701** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
3-Methylphenanthrene	**14500** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
2-Methylphenanthrene	**16100** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
2-Methylanthracene	**8050** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
4/9-Methylphenanthrene	**14400** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601
1-Methylphenanthrene	**10600** (24.2)	12.1	8270 Mod		5	09/19/19 0:36	F9I0006	FI91601

	%Recovery	*Qualifier*	*Limits*
Surrogate: Naphthalene-d8	*76 %*		*50-120*
Surrogate: Perylene-d12	*99 %*		*50-120*
Surrogate: Phenanthrene-d10	*83 %*		*50-120*
Surrogate: Toluene-D8	*67 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-682-S2
Date Sampled: 09/12/19 13:05
Percent Solids: 71

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-11
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**47100** (104)		TOC-LK		1	CCP	09/19/19 19:49	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-682-S3
Date Sampled: 09/12/19 13:15
Percent Solids: 55
Initial Volume: 6.07
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-12
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**18.3** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C1-Benzene	**41.8** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C2-Benzenes	**29.7** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C3-Benzenes	**20.0** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C4-Benzenes	**31.8** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C5-Benzenes	**15.0** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
Methylcyclohexane	ND (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
Toluene	**85.4** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
Ethylbenzene	**11.6** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
m,p-Xylene	**65.8** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
Styrene	**62.6** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
o-Xylene	**J 5.93** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
Isopropylbenzene	ND (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
n-Propylbenzene	ND (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
1,3,5-Trimethylbenzene	**23.6** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
1,2,3-Trimethylbenzene	**9.55** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
1,2,4-Trimethylbenzene	**17.1** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
t-Butylbenzene	ND (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
sec-Butylbenzene	ND (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
p-Isopropyltoluene	**25.2** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
n-Butylbenzene	ND (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
trans-Decalin	**10.6** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
cis-Decalin	**6.61** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C1-Decalins	**29.1** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C2-Decalins	**27.1** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C3-Decalins	ND (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C4-Decalins	ND (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
Benzo(b)thiophene	**J 3.06** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C1-Benzo(b)thiophenes	**7.71** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C2-Benzo(b)thiophenes	**23.1** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C3-Benzo(b)thiophenes	**34.6** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C4-Benzo(b)thiophenes	**7.88** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-682-S3
Date Sampled: 09/12/19 13:15
Percent Solids: 55
Initial Volume: 6.07
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-12
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**210** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
2-Methylnaphthalene	**246** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
1-Methylnaphthalene	**158** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C1-Naphthalenes	**246** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C2-Naphthalenes	**514** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C3-Naphthalenes	**453** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C4-Naphthalenes	**220** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
Biphenyl	**83.6** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
Acenaphthylene	**298** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
Acenaphthene	**349** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
Dibenzofuran	**40.4** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
Fluorene	**230** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C1-Fluorenes	**375** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C2-Fluorenes	**326** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C3-Fluorenes	**188** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
Dibenzothiophene	**65.9** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C1-Dibenzothiophenes	**115** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C2-Dibenzothiophenes	**129** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C3-Dibenzothiophenes	**96.0** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C4-Dibenzothiophenes	**50.8** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
Phenanthrene	**1170** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
Anthracene	**837** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C1-Phenanthrenes/Anthracenes	**2250** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C2-Phenanthrenes/Anthracenes	**1270** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C3-Phenanthrenes/Anthracenes	**472** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C4-Phenanthrenes/Anthracenes	**263** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
Retene	**473** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
Benzo(b)naphtho(2,1-d)thiophene	**116** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C0-Benzonaphthothiophenes	**249** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C1-Benzonaphthothiophenes	**218** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C2-Benzonaphthothiophenes	**147** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C3-Benzonaphthothiophenes	**91.1** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-682-S3
Date Sampled: 09/12/19 13:15
Percent Solids: 55
Initial Volume: 6.07
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-12
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**29.5** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
Fluoranthene	**2570** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
Pyrene	**4410** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C1-Fluoranthenes/Pyrenes	**3330** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C2-Fluoranthenes/Pyrenes	**1200** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C3-Fluoranthenes/Pyrenes	**404** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
Benzo(b)fluorene	**320** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
Benzo(c)fluorene	**187** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
2-Methylpyrene	**481** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
4-Methylpyrene	**490** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
1-Methylpyrene	**413** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
Benz(a)anthracene	**2240** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
Chrysene/triphenylene	**1990** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C1-Benzo(a)anthracenes/Chrysenes	**1690** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C2-Benzo(a)anthracenes/Chrysenes	**883** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C3-Benzo(a)anthracenes/Chrysenes	**378** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C4-Benzo(a)anthracenes/Chrysenes	**164** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
Benzo(b)fluoranthene	**1190** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
Benzo(j/k)fluoranthene	**1340** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
Benzo(e)pyrene	**1630** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
Benzo(a)pyrene	**2430** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
Perylene	**690** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
Indeno(1,2,3-cd)pyrene	**840** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
Dibenzo(a,h)anthracene	**330** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
Benzo(g,h,i)perylene	**1280** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
Coronene	**306** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
Tetramethyl lead	ND (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
Trimethylethyl lead	ND (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
Dimethyldiethyl lead	ND (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
Methyltriethyl lead	ND (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
Tetraethyl lead	ND (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
2,6,10-trimethyldodecane (1380)	**46.5** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-682-S3
Date Sampled: 09/12/19 13:15
Percent Solids: 55
Initial Volume: 6.07
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-12
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**81.3** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
2,6,10-trimethylpentadecane (1650)	**60.3** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C-17	**142** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
Pristane	**149** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
C-18	**B 81.5** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
Phytane	**107** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
Carbazole	**19.1** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
2,6-Dimethylnaphthalene	**74.1** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
2,3,5-Trimethylnaphthene	**36.1** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
4-Methyldibenzothiophene	**30.8** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
2/3-Methyldibenzothiophene	**41.2** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
1-Methyldibenzothiophene	**12.9** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
3-Methylphenanthrene	**540** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
2-Methylphenanthrene	**579** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
2-Methylanthracene	**309** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
4/9-Methylphenanthrene	**620** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601
1-Methylphenanthrene	**174** (6.00)	3.00	8270 Mod		1	09/23/19 20:24	F9I0009	FI91601

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*84 %*		*50-120*
Surrogate: Perylene-d12	*95 %*		*50-120*
Surrogate: Phenanthrene-d10	*95 %*		*50-120*
Surrogate: Toluene-D8	*69 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-682-S3
Date Sampled: 09/12/19 13:15
Percent Solids: 55

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-12
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**89800** (115)		TOC-LK		1	CCP	09/19/19 20:39	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-683-S2
Date Sampled: 09/12/19 13:55
Percent Solids: 75
Initial Volume: 5.76
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-13
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**33.6** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
C1-Benzene	**89.5** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
C2-Benzenes	**179** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
C3-Benzenes	**147** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
C4-Benzenes	**457** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
C5-Benzenes	**370** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
Methylcyclohexane	**20.7** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
Toluene	**152** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
Ethylbenzene	**59.7** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
m,p-Xylene	**301** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
Styrene	**388** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
o-Xylene	**21.4** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
Isopropylbenzene	**14.2** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
n-Propylbenzene	**23.1** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
1,3,5-Trimethylbenzene	**58.2** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
1,2,3-Trimethylbenzene	**31.8** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
1,2,4-Trimethylbenzene	**88.3** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
t-Butylbenzene	**J 3.14** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
sec-Butylbenzene	**12.3** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
p-Isopropyltoluene	**22.0** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
n-Butylbenzene	ND (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
trans-Decalin	**78.5** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
cis-Decalin	**10.1** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
C1-Decalins	**271** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
C2-Decalins	**438** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
C3-Decalins	**445** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
C4-Decalins	**843** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
Benzo(b)thiophene	**47.7** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
C1-Benzo(b)thiophenes	**176** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
C2-Benzo(b)thiophenes	**713** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
C3-Benzo(b)thiophenes	**881** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
C4-Benzo(b)thiophenes	**349** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-683-S2
Date Sampled: 09/12/19 13:55
Percent Solids: 75
Initial Volume: 5.76
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-13
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**1420** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
2-Methylnaphthalene	**600** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
1-Methylnaphthalene	**4120** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
C1-Naphthalenes	**2820** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
C2-Naphthalenes	**10400** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
C3-Naphthalenes	**8080** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
C4-Naphthalenes	**3440** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
Biphenyl	**358** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
Acenaphthylene	**4110** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
Acenaphthene	**10800** (92.2)	46.1	8270 Mod		20	09/21/19 12:14	F9I0006	FI91601
Dibenzofuran	**677** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
Fluorene	**6990** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
C1-Fluorenes	**5270** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
C2-Fluorenes	**3730** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
C3-Fluorenes	**1870** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
Dibenzothiophene	**3200** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
C1-Dibenzothiophenes	**4320** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
C2-Dibenzothiophenes	**3590** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
C3-Dibenzothiophenes	**1770** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
C4-Dibenzothiophenes	**656** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
Phenanthrene	**44200** (92.2)	46.1	8270 Mod		20	09/21/19 12:14	F9I0006	FI91601
Anthracene	**13300** (92.2)	46.1	8270 Mod		20	09/21/19 12:14	F9I0006	FI91601
C1-Phenanthrenes/Anthracenes	**22700** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
C2-Phenanthrenes/Anthracenes	**10300** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
C3-Phenanthrenes/Anthracenes	**3980** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
C4-Phenanthrenes/Anthracenes	**2890** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
Retene	**13300** (92.2)	46.1	8270 Mod		20	09/21/19 12:14	F9I0006	FI91601
Benzo(b)naphtho(2,1-d)thiophene	**2280** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
C0-Benzonaphthothiophenes	**4160** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
C1-Benzonaphthothiophenes	**2780** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
C2-Benzonaphthothiophenes	**1440** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
C3-Benzonaphthothiophenes	**788** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-683-S2
Date Sampled: 09/12/19 13:55
Percent Solids: 75
Initial Volume: 5.76
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-13
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**206** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
Fluoranthene	**34100** (92.2)	46.1	8270 Mod		20	09/21/19 12:14	F9I0006	FI91601
Pyrene	**49800** (92.2)	46.1	8270 Mod		20	09/21/19 12:14	F9I0006	FI91601
C1-Fluoranthenes/Pyrenes	**20800** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
C2-Fluoranthenes/Pyrenes	**6240** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
C3-Fluoranthenes/Pyrenes	**1760** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
Benzo(b)fluorene	**2500** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
Benzo(c)fluorene	**941** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
2-Methylpyrene	**2880** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
4-Methylpyrene	**2670** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
1-Methylpyrene	**2830** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
Benz(a)anthracene	**19800** (92.2)	46.1	8270 Mod		20	09/21/19 12:14	F9I0006	FI91601
Chrysene/triphenylene	**13800** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
C1-Benzo(a)anthracenes/Chrysenes	**8170** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
C2-Benzo(a)anthracenes/Chrysenes	**3290** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
C3-Benzo(a)anthracenes/Chrysenes	**1070** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
C4-Benzo(a)anthracenes/Chrysenes	**507** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
Benzo(b)fluoranthene	**8270** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
Benzo(j/k)fluoranthene	**8060** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
Benzo(e)pyrene	**7660** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
Benzo(a)pyrene	**19400** (92.2)	46.1	8270 Mod		20	09/21/19 12:14	F9I0006	FI91601
Perylene	**2200** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
Indeno(1,2,3-cd)pyrene	**4920** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
Dibenzo(a,h)anthracene	**1480** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
Benzo(g,h,i)perylene	**5930** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
Coronene	**2870** (92.2)	46.1	8270 Mod		20	09/21/19 12:14	F9I0006	FI91601
Tetramethyl lead	ND (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
Trimethylethyl lead	ND (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
Dimethyldiethyl lead	ND (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
Methyltriethyl lead	ND (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
Tetraethyl lead	ND (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
2,6,10-trimethyldodecane (1380)	**837** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-683-S2
Date Sampled: 09/12/19 13:55
Percent Solids: 75
Initial Volume: 5.76
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-13
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**1270** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
2,6,10-trimethylpentadecane (1650)	**1510** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
C-17	**309** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
Pristane	**3290** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
C-18	**341** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
Phytane	**2930** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
Carbazole	**235** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
2,6-Dimethylnaphthalene	**2140** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
2,3,5-Trimethylnaphthene	**583** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
4-Methyldibenzothiophene	**1730** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
2/3-Methyldibenzothiophene	**1420** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
1-Methyldibenzothiophene	**478** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
3-Methylphenanthrene	**5060** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
2-Methylphenanthrene	**5650** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
2-Methylanthracene	**2530** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
4/9-Methylphenanthrene	**5410** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601
1-Methylphenanthrene	**3970** (4.61)	2.30	8270 Mod		1	09/19/19 3:19	F9I0006	FI91601

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*79 %*		*50-120*
Surrogate: Perylene-d12	*76 %*		*50-120*
Surrogate: Phenanthrene-d10	*82 %*		*50-120*
Surrogate: Toluene-D8	*64 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-683-S2
Date Sampled: 09/12/19 13:55
Percent Solids: 75

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-13
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**61000** (116)		TOC-LK		1	CCP	09/19/19 20:55	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-683-S4
Date Sampled: 09/12/19 14:04
Percent Solids: 62
Initial Volume: 6.94
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-14
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**6.18** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C1-Benzene	**50.8** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C2-Benzenes	**22.6** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C3-Benzenes	**17.9** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C4-Benzenes	**22.6** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C5-Benzenes	**11.0** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
Methylcyclohexane	ND (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
Toluene	**93.8** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
Ethylbenzene	**8.49** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
m,p-Xylene	**47.3** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
Styrene	**34.8** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
o-Xylene	**7.59** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
Isopropylbenzene	ND (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
n-Propylbenzene	ND (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
1,3,5-Trimethylbenzene	**16.6** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
1,2,3-Trimethylbenzene	**8.29** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
1,2,4-Trimethylbenzene	**14.6** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
t-Butylbenzene	ND (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
sec-Butylbenzene	ND (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
p-Isopropyltoluene	**26.2** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
n-Butylbenzene	ND (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
trans-Decalin	**J 3.99** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
cis-Decalin	**5.20** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C1-Decalins	**16.4** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C2-Decalins	**31.5** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C3-Decalins	**19.5** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C4-Decalins	**34.0** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
Benzo(b)thiophene	**J 3.06** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C1-Benzo(b)thiophenes	**6.92** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C2-Benzo(b)thiophenes	**15.1** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C3-Benzo(b)thiophenes	**13.3** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C4-Benzo(b)thiophenes	**7.06** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-683-S4
Date Sampled: 09/12/19 14:04
Percent Solids: 62
Initial Volume: 6.94
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-14
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**138** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
2-Methylnaphthalene	**135** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
1-Methylnaphthalene	**93.2** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C1-Naphthalenes	**139** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C2-Naphthalenes	**300** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C3-Naphthalenes	**286** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C4-Naphthalenes	**170** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
Biphenyl	**47.7** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
Acenaphthylene	**161** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
Acenaphthene	**165** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
Dibenzofuran	**31.4** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
Fluorene	**148** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C1-Fluorenes	**185** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C2-Fluorenes	**208** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C3-Fluorenes	**176** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
Dibenzothiophene	**46.7** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C1-Dibenzothiophenes	**93.6** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C2-Dibenzothiophenes	**103** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C3-Dibenzothiophenes	**74.0** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C4-Dibenzothiophenes	**39.3** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
Phenanthrene	**855** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
Anthracene	**357** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C1-Phenanthrenes/Anthracenes	**1280** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C2-Phenanthrenes/Anthracenes	**1180** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C3-Phenanthrenes/Anthracenes	**557** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C4-Phenanthrenes/Anthracenes	**478** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
Retene	**901** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
Benzo(b)naphtho(2,1-d)thiophene	**83.7** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C0-Benzonaphthothiophenes	**165** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C1-Benzonaphthothiophenes	**150** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C2-Benzonaphthothiophenes	**99.7** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C3-Benzonaphthothiophenes	**65.3** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-683-S4
Date Sampled: 09/12/19 14:04
Percent Solids: 62
Initial Volume: 6.94
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-14
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**17.7** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
Fluoranthene	**1640** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
Pyrene	**2550** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C1-Fluoranthenes/Pyrenes	**1970** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C2-Fluoranthenes/Pyrenes	**817** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C3-Fluoranthenes/Pyrenes	**298** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
Benzo(b)fluorene	**177** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
Benzo(c)fluorene	**107** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
2-Methylpyrene	**297** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
4-Methylpyrene	**321** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
1-Methylpyrene	**245** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
Benz(a)anthracene	**1330** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
Chrysene/triphenylene	**1280** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C1-Benzo(a)anthracenes/Chrysenes	**1150** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C2-Benzo(a)anthracenes/Chrysenes	**642** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C3-Benzo(a)anthracenes/Chrysenes	**283** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C4-Benzo(a)anthracenes/Chrysenes	**99.9** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
Benzo(b)fluoranthene	**738** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
Benzo(j/k)fluoranthene	**843** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
Benzo(e)pyrene	**984** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
Benzo(a)pyrene	**1370** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
Perylene	**449** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
Indeno(1,2,3-cd)pyrene	**481** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
Dibenzo(a,h)anthracene	**179** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
Benzo(g,h,i)perylene	**714** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
Coronene	**166** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
Tetramethyl lead	ND (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
Trimethylethyl lead	ND (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
Dimethyldiethyl lead	ND (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
Methyltriethyl lead	ND (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
Tetraethyl lead	ND (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
2,6,10-trimethyldodecane (1380)	**29.8** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-683-S4
Date Sampled: 09/12/19 14:04
Percent Solids: 62
Initial Volume: 6.94
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-14
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**71.2** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
2,6,10-trimethylpentadecane (1650)	**61.9** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C-17	**138** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
Pristane	**150** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
C-18	**B 65.0** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
Phytane	**127** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
Carbazole	**20.3** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
2,6-Dimethylnaphthalene	**52.7** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
2,3,5-Trimethylnaphthene	**21.6** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
4-Methyldibenzothiophene	**29.3** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
2/3-Methyldibenzothiophene	**31.8** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
1-Methyldibenzothiophene	**9.88** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
3-Methylphenanthrene	**305** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
2-Methylphenanthrene	**306** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
2-Methylanthracene	**152** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
4/9-Methylphenanthrene	**358** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601
1-Methylphenanthrene	**129** (4.63)	2.31	8270 Mod		1	09/23/19 21:47	F9I0009	FI91601

	%Recovery	*Qualifier*	*Limits*
Surrogate: Naphthalene-d8	*78 %*		*50-120*
Surrogate: Perylene-d12	*74 %*		*50-120*
Surrogate: Phenanthrene-d10	*85 %*		*50-120*
Surrogate: Toluene-D8	*64 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-683-S4
Date Sampled: 09/12/19 14:04
Percent Solids: 62

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-14
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**42500** (119)		TOC-LK		1	CCP	09/19/19 21:12	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-683-S5
Date Sampled: 09/12/19 14:09
Percent Solids: 24
Initial Volume: 5.74
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-15
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**17.3** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C1-Benzene	**85.0** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C2-Benzenes	**43.8** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C3-Benzenes	**36.6** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C4-Benzenes	**33.8** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C5-Benzenes	**15.7** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
Methylcyclohexane	ND (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
Toluene	**180** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
Ethylbenzene	**20.8** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
m,p-Xylene	**103** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
Styrene	**74.4** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
o-Xylene	**J 11.9** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
Isopropylbenzene	ND (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
n-Propylbenzene	ND (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
1,3,5-Trimethylbenzene	**50.5** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
1,2,3-Trimethylbenzene	**14.7** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
1,2,4-Trimethylbenzene	**36.4** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
t-Butylbenzene	ND (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
sec-Butylbenzene	ND (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
p-Isopropyltoluene	**52.4** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
n-Butylbenzene	ND (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
trans-Decalin	**23.1** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
cis-Decalin	**16.9** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C1-Decalins	**42.7** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C2-Decalins	**74.1** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C3-Decalins	**45.4** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C4-Decalins	**83.8** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
Benzo(b)thiophene	**J 10.0** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C1-Benzo(b)thiophenes	**17.1** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C2-Benzo(b)thiophenes	**41.5** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C3-Benzo(b)thiophenes	**47.7** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C4-Benzo(b)thiophenes	**21.6** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-683-S5
Date Sampled: 09/12/19 14:09
Percent Solids: 24
Initial Volume: 5.74
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-15
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**388** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
2-Methylnaphthalene	**402** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
1-Methylnaphthalene	**298** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C1-Naphthalenes	**426** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C2-Naphthalenes	**930** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C3-Naphthalenes	**829** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C4-Naphthalenes	**423** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
Biphenyl	**144** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
Acenaphthylene	**569** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
Acenaphthene	**538** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
Dibenzofuran	**142** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
Fluorene	**570** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C1-Fluorenes	**614** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C2-Fluorenes	**593** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C3-Fluorenes	**374** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
Dibenzothiophene	**206** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C1-Dibenzothiophenes	**314** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C2-Dibenzothiophenes	**313** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C3-Dibenzothiophenes	**202** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C4-Dibenzothiophenes	**89.7** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
Phenanthrene	**3520** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
Anthracene	**1400** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C1-Phenanthrenes/Anthracenes	**4000** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C2-Phenanthrenes/Anthracenes	**2230** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C3-Phenanthrenes/Anthracenes	**909** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C4-Phenanthrenes/Anthracenes	**428** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
Retene	**534** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
Benzo(b)naphtho(2,1-d)thiophene	**288** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C0-Benzonaphthothiophenes	**567** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C1-Benzonaphthothiophenes	**458** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C2-Benzonaphthothiophenes	**275** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C3-Benzonaphthothiophenes	**167** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-683-S5
Date Sampled: 09/12/19 14:09
Percent Solids: 24
Initial Volume: 5.74
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-15
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**51.5** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
Fluoranthene	**4890** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
Pyrene	**7860** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C1-Fluoranthenes/Pyrenes	**5620** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C2-Fluoranthenes/Pyrenes	**2140** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C3-Fluoranthenes/Pyrenes	**788** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
Benzo(b)fluorene	**543** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
Benzo(c)fluorene	**325** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
2-Methylpyrene	**792** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
4-Methylpyrene	**809** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
1-Methylpyrene	**665** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
Benz(a)anthracene	**4040** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
Chrysene/triphenylene	**3660** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C1-Benzo(a)anthracenes/Chrysenes	**3010** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C2-Benzo(a)anthracenes/Chrysenes	**1580** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C3-Benzo(a)anthracenes/Chrysenes	**671** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C4-Benzo(a)anthracenes/Chrysenes	**256** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
Benzo(b)fluoranthene	**2290** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
Benzo(j/k)fluoranthene	**2570** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
Benzo(e)pyrene	**2730** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
Benzo(a)pyrene	**4140** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
Perylene	**1480** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
Indeno(1,2,3-cd)pyrene	**1550** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
Dibenzo(a,h)anthracene	**601** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
Benzo(g,h,i)perylene	**2100** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
Coronene	**506** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
Tetramethyl lead	ND (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
Trimethylethyl lead	ND (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
Dimethyldiethyl lead	ND (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
Methyltriethyl lead	ND (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
Tetraethyl lead	ND (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
2,6,10-trimethyldodecane (1380)	**81.5** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-683-S5
Date Sampled: 09/12/19 14:09
Percent Solids: 24
Initial Volume: 5.74
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-15
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**150** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
2,6,10-trimethylpentadecane (1650)	**119** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C-17	**260** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
Pristane	**285** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
C-18	**196** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
Phytane	**262** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
Carbazole	**84.2** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
2,6-Dimethylnaphthalene	**179** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
2,3,5-Trimethylnaphthene	**63.5** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
4-Methyldibenzothiophene	**102** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
2/3-Methyldibenzothiophene	**113** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
1-Methyldibenzothiophene	**35.2** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
3-Methylphenanthrene	**946** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
2-Methylphenanthrene	**1000** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
2-Methylanthracene	**492** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
4/9-Methylphenanthrene	**1040** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601
1-Methylphenanthrene	**419** (14.5)	7.25	8270 Mod		1	09/23/19 23:10	F9I0009	FI91601

	%Recovery	*Qualifier*	*Limits*
Surrogate: Naphthalene-d8	*82 %*		*50-120*
Surrogate: Perylene-d12	*96 %*		*50-120*
Surrogate: Phenanthrene-d10	*94 %*		*50-120*
Surrogate: Toluene-D8	*65 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-683-S5
Date Sampled: 09/12/19 14:09
Percent Solids: 24

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-15
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**19600** (118)		TOC-LK		1	CCP	09/19/19 21:29	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-684-S2
Date Sampled: 09/12/19 14:45
Percent Solids: 98
Initial Volume: 6.15
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-16
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**50.9** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C1-Benzene	**180** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C2-Benzenes	**116** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C3-Benzenes	**62.4** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C4-Benzenes	**242** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C5-Benzenes	**252** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
Methylcyclohexane	**7.99** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
Toluene	**292** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
Ethylbenzene	**19.0** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
m,p-Xylene	**225** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
Styrene	**103** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
o-Xylene	**17.0** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
Isopropylbenzene	**J 3.20** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
n-Propylbenzene	**32.0** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
1,3,5-Trimethylbenzene	**53.4** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
1,2,3-Trimethylbenzene	**19.5** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
1,2,4-Trimethylbenzene	**42.2** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
t-Butylbenzene	**J 3.23** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
sec-Butylbenzene	**3.88** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
p-Isopropyltoluene	**14.0** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
n-Butylbenzene	ND (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
trans-Decalin	**1780** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
cis-Decalin	**246** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C1-Decalins	**2300** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C2-Decalins	**800** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C3-Decalins	**350** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C4-Decalins	**571** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
Benzo(b)thiophene	**5.23** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C1-Benzo(b)thiophenes	**20.6** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C2-Benzo(b)thiophenes	**53.0** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C3-Benzo(b)thiophenes	**81.1** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C4-Benzo(b)thiophenes	**70.2** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-684-S2
Date Sampled: 09/12/19 14:45
Percent Solids: 98
Initial Volume: 6.15
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-16
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**63.2** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
2-Methylnaphthalene	**46.2** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
1-Methylnaphthalene	**28.6** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C1-Naphthalenes	**45.7** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C2-Naphthalenes	**495** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C3-Naphthalenes	**1330** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C4-Naphthalenes	**966** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
Biphenyl	**109** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
Acenaphthylene	**235** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
Acenaphthene	**233** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
Dibenzofuran	**30.3** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
Fluorene	**174** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C1-Fluorenes	**275** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C2-Fluorenes	**502** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C3-Fluorenes	**428** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
Dibenzothiophene	**119** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C1-Dibenzothiophenes	**289** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C2-Dibenzothiophenes	**423** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C3-Dibenzothiophenes	**373** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C4-Dibenzothiophenes	**196** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
Phenanthrene	**846** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
Anthracene	**304** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C1-Phenanthrenes/Anthracenes	**1050** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C2-Phenanthrenes/Anthracenes	**886** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C3-Phenanthrenes/Anthracenes	**488** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C4-Phenanthrenes/Anthracenes	**215** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
Retene	**80.1** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
Benzo(b)naphtho(2,1-d)thiophene	**139** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C0-Benzonaphthothiophenes	**260** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C1-Benzonaphthothiophenes	**224** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C2-Benzonaphthothiophenes	**218** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C3-Benzonaphthothiophenes	**170** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-684-S2
Date Sampled: 09/12/19 14:45
Percent Solids: 98
Initial Volume: 6.15
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-16
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**74.6** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
Fluoranthene	**1520** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
Pyrene	**1880** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C1-Fluoranthenes/Pyrenes	**958** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C2-Fluoranthenes/Pyrenes	**441** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C3-Fluoranthenes/Pyrenes	**208** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
Benzo(b)fluorene	**97.5** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
Benzo(c)fluorene	**55.9** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
2-Methylpyrene	**139** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
4-Methylpyrene	**138** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
1-Methylpyrene	**108** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
Benz(a)anthracene	**776** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
Chrysene/triphenylene	**897** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C1-Benzo(a)anthracenes/Chrysenes	**500** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C2-Benzo(a)anthracenes/Chrysenes	**310** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C3-Benzo(a)anthracenes/Chrysenes	**172** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C4-Benzo(a)anthracenes/Chrysenes	**87.2** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
Benzo(b)fluoranthene	**670** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
Benzo(j/k)fluoranthene	**668** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
Benzo(e)pyrene	**645** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
Benzo(a)pyrene	**838** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
Perylene	**301** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
Indeno(1,2,3-cd)pyrene	**465** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
Dibenzo(a,h)anthracene	**136** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
Benzo(g,h,i)perylene	**585** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
Coronene	**181** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
Tetramethyl lead	ND (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
Trimethylethyl lead	ND (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
Dimethyldiethyl lead	ND (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
Methyltriethyl lead	ND (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
Tetraethyl lead	ND (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
2,6,10-trimethyldodecane (1380)	**731** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-684-S2
Date Sampled: 09/12/19 14:45
Percent Solids: 98
Initial Volume: 6.15
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-16
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**1020** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
2,6,10-trimethylpentadecane (1650)	**803** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C-17	**119** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
Pristane	**2550** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
C-18	**94.9** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
Phytane	**2100** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
Carbazole	**26.9** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
2,6-Dimethylnaphthalene	**69.9** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
2,3,5-Trimethylnaphthene	**92.2** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
4-Methyldibenzothiophene	**130** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
2/3-Methyldibenzothiophene	**104** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
1-Methyldibenzothiophene	**33.1** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
3-Methylphenanthrene	**260** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
2-Methylphenanthrene	**295** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
2-Methylanthracene	**71.4** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
4/9-Methylphenanthrene	**256** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601
1-Methylphenanthrene	**148** (3.31)	1.66	8270 Mod		1	09/24/19 0:34	F9I0009	FI91601

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*69 %*		*50-120*
Surrogate: Perylene-d12	*63 %*		*50-120*
Surrogate: Phenanthrene-d10	*73 %*		*50-120*
Surrogate: Toluene-D8	*57 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-684-S2
Date Sampled: 09/12/19 14:45
Percent Solids: 98

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-16
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**73400** (116)		TOC-LK		1	CCP	09/19/19 21:37	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-684-S4
Date Sampled: 09/12/19 14:56
Percent Solids: 81
Initial Volume: 5.92
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-17
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**20.7** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
C1-Benzene	**113** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
C2-Benzenes	**131** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
C3-Benzenes	**316** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
C4-Benzenes	**584** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
C5-Benzenes	**319** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
Methylcyclohexane	**24.5** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
Toluene	**216** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
Ethylbenzene	**49.7** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
m,p-Xylene	**184** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
Styrene	**99.5** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
o-Xylene	**59.1** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
Isopropylbenzene	**15.0** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
n-Propylbenzene	**17.2** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
1,3,5-Trimethylbenzene	**82.6** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
1,2,3-Trimethylbenzene	**48.3** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
1,2,4-Trimethylbenzene	**302** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
t-Butylbenzene	ND (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
sec-Butylbenzene	**J 3.81** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
p-Isopropyltoluene	**50.3** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
n-Butylbenzene	ND (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
trans-Decalin	**20.1** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
cis-Decalin	**4.52** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
C1-Decalins	**74.9** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
C2-Decalins	**148** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
C3-Decalins	**146** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
C4-Decalins	**299** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
Benzo(b)thiophene	**81.9** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
C1-Benzo(b)thiophenes	**215** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
C2-Benzo(b)thiophenes	**527** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
C3-Benzo(b)thiophenes	**327** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
C4-Benzo(b)thiophenes	**109** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-684-S4
Date Sampled: 09/12/19 14:56
Percent Solids: 81
Initial Volume: 5.92
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-17
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**2630** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
2-Methylnaphthalene	**1020** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
1-Methylnaphthalene	**6860** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
C1-Naphthalenes	**4710** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
C2-Naphthalenes	**13400** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
C3-Naphthalenes	**6970** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
C4-Naphthalenes	**2180** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
Biphenyl	**500** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
Acenaphthylene	**1300** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
Acenaphthene	**14400** (83.8)	41.9	8270 Mod		20	09/21/19 13:37	F9I0006	FI91601
Dibenzofuran	**818** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
Fluorene	**7950** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
C1-Fluorenes	**4990** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
C2-Fluorenes	**3110** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
C3-Fluorenes	**1410** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
Dibenzothiophene	**1700** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
C1-Dibenzothiophenes	**2150** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
C2-Dibenzothiophenes	**1670** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
C3-Dibenzothiophenes	**788** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
C4-Dibenzothiophenes	**264** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
Phenanthrene	**30700** (83.8)	41.9	8270 Mod		20	09/21/19 13:37	F9I0006	FI91601
Anthracene	**8540** (83.8)	41.9	8270 Mod		20	09/21/19 13:37	F9I0006	FI91601
C1-Phenanthrenes/Anthracenes	**18500** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
C2-Phenanthrenes/Anthracenes	**8080** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
C3-Phenanthrenes/Anthracenes	**2430** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
C4-Phenanthrenes/Anthracenes	**747** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
Retene	**377** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
Benzo(b)naphtho(2,1-d)thiophene	**744** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
C0-Benzonaphthothiophenes	**1330** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
C1-Benzonaphthothiophenes	**1020** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
C2-Benzonaphthothiophenes	**560** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
C3-Benzonaphthothiophenes	**282** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-684-S4
Date Sampled: 09/12/19 14:56
Percent Solids: 81
Initial Volume: 5.92
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-17
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**69.7** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
Fluoranthene	**14100** (83.8)	41.9	8270 Mod		20	09/21/19 13:37	F9I0006	FI91601
Pyrene	**19800** (83.8)	41.9	8270 Mod		20	09/21/19 13:37	F9I0006	FI91601
C1-Fluoranthenes/Pyrenes	**11500** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
C2-Fluoranthenes/Pyrenes	**3680** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
C3-Fluoranthenes/Pyrenes	**1120** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
Benzo(b)fluorene	**1310** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
Benzo(c)fluorene	**554** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
2-Methylpyrene	**1570** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
4-Methylpyrene	**1410** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
1-Methylpyrene	**1320** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
Benz(a)anthracene	**5970** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
Chrysene/triphenylene	**5980** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
C1-Benzo(a)anthracenes/Chrysenes	**4510** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
C2-Benzo(a)anthracenes/Chrysenes	**2000** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
C3-Benzo(a)anthracenes/Chrysenes	**718** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
C4-Benzo(a)anthracenes/Chrysenes	**282** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
Benzo(b)fluoranthene	**2670** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
Benzo(j/k)fluoranthene	**3080** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
Benzo(e)pyrene	**2720** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
Benzo(a)pyrene	**4290** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
Perylene	**958** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
Indeno(1,2,3-cd)pyrene	**1570** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
Dibenzo(a,h)anthracene	**565** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
Benzo(g,h,i)perylene	**1850** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
Coronene	**676** (83.8)	41.9	8270 Mod		20	09/21/19 13:37	F9I0006	FI91601
Tetramethyl lead	ND (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
Trimethylethyl lead	ND (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
Dimethyldiethyl lead	ND (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
Methyltriethyl lead	ND (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
Tetraethyl lead	ND (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
2,6,10-trimethyldodecane (1380)	**133** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-684-S4
Date Sampled: 09/12/19 14:56
Percent Solids: 81
Initial Volume: 5.92
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-17
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/16/19 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**352** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
2,6,10-trimethylpentadecane (1650)	**500** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
C-17	**262** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
Pristane	**1070** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
C-18	**165** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
Phytane	**1140** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
Carbazole	**92.0** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
2,6-Dimethylnaphthalene	**3050** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
2,3,5-Trimethylnaphthene	**516** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
4-Methyldibenzothiophene	**915** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
2/3-Methyldibenzothiophene	**734** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
1-Methyldibenzothiophene	**194** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
3-Methylphenanthrene	**4400** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
2-Methylphenanthrene	**4810** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
2-Methylanthracene	**1810** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
4/9-Methylphenanthrene	**4240** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601
1-Methylphenanthrene	**3170** (4.19)	2.09	8270 Mod		1	09/19/19 8:47	F9I0006	FI91601

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*91 %*		*50-120*
Surrogate: Perylene-d12	*85 %*		*50-120*
Surrogate: Phenanthrene-d10	*92 %*		*50-120*
Surrogate: Toluene-D8	*76 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS-684-S4
Date Sampled: 09/12/19 14:56
Percent Solids: 81

ESS Laboratory Work Order: F190039
ESS Laboratory Sample ID: F190039-17
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**58300** (111)		TOC-LK		1	CCP	09/19/19 22:35	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190039

Quality Control Data

Classical Chemistry

Batch CI91848 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	100	mg/kg							
Total Organic Carbon (2)	ND	100	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190039

Quality Control Data

Classical Chemistry

Batch CI91848 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9680	100	mg/kg	10000		97	80-120			
Total Organic Carbon (2)	9990	100	mg/kg	10000		100	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190039

Quality Control Data

Classical Chemistry

Batch CI91848 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	10100	100	mg/kg	10000		101	80-120	5	20	
Total Organic Carbon (2)	10200	100	mg/kg	10000		102	80-120	2	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190039

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FI91601 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	2.55	4.00	ug/Kg wet							J
C1-Benzene	ND	4.00	ug/Kg wet							
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	ND	4.00	ug/Kg wet							
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	ND	4.00	ug/Kg wet							
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190039

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FI91601 - 3570

C1-Fluorenes	ND	4.00	ug/Kg wet
C2-Fluorenes	ND	4.00	ug/Kg wet
C3-Fluorenes	ND	4.00	ug/Kg wet
Dibenzothiophene	ND	4.00	ug/Kg wet
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet
Phenanthrene	ND	4.00	ug/Kg wet
Anthracene	ND	4.00	ug/Kg wet
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
Retene	ND	4.00	ug/Kg wet
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
Fluoranthene	ND	4.00	ug/Kg wet
Pyrene	ND	4.00	ug/Kg wet
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
Benzo(b)fluorene	ND	4.00	ug/Kg wet
Benzo(c)fluorene	ND	4.00	ug/Kg wet
2-Methylpyrene	ND	4.00	ug/Kg wet
4-Methylpyrene	ND	4.00	ug/Kg wet
1-Methylpyrene	ND	4.00	ug/Kg wet
Benz(a)anthracene	ND	4.00	ug/Kg wet
Chrysene/triphenylene	ND	4.00	ug/Kg wet
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet
Benzo(e)pyrene	ND	4.00	ug/Kg wet
Benzo(a)pyrene	ND	4.00	ug/Kg wet
Perylene	ND	4.00	ug/Kg wet
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet
Coronene	ND	4.00	ug/Kg wet
Tetramethyl lead	ND	4.00	ug/Kg wet
Trimethylethyl lead	ND	4.00	ug/Kg wet

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190039

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FI91601 - 3570						
Dimethyldiethyl lead	ND	4.00	ug/Kg wet			
Methyltriethyl lead	ND	4.00	ug/Kg wet			
Tetraethyl lead	ND	4.00	ug/Kg wet			
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet			
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet			
2,6,10-trimethylpentadecane (1650)	ND	4.00	ug/Kg wet			
C-17	6.54	4.00	ug/Kg wet			
Pristane	5.25	4.00	ug/Kg wet			
C-18	9.37	4.00	ug/Kg wet			
Phytane	8.18	4.00	ug/Kg wet			
Carbazole	ND	4.00	ug/Kg wet			
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet			
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet			
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
3-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylanthracene	ND	4.00	ug/Kg wet			
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet			
1-Methylphenanthrene	ND	4.00	ug/Kg wet			
Surrogate: Naphthalene-d8	*366*		ug/Kg wet	*400.0*	*91*	*50-120*
Surrogate: Perylene-d12	*366*		ug/Kg wet	*400.0*	*92*	*50-120*
Surrogate: Phenanthrene-d10	*375*		ug/Kg wet	*400.0*	*94*	*50-120*
Surrogate: Toluene-D8	*352*		ug/Kg wet	*400.0*	*88*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190039

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FI91601 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	269	4.00	ug/Kg wet	400.0		67	60-130			
Methylcyclohexane	197	4.00	ug/Kg wet	400.0		49	60-130			B-
Toluene	325	4.00	ug/Kg wet	400.0		81	60-130			
Ethylbenzene	360	4.00	ug/Kg wet	400.0		90	60-130			
m,p-Xylene	343	4.00	ug/Kg wet	400.0		86	60-130			
Styrene	340	4.00	ug/Kg wet	400.0		85	60-130			
o-Xylene	342	4.00	ug/Kg wet	400.0		86	60-130			
Isopropylbenzene	339	4.00	ug/Kg wet	400.0		85	60-130			
n-Propylbenzene	347	4.00	ug/Kg wet	400.0		87	60-130			
1,3,5-Trimethylbenzene	352	4.00	ug/Kg wet	400.0		88	60-130			
1,2,3-Trimethylbenzene	346	4.00	ug/Kg wet	400.0		86	60-130			
1,2,4-Trimethylbenzene	357	4.00	ug/Kg wet	400.0		89	60-130			
t-Butylbenzene	347	4.00	ug/Kg wet	400.0		87	60-130			
sec-Butylbenzene	349	4.00	ug/Kg wet	400.0		87	60-130			
p-Isopropyltoluene	349	4.00	ug/Kg wet	400.0		87	60-130			
n-Butylbenzene	339	4.00	ug/Kg wet	400.0		85	60-130			
trans-Decalin	337	4.00	ug/Kg wet	400.0		84	60-130			
cis-Decalin	346	4.00	ug/Kg wet	400.0		87	60-130			
Benzo(b)thiophene	351	4.00	ug/Kg wet	400.0		88	60-130			
Naphthalene	352	4.00	ug/Kg wet	400.0		88	60-130			
2-Methylnaphthalene	345	4.00	ug/Kg wet	400.0		86	60-130			
1-Methylnaphthalene	336	4.00	ug/Kg wet	400.0		84	60-130			
Biphenyl	357	4.00	ug/Kg wet	400.0		89	60-130			
Acenaphthylene	357	4.00	ug/Kg wet	400.0		89	60-130			
Acenaphthene	347	4.00	ug/Kg wet	400.0		87	60-130			
Dibenzofuran	365	4.00	ug/Kg wet	400.0		91	60-130			
Fluorene	358	4.00	ug/Kg wet	400.0		89	60-130			
Dibenzothiophene	364	4.00	ug/Kg wet	400.0		91	60-130			
Phenanthrene	354	4.00	ug/Kg wet	400.0		88	60-130			
Anthracene	293	4.00	ug/Kg wet	400.0		73	60-130			
Retene	360	4.00	ug/Kg wet	400.0		90	60-130			
Benzo(b)naphtho(2,1-d)thiophene	364	4.00	ug/Kg wet	400.0		91	60-130			
Fluoranthene	372	4.00	ug/Kg wet	400.0		93	60-130			
Pyrene	360	4.00	ug/Kg wet	400.0		90	60-130			
Benz(a)anthracene	360	4.00	ug/Kg wet	400.0		90	60-130			
Chrysene/triphenylene	370	4.00	ug/Kg wet	400.0		93	60-130			
Benzo(b)fluoranthene	354	4.00	ug/Kg wet	400.0		88	60-130			
Benzo(j/k)fluoranthene	361	4.00	ug/Kg wet	400.0		90	60-130			
Benzo(e)pyrene	350	4.00	ug/Kg wet	400.0		88	60-130			
Benzo(a)pyrene	327	4.00	ug/Kg wet	400.0		82	60-130			
Perylene	340	4.00	ug/Kg wet	400.0		85	60-130			
Indeno(1,2,3-cd)pyrene	349	4.00	ug/Kg wet	400.0		87	60-130			
Dibenzo(a,h)anthracene	348	4.00	ug/Kg wet	400.0		87	60-130			
Benzo(g,h,i)perylene	342	4.00	ug/Kg wet	400.0		86	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190039

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FI91601 - 3570						
Coronene	359	4.00	ug/Kg wet	400.0	90	60-130
Tetraethyl lead	302	4.00	ug/Kg wet	400.0	76	60-130
Pristane	375	4.00	ug/Kg wet	400.0	94	60-130
Phytane	395	4.00	ug/Kg wet	400.0	99	60-130
Surrogate: Naphthalene-d8	*341*		ug/Kg wet	*400.0*	*85*	*50-120*
Surrogate: Perylene-d12	*328*		ug/Kg wet	*400.0*	*82*	*50-120*
Surrogate: Phenanthrene-d10	*358*		ug/Kg wet	*400.0*	*90*	*50-120*
Surrogate: Toluene-D8	*314*		ug/Kg wet	*400.0*	*78*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190039

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FI91601 - 3570

Duplicate **Source: F190039-17**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	13.1	4.48	ug/Kg dry		20.7			45	50	
C1-Benzene	118	4.48	ug/Kg dry		113			4	50	
C2-Benzenes	118	4.48	ug/Kg dry		131			10	50	
C3-Benzenes	284	4.48	ug/Kg dry		316			11	50	
C4-Benzenes	514	4.48	ug/Kg dry		584			13	50	
C5-Benzenes	281	4.48	ug/Kg dry		319			13	50	
Methylcyclohexane	21.8	4.48	ug/Kg dry		24.5			12	50	
Toluene	199	4.48	ug/Kg dry		216			8	50	
Ethylbenzene	40.7	4.48	ug/Kg dry		49.7			20	50	
m,p-Xylene	179	4.48	ug/Kg dry		184			2	50	
Styrene	87.6	4.48	ug/Kg dry		99.5			13	50	
o-Xylene	51.9	4.48	ug/Kg dry		59.1			13	50	
Isopropylbenzene	13.1	4.48	ug/Kg dry		15.0			14	50	
n-Propylbenzene	16.0	4.48	ug/Kg dry		17.2			7	50	
1,3,5-Trimethylbenzene	76.8	4.48	ug/Kg dry		82.6			7	50	
1,2,3-Trimethylbenzene	42.8	4.48	ug/Kg dry		48.3			12	50	
1,2,4-Trimethylbenzene	269	4.48	ug/Kg dry		302			11	50	
t-Butylbenzene	ND	4.48	ug/Kg dry		ND				50	
sec-Butylbenzene	3.32	4.48	ug/Kg dry		3.81			14	50	J
p-Isopropyltoluene	43.5	4.48	ug/Kg dry		50.3			14	50	
n-Butylbenzene	ND	4.48	ug/Kg dry		ND				50	
trans-Decalin	21.8	4.48	ug/Kg dry		20.1			8	50	
cis-Decalin	4.07	4.48	ug/Kg dry		4.52			10	50	J
C1-Decalins	68.1	4.48	ug/Kg dry		74.9			9	50	
C2-Decalins	131	4.48	ug/Kg dry		148			12	50	
C3-Decalins	129	4.48	ug/Kg dry		146			12	50	
C4-Decalins	240	4.48	ug/Kg dry		299			22	50	
Benzo(b)thiophene	76.3	4.48	ug/Kg dry		81.9			7	50	
C1-Benzo(b)thiophenes	189	4.48	ug/Kg dry		215			13	50	
C2-Benzo(b)thiophenes	461	4.48	ug/Kg dry		527			13	50	
C3-Benzo(b)thiophenes	265	4.48	ug/Kg dry		327			21	50	
C4-Benzo(b)thiophenes	83.1	4.48	ug/Kg dry		109			27	50	
Naphthalene	2180	4.48	ug/Kg dry		2630			18	50	
2-Methylnaphthalene	955	4.48	ug/Kg dry		1020			7	50	
1-Methylnaphthalene	5920	4.48	ug/Kg dry		6860			15	50	
C1-Naphthalenes	4110	4.48	ug/Kg dry		4710			14	50	
C2-Naphthalenes	11700	4.48	ug/Kg dry		13400			14	50	
C3-Naphthalenes	5780	4.48	ug/Kg dry		6970			19	50	
C4-Naphthalenes	1760	4.48	ug/Kg dry		2180			21	50	
Biphenyl	416	4.48	ug/Kg dry		500			18	50	
Acenaphthylene	1100	4.48	ug/Kg dry		1300			16	50	
Acenaphthene	12900	89.7	ug/Kg dry		14400			11	50	
Dibenzofuran	772	4.48	ug/Kg dry		818			6	50	
Fluorene	7040	4.48	ug/Kg dry		7950			12	50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190039

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FI91601 - 3570						
C1-Fluorenes	4070	4.48	ug/Kg dry	4990	20	50
C2-Fluorenes	2490	4.48	ug/Kg dry	3110	22	50
C3-Fluorenes	1120	4.48	ug/Kg dry	1410	24	50
Dibenzothiophene	1430	4.48	ug/Kg dry	1700	17	50
C1-Dibenzothiophenes	1680	4.48	ug/Kg dry	2150	25	50
C2-Dibenzothiophenes	1290	4.48	ug/Kg dry	1670	26	50
C3-Dibenzothiophenes	605	4.48	ug/Kg dry	788	26	50
C4-Dibenzothiophenes	208	4.48	ug/Kg dry	264	24	50
Phenanthrene	26200	89.7	ug/Kg dry	30700	16	50
Anthracene	7390	89.7	ug/Kg dry	8540	14	50
C1-Phenanthrenes/Anthracenes	15100	4.48	ug/Kg dry	18500	20	50
C2-Phenanthrenes/Anthracenes	6370	4.48	ug/Kg dry	8080	24	50
C3-Phenanthrenes/Anthracenes	1880	4.48	ug/Kg dry	2430	26	50
C4-Phenanthrenes/Anthracenes	598	4.48	ug/Kg dry	747	22	50
Retene	294	4.48	ug/Kg dry	377	25	50
Benzo(b)naphtho(2,1-d)thiophene	619	4.48	ug/Kg dry	744	18	50
C0-Benzonaphthothiophenes	1110	4.48	ug/Kg dry	1330	18	50
C1-Benzonaphthothiophenes	824	4.48	ug/Kg dry	1020	22	50
C2-Benzonaphthothiophenes	460	4.48	ug/Kg dry	560	20	50
C3-Benzonaphthothiophenes	228	4.48	ug/Kg dry	282	21	50
C4-Benzonaphthothiophenes	66.6	4.48	ug/Kg dry	69.7	4	50
Fluoranthene	11700	89.7	ug/Kg dry	14100	18	50
Pyrene	16100	89.7	ug/Kg dry	19800	20	50
C1-Fluoranthenes/Pyrenes	9520	4.48	ug/Kg dry	11500	19	50
C2-Fluoranthenes/Pyrenes	2980	4.48	ug/Kg dry	3680	21	50
C3-Fluoranthenes/Pyrenes	908	4.48	ug/Kg dry	1120	21	50
Benzo(b)fluorene	988	4.48	ug/Kg dry	1310	28	50
Benzo(c)fluorene	545	4.48	ug/Kg dry	554	2	50
2-Methylpyrene	1250	4.48	ug/Kg dry	1570	22	50
4-Methylpyrene	1140	4.48	ug/Kg dry	1410	21	50
1-Methylpyrene	1100	4.48	ug/Kg dry	1320	19	50
Benz(a)anthracene	5170	4.48	ug/Kg dry	5970	14	50
Chrysene/triphenylene	5110	4.48	ug/Kg dry	5980	16	50
C1-Benzo(a)anthracenes/Chrysenes	3670	4.48	ug/Kg dry	4510	20	50
C2-Benzo(a)anthracenes/Chrysenes	1670	4.48	ug/Kg dry	2000	18	50
C3-Benzo(a)anthracenes/Chrysenes	604	4.48	ug/Kg dry	718	17	50
C4-Benzo(a)anthracenes/Chrysenes	256	4.48	ug/Kg dry	282	9	50
Benzo(b)fluoranthene	2560	4.48	ug/Kg dry	2670	5	50
Benzo(j/k)fluoranthene	2660	4.48	ug/Kg dry	3080	15	50
Benzo(e)pyrene	2480	4.48	ug/Kg dry	2720	9	50
Benzo(a)pyrene	3910	4.48	ug/Kg dry	4290	9	50
Perylene	942	4.48	ug/Kg dry	958	2	50
Indeno(1,2,3-cd)pyrene	1490	4.48	ug/Kg dry	1570	6	50
Dibenzo(a,h)anthracene	475	4.48	ug/Kg dry	565	17	50
Benzo(g,h,i)perylene	1750	4.48	ug/Kg dry	1850	6	50
Coronene	468	89.7	ug/Kg dry	676	36	50
Tetramethyl lead	ND	4.48	ug/Kg dry	ND		50
Trimethylethyl lead	ND	4.48	ug/Kg dry	ND		50

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190039

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FI91601 - 3570								
Dimethyldiethyl lead	ND	4.48	ug/Kg dry	ND				50
Methyltriethyl lead	ND	4.48	ug/Kg dry	ND				50
Tetraethyl lead	ND	4.48	ug/Kg dry	ND				50
2,6,10-trimethyldodecane (1380)	119	4.48	ug/Kg dry	133			11	50
2,6,10-trimethyltridecane (1470)	309	4.48	ug/Kg dry	352			13	50
2,6,10-trimethylpentadecane (1650)	420	4.48	ug/Kg dry	500			18	50
C-17	225	4.48	ug/Kg dry	262			15	50
Pristane	912	4.48	ug/Kg dry	1070			16	50
C-18	155	4.48	ug/Kg dry	165			6	50
Phytane	966	4.48	ug/Kg dry	1140			17	50
Carbazole	134	4.48	ug/Kg dry	92.0			37	50
2,6-Dimethylnaphthalene	2690	4.48	ug/Kg dry	3050			13	50
2,3,5-Trimethylnaphthene	403	4.48	ug/Kg dry	516			25	50
4-Methyldibenzothiophene	708	4.48	ug/Kg dry	915			26	50
2/3-Methyldibenzothiophene	572	4.48	ug/Kg dry	734			25	50
1-Methyldibenzothiophene	153	4.48	ug/Kg dry	194			23	50
3-Methylphenanthrene	3620	4.48	ug/Kg dry	4400			19	50
2-Methylphenanthrene	3930	4.48	ug/Kg dry	4810			20	50
2-Methylanthracene	1470	4.48	ug/Kg dry	1810			21	50
4/9-Methylphenanthrene	3480	4.48	ug/Kg dry	4240			20	50
1-Methylphenanthrene	2550	4.48	ug/Kg dry	3170			21	50
Surrogate: Naphthalene-d8	*419*		ug/Kg dry	*448.4*		*93*	*50-120*	
Surrogate: Perylene-d12	*400*		ug/Kg dry	*448.4*		*89*	*50-120*	
Surrogate: Phenanthrene-d10	*430*		ug/Kg dry	*448.4*		*96*	*50-120*	
Surrogate: Toluene-D8	*326*		ug/Kg dry	*448.4*		*73*	*50-120*	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F190039

Notes and Definitions

U	Analyte included in the analysis, but not detected
SM	Surrogate recovery(ies) outside of criteria due to matrix (UCM/coelution/matrix is present) (SM).
J	Reported between MDL and MRL
D	Diluted.
B-	Blank Spike recovery is below lower control limit (B-).
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190039

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Chain-of-Custody Record

Laboratory: ~~AquaSurvey~~ ESS

Laboratory Job # (Lab use only) 1910445

F190039

GEI Consultants

400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

Preservative

None | None

Analysis

Sample Handling

Samples Field Filtered: YES NO **NA**

Sampled Shipped With Ice: **YES** NO

MCP PRESUMPTIVE CERTAINTY REQUIRED -- **YES** NO

If Yes, Are MCP Analytical Methods Required? **YES** NO NA

Are Drinking Water Samples Submitted? YES **NO** NA

If Yes, Have Drinking Water Sampling Requirements Been Met? YES NO **NA**

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Parent and Alkylated MAHs & PAHs 8270**	TOCs by Lloyd-Kahn	Sample Specific Remarks
1	1804576-SS 678-S4	9/11/19	1323	Sed	1	BFM	X	X	
2	1804576-SS 679-S1	9/11/19	1435	Sed	1	BFM	X	X	
3	1804576-SS 679-S4	9/11/19	1449	Sed	1	BFM	X	X	
4	1804576-SS 679-S5	9/11/19	1453	Sed	1	BFM	X	X	
5	1804576-SS 680-S1	9/11/19	1720	Sed	1	BFM	X	X	
6	1804576-SS 680-S4	9/11/19	1733	Sed	1	BFM	X	X	
7	1804576-SS 680-S5	9/11/19	1737	Sed	1	BFM	X	X	
8	1804576-SS 681-S1	9/12/19	1145	Sed	1	BFM	X	X	
9	1804576-SS 681-S3	9/12/19	1154	Sed	1	BFM	X	X	
10	1804576-SS 681-S4	9/12/19	1158	Sed	1	BFM	X	X	
11	1804576-SS 682-S2	9/12/19	1305	Sed	1	BFM	X	X	
12	1804776-SS 682-S3	9/12/19	1315	Sed	1	BFM	X	X	

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

	Date:	Time:	
Relinquished by sampler: (signature) 1.	9/12/19	1910	Received by: (signature) 1. GEI Sample Fridge
Relinquished by: (signature) 2. GEI Sample Fridge	9/13/19	1205	Received by: (signature) 2.
Relinquished by: (signature) 3.	9/13/19	1205	Received by: (signature) 3. 9/13/19
Relinquished by: (signature) 4.	9/13/19	14:46	Received by: (signature) 4. 9/13/19 1446

Turnaround Time (Business days):

Normal __X__ Other ____

10-Day ____ 7-Day ____

5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

**Parent and Alkylated MAHs & PAHs (34) by GC/MS/SIM/SCAN

RJ-

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 1910445

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP
Project Location: Amesbury, MA
Project Number: 1804576
Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman
Send EDD to: labdata@geiconsultants.com

Page 4 of 4

Preservative: None | None

Sample Handling
Samples Field Filtered: YES NO **NA**
Sampled Shipped With Ice: **YES** NO

MCP PRESUMPTIVE CERTAINTY REQUIRED -- **YES** NO

If Yes, Are MCP Analytical Methods Required?	**YES**	NO	NA
Are Drinking Water Samples Submitted?	YES	**NO**	NA
If Yes, Have Drinking Water Sampling Requirements Been Met?	YES	NO	**NA**

Analysis

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Parent and Alkylated MAHs & PAHs 8270**	TOCs by Lloyd-Kahn							Sample Specific Remarks
13	1804576-SS683-S2	9/12/19	1355	Sed	1	BFM	X	X							
14	1804576-SS683-S4	9/12/19	1404	Sed	1	BFM	X	X							
15	1804576-SS683-S5	9/12/19	1409	Sed	1	BFM	X	X							
16	1804576-SS684-S2	9/12/19	1445	Sed	1	BFM	X	X							
17	1804576-SS684-S4	9/12/19	1456	Sed	1	BFM	X	X							

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1. Ry H for Brian Fong-Mullock	9/12/19	1910	1. GEI Sample Fridge
2. GEI Sample Fridge	9/13/19	1205	2. [signature]
3. [signature]	9/13/19	1205	3. [signature] 9/13/19 12:05
4. [signature]	9/13/19	14:46	4. [signature] 9/13/19 1446

Turnaround Time (Business days):
Normal __X__ Other ____
10-Day ____ 7-Day ____
5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

**Parent and Alkylated MAHs & PAHs (34) by GC/MS/SIM/SCAN

Run

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

Shipped/Delivered Via: ESS Courier

ESS Project ID: 1910445
Date Received: 9/13/2019
Project Due Date: 9/20/2019
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 3.1 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA
13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / (No)
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	388363	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
02	388362	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
03	388361	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
04	388360	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
05	388359	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
06	388358	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
07	388357	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
08	388356	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
09	388355	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
10	388354	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
11	388353	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
12	388352	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
13	388351	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
14	388350	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
15	388349	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
16	388348	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
17	388347	Yes	NA	Yes	4 oz. Jar - Unpres	NP	

2nd Review
Were all containers scanned into storage/lab? Initials
Are barcode labels on correct containers? Yes / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

ESS Project ID: 1910445
Date Received: 9/13/2019

Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached & bubbles noted? Yes / No / NA

Completed By: _____ Date & Time: 9/13/19 16:49

Reviewed By: _____ Date & Time: 9/13/19 8:12

Delivered By: _____ 9/13/19 18:12

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (044752)
ESS Laboratory Work Order Number: F190040

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 2:36 pm, Oct 01, 2019

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses
ESS Laboratory - Cranston, RI TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190040

SAMPLE RECEIPT

The following samples were received on September 13, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F190040-01	1804576-SS668-S2	Sediment	8270 Mod, TOC-LK
F190040-02	1804576-SS670-S1	Sediment	8270 Mod, TOC-LK
F190040-03	1804576-SS670-S2	Sediment	8270 Mod, TOC-LK
F190040-04	1804576-SS673-S2	Sediment	8270 Mod, TOC-LK
F190040-05	1804576-SS673-S3	Sediment	8270 Mod, TOC-LK
F190040-06	1804576-SS674-S4	Sediment	8270 Mod, TOC-LK
F190040-07	1804576-SS676-S2	Sediment	8270 Mod, TOC-LK
F190040-08	1804576-SS6777-S2	Sediment	8270 Mod, TOC-LK
F190040-09	1804576-SS6777-S3	Sediment	8270 Mod, TOC-LK
F190040-10	1804576-SS6777-S4A	Sediment	8270 Mod, TOC-LK
F190040-11	1804576-SS6777-S5A	Sediment	8270 Mod, TOC-LK
F190040-12	1804576-SS6778-S1	Sediment	8270 Mod, TOC-LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190040

PROJECT NARRATIVE

8270D (SIM) Semi-Volatile Organic Compounds

F190040-05	**Present in Method Blank (B).**
	C-17 , C-18 , Phytane , Pristane
F190040-10	**Present in Method Blank (B).**
	C-18
FI91702-DUP2	**Relative percent difference for duplicate is outside of criteria (D+).**
	o-Xylene (87% @ 50%)

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

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Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190040

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS668-S2
Date Sampled: 09/11/19 16:13
Percent Solids: 85
Initial Volume: 5.23
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-01
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**148** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C1-Benzene	**400** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C2-Benzenes	**1340** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C3-Benzenes	**1120** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C4-Benzenes	**393** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C5-Benzenes	**182** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
Methylcyclohexane	**1720** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
Toluene	**638** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
Ethylbenzene	**2240** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
m,p-Xylene	**2130** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
Styrene	**99.9** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
o-Xylene	**451** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
Isopropylbenzene	**59.1** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
n-Propylbenzene	**138** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
1,3,5-Trimethylbenzene	**584** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
1,2,3-Trimethylbenzene	**153** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
1,2,4-Trimethylbenzene	**988** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
t-Butylbenzene	ND (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
sec-Butylbenzene	**37.2** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
p-Isopropyltoluene	**104** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
n-Butylbenzene	**136** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
trans-Decalin	**338** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
cis-Decalin	**50.5** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C1-Decalins	**390** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C2-Decalins	**262** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C3-Decalins	**191** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C4-Decalins	**346** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
Benzo(b)thiophene	**78.1** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C1-Benzo(b)thiophenes	**92.0** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C2-Benzo(b)thiophenes	**124** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C3-Benzo(b)thiophenes	**72.5** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C4-Benzo(b)thiophenes	**53.6** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS668-S2
Date Sampled: 09/11/19 16:13
Percent Solids: 85
Initial Volume: 5.23
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-01
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**663** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
2-Methylnaphthalene	**961** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
1-Methylnaphthalene	**353** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C1-Naphthalenes	**805** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C2-Naphthalenes	**967** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C3-Naphthalenes	**749** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C4-Naphthalenes	**614** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
Biphenyl	**276** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
Acenaphthylene	**342** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
Acenaphthene	**3830** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
Dibenzofuran	**191** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
Fluorene	**1130** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C1-Fluorenes	**490** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C2-Fluorenes	**597** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C3-Fluorenes	**489** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
Dibenzothiophene	**758** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C1-Dibenzothiophenes	**474** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C2-Dibenzothiophenes	**670** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C3-Dibenzothiophenes	**657** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C4-Dibenzothiophenes	**366** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
Phenanthrene	**1340** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
Anthracene	**655** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C1-Phenanthrenes/Anthracenes	**1090** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C2-Phenanthrenes/Anthracenes	**862** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C3-Phenanthrenes/Anthracenes	**503** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C4-Phenanthrenes/Anthracenes	**234** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
Retene	**127** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
Benzo(b)naphtho(2,1-d)thiophene	**254** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C0-Benzonaphthothiophenes	**458** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C1-Benzonaphthothiophenes	**293** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C2-Benzonaphthothiophenes	**287** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C3-Benzonaphthothiophenes	**239** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS668-S2
Date Sampled: 09/11/19 16:13
Percent Solids: 85
Initial Volume: 5.23
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-01
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**122** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
Fluoranthene	**3480** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
Pyrene	**3990** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C1-Fluoranthenes/Pyrenes	**1390** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C2-Fluoranthenes/Pyrenes	**491** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C3-Fluoranthenes/Pyrenes	**243** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
Benzo(b)fluorene	**201** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
Benzo(c)fluorene	**96.1** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
2-Methylpyrene	**175** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
4-Methylpyrene	**165** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
1-Methylpyrene	**148** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
Benz(a)anthracene	**1320** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
Chrysene/triphenylene	**1340** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C1-Benzo(a)anthracenes/Chrysenes	**573** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C2-Benzo(a)anthracenes/Chrysenes	**276** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C3-Benzo(a)anthracenes/Chrysenes	**140** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C4-Benzo(a)anthracenes/Chrysenes	**96.1** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
Benzo(b)fluoranthene	**904** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
Benzo(j/k)fluoranthene	**949** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
Benzo(e)pyrene	**868** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
Benzo(a)pyrene	**1260** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
Perylene	**275** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
Indeno(1,2,3-cd)pyrene	**616** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
Dibenzo(a,h)anthracene	**170** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
Benzo(g,h,i)perylene	**748** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
Coronene	**233** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
Tetramethyl lead	ND (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
Trimethylethyl lead	ND (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
Dimethyldiethyl lead	ND (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
Methyltriethyl lead	ND (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
Tetraethyl lead	ND (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
2,6,10-trimethyldodecane (1380)	**469** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS668-S2
Date Sampled: 09/11/19 16:13
Percent Solids: 85
Initial Volume: 5.23
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-01
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**947** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
2,6,10-trimethylpentadecane (1650)	**1580** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C-17	**229** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
Pristane	**5730** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
C-18	**241** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
Phytane	**4190** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
Carbazole	**98.6** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
2,6-Dimethylnaphthalene	**336** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
2,3,5-Trimethylnaphthene	**42.6** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
4-Methyldibenzothiophene	**209** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
2/3-Methyldibenzothiophene	**157** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
1-Methyldibenzothiophene	**65.1** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
3-Methylphenanthrene	**294** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
2-Methylphenanthrene	**228** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
2-Methylanthracene	**101** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
4/9-Methylphenanthrene	**238** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702
1-Methylphenanthrene	**227** (4.51)	2.26	8270 Mod		1	09/23/19 7:16	F9I0008	FI91702

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*86 %*		*50-120*
Surrogate: Perylene-d12	*69 %*		*50-120*
Surrogate: Phenanthrene-d10	*85 %*		*50-120*
Surrogate: Toluene-D8	*70 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS668-S2
Date Sampled: 09/11/19 16:13
Percent Solids: 85

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-01
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**32200** (122)		TOC-LK		1	CCP	09/24/19 15:36	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS670-S1
Date Sampled: 09/10/19 10:50
Percent Solids: 55
Initial Volume: 7.83
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-02
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**23.5** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C1-Benzene	**103** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C2-Benzenes	**97.6** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C3-Benzenes	**J 18.0** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C4-Benzenes	**J 18.4** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C5-Benzenes	ND (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
Methylcyclohexane	ND (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
Toluene	**218** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
Ethylbenzene	**43.7** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
m,p-Xylene	**211** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
Styrene	ND (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
o-Xylene	ND (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
Isopropylbenzene	ND (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
n-Propylbenzene	ND (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
1,3,5-Trimethylbenzene	**38.8** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
1,2,3-Trimethylbenzene	**J 17.2** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
1,2,4-Trimethylbenzene	**40.4** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
t-Butylbenzene	ND (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
sec-Butylbenzene	ND (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
p-Isopropyltoluene	ND (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
n-Butylbenzene	**J 19.0** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
trans-Decalin	ND (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
cis-Decalin	ND (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C1-Decalins	ND (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C2-Decalins	ND (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C3-Decalins	ND (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C4-Decalins	ND (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
Benzo(b)thiophene	**88.9** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C1-Benzo(b)thiophenes	**96.0** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C2-Benzo(b)thiophenes	**232** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C3-Benzo(b)thiophenes	**141** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C4-Benzo(b)thiophenes	**88.4** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS670-S1
Date Sampled: 09/10/19 10:50
Percent Solids: 55
Initial Volume: 7.83
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-02
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**973** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
2-Methylnaphthalene	**440** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
1-Methylnaphthalene	**488** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C1-Naphthalenes	**553** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C2-Naphthalenes	**1480** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C3-Naphthalenes	**656** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C4-Naphthalenes	**185** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
Biphenyl	**464** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
Acenaphthylene	**5290** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
Acenaphthene	**9570** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
Dibenzofuran	**355** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
Fluorene	**5230** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C1-Fluorenes	**1210** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C2-Fluorenes	**418** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C3-Fluorenes	**549** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
Dibenzothiophene	**5830** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C1-Dibenzothiophenes	**2620** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C2-Dibenzothiophenes	**954** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C3-Dibenzothiophenes	**318** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C4-Dibenzothiophenes	**118** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
Phenanthrene	**43200** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
Anthracene	**10700** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C1-Phenanthrenes/Anthracenes	**9920** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C2-Phenanthrenes/Anthracenes	**1780** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C3-Phenanthrenes/Anthracenes	**373** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C4-Phenanthrenes/Anthracenes	**170** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
Retene	**104** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
Benzo(b)naphtho(2,1-d)thiophene	**3370** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C0-Benzonaphthothiophenes	**6610** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C1-Benzonaphthothiophenes	**1630** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C2-Benzonaphthothiophenes	**524** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C3-Benzonaphthothiophenes	**536** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS670-S1
Date Sampled: 09/10/19 10:50
Percent Solids: 55
Initial Volume: 7.83
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-02
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**150** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
Fluoranthene	**44200** (92.4)	46.2	8270 Mod		20	09/27/19 10:12	F9I0008	FI91702
Pyrene	**63700** (92.4)	46.2	8270 Mod		20	09/27/19 10:12	F9I0008	FI91702
C1-Fluoranthenes/Pyrenes	**15700** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C2-Fluoranthenes/Pyrenes	**2000** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C3-Fluoranthenes/Pyrenes	**397** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
Benzo(b)fluorene	**1840** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
Benzo(c)fluorene	**1060** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
2-Methylpyrene	**2100** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
4-Methylpyrene	**1930** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
1-Methylpyrene	**2230** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
Benz(a)anthracene	**19900** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
Chrysene/triphenylene	**14600** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C1-Benzo(a)anthracenes/Chrysenes	**3630** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C2-Benzo(a)anthracenes/Chrysenes	**923** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C3-Benzo(a)anthracenes/Chrysenes	**226** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C4-Benzo(a)anthracenes/Chrysenes	**321** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
Benzo(b)fluoranthene	**11400** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
Benzo(j/k)fluoranthene	**12300** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
Benzo(e)pyrene	**11400** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
Benzo(a)pyrene	**21500** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
Perylene	**3390** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
Indeno(1,2,3-cd)pyrene	**8740** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
Dibenzo(a,h)anthracene	**2070** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
Benzo(g,h,i)perylene	**10800** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
Coronene	**3470** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
Tetramethyl lead	ND (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
Trimethylethyl lead	ND (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
Dimethyldiethyl lead	ND (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
Methyltriethyl lead	ND (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
Tetraethyl lead	ND (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
2,6,10-trimethyldodecane (1380)	**69.2** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS670-S1
Date Sampled: 09/10/19 10:50
Percent Solids: 55
Initial Volume: 7.83
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-02
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**152** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
2,6,10-trimethylpentadecane (1650)	**94.3** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C-17	**296** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
Pristane	**227** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
C-18	**181** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
Phytane	**231** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
Carbazole	**182** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
2,6-Dimethylnaphthalene	**246** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
2,3,5-Trimethylnaphthene	**41.1** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
4-Methyldibenzothiophene	**909** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
2/3-Methyldibenzothiophene	**967** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
1-Methyldibenzothiophene	**286** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
3-Methylphenanthrene	**2410** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
2-Methylphenanthrene	**2640** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
2-Methylanthracene	**1070** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
4/9-Methylphenanthrene	**2020** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702
1-Methylphenanthrene	**1570** (23.1)	11.5	8270 Mod		5	09/23/19 8:39	F9I0008	FI91702

	%Recovery	*Qualifier*	*Limits*
Surrogate: Naphthalene-d8	*76 %*		*50-120*
Surrogate: Perylene-d12	*88 %*		*50-120*
Surrogate: Phenanthrene-d10	*92 %*		*50-120*
Surrogate: Toluene-D8	*76 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS670-S1
Date Sampled: 09/10/19 10:50
Percent Solids: 55

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-02
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**62000** (103)		TOC-LK		1	CCP	09/24/19 15:03	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS670-S2
Date Sampled: 09/10/19 10:53
Percent Solids: 72
Initial Volume: 5.89
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-03
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**22.5** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C1-Benzene	**189** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C2-Benzenes	**115** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C3-Benzenes	**69.9** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C4-Benzenes	**78.0** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C5-Benzenes	**57.5** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
Methylcyclohexane	**5.65** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
Toluene	**314** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
Ethylbenzene	**22.1** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
m,p-Xylene	**215** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
Styrene	**96.2** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
o-Xylene	**24.5** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
Isopropylbenzene	**J 2.53** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
n-Propylbenzene	**31.0** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
1,3,5-Trimethylbenzene	**34.3** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
1,2,3-Trimethylbenzene	**23.1** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
1,2,4-Trimethylbenzene	**55.6** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
t-Butylbenzene	ND (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
sec-Butylbenzene	**J 3.28** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
p-Isopropyltoluene	**14.2** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
n-Butylbenzene	ND (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
trans-Decalin	**2110** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
cis-Decalin	**263** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C1-Decalins	**2870** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C2-Decalins	**833** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C3-Decalins	**325** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C4-Decalins	**521** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
Benzo(b)thiophene	**9.96** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C1-Benzo(b)thiophenes	**22.6** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C2-Benzo(b)thiophenes	**35.3** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C3-Benzo(b)thiophenes	**35.2** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C4-Benzo(b)thiophenes	**78.4** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS670-S2
Date Sampled: 09/10/19 10:53
Percent Solids: 72
Initial Volume: 5.89
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-03
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**120** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
2-Methylnaphthalene	**84.8** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
1-Methylnaphthalene	**41.1** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C1-Naphthalenes	**76.9** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C2-Naphthalenes	**228** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C3-Naphthalenes	**500** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C4-Naphthalenes	**535** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
Biphenyl	**53.0** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
Acenaphthylene	**299** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
Acenaphthene	**470** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
Dibenzofuran	**48.9** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
Fluorene	**167** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C1-Fluorenes	**183** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C2-Fluorenes	**358** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C3-Fluorenes	**383** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
Dibenzothiophene	**216** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C1-Dibenzothiophenes	**263** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C2-Dibenzothiophenes	**439** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C3-Dibenzothiophenes	**425** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C4-Dibenzothiophenes	**242** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
Phenanthrene	**1330** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
Anthracene	**707** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C1-Phenanthrenes/Anthracenes	**1140** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C2-Phenanthrenes/Anthracenes	**956** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C3-Phenanthrenes/Anthracenes	**505** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C4-Phenanthrenes/Anthracenes	**217** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
Retene	**69.5** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
Benzo(b)naphtho(2,1-d)thiophene	**245** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C0-Benzonaphthothiophenes	**477** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C1-Benzonaphthothiophenes	**350** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C2-Benzonaphthothiophenes	**323** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C3-Benzonaphthothiophenes	**241** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS670-S2
Date Sampled: 09/10/19 10:53
Percent Solids: 72
Initial Volume: 5.89
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-03
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**112** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
Fluoranthene	**2690** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
Pyrene	**3180** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C1-Fluoranthenes/Pyrenes	**1480** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C2-Fluoranthenes/Pyrenes	**621** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C3-Fluoranthenes/Pyrenes	**320** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
Benzo(b)fluorene	**188** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
Benzo(c)fluorene	**92.0** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
2-Methylpyrene	**201** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
4-Methylpyrene	**179** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
1-Methylpyrene	**148** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
Benz(a)anthracene	**1400** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
Chrysene/triphenylene	**1450** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C1-Benzo(a)anthracenes/Chrysenes	**847** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C2-Benzo(a)anthracenes/Chrysenes	**500** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C3-Benzo(a)anthracenes/Chrysenes	**272** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C4-Benzo(a)anthracenes/Chrysenes	**154** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
Benzo(b)fluoranthene	**979** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
Benzo(j/k)fluoranthene	**1070** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
Benzo(e)pyrene	**966** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
Benzo(a)pyrene	**1330** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
Perylene	**321** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
Indeno(1,2,3-cd)pyrene	**669** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
Dibenzo(a,h)anthracene	**221** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
Benzo(g,h,i)perylene	**804** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
Coronene	**229** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
Tetramethyl lead	ND (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
Trimethylethyl lead	ND (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
Dimethyldiethyl lead	ND (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
Methyltriethyl lead	ND (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
Tetraethyl lead	ND (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
2,6,10-trimethyldodecane (1380)	**712** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS670-S2
Date Sampled: 09/10/19 10:53
Percent Solids: 72
Initial Volume: 5.89
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-03
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**988** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
2,6,10-trimethylpentadecane (1650)	**674** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C-17	ND (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
Pristane	**1860** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
C-18	ND (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
Phytane	**1630** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
Carbazole	**44.8** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
2,6-Dimethylnaphthalene	**68.0** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
2,3,5-Trimethylnaphthene	**33.4** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
4-Methyldibenzothiophene	**89.1** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
2/3-Methyldibenzothiophene	**101** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
1-Methyldibenzothiophene	**32.8** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
3-Methylphenanthrene	**296** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
2-Methylphenanthrene	**320** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
2-Methylanthracene	**106** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
4/9-Methylphenanthrene	**287** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702
1-Methylphenanthrene	**91.6** (4.72)	2.36	8270 Mod		1	09/24/19 1:57	F9I0009	FI91702

	%Recovery	*Qualifier*	*Limits*
Surrogate: Naphthalene-d8	*77 %*		*50-120*
Surrogate: Perylene-d12	*69 %*		*50-120*
Surrogate: Phenanthrene-d10	*83 %*		*50-120*
Surrogate: Toluene-D8	*71 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS670-S2
Date Sampled: 09/10/19 10:53
Percent Solids: 72

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-03
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**34700** (116)		TOC-LK		1	CCP	09/24/19 16:43	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS673-S2
Date Sampled: 09/12/19 15:37
Percent Solids: 80
Initial Volume: 7.14
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-04
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	J **10.4** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C1-Benzene	**129** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C2-Benzenes	**43.5** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C3-Benzenes	**33.8** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C4-Benzenes	**44.8** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C5-Benzenes	**68.5** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
Methylcyclohexane	**21.0** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
Toluene	**249** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
Ethylbenzene	**23.8** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
m,p-Xylene	**115** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
Styrene	**97.4** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
o-Xylene	**21.2** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
Isopropylbenzene	ND (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
n-Propylbenzene	ND (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
1,3,5-Trimethylbenzene	**51.5** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
1,2,3-Trimethylbenzene	J **15.5** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
1,2,4-Trimethylbenzene	**46.3** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
t-Butylbenzene	ND (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
sec-Butylbenzene	ND (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
p-Isopropyltoluene	J **10.1** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
n-Butylbenzene	ND (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
trans-Decalin	**77.2** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
cis-Decalin	**22.0** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C1-Decalins	**515** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C2-Decalins	**715** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C3-Decalins	**615** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C4-Decalins	**766** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
Benzo(b)thiophene	**66.0** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C1-Benzo(b)thiophenes	**65.0** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C2-Benzo(b)thiophenes	**179** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C3-Benzo(b)thiophenes	**247** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C4-Benzo(b)thiophenes	**190** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS673-S2
Date Sampled: 09/12/19 15:37
Percent Solids: 80
Initial Volume: 7.14
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-04
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**745** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
2-Methylnaphthalene	**285** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
1-Methylnaphthalene	**265** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C1-Naphthalenes	**337** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C2-Naphthalenes	**1390** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C3-Naphthalenes	**2100** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C4-Naphthalenes	**1390** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
Biphenyl	**186** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
Acenaphthylene	**1200** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
Acenaphthene	**3370** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
Dibenzofuran	**342** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
Fluorene	**2610** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C1-Fluorenes	**1190** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C2-Fluorenes	**1110** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C3-Fluorenes	**958** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
Dibenzothiophene	**2660** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C1-Dibenzothiophenes	**1550** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C2-Dibenzothiophenes	**1340** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C3-Dibenzothiophenes	**975** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C4-Dibenzothiophenes	**528** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
Phenanthrene	**23900** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
Anthracene	**7250** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C1-Phenanthrenes/Anthracenes	**7640** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C2-Phenanthrenes/Anthracenes	**3360** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C3-Phenanthrenes/Anthracenes	**1440** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C4-Phenanthrenes/Anthracenes	**607** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
Retene	**121** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
Benzo(b)naphtho(2,1-d)thiophene	**1570** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C0-Benzonaphthothiophenes	**2740** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C1-Benzonaphthothiophenes	**1630** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C2-Benzonaphthothiophenes	**1230** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C3-Benzonaphthothiophenes	**790** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS673-S2
Date Sampled: 09/12/19 15:37
Percent Solids: 80
Initial Volume: 7.14
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-04
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**299** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
Fluoranthene	**23600** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
Pyrene	**24200** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C1-Fluoranthenes/Pyrenes	**8960** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C2-Fluoranthenes/Pyrenes	**2710** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C3-Fluoranthenes/Pyrenes	**1190** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
Benzo(b)fluorene	**1550** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
Benzo(c)fluorene	**596** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
2-Methylpyrene	**1060** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
4-Methylpyrene	**797** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
1-Methylpyrene	**725** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
Benz(a)anthracene	**10200** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
Chrysene/triphenylene	**9650** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C1-Benzo(a)anthracenes/Chrysenes	**4290** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C2-Benzo(a)anthracenes/Chrysenes	**2220** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C3-Benzo(a)anthracenes/Chrysenes	**1040** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C4-Benzo(a)anthracenes/Chrysenes	**646** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
Benzo(b)fluoranthene	**7350** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
Benzo(j/k)fluoranthene	**7240** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
Benzo(e)pyrene	**5830** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
Benzo(a)pyrene	**9110** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
Perylene	**2140** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
Indeno(1,2,3-cd)pyrene	**4560** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
Dibenzo(a,h)anthracene	**1490** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
Benzo(g,h,i)perylene	**4950** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
Coronene	**1250** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
Tetramethyl lead	ND (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
Trimethylethyl lead	ND (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
Dimethyldiethyl lead	ND (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
Methyltriethyl lead	ND (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
Tetraethyl lead	ND (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
2,6,10-trimethyldodecane (1380)	**1880** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS673-S2
Date Sampled: 09/12/19 15:37
Percent Solids: 80
Initial Volume: 7.14
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-04
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**2270** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
2,6,10-trimethylpentadecane (1650)	**2440** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C-17	**194** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
Pristane	**5420** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
C-18	**199** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
Phytane	**4670** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
Carbazole	**278** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
2,6-Dimethylnaphthalene	**188** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
2,3,5-Trimethylnaphthene	**169** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
4-Methyldibenzothiophene	**556** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
2/3-Methyldibenzothiophene	**544** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
1-Methyldibenzothiophene	**194** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
3-Methylphenanthrene	**1720** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
2-Methylphenanthrene	**2090** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
2-Methylanthracene	**898** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
4/9-Methylphenanthrene	**1580** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702
1-Methylphenanthrene	**1210** (17.6)	8.80	8270 Mod		5	09/23/19 0:16	F9I0008	FI91702

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*74 %*		*50-120*
Surrogate: Perylene-d12	*97 %*		*50-120*
Surrogate: Phenanthrene-d10	*89 %*		*50-120*
Surrogate: Toluene-D8	*74 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS673-S2
Date Sampled: 09/12/19 15:37
Percent Solids: 80

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-04
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**38900** (111)		TOC-LK		1	CCP	09/24/19 20:27	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS673-S3
Date Sampled: 09/12/19 15:44
Percent Solids: 78
Initial Volume: 6.28
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-05
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C1-Benzene	**107** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C2-Benzenes	**13.0** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C3-Benzenes	**21.7** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C4-Benzenes	**31.1** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C5-Benzenes	**11.9** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
Methylcyclohexane	**24.5** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
Toluene	**185** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
Ethylbenzene	**J 2.91** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
m,p-Xylene	**29.5** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
Styrene	ND (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
o-Xylene	**5.21** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
Isopropylbenzene	ND (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
n-Propylbenzene	ND (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
1,3,5-Trimethylbenzene	**28.5** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
1,2,3-Trimethylbenzene	**5.09** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
1,2,4-Trimethylbenzene	**24.2** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
t-Butylbenzene	ND (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
sec-Butylbenzene	ND (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
p-Isopropyltoluene	ND (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
n-Butylbenzene	ND (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
trans-Decalin	ND (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
cis-Decalin	ND (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C1-Decalins	ND (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C2-Decalins	ND (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C3-Decalins	ND (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C4-Decalins	ND (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
Benzo(b)thiophene	**15.4** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C1-Benzo(b)thiophenes	**15.0** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C2-Benzo(b)thiophenes	**28.0** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C3-Benzo(b)thiophenes	**12.7** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C4-Benzo(b)thiophenes	**J 3.80** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS673-S3
Date Sampled: 09/12/19 15:44
Percent Solids: 78
Initial Volume: 6.28
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-05
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**109** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
2-Methylnaphthalene	**57.2** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
1-Methylnaphthalene	**72.4** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C1-Naphthalenes	**79.2** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C2-Naphthalenes	**271** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C3-Naphthalenes	**141** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C4-Naphthalenes	**48.2** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
Biphenyl	**23.4** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
Acenaphthylene	**35.8** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
Acenaphthene	**739** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
Dibenzofuran	**108** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
Fluorene	**187** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C1-Fluorenes	**79.4** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C2-Fluorenes	**49.2** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C3-Fluorenes	**48.4** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
Dibenzothiophene	**82.9** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C1-Dibenzothiophenes	**39.8** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C2-Dibenzothiophenes	**33.3** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C3-Dibenzothiophenes	**21.5** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C4-Dibenzothiophenes	**12.1** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
Phenanthrene	**1230** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
Anthracene	**374** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C1-Phenanthrenes/Anthracenes	**449** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C2-Phenanthrenes/Anthracenes	**222** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C3-Phenanthrenes/Anthracenes	**93.6** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C4-Phenanthrenes/Anthracenes	**50.9** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
Retene	**46.4** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
Benzo(b)naphtho(2,1-d)thiophene	**63.8** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C0-Benzonaphthothiophenes	**127** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C1-Benzonaphthothiophenes	**78.6** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C2-Benzonaphthothiophenes	**53.1** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C3-Benzonaphthothiophenes	**28.2** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS673-S3
Date Sampled: 09/12/19 15:44
Percent Solids: 78
Initial Volume: 6.28
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-05
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**9.59** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
Fluoranthene	**1330** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
Pyrene	**1290** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C1-Fluoranthenes/Pyrenes	**550** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C2-Fluoranthenes/Pyrenes	**239** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C3-Fluoranthenes/Pyrenes	**132** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
Benzo(b)fluorene	**60.0** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
Benzo(c)fluorene	**50.3** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
2-Methylpyrene	**70.8** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
4-Methylpyrene	**56.8** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
1-Methylpyrene	**47.3** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
Benz(a)anthracene	**662** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
Chrysene/triphenylene	**621** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C1-Benzo(a)anthracenes/Chrysenes	**372** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C2-Benzo(a)anthracenes/Chrysenes	**223** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C3-Benzo(a)anthracenes/Chrysenes	**123** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C4-Benzo(a)anthracenes/Chrysenes	**49.5** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
Benzo(b)fluoranthene	**442** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
Benzo(j/k)fluoranthene	**469** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
Benzo(e)pyrene	**371** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
Benzo(a)pyrene	**587** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
Perylene	**158** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
Indeno(1,2,3-cd)pyrene	**244** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
Dibenzo(a,h)anthracene	**75.6** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
Benzo(g,h,i)perylene	**287** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
Coronene	**64.0** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
Tetramethyl lead	ND (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
Trimethylethyl lead	ND (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
Dimethyldiethyl lead	ND (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
Methyltriethyl lead	ND (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
Tetraethyl lead	ND (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
2,6,10-trimethyldodecane (1380)	**12.5** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS673-S3
Date Sampled: 09/12/19 15:44
Percent Solids: 78
Initial Volume: 6.28
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-05
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**27.4** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
2,6,10-trimethylpentadecane (1650)	**19.5** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C-17	**B 45.9** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
Pristane	**B 60.9** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
C-18	**B 31.1** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
Phytane	**B 49.0** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
Carbazole	**112** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
2,6-Dimethylnaphthalene	**35.8** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
2,3,5-Trimethylnaphthene	**12.3** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
4-Methyldibenzothiophene	**12.5** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
2/3-Methyldibenzothiophene	**9.48** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
1-Methyldibenzothiophene	**5.93** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
3-Methylphenanthrene	**96.9** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
2-Methylphenanthrene	**130** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
2-Methylanthracene	**61.3** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
4/9-Methylphenanthrene	**85.2** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702
1-Methylphenanthrene	**64.8** (4.09)	2.05	8270 Mod		1	09/21/19 16:22	F9I0008	FI91702

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*75 %*		*50-120*
Surrogate: Perylene-d12	*70 %*		*50-120*
Surrogate: Phenanthrene-d10	*87 %*		*50-120*
Surrogate: Toluene-D8	*78 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS673-S3
Date Sampled: 09/12/19 15:44
Percent Solids: 78

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-05
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**86500** (99.4)		TOC-LK		1	CCP	09/24/19 17:16	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS674-S4
Date Sampled: 09/12/19 15:23
Percent Solids: 77
Initial Volume: 5.81
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-06
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**41.9** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
C1-Benzene	**148** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
C2-Benzenes	**280** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
C3-Benzenes	**124** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
C4-Benzenes	**163** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
C5-Benzenes	**153** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
Methylcyclohexane	**10.1** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
Toluene	**250** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
Ethylbenzene	**308** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
m,p-Xylene	**316** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
Styrene	**138** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
o-Xylene	**41.3** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
Isopropylbenzene	**11.0** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
n-Propylbenzene	**12.5** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
1,3,5-Trimethylbenzene	**165** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
1,2,3-Trimethylbenzene	**18.1** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
1,2,4-Trimethylbenzene	**63.7** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
t-Butylbenzene	ND (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
sec-Butylbenzene	**9.03** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
p-Isopropyltoluene	**9.41** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
n-Butylbenzene	**30.5** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
trans-Decalin	**36.4** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
cis-Decalin	ND (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
C1-Decalins	**141** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
C2-Decalins	**387** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
C3-Decalins	**466** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
C4-Decalins	**870** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
Benzo(b)thiophene	**38.2** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
C1-Benzo(b)thiophenes	**60.1** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
C2-Benzo(b)thiophenes	**242** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
C3-Benzo(b)thiophenes	**308** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
C4-Benzo(b)thiophenes	**173** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS674-S4
Date Sampled: 09/12/19 15:23
Percent Solids: 77
Initial Volume: 5.81
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-06
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**841** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
2-Methylnaphthalene	**567** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
1-Methylnaphthalene	**766** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
C1-Naphthalenes	**813** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
C2-Naphthalenes	**6160** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
C3-Naphthalenes	**6120** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
C4-Naphthalenes	**3590** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
Biphenyl	**205** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
Acenaphthylene	**2840** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
Acenaphthene	**8260** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
Dibenzofuran	**345** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
Fluorene	**5060** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
C1-Fluorenes	**4750** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
C2-Fluorenes	**5860** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
C3-Fluorenes	**2680** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
Dibenzothiophene	**1760** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
C1-Dibenzothiophenes	**3410** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
C2-Dibenzothiophenes	**3630** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
C3-Dibenzothiophenes	**1750** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
C4-Dibenzothiophenes	**534** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
Phenanthrene	**32500** (89.9)	44.9	8270 Mod		20	09/24/19 3:21	F9I0008	FI91702
Anthracene	**12300** (89.9)	44.9	8270 Mod		20	09/24/19 3:21	F9I0008	FI91702
C1-Phenanthrenes/Anthracenes	**30800** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
C2-Phenanthrenes/Anthracenes	**17300** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
C3-Phenanthrenes/Anthracenes	**5310** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
C4-Phenanthrenes/Anthracenes	**1520** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
Retene	**778** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
Benzo(b)naphtho(2,1-d)thiophene	**1690** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
C0-Benzonaphthothiophenes	**2970** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
C1-Benzonaphthothiophenes	**2340** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
C2-Benzonaphthothiophenes	**1130** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
C3-Benzonaphthothiophenes	**544** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS674-S4
Date Sampled: 09/12/19 15:23
Percent Solids: 77
Initial Volume: 5.81
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-06
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**110** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
Fluoranthene	**23200** (89.9)	44.9	8270 Mod		20	09/24/19 3:21	F9I0008	FI91702
Pyrene	**35700** (89.9)	44.9	8270 Mod		20	09/24/19 3:21	F9I0008	FI91702
C1-Fluoranthenes/Pyrenes	**26300** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
C2-Fluoranthenes/Pyrenes	**8510** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
C3-Fluoranthenes/Pyrenes	**2470** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
Benzo(b)fluorene	**2880** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
Benzo(c)fluorene	**1140** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
2-Methylpyrene	**3240** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
4-Methylpyrene	**3070** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
1-Methylpyrene	**3190** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
Benz(a)anthracene	**16700** (89.9)	44.9	8270 Mod		20	09/24/19 3:21	F9I0008	FI91702
Chrysene/triphenylene	**16200** (89.9)	44.9	8270 Mod		20	09/24/19 3:21	F9I0008	FI91702
C1-Benzo(a)anthracenes/Chrysenes	**10300** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
C2-Benzo(a)anthracenes/Chrysenes	**4410** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
C3-Benzo(a)anthracenes/Chrysenes	**1370** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
C4-Benzo(a)anthracenes/Chrysenes	**437** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
Benzo(b)fluoranthene	**6150** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
Benzo(j/k)fluoranthene	**6790** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
Benzo(e)pyrene	**6410** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
Benzo(a)pyrene	**12000** (89.9)	44.9	8270 Mod		20	09/24/19 3:21	F9I0008	FI91702
Perylene	**1880** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
Indeno(1,2,3-cd)pyrene	**4200** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
Dibenzo(a,h)anthracene	**1410** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
Benzo(g,h,i)perylene	**5220** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
Coronene	**1430** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
Tetramethyl lead	ND (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
Trimethylethyl lead	ND (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
Dimethyldiethyl lead	ND (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
Methyltriethyl lead	ND (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
Tetraethyl lead	ND (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
2,6,10-trimethyldodecane (1380)	**289** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS674-S4
Date Sampled: 09/12/19 15:23
Percent Solids: 77
Initial Volume: 5.81
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-06
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**545** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
2,6,10-trimethylpentadecane (1650)	**938** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
C-17	ND (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
Pristane	**2160** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
C-18	ND (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
Phytane	**2120** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
Carbazole	ND (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
2,6-Dimethylnaphthalene	**1280** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
2,3,5-Trimethylnaphthene	**403** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
4-Methyldibenzothiophene	**1500** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
2/3-Methyldibenzothiophene	**1170** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
1-Methyldibenzothiophene	**302** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
3-Methylphenanthrene	**6320** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
2-Methylphenanthrene	**7520** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
2-Methylanthracene	**4300** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
4/9-Methylphenanthrene	**7440** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702
1-Methylphenanthrene	**5050** (4.49)	2.25	8270 Mod		1	09/23/19 1:40	F9I0008	FI91702

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*77 %*		*50-120*
Surrogate: Perylene-d12	*91 %*		*50-120*
Surrogate: Phenanthrene-d10	*81 %*		*50-120*
Surrogate: Toluene-D8	*67 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS674-S4
Date Sampled: 09/12/19 15:23
Percent Solids: 77

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-06
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**26300** (106)		TOC-LK		1	CCP	09/24/19 17:33	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS676-S2
Date Sampled: 09/11/19 09:45
Percent Solids: 55
Initial Volume: 5.44
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-07
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**156** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C1-Benzene	**137** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C2-Benzenes	**189** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C3-Benzenes	**46.9** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C4-Benzenes	**62.9** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C5-Benzenes	**48.2** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
Methylcyclohexane	**9.32** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
Toluene	**230** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
Ethylbenzene	**32.5** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
m,p-Xylene	**375** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
Styrene	**114** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
o-Xylene	**18.7** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
Isopropylbenzene	**36.1** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
n-Propylbenzene	**23.4** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
1,3,5-Trimethylbenzene	**70.8** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
1,2,3-Trimethylbenzene	**12.0** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
1,2,4-Trimethylbenzene	**23.8** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
t-Butylbenzene	ND (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
sec-Butylbenzene	**J 4.94** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
p-Isopropyltoluene	**16.0** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
n-Butylbenzene	**34.6** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
trans-Decalin	**202** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
cis-Decalin	**19.8** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C1-Decalins	**373** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C2-Decalins	**210** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C3-Decalins	**155** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C4-Decalins	**274** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
Benzo(b)thiophene	**9.02** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C1-Benzo(b)thiophenes	**19.6** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C2-Benzo(b)thiophenes	**55.2** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C3-Benzo(b)thiophenes	**64.2** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C4-Benzo(b)thiophenes	**56.3** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS676-S2
Date Sampled: 09/11/19 09:45
Percent Solids: 55
Initial Volume: 5.44
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-07
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**166** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
2-Methylnaphthalene	**140** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
1-Methylnaphthalene	**95.3** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C1-Naphthalenes	**141** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C2-Naphthalenes	**416** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C3-Naphthalenes	**623** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C4-Naphthalenes	**493** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
Biphenyl	**145** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
Acenaphthylene	**334** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
Acenaphthene	**660** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
Dibenzofuran	**139** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
Fluorene	**325** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C1-Fluorenes	**344** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C2-Fluorenes	**346** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C3-Fluorenes	**441** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
Dibenzothiophene	**310** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C1-Dibenzothiophenes	**433** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C2-Dibenzothiophenes	**532** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C3-Dibenzothiophenes	**392** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C4-Dibenzothiophenes	**200** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
Phenanthrene	**2650** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
Anthracene	**1240** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C1-Phenanthrenes/Anthracenes	**2450** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C2-Phenanthrenes/Anthracenes	**1520** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C3-Phenanthrenes/Anthracenes	**671** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C4-Phenanthrenes/Anthracenes	**262** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
Retene	**76.9** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
Benzo(b)naphtho(2,1-d)thiophene	**339** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C0-Benzonaphthothiophenes	**614** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C1-Benzonaphthothiophenes	**473** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C2-Benzonaphthothiophenes	**349** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C3-Benzonaphthothiophenes	**244** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS676-S2
Date Sampled: 09/11/19 09:45
Percent Solids: 55
Initial Volume: 5.44
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-07
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**97.8** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
Fluoranthene	**4330** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
Pyrene	**4790** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C1-Fluoranthenes/Pyrenes	**2550** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C2-Fluoranthenes/Pyrenes	**1160** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C3-Fluoranthenes/Pyrenes	**490** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
Benzo(b)fluorene	**276** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
Benzo(c)fluorene	**137** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
2-Methylpyrene	**359** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
4-Methylpyrene	**337** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
1-Methylpyrene	**293** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
Benz(a)anthracene	**2320** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
Chrysene/triphenylene	**2320** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C1-Benzo(a)anthracenes/Chrysenes	**1420** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C2-Benzo(a)anthracenes/Chrysenes	**761** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C3-Benzo(a)anthracenes/Chrysenes	**331** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C4-Benzo(a)anthracenes/Chrysenes	**155** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
Benzo(b)fluoranthene	**1480** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
Benzo(j/k)fluoranthene	**1630** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
Benzo(e)pyrene	**1360** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
Benzo(a)pyrene	**2050** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
Perylene	**1340** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
Indeno(1,2,3-cd)pyrene	**992** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
Dibenzo(a,h)anthracene	**325** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
Benzo(g,h,i)perylene	**1140** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
Coronene	**301** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
Tetramethyl lead	ND (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
Trimethylethyl lead	ND (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
Dimethyldiethyl lead	ND (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
Methyltriethyl lead	ND (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
Tetraethyl lead	ND (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
2,6,10-trimethyldodecane (1380)	**259** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS676-S2
Date Sampled: 09/11/19 09:45
Percent Solids: 55
Initial Volume: 5.44
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-07
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**424** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
2,6,10-trimethylpentadecane (1650)	**428** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C-17	**215** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
Pristane	**1120** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
C-18	**177** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
Phytane	**1050** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
Carbazole	**180** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
2,6-Dimethylnaphthalene	**80.7** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
2,3,5-Trimethylnaphthene	**44.7** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
4-Methyldibenzothiophene	**152** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
2/3-Methyldibenzothiophene	**156** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
1-Methyldibenzothiophene	**54.7** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
3-Methylphenanthrene	**582** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
2-Methylphenanthrene	**624** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
2-Methylanthracene	**297** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
4/9-Methylphenanthrene	**628** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702
1-Methylphenanthrene	**245** (6.72)	3.36	8270 Mod		1	09/22/19 17:15	F9I0008	FI91702

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*79 %*		*50-120*
Surrogate: Perylene-d12	*84 %*		*50-120*
Surrogate: Phenanthrene-d10	*85 %*		*50-120*
Surrogate: Toluene-D8	*69 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS676-S2
Date Sampled: 09/11/19 09:45
Percent Solids: 55

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-07
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**43400** (123)		TOC-LK		1	CCP	09/24/19 17:50	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS6777-S2
Date Sampled: 09/11/19 10:40
Percent Solids: 82
Initial Volume: 5.74
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-08
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
C1-Benzene	ND (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
C2-Benzenes	ND (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
C3-Benzenes	**31.4** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
C4-Benzenes	**52.9** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
C5-Benzenes	**30.1** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
Methylcyclohexane	ND (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
Toluene	**27.7** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
Ethylbenzene	ND (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
m,p-Xylene	ND (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
Styrene	ND (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
o-Xylene	ND (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
Isopropylbenzene	ND (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
n-Propylbenzene	ND (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
1,3,5-Trimethylbenzene	**27.8** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
1,2,3-Trimethylbenzene	**J 19.7** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
1,2,4-Trimethylbenzene	**38.2** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
t-Butylbenzene	ND (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
sec-Butylbenzene	ND (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
p-Isopropyltoluene	ND (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
n-Butylbenzene	ND (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
trans-Decalin	**25.1** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
cis-Decalin	ND (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
C1-Decalins	**61.9** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
C2-Decalins	ND (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
C3-Decalins	ND (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
C4-Decalins	ND (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
Benzo(b)thiophene	**27.4** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
C1-Benzo(b)thiophenes	**74.3** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
C2-Benzo(b)thiophenes	**191** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
C3-Benzo(b)thiophenes	**168** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
C4-Benzo(b)thiophenes	**68.9** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS6777-S2
Date Sampled: 09/11/19 10:40
Percent Solids: 82
Initial Volume: 5.74
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-08
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**815** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
2-Methylnaphthalene	**975** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
1-Methylnaphthalene	**1230** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
C1-Naphthalenes	**1340** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
C2-Naphthalenes	**2630** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
C3-Naphthalenes	**2170** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
C4-Naphthalenes	**841** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
Biphenyl	**387** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
Acenaphthylene	**762** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
Acenaphthene	**4720** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
Dibenzofuran	**3940** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
Fluorene	**7280** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
C1-Fluorenes	**1990** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
C2-Fluorenes	**1210** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
C3-Fluorenes	**1350** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
Dibenzothiophene	**3260** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
C1-Dibenzothiophenes	**1780** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
C2-Dibenzothiophenes	**1160** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
C3-Dibenzothiophenes	**609** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
C4-Dibenzothiophenes	**214** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
Phenanthrene	**55700** (426)	213	8270 Mod		100	09/24/19 4:44	F9I0008	FI91702
Anthracene	**20100** (426)	213	8270 Mod		100	09/24/19 4:44	F9I0008	FI91702
C1-Phenanthrenes/Anthracenes	**14600** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
C2-Phenanthrenes/Anthracenes	**5460** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
C3-Phenanthrenes/Anthracenes	**1640** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
C4-Phenanthrenes/Anthracenes	**511** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
Retene	**77.8** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
Benzo(b)naphtho(2,1-d)thiophene	**2580** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
C0-Benzonaphthothiophenes	**4670** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
C1-Benzonaphthothiophenes	**1810** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
C2-Benzonaphthothiophenes	**847** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
C3-Benzonaphthothiophenes	**398** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS6777-S2
Date Sampled: 09/11/19 10:40
Percent Solids: 82
Initial Volume: 5.74
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-08
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**149** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
Fluoranthene	**58500** (426)	213	8270 Mod		100	09/24/19 4:44	F9I0008	FI91702
Pyrene	**46300** (426)	213	8270 Mod		100	09/24/19 4:44	F9I0008	FI91702
C1-Fluoranthenes/Pyrenes	**14000** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
C2-Fluoranthenes/Pyrenes	**5180** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
C3-Fluoranthenes/Pyrenes	**1970** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
Benzo(b)fluorene	**2270** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
Benzo(c)fluorene	**1080** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
2-Methylpyrene	**1750** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
4-Methylpyrene	**1090** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
1-Methylpyrene	**907** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
Benz(a)anthracene	**21000** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
Chrysene/triphenylene	**17300** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
C1-Benzo(a)anthracenes/Chrysenes	**6480** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
C2-Benzo(a)anthracenes/Chrysenes	**2770** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
C3-Benzo(a)anthracenes/Chrysenes	**1270** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
C4-Benzo(a)anthracenes/Chrysenes	**598** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
Benzo(b)fluoranthene	**11500** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
Benzo(j/k)fluoranthene	**12300** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
Benzo(e)pyrene	**8410** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
Benzo(a)pyrene	**14600** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
Perylene	**3600** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
Indeno(1,2,3-cd)pyrene	**6750** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
Dibenzo(a,h)anthracene	**2250** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
Benzo(g,h,i)perylene	**6830** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
Coronene	**1620** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
Tetramethyl lead	ND (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
Trimethylethyl lead	ND (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
Dimethyldiethyl lead	ND (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
Methyltriethyl lead	ND (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
Tetraethyl lead	ND (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
2,6,10-trimethyldodecane (1380)	**J 20.4** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS6777-S2
Date Sampled: 09/11/19 10:40
Percent Solids: 82
Initial Volume: 5.74
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-08
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**60.6** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
2,6,10-trimethylpentadecane (1650)	**99.8** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
C-17	**170** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
Pristane	**119** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
C-18	**175** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
Phytane	**91.8** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
Carbazole	**4520** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
2,6-Dimethylnaphthalene	**566** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
2,3,5-Trimethylnaphthene	**192** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
4-Methyldibenzothiophene	**483** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
2/3-Methyldibenzothiophene	**639** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
1-Methyldibenzothiophene	**223** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
3-Methylphenanthrene	**3190** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
2-Methylphenanthrene	**4170** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
2-Methylanthracene	**2280** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
4/9-Methylphenanthrene	**2650** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702
1-Methylphenanthrene	**2140** (21.3)	10.6	8270 Mod		5	09/23/19 3:04	F9I0008	FI91702

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*72 %*		*50-120*
Surrogate: Perylene-d12	*92 %*		*50-120*
Surrogate: Phenanthrene-d10	*89 %*		*50-120*
Surrogate: Toluene-D8	*77 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS6777-S2
Date Sampled: 09/11/19 10:40
Percent Solids: 82

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-08
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**12500** (98.6)		TOC-LK		1	CCP	09/24/19 18:40	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS6777-S3
Date Sampled: 09/11/19 10:43
Percent Solids: 50
Initial Volume: 4.59
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-09
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**23.7** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C1-Benzene	**93.5** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C2-Benzenes	**81.8** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C3-Benzenes	**28.5** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C4-Benzenes	**144** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C5-Benzenes	**80.9** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
Methylcyclohexane	**J 8.18** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
Toluene	**175** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
Ethylbenzene	**9.64** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
m,p-Xylene	**169** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
Styrene	ND (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
o-Xylene	**12.3** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
Isopropylbenzene	ND (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
n-Propylbenzene	**12.8** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
1,3,5-Trimethylbenzene	**37.6** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
1,2,3-Trimethylbenzene	**9.64** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
1,2,4-Trimethylbenzene	**24.8** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
t-Butylbenzene	ND (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
sec-Butylbenzene	**J 8.01** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
p-Isopropyltoluene	**10.3** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
n-Butylbenzene	**32.8** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
trans-Decalin	**178** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
cis-Decalin	**17.0** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C1-Decalins	**294** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C2-Decalins	**125** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C3-Decalins	**69.9** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C4-Decalins	**118** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
Benzo(b)thiophene	**17.0** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C1-Benzo(b)thiophenes	**52.7** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C2-Benzo(b)thiophenes	**136** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C3-Benzo(b)thiophenes	**52.3** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C4-Benzo(b)thiophenes	**22.6** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS6777-S3
Date Sampled: 09/11/19 10:43
Percent Solids: 50
Initial Volume: 4.59
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-09
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**153** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
2-Methylnaphthalene	**68.6** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
1-Methylnaphthalene	**144** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C1-Naphthalenes	**127** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C2-Naphthalenes	**810** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C3-Naphthalenes	**463** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C4-Naphthalenes	**271** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
Biphenyl	**28.3** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
Acenaphthylene	**123** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
Acenaphthene	**6450** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
Dibenzofuran	**49.1** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
Fluorene	**554** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C1-Fluorenes	**250** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C2-Fluorenes	**231** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C3-Fluorenes	**195** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
Dibenzothiophene	**283** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C1-Dibenzothiophenes	**254** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C2-Dibenzothiophenes	**239** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C3-Dibenzothiophenes	**168** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C4-Dibenzothiophenes	**85.7** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
Phenanthrene	**2030** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
Anthracene	**691** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C1-Phenanthrenes/Anthracenes	**1080** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C2-Phenanthrenes/Anthracenes	**612** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C3-Phenanthrenes/Anthracenes	**277** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C4-Phenanthrenes/Anthracenes	**128** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
Retene	**58.0** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
Benzo(b)naphtho(2,1-d)thiophene	**103** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C0-Benzonaphthothiophenes	**195** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C1-Benzonaphthothiophenes	**153** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C2-Benzonaphthothiophenes	**120** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C3-Benzonaphthothiophenes	**81.1** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS6777-S3
Date Sampled: 09/11/19 10:43
Percent Solids: 50
Initial Volume: 4.59
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-09
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**33.0** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
Fluoranthene	**1880** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
Pyrene	**2100** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C1-Fluoranthenes/Pyrenes	**875** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C2-Fluoranthenes/Pyrenes	**354** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C3-Fluoranthenes/Pyrenes	**152** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
Benzo(b)fluorene	**89.3** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
Benzo(c)fluorene	**62.1** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
2-Methylpyrene	**120** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
4-Methylpyrene	**113** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
1-Methylpyrene	**92.0** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
Benz(a)anthracene	**659** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
Chrysene/triphenylene	**718** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C1-Benzo(a)anthracenes/Chrysenes	**406** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C2-Benzo(a)anthracenes/Chrysenes	**224** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C3-Benzo(a)anthracenes/Chrysenes	**111** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C4-Benzo(a)anthracenes/Chrysenes	**41.4** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
Benzo(b)fluoranthene	**453** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
Benzo(j/k)fluoranthene	**453** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
Benzo(e)pyrene	**402** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
Benzo(a)pyrene	**550** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
Perylene	**1260** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
Indeno(1,2,3-cd)pyrene	**255** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
Dibenzo(a,h)anthracene	**83.3** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
Benzo(g,h,i)perylene	**311** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
Coronene	**77.7** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
Tetramethyl lead	ND (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
Trimethylethyl lead	ND (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
Dimethyldiethyl lead	ND (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
Methyltriethyl lead	ND (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
Tetraethyl lead	ND (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
2,6,10-trimethyldodecane (1380)	**84.8** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS6777-S3
Date Sampled: 09/11/19 10:43
Percent Solids: 50
Initial Volume: 4.59
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-09
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**160** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
2,6,10-trimethylpentadecane (1650)	**153** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C-17	**226** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
Pristane	**435** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
C-18	**150** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
Phytane	**396** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
Carbazole	**31.7** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
2,6-Dimethylnaphthalene	**60.7** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
2,3,5-Trimethylnaphthene	**35.7** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
4-Methyldibenzothiophene	**92.5** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
2/3-Methyldibenzothiophene	**94.5** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
1-Methyldibenzothiophene	**32.8** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
3-Methylphenanthrene	**270** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
2-Methylphenanthrene	**295** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
2-Methylanthracene	**104** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
4/9-Methylphenanthrene	**271** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702
1-Methylphenanthrene	**122** (8.67)	4.33	8270 Mod		1	09/21/19 17:45	F9I0008	FI91702

	%Recovery	*Qualifier*	*Limits*
Surrogate: Naphthalene-d8	*81 %*		*50-120*
Surrogate: Perylene-d12	*86 %*		*50-120*
Surrogate: Phenanthrene-d10	*93 %*		*50-120*
Surrogate: Toluene-D8	*72 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS6777-S3
Date Sampled: 09/11/19 10:43
Percent Solids: 50

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-09
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**57000** (109)		TOC-LK		1	CCP	09/24/19 18:56	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS6777-S4A
Date Sampled: 09/11/19 11:50
Percent Solids: 77
Initial Volume: 6.91
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-10
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**31.2** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
C1-Benzene	**45.2** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
C2-Benzenes	**155** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
C3-Benzenes	**114** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
C4-Benzenes	**270** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
C5-Benzenes	**230** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
Methylcyclohexane	**6.49** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
Toluene	**85.9** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
Ethylbenzene	**110** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
m,p-Xylene	**230** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
Styrene	**51.8** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
o-Xylene	**20.1** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
Isopropylbenzene	**10.2** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
n-Propylbenzene	**22.7** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
1,3,5-Trimethylbenzene	**46.0** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
1,2,3-Trimethylbenzene	**22.3** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
1,2,4-Trimethylbenzene	**67.7** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
t-Butylbenzene	ND (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
sec-Butylbenzene	**J 3.60** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
p-Isopropyltoluene	**10.4** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
n-Butylbenzene	ND (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
trans-Decalin	**703** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
cis-Decalin	**82.8** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
C1-Decalins	**1570** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
C2-Decalins	**376** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
C3-Decalins	**161** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
C4-Decalins	**205** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
Benzo(b)thiophene	**168** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
C1-Benzo(b)thiophenes	**141** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
C2-Benzo(b)thiophenes	**400** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
C3-Benzo(b)thiophenes	**228** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
C4-Benzo(b)thiophenes	**78.6** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS6777-S4A
Date Sampled: 09/11/19 11:50
Percent Solids: 77
Initial Volume: 6.91
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-10
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**4720** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
2-Methylnaphthalene	**1100** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
1-Methylnaphthalene	**3250** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
C1-Naphthalenes	**2630** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
C2-Naphthalenes	**7380** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
C3-Naphthalenes	**1860** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
C4-Naphthalenes	**515** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
Biphenyl	**252** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
Acenaphthylene	**694** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
Acenaphthene	**17300** (75.0)	37.5	8270 Mod		20	09/24/19 6:07	F9I0008	FI91702
Dibenzofuran	**339** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
Fluorene	**9520** (75.0)	37.5	8270 Mod		20	09/24/19 6:07	F9I0008	FI91702
C1-Fluorenes	**1320** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
C2-Fluorenes	**411** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
C3-Fluorenes	**413** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
Dibenzothiophene	**2260** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
C1-Dibenzothiophenes	**789** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
C2-Dibenzothiophenes	**541** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
C3-Dibenzothiophenes	**407** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
C4-Dibenzothiophenes	**222** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
Phenanthrene	**27200** (75.0)	37.5	8270 Mod		20	09/24/19 6:07	F9I0008	FI91702
Anthracene	**6530** (75.0)	37.5	8270 Mod		20	09/24/19 6:07	F9I0008	FI91702
C1-Phenanthrenes/Anthracenes	**3620** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
C2-Phenanthrenes/Anthracenes	**1410** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
C3-Phenanthrenes/Anthracenes	**640** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
C4-Phenanthrenes/Anthracenes	**428** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
Retene	**1060** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
Benzo(b)naphtho(2,1-d)thiophene	**441** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
C0-Benzonaphthothiophenes	**821** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
C1-Benzonaphthothiophenes	**537** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
C2-Benzonaphthothiophenes	**423** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
C3-Benzonaphthothiophenes	**290** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS6777-S4A
Date Sampled: 09/11/19 11:50
Percent Solids: 77
Initial Volume: 6.91
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-10
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**120** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
Fluoranthene	**11000** (75.0)	37.5	8270 Mod		20	09/24/19 6:07	F9I0008	FI91702
Pyrene	**11500** (75.0)	37.5	8270 Mod		20	09/24/19 6:07	F9I0008	FI91702
C1-Fluoranthenes/Pyrenes	**3180** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
C2-Fluoranthenes/Pyrenes	**1100** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
C3-Fluoranthenes/Pyrenes	**477** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
Benzo(b)fluorene	**485** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
Benzo(c)fluorene	**197** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
2-Methylpyrene	**397** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
4-Methylpyrene	**331** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
1-Methylpyrene	**301** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
Benz(a)anthracene	**2930** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
Chrysene/triphenylene	**2790** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
C1-Benzo(a)anthracenes/Chrysenes	**1350** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
C2-Benzo(a)anthracenes/Chrysenes	**734** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
C3-Benzo(a)anthracenes/Chrysenes	**378** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
C4-Benzo(a)anthracenes/Chrysenes	**206** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
Benzo(b)fluoranthene	**2190** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
Benzo(j/k)fluoranthene	**2140** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
Benzo(e)pyrene	**1740** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
Benzo(a)pyrene	**2720** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
Perylene	**618** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
Indeno(1,2,3-cd)pyrene	**1420** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
Dibenzo(a,h)anthracene	**429** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
Benzo(g,h,i)perylene	**1560** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
Coronene	**406** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
Tetramethyl lead	ND (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
Trimethylethyl lead	ND (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
Dimethyldiethyl lead	ND (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
Methyltriethyl lead	ND (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
Tetraethyl lead	ND (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
2,6,10-trimethyldodecane (1380)	**279** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS6777-S4A
Date Sampled: 09/11/19 11:50
Percent Solids: 77
Initial Volume: 6.91
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-10
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**369** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
2,6,10-trimethylpentadecane (1650)	**333** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
C-17	**96.3** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
Pristane	**806** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
C-18	**B 98.4** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
Phytane	**738** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
Carbazole	**124** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
2,6-Dimethylnaphthalene	**1480** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
2,3,5-Trimethylnaphthene	**153** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
4-Methyldibenzothiophene	**275** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
2/3-Methyldibenzothiophene	**279** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
1-Methyldibenzothiophene	**102** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
3-Methylphenanthrene	**853** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
2-Methylphenanthrene	**944** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
2-Methylanthracene	**408** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
4/9-Methylphenanthrene	**764** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702
1-Methylphenanthrene	**596** (3.75)	1.88	8270 Mod		1	09/23/19 4:29	F9I0008	FI91702

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*70 %*		*50-120*
Surrogate: Perylene-d12	*72 %*		*50-120*
Surrogate: Phenanthrene-d10	*71 %*		*50-120*
Surrogate: Toluene-D8	*55 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS6777-S4A
Date Sampled: 09/11/19 11:50
Percent Solids: 77

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-10
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**13300** (110)		TOC-LK		1	CCP	09/24/19 19:13	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS6777-S5A
Date Sampled: 09/11/19 11:55
Percent Solids: 92
Initial Volume: 5.81
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-11
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**42.2** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
C1-Benzene	**68.4** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
C2-Benzenes	**111** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
C3-Benzenes	**139** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
C4-Benzenes	**276** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
C5-Benzenes	**199** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
Methylcyclohexane	ND (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
Toluene	**125** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
Ethylbenzene	**158** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
m,p-Xylene	**96.3** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
Styrene	**126** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
o-Xylene	**16.1** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
Isopropylbenzene	**12.3** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
n-Propylbenzene	**10.8** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
1,3,5-Trimethylbenzene	**196** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
1,2,3-Trimethylbenzene	**27.0** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
1,2,4-Trimethylbenzene	**86.1** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
t-Butylbenzene	ND (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
sec-Butylbenzene	**6.69** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
p-Isopropyltoluene	**14.2** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
n-Butylbenzene	**49.6** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
trans-Decalin	**42.6** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
cis-Decalin	**11.1** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
C1-Decalins	**120** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
C2-Decalins	**306** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
C3-Decalins	**370** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
C4-Decalins	**556** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
Benzo(b)thiophene	**233** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
C1-Benzo(b)thiophenes	**220** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
C2-Benzo(b)thiophenes	**396** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
C3-Benzo(b)thiophenes	**400** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
C4-Benzo(b)thiophenes	**199** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS6777-S5A
Date Sampled: 09/11/19 11:55
Percent Solids: 92
Initial Volume: 5.81
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-11
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**10300** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
2-Methylnaphthalene	**2450** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
1-Methylnaphthalene	**5170** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
C1-Naphthalenes	**4600** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
C2-Naphthalenes	**9590** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
C3-Naphthalenes	**6820** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
C4-Naphthalenes	**2810** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
Biphenyl	**498** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
Acenaphthylene	**2880** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
Acenaphthene	**19000** (75.0)	37.5	8270 Mod		20	09/24/19 7:30	F9I0008	FI91702
Dibenzofuran	**841** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
Fluorene	**9160** (75.0)	37.5	8270 Mod		20	09/24/19 7:30	F9I0008	FI91702
C1-Fluorenes	**5670** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
C2-Fluorenes	**4500** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
C3-Fluorenes	**1780** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
Dibenzothiophene	**3490** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
C1-Dibenzothiophenes	**3730** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
C2-Dibenzothiophenes	**2710** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
C3-Dibenzothiophenes	**1260** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
C4-Dibenzothiophenes	**436** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
Phenanthrene	**66400** (75.0)	37.5	8270 Mod		20	09/24/19 7:30	F9I0008	FI91702
Anthracene	**42200** (75.0)	37.5	8270 Mod		20	09/24/19 7:30	F9I0008	FI91702
C1-Phenanthrenes/Anthracenes	**35200** (75.0)	37.5	8270 Mod		20	09/24/19 7:30	F9I0008	FI91702
C2-Phenanthrenes/Anthracenes	**10900** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
C3-Phenanthrenes/Anthracenes	**2660** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
C4-Phenanthrenes/Anthracenes	**721** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
Retene	**139** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
Benzo(b)naphtho(2,1-d)thiophene	**1650** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
C0-Benzonaphthothiophenes	**3010** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
C1-Benzonaphthothiophenes	**1560** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
C2-Benzonaphthothiophenes	**664** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
C3-Benzonaphthothiophenes	**492** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS6777-S5A
Date Sampled: 09/11/19 11:55
Percent Solids: 92
Initial Volume: 5.81
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-11
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**115** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
Fluoranthene	**45800** (75.0)	37.5	8270 Mod		20	09/24/19 7:30	F9I0008	FI91702
Pyrene	**67200** (75.0)	37.5	8270 Mod		20	09/24/19 7:30	F9I0008	FI91702
C1-Fluoranthenes/Pyrenes	**26500** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
C2-Fluoranthenes/Pyrenes	**5830** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
C3-Fluoranthenes/Pyrenes	**1330** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
Benzo(b)fluorene	**3090** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
Benzo(c)fluorene	**1540** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
2-Methylpyrene	**3520** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
4-Methylpyrene	**3120** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
1-Methylpyrene	**3560** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
Benz(a)anthracene	**23500** (75.0)	37.5	8270 Mod		20	09/24/19 7:30	F9I0008	FI91702
Chrysene/triphenylene	**20500** (75.0)	37.5	8270 Mod		20	09/24/19 7:30	F9I0008	FI91702
C1-Benzo(a)anthracenes/Chrysenes	**7550** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
C2-Benzo(a)anthracenes/Chrysenes	**2440** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
C3-Benzo(a)anthracenes/Chrysenes	**675** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
C4-Benzo(a)anthracenes/Chrysenes	**270** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
Benzo(b)fluoranthene	**9860** (75.0)	37.5	8270 Mod		20	09/24/19 7:30	F9I0008	FI91702
Benzo(j/k)fluoranthene	**11900** (75.0)	37.5	8270 Mod		20	09/24/19 7:30	F9I0008	FI91702
Benzo(e)pyrene	**10700** (75.0)	37.5	8270 Mod		20	09/24/19 7:30	F9I0008	FI91702
Benzo(a)pyrene	**20500** (75.0)	37.5	8270 Mod		20	09/24/19 7:30	F9I0008	FI91702
Perylene	**2620** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
Indeno(1,2,3-cd)pyrene	**5810** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
Dibenzo(a,h)anthracene	**1770** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
Benzo(g,h,i)perylene	**7080** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
Coronene	**1930** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
Tetramethyl lead	ND (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
Trimethylethyl lead	ND (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
Dimethyldiethyl lead	ND (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
Methyltriethyl lead	ND (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
Tetraethyl lead	ND (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
2,6,10-trimethyldodecane (1380)	**376** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS6777-S5A
Date Sampled: 09/11/19 11:55
Percent Solids: 92
Initial Volume: 5.81
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-11
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**572** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
2,6,10-trimethylpentadecane (1650)	**655** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
C-17	**142** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
Pristane	**1380** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
C-18	**171** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
Phytane	**1400** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
Carbazole	**59.5** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
2,6-Dimethylnaphthalene	**1940** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
2,3,5-Trimethylnaphthene	**424** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
4-Methyldibenzothiophene	**1600** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
2/3-Methyldibenzothiophene	**1300** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
1-Methyldibenzothiophene	**363** (3.75)	1.88	8270 Mod		1	09/23/19 5:53	F9I0008	FI91702
3-Methylphenanthrene	**7670** (75.0)	37.5	8270 Mod		20	09/24/19 7:30	F9I0008	FI91702
2-Methylphenanthrene	**8770** (75.0)	37.5	8270 Mod		20	09/24/19 7:30	F9I0008	FI91702
2-Methylanthracene	**4200** (75.0)	37.5	8270 Mod		20	09/24/19 7:30	F9I0008	FI91702
4/9-Methylphenanthrene	**7360** (75.0)	37.5	8270 Mod		20	09/24/19 7:30	F9I0008	FI91702
1-Methylphenanthrene	**6030** (75.0)	37.5	8270 Mod		20	09/24/19 7:30	F9I0008	FI91702

	%Recovery	*Qualifier*	*Limits*
Surrogate: Naphthalene-d8	*73 %*		*50-120*
Surrogate: Perylene-d12	*86 %*		*50-120*
Surrogate: Phenanthrene-d10	*75 %*		*50-120*
Surrogate: Toluene-D8	*67 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS6777-S5A
Date Sampled: 09/11/19 11:55
Percent Solids: 92

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-11
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**29100** (103)		TOC-LK		1	CCP	09/24/19 19:29	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS6778-S1
Date Sampled: 09/11/19 11:15
Percent Solids: 56
Initial Volume: 7.73
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-12
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**80.5** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C1-Benzene	**98.5** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C2-Benzenes	**159** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C3-Benzenes	**41.8** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C4-Benzenes	**25.4** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C5-Benzenes	ND (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
Methylcyclohexane	ND (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
Toluene	**228** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
Ethylbenzene	**37.9** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
m,p-Xylene	**355** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
Styrene	ND (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
o-Xylene	**J 21.8** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
Isopropylbenzene	ND (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
n-Propylbenzene	**28.1** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
1,3,5-Trimethylbenzene	**43.8** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
1,2,3-Trimethylbenzene	**29.8** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
1,2,4-Trimethylbenzene	**56.4** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
t-Butylbenzene	ND (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
sec-Butylbenzene	ND (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
p-Isopropyltoluene	**J 16.2** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
n-Butylbenzene	ND (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
trans-Decalin	ND (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
cis-Decalin	ND (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C1-Decalins	ND (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C2-Decalins	ND (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C3-Decalins	ND (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C4-Decalins	ND (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
Benzo(b)thiophene	**46.8** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C1-Benzo(b)thiophenes	**48.0** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C2-Benzo(b)thiophenes	**122** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C3-Benzo(b)thiophenes	**79.9** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C4-Benzo(b)thiophenes	**37.5** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS6778-S1
Date Sampled: 09/11/19 11:15
Percent Solids: 56
Initial Volume: 7.73
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-12
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**531** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
2-Methylnaphthalene	**271** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
1-Methylnaphthalene	**230** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C1-Naphthalenes	**303** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C2-Naphthalenes	**735** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C3-Naphthalenes	**381** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C4-Naphthalenes	**117** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
Biphenyl	**236** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
Acenaphthylene	**2220** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
Acenaphthene	**3670** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
Dibenzofuran	**186** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
Fluorene	**2050** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C1-Fluorenes	**494** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C2-Fluorenes	**221** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C3-Fluorenes	**338** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
Dibenzothiophene	**2380** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C1-Dibenzothiophenes	**1110** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C2-Dibenzothiophenes	**460** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C3-Dibenzothiophenes	**200** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C4-Dibenzothiophenes	**93.8** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
Phenanthrene	**18300** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
Anthracene	**5380** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C1-Phenanthrenes/Anthracenes	**4200** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C2-Phenanthrenes/Anthracenes	**1000** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C3-Phenanthrenes/Anthracenes	**274** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C4-Phenanthrenes/Anthracenes	**130** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
Retene	**102** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
Benzo(b)naphtho(2,1-d)thiophene	**1550** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C0-Benzonaphthothiophenes	**3000** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C1-Benzonaphthothiophenes	**872** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C2-Benzonaphthothiophenes	**438** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C3-Benzonaphthothiophenes	**378** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS6778-S1
Date Sampled: 09/11/19 11:15
Percent Solids: 56
Initial Volume: 7.73
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-12
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**122** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
Fluoranthene	**19800** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
Pyrene	**26800** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C1-Fluoranthenes/Pyrenes	**6860** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C2-Fluoranthenes/Pyrenes	**1320** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C3-Fluoranthenes/Pyrenes	**375** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
Benzo(b)fluorene	**853** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
Benzo(c)fluorene	**396** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
2-Methylpyrene	**947** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
4-Methylpyrene	**823** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
1-Methylpyrene	**953** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
Benz(a)anthracene	**9330** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
Chrysene/triphenylene	**7550** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C1-Benzo(a)anthracenes/Chrysenes	**2190** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C2-Benzo(a)anthracenes/Chrysenes	**824** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C3-Benzo(a)anthracenes/Chrysenes	**291** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C4-Benzo(a)anthracenes/Chrysenes	**243** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
Benzo(b)fluoranthene	**5960** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
Benzo(j/k)fluoranthene	**6630** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
Benzo(e)pyrene	**6100** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
Benzo(a)pyrene	**10700** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
Perylene	**1790** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
Indeno(1,2,3-cd)pyrene	**4650** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
Dibenzo(a,h)anthracene	**1230** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
Benzo(g,h,i)perylene	**5780** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
Coronene	**1750** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
Tetramethyl lead	ND (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
Trimethylethyl lead	ND (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
Dimethyldiethyl lead	ND (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
Methyltriethyl lead	ND (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
Tetraethyl lead	ND (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
2,6,10-trimethyldodecane (1380)	**51.7** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS6778-S1
Date Sampled: 09/11/19 11:15
Percent Solids: 56
Initial Volume: 7.73
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-12
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/17/19 15:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**126** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
2,6,10-trimethylpentadecane (1650)	**56.2** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C-17	**251** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
Pristane	**150** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
C-18	**167** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
Phytane	**155** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
Carbazole	**240** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
2,6-Dimethylnaphthalene	**155** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
2,3,5-Trimethylnaphthene	**J 20.3** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
4-Methyldibenzothiophene	**380** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
2/3-Methyldibenzothiophene	**409** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
1-Methyldibenzothiophene	**123** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
3-Methylphenanthrene	**995** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
2-Methylphenanthrene	**1130** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
2-Methylanthracene	**465** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
4/9-Methylphenanthrene	**875** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702
1-Methylphenanthrene	**680** (23.2)	11.6	8270 Mod		5	09/23/19 10:02	F9I0008	FI91702

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*85 %*		*50-120*
Surrogate: Perylene-d12	*101 %*		*50-120*
Surrogate: Phenanthrene-d10	*99 %*		*50-120*
Surrogate: Toluene-D8	*85 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS6778-S1
Date Sampled: 09/11/19 11:15
Percent Solids: 56

ESS Laboratory Work Order: F190040
ESS Laboratory Sample ID: F190040-12
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**43500** (102)		TOC-LK		1	CCP	09/24/19 19:46	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190040

Quality Control Data

Classical Chemistry

Batch CI92040 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	100	mg/kg							
Total Organic Carbon (2)	ND	100	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190040

Quality Control Data

Classical Chemistry

Batch CI92040 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	10000	100	mg/kg	10000		100	80-120			
Total Organic Carbon (2)	9970	100	mg/kg	10000		100	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190040

Quality Control Data

Classical Chemistry

Batch CI92040 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9940	100	mg/kg	10000		99	80-120	0.8	20	
Total Organic Carbon (2)	10000	100	mg/kg	10000		100	80-120	0.7	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190040

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FI91702 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	ND	4.00	ug/Kg wet							
C1-Benzene	ND	4.00	ug/Kg wet							
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	ND	4.00	ug/Kg wet							
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	ND	4.00	ug/Kg wet							
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190040

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FI91702 - 3570

C1-Fluorenes	ND	4.00	ug/Kg wet	
C2-Fluorenes	ND	4.00	ug/Kg wet	
C3-Fluorenes	ND	4.00	ug/Kg wet	
Dibenzothiophene	ND	4.00	ug/Kg wet	
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet	
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet	
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet	
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet	
Phenanthrene	2.34	4.00	ug/Kg wet	J
Anthracene	ND	4.00	ug/Kg wet	
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet	
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet	
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet	
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet	
Retene	ND	4.00	ug/Kg wet	
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet	
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet	
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet	
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet	
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet	
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet	
Fluoranthene	ND	4.00	ug/Kg wet	
Pyrene	ND	4.00	ug/Kg wet	
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet	
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet	
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet	
Benzo(b)fluorene	ND	4.00	ug/Kg wet	
Benzo(c)fluorene	ND	4.00	ug/Kg wet	
2-Methylpyrene	ND	4.00	ug/Kg wet	
4-Methylpyrene	ND	4.00	ug/Kg wet	
1-Methylpyrene	ND	4.00	ug/Kg wet	
Benz(a)anthracene	ND	4.00	ug/Kg wet	
Chrysene/triphenylene	ND	4.00	ug/Kg wet	
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet	
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet	
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet	
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet	
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet	
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet	
Benzo(e)pyrene	ND	4.00	ug/Kg wet	
Benzo(a)pyrene	ND	4.00	ug/Kg wet	
Perylene	ND	4.00	ug/Kg wet	
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet	
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet	
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet	
Coronene	ND	4.00	ug/Kg wet	
Tetramethyl lead	ND	4.00	ug/Kg wet	
Trimethylethyl lead	ND	4.00	ug/Kg wet	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190040

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FI91702 - 3570						
Dimethyldiethyl lead	ND	4.00	ug/Kg wet			
Methyltriethyl lead	ND	4.00	ug/Kg wet			
Tetraethyl lead	ND	4.00	ug/Kg wet			
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet			
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet			
2,6,10-trimethylpentadecane (1650)	ND	4.00	ug/Kg wet			
C-17	7.84	4.00	ug/Kg wet			
Pristane	6.13	4.00	ug/Kg wet			
C-18	9.88	4.00	ug/Kg wet			
Phytane	8.54	4.00	ug/Kg wet			
Carbazole	ND	4.00	ug/Kg wet			
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet			
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet			
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
3-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylanthracene	ND	4.00	ug/Kg wet			
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet			
1-Methylphenanthrene	ND	4.00	ug/Kg wet			
Surrogate: Naphthalene-d8	*340*		ug/Kg wet	*400.0*	*85*	*50-120*
Surrogate: Perylene-d12	*333*		ug/Kg wet	*400.0*	*83*	*50-120*
Surrogate: Phenanthrene-d10	*351*		ug/Kg wet	*400.0*	*88*	*50-120*
Surrogate: Toluene-D8	*389*		ug/Kg wet	*400.0*	*97*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190040

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FI91702 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	321	4.00	ug/Kg wet	400.0		80	60-130			
Methylcyclohexane	269	4.00	ug/Kg wet	400.0		67	60-130			
Toluene	378	4.00	ug/Kg wet	400.0		95	60-130			
Ethylbenzene	399	4.00	ug/Kg wet	400.0		100	60-130			
m,p-Xylene	383	4.00	ug/Kg wet	400.0		96	60-130			
Styrene	380	4.00	ug/Kg wet	400.0		95	60-130			
o-Xylene	380	4.00	ug/Kg wet	400.0		95	60-130			
Isopropylbenzene	373	4.00	ug/Kg wet	400.0		93	60-130			
n-Propylbenzene	376	4.00	ug/Kg wet	400.0		94	60-130			
1,3,5-Trimethylbenzene	385	4.00	ug/Kg wet	400.0		96	60-130			
1,2,3-Trimethylbenzene	380	4.00	ug/Kg wet	400.0		95	60-130			
1,2,4-Trimethylbenzene	385	4.00	ug/Kg wet	400.0		96	60-130			
t-Butylbenzene	373	4.00	ug/Kg wet	400.0		93	60-130			
sec-Butylbenzene	381	4.00	ug/Kg wet	400.0		95	60-130			
p-Isopropyltoluene	385	4.00	ug/Kg wet	400.0		96	60-130			
n-Butylbenzene	371	4.00	ug/Kg wet	400.0		93	60-130			
trans-Decalin	386	4.00	ug/Kg wet	400.0		96	60-130			
cis-Decalin	394	4.00	ug/Kg wet	400.0		98	60-130			
Benzo(b)thiophene	371	4.00	ug/Kg wet	400.0		93	60-130			
Naphthalene	384	4.00	ug/Kg wet	400.0		96	60-130			
2-Methylnaphthalene	382	4.00	ug/Kg wet	400.0		96	60-130			
1-Methylnaphthalene	372	4.00	ug/Kg wet	400.0		93	60-130			
Biphenyl	386	4.00	ug/Kg wet	400.0		97	60-130			
Acenaphthylene	372	4.00	ug/Kg wet	400.0		93	60-130			
Acenaphthene	379	4.00	ug/Kg wet	400.0		95	60-130			
Dibenzofuran	404	4.00	ug/Kg wet	400.0		101	60-130			
Fluorene	393	4.00	ug/Kg wet	400.0		98	60-130			
Dibenzothiophene	395	4.00	ug/Kg wet	400.0		99	60-130			
Phenanthrene	386	4.00	ug/Kg wet	400.0		97	60-130			
Anthracene	320	4.00	ug/Kg wet	400.0		80	60-130			
Retene	384	4.00	ug/Kg wet	400.0		96	60-130			
Benzo(b)naphtho(2,1-d)thiophene	397	4.00	ug/Kg wet	400.0		99	60-130			
Fluoranthene	393	4.00	ug/Kg wet	400.0		98	60-130			
Pyrene	387	4.00	ug/Kg wet	400.0		97	60-130			
Benz(a)anthracene	384	4.00	ug/Kg wet	400.0		96	60-130			
Chrysene/triphenylene	416	4.00	ug/Kg wet	400.0		104	60-130			
Benzo(b)fluoranthene	403	4.00	ug/Kg wet	400.0		101	60-130			
Benzo(j/k)fluoranthene	404	4.00	ug/Kg wet	400.0		101	60-130			
Benzo(e)pyrene	400	4.00	ug/Kg wet	400.0		100	60-130			
Benzo(a)pyrene	370	4.00	ug/Kg wet	400.0		93	60-130			
Perylene	390	4.00	ug/Kg wet	400.0		97	60-130			
Indeno(1,2,3-cd)pyrene	403	4.00	ug/Kg wet	400.0		101	60-130			
Dibenzo(a,h)anthracene	402	4.00	ug/Kg wet	400.0		101	60-130			
Benzo(g,h,i)perylene	393	4.00	ug/Kg wet	400.0		98	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190040

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FI91702 - 3570						
Coronene	416	4.00	ug/Kg wet	400.0	104	60-130
Tetraethyl lead	362	4.00	ug/Kg wet	400.0	90	60-130
Pristane	404	4.00	ug/Kg wet	400.0	101	60-130
Phytane	423	4.00	ug/Kg wet	400.0	106	60-130
Surrogate: Naphthalene-d8	*370*		ug/Kg wet	*400.0*	*93*	*50-120*
Surrogate: Perylene-d12	*378*		ug/Kg wet	*400.0*	*94*	*50-120*
Surrogate: Phenanthrene-d10	*398*		ug/Kg wet	*400.0*	*99*	*50-120*
Surrogate: Toluene-D8	*365*		ug/Kg wet	*400.0*	*91*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190040

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FI91702 - 3570

Duplicate **Source: F190040-12**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	64.2	25.6	ug/Kg dry		80.5			23	50	
C1-Benzene	102	25.6	ug/Kg dry		98.5			4	50	
C2-Benzenes	156	25.6	ug/Kg dry		159			2	50	
C3-Benzenes	42.5	25.6	ug/Kg dry		41.8			2	50	
C4-Benzenes	18.5	25.6	ug/Kg dry		25.4			31	50	J
C5-Benzenes	ND	25.6	ug/Kg dry		ND				50	
Methylcyclohexane	ND	25.6	ug/Kg dry		ND				50	
Toluene	234	25.6	ug/Kg dry		228			3	50	
Ethylbenzene	43.8	25.6	ug/Kg dry		37.9			15	50	
m,p-Xylene	373	25.6	ug/Kg dry		355			5	50	
Styrene	ND	25.6	ug/Kg dry		ND				50	
o-Xylene	55.5	25.6	ug/Kg dry		21.8			87	50	D+
Isopropylbenzene	ND	25.6	ug/Kg dry		ND				50	
n-Propylbenzene	ND	25.6	ug/Kg dry		28.1				50	
1,3,5-Trimethylbenzene	44.4	25.6	ug/Kg dry		43.8			1	50	
1,2,3-Trimethylbenzene	21.2	25.6	ug/Kg dry		29.8			34	50	J
1,2,4-Trimethylbenzene	41.9	25.6	ug/Kg dry		56.4			29	50	
t-Butylbenzene	ND	25.6	ug/Kg dry		ND				50	
sec-Butylbenzene	ND	25.6	ug/Kg dry		ND				50	
p-Isopropyltoluene	20.9	25.6	ug/Kg dry		16.2			25	50	J
n-Butylbenzene	ND	25.6	ug/Kg dry		ND				50	
trans-Decalin	ND	25.6	ug/Kg dry		ND				50	
cis-Decalin	ND	25.6	ug/Kg dry		ND				50	
C1-Decalins	ND	25.6	ug/Kg dry		ND				50	
C2-Decalins	ND	25.6	ug/Kg dry		ND				50	
C3-Decalins	ND	25.6	ug/Kg dry		ND				50	
C4-Decalins	ND	25.6	ug/Kg dry		ND				50	
Benzo(b)thiophene	51.4	25.6	ug/Kg dry		46.8			9	50	
C1-Benzo(b)thiophenes	46.7	25.6	ug/Kg dry		48.0			3	50	
C2-Benzo(b)thiophenes	107	25.6	ug/Kg dry		122			13	50	
C3-Benzo(b)thiophenes	64.9	25.6	ug/Kg dry		79.9			21	50	
C4-Benzo(b)thiophenes	28.4	25.6	ug/Kg dry		37.5			28	50	
Naphthalene	609	25.6	ug/Kg dry		531			14	50	
2-Methylnaphthalene	274	25.6	ug/Kg dry		271			1	50	
1-Methylnaphthalene	213	25.6	ug/Kg dry		230			8	50	
C1-Naphthalenes	304	25.6	ug/Kg dry		303			0.3	50	
C2-Naphthalenes	523	25.6	ug/Kg dry		735			34	50	
C3-Naphthalenes	281	25.6	ug/Kg dry		381			30	50	
C4-Naphthalenes	113	25.6	ug/Kg dry		117			3	50	
Biphenyl	185	25.6	ug/Kg dry		236			24	50	
Acenaphthylene	2320	25.6	ug/Kg dry		2220			4	50	
Acenaphthene	2350	25.6	ug/Kg dry		3670			44	50	
Dibenzofuran	162	25.6	ug/Kg dry		186			13	50	
Fluorene	1320	25.6	ug/Kg dry		2050			43	50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190040

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FI91702 - 3570

C1-Fluorenes	395	25.6	ug/Kg dry	494	22	50
C2-Fluorenes	191	25.6	ug/Kg dry	221	14	50
C3-Fluorenes	368	25.6	ug/Kg dry	338	9	50
Dibenzothiophene	1560	25.6	ug/Kg dry	2380	41	50
C1-Dibenzothiophenes	1050	25.6	ug/Kg dry	1110	6	50
C2-Dibenzothiophenes	527	25.6	ug/Kg dry	460	13	50
C3-Dibenzothiophenes	218	25.6	ug/Kg dry	200	9	50
C4-Dibenzothiophenes	91.9	25.6	ug/Kg dry	93.8	2	50
Phenanthrene	11800	25.6	ug/Kg dry	18300	43	50
Anthracene	5060	25.6	ug/Kg dry	5380	6	50
C1-Phenanthrenes/Anthracenes	3810	25.6	ug/Kg dry	4200	10	50
C2-Phenanthrenes/Anthracenes	1020	25.6	ug/Kg dry	1000	1	50
C3-Phenanthrenes/Anthracenes	267	25.6	ug/Kg dry	274	3	50
C4-Phenanthrenes/Anthracenes	123	25.6	ug/Kg dry	130	5	50
Retene	75.9	25.6	ug/Kg dry	102	29	50
Benzo(b)naphtho(2,1-d)thiophene	1780	25.6	ug/Kg dry	1550	14	50
C0-Benzonaphthothiophenes	3440	25.6	ug/Kg dry	3000	14	50
C1-Benzonaphthothiophenes	934	25.6	ug/Kg dry	872	7	50
C2-Benzonaphthothiophenes	383	25.6	ug/Kg dry	438	13	50
C3-Benzonaphthothiophenes	347	25.6	ug/Kg dry	378	9	50
C4-Benzonaphthothiophenes	133	25.6	ug/Kg dry	122	8	50
Fluoranthene	19900	25.6	ug/Kg dry	19800	0.2	50
Pyrene	27500	25.6	ug/Kg dry	26800	3	50
C1-Fluoranthenes/Pyrenes	7590	25.6	ug/Kg dry	6860	10	50
C2-Fluoranthenes/Pyrenes	1350	25.6	ug/Kg dry	1320	2	50
C3-Fluoranthenes/Pyrenes	330	25.6	ug/Kg dry	375	13	50
Benzo(b)fluorene	864	25.6	ug/Kg dry	853	1	50
Benzo(c)fluorene	474	25.6	ug/Kg dry	396	18	50
2-Methylpyrene	1060	25.6	ug/Kg dry	947	11	50
4-Methylpyrene	954	25.6	ug/Kg dry	823	15	50
1-Methylpyrene	1040	25.6	ug/Kg dry	953	9	50
Benz(a)anthracene	9980	25.6	ug/Kg dry	9330	7	50
Chrysene/triphenylene	8550	25.6	ug/Kg dry	7550	13	50
C1-Benzo(a)anthracenes/Chrysenes	2110	25.6	ug/Kg dry	2190	4	50
C2-Benzo(a)anthracenes/Chrysenes	609	25.6	ug/Kg dry	824	30	50
C3-Benzo(a)anthracenes/Chrysenes	223	25.6	ug/Kg dry	291	26	50
C4-Benzo(a)anthracenes/Chrysenes	172	25.6	ug/Kg dry	243	34	50
Benzo(b)fluoranthene	6170	25.6	ug/Kg dry	5960	3	50
Benzo(j/k)fluoranthene	7200	25.6	ug/Kg dry	6630	8	50
Benzo(e)pyrene	6420	25.6	ug/Kg dry	6100	5	50
Benzo(a)pyrene	11300	25.6	ug/Kg dry	10700	6	50
Perylene	1920	25.6	ug/Kg dry	1790	7	50
Indeno(1,2,3-cd)pyrene	4890	25.6	ug/Kg dry	4650	5	50
Dibenzo(a,h)anthracene	1180	25.6	ug/Kg dry	1230	4	50
Benzo(g,h,i)perylene	6170	25.6	ug/Kg dry	5780	7	50
Coronene	1900	25.6	ug/Kg dry	1750	9	50
Tetramethyl lead	ND	25.6	ug/Kg dry	ND		50
Trimethylethyl lead	ND	25.6	ug/Kg dry	ND		50

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190040

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FI91702 - 3570									
Dimethyldiethyl lead	ND	25.6	ug/Kg dry		ND			50	
Methyltriethyl lead	ND	25.6	ug/Kg dry		ND			50	
Tetraethyl lead	ND	25.6	ug/Kg dry		ND			50	
2,6,10-trimethyldodecane (1380)	48.3	25.6	ug/Kg dry		51.7		7	50	
2,6,10-trimethyltridecane (1470)	127	25.6	ug/Kg dry		126		1	50	
2,6,10-trimethylpentadecane (1650)	67.2	25.6	ug/Kg dry		56.2		18	50	
C-17	270	25.6	ug/Kg dry		251		8	50	
Pristane	180	25.6	ug/Kg dry		150		18	50	
C-18	180	25.6	ug/Kg dry		167		7	50	
Phytane	174	25.6	ug/Kg dry		155		12	50	
Carbazole	231	25.6	ug/Kg dry		240		4	50	
2,6-Dimethylnaphthalene	116	25.6	ug/Kg dry		155		29	50	
2,3,5-Trimethylnaphthene	17.0	25.6	ug/Kg dry		20.3		18	50	J
4-Methyldibenzothiophene	365	25.6	ug/Kg dry		380		4	50	
2/3-Methyldibenzothiophene	377	25.6	ug/Kg dry		409		8	50	
1-Methyldibenzothiophene	122	25.6	ug/Kg dry		123		1	50	
3-Methylphenanthrene	853	25.6	ug/Kg dry		995		15	50	
2-Methylphenanthrene	1020	25.6	ug/Kg dry		1130		10	50	
2-Methylanthracene	416	25.6	ug/Kg dry		465		11	50	
4/9-Methylphenanthrene	846	25.6	ug/Kg dry		875		3	50	
1-Methylphenanthrene	613	25.6	ug/Kg dry		680		10	50	
Surrogate: Naphthalene-d8	*383*		ug/Kg dry	*512.9*		*75*	*50-120*		
Surrogate: Perylene-d12	*416*		ug/Kg dry	*512.9*		*81*	*50-120*		
Surrogate: Phenanthrene-d10	*433*		ug/Kg dry	*512.9*		*84*	*50-120*		
Surrogate: Toluene-D8	*380*		ug/Kg dry	*512.9*		*74*	*50-120*		

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F190040

Notes and Definitions

U	Analyte included in the analysis, but not detected
J	Reported between MDL and MRL
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190040

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

F190040

Chain-of-Custody Record

Laboratory: ~~AquaSurvey~~ ESS RS/J 9/13

Laboratory Job # (Lab use only) 1910446

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman

Page 2 of 4

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

Preservative: None | None

Analysis

Sample Handling

Samples Field Filtered: YES NO NA

Sampled Shipped With Ice: YES NO

MCP PRESUMPTIVE CERTAINTY REQUIRED -- YES NO

If Yes, Are MCP Analytical Methods Required? YES NO NA

Are Drinking Water Samples Submitted? YES NO NA

If Yes, Have Drinking Water Sampling Requirements Been Met? YES NO NA

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Parent and Alkylated MAHs & PAHs 8270**	TOCs by Lloyd-Kahn							Sample Specific Remarks
1	1804576-SS668-S2	9/11/19	1613	Sed	1	BFM	X	X							
2	1804576-SS670-S1	9/10/19	1050	Sed	1	BFM	X	X							
3	1804576-SS670-S2	9/10/19	1053	Sed	1	BFM	X	X							
4	1804576-SS673-S2	9/12/19	1537	Sed	1	BFM	X	X							
5	1804576-SS673-S3	9/12/19	1544	Sed	1	BFM	X	X							
6	1804576-SS674-S4	9/12/19	1523	Sed	1	BFM	X	X							
7	1804576-SS676-S2	9/11/19	945	Sed	1	BFM	X	X							
8	1804576-SS677-S2	9/11/19	1040	Sed	1	BFM	X	X							
9	1804576-SS677-S3	9/11/19	1043	Sed	1	BFM	X	X							
10	1804576-SS677-S4A	9/11/19	1150	Sed	1	BFM	X	X							
11	1804576-SS677-S5A	9/11/19	1155	Sed	1	BFM	X	X							
12	1804576-SS678-S1	9/11/19	1115	Sed	1	BFM	X	X							

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1. [signature]	9/12/19	1910	1. GEI Sample Fridge
2. GEI Sample Fridge	9/13/19	1205	2. [signature]
3. [signature]	9/13/19	1205	3. [signature] 9/13/19 12:05
4. [signature]	9/13/19	14:46	4. [signature] 9/13/19 1446

Turnaround Time (Business days):

Normal __X__ Other ____

10-Day ____ 7-Day ____

5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

**Parent and Alkylated MAHs & PAHs (34) by GC/MS/SIM/SCAN

Run

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

Shipped/Delivered Via: ESS Courier

ESS Project ID: 1910446
Date Received: 9/13/2019
Project Due Date: 9/20/2019
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 3.1 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / (NA)
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / (No)
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / (No)
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	388380	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
02	388379	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
03	388378	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
04	388377	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
05	388376	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
06	388375	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
07	388374	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
08	388373	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
09	388372	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
10	388371	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
11	388370	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
12	388369	Yes	NA	Yes	4 oz. Jar - Unpres	NP	

2nd Review
Were all containers scanned into storage/lab? Initials
Are barcode labels on correct containers? Yes / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

ESS Project ID: 1910446

Date Received: 9/13/2019

Completed By: _____ Date & Time: 9/13/19 17:04

Reviewed By: _____ Date & Time: 9/13/19 1808

Delivered By: _____ 9/13/19 1808

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (044752)
ESS Laboratory Work Order Number: F190041

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 1:50 pm, Oct 01, 2019

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses
ESS Laboratory - Cranston, RI TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190041

SAMPLE RECEIPT

The following samples were received on September 13, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F190041-01	1804576-SS664-S2	Sediment	8270 Mod, TOC-LK
F190041-02	1804576-SS664-S3	Sediment	8270 Mod, TOC-LK
F190041-03	1804576-SS664-S4	Sediment	8270 Mod, TOC-LK
F190041-04	1804576-SS665-S1	Sediment	8270 Mod, TOC-LK
F190041-05	1804576-SS665-S2	Sediment	8270 Mod, TOC-LK
F190041-06	1804576-SS666-S2	Sediment	8270 Mod, TOC-LK
F190041-07	1804576-SS666-S3	Sediment	8270 Mod, TOC-LK
F190041-08	1804576-SS666-S4	Sediment	8270 Mod, TOC-LK
F190041-09	1804576-SS666-S5	Sediment	8270 Mod, TOC-LK
F190041-10	1804576-SS667-S1	Sediment	8270 Mod, TOC-LK
F190041-11	1804576-SS667-S2	Sediment	8270 Mod, TOC-LK
F190041-12	1804576-SS668-S1	Sediment	8270 Mod, TOC-LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190041

PROJECT NARRATIVE

8270D (SIM) Semi-Volatile Organic Compounds

F190041-01	**Present in Method Blank (B).** C-18
F190041-02	**Present in Method Blank (B).** C-17 , C-18 , Phytane , Pristane
F190041-03	**Present in Method Blank (B).** C-17 , C-18 , Phytane , Pristane
F190041-06	**Present in Method Blank (B).** Phytane , Pristane
F190041-07	**Present in Method Blank (B).** C-18 , Phytane , Pristane
F190041-08	**Present in Method Blank (B).** C-17 , C-18 , Phytane , Pristane
F190041-09	**Present in Method Blank (B).** C-17 , C-18 , Phytane , Pristane
F190041-10	**Present in Method Blank (B).** C-18 , Phytane , Pristane
FI91802-DUP2	**Relative percent difference for duplicate is outside of criteria (D+).** Benzene (109% @ 50%), Biphenyl (51% @ 50%), C1-Decalins (103% @ 50%), trans-Decalin (103% @ 50%)

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190041

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS664-S2
Date Sampled: 09/11/19 14:00
Percent Solids: 60
Initial Volume: 5.28
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-01
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C1-Benzene	**78.7** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C2-Benzenes	**46.9** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C3-Benzenes	**J 3.25** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C4-Benzenes	**J 6.01** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C5-Benzenes	ND (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
Methylcyclohexane	ND (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
Toluene	**136** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
Ethylbenzene	**18.7** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
m,p-Xylene	**90.7** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
Styrene	ND (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
o-Xylene	**15.6** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
Isopropylbenzene	ND (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
n-Propylbenzene	ND (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
1,3,5-Trimethylbenzene	ND (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
1,2,3-Trimethylbenzene	**8.57** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
1,2,4-Trimethylbenzene	**11.2** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
t-Butylbenzene	ND (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
sec-Butylbenzene	ND (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
p-Isopropyltoluene	**23.1** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
n-Butylbenzene	ND (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
trans-Decalin	ND (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
cis-Decalin	ND (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C1-Decalins	ND (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C2-Decalins	ND (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C3-Decalins	ND (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C4-Decalins	ND (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
Benzo(b)thiophene	ND (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C1-Benzo(b)thiophenes	ND (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C2-Benzo(b)thiophenes	**J 5.06** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C3-Benzo(b)thiophenes	**J 5.56** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C4-Benzo(b)thiophenes	**J 3.81** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS664-S2
Date Sampled: 09/11/19 14:00
Percent Solids: 60
Initial Volume: 5.28
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-01
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**10.4** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
2-Methylnaphthalene	**6.35** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
1-Methylnaphthalene	**J 4.92** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C1-Naphthalenes	**6.73** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C2-Naphthalenes	**26.5** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C3-Naphthalenes	**32.1** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C4-Naphthalenes	**29.4** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
Biphenyl	**J 5.04** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
Acenaphthylene	**20.3** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
Acenaphthene	**70.2** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
Dibenzofuran	ND (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
Fluorene	**41.8** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C1-Fluorenes	**21.6** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C2-Fluorenes	**22.0** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C3-Fluorenes	**25.1** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
Dibenzothiophene	**46.6** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C1-Dibenzothiophenes	**41.3** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C2-Dibenzothiophenes	**44.6** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C3-Dibenzothiophenes	**37.7** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C4-Dibenzothiophenes	**36.2** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
Phenanthrene	**310** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
Anthracene	**182** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C1-Phenanthrenes/Anthracenes	**142** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C2-Phenanthrenes/Anthracenes	**85.8** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C3-Phenanthrenes/Anthracenes	**70.1** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C4-Phenanthrenes/Anthracenes	**128** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
Retene	**564** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
Benzo(b)naphtho(2,1-d)thiophene	**29.3** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C0-Benzonaphthothiophenes	**56.2** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C1-Benzonaphthothiophenes	**24.3** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C2-Benzonaphthothiophenes	**17.1** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C3-Benzonaphthothiophenes	**12.9** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS664-S2
Date Sampled: 09/11/19 14:00
Percent Solids: 60
Initial Volume: 5.28
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-01
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	J **3.60** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
Fluoranthene	**359** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
Pyrene	**461** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C1-Fluoranthenes/Pyrenes	**162** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C2-Fluoranthenes/Pyrenes	**35.7** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C3-Fluoranthenes/Pyrenes	**14.0** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
Benzo(b)fluorene	**16.0** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
Benzo(c)fluorene	**13.6** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
2-Methylpyrene	**19.3** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
4-Methylpyrene	**17.1** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
1-Methylpyrene	**18.0** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
Benz(a)anthracene	**149** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
Chrysene/triphenylene	**168** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C1-Benzo(a)anthracenes/Chrysenes	**44.1** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C2-Benzo(a)anthracenes/Chrysenes	**21.5** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C3-Benzo(a)anthracenes/Chrysenes	**9.20** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C4-Benzo(a)anthracenes/Chrysenes	ND (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
Benzo(b)fluoranthene	**66.7** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
Benzo(j/k)fluoranthene	**88.4** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
Benzo(e)pyrene	**67.8** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
Benzo(a)pyrene	**121** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
Perylene	**210** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
Indeno(1,2,3-cd)pyrene	**45.9** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
Dibenzo(a,h)anthracene	**11.1** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
Benzo(g,h,i)perylene	**57.5** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
Coronene	**16.3** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
Tetramethyl lead	ND (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
Trimethylethyl lead	ND (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
Dimethyldiethyl lead	ND (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
Methyltriethyl lead	ND (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
Tetraethyl lead	ND (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
2,6,10-trimethyldodecane (1380)	**13.8** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS664-S2
Date Sampled: 09/11/19 14:00
Percent Solids: 60
Initial Volume: 5.28
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-01
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**32.3** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
2,6,10-trimethylpentadecane (1650)	**42.1** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C-17	**70.7** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
Pristane	**156** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
C-18	**B 63.8** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
Phytane	**187** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
Carbazole	ND (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
2,6-Dimethylnaphthalene	**7.17** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
2,3,5-Trimethylnaphthene	ND (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
4-Methyldibenzothiophene	**14.3** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
2/3-Methyldibenzothiophene	**13.9** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
1-Methyldibenzothiophene	**J 4.07** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
3-Methylphenanthrene	**29.8** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
2-Methylphenanthrene	**36.8** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
2-Methylanthracene	**16.3** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
4/9-Methylphenanthrene	**30.6** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802
1-Methylphenanthrene	**24.6** (6.34)	3.17	8270 Mod		1	09/21/19 19:07	F9I0008	FI91802

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*75 %*		*50-120*
Surrogate: Perylene-d12	*70 %*		*50-120*
Surrogate: Phenanthrene-d10	*84 %*		*50-120*
Surrogate: Toluene-D8	*72 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS664-S2
Date Sampled: 09/11/19 14:00
Percent Solids: 60

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-01
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**48400** (108)		TOC-LK		1	CCP	09/26/19 20:28	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS664-S3
Date Sampled: 09/11/19 14:03
Percent Solids: 68
Initial Volume: 5.64
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-02
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C1-Benzene	**27.3** (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C2-Benzenes	**17.5** (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C3-Benzenes	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C4-Benzenes	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C5-Benzenes	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
Methylcyclohexane	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
Toluene	**57.4** (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
Ethylbenzene	**7.94** (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
m,p-Xylene	**41.1** (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
Styrene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
o-Xylene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
Isopropylbenzene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
n-Propylbenzene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
1,3,5-Trimethylbenzene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
1,2,3-Trimethylbenzene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
1,2,4-Trimethylbenzene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
t-Butylbenzene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
sec-Butylbenzene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
p-Isopropyltoluene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
n-Butylbenzene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
trans-Decalin	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
cis-Decalin	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C1-Decalins	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C2-Decalins	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C3-Decalins	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C4-Decalins	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
Benzo(b)thiophene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C1-Benzo(b)thiophenes	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C2-Benzo(b)thiophenes	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C3-Benzo(b)thiophenes	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C4-Benzo(b)thiophenes	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS664-S3
Date Sampled: 09/11/19 14:03
Percent Solids: 68
Initial Volume: 5.64
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-02
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
2-Methylnaphthalene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
1-Methylnaphthalene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C1-Naphthalenes	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C2-Naphthalenes	**7.22** (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C3-Naphthalenes	**J 3.91** (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C4-Naphthalenes	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
Biphenyl	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
Acenaphthylene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
Acenaphthene	**J 2.91** (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
Dibenzofuran	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
Fluorene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C1-Fluorenes	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C2-Fluorenes	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C3-Fluorenes	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
Dibenzothiophene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C1-Dibenzothiophenes	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C2-Dibenzothiophenes	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C3-Dibenzothiophenes	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C4-Dibenzothiophenes	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
Phenanthrene	**9.44** (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
Anthracene	**10.6** (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C1-Phenanthrenes/Anthracenes	**5.72** (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C2-Phenanthrenes/Anthracenes	**J 4.17** (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C3-Phenanthrenes/Anthracenes	**8.07** (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C4-Phenanthrenes/Anthracenes	**22.1** (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
Retene	**103** (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
Benzo(b)naphtho(2,1-d)thiophene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C0-Benzonaphthothiophenes	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C1-Benzonaphthothiophenes	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C2-Benzonaphthothiophenes	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C3-Benzonaphthothiophenes	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS664-S3
Date Sampled: 09/11/19 14:03
Percent Solids: 68
Initial Volume: 5.64
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-02
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
Fluoranthene	**9.60** (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
Pyrene	**11.3** (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C1-Fluoranthenes/Pyrenes	**7.72** (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C2-Fluoranthenes/Pyrenes	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C3-Fluoranthenes/Pyrenes	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
Benzo(b)fluorene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
Benzo(c)fluorene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
2-Methylpyrene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
4-Methylpyrene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
1-Methylpyrene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
Benz(a)anthracene	**J 3.83** (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
Chrysene/triphenylene	**7.47** (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C1-Benzo(a)anthracenes/Chrysenes	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C2-Benzo(a)anthracenes/Chrysenes	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C3-Benzo(a)anthracenes/Chrysenes	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C4-Benzo(a)anthracenes/Chrysenes	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
Benzo(b)fluoranthene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
Benzo(j/k)fluoranthene	**J 2.98** (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
Benzo(e)pyrene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
Benzo(a)pyrene	**J 3.42** (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
Perylene	**305** (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
Indeno(1,2,3-cd)pyrene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
Dibenzo(a,h)anthracene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
Benzo(g,h,i)perylene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
Coronene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
Tetramethyl lead	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
Trimethylethyl lead	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
Dimethyldiethyl lead	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
Methyltriethyl lead	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
Tetraethyl lead	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
2,6,10-trimethyldodecane (1380)	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS664-S3
Date Sampled: 09/11/19 14:03
Percent Solids: 68
Initial Volume: 5.64
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-02
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
2,6,10-trimethylpentadecane (1650)	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C-17	**B 35.7** (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
Pristane	**B 14.9** (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
C-18	**B 33.1** (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
Phytane	**B 29.0** (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
Carbazole	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
2,6-Dimethylnaphthalene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
2,3,5-Trimethylnaphthene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
4-Methyldibenzothiophene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
2/3-Methyldibenzothiophene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
1-Methyldibenzothiophene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
3-Methylphenanthrene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
2-Methylphenanthrene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
2-Methylanthracene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
4/9-Methylphenanthrene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802
1-Methylphenanthrene	ND (5.23)	2.62	8270 Mod		1	09/21/19 20:30	F9I0008	FI91802

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*82 %*		*50-120*
Surrogate: Perylene-d12	*77 %*		*50-120*
Surrogate: Phenanthrene-d10	*85 %*		*50-120*
Surrogate: Toluene-D8	*79 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS664-S3
Date Sampled: 09/11/19 14:03
Percent Solids: 68

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-02
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**24300** (120)		TOC-LK		1	CCP	09/26/19 15:38	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS664-S4
Date Sampled: 09/11/19 14:05
Percent Solids: 68
Initial Volume: 6.45
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-03
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C1-Benzene	**15.9** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C2-Benzenes	**8.60** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C3-Benzenes	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C4-Benzenes	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C5-Benzenes	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
Methylcyclohexane	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
Toluene	**37.4** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
Ethylbenzene	J **3.89** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
m,p-Xylene	**27.5** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
Styrene	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
o-Xylene	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
Isopropylbenzene	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
n-Propylbenzene	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
1,3,5-Trimethylbenzene	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
1,2,3-Trimethylbenzene	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
1,2,4-Trimethylbenzene	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
t-Butylbenzene	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
sec-Butylbenzene	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
p-Isopropyltoluene	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
n-Butylbenzene	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
trans-Decalin	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
cis-Decalin	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C1-Decalins	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C2-Decalins	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C3-Decalins	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C4-Decalins	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
Benzo(b)thiophene	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C1-Benzo(b)thiophenes	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C2-Benzo(b)thiophenes	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C3-Benzo(b)thiophenes	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C4-Benzo(b)thiophenes	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS664-S4
Date Sampled: 09/11/19 14:05
Percent Solids: 68
Initial Volume: 6.45
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-03
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	J **3.94** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
2-Methylnaphthalene	J **2.47** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
1-Methylnaphthalene	J **2.35** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C1-Naphthalenes	J **3.14** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C2-Naphthalenes	**10.9** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C3-Naphthalenes	**5.50** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C4-Naphthalenes	J **3.91** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
Biphenyl	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
Acenaphthylene	J **2.48** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
Acenaphthene	**17.9** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
Dibenzofuran	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
Fluorene	**7.62** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C1-Fluorenes	J **4.07** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C2-Fluorenes	J **3.25** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C3-Fluorenes	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
Dibenzothiophene	**7.18** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C1-Dibenzothiophenes	**4.63** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C2-Dibenzothiophenes	**8.22** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C3-Dibenzothiophenes	**8.80** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C4-Dibenzothiophenes	J **3.15** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
Phenanthrene	**48.9** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
Anthracene	**32.1** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C1-Phenanthrenes/Anthracenes	**13.9** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C2-Phenanthrenes/Anthracenes	**9.73** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C3-Phenanthrenes/Anthracenes	**12.8** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C4-Phenanthrenes/Anthracenes	**27.0** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
Retene	**128** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
Benzo(b)naphtho(2,1-d)thiophene	J **3.64** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C0-Benzonaphthothiophenes	**8.42** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C1-Benzonaphthothiophenes	J **3.82** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C2-Benzonaphthothiophenes	J **3.85** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C3-Benzonaphthothiophenes	J **3.01** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS664-S4
Date Sampled: 09/11/19 14:05
Percent Solids: 68
Initial Volume: 6.45
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-03
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
Fluoranthene	**38.2** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
Pyrene	**52.2** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C1-Fluoranthenes/Pyrenes	**18.5** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C2-Fluoranthenes/Pyrenes	**5.18** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C3-Fluoranthenes/Pyrenes	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
Benzo(b)fluorene	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
Benzo(c)fluorene	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
2-Methylpyrene	**J 2.30** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
4-Methylpyrene	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
1-Methylpyrene	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
Benz(a)anthracene	**16.2** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
Chrysene/triphenylene	**24.9** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C1-Benzo(a)anthracenes/Chrysenes	**6.13** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C2-Benzo(a)anthracenes/Chrysenes	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C3-Benzo(a)anthracenes/Chrysenes	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C4-Benzo(a)anthracenes/Chrysenes	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
Benzo(b)fluoranthene	**6.79** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
Benzo(j/k)fluoranthene	**12.0** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
Benzo(e)pyrene	**8.81** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
Benzo(a)pyrene	**14.2** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
Perylene	**294** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
Indeno(1,2,3-cd)pyrene	**5.28** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
Dibenzo(a,h)anthracene	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
Benzo(g,h,i)perylene	**7.43** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
Coronene	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
Tetramethyl lead	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
Trimethylethyl lead	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
Dimethyldiethyl lead	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
Methyltriethyl lead	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
Tetraethyl lead	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
2,6,10-trimethyldodecane (1380)	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS664-S4
Date Sampled: 09/11/19 14:05
Percent Solids: 68
Initial Volume: 6.45
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-03
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**6.84** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
2,6,10-trimethylpentadecane (1650)	**J 3.68** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C-17	**B 26.7** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
Pristane	**B 19.6** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
C-18	**B 23.0** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
Phytane	**B 30.5** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
Carbazole	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
2,6-Dimethylnaphthalene	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
2,3,5-Trimethylnaphthene	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
4-Methyldibenzothiophene	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
2/3-Methyldibenzothiophene	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
1-Methyldibenzothiophene	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
3-Methylphenanthrene	**J 2.76** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
2-Methylphenanthrene	**J 3.32** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
2-Methylanthracene	ND (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
4/9-Methylphenanthrene	**J 2.95** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802
1-Methylphenanthrene	**J 3.14** (4.58)	2.29	8270 Mod		1	09/22/19 4:42	F9I0008	FI91802

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*78 %*		*50-120*
Surrogate: Perylene-d12	*74 %*		*50-120*
Surrogate: Phenanthrene-d10	*85 %*		*50-120*
Surrogate: Toluene-D8	*73 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS664-S4
Date Sampled: 09/11/19 14:05
Percent Solids: 68

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-03
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**12000** (105)		TOC-LK		1	CCP	09/26/19 16:44	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS665-S1
Date Sampled: 09/10/19 14:15
Percent Solids: 73
Initial Volume: 5.04
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-04
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C1-Benzene	**52.9** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C2-Benzenes	**89.4** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C3-Benzenes	**J 16.1** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C4-Benzenes	ND (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C5-Benzenes	ND (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
Methylcyclohexane	**69.8** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
Toluene	**152** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
Ethylbenzene	**J 15.4** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
m,p-Xylene	**222** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
Styrene	ND (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
o-Xylene	ND (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
Isopropylbenzene	ND (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
n-Propylbenzene	ND (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
1,3,5-Trimethylbenzene	**39.7** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
1,2,3-Trimethylbenzene	**J 20.6** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
1,2,4-Trimethylbenzene	**32.6** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
t-Butylbenzene	ND (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
sec-Butylbenzene	ND (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
p-Isopropyltoluene	**J 15.2** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
n-Butylbenzene	ND (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
trans-Decalin	**118** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
cis-Decalin	ND (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C1-Decalins	**113** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C2-Decalins	**102** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C3-Decalins	ND (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C4-Decalins	ND (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
Benzo(b)thiophene	**J 20.2** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C1-Benzo(b)thiophenes	**J 23.3** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C2-Benzo(b)thiophenes	**86.1** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C3-Benzo(b)thiophenes	**61.2** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C4-Benzo(b)thiophenes	**44.6** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS665-S1
Date Sampled: 09/10/19 14:15
Percent Solids: 73
Initial Volume: 5.04
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-04
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**179** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
2-Methylnaphthalene	**86.4** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
1-Methylnaphthalene	**68.3** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C1-Naphthalenes	**90.9** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C2-Naphthalenes	**249** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C3-Naphthalenes	**371** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C4-Naphthalenes	**225** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
Biphenyl	**54.5** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
Acenaphthylene	**469** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
Acenaphthene	**970** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
Dibenzofuran	**74.7** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
Fluorene	**588** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C1-Fluorenes	**257** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C2-Fluorenes	**220** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C3-Fluorenes	**225** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
Dibenzothiophene	**816** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C1-Dibenzothiophenes	**412** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C2-Dibenzothiophenes	**313** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C3-Dibenzothiophenes	**292** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C4-Dibenzothiophenes	**185** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
Phenanthrene	**4250** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
Anthracene	**1540** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C1-Phenanthrenes/Anthracenes	**1450** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C2-Phenanthrenes/Anthracenes	**627** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C3-Phenanthrenes/Anthracenes	**280** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C4-Phenanthrenes/Anthracenes	**158** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
Retene	**159** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
Benzo(b)naphtho(2,1-d)thiophene	**554** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C0-Benzonaphthothiophenes	**1000** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C1-Benzonaphthothiophenes	**393** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C2-Benzonaphthothiophenes	**389** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C3-Benzonaphthothiophenes	**401** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS665-S1
Date Sampled: 09/10/19 14:15
Percent Solids: 73
Initial Volume: 5.04
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-04
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**200** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
Fluoranthene	**8460** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
Pyrene	**9340** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C1-Fluoranthenes/Pyrenes	**2340** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C2-Fluoranthenes/Pyrenes	**713** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C3-Fluoranthenes/Pyrenes	**294** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
Benzo(b)fluorene	**286** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
Benzo(c)fluorene	**169** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
2-Methylpyrene	**300** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
4-Methylpyrene	**257** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
1-Methylpyrene	**261** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
Benz(a)anthracene	**3140** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
Chrysene/triphenylene	**3070** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C1-Benzo(a)anthracenes/Chrysenes	**854** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C2-Benzo(a)anthracenes/Chrysenes	**392** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C3-Benzo(a)anthracenes/Chrysenes	**250** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C4-Benzo(a)anthracenes/Chrysenes	ND (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
Benzo(b)fluoranthene	**2050** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
Benzo(j/k)fluoranthene	**2400** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
Benzo(e)pyrene	**1970** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
Benzo(a)pyrene	**3030** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
Perylene	**667** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
Indeno(1,2,3-cd)pyrene	**1480** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
Dibenzo(a,h)anthracene	**389** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
Benzo(g,h,i)perylene	**1850** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
Coronene	**533** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
Tetramethyl lead	ND (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
Trimethylethyl lead	ND (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
Dimethyldiethyl lead	ND (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
Methyltriethyl lead	ND (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
Tetraethyl lead	ND (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
2,6,10-trimethyldodecane (1380)	**98.0** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS665-S1
Date Sampled: 09/10/19 14:15
Percent Solids: 73
Initial Volume: 5.04
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-04
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**233** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
2,6,10-trimethylpentadecane (1650)	**237** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C-17	**220** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
Pristane	**779** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
C-18	**180** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
Phytane	**770** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
Carbazole	**237** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
2,6-Dimethylnaphthalene	**56.8** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
2,3,5-Trimethylnaphthene	**J 19.1** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
4-Methyldibenzothiophene	**140** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
2/3-Methyldibenzothiophene	**158** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
1-Methyldibenzothiophene	**49.7** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
3-Methylphenanthrene	**384** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
2-Methylphenanthrene	**311** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
2-Methylanthracene	**144** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
4/9-Methylphenanthrene	**301** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802
1-Methylphenanthrene	**271** (27.3)	13.7	8270 Mod		5	09/22/19 11:38	F9I0008	FI91802

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*80 %*		*50-120*
Surrogate: Perylene-d12	*95 %*		*50-120*
Surrogate: Phenanthrene-d10	*101 %*		*50-120*
Surrogate: Toluene-D8	*86 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS665-S1
Date Sampled: 09/10/19 14:15
Percent Solids: 73

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-04
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**21000** (97.2)		TOC-LK		1	CCP	09/26/19 21:27	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS665-S2
Date Sampled: 09/10/19 14:18
Percent Solids: 70
Initial Volume: 5.1
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-05
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C1-Benzene	**74.1** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C2-Benzenes	**30.0** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C3-Benzenes	**33.7** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C4-Benzenes	**78.5** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C5-Benzenes	**54.7** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
Methylcyclohexane	ND (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
Toluene	**139** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
Ethylbenzene	**9.35** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
m,p-Xylene	**67.9** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
Styrene	ND (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
o-Xylene	**15.2** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
Isopropylbenzene	ND (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
n-Propylbenzene	**9.19** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
1,3,5-Trimethylbenzene	**20.1** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
1,2,3-Trimethylbenzene	**17.8** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
1,2,4-Trimethylbenzene	**34.6** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
t-Butylbenzene	ND (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
sec-Butylbenzene	ND (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
p-Isopropyltoluene	**21.0** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
n-Butylbenzene	ND (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
trans-Decalin	**64.7** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
cis-Decalin	**J 3.97** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C1-Decalins	**63.1** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C2-Decalins	**37.8** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C3-Decalins	ND (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C4-Decalins	ND (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
Benzo(b)thiophene	ND (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C1-Benzo(b)thiophenes	**9.94** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C2-Benzo(b)thiophenes	**29.7** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C3-Benzo(b)thiophenes	**33.4** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C4-Benzo(b)thiophenes	**28.6** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS665-S2
Date Sampled: 09/10/19 14:18
Percent Solids: 70
Initial Volume: 5.1
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-05
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**47.6** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
2-Methylnaphthalene	**27.4** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
1-Methylnaphthalene	**40.5** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C1-Naphthalenes	**39.1** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C2-Naphthalenes	**202** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C3-Naphthalenes	**309** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C4-Naphthalenes	**229** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
Biphenyl	**18.3** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
Acenaphthylene	**85.5** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
Acenaphthene	**555** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
Dibenzofuran	**31.8** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
Fluorene	**452** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C1-Fluorenes	**189** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C2-Fluorenes	**152** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C3-Fluorenes	**126** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
Dibenzothiophene	**464** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C1-Dibenzothiophenes	**221** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C2-Dibenzothiophenes	**188** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C3-Dibenzothiophenes	**158** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C4-Dibenzothiophenes	**88.4** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
Phenanthrene	**3480** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
Anthracene	**800** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C1-Phenanthrenes/Anthracenes	**760** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C2-Phenanthrenes/Anthracenes	**308** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C3-Phenanthrenes/Anthracenes	**168** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C4-Phenanthrenes/Anthracenes	**170** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
Retene	**614** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
Benzo(b)naphtho(2,1-d)thiophene	**110** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C0-Benzonaphthothiophenes	**205** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C1-Benzonaphthothiophenes	**106** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C2-Benzonaphthothiophenes	**117** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C3-Benzonaphthothiophenes	**116** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS665-S2
Date Sampled: 09/10/19 14:18
Percent Solids: 70
Initial Volume: 5.1
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-05
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**63.8** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
Fluoranthene	**2440** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
Pyrene	**2720** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C1-Fluoranthenes/Pyrenes	**651** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C2-Fluoranthenes/Pyrenes	**162** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C3-Fluoranthenes/Pyrenes	**71.4** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
Benzo(b)fluorene	**57.2** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
Benzo(c)fluorene	**75.9** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
2-Methylpyrene	**80.2** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
4-Methylpyrene	**70.5** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
1-Methylpyrene	**68.4** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
Benz(a)anthracene	**623** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
Chrysene/triphenylene	**628** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C1-Benzo(a)anthracenes/Chrysenes	**204** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C2-Benzo(a)anthracenes/Chrysenes	**108** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C3-Benzo(a)anthracenes/Chrysenes	**65.0** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C4-Benzo(a)anthracenes/Chrysenes	ND (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
Benzo(b)fluoranthene	**321** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
Benzo(j/k)fluoranthene	**460** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
Benzo(e)pyrene	**353** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
Benzo(a)pyrene	**542** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
Perylene	**192** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
Indeno(1,2,3-cd)pyrene	**257** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
Dibenzo(a,h)anthracene	**68.8** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
Benzo(g,h,i)perylene	**314** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
Coronene	**86.5** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
Tetramethyl lead	ND (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
Trimethylethyl lead	ND (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
Dimethyldiethyl lead	ND (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
Methyltriethyl lead	ND (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
Tetraethyl lead	ND (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
2,6,10-trimethyldodecane (1380)	**67.5** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS665-S2
Date Sampled: 09/10/19 14:18
Percent Solids: 70
Initial Volume: 5.1
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-05
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**169** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
2,6,10-trimethylpentadecane (1650)	**229** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C-17	**90.4** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
Pristane	**796** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
C-18	**95.0** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
Phytane	**601** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
Carbazole	**13.7** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
2,6-Dimethylnaphthalene	**16.6** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
2,3,5-Trimethylnaphthene	**22.8** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
4-Methyldibenzothiophene	**80.3** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
2/3-Methyldibenzothiophene	**60.0** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
1-Methyldibenzothiophene	**29.6** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
3-Methylphenanthrene	**189** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
2-Methylphenanthrene	**198** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
2-Methylanthracene	**50.1** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
4/9-Methylphenanthrene	**157** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802
1-Methylphenanthrene	**137** (5.61)	2.80	8270 Mod		1	09/22/19 6:04	F9I0008	FI91802

	%Recovery	*Qualifier*	*Limits*
Surrogate: Naphthalene-d8	*78 %*		*50-120*
Surrogate: Perylene-d12	*83 %*		*50-120*
Surrogate: Phenanthrene-d10	*94 %*		*50-120*
Surrogate: Toluene-D8	*73 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS665-S2
Date Sampled: 09/10/19 14:18
Percent Solids: 70

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-05
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**25700** (120)		TOC-LK		1	CCP	09/26/19 17:17	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS666-S2
Date Sampled: 09/11/19 15:10
Percent Solids: 76
Initial Volume: 6.17
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-06
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	J **3.71** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C1-Benzene	**61.0** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C2-Benzenes	**32.0** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C3-Benzenes	J **3.66** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C4-Benzenes	ND (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C5-Benzenes	ND (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
Methylcyclohexane	ND (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
Toluene	**107** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
Ethylbenzene	J **3.37** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
m,p-Xylene	**71.0** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
Styrene	**8.01** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
o-Xylene	**8.85** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
Isopropylbenzene	ND (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
n-Propylbenzene	ND (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
1,3,5-Trimethylbenzene	**5.00** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
1,2,3-Trimethylbenzene	J **4.09** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
1,2,4-Trimethylbenzene	**8.88** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
t-Butylbenzene	ND (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
sec-Butylbenzene	ND (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
p-Isopropyltoluene	**6.52** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
n-Butylbenzene	ND (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
trans-Decalin	ND (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
cis-Decalin	ND (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C1-Decalins	ND (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C2-Decalins	ND (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C3-Decalins	ND (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C4-Decalins	ND (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
Benzo(b)thiophene	ND (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C1-Benzo(b)thiophenes	J **2.83** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C2-Benzo(b)thiophenes	**4.65** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C3-Benzo(b)thiophenes	**4.86** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C4-Benzo(b)thiophenes	**4.68** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS666-S2
Date Sampled: 09/11/19 15:10
Percent Solids: 76
Initial Volume: 6.17
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-06
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**37.1** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
2-Methylnaphthalene	**25.4** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
1-Methylnaphthalene	**8.91** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C1-Naphthalenes	**21.8** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C2-Naphthalenes	**58.4** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C3-Naphthalenes	**89.6** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C4-Naphthalenes	**69.2** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
Biphenyl	**9.69** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
Acenaphthylene	**101** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
Acenaphthene	**9.16** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
Dibenzofuran	**18.8** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
Fluorene	**29.0** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C1-Fluorenes	**58.1** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C2-Fluorenes	**102** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C3-Fluorenes	**83.5** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
Dibenzothiophene	**15.0** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C1-Dibenzothiophenes	**55.1** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C2-Dibenzothiophenes	**91.5** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C3-Dibenzothiophenes	**60.2** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C4-Dibenzothiophenes	**33.4** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
Phenanthrene	**160** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
Anthracene	**148** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C1-Phenanthrenes/Anthracenes	**531** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C2-Phenanthrenes/Anthracenes	**476** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C3-Phenanthrenes/Anthracenes	**214** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C4-Phenanthrenes/Anthracenes	**110** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
Retene	**66.0** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
Benzo(b)naphtho(2,1-d)thiophene	**104** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C0-Benzonaphthothiophenes	**208** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C1-Benzonaphthothiophenes	**152** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C2-Benzonaphthothiophenes	**85.1** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C3-Benzonaphthothiophenes	**45.0** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS666-S2
Date Sampled: 09/11/19 15:10
Percent Solids: 76
Initial Volume: 6.17
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-06
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**14.5** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
Fluoranthene	**1060** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
Pyrene	**1420** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C1-Fluoranthenes/Pyrenes	**1060** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C2-Fluoranthenes/Pyrenes	**462** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C3-Fluoranthenes/Pyrenes	**206** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
Benzo(b)fluorene	**123** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
Benzo(c)fluorene	**50.4** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
2-Methylpyrene	**159** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
4-Methylpyrene	**138** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
1-Methylpyrene	**114** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
Benz(a)anthracene	**872** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
Chrysene/triphenylene	**868** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C1-Benzo(a)anthracenes/Chrysenes	**649** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C2-Benzo(a)anthracenes/Chrysenes	**353** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C3-Benzo(a)anthracenes/Chrysenes	**165** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C4-Benzo(a)anthracenes/Chrysenes	**66.6** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
Benzo(b)fluoranthene	**534** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
Benzo(j/k)fluoranthene	**601** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
Benzo(e)pyrene	**573** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
Benzo(a)pyrene	**788** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
Perylene	**218** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
Indeno(1,2,3-cd)pyrene	**341** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
Dibenzo(a,h)anthracene	**115** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
Benzo(g,h,i)perylene	**455** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
Coronene	**111** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
Tetramethyl lead	ND (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
Trimethylethyl lead	ND (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
Dimethyldiethyl lead	ND (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
Methyltriethyl lead	ND (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
Tetraethyl lead	ND (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
2,6,10-trimethyldodecane (1380)	**18.0** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS666-S2
Date Sampled: 09/11/19 15:10
Percent Solids: 76
Initial Volume: 6.17
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-06
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**52.4** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
2,6,10-trimethylpentadecane (1650)	**23.2** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C-17	**131** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
Pristane	**B 61.8** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
C-18	**131** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
Phytane	**B 74.9** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
Carbazole	**5.09** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
2,6-Dimethylnaphthalene	**12.8** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
2,3,5-Trimethylnaphthene	**7.37** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
4-Methyldibenzothiophene	**15.5** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
2/3-Methyldibenzothiophene	**19.2** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
1-Methyldibenzothiophene	**5.82** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
3-Methylphenanthrene	**122** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
2-Methylphenanthrene	**111** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
2-Methylanthracene	**73.5** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
4/9-Methylphenanthrene	**160** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802
1-Methylphenanthrene	**52.0** (4.28)	2.14	8270 Mod		1	09/22/19 7:26	F9I0008	FI91802

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*75 %*		*50-120*
Surrogate: Perylene-d12	*90 %*		*50-120*
Surrogate: Phenanthrene-d10	*93 %*		*50-120*
Surrogate: Toluene-D8	*73 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS666-S2
Date Sampled: 09/11/19 15:10
Percent Solids: 76

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-06
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**25600** (121)		TOC-LK		1	CCP	09/26/19 17:37	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS666-S3
Date Sampled: 09/11/19 15:15
Percent Solids: 52
Initial Volume: 5.42
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-07
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**8.21** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C1-Benzene	**118** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C2-Benzenes	**26.0** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C3-Benzenes	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C4-Benzenes	**34.9** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C5-Benzenes	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
Methylcyclohexane	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
Toluene	**203** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
Ethylbenzene	**J 3.81** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
m,p-Xylene	**68.5** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
Styrene	**18.3** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
o-Xylene	**J 5.38** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
Isopropylbenzene	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
n-Propylbenzene	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
1,3,5-Trimethylbenzene	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
1,2,3-Trimethylbenzene	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
1,2,4-Trimethylbenzene	**J 4.45** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
t-Butylbenzene	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
sec-Butylbenzene	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
p-Isopropyltoluene	**82.4** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
n-Butylbenzene	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
trans-Decalin	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
cis-Decalin	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C1-Decalins	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C2-Decalins	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C3-Decalins	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C4-Decalins	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
Benzo(b)thiophene	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C1-Benzo(b)thiophenes	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C2-Benzo(b)thiophenes	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C3-Benzo(b)thiophenes	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C4-Benzo(b)thiophenes	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS666-S3
Date Sampled: 09/11/19 15:15
Percent Solids: 52
Initial Volume: 5.42
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-07
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**J 5.25** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
2-Methylnaphthalene	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
1-Methylnaphthalene	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C1-Naphthalenes	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C2-Naphthalenes	**14.4** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C3-Naphthalenes	**9.79** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C4-Naphthalenes	**7.46** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
Biphenyl	**J 3.73** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
Acenaphthylene	**J 5.04** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
Acenaphthene	**J 3.94** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
Dibenzofuran	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
Fluorene	**J 4.07** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C1-Fluorenes	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C2-Fluorenes	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C3-Fluorenes	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
Dibenzothiophene	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C1-Dibenzothiophenes	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C2-Dibenzothiophenes	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C3-Dibenzothiophenes	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C4-Dibenzothiophenes	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
Phenanthrene	**28.0** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
Anthracene	**J 5.83** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C1-Phenanthrenes/Anthracenes	**22.1** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C2-Phenanthrenes/Anthracenes	**35.7** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C3-Phenanthrenes/Anthracenes	**88.2** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C4-Phenanthrenes/Anthracenes	**231** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
Retene	**1080** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
Benzo(b)naphtho(2,1-d)thiophene	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C0-Benzonaphthothiophenes	**12.0** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C1-Benzonaphthothiophenes	**J 5.75** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C2-Benzonaphthothiophenes	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C3-Benzonaphthothiophenes	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS666-S3
Date Sampled: 09/11/19 15:15
Percent Solids: 52
Initial Volume: 5.42
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-07
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
Fluoranthene	**27.5** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
Pyrene	**38.1** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C1-Fluoranthenes/Pyrenes	**27.3** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C2-Fluoranthenes/Pyrenes	**9.87** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C3-Fluoranthenes/Pyrenes	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
Benzo(b)fluorene	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
Benzo(c)fluorene	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
2-Methylpyrene	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
4-Methylpyrene	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
1-Methylpyrene	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
Benz(a)anthracene	**11.6** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
Chrysene/triphenylene	**11.1** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C1-Benzo(a)anthracenes/Chrysenes	**10.1** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C2-Benzo(a)anthracenes/Chrysenes	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C3-Benzo(a)anthracenes/Chrysenes	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C4-Benzo(a)anthracenes/Chrysenes	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
Benzo(b)fluoranthene	**10.4** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
Benzo(j/k)fluoranthene	**8.94** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
Benzo(e)pyrene	**8.93** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
Benzo(a)pyrene	**13.2** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
Perylene	**348** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
Indeno(1,2,3-cd)pyrene	**J 6.75** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
Dibenzo(a,h)anthracene	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
Benzo(g,h,i)perylene	**7.58** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
Coronene	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
Tetramethyl lead	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
Trimethylethyl lead	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
Dimethyldiethyl lead	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
Methyltriethyl lead	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
Tetraethyl lead	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
2,6,10-trimethyldodecane (1380)	**22.8** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS666-S3
Date Sampled: 09/11/19 15:15
Percent Solids: 52
Initial Volume: 5.42
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-07
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**24.1** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
2,6,10-trimethylpentadecane (1650)	**7.19** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C-17	**127** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
Pristane	**B 27.6** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
C-18	**B 69.6** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
Phytane	**B 58.3** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
Carbazole	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
2,6-Dimethylnaphthalene	**J 4.81** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
2,3,5-Trimethylnaphthene	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
4-Methyldibenzothiophene	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
2/3-Methyldibenzothiophene	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
1-Methyldibenzothiophene	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
3-Methylphenanthrene	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
2-Methylphenanthrene	**J 4.95** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
2-Methylanthracene	ND (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
4/9-Methylphenanthrene	**J 4.52** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802
1-Methylphenanthrene	**7.34** (7.13)	3.56	8270 Mod		1	09/22/19 8:49	F9I0008	FI91802

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*82 %*		*50-120*
Surrogate: Perylene-d12	*88 %*		*50-120*
Surrogate: Phenanthrene-d10	*92 %*		*50-120*
Surrogate: Toluene-D8	*76 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS666-S3
Date Sampled: 09/11/19 15:15
Percent Solids: 52

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-07
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**44600** (116)		TOC-LK		1	CCP	09/26/19 17:51	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS666-S4
Date Sampled: 09/11/19 15:18
Percent Solids: 68
Initial Volume: 5.22
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-08
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C1-Benzene	**19.0** (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C2-Benzenes	**8.38** (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C3-Benzenes	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C4-Benzenes	**J 3.09** (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C5-Benzenes	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
Methylcyclohexane	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
Toluene	**47.1** (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
Ethylbenzene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
m,p-Xylene	**34.3** (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
Styrene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
o-Xylene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
Isopropylbenzene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
n-Propylbenzene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
1,3,5-Trimethylbenzene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
1,2,3-Trimethylbenzene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
1,2,4-Trimethylbenzene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
t-Butylbenzene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
sec-Butylbenzene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
p-Isopropyltoluene	**12.2** (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
n-Butylbenzene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
trans-Decalin	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
cis-Decalin	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C1-Decalins	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C2-Decalins	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C3-Decalins	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C4-Decalins	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
Benzo(b)thiophene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C1-Benzo(b)thiophenes	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C2-Benzo(b)thiophenes	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C3-Benzo(b)thiophenes	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C4-Benzo(b)thiophenes	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS666-S4
Date Sampled: 09/11/19 15:18
Percent Solids: 68
Initial Volume: 5.22
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-08
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
2-Methylnaphthalene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
1-Methylnaphthalene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C1-Naphthalenes	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C2-Naphthalenes	**7.47** (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C3-Naphthalenes	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C4-Naphthalenes	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
Biphenyl	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
Acenaphthylene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
Acenaphthene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
Dibenzofuran	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
Fluorene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C1-Fluorenes	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C2-Fluorenes	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C3-Fluorenes	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
Dibenzothiophene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C1-Dibenzothiophenes	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C2-Dibenzothiophenes	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C3-Dibenzothiophenes	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C4-Dibenzothiophenes	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
Phenanthrene	**J 3.42** (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
Anthracene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C1-Phenanthrenes/Anthracenes	**J 3.73** (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C2-Phenanthrenes/Anthracenes	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C3-Phenanthrenes/Anthracenes	**19.6** (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C4-Phenanthrenes/Anthracenes	**53.2** (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
Retene	**269** (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
Benzo(b)naphtho(2,1-d)thiophene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C0-Benzonaphthothiophenes	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C1-Benzonaphthothiophenes	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C2-Benzonaphthothiophenes	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C3-Benzonaphthothiophenes	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS666-S4
Date Sampled: 09/11/19 15:18
Percent Solids: 68
Initial Volume: 5.22
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-08
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
Fluoranthene	**J 2.90** (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
Pyrene	**J 3.47** (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C1-Fluoranthenes/Pyrenes	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C2-Fluoranthenes/Pyrenes	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C3-Fluoranthenes/Pyrenes	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
Benzo(b)fluorene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
Benzo(c)fluorene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
2-Methylpyrene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
4-Methylpyrene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
1-Methylpyrene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
Benz(a)anthracene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
Chrysene/triphenylene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C1-Benzo(a)anthracenes/Chrysenes	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C2-Benzo(a)anthracenes/Chrysenes	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C3-Benzo(a)anthracenes/Chrysenes	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C4-Benzo(a)anthracenes/Chrysenes	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
Benzo(b)fluoranthene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
Benzo(j/k)fluoranthene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
Benzo(e)pyrene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
Benzo(a)pyrene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
Perylene	**490** (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
Indeno(1,2,3-cd)pyrene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
Dibenzo(a,h)anthracene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
Benzo(g,h,i)perylene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
Coronene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
Tetramethyl lead	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
Trimethylethyl lead	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
Dimethyldiethyl lead	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
Methyltriethyl lead	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
Tetraethyl lead	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
2,6,10-trimethyldodecane (1380)	**J 4.10** (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS666-S4
Date Sampled: 09/11/19 15:18
Percent Solids: 68
Initial Volume: 5.22
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-08
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**J 4.87** (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
2,6,10-trimethylpentadecane (1650)	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C-17	**B 36.7** (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
Pristane	**B 11.3** (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
C-18	**B 35.1** (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
Phytane	**B 22.7** (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
Carbazole	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
2,6-Dimethylnaphthalene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
2,3,5-Trimethylnaphthene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
4-Methyldibenzothiophene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
2/3-Methyldibenzothiophene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
1-Methyldibenzothiophene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
3-Methylphenanthrene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
2-Methylphenanthrene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
2-Methylanthracene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
4/9-Methylphenanthrene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802
1-Methylphenanthrene	ND (5.65)	2.83	8270 Mod		1	09/21/19 21:52	F9I0008	FI91802

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*81 %*		*50-120*
Surrogate: Perylene-d12	*92 %*		*50-120*
Surrogate: Phenanthrene-d10	*90 %*		*50-120*
Surrogate: Toluene-D8	*74 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS666-S4
Date Sampled: 09/11/19 15:18
Percent Solids: 68

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-08
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**23900** (105)		TOC-LK		1	CCP	09/26/19 18:40	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS666-S5
Date Sampled: 09/11/19 15:22
Percent Solids: 77
Initial Volume: 5.28
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-09
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C1-Benzene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C2-Benzenes	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C3-Benzenes	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C4-Benzenes	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C5-Benzenes	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
Methylcyclohexane	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
Toluene	**16.9** (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
Ethylbenzene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
m,p-Xylene	**12.0** (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
Styrene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
o-Xylene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
Isopropylbenzene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
n-Propylbenzene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
1,3,5-Trimethylbenzene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
1,2,3-Trimethylbenzene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
1,2,4-Trimethylbenzene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
t-Butylbenzene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
sec-Butylbenzene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
p-Isopropyltoluene	**J 4.16** (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
n-Butylbenzene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
trans-Decalin	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
cis-Decalin	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C1-Decalins	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C2-Decalins	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C3-Decalins	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C4-Decalins	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
Benzo(b)thiophene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C1-Benzo(b)thiophenes	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C2-Benzo(b)thiophenes	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C3-Benzo(b)thiophenes	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C4-Benzo(b)thiophenes	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS666-S5
Date Sampled: 09/11/19 15:22
Percent Solids: 77
Initial Volume: 5.28
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-09
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
2-Methylnaphthalene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
1-Methylnaphthalene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C1-Naphthalenes	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C2-Naphthalenes	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C3-Naphthalenes	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C4-Naphthalenes	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
Biphenyl	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
Acenaphthylene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
Acenaphthene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
Dibenzofuran	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
Fluorene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C1-Fluorenes	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C2-Fluorenes	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C3-Fluorenes	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
Dibenzothiophene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C1-Dibenzothiophenes	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C2-Dibenzothiophenes	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C3-Dibenzothiophenes	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C4-Dibenzothiophenes	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
Phenanthrene	J **2.72** (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
Anthracene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C1-Phenanthrenes/Anthracenes	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C2-Phenanthrenes/Anthracenes	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C3-Phenanthrenes/Anthracenes	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C4-Phenanthrenes/Anthracenes	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
Retene	**35.8** (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
Benzo(b)naphtho(2,1-d)thiophene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C0-Benzonaphthothiophenes	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C1-Benzonaphthothiophenes	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C2-Benzonaphthothiophenes	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C3-Benzonaphthothiophenes	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS666-S5
Date Sampled: 09/11/19 15:22
Percent Solids: 77
Initial Volume: 5.28
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-09
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
Fluoranthene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
Pyrene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C1-Fluoranthenes/Pyrenes	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C2-Fluoranthenes/Pyrenes	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C3-Fluoranthenes/Pyrenes	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
Benzo(b)fluorene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
Benzo(c)fluorene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
2-Methylpyrene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
4-Methylpyrene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
1-Methylpyrene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
Benz(a)anthracene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
Chrysene/triphenylene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C1-Benzo(a)anthracenes/Chrysenes	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C2-Benzo(a)anthracenes/Chrysenes	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C3-Benzo(a)anthracenes/Chrysenes	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C4-Benzo(a)anthracenes/Chrysenes	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
Benzo(b)fluoranthene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
Benzo(j/k)fluoranthene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
Benzo(e)pyrene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
Benzo(a)pyrene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
Perylene	**308** (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
Indeno(1,2,3-cd)pyrene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
Dibenzo(a,h)anthracene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
Benzo(g,h,i)perylene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
Coronene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
Tetramethyl lead	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
Trimethylethyl lead	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
Dimethyldiethyl lead	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
Methyltriethyl lead	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
Tetraethyl lead	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
2,6,10-trimethyldodecane (1380)	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS666-S5
Date Sampled: 09/11/19 15:22
Percent Solids: 77
Initial Volume: 5.28
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-09
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
2,6,10-trimethylpentadecane (1650)	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C-17	**B 29.7** (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
Pristane	**B 7.95** (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
C-18	**B 30.6** (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
Phytane	**B 17.3** (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
Carbazole	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
2,6-Dimethylnaphthalene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
2,3,5-Trimethylnaphthene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
4-Methyldibenzothiophene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
2/3-Methyldibenzothiophene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
1-Methyldibenzothiophene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
3-Methylphenanthrene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
2-Methylphenanthrene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
2-Methylanthracene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
4/9-Methylphenanthrene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802
1-Methylphenanthrene	ND (4.94)	2.47	8270 Mod		1	09/21/19 23:14	F9I0008	FI91802

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*86 %*		*50-120*
Surrogate: Perylene-d12	*82 %*		*50-120*
Surrogate: Phenanthrene-d10	*92 %*		*50-120*
Surrogate: Toluene-D8	*85 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS666-S5
Date Sampled: 09/11/19 15:22
Percent Solids: 77

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-09
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**15500** (105)		TOC-LK		1	CCP	09/26/19 18:57	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS667-S1
Date Sampled: 09/11/19 17:05
Percent Solids: 76
Initial Volume: 6.35
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-10
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**7.61** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
C1-Benzene	**26.1** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
C2-Benzenes	**24.7** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
C3-Benzenes	**5.19** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
C4-Benzenes	**J 3.29** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
C5-Benzenes	ND (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
Methylcyclohexane	ND (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
Toluene	**56.0** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
Ethylbenzene	**6.07** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
m,p-Xylene	**61.4** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
Styrene	**19.9** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
o-Xylene	**4.58** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
Isopropylbenzene	ND (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
n-Propylbenzene	ND (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
1,3,5-Trimethylbenzene	**6.08** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
1,2,3-Trimethylbenzene	**J 3.13** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
1,2,4-Trimethylbenzene	**5.24** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
t-Butylbenzene	ND (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
sec-Butylbenzene	ND (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
p-Isopropyltoluene	**J 3.03** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
n-Butylbenzene	ND (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
trans-Decalin	ND (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
cis-Decalin	ND (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
C1-Decalins	**7.94** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
C2-Decalins	**10.0** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
C3-Decalins	ND (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
C4-Decalins	ND (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
Benzo(b)thiophene	**13.6** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
C1-Benzo(b)thiophenes	**7.93** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
C2-Benzo(b)thiophenes	**18.7** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
C3-Benzo(b)thiophenes	**16.8** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
C4-Benzo(b)thiophenes	**8.07** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS667-S1
Date Sampled: 09/11/19 17:05
Percent Solids: 76
Initial Volume: 6.35
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-10
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**163** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
2-Methylnaphthalene	**61.9** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
1-Methylnaphthalene	**31.3** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
C1-Naphthalenes	**56.7** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
C2-Naphthalenes	**180** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
C3-Naphthalenes	**125** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
C4-Naphthalenes	**50.9** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
Biphenyl	**66.4** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
Acenaphthylene	**1030** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
Acenaphthene	**870** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
Dibenzofuran	**39.2** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
Fluorene	**599** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
C1-Fluorenes	**227** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
C2-Fluorenes	**93.9** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
C3-Fluorenes	**107** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
Dibenzothiophene	**1010** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
C1-Dibenzothiophenes	**591** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
C2-Dibenzothiophenes	**225** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
C3-Dibenzothiophenes	**75.0** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
C4-Dibenzothiophenes	**27.4** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
Phenanthrene	**9280** (82.6)	41.3	8270 Mod		20	09/24/19 8:54	F9I0008	FI91802
Anthracene	**3450** (82.6)	41.3	8270 Mod		20	09/24/19 8:54	F9I0008	FI91802
C1-Phenanthrenes/Anthracenes	**2230** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
C2-Phenanthrenes/Anthracenes	**440** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
C3-Phenanthrenes/Anthracenes	**101** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
C4-Phenanthrenes/Anthracenes	**47.0** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
Retene	**25.2** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
Benzo(b)naphtho(2,1-d)thiophene	**857** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
C0-Benzonaphthothiophenes	**1690** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
C1-Benzonaphthothiophenes	**386** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
C2-Benzonaphthothiophenes	**117** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
C3-Benzonaphthothiophenes	**126** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS667-S1
Date Sampled: 09/11/19 17:05
Percent Solids: 76
Initial Volume: 6.35
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-10
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**33.2** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
Fluoranthene	**12200** (82.6)	41.3	8270 Mod		20	09/24/19 8:54	F9I0008	FI91802
Pyrene	**17400** (82.6)	41.3	8270 Mod		20	09/24/19 8:54	F9I0008	FI91802
C1-Fluoranthenes/Pyrenes	**3820** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
C2-Fluoranthenes/Pyrenes	**476** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
C3-Fluoranthenes/Pyrenes	**103** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
Benzo(b)fluorene	**472** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
Benzo(c)fluorene	**250** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
2-Methylpyrene	**527** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
4-Methylpyrene	**452** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
1-Methylpyrene	**549** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
Benz(a)anthracene	**4760** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
Chrysene/triphenylene	**3810** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
C1-Benzo(a)anthracenes/Chrysenes	**859** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
C2-Benzo(a)anthracenes/Chrysenes	**231** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
C3-Benzo(a)anthracenes/Chrysenes	**83.7** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
C4-Benzo(a)anthracenes/Chrysenes	**93.0** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
Benzo(b)fluoranthene	**2500** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
Benzo(j/k)fluoranthene	**3220** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
Benzo(e)pyrene	**2750** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
Benzo(a)pyrene	**5100** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
Perylene	**830** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
Indeno(1,2,3-cd)pyrene	**2070** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
Dibenzo(a,h)anthracene	**491** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
Benzo(g,h,i)perylene	**2600** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
Coronene	**849** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
Tetramethyl lead	ND (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
Trimethylethyl lead	ND (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
Dimethyldiethyl lead	ND (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
Methyltriethyl lead	ND (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
Tetraethyl lead	ND (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
2,6,10-trimethyldodecane (1380)	**15.6** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS667-S1
Date Sampled: 09/11/19 17:05
Percent Solids: 76
Initial Volume: 6.35
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-10
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**40.1** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
2,6,10-trimethylpentadecane (1650)	**22.2** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
C-17	**97.1** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
Pristane	**B 60.1** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
C-18	**B 58.5** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
Phytane	**B 75.3** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
Carbazole	**25.6** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
2,6-Dimethylnaphthalene	**35.9** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
2,3,5-Trimethylnaphthene	**7.36** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
4-Methyldibenzothiophene	**209** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
2/3-Methyldibenzothiophene	**213** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
1-Methyldibenzothiophene	**60.6** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
3-Methylphenanthrene	**526** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
2-Methylphenanthrene	**605** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
2-Methylanthracene	**245** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
4/9-Methylphenanthrene	**470** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802
1-Methylphenanthrene	**336** (4.13)	2.06	8270 Mod		1	09/22/19 13:02	F9I0008	FI91802

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*77 %*		*50-120*
Surrogate: Perylene-d12	*78 %*		*50-120*
Surrogate: Phenanthrene-d10	*93 %*		*50-120*
Surrogate: Toluene-D8	*68 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS667-S1
Date Sampled: 09/11/19 17:05
Percent Solids: 76

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-10
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**21000** (119)		TOC-LK		1	CCP	09/26/19 19:14	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS667-S2
Date Sampled: 09/11/19 17:08
Percent Solids: 75
Initial Volume: 6.15
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-11
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**6.05** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C1-Benzene	**97.8** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C2-Benzenes	**43.7** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C3-Benzenes	**21.9** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C4-Benzenes	**9.75** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C5-Benzenes	**J 3.56** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
Methylcyclohexane	ND (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
Toluene	**171** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
Ethylbenzene	**14.0** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
m,p-Xylene	**74.6** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
Styrene	**167** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
o-Xylene	**10.4** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
Isopropylbenzene	ND (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
n-Propylbenzene	**5.38** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
1,3,5-Trimethylbenzene	**25.8** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
1,2,3-Trimethylbenzene	**5.98** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
1,2,4-Trimethylbenzene	**16.4** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
t-Butylbenzene	ND (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
sec-Butylbenzene	ND (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
p-Isopropyltoluene	**9.55** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
n-Butylbenzene	ND (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
trans-Decalin	**6.57** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
cis-Decalin	ND (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C1-Decalins	**26.1** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C2-Decalins	**47.7** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C3-Decalins	**45.1** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C4-Decalins	**74.9** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
Benzo(b)thiophene	**J 3.19** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C1-Benzo(b)thiophenes	**4.64** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C2-Benzo(b)thiophenes	**8.17** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C3-Benzo(b)thiophenes	**5.53** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C4-Benzo(b)thiophenes	**5.34** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS667-S2
Date Sampled: 09/11/19 17:08
Percent Solids: 75
Initial Volume: 6.15
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-11
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**163** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
2-Methylnaphthalene	**158** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
1-Methylnaphthalene	**60.1** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C1-Naphthalenes	**134** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C2-Naphthalenes	**204** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C3-Naphthalenes	**249** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C4-Naphthalenes	**261** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
Biphenyl	**62.5** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
Acenaphthylene	**592** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
Acenaphthene	**30.5** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
Dibenzofuran	**23.7** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
Fluorene	**90.2** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C1-Fluorenes	**255** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C2-Fluorenes	**466** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C3-Fluorenes	**432** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
Dibenzothiophene	**21.9** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C1-Dibenzothiophenes	**57.4** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C2-Dibenzothiophenes	**144** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C3-Dibenzothiophenes	**184** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C4-Dibenzothiophenes	**110** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
Phenanthrene	**496** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
Anthracene	**431** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C1-Phenanthrenes/Anthracenes	**1900** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C2-Phenanthrenes/Anthracenes	**2060** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C3-Phenanthrenes/Anthracenes	**1180** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C4-Phenanthrenes/Anthracenes	**549** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
Retene	**78.8** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
Benzo(b)naphtho(2,1-d)thiophene	**102** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C0-Benzonaphthothiophenes	**186** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C1-Benzonaphthothiophenes	**302** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C2-Benzonaphthothiophenes	**261** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C3-Benzonaphthothiophenes	**193** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS667-S2
Date Sampled: 09/11/19 17:08
Percent Solids: 75
Initial Volume: 6.15
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-11
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**59.0** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
Fluoranthene	**1850** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
Pyrene	**4090** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C1-Fluoranthenes/Pyrenes	**5020** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C2-Fluoranthenes/Pyrenes	**2670** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C3-Fluoranthenes/Pyrenes	**1100** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
Benzo(b)fluorene	**288** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
Benzo(c)fluorene	**183** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
2-Methylpyrene	**841** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
4-Methylpyrene	**1030** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
1-Methylpyrene	**746** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
Benz(a)anthracene	**2560** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
Chrysene/triphenylene	**2780** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C1-Benzo(a)anthracenes/Chrysenes	**3390** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C2-Benzo(a)anthracenes/Chrysenes	**1900** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C3-Benzo(a)anthracenes/Chrysenes	**797** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C4-Benzo(a)anthracenes/Chrysenes	**293** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
Benzo(b)fluoranthene	**1780** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
Benzo(j/k)fluoranthene	**1630** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
Benzo(e)pyrene	**2830** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
Benzo(a)pyrene	**3100** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
Perylene	**506** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
Indeno(1,2,3-cd)pyrene	**1140** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
Dibenzo(a,h)anthracene	**477** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
Benzo(g,h,i)perylene	**1960** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
Coronene	**391** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
Tetramethyl lead	ND (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
Trimethylethyl lead	ND (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
Dimethyldiethyl lead	ND (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
Methyltriethyl lead	ND (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
Tetraethyl lead	ND (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
2,6,10-trimethyldodecane (1380)	**97.3** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS667-S2
Date Sampled: 09/11/19 17:08
Percent Solids: 75
Initial Volume: 6.15
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-11
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**255** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
2,6,10-trimethylpentadecane (1650)	**363** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C-17	**244** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
Pristane	**833** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
C-18	**195** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
Phytane	**677** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
Carbazole	**13.5** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
2,6-Dimethylnaphthalene	**44.8** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
2,3,5-Trimethylnaphthene	**13.9** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
4-Methyldibenzothiophene	**22.8** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
2/3-Methyldibenzothiophene	**16.5** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
1-Methyldibenzothiophene	**J 4.29** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
3-Methylphenanthrene	**442** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
2-Methylphenanthrene	**423** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
2-Methylanthracene	**240** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
4/9-Methylphenanthrene	**678** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802
1-Methylphenanthrene	**96.0** (4.31)	2.15	8270 Mod		1	09/22/19 10:13	F9I0008	FI91802

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*81 %*		*50-120*
Surrogate: Perylene-d12	*77 %*		*50-120*
Surrogate: Phenanthrene-d10	*90 %*		*50-120*
Surrogate: Toluene-D8	*73 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS667-S2
Date Sampled: 09/11/19 17:08
Percent Solids: 75

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-11
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**14500** (108)		TOC-LK		1	CCP	09/26/19 19:30	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS668-S1
Date Sampled: 09/11/19 16:10
Percent Solids: 51
Initial Volume: 6.13
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-12
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	J **23.9** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C1-Benzene	**133** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C2-Benzenes	**211** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C3-Benzenes	J **21.4** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C4-Benzenes	ND (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C5-Benzenes	ND (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
Methylcyclohexane	ND (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
Toluene	**288** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
Ethylbenzene	**32.9** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
m,p-Xylene	**493** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
Styrene	ND (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
o-Xylene	ND (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
Isopropylbenzene	ND (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
n-Propylbenzene	ND (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
1,3,5-Trimethylbenzene	ND (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
1,2,3-Trimethylbenzene	J **21.5** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
1,2,4-Trimethylbenzene	J **32.0** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
t-Butylbenzene	ND (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
sec-Butylbenzene	ND (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
p-Isopropyltoluene	J **19.4** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
n-Butylbenzene	ND (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
trans-Decalin	**100** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
cis-Decalin	ND (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C1-Decalins	**143** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C2-Decalins	ND (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C3-Decalins	ND (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C4-Decalins	ND (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
Benzo(b)thiophene	**54.5** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C1-Benzo(b)thiophenes	**77.0** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C2-Benzo(b)thiophenes	**200** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C3-Benzo(b)thiophenes	**107** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C4-Benzo(b)thiophenes	**38.9** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS668-S1
Date Sampled: 09/11/19 16:10
Percent Solids: 51
Initial Volume: 6.13
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-12
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**566** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
2-Methylnaphthalene	**228** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
1-Methylnaphthalene	**230** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C1-Naphthalenes	**277** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C2-Naphthalenes	**835** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C3-Naphthalenes	**461** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C4-Naphthalenes	**166** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
Biphenyl	**234** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
Acenaphthylene	**2110** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
Acenaphthene	**6890** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
Dibenzofuran	**224** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
Fluorene	**2730** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C1-Fluorenes	**599** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C2-Fluorenes	**236** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C3-Fluorenes	**257** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
Dibenzothiophene	**3050** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C1-Dibenzothiophenes	**1390** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C2-Dibenzothiophenes	**552** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C3-Dibenzothiophenes	**250** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C4-Dibenzothiophenes	**125** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
Phenanthrene	**19100** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
Anthracene	**5140** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C1-Phenanthrenes/Anthracenes	**4700** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C2-Phenanthrenes/Anthracenes	**1020** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C3-Phenanthrenes/Anthracenes	**273** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C4-Phenanthrenes/Anthracenes	**125** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
Retene	**142** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
Benzo(b)naphtho(2,1-d)thiophene	**1590** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C0-Benzonaphthothiophenes	**3150** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C1-Benzonaphthothiophenes	**901** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C2-Benzonaphthothiophenes	**471** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C3-Benzonaphthothiophenes	**478** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS668-S1
Date Sampled: 09/11/19 16:10
Percent Solids: 51
Initial Volume: 6.13
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-12
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**202** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
Fluoranthene	**21000** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
Pyrene	**29100** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C1-Fluoranthenes/Pyrenes	**7220** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C2-Fluoranthenes/Pyrenes	**1100** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C3-Fluoranthenes/Pyrenes	**285** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
Benzo(b)fluorene	**940** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
Benzo(c)fluorene	**386** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
2-Methylpyrene	**999** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
4-Methylpyrene	**875** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
1-Methylpyrene	**1050** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
Benz(a)anthracene	**9220** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
Chrysene/triphenylene	**7140** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C1-Benzo(a)anthracenes/Chrysenes	**1830** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C2-Benzo(a)anthracenes/Chrysenes	**587** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C3-Benzo(a)anthracenes/Chrysenes	**244** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C4-Benzo(a)anthracenes/Chrysenes	**214** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
Benzo(b)fluoranthene	**5130** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
Benzo(j/k)fluoranthene	**6170** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
Benzo(e)pyrene	**5390** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
Benzo(a)pyrene	**9750** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
Perylene	**1670** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
Indeno(1,2,3-cd)pyrene	**3980** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
Dibenzo(a,h)anthracene	**946** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
Benzo(g,h,i)perylene	**5010** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
Coronene	**1550** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
Tetramethyl lead	ND (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
Trimethylethyl lead	ND (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
Dimethyldiethyl lead	ND (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
Methyltriethyl lead	ND (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
Tetraethyl lead	ND (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
2,6,10-trimethyldodecane (1380)	**53.1** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS668-S1
Date Sampled: 09/11/19 16:10
Percent Solids: 51
Initial Volume: 6.13
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-12
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/18/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**177** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
2,6,10-trimethylpentadecane (1650)	**72.4** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C-17	**321** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
Pristane	**179** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
C-18	**210** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
Phytane	**199** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
Carbazole	**108** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
2,6-Dimethylnaphthalene	**179** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
2,3,5-Trimethylnaphthene	**J 28.1** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
4-Methyldibenzothiophene	**475** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
2/3-Methyldibenzothiophene	**511** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
1-Methyldibenzothiophene	**154** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
3-Methylphenanthrene	**1140** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
2-Methylphenanthrene	**1210** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
2-Methylanthracene	**477** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
4/9-Methylphenanthrene	**981** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802
1-Methylphenanthrene	**757** (32.3)	16.1	8270 Mod		5	09/22/19 14:26	F9I0008	FI91802

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*87 %*		*50-120*
Surrogate: Perylene-d12	*96 %*		*50-120*
Surrogate: Phenanthrene-d10	*102 %*		*50-120*
Surrogate: Toluene-D8	*90 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS668-S1
Date Sampled: 09/11/19 16:10
Percent Solids: 51

ESS Laboratory Work Order: F190041
ESS Laboratory Sample ID: F190041-12
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**45300** (108)		TOC-LK		1	CCP	09/26/19 19:47	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190041

Quality Control Data

Classical Chemistry

Batch CI92427 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	100	mg/kg							
Total Organic Carbon (2)	ND	100	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190041

Quality Control Data

Classical Chemistry

Batch CI92427 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9640	100	mg/kg	10000		96	80-120			
Total Organic Carbon (2)	9640	100	mg/kg	10000		96	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190041

Quality Control Data

Classical Chemistry

Batch CI92427 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9550	100	mg/kg	10000		95	80-120	1	20	
Total Organic Carbon (2)	9720	100	mg/kg	10000		97	80-120	0.8	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190041

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FI91802 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	ND	4.00	ug/Kg wet							
C1-Benzene	ND	4.00	ug/Kg wet							
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	ND	4.00	ug/Kg wet							
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	ND	4.00	ug/Kg wet							
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190041

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FI91802 - 3570

C1-Fluorenes	ND	4.00	ug/Kg wet
C2-Fluorenes	ND	4.00	ug/Kg wet
C3-Fluorenes	ND	4.00	ug/Kg wet
Dibenzothiophene	ND	4.00	ug/Kg wet
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet
Phenanthrene	ND	4.00	ug/Kg wet
Anthracene	ND	4.00	ug/Kg wet
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
Retene	ND	4.00	ug/Kg wet
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
Fluoranthene	ND	4.00	ug/Kg wet
Pyrene	ND	4.00	ug/Kg wet
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
Benzo(b)fluorene	ND	4.00	ug/Kg wet
Benzo(c)fluorene	ND	4.00	ug/Kg wet
2-Methylpyrene	ND	4.00	ug/Kg wet
4-Methylpyrene	ND	4.00	ug/Kg wet
1-Methylpyrene	ND	4.00	ug/Kg wet
Benz(a)anthracene	ND	4.00	ug/Kg wet
Chrysene/triphenylene	ND	4.00	ug/Kg wet
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet
Benzo(e)pyrene	ND	4.00	ug/Kg wet
Benzo(a)pyrene	ND	4.00	ug/Kg wet
Perylene	ND	4.00	ug/Kg wet
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet
Coronene	ND	4.00	ug/Kg wet
Tetramethyl lead	ND	4.00	ug/Kg wet
Trimethylethyl lead	ND	4.00	ug/Kg wet

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190041

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FI91802 - 3570						
Dimethyldiethyl lead	ND	4.00	ug/Kg wet			
Methyltriethyl lead	ND	4.00	ug/Kg wet			
Tetraethyl lead	ND	4.00	ug/Kg wet			
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet			
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet			
2,6,10-trimethylpentadecane (1650)	ND	4.00	ug/Kg wet			
C-17	5.63	4.00	ug/Kg wet			
Pristane	6.38	4.00	ug/Kg wet			
C-18	7.59	4.00	ug/Kg wet			
Phytane	8.76	4.00	ug/Kg wet			
Carbazole	ND	4.00	ug/Kg wet			
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet			
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet			
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
3-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylanthracene	ND	4.00	ug/Kg wet			
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet			
1-Methylphenanthrene	ND	4.00	ug/Kg wet			
Surrogate: Naphthalene-d8	*337*		ug/Kg wet	*400.0*	*84*	*50-120*
Surrogate: Perylene-d12	*363*		ug/Kg wet	*400.0*	*91*	*50-120*
Surrogate: Phenanthrene-d10	*347*		ug/Kg wet	*400.0*	*87*	*50-120*
Surrogate: Toluene-D8	*377*		ug/Kg wet	*400.0*	*94*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190041

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FI91802 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	301	4.00	ug/Kg wet	400.0		75	60-130			
Methylcyclohexane	253	4.00	ug/Kg wet	400.0		63	60-130			
Toluene	352	4.00	ug/Kg wet	400.0		88	60-130			
Ethylbenzene	376	4.00	ug/Kg wet	400.0		94	60-130			
m,p-Xylene	369	4.00	ug/Kg wet	400.0		92	60-130			
Styrene	356	4.00	ug/Kg wet	400.0		89	60-130			
o-Xylene	364	4.00	ug/Kg wet	400.0		91	60-130			
Isopropylbenzene	360	4.00	ug/Kg wet	400.0		90	60-130			
n-Propylbenzene	356	4.00	ug/Kg wet	400.0		89	60-130			
1,3,5-Trimethylbenzene	357	4.00	ug/Kg wet	400.0		89	60-130			
1,2,3-Trimethylbenzene	360	4.00	ug/Kg wet	400.0		90	60-130			
1,2,4-Trimethylbenzene	366	4.00	ug/Kg wet	400.0		92	60-130			
t-Butylbenzene	358	4.00	ug/Kg wet	400.0		90	60-130			
sec-Butylbenzene	353	4.00	ug/Kg wet	400.0		88	60-130			
p-Isopropyltoluene	361	4.00	ug/Kg wet	400.0		90	60-130			
n-Butylbenzene	346	4.00	ug/Kg wet	400.0		86	60-130			
trans-Decalin	351	4.00	ug/Kg wet	400.0		88	60-130			
cis-Decalin	367	4.00	ug/Kg wet	400.0		92	60-130			
Benzo(b)thiophene	360	4.00	ug/Kg wet	400.0		90	60-130			
Naphthalene	354	4.00	ug/Kg wet	400.0		89	60-130			
2-Methylnaphthalene	349	4.00	ug/Kg wet	400.0		87	60-130			
1-Methylnaphthalene	349	4.00	ug/Kg wet	400.0		87	60-130			
Biphenyl	358	4.00	ug/Kg wet	400.0		90	60-130			
Acenaphthylene	346	4.00	ug/Kg wet	400.0		86	60-130			
Acenaphthene	354	4.00	ug/Kg wet	400.0		89	60-130			
Dibenzofuran	375	4.00	ug/Kg wet	400.0		94	60-130			
Fluorene	352	4.00	ug/Kg wet	400.0		88	60-130			
Dibenzothiophene	370	4.00	ug/Kg wet	400.0		93	60-130			
Phenanthrene	364	4.00	ug/Kg wet	400.0		91	60-130			
Anthracene	296	4.00	ug/Kg wet	400.0		74	60-130			
Retene	359	4.00	ug/Kg wet	400.0		90	60-130			
Benzo(b)naphtho(2,1-d)thiophene	372	4.00	ug/Kg wet	400.0		93	60-130			
Fluoranthene	366	4.00	ug/Kg wet	400.0		92	60-130			
Pyrene	361	4.00	ug/Kg wet	400.0		90	60-130			
Benz(a)anthracene	345	4.00	ug/Kg wet	400.0		86	60-130			
Chrysene/triphenylene	385	4.00	ug/Kg wet	400.0		96	60-130			
Benzo(b)fluoranthene	363	4.00	ug/Kg wet	400.0		91	60-130			
Benzo(j/k)fluoranthene	384	4.00	ug/Kg wet	400.0		96	60-130			
Benzo(e)pyrene	374	4.00	ug/Kg wet	400.0		93	60-130			
Benzo(a)pyrene	341	4.00	ug/Kg wet	400.0		85	60-130			
Perylene	364	4.00	ug/Kg wet	400.0		91	60-130			
Indeno(1,2,3-cd)pyrene	369	4.00	ug/Kg wet	400.0		92	60-130			
Dibenzo(a,h)anthracene	363	4.00	ug/Kg wet	400.0		91	60-130			
Benzo(g,h,i)perylene	373	4.00	ug/Kg wet	400.0		93	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190041

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FI91802 - 3570						
Coronene	383	4.00	ug/Kg wet	400.0	96	60-130
Tetraethyl lead	326	4.00	ug/Kg wet	400.0	82	60-130
Pristane	382	4.00	ug/Kg wet	400.0	95	60-130
Phytane	398	4.00	ug/Kg wet	400.0	100	60-130
Surrogate: Naphthalene-d8	*360*		ug/Kg wet	*400.0*	*90*	*50-120*
Surrogate: Perylene-d12	*364*		ug/Kg wet	*400.0*	*91*	*50-120*
Surrogate: Phenanthrene-d10	*391*		ug/Kg wet	*400.0*	*98*	*50-120*
Surrogate: Toluene-D8	*352*		ug/Kg wet	*400.0*	*88*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190041

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FI91802 - 3570

Duplicate **Source: F190041-12**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	81.4	30.8	ug/Kg dry		23.9			109	50	D+
C1-Benzene	132	30.8	ug/Kg dry		133			0.5	50	
C2-Benzenes	205	30.8	ug/Kg dry		211			3	50	
C3-Benzenes	ND	30.8	ug/Kg dry		21.4				50	
C4-Benzenes	ND	30.8	ug/Kg dry		ND				50	
C5-Benzenes	ND	30.8	ug/Kg dry		ND				50	
Methylcyclohexane	ND	30.8	ug/Kg dry		ND				50	
Toluene	278	30.8	ug/Kg dry		288			3	50	
Ethylbenzene	35.5	30.8	ug/Kg dry		32.9			7	50	
m,p-Xylene	477	30.8	ug/Kg dry		493			3	50	
Styrene	ND	30.8	ug/Kg dry		ND				50	
o-Xylene	ND	30.8	ug/Kg dry		ND				50	
Isopropylbenzene	ND	30.8	ug/Kg dry		ND				50	
n-Propylbenzene	ND	30.8	ug/Kg dry		ND				50	
1,3,5-Trimethylbenzene	27.0	30.8	ug/Kg dry		ND				50	J
1,2,3-Trimethylbenzene	ND	30.8	ug/Kg dry		21.5				50	
1,2,4-Trimethylbenzene	25.1	30.8	ug/Kg dry		32.0			24	50	J
t-Butylbenzene	ND	30.8	ug/Kg dry		ND				50	
sec-Butylbenzene	ND	30.8	ug/Kg dry		ND				50	
p-Isopropyltoluene	18.3	30.8	ug/Kg dry		19.4			6	50	J
n-Butylbenzene	52.2	30.8	ug/Kg dry		ND				50	
trans-Decalin	32.2	30.8	ug/Kg dry		100			103	50	D+
cis-Decalin	ND	30.8	ug/Kg dry		ND				50	
C1-Decalins	46.0	30.8	ug/Kg dry		143			103	50	D+
C2-Decalins	ND	30.8	ug/Kg dry		ND				50	
C3-Decalins	ND	30.8	ug/Kg dry		ND				50	
C4-Decalins	ND	30.8	ug/Kg dry		ND				50	
Benzo(b)thiophene	48.0	30.8	ug/Kg dry		54.5			13	50	
C1-Benzo(b)thiophenes	65.2	30.8	ug/Kg dry		77.0			17	50	
C2-Benzo(b)thiophenes	144	30.8	ug/Kg dry		200			32	50	
C3-Benzo(b)thiophenes	64.0	30.8	ug/Kg dry		107			50	50	
C4-Benzo(b)thiophenes	32.4	30.8	ug/Kg dry		38.9			18	50	
Naphthalene	499	30.8	ug/Kg dry		566			13	50	
2-Methylnaphthalene	181	30.8	ug/Kg dry		228			23	50	
1-Methylnaphthalene	150	30.8	ug/Kg dry		230			42	50	
C1-Naphthalenes	197	30.8	ug/Kg dry		277			34	50	
C2-Naphthalenes	549	30.8	ug/Kg dry		835			41	50	
C3-Naphthalenes	326	30.8	ug/Kg dry		461			34	50	
C4-Naphthalenes	141	30.8	ug/Kg dry		166			17	50	
Biphenyl	139	30.8	ug/Kg dry		234			51	50	D+
Acenaphthylene	1670	30.8	ug/Kg dry		2110			23	50	
Acenaphthene	5040	30.8	ug/Kg dry		6890			31	50	
Dibenzofuran	152	30.8	ug/Kg dry		224			39	50	
Fluorene	1850	30.8	ug/Kg dry		2730			38	50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190041

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FI91802 - 3570						
C1-Fluorenes	423	30.8	ug/Kg dry	599	34	50
C2-Fluorenes	165	30.8	ug/Kg dry	236	35	50
C3-Fluorenes	237	30.8	ug/Kg dry	257	8	50
Dibenzothiophene	2060	30.8	ug/Kg dry	3050	39	50
C1-Dibenzothiophenes	937	30.8	ug/Kg dry	1390	39	50
C2-Dibenzothiophenes	424	30.8	ug/Kg dry	552	26	50
C3-Dibenzothiophenes	209	30.8	ug/Kg dry	250	18	50
C4-Dibenzothiophenes	109	30.8	ug/Kg dry	125	14	50
Phenanthrene	12500	30.8	ug/Kg dry	19100	42	50
Anthracene	4390	30.8	ug/Kg dry	5140	16	50
C1-Phenanthrenes/Anthracenes	3320	30.8	ug/Kg dry	4700	35	50
C2-Phenanthrenes/Anthracenes	840	30.8	ug/Kg dry	1020	20	50
C3-Phenanthrenes/Anthracenes	235	30.8	ug/Kg dry	273	15	50
C4-Phenanthrenes/Anthracenes	130	30.8	ug/Kg dry	125	4	50
Retene	134	30.8	ug/Kg dry	142	6	50
Benzo(b)naphtho(2,1-d)thiophene	1390	30.8	ug/Kg dry	1590	14	50
C0-Benzonaphthothiophenes	2700	30.8	ug/Kg dry	3150	15	50
C1-Benzonaphthothiophenes	733	30.8	ug/Kg dry	901	21	50
C2-Benzonaphthothiophenes	355	30.8	ug/Kg dry	471	28	50
C3-Benzonaphthothiophenes	378	30.8	ug/Kg dry	478	23	50
C4-Benzonaphthothiophenes	135	30.8	ug/Kg dry	202	40	50
Fluoranthene	16500	30.8	ug/Kg dry	21000	24	50
Pyrene	23000	30.8	ug/Kg dry	29100	24	50
C1-Fluoranthenes/Pyrenes	6430	30.8	ug/Kg dry	7220	12	50
C2-Fluoranthenes/Pyrenes	1040	30.8	ug/Kg dry	1100	5	50
C3-Fluoranthenes/Pyrenes	280	30.8	ug/Kg dry	285	2	50
Benzo(b)fluorene	721	30.8	ug/Kg dry	940	26	50
Benzo(c)fluorene	450	30.8	ug/Kg dry	386	15	50
2-Methylpyrene	876	30.8	ug/Kg dry	999	13	50
4-Methylpyrene	829	30.8	ug/Kg dry	875	5	50
1-Methylpyrene	926	30.8	ug/Kg dry	1050	13	50
Benz(a)anthracene	8920	30.8	ug/Kg dry	9220	3	50
Chrysene/triphenylene	7780	30.8	ug/Kg dry	7140	9	50
C1-Benzo(a)anthracenes/Chrysenes	1810	30.8	ug/Kg dry	1830	1	50
C2-Benzo(a)anthracenes/Chrysenes	547	30.8	ug/Kg dry	587	7	50
C3-Benzo(a)anthracenes/Chrysenes	214	30.8	ug/Kg dry	244	13	50
C4-Benzo(a)anthracenes/Chrysenes	171	30.8	ug/Kg dry	214	22	50
Benzo(b)fluoranthene	5630	30.8	ug/Kg dry	5130	9	50
Benzo(j/k)fluoranthene	6490	30.8	ug/Kg dry	6170	5	50
Benzo(e)pyrene	5910	30.8	ug/Kg dry	5390	9	50
Benzo(a)pyrene	10800	30.8	ug/Kg dry	9750	10	50
Perylene	1800	30.8	ug/Kg dry	1670	8	50
Indeno(1,2,3-cd)pyrene	4680	30.8	ug/Kg dry	3980	16	50
Dibenzo(a,h)anthracene	1110	30.8	ug/Kg dry	946	16	50
Benzo(g,h,i)perylene	5940	30.8	ug/Kg dry	5010	17	50
Coronene	1920	30.8	ug/Kg dry	1550	21	50
Tetramethyl lead	ND	30.8	ug/Kg dry	ND		50
Trimethylethyl lead	ND	30.8	ug/Kg dry	ND		50

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190041

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FI91802 - 3570								
Dimethyldiethyl lead	ND	30.8	ug/Kg dry	ND				50
Methyltriethyl lead	ND	30.8	ug/Kg dry	ND				50
Tetraethyl lead	ND	30.8	ug/Kg dry	ND				50
2,6,10-trimethyldodecane (1380)	62.5	30.8	ug/Kg dry	53.1			16	50
2,6,10-trimethyltridecane (1470)	181	30.8	ug/Kg dry	177			3	50
2,6,10-trimethylpentadecane (1650)	98.5	30.8	ug/Kg dry	72.4			31	50
C-17	351	30.8	ug/Kg dry	321			9	50
Pristane	277	30.8	ug/Kg dry	179			43	50
C-18	222	30.8	ug/Kg dry	210			6	50
Phytane	326	30.8	ug/Kg dry	199			48	50
Carbazole	113	30.8	ug/Kg dry	108			4	50
2,6-Dimethylnaphthalene	127	30.8	ug/Kg dry	179			34	50
2,3,5-Trimethylnaphthene	ND	30.8	ug/Kg dry	28.1				50
4-Methyldibenzothiophene	322	30.8	ug/Kg dry	475			38	50
2/3-Methyldibenzothiophene	338	30.8	ug/Kg dry	511			41	50
1-Methyldibenzothiophene	107	30.8	ug/Kg dry	154			36	50
3-Methylphenanthrene	792	30.8	ug/Kg dry	1140			36	50
2-Methylphenanthrene	834	30.8	ug/Kg dry	1210			37	50
2-Methylanthracene	389	30.8	ug/Kg dry	477			20	50
4/9-Methylphenanthrene	722	30.8	ug/Kg dry	981			30	50
1-Methylphenanthrene	551	30.8	ug/Kg dry	757			32	50
Surrogate: Naphthalene-d8	*514*		ug/Kg dry	*616.5*		*83*	*50-120*	
Surrogate: Perylene-d12	*620*		ug/Kg dry	*616.5*		*101*	*50-120*	
Surrogate: Phenanthrene-d10	*595*		ug/Kg dry	*616.5*		*96*	*50-120*	
Surrogate: Toluene-D8	*508*		ug/Kg dry	*616.5*		*82*	*50-120*	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190041

Notes and Definitions

U	Analyte included in the analysis, but not detected
J	Reported between MDL and MRL
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190041

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Chain-of-Custody Record

Laboratory: ~~AquaSurvey~~ ESS BL 9/13

Laboratory Job # (Lab use only) 1910447 F190044

GEI Consultants

400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY REQUIRED -- YES NO

If Yes, Are MCP Analytical Methods Required? YES NO NA

Are Drinking Water Samples Submitted? YES NO NA

If Yes, Have Drinking Water Sampling Requirements Been Met? YES NO NA

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Preservative: None	Preservative: None	Analysis: Parent and Alkylated MAHs & PAHs 8270**	Analysis: TOCs by Lloyd-Kahn	Sample Specific Remarks
1	1804576-SS604-S2	9/11/19	1400	Sed	1	BFM			X	X	
2	1804576-SS604-S3	9/11/19	1403	Sed	1	BFM			X	X	
3	1804576-SS604-S4	9/11/19	1405	Sed	1	BFM			X	X	
4	1804576-SS605-S1	9/10/19	1415	Sed	1	BFM			X	X	
5	1804576-SS665-S2	9/10/19	1418	Sed	1	BFM			X	X	
6	1804576-SS666-S2	9/11/19	1510	Sed	1	BFM			X	X	
7	1804576-SS666-S3	9/11/19	1515	Sed	1	BFM			X	X	
8	1804576-SS666-S4	9/11/19	1518	Sed	1	BFM			X	X	
9	1804576-SS666-S5	9/11/19	1522	Sed	1	BFM			X	X	
10	1804576-SS667-S1	9/11/19	1705	Sed	1	BFM			X	X	
11	1804576-SS667-S2	9/11/19	1708	Sed	1	BFM			X	X	
12	1804576-SS668-S1	9/11/19	1610	Sed	1	BFM			X	X	

Sample Handling

Samples Field Filtered: YES NO NA

Sampled Shipped With Ice: YES NO

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

Relinquished by: (signature)	Date:	Time:	Received by: (signature)
1.	9/12/19	1910	1. GEI Sample Fridge
2. GEI Sample Fridge	9/13/19	1205	2.
3.	9/13/19	1205	3. 9/13/19 12:05
4.	9/13/19	1446	4. 9/13/19 1446

Turnaround Time (Business days):

Normal __X__ Other ____

10-Day ____ 7-Day ____

5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

**Parent and Alkylated MAHs & PAHs (34) by GC/MS/SIM/SCAN

R-n

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

Shipped/Delivered Via: ESS Courier

ESS Project ID: 1910447
Date Received: 9/13/2019
Project Due Date: 9/20/2019
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 3.1 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA
13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	388392	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
02	388391	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
03	388390	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
04	388389	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
05	388388	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
06	388387	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
07	388386	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
08	388385	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
09	388384	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
10	388383	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
11	388382	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
12	388381	Yes	NA	Yes	4 oz. Jar - Unpres	NP	

2nd Review
Were all containers scanned into storage/lab? Initials
Are barcode labels on correct containers? Yes / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

ESS Laboratory Sample and Cooler Receipt Checklist

Client:	GEI Consultants, Inc. - TB/MM	ESS Project ID:	1910447
		Date Received:	9/13/2019
Completed By:		Date & Time:	9/13/19 17:10
Reviewed By:		Date & Time:	9/13/19 1803
Delivered By:			9/13/19 1803

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (044752)
ESS Laboratory Work Order Number: F190046

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 3:35 pm, Oct 09, 2019

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses
ESS Laboratory - Cranston, RI TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190046

SAMPLE RECEIPT

The following samples were received on September 24, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F190046-01	1804576-SS669-S1	Sediment	8270 Mod, TOC-LK
F190046-02	1804576-SS669-S3	Sediment	8270 Mod, TOC-LK
F190046-03	1804576-SS671-S1	Sediment	8270 Mod, TOC-LK
F190046-04	1804576-SS671-S2	Sediment	8270 Mod, TOC-LK
F190046-05	1804576-SS687-S1	Sediment	8270 Mod, TOC-LK
F190046-06	1804576-SS687-S2	Sediment	8270 Mod, TOC-LK
F190046-07	1804576-SS687-S4	Sediment	8270 Mod, TOC-LK
F190046-08	1804576-SS688-S4	Sediment	8270 Mod, TOC-LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190046

PROJECT NARRATIVE

8270D (SIM) Semi-Volatile Organic Compounds

F190046-02	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , C-18 , Phytane , Pristane
F190046-04	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , C-17 , C-18 , Phytane , Pristane
F190046-05	**Present in Method Blank (B).**
	C-18
F190046-07	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , C-18 , Phytane , Pristane
F190046-08	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , C-17 , C-18 , Phytane , Pristane
FI93001-DUP2	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650), C-17, C-18 , Phytane, Pristane
FI93001-DUP2	**Relative percent difference for duplicate is outside of criteria (D+).**
	Acenaphthylene (58% @ 50%)

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190046

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS669-S1
Date Sampled: 09/23/19 10:32
Percent Solids: 84
Initial Volume: 5.93
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-01
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**203** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
C1-Benzene	**247** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
C2-Benzenes	**305** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
C3-Benzenes	**522** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
C4-Benzenes	**849** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
C5-Benzenes	**871** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
Methylcyclohexane	**22.6** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
Toluene	**354** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
Ethylbenzene	**59.8** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
m,p-Xylene	**468** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
Styrene	**60.0** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
o-Xylene	**57.0** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
Isopropylbenzene	**15.2** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
n-Propylbenzene	**115** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
1,3,5-Trimethylbenzene	**135** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
1,2,3-Trimethylbenzene	**75.0** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
1,2,4-Trimethylbenzene	**490** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
t-Butylbenzene	ND (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
sec-Butylbenzene	**38.8** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
p-Isopropyltoluene	**24.5** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
n-Butylbenzene	**202** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
trans-Decalin	**1550** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
cis-Decalin	**228** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
C1-Decalins	**2810** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
C2-Decalins	**2470** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
C3-Decalins	**1910** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
C4-Decalins	**2310** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
Benzo(b)thiophene	**58.6** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
C1-Benzo(b)thiophenes	**144** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
C2-Benzo(b)thiophenes	**341** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
C3-Benzo(b)thiophenes	**391** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
C4-Benzo(b)thiophenes	**323** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS669-S1
Date Sampled: 09/23/19 10:32
Percent Solids: 84
Initial Volume: 5.93
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-01
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**573** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
2-Methylnaphthalene	**414** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
1-Methylnaphthalene	**225** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
C1-Naphthalenes	**414** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
C2-Naphthalenes	**2430** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
C3-Naphthalenes	**4220** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
C4-Naphthalenes	**2610** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
Biphenyl	**153** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
Acenaphthylene	**795** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
Acenaphthene	**2840** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
Dibenzofuran	**134** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
Fluorene	**1470** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
C1-Fluorenes	**918** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
C2-Fluorenes	**1330** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
C3-Fluorenes	**1360** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
Dibenzothiophene	**1350** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
C1-Dibenzothiophenes	**1070** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
C2-Dibenzothiophenes	**1470** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
C3-Dibenzothiophenes	**1280** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
C4-Dibenzothiophenes	**697** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
Phenanthrene	**10400** (80.0)	40.0	8270 Mod		20	10/05/19 11:27	F9J0002	FI93001
Anthracene	**2840** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
C1-Phenanthrenes/Anthracenes	**3980** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
C2-Phenanthrenes/Anthracenes	**3470** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
C3-Phenanthrenes/Anthracenes	**2100** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
C4-Phenanthrenes/Anthracenes	**943** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
Retene	**125** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
Benzo(b)naphtho(2,1-d)thiophene	**574** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
C0-Benzonaphthothiophenes	**1070** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
C1-Benzonaphthothiophenes	**813** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
C2-Benzonaphthothiophenes	**815** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
C3-Benzonaphthothiophenes	**623** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS669-S1
Date Sampled: 09/23/19 10:32
Percent Solids: 84
Initial Volume: 5.93
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-01
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**305** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
Fluoranthene	**7800** (80.0)	40.0	8270 Mod		20	10/05/19 11:27	F9J0002	FI93001
Pyrene	**10100** (80.0)	40.0	8270 Mod		20	10/05/19 11:27	F9J0002	FI93001
C1-Fluoranthenes/Pyrenes	**4440** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
C2-Fluoranthenes/Pyrenes	**1940** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
C3-Fluoranthenes/Pyrenes	**1120** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
Benzo(b)fluorene	**494** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
Benzo(c)fluorene	**254** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
2-Methylpyrene	**621** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
4-Methylpyrene	**594** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
1-Methylpyrene	**522** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
Benz(a)anthracene	**3020** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
Chrysene/triphenylene	**3550** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
C1-Benzo(a)anthracenes/Chrysenes	**2020** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
C2-Benzo(a)anthracenes/Chrysenes	**1190** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
C3-Benzo(a)anthracenes/Chrysenes	**673** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
C4-Benzo(a)anthracenes/Chrysenes	**380** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
Benzo(b)fluoranthene	**1950** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
Benzo(j/k)fluoranthene	**2210** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
Benzo(e)pyrene	**2040** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
Benzo(a)pyrene	**2980** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
Perylene	**632** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
Indeno(1,2,3-cd)pyrene	**1600** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
Dibenzo(a,h)anthracene	**349** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
Benzo(g,h,i)perylene	**1690** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
Coronene	**468** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
Tetramethyl lead	ND (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
Trimethylethyl lead	ND (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
Dimethyldiethyl lead	ND (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
Methyltriethyl lead	ND (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
Tetraethyl lead	ND (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
2,6,10-trimethyldodecane (1380)	**4820** (80.0)	40.0	8270 Mod		20	10/05/19 11:27	F9J0002	FI93001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS669-S1
Date Sampled: 09/23/19 10:32
Percent Solids: 84
Initial Volume: 5.93
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-01
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**5470** (80.0)	40.0	8270 Mod		20	10/05/19 11:27	F9J0002	FI93001
2,6,10-trimethylpentadecane (1650)	**4360** (80.0)	40.0	8270 Mod		20	10/05/19 11:27	F9J0002	FI93001
C-17	ND (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
Pristane	**9330** (80.0)	40.0	8270 Mod		20	10/05/19 11:27	F9J0002	FI93001
C-18	ND (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
Phytane	**6630** (80.0)	40.0	8270 Mod		20	10/05/19 11:27	F9J0002	FI93001
Carbazole	**95.1** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
2,6-Dimethylnaphthalene	**226** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
2,3,5-Trimethylnaphthene	**329** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
4-Methyldibenzothiophene	**436** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
2/3-Methyldibenzothiophene	**385** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
1-Methyldibenzothiophene	**133** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
3-Methylphenanthrene	**906** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
2-Methylphenanthrene	**1070** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
2-Methylanthracene	**378** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
4/9-Methylphenanthrene	**990** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001
1-Methylphenanthrene	**584** (4.00)	2.00	8270 Mod		1	10/03/19 12:13	F9J0002	FI93001

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*83 %*		*50-120*
Surrogate: Perylene-d12	*74 %*		*50-120*
Surrogate: Phenanthrene-d10	*83 %*		*50-120*
Surrogate: Toluene-D8	*79 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS669-S1
Date Sampled: 09/23/19 10:32
Percent Solids: 84

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-01
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**30900** (110)		TOC-LK		1	CCP	09/30/19 15:27	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS669-S3
Date Sampled: 09/23/19 10:36
Percent Solids: 79
Initial Volume: 5
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-02
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	J **4.28** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C1-Benzene	**15.0** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C2-Benzenes	**15.3** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C3-Benzenes	**6.63** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C4-Benzenes	**8.30** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C5-Benzenes	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
Methylcyclohexane	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
Toluene	**22.2** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
Ethylbenzene	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
m,p-Xylene	**21.2** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
Styrene	**5.61** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
o-Xylene	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
Isopropylbenzene	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
n-Propylbenzene	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
1,3,5-Trimethylbenzene	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
1,2,3-Trimethylbenzene	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
1,2,4-Trimethylbenzene	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
t-Butylbenzene	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
sec-Butylbenzene	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
p-Isopropyltoluene	J **4.03** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
n-Butylbenzene	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
trans-Decalin	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
cis-Decalin	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C1-Decalins	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C2-Decalins	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C3-Decalins	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C4-Decalins	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
Benzo(b)thiophene	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C1-Benzo(b)thiophenes	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C2-Benzo(b)thiophenes	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C3-Benzo(b)thiophenes	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C4-Benzo(b)thiophenes	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS669-S3
Date Sampled: 09/23/19 10:36
Percent Solids: 79
Initial Volume: 5
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-02
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**5.61** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
2-Methylnaphthalene	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
1-Methylnaphthalene	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C1-Naphthalenes	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C2-Naphthalenes	**7.96** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C3-Naphthalenes	**7.22** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C4-Naphthalenes	**J 4.85** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
Biphenyl	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
Acenaphthylene	**8.31** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
Acenaphthene	**J 3.86** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
Dibenzofuran	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
Fluorene	**J 2.99** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C1-Fluorenes	**8.51** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C2-Fluorenes	**6.22** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C3-Fluorenes	**6.98** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
Dibenzothiophene	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C1-Dibenzothiophenes	**J 4.21** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C2-Dibenzothiophenes	**5.26** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C3-Dibenzothiophenes	**J 4.39** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C4-Dibenzothiophenes	**J 2.88** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
Phenanthrene	**12.2** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
Anthracene	**J 5.04** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C1-Phenanthrenes/Anthracenes	**8.59** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C2-Phenanthrenes/Anthracenes	**7.12** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C3-Phenanthrenes/Anthracenes	**J 4.97** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C4-Phenanthrenes/Anthracenes	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
Retene	**11.2** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
Benzo(b)naphtho(2,1-d)thiophene	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C0-Benzonaphthothiophenes	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C1-Benzonaphthothiophenes	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C2-Benzonaphthothiophenes	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C3-Benzonaphthothiophenes	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS669-S3
Date Sampled: 09/23/19 10:36
Percent Solids: 79
Initial Volume: 5
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-02
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
Fluoranthene	**9.48** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
Pyrene	**12.5** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C1-Fluoranthenes/Pyrenes	**13.0** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C2-Fluoranthenes/Pyrenes	**9.87** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C3-Fluoranthenes/Pyrenes	**6.81** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
Benzo(b)fluorene	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
Benzo(c)fluorene	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
2-Methylpyrene	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
4-Methylpyrene	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
1-Methylpyrene	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
Benz(a)anthracene	**J 3.95** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
Chrysene/triphenylene	**J 4.66** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C1-Benzo(a)anthracenes/Chrysenes	**J 4.33** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C2-Benzo(a)anthracenes/Chrysenes	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C3-Benzo(a)anthracenes/Chrysenes	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C4-Benzo(a)anthracenes/Chrysenes	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
Benzo(b)fluoranthene	**J 2.55** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
Benzo(j/k)fluoranthene	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
Benzo(e)pyrene	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
Benzo(a)pyrene	**J 3.70** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
Perylene	**200** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
Indeno(1,2,3-cd)pyrene	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
Dibenzo(a,h)anthracene	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
Benzo(g,h,i)perylene	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
Coronene	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
Tetramethyl lead	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
Trimethylethyl lead	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
Dimethyldiethyl lead	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
Methyltriethyl lead	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
Tetraethyl lead	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
2,6,10-trimethyldodecane (1380)	**J 4.43** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS669-S3
Date Sampled: 09/23/19 10:36
Percent Solids: 79
Initial Volume: 5
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-02
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**9.84** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
2,6,10-trimethylpentadecane (1650)	**B 13.4** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C-17	**50.9** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
Pristane	**B 28.4** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
C-18	**B 37.8** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
Phytane	**B 37.4** (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
Carbazole	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
2,6-Dimethylnaphthalene	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
2,3,5-Trimethylnaphthene	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
4-Methyldibenzothiophene	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
2/3-Methyldibenzothiophene	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
1-Methyldibenzothiophene	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
3-Methylphenanthrene	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
2-Methylphenanthrene	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
2-Methylanthracene	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
4/9-Methylphenanthrene	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001
1-Methylphenanthrene	ND (5.08)	2.54	8270 Mod		1	10/03/19 13:36	F9J0002	FI93001

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*96 %*		*50-120*
Surrogate: Perylene-d12	*85 %*		*50-120*
Surrogate: Phenanthrene-d10	*98 %*		*50-120*
Surrogate: Toluene-D8	*91 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS669-S3
Date Sampled: 09/23/19 10:36
Percent Solids: 79

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-02
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**13300** (115)		TOC-LK		1	CCP	09/30/19 16:33	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS671-S1
Date Sampled: 09/23/19 11:28
Percent Solids: 66
Initial Volume: 5.98
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-03
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**132** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C1-Benzene	**659** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C2-Benzenes	**481** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C3-Benzenes	**391** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C4-Benzenes	**523** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C5-Benzenes	**465** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
Methylcyclohexane	**J 24.2** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
Toluene	**972** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
Ethylbenzene	**122** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
m,p-Xylene	**693** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
Styrene	**357** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
o-Xylene	**93.7** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
Isopropylbenzene	ND (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
n-Propylbenzene	**71.4** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
1,3,5-Trimethylbenzene	**64.2** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
1,2,3-Trimethylbenzene	**81.5** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
1,2,4-Trimethylbenzene	**260** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
t-Butylbenzene	ND (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
sec-Butylbenzene	**J 16.5** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
p-Isopropyltoluene	**42.5** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
n-Butylbenzene	**172** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
trans-Decalin	**3400** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
cis-Decalin	**416** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C1-Decalins	**4670** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C2-Decalins	**1790** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C3-Decalins	**911** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C4-Decalins	**1440** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
Benzo(b)thiophene	**183** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C1-Benzo(b)thiophenes	**123** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C2-Benzo(b)thiophenes	**181** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C3-Benzo(b)thiophenes	**186** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C4-Benzo(b)thiophenes	**177** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS671-S1
Date Sampled: 09/23/19 11:28
Percent Solids: 66
Initial Volume: 5.98
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-03
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**1950** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
2-Methylnaphthalene	**672** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
1-Methylnaphthalene	**241** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C1-Naphthalenes	**577** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C2-Naphthalenes	**1450** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C3-Naphthalenes	**2400** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C4-Naphthalenes	**1890** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
Biphenyl	**432** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
Acenaphthylene	**10400** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
Acenaphthene	**1280** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
Dibenzofuran	**188** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
Fluorene	**930** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C1-Fluorenes	**1520** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C2-Fluorenes	**1580** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C3-Fluorenes	**1620** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
Dibenzothiophene	**3040** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C1-Dibenzothiophenes	**4860** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C2-Dibenzothiophenes	**3060** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C3-Dibenzothiophenes	**1710** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C4-Dibenzothiophenes	**809** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
Phenanthrene	**32800** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
Anthracene	**19400** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C1-Phenanthrenes/Anthracenes	**20400** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C2-Phenanthrenes/Anthracenes	**6430** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C3-Phenanthrenes/Anthracenes	**2410** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C4-Phenanthrenes/Anthracenes	**1050** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
Retene	**150** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
Benzo(b)naphtho(2,1-d)thiophene	**9090** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C0-Benzonaphthothiophenes	**17700** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C1-Benzonaphthothiophenes	**4050** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C2-Benzonaphthothiophenes	**1490** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C3-Benzonaphthothiophenes	**1590** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS671-S1
Date Sampled: 09/23/19 11:28
Percent Solids: 66
Initial Volume: 5.98
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-03
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**378** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
Fluoranthene	**105000** (510)	255	8270 Mod		100	10/05/19 12:49	F9J0002	FI93001
Pyrene	**158000** (510)	255	8270 Mod		100	10/05/19 12:49	F9J0002	FI93001
C1-Fluoranthenes/Pyrenes	**45100** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C2-Fluoranthenes/Pyrenes	**5890** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C3-Fluoranthenes/Pyrenes	**1670** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
Benzo(b)fluorene	**6520** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
Benzo(c)fluorene	**2320** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
2-Methylpyrene	**6000** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
4-Methylpyrene	**4980** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
1-Methylpyrene	**6230** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
Benz(a)anthracene	**47000** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
Chrysene/triphenylene	**45200** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C1-Benzo(a)anthracenes/Chrysenes	**9960** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C2-Benzo(a)anthracenes/Chrysenes	**2730** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C3-Benzo(a)anthracenes/Chrysenes	**840** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C4-Benzo(a)anthracenes/Chrysenes	**1090** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
Benzo(b)fluoranthene	**29200** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
Benzo(j/k)fluoranthene	**35600** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
Benzo(e)pyrene	**32300** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
Benzo(a)pyrene	**77200** (510)	255	8270 Mod		100	10/05/19 12:49	F9J0002	FI93001
Perylene	**9850** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
Indeno(1,2,3-cd)pyrene	**30200** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
Dibenzo(a,h)anthracene	**5570** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
Benzo(g,h,i)perylene	**33000** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
Coronene	**11200** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
Tetramethyl lead	ND (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
Trimethylethyl lead	ND (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
Dimethyldiethyl lead	ND (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
Methyltriethyl lead	ND (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
Tetraethyl lead	ND (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
2,6,10-trimethyldodecane (1380)	**1940** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS671-S1
Date Sampled: 09/23/19 11:28
Percent Solids: 66
Initial Volume: 5.98
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-03
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**2820** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
2,6,10-trimethylpentadecane (1650)	**2270** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C-17	**399** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
Pristane	**5790** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
C-18	**316** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
Phytane	**4610** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
Carbazole	**276** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
2,6-Dimethylnaphthalene	**272** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
2,3,5-Trimethylnaphthene	**162** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
4-Methyldibenzothiophene	**1800** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
2/3-Methyldibenzothiophene	**1810** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
1-Methyldibenzothiophene	**480** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
3-Methylphenanthrene	**4560** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
2-Methylphenanthrene	**5610** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
2-Methylanthracene	**2690** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
4/9-Methylphenanthrene	**4480** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001
1-Methylphenanthrene	**2970** (25.5)	12.7	8270 Mod		5	10/03/19 14:58	F9J0002	FI93001

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*97 %*		*50-120*
Surrogate: Perylene-d12	*95 %*		*50-120*
Surrogate: Phenanthrene-d10	*98 %*		*50-120*
Surrogate: Toluene-D8	*85 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS671-S1
Date Sampled: 09/23/19 11:28
Percent Solids: 66

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-03
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**36900** (106)		TOC-LK		1	CCP	09/30/19 16:50	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS671-S2
Date Sampled: 09/23/19 11:31
Percent Solids: 44
Initial Volume: 5.09
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-04
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**18.3** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C1-Benzene	**59.5** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C2-Benzenes	**60.6** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C3-Benzenes	**15.4** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C4-Benzenes	**21.2** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C5-Benzenes	**17.9** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
Methylcyclohexane	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
Toluene	**89.0** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
Ethylbenzene	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
m,p-Xylene	**93.6** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
Styrene	**9.46** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
o-Xylene	**J 5.48** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
Isopropylbenzene	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
n-Propylbenzene	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
1,3,5-Trimethylbenzene	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
1,2,3-Trimethylbenzene	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
1,2,4-Trimethylbenzene	**J 6.51** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
t-Butylbenzene	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
sec-Butylbenzene	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
p-Isopropyltoluene	**15.2** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
n-Butylbenzene	**J 4.62** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
trans-Decalin	**J 5.19** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
cis-Decalin	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C1-Decalins	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C2-Decalins	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C3-Decalins	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C4-Decalins	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
Benzo(b)thiophene	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C1-Benzo(b)thiophenes	**11.1** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C2-Benzo(b)thiophenes	**17.7** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C3-Benzo(b)thiophenes	**13.7** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C4-Benzo(b)thiophenes	**8.99** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS671-S2
Date Sampled: 09/23/19 11:31
Percent Solids: 44
Initial Volume: 5.09
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-04
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**9.16** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
2-Methylnaphthalene	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
1-Methylnaphthalene	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C1-Naphthalenes	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C2-Naphthalenes	**45.5** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C3-Naphthalenes	**30.0** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C4-Naphthalenes	**15.5** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
Biphenyl	**J 6.14** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
Acenaphthylene	**17.2** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
Acenaphthene	**J 5.29** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
Dibenzofuran	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
Fluorene	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C1-Fluorenes	**J 5.03** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C2-Fluorenes	**17.6** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C3-Fluorenes	**14.4** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
Dibenzothiophene	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C1-Dibenzothiophenes	**9.09** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C2-Dibenzothiophenes	**J 6.89** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C3-Dibenzothiophenes	**J 5.24** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C4-Dibenzothiophenes	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
Phenanthrene	**J 4.92** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
Anthracene	**J 6.17** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C1-Phenanthrenes/Anthracenes	**38.2** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C2-Phenanthrenes/Anthracenes	**14.2** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C3-Phenanthrenes/Anthracenes	**J 8.19** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C4-Phenanthrenes/Anthracenes	**21.2** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
Retene	**26.4** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
Benzo(b)naphtho(2,1-d)thiophene	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C0-Benzonaphthothiophenes	**12.5** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C1-Benzonaphthothiophenes	**J 6.17** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C2-Benzonaphthothiophenes	**19.9** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C3-Benzonaphthothiophenes	**9.00** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS671-S2
Date Sampled: 09/23/19 11:31
Percent Solids: 44
Initial Volume: 5.09
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-04
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	J **6.07** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
Fluoranthene	**25.2** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
Pyrene	**27.0** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C1-Fluoranthenes/Pyrenes	**24.5** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C2-Fluoranthenes/Pyrenes	**132** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C3-Fluoranthenes/Pyrenes	**30.5** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
Benzo(b)fluorene	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
Benzo(c)fluorene	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
2-Methylpyrene	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
4-Methylpyrene	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
1-Methylpyrene	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
Benz(a)anthracene	J **6.38** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
Chrysene/triphenylene	J **6.32** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C1-Benzo(a)anthracenes/Chrysenes	**9.71** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C2-Benzo(a)anthracenes/Chrysenes	J **6.45** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C3-Benzo(a)anthracenes/Chrysenes	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C4-Benzo(a)anthracenes/Chrysenes	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
Benzo(b)fluoranthene	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
Benzo(j/k)fluoranthene	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
Benzo(e)pyrene	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
Benzo(a)pyrene	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
Perylene	**654** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
Indeno(1,2,3-cd)pyrene	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
Dibenzo(a,h)anthracene	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
Benzo(g,h,i)perylene	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
Coronene	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
Tetramethyl lead	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
Trimethylethyl lead	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
Dimethyldiethyl lead	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
Methyltriethyl lead	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
Tetraethyl lead	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
2,6,10-trimethyldodecane (1380)	**10.8** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS671-S2
Date Sampled: 09/23/19 11:31
Percent Solids: 44
Initial Volume: 5.09
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-04
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**32.9** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
2,6,10-trimethylpentadecane (1650)	**B 26.6** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C-17	**B 134** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
Pristane	**B 57.0** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
C-18	**B 78.9** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
Phytane	**B 76.1** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
Carbazole	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
2,6-Dimethylnaphthalene	**J 4.82** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
2,3,5-Trimethylnaphthene	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
4-Methyldibenzothiophene	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
2/3-Methyldibenzothiophene	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
1-Methyldibenzothiophene	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
3-Methylphenanthrene	**12.6** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
2-Methylphenanthrene	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
2-Methylanthracene	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
4/9-Methylphenanthrene	**13.1** (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001
1-Methylphenanthrene	ND (8.98)	4.49	8270 Mod		1	10/03/19 16:21	F9J0002	FI93001

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*90 %*		*50-120*
Surrogate: Perylene-d12	*94 %*		*50-120*
Surrogate: Phenanthrene-d10	*95 %*		*50-120*
Surrogate: Toluene-D8	*80 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS671-S2
Date Sampled: 09/23/19 11:31
Percent Solids: 44

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-04
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**20800** (105)		TOC-LK		1	CCP	09/30/19 17:06	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS687-S1
Date Sampled: 09/23/19 12:31
Percent Solids: 59
Initial Volume: 5.52
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-05
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**91.4** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C1-Benzene	**183** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C2-Benzenes	**256** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C3-Benzenes	**87.4** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C4-Benzenes	**78.7** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C5-Benzenes	**54.6** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
Methylcyclohexane	**29.5** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
Toluene	**268** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
Ethylbenzene	**33.6** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
m,p-Xylene	**424** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
Styrene	**54.2** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
o-Xylene	**28.6** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
Isopropylbenzene	**J 5.10** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
n-Propylbenzene	**18.7** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
1,3,5-Trimethylbenzene	**18.5** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
1,2,3-Trimethylbenzene	**17.8** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
1,2,4-Trimethylbenzene	**50.5** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
t-Butylbenzene	ND (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
sec-Butylbenzene	**J 3.11** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
p-Isopropyltoluene	**17.0** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
n-Butylbenzene	**21.0** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
trans-Decalin	**83.4** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
cis-Decalin	**9.97** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C1-Decalins	**135** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C2-Decalins	**109** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C3-Decalins	**87.9** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C4-Decalins	**158** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
Benzo(b)thiophene	**22.8** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C1-Benzo(b)thiophenes	**53.0** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C2-Benzo(b)thiophenes	**90.4** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C3-Benzo(b)thiophenes	**42.1** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C4-Benzo(b)thiophenes	**35.3** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS687-S1
Date Sampled: 09/23/19 12:31
Percent Solids: 59
Initial Volume: 5.52
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-05
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**302** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
2-Methylnaphthalene	**152** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
1-Methylnaphthalene	**250** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C1-Naphthalenes	**244** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C2-Naphthalenes	**784** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C3-Naphthalenes	**534** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C4-Naphthalenes	**245** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
Biphenyl	**109** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
Acenaphthylene	**735** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
Acenaphthene	**3660** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
Dibenzofuran	**270** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
Fluorene	**1830** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C1-Fluorenes	**436** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C2-Fluorenes	**304** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C3-Fluorenes	**404** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
Dibenzothiophene	**1290** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C1-Dibenzothiophenes	**497** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C2-Dibenzothiophenes	**354** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C3-Dibenzothiophenes	**239** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C4-Dibenzothiophenes	**139** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
Phenanthrene	**9950** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
Anthracene	**2690** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C1-Phenanthrenes/Anthracenes	**2970** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C2-Phenanthrenes/Anthracenes	**1240** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C3-Phenanthrenes/Anthracenes	**498** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C4-Phenanthrenes/Anthracenes	**210** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
Retene	**91.3** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
Benzo(b)naphtho(2,1-d)thiophene	**573** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C0-Benzonaphthothiophenes	**1090** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C1-Benzonaphthothiophenes	**442** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C2-Benzonaphthothiophenes	**313** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C3-Benzonaphthothiophenes	**259** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS687-S1
Date Sampled: 09/23/19 12:31
Percent Solids: 59
Initial Volume: 5.52
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-05
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**140** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
Fluoranthene	**9510** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
Pyrene	**9870** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C1-Fluoranthenes/Pyrenes	**3460** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C2-Fluoranthenes/Pyrenes	**1480** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C3-Fluoranthenes/Pyrenes	**612** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
Benzo(b)fluorene	**424** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
Benzo(c)fluorene	**203** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
2-Methylpyrene	**471** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
4-Methylpyrene	**378** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
1-Methylpyrene	**356** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
Benz(a)anthracene	**3890** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
Chrysene/triphenylene	**3900** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C1-Benzo(a)anthracenes/Chrysenes	**1470** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C2-Benzo(a)anthracenes/Chrysenes	**723** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C3-Benzo(a)anthracenes/Chrysenes	**375** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C4-Benzo(a)anthracenes/Chrysenes	**215** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
Benzo(b)fluoranthene	**2800** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
Benzo(j/k)fluoranthene	**2970** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
Benzo(e)pyrene	**2440** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
Benzo(a)pyrene	**3780** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
Perylene	**913** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
Indeno(1,2,3-cd)pyrene	**2240** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
Dibenzo(a,h)anthracene	**500** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
Benzo(g,h,i)perylene	**2120** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
Coronene	**579** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
Tetramethyl lead	ND (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
Trimethylethyl lead	ND (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
Dimethyldiethyl lead	ND (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
Methyltriethyl lead	ND (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
Tetraethyl lead	ND (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
2,6,10-trimethyldodecane (1380)	**104** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS687-S1
Date Sampled: 09/23/19 12:31
Percent Solids: 59
Initial Volume: 5.52
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-05
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**213** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
2,6,10-trimethylpentadecane (1650)	**199** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C-17	**260** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
Pristane	**584** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
C-18	**B 145** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
Phytane	**564** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
Carbazole	**353** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
2,6-Dimethylnaphthalene	**154** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
2,3,5-Trimethylnaphthene	**40.4** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
4-Methyldibenzothiophene	**164** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
2/3-Methyldibenzothiophene	**174** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
1-Methyldibenzothiophene	**56.9** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
3-Methylphenanthrene	**700** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
2-Methylphenanthrene	**821** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
2-Methylanthracene	**350** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
4/9-Methylphenanthrene	**611** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001
1-Methylphenanthrene	**465** (6.10)	3.05	8270 Mod		1	10/03/19 17:43	F9J0002	FI93001

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*88 %*		*50-120*
Surrogate: Perylene-d12	*80 %*		*50-120*
Surrogate: Phenanthrene-d10	*89 %*		*50-120*
Surrogate: Toluene-D8	*82 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS687-S1
Date Sampled: 09/23/19 12:31
Percent Solids: 59

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-05
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**54700** (108)		TOC-LK		1	CCP	09/30/19 17:23	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS687-S2
Date Sampled: 09/23/19 12:35
Percent Solids: 61
Initial Volume: 6.33
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-06
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**130** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C1-Benzene	**209** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C2-Benzenes	**183** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C3-Benzenes	**150** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C4-Benzenes	**424** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C5-Benzenes	**403** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
Methylcyclohexane	**27.2** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
Toluene	**305** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
Ethylbenzene	**44.6** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
m,p-Xylene	**261** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
Styrene	**109** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
o-Xylene	**37.2** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
Isopropylbenzene	**J 4.89** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
n-Propylbenzene	**46.1** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
1,3,5-Trimethylbenzene	**30.1** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
1,2,3-Trimethylbenzene	**35.7** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
1,2,4-Trimethylbenzene	**88.1** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
t-Butylbenzene	**6.30** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
sec-Butylbenzene	**7.82** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
p-Isopropyltoluene	**17.9** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
n-Butylbenzene	**99.1** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
trans-Decalin	**3520** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
cis-Decalin	**392** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C1-Decalins	**4210** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C2-Decalins	**872** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C3-Decalins	**264** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C4-Decalins	**422** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
Benzo(b)thiophene	**19.1** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C1-Benzo(b)thiophenes	**47.0** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C2-Benzo(b)thiophenes	**74.1** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C3-Benzo(b)thiophenes	**63.4** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C4-Benzo(b)thiophenes	**55.8** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS687-S2
Date Sampled: 09/23/19 12:35
Percent Solids: 61
Initial Volume: 6.33
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-06
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**374** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
2-Methylnaphthalene	**204** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
1-Methylnaphthalene	**179** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C1-Naphthalenes	**238** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C2-Naphthalenes	**647** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C3-Naphthalenes	**884** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C4-Naphthalenes	**617** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
Biphenyl	**101** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
Acenaphthylene	**839** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
Acenaphthene	**1370** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
Dibenzofuran	**296** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
Fluorene	**974** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C1-Fluorenes	**532** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C2-Fluorenes	**599** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C3-Fluorenes	**741** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
Dibenzothiophene	**539** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C1-Dibenzothiophenes	**675** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C2-Dibenzothiophenes	**857** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C3-Dibenzothiophenes	**701** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C4-Dibenzothiophenes	**372** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
Phenanthrene	**7670** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
Anthracene	**2440** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C1-Phenanthrenes/Anthracenes	**4170** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C2-Phenanthrenes/Anthracenes	**2540** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C3-Phenanthrenes/Anthracenes	**1190** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C4-Phenanthrenes/Anthracenes	**498** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
Retene	**103** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
Benzo(b)naphtho(2,1-d)thiophene	**857** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C0-Benzonaphthothiophenes	**1570** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C1-Benzonaphthothiophenes	**946** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C2-Benzonaphthothiophenes	**741** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C3-Benzonaphthothiophenes	**504** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS687-S2
Date Sampled: 09/23/19 12:35
Percent Solids: 61
Initial Volume: 6.33
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-06
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**229** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
Fluoranthene	**11900** (104)	51.9	8270 Mod		20	10/05/19 14:10	F9J0002	FI93001
Pyrene	**10800** (104)	51.9	8270 Mod		20	10/05/19 14:10	F9J0002	FI93001
C1-Fluoranthenes/Pyrenes	**5610** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C2-Fluoranthenes/Pyrenes	**2550** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C3-Fluoranthenes/Pyrenes	**1210** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
Benzo(b)fluorene	**836** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
Benzo(c)fluorene	**367** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
2-Methylpyrene	**711** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
4-Methylpyrene	**572** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
1-Methylpyrene	**480** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
Benz(a)anthracene	**5800** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
Chrysene/triphenylene	**5790** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C1-Benzo(a)anthracenes/Chrysenes	**2830** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C2-Benzo(a)anthracenes/Chrysenes	**1530** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C3-Benzo(a)anthracenes/Chrysenes	**766** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C4-Benzo(a)anthracenes/Chrysenes	**386** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
Benzo(b)fluoranthene	**4580** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
Benzo(j/k)fluoranthene	**4660** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
Benzo(e)pyrene	**3710** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
Benzo(a)pyrene	**5670** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
Perylene	**1430** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
Indeno(1,2,3-cd)pyrene	**3460** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
Dibenzo(a,h)anthracene	**875** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
Benzo(g,h,i)perylene	**3130** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
Coronene	**730** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
Tetramethyl lead	ND (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
Trimethylethyl lead	ND (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
Dimethyldiethyl lead	ND (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
Methyltriethyl lead	ND (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
Tetraethyl lead	ND (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
2,6,10-trimethyldodecane (1380)	**408** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS687-S2
Date Sampled: 09/23/19 12:35
Percent Solids: 61
Initial Volume: 6.33
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-06
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**589** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
2,6,10-trimethylpentadecane (1650)	**446** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C-17	**233** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
Pristane	**1220** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
C-18	**177** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
Phytane	**938** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
Carbazole	**560** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
2,6-Dimethylnaphthalene	**115** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
2,3,5-Trimethylnaphthene	**69.4** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
4-Methyldibenzothiophene	**234** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
2/3-Methyldibenzothiophene	**231** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
1-Methyldibenzothiophene	**87.2** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
3-Methylphenanthrene	**910** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
2-Methylphenanthrene	**1140** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
2-Methylanthracene	**541** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
4/9-Methylphenanthrene	**928** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001
1-Methylphenanthrene	**640** (5.19)	2.60	8270 Mod		1	10/03/19 19:05	F9J0002	FI93001

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*83 %*		*50-120*
Surrogate: Perylene-d12	*88 %*		*50-120*
Surrogate: Phenanthrene-d10	*85 %*		*50-120*
Surrogate: Toluene-D8	*77 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS687-S2
Date Sampled: 09/23/19 12:35
Percent Solids: 61

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-06
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**47200** (110)		TOC-LK		1	CCP	09/30/19 17:39	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS687-S4
Date Sampled: 09/23/19 12:41
Percent Solids: 90
Initial Volume: 5.89
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-07
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**4.98** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C1-Benzene	**21.8** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C2-Benzenes	**11.8** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C3-Benzenes	**17.6** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C4-Benzenes	**17.9** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C5-Benzenes	**10.1** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
Methylcyclohexane	**J 2.18** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
Toluene	**32.1** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
Ethylbenzene	**4.89** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
m,p-Xylene	**14.8** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
Styrene	**14.6** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
o-Xylene	**J 2.54** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
Isopropylbenzene	ND (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
n-Propylbenzene	ND (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
1,3,5-Trimethylbenzene	**3.87** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
1,2,3-Trimethylbenzene	**J 2.23** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
1,2,4-Trimethylbenzene	**11.8** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
t-Butylbenzene	ND (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
sec-Butylbenzene	ND (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
p-Isopropyltoluene	**9.64** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
n-Butylbenzene	**J 1.94** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
trans-Decalin	ND (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
cis-Decalin	ND (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C1-Decalins	**J 2.74** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C2-Decalins	**5.62** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C3-Decalins	**J 3.67** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C4-Decalins	**7.92** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
Benzo(b)thiophene	**4.21** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C1-Benzo(b)thiophenes	**9.06** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C2-Benzo(b)thiophenes	**17.4** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C3-Benzo(b)thiophenes	**11.6** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C4-Benzo(b)thiophenes	**7.18** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS687-S4
Date Sampled: 09/23/19 12:41
Percent Solids: 90
Initial Volume: 5.89
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-07
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**72.8** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
2-Methylnaphthalene	**64.5** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
1-Methylnaphthalene	**60.3** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C1-Naphthalenes	**76.0** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C2-Naphthalenes	**201** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C3-Naphthalenes	**174** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C4-Naphthalenes	**71.1** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
Biphenyl	**29.6** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
Acenaphthylene	**113** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
Acenaphthene	**169** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
Dibenzofuran	**65.3** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
Fluorene	**177** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C1-Fluorenes	**122** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C2-Fluorenes	**81.4** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C3-Fluorenes	**55.2** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
Dibenzothiophene	**65.4** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C1-Dibenzothiophenes	**68.7** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C2-Dibenzothiophenes	**55.7** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C3-Dibenzothiophenes	**29.9** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C4-Dibenzothiophenes	**11.8** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
Phenanthrene	**1110** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
Anthracene	**387** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C1-Phenanthrenes/Anthracenes	**683** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C2-Phenanthrenes/Anthracenes	**327** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C3-Phenanthrenes/Anthracenes	**113** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C4-Phenanthrenes/Anthracenes	**43.6** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
Retene	**22.2** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
Benzo(b)naphtho(2,1-d)thiophene	**51.6** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C0-Benzonaphthothiophenes	**107** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C1-Benzonaphthothiophenes	**58.1** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C2-Benzonaphthothiophenes	**32.7** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C3-Benzonaphthothiophenes	**17.6** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS687-S4
Date Sampled: 09/23/19 12:41
Percent Solids: 90
Initial Volume: 5.89
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-07
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**5.05** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
Fluoranthene	**1050** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
Pyrene	**999** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C1-Fluoranthenes/Pyrenes	**636** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C2-Fluoranthenes/Pyrenes	**259** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C3-Fluoranthenes/Pyrenes	**104** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
Benzo(b)fluorene	**82.5** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
Benzo(c)fluorene	**36.3** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
2-Methylpyrene	**81.9** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
4-Methylpyrene	**62.9** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
1-Methylpyrene	**55.2** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
Benz(a)anthracene	**561** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
Chrysene/triphenylene	**502** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C1-Benzo(a)anthracenes/Chrysenes	**289** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C2-Benzo(a)anthracenes/Chrysenes	**136** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C3-Benzo(a)anthracenes/Chrysenes	**64.1** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C4-Benzo(a)anthracenes/Chrysenes	**27.5** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
Benzo(b)fluoranthene	**312** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
Benzo(j/k)fluoranthene	**359** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
Benzo(e)pyrene	**254** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
Benzo(a)pyrene	**448** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
Perylene	**123** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
Indeno(1,2,3-cd)pyrene	**216** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
Dibenzo(a,h)anthracene	**58.2** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
Benzo(g,h,i)perylene	**182** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
Coronene	**42.1** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
Tetramethyl lead	ND (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
Trimethylethyl lead	ND (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
Dimethyldiethyl lead	ND (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
Methyltriethyl lead	ND (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
Tetraethyl lead	ND (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
2,6,10-trimethyldodecane (1380)	**7.17** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS687-S4
Date Sampled: 09/23/19 12:41
Percent Solids: 90
Initial Volume: 5.89
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-07
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**20.2** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
2,6,10-trimethylpentadecane (1650)	**B 30.6** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C-17	**66.9** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
Pristane	**B 59.5** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
C-18	**B 53.0** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
Phytane	**B 56.8** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
Carbazole	**25.3** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
2,6-Dimethylnaphthalene	**43.5** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
2,3,5-Trimethylnaphthene	**15.1** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
4-Methyldibenzothiophene	**20.9** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
2/3-Methyldibenzothiophene	**21.8** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
1-Methyldibenzothiophene	**7.64** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
3-Methylphenanthrene	**153** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
2-Methylphenanthrene	**186** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
2-Methylanthracene	**97.0** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
4/9-Methylphenanthrene	**144** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001
1-Methylphenanthrene	**99.6** (3.77)	1.88	8270 Mod		1	10/03/19 20:26	F9J0002	FI93001

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*99 %*		*50-120*
Surrogate: Perylene-d12	*84 %*		*50-120*
Surrogate: Phenanthrene-d10	*102 %*		*50-120*
Surrogate: Toluene-D8	*91 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS687-S4
Date Sampled: 09/23/19 12:41
Percent Solids: 90

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-07
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**16700** (94.1)		TOC-LK		1	CCP	09/30/19 23:00	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS688-S4
Date Sampled: 09/23/19 13:56
Percent Solids: 77
Initial Volume: 5.1
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-08
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	J **3.94** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C1-Benzene	**10.8** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C2-Benzenes	**13.2** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C3-Benzenes	J **5.00** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C4-Benzenes	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C5-Benzenes	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
Methylcyclohexane	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
Toluene	**16.3** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
Ethylbenzene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
m,p-Xylene	**18.5** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
Styrene	**10.8** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
o-Xylene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
Isopropylbenzene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
n-Propylbenzene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
1,3,5-Trimethylbenzene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
1,2,3-Trimethylbenzene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
1,2,4-Trimethylbenzene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
t-Butylbenzene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
sec-Butylbenzene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
p-Isopropyltoluene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
n-Butylbenzene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
trans-Decalin	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
cis-Decalin	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C1-Decalins	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C2-Decalins	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C3-Decalins	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C4-Decalins	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
Benzo(b)thiophene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C1-Benzo(b)thiophenes	**6.65** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C2-Benzo(b)thiophenes	J **4.22** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C3-Benzo(b)thiophenes	J **3.29** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C4-Benzo(b)thiophenes	J **3.85** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS688-S4
Date Sampled: 09/23/19 13:56
Percent Solids: 77
Initial Volume: 5.1
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-08
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	J **3.38** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
2-Methylnaphthalene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
1-Methylnaphthalene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C1-Naphthalenes	J **2.55** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C2-Naphthalenes	**6.49** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C3-Naphthalenes	**5.21** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C4-Naphthalenes	J **3.08** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
Biphenyl	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
Acenaphthylene	**8.20** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
Acenaphthene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
Dibenzofuran	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
Fluorene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C1-Fluorenes	J **4.72** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C2-Fluorenes	J **4.07** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C3-Fluorenes	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
Dibenzothiophene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C1-Dibenzothiophenes	J **3.22** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C2-Dibenzothiophenes	J **4.56** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C3-Dibenzothiophenes	J **3.49** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C4-Dibenzothiophenes	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
Phenanthrene	J **3.87** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
Anthracene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C1-Phenanthrenes/Anthracenes	**5.43** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C2-Phenanthrenes/Anthracenes	J **3.74** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C3-Phenanthrenes/Anthracenes	J **2.94** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C4-Phenanthrenes/Anthracenes	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
Retene	J **4.46** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
Benzo(b)naphtho(2,1-d)thiophene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C0-Benzonaphthothiophenes	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C1-Benzonaphthothiophenes	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C2-Benzonaphthothiophenes	J **3.23** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C3-Benzonaphthothiophenes	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS688-S4
Date Sampled: 09/23/19 13:56
Percent Solids: 77
Initial Volume: 5.1
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-08
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
Fluoranthene	J **3.12** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
Pyrene	J **3.73** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C1-Fluoranthenes/Pyrenes	**7.90** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C2-Fluoranthenes/Pyrenes	J **4.82** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C3-Fluoranthenes/Pyrenes	J **3.36** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
Benzo(b)fluorene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
Benzo(c)fluorene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
2-Methylpyrene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
4-Methylpyrene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
1-Methylpyrene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
Benz(a)anthracene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
Chrysene/triphenylene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C1-Benzo(a)anthracenes/Chrysenes	J **2.57** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C2-Benzo(a)anthracenes/Chrysenes	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C3-Benzo(a)anthracenes/Chrysenes	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C4-Benzo(a)anthracenes/Chrysenes	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
Benzo(b)fluoranthene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
Benzo(j/k)fluoranthene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
Benzo(e)pyrene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
Benzo(a)pyrene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
Perylene	**240** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
Indeno(1,2,3-cd)pyrene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
Dibenzo(a,h)anthracene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
Benzo(g,h,i)perylene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
Coronene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
Tetramethyl lead	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
Trimethylethyl lead	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
Dimethyldiethyl lead	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
Methyltriethyl lead	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
Tetraethyl lead	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
2,6,10-trimethyldodecane (1380)	J **3.11** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS688-S4
Date Sampled: 09/23/19 13:56
Percent Solids: 77
Initial Volume: 5.1
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-08
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**9.91** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
2,6,10-trimethylpentadecane (1650)	**B 16.1** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C-17	**B 58.7** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
Pristane	**B 31.1** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
C-18	**B 43.5** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
Phytane	**B 38.1** (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
Carbazole	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
2,6-Dimethylnaphthalene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
2,3,5-Trimethylnaphthene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
4-Methyldibenzothiophene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
2/3-Methyldibenzothiophene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
1-Methyldibenzothiophene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
3-Methylphenanthrene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
2-Methylphenanthrene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
2-Methylanthracene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
4/9-Methylphenanthrene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001
1-Methylphenanthrene	ND (5.08)	2.54	8270 Mod		1	10/03/19 21:48	F9J0002	FI93001

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*106 %*		*50-120*
Surrogate: Perylene-d12	*88 %*		*50-120*
Surrogate: Phenanthrene-d10	*107 %*		*50-120*
Surrogate: Toluene-D8	*99 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS688-S4
Date Sampled: 09/23/19 13:56
Percent Solids: 77

ESS Laboratory Work Order: F190046
ESS Laboratory Sample ID: F190046-08
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**8380** (115)		TOC-LK		1	CCP	09/30/19 18:46	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190046

Quality Control Data

Classical Chemistry

Batch CI92634 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	100	mg/kg							
Total Organic Carbon (2)	ND	100	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190046

Quality Control Data

Classical Chemistry

Batch CI92634 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9630	100	mg/kg	10000		96	80-120			
Total Organic Carbon (2)	9940	100	mg/kg	10000		99	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190046

Quality Control Data

Classical Chemistry

Batch CI92634 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9660	100	mg/kg	10000		97	80-120	0.4	20	
Total Organic Carbon (2)	9800	100	mg/kg	10000		98	80-120	1	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190046

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FI93001 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	3.56	4.00	ug/Kg wet							J
C1-Benzene	ND	4.00	ug/Kg wet							
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	ND	4.00	ug/Kg wet							
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	ND	4.00	ug/Kg wet							
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190046

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FI93001 - 3570

C1-Fluorenes	ND	4.00	ug/Kg wet
C2-Fluorenes	ND	4.00	ug/Kg wet
C3-Fluorenes	ND	4.00	ug/Kg wet
Dibenzothiophene	ND	4.00	ug/Kg wet
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet
Phenanthrene	ND	4.00	ug/Kg wet
Anthracene	ND	4.00	ug/Kg wet
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
Retene	ND	4.00	ug/Kg wet
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
Fluoranthene	ND	4.00	ug/Kg wet
Pyrene	ND	4.00	ug/Kg wet
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
Benzo(b)fluorene	ND	4.00	ug/Kg wet
Benzo(c)fluorene	ND	4.00	ug/Kg wet
2-Methylpyrene	ND	4.00	ug/Kg wet
4-Methylpyrene	ND	4.00	ug/Kg wet
1-Methylpyrene	ND	4.00	ug/Kg wet
Benz(a)anthracene	ND	4.00	ug/Kg wet
Chrysene/triphenylene	ND	4.00	ug/Kg wet
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet
Benzo(e)pyrene	ND	4.00	ug/Kg wet
Benzo(a)pyrene	ND	4.00	ug/Kg wet
Perylene	ND	4.00	ug/Kg wet
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet
Coronene	ND	4.00	ug/Kg wet
Tetramethyl lead	ND	4.00	ug/Kg wet
Trimethylethyl lead	ND	4.00	ug/Kg wet

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190046

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FI93001 - 3570						
Dimethyldiethyl lead	ND	4.00	ug/Kg wet			
Methyltriethyl lead	ND	4.00	ug/Kg wet			
Tetraethyl lead	ND	4.00	ug/Kg wet			
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet			
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet			
2,6,10-trimethylpentadecane (1650)	5.93	4.00	ug/Kg wet			
C-17	22.0	4.00	ug/Kg wet			
Pristane	15.3	4.00	ug/Kg wet			
C-18	15.6	4.00	ug/Kg wet			
Phytane	18.9	4.00	ug/Kg wet			
Carbazole	ND	4.00	ug/Kg wet			
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet			
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet			
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
3-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylanthracene	ND	4.00	ug/Kg wet			
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet			
1-Methylphenanthrene	ND	4.00	ug/Kg wet			
Surrogate: Naphthalene-d8	*408*		ug/Kg wet	*400.0*	*102*	*50-120*
Surrogate: Perylene-d12	*360*		ug/Kg wet	*400.0*	*90*	*50-120*
Surrogate: Phenanthrene-d10	*419*		ug/Kg wet	*400.0*	*105*	*50-120*
Surrogate: Toluene-D8	*397*		ug/Kg wet	*400.0*	*99*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190046

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FI93001 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	292	4.00	ug/Kg wet	400.0		73	60-130			
Methylcyclohexane	261	4.00	ug/Kg wet	400.0		65	60-130			
Toluene	404	4.00	ug/Kg wet	400.0		101	60-130			
Ethylbenzene	402	4.00	ug/Kg wet	400.0		100	60-130			
m,p-Xylene	404	4.00	ug/Kg wet	400.0		101	60-130			
Styrene	373	4.00	ug/Kg wet	400.0		93	60-130			
o-Xylene	405	4.00	ug/Kg wet	400.0		101	60-130			
Isopropylbenzene	401	4.00	ug/Kg wet	400.0		100	60-130			
n-Propylbenzene	402	4.00	ug/Kg wet	400.0		100	60-130			
1,3,5-Trimethylbenzene	398	4.00	ug/Kg wet	400.0		100	60-130			
1,2,3-Trimethylbenzene	408	4.00	ug/Kg wet	400.0		102	60-130			
1,2,4-Trimethylbenzene	407	4.00	ug/Kg wet	400.0		102	60-130			
t-Butylbenzene	407	4.00	ug/Kg wet	400.0		102	60-130			
sec-Butylbenzene	402	4.00	ug/Kg wet	400.0		100	60-130			
p-Isopropyltoluene	417	4.00	ug/Kg wet	400.0		104	60-130			
n-Butylbenzene	395	4.00	ug/Kg wet	400.0		99	60-130			
trans-Decalin	395	4.00	ug/Kg wet	400.0		99	60-130			
cis-Decalin	385	4.00	ug/Kg wet	400.0		96	60-130			
Benzo(b)thiophene	388	4.00	ug/Kg wet	400.0		97	60-130			
Naphthalene	398	4.00	ug/Kg wet	400.0		100	60-130			
2-Methylnaphthalene	384	4.00	ug/Kg wet	400.0		96	60-130			
1-Methylnaphthalene	387	4.00	ug/Kg wet	400.0		97	60-130			
Biphenyl	399	4.00	ug/Kg wet	400.0		100	60-130			
Acenaphthylene	355	4.00	ug/Kg wet	400.0		89	60-130			
Acenaphthene	389	4.00	ug/Kg wet	400.0		97	60-130			
Dibenzofuran	396	4.00	ug/Kg wet	400.0		99	60-130			
Fluorene	381	4.00	ug/Kg wet	400.0		95	60-130			
Dibenzothiophene	390	4.00	ug/Kg wet	400.0		98	60-130			
Phenanthrene	400	4.00	ug/Kg wet	400.0		100	60-130			
Anthracene	295	4.00	ug/Kg wet	400.0		74	60-130			
Retene	351	4.00	ug/Kg wet	400.0		88	60-130			
Benzo(b)naphtho(2,1-d)thiophene	343	4.00	ug/Kg wet	400.0		86	60-130			
Fluoranthene	371	4.00	ug/Kg wet	400.0		93	60-130			
Pyrene	367	4.00	ug/Kg wet	400.0		92	60-130			
Benz(a)anthracene	327	4.00	ug/Kg wet	400.0		82	60-130			
Chrysene/triphenylene	358	4.00	ug/Kg wet	400.0		89	60-130			
Benzo(b)fluoranthene	325	4.00	ug/Kg wet	400.0		81	60-130			
Benzo(j/k)fluoranthene	335	4.00	ug/Kg wet	400.0		84	60-130			
Benzo(e)pyrene	328	4.00	ug/Kg wet	400.0		82	60-130			
Benzo(a)pyrene	295	4.00	ug/Kg wet	400.0		74	60-130			
Perylene	305	4.00	ug/Kg wet	400.0		76	60-130			
Indeno(1,2,3-cd)pyrene	259	4.00	ug/Kg wet	400.0		65	60-130			
Dibenzo(a,h)anthracene	291	4.00	ug/Kg wet	400.0		73	60-130			
Benzo(g,h,i)perylene	303	4.00	ug/Kg wet	400.0		76	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190046

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FI93001 - 3570						
Coronene	284	4.00	ug/Kg wet	400.0	71	60-130
Tetraethyl lead	308	4.00	ug/Kg wet	400.0	77	60-130
Pristane	405	4.00	ug/Kg wet	400.0	101	60-130
Phytane	394	4.00	ug/Kg wet	400.0	99	60-130
Surrogate: Naphthalene-d8	*406*		ug/Kg wet	*400.0*	*102*	*50-120*
Surrogate: Perylene-d12	*326*		ug/Kg wet	*400.0*	*82*	*50-120*
Surrogate: Phenanthrene-d10	*428*		ug/Kg wet	*400.0*	*107*	*50-120*
Surrogate: Toluene-D8	*399*		ug/Kg wet	*400.0*	*100*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190046

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FI93001 - 3570

Duplicate **Source: F190046-08**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	5.13	5.09	ug/Kg dry		3.94			26	50	
C1-Benzene	9.98	5.09	ug/Kg dry		10.8			7	50	
C2-Benzenes	12.3	5.09	ug/Kg dry		13.2			8	50	
C3-Benzenes	4.66	5.09	ug/Kg dry		5.00			7	50	J
C4-Benzenes	ND	5.09	ug/Kg dry		ND				50	
C5-Benzenes	ND	5.09	ug/Kg dry		ND				50	
Methylcyclohexane	ND	5.09	ug/Kg dry		ND				50	
Toluene	14.5	5.09	ug/Kg dry		16.3			11	50	
Ethylbenzene	ND	5.09	ug/Kg dry		ND				50	
m,p-Xylene	18.6	5.09	ug/Kg dry		18.5			0.4	50	
Styrene	7.72	5.09	ug/Kg dry		10.8			33	50	
o-Xylene	ND	5.09	ug/Kg dry		ND				50	
Isopropylbenzene	ND	5.09	ug/Kg dry		ND				50	
n-Propylbenzene	ND	5.09	ug/Kg dry		ND				50	
1,3,5-Trimethylbenzene	ND	5.09	ug/Kg dry		ND				50	
1,2,3-Trimethylbenzene	ND	5.09	ug/Kg dry		ND				50	
1,2,4-Trimethylbenzene	ND	5.09	ug/Kg dry		ND				50	
t-Butylbenzene	ND	5.09	ug/Kg dry		ND				50	
sec-Butylbenzene	ND	5.09	ug/Kg dry		ND				50	
p-Isopropyltoluene	ND	5.09	ug/Kg dry		ND				50	
n-Butylbenzene	ND	5.09	ug/Kg dry		ND				50	
trans-Decalin	ND	5.09	ug/Kg dry		ND				50	
cis-Decalin	ND	5.09	ug/Kg dry		ND				50	
C1-Decalins	ND	5.09	ug/Kg dry		ND				50	
C2-Decalins	ND	5.09	ug/Kg dry		ND				50	
C3-Decalins	ND	5.09	ug/Kg dry		ND				50	
C4-Decalins	ND	5.09	ug/Kg dry		ND				50	
Benzo(b)thiophene	ND	5.09	ug/Kg dry		ND				50	
C1-Benzo(b)thiophenes	4.10	5.09	ug/Kg dry		6.65			48	50	J
C2-Benzo(b)thiophenes	4.03	5.09	ug/Kg dry		4.22			5	50	J
C3-Benzo(b)thiophenes	2.75	5.09	ug/Kg dry		3.29			18	50	J
C4-Benzo(b)thiophenes	4.85	5.09	ug/Kg dry		3.85			23	50	J
Naphthalene	ND	5.09	ug/Kg dry		3.38				50	
2-Methylnaphthalene	ND	5.09	ug/Kg dry		ND				50	
1-Methylnaphthalene	ND	5.09	ug/Kg dry		ND				50	
C1-Naphthalenes	ND	5.09	ug/Kg dry		2.55				50	
C2-Naphthalenes	5.19	5.09	ug/Kg dry		6.49			22	50	
C3-Naphthalenes	4.99	5.09	ug/Kg dry		5.21			4	50	J
C4-Naphthalenes	2.96	5.09	ug/Kg dry		3.08			4	50	J
Biphenyl	ND	5.09	ug/Kg dry		ND				50	
Acenaphthylene	4.53	5.09	ug/Kg dry		8.20			58	50	D+, J
Acenaphthene	ND	5.09	ug/Kg dry		ND				50	
Dibenzofuran	ND	5.09	ug/Kg dry		ND				50	
Fluorene	ND	5.09	ug/Kg dry		ND				50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190046

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FI93001 - 3570							
C1-Fluorenes	4.80	5.09	ug/Kg dry	4.72	2	50	J
C2-Fluorenes	4.72	5.09	ug/Kg dry	4.07	15	50	J
C3-Fluorenes	ND	5.09	ug/Kg dry	ND		50	
Dibenzothiophene	ND	5.09	ug/Kg dry	ND		50	
C1-Dibenzothiophenes	3.07	5.09	ug/Kg dry	3.22	5	50	J
C2-Dibenzothiophenes	3.63	5.09	ug/Kg dry	4.56	23	50	J
C3-Dibenzothiophenes	2.86	5.09	ug/Kg dry	3.49	20	50	J
C4-Dibenzothiophenes	ND	5.09	ug/Kg dry	ND		50	
Phenanthrene	4.74	5.09	ug/Kg dry	3.87	20	50	J
Anthracene	ND	5.09	ug/Kg dry	ND		50	
C1-Phenanthrenes/Anthracenes	6.21	5.09	ug/Kg dry	5.43	13	50	
C2-Phenanthrenes/Anthracenes	4.37	5.09	ug/Kg dry	3.74	16	50	J
C3-Phenanthrenes/Anthracenes	ND	5.09	ug/Kg dry	2.94		50	
C4-Phenanthrenes/Anthracenes	ND	5.09	ug/Kg dry	ND		50	
Retene	3.62	5.09	ug/Kg dry	4.46	21	50	J
Benzo(b)naphtho(2,1-d)thiophene	ND	5.09	ug/Kg dry	ND		50	
C0-Benzonaphthothiophenes	ND	5.09	ug/Kg dry	ND		50	
C1-Benzonaphthothiophenes	ND	5.09	ug/Kg dry	ND		50	
C2-Benzonaphthothiophenes	3.33	5.09	ug/Kg dry	3.23	3	50	J
C3-Benzonaphthothiophenes	ND	5.09	ug/Kg dry	ND		50	
C4-Benzonaphthothiophenes	ND	5.09	ug/Kg dry	ND		50	
Fluoranthene	3.87	5.09	ug/Kg dry	3.12	22	50	J
Pyrene	4.36	5.09	ug/Kg dry	3.73	16	50	J
C1-Fluoranthenes/Pyrenes	7.63	5.09	ug/Kg dry	7.90	3	50	
C2-Fluoranthenes/Pyrenes	4.55	5.09	ug/Kg dry	4.82	6	50	J
C3-Fluoranthenes/Pyrenes	3.29	5.09	ug/Kg dry	3.36	2	50	J
Benzo(b)fluorene	ND	5.09	ug/Kg dry	ND		50	
Benzo(c)fluorene	ND	5.09	ug/Kg dry	ND		50	
2-Methylpyrene	ND	5.09	ug/Kg dry	ND		50	
4-Methylpyrene	ND	5.09	ug/Kg dry	ND		50	
1-Methylpyrene	ND	5.09	ug/Kg dry	ND		50	
Benz(a)anthracene	ND	5.09	ug/Kg dry	ND		50	
Chrysene/triphenylene	ND	5.09	ug/Kg dry	ND		50	
C1-Benzo(a)anthracenes/Chrysenes	2.80	5.09	ug/Kg dry	2.57	9	50	J
C2-Benzo(a)anthracenes/Chrysenes	ND	5.09	ug/Kg dry	ND		50	
C3-Benzo(a)anthracenes/Chrysenes	ND	5.09	ug/Kg dry	ND		50	
C4-Benzo(a)anthracenes/Chrysenes	ND	5.09	ug/Kg dry	ND		50	
Benzo(b)fluoranthene	ND	5.09	ug/Kg dry	ND		50	
Benzo(j/k)fluoranthene	ND	5.09	ug/Kg dry	ND		50	
Benzo(e)pyrene	ND	5.09	ug/Kg dry	ND		50	
Benzo(a)pyrene	ND	5.09	ug/Kg dry	ND		50	
Perylene	313	5.09	ug/Kg dry	240	26	50	
Indeno(1,2,3-cd)pyrene	ND	5.09	ug/Kg dry	ND		50	
Dibenzo(a,h)anthracene	ND	5.09	ug/Kg dry	ND		50	
Benzo(g,h,i)perylene	ND	5.09	ug/Kg dry	ND		50	
Coronene	ND	5.09	ug/Kg dry	ND		50	
Tetramethyl lead	ND	5.09	ug/Kg dry	ND		50	
Trimethylethyl lead	ND	5.09	ug/Kg dry	ND		50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190046

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FI93001 - 3570									
Dimethyldiethyl lead	ND	5.09	ug/Kg dry	ND				50	
Methyltriethyl lead	ND	5.09	ug/Kg dry	ND				50	
Tetraethyl lead	ND	5.09	ug/Kg dry	ND				50	
2,6,10-trimethyldodecane (1380)	2.76	5.09	ug/Kg dry	3.11			12	50	J
2,6,10-trimethyltridecane (1470)	9.46	5.09	ug/Kg dry	9.91			5	50	
2,6,10-trimethylpentadecane (1650)	17.5	5.09	ug/Kg dry	16.1			9	50	B
C-17	61.7	5.09	ug/Kg dry	58.7			5	50	B
Pristane	34.7	5.09	ug/Kg dry	31.1			11	50	B
C-18	46.2	5.09	ug/Kg dry	43.5			6	50	B
Phytane	44.5	5.09	ug/Kg dry	38.1			15	50	B
Carbazole	ND	5.09	ug/Kg dry	ND				50	
2,6-Dimethylnaphthalene	ND	5.09	ug/Kg dry	ND				50	
2,3,5-Trimethylnaphthene	ND	5.09	ug/Kg dry	ND				50	
4-Methyldibenzothiophene	ND	5.09	ug/Kg dry	ND				50	
2/3-Methyldibenzothiophene	ND	5.09	ug/Kg dry	ND				50	
1-Methyldibenzothiophene	ND	5.09	ug/Kg dry	ND				50	
3-Methylphenanthrene	ND	5.09	ug/Kg dry	ND				50	
2-Methylphenanthrene	ND	5.09	ug/Kg dry	ND				50	
2-Methylanthracene	ND	5.09	ug/Kg dry	ND				50	
4/9-Methylphenanthrene	ND	5.09	ug/Kg dry	ND				50	
1-Methylphenanthrene	ND	5.09	ug/Kg dry	ND				50	
Surrogate: Naphthalene-d8	*496*		ug/Kg dry	*508.8*		*97*	*50-120*		
Surrogate: Perylene-d12	*491*		ug/Kg dry	*508.8*		*97*	*50-120*		
Surrogate: Phenanthrene-d10	*519*		ug/Kg dry	*508.8*		*102*	*50-120*		
Surrogate: Toluene-D8	*465*		ug/Kg dry	*508.8*		*91*	*50-120*		

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F190046

Notes and Definitions

U	Analyte included in the analysis, but not detected
J	Reported between MDL and MRL
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190046

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 19I0744/F190046

GEI Consultants

400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

Preservative

None	None						

Sample Handling

Samples Field Filtered: YES NO (NA)

Sampled Shipped With Ice: (YES) NO

MCP PRESUMPTIVE CERTAINTY REQUIRED -- (YES) NO

If Yes, Are MCP Analytical Methods Required? (YES) NO NA

Are Drinking Water Samples Submitted? YES (NO) NA

If Yes, Have Drinking Water Sampling Requirements Been Met? YES NO (NA)

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Analysis: Parent and Alkylated MAHs & PAHs 8270**	Analysis: TOCs by Lloyd-Kahn	Sample Specific Remarks
1	1804576-SS69-S1	9/23/19	1032	Sediment	1	BFM	X	X	
2	1804576-SS69-S3	9/23/19	1036	Sediment	1	BFM	X	X	
3	1804576-SS71-S1	9/23/19	1128	Sediment	1	BFM	X	X	
4	1804576-SS71-S2	9/23/19	1131	Sediment	1	BFM	X	X	
5	1804576-SS687-S1	9/23/19	1231	Sediment	1	BFM	X	X	
6	1804576-SS687-S2	9/23/19	1235	Sediment	1	BFM	X	X	
7	1804576-SS687-S4	9/23/19	1241	Sediment	1	BFM	X	X	
8	1804576-SS688-S4	9/23/19	1356	Sediment	1	BFM	X	X	

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

	Date	Time	
Relinquished by sampler: (signature) 1.	9/23/19	1601	Received by: (signature) 1. GEI Sample Fridge
~~Relinquished by: (signature)~~ 2. GEI Sample Fridge	9/24/19	1225	Received by: (signature) 2.
Relinquished by: (signature) 3.	9/24/19	1225	Received by: (signature) 3.
Relinquished by: (signature) 4.	9/24	16:48	Received by: (signature) 4. 9/24/19 1648

Turnaround Time (Business days):

Normal __X__ Other ____

10-Day ____ 7-Day ____

5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

**Parent and Alkylated MAHs & PAHs (34) by GC/MS/SIM/SCAN

icetemp: 2.9

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

Shipped/Delivered Via: ESS Courier

ESS Project ID: 1910744
Date Received: 9/24/2019
Project Due Date: 10/1/2019
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 2.9 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / (NA)
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / (No)
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	391139	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
02	391138	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
03	391137	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
04	391136	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
05	391135	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
06	391134	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
07	391133	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
08	391132	Yes	NA	Yes	4 oz. Jar - Unpres	NP	

2nd Review

Were all containers scanned into storage/lab? Initials
(Yes) / No
Are barcode labels on correct containers? Yes / No / NA
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

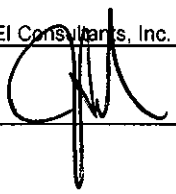
Completed By: Date & Time: 9/24/19 2032
Reviewed By: Date & Time: 9/24/19 2045

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

ESS Project ID: 19I0744

Date Received: 9/24/2019

Delivered By:  9/24/19 2047

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (044752)
ESS Laboratory Work Order Number: F190048

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 1:21 pm, Oct 11, 2019

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses
ESS Laboratory - Cranston, RI TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190048

SAMPLE RECEIPT

The following samples were received on September 26, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F190048-01	1804576-SS672-S1	Sediment	8270 Mod, TOC-LK
F190048-02	1804576-SS672-S3	Sediment	8270 Mod, TOC-LK
F190048-03	1804576-SS675-S2	Sediment	8270 Mod, TOC-LK
F190048-04	1804576-SS689-S2	Sediment	8270 Mod, TOC-LK
F190048-05	1804576-SS691-S3	Sediment	8270 Mod, TOC-LK
F190048-06	1804576-SS691-S5	Sediment	8270 Mod, TOC-LK
F190048-07	1804576-SS692-S4	Sediment	8270 Mod
F190048-08	1804576-SS692-S5	Sediment	8270 Mod, TOC-LK
F190048-09	1804576-SS680R-S1	Sediment	8270 Mod, TOC-LK
F190048-10	1804576-SS690-S5	Sediment	8270 Mod, TOC-LK
F190048-11	1804576-SS693-S3	Sediment	8270 Mod, TOC-LK
F190048-12	1804576-SS693-S5	Sediment	8270 Mod, TOC-LK
F190048-13	1804576-SS694-S4	Sediment	8270 Mod, TOC-LK
F190048-14	1804576-SS694-S6	Sediment	8270 Mod, TOC-LK
F190048-15	1804576-SS695-S6	Sediment	8270 Mod, TOC-LK
F190048-16	1804576-SS696-S3	Sediment	8270 Mod, TOC-LK
F190048-17	1804576-SS696-S5	Sediment	8270 Mod, TOC-LK
F190048-18	1804576-SS697-S2	Sediment	8270 Mod, TOC-LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190048

PROJECT NARRATIVE

8270D (SIM) Semi-Volatile Organic Compounds

F190048-02	**Present in Method Blank (B).**
	Benzene , C-17
F190048-03	**Present in Method Blank (B).**
	Benzene
F190048-04	**Present in Method Blank (B).**
	Benzene , C-17 , C-18 , Phytane , Pristane
F190048-05	**Present in Method Blank (B).**
	Benzene
F190048-07	**Surrogate recovery(ies) outside of criteria due to matrix (UCM/coelution/matrix is present) (SM).**
	Perylene-d12 (175% @ 50-120%)
F190048-08	**Present in Method Blank (B).**
	Benzene , C-17 , C-18 , Phytane , Pristane
F190048-09	**Present in Method Blank (B).**
	C-17 , C-18 , Phytane , Pristane
F190048-10	**Present in Method Blank (B).**
	Benzene
F190048-11	**Present in Method Blank (B).**
	Benzene
F190048-12	**Present in Method Blank (B).**
	C-17 , C-18 , Phytane , Pristane
F190048-13	**Surrogate recovery(ies) outside of criteria due to matrix (UCM/coelution/matrix is present) (SM).**
	Perylene-d12 (136% @ 50-120%)
F190048-14	**Present in Method Blank (B).**
	C-17 , C-18 , Phytane , Pristane
F190048-15	**Present in Method Blank (B).**
	Benzene , C-17 , C-18 , Phytane , Pristane
F9J0003-CCV3	**Continuing Calibration %Diff/Drift is below control limit (CD-).**
	Tetraethyl lead (26% @ 25%)
FJ90104-DUP2	**Relative percent difference for duplicate is outside of criteria, due to apparent inhomogeneity of the sample material.**

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS672-S1
Date Sampled: 09/24/19 10:01
Percent Solids: 43
Initial Volume: 6.48
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-01
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**113** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C1-Benzene	**259** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C2-Benzenes	**308** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C3-Benzenes	**89.4** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C4-Benzenes	**79.2** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C5-Benzenes	**53.5** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
Methylcyclohexane	ND (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
Toluene	**388** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
Ethylbenzene	**42.1** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
m,p-Xylene	**510** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
Styrene	**72.9** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
o-Xylene	**J 29.2** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
Isopropylbenzene	ND (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
n-Propylbenzene	**J 18.9** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
1,3,5-Trimethylbenzene	ND (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
1,2,3-Trimethylbenzene	ND (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
1,2,4-Trimethylbenzene	**42.9** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
t-Butylbenzene	ND (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
sec-Butylbenzene	ND (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
p-Isopropyltoluene	ND (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
n-Butylbenzene	**J 28.3** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
trans-Decalin	**46.9** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
cis-Decalin	ND (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C1-Decalins	**81.5** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C2-Decalins	**85.1** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C3-Decalins	**92.7** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C4-Decalins	**132** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
Benzo(b)thiophene	**60.3** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C1-Benzo(b)thiophenes	**52.4** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C2-Benzo(b)thiophenes	**86.7** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C3-Benzo(b)thiophenes	**47.0** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C4-Benzo(b)thiophenes	**J 32.9** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
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Client Sample ID: 1804576-SS672-S1
Date Sampled: 09/24/19 10:01
Percent Solids: 43
Initial Volume: 6.48
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-01
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**572** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
2-Methylnaphthalene	**186** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
1-Methylnaphthalene	**127** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C1-Naphthalenes	**196** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C2-Naphthalenes	**484** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C3-Naphthalenes	**264** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C4-Naphthalenes	**134** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
Biphenyl	**144** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
Acenaphthylene	**1850** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
Acenaphthene	**3840** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
Dibenzofuran	**143** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
Fluorene	**929** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C1-Fluorenes	**364** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C2-Fluorenes	**197** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C3-Fluorenes	**298** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
Dibenzothiophene	**1570** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C1-Dibenzothiophenes	**843** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C2-Dibenzothiophenes	**452** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C3-Dibenzothiophenes	**255** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C4-Dibenzothiophenes	**122** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
Phenanthrene	**11200** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
Anthracene	**3970** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C1-Phenanthrenes/Anthracenes	**3620** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C2-Phenanthrenes/Anthracenes	**1120** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C3-Phenanthrenes/Anthracenes	**388** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C4-Phenanthrenes/Anthracenes	**182** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
Retene	**99.6** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
Benzo(b)naphtho(2,1-d)thiophene	**1570** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C0-Benzonaphthothiophenes	**3080** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C1-Benzonaphthothiophenes	**826** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C2-Benzonaphthothiophenes	**407** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C3-Benzonaphthothiophenes	**406** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS672-S1
Date Sampled: 09/24/19 10:01
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Initial Volume: 6.48
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-01
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**154** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
Fluoranthene	**18700** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
Pyrene	**25400** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C1-Fluoranthenes/Pyrenes	**7240** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C2-Fluoranthenes/Pyrenes	**1330** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C3-Fluoranthenes/Pyrenes	**493** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
Benzo(b)fluorene	**947** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
Benzo(c)fluorene	**404** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
2-Methylpyrene	**983** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
4-Methylpyrene	**838** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
1-Methylpyrene	**952** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
Benz(a)anthracene	**9190** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
Chrysene/triphenylene	**8220** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C1-Benzo(a)anthracenes/Chrysenes	**2180** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C2-Benzo(a)anthracenes/Chrysenes	**778** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C3-Benzo(a)anthracenes/Chrysenes	**272** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C4-Benzo(a)anthracenes/Chrysenes	**195** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
Benzo(b)fluoranthene	**6240** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
Benzo(j/k)fluoranthene	**7420** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
Benzo(e)pyrene	**6670** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
Benzo(a)pyrene	**11700** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
Perylene	**2100** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
Indeno(1,2,3-cd)pyrene	**5660** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
Dibenzo(a,h)anthracene	**1020** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
Benzo(g,h,i)perylene	**6060** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
Coronene	**1760** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
Tetramethyl lead	ND (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
Trimethylethyl lead	ND (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
Dimethyldiethyl lead	ND (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
Methyltriethyl lead	ND (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
Tetraethyl lead	ND (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
2,6,10-trimethyldodecane (1380)	**77.4** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS672-S1
Date Sampled: 09/24/19 10:01
Percent Solids: 43
Initial Volume: 6.48
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-01
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**183** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
2,6,10-trimethylpentadecane (1650)	**108** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C-17	**322** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
Pristane	**278** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
C-18	**110** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
Phytane	**315** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
Carbazole	**169** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
2,6-Dimethylnaphthalene	**113** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
2,3,5-Trimethylnaphthene	ND (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
4-Methyldibenzothiophene	**308** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
2/3-Methyldibenzothiophene	**296** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
1-Methyldibenzothiophene	**91.5** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
3-Methylphenanthrene	**853** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
2-Methylphenanthrene	**938** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
2-Methylanthracene	**434** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
4/9-Methylphenanthrene	**801** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104
1-Methylphenanthrene	**592** (35.8)	17.9	8270 Mod		5	10/05/19 19:35	F9J0003	FJ90104

	%Recovery	*Qualifier*	*Limits*
Surrogate: Naphthalene-d8	*81 %*		*50-120*
Surrogate: Perylene-d12	*77 %*		*50-120*
Surrogate: Phenanthrene-d10	*85 %*		*50-120*
Surrogate: Toluene-D8	*82 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS672-S1
Date Sampled: 09/24/19 10:01
Percent Solids: 43

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-01
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**68500** (105)		TOC-LK		1	CCP	10/03/19 15:35	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS672-S3
Date Sampled: 09/24/19 10:09
Percent Solids: 92
Initial Volume: 5.2
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-02
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **24.5** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C1-Benzene	**28.6** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C2-Benzenes	**56.9** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C3-Benzenes	**83.7** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C4-Benzenes	**65.1** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C5-Benzenes	**54.8** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
Methylcyclohexane	J **2.29** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
Toluene	**42.5** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
Ethylbenzene	**18.3** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
m,p-Xylene	**79.5** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
Styrene	**28.3** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
o-Xylene	**12.4** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
Isopropylbenzene	ND (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
n-Propylbenzene	**15.8** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
1,3,5-Trimethylbenzene	**15.0** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
1,2,3-Trimethylbenzene	**14.0** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
1,2,4-Trimethylbenzene	**70.1** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
t-Butylbenzene	ND (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
sec-Butylbenzene	J **3.96** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
p-Isopropyltoluene	J **4.00** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
n-Butylbenzene	**21.2** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
trans-Decalin	**435** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
cis-Decalin	**56.7** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C1-Decalins	**811** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C2-Decalins	**364** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C3-Decalins	**193** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C4-Decalins	**240** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
Benzo(b)thiophene	**8.19** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C1-Benzo(b)thiophenes	**24.0** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C2-Benzo(b)thiophenes	**71.8** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C3-Benzo(b)thiophenes	**61.5** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C4-Benzo(b)thiophenes	**39.3** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS672-S3
Date Sampled: 09/24/19 10:09
Percent Solids: 92
Initial Volume: 5.2
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-02
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**107** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
2-Methylnaphthalene	**41.3** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
1-Methylnaphthalene	**32.5** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C1-Naphthalenes	**46.6** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C2-Naphthalenes	**330** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C3-Naphthalenes	**528** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C4-Naphthalenes	**319** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
Biphenyl	**16.5** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
Acenaphthylene	**354** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
Acenaphthene	**1860** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
Dibenzofuran	**45.8** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
Fluorene	**714** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C1-Fluorenes	**297** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C2-Fluorenes	**240** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C3-Fluorenes	**252** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
Dibenzothiophene	**852** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C1-Dibenzothiophenes	**274** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C2-Dibenzothiophenes	**312** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C3-Dibenzothiophenes	**228** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C4-Dibenzothiophenes	**124** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
Phenanthrene	**5300** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
Anthracene	**1250** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C1-Phenanthrenes/Anthracenes	**1520** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C2-Phenanthrenes/Anthracenes	**923** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C3-Phenanthrenes/Anthracenes	**427** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C4-Phenanthrenes/Anthracenes	**162** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
Retene	**19.3** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
Benzo(b)naphtho(2,1-d)thiophene	**252** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C0-Benzonaphthothiophenes	**485** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C1-Benzonaphthothiophenes	**285** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C2-Benzonaphthothiophenes	**271** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C3-Benzonaphthothiophenes	**212** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS672-S3
Date Sampled: 09/24/19 10:09
Percent Solids: 92
Initial Volume: 5.2
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-02
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**115** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
Fluoranthene	**3930** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
Pyrene	**4050** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C1-Fluoranthenes/Pyrenes	**1750** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C2-Fluoranthenes/Pyrenes	**814** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C3-Fluoranthenes/Pyrenes	**398** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
Benzo(b)fluorene	**231** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
Benzo(c)fluorene	**93.4** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
2-Methylpyrene	**238** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
4-Methylpyrene	**204** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
1-Methylpyrene	**172** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
Benz(a)anthracene	**1740** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
Chrysene/triphenylene	**1770** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C1-Benzo(a)anthracenes/Chrysenes	**862** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C2-Benzo(a)anthracenes/Chrysenes	**503** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C3-Benzo(a)anthracenes/Chrysenes	**272** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C4-Benzo(a)anthracenes/Chrysenes	**135** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
Benzo(b)fluoranthene	**1300** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
Benzo(j/k)fluoranthene	**1440** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
Benzo(e)pyrene	**1160** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
Benzo(a)pyrene	**1720** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
Perylene	**456** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
Indeno(1,2,3-cd)pyrene	**1080** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
Dibenzo(a,h)anthracene	**245** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
Benzo(g,h,i)perylene	**1010** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
Coronene	**262** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
Tetramethyl lead	ND (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
Trimethylethyl lead	ND (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
Dimethyldiethyl lead	ND (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
Methyltriethyl lead	ND (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
Tetraethyl lead	ND (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
2,6,10-trimethyldodecane (1380)	**366** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS672-S3
Date Sampled: 09/24/19 10:09
Percent Solids: 92
Initial Volume: 5.2
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-02
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**428** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
2,6,10-trimethylpentadecane (1650)	**298** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C-17	**B 70.4** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
Pristane	**630** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
C-18	**65.8** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
Phytane	**548** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
Carbazole	**69.9** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
2,6-Dimethylnaphthalene	**25.6** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
2,3,5-Trimethylnaphthene	**40.1** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
4-Methyldibenzothiophene	**101** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
2/3-Methyldibenzothiophene	**92.7** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
1-Methyldibenzothiophene	**35.9** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
3-Methylphenanthrene	**344** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
2-Methylphenanthrene	**401** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
2-Methylanthracene	**178** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
4/9-Methylphenanthrene	**347** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104
1-Methylphenanthrene	**249** (4.16)	2.08	8270 Mod		1	10/05/19 20:56	F9J0003	FJ90104

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*80 %*		*50-120*
Surrogate: Perylene-d12	*90 %*		*50-120*
Surrogate: Phenanthrene-d10	*83 %*		*50-120*
Surrogate: Toluene-D8	*75 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS672-S3
Date Sampled: 09/24/19 10:09
Percent Solids: 92

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-02
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**9360** (96.0)		TOC-LK		1	CCP	10/03/19 16:41	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS675-S2
Date Sampled: 09/24/19 12:06
Percent Solids: 80
Initial Volume: 5.68
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-03
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **70.1** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C1-Benzene	**130** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C2-Benzenes	**101** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C3-Benzenes	**145** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C4-Benzenes	**191** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C5-Benzenes	**121** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
Methylcyclohexane	**30.2** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
Toluene	**193** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
Ethylbenzene	**35.0** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
m,p-Xylene	**119** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
Styrene	J **15.5** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
o-Xylene	**44.4** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
Isopropylbenzene	J **12.0** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
n-Propylbenzene	J **11.5** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
1,3,5-Trimethylbenzene	**43.5** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
1,2,3-Trimethylbenzene	**34.7** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
1,2,4-Trimethylbenzene	**95.0** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
t-Butylbenzene	ND (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
sec-Butylbenzene	ND (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
p-Isopropyltoluene	J **11.4** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
n-Butylbenzene	ND (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
trans-Decalin	J **14.7** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
cis-Decalin	ND (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C1-Decalins	**30.3** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C2-Decalins	**46.2** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C3-Decalins	**45.1** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C4-Decalins	**84.3** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
Benzo(b)thiophene	**101** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C1-Benzo(b)thiophenes	**110** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C2-Benzo(b)thiophenes	**219** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C3-Benzo(b)thiophenes	**165** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C4-Benzo(b)thiophenes	**70.5** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS675-S2
Date Sampled: 09/24/19 12:06
Percent Solids: 80
Initial Volume: 5.68
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-03
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**2550** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
2-Methylnaphthalene	**1300** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
1-Methylnaphthalene	**2230** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C1-Naphthalenes	**2140** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C2-Naphthalenes	**4190** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C3-Naphthalenes	**2910** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C4-Naphthalenes	**1260** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
Biphenyl	**430** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
Acenaphthylene	**231** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
Acenaphthene	**8620** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
Dibenzofuran	**4110** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
Fluorene	**7500** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C1-Fluorenes	**2660** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C2-Fluorenes	**1840** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C3-Fluorenes	**1280** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
Dibenzothiophene	**4360** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C1-Dibenzothiophenes	**2410** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C2-Dibenzothiophenes	**1690** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C3-Dibenzothiophenes	**872** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C4-Dibenzothiophenes	**287** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
Phenanthrene	**62300** (439)	219	8270 Mod		100	10/09/19 6:08	F9J0004	FJ90104
Anthracene	**18000** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C1-Phenanthrenes/Anthracenes	**19400** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C2-Phenanthrenes/Anthracenes	**8370** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C3-Phenanthrenes/Anthracenes	**2960** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C4-Phenanthrenes/Anthracenes	**1080** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
Retene	**202** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
Benzo(b)naphtho(2,1-d)thiophene	**3640** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C0-Benzonaphthothiophenes	**7230** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C1-Benzonaphthothiophenes	**2490** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C2-Benzonaphthothiophenes	**1170** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C3-Benzonaphthothiophenes	**612** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS675-S2
Date Sampled: 09/24/19 12:06
Percent Solids: 80
Initial Volume: 5.68
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-03
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**167** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
Fluoranthene	**61500** (439)	219	8270 Mod		100	10/09/19 6:08	F9J0004	FJ90104
Pyrene	**52200** (439)	219	8270 Mod		100	10/09/19 6:08	F9J0004	FJ90104
C1-Fluoranthenes/Pyrenes	**21300** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C2-Fluoranthenes/Pyrenes	**6570** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C3-Fluoranthenes/Pyrenes	**3280** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
Benzo(b)fluorene	**3950** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
Benzo(c)fluorene	**1510** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
2-Methylpyrene	**2410** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
4-Methylpyrene	**1680** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
1-Methylpyrene	**1450** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
Benz(a)anthracene	**24500** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
Chrysene/triphenylene	**23200** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C1-Benzo(a)anthracenes/Chrysenes	**9310** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C2-Benzo(a)anthracenes/Chrysenes	**4150** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C3-Benzo(a)anthracenes/Chrysenes	**2030** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C4-Benzo(a)anthracenes/Chrysenes	**1050** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
Benzo(b)fluoranthene	**16700** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
Benzo(j/k)fluoranthene	**17900** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
Benzo(e)pyrene	**14000** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
Benzo(a)pyrene	**23100** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
Perylene	**5840** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
Indeno(1,2,3-cd)pyrene	**13000** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
Dibenzo(a,h)anthracene	**3140** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
Benzo(g,h,i)perylene	**11600** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
Coronene	**2770** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
Tetramethyl lead	ND (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
Trimethylethyl lead	ND (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
Dimethyldiethyl lead	ND (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
Methyltriethyl lead	ND (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
Tetraethyl lead	ND (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
2,6,10-trimethyldodecane (1380)	**54.8** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS675-S2
Date Sampled: 09/24/19 12:06
Percent Solids: 80
Initial Volume: 5.68
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-03
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**104** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
2,6,10-trimethylpentadecane (1650)	**128** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C-17	**109** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
Pristane	**232** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
C-18	**103** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
Phytane	**192** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
Carbazole	**7800** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
2,6-Dimethylnaphthalene	**761** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
2,3,5-Trimethylnaphthene	**241** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
4-Methyldibenzothiophene	**542** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
2/3-Methyldibenzothiophene	**798** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
1-Methyldibenzothiophene	**207** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
3-Methylphenanthrene	**4100** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
2-Methylphenanthrene	**5150** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
2-Methylanthracene	**3090** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
4/9-Methylphenanthrene	**4010** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104
1-Methylphenanthrene	**2900** (21.9)	11.0	8270 Mod		5	10/07/19 17:28	F9J0004	FJ90104

	%Recovery	*Qualifier*	*Limits*
Surrogate: Naphthalene-d8	*71 %*		*50-120*
Surrogate: Perylene-d12	*98 %*		*50-120*
Surrogate: Phenanthrene-d10	*79 %*		*50-120*
Surrogate: Toluene-D8	*66 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS675-S2
Date Sampled: 09/24/19 12:06
Percent Solids: 80

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-03
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**41100** (96.8)		TOC-LK		1	CCP	10/03/19 16:58	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS689-S2
Date Sampled: 09/24/19 12:43
Percent Solids: 59
Initial Volume: 4.86
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-04
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **13.2** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C1-Benzene	**23.5** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C2-Benzenes	**21.4** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C3-Benzenes	**7.89** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C4-Benzenes	**9.03** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C5-Benzenes	J **4.56** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
Methylcyclohexane	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
Toluene	**33.3** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
Ethylbenzene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
m,p-Xylene	**30.8** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
Styrene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
o-Xylene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
Isopropylbenzene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
n-Propylbenzene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
1,3,5-Trimethylbenzene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
1,2,3-Trimethylbenzene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
1,2,4-Trimethylbenzene	J **3.52** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
t-Butylbenzene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
sec-Butylbenzene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
p-Isopropyltoluene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
n-Butylbenzene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
trans-Decalin	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
cis-Decalin	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C1-Decalins	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C2-Decalins	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C3-Decalins	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C4-Decalins	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
Benzo(b)thiophene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C1-Benzo(b)thiophenes	J **4.55** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C2-Benzo(b)thiophenes	J **5.52** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C3-Benzo(b)thiophenes	J **4.39** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C4-Benzo(b)thiophenes	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS689-S2
Date Sampled: 09/24/19 12:43
Percent Solids: 59
Initial Volume: 4.86
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-04
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**13.5** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
2-Methylnaphthalene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
1-Methylnaphthalene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C1-Naphthalenes	**J 4.07** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C2-Naphthalenes	**9.71** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C3-Naphthalenes	**J 6.76** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C4-Naphthalenes	**J 4.03** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
Biphenyl	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
Acenaphthylene	**J 4.77** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
Acenaphthene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
Dibenzofuran	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
Fluorene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C1-Fluorenes	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C2-Fluorenes	**J 4.68** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C3-Fluorenes	**J 3.76** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
Dibenzothiophene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C1-Dibenzothiophenes	**J 3.82** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C2-Dibenzothiophenes	**J 4.50** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C3-Dibenzothiophenes	**J 3.67** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C4-Dibenzothiophenes	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
Phenanthrene	**J 3.89** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
Anthracene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C1-Phenanthrenes/Anthracenes	**8.52** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C2-Phenanthrenes/Anthracenes	**J 3.92** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C3-Phenanthrenes/Anthracenes	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C4-Phenanthrenes/Anthracenes	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
Retene	**7.10** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
Benzo(b)naphtho(2,1-d)thiophene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C0-Benzonaphthothiophenes	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C1-Benzonaphthothiophenes	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C2-Benzonaphthothiophenes	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C3-Benzonaphthothiophenes	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS689-S2
Date Sampled: 09/24/19 12:43
Percent Solids: 59
Initial Volume: 4.86
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-04
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
Fluoranthene	**8.28** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
Pyrene	J **5.61** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C1-Fluoranthenes/Pyrenes	**8.82** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C2-Fluoranthenes/Pyrenes	J **4.98** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C3-Fluoranthenes/Pyrenes	J **5.25** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
Benzo(b)fluorene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
Benzo(c)fluorene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
2-Methylpyrene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
4-Methylpyrene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
1-Methylpyrene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
Benz(a)anthracene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
Chrysene/triphenylene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C1-Benzo(a)anthracenes/Chrysenes	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C2-Benzo(a)anthracenes/Chrysenes	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C3-Benzo(a)anthracenes/Chrysenes	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C4-Benzo(a)anthracenes/Chrysenes	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
Benzo(b)fluoranthene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
Benzo(j/k)fluoranthene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
Benzo(e)pyrene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
Benzo(a)pyrene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
Perylene	**781** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
Indeno(1,2,3-cd)pyrene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
Dibenzo(a,h)anthracene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
Benzo(g,h,i)perylene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
Coronene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
Tetramethyl lead	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
Trimethylethyl lead	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
Dimethyldiethyl lead	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
Methyltriethyl lead	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
Tetraethyl lead	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
2,6,10-trimethyldodecane (1380)	J **3.48** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS689-S2
Date Sampled: 09/24/19 12:43
Percent Solids: 59
Initial Volume: 4.86
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-04
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**11.4** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
2,6,10-trimethylpentadecane (1650)	**7.17** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C-17	**B 68.4** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
Pristane	**B 16.4** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
C-18	**B 47.0** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
Phytane	**B 21.2** (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
Carbazole	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
2,6-Dimethylnaphthalene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
2,3,5-Trimethylnaphthene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
4-Methyldibenzothiophene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
2/3-Methyldibenzothiophene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
1-Methyldibenzothiophene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
3-Methylphenanthrene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
2-Methylphenanthrene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
2-Methylanthracene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
4/9-Methylphenanthrene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104
1-Methylphenanthrene	ND (6.92)	3.46	8270 Mod		1	10/05/19 22:17	F9J0003	FJ90104

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*81 %*		*50-120*
Surrogate: Perylene-d12	*85 %*		*50-120*
Surrogate: Phenanthrene-d10	*83 %*		*50-120*
Surrogate: Toluene-D8	*76 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS689-S2
Date Sampled: 09/24/19 12:43
Percent Solids: 59

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-04
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**30500** (108)		TOC-LK		1	CCP	10/03/19 17:14	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS691-S3
Date Sampled: 09/24/19 14:37
Percent Solids: 67
Initial Volume: 5.03
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-05
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **11.1** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
C1-Benzene	**669** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
C2-Benzenes	**306** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
C3-Benzenes	**245** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
C4-Benzenes	**641** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
C5-Benzenes	**768** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
Methylcyclohexane	**62.1** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
Toluene	**1020** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
Ethylbenzene	**83.5** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
m,p-Xylene	**439** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
Styrene	**104** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
o-Xylene	**69.3** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
Isopropylbenzene	**11.2** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
n-Propylbenzene	**47.4** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
1,3,5-Trimethylbenzene	**46.2** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
1,2,3-Trimethylbenzene	**56.1** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
1,2,4-Trimethylbenzene	**175** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
t-Butylbenzene	ND (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
sec-Butylbenzene	**37.0** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
p-Isopropyltoluene	**40.0** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
n-Butylbenzene	**138** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
trans-Decalin	**2220** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
cis-Decalin	**264** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
C1-Decalins	**3960** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
C2-Decalins	**3800** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
C3-Decalins	**2740** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
C4-Decalins	**3240** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
Benzo(b)thiophene	**146** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
C1-Benzo(b)thiophenes	**236** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
C2-Benzo(b)thiophenes	**473** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
C3-Benzo(b)thiophenes	**610** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
C4-Benzo(b)thiophenes	**421** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS691-S3
Date Sampled: 09/24/19 14:37
Percent Solids: 67
Initial Volume: 5.03
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-05
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**1510** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
2-Methylnaphthalene	**727** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
1-Methylnaphthalene	**783** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
C1-Naphthalenes	**930** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
C2-Naphthalenes	**3780** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
C3-Naphthalenes	**4690** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
C4-Naphthalenes	**3260** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
Biphenyl	**285** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
Acenaphthylene	**1470** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
Acenaphthene	**7710** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
Dibenzofuran	**472** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
Fluorene	**3630** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
C1-Fluorenes	**1940** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
C2-Fluorenes	**2080** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
C3-Fluorenes	**2030** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
Dibenzothiophene	**1920** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
C1-Dibenzothiophenes	**2530** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
C2-Dibenzothiophenes	**2960** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
C3-Dibenzothiophenes	**2260** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
C4-Dibenzothiophenes	**1230** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
Phenanthrene	**21200** (119)	59.3	8270 Mod		20	10/07/19 18:54	F9J0003	FJ90104
Anthracene	**5400** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
C1-Phenanthrenes/Anthracenes	**12400** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
C2-Phenanthrenes/Anthracenes	**7400** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
C3-Phenanthrenes/Anthracenes	**3550** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
C4-Phenanthrenes/Anthracenes	**1560** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
Retene	**566** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
Benzo(b)naphtho(2,1-d)thiophene	**1490** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
C0-Benzonaphthothiophenes	**2770** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
C1-Benzonaphthothiophenes	**1990** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
C2-Benzonaphthothiophenes	**1540** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
C3-Benzonaphthothiophenes	**1070** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS691-S3
Date Sampled: 09/24/19 14:37
Percent Solids: 67
Initial Volume: 5.03
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-05
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**422** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
Fluoranthene	**21600** (119)	59.3	8270 Mod		20	10/07/19 18:54	F9J0003	FJ90104
Pyrene	**28200** (119)	59.3	8270 Mod		20	10/07/19 18:54	F9J0003	FJ90104
C1-Fluoranthenes/Pyrenes	**13100** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
C2-Fluoranthenes/Pyrenes	**4760** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
C3-Fluoranthenes/Pyrenes	**2350** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
Benzo(b)fluorene	**1590** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
Benzo(c)fluorene	**755** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
2-Methylpyrene	**1840** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
4-Methylpyrene	**1630** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
1-Methylpyrene	**1490** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
Benz(a)anthracene	**9020** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
Chrysene/triphenylene	**9970** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
C1-Benzo(a)anthracenes/Chrysenes	**5770** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
C2-Benzo(a)anthracenes/Chrysenes	**3130** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
C3-Benzo(a)anthracenes/Chrysenes	**1420** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
C4-Benzo(a)anthracenes/Chrysenes	**707** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
Benzo(b)fluoranthene	**5800** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
Benzo(j/k)fluoranthene	**6520** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
Benzo(e)pyrene	**5780** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
Benzo(a)pyrene	**8530** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
Perylene	**1710** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
Indeno(1,2,3-cd)pyrene	**4690** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
Dibenzo(a,h)anthracene	**1100** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
Benzo(g,h,i)perylene	**4750** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
Coronene	**1280** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
Tetramethyl lead	ND (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
Trimethylethyl lead	ND (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
Dimethyldiethyl lead	ND (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
Methyltriethyl lead	ND (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
Tetraethyl lead	ND (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
2,6,10-trimethyldodecane (1380)	**7490** (119)	59.3	8270 Mod		20	10/07/19 18:54	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS691-S3
Date Sampled: 09/24/19 14:37
Percent Solids: 67
Initial Volume: 5.03
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-05
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**9210** (119)	59.3	8270 Mod		20	10/07/19 18:54	F9J0003	FJ90104
2,6,10-trimethylpentadecane (1650)	**8020** (119)	59.3	8270 Mod		20	10/07/19 18:54	F9J0003	FJ90104
C-17	**403** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
Pristane	**16800** (119)	59.3	8270 Mod		20	10/07/19 18:54	F9J0003	FJ90104
C-18	**381** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
Phytane	**12600** (119)	59.3	8270 Mod		20	10/07/19 18:54	F9J0003	FJ90104
Carbazole	**389** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
2,6-Dimethylnaphthalene	**968** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
2,3,5-Trimethylnaphthene	**387** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
4-Methyldibenzothiophene	**991** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
2/3-Methyldibenzothiophene	**858** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
1-Methyldibenzothiophene	**310** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
3-Methylphenanthrene	**2730** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
2-Methylphenanthrene	**3170** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
2-Methylanthracene	**1330** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
4/9-Methylphenanthrene	**2970** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104
1-Methylphenanthrene	**2170** (5.93)	2.96	8270 Mod		1	10/06/19 18:52	F9J0003	FJ90104

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*70 %*		*50-120*
Surrogate: Perylene-d12	*64 %*		*50-120*
Surrogate: Phenanthrene-d10	*70 %*		*50-120*
Surrogate: Toluene-D8	*66 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS691-S3
Date Sampled: 09/24/19 14:37
Percent Solids: 67

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-05
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**73800** (110)		TOC-LK		1	CCP	10/03/19 17:31	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS691-S5
Date Sampled: 09/24/19 14:44
Percent Solids: 71
Initial Volume: 5.01
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-06
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**100** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
C1-Benzene	**595** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
C2-Benzenes	**710** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
C3-Benzenes	**1490** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
C4-Benzenes	**3700** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
C5-Benzenes	**2350** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
Methylcyclohexane	**47.8** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
Toluene	**910** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
Ethylbenzene	**551** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
m,p-Xylene	**720** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
Styrene	**328** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
o-Xylene	**152** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
Isopropylbenzene	**122** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
n-Propylbenzene	**108** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
1,3,5-Trimethylbenzene	**306** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
1,2,3-Trimethylbenzene	**312** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
1,2,4-Trimethylbenzene	**915** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
t-Butylbenzene	ND (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
sec-Butylbenzene	**22.7** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
p-Isopropyltoluene	**175** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
n-Butylbenzene	**245** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
trans-Decalin	**128** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
cis-Decalin	**44.7** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
C1-Decalins	**519** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
C2-Decalins	**1120** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
C3-Decalins	**1120** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
C4-Decalins	**2140** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
Benzo(b)thiophene	**238** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
C1-Benzo(b)thiophenes	**970** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
C2-Benzo(b)thiophenes	**2240** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
C3-Benzo(b)thiophenes	**1500** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
C4-Benzo(b)thiophenes	**511** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS691-S5
Date Sampled: 09/24/19 14:44
Percent Solids: 71
Initial Volume: 5.01
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-06
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**11300** (113)	56.5	8270 Mod		20	10/07/19 20:19	F9J0003	FJ90104
2-Methylnaphthalene	**5680** (113)	56.5	8270 Mod		20	10/07/19 20:19	F9J0003	FJ90104
1-Methylnaphthalene	**50300** (113)	56.5	8270 Mod		20	10/07/19 20:19	F9J0003	FJ90104
C1-Naphthalenes	**33100** (113)	56.5	8270 Mod		20	10/07/19 20:19	F9J0003	FJ90104
C2-Naphthalenes	**71100** (113)	56.5	8270 Mod		20	10/07/19 20:19	F9J0003	FJ90104
C3-Naphthalenes	**32300** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
C4-Naphthalenes	**10700** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
Biphenyl	**2590** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
Acenaphthylene	**4220** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
Acenaphthene	**61000** (113)	56.5	8270 Mod		20	10/07/19 20:19	F9J0003	FJ90104
Dibenzofuran	**2970** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
Fluorene	**31400** (113)	56.5	8270 Mod		20	10/07/19 20:19	F9J0003	FJ90104
C1-Fluorenes	**19000** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
C2-Fluorenes	**14100** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
C3-Fluorenes	**5390** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
Dibenzothiophene	**5580** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
C1-Dibenzothiophenes	**8270** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
C2-Dibenzothiophenes	**6850** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
C3-Dibenzothiophenes	**3140** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
C4-Dibenzothiophenes	**1070** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
Phenanthrene	**113000** (113)	56.5	8270 Mod		20	10/07/19 20:19	F9J0003	FJ90104
Anthracene	**37000** (113)	56.5	8270 Mod		20	10/07/19 20:19	F9J0003	FJ90104
C1-Phenanthrenes/Anthracenes	**94100** (113)	56.5	8270 Mod		20	10/07/19 20:19	F9J0003	FJ90104
C2-Phenanthrenes/Anthracenes	**36300** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
C3-Phenanthrenes/Anthracenes	**11500** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
C4-Phenanthrenes/Anthracenes	**3400** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
Retene	**1000** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
Benzo(b)naphtho(2,1-d)thiophene	**2370** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
C0-Benzonaphthothiophenes	**4240** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
C1-Benzonaphthothiophenes	**3570** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
C2-Benzonaphthothiophenes	**1970** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
C3-Benzonaphthothiophenes	**891** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS691-S5
Date Sampled: 09/24/19 14:44
Percent Solids: 71
Initial Volume: 5.01
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-06
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**193** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
Fluoranthene	**42600** (113)	56.5	8270 Mod		20	10/07/19 20:19	F9J0003	FJ90104
Pyrene	**65100** (113)	56.5	8270 Mod		20	10/07/19 20:19	F9J0003	FJ90104
C1-Fluoranthenes/Pyrenes	**46500** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
C2-Fluoranthenes/Pyrenes	**16900** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
C3-Fluoranthenes/Pyrenes	**6000** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
Benzo(b)fluorene	**4980** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
Benzo(c)fluorene	**2270** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
2-Methylpyrene	**6090** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
4-Methylpyrene	**5330** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
1-Methylpyrene	**5920** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
Benz(a)anthracene	**25100** (113)	56.5	8270 Mod		20	10/07/19 20:19	F9J0003	FJ90104
Chrysene/triphenylene	**25500** (113)	56.5	8270 Mod		20	10/07/19 20:19	F9J0003	FJ90104
C1-Benzo(a)anthracenes/Chrysenes	**17100** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
C2-Benzo(a)anthracenes/Chrysenes	**8190** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
C3-Benzo(a)anthracenes/Chrysenes	**2800** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
C4-Benzo(a)anthracenes/Chrysenes	**892** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
Benzo(b)fluoranthene	**6980** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
Benzo(j/k)fluoranthene	**8020** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
Benzo(e)pyrene	**7310** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
Benzo(a)pyrene	**18500** (113)	56.5	8270 Mod		20	10/07/19 20:19	F9J0003	FJ90104
Perylene	**2070** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
Indeno(1,2,3-cd)pyrene	**4940** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
Dibenzo(a,h)anthracene	**1530** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
Benzo(g,h,i)perylene	**4780** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
Coronene	**1180** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
Tetramethyl lead	ND (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
Trimethylethyl lead	ND (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
Dimethyldiethyl lead	ND (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
Methyltriethyl lead	ND (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
Tetraethyl lead	ND (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
2,6,10-trimethyldodecane (1380)	**712** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS691-S5
Date Sampled: 09/24/19 14:44
Percent Solids: 71
Initial Volume: 5.01
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-06
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**1190** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
2,6,10-trimethylpentadecane (1650)	**1490** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
C-17	**519** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
Pristane	**3090** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
C-18	**365** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
Phytane	**2750** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
Carbazole	**190** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
2,6-Dimethylnaphthalene	**15200** (113)	56.5	8270 Mod		20	10/07/19 20:19	F9J0003	FJ90104
2,3,5-Trimethylnaphthene	**2230** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
4-Methyldibenzothiophene	**3450** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
2/3-Methyldibenzothiophene	**2870** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
1-Methyldibenzothiophene	**722** (5.65)	2.82	8270 Mod		1	10/06/19 20:19	F9J0003	FJ90104
3-Methylphenanthrene	**21300** (113)	56.5	8270 Mod		20	10/07/19 20:19	F9J0003	FJ90104
2-Methylphenanthrene	**23400** (113)	56.5	8270 Mod		20	10/07/19 20:19	F9J0003	FJ90104
2-Methylanthracene	**11000** (113)	56.5	8270 Mod		20	10/07/19 20:19	F9J0003	FJ90104
4/9-Methylphenanthrene	**22300** (113)	56.5	8270 Mod		20	10/07/19 20:19	F9J0003	FJ90104
1-Methylphenanthrene	**15300** (113)	56.5	8270 Mod		20	10/07/19 20:19	F9J0003	FJ90104

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*78 %*		*50-120*
Surrogate: Perylene-d12	*77 %*		*50-120*
Surrogate: Phenanthrene-d10	*78 %*		*50-120*
Surrogate: Toluene-D8	*71 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS691-S5
Date Sampled: 09/24/19 14:44
Percent Solids: 71

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-06
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**70600** (110)		TOC-LK		1	CCP	10/03/19 17:47	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS692-S4
Date Sampled: 09/24/19 16:10
Percent Solids: 50
Initial Volume: 1.98
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-07
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**190** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
C1-Benzene	**1820** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
C2-Benzenes	**59300** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
C3-Benzenes	**132000** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
C4-Benzenes	**212000** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
C5-Benzenes	**79900** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
Methylcyclohexane	ND (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
Toluene	**3240** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
Ethylbenzene	**72100** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
m,p-Xylene	**24200** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
Styrene	**6130** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
o-Xylene	**31100** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
Isopropylbenzene	**20000** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
n-Propylbenzene	**6640** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
1,3,5-Trimethylbenzene	**23300** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
1,2,3-Trimethylbenzene	**36500** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
1,2,4-Trimethylbenzene	**89600** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
t-Butylbenzene	ND (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
sec-Butylbenzene	**896** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
p-Isopropyltoluene	**26900** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
n-Butylbenzene	**13400** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
trans-Decalin	**1940** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
cis-Decalin	**863** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
C1-Decalins	**7260** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
C2-Decalins	**16900** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
C3-Decalins	**18100** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
C4-Decalins	**31400** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
Benzo(b)thiophene	**54000** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
C1-Benzo(b)thiophenes	**77200** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
C2-Benzo(b)thiophenes	**95100** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
C3-Benzo(b)thiophenes	**50100** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
C4-Benzo(b)thiophenes	**13600** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS692-S4
Date Sampled: 09/24/19 16:10
Percent Solids: 50
Initial Volume: 1.98
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-07
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**5300000** (40600)	20300	8270 Mod		2000	10/08/19 1:58	F9J0003	FJ90104
2-Methylnaphthalene	**3610000** (2030)	1010	8270 Mod		100	10/08/19 0:33	F9J0003	FJ90104
1-Methylnaphthalene	**2600000** (2030)	1010	8270 Mod		100	10/08/19 0:33	F9J0003	FJ90104
C1-Naphthalenes	**3820000** (2030)	1010	8270 Mod		100	10/08/19 0:33	F9J0003	FJ90104
C2-Naphthalenes	**2600000** (2030)	1010	8270 Mod		100	10/08/19 0:33	F9J0003	FJ90104
C3-Naphthalenes	**937000** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
C4-Naphthalenes	**271000** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
Biphenyl	**480000** (2030)	1010	8270 Mod		100	10/08/19 0:33	F9J0003	FJ90104
Acenaphthylene	**145000** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
Acenaphthene	**3250000** (2030)	1010	8270 Mod		100	10/08/19 0:33	F9J0003	FJ90104
Dibenzofuran	**109000** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
Fluorene	**1260000** (2030)	1010	8270 Mod		100	10/08/19 0:33	F9J0003	FJ90104
C1-Fluorenes	**639000** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
C2-Fluorenes	**443000** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
C3-Fluorenes	**145000** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
Dibenzothiophene	**269000** (2030)	1010	8270 Mod		100	10/08/19 0:33	F9J0003	FJ90104
C1-Dibenzothiophenes	**270000** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
C2-Dibenzothiophenes	**198000** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
C3-Dibenzothiophenes	**82200** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
C4-Dibenzothiophenes	**25700** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
Phenanthrene	**4450000** (40600)	20300	8270 Mod		2000	10/08/19 1:58	F9J0003	FJ90104
Anthracene	**1120000** (2030)	1010	8270 Mod		100	10/08/19 0:33	F9J0003	FJ90104
C1-Phenanthrenes/Anthracenes	**2730000** (2030)	1010	8270 Mod		100	10/08/19 0:33	F9J0003	FJ90104
C2-Phenanthrenes/Anthracenes	**1090000** (2030)	1010	8270 Mod		100	10/08/19 0:33	F9J0003	FJ90104
C3-Phenanthrenes/Anthracenes	**299000** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
C4-Phenanthrenes/Anthracenes	**87400** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
Retene	**35600** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
Benzo(b)naphtho(2,1-d)thiophene	**70900** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
C0-Benzonaphthothiophenes	**127000** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
C1-Benzonaphthothiophenes	**99200** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
C2-Benzonaphthothiophenes	**48700** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
C3-Benzonaphthothiophenes	**22000** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS692-S4
Date Sampled: 09/24/19 16:10
Percent Solids: 50
Initial Volume: 1.98
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-07
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**3830** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
Fluoranthene	**1330000** (2030)	1010	8270 Mod		100	10/08/19 0:33	F9J0003	FJ90104
Pyrene	**1920000** (2030)	1010	8270 Mod		100	10/08/19 0:33	F9J0003	FJ90104
C1-Fluoranthenes/Pyrenes	**1540000** (2030)	1010	8270 Mod		100	10/08/19 0:33	F9J0003	FJ90104
C2-Fluoranthenes/Pyrenes	**462000** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
C3-Fluoranthenes/Pyrenes	**156000** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
Benzo(b)fluorene	**145000** (2030)	1010	8270 Mod		100	10/08/19 0:33	F9J0003	FJ90104
Benzo(c)fluorene	**81600** (2030)	1010	8270 Mod		100	10/08/19 0:33	F9J0003	FJ90104
2-Methylpyrene	**193000** (2030)	1010	8270 Mod		100	10/08/19 0:33	F9J0003	FJ90104
4-Methylpyrene	**170000** (2030)	1010	8270 Mod		100	10/08/19 0:33	F9J0003	FJ90104
1-Methylpyrene	**193000** (2030)	1010	8270 Mod		100	10/08/19 0:33	F9J0003	FJ90104
Benz(a)anthracene	**718000** (2030)	1010	8270 Mod		100	10/08/19 0:33	F9J0003	FJ90104
Chrysene/triphenylene	**647000** (2030)	1010	8270 Mod		100	10/08/19 0:33	F9J0003	FJ90104
C1-Benzo(a)anthracenes/Chrysenes	**510000** (2030)	1010	8270 Mod		100	10/08/19 0:33	F9J0003	FJ90104
C2-Benzo(a)anthracenes/Chrysenes	**201000** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
C3-Benzo(a)anthracenes/Chrysenes	**66500** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
C4-Benzo(a)anthracenes/Chrysenes	**18100** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
Benzo(b)fluoranthene	**244000** (2030)	1010	8270 Mod		100	10/08/19 0:33	F9J0003	FJ90104
Benzo(j/k)fluoranthene	**333000** (2030)	1010	8270 Mod		100	10/08/19 0:33	F9J0003	FJ90104
Benzo(e)pyrene	**301000** (2030)	1010	8270 Mod		100	10/08/19 0:33	F9J0003	FJ90104
Benzo(a)pyrene	**573000** (2030)	1010	8270 Mod		100	10/08/19 0:33	F9J0003	FJ90104
Perylene	**67300** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
Indeno(1,2,3-cd)pyrene	**152000** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
Dibenzo(a,h)anthracene	**43600** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
Benzo(g,h,i)perylene	**155000** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
Coronene	**41300** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
Tetramethyl lead	ND (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
Trimethylethyl lead	ND (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
Dimethyldiethyl lead	ND (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
Methyltriethyl lead	ND (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
Tetraethyl lead	ND (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
2,6,10-trimethyldodecane (1380)	**12800** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS692-S4
Date Sampled: 09/24/19 16:10
Percent Solids: 50
Initial Volume: 1.98
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-07
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**27200** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
2,6,10-trimethylpentadecane (1650)	**37200** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
C-17	ND (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
Pristane	**70600** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
C-18	ND (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
Phytane	**64100** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
Carbazole	**10200** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
2,6-Dimethylnaphthalene	**533000** (2030)	1010	8270 Mod		100	10/08/19 0:33	F9J0003	FJ90104
2,3,5-Trimethylnaphthene	**61000** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
4-Methyldibenzothiophene	**111000** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
2/3-Methyldibenzothiophene	**95500** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
1-Methyldibenzothiophene	**22900** (101)	50.7	8270 Mod		5	10/06/19 21:47	F9J0003	FJ90104
3-Methylphenanthrene	**647000** (2030)	1010	8270 Mod		100	10/08/19 0:33	F9J0003	FJ90104
2-Methylphenanthrene	**694000** (2030)	1010	8270 Mod		100	10/08/19 0:33	F9J0003	FJ90104
2-Methylanthracene	**300000** (2030)	1010	8270 Mod		100	10/08/19 0:33	F9J0003	FJ90104
4/9-Methylphenanthrene	**632000** (2030)	1010	8270 Mod		100	10/08/19 0:33	F9J0003	FJ90104
1-Methylphenanthrene	**435000** (2030)	1010	8270 Mod		100	10/08/19 0:33	F9J0003	FJ90104

	%Recovery	*Qualifier*	*Limits*
Surrogate: Naphthalene-d8	*77 %*		*50-120*
Surrogate: Perylene-d12	*175 %*	*SM*	*50-120*
Surrogate: Phenanthrene-d10	*86 %*		*50-120*
Surrogate: Toluene-D8	*74 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS692-S5
Date Sampled: 09/24/19 16:15
Percent Solids: 71
Initial Volume: 4.89
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-08
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**B 7.56** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C1-Benzene	**J 3.24** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C2-Benzenes	**J 4.19** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C3-Benzenes	**6.32** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C4-Benzenes	**6.86** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C5-Benzenes	**J 5.53** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
Methylcyclohexane	ND (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
Toluene	**J 3.99** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
Ethylbenzene	**J 2.96** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
m,p-Xylene	ND (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
Styrene	ND (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
o-Xylene	ND (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
Isopropylbenzene	ND (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
n-Propylbenzene	ND (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
1,3,5-Trimethylbenzene	ND (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
1,2,3-Trimethylbenzene	ND (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
1,2,4-Trimethylbenzene	ND (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
t-Butylbenzene	ND (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
sec-Butylbenzene	ND (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
p-Isopropyltoluene	ND (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
n-Butylbenzene	ND (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
trans-Decalin	ND (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
cis-Decalin	ND (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C1-Decalins	ND (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C2-Decalins	ND (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C3-Decalins	ND (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C4-Decalins	ND (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
Benzo(b)thiophene	**J 4.05** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C1-Benzo(b)thiophenes	**6.71** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C2-Benzo(b)thiophenes	**9.29** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C3-Benzo(b)thiophenes	**J 5.77** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C4-Benzo(b)thiophenes	ND (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS692-S5
Date Sampled: 09/24/19 16:15
Percent Solids: 71
Initial Volume: 4.89
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-08
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**208** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
2-Methylnaphthalene	**171** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
1-Methylnaphthalene	**112** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C1-Naphthalenes	**174** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C2-Naphthalenes	**144** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C3-Naphthalenes	**60.1** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C4-Naphthalenes	**16.8** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
Biphenyl	**22.4** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
Acenaphthylene	**13.0** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
Acenaphthene	**174** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
Dibenzofuran	**10.1** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
Fluorene	**92.0** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C1-Fluorenes	**47.9** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C2-Fluorenes	**23.3** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C3-Fluorenes	**12.7** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
Dibenzothiophene	**30.6** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C1-Dibenzothiophenes	**25.0** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C2-Dibenzothiophenes	**17.9** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C3-Dibenzothiophenes	**8.76** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C4-Dibenzothiophenes	**J 3.18** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
Phenanthrene	**473** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
Anthracene	**86.3** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C1-Phenanthrenes/Anthracenes	**190** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C2-Phenanthrenes/Anthracenes	**84.2** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C3-Phenanthrenes/Anthracenes	**19.4** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C4-Phenanthrenes/Anthracenes	**6.35** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
Retene	**J 3.20** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
Benzo(b)naphtho(2,1-d)thiophene	**8.20** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C0-Benzonaphthothiophenes	**14.9** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C1-Benzonaphthothiophenes	**10.5** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C2-Benzonaphthothiophenes	**J 5.56** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C3-Benzonaphthothiophenes	**J 4.33** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS692-S5
Date Sampled: 09/24/19 16:15
Percent Solids: 71
Initial Volume: 4.89
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-08
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
Fluoranthene	**143** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
Pyrene	**217** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C1-Fluoranthenes/Pyrenes	**117** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C2-Fluoranthenes/Pyrenes	**33.3** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C3-Fluoranthenes/Pyrenes	**12.0** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
Benzo(b)fluorene	**11.8** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
Benzo(c)fluorene	**6.28** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
2-Methylpyrene	**16.2** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
4-Methylpyrene	**13.6** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
1-Methylpyrene	**15.1** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
Benz(a)anthracene	**70.3** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
Chrysene/triphenylene	**63.3** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C1-Benzo(a)anthracenes/Chrysenes	**41.2** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C2-Benzo(a)anthracenes/Chrysenes	**15.1** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C3-Benzo(a)anthracenes/Chrysenes	ND (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C4-Benzo(a)anthracenes/Chrysenes	ND (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
Benzo(b)fluoranthene	**26.4** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
Benzo(j/k)fluoranthene	**38.7** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
Benzo(e)pyrene	**34.9** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
Benzo(a)pyrene	**60.9** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
Perylene	**17.5** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
Indeno(1,2,3-cd)pyrene	**25.2** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
Dibenzo(a,h)anthracene	**6.05** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
Benzo(g,h,i)perylene	**28.2** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
Coronene	**6.74** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
Tetramethyl lead	ND (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
Trimethylethyl lead	ND (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
Dimethyldiethyl lead	ND (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
Methyltriethyl lead	ND (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
Tetraethyl lead	ND (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
2,6,10-trimethyldodecane (1380)	ND (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS692-S5
Date Sampled: 09/24/19 16:15
Percent Solids: 71
Initial Volume: 4.89
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-08
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**6.00** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
2,6,10-trimethylpentadecane (1650)	**20.0** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C-17	**B 67.3** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
Pristane	**B 41.4** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
C-18	**B 52.4** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
Phytane	**B 46.6** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
Carbazole	**J 3.21** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
2,6-Dimethylnaphthalene	**32.3** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
2,3,5-Trimethylnaphthene	**J 4.33** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
4-Methyldibenzothiophene	**10.1** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
2/3-Methyldibenzothiophene	**8.02** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
1-Methyldibenzothiophene	**J 3.11** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
3-Methylphenanthrene	**45.8** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
2-Methylphenanthrene	**49.3** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
2-Methylanthracene	**16.9** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
4/9-Methylphenanthrene	**43.3** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104
1-Methylphenanthrene	**31.2** (5.78)	2.89	8270 Mod		1	10/05/19 23:37	F9J0003	FJ90104

	%Recovery	*Qualifier*	*Limits*
Surrogate: Naphthalene-d8	*84 %*		*50-120*
Surrogate: Perylene-d12	*86 %*		*50-120*
Surrogate: Phenanthrene-d10	*88 %*		*50-120*
Surrogate: Toluene-D8	*80 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS692-S5
Date Sampled: 09/24/19 16:15
Percent Solids: 71

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-08
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**2590** (95.4)		TOC-LK		1	CCP	10/03/19 18:54	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS680R-S1
Date Sampled: 09/25/19 16:11
Percent Solids: 73
Initial Volume: 5.51
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-09
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**J 3.08** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C1-Benzene	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C2-Benzenes	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C3-Benzenes	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C4-Benzenes	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C5-Benzenes	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
Methylcyclohexane	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
Toluene	**J 3.18** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
Ethylbenzene	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
m,p-Xylene	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
Styrene	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
o-Xylene	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
Isopropylbenzene	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
n-Propylbenzene	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
1,3,5-Trimethylbenzene	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
1,2,3-Trimethylbenzene	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
1,2,4-Trimethylbenzene	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
t-Butylbenzene	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
sec-Butylbenzene	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
p-Isopropyltoluene	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
n-Butylbenzene	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
trans-Decalin	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
cis-Decalin	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C1-Decalins	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C2-Decalins	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C3-Decalins	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C4-Decalins	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
Benzo(b)thiophene	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C1-Benzo(b)thiophenes	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C2-Benzo(b)thiophenes	**J 3.55** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C3-Benzo(b)thiophenes	**J 2.90** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C4-Benzo(b)thiophenes	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS680R-S1
Date Sampled: 09/25/19 16:11
Percent Solids: 73
Initial Volume: 5.51
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-09
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**10.5** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
2-Methylnaphthalene	**27.1** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
1-Methylnaphthalene	**26.9** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C1-Naphthalenes	**33.0** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C2-Naphthalenes	**57.4** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C3-Naphthalenes	**30.7** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C4-Naphthalenes	**10.8** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
Biphenyl	**14.7** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
Acenaphthylene	**11.5** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
Acenaphthene	**128** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
Dibenzofuran	**6.22** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
Fluorene	**65.2** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C1-Fluorenes	**27.2** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C2-Fluorenes	**14.8** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C3-Fluorenes	**6.10** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
Dibenzothiophene	**22.8** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C1-Dibenzothiophenes	**15.3** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C2-Dibenzothiophenes	**9.81** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C3-Dibenzothiophenes	**J 4.65** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C4-Dibenzothiophenes	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
Phenanthrene	**467** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
Anthracene	**65.0** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C1-Phenanthrenes/Anthracenes	**142** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C2-Phenanthrenes/Anthracenes	**39.8** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C3-Phenanthrenes/Anthracenes	**8.80** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C4-Phenanthrenes/Anthracenes	**J 2.49** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
Retene	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
Benzo(b)naphtho(2,1-d)thiophene	**6.33** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C0-Benzonaphthothiophenes	**11.5** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C1-Benzonaphthothiophenes	**5.61** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C2-Benzonaphthothiophenes	**J 2.80** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C3-Benzonaphthothiophenes	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS680R-S1
Date Sampled: 09/25/19 16:11
Percent Solids: 73
Initial Volume: 5.51
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-09
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
Fluoranthene	**223** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
Pyrene	**319** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C1-Fluoranthenes/Pyrenes	**95.7** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C2-Fluoranthenes/Pyrenes	**18.2** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C3-Fluoranthenes/Pyrenes	**J 4.81** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
Benzo(b)fluorene	**10.9** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
Benzo(c)fluorene	**5.80** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
2-Methylpyrene	**12.6** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
4-Methylpyrene	**10.5** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
1-Methylpyrene	**12.3** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
Benz(a)anthracene	**75.9** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
Chrysene/triphenylene	**63.3** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C1-Benzo(a)anthracenes/Chrysenes	**25.1** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C2-Benzo(a)anthracenes/Chrysenes	**7.76** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C3-Benzo(a)anthracenes/Chrysenes	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C4-Benzo(a)anthracenes/Chrysenes	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
Benzo(b)fluoranthene	**33.9** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
Benzo(j/k)fluoranthene	**50.4** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
Benzo(e)pyrene	**42.3** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
Benzo(a)pyrene	**74.5** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
Perylene	**18.5** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
Indeno(1,2,3-cd)pyrene	**31.2** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
Dibenzo(a,h)anthracene	**6.03** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
Benzo(g,h,i)perylene	**34.1** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
Coronene	**8.70** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
Tetramethyl lead	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
Trimethylethyl lead	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
Dimethyldiethyl lead	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
Methyltriethyl lead	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
Tetraethyl lead	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
2,6,10-trimethyldodecane (1380)	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS680R-S1
Date Sampled: 09/25/19 16:11
Percent Solids: 73
Initial Volume: 5.51
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-09
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	J **4.17** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
2,6,10-trimethylpentadecane (1650)	**15.8** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C-17	B **61.0** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
Pristane	B **35.0** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
C-18	B **45.0** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
Phytane	B **38.7** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
Carbazole	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
2,6-Dimethylnaphthalene	**11.4** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
2,3,5-Trimethylnaphthene	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
4-Methyldibenzothiophene	**6.14** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
2/3-Methyldibenzothiophene	**5.07** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
1-Methyldibenzothiophene	ND (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
3-Methylphenanthrene	**34.9** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
2-Methylphenanthrene	**38.1** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
2-Methylanthracene	**12.8** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
4/9-Methylphenanthrene	**30.6** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104
1-Methylphenanthrene	**23.0** (4.98)	2.49	8270 Mod		1	10/06/19 0:58	F9J0003	FJ90104

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*76 %*		*50-120*
Surrogate: Perylene-d12	*65 %*		*50-120*
Surrogate: Phenanthrene-d10	*80 %*		*50-120*
Surrogate: Toluene-D8	*73 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS680R-S1
Date Sampled: 09/25/19 16:11
Percent Solids: 73

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-09
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**2530** (100)		TOC-LK		1	CCP	10/03/19 19:10	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS690-S5
Date Sampled: 09/25/19 15:23
Percent Solids: 54
Initial Volume: 4.97
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-10
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **64.8** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C1-Benzene	**198** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C2-Benzenes	**94.6** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C3-Benzenes	**63.9** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C4-Benzenes	**71.0** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C5-Benzenes	**36.3** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
Methylcyclohexane	**14.6** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
Toluene	**294** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
Ethylbenzene	**24.9** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
m,p-Xylene	**138** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
Styrene	**29.0** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
o-Xylene	**14.0** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
Isopropylbenzene	ND (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
n-Propylbenzene	J **7.14** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
1,3,5-Trimethylbenzene	**15.5** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
1,2,3-Trimethylbenzene	**10.1** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
1,2,4-Trimethylbenzene	**36.3** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
t-Butylbenzene	ND (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
sec-Butylbenzene	ND (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
p-Isopropyltoluene	**62.1** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
n-Butylbenzene	**12.4** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
trans-Decalin	**10.6** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
cis-Decalin	ND (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C1-Decalins	**26.7** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C2-Decalins	**42.8** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C3-Decalins	**20.8** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C4-Decalins	**23.1** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
Benzo(b)thiophene	**14.4** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C1-Benzo(b)thiophenes	**17.4** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C2-Benzo(b)thiophenes	**28.3** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C3-Benzo(b)thiophenes	**32.5** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C4-Benzo(b)thiophenes	**45.0** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS690-S5
Date Sampled: 09/25/19 15:23
Percent Solids: 54
Initial Volume: 4.97
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-10
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**384** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
2-Methylnaphthalene	**273** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
1-Methylnaphthalene	**155** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C1-Naphthalenes	**267** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C2-Naphthalenes	**409** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C3-Naphthalenes	**443** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C4-Naphthalenes	**280** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
Biphenyl	**90.5** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
Acenaphthylene	**421** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
Acenaphthene	**451** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
Dibenzofuran	**294** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
Fluorene	**578** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C1-Fluorenes	**442** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C2-Fluorenes	**450** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C3-Fluorenes	**425** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
Dibenzothiophene	**351** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C1-Dibenzothiophenes	**329** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C2-Dibenzothiophenes	**328** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C3-Dibenzothiophenes	**212** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C4-Dibenzothiophenes	**135** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
Phenanthrene	**6930** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
Anthracene	**4080** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C1-Phenanthrenes/Anthracenes	**4800** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C2-Phenanthrenes/Anthracenes	**2810** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C3-Phenanthrenes/Anthracenes	**1270** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C4-Phenanthrenes/Anthracenes	**731** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
Retene	**1190** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
Benzo(b)naphtho(2,1-d)thiophene	**1130** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C0-Benzonaphthothiophenes	**2230** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C1-Benzonaphthothiophenes	**815** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C2-Benzonaphthothiophenes	**430** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C3-Benzonaphthothiophenes	**275** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS690-S5
Date Sampled: 09/25/19 15:23
Percent Solids: 54
Initial Volume: 4.97
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-10
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**68.2** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
Fluoranthene	**17700** (149)	74.5	8270 Mod		20	10/07/19 21:43	F9J0003	FJ90104
Pyrene	**17100** (149)	74.5	8270 Mod		20	10/07/19 21:43	F9J0003	FJ90104
C1-Fluoranthenes/Pyrenes	**7570** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C2-Fluoranthenes/Pyrenes	**3110** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C3-Fluoranthenes/Pyrenes	**1400** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
Benzo(b)fluorene	**953** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
Benzo(c)fluorene	**345** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
2-Methylpyrene	**1040** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
4-Methylpyrene	**847** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
1-Methylpyrene	**704** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
Benz(a)anthracene	**10700** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
Chrysene/triphenylene	**11400** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C1-Benzo(a)anthracenes/Chrysenes	**4330** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C2-Benzo(a)anthracenes/Chrysenes	**2030** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C3-Benzo(a)anthracenes/Chrysenes	**979** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C4-Benzo(a)anthracenes/Chrysenes	**450** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
Benzo(b)fluoranthene	**8830** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
Benzo(j/k)fluoranthene	**8270** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
Benzo(e)pyrene	**7200** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
Benzo(a)pyrene	**10200** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
Perylene	**3340** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
Indeno(1,2,3-cd)pyrene	**5600** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
Dibenzo(a,h)anthracene	**1310** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
Benzo(g,h,i)perylene	**5180** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
Coronene	**1030** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
Tetramethyl lead	ND (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
Trimethylethyl lead	ND (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
Dimethyldiethyl lead	ND (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
Methyltriethyl lead	ND (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
Tetraethyl lead	ND (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
2,6,10-trimethyldodecane (1380)	**17.0** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS690-S5
Date Sampled: 09/25/19 15:23
Percent Solids: 54
Initial Volume: 4.97
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-10
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**49.9** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
2,6,10-trimethylpentadecane (1650)	**68.9** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C-17	**305** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
Pristane	**157** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
C-18	**175** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
Phytane	**141** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
Carbazole	**418** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
2,6-Dimethylnaphthalene	**85.3** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
2,3,5-Trimethylnaphthene	**34.9** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
4-Methyldibenzothiophene	**77.0** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
2/3-Methyldibenzothiophene	**111** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
1-Methyldibenzothiophene	**29.3** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
3-Methylphenanthrene	**998** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
2-Methylphenanthrene	**1310** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
2-Methylanthracene	**869** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
4/9-Methylphenanthrene	**1010** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104
1-Methylphenanthrene	**572** (7.45)	3.73	8270 Mod		1	10/06/19 2:19	F9J0003	FJ90104

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*76 %*		*50-120*
Surrogate: Perylene-d12	*89 %*		*50-120*
Surrogate: Phenanthrene-d10	*82 %*		*50-120*
Surrogate: Toluene-D8	*69 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS690-S5
Date Sampled: 09/25/19 15:23
Percent Solids: 54

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-10
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**75600** (97.3)		TOC-LK		1	CCP	10/03/19 22:57	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS693-S3
Date Sampled: 09/25/19 10:53
Percent Solids: 65
Initial Volume: 6.22
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-11
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **22.9** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C1-Benzene	**101** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C2-Benzenes	**72.4** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C3-Benzenes	**81.7** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C4-Benzenes	**65.4** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C5-Benzenes	**32.2** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
Methylcyclohexane	**67.0** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
Toluene	**149** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
Ethylbenzene	**12.6** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
m,p-Xylene	**118** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
Styrene	**12.1** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
o-Xylene	**9.27** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
Isopropylbenzene	J **3.14** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
n-Propylbenzene	**7.43** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
1,3,5-Trimethylbenzene	**49.0** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
1,2,3-Trimethylbenzene	**12.6** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
1,2,4-Trimethylbenzene	**36.4** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
t-Butylbenzene	ND (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
sec-Butylbenzene	ND (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
p-Isopropyltoluene	**56.2** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
n-Butylbenzene	**10.5** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
trans-Decalin	**23.0** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
cis-Decalin	ND (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C1-Decalins	**53.7** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C2-Decalins	**71.1** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C3-Decalins	**59.3** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C4-Decalins	**74.9** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
Benzo(b)thiophene	**12.8** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C1-Benzo(b)thiophenes	**17.4** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C2-Benzo(b)thiophenes	**20.8** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C3-Benzo(b)thiophenes	**15.0** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C4-Benzo(b)thiophenes	**11.1** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS693-S3
Date Sampled: 09/25/19 10:53
Percent Solids: 65
Initial Volume: 6.22
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-11
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**468** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
2-Methylnaphthalene	**401** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
1-Methylnaphthalene	**229** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C1-Naphthalenes	**392** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C2-Naphthalenes	**376** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C3-Naphthalenes	**298** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C4-Naphthalenes	**169** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
Biphenyl	**91.8** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
Acenaphthylene	**126** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
Acenaphthene	**260** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
Dibenzofuran	**136** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
Fluorene	**285** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C1-Fluorenes	**228** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C2-Fluorenes	**229** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C3-Fluorenes	**184** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
Dibenzothiophene	**115** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C1-Dibenzothiophenes	**157** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C2-Dibenzothiophenes	**157** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C3-Dibenzothiophenes	**95.7** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C4-Dibenzothiophenes	**70.3** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
Phenanthrene	**1640** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
Anthracene	**528** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C1-Phenanthrenes/Anthracenes	**1480** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C2-Phenanthrenes/Anthracenes	**992** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C3-Phenanthrenes/Anthracenes	**500** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C4-Phenanthrenes/Anthracenes	**343** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
Retene	**414** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
Benzo(b)naphtho(2,1-d)thiophene	**139** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C0-Benzonaphthothiophenes	**340** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C1-Benzonaphthothiophenes	**280** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C2-Benzonaphthothiophenes	**232** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C3-Benzonaphthothiophenes	**171** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS693-S3
Date Sampled: 09/25/19 10:53
Percent Solids: 65
Initial Volume: 6.22
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-11
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**59.7** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
Fluoranthene	**1920** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
Pyrene	**1980** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C1-Fluoranthenes/Pyrenes	**1790** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C2-Fluoranthenes/Pyrenes	**957** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C3-Fluoranthenes/Pyrenes	**595** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
Benzo(b)fluorene	**230** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
Benzo(c)fluorene	**124** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
2-Methylpyrene	**233** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
4-Methylpyrene	**186** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
1-Methylpyrene	**152** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
Benz(a)anthracene	**1300** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
Chrysene/triphenylene	**1200** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C1-Benzo(a)anthracenes/Chrysenes	**1250** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C2-Benzo(a)anthracenes/Chrysenes	**1050** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C3-Benzo(a)anthracenes/Chrysenes	**683** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C4-Benzo(a)anthracenes/Chrysenes	**404** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
Benzo(b)fluoranthene	**728** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
Benzo(j/k)fluoranthene	**844** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
Benzo(e)pyrene	**644** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
Benzo(a)pyrene	**1010** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
Perylene	**325** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
Indeno(1,2,3-cd)pyrene	**471** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
Dibenzo(a,h)anthracene	**151** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
Benzo(g,h,i)perylene	**422** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
Coronene	**92.4** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
Tetramethyl lead	ND (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
Trimethylethyl lead	ND (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
Dimethyldiethyl lead	ND (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
Methyltriethyl lead	ND (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
Tetraethyl lead	ND (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
2,6,10-trimethyldodecane (1380)	**125** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS693-S3
Date Sampled: 09/25/19 10:53
Percent Solids: 65
Initial Volume: 6.22
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-11
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**240** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
2,6,10-trimethylpentadecane (1650)	**184** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C-17	**416** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
Pristane	**354** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
C-18	**311** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
Phytane	**228** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
Carbazole	**114** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
2,6-Dimethylnaphthalene	**113** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
2,3,5-Trimethylnaphthene	**22.3** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
4-Methyldibenzothiophene	**46.5** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
2/3-Methyldibenzothiophene	**52.1** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
1-Methyldibenzothiophene	**13.8** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
3-Methylphenanthrene	**303** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
2-Methylphenanthrene	**397** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
2-Methylanthracene	**237** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
4/9-Methylphenanthrene	**323** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104
1-Methylphenanthrene	**216** (4.91)	2.45	8270 Mod		1	10/06/19 3:39	F9J0003	FJ90104

	%Recovery	*Qualifier*	*Limits*
Surrogate: Naphthalene-d8	*80 %*		*50-120*
Surrogate: Perylene-d12	*77 %*		*50-120*
Surrogate: Phenanthrene-d10	*84 %*		*50-120*
Surrogate: Toluene-D8	*76 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS693-S3
Date Sampled: 09/25/19 10:53
Percent Solids: 65

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-11
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**40300** (105)		TOC-LK		1	CCP	10/03/19 19:44	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS693-S5
Date Sampled: 09/25/19 11:00
Percent Solids: 71
Initial Volume: 5.98
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-12
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**J 2.86** (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C1-Benzene	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C2-Benzenes	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C3-Benzenes	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C4-Benzenes	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C5-Benzenes	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
Methylcyclohexane	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
Toluene	**J 2.83** (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
Ethylbenzene	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
m,p-Xylene	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
Styrene	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
o-Xylene	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
Isopropylbenzene	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
n-Propylbenzene	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
1,3,5-Trimethylbenzene	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
1,2,3-Trimethylbenzene	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
1,2,4-Trimethylbenzene	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
t-Butylbenzene	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
sec-Butylbenzene	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
p-Isopropyltoluene	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
n-Butylbenzene	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
trans-Decalin	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
cis-Decalin	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C1-Decalins	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C2-Decalins	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C3-Decalins	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C4-Decalins	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
Benzo(b)thiophene	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C1-Benzo(b)thiophenes	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C2-Benzo(b)thiophenes	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C3-Benzo(b)thiophenes	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C4-Benzo(b)thiophenes	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS693-S5
Date Sampled: 09/25/19 11:00
Percent Solids: 71
Initial Volume: 5.98
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-12
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	J **2.78** (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
2-Methylnaphthalene	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
1-Methylnaphthalene	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C1-Naphthalenes	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C2-Naphthalenes	J **3.88** (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C3-Naphthalenes	J **3.38** (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C4-Naphthalenes	J **2.51** (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
Biphenyl	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
Acenaphthylene	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
Acenaphthene	J **3.65** (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
Dibenzofuran	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
Fluorene	J **2.76** (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C1-Fluorenes	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C2-Fluorenes	J **3.06** (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C3-Fluorenes	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
Dibenzothiophene	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C1-Dibenzothiophenes	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C2-Dibenzothiophenes	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C3-Dibenzothiophenes	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C4-Dibenzothiophenes	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
Phenanthrene	**17.4** (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
Anthracene	**6.67** (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C1-Phenanthrenes/Anthracenes	**8.08** (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C2-Phenanthrenes/Anthracenes	J **4.03** (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C3-Phenanthrenes/Anthracenes	J **3.43** (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C4-Phenanthrenes/Anthracenes	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
Retene	**11.9** (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
Benzo(b)naphtho(2,1-d)thiophene	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C0-Benzonaphthothiophenes	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C1-Benzonaphthothiophenes	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C2-Benzonaphthothiophenes	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C3-Benzonaphthothiophenes	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS693-S5
Date Sampled: 09/25/19 11:00
Percent Solids: 71
Initial Volume: 5.98
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-12
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
Fluoranthene	**10.3** (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
Pyrene	**15.9** (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C1-Fluoranthenes/Pyrenes	**8.09** (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C2-Fluoranthenes/Pyrenes	**J 3.16** (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C3-Fluoranthenes/Pyrenes	**J 2.45** (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
Benzo(b)fluorene	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
Benzo(c)fluorene	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
2-Methylpyrene	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
4-Methylpyrene	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
1-Methylpyrene	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
Benz(a)anthracene	**5.59** (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
Chrysene/triphenylene	**6.65** (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C1-Benzo(a)anthracenes/Chrysenes	**J 3.63** (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C2-Benzo(a)anthracenes/Chrysenes	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C3-Benzo(a)anthracenes/Chrysenes	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C4-Benzo(a)anthracenes/Chrysenes	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
Benzo(b)fluoranthene	**J 3.42** (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
Benzo(j/k)fluoranthene	**J 3.86** (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
Benzo(e)pyrene	**J 3.80** (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
Benzo(a)pyrene	**5.35** (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
Perylene	**8.20** (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
Indeno(1,2,3-cd)pyrene	**J 2.48** (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
Dibenzo(a,h)anthracene	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
Benzo(g,h,i)perylene	**J 2.59** (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
Coronene	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
Tetramethyl lead	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
Trimethylethyl lead	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
Dimethyldiethyl lead	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
Methyltriethyl lead	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
Tetraethyl lead	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
2,6,10-trimethyldodecane (1380)	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS693-S5
Date Sampled: 09/25/19 11:00
Percent Solids: 71
Initial Volume: 5.98
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-12
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	J **4.27** (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
2,6,10-trimethylpentadecane (1650)	**14.8** (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C-17	B **60.6** (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
Pristane	B **31.4** (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
C-18	B **46.4** (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
Phytane	B **34.2** (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
Carbazole	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
2,6-Dimethylnaphthalene	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
2,3,5-Trimethylnaphthene	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
4-Methyldibenzothiophene	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
2/3-Methyldibenzothiophene	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
1-Methyldibenzothiophene	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
3-Methylphenanthrene	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
2-Methylphenanthrene	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
2-Methylanthracene	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
4/9-Methylphenanthrene	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104
1-Methylphenanthrene	ND (4.72)	2.36	8270 Mod		1	10/06/19 5:00	F9J0003	FJ90104

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*81 %*		*50-120*
Surrogate: Perylene-d12	*77 %*		*50-120*
Surrogate: Phenanthrene-d10	*85 %*		*50-120*
Surrogate: Toluene-D8	*81 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS693-S5
Date Sampled: 09/25/19 11:00
Percent Solids: 71

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-12
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**3140** (105)		TOC-LK		1	CCP	10/03/19 20:33	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS694-S4
Date Sampled: 09/25/19 14:02
Percent Solids: 64
Initial Volume: 2.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-13
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**1980** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
C1-Benzene	**2220** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
C2-Benzenes	**9660** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
C3-Benzenes	**22200** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
C4-Benzenes	**44400** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
C5-Benzenes	**15000** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
Methylcyclohexane	**199** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
Toluene	**3460** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
Ethylbenzene	**15600** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
m,p-Xylene	**3130** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
Styrene	**3170** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
o-Xylene	**2690** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
Isopropylbenzene	**2510** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
n-Propylbenzene	**782** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
1,3,5-Trimethylbenzene	**3610** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
1,2,3-Trimethylbenzene	**6380** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
1,2,4-Trimethylbenzene	**13600** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
t-Butylbenzene	ND (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
sec-Butylbenzene	**147** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
p-Isopropyltoluene	**4050** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
n-Butylbenzene	ND (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
trans-Decalin	**430** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
cis-Decalin	**153** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
C1-Decalins	**1890** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
C2-Decalins	**3880** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
C3-Decalins	**3460** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
C4-Decalins	**4980** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
Benzo(b)thiophene	**57000** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
C1-Benzo(b)thiophenes	**47600** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
C2-Benzo(b)thiophenes	**42900** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
C3-Benzo(b)thiophenes	**17500** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
C4-Benzo(b)thiophenes	**3840** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS694-S4
Date Sampled: 09/25/19 14:02
Percent Solids: 64
Initial Volume: 2.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-13
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**3740000** (27700)	13800	8270 Mod		2000	10/08/19 4:46	F9J0003	FJ90104
2-Methylnaphthalene	**1630000** (1380)	692	8270 Mod		100	10/08/19 3:22	F9J0003	FJ90104
1-Methylnaphthalene	**1020000** (1380)	692	8270 Mod		100	10/08/19 3:22	F9J0003	FJ90104
C1-Naphthalenes	**1640000** (1380)	692	8270 Mod		100	10/08/19 3:22	F9J0003	FJ90104
C2-Naphthalenes	**816000** (1380)	692	8270 Mod		100	10/08/19 3:22	F9J0003	FJ90104
C3-Naphthalenes	**202000** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
C4-Naphthalenes	**40400** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
Biphenyl	**460000** (1380)	692	8270 Mod		100	10/08/19 3:22	F9J0003	FJ90104
Acenaphthylene	**71500** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
Acenaphthene	**2310000** (1380)	692	8270 Mod		100	10/08/19 3:22	F9J0003	FJ90104
Dibenzofuran	**79000** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
Fluorene	**841000** (1380)	692	8270 Mod		100	10/08/19 3:22	F9J0003	FJ90104
C1-Fluorenes	**180000** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
C2-Fluorenes	**69000** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
C3-Fluorenes	**24200** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
Dibenzothiophene	**268000** (1380)	692	8270 Mod		100	10/08/19 3:22	F9J0003	FJ90104
C1-Dibenzothiophenes	**127000** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
C2-Dibenzothiophenes	**55900** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
C3-Dibenzothiophenes	**17200** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
C4-Dibenzothiophenes	**4500** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
Phenanthrene	**3460000** (27700)	13800	8270 Mod		2000	10/08/19 4:46	F9J0003	FJ90104
Anthracene	**1800000** (1380)	692	8270 Mod		100	10/08/19 3:22	F9J0003	FJ90104
C1-Phenanthrenes/Anthracenes	**961000** (1380)	692	8270 Mod		100	10/08/19 3:22	F9J0003	FJ90104
C2-Phenanthrenes/Anthracenes	**202000** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
C3-Phenanthrenes/Anthracenes	**40500** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
C4-Phenanthrenes/Anthracenes	**10400** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
Retene	**2130** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
Benzo(b)naphtho(2,1-d)thiophene	**57200** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
C0-Benzonaphthothiophenes	**104000** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
C1-Benzonaphthothiophenes	**39500** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
C2-Benzonaphthothiophenes	**12300** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
C3-Benzonaphthothiophenes	**9070** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS694-S4
Date Sampled: 09/25/19 14:02
Percent Solids: 64
Initial Volume: 2.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-13
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**1440** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
Fluoranthene	**1250000** (1380)	692	8270 Mod		100	10/08/19 3:22	F9J0003	FJ90104
Pyrene	**1910000** (1380)	692	8270 Mod		100	10/08/19 3:22	F9J0003	FJ90104
C1-Fluoranthenes/Pyrenes	**655000** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
C2-Fluoranthenes/Pyrenes	**116000** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
C3-Fluoranthenes/Pyrenes	**24500** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
Benzo(b)fluorene	**86400** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
Benzo(c)fluorene	**36400** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
2-Methylpyrene	**86700** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
4-Methylpyrene	**68300** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
1-Methylpyrene	**88300** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
Benz(a)anthracene	**532000** (1380)	692	8270 Mod		100	10/08/19 3:22	F9J0003	FJ90104
Chrysene/triphenylene	**646000** (1380)	692	8270 Mod		100	10/08/19 3:22	F9J0003	FJ90104
C1-Benzo(a)anthracenes/Chrysenes	**157000** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
C2-Benzo(a)anthracenes/Chrysenes	**40600** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
C3-Benzo(a)anthracenes/Chrysenes	**9570** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
C4-Benzo(a)anthracenes/Chrysenes	**4020** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
Benzo(b)fluoranthene	**208000** (1380)	692	8270 Mod		100	10/08/19 3:22	F9J0003	FJ90104
Benzo(j/k)fluoranthene	**310000** (1380)	692	8270 Mod		100	10/08/19 3:22	F9J0003	FJ90104
Benzo(e)pyrene	**276000** (1380)	692	8270 Mod		100	10/08/19 3:22	F9J0003	FJ90104
Benzo(a)pyrene	**530000** (1380)	692	8270 Mod		100	10/08/19 3:22	F9J0003	FJ90104
Perylene	**58800** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
Indeno(1,2,3-cd)pyrene	**206000** (1380)	692	8270 Mod		100	10/08/19 3:22	F9J0003	FJ90104
Dibenzo(a,h)anthracene	**32200** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
Benzo(g,h,i)perylene	**240000** (1380)	692	8270 Mod		100	10/08/19 3:22	F9J0003	FJ90104
Coronene	**44900** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
Tetramethyl lead	ND (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
Trimethylethyl lead	ND (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
Dimethyldiethyl lead	ND (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
Methyltriethyl lead	ND (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
Tetraethyl lead	ND (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
2,6,10-trimethyldodecane (1380)	**4470** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS694-S4
Date Sampled: 09/25/19 14:02
Percent Solids: 64
Initial Volume: 2.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-13
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**7310** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
2,6,10-trimethylpentadecane (1650)	**7730** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
C-17	**906** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
Pristane	**12900** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
C-18	**1040** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
Phytane	**10900** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
Carbazole	**24700** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
2,6-Dimethylnaphthalene	**151000** (1380)	692	8270 Mod		100	10/08/19 3:22	F9J0003	FJ90104
2,3,5-Trimethylnaphthene	**10600** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
4-Methyldibenzothiophene	**51400** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
2/3-Methyldibenzothiophene	**46600** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
1-Methyldibenzothiophene	**10800** (69.2)	34.6	8270 Mod		5	10/06/19 23:14	F9J0003	FJ90104
3-Methylphenanthrene	**238000** (1380)	692	8270 Mod		100	10/08/19 3:22	F9J0003	FJ90104
2-Methylphenanthrene	**257000** (1380)	692	8270 Mod		100	10/08/19 3:22	F9J0003	FJ90104
2-Methylanthracene	**129000** (1380)	692	8270 Mod		100	10/08/19 3:22	F9J0003	FJ90104
4/9-Methylphenanthrene	**186000** (1380)	692	8270 Mod		100	10/08/19 3:22	F9J0003	FJ90104
1-Methylphenanthrene	**139000** (1380)	692	8270 Mod		100	10/08/19 3:22	F9J0003	FJ90104

	%Recovery	*Qualifier*	*Limits*
Surrogate: Naphthalene-d8	*83 %*		*50-120*
Surrogate: Perylene-d12	*136 %*	*SM*	*50-120*
Surrogate: Phenanthrene-d10	*85 %*		*50-120*
Surrogate: Toluene-D8	*83 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS694-S4
Date Sampled: 09/25/19 14:02
Percent Solids: 64

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-13
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**172000** (98.6)		TOC-LK		1	CCP	10/03/19 20:51	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS694-S6
Date Sampled: 09/25/19 14:08
Percent Solids: 72
Initial Volume: 5.6
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-14
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	J **4.82** (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C1-Benzene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C2-Benzenes	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C3-Benzenes	J **2.88** (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C4-Benzenes	J **3.67** (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C5-Benzenes	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
Methylcyclohexane	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
Toluene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
Ethylbenzene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
m,p-Xylene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
Styrene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
o-Xylene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
Isopropylbenzene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
n-Propylbenzene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
1,3,5-Trimethylbenzene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
1,2,3-Trimethylbenzene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
1,2,4-Trimethylbenzene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
t-Butylbenzene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
sec-Butylbenzene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
p-Isopropyltoluene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
n-Butylbenzene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
trans-Decalin	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
cis-Decalin	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C1-Decalins	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C2-Decalins	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C3-Decalins	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C4-Decalins	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
Benzo(b)thiophene	J **3.58** (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C1-Benzo(b)thiophenes	J **4.32** (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C2-Benzo(b)thiophenes	J **3.42** (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C3-Benzo(b)thiophenes	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C4-Benzo(b)thiophenes	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS694-S6
Date Sampled: 09/25/19 14:08
Percent Solids: 72
Initial Volume: 5.6
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-14
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**147** (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
2-Methylnaphthalene	**71.3** (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
1-Methylnaphthalene	**50.8** (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C1-Naphthalenes	**74.8** (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C2-Naphthalenes	**29.2** (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C3-Naphthalenes	**J 3.86** (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C4-Naphthalenes	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
Biphenyl	**14.1** (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
Acenaphthylene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
Acenaphthene	**97.1** (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
Dibenzofuran	**J 4.77** (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
Fluorene	**29.6** (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C1-Fluorenes	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C2-Fluorenes	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C3-Fluorenes	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
Dibenzothiophene	**J 2.57** (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C1-Dibenzothiophenes	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C2-Dibenzothiophenes	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C3-Dibenzothiophenes	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C4-Dibenzothiophenes	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
Phenanthrene	**14.6** (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
Anthracene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C1-Phenanthrenes/Anthracenes	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C2-Phenanthrenes/Anthracenes	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C3-Phenanthrenes/Anthracenes	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C4-Phenanthrenes/Anthracenes	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
Retene	**J 4.27** (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
Benzo(b)naphtho(2,1-d)thiophene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C0-Benzonaphthothiophenes	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C1-Benzonaphthothiophenes	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C2-Benzonaphthothiophenes	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C3-Benzonaphthothiophenes	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS694-S6
Date Sampled: 09/25/19 14:08
Percent Solids: 72
Initial Volume: 5.6
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-14
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
Fluoranthene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
Pyrene	**J 2.91** (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C1-Fluoranthenes/Pyrenes	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C2-Fluoranthenes/Pyrenes	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C3-Fluoranthenes/Pyrenes	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
Benzo(b)fluorene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
Benzo(c)fluorene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
2-Methylpyrene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
4-Methylpyrene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
1-Methylpyrene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
Benz(a)anthracene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
Chrysene/triphenylene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C1-Benzo(a)anthracenes/Chrysenes	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C2-Benzo(a)anthracenes/Chrysenes	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C3-Benzo(a)anthracenes/Chrysenes	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C4-Benzo(a)anthracenes/Chrysenes	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
Benzo(b)fluoranthene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
Benzo(j/k)fluoranthene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
Benzo(e)pyrene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
Benzo(a)pyrene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
Perylene	**5.29** (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
Indeno(1,2,3-cd)pyrene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
Dibenzo(a,h)anthracene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
Benzo(g,h,i)perylene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
Coronene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
Tetramethyl lead	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
Trimethylethyl lead	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
Dimethyldiethyl lead	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
Methyltriethyl lead	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
Tetraethyl lead	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
2,6,10-trimethyldodecane (1380)	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS694-S6
Date Sampled: 09/25/19 14:08
Percent Solids: 72
Initial Volume: 5.6
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-14
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	J **3.84** (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
2,6,10-trimethylpentadecane (1650)	**15.4** (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C-17	B **57.6** (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
Pristane	B **33.2** (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
C-18	B **44.0** (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
Phytane	B **37.9** (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
Carbazole	J **3.01** (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
2,6-Dimethylnaphthalene	**5.56** (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
2,3,5-Trimethylnaphthene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
4-Methyldibenzothiophene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
2/3-Methyldibenzothiophene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
1-Methyldibenzothiophene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
3-Methylphenanthrene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
2-Methylphenanthrene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
2-Methylanthracene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
4/9-Methylphenanthrene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104
1-Methylphenanthrene	ND (4.93)	2.46	8270 Mod		1	10/06/19 6:21	F9J0003	FJ90104

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*84 %*		*50-120*
Surrogate: Perylene-d12	*83 %*		*50-120*
Surrogate: Phenanthrene-d10	*87 %*		*50-120*
Surrogate: Toluene-D8	*81 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS694-S6
Date Sampled: 09/25/19 14:08
Percent Solids: 72

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-14
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**3190** (96.3)		TOC-LK		1	CCP	10/03/19 21:08	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS695-S6
Date Sampled: 09/25/19 13:20
Percent Solids: 76
Initial Volume: 5.44
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-15
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **7.38** (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C1-Benzene	**15.6** (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C2-Benzenes	**13.8** (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C3-Benzenes	**5.37** (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C4-Benzenes	**6.37** (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C5-Benzenes	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
Methylcyclohexane	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
Toluene	**22.4** (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
Ethylbenzene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
m,p-Xylene	**21.5** (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
Styrene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
o-Xylene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
Isopropylbenzene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
n-Propylbenzene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
1,3,5-Trimethylbenzene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
1,2,3-Trimethylbenzene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
1,2,4-Trimethylbenzene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
t-Butylbenzene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
sec-Butylbenzene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
p-Isopropyltoluene	**6.69** (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
n-Butylbenzene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
trans-Decalin	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
cis-Decalin	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C1-Decalins	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C2-Decalins	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C3-Decalins	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C4-Decalins	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
Benzo(b)thiophene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C1-Benzo(b)thiophenes	J **2.74** (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C2-Benzo(b)thiophenes	J **2.45** (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C3-Benzo(b)thiophenes	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C4-Benzo(b)thiophenes	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS695-S6
Date Sampled: 09/25/19 13:20
Percent Solids: 76
Initial Volume: 5.44
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-15
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**8.06** (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
2-Methylnaphthalene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
1-Methylnaphthalene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C1-Naphthalenes	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C2-Naphthalenes	**J 3.93** (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C3-Naphthalenes	**J 3.18** (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C4-Naphthalenes	**J 2.73** (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
Biphenyl	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
Acenaphthylene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
Acenaphthene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
Dibenzofuran	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
Fluorene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C1-Fluorenes	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C2-Fluorenes	**J 3.89** (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C3-Fluorenes	**J 2.80** (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
Dibenzothiophene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C1-Dibenzothiophenes	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C2-Dibenzothiophenes	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C3-Dibenzothiophenes	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C4-Dibenzothiophenes	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
Phenanthrene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
Anthracene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C1-Phenanthrenes/Anthracenes	**J 4.01** (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C2-Phenanthrenes/Anthracenes	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C3-Phenanthrenes/Anthracenes	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C4-Phenanthrenes/Anthracenes	**J 4.00** (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
Retene	**12.4** (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
Benzo(b)naphtho(2,1-d)thiophene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C0-Benzonaphthothiophenes	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C1-Benzonaphthothiophenes	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C2-Benzonaphthothiophenes	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C3-Benzonaphthothiophenes	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS695-S6
Date Sampled: 09/25/19 13:20
Percent Solids: 76
Initial Volume: 5.44
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-15
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
Fluoranthene	**J 2.67** (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
Pyrene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C1-Fluoranthenes/Pyrenes	**J 3.03** (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C2-Fluoranthenes/Pyrenes	**J 4.10** (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C3-Fluoranthenes/Pyrenes	**J 3.52** (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
Benzo(b)fluorene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
Benzo(c)fluorene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
2-Methylpyrene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
4-Methylpyrene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
1-Methylpyrene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
Benz(a)anthracene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
Chrysene/triphenylene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C1-Benzo(a)anthracenes/Chrysenes	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C2-Benzo(a)anthracenes/Chrysenes	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C3-Benzo(a)anthracenes/Chrysenes	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C4-Benzo(a)anthracenes/Chrysenes	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
Benzo(b)fluoranthene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
Benzo(j/k)fluoranthene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
Benzo(e)pyrene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
Benzo(a)pyrene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
Perylene	**620** (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
Indeno(1,2,3-cd)pyrene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
Dibenzo(a,h)anthracene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
Benzo(g,h,i)perylene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
Coronene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
Tetramethyl lead	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
Trimethylethyl lead	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
Dimethyldiethyl lead	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
Methyltriethyl lead	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
Tetraethyl lead	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
2,6,10-trimethyldodecane (1380)	**J 2.53** (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS695-S6
Date Sampled: 09/25/19 13:20
Percent Solids: 76
Initial Volume: 5.44
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-15
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**8.83** (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
2,6,10-trimethylpentadecane (1650)	**19.0** (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C-17	**B 91.8** (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
Pristane	**B 40.8** (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
C-18	**B 57.1** (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
Phytane	**B 51.6** (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
Carbazole	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
2,6-Dimethylnaphthalene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
2,3,5-Trimethylnaphthene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
4-Methyldibenzothiophene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
2/3-Methyldibenzothiophene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
1-Methyldibenzothiophene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
3-Methylphenanthrene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
2-Methylphenanthrene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
2-Methylanthracene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
4/9-Methylphenanthrene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104
1-Methylphenanthrene	ND (4.87)	2.43	8270 Mod		1	10/06/19 7:43	F9J0003	FJ90104

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*85 %*		*50-120*
Surrogate: Perylene-d12	*91 %*		*50-120*
Surrogate: Phenanthrene-d10	*91 %*		*50-120*
Surrogate: Toluene-D8	*75 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS695-S6
Date Sampled: 09/25/19 13:20
Percent Solids: 76

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-15
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**16600** (92.3)		TOC-LK		1	CCP	10/03/19 21:25	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS696-S3
Date Sampled: 09/25/19 16:47
Percent Solids: 41
Initial Volume: 3.97
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-16
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**113** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C1-Benzene	**313** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C2-Benzenes	**300** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C3-Benzenes	**157** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C4-Benzenes	**684** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C5-Benzenes	**616** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
Methylcyclohexane	**21.4** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
Toluene	**466** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
Ethylbenzene	**50.5** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
m,p-Xylene	**480** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
Styrene	**128** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
o-Xylene	**43.0** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
Isopropylbenzene	**12.6** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
n-Propylbenzene	**37.6** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
1,3,5-Trimethylbenzene	**28.3** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
1,2,3-Trimethylbenzene	**37.4** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
1,2,4-Trimethylbenzene	**85.7** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
t-Butylbenzene	**J 7.65** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
sec-Butylbenzene	**15.0** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
p-Isopropyltoluene	**30.8** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
n-Butylbenzene	**122** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
trans-Decalin	**3730** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
cis-Decalin	**373** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C1-Decalins	**3430** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C2-Decalins	**1050** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C3-Decalins	**575** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C4-Decalins	**1010** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
Benzo(b)thiophene	**33.5** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C1-Benzo(b)thiophenes	**75.3** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C2-Benzo(b)thiophenes	**160** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C3-Benzo(b)thiophenes	**119** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C4-Benzo(b)thiophenes	**146** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS696-S3
Date Sampled: 09/25/19 16:47
Percent Solids: 41
Initial Volume: 3.97
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-16
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**1100** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
2-Methylnaphthalene	**385** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
1-Methylnaphthalene	**1060** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C1-Naphthalenes	**872** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C2-Naphthalenes	**1880** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C3-Naphthalenes	**1580** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C4-Naphthalenes	**1010** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
Biphenyl	**281** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
Acenaphthylene	**720** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
Acenaphthene	**3110** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
Dibenzofuran	**301** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
Fluorene	**2000** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C1-Fluorenes	**925** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C2-Fluorenes	**845** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C3-Fluorenes	**908** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
Dibenzothiophene	**786** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C1-Dibenzothiophenes	**816** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C2-Dibenzothiophenes	**1010** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C3-Dibenzothiophenes	**852** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C4-Dibenzothiophenes	**534** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
Phenanthrene	**8660** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
Anthracene	**3030** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C1-Phenanthrenes/Anthracenes	**5270** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C2-Phenanthrenes/Anthracenes	**2990** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C3-Phenanthrenes/Anthracenes	**1440** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C4-Phenanthrenes/Anthracenes	**669** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
Retene	**203** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
Benzo(b)naphtho(2,1-d)thiophene	**685** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C0-Benzonaphthothiophenes	**1260** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C1-Benzonaphthothiophenes	**831** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C2-Benzonaphthothiophenes	**739** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C3-Benzonaphthothiophenes	**588** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS696-S3
Date Sampled: 09/25/19 16:47
Percent Solids: 41
Initial Volume: 3.97
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-16
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**306** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
Fluoranthene	**9810** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
Pyrene	**11300** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C1-Fluoranthenes/Pyrenes	**5580** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C2-Fluoranthenes/Pyrenes	**2460** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C3-Fluoranthenes/Pyrenes	**1130** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
Benzo(b)fluorene	**599** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
Benzo(c)fluorene	**313** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
2-Methylpyrene	**801** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
4-Methylpyrene	**711** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
1-Methylpyrene	**642** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
Benz(a)anthracene	**4630** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
Chrysene/triphenylene	**4950** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C1-Benzo(a)anthracenes/Chrysenes	**2630** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C2-Benzo(a)anthracenes/Chrysenes	**1450** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C3-Benzo(a)anthracenes/Chrysenes	**746** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C4-Benzo(a)anthracenes/Chrysenes	**364** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
Benzo(b)fluoranthene	**3300** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
Benzo(j/k)fluoranthene	**3530** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
Benzo(e)pyrene	**3160** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
Benzo(a)pyrene	**4600** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
Perylene	**1470** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
Indeno(1,2,3-cd)pyrene	**2450** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
Dibenzo(a,h)anthracene	**579** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
Benzo(g,h,i)perylene	**2460** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
Coronene	**586** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
Tetramethyl lead	ND (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
Trimethylethyl lead	ND (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
Dimethyldiethyl lead	ND (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
Methyltriethyl lead	ND (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
Tetraethyl lead	ND (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
2,6,10-trimethyldodecane (1380)	**799** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS696-S3
Date Sampled: 09/25/19 16:47
Percent Solids: 41
Initial Volume: 3.97
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-16
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**1360** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
2,6,10-trimethylpentadecane (1650)	**1160** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C-17	**516** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
Pristane	**3330** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
C-18	**317** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
Phytane	**2520** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
Carbazole	**353** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
2,6-Dimethylnaphthalene	**370** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
2,3,5-Trimethylnaphthene	**107** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
4-Methyldibenzothiophene	**297** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
2/3-Methyldibenzothiophene	**292** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
1-Methyldibenzothiophene	**96.9** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
3-Methylphenanthrene	**1260** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
2-Methylphenanthrene	**1450** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
2-Methylanthracene	**603** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
4/9-Methylphenanthrene	**1280** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104
1-Methylphenanthrene	**646** (12.2)	6.11	8270 Mod		1	10/06/19 13:14	F9J0003	FJ90104

	%Recovery	*Qualifier*	*Limits*
Surrogate: Naphthalene-d8	*78 %*		*50-120*
Surrogate: Perylene-d12	*78 %*		*50-120*
Surrogate: Phenanthrene-d10	*83 %*		*50-120*
Surrogate: Toluene-D8	*73 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS696-S3
Date Sampled: 09/25/19 16:47
Percent Solids: 41

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-16
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**54600** (94.8)		TOC-LK		1	CCP	10/03/19 21:41	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS696-S5
Date Sampled: 09/25/19 16:54
Percent Solids: 56
Initial Volume: 5.29
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-17
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**305** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
C1-Benzene	**1010** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
C2-Benzenes	**1690** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
C3-Benzenes	**4100** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
C4-Benzenes	**7690** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
C5-Benzenes	**3940** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
Methylcyclohexane	ND (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
Toluene	**1530** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
Ethylbenzene	**1810** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
m,p-Xylene	**1340** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
Styrene	**1010** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
o-Xylene	**378** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
Isopropylbenzene	**367** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
n-Propylbenzene	**240** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
1,3,5-Trimethylbenzene	**827** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
1,2,3-Trimethylbenzene	**1080** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
1,2,4-Trimethylbenzene	**2600** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
t-Butylbenzene	ND (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
sec-Butylbenzene	**52.8** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
p-Isopropyltoluene	**1020** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
n-Butylbenzene	ND (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
trans-Decalin	**359** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
cis-Decalin	**127** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
C1-Decalins	**1350** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
C2-Decalins	**2660** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
C3-Decalins	**2760** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
C4-Decalins	**5000** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
Benzo(b)thiophene	**1480** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
C1-Benzo(b)thiophenes	**2620** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
C2-Benzo(b)thiophenes	**4570** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
C3-Benzo(b)thiophenes	**3830** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
C4-Benzo(b)thiophenes	**1420** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS696-S5
Date Sampled: 09/25/19 16:54
Percent Solids: 56
Initial Volume: 5.29
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-17
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**115000** (677)	338	8270 Mod		100	10/08/19 6:11	F9J0003	FJ90104
2-Methylnaphthalene	**13200** (677)	338	8270 Mod		100	10/08/19 6:11	F9J0003	FJ90104
1-Methylnaphthalene	**93400** (677)	338	8270 Mod		100	10/08/19 6:11	F9J0003	FJ90104
C1-Naphthalenes	**63100** (677)	338	8270 Mod		100	10/08/19 6:11	F9J0003	FJ90104
C2-Naphthalenes	**112000** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
C3-Naphthalenes	**64200** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
C4-Naphthalenes	**24300** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
Biphenyl	**29800** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
Acenaphthylene	**14700** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
Acenaphthene	**204000** (677)	338	8270 Mod		100	10/08/19 6:11	F9J0003	FJ90104
Dibenzofuran	**9890** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
Fluorene	**101000** (677)	338	8270 Mod		100	10/08/19 6:11	F9J0003	FJ90104
C1-Fluorenes	**43800** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
C2-Fluorenes	**29200** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
C3-Fluorenes	**13900** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
Dibenzothiophene	**30100** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
C1-Dibenzothiophenes	**26700** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
C2-Dibenzothiophenes	**20400** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
C3-Dibenzothiophenes	**9720** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
C4-Dibenzothiophenes	**3490** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
Phenanthrene	**487000** (677)	338	8270 Mod		100	10/08/19 6:11	F9J0003	FJ90104
Anthracene	**136000** (677)	338	8270 Mod		100	10/08/19 6:11	F9J0003	FJ90104
C1-Phenanthrenes/Anthracenes	**184000** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
C2-Phenanthrenes/Anthracenes	**83000** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
C3-Phenanthrenes/Anthracenes	**26900** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
C4-Phenanthrenes/Anthracenes	**8680** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
Retene	**1640** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
Benzo(b)naphtho(2,1-d)thiophene	**11600** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
C0-Benzonaphthothiophenes	**20600** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
C1-Benzonaphthothiophenes	**11200** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
C2-Benzonaphthothiophenes	**5440** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
C3-Benzonaphthothiophenes	**3070** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS696-S5
Date Sampled: 09/25/19 16:54
Percent Solids: 56
Initial Volume: 5.29
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-17
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**593** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
Fluoranthene	**280000** (677)	338	8270 Mod		100	10/08/19 6:11	F9J0003	FJ90104
Pyrene	**383000** (677)	338	8270 Mod		100	10/08/19 6:11	F9J0003	FJ90104
C1-Fluoranthenes/Pyrenes	**150000** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
C2-Fluoranthenes/Pyrenes	**40200** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
C3-Fluoranthenes/Pyrenes	**13400** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
Benzo(b)fluorene	**18200** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
Benzo(c)fluorene	**7260** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
2-Methylpyrene	**20000** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
4-Methylpyrene	**16800** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
1-Methylpyrene	**18300** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
Benz(a)anthracene	**111000** (677)	338	8270 Mod		100	10/08/19 6:11	F9J0003	FJ90104
Chrysene/triphenylene	**118000** (677)	338	8270 Mod		100	10/08/19 6:11	F9J0003	FJ90104
C1-Benzo(a)anthracenes/Chrysenes	**43000** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
C2-Benzo(a)anthracenes/Chrysenes	**16500** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
C3-Benzo(a)anthracenes/Chrysenes	**5220** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
C4-Benzo(a)anthracenes/Chrysenes	**1890** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
Benzo(b)fluoranthene	**37100** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
Benzo(j/k)fluoranthene	**40700** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
Benzo(e)pyrene	**37700** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
Benzo(a)pyrene	**61600** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
Perylene	**10100** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
Indeno(1,2,3-cd)pyrene	**25900** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
Dibenzo(a,h)anthracene	**5700** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
Benzo(g,h,i)perylene	**27300** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
Coronene	**7520** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
Tetramethyl lead	ND (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
Trimethylethyl lead	ND (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
Dimethyldiethyl lead	ND (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
Methyltriethyl lead	ND (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
Tetraethyl lead	ND (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
2,6,10-trimethyldodecane (1380)	**3360** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS696-S5
Date Sampled: 09/25/19 16:54
Percent Solids: 56
Initial Volume: 5.29
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-17
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**6870** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
2,6,10-trimethylpentadecane (1650)	**10400** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
C-17	**1980** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
Pristane	**22900** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
C-18	**1580** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
Phytane	**20400** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
Carbazole	**1570** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
2,6-Dimethylnaphthalene	**21900** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
2,3,5-Trimethylnaphthene	**4600** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
4-Methyldibenzothiophene	**11700** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
2/3-Methyldibenzothiophene	**9250** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
1-Methyldibenzothiophene	**2490** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
3-Methylphenanthrene	**42000** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
2-Methylphenanthrene	**46300** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
2-Methylanthracene	**20700** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
4/9-Methylphenanthrene	**42000** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104
1-Methylphenanthrene	**31100** (33.8)	16.9	8270 Mod		5	10/07/19 0:41	F9J0003	FJ90104

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*79 %*		*50-120*
Surrogate: Perylene-d12	*78 %*		*50-120*
Surrogate: Phenanthrene-d10	*77 %*		*50-120*
Surrogate: Toluene-D8	*68 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS696-S5
Date Sampled: 09/25/19 16:54
Percent Solids: 56

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-17
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**91600** (95.6)		TOC-LK		1	CCP	10/03/19 22:31	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS697-S2
Date Sampled: 09/25/19 17:14
Percent Solids: 64
Initial Volume: 4.93
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-18
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**89.6** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
C1-Benzene	**251** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
C2-Benzenes	**224** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
C3-Benzenes	**131** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
C4-Benzenes	**336** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
C5-Benzenes	**327** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
Methylcyclohexane	**J 17.4** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
Toluene	**369** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
Ethylbenzene	**46.8** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
m,p-Xylene	**326** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
Styrene	**216** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
o-Xylene	**35.3** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
Isopropylbenzene	ND (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
n-Propylbenzene	**J 23.5** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
1,3,5-Trimethylbenzene	**J 23.1** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
1,2,3-Trimethylbenzene	**J 25.3** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
1,2,4-Trimethylbenzene	**67.2** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
t-Butylbenzene	ND (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
sec-Butylbenzene	ND (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
p-Isopropyltoluene	**J 26.8** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
n-Butylbenzene	**54.0** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
trans-Decalin	**1170** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
cis-Decalin	**140** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
C1-Decalins	**1460** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
C2-Decalins	**807** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
C3-Decalins	**525** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
C4-Decalins	**1070** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
Benzo(b)thiophene	**280** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
C1-Benzo(b)thiophenes	**248** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
C2-Benzo(b)thiophenes	**413** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
C3-Benzo(b)thiophenes	**348** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
C4-Benzo(b)thiophenes	**259** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS697-S2
Date Sampled: 09/25/19 17:14
Percent Solids: 64
Initial Volume: 4.93
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-18
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**8100** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
2-Methylnaphthalene	**3220** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
1-Methylnaphthalene	**2310** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
C1-Naphthalenes	**3430** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
C2-Naphthalenes	**5580** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
C3-Naphthalenes	**7090** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
C4-Naphthalenes	**4200** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
Biphenyl	**1060** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
Acenaphthylene	**1650** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
Acenaphthene	**19300** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
Dibenzofuran	**8350** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
Fluorene	**15000** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
C1-Fluorenes	**3310** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
C2-Fluorenes	**2980** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
C3-Fluorenes	**3500** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
Dibenzothiophene	**5640** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
C1-Dibenzothiophenes	**3170** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
C2-Dibenzothiophenes	**2510** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
C3-Dibenzothiophenes	**1330** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
C4-Dibenzothiophenes	**605** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
Phenanthrene	**90000** (127)	63.6	8270 Mod		20	10/07/19 23:09	F9J0003	FJ90104
Anthracene	**25500** (127)	63.6	8270 Mod		20	10/07/19 23:09	F9J0003	FJ90104
C1-Phenanthrenes/Anthracenes	**24300** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
C2-Phenanthrenes/Anthracenes	**10700** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
C3-Phenanthrenes/Anthracenes	**3770** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
C4-Phenanthrenes/Anthracenes	**1320** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
Retene	**252** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
Benzo(b)naphtho(2,1-d)thiophene	**5010** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
C0-Benzonaphthothiophenes	**8960** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
C1-Benzonaphthothiophenes	**3380** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
C2-Benzonaphthothiophenes	**1780** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
C3-Benzonaphthothiophenes	**1010** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS697-S2
Date Sampled: 09/25/19 17:14
Percent Solids: 64
Initial Volume: 4.93
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-18
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**328** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
Fluoranthene	**87500** (127)	63.6	8270 Mod		20	10/07/19 23:09	F9J0003	FJ90104
Pyrene	**73000** (127)	63.6	8270 Mod		20	10/07/19 23:09	F9J0003	FJ90104
C1-Fluoranthenes/Pyrenes	**26500** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
C2-Fluoranthenes/Pyrenes	**12300** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
C3-Fluoranthenes/Pyrenes	**4810** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
Benzo(b)fluorene	**4170** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
Benzo(c)fluorene	**1600** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
2-Methylpyrene	**3340** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
4-Methylpyrene	**2300** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
1-Methylpyrene	**2140** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
Benz(a)anthracene	**34400** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
Chrysene/triphenylene	**31900** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
C1-Benzo(a)anthracenes/Chrysenes	**12400** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
C2-Benzo(a)anthracenes/Chrysenes	**5490** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
C3-Benzo(a)anthracenes/Chrysenes	**2670** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
C4-Benzo(a)anthracenes/Chrysenes	**1300** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
Benzo(b)fluoranthene	**24800** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
Benzo(j/k)fluoranthene	**24700** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
Benzo(e)pyrene	**18600** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
Benzo(a)pyrene	**30400** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
Perylene	**7630** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
Indeno(1,2,3-cd)pyrene	**17100** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
Dibenzo(a,h)anthracene	**4010** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
Benzo(g,h,i)perylene	**15100** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
Coronene	**3590** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
Tetramethyl lead	ND (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
Trimethylethyl lead	ND (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
Dimethyldiethyl lead	ND (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
Methyltriethyl lead	ND (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
Tetraethyl lead	ND (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
2,6,10-trimethyldodecane (1380)	**1380** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS697-S2
Date Sampled: 09/25/19 17:14
Percent Solids: 64
Initial Volume: 4.93
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-18
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/1/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**2080** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
2,6,10-trimethylpentadecane (1650)	**1900** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
C-17	**470** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
Pristane	**4510** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
C-18	**459** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
Phytane	**2640** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
Carbazole	**11900** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
2,6-Dimethylnaphthalene	**844** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
2,3,5-Trimethylnaphthene	**502** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
4-Methyldibenzothiophene	**1060** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
2/3-Methyldibenzothiophene	**1160** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
1-Methyldibenzothiophene	**270** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
3-Methylphenanthrene	**5680** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
2-Methylphenanthrene	**7260** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
2-Methylanthracene	**3160** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
4/9-Methylphenanthrene	**4690** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104
1-Methylphenanthrene	**3510** (31.8)	15.9	8270 Mod		5	10/06/19 14:37	F9J0003	FJ90104

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*85 %*		*50-120*
Surrogate: Perylene-d12	*93 %*		*50-120*
Surrogate: Phenanthrene-d10	*92 %*		*50-120*
Surrogate: Toluene-D8	*80 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS697-S2
Date Sampled: 09/25/19 17:14
Percent Solids: 64

ESS Laboratory Work Order: F190048
ESS Laboratory Sample ID: F190048-18
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**70800** (102)		TOC-LK		1	CCP	10/03/19 22:48	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190048

Quality Control Data

Classical Chemistry

Batch CJ90245 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	100	mg/kg							
Total Organic Carbon (2)	ND	100	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190048

Quality Control Data

Classical Chemistry

Batch CJ90245 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9560	100	mg/kg	10000		96	80-120			
Total Organic Carbon (2)	9570	100	mg/kg	10000		96	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190048

Quality Control Data

Classical Chemistry

Batch CJ90245 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9540	100	mg/kg	10000		95	80-120	0.2	20	
Total Organic Carbon (2)	9910	100	mg/kg	10000		99	80-120	3	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190048

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FJ90104 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	10.9	4.00	ug/Kg wet							
C1-Benzene	ND	4.00	ug/Kg wet							
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	ND	4.00	ug/Kg wet							
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	ND	4.00	ug/Kg wet							
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190048

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FJ90104 - 3570

C1-Fluorenes	ND	4.00	ug/Kg wet
C2-Fluorenes	ND	4.00	ug/Kg wet
C3-Fluorenes	ND	4.00	ug/Kg wet
Dibenzothiophene	ND	4.00	ug/Kg wet
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet
Phenanthrene	ND	4.00	ug/Kg wet
Anthracene	ND	4.00	ug/Kg wet
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
Retene	ND	4.00	ug/Kg wet
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
Fluoranthene	ND	4.00	ug/Kg wet
Pyrene	ND	4.00	ug/Kg wet
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
Benzo(b)fluorene	ND	4.00	ug/Kg wet
Benzo(c)fluorene	ND	4.00	ug/Kg wet
2-Methylpyrene	ND	4.00	ug/Kg wet
4-Methylpyrene	ND	4.00	ug/Kg wet
1-Methylpyrene	ND	4.00	ug/Kg wet
Benz(a)anthracene	ND	4.00	ug/Kg wet
Chrysene/triphenylene	ND	4.00	ug/Kg wet
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet
Benzo(e)pyrene	ND	4.00	ug/Kg wet
Benzo(a)pyrene	ND	4.00	ug/Kg wet
Perylene	ND	4.00	ug/Kg wet
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet
Coronene	ND	4.00	ug/Kg wet
Tetramethyl lead	ND	4.00	ug/Kg wet
Trimethylethyl lead	ND	4.00	ug/Kg wet

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190048

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FJ90104 - 3570							
Dimethyldiethyl lead	ND	4.00	ug/Kg wet				
Methyltriethyl lead	ND	4.00	ug/Kg wet				
Tetraethyl lead	ND	4.00	ug/Kg wet				
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet				
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet				
2,6,10-trimethylpentadecane (1650)	2.74	4.00	ug/Kg wet				J
C-17	10.6	4.00	ug/Kg wet				
Pristane	6.78	4.00	ug/Kg wet				
C-18	6.31	4.00	ug/Kg wet				
Phytane	6.35	4.00	ug/Kg wet				
Carbazole	ND	4.00	ug/Kg wet				
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet				
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet				
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
3-Methylphenanthrene	ND	4.00	ug/Kg wet				
2-Methylphenanthrene	ND	4.00	ug/Kg wet				
2-Methylanthracene	ND	4.00	ug/Kg wet				
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet				
1-Methylphenanthrene	ND	4.00	ug/Kg wet				
Surrogate: Naphthalene-d8	*348*		ug/Kg wet	*400.0*	*87*	*50-120*	
Surrogate: Perylene-d12	*345*		ug/Kg wet	*400.0*	*86*	*50-120*	
Surrogate: Phenanthrene-d10	*364*		ug/Kg wet	*400.0*	*91*	*50-120*	
Surrogate: Toluene-D8	*348*		ug/Kg wet	*400.0*	*87*	*50-120*	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190048

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FJ90104 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	327	4.00	ug/Kg wet	400.0		82	60-130			
Methylcyclohexane	246	4.00	ug/Kg wet	400.0		61	60-130			
Toluene	395	4.00	ug/Kg wet	400.0		99	60-130			
Ethylbenzene	397	4.00	ug/Kg wet	400.0		99	60-130			
m,p-Xylene	394	4.00	ug/Kg wet	400.0		99	60-130			
Styrene	384	4.00	ug/Kg wet	400.0		96	60-130			
o-Xylene	400	4.00	ug/Kg wet	400.0		100	60-130			
Isopropylbenzene	398	4.00	ug/Kg wet	400.0		100	60-130			
n-Propylbenzene	399	4.00	ug/Kg wet	400.0		100	60-130			
1,3,5-Trimethylbenzene	399	4.00	ug/Kg wet	400.0		100	60-130			
1,2,3-Trimethylbenzene	408	4.00	ug/Kg wet	400.0		102	60-130			
1,2,4-Trimethylbenzene	406	4.00	ug/Kg wet	400.0		102	60-130			
t-Butylbenzene	404	4.00	ug/Kg wet	400.0		101	60-130			
sec-Butylbenzene	400	4.00	ug/Kg wet	400.0		100	60-130			
p-Isopropyltoluene	415	4.00	ug/Kg wet	400.0		104	60-130			
n-Butylbenzene	391	4.00	ug/Kg wet	400.0		98	60-130			
trans-Decalin	388	4.00	ug/Kg wet	400.0		97	60-130			
cis-Decalin	385	4.00	ug/Kg wet	400.0		96	60-130			
Benzo(b)thiophene	385	4.00	ug/Kg wet	400.0		96	60-130			
Naphthalene	395	4.00	ug/Kg wet	400.0		99	60-130			
2-Methylnaphthalene	386	4.00	ug/Kg wet	400.0		97	60-130			
1-Methylnaphthalene	389	4.00	ug/Kg wet	400.0		97	60-130			
Biphenyl	397	4.00	ug/Kg wet	400.0		99	60-130			
Acenaphthylene	370	4.00	ug/Kg wet	400.0		92	60-130			
Acenaphthene	394	4.00	ug/Kg wet	400.0		98	60-130			
Dibenzofuran	400	4.00	ug/Kg wet	400.0		100	60-130			
Fluorene	388	4.00	ug/Kg wet	400.0		97	60-130			
Dibenzothiophene	396	4.00	ug/Kg wet	400.0		99	60-130			
Phenanthrene	404	4.00	ug/Kg wet	400.0		101	60-130			
Anthracene	293	4.00	ug/Kg wet	400.0		73	60-130			
Retene	384	4.00	ug/Kg wet	400.0		96	60-130			
Benzo(b)naphtho(2,1-d)thiophene	383	4.00	ug/Kg wet	400.0		96	60-130			
Fluoranthene	396	4.00	ug/Kg wet	400.0		99	60-130			
Pyrene	396	4.00	ug/Kg wet	400.0		99	60-130			
Benz(a)anthracene	370	4.00	ug/Kg wet	400.0		92	60-130			
Chrysene/triphenylene	401	4.00	ug/Kg wet	400.0		100	60-130			
Benzo(b)fluoranthene	390	4.00	ug/Kg wet	400.0		98	60-130			
Benzo(j/k)fluoranthene	391	4.00	ug/Kg wet	400.0		98	60-130			
Benzo(e)pyrene	397	4.00	ug/Kg wet	400.0		99	60-130			
Benzo(a)pyrene	362	4.00	ug/Kg wet	400.0		90	60-130			
Perylene	376	4.00	ug/Kg wet	400.0		94	60-130			
Indeno(1,2,3-cd)pyrene	387	4.00	ug/Kg wet	400.0		97	60-130			
Dibenzo(a,h)anthracene	395	4.00	ug/Kg wet	400.0		99	60-130			
Benzo(g,h,i)perylene	406	4.00	ug/Kg wet	400.0		102	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190048

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FJ90104 - 3570						
Coronene	423	4.00	ug/Kg wet	400.0	106	60-130
Tetraethyl lead	306	4.00	ug/Kg wet	400.0	76	60-130
Pristane	380	4.00	ug/Kg wet	400.0	95	60-130
Phytane	366	4.00	ug/Kg wet	400.0	92	60-130
Surrogate: Naphthalene-d8	*362*		ug/Kg wet	*400.0*	*90*	*50-120*
Surrogate: Perylene-d12	*350*		ug/Kg wet	*400.0*	*87*	*50-120*
Surrogate: Phenanthrene-d10	*381*		ug/Kg wet	*400.0*	*95*	*50-120*
Surrogate: Toluene-D8	*349*		ug/Kg wet	*400.0*	*87*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190048

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FJ90104 - 3570

Duplicate **Source: F190048-18**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	68.4	29.4	ug/Kg dry		89.6			27	50	
C1-Benzene	156	29.4	ug/Kg dry		251			47	50	
C2-Benzenes	174	29.4	ug/Kg dry		224			25	50	
C3-Benzenes	104	29.4	ug/Kg dry		131			23	50	
C4-Benzenes	229	29.4	ug/Kg dry		336			38	50	
C5-Benzenes	183	29.4	ug/Kg dry		327			56	50	
Methylcyclohexane	19.5	29.4	ug/Kg dry		17.4			11	50	J
Toluene	241	29.4	ug/Kg dry		369			42	50	
Ethylbenzene	34.9	29.4	ug/Kg dry		46.8			29	50	
m,p-Xylene	241	29.4	ug/Kg dry		326			30	50	
Styrene	118	29.4	ug/Kg dry		216			59	50	
o-Xylene	27.1	29.4	ug/Kg dry		35.3			26	50	J
Isopropylbenzene	ND	29.4	ug/Kg dry		ND				50	
n-Propylbenzene	22.4	29.4	ug/Kg dry		23.5			5	50	J
1,3,5-Trimethylbenzene	22.1	29.4	ug/Kg dry		23.1			4	50	J
1,2,3-Trimethylbenzene	19.7	29.4	ug/Kg dry		25.3			25	50	J
1,2,4-Trimethylbenzene	46.7	29.4	ug/Kg dry		67.2			36	50	
t-Butylbenzene	ND	29.4	ug/Kg dry		ND				50	
sec-Butylbenzene	ND	29.4	ug/Kg dry		15.8				50	
p-Isopropyltoluene	ND	29.4	ug/Kg dry		26.8				50	
n-Butylbenzene	42.5	29.4	ug/Kg dry		54.0			24	50	
trans-Decalin	482	29.4	ug/Kg dry		1170			84	50	
cis-Decalin	67.1	29.4	ug/Kg dry		140			70	50	
C1-Decalins	677	29.4	ug/Kg dry		1460			74	50	
C2-Decalins	462	29.4	ug/Kg dry		807			54	50	
C3-Decalins	361	29.4	ug/Kg dry		525			37	50	
C4-Decalins	670	29.4	ug/Kg dry		1070			46	50	
Benzo(b)thiophene	20.0	29.4	ug/Kg dry		280			173	50	J
C1-Benzo(b)thiophenes	101	29.4	ug/Kg dry		248			84	50	
C2-Benzo(b)thiophenes	154	29.4	ug/Kg dry		413			91	50	
C3-Benzo(b)thiophenes	144	29.4	ug/Kg dry		348			83	50	
C4-Benzo(b)thiophenes	123	29.4	ug/Kg dry		259			71	50	
Naphthalene	508	29.4	ug/Kg dry		8100			176	50	
2-Methylnaphthalene	275	29.4	ug/Kg dry		3220			169	50	
1-Methylnaphthalene	218	29.4	ug/Kg dry		2310			166	50	
C1-Naphthalenes	176	29.4	ug/Kg dry		3430			181	50	
C2-Naphthalenes	1600	29.4	ug/Kg dry		5580			111	50	
C3-Naphthalenes	2560	29.4	ug/Kg dry		7090			94	50	
C4-Naphthalenes	1720	29.4	ug/Kg dry		4200			84	50	
Biphenyl	127	29.4	ug/Kg dry		1060			157	50	
Acenaphthylene	785	29.4	ug/Kg dry		1650			71	50	
Acenaphthene	5010	29.4	ug/Kg dry		19300			118	50	
Dibenzofuran	316	29.4	ug/Kg dry		8350			185	50	
Fluorene	2000	29.4	ug/Kg dry		15000			153	50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190048

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FJ90104 - 3570

C1-Fluorenes	834	29.4	ug/Kg dry	3310	119	50
C2-Fluorenes	1010	29.4	ug/Kg dry	2980	99	50
C3-Fluorenes	1000	29.4	ug/Kg dry	3500	111	50
Dibenzothiophene	709	29.4	ug/Kg dry	5640	155	50
C1-Dibenzothiophenes	941	29.4	ug/Kg dry	3170	108	50
C2-Dibenzothiophenes	954	29.4	ug/Kg dry	2510	90	50
C3-Dibenzothiophenes	630	29.4	ug/Kg dry	1330	71	50
C4-Dibenzothiophenes	317	29.4	ug/Kg dry	605	63	50
Phenanthrene	11000	29.4	ug/Kg dry	90000	156	50
Anthracene	2720	29.4	ug/Kg dry	25500	161	50
C1-Phenanthrenes/Anthracenes	5710	29.4	ug/Kg dry	24300	124	50
C2-Phenanthrenes/Anthracenes	3200	29.4	ug/Kg dry	10700	108	50
C3-Phenanthrenes/Anthracenes	1240	29.4	ug/Kg dry	3770	101	50
C4-Phenanthrenes/Anthracenes	476	29.4	ug/Kg dry	1320	94	50
Retene	147	29.4	ug/Kg dry	252	53	50
Benzo(b)naphtho(2,1-d)thiophene	820	29.4	ug/Kg dry	5010	144	50
C0-Benzonaphthothiophenes	1480	29.4	ug/Kg dry	8960	143	50
C1-Benzonaphthothiophenes	732	29.4	ug/Kg dry	3380	129	50
C2-Benzonaphthothiophenes	510	29.4	ug/Kg dry	1780	111	50
C3-Benzonaphthothiophenes	408	29.4	ug/Kg dry	1010	85	50
C4-Benzonaphthothiophenes	173	29.4	ug/Kg dry	328	62	50
Fluoranthene	12100	29.4	ug/Kg dry	87500	151	50
Pyrene	15400	29.4	ug/Kg dry	73000	130	50
C1-Fluoranthenes/Pyrenes	6670	29.4	ug/Kg dry	26500	120	50
C2-Fluoranthenes/Pyrenes	2260	29.4	ug/Kg dry	12300	138	50
C3-Fluoranthenes/Pyrenes	904	29.4	ug/Kg dry	4810	137	50
Benzo(b)fluorene	768	29.4	ug/Kg dry	4170	138	50
Benzo(c)fluorene	362	29.4	ug/Kg dry	1600	126	50
2-Methylpyrene	950	29.4	ug/Kg dry	3340	111	50
4-Methylpyrene	829	29.4	ug/Kg dry	2300	94	50
1-Methylpyrene	781	29.4	ug/Kg dry	2140	93	50
Benz(a)anthracene	6090	29.4	ug/Kg dry	34400	140	50
Chrysene/triphenylene	6570	29.4	ug/Kg dry	31900	132	50
C1-Benzo(a)anthracenes/Chrysenes	2770	29.4	ug/Kg dry	12400	127	50
C2-Benzo(a)anthracenes/Chrysenes	1180	29.4	ug/Kg dry	5490	129	50
C3-Benzo(a)anthracenes/Chrysenes	486	29.4	ug/Kg dry	2670	138	50
C4-Benzo(a)anthracenes/Chrysenes	248	29.4	ug/Kg dry	1300	136	50
Benzo(b)fluoranthene	4070	29.4	ug/Kg dry	24800	144	50
Benzo(j/k)fluoranthene	4720	29.4	ug/Kg dry	24700	136	50
Benzo(e)pyrene	4250	29.4	ug/Kg dry	18600	125	50
Benzo(a)pyrene	6390	29.4	ug/Kg dry	30400	131	50
Perylene	1240	29.4	ug/Kg dry	7630	144	50
Indeno(1,2,3-cd)pyrene	3280	29.4	ug/Kg dry	17100	136	50
Dibenzo(a,h)anthracene	668	29.4	ug/Kg dry	4010	143	50
Benzo(g,h,i)perylene	3440	29.4	ug/Kg dry	15100	126	50
Coronene	903	29.4	ug/Kg dry	3590	120	50
Tetramethyl lead	ND	29.4	ug/Kg dry	ND		50
Trimethylethyl lead	ND	29.4	ug/Kg dry	ND		50

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190048

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FJ90104 - 3570								
Dimethyldiethyl lead	ND	29.4	ug/Kg dry	ND				50
Methyltriethyl lead	ND	29.4	ug/Kg dry	ND				50
Tetraethyl lead	ND	29.4	ug/Kg dry	ND				50
2,6,10-trimethyldodecane (1380)	782	29.4	ug/Kg dry	1380			56	50
2,6,10-trimethyltridecane (1470)	1260	29.4	ug/Kg dry	2080			49	50
2,6,10-trimethylpentadecane (1650)	1190	29.4	ug/Kg dry	1900			46	50
C-17	339	29.4	ug/Kg dry	470			32	50
Pristane	2980	29.4	ug/Kg dry	4510			41	50
C-18	294	29.4	ug/Kg dry	459			44	50
Phytane	1720	29.4	ug/Kg dry	2640			42	50
Carbazole	457	29.4	ug/Kg dry	11900			185	50
2,6-Dimethylnaphthalene	139	29.4	ug/Kg dry	844			143	50
2,3,5-Trimethylnaphthene	171	29.4	ug/Kg dry	502			98	50
4-Methyldibenzothiophene	375	29.4	ug/Kg dry	1060			95	50
2/3-Methyldibenzothiophene	328	29.4	ug/Kg dry	1160			112	50
1-Methyldibenzothiophene	87.8	29.4	ug/Kg dry	270			102	50
3-Methylphenanthrene	1380	29.4	ug/Kg dry	5680			122	50
2-Methylphenanthrene	1640	29.4	ug/Kg dry	7260			126	50
2-Methylanthracene	490	29.4	ug/Kg dry	3160			146	50
4/9-Methylphenanthrene	1260	29.4	ug/Kg dry	4690			115	50
1-Methylphenanthrene	916	29.4	ug/Kg dry	3510			117	50
Surrogate: Naphthalene-d8	*486*		ug/Kg dry	*587.2*		*83*	*50-120*	
Surrogate: Perylene-d12	*452*		ug/Kg dry	*587.2*		*77*	*50-120*	
Surrogate: Phenanthrene-d10	*517*		ug/Kg dry	*587.2*		*88*	*50-120*	
Surrogate: Toluene-D8	*455*		ug/Kg dry	*587.2*		*78*	*50-120*	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190048

Notes and Definitions

U	Analyte included in the analysis, but not detected
SM	Surrogate recovery(ies) outside of criteria due to matrix (UCM/coelution/matrix is present) (SM).
J	Reported between MDL and MRL
D+I	Relative percent difference for duplicate is outside of criteria, due to apparent inhomogeneity of the sample material.
D	Diluted.
CD-	Continuing Calibration %Diff/Drift is below control limit (CD-).
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190048

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 190861 / F190048

GEI Consultants

400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

Preservative

None	None						

Analysis

MCP PRESUMPTIVE CERTAINTY REQUIRED -- YES NO

If Yes, Are MCP Analytical Methods Required?	YES	NO	NA
Are Drinking Water Samples Submitted?	YES	NO	NA
If Yes, Have Drinking Water Sampling Requirements Been Met?	YES	NO	NA

Sample Handling

Samples Field Filtered: YES NO NA

Sampled Shipped With Ice: YES NO

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Parent and Alkylated MAHs & PAHs 8270**	TOCs by Lloyd-Kahn						Sample Specific Remarks
1	1804576-SS672-S1	9/24/19	1001	Sed	1	BFM	X	X						
2	1804576-SS672-S3	9/24/19	1009	Sed	1	BFM	X	X						
3	1804576-SS675-SQ	9/24/19	1206	Sed	1	BFM	X	X						
4	1804576-SS689-S2	9/24/19	1243	Sed	1	BFM	X	X						
5	1804576-SS691-S3	9/24/19	1437	Sed	1	BFM	X	X						
6	1804576-SS691-S5	9/24/19	1444	Sed	1	BFM	X	X						
7	1804576-SS692-S4	9/24/19	1610	Sed	1	BFM	X							
8	1804576-SS692-S5	9/24/19	1615	Sed	1	BFM	X	X						
9	1804576-SS680R-S1	9/25/19	1611	Sed	1	BFM	X	X						
10	1804576-SS690-S5	9/25/19	1523	Sed	1	BFM	X	X						
11	1804576-SS693-S3	9/25/19	1053	Sed	1	BFM	X	X						
12	1804576-SS693-S5	9/25/19	1100	Sed	1	BFM	X	X						

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

Turnaround Time (Business days):

Normal __X__ Other ____

10-Day ____ 7-Day ____

5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Relinquished by: (signature)	Date:	Time:	Received by: (signature)
1.	9/25/19	1930	1. GEI Sample Fridge
2. GEI Sample Fridge	9/26/19	1245	2. James Donnelly
3. J Donnelly	9/26/19	1345	3.
4.	9/26/19	1855	4. 9/26/19 1924

Additional Requirements/Comments/Remarks:

**Parent and Alkylated MAHs & PAHs (34) by GC/MS/SIM/SCAN

Ice temp: 3.9

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 19D0861/F19004

GEI Consultants

400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

Preservative

None	None						

Analysis

Sample Handling

Samples Field Filtered: YES NO **NA**

Sampled Shipped With Ice: **YES** NO

MCP PRESUMPTIVE CERTAINTY REQUIRED -- **YES** NO

If Yes, Are MCP Analytical Methods Required? **YES** NO NA

Are Drinking Water Samples Submitted? YES **NO** NA

If Yes, Have Drinking Water Sampling Requirements Been Met? YES NO **NA**

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Parent and Alkylated MAHs & PAHs 8270**	TOCs by Lloyd-Kahn	Sample Specific Remarks
13	1804576-SS694-S4	9/25/19	1402	Sed	1	BFM	X	X	
14	1804576-SS694-S6	9/25/19	1408	Sed	1	BFM	X	X	
15	1804576-SS695-S6	9/25/19	1320	Sed	1	BFM	X	X	
16	1804576-SS696-S3	9/25/19	1647	Sed	1	BFM	X	X	
17	1804576-SS696-S5	9/25/19	1654	Sed	1	BFM	X	X	
18	1804576-SS697-S2	9/25/19	~~1720~~ 1714	Sed	1	BFM	X	X	
		RLB	9/25						

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

Turnaround Time (Business days):

Normal __X__ Other ____

10-Day ____ 7-Day ____

5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1.	9/25/19	1930	1. GEI Sample Fridge
Relinquished by: (signature)	Date:	Time:	Received by: (signature)
2. GEI Sample Fridge	9/26/19	1345	2. J Zencais
Relinquished by: (signature)	Date:	Time:	Received by: (signature)
3. J Zencais	9/26/19	1345	3.
Relinquished by: (signature)	Date:	Time:	Received by: (signature)
4.	9/26	18:55	4. 9/26/19 1924

Additional Requirements/Comments/Remarks:

**Parent and Alkylated MAHs & PAHs (34) by GC/MS/SIM/SCAN

ice temp: 3.9

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

Shipped/Delivered Via: ESS Courier

ESS Project ID: 19I0861
Date Received: 9/26/2019
Project Due Date: 10/11/19 ~~10/3/2019~~ 10/18/2019
Days for Project: 10 ~~5~~ Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 3.9 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Ryan Hoffman Date: 10/10/2019 Time: 14:06 By: NL

Email sent to confirm sample -07 was not needed for TOC by Lloyd Khan. Sample confirmed as not required.

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	391974	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
02	391973	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
03	391972	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
04	391971	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
05	391970	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
06	391969	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
07	391968	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
08	391967	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
09	391966	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
10	391965	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
11	391964	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
12	391963	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
13	391962	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
14	391961	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
15	391960	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
16	391959	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
17	391958	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
18	391957	Yes	NA	Yes	4 oz. Jar - Unpres	NP	

2nd Review
Were all containers scanned into storage/lab? Initials
Are barcode labels on correct containers? Yes / No

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

ESS Project ID: 1910861

Date Received: 9/26/2019

Are all Flashpoint stickers attached/container ID # circled?	Yes / No / NA
Are all Hex Chrome stickers attached?	Yes / No / NA
Are all QC stickers attached?	Yes / No / NA
Are VOA stickers attached if bubbles noted?	Yes / No / NA

Completed By: _____ Date & Time: 9/26/19 2102

Reviewed By: _____ Date & Time: 9/26/19 2127

Delivered By: _____ 9/26/19 2127

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (044752)
ESS Laboratory Work Order Number: F190050

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 4:14 pm, Oct 16, 2019

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses
ESS Laboratory - Cranston, RI TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190050

SAMPLE RECEIPT

The following samples were received on September 26, 2019 for the analyses specified on the enclosed Chain of Custody Record.

8270D (SIM) Semi-Volatile Organic Compounds

Samples 1804576-SS685-S3 (F190050-01) and 1804576-SS686-S3 (F190050-02) were received outside of hold time. Per the clients request the samples were extracted and analyzed.

Lab Number	Sample Name	Matrix	Analysis
F190050-01	1804576-SS685-S3	Sediment	8270 Mod, TOC-LK
F190050-02	1804576-SS686-S3	Sediment	8270 Mod, TOC-LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190050

PROJECT NARRATIVE

8270D (SIM) Semi-Volatile Organic Compounds

F190050-01	**Estimated value. Sample hold times were exceeded (H).**
F190050-02	**Estimated value. Sample hold times were exceeded (H).**

Classical Chemistry

F190050-01	**Estimated value. Sample hold times were exceeded (H).**
	Total Organic Carbon (Average)
F190050-02	**Estimated value. Sample hold times were exceeded (H).**
	Total Organic Carbon (Average)

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190050

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS685-S3
Date Sampled: 09/10/19 12:35
Percent Solids: 64
Initial Volume: 4.98
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190050
ESS Laboratory Sample ID: F190050-01
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**21.6** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C1-Benzene	**213** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C2-Benzenes	**76.9** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C3-Benzenes	**33.6** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C4-Benzenes	**38.5** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C5-Benzenes	**18.8** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
Methylcyclohexane	ND (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
Toluene	**313** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
Ethylbenzene	**9.21** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
m,p-Xylene	**117** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
Styrene	**14.6** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
o-Xylene	**9.46** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
Isopropylbenzene	ND (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
n-Propylbenzene	ND (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
1,3,5-Trimethylbenzene	**J 4.12** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
1,2,3-Trimethylbenzene	**7.53** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
1,2,4-Trimethylbenzene	**18.0** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
t-Butylbenzene	ND (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
sec-Butylbenzene	ND (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
p-Isopropyltoluene	**40.3** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
n-Butylbenzene	**8.47** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
trans-Decalin	**J 4.68** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
cis-Decalin	ND (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C1-Decalins	**11.6** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C2-Decalins	**20.3** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C3-Decalins	**14.9** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C4-Decalins	**21.4** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
Benzo(b)thiophene	**7.03** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C1-Benzo(b)thiophenes	**17.1** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C2-Benzo(b)thiophenes	**19.3** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C3-Benzo(b)thiophenes	**20.2** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C4-Benzo(b)thiophenes	**73.2** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS685-S3
Date Sampled: 09/10/19 12:35
Percent Solids: 64
Initial Volume: 4.98
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190050
ESS Laboratory Sample ID: F190050-01
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**94.1** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
2-Methylnaphthalene	**75.7** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
1-Methylnaphthalene	**30.2** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C1-Naphthalenes	**68.1** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C2-Naphthalenes	**175** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C3-Naphthalenes	**338** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C4-Naphthalenes	**246** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
Biphenyl	**21.7** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
Acenaphthylene	**137** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
Acenaphthene	**63.7** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
Dibenzofuran	**74.6** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
Fluorene	**119** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C1-Fluorenes	**210** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C2-Fluorenes	**358** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C3-Fluorenes	**217** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
Dibenzothiophene	**61.2** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C1-Dibenzothiophenes	**170** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C2-Dibenzothiophenes	**237** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C3-Dibenzothiophenes	**177** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C4-Dibenzothiophenes	**115** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
Phenanthrene	**669** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
Anthracene	**625** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C1-Phenanthrenes/Anthracenes	**2110** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C2-Phenanthrenes/Anthracenes	**1940** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C3-Phenanthrenes/Anthracenes	**918** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C4-Phenanthrenes/Anthracenes	**380** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
Retene	**237** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
Benzo(b)naphtho(2,1-d)thiophene	**182** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C0-Benzonaphthothiophenes	**513** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C1-Benzonaphthothiophenes	**495** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C2-Benzonaphthothiophenes	**326** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C3-Benzonaphthothiophenes	**168** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS685-S3
Date Sampled: 09/10/19 12:35
Percent Solids: 64
Initial Volume: 4.98
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190050
ESS Laboratory Sample ID: F190050-01
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**53.0** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
Fluoranthene	**2100** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
Pyrene	**1850** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C1-Fluoranthenes/Pyrenes	**3380** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C2-Fluoranthenes/Pyrenes	**1860** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C3-Fluoranthenes/Pyrenes	**943** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
Benzo(b)fluorene	**530** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
Benzo(c)fluorene	**245** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
2-Methylpyrene	**360** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
4-Methylpyrene	**292** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
1-Methylpyrene	**253** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
Benz(a)anthracene	**1960** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
Chrysene/triphenylene	**1740** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C1-Benzo(a)anthracenes/Chrysenes	**2020** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C2-Benzo(a)anthracenes/Chrysenes	**1270** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C3-Benzo(a)anthracenes/Chrysenes	**783** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C4-Benzo(a)anthracenes/Chrysenes	**406** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
Benzo(b)fluoranthene	**846** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
Benzo(j/k)fluoranthene	**1230** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
Benzo(e)pyrene	**695** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
Benzo(a)pyrene	**1330** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
Perylene	**350** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
Indeno(1,2,3-cd)pyrene	**468** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
Dibenzo(a,h)anthracene	**175** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
Benzo(g,h,i)perylene	**382** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
Coronene	**73.4** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
Tetramethyl lead	ND (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
Trimethylethyl lead	ND (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
Dimethyldiethyl lead	ND (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
Methyltriethyl lead	ND (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
Tetraethyl lead	ND (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
2,6,10-trimethyldodecane (1380)	**29.9** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS685-S3
Date Sampled: 09/10/19 12:35
Percent Solids: 64
Initial Volume: 4.98
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190050
ESS Laboratory Sample ID: F190050-01
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**93.5** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
2,6,10-trimethylpentadecane (1650)	**48.5** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C-17	**260** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
Pristane	**160** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
C-18	**165** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
Phytane	**85.3** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
Carbazole	**16.1** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
2,6-Dimethylnaphthalene	**48.9** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
2,3,5-Trimethylnaphthene	**32.9** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
4-Methyldibenzothiophene	**31.2** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
2/3-Methyldibenzothiophene	**55.0** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
1-Methyldibenzothiophene	**16.5** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
3-Methylphenanthrene	**335** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
2-Methylphenanthrene	**474** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
2-Methylanthracene	**604** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
4/9-Methylphenanthrene	**453** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001
1-Methylphenanthrene	**220** (6.32)	3.16	8270 Mod		1	10/12/19 7:43	F9J0004	FI93001

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*93 %*		*50-120*
Surrogate: Perylene-d12	*104 %*		*50-120*
Surrogate: Phenanthrene-d10	*103 %*		*50-120*
Surrogate: Toluene-D8	*85 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS685-S3
Date Sampled: 09/10/19 12:35
Percent Solids: 64

ESS Laboratory Work Order: F190050
ESS Laboratory Sample ID: F190050-01
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**H 50000** (97.0)		TOC-LK		1	CCP	10/08/19 21:14	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS686-S3
Date Sampled: 09/10/19 11:47
Percent Solids: 64
Initial Volume: 5.41
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190050
ESS Laboratory Sample ID: F190050-02
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**17.1** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C1-Benzene	**155** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C2-Benzenes	**61.1** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C3-Benzenes	**24.8** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C4-Benzenes	**34.2** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C5-Benzenes	**21.4** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
Methylcyclohexane	ND (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
Toluene	**229** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
Ethylbenzene	**6.27** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
m,p-Xylene	**91.8** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
Styrene	**6.11** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
o-Xylene	**8.73** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
Isopropylbenzene	ND (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
n-Propylbenzene	ND (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
1,3,5-Trimethylbenzene	**J 3.30** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
1,2,3-Trimethylbenzene	**J 5.73** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
1,2,4-Trimethylbenzene	**11.9** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
t-Butylbenzene	ND (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
sec-Butylbenzene	ND (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
p-Isopropyltoluene	**46.3** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
n-Butylbenzene	**6.37** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
trans-Decalin	**J 4.31** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
cis-Decalin	ND (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C1-Decalins	**10.2** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C2-Decalins	**11.6** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C3-Decalins	**7.66** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C4-Decalins	ND (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
Benzo(b)thiophene	**J 3.29** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C1-Benzo(b)thiophenes	**13.2** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C2-Benzo(b)thiophenes	**12.1** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C3-Benzo(b)thiophenes	**7.28** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C4-Benzo(b)thiophenes	**14.8** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS686-S3
Date Sampled: 09/10/19 11:47
Percent Solids: 64
Initial Volume: 5.41
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190050
ESS Laboratory Sample ID: F190050-02
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**38.3** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
2-Methylnaphthalene	**27.7** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
1-Methylnaphthalene	**12.5** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C1-Naphthalenes	**25.1** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C2-Naphthalenes	**102** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C3-Naphthalenes	**114** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C4-Naphthalenes	**59.0** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
Biphenyl	**12.0** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
Acenaphthylene	**19.5** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
Acenaphthene	**27.7** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
Dibenzofuran	**30.2** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
Fluorene	**44.6** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C1-Fluorenes	**50.6** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C2-Fluorenes	**62.6** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C3-Fluorenes	**56.8** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
Dibenzothiophene	**20.1** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C1-Dibenzothiophenes	**36.2** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C2-Dibenzothiophenes	**42.5** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C3-Dibenzothiophenes	**37.2** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C4-Dibenzothiophenes	**28.8** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
Phenanthrene	**251** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
Anthracene	**118** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C1-Phenanthrenes/Anthracenes	**343** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C2-Phenanthrenes/Anthracenes	**339** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C3-Phenanthrenes/Anthracenes	**197** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C4-Phenanthrenes/Anthracenes	**137** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
Retene	**81.5** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
Benzo(b)naphtho(2,1-d)thiophene	**30.1** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C0-Benzonaphthothiophenes	**70.0** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C1-Benzonaphthothiophenes	**59.8** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C2-Benzonaphthothiophenes	**32.7** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C3-Benzonaphthothiophenes	**21.2** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS686-S3
Date Sampled: 09/10/19 11:47
Percent Solids: 64
Initial Volume: 5.41
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190050
ESS Laboratory Sample ID: F190050-02
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**10.1** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
Fluoranthene	**478** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
Pyrene	**422** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C1-Fluoranthenes/Pyrenes	**426** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C2-Fluoranthenes/Pyrenes	**212** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C3-Fluoranthenes/Pyrenes	**123** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
Benzo(b)fluorene	**60.7** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
Benzo(c)fluorene	**32.0** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
2-Methylpyrene	**55.7** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
4-Methylpyrene	**39.6** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
1-Methylpyrene	**29.8** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
Benz(a)anthracene	**252** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
Chrysene/triphenylene	**256** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C1-Benzo(a)anthracenes/Chrysenes	**224** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C2-Benzo(a)anthracenes/Chrysenes	**142** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C3-Benzo(a)anthracenes/Chrysenes	**78.2** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C4-Benzo(a)anthracenes/Chrysenes	**43.4** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
Benzo(b)fluoranthene	**124** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
Benzo(j/k)fluoranthene	**159** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
Benzo(e)pyrene	**102** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
Benzo(a)pyrene	**147** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
Perylene	**127** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
Indeno(1,2,3-cd)pyrene	**68.2** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
Dibenzo(a,h)anthracene	**22.6** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
Benzo(g,h,i)perylene	**60.3** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
Coronene	**12.7** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
Tetramethyl lead	ND (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
Trimethylethyl lead	ND (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
Dimethyldiethyl lead	ND (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
Methyltriethyl lead	ND (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
Tetraethyl lead	ND (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
2,6,10-trimethyldodecane (1380)	**6.29** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS686-S3
Date Sampled: 09/10/19 11:47
Percent Solids: 64
Initial Volume: 5.41
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190050
ESS Laboratory Sample ID: F190050-02
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 9/30/19 15:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**41.3** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
2,6,10-trimethylpentadecane (1650)	**24.0** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C-17	**234** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
Pristane	**56.5** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
C-18	**89.8** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
Phytane	**75.6** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
Carbazole	**11.3** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
2,6-Dimethylnaphthalene	**18.2** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
2,3,5-Trimethylnaphthene	**9.72** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
4-Methyldibenzothiophene	**7.13** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
2/3-Methyldibenzothiophene	**11.4** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
1-Methyldibenzothiophene	**J 3.43** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
3-Methylphenanthrene	**74.2** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
2-Methylphenanthrene	**98.4** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
2-Methylanthracene	**45.2** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
4/9-Methylphenanthrene	**79.3** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001
1-Methylphenanthrene	**39.7** (5.74)	2.87	8270 Mod		1	10/12/19 9:09	F9J0004	FI93001

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*95 %*		*50-120*
Surrogate: Perylene-d12	*93 %*		*50-120*
Surrogate: Phenanthrene-d10	*106 %*		*50-120*
Surrogate: Toluene-D8	*87 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS686-S3
Date Sampled: 09/10/19 11:47
Percent Solids: 64

ESS Laboratory Work Order: F190050
ESS Laboratory Sample ID: F190050-02
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**H 35000** (97.5)		TOC-LK		1	CCP	10/08/19 15:49	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190050

Quality Control Data

Classical Chemistry

Batch CJ90355 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	100	mg/kg							
Total Organic Carbon (2)	ND	100	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190050

Quality Control Data

Classical Chemistry

Batch CJ90355 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9490	100	mg/kg	10000		95	80-120			
Total Organic Carbon (2)	9520	100	mg/kg	10000		95	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190050

Quality Control Data

Classical Chemistry

Batch CJ90355 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9610	100	mg/kg	10000		96	80-120	1	20	
Total Organic Carbon (2)	9610	100	mg/kg	10000		96	80-120	1	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190050

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FI93001 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	3.56	4.00	ug/Kg wet							J
C1-Benzene	ND	4.00	ug/Kg wet							
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	ND	4.00	ug/Kg wet							
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	ND	4.00	ug/Kg wet							
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190050

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FI93001 - 3570

C1-Fluorenes	ND	4.00	ug/Kg wet
C2-Fluorenes	ND	4.00	ug/Kg wet
C3-Fluorenes	ND	4.00	ug/Kg wet
Dibenzothiophene	ND	4.00	ug/Kg wet
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet
Phenanthrene	ND	4.00	ug/Kg wet
Anthracene	ND	4.00	ug/Kg wet
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
Retene	ND	4.00	ug/Kg wet
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
Fluoranthene	ND	4.00	ug/Kg wet
Pyrene	ND	4.00	ug/Kg wet
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
Benzo(b)fluorene	ND	4.00	ug/Kg wet
Benzo(c)fluorene	ND	4.00	ug/Kg wet
2-Methylpyrene	ND	4.00	ug/Kg wet
4-Methylpyrene	ND	4.00	ug/Kg wet
1-Methylpyrene	ND	4.00	ug/Kg wet
Benz(a)anthracene	ND	4.00	ug/Kg wet
Chrysene/triphenylene	ND	4.00	ug/Kg wet
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet
Benzo(e)pyrene	ND	4.00	ug/Kg wet
Benzo(a)pyrene	ND	4.00	ug/Kg wet
Perylene	ND	4.00	ug/Kg wet
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet
Coronene	ND	4.00	ug/Kg wet
Tetramethyl lead	ND	4.00	ug/Kg wet
Trimethylethyl lead	ND	4.00	ug/Kg wet

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190050

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FI93001 - 3570						
Dimethyldiethyl lead	ND	4.00	ug/Kg wet			
Methyltriethyl lead	ND	4.00	ug/Kg wet			
Tetraethyl lead	ND	4.00	ug/Kg wet			
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet			
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet			
2,6,10-trimethylpentadecane (1650)	5.93	4.00	ug/Kg wet			
C-17	22.0	4.00	ug/Kg wet			
Pristane	15.3	4.00	ug/Kg wet			
C-18	15.6	4.00	ug/Kg wet			
Phytane	18.9	4.00	ug/Kg wet			
Carbazole	ND	4.00	ug/Kg wet			
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet			
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet			
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
3-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylanthracene	ND	4.00	ug/Kg wet			
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet			
1-Methylphenanthrene	ND	4.00	ug/Kg wet			
Surrogate: Naphthalene-d8	*408*		ug/Kg wet	*400.0*	*102*	*50-120*
Surrogate: Perylene-d12	*360*		ug/Kg wet	*400.0*	*90*	*50-120*
Surrogate: Phenanthrene-d10	*419*		ug/Kg wet	*400.0*	*105*	*50-120*
Surrogate: Toluene-D8	*397*		ug/Kg wet	*400.0*	*99*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190050

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FI93001 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	292	4.00	ug/Kg wet	400.0		73	60-130			
Methylcyclohexane	261	4.00	ug/Kg wet	400.0		65	60-130			
Toluene	404	4.00	ug/Kg wet	400.0		101	60-130			
Ethylbenzene	402	4.00	ug/Kg wet	400.0		100	60-130			
m,p-Xylene	404	4.00	ug/Kg wet	400.0		101	60-130			
Styrene	373	4.00	ug/Kg wet	400.0		93	60-130			
o-Xylene	405	4.00	ug/Kg wet	400.0		101	60-130			
Isopropylbenzene	401	4.00	ug/Kg wet	400.0		100	60-130			
n-Propylbenzene	402	4.00	ug/Kg wet	400.0		100	60-130			
1,3,5-Trimethylbenzene	398	4.00	ug/Kg wet	400.0		100	60-130			
1,2,3-Trimethylbenzene	408	4.00	ug/Kg wet	400.0		102	60-130			
1,2,4-Trimethylbenzene	407	4.00	ug/Kg wet	400.0		102	60-130			
t-Butylbenzene	407	4.00	ug/Kg wet	400.0		102	60-130			
sec-Butylbenzene	402	4.00	ug/Kg wet	400.0		100	60-130			
p-Isopropyltoluene	417	4.00	ug/Kg wet	400.0		104	60-130			
n-Butylbenzene	395	4.00	ug/Kg wet	400.0		99	60-130			
trans-Decalin	395	4.00	ug/Kg wet	400.0		99	60-130			
cis-Decalin	385	4.00	ug/Kg wet	400.0		96	60-130			
Benzo(b)thiophene	388	4.00	ug/Kg wet	400.0		97	60-130			
Naphthalene	398	4.00	ug/Kg wet	400.0		100	60-130			
2-Methylnaphthalene	384	4.00	ug/Kg wet	400.0		96	60-130			
1-Methylnaphthalene	387	4.00	ug/Kg wet	400.0		97	60-130			
Biphenyl	399	4.00	ug/Kg wet	400.0		100	60-130			
Acenaphthylene	355	4.00	ug/Kg wet	400.0		89	60-130			
Acenaphthene	389	4.00	ug/Kg wet	400.0		97	60-130			
Dibenzofuran	396	4.00	ug/Kg wet	400.0		99	60-130			
Fluorene	381	4.00	ug/Kg wet	400.0		95	60-130			
Dibenzothiophene	390	4.00	ug/Kg wet	400.0		98	60-130			
Phenanthrene	400	4.00	ug/Kg wet	400.0		100	60-130			
Anthracene	295	4.00	ug/Kg wet	400.0		74	60-130			
Retene	351	4.00	ug/Kg wet	400.0		88	60-130			
Benzo(b)naphtho(2,1-d)thiophene	343	4.00	ug/Kg wet	400.0		86	60-130			
Fluoranthene	371	4.00	ug/Kg wet	400.0		93	60-130			
Pyrene	367	4.00	ug/Kg wet	400.0		92	60-130			
Benz(a)anthracene	327	4.00	ug/Kg wet	400.0		82	60-130			
Chrysene/triphenylene	358	4.00	ug/Kg wet	400.0		89	60-130			
Benzo(b)fluoranthene	325	4.00	ug/Kg wet	400.0		81	60-130			
Benzo(j/k)fluoranthene	335	4.00	ug/Kg wet	400.0		84	60-130			
Benzo(e)pyrene	328	4.00	ug/Kg wet	400.0		82	60-130			
Benzo(a)pyrene	295	4.00	ug/Kg wet	400.0		74	60-130			
Perylene	305	4.00	ug/Kg wet	400.0		76	60-130			
Indeno(1,2,3-cd)pyrene	259	4.00	ug/Kg wet	400.0		65	60-130			
Dibenzo(a,h)anthracene	291	4.00	ug/Kg wet	400.0		73	60-130			
Benzo(g,h,i)perylene	303	4.00	ug/Kg wet	400.0		76	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190050

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FI93001 - 3570						
Coronene	284	4.00	ug/Kg wet	400.0	71	60-130
Tetraethyl lead	308	4.00	ug/Kg wet	400.0	77	60-130
Pristane	405	4.00	ug/Kg wet	400.0	101	60-130
Phytane	394	4.00	ug/Kg wet	400.0	99	60-130
Surrogate: Naphthalene-d8	*406*		ug/Kg wet	*400.0*	*102*	*50-120*
Surrogate: Perylene-d12	*326*		ug/Kg wet	*400.0*	*82*	*50-120*
Surrogate: Phenanthrene-d10	*428*		ug/Kg wet	*400.0*	*107*	*50-120*
Surrogate: Toluene-D8	*399*		ug/Kg wet	*400.0*	*100*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F190050

Notes and Definitions

U	Analyte included in the analysis, but not detected
J	Reported between MDL and MRL
H	Estimated value. Sample hold times were exceeded (H).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190050

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 19I0858/F140050

GEI Consultants

400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY REQUIRED -- (YES) NO

If Yes, Are MCP Analytical Methods Required? (YES) NO NA

Are Drinking Water Samples Submitted? YES (NO) NA

If Yes, Have Drinking Water Sampling Requirements Been Met? YES NO (NA)

Preservative

None | None

Analysis

Sample Handling

Samples Field Filtered: YES NO (NA)

Sampled Shipped With Ice: (YES) NO

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Parent and Alkylated MAHs & PAHs 8270**	TOCs by Lloyd-Kahn	Sample Specific Remarks
1	1804576-SS685-S3	9/10/19	1235	Soil	1	BFM	X	X	
2	1804576-SS626-S3	9/10/19	1147	Soil	1	BFM	X	X	

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

	Date	Time	
Relinquished by sampler: (signature) 1.	9/12/19	1400	Received by: (signature) 1. GEI Sample Fridge
Relinquished by: (signature) 2. GEI Sample Fridge	9/26/19	1345	Received by: (signature) 2. James Zemaitis
Relinquished by: (signature) 3. James Zemaitis	9/26/19	1345	Received by: (signature) 3.
Relinquished by: (signature) 4.	9/26/19	18:55	Received by: (signature) 4. 9/26/19 1855

Cooler temp: 3.9

Turnaround Time (Business days):

Normal __X__ Other ____

10-Day ____ 7-Day ____

5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

**Parent and Alkylated MAHs & PAHs (34) by GC/MS/SIM/SCAN

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

Shipped/Delivered Via: ESS Courier

ESS Project ID: 1910858
Date Received: 9/26/2019
Project Due Date: ~~10/3/2019~~ 10/10/2019
Days for Project: ~~5~~ 10 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 3.9 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA
13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Ryan Hoffman Date: 9/30/19 Time: 11:30 By: DWL

Samples F190050-01 + -02 received outside of Hold Time.

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	392177	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
02	392176	Yes	NA	Yes	4 oz. Jar - Unpres	NP	

2nd Review
Were all containers scanned into storage/lab? Initials
Are barcode labels on correct containers? Yes / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: Date & Time: 9/26/19 2107
Reviewed By: Date & Time: 9/26/19 ~~2107~~ 2120
Delivered By: 9/26/19 2120

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (044752)
ESS Laboratory Work Order Number: F190051

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 12:13 pm, Oct 15, 2019

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses
ESS Laboratory - Cranston, RI TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190051

SAMPLE RECEIPT

The following samples were received on September 27, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F190051-01	1804576-SS698-S4	Sediment	8270 Mod, TOC-LK
F190051-02	1804576-SS699-S3	Sediment	8270 Mod, TOC-LK
F190051-03	1804576-SS700-S2	Sediment	8270 Mod, TOC-LK
F190051-04	1804576-SS700-S5	Sediment	8270 Mod, TOC-LK
F190051-05	1804576-SS701-S2	Sediment	8270 Mod, TOC-LK
F190051-06	1804576-SS701-S4	Sediment	8270 Mod, TOC-LK
F190051-07	1804576-SS702-S3	Sediment	8270 Mod, TOC-LK
F190051-08	1804576-SS703-S3	Sediment	8270 Mod, TOC-LK
F190051-09	1804576-SS704-S2	Sediment	8270 Mod, TOC-LK
F190051-10	1804576-SS704-S4	Sediment	8270 Mod, TOC-LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190051

PROJECT NARRATIVE

8270D (SIM) Semi-Volatile Organic Compounds

F190051-01	**Present in Method Blank (B).**
	Benzene , C-17 , C-18
F190051-02	**Surrogate recovery(ies) outside of criteria due to matrix (UCM/coelution/matrix is present) (SM).**
	Perylene-d12 (132% @ 50-120%)
F190051-04	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , Benzene , C-17 , C-18 , Phytane , Pristane
F190051-06	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , Benzene , C-17 , C-18 , Phytane , Pristane
F190051-10	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , Benzene , C-17 , C-18 , Phytane , Pristane
FJ90201-BS2	**Blank Spike recovery is below lower control limit (B-).**
	Methylcyclohexane (56% @ 60-130%)
FJ90201-DUP2	**Relative percent difference for duplicate is outside of criteria (D+).**
	Benzo(a)pyrene (70% @ 50%), Benzo(e)pyrene (70% @ 50%), Benzo(g,h,i)perylene (55% @ 50%), Benzo(j/k)fluoranthene (68% @ 50%), C1-Benzo(a)anthracenes/Chrysenes (55% @ 50%)

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190051

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS698-S4
Date Sampled: 09/26/19 08:54
Percent Solids: 74
Initial Volume: 5.35
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-01
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **5.48** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C1-Benzene	**42.1** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C2-Benzenes	**38.8** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C3-Benzenes	**49.5** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C4-Benzenes	**71.6** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C5-Benzenes	**43.9** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
Methylcyclohexane	J **4.42** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
Toluene	**64.3** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
Ethylbenzene	**13.6** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
m,p-Xylene	**48.4** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
Styrene	**26.9** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
o-Xylene	**15.1** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
Isopropylbenzene	ND (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
n-Propylbenzene	J **3.38** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
1,3,5-Trimethylbenzene	**8.31** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
1,2,3-Trimethylbenzene	**8.45** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
1,2,4-Trimethylbenzene	**31.5** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
t-Butylbenzene	ND (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
sec-Butylbenzene	ND (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
p-Isopropyltoluene	**31.1** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
n-Butylbenzene	**6.05** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
trans-Decalin	**14.7** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
cis-Decalin	J **2.61** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C1-Decalins	**33.4** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C2-Decalins	**50.6** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C3-Decalins	**40.4** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C4-Decalins	**59.9** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
Benzo(b)thiophene	**16.8** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C1-Benzo(b)thiophenes	**25.1** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C2-Benzo(b)thiophenes	**69.5** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C3-Benzo(b)thiophenes	**51.0** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C4-Benzo(b)thiophenes	**20.9** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS698-S4
Date Sampled: 09/26/19 08:54
Percent Solids: 74
Initial Volume: 5.35
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-01
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**239** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
2-Methylnaphthalene	**112** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
1-Methylnaphthalene	**189** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C1-Naphthalenes	**184** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C2-Naphthalenes	**700** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C3-Naphthalenes	**567** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C4-Naphthalenes	**243** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
Biphenyl	**49.9** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
Acenaphthylene	**166** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
Acenaphthene	**1250** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
Dibenzofuran	**43.5** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
Fluorene	**456** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C1-Fluorenes	**343** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C2-Fluorenes	**283** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C3-Fluorenes	**162** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
Dibenzothiophene	**168** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C1-Dibenzothiophenes	**221** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C2-Dibenzothiophenes	**209** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C3-Dibenzothiophenes	**116** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C4-Dibenzothiophenes	**49.9** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
Phenanthrene	**1920** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
Anthracene	**661** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C1-Phenanthrenes/Anthracenes	**1760** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C2-Phenanthrenes/Anthracenes	**949** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C3-Phenanthrenes/Anthracenes	**342** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C4-Phenanthrenes/Anthracenes	**129** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
Retene	**59.3** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
Benzo(b)naphtho(2,1-d)thiophene	**110** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C0-Benzonaphthothiophenes	**203** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C1-Benzonaphthothiophenes	**150** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C2-Benzonaphthothiophenes	**95.9** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C3-Benzonaphthothiophenes	**58.3** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS698-S4
Date Sampled: 09/26/19 08:54
Percent Solids: 74
Initial Volume: 5.35
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-01
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**19.1** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
Fluoranthene	**1640** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
Pyrene	**2240** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C1-Fluoranthenes/Pyrenes	**1530** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C2-Fluoranthenes/Pyrenes	**560** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C3-Fluoranthenes/Pyrenes	**227** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
Benzo(b)fluorene	**176** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
Benzo(c)fluorene	**72.7** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
2-Methylpyrene	**205** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
4-Methylpyrene	**182** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
1-Methylpyrene	**179** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
Benz(a)anthracene	**863** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
Chrysene/triphenylene	**914** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C1-Benzo(a)anthracenes/Chrysenes	**642** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C2-Benzo(a)anthracenes/Chrysenes	**331** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C3-Benzo(a)anthracenes/Chrysenes	**144** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C4-Benzo(a)anthracenes/Chrysenes	**57.8** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
Benzo(b)fluoranthene	**457** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
Benzo(j/k)fluoranthene	**488** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
Benzo(e)pyrene	**456** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
Benzo(a)pyrene	**714** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
Perylene	**211** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
Indeno(1,2,3-cd)pyrene	**316** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
Dibenzo(a,h)anthracene	**87.2** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
Benzo(g,h,i)perylene	**322** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
Coronene	**87.0** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
Tetramethyl lead	ND (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
Trimethylethyl lead	ND (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
Dimethyldiethyl lead	ND (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
Methyltriethyl lead	ND (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
Tetraethyl lead	ND (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
2,6,10-trimethyldodecane (1380)	**41.8** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS698-S4
Date Sampled: 09/26/19 08:54
Percent Solids: 74
Initial Volume: 5.35
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-01
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**77.0** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
2,6,10-trimethylpentadecane (1650)	**93.5** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C-17	**B 114** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
Pristane	**201** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
C-18	**B 77.7** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
Phytane	**184** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
Carbazole	**16.0** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
2,6-Dimethylnaphthalene	**102** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
2,3,5-Trimethylnaphthene	**43.7** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
4-Methyldibenzothiophene	**87.1** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
2/3-Methyldibenzothiophene	**74.4** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
1-Methyldibenzothiophene	**23.7** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
3-Methylphenanthrene	**400** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
2-Methylphenanthrene	**445** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
2-Methylanthracene	**205** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
4/9-Methylphenanthrene	**438** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201
1-Methylphenanthrene	**257** (5.04)	2.52	8270 Mod		1	10/07/19 2:07	F9J0003	FJ90201

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*71 %*		*50-120*
Surrogate: Perylene-d12	*60 %*		*50-120*
Surrogate: Phenanthrene-d10	*76 %*		*50-120*
Surrogate: Toluene-D8	*59 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS698-S4
Date Sampled: 09/26/19 08:54
Percent Solids: 74

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-01
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**14800** (95.4)		TOC-LK		1	CCP	10/08/19 17:04	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS699-S3
Date Sampled: 09/26/19 09:46
Percent Solids: 46
Initial Volume: 5.92
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-02
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**478** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
C1-Benzene	**858** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
C2-Benzenes	**659** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
C3-Benzenes	**1780** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
C4-Benzenes	**6040** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
C5-Benzenes	**4920** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
Methylcyclohexane	**55.5** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
Toluene	**1090** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
Ethylbenzene	**374** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
m,p-Xylene	**515** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
Styrene	**1080** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
o-Xylene	**101** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
Isopropylbenzene	**122** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
n-Propylbenzene	**80.2** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
1,3,5-Trimethylbenzene	**403** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
1,2,3-Trimethylbenzene	**551** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
1,2,4-Trimethylbenzene	**1080** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
t-Butylbenzene	ND (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
sec-Butylbenzene	**40.0** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
p-Isopropyltoluene	**408** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
n-Butylbenzene	**289** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
trans-Decalin	**313** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
cis-Decalin	**120** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
C1-Decalins	**1440** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
C2-Decalins	**3040** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
C3-Decalins	**3090** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
C4-Decalins	**4460** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
Benzo(b)thiophene	**403** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
C1-Benzo(b)thiophenes	**2530** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
C2-Benzo(b)thiophenes	**8030** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
C3-Benzo(b)thiophenes	**8480** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
C4-Benzo(b)thiophenes	**3100** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS699-S3
Date Sampled: 09/26/19 09:46
Percent Solids: 46
Initial Volume: 5.92
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-02
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**30900** (729)	365	8270 Mod		100	10/09/19 7:33	F9J0004	FJ90201
2-Methylnaphthalene	**7840** (729)	365	8270 Mod		100	10/09/19 7:33	F9J0004	FJ90201
1-Methylnaphthalene	**93600** (729)	365	8270 Mod		100	10/09/19 7:33	F9J0004	FJ90201
C1-Naphthalenes	**59900** (729)	365	8270 Mod		100	10/09/19 7:33	F9J0004	FJ90201
C2-Naphthalenes	**170000** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
C3-Naphthalenes	**115000** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
C4-Naphthalenes	**40800** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
Biphenyl	**3090** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
Acenaphthylene	**22200** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
Acenaphthene	**258000** (729)	365	8270 Mod		100	10/09/19 7:33	F9J0004	FJ90201
Dibenzofuran	**10200** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
Fluorene	**132000** (729)	365	8270 Mod		100	10/09/19 7:33	F9J0004	FJ90201
C1-Fluorenes	**74800** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
C2-Fluorenes	**58200** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
C3-Fluorenes	**23100** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
Dibenzothiophene	**46100** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
C1-Dibenzothiophenes	**49300** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
C2-Dibenzothiophenes	**37500** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
C3-Dibenzothiophenes	**16900** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
C4-Dibenzothiophenes	**5860** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
Phenanthrene	**900000** (729)	365	8270 Mod		100	10/09/19 7:33	F9J0004	FJ90201
Anthracene	**291000** (729)	365	8270 Mod		100	10/09/19 7:33	F9J0004	FJ90201
C1-Phenanthrenes/Anthracenes	**489000** (729)	365	8270 Mod		100	10/09/19 7:33	F9J0004	FJ90201
C2-Phenanthrenes/Anthracenes	**148000** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
C3-Phenanthrenes/Anthracenes	**45300** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
C4-Phenanthrenes/Anthracenes	**12900** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
Retene	**2820** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
Benzo(b)naphtho(2,1-d)thiophene	**19000** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
C0-Benzonaphthothiophenes	**34100** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
C1-Benzonaphthothiophenes	**20500** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
C2-Benzonaphthothiophenes	**10200** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
C3-Benzonaphthothiophenes	**5920** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS699-S3
Date Sampled: 09/26/19 09:46
Percent Solids: 46
Initial Volume: 5.92
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-02
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**1130** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
Fluoranthene	**370000** (729)	365	8270 Mod		100	10/09/19 7:33	F9J0004	FJ90201
Pyrene	**545000** (729)	365	8270 Mod		100	10/09/19 7:33	F9J0004	FJ90201
C1-Fluoranthenes/Pyrenes	**257000** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
C2-Fluoranthenes/Pyrenes	**76700** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
C3-Fluoranthenes/Pyrenes	**25600** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
Benzo(b)fluorene	**28500** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
Benzo(c)fluorene	**12200** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
2-Methylpyrene	**33800** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
4-Methylpyrene	**30600** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
1-Methylpyrene	**34900** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
Benz(a)anthracene	**167000** (729)	365	8270 Mod		100	10/09/19 7:33	F9J0004	FJ90201
Chrysene/triphenylene	**159000** (729)	365	8270 Mod		100	10/09/19 7:33	F9J0004	FJ90201
C1-Benzo(a)anthracenes/Chrysenes	**82200** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
C2-Benzo(a)anthracenes/Chrysenes	**32800** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
C3-Benzo(a)anthracenes/Chrysenes	**11400** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
C4-Benzo(a)anthracenes/Chrysenes	**3910** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
Benzo(b)fluoranthene	**68800** (729)	365	8270 Mod		100	10/09/19 7:33	F9J0004	FJ90201
Benzo(j/k)fluoranthene	**97200** (729)	365	8270 Mod		100	10/09/19 7:33	F9J0004	FJ90201
Benzo(e)pyrene	**86900** (729)	365	8270 Mod		100	10/09/19 7:33	F9J0004	FJ90201
Benzo(a)pyrene	**155000** (729)	365	8270 Mod		100	10/09/19 7:33	F9J0004	FJ90201
Perylene	**23300** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
Indeno(1,2,3-cd)pyrene	**62200** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
Dibenzo(a,h)anthracene	**14900** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
Benzo(g,h,i)perylene	**66600** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
Coronene	**19100** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
Tetramethyl lead	ND (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
Trimethylethyl lead	ND (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
Dimethyldiethyl lead	ND (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
Methyltriethyl lead	ND (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
Tetraethyl lead	ND (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
2,6,10-trimethyldodecane (1380)	**3740** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS699-S3
Date Sampled: 09/26/19 09:46
Percent Solids: 46
Initial Volume: 5.92
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-02
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**5830** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
2,6,10-trimethylpentadecane (1650)	**8250** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
C-17	**794** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
Pristane	**16600** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
C-18	**745** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
Phytane	**13200** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
Carbazole	**598** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
2,6-Dimethylnaphthalene	**33800** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
2,3,5-Trimethylnaphthene	**7290** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
4-Methyldibenzothiophene	**21000** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
2/3-Methyldibenzothiophene	**17000** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
1-Methyldibenzothiophene	**4810** (36.5)	18.2	8270 Mod		5	10/08/19 11:50	F9J0004	FJ90201
3-Methylphenanthrene	**110000** (729)	365	8270 Mod		100	10/09/19 7:33	F9J0004	FJ90201
2-Methylphenanthrene	**121000** (729)	365	8270 Mod		100	10/09/19 7:33	F9J0004	FJ90201
2-Methylanthracene	**55600** (729)	365	8270 Mod		100	10/09/19 7:33	F9J0004	FJ90201
4/9-Methylphenanthrene	**116000** (729)	365	8270 Mod		100	10/09/19 7:33	F9J0004	FJ90201
1-Methylphenanthrene	**79400** (729)	365	8270 Mod		100	10/09/19 7:33	F9J0004	FJ90201

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*70 %*		*50-120*
Surrogate: Perylene-d12	*132 %*	*SM*	*50-120*
Surrogate: Phenanthrene-d10	*76 %*		*50-120*
Surrogate: Toluene-D8	*65 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS699-S3
Date Sampled: 09/26/19 09:46
Percent Solids: 46

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-02
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**158000** (100)		TOC-LK		1	CCP	10/08/19 17:21	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS700-S2
Date Sampled: 09/26/19 11:20
Percent Solids: 60
Initial Volume: 5.43
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-03
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**56.9** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
C1-Benzene	**502** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
C2-Benzenes	**201** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
C3-Benzenes	**304** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
C4-Benzenes	**723** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
C5-Benzenes	**674** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
Methylcyclohexane	**43.3** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
Toluene	**772** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
Ethylbenzene	**78.1** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
m,p-Xylene	**241** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
Styrene	**173** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
o-Xylene	**37.6** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
Isopropylbenzene	**17.9** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
n-Propylbenzene	**21.4** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
1,3,5-Trimethylbenzene	**73.1** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
1,2,3-Trimethylbenzene	**68.6** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
1,2,4-Trimethylbenzene	**177** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
t-Butylbenzene	ND (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
sec-Butylbenzene	**7.20** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
p-Isopropyltoluene	**46.6** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
n-Butylbenzene	**38.1** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
trans-Decalin	**51.3** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
cis-Decalin	**20.5** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
C1-Decalins	**227** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
C2-Decalins	**651** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
C3-Decalins	**788** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
C4-Decalins	**1670** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
Benzo(b)thiophene	**64.8** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
C1-Benzo(b)thiophenes	**209** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
C2-Benzo(b)thiophenes	**603** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
C3-Benzo(b)thiophenes	**704** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
C4-Benzo(b)thiophenes	**326** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS700-S2
Date Sampled: 09/26/19 11:20
Percent Solids: 60
Initial Volume: 5.43
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-03
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**2660** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
2-Methylnaphthalene	**2180** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
1-Methylnaphthalene	**8140** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
C1-Naphthalenes	**6160** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
C2-Naphthalenes	**20800** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
C3-Naphthalenes	**17700** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
C4-Naphthalenes	**8210** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
Biphenyl	**738** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
Acenaphthylene	**3810** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
Acenaphthene	**10400** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
Dibenzofuran	**823** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
Fluorene	**8900** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
C1-Fluorenes	**11200** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
C2-Fluorenes	**11000** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
C3-Fluorenes	**6010** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
Dibenzothiophene	**2370** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
C1-Dibenzothiophenes	**5130** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
C2-Dibenzothiophenes	**5620** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
C3-Dibenzothiophenes	**3190** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
C4-Dibenzothiophenes	**1210** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
Phenanthrene	**55700** (123)	61.6	8270 Mod		20	10/09/19 8:58	F9J0004	FJ90201
Anthracene	**17300** (123)	61.6	8270 Mod		20	10/09/19 8:58	F9J0004	FJ90201
C1-Phenanthrenes/Anthracenes	**49000** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
C2-Phenanthrenes/Anthracenes	**32000** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
C3-Phenanthrenes/Anthracenes	**12500** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
C4-Phenanthrenes/Anthracenes	**4240** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
Retene	**980** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
Benzo(b)naphtho(2,1-d)thiophene	**2070** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
C0-Benzonaphthothiophenes	**3620** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
C1-Benzonaphthothiophenes	**3490** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
C2-Benzonaphthothiophenes	**2170** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
C3-Benzonaphthothiophenes	**1060** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS700-S2
Date Sampled: 09/26/19 11:20
Percent Solids: 60
Initial Volume: 5.43
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-03
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**261** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
Fluoranthene	**30400** (123)	61.6	8270 Mod		20	10/09/19 8:58	F9J0004	FJ90201
Pyrene	**47500** (123)	61.6	8270 Mod		20	10/09/19 8:58	F9J0004	FJ90201
C1-Fluoranthenes/Pyrenes	**38100** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
C2-Fluoranthenes/Pyrenes	**16100** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
C3-Fluoranthenes/Pyrenes	**6830** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
Benzo(b)fluorene	**3920** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
Benzo(c)fluorene	**1690** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
2-Methylpyrene	**5310** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
4-Methylpyrene	**4850** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
1-Methylpyrene	**4640** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
Benz(a)anthracene	**19300** (123)	61.6	8270 Mod		20	10/09/19 8:58	F9J0004	FJ90201
Chrysene/triphenylene	**21300** (123)	61.6	8270 Mod		20	10/09/19 8:58	F9J0004	FJ90201
C1-Benzo(a)anthracenes/Chrysenes	**17400** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
C2-Benzo(a)anthracenes/Chrysenes	**9320** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
C3-Benzo(a)anthracenes/Chrysenes	**3510** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
C4-Benzo(a)anthracenes/Chrysenes	**1280** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
Benzo(b)fluoranthene	**7280** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
Benzo(j/k)fluoranthene	**8440** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
Benzo(e)pyrene	**8220** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
Benzo(a)pyrene	**14800** (123)	61.6	8270 Mod		20	10/09/19 8:58	F9J0004	FJ90201
Perylene	**2130** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
Indeno(1,2,3-cd)pyrene	**5530** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
Dibenzo(a,h)anthracene	**1800** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
Benzo(g,h,i)perylene	**5550** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
Coronene	**1320** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
Tetramethyl lead	ND (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
Trimethylethyl lead	ND (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
Dimethyldiethyl lead	ND (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
Methyltriethyl lead	ND (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
Tetraethyl lead	ND (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
2,6,10-trimethyldodecane (1380)	**621** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS700-S2
Date Sampled: 09/26/19 11:20
Percent Solids: 60
Initial Volume: 5.43
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-03
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**1110** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
2,6,10-trimethylpentadecane (1650)	**1730** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
C-17	**305** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
Pristane	**3760** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
C-18	**380** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
Phytane	**3730** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
Carbazole	**103** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
2,6-Dimethylnaphthalene	**4480** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
2,3,5-Trimethylnaphthene	**1180** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
4-Methyldibenzothiophene	**2230** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
2/3-Methyldibenzothiophene	**1720** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
1-Methyldibenzothiophene	**443** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
3-Methylphenanthrene	**11000** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
2-Methylphenanthrene	**11800** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
2-Methylanthracene	**5860** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
4/9-Methylphenanthrene	**11800** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201
1-Methylphenanthrene	**8400** (6.16)	3.08	8270 Mod		1	10/08/19 13:15	F9J0004	FJ90201

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*73 %*		*50-120*
Surrogate: Perylene-d12	*91 %*		*50-120*
Surrogate: Phenanthrene-d10	*76 %*		*50-120*
Surrogate: Toluene-D8	*65 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS700-S2
Date Sampled: 09/26/19 11:20
Percent Solids: 60

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-03
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**63700** (105)		TOC-LK		1	CCP	10/08/19 21:22	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS700-S5
Date Sampled: 09/26/19 11:30
Percent Solids: 72
Initial Volume: 5.35
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-04
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**B, J 4.91** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C1-Benzene	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C2-Benzenes	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C3-Benzenes	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C4-Benzenes	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C5-Benzenes	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
Methylcyclohexane	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
Toluene	**J 3.66** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
Ethylbenzene	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
m,p-Xylene	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
Styrene	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
o-Xylene	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
Isopropylbenzene	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
n-Propylbenzene	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
1,3,5-Trimethylbenzene	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
1,2,3-Trimethylbenzene	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
1,2,4-Trimethylbenzene	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
t-Butylbenzene	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
sec-Butylbenzene	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
p-Isopropyltoluene	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
n-Butylbenzene	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
trans-Decalin	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
cis-Decalin	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C1-Decalins	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C2-Decalins	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C3-Decalins	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C4-Decalins	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
Benzo(b)thiophene	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C1-Benzo(b)thiophenes	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C2-Benzo(b)thiophenes	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C3-Benzo(b)thiophenes	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C4-Benzo(b)thiophenes	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS700-S5
Date Sampled: 09/26/19 11:30
Percent Solids: 72
Initial Volume: 5.35
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-04
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
2-Methylnaphthalene	**J 2.74** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
1-Methylnaphthalene	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C1-Naphthalenes	**J 2.91** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C2-Naphthalenes	**7.86** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C3-Naphthalenes	**7.27** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C4-Naphthalenes	**6.86** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
Biphenyl	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
Acenaphthylene	**27.3** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
Acenaphthene	**J 3.99** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
Dibenzofuran	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
Fluorene	**5.60** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C1-Fluorenes	**13.4** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C2-Fluorenes	**14.6** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C3-Fluorenes	**6.05** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
Dibenzothiophene	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C1-Dibenzothiophenes	**J 3.31** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C2-Dibenzothiophenes	**J 3.77** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C3-Dibenzothiophenes	**J 2.67** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C4-Dibenzothiophenes	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
Phenanthrene	**12.0** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
Anthracene	**9.01** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C1-Phenanthrenes/Anthracenes	**36.8** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C2-Phenanthrenes/Anthracenes	**29.6** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C3-Phenanthrenes/Anthracenes	**10.7** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C4-Phenanthrenes/Anthracenes	**J 4.60** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
Retene	**J 3.58** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
Benzo(b)naphtho(2,1-d)thiophene	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C0-Benzonaphthothiophenes	**J 3.25** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C1-Benzonaphthothiophenes	**J 2.83** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C2-Benzonaphthothiophenes	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C3-Benzonaphthothiophenes	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS700-S5
Date Sampled: 09/26/19 11:30
Percent Solids: 72
Initial Volume: 5.35
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-04
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
Fluoranthene	**18.1** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
Pyrene	**75.2** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C1-Fluoranthenes/Pyrenes	**65.5** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C2-Fluoranthenes/Pyrenes	**37.0** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C3-Fluoranthenes/Pyrenes	**10.6** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
Benzo(b)fluorene	**6.48** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
Benzo(c)fluorene	**J 4.40** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
2-Methylpyrene	**7.85** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
4-Methylpyrene	**7.30** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
1-Methylpyrene	**6.03** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
Benz(a)anthracene	**18.3** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
Chrysene/triphenylene	**15.8** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C1-Benzo(a)anthracenes/Chrysenes	**15.2** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C2-Benzo(a)anthracenes/Chrysenes	**10.4** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C3-Benzo(a)anthracenes/Chrysenes	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C4-Benzo(a)anthracenes/Chrysenes	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
Benzo(b)fluoranthene	**6.08** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
Benzo(j/k)fluoranthene	**8.03** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
Benzo(e)pyrene	**7.96** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
Benzo(a)pyrene	**11.2** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
Perylene	**10.7** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
Indeno(1,2,3-cd)pyrene	**J 4.70** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
Dibenzo(a,h)anthracene	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
Benzo(g,h,i)perylene	**5.28** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
Coronene	**J 4.21** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
Tetramethyl lead	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
Trimethylethyl lead	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
Dimethyldiethyl lead	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
Methyltriethyl lead	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
Tetraethyl lead	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
2,6,10-trimethyldodecane (1380)	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS700-S5
Date Sampled: 09/26/19 11:30
Percent Solids: 72
Initial Volume: 5.35
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-04
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	J **4.29** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
2,6,10-trimethylpentadecane (1650)	B **18.3** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C-17	B **70.0** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
Pristane	B **44.1** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
C-18	B **50.9** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
Phytane	B **55.9** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
Carbazole	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
2,6-Dimethylnaphthalene	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
2,3,5-Trimethylnaphthene	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
4-Methyldibenzothiophene	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
2/3-Methyldibenzothiophene	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
1-Methyldibenzothiophene	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
3-Methylphenanthrene	**8.74** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
2-Methylphenanthrene	**7.62** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
2-Methylanthracene	**7.30** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
4/9-Methylphenanthrene	**9.97** (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201
1-Methylphenanthrene	ND (5.22)	2.61	8270 Mod		1	10/08/19 14:39	F9J0004	FJ90201

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*83 %*		*50-120*
Surrogate: Perylene-d12	*88 %*		*50-120*
Surrogate: Phenanthrene-d10	*88 %*		*50-120*
Surrogate: Toluene-D8	*71 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS700-S5
Date Sampled: 09/26/19 11:30
Percent Solids: 72

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-04
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**4110** (93.0)		TOC-LK		1	CCP	10/08/19 17:54	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS701-S2
Date Sampled: 09/26/19 13:01
Percent Solids: 66
Initial Volume: 2.03
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-05
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**404** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
C1-Benzene	**392** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
C2-Benzenes	**914** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
C3-Benzenes	**2580** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
C4-Benzenes	**5660** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
C5-Benzenes	**2250** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
Methylcyclohexane	**201** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
Toluene	**529** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
Ethylbenzene	**877** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
m,p-Xylene	**672** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
Styrene	**558** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
o-Xylene	**328** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
Isopropylbenzene	**299** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
n-Propylbenzene	**157** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
1,3,5-Trimethylbenzene	**454** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
1,2,3-Trimethylbenzene	**797** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
1,2,4-Trimethylbenzene	**1610** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
t-Butylbenzene	ND (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
sec-Butylbenzene	**J 44.1** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
p-Isopropyltoluene	**758** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
n-Butylbenzene	ND (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
trans-Decalin	**425** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
cis-Decalin	**83.5** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
C1-Decalins	**1110** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
C2-Decalins	**1400** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
C3-Decalins	**1280** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
C4-Decalins	**1670** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
Benzo(b)thiophene	**3110** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
C1-Benzo(b)thiophenes	**4870** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
C2-Benzo(b)thiophenes	**5910** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
C3-Benzo(b)thiophenes	**3020** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
C4-Benzo(b)thiophenes	**816** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS701-S2
Date Sampled: 09/26/19 13:01
Percent Solids: 66
Initial Volume: 2.03
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-05
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**183000** (1500)	751	8270 Mod		100	10/09/19 10:22	F9J0004	FJ90201
2-Methylnaphthalene	**111000** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
1-Methylnaphthalene	**96200** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
C1-Naphthalenes	**127000** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
C2-Naphthalenes	**87200** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
C3-Naphthalenes	**28100** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
C4-Naphthalenes	**7310** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
Biphenyl	**28200** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
Acenaphthylene	**14500** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
Acenaphthene	**269000** (1500)	751	8270 Mod		100	10/09/19 10:22	F9J0004	FJ90201
Dibenzofuran	**8870** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
Fluorene	**86700** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
C1-Fluorenes	**24100** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
C2-Fluorenes	**9960** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
C3-Fluorenes	**4640** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
Dibenzothiophene	**27900** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
C1-Dibenzothiophenes	**16400** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
C2-Dibenzothiophenes	**8940** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
C3-Dibenzothiophenes	**3930** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
C4-Dibenzothiophenes	**1430** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
Phenanthrene	**568000** (1500)	751	8270 Mod		100	10/09/19 10:22	F9J0004	FJ90201
Anthracene	**128000** (1500)	751	8270 Mod		100	10/09/19 10:22	F9J0004	FJ90201
C1-Phenanthrenes/Anthracenes	**113000** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
C2-Phenanthrenes/Anthracenes	**31600** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
C3-Phenanthrenes/Anthracenes	**8280** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
C4-Phenanthrenes/Anthracenes	**2640** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
Retene	**1160** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
Benzo(b)naphtho(2,1-d)thiophene	**9020** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
C0-Benzonaphthothiophenes	**16600** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
C1-Benzonaphthothiophenes	**7320** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
C2-Benzonaphthothiophenes	**3150** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
C3-Benzonaphthothiophenes	**2480** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS701-S2
Date Sampled: 09/26/19 13:01
Percent Solids: 66
Initial Volume: 2.03
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-05
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**534** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
Fluoranthene	**245000** (1500)	751	8270 Mod		100	10/09/19 10:22	F9J0004	FJ90201
Pyrene	**368000** (1500)	751	8270 Mod		100	10/09/19 10:22	F9J0004	FJ90201
C1-Fluoranthenes/Pyrenes	**106000** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
C2-Fluoranthenes/Pyrenes	**21700** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
C3-Fluoranthenes/Pyrenes	**6040** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
Benzo(b)fluorene	**12600** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
Benzo(c)fluorene	**5690** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
2-Methylpyrene	**13900** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
4-Methylpyrene	**11700** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
1-Methylpyrene	**13100** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
Benz(a)anthracene	**78100** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
Chrysene/triphenylene	**70300** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
C1-Benzo(a)anthracenes/Chrysenes	**30100** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
C2-Benzo(a)anthracenes/Chrysenes	**9700** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
C3-Benzo(a)anthracenes/Chrysenes	**3030** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
C4-Benzo(a)anthracenes/Chrysenes	**1270** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
Benzo(b)fluoranthene	**41400** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
Benzo(j/k)fluoranthene	**50800** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
Benzo(e)pyrene	**48400** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
Benzo(a)pyrene	**88500** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
Perylene	**14300** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
Indeno(1,2,3-cd)pyrene	**39400** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
Dibenzo(a,h)anthracene	**8030** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
Benzo(g,h,i)perylene	**43600** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
Coronene	**12700** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
Tetramethyl lead	ND (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
Trimethylethyl lead	ND (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
Dimethyldiethyl lead	ND (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
Methyltriethyl lead	ND (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
Tetraethyl lead	ND (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
2,6,10-trimethyldodecane (1380)	**1910** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS701-S2
Date Sampled: 09/26/19 13:01
Percent Solids: 66
Initial Volume: 2.03
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-05
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**2650** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
2,6,10-trimethylpentadecane (1650)	**2630** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
C-17	**436** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
Pristane	**5460** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
C-18	**393** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
Phytane	**4250** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
Carbazole	**1270** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
2,6-Dimethylnaphthalene	**16100** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
2,3,5-Trimethylnaphthene	**1590** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
4-Methyldibenzothiophene	**6620** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
2/3-Methyldibenzothiophene	**5800** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
1-Methyldibenzothiophene	**1560** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
3-Methylphenanthrene	**27600** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
2-Methylphenanthrene	**30000** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
2-Methylanthracene	**12900** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
4/9-Methylphenanthrene	**23500** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201
1-Methylphenanthrene	**17600** (75.1)	37.5	8270 Mod		5	10/08/19 16:04	F9J0004	FJ90201

	%Recovery	*Qualifier*	*Limits*
Surrogate: Naphthalene-d8	*89 %*		*50-120*
Surrogate: Perylene-d12	*108 %*		*50-120*
Surrogate: Phenanthrene-d10	*95 %*		*50-120*
Surrogate: Toluene-D8	*83 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS701-S2
Date Sampled: 09/26/19 13:01
Percent Solids: 66

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-05
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**205000** (95.9)		TOC-LK		1	CCP	10/08/19 18:11	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS701-S4
Date Sampled: 09/26/19 13:14
Percent Solids: 72
Initial Volume: 5.14
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-06
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**B, J 4.28** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C1-Benzene	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C2-Benzenes	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C3-Benzenes	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C4-Benzenes	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C5-Benzenes	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
Methylcyclohexane	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
Toluene	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
Ethylbenzene	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
m,p-Xylene	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
Styrene	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
o-Xylene	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
Isopropylbenzene	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
n-Propylbenzene	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
1,3,5-Trimethylbenzene	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
1,2,3-Trimethylbenzene	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
1,2,4-Trimethylbenzene	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
t-Butylbenzene	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
sec-Butylbenzene	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
p-Isopropyltoluene	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
n-Butylbenzene	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
trans-Decalin	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
cis-Decalin	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C1-Decalins	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C2-Decalins	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C3-Decalins	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C4-Decalins	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
Benzo(b)thiophene	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C1-Benzo(b)thiophenes	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C2-Benzo(b)thiophenes	**J 2.75** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C3-Benzo(b)thiophenes	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C4-Benzo(b)thiophenes	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS701-S4
Date Sampled: 09/26/19 13:14
Percent Solids: 72
Initial Volume: 5.14
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-06
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**15.5** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
2-Methylnaphthalene	**17.4** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
1-Methylnaphthalene	**17.0** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C1-Naphthalenes	**21.2** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C2-Naphthalenes	**31.2** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C3-Naphthalenes	**17.5** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C4-Naphthalenes	**6.89** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
Biphenyl	**6.93** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
Acenaphthylene	**14.1** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
Acenaphthene	**68.4** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
Dibenzofuran	**J 3.87** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
Fluorene	**33.7** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C1-Fluorenes	**15.9** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C2-Fluorenes	**10.1** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C3-Fluorenes	**J 3.89** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
Dibenzothiophene	**13.1** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C1-Dibenzothiophenes	**9.11** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C2-Dibenzothiophenes	**5.98** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C3-Dibenzothiophenes	**J 3.04** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C4-Dibenzothiophenes	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
Phenanthrene	**213** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
Anthracene	**44.0** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C1-Phenanthrenes/Anthracenes	**68.7** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C2-Phenanthrenes/Anthracenes	**26.3** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C3-Phenanthrenes/Anthracenes	**7.79** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C4-Phenanthrenes/Anthracenes	**J 3.37** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
Retene	**J 3.06** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
Benzo(b)naphtho(2,1-d)thiophene	**J 3.89** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C0-Benzonaphthothiophenes	**7.71** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C1-Benzonaphthothiophenes	**J 4.91** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C2-Benzonaphthothiophenes	**J 2.85** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C3-Benzonaphthothiophenes	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS701-S4
Date Sampled: 09/26/19 13:14
Percent Solids: 72
Initial Volume: 5.14
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-06
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
Fluoranthene	**95.0** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
Pyrene	**139** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C1-Fluoranthenes/Pyrenes	**60.9** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C2-Fluoranthenes/Pyrenes	**17.3** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C3-Fluoranthenes/Pyrenes	**7.70** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
Benzo(b)fluorene	**6.60** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
Benzo(c)fluorene	**J 3.63** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
2-Methylpyrene	**7.78** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
4-Methylpyrene	**6.70** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
1-Methylpyrene	**7.07** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
Benz(a)anthracene	**38.3** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
Chrysene/triphenylene	**36.4** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C1-Benzo(a)anthracenes/Chrysenes	**20.1** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C2-Benzo(a)anthracenes/Chrysenes	**10.8** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C3-Benzo(a)anthracenes/Chrysenes	**J 2.80** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C4-Benzo(a)anthracenes/Chrysenes	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
Benzo(b)fluoranthene	**17.6** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
Benzo(j/k)fluoranthene	**24.0** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
Benzo(e)pyrene	**21.0** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
Benzo(a)pyrene	**35.1** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
Perylene	**11.9** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
Indeno(1,2,3-cd)pyrene	**15.3** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
Dibenzo(a,h)anthracene	**J 3.60** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
Benzo(g,h,i)perylene	**16.2** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
Coronene	**6.47** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
Tetramethyl lead	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
Trimethylethyl lead	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
Dimethyldiethyl lead	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
Methyltriethyl lead	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
Tetraethyl lead	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
2,6,10-trimethyldodecane (1380)	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS701-S4
Date Sampled: 09/26/19 13:14
Percent Solids: 72
Initial Volume: 5.14
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-06
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**J 3.10** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
2,6,10-trimethylpentadecane (1650)	**B 8.23** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C-17	**B 29.5** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
Pristane	**B 21.8** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
C-18	**B 21.8** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
Phytane	**B 24.5** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
Carbazole	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
2,6-Dimethylnaphthalene	**5.69** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
2,3,5-Trimethylnaphthene	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
4-Methyldibenzothiophene	**J 3.59** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
2/3-Methyldibenzothiophene	**J 3.01** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
1-Methyldibenzothiophene	ND (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
3-Methylphenanthrene	**17.0** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
2-Methylphenanthrene	**18.0** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
2-Methylanthracene	**6.66** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
4/9-Methylphenanthrene	**15.0** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201
1-Methylphenanthrene	**10.3** (5.39)	2.69	8270 Mod		1	10/08/19 17:28	F9J0004	FJ90201

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*82 %*		*50-120*
Surrogate: Perylene-d12	*81 %*		*50-120*
Surrogate: Phenanthrene-d10	*86 %*		*50-120*
Surrogate: Toluene-D8	*65 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS701-S4
Date Sampled: 09/26/19 13:14
Percent Solids: 72

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-06
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**2270** (92.9)		TOC-LK		1	CCP	10/08/19 19:17	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS702-S3
Date Sampled: 09/26/19 13:53
Percent Solids: 58
Initial Volume: 5.06
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-07
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**296** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
C1-Benzene	**1070** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
C2-Benzenes	**434** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
C3-Benzenes	**611** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
C4-Benzenes	**1130** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
C5-Benzenes	**695** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
Methylcyclohexane	**81.9** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
Toluene	**1530** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
Ethylbenzene	**231** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
m,p-Xylene	**494** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
Styrene	**278** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
o-Xylene	**104** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
Isopropylbenzene	**53.9** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
n-Propylbenzene	**39.8** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
1,3,5-Trimethylbenzene	**143** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
1,2,3-Trimethylbenzene	**162** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
1,2,4-Trimethylbenzene	**358** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
t-Butylbenzene	ND (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
sec-Butylbenzene	ND (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
p-Isopropyltoluene	**123** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
n-Butylbenzene	ND (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
trans-Decalin	**89.9** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
cis-Decalin	**J 25.9** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
C1-Decalins	**392** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
C2-Decalins	**742** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
C3-Decalins	**686** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
C4-Decalins	**977** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
Benzo(b)thiophene	**371** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
C1-Benzo(b)thiophenes	**518** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
C2-Benzo(b)thiophenes	**990** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
C3-Benzo(b)thiophenes	**742** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
C4-Benzo(b)thiophenes	**306** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS702-S3
Date Sampled: 09/26/19 13:53
Percent Solids: 58
Initial Volume: 5.06
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-07
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**16500** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
2-Methylnaphthalene	**6100** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
1-Methylnaphthalene	**18500** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
C1-Naphthalenes	**14700** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
C2-Naphthalenes	**24100** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
C3-Naphthalenes	**12400** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
C4-Naphthalenes	**4840** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
Biphenyl	**3090** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
Acenaphthylene	**5370** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
Acenaphthene	**46200** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
Dibenzofuran	**2530** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
Fluorene	**22300** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
C1-Fluorenes	**9140** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
C2-Fluorenes	**6050** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
C3-Fluorenes	**3420** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
Dibenzothiophene	**7180** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
C1-Dibenzothiophenes	**6030** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
C2-Dibenzothiophenes	**4680** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
C3-Dibenzothiophenes	**2390** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
C4-Dibenzothiophenes	**894** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
Phenanthrene	**139000** (678)	339	8270 Mod		100	10/09/19 11:47	F9J0004	FJ90201
Anthracene	**39000** (678)	339	8270 Mod		100	10/09/19 11:47	F9J0004	FJ90201
C1-Phenanthrenes/Anthracenes	**50900** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
C2-Phenanthrenes/Anthracenes	**20900** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
C3-Phenanthrenes/Anthracenes	**6960** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
C4-Phenanthrenes/Anthracenes	**2400** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
Retene	**1100** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
Benzo(b)naphtho(2,1-d)thiophene	**4090** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
C0-Benzonaphthothiophenes	**7450** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
C1-Benzonaphthothiophenes	**3550** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
C2-Benzonaphthothiophenes	**1840** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
C3-Benzonaphthothiophenes	**1330** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS702-S3
Date Sampled: 09/26/19 13:53
Percent Solids: 58
Initial Volume: 5.06
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-07
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**302** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
Fluoranthene	**106000** (678)	339	8270 Mod		100	10/09/19 11:47	F9J0004	FJ90201
Pyrene	**144000** (678)	339	8270 Mod		100	10/09/19 11:47	F9J0004	FJ90201
C1-Fluoranthenes/Pyrenes	**51200** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
C2-Fluoranthenes/Pyrenes	**12800** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
C3-Fluoranthenes/Pyrenes	**4290** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
Benzo(b)fluorene	**6310** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
Benzo(c)fluorene	**2940** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
2-Methylpyrene	**6690** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
4-Methylpyrene	**5730** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
1-Methylpyrene	**6210** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
Benz(a)anthracene	**38700** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
Chrysene/triphenylene	**39600** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
C1-Benzo(a)anthracenes/Chrysenes	**16400** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
C2-Benzo(a)anthracenes/Chrysenes	**6600** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
C3-Benzo(a)anthracenes/Chrysenes	**2540** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
C4-Benzo(a)anthracenes/Chrysenes	**1100** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
Benzo(b)fluoranthene	**22200** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
Benzo(j/k)fluoranthene	**27700** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
Benzo(e)pyrene	**24400** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
Benzo(a)pyrene	**41600** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
Perylene	**7420** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
Indeno(1,2,3-cd)pyrene	**20600** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
Dibenzo(a,h)anthracene	**4320** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
Benzo(g,h,i)perylene	**21500** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
Coronene	**6270** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
Tetramethyl lead	ND (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
Trimethylethyl lead	ND (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
Dimethyldiethyl lead	ND (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
Methyltriethyl lead	ND (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
Tetraethyl lead	ND (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
2,6,10-trimethyldodecane (1380)	**806** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS702-S3
Date Sampled: 09/26/19 13:53
Percent Solids: 58
Initial Volume: 5.06
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-07
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**1470** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
2,6,10-trimethylpentadecane (1650)	**1980** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
C-17	**532** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
Pristane	**4380** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
C-18	**539** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
Phytane	**4060** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
Carbazole	**526** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
2,6-Dimethylnaphthalene	**4740** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
2,3,5-Trimethylnaphthene	**780** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
4-Methyldibenzothiophene	**2620** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
2/3-Methyldibenzothiophene	**2070** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
1-Methyldibenzothiophene	**573** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
3-Methylphenanthrene	**11600** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
2-Methylphenanthrene	**13100** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
2-Methylanthracene	**5970** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
4/9-Methylphenanthrene	**11700** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201
1-Methylphenanthrene	**8460** (33.9)	17.0	8270 Mod		5	10/08/19 18:53	F9J0004	FJ90201

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*87 %*		*50-120*
Surrogate: Perylene-d12	*108 %*		*50-120*
Surrogate: Phenanthrene-d10	*91 %*		*50-120*
Surrogate: Toluene-D8	*81 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS702-S3
Date Sampled: 09/26/19 13:53
Percent Solids: 58

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-07
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**101000** (94.8)		TOC-LK		1	CCP	10/08/19 19:34	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS703-S3
Date Sampled: 09/26/19 16:22
Percent Solids: 60
Initial Volume: 1.87
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-08
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**333** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
C1-Benzene	**1410** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
C2-Benzenes	**2880** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
C3-Benzenes	**8190** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
C4-Benzenes	**19500** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
C5-Benzenes	**10100** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
Methylcyclohexane	**306** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
Toluene	**1790** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
Ethylbenzene	**3190** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
m,p-Xylene	**2040** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
Styrene	**1180** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
o-Xylene	**652** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
Isopropylbenzene	**715** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
n-Propylbenzene	**472** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
1,3,5-Trimethylbenzene	**1620** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
1,2,3-Trimethylbenzene	**2120** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
1,2,4-Trimethylbenzene	**5050** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
t-Butylbenzene	ND (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
sec-Butylbenzene	**119** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
p-Isopropyltoluene	**2380** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
n-Butylbenzene	ND (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
trans-Decalin	**499** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
cis-Decalin	**169** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
C1-Decalins	**1960** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
C2-Decalins	**3560** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
C3-Decalins	**3390** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
C4-Decalins	**4580** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
Benzo(b)thiophene	**2050** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
C1-Benzo(b)thiophenes	**5470** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
C2-Benzo(b)thiophenes	**8830** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
C3-Benzo(b)thiophenes	**6070** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
C4-Benzo(b)thiophenes	**2010** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS703-S3
Date Sampled: 09/26/19 16:22
Percent Solids: 60
Initial Volume: 1.87
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-08
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**272000** (1790)	896	8270 Mod		100	10/09/19 13:12	F9J0004	FJ90201
2-Methylnaphthalene	**170000** (1790)	896	8270 Mod		100	10/09/19 13:12	F9J0004	FJ90201
1-Methylnaphthalene	**251000** (1790)	896	8270 Mod		100	10/09/19 13:12	F9J0004	FJ90201
C1-Naphthalenes	**255000** (1790)	896	8270 Mod		100	10/09/19 13:12	F9J0004	FJ90201
C2-Naphthalenes	**212000** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
C3-Naphthalenes	**98700** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
C4-Naphthalenes	**30300** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
Biphenyl	**22900** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
Acenaphthylene	**14400** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
Acenaphthene	**287000** (1790)	896	8270 Mod		100	10/09/19 13:12	F9J0004	FJ90201
Dibenzofuran	**10700** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
Fluorene	**99600** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
C1-Fluorenes	**59300** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
C2-Fluorenes	**38200** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
C3-Fluorenes	**15300** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
Dibenzothiophene	**27700** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
C1-Dibenzothiophenes	**27700** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
C2-Dibenzothiophenes	**20500** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
C3-Dibenzothiophenes	**9480** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
C4-Dibenzothiophenes	**3000** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
Phenanthrene	**466000** (1790)	896	8270 Mod		100	10/09/19 13:12	F9J0004	FJ90201
Anthracene	**122000** (1790)	896	8270 Mod		100	10/09/19 13:12	F9J0004	FJ90201
C1-Phenanthrenes/Anthracenes	**226000** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
C2-Phenanthrenes/Anthracenes	**95100** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
C3-Phenanthrenes/Anthracenes	**30400** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
C4-Phenanthrenes/Anthracenes	**11100** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
Retene	**11400** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
Benzo(b)naphtho(2,1-d)thiophene	**8740** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
C0-Benzonaphthothiophenes	**15700** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
C1-Benzonaphthothiophenes	**10500** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
C2-Benzonaphthothiophenes	**5460** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
C3-Benzonaphthothiophenes	**2890** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS703-S3
Date Sampled: 09/26/19 16:22
Percent Solids: 60
Initial Volume: 1.87
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-08
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**589** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
Fluoranthene	**166000** (1790)	896	8270 Mod		100	10/09/19 13:12	F9J0004	FJ90201
Pyrene	**244000** (1790)	896	8270 Mod		100	10/09/19 13:12	F9J0004	FJ90201
C1-Fluoranthenes/Pyrenes	**141000** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
C2-Fluoranthenes/Pyrenes	**44700** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
C3-Fluoranthenes/Pyrenes	**16700** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
Benzo(b)fluorene	**14000** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
Benzo(c)fluorene	**7260** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
2-Methylpyrene	**18300** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
4-Methylpyrene	**16500** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
1-Methylpyrene	**18400** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
Benz(a)anthracene	**72100** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
Chrysene/triphenylene	**69900** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
C1-Benzo(a)anthracenes/Chrysenes	**46500** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
C2-Benzo(a)anthracenes/Chrysenes	**20800** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
C3-Benzo(a)anthracenes/Chrysenes	**7410** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
C4-Benzo(a)anthracenes/Chrysenes	**2440** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
Benzo(b)fluoranthene	**27600** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
Benzo(j/k)fluoranthene	**37300** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
Benzo(e)pyrene	**34000** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
Benzo(a)pyrene	**61700** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
Perylene	**9710** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
Indeno(1,2,3-cd)pyrene	**25000** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
Dibenzo(a,h)anthracene	**6280** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
Benzo(g,h,i)perylene	**26800** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
Coronene	**7330** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
Tetramethyl lead	ND (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
Trimethylethyl lead	ND (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
Dimethyldiethyl lead	ND (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
Methyltriethyl lead	ND (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
Tetraethyl lead	ND (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
2,6,10-trimethyldodecane (1380)	**3180** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS703-S3
Date Sampled: 09/26/19 16:22
Percent Solids: 60
Initial Volume: 1.87
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-08
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**5490** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
2,6,10-trimethylpentadecane (1650)	**6180** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
C-17	**613** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
Pristane	**11700** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
C-18	**595** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
Phytane	**9250** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
Carbazole	**1490** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
2,6-Dimethylnaphthalene	**42200** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
2,3,5-Trimethylnaphthene	**6400** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
4-Methyldibenzothiophene	**11800** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
2/3-Methyldibenzothiophene	**9480** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
1-Methyldibenzothiophene	**2650** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
3-Methylphenanthrene	**51500** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
2-Methylphenanthrene	**55900** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
2-Methylanthracene	**25700** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
4/9-Methylphenanthrene	**52600** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201
1-Methylphenanthrene	**35700** (89.6)	44.8	8270 Mod		5	10/08/19 20:17	F9J0004	FJ90201

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*83 %*		*50-120*
Surrogate: Perylene-d12	*99 %*		*50-120*
Surrogate: Phenanthrene-d10	*88 %*		*50-120*
Surrogate: Toluene-D8	*77 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS703-S3
Date Sampled: 09/26/19 16:22
Percent Solids: 60

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-08
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**112000** (101)		TOC-LK		1	CCP	10/08/19 19:51	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS704-S2
Date Sampled: 09/26/19 16:45
Percent Solids: 73
Initial Volume: 5.37
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-09
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**122** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
C1-Benzene	**314** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
C2-Benzenes	**200** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
C3-Benzenes	**209** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
C4-Benzenes	**335** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
C5-Benzenes	**469** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
Methylcyclohexane	**131** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
Toluene	**439** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
Ethylbenzene	**63.5** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
m,p-Xylene	**249** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
Styrene	**209** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
o-Xylene	**49.3** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
Isopropylbenzene	ND (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
n-Propylbenzene	**25.8** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
1,3,5-Trimethylbenzene	**66.5** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
1,2,3-Trimethylbenzene	**36.8** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
1,2,4-Trimethylbenzene	**113** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
t-Butylbenzene	ND (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
sec-Butylbenzene	ND (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
p-Isopropyltoluene	**36.1** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
n-Butylbenzene	**41.1** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
trans-Decalin	**353** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
cis-Decalin	**61.9** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
C1-Decalins	**952** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
C2-Decalins	**974** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
C3-Decalins	**684** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
C4-Decalins	**883** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
Benzo(b)thiophene	**256** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
C1-Benzo(b)thiophenes	**271** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
C2-Benzo(b)thiophenes	**868** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
C3-Benzo(b)thiophenes	**812** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
C4-Benzo(b)thiophenes	**398** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS704-S2
Date Sampled: 09/26/19 16:45
Percent Solids: 73
Initial Volume: 5.37
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-09
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**3950** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
2-Methylnaphthalene	**1960** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
1-Methylnaphthalene	**3660** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
C1-Naphthalenes	**3370** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
C2-Naphthalenes	**8960** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
C3-Naphthalenes	**6680** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
C4-Naphthalenes	**2790** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
Biphenyl	**877** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
Acenaphthylene	**6030** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
Acenaphthene	**20900** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
Dibenzofuran	**5660** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
Fluorene	**16700** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
C1-Fluorenes	**4460** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
C2-Fluorenes	**2980** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
C3-Fluorenes	**3280** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
Dibenzothiophene	**6110** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
C1-Dibenzothiophenes	**4330** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
C2-Dibenzothiophenes	**3990** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
C3-Dibenzothiophenes	**2660** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
C4-Dibenzothiophenes	**1300** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
Phenanthrene	**133000** (514)	257	8270 Mod		100	10/09/19 14:37	F9J0004	FJ90201
Anthracene	**32500** (514)	257	8270 Mod		100	10/09/19 14:37	F9J0004	FJ90201
C1-Phenanthrenes/Anthracenes	**28000** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
C2-Phenanthrenes/Anthracenes	**12600** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
C3-Phenanthrenes/Anthracenes	**4920** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
C4-Phenanthrenes/Anthracenes	**1980** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
Retene	**397** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
Benzo(b)naphtho(2,1-d)thiophene	**4770** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
C0-Benzonaphthothiophenes	**9090** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
C1-Benzonaphthothiophenes	**4280** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
C2-Benzonaphthothiophenes	**2650** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
C3-Benzonaphthothiophenes	**1670** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS704-S2
Date Sampled: 09/26/19 16:45
Percent Solids: 73
Initial Volume: 5.37
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-09
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**534** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
Fluoranthene	**130000** (514)	257	8270 Mod		100	10/09/19 14:37	F9J0004	FJ90201
Pyrene	**139000** (514)	257	8270 Mod		100	10/09/19 14:37	F9J0004	FJ90201
C1-Fluoranthenes/Pyrenes	**33500** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
C2-Fluoranthenes/Pyrenes	**12300** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
C3-Fluoranthenes/Pyrenes	**5210** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
Benzo(b)fluorene	**4250** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
Benzo(c)fluorene	**1850** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
2-Methylpyrene	**4540** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
4-Methylpyrene	**3670** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
1-Methylpyrene	**3450** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
Benz(a)anthracene	**52400** (514)	257	8270 Mod		100	10/09/19 14:37	F9J0004	FJ90201
Chrysene/triphenylene	**54900** (514)	257	8270 Mod		100	10/09/19 14:37	F9J0004	FJ90201
C1-Benzo(a)anthracenes/Chrysenes	**14100** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
C2-Benzo(a)anthracenes/Chrysenes	**6710** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
C3-Benzo(a)anthracenes/Chrysenes	**2950** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
C4-Benzo(a)anthracenes/Chrysenes	**1630** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
Benzo(b)fluoranthene	**25000** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
Benzo(j/k)fluoranthene	**24800** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
Benzo(e)pyrene	**22500** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
Benzo(a)pyrene	**53200** (514)	257	8270 Mod		100	10/09/19 14:37	F9J0004	FJ90201
Perylene	**8280** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
Indeno(1,2,3-cd)pyrene	**20700** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
Dibenzo(a,h)anthracene	**4780** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
Benzo(g,h,i)perylene	**20100** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
Coronene	**5270** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
Tetramethyl lead	ND (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
Trimethylethyl lead	ND (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
Dimethyldiethyl lead	ND (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
Methyltriethyl lead	ND (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
Tetraethyl lead	ND (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
2,6,10-trimethyldodecane (1380)	**1370** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS704-S2
Date Sampled: 09/26/19 16:45
Percent Solids: 73
Initial Volume: 5.37
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-09
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**1910** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
2,6,10-trimethylpentadecane (1650)	**2090** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
C-17	**445** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
Pristane	**4830** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
C-18	**353** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
Phytane	**3300** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
Carbazole	**4180** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
2,6-Dimethylnaphthalene	**1570** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
2,3,5-Trimethylnaphthene	**496** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
4-Methyldibenzothiophene	**1460** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
2/3-Methyldibenzothiophene	**1430** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
1-Methyldibenzothiophene	**438** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
3-Methylphenanthrene	**6280** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
2-Methylphenanthrene	**7620** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
2-Methylanthracene	**3530** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
4/9-Methylphenanthrene	**6010** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201
1-Methylphenanthrene	**4560** (25.7)	12.8	8270 Mod		5	10/08/19 21:41	F9J0004	FJ90201

	%Recovery	*Qualifier*	*Limits*
Surrogate: Naphthalene-d8	*71 %*		*50-120*
Surrogate: Perylene-d12	*74 %*		*50-120*
Surrogate: Phenanthrene-d10	*54 %*		*50-120*
Surrogate: Toluene-D8	*66 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS704-S2
Date Sampled: 09/26/19 16:45
Percent Solids: 73

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-09
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**172000** (110)		TOC-LK		1	CCP	10/08/19 20:07	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS704-S4
Date Sampled: 09/26/19 16:49
Percent Solids: 78
Initial Volume: 5.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-10
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**B 5.14** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C1-Benzene	**J 3.53** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C2-Benzenes	**J 3.22** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C3-Benzenes	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C4-Benzenes	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C5-Benzenes	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
Methylcyclohexane	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
Toluene	**5.06** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
Ethylbenzene	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
m,p-Xylene	**J 4.38** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
Styrene	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
o-Xylene	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
Isopropylbenzene	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
n-Propylbenzene	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
1,3,5-Trimethylbenzene	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
1,2,3-Trimethylbenzene	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
1,2,4-Trimethylbenzene	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
t-Butylbenzene	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
sec-Butylbenzene	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
p-Isopropyltoluene	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
n-Butylbenzene	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
trans-Decalin	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
cis-Decalin	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C1-Decalins	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C2-Decalins	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C3-Decalins	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C4-Decalins	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
Benzo(b)thiophene	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C1-Benzo(b)thiophenes	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C2-Benzo(b)thiophenes	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C3-Benzo(b)thiophenes	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C4-Benzo(b)thiophenes	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS704-S4
Date Sampled: 09/26/19 16:49
Percent Solids: 78
Initial Volume: 5.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-10
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
2-Methylnaphthalene	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
1-Methylnaphthalene	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C1-Naphthalenes	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C2-Naphthalenes	**J 4.61** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C3-Naphthalenes	**J 3.80** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C4-Naphthalenes	**J 3.05** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
Biphenyl	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
Acenaphthylene	**12.4** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
Acenaphthene	**J 4.03** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
Dibenzofuran	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
Fluorene	**J 4.15** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C1-Fluorenes	**J 3.78** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C2-Fluorenes	**J 3.79** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C3-Fluorenes	**J 3.10** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
Dibenzothiophene	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C1-Dibenzothiophenes	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C2-Dibenzothiophenes	**J 2.50** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C3-Dibenzothiophenes	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C4-Dibenzothiophenes	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
Phenanthrene	**13.6** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
Anthracene	**J 4.27** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C1-Phenanthrenes/Anthracenes	**10.3** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C2-Phenanthrenes/Anthracenes	**4.96** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C3-Phenanthrenes/Anthracenes	**J 3.40** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C4-Phenanthrenes/Anthracenes	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
Retene	**13.0** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
Benzo(b)naphtho(2,1-d)thiophene	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C0-Benzonaphthothiophenes	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C1-Benzonaphthothiophenes	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C2-Benzonaphthothiophenes	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C3-Benzonaphthothiophenes	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS704-S4
Date Sampled: 09/26/19 16:49
Percent Solids: 78
Initial Volume: 5.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-10
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
Fluoranthene	**11.3** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
Pyrene	**15.3** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C1-Fluoranthenes/Pyrenes	**18.1** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C2-Fluoranthenes/Pyrenes	**6.09** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C3-Fluoranthenes/Pyrenes	**J 2.83** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
Benzo(b)fluorene	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
Benzo(c)fluorene	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
2-Methylpyrene	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
4-Methylpyrene	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
1-Methylpyrene	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
Benz(a)anthracene	**5.80** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
Chrysene/triphenylene	**5.73** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C1-Benzo(a)anthracenes/Chrysenes	**5.50** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C2-Benzo(a)anthracenes/Chrysenes	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C3-Benzo(a)anthracenes/Chrysenes	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C4-Benzo(a)anthracenes/Chrysenes	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
Benzo(b)fluoranthene	**J 4.28** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
Benzo(j/k)fluoranthene	**5.56** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
Benzo(e)pyrene	**5.22** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
Benzo(a)pyrene	**8.22** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
Perylene	**206** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
Indeno(1,2,3-cd)pyrene	**J 3.63** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
Dibenzo(a,h)anthracene	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
Benzo(g,h,i)perylene	**J 4.16** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
Coronene	**J 3.28** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
Tetramethyl lead	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
Trimethylethyl lead	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
Dimethyldiethyl lead	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
Methyltriethyl lead	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
Tetraethyl lead	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
2,6,10-trimethyldodecane (1380)	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS704-S4
Date Sampled: 09/26/19 16:49
Percent Solids: 78
Initial Volume: 5.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-10
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/2/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**J 3.46** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
2,6,10-trimethylpentadecane (1650)	**B 13.1** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C-17	**B 50.0** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
Pristane	**B 31.3** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
C-18	**B 35.9** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
Phytane	**B 38.4** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
Carbazole	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
2,6-Dimethylnaphthalene	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
2,3,5-Trimethylnaphthene	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
4-Methyldibenzothiophene	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
2/3-Methyldibenzothiophene	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
1-Methyldibenzothiophene	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
3-Methylphenanthrene	**J 2.45** (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
2-Methylphenanthrene	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
2-Methylanthracene	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
4/9-Methylphenanthrene	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201
1-Methylphenanthrene	ND (4.84)	2.42	8270 Mod		1	10/08/19 23:05	F9J0004	FJ90201

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*82 %*		*50-120*
Surrogate: Perylene-d12	*117 %*		*50-120*
Surrogate: Phenanthrene-d10	*86 %*		*50-120*
Surrogate: Toluene-D8	*82 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS704-S4
Date Sampled: 09/26/19 16:49
Percent Solids: 78

ESS Laboratory Work Order: F190051
ESS Laboratory Sample ID: F190051-10
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**8680** (92.1)		TOC-LK		1	CCP	10/08/19 20:25	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190051

Quality Control Data

Classical Chemistry

Batch CJ90355 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	100	mg/kg							
Total Organic Carbon (2)	ND	100	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190051

Quality Control Data

Classical Chemistry

Batch CJ90355 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9490	100	mg/kg	10000		95	80-120			
Total Organic Carbon (2)	9520	100	mg/kg	10000		95	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190051

Quality Control Data

Classical Chemistry

Batch CJ90355 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9610	100	mg/kg	10000		96	80-120	1	20	
Total Organic Carbon (2)	9610	100	mg/kg	10000		96	80-120	1	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190051

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FJ90201 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	5.14	4.00	ug/Kg wet							
C1-Benzene	ND	4.00	ug/Kg wet							
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	ND	4.00	ug/Kg wet							
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	ND	4.00	ug/Kg wet							
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190051

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FJ90201 - 3570

C1-Fluorenes	ND	4.00	ug/Kg wet
C2-Fluorenes	ND	4.00	ug/Kg wet
C3-Fluorenes	ND	4.00	ug/Kg wet
Dibenzothiophene	ND	4.00	ug/Kg wet
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet
Phenanthrene	ND	4.00	ug/Kg wet
Anthracene	ND	4.00	ug/Kg wet
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
Retene	ND	4.00	ug/Kg wet
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
Fluoranthene	ND	4.00	ug/Kg wet
Pyrene	ND	4.00	ug/Kg wet
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
Benzo(b)fluorene	ND	4.00	ug/Kg wet
Benzo(c)fluorene	ND	4.00	ug/Kg wet
2-Methylpyrene	ND	4.00	ug/Kg wet
4-Methylpyrene	ND	4.00	ug/Kg wet
1-Methylpyrene	ND	4.00	ug/Kg wet
Benz(a)anthracene	ND	4.00	ug/Kg wet
Chrysene/triphenylene	ND	4.00	ug/Kg wet
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet
Benzo(e)pyrene	ND	4.00	ug/Kg wet
Benzo(a)pyrene	ND	4.00	ug/Kg wet
Perylene	ND	4.00	ug/Kg wet
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet
Coronene	ND	4.00	ug/Kg wet
Tetramethyl lead	ND	4.00	ug/Kg wet
Trimethylethyl lead	ND	4.00	ug/Kg wet

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190051

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FJ90201 - 3570						
Dimethyldiethyl lead	ND	4.00	ug/Kg wet			
Methyltriethyl lead	ND	4.00	ug/Kg wet			
Tetraethyl lead	ND	4.00	ug/Kg wet			
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet			
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet			
2,6,10-trimethylpentadecane (1650)	6.59	4.00	ug/Kg wet			
C-17	28.8	4.00	ug/Kg wet			
Pristane	15.6	4.00	ug/Kg wet			
C-18	20.2	4.00	ug/Kg wet			
Phytane	17.9	4.00	ug/Kg wet			
Carbazole	ND	4.00	ug/Kg wet			
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet			
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet			
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
3-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylanthracene	ND	4.00	ug/Kg wet			
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet			
1-Methylphenanthrene	ND	4.00	ug/Kg wet			
Surrogate: Naphthalene-d8	*356*		ug/Kg wet	*400.0*	*89*	*50-120*
Surrogate: Perylene-d12	*332*		ug/Kg wet	*400.0*	*83*	*50-120*
Surrogate: Phenanthrene-d10	*370*		ug/Kg wet	*400.0*	*92*	*50-120*
Surrogate: Toluene-D8	*346*		ug/Kg wet	*400.0*	*86*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190051

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FJ90201 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	305	4.00	ug/Kg wet	400.0		76	60-130			
Methylcyclohexane	224	4.00	ug/Kg wet	400.0		56	60-130			B-
Toluene	376	4.00	ug/Kg wet	400.0		94	60-130			
Ethylbenzene	377	4.00	ug/Kg wet	400.0		94	60-130			
m,p-Xylene	375	4.00	ug/Kg wet	400.0		94	60-130			
Styrene	360	4.00	ug/Kg wet	400.0		90	60-130			
o-Xylene	380	4.00	ug/Kg wet	400.0		95	60-130			
Isopropylbenzene	377	4.00	ug/Kg wet	400.0		94	60-130			
n-Propylbenzene	376	4.00	ug/Kg wet	400.0		94	60-130			
1,3,5-Trimethylbenzene	376	4.00	ug/Kg wet	400.0		94	60-130			
1,2,3-Trimethylbenzene	385	4.00	ug/Kg wet	400.0		96	60-130			
1,2,4-Trimethylbenzene	384	4.00	ug/Kg wet	400.0		96	60-130			
t-Butylbenzene	383	4.00	ug/Kg wet	400.0		96	60-130			
sec-Butylbenzene	379	4.00	ug/Kg wet	400.0		95	60-130			
p-Isopropyltoluene	391	4.00	ug/Kg wet	400.0		98	60-130			
n-Butylbenzene	368	4.00	ug/Kg wet	400.0		92	60-130			
trans-Decalin	369	4.00	ug/Kg wet	400.0		92	60-130			
cis-Decalin	366	4.00	ug/Kg wet	400.0		92	60-130			
Benzo(b)thiophene	362	4.00	ug/Kg wet	400.0		90	60-130			
Naphthalene	373	4.00	ug/Kg wet	400.0		93	60-130			
2-Methylnaphthalene	357	4.00	ug/Kg wet	400.0		89	60-130			
1-Methylnaphthalene	361	4.00	ug/Kg wet	400.0		90	60-130			
Biphenyl	369	4.00	ug/Kg wet	400.0		92	60-130			
Acenaphthylene	338	4.00	ug/Kg wet	400.0		84	60-130			
Acenaphthene	364	4.00	ug/Kg wet	400.0		91	60-130			
Dibenzofuran	373	4.00	ug/Kg wet	400.0		93	60-130			
Fluorene	359	4.00	ug/Kg wet	400.0		90	60-130			
Dibenzothiophene	374	4.00	ug/Kg wet	400.0		94	60-130			
Phenanthrene	380	4.00	ug/Kg wet	400.0		95	60-130			
Anthracene	267	4.00	ug/Kg wet	400.0		67	60-130			
Retene	350	4.00	ug/Kg wet	400.0		87	60-130			
Benzo(b)naphtho(2,1-d)thiophene	356	4.00	ug/Kg wet	400.0		89	60-130			
Fluoranthene	369	4.00	ug/Kg wet	400.0		92	60-130			
Pyrene	368	4.00	ug/Kg wet	400.0		92	60-130			
Benz(a)anthracene	339	4.00	ug/Kg wet	400.0		85	60-130			
Chrysene/triphenylene	370	4.00	ug/Kg wet	400.0		92	60-130			
Benzo(b)fluoranthene	353	4.00	ug/Kg wet	400.0		88	60-130			
Benzo(j/k)fluoranthene	367	4.00	ug/Kg wet	400.0		92	60-130			
Benzo(e)pyrene	368	4.00	ug/Kg wet	400.0		92	60-130			
Benzo(a)pyrene	323	4.00	ug/Kg wet	400.0		81	60-130			
Perylene	341	4.00	ug/Kg wet	400.0		85	60-130			
Indeno(1,2,3-cd)pyrene	340	4.00	ug/Kg wet	400.0		85	60-130			
Dibenzo(a,h)anthracene	356	4.00	ug/Kg wet	400.0		89	60-130			
Benzo(g,h,i)perylene	372	4.00	ug/Kg wet	400.0		93	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190051

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FJ90201 - 3570						
Coronene	388	4.00	ug/Kg wet	400.0	97	60-130
Tetraethyl lead	264	4.00	ug/Kg wet	400.0	66	60-130
Pristane	366	4.00	ug/Kg wet	400.0	92	60-130
Phytane	359	4.00	ug/Kg wet	400.0	90	60-130
Surrogate: Naphthalene-d8	*354*		ug/Kg wet	*400.0*	*88*	*50-120*
Surrogate: Perylene-d12	*327*		ug/Kg wet	*400.0*	*82*	*50-120*
Surrogate: Phenanthrene-d10	*372*		ug/Kg wet	*400.0*	*93*	*50-120*
Surrogate: Toluene-D8	*349*		ug/Kg wet	*400.0*	*87*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190051

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FJ90201 - 3570

Duplicate **Source: F190051-10**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	5.11	4.60	ug/Kg dry		5.14			0.7	50	
C1-Benzene	4.25	4.60	ug/Kg dry		3.53			19	50	J
C2-Benzenes	3.10	4.60	ug/Kg dry		3.22			4	50	J
C3-Benzenes	ND	4.60	ug/Kg dry		ND				50	
C4-Benzenes	ND	4.60	ug/Kg dry		ND				50	
C5-Benzenes	ND	4.60	ug/Kg dry		ND				50	
Methylcyclohexane	ND	4.60	ug/Kg dry		ND				50	
Toluene	6.42	4.60	ug/Kg dry		5.06			24	50	
Ethylbenzene	ND	4.60	ug/Kg dry		ND				50	
m,p-Xylene	3.87	4.60	ug/Kg dry		4.38			12	50	J
Styrene	ND	4.60	ug/Kg dry		ND				50	
o-Xylene	ND	4.60	ug/Kg dry		ND				50	
Isopropylbenzene	ND	4.60	ug/Kg dry		ND				50	
n-Propylbenzene	ND	4.60	ug/Kg dry		ND				50	
1,3,5-Trimethylbenzene	ND	4.60	ug/Kg dry		ND				50	
1,2,3-Trimethylbenzene	ND	4.60	ug/Kg dry		ND				50	
1,2,4-Trimethylbenzene	ND	4.60	ug/Kg dry		ND				50	
t-Butylbenzene	ND	4.60	ug/Kg dry		ND				50	
sec-Butylbenzene	ND	4.60	ug/Kg dry		ND				50	
p-Isopropyltoluene	ND	4.60	ug/Kg dry		ND				50	
n-Butylbenzene	ND	4.60	ug/Kg dry		ND				50	
trans-Decalin	ND	4.60	ug/Kg dry		ND				50	
cis-Decalin	ND	4.60	ug/Kg dry		ND				50	
C1-Decalins	ND	4.60	ug/Kg dry		ND				50	
C2-Decalins	ND	4.60	ug/Kg dry		ND				50	
C3-Decalins	ND	4.60	ug/Kg dry		ND				50	
C4-Decalins	ND	4.60	ug/Kg dry		ND				50	
Benzo(b)thiophene	ND	4.60	ug/Kg dry		ND				50	
C1-Benzo(b)thiophenes	ND	4.60	ug/Kg dry		ND				50	
C2-Benzo(b)thiophenes	ND	4.60	ug/Kg dry		ND				50	
C3-Benzo(b)thiophenes	ND	4.60	ug/Kg dry		ND				50	
C4-Benzo(b)thiophenes	ND	4.60	ug/Kg dry		ND				50	
Naphthalene	ND	4.60	ug/Kg dry		ND				50	
2-Methylnaphthalene	ND	4.60	ug/Kg dry		ND				50	
1-Methylnaphthalene	ND	4.60	ug/Kg dry		ND				50	
C1-Naphthalenes	ND	4.60	ug/Kg dry		ND				50	
C2-Naphthalenes	4.68	4.60	ug/Kg dry		4.61			1	50	
C3-Naphthalenes	4.18	4.60	ug/Kg dry		3.80			10	50	J
C4-Naphthalenes	2.72	4.60	ug/Kg dry		3.05			11	50	J
Biphenyl	ND	4.60	ug/Kg dry		ND				50	
Acenaphthylene	8.58	4.60	ug/Kg dry		12.4			37	50	
Acenaphthene	3.69	4.60	ug/Kg dry		4.03			9	50	J
Dibenzofuran	ND	4.60	ug/Kg dry		ND				50	
Fluorene	3.34	4.60	ug/Kg dry		4.15			22	50	J

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190051

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FJ90201 - 3570							
C1-Fluorenes	3.50	4.60	ug/Kg dry	3.78	8	50	J
C2-Fluorenes	4.15	4.60	ug/Kg dry	3.79	9	50	J
C3-Fluorenes	ND	4.60	ug/Kg dry	3.10		50	
Dibenzothiophene	ND	4.60	ug/Kg dry	ND		50	
C1-Dibenzothiophenes	ND	4.60	ug/Kg dry	ND		50	
C2-Dibenzothiophenes	ND	4.60	ug/Kg dry	2.50		50	
C3-Dibenzothiophenes	ND	4.60	ug/Kg dry	ND		50	
C4-Dibenzothiophenes	ND	4.60	ug/Kg dry	ND		50	
Phenanthrene	12.1	4.60	ug/Kg dry	13.6	12	50	
Anthracene	3.21	4.60	ug/Kg dry	4.27	28	50	J
C1-Phenanthrenes/Anthracenes	9.18	4.60	ug/Kg dry	10.3	11	50	
C2-Phenanthrenes/Anthracenes	3.95	4.60	ug/Kg dry	4.96	23	50	J
C3-Phenanthrenes/Anthracenes	2.53	4.60	ug/Kg dry	3.40	30	50	J
C4-Phenanthrenes/Anthracenes	ND	4.60	ug/Kg dry	ND		50	
Retene	10.4	4.60	ug/Kg dry	13.0	22	50	
Benzo(b)naphtho(2,1-d)thiophene	ND	4.60	ug/Kg dry	ND		50	
C0-Benzonaphthothiophenes	ND	4.60	ug/Kg dry	ND		50	
C1-Benzonaphthothiophenes	ND	4.60	ug/Kg dry	ND		50	
C2-Benzonaphthothiophenes	ND	4.60	ug/Kg dry	ND		50	
C3-Benzonaphthothiophenes	ND	4.60	ug/Kg dry	ND		50	
C4-Benzonaphthothiophenes	ND	4.60	ug/Kg dry	ND		50	
Fluoranthene	8.79	4.60	ug/Kg dry	11.3	25	50	
Pyrene	11.8	4.60	ug/Kg dry	15.3	27	50	
C1-Fluoranthenes/Pyrenes	13.6	4.60	ug/Kg dry	18.1	28	50	
C2-Fluoranthenes/Pyrenes	4.58	4.60	ug/Kg dry	6.09	28	50	J
C3-Fluoranthenes/Pyrenes	ND	4.60	ug/Kg dry	2.83		50	
Benzo(b)fluorene	ND	4.60	ug/Kg dry	ND		50	
Benzo(c)fluorene	ND	4.60	ug/Kg dry	ND		50	
2-Methylpyrene	ND	4.60	ug/Kg dry	ND		50	
4-Methylpyrene	ND	4.60	ug/Kg dry	ND		50	
1-Methylpyrene	ND	4.60	ug/Kg dry	ND		50	
Benz(a)anthracene	4.08	4.60	ug/Kg dry	5.80	35	50	J
Chrysene/triphenylene	4.29	4.60	ug/Kg dry	5.73	29	50	J
C1-Benzo(a)anthracenes/Chrysenes	3.13	4.60	ug/Kg dry	5.50	55	50	D+, J
C2-Benzo(a)anthracenes/Chrysenes	ND	4.60	ug/Kg dry	ND		50	
C3-Benzo(a)anthracenes/Chrysenes	ND	4.60	ug/Kg dry	ND		50	
C4-Benzo(a)anthracenes/Chrysenes	ND	4.60	ug/Kg dry	ND		50	
Benzo(b)fluoranthene	ND	4.60	ug/Kg dry	4.28		50	
Benzo(j/k)fluoranthene	2.74	4.60	ug/Kg dry	5.56	68	50	D+, J
Benzo(e)pyrene	2.50	4.60	ug/Kg dry	5.22	70	50	D+, J
Benzo(a)pyrene	3.95	4.60	ug/Kg dry	8.22	70	50	D+, J
Perylene	187	4.60	ug/Kg dry	206	10	50	
Indeno(1,2,3-cd)pyrene	ND	4.60	ug/Kg dry	3.63		50	
Dibenzo(a,h)anthracene	ND	4.60	ug/Kg dry	ND		50	
Benzo(g,h,i)perylene	2.36	4.60	ug/Kg dry	4.16	55	50	D+, J
Coronene	ND	4.60	ug/Kg dry	3.28		50	
Tetramethyl lead	ND	4.60	ug/Kg dry	ND		50	
Trimethylethyl lead	ND	4.60	ug/Kg dry	ND		50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190051

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FJ90201 - 3570									
Dimethyldiethyl lead	ND	4.60	ug/Kg dry	ND				50	
Methyltriethyl lead	ND	4.60	ug/Kg dry	ND				50	
Tetraethyl lead	ND	4.60	ug/Kg dry	ND				50	
2,6,10-trimethyldodecane (1380)	ND	4.60	ug/Kg dry	ND				50	
2,6,10-trimethyltridecane (1470)	2.89	4.60	ug/Kg dry	3.46			18	50	J
2,6,10-trimethylpentadecane (1650)	11.5	4.60	ug/Kg dry	13.1			13	50	
C-17	45.6	4.60	ug/Kg dry	50.0			9	50	
Pristane	28.7	4.60	ug/Kg dry	31.3			9	50	
C-18	32.7	4.60	ug/Kg dry	35.9			9	50	
Phytane	35.6	4.60	ug/Kg dry	38.4			8	50	
Carbazole	ND	4.60	ug/Kg dry	ND				50	
2,6-Dimethylnaphthalene	ND	4.60	ug/Kg dry	ND				50	
2,3,5-Trimethylnaphthene	ND	4.60	ug/Kg dry	ND				50	
4-Methyldibenzothiophene	ND	4.60	ug/Kg dry	ND				50	
2/3-Methyldibenzothiophene	ND	4.60	ug/Kg dry	ND				50	
1-Methyldibenzothiophene	ND	4.60	ug/Kg dry	ND				50	
3-Methylphenanthrene	2.48	4.60	ug/Kg dry	2.45			1	50	J
2-Methylphenanthrene	ND	4.60	ug/Kg dry	ND				50	
2-Methylanthracene	ND	4.60	ug/Kg dry	ND				50	
4/9-Methylphenanthrene	ND	4.60	ug/Kg dry	2.32				50	
1-Methylphenanthrene	ND	4.60	ug/Kg dry	ND				50	
Surrogate: Naphthalene-d8	*377*		ug/Kg dry	*460.1*		*82*	*50-120*		
Surrogate: Perylene-d12	*400*		ug/Kg dry	*460.1*		*87*	*50-120*		
Surrogate: Phenanthrene-d10	*409*		ug/Kg dry	*460.1*		*89*	*50-120*		
Surrogate: Toluene-D8	*417*		ug/Kg dry	*460.1*		*91*	*50-120*		

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F190051

Notes and Definitions

U	Analyte included in the analysis, but not detected
SM	Surrogate recovery(ies) outside of criteria due to matrix (UCM/coelution/matrix is present) (SM).
J	Reported between MDL and MRL
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
B-	Blank Spike recovery is below lower control limit (B-).
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190051

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 190901/F190051

GEI Consultants

400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

Preservative

None | None

Sample Handling

Samples Field Filtered: YES NO (NA)

Sampled Shipped With Ice: (YES) NO

MCP PRESUMPTIVE CERTAINTY REQUIRED -- YES NO

If Yes, Are MCP Analytical Methods Required? **YES** NO NA

Are Drinking Water Samples Submitted? YES **NO** NA

If Yes, Have Drinking Water Sampling Requirements Been Met? YES NO **NA**

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Analysis: Parent and Alkylated MAHs & PAHs 8270**	Analysis: TOCs by Lloyd-Kahn	Sample Specific Remarks
1	180576-SS698-S4	9/26/19	854	Sed	1	BFM	X	X	
2	180576-SS699-S3	9/26/19	946	Sed	1	BFM	X	X	
3	180576-SS700-S2	9/26/19	1120	Sed	1	BFM	X	X	
4	180576-SS700-S5	9/26/19	1130	Sed	1	BFM	X	X	
5	180576-SS701-S2	9/26/19	1301	Sed	1	BFM	X	X	
6	180576-SS701-S4 RN	~~9/26~~ 9/26/19	1314	Sed	1	BFM	X	X	
7	180576-SS702-S3	9/26/19	1353	Sed	1	BFM	X	X	
8	180576-SS703-S3	9/26/19	1622	Sed	1	BFM	X	X	
9	180576-SS704-S2	9/26/19	1645	Sed	1	BFM	X	X	
10	180576-SS704-S4	9/26/19	1649	Sed	1	BFM	X	X	

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

Turnaround Time (Business days):

Normal __X__ Other ____

10-Day ____ 7-Day ____

5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Relinquished by sampler: (signature)	Date :	Time:	Received by: (signature)
1.			1. GEI Sample Fridge
Relinquished by: (signature)	Date :	Time:	Received by: (signature)
2. GEI Sample Fridge	9/27	1310	2.
Relinquished by: (signature)	Date :	Time:	Received by: (signature)
3.	9/27	1310	3. 9/27/19 13:10
Relinquished by: (signature)	Date :	Time:	Received by: (signature)
4. 9/27/19 18:25			4. 9/27/19 1826

Temp - 0.3 Ice Y

Additional Requirements/Comments/Remarks:

**Parent and Alkylated MAHs & PAHs (34) by GC/MS/SIM/SCAN

Run

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

Shipped/Delivered Via: ESS Courier

ESS Project ID: 1910901
Date Received: 9/27/2019
Project Due Date: 10/4/2019
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 0.3 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / (NA)
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / (No)
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? (Yes) No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	392420	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
02	392419	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
03	392418	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
04	392417	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
05	392416	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
06	392415	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
07	392414	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
08	392413	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
09	392412	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
10	392411	Yes	NA	Yes	8 oz. Jar - Unpres	NP	

2nd Review
Were all containers scanned into storage/lab? Initials
Are barcode labels on correct containers? Yes / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: Date & Time: 9/27/19 1948

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

ESS Project ID: 1910901

Date Received: 9/27/2019

Reviewed By:

Date & Time: 9/27/19 2010

Delivered By:

9/27/19 2010

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (044752)
ESS Laboratory Work Order Number: F190052

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 12:14 pm, Oct 18, 2019

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses
ESS Laboratory - Cranston, RI TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190052

SAMPLE RECEIPT

The following samples were received on October 01, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F190052-01	1804576-SS705-S1	Sediment	8270 Mod, TOC-LK
F190052-02	1804576-SS705-S2	Sediment	8270 Mod, TOC-LK
F190052-03	1804576-SS705-S3	Sediment	8270 Mod, TOC-LK
F190052-04	1804576-SS706-S1	Sediment	8270 Mod, TOC-LK
F190052-05	1804576-SS706-S2	Sediment	8270 Mod, TOC-LK
F190052-06	1804576-SS706-S3	Sediment	8270 Mod, TOC-LK
F190052-07	1804576-SS707-S3	Sediment	8270 Mod, TOC-LK
F190052-08	1804576-SS708-S1	Sediment	8270 Mod, TOC-LK
F190052-09	1804576-SS708-S2	Sediment	8270 Mod, TOC-LK
F190052-10	1804576-SS708-S3	Sediment	8270 Mod, TOC-LK
F190052-11	1804576-SS709-S1	Sediment	8270 Mod, TOC-LK
F190052-12	1804576-SS709-S3	Sediment	8270 Mod, TOC-LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190052

PROJECT NARRATIVE

8270D (SIM) Semi-Volatile Organic Compounds

F190052-01 **Present in Method Blank (B).**
Benzene , Phytane

F190052-02 **Surrogate recovery(ies) outside of criteria due to matrix (UCM/coelution/matrix is present) (SM).**
Perylene-d12 (147% @ 50-120%)

F190052-03 **Present in Method Blank (B).**
Benzene , C-17 , C-18 , Phytane , Pristane

F190052-05 **Surrogate recovery(ies) outside of criteria due to matrix (UCM/coelution/matrix is present) (SM).**
Perylene-d12 (326% @ 50-120%)

F190052-07 **Present in Method Blank (B).**
Benzene , C-17 , C-18 , Phytane , Pristane

F190052-08 **Present in Method Blank (B).**
Benzene

F190052-09 **Surrogate recovery(ies) outside of criteria due to matrix (UCM/coelution/matrix is present) (SM).**
Perylene-d12 (320% @ 50-120%)

F190052-10 **Present in Method Blank (B).**
Benzene , C-17 , C-18 , Phytane , Pristane

F190052-11 **Present in Method Blank (B).**
Benzene

F190052-12 **Present in Method Blank (B).**
Benzene , C-17 , C-18 , Phytane , Pristane

FJ90701-DUP2 **Relative percent difference for duplicate is outside of criteria (D+).**
Anthracene (150% @ 50%)

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190052

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS705-S1
Date Sampled: 09/27/19 10:08
Percent Solids: 75
Initial Volume: 6.1
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-01
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **58.5** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C1-Benzene	**66.7** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C2-Benzenes	**87.5** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C3-Benzenes	**26.2** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C4-Benzenes	**20.2** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C5-Benzenes	**11.9** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
Methylcyclohexane	**8.33** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
Toluene	**96.3** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
Ethylbenzene	**8.95** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
m,p-Xylene	**142** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
Styrene	**37.6** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
o-Xylene	**8.42** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
Isopropylbenzene	ND (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
n-Propylbenzene	**5.76** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
1,3,5-Trimethylbenzene	**5.28** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
1,2,3-Trimethylbenzene	**5.23** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
1,2,4-Trimethylbenzene	**12.2** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
t-Butylbenzene	ND (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
sec-Butylbenzene	ND (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
p-Isopropyltoluene	**4.85** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
n-Butylbenzene	**6.79** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
trans-Decalin	**4.80** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
cis-Decalin	ND (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C1-Decalins	**9.87** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C2-Decalins	**12.5** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C3-Decalins	**9.58** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C4-Decalins	**21.0** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
Benzo(b)thiophene	**5.40** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C1-Benzo(b)thiophenes	**13.3** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C2-Benzo(b)thiophenes	**18.3** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C3-Benzo(b)thiophenes	**14.6** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C4-Benzo(b)thiophenes	**12.3** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS705-S1
Date Sampled: 09/27/19 10:08
Percent Solids: 75
Initial Volume: 6.1
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-01
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**115** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
2-Methylnaphthalene	**71.0** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
1-Methylnaphthalene	**67.4** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C1-Naphthalenes	**86.3** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C2-Naphthalenes	**179** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C3-Naphthalenes	**147** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C4-Naphthalenes	**82.7** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
Biphenyl	**27.4** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
Acenaphthylene	**262** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
Acenaphthene	**288** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
Dibenzofuran	**103** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
Fluorene	**220** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C1-Fluorenes	**121** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C2-Fluorenes	**144** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C3-Fluorenes	**261** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
Dibenzothiophene	**187** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C1-Dibenzothiophenes	**247** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C2-Dibenzothiophenes	**221** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C3-Dibenzothiophenes	**117** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C4-Dibenzothiophenes	**53.2** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
Phenanthrene	**2430** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
Anthracene	**657** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C1-Phenanthrenes/Anthracenes	**1550** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C2-Phenanthrenes/Anthracenes	**753** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C3-Phenanthrenes/Anthracenes	**358** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C4-Phenanthrenes/Anthracenes	**89.4** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
Retene	**40.8** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
Benzo(b)naphtho(2,1-d)thiophene	**231** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C0-Benzonaphthothiophenes	**429** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C1-Benzonaphthothiophenes	**277** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C2-Benzonaphthothiophenes	**193** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C3-Benzonaphthothiophenes	**142** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS705-S1
Date Sampled: 09/27/19 10:08
Percent Solids: 75
Initial Volume: 6.1
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-01
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**75.8** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
Fluoranthene	**3090** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
Pyrene	**3420** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C1-Fluoranthenes/Pyrenes	**1640** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C2-Fluoranthenes/Pyrenes	**1000** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C3-Fluoranthenes/Pyrenes	**469** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
Benzo(b)fluorene	**132** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
Benzo(c)fluorene	**63.4** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
2-Methylpyrene	**260** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
4-Methylpyrene	**231** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
1-Methylpyrene	**210** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
Benz(a)anthracene	**1650** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
Chrysene/triphenylene	**1740** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C1-Benzo(a)anthracenes/Chrysenes	**984** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C2-Benzo(a)anthracenes/Chrysenes	**525** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C3-Benzo(a)anthracenes/Chrysenes	**231** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C4-Benzo(a)anthracenes/Chrysenes	**119** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
Benzo(b)fluoranthene	**1230** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
Benzo(j/k)fluoranthene	**1330** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
Benzo(e)pyrene	**1110** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
Benzo(a)pyrene	**1610** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
Perylene	**390** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
Indeno(1,2,3-cd)pyrene	**959** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
Dibenzo(a,h)anthracene	**227** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
Benzo(g,h,i)perylene	**929** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
Coronene	**232** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
Tetramethyl lead	ND (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
Trimethylethyl lead	ND (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
Dimethyldiethyl lead	ND (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
Methyltriethyl lead	ND (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
Tetraethyl lead	ND (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
2,6,10-trimethyldodecane (1380)	**10.6** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS705-S1
Date Sampled: 09/27/19 10:08
Percent Solids: 75
Initial Volume: 6.1
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-01
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**25.7** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
2,6,10-trimethylpentadecane (1650)	**23.0** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C-17	**125** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
Pristane	**59.1** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
C-18	**67.8** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
Phytane	**B 64.8** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
Carbazole	**144** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
2,6-Dimethylnaphthalene	**49.1** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
2,3,5-Trimethylnaphthene	**10.8** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
4-Methyldibenzothiophene	**89.3** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
2/3-Methyldibenzothiophene	**83.0** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
1-Methyldibenzothiophene	**30.3** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
3-Methylphenanthrene	**359** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
2-Methylphenanthrene	**399** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
2-Methylanthracene	**157** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
4/9-Methylphenanthrene	**370** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701
1-Methylphenanthrene	**269** (4.36)	2.18	8270 Mod		1	10/10/19 21:42	F9J0004	FJ90701

	%Recovery	*Qualifier*	*Limits*
Surrogate: Naphthalene-d8	*76 %*		*50-120*
Surrogate: Perylene-d12	*77 %*		*50-120*
Surrogate: Phenanthrene-d10	*78 %*		*50-120*
Surrogate: Toluene-D8	*82 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS705-S1
Date Sampled: 09/27/19 10:08
Percent Solids: 75

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-01
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**7800** (101)		TOC-LK		1	CCP	10/15/19 15:42	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS705-S2
Date Sampled: 09/27/19 10:21
Percent Solids: 63
Initial Volume: 1.59
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-02
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**1660** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
C1-Benzene	**1540** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
C2-Benzenes	**9230** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
C3-Benzenes	**26800** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
C4-Benzenes	**52300** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
C5-Benzenes	**19100** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
Methylcyclohexane	**J 74.3** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
Toluene	**2540** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
Ethylbenzene	**12700** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
m,p-Xylene	**3720** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
Styrene	**4020** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
o-Xylene	**3130** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
Isopropylbenzene	**3900** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
n-Propylbenzene	**1260** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
1,3,5-Trimethylbenzene	**3990** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
1,2,3-Trimethylbenzene	**6920** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
1,2,4-Trimethylbenzene	**15000** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
t-Butylbenzene	ND (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
sec-Butylbenzene	**172** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
p-Isopropyltoluene	**5750** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
n-Butylbenzene	ND (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
trans-Decalin	**513** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
cis-Decalin	**196** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
C1-Decalins	**2300** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
C2-Decalins	**5610** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
C3-Decalins	**5790** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
C4-Decalins	**9180** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
Benzo(b)thiophene	**35700** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
C1-Benzo(b)thiophenes	**31500** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
C2-Benzo(b)thiophenes	**31100** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
C3-Benzo(b)thiophenes	**15400** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
C4-Benzo(b)thiophenes	**3890** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS705-S2
Date Sampled: 09/27/19 10:21
Percent Solids: 63
Initial Volume: 1.59
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-02
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**3090000** (1980)	991	8270 Mod		100	10/11/19 3:22	F9J0004	FJ90701
2-Methylnaphthalene	**1560000** (1980)	991	8270 Mod		100	10/11/19 3:22	F9J0004	FJ90701
1-Methylnaphthalene	**1040000** (1980)	991	8270 Mod		100	10/11/19 3:22	F9J0004	FJ90701
C1-Naphthalenes	**1610000** (1980)	991	8270 Mod		100	10/11/19 3:22	F9J0004	FJ90701
C2-Naphthalenes	**741000** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
C3-Naphthalenes	**258000** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
C4-Naphthalenes	**62500** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
Biphenyl	**401000** (1980)	991	8270 Mod		100	10/11/19 3:22	F9J0004	FJ90701
Acenaphthylene	**77900** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
Acenaphthene	**2200000** (1980)	991	8270 Mod		100	10/11/19 3:22	F9J0004	FJ90701
Dibenzofuran	**74900** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
Fluorene	**768000** (1980)	991	8270 Mod		100	10/11/19 3:22	F9J0004	FJ90701
C1-Fluorenes	**213000** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
C2-Fluorenes	**102000** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
C3-Fluorenes	**31800** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
Dibenzothiophene	**172000** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
C1-Dibenzothiophenes	**107000** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
C2-Dibenzothiophenes	**58200** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
C3-Dibenzothiophenes	**22300** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
C4-Dibenzothiophenes	**8560** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
Phenanthrene	**2910000** (1980)	991	8270 Mod		100	10/11/19 3:22	F9J0004	FJ90701
Anthracene	**1200000** (1980)	991	8270 Mod		100	10/11/19 3:22	F9J0004	FJ90701
C1-Phenanthrenes/Anthracenes	**916000** (1980)	991	8270 Mod		100	10/11/19 3:22	F9J0004	FJ90701
C2-Phenanthrenes/Anthracenes	**250000** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
C3-Phenanthrenes/Anthracenes	**74100** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
C4-Phenanthrenes/Anthracenes	**21900** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
Retene	**4320** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
Benzo(b)naphtho(2,1-d)thiophene	**59100** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
C0-Benzonaphthothiophenes	**101000** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
C1-Benzonaphthothiophenes	**37200** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
C2-Benzonaphthothiophenes	**14400** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
C3-Benzonaphthothiophenes	**11100** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS705-S2
Date Sampled: 09/27/19 10:21
Percent Solids: 63
Initial Volume: 1.59
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-02
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**1710** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
Fluoranthene	**1100000** (1980)	991	8270 Mod		100	10/11/19 3:22	F9J0004	FJ90701
Pyrene	**1590000** (1980)	991	8270 Mod		100	10/11/19 3:22	F9J0004	FJ90701
C1-Fluoranthenes/Pyrenes	**936000** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
C2-Fluoranthenes/Pyrenes	**195000** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
C3-Fluoranthenes/Pyrenes	**36100** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
Benzo(b)fluorene	**116000** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
Benzo(c)fluorene	**47000** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
2-Methylpyrene	**116000** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
4-Methylpyrene	**97800** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
1-Methylpyrene	**122000** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
Benz(a)anthracene	**451000** (1980)	991	8270 Mod		100	10/11/19 3:22	F9J0004	FJ90701
Chrysene/triphenylene	**478000** (1980)	991	8270 Mod		100	10/11/19 3:22	F9J0004	FJ90701
C1-Benzo(a)anthracenes/Chrysenes	**182000** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
C2-Benzo(a)anthracenes/Chrysenes	**56400** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
C3-Benzo(a)anthracenes/Chrysenes	**15500** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
C4-Benzo(a)anthracenes/Chrysenes	**5750** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
Benzo(b)fluoranthene	**176000** (1980)	991	8270 Mod		100	10/11/19 3:22	F9J0004	FJ90701
Benzo(j/k)fluoranthene	**258000** (1980)	991	8270 Mod		100	10/11/19 3:22	F9J0004	FJ90701
Benzo(e)pyrene	**224000** (1980)	991	8270 Mod		100	10/11/19 3:22	F9J0004	FJ90701
Benzo(a)pyrene	**427000** (1980)	991	8270 Mod		100	10/11/19 3:22	F9J0004	FJ90701
Perylene	**73500** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
Indeno(1,2,3-cd)pyrene	**167000** (1980)	991	8270 Mod		100	10/11/19 3:22	F9J0004	FJ90701
Dibenzo(a,h)anthracene	**45400** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
Benzo(g,h,i)perylene	**182000** (1980)	991	8270 Mod		100	10/11/19 3:22	F9J0004	FJ90701
Coronene	**55500** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
Tetramethyl lead	ND (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
Trimethylethyl lead	ND (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
Dimethyldiethyl lead	ND (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
Methyltriethyl lead	ND (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
Tetraethyl lead	ND (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
2,6,10-trimethyldodecane (1380)	**5800** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701

CERTIFICATE OF ANALYSIS

Client Name: GEI
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Client Sample ID: 1804576-SS705-S2
Date Sampled: 09/27/19 10:21
Percent Solids: 63
Initial Volume: 1.59
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-02
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**10900** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
2,6,10-trimethylpentadecane (1650)	**11900** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
C-17	ND (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
Pristane	**21200** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
C-18	ND (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
Phytane	**16500** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
Carbazole	**10600** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
2,6-Dimethylnaphthalene	**141000** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
2,3,5-Trimethylnaphthene	**14800** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
4-Methyldibenzothiophene	**45000** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
2/3-Methyldibenzothiophene	**38900** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
1-Methyldibenzothiophene	**9460** (99.1)	49.5	8270 Mod		5	10/10/19 0:31	F9J0004	FJ90701
3-Methylphenanthrene	**221000** (1980)	991	8270 Mod		100	10/11/19 3:22	F9J0004	FJ90701
2-Methylphenanthrene	**239000** (1980)	991	8270 Mod		100	10/11/19 3:22	F9J0004	FJ90701
2-Methylanthracene	**109000** (1980)	991	8270 Mod		100	10/11/19 3:22	F9J0004	FJ90701
4/9-Methylphenanthrene	**193000** (1980)	991	8270 Mod		100	10/11/19 3:22	F9J0004	FJ90701
1-Methylphenanthrene	**139000** (1980)	991	8270 Mod		100	10/11/19 3:22	F9J0004	FJ90701

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*87 %*		*50-120*
Surrogate: Perylene-d12	*147 %*	*SM*	*50-120*
Surrogate: Phenanthrene-d10	*86 %*		*50-120*
Surrogate: Toluene-D8	*109 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
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Client Sample ID: 1804576-SS705-S2
Date Sampled: 09/27/19 10:21
Percent Solids: 63

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-02
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**295000** (99.1)		TOC-LK		1	CCP	10/15/19 15:05	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS705-S3
Date Sampled: 09/27/19 10:28
Percent Solids: 79
Initial Volume: 5.23
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-03
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **10.4** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C1-Benzene	J **2.70** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C2-Benzenes	J **2.92** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C3-Benzenes	J **4.06** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C4-Benzenes	**4.98** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C5-Benzenes	J **4.12** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
Methylcyclohexane	ND (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
Toluene	J **3.91** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
Ethylbenzene	ND (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
m,p-Xylene	ND (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
Styrene	**19.0** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
o-Xylene	ND (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
Isopropylbenzene	ND (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
n-Propylbenzene	ND (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
1,3,5-Trimethylbenzene	ND (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
1,2,3-Trimethylbenzene	ND (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
1,2,4-Trimethylbenzene	ND (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
t-Butylbenzene	ND (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
sec-Butylbenzene	ND (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
p-Isopropyltoluene	ND (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
n-Butylbenzene	ND (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
trans-Decalin	ND (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
cis-Decalin	ND (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C1-Decalins	ND (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C2-Decalins	ND (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C3-Decalins	ND (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C4-Decalins	ND (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
Benzo(b)thiophene	J **2.93** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C1-Benzo(b)thiophenes	**6.58** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C2-Benzo(b)thiophenes	**7.88** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C3-Benzo(b)thiophenes	**4.98** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C4-Benzo(b)thiophenes	J **2.62** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701

CERTIFICATE OF ANALYSIS

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Client Sample ID: 1804576-SS705-S3
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Initial Volume: 5.23
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-03
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**196** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
2-Methylnaphthalene	**124** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
1-Methylnaphthalene	**91.3** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C1-Naphthalenes	**133** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C2-Naphthalenes	**100** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C3-Naphthalenes	**39.4** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C4-Naphthalenes	**11.4** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
Biphenyl	**45.8** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
Acenaphthylene	**19.8** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
Acenaphthene	**284** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
Dibenzofuran	**10.2** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
Fluorene	**109** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C1-Fluorenes	**31.2** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C2-Fluorenes	**16.7** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C3-Fluorenes	**7.88** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
Dibenzothiophene	**29.3** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C1-Dibenzothiophenes	**20.5** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C2-Dibenzothiophenes	**15.5** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C3-Dibenzothiophenes	**8.64** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C4-Dibenzothiophenes	**J 4.24** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
Phenanthrene	**520** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
Anthracene	**265** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C1-Phenanthrenes/Anthracenes	**163** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C2-Phenanthrenes/Anthracenes	**50.7** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C3-Phenanthrenes/Anthracenes	**13.6** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C4-Phenanthrenes/Anthracenes	ND (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
Retene	**J 3.03** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
Benzo(b)naphtho(2,1-d)thiophene	**8.74** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C0-Benzonaphthothiophenes	**15.8** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C1-Benzonaphthothiophenes	**14.7** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C2-Benzonaphthothiophenes	**6.78** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C3-Benzonaphthothiophenes	**J 4.13** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS705-S3
Date Sampled: 09/27/19 10:28
Percent Solids: 79
Initial Volume: 5.23
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-03
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
Fluoranthene	**206** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
Pyrene	**304** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C1-Fluoranthenes/Pyrenes	**136** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C2-Fluoranthenes/Pyrenes	**29.3** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C3-Fluoranthenes/Pyrenes	**9.51** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
Benzo(b)fluorene	**15.2** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
Benzo(c)fluorene	**7.46** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
2-Methylpyrene	**17.0** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
4-Methylpyrene	**15.1** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
1-Methylpyrene	**17.5** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
Benz(a)anthracene	**90.8** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
Chrysene/triphenylene	**92.2** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C1-Benzo(a)anthracenes/Chrysenes	**38.3** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C2-Benzo(a)anthracenes/Chrysenes	**11.7** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C3-Benzo(a)anthracenes/Chrysenes	ND (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C4-Benzo(a)anthracenes/Chrysenes	ND (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
Benzo(b)fluoranthene	**39.2** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
Benzo(j/k)fluoranthene	**57.1** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
Benzo(e)pyrene	**51.1** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
Benzo(a)pyrene	**95.3** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
Perylene	**15.4** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
Indeno(1,2,3-cd)pyrene	**40.9** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
Dibenzo(a,h)anthracene	**8.86** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
Benzo(g,h,i)perylene	**43.5** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
Coronene	**15.6** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
Tetramethyl lead	ND (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
Trimethylethyl lead	ND (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
Dimethyldiethyl lead	ND (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
Methyltriethyl lead	ND (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
Tetraethyl lead	ND (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
2,6,10-trimethyldodecane (1380)	ND (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS705-S3
Date Sampled: 09/27/19 10:28
Percent Solids: 79
Initial Volume: 5.23
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-03
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**5.99** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
2,6,10-trimethylpentadecane (1650)	**12.5** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C-17	**B 42.2** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
Pristane	**B 25.6** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
C-18	**B 34.3** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
Phytane	**B 30.5** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
Carbazole	ND (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
2,6-Dimethylnaphthalene	**16.5** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
2,3,5-Trimethylnaphthene	ND (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
4-Methyldibenzothiophene	**8.49** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
2/3-Methyldibenzothiophene	**6.63** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
1-Methyldibenzothiophene	**J 3.53** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
3-Methylphenanthrene	**38.1** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
2-Methylphenanthrene	**40.9** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
2-Methylanthracene	**17.7** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
4/9-Methylphenanthrene	**34.6** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701
1-Methylphenanthrene	**25.1** (4.85)	2.43	8270 Mod		1	10/10/19 23:07	F9J0004	FJ90701

	%Recovery	*Qualifier*	*Limits*
Surrogate: Naphthalene-d8	*100 %*		*50-120*
Surrogate: Perylene-d12	*93 %*		*50-120*
Surrogate: Phenanthrene-d10	*94 %*		*50-120*
Surrogate: Toluene-D8	*98 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS705-S3
Date Sampled: 09/27/19 10:28
Percent Solids: 79

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-03
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**2440** (93.6)		TOC-LK		1	CCP	10/15/19 17:00	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS706-S1
Date Sampled: 09/27/19 11:31
Percent Solids: 59
Initial Volume: 5.6
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-04
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**102** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C1-Benzene	**138** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C2-Benzenes	**183** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C3-Benzenes	**108** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C4-Benzenes	**127** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C5-Benzenes	**59.2** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
Methylcyclohexane	ND (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
Toluene	**202** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
Ethylbenzene	**51.8** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
m,p-Xylene	**265** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
Styrene	**48.0** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
o-Xylene	**J 24.5** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
Isopropylbenzene	ND (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
n-Propylbenzene	ND (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
1,3,5-Trimethylbenzene	**J 15.3** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
1,2,3-Trimethylbenzene	**J 21.4** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
1,2,4-Trimethylbenzene	**56.6** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
t-Butylbenzene	ND (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
sec-Butylbenzene	ND (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
p-Isopropyltoluene	**J 16.3** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
n-Butylbenzene	**J 17.4** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
trans-Decalin	**J 21.8** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
cis-Decalin	ND (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C1-Decalins	**39.4** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C2-Decalins	**35.8** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C3-Decalins	**31.3** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C4-Decalins	ND (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
Benzo(b)thiophene	**103** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C1-Benzo(b)thiophenes	**118** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C2-Benzo(b)thiophenes	**125** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C3-Benzo(b)thiophenes	**59.5** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C4-Benzo(b)thiophenes	**J 30.2** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS706-S1
Date Sampled: 09/27/19 11:31
Percent Solids: 59
Initial Volume: 5.6
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-04
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**6090** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
2-Methylnaphthalene	**3020** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
1-Methylnaphthalene	**2130** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C1-Naphthalenes	**3190** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C2-Naphthalenes	**1880** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C3-Naphthalenes	**644** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C4-Naphthalenes	**206** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
Biphenyl	**803** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
Acenaphthylene	**466** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
Acenaphthene	**5010** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
Dibenzofuran	**296** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
Fluorene	**1890** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C1-Fluorenes	**527** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C2-Fluorenes	**292** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C3-Fluorenes	**280** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
Dibenzothiophene	**669** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C1-Dibenzothiophenes	**433** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C2-Dibenzothiophenes	**304** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C3-Dibenzothiophenes	**161** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C4-Dibenzothiophenes	**77.6** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
Phenanthrene	**9460** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
Anthracene	**2800** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C1-Phenanthrenes/Anthracenes	**3180** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C2-Phenanthrenes/Anthracenes	**1170** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C3-Phenanthrenes/Anthracenes	**351** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C4-Phenanthrenes/Anthracenes	**116** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
Retene	**64.2** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
Benzo(b)naphtho(2,1-d)thiophene	**380** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C0-Benzonaphthothiophenes	**702** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C1-Benzonaphthothiophenes	**345** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C2-Benzonaphthothiophenes	**235** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C3-Benzonaphthothiophenes	**195** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS706-S1
Date Sampled: 09/27/19 11:31
Percent Solids: 59
Initial Volume: 5.6
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-04
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**104** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
Fluoranthene	**6620** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
Pyrene	**7660** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C1-Fluoranthenes/Pyrenes	**3080** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C2-Fluoranthenes/Pyrenes	**1090** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C3-Fluoranthenes/Pyrenes	**450** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
Benzo(b)fluorene	**370** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
Benzo(c)fluorene	**160** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
2-Methylpyrene	**420** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
4-Methylpyrene	**357** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
1-Methylpyrene	**339** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
Benz(a)anthracene	**2920** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
Chrysene/triphenylene	**3060** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C1-Benzo(a)anthracenes/Chrysenes	**1250** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C2-Benzo(a)anthracenes/Chrysenes	**561** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C3-Benzo(a)anthracenes/Chrysenes	**283** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C4-Benzo(a)anthracenes/Chrysenes	**148** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
Benzo(b)fluoranthene	**1980** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
Benzo(j/k)fluoranthene	**2270** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
Benzo(e)pyrene	**1910** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
Benzo(a)pyrene	**3010** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
Perylene	**662** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
Indeno(1,2,3-cd)pyrene	**1590** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
Dibenzo(a,h)anthracene	**351** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
Benzo(g,h,i)perylene	**1570** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
Coronene	**430** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
Tetramethyl lead	ND (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
Trimethylethyl lead	ND (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
Dimethyldiethyl lead	ND (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
Methyltriethyl lead	ND (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
Tetraethyl lead	ND (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
2,6,10-trimethyldodecane (1380)	**37.7** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS706-S1
Date Sampled: 09/27/19 11:31
Percent Solids: 59
Initial Volume: 5.6
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-04
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**82.2** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
2,6,10-trimethylpentadecane (1650)	**70.0** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C-17	**210** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
Pristane	**151** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
C-18	**106** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
Phytane	**161** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
Carbazole	**302** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
2,6-Dimethylnaphthalene	**366** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
2,3,5-Trimethylnaphthene	**45.2** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
4-Methyldibenzothiophene	**168** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
2/3-Methyldibenzothiophene	**153** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
1-Methyldibenzothiophene	**47.8** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
3-Methylphenanthrene	**775** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
2-Methylphenanthrene	**850** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
2-Methylanthracene	**390** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
4/9-Methylphenanthrene	**658** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701
1-Methylphenanthrene	**497** (30.2)	15.1	8270 Mod		5	10/10/19 3:20	F9J0004	FJ90701

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*86 %*		*50-120*
Surrogate: Perylene-d12	*86 %*		*50-120*
Surrogate: Phenanthrene-d10	*92 %*		*50-120*
Surrogate: Toluene-D8	*108 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS706-S1
Date Sampled: 09/27/19 11:31
Percent Solids: 59

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-04
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**31700** (94.4)		TOC-LK		1	CCP	10/15/19 17:17	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS706-S2
Date Sampled: 09/27/19 11:34
Percent Solids: 64
Initial Volume: 2.37
Final Volume: 10
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-05
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**4580** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
C1-Benzene	**3470** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
C2-Benzenes	**29300** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
C3-Benzenes	**81200** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
C4-Benzenes	**180000** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
C5-Benzenes	**67800** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
Methylcyclohexane	**J 192** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
Toluene	**5810** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
Ethylbenzene	**43300** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
m,p-Xylene	**9200** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
Styrene	**10700** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
o-Xylene	**9900** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
Isopropylbenzene	**9440** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
n-Propylbenzene	**2930** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
1,3,5-Trimethylbenzene	**13600** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
1,2,3-Trimethylbenzene	**23000** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
1,2,4-Trimethylbenzene	**48500** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
t-Butylbenzene	**6440** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
sec-Butylbenzene	**578** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
p-Isopropyltoluene	**14700** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
n-Butylbenzene	ND (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
trans-Decalin	**1890** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
cis-Decalin	**598** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
C1-Decalins	**8450** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
C2-Decalins	**18300** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
C3-Decalins	**16700** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
C4-Decalins	**24200** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
Benzo(b)thiophene	**177000** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
C1-Benzo(b)thiophenes	**183000** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
C2-Benzo(b)thiophenes	**196000** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
C3-Benzo(b)thiophenes	**94200** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
C4-Benzo(b)thiophenes	**21500** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS706-S2
Date Sampled: 09/27/19 11:34
Percent Solids: 64
Initial Volume: 2.37
Final Volume: 10
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-05
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**9480000** (6630)	3320	8270 Mod		100	10/11/19 17:32	F9J0004	FJ90701
2-Methylnaphthalene	**5080000** (6630)	3320	8270 Mod		100	10/11/19 17:32	F9J0004	FJ90701
1-Methylnaphthalene	**3280000** (6630)	3320	8270 Mod		100	10/11/19 17:32	F9J0004	FJ90701
C1-Naphthalenes	**5180000** (6630)	3320	8270 Mod		100	10/11/19 17:32	F9J0004	FJ90701
C2-Naphthalenes	**2770000** (6630)	3320	8270 Mod		100	10/11/19 17:32	F9J0004	FJ90701
C3-Naphthalenes	**936000** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
C4-Naphthalenes	**206000** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
Biphenyl	**1470000** (6630)	3320	8270 Mod		100	10/11/19 17:32	F9J0004	FJ90701
Acenaphthylene	**371000** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
Acenaphthene	**7630000** (6630)	3320	8270 Mod		100	10/11/19 17:32	F9J0004	FJ90701
Dibenzofuran	**321000** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
Fluorene	**2850000** (6630)	3320	8270 Mod		100	10/11/19 17:32	F9J0004	FJ90701
C1-Fluorenes	**819000** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
C2-Fluorenes	**341000** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
C3-Fluorenes	**107000** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
Dibenzothiophene	**931000** (6630)	3320	8270 Mod		100	10/11/19 17:32	F9J0004	FJ90701
C1-Dibenzothiophenes	**560000** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
C2-Dibenzothiophenes	**264000** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
C3-Dibenzothiophenes	**86300** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
C4-Dibenzothiophenes	**23300** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
Phenanthrene	**11500000** (6630)	3320	8270 Mod		100	10/11/19 17:32	F9J0004	FJ90701
Anthracene	**4230000** (6630)	3320	8270 Mod		100	10/11/19 17:32	F9J0004	FJ90701
C1-Phenanthrenes/Anthracenes	**3430000** (6630)	3320	8270 Mod		100	10/11/19 17:32	F9J0004	FJ90701
C2-Phenanthrenes/Anthracenes	**932000** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
C3-Phenanthrenes/Anthracenes	**197000** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
C4-Phenanthrenes/Anthracenes	**50500** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
Retene	**14700** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
Benzo(b)naphtho(2,1-d)thiophene	**266000** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
C0-Benzonaphthothiophenes	**488000** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
C1-Benzonaphthothiophenes	**187000** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
C2-Benzonaphthothiophenes	**62600** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
C3-Benzonaphthothiophenes	**46700** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS706-S2
Date Sampled: 09/27/19 11:34
Percent Solids: 64
Initial Volume: 2.37
Final Volume: 10
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-05
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**6950** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
Fluoranthene	**4630000** (6630)	3320	8270 Mod		100	10/11/19 17:32	F9J0004	FJ90701
Pyrene	**6910000** (6630)	3320	8270 Mod		100	10/11/19 17:32	F9J0004	FJ90701
C1-Fluoranthenes/Pyrenes	**3160000** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
C2-Fluoranthenes/Pyrenes	**570000** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
C3-Fluoranthenes/Pyrenes	**122000** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
Benzo(b)fluorene	**419000** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
Benzo(c)fluorene	**147000** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
2-Methylpyrene	**400000** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
4-Methylpyrene	**331000** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
1-Methylpyrene	**434000** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
Benz(a)anthracene	**1970000** (6630)	3320	8270 Mod		100	10/11/19 17:32	F9J0004	FJ90701
Chrysene/triphenylene	**2110000** (6630)	3320	8270 Mod		100	10/11/19 17:32	F9J0004	FJ90701
C1-Benzo(a)anthracenes/Chrysenes	**742000** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
C2-Benzo(a)anthracenes/Chrysenes	**207000** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
C3-Benzo(a)anthracenes/Chrysenes	**50000** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
C4-Benzo(a)anthracenes/Chrysenes	**23400** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
Benzo(b)fluoranthene	**837000** (6630)	3320	8270 Mod		100	10/11/19 17:32	F9J0004	FJ90701
Benzo(j/k)fluoranthene	**1120000** (6630)	3320	8270 Mod		100	10/11/19 17:32	F9J0004	FJ90701
Benzo(e)pyrene	**1040000** (6630)	3320	8270 Mod		100	10/11/19 17:32	F9J0004	FJ90701
Benzo(a)pyrene	**1960000** (6630)	3320	8270 Mod		100	10/11/19 17:32	F9J0004	FJ90701
Perylene	**328000** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
Indeno(1,2,3-cd)pyrene	**744000** (6630)	3320	8270 Mod		100	10/11/19 17:32	F9J0004	FJ90701
Dibenzo(a,h)anthracene	**198000** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
Benzo(g,h,i)perylene	**852000** (6630)	3320	8270 Mod		100	10/11/19 17:32	F9J0004	FJ90701
Coronene	**271000** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
Tetramethyl lead	ND (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
Trimethylethyl lead	ND (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
Dimethyldiethyl lead	ND (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
Methyltriethyl lead	ND (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
Tetraethyl lead	ND (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
2,6,10-trimethyldodecane (1380)	**22200** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS706-S2
Date Sampled: 09/27/19 11:34
Percent Solids: 64
Initial Volume: 2.37
Final Volume: 10
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-05
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**39200** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
2,6,10-trimethylpentadecane (1650)	**37900** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
C-17	ND (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
Pristane	**62500** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
C-18	ND (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
Phytane	**49000** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
Carbazole	**68000** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
2,6-Dimethylnaphthalene	**509000** (6630)	3320	8270 Mod		100	10/11/19 17:32	F9J0004	FJ90701
2,3,5-Trimethylnaphthene	**52300** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
4-Methyldibenzothiophene	**227000** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
2/3-Methyldibenzothiophene	**203000** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
1-Methyldibenzothiophene	**49700** (332)	166	8270 Mod		5	10/10/19 4:45	F9J0004	FJ90701
3-Methylphenanthrene	**842000** (6630)	3320	8270 Mod		100	10/11/19 17:32	F9J0004	FJ90701
2-Methylphenanthrene	**911000** (6630)	3320	8270 Mod		100	10/11/19 17:32	F9J0004	FJ90701
2-Methylanthracene	**403000** (6630)	3320	8270 Mod		100	10/11/19 17:32	F9J0004	FJ90701
4/9-Methylphenanthrene	**691000** (6630)	3320	8270 Mod		100	10/11/19 17:32	F9J0004	FJ90701
1-Methylphenanthrene	**498000** (6630)	3320	8270 Mod		100	10/11/19 17:32	F9J0004	FJ90701

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*116 %*		*50-120*
Surrogate: Perylene-d12	*326 %*	*SM*	*50-120*
Surrogate: Phenanthrene-d10	*119 %*		*50-120*
Surrogate: Toluene-D8	*108 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS706-S2
Date Sampled: 09/27/19 11:34
Percent Solids: 64

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-05
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**212000** (96.8)		TOC-LK		1	CCP	10/15/19 17:34	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS706-S3
Date Sampled: 09/27/19 11:34
Percent Solids: 68
Initial Volume: 3.9
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-06
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**197** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
C1-Benzene	**275** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
C2-Benzenes	**1380** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
C3-Benzenes	**2390** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
C4-Benzenes	**3090** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
C5-Benzenes	**1140** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
Methylcyclohexane	**88.0** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
Toluene	**405** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
Ethylbenzene	**1400** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
m,p-Xylene	**1080** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
Styrene	**45.6** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
o-Xylene	**428** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
Isopropylbenzene	**233** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
n-Propylbenzene	**244** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
1,3,5-Trimethylbenzene	**329** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
1,2,3-Trimethylbenzene	**318** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
1,2,4-Trimethylbenzene	**1450** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
t-Butylbenzene	ND (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
sec-Butylbenzene	**21.2** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
p-Isopropyltoluene	**198** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
n-Butylbenzene	ND (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
trans-Decalin	**45.9** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
cis-Decalin	**10.9** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
C1-Decalins	**110** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
C2-Decalins	**168** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
C3-Decalins	**143** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
C4-Decalins	**193** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
Benzo(b)thiophene	**2030** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
C1-Benzo(b)thiophenes	**1200** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
C2-Benzo(b)thiophenes	**1280** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
C3-Benzo(b)thiophenes	**565** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
C4-Benzo(b)thiophenes	**102** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS706-S3
Date Sampled: 09/27/19 11:34
Percent Solids: 68
Initial Volume: 3.9
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-06
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**46600** (151)	75.3	8270 Mod		20	10/11/19 20:23	F9J0004	FJ90701
2-Methylnaphthalene	**17300** (151)	75.3	8270 Mod		20	10/11/19 20:23	F9J0004	FJ90701
1-Methylnaphthalene	**37100** (151)	75.3	8270 Mod		20	10/11/19 20:23	F9J0004	FJ90701
C1-Naphthalenes	**33000** (151)	75.3	8270 Mod		20	10/11/19 20:23	F9J0004	FJ90701
C2-Naphthalenes	**26900** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
C3-Naphthalenes	**7820** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
C4-Naphthalenes	**1550** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
Biphenyl	**5370** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
Acenaphthylene	**854** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
Acenaphthene	**51500** (151)	75.3	8270 Mod		20	10/11/19 20:23	F9J0004	FJ90701
Dibenzofuran	**2310** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
Fluorene	**17300** (151)	75.3	8270 Mod		20	10/11/19 20:23	F9J0004	FJ90701
C1-Fluorenes	**4860** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
C2-Fluorenes	**1800** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
C3-Fluorenes	**695** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
Dibenzothiophene	**3900** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
C1-Dibenzothiophenes	**1910** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
C2-Dibenzothiophenes	**901** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
C3-Dibenzothiophenes	**355** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
C4-Dibenzothiophenes	**134** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
Phenanthrene	**53200** (151)	75.3	8270 Mod		20	10/11/19 20:23	F9J0004	FJ90701
Anthracene	**11100** (151)	75.3	8270 Mod		20	10/11/19 20:23	F9J0004	FJ90701
C1-Phenanthrenes/Anthracenes	**15100** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
C2-Phenanthrenes/Anthracenes	**4160** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
C3-Phenanthrenes/Anthracenes	**1210** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
C4-Phenanthrenes/Anthracenes	**523** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
Retene	**542** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
Benzo(b)naphtho(2,1-d)thiophene	**679** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
C0-Benzonaphthothiophenes	**1270** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
C1-Benzonaphthothiophenes	**669** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
C2-Benzonaphthothiophenes	**392** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
C3-Benzonaphthothiophenes	**270** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS706-S3
Date Sampled: 09/27/19 11:34
Percent Solids: 68
Initial Volume: 3.9
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-06
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**75.9** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
Fluoranthene	**14200** (151)	75.3	8270 Mod		20	10/11/19 20:23	F9J0004	FJ90701
Pyrene	**19600** (151)	75.3	8270 Mod		20	10/11/19 20:23	F9J0004	FJ90701
C1-Fluoranthenes/Pyrenes	**8690** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
C2-Fluoranthenes/Pyrenes	**2290** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
C3-Fluoranthenes/Pyrenes	**936** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
Benzo(b)fluorene	**1050** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
Benzo(c)fluorene	**516** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
2-Methylpyrene	**1140** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
4-Methylpyrene	**954** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
1-Methylpyrene	**1060** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
Benz(a)anthracene	**5810** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
Chrysene/triphenylene	**5450** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
C1-Benzo(a)anthracenes/Chrysenes	**2950** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
C2-Benzo(a)anthracenes/Chrysenes	**1430** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
C3-Benzo(a)anthracenes/Chrysenes	**652** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
C4-Benzo(a)anthracenes/Chrysenes	**349** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
Benzo(b)fluoranthene	**3190** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
Benzo(j/k)fluoranthene	**3780** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
Benzo(e)pyrene	**3430** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
Benzo(a)pyrene	**5730** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
Perylene	**1210** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
Indeno(1,2,3-cd)pyrene	**2750** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
Dibenzo(a,h)anthracene	**677** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
Benzo(g,h,i)perylene	**2870** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
Coronene	**757** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
Tetramethyl lead	ND (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
Trimethylethyl lead	ND (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
Dimethyldiethyl lead	ND (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
Methyltriethyl lead	ND (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
Tetraethyl lead	ND (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
2,6,10-trimethyldodecane (1380)	**186** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS706-S3
Date Sampled: 09/27/19 11:34
Percent Solids: 68
Initial Volume: 3.9
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-06
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**357** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
2,6,10-trimethylpentadecane (1650)	**318** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
C-17	**327** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
Pristane	**565** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
C-18	**145** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
Phytane	**506** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
Carbazole	**572** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
2,6-Dimethylnaphthalene	**5660** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
2,3,5-Trimethylnaphthene	**479** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
4-Methyldibenzothiophene	**775** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
2/3-Methyldibenzothiophene	**674** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
1-Methyldibenzothiophene	**178** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
3-Methylphenanthrene	**3830** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
2-Methylphenanthrene	**3960** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
2-Methylanthracene	**1590** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
4/9-Methylphenanthrene	**3210** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701
1-Methylphenanthrene	**2310** (7.53)	3.77	8270 Mod		1	10/10/19 6:09	F9J0004	FJ90701

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*89 %*		*50-120*
Surrogate: Perylene-d12	*105 %*		*50-120*
Surrogate: Phenanthrene-d10	*104 %*		*50-120*
Surrogate: Toluene-D8	*88 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS706-S3
Date Sampled: 09/27/19 11:34
Percent Solids: 68

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-06
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**91500** (94.0)		TOC-LK		1	CCP	10/15/19 17:50	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS707-S3
Date Sampled: 09/27/19 12:22
Percent Solids: 83
Initial Volume: 6.38
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-07
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **7.88** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C1-Benzene	**5.03** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C2-Benzenes	J **3.21** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C3-Benzenes	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C4-Benzenes	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C5-Benzenes	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
Methylcyclohexane	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
Toluene	**7.69** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
Ethylbenzene	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
m,p-Xylene	**4.02** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
Styrene	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
o-Xylene	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
Isopropylbenzene	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
n-Propylbenzene	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
1,3,5-Trimethylbenzene	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
1,2,3-Trimethylbenzene	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
1,2,4-Trimethylbenzene	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
t-Butylbenzene	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
sec-Butylbenzene	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
p-Isopropyltoluene	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
n-Butylbenzene	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
trans-Decalin	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
cis-Decalin	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C1-Decalins	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C2-Decalins	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C3-Decalins	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C4-Decalins	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
Benzo(b)thiophene	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C1-Benzo(b)thiophenes	J **2.25** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C2-Benzo(b)thiophenes	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C3-Benzo(b)thiophenes	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C4-Benzo(b)thiophenes	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS707-S3
Date Sampled: 09/27/19 12:22
Percent Solids: 83
Initial Volume: 6.38
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-07
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**4.79** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
2-Methylnaphthalene	**3.82** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
1-Methylnaphthalene	**J 2.96** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C1-Naphthalenes	**4.41** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C2-Naphthalenes	**5.87** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C3-Naphthalenes	**4.58** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C4-Naphthalenes	**J 3.13** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
Biphenyl	**J 2.29** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
Acenaphthylene	**9.24** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
Acenaphthene	**7.79** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
Dibenzofuran	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
Fluorene	**4.81** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C1-Fluorenes	**J 3.65** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C2-Fluorenes	**J 3.03** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C3-Fluorenes	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
Dibenzothiophene	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C1-Dibenzothiophenes	**J 2.13** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C2-Dibenzothiophenes	**J 2.43** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C3-Dibenzothiophenes	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C4-Dibenzothiophenes	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
Phenanthrene	**15.7** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
Anthracene	**11.6** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C1-Phenanthrenes/Anthracenes	**12.1** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C2-Phenanthrenes/Anthracenes	**6.54** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C3-Phenanthrenes/Anthracenes	**3.78** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C4-Phenanthrenes/Anthracenes	**J 3.53** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
Retene	**9.58** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
Benzo(b)naphtho(2,1-d)thiophene	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C0-Benzonaphthothiophenes	**J 2.45** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C1-Benzonaphthothiophenes	**J 2.44** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C2-Benzonaphthothiophenes	**J 2.04** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C3-Benzonaphthothiophenes	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS707-S3
Date Sampled: 09/27/19 12:22
Percent Solids: 83
Initial Volume: 6.38
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-07
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
Fluoranthene	**13.5** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
Pyrene	**17.9** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C1-Fluoranthenes/Pyrenes	**21.4** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C2-Fluoranthenes/Pyrenes	**7.72** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C3-Fluoranthenes/Pyrenes	**J 3.77** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
Benzo(b)fluorene	**J 2.00** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
Benzo(c)fluorene	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
2-Methylpyrene	**J 2.27** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
4-Methylpyrene	**J 2.62** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
1-Methylpyrene	**J 2.06** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
Benz(a)anthracene	**8.49** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
Chrysene/triphenylene	**11.2** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C1-Benzo(a)anthracenes/Chrysenes	**7.83** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C2-Benzo(a)anthracenes/Chrysenes	**5.66** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C3-Benzo(a)anthracenes/Chrysenes	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C4-Benzo(a)anthracenes/Chrysenes	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
Benzo(b)fluoranthene	**5.30** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
Benzo(j/k)fluoranthene	**6.73** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
Benzo(e)pyrene	**6.26** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
Benzo(a)pyrene	**9.25** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
Perylene	**44.4** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
Indeno(1,2,3-cd)pyrene	**6.63** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
Dibenzo(a,h)anthracene	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
Benzo(g,h,i)perylene	**6.50** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
Coronene	**5.90** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
Tetramethyl lead	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
Trimethylethyl lead	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
Dimethyldiethyl lead	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
Methyltriethyl lead	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
Tetraethyl lead	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
2,6,10-trimethyldodecane (1380)	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS707-S3
Date Sampled: 09/27/19 12:22
Percent Solids: 83
Initial Volume: 6.38
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-07
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**J 3.45** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
2,6,10-trimethylpentadecane (1650)	**8.62** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C-17	**B 32.8** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
Pristane	**B 19.5** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
C-18	**B 23.7** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
Phytane	**B 24.9** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
Carbazole	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
2,6-Dimethylnaphthalene	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
2,3,5-Trimethylnaphthene	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
4-Methyldibenzothiophene	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
2/3-Methyldibenzothiophene	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
1-Methyldibenzothiophene	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
3-Methylphenanthrene	**J 3.01** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
2-Methylphenanthrene	**J 2.78** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
2-Methylanthracene	**J 1.99** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
4/9-Methylphenanthrene	**J 2.57** (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701
1-Methylphenanthrene	ND (3.78)	1.89	8270 Mod		1	10/10/19 7:34	F9J0004	FJ90701

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*81 %*		*50-120*
Surrogate: Perylene-d12	*90 %*		*50-120*
Surrogate: Phenanthrene-d10	*89 %*		*50-120*
Surrogate: Toluene-D8	*84 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS707-S3
Date Sampled: 09/27/19 12:22
Percent Solids: 83

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-07
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**4760** (96.8)		TOC-LK		1	CCP	10/15/19 18:07	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS708-S1
Date Sampled: 09/27/19 12:45
Percent Solids: 75
Initial Volume: 5.52
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-08
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **48.7** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C1-Benzene	**87.3** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C2-Benzenes	**102** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C3-Benzenes	**40.9** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C4-Benzenes	**37.9** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C5-Benzenes	**30.0** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
Methylcyclohexane	**26.9** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
Toluene	**127** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
Ethylbenzene	**19.4** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
m,p-Xylene	**156** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
Styrene	**35.4** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
o-Xylene	**14.0** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
Isopropylbenzene	ND (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
n-Propylbenzene	**6.70** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
1,3,5-Trimethylbenzene	**12.1** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
1,2,3-Trimethylbenzene	**8.07** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
1,2,4-Trimethylbenzene	**20.7** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
t-Butylbenzene	ND (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
sec-Butylbenzene	ND (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
p-Isopropyltoluene	**7.15** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
n-Butylbenzene	**9.01** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
trans-Decalin	**42.8** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
cis-Decalin	**5.22** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C1-Decalins	**75.2** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C2-Decalins	**59.0** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C3-Decalins	**44.3** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C4-Decalins	**75.3** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
Benzo(b)thiophene	**14.1** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C1-Benzo(b)thiophenes	**19.2** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C2-Benzo(b)thiophenes	**28.9** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C3-Benzo(b)thiophenes	**19.8** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C4-Benzo(b)thiophenes	**15.0** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS708-S1
Date Sampled: 09/27/19 12:45
Percent Solids: 75
Initial Volume: 5.52
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-08
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**274** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
2-Methylnaphthalene	**124** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
1-Methylnaphthalene	**117** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C1-Naphthalenes	**146** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C2-Naphthalenes	**259** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C3-Naphthalenes	**192** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C4-Naphthalenes	**107** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
Biphenyl	**44.5** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
Acenaphthylene	**306** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
Acenaphthene	**446** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
Dibenzofuran	**129** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
Fluorene	**352** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C1-Fluorenes	**151** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C2-Fluorenes	**141** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C3-Fluorenes	**220** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
Dibenzothiophene	**221** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C1-Dibenzothiophenes	**187** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C2-Dibenzothiophenes	**182** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C3-Dibenzothiophenes	**118** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C4-Dibenzothiophenes	**72.4** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
Phenanthrene	**2930** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
Anthracene	**860** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C1-Phenanthrenes/Anthracenes	**1230** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C2-Phenanthrenes/Anthracenes	**621** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C3-Phenanthrenes/Anthracenes	**259** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C4-Phenanthrenes/Anthracenes	**117** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
Retene	**38.4** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
Benzo(b)naphtho(2,1-d)thiophene	**242** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C0-Benzonaphthothiophenes	**446** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C1-Benzonaphthothiophenes	**245** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C2-Benzonaphthothiophenes	**213** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C3-Benzonaphthothiophenes	**181** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS708-S1
Date Sampled: 09/27/19 12:45
Percent Solids: 75
Initial Volume: 5.52
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-08
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**99.8** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
Fluoranthene	**3650** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
Pyrene	**3440** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C1-Fluoranthenes/Pyrenes	**1430** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C2-Fluoranthenes/Pyrenes	**773** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C3-Fluoranthenes/Pyrenes	**383** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
Benzo(b)fluorene	**157** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
Benzo(c)fluorene	**86.6** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
2-Methylpyrene	**194** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
4-Methylpyrene	**163** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
1-Methylpyrene	**136** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
Benz(a)anthracene	**1650** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
Chrysene/triphenylene	**1740** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C1-Benzo(a)anthracenes/Chrysenes	**779** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C2-Benzo(a)anthracenes/Chrysenes	**460** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C3-Benzo(a)anthracenes/Chrysenes	**255** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C4-Benzo(a)anthracenes/Chrysenes	**141** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
Benzo(b)fluoranthene	**1390** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
Benzo(j/k)fluoranthene	**1430** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
Benzo(e)pyrene	**1180** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
Benzo(a)pyrene	**1710** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
Perylene	**459** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
Indeno(1,2,3-cd)pyrene	**1080** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
Dibenzo(a,h)anthracene	**254** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
Benzo(g,h,i)perylene	**1010** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
Coronene	**254** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
Tetramethyl lead	ND (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
Trimethylethyl lead	ND (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
Dimethyldiethyl lead	ND (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
Methyltriethyl lead	ND (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
Tetraethyl lead	ND (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
2,6,10-trimethyldodecane (1380)	**48.5** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS708-S1
Date Sampled: 09/27/19 12:45
Percent Solids: 75
Initial Volume: 5.52
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-08
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**83.2** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
2,6,10-trimethylpentadecane (1650)	**71.8** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C-17	**159** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
Pristane	**184** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
C-18	**95.9** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
Phytane	**183** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
Carbazole	**226** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
2,6-Dimethylnaphthalene	**67.5** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
2,3,5-Trimethylnaphthene	**16.1** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
4-Methyldibenzothiophene	**65.6** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
2/3-Methyldibenzothiophene	**62.4** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
1-Methyldibenzothiophene	**23.8** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
3-Methylphenanthrene	**283** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
2-Methylphenanthrene	**336** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
2-Methylanthracene	**148** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
4/9-Methylphenanthrene	**263** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701
1-Methylphenanthrene	**195** (4.84)	2.42	8270 Mod		1	10/11/19 0:32	F9J0004	FJ90701

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*91 %*		*50-120*
Surrogate: Perylene-d12	*83 %*		*50-120*
Surrogate: Phenanthrene-d10	*85 %*		*50-120*
Surrogate: Toluene-D8	*83 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS708-S1
Date Sampled: 09/27/19 12:45
Percent Solids: 75

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-08
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**18600** (92.7)		TOC-LK		1	CCP	10/15/19 19:08	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS708-S2
Date Sampled: 09/27/19 12:48
Percent Solids: 76
Initial Volume: 2.08
Final Volume: 5
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-09
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**5040** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
C1-Benzene	**3180** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
C2-Benzenes	**37000** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
C3-Benzenes	**64100** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
C4-Benzenes	**109000** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
C5-Benzenes	**33800** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
Methylcyclohexane	**J 82.8** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
Toluene	**5210** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
Ethylbenzene	**49900** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
m,p-Xylene	**16100** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
Styrene	**7770** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
o-Xylene	**12400** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
Isopropylbenzene	**7680** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
n-Propylbenzene	**2400** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
1,3,5-Trimethylbenzene	**10100** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
1,2,3-Trimethylbenzene	**17500** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
1,2,4-Trimethylbenzene	**38300** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
t-Butylbenzene	ND (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
sec-Butylbenzene	**379** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
p-Isopropyltoluene	**10100** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
n-Butylbenzene	ND (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
trans-Decalin	**1150** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
cis-Decalin	**358** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
C1-Decalins	**5070** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
C2-Decalins	**11300** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
C3-Decalins	**11100** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
C4-Decalins	**17200** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
Benzo(b)thiophene	**163000** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
C1-Benzo(b)thiophenes	**120000** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
C2-Benzo(b)thiophenes	**104000** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
C3-Benzo(b)thiophenes	**40300** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
C4-Benzo(b)thiophenes	**8830** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS708-S2
Date Sampled: 09/27/19 12:48
Percent Solids: 76
Initial Volume: 2.08
Final Volume: 5
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-09
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**9250000** (63200)	31600	8270 Mod		2000	10/11/19 23:13	F9J0004	FJ90701
2-Methylnaphthalene	**3360000** (3160)	1580	8270 Mod		100	10/11/19 21:48	F9J0004	FJ90701
1-Methylnaphthalene	**2130000** (3160)	1580	8270 Mod		100	10/11/19 21:48	F9J0004	FJ90701
C1-Naphthalenes	**3390000** (3160)	1580	8270 Mod		100	10/11/19 21:48	F9J0004	FJ90701
C2-Naphthalenes	**1700000** (3160)	1580	8270 Mod		100	10/11/19 21:48	F9J0004	FJ90701
C3-Naphthalenes	**560000** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
C4-Naphthalenes	**128000** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
Biphenyl	**930000** (3160)	1580	8270 Mod		100	10/11/19 21:48	F9J0004	FJ90701
Acenaphthylene	**256000** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
Acenaphthene	**4890000** (3160)	1580	8270 Mod		100	10/11/19 21:48	F9J0004	FJ90701
Dibenzofuran	**221000** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
Fluorene	**1820000** (3160)	1580	8270 Mod		100	10/11/19 21:48	F9J0004	FJ90701
C1-Fluorenes	**520000** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
C2-Fluorenes	**223000** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
C3-Fluorenes	**73600** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
Dibenzothiophene	**600000** (3160)	1580	8270 Mod		100	10/11/19 21:48	F9J0004	FJ90701
C1-Dibenzothiophenes	**353000** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
C2-Dibenzothiophenes	**161000** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
C3-Dibenzothiophenes	**49100** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
C4-Dibenzothiophenes	**13500** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
Phenanthrene	**7810000** (63200)	31600	8270 Mod		2000	10/11/19 23:13	F9J0004	FJ90701
Anthracene	**2080000** (3160)	1580	8270 Mod		100	10/11/19 21:48	F9J0004	FJ90701
C1-Phenanthrenes/Anthracenes	**2170000** (3160)	1580	8270 Mod		100	10/11/19 21:48	F9J0004	FJ90701
C2-Phenanthrenes/Anthracenes	**605000** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
C3-Phenanthrenes/Anthracenes	**130000** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
C4-Phenanthrenes/Anthracenes	**34900** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
Retene	**14300** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
Benzo(b)naphtho(2,1-d)thiophene	**172000** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
C0-Benzonaphthothiophenes	**317000** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
C1-Benzonaphthothiophenes	**124000** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
C2-Benzonaphthothiophenes	**40400** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
C3-Benzonaphthothiophenes	**28900** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS708-S2
Date Sampled: 09/27/19 12:48
Percent Solids: 76
Initial Volume: 2.08
Final Volume: 5
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-09
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**4320** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
Fluoranthene	**2790000** (3160)	1580	8270 Mod		100	10/11/19 21:48	F9J0004	FJ90701
Pyrene	**4090000** (3160)	1580	8270 Mod		100	10/11/19 21:48	F9J0004	FJ90701
C1-Fluoranthenes/Pyrenes	**1680000** (3160)	1580	8270 Mod		100	10/11/19 21:48	F9J0004	FJ90701
C2-Fluoranthenes/Pyrenes	**374000** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
C3-Fluoranthenes/Pyrenes	**86100** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
Benzo(b)fluorene	**203000** (3160)	1580	8270 Mod		100	10/11/19 21:48	F9J0004	FJ90701
Benzo(c)fluorene	**95100** (3160)	1580	8270 Mod		100	10/11/19 21:48	F9J0004	FJ90701
2-Methylpyrene	**227000** (3160)	1580	8270 Mod		100	10/11/19 21:48	F9J0004	FJ90701
4-Methylpyrene	**179000** (3160)	1580	8270 Mod		100	10/11/19 21:48	F9J0004	FJ90701
1-Methylpyrene	**206000** (3160)	1580	8270 Mod		100	10/11/19 21:48	F9J0004	FJ90701
Benz(a)anthracene	**1240000** (3160)	1580	8270 Mod		100	10/11/19 21:48	F9J0004	FJ90701
Chrysene/triphenylene	**1420000** (3160)	1580	8270 Mod		100	10/11/19 21:48	F9J0004	FJ90701
C1-Benzo(a)anthracenes/Chrysenes	**521000** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
C2-Benzo(a)anthracenes/Chrysenes	**146000** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
C3-Benzo(a)anthracenes/Chrysenes	**33100** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
C4-Benzo(a)anthracenes/Chrysenes	**14600** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
Benzo(b)fluoranthene	**468000** (3160)	1580	8270 Mod		100	10/11/19 21:48	F9J0004	FJ90701
Benzo(j/k)fluoranthene	**735000** (3160)	1580	8270 Mod		100	10/11/19 21:48	F9J0004	FJ90701
Benzo(e)pyrene	**643000** (3160)	1580	8270 Mod		100	10/11/19 21:48	F9J0004	FJ90701
Benzo(a)pyrene	**1210000** (3160)	1580	8270 Mod		100	10/11/19 21:48	F9J0004	FJ90701
Perylene	**202000** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
Indeno(1,2,3-cd)pyrene	**444000** (3160)	1580	8270 Mod		100	10/11/19 21:48	F9J0004	FJ90701
Dibenzo(a,h)anthracene	**121000** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
Benzo(g,h,i)perylene	**507000** (3160)	1580	8270 Mod		100	10/11/19 21:48	F9J0004	FJ90701
Coronene	**155000** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
Tetramethyl lead	ND (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
Trimethylethyl lead	ND (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
Dimethyldiethyl lead	ND (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
Methyltriethyl lead	ND (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
Tetraethyl lead	ND (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
2,6,10-trimethyldodecane (1380)	**11500** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS708-S2
Date Sampled: 09/27/19 12:48
Percent Solids: 76
Initial Volume: 2.08
Final Volume: 5
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-09
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**22500** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
2,6,10-trimethylpentadecane (1650)	**23300** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
C-17	ND (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
Pristane	**35100** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
C-18	ND (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
Phytane	**26800** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
Carbazole	**48100** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
2,6-Dimethylnaphthalene	**321000** (3160)	1580	8270 Mod		100	10/11/19 21:48	F9J0004	FJ90701
2,3,5-Trimethylnaphthene	**37900** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
4-Methyldibenzothiophene	**144000** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
2/3-Methyldibenzothiophene	**131000** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
1-Methyldibenzothiophene	**29500** (158)	79.0	8270 Mod		5	10/10/19 10:22	F9J0004	FJ90701
3-Methylphenanthrene	**548000** (3160)	1580	8270 Mod		100	10/11/19 21:48	F9J0004	FJ90701
2-Methylphenanthrene	**595000** (3160)	1580	8270 Mod		100	10/11/19 21:48	F9J0004	FJ90701
2-Methylanthracene	**251000** (3160)	1580	8270 Mod		100	10/11/19 21:48	F9J0004	FJ90701
4/9-Methylphenanthrene	**426000** (3160)	1580	8270 Mod		100	10/11/19 21:48	F9J0004	FJ90701
1-Methylphenanthrene	**326000** (3160)	1580	8270 Mod		100	10/11/19 21:48	F9J0004	FJ90701

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*117 %*		*50-120*
Surrogate: Perylene-d12	*320 %*	*SM*	*50-120*
Surrogate: Phenanthrene-d10	*119 %*		*50-120*
Surrogate: Toluene-D8	*118 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS708-S2
Date Sampled: 09/27/19 12:48
Percent Solids: 76

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-09
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**110000** (98.7)		TOC-LK		1	CCP	10/15/19 19:26	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS708-S3
Date Sampled: 09/27/19 12:52
Percent Solids: 79
Initial Volume: 5.53
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-10
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**B 8.50** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C1-Benzene	ND (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C2-Benzenes	**J 3.70** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C3-Benzenes	**J 4.41** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C4-Benzenes	**J 3.72** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C5-Benzenes	ND (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
Methylcyclohexane	ND (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
Toluene	**J 3.00** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
Ethylbenzene	**J 2.65** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
m,p-Xylene	ND (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
Styrene	**9.42** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
o-Xylene	ND (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
Isopropylbenzene	ND (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
n-Propylbenzene	ND (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
1,3,5-Trimethylbenzene	ND (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
1,2,3-Trimethylbenzene	ND (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
1,2,4-Trimethylbenzene	ND (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
t-Butylbenzene	ND (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
sec-Butylbenzene	ND (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
p-Isopropyltoluene	ND (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
n-Butylbenzene	ND (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
trans-Decalin	ND (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
cis-Decalin	ND (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C1-Decalins	ND (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C2-Decalins	ND (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C3-Decalins	ND (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C4-Decalins	ND (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
Benzo(b)thiophene	**8.72** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C1-Benzo(b)thiophenes	**9.18** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C2-Benzo(b)thiophenes	**9.79** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C3-Benzo(b)thiophenes	**5.42** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C4-Benzo(b)thiophenes	**J 2.52** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS708-S3
Date Sampled: 09/27/19 12:52
Percent Solids: 79
Initial Volume: 5.53
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-10
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**281** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
2-Methylnaphthalene	**128** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
1-Methylnaphthalene	**80.7** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C1-Naphthalenes	**130** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C2-Naphthalenes	**93.7** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C3-Naphthalenes	**40.8** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C4-Naphthalenes	**13.8** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
Biphenyl	**48.3** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
Acenaphthylene	**9.49** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
Acenaphthene	**242** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
Dibenzofuran	**14.6** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
Fluorene	**129** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C1-Fluorenes	**34.4** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C2-Fluorenes	**19.4** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C3-Fluorenes	**10.3** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
Dibenzothiophene	**50.0** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C1-Dibenzothiophenes	**30.1** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C2-Dibenzothiophenes	**15.0** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C3-Dibenzothiophenes	**5.78** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C4-Dibenzothiophenes	**J 3.11** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
Phenanthrene	**671** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
Anthracene	**84.8** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C1-Phenanthrenes/Anthracenes	**194** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C2-Phenanthrenes/Anthracenes	**44.1** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C3-Phenanthrenes/Anthracenes	**6.64** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C4-Phenanthrenes/Anthracenes	ND (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
Retene	ND (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
Benzo(b)naphtho(2,1-d)thiophene	**J 3.29** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C0-Benzonaphthothiophenes	**7.30** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C1-Benzonaphthothiophenes	**6.04** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C2-Benzonaphthothiophenes	**J 3.54** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C3-Benzonaphthothiophenes	ND (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS708-S3
Date Sampled: 09/27/19 12:52
Percent Solids: 79
Initial Volume: 5.53
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-10
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
Fluoranthene	**233** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
Pyrene	**360** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C1-Fluoranthenes/Pyrenes	**85.4** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C2-Fluoranthenes/Pyrenes	**8.59** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C3-Fluoranthenes/Pyrenes	**J 3.47** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
Benzo(b)fluorene	**8.64** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
Benzo(c)fluorene	**6.95** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
2-Methylpyrene	**9.98** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
4-Methylpyrene	**7.54** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
1-Methylpyrene	**10.9** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
Benz(a)anthracene	**28.4** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
Chrysene/triphenylene	**22.0** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C1-Benzo(a)anthracenes/Chrysenes	**8.12** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C2-Benzo(a)anthracenes/Chrysenes	**J 4.55** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C3-Benzo(a)anthracenes/Chrysenes	ND (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C4-Benzo(a)anthracenes/Chrysenes	ND (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
Benzo(b)fluoranthene	**7.41** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
Benzo(j/k)fluoranthene	**9.62** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
Benzo(e)pyrene	**9.30** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
Benzo(a)pyrene	**15.4** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
Perylene	**4.82** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
Indeno(1,2,3-cd)pyrene	**6.88** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
Dibenzo(a,h)anthracene	ND (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
Benzo(g,h,i)perylene	**7.63** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
Coronene	**J 3.60** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
Tetramethyl lead	ND (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
Trimethylethyl lead	ND (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
Dimethyldiethyl lead	ND (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
Methyltriethyl lead	ND (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
Tetraethyl lead	ND (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
2,6,10-trimethyldodecane (1380)	ND (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS708-S3
Date Sampled: 09/27/19 12:52
Percent Solids: 79
Initial Volume: 5.53
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-10
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**5.60** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
2,6,10-trimethylpentadecane (1650)	**11.8** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C-17	**B 43.2** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
Pristane	**B 22.8** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
C-18	**B 33.4** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
Phytane	**B 31.1** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
Carbazole	**7.11** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
2,6-Dimethylnaphthalene	**18.3** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
2,3,5-Trimethylnaphthene	**J 2.63** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
4-Methyldibenzothiophene	**12.2** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
2/3-Methyldibenzothiophene	**9.76** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
1-Methyldibenzothiophene	**J 4.02** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
3-Methylphenanthrene	**49.9** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
2-Methylphenanthrene	**55.6** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
2-Methylanthracene	**19.1** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
4/9-Methylphenanthrene	**37.2** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701
1-Methylphenanthrene	**29.7** (4.56)	2.28	8270 Mod		1	10/11/19 1:57	F9J0004	FJ90701

	%Recovery	*Qualifier*	*Limits*
Surrogate: Naphthalene-d8	*88 %*		*50-120*
Surrogate: Perylene-d12	*76 %*		*50-120*
Surrogate: Phenanthrene-d10	*93 %*		*50-120*
Surrogate: Toluene-D8	*81 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS708-S3
Date Sampled: 09/27/19 12:52
Percent Solids: 79

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-10
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**4800** (98.3)		TOC-LK		1	CCP	10/15/19 21:52	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS709-S1
Date Sampled: 09/27/19 13:16
Percent Solids: 41
Initial Volume: 5.11
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-11
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **83.9** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C1-Benzene	**258** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C2-Benzenes	**458** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C3-Benzenes	**203** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C4-Benzenes	**78.2** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C5-Benzenes	**55.9** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
Methylcyclohexane	**10.3** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
Toluene	**383** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
Ethylbenzene	**141** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
m,p-Xylene	**686** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
Styrene	**975** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
o-Xylene	**29.0** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
Isopropylbenzene	**345** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
n-Propylbenzene	**37.1** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
1,3,5-Trimethylbenzene	**9.57** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
1,2,3-Trimethylbenzene	**12.8** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
1,2,4-Trimethylbenzene	**26.4** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
t-Butylbenzene	ND (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
sec-Butylbenzene	ND (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
p-Isopropyltoluene	**22.7** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
n-Butylbenzene	**29.3** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
trans-Decalin	**509** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
cis-Decalin	**110** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C1-Decalins	**1340** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C2-Decalins	**691** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C3-Decalins	**360** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C4-Decalins	**696** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
Benzo(b)thiophene	J **8.15** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C1-Benzo(b)thiophenes	**30.5** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C2-Benzo(b)thiophenes	**43.8** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C3-Benzo(b)thiophenes	**30.5** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C4-Benzo(b)thiophenes	**35.2** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS709-S1
Date Sampled: 09/27/19 13:16
Percent Solids: 41
Initial Volume: 5.11
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-11
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**165** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
2-Methylnaphthalene	**103** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
1-Methylnaphthalene	**63.7** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C1-Naphthalenes	**105** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C2-Naphthalenes	**239** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C3-Naphthalenes	**290** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C4-Naphthalenes	**366** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
Biphenyl	**57.0** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
Acenaphthylene	**555** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
Acenaphthene	**203** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
Dibenzofuran	**70.8** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
Fluorene	**174** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C1-Fluorenes	**167** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C2-Fluorenes	**273** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C3-Fluorenes	**417** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
Dibenzothiophene	**130** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C1-Dibenzothiophenes	**239** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C2-Dibenzothiophenes	**508** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C3-Dibenzothiophenes	**585** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C4-Dibenzothiophenes	**400** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
Phenanthrene	**1420** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
Anthracene	**641** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C1-Phenanthrenes/Anthracenes	**1310** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C2-Phenanthrenes/Anthracenes	**1190** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C3-Phenanthrenes/Anthracenes	**759** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C4-Phenanthrenes/Anthracenes	**378** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
Retene	**63.0** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
Benzo(b)naphtho(2,1-d)thiophene	**342** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C0-Benzonaphthothiophenes	**633** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C1-Benzonaphthothiophenes	**502** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C2-Benzonaphthothiophenes	**492** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C3-Benzonaphthothiophenes	**418** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS709-S1
Date Sampled: 09/27/19 13:16
Percent Solids: 41
Initial Volume: 5.11
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-11
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**195** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
Fluoranthene	**3540** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
Pyrene	**4570** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C1-Fluoranthenes/Pyrenes	**2710** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C2-Fluoranthenes/Pyrenes	**1150** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C3-Fluoranthenes/Pyrenes	**622** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
Benzo(b)fluorene	**301** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
Benzo(c)fluorene	**129** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
2-Methylpyrene	**382** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
4-Methylpyrene	**382** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
1-Methylpyrene	**320** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
Benz(a)anthracene	**2390** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
Chrysene/triphenylene	**2660** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C1-Benzo(a)anthracenes/Chrysenes	**1400** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C2-Benzo(a)anthracenes/Chrysenes	**800** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C3-Benzo(a)anthracenes/Chrysenes	**443** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C4-Benzo(a)anthracenes/Chrysenes	**229** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
Benzo(b)fluoranthene	**1900** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
Benzo(j/k)fluoranthene	**2210** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
Benzo(e)pyrene	**2050** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
Benzo(a)pyrene	**3090** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
Perylene	**929** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
Indeno(1,2,3-cd)pyrene	**1730** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
Dibenzo(a,h)anthracene	**375** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
Benzo(g,h,i)perylene	**1830** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
Coronene	**518** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
Tetramethyl lead	ND (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
Trimethylethyl lead	ND (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
Dimethyldiethyl lead	ND (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
Methyltriethyl lead	ND (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
Tetraethyl lead	ND (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
2,6,10-trimethyldodecane (1380)	**663** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS709-S1
Date Sampled: 09/27/19 13:16
Percent Solids: 41
Initial Volume: 5.11
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-11
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**1120** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
2,6,10-trimethylpentadecane (1650)	**1380** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C-17	**319** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
Pristane	**3180** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
C-18	**271** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
Phytane	**2480** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
Carbazole	**134** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
2,6-Dimethylnaphthalene	**67.6** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
2,3,5-Trimethylnaphthene	**19.0** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
4-Methyldibenzothiophene	**90.0** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
2/3-Methyldibenzothiophene	**78.8** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
1-Methyldibenzothiophene	**30.6** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
3-Methylphenanthrene	**307** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
2-Methylphenanthrene	**299** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
2-Methylanthracene	**181** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
4/9-Methylphenanthrene	**354** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701
1-Methylphenanthrene	**160** (9.51)	4.76	8270 Mod		1	10/10/19 13:13	F9J0004	FJ90701

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*86 %*		*50-120*
Surrogate: Perylene-d12	*92 %*		*50-120*
Surrogate: Phenanthrene-d10	*93 %*		*50-120*
Surrogate: Toluene-D8	*76 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS709-S1
Date Sampled: 09/27/19 13:16
Percent Solids: 41

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-11
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**51300** (95.4)		TOC-LK		1	CCP	10/15/19 19:59	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS709-S3
Date Sampled: 09/27/19 13:22
Percent Solids: 83
Initial Volume: 6.08
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-12
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**B 8.60** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C1-Benzene	**5.63** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C2-Benzenes	**J 3.48** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C3-Benzenes	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C4-Benzenes	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C5-Benzenes	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
Methylcyclohexane	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
Toluene	**6.67** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
Ethylbenzene	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
m,p-Xylene	**J 3.59** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
Styrene	**25.3** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
o-Xylene	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
Isopropylbenzene	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
n-Propylbenzene	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
1,3,5-Trimethylbenzene	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
1,2,3-Trimethylbenzene	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
1,2,4-Trimethylbenzene	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
t-Butylbenzene	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
sec-Butylbenzene	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
p-Isopropyltoluene	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
n-Butylbenzene	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
trans-Decalin	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
cis-Decalin	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C1-Decalins	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C2-Decalins	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C3-Decalins	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C4-Decalins	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
Benzo(b)thiophene	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C1-Benzo(b)thiophenes	**J 2.28** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C2-Benzo(b)thiophenes	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C3-Benzo(b)thiophenes	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C4-Benzo(b)thiophenes	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS709-S3
Date Sampled: 09/27/19 13:22
Percent Solids: 83
Initial Volume: 6.08
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-12
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	J **3.17** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
2-Methylnaphthalene	J **2.47** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
1-Methylnaphthalene	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C1-Naphthalenes	J **3.17** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C2-Naphthalenes	**7.45** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C3-Naphthalenes	J **3.30** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C4-Naphthalenes	J **2.49** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
Biphenyl	J **2.50** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
Acenaphthylene	**4.71** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
Acenaphthene	**4.92** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
Dibenzofuran	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
Fluorene	J **3.37** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C1-Fluorenes	**4.20** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C2-Fluorenes	J **3.46** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C3-Fluorenes	J **2.71** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
Dibenzothiophene	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C1-Dibenzothiophenes	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C2-Dibenzothiophenes	J **2.17** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C3-Dibenzothiophenes	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C4-Dibenzothiophenes	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
Phenanthrene	**11.3** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
Anthracene	J **2.67** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C1-Phenanthrenes/Anthracenes	**8.10** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C2-Phenanthrenes/Anthracenes	**4.63** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C3-Phenanthrenes/Anthracenes	**6.38** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C4-Phenanthrenes/Anthracenes	J **3.58** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
Retene	**10.7** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
Benzo(b)naphtho(2,1-d)thiophene	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C0-Benzonaphthothiophenes	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C1-Benzonaphthothiophenes	**8.97** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C2-Benzonaphthothiophenes	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C3-Benzonaphthothiophenes	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS709-S3
Date Sampled: 09/27/19 13:22
Percent Solids: 83
Initial Volume: 6.08
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-12
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
Fluoranthene	**5.91** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
Pyrene	**12.4** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C1-Fluoranthenes/Pyrenes	**12.8** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C2-Fluoranthenes/Pyrenes	**J 3.81** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C3-Fluoranthenes/Pyrenes	**J 2.36** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
Benzo(b)fluorene	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
Benzo(c)fluorene	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
2-Methylpyrene	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
4-Methylpyrene	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
1-Methylpyrene	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
Benz(a)anthracene	**J 3.67** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
Chrysene/triphenylene	**4.11** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C1-Benzo(a)anthracenes/Chrysenes	**4.56** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C2-Benzo(a)anthracenes/Chrysenes	**J 2.65** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C3-Benzo(a)anthracenes/Chrysenes	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C4-Benzo(a)anthracenes/Chrysenes	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
Benzo(b)fluoranthene	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
Benzo(j/k)fluoranthene	**J 2.31** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
Benzo(e)pyrene	**J 2.78** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
Benzo(a)pyrene	**J 3.51** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
Perylene	**39.1** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
Indeno(1,2,3-cd)pyrene	**J 2.62** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
Dibenzo(a,h)anthracene	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
Benzo(g,h,i)perylene	**J 2.48** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
Coronene	**J 3.10** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
Tetramethyl lead	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
Trimethylethyl lead	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
Dimethyldiethyl lead	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
Methyltriethyl lead	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
Tetraethyl lead	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
2,6,10-trimethyldodecane (1380)	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS709-S3
Date Sampled: 09/27/19 13:22
Percent Solids: 83
Initial Volume: 6.08
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-12
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/7/19 16:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**4.22** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
2,6,10-trimethylpentadecane (1650)	**10.5** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C-17	**B 39.4** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
Pristane	**B 23.6** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
C-18	**B 29.1** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
Phytane	**B 28.4** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
Carbazole	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
2,6-Dimethylnaphthalene	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
2,3,5-Trimethylnaphthene	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
4-Methyldibenzothiophene	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
2/3-Methyldibenzothiophene	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
1-Methyldibenzothiophene	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
3-Methylphenanthrene	**J 2.06** (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
2-Methylphenanthrene	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
2-Methylanthracene	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
4/9-Methylphenanthrene	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701
1-Methylphenanthrene	ND (3.95)	1.97	8270 Mod		1	10/10/19 18:51	F9J0004	FJ90701

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*102 %*		*50-120*
Surrogate: Perylene-d12	*94 %*		*50-120*
Surrogate: Phenanthrene-d10	*96 %*		*50-120*
Surrogate: Toluene-D8	*96 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS709-S3
Date Sampled: 09/27/19 13:22
Percent Solids: 83

ESS Laboratory Work Order: F190052
ESS Laboratory Sample ID: F190052-12
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**2590** (91.5)		TOC-LK		1	CCP	10/15/19 20:15	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190052

Quality Control Data

Classical Chemistry

Batch CJ91076 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	100	mg/kg							
Total Organic Carbon (2)	ND	100	mg/kg							
Total Organic Carbon (3)	ND	100	mg/kg							
Total Organic Carbon (4)	ND	100	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190052

Quality Control Data

Classical Chemistry

Batch CJ91076 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9140	100	mg/kg	10000		91	80-120			
Total Organic Carbon (2)	9060	100	mg/kg	10000		91	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190052

Quality Control Data

Classical Chemistry

Batch CJ91076 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9710	100	mg/kg	10000		97	80-120	6	20	
Total Organic Carbon (2)	9490	100	mg/kg	10000		95	80-120	5	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190052

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FJ90701 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	8.99	4.00	ug/Kg wet							
C1-Benzene	2.17	4.00	ug/Kg wet							J
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	2.35	4.00	ug/Kg wet							J
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	3.19	4.00	ug/Kg wet							J
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	ND	4.00	ug/Kg wet							
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	2.56	4.00	ug/Kg wet							J
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190052

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FJ90701 - 3570

C1-Fluorenes	ND	4.00	ug/Kg wet	
C2-Fluorenes	ND	4.00	ug/Kg wet	
C3-Fluorenes	ND	4.00	ug/Kg wet	
Dibenzothiophene	ND	4.00	ug/Kg wet	
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet	
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet	
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet	
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet	
Phenanthrene	3.28	4.00	ug/Kg wet	J
Anthracene	ND	4.00	ug/Kg wet	
C1-Phenanthrenes/Anthracenes	2.78	4.00	ug/Kg wet	J
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet	
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet	
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet	
Retene	ND	4.00	ug/Kg wet	
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet	
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet	
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet	
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet	
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet	
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet	
Fluoranthene	ND	4.00	ug/Kg wet	
Pyrene	2.28	4.00	ug/Kg wet	J
C1-Fluoranthenes/Pyrenes	2.26	4.00	ug/Kg wet	J
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet	
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet	
Benzo(b)fluorene	ND	4.00	ug/Kg wet	
Benzo(c)fluorene	ND	4.00	ug/Kg wet	
2-Methylpyrene	ND	4.00	ug/Kg wet	
4-Methylpyrene	ND	4.00	ug/Kg wet	
1-Methylpyrene	ND	4.00	ug/Kg wet	
Benz(a)anthracene	ND	4.00	ug/Kg wet	
Chrysene/triphenylene	ND	4.00	ug/Kg wet	
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet	
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet	
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet	
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet	
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet	
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet	
Benzo(e)pyrene	ND	4.00	ug/Kg wet	
Benzo(a)pyrene	ND	4.00	ug/Kg wet	
Perylene	ND	4.00	ug/Kg wet	
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet	
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet	
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet	
Coronene	ND	4.00	ug/Kg wet	
Tetramethyl lead	ND	4.00	ug/Kg wet	
Trimethylethyl lead	ND	4.00	ug/Kg wet	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190052

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FJ90701 - 3570						
Dimethyldiethyl lead	ND	4.00	ug/Kg wet			
Methyltriethyl lead	ND	4.00	ug/Kg wet			
Tetraethyl lead	ND	4.00	ug/Kg wet			
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet			
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet			
2,6,10-trimethylpentadecane (1650)	ND	4.00	ug/Kg wet			
C-17	9.12	4.00	ug/Kg wet			
Pristane	5.14	4.00	ug/Kg wet			
C-18	7.18	4.00	ug/Kg wet			
Phytane	6.64	4.00	ug/Kg wet			
Carbazole	ND	4.00	ug/Kg wet			
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet			
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet			
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
3-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylanthracene	ND	4.00	ug/Kg wet			
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet			
1-Methylphenanthrene	ND	4.00	ug/Kg wet			
Surrogate: Naphthalene-d8	*455*		ug/Kg wet	*400.0*	*114*	*50-120*
Surrogate: Perylene-d12	*322*		ug/Kg wet	*400.0*	*80*	*50-120*
Surrogate: Phenanthrene-d10	*374*		ug/Kg wet	*400.0*	*93*	*50-120*
Surrogate: Toluene-D8	*443*		ug/Kg wet	*400.0*	*111*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190052

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FJ90701 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	379	4.00	ug/Kg wet	400.0		95	60-130			
Methylcyclohexane	294	4.00	ug/Kg wet	400.0		74	60-130			
Toluene	471	4.00	ug/Kg wet	400.0		118	60-130			
Ethylbenzene	458	4.00	ug/Kg wet	400.0		114	60-130			
m,p-Xylene	452	4.00	ug/Kg wet	400.0		113	60-130			
Styrene	448	4.00	ug/Kg wet	400.0		112	60-130			
o-Xylene	470	4.00	ug/Kg wet	400.0		118	60-130			
Isopropylbenzene	462	4.00	ug/Kg wet	400.0		116	60-130			
n-Propylbenzene	467	4.00	ug/Kg wet	400.0		117	60-130			
1,3,5-Trimethylbenzene	464	4.00	ug/Kg wet	400.0		116	60-130			
1,2,3-Trimethylbenzene	480	4.00	ug/Kg wet	400.0		120	60-130			
1,2,4-Trimethylbenzene	478	4.00	ug/Kg wet	400.0		120	60-130			
t-Butylbenzene	482	4.00	ug/Kg wet	400.0		120	60-130			
sec-Butylbenzene	466	4.00	ug/Kg wet	400.0		117	60-130			
p-Isopropyltoluene	487	4.00	ug/Kg wet	400.0		122	60-130			
n-Butylbenzene	447	4.00	ug/Kg wet	400.0		112	60-130			
trans-Decalin	458	4.00	ug/Kg wet	400.0		115	60-130			
cis-Decalin	446	4.00	ug/Kg wet	400.0		112	60-130			
Benzo(b)thiophene	386	4.00	ug/Kg wet	400.0		97	60-130			
Naphthalene	398	4.00	ug/Kg wet	400.0		99	60-130			
2-Methylnaphthalene	385	4.00	ug/Kg wet	400.0		96	60-130			
1-Methylnaphthalene	392	4.00	ug/Kg wet	400.0		98	60-130			
Biphenyl	394	4.00	ug/Kg wet	400.0		99	60-130			
Acenaphthylene	372	4.00	ug/Kg wet	400.0		93	60-130			
Acenaphthene	400	4.00	ug/Kg wet	400.0		100	60-130			
Dibenzofuran	400	4.00	ug/Kg wet	400.0		100	60-130			
Fluorene	387	4.00	ug/Kg wet	400.0		97	60-130			
Dibenzothiophene	403	4.00	ug/Kg wet	400.0		101	60-130			
Phenanthrene	415	4.00	ug/Kg wet	400.0		104	60-130			
Anthracene	287	4.00	ug/Kg wet	400.0		72	60-130			
Retene	390	4.00	ug/Kg wet	400.0		97	60-130			
Benzo(b)naphtho(2,1-d)thiophene	396	4.00	ug/Kg wet	400.0		99	60-130			
Fluoranthene	412	4.00	ug/Kg wet	400.0		103	60-130			
Pyrene	415	4.00	ug/Kg wet	400.0		104	60-130			
Benz(a)anthracene	382	4.00	ug/Kg wet	400.0		96	60-130			
Chrysene/triphenylene	426	4.00	ug/Kg wet	400.0		107	60-130			
Benzo(b)fluoranthene	390	4.00	ug/Kg wet	400.0		98	60-130			
Benzo(j/k)fluoranthene	424	4.00	ug/Kg wet	400.0		106	60-130			
Benzo(e)pyrene	408	4.00	ug/Kg wet	400.0		102	60-130			
Benzo(a)pyrene	372	4.00	ug/Kg wet	400.0		93	60-130			
Perylene	392	4.00	ug/Kg wet	400.0		98	60-130			
Indeno(1,2,3-cd)pyrene	346	4.00	ug/Kg wet	400.0		87	60-130			
Dibenzo(a,h)anthracene	369	4.00	ug/Kg wet	400.0		92	60-130			
Benzo(g,h,i)perylene	382	4.00	ug/Kg wet	400.0		95	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190052

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FJ90701 - 3570						
Coronene	359	4.00	ug/Kg wet	400.0	90	60-130
Tetraethyl lead	295	4.00	ug/Kg wet	400.0	74	60-130
Pristane	389	4.00	ug/Kg wet	400.0	97	60-130
Phytane	386	4.00	ug/Kg wet	400.0	96	60-130
Surrogate: Naphthalene-d8	*381*		ug/Kg wet	*400.0*	*95*	*50-120*
Surrogate: Perylene-d12	*360*		ug/Kg wet	*400.0*	*90*	*50-120*
Surrogate: Phenanthrene-d10	*403*		ug/Kg wet	*400.0*	*101*	*50-120*
Surrogate: Toluene-D8	*444*		ug/Kg wet	*400.0*	*111*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190052

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FJ90701 - 3570

Duplicate **Source: F190052-12**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	7.42	3.92	ug/Kg dry		8.60			15	50	
C1-Benzene	4.73	3.92	ug/Kg dry		5.63			17	50	
C2-Benzenes	3.03	3.92	ug/Kg dry		3.48			14	50	J
C3-Benzenes	ND	3.92	ug/Kg dry		ND				50	
C4-Benzenes	ND	3.92	ug/Kg dry		ND				50	
C5-Benzenes	ND	3.92	ug/Kg dry		ND				50	
Methylcyclohexane	ND	3.92	ug/Kg dry		ND				50	
Toluene	6.11	3.92	ug/Kg dry		6.67			9	50	
Ethylbenzene	ND	3.92	ug/Kg dry		ND				50	
m,p-Xylene	3.39	3.92	ug/Kg dry		3.59			6	50	J
Styrene	18.7	3.92	ug/Kg dry		25.3			30	50	
o-Xylene	ND	3.92	ug/Kg dry		ND				50	
Isopropylbenzene	ND	3.92	ug/Kg dry		ND				50	
n-Propylbenzene	ND	3.92	ug/Kg dry		ND				50	
1,3,5-Trimethylbenzene	ND	3.92	ug/Kg dry		ND				50	
1,2,3-Trimethylbenzene	ND	3.92	ug/Kg dry		ND				50	
1,2,4-Trimethylbenzene	ND	3.92	ug/Kg dry		ND				50	
t-Butylbenzene	ND	3.92	ug/Kg dry		ND				50	
sec-Butylbenzene	ND	3.92	ug/Kg dry		ND				50	
p-Isopropyltoluene	ND	3.92	ug/Kg dry		ND				50	
n-Butylbenzene	ND	3.92	ug/Kg dry		ND				50	
trans-Decalin	ND	3.92	ug/Kg dry		ND				50	
cis-Decalin	ND	3.92	ug/Kg dry		ND				50	
C1-Decalins	ND	3.92	ug/Kg dry		ND				50	
C2-Decalins	ND	3.92	ug/Kg dry		ND				50	
C3-Decalins	ND	3.92	ug/Kg dry		ND				50	
C4-Decalins	ND	3.92	ug/Kg dry		ND				50	
Benzo(b)thiophene	ND	3.92	ug/Kg dry		ND				50	
C1-Benzo(b)thiophenes	ND	3.92	ug/Kg dry		2.28				50	
C2-Benzo(b)thiophenes	ND	3.92	ug/Kg dry		ND				50	
C3-Benzo(b)thiophenes	ND	3.92	ug/Kg dry		ND				50	
C4-Benzo(b)thiophenes	ND	3.92	ug/Kg dry		ND				50	
Naphthalene	2.60	3.92	ug/Kg dry		3.17			20	50	J
2-Methylnaphthalene	1.97	3.92	ug/Kg dry		2.47			22	50	J
1-Methylnaphthalene	ND	3.92	ug/Kg dry		ND				50	
C1-Naphthalenes	2.58	3.92	ug/Kg dry		3.17			21	50	J
C2-Naphthalenes	6.07	3.92	ug/Kg dry		7.45			20	50	
C3-Naphthalenes	3.33	3.92	ug/Kg dry		3.30			0.9	50	J
C4-Naphthalenes	2.14	3.92	ug/Kg dry		2.49			15	50	J
Biphenyl	ND	3.92	ug/Kg dry		2.50				50	
Acenaphthylene	3.72	3.92	ug/Kg dry		4.71			24	50	J
Acenaphthene	4.49	3.92	ug/Kg dry		4.92			9	50	
Dibenzofuran	ND	3.92	ug/Kg dry		ND				50	
Fluorene	3.15	3.92	ug/Kg dry		3.37			7	50	J

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190052

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FJ90701 - 3570

C1-Fluorenes	2.96	3.92	ug/Kg dry	4.20	35	50	J
C2-Fluorenes	2.90	3.92	ug/Kg dry	3.46	17	50	J
C3-Fluorenes	2.01	3.92	ug/Kg dry	2.71	29	50	J
Dibenzothiophene	ND	3.92	ug/Kg dry	ND		50	
C1-Dibenzothiophenes	ND	3.92	ug/Kg dry	ND		50	
C2-Dibenzothiophenes	ND	3.92	ug/Kg dry	2.17		50	
C3-Dibenzothiophenes	ND	3.92	ug/Kg dry	ND		50	
C4-Dibenzothiophenes	ND	3.92	ug/Kg dry	ND		50	
Phenanthrene	10.4	3.92	ug/Kg dry	11.3	9	50	
Anthracene	18.7	3.92	ug/Kg dry	2.67	150	50	D+
C1-Phenanthrenes/Anthracenes	6.85	3.92	ug/Kg dry	8.10	17	50	
C2-Phenanthrenes/Anthracenes	3.33	3.92	ug/Kg dry	4.63	33	50	J
C3-Phenanthrenes/Anthracenes	4.00	3.92	ug/Kg dry	6.38	46	50	
C4-Phenanthrenes/Anthracenes	2.33	3.92	ug/Kg dry	3.58	43	50	J
Retene	6.74	3.92	ug/Kg dry	10.7	45	50	
Benzo(b)naphtho(2,1-d)thiophene	ND	3.92	ug/Kg dry	ND		50	
C0-Benzonaphthothiophenes	ND	3.92	ug/Kg dry	ND		50	
C1-Benzonaphthothiophenes	6.24	3.92	ug/Kg dry	8.97	36	50	
C2-Benzonaphthothiophenes	ND	3.92	ug/Kg dry	ND		50	
C3-Benzonaphthothiophenes	ND	3.92	ug/Kg dry	ND		50	
C4-Benzonaphthothiophenes	ND	3.92	ug/Kg dry	ND		50	
Fluoranthene	4.56	3.92	ug/Kg dry	5.91	26	50	
Pyrene	8.68	3.92	ug/Kg dry	12.4	35	50	
C1-Fluoranthenes/Pyrenes	8.76	3.92	ug/Kg dry	12.8	37	50	
C2-Fluoranthenes/Pyrenes	3.17	3.92	ug/Kg dry	3.81	18	50	J
C3-Fluoranthenes/Pyrenes	ND	3.92	ug/Kg dry	2.36		50	
Benzo(b)fluorene	ND	3.92	ug/Kg dry	ND		50	
Benzo(c)fluorene	ND	3.92	ug/Kg dry	ND		50	
2-Methylpyrene	ND	3.92	ug/Kg dry	ND		50	
4-Methylpyrene	ND	3.92	ug/Kg dry	ND		50	
1-Methylpyrene	ND	3.92	ug/Kg dry	ND		50	
Benz(a)anthracene	2.64	3.92	ug/Kg dry	3.67	33	50	J
Chrysene/triphenylene	5.05	3.92	ug/Kg dry	4.11	21	50	
C1-Benzo(a)anthracenes/Chrysenes	3.03	3.92	ug/Kg dry	4.56	41	50	J
C2-Benzo(a)anthracenes/Chrysenes	ND	3.92	ug/Kg dry	2.65		50	
C3-Benzo(a)anthracenes/Chrysenes	ND	3.92	ug/Kg dry	ND		50	
C4-Benzo(a)anthracenes/Chrysenes	ND	3.92	ug/Kg dry	ND		50	
Benzo(b)fluoranthene	ND	3.92	ug/Kg dry	ND		50	
Benzo(j/k)fluoranthene	ND	3.92	ug/Kg dry	2.31		50	
Benzo(e)pyrene	ND	3.92	ug/Kg dry	2.78		50	
Benzo(a)pyrene	2.41	3.92	ug/Kg dry	3.51	37	50	J
Perylene	29.2	3.92	ug/Kg dry	39.1	29	50	
Indeno(1,2,3-cd)pyrene	ND	3.92	ug/Kg dry	2.62		50	
Dibenzo(a,h)anthracene	ND	3.92	ug/Kg dry	ND		50	
Benzo(g,h,i)perylene	ND	3.92	ug/Kg dry	2.48		50	
Coronene	ND	3.92	ug/Kg dry	3.10		50	
Tetramethyl lead	ND	3.92	ug/Kg dry	ND		50	
Trimethylethyl lead	ND	3.92	ug/Kg dry	ND		50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190052

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FJ90701 - 3570								
Dimethyldiethyl lead	ND	3.92	ug/Kg dry	ND				50
Methyltriethyl lead	ND	3.92	ug/Kg dry	ND				50
Tetraethyl lead	ND	3.92	ug/Kg dry	ND				50
2,6,10-trimethyldodecane (1380)	ND	3.92	ug/Kg dry	ND				50
2,6,10-trimethyltridecane (1470)	4.04	3.92	ug/Kg dry	4.22			4	50
2,6,10-trimethylpentadecane (1650)	10.8	3.92	ug/Kg dry	10.5			3	50
C-17	39.4	3.92	ug/Kg dry	39.4			0.02	50
Pristane	23.5	3.92	ug/Kg dry	23.6			0.6	50
C-18	28.6	3.92	ug/Kg dry	29.1			2	50
Phytane	29.4	3.92	ug/Kg dry	28.4			3	50
Carbazole	ND	3.92	ug/Kg dry	ND				50
2,6-Dimethylnaphthalene	ND	3.92	ug/Kg dry	ND				50
2,3,5-Trimethylnaphthene	ND	3.92	ug/Kg dry	ND				50
4-Methyldibenzothiophene	ND	3.92	ug/Kg dry	ND				50
2/3-Methyldibenzothiophene	ND	3.92	ug/Kg dry	ND				50
1-Methyldibenzothiophene	ND	3.92	ug/Kg dry	ND				50
3-Methylphenanthrene	ND	3.92	ug/Kg dry	2.06				50
2-Methylphenanthrene	ND	3.92	ug/Kg dry	ND				50
2-Methylanthracene	ND	3.92	ug/Kg dry	ND				50
4/9-Methylphenanthrene	ND	3.92	ug/Kg dry	ND				50
1-Methylphenanthrene	ND	3.92	ug/Kg dry	ND				50
Surrogate: Naphthalene-d8	*352*		ug/Kg dry	*392.0*		*90*	*50-120*	
Surrogate: Perylene-d12	*362*		ug/Kg dry	*392.0*		*92*	*50-120*	
Surrogate: Phenanthrene-d10	*375*		ug/Kg dry	*392.0*		*96*	*50-120*	
Surrogate: Toluene-D8	*350*		ug/Kg dry	*392.0*		*89*	*50-120*	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F190052

Notes and Definitions

U	Analyte included in the analysis, but not detected
SM	Surrogate recovery(ies) outside of criteria due to matrix (UCM/coelution/matrix is present) (SM).
J	Reported between MDL and MRL
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190052

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 1936018 / F190052

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY REQUIRED -- YES NO

If Yes, Are MCP Analytical Methods Required?	**YES**	NO	NA
Are Drinking Water Samples Submitted?	YES	**NO**	NA
If Yes, Have Drinking Water Sampling Requirements Been Met?	YES	NO	**NA**

Preservative

None	None						

Analysis

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Parent and Alkylated MAHs & PAHs 8270**	TOCs by Lloyd-Kahn							
1	180457 6-SS 705-S1	9/27/19	1008	Sed	1	BFM	X	X							
2	180457 6-SS 705-S2	9/27/19	1021	Sed	1	BFM	X	X							
3	180457 6-SS 705-S3	9/27/19	1028	Sed	1	BFM	X	X							
4	180457 6-SS 706-S1	9/27/19	1131	Sed	1	BFM	X	X							
5	180457 6-SS 706-S2	9/27/19	1134	Sed	1	BFM	X	X							
6	180457 6-SS 706-S3	9/27/19	1134	Sed	1	BFM	X	X							
7	180457 6-SS 707-S3	9/27/19	1222	Sed	1	BFM	X	X							
RJJ 9/30/19 8	180457 6-SS 708-S1	9/27/19	~~1252~~ 1248	Sed	1	BFM	X	X							
9	180457 6-SS 708-S2	9/27/19	1248	Sed	1	BFM	X	X							
10	180457 6-SS 708-S3	9/27/19	1252	Sed	1	BFM	X	X							
11	180457 6-SS 709-S1	9/27/19	1316	Sed	1	BFM	X	X							
12	180457 6-SS 709-S3	9/27/19	1322	Sed	1	BFM	X	X							

Sample Handling

Samples Field Filtered

YES NO **NA**

Sampled Shipped With Ice

YES NO

Sample Specific Remarks

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

	Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1.	RJJ for Brian Fay Mudrick	9/27/19	1700	1. GEI Sample Fridge
2.	Relinquished by: (signature) GEI Sample Fridge	Date: 10/1	Time: 1245	Received by: (signature) 2. James Comotis
3.	Relinquished by: (signature) James Comotis	Date: 10/1	Time: 1245	Received by: (signature) 3. 10/1/19 12:53
4.	Relinquished by: (signature) 10/1/19 19:20	Date:	Time:	Received by: (signature) 4. 10/1/19 1920

Temp On Ice

Turnaround Time (Business days):

Normal __X__ Other ____

10-Day ____ 7-Day ____

5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

**Parent and Alkylated MAHs & PAHs (34) by GC/MS/SIM/SCAN

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

Shipped/Delivered Via: ESS Courier

ESS Project ID: F190052
Date Received: 10/1/2019
Project Due Date: 10/2/19 ~~10/8/2019~~ 10/15/2019
Days for Project: 10 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 0.7 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	393684	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
02	393683	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
03	393682	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
04	393681	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
05	393680	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
06	393679	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
07	393678	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
08	393677	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
09	393676	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
10	393675	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
11	393674	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
12	393673	Yes	NA	Yes	8 oz. Jar - Unpres	NP	

2nd Review
Were all containers scanned into storage/lab? Initials 10/2/19
Are barcode labels on correct containers? Yes / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

ESS Project ID: F190052

Date Received: 10/1/2019

Completed By: [signature]

Date & Time: 10/1/19

Reviewed By: [signature]

Date & Time: 10/2/19

Delivered By: [signature]

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: F190056

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 4:05 pm, Dec 02, 2019

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses
ESS Laboratory - Cranston, RI TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190056

SAMPLE RECEIPT

The following samples were received on November 13, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F190056-01	1804576-SS710-S1	Soil	8270 Mod, TOC-LK
F190056-02	1804576-SS710-S2	Soil	8270 Mod, TOC-LK
F190056-03	1804576-SS711-S1	Soil	8270 Mod, TOC-LK
F190056-04	1804576-SS711-S2	Soil	8270 Mod, TOC-LK
F190056-05	1804576-SS712-S1	Soil	8270 Mod, TOC-LK
F190056-06	1804576-SS712-S2	Soil	8270 Mod, TOC-LK
F190056-07	1804576-SS716-S1	Soil	8270 Mod, TOC-LK
F190056-08	1804576-SS716-S2	Soil	8270 Mod, TOC-LK
F190056-09	1804576-SS717-S1	Soil	8270 Mod, TOC-LK
F190056-10	1804576-SS717-S3	Soil	8270 Mod, TOC-LK
F190056-11	1804576-SS718-S5	Soil	8270 Mod, TOC-LK
F190056-12	1804576-SS719-S1	Soil	8270 Mod, TOC-LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190056

PROJECT NARRATIVE

8270D (SIM) Semi-Volatile Organic Compounds

F190056-01	**Surrogate recovery(ies) outside of criteria due to matrix (UCM/coelution/matrix is present) (SM).**
	Perylene-d12 (162% @ 50-120%)
F190056-02	**Present in Method Blank (B).**
	Benzene , C-17 , C-18 , Phytane , Pristane
F190056-03	**Present in Method Blank (B).**
	Benzene , C-17 , C-18
F190056-04	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , Benzene , C-17 , C-18 , Phytane , Pristane
F190056-05	**Surrogate recovery(ies) outside of criteria due to matrix (UCM/coelution/matrix is present) (SM).**
	Perylene-d12 (123% @ 50-120%)
F190056-06	**Present in Method Blank (B).**
	Benzene , C-17 , C-18 , Phytane , Pristane
F190056-07	**Present in Method Blank (B).**
	Benzene
F190056-08	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , Benzene , C-17 , C-18 , Phytane , Pristane
F190056-09	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , Benzene , C-17 , C-18 , Phytane , Pristane
F190056-10	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , Benzene , C-17 , C-18 , Phytane , Pristane
F190056-11	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , Benzene , C-17 , C-18 , Phytane , Pristane
F190056-12	**Present in Method Blank (B).**
	Benzene , C-18 , Phytane
FK91401-BLK2	**Surrogate recovery(ies) above upper control limit (S+).**
	Toluene-D8 (137% @ 50-120%)
FK91401-DUP2	**Relative percent difference for duplicate is outside of criteria (D+).**

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190056

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS710-S1
Date Sampled: 11/11/19 10:30
Percent Solids: 69
Initial Volume: 5.41
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**353** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
C1-Benzene	**512** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
C2-Benzenes	**449** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
C3-Benzenes	**1170** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
C4-Benzenes	**5160** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
C5-Benzenes	**4000** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
Methylcyclohexane	**57.9** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
Toluene	**771** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
Ethylbenzene	**324** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
m,p-Xylene	**360** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
Styrene	**898** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
o-Xylene	**59.4** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
Isopropylbenzene	**68.6** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
n-Propylbenzene	**51.7** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
1,3,5-Trimethylbenzene	**245** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
1,2,3-Trimethylbenzene	**280** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
1,2,4-Trimethylbenzene	**631** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
t-Butylbenzene	ND (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
sec-Butylbenzene	**28.1** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
p-Isopropyltoluene	**241** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
n-Butylbenzene	ND (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
trans-Decalin	**290** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
cis-Decalin	**102** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
C1-Decalins	**978** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
C2-Decalins	**2030** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
C3-Decalins	**2180** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
C4-Decalins	**3490** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
Benzo(b)thiophene	**797** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
C1-Benzo(b)thiophenes	**3490** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
C2-Benzo(b)thiophenes	**8760** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
C3-Benzo(b)thiophenes	**6130** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
C4-Benzo(b)thiophenes	**1960** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS710-S1
Date Sampled: 11/11/19 10:30
Percent Solids: 69
Initial Volume: 5.41
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**19800** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
2-Methylnaphthalene	**9220** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
1-Methylnaphthalene	**107000** (533)	266	8270 Mod		100	11/16/19 10:04	F9K0001	FK91401
C1-Naphthalenes	**68000** (533)	266	8270 Mod		100	11/16/19 10:04	F9K0001	FK91401
C2-Naphthalenes	**159000** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
C3-Naphthalenes	**79100** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
C4-Naphthalenes	**26800** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
Biphenyl	**3480** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
Acenaphthylene	**23000** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
Acenaphthene	**330000** (533)	266	8270 Mod		100	11/16/19 10:04	F9K0001	FK91401
Dibenzofuran	**14000** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
Fluorene	**151000** (533)	266	8270 Mod		100	11/16/19 10:04	F9K0001	FK91401
C1-Fluorenes	**82600** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
C2-Fluorenes	**39200** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
C3-Fluorenes	**14000** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
Dibenzothiophene	**56500** (533)	266	8270 Mod		100	11/16/19 10:04	F9K0001	FK91401
C1-Dibenzothiophenes	**48100** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
C2-Dibenzothiophenes	**28600** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
C3-Dibenzothiophenes	**10500** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
C4-Dibenzothiophenes	**3450** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
Phenanthrene	**665000** (533)	266	8270 Mod		100	11/16/19 10:04	F9K0001	FK91401
Anthracene	**200000** (533)	266	8270 Mod		100	11/16/19 10:04	F9K0001	FK91401
C1-Phenanthrenes/Anthracenes	**299000** (533)	266	8270 Mod		100	11/16/19 10:04	F9K0001	FK91401
C2-Phenanthrenes/Anthracenes	**102000** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
C3-Phenanthrenes/Anthracenes	**26800** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
C4-Phenanthrenes/Anthracenes	**7740** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
Retene	**1070** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
Benzo(b)naphtho(2,1-d)thiophene	**20700** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
C0-Benzonaphthothiophenes	**37900** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
C1-Benzonaphthothiophenes	**19100** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
C2-Benzonaphthothiophenes	**7560** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
C3-Benzonaphthothiophenes	**4350** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS710-S1
Date Sampled: 11/11/19 10:30
Percent Solids: 69
Initial Volume: 5.41
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**799** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
Fluoranthene	**310000** (533)	266	8270 Mod		100	11/16/19 10:04	F9K0001	FK91401
Pyrene	**467000** (533)	266	8270 Mod		100	11/16/19 10:04	F9K0001	FK91401
C1-Fluoranthenes/Pyrenes	**239000** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
C2-Fluoranthenes/Pyrenes	**58400** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
C3-Fluoranthenes/Pyrenes	**15000** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
Benzo(b)fluorene	**28900** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
Benzo(c)fluorene	**10200** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
2-Methylpyrene	**31000** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
4-Methylpyrene	**26300** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
1-Methylpyrene	**31700** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
Benz(a)anthracene	**143000** (533)	266	8270 Mod		100	11/16/19 10:04	F9K0001	FK91401
Chrysene/triphenylene	**137000** (533)	266	8270 Mod		100	11/16/19 10:04	F9K0001	FK91401
C1-Benzo(a)anthracenes/Chrysenes	**70400** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
C2-Benzo(a)anthracenes/Chrysenes	**24100** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
C3-Benzo(a)anthracenes/Chrysenes	**6930** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
C4-Benzo(a)anthracenes/Chrysenes	**2480** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
Benzo(b)fluoranthene	**63200** (533)	266	8270 Mod		100	11/16/19 10:04	F9K0001	FK91401
Benzo(j/k)fluoranthene	**76300** (533)	266	8270 Mod		100	11/16/19 10:04	F9K0001	FK91401
Benzo(e)pyrene	**74300** (533)	266	8270 Mod		100	11/16/19 10:04	F9K0001	FK91401
Benzo(a)pyrene	**135000** (533)	266	8270 Mod		100	11/16/19 10:04	F9K0001	FK91401
Perylene	**23100** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
Indeno(1,2,3-cd)pyrene	**55500** (533)	266	8270 Mod		100	11/16/19 10:04	F9K0001	FK91401
Dibenzo(a,h)anthracene	**14500** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
Benzo(g,h,i)perylene	**62400** (533)	266	8270 Mod		100	11/16/19 10:04	F9K0001	FK91401
Coronene	**19600** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
Tetramethyl lead	ND (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
Trimethylethyl lead	ND (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
Dimethyldiethyl lead	ND (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
Methyltriethyl lead	ND (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
Tetraethyl lead	ND (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
2,6,10-trimethyldodecane (1380)	**3100** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS710-S1
Date Sampled: 11/11/19 10:30
Percent Solids: 69
Initial Volume: 5.41
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**5650** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
2,6,10-trimethylpentadecane (1650)	**7910** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
C-17	**1480** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
Pristane	**16900** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
C-18	**746** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
Phytane	**13100** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
Carbazole	**537** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
2,6-Dimethylnaphthalene	**32000** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
2,3,5-Trimethylnaphthene	**5300** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
4-Methyldibenzothiophene	**20100** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
2/3-Methyldibenzothiophene	**17200** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
1-Methyldibenzothiophene	**4280** (26.6)	13.3	8270 Mod		5	11/14/19 23:42	F9K0001	FK91401
3-Methylphenanthrene	**71400** (533)	266	8270 Mod		100	11/16/19 10:04	F9K0001	FK91401
2-Methylphenanthrene	**79800** (533)	266	8270 Mod		100	11/16/19 10:04	F9K0001	FK91401
2-Methylanthracene	**33000** (533)	266	8270 Mod		100	11/16/19 10:04	F9K0001	FK91401
4/9-Methylphenanthrene	**64500** (533)	266	8270 Mod		100	11/16/19 10:04	F9K0001	FK91401
1-Methylphenanthrene	**47000** (533)	266	8270 Mod		100	11/16/19 10:04	F9K0001	FK91401

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*98 %*		*50-120*
Surrogate: Naphthalene-d8	*97 %*		*50-120*
Surrogate: Phenanthrene-d10	*93 %*		*50-120*
Surrogate: Perylene-d12	*162 %*	*SM*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS710-S1
Date Sampled: 11/11/19 10:30
Percent Solids: 69

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**97400** (99.2)		TOC-LK		1	CCP	11/20/19 19:33	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS710-S2
Date Sampled: 11/11/19 10:32
Percent Solids: 58
Initial Volume: 5.36
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**B 34.2** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C1-Benzene	**120** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C2-Benzenes	**77.9** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C3-Benzenes	**50.1** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C4-Benzenes	**52.3** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C5-Benzenes	**26.6** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
Methylcyclohexane	**22.4** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
Toluene	**181** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
Ethylbenzene	**14.2** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
m,p-Xylene	**113** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
Styrene	**23.8** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
o-Xylene	**11.1** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
Isopropylbenzene	ND (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
n-Propylbenzene	**J 4.34** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
1,3,5-Trimethylbenzene	**12.9** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
1,2,3-Trimethylbenzene	**J 5.40** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
1,2,4-Trimethylbenzene	**33.5** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
t-Butylbenzene	ND (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
sec-Butylbenzene	ND (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
p-Isopropyltoluene	**29.7** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
n-Butylbenzene	**7.21** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
trans-Decalin	**10.1** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
cis-Decalin	ND (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C1-Decalins	**25.5** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C2-Decalins	**39.4** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C3-Decalins	**28.6** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C4-Decalins	**29.1** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
Benzo(b)thiophene	**6.67** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C1-Benzo(b)thiophenes	**12.9** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C2-Benzo(b)thiophenes	**19.4** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C3-Benzo(b)thiophenes	**10.6** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C4-Benzo(b)thiophenes	**J 6.17** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS710-S2
Date Sampled: 11/11/19 10:32
Percent Solids: 58
Initial Volume: 5.36
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**175** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
2-Methylnaphthalene	**138** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
1-Methylnaphthalene	**105** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C1-Naphthalenes	**149** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C2-Naphthalenes	**274** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C3-Naphthalenes	**208** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C4-Naphthalenes	**118** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
Biphenyl	**49.9** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
Acenaphthylene	**167** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
Acenaphthene	**306** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
Dibenzofuran	**75.9** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
Fluorene	**205** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C1-Fluorenes	**144** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C2-Fluorenes	**173** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C3-Fluorenes	**117** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
Dibenzothiophene	**80.3** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C1-Dibenzothiophenes	**90.7** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C2-Dibenzothiophenes	**92.0** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C3-Dibenzothiophenes	**52.9** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C4-Dibenzothiophenes	**32.8** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
Phenanthrene	**1170** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
Anthracene	**432** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C1-Phenanthrenes/Anthracenes	**1160** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C2-Phenanthrenes/Anthracenes	**687** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C3-Phenanthrenes/Anthracenes	**317** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C4-Phenanthrenes/Anthracenes	**209** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
Retene	**411** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
Benzo(b)naphtho(2,1-d)thiophene	**104** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C0-Benzonaphthothiophenes	**217** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C1-Benzonaphthothiophenes	**137** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C2-Benzonaphthothiophenes	**96.5** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C3-Benzonaphthothiophenes	**65.1** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS710-S2
Date Sampled: 11/11/19 10:32
Percent Solids: 58
Initial Volume: 5.36
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**18.5** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
Fluoranthene	**2170** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
Pyrene	**2730** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C1-Fluoranthenes/Pyrenes	**1670** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C2-Fluoranthenes/Pyrenes	**656** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C3-Fluoranthenes/Pyrenes	**306** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
Benzo(b)fluorene	**177** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
Benzo(c)fluorene	**95.7** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
2-Methylpyrene	**234** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
4-Methylpyrene	**224** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
1-Methylpyrene	**185** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
Benz(a)anthracene	**1200** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
Chrysene/triphenylene	**1190** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C1-Benzo(a)anthracenes/Chrysenes	**831** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C2-Benzo(a)anthracenes/Chrysenes	**470** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C3-Benzo(a)anthracenes/Chrysenes	**229** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C4-Benzo(a)anthracenes/Chrysenes	**103** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
Benzo(b)fluoranthene	**763** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
Benzo(j/k)fluoranthene	**832** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
Benzo(e)pyrene	**873** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
Benzo(a)pyrene	**1270** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
Perylene	**1130** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
Indeno(1,2,3-cd)pyrene	**624** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
Dibenzo(a,h)anthracene	**173** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
Benzo(g,h,i)perylene	**719** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
Coronene	**186** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
Tetramethyl lead	ND (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
Trimethylethyl lead	ND (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
Dimethyldiethyl lead	ND (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
Methyltriethyl lead	ND (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
Tetraethyl lead	ND (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
2,6,10-trimethyldodecane (1380)	**22.6** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS710-S2
Date Sampled: 11/11/19 10:32
Percent Solids: 58
Initial Volume: 5.36
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**68.6** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
2,6,10-trimethylpentadecane (1650)	**71.7** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C-17	**B 178** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
Pristane	**B 133** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
C-18	**B 110** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
Phytane	**B 146** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
Carbazole	**71.7** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
2,6-Dimethylnaphthalene	**56.6** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
2,3,5-Trimethylnaphthene	**17.8** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
4-Methyldibenzothiophene	**24.9** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
2/3-Methyldibenzothiophene	**31.1** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
1-Methyldibenzothiophene	**7.66** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
3-Methylphenanthrene	**290** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
2-Methylphenanthrene	**260** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
2-Methylanthracene	**179** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
4/9-Methylphenanthrene	**324** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401
1-Methylphenanthrene	**96.3** (6.39)	3.19	8270 Mod		1	11/15/19 1:07	F9K0001	FK91401

	%Recovery	*Qualifier*	*Limits*
Surrogate: Toluene-D8	*100 %*		*50-120*
Surrogate: Naphthalene-d8	*101 %*		*50-120*
Surrogate: Phenanthrene-d10	*96 %*		*50-120*
Surrogate: Perylene-d12	*89 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS710-S2
Date Sampled: 11/11/19 10:32
Percent Solids: 58

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**44000** (100)		TOC-LK		1	CCP	11/20/19 19:50	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS711-S1
Date Sampled: 11/11/19 11:27
Percent Solids: 54
Initial Volume: 5.82
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **50.1** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C1-Benzene	**99.2** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C2-Benzenes	**102** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C3-Benzenes	**36.4** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C4-Benzenes	**59.0** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C5-Benzenes	**57.4** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
Methylcyclohexane	ND (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
Toluene	**152** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
Ethylbenzene	**13.2** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
m,p-Xylene	**165** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
Styrene	**48.9** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
o-Xylene	**11.7** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
Isopropylbenzene	ND (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
n-Propylbenzene	**7.61** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
1,3,5-Trimethylbenzene	J **5.46** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
1,2,3-Trimethylbenzene	**8.95** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
1,2,4-Trimethylbenzene	**16.2** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
t-Butylbenzene	ND (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
sec-Butylbenzene	ND (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
p-Isopropyltoluene	**8.22** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
n-Butylbenzene	**17.1** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
trans-Decalin	**440** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
cis-Decalin	**54.7** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C1-Decalins	**502** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C2-Decalins	**182** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C3-Decalins	**89.6** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C4-Decalins	**140** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
Benzo(b)thiophene	J **5.18** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C1-Benzo(b)thiophenes	**13.8** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C2-Benzo(b)thiophenes	**25.4** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C3-Benzo(b)thiophenes	**18.9** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C4-Benzo(b)thiophenes	**16.5** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS711-S1
Date Sampled: 11/11/19 11:27
Percent Solids: 54
Initial Volume: 5.82
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**93.0** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
2-Methylnaphthalene	**58.8** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
1-Methylnaphthalene	**52.8** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C1-Naphthalenes	**69.6** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C2-Naphthalenes	**199** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C3-Naphthalenes	**215** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C4-Naphthalenes	**157** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
Biphenyl	**41.6** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
Acenaphthylene	**340** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
Acenaphthene	**249** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
Dibenzofuran	**56.1** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
Fluorene	**182** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C1-Fluorenes	**182** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C2-Fluorenes	**184** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C3-Fluorenes	**183** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
Dibenzothiophene	**125** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C1-Dibenzothiophenes	**150** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C2-Dibenzothiophenes	**222** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C3-Dibenzothiophenes	**200** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C4-Dibenzothiophenes	**123** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
Phenanthrene	**1750** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
Anthracene	**709** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C1-Phenanthrenes/Anthracenes	**1250** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C2-Phenanthrenes/Anthracenes	**722** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C3-Phenanthrenes/Anthracenes	**340** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C4-Phenanthrenes/Anthracenes	**158** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
Retene	**60.0** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
Benzo(b)naphtho(2,1-d)thiophene	**255** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C0-Benzonaphthothiophenes	**476** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C1-Benzonaphthothiophenes	**322** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C2-Benzonaphthothiophenes	**232** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C3-Benzonaphthothiophenes	**173** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS711-S1
Date Sampled: 11/11/19 11:27
Percent Solids: 54
Initial Volume: 5.82
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**74.4** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
Fluoranthene	**3160** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
Pyrene	**3860** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C1-Fluoranthenes/Pyrenes	**2260** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C2-Fluoranthenes/Pyrenes	**834** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C3-Fluoranthenes/Pyrenes	**352** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
Benzo(b)fluorene	**285** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
Benzo(c)fluorene	**101** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
2-Methylpyrene	**317** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
4-Methylpyrene	**296** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
1-Methylpyrene	**255** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
Benz(a)anthracene	**1960** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
Chrysene/triphenylene	**2060** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C1-Benzo(a)anthracenes/Chrysenes	**1070** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C2-Benzo(a)anthracenes/Chrysenes	**478** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C3-Benzo(a)anthracenes/Chrysenes	**227** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C4-Benzo(a)anthracenes/Chrysenes	**108** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
Benzo(b)fluoranthene	**1500** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
Benzo(j/k)fluoranthene	**1540** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
Benzo(e)pyrene	**1560** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
Benzo(a)pyrene	**2350** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
Perylene	**796** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
Indeno(1,2,3-cd)pyrene	**1200** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
Dibenzo(a,h)anthracene	**289** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
Benzo(g,h,i)perylene	**1300** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
Coronene	**338** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
Tetramethyl lead	ND (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
Trimethylethyl lead	ND (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
Dimethyldiethyl lead	ND (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
Methyltriethyl lead	ND (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
Tetraethyl lead	ND (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
2,6,10-trimethyldodecane (1380)	**122** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS711-S1
Date Sampled: 11/11/19 11:27
Percent Solids: 54
Initial Volume: 5.82
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**217** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
2,6,10-trimethylpentadecane (1650)	**199** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C-17	**B 194** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
Pristane	**518** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
C-18	**B 105** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
Phytane	**486** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
Carbazole	**117** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
2,6-Dimethylnaphthalene	**46.0** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
2,3,5-Trimethylnaphthene	**15.2** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
4-Methyldibenzothiophene	**50.6** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
2/3-Methyldibenzothiophene	**53.1** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
1-Methyldibenzothiophene	**16.5** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
3-Methylphenanthrene	**281** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
2-Methylphenanthrene	**321** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
2-Methylanthracene	**177** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
4/9-Methylphenanthrene	**315** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401
1-Methylphenanthrene	**145** (6.36)	3.18	8270 Mod		1	11/15/19 2:32	F9K0001	FK91401

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*94 %*		*50-120*
Surrogate: Naphthalene-d8	*95 %*		*50-120*
Surrogate: Phenanthrene-d10	*91 %*		*50-120*
Surrogate: Perylene-d12	*81 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS711-S1
Date Sampled: 11/11/19 11:27
Percent Solids: 54

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**65100** (103)		TOC-LK		1	CCP	11/20/19 20:06	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS711-S2
Date Sampled: 11/11/19 11:31
Percent Solids: 29
Initial Volume: 5.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **52.6** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C1-Benzene	**98.9** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C2-Benzenes	**93.2** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C3-Benzenes	**14.7** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C4-Benzenes	**21.0** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C5-Benzenes	**13.5** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
Methylcyclohexane	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
Toluene	**151** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
Ethylbenzene	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
m,p-Xylene	**148** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
Styrene	J **13.0** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
o-Xylene	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
Isopropylbenzene	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
n-Propylbenzene	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
1,3,5-Trimethylbenzene	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
1,2,3-Trimethylbenzene	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
1,2,4-Trimethylbenzene	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
t-Butylbenzene	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
sec-Butylbenzene	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
p-Isopropyltoluene	J **11.7** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
n-Butylbenzene	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
trans-Decalin	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
cis-Decalin	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C1-Decalins	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C2-Decalins	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C3-Decalins	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C4-Decalins	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
Benzo(b)thiophene	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C1-Benzo(b)thiophenes	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C2-Benzo(b)thiophenes	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C3-Benzo(b)thiophenes	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C4-Benzo(b)thiophenes	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS711-S2
Date Sampled: 11/11/19 11:31
Percent Solids: 29
Initial Volume: 5.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
2-Methylnaphthalene	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
1-Methylnaphthalene	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C1-Naphthalenes	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C2-Naphthalenes	**31.0** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C3-Naphthalenes	**16.6** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C4-Naphthalenes	**21.9** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
Biphenyl	**J 10.4** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
Acenaphthylene	**20.9** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
Acenaphthene	**J 6.72** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
Dibenzofuran	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
Fluorene	**J 12.9** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C1-Fluorenes	**J 11.7** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C2-Fluorenes	**28.9** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C3-Fluorenes	**16.2** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
Dibenzothiophene	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C1-Dibenzothiophenes	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C2-Dibenzothiophenes	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C3-Dibenzothiophenes	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C4-Dibenzothiophenes	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
Phenanthrene	**15.5** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
Anthracene	**J 7.88** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C1-Phenanthrenes/Anthracenes	**26.1** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C2-Phenanthrenes/Anthracenes	**J 13.3** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C3-Phenanthrenes/Anthracenes	**J 11.9** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C4-Phenanthrenes/Anthracenes	**28.5** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
Retene	**61.6** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
Benzo(b)naphtho(2,1-d)thiophene	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C0-Benzonaphthothiophenes	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C1-Benzonaphthothiophenes	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C2-Benzonaphthothiophenes	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C3-Benzonaphthothiophenes	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS711-S2
Date Sampled: 11/11/19 11:31
Percent Solids: 29
Initial Volume: 5.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
Fluoranthene	**19.4** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
Pyrene	**25.3** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C1-Fluoranthenes/Pyrenes	**40.2** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C2-Fluoranthenes/Pyrenes	**14.4** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C3-Fluoranthenes/Pyrenes	**J 12.9** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
Benzo(b)fluorene	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
Benzo(c)fluorene	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
2-Methylpyrene	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
4-Methylpyrene	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
1-Methylpyrene	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
Benz(a)anthracene	**J 9.35** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
Chrysene/triphenylene	**J 9.81** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C1-Benzo(a)anthracenes/Chrysenes	**15.0** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C2-Benzo(a)anthracenes/Chrysenes	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C3-Benzo(a)anthracenes/Chrysenes	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C4-Benzo(a)anthracenes/Chrysenes	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
Benzo(b)fluoranthene	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
Benzo(j/k)fluoranthene	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
Benzo(e)pyrene	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
Benzo(a)pyrene	**J 8.61** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
Perylene	**955** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
Indeno(1,2,3-cd)pyrene	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
Dibenzo(a,h)anthracene	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
Benzo(g,h,i)perylene	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
Coronene	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
Tetramethyl lead	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
Trimethylethyl lead	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
Dimethyldiethyl lead	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
Methyltriethyl lead	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
Tetraethyl lead	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
2,6,10-trimethyldodecane (1380)	**J 9.65** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS711-S2
Date Sampled: 11/11/19 11:31
Percent Solids: 29
Initial Volume: 5.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**35.6** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
2,6,10-trimethylpentadecane (1650)	**B 30.0** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C-17	**B 189** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
Pristane	**B 69.8** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
C-18	**B 127** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
Phytane	**B 98.7** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
Carbazole	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
2,6-Dimethylnaphthalene	**J 10.6** (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
2,3,5-Trimethylnaphthene	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
4-Methyldibenzothiophene	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
2/3-Methyldibenzothiophene	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
1-Methyldibenzothiophene	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
3-Methylphenanthrene	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
2-Methylphenanthrene	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
2-Methylanthracene	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
4/9-Methylphenanthrene	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401
1-Methylphenanthrene	ND (13.3)	6.64	8270 Mod		1	11/15/19 3:56	F9K0001	FK91401

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*84 %*		*50-120*
Surrogate: Naphthalene-d8	*91 %*		*50-120*
Surrogate: Phenanthrene-d10	*90 %*		*50-120*
Surrogate: Perylene-d12	*81 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS711-S2
Date Sampled: 11/11/19 11:31
Percent Solids: 29

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-04
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**149000** (99.6)		TOC-LK		1	CCP	11/20/19 20:57	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS712-S1
Date Sampled: 11/11/19 12:11
Percent Solids: 54
Initial Volume: 5.24
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**553** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
C1-Benzene	**632** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
C2-Benzenes	**604** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
C3-Benzenes	**1590** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
C4-Benzenes	**8540** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
C5-Benzenes	**5020** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
Methylcyclohexane	**92.1** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
Toluene	**805** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
Ethylbenzene	**509** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
m,p-Xylene	**579** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
Styrene	**890** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
o-Xylene	**74.5** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
Isopropylbenzene	**80.1** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
n-Propylbenzene	**115** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
1,3,5-Trimethylbenzene	**361** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
1,2,3-Trimethylbenzene	**327** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
1,2,4-Trimethylbenzene	**1010** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
t-Butylbenzene	ND (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
sec-Butylbenzene	**48.3** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
p-Isopropyltoluene	**358** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
n-Butylbenzene	ND (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
trans-Decalin	**387** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
cis-Decalin	**104** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
C1-Decalins	**1250** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
C2-Decalins	**2110** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
C3-Decalins	**1860** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
C4-Decalins	**2150** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
Benzo(b)thiophene	**950** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
C1-Benzo(b)thiophenes	**3390** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
C2-Benzo(b)thiophenes	**8510** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
C3-Benzo(b)thiophenes	**4850** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
C4-Benzo(b)thiophenes	**1160** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS712-S1
Date Sampled: 11/11/19 12:11
Percent Solids: 54
Initial Volume: 5.24
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**31700** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
2-Methylnaphthalene	**11900** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
1-Methylnaphthalene	**117000** (709)	354	8270 Mod		100	11/16/19 11:40	F9K0001	FK91401
C1-Naphthalenes	**76500** (709)	354	8270 Mod		100	11/16/19 11:40	F9K0001	FK91401
C2-Naphthalenes	**139000** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
C3-Naphthalenes	**53400** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
C4-Naphthalenes	**14800** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
Biphenyl	**7440** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
Acenaphthylene	**22300** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
Acenaphthene	**304000** (709)	354	8270 Mod		100	11/16/19 11:40	F9K0001	FK91401
Dibenzofuran	**12900** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
Fluorene	**147000** (709)	354	8270 Mod		100	11/16/19 11:40	F9K0001	FK91401
C1-Fluorenes	**44300** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
C2-Fluorenes	**22200** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
C3-Fluorenes	**8210** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
Dibenzothiophene	**51100** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
C1-Dibenzothiophenes	**32600** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
C2-Dibenzothiophenes	**18000** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
C3-Dibenzothiophenes	**6660** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
C4-Dibenzothiophenes	**2420** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
Phenanthrene	**674000** (709)	354	8270 Mod		100	11/16/19 11:40	F9K0001	FK91401
Anthracene	**200000** (709)	354	8270 Mod		100	11/16/19 11:40	F9K0001	FK91401
C1-Phenanthrenes/Anthracenes	**200000** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
C2-Phenanthrenes/Anthracenes	**63300** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
C3-Phenanthrenes/Anthracenes	**16000** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
C4-Phenanthrenes/Anthracenes	**4780** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
Retene	**1390** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
Benzo(b)naphtho(2,1-d)thiophene	**18800** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
C0-Benzonaphthothiophenes	**34000** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
C1-Benzonaphthothiophenes	**14300** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
C2-Benzonaphthothiophenes	**5470** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
C3-Benzonaphthothiophenes	**3830** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS712-S1
Date Sampled: 11/11/19 12:11
Percent Solids: 54
Initial Volume: 5.24
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**680** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
Fluoranthene	**348000** (709)	354	8270 Mod		100	11/16/19 11:40	F9K0001	FK91401
Pyrene	**530000** (709)	354	8270 Mod		100	11/16/19 11:40	F9K0001	FK91401
C1-Fluoranthenes/Pyrenes	**195000** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
C2-Fluoranthenes/Pyrenes	**39600** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
C3-Fluoranthenes/Pyrenes	**9970** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
Benzo(b)fluorene	**25700** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
Benzo(c)fluorene	**9660** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
2-Methylpyrene	**26100** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
4-Methylpyrene	**21800** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
1-Methylpyrene	**25500** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
Benz(a)anthracene	**138000** (709)	354	8270 Mod		100	11/16/19 11:40	F9K0001	FK91401
Chrysene/triphenylene	**139000** (709)	354	8270 Mod		100	11/16/19 11:40	F9K0001	FK91401
C1-Benzo(a)anthracenes/Chrysenes	**53100** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
C2-Benzo(a)anthracenes/Chrysenes	**15600** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
C3-Benzo(a)anthracenes/Chrysenes	**4610** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
C4-Benzo(a)anthracenes/Chrysenes	**1920** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
Benzo(b)fluoranthene	**63900** (709)	354	8270 Mod		100	11/16/19 11:40	F9K0001	FK91401
Benzo(j/k)fluoranthene	**87400** (709)	354	8270 Mod		100	11/16/19 11:40	F9K0001	FK91401
Benzo(e)pyrene	**81000** (709)	354	8270 Mod		100	11/16/19 11:40	F9K0001	FK91401
Benzo(a)pyrene	**143000** (709)	354	8270 Mod		100	11/16/19 11:40	F9K0001	FK91401
Perylene	**20900** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
Indeno(1,2,3-cd)pyrene	**54300** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
Dibenzo(a,h)anthracene	**13000** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
Benzo(g,h,i)perylene	**58400** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
Coronene	**17300** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
Tetramethyl lead	ND (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
Trimethylethyl lead	ND (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
Dimethyldiethyl lead	ND (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
Methyltriethyl lead	ND (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
Tetraethyl lead	ND (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
2,6,10-trimethyldodecane (1380)	**2780** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS712-S1
Date Sampled: 11/11/19 12:11
Percent Solids: 54
Initial Volume: 5.24
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**3920** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
2,6,10-trimethylpentadecane (1650)	**4130** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
C-17	**1490** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
Pristane	**8900** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
C-18	**747** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
Phytane	**7590** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
Carbazole	**624** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
2,6-Dimethylnaphthalene	**27100** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
2,3,5-Trimethylnaphthene	**3580** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
4-Methyldibenzothiophene	**13700** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
2/3-Methyldibenzothiophene	**11700** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
1-Methyldibenzothiophene	**2940** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
3-Methylphenanthrene	**48200** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
2-Methylphenanthrene	**52300** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
2-Methylanthracene	**25100** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
4/9-Methylphenanthrene	**39200** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401
1-Methylphenanthrene	**33800** (35.4)	17.7	8270 Mod		5	11/15/19 5:21	F9K0001	FK91401

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*94 %*		*50-120*
Surrogate: Naphthalene-d8	*92 %*		*50-120*
Surrogate: Phenanthrene-d10	*91 %*		*50-120*
Surrogate: Perylene-d12	*123 %*	*SM*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS712-S1
Date Sampled: 11/11/19 12:11
Percent Solids: 54

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-05
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**102000** (98.2)		TOC-LK		1	CCP	11/20/19 21:13	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS712-S2
Date Sampled: 11/11/19 12:14
Percent Solids: 83
Initial Volume: 5.89
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **12.7** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C1-Benzene	**12.3** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C2-Benzenes	**12.7** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C3-Benzenes	**9.10** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C4-Benzenes	**9.96** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C5-Benzenes	**5.20** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
Methylcyclohexane	ND (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
Toluene	**18.4** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
Ethylbenzene	ND (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
m,p-Xylene	**19.6** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
Styrene	J **3.50** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
o-Xylene	ND (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
Isopropylbenzene	ND (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
n-Propylbenzene	ND (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
1,3,5-Trimethylbenzene	ND (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
1,2,3-Trimethylbenzene	ND (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
1,2,4-Trimethylbenzene	**6.16** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
t-Butylbenzene	ND (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
sec-Butylbenzene	ND (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
p-Isopropyltoluene	**7.44** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
n-Butylbenzene	ND (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
trans-Decalin	ND (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
cis-Decalin	ND (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C1-Decalins	ND (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C2-Decalins	ND (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C3-Decalins	ND (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C4-Decalins	ND (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
Benzo(b)thiophene	ND (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C1-Benzo(b)thiophenes	J **2.98** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C2-Benzo(b)thiophenes	**4.10** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C3-Benzo(b)thiophenes	J **2.93** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C4-Benzo(b)thiophenes	ND (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS712-S2
Date Sampled: 11/11/19 12:14
Percent Solids: 83
Initial Volume: 5.89
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**42.7** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
2-Methylnaphthalene	**27.5** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
1-Methylnaphthalene	**24.8** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C1-Naphthalenes	**32.3** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C2-Naphthalenes	**58.1** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C3-Naphthalenes	**43.0** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C4-Naphthalenes	**20.5** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
Biphenyl	**7.15** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
Acenaphthylene	**19.1** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
Acenaphthene	**64.1** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
Dibenzofuran	**15.2** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
Fluorene	**37.1** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C1-Fluorenes	**26.0** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C2-Fluorenes	**24.4** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C3-Fluorenes	**12.9** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
Dibenzothiophene	**12.8** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C1-Dibenzothiophenes	**15.8** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C2-Dibenzothiophenes	**15.0** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C3-Dibenzothiophenes	**7.58** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C4-Dibenzothiophenes	**4.31** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
Phenanthrene	**203** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
Anthracene	**72.2** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C1-Phenanthrenes/Anthracenes	**172** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C2-Phenanthrenes/Anthracenes	**114** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C3-Phenanthrenes/Anthracenes	**42.1** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C4-Phenanthrenes/Anthracenes	**17.2** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
Retene	**12.7** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
Benzo(b)naphtho(2,1-d)thiophene	**17.3** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C0-Benzonaphthothiophenes	**36.8** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C1-Benzonaphthothiophenes	**22.6** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C2-Benzonaphthothiophenes	**14.5** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C3-Benzonaphthothiophenes	**7.35** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS712-S2
Date Sampled: 11/11/19 12:14
Percent Solids: 83
Initial Volume: 5.89
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	J **2.76** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
Fluoranthene	**293** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
Pyrene	**316** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C1-Fluoranthenes/Pyrenes	**231** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C2-Fluoranthenes/Pyrenes	**93.4** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C3-Fluoranthenes/Pyrenes	**39.9** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
Benzo(b)fluorene	**31.2** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
Benzo(c)fluorene	**13.7** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
2-Methylpyrene	**28.6** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
4-Methylpyrene	**24.4** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
1-Methylpyrene	**20.9** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
Benz(a)anthracene	**178** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
Chrysene/triphenylene	**170** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C1-Benzo(a)anthracenes/Chrysenes	**117** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C2-Benzo(a)anthracenes/Chrysenes	**58.9** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C3-Benzo(a)anthracenes/Chrysenes	**27.6** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C4-Benzo(a)anthracenes/Chrysenes	ND (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
Benzo(b)fluoranthene	**114** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
Benzo(j/k)fluoranthene	**127** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
Benzo(e)pyrene	**104** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
Benzo(a)pyrene	**170** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
Perylene	**43.8** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
Indeno(1,2,3-cd)pyrene	**86.4** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
Dibenzo(a,h)anthracene	**24.2** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
Benzo(g,h,i)perylene	**84.2** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
Coronene	**21.7** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
Tetramethyl lead	ND (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
Trimethylethyl lead	ND (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
Dimethyldiethyl lead	ND (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
Methyltriethyl lead	ND (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
Tetraethyl lead	ND (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
2,6,10-trimethyldodecane (1380)	J **2.33** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS712-S2
Date Sampled: 11/11/19 12:14
Percent Solids: 83
Initial Volume: 5.89
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**6.87** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
2,6,10-trimethylpentadecane (1650)	**11.3** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C-17	**B 40.3** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
Pristane	**B 31.1** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
C-18	**B 26.7** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
Phytane	**B 28.7** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
Carbazole	**J 3.55** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
2,6-Dimethylnaphthalene	**11.7** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
2,3,5-Trimethylnaphthene	**J 3.58** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
4-Methyldibenzothiophene	**4.38** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
2/3-Methyldibenzothiophene	**4.96** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
1-Methyldibenzothiophene	ND (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
3-Methylphenanthrene	**35.4** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
2-Methylphenanthrene	**45.1** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
2-Methylanthracene	**28.2** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
4/9-Methylphenanthrene	**38.2** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401
1-Methylphenanthrene	**20.6** (4.09)	2.04	8270 Mod		1	11/18/19 16:21	F9K0003	FK91401

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*91 %*		*50-120*
Surrogate: Naphthalene-d8	*89 %*		*50-120*
Surrogate: Phenanthrene-d10	*89 %*		*50-120*
Surrogate: Perylene-d12	*75 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS712-S2
Date Sampled: 11/11/19 12:14
Percent Solids: 83

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-06
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**8220** (102)		TOC-LK		1	CCP	11/20/19 21:38	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS716-S1
Date Sampled: 11/11/19 12:47
Percent Solids: 65
Initial Volume: 5.57
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **58.9** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
C1-Benzene	**394** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
C2-Benzenes	**174** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
C3-Benzenes	**310** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
C4-Benzenes	**909** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
C5-Benzenes	**834** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
Methylcyclohexane	**61.3** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
Toluene	**565** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
Ethylbenzene	**56.2** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
m,p-Xylene	**219** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
Styrene	**110** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
o-Xylene	**30.2** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
Isopropylbenzene	**15.3** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
n-Propylbenzene	**21.8** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
1,3,5-Trimethylbenzene	**68.6** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
1,2,3-Trimethylbenzene	**58.1** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
1,2,4-Trimethylbenzene	**180** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
t-Butylbenzene	**7.18** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
sec-Butylbenzene	**6.26** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
p-Isopropyltoluene	**88.3** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
n-Butylbenzene	**62.7** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
trans-Decalin	**58.3** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
cis-Decalin	**23.6** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
C1-Decalins	**188** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
C2-Decalins	**496** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
C3-Decalins	**559** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
C4-Decalins	**1240** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
Benzo(b)thiophene	**108** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
C1-Benzo(b)thiophenes	**281** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
C2-Benzo(b)thiophenes	**954** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
C3-Benzo(b)thiophenes	**1010** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
C4-Benzo(b)thiophenes	**415** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS716-S1
Date Sampled: 11/11/19 12:47
Percent Solids: 65
Initial Volume: 5.57
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**2520** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
2-Methylnaphthalene	**1570** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
1-Methylnaphthalene	**7960** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
C1-Naphthalenes	**5660** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
C2-Naphthalenes	**25200** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
C3-Naphthalenes	**20900** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
C4-Naphthalenes	**8560** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
Biphenyl	**628** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
Acenaphthylene	**3160** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
Acenaphthene	**16100** (111)	55.3	8270 Mod		20	11/17/19 9:53	F9K0003	FK91401
Dibenzofuran	**1120** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
Fluorene	**12600** (111)	55.3	8270 Mod		20	11/17/19 9:53	F9K0003	FK91401
C1-Fluorenes	**13500** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
C2-Fluorenes	**12100** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
C3-Fluorenes	**5380** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
Dibenzothiophene	**3400** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
C1-Dibenzothiophenes	**6180** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
C2-Dibenzothiophenes	**5570** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
C3-Dibenzothiophenes	**2710** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
C4-Dibenzothiophenes	**1030** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
Phenanthrene	**64800** (111)	55.3	8270 Mod		20	11/17/19 9:53	F9K0003	FK91401
Anthracene	**18400** (111)	55.3	8270 Mod		20	11/17/19 9:53	F9K0003	FK91401
C1-Phenanthrenes/Anthracenes	**61300** (111)	55.3	8270 Mod		20	11/17/19 9:53	F9K0003	FK91401
C2-Phenanthrenes/Anthracenes	**29500** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
C3-Phenanthrenes/Anthracenes	**10300** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
C4-Phenanthrenes/Anthracenes	**2910** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
Retene	**530** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
Benzo(b)naphtho(2,1-d)thiophene	**2390** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
C0-Benzonaphthothiophenes	**4330** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
C1-Benzonaphthothiophenes	**3270** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
C2-Benzonaphthothiophenes	**1810** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
C3-Benzonaphthothiophenes	**927** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS716-S1
Date Sampled: 11/11/19 12:47
Percent Solids: 65
Initial Volume: 5.57
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**220** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
Fluoranthene	**35500** (111)	55.3	8270 Mod		20	11/17/19 9:53	F9K0003	FK91401
Pyrene	**52400** (111)	55.3	8270 Mod		20	11/17/19 9:53	F9K0003	FK91401
C1-Fluoranthenes/Pyrenes	**38900** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
C2-Fluoranthenes/Pyrenes	**15300** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
C3-Fluoranthenes/Pyrenes	**5600** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
Benzo(b)fluorene	**4340** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
Benzo(c)fluorene	**1650** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
2-Methylpyrene	**5370** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
4-Methylpyrene	**4860** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
1-Methylpyrene	**4840** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
Benz(a)anthracene	**18100** (111)	55.3	8270 Mod		20	11/17/19 9:53	F9K0003	FK91401
Chrysene/triphenylene	**19700** (111)	55.3	8270 Mod		20	11/17/19 9:53	F9K0003	FK91401
C1-Benzo(a)anthracenes/Chrysenes	**15400** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
C2-Benzo(a)anthracenes/Chrysenes	**7010** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
C3-Benzo(a)anthracenes/Chrysenes	**2680** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
C4-Benzo(a)anthracenes/Chrysenes	**993** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
Benzo(b)fluoranthene	**9710** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
Benzo(j/k)fluoranthene	**9470** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
Benzo(e)pyrene	**9600** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
Benzo(a)pyrene	**13800** (111)	55.3	8270 Mod		20	11/17/19 9:53	F9K0003	FK91401
Perylene	**2980** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
Indeno(1,2,3-cd)pyrene	**7390** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
Dibenzo(a,h)anthracene	**2120** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
Benzo(g,h,i)perylene	**7490** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
Coronene	**1770** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
Tetramethyl lead	ND (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
Trimethylethyl lead	ND (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
Dimethyldiethyl lead	ND (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
Methyltriethyl lead	ND (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
Tetraethyl lead	ND (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
2,6,10-trimethyldodecane (1380)	**439** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS716-S1
Date Sampled: 11/11/19 12:47
Percent Solids: 65
Initial Volume: 5.57
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**861** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
2,6,10-trimethylpentadecane (1650)	**1280** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
C-17	**433** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
Pristane	**2450** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
C-18	**353** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
Phytane	**2620** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
Carbazole	**495** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
2,6-Dimethylnaphthalene	**5650** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
2,3,5-Trimethylnaphthene	**1420** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
4-Methyldibenzothiophene	**2480** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
2/3-Methyldibenzothiophene	**2040** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
1-Methyldibenzothiophene	**527** (5.53)	2.76	8270 Mod		1	11/18/19 17:46	F9K0003	FK91401
3-Methylphenanthrene	**14200** (111)	55.3	8270 Mod		20	11/17/19 9:53	F9K0003	FK91401
2-Methylphenanthrene	**16100** (111)	55.3	8270 Mod		20	11/17/19 9:53	F9K0003	FK91401
2-Methylanthracene	**5710** (111)	55.3	8270 Mod		20	11/17/19 9:53	F9K0003	FK91401
4/9-Methylphenanthrene	**14300** (111)	55.3	8270 Mod		20	11/17/19 9:53	F9K0003	FK91401
1-Methylphenanthrene	**10600** (111)	55.3	8270 Mod		20	11/17/19 9:53	F9K0003	FK91401

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*97 %*		*50-120*
Surrogate: Naphthalene-d8	*89 %*		*50-120*
Surrogate: Phenanthrene-d10	*91 %*		*50-120*
Surrogate: Perylene-d12	*102 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS716-S1
Date Sampled: 11/11/19 12:47
Percent Solids: 65

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-07
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**73000** (95.8)		TOC-LK		1	CCP	11/26/19 20:50	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS716-S2
Date Sampled: 11/11/19 12:50
Percent Solids: 48
Initial Volume: 5.14
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**B 37.0** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C1-Benzene	**105** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C2-Benzenes	**69.0** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C3-Benzenes	**13.7** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C4-Benzenes	**17.8** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C5-Benzenes	**8.22** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
Methylcyclohexane	ND (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
Toluene	**158** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
Ethylbenzene	ND (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
m,p-Xylene	**108** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
Styrene	**10.3** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
o-Xylene	**J 5.70** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
Isopropylbenzene	ND (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
n-Propylbenzene	ND (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
1,3,5-Trimethylbenzene	ND (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
1,2,3-Trimethylbenzene	ND (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
1,2,4-Trimethylbenzene	**J 6.79** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
t-Butylbenzene	ND (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
sec-Butylbenzene	ND (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
p-Isopropyltoluene	**8.48** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
n-Butylbenzene	ND (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
trans-Decalin	ND (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
cis-Decalin	ND (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C1-Decalins	**J 5.59** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C2-Decalins	ND (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C3-Decalins	ND (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C4-Decalins	ND (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
Benzo(b)thiophene	ND (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C1-Benzo(b)thiophenes	**J 7.18** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C2-Benzo(b)thiophenes	**12.4** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C3-Benzo(b)thiophenes	**J 6.69** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C4-Benzo(b)thiophenes	ND (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS716-S2
Date Sampled: 11/11/19 12:50
Percent Solids: 48
Initial Volume: 5.14
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**20.2** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
2-Methylnaphthalene	**17.6** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
1-Methylnaphthalene	**18.2** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C1-Naphthalenes	**22.3** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C2-Naphthalenes	**56.4** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C3-Naphthalenes	**38.8** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C4-Naphthalenes	**27.3** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
Biphenyl	**J 7.12** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
Acenaphthylene	**45.3** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
Acenaphthene	**23.7** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
Dibenzofuran	**8.02** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
Fluorene	**23.1** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C1-Fluorenes	**40.3** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C2-Fluorenes	**55.6** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C3-Fluorenes	**27.2** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
Dibenzothiophene	**8.36** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C1-Dibenzothiophenes	**17.0** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C2-Dibenzothiophenes	**18.2** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C3-Dibenzothiophenes	**14.6** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C4-Dibenzothiophenes	ND (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
Phenanthrene	**107** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
Anthracene	**42.8** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C1-Phenanthrenes/Anthracenes	**181** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C2-Phenanthrenes/Anthracenes	**152** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C3-Phenanthrenes/Anthracenes	**68.4** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C4-Phenanthrenes/Anthracenes	**68.3** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
Retene	**141** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
Benzo(b)naphtho(2,1-d)thiophene	**10.3** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C0-Benzonaphthothiophenes	**23.0** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C1-Benzonaphthothiophenes	**19.4** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C2-Benzonaphthothiophenes	**20.0** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C3-Benzonaphthothiophenes	ND (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS716-S2
Date Sampled: 11/11/19 12:50
Percent Solids: 48
Initial Volume: 5.14
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
Fluoranthene	**121** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
Pyrene	**330** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C1-Fluoranthenes/Pyrenes	**273** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C2-Fluoranthenes/Pyrenes	**137** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C3-Fluoranthenes/Pyrenes	**66.7** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
Benzo(b)fluorene	**25.3** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
Benzo(c)fluorene	**14.9** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
2-Methylpyrene	**37.9** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
4-Methylpyrene	**38.1** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
1-Methylpyrene	**31.9** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
Benz(a)anthracene	**134** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
Chrysene/triphenylene	**135** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C1-Benzo(a)anthracenes/Chrysenes	**123** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C2-Benzo(a)anthracenes/Chrysenes	**57.0** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C3-Benzo(a)anthracenes/Chrysenes	**20.6** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C4-Benzo(a)anthracenes/Chrysenes	ND (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
Benzo(b)fluoranthene	**71.6** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
Benzo(j/k)fluoranthene	**71.8** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
Benzo(e)pyrene	**91.3** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
Benzo(a)pyrene	**130** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
Perylene	**1310** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
Indeno(1,2,3-cd)pyrene	**65.7** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
Dibenzo(a,h)anthracene	**17.4** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
Benzo(g,h,i)perylene	**82.6** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
Coronene	**22.4** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
Tetramethyl lead	ND (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
Trimethylethyl lead	ND (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
Dimethyldiethyl lead	ND (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
Methyltriethyl lead	ND (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
Tetraethyl lead	ND (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
2,6,10-trimethyldodecane (1380)	**J 5.97** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS716-S2
Date Sampled: 11/11/19 12:50
Percent Solids: 48
Initial Volume: 5.14
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**24.3** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
2,6,10-trimethylpentadecane (1650)	**B 28.4** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C-17	**B 142** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
Pristane	**B 67.5** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
C-18	**B 115** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
Phytane	**B 117** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
Carbazole	ND (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
2,6-Dimethylnaphthalene	**15.6** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
2,3,5-Trimethylnaphthene	ND (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
4-Methyldibenzothiophene	**J 5.51** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
2/3-Methyldibenzothiophene	**J 5.12** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
1-Methyldibenzothiophene	ND (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
3-Methylphenanthrene	**49.2** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
2-Methylphenanthrene	**41.1** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
2-Methylanthracene	**19.3** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
4/9-Methylphenanthrene	**53.0** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401
1-Methylphenanthrene	**16.0** (8.02)	4.01	8270 Mod		1	11/18/19 19:12	F9K0003	FK91401

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*115 %*		*50-120*
Surrogate: Naphthalene-d8	*113 %*		*50-120*
Surrogate: Phenanthrene-d10	*119 %*		*50-120*
Surrogate: Perylene-d12	*79 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS716-S2
Date Sampled: 11/11/19 12:50
Percent Solids: 48

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-08
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**57500** (92.3)		TOC-LK		1	CCP	11/26/19 21:06	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS717-S1
Date Sampled: 11/11/19 13:46
Percent Solids: 56
Initial Volume: 5.02
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **20.7** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C1-Benzene	**27.9** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C2-Benzenes	**26.8** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C3-Benzenes	**10.2** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C4-Benzenes	**11.1** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C5-Benzenes	**14.3** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
Methylcyclohexane	ND (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
Toluene	**45.0** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
Ethylbenzene	ND (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
m,p-Xylene	**43.5** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
Styrene	J **3.66** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
o-Xylene	ND (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
Isopropylbenzene	ND (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
n-Propylbenzene	ND (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
1,3,5-Trimethylbenzene	ND (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
1,2,3-Trimethylbenzene	ND (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
1,2,4-Trimethylbenzene	ND (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
t-Butylbenzene	ND (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
sec-Butylbenzene	ND (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
p-Isopropyltoluene	J **4.61** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
n-Butylbenzene	ND (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
trans-Decalin	**14.8** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
cis-Decalin	ND (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C1-Decalins	**11.7** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C2-Decalins	**14.7** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C3-Decalins	J **6.27** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C4-Decalins	**13.6** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
Benzo(b)thiophene	ND (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C1-Benzo(b)thiophenes	J **6.54** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C2-Benzo(b)thiophenes	**25.0** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C3-Benzo(b)thiophenes	**15.2** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C4-Benzo(b)thiophenes	J **5.53** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS717-S1
Date Sampled: 11/11/19 13:46
Percent Solids: 56
Initial Volume: 5.02
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**8.24** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
2-Methylnaphthalene	J **7.05** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
1-Methylnaphthalene	J **4.22** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C1-Naphthalenes	**7.24** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C2-Naphthalenes	**142** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C3-Naphthalenes	**68.3** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C4-Naphthalenes	**30.6** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
Biphenyl	ND (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
Acenaphthylene	**30.8** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
Acenaphthene	**171** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
Dibenzofuran	J **3.78** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
Fluorene	**8.66** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C1-Fluorenes	**37.1** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C2-Fluorenes	**41.1** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C3-Fluorenes	**15.7** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
Dibenzothiophene	**12.6** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C1-Dibenzothiophenes	**20.6** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C2-Dibenzothiophenes	**11.6** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C3-Dibenzothiophenes	**7.64** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C4-Dibenzothiophenes	J **5.01** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
Phenanthrene	**20.1** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
Anthracene	**18.9** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C1-Phenanthrenes/Anthracenes	**86.7** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C2-Phenanthrenes/Anthracenes	**66.5** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C3-Phenanthrenes/Anthracenes	**26.6** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C4-Phenanthrenes/Anthracenes	**19.8** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
Retene	**35.1** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
Benzo(b)naphtho(2,1-d)thiophene	J **4.27** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C0-Benzonaphthothiophenes	**9.95** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C1-Benzonaphthothiophenes	**9.35** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C2-Benzonaphthothiophenes	**7.83** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C3-Benzonaphthothiophenes	J **5.33** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS717-S1
Date Sampled: 11/11/19 13:46
Percent Solids: 56
Initial Volume: 5.02
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
Fluoranthene	**92.2** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
Pyrene	**177** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C1-Fluoranthenes/Pyrenes	**115** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C2-Fluoranthenes/Pyrenes	**56.1** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C3-Fluoranthenes/Pyrenes	**22.5** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
Benzo(b)fluorene	**11.4** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
Benzo(c)fluorene	**J 6.15** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
2-Methylpyrene	**15.7** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
4-Methylpyrene	**17.5** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
1-Methylpyrene	**13.6** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
Benz(a)anthracene	**50.3** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
Chrysene/triphenylene	**51.9** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C1-Benzo(a)anthracenes/Chrysenes	**57.3** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C2-Benzo(a)anthracenes/Chrysenes	**34.6** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C3-Benzo(a)anthracenes/Chrysenes	**14.5** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C4-Benzo(a)anthracenes/Chrysenes	ND (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
Benzo(b)fluoranthene	**36.8** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
Benzo(j/k)fluoranthene	**36.3** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
Benzo(e)pyrene	**51.5** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
Benzo(a)pyrene	**72.0** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
Perylene	**1780** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
Indeno(1,2,3-cd)pyrene	**33.3** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
Dibenzo(a,h)anthracene	**9.61** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
Benzo(g,h,i)perylene	**44.0** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
Coronene	**11.0** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
Tetramethyl lead	ND (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
Trimethylethyl lead	ND (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
Dimethyldiethyl lead	ND (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
Methyltriethyl lead	ND (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
Tetraethyl lead	ND (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
2,6,10-trimethyldodecane (1380)	**7.82** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS717-S1
Date Sampled: 11/11/19 13:46
Percent Solids: 56
Initial Volume: 5.02
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**23.4** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
2,6,10-trimethylpentadecane (1650)	**B 18.8** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C-17	**B 72.0** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
Pristane	**B 38.2** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
C-18	**B 50.5** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
Phytane	**B 52.2** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
Carbazole	ND (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
2,6-Dimethylnaphthalene	**7.27** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
2,3,5-Trimethylnaphthene	**7.20** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
4-Methyldibenzothiophene	**9.08** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
2/3-Methyldibenzothiophene	**J 3.75** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
1-Methyldibenzothiophene	ND (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
3-Methylphenanthrene	**31.9** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
2-Methylphenanthrene	**7.77** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
2-Methylanthracene	**10.0** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
4/9-Methylphenanthrene	**32.0** (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401
1-Methylphenanthrene	ND (7.18)	3.59	8270 Mod		1	11/18/19 20:37	F9K0003	FK91401

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*91 %*		*50-120*
Surrogate: Naphthalene-d8	*98 %*		*50-120*
Surrogate: Phenanthrene-d10	*99 %*		*50-120*
Surrogate: Perylene-d12	*66 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS717-S1
Date Sampled: 11/11/19 13:46
Percent Solids: 56

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-09
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**81600** (100)		TOC-LK		1	CCP	11/26/19 16:57	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS717-S3
Date Sampled: 11/11/19 13:54
Percent Solids: 65
Initial Volume: 5.82
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**B 14.9** (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C1-Benzene	**25.3** (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C2-Benzenes	**21.9** (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C3-Benzenes	**J 3.67** (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C4-Benzenes	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C5-Benzenes	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
Methylcyclohexane	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
Toluene	**38.7** (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
Ethylbenzene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
m,p-Xylene	**36.0** (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
Styrene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
o-Xylene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
Isopropylbenzene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
n-Propylbenzene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
1,3,5-Trimethylbenzene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
1,2,3-Trimethylbenzene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
1,2,4-Trimethylbenzene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
t-Butylbenzene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
sec-Butylbenzene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
p-Isopropyltoluene	**J 3.95** (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
n-Butylbenzene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
trans-Decalin	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
cis-Decalin	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C1-Decalins	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C2-Decalins	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C3-Decalins	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C4-Decalins	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
Benzo(b)thiophene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C1-Benzo(b)thiophenes	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C2-Benzo(b)thiophenes	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C3-Benzo(b)thiophenes	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C4-Benzo(b)thiophenes	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS717-S3
Date Sampled: 11/11/19 13:54
Percent Solids: 65
Initial Volume: 5.82
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
2-Methylnaphthalene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
1-Methylnaphthalene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C1-Naphthalenes	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C2-Naphthalenes	**10.7** (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C3-Naphthalenes	**J 4.72** (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C4-Naphthalenes	**J 3.38** (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
Biphenyl	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
Acenaphthylene	**9.65** (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
Acenaphthene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
Dibenzofuran	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
Fluorene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C1-Fluorenes	**J 4.39** (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C2-Fluorenes	**5.83** (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C3-Fluorenes	**J 4.66** (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
Dibenzothiophene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C1-Dibenzothiophenes	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C2-Dibenzothiophenes	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C3-Dibenzothiophenes	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C4-Dibenzothiophenes	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
Phenanthrene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
Anthracene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C1-Phenanthrenes/Anthracenes	**6.80** (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C2-Phenanthrenes/Anthracenes	**J 3.88** (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C3-Phenanthrenes/Anthracenes	**J 2.89** (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C4-Phenanthrenes/Anthracenes	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
Retene	**J 2.91** (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
Benzo(b)naphtho(2,1-d)thiophene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C0-Benzonaphthothiophenes	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C1-Benzonaphthothiophenes	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C2-Benzonaphthothiophenes	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C3-Benzonaphthothiophenes	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS717-S3
Date Sampled: 11/11/19 13:54
Percent Solids: 65
Initial Volume: 5.82
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
Fluoranthene	J **3.11** (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
Pyrene	J **4.54** (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C1-Fluoranthenes/Pyrenes	**14.3** (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C2-Fluoranthenes/Pyrenes	**6.36** (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C3-Fluoranthenes/Pyrenes	J **4.57** (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
Benzo(b)fluorene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
Benzo(c)fluorene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
2-Methylpyrene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
4-Methylpyrene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
1-Methylpyrene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
Benz(a)anthracene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
Chrysene/triphenylene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C1-Benzo(a)anthracenes/Chrysenes	J **3.46** (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C2-Benzo(a)anthracenes/Chrysenes	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C3-Benzo(a)anthracenes/Chrysenes	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C4-Benzo(a)anthracenes/Chrysenes	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
Benzo(b)fluoranthene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
Benzo(j/k)fluoranthene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
Benzo(e)pyrene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
Benzo(a)pyrene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
Perylene	**498** (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
Indeno(1,2,3-cd)pyrene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
Dibenzo(a,h)anthracene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
Benzo(g,h,i)perylene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
Coronene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
Tetramethyl lead	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
Trimethylethyl lead	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
Dimethyldiethyl lead	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
Methyltriethyl lead	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
Tetraethyl lead	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
2,6,10-trimethyldodecane (1380)	J **3.26** (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS717-S3
Date Sampled: 11/11/19 13:54
Percent Solids: 65
Initial Volume: 5.82
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**10.7** (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
2,6,10-trimethylpentadecane (1650)	**B 10.9** (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C-17	**B 52.1** (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
Pristane	**B 23.8** (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
C-18	**B 36.8** (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
Phytane	**B 34.5** (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
Carbazole	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
2,6-Dimethylnaphthalene	**J 2.77** (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
2,3,5-Trimethylnaphthene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
4-Methyldibenzothiophene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
2/3-Methyldibenzothiophene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
1-Methyldibenzothiophene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
3-Methylphenanthrene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
2-Methylphenanthrene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
2-Methylanthracene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
4/9-Methylphenanthrene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401
1-Methylphenanthrene	ND (5.27)	2.63	8270 Mod		1	11/18/19 22:02	F9K0003	FK91401

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*87 %*		*50-120*
Surrogate: Naphthalene-d8	*99 %*		*50-120*
Surrogate: Phenanthrene-d10	*91 %*		*50-120*
Surrogate: Perylene-d12	*86 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS717-S3
Date Sampled: 11/11/19 13:54
Percent Solids: 65

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-10
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**81000** (99.8)		TOC-LK		1	CCP	11/26/19 23:35	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS718-S5
Date Sampled: 11/11/19 15:04
Percent Solids: 80
Initial Volume: 5.85
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**B 9.00** (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C1-Benzene	**6.26** (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C2-Benzenes	**J 4.17** (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C3-Benzenes	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C4-Benzenes	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C5-Benzenes	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
Methylcyclohexane	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
Toluene	**9.43** (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
Ethylbenzene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
m,p-Xylene	**5.51** (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
Styrene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
o-Xylene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
Isopropylbenzene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
n-Propylbenzene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
1,3,5-Trimethylbenzene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
1,2,3-Trimethylbenzene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
1,2,4-Trimethylbenzene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
t-Butylbenzene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
sec-Butylbenzene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
p-Isopropyltoluene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
n-Butylbenzene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
trans-Decalin	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
cis-Decalin	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C1-Decalins	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C2-Decalins	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C3-Decalins	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C4-Decalins	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
Benzo(b)thiophene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C1-Benzo(b)thiophenes	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C2-Benzo(b)thiophenes	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C3-Benzo(b)thiophenes	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C4-Benzo(b)thiophenes	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS718-S5
Date Sampled: 11/11/19 15:04
Percent Solids: 80
Initial Volume: 5.85
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
2-Methylnaphthalene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
1-Methylnaphthalene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C1-Naphthalenes	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C2-Naphthalenes	**5.71** (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C3-Naphthalenes	**J 2.64** (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C4-Naphthalenes	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
Biphenyl	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
Acenaphthylene	**4.75** (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
Acenaphthene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
Dibenzofuran	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
Fluorene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C1-Fluorenes	**J 2.40** (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C2-Fluorenes	**J 2.94** (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C3-Fluorenes	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
Dibenzothiophene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C1-Dibenzothiophenes	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C2-Dibenzothiophenes	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C3-Dibenzothiophenes	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C4-Dibenzothiophenes	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
Phenanthrene	**J 4.16** (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
Anthracene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C1-Phenanthrenes/Anthracenes	**J 3.28** (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C2-Phenanthrenes/Anthracenes	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C3-Phenanthrenes/Anthracenes	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C4-Phenanthrenes/Anthracenes	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
Retene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
Benzo(b)naphtho(2,1-d)thiophene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C0-Benzonaphthothiophenes	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C1-Benzonaphthothiophenes	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C2-Benzonaphthothiophenes	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C3-Benzonaphthothiophenes	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS718-S5
Date Sampled: 11/11/19 15:04
Percent Solids: 80
Initial Volume: 5.85
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
Fluoranthene	J **3.49** (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
Pyrene	J **3.73** (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C1-Fluoranthenes/Pyrenes	**5.05** (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C2-Fluoranthenes/Pyrenes	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C3-Fluoranthenes/Pyrenes	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
Benzo(b)fluorene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
Benzo(c)fluorene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
2-Methylpyrene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
4-Methylpyrene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
1-Methylpyrene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
Benz(a)anthracene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
Chrysene/triphenylene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C1-Benzo(a)anthracenes/Chrysenes	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C2-Benzo(a)anthracenes/Chrysenes	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C3-Benzo(a)anthracenes/Chrysenes	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C4-Benzo(a)anthracenes/Chrysenes	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
Benzo(b)fluoranthene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
Benzo(j/k)fluoranthene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
Benzo(e)pyrene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
Benzo(a)pyrene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
Perylene	**53.3** (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
Indeno(1,2,3-cd)pyrene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
Dibenzo(a,h)anthracene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
Benzo(g,h,i)perylene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
Coronene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
Tetramethyl lead	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
Trimethylethyl lead	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
Dimethyldiethyl lead	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
Methyltriethyl lead	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
Tetraethyl lead	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
2,6,10-trimethyldodecane (1380)	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS718-S5
Date Sampled: 11/11/19 15:04
Percent Solids: 80
Initial Volume: 5.85
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**5.84** (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
2,6,10-trimethylpentadecane (1650)	**B 11.5** (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C-17	**B 46.8** (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
Pristane	**B 27.3** (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
C-18	**B 37.0** (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
Phytane	**B 36.9** (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
Carbazole	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
2,6-Dimethylnaphthalene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
2,3,5-Trimethylnaphthene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
4-Methyldibenzothiophene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
2/3-Methyldibenzothiophene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
1-Methyldibenzothiophene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
3-Methylphenanthrene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
2-Methylphenanthrene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
2-Methylanthracene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
4/9-Methylphenanthrene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401
1-Methylphenanthrene	ND (4.26)	2.13	8270 Mod		1	11/18/19 23:27	F9K0003	FK91401

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*94 %*		*50-120*
Surrogate: Naphthalene-d8	*93 %*		*50-120*
Surrogate: Phenanthrene-d10	*95 %*		*50-120*
Surrogate: Perylene-d12	*80 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS718-S5
Date Sampled: 11/11/19 15:04
Percent Solids: 80

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-11
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**31000** (92.6)		TOC-LK		1	CCP	11/26/19 17:30	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS719-S1
Date Sampled: 11/11/19 15:29
Percent Solids: 52
Initial Volume: 6
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **113** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C1-Benzene	**138** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C2-Benzenes	**160** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C3-Benzenes	**48.3** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C4-Benzenes	**56.6** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C5-Benzenes	**33.1** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
Methylcyclohexane	ND (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
Toluene	**193** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
Ethylbenzene	J **25.1** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
m,p-Xylene	**249** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
Styrene	**71.2** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
o-Xylene	ND (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
Isopropylbenzene	ND (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
n-Propylbenzene	ND (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
1,3,5-Trimethylbenzene	ND (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
1,2,3-Trimethylbenzene	ND (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
1,2,4-Trimethylbenzene	J **19.3** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
t-Butylbenzene	ND (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
sec-Butylbenzene	ND (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
p-Isopropyltoluene	ND (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
n-Butylbenzene	ND (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
trans-Decalin	J **23.1** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
cis-Decalin	ND (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C1-Decalins	**45.8** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C2-Decalins	**71.7** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C3-Decalins	**49.8** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C4-Decalins	**82.1** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
Benzo(b)thiophene	**48.2** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C1-Benzo(b)thiophenes	**57.0** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C2-Benzo(b)thiophenes	**81.0** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C3-Benzo(b)thiophenes	**49.4** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C4-Benzo(b)thiophenes	J **17.0** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS719-S1
Date Sampled: 11/11/19 15:29
Percent Solids: 52
Initial Volume: 6
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**620** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
2-Methylnaphthalene	**252** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
1-Methylnaphthalene	**213** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C1-Naphthalenes	**287** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C2-Naphthalenes	**534** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C3-Naphthalenes	**278** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C4-Naphthalenes	**128** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
Biphenyl	**134** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
Acenaphthylene	**2610** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
Acenaphthene	**3440** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
Dibenzofuran	**168** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
Fluorene	**1430** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C1-Fluorenes	**406** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C2-Fluorenes	**234** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C3-Fluorenes	**286** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
Dibenzothiophene	**1730** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C1-Dibenzothiophenes	**857** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C2-Dibenzothiophenes	**435** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C3-Dibenzothiophenes	**197** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C4-Dibenzothiophenes	**89.5** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
Phenanthrene	**12700** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
Anthracene	**4520** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C1-Phenanthrenes/Anthracenes	**3820** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C2-Phenanthrenes/Anthracenes	**1250** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C3-Phenanthrenes/Anthracenes	**366** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C4-Phenanthrenes/Anthracenes	**154** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
Retene	**103** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
Benzo(b)naphtho(2,1-d)thiophene	**1260** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C0-Benzonaphthothiophenes	**2440** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C1-Benzonaphthothiophenes	**707** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C2-Benzonaphthothiophenes	**347** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C3-Benzonaphthothiophenes	**350** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS719-S1
Date Sampled: 11/11/19 15:29
Percent Solids: 52
Initial Volume: 6
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**116** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
Fluoranthene	**16900** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
Pyrene	**24400** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C1-Fluoranthenes/Pyrenes	**7900** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C2-Fluoranthenes/Pyrenes	**1570** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C3-Fluoranthenes/Pyrenes	**468** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
Benzo(b)fluorene	**987** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
Benzo(c)fluorene	**379** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
2-Methylpyrene	**1090** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
4-Methylpyrene	**959** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
1-Methylpyrene	**1060** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
Benz(a)anthracene	**8160** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
Chrysene/triphenylene	**7500** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C1-Benzo(a)anthracenes/Chrysenes	**2370** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C2-Benzo(a)anthracenes/Chrysenes	**794** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C3-Benzo(a)anthracenes/Chrysenes	**302** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C4-Benzo(a)anthracenes/Chrysenes	**194** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
Benzo(b)fluoranthene	**5590** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
Benzo(j/k)fluoranthene	**6450** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
Benzo(e)pyrene	**6000** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
Benzo(a)pyrene	**10400** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
Perylene	**1730** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
Indeno(1,2,3-cd)pyrene	**5630** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
Dibenzo(a,h)anthracene	**1090** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
Benzo(g,h,i)perylene	**6090** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
Coronene	**1990** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
Tetramethyl lead	ND (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
Trimethylethyl lead	ND (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
Dimethyldiethyl lead	ND (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
Methyltriethyl lead	ND (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
Tetraethyl lead	ND (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
2,6,10-trimethyldodecane (1380)	**62.1** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS719-S1
Date Sampled: 11/11/19 15:29
Percent Solids: 52
Initial Volume: 6
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**147** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
2,6,10-trimethylpentadecane (1650)	**79.1** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C-17	**284** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
Pristane	**179** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
C-18	**B 143** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
Phytane	**B 213** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
Carbazole	**150** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
2,6-Dimethylnaphthalene	**99.7** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
2,3,5-Trimethylnaphthene	ND (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
4-Methyldibenzothiophene	**316** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
2/3-Methyldibenzothiophene	**308** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
1-Methyldibenzothiophene	**92.9** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
3-Methylphenanthrene	**861** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
2-Methylphenanthrene	**958** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
2-Methylanthracene	**441** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
4/9-Methylphenanthrene	**886** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401
1-Methylphenanthrene	**617** (32.3)	16.1	8270 Mod		5	11/19/19 0:51	F9K0003	FK91401

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*87 %*		*50-120*
Surrogate: Naphthalene-d8	*90 %*		*50-120*
Surrogate: Phenanthrene-d10	*93 %*		*50-120*
Surrogate: Perylene-d12	*81 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS719-S1
Date Sampled: 11/11/19 15:29
Percent Solids: 52

ESS Laboratory Work Order: F190056
ESS Laboratory Sample ID: F190056-12
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**49100** (94.2)		TOC-LK		1	CCP	11/26/19 17:47	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190056

Quality Control Data

Classical Chemistry

Batch CK91438 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	100	mg/kg							
Total Organic Carbon (2)	ND	100	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190056

Quality Control Data

Classical Chemistry

Batch CK91438 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9200	100	mg/kg	10000		92	80-120			
Total Organic Carbon (2)	10500	100	mg/kg	10000		105	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190056

Quality Control Data

Classical Chemistry

Batch CK91438 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9490	100	mg/kg	10000		95	80-120	3	20	
Total Organic Carbon (2)	9610	100	mg/kg	10000		96	80-120	9	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190056

Quality Control Data

Classical Chemistry

Batch CK92246 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	100	mg/kg							
Total Organic Carbon (2)	ND	100	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190056

Quality Control Data

Classical Chemistry

Batch CK92246 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	10200	100	mg/kg	10000		102	80-120			
Total Organic Carbon (2)	10100	100	mg/kg	10000		101	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190056

Quality Control Data

Classical Chemistry

Batch CK92246 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	10000	100	mg/kg	10000		100	80-120	1	20	
Total Organic Carbon (2)	10700	100	mg/kg	10000		107	80-120	6	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190056

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FK91401 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	11.6	4.00	ug/Kg wet							
C1-Benzene	ND	4.00	ug/Kg wet							
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	2.59	4.00	ug/Kg wet							J
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	3.05	4.00	ug/Kg wet							J
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190056

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FK91401 - 3570

C1-Fluorenes	ND	4.00	ug/Kg wet
C2-Fluorenes	ND	4.00	ug/Kg wet
C3-Fluorenes	ND	4.00	ug/Kg wet
Dibenzothiophene	ND	4.00	ug/Kg wet
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet
Phenanthrene	ND	4.00	ug/Kg wet
Anthracene	ND	4.00	ug/Kg wet
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
Retene	ND	4.00	ug/Kg wet
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
Fluoranthene	ND	4.00	ug/Kg wet
Pyrene	ND	4.00	ug/Kg wet
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
Benzo(b)fluorene	ND	4.00	ug/Kg wet
Benzo(c)fluorene	ND	4.00	ug/Kg wet
2-Methylpyrene	ND	4.00	ug/Kg wet
4-Methylpyrene	ND	4.00	ug/Kg wet
1-Methylpyrene	ND	4.00	ug/Kg wet
Benz(a)anthracene	ND	4.00	ug/Kg wet
Chrysene/triphenylene	ND	4.00	ug/Kg wet
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet
Benzo(e)pyrene	ND	4.00	ug/Kg wet
Benzo(a)pyrene	ND	4.00	ug/Kg wet
Perylene	ND	4.00	ug/Kg wet
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet
Coronene	ND	4.00	ug/Kg wet
Tetramethyl lead	ND	4.00	ug/Kg wet
Trimethylethyl lead	ND	4.00	ug/Kg wet

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190056

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FK91401 - 3570							
Dimethyldiethyl lead	ND	4.00	ug/Kg wet				
Methyltriethyl lead	ND	4.00	ug/Kg wet				
Tetraethyl lead	ND	4.00	ug/Kg wet				
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet				
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet				
2,6,10-trimethylpentadecane (1650)	6.15	4.00	ug/Kg wet				
C-17	25.4	4.00	ug/Kg wet				
Pristane	17.4	4.00	ug/Kg wet				
C-18	18.0	4.00	ug/Kg wet				
Phytane	22.4	4.00	ug/Kg wet				
Carbazole	ND	4.00	ug/Kg wet				
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet				
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet				
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
3-Methylphenanthrene	ND	4.00	ug/Kg wet				
2-Methylphenanthrene	ND	4.00	ug/Kg wet				
2-Methylanthracene	ND	4.00	ug/Kg wet				
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet				
1-Methylphenanthrene	ND	4.00	ug/Kg wet				
Surrogate: Toluene-D8	*546*		ug/Kg wet	*400.0*	*137*	*50-120*	*S+*
Surrogate: Naphthalene-d8	*458*		ug/Kg wet	*400.0*	*115*	*50-120*	
Surrogate: Phenanthrene-d10	*434*		ug/Kg wet	*400.0*	*109*	*50-120*	
Surrogate: Perylene-d12	*393*		ug/Kg wet	*400.0*	*98*	*50-120*	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190056

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FK91401 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	412	4.00	ug/Kg wet	400.0		103	60-130			
Methylcyclohexane	337	4.00	ug/Kg wet	400.0		84	60-130			
Toluene	474	4.00	ug/Kg wet	400.0		119	60-130			
Ethylbenzene	464	4.00	ug/Kg wet	400.0		116	60-130			
m,p-Xylene	461	4.00	ug/Kg wet	400.0		115	60-130			
Styrene	435	4.00	ug/Kg wet	400.0		109	60-130			
o-Xylene	470	4.00	ug/Kg wet	400.0		117	60-130			
Isopropylbenzene	456	4.00	ug/Kg wet	400.0		114	60-130			
n-Propylbenzene	464	4.00	ug/Kg wet	400.0		116	60-130			
1,3,5-Trimethylbenzene	453	4.00	ug/Kg wet	400.0		113	60-130			
1,2,3-Trimethylbenzene	466	4.00	ug/Kg wet	400.0		117	60-130			
1,2,4-Trimethylbenzene	461	4.00	ug/Kg wet	400.0		115	60-130			
t-Butylbenzene	448	4.00	ug/Kg wet	400.0		112	60-130			
sec-Butylbenzene	458	4.00	ug/Kg wet	400.0		115	60-130			
p-Isopropyltoluene	460	4.00	ug/Kg wet	400.0		115	60-130			
n-Butylbenzene	454	4.00	ug/Kg wet	400.0		113	60-130			
trans-Decalin	447	4.00	ug/Kg wet	400.0		112	60-130			
cis-Decalin	438	4.00	ug/Kg wet	400.0		110	60-130			
Benzo(b)thiophene	443	4.00	ug/Kg wet	400.0		111	60-130			
Naphthalene	448	4.00	ug/Kg wet	400.0		112	60-130			
2-Methylnaphthalene	412	4.00	ug/Kg wet	400.0		103	60-130			
1-Methylnaphthalene	418	4.00	ug/Kg wet	400.0		104	60-130			
Biphenyl	413	4.00	ug/Kg wet	400.0		103	60-130			
Acenaphthylene	379	4.00	ug/Kg wet	400.0		95	60-130			
Acenaphthene	409	4.00	ug/Kg wet	400.0		102	60-130			
Dibenzofuran	414	4.00	ug/Kg wet	400.0		103	60-130			
Fluorene	390	4.00	ug/Kg wet	400.0		97	60-130			
Dibenzothiophene	422	4.00	ug/Kg wet	400.0		105	60-130			
Phenanthrene	412	4.00	ug/Kg wet	400.0		103	60-130			
Anthracene	376	4.00	ug/Kg wet	400.0		94	60-130			
Retene	317	4.00	ug/Kg wet	400.0		79	60-130			
Benzo(b)naphtho(2,1-d)thiophene	373	4.00	ug/Kg wet	400.0		93	60-130			
Fluoranthene	380	4.00	ug/Kg wet	400.0		95	60-130			
Pyrene	383	4.00	ug/Kg wet	400.0		96	60-130			
Benz(a)anthracene	343	4.00	ug/Kg wet	400.0		86	60-130			
Chrysene/triphenylene	368	4.00	ug/Kg wet	400.0		92	60-130			
Benzo(b)fluoranthene	341	4.00	ug/Kg wet	400.0		85	60-130			
Benzo(j/k)fluoranthene	356	4.00	ug/Kg wet	400.0		89	60-130			
Benzo(e)pyrene	350	4.00	ug/Kg wet	400.0		87	60-130			
Benzo(a)pyrene	328	4.00	ug/Kg wet	400.0		82	60-130			
Perylene	337	4.00	ug/Kg wet	400.0		84	60-130			
Indeno(1,2,3-cd)pyrene	312	4.00	ug/Kg wet	400.0		78	60-130			
Dibenzo(a,h)anthracene	339	4.00	ug/Kg wet	400.0		85	60-130			
Benzo(g,h,i)perylene	348	4.00	ug/Kg wet	400.0		87	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190056

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FK91401 - 3570						
Coronene	375	4.00	ug/Kg wet	400.0	94	60-130
Tetraethyl lead	407	4.00	ug/Kg wet	400.0	102	60-130
Pristane	427	4.00	ug/Kg wet	400.0	107	60-130
Phytane	418	4.00	ug/Kg wet	400.0	104	60-130
Surrogate: Toluene-D8	*476*		ug/Kg wet	*400.0*	*119*	*50-120*
Surrogate: Naphthalene-d8	*457*		ug/Kg wet	*400.0*	*114*	*50-120*
Surrogate: Phenanthrene-d10	*434*		ug/Kg wet	*400.0*	*109*	*50-120*
Surrogate: Perylene-d12	*338*		ug/Kg wet	*400.0*	*85*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190056

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FK91401 - 3570

Duplicate **Source: F190056-12** **D+**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	109	32.5	ug/Kg dry		113			4	50	
C1-Benzene	148	32.5	ug/Kg dry		138			7	50	
C2-Benzenes	160	32.5	ug/Kg dry		160			0.05	50	
C3-Benzenes	63.2	32.5	ug/Kg dry		48.3			27	50	
C4-Benzenes	58.3	32.5	ug/Kg dry		56.6			3	50	
C5-Benzenes	37.4	32.5	ug/Kg dry		33.1			12	50	
Methylcyclohexane	ND	32.5	ug/Kg dry		ND				50	
Toluene	223	32.5	ug/Kg dry		193			14	50	
Ethylbenzene	28.2	32.5	ug/Kg dry		25.1			12	50	J
m,p-Xylene	250	32.5	ug/Kg dry		249			0.3	50	
Styrene	91.5	32.5	ug/Kg dry		71.2			25	50	
o-Xylene	18.6	32.5	ug/Kg dry		ND				50	J
Isopropylbenzene	ND	32.5	ug/Kg dry		ND				50	
n-Propylbenzene	ND	32.5	ug/Kg dry		ND				50	
1,3,5-Trimethylbenzene	ND	32.5	ug/Kg dry		ND				50	
1,2,3-Trimethylbenzene	ND	32.5	ug/Kg dry		ND				50	
1,2,4-Trimethylbenzene	33.4	32.5	ug/Kg dry		19.3			54	50	
t-Butylbenzene	ND	32.5	ug/Kg dry		ND				50	
sec-Butylbenzene	ND	32.5	ug/Kg dry		ND				50	
p-Isopropyltoluene	ND	32.5	ug/Kg dry		ND				50	
n-Butylbenzene	ND	32.5	ug/Kg dry		ND				50	
trans-Decalin	52.3	32.5	ug/Kg dry		23.1			78	50	
cis-Decalin	ND	32.5	ug/Kg dry		ND				50	
C1-Decalins	93.7	32.5	ug/Kg dry		45.8			69	50	
C2-Decalins	118	32.5	ug/Kg dry		71.7			49	50	
C3-Decalins	96.3	32.5	ug/Kg dry		49.8			64	50	
C4-Decalins	149	32.5	ug/Kg dry		82.1			58	50	
Benzo(b)thiophene	53.1	32.5	ug/Kg dry		48.2			10	50	
C1-Benzo(b)thiophenes	58.3	32.5	ug/Kg dry		57.0			2	50	
C2-Benzo(b)thiophenes	103	32.5	ug/Kg dry		81.0			24	50	
C3-Benzo(b)thiophenes	59.6	32.5	ug/Kg dry		49.4			19	50	
C4-Benzo(b)thiophenes	28.0	32.5	ug/Kg dry		17.0			49	50	J
Naphthalene	604	32.5	ug/Kg dry		620			3	50	
2-Methylnaphthalene	210	32.5	ug/Kg dry		252			18	50	
1-Methylnaphthalene	169	32.5	ug/Kg dry		213			23	50	
C1-Naphthalenes	233	32.5	ug/Kg dry		287			21	50	
C2-Naphthalenes	594	32.5	ug/Kg dry		534			11	50	
C3-Naphthalenes	361	32.5	ug/Kg dry		278			26	50	
C4-Naphthalenes	174	32.5	ug/Kg dry		128			31	50	
Biphenyl	122	32.5	ug/Kg dry		134			9	50	
Acenaphthylene	3480	32.5	ug/Kg dry		2610			29	50	
Acenaphthene	4860	32.5	ug/Kg dry		3440			34	50	
Dibenzofuran	172	32.5	ug/Kg dry		168			3	50	
Fluorene	1440	32.5	ug/Kg dry		1430			1	50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190056

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FK91401 - 3570						
C1-Fluorenes	485	32.5	ug/Kg dry	406	18	50
C2-Fluorenes	282	32.5	ug/Kg dry	234	19	50
C3-Fluorenes	341	32.5	ug/Kg dry	286	18	50
Dibenzothiophene	2040	32.5	ug/Kg dry	1730	17	50
C1-Dibenzothiophenes	1030	32.5	ug/Kg dry	857	18	50
C2-Dibenzothiophenes	539	32.5	ug/Kg dry	435	21	50
C3-Dibenzothiophenes	278	32.5	ug/Kg dry	197	34	50
C4-Dibenzothiophenes	149	32.5	ug/Kg dry	89.5	50	50
Phenanthrene	15100	32.5	ug/Kg dry	12700	18	50
Anthracene	4300	32.5	ug/Kg dry	4520	5	50
C1-Phenanthrenes/Anthracenes	4340	32.5	ug/Kg dry	3820	13	50
C2-Phenanthrenes/Anthracenes	1350	32.5	ug/Kg dry	1250	8	50
C3-Phenanthrenes/Anthracenes	445	32.5	ug/Kg dry	366	20	50
C4-Phenanthrenes/Anthracenes	195	32.5	ug/Kg dry	154	23	50
Retene	101	32.5	ug/Kg dry	103	2	50
Benzo(b)naphtho(2,1-d)thiophene	1830	32.5	ug/Kg dry	1260	37	50
C0-Benzonaphthothiophenes	3560	32.5	ug/Kg dry	2440	37	50
C1-Benzonaphthothiophenes	962	32.5	ug/Kg dry	707	31	50
C2-Benzonaphthothiophenes	421	32.5	ug/Kg dry	347	19	50
C3-Benzonaphthothiophenes	444	32.5	ug/Kg dry	350	24	50
C4-Benzonaphthothiophenes	134	32.5	ug/Kg dry	116	15	50
Fluoranthene	21700	32.5	ug/Kg dry	16900	25	50
Pyrene	31300	32.5	ug/Kg dry	24400	25	50
C1-Fluoranthenes/Pyrenes	9190	32.5	ug/Kg dry	7900	15	50
C2-Fluoranthenes/Pyrenes	1780	32.5	ug/Kg dry	1570	12	50
C3-Fluoranthenes/Pyrenes	535	32.5	ug/Kg dry	468	13	50
Benzo(b)fluorene	1170	32.5	ug/Kg dry	987	17	50
Benzo(c)fluorene	457	32.5	ug/Kg dry	379	19	50
2-Methylpyrene	1270	32.5	ug/Kg dry	1090	15	50
4-Methylpyrene	1150	32.5	ug/Kg dry	959	18	50
1-Methylpyrene	1260	32.5	ug/Kg dry	1060	17	50
Benz(a)anthracene	10400	32.5	ug/Kg dry	8160	24	50
Chrysene/triphenylene	9800	32.5	ug/Kg dry	7500	27	50
C1-Benzo(a)anthracenes/Chrysenes	2660	32.5	ug/Kg dry	2370	12	50
C2-Benzo(a)anthracenes/Chrysenes	865	32.5	ug/Kg dry	794	9	50
C3-Benzo(a)anthracenes/Chrysenes	287	32.5	ug/Kg dry	302	5	50
C4-Benzo(a)anthracenes/Chrysenes	257	32.5	ug/Kg dry	194	28	50
Benzo(b)fluoranthene	7380	32.5	ug/Kg dry	5590	28	50
Benzo(j/k)fluoranthene	8990	32.5	ug/Kg dry	6450	33	50
Benzo(e)pyrene	8660	32.5	ug/Kg dry	6000	36	50
Benzo(a)pyrene	14600	32.5	ug/Kg dry	10400	33	50
Perylene	2460	32.5	ug/Kg dry	1730	35	50
Indeno(1,2,3-cd)pyrene	8190	32.5	ug/Kg dry	5630	37	50
Dibenzo(a,h)anthracene	1550	32.5	ug/Kg dry	1090	34	50
Benzo(g,h,i)perylene	9080	32.5	ug/Kg dry	6090	39	50
Coronene	2880	32.5	ug/Kg dry	1990	37	50
Tetramethyl lead	ND	32.5	ug/Kg dry	ND		50
Trimethylethyl lead	ND	32.5	ug/Kg dry	ND		50

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190056

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FK91401 - 3570									
Dimethyldiethyl lead	ND	32.5	ug/Kg dry		ND			50	
Methyltriethyl lead	ND	32.5	ug/Kg dry		ND			50	
Tetraethyl lead	ND	32.5	ug/Kg dry		ND			50	
2,6,10-trimethyldodecane (1380)	138	32.5	ug/Kg dry		62.1		76	50	
2,6,10-trimethyltridecane (1470)	260	32.5	ug/Kg dry		147		56	50	
2,6,10-trimethylpentadecane (1650)	204	32.5	ug/Kg dry		79.1		88	50	
C-17	343	32.5	ug/Kg dry		284		19	50	
Pristane	489	32.5	ug/Kg dry		179		93	50	
C-18	180	32.5	ug/Kg dry		143		23	50	
Phytane	511	32.5	ug/Kg dry		213		82	50	
Carbazole	175	32.5	ug/Kg dry		150		16	50	
2,6-Dimethylnaphthalene	97.6	32.5	ug/Kg dry		99.7		2	50	
2,3,5-Trimethylnaphthene	25.8	32.5	ug/Kg dry		ND			50	J
4-Methyldibenzothiophene	377	32.5	ug/Kg dry		316		18	50	
2/3-Methyldibenzothiophene	365	32.5	ug/Kg dry		308		17	50	
1-Methyldibenzothiophene	114	32.5	ug/Kg dry		92.9		21	50	
3-Methylphenanthrene	996	32.5	ug/Kg dry		861		15	50	
2-Methylphenanthrene	1120	32.5	ug/Kg dry		958		15	50	
2-Methylanthracene	476	32.5	ug/Kg dry		441		8	50	
4/9-Methylphenanthrene	1020	32.5	ug/Kg dry		886		14	50	
1-Methylphenanthrene	686	32.5	ug/Kg dry		617		11	50	
Surrogate: Toluene-D8	*606*		ug/Kg dry	*649.2*		*93*	*50-120*		
Surrogate: Naphthalene-d8	*621*		ug/Kg dry	*649.2*		*96*	*50-120*		
Surrogate: Phenanthrene-d10	*646*		ug/Kg dry	*649.2*		*99*	*50-120*		
Surrogate: Perylene-d12	*590*		ug/Kg dry	*649.2*		*91*	*50-120*		

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F190056

Notes and Definitions

U	Analyte included in the analysis, but not detected
SM	Surrogate recovery(ies) outside of criteria due to matrix (UCM/coelution/matrix is present) (SM).
S+	Surrogate recovery(ies) above upper control limit (S+).
J	Reported between MDL and MRL
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190056

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) F1900576

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP
Project Location: Amesbury, MA
Project Number: 1804576
Project Manager: Ryan Hoffman
Send Report to: Ryan Hoffman
Send EDD to: labdata@geiconsultants.com

Preservative

None	None						

Sample Handling

Samples Field Filtered: YES NO (NA)

Sampled Shipped With Ice: (YES) NO

MCP PRESUMPTIVE CERTAINTY REQUIRED -- (YES) NO

If Yes, Are MCP Analytical Methods Required? (YES) NO NA
Are Drinking Water Samples Submitted? YES (NO) NA
If Yes, Have Drinking Water Sampling Requirements Been Met? YES NO (NA)

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Parent and Alkylated MAHs & PAHs 8270**	TOCs by Lloyd-Kahn	Sample Specific Remarks
1	1804576-SS710-S1	11/11/19	10:30	Soil	1	BFM	X	X	
2	1804576-SS710-S2	11/11/19	10:32	Soil	1	BFM	X	X	
3	1804576-SS711-S1	11/11/19	11:27	Soil	1	BFM	X	X	
4	1804576-SS711-S2	11/11/19	11:31	Soil	1	BFM	X	X	
5	1804576-SS712-S1	11/11/19	12:11	Soil	1	BFM	X	X	
6	1804576-SS712-S2	11/11/19	12:14	Soil	1	BFM	X	X	
7	1804576-SS716-S1	11/11/19	12:47	Soil	1	BFM	X	X	
8	1804576-SS716-S2	11/11/19	12:50	Soil	1	BFM	X	X	
9	1804576-SS717-S1	11/11/19	13:46	Soil	1	BFM	X	X	
10	1804576-SS717-S3	11/11/19	13:54	Soil	1	BFM	X	X	
11	1804576-SS718-S5	11/11/19	15:04	Soil	1	BFM	X	X	
12	1804576-SS719-S1	11/11/19	15:29	Soil	1	BFM	X	X	

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

	Date	Time	
Relinquished by sampler: (signature) 1.	11/11/19	1710	Received by: (signature) 1. GEI Sample Fridge
Relinquished by: (signature) 2. GEI Sample Fridge	11/13	1240	Received by: (signature) 2.
Relinquished by: (signature) 3.	11/13	1240	Received by: (signature) 3.
Relinquished by: (signature) 4.	11/13	17:47	Received by: (signature) 4. 11/13/19 1747

Turnaround Time (Business days):

Normal __X__ Other ____
10-Day ____ 7-Day ____
5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

**Parent and Alkylated MAHs & PAHs (34) by GC/MS/SIM/SCAN

Ice temp: 1.8

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI

Shipped/Delivered Via: ESS Courier

ESS Project ID: F190056
Date Received: 11/13/2019
Project Due Date: 11/20/2019
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 1.8 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / (NA)
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / (No)
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / (No)
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608.3 Pesticides)
1					4oz Jar - Unpres	NP	
2					4oz Jar - Unpres	NP	
3					4oz Jar - Unpres	NP	
4					4oz Jar - Unpres	NP	
5					4oz Jar - Unpres	NP	
6					4oz Jar - Unpres	NP	
7					4oz Jar - Unpres	NP	
8					4oz Jar - Unpres	NP	
9					4oz Jar - Unpres	NP	
10					4oz Jar - Unpres	NP	
11					4oz Jar - Unpres	NP	
12					4oz Jar - Unpres	NP	

2nd Review
All containers scanned into storage/lab Initials:
Are barcode labels on correct containers? Yes / No
Are all necessary stickers attached? Yes / No

Completed By: Date & Time: 11/13/19 2033
Reviewed By: Date & Time: 11/14/19 08:13
Delivered

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: F190057

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 12:53 pm, Dec 02, 2019

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses
ESS Laboratory - Cranston, RI TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190057

SAMPLE RECEIPT

The following samples were received on November 13, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F190057-01	1804576-SS729-S3	Soil	8270 Mod, TOC-LK
F190057-02	1804576-SS729-S4	Soil	8270 Mod, TOC-LK
F190057-03	1804576-SS724-S3	Soil	8270 Mod, TOC-LK
F190057-04	1804576-SS726-S2	Soil	8270 Mod, TOC-LK
F190057-05	1804576-SS720-S1	Soil	8270 Mod, TOC-LK
F190057-06	1804576-SS720-S2	Soil	8270 Mod, TOC-LK
F190057-07	1804576-SS721-S1	Soil	8270 Mod, TOC-LK
F190057-08	1804576-SS721-S2	Soil	8270 Mod, TOC-LK
F190057-09	1804576-SS722-S1	Soil	8270 Mod, TOC-LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190057

PROJECT NARRATIVE

8270D (SIM) Semi-Volatile Organic Compounds

F190057-02	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , Benzene , C-17 , C-18 , Phytane , Pristane
F190057-03	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , Benzene , C-17 , C-18 , Phytane , Pristane
F190057-05	**Present in Method Blank (B).**
	Benzene
F190057-06	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , Benzene , C-17 , C-18 , Phytane , Pristane
F190057-07	**Surrogate recovery(ies) outside of criteria due to matrix (UCM/coelution/matrix is present) (SM).**
	Perylene-d12 (129% @ 50-120%)
F190057-08	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , Benzene , C-17 , C-18 , Phytane , Pristane
F190057-09	**Present in Method Blank (B).**
	Benzene
FK91402-DUP2	**Relative percent difference for duplicate is outside of criteria (D+).**
	C3-Dibenzothiophenes (56% @ 50%), Retene (93% @ 50%)

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190057

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS729-S3
Date Sampled: 11/12/19 10:07
Percent Solids: 59
Initial Volume: 4.05
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**288** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
C1-Benzene	**782** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
C2-Benzenes	**782** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
C3-Benzenes	**2890** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
C4-Benzenes	**9610** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
C5-Benzenes	**5840** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
Methylcyclohexane	**66.8** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
Toluene	**1180** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
Ethylbenzene	**518** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
m,p-Xylene	**726** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
Styrene	**952** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
o-Xylene	**165** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
Isopropylbenzene	**215** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
n-Propylbenzene	**174** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
1,3,5-Trimethylbenzene	**621** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
1,2,3-Trimethylbenzene	**861** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
1,2,4-Trimethylbenzene	**1790** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
t-Butylbenzene	**249** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
sec-Butylbenzene	**80.1** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
p-Isopropyltoluene	**524** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
n-Butylbenzene	ND (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
trans-Decalin	**398** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
cis-Decalin	**115** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
C1-Decalins	**1380** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
C2-Decalins	**2720** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
C3-Decalins	**2690** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
C4-Decalins	**4340** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
Benzo(b)thiophene	**700** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
C1-Benzo(b)thiophenes	**2910** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
C2-Benzo(b)thiophenes	**6660** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
C3-Benzo(b)thiophenes	**4730** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
C4-Benzo(b)thiophenes	**1530** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS729-S3
Date Sampled: 11/12/19 10:07
Percent Solids: 59
Initial Volume: 4.05
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**34000** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
2-Methylnaphthalene	**11100** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
1-Methylnaphthalene	**113000** (838)	419	8270 Mod		100	11/17/19 11:28	F9K0002	FK91402
C1-Naphthalenes	**72500** (838)	419	8270 Mod		100	11/17/19 11:28	F9K0002	FK91402
C2-Naphthalenes	**165000** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
C3-Naphthalenes	**78700** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
C4-Naphthalenes	**24200** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
Biphenyl	**4720** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
Acenaphthylene	**18500** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
Acenaphthene	**266000** (838)	419	8270 Mod		100	11/17/19 11:28	F9K0002	FK91402
Dibenzofuran	**10500** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
Fluorene	**118000** (838)	419	8270 Mod		100	11/17/19 11:28	F9K0002	FK91402
C1-Fluorenes	**54100** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
C2-Fluorenes	**33700** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
C3-Fluorenes	**11800** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
Dibenzothiophene	**31200** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
C1-Dibenzothiophenes	**27200** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
C2-Dibenzothiophenes	**19400** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
C3-Dibenzothiophenes	**9010** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
C4-Dibenzothiophenes	**3160** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
Phenanthrene	**572000** (838)	419	8270 Mod		100	11/17/19 11:28	F9K0002	FK91402
Anthracene	**181000** (838)	419	8270 Mod		100	11/17/19 11:28	F9K0002	FK91402
C1-Phenanthrenes/Anthracenes	**215000** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
C2-Phenanthrenes/Anthracenes	**81200** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
C3-Phenanthrenes/Anthracenes	**22800** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
C4-Phenanthrenes/Anthracenes	**6530** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
Retene	**1440** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
Benzo(b)naphtho(2,1-d)thiophene	**11700** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
C0-Benzonaphthothiophenes	**21200** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
C1-Benzonaphthothiophenes	**11100** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
C2-Benzonaphthothiophenes	**5380** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
C3-Benzonaphthothiophenes	**3800** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS729-S3
Date Sampled: 11/12/19 10:07
Percent Solids: 59
Initial Volume: 4.05
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**693** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
Fluoranthene	**289000** (838)	419	8270 Mod		100	11/17/19 11:28	F9K0002	FK91402
Pyrene	**419000** (838)	419	8270 Mod		100	11/17/19 11:28	F9K0002	FK91402
C1-Fluoranthenes/Pyrenes	**182000** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
C2-Fluoranthenes/Pyrenes	**45200** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
C3-Fluoranthenes/Pyrenes	**13200** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
Benzo(b)fluorene	**21000** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
Benzo(c)fluorene	**10600** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
2-Methylpyrene	**23100** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
4-Methylpyrene	**20500** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
1-Methylpyrene	**24100** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
Benz(a)anthracene	**120000** (838)	419	8270 Mod		100	11/17/19 11:28	F9K0002	FK91402
Chrysene/triphenylene	**116000** (838)	419	8270 Mod		100	11/17/19 11:28	F9K0002	FK91402
C1-Benzo(a)anthracenes/Chrysenes	**52900** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
C2-Benzo(a)anthracenes/Chrysenes	**19300** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
C3-Benzo(a)anthracenes/Chrysenes	**6320** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
C4-Benzo(a)anthracenes/Chrysenes	**2050** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
Benzo(b)fluoranthene	**56100** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
Benzo(j/k)fluoranthene	**63200** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
Benzo(e)pyrene	**58600** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
Benzo(a)pyrene	**107000** (838)	419	8270 Mod		100	11/17/19 11:28	F9K0002	FK91402
Perylene	**18400** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
Indeno(1,2,3-cd)pyrene	**47800** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
Dibenzo(a,h)anthracene	**11000** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
Benzo(g,h,i)perylene	**49500** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
Coronene	**13300** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
Tetramethyl lead	ND (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
Trimethylethyl lead	ND (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
Dimethyldiethyl lead	ND (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
Methyltriethyl lead	ND (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
Tetraethyl lead	ND (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
2,6,10-trimethyldodecane (1380)	**2960** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS729-S3
Date Sampled: 11/12/19 10:07
Percent Solids: 59
Initial Volume: 4.05
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**4870** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
2,6,10-trimethylpentadecane (1650)	**6110** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
C-17	**1000** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
Pristane	**12700** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
C-18	**851** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
Phytane	**10900** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
Carbazole	**430** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
2,6-Dimethylnaphthalene	**31900** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
2,3,5-Trimethylnaphthene	**4980** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
4-Methyldibenzothiophene	**12000** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
2/3-Methyldibenzothiophene	**9590** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
1-Methyldibenzothiophene	**2620** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
3-Methylphenanthrene	**50100** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
2-Methylphenanthrene	**53900** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
2-Methylanthracene	**27100** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
4/9-Methylphenanthrene	**45800** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402
1-Methylphenanthrene	**35900** (41.9)	21.0	8270 Mod		5	11/16/19 13:16	F9K0002	FK91402

	%Recovery	*Qualifier*	*Limits*
Surrogate: Toluene-D8	*94 %*		*50-120*
Surrogate: Naphthalene-d8	*95 %*		*50-120*
Surrogate: Phenanthrene-d10	*96 %*		*50-120*
Surrogate: Perylene-d12	*119 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS729-S3
Date Sampled: 11/12/19 10:07
Percent Solids: 59

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**81700** (94.4)		TOC-LK		1	CCP	11/20/19 15:20	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS729-S4
Date Sampled: 11/12/19 10:10
Percent Solids: 80
Initial Volume: 6.33
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**B 5.56** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C1-Benzene	**J 2.03** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C2-Benzenes	**J 2.25** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C3-Benzenes	**J 2.86** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C4-Benzenes	**J 3.53** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C5-Benzenes	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
Methylcyclohexane	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
Toluene	**J 2.75** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
Ethylbenzene	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
m,p-Xylene	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
Styrene	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
o-Xylene	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
Isopropylbenzene	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
n-Propylbenzene	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
1,3,5-Trimethylbenzene	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
1,2,3-Trimethylbenzene	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
1,2,4-Trimethylbenzene	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
t-Butylbenzene	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
sec-Butylbenzene	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
p-Isopropyltoluene	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
n-Butylbenzene	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
trans-Decalin	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
cis-Decalin	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C1-Decalins	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C2-Decalins	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C3-Decalins	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C4-Decalins	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
Benzo(b)thiophene	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C1-Benzo(b)thiophenes	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C2-Benzo(b)thiophenes	**J 2.76** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C3-Benzo(b)thiophenes	**J 2.12** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C4-Benzo(b)thiophenes	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS729-S4
Date Sampled: 11/12/19 10:10
Percent Solids: 80
Initial Volume: 6.33
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**5.15** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
2-Methylnaphthalene	**J 3.68** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
1-Methylnaphthalene	**7.17** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C1-Naphthalenes	**6.88** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C2-Naphthalenes	**13.2** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C3-Naphthalenes	**9.42** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C4-Naphthalenes	**4.87** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
Biphenyl	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
Acenaphthylene	**20.1** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
Acenaphthene	**14.3** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
Dibenzofuran	**J 2.05** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
Fluorene	**12.0** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C1-Fluorenes	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C2-Fluorenes	**6.42** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C3-Fluorenes	**4.03** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
Dibenzothiophene	**5.77** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C1-Dibenzothiophenes	**5.93** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C2-Dibenzothiophenes	**5.28** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C3-Dibenzothiophenes	**J 3.15** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C4-Dibenzothiophenes	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
Phenanthrene	**90.8** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
Anthracene	**28.1** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C1-Phenanthrenes/Anthracenes	**41.3** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C2-Phenanthrenes/Anthracenes	**20.7** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C3-Phenanthrenes/Anthracenes	**7.80** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C4-Phenanthrenes/Anthracenes	**J 3.00** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
Retene	**J 3.25** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
Benzo(b)naphtho(2,1-d)thiophene	**5.73** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C0-Benzonaphthothiophenes	**11.6** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C1-Benzonaphthothiophenes	**5.66** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C2-Benzonaphthothiophenes	**J 3.40** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C3-Benzonaphthothiophenes	**J 3.33** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS729-S4
Date Sampled: 11/12/19 10:10
Percent Solids: 80
Initial Volume: 6.33
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
Fluoranthene	**128** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
Pyrene	**114** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C1-Fluoranthenes/Pyrenes	**54.8** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C2-Fluoranthenes/Pyrenes	**19.9** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C3-Fluoranthenes/Pyrenes	**8.36** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
Benzo(b)fluorene	**6.71** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
Benzo(c)fluorene	**J 3.72** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
2-Methylpyrene	**6.50** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
4-Methylpyrene	**4.98** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
1-Methylpyrene	**4.36** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
Benz(a)anthracene	**61.1** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
Chrysene/triphenylene	**55.2** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C1-Benzo(a)anthracenes/Chrysenes	**22.9** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C2-Benzo(a)anthracenes/Chrysenes	**11.4** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C3-Benzo(a)anthracenes/Chrysenes	**4.93** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C4-Benzo(a)anthracenes/Chrysenes	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
Benzo(b)fluoranthene	**40.3** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
Benzo(j/k)fluoranthene	**46.2** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
Benzo(e)pyrene	**31.8** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
Benzo(a)pyrene	**54.2** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
Perylene	**92.6** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
Indeno(1,2,3-cd)pyrene	**32.5** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
Dibenzo(a,h)anthracene	**7.24** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
Benzo(g,h,i)perylene	**27.5** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
Coronene	**8.29** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
Tetramethyl lead	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
Trimethylethyl lead	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
Dimethyldiethyl lead	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
Methyltriethyl lead	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
Tetraethyl lead	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
2,6,10-trimethyldodecane (1380)	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS729-S4
Date Sampled: 11/12/19 10:10
Percent Solids: 80
Initial Volume: 6.33
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**4.81** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
2,6,10-trimethylpentadecane (1650)	**B 11.5** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C-17	**B 40.7** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
Pristane	**B 26.2** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
C-18	**B 33.1** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
Phytane	**B 33.9** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
Carbazole	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
2,6-Dimethylnaphthalene	**J 2.23** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
2,3,5-Trimethylnaphthene	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
4-Methyldibenzothiophene	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
2/3-Methyldibenzothiophene	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
1-Methyldibenzothiophene	ND (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
3-Methylphenanthrene	**9.04** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
2-Methylphenanthrene	**11.2** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
2-Methylanthracene	**6.06** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
4/9-Methylphenanthrene	**8.33** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402
1-Methylphenanthrene	**5.73** (3.96)	1.98	8270 Mod		1	11/16/19 14:54	F9K0002	FK91402

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*95 %*		*50-120*
Surrogate: Naphthalene-d8	*92 %*		*50-120*
Surrogate: Phenanthrene-d10	*95 %*		*50-120*
Surrogate: Perylene-d12	*81 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS729-S4
Date Sampled: 11/12/19 10:10
Percent Solids: 80

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**1270** (92.9)		TOC-LK		1	CCP	11/20/19 15:53	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS724-S3
Date Sampled: 11/12/19 11:23
Percent Solids: 67
Initial Volume: 6.23
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**B 10.9** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C1-Benzene	**14.0** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C2-Benzenes	**14.2** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C3-Benzenes	**J 3.73** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C4-Benzenes	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C5-Benzenes	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
Methylcyclohexane	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
Toluene	**22.5** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
Ethylbenzene	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
m,p-Xylene	**22.4** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
Styrene	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
o-Xylene	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
Isopropylbenzene	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
n-Propylbenzene	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
1,3,5-Trimethylbenzene	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
1,2,3-Trimethylbenzene	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
1,2,4-Trimethylbenzene	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
t-Butylbenzene	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
sec-Butylbenzene	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
p-Isopropyltoluene	**J 3.67** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
n-Butylbenzene	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
trans-Decalin	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
cis-Decalin	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C1-Decalins	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C2-Decalins	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C3-Decalins	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C4-Decalins	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
Benzo(b)thiophene	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C1-Benzo(b)thiophenes	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C2-Benzo(b)thiophenes	**J 2.61** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C3-Benzo(b)thiophenes	**J 2.59** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C4-Benzo(b)thiophenes	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS724-S3
Date Sampled: 11/12/19 11:23
Percent Solids: 67
Initial Volume: 6.23
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
2-Methylnaphthalene	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
1-Methylnaphthalene	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C1-Naphthalenes	**J 2.49** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C2-Naphthalenes	**10.1** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C3-Naphthalenes	**6.81** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C4-Naphthalenes	**J 4.11** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
Biphenyl	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
Acenaphthylene	**10.7** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
Acenaphthene	**6.95** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
Dibenzofuran	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
Fluorene	**5.53** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C1-Fluorenes	**5.69** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C2-Fluorenes	**5.55** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C3-Fluorenes	**J 4.36** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
Dibenzothiophene	**J 2.79** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C1-Dibenzothiophenes	**J 4.46** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C2-Dibenzothiophenes	**5.83** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C3-Dibenzothiophenes	**J 4.57** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C4-Dibenzothiophenes	**J 2.76** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
Phenanthrene	**33.2** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
Anthracene	**9.81** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C1-Phenanthrenes/Anthracenes	**22.5** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C2-Phenanthrenes/Anthracenes	**16.4** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C3-Phenanthrenes/Anthracenes	**6.08** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C4-Phenanthrenes/Anthracenes	**J 3.82** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
Retene	**5.25** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
Benzo(b)naphtho(2,1-d)thiophene	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C0-Benzonaphthothiophenes	**J 4.50** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C1-Benzonaphthothiophenes	**J 3.68** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C2-Benzonaphthothiophenes	**J 4.22** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C3-Benzonaphthothiophenes	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS724-S3
Date Sampled: 11/12/19 11:23
Percent Solids: 67
Initial Volume: 6.23
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
Fluoranthene	**35.6** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
Pyrene	**55.3** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C1-Fluoranthenes/Pyrenes	**28.1** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C2-Fluoranthenes/Pyrenes	**12.8** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C3-Fluoranthenes/Pyrenes	**7.03** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
Benzo(b)fluorene	**J 3.16** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
Benzo(c)fluorene	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
2-Methylpyrene	**J 3.69** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
4-Methylpyrene	**J 3.17** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
1-Methylpyrene	**J 2.89** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
Benz(a)anthracene	**15.1** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
Chrysene/triphenylene	**15.6** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C1-Benzo(a)anthracenes/Chrysenes	**10.7** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C2-Benzo(a)anthracenes/Chrysenes	**6.16** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C3-Benzo(a)anthracenes/Chrysenes	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C4-Benzo(a)anthracenes/Chrysenes	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
Benzo(b)fluoranthene	**9.41** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
Benzo(j/k)fluoranthene	**11.7** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
Benzo(e)pyrene	**11.3** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
Benzo(a)pyrene	**16.9** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
Perylene	**192** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
Indeno(1,2,3-cd)pyrene	**8.06** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
Dibenzo(a,h)anthracene	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
Benzo(g,h,i)perylene	**8.48** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
Coronene	**J 3.61** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
Tetramethyl lead	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
Trimethylethyl lead	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
Dimethyldiethyl lead	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
Methyltriethyl lead	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
Tetraethyl lead	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
2,6,10-trimethyldodecane (1380)	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS724-S3
Date Sampled: 11/12/19 11:23
Percent Solids: 67
Initial Volume: 6.23
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**8.31** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
2,6,10-trimethylpentadecane (1650)	**B 9.56** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C-17	**B 65.8** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
Pristane	**B 21.4** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
C-18	**B 26.7** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
Phytane	**B 28.3** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
Carbazole	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
2,6-Dimethylnaphthalene	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
2,3,5-Trimethylnaphthene	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
4-Methyldibenzothiophene	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
2/3-Methyldibenzothiophene	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
1-Methyldibenzothiophene	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
3-Methylphenanthrene	**4.99** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
2-Methylphenanthrene	**5.21** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
2-Methylanthracene	ND (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
4/9-Methylphenanthrene	**5.57** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402
1-Methylphenanthrene	**J 3.89** (4.81)	2.41	8270 Mod		1	11/16/19 16:31	F9K0002	FK91402

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*101 %*		*50-120*
Surrogate: Naphthalene-d8	*96 %*		*50-120*
Surrogate: Phenanthrene-d10	*77 %*		*50-120*
Surrogate: Perylene-d12	*91 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS724-S3
Date Sampled: 11/12/19 11:23
Percent Solids: 67

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**10800** (94.4)		TOC-LK		1	CCP	11/20/19 17:00	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS726-S2
Date Sampled: 11/12/19 12:05
Percent Solids: 47
Initial Volume: 4.03
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**141** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C1-Benzene	**561** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C2-Benzenes	**698** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C3-Benzenes	**169** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C4-Benzenes	**306** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C5-Benzenes	**187** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
Methylcyclohexane	**46.8** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
Toluene	**854** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
Ethylbenzene	**57.6** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
m,p-Xylene	**1190** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
Styrene	**187** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
o-Xylene	**61.7** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
Isopropylbenzene	**J 9.63** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
n-Propylbenzene	**31.9** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
1,3,5-Trimethylbenzene	**28.0** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
1,2,3-Trimethylbenzene	**41.7** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
1,2,4-Trimethylbenzene	**72.2** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
t-Butylbenzene	**J 7.85** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
sec-Butylbenzene	**J 9.17** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
p-Isopropyltoluene	**50.8** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
n-Butylbenzene	**61.9** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
trans-Decalin	**1130** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
cis-Decalin	**122** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C1-Decalins	**1350** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C2-Decalins	**591** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C3-Decalins	**384** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C4-Decalins	**944** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
Benzo(b)thiophene	**18.0** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C1-Benzo(b)thiophenes	**48.4** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C2-Benzo(b)thiophenes	**100** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C3-Benzo(b)thiophenes	**55.8** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C4-Benzo(b)thiophenes	**53.2** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS726-S2
Date Sampled: 11/12/19 12:05
Percent Solids: 47
Initial Volume: 4.03
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**283** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
2-Methylnaphthalene	**201** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
1-Methylnaphthalene	**135** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C1-Naphthalenes	**210** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C2-Naphthalenes	**613** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C3-Naphthalenes	**547** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C4-Naphthalenes	**561** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
Biphenyl	**156** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
Acenaphthylene	**843** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
Acenaphthene	**579** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
Dibenzofuran	**245** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
Fluorene	**544** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C1-Fluorenes	**311** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C2-Fluorenes	**516** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C3-Fluorenes	**659** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
Dibenzothiophene	**356** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C1-Dibenzothiophenes	**467** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C2-Dibenzothiophenes	**699** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C3-Dibenzothiophenes	**880** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C4-Dibenzothiophenes	**595** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
Phenanthrene	**4660** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
Anthracene	**1450** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C1-Phenanthrenes/Anthracenes	**2500** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C2-Phenanthrenes/Anthracenes	**2060** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C3-Phenanthrenes/Anthracenes	**1320** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C4-Phenanthrenes/Anthracenes	**663** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
Retene	**422** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
Benzo(b)naphtho(2,1-d)thiophene	**714** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C0-Benzonaphthothiophenes	**1370** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C1-Benzonaphthothiophenes	**746** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C2-Benzonaphthothiophenes	**721** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C3-Benzonaphthothiophenes	**600** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS726-S2
Date Sampled: 11/12/19 12:05
Percent Solids: 47
Initial Volume: 4.03
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**304** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
Fluoranthene	**8620** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
Pyrene	**9170** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C1-Fluoranthenes/Pyrenes	**4710** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C2-Fluoranthenes/Pyrenes	**2450** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C3-Fluoranthenes/Pyrenes	**1020** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
Benzo(b)fluorene	**585** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
Benzo(c)fluorene	**206** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
2-Methylpyrene	**659** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
4-Methylpyrene	**642** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
1-Methylpyrene	**499** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
Benz(a)anthracene	**4650** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
Chrysene/triphenylene	**4730** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C1-Benzo(a)anthracenes/Chrysenes	**2090** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C2-Benzo(a)anthracenes/Chrysenes	**1380** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C3-Benzo(a)anthracenes/Chrysenes	**684** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C4-Benzo(a)anthracenes/Chrysenes	**342** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
Benzo(b)fluoranthene	**3170** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
Benzo(j/k)fluoranthene	**3070** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
Benzo(e)pyrene	**2760** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
Benzo(a)pyrene	**3900** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
Perylene	**1170** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
Indeno(1,2,3-cd)pyrene	**2420** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
Dibenzo(a,h)anthracene	**595** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
Benzo(g,h,i)perylene	**2330** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
Coronene	**695** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
Tetramethyl lead	ND (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
Trimethylethyl lead	ND (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
Dimethyldiethyl lead	ND (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
Methyltriethyl lead	ND (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
Tetraethyl lead	ND (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
2,6,10-trimethyldodecane (1380)	**783** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS726-S2
Date Sampled: 11/12/19 12:05
Percent Solids: 47
Initial Volume: 4.03
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**1480** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
2,6,10-trimethylpentadecane (1650)	**842** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C-17	**439** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
Pristane	**2490** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
C-18	**228** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
Phytane	**2160** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
Carbazole	**435** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
2,6-Dimethylnaphthalene	**207** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
2,3,5-Trimethylnaphthene	**37.7** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
4-Methyldibenzothiophene	**173** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
2/3-Methyldibenzothiophene	**154** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
1-Methyldibenzothiophene	**57.3** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
3-Methylphenanthrene	**549** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
2-Methylphenanthrene	**658** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
2-Methylanthracene	**301** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
4/9-Methylphenanthrene	**580** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402
1-Methylphenanthrene	**402** (10.6)	5.30	8270 Mod		1	11/16/19 18:05	F9K0002	FK91402

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*108 %*		*50-120*
Surrogate: Naphthalene-d8	*84 %*		*50-120*
Surrogate: Phenanthrene-d10	*82 %*		*50-120*
Surrogate: Perylene-d12	*74 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS726-S2
Date Sampled: 11/12/19 12:05
Percent Solids: 47

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-04
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**76400** (97.1)		TOC-LK		1	CCP	11/20/19 17:16	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS720-S1
Date Sampled: 11/12/19 12:41
Percent Solids: 57
Initial Volume: 5.11
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **103** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C1-Benzene	**672** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C2-Benzenes	**325** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C3-Benzenes	**286** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C4-Benzenes	**341** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C5-Benzenes	**327** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
Methylcyclohexane	**61.5** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
Toluene	**1010** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
Ethylbenzene	**79.0** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
m,p-Xylene	**462** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
Styrene	**121** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
o-Xylene	**71.9** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
Isopropylbenzene	**8.60** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
n-Propylbenzene	**53.3** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
1,3,5-Trimethylbenzene	**51.5** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
1,2,3-Trimethylbenzene	**63.1** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
1,2,4-Trimethylbenzene	**185** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
t-Butylbenzene	ND (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
sec-Butylbenzene	**13.0** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
p-Isopropyltoluene	**52.9** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
n-Butylbenzene	**99.7** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
trans-Decalin	**1350** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
cis-Decalin	**139** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C1-Decalins	**1730** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C2-Decalins	**2430** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C3-Decalins	**2140** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C4-Decalins	**3240** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
Benzo(b)thiophene	**110** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C1-Benzo(b)thiophenes	**118** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C2-Benzo(b)thiophenes	**223** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C3-Benzo(b)thiophenes	**327** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C4-Benzo(b)thiophenes	**312** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS720-S1
Date Sampled: 11/12/19 12:41
Percent Solids: 57
Initial Volume: 5.11
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**1680** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
2-Methylnaphthalene	**896** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
1-Methylnaphthalene	**583** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C1-Naphthalenes	**914** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C2-Naphthalenes	**1880** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C3-Naphthalenes	**2670** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C4-Naphthalenes	**2450** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
Biphenyl	**356** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
Acenaphthylene	**2170** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
Acenaphthene	**2900** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
Dibenzofuran	**1390** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
Fluorene	**2600** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C1-Fluorenes	**1470** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C2-Fluorenes	**1870** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C3-Fluorenes	**2030** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
Dibenzothiophene	**1720** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C1-Dibenzothiophenes	**1920** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C2-Dibenzothiophenes	**2620** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C3-Dibenzothiophenes	**2450** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C4-Dibenzothiophenes	**1660** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
Phenanthrene	**19900** (137)	68.5	8270 Mod		20	11/17/19 13:02	F9K0002	FK91402
Anthracene	**7380** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C1-Phenanthrenes/Anthracenes	**10500** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C2-Phenanthrenes/Anthracenes	**6160** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C3-Phenanthrenes/Anthracenes	**3100** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C4-Phenanthrenes/Anthracenes	**1560** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
Retene	**216** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
Benzo(b)naphtho(2,1-d)thiophene	**1680** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C0-Benzonaphthothiophenes	**3270** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C1-Benzonaphthothiophenes	**2110** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C2-Benzonaphthothiophenes	**2040** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C3-Benzonaphthothiophenes	**1600** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS720-S1
Date Sampled: 11/12/19 12:41
Percent Solids: 57
Initial Volume: 5.11
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**682** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
Fluoranthene	**31800** (137)	68.5	8270 Mod		20	11/17/19 13:02	F9K0002	FK91402
Pyrene	**38000** (137)	68.5	8270 Mod		20	11/17/19 13:02	F9K0002	FK91402
C1-Fluoranthenes/Pyrenes	**14800** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C2-Fluoranthenes/Pyrenes	**5720** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C3-Fluoranthenes/Pyrenes	**2730** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
Benzo(b)fluorene	**1770** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
Benzo(c)fluorene	**828** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
2-Methylpyrene	**2010** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
4-Methylpyrene	**1950** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
1-Methylpyrene	**1590** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
Benz(a)anthracene	**11400** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
Chrysene/triphenylene	**12200** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C1-Benzo(a)anthracenes/Chrysenes	**6360** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C2-Benzo(a)anthracenes/Chrysenes	**3610** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C3-Benzo(a)anthracenes/Chrysenes	**1950** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C4-Benzo(a)anthracenes/Chrysenes	**1060** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
Benzo(b)fluoranthene	**9320** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
Benzo(j/k)fluoranthene	**9460** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
Benzo(e)pyrene	**8730** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
Benzo(a)pyrene	**11900** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
Perylene	**2970** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
Indeno(1,2,3-cd)pyrene	**8070** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
Dibenzo(a,h)anthracene	**1780** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
Benzo(g,h,i)perylene	**7910** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
Coronene	**2060** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
Tetramethyl lead	ND (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
Trimethylethyl lead	ND (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
Dimethyldiethyl lead	ND (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
Methyltriethyl lead	ND (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
Tetraethyl lead	ND (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
2,6,10-trimethyldodecane (1380)	**3100** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS720-S1
Date Sampled: 11/12/19 12:41
Percent Solids: 57
Initial Volume: 5.11
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**4350** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
2,6,10-trimethylpentadecane (1650)	**4570** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C-17	**452** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
Pristane	**9410** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
C-18	ND (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
Phytane	**9450** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
Carbazole	**2030** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
2,6-Dimethylnaphthalene	**373** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
2,3,5-Trimethylnaphthene	**186** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
4-Methyldibenzothiophene	**700** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
2/3-Methyldibenzothiophene	**650** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
1-Methyldibenzothiophene	**228** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
3-Methylphenanthrene	**2480** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
2-Methylphenanthrene	**2540** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
2-Methylanthracene	**1380** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
4/9-Methylphenanthrene	**2530** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402
1-Methylphenanthrene	**1520** (6.85)	3.43	8270 Mod		1	11/16/19 19:40	F9K0002	FK91402

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*86 %*		*50-120*
Surrogate: Naphthalene-d8	*88 %*		*50-120*
Surrogate: Phenanthrene-d10	*80 %*		*50-120*
Surrogate: Perylene-d12	*82 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS720-S1
Date Sampled: 11/12/19 12:41
Percent Solids: 57

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-05
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**69700** (94.6)		TOC-LK		1	CCP	11/20/19 17:33	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS720-S2
Date Sampled: 11/12/19 12:45
Percent Solids: 64
Initial Volume: 5.23
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**B 13.0** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C1-Benzene	**97.7** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C2-Benzenes	**55.1** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C3-Benzenes	**21.4** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C4-Benzenes	**29.4** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C5-Benzenes	**18.9** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
Methylcyclohexane	**J 4.48** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
Toluene	**150** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
Ethylbenzene	**J 3.33** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
m,p-Xylene	**84.5** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
Styrene	**11.5** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
o-Xylene	**6.18** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
Isopropylbenzene	ND (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
n-Propylbenzene	ND (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
1,3,5-Trimethylbenzene	ND (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
1,2,3-Trimethylbenzene	**J 5.85** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
1,2,4-Trimethylbenzene	**9.09** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
t-Butylbenzene	ND (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
sec-Butylbenzene	ND (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
p-Isopropyltoluene	**27.2** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
n-Butylbenzene	**8.01** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
trans-Decalin	**J 4.38** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
cis-Decalin	ND (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C1-Decalins	**10.8** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C2-Decalins	**15.5** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C3-Decalins	**9.33** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C4-Decalins	**13.8** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
Benzo(b)thiophene	ND (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C1-Benzo(b)thiophenes	**9.45** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C2-Benzo(b)thiophenes	**16.2** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C3-Benzo(b)thiophenes	**8.10** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C4-Benzo(b)thiophenes	**J 5.50** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS720-S2
Date Sampled: 11/12/19 12:45
Percent Solids: 64
Initial Volume: 5.23
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**20.7** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
2-Methylnaphthalene	**16.7** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
1-Methylnaphthalene	**9.52** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C1-Naphthalenes	**16.7** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C2-Naphthalenes	**62.3** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C3-Naphthalenes	**60.2** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C4-Naphthalenes	**34.3** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
Biphenyl	**8.42** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
Acenaphthylene	**34.6** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
Acenaphthene	**18.8** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
Dibenzofuran	**15.3** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
Fluorene	**28.5** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C1-Fluorenes	**24.6** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C2-Fluorenes	**28.2** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C3-Fluorenes	**25.3** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
Dibenzothiophene	**10.4** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C1-Dibenzothiophenes	**19.5** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C2-Dibenzothiophenes	**24.3** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C3-Dibenzothiophenes	**17.8** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C4-Dibenzothiophenes	**14.3** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
Phenanthrene	**98.4** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
Anthracene	**43.5** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C1-Phenanthrenes/Anthracenes	**122** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C2-Phenanthrenes/Anthracenes	**118** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C3-Phenanthrenes/Anthracenes	**63.0** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C4-Phenanthrenes/Anthracenes	**59.6** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
Retene	**65.5** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
Benzo(b)naphtho(2,1-d)thiophene	**17.2** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C0-Benzonaphthothiophenes	**38.1** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C1-Benzonaphthothiophenes	**24.6** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C2-Benzonaphthothiophenes	**17.4** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C3-Benzonaphthothiophenes	**10.1** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS720-S2
Date Sampled: 11/12/19 12:45
Percent Solids: 64
Initial Volume: 5.23
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
Fluoranthene	**205** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
Pyrene	**211** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C1-Fluoranthenes/Pyrenes	**166** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C2-Fluoranthenes/Pyrenes	**70.2** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C3-Fluoranthenes/Pyrenes	**33.4** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
Benzo(b)fluorene	**23.1** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
Benzo(c)fluorene	**12.9** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
2-Methylpyrene	**19.4** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
4-Methylpyrene	**16.8** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
1-Methylpyrene	**13.6** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
Benz(a)anthracene	**108** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
Chrysene/triphenylene	**113** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C1-Benzo(a)anthracenes/Chrysenes	**81.0** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C2-Benzo(a)anthracenes/Chrysenes	**55.6** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C3-Benzo(a)anthracenes/Chrysenes	**33.7** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C4-Benzo(a)anthracenes/Chrysenes	**18.0** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
Benzo(b)fluoranthene	**72.2** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
Benzo(j/k)fluoranthene	**89.6** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
Benzo(e)pyrene	**65.8** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
Benzo(a)pyrene	**96.2** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
Perylene	**86.1** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
Indeno(1,2,3-cd)pyrene	**50.6** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
Dibenzo(a,h)anthracene	**14.5** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
Benzo(g,h,i)perylene	**46.7** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
Coronene	**12.5** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
Tetramethyl lead	ND (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
Trimethylethyl lead	ND (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
Dimethyldiethyl lead	ND (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
Methyltriethyl lead	ND (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
Tetraethyl lead	ND (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
2,6,10-trimethyldodecane (1380)	**11.9** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS720-S2
Date Sampled: 11/12/19 12:45
Percent Solids: 64
Initial Volume: 5.23
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**43.4** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
2,6,10-trimethylpentadecane (1650)	**B 33.2** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C-17	**B 196** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
Pristane	**B 72.7** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
C-18	**B 84.0** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
Phytane	**B 70.0** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
Carbazole	**J 5.24** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
2,6-Dimethylnaphthalene	**13.9** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
2,3,5-Trimethylnaphthene	**J 5.59** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
4-Methyldibenzothiophene	**J 4.46** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
2/3-Methyldibenzothiophene	**J 5.31** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
1-Methyldibenzothiophene	**J 3.10** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
3-Methylphenanthrene	**27.2** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
2-Methylphenanthrene	**32.8** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
2-Methylanthracene	**14.0** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
4/9-Methylphenanthrene	**28.9** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402
1-Methylphenanthrene	**17.7** (6.01)	3.01	8270 Mod		1	11/16/19 21:15	F9K0002	FK91402

	%Recovery	*Qualifier*	*Limits*
Surrogate: Toluene-D8	*81 %*		*50-120*
Surrogate: Naphthalene-d8	*83 %*		*50-120*
Surrogate: Phenanthrene-d10	*68 %*		*50-120*
Surrogate: Perylene-d12	*62 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS720-S2
Date Sampled: 11/12/19 12:45
Percent Solids: 64

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-06
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**29900** (95.8)		TOC-LK		1	CCP	11/20/19 23:35	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS721-S1
Date Sampled: 11/12/19 13:48
Percent Solids: 67
Initial Volume: 5.19
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**402** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
C1-Benzene	**286** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
C2-Benzenes	**186** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
C3-Benzenes	**123** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
C4-Benzenes	**104** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
C5-Benzenes	**96.1** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
Methylcyclohexane	**120** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
Toluene	**413** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
Ethylbenzene	**39.4** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
m,p-Xylene	**233** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
Styrene	**650** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
o-Xylene	**37.8** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
Isopropylbenzene	ND (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
n-Propylbenzene	ND (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
1,3,5-Trimethylbenzene	**37.5** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
1,2,3-Trimethylbenzene	**J 26.0** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
1,2,4-Trimethylbenzene	**57.6** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
t-Butylbenzene	ND (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
sec-Butylbenzene	ND (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
p-Isopropyltoluene	ND (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
n-Butylbenzene	**J 15.7** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
trans-Decalin	**222** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
cis-Decalin	**29.7** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
C1-Decalins	**432** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
C2-Decalins	**337** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
C3-Decalins	**309** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
C4-Decalins	**548** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
Benzo(b)thiophene	**129** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
C1-Benzo(b)thiophenes	**85.1** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
C2-Benzo(b)thiophenes	**124** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
C3-Benzo(b)thiophenes	**164** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
C4-Benzo(b)thiophenes	**147** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS721-S1
Date Sampled: 11/12/19 13:48
Percent Solids: 67
Initial Volume: 5.19
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**3440** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
2-Methylnaphthalene	**954** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
1-Methylnaphthalene	**372** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
C1-Naphthalenes	**830** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
C2-Naphthalenes	**1630** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
C3-Naphthalenes	**2450** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
C4-Naphthalenes	**2180** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
Biphenyl	**635** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
Acenaphthylene	**16500** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
Acenaphthene	**1400** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
Dibenzofuran	**233** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
Fluorene	**1720** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
C1-Fluorenes	**3680** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
C2-Fluorenes	**4190** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
C3-Fluorenes	**2910** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
Dibenzothiophene	**2760** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
C1-Dibenzothiophenes	**8140** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
C2-Dibenzothiophenes	**6730** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
C3-Dibenzothiophenes	**2880** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
C4-Dibenzothiophenes	**998** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
Phenanthrene	**45500** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
Anthracene	**40000** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
C1-Phenanthrenes/Anthracenes	**55200** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
C2-Phenanthrenes/Anthracenes	**21000** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
C3-Phenanthrenes/Anthracenes	**5530** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
C4-Phenanthrenes/Anthracenes	**1720** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
Retene	**302** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
Benzo(b)naphtho(2,1-d)thiophene	**14100** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
C0-Benzonaphthothiophenes	**26200** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
C1-Benzonaphthothiophenes	**9650** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
C2-Benzonaphthothiophenes	**3130** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
C3-Benzonaphthothiophenes	**2580** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS721-S1
Date Sampled: 11/12/19 13:48
Percent Solids: 67
Initial Volume: 5.19
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**385** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
Fluoranthene	**171000** (571)	286	8270 Mod		100	11/17/19 14:36	F9K0002	FK91402
Pyrene	**265000** (571)	286	8270 Mod		100	11/17/19 14:36	F9K0002	FK91402
C1-Fluoranthenes/Pyrenes	**109000** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
C2-Fluoranthenes/Pyrenes	**18400** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
C3-Fluoranthenes/Pyrenes	**3650** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
Benzo(b)fluorene	**14100** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
Benzo(c)fluorene	**6130** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
2-Methylpyrene	**15100** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
4-Methylpyrene	**12600** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
1-Methylpyrene	**14200** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
Benz(a)anthracene	**103000** (571)	286	8270 Mod		100	11/17/19 14:36	F9K0002	FK91402
Chrysene/triphenylene	**99400** (571)	286	8270 Mod		100	11/17/19 14:36	F9K0002	FK91402
C1-Benzo(a)anthracenes/Chrysenes	**33200** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
C2-Benzo(a)anthracenes/Chrysenes	**8440** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
C3-Benzo(a)anthracenes/Chrysenes	**2040** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
C4-Benzo(a)anthracenes/Chrysenes	**1390** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
Benzo(b)fluoranthene	**49000** (571)	286	8270 Mod		100	11/17/19 14:36	F9K0002	FK91402
Benzo(j/k)fluoranthene	**70500** (571)	286	8270 Mod		100	11/17/19 14:36	F9K0002	FK91402
Benzo(e)pyrene	**63900** (571)	286	8270 Mod		100	11/17/19 14:36	F9K0002	FK91402
Benzo(a)pyrene	**109000** (571)	286	8270 Mod		100	11/17/19 14:36	F9K0002	FK91402
Perylene	**18800** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
Indeno(1,2,3-cd)pyrene	**46300** (571)	286	8270 Mod		100	11/17/19 14:36	F9K0002	FK91402
Dibenzo(a,h)anthracene	**12500** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
Benzo(g,h,i)perylene	**52400** (571)	286	8270 Mod		100	11/17/19 14:36	F9K0002	FK91402
Coronene	**19900** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
Tetramethyl lead	ND (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
Trimethylethyl lead	ND (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
Dimethyldiethyl lead	ND (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
Methyltriethyl lead	ND (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
Tetraethyl lead	ND (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
2,6,10-trimethyldodecane (1380)	**598** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS721-S1
Date Sampled: 11/12/19 13:48
Percent Solids: 67
Initial Volume: 5.19
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**1250** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
2,6,10-trimethylpentadecane (1650)	**1360** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
C-17	**304** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
Pristane	**2860** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
C-18	**323** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
Phytane	**2240** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
Carbazole	**300** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
2,6-Dimethylnaphthalene	**207** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
2,3,5-Trimethylnaphthene	**190** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
4-Methyldibenzothiophene	**3530** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
2/3-Methyldibenzothiophene	**2860** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
1-Methyldibenzothiophene	**685** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
3-Methylphenanthrene	**11100** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
2-Methylphenanthrene	**14400** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
2-Methylanthracene	**7750** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
4/9-Methylphenanthrene	**12400** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402
1-Methylphenanthrene	**9340** (28.6)	14.3	8270 Mod		5	11/16/19 22:51	F9K0002	FK91402

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*91 %*		*50-120*
Surrogate: Naphthalene-d8	*92 %*		*50-120*
Surrogate: Phenanthrene-d10	*87 %*		*50-120*
Surrogate: Perylene-d12	*129 %*	*SM*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS721-S1
Date Sampled: 11/12/19 13:48
Percent Solids: 67

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-07
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**213000** (94.9)		TOC-LK		1	CCP	11/20/19 18:07	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS721-S2
Date Sampled: 11/12/19 13:53
Percent Solids: 48
Initial Volume: 4.8
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **10.2** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C1-Benzene	**73.3** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C2-Benzenes	**59.0** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C3-Benzenes	**9.40** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C4-Benzenes	**11.9** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C5-Benzenes	**10.1** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
Methylcyclohexane	ND (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
Toluene	**116** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
Ethylbenzene	ND (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
m,p-Xylene	**96.9** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
Styrene	**15.8** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
o-Xylene	ND (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
Isopropylbenzene	ND (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
n-Propylbenzene	ND (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
1,3,5-Trimethylbenzene	ND (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
1,2,3-Trimethylbenzene	ND (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
1,2,4-Trimethylbenzene	ND (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
t-Butylbenzene	ND (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
sec-Butylbenzene	ND (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
p-Isopropyltoluene	J **7.59** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
n-Butylbenzene	J **4.67** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
trans-Decalin	ND (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
cis-Decalin	ND (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C1-Decalins	ND (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C2-Decalins	ND (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C3-Decalins	ND (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C4-Decalins	ND (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
Benzo(b)thiophene	ND (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C1-Benzo(b)thiophenes	**8.98** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C2-Benzo(b)thiophenes	**10.5** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C3-Benzo(b)thiophenes	J **8.18** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C4-Benzo(b)thiophenes	ND (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS721-S2
Date Sampled: 11/12/19 13:53
Percent Solids: 48
Initial Volume: 4.8
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	J **5.37** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
2-Methylnaphthalene	J **4.57** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
1-Methylnaphthalene	ND (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C1-Naphthalenes	J **5.32** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C2-Naphthalenes	**29.7** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C3-Naphthalenes	**20.6** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C4-Naphthalenes	**10.6** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
Biphenyl	**11.4** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
Acenaphthylene	**17.9** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
Acenaphthene	J **5.10** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
Dibenzofuran	ND (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
Fluorene	J **7.54** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C1-Fluorenes	**9.20** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C2-Fluorenes	**13.5** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C3-Fluorenes	**10.8** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
Dibenzothiophene	ND (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C1-Dibenzothiophenes	J **7.78** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C2-Dibenzothiophenes	J **8.60** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C3-Dibenzothiophenes	J **8.12** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C4-Dibenzothiophenes	J **5.56** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
Phenanthrene	**29.8** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
Anthracene	**15.0** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C1-Phenanthrenes/Anthracenes	**46.1** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C2-Phenanthrenes/Anthracenes	**25.3** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C3-Phenanthrenes/Anthracenes	**15.1** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C4-Phenanthrenes/Anthracenes	**17.0** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
Retene	**18.2** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
Benzo(b)naphtho(2,1-d)thiophene	ND (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C0-Benzonaphthothiophenes	**9.45** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C1-Benzonaphthothiophenes	J **8.57** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C2-Benzonaphthothiophenes	**17.7** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C3-Benzonaphthothiophenes	J **6.06** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS721-S2
Date Sampled: 11/12/19 13:53
Percent Solids: 48
Initial Volume: 4.8
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	J **4.91** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
Fluoranthene	**52.1** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
Pyrene	**60.2** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C1-Fluoranthenes/Pyrenes	**53.1** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C2-Fluoranthenes/Pyrenes	**26.0** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C3-Fluoranthenes/Pyrenes	**23.9** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
Benzo(b)fluorene	J **6.41** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
Benzo(c)fluorene	ND (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
2-Methylpyrene	J **5.87** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
4-Methylpyrene	J **5.68** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
1-Methylpyrene	J **5.21** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
Benz(a)anthracene	**28.4** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
Chrysene/triphenylene	**29.9** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C1-Benzo(a)anthracenes/Chrysenes	**30.1** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C2-Benzo(a)anthracenes/Chrysenes	**14.3** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C3-Benzo(a)anthracenes/Chrysenes	ND (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C4-Benzo(a)anthracenes/Chrysenes	ND (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
Benzo(b)fluoranthene	**15.7** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
Benzo(j/k)fluoranthene	**18.8** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
Benzo(e)pyrene	**16.6** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
Benzo(a)pyrene	**25.2** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
Perylene	**703** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
Indeno(1,2,3-cd)pyrene	**12.5** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
Dibenzo(a,h)anthracene	ND (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
Benzo(g,h,i)perylene	**12.6** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
Coronene	J **5.28** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
Tetramethyl lead	ND (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
Trimethylethyl lead	ND (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
Dimethyldiethyl lead	ND (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
Methyltriethyl lead	ND (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
Tetraethyl lead	ND (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
2,6,10-trimethyldodecane (1380)	J **5.61** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS721-S2
Date Sampled: 11/12/19 13:53
Percent Solids: 48
Initial Volume: 4.8
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**23.3** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
2,6,10-trimethylpentadecane (1650)	**B 19.3** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C-17	**B 141** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
Pristane	**B 38.2** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
C-18	**B 68.8** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
Phytane	**B 61.2** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
Carbazole	ND (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
2,6-Dimethylnaphthalene	**8.98** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
2,3,5-Trimethylnaphthene	ND (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
4-Methyldibenzothiophene	ND (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
2/3-Methyldibenzothiophene	ND (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
1-Methyldibenzothiophene	ND (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
3-Methylphenanthrene	**9.67** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
2-Methylphenanthrene	**11.3** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
2-Methylanthracene	**J 6.70** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
4/9-Methylphenanthrene	**10.6** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402
1-Methylphenanthrene	**J 6.16** (8.62)	4.31	8270 Mod		1	11/17/19 5:10	F9K0002	FK91402

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*74 %*		*50-120*
Surrogate: Naphthalene-d8	*75 %*		*50-120*
Surrogate: Phenanthrene-d10	*79 %*		*50-120*
Surrogate: Perylene-d12	*59 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS721-S2
Date Sampled: 11/12/19 13:53
Percent Solids: 48

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-08
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**51600** (98.0)		TOC-LK		1	CCP	11/20/19 18:57	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS722-S1
Date Sampled: 11/12/19 14:52
Percent Solids: 70
Initial Volume: 4.59
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **49.1** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C1-Benzene	**62.5** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C2-Benzenes	**83.5** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C3-Benzenes	**91.3** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C4-Benzenes	**54.8** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C5-Benzenes	**50.0** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
Methylcyclohexane	**59.5** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
Toluene	**86.6** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
Ethylbenzene	J **24.7** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
m,p-Xylene	**91.7** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
Styrene	**195** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
o-Xylene	J **16.2** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
Isopropylbenzene	ND (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
n-Propylbenzene	ND (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
1,3,5-Trimethylbenzene	**31.0** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
1,2,3-Trimethylbenzene	ND (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
1,2,4-Trimethylbenzene	**33.1** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
t-Butylbenzene	ND (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
sec-Butylbenzene	ND (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
p-Isopropyltoluene	J **18.9** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
n-Butylbenzene	ND (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
trans-Decalin	J **23.7** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
cis-Decalin	ND (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C1-Decalins	**47.7** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C2-Decalins	**69.3** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C3-Decalins	**36.5** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C4-Decalins	**111** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
Benzo(b)thiophene	J **27.4** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C1-Benzo(b)thiophenes	**33.0** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C2-Benzo(b)thiophenes	**39.2** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C3-Benzo(b)thiophenes	**42.0** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C4-Benzo(b)thiophenes	J **23.7** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS722-S1
Date Sampled: 11/12/19 14:52
Percent Solids: 70
Initial Volume: 4.59
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**704** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
2-Methylnaphthalene	**311** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
1-Methylnaphthalene	**186** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C1-Naphthalenes	**306** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C2-Naphthalenes	**507** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C3-Naphthalenes	**523** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C4-Naphthalenes	**342** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
Biphenyl	**170** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
Acenaphthylene	**3710** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
Acenaphthene	**751** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
Dibenzofuran	**416** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
Fluorene	**948** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C1-Fluorenes	**763** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C2-Fluorenes	**798** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C3-Fluorenes	**1030** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
Dibenzothiophene	**931** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C1-Dibenzothiophenes	**1180** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C2-Dibenzothiophenes	**1140** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C3-Dibenzothiophenes	**685** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C4-Dibenzothiophenes	**287** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
Phenanthrene	**14400** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
Anthracene	**6870** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C1-Phenanthrenes/Anthracenes	**8300** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C2-Phenanthrenes/Anthracenes	**4180** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C3-Phenanthrenes/Anthracenes	**1540** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C4-Phenanthrenes/Anthracenes	**594** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
Retene	**112** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
Benzo(b)naphtho(2,1-d)thiophene	**1920** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C0-Benzonaphthothiophenes	**3550** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C1-Benzonaphthothiophenes	**1800** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C2-Benzonaphthothiophenes	**937** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C3-Benzonaphthothiophenes	**707** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS722-S1
Date Sampled: 11/12/19 14:52
Percent Solids: 70
Initial Volume: 4.59
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**148** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
Fluoranthene	**26100** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
Pyrene	**35600** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C1-Fluoranthenes/Pyrenes	**16700** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C2-Fluoranthenes/Pyrenes	**5380** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C3-Fluoranthenes/Pyrenes	**1950** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
Benzo(b)fluorene	**1780** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
Benzo(c)fluorene	**591** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
2-Methylpyrene	**2420** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
4-Methylpyrene	**2300** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
1-Methylpyrene	**2040** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
Benz(a)anthracene	**15800** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
Chrysene/triphenylene	**16400** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C1-Benzo(a)anthracenes/Chrysenes	**7200** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C2-Benzo(a)anthracenes/Chrysenes	**2800** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C3-Benzo(a)anthracenes/Chrysenes	**990** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C4-Benzo(a)anthracenes/Chrysenes	**524** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
Benzo(b)fluoranthene	**10800** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
Benzo(j/k)fluoranthene	**12200** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
Benzo(e)pyrene	**12400** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
Benzo(a)pyrene	**19000** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
Perylene	**3310** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
Indeno(1,2,3-cd)pyrene	**9840** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
Dibenzo(a,h)anthracene	**2050** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
Benzo(g,h,i)perylene	**10600** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
Coronene	**2820** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
Tetramethyl lead	ND (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
Trimethylethyl lead	ND (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
Dimethyldiethyl lead	ND (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
Methyltriethyl lead	ND (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
Tetraethyl lead	ND (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
2,6,10-trimethyldodecane (1380)	**54.7** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS722-S1
Date Sampled: 11/12/19 14:52
Percent Solids: 70
Initial Volume: 4.59
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/14/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**158** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
2,6,10-trimethylpentadecane (1650)	**227** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C-17	**673** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
Pristane	**474** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
C-18	**690** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
Phytane	**491** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
Carbazole	**680** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
2,6-Dimethylnaphthalene	**107** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
2,3,5-Trimethylnaphthene	**36.4** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
4-Methyldibenzothiophene	**495** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
2/3-Methyldibenzothiophene	**393** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
1-Methyldibenzothiophene	**104** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
3-Methylphenanthrene	**1800** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
2-Methylphenanthrene	**2010** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
2-Methylanthracene	**1130** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
4/9-Methylphenanthrene	**1980** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402
1-Methylphenanthrene	**1300** (30.9)	15.5	8270 Mod		5	11/17/19 8:19	F9K0002	FK91402

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*83 %*		*50-120*
Surrogate: Naphthalene-d8	*82 %*		*50-120*
Surrogate: Phenanthrene-d10	*84 %*		*50-120*
Surrogate: Perylene-d12	*78 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS722-S1
Date Sampled: 11/12/19 14:52
Percent Solids: 70

ESS Laboratory Work Order: F190057
ESS Laboratory Sample ID: F190057-09
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**178000** (99.7)		TOC-LK		1	CCP	11/20/19 19:17	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190057

Quality Control Data

Classical Chemistry

Batch CK91438 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	100	mg/kg							
Total Organic Carbon (2)	ND	100	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190057

Quality Control Data

Classical Chemistry

Batch CK91438 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9200	100	mg/kg	10000		92	80-120			
Total Organic Carbon (2)	10500	100	mg/kg	10000		105	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190057

Quality Control Data

Classical Chemistry

Batch CK91438 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9490	100	mg/kg	10000		95	80-120	3	20	
Total Organic Carbon (2)	9610	100	mg/kg	10000		96	80-120	9	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190057

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FK91402 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	11.1	4.00	ug/Kg wet							
C1-Benzene	ND	4.00	ug/Kg wet							
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	2.13	4.00	ug/Kg wet							J
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	ND	4.00	ug/Kg wet							
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190057

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FK91402 - 3570

C1-Fluorenes	ND	4.00	ug/Kg wet
C2-Fluorenes	ND	4.00	ug/Kg wet
C3-Fluorenes	ND	4.00	ug/Kg wet
Dibenzothiophene	ND	4.00	ug/Kg wet
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet
Phenanthrene	ND	4.00	ug/Kg wet
Anthracene	ND	4.00	ug/Kg wet
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
Retene	ND	4.00	ug/Kg wet
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
Fluoranthene	ND	4.00	ug/Kg wet
Pyrene	ND	4.00	ug/Kg wet
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
Benzo(b)fluorene	ND	4.00	ug/Kg wet
Benzo(c)fluorene	ND	4.00	ug/Kg wet
2-Methylpyrene	ND	4.00	ug/Kg wet
4-Methylpyrene	ND	4.00	ug/Kg wet
1-Methylpyrene	ND	4.00	ug/Kg wet
Benz(a)anthracene	ND	4.00	ug/Kg wet
Chrysene/triphenylene	ND	4.00	ug/Kg wet
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet
Benzo(e)pyrene	ND	4.00	ug/Kg wet
Benzo(a)pyrene	ND	4.00	ug/Kg wet
Perylene	ND	4.00	ug/Kg wet
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet
Coronene	ND	4.00	ug/Kg wet
Tetramethyl lead	ND	4.00	ug/Kg wet
Trimethylethyl lead	ND	4.00	ug/Kg wet

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190057

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FK91402 - 3570						
Dimethyldiethyl lead	ND	4.00	ug/Kg wet			
Methyltriethyl lead	ND	4.00	ug/Kg wet			
Tetraethyl lead	ND	4.00	ug/Kg wet			
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet			
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet			
2,6,10-trimethylpentadecane (1650)	6.94	4.00	ug/Kg wet			
C-17	28.2	4.00	ug/Kg wet			
Pristane	18.9	4.00	ug/Kg wet			
C-18	18.6	4.00	ug/Kg wet			
Phytane	22.7	4.00	ug/Kg wet			
Carbazole	ND	4.00	ug/Kg wet			
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet			
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet			
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
3-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylanthracene	ND	4.00	ug/Kg wet			
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet			
1-Methylphenanthrene	ND	4.00	ug/Kg wet			
Surrogate: Toluene-D8	*409*		ug/Kg wet	*400.0*	*102*	*50-120*
Surrogate: Naphthalene-d8	*382*		ug/Kg wet	*400.0*	*95*	*50-120*
Surrogate: Phenanthrene-d10	*405*		ug/Kg wet	*400.0*	*101*	*50-120*
Surrogate: Perylene-d12	*344*		ug/Kg wet	*400.0*	*86*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190057

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FK91402 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	338	4.00	ug/Kg wet	400.0		85	60-130			
Methylcyclohexane	267	4.00	ug/Kg wet	400.0		67	60-130			
Toluene	390	4.00	ug/Kg wet	400.0		97	60-130			
Ethylbenzene	387	4.00	ug/Kg wet	400.0		97	60-130			
m,p-Xylene	384	4.00	ug/Kg wet	400.0		96	60-130			
Styrene	361	4.00	ug/Kg wet	400.0		90	60-130			
o-Xylene	390	4.00	ug/Kg wet	400.0		98	60-130			
Isopropylbenzene	385	4.00	ug/Kg wet	400.0		96	60-130			
n-Propylbenzene	390	4.00	ug/Kg wet	400.0		97	60-130			
1,3,5-Trimethylbenzene	383	4.00	ug/Kg wet	400.0		96	60-130			
1,2,3-Trimethylbenzene	394	4.00	ug/Kg wet	400.0		98	60-130			
1,2,4-Trimethylbenzene	391	4.00	ug/Kg wet	400.0		98	60-130			
t-Butylbenzene	383	4.00	ug/Kg wet	400.0		96	60-130			
sec-Butylbenzene	385	4.00	ug/Kg wet	400.0		96	60-130			
p-Isopropyltoluene	393	4.00	ug/Kg wet	400.0		98	60-130			
n-Butylbenzene	383	4.00	ug/Kg wet	400.0		96	60-130			
trans-Decalin	381	4.00	ug/Kg wet	400.0		95	60-130			
cis-Decalin	378	4.00	ug/Kg wet	400.0		95	60-130			
Benzo(b)thiophene	369	4.00	ug/Kg wet	400.0		92	60-130			
Naphthalene	377	4.00	ug/Kg wet	400.0		94	60-130			
2-Methylnaphthalene	353	4.00	ug/Kg wet	400.0		88	60-130			
1-Methylnaphthalene	357	4.00	ug/Kg wet	400.0		89	60-130			
Biphenyl	361	4.00	ug/Kg wet	400.0		90	60-130			
Acenaphthylene	325	4.00	ug/Kg wet	400.0		81	60-130			
Acenaphthene	363	4.00	ug/Kg wet	400.0		91	60-130			
Dibenzofuran	366	4.00	ug/Kg wet	400.0		91	60-130			
Fluorene	352	4.00	ug/Kg wet	400.0		88	60-130			
Dibenzothiophene	361	4.00	ug/Kg wet	400.0		90	60-130			
Phenanthrene	363	4.00	ug/Kg wet	400.0		91	60-130			
Anthracene	335	4.00	ug/Kg wet	400.0		84	60-130			
Retene	316	4.00	ug/Kg wet	400.0		79	60-130			
Benzo(b)naphtho(2,1-d)thiophene	333	4.00	ug/Kg wet	400.0		83	60-130			
Fluoranthene	350	4.00	ug/Kg wet	400.0		88	60-130			
Pyrene	351	4.00	ug/Kg wet	400.0		88	60-130			
Benz(a)anthracene	323	4.00	ug/Kg wet	400.0		81	60-130			
Chrysene/triphenylene	342	4.00	ug/Kg wet	400.0		86	60-130			
Benzo(b)fluoranthene	334	4.00	ug/Kg wet	400.0		84	60-130			
Benzo(j/k)fluoranthene	335	4.00	ug/Kg wet	400.0		84	60-130			
Benzo(e)pyrene	339	4.00	ug/Kg wet	400.0		85	60-130			
Benzo(a)pyrene	329	4.00	ug/Kg wet	400.0		82	60-130			
Perylene	329	4.00	ug/Kg wet	400.0		82	60-130			
Indeno(1,2,3-cd)pyrene	336	4.00	ug/Kg wet	400.0		84	60-130			
Dibenzo(a,h)anthracene	346	4.00	ug/Kg wet	400.0		86	60-130			
Benzo(g,h,i)perylene	353	4.00	ug/Kg wet	400.0		88	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190057

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FK91402 - 3570						
Coronene	360	4.00	ug/Kg wet	400.0	90	60-130
Tetraethyl lead	352	4.00	ug/Kg wet	400.0	88	60-130
Pristane	389	4.00	ug/Kg wet	400.0	97	60-130
Phytane	375	4.00	ug/Kg wet	400.0	94	60-130
Surrogate: Toluene-D8	*418*		ug/Kg wet	*400.0*	*105*	*50-120*
Surrogate: Naphthalene-d8	*408*		ug/Kg wet	*400.0*	*102*	*50-120*
Surrogate: Phenanthrene-d10	*416*		ug/Kg wet	*400.0*	*104*	*50-120*
Surrogate: Perylene-d12	*344*		ug/Kg wet	*400.0*	*86*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190057

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FK91402 - 3570

Duplicate **Source: F190057-08**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	9.31	8.92	ug/Kg dry		10.2			9	50	
C1-Benzene	88.7	8.92	ug/Kg dry		73.3			19	50	
C2-Benzenes	74.3	8.92	ug/Kg dry		59.0			23	50	
C3-Benzenes	12.7	8.92	ug/Kg dry		9.40			30	50	
C4-Benzenes	14.6	8.92	ug/Kg dry		11.9			21	50	
C5-Benzenes	13.2	8.92	ug/Kg dry		10.1			26	50	
Methylcyclohexane	ND	8.92	ug/Kg dry		ND				50	
Toluene	137	8.92	ug/Kg dry		116			16	50	
Ethylbenzene	ND	8.92	ug/Kg dry		ND				50	
m,p-Xylene	124	8.92	ug/Kg dry		96.9			25	50	
Styrene	11.2	8.92	ug/Kg dry		15.8			34	50	
o-Xylene	4.64	8.92	ug/Kg dry		ND				50	J
Isopropylbenzene	ND	8.92	ug/Kg dry		ND				50	
n-Propylbenzene	ND	8.92	ug/Kg dry		ND				50	
1,3,5-Trimethylbenzene	ND	8.92	ug/Kg dry		ND				50	
1,2,3-Trimethylbenzene	ND	8.92	ug/Kg dry		ND				50	
1,2,4-Trimethylbenzene	ND	8.92	ug/Kg dry		ND				50	
t-Butylbenzene	ND	8.92	ug/Kg dry		ND				50	
sec-Butylbenzene	ND	8.92	ug/Kg dry		ND				50	
p-Isopropyltoluene	10.9	8.92	ug/Kg dry		7.59			36	50	
n-Butylbenzene	4.86	8.92	ug/Kg dry		4.67			4	50	J
trans-Decalin	ND	8.92	ug/Kg dry		ND				50	
cis-Decalin	ND	8.92	ug/Kg dry		ND				50	
C1-Decalins	ND	8.92	ug/Kg dry		ND				50	
C2-Decalins	ND	8.92	ug/Kg dry		ND				50	
C3-Decalins	ND	8.92	ug/Kg dry		ND				50	
C4-Decalins	ND	8.92	ug/Kg dry		ND				50	
Benzo(b)thiophene	ND	8.92	ug/Kg dry		ND				50	
C1-Benzo(b)thiophenes	8.01	8.92	ug/Kg dry		8.98			11	50	J
C2-Benzo(b)thiophenes	11.7	8.92	ug/Kg dry		10.5			11	50	
C3-Benzo(b)thiophenes	6.25	8.92	ug/Kg dry		8.18			27	50	J
C4-Benzo(b)thiophenes	ND	8.92	ug/Kg dry		ND				50	
Naphthalene	5.83	8.92	ug/Kg dry		5.37			8	50	J
2-Methylnaphthalene	5.10	8.92	ug/Kg dry		4.57			11	50	J
1-Methylnaphthalene	ND	8.92	ug/Kg dry		ND				50	
C1-Naphthalenes	5.84	8.92	ug/Kg dry		5.32			9	50	J
C2-Naphthalenes	37.0	8.92	ug/Kg dry		29.7			22	50	
C3-Naphthalenes	22.7	8.92	ug/Kg dry		20.6			9	50	
C4-Naphthalenes	13.2	8.92	ug/Kg dry		10.6			22	50	
Biphenyl	12.9	8.92	ug/Kg dry		11.4			12	50	
Acenaphthylene	14.8	8.92	ug/Kg dry		17.9			19	50	
Acenaphthene	5.47	8.92	ug/Kg dry		5.10			7	50	J
Dibenzofuran	ND	8.92	ug/Kg dry		ND				50	
Fluorene	7.54	8.92	ug/Kg dry		7.54			0.02	50	J

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190057

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FK91402 - 3570							
C1-Fluorenes	9.98	8.92	ug/Kg dry	9.20	8	50	
C2-Fluorenes	15.1	8.92	ug/Kg dry	13.5	11	50	
C3-Fluorenes	13.3	8.92	ug/Kg dry	10.8	21	50	
Dibenzothiophene	ND	8.92	ug/Kg dry	ND		50	
C1-Dibenzothiophenes	7.61	8.92	ug/Kg dry	7.78	2	50	J
C2-Dibenzothiophenes	8.46	8.92	ug/Kg dry	8.60	2	50	J
C3-Dibenzothiophenes	4.57	8.92	ug/Kg dry	8.12	56	50	D+, J
C4-Dibenzothiophenes	6.41	8.92	ug/Kg dry	5.56	14	50	J
Phenanthrene	27.6	8.92	ug/Kg dry	29.8	8	50	
Anthracene	14.0	8.92	ug/Kg dry	15.0	7	50	
C1-Phenanthrenes/Anthracenes	45.7	8.92	ug/Kg dry	46.1	0.8	50	
C2-Phenanthrenes/Anthracenes	27.0	8.92	ug/Kg dry	25.3	6	50	
C3-Phenanthrenes/Anthracenes	18.1	8.92	ug/Kg dry	15.1	18	50	
C4-Phenanthrenes/Anthracenes	27.6	8.92	ug/Kg dry	17.0	47	50	
Retene	49.8	8.92	ug/Kg dry	18.2	93	50	D+
Benzo(b)naphtho(2,1-d)thiophene	ND	8.92	ug/Kg dry	ND		50	
C0-Benzonaphthothiophenes	10.2	8.92	ug/Kg dry	9.45	8	50	
C1-Benzonaphthothiophenes	9.13	8.92	ug/Kg dry	8.57	6	50	
C2-Benzonaphthothiophenes	20.7	8.92	ug/Kg dry	17.7	16	50	
C3-Benzonaphthothiophenes	5.58	8.92	ug/Kg dry	6.06	8	50	J
C4-Benzonaphthothiophenes	5.94	8.92	ug/Kg dry	4.91	19	50	J
Fluoranthene	56.0	8.92	ug/Kg dry	52.1	7	50	
Pyrene	69.0	8.92	ug/Kg dry	60.2	14	50	
C1-Fluoranthenes/Pyrenes	62.7	8.92	ug/Kg dry	53.1	17	50	
C2-Fluoranthenes/Pyrenes	28.1	8.92	ug/Kg dry	26.0	8	50	
C3-Fluoranthenes/Pyrenes	27.0	8.92	ug/Kg dry	23.9	12	50	
Benzo(b)fluorene	6.81	8.92	ug/Kg dry	6.41	6	50	J
Benzo(c)fluorene	ND	8.92	ug/Kg dry	ND		50	
2-Methylpyrene	7.48	8.92	ug/Kg dry	5.87	24	50	J
4-Methylpyrene	6.87	8.92	ug/Kg dry	5.68	19	50	J
1-Methylpyrene	6.49	8.92	ug/Kg dry	5.21	22	50	J
Benz(a)anthracene	31.4	8.92	ug/Kg dry	28.4	10	50	
Chrysene/triphenylene	31.1	8.92	ug/Kg dry	29.9	4	50	
C1-Benzo(a)anthracenes/Chrysenes	34.0	8.92	ug/Kg dry	30.1	12	50	
C2-Benzo(a)anthracenes/Chrysenes	16.6	8.92	ug/Kg dry	14.3	15	50	
C3-Benzo(a)anthracenes/Chrysenes	ND	8.92	ug/Kg dry	ND		50	
C4-Benzo(a)anthracenes/Chrysenes	ND	8.92	ug/Kg dry	ND		50	
Benzo(b)fluoranthene	16.9	8.92	ug/Kg dry	15.7	7	50	
Benzo(j/k)fluoranthene	19.6	8.92	ug/Kg dry	18.8	4	50	
Benzo(e)pyrene	18.4	8.92	ug/Kg dry	16.6	11	50	
Benzo(a)pyrene	27.0	8.92	ug/Kg dry	25.2	7	50	
Perylene	715	8.92	ug/Kg dry	703	2	50	
Indeno(1,2,3-cd)pyrene	12.3	8.92	ug/Kg dry	12.5	2	50	
Dibenzo(a,h)anthracene	ND	8.92	ug/Kg dry	ND		50	
Benzo(g,h,i)perylene	13.3	8.92	ug/Kg dry	12.6	6	50	
Coronene	ND	8.92	ug/Kg dry	5.28		50	
Tetramethyl lead	ND	8.92	ug/Kg dry	ND		50	
Trimethylethyl lead	ND	8.92	ug/Kg dry	ND		50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190057

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FK91402 - 3570									
Dimethyldiethyl lead	ND	8.92	ug/Kg dry		ND			50	
Methyltriethyl lead	ND	8.92	ug/Kg dry		ND			50	
Tetraethyl lead	ND	8.92	ug/Kg dry		ND			50	
2,6,10-trimethyldodecane (1380)	7.35	8.92	ug/Kg dry		5.61		27	50	J
2,6,10-trimethyltridecane (1470)	25.8	8.92	ug/Kg dry		23.3		10	50	
2,6,10-trimethylpentadecane (1650)	28.2	8.92	ug/Kg dry		19.3		38	50	
C-17	172	8.92	ug/Kg dry		141		20	50	
Pristane	59.3	8.92	ug/Kg dry		38.2		43	50	
C-18	101	8.92	ug/Kg dry		68.8		38	50	
Phytane	89.6	8.92	ug/Kg dry		61.2		38	50	
Carbazole	ND	8.92	ug/Kg dry		ND			50	
2,6-Dimethylnaphthalene	10.8	8.92	ug/Kg dry		8.98		19	50	
2,3,5-Trimethylnaphthene	ND	8.92	ug/Kg dry		ND			50	
4-Methyldibenzothiophene	ND	8.92	ug/Kg dry		ND			50	
2/3-Methyldibenzothiophene	ND	8.92	ug/Kg dry		ND			50	
1-Methyldibenzothiophene	ND	8.92	ug/Kg dry		ND			50	
3-Methylphenanthrene	9.82	8.92	ug/Kg dry		9.67		2	50	
2-Methylphenanthrene	11.1	8.92	ug/Kg dry		11.3		2	50	
2-Methylanthracene	6.34	8.92	ug/Kg dry		6.70		6	50	J
4/9-Methylphenanthrene	12.1	8.92	ug/Kg dry		10.6		13	50	
1-Methylphenanthrene	6.00	8.92	ug/Kg dry		6.16		3	50	J
Surrogate: Toluene-D8	*639*		ug/Kg dry	*891.9*		*72*	*50-120*		
Surrogate: Naphthalene-d8	*700*		ug/Kg dry	*891.9*		*78*	*50-120*		
Surrogate: Phenanthrene-d10	*692*		ug/Kg dry	*891.9*		*78*	*50-120*		
Surrogate: Perylene-d12	*579*		ug/Kg dry	*891.9*		*65*	*50-120*		

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F190057

Notes and Definitions

U	Analyte included in the analysis, but not detected
SM	Surrogate recovery(ies) outside of criteria due to matrix (UCM/coelution/matrix is present) (SM).
J	Reported between MDL and MRL
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190057

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) F190057

GEI Consultants

400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

Preservative

None | None

Sample Handling

Samples Field Filtered: YES (NO) NA

Sampled Shipped With Ice: (YES) NO

MCP PRESUMPTIVE CERTAINTY REQUIRED -- (YES) NO

If Yes, Are MCP Analytical Methods Required? (YES) NO NA

Are Drinking Water Samples Submitted? YES (NO) NA

If Yes, Have Drinking Water Sampling Requirements Been Met? YES NO (NA)

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Analysis: Parent and Alkylated MAHs & PAHs 8270**	Analysis: TOCs by Lloyd-Kahn	Sample Specific Remarks
1	1804576-SS729-S3	11/12/19	1007	Soil	1	BFM	X	X	
2	1804576-SS729-S4	11/12/19	1010	Soil	1	BFM	X	X	
3	1804576-SS724-S3	11/12/19	1123	Soil	1	BFM	X	X	
4	1804576-SS726-S2	11/12/19	1205	Soil	1	BFM	X	X	
5	1804576-SS720-S1	11/12/19	1241	Soil	1	BFM	X	X	
6	1804576-SS720-S2	11/12/19	1245	Soil	1	BFM	X	X	
7	1804576-SS721-S1	11/12/19	1348	Soil	1	BFM	X	X	
8	1804576-SS721-S2	11/12/19	1353	Soil	1	BFM	X	X	
9	1804576-SS722-S1	11/12/19	1452	Soil	1	BFM	X	X	

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1.	11/12/19	1700	1. GEI Sample Fridge
Relinquished by: (signature)	Date:	Time:	Received by: (signature)
2. GEI Sample Fridge	11/13	1240	2.
Relinquished by: (signature)	Date:	Time:	Received by: (signature)
3.	11/13	1240	3.
Relinquished by: (signature)	Date:	Time:	Received by: (signature)
4.	11/13	17:47	4. 11/13/19 1747

Ice temp: 1.8

Turnaround Time (Business days):

Normal __X__ Other ____

10-Day ____ 7-Day ____

5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

**Parent and Alkylated MAHs & PAHs (34) by GC/MS/SIM/SCAN

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI

Shipped/Delivered Via: ESS Courier

ESS Project ID: F190057
Date Received: 11/13/2019
Project Due Date: 11/20/2019
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 1.8 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No (NA)
10. Were any analyses received outside of hold time? Yes (No)

11. Any Subcontracting needed? Yes (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes (No)
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? (Yes) No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes (No)
    a. Was there a need to contact the client? Yes (No)
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608.3 Pesticides)
1					4oz Jar - Unpres	NP	
2					4oz Jar - Unpres	NP	
3					4oz Jar - Unpres	NP	
4					4oz Jar - Unpres	NP	
5					4oz Jar - Unpres	NP	
6					4oz Jar - Unpres	NP	
7					4oz Jar - Unpres	NP	
8					4oz Jar - Unpres	NP	
9					4oz Jar - Unpres	NP	

2nd Review
All containers scanned into storage/lab Initials:
Are barcode labels on correct containers? Yes / No
Are all necessary stickers attached? Yes / No

Completed By: Date & Time: 11/13/19 2055
Reviewed By: Date & Time: 11/14/19 08:30
Delivered

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: F190058

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 4:26 pm, Dec 05, 2019

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses
ESS Laboratory - Cranston, RI TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190058

SAMPLE RECEIPT

The following samples were received on November 18, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F190058-01	1804576-SS733-S4	Soil	8270 Mod, TOC-LK
F190058-02	1804576-SS735-S2	Soil	8270 Mod, TOC-LK
F190058-03	1804576-SS735-S3	Soil	8270 Mod, TOC-LK
F190058-04	1804576-SS735-S4	Soil	8270 Mod, TOC-LK
F190058-05	1804576-SS713-S2	Soil	8270 Mod, TOC-LK
F190058-06	1804576-SS715-S2	Soil	8270 Mod, TOC-LK
F190058-07	1804576-SS731-S2	Soil	8270 Mod, TOC-LK
F190058-08	1804576-SS734-S1	Soil	8270 Mod, TOC-LK
F190058-09	1804576-SS734-S2	Soil	8270 Mod, TOC-LK
F190058-10	1804576-SS736-S2	Soil	8270 Mod, TOC-LK
F190058-11	1804576-SS737-S1	Soil	8270 Mod, TOC-LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190058

PROJECT NARRATIVE

8270D (SIM) Semi-Volatile Organic Compounds

F190058-01 **Present in Method Blank (B).**
2,6,10-trimethylpentadecane (1650) , Benzene , C-17 , C-18 , Phytane , Pristane

F190058-03 **Present in Method Blank (B).**
Benzene , C-17 , C-18 , Phytane

F190058-04 **Present in Method Blank (B).**
C-17 , C-18 , Phytane , Pristane

F190058-05 **Present in Method Blank (B).**
Benzene , C-17 , C-18

F190058-06 **Present in Method Blank (B).**
2,6,10-trimethylpentadecane (1650) , Benzene , C-17 , C-18 , Phytane , Pristane

F190058-07 **Present in Method Blank (B).**
C-18

F190058-09 **Present in Method Blank (B).**
2,6,10-trimethylpentadecane (1650) , C-17 , C-18 , Phytane , Pristane

F190058-10 **Present in Method Blank (B).**
2,6,10-trimethylpentadecane (1650) , Benzene , C-17 , C-18 , Phytane , Pristane

F9K0005-CCV2 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
Tetraethyl lead (41% @ 25%)

F9K0005-CCV3 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
Tetraethyl lead (36% @ 25%)

FK92001-DUP2 **Relative percent difference for duplicate is outside of criteria (D+).**
Benzene (116% @ 50%)

FK92001-DUP2 **Surrogate recovery(ies) below lower control limit (S-).**
Toluene-D8 (43% @ 50-120%)

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190058

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS733-S4
Date Sampled: 11/15/19 10:28
Percent Solids: 77
Initial Volume: 5.95
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **9.81** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C1-Benzene	ND (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C2-Benzenes	ND (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C3-Benzenes	**4.99** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C4-Benzenes	**16.0** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C5-Benzenes	**13.1** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
Methylcyclohexane	ND (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
Toluene	J **2.63** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
Ethylbenzene	ND (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
m,p-Xylene	ND (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
Styrene	J **4.01** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
o-Xylene	ND (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
Isopropylbenzene	ND (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
n-Propylbenzene	ND (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
1,3,5-Trimethylbenzene	ND (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
1,2,3-Trimethylbenzene	ND (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
1,2,4-Trimethylbenzene	J **2.37** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
t-Butylbenzene	ND (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
sec-Butylbenzene	ND (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
p-Isopropyltoluene	ND (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
n-Butylbenzene	ND (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
trans-Decalin	ND (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
cis-Decalin	ND (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C1-Decalins	J **3.52** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C2-Decalins	**8.54** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C3-Decalins	**10.5** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C4-Decalins	**17.6** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
Benzo(b)thiophene	ND (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C1-Benzo(b)thiophenes	**8.19** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C2-Benzo(b)thiophenes	**19.4** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C3-Benzo(b)thiophenes	**18.3** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C4-Benzo(b)thiophenes	**6.21** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS733-S4
Date Sampled: 11/15/19 10:28
Percent Solids: 77
Initial Volume: 5.95
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**117** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
2-Methylnaphthalene	**84.3** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
1-Methylnaphthalene	**220** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C1-Naphthalenes	**183** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C2-Naphthalenes	**459** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C3-Naphthalenes	**284** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C4-Naphthalenes	**96.2** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
Biphenyl	**78.6** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
Acenaphthylene	**46.7** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
Acenaphthene	**691** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
Dibenzofuran	**29.3** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
Fluorene	**359** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C1-Fluorenes	**218** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C2-Fluorenes	**132** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C3-Fluorenes	**52.3** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
Dibenzothiophene	**120** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C1-Dibenzothiophenes	**123** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C2-Dibenzothiophenes	**80.8** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C3-Dibenzothiophenes	**33.0** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C4-Dibenzothiophenes	**9.80** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
Phenanthrene	**1950** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
Anthracene	**514** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C1-Phenanthrenes/Anthracenes	**1030** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C2-Phenanthrenes/Anthracenes	**367** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C3-Phenanthrenes/Anthracenes	**94.2** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C4-Phenanthrenes/Anthracenes	**24.2** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
Retene	**7.62** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
Benzo(b)naphtho(2,1-d)thiophene	**38.6** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C0-Benzonaphthothiophenes	**68.3** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C1-Benzonaphthothiophenes	**40.8** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C2-Benzonaphthothiophenes	**19.3** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C3-Benzonaphthothiophenes	**10.0** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS733-S4
Date Sampled: 11/15/19 10:28
Percent Solids: 77
Initial Volume: 5.95
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
Fluoranthene	**765** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
Pyrene	**1100** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C1-Fluoranthenes/Pyrenes	**609** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C2-Fluoranthenes/Pyrenes	**155** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C3-Fluoranthenes/Pyrenes	**45.6** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
Benzo(b)fluorene	**60.6** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
Benzo(c)fluorene	**36.4** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
2-Methylpyrene	**79.0** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
4-Methylpyrene	**68.9** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
1-Methylpyrene	**81.1** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
Benz(a)anthracene	**362** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
Chrysene/triphenylene	**356** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C1-Benzo(a)anthracenes/Chrysenes	**181** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C2-Benzo(a)anthracenes/Chrysenes	**64.8** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C3-Benzo(a)anthracenes/Chrysenes	**17.6** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C4-Benzo(a)anthracenes/Chrysenes	ND (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
Benzo(b)fluoranthene	**129** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
Benzo(j/k)fluoranthene	**172** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
Benzo(e)pyrene	**160** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
Benzo(a)pyrene	**287** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
Perylene	**50.6** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
Indeno(1,2,3-cd)pyrene	**114** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
Dibenzo(a,h)anthracene	**25.7** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
Benzo(g,h,i)perylene	**128** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
Coronene	**36.5** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
Tetramethyl lead	ND (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
Trimethylethyl lead	ND (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
Dimethyldiethyl lead	ND (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
Methyltriethyl lead	ND (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
Tetraethyl lead	ND (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
2,6,10-trimethyldodecane (1380)	**5.85** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS733-S4
Date Sampled: 11/15/19 10:28
Percent Solids: 77
Initial Volume: 5.95
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**9.61** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
2,6,10-trimethylpentadecane (1650)	**B 20.5** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C-17	**B 29.3** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
Pristane	**B 41.8** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
C-18	**B 19.8** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
Phytane	**B 38.5** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
Carbazole	ND (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
2,6-Dimethylnaphthalene	**96.0** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
2,3,5-Trimethylnaphthene	**16.5** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
4-Methyldibenzothiophene	**53.4** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
2/3-Methyldibenzothiophene	**41.9** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
1-Methyldibenzothiophene	**11.7** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
3-Methylphenanthrene	**234** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
2-Methylphenanthrene	**270** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
2-Methylanthracene	**111** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
4/9-Methylphenanthrene	**230** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001
1-Methylphenanthrene	**167** (4.34)	2.17	8270 Mod		1	11/21/19 23:15	F9K0005	FK92001

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*75 %*		*50-120*
Surrogate: Naphthalene-d8	*80 %*		*50-120*
Surrogate: Phenanthrene-d10	*78 %*		*50-120*
Surrogate: Perylene-d12	*73 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS733-S4
Date Sampled: 11/15/19 10:28
Percent Solids: 77

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**1230** (95.3)		TOC-LK		1	CCP	11/26/19 18:04	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS735-S2
Date Sampled: 11/15/19 10:59
Percent Solids: 63
Initial Volume: 5.56
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**174** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C1-Benzene	**447** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C2-Benzenes	**302** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C3-Benzenes	**311** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C4-Benzenes	**370** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C5-Benzenes	**218** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
Methylcyclohexane	**153** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
Toluene	**682** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
Ethylbenzene	**94.6** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
m,p-Xylene	**433** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
Styrene	**135** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
o-Xylene	**81.8** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
Isopropylbenzene	**23.2** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
n-Propylbenzene	**39.3** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
1,3,5-Trimethylbenzene	**70.8** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
1,2,3-Trimethylbenzene	**73.4** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
1,2,4-Trimethylbenzene	**206** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
t-Butylbenzene	ND (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
sec-Butylbenzene	**9.96** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
p-Isopropyltoluene	**38.6** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
n-Butylbenzene	**51.1** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
trans-Decalin	**242** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
cis-Decalin	**31.6** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C1-Decalins	**531** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C2-Decalins	**427** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C3-Decalins	**239** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C4-Decalins	**323** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
Benzo(b)thiophene	**146** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C1-Benzo(b)thiophenes	**226** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C2-Benzo(b)thiophenes	**504** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C3-Benzo(b)thiophenes	**297** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C4-Benzo(b)thiophenes	**95.8** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS735-S2
Date Sampled: 11/15/19 10:59
Percent Solids: 63
Initial Volume: 5.56
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**2300** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
2-Methylnaphthalene	**660** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
1-Methylnaphthalene	**1250** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C1-Naphthalenes	**1150** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C2-Naphthalenes	**2600** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C3-Naphthalenes	**1740** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C4-Naphthalenes	**771** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
Biphenyl	**305** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
Acenaphthylene	**1250** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
Acenaphthene	**8310** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
Dibenzofuran	**898** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
Fluorene	**2760** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C1-Fluorenes	**1510** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C2-Fluorenes	**1030** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C3-Fluorenes	**921** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
Dibenzothiophene	**1840** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C1-Dibenzothiophenes	**1650** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C2-Dibenzothiophenes	**1360** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C3-Dibenzothiophenes	**817** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C4-Dibenzothiophenes	**502** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
Phenanthrene	**24200** (114)	56.9	8270 Mod		20	11/23/19 3:32	F9K0005	FK92001
Anthracene	**6440** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C1-Phenanthrenes/Anthracenes	**8880** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C2-Phenanthrenes/Anthracenes	**4050** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C3-Phenanthrenes/Anthracenes	**1750** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C4-Phenanthrenes/Anthracenes	**717** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
Retene	**312** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
Benzo(b)naphtho(2,1-d)thiophene	**1440** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C0-Benzonaphthothiophenes	**2560** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C1-Benzonaphthothiophenes	**1380** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C2-Benzonaphthothiophenes	**1030** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C3-Benzonaphthothiophenes	**650** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS735-S2
Date Sampled: 11/15/19 10:59
Percent Solids: 63
Initial Volume: 5.56
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**263** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
Fluoranthene	**22700** (114)	56.9	8270 Mod		20	11/23/19 3:32	F9K0005	FK92001
Pyrene	**22800** (114)	56.9	8270 Mod		20	11/23/19 3:32	F9K0005	FK92001
C1-Fluoranthenes/Pyrenes	**10200** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C2-Fluoranthenes/Pyrenes	**3660** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C3-Fluoranthenes/Pyrenes	**1690** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
Benzo(b)fluorene	**1610** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
Benzo(c)fluorene	**674** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
2-Methylpyrene	**1280** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
4-Methylpyrene	**988** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
1-Methylpyrene	**945** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
Benz(a)anthracene	**8720** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
Chrysene/triphenylene	**8790** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C1-Benzo(a)anthracenes/Chrysenes	**4060** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C2-Benzo(a)anthracenes/Chrysenes	**2010** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C3-Benzo(a)anthracenes/Chrysenes	**1050** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C4-Benzo(a)anthracenes/Chrysenes	**487** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
Benzo(b)fluoranthene	**5890** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
Benzo(j/k)fluoranthene	**5920** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
Benzo(e)pyrene	**5010** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
Benzo(a)pyrene	**7500** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
Perylene	**1820** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
Indeno(1,2,3-cd)pyrene	**4330** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
Dibenzo(a,h)anthracene	**1050** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
Benzo(g,h,i)perylene	**4110** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
Coronene	**1040** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
Tetramethyl lead	ND (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
Trimethylethyl lead	ND (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
Dimethyldiethyl lead	ND (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
Methyltriethyl lead	ND (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
Tetraethyl lead	ND (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
2,6,10-trimethyldodecane (1380)	**252** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS735-S2
Date Sampled: 11/15/19 10:59
Percent Solids: 63
Initial Volume: 5.56
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**386** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
2,6,10-trimethylpentadecane (1650)	**313** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C-17	**389** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
Pristane	**842** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
C-18	**394** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
Phytane	**1040** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
Carbazole	**1410** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
2,6-Dimethylnaphthalene	**318** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
2,3,5-Trimethylnaphthene	**146** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
4-Methyldibenzothiophene	**581** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
2/3-Methyldibenzothiophene	**561** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
1-Methyldibenzothiophene	**205** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
3-Methylphenanthrene	**2070** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
2-Methylphenanthrene	**2440** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
2-Methylanthracene	**1060** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
4/9-Methylphenanthrene	**1910** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001
1-Methylphenanthrene	**1370** (5.69)	2.84	8270 Mod		1	11/23/19 2:06	F9K0005	FK92001

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*89 %*		*50-120*
Surrogate: Naphthalene-d8	*95 %*		*50-120*
Surrogate: Phenanthrene-d10	*86 %*		*50-120*
Surrogate: Perylene-d12	*77 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS735-S2
Date Sampled: 11/15/19 10:59
Percent Solids: 63

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**248000** (97.2)		TOC-LK		1	CCP	11/26/19 18:54	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS735-S3
Date Sampled: 11/15/19 11:03
Percent Solids: 47
Initial Volume: 5.71
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**B 31.0** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C1-Benzene	**373** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C2-Benzenes	**125** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C3-Benzenes	**107** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C4-Benzenes	**113** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C5-Benzenes	**63.8** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
Methylcyclohexane	**40.7** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
Toluene	**564** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
Ethylbenzene	**27.9** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
m,p-Xylene	**197** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
Styrene	**41.0** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
o-Xylene	**15.5** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
Isopropylbenzene	**J 4.35** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
n-Propylbenzene	**12.4** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
1,3,5-Trimethylbenzene	**52.7** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
1,2,3-Trimethylbenzene	**12.5** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
1,2,4-Trimethylbenzene	**55.7** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
t-Butylbenzene	ND (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
sec-Butylbenzene	ND (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
p-Isopropyltoluene	**48.3** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
n-Butylbenzene	**15.7** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
trans-Decalin	**26.0** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
cis-Decalin	**J 4.31** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C1-Decalins	**58.1** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C2-Decalins	**73.0** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C3-Decalins	**61.2** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C4-Decalins	**68.1** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
Benzo(b)thiophene	**15.1** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C1-Benzo(b)thiophenes	**16.8** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C2-Benzo(b)thiophenes	**33.0** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C3-Benzo(b)thiophenes	**31.9** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C4-Benzo(b)thiophenes	**13.7** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS735-S3
Date Sampled: 11/15/19 11:03
Percent Solids: 47
Initial Volume: 5.71
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**336** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
2-Methylnaphthalene	**399** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
1-Methylnaphthalene	**270** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C1-Naphthalenes	**416** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C2-Naphthalenes	**938** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C3-Naphthalenes	**914** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C4-Naphthalenes	**435** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
Biphenyl	**101** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
Acenaphthylene	**209** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
Acenaphthene	**457** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
Dibenzofuran	**134** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
Fluorene	**321** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C1-Fluorenes	**713** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C2-Fluorenes	**584** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C3-Fluorenes	**314** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
Dibenzothiophene	**130** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C1-Dibenzothiophenes	**202** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C2-Dibenzothiophenes	**209** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C3-Dibenzothiophenes	**130** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C4-Dibenzothiophenes	**68.1** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
Phenanthrene	**1390** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
Anthracene	**947** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C1-Phenanthrenes/Anthracenes	**3350** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C2-Phenanthrenes/Anthracenes	**1970** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C3-Phenanthrenes/Anthracenes	**848** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C4-Phenanthrenes/Anthracenes	**368** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
Retene	**173** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
Benzo(b)naphtho(2,1-d)thiophene	**139** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C0-Benzonaphthothiophenes	**289** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C1-Benzonaphthothiophenes	**250** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C2-Benzonaphthothiophenes	**200** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C3-Benzonaphthothiophenes	**119** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS735-S3
Date Sampled: 11/15/19 11:03
Percent Solids: 47
Initial Volume: 5.71
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**38.1** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
Fluoranthene	**2620** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
Pyrene	**4780** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C1-Fluoranthenes/Pyrenes	**3760** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C2-Fluoranthenes/Pyrenes	**1590** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C3-Fluoranthenes/Pyrenes	**720** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
Benzo(b)fluorene	**382** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
Benzo(c)fluorene	**222** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
2-Methylpyrene	**543** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
4-Methylpyrene	**545** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
1-Methylpyrene	**447** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
Benz(a)anthracene	**2170** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
Chrysene/triphenylene	**2060** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C1-Benzo(a)anthracenes/Chrysenes	**1850** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C2-Benzo(a)anthracenes/Chrysenes	**1100** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C3-Benzo(a)anthracenes/Chrysenes	**521** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C4-Benzo(a)anthracenes/Chrysenes	**204** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
Benzo(b)fluoranthene	**1070** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
Benzo(j/k)fluoranthene	**1100** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
Benzo(e)pyrene	**1370** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
Benzo(a)pyrene	**1960** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
Perylene	**688** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
Indeno(1,2,3-cd)pyrene	**762** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
Dibenzo(a,h)anthracene	**239** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
Benzo(g,h,i)perylene	**954** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
Coronene	**202** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
Tetramethyl lead	ND (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
Trimethylethyl lead	ND (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
Dimethyldiethyl lead	ND (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
Methyltriethyl lead	ND (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
Tetraethyl lead	ND (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
2,6,10-trimethyldodecane (1380)	**48.2** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS735-S3
Date Sampled: 11/15/19 11:03
Percent Solids: 47
Initial Volume: 5.71
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**131** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
2,6,10-trimethylpentadecane (1650)	**112** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C-17	**B 279** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
Pristane	**254** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
C-18	**B 139** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
Phytane	**B 197** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
Carbazole	**49.1** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
2,6-Dimethylnaphthalene	**206** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
2,3,5-Trimethylnaphthene	**74.5** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
4-Methyldibenzothiophene	**49.7** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
2/3-Methyldibenzothiophene	**74.1** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
1-Methyldibenzothiophene	**17.2** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
3-Methylphenanthrene	**849** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
2-Methylphenanthrene	**908** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
2-Methylanthracene	**492** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
4/9-Methylphenanthrene	**929** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001
1-Methylphenanthrene	**139** (7.38)	3.69	8270 Mod		1	11/22/19 2:04	F9K0005	FK92001

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*89 %*		*50-120*
Surrogate: Naphthalene-d8	*81 %*		*50-120*
Surrogate: Phenanthrene-d10	*94 %*		*50-120*
Surrogate: Perylene-d12	*84 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS735-S3
Date Sampled: 11/15/19 11:03
Percent Solids: 47

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**52800** (97.0)		TOC-LK		1	CCP	11/26/19 19:10	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS735-S4
Date Sampled: 11/15/19 11:07
Percent Solids: 78
Initial Volume: 5.98
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C1-Benzene	**J 2.45** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C2-Benzenes	**J 2.92** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C3-Benzenes	**J 3.08** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C4-Benzenes	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C5-Benzenes	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
Methylcyclohexane	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
Toluene	**J 4.24** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
Ethylbenzene	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
m,p-Xylene	**J 3.65** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
Styrene	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
o-Xylene	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
Isopropylbenzene	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
n-Propylbenzene	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
1,3,5-Trimethylbenzene	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
1,2,3-Trimethylbenzene	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
1,2,4-Trimethylbenzene	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
t-Butylbenzene	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
sec-Butylbenzene	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
p-Isopropyltoluene	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
n-Butylbenzene	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
trans-Decalin	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
cis-Decalin	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C1-Decalins	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C2-Decalins	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C3-Decalins	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C4-Decalins	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
Benzo(b)thiophene	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C1-Benzo(b)thiophenes	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C2-Benzo(b)thiophenes	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C3-Benzo(b)thiophenes	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C4-Benzo(b)thiophenes	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS735-S4
Date Sampled: 11/15/19 11:07
Percent Solids: 78
Initial Volume: 5.98
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
2-Methylnaphthalene	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
1-Methylnaphthalene	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C1-Naphthalenes	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C2-Naphthalenes	**5.09** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C3-Naphthalenes	**4.65** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C4-Naphthalenes	**J 3.36** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
Biphenyl	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
Acenaphthylene	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
Acenaphthene	**J 2.39** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
Dibenzofuran	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
Fluorene	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C1-Fluorenes	**J 3.30** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C2-Fluorenes	**J 3.83** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C3-Fluorenes	**J 3.90** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
Dibenzothiophene	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C1-Dibenzothiophenes	**J 2.36** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C2-Dibenzothiophenes	**J 2.94** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C3-Dibenzothiophenes	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C4-Dibenzothiophenes	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
Phenanthrene	**8.38** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
Anthracene	**4.70** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C1-Phenanthrenes/Anthracenes	**18.5** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C2-Phenanthrenes/Anthracenes	**8.66** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C3-Phenanthrenes/Anthracenes	**J 4.09** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C4-Phenanthrenes/Anthracenes	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
Retene	**J 2.63** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
Benzo(b)naphtho(2,1-d)thiophene	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C0-Benzonaphthothiophenes	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C1-Benzonaphthothiophenes	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C2-Benzonaphthothiophenes	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C3-Benzonaphthothiophenes	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS735-S4
Date Sampled: 11/15/19 11:07
Percent Solids: 78
Initial Volume: 5.98
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
Fluoranthene	**9.90** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
Pyrene	**22.4** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C1-Fluoranthenes/Pyrenes	**14.5** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C2-Fluoranthenes/Pyrenes	**4.94** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C3-Fluoranthenes/Pyrenes	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
Benzo(b)fluorene	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
Benzo(c)fluorene	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
2-Methylpyrene	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
4-Methylpyrene	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
1-Methylpyrene	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
Benz(a)anthracene	**6.96** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
Chrysene/triphenylene	**7.27** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C1-Benzo(a)anthracenes/Chrysenes	**J 3.86** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C2-Benzo(a)anthracenes/Chrysenes	**J 2.29** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C3-Benzo(a)anthracenes/Chrysenes	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C4-Benzo(a)anthracenes/Chrysenes	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
Benzo(b)fluoranthene	**J 2.37** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
Benzo(j/k)fluoranthene	**J 2.48** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
Benzo(e)pyrene	**J 2.99** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
Benzo(a)pyrene	**J 3.02** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
Perylene	**8.07** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
Indeno(1,2,3-cd)pyrene	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
Dibenzo(a,h)anthracene	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
Benzo(g,h,i)perylene	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
Coronene	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
Tetramethyl lead	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
Trimethylethyl lead	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
Dimethyldiethyl lead	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
Methyltriethyl lead	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
Tetraethyl lead	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
2,6,10-trimethyldodecane (1380)	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS735-S4
Date Sampled: 11/15/19 11:07
Percent Solids: 78
Initial Volume: 5.98
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
2,6,10-trimethylpentadecane (1650)	**10.3** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C-17	**B 41.7** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
Pristane	**B 27.6** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
C-18	**B 32.9** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
Phytane	**B 33.9** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
Carbazole	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
2,6-Dimethylnaphthalene	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
2,3,5-Trimethylnaphthene	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
4-Methyldibenzothiophene	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
2/3-Methyldibenzothiophene	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
1-Methyldibenzothiophene	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
3-Methylphenanthrene	**4.51** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
2-Methylphenanthrene	**J 3.63** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
2-Methylanthracene	**J 2.72** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
4/9-Methylphenanthrene	**J 4.13** (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001
1-Methylphenanthrene	ND (4.29)	2.14	8270 Mod		1	11/22/19 7:39	F9K0005	FK92001

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*82 %*		*50-120*
Surrogate: Naphthalene-d8	*81 %*		*50-120*
Surrogate: Phenanthrene-d10	*86 %*		*50-120*
Surrogate: Perylene-d12	*61 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS735-S4
Date Sampled: 11/15/19 11:07
Percent Solids: 78

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-04
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**9850** (94.2)		TOC-LK		1	CCP	11/26/19 23:49	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS713-S2
Date Sampled: 11/15/19 11:28
Percent Solids: 79
Initial Volume: 6.22
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **12.5** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C1-Benzene	**27.9** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C2-Benzenes	**35.2** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C3-Benzenes	**44.1** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C4-Benzenes	**217** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C5-Benzenes	**82.8** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
Methylcyclohexane	**17.5** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
Toluene	**43.6** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
Ethylbenzene	**8.95** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
m,p-Xylene	**52.7** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
Styrene	**44.2** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
o-Xylene	**7.52** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
Isopropylbenzene	**10.0** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
n-Propylbenzene	**7.25** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
1,3,5-Trimethylbenzene	**6.40** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
1,2,3-Trimethylbenzene	**12.4** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
1,2,4-Trimethylbenzene	**17.8** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
t-Butylbenzene	ND (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
sec-Butylbenzene	**12.4** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
p-Isopropyltoluene	J **4.01** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
n-Butylbenzene	**29.9** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
trans-Decalin	**345** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
cis-Decalin	**33.7** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C1-Decalins	**331** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C2-Decalins	**149** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C3-Decalins	**78.7** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C4-Decalins	**128** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
Benzo(b)thiophene	**7.72** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C1-Benzo(b)thiophenes	**102** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C2-Benzo(b)thiophenes	**33.4** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C3-Benzo(b)thiophenes	**21.2** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C4-Benzo(b)thiophenes	**16.1** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS713-S2
Date Sampled: 11/15/19 11:28
Percent Solids: 79
Initial Volume: 6.22
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**98.6** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
2-Methylnaphthalene	**52.0** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
1-Methylnaphthalene	**1100** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C1-Naphthalenes	**33.3** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C2-Naphthalenes	**249** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C3-Naphthalenes	**242** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C4-Naphthalenes	**183** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
Biphenyl	**17.4** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
Acenaphthylene	**255** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
Acenaphthene	**1450** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
Dibenzofuran	**49.1** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
Fluorene	**173** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C1-Fluorenes	**180** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C2-Fluorenes	**222** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C3-Fluorenes	**201** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
Dibenzothiophene	**140** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C1-Dibenzothiophenes	**193** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C2-Dibenzothiophenes	**237** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C3-Dibenzothiophenes	**180** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C4-Dibenzothiophenes	**100** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
Phenanthrene	**2080** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
Anthracene	**648** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C1-Phenanthrenes/Anthracenes	**1430** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C2-Phenanthrenes/Anthracenes	**987** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C3-Phenanthrenes/Anthracenes	**487** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C4-Phenanthrenes/Anthracenes	**178** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
Retene	**44.0** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
Benzo(b)naphtho(2,1-d)thiophene	**178** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C0-Benzonaphthothiophenes	**337** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C1-Benzonaphthothiophenes	**248** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C2-Benzonaphthothiophenes	**226** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C3-Benzonaphthothiophenes	**162** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS713-S2
Date Sampled: 11/15/19 11:28
Percent Solids: 79
Initial Volume: 6.22
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**79.1** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
Fluoranthene	**2530** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
Pyrene	**2580** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C1-Fluoranthenes/Pyrenes	**1840** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C2-Fluoranthenes/Pyrenes	**934** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C3-Fluoranthenes/Pyrenes	**435** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
Benzo(b)fluorene	**217** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
Benzo(c)fluorene	**85.6** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
2-Methylpyrene	**262** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
4-Methylpyrene	**238** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
1-Methylpyrene	**199** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
Benz(a)anthracene	**1350** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
Chrysene/triphenylene	**1380** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C1-Benzo(a)anthracenes/Chrysenes	**906** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C2-Benzo(a)anthracenes/Chrysenes	**546** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C3-Benzo(a)anthracenes/Chrysenes	**284** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C4-Benzo(a)anthracenes/Chrysenes	**117** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
Benzo(b)fluoranthene	**830** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
Benzo(j/k)fluoranthene	**915** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
Benzo(e)pyrene	**723** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
Benzo(a)pyrene	**1070** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
Perylene	**242** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
Indeno(1,2,3-cd)pyrene	**565** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
Dibenzo(a,h)anthracene	**146** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
Benzo(g,h,i)perylene	**534** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
Coronene	**127** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
Tetramethyl lead	ND (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
Trimethylethyl lead	ND (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
Dimethyldiethyl lead	ND (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
Methyltriethyl lead	ND (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
Tetraethyl lead	ND (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
2,6,10-trimethyldodecane (1380)	**75.1** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS713-S2
Date Sampled: 11/15/19 11:28
Percent Solids: 79
Initial Volume: 6.22
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**113** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
2,6,10-trimethylpentadecane (1650)	**97.8** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C-17	**B 142** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
Pristane	**299** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
C-18	**B 119** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
Phytane	**240** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
Carbazole	**83.6** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
2,6-Dimethylnaphthalene	**28.6** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
2,3,5-Trimethylnaphthene	**20.2** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
4-Methyldibenzothiophene	**69.8** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
2/3-Methyldibenzothiophene	**65.8** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
1-Methyldibenzothiophene	**24.6** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
3-Methylphenanthrene	**305** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
2-Methylphenanthrene	**372** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
2-Methylanthracene	**198** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
4/9-Methylphenanthrene	**322** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001
1-Methylphenanthrene	**224** (4.06)	2.03	8270 Mod		1	11/22/19 9:03	F9K0005	FK92001

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*73 %*		*50-120*
Surrogate: Naphthalene-d8	*82 %*		*50-120*
Surrogate: Phenanthrene-d10	*88 %*		*50-120*
Surrogate: Perylene-d12	*69 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS713-S2
Date Sampled: 11/15/19 11:28
Percent Solids: 79

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-05
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**15000** (94.4)		TOC-LK		1	CCP	11/26/19 19:43	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS715-S2
Date Sampled: 11/15/19 12:15
Percent Solids: 40
Initial Volume: 4.68
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **16.5** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C1-Benzene	**89.5** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C2-Benzenes	**82.8** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C3-Benzenes	**11.7** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C4-Benzenes	**10.7** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C5-Benzenes	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
Methylcyclohexane	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
Toluene	**141** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
Ethylbenzene	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
m,p-Xylene	**134** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
Styrene	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
o-Xylene	J **5.72** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
Isopropylbenzene	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
n-Propylbenzene	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
1,3,5-Trimethylbenzene	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
1,2,3-Trimethylbenzene	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
1,2,4-Trimethylbenzene	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
t-Butylbenzene	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
sec-Butylbenzene	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
p-Isopropyltoluene	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
n-Butylbenzene	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
trans-Decalin	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
cis-Decalin	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C1-Decalins	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C2-Decalins	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C3-Decalins	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C4-Decalins	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
Benzo(b)thiophene	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C1-Benzo(b)thiophenes	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C2-Benzo(b)thiophenes	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C3-Benzo(b)thiophenes	J **6.91** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C4-Benzo(b)thiophenes	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS715-S2
Date Sampled: 11/15/19 12:15
Percent Solids: 40
Initial Volume: 4.68
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**10.9** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
2-Methylnaphthalene	**J 6.92** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
1-Methylnaphthalene	**J 7.47** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C1-Naphthalenes	**J 9.77** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C2-Naphthalenes	**19.8** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C3-Naphthalenes	**11.0** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C4-Naphthalenes	**J 9.86** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
Biphenyl	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
Acenaphthylene	**12.6** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
Acenaphthene	**11.7** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
Dibenzofuran	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
Fluorene	**J 7.06** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C1-Fluorenes	**J 8.70** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C2-Fluorenes	**15.2** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C3-Fluorenes	**13.4** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
Dibenzothiophene	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C1-Dibenzothiophenes	**J 7.42** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C2-Dibenzothiophenes	**J 6.42** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C3-Dibenzothiophenes	**J 10.0** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C4-Dibenzothiophenes	**J 7.13** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
Phenanthrene	**22.6** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
Anthracene	**J 6.23** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C1-Phenanthrenes/Anthracenes	**20.4** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C2-Phenanthrenes/Anthracenes	**11.7** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C3-Phenanthrenes/Anthracenes	**12.6** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C4-Phenanthrenes/Anthracenes	**23.7** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
Retene	**73.5** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
Benzo(b)naphtho(2,1-d)thiophene	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C0-Benzonaphthothiophenes	**J 8.19** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C1-Benzonaphthothiophenes	**11.5** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C2-Benzonaphthothiophenes	**J 9.77** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C3-Benzonaphthothiophenes	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS715-S2
Date Sampled: 11/15/19 12:15
Percent Solids: 40
Initial Volume: 4.68
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
Fluoranthene	**17.5** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
Pyrene	**18.7** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C1-Fluoranthenes/Pyrenes	**21.5** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C2-Fluoranthenes/Pyrenes	**19.5** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C3-Fluoranthenes/Pyrenes	**27.3** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
Benzo(b)fluorene	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
Benzo(c)fluorene	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
2-Methylpyrene	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
4-Methylpyrene	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
1-Methylpyrene	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
Benz(a)anthracene	**J 5.38** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
Chrysene/triphenylene	**J 6.70** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C1-Benzo(a)anthracenes/Chrysenes	**J 9.26** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C2-Benzo(a)anthracenes/Chrysenes	**J 7.70** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C3-Benzo(a)anthracenes/Chrysenes	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C4-Benzo(a)anthracenes/Chrysenes	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
Benzo(b)fluoranthene	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
Benzo(j/k)fluoranthene	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
Benzo(e)pyrene	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
Benzo(a)pyrene	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
Perylene	**1700** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
Indeno(1,2,3-cd)pyrene	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
Dibenzo(a,h)anthracene	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
Benzo(g,h,i)perylene	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
Coronene	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
Tetramethyl lead	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
Trimethylethyl lead	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
Dimethyldiethyl lead	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
Methyltriethyl lead	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
Tetraethyl lead	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
2,6,10-trimethyldodecane (1380)	**J 10.1** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS715-S2
Date Sampled: 11/15/19 12:15
Percent Solids: 40
Initial Volume: 4.68
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**31.4** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
2,6,10-trimethylpentadecane (1650)	**B 24.7** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C-17	**B 207** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
Pristane	**B 51.7** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
C-18	**B 103** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
Phytane	**B 86.2** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
Carbazole	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
2,6-Dimethylnaphthalene	**J 6.28** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
2,3,5-Trimethylnaphthene	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
4-Methyldibenzothiophene	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
2/3-Methyldibenzothiophene	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
1-Methyldibenzothiophene	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
3-Methylphenanthrene	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
2-Methylphenanthrene	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
2-Methylanthracene	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
4/9-Methylphenanthrene	**J 5.48** (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001
1-Methylphenanthrene	ND (10.7)	5.34	8270 Mod		1	11/22/19 10:28	F9K0005	FK92001

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*96 %*		*50-120*
Surrogate: Naphthalene-d8	*85 %*		*50-120*
Surrogate: Phenanthrene-d10	*98 %*		*50-120*
Surrogate: Perylene-d12	*75 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS715-S2
Date Sampled: 11/15/19 12:15
Percent Solids: 40

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-06
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**104000** (105)		TOC-LK		1	CCP	11/26/19 20:00	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS731-S2
Date Sampled: 11/15/19 12:48
Percent Solids: 63
Initial Volume: 5.55
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**57.5** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C1-Benzene	**428** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C2-Benzenes	**300** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C3-Benzenes	**572** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C4-Benzenes	**816** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C5-Benzenes	**421** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
Methylcyclohexane	**77.3** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
Toluene	**639** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
Ethylbenzene	**81.1** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
m,p-Xylene	**418** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
Styrene	**36.7** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
o-Xylene	**99.4** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
Isopropylbenzene	**27.5** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
n-Propylbenzene	**37.9** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
1,3,5-Trimethylbenzene	**111** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
1,2,3-Trimethylbenzene	**93.6** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
1,2,4-Trimethylbenzene	**423** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
t-Butylbenzene	ND (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
sec-Butylbenzene	**7.49** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
p-Isopropyltoluene	**66.5** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
n-Butylbenzene	**63.6** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
trans-Decalin	**33.3** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
cis-Decalin	**5.72** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C1-Decalins	**94.3** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C2-Decalins	**162** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C3-Decalins	**129** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C4-Decalins	**152** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
Benzo(b)thiophene	**257** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C1-Benzo(b)thiophenes	**218** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C2-Benzo(b)thiophenes	**391** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C3-Benzo(b)thiophenes	**234** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C4-Benzo(b)thiophenes	**72.4** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS731-S2
Date Sampled: 11/15/19 12:48
Percent Solids: 63
Initial Volume: 5.55
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**6820** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
2-Methylnaphthalene	**3090** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
1-Methylnaphthalene	**4140** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C1-Naphthalenes	**4390** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C2-Naphthalenes	**7690** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C3-Naphthalenes	**3860** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C4-Naphthalenes	**1220** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
Biphenyl	**999** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
Acenaphthylene	**365** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
Acenaphthene	**8500** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
Dibenzofuran	**558** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
Fluorene	**5000** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C1-Fluorenes	**2510** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C2-Fluorenes	**1400** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C3-Fluorenes	**553** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
Dibenzothiophene	**1020** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C1-Dibenzothiophenes	**1030** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C2-Dibenzothiophenes	**572** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C3-Dibenzothiophenes	**225** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C4-Dibenzothiophenes	**109** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
Phenanthrene	**17500** (28.5)	14.3	8270 Mod		5	11/23/19 5:00	F9K0005	FK92001
Anthracene	**4290** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C1-Phenanthrenes/Anthracenes	**8070** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C2-Phenanthrenes/Anthracenes	**2810** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C3-Phenanthrenes/Anthracenes	**923** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C4-Phenanthrenes/Anthracenes	**374** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
Retene	**205** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
Benzo(b)naphtho(2,1-d)thiophene	**323** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C0-Benzonaphthothiophenes	**604** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C1-Benzonaphthothiophenes	**430** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C2-Benzonaphthothiophenes	**335** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C3-Benzonaphthothiophenes	**216** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS731-S2
Date Sampled: 11/15/19 12:48
Percent Solids: 63
Initial Volume: 5.55
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**67.7** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
Fluoranthene	**6870** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
Pyrene	**8050** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C1-Fluoranthenes/Pyrenes	**4000** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C2-Fluoranthenes/Pyrenes	**1510** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C3-Fluoranthenes/Pyrenes	**754** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
Benzo(b)fluorene	**493** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
Benzo(c)fluorene	**268** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
2-Methylpyrene	**508** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
4-Methylpyrene	**441** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
1-Methylpyrene	**395** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
Benz(a)anthracene	**2650** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
Chrysene/triphenylene	**2950** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C1-Benzo(a)anthracenes/Chrysenes	**1800** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C2-Benzo(a)anthracenes/Chrysenes	**1150** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C3-Benzo(a)anthracenes/Chrysenes	**647** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C4-Benzo(a)anthracenes/Chrysenes	**319** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
Benzo(b)fluoranthene	**1800** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
Benzo(j/k)fluoranthene	**1920** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
Benzo(e)pyrene	**1640** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
Benzo(a)pyrene	**2380** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
Perylene	**764** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
Indeno(1,2,3-cd)pyrene	**1390** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
Dibenzo(a,h)anthracene	**348** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
Benzo(g,h,i)perylene	**1340** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
Coronene	**335** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
Tetramethyl lead	ND (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
Trimethylethyl lead	ND (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
Dimethyldiethyl lead	ND (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
Methyltriethyl lead	ND (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
Tetraethyl lead	ND (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
2,6,10-trimethyldodecane (1380)	**113** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS731-S2
Date Sampled: 11/15/19 12:48
Percent Solids: 63
Initial Volume: 5.55
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**234** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
2,6,10-trimethylpentadecane (1650)	**194** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C-17	**346** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
Pristane	**366** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
C-18	**B 142** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
Phytane	**344** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
Carbazole	**126** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
2,6-Dimethylnaphthalene	**1820** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
2,3,5-Trimethylnaphthene	**253** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
4-Methyldibenzothiophene	**427** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
2/3-Methyldibenzothiophene	**345** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
1-Methyldibenzothiophene	**105** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
3-Methylphenanthrene	**1870** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
2-Methylphenanthrene	**2010** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
2-Methylanthracene	**761** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
4/9-Methylphenanthrene	**2010** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001
1-Methylphenanthrene	**1370** (5.71)	2.85	8270 Mod		1	11/22/19 11:54	F9K0005	FK92001

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*79 %*		*50-120*
Surrogate: Naphthalene-d8	*84 %*		*50-120*
Surrogate: Phenanthrene-d10	*85 %*		*50-120*
Surrogate: Perylene-d12	*86 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS731-S2
Date Sampled: 11/15/19 12:48
Percent Solids: 63

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-07
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**109000** (92.8)		TOC-LK		1	CCP	11/27/19 21:44	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS734-S1
Date Sampled: 11/15/19 13:33
Percent Solids: 73
Initial Volume: 2.77
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**2490** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C1-Benzene	**998** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C2-Benzenes	**6800** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C3-Benzenes	**18600** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C4-Benzenes	**41900** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C5-Benzenes	**14700** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
Methylcyclohexane	ND (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
Toluene	**1540** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
Ethylbenzene	**9830** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
m,p-Xylene	**2540** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
Styrene	**2810** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
o-Xylene	**2320** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
Isopropylbenzene	**2310** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
n-Propylbenzene	**J 792** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
1,3,5-Trimethylbenzene	**3090** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
1,2,3-Trimethylbenzene	**5680** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
1,2,4-Trimethylbenzene	**11700** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
t-Butylbenzene	ND (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
sec-Butylbenzene	ND (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
p-Isopropyltoluene	**3850** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
n-Butylbenzene	ND (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
trans-Decalin	ND (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
cis-Decalin	ND (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C1-Decalins	**2040** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C2-Decalins	**4800** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C3-Decalins	**4710** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C4-Decalins	**7810** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
Benzo(b)thiophene	**45500** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C1-Benzo(b)thiophenes	**44400** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C2-Benzo(b)thiophenes	**39300** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C3-Benzo(b)thiophenes	**16100** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C4-Benzo(b)thiophenes	**3670** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS734-S1
Date Sampled: 11/15/19 13:33
Percent Solids: 73
Initial Volume: 2.77
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**2510000** (4910)	2460	8270 Mod		500	11/23/19 7:53	F9K0005	FK92001
2-Methylnaphthalene	**1390000** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
1-Methylnaphthalene	**917000** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C1-Naphthalenes	**1420000** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C2-Naphthalenes	**716000** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C3-Naphthalenes	**188000** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C4-Naphthalenes	**43500** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
Biphenyl	**359000** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
Acenaphthylene	**71400** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
Acenaphthene	**1710000** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
Dibenzofuran	**66000** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
Fluorene	**664000** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C1-Fluorenes	**181000** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C2-Fluorenes	**75300** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C3-Fluorenes	**22500** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
Dibenzothiophene	**215000** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C1-Dibenzothiophenes	**119000** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C2-Dibenzothiophenes	**54600** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C3-Dibenzothiophenes	**17900** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C4-Dibenzothiophenes	**4700** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
Phenanthrene	**2880000** (4910)	2460	8270 Mod		500	11/23/19 7:53	F9K0005	FK92001
Anthracene	**704000** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C1-Phenanthrenes/Anthracenes	**829000** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C2-Phenanthrenes/Anthracenes	**198000** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C3-Phenanthrenes/Anthracenes	**42400** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C4-Phenanthrenes/Anthracenes	**12400** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
Retene	**5760** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
Benzo(b)naphtho(2,1-d)thiophene	**51200** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C0-Benzonaphthothiophenes	**92200** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C1-Benzonaphthothiophenes	**38200** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C2-Benzonaphthothiophenes	**13800** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C3-Benzonaphthothiophenes	**8630** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS734-S1
Date Sampled: 11/15/19 13:33
Percent Solids: 73
Initial Volume: 2.77
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**1850** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
Fluoranthene	**975000** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
Pyrene	**1430000** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C1-Fluoranthenes/Pyrenes	**647000** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C2-Fluoranthenes/Pyrenes	**121000** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C3-Fluoranthenes/Pyrenes	**24700** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
Benzo(b)fluorene	**73300** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
Benzo(c)fluorene	**38300** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
2-Methylpyrene	**85800** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
4-Methylpyrene	**68200** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
1-Methylpyrene	**84100** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
Benz(a)anthracene	**462000** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
Chrysene/triphenylene	**414000** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C1-Benzo(a)anthracenes/Chrysenes	**165000** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C2-Benzo(a)anthracenes/Chrysenes	**45800** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C3-Benzo(a)anthracenes/Chrysenes	**8090** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C4-Benzo(a)anthracenes/Chrysenes	**4420** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
Benzo(b)fluoranthene	**187000** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
Benzo(j/k)fluoranthene	**254000** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
Benzo(e)pyrene	**236000** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
Benzo(a)pyrene	**447000** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
Perylene	**66800** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
Indeno(1,2,3-cd)pyrene	**195000** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
Dibenzo(a,h)anthracene	**40100** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
Benzo(g,h,i)perylene	**214000** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
Coronene	**60900** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
Tetramethyl lead	ND (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
Trimethylethyl lead	ND (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
Dimethyldiethyl lead	ND (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
Methyltriethyl lead	ND (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
Tetraethyl lead	ND (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
2,6,10-trimethyldodecane (1380)	**4260** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS734-S1
Date Sampled: 11/15/19 13:33
Percent Solids: 73
Initial Volume: 2.77
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**7200** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
2,6,10-trimethylpentadecane (1650)	**7100** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C-17	**1500** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
Pristane	**10600** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
C-18	**1920** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
Phytane	**7770** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
Carbazole	**12000** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
2,6-Dimethylnaphthalene	**138000** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
2,3,5-Trimethylnaphthene	**10500** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
4-Methyldibenzothiophene	**49500** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
2/3-Methyldibenzothiophene	**43400** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
1-Methyldibenzothiophene	**10600** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
3-Methylphenanthrene	**208000** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
2-Methylphenanthrene	**226000** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
2-Methylanthracene	**95500** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
4/9-Methylphenanthrene	**166000** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001
1-Methylphenanthrene	**126000** (983)	491	8270 Mod		100	11/22/19 14:45	F9K0005	FK92001

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*104 %*		*50-120*
Surrogate: Naphthalene-d8	*109 %*		*50-120*
Surrogate: Phenanthrene-d10	*98 %*		*50-120*
Surrogate: Perylene-d12	*186 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS734-S1
Date Sampled: 11/15/19 13:33
Percent Solids: 73

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-08
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**79800** (94.1)		TOC-LK		1	CCP	11/27/19 21:44	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS734-S2
Date Sampled: 11/15/19 13:37
Percent Solids: 76
Initial Volume: 5.42
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C1-Benzene	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C2-Benzenes	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C3-Benzenes	J **4.74** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C4-Benzenes	**5.83** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C5-Benzenes	J **3.37** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
Methylcyclohexane	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
Toluene	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
Ethylbenzene	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
m,p-Xylene	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
Styrene	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
o-Xylene	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
Isopropylbenzene	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
n-Propylbenzene	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
1,3,5-Trimethylbenzene	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
1,2,3-Trimethylbenzene	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
1,2,4-Trimethylbenzene	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
t-Butylbenzene	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
sec-Butylbenzene	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
p-Isopropyltoluene	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
n-Butylbenzene	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
trans-Decalin	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
cis-Decalin	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C1-Decalins	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C2-Decalins	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C3-Decalins	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C4-Decalins	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
Benzo(b)thiophene	**6.17** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C1-Benzo(b)thiophenes	**7.37** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C2-Benzo(b)thiophenes	**8.03** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C3-Benzo(b)thiophenes	J **4.01** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C4-Benzo(b)thiophenes	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS734-S2
Date Sampled: 11/15/19 13:37
Percent Solids: 76
Initial Volume: 5.42
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**299** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
2-Methylnaphthalene	**104** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
1-Methylnaphthalene	**127** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C1-Naphthalenes	**142** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C2-Naphthalenes	**123** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C3-Naphthalenes	**44.9** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C4-Naphthalenes	**12.6** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
Biphenyl	**43.6** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
Acenaphthylene	**8.58** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
Acenaphthene	**276** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
Dibenzofuran	**13.8** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
Fluorene	**116** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C1-Fluorenes	**38.8** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C2-Fluorenes	**18.1** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C3-Fluorenes	**5.47** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
Dibenzothiophene	**38.9** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C1-Dibenzothiophenes	**22.1** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C2-Dibenzothiophenes	**9.91** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C3-Dibenzothiophenes	**J 3.38** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C4-Dibenzothiophenes	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
Phenanthrene	**612** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
Anthracene	**83.0** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C1-Phenanthrenes/Anthracenes	**163** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C2-Phenanthrenes/Anthracenes	**29.9** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C3-Phenanthrenes/Anthracenes	**5.84** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C4-Phenanthrenes/Anthracenes	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
Retene	**J 3.77** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
Benzo(b)naphtho(2,1-d)thiophene	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C0-Benzonaphthothiophenes	**J 4.64** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C1-Benzonaphthothiophenes	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C2-Benzonaphthothiophenes	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C3-Benzonaphthothiophenes	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS734-S2
Date Sampled: 11/15/19 13:37
Percent Solids: 76
Initial Volume: 5.42
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
Fluoranthene	**180** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
Pyrene	**263** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C1-Fluoranthenes/Pyrenes	**67.5** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C2-Fluoranthenes/Pyrenes	**7.27** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C3-Fluoranthenes/Pyrenes	**J 2.95** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
Benzo(b)fluorene	**6.91** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
Benzo(c)fluorene	**5.33** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
2-Methylpyrene	**7.50** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
4-Methylpyrene	**6.38** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
1-Methylpyrene	**8.09** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
Benz(a)anthracene	**17.6** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
Chrysene/triphenylene	**15.5** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C1-Benzo(a)anthracenes/Chrysenes	**6.48** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C2-Benzo(a)anthracenes/Chrysenes	**J 3.41** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C3-Benzo(a)anthracenes/Chrysenes	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C4-Benzo(a)anthracenes/Chrysenes	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
Benzo(b)fluoranthene	**J 4.44** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
Benzo(j/k)fluoranthene	**5.13** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
Benzo(e)pyrene	**5.37** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
Benzo(a)pyrene	**8.41** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
Perylene	**5.32** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
Indeno(1,2,3-cd)pyrene	**J 4.04** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
Dibenzo(a,h)anthracene	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
Benzo(g,h,i)perylene	**J 3.70** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
Coronene	**J 2.58** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
Tetramethyl lead	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
Trimethylethyl lead	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
Dimethyldiethyl lead	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
Methyltriethyl lead	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
Tetraethyl lead	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
2,6,10-trimethyldodecane (1380)	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS734-S2
Date Sampled: 11/15/19 13:37
Percent Solids: 76
Initial Volume: 5.42
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	J **3.60** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
2,6,10-trimethylpentadecane (1650)	B **10.6** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C-17	B **40.3** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
Pristane	B **23.7** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
C-18	B **31.9** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
Phytane	B **30.3** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
Carbazole	**5.38** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
2,6-Dimethylnaphthalene	**24.6** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
2,3,5-Trimethylnaphthene	J **2.87** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
4-Methyldibenzothiophene	**9.34** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
2/3-Methyldibenzothiophene	**7.24** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
1-Methyldibenzothiophene	ND (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
3-Methylphenanthrene	**40.9** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
2-Methylphenanthrene	**45.0** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
2-Methylanthracene	**17.2** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
4/9-Methylphenanthrene	**32.0** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001
1-Methylphenanthrene	**25.7** (4.87)	2.44	8270 Mod		1	11/22/19 16:09	F9K0005	FK92001

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*83 %*		*50-120*
Surrogate: Naphthalene-d8	*85 %*		*50-120*
Surrogate: Phenanthrene-d10	*90 %*		*50-120*
Surrogate: Perylene-d12	*65 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS734-S2
Date Sampled: 11/15/19 13:37
Percent Solids: 76

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-09
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**1750** (94.7)		TOC-LK		1	CCP	11/27/19 21:44	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS736-S2
Date Sampled: 11/15/19 14:15
Percent Solids: 76
Initial Volume: 4.94
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**B 13.0** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C1-Benzene	**J 5.13** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C2-Benzenes	**J 5.22** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C3-Benzenes	**J 2.90** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C4-Benzenes	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C5-Benzenes	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
Methylcyclohexane	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
Toluene	**7.39** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
Ethylbenzene	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
m,p-Xylene	**J 5.33** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
Styrene	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
o-Xylene	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
Isopropylbenzene	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
n-Propylbenzene	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
1,3,5-Trimethylbenzene	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
1,2,3-Trimethylbenzene	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
1,2,4-Trimethylbenzene	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
t-Butylbenzene	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
sec-Butylbenzene	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
p-Isopropyltoluene	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
n-Butylbenzene	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
trans-Decalin	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
cis-Decalin	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C1-Decalins	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C2-Decalins	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C3-Decalins	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C4-Decalins	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
Benzo(b)thiophene	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C1-Benzo(b)thiophenes	**J 4.65** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C2-Benzo(b)thiophenes	**J 2.94** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C3-Benzo(b)thiophenes	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C4-Benzo(b)thiophenes	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS736-S2
Date Sampled: 11/15/19 14:15
Percent Solids: 76
Initial Volume: 4.94
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**27.0** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
2-Methylnaphthalene	**12.9** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
1-Methylnaphthalene	**10.7** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C1-Naphthalenes	**14.4** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C2-Naphthalenes	**10.1** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C3-Naphthalenes	**5.43** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C4-Naphthalenes	**J 3.65** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
Biphenyl	**J 3.32** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
Acenaphthylene	**6.27** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
Acenaphthene	**17.0** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
Dibenzofuran	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
Fluorene	**6.37** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C1-Fluorenes	**J 4.47** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C2-Fluorenes	**J 4.74** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C3-Fluorenes	**J 4.58** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
Dibenzothiophene	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C1-Dibenzothiophenes	**J 2.80** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C2-Dibenzothiophenes	**J 2.82** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C3-Dibenzothiophenes	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C4-Dibenzothiophenes	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
Phenanthrene	**24.3** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
Anthracene	**6.78** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C1-Phenanthrenes/Anthracenes	**12.0** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C2-Phenanthrenes/Anthracenes	**5.49** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C3-Phenanthrenes/Anthracenes	**J 2.84** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C4-Phenanthrenes/Anthracenes	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
Retene	**J 3.06** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
Benzo(b)naphtho(2,1-d)thiophene	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C0-Benzonaphthothiophenes	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C1-Benzonaphthothiophenes	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C2-Benzonaphthothiophenes	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C3-Benzonaphthothiophenes	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS736-S2
Date Sampled: 11/15/19 14:15
Percent Solids: 76
Initial Volume: 4.94
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
Fluoranthene	**10.8** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
Pyrene	**16.7** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C1-Fluoranthenes/Pyrenes	**16.4** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C2-Fluoranthenes/Pyrenes	**5.92** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C3-Fluoranthenes/Pyrenes	**J 3.47** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
Benzo(b)fluorene	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
Benzo(c)fluorene	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
2-Methylpyrene	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
4-Methylpyrene	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
1-Methylpyrene	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
Benz(a)anthracene	**6.20** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
Chrysene/triphenylene	**6.41** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C1-Benzo(a)anthracenes/Chrysenes	**5.70** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C2-Benzo(a)anthracenes/Chrysenes	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C3-Benzo(a)anthracenes/Chrysenes	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C4-Benzo(a)anthracenes/Chrysenes	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
Benzo(b)fluoranthene	**J 3.40** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
Benzo(j/k)fluoranthene	**J 3.76** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
Benzo(e)pyrene	**J 4.05** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
Benzo(a)pyrene	**5.78** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
Perylene	**2010** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
Indeno(1,2,3-cd)pyrene	**J 3.53** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
Dibenzo(a,h)anthracene	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
Benzo(g,h,i)perylene	**J 4.16** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
Coronene	**J 2.96** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
Tetramethyl lead	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
Trimethylethyl lead	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
Dimethyldiethyl lead	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
Methyltriethyl lead	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
Tetraethyl lead	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
2,6,10-trimethyldodecane (1380)	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS736-S2
Date Sampled: 11/15/19 14:15
Percent Solids: 76
Initial Volume: 4.94
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**6.09** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
2,6,10-trimethylpentadecane (1650)	**B 12.2** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C-17	**B 49.8** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
Pristane	**B 30.5** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
C-18	**B 42.6** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
Phytane	**B 38.5** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
Carbazole	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
2,6-Dimethylnaphthalene	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
2,3,5-Trimethylnaphthene	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
4-Methyldibenzothiophene	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
2/3-Methyldibenzothiophene	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
1-Methyldibenzothiophene	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
3-Methylphenanthrene	**J 2.89** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
2-Methylphenanthrene	**J 2.77** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
2-Methylanthracene	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
4/9-Methylphenanthrene	**J 2.75** (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001
1-Methylphenanthrene	ND (5.34)	2.67	8270 Mod		1	11/22/19 17:33	F9K0005	FK92001

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*98 %*		*50-120*
Surrogate: Naphthalene-d8	*88 %*		*50-120*
Surrogate: Phenanthrene-d10	*95 %*		*50-120*
Surrogate: Perylene-d12	*103 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS736-S2
Date Sampled: 11/15/19 14:15
Percent Solids: 76

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-10
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**12100** (95.8)		TOC-LK		1	CCP	11/26/19 21:40	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS737-S1
Date Sampled: 11/15/19 14:49
Percent Solids: 39
Initial Volume: 2.11
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**355** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
C1-Benzene	**1250** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
C2-Benzenes	**20700** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
C3-Benzenes	**55600** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
C4-Benzenes	**71200** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
C5-Benzenes	**28200** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
Methylcyclohexane	**220** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
Toluene	**1860** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
Ethylbenzene	**25800** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
m,p-Xylene	**9780** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
Styrene	**5440** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
o-Xylene	**9930** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
Isopropylbenzene	**7250** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
n-Propylbenzene	**3500** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
1,3,5-Trimethylbenzene	**10700** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
1,2,3-Trimethylbenzene	**14700** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
1,2,4-Trimethylbenzene	**39100** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
t-Butylbenzene	ND (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
sec-Butylbenzene	**490** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
p-Isopropyltoluene	**9220** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
n-Butylbenzene	ND (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
trans-Decalin	**929** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
cis-Decalin	**368** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
C1-Decalins	**3860** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
C2-Decalins	**9380** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
C3-Decalins	**9220** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
C4-Decalins	**15900** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
Benzo(b)thiophene	**7200** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
C1-Benzo(b)thiophenes	**19200** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
C2-Benzo(b)thiophenes	**25200** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
C3-Benzo(b)thiophenes	**15600** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
C4-Benzo(b)thiophenes	**4150** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS737-S1
Date Sampled: 11/15/19 14:49
Percent Solids: 39
Initial Volume: 2.11
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**861000** (2430)	1210	8270 Mod		100	11/23/19 6:26	F9K0005	FK92001
2-Methylnaphthalene	**912000** (2430)	1210	8270 Mod		100	11/23/19 6:26	F9K0005	FK92001
1-Methylnaphthalene	**701000** (2430)	1210	8270 Mod		100	11/23/19 6:26	F9K0005	FK92001
C1-Naphthalenes	**994000** (2430)	1210	8270 Mod		100	11/23/19 6:26	F9K0005	FK92001
C2-Naphthalenes	**672000** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
C3-Naphthalenes	**298000** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
C4-Naphthalenes	**87700** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
Biphenyl	**102000** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
Acenaphthylene	**45000** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
Acenaphthene	**800000** (2430)	1210	8270 Mod		100	11/23/19 6:26	F9K0005	FK92001
Dibenzofuran	**34300** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
Fluorene	**345000** (2430)	1210	8270 Mod		100	11/23/19 6:26	F9K0005	FK92001
C1-Fluorenes	**211000** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
C2-Fluorenes	**131000** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
C3-Fluorenes	**42200** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
Dibenzothiophene	**63400** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
C1-Dibenzothiophenes	**81900** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
C2-Dibenzothiophenes	**58700** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
C3-Dibenzothiophenes	**25500** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
C4-Dibenzothiophenes	**8060** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
Phenanthrene	**1180000** (2430)	1210	8270 Mod		100	11/23/19 6:26	F9K0005	FK92001
Anthracene	**352000** (2430)	1210	8270 Mod		100	11/23/19 6:26	F9K0005	FK92001
C1-Phenanthrenes/Anthracenes	**720000** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
C2-Phenanthrenes/Anthracenes	**303000** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
C3-Phenanthrenes/Anthracenes	**94600** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
C4-Phenanthrenes/Anthracenes	**28700** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
Retene	**20900** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
Benzo(b)naphtho(2,1-d)thiophene	**21800** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
C0-Benzonaphthothiophenes	**38500** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
C1-Benzonaphthothiophenes	**32200** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
C2-Benzonaphthothiophenes	**17000** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
C3-Benzonaphthothiophenes	**7880** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS737-S1
Date Sampled: 11/15/19 14:49
Percent Solids: 39
Initial Volume: 2.11
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**1450** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
Fluoranthene	**349000** (2430)	1210	8270 Mod		100	11/23/19 6:26	F9K0005	FK92001
Pyrene	**513000** (2430)	1210	8270 Mod		100	11/23/19 6:26	F9K0005	FK92001
C1-Fluoranthenes/Pyrenes	**437000** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
C2-Fluoranthenes/Pyrenes	**166000** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
C3-Fluoranthenes/Pyrenes	**54600** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
Benzo(b)fluorene	**41400** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
Benzo(c)fluorene	**24300** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
2-Methylpyrene	**53600** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
4-Methylpyrene	**47600** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
1-Methylpyrene	**55700** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
Benz(a)anthracene	**196000** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
Chrysene/triphenylene	**184000** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
C1-Benzo(a)anthracenes/Chrysenes	**158000** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
C2-Benzo(a)anthracenes/Chrysenes	**72600** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
C3-Benzo(a)anthracenes/Chrysenes	**24800** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
C4-Benzo(a)anthracenes/Chrysenes	**6340** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
Benzo(b)fluoranthene	**60300** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
Benzo(j/k)fluoranthene	**75900** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
Benzo(e)pyrene	**65700** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
Benzo(a)pyrene	**124000** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
Perylene	**18300** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
Indeno(1,2,3-cd)pyrene	**41700** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
Dibenzo(a,h)anthracene	**13400** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
Benzo(g,h,i)perylene	**41400** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
Coronene	**10500** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
Tetramethyl lead	ND (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
Trimethylethyl lead	ND (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
Dimethyldiethyl lead	ND (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
Methyltriethyl lead	ND (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
Tetraethyl lead	ND (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
2,6,10-trimethyldodecane (1380)	**4500** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS737-S1
Date Sampled: 11/15/19 14:49
Percent Solids: 39
Initial Volume: 2.11
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/20/19 11:45

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**9360** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
2,6,10-trimethylpentadecane (1650)	**10500** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
C-17	**1380** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
Pristane	**20500** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
C-18	**1280** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
Phytane	**17600** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
Carbazole	**2830** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
2,6-Dimethylnaphthalene	**139000** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
2,3,5-Trimethylnaphthene	**21300** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
4-Methyldibenzothiophene	**34400** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
2/3-Methyldibenzothiophene	**28300** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
1-Methyldibenzothiophene	**7270** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
3-Methylphenanthrene	**165000** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
2-Methylphenanthrene	**176000** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
2-Methylanthracene	**91000** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
4/9-Methylphenanthrene	**165000** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001
1-Methylphenanthrene	**118000** (121)	60.7	8270 Mod		5	11/22/19 20:24	F9K0005	FK92001

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*97 %*		*50-120*
Surrogate: Naphthalene-d8	*88 %*		*50-120*
Surrogate: Phenanthrene-d10	*89 %*		*50-120*
Surrogate: Perylene-d12	*109 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS737-S1
Date Sampled: 11/15/19 14:49
Percent Solids: 39

ESS Laboratory Work Order: F190058
ESS Laboratory Sample ID: F190058-11
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**116000** (97.1)		TOC-LK		1	CCP	11/26/19 21:56	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190058

Quality Control Data

Classical Chemistry

Batch CK92246 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	100	mg/kg							
Total Organic Carbon (2)	ND	100	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190058

Quality Control Data

Classical Chemistry

Batch CK92246 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	10200	100	mg/kg	10000		102	80-120			
Total Organic Carbon (2)	10100	100	mg/kg	10000		101	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190058

Quality Control Data

Classical Chemistry

Batch CK92246 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	10000	100	mg/kg	10000		100	80-120	1	20	
Total Organic Carbon (2)	10700	100	mg/kg	10000		107	80-120	6	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190058

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FK92001 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	5.11	4.00	ug/Kg wet							
C1-Benzene	ND	4.00	ug/Kg wet							
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	ND	4.00	ug/Kg wet							
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	2.33	4.00	ug/Kg wet							J
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190058

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FK92001 - 3570

C1-Fluorenes	ND	4.00	ug/Kg wet
C2-Fluorenes	ND	4.00	ug/Kg wet
C3-Fluorenes	ND	4.00	ug/Kg wet
Dibenzothiophene	ND	4.00	ug/Kg wet
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet
Phenanthrene	ND	4.00	ug/Kg wet
Anthracene	ND	4.00	ug/Kg wet
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
Retene	ND	4.00	ug/Kg wet
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
Fluoranthene	ND	4.00	ug/Kg wet
Pyrene	ND	4.00	ug/Kg wet
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
Benzo(b)fluorene	ND	4.00	ug/Kg wet
Benzo(c)fluorene	ND	4.00	ug/Kg wet
2-Methylpyrene	ND	4.00	ug/Kg wet
4-Methylpyrene	ND	4.00	ug/Kg wet
1-Methylpyrene	ND	4.00	ug/Kg wet
Benz(a)anthracene	ND	4.00	ug/Kg wet
Chrysene/triphenylene	ND	4.00	ug/Kg wet
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet
Benzo(e)pyrene	ND	4.00	ug/Kg wet
Benzo(a)pyrene	ND	4.00	ug/Kg wet
Perylene	ND	4.00	ug/Kg wet
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet
Coronene	ND	4.00	ug/Kg wet
Tetramethyl lead	ND	4.00	ug/Kg wet
Trimethylethyl lead	ND	4.00	ug/Kg wet

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190058

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FK92001 - 3570						
Dimethyldiethyl lead	ND	4.00	ug/Kg wet			
Methyltriethyl lead	ND	4.00	ug/Kg wet			
Tetraethyl lead	ND	4.00	ug/Kg wet			
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet			
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet			
2,6,10-trimethylpentadecane (1650)	7.03	4.00	ug/Kg wet			
C-17	31.6	4.00	ug/Kg wet			
Pristane	20.6	4.00	ug/Kg wet			
C-18	19.5	4.00	ug/Kg wet			
Phytane	23.5	4.00	ug/Kg wet			
Carbazole	ND	4.00	ug/Kg wet			
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet			
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet			
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
3-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylanthracene	ND	4.00	ug/Kg wet			
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet			
1-Methylphenanthrene	ND	4.00	ug/Kg wet			
Surrogate: Toluene-D8	*428*		ug/Kg wet	*400.0*	*107*	*50-120*
Surrogate: Naphthalene-d8	*357*		ug/Kg wet	*400.0*	*89*	*50-120*
Surrogate: Phenanthrene-d10	*372*		ug/Kg wet	*400.0*	*93*	*50-120*
Surrogate: Perylene-d12	*367*		ug/Kg wet	*400.0*	*92*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190058

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FK92001 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	302	4.00	ug/Kg wet	400.0		76	60-130			
Methylcyclohexane	257	4.00	ug/Kg wet	400.0		64	60-130			
Toluene	370	4.00	ug/Kg wet	400.0		92	60-130			
Ethylbenzene	347	4.00	ug/Kg wet	400.0		87	60-130			
m,p-Xylene	348	4.00	ug/Kg wet	400.0		87	60-130			
Styrene	320	4.00	ug/Kg wet	400.0		80	60-130			
o-Xylene	359	4.00	ug/Kg wet	400.0		90	60-130			
Isopropylbenzene	336	4.00	ug/Kg wet	400.0		84	60-130			
n-Propylbenzene	344	4.00	ug/Kg wet	400.0		86	60-130			
1,3,5-Trimethylbenzene	352	4.00	ug/Kg wet	400.0		88	60-130			
1,2,3-Trimethylbenzene	349	4.00	ug/Kg wet	400.0		87	60-130			
1,2,4-Trimethylbenzene	350	4.00	ug/Kg wet	400.0		87	60-130			
t-Butylbenzene	343	4.00	ug/Kg wet	400.0		86	60-130			
sec-Butylbenzene	344	4.00	ug/Kg wet	400.0		86	60-130			
p-Isopropyltoluene	359	4.00	ug/Kg wet	400.0		90	60-130			
n-Butylbenzene	345	4.00	ug/Kg wet	400.0		86	60-130			
trans-Decalin	335	4.00	ug/Kg wet	400.0		84	60-130			
cis-Decalin	338	4.00	ug/Kg wet	400.0		85	60-130			
Benzo(b)thiophene	339	4.00	ug/Kg wet	400.0		85	60-130			
Naphthalene	347	4.00	ug/Kg wet	400.0		87	60-130			
2-Methylnaphthalene	342	4.00	ug/Kg wet	400.0		86	60-130			
1-Methylnaphthalene	333	4.00	ug/Kg wet	400.0		83	60-130			
Biphenyl	328	4.00	ug/Kg wet	400.0		82	60-130			
Acenaphthylene	310	4.00	ug/Kg wet	400.0		77	60-130			
Acenaphthene	334	4.00	ug/Kg wet	400.0		84	60-130			
Dibenzofuran	331	4.00	ug/Kg wet	400.0		83	60-130			
Fluorene	338	4.00	ug/Kg wet	400.0		84	60-130			
Dibenzothiophene	335	4.00	ug/Kg wet	400.0		84	60-130			
Phenanthrene	352	4.00	ug/Kg wet	400.0		88	60-130			
Anthracene	327	4.00	ug/Kg wet	400.0		82	60-130			
Retene	315	4.00	ug/Kg wet	400.0		79	60-130			
Benzo(b)naphtho(2,1-d)thiophene	313	4.00	ug/Kg wet	400.0		78	60-130			
Fluoranthene	319	4.00	ug/Kg wet	400.0		80	60-130			
Pyrene	323	4.00	ug/Kg wet	400.0		81	60-130			
Benz(a)anthracene	330	4.00	ug/Kg wet	400.0		83	60-130			
Chrysene/triphenylene	347	4.00	ug/Kg wet	400.0		87	60-130			
Benzo(b)fluoranthene	319	4.00	ug/Kg wet	400.0		80	60-130			
Benzo(j/k)fluoranthene	319	4.00	ug/Kg wet	400.0		80	60-130			
Benzo(e)pyrene	325	4.00	ug/Kg wet	400.0		81	60-130			
Benzo(a)pyrene	318	4.00	ug/Kg wet	400.0		79	60-130			
Perylene	310	4.00	ug/Kg wet	400.0		77	60-130			
Indeno(1,2,3-cd)pyrene	319	4.00	ug/Kg wet	400.0		80	60-130			
Dibenzo(a,h)anthracene	322	4.00	ug/Kg wet	400.0		80	60-130			
Benzo(g,h,i)perylene	327	4.00	ug/Kg wet	400.0		82	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190058

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FK92001 - 3570						
Coronene	344	4.00	ug/Kg wet	400.0	86	60-130
Tetraethyl lead	336	4.00	ug/Kg wet	400.0	84	60-130
Pristane	344	4.00	ug/Kg wet	400.0	86	60-130
Phytane	334	4.00	ug/Kg wet	400.0	84	60-130
Surrogate: Toluene-D8	*342*		ug/Kg wet	*400.0*	*86*	*50-120*
Surrogate: Naphthalene-d8	*324*		ug/Kg wet	*400.0*	*81*	*50-120*
Surrogate: Phenanthrene-d10	*352*		ug/Kg wet	*400.0*	*88*	*50-120*
Surrogate: Perylene-d12	*318*		ug/Kg wet	*400.0*	*79*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190058

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FK92001 - 3570

Duplicate **Source: F190058-10**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	3.43	5.31	ug/Kg dry		13.0			116	50	D+, J
C1-Benzene	4.12	5.31	ug/Kg dry		5.13			22	50	J
C2-Benzenes	4.98	5.31	ug/Kg dry		5.22			5	50	J
C3-Benzenes	2.99	5.31	ug/Kg dry		2.90			3	50	J
C4-Benzenes	ND	5.31	ug/Kg dry		ND				50	
C5-Benzenes	ND	5.31	ug/Kg dry		ND				50	
Methylcyclohexane	ND	5.31	ug/Kg dry		ND				50	
Toluene	5.70	5.31	ug/Kg dry		7.39			26	50	
Ethylbenzene	ND	5.31	ug/Kg dry		ND				50	
m,p-Xylene	5.54	5.31	ug/Kg dry		5.33			4	50	
Styrene	ND	5.31	ug/Kg dry		ND				50	
o-Xylene	ND	5.31	ug/Kg dry		ND				50	
Isopropylbenzene	ND	5.31	ug/Kg dry		ND				50	
n-Propylbenzene	ND	5.31	ug/Kg dry		ND				50	
1,3,5-Trimethylbenzene	ND	5.31	ug/Kg dry		ND				50	
1,2,3-Trimethylbenzene	ND	5.31	ug/Kg dry		ND				50	
1,2,4-Trimethylbenzene	ND	5.31	ug/Kg dry		ND				50	
t-Butylbenzene	ND	5.31	ug/Kg dry		ND				50	
sec-Butylbenzene	ND	5.31	ug/Kg dry		ND				50	
p-Isopropyltoluene	ND	5.31	ug/Kg dry		ND				50	
n-Butylbenzene	ND	5.31	ug/Kg dry		ND				50	
trans-Decalin	ND	5.31	ug/Kg dry		ND				50	
cis-Decalin	ND	5.31	ug/Kg dry		ND				50	
C1-Decalins	ND	5.31	ug/Kg dry		ND				50	
C2-Decalins	ND	5.31	ug/Kg dry		ND				50	
C3-Decalins	ND	5.31	ug/Kg dry		ND				50	
C4-Decalins	ND	5.31	ug/Kg dry		ND				50	
Benzo(b)thiophene	ND	5.31	ug/Kg dry		ND				50	
C1-Benzo(b)thiophenes	3.10	5.31	ug/Kg dry		4.65			40	50	J
C2-Benzo(b)thiophenes	3.33	5.31	ug/Kg dry		2.94			12	50	J
C3-Benzo(b)thiophenes	ND	5.31	ug/Kg dry		ND				50	
C4-Benzo(b)thiophenes	ND	5.31	ug/Kg dry		ND				50	
Naphthalene	23.6	5.31	ug/Kg dry		27.0			13	50	
2-Methylnaphthalene	12.3	5.31	ug/Kg dry		12.9			5	50	
1-Methylnaphthalene	9.55	5.31	ug/Kg dry		10.7			12	50	
C1-Naphthalenes	13.6	5.31	ug/Kg dry		14.4			6	50	
C2-Naphthalenes	11.3	5.31	ug/Kg dry		10.1			12	50	
C3-Naphthalenes	4.90	5.31	ug/Kg dry		5.43			10	50	J
C4-Naphthalenes	2.94	5.31	ug/Kg dry		3.65			22	50	J
Biphenyl	3.64	5.31	ug/Kg dry		3.32			9	50	J
Acenaphthylene	5.08	5.31	ug/Kg dry		6.27			21	50	J
Acenaphthene	17.4	5.31	ug/Kg dry		17.0			2	50	
Dibenzofuran	ND	5.31	ug/Kg dry		ND				50	
Fluorene	6.72	5.31	ug/Kg dry		6.37			5	50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190058

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FK92001 - 3570							
C1-Fluorenes	3.45	5.31	ug/Kg dry	4.47	26	50	J
C2-Fluorenes	4.01	5.31	ug/Kg dry	4.74	17	50	J
C3-Fluorenes	3.30	5.31	ug/Kg dry	4.58	33	50	J
Dibenzothiophene	ND	5.31	ug/Kg dry	ND		50	
C1-Dibenzothiophenes	ND	5.31	ug/Kg dry	2.80		50	
C2-Dibenzothiophenes	ND	5.31	ug/Kg dry	2.82		50	
C3-Dibenzothiophenes	ND	5.31	ug/Kg dry	ND		50	
C4-Dibenzothiophenes	ND	5.31	ug/Kg dry	ND		50	
Phenanthrene	24.4	5.31	ug/Kg dry	24.3	0.4	50	
Anthracene	6.61	5.31	ug/Kg dry	6.78	3	50	
C1-Phenanthrenes/Anthracenes	10.5	5.31	ug/Kg dry	12.0	14	50	
C2-Phenanthrenes/Anthracenes	4.34	5.31	ug/Kg dry	5.49	23	50	J
C3-Phenanthrenes/Anthracenes	ND	5.31	ug/Kg dry	2.84		50	
C4-Phenanthrenes/Anthracenes	ND	5.31	ug/Kg dry	ND		50	
Retene	ND	5.31	ug/Kg dry	3.06		50	
Benzo(b)naphtho(2,1-d)thiophene	ND	5.31	ug/Kg dry	ND		50	
C0-Benzonaphthothiophenes	ND	5.31	ug/Kg dry	ND		50	
C1-Benzonaphthothiophenes	ND	5.31	ug/Kg dry	ND		50	
C2-Benzonaphthothiophenes	ND	5.31	ug/Kg dry	ND		50	
C3-Benzonaphthothiophenes	ND	5.31	ug/Kg dry	ND		50	
C4-Benzonaphthothiophenes	ND	5.31	ug/Kg dry	ND		50	
Fluoranthene	10.1	5.31	ug/Kg dry	10.8	7	50	
Pyrene	15.6	5.31	ug/Kg dry	16.7	7	50	
C1-Fluoranthenes/Pyrenes	13.6	5.31	ug/Kg dry	16.4	18	50	
C2-Fluoranthenes/Pyrenes	4.59	5.31	ug/Kg dry	5.92	25	50	J
C3-Fluoranthenes/Pyrenes	ND	5.31	ug/Kg dry	3.47		50	
Benzo(b)fluorene	ND	5.31	ug/Kg dry	ND		50	
Benzo(c)fluorene	ND	5.31	ug/Kg dry	ND		50	
2-Methylpyrene	ND	5.31	ug/Kg dry	ND		50	
4-Methylpyrene	ND	5.31	ug/Kg dry	ND		50	
1-Methylpyrene	ND	5.31	ug/Kg dry	ND		50	
Benz(a)anthracene	5.12	5.31	ug/Kg dry	6.20	19	50	J
Chrysene/triphenylene	5.76	5.31	ug/Kg dry	6.41	11	50	
C1-Benzo(a)anthracenes/Chrysenes	3.83	5.31	ug/Kg dry	5.70	39	50	J
C2-Benzo(a)anthracenes/Chrysenes	ND	5.31	ug/Kg dry	ND		50	
C3-Benzo(a)anthracenes/Chrysenes	ND	5.31	ug/Kg dry	ND		50	
C4-Benzo(a)anthracenes/Chrysenes	ND	5.31	ug/Kg dry	ND		50	
Benzo(b)fluoranthene	ND	5.31	ug/Kg dry	3.40		50	
Benzo(j/k)fluoranthene	2.71	5.31	ug/Kg dry	3.76	33	50	J
Benzo(e)pyrene	2.89	5.31	ug/Kg dry	4.05	33	50	J
Benzo(a)pyrene	4.26	5.31	ug/Kg dry	5.78	30	50	J
Perylene	1630	5.31	ug/Kg dry	2010	21	50	
Indeno(1,2,3-cd)pyrene	2.67	5.31	ug/Kg dry	3.53	28	50	J
Dibenzo(a,h)anthracene	ND	5.31	ug/Kg dry	ND		50	
Benzo(g,h,i)perylene	ND	5.31	ug/Kg dry	4.16		50	
Coronene	ND	5.31	ug/Kg dry	2.96		50	
Tetramethyl lead	ND	5.31	ug/Kg dry	ND		50	
Trimethylethyl lead	ND	5.31	ug/Kg dry	ND		50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190058

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FK92001 - 3570									
Dimethyldiethyl lead	ND	5.31	ug/Kg dry	ND				50	
Methyltriethyl lead	ND	5.31	ug/Kg dry	ND				50	
Tetraethyl lead	ND	5.31	ug/Kg dry	ND				50	
2,6,10-trimethyldodecane (1380)	ND	5.31	ug/Kg dry	ND				50	
2,6,10-trimethyltridecane (1470)	7.43	5.31	ug/Kg dry	6.09			20	50	
2,6,10-trimethylpentadecane (1650)	11.0	5.31	ug/Kg dry	12.2			10	50	
C-17	42.5	5.31	ug/Kg dry	49.8			16	50	
Pristane	23.7	5.31	ug/Kg dry	30.5			25	50	
C-18	36.7	5.31	ug/Kg dry	42.6			15	50	
Phytane	31.7	5.31	ug/Kg dry	38.5			20	50	
Carbazole	ND	5.31	ug/Kg dry	ND				50	
2,6-Dimethylnaphthalene	ND	5.31	ug/Kg dry	ND				50	
2,3,5-Trimethylnaphthene	ND	5.31	ug/Kg dry	ND				50	
4-Methyldibenzothiophene	ND	5.31	ug/Kg dry	ND				50	
2/3-Methyldibenzothiophene	ND	5.31	ug/Kg dry	ND				50	
1-Methyldibenzothiophene	ND	5.31	ug/Kg dry	ND				50	
3-Methylphenanthrene	ND	5.31	ug/Kg dry	2.89				50	
2-Methylphenanthrene	ND	5.31	ug/Kg dry	2.77				50	
2-Methylanthracene	ND	5.31	ug/Kg dry	ND				50	
4/9-Methylphenanthrene	ND	5.31	ug/Kg dry	2.75				50	
1-Methylphenanthrene	ND	5.31	ug/Kg dry	ND				50	
Surrogate: Toluene-D8	*229*		ug/Kg dry	*531.2*		*43*	*50-120*		*S-*
Surrogate: Naphthalene-d8	*315*		ug/Kg dry	*531.2*		*59*	*50-120*		
Surrogate: Phenanthrene-d10	*376*		ug/Kg dry	*531.2*		*71*	*50-120*		
Surrogate: Perylene-d12	*324*		ug/Kg dry	*531.2*		*61*	*50-120*		

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F190058

Notes and Definitions

U	Analyte included in the analysis, but not detected
S-	Surrogate recovery(ies) below lower control limit (S-).
J	Reported between MDL and MRL
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
CD-	Continuing Calibration %Diff/Drift is below control limit (CD-).
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190058

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) F900058

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY REQUIRED -- (YES) NO

If Yes, Are MCP Analytical Methods Required? (YES) NO NA

Are Drinking Water Samples Submitted? YES (NO) NA

If Yes, Have Drinking Water Sampling Requirements Been Met? YES NO (NA)

Preservative

None | None

Analysis

Sample Handling

Samples Field Filtered: YES NO (NA)

Sampled Shipped With Ice: (YES) NO

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Parent and Alkylated MAHs & PAHs 8270**	TOCs by Lloyd-Kahn	Sample Specific Remarks
1	1804576-SS733-S4	11/15/19	1028	SOIL	1	BFM	X	X	
2	1804576-SS735-S2	11/15/19	1059	SOIL	1	BFM	X	X	
3	1804576-SS735-S3	11/15/19	1103	SOIL	1	BFM	X	X	
4	1804576-SS735-S4	11/15/19	1107	SOIL	1	BFM	X	X	
5	1804576-SS713-S2	11/15/19	1128	SOIL	1	BFM	X	X	
6	1804576-SS715-S2	11/15/19	1215	SOIL	1	BFM	X	X	
7	1804576-SS731-S2	11/15/19	1248	SOIL	1	BFM	X	X	
8	1804576-SS734-S1	11/15/19	1333	SOIL	1	BFM	X	X	
9	1804576-SS734-S2	11/15/19	1337	SOIL	1	BFM	X	X	
10	1804576-SS736-S2	11/15/19	1415	SOIL	1	BFM	X	X	
11	1804576-SS737-S1	11/15/19	1449	SOIL	1	BFM	X	X	

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

Turnaround Time (Business days):

Normal __X__ Other ____

10-Day ____ 7-Day ____

5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Relinquished by: (signature)	Date:	Time:	Received by: (signature)
1.	11/15/19	1645	1. GEI Sample Fridge
2. GEI Sample Fridge	11/18/19	1255	2.
3.	11/18/19	1256	3.
4.	11/18	16:39	4. 11/18/19 1639

Additional Requirements/Comments/Remarks:

**Parent and Alkylated MAHs & PAHs (34) by GC/MS/SIM/SCAN

ICE temp: 0.3

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI

Shipped/Delivered Via: ESS Courier

ESS Project ID: F190058
Date Received: 11/18/2019
Project Due Date: 11/25/2019
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 0.3 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / (NA)
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / (No)
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / (No)
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608.3 Pesticides)
1					4oz Jar - Unpres	NP	
2					4oz Jar - Unpres	NP	
3					4oz Jar - Unpres	NP	
4					4oz Jar - Unpres	NP	
5					4oz Jar - Unpres	NP	
6					4oz Jar - Unpres	NP	
7					4oz Jar - Unpres	NP	
8					4oz Jar - Unpres	NP	
9					4oz Jar - Unpres	NP	
10					4oz Jar - Unpres	NP	
11					4oz Jar - Unpres	NP	

2nd Review
All containers scanned into storage/lab Initials:
Are barcode labels on correct containers? Yes / No
Are all necessary stickers attached? Yes / No

Completed By: Date & Time: 11/18/19 1847
Reviewed By: Date & Time: 11/19/19 1000
Delivered

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: F190059

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 8:04 am, Dec 09, 2019

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses
ESS Laboratory - Cranston, RI TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190059

SAMPLE RECEIPT

The following samples were received on November 18, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F190059-01	1804576-SS714-S3	Soil	8270 Mod, TOC-LK
F190059-02	1804576-SS714-S4	Soil	8270 Mod, TOC-LK
F190059-03	1804576-SS723-S1	Soil	8270 Mod, TOC-LK
F190059-04	1804576-SS725-S2	Soil	8270 Mod, TOC-LK
F190059-05	1804576-SS727-S2	Soil	8270 Mod, TOC-LK
F190059-06	1804576-SS727-S3	Soil	8270 Mod, TOC-LK
F190059-07	1804576-SS728-S3	Soil	8270 Mod, TOC-LK
F190059-08	1804576-SS730-S2	Soil	8270 Mod, TOC-LK
F190059-09	1804576-SS730-S3	Soil	8270 Mod, TOC-LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190059

PROJECT NARRATIVE

8270D (SIM) Semi-Volatile Organic Compounds

F190059-02	**Present in Method Blank (B).**
	Benzene , C-17 , C-18 , Phytane , Pristane
F190059-03	**Present in Method Blank (B).**
	Benzene
F190059-04	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , Benzene , C-17 , C-18 , Phytane , Pristane
F190059-06	**Present in Method Blank (B).**
	Benzene
F190059-08	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , Benzene , C-17 , C-18 , Phytane , Pristane
F190059-09	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , Benzene , C-17 , C-18 , Phytane , Pristane
F9K0005-CCV2	**Continuing Calibration %Diff/Drift is below control limit (CD-).**
	Tetraethyl lead (41% @ 25%)
F9K0005-CCV3	**Continuing Calibration %Diff/Drift is below control limit (CD-).**
	Tetraethyl lead (36% @ 25%)
FK91901-DUP2	**Relative percent difference for duplicate is outside of criteria (D+).**
	Benzene (104% @ 50%)

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190059

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS714-S3
Date Sampled: 11/14/19 10:03
Percent Solids: 55
Initial Volume: 2.71
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/19/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**465** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
C1-Benzene	**1690** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
C2-Benzenes	**3860** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
C3-Benzenes	**12600** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
C4-Benzenes	**23900** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
C5-Benzenes	**11600** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
Methylcyclohexane	**205** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
Toluene	**2290** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
Ethylbenzene	**3630** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
m,p-Xylene	**3100** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
Styrene	**1490** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
o-Xylene	**1080** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
Isopropylbenzene	**1020** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
n-Propylbenzene	**706** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
1,3,5-Trimethylbenzene	**2270** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
1,2,3-Trimethylbenzene	**2490** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
1,2,4-Trimethylbenzene	**6870** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
t-Butylbenzene	ND (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
sec-Butylbenzene	**125** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
p-Isopropyltoluene	**2380** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
n-Butylbenzene	ND (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
trans-Decalin	**329** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
cis-Decalin	**145** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
C1-Decalins	**1030** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
C2-Decalins	**2610** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
C3-Decalins	**2990** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
C4-Decalins	**5310** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
Benzo(b)thiophene	**2940** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
C1-Benzo(b)thiophenes	**7880** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
C2-Benzo(b)thiophenes	**14100** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
C3-Benzo(b)thiophenes	**9540** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
C4-Benzo(b)thiophenes	**2850** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS714-S3
Date Sampled: 11/14/19 10:03
Percent Solids: 55
Initial Volume: 2.71
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/19/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**192000** (1340)	671	8270 Mod		100	11/21/19 21:50	F9K0004	FK91901
2-Methylnaphthalene	**110000** (1340)	671	8270 Mod		100	11/21/19 21:50	F9K0004	FK91901
1-Methylnaphthalene	**295000** (1340)	671	8270 Mod		100	11/21/19 21:50	F9K0004	FK91901
C1-Naphthalenes	**242000** (1340)	671	8270 Mod		100	11/21/19 21:50	F9K0004	FK91901
C2-Naphthalenes	**348000** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
C3-Naphthalenes	**186000** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
C4-Naphthalenes	**58400** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
Biphenyl	**45100** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
Acenaphthylene	**26800** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
Acenaphthene	**346000** (1340)	671	8270 Mod		100	11/21/19 21:50	F9K0004	FK91901
Dibenzofuran	**13400** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
Fluorene	**165000** (1340)	671	8270 Mod		100	11/21/19 21:50	F9K0004	FK91901
C1-Fluorenes	**124000** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
C2-Fluorenes	**95200** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
C3-Fluorenes	**35800** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
Dibenzothiophene	**38400** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
C1-Dibenzothiophenes	**58200** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
C2-Dibenzothiophenes	**46600** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
C3-Dibenzothiophenes	**20800** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
C4-Dibenzothiophenes	**6470** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
Phenanthrene	**651000** (1340)	671	8270 Mod		100	11/21/19 21:50	F9K0004	FK91901
Anthracene	**195000** (1340)	671	8270 Mod		100	11/21/19 21:50	F9K0004	FK91901
C1-Phenanthrenes/Anthracenes	**482000** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
C2-Phenanthrenes/Anthracenes	**236000** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
C3-Phenanthrenes/Anthracenes	**72500** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
C4-Phenanthrenes/Anthracenes	**20000** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
Retene	**3340** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
Benzo(b)naphtho(2,1-d)thiophene	**15000** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
C0-Benzonaphthothiophenes	**25900** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
C1-Benzonaphthothiophenes	**22900** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
C2-Benzonaphthothiophenes	**11500** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
C3-Benzonaphthothiophenes	**4890** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS714-S3
Date Sampled: 11/14/19 10:03
Percent Solids: 55
Initial Volume: 2.71
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/19/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**934** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
Fluoranthene	**189000** (1340)	671	8270 Mod		100	11/21/19 21:50	F9K0004	FK91901
Pyrene	**278000** (1340)	671	8270 Mod		100	11/21/19 21:50	F9K0004	FK91901
C1-Fluoranthenes/Pyrenes	**279000** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
C2-Fluoranthenes/Pyrenes	**101000** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
C3-Fluoranthenes/Pyrenes	**34100** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
Benzo(b)fluorene	**26800** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
Benzo(c)fluorene	**13100** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
2-Methylpyrene	**35400** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
4-Methylpyrene	**31000** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
1-Methylpyrene	**34100** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
Benz(a)anthracene	**102000** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
Chrysene/triphenylene	**102000** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
C1-Benzo(a)anthracenes/Chrysenes	**100000** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
C2-Benzo(a)anthracenes/Chrysenes	**43700** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
C3-Benzo(a)anthracenes/Chrysenes	**15100** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
C4-Benzo(a)anthracenes/Chrysenes	**4390** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
Benzo(b)fluoranthene	**35000** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
Benzo(j/k)fluoranthene	**42100** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
Benzo(e)pyrene	**39700** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
Benzo(a)pyrene	**70100** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
Perylene	**12200** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
Indeno(1,2,3-cd)pyrene	**25300** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
Dibenzo(a,h)anthracene	**8380** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
Benzo(g,h,i)perylene	**25400** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
Coronene	**5770** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
Tetramethyl lead	ND (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
Trimethylethyl lead	ND (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
Dimethyldiethyl lead	ND (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
Methyltriethyl lead	ND (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
Tetraethyl lead	ND (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
2,6,10-trimethyldodecane (1380)	**2640** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS714-S3
Date Sampled: 11/14/19 10:03
Percent Solids: 55
Initial Volume: 2.71
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/19/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**5190** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
2,6,10-trimethylpentadecane (1650)	**8850** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
C-17	**1680** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
Pristane	**18300** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
C-18	ND (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
Phytane	**17600** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
Carbazole	**1700** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
2,6-Dimethylnaphthalene	**71500** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
2,3,5-Trimethylnaphthene	**11700** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
4-Methyldibenzothiophene	**25000** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
2/3-Methyldibenzothiophene	**20000** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
1-Methyldibenzothiophene	**5020** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
3-Methylphenanthrene	**110000** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
2-Methylphenanthrene	**118000** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
2-Methylanthracene	**61800** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
4/9-Methylphenanthrene	**110000** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901
1-Methylphenanthrene	**78700** (67.1)	33.5	8270 Mod		5	11/20/19 16:15	F9K0004	FK91901

	%Recovery	*Qualifier*	*Limits*
Surrogate: Toluene-D8	*88 %*		*50-120*
Surrogate: Naphthalene-d8	*91 %*		*50-120*
Surrogate: Phenanthrene-d10	*94 %*		*50-120*
Surrogate: Perylene-d12	*107 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS714-S3
Date Sampled: 11/14/19 10:03
Percent Solids: 55

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**133000** (107)		TOC-LK		1	CCP	11/26/19 23:06	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS714-S4
Date Sampled: 11/14/19 10:07
Percent Solids: 53
Initial Volume: 5.03
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/19/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**B 50.9** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C1-Benzene	**320** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C2-Benzenes	**83.0** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C3-Benzenes	**52.1** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C4-Benzenes	**44.4** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C5-Benzenes	**28.6** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
Methylcyclohexane	**25.7** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
Toluene	**474** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
Ethylbenzene	**26.1** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
m,p-Xylene	**114** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
Styrene	**26.6** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
o-Xylene	**10.7** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
Isopropylbenzene	ND (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
n-Propylbenzene	**J 5.80** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
1,3,5-Trimethylbenzene	**17.6** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
1,2,3-Trimethylbenzene	**J 6.58** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
1,2,4-Trimethylbenzene	**25.3** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
t-Butylbenzene	ND (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
sec-Butylbenzene	ND (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
p-Isopropyltoluene	**36.0** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
n-Butylbenzene	**J 5.98** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
trans-Decalin	**9.36** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
cis-Decalin	ND (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C1-Decalins	**30.8** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C2-Decalins	**41.7** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C3-Decalins	**31.2** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C4-Decalins	**39.0** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
Benzo(b)thiophene	**J 6.98** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C1-Benzo(b)thiophenes	**14.0** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C2-Benzo(b)thiophenes	**22.8** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C3-Benzo(b)thiophenes	**8.37** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C4-Benzo(b)thiophenes	**J 6.17** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS714-S4
Date Sampled: 11/14/19 10:07
Percent Solids: 53
Initial Volume: 5.03
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/19/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**211** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
2-Methylnaphthalene	**150** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
1-Methylnaphthalene	**75.9** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C1-Naphthalenes	**140** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C2-Naphthalenes	**212** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C3-Naphthalenes	**190** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C4-Naphthalenes	**102** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
Biphenyl	**58.7** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
Acenaphthylene	**167** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
Acenaphthene	**150** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
Dibenzofuran	**48.2** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
Fluorene	**113** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C1-Fluorenes	**138** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C2-Fluorenes	**186** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C3-Fluorenes	**110** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
Dibenzothiophene	**42.4** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C1-Dibenzothiophenes	**64.2** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C2-Dibenzothiophenes	**74.5** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C3-Dibenzothiophenes	**46.2** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C4-Dibenzothiophenes	**30.1** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
Phenanthrene	**582** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
Anthracene	**299** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C1-Phenanthrenes/Anthracenes	**985** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C2-Phenanthrenes/Anthracenes	**623** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C3-Phenanthrenes/Anthracenes	**268** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C4-Phenanthrenes/Anthracenes	**126** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
Retene	**96.1** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
Benzo(b)naphtho(2,1-d)thiophene	**71.1** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C0-Benzonaphthothiophenes	**143** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C1-Benzonaphthothiophenes	**116** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C2-Benzonaphthothiophenes	**86.3** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C3-Benzonaphthothiophenes	**64.2** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS714-S4
Date Sampled: 11/14/19 10:07
Percent Solids: 53
Initial Volume: 5.03
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/19/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**20.3** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
Fluoranthene	**1580** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
Pyrene	**2230** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C1-Fluoranthenes/Pyrenes	**1520** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C2-Fluoranthenes/Pyrenes	**630** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C3-Fluoranthenes/Pyrenes	**277** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
Benzo(b)fluorene	**160** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
Benzo(c)fluorene	**79.4** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
2-Methylpyrene	**225** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
4-Methylpyrene	**217** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
1-Methylpyrene	**183** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
Benz(a)anthracene	**950** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
Chrysene/triphenylene	**920** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C1-Benzo(a)anthracenes/Chrysenes	**786** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C2-Benzo(a)anthracenes/Chrysenes	**428** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C3-Benzo(a)anthracenes/Chrysenes	**202** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C4-Benzo(a)anthracenes/Chrysenes	**93.7** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
Benzo(b)fluoranthene	**600** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
Benzo(j/k)fluoranthene	**646** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
Benzo(e)pyrene	**729** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
Benzo(a)pyrene	**1070** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
Perylene	**1110** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
Indeno(1,2,3-cd)pyrene	**509** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
Dibenzo(a,h)anthracene	**137** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
Benzo(g,h,i)perylene	**594** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
Coronene	**136** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
Tetramethyl lead	ND (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
Trimethylethyl lead	ND (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
Dimethyldiethyl lead	ND (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
Methyltriethyl lead	ND (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
Tetraethyl lead	ND (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
2,6,10-trimethyldodecane (1380)	**22.7** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS714-S4
Date Sampled: 11/14/19 10:07
Percent Solids: 53
Initial Volume: 5.03
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/19/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**70.8** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
2,6,10-trimethylpentadecane (1650)	**77.0** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C-17	**B 225** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
Pristane	**B 158** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
C-18	**B 131** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
Phytane	**B 152** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
Carbazole	**24.8** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
2,6-Dimethylnaphthalene	**44.6** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
2,3,5-Trimethylnaphthene	**15.7** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
4-Methyldibenzothiophene	**19.4** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
2/3-Methyldibenzothiophene	**22.1** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
1-Methyldibenzothiophene	**J 4.68** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
3-Methylphenanthrene	**242** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
2-Methylphenanthrene	**235** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
2-Methylanthracene	**150** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
4/9-Methylphenanthrene	**286** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901
1-Methylphenanthrene	**58.2** (7.54)	3.77	8270 Mod		1	11/20/19 17:42	F9K0004	FK91901

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*88 %*		*50-120*
Surrogate: Naphthalene-d8	*90 %*		*50-120*
Surrogate: Phenanthrene-d10	*81 %*		*50-120*
Surrogate: Perylene-d12	*78 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS714-S4
Date Sampled: 11/14/19 10:07
Percent Solids: 53

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**49500** (106)		TOC-LK		1	CCP	11/26/19 23:22	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS723-S1
Date Sampled: 11/14/19 11:14
Percent Solids: 73
Initial Volume: 5.89
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/19/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	B **48.0** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
C1-Benzene	**84.3** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
C2-Benzenes	**68.5** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
C3-Benzenes	**58.9** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
C4-Benzenes	**44.9** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
C5-Benzenes	**32.7** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
Methylcyclohexane	**39.8** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
Toluene	**125** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
Ethylbenzene	**29.4** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
m,p-Xylene	**75.9** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
Styrene	**150** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
o-Xylene	**9.98** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
Isopropylbenzene	ND (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
n-Propylbenzene	**4.77** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
1,3,5-Trimethylbenzene	**18.0** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
1,2,3-Trimethylbenzene	**6.45** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
1,2,4-Trimethylbenzene	**18.4** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
t-Butylbenzene	ND (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
sec-Butylbenzene	ND (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
p-Isopropyltoluene	**8.26** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
n-Butylbenzene	**5.45** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
trans-Decalin	**16.0** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
cis-Decalin	J **4.16** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
C1-Decalins	**36.2** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
C2-Decalins	**134** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
C3-Decalins	**214** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
C4-Decalins	**458** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
Benzo(b)thiophene	**59.4** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
C1-Benzo(b)thiophenes	**81.8** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
C2-Benzo(b)thiophenes	**137** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
C3-Benzo(b)thiophenes	**103** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
C4-Benzo(b)thiophenes	**63.5** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS723-S1
Date Sampled: 11/14/19 11:14
Percent Solids: 73
Initial Volume: 5.89
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/19/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**1410** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
2-Methylnaphthalene	**1070** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
1-Methylnaphthalene	**917** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
C1-Naphthalenes	**1230** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
C2-Naphthalenes	**1720** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
C3-Naphthalenes	**1250** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
C4-Naphthalenes	**928** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
Biphenyl	**406** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
Acenaphthylene	**2540** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
Acenaphthene	**3670** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
Dibenzofuran	**2680** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
Fluorene	**4110** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
C1-Fluorenes	**1510** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
C2-Fluorenes	**1630** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
C3-Fluorenes	**1520** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
Dibenzothiophene	**2240** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
C1-Dibenzothiophenes	**1470** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
C2-Dibenzothiophenes	**1790** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
C3-Dibenzothiophenes	**1170** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
C4-Dibenzothiophenes	**499** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
Phenanthrene	**29400** (93.0)	46.5	8270 Mod		20	11/21/19 19:02	F9K0004	FK91901
Anthracene	**11300** (93.0)	46.5	8270 Mod		20	11/21/19 19:02	F9K0004	FK91901
C1-Phenanthrenes/Anthracenes	**8670** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
C2-Phenanthrenes/Anthracenes	**6430** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
C3-Phenanthrenes/Anthracenes	**3300** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
C4-Phenanthrenes/Anthracenes	**1150** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
Retene	**122** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
Benzo(b)naphtho(2,1-d)thiophene	**1940** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
C0-Benzonaphthothiophenes	**3850** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
C1-Benzonaphthothiophenes	**2130** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
C2-Benzonaphthothiophenes	**1230** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
C3-Benzonaphthothiophenes	**719** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS723-S1
Date Sampled: 11/14/19 11:14
Percent Solids: 73
Initial Volume: 5.89
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/19/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**185** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
Fluoranthene	**27700** (93.0)	46.5	8270 Mod		20	11/21/19 19:02	F9K0004	FK91901
Pyrene	**35200** (93.0)	46.5	8270 Mod		20	11/21/19 19:02	F9K0004	FK91901
C1-Fluoranthenes/Pyrenes	**19000** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
C2-Fluoranthenes/Pyrenes	**6250** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
C3-Fluoranthenes/Pyrenes	**2560** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
Benzo(b)fluorene	**2500** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
Benzo(c)fluorene	**1020** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
2-Methylpyrene	**2480** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
4-Methylpyrene	**2250** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
1-Methylpyrene	**1950** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
Benz(a)anthracene	**19200** (93.0)	46.5	8270 Mod		20	11/21/19 19:02	F9K0004	FK91901
Chrysene/triphenylene	**18000** (93.0)	46.5	8270 Mod		20	11/21/19 19:02	F9K0004	FK91901
C1-Benzo(a)anthracenes/Chrysenes	**7930** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
C2-Benzo(a)anthracenes/Chrysenes	**3590** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
C3-Benzo(a)anthracenes/Chrysenes	**1560** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
C4-Benzo(a)anthracenes/Chrysenes	**708** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
Benzo(b)fluoranthene	**11300** (93.0)	46.5	8270 Mod		20	11/21/19 19:02	F9K0004	FK91901
Benzo(j/k)fluoranthene	**12400** (93.0)	46.5	8270 Mod		20	11/21/19 19:02	F9K0004	FK91901
Benzo(e)pyrene	**10900** (93.0)	46.5	8270 Mod		20	11/21/19 19:02	F9K0004	FK91901
Benzo(a)pyrene	**18000** (93.0)	46.5	8270 Mod		20	11/21/19 19:02	F9K0004	FK91901
Perylene	**2980** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
Indeno(1,2,3-cd)pyrene	**7840** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
Dibenzo(a,h)anthracene	**2130** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
Benzo(g,h,i)perylene	**7670** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
Coronene	**2240** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
Tetramethyl lead	ND (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
Trimethylethyl lead	ND (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
Dimethyldiethyl lead	ND (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
Methyltriethyl lead	ND (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
Tetraethyl lead	ND (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
2,6,10-trimethyldodecane (1380)	**54.3** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS723-S1
Date Sampled: 11/14/19 11:14
Percent Solids: 73
Initial Volume: 5.89
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/19/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**118** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
2,6,10-trimethylpentadecane (1650)	**193** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
C-17	**342** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
Pristane	**331** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
C-18	**371** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
Phytane	**418** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
Carbazole	**2820** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
2,6-Dimethylnaphthalene	**368** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
2,3,5-Trimethylnaphthene	**101** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
4-Methyldibenzothiophene	**405** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
2/3-Methyldibenzothiophene	**450** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
1-Methyldibenzothiophene	**119** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
3-Methylphenanthrene	**1690** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
2-Methylphenanthrene	**2030** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
2-Methylanthracene	**1790** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
4/9-Methylphenanthrene	**1960** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901
1-Methylphenanthrene	**1150** (4.65)	2.33	8270 Mod		1	11/20/19 19:08	F9K0004	FK91901

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*79 %*		*50-120*
Surrogate: Naphthalene-d8	*84 %*		*50-120*
Surrogate: Phenanthrene-d10	*86 %*		*50-120*
Surrogate: Perylene-d12	*85 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS723-S1
Date Sampled: 11/14/19 11:14
Percent Solids: 73

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**202000** (95.9)		TOC-LK		1	CCP	12/04/19 16:16	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS725-S2
Date Sampled: 11/14/19 13:14
Percent Solids: 75
Initial Volume: 5.39
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/19/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**B 12.8** (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C1-Benzene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C2-Benzenes	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C3-Benzenes	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C4-Benzenes	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C5-Benzenes	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
Methylcyclohexane	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
Toluene	**J 3.41** (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
Ethylbenzene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
m,p-Xylene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
Styrene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
o-Xylene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
Isopropylbenzene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
n-Propylbenzene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
1,3,5-Trimethylbenzene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
1,2,3-Trimethylbenzene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
1,2,4-Trimethylbenzene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
t-Butylbenzene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
sec-Butylbenzene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
p-Isopropyltoluene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
n-Butylbenzene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
trans-Decalin	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
cis-Decalin	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C1-Decalins	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C2-Decalins	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C3-Decalins	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C4-Decalins	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
Benzo(b)thiophene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C1-Benzo(b)thiophenes	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C2-Benzo(b)thiophenes	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C3-Benzo(b)thiophenes	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C4-Benzo(b)thiophenes	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS725-S2
Date Sampled: 11/14/19 13:14
Percent Solids: 75
Initial Volume: 5.39
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/19/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
2-Methylnaphthalene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
1-Methylnaphthalene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C1-Naphthalenes	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C2-Naphthalenes	**6.73** (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C3-Naphthalenes	**J 3.97** (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C4-Naphthalenes	**J 3.03** (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
Biphenyl	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
Acenaphthylene	**18.2** (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
Acenaphthene	**J 2.87** (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
Dibenzofuran	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
Fluorene	**J 4.20** (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C1-Fluorenes	**J 4.29** (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C2-Fluorenes	**5.15** (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C3-Fluorenes	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
Dibenzothiophene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C1-Dibenzothiophenes	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C2-Dibenzothiophenes	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C3-Dibenzothiophenes	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C4-Dibenzothiophenes	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
Phenanthrene	**J 4.18** (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
Anthracene	**J 2.78** (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C1-Phenanthrenes/Anthracenes	**7.36** (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C2-Phenanthrenes/Anthracenes	**5.10** (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C3-Phenanthrenes/Anthracenes	**J 3.20** (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C4-Phenanthrenes/Anthracenes	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
Retene	**J 2.84** (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
Benzo(b)naphtho(2,1-d)thiophene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C0-Benzonaphthothiophenes	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C1-Benzonaphthothiophenes	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C2-Benzonaphthothiophenes	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C3-Benzonaphthothiophenes	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS725-S2
Date Sampled: 11/14/19 13:14
Percent Solids: 75
Initial Volume: 5.39
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/19/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
Fluoranthene	J **2.47** (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
Pyrene	J **3.79** (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C1-Fluoranthenes/Pyrenes	**20.5** (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C2-Fluoranthenes/Pyrenes	**7.42** (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C3-Fluoranthenes/Pyrenes	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
Benzo(b)fluorene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
Benzo(c)fluorene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
2-Methylpyrene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
4-Methylpyrene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
1-Methylpyrene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
Benz(a)anthracene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
Chrysene/triphenylene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C1-Benzo(a)anthracenes/Chrysenes	J **4.25** (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C2-Benzo(a)anthracenes/Chrysenes	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C3-Benzo(a)anthracenes/Chrysenes	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C4-Benzo(a)anthracenes/Chrysenes	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
Benzo(b)fluoranthene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
Benzo(j/k)fluoranthene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
Benzo(e)pyrene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
Benzo(a)pyrene	J **2.94** (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
Perylene	**5.90** (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
Indeno(1,2,3-cd)pyrene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
Dibenzo(a,h)anthracene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
Benzo(g,h,i)perylene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
Coronene	J **2.47** (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
Tetramethyl lead	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
Trimethylethyl lead	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
Dimethyldiethyl lead	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
Methyltriethyl lead	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
Tetraethyl lead	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
2,6,10-trimethyldodecane (1380)	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS725-S2
Date Sampled: 11/14/19 13:14
Percent Solids: 75
Initial Volume: 5.39
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/19/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**J 2.73** (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
2,6,10-trimethylpentadecane (1650)	**B 12.6** (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C-17	**B 55.4** (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
Pristane	**B 34.5** (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
C-18	**B 44.3** (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
Phytane	**B 43.7** (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
Carbazole	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
2,6-Dimethylnaphthalene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
2,3,5-Trimethylnaphthene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
4-Methyldibenzothiophene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
2/3-Methyldibenzothiophene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
1-Methyldibenzothiophene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
3-Methylphenanthrene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
2-Methylphenanthrene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
2-Methylanthracene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
4/9-Methylphenanthrene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901
1-Methylphenanthrene	ND (4.92)	2.46	8270 Mod		1	11/20/19 20:34	F9K0004	FK91901

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*99 %*		*50-120*
Surrogate: Naphthalene-d8	*88 %*		*50-120*
Surrogate: Phenanthrene-d10	*92 %*		*50-120*
Surrogate: Perylene-d12	*91 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS725-S2
Date Sampled: 11/14/19 13:14
Percent Solids: 75

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-04
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**2060** (101)		TOC-LK		1	CCP	12/04/19 16:50	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS727-S2
Date Sampled: 11/14/19 13:38
Percent Solids: 39
Initial Volume: 5.21
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/19/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**485** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C1-Benzene	**1390** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C2-Benzenes	**861** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C3-Benzenes	**340** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C4-Benzenes	**758** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C5-Benzenes	**786** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
Methylcyclohexane	**J 44.0** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
Toluene	**2110** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
Ethylbenzene	**79.4** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
m,p-Xylene	**1460** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
Styrene	**282** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
o-Xylene	**89.5** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
Isopropylbenzene	ND (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
n-Propylbenzene	**75.3** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
1,3,5-Trimethylbenzene	**52.6** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
1,2,3-Trimethylbenzene	**87.6** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
1,2,4-Trimethylbenzene	**197** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
t-Butylbenzene	ND (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
sec-Butylbenzene	ND (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
p-Isopropyltoluene	**55.5** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
n-Butylbenzene	**238** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
trans-Decalin	**7640** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
cis-Decalin	**864** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C1-Decalins	**8390** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C2-Decalins	**2770** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C3-Decalins	**1210** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C4-Decalins	**1700** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
Benzo(b)thiophene	ND (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C1-Benzo(b)thiophenes	**80.0** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C2-Benzo(b)thiophenes	**187** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C3-Benzo(b)thiophenes	**159** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C4-Benzo(b)thiophenes	**102** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS727-S2
Date Sampled: 11/14/19 13:38
Percent Solids: 39
Initial Volume: 5.21
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/19/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**328** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
2-Methylnaphthalene	**263** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
1-Methylnaphthalene	**153** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C1-Naphthalenes	**254** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C2-Naphthalenes	**1480** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C3-Naphthalenes	**2160** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C4-Naphthalenes	**1680** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
Biphenyl	**286** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
Acenaphthylene	**863** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
Acenaphthene	**782** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
Dibenzofuran	**196** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
Fluorene	**786** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C1-Fluorenes	**638** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C2-Fluorenes	**896** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C3-Fluorenes	**948** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
Dibenzothiophene	**380** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C1-Dibenzothiophenes	**691** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C2-Dibenzothiophenes	**1020** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C3-Dibenzothiophenes	**1000** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C4-Dibenzothiophenes	**680** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
Phenanthrene	**4520** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
Anthracene	**1380** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C1-Phenanthrenes/Anthracenes	**3170** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C2-Phenanthrenes/Anthracenes	**2400** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C3-Phenanthrenes/Anthracenes	**1410** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C4-Phenanthrenes/Anthracenes	**680** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
Retene	**197** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
Benzo(b)naphtho(2,1-d)thiophene	**520** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C0-Benzonaphthothiophenes	**979** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C1-Benzonaphthothiophenes	**836** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C2-Benzonaphthothiophenes	**923** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C3-Benzonaphthothiophenes	**805** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS727-S2
Date Sampled: 11/14/19 13:38
Percent Solids: 39
Initial Volume: 5.21
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/19/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**473** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
Fluoranthene	**6540** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
Pyrene	**7130** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C1-Fluoranthenes/Pyrenes	**3750** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C2-Fluoranthenes/Pyrenes	**1920** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C3-Fluoranthenes/Pyrenes	**984** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
Benzo(b)fluorene	**494** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
Benzo(c)fluorene	**186** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
2-Methylpyrene	**526** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
4-Methylpyrene	**504** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
1-Methylpyrene	**393** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
Benz(a)anthracene	**3000** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
Chrysene/triphenylene	**3540** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C1-Benzo(a)anthracenes/Chrysenes	**2110** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C2-Benzo(a)anthracenes/Chrysenes	**1350** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C3-Benzo(a)anthracenes/Chrysenes	**940** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C4-Benzo(a)anthracenes/Chrysenes	**659** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
Benzo(b)fluoranthene	**2950** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
Benzo(j/k)fluoranthene	**3030** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
Benzo(e)pyrene	**2810** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
Benzo(a)pyrene	**3660** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
Perylene	**931** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
Indeno(1,2,3-cd)pyrene	**2180** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
Dibenzo(a,h)anthracene	**547** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
Benzo(g,h,i)perylene	**2130** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
Coronene	**639** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
Tetramethyl lead	ND (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
Trimethylethyl lead	ND (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
Dimethyldiethyl lead	ND (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
Methyltriethyl lead	ND (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
Tetraethyl lead	ND (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
2,6,10-trimethyldodecane (1380)	**1650** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS727-S2
Date Sampled: 11/14/19 13:38
Percent Solids: 39
Initial Volume: 5.21
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/19/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**2470** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
2,6,10-trimethylpentadecane (1650)	**1680** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C-17	**609** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
Pristane	**4870** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
C-18	**296** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
Phytane	**3580** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
Carbazole	**206** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
2,6-Dimethylnaphthalene	**574** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
2,3,5-Trimethylnaphthene	**141** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
4-Methyldibenzothiophene	**288** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
2/3-Methyldibenzothiophene	**244** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
1-Methyldibenzothiophene	**83.0** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
3-Methylphenanthrene	**714** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
2-Methylphenanthrene	**834** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
2-Methylanthracene	**308** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
4/9-Methylphenanthrene	**734** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901
1-Methylphenanthrene	**514** (49.4)	24.7	8270 Mod		5	11/20/19 22:00	F9K0004	FK91901

	%Recovery	*Qualifier*	*Limits*
Surrogate: Toluene-D8	*91 %*		*50-120*
Surrogate: Naphthalene-d8	*88 %*		*50-120*
Surrogate: Phenanthrene-d10	*75 %*		*50-120*
Surrogate: Perylene-d12	*76 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS727-S2
Date Sampled: 11/14/19 13:38
Percent Solids: 39

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-05
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**81100** (95.0)		TOC-LK		1	CCP	12/04/19 17:56	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS727-S3
Date Sampled: 11/14/19 13:41
Percent Solids: 54
Initial Volume: 5.11
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/19/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**B 64.4** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C1-Benzene	**466** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C2-Benzenes	**168** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C3-Benzenes	**105** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C4-Benzenes	**98.1** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C5-Benzenes	**45.9** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
Methylcyclohexane	**42.8** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
Toluene	**666** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
Ethylbenzene	**43.7** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
m,p-Xylene	**240** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
Styrene	**145** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
o-Xylene	**27.4** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
Isopropylbenzene	**J 4.28** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
n-Propylbenzene	**12.4** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
1,3,5-Trimethylbenzene	**29.1** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
1,2,3-Trimethylbenzene	**14.4** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
1,2,4-Trimethylbenzene	**58.3** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
t-Butylbenzene	ND (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
sec-Butylbenzene	ND (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
p-Isopropyltoluene	**89.7** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
n-Butylbenzene	**15.0** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
trans-Decalin	**14.7** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
cis-Decalin	ND (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C1-Decalins	**53.3** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C2-Decalins	**94.9** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C3-Decalins	**75.2** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C4-Decalins	**77.5** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
Benzo(b)thiophene	**14.2** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C1-Benzo(b)thiophenes	**27.3** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C2-Benzo(b)thiophenes	**28.4** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C3-Benzo(b)thiophenes	**20.4** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C4-Benzo(b)thiophenes	**12.0** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS727-S3
Date Sampled: 11/14/19 13:41
Percent Solids: 54
Initial Volume: 5.11
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/19/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**448** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
2-Methylnaphthalene	**367** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
1-Methylnaphthalene	**169** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C1-Naphthalenes	**332** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C2-Naphthalenes	**547** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C3-Naphthalenes	**522** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C4-Naphthalenes	**338** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
Biphenyl	**121** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
Acenaphthylene	**513** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
Acenaphthene	**267** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
Dibenzofuran	**172** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
Fluorene	**354** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C1-Fluorenes	**443** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C2-Fluorenes	**537** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C3-Fluorenes	**398** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
Dibenzothiophene	**113** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C1-Dibenzothiophenes	**165** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C2-Dibenzothiophenes	**216** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C3-Dibenzothiophenes	**152** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C4-Dibenzothiophenes	**106** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
Phenanthrene	**1850** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
Anthracene	**937** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C1-Phenanthrenes/Anthracenes	**2820** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C2-Phenanthrenes/Anthracenes	**2160** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C3-Phenanthrenes/Anthracenes	**1100** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C4-Phenanthrenes/Anthracenes	**564** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
Retene	**575** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
Benzo(b)naphtho(2,1-d)thiophene	**217** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C0-Benzonaphthothiophenes	**491** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C1-Benzonaphthothiophenes	**424** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C2-Benzonaphthothiophenes	**336** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C3-Benzonaphthothiophenes	**227** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS727-S3
Date Sampled: 11/14/19 13:41
Percent Solids: 54
Initial Volume: 5.11
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/19/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**68.4** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
Fluoranthene	**4130** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
Pyrene	**6160** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C1-Fluoranthenes/Pyrenes	**5750** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C2-Fluoranthenes/Pyrenes	**2650** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C3-Fluoranthenes/Pyrenes	**1190** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
Benzo(b)fluorene	**578** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
Benzo(c)fluorene	**251** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
2-Methylpyrene	**826** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
4-Methylpyrene	**920** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
1-Methylpyrene	**692** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
Benz(a)anthracene	**3390** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
Chrysene/triphenylene	**3400** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C1-Benzo(a)anthracenes/Chrysenes	**3350** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C2-Benzo(a)anthracenes/Chrysenes	**1850** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C3-Benzo(a)anthracenes/Chrysenes	**915** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C4-Benzo(a)anthracenes/Chrysenes	**391** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
Benzo(b)fluoranthene	**2320** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
Benzo(j/k)fluoranthene	**2430** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
Benzo(e)pyrene	**3080** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
Benzo(a)pyrene	**4230** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
Perylene	**964** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
Indeno(1,2,3-cd)pyrene	**1930** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
Dibenzo(a,h)anthracene	**595** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
Benzo(g,h,i)perylene	**2390** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
Coronene	**477** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
Tetramethyl lead	ND (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
Trimethylethyl lead	ND (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
Dimethyldiethyl lead	ND (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
Methyltriethyl lead	ND (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
Tetraethyl lead	ND (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
2,6,10-trimethyldodecane (1380)	**77.6** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS727-S3
Date Sampled: 11/14/19 13:41
Percent Solids: 54
Initial Volume: 5.11
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/19/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**206** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
2,6,10-trimethylpentadecane (1650)	**150** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C-17	**481** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
Pristane	**316** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
C-18	**230** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
Phytane	**259** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
Carbazole	**93.7** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
2,6-Dimethylnaphthalene	**131** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
2,3,5-Trimethylnaphthene	**37.3** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
4-Methyldibenzothiophene	**43.8** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
2/3-Methyldibenzothiophene	**55.1** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
1-Methyldibenzothiophene	**12.3** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
3-Methylphenanthrene	**567** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
2-Methylphenanthrene	**671** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
2-Methylanthracene	**466** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
4/9-Methylphenanthrene	**839** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901
1-Methylphenanthrene	**268** (7.20)	3.60	8270 Mod		1	11/20/19 23:26	F9K0004	FK91901

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*86 %*		*50-120*
Surrogate: Naphthalene-d8	*89 %*		*50-120*
Surrogate: Phenanthrene-d10	*89 %*		*50-120*
Surrogate: Perylene-d12	*86 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS727-S3
Date Sampled: 11/14/19 13:41
Percent Solids: 54

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-06
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**55100** (97.8)		TOC-LK		1	CCP	12/04/19 18:15	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS728-S3
Date Sampled: 11/14/19 14:52
Percent Solids: 52
Initial Volume: 3.87
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/19/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**161** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
C1-Benzene	**1840** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
C2-Benzenes	**622** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
C3-Benzenes	**1060** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
C4-Benzenes	**2250** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
C5-Benzenes	**2240** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
Methylcyclohexane	**136** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
Toluene	**2780** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
Ethylbenzene	**279** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
m,p-Xylene	**738** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
Styrene	**329** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
o-Xylene	**142** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
Isopropylbenzene	**74.2** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
n-Propylbenzene	**96.2** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
1,3,5-Trimethylbenzene	**257** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
1,2,3-Trimethylbenzene	**213** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
1,2,4-Trimethylbenzene	**585** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
t-Butylbenzene	ND (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
sec-Butylbenzene	**18.5** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
p-Isopropyltoluene	**183** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
n-Butylbenzene	**143** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
trans-Decalin	**170** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
cis-Decalin	**81.3** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
C1-Decalins	**656** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
C2-Decalins	**1670** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
C3-Decalins	**1770** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
C4-Decalins	**3450** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
Benzo(b)thiophene	**345** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
C1-Benzo(b)thiophenes	**694** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
C2-Benzo(b)thiophenes	**1900** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
C3-Benzo(b)thiophenes	**2360** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
C4-Benzo(b)thiophenes	**992** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS728-S3
Date Sampled: 11/14/19 14:52
Percent Solids: 52
Initial Volume: 3.87
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/19/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**10200** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
2-Methylnaphthalene	**9110** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
1-Methylnaphthalene	**33500** (199)	99.4	8270 Mod		20	11/21/19 20:26	F9K0004	FK91901
C1-Naphthalenes	**27300** (199)	99.4	8270 Mod		20	11/21/19 20:26	F9K0004	FK91901
C2-Naphthalenes	**53200** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
C3-Naphthalenes	**50000** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
C4-Naphthalenes	**19900** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
Biphenyl	**2400** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
Acenaphthylene	**5310** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
Acenaphthene	**41600** (199)	99.4	8270 Mod		20	11/21/19 20:26	F9K0004	FK91901
Dibenzofuran	**2450** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
Fluorene	**29800** (199)	99.4	8270 Mod		20	11/21/19 20:26	F9K0004	FK91901
C1-Fluorenes	**28800** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
C2-Fluorenes	**26500** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
C3-Fluorenes	**11900** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
Dibenzothiophene	**6900** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
C1-Dibenzothiophenes	**12400** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
C2-Dibenzothiophenes	**11900** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
C3-Dibenzothiophenes	**6080** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
C4-Dibenzothiophenes	**2300** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
Phenanthrene	**166000** (199)	99.4	8270 Mod		20	11/21/19 20:26	F9K0004	FK91901
Anthracene	**53000** (199)	99.4	8270 Mod		20	11/21/19 20:26	F9K0004	FK91901
C1-Phenanthrenes/Anthracenes	**151000** (199)	99.4	8270 Mod		20	11/21/19 20:26	F9K0004	FK91901
C2-Phenanthrenes/Anthracenes	**65100** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
C3-Phenanthrenes/Anthracenes	**24500** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
C4-Phenanthrenes/Anthracenes	**7390** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
Retene	**2510** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
Benzo(b)naphtho(2,1-d)thiophene	**4310** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
C0-Benzonaphthothiophenes	**7740** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
C1-Benzonaphthothiophenes	**6810** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
C2-Benzonaphthothiophenes	**3870** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
C3-Benzonaphthothiophenes	**2010** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS728-S3
Date Sampled: 11/14/19 14:52
Percent Solids: 52
Initial Volume: 3.87
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/19/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**451** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
Fluoranthene	**69400** (199)	99.4	8270 Mod		20	11/21/19 20:26	F9K0004	FK91901
Pyrene	**103000** (199)	99.4	8270 Mod		20	11/21/19 20:26	F9K0004	FK91901
C1-Fluoranthenes/Pyrenes	**81500** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
C2-Fluoranthenes/Pyrenes	**33300** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
C3-Fluoranthenes/Pyrenes	**12700** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
Benzo(b)fluorene	**8780** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
Benzo(c)fluorene	**3290** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
2-Methylpyrene	**10800** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
4-Methylpyrene	**9830** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
1-Methylpyrene	**10300** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
Benz(a)anthracene	**43200** (199)	99.4	8270 Mod		20	11/21/19 20:26	F9K0004	FK91901
Chrysene/triphenylene	**42800** (199)	99.4	8270 Mod		20	11/21/19 20:26	F9K0004	FK91901
C1-Benzo(a)anthracenes/Chrysenes	**33300** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
C2-Benzo(a)anthracenes/Chrysenes	**16500** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
C3-Benzo(a)anthracenes/Chrysenes	**6380** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
C4-Benzo(a)anthracenes/Chrysenes	**2220** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
Benzo(b)fluoranthene	**16000** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
Benzo(j/k)fluoranthene	**15300** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
Benzo(e)pyrene	**16200** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
Benzo(a)pyrene	**29200** (199)	99.4	8270 Mod		20	11/21/19 20:26	F9K0004	FK91901
Perylene	**4630** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
Indeno(1,2,3-cd)pyrene	**11000** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
Dibenzo(a,h)anthracene	**3280** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
Benzo(g,h,i)perylene	**11200** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
Coronene	**2390** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
Tetramethyl lead	ND (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
Trimethylethyl lead	ND (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
Dimethyldiethyl lead	ND (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
Methyltriethyl lead	ND (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
Tetraethyl lead	ND (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
2,6,10-trimethyldodecane (1380)	**1600** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS728-S3
Date Sampled: 11/14/19 14:52
Percent Solids: 52
Initial Volume: 3.87
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/19/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**2770** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
2,6,10-trimethylpentadecane (1650)	**3670** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
C-17	**786** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
Pristane	**7070** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
C-18	**850** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
Phytane	**6590** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
Carbazole	**341** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
2,6-Dimethylnaphthalene	**11800** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
2,3,5-Trimethylnaphthene	**3300** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
4-Methyldibenzothiophene	**5020** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
2/3-Methyldibenzothiophene	**4170** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
1-Methyldibenzothiophene	**1060** (9.94)	4.97	8270 Mod		1	11/21/19 0:53	F9K0004	FK91901
3-Methylphenanthrene	**34400** (199)	99.4	8270 Mod		20	11/21/19 20:26	F9K0004	FK91901
2-Methylphenanthrene	**38100** (199)	99.4	8270 Mod		20	11/21/19 20:26	F9K0004	FK91901
2-Methylanthracene	**17300** (199)	99.4	8270 Mod		20	11/21/19 20:26	F9K0004	FK91901
4/9-Methylphenanthrene	**35500** (199)	99.4	8270 Mod		20	11/21/19 20:26	F9K0004	FK91901
1-Methylphenanthrene	**24500** (199)	99.4	8270 Mod		20	11/21/19 20:26	F9K0004	FK91901

	%Recovery	*Qualifier*	*Limits*
Surrogate: Toluene-D8	*83 %*		*50-120*
Surrogate: Naphthalene-d8	*75 %*		*50-120*
Surrogate: Phenanthrene-d10	*93 %*		*50-120*
Surrogate: Perylene-d12	*93 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS728-S3
Date Sampled: 11/14/19 14:52
Percent Solids: 52

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-07
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**92800** (97.1)		TOC-LK		1	CCP	12/04/19 18:31	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS730-S2
Date Sampled: 11/14/19 15:21
Percent Solids: 74
Initial Volume: 5.51
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/19/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**B 10.5** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C1-Benzene	**8.02** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C2-Benzenes	**6.34** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C3-Benzenes	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C4-Benzenes	**7.77** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C5-Benzenes	**12.0** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
Methylcyclohexane	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
Toluene	**10.8** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
Ethylbenzene	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
m,p-Xylene	**7.45** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
Styrene	**6.48** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
o-Xylene	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
Isopropylbenzene	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
n-Propylbenzene	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
1,3,5-Trimethylbenzene	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
1,2,3-Trimethylbenzene	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
1,2,4-Trimethylbenzene	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
t-Butylbenzene	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
sec-Butylbenzene	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
p-Isopropyltoluene	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
n-Butylbenzene	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
trans-Decalin	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
cis-Decalin	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C1-Decalins	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C2-Decalins	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C3-Decalins	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C4-Decalins	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
Benzo(b)thiophene	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C1-Benzo(b)thiophenes	**J 3.52** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C2-Benzo(b)thiophenes	**5.45** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C3-Benzo(b)thiophenes	**J 3.28** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C4-Benzo(b)thiophenes	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS730-S2
Date Sampled: 11/14/19 15:21
Percent Solids: 74
Initial Volume: 5.51
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/19/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
2-Methylnaphthalene	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
1-Methylnaphthalene	**J 2.47** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C1-Naphthalenes	**J 3.39** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C2-Naphthalenes	**20.0** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C3-Naphthalenes	**13.9** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C4-Naphthalenes	**6.89** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
Biphenyl	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
Acenaphthylene	**25.8** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
Acenaphthene	**5.45** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
Dibenzofuran	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
Fluorene	**6.43** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C1-Fluorenes	**11.0** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C2-Fluorenes	**15.2** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C3-Fluorenes	**7.89** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
Dibenzothiophene	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C1-Dibenzothiophenes	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C2-Dibenzothiophenes	**J 4.45** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C3-Dibenzothiophenes	**J 2.68** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C4-Dibenzothiophenes	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
Phenanthrene	**16.2** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
Anthracene	**10.2** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C1-Phenanthrenes/Anthracenes	**28.4** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C2-Phenanthrenes/Anthracenes	**16.2** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C3-Phenanthrenes/Anthracenes	**8.38** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C4-Phenanthrenes/Anthracenes	**6.99** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
Retene	**10.6** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
Benzo(b)naphtho(2,1-d)thiophene	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C0-Benzonaphthothiophenes	**J 2.47** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C1-Benzonaphthothiophenes	**J 3.03** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C2-Benzonaphthothiophenes	**J 3.57** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C3-Benzonaphthothiophenes	**J 2.78** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS730-S2
Date Sampled: 11/14/19 15:21
Percent Solids: 74
Initial Volume: 5.51
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/19/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
Fluoranthene	**22.8** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
Pyrene	**34.7** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C1-Fluoranthenes/Pyrenes	**47.2** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C2-Fluoranthenes/Pyrenes	**20.4** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C3-Fluoranthenes/Pyrenes	**9.22** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
Benzo(b)fluorene	**5.30** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
Benzo(c)fluorene	**J 2.72** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
2-Methylpyrene	**J 4.56** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
4-Methylpyrene	**J 4.58** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
1-Methylpyrene	**J 4.25** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
Benz(a)anthracene	**14.7** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
Chrysene/triphenylene	**15.0** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C1-Benzo(a)anthracenes/Chrysenes	**12.5** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C2-Benzo(a)anthracenes/Chrysenes	**8.72** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C3-Benzo(a)anthracenes/Chrysenes	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C4-Benzo(a)anthracenes/Chrysenes	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
Benzo(b)fluoranthene	**8.88** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
Benzo(j/k)fluoranthene	**10.2** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
Benzo(e)pyrene	**12.0** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
Benzo(a)pyrene	**18.2** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
Perylene	**991** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
Indeno(1,2,3-cd)pyrene	**8.51** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
Dibenzo(a,h)anthracene	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
Benzo(g,h,i)perylene	**10.2** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
Coronene	**J 3.73** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
Tetramethyl lead	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
Trimethylethyl lead	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
Dimethyldiethyl lead	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
Methyltriethyl lead	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
Tetraethyl lead	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
2,6,10-trimethyldodecane (1380)	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS730-S2
Date Sampled: 11/14/19 15:21
Percent Solids: 74
Initial Volume: 5.51
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/19/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**8.65** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
2,6,10-trimethylpentadecane (1650)	**B 15.1** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C-17	**B 67.9** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
Pristane	**B 35.2** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
C-18	**B 52.1** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
Phytane	**B 45.7** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
Carbazole	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
2,6-Dimethylnaphthalene	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
2,3,5-Trimethylnaphthene	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
4-Methyldibenzothiophene	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
2/3-Methyldibenzothiophene	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
1-Methyldibenzothiophene	ND (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
3-Methylphenanthrene	**6.82** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
2-Methylphenanthrene	**J 4.42** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
2-Methylanthracene	**J 4.26** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
4/9-Methylphenanthrene	**9.03** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901
1-Methylphenanthrene	**J 2.86** (4.92)	2.46	8270 Mod		1	11/21/19 2:20	F9K0004	FK91901

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*82 %*		*50-120*
Surrogate: Naphthalene-d8	*86 %*		*50-120*
Surrogate: Phenanthrene-d10	*91 %*		*50-120*
Surrogate: Perylene-d12	*79 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS730-S2
Date Sampled: 11/14/19 15:21
Percent Solids: 74

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-08
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**11400** (95.9)		TOC-LK		1	CCP	12/04/19 18:48	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS730-S3
Date Sampled: 11/14/19 15:24
Percent Solids: 80
Initial Volume: 5.16
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/19/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**B 15.7** (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C1-Benzene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C2-Benzenes	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C3-Benzenes	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C4-Benzenes	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C5-Benzenes	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
Methylcyclohexane	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
Toluene	**J 2.85** (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
Ethylbenzene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
m,p-Xylene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
Styrene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
o-Xylene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
Isopropylbenzene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
n-Propylbenzene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
1,3,5-Trimethylbenzene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
1,2,3-Trimethylbenzene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
1,2,4-Trimethylbenzene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
t-Butylbenzene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
sec-Butylbenzene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
p-Isopropyltoluene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
n-Butylbenzene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
trans-Decalin	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
cis-Decalin	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C1-Decalins	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C2-Decalins	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C3-Decalins	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C4-Decalins	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
Benzo(b)thiophene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C1-Benzo(b)thiophenes	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C2-Benzo(b)thiophenes	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C3-Benzo(b)thiophenes	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C4-Benzo(b)thiophenes	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS730-S3
Date Sampled: 11/14/19 15:24
Percent Solids: 80
Initial Volume: 5.16
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/19/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
2-Methylnaphthalene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
1-Methylnaphthalene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C1-Naphthalenes	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C2-Naphthalenes	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C3-Naphthalenes	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C4-Naphthalenes	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
Biphenyl	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
Acenaphthylene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
Acenaphthene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
Dibenzofuran	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
Fluorene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C1-Fluorenes	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C2-Fluorenes	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C3-Fluorenes	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
Dibenzothiophene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C1-Dibenzothiophenes	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C2-Dibenzothiophenes	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C3-Dibenzothiophenes	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C4-Dibenzothiophenes	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
Phenanthrene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
Anthracene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C1-Phenanthrenes/Anthracenes	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C2-Phenanthrenes/Anthracenes	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C3-Phenanthrenes/Anthracenes	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C4-Phenanthrenes/Anthracenes	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
Retene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
Benzo(b)naphtho(2,1-d)thiophene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C0-Benzonaphthothiophenes	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C1-Benzonaphthothiophenes	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C2-Benzonaphthothiophenes	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C3-Benzonaphthothiophenes	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS730-S3
Date Sampled: 11/14/19 15:24
Percent Solids: 80
Initial Volume: 5.16
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/19/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
Fluoranthene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
Pyrene	**J 3.52** (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C1-Fluoranthenes/Pyrenes	**J 3.71** (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C2-Fluoranthenes/Pyrenes	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C3-Fluoranthenes/Pyrenes	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
Benzo(b)fluorene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
Benzo(c)fluorene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
2-Methylpyrene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
4-Methylpyrene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
1-Methylpyrene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
Benz(a)anthracene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
Chrysene/triphenylene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C1-Benzo(a)anthracenes/Chrysenes	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C2-Benzo(a)anthracenes/Chrysenes	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C3-Benzo(a)anthracenes/Chrysenes	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C4-Benzo(a)anthracenes/Chrysenes	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
Benzo(b)fluoranthene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
Benzo(j/k)fluoranthene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
Benzo(e)pyrene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
Benzo(a)pyrene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
Perylene	**4100** (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
Indeno(1,2,3-cd)pyrene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
Dibenzo(a,h)anthracene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
Benzo(g,h,i)perylene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
Coronene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
Tetramethyl lead	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
Trimethylethyl lead	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
Dimethyldiethyl lead	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
Methyltriethyl lead	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
Tetraethyl lead	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
2,6,10-trimethyldodecane (1380)	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS730-S3
Date Sampled: 11/14/19 15:24
Percent Solids: 80
Initial Volume: 5.16
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/19/19 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
2,6,10-trimethylpentadecane (1650)	**B 9.25** (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C-17	**B 37.1** (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
Pristane	**B 25.5** (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
C-18	**B 26.8** (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
Phytane	**B 30.0** (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
Carbazole	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
2,6-Dimethylnaphthalene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
2,3,5-Trimethylnaphthene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
4-Methyldibenzothiophene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
2/3-Methyldibenzothiophene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
1-Methyldibenzothiophene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
3-Methylphenanthrene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
2-Methylphenanthrene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
2-Methylanthracene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
4/9-Methylphenanthrene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901
1-Methylphenanthrene	ND (4.86)	2.43	8270 Mod		1	11/21/19 16:13	F9K0005	FK91901

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*93 %*		*50-120*
Surrogate: Naphthalene-d8	*95 %*		*50-120*
Surrogate: Phenanthrene-d10	*92 %*		*50-120*
Surrogate: Perylene-d12	*96 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS730-S3
Date Sampled: 11/14/19 15:24
Percent Solids: 80

ESS Laboratory Work Order: F190059
ESS Laboratory Sample ID: F190059-09
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**3260** (93.8)		TOC-LK		1	CCP	12/04/19 19:04	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190059

Quality Control Data

Classical Chemistry

Batch CK92246 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	100	mg/kg							
Total Organic Carbon (2)	ND	100	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190059

Quality Control Data

Classical Chemistry

Batch CK92246 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	10200	100	mg/kg	10000		102	80-120			
Total Organic Carbon (2)	10100	100	mg/kg	10000		101	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190059

Quality Control Data

Classical Chemistry

Batch CK92246 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	10000	100	mg/kg	10000		100	80-120	1	20	
Total Organic Carbon (2)	10700	100	mg/kg	10000		107	80-120	6	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190059

Quality Control Data

Classical Chemistry

Batch CL90265 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	100	mg/kg							
Total Organic Carbon (2)	ND	100	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190059

Quality Control Data

Classical Chemistry

Batch CL90265 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9820	100	mg/kg	10000		98	80-120			
Total Organic Carbon (2)	10100	100	mg/kg	10000		101	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190059

Quality Control Data

Classical Chemistry

Batch CL90265 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	10900	100	mg/kg	10000		109	80-120	11	20	
Total Organic Carbon (2)	9720	100	mg/kg	10000		97	80-120	4	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190059

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FK91901 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	12.4	4.00	ug/Kg wet							
C1-Benzene	ND	4.00	ug/Kg wet							
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	ND	4.00	ug/Kg wet							
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	3.95	4.00	ug/Kg wet							J
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190059

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FK91901 - 3570

C1-Fluorenes	ND	4.00	ug/Kg wet
C2-Fluorenes	ND	4.00	ug/Kg wet
C3-Fluorenes	ND	4.00	ug/Kg wet
Dibenzothiophene	ND	4.00	ug/Kg wet
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet
Phenanthrene	ND	4.00	ug/Kg wet
Anthracene	ND	4.00	ug/Kg wet
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
Retene	ND	4.00	ug/Kg wet
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
Fluoranthene	ND	4.00	ug/Kg wet
Pyrene	ND	4.00	ug/Kg wet
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
Benzo(b)fluorene	ND	4.00	ug/Kg wet
Benzo(c)fluorene	ND	4.00	ug/Kg wet
2-Methylpyrene	ND	4.00	ug/Kg wet
4-Methylpyrene	ND	4.00	ug/Kg wet
1-Methylpyrene	ND	4.00	ug/Kg wet
Benz(a)anthracene	ND	4.00	ug/Kg wet
Chrysene/triphenylene	ND	4.00	ug/Kg wet
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet
Benzo(e)pyrene	ND	4.00	ug/Kg wet
Benzo(a)pyrene	ND	4.00	ug/Kg wet
Perylene	ND	4.00	ug/Kg wet
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet
Coronene	ND	4.00	ug/Kg wet
Tetramethyl lead	ND	4.00	ug/Kg wet
Trimethylethyl lead	ND	4.00	ug/Kg wet

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190059

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FK91901 - 3570						
Dimethyldiethyl lead	ND	4.00	ug/Kg wet			
Methyltriethyl lead	ND	4.00	ug/Kg wet			
Tetraethyl lead	ND	4.00	ug/Kg wet			
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet			
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet			
2,6,10-trimethylpentadecane (1650)	5.45	4.00	ug/Kg wet			
C-17	25.7	4.00	ug/Kg wet			
Pristane	19.0	4.00	ug/Kg wet			
C-18	17.1	4.00	ug/Kg wet			
Phytane	20.6	4.00	ug/Kg wet			
Carbazole	ND	4.00	ug/Kg wet			
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet			
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet			
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
3-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylanthracene	ND	4.00	ug/Kg wet			
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet			
1-Methylphenanthrene	ND	4.00	ug/Kg wet			
Surrogate: Toluene-D8	*394*		ug/Kg wet	*400.0*	*99*	*50-120*
Surrogate: Naphthalene-d8	*375*		ug/Kg wet	*400.0*	*94*	*50-120*
Surrogate: Phenanthrene-d10	*367*		ug/Kg wet	*400.0*	*92*	*50-120*
Surrogate: Perylene-d12	*304*		ug/Kg wet	*400.0*	*76*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190059

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FK91901 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	322	4.00	ug/Kg wet	400.0		81	60-130			
Methylcyclohexane	257	4.00	ug/Kg wet	400.0		64	60-130			
Toluene	382	4.00	ug/Kg wet	400.0		96	60-130			
Ethylbenzene	385	4.00	ug/Kg wet	400.0		96	60-130			
m,p-Xylene	384	4.00	ug/Kg wet	400.0		96	60-130			
Styrene	369	4.00	ug/Kg wet	400.0		92	60-130			
o-Xylene	391	4.00	ug/Kg wet	400.0		98	60-130			
Isopropylbenzene	384	4.00	ug/Kg wet	400.0		96	60-130			
n-Propylbenzene	390	4.00	ug/Kg wet	400.0		97	60-130			
1,3,5-Trimethylbenzene	385	4.00	ug/Kg wet	400.0		96	60-130			
1,2,3-Trimethylbenzene	398	4.00	ug/Kg wet	400.0		100	60-130			
1,2,4-Trimethylbenzene	394	4.00	ug/Kg wet	400.0		99	60-130			
t-Butylbenzene	387	4.00	ug/Kg wet	400.0		97	60-130			
sec-Butylbenzene	388	4.00	ug/Kg wet	400.0		97	60-130			
p-Isopropyltoluene	398	4.00	ug/Kg wet	400.0		100	60-130			
n-Butylbenzene	389	4.00	ug/Kg wet	400.0		97	60-130			
trans-Decalin	384	4.00	ug/Kg wet	400.0		96	60-130			
cis-Decalin	379	4.00	ug/Kg wet	400.0		95	60-130			
Benzo(b)thiophene	377	4.00	ug/Kg wet	400.0		94	60-130			
Naphthalene	385	4.00	ug/Kg wet	400.0		96	60-130			
2-Methylnaphthalene	366	4.00	ug/Kg wet	400.0		91	60-130			
1-Methylnaphthalene	371	4.00	ug/Kg wet	400.0		93	60-130			
Biphenyl	372	4.00	ug/Kg wet	400.0		93	60-130			
Acenaphthylene	352	4.00	ug/Kg wet	400.0		88	60-130			
Acenaphthene	375	4.00	ug/Kg wet	400.0		94	60-130			
Dibenzofuran	375	4.00	ug/Kg wet	400.0		94	60-130			
Fluorene	364	4.00	ug/Kg wet	400.0		91	60-130			
Dibenzothiophene	374	4.00	ug/Kg wet	400.0		94	60-130			
Phenanthrene	376	4.00	ug/Kg wet	400.0		94	60-130			
Anthracene	357	4.00	ug/Kg wet	400.0		89	60-130			
Retene	328	4.00	ug/Kg wet	400.0		82	60-130			
Benzo(b)naphtho(2,1-d)thiophene	336	4.00	ug/Kg wet	400.0		84	60-130			
Fluoranthene	362	4.00	ug/Kg wet	400.0		90	60-130			
Pyrene	363	4.00	ug/Kg wet	400.0		91	60-130			
Benz(a)anthracene	331	4.00	ug/Kg wet	400.0		83	60-130			
Chrysene/triphenylene	350	4.00	ug/Kg wet	400.0		87	60-130			
Benzo(b)fluoranthene	327	4.00	ug/Kg wet	400.0		82	60-130			
Benzo(j/k)fluoranthene	331	4.00	ug/Kg wet	400.0		83	60-130			
Benzo(e)pyrene	332	4.00	ug/Kg wet	400.0		83	60-130			
Benzo(a)pyrene	325	4.00	ug/Kg wet	400.0		81	60-130			
Perylene	326	4.00	ug/Kg wet	400.0		82	60-130			
Indeno(1,2,3-cd)pyrene	317	4.00	ug/Kg wet	400.0		79	60-130			
Dibenzo(a,h)anthracene	326	4.00	ug/Kg wet	400.0		82	60-130			
Benzo(g,h,i)perylene	334	4.00	ug/Kg wet	400.0		83	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190059

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FK91901 - 3570						
Coronene	334	4.00	ug/Kg wet	400.0	83	60-130
Tetraethyl lead	324	4.00	ug/Kg wet	400.0	81	60-130
Pristane	409	4.00	ug/Kg wet	400.0	102	60-130
Phytane	400	4.00	ug/Kg wet	400.0	100	60-130
Surrogate: Toluene-D8	*353*		ug/Kg wet	*400.0*	*88*	*50-120*
Surrogate: Naphthalene-d8	*367*		ug/Kg wet	*400.0*	*92*	*50-120*
Surrogate: Phenanthrene-d10	*375*		ug/Kg wet	*400.0*	*94*	*50-120*
Surrogate: Perylene-d12	*304*		ug/Kg wet	*400.0*	*76*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
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ESS Laboratory Work Order: F190059

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FK91901 - 3570

Duplicate **Source: F190059-09**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	4.99	5.01	ug/Kg dry		15.7			104	50	D+, J
C1-Benzene	ND	5.01	ug/Kg dry		ND				50	
C2-Benzenes	ND	5.01	ug/Kg dry		ND				50	
C3-Benzenes	ND	5.01	ug/Kg dry		ND				50	
C4-Benzenes	ND	5.01	ug/Kg dry		ND				50	
C5-Benzenes	ND	5.01	ug/Kg dry		ND				50	
Methylcyclohexane	ND	5.01	ug/Kg dry		ND				50	
Toluene	ND	5.01	ug/Kg dry		2.85				50	
Ethylbenzene	ND	5.01	ug/Kg dry		ND				50	
m,p-Xylene	ND	5.01	ug/Kg dry		ND				50	
Styrene	ND	5.01	ug/Kg dry		ND				50	
o-Xylene	ND	5.01	ug/Kg dry		ND				50	
Isopropylbenzene	ND	5.01	ug/Kg dry		ND				50	
n-Propylbenzene	ND	5.01	ug/Kg dry		ND				50	
1,3,5-Trimethylbenzene	ND	5.01	ug/Kg dry		ND				50	
1,2,3-Trimethylbenzene	ND	5.01	ug/Kg dry		ND				50	
1,2,4-Trimethylbenzene	ND	5.01	ug/Kg dry		ND				50	
t-Butylbenzene	ND	5.01	ug/Kg dry		ND				50	
sec-Butylbenzene	ND	5.01	ug/Kg dry		ND				50	
p-Isopropyltoluene	ND	5.01	ug/Kg dry		ND				50	
n-Butylbenzene	ND	5.01	ug/Kg dry		ND				50	
trans-Decalin	ND	5.01	ug/Kg dry		ND				50	
cis-Decalin	ND	5.01	ug/Kg dry		ND				50	
C1-Decalins	ND	5.01	ug/Kg dry		ND				50	
C2-Decalins	ND	5.01	ug/Kg dry		ND				50	
C3-Decalins	ND	5.01	ug/Kg dry		ND				50	
C4-Decalins	ND	5.01	ug/Kg dry		ND				50	
Benzo(b)thiophene	ND	5.01	ug/Kg dry		ND				50	
C1-Benzo(b)thiophenes	ND	5.01	ug/Kg dry		ND				50	
C2-Benzo(b)thiophenes	ND	5.01	ug/Kg dry		ND				50	
C3-Benzo(b)thiophenes	ND	5.01	ug/Kg dry		ND				50	
C4-Benzo(b)thiophenes	ND	5.01	ug/Kg dry		ND				50	
Naphthalene	ND	5.01	ug/Kg dry		ND				50	
2-Methylnaphthalene	ND	5.01	ug/Kg dry		ND				50	
1-Methylnaphthalene	ND	5.01	ug/Kg dry		ND				50	
C1-Naphthalenes	ND	5.01	ug/Kg dry		ND				50	
C2-Naphthalenes	ND	5.01	ug/Kg dry		ND				50	
C3-Naphthalenes	ND	5.01	ug/Kg dry		ND				50	
C4-Naphthalenes	ND	5.01	ug/Kg dry		ND				50	
Biphenyl	ND	5.01	ug/Kg dry		ND				50	
Acenaphthylene	ND	5.01	ug/Kg dry		ND				50	
Acenaphthene	ND	5.01	ug/Kg dry		ND				50	
Dibenzofuran	ND	5.01	ug/Kg dry		ND				50	
Fluorene	ND	5.01	ug/Kg dry		ND				50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
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ESS Laboratory Work Order: F190059

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FK91901 - 3570							
C1-Fluorenes	ND	5.01	ug/Kg dry	ND		50	
C2-Fluorenes	ND	5.01	ug/Kg dry	ND		50	
C3-Fluorenes	ND	5.01	ug/Kg dry	ND		50	
Dibenzothiophene	ND	5.01	ug/Kg dry	ND		50	
C1-Dibenzothiophenes	ND	5.01	ug/Kg dry	ND		50	
C2-Dibenzothiophenes	ND	5.01	ug/Kg dry	ND		50	
C3-Dibenzothiophenes	ND	5.01	ug/Kg dry	ND		50	
C4-Dibenzothiophenes	ND	5.01	ug/Kg dry	ND		50	
Phenanthrene	2.87	5.01	ug/Kg dry	ND		50	J
Anthracene	ND	5.01	ug/Kg dry	ND		50	
C1-Phenanthrenes/Anthracenes	2.56	5.01	ug/Kg dry	ND		50	J
C2-Phenanthrenes/Anthracenes	ND	5.01	ug/Kg dry	ND		50	
C3-Phenanthrenes/Anthracenes	ND	5.01	ug/Kg dry	ND		50	
C4-Phenanthrenes/Anthracenes	ND	5.01	ug/Kg dry	ND		50	
Retene	ND	5.01	ug/Kg dry	ND		50	
Benzo(b)naphtho(2,1-d)thiophene	ND	5.01	ug/Kg dry	ND		50	
C0-Benzonaphthothiophenes	ND	5.01	ug/Kg dry	ND		50	
C1-Benzonaphthothiophenes	ND	5.01	ug/Kg dry	ND		50	
C2-Benzonaphthothiophenes	ND	5.01	ug/Kg dry	ND		50	
C3-Benzonaphthothiophenes	ND	5.01	ug/Kg dry	ND		50	
C4-Benzonaphthothiophenes	ND	5.01	ug/Kg dry	ND		50	
Fluoranthene	ND	5.01	ug/Kg dry	ND		50	
Pyrene	3.46	5.01	ug/Kg dry	3.52	2	50	J
C1-Fluoranthenes/Pyrenes	3.61	5.01	ug/Kg dry	3.71	3	50	J
C2-Fluoranthenes/Pyrenes	ND	5.01	ug/Kg dry	ND		50	
C3-Fluoranthenes/Pyrenes	ND	5.01	ug/Kg dry	ND		50	
Benzo(b)fluorene	ND	5.01	ug/Kg dry	ND		50	
Benzo(c)fluorene	ND	5.01	ug/Kg dry	ND		50	
2-Methylpyrene	ND	5.01	ug/Kg dry	ND		50	
4-Methylpyrene	ND	5.01	ug/Kg dry	ND		50	
1-Methylpyrene	ND	5.01	ug/Kg dry	ND		50	
Benz(a)anthracene	ND	5.01	ug/Kg dry	ND		50	
Chrysene/triphenylene	ND	5.01	ug/Kg dry	ND		50	
C1-Benzo(a)anthracenes/Chrysenes	ND	5.01	ug/Kg dry	ND		50	
C2-Benzo(a)anthracenes/Chrysenes	ND	5.01	ug/Kg dry	ND		50	
C3-Benzo(a)anthracenes/Chrysenes	ND	5.01	ug/Kg dry	ND		50	
C4-Benzo(a)anthracenes/Chrysenes	ND	5.01	ug/Kg dry	ND		50	
Benzo(b)fluoranthene	ND	5.01	ug/Kg dry	ND		50	
Benzo(j/k)fluoranthene	ND	5.01	ug/Kg dry	ND		50	
Benzo(e)pyrene	ND	5.01	ug/Kg dry	ND		50	
Benzo(a)pyrene	ND	5.01	ug/Kg dry	ND		50	
Perylene	3400	5.01	ug/Kg dry	4100	19	50	
Indeno(1,2,3-cd)pyrene	ND	5.01	ug/Kg dry	ND		50	
Dibenzo(a,h)anthracene	ND	5.01	ug/Kg dry	ND		50	
Benzo(g,h,i)perylene	ND	5.01	ug/Kg dry	ND		50	
Coronene	ND	5.01	ug/Kg dry	ND		50	
Tetramethyl lead	ND	5.01	ug/Kg dry	ND		50	
Trimethylethyl lead	ND	5.01	ug/Kg dry	ND		50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190059

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FK91901 - 3570								
Dimethyldiethyl lead	ND	5.01	ug/Kg dry		ND			50
Methyltriethyl lead	ND	5.01	ug/Kg dry		ND			50
Tetraethyl lead	ND	5.01	ug/Kg dry		ND			50
2,6,10-trimethyldodecane (1380)	ND	5.01	ug/Kg dry		ND			50
2,6,10-trimethyltridecane (1470)	ND	5.01	ug/Kg dry		ND			50
2,6,10-trimethylpentadecane (1650)	11.4	5.01	ug/Kg dry		9.25		20	50
C-17	52.9	5.01	ug/Kg dry		37.1		35	50
Pristane	35.8	5.01	ug/Kg dry		25.5		34	50
C-18	37.8	5.01	ug/Kg dry		26.8		34	50
Phytane	43.0	5.01	ug/Kg dry		30.0		36	50
Carbazole	ND	5.01	ug/Kg dry		ND			50
2,6-Dimethylnaphthalene	ND	5.01	ug/Kg dry		ND			50
2,3,5-Trimethylnaphthene	ND	5.01	ug/Kg dry		ND			50
4-Methyldibenzothiophene	ND	5.01	ug/Kg dry		ND			50
2/3-Methyldibenzothiophene	ND	5.01	ug/Kg dry		ND			50
1-Methyldibenzothiophene	ND	5.01	ug/Kg dry		ND			50
3-Methylphenanthrene	ND	5.01	ug/Kg dry		ND			50
2-Methylphenanthrene	ND	5.01	ug/Kg dry		ND			50
2-Methylanthracene	ND	5.01	ug/Kg dry		ND			50
4/9-Methylphenanthrene	ND	5.01	ug/Kg dry		ND			50
1-Methylphenanthrene	ND	5.01	ug/Kg dry		ND			50
Surrogate: Toluene-D8	*492*		ug/Kg dry	*500.5*		*98*	*50-120*	
Surrogate: Naphthalene-d8	*430*		ug/Kg dry	*500.5*		*86*	*50-120*	
Surrogate: Phenanthrene-d10	*514*		ug/Kg dry	*500.5*		*103*	*50-120*	
Surrogate: Perylene-d12	*401*		ug/Kg dry	*500.5*		*80*	*50-120*	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F190059

Notes and Definitions

U	Analyte included in the analysis, but not detected
J	Reported between MDL and MRL
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
CD-	Continuing Calibration %Diff/Drift is below control limit (CD-).
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F190059

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) F190059

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY REQUIRED -- (YES) NO

If Yes, Are MCP Analytical Methods Required? (YES) NO NA

Are Drinking Water Samples Submitted? YES (NO) NA

If Yes, Have Drinking Water Sampling Requirements Been Met? YES NO (NA)

Preservative

None	None						

Analysis

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Parent and Alkylated MAHs & PAHs 8270**	TOCs by Lloyd-Kahn						Sample Specific Remarks
1	1804576-SS714-S3	11/14/19	1003	SOIL	1	BFM	X	X						
2	1804576-SS714-S4	11/14/19	1007	SOIL	1	BFM	X	X						
3	1804576-SS723-S1	11/14/19	1114	SOIL	1	BFM	X	X						
4	1804576-SS725-S2	11/14/19	1314	SOIL	1	BFM	X	X						
5	1804576-SS727-S2	11/14/19	1338	SOIL	1	BFM	X	X						
6	1804576-SS727-S3	11/14/19	1341	SOIL	1	BFM	X	X						
7	1804576-SS728-S3	11/14/19	1462	SOIL	1	BFM	X	X						
8	1804576-SS730-S2	11/14/19	1521	SOIL	1	BFM	X	X						
9	1804576-SS730-S3	11/14/19	1524	SOIL	1	BFM	X	X						

Sample Handling

Samples Field Filtered: YES NO (NA)

Sampled Shipped With Ice: (YES) NO

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1.	11/14/19	1632	1. GEI Sample Fridge
Relinquished by: (signature) 2. GEI Sample Fridge	11/18/19	1257	Received by: (signature) 2.
Relinquished by: (signature) 3.	11/18/19	1257	Received by: (signature) 3.
Relinquished by: (signature) 4.	11/18/19	1639	Received by: (signature) 4. 11/18/19 1639

Turnaround Time (Business days):

Normal __X__ Other ____

10-Day ____ 7-Day ____

5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

**Parent and Alkylated MAHs & PAHs (34) by GC/MS/SIM/SCAN

icetemp 1.3

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI

Shipped/Delivered Via: ESS Courier

ESS Project ID: F190059
Date Received: 11/18/2019
Project Due Date: 11/25/2019
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 0.3 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / (NA)
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / (No)
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

COC = Sample 4 collected 1314 ; Label = 1114

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608.3 Pesticides)
1					4oz Jar - Unpres	NP	
2					4oz Jar - Unpres	NP	
3					4oz Jar - Unpres	NP	
4					4oz Jar - Unpres	NP	
5					4oz Jar - Unpres	NP	
6					4oz Jar - Unpres	NP	
7					4oz Jar - Unpres	NP	
8					4oz Jar - Unpres	NP	
9					4oz Jar - Unpres	NP	

2nd Review
All containers scanned into storage/lab Initials:
Are barcode labels on correct containers? Yes / No
Are all necessary stickers attached? Yes / No

Completed By: Date & Time: 11/18/19 1847
Reviewed By: Date & Time: 11/19/19 1000
Delivered By:

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (044752)
ESS Laboratory Work Order Number: F200006

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 4:44 pm, Feb 19, 2020

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses
ESS Laboratory - Cranston, RI TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200006

SAMPLE RECEIPT

The following samples were received on February 05, 2020 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F200006-01	1804576-SS753-S1	Soil	8270 Mod, LK
F200006-02	1804576-SS753-S2	Soil	8270 Mod, LK
F200006-03	1804576-SS738-S1	Soil	8270 Mod, LK
F200006-04	1804576-SS738-S2	Soil	8270 Mod, LK
F200006-05	1804576-SS739-S1	Soil	8270 Mod, LK
F200006-06	1804576-SS739-S2	Soil	8270 Mod, LK
F200006-07	1804576-SS739-S3	Soil	8270 Mod, LK
F200006-08	1804576-SS740-S1	Soil	8270 Mod, LK
F200006-09	1804576-SS740-S2	Soil	8270 Mod, LK
F200006-10	1804576-SS742-S1	Soil	8270 Mod, LK
F200006-11	1804576-SS743-S2	Soil	8270 Mod, LK
F200006-12	1804576-SS745-S2	Soil	8270 Mod, LK
F200006-13	1804576-SS747-S2	Soil	8270 Mod, LK
F200006-14	1804576-SS749-S1	Soil	8270 Mod, LK
F200006-15	1804576-SS749-S2	Soil	8270 Mod, LK
F200006-16	1804576-SS750-S1	Soil	8270 Mod, LK
F200006-17	1804576-SS751-S1	Soil	8270 Mod, LK
F200006-18	1804576-SS751-S2	Soil	8270 Mod, LK
F200006-19	1804576-SS752-S1	Soil	8270 Mod, LK
F200006-20	1804576-SS752-S2	Soil	8270 Mod, LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200006

PROJECT NARRATIVE

8270D (SIM) Semi-Volatile Organic Compounds

F200006-01 **Present in Method Blank (B).**
C-17 , C-18

F200006-02 **Present in Method Blank (B).**
C-17 , C-18 , Phytane , Pristane

F200006-03 **Present in Method Blank (B).**
2,6,10-trimethylpentadecane (1650) , C-17 , C-18 , Phytane , Pristane

F200006-04 **Present in Method Blank (B).**
2,6,10-trimethylpentadecane (1650) , C-17 , C-18 , Phytane , Pristane

F200006-05 **Present in Method Blank (B).**
C-17 , C-18

F200006-06 **Present in Method Blank (B).**
C-17 , C-18

F200006-07 **Present in Method Blank (B).**
2,6,10-trimethylpentadecane (1650) , C-17 , C-18 , Phytane , Pristane

F200006-08 **Present in Method Blank (B).**
2,6,10-trimethylpentadecane (1650) , C-17 , C-18 , Phytane , Pristane

F200006-09 **Present in Method Blank (B).**
C-17 , C-18 , Phytane , Pristane

F200006-10 **Present in Method Blank (B).**
C-17 , C-18 , Phytane , Pristane

F200006-11 **Present in Method Blank (B).**
C-17 , C-18 , Phytane , Pristane

F200006-12 **Present in Method Blank (B).**
C-17

F200006-13 **Present in Method Blank (B).**
C-17 , C-18 , Phytane , Pristane

F200006-14 **Present in Method Blank (B).**
C-17 , C-18

F200006-15 **Present in Method Blank (B).**
C-17 , C-18 , Phytane , Pristane

F200006-16 **Present in Method Blank (B).**
2,6,10-trimethylpentadecane (1650) , C-17 , C-18 , Phytane , Pristane

F200006-17 **Present in Method Blank (B).**
C-17

F200006-18 **Present in Method Blank (B).**
C-17 , C-18 , Phytane , Pristane

F200006-19 **Present in Method Blank (B).**
C-17

F200006-20 **Present in Method Blank (B).**

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F200006

2,6,10-trimethylpentadecane (1650) , C-17 , C-18 , Phytane , Pristane

FB00701-BS2 **Blank Spike recovery is below lower control limit (B-).**

Benzene (56% @ 60-130%), Methylcyclohexane (55% @ 60-130%)

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200006

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS753-S1
Date Sampled: 02/04/20 08:47
Percent Solids: 68
Initial Volume: 5.298
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**6.80** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C1-Benzene	**121** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C2-Benzenes	**79.7** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C3-Benzenes	**128** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C4-Benzenes	**105** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C5-Benzenes	**50.3** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
Methylcyclohexane	J **4.92** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
Toluene	**152** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
Ethylbenzene	**26.6** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
m,p-Xylene	**90.7** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
Styrene	**19.5** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
o-Xylene	**17.9** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
Isopropylbenzene	**6.06** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
n-Propylbenzene	**12.7** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
1,3,5-Trimethylbenzene	**20.3** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
1,2,3-Trimethylbenzene	**15.1** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
1,2,4-Trimethylbenzene	**63.5** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
t-Butylbenzene	ND (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
sec-Butylbenzene	ND (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
p-Isopropyltoluene	**21.7** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
n-Butylbenzene	**14.8** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
trans-Decalin	**63.5** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
cis-Decalin	**9.72** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C1-Decalins	**117** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C2-Decalins	**161** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C3-Decalins	**160** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C4-Decalins	**304** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
Benzo(b)thiophene	**13.6** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C1-Benzo(b)thiophenes	**21.9** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C2-Benzo(b)thiophenes	**38.3** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C3-Benzo(b)thiophenes	**65.7** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C4-Benzo(b)thiophenes	**44.4** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS753-S1
Date Sampled: 02/04/20 08:47
Percent Solids: 68
Initial Volume: 5.298
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**1070** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
2-Methylnaphthalene	**1300** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
1-Methylnaphthalene	**520** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C1-Naphthalenes	**1120** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C2-Naphthalenes	**844** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C3-Naphthalenes	**1090** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C4-Naphthalenes	**761** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
Biphenyl	**288** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
Acenaphthylene	**354** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
Acenaphthene	**516** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
Dibenzofuran	**111** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
Fluorene	**438** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C1-Fluorenes	**279** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C2-Fluorenes	**1120** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C3-Fluorenes	**776** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
Dibenzothiophene	**373** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C1-Dibenzothiophenes	**732** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C2-Dibenzothiophenes	**810** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C3-Dibenzothiophenes	**557** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C4-Dibenzothiophenes	**233** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
Phenanthrene	**4580** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
Anthracene	**1700** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C1-Phenanthrenes/Anthracenes	**5710** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C2-Phenanthrenes/Anthracenes	**3820** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C3-Phenanthrenes/Anthracenes	**1680** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C4-Phenanthrenes/Anthracenes	**957** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
Retene	**282** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
Benzo(b)naphtho(2,1-d)thiophene	**370** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C0-Benzonaphthothiophenes	**654** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C1-Benzonaphthothiophenes	**585** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C2-Benzonaphthothiophenes	**351** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C3-Benzonaphthothiophenes	**205** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS753-S1
Date Sampled: 02/04/20 08:47
Percent Solids: 68
Initial Volume: 5.298
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**59.4** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
Fluoranthene	**4410** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
Pyrene	**7160** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C1-Fluoranthenes/Pyrenes	**4880** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C2-Fluoranthenes/Pyrenes	**2240** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C3-Fluoranthenes/Pyrenes	**992** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
Benzo(b)fluorene	**471** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
Benzo(c)fluorene	**243** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
2-Methylpyrene	**705** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
4-Methylpyrene	**641** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
1-Methylpyrene	**570** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
Benz(a)anthracene	**2850** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
Chrysene/triphenylene	**2870** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C1-Benzo(a)anthracenes/Chrysenes	**2440** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C2-Benzo(a)anthracenes/Chrysenes	**1190** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C3-Benzo(a)anthracenes/Chrysenes	**517** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C4-Benzo(a)anthracenes/Chrysenes	**193** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
Benzo(b)fluoranthene	**1420** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
Benzo(j/k)fluoranthene	**1560** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
Benzo(e)pyrene	**1490** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
Benzo(a)pyrene	**2290** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
Perylene	**783** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
Indeno(1,2,3-cd)pyrene	**1240** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
Dibenzo(a,h)anthracene	**291** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
Benzo(g,h,i)perylene	**1090** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
Coronene	**291** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
Tetramethyl lead	ND (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
Trimethylethyl lead	ND (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
Dimethyldiethyl lead	ND (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
Methyltriethyl lead	ND (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
Tetraethyl lead	ND (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
2,6,10-trimethyldodecane (1380)	**202** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS753-S1
Date Sampled: 02/04/20 08:47
Percent Solids: 68
Initial Volume: 5.298
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**361** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
2,6,10-trimethylpentadecane (1650)	**455** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C-17	**B 93.2** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
Pristane	**1020** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
C-18	**B 103** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
Phytane	**896** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
Carbazole	**85.5** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
2,6-Dimethylnaphthalene	**199** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
2,3,5-Trimethylnaphthene	**81.1** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
4-Methyldibenzothiophene	**305** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
2/3-Methyldibenzothiophene	**244** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
1-Methyldibenzothiophene	**69.1** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
3-Methylphenanthrene	**1270** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
2-Methylphenanthrene	**1480** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
2-Methylanthracene	**620** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
4/9-Methylphenanthrene	**1480** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701
1-Methylphenanthrene	**859** (5.56)	2.78	8270 Mod		1	02/13/20 8:52	F0B0006	FB00701

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*57 %*		*50-120*
Surrogate: Naphthalene-d8	*70 %*		*50-120*
Surrogate: Phenanthrene-d10	*74 %*		*50-120*
Surrogate: Perylene-d12	*73 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS753-S1
Date Sampled: 02/04/20 08:47
Percent Solids: 68

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**27200** (92.4)		LK		1	CCP	02/11/20 14:44	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS753-S2
Date Sampled: 02/04/20 08:55
Percent Solids: 79
Initial Volume: 5.61
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C1-Benzene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C2-Benzenes	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C3-Benzenes	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C4-Benzenes	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C5-Benzenes	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
Methylcyclohexane	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
Toluene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
Ethylbenzene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
m,p-Xylene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
Styrene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
o-Xylene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
Isopropylbenzene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
n-Propylbenzene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
1,3,5-Trimethylbenzene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
1,2,3-Trimethylbenzene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
1,2,4-Trimethylbenzene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
t-Butylbenzene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
sec-Butylbenzene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
p-Isopropyltoluene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
n-Butylbenzene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
trans-Decalin	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
cis-Decalin	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C1-Decalins	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C2-Decalins	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C3-Decalins	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C4-Decalins	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
Benzo(b)thiophene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C1-Benzo(b)thiophenes	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C2-Benzo(b)thiophenes	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C3-Benzo(b)thiophenes	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C4-Benzo(b)thiophenes	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS753-S2
Date Sampled: 02/04/20 08:55
Percent Solids: 79
Initial Volume: 5.61
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
2-Methylnaphthalene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
1-Methylnaphthalene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C1-Naphthalenes	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C2-Naphthalenes	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C3-Naphthalenes	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C4-Naphthalenes	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
Biphenyl	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
Acenaphthylene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
Acenaphthene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
Dibenzofuran	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
Fluorene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C1-Fluorenes	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C2-Fluorenes	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C3-Fluorenes	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
Dibenzothiophene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C1-Dibenzothiophenes	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C2-Dibenzothiophenes	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C3-Dibenzothiophenes	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C4-Dibenzothiophenes	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
Phenanthrene	**J 2.70** (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
Anthracene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C1-Phenanthrenes/Anthracenes	**J 3.66** (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C2-Phenanthrenes/Anthracenes	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C3-Phenanthrenes/Anthracenes	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C4-Phenanthrenes/Anthracenes	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
Retene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
Benzo(b)naphtho(2,1-d)thiophene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C0-Benzonaphthothiophenes	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C1-Benzonaphthothiophenes	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C2-Benzonaphthothiophenes	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C3-Benzonaphthothiophenes	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS753-S2
Date Sampled: 02/04/20 08:55
Percent Solids: 79
Initial Volume: 5.61
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
Fluoranthene	**J 3.18** (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
Pyrene	**5.71** (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C1-Fluoranthenes/Pyrenes	**J 3.40** (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C2-Fluoranthenes/Pyrenes	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C3-Fluoranthenes/Pyrenes	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
Benzo(b)fluorene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
Benzo(c)fluorene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
2-Methylpyrene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
4-Methylpyrene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
1-Methylpyrene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
Benz(a)anthracene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
Chrysene/triphenylene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C1-Benzo(a)anthracenes/Chrysenes	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C2-Benzo(a)anthracenes/Chrysenes	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C3-Benzo(a)anthracenes/Chrysenes	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C4-Benzo(a)anthracenes/Chrysenes	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
Benzo(b)fluoranthene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
Benzo(j/k)fluoranthene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
Benzo(e)pyrene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
Benzo(a)pyrene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
Perylene	**1050** (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
Indeno(1,2,3-cd)pyrene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
Dibenzo(a,h)anthracene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
Benzo(g,h,i)perylene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
Coronene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
Tetramethyl lead	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
Trimethylethyl lead	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
Dimethyldiethyl lead	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
Methyltriethyl lead	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
Tetraethyl lead	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
2,6,10-trimethyldodecane (1380)	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS753-S2
Date Sampled: 02/04/20 08:55
Percent Solids: 79
Initial Volume: 5.61
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
2,6,10-trimethylpentadecane (1650)	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C-17	**B 6.12** (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
Pristane	**B 5.86** (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
C-18	**B 5.03** (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
Phytane	**B 7.63** (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
Carbazole	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
2,6-Dimethylnaphthalene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
2,3,5-Trimethylnaphthene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
4-Methyldibenzothiophene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
2/3-Methyldibenzothiophene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
1-Methyldibenzothiophene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
3-Methylphenanthrene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
2-Methylphenanthrene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
2-Methylanthracene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
4/9-Methylphenanthrene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701
1-Methylphenanthrene	ND (4.54)	2.27	8270 Mod		1	02/07/20 19:40	F0B0003	FB00701

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*74 %*		*50-120*
Surrogate: Naphthalene-d8	*63 %*		*50-120*
Surrogate: Phenanthrene-d10	*83 %*		*50-120*
Surrogate: Perylene-d12	*84 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS753-S2
Date Sampled: 02/04/20 08:55
Percent Solids: 79

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**1650** (106)		LK		1	CCP	02/11/20 15:34	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS738-S1
Date Sampled: 02/04/20 09:12
Percent Solids: 79
Initial Volume: 5.158
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	J **17.8** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C1-Benzene	**78.2** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C2-Benzenes	**44.3** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C3-Benzenes	**48.0** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C4-Benzenes	**70.8** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C5-Benzenes	**53.1** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
Methylcyclohexane	ND (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
Toluene	**94.0** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
Ethylbenzene	J **12.4** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
m,p-Xylene	**41.1** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
Styrene	J **17.6** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
o-Xylene	ND (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
Isopropylbenzene	ND (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
n-Propylbenzene	ND (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
1,3,5-Trimethylbenzene	ND (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
1,2,3-Trimethylbenzene	ND (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
1,2,4-Trimethylbenzene	J **18.8** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
t-Butylbenzene	ND (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
sec-Butylbenzene	ND (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
p-Isopropyltoluene	J **12.4** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
n-Butylbenzene	ND (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
trans-Decalin	**107** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
cis-Decalin	ND (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C1-Decalins	**168** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C2-Decalins	**132** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C3-Decalins	**62.3** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C4-Decalins	**108** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
Benzo(b)thiophene	J **12.7** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C1-Benzo(b)thiophenes	J **21.7** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C2-Benzo(b)thiophenes	**40.4** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C3-Benzo(b)thiophenes	**27.3** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C4-Benzo(b)thiophenes	J **22.6** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS738-S1
Date Sampled: 02/04/20 09:12
Percent Solids: 79
Initial Volume: 5.158
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**337** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
2-Methylnaphthalene	**217** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
1-Methylnaphthalene	**294** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C1-Naphthalenes	**306** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C2-Naphthalenes	**454** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C3-Naphthalenes	**332** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C4-Naphthalenes	**163** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
Biphenyl	**116** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
Acenaphthylene	**315** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
Acenaphthene	**1230** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
Dibenzofuran	**162** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
Fluorene	**807** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C1-Fluorenes	**300** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C2-Fluorenes	**223** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C3-Fluorenes	**208** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
Dibenzothiophene	**362** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C1-Dibenzothiophenes	**293** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C2-Dibenzothiophenes	**258** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C3-Dibenzothiophenes	**226** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C4-Dibenzothiophenes	**146** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
Phenanthrene	**5210** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
Anthracene	**1280** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C1-Phenanthrenes/Anthracenes	**1910** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C2-Phenanthrenes/Anthracenes	**866** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C3-Phenanthrenes/Anthracenes	**364** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C4-Phenanthrenes/Anthracenes	**429** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
Retene	**131** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
Benzo(b)naphtho(2,1-d)thiophene	**298** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C0-Benzonaphthothiophenes	**551** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C1-Benzonaphthothiophenes	**336** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C2-Benzonaphthothiophenes	**299** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C3-Benzonaphthothiophenes	**266** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS738-S1
Date Sampled: 02/04/20 09:12
Percent Solids: 79
Initial Volume: 5.158
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**145** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
Fluoranthene	**5160** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
Pyrene	**5340** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C1-Fluoranthenes/Pyrenes	**2000** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C2-Fluoranthenes/Pyrenes	**676** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C3-Fluoranthenes/Pyrenes	**416** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
Benzo(b)fluorene	**270** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
Benzo(c)fluorene	**106** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
2-Methylpyrene	**260** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
4-Methylpyrene	**219** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
1-Methylpyrene	**192** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
Benz(a)anthracene	**2250** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
Chrysene/triphenylene	**2150** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C1-Benzo(a)anthracenes/Chrysenes	**1060** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C2-Benzo(a)anthracenes/Chrysenes	**548** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C3-Benzo(a)anthracenes/Chrysenes	**312** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C4-Benzo(a)anthracenes/Chrysenes	**149** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
Benzo(b)fluoranthene	**1650** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
Benzo(j/k)fluoranthene	**1740** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
Benzo(e)pyrene	**1390** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
Benzo(a)pyrene	**2140** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
Perylene	**497** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
Indeno(1,2,3-cd)pyrene	**1530** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
Dibenzo(a,h)anthracene	**317** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
Benzo(g,h,i)perylene	**1190** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
Coronene	**302** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
Tetramethyl lead	ND (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
Trimethylethyl lead	ND (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
Dimethyldiethyl lead	ND (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
Methyltriethyl lead	ND (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
Tetraethyl lead	ND (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
2,6,10-trimethyldodecane (1380)	**65.0** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS738-S1
Date Sampled: 02/04/20 09:12
Percent Solids: 79
Initial Volume: 5.158
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**101** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
2,6,10-trimethylpentadecane (1650)	**B 77.4** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C-17	**B 110** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
Pristane	**B 170** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
C-18	**B 106** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
Phytane	**B 194** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
Carbazole	**202** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
2,6-Dimethylnaphthalene	**73.3** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
2,3,5-Trimethylnaphthene	**J 24.5** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
4-Methyldibenzothiophene	**107** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
2/3-Methyldibenzothiophene	**97.7** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
1-Methyldibenzothiophene	**32.2** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
3-Methylphenanthrene	**467** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
2-Methylphenanthrene	**523** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
2-Methylanthracene	**192** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
4/9-Methylphenanthrene	**421** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701
1-Methylphenanthrene	**302** (24.6)	12.3	8270 Mod		5	02/13/20 15:51	F0B0006	FB00701

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*63 %*		*50-120*
Surrogate: Naphthalene-d8	*69 %*		*50-120*
Surrogate: Phenanthrene-d10	*75 %*		*50-120*
Surrogate: Perylene-d12	*79 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS738-S1
Date Sampled: 02/04/20 09:12
Percent Solids: 79

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**39600** (92.1)		LK		1	CCP	02/11/20 16:41	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS738-S2
Date Sampled: 02/04/20 09:21
Percent Solids: 52
Initial Volume: 5.232
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C1-Benzene	**189** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C2-Benzenes	**66.8** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C3-Benzenes	**45.4** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C4-Benzenes	**58.0** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C5-Benzenes	**30.1** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
Methylcyclohexane	**J 6.55** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
Toluene	**215** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
Ethylbenzene	**12.9** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
m,p-Xylene	**77.5** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
Styrene	**23.5** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
o-Xylene	**11.3** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
Isopropylbenzene	ND (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
n-Propylbenzene	ND (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
1,3,5-Trimethylbenzene	**8.42** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
1,2,3-Trimethylbenzene	**J 4.95** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
1,2,4-Trimethylbenzene	**23.6** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
t-Butylbenzene	ND (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
sec-Butylbenzene	ND (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
p-Isopropyltoluene	**29.0** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
n-Butylbenzene	**J 4.41** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
trans-Decalin	**11.7** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
cis-Decalin	**J 3.69** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C1-Decalins	**32.2** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C2-Decalins	**45.5** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C3-Decalins	**30.7** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C4-Decalins	**27.5** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
Benzo(b)thiophene	**J 5.71** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C1-Benzo(b)thiophenes	**7.60** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C2-Benzo(b)thiophenes	**15.0** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C3-Benzo(b)thiophenes	**15.9** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C4-Benzo(b)thiophenes	**8.67** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS738-S2
Date Sampled: 02/04/20 09:21
Percent Solids: 52
Initial Volume: 5.232
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**177** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
2-Methylnaphthalene	**179** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
1-Methylnaphthalene	**78.5** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C1-Naphthalenes	**157** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C2-Naphthalenes	**341** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C3-Naphthalenes	**369** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C4-Naphthalenes	**189** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
Biphenyl	**55.6** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
Acenaphthylene	**158** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
Acenaphthene	**471** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
Dibenzofuran	**55.4** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
Fluorene	**158** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C1-Fluorenes	**321** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C2-Fluorenes	**284** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C3-Fluorenes	**153** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
Dibenzothiophene	**65.8** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C1-Dibenzothiophenes	**107** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C2-Dibenzothiophenes	**107** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C3-Dibenzothiophenes	**74.6** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C4-Dibenzothiophenes	**35.7** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
Phenanthrene	**819** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
Anthracene	**652** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C1-Phenanthrenes/Anthracenes	**2030** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C2-Phenanthrenes/Anthracenes	**1090** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C3-Phenanthrenes/Anthracenes	**415** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C4-Phenanthrenes/Anthracenes	**307** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
Retene	**244** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
Benzo(b)naphtho(2,1-d)thiophene	**111** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C0-Benzonaphthothiophenes	**241** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C1-Benzonaphthothiophenes	**203** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C2-Benzonaphthothiophenes	**142** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C3-Benzonaphthothiophenes	**96.9** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS738-S2
Date Sampled: 02/04/20 09:21
Percent Solids: 52
Initial Volume: 5.232
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**31.3** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
Fluoranthene	**2710** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
Pyrene	**3880** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C1-Fluoranthenes/Pyrenes	**2360** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C2-Fluoranthenes/Pyrenes	**1020** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C3-Fluoranthenes/Pyrenes	**447** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
Benzo(b)fluorene	**255** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
Benzo(c)fluorene	**147** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
2-Methylpyrene	**329** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
4-Methylpyrene	**319** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
1-Methylpyrene	**281** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
Benz(a)anthracene	**1670** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
Chrysene/triphenylene	**1530** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C1-Benzo(a)anthracenes/Chrysenes	**1340** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C2-Benzo(a)anthracenes/Chrysenes	**746** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C3-Benzo(a)anthracenes/Chrysenes	**410** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C4-Benzo(a)anthracenes/Chrysenes	**184** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
Benzo(b)fluoranthene	**1020** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
Benzo(j/k)fluoranthene	**1130** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
Benzo(e)pyrene	**1170** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
Benzo(a)pyrene	**1670** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
Perylene	**961** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
Indeno(1,2,3-cd)pyrene	**979** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
Dibenzo(a,h)anthracene	**240** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
Benzo(g,h,i)perylene	**934** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
Coronene	**227** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
Tetramethyl lead	ND (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
Trimethylethyl lead	ND (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
Dimethyldiethyl lead	ND (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
Methyltriethyl lead	ND (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
Tetraethyl lead	ND (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
2,6,10-trimethyldodecane (1380)	**26.0** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS738-S2
Date Sampled: 02/04/20 09:21
Percent Solids: 52
Initial Volume: 5.232
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**77.0** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
2,6,10-trimethylpentadecane (1650)	**B 68.8** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C-17	**B 119** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
Pristane	**B 137** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
C-18	**B 79.3** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
Phytane	**B 111** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
Carbazole	**35.1** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
2,6-Dimethylnaphthalene	**48.3** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
2,3,5-Trimethylnaphthene	**29.1** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
4-Methyldibenzothiophene	**23.5** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
2/3-Methyldibenzothiophene	**36.0** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
1-Methyldibenzothiophene	**9.27** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
3-Methylphenanthrene	**509** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
2-Methylphenanthrene	**535** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
2-Methylanthracene	**312** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
4/9-Methylphenanthrene	**580** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701
1-Methylphenanthrene	**91.2** (7.32)	3.66	8270 Mod		1	02/12/20 17:36	F0B0006	FB00701

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*55 %*		*50-120*
Surrogate: Naphthalene-d8	*62 %*		*50-120*
Surrogate: Phenanthrene-d10	*68 %*		*50-120*
Surrogate: Perylene-d12	*85 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS738-S2
Date Sampled: 02/04/20 09:21
Percent Solids: 52

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-04
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**45100** (96.4)		LK		1	CCP	02/11/20 16:57	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS739-S1
Date Sampled: 02/04/20 09:56
Percent Solids: 62
Initial Volume: 3.092
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**11.4** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C1-Benzene	**139** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C2-Benzenes	**131** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C3-Benzenes	**146** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C4-Benzenes	**653** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C5-Benzenes	**328** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
Methylcyclohexane	**19.3** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
Toluene	**167** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
Ethylbenzene	**26.6** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
m,p-Xylene	**169** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
Styrene	**49.7** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
o-Xylene	**19.7** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
Isopropylbenzene	**J 10.3** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
n-Propylbenzene	**50.9** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
1,3,5-Trimethylbenzene	**20.9** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
1,2,3-Trimethylbenzene	**23.8** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
1,2,4-Trimethylbenzene	**70.2** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
t-Butylbenzene	**J 9.31** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
sec-Butylbenzene	**125** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
p-Isopropyltoluene	**61.2** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
n-Butylbenzene	**244** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
trans-Decalin	**1140** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
cis-Decalin	**102** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C1-Decalins	**638** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C2-Decalins	**256** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C3-Decalins	**191** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C4-Decalins	**357** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
Benzo(b)thiophene	**15.0** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C1-Benzo(b)thiophenes	**46.3** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C2-Benzo(b)thiophenes	**117** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C3-Benzo(b)thiophenes	**275** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C4-Benzo(b)thiophenes	**55.9** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS739-S1
Date Sampled: 02/04/20 09:56
Percent Solids: 62
Initial Volume: 3.092
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**578** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
2-Methylnaphthalene	**359** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
1-Methylnaphthalene	**818** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C1-Naphthalenes	**702** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C2-Naphthalenes	**1740** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C3-Naphthalenes	**1450** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C4-Naphthalenes	**730** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
Biphenyl	**146** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
Acenaphthylene	**390** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
Acenaphthene	**2600** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
Dibenzofuran	**130** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
Fluorene	**1340** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C1-Fluorenes	**945** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C2-Fluorenes	**837** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C3-Fluorenes	**487** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
Dibenzothiophene	**415** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C1-Dibenzothiophenes	**628** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C2-Dibenzothiophenes	**606** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C3-Dibenzothiophenes	**387** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C4-Dibenzothiophenes	**193** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
Phenanthrene	**5360** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
Anthracene	**1810** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C1-Phenanthrenes/Anthracenes	**4700** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C2-Phenanthrenes/Anthracenes	**2470** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C3-Phenanthrenes/Anthracenes	**960** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C4-Phenanthrenes/Anthracenes	**776** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
Retene	**389** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
Benzo(b)naphtho(2,1-d)thiophene	**386** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C0-Benzonaphthothiophenes	**727** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C1-Benzonaphthothiophenes	**632** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C2-Benzonaphthothiophenes	**431** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C3-Benzonaphthothiophenes	**297** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS739-S1
Date Sampled: 02/04/20 09:56
Percent Solids: 62
Initial Volume: 3.092
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**119** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
Fluoranthene	**5340** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
Pyrene	**7320** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C1-Fluoranthenes/Pyrenes	**4490** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C2-Fluoranthenes/Pyrenes	**1920** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C3-Fluoranthenes/Pyrenes	**778** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
Benzo(b)fluorene	**513** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
Benzo(c)fluorene	**218** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
2-Methylpyrene	**615** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
4-Methylpyrene	**581** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
1-Methylpyrene	**549** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
Benz(a)anthracene	**3090** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
Chrysene/triphenylene	**3110** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C1-Benzo(a)anthracenes/Chrysenes	**2330** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C2-Benzo(a)anthracenes/Chrysenes	**1140** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C3-Benzo(a)anthracenes/Chrysenes	**504** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C4-Benzo(a)anthracenes/Chrysenes	**263** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
Benzo(b)fluoranthene	**1670** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
Benzo(j/k)fluoranthene	**1920** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
Benzo(e)pyrene	**1760** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
Benzo(a)pyrene	**2730** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
Perylene	**855** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
Indeno(1,2,3-cd)pyrene	**1400** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
Dibenzo(a,h)anthracene	**323** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
Benzo(g,h,i)perylene	**1240** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
Coronene	**300** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
Tetramethyl lead	ND (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
Trimethylethyl lead	ND (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
Dimethyldiethyl lead	ND (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
Methyltriethyl lead	ND (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
Tetraethyl lead	ND (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
2,6,10-trimethyldodecane (1380)	**275** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS739-S1
Date Sampled: 02/04/20 09:56
Percent Solids: 62
Initial Volume: 3.092
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**461** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
2,6,10-trimethylpentadecane (1650)	**417** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C-17	**B 271** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
Pristane	**959** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
C-18	**B 201** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
Phytane	**741** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
Carbazole	**44.7** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
2,6-Dimethylnaphthalene	**316** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
2,3,5-Trimethylnaphthene	**105** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
4-Methyldibenzothiophene	**256** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
2/3-Methyldibenzothiophene	**202** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
1-Methyldibenzothiophene	**69.5** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
3-Methylphenanthrene	**1010** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
2-Methylphenanthrene	**1140** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
2-Methylanthracene	**545** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
4/9-Methylphenanthrene	**1210** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701
1-Methylphenanthrene	**806** (10.4)	5.22	8270 Mod		1	02/12/20 19:00	F0B0006	FB00701

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*72 %*		*50-120*
Surrogate: Naphthalene-d8	*82 %*		*50-120*
Surrogate: Phenanthrene-d10	*89 %*		*50-120*
Surrogate: Perylene-d12	*97 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS739-S1
Date Sampled: 02/04/20 09:56
Percent Solids: 62

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-05
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**67100** (107)		LK		1	CCP	02/11/20 17:14	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS739-S2
Date Sampled: 02/04/20 10:09
Percent Solids: 65
Initial Volume: 5.431
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**14.6** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C1-Benzene	**161** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C2-Benzenes	**78.2** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C3-Benzenes	**87.5** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C4-Benzenes	**108** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C5-Benzenes	**82.5** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
Methylcyclohexane	**30.1** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
Toluene	**190** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
Ethylbenzene	**22.3** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
m,p-Xylene	**91.0** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
Styrene	**30.2** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
o-Xylene	**18.7** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
Isopropylbenzene	**J 3.79** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
n-Propylbenzene	**6.20** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
1,3,5-Trimethylbenzene	**31.0** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
1,2,3-Trimethylbenzene	**13.4** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
1,2,4-Trimethylbenzene	**43.7** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
t-Butylbenzene	ND (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
sec-Butylbenzene	ND (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
p-Isopropyltoluene	**36.6** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
n-Butylbenzene	**5.79** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
trans-Decalin	**17.9** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
cis-Decalin	**7.79** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C1-Decalins	**53.9** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C2-Decalins	**146** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C3-Decalins	**151** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C4-Decalins	**316** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
Benzo(b)thiophene	**20.9** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C1-Benzo(b)thiophenes	**26.8** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C2-Benzo(b)thiophenes	**51.4** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C3-Benzo(b)thiophenes	**79.8** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C4-Benzo(b)thiophenes	**33.4** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS739-S2
Date Sampled: 02/04/20 10:09
Percent Solids: 65
Initial Volume: 5.431
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**457** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
2-Methylnaphthalene	**395** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
1-Methylnaphthalene	**607** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C1-Naphthalenes	**601** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C2-Naphthalenes	**1400** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C3-Naphthalenes	**1540** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C4-Naphthalenes	**822** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
Biphenyl	**119** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
Acenaphthylene	**496** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
Acenaphthene	**1110** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
Dibenzofuran	**210** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
Fluorene	**829** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C1-Fluorenes	**1010** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C2-Fluorenes	**1210** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C3-Fluorenes	**690** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
Dibenzothiophene	**299** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C1-Dibenzothiophenes	**610** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C2-Dibenzothiophenes	**643** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C3-Dibenzothiophenes	**384** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C4-Dibenzothiophenes	**149** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
Phenanthrene	**4860** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
Anthracene	**1730** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C1-Phenanthrenes/Anthracenes	**6020** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C2-Phenanthrenes/Anthracenes	**3740** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C3-Phenanthrenes/Anthracenes	**1470** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C4-Phenanthrenes/Anthracenes	**923** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
Retene	**302** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
Benzo(b)naphtho(2,1-d)thiophene	**415** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C0-Benzonaphthothiophenes	**769** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C1-Benzonaphthothiophenes	**687** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C2-Benzonaphthothiophenes	**450** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C3-Benzonaphthothiophenes	**263** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS739-S2
Date Sampled: 02/04/20 10:09
Percent Solids: 65
Initial Volume: 5.431
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**73.2** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
Fluoranthene	**5450** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
Pyrene	**6650** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C1-Fluoranthenes/Pyrenes	**5890** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C2-Fluoranthenes/Pyrenes	**3030** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C3-Fluoranthenes/Pyrenes	**1350** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
Benzo(b)fluorene	**575** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
Benzo(c)fluorene	**293** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
2-Methylpyrene	**792** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
4-Methylpyrene	**744** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
1-Methylpyrene	**687** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
Benz(a)anthracene	**3990** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
Chrysene/triphenylene	**3820** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C1-Benzo(a)anthracenes/Chrysenes	**3540** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C2-Benzo(a)anthracenes/Chrysenes	**1860** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C3-Benzo(a)anthracenes/Chrysenes	**879** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C4-Benzo(a)anthracenes/Chrysenes	**370** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
Benzo(b)fluoranthene	**2280** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
Benzo(j/k)fluoranthene	**2440** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
Benzo(e)pyrene	**2440** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
Benzo(a)pyrene	**3880** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
Perylene	**767** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
Indeno(1,2,3-cd)pyrene	**2120** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
Dibenzo(a,h)anthracene	**545** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
Benzo(g,h,i)perylene	**1920** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
Coronene	**451** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
Tetramethyl lead	ND (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
Trimethylethyl lead	ND (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
Dimethyldiethyl lead	ND (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
Methyltriethyl lead	ND (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
Tetraethyl lead	ND (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
2,6,10-trimethyldodecane (1380)	**104** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS739-S2
Date Sampled: 02/04/20 10:09
Percent Solids: 65
Initial Volume: 5.431
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**233** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
2,6,10-trimethylpentadecane (1650)	**257** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C-17	**B 211** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
Pristane	**478** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
C-18	**B 121** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
Phytane	**449** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
Carbazole	**150** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
2,6-Dimethylnaphthalene	**271** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
2,3,5-Trimethylnaphthene	**111** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
4-Methyldibenzothiophene	**250** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
2/3-Methyldibenzothiophene	**203** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
1-Methyldibenzothiophene	**53.3** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
3-Methylphenanthrene	**1280** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
2-Methylphenanthrene	**1470** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
2-Methylanthracene	**752** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
4/9-Methylphenanthrene	**1530** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701
1-Methylphenanthrene	**970** (5.70)	2.85	8270 Mod		1	02/12/20 20:24	F0B0006	FB00701

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*66 %*		*50-120*
Surrogate: Naphthalene-d8	*77 %*		*50-120*
Surrogate: Phenanthrene-d10	*79 %*		*50-120*
Surrogate: Perylene-d12	*87 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS739-S2
Date Sampled: 02/04/20 10:09
Percent Solids: 65

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-06
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**124000** (105)		LK		1	CCP	02/11/20 17:34	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS739-S3
Date Sampled: 02/04/20 10:18
Percent Solids: 64
Initial Volume: 5.2
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**16.5** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C1-Benzene	**77.8** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C2-Benzenes	**34.4** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C3-Benzenes	**39.9** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C4-Benzenes	**33.6** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C5-Benzenes	**17.8** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
Methylcyclohexane	**13.7** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
Toluene	**89.9** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
Ethylbenzene	**12.4** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
m,p-Xylene	**34.1** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
Styrene	**23.9** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
o-Xylene	**8.21** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
Isopropylbenzene	ND (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
n-Propylbenzene	ND (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
1,3,5-Trimethylbenzene	**13.7** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
1,2,3-Trimethylbenzene	**J 5.28** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
1,2,4-Trimethylbenzene	**19.5** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
t-Butylbenzene	ND (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
sec-Butylbenzene	ND (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
p-Isopropyltoluene	**12.0** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
n-Butylbenzene	ND (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
trans-Decalin	**6.42** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
cis-Decalin	ND (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C1-Decalins	**14.7** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C2-Decalins	**29.9** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C3-Decalins	**25.5** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C4-Decalins	**27.0** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
Benzo(b)thiophene	**6.06** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C1-Benzo(b)thiophenes	**6.71** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C2-Benzo(b)thiophenes	**7.79** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C3-Benzo(b)thiophenes	**6.52** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C4-Benzo(b)thiophenes	**J 3.32** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS739-S3
Date Sampled: 02/04/20 10:18
Percent Solids: 64
Initial Volume: 5.2
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**172** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
2-Methylnaphthalene	**98.0** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
1-Methylnaphthalene	**85.2** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C1-Naphthalenes	**111** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C2-Naphthalenes	**193** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C3-Naphthalenes	**171** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C4-Naphthalenes	**80.6** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
Biphenyl	**37.5** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
Acenaphthylene	**167** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
Acenaphthene	**237** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
Dibenzofuran	**67.5** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
Fluorene	**205** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C1-Fluorenes	**178** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C2-Fluorenes	**150** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C3-Fluorenes	**105** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
Dibenzothiophene	**67.9** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C1-Dibenzothiophenes	**73.4** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C2-Dibenzothiophenes	**69.3** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C3-Dibenzothiophenes	**47.8** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C4-Dibenzothiophenes	**24.6** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
Phenanthrene	**1740** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
Anthracene	**512** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C1-Phenanthrenes/Anthracenes	**1260** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C2-Phenanthrenes/Anthracenes	**562** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C3-Phenanthrenes/Anthracenes	**221** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C4-Phenanthrenes/Anthracenes	**217** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
Retene	**158** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
Benzo(b)naphtho(2,1-d)thiophene	**110** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C0-Benzonaphthothiophenes	**214** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C1-Benzonaphthothiophenes	**138** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C2-Benzonaphthothiophenes	**99.2** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C3-Benzonaphthothiophenes	**87.8** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS739-S3
Date Sampled: 02/04/20 10:18
Percent Solids: 64
Initial Volume: 5.2
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**24.9** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
Fluoranthene	**2810** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
Pyrene	**3930** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C1-Fluoranthenes/Pyrenes	**1880** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C2-Fluoranthenes/Pyrenes	**686** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C3-Fluoranthenes/Pyrenes	**272** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
Benzo(b)fluorene	**193** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
Benzo(c)fluorene	**112** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
2-Methylpyrene	**264** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
4-Methylpyrene	**243** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
1-Methylpyrene	**224** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
Benz(a)anthracene	**1920** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
Chrysene/triphenylene	**1620** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C1-Benzo(a)anthracenes/Chrysenes	**1010** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C2-Benzo(a)anthracenes/Chrysenes	**476** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C3-Benzo(a)anthracenes/Chrysenes	**231** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C4-Benzo(a)anthracenes/Chrysenes	**125** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
Benzo(b)fluoranthene	**1280** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
Benzo(j/k)fluoranthene	**1440** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
Benzo(e)pyrene	**1540** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
Benzo(a)pyrene	**2420** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
Perylene	**519** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
Indeno(1,2,3-cd)pyrene	**1430** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
Dibenzo(a,h)anthracene	**323** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
Benzo(g,h,i)perylene	**1390** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
Coronene	**368** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
Tetramethyl lead	ND (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
Trimethylethyl lead	ND (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
Dimethyldiethyl lead	ND (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
Methyltriethyl lead	ND (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
Tetraethyl lead	ND (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
2,6,10-trimethyldodecane (1380)	**22.0** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS739-S3
Date Sampled: 02/04/20 10:18
Percent Solids: 64
Initial Volume: 5.2
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**65.2** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
2,6,10-trimethylpentadecane (1650)	B **53.5** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C-17	B **108** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
Pristane	B **95.5** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
C-18	B **59.9** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
Phytane	B **90.7** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
Carbazole	**63.7** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
2,6-Dimethylnaphthalene	**38.8** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
2,3,5-Trimethylnaphthene	**12.2** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
4-Methyldibenzothiophene	**24.3** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
2/3-Methyldibenzothiophene	**24.6** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
1-Methyldibenzothiophene	**6.29** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
3-Methylphenanthrene	**286** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
2-Methylphenanthrene	**334** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
2-Methylanthracene	**148** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
4/9-Methylphenanthrene	**307** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701
1-Methylphenanthrene	**183** (6.03)	3.02	8270 Mod		1	02/12/20 21:47	F0B0006	FB00701

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*65 %*		*50-120*
Surrogate: Naphthalene-d8	*79 %*		*50-120*
Surrogate: Phenanthrene-d10	*85 %*		*50-120*
Surrogate: Perylene-d12	*109 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS739-S3
Date Sampled: 02/04/20 10:18
Percent Solids: 64

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-07
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**35100** (95.2)		LK		1	CCP	02/11/20 18:24	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS740-S1
Date Sampled: 02/04/20 10:37
Percent Solids: 66
Initial Volume: 5.001
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**13.0** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C1-Benzene	**25.1** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C2-Benzenes	**25.3** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C3-Benzenes	**19.6** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C4-Benzenes	**78.2** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C5-Benzenes	**56.6** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
Methylcyclohexane	ND (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
Toluene	**27.2** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
Ethylbenzene	J **3.24** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
m,p-Xylene	**31.6** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
Styrene	J **6.03** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
o-Xylene	J **3.22** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
Isopropylbenzene	ND (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
n-Propylbenzene	ND (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
1,3,5-Trimethylbenzene	J **3.11** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
1,2,3-Trimethylbenzene	J **5.45** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
1,2,4-Trimethylbenzene	**8.87** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
t-Butylbenzene	ND (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
sec-Butylbenzene	ND (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
p-Isopropyltoluene	J **4.60** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
n-Butylbenzene	**6.66** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
trans-Decalin	**135** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
cis-Decalin	**14.6** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C1-Decalins	**126** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C2-Decalins	**44.6** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C3-Decalins	**21.7** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C4-Decalins	**40.0** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
Benzo(b)thiophene	ND (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C1-Benzo(b)thiophenes	**17.7** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C2-Benzo(b)thiophenes	**49.2** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C3-Benzo(b)thiophenes	**31.0** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C4-Benzo(b)thiophenes	**9.96** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS740-S1
Date Sampled: 02/04/20 10:37
Percent Solids: 66
Initial Volume: 5.001
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**44.5** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
2-Methylnaphthalene	**22.4** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
1-Methylnaphthalene	**212** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C1-Naphthalenes	**137** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C2-Naphthalenes	**965** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C3-Naphthalenes	**438** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C4-Naphthalenes	**127** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
Biphenyl	**7.41** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
Acenaphthylene	**84.9** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
Acenaphthene	**1720** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
Dibenzofuran	**28.9** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
Fluorene	**784** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C1-Fluorenes	**284** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C2-Fluorenes	**150** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C3-Fluorenes	**75.7** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
Dibenzothiophene	**164** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C1-Dibenzothiophenes	**132** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C2-Dibenzothiophenes	**94.0** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C3-Dibenzothiophenes	**60.7** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C4-Dibenzothiophenes	**27.1** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
Phenanthrene	**2170** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
Anthracene	**570** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C1-Phenanthrenes/Anthracenes	**962** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C2-Phenanthrenes/Anthracenes	**377** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C3-Phenanthrenes/Anthracenes	**136** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C4-Phenanthrenes/Anthracenes	**124** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
Retene	**111** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
Benzo(b)naphtho(2,1-d)thiophene	**70.3** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C0-Benzonaphthothiophenes	**126** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C1-Benzonaphthothiophenes	**89.9** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C2-Benzonaphthothiophenes	**66.5** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C3-Benzonaphthothiophenes	**52.6** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS740-S1
Date Sampled: 02/04/20 10:37
Percent Solids: 66
Initial Volume: 5.001
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**25.8** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
Fluoranthene	**1040** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
Pyrene	**1360** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C1-Fluoranthenes/Pyrenes	**681** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C2-Fluoranthenes/Pyrenes	**272** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C3-Fluoranthenes/Pyrenes	**113** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
Benzo(b)fluorene	**72.8** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
Benzo(c)fluorene	**38.6** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
2-Methylpyrene	**93.2** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
4-Methylpyrene	**81.9** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
1-Methylpyrene	**83.4** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
Benz(a)anthracene	**529** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
Chrysene/triphenylene	**541** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C1-Benzo(a)anthracenes/Chrysenes	**332** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C2-Benzo(a)anthracenes/Chrysenes	**155** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C3-Benzo(a)anthracenes/Chrysenes	**73.6** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C4-Benzo(a)anthracenes/Chrysenes	**33.1** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
Benzo(b)fluoranthene	**346** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
Benzo(j/k)fluoranthene	**369** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
Benzo(e)pyrene	**330** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
Benzo(a)pyrene	**532** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
Perylene	**182** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
Indeno(1,2,3-cd)pyrene	**336** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
Dibenzo(a,h)anthracene	**71.3** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
Benzo(g,h,i)perylene	**281** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
Coronene	**76.5** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
Tetramethyl lead	ND (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
Trimethylethyl lead	ND (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
Dimethyldiethyl lead	ND (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
Methyltriethyl lead	ND (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
Tetraethyl lead	ND (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
2,6,10-trimethyldodecane (1380)	**38.6** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS740-S1
Date Sampled: 02/04/20 10:37
Percent Solids: 66
Initial Volume: 5.001
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**68.5** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
2,6,10-trimethylpentadecane (1650)	B **54.9** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C-17	B **37.2** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
Pristane	B **130** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
C-18	B **26.7** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
Phytane	B **113** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
Carbazole	**12.5** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
2,6-Dimethylnaphthalene	**200** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
2,3,5-Trimethylnaphthene	**25.7** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
4-Methyldibenzothiophene	**55.1** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
2/3-Methyldibenzothiophene	**44.7** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
1-Methyldibenzothiophene	**14.0** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
3-Methylphenanthrene	**226** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
2-Methylphenanthrene	**248** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
2-Methylanthracene	**88.7** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
4/9-Methylphenanthrene	**222** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701
1-Methylphenanthrene	**169** (6.03)	3.01	8270 Mod		1	02/12/20 23:10	F0B0006	FB00701

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*69 %*		*50-120*
Surrogate: Naphthalene-d8	*80 %*		*50-120*
Surrogate: Phenanthrene-d10	*88 %*		*50-120*
Surrogate: Perylene-d12	*113 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS740-S1
Date Sampled: 02/04/20 10:37
Percent Solids: 66

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-08
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**23600** (93.3)		LK		1	CCP	02/11/20 18:40	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS740-S2
Date Sampled: 02/04/20 10:46
Percent Solids: 30
Initial Volume: 5.45
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**18.7** (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C1-Benzene	**39.0** (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C2-Benzenes	**39.7** (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C3-Benzenes	**J 6.51** (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C4-Benzenes	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C5-Benzenes	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
Methylcyclohexane	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
Toluene	**45.7** (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
Ethylbenzene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
m,p-Xylene	**49.4** (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
Styrene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
o-Xylene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
Isopropylbenzene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
n-Propylbenzene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
1,3,5-Trimethylbenzene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
1,2,3-Trimethylbenzene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
1,2,4-Trimethylbenzene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
t-Butylbenzene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
sec-Butylbenzene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
p-Isopropyltoluene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
n-Butylbenzene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
trans-Decalin	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
cis-Decalin	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C1-Decalins	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C2-Decalins	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C3-Decalins	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C4-Decalins	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
Benzo(b)thiophene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C1-Benzo(b)thiophenes	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C2-Benzo(b)thiophenes	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C3-Benzo(b)thiophenes	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C4-Benzo(b)thiophenes	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS740-S2
Date Sampled: 02/04/20 10:46
Percent Solids: 30
Initial Volume: 5.45
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
2-Methylnaphthalene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
1-Methylnaphthalene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C1-Naphthalenes	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C2-Naphthalenes	**J 9.58** (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C3-Naphthalenes	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C4-Naphthalenes	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
Biphenyl	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
Acenaphthylene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
Acenaphthene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
Dibenzofuran	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
Fluorene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C1-Fluorenes	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C2-Fluorenes	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C3-Fluorenes	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
Dibenzothiophene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C1-Dibenzothiophenes	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C2-Dibenzothiophenes	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C3-Dibenzothiophenes	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C4-Dibenzothiophenes	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
Phenanthrene	**J 9.66** (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
Anthracene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C1-Phenanthrenes/Anthracenes	**J 11.9** (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C2-Phenanthrenes/Anthracenes	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C3-Phenanthrenes/Anthracenes	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C4-Phenanthrenes/Anthracenes	**J 10.5** (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
Retene	**22.0** (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
Benzo(b)naphtho(2,1-d)thiophene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C0-Benzonaphthothiophenes	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C1-Benzonaphthothiophenes	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C2-Benzonaphthothiophenes	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C3-Benzonaphthothiophenes	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS740-S2
Date Sampled: 02/04/20 10:46
Percent Solids: 30
Initial Volume: 5.45
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
Fluoranthene	**12.7** (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
Pyrene	J **11.2** (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C1-Fluoranthenes/Pyrenes	**15.8** (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C2-Fluoranthenes/Pyrenes	J **9.98** (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C3-Fluoranthenes/Pyrenes	**17.9** (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
Benzo(b)fluorene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
Benzo(c)fluorene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
2-Methylpyrene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
4-Methylpyrene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
1-Methylpyrene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
Benz(a)anthracene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
Chrysene/triphenylene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C1-Benzo(a)anthracenes/Chrysenes	J **8.06** (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C2-Benzo(a)anthracenes/Chrysenes	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C3-Benzo(a)anthracenes/Chrysenes	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C4-Benzo(a)anthracenes/Chrysenes	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
Benzo(b)fluoranthene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
Benzo(j/k)fluoranthene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
Benzo(e)pyrene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
Benzo(a)pyrene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
Perylene	**856** (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
Indeno(1,2,3-cd)pyrene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
Dibenzo(a,h)anthracene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
Benzo(g,h,i)perylene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
Coronene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
Tetramethyl lead	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
Trimethylethyl lead	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
Dimethyldiethyl lead	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
Methyltriethyl lead	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
Tetraethyl lead	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
2,6,10-trimethyldodecane (1380)	J **7.22** (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS740-S2
Date Sampled: 02/04/20 10:46
Percent Solids: 30
Initial Volume: 5.45
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**20.1** (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
2,6,10-trimethylpentadecane (1650)	**J 7.31** (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C-17	**B 59.6** (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
Pristane	**B 31.4** (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
C-18	**B 62.0** (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
Phytane	**B 49.6** (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
Carbazole	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
2,6-Dimethylnaphthalene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
2,3,5-Trimethylnaphthene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
4-Methyldibenzothiophene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
2/3-Methyldibenzothiophene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
1-Methyldibenzothiophene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
3-Methylphenanthrene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
2-Methylphenanthrene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
2-Methylanthracene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
4/9-Methylphenanthrene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701
1-Methylphenanthrene	ND (12.2)	6.11	8270 Mod		1	02/13/20 0:33	F0B0006	FB00701

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*74 %*		*50-120*
Surrogate: Naphthalene-d8	*84 %*		*50-120*
Surrogate: Phenanthrene-d10	*90 %*		*50-120*
Surrogate: Perylene-d12	*114 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS740-S2
Date Sampled: 02/04/20 10:46
Percent Solids: 30

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-09
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**162000** (94.7)		LK		1	CCP	02/11/20 18:57	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS742-S1
Date Sampled: 02/04/20 11:31
Percent Solids: 79
Initial Volume: 5.774
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C1-Benzene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C2-Benzenes	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C3-Benzenes	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C4-Benzenes	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C5-Benzenes	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
Methylcyclohexane	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
Toluene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
Ethylbenzene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
m,p-Xylene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
Styrene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
o-Xylene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
Isopropylbenzene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
n-Propylbenzene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
1,3,5-Trimethylbenzene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
1,2,3-Trimethylbenzene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
1,2,4-Trimethylbenzene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
t-Butylbenzene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
sec-Butylbenzene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
p-Isopropyltoluene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
n-Butylbenzene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
trans-Decalin	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
cis-Decalin	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C1-Decalins	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C2-Decalins	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C3-Decalins	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C4-Decalins	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
Benzo(b)thiophene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C1-Benzo(b)thiophenes	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C2-Benzo(b)thiophenes	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C3-Benzo(b)thiophenes	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C4-Benzo(b)thiophenes	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS742-S1
Date Sampled: 02/04/20 11:31
Percent Solids: 79
Initial Volume: 5.774
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
2-Methylnaphthalene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
1-Methylnaphthalene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C1-Naphthalenes	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C2-Naphthalenes	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C3-Naphthalenes	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C4-Naphthalenes	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
Biphenyl	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
Acenaphthylene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
Acenaphthene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
Dibenzofuran	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
Fluorene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C1-Fluorenes	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C2-Fluorenes	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C3-Fluorenes	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
Dibenzothiophene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C1-Dibenzothiophenes	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C2-Dibenzothiophenes	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C3-Dibenzothiophenes	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C4-Dibenzothiophenes	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
Phenanthrene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
Anthracene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C1-Phenanthrenes/Anthracenes	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C2-Phenanthrenes/Anthracenes	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C3-Phenanthrenes/Anthracenes	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C4-Phenanthrenes/Anthracenes	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
Retene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
Benzo(b)naphtho(2,1-d)thiophene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C0-Benzonaphthothiophenes	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C1-Benzonaphthothiophenes	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C2-Benzonaphthothiophenes	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C3-Benzonaphthothiophenes	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS742-S1
Date Sampled: 02/04/20 11:31
Percent Solids: 79
Initial Volume: 5.774
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
Fluoranthene	**J 3.79** (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
Pyrene	**J 3.76** (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C1-Fluoranthenes/Pyrenes	**5.30** (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C2-Fluoranthenes/Pyrenes	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C3-Fluoranthenes/Pyrenes	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
Benzo(b)fluorene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
Benzo(c)fluorene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
2-Methylpyrene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
4-Methylpyrene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
1-Methylpyrene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
Benz(a)anthracene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
Chrysene/triphenylene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C1-Benzo(a)anthracenes/Chrysenes	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C2-Benzo(a)anthracenes/Chrysenes	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C3-Benzo(a)anthracenes/Chrysenes	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C4-Benzo(a)anthracenes/Chrysenes	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
Benzo(b)fluoranthene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
Benzo(j/k)fluoranthene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
Benzo(e)pyrene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
Benzo(a)pyrene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
Perylene	**1780** (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
Indeno(1,2,3-cd)pyrene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
Dibenzo(a,h)anthracene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
Benzo(g,h,i)perylene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
Coronene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
Tetramethyl lead	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
Trimethylethyl lead	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
Dimethyldiethyl lead	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
Methyltriethyl lead	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
Tetraethyl lead	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
2,6,10-trimethyldodecane (1380)	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS742-S1
Date Sampled: 02/04/20 11:31
Percent Solids: 79
Initial Volume: 5.774
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
2,6,10-trimethylpentadecane (1650)	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C-17	**B 7.57** (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
Pristane	**B 5.84** (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
C-18	**B 7.04** (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
Phytane	**B 6.40** (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
Carbazole	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
2,6-Dimethylnaphthalene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
2,3,5-Trimethylnaphthene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
4-Methyldibenzothiophene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
2/3-Methyldibenzothiophene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
1-Methyldibenzothiophene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
3-Methylphenanthrene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
2-Methylphenanthrene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
2-Methylanthracene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
4/9-Methylphenanthrene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701
1-Methylphenanthrene	ND (4.41)	2.20	8270 Mod		1	02/07/20 21:06	F0B0003	FB00701

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*83 %*		*50-120*
Surrogate: Naphthalene-d8	*78 %*		*50-120*
Surrogate: Phenanthrene-d10	*94 %*		*50-120*
Surrogate: Perylene-d12	*89 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS742-S1
Date Sampled: 02/04/20 11:31
Percent Solids: 79

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-10
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**3710** (106)		LK		1	CCP	02/11/20 19:13	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS743-S2
Date Sampled: 02/04/20 12:08
Percent Solids: 69
Initial Volume: 5.503
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**6.95** (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C1-Benzene	**8.52** (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C2-Benzenes	**6.58** (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C3-Benzenes	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C4-Benzenes	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C5-Benzenes	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
Methylcyclohexane	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
Toluene	**9.99** (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
Ethylbenzene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
m,p-Xylene	**6.72** (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
Styrene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
o-Xylene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
Isopropylbenzene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
n-Propylbenzene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
1,3,5-Trimethylbenzene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
1,2,3-Trimethylbenzene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
1,2,4-Trimethylbenzene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
t-Butylbenzene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
sec-Butylbenzene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
p-Isopropyltoluene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
n-Butylbenzene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
trans-Decalin	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
cis-Decalin	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C1-Decalins	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C2-Decalins	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C3-Decalins	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C4-Decalins	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
Benzo(b)thiophene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C1-Benzo(b)thiophenes	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C2-Benzo(b)thiophenes	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C3-Benzo(b)thiophenes	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C4-Benzo(b)thiophenes	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS743-S2
Date Sampled: 02/04/20 12:08
Percent Solids: 69
Initial Volume: 5.503
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
2-Methylnaphthalene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
1-Methylnaphthalene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C1-Naphthalenes	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C2-Naphthalenes	**J 2.88** (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C3-Naphthalenes	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C4-Naphthalenes	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
Biphenyl	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
Acenaphthylene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
Acenaphthene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
Dibenzofuran	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
Fluorene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C1-Fluorenes	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C2-Fluorenes	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C3-Fluorenes	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
Dibenzothiophene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C1-Dibenzothiophenes	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C2-Dibenzothiophenes	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C3-Dibenzothiophenes	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C4-Dibenzothiophenes	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
Phenanthrene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
Anthracene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C1-Phenanthrenes/Anthracenes	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C2-Phenanthrenes/Anthracenes	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C3-Phenanthrenes/Anthracenes	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C4-Phenanthrenes/Anthracenes	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
Retene	**J 3.12** (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
Benzo(b)naphtho(2,1-d)thiophene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C0-Benzonaphthothiophenes	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C1-Benzonaphthothiophenes	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C2-Benzonaphthothiophenes	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C3-Benzonaphthothiophenes	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS743-S2
Date Sampled: 02/04/20 12:08
Percent Solids: 69
Initial Volume: 5.503
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
Fluoranthene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
Pyrene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C1-Fluoranthenes/Pyrenes	**J 2.72** (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C2-Fluoranthenes/Pyrenes	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C3-Fluoranthenes/Pyrenes	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
Benzo(b)fluorene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
Benzo(c)fluorene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
2-Methylpyrene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
4-Methylpyrene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
1-Methylpyrene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
Benz(a)anthracene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
Chrysene/triphenylene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C1-Benzo(a)anthracenes/Chrysenes	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C2-Benzo(a)anthracenes/Chrysenes	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C3-Benzo(a)anthracenes/Chrysenes	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C4-Benzo(a)anthracenes/Chrysenes	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
Benzo(b)fluoranthene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
Benzo(j/k)fluoranthene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
Benzo(e)pyrene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
Benzo(a)pyrene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
Perylene	**350** (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
Indeno(1,2,3-cd)pyrene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
Dibenzo(a,h)anthracene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
Benzo(g,h,i)perylene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
Coronene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
Tetramethyl lead	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
Trimethylethyl lead	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
Dimethyldiethyl lead	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
Methyltriethyl lead	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
Tetraethyl lead	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
2,6,10-trimethyldodecane (1380)	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS743-S2
Date Sampled: 02/04/20 12:08
Percent Solids: 69
Initial Volume: 5.503
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**5.66** (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
2,6,10-trimethylpentadecane (1650)	**J 3.70** (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C-17	**B 29.2** (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
Pristane	**B 8.60** (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
C-18	**B 13.3** (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
Phytane	**B 11.2** (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
Carbazole	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
2,6-Dimethylnaphthalene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
2,3,5-Trimethylnaphthene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
4-Methyldibenzothiophene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
2/3-Methyldibenzothiophene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
1-Methyldibenzothiophene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
3-Methylphenanthrene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
2-Methylphenanthrene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
2-Methylanthracene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
4/9-Methylphenanthrene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701
1-Methylphenanthrene	ND (5.26)	2.63	8270 Mod		1	02/13/20 1:56	F0B0006	FB00701

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*68 %*		*50-120*
Surrogate: Naphthalene-d8	*77 %*		*50-120*
Surrogate: Phenanthrene-d10	*82 %*		*50-120*
Surrogate: Perylene-d12	*103 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS743-S2
Date Sampled: 02/04/20 12:08
Percent Solids: 69

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-11
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**8370** (93.9)		LK		1	CCP	02/14/20 15:25	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS745-S2
Date Sampled: 02/04/20 13:40
Percent Solids: 79
Initial Volume: 5.272
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C1-Benzene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C2-Benzenes	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C3-Benzenes	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C4-Benzenes	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C5-Benzenes	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
Methylcyclohexane	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
Toluene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
Ethylbenzene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
m,p-Xylene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
Styrene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
o-Xylene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
Isopropylbenzene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
n-Propylbenzene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
1,3,5-Trimethylbenzene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
1,2,3-Trimethylbenzene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
1,2,4-Trimethylbenzene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
t-Butylbenzene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
sec-Butylbenzene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
p-Isopropyltoluene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
n-Butylbenzene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
trans-Decalin	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
cis-Decalin	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C1-Decalins	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C2-Decalins	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C3-Decalins	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C4-Decalins	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
Benzo(b)thiophene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C1-Benzo(b)thiophenes	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C2-Benzo(b)thiophenes	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C3-Benzo(b)thiophenes	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C4-Benzo(b)thiophenes	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS745-S2
Date Sampled: 02/04/20 13:40
Percent Solids: 79
Initial Volume: 5.272
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
2-Methylnaphthalene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
1-Methylnaphthalene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C1-Naphthalenes	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C2-Naphthalenes	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C3-Naphthalenes	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C4-Naphthalenes	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
Biphenyl	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
Acenaphthylene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
Acenaphthene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
Dibenzofuran	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
Fluorene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C1-Fluorenes	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C2-Fluorenes	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C3-Fluorenes	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
Dibenzothiophene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C1-Dibenzothiophenes	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C2-Dibenzothiophenes	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C3-Dibenzothiophenes	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C4-Dibenzothiophenes	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
Phenanthrene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
Anthracene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C1-Phenanthrenes/Anthracenes	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C2-Phenanthrenes/Anthracenes	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C3-Phenanthrenes/Anthracenes	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C4-Phenanthrenes/Anthracenes	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
Retene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
Benzo(b)naphtho(2,1-d)thiophene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C0-Benzonaphthothiophenes	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C1-Benzonaphthothiophenes	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C2-Benzonaphthothiophenes	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C3-Benzonaphthothiophenes	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS745-S2
Date Sampled: 02/04/20 13:40
Percent Solids: 79
Initial Volume: 5.272
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
Fluoranthene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
Pyrene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C1-Fluoranthenes/Pyrenes	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C2-Fluoranthenes/Pyrenes	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C3-Fluoranthenes/Pyrenes	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
Benzo(b)fluorene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
Benzo(c)fluorene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
2-Methylpyrene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
4-Methylpyrene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
1-Methylpyrene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
Benz(a)anthracene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
Chrysene/triphenylene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C1-Benzo(a)anthracenes/Chrysenes	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C2-Benzo(a)anthracenes/Chrysenes	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C3-Benzo(a)anthracenes/Chrysenes	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C4-Benzo(a)anthracenes/Chrysenes	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
Benzo(b)fluoranthene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
Benzo(j/k)fluoranthene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
Benzo(e)pyrene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
Benzo(a)pyrene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
Perylene	**5160** (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
Indeno(1,2,3-cd)pyrene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
Dibenzo(a,h)anthracene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
Benzo(g,h,i)perylene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
Coronene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
Tetramethyl lead	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
Trimethylethyl lead	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
Dimethyldiethyl lead	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
Methyltriethyl lead	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
Tetraethyl lead	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
2,6,10-trimethyldodecane (1380)	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS745-S2
Date Sampled: 02/04/20 13:40
Percent Solids: 79
Initial Volume: 5.272
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
2,6,10-trimethylpentadecane (1650)	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C-17	**B 5.68** (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
Pristane	**J 3.29** (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
C-18	**J 3.80** (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
Phytane	**J 4.36** (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
Carbazole	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
2,6-Dimethylnaphthalene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
2,3,5-Trimethylnaphthene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
4-Methyldibenzothiophene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
2/3-Methyldibenzothiophene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
1-Methyldibenzothiophene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
3-Methylphenanthrene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
2-Methylphenanthrene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
2-Methylanthracene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
4/9-Methylphenanthrene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701
1-Methylphenanthrene	ND (4.83)	2.42	8270 Mod		1	02/07/20 22:32	F0B0003	FB00701

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*83 %*		*50-120*
Surrogate: Naphthalene-d8	*76 %*		*50-120*
Surrogate: Phenanthrene-d10	*95 %*		*50-120*
Surrogate: Perylene-d12	*92 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS745-S2
Date Sampled: 02/04/20 13:40
Percent Solids: 79

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-12
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**7430** (93.2)		LK		1	CCP	02/14/20 14:35	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS747-S2
Date Sampled: 02/04/20 14:30
Percent Solids: 79
Initial Volume: 5.735
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-13
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C1-Benzene	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C2-Benzenes	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C3-Benzenes	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C4-Benzenes	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C5-Benzenes	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
Methylcyclohexane	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
Toluene	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
Ethylbenzene	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
m,p-Xylene	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
Styrene	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
o-Xylene	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
Isopropylbenzene	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
n-Propylbenzene	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
1,3,5-Trimethylbenzene	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
1,2,3-Trimethylbenzene	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
1,2,4-Trimethylbenzene	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
t-Butylbenzene	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
sec-Butylbenzene	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
p-Isopropyltoluene	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
n-Butylbenzene	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
trans-Decalin	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
cis-Decalin	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C1-Decalins	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C2-Decalins	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C3-Decalins	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C4-Decalins	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
Benzo(b)thiophene	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C1-Benzo(b)thiophenes	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C2-Benzo(b)thiophenes	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C3-Benzo(b)thiophenes	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C4-Benzo(b)thiophenes	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS747-S2
Date Sampled: 02/04/20 14:30
Percent Solids: 79
Initial Volume: 5.735
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-13
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
2-Methylnaphthalene	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
1-Methylnaphthalene	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C1-Naphthalenes	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C2-Naphthalenes	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C3-Naphthalenes	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C4-Naphthalenes	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
Biphenyl	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
Acenaphthylene	**J 3.57** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
Acenaphthene	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
Dibenzofuran	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
Fluorene	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C1-Fluorenes	**J 3.54** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C2-Fluorenes	**7.73** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C3-Fluorenes	**6.90** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
Dibenzothiophene	**J 2.51** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C1-Dibenzothiophenes	**J 3.62** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C2-Dibenzothiophenes	**5.91** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C3-Dibenzothiophenes	**J 4.13** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C4-Dibenzothiophenes	**J 3.11** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
Phenanthrene	**15.8** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
Anthracene	**6.49** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C1-Phenanthrenes/Anthracenes	**15.3** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C2-Phenanthrenes/Anthracenes	**15.9** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C3-Phenanthrenes/Anthracenes	**8.69** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C4-Phenanthrenes/Anthracenes	**4.75** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
Retene	**J 2.68** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
Benzo(b)naphtho(2,1-d)thiophene	**J 3.81** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C0-Benzonaphthothiophenes	**7.78** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C1-Benzonaphthothiophenes	**4.68** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C2-Benzonaphthothiophenes	**J 3.88** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C3-Benzonaphthothiophenes	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS747-S2
Date Sampled: 02/04/20 14:30
Percent Solids: 79
Initial Volume: 5.735
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-13
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
Fluoranthene	**57.7** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
Pyrene	**86.9** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C1-Fluoranthenes/Pyrenes	**43.4** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C2-Fluoranthenes/Pyrenes	**13.2** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C3-Fluoranthenes/Pyrenes	**5.80** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
Benzo(b)fluorene	**J 3.65** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
Benzo(c)fluorene	**J 2.40** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
2-Methylpyrene	**5.61** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
4-Methylpyrene	**5.43** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
1-Methylpyrene	**5.01** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
Benz(a)anthracene	**31.6** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
Chrysene/triphenylene	**36.3** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C1-Benzo(a)anthracenes/Chrysenes	**16.2** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C2-Benzo(a)anthracenes/Chrysenes	**7.84** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C3-Benzo(a)anthracenes/Chrysenes	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C4-Benzo(a)anthracenes/Chrysenes	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
Benzo(b)fluoranthene	**22.1** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
Benzo(j/k)fluoranthene	**26.5** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
Benzo(e)pyrene	**24.3** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
Benzo(a)pyrene	**36.0** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
Perylene	**1130** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
Indeno(1,2,3-cd)pyrene	**17.2** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
Dibenzo(a,h)anthracene	**J 3.66** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
Benzo(g,h,i)perylene	**18.3** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
Coronene	**5.11** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
Tetramethyl lead	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
Trimethylethyl lead	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
Dimethyldiethyl lead	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
Methyltriethyl lead	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
Tetraethyl lead	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
2,6,10-trimethyldodecane (1380)	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS747-S2
Date Sampled: 02/04/20 14:30
Percent Solids: 79
Initial Volume: 5.735
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-13
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
2,6,10-trimethylpentadecane (1650)	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C-17	**B 6.64** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
Pristane	**B 7.73** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
C-18	**B 7.20** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
Phytane	**B 13.3** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
Carbazole	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
2,6-Dimethylnaphthalene	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
2,3,5-Trimethylnaphthene	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
4-Methyldibenzothiophene	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
2/3-Methyldibenzothiophene	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
1-Methyldibenzothiophene	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
3-Methylphenanthrene	**J 2.87** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
2-Methylphenanthrene	ND (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
2-Methylanthracene	**J 2.93** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
4/9-Methylphenanthrene	**J 4.39** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701
1-Methylphenanthrene	**J 2.71** (4.43)	2.21	8270 Mod		1	02/07/20 23:59	F0B0003	FB00701

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*77 %*		*50-120*
Surrogate: Naphthalene-d8	*66 %*		*50-120*
Surrogate: Phenanthrene-d10	*86 %*		*50-120*
Surrogate: Perylene-d12	*83 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS747-S2
Date Sampled: 02/04/20 14:30
Percent Solids: 79

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-13
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**1680** (92.9)		LK		1	CCP	02/14/20 16:31	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS749-S1
Date Sampled: 02/03/20 11:14
Percent Solids: 72
Initial Volume: 5.528
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-14
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**6.78** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C1-Benzene	**152** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C2-Benzenes	**62.3** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C3-Benzenes	**26.2** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C4-Benzenes	**25.5** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C5-Benzenes	**18.1** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
Methylcyclohexane	ND (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
Toluene	**182** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
Ethylbenzene	**13.7** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
m,p-Xylene	**83.7** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
Styrene	**28.1** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
o-Xylene	**5.20** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
Isopropylbenzene	ND (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
n-Propylbenzene	**J 3.66** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
1,3,5-Trimethylbenzene	**J 4.52** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
1,2,3-Trimethylbenzene	**J 3.03** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
1,2,4-Trimethylbenzene	**8.22** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
t-Butylbenzene	ND (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
sec-Butylbenzene	ND (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
p-Isopropyltoluene	**7.88** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
n-Butylbenzene	**6.31** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
trans-Decalin	**7.88** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
cis-Decalin	ND (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C1-Decalins	**45.7** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C2-Decalins	**112** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C3-Decalins	**103** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C4-Decalins	**171** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
Benzo(b)thiophene	**13.5** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C1-Benzo(b)thiophenes	**11.9** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C2-Benzo(b)thiophenes	**22.0** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C3-Benzo(b)thiophenes	**20.5** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C4-Benzo(b)thiophenes	**24.4** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS749-S1
Date Sampled: 02/03/20 11:14
Percent Solids: 72
Initial Volume: 5.528
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-14
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**442** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
2-Methylnaphthalene	**336** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
1-Methylnaphthalene	**160** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C1-Naphthalenes	**304** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C2-Naphthalenes	**381** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C3-Naphthalenes	**391** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C4-Naphthalenes	**461** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
Biphenyl	**222** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
Acenaphthylene	**543** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
Acenaphthene	**379** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
Dibenzofuran	**117** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
Fluorene	**501** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C1-Fluorenes	**550** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C2-Fluorenes	**795** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C3-Fluorenes	**495** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
Dibenzothiophene	**350** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C1-Dibenzothiophenes	**545** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C2-Dibenzothiophenes	**616** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C3-Dibenzothiophenes	**385** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C4-Dibenzothiophenes	**178** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
Phenanthrene	**1800** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
Anthracene	**952** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C1-Phenanthrenes/Anthracenes	**2260** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C2-Phenanthrenes/Anthracenes	**2350** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C3-Phenanthrenes/Anthracenes	**1100** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C4-Phenanthrenes/Anthracenes	**953** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
Retene	**125** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
Benzo(b)naphtho(2,1-d)thiophene	**566** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C0-Benzonaphthothiophenes	**1040** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C1-Benzonaphthothiophenes	**645** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C2-Benzonaphthothiophenes	**359** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C3-Benzonaphthothiophenes	**241** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS749-S1
Date Sampled: 02/03/20 11:14
Percent Solids: 72
Initial Volume: 5.528
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-14
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**59.8** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
Fluoranthene	**8030** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
Pyrene	**14700** (101)	50.3	8270 Mod		20	02/13/20 13:03	F0B0006	FB00701
C1-Fluoranthenes/Pyrenes	**6010** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C2-Fluoranthenes/Pyrenes	**2000** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C3-Fluoranthenes/Pyrenes	**765** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
Benzo(b)fluorene	**754** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
Benzo(c)fluorene	**294** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
2-Methylpyrene	**821** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
4-Methylpyrene	**694** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
1-Methylpyrene	**698** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
Benz(a)anthracene	**4860** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
Chrysene/triphenylene	**4610** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C1-Benzo(a)anthracenes/Chrysenes	**2570** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C2-Benzo(a)anthracenes/Chrysenes	**1090** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C3-Benzo(a)anthracenes/Chrysenes	**457** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C4-Benzo(a)anthracenes/Chrysenes	**215** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
Benzo(b)fluoranthene	**2850** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
Benzo(j/k)fluoranthene	**3090** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
Benzo(e)pyrene	**2710** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
Benzo(a)pyrene	**4430** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
Perylene	**884** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
Indeno(1,2,3-cd)pyrene	**2600** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
Dibenzo(a,h)anthracene	**511** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
Benzo(g,h,i)perylene	**2190** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
Coronene	**635** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
Tetramethyl lead	ND (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
Trimethylethyl lead	ND (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
Dimethyldiethyl lead	ND (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
Methyltriethyl lead	ND (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
Tetraethyl lead	ND (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
2,6,10-trimethyldodecane (1380)	**97.9** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS749-S1
Date Sampled: 02/03/20 11:14
Percent Solids: 72
Initial Volume: 5.528
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-14
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**230** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
2,6,10-trimethylpentadecane (1650)	**228** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C-17	**B 220** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
Pristane	**524** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
C-18	**B 174** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
Phytane	**645** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
Carbazole	**91.6** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
2,6-Dimethylnaphthalene	**119** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
2,3,5-Trimethylnaphthene	**15.7** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
4-Methyldibenzothiophene	**255** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
2/3-Methyldibenzothiophene	**166** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
1-Methyldibenzothiophene	**53.3** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
3-Methylphenanthrene	**427** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
2-Methylphenanthrene	**270** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
2-Methylanthracene	**559** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
4/9-Methylphenanthrene	**685** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701
1-Methylphenanthrene	**321** (5.03)	2.51	8270 Mod		1	02/13/20 11:40	F0B0006	FB00701

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*71 %*		*50-120*
Surrogate: Naphthalene-d8	*82 %*		*50-120*
Surrogate: Phenanthrene-d10	*88 %*		*50-120*
Surrogate: Perylene-d12	*82 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS749-S1
Date Sampled: 02/03/20 11:14
Percent Solids: 72

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-14
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**18000** (95.3)		LK		1	CCP	02/14/20 16:48	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS749-S2
Date Sampled: 02/03/20 11:25
Percent Solids: 89
Initial Volume: 5.875
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-15
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C1-Benzene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C2-Benzenes	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C3-Benzenes	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C4-Benzenes	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C5-Benzenes	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
Methylcyclohexane	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
Toluene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
Ethylbenzene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
m,p-Xylene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
Styrene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
o-Xylene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
Isopropylbenzene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
n-Propylbenzene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
1,3,5-Trimethylbenzene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
1,2,3-Trimethylbenzene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
1,2,4-Trimethylbenzene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
t-Butylbenzene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
sec-Butylbenzene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
p-Isopropyltoluene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
n-Butylbenzene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
trans-Decalin	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
cis-Decalin	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C1-Decalins	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C2-Decalins	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C3-Decalins	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C4-Decalins	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
Benzo(b)thiophene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C1-Benzo(b)thiophenes	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C2-Benzo(b)thiophenes	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C3-Benzo(b)thiophenes	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C4-Benzo(b)thiophenes	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS749-S2
Date Sampled: 02/03/20 11:25
Percent Solids: 89
Initial Volume: 5.875
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-15
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
2-Methylnaphthalene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
1-Methylnaphthalene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C1-Naphthalenes	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C2-Naphthalenes	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C3-Naphthalenes	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C4-Naphthalenes	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
Biphenyl	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
Acenaphthylene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
Acenaphthene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
Dibenzofuran	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
Fluorene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C1-Fluorenes	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C2-Fluorenes	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C3-Fluorenes	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
Dibenzothiophene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C1-Dibenzothiophenes	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C2-Dibenzothiophenes	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C3-Dibenzothiophenes	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C4-Dibenzothiophenes	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
Phenanthrene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
Anthracene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C1-Phenanthrenes/Anthracenes	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C2-Phenanthrenes/Anthracenes	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C3-Phenanthrenes/Anthracenes	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C4-Phenanthrenes/Anthracenes	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
Retene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
Benzo(b)naphtho(2,1-d)thiophene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C0-Benzonaphthothiophenes	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C1-Benzonaphthothiophenes	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C2-Benzonaphthothiophenes	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C3-Benzonaphthothiophenes	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS749-S2
Date Sampled: 02/03/20 11:25
Percent Solids: 89
Initial Volume: 5.875
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-15
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
Fluoranthene	**J 3.63** (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
Pyrene	**5.54** (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C1-Fluoranthenes/Pyrenes	**J 3.18** (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C2-Fluoranthenes/Pyrenes	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C3-Fluoranthenes/Pyrenes	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
Benzo(b)fluorene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
Benzo(c)fluorene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
2-Methylpyrene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
4-Methylpyrene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
1-Methylpyrene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
Benz(a)anthracene	**J 1.98** (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
Chrysene/triphenylene	**J 2.38** (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C1-Benzo(a)anthracenes/Chrysenes	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C2-Benzo(a)anthracenes/Chrysenes	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C3-Benzo(a)anthracenes/Chrysenes	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C4-Benzo(a)anthracenes/Chrysenes	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
Benzo(b)fluoranthene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
Benzo(j/k)fluoranthene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
Benzo(e)pyrene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
Benzo(a)pyrene	**J 2.16** (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
Perylene	**J 2.78** (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
Indeno(1,2,3-cd)pyrene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
Dibenzo(a,h)anthracene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
Benzo(g,h,i)perylene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
Coronene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
Tetramethyl lead	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
Trimethylethyl lead	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
Dimethyldiethyl lead	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
Methyltriethyl lead	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
Tetraethyl lead	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
2,6,10-trimethyldodecane (1380)	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS749-S2
Date Sampled: 02/03/20 11:25
Percent Solids: 89
Initial Volume: 5.875
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-15
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
2,6,10-trimethylpentadecane (1650)	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C-17	**B 6.37** (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
Pristane	**B 4.44** (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
C-18	**B 4.64** (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
Phytane	**B 5.44** (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
Carbazole	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
2,6-Dimethylnaphthalene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
2,3,5-Trimethylnaphthene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
4-Methyldibenzothiophene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
2/3-Methyldibenzothiophene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
1-Methyldibenzothiophene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
3-Methylphenanthrene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
2-Methylphenanthrene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
2-Methylanthracene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
4/9-Methylphenanthrene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701
1-Methylphenanthrene	ND (3.84)	1.92	8270 Mod		1	02/08/20 1:26	F0B0003	FB00701

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*76 %*		*50-120*
Surrogate: Naphthalene-d8	*69 %*		*50-120*
Surrogate: Phenanthrene-d10	*91 %*		*50-120*
Surrogate: Perylene-d12	*74 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS749-S2
Date Sampled: 02/03/20 11:25
Percent Solids: 89

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-15
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**2380** (94.0)		LK		1	CCP	02/14/20 16:56	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS750-S1
Date Sampled: 02/03/20 12:56
Percent Solids: 73
Initial Volume: 5.37
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-16
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**15.0** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C1-Benzene	**20.5** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C2-Benzenes	**27.4** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C3-Benzenes	**13.3** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C4-Benzenes	**10.6** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C5-Benzenes	**6.51** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
Methylcyclohexane	**J 3.20** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
Toluene	**24.7** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
Ethylbenzene	**J 3.24** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
m,p-Xylene	**36.8** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
Styrene	**5.88** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
o-Xylene	**J 4.15** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
Isopropylbenzene	ND (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
n-Propylbenzene	ND (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
1,3,5-Trimethylbenzene	ND (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
1,2,3-Trimethylbenzene	ND (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
1,2,4-Trimethylbenzene	**J 4.23** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
t-Butylbenzene	ND (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
sec-Butylbenzene	ND (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
p-Isopropyltoluene	ND (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
n-Butylbenzene	ND (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
trans-Decalin	ND (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
cis-Decalin	ND (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C1-Decalins	**J 4.43** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C2-Decalins	ND (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C3-Decalins	ND (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C4-Decalins	ND (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
Benzo(b)thiophene	**J 2.62** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C1-Benzo(b)thiophenes	**5.93** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C2-Benzo(b)thiophenes	**12.3** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C3-Benzo(b)thiophenes	**10.9** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C4-Benzo(b)thiophenes	**J 5.02** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS750-S1
Date Sampled: 02/03/20 12:56
Percent Solids: 73
Initial Volume: 5.37
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-16
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**45.6** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
2-Methylnaphthalene	**57.4** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
1-Methylnaphthalene	**81.0** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C1-Naphthalenes	**84.1** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C2-Naphthalenes	**171** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C3-Naphthalenes	**145** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C4-Naphthalenes	**61.9** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
Biphenyl	**28.7** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
Acenaphthylene	**107** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
Acenaphthene	**334** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
Dibenzofuran	**241** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
Fluorene	**525** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C1-Fluorenes	**149** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C2-Fluorenes	**106** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C3-Fluorenes	**91.1** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
Dibenzothiophene	**197** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C1-Dibenzothiophenes	**105** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C2-Dibenzothiophenes	**77.6** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C3-Dibenzothiophenes	**38.5** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C4-Dibenzothiophenes	**25.7** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
Phenanthrene	**3010** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
Anthracene	**982** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C1-Phenanthrenes/Anthracenes	**1010** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C2-Phenanthrenes/Anthracenes	**399** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C3-Phenanthrenes/Anthracenes	**142** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C4-Phenanthrenes/Anthracenes	**198** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
Retene	**28.5** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
Benzo(b)naphtho(2,1-d)thiophene	**160** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C0-Benzonaphthothiophenes	**318** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C1-Benzonaphthothiophenes	**143** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C2-Benzonaphthothiophenes	**93.9** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C3-Benzonaphthothiophenes	**87.3** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS750-S1
Date Sampled: 02/03/20 12:56
Percent Solids: 73
Initial Volume: 5.37
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-16
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**45.7** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
Fluoranthene	**3750** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
Pyrene	**3070** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C1-Fluoranthenes/Pyrenes	**1210** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C2-Fluoranthenes/Pyrenes	**480** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C3-Fluoranthenes/Pyrenes	**216** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
Benzo(b)fluorene	**207** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
Benzo(c)fluorene	**80.7** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
2-Methylpyrene	**141** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
4-Methylpyrene	**99.7** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
1-Methylpyrene	**84.7** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
Benz(a)anthracene	**1660** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
Chrysene/triphenylene	**1370** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C1-Benzo(a)anthracenes/Chrysenes	**611** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C2-Benzo(a)anthracenes/Chrysenes	**274** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C3-Benzo(a)anthracenes/Chrysenes	**153** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C4-Benzo(a)anthracenes/Chrysenes	**76.3** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
Benzo(b)fluoranthene	**1030** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
Benzo(j/k)fluoranthene	**1150** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
Benzo(e)pyrene	**830** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
Benzo(a)pyrene	**1420** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
Perylene	**397** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
Indeno(1,2,3-cd)pyrene	**901** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
Dibenzo(a,h)anthracene	**173** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
Benzo(g,h,i)perylene	**682** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
Coronene	**173** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
Tetramethyl lead	ND (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
Trimethylethyl lead	ND (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
Dimethyldiethyl lead	ND (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
Methyltriethyl lead	ND (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
Tetraethyl lead	ND (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
2,6,10-trimethyldodecane (1380)	**J 4.22** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS750-S1
Date Sampled: 02/03/20 12:56
Percent Solids: 73
Initial Volume: 5.37
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-16
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**15.6** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
2,6,10-trimethylpentadecane (1650)	B **23.2** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C-17	B **82.9** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
Pristane	B **46.0** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
C-18	B **53.5** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
Phytane	B **52.1** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
Carbazole	**164** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
2,6-Dimethylnaphthalene	**38.7** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
2,3,5-Trimethylnaphthene	**12.7** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
4-Methyldibenzothiophene	**24.3** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
2/3-Methyldibenzothiophene	**34.1** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
1-Methyldibenzothiophene	**9.79** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
3-Methylphenanthrene	**227** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
2-Methylphenanthrene	**274** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
2-Methylanthracene	**161** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
4/9-Methylphenanthrene	**196** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701
1-Methylphenanthrene	**148** (5.07)	2.53	8270 Mod		1	02/13/20 14:27	F0B0006	FB00701

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*68 %*		*50-120*
Surrogate: Naphthalene-d8	*81 %*		*50-120*
Surrogate: Phenanthrene-d10	*84 %*		*50-120*
Surrogate: Perylene-d12	*85 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS750-S1
Date Sampled: 02/03/20 12:56
Percent Solids: 73

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-16
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**9870** (98.8)		LK		1	CCP	02/14/20 17:21	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS751-S1
Date Sampled: 02/03/20 14:01
Percent Solids: 68
Initial Volume: 4.981
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-17
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**228** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C1-Benzene	**126** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C2-Benzenes	**264** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C3-Benzenes	**353** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C4-Benzenes	**313** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C5-Benzenes	**156** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
Methylcyclohexane	**36.2** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
Toluene	**155** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
Ethylbenzene	**176** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
m,p-Xylene	**164** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
Styrene	**114** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
o-Xylene	**136** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
Isopropylbenzene	**209** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
n-Propylbenzene	**43.3** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
1,3,5-Trimethylbenzene	**97.0** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
1,2,3-Trimethylbenzene	**71.2** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
1,2,4-Trimethylbenzene	**158** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
t-Butylbenzene	ND (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
sec-Butylbenzene	**J 21.5** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
p-Isopropyltoluene	**J 20.7** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
n-Butylbenzene	**J 22.6** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
trans-Decalin	**219** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
cis-Decalin	**37.0** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C1-Decalins	**293** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C2-Decalins	**282** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C3-Decalins	**232** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C4-Decalins	**395** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
Benzo(b)thiophene	ND (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C1-Benzo(b)thiophenes	**65.4** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C2-Benzo(b)thiophenes	**68.0** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C3-Benzo(b)thiophenes	**64.9** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C4-Benzo(b)thiophenes	**49.9** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS751-S1
Date Sampled: 02/03/20 14:01
Percent Solids: 68
Initial Volume: 4.981
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-17
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**1200** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
2-Methylnaphthalene	**76.1** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
1-Methylnaphthalene	**52.3** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C1-Naphthalenes	**78.5** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C2-Naphthalenes	**549** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C3-Naphthalenes	**701** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C4-Naphthalenes	**466** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
Biphenyl	**697** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
Acenaphthylene	**157** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
Acenaphthene	**131** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
Dibenzofuran	**46.8** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
Fluorene	**233** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C1-Fluorenes	**345** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C2-Fluorenes	**447** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C3-Fluorenes	**515** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
Dibenzothiophene	**112** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C1-Dibenzothiophenes	**216** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C2-Dibenzothiophenes	**327** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C3-Dibenzothiophenes	**364** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C4-Dibenzothiophenes	**245** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
Phenanthrene	**1300** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
Anthracene	**286** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C1-Phenanthrenes/Anthracenes	**846** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C2-Phenanthrenes/Anthracenes	**901** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C3-Phenanthrenes/Anthracenes	**691** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C4-Phenanthrenes/Anthracenes	**465** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
Retene	**163** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
Benzo(b)naphtho(2,1-d)thiophene	**117** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C0-Benzonaphthothiophenes	**217** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C1-Benzonaphthothiophenes	**216** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C2-Benzonaphthothiophenes	**209** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C3-Benzonaphthothiophenes	**166** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS751-S1
Date Sampled: 02/03/20 14:01
Percent Solids: 68
Initial Volume: 4.981
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-17
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**143** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
Fluoranthene	**1580** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
Pyrene	**1670** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C1-Fluoranthenes/Pyrenes	**927** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C2-Fluoranthenes/Pyrenes	**572** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C3-Fluoranthenes/Pyrenes	**321** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
Benzo(b)fluorene	**98.7** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
Benzo(c)fluorene	**45.8** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
2-Methylpyrene	**117** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
4-Methylpyrene	**135** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
1-Methylpyrene	**104** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
Benz(a)anthracene	**769** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
Chrysene/triphenylene	**869** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C1-Benzo(a)anthracenes/Chrysenes	**522** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C2-Benzo(a)anthracenes/Chrysenes	**307** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C3-Benzo(a)anthracenes/Chrysenes	**191** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C4-Benzo(a)anthracenes/Chrysenes	ND (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
Benzo(b)fluoranthene	**581** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
Benzo(j/k)fluoranthene	**615** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
Benzo(e)pyrene	**522** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
Benzo(a)pyrene	**736** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
Perylene	**274** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
Indeno(1,2,3-cd)pyrene	**505** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
Dibenzo(a,h)anthracene	**115** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
Benzo(g,h,i)perylene	**420** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
Coronene	**108** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
Tetramethyl lead	ND (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
Trimethylethyl lead	ND (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
Dimethyldiethyl lead	ND (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
Methyltriethyl lead	ND (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
Tetraethyl lead	ND (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
2,6,10-trimethyldodecane (1380)	**557** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS751-S1
Date Sampled: 02/03/20 14:01
Percent Solids: 68
Initial Volume: 4.981
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-17
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**835** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
2,6,10-trimethylpentadecane (1650)	**829** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C-17	**B 349** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
Pristane	**2420** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
C-18	**326** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
Phytane	**2320** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
Carbazole	**78.6** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
2,6-Dimethylnaphthalene	**176** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
2,3,5-Trimethylnaphthene	**50.7** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
4-Methyldibenzothiophene	**99.5** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
2/3-Methyldibenzothiophene	**72.0** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
1-Methyldibenzothiophene	**J 24.9** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
3-Methylphenanthrene	**195** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
2-Methylphenanthrene	**229** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
2-Methylanthracene	**65.4** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
4/9-Methylphenanthrene	**203** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701
1-Methylphenanthrene	**144** (29.3)	14.7	8270 Mod		5	02/13/20 18:38	F0B0006	FB00701

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*57 %*		*50-120*
Surrogate: Naphthalene-d8	*66 %*		*50-120*
Surrogate: Phenanthrene-d10	*72 %*		*50-120*
Surrogate: Perylene-d12	*62 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS751-S1
Date Sampled: 02/03/20 14:01
Percent Solids: 68

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-17
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**35200** (94.8)		LK		1	CCP	02/14/20 17:38	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS751-S2
Date Sampled: 02/03/20 14:12
Percent Solids: 73
Initial Volume: 5.227
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-18
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C1-Benzene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C2-Benzenes	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C3-Benzenes	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C4-Benzenes	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C5-Benzenes	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
Methylcyclohexane	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
Toluene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
Ethylbenzene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
m,p-Xylene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
Styrene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
o-Xylene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
Isopropylbenzene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
n-Propylbenzene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
1,3,5-Trimethylbenzene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
1,2,3-Trimethylbenzene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
1,2,4-Trimethylbenzene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
t-Butylbenzene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
sec-Butylbenzene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
p-Isopropyltoluene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
n-Butylbenzene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
trans-Decalin	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
cis-Decalin	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C1-Decalins	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C2-Decalins	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C3-Decalins	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C4-Decalins	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
Benzo(b)thiophene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C1-Benzo(b)thiophenes	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C2-Benzo(b)thiophenes	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C3-Benzo(b)thiophenes	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C4-Benzo(b)thiophenes	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS751-S2
Date Sampled: 02/03/20 14:12
Percent Solids: 73
Initial Volume: 5.227
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-18
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
2-Methylnaphthalene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
1-Methylnaphthalene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C1-Naphthalenes	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C2-Naphthalenes	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C3-Naphthalenes	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C4-Naphthalenes	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
Biphenyl	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
Acenaphthylene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
Acenaphthene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
Dibenzofuran	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
Fluorene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C1-Fluorenes	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C2-Fluorenes	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C3-Fluorenes	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
Dibenzothiophene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C1-Dibenzothiophenes	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C2-Dibenzothiophenes	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C3-Dibenzothiophenes	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C4-Dibenzothiophenes	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
Phenanthrene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
Anthracene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C1-Phenanthrenes/Anthracenes	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C2-Phenanthrenes/Anthracenes	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C3-Phenanthrenes/Anthracenes	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C4-Phenanthrenes/Anthracenes	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
Retene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
Benzo(b)naphtho(2,1-d)thiophene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C0-Benzonaphthothiophenes	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C1-Benzonaphthothiophenes	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C2-Benzonaphthothiophenes	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C3-Benzonaphthothiophenes	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS751-S2
Date Sampled: 02/03/20 14:12
Percent Solids: 73
Initial Volume: 5.227
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-18
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
Fluoranthene	**J 4.73** (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
Pyrene	**7.85** (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C1-Fluoranthenes/Pyrenes	**6.35** (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C2-Fluoranthenes/Pyrenes	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C3-Fluoranthenes/Pyrenes	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
Benzo(b)fluorene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
Benzo(c)fluorene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
2-Methylpyrene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
4-Methylpyrene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
1-Methylpyrene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
Benz(a)anthracene	**J 4.46** (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
Chrysene/triphenylene	**5.33** (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C1-Benzo(a)anthracenes/Chrysenes	**J 4.18** (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C2-Benzo(a)anthracenes/Chrysenes	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C3-Benzo(a)anthracenes/Chrysenes	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C4-Benzo(a)anthracenes/Chrysenes	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
Benzo(b)fluoranthene	**5.61** (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
Benzo(j/k)fluoranthene	**5.55** (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
Benzo(e)pyrene	**J 4.87** (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
Benzo(a)pyrene	**5.97** (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
Perylene	**5060** (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
Indeno(1,2,3-cd)pyrene	**J 3.69** (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
Dibenzo(a,h)anthracene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
Benzo(g,h,i)perylene	**J 3.60** (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
Coronene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
Tetramethyl lead	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
Trimethylethyl lead	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
Dimethyldiethyl lead	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
Methyltriethyl lead	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
Tetraethyl lead	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
2,6,10-trimethyldodecane (1380)	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS751-S2
Date Sampled: 02/03/20 14:12
Percent Solids: 73
Initial Volume: 5.227
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-18
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: NL
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
2,6,10-trimethylpentadecane (1650)	**J 4.31** (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C-17	**B 22.4** (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
Pristane	**B 15.7** (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
C-18	**B 16.0** (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
Phytane	**B 21.6** (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
Carbazole	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
2,6-Dimethylnaphthalene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
2,3,5-Trimethylnaphthene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
4-Methyldibenzothiophene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
2/3-Methyldibenzothiophene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
1-Methyldibenzothiophene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
3-Methylphenanthrene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
2-Methylphenanthrene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
2-Methylanthracene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
4/9-Methylphenanthrene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701
1-Methylphenanthrene	ND (5.21)	2.60	8270 Mod		1	02/08/20 2:52	F0B0003	FB00701

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*64 %*		*50-120*
Surrogate: Naphthalene-d8	*57 %*		*50-120*
Surrogate: Phenanthrene-d10	*67 %*		*50-120*
Surrogate: Perylene-d12	*62 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS751-S2
Date Sampled: 02/03/20 14:12
Percent Solids: 73

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-18
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**7550** (94.3)		LK		1	CCP	02/14/20 18:28	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS752-S1
Date Sampled: 02/03/20 14:49
Percent Solids: 55
Initial Volume: 5.359
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-19
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	J **17.6** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C1-Benzene	**331** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C2-Benzenes	**121** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C3-Benzenes	**142** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C4-Benzenes	**370** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C5-Benzenes	**354** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
Methylcyclohexane	J **27.8** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
Toluene	**401** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
Ethylbenzene	J **27.7** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
m,p-Xylene	**134** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
Styrene	**77.6** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
o-Xylene	J **24.7** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
Isopropylbenzene	ND (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
n-Propylbenzene	ND (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
1,3,5-Trimethylbenzene	J **22.0** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
1,2,3-Trimethylbenzene	J **33.8** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
1,2,4-Trimethylbenzene	**64.1** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
t-Butylbenzene	ND (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
sec-Butylbenzene	ND (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
p-Isopropyltoluene	J **18.1** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
n-Butylbenzene	J **25.6** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
trans-Decalin	**128** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
cis-Decalin	J **24.7** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C1-Decalins	**308** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C2-Decalins	**644** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C3-Decalins	**587** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C4-Decalins	**930** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
Benzo(b)thiophene	**96.0** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C1-Benzo(b)thiophenes	**122** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C2-Benzo(b)thiophenes	**421** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C3-Benzo(b)thiophenes	**403** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C4-Benzo(b)thiophenes	**185** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS752-S1
Date Sampled: 02/03/20 14:49
Percent Solids: 55
Initial Volume: 5.359
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-19
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**1480** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
2-Methylnaphthalene	**573** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
1-Methylnaphthalene	**1220** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C1-Naphthalenes	**1070** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C2-Naphthalenes	**6160** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C3-Naphthalenes	**3510** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C4-Naphthalenes	**1340** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
Biphenyl	**284** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
Acenaphthylene	**1610** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
Acenaphthene	**13000** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
Dibenzofuran	**315** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
Fluorene	**7060** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C1-Fluorenes	**2590** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C2-Fluorenes	**1730** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C3-Fluorenes	**1370** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
Dibenzothiophene	**2250** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C1-Dibenzothiophenes	**2480** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C2-Dibenzothiophenes	**2440** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C3-Dibenzothiophenes	**1850** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C4-Dibenzothiophenes	**980** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
Phenanthrene	**28900** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
Anthracene	**8380** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C1-Phenanthrenes/Anthracenes	**13200** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C2-Phenanthrenes/Anthracenes	**6180** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C3-Phenanthrenes/Anthracenes	**4140** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C4-Phenanthrenes/Anthracenes	**7820** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
Retene	**25900** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
Benzo(b)naphtho(2,1-d)thiophene	**1820** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C0-Benzonaphthothiophenes	**3360** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C1-Benzonaphthothiophenes	**2410** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C2-Benzonaphthothiophenes	**1420** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C3-Benzonaphthothiophenes	**950** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS752-S1
Date Sampled: 02/03/20 14:49
Percent Solids: 55
Initial Volume: 5.359
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-19
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**331** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
Fluoranthene	**23600** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
Pyrene	**32600** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C1-Fluoranthenes/Pyrenes	**15400** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C2-Fluoranthenes/Pyrenes	**5090** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C3-Fluoranthenes/Pyrenes	**1950** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
Benzo(b)fluorene	**1760** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
Benzo(c)fluorene	**815** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
2-Methylpyrene	**2130** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
4-Methylpyrene	**1880** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
1-Methylpyrene	**1840** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
Benz(a)anthracene	**12500** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
Chrysene/triphenylene	**12600** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C1-Benzo(a)anthracenes/Chrysenes	**6700** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C2-Benzo(a)anthracenes/Chrysenes	**2670** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C3-Benzo(a)anthracenes/Chrysenes	**1130** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C4-Benzo(a)anthracenes/Chrysenes	**602** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
Benzo(b)fluoranthene	**7210** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
Benzo(j/k)fluoranthene	**8000** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
Benzo(e)pyrene	**7370** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
Benzo(a)pyrene	**12200** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
Perylene	**2020** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
Indeno(1,2,3-cd)pyrene	**6530** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
Dibenzo(a,h)anthracene	**1340** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
Benzo(g,h,i)perylene	**5740** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
Coronene	**1530** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
Tetramethyl lead	ND (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
Trimethylethyl lead	ND (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
Dimethyldiethyl lead	ND (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
Methyltriethyl lead	ND (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
Tetraethyl lead	ND (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
2,6,10-trimethyldodecane (1380)	**1640** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS752-S1
Date Sampled: 02/03/20 14:49
Percent Solids: 55
Initial Volume: 5.359
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-19
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**2190** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
2,6,10-trimethylpentadecane (1650)	**2290** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C-17	**B 506** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
Pristane	**4270** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
C-18	**449** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
Phytane	**3920** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
Carbazole	**136** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
2,6-Dimethylnaphthalene	**1170** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
2,3,5-Trimethylnaphthene	**205** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
4-Methyldibenzothiophene	**990** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
2/3-Methyldibenzothiophene	**822** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
1-Methyldibenzothiophene	**268** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
3-Methylphenanthrene	**3010** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
2-Methylphenanthrene	**3440** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
2-Methylanthracene	**1370** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
4/9-Methylphenanthrene	**3130** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701
1-Methylphenanthrene	**2280** (34.1)	17.1	8270 Mod		5	02/13/20 17:14	F0B0006	FB00701

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*52 %*		*50-120*
Surrogate: Naphthalene-d8	*58 %*		*50-120*
Surrogate: Phenanthrene-d10	*67 %*		*50-120*
Surrogate: Perylene-d12	*68 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS752-S1
Date Sampled: 02/03/20 14:49
Percent Solids: 55

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-19
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**72600** (94.0)		LK		1	CCP	02/14/20 18:44	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS752-S2
Date Sampled: 02/03/20 14:57
Percent Solids: 62
Initial Volume: 5.197
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-20
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	J **6.06** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C1-Benzene	**94.4** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C2-Benzenes	**38.6** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C3-Benzenes	**29.4** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C4-Benzenes	**31.4** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C5-Benzenes	**17.6** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
Methylcyclohexane	**9.54** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
Toluene	**114** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
Ethylbenzene	J **5.86** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
m,p-Xylene	**50.2** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
Styrene	**8.05** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
o-Xylene	J **4.81** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
Isopropylbenzene	ND (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
n-Propylbenzene	ND (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
1,3,5-Trimethylbenzene	**10.7** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
1,2,3-Trimethylbenzene	J **3.84** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
1,2,4-Trimethylbenzene	**13.6** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
t-Butylbenzene	ND (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
sec-Butylbenzene	ND (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
p-Isopropyltoluene	**23.5** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
n-Butylbenzene	ND (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
trans-Decalin	**10.5** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
cis-Decalin	ND (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C1-Decalins	**19.1** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C2-Decalins	**27.2** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C3-Decalins	**18.6** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C4-Decalins	**25.5** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
Benzo(b)thiophene	J **4.34** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C1-Benzo(b)thiophenes	**8.28** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C2-Benzo(b)thiophenes	**9.10** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C3-Benzo(b)thiophenes	**9.02** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C4-Benzo(b)thiophenes	J **3.57** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS752-S2
Date Sampled: 02/03/20 14:57
Percent Solids: 62
Initial Volume: 5.197
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-20
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**97.3** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
2-Methylnaphthalene	**84.7** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
1-Methylnaphthalene	**38.0** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C1-Naphthalenes	**75.5** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C2-Naphthalenes	**117** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C3-Naphthalenes	**112** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C4-Naphthalenes	**66.5** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
Biphenyl	**29.1** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
Acenaphthylene	**55.6** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
Acenaphthene	**48.2** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
Dibenzofuran	**51.2** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
Fluorene	**87.0** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C1-Fluorenes	**66.8** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C2-Fluorenes	**123** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C3-Fluorenes	**115** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
Dibenzothiophene	**31.2** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C1-Dibenzothiophenes	**45.6** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C2-Dibenzothiophenes	**53.7** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C3-Dibenzothiophenes	**37.5** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C4-Dibenzothiophenes	**22.2** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
Phenanthrene	**497** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
Anthracene	**200** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C1-Phenanthrenes/Anthracenes	**574** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C2-Phenanthrenes/Anthracenes	**431** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C3-Phenanthrenes/Anthracenes	**208** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C4-Phenanthrenes/Anthracenes	**168** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
Retene	**69.1** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
Benzo(b)naphtho(2,1-d)thiophene	**69.6** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C0-Benzonaphthothiophenes	**131** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C1-Benzonaphthothiophenes	**113** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C2-Benzonaphthothiophenes	**94.5** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C3-Benzonaphthothiophenes	**59.0** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS752-S2
Date Sampled: 02/03/20 14:57
Percent Solids: 62
Initial Volume: 5.197
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-20
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**21.3** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
Fluoranthene	**692** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
Pyrene	**1300** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C1-Fluoranthenes/Pyrenes	**786** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C2-Fluoranthenes/Pyrenes	**440** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C3-Fluoranthenes/Pyrenes	**254** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
Benzo(b)fluorene	**85.5** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
Benzo(c)fluorene	**46.4** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
2-Methylpyrene	**110** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
4-Methylpyrene	**106** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
1-Methylpyrene	**80.6** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
Benz(a)anthracene	**675** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
Chrysene/triphenylene	**658** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C1-Benzo(a)anthracenes/Chrysenes	**506** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C2-Benzo(a)anthracenes/Chrysenes	**325** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C3-Benzo(a)anthracenes/Chrysenes	**193** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C4-Benzo(a)anthracenes/Chrysenes	**116** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
Benzo(b)fluoranthene	**462** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
Benzo(j/k)fluoranthene	**461** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
Benzo(e)pyrene	**436** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
Benzo(a)pyrene	**636** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
Perylene	**947** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
Indeno(1,2,3-cd)pyrene	**401** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
Dibenzo(a,h)anthracene	**95.2** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
Benzo(g,h,i)perylene	**353** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
Coronene	**81.5** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
Tetramethyl lead	ND (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
Trimethylethyl lead	ND (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
Dimethyldiethyl lead	ND (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
Methyltriethyl lead	ND (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
Tetraethyl lead	ND (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
2,6,10-trimethyldodecane (1380)	**18.8** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS752-S2
Date Sampled: 02/03/20 14:57
Percent Solids: 62
Initial Volume: 5.197
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-20
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/6/20 12:34

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**49.7** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
2,6,10-trimethylpentadecane (1650)	**B 43.9** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C-17	**B 159** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
Pristane	**B 87.1** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
C-18	**B 93.7** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
Phytane	**B 103** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
Carbazole	**33.2** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
2,6-Dimethylnaphthalene	**29.5** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
2,3,5-Trimethylnaphthene	**9.00** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
4-Methyldibenzothiophene	**14.5** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
2/3-Methyldibenzothiophene	**14.7** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
1-Methyldibenzothiophene	**J 3.97** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
3-Methylphenanthrene	**142** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
2-Methylphenanthrene	**138** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
2-Methylanthracene	**77.1** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
4/9-Methylphenanthrene	**161** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701
1-Methylphenanthrene	**51.9** (6.21)	3.10	8270 Mod		1	02/13/20 3:20	F0B0006	FB00701

	%Recovery	*Qualifier*	*Limits*
Surrogate: Toluene-D8	*61 %*		*50-120*
Surrogate: Naphthalene-d8	*74 %*		*50-120*
Surrogate: Phenanthrene-d10	*82 %*		*50-120*
Surrogate: Perylene-d12	*83 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS752-S2
Date Sampled: 02/03/20 14:57
Percent Solids: 62

ESS Laboratory Work Order: F200006
ESS Laboratory Sample ID: F200006-20
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**27400** (96.8)		LK		1	CCP	02/14/20 19:01	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200006

Quality Control Data

Classical Chemistry

Batch DB00751 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	100	mg/kg							
Total Organic Carbon (2)	ND	100	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200006

Quality Control Data

Classical Chemistry

Batch DB00751 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9840	100	mg/kg	10000		98	80-120			
Total Organic Carbon (2)	10000	100	mg/kg	10000		100	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200006

Quality Control Data

Classical Chemistry

Batch DB00751 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9740	100	mg/kg	10000		97	80-120	1	20	
Total Organic Carbon (2)	9640	100	mg/kg	10000		96	80-120	4	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200006

Quality Control Data

Classical Chemistry

Batch DB01137 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	100	mg/kg							
Total Organic Carbon (2)	ND	100	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200006

Quality Control Data

Classical Chemistry

Batch DB01137 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9380	100	mg/kg	10000		94	80-120			
Total Organic Carbon (2)	9350	100	mg/kg	10000		93	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200006

Quality Control Data

Classical Chemistry

Batch DB01137 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9430	100	mg/kg	10000		94	80-120	0.5	20	
Total Organic Carbon (2)	9830	100	mg/kg	10000		98	80-120	5	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200006

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FB00701 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	ND	4.00	ug/Kg wet							
C1-Benzene	ND	4.00	ug/Kg wet							
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	ND	4.00	ug/Kg wet							
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	2.42	4.00	ug/Kg wet							J
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200006

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FB00701 - 3570

C1-Fluorenes	ND	4.00	ug/Kg wet
C2-Fluorenes	ND	4.00	ug/Kg wet
C3-Fluorenes	ND	4.00	ug/Kg wet
Dibenzothiophene	ND	4.00	ug/Kg wet
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet
Phenanthrene	ND	4.00	ug/Kg wet
Anthracene	ND	4.00	ug/Kg wet
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
Retene	ND	4.00	ug/Kg wet
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
Fluoranthene	ND	4.00	ug/Kg wet
Pyrene	ND	4.00	ug/Kg wet
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
Benzo(b)fluorene	ND	4.00	ug/Kg wet
Benzo(c)fluorene	ND	4.00	ug/Kg wet
2-Methylpyrene	ND	4.00	ug/Kg wet
4-Methylpyrene	ND	4.00	ug/Kg wet
1-Methylpyrene	ND	4.00	ug/Kg wet
Benz(a)anthracene	ND	4.00	ug/Kg wet
Chrysene/triphenylene	ND	4.00	ug/Kg wet
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet
Benzo(e)pyrene	ND	4.00	ug/Kg wet
Benzo(a)pyrene	ND	4.00	ug/Kg wet
Perylene	ND	4.00	ug/Kg wet
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet
Coronene	ND	4.00	ug/Kg wet
Tetramethyl lead	ND	4.00	ug/Kg wet
Trimethylethyl lead	ND	4.00	ug/Kg wet

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200006

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FB00701 - 3570						
Dimethyldiethyl lead	ND	4.00	ug/Kg wet			
Methyltriethyl lead	ND	4.00	ug/Kg wet			
Tetraethyl lead	ND	4.00	ug/Kg wet			
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet			
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet			
2,6,10-trimethylpentadecane (1650)	7.60	4.00	ug/Kg wet			
C-17	28.4	4.00	ug/Kg wet			
Pristane	20.2	4.00	ug/Kg wet			
C-18	19.3	4.00	ug/Kg wet			
Phytane	24.2	4.00	ug/Kg wet			
Carbazole	ND	4.00	ug/Kg wet			
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet			
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet			
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
3-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylanthracene	ND	4.00	ug/Kg wet			
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet			
1-Methylphenanthrene	ND	4.00	ug/Kg wet			
Surrogate: Toluene-D8	*376*		ug/Kg wet	*400.0*	*94*	*50-120*
Surrogate: Naphthalene-d8	*320*		ug/Kg wet	*400.0*	*80*	*50-120*
Surrogate: Phenanthrene-d10	*399*		ug/Kg wet	*400.0*	*100*	*50-120*
Surrogate: Perylene-d12	*376*		ug/Kg wet	*400.0*	*94*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200006

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FB00701 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	222	4.00	ug/Kg wet	400.0		56	60-130			B-
Methylcyclohexane	219	4.00	ug/Kg wet	400.0		55	60-130			B-
Toluene	358	4.00	ug/Kg wet	400.0		90	60-130			
Ethylbenzene	378	4.00	ug/Kg wet	400.0		94	60-130			
m,p-Xylene	377	4.00	ug/Kg wet	400.0		94	60-130			
Styrene	330	4.00	ug/Kg wet	400.0		82	60-130			
o-Xylene	392	4.00	ug/Kg wet	400.0		98	60-130			
Isopropylbenzene	391	4.00	ug/Kg wet	400.0		98	60-130			
n-Propylbenzene	380	4.00	ug/Kg wet	400.0		95	60-130			
1,3,5-Trimethylbenzene	396	4.00	ug/Kg wet	400.0		99	60-130			
1,2,3-Trimethylbenzene	375	4.00	ug/Kg wet	400.0		94	60-130			
1,2,4-Trimethylbenzene	395	4.00	ug/Kg wet	400.0		99	60-130			
t-Butylbenzene	398	4.00	ug/Kg wet	400.0		100	60-130			
sec-Butylbenzene	350	4.00	ug/Kg wet	400.0		87	60-130			
p-Isopropyltoluene	374	4.00	ug/Kg wet	400.0		94	60-130			
n-Butylbenzene	323	4.00	ug/Kg wet	400.0		81	60-130			
trans-Decalin	339	4.00	ug/Kg wet	400.0		85	60-130			
cis-Decalin	329	4.00	ug/Kg wet	400.0		82	60-130			
Benzo(b)thiophene	351	4.00	ug/Kg wet	400.0		88	60-130			
Naphthalene	336	4.00	ug/Kg wet	400.0		84	60-130			
2-Methylnaphthalene	340	4.00	ug/Kg wet	400.0		85	60-130			
1-Methylnaphthalene	347	4.00	ug/Kg wet	400.0		87	60-130			
Biphenyl	351	4.00	ug/Kg wet	400.0		88	60-130			
Acenaphthylene	361	4.00	ug/Kg wet	400.0		90	60-130			
Acenaphthene	371	4.00	ug/Kg wet	400.0		93	60-130			
Dibenzofuran	360	4.00	ug/Kg wet	400.0		90	60-130			
Fluorene	363	4.00	ug/Kg wet	400.0		91	60-130			
Dibenzothiophene	382	4.00	ug/Kg wet	400.0		96	60-130			
Phenanthrene	368	4.00	ug/Kg wet	400.0		92	60-130			
Anthracene	346	4.00	ug/Kg wet	400.0		87	60-130			
Retene	374	4.00	ug/Kg wet	400.0		93	60-130			
Benzo(b)naphtho(2,1-d)thiophene	370	4.00	ug/Kg wet	400.0		92	60-130			
Fluoranthene	370	4.00	ug/Kg wet	400.0		92	60-130			
Pyrene	375	4.00	ug/Kg wet	400.0		94	60-130			
Benz(a)anthracene	359	4.00	ug/Kg wet	400.0		90	60-130			
Chrysene/triphenylene	380	4.00	ug/Kg wet	400.0		95	60-130			
Benzo(b)fluoranthene	357	4.00	ug/Kg wet	400.0		89	60-130			
Benzo(j/k)fluoranthene	380	4.00	ug/Kg wet	400.0		95	60-130			
Benzo(e)pyrene	366	4.00	ug/Kg wet	400.0		92	60-130			
Benzo(a)pyrene	355	4.00	ug/Kg wet	400.0		89	60-130			
Perylene	353	4.00	ug/Kg wet	400.0		88	60-130			
Indeno(1,2,3-cd)pyrene	316	4.00	ug/Kg wet	400.0		79	60-130			
Dibenzo(a,h)anthracene	329	4.00	ug/Kg wet	400.0		82	60-130			
Benzo(g,h,i)perylene	325	4.00	ug/Kg wet	400.0		81	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200006

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FB00701 - 3570						
Coronene	304	4.00	ug/Kg wet	400.0	76	60-130
Tetraethyl lead	413	4.00	ug/Kg wet	400.0	103	60-130
Pristane	402	4.00	ug/Kg wet	400.0	100	60-130
Phytane	398	4.00	ug/Kg wet	400.0	100	60-130
Surrogate: Toluene-D8	*347*		ug/Kg wet	*400.0*	*87*	*50-120*
Surrogate: Naphthalene-d8	*327*		ug/Kg wet	*400.0*	*82*	*50-120*
Surrogate: Phenanthrene-d10	*391*		ug/Kg wet	*400.0*	*98*	*50-120*
Surrogate: Perylene-d12	*353*		ug/Kg wet	*400.0*	*88*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F200006

Notes and Definitions

U	Analyte included in the analysis, but not detected
J	Reported between MDL and MRL
D	Diluted.
B-	Blank Spike recovery is below lower control limit (B-).
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200006

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 20G0097 / FL00006

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

Preservative

None | None

Analysis

Sample Handling

Samples Field Filtered: YES NO (NA)

Sampled Shipped With Ice: (YES) NO

MCP PRESUMPTIVE CERTAINTY REQUIRED -- (YES) NO

If Yes, Are MCP Analytical Methods Required?	(YES)	NO	NA
Are Drinking Water Samples Submitted?	YES	(NO)	NA
If Yes, Have Drinking Water Sampling Requirements Been Met?	YES	NO	(NA)

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Parent and Alkylated MAHs & PAHs 8270**	TOCs by Lloyd-Kahn	Sample Specific Remarks
1	1804576-SS753-S1	2/4/2020	8:47	Soil	1	BFM	X	X	
2	1804576-SS753-S2	2/4/2020	8:55	Soil	1	BFM	X	X	
3	1804576-SS738-S1	2/4/2020	9:12	Soil	1	BFM	X	X	
4	1804576-SS738-S2	2/4/2020	9:21	Soil	1	BFM	X	X	
5	1804576-SS739-S1	2/4/2020	9:56	Soil	1	BFM	X	X	
6	1804576-SS739-S2	2/4/2020	10:09	Soil	1	BFM	X	X	
7	1804576-SS739-S3	2/4/2020	10:18	Soil	1	BFM	X	X	
8	1804576-SS740-S1	2/4/2020	10:37	Soil	1	BFM	X	X	
9	1804576-SS740-S2	2/4/2020	10:46	Soil	1	BFM	X	X	
10	1804576-SS742-S1	2/4/2020	11:31	Soil	1	BFM	X	X	
11	1804576-SS743-S2	2/4/2020	12:08	Soil	1	BFM	X	X	
12	1804576-SS745-S2	2/4/2020	13:40	Soil	1	BFM	X	X	
13	1804576-SS747-S2	2/4/2020	14:30	Soil	1	BFM	X	X	

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

	Date	Time	
Relinquished by sampler: (signature) 1.	2/4/20	15:32	Received by: (signature) 1. GEI Sample Fridge
Relinquished by: (signature) 2. GEI Sample Fridge	2/5/20	12:30	Received by: (signature) 2.
Relinquished by: (signature) 3.	2/5/20	12:30	Received by: (signature) 3.
Relinquished by: (signature) 4.	2/5	17:36	Received by: (signature) 4.

Turnaround Time (Business days):

Normal __X__ Other ____

10-Day ____ 7-Day ____

5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

**Parent and Alkylated MAHs & PAHs (34) by GC/MS/SIM/SCAN

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 2086097

F200006

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY REQUIRED -- (YES) NO

If Yes, Are MCP Analytical Methods Required?	(YES)	NO	NA
Are Drinking Water Samples Submitted?	YES	(NO)	NA
If Yes, Have Drinking Water Sampling Requirements Been Met?	YES	NO	(NA)

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Preservative: None	Preservative: None	Analysis: Parent and Alkylated MAHs & PAHs 8270**	Analysis: TOCs by Lloyd-Kahn
14	1804576-SS749-S1	2/3/2020	11:14	Soil	1	BFM			X	X
15	1804576-SS749-S2	2/3/2020	11:25	Soil	1	BFM			X	X
16	1804576-SS750-S1	2/3/2020	12:56	Soil	1	BFM			X	X
17	1804576-SS751-S1	2/3/2020	14:01	Soil	1	BFM			X	X
18	1804576-SS751-S2	2/3/2020	14:12	Soil	1	BFM			X	X
19	1804576-SS752-S1	2/3/2020	14:49	Soil	1	BFM			X	X
20	1804576-SS752-S2	2/3/2020	14:57	Soil	1	BFM			X	X

Sample Handling

Samples Field Filtered: YES NO (NA)

Sampled Shipped With Ice: (YES) NO

Sample Specific Remarks

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

	Date	Time		Date	Time
Relinquished by sampler: (signature) 1.	2/3/20	15:15	Received by: (signature) 1. GEI Sample Fridge		
Relinquished by: (signature) 2. GEI Sample Fridge	2/5/20	12:30	Received by: (signature) 2.		
Relinquished by: (signature) 3.	2/5/20	12:30	Received by: (signature) 3.		
Relinquished by: (signature) 4.	2/5	17:35	Received by: (signature) 4.	2/5/20	1735

Turnaround Time (Business days):

Normal __X__ Other ____

10-Day ____ 7-Day ____

5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

**Parent and Alkylated MAHs & PAHs (34) by GC/MS/SIM/SCAN

Icetemp 1.5

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI

Shipped/Delivered Via: ESS Courier

ESS Project ID: F200006
Date Received: 2/5/2020
Project Due Date: 2/12/2020
Days for Project: 10 / 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 1.5 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? 2/7/20 Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA
13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608.3 Pesticides)
1		Yes			4oz Jar	NP	
2		Yes			4oz Jar	NP	
3		Yes			4oz Jar	NP	
4		Yes			4oz Jar	NP	
5		Yes			4oz Jar	NP	
6		Yes			4oz Jar	NP	
7		Yes			4oz Jar	NP	
8		Yes			4oz Jar	NP	
9		Yes			4oz Jar	NP	
10		Yes			4oz Jar	NP	
11		Yes			4oz Jar	NP	
12		Yes			4oz Jar	NP	
13		Yes			4oz Jar	NP	
14		Yes			4oz Jar	NP	
15		Yes			4oz Jar	NP	
16		Yes			4oz Jar	NP	
17		Yes			4oz Jar	NP	
18		Yes			4oz Jar	NP	
19		Yes			4oz Jar	NP	
20		Yes			4oz Jar	NP	

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI

ESS Project ID: F200006
Date Received: 2/5/2020

2nd Review
All containers scanned into storage/lab Initials: _____
Are barcode labels on correct containers? Yes / No
Are all necessary stickers attached? Yes / No

Completed By: _____ Date & Time: 2/5/20 1850

Reviewed By: _____ Date & Time: 2/7/20 @ 11:45

Delivered By: _____

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (044752)
ESS Laboratory Work Order Number: F200008

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 10:10 am, Feb 25, 2020

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses
ESS Laboratory - Cranston, RI TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200008

SAMPLE RECEIPT

The following samples were received on February 10, 2020 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F200008-01	1804576-SS741-S1	Soil	8270 Mod, TOC-LK
F200008-02	1804576-SS741-S3	Soil	8270 Mod, TOC-LK
F200008-03	1804576-SS744-S1	Soil	8270 Mod, TOC-LK
F200008-04	1804576-SS744-S2	Soil	8270 Mod, TOC-LK
F200008-05	1804576-SS748-S1	Soil	8270 Mod, TOC-LK
F200008-06	1804576-SS748-S3	Soil	8270 Mod, TOC-LK
F200008-07	1804576-SS755-S1	Soil	8270 Mod, TOC-LK
F200008-08	1804576-SS756-S1	Soil	8270 Mod, TOC-LK
F200008-09	1804576-SS746-S1	Soil	8270 Mod, TOC-LK
F200008-10	1804576-SS746-S3	Soil	8270 Mod, TOC-LK
F200008-11	1804576-SS754-S1	Soil	8270 Mod, TOC-LK
F200008-12	1804576-SS754-S2	Soil	8270 Mod, TOC-LK
F200008-13	1804576-SS757-S1	Soil	8270 Mod, TOC-LK
F200008-14	1804576-SS758-S1	Soil	8270 Mod, TOC-LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200008

PROJECT NARRATIVE

8270D (SIM) Semi-Volatile Organic Compounds

F200008-02	**Present in Method Blank (B).**
	C-17 , C-18
F200008-03	**Present in Method Blank (B).**
	C-17 , C-18
F200008-04	**Present in Method Blank (B).**
	C-17 , C-18
F200008-06	**Present in Method Blank (B).**
	C-17 , C-18
F200008-07	**Present in Method Blank (B).**
	C-18
F200008-10	**Present in Method Blank (B).**
	C-17 , C-18
F200008-12	**Present in Method Blank (B).**
	C-18
F200008-14	**Present in Method Blank (B).**
	C-17 , C-18
FB01301-DUP2	**Relative percent difference for duplicate is outside of criteria (D+).**

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200008

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS741-S1
Date Sampled: 02/05/20 08:16
Percent Solids: 64
Initial Volume: 3.657
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**18.9** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C1-Benzene	**212** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C2-Benzenes	**184** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C3-Benzenes	**70.2** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C4-Benzenes	**188** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C5-Benzenes	**223** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
Methylcyclohexane	**J 8.16** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
Toluene	**275** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
Ethylbenzene	**20.9** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
m,p-Xylene	**250** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
Styrene	**49.9** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
o-Xylene	**19.8** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
Isopropylbenzene	ND (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
n-Propylbenzene	**11.6** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
1,3,5-Trimethylbenzene	**13.9** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
1,2,3-Trimethylbenzene	**16.0** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
1,2,4-Trimethylbenzene	**37.3** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
t-Butylbenzene	ND (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
sec-Butylbenzene	ND (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
p-Isopropyltoluene	**12.3** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
n-Butylbenzene	**26.0** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
trans-Decalin	**1720** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
cis-Decalin	**177** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C1-Decalins	**1980** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C2-Decalins	**822** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C3-Decalins	**388** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C4-Decalins	**591** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
Benzo(b)thiophene	**19.3** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C1-Benzo(b)thiophenes	**53.5** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C2-Benzo(b)thiophenes	**191** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C3-Benzo(b)thiophenes	**114** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C4-Benzo(b)thiophenes	**50.1** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS741-S1
Date Sampled: 02/05/20 08:16
Percent Solids: 64
Initial Volume: 3.657
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**225** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
2-Methylnaphthalene	**156** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
1-Methylnaphthalene	**233** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C1-Naphthalenes	**237** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C2-Naphthalenes	**1030** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C3-Naphthalenes	**945** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C4-Naphthalenes	**607** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
Biphenyl	**67.8** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
Acenaphthylene	**613** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
Acenaphthene	**2890** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
Dibenzofuran	**189** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
Fluorene	**715** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C1-Fluorenes	**626** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C2-Fluorenes	**642** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C3-Fluorenes	**764** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
Dibenzothiophene	**663** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C1-Dibenzothiophenes	**749** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C2-Dibenzothiophenes	**925** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C3-Dibenzothiophenes	**888** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C4-Dibenzothiophenes	**530** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
Phenanthrene	**6800** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
Anthracene	**1720** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C1-Phenanthrenes/Anthracenes	**3620** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C2-Phenanthrenes/Anthracenes	**2320** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C3-Phenanthrenes/Anthracenes	**1320** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C4-Phenanthrenes/Anthracenes	**1230** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
Retene	**436** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
Benzo(b)naphtho(2,1-d)thiophene	**640** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C0-Benzonaphthothiophenes	**1180** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C1-Benzonaphthothiophenes	**911** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C2-Benzonaphthothiophenes	**782** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C3-Benzonaphthothiophenes	**607** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS741-S1
Date Sampled: 02/05/20 08:16
Percent Solids: 64
Initial Volume: 3.657
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**293** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
Fluoranthene	**8660** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
Pyrene	**8560** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C1-Fluoranthenes/Pyrenes	**4150** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C2-Fluoranthenes/Pyrenes	**2250** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C3-Fluoranthenes/Pyrenes	**1150** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
Benzo(b)fluorene	**513** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
Benzo(c)fluorene	**542** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
2-Methylpyrene	**537** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
4-Methylpyrene	**483** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
1-Methylpyrene	**388** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
Benz(a)anthracene	**3890** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
Chrysene/triphenylene	**3960** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C1-Benzo(a)anthracenes/Chrysenes	**2350** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C2-Benzo(a)anthracenes/Chrysenes	**1360** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C3-Benzo(a)anthracenes/Chrysenes	**811** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C4-Benzo(a)anthracenes/Chrysenes	**438** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
Benzo(b)fluoranthene	**2840** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
Benzo(j/k)fluoranthene	**3080** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
Benzo(e)pyrene	**2460** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
Benzo(a)pyrene	**3710** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
Perylene	**880** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
Indeno(1,2,3-cd)pyrene	**2700** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
Dibenzo(a,h)anthracene	**602** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
Benzo(g,h,i)perylene	**2100** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
Coronene	**597** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
Tetramethyl lead	ND (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
Trimethylethyl lead	ND (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
Dimethyldiethyl lead	ND (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
Methyltriethyl lead	ND (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
Tetraethyl lead	ND (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
2,6,10-trimethyldodecane (1380)	**695** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS741-S1
Date Sampled: 02/05/20 08:16
Percent Solids: 64
Initial Volume: 3.657
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**1030** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
2,6,10-trimethylpentadecane (1650)	**796** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C-17	**258** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
Pristane	**2110** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
C-18	**202** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
Phytane	**2020** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
Carbazole	**399** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
2,6-Dimethylnaphthalene	**106** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
2,3,5-Trimethylnaphthene	**74.3** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
4-Methyldibenzothiophene	**265** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
2/3-Methyldibenzothiophene	**250** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
1-Methyldibenzothiophene	**103** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
3-Methylphenanthrene	**854** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
2-Methylphenanthrene	**1010** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
2-Methylanthracene	**356** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
4/9-Methylphenanthrene	**861** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301
1-Methylphenanthrene	**540** (8.52)	4.26	8270 Mod		1	02/15/20 8:02	F0B0006	FB01301

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*66 %*		*50-120*
Surrogate: Naphthalene-d8	*76 %*		*50-120*
Surrogate: Phenanthrene-d10	*81 %*		*50-120*
Surrogate: Perylene-d12	*75 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS741-S1
Date Sampled: 02/05/20 08:16
Percent Solids: 64

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**23100** (94.8)		TOC-LK		1	CCP	02/20/20 15:15	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS741-S3
Date Sampled: 02/05/20 08:43
Percent Solids: 76
Initial Volume: 5.351
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C1-Benzene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C2-Benzenes	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C3-Benzenes	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C4-Benzenes	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C5-Benzenes	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
Methylcyclohexane	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
Toluene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
Ethylbenzene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
m,p-Xylene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
Styrene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
o-Xylene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
Isopropylbenzene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
n-Propylbenzene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
1,3,5-Trimethylbenzene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
1,2,3-Trimethylbenzene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
1,2,4-Trimethylbenzene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
t-Butylbenzene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
sec-Butylbenzene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
p-Isopropyltoluene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
n-Butylbenzene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
trans-Decalin	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
cis-Decalin	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C1-Decalins	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C2-Decalins	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C3-Decalins	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C4-Decalins	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
Benzo(b)thiophene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C1-Benzo(b)thiophenes	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C2-Benzo(b)thiophenes	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C3-Benzo(b)thiophenes	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C4-Benzo(b)thiophenes	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS741-S3
Date Sampled: 02/05/20 08:43
Percent Solids: 76
Initial Volume: 5.351
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
2-Methylnaphthalene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
1-Methylnaphthalene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C1-Naphthalenes	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C2-Naphthalenes	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C3-Naphthalenes	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C4-Naphthalenes	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
Biphenyl	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
Acenaphthylene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
Acenaphthene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
Dibenzofuran	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
Fluorene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C1-Fluorenes	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C2-Fluorenes	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C3-Fluorenes	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
Dibenzothiophene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C1-Dibenzothiophenes	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C2-Dibenzothiophenes	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C3-Dibenzothiophenes	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C4-Dibenzothiophenes	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
Phenanthrene	**J 2.61** (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
Anthracene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C1-Phenanthrenes/Anthracenes	**J 2.61** (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C2-Phenanthrenes/Anthracenes	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C3-Phenanthrenes/Anthracenes	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C4-Phenanthrenes/Anthracenes	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
Retene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
Benzo(b)naphtho(2,1-d)thiophene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C0-Benzonaphthothiophenes	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C1-Benzonaphthothiophenes	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C2-Benzonaphthothiophenes	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C3-Benzonaphthothiophenes	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS741-S3
Date Sampled: 02/05/20 08:43
Percent Solids: 76
Initial Volume: 5.351
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
Fluoranthene	**J 3.01** (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
Pyrene	**J 3.92** (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C1-Fluoranthenes/Pyrenes	**J 3.85** (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C2-Fluoranthenes/Pyrenes	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C3-Fluoranthenes/Pyrenes	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
Benzo(b)fluorene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
Benzo(c)fluorene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
2-Methylpyrene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
4-Methylpyrene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
1-Methylpyrene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
Benz(a)anthracene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
Chrysene/triphenylene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C1-Benzo(a)anthracenes/Chrysenes	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C2-Benzo(a)anthracenes/Chrysenes	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C3-Benzo(a)anthracenes/Chrysenes	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C4-Benzo(a)anthracenes/Chrysenes	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
Benzo(b)fluoranthene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
Benzo(j/k)fluoranthene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
Benzo(e)pyrene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
Benzo(a)pyrene	**J 2.50** (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
Perylene	**18.2** (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
Indeno(1,2,3-cd)pyrene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
Dibenzo(a,h)anthracene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
Benzo(g,h,i)perylene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
Coronene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
Tetramethyl lead	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
Trimethylethyl lead	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
Dimethyldiethyl lead	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
Methyltriethyl lead	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
Tetraethyl lead	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
2,6,10-trimethyldodecane (1380)	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS741-S3
Date Sampled: 02/05/20 08:43
Percent Solids: 76
Initial Volume: 5.351
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
2,6,10-trimethylpentadecane (1650)	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C-17	B **10.6** (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
Pristane	**5.72** (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
C-18	B **7.36** (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
Phytane	**8.09** (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
Carbazole	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
2,6-Dimethylnaphthalene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
2,3,5-Trimethylnaphthene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
4-Methyldibenzothiophene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
2/3-Methyldibenzothiophene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
1-Methyldibenzothiophene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
3-Methylphenanthrene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
2-Methylphenanthrene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
2-Methylanthracene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
4/9-Methylphenanthrene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301
1-Methylphenanthrene	ND (4.93)	2.46	8270 Mod		1	02/14/20 15:30	F0B0006	FB01301

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*76 %*		*50-120*
Surrogate: Naphthalene-d8	*79 %*		*50-120*
Surrogate: Phenanthrene-d10	*87 %*		*50-120*
Surrogate: Perylene-d12	*80 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS741-S3
Date Sampled: 02/05/20 08:43
Percent Solids: 76

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**1190** (93.6)		TOC-LK		1	CCP	02/20/20 15:56	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS744-S1
Date Sampled: 02/05/20 09:31
Percent Solids: 59
Initial Volume: 5.356
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C1-Benzene	**37.4** (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C2-Benzenes	**11.5** (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C3-Benzenes	**9.78** (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C4-Benzenes	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C5-Benzenes	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
Methylcyclohexane	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
Toluene	**46.5** (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
Ethylbenzene	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
m,p-Xylene	**13.0** (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
Styrene	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
o-Xylene	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
Isopropylbenzene	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
n-Propylbenzene	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
1,3,5-Trimethylbenzene	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
1,2,3-Trimethylbenzene	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
1,2,4-Trimethylbenzene	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
t-Butylbenzene	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
sec-Butylbenzene	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
p-Isopropyltoluene	**17.8** (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
n-Butylbenzene	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
trans-Decalin	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
cis-Decalin	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C1-Decalins	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C2-Decalins	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C3-Decalins	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C4-Decalins	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
Benzo(b)thiophene	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C1-Benzo(b)thiophenes	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C2-Benzo(b)thiophenes	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C3-Benzo(b)thiophenes	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C4-Benzo(b)thiophenes	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS744-S1
Date Sampled: 02/05/20 09:31
Percent Solids: 59
Initial Volume: 5.356
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
2-Methylnaphthalene	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
1-Methylnaphthalene	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C1-Naphthalenes	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C2-Naphthalenes	**J 4.42** (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C3-Naphthalenes	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C4-Naphthalenes	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
Biphenyl	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
Acenaphthylene	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
Acenaphthene	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
Dibenzofuran	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
Fluorene	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C1-Fluorenes	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C2-Fluorenes	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C3-Fluorenes	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
Dibenzothiophene	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C1-Dibenzothiophenes	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C2-Dibenzothiophenes	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C3-Dibenzothiophenes	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C4-Dibenzothiophenes	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
Phenanthrene	**7.85** (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
Anthracene	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C1-Phenanthrenes/Anthracenes	**6.59** (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C2-Phenanthrenes/Anthracenes	**J 5.74** (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C3-Phenanthrenes/Anthracenes	**J 4.02** (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C4-Phenanthrenes/Anthracenes	**82.7** (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
Retene	**378** (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
Benzo(b)naphtho(2,1-d)thiophene	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C0-Benzonaphthothiophenes	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C1-Benzonaphthothiophenes	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C2-Benzonaphthothiophenes	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C3-Benzonaphthothiophenes	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS744-S1
Date Sampled: 02/05/20 09:31
Percent Solids: 59
Initial Volume: 5.356
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
Fluoranthene	**12.0** (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
Pyrene	**13.0** (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C1-Fluoranthenes/Pyrenes	**9.90** (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C2-Fluoranthenes/Pyrenes	**J 4.81** (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C3-Fluoranthenes/Pyrenes	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
Benzo(b)fluorene	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
Benzo(c)fluorene	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
2-Methylpyrene	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
4-Methylpyrene	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
1-Methylpyrene	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
Benz(a)anthracene	**J 5.84** (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
Chrysene/triphenylene	**6.66** (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C1-Benzo(a)anthracenes/Chrysenes	**J 5.57** (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C2-Benzo(a)anthracenes/Chrysenes	**7.56** (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C3-Benzo(a)anthracenes/Chrysenes	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C4-Benzo(a)anthracenes/Chrysenes	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
Benzo(b)fluoranthene	**J 4.97** (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
Benzo(j/k)fluoranthene	**J 4.46** (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
Benzo(e)pyrene	**J 4.52** (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
Benzo(a)pyrene	**J 5.86** (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
Perylene	**101** (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
Indeno(1,2,3-cd)pyrene	**J 3.99** (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
Dibenzo(a,h)anthracene	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
Benzo(g,h,i)perylene	**J 3.61** (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
Coronene	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
Tetramethyl lead	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
Trimethylethyl lead	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
Dimethyldiethyl lead	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
Methyltriethyl lead	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
Tetraethyl lead	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
2,6,10-trimethyldodecane (1380)	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS744-S1
Date Sampled: 02/05/20 09:31
Percent Solids: 59
Initial Volume: 5.356
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**J 4.25** (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
2,6,10-trimethylpentadecane (1650)	**J 5.57** (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C-17	**B 41.1** (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
Pristane	**13.5** (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
C-18	**B 20.4** (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
Phytane	**20.8** (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
Carbazole	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
2,6-Dimethylnaphthalene	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
2,3,5-Trimethylnaphthene	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
4-Methyldibenzothiophene	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
2/3-Methyldibenzothiophene	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
1-Methyldibenzothiophene	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
3-Methylphenanthrene	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
2-Methylphenanthrene	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
2-Methylanthracene	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
4/9-Methylphenanthrene	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301
1-Methylphenanthrene	ND (6.31)	3.15	8270 Mod		1	02/15/20 3:54	F0B0006	FB01301

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*70 %*		*50-120*
Surrogate: Naphthalene-d8	*74 %*		*50-120*
Surrogate: Phenanthrene-d10	*85 %*		*50-120*
Surrogate: Perylene-d12	*80 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS744-S1
Date Sampled: 02/05/20 09:31
Percent Solids: 59

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**31600** (97.7)		TOC-LK		1	CCP	02/20/20 17:02	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS744-S2
Date Sampled: 02/05/20 09:47
Percent Solids: 77
Initial Volume: 5.512
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C1-Benzene	J **4.54** (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C2-Benzenes	J **3.26** (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C3-Benzenes	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C4-Benzenes	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C5-Benzenes	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
Methylcyclohexane	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
Toluene	**5.56** (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
Ethylbenzene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
m,p-Xylene	J **3.10** (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
Styrene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
o-Xylene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
Isopropylbenzene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
n-Propylbenzene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
1,3,5-Trimethylbenzene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
1,2,3-Trimethylbenzene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
1,2,4-Trimethylbenzene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
t-Butylbenzene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
sec-Butylbenzene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
p-Isopropyltoluene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
n-Butylbenzene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
trans-Decalin	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
cis-Decalin	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C1-Decalins	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C2-Decalins	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C3-Decalins	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C4-Decalins	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
Benzo(b)thiophene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C1-Benzo(b)thiophenes	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C2-Benzo(b)thiophenes	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C3-Benzo(b)thiophenes	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C4-Benzo(b)thiophenes	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS744-S2
Date Sampled: 02/05/20 09:47
Percent Solids: 77
Initial Volume: 5.512
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
2-Methylnaphthalene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
1-Methylnaphthalene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C1-Naphthalenes	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C2-Naphthalenes	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C3-Naphthalenes	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C4-Naphthalenes	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
Biphenyl	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
Acenaphthylene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
Acenaphthene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
Dibenzofuran	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
Fluorene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C1-Fluorenes	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C2-Fluorenes	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C3-Fluorenes	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
Dibenzothiophene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C1-Dibenzothiophenes	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C2-Dibenzothiophenes	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C3-Dibenzothiophenes	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C4-Dibenzothiophenes	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
Phenanthrene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
Anthracene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C1-Phenanthrenes/Anthracenes	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C2-Phenanthrenes/Anthracenes	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C3-Phenanthrenes/Anthracenes	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C4-Phenanthrenes/Anthracenes	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
Retene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
Benzo(b)naphtho(2,1-d)thiophene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C0-Benzonaphthothiophenes	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C1-Benzonaphthothiophenes	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C2-Benzonaphthothiophenes	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C3-Benzonaphthothiophenes	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS744-S2
Date Sampled: 02/05/20 09:47
Percent Solids: 77
Initial Volume: 5.512
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
Fluoranthene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
Pyrene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C1-Fluoranthenes/Pyrenes	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C2-Fluoranthenes/Pyrenes	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C3-Fluoranthenes/Pyrenes	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
Benzo(b)fluorene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
Benzo(c)fluorene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
2-Methylpyrene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
4-Methylpyrene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
1-Methylpyrene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
Benz(a)anthracene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
Chrysene/triphenylene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C1-Benzo(a)anthracenes/Chrysenes	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C2-Benzo(a)anthracenes/Chrysenes	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C3-Benzo(a)anthracenes/Chrysenes	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C4-Benzo(a)anthracenes/Chrysenes	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
Benzo(b)fluoranthene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
Benzo(j/k)fluoranthene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
Benzo(e)pyrene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
Benzo(a)pyrene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
Perylene	**132** (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
Indeno(1,2,3-cd)pyrene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
Dibenzo(a,h)anthracene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
Benzo(g,h,i)perylene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
Coronene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
Tetramethyl lead	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
Trimethylethyl lead	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
Dimethyldiethyl lead	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
Methyltriethyl lead	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
Tetraethyl lead	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
2,6,10-trimethyldodecane (1380)	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS744-S2
Date Sampled: 02/05/20 09:47
Percent Solids: 77
Initial Volume: 5.512
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
2,6,10-trimethylpentadecane (1650)	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C-17	**B 14.6** (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
Pristane	**8.01** (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
C-18	**B 11.6** (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
Phytane	**9.96** (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
Carbazole	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
2,6-Dimethylnaphthalene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
2,3,5-Trimethylnaphthene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
4-Methyldibenzothiophene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
2/3-Methyldibenzothiophene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
1-Methyldibenzothiophene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
3-Methylphenanthrene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
2-Methylphenanthrene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
2-Methylanthracene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
4/9-Methylphenanthrene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301
1-Methylphenanthrene	ND (4.74)	2.37	8270 Mod		1	02/14/20 16:53	F0B0006	FB01301

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*70 %*		*50-120*
Surrogate: Naphthalene-d8	*76 %*		*50-120*
Surrogate: Phenanthrene-d10	*83 %*		*50-120*
Surrogate: Perylene-d12	*62 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS744-S2
Date Sampled: 02/05/20 09:47
Percent Solids: 77

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-04
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**33600** (94.7)		TOC-LK		1	CCP	02/20/20 17:19	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS748-S1
Date Sampled: 02/05/20 10:22
Percent Solids: 55
Initial Volume: 5.04
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**36.6** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C1-Benzene	**483** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C2-Benzenes	**187** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C3-Benzenes	**187** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C4-Benzenes	**451** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C5-Benzenes	**554** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
Methylcyclohexane	**J 23.4** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
Toluene	**601** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
Ethylbenzene	**69.0** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
m,p-Xylene	**166** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
Styrene	**260** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
o-Xylene	**J 19.9** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
Isopropylbenzene	ND (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
n-Propylbenzene	**J 18.2** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
1,3,5-Trimethylbenzene	**J 29.5** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
1,2,3-Trimethylbenzene	**J 21.0** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
1,2,4-Trimethylbenzene	**75.6** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
t-Butylbenzene	ND (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
sec-Butylbenzene	ND (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
p-Isopropyltoluene	**J 30.2** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
n-Butylbenzene	**36.3** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
trans-Decalin	**114** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
cis-Decalin	**J 32.7** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C1-Decalins	**457** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C2-Decalins	**1020** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C3-Decalins	**997** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C4-Decalins	**1820** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
Benzo(b)thiophene	**51.8** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C1-Benzo(b)thiophenes	**120** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C2-Benzo(b)thiophenes	**426** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C3-Benzo(b)thiophenes	**590** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C4-Benzo(b)thiophenes	**323** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS748-S1
Date Sampled: 02/05/20 10:22
Percent Solids: 55
Initial Volume: 5.04
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**1350** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
2-Methylnaphthalene	**1460** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
1-Methylnaphthalene	**3860** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C1-Naphthalenes	**3140** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C2-Naphthalenes	**11000** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C3-Naphthalenes	**11600** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C4-Naphthalenes	**5480** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
Biphenyl	**548** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
Acenaphthylene	**2910** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
Acenaphthene	**6870** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
Dibenzofuran	**611** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
Fluorene	**7140** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C1-Fluorenes	**8060** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C2-Fluorenes	**7550** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C3-Fluorenes	**3890** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
Dibenzothiophene	**2700** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C1-Dibenzothiophenes	**5290** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C2-Dibenzothiophenes	**4980** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C3-Dibenzothiophenes	**3030** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C4-Dibenzothiophenes	**1140** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
Phenanthrene	**39800** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
Anthracene	**13900** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C1-Phenanthrenes/Anthracenes	**42200** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C2-Phenanthrenes/Anthracenes	**22100** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C3-Phenanthrenes/Anthracenes	**8440** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C4-Phenanthrenes/Anthracenes	**5540** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
Retene	**1610** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
Benzo(b)naphtho(2,1-d)thiophene	**2550** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C0-Benzonaphthothiophenes	**4490** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C1-Benzonaphthothiophenes	**4310** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C2-Benzonaphthothiophenes	**2550** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C3-Benzonaphthothiophenes	**1430** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS748-S1
Date Sampled: 02/05/20 10:22
Percent Solids: 55
Initial Volume: 5.04
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**429** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
Fluoranthene	**29800** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
Pyrene	**42300** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C1-Fluoranthenes/Pyrenes	**32600** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C2-Fluoranthenes/Pyrenes	**13800** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C3-Fluoranthenes/Pyrenes	**5590** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
Benzo(b)fluorene	**3320** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
Benzo(c)fluorene	**1700** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
2-Methylpyrene	**4330** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
4-Methylpyrene	**4030** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
1-Methylpyrene	**3820** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
Benz(a)anthracene	**17100** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
Chrysene/triphenylene	**18600** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C1-Benzo(a)anthracenes/Chrysenes	**16000** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C2-Benzo(a)anthracenes/Chrysenes	**7630** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C3-Benzo(a)anthracenes/Chrysenes	**3190** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C4-Benzo(a)anthracenes/Chrysenes	**1220** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
Benzo(b)fluoranthene	**7200** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
Benzo(j/k)fluoranthene	**9270** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
Benzo(e)pyrene	**8000** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
Benzo(a)pyrene	**12700** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
Perylene	**2070** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
Indeno(1,2,3-cd)pyrene	**6570** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
Dibenzo(a,h)anthracene	**1690** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
Benzo(g,h,i)perylene	**5390** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
Coronene	**1480** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
Tetramethyl lead	ND (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
Trimethylethyl lead	ND (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
Dimethyldiethyl lead	ND (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
Methyltriethyl lead	ND (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
Tetraethyl lead	ND (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
2,6,10-trimethyldodecane (1380)	**1220** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS748-S1
Date Sampled: 02/05/20 10:22
Percent Solids: 55
Initial Volume: 5.04
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**2110** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
2,6,10-trimethylpentadecane (1650)	**2600** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C-17	**685** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
Pristane	**5220** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
C-18	**608** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
Phytane	**4310** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
Carbazole	**105** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
2,6-Dimethylnaphthalene	**2520** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
2,3,5-Trimethylnaphthene	**722** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
4-Methyldibenzothiophene	**2340** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
2/3-Methyldibenzothiophene	**1750** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
1-Methyldibenzothiophene	**532** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
3-Methylphenanthrene	**9010** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
2-Methylphenanthrene	**10300** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
2-Methylanthracene	**4590** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
4/9-Methylphenanthrene	**10800** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301
1-Methylphenanthrene	**7470** (36.2)	18.1	8270 Mod		5	02/14/20 1:35	F0B0006	FB01301

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*59 %*		*50-120*
Surrogate: Naphthalene-d8	*65 %*		*50-120*
Surrogate: Phenanthrene-d10	*72 %*		*50-120*
Surrogate: Perylene-d12	*80 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS748-S1
Date Sampled: 02/05/20 10:22
Percent Solids: 55

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-05
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**55200** (96.4)		TOC-LK		1	CCP	02/20/20 17:36	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS748-S3
Date Sampled: 02/05/20 10:51
Percent Solids: 85
Initial Volume: 5.162
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C1-Benzene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C2-Benzenes	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C3-Benzenes	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C4-Benzenes	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C5-Benzenes	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
Methylcyclohexane	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
Toluene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
Ethylbenzene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
m,p-Xylene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
Styrene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
o-Xylene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
Isopropylbenzene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
n-Propylbenzene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
1,3,5-Trimethylbenzene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
1,2,3-Trimethylbenzene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
1,2,4-Trimethylbenzene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
t-Butylbenzene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
sec-Butylbenzene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
p-Isopropyltoluene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
n-Butylbenzene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
trans-Decalin	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
cis-Decalin	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C1-Decalins	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C2-Decalins	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C3-Decalins	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C4-Decalins	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
Benzo(b)thiophene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C1-Benzo(b)thiophenes	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C2-Benzo(b)thiophenes	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C3-Benzo(b)thiophenes	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C4-Benzo(b)thiophenes	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS748-S3
Date Sampled: 02/05/20 10:51
Percent Solids: 85
Initial Volume: 5.162
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
2-Methylnaphthalene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
1-Methylnaphthalene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C1-Naphthalenes	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C2-Naphthalenes	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C3-Naphthalenes	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C4-Naphthalenes	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
Biphenyl	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
Acenaphthylene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
Acenaphthene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
Dibenzofuran	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
Fluorene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C1-Fluorenes	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C2-Fluorenes	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C3-Fluorenes	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
Dibenzothiophene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C1-Dibenzothiophenes	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C2-Dibenzothiophenes	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C3-Dibenzothiophenes	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C4-Dibenzothiophenes	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
Phenanthrene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
Anthracene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C1-Phenanthrenes/Anthracenes	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C2-Phenanthrenes/Anthracenes	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C3-Phenanthrenes/Anthracenes	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C4-Phenanthrenes/Anthracenes	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
Retene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
Benzo(b)naphtho(2,1-d)thiophene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C0-Benzonaphthothiophenes	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C1-Benzonaphthothiophenes	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C2-Benzonaphthothiophenes	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C3-Benzonaphthothiophenes	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS748-S3
Date Sampled: 02/05/20 10:51
Percent Solids: 85
Initial Volume: 5.162
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
Fluoranthene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
Pyrene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C1-Fluoranthenes/Pyrenes	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C2-Fluoranthenes/Pyrenes	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C3-Fluoranthenes/Pyrenes	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
Benzo(b)fluorene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
Benzo(c)fluorene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
2-Methylpyrene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
4-Methylpyrene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
1-Methylpyrene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
Benz(a)anthracene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
Chrysene/triphenylene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C1-Benzo(a)anthracenes/Chrysenes	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C2-Benzo(a)anthracenes/Chrysenes	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C3-Benzo(a)anthracenes/Chrysenes	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C4-Benzo(a)anthracenes/Chrysenes	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
Benzo(b)fluoranthene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
Benzo(j/k)fluoranthene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
Benzo(e)pyrene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
Benzo(a)pyrene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
Perylene	**J 4.37** (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
Indeno(1,2,3-cd)pyrene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
Dibenzo(a,h)anthracene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
Benzo(g,h,i)perylene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
Coronene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
Tetramethyl lead	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
Trimethylethyl lead	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
Dimethyldiethyl lead	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
Methyltriethyl lead	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
Tetraethyl lead	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
2,6,10-trimethyldodecane (1380)	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS748-S3
Date Sampled: 02/05/20 10:51
Percent Solids: 85
Initial Volume: 5.162
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	J **2.48** (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
2,6,10-trimethylpentadecane (1650)	**7.39** (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C-17	B **24.9** (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
Pristane	**18.5** (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
C-18	B **19.4** (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
Phytane	**20.7** (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
Carbazole	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
2,6-Dimethylnaphthalene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
2,3,5-Trimethylnaphthene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
4-Methyldibenzothiophene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
2/3-Methyldibenzothiophene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
1-Methyldibenzothiophene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
3-Methylphenanthrene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
2-Methylphenanthrene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
2-Methylanthracene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
4/9-Methylphenanthrene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301
1-Methylphenanthrene	ND (4.55)	2.28	8270 Mod		1	02/14/20 18:16	F0B0006	FB01301

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*67 %*		*50-120*
Surrogate: Naphthalene-d8	*69 %*		*50-120*
Surrogate: Phenanthrene-d10	*76 %*		*50-120*
Surrogate: Perylene-d12	*67 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS748-S3
Date Sampled: 02/05/20 10:51
Percent Solids: 85

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-06
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**2190** (96.4)		TOC-LK		1	CCP	02/20/20 17:52	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS755-S1
Date Sampled: 02/05/20 11:07
Percent Solids: 53
Initial Volume: 5.245
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**J 5.33** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C1-Benzene	**68.1** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C2-Benzenes	**36.0** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C3-Benzenes	**20.1** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C4-Benzenes	**20.4** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C5-Benzenes	**16.8** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
Methylcyclohexane	**J 5.79** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
Toluene	**84.3** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
Ethylbenzene	**J 3.64** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
m,p-Xylene	**46.0** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
Styrene	**J 5.06** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
o-Xylene	**J 6.13** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
Isopropylbenzene	ND (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
n-Propylbenzene	ND (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
1,3,5-Trimethylbenzene	**J 4.36** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
1,2,3-Trimethylbenzene	ND (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
1,2,4-Trimethylbenzene	**10.2** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
t-Butylbenzene	ND (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
sec-Butylbenzene	ND (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
p-Isopropyltoluene	**J 5.96** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
n-Butylbenzene	ND (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
trans-Decalin	**15.9** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
cis-Decalin	ND (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C1-Decalins	**23.2** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C2-Decalins	**29.0** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C3-Decalins	**22.7** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C4-Decalins	**37.7** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
Benzo(b)thiophene	ND (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C1-Benzo(b)thiophenes	**J 5.30** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C2-Benzo(b)thiophenes	**10.1** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C3-Benzo(b)thiophenes	**9.45** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C4-Benzo(b)thiophenes	**J 5.24** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS755-S1
Date Sampled: 02/05/20 11:07
Percent Solids: 53
Initial Volume: 5.245
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**45.3** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
2-Methylnaphthalene	**35.6** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
1-Methylnaphthalene	**29.9** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C1-Naphthalenes	**40.3** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C2-Naphthalenes	**97.5** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C3-Naphthalenes	**108** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C4-Naphthalenes	**75.2** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
Biphenyl	**13.0** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
Acenaphthylene	**41.1** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
Acenaphthene	**47.8** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
Dibenzofuran	**21.7** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
Fluorene	**53.7** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C1-Fluorenes	**52.2** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C2-Fluorenes	**93.8** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C3-Fluorenes	**72.7** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
Dibenzothiophene	**27.4** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C1-Dibenzothiophenes	**45.9** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C2-Dibenzothiophenes	**52.8** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C3-Dibenzothiophenes	**41.6** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C4-Dibenzothiophenes	**24.1** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
Phenanthrene	**343** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
Anthracene	**125** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C1-Phenanthrenes/Anthracenes	**383** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C2-Phenanthrenes/Anthracenes	**289** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C3-Phenanthrenes/Anthracenes	**147** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C4-Phenanthrenes/Anthracenes	**124** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
Retene	**63.4** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
Benzo(b)naphtho(2,1-d)thiophene	**46.7** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C0-Benzonaphthothiophenes	**85.8** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C1-Benzonaphthothiophenes	**73.2** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C2-Benzonaphthothiophenes	**56.7** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C3-Benzonaphthothiophenes	**37.7** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS755-S1
Date Sampled: 02/05/20 11:07
Percent Solids: 53
Initial Volume: 5.245
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**15.2** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
Fluoranthene	**661** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
Pyrene	**789** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C1-Fluoranthenes/Pyrenes	**467** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C2-Fluoranthenes/Pyrenes	**247** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C3-Fluoranthenes/Pyrenes	**141** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
Benzo(b)fluorene	**50.2** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
Benzo(c)fluorene	**25.2** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
2-Methylpyrene	**62.5** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
4-Methylpyrene	**61.0** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
1-Methylpyrene	**46.9** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
Benz(a)anthracene	**377** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
Chrysene/triphenylene	**397** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C1-Benzo(a)anthracenes/Chrysenes	**306** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C2-Benzo(a)anthracenes/Chrysenes	**184** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C3-Benzo(a)anthracenes/Chrysenes	**112** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C4-Benzo(a)anthracenes/Chrysenes	**64.1** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
Benzo(b)fluoranthene	**255** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
Benzo(j/k)fluoranthene	**288** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
Benzo(e)pyrene	**247** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
Benzo(a)pyrene	**349** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
Perylene	**806** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
Indeno(1,2,3-cd)pyrene	**230** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
Dibenzo(a,h)anthracene	**52.2** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
Benzo(g,h,i)perylene	**190** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
Coronene	**50.5** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
Tetramethyl lead	ND (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
Trimethylethyl lead	ND (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
Dimethyldiethyl lead	ND (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
Methyltriethyl lead	ND (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
Tetraethyl lead	ND (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
2,6,10-trimethyldodecane (1380)	**16.6** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS755-S1
Date Sampled: 02/05/20 11:07
Percent Solids: 53
Initial Volume: 5.245
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**45.8** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
2,6,10-trimethylpentadecane (1650)	**65.5** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C-17	**123** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
Pristane	**144** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
C-18	**B 74.8** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
Phytane	**131** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
Carbazole	**22.2** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
2,6-Dimethylnaphthalene	**23.8** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
2,3,5-Trimethylnaphthene	**8.18** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
4-Methyldibenzothiophene	**17.2** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
2/3-Methyldibenzothiophene	**14.4** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
1-Methyldibenzothiophene	**J 4.59** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
3-Methylphenanthrene	**94.0** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
2-Methylphenanthrene	**91.2** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
2-Methylanthracene	**44.0** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
4/9-Methylphenanthrene	**110** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301
1-Methylphenanthrene	**39.7** (7.15)	3.58	8270 Mod		1	02/15/20 5:16	F0B0006	FB01301

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*64 %*		*50-120*
Surrogate: Naphthalene-d8	*72 %*		*50-120*
Surrogate: Phenanthrene-d10	*77 %*		*50-120*
Surrogate: Perylene-d12	*70 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS755-S1
Date Sampled: 02/05/20 11:07
Percent Solids: 53

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-07
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**36400** (94.4)		TOC-LK		1	CCP	02/20/20 18:09	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS756-S1
Date Sampled: 02/05/20 11:46
Percent Solids: 44
Initial Volume: 5.386
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C1-Benzene	**477** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C2-Benzenes	**143** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C3-Benzenes	**55.4** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C4-Benzenes	**262** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C5-Benzenes	**455** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
Methylcyclohexane	ND (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
Toluene	**612** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
Ethylbenzene	**20.7** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
m,p-Xylene	**203** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
Styrene	**24.0** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
o-Xylene	**11.0** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
Isopropylbenzene	ND (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
n-Propylbenzene	**10.7** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
1,3,5-Trimethylbenzene	**9.18** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
1,2,3-Trimethylbenzene	**14.6** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
1,2,4-Trimethylbenzene	**25.2** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
t-Butylbenzene	ND (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
sec-Butylbenzene	**J 4.74** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
p-Isopropyltoluene	**10.3** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
n-Butylbenzene	**73.0** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
trans-Decalin	**5220** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
cis-Decalin	**578** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C1-Decalins	**5550** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C2-Decalins	**2450** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C3-Decalins	**1320** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C4-Decalins	**2380** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
Benzo(b)thiophene	**10.5** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C1-Benzo(b)thiophenes	**37.7** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C2-Benzo(b)thiophenes	**85.7** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C3-Benzo(b)thiophenes	**153** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C4-Benzo(b)thiophenes	**141** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS756-S1
Date Sampled: 02/05/20 11:46
Percent Solids: 44
Initial Volume: 5.386
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**84.2** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
2-Methylnaphthalene	**80.0** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
1-Methylnaphthalene	**41.7** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C1-Naphthalenes	**78.6** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C2-Naphthalenes	**598** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C3-Naphthalenes	**2480** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C4-Naphthalenes	**2360** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
Biphenyl	**50.6** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
Acenaphthylene	**205** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
Acenaphthene	**227** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
Dibenzofuran	**40.5** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
Fluorene	**89.5** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C1-Fluorenes	**569** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C2-Fluorenes	**1300** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C3-Fluorenes	**1020** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
Dibenzothiophene	**193** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C1-Dibenzothiophenes	**728** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C2-Dibenzothiophenes	**1010** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C3-Dibenzothiophenes	**790** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C4-Dibenzothiophenes	**414** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
Phenanthrene	**1660** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
Anthracene	**449** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C1-Phenanthrenes/Anthracenes	**2480** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C2-Phenanthrenes/Anthracenes	**2120** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C3-Phenanthrenes/Anthracenes	**1050** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C4-Phenanthrenes/Anthracenes	**631** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
Retene	**87.5** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
Benzo(b)naphtho(2,1-d)thiophene	**188** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C0-Benzonaphthothiophenes	**337** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C1-Benzonaphthothiophenes	**345** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C2-Benzonaphthothiophenes	**344** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C3-Benzonaphthothiophenes	**286** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS756-S1
Date Sampled: 02/05/20 11:46
Percent Solids: 44
Initial Volume: 5.386
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**153** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
Fluoranthene	**2460** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
Pyrene	**3020** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C1-Fluoranthenes/Pyrenes	**1560** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C2-Fluoranthenes/Pyrenes	**760** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C3-Fluoranthenes/Pyrenes	**389** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
Benzo(b)fluorene	**174** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
Benzo(c)fluorene	**84.5** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
2-Methylpyrene	**214** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
4-Methylpyrene	**207** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
1-Methylpyrene	**163** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
Benz(a)anthracene	**970** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
Chrysene/triphenylene	**1120** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C1-Benzo(a)anthracenes/Chrysenes	**757** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C2-Benzo(a)anthracenes/Chrysenes	**499** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C3-Benzo(a)anthracenes/Chrysenes	**305** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C4-Benzo(a)anthracenes/Chrysenes	**196** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
Benzo(b)fluoranthene	**696** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
Benzo(j/k)fluoranthene	**707** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
Benzo(e)pyrene	**656** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
Benzo(a)pyrene	**908** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
Perylene	**774** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
Indeno(1,2,3-cd)pyrene	**631** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
Dibenzo(a,h)anthracene	**132** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
Benzo(g,h,i)perylene	**544** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
Coronene	**170** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
Tetramethyl lead	ND (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
Trimethylethyl lead	ND (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
Dimethyldiethyl lead	ND (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
Methyltriethyl lead	ND (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
Tetraethyl lead	ND (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
2,6,10-trimethyldodecane (1380)	**5300** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS756-S1
Date Sampled: 02/05/20 11:46
Percent Solids: 44
Initial Volume: 5.386
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**6130** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
2,6,10-trimethylpentadecane (1650)	**4210** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C-17	ND (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
Pristane	**9880** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
C-18	ND (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
Phytane	**6040** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
Carbazole	**57.4** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
2,6-Dimethylnaphthalene	**74.9** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
2,3,5-Trimethylnaphthene	**165** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
4-Methyldibenzothiophene	**325** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
2/3-Methyldibenzothiophene	**263** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
1-Methyldibenzothiophene	**76.5** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
3-Methylphenanthrene	**626** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
2-Methylphenanthrene	**693** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
2-Methylanthracene	**157** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
4/9-Methylphenanthrene	**608** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301
1-Methylphenanthrene	**369** (8.49)	4.24	8270 Mod		1	02/15/20 9:24	F0B0006	FB01301

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*59 %*		*50-120*
Surrogate: Naphthalene-d8	*72 %*		*50-120*
Surrogate: Phenanthrene-d10	*75 %*		*50-120*
Surrogate: Perylene-d12	*61 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS756-S1
Date Sampled: 02/05/20 11:46
Percent Solids: 44

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-08
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**63600** (95.8)		TOC-LK		1	CCP	02/20/20 18:59	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS746-S1
Date Sampled: 02/05/20 12:15
Percent Solids: 52
Initial Volume: 5.394
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**39.8** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C1-Benzene	**565** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C2-Benzenes	**353** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C3-Benzenes	**719** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C4-Benzenes	**1960** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C5-Benzenes	**1550** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
Methylcyclohexane	**53.0** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
Toluene	**711** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
Ethylbenzene	**142** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
m,p-Xylene	**342** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
Styrene	**211** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
o-Xylene	**66.8** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
Isopropylbenzene	**42.2** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
n-Propylbenzene	**42.4** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
1,3,5-Trimethylbenzene	**153** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
1,2,3-Trimethylbenzene	**142** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
1,2,4-Trimethylbenzene	**389** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
t-Butylbenzene	ND (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
sec-Butylbenzene	ND (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
p-Isopropyltoluene	**75.5** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
n-Butylbenzene	**86.0** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
trans-Decalin	**83.5** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
cis-Decalin	**39.5** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C1-Decalins	**219** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C2-Decalins	**623** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C3-Decalins	**776** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C4-Decalins	**1940** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
Benzo(b)thiophene	**139** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C1-Benzo(b)thiophenes	**494** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C2-Benzo(b)thiophenes	**1450** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C3-Benzo(b)thiophenes	**1160** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C4-Benzo(b)thiophenes	**471** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS746-S1
Date Sampled: 02/05/20 12:15
Percent Solids: 52
Initial Volume: 5.394
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**5850** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
2-Methylnaphthalene	**2510** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
1-Methylnaphthalene	**22100** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C1-Naphthalenes	**14400** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C2-Naphthalenes	**39200** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C3-Naphthalenes	**25300** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C4-Naphthalenes	**10800** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
Biphenyl	**990** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
Acenaphthylene	**5990** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
Acenaphthene	**26500** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
Dibenzofuran	**1620** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
Fluorene	**19600** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C1-Fluorenes	**18700** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C2-Fluorenes	**18600** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C3-Fluorenes	**11500** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
Dibenzothiophene	**4460** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C1-Dibenzothiophenes	**10300** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C2-Dibenzothiophenes	**11000** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C3-Dibenzothiophenes	**7400** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C4-Dibenzothiophenes	**2850** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
Phenanthrene	**65700** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
Anthracene	**22100** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C1-Phenanthrenes/Anthracenes	**88500** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C2-Phenanthrenes/Anthracenes	**58000** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C3-Phenanthrenes/Anthracenes	**25000** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C4-Phenanthrenes/Anthracenes	**13800** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
Retene	**1870** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
Benzo(b)naphtho(2,1-d)thiophene	**5020** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C0-Benzonaphthothiophenes	**8310** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C1-Benzonaphthothiophenes	**8920** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C2-Benzonaphthothiophenes	**4770** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C3-Benzonaphthothiophenes	**2260** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS746-S1
Date Sampled: 02/05/20 12:15
Percent Solids: 52
Initial Volume: 5.394
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**599** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
Fluoranthene	**48300** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
Pyrene	**70600** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C1-Fluoranthenes/Pyrenes	**73500** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C2-Fluoranthenes/Pyrenes	**34800** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C3-Fluoranthenes/Pyrenes	**14000** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
Benzo(b)fluorene	**7040** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
Benzo(c)fluorene	**3460** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
2-Methylpyrene	**10600** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
4-Methylpyrene	**10100** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
1-Methylpyrene	**8480** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
Benz(a)anthracene	**33900** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
Chrysene/triphenylene	**40000** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C1-Benzo(a)anthracenes/Chrysenes	**38200** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C2-Benzo(a)anthracenes/Chrysenes	**17300** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C3-Benzo(a)anthracenes/Chrysenes	**6580** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C4-Benzo(a)anthracenes/Chrysenes	**2170** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
Benzo(b)fluoranthene	**16000** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
Benzo(j/k)fluoranthene	**18800** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
Benzo(e)pyrene	**18700** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
Benzo(a)pyrene	**25100** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
Perylene	**3940** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
Indeno(1,2,3-cd)pyrene	**13500** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
Dibenzo(a,h)anthracene	**3300** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
Benzo(g,h,i)perylene	**11400** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
Coronene	**3040** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
Tetramethyl lead	ND (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
Trimethylethyl lead	ND (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
Dimethyldiethyl lead	ND (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
Methyltriethyl lead	ND (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
Tetraethyl lead	ND (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
2,6,10-trimethyldodecane (1380)	**1080** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS746-S1
Date Sampled: 02/05/20 12:15
Percent Solids: 52
Initial Volume: 5.394
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**2440** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
2,6,10-trimethylpentadecane (1650)	**4670** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C-17	**1450** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
Pristane	**11100** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
C-18	**1770** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
Phytane	**12500** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
Carbazole	**203** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
2,6-Dimethylnaphthalene	**8540** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
2,3,5-Trimethylnaphthene	**1780** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
4-Methyldibenzothiophene	**4450** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
2/3-Methyldibenzothiophene	**3330** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
1-Methyldibenzothiophene	**908** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
3-Methylphenanthrene	**19500** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
2-Methylphenanthrene	**22200** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
2-Methylanthracene	**8180** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
4/9-Methylphenanthrene	**22400** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301
1-Methylphenanthrene	**16200** (36.0)	18.0	8270 Mod		5	02/14/20 4:21	F0B0006	FB01301

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*68 %*		*50-120*
Surrogate: Naphthalene-d8	*75 %*		*50-120*
Surrogate: Phenanthrene-d10	*85 %*		*50-120*
Surrogate: Perylene-d12	*106 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS746-S1
Date Sampled: 02/05/20 12:15
Percent Solids: 52

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-09
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**71400** (94.7)		TOC-LK		1	CCP	02/20/20 19:15	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS746-S3
Date Sampled: 02/05/20 12:41
Percent Solids: 80
Initial Volume: 5.697
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C1-Benzene	**J 2.70** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C2-Benzenes	**J 3.23** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C3-Benzenes	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C4-Benzenes	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C5-Benzenes	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
Methylcyclohexane	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
Toluene	**J 3.49** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
Ethylbenzene	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
m,p-Xylene	**J 2.82** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
Styrene	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
o-Xylene	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
Isopropylbenzene	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
n-Propylbenzene	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
1,3,5-Trimethylbenzene	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
1,2,3-Trimethylbenzene	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
1,2,4-Trimethylbenzene	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
t-Butylbenzene	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
sec-Butylbenzene	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
p-Isopropyltoluene	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
n-Butylbenzene	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
trans-Decalin	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
cis-Decalin	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C1-Decalins	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C2-Decalins	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C3-Decalins	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C4-Decalins	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
Benzo(b)thiophene	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C1-Benzo(b)thiophenes	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C2-Benzo(b)thiophenes	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C3-Benzo(b)thiophenes	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C4-Benzo(b)thiophenes	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS746-S3
Date Sampled: 02/05/20 12:41
Percent Solids: 80
Initial Volume: 5.697
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**5.51** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
2-Methylnaphthalene	J **2.55** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
1-Methylnaphthalene	**8.83** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C1-Naphthalenes	**7.08** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C2-Naphthalenes	**18.2** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C3-Naphthalenes	**13.4** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C4-Naphthalenes	**6.31** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
Biphenyl	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
Acenaphthylene	J **3.47** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
Acenaphthene	**11.9** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
Dibenzofuran	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
Fluorene	**8.92** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C1-Fluorenes	**8.17** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C2-Fluorenes	**8.07** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C3-Fluorenes	**6.17** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
Dibenzothiophene	J **2.49** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C1-Dibenzothiophenes	**4.70** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C2-Dibenzothiophenes	**5.76** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C3-Dibenzothiophenes	J **3.54** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C4-Dibenzothiophenes	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
Phenanthrene	**39.1** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
Anthracene	**10.3** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C1-Phenanthrenes/Anthracenes	**37.3** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C2-Phenanthrenes/Anthracenes	**22.8** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C3-Phenanthrenes/Anthracenes	**8.93** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C4-Phenanthrenes/Anthracenes	**5.42** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
Retene	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
Benzo(b)naphtho(2,1-d)thiophene	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C0-Benzonaphthothiophenes	J **3.37** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C1-Benzonaphthothiophenes	J **3.89** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C2-Benzonaphthothiophenes	J **2.63** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C3-Benzonaphthothiophenes	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS746-S3
Date Sampled: 02/05/20 12:41
Percent Solids: 80
Initial Volume: 5.697
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
Fluoranthene	**22.9** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
Pyrene	**34.7** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C1-Fluoranthenes/Pyrenes	**25.5** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C2-Fluoranthenes/Pyrenes	**11.3** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C3-Fluoranthenes/Pyrenes	**5.93** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
Benzo(b)fluorene	**J 2.22** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
Benzo(c)fluorene	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
2-Methylpyrene	**J 3.69** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
4-Methylpyrene	**J 3.57** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
1-Methylpyrene	**J 3.00** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
Benz(a)anthracene	**12.5** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
Chrysene/triphenylene	**15.0** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C1-Benzo(a)anthracenes/Chrysenes	**11.1** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C2-Benzo(a)anthracenes/Chrysenes	**6.96** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C3-Benzo(a)anthracenes/Chrysenes	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C4-Benzo(a)anthracenes/Chrysenes	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
Benzo(b)fluoranthene	**5.85** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
Benzo(j/k)fluoranthene	**7.36** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
Benzo(e)pyrene	**7.29** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
Benzo(a)pyrene	**9.05** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
Perylene	**710** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
Indeno(1,2,3-cd)pyrene	**5.45** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
Dibenzo(a,h)anthracene	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
Benzo(g,h,i)perylene	**4.72** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
Coronene	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
Tetramethyl lead	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
Trimethylethyl lead	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
Dimethyldiethyl lead	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
Methyltriethyl lead	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
Tetraethyl lead	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
2,6,10-trimethyldodecane (1380)	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS746-S3
Date Sampled: 02/05/20 12:41
Percent Solids: 80
Initial Volume: 5.697
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**J 3.71** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
2,6,10-trimethylpentadecane (1650)	**9.24** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C-17	**B 22.9** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
Pristane	**19.9** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
C-18	**B 16.9** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
Phytane	**20.5** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
Carbazole	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
2,6-Dimethylnaphthalene	**J 3.69** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
2,3,5-Trimethylnaphthene	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
4-Methyldibenzothiophene	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
2/3-Methyldibenzothiophene	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
1-Methyldibenzothiophene	ND (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
3-Methylphenanthrene	**8.01** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
2-Methylphenanthrene	**9.30** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
2-Methylanthracene	**J 2.85** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
4/9-Methylphenanthrene	**9.78** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301
1-Methylphenanthrene	**7.11** (4.41)	2.20	8270 Mod		1	02/14/20 19:38	F0B0006	FB01301

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*68 %*		*50-120*
Surrogate: Naphthalene-d8	*76 %*		*50-120*
Surrogate: Phenanthrene-d10	*81 %*		*50-120*
Surrogate: Perylene-d12	*65 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS746-S3
Date Sampled: 02/05/20 12:41
Percent Solids: 80

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-10
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**12600** (95.2)		TOC-LK		1	CCP	02/20/20 19:32	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS754-S1
Date Sampled: 02/05/20 13:01
Percent Solids: 45
Initial Volume: 5.648
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**108** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C1-Benzene	**445** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C2-Benzenes	**491** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C3-Benzenes	**1420** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C4-Benzenes	**3190** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C5-Benzenes	**1660** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
Methylcyclohexane	**J 31.7** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
Toluene	**552** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
Ethylbenzene	**220** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
m,p-Xylene	**478** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
Styrene	**220** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
o-Xylene	**130** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
Isopropylbenzene	**157** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
n-Propylbenzene	**158** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
1,3,5-Trimethylbenzene	**299** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
1,2,3-Trimethylbenzene	**396** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
1,2,4-Trimethylbenzene	**647** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
t-Butylbenzene	**92.6** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
sec-Butylbenzene	**J 38.7** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
p-Isopropyltoluene	**110** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
n-Butylbenzene	**191** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
trans-Decalin	**146** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
cis-Decalin	**52.4** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C1-Decalins	**509** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C2-Decalins	**991** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C3-Decalins	**961** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C4-Decalins	**1510** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
Benzo(b)thiophene	**470** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C1-Benzo(b)thiophenes	**693** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C2-Benzo(b)thiophenes	**1820** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C3-Benzo(b)thiophenes	**1540** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C4-Benzo(b)thiophenes	**508** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS754-S1
Date Sampled: 02/05/20 13:01
Percent Solids: 45
Initial Volume: 5.648
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**9550** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
2-Methylnaphthalene	**4420** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
1-Methylnaphthalene	**31700** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C1-Naphthalenes	**21100** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C2-Naphthalenes	**39600** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C3-Naphthalenes	**18900** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C4-Naphthalenes	**5460** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
Biphenyl	**2210** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
Acenaphthylene	**5110** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
Acenaphthene	**50900** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
Dibenzofuran	**2660** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
Fluorene	**29400** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C1-Fluorenes	**14200** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C2-Fluorenes	**7830** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C3-Fluorenes	**3520** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
Dibenzothiophene	**10600** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C1-Dibenzothiophenes	**10700** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C2-Dibenzothiophenes	**6770** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C3-Dibenzothiophenes	**3500** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C4-Dibenzothiophenes	**1400** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
Phenanthrene	**161000** (789)	394	8270 Mod		100	02/15/20 12:09	F0B0006	FB01301
Anthracene	**47400** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C1-Phenanthrenes/Anthracenes	**71700** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C2-Phenanthrenes/Anthracenes	**23900** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C3-Phenanthrenes/Anthracenes	**7340** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C4-Phenanthrenes/Anthracenes	**8590** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
Retene	**1460** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
Benzo(b)naphtho(2,1-d)thiophene	**6340** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C0-Benzonaphthothiophenes	**11600** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C1-Benzonaphthothiophenes	**6550** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C2-Benzonaphthothiophenes	**2870** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C3-Benzonaphthothiophenes	**1970** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS754-S1
Date Sampled: 02/05/20 13:01
Percent Solids: 45
Initial Volume: 5.648
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**477** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
Fluoranthene	**110000** (789)	394	8270 Mod		100	02/15/20 12:09	F0B0006	FB01301
Pyrene	**169000** (789)	394	8270 Mod		100	02/15/20 12:09	F0B0006	FB01301
C1-Fluoranthenes/Pyrenes	**66500** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C2-Fluoranthenes/Pyrenes	**17600** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C3-Fluoranthenes/Pyrenes	**5220** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
Benzo(b)fluorene	**7950** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
Benzo(c)fluorene	**3460** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
2-Methylpyrene	**9290** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
4-Methylpyrene	**7410** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
1-Methylpyrene	**7990** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
Benz(a)anthracene	**48600** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
Chrysene/triphenylene	**43900** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C1-Benzo(a)anthracenes/Chrysenes	**23900** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C2-Benzo(a)anthracenes/Chrysenes	**7960** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C3-Benzo(a)anthracenes/Chrysenes	**2670** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C4-Benzo(a)anthracenes/Chrysenes	**1220** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
Benzo(b)fluoranthene	**22500** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
Benzo(j/k)fluoranthene	**28700** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
Benzo(e)pyrene	**26100** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
Benzo(a)pyrene	**45600** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
Perylene	**7050** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
Indeno(1,2,3-cd)pyrene	**24100** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
Dibenzo(a,h)anthracene	**4940** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
Benzo(g,h,i)perylene	**21500** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
Coronene	**6440** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
Tetramethyl lead	ND (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
Trimethylethyl lead	ND (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
Dimethyldiethyl lead	ND (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
Methyltriethyl lead	ND (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
Tetraethyl lead	ND (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
2,6,10-trimethyldodecane (1380)	**1680** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS754-S1
Date Sampled: 02/05/20 13:01
Percent Solids: 45
Initial Volume: 5.648
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**2450** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
2,6,10-trimethylpentadecane (1650)	**2660** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C-17	**618** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
Pristane	**5890** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
C-18	**722** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
Phytane	**4960** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
Carbazole	**223** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
2,6-Dimethylnaphthalene	**7770** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
2,3,5-Trimethylnaphthene	**1050** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
4-Methyldibenzothiophene	**4440** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
2/3-Methyldibenzothiophene	**3730** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
1-Methyldibenzothiophene	**1000** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
3-Methylphenanthrene	**16800** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
2-Methylphenanthrene	**18800** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
2-Methylanthracene	**8920** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
4/9-Methylphenanthrene	**15700** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301
1-Methylphenanthrene	**11500** (39.4)	19.7	8270 Mod		5	02/14/20 7:07	F0B0006	FB01301

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*66 %*		*50-120*
Surrogate: Naphthalene-d8	*74 %*		*50-120*
Surrogate: Phenanthrene-d10	*83 %*		*50-120*
Surrogate: Perylene-d12	*96 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS754-S1
Date Sampled: 02/05/20 13:01
Percent Solids: 45

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-11
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**76800** (96.2)		TOC-LK		1	CCP	02/20/20 19:48	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS754-S2
Date Sampled: 02/05/20 13:12
Percent Solids: 65
Initial Volume: 5.262
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C1-Benzene	**47.8** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C2-Benzenes	**23.3** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C3-Benzenes	**11.3** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C4-Benzenes	**11.0** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C5-Benzenes	**7.23** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
Methylcyclohexane	**J 4.17** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
Toluene	**56.9** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
Ethylbenzene	ND (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
m,p-Xylene	**29.6** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
Styrene	**J 3.71** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
o-Xylene	ND (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
Isopropylbenzene	ND (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
n-Propylbenzene	ND (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
1,3,5-Trimethylbenzene	**J 3.33** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
1,2,3-Trimethylbenzene	ND (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
1,2,4-Trimethylbenzene	**J 3.92** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
t-Butylbenzene	ND (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
sec-Butylbenzene	ND (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
p-Isopropyltoluene	**J 4.01** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
n-Butylbenzene	ND (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
trans-Decalin	ND (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
cis-Decalin	ND (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C1-Decalins	**7.64** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C2-Decalins	**15.1** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C3-Decalins	**14.6** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C4-Decalins	**16.0** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
Benzo(b)thiophene	ND (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C1-Benzo(b)thiophenes	**J 3.56** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C2-Benzo(b)thiophenes	**J 4.42** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C3-Benzo(b)thiophenes	**J 3.09** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C4-Benzo(b)thiophenes	ND (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS754-S2
Date Sampled: 02/05/20 13:12
Percent Solids: 65
Initial Volume: 5.262
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**32.4** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
2-Methylnaphthalene	**26.7** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
1-Methylnaphthalene	**15.4** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C1-Naphthalenes	**25.7** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C2-Naphthalenes	**49.8** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C3-Naphthalenes	**47.0** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C4-Naphthalenes	**27.1** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
Biphenyl	**8.64** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
Acenaphthylene	**25.8** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
Acenaphthene	**15.6** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
Dibenzofuran	**14.1** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
Fluorene	**29.2** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C1-Fluorenes	**24.2** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C2-Fluorenes	**42.7** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C3-Fluorenes	**38.2** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
Dibenzothiophene	**10.7** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C1-Dibenzothiophenes	**17.6** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C2-Dibenzothiophenes	**22.0** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C3-Dibenzothiophenes	**19.6** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C4-Dibenzothiophenes	**17.3** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
Phenanthrene	**158** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
Anthracene	**65.3** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C1-Phenanthrenes/Anthracenes	**211** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C2-Phenanthrenes/Anthracenes	**142** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C3-Phenanthrenes/Anthracenes	**93.6** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C4-Phenanthrenes/Anthracenes	**87.0** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
Retene	**46.4** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
Benzo(b)naphtho(2,1-d)thiophene	**26.8** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C0-Benzonaphthothiophenes	**51.6** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C1-Benzonaphthothiophenes	**46.0** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C2-Benzonaphthothiophenes	**38.1** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C3-Benzonaphthothiophenes	**27.4** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS754-S2
Date Sampled: 02/05/20 13:12
Percent Solids: 65
Initial Volume: 5.262
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**10.4** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
Fluoranthene	**256** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
Pyrene	**444** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C1-Fluoranthenes/Pyrenes	**293** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C2-Fluoranthenes/Pyrenes	**168** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C3-Fluoranthenes/Pyrenes	**94.8** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
Benzo(b)fluorene	**34.8** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
Benzo(c)fluorene	**16.5** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
2-Methylpyrene	**40.6** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
4-Methylpyrene	**38.9** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
1-Methylpyrene	**28.6** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
Benz(a)anthracene	**249** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
Chrysene/triphenylene	**256** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C1-Benzo(a)anthracenes/Chrysenes	**215** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C2-Benzo(a)anthracenes/Chrysenes	**142** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C3-Benzo(a)anthracenes/Chrysenes	**90.6** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C4-Benzo(a)anthracenes/Chrysenes	**45.8** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
Benzo(b)fluoranthene	**169** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
Benzo(j/k)fluoranthene	**191** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
Benzo(e)pyrene	**165** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
Benzo(a)pyrene	**232** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
Perylene	**506** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
Indeno(1,2,3-cd)pyrene	**152** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
Dibenzo(a,h)anthracene	**34.5** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
Benzo(g,h,i)perylene	**125** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
Coronene	**32.2** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
Tetramethyl lead	ND (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
Trimethylethyl lead	ND (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
Dimethyldiethyl lead	ND (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
Methyltriethyl lead	ND (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
Tetraethyl lead	ND (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
2,6,10-trimethyldodecane (1380)	**6.07** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS754-S2
Date Sampled: 02/05/20 13:12
Percent Solids: 65
Initial Volume: 5.262
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**21.2** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
2,6,10-trimethylpentadecane (1650)	**20.9** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C-17	**114** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
Pristane	**35.1** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
C-18	**B 35.8** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
Phytane	**43.9** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
Carbazole	**9.46** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
2,6-Dimethylnaphthalene	**12.1** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
2,3,5-Trimethylnaphthene	**J 3.80** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
4-Methyldibenzothiophene	**J 5.34** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
2/3-Methyldibenzothiophene	**J 5.60** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
1-Methyldibenzothiophene	ND (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
3-Methylphenanthrene	**55.2** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
2-Methylphenanthrene	**49.9** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
2-Methylanthracene	**26.7** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
4/9-Methylphenanthrene	**61.2** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301
1-Methylphenanthrene	**17.8** (5.89)	2.94	8270 Mod		1	02/15/20 6:39	F0B0006	FB01301

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*67 %*		*50-120*
Surrogate: Naphthalene-d8	*73 %*		*50-120*
Surrogate: Phenanthrene-d10	*82 %*		*50-120*
Surrogate: Perylene-d12	*81 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS754-S2
Date Sampled: 02/05/20 13:12
Percent Solids: 65

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-12
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**22700** (95.5)		TOC-LK		1	CCP	02/20/20 20:05	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS757-S1
Date Sampled: 02/05/20 14:20
Percent Solids: 80
Initial Volume: 4.36
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-13
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C1-Benzene	**44.6** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C2-Benzenes	**57.6** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C3-Benzenes	**45.9** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C4-Benzenes	**48.7** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C5-Benzenes	**36.9** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
Methylcyclohexane	**12.7** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
Toluene	**57.7** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
Ethylbenzene	**13.6** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
m,p-Xylene	**65.1** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
Styrene	**30.7** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
o-Xylene	**12.8** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
Isopropylbenzene	**J 3.25** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
n-Propylbenzene	**8.15** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
1,3,5-Trimethylbenzene	**7.14** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
1,2,3-Trimethylbenzene	**10.1** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
1,2,4-Trimethylbenzene	**23.9** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
t-Butylbenzene	ND (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
sec-Butylbenzene	**J 3.07** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
p-Isopropyltoluene	**7.17** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
n-Butylbenzene	**13.4** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
trans-Decalin	**89.4** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
cis-Decalin	**16.8** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C1-Decalins	**203** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C2-Decalins	**146** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C3-Decalins	**101** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C4-Decalins	**158** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
Benzo(b)thiophene	**10.5** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C1-Benzo(b)thiophenes	**15.0** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C2-Benzo(b)thiophenes	**24.3** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C3-Benzo(b)thiophenes	**24.1** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C4-Benzo(b)thiophenes	**16.5** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS757-S1
Date Sampled: 02/05/20 14:20
Percent Solids: 80
Initial Volume: 4.36
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-13
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**221** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
2-Methylnaphthalene	**125** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
1-Methylnaphthalene	**104** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C1-Naphthalenes	**138** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C2-Naphthalenes	**238** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C3-Naphthalenes	**292** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C4-Naphthalenes	**182** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
Biphenyl	**56.8** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
Acenaphthylene	**368** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
Acenaphthene	**595** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
Dibenzofuran	**249** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
Fluorene	**532** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C1-Fluorenes	**299** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C2-Fluorenes	**309** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C3-Fluorenes	**406** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
Dibenzothiophene	**374** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C1-Dibenzothiophenes	**385** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C2-Dibenzothiophenes	**367** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C3-Dibenzothiophenes	**265** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C4-Dibenzothiophenes	**161** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
Phenanthrene	**5200** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
Anthracene	**1450** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C1-Phenanthrenes/Anthracenes	**2520** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C2-Phenanthrenes/Anthracenes	ND (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C3-Phenanthrenes/Anthracenes	**541** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C4-Phenanthrenes/Anthracenes	**715** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
Retene	**208** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
Benzo(b)naphtho(2,1-d)thiophene	**514** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C0-Benzonaphthothiophenes	**939** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C1-Benzonaphthothiophenes	**536** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C2-Benzonaphthothiophenes	**386** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C3-Benzonaphthothiophenes	**298** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS757-S1
Date Sampled: 02/05/20 14:20
Percent Solids: 80
Initial Volume: 4.36
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-13
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**146** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
Fluoranthene	**7510** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
Pyrene	**6490** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C1-Fluoranthenes/Pyrenes	**2970** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C2-Fluoranthenes/Pyrenes	**1610** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C3-Fluoranthenes/Pyrenes	**704** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
Benzo(b)fluorene	**398** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
Benzo(c)fluorene	**195** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
2-Methylpyrene	**384** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
4-Methylpyrene	**299** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
1-Methylpyrene	**245** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
Benz(a)anthracene	**3540** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
Chrysene/triphenylene	**3250** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C1-Benzo(a)anthracenes/Chrysenes	**1650** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C2-Benzo(a)anthracenes/Chrysenes	**825** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C3-Benzo(a)anthracenes/Chrysenes	**450** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C4-Benzo(a)anthracenes/Chrysenes	**229** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
Benzo(b)fluoranthene	**2410** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
Benzo(j/k)fluoranthene	**2540** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
Benzo(e)pyrene	**1930** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
Benzo(a)pyrene	**2940** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
Perylene	**738** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
Indeno(1,2,3-cd)pyrene	**2070** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
Dibenzo(a,h)anthracene	**483** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
Benzo(g,h,i)perylene	**1530** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
Coronene	**433** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
Tetramethyl lead	ND (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
Trimethylethyl lead	ND (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
Dimethyldiethyl lead	ND (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
Methyltriethyl lead	ND (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
Tetraethyl lead	ND (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
2,6,10-trimethyldodecane (1380)	**110** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS757-S1
Date Sampled: 02/05/20 14:20
Percent Solids: 80
Initial Volume: 4.36
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-13
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**170** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
2,6,10-trimethylpentadecane (1650)	**104** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C-17	**118** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
Pristane	**230** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
C-18	**108** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
Phytane	**238** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
Carbazole	**529** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
2,6-Dimethylnaphthalene	**46.0** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
2,3,5-Trimethylnaphthene	**20.7** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
4-Methyldibenzothiophene	**127** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
2/3-Methyldibenzothiophene	**133** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
1-Methyldibenzothiophene	**43.8** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
3-Methylphenanthrene	**595** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
2-Methylphenanthrene	**710** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
2-Methylanthracene	**278** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
4/9-Methylphenanthrene	**544** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301
1-Methylphenanthrene	**425** (5.76)	2.88	8270 Mod		1	02/15/20 10:46	F0B0006	FB01301

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*59 %*		*50-120*
Surrogate: Naphthalene-d8	*65 %*		*50-120*
Surrogate: Phenanthrene-d10	*74 %*		*50-120*
Surrogate: Perylene-d12	*69 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS757-S1
Date Sampled: 02/05/20 14:20
Percent Solids: 80

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-13
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**40000** (94.8)		TOC-LK		1	CCP	02/20/20 21:10	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS758-S1
Date Sampled: 02/05/20 14:53
Percent Solids: 76
Initial Volume: 5.429
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-14
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C1-Benzene	**6.23** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C2-Benzenes	**5.40** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C3-Benzenes	J **4.50** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C4-Benzenes	ND (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C5-Benzenes	ND (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
Methylcyclohexane	ND (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
Toluene	**8.77** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
Ethylbenzene	ND (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
m,p-Xylene	**5.78** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
Styrene	ND (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
o-Xylene	ND (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
Isopropylbenzene	ND (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
n-Propylbenzene	ND (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
1,3,5-Trimethylbenzene	ND (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
1,2,3-Trimethylbenzene	ND (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
1,2,4-Trimethylbenzene	ND (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
t-Butylbenzene	ND (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
sec-Butylbenzene	ND (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
p-Isopropyltoluene	ND (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
n-Butylbenzene	ND (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
trans-Decalin	ND (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
cis-Decalin	ND (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C1-Decalins	ND (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C2-Decalins	ND (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C3-Decalins	ND (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C4-Decalins	ND (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
Benzo(b)thiophene	ND (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C1-Benzo(b)thiophenes	ND (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C2-Benzo(b)thiophenes	ND (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C3-Benzo(b)thiophenes	ND (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C4-Benzo(b)thiophenes	ND (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS758-S1
Date Sampled: 02/05/20 14:53
Percent Solids: 76
Initial Volume: 5.429
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-14
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**5.86** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
2-Methylnaphthalene	**J 3.56** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
1-Methylnaphthalene	**J 2.70** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C1-Naphthalenes	**J 4.00** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C2-Naphthalenes	**7.12** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C3-Naphthalenes	**6.88** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C4-Naphthalenes	**4.96** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
Biphenyl	ND (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
Acenaphthylene	**15.9** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
Acenaphthene	**6.81** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
Dibenzofuran	**J 3.11** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
Fluorene	**7.99** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C1-Fluorenes	**7.29** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C2-Fluorenes	**9.18** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C3-Fluorenes	**9.27** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
Dibenzothiophene	**6.22** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C1-Dibenzothiophenes	**9.65** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C2-Dibenzothiophenes	**12.1** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C3-Dibenzothiophenes	**8.20** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C4-Dibenzothiophenes	**6.26** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
Phenanthrene	**82.0** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
Anthracene	**29.5** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C1-Phenanthrenes/Anthracenes	**61.4** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C2-Phenanthrenes/Anthracenes	**38.0** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C3-Phenanthrenes/Anthracenes	**17.0** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C4-Phenanthrenes/Anthracenes	**21.8** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
Retene	**6.72** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
Benzo(b)naphtho(2,1-d)thiophene	**16.8** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C0-Benzonaphthothiophenes	**30.9** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C1-Benzonaphthothiophenes	**19.6** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C2-Benzonaphthothiophenes	**17.3** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C3-Benzonaphthothiophenes	**17.8** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS758-S1
Date Sampled: 02/05/20 14:53
Percent Solids: 76
Initial Volume: 5.429
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-14
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**10.7** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
Fluoranthene	**241** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
Pyrene	**266** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C1-Fluoranthenes/Pyrenes	**110** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C2-Fluoranthenes/Pyrenes	**50.6** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C3-Fluoranthenes/Pyrenes	**21.2** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
Benzo(b)fluorene	**11.5** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
Benzo(c)fluorene	**5.33** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
2-Methylpyrene	**15.7** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
4-Methylpyrene	**14.4** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
1-Methylpyrene	**11.2** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
Benz(a)anthracene	**131** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
Chrysene/triphenylene	**126** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C1-Benzo(a)anthracenes/Chrysenes	**68.0** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C2-Benzo(a)anthracenes/Chrysenes	**33.6** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C3-Benzo(a)anthracenes/Chrysenes	**21.1** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C4-Benzo(a)anthracenes/Chrysenes	ND (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
Benzo(b)fluoranthene	**91.4** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
Benzo(j/k)fluoranthene	**104** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
Benzo(e)pyrene	**83.3** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
Benzo(a)pyrene	**118** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
Perylene	**29.1** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
Indeno(1,2,3-cd)pyrene	**75.0** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
Dibenzo(a,h)anthracene	**16.5** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
Benzo(g,h,i)perylene	**59.8** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
Coronene	**15.2** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
Tetramethyl lead	ND (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
Trimethylethyl lead	ND (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
Dimethyldiethyl lead	ND (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
Methyltriethyl lead	ND (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
Tetraethyl lead	ND (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
2,6,10-trimethyldodecane (1380)	ND (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS758-S1
Date Sampled: 02/05/20 14:53
Percent Solids: 76
Initial Volume: 5.429
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-14
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 2/13/20 10:15

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**J 4.07** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
2,6,10-trimethylpentadecane (1650)	**J 2.86** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C-17	**B 22.3** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
Pristane	**7.72** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
C-18	**B 10.3** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
Phytane	**8.44** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
Carbazole	**J 4.38** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
2,6-Dimethylnaphthalene	ND (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
2,3,5-Trimethylnaphthene	ND (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
4-Methyldibenzothiophene	**J 3.49** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
2/3-Methyldibenzothiophene	**J 2.63** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
1-Methyldibenzothiophene	ND (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
3-Methylphenanthrene	**13.2** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
2-Methylphenanthrene	**15.5** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
2-Methylanthracene	**7.75** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
4/9-Methylphenanthrene	**15.2** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301
1-Methylphenanthrene	**10.8** (4.87)	2.44	8270 Mod		1	02/14/20 21:01	F0B0006	FB01301

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*69 %*		*50-120*
Surrogate: Naphthalene-d8	*75 %*		*50-120*
Surrogate: Phenanthrene-d10	*85 %*		*50-120*
Surrogate: Perylene-d12	*76 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS758-S1
Date Sampled: 02/05/20 14:53
Percent Solids: 76

ESS Laboratory Work Order: F200008
ESS Laboratory Sample ID: F200008-14
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**3210** (98.3)		TOC-LK		1	CCP	02/20/20 21:36	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200008

Quality Control Data

Classical Chemistry

Batch DB01437 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	100	mg/kg							
Total Organic Carbon (2)	ND	100	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200008

Quality Control Data

Classical Chemistry

Batch DB01437 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9910	100	mg/kg	10000		99	80-120			
Total Organic Carbon (2)	9170	100	mg/kg	10000		92	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200008

Quality Control Data

Classical Chemistry

Batch DB01437 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9720	100	mg/kg	10000		97	80-120	2	20	
Total Organic Carbon (2)	9320	100	mg/kg	10000		93	80-120	2	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200008

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FB01301 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	ND	4.00	ug/Kg wet							
C1-Benzene	ND	4.00	ug/Kg wet							
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	ND	4.00	ug/Kg wet							
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	ND	4.00	ug/Kg wet							
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200008

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FB01301 - 3570

C1-Fluorenes	ND	4.00	ug/Kg wet	
C2-Fluorenes	ND	4.00	ug/Kg wet	
C3-Fluorenes	ND	4.00	ug/Kg wet	
Dibenzothiophene	ND	4.00	ug/Kg wet	
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet	
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet	
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet	
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet	
Phenanthrene	ND	4.00	ug/Kg wet	
Anthracene	ND	4.00	ug/Kg wet	
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet	
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet	
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet	
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet	
Retene	ND	4.00	ug/Kg wet	
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet	
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet	
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet	
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet	
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet	
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet	
Fluoranthene	ND	4.00	ug/Kg wet	
Pyrene	ND	4.00	ug/Kg wet	
C1-Fluoranthenes/Pyrenes	2.11	4.00	ug/Kg wet	J
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet	
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet	
Benzo(b)fluorene	ND	4.00	ug/Kg wet	
Benzo(c)fluorene	ND	4.00	ug/Kg wet	
2-Methylpyrene	ND	4.00	ug/Kg wet	
4-Methylpyrene	ND	4.00	ug/Kg wet	
1-Methylpyrene	ND	4.00	ug/Kg wet	
Benz(a)anthracene	ND	4.00	ug/Kg wet	
Chrysene/triphenylene	ND	4.00	ug/Kg wet	
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet	
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet	
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet	
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet	
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet	
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet	
Benzo(e)pyrene	ND	4.00	ug/Kg wet	
Benzo(a)pyrene	ND	4.00	ug/Kg wet	
Perylene	ND	4.00	ug/Kg wet	
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet	
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet	
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet	
Coronene	ND	4.00	ug/Kg wet	
Tetramethyl lead	ND	4.00	ug/Kg wet	
Trimethylethyl lead	ND	4.00	ug/Kg wet	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200008

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FB01301 - 3570							
Dimethyldiethyl lead	ND	4.00	ug/Kg wet				
Methyltriethyl lead	ND	4.00	ug/Kg wet				
Tetraethyl lead	ND	4.00	ug/Kg wet				
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet				
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet				
2,6,10-trimethylpentadecane (1650)	ND	4.00	ug/Kg wet				
C-17	5.66	4.00	ug/Kg wet				
Pristane	3.05	4.00	ug/Kg wet				J
C-18	4.36	4.00	ug/Kg wet				
Phytane	2.48	4.00	ug/Kg wet				J
Carbazole	ND	4.00	ug/Kg wet				
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet				
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet				
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
3-Methylphenanthrene	ND	4.00	ug/Kg wet				
2-Methylphenanthrene	ND	4.00	ug/Kg wet				
2-Methylanthracene	ND	4.00	ug/Kg wet				
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet				
1-Methylphenanthrene	ND	4.00	ug/Kg wet				
Surrogate: Toluene-D8	*367*		ug/Kg wet	*400.0*	*92*	*50-120*	
Surrogate: Naphthalene-d8	*372*		ug/Kg wet	*400.0*	*93*	*50-120*	
Surrogate: Phenanthrene-d10	*385*		ug/Kg wet	*400.0*	*96*	*50-120*	
Surrogate: Perylene-d12	*479*		ug/Kg wet	*400.0*	*120*	*50-120*	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200008

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FB01301 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	316	4.00	ug/Kg wet	400.0		79	60-130			
Methylcyclohexane	212	4.00	ug/Kg wet	400.0		53	60-130			
Toluene	316	4.00	ug/Kg wet	400.0		79	60-130			
Ethylbenzene	321	4.00	ug/Kg wet	400.0		80	60-130			
m,p-Xylene	317	4.00	ug/Kg wet	400.0		79	60-130			
Styrene	319	4.00	ug/Kg wet	400.0		80	60-130			
o-Xylene	320	4.00	ug/Kg wet	400.0		80	60-130			
Isopropylbenzene	326	4.00	ug/Kg wet	400.0		82	60-130			
n-Propylbenzene	322	4.00	ug/Kg wet	400.0		81	60-130			
1,3,5-Trimethylbenzene	328	4.00	ug/Kg wet	400.0		82	60-130			
1,2,3-Trimethylbenzene	331	4.00	ug/Kg wet	400.0		83	60-130			
1,2,4-Trimethylbenzene	328	4.00	ug/Kg wet	400.0		82	60-130			
t-Butylbenzene	338	4.00	ug/Kg wet	400.0		84	60-130			
sec-Butylbenzene	328	4.00	ug/Kg wet	400.0		82	60-130			
p-Isopropyltoluene	339	4.00	ug/Kg wet	400.0		85	60-130			
n-Butylbenzene	321	4.00	ug/Kg wet	400.0		80	60-130			
trans-Decalin	321	4.00	ug/Kg wet	400.0		80	60-130			
cis-Decalin	324	4.00	ug/Kg wet	400.0		81	60-130			
Benzo(b)thiophene	331	4.00	ug/Kg wet	400.0		83	60-130			
Naphthalene	336	4.00	ug/Kg wet	400.0		84	60-130			
2-Methylnaphthalene	346	4.00	ug/Kg wet	400.0		87	60-130			
1-Methylnaphthalene	349	4.00	ug/Kg wet	400.0		87	60-130			
Biphenyl	332	4.00	ug/Kg wet	400.0		83	60-130			
Acenaphthylene	360	4.00	ug/Kg wet	400.0		90	60-130			
Acenaphthene	352	4.00	ug/Kg wet	400.0		88	60-130			
Dibenzofuran	358	4.00	ug/Kg wet	400.0		89	60-130			
Fluorene	375	4.00	ug/Kg wet	400.0		94	60-130			
Dibenzothiophene	362	4.00	ug/Kg wet	400.0		91	60-130			
Phenanthrene	373	4.00	ug/Kg wet	400.0		93	60-130			
Anthracene	368	4.00	ug/Kg wet	400.0		92	60-130			
Retene	407	4.00	ug/Kg wet	400.0		102	60-130			
Benzo(b)naphtho(2,1-d)thiophene	343	4.00	ug/Kg wet	400.0		86	60-130			
Fluoranthene	376	4.00	ug/Kg wet	400.0		94	60-130			
Pyrene	371	4.00	ug/Kg wet	400.0		93	60-130			
Benz(a)anthracene	359	4.00	ug/Kg wet	400.0		90	60-130			
Chrysene/triphenylene	339	4.00	ug/Kg wet	400.0		85	60-130			
Benzo(b)fluoranthene	303	4.00	ug/Kg wet	400.0		76	60-130			
Benzo(j/k)fluoranthene	300	4.00	ug/Kg wet	400.0		75	60-130			
Benzo(e)pyrene	281	4.00	ug/Kg wet	400.0		70	60-130			
Benzo(a)pyrene	288	4.00	ug/Kg wet	400.0		72	60-130			
Perylene	281	4.00	ug/Kg wet	400.0		70	60-130			
Indeno(1,2,3-cd)pyrene	287	4.00	ug/Kg wet	400.0		72	60-130			
Dibenzo(a,h)anthracene	283	4.00	ug/Kg wet	400.0		71	60-130			
Benzo(g,h,i)perylene	248	4.00	ug/Kg wet	400.0		62	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200008

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FB01301 - 3570						
Coronene	245	4.00	ug/Kg wet	400.0	61	60-130
Tetraethyl lead	273	4.00	ug/Kg wet	400.0	68	60-130
Pristane	410	4.00	ug/Kg wet	400.0	103	60-130
Phytane	408	4.00	ug/Kg wet	400.0	102	60-130
Surrogate: Toluene-D8	*318*		ug/Kg wet	*400.0*	*80*	*50-120*
Surrogate: Naphthalene-d8	*353*		ug/Kg wet	*400.0*	*88*	*50-120*
Surrogate: Phenanthrene-d10	*403*		ug/Kg wet	*400.0*	*101*	*50-120*
Surrogate: Perylene-d12	*296*		ug/Kg wet	*400.0*	*74*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200008

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FB01301 - 3570

Duplicate **Source: F200008-14** **D+**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	ND	5.00	ug/Kg dry		ND				50	
C1-Benzene	2.87	5.00	ug/Kg dry		6.23			74	50	J
C2-Benzenes	2.89	5.00	ug/Kg dry		5.40			61	50	J
C3-Benzenes	3.08	5.00	ug/Kg dry		4.50			37	50	J
C4-Benzenes	ND	5.00	ug/Kg dry		ND				50	
C5-Benzenes	ND	5.00	ug/Kg dry		ND				50	
Methylcyclohexane	ND	5.00	ug/Kg dry		ND				50	
Toluene	3.95	5.00	ug/Kg dry		8.77			76	50	J
Ethylbenzene	ND	5.00	ug/Kg dry		ND				50	
m,p-Xylene	2.85	5.00	ug/Kg dry		5.78			68	50	J
Styrene	ND	5.00	ug/Kg dry		ND				50	
o-Xylene	ND	5.00	ug/Kg dry		ND				50	
Isopropylbenzene	ND	5.00	ug/Kg dry		ND				50	
n-Propylbenzene	ND	5.00	ug/Kg dry		ND				50	
1,3,5-Trimethylbenzene	ND	5.00	ug/Kg dry		ND				50	
1,2,3-Trimethylbenzene	ND	5.00	ug/Kg dry		ND				50	
1,2,4-Trimethylbenzene	ND	5.00	ug/Kg dry		ND				50	
t-Butylbenzene	ND	5.00	ug/Kg dry		ND				50	
sec-Butylbenzene	ND	5.00	ug/Kg dry		ND				50	
p-Isopropyltoluene	ND	5.00	ug/Kg dry		ND				50	
n-Butylbenzene	ND	5.00	ug/Kg dry		ND				50	
trans-Decalin	ND	5.00	ug/Kg dry		ND				50	
cis-Decalin	ND	5.00	ug/Kg dry		ND				50	
C1-Decalins	ND	5.00	ug/Kg dry		ND				50	
C2-Decalins	ND	5.00	ug/Kg dry		ND				50	
C3-Decalins	ND	5.00	ug/Kg dry		ND				50	
C4-Decalins	ND	5.00	ug/Kg dry		ND				50	
Benzo(b)thiophene	ND	5.00	ug/Kg dry		ND				50	
C1-Benzo(b)thiophenes	ND	5.00	ug/Kg dry		ND				50	
C2-Benzo(b)thiophenes	ND	5.00	ug/Kg dry		ND				50	
C3-Benzo(b)thiophenes	ND	5.00	ug/Kg dry		ND				50	
C4-Benzo(b)thiophenes	ND	5.00	ug/Kg dry		ND				50	
Naphthalene	31.0	5.00	ug/Kg dry		5.86			136	50	
2-Methylnaphthalene	11.5	5.00	ug/Kg dry		3.56			106	50	
1-Methylnaphthalene	8.92	5.00	ug/Kg dry		2.70			107	50	
C1-Naphthalenes	12.7	5.00	ug/Kg dry		4.00			104	50	
C2-Naphthalenes	11.8	5.00	ug/Kg dry		7.12			49	50	
C3-Naphthalenes	9.04	5.00	ug/Kg dry		6.88			27	50	
C4-Naphthalenes	5.10	5.00	ug/Kg dry		4.96			3	50	
Biphenyl	4.02	5.00	ug/Kg dry		ND				50	J
Acenaphthylene	5.13	5.00	ug/Kg dry		15.9			102	50	
Acenaphthene	42.7	5.00	ug/Kg dry		6.81			145	50	
Dibenzofuran	26.6	5.00	ug/Kg dry		3.11			158	50	
Fluorene	41.7	5.00	ug/Kg dry		7.99			136	50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200008

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FB01301 - 3570							
C1-Fluorenes	10.0	5.00	ug/Kg dry	7.29	32	50	
C2-Fluorenes	10.5	5.00	ug/Kg dry	9.18	13	50	
C3-Fluorenes	ND	5.00	ug/Kg dry	9.27		50	
Dibenzothiophene	22.7	5.00	ug/Kg dry	6.22	114	50	
C1-Dibenzothiophenes	11.6	5.00	ug/Kg dry	9.65	18	50	
C2-Dibenzothiophenes	8.72	5.00	ug/Kg dry	12.1	33	50	
C3-Dibenzothiophenes	5.28	5.00	ug/Kg dry	8.20	43	50	
C4-Dibenzothiophenes	3.79	5.00	ug/Kg dry	6.26	49	50	J
Phenanthrene	392	5.00	ug/Kg dry	82.0	131	50	
Anthracene	86.5	5.00	ug/Kg dry	29.5	98	50	
C1-Phenanthrenes/Anthracenes	99.0	5.00	ug/Kg dry	61.4	47	50	
C2-Phenanthrenes/Anthracenes	40.7	5.00	ug/Kg dry	38.0	7	50	
C3-Phenanthrenes/Anthracenes	14.6	5.00	ug/Kg dry	17.0	15	50	
C4-Phenanthrenes/Anthracenes	26.3	5.00	ug/Kg dry	21.8	19	50	
Retene	ND	5.00	ug/Kg dry	6.72		50	
Benzo(b)naphtho(2,1-d)thiophene	23.2	5.00	ug/Kg dry	16.8	32	50	
C0-Benzonaphthothiophenes	41.2	5.00	ug/Kg dry	30.9	28	50	
C1-Benzonaphthothiophenes	17.1	5.00	ug/Kg dry	19.6	13	50	
C2-Benzonaphthothiophenes	10.4	5.00	ug/Kg dry	17.3	50	50	
C3-Benzonaphthothiophenes	9.30	5.00	ug/Kg dry	17.8	63	50	
C4-Benzonaphthothiophenes	5.78	5.00	ug/Kg dry	10.7	60	50	
Fluoranthene	469	5.00	ug/Kg dry	241	64	50	
Pyrene	387	5.00	ug/Kg dry	266	37	50	
C1-Fluoranthenes/Pyrenes	117	5.00	ug/Kg dry	110	6	50	
C2-Fluoranthenes/Pyrenes	56.1	5.00	ug/Kg dry	50.6	10	50	
C3-Fluoranthenes/Pyrenes	22.9	5.00	ug/Kg dry	21.2	8	50	
Benzo(b)fluorene	13.4	5.00	ug/Kg dry	11.5	15	50	
Benzo(c)fluorene	6.74	5.00	ug/Kg dry	5.33	23	50	
2-Methylpyrene	15.7	5.00	ug/Kg dry	15.7	0.02	50	
4-Methylpyrene	11.5	5.00	ug/Kg dry	14.4	23	50	
1-Methylpyrene	9.42	5.00	ug/Kg dry	11.2	18	50	
Benz(a)anthracene	181	5.00	ug/Kg dry	131	32	50	
Chrysene/triphenylene	182	5.00	ug/Kg dry	126	36	50	
C1-Benzo(a)anthracenes/Chrysenes	65.3	5.00	ug/Kg dry	68.0	4	50	
C2-Benzo(a)anthracenes/Chrysenes	29.8	5.00	ug/Kg dry	33.6	12	50	
C3-Benzo(a)anthracenes/Chrysenes	22.5	5.00	ug/Kg dry	21.1	7	50	
C4-Benzo(a)anthracenes/Chrysenes	ND	5.00	ug/Kg dry	ND		50	
Benzo(b)fluoranthene	129	5.00	ug/Kg dry	91.4	34	50	
Benzo(j/k)fluoranthene	145	5.00	ug/Kg dry	104	33	50	
Benzo(e)pyrene	106	5.00	ug/Kg dry	83.3	24	50	
Benzo(a)pyrene	158	5.00	ug/Kg dry	118	29	50	
Perylene	41.6	5.00	ug/Kg dry	29.1	35	50	
Indeno(1,2,3-cd)pyrene	103	5.00	ug/Kg dry	75.0	32	50	
Dibenzo(a,h)anthracene	22.6	5.00	ug/Kg dry	16.5	31	50	
Benzo(g,h,i)perylene	80.1	5.00	ug/Kg dry	59.8	29	50	
Coronene	19.3	5.00	ug/Kg dry	15.2	24	50	
Tetramethyl lead	ND	5.00	ug/Kg dry	ND		50	
Trimethylethyl lead	ND	5.00	ug/Kg dry	ND		50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200008

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FB01301 - 3570									
Dimethyldiethyl lead	ND	5.00	ug/Kg dry		ND			50	
Methyltriethyl lead	ND	5.00	ug/Kg dry		ND			50	
Tetraethyl lead	ND	5.00	ug/Kg dry		ND			50	
2,6,10-trimethyldodecane (1380)	ND	5.00	ug/Kg dry		ND			50	
2,6,10-trimethyltridecane (1470)	3.81	5.00	ug/Kg dry		4.07		6	50	J
2,6,10-trimethylpentadecane (1650)	5.79	5.00	ug/Kg dry		2.86		68	50	
C-17	22.5	5.00	ug/Kg dry		22.3		0.9	50	
Pristane	12.5	5.00	ug/Kg dry		7.72		47	50	
C-18	24.8	5.00	ug/Kg dry		10.3		83	50	
Phytane	18.5	5.00	ug/Kg dry		8.44		75	50	
Carbazole	41.8	5.00	ug/Kg dry		4.38		162	50	
2,6-Dimethylnaphthalene	ND	5.00	ug/Kg dry		ND			50	
2,3,5-Trimethylnaphthene	ND	5.00	ug/Kg dry		ND			50	
4-Methyldibenzothiophene	3.50	5.00	ug/Kg dry		3.49		0.2	50	J
2/3-Methyldibenzothiophene	3.70	5.00	ug/Kg dry		2.63		34	50	J
1-Methyldibenzothiophene	ND	5.00	ug/Kg dry		ND			50	
3-Methylphenanthrene	23.5	5.00	ug/Kg dry		13.2		56	50	
2-Methylphenanthrene	29.6	5.00	ug/Kg dry		15.5		63	50	
2-Methylanthracene	8.97	5.00	ug/Kg dry		7.75		15	50	
4/9-Methylphenanthrene	19.4	5.00	ug/Kg dry		15.2		24	50	
1-Methylphenanthrene	15.8	5.00	ug/Kg dry		10.8		37	50	
Surrogate: Toluene-D8	*270*		ug/Kg dry	*499.6*		*54*	*50-120*		
Surrogate: Naphthalene-d8	*294*		ug/Kg dry	*499.6*		*59*	*50-120*		
Surrogate: Phenanthrene-d10	*329*		ug/Kg dry	*499.6*		*66*	*50-120*		
Surrogate: Perylene-d12	*301*		ug/Kg dry	*499.6*		*60*	*50-120*		

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F200008

Notes and Definitions

U	Analyte included in the analysis, but not detected
J	Reported between MDL and MRL
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200008

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only): 20B0354 / E20008

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

Preservative

None | None

Sample Handling

Samples Field Filtered: YES NO (NA)

Sampled Shipped With Ice: (YES) NO

MCP PRESUMPTIVE CERTAINTY REQUIRED -- (YES) NO

If Yes, Are MCP Analytical Methods Required?	(YES)	NO	NA
Are Drinking Water Samples Submitted?	YES	(NO)	NA
If Yes, Have Drinking Water Sampling Requirements Been Met?	YES	NO	(NA)

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Analysis: Parent and Alkylated MAHs & PAHs 8270**	Analysis: TOCs by Lloyd-Kahn	Sample Specific Remarks
1	1804576-SS741-S1	2/5/2020	8:16	Soil	1	BFM	X	X	
2	1804576-SS741-S3	2/5/2020	8:43	Soil	1	BFM	X	X	
3	1804576-SS744-S1	2/5/2020	9:31	Soil	1	BFM	X	X	
4	1804576-SS744-S2	2/5/2020	9:47	Soil	1	BFM	X	X	
5	1804576-SS748-S1	2/5/2020	10:22	Soil	1	BFM	X	X	
6	1804576-SS748-S3	2/5/2020	10:51	Soil	1	BFM	X	X	
7	1804576-SS755-S1	2/5/2020	11:07	Soil	1	BFM	X	X	
8	1804576-SS756-S1	2/5/2020	11:46	Soil	1	BFM	X	X	
9	1804576-SS746-S1	2/5/2020	12:15	Soil	1	BFM	X	X	
10	1804576-SS746-S3	2/5/2020	12:41	Soil	1	BFM	X	X	
11	1804576-SS754-S1	2/5/2020	13:01	Soil	1	BFM	X	X	
12	1804576-SS754-S2	2/5/2020	13:12	Soil	1	BFM	X	X	
13	1804576-SS757-S1	2/5/2020	14:20	Soil	1	BFM	X	X	
14	1804576-SS758-S1	2/5/2020	14:53	Soil	1	BFM	X	X	

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

	Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1.		2/5/20	1530	1. GEI Sample Fridge
2.	Relinquished by: (signature) 2. GEI Sample Fridge	Date: 02/10/20	Time: 13:00	Received by: (signature) 2.
3.	Relinquished by: (signature)	Date: 02/10/20	Time:	Received by: (signature) 3. 2/10/20 13:00
4.	Relinquished by: (signature) 2/10/20	Date:	Time:	Received by: (signature) 4. 2/10/20 1717

Turnaround Time (Business days)

Normal __X__ Other ____

10-Day ____ 7-Day ____

5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

**Parent and Alkylated MAHs & PAHs (34) by GC/MS/SIM/SCAN

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI

Shipped/Delivered Via: ESS Courier

ESS Project ID: F200008
Date Received: 2/10/2020
Project Due Date: ~~2/18/2020~~ 02/25/2020
Days for Project: 10 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 0.7 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? 02/28/20 Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No (NA)
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / (No)
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / (No)
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608.3 Pesticides)
1					4oz Jar	NP	
2					4oz Jar	NP	
3					4oz Jar	NP	
4					4oz Jar	NP	
5					4oz Jar	NP	
6					4oz Jar	NP	
7					4oz Jar	NP	
8					4oz Jar	NP	
9					4oz Jar	NP	
10					4oz Jar	NP	
11					4oz Jar	NP	
12					4oz Jar	NP	
13					4oz Jar	NP	
14					4oz Jar	NP	

2nd Review
All containers scanned into storage/lab Initials:
Are barcode labels on correct containers? Yes / No
Are all necessary stickers attached? Yes / No

Completed By: Date & Time: 2/10/20 1833

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI

ESS Project ID: F200008

Date Received: 2/10/2020

Reviewed By: Norman Lamont

Date & Time: 02/18/2020 @ 13:31

Delivered By: Norman Lamont

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: F200013

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 4:12 pm, Mar 25, 2020

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses
ESS Laboratory - Cranston, RI TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200013

SAMPLE RECEIPT

The following samples were received on March 11, 2020 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F200013-01	1804576-SS759-S1	Soil	8270 Mod, TOC-LK
F200013-02	1804576-SS760-S2	Soil	8270 Mod, TOC-LK
F200013-03	1804576-SS761-S1	Soil	8270 Mod, TOC-LK
F200013-04	1804576-SS761-S2	Soil	8270 Mod, TOC-LK
F200013-05	1804576-SS762-S2	Soil	8270 Mod, TOC-LK
F200013-06	1804576-SS762-S3	Soil	8270 Mod, TOC-LK
F200013-07	1804576-SS763-S1	Soil	8270 Mod, TOC-LK
F200013-08	1804576-SS763-S2	Soil	8270 Mod, TOC-LK
F200013-09	1804576-SS764-S2	Soil	8270 Mod, TOC-LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200013

PROJECT NARRATIVE

8270D (SIM) Semi-Volatile Organic Compounds

F0C0006-CCV2	**Continuing Calibration %Diff/Drift is above control limit (CD+).**
	Retene (27% @ 25%)
F0C0007-CCV3	**Continuing Calibration %Diff/Drift is below control limit (CD-).**
	Tetraethyl lead (27% @ 25%)
F200013-01	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , C-17 , C-18 , Phytane , Pristane
F200013-02	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , C-17 , C-18 , Phytane , Pristane
F200013-03	**Present in Method Blank (B).**
	C-17 , C-18
F200013-04	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , C-17 , C-18 , Phytane , Pristane
F200013-05	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , C-17 , C-18 , Phytane , Pristane
F200013-06	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , C-17 , C-18 , Phytane , Pristane
F200013-08	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , C-17 , C-18 , Phytane , Pristane
F200013-09	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , C-17 , C-18 , Phytane , Pristane
FC01201-DUP2	**Relative percent difference for duplicate is outside of criteria (D+).**
	Retene (179% @ 50%)

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200013

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS759-S1
Date Sampled: 03/09/20 13:22
Percent Solids: 61
Initial Volume: 5.35
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	J **3.68** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C1-Benzene	**36.6** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C2-Benzenes	**42.7** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C3-Benzenes	**16.3** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C4-Benzenes	**16.6** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C5-Benzenes	**11.1** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
Methylcyclohexane	ND (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
Toluene	**46.1** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
Ethylbenzene	J **6.06** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
m,p-Xylene	**55.3** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
Styrene	**15.4** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
o-Xylene	J **4.96** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
Isopropylbenzene	ND (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
n-Propylbenzene	ND (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
1,3,5-Trimethylbenzene	J **3.08** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
1,2,3-Trimethylbenzene	ND (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
1,2,4-Trimethylbenzene	**6.46** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
t-Butylbenzene	ND (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
sec-Butylbenzene	ND (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
p-Isopropyltoluene	ND (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
n-Butylbenzene	ND (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
trans-Decalin	J **5.37** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
cis-Decalin	ND (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C1-Decalins	**16.3** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C2-Decalins	**33.2** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C3-Decalins	**30.7** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C4-Decalins	**66.3** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
Benzo(b)thiophene	ND (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C1-Benzo(b)thiophenes	**6.90** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C2-Benzo(b)thiophenes	**9.44** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C3-Benzo(b)thiophenes	**8.07** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C4-Benzo(b)thiophenes	**8.23** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS759-S1
Date Sampled: 03/09/20 13:22
Percent Solids: 61
Initial Volume: 5.35
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**39.5** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
2-Methylnaphthalene	**28.9** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
1-Methylnaphthalene	**26.6** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C1-Naphthalenes	**33.7** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C2-Naphthalenes	**98.0** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C3-Naphthalenes	**109** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C4-Naphthalenes	**80.7** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
Biphenyl	**11.5** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
Acenaphthylene	**273** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
Acenaphthene	**127** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
Dibenzofuran	**36.5** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
Fluorene	**98.1** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C1-Fluorenes	**99.6** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C2-Fluorenes	**138** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C3-Fluorenes	**165** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
Dibenzothiophene	**70.5** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C1-Dibenzothiophenes	**92.9** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C2-Dibenzothiophenes	**132** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C3-Dibenzothiophenes	**121** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C4-Dibenzothiophenes	**70.1** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
Phenanthrene	**852** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
Anthracene	**361** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C1-Phenanthrenes/Anthracenes	**654** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C2-Phenanthrenes/Anthracenes	**507** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C3-Phenanthrenes/Anthracenes	**267** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C4-Phenanthrenes/Anthracenes	**128** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
Retene	**30.3** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
Benzo(b)naphtho(2,1-d)thiophene	**150** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C0-Benzonaphthothiophenes	**278** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C1-Benzonaphthothiophenes	**237** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C2-Benzonaphthothiophenes	**193** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C3-Benzonaphthothiophenes	**141** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS759-S1
Date Sampled: 03/09/20 13:22
Percent Solids: 61
Initial Volume: 5.35
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**63.2** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
Fluoranthene	**1970** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
Pyrene	**2190** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C1-Fluoranthenes/Pyrenes	**1260** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C2-Fluoranthenes/Pyrenes	**695** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C3-Fluoranthenes/Pyrenes	**345** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
Benzo(b)fluorene	**130** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
Benzo(c)fluorene	**61.7** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
2-Methylpyrene	**176** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
4-Methylpyrene	**183** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
1-Methylpyrene	**132** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
Benz(a)anthracene	**1070** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
Chrysene/triphenylene	**1210** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C1-Benzo(a)anthracenes/Chrysenes	**876** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C2-Benzo(a)anthracenes/Chrysenes	**478** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C3-Benzo(a)anthracenes/Chrysenes	**239** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C4-Benzo(a)anthracenes/Chrysenes	**128** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
Benzo(b)fluoranthene	**901** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
Benzo(j/k)fluoranthene	**909** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
Benzo(e)pyrene	**826** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
Benzo(a)pyrene	**1170** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
Perylene	**285** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
Indeno(1,2,3-cd)pyrene	**856** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
Dibenzo(a,h)anthracene	**211** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
Benzo(g,h,i)perylene	**699** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
Coronene	**253** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
Tetramethyl lead	ND (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
Trimethylethyl lead	ND (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
Dimethyldiethyl lead	ND (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
Methyltriethyl lead	ND (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
Tetraethyl lead	ND (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
2,6,10-trimethyldodecane (1380)	**24.4** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS759-S1
Date Sampled: 03/09/20 13:22
Percent Solids: 61
Initial Volume: 5.35
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**76.1** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
2,6,10-trimethylpentadecane (1650)	**B 88.4** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C-17	**B 254** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
Pristane	**B 224** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
C-18	**B 149** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
Phytane	**B 252** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
Carbazole	**72.7** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
2,6-Dimethylnaphthalene	**22.3** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
2,3,5-Trimethylnaphthene	**7.34** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
4-Methyldibenzothiophene	**36.1** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
2/3-Methyldibenzothiophene	**27.9** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
1-Methyldibenzothiophene	**11.5** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
3-Methylphenanthrene	**136** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
2-Methylphenanthrene	**149** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
2-Methylanthracene	**94.4** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
4/9-Methylphenanthrene	**168** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201
1-Methylphenanthrene	**107** (6.15)	3.07	8270 Mod		1	03/16/20 2:51	F0C0007	FC01201

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*68 %*		*50-120*
Surrogate: Naphthalene-d8	*63 %*		*50-120*
Surrogate: Phenanthrene-d10	*88 %*		*50-120*
Surrogate: Perylene-d12	*73 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS759-S1
Date Sampled: 03/09/20 13:22
Percent Solids: 61

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**30500** (99.3)		TOC-LK		1	CCP	03/16/20 16:54	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS760-S2
Date Sampled: 03/09/20 12:55
Percent Solids: 72
Initial Volume: 4.99
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**11.8** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C1-Benzene	**107** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C2-Benzenes	**33.5** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C3-Benzenes	**29.3** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C4-Benzenes	**20.1** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C5-Benzenes	**7.92** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
Methylcyclohexane	ND (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
Toluene	**131** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
Ethylbenzene	**9.30** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
m,p-Xylene	**40.4** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
Styrene	**16.4** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
o-Xylene	**6.22** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
Isopropylbenzene	ND (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
n-Propylbenzene	ND (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
1,3,5-Trimethylbenzene	**7.15** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
1,2,3-Trimethylbenzene	**J 4.03** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
1,2,4-Trimethylbenzene	**15.8** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
t-Butylbenzene	ND (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
sec-Butylbenzene	ND (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
p-Isopropyltoluene	**13.9** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
n-Butylbenzene	ND (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
trans-Decalin	ND (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
cis-Decalin	ND (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C1-Decalins	**J 5.49** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C2-Decalins	**19.2** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C3-Decalins	**16.4** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C4-Decalins	**16.3** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
Benzo(b)thiophene	**J 5.05** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C1-Benzo(b)thiophenes	**14.8** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C2-Benzo(b)thiophenes	**6.90** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C3-Benzo(b)thiophenes	**J 5.02** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C4-Benzo(b)thiophenes	**J 3.41** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS760-S2
Date Sampled: 03/09/20 12:55
Percent Solids: 72
Initial Volume: 4.99
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**151** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
2-Methylnaphthalene	**132** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
1-Methylnaphthalene	**79.1** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C1-Naphthalenes	**126** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C2-Naphthalenes	**153** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C3-Naphthalenes	**146** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C4-Naphthalenes	**104** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
Biphenyl	**38.5** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
Acenaphthylene	**74.2** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
Acenaphthene	**129** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
Dibenzofuran	**112** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
Fluorene	**211** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C1-Fluorenes	**158** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C2-Fluorenes	**238** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C3-Fluorenes	**221** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
Dibenzothiophene	**95.7** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C1-Dibenzothiophenes	**93.8** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C2-Dibenzothiophenes	**106** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C3-Dibenzothiophenes	**77.1** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C4-Dibenzothiophenes	**35.3** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
Phenanthrene	**1580** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
Anthracene	**610** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C1-Phenanthrenes/Anthracenes	**1380** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C2-Phenanthrenes/Anthracenes	**1050** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C3-Phenanthrenes/Anthracenes	**501** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C4-Phenanthrenes/Anthracenes	**287** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
Retene	**89.4** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
Benzo(b)naphtho(2,1-d)thiophene	**146** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C0-Benzonaphthothiophenes	**313** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C1-Benzonaphthothiophenes	**219** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C2-Benzonaphthothiophenes	**130** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C3-Benzonaphthothiophenes	**82.1** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS760-S2
Date Sampled: 03/09/20 12:55
Percent Solids: 72
Initial Volume: 4.99
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**28.0** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
Fluoranthene	**2980** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
Pyrene	**4180** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C1-Fluoranthenes/Pyrenes	**2820** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C2-Fluoranthenes/Pyrenes	**1110** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C3-Fluoranthenes/Pyrenes	**464** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
Benzo(b)fluorene	**273** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
Benzo(c)fluorene	**164** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
2-Methylpyrene	**396** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
4-Methylpyrene	**381** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
1-Methylpyrene	**326** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
Benz(a)anthracene	**2230** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
Chrysene/triphenylene	**1910** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C1-Benzo(a)anthracenes/Chrysenes	**1380** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C2-Benzo(a)anthracenes/Chrysenes	**663** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C3-Benzo(a)anthracenes/Chrysenes	**320** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C4-Benzo(a)anthracenes/Chrysenes	**139** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
Benzo(b)fluoranthene	**1110** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
Benzo(j/k)fluoranthene	**1240** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
Benzo(e)pyrene	**1160** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
Benzo(a)pyrene	**1850** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
Perylene	**360** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
Indeno(1,2,3-cd)pyrene	**862** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
Dibenzo(a,h)anthracene	**245** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
Benzo(g,h,i)perylene	**808** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
Coronene	**195** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
Tetramethyl lead	ND (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
Trimethylethyl lead	ND (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
Dimethyldiethyl lead	ND (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
Methyltriethyl lead	ND (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
Tetraethyl lead	ND (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
2,6,10-trimethyldodecane (1380)	**18.6** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS760-S2
Date Sampled: 03/09/20 12:55
Percent Solids: 72
Initial Volume: 4.99
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**49.8** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
2,6,10-trimethylpentadecane (1650)	B **60.5** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C-17	B **175** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
Pristane	B **135** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
C-18	B **99.2** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
Phytane	B **105** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
Carbazole	**158** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
2,6-Dimethylnaphthalene	**37.6** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
2,3,5-Trimethylnaphthene	**12.4** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
4-Methyldibenzothiophene	**24.7** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
2/3-Methyldibenzothiophene	**28.8** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
1-Methyldibenzothiophene	**9.09** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
3-Methylphenanthrene	**281** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
2-Methylphenanthrene	**281** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
2-Methylanthracene	**269** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
4/9-Methylphenanthrene	**345** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201
1-Methylphenanthrene	**174** (5.53)	2.77	8270 Mod		1	03/13/20 0:22	F0C0006	FC01201

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*77 %*		*50-120*
Surrogate: Naphthalene-d8	*69 %*		*50-120*
Surrogate: Phenanthrene-d10	*100 %*		*50-120*
Surrogate: Perylene-d12	*97 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS760-S2
Date Sampled: 03/09/20 12:55
Percent Solids: 72

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**53600** (92.9)		TOC-LK		1	CCP	03/16/20 17:11	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS761-S1
Date Sampled: 03/09/20 13:51
Percent Solids: 79
Initial Volume: 5.21
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C1-Benzene	**42.3** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C2-Benzenes	**37.3** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C3-Benzenes	**36.2** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C4-Benzenes	**24.0** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C5-Benzenes	**14.7** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
Methylcyclohexane	**32.3** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
Toluene	**58.1** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
Ethylbenzene	**9.22** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
m,p-Xylene	**29.3** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
Styrene	**66.1** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
o-Xylene	**13.6** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
Isopropylbenzene	**J 3.22** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
n-Propylbenzene	**J 3.72** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
1,3,5-Trimethylbenzene	**10.9** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
1,2,3-Trimethylbenzene	**6.37** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
1,2,4-Trimethylbenzene	**13.6** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
t-Butylbenzene	ND (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
sec-Butylbenzene	ND (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
p-Isopropyltoluene	**J 3.14** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
n-Butylbenzene	ND (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
trans-Decalin	**7.18** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
cis-Decalin	ND (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C1-Decalins	**13.6** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C2-Decalins	**25.7** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C3-Decalins	**29.5** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C4-Decalins	**94.3** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
Benzo(b)thiophene	**J 3.33** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C1-Benzo(b)thiophenes	**6.59** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C2-Benzo(b)thiophenes	**8.83** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C3-Benzo(b)thiophenes	**11.2** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C4-Benzo(b)thiophenes	**12.8** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS761-S1
Date Sampled: 03/09/20 13:51
Percent Solids: 79
Initial Volume: 5.21
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**92.3** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
2-Methylnaphthalene	**83.4** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
1-Methylnaphthalene	**67.3** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C1-Naphthalenes	**93.2** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C2-Naphthalenes	**210** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C3-Naphthalenes	**199** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C4-Naphthalenes	**189** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
Biphenyl	**24.9** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
Acenaphthylene	**982** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
Acenaphthene	**73.9** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
Dibenzofuran	**56.4** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
Fluorene	**121** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C1-Fluorenes	**176** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C2-Fluorenes	**316** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C3-Fluorenes	**332** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
Dibenzothiophene	**57.7** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C1-Dibenzothiophenes	**161** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C2-Dibenzothiophenes	**303** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C3-Dibenzothiophenes	**306** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C4-Dibenzothiophenes	**154** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
Phenanthrene	**816** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
Anthracene	**454** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C1-Phenanthrenes/Anthracenes	**1160** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C2-Phenanthrenes/Anthracenes	**1240** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C3-Phenanthrenes/Anthracenes	**718** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C4-Phenanthrenes/Anthracenes	**328** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
Retene	**64.6** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
Benzo(b)naphtho(2,1-d)thiophene	**249** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C0-Benzonaphthothiophenes	**471** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C1-Benzonaphthothiophenes	**549** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C2-Benzonaphthothiophenes	**401** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C3-Benzonaphthothiophenes	**289** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS761-S1
Date Sampled: 03/09/20 13:51
Percent Solids: 79
Initial Volume: 5.21
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**105** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
Fluoranthene	**2450** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
Pyrene	**3520** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C1-Fluoranthenes/Pyrenes	**3020** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C2-Fluoranthenes/Pyrenes	**1720** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C3-Fluoranthenes/Pyrenes	**966** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
Benzo(b)fluorene	**191** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
Benzo(c)fluorene	**81.4** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
2-Methylpyrene	**432** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
4-Methylpyrene	**579** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
1-Methylpyrene	**371** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
Benz(a)anthracene	**2080** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
Chrysene/triphenylene	**2400** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C1-Benzo(a)anthracenes/Chrysenes	**2280** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C2-Benzo(a)anthracenes/Chrysenes	**1210** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C3-Benzo(a)anthracenes/Chrysenes	**533** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C4-Benzo(a)anthracenes/Chrysenes	**284** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
Benzo(b)fluoranthene	**2010** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
Benzo(j/k)fluoranthene	**2140** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
Benzo(e)pyrene	**2630** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
Benzo(a)pyrene	**3440** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
Perylene	**672** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
Indeno(1,2,3-cd)pyrene	**2980** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
Dibenzo(a,h)anthracene	**631** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
Benzo(g,h,i)perylene	**2750** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
Coronene	**988** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
Tetramethyl lead	ND (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
Trimethylethyl lead	ND (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
Dimethyldiethyl lead	ND (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
Methyltriethyl lead	ND (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
Tetraethyl lead	ND (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
2,6,10-trimethyldodecane (1380)	**79.4** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS761-S1
Date Sampled: 03/09/20 13:51
Percent Solids: 79
Initial Volume: 5.21
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**159** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
2,6,10-trimethylpentadecane (1650)	**218** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C-17	**B 204** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
Pristane	**509** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
C-18	**B 224** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
Phytane	**442** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
Carbazole	**47.5** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
2,6-Dimethylnaphthalene	**32.8** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
2,3,5-Trimethylnaphthene	**13.1** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
4-Methyldibenzothiophene	**72.5** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
2/3-Methyldibenzothiophene	**48.8** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
1-Methyldibenzothiophene	**18.8** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
3-Methylphenanthrene	**206** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
2-Methylphenanthrene	**216** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
2-Methylanthracene	**152** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
4/9-Methylphenanthrene	**379** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201
1-Methylphenanthrene	**193** (4.87)	2.44	8270 Mod		1	03/16/20 8:09	F0C0007	FC01201

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*76 %*		*50-120*
Surrogate: Naphthalene-d8	*72 %*		*50-120*
Surrogate: Phenanthrene-d10	*97 %*		*50-120*
Surrogate: Perylene-d12	*70 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS761-S1
Date Sampled: 03/09/20 13:51
Percent Solids: 79

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**39000** (95.7)		TOC-LK		1	CCP	03/16/20 17:28	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS761-S2
Date Sampled: 03/09/20 13:57
Percent Solids: 66
Initial Volume: 5.05
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	J **4.08** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C1-Benzene	**69.7** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C2-Benzenes	**39.8** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C3-Benzenes	**12.0** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C4-Benzenes	**20.3** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C5-Benzenes	**17.7** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
Methylcyclohexane	ND (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
Toluene	**86.3** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
Ethylbenzene	ND (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
m,p-Xylene	**53.6** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
Styrene	J **3.92** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
o-Xylene	J **4.62** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
Isopropylbenzene	ND (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
n-Propylbenzene	ND (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
1,3,5-Trimethylbenzene	ND (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
1,2,3-Trimethylbenzene	ND (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
1,2,4-Trimethylbenzene	J **4.41** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
t-Butylbenzene	ND (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
sec-Butylbenzene	ND (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
p-Isopropyltoluene	**8.96** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
n-Butylbenzene	ND (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
trans-Decalin	ND (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
cis-Decalin	ND (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C1-Decalins	J **5.08** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C2-Decalins	ND (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C3-Decalins	ND (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C4-Decalins	ND (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
Benzo(b)thiophene	ND (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C1-Benzo(b)thiophenes	ND (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C2-Benzo(b)thiophenes	**7.88** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C3-Benzo(b)thiophenes	**6.89** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C4-Benzo(b)thiophenes	ND (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS761-S2
Date Sampled: 03/09/20 13:57
Percent Solids: 66
Initial Volume: 5.05
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**13.5** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
2-Methylnaphthalene	**9.12** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
1-Methylnaphthalene	**J 5.17** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C1-Naphthalenes	**9.61** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C2-Naphthalenes	**104** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C3-Naphthalenes	**123** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C4-Naphthalenes	**66.4** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
Biphenyl	**J 5.15** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
Acenaphthylene	**28.0** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
Acenaphthene	**11.3** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
Dibenzofuran	**9.68** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
Fluorene	**19.6** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C1-Fluorenes	**60.5** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C2-Fluorenes	**91.8** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C3-Fluorenes	**60.9** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
Dibenzothiophene	**12.3** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C1-Dibenzothiophenes	**41.9** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C2-Dibenzothiophenes	**49.2** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C3-Dibenzothiophenes	**38.1** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C4-Dibenzothiophenes	**20.3** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
Phenanthrene	**135** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
Anthracene	**67.6** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C1-Phenanthrenes/Anthracenes	**365** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C2-Phenanthrenes/Anthracenes	**316** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C3-Phenanthrenes/Anthracenes	**155** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C4-Phenanthrenes/Anthracenes	**114** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
Retene	**121** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
Benzo(b)naphtho(2,1-d)thiophene	**35.6** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C0-Benzonaphthothiophenes	**68.6** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C1-Benzonaphthothiophenes	**60.4** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C2-Benzonaphthothiophenes	**42.3** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C3-Benzonaphthothiophenes	**21.2** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS761-S2
Date Sampled: 03/09/20 13:57
Percent Solids: 66
Initial Volume: 5.05
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
Fluoranthene	**430** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
Pyrene	**608** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C1-Fluoranthenes/Pyrenes	**483** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C2-Fluoranthenes/Pyrenes	**229** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C3-Fluoranthenes/Pyrenes	**111** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
Benzo(b)fluorene	**49.7** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
Benzo(c)fluorene	**23.2** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
2-Methylpyrene	**66.4** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
4-Methylpyrene	**70.1** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
1-Methylpyrene	**51.0** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
Benz(a)anthracene	**287** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
Chrysene/triphenylene	**325** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C1-Benzo(a)anthracenes/Chrysenes	**290** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C2-Benzo(a)anthracenes/Chrysenes	**160** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C3-Benzo(a)anthracenes/Chrysenes	**66.6** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C4-Benzo(a)anthracenes/Chrysenes	**26.6** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
Benzo(b)fluoranthene	**166** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
Benzo(j/k)fluoranthene	**187** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
Benzo(e)pyrene	**187** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
Benzo(a)pyrene	**249** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
Perylene	**151** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
Indeno(1,2,3-cd)pyrene	**145** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
Dibenzo(a,h)anthracene	**36.5** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
Benzo(g,h,i)perylene	**135** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
Coronene	**31.1** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
Tetramethyl lead	ND (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
Trimethylethyl lead	ND (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
Dimethyldiethyl lead	ND (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
Methyltriethyl lead	ND (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
Tetraethyl lead	ND (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
2,6,10-trimethyldodecane (1380)	**12.2** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS761-S2
Date Sampled: 03/09/20 13:57
Percent Solids: 66
Initial Volume: 5.05
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**38.1** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
2,6,10-trimethylpentadecane (1650)	**B 42.0** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C-17	**B 267** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
Pristane	**B 102** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
C-18	**B 74.0** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
Phytane	**B 115** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
Carbazole	**J 3.82** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
2,6-Dimethylnaphthalene	**12.8** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
2,3,5-Trimethylnaphthene	**11.4** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
4-Methyldibenzothiophene	**15.7** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
2/3-Methyldibenzothiophene	**12.4** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
1-Methyldibenzothiophene	**J 3.05** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
3-Methylphenanthrene	**90.1** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
2-Methylphenanthrene	**81.5** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
2-Methylanthracene	**34.5** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
4/9-Methylphenanthrene	**117** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201
1-Methylphenanthrene	**44.3** (6.00)	3.00	8270 Mod		1	03/13/20 1:47	F0C0006	FC01201

	%Recovery	*Qualifier*	*Limits*
Surrogate: Toluene-D8	*78 %*		*50-120*
Surrogate: Naphthalene-d8	*69 %*		*50-120*
Surrogate: Phenanthrene-d10	*98 %*		*50-120*
Surrogate: Perylene-d12	*94 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS761-S2
Date Sampled: 03/09/20 13:57
Percent Solids: 66

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-04
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**26500** (95.6)		TOC-LK		1	CCP	03/16/20 17:45	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS762-S2
Date Sampled: 03/09/20 12:21
Percent Solids: 59
Initial Volume: 4.95
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C1-Benzene	**19.9** (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C2-Benzenes	**19.0** (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C3-Benzenes	**J 4.78** (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C4-Benzenes	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C5-Benzenes	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
Methylcyclohexane	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
Toluene	**26.4** (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
Ethylbenzene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
m,p-Xylene	**23.5** (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
Styrene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
o-Xylene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
Isopropylbenzene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
n-Propylbenzene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
1,3,5-Trimethylbenzene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
1,2,3-Trimethylbenzene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
1,2,4-Trimethylbenzene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
t-Butylbenzene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
sec-Butylbenzene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
p-Isopropyltoluene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
n-Butylbenzene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
trans-Decalin	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
cis-Decalin	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C1-Decalins	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C2-Decalins	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C3-Decalins	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C4-Decalins	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
Benzo(b)thiophene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C1-Benzo(b)thiophenes	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C2-Benzo(b)thiophenes	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C3-Benzo(b)thiophenes	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C4-Benzo(b)thiophenes	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS762-S2
Date Sampled: 03/09/20 12:21
Percent Solids: 59
Initial Volume: 4.95
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
2-Methylnaphthalene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
1-Methylnaphthalene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C1-Naphthalenes	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C2-Naphthalenes	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C3-Naphthalenes	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C4-Naphthalenes	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
Biphenyl	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
Acenaphthylene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
Acenaphthene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
Dibenzofuran	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
Fluorene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C1-Fluorenes	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C2-Fluorenes	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C3-Fluorenes	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
Dibenzothiophene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C1-Dibenzothiophenes	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C2-Dibenzothiophenes	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C3-Dibenzothiophenes	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C4-Dibenzothiophenes	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
Phenanthrene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
Anthracene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C1-Phenanthrenes/Anthracenes	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C2-Phenanthrenes/Anthracenes	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C3-Phenanthrenes/Anthracenes	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C4-Phenanthrenes/Anthracenes	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
Retene	**7.11** (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
Benzo(b)naphtho(2,1-d)thiophene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C0-Benzonaphthothiophenes	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C1-Benzonaphthothiophenes	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C2-Benzonaphthothiophenes	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C3-Benzonaphthothiophenes	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS762-S2
Date Sampled: 03/09/20 12:21
Percent Solids: 59
Initial Volume: 4.95
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
Fluoranthene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
Pyrene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C1-Fluoranthenes/Pyrenes	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C2-Fluoranthenes/Pyrenes	**8.17** (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C3-Fluoranthenes/Pyrenes	**9.09** (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
Benzo(b)fluorene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
Benzo(c)fluorene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
2-Methylpyrene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
4-Methylpyrene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
1-Methylpyrene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
Benz(a)anthracene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
Chrysene/triphenylene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C1-Benzo(a)anthracenes/Chrysenes	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C2-Benzo(a)anthracenes/Chrysenes	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C3-Benzo(a)anthracenes/Chrysenes	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C4-Benzo(a)anthracenes/Chrysenes	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
Benzo(b)fluoranthene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
Benzo(j/k)fluoranthene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
Benzo(e)pyrene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
Benzo(a)pyrene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
Perylene	**521** (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
Indeno(1,2,3-cd)pyrene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
Dibenzo(a,h)anthracene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
Benzo(g,h,i)perylene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
Coronene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
Tetramethyl lead	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
Trimethylethyl lead	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
Dimethyldiethyl lead	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
Methyltriethyl lead	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
Tetraethyl lead	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
2,6,10-trimethyldodecane (1380)	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS762-S2
Date Sampled: 03/09/20 12:21
Percent Solids: 59
Initial Volume: 4.95
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**7.48** (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
2,6,10-trimethylpentadecane (1650)	**B 12.0** (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C-17	**B 87.2** (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
Pristane	**B 36.8** (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
C-18	**B 44.4** (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
Phytane	**B 53.0** (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
Carbazole	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
2,6-Dimethylnaphthalene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
2,3,5-Trimethylnaphthene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
4-Methyldibenzothiophene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
2/3-Methyldibenzothiophene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
1-Methyldibenzothiophene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
3-Methylphenanthrene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
2-Methylphenanthrene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
2-Methylanthracene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
4/9-Methylphenanthrene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201
1-Methylphenanthrene	ND (6.85)	3.42	8270 Mod		1	03/13/20 3:12	F0C0006	FC01201

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*81 %*		*50-120*
Surrogate: Naphthalene-d8	*67 %*		*50-120*
Surrogate: Phenanthrene-d10	*93 %*		*50-120*
Surrogate: Perylene-d12	*97 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS762-S2
Date Sampled: 03/09/20 12:21
Percent Solids: 59

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-05
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**37600** (96.5)		TOC-LK		1	CCP	03/16/20 18:01	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS762-S3
Date Sampled: 03/09/20 12:37
Percent Solids: 75
Initial Volume: 4.79
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C1-Benzene	**8.12** (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C2-Benzenes	**6.83** (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C3-Benzenes	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C4-Benzenes	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C5-Benzenes	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
Methylcyclohexane	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
Toluene	**9.94** (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
Ethylbenzene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
m,p-Xylene	**6.75** (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
Styrene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
o-Xylene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
Isopropylbenzene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
n-Propylbenzene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
1,3,5-Trimethylbenzene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
1,2,3-Trimethylbenzene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
1,2,4-Trimethylbenzene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
t-Butylbenzene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
sec-Butylbenzene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
p-Isopropyltoluene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
n-Butylbenzene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
trans-Decalin	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
cis-Decalin	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C1-Decalins	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C2-Decalins	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C3-Decalins	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C4-Decalins	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
Benzo(b)thiophene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C1-Benzo(b)thiophenes	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C2-Benzo(b)thiophenes	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C3-Benzo(b)thiophenes	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C4-Benzo(b)thiophenes	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS762-S3
Date Sampled: 03/09/20 12:37
Percent Solids: 75
Initial Volume: 4.79
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
2-Methylnaphthalene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
1-Methylnaphthalene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C1-Naphthalenes	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C2-Naphthalenes	**J 5.01** (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C3-Naphthalenes	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C4-Naphthalenes	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
Biphenyl	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
Acenaphthylene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
Acenaphthene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
Dibenzofuran	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
Fluorene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C1-Fluorenes	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C2-Fluorenes	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C3-Fluorenes	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
Dibenzothiophene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C1-Dibenzothiophenes	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C2-Dibenzothiophenes	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C3-Dibenzothiophenes	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C4-Dibenzothiophenes	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
Phenanthrene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
Anthracene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C1-Phenanthrenes/Anthracenes	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C2-Phenanthrenes/Anthracenes	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C3-Phenanthrenes/Anthracenes	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C4-Phenanthrenes/Anthracenes	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
Retene	**10.6** (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
Benzo(b)naphtho(2,1-d)thiophene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C0-Benzonaphthothiophenes	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C1-Benzonaphthothiophenes	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C2-Benzonaphthothiophenes	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C3-Benzonaphthothiophenes	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS762-S3
Date Sampled: 03/09/20 12:37
Percent Solids: 75
Initial Volume: 4.79
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
Fluoranthene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
Pyrene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C1-Fluoranthenes/Pyrenes	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C2-Fluoranthenes/Pyrenes	**J 2.93** (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C3-Fluoranthenes/Pyrenes	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
Benzo(b)fluorene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
Benzo(c)fluorene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
2-Methylpyrene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
4-Methylpyrene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
1-Methylpyrene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
Benz(a)anthracene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
Chrysene/triphenylene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C1-Benzo(a)anthracenes/Chrysenes	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C2-Benzo(a)anthracenes/Chrysenes	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C3-Benzo(a)anthracenes/Chrysenes	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C4-Benzo(a)anthracenes/Chrysenes	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
Benzo(b)fluoranthene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
Benzo(j/k)fluoranthene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
Benzo(e)pyrene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
Benzo(a)pyrene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
Perylene	**226** (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
Indeno(1,2,3-cd)pyrene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
Dibenzo(a,h)anthracene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
Benzo(g,h,i)perylene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
Coronene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
Tetramethyl lead	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
Trimethylethyl lead	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
Dimethyldiethyl lead	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
Methyltriethyl lead	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
Tetraethyl lead	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
2,6,10-trimethyldodecane (1380)	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS762-S3
Date Sampled: 03/09/20 12:37
Percent Solids: 75
Initial Volume: 4.79
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	J **4.49** (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
2,6,10-trimethylpentadecane (1650)	B **16.4** (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C-17	B **76.3** (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
Pristane	B **43.8** (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
C-18	B **52.4** (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
Phytane	B **57.1** (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
Carbazole	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
2,6-Dimethylnaphthalene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
2,3,5-Trimethylnaphthene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
4-Methyldibenzothiophene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
2/3-Methyldibenzothiophene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
1-Methyldibenzothiophene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
3-Methylphenanthrene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
2-Methylphenanthrene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
2-Methylanthracene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
4/9-Methylphenanthrene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201
1-Methylphenanthrene	ND (5.58)	2.79	8270 Mod		1	03/13/20 4:37	F0C0006	FC01201

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*80 %*		*50-120*
Surrogate: Naphthalene-d8	*68 %*		*50-120*
Surrogate: Phenanthrene-d10	*94 %*		*50-120*
Surrogate: Perylene-d12	*95 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS762-S3
Date Sampled: 03/09/20 12:37
Percent Solids: 75

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-06
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**11400** (95.6)		TOC-LK		1	CCP	03/16/20 18:51	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS763-S1
Date Sampled: 03/09/20 12:33
Percent Solids: 63
Initial Volume: 4.95
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
C1-Benzene	**256** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
C2-Benzenes	**91.6** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
C3-Benzenes	**79.3** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
C4-Benzenes	**170** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
C5-Benzenes	**193** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
Methylcyclohexane	**9.07** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
Toluene	**314** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
Ethylbenzene	**25.9** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
m,p-Xylene	**90.7** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
Styrene	**137** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
o-Xylene	**12.0** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
Isopropylbenzene	ND (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
n-Propylbenzene	**6.67** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
1,3,5-Trimethylbenzene	**12.9** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
1,2,3-Trimethylbenzene	**7.55** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
1,2,4-Trimethylbenzene	**29.2** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
t-Butylbenzene	ND (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
sec-Butylbenzene	ND (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
p-Isopropyltoluene	**13.9** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
n-Butylbenzene	**11.5** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
trans-Decalin	**52.5** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
cis-Decalin	**9.26** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
C1-Decalins	**166** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
C2-Decalins	**331** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
C3-Decalins	**287** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
C4-Decalins	**541** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
Benzo(b)thiophene	**71.9** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
C1-Benzo(b)thiophenes	**101** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
C2-Benzo(b)thiophenes	**410** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
C3-Benzo(b)thiophenes	**363** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
C4-Benzo(b)thiophenes	**136** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS763-S1
Date Sampled: 03/09/20 12:33
Percent Solids: 63
Initial Volume: 4.95
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**1750** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
2-Methylnaphthalene	**751** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
1-Methylnaphthalene	**991** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
C1-Naphthalenes	**1050** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
C2-Naphthalenes	**6120** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
C3-Naphthalenes	**5540** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
C4-Naphthalenes	**2370** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
Biphenyl	**601** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
Acenaphthylene	**2610** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
Acenaphthene	**17400** (129)	64.3	8270 Mod		20	03/16/20 12:19	F0C0007	FC01201
Dibenzofuran	**463** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
Fluorene	**8080** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
C1-Fluorenes	**4800** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
C2-Fluorenes	**3820** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
C3-Fluorenes	**2350** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
Dibenzothiophene	**3280** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
C1-Dibenzothiophenes	**3230** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
C2-Dibenzothiophenes	**2920** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
C3-Dibenzothiophenes	**1720** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
C4-Dibenzothiophenes	**680** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
Phenanthrene	**58200** (129)	64.3	8270 Mod		20	03/16/20 12:19	F0C0007	FC01201
Anthracene	**17900** (129)	64.3	8270 Mod		20	03/16/20 12:19	F0C0007	FC01201
C1-Phenanthrenes/Anthracenes	**24900** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
C2-Phenanthrenes/Anthracenes	**12500** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
C3-Phenanthrenes/Anthracenes	**4740** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
C4-Phenanthrenes/Anthracenes	**1680** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
Retene	**753** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
Benzo(b)naphtho(2,1-d)thiophene	**2200** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
C0-Benzonaphthothiophenes	**3980** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
C1-Benzonaphthothiophenes	**2590** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
C2-Benzonaphthothiophenes	**1420** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
C3-Benzonaphthothiophenes	**871** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS763-S1
Date Sampled: 03/09/20 12:33
Percent Solids: 63
Initial Volume: 4.95
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**229** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
Fluoranthene	**56200** (129)	64.3	8270 Mod		20	03/16/20 12:19	F0C0007	FC01201
Pyrene	**71800** (129)	64.3	8270 Mod		20	03/16/20 12:19	F0C0007	FC01201
C1-Fluoranthenes/Pyrenes	**24600** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
C2-Fluoranthenes/Pyrenes	**7720** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
C3-Fluoranthenes/Pyrenes	**2920** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
Benzo(b)fluorene	**3130** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
Benzo(c)fluorene	**1260** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
2-Methylpyrene	**3340** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
4-Methylpyrene	**2820** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
1-Methylpyrene	**2800** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
Benz(a)anthracene	**28300** (129)	64.3	8270 Mod		20	03/16/20 12:19	F0C0007	FC01201
Chrysene/triphenylene	**28600** (129)	64.3	8270 Mod		20	03/16/20 12:19	F0C0007	FC01201
C1-Benzo(a)anthracenes/Chrysenes	**10800** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
C2-Benzo(a)anthracenes/Chrysenes	**4360** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
C3-Benzo(a)anthracenes/Chrysenes	**1710** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
C4-Benzo(a)anthracenes/Chrysenes	**823** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
Benzo(b)fluoranthene	**11100** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
Benzo(j/k)fluoranthene	**12000** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
Benzo(e)pyrene	**10700** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
Benzo(a)pyrene	**27500** (129)	64.3	8270 Mod		20	03/16/20 12:19	F0C0007	FC01201
Perylene	**3520** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
Indeno(1,2,3-cd)pyrene	**12000** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
Dibenzo(a,h)anthracene	**3090** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
Benzo(g,h,i)perylene	**10300** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
Coronene	**3660** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
Tetramethyl lead	ND (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
Trimethylethyl lead	ND (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
Dimethyldiethyl lead	ND (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
Methyltriethyl lead	ND (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
Tetraethyl lead	ND (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
2,6,10-trimethyldodecane (1380)	**538** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS763-S1
Date Sampled: 03/09/20 12:33
Percent Solids: 63
Initial Volume: 4.95
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**1030** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
2,6,10-trimethylpentadecane (1650)	**1730** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
C-17	**704** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
Pristane	**3700** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
C-18	**729** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
Phytane	**3690** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
Carbazole	**160** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
2,6-Dimethylnaphthalene	**643** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
2,3,5-Trimethylnaphthene	**390** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
4-Methyldibenzothiophene	**1390** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
2/3-Methyldibenzothiophene	**1110** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
1-Methyldibenzothiophene	**306** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
3-Methylphenanthrene	**5530** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
2-Methylphenanthrene	**6400** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
2-Methylanthracene	**2950** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
4/9-Methylphenanthrene	**5650** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201
1-Methylphenanthrene	**4330** (6.43)	3.21	8270 Mod		1	03/16/20 9:32	F0C0007	FC01201

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*65 %*		*50-120*
Surrogate: Naphthalene-d8	*71 %*		*50-120*
Surrogate: Phenanthrene-d10	*75 %*		*50-120*
Surrogate: Perylene-d12	*63 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS763-S1
Date Sampled: 03/09/20 12:33
Percent Solids: 63

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-07
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**54000** (104)		TOC-LK		1	CCP	03/16/20 19:08	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS763-S2
Date Sampled: 03/09/20 14:40
Percent Solids: 82
Initial Volume: 5.04
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C1-Benzene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C2-Benzenes	**5.73** (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C3-Benzenes	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C4-Benzenes	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C5-Benzenes	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
Methylcyclohexane	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
Toluene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
Ethylbenzene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
m,p-Xylene	**8.13** (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
Styrene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
o-Xylene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
Isopropylbenzene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
n-Propylbenzene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
1,3,5-Trimethylbenzene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
1,2,3-Trimethylbenzene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
1,2,4-Trimethylbenzene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
t-Butylbenzene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
sec-Butylbenzene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
p-Isopropyltoluene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
n-Butylbenzene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
trans-Decalin	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
cis-Decalin	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C1-Decalins	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C2-Decalins	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C3-Decalins	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C4-Decalins	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
Benzo(b)thiophene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C1-Benzo(b)thiophenes	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C2-Benzo(b)thiophenes	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C3-Benzo(b)thiophenes	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C4-Benzo(b)thiophenes	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS763-S2
Date Sampled: 03/09/20 14:40
Percent Solids: 82
Initial Volume: 5.04
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
2-Methylnaphthalene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
1-Methylnaphthalene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C1-Naphthalenes	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C2-Naphthalenes	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C3-Naphthalenes	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C4-Naphthalenes	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
Biphenyl	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
Acenaphthylene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
Acenaphthene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
Dibenzofuran	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
Fluorene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C1-Fluorenes	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C2-Fluorenes	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C3-Fluorenes	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
Dibenzothiophene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C1-Dibenzothiophenes	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C2-Dibenzothiophenes	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C3-Dibenzothiophenes	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C4-Dibenzothiophenes	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
Phenanthrene	**J 3.53** (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
Anthracene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C1-Phenanthrenes/Anthracenes	**J 4.24** (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C2-Phenanthrenes/Anthracenes	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C3-Phenanthrenes/Anthracenes	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C4-Phenanthrenes/Anthracenes	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
Retene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
Benzo(b)naphtho(2,1-d)thiophene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C0-Benzonaphthothiophenes	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C1-Benzonaphthothiophenes	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C2-Benzonaphthothiophenes	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C3-Benzonaphthothiophenes	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS763-S2
Date Sampled: 03/09/20 14:40
Percent Solids: 82
Initial Volume: 5.04
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
Fluoranthene	J **3.33** (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
Pyrene	**5.52** (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C1-Fluoranthenes/Pyrenes	J **3.03** (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C2-Fluoranthenes/Pyrenes	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C3-Fluoranthenes/Pyrenes	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
Benzo(b)fluorene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
Benzo(c)fluorene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
2-Methylpyrene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
4-Methylpyrene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
1-Methylpyrene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
Benz(a)anthracene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
Chrysene/triphenylene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C1-Benzo(a)anthracenes/Chrysenes	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C2-Benzo(a)anthracenes/Chrysenes	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C3-Benzo(a)anthracenes/Chrysenes	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C4-Benzo(a)anthracenes/Chrysenes	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
Benzo(b)fluoranthene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
Benzo(j/k)fluoranthene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
Benzo(e)pyrene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
Benzo(a)pyrene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
Perylene	**199** (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
Indeno(1,2,3-cd)pyrene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
Dibenzo(a,h)anthracene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
Benzo(g,h,i)perylene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
Coronene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
Tetramethyl lead	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
Trimethylethyl lead	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
Dimethyldiethyl lead	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
Methyltriethyl lead	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
Tetraethyl lead	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
2,6,10-trimethyldodecane (1380)	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS763-S2
Date Sampled: 03/09/20 14:40
Percent Solids: 82
Initial Volume: 5.04
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
2,6,10-trimethylpentadecane (1650)	**B 10.2** (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C-17	**B 38.6** (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
Pristane	**B 26.5** (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
C-18	**B 31.8** (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
Phytane	**B 37.1** (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
Carbazole	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
2,6-Dimethylnaphthalene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
2,3,5-Trimethylnaphthene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
4-Methyldibenzothiophene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
2/3-Methyldibenzothiophene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
1-Methyldibenzothiophene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
3-Methylphenanthrene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
2-Methylphenanthrene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
2-Methylanthracene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
4/9-Methylphenanthrene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201
1-Methylphenanthrene	ND (4.85)	2.42	8270 Mod		1	03/13/20 6:03	F0C0006	FC01201

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*81 %*		*50-120*
Surrogate: Naphthalene-d8	*65 %*		*50-120*
Surrogate: Phenanthrene-d10	*96 %*		*50-120*
Surrogate: Perylene-d12	*95 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS763-S2
Date Sampled: 03/09/20 14:40
Percent Solids: 82

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-08
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**3680** (103)		TOC-LK		1	CCP	03/16/20 19:24	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS764-S2
Date Sampled: 03/09/20 15:22
Percent Solids: 55
Initial Volume: 4.93
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C1-Benzene	**36.9** (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C2-Benzenes	**29.8** (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C3-Benzenes	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C4-Benzenes	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C5-Benzenes	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
Methylcyclohexane	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
Toluene	**49.1** (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
Ethylbenzene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
m,p-Xylene	**43.2** (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
Styrene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
o-Xylene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
Isopropylbenzene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
n-Propylbenzene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
1,3,5-Trimethylbenzene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
1,2,3-Trimethylbenzene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
1,2,4-Trimethylbenzene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
t-Butylbenzene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
sec-Butylbenzene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
p-Isopropyltoluene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
n-Butylbenzene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
trans-Decalin	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
cis-Decalin	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C1-Decalins	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C2-Decalins	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C3-Decalins	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C4-Decalins	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
Benzo(b)thiophene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C1-Benzo(b)thiophenes	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C2-Benzo(b)thiophenes	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C3-Benzo(b)thiophenes	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C4-Benzo(b)thiophenes	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS764-S2
Date Sampled: 03/09/20 15:22
Percent Solids: 55
Initial Volume: 4.93
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
2-Methylnaphthalene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
1-Methylnaphthalene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C1-Naphthalenes	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C2-Naphthalenes	**J 5.42** (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C3-Naphthalenes	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C4-Naphthalenes	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
Biphenyl	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
Acenaphthylene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
Acenaphthene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
Dibenzofuran	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
Fluorene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C1-Fluorenes	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C2-Fluorenes	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C3-Fluorenes	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
Dibenzothiophene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C1-Dibenzothiophenes	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C2-Dibenzothiophenes	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C3-Dibenzothiophenes	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C4-Dibenzothiophenes	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
Phenanthrene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
Anthracene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C1-Phenanthrenes/Anthracenes	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C2-Phenanthrenes/Anthracenes	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C3-Phenanthrenes/Anthracenes	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C4-Phenanthrenes/Anthracenes	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
Retene	**J 4.47** (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
Benzo(b)naphtho(2,1-d)thiophene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C0-Benzonaphthothiophenes	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C1-Benzonaphthothiophenes	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C2-Benzonaphthothiophenes	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C3-Benzonaphthothiophenes	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS764-S2
Date Sampled: 03/09/20 15:22
Percent Solids: 55
Initial Volume: 4.93
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
Fluoranthene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
Pyrene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C1-Fluoranthenes/Pyrenes	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C2-Fluoranthenes/Pyrenes	**J 4.94** (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C3-Fluoranthenes/Pyrenes	**J 5.43** (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
Benzo(b)fluorene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
Benzo(c)fluorene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
2-Methylpyrene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
4-Methylpyrene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
1-Methylpyrene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
Benz(a)anthracene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
Chrysene/triphenylene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C1-Benzo(a)anthracenes/Chrysenes	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C2-Benzo(a)anthracenes/Chrysenes	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C3-Benzo(a)anthracenes/Chrysenes	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C4-Benzo(a)anthracenes/Chrysenes	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
Benzo(b)fluoranthene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
Benzo(j/k)fluoranthene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
Benzo(e)pyrene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
Benzo(a)pyrene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
Perylene	**821** (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
Indeno(1,2,3-cd)pyrene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
Dibenzo(a,h)anthracene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
Benzo(g,h,i)perylene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
Coronene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
Tetramethyl lead	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
Trimethylethyl lead	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
Dimethyldiethyl lead	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
Methyltriethyl lead	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
Tetraethyl lead	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
2,6,10-trimethyldodecane (1380)	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS764-S2
Date Sampled: 03/09/20 15:22
Percent Solids: 55
Initial Volume: 4.93
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**J 7.30** (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
2,6,10-trimethylpentadecane (1650)	**B 21.6** (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C-17	**B 164** (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
Pristane	**B 61.8** (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
C-18	**B 70.5** (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
Phytane	**B 81.5** (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
Carbazole	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
2,6-Dimethylnaphthalene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
2,3,5-Trimethylnaphthene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
4-Methyldibenzothiophene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
2/3-Methyldibenzothiophene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
1-Methyldibenzothiophene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
3-Methylphenanthrene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
2-Methylphenanthrene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
2-Methylanthracene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
4/9-Methylphenanthrene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201
1-Methylphenanthrene	ND (7.43)	3.72	8270 Mod		1	03/13/20 7:28	F0C0006	FC01201

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*81 %*		*50-120*
Surrogate: Naphthalene-d8	*69 %*		*50-120*
Surrogate: Phenanthrene-d10	*98 %*		*50-120*
Surrogate: Perylene-d12	*108 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS764-S2
Date Sampled: 03/09/20 15:22
Percent Solids: 55

ESS Laboratory Work Order: F200013
ESS Laboratory Sample ID: F200013-09
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**43700** (96.5)		TOC-LK		1	CCP	03/16/20 19:41	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200013

Quality Control Data

Classical Chemistry

Batch DC01260 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	100	mg/kg							
Total Organic Carbon (2)	ND	100	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200013

Quality Control Data

Classical Chemistry

Batch DC01260 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9240	100	mg/kg	10000		92	80-120			
Total Organic Carbon (2)	8940	100	mg/kg	10000		89	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200013

Quality Control Data

Classical Chemistry

Batch DC01260 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9050	100	mg/kg	10000		91	80-120	2	20	
Total Organic Carbon (2)	9490	100	mg/kg	10000		95	80-120	6	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200013

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FC01201 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	ND	4.00	ug/Kg wet							
C1-Benzene	ND	4.00	ug/Kg wet							
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	ND	4.00	ug/Kg wet							
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	ND	4.00	ug/Kg wet							
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200013

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FC01201 - 3570

C1-Fluorenes	ND	4.00	ug/Kg wet
C2-Fluorenes	ND	4.00	ug/Kg wet
C3-Fluorenes	ND	4.00	ug/Kg wet
Dibenzothiophene	ND	4.00	ug/Kg wet
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet
Phenanthrene	ND	4.00	ug/Kg wet
Anthracene	ND	4.00	ug/Kg wet
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
Retene	ND	4.00	ug/Kg wet
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
Fluoranthene	ND	4.00	ug/Kg wet
Pyrene	ND	4.00	ug/Kg wet
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
Benzo(b)fluorene	ND	4.00	ug/Kg wet
Benzo(c)fluorene	ND	4.00	ug/Kg wet
2-Methylpyrene	ND	4.00	ug/Kg wet
4-Methylpyrene	ND	4.00	ug/Kg wet
1-Methylpyrene	ND	4.00	ug/Kg wet
Benz(a)anthracene	ND	4.00	ug/Kg wet
Chrysene/triphenylene	ND	4.00	ug/Kg wet
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet
Benzo(e)pyrene	ND	4.00	ug/Kg wet
Benzo(a)pyrene	ND	4.00	ug/Kg wet
Perylene	ND	4.00	ug/Kg wet
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet
Coronene	ND	4.00	ug/Kg wet
Tetramethyl lead	ND	4.00	ug/Kg wet
Trimethylethyl lead	ND	4.00	ug/Kg wet

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200013

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FC01201 - 3570						
Dimethyldiethyl lead	ND	4.00	ug/Kg wet			
Methyltriethyl lead	ND	4.00	ug/Kg wet			
Tetraethyl lead	ND	4.00	ug/Kg wet			
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet			
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet			
2,6,10-trimethylpentadecane (1650)	12.3	4.00	ug/Kg wet			
C-17	41.7	4.00	ug/Kg wet			
Pristane	33.7	4.00	ug/Kg wet			
C-18	35.2	4.00	ug/Kg wet			
Phytane	39.1	4.00	ug/Kg wet			
Carbazole	ND	4.00	ug/Kg wet			
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet			
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet			
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
3-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylanthracene	ND	4.00	ug/Kg wet			
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet			
1-Methylphenanthrene	ND	4.00	ug/Kg wet			
Surrogate: Toluene-D8	*357*		ug/Kg wet	*400.0*	*89*	*50-120*
Surrogate: Naphthalene-d8	*284*		ug/Kg wet	*400.0*	*71*	*50-120*
Surrogate: Phenanthrene-d10	*397*		ug/Kg wet	*400.0*	*99*	*50-120*
Surrogate: Perylene-d12	*430*		ug/Kg wet	*400.0*	*107*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200013

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FC01201 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	298	4.00	ug/Kg wet	400.0		74	60-130			
Methylcyclohexane	243	4.00	ug/Kg wet	400.0		61	60-130			
Toluene	349	4.00	ug/Kg wet	400.0		87	60-130			
Ethylbenzene	349	4.00	ug/Kg wet	400.0		87	60-130			
m,p-Xylene	348	4.00	ug/Kg wet	400.0		87	60-130			
Styrene	343	4.00	ug/Kg wet	400.0		86	60-130			
o-Xylene	349	4.00	ug/Kg wet	400.0		87	60-130			
Isopropylbenzene	353	4.00	ug/Kg wet	400.0		88	60-130			
n-Propylbenzene	338	4.00	ug/Kg wet	400.0		85	60-130			
1,3,5-Trimethylbenzene	351	4.00	ug/Kg wet	400.0		88	60-130			
1,2,3-Trimethylbenzene	347	4.00	ug/Kg wet	400.0		87	60-130			
1,2,4-Trimethylbenzene	346	4.00	ug/Kg wet	400.0		86	60-130			
t-Butylbenzene	361	4.00	ug/Kg wet	400.0		90	60-130			
sec-Butylbenzene	347	4.00	ug/Kg wet	400.0		87	60-130			
p-Isopropyltoluene	349	4.00	ug/Kg wet	400.0		87	60-130			
n-Butylbenzene	304	4.00	ug/Kg wet	400.0		76	60-130			
trans-Decalin	333	4.00	ug/Kg wet	400.0		83	60-130			
cis-Decalin	334	4.00	ug/Kg wet	400.0		83	60-130			
Benzo(b)thiophene	287	4.00	ug/Kg wet	400.0		72	60-130			
Naphthalene	296	4.00	ug/Kg wet	400.0		74	60-130			
2-Methylnaphthalene	327	4.00	ug/Kg wet	400.0		82	60-130			
1-Methylnaphthalene	335	4.00	ug/Kg wet	400.0		84	60-130			
Biphenyl	308	4.00	ug/Kg wet	400.0		77	60-130			
Acenaphthylene	357	4.00	ug/Kg wet	400.0		89	60-130			
Acenaphthene	357	4.00	ug/Kg wet	400.0		89	60-130			
Dibenzofuran	348	4.00	ug/Kg wet	400.0		87	60-130			
Fluorene	357	4.00	ug/Kg wet	400.0		89	60-130			
Dibenzothiophene	352	4.00	ug/Kg wet	400.0		88	60-130			
Phenanthrene	358	4.00	ug/Kg wet	400.0		89	60-130			
Anthracene	347	4.00	ug/Kg wet	400.0		87	60-130			
Retene	435	4.00	ug/Kg wet	400.0		109	60-130			
Benzo(b)naphtho(2,1-d)thiophene	402	4.00	ug/Kg wet	400.0		100	60-130			
Fluoranthene	396	4.00	ug/Kg wet	400.0		99	60-130			
Pyrene	397	4.00	ug/Kg wet	400.0		99	60-130			
Benz(a)anthracene	425	4.00	ug/Kg wet	400.0		106	60-130			
Chrysene/triphenylene	440	4.00	ug/Kg wet	400.0		110	60-130			
Benzo(b)fluoranthene	383	4.00	ug/Kg wet	400.0		96	60-130			
Benzo(j/k)fluoranthene	426	4.00	ug/Kg wet	400.0		106	60-130			
Benzo(e)pyrene	394	4.00	ug/Kg wet	400.0		98	60-130			
Benzo(a)pyrene	400	4.00	ug/Kg wet	400.0		100	60-130			
Perylene	393	4.00	ug/Kg wet	400.0		98	60-130			
Indeno(1,2,3-cd)pyrene	374	4.00	ug/Kg wet	400.0		94	60-130			
Dibenzo(a,h)anthracene	460	4.00	ug/Kg wet	400.0		115	60-130			
Benzo(g,h,i)perylene	390	4.00	ug/Kg wet	400.0		97	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200013

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FC01201 - 3570						
Coronene	409	4.00	ug/Kg wet	400.0	102	60-130
Tetraethyl lead	287	4.00	ug/Kg wet	400.0	72	60-130
Pristane	413	4.00	ug/Kg wet	400.0	103	60-130
Phytane	399	4.00	ug/Kg wet	400.0	100	60-130
Surrogate: Toluene-D8	*369*		ug/Kg wet	*400.0*	*92*	*50-120*
Surrogate: Naphthalene-d8	*316*		ug/Kg wet	*400.0*	*79*	*50-120*
Surrogate: Phenanthrene-d10	*411*		ug/Kg wet	*400.0*	*103*	*50-120*
Surrogate: Perylene-d12	*442*		ug/Kg wet	*400.0*	*111*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200013

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FC01201 - 3570

Duplicate **Source: F200013-09**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	ND	7.06	ug/Kg dry		ND				50	
C1-Benzene	37.1	7.06	ug/Kg dry		36.9			0.7	50	
C2-Benzenes	31.0	7.06	ug/Kg dry		29.8			4	50	
C3-Benzenes	ND	7.06	ug/Kg dry		ND				50	
C4-Benzenes	ND	7.06	ug/Kg dry		ND				50	
C5-Benzenes	ND	7.06	ug/Kg dry		ND				50	
Methylcyclohexane	ND	7.06	ug/Kg dry		ND				50	
Toluene	51.2	7.06	ug/Kg dry		49.1			4	50	
Ethylbenzene	ND	7.06	ug/Kg dry		ND				50	
m,p-Xylene	44.6	7.06	ug/Kg dry		43.2			3	50	
Styrene	ND	7.06	ug/Kg dry		ND				50	
o-Xylene	ND	7.06	ug/Kg dry		ND				50	
Isopropylbenzene	ND	7.06	ug/Kg dry		ND				50	
n-Propylbenzene	ND	7.06	ug/Kg dry		ND				50	
1,3,5-Trimethylbenzene	ND	7.06	ug/Kg dry		ND				50	
1,2,3-Trimethylbenzene	ND	7.06	ug/Kg dry		ND				50	
1,2,4-Trimethylbenzene	ND	7.06	ug/Kg dry		ND				50	
t-Butylbenzene	ND	7.06	ug/Kg dry		ND				50	
sec-Butylbenzene	ND	7.06	ug/Kg dry		ND				50	
p-Isopropyltoluene	ND	7.06	ug/Kg dry		ND				50	
n-Butylbenzene	ND	7.06	ug/Kg dry		ND				50	
trans-Decalin	ND	7.06	ug/Kg dry		ND				50	
cis-Decalin	ND	7.06	ug/Kg dry		ND				50	
C1-Decalins	ND	7.06	ug/Kg dry		ND				50	
C2-Decalins	ND	7.06	ug/Kg dry		ND				50	
C3-Decalins	ND	7.06	ug/Kg dry		ND				50	
C4-Decalins	ND	7.06	ug/Kg dry		ND				50	
Benzo(b)thiophene	ND	7.06	ug/Kg dry		ND				50	
C1-Benzo(b)thiophenes	ND	7.06	ug/Kg dry		ND				50	
C2-Benzo(b)thiophenes	ND	7.06	ug/Kg dry		ND				50	
C3-Benzo(b)thiophenes	ND	7.06	ug/Kg dry		ND				50	
C4-Benzo(b)thiophenes	ND	7.06	ug/Kg dry		ND				50	
Naphthalene	ND	7.06	ug/Kg dry		ND				50	
2-Methylnaphthalene	ND	7.06	ug/Kg dry		ND				50	
1-Methylnaphthalene	ND	7.06	ug/Kg dry		ND				50	
C1-Naphthalenes	ND	7.06	ug/Kg dry		ND				50	
C2-Naphthalenes	6.91	7.06	ug/Kg dry		5.42			24	50	J
C3-Naphthalenes	ND	7.06	ug/Kg dry		ND				50	
C4-Naphthalenes	ND	7.06	ug/Kg dry		ND				50	
Biphenyl	ND	7.06	ug/Kg dry		ND				50	
Acenaphthylene	ND	7.06	ug/Kg dry		ND				50	
Acenaphthene	ND	7.06	ug/Kg dry		ND				50	
Dibenzofuran	ND	7.06	ug/Kg dry		ND				50	
Fluorene	ND	7.06	ug/Kg dry		ND				50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
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ESS Laboratory Work Order: F200013

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FC01201 - 3570

C1-Fluorenes	ND	7.06	ug/Kg dry	ND		50	
C2-Fluorenes	ND	7.06	ug/Kg dry	ND		50	
C3-Fluorenes	ND	7.06	ug/Kg dry	ND		50	
Dibenzothiophene	ND	7.06	ug/Kg dry	ND		50	
C1-Dibenzothiophenes	ND	7.06	ug/Kg dry	ND		50	
C2-Dibenzothiophenes	ND	7.06	ug/Kg dry	ND		50	
C3-Dibenzothiophenes	ND	7.06	ug/Kg dry	ND		50	
C4-Dibenzothiophenes	ND	7.06	ug/Kg dry	ND		50	
Phenanthrene	ND	7.06	ug/Kg dry	ND		50	
Anthracene	ND	7.06	ug/Kg dry	ND		50	
C1-Phenanthrenes/Anthracenes	ND	7.06	ug/Kg dry	3.59		50	
C2-Phenanthrenes/Anthracenes	ND	7.06	ug/Kg dry	ND		50	
C3-Phenanthrenes/Anthracenes	ND	7.06	ug/Kg dry	ND		50	
C4-Phenanthrenes/Anthracenes	22.2	7.06	ug/Kg dry	ND		50	
Retene	80.5	7.06	ug/Kg dry	4.47	179	50	D+
Benzo(b)naphtho(2,1-d)thiophene	ND	7.06	ug/Kg dry	ND		50	
C0-Benzonaphthothiophenes	ND	7.06	ug/Kg dry	ND		50	
C1-Benzonaphthothiophenes	ND	7.06	ug/Kg dry	ND		50	
C2-Benzonaphthothiophenes	ND	7.06	ug/Kg dry	ND		50	
C3-Benzonaphthothiophenes	ND	7.06	ug/Kg dry	ND		50	
C4-Benzonaphthothiophenes	ND	7.06	ug/Kg dry	ND		50	
Fluoranthene	ND	7.06	ug/Kg dry	ND		50	
Pyrene	ND	7.06	ug/Kg dry	ND		50	
C1-Fluoranthenes/Pyrenes	5.12	7.06	ug/Kg dry	ND		50	J
C2-Fluoranthenes/Pyrenes	4.85	7.06	ug/Kg dry	4.94	2	50	J
C3-Fluoranthenes/Pyrenes	5.51	7.06	ug/Kg dry	5.43	2	50	J
Benzo(b)fluorene	ND	7.06	ug/Kg dry	ND		50	
Benzo(c)fluorene	ND	7.06	ug/Kg dry	ND		50	
2-Methylpyrene	ND	7.06	ug/Kg dry	ND		50	
4-Methylpyrene	ND	7.06	ug/Kg dry	ND		50	
1-Methylpyrene	ND	7.06	ug/Kg dry	ND		50	
Benz(a)anthracene	ND	7.06	ug/Kg dry	ND		50	
Chrysene/triphenylene	ND	7.06	ug/Kg dry	ND		50	
C1-Benzo(a)anthracenes/Chrysenes	ND	7.06	ug/Kg dry	ND		50	
C2-Benzo(a)anthracenes/Chrysenes	ND	7.06	ug/Kg dry	ND		50	
C3-Benzo(a)anthracenes/Chrysenes	ND	7.06	ug/Kg dry	ND		50	
C4-Benzo(a)anthracenes/Chrysenes	ND	7.06	ug/Kg dry	ND		50	
Benzo(b)fluoranthene	ND	7.06	ug/Kg dry	ND		50	
Benzo(j/k)fluoranthene	ND	7.06	ug/Kg dry	ND		50	
Benzo(e)pyrene	ND	7.06	ug/Kg dry	ND		50	
Benzo(a)pyrene	ND	7.06	ug/Kg dry	ND		50	
Perylene	856	7.06	ug/Kg dry	821	4	50	
Indeno(1,2,3-cd)pyrene	ND	7.06	ug/Kg dry	ND		50	
Dibenzo(a,h)anthracene	ND	7.06	ug/Kg dry	ND		50	
Benzo(g,h,i)perylene	ND	7.06	ug/Kg dry	ND		50	
Coronene	ND	7.06	ug/Kg dry	ND		50	
Tetramethyl lead	ND	7.06	ug/Kg dry	ND		50	
Trimethylethyl lead	ND	7.06	ug/Kg dry	ND		50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200013

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FC01201 - 3570								
Dimethyldiethyl lead	ND	7.06	ug/Kg dry	ND				50
Methyltriethyl lead	ND	7.06	ug/Kg dry	ND				50
Tetraethyl lead	ND	7.06	ug/Kg dry	ND				50
2,6,10-trimethyldodecane (1380)	ND	7.06	ug/Kg dry	ND				50
2,6,10-trimethyltridecane (1470)	7.15	7.06	ug/Kg dry	7.30			2	50
2,6,10-trimethylpentadecane (1650)	27.2	7.06	ug/Kg dry	21.6			23	50
C-17	186	7.06	ug/Kg dry	164			13	50
Pristane	77.2	7.06	ug/Kg dry	61.8			22	50
C-18	88.0	7.06	ug/Kg dry	70.5			22	50
Phytane	97.7	7.06	ug/Kg dry	81.5			18	50
Carbazole	ND	7.06	ug/Kg dry	ND				50
2,6-Dimethylnaphthalene	ND	7.06	ug/Kg dry	ND				50
2,3,5-Trimethylnaphthene	ND	7.06	ug/Kg dry	ND				50
4-Methyldibenzothiophene	ND	7.06	ug/Kg dry	ND				50
2/3-Methyldibenzothiophene	ND	7.06	ug/Kg dry	ND				50
1-Methyldibenzothiophene	ND	7.06	ug/Kg dry	ND				50
3-Methylphenanthrene	ND	7.06	ug/Kg dry	ND				50
2-Methylphenanthrene	ND	7.06	ug/Kg dry	ND				50
2-Methylanthracene	ND	7.06	ug/Kg dry	ND				50
4/9-Methylphenanthrene	ND	7.06	ug/Kg dry	ND				50
1-Methylphenanthrene	ND	7.06	ug/Kg dry	ND				50
Surrogate: Toluene-D8	*529*		ug/Kg dry	*706.0*		*75*	*50-120*	
Surrogate: Naphthalene-d8	*473*		ug/Kg dry	*706.0*		*67*	*50-120*	
Surrogate: Phenanthrene-d10	*658*		ug/Kg dry	*706.0*		*93*	*50-120*	
Surrogate: Perylene-d12	*703*		ug/Kg dry	*706.0*		*100*	*50-120*	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F200013

Notes and Definitions

U	Analyte included in the analysis, but not detected
J	Reported between MDL and MRL
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
CD-	Continuing Calibration %Diff/Drift is below control limit (CD-).
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200013

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Chain-of-Custody Record

Laboratory: TBD

Laboratory Job # (Lab use only): 580-55541-1

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Number: 1804576

Project Location: Amesbury, MA

Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY REQUIRED? (YES) NO

If Yes, Are MCP Analytical Methods Required?	(YES)	NO	NA
Are Drinking Water Samples Submitted?	YES	(NO)	NA
If Yes, Have Drinking Water Sampling Requirements Been Met?	YES	NO	(NA)

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sample (G) or Initials	Preservative: None	Preservative: None	Analysis: Parent and Alkylated MAHs & PAHs 8270**	Analysis: TOCs by Lloyd-Kahn	Sample Specific Remarks
1	1804576-SS759-S1	3/9/2020	13:22	Soil	1	BFM			X	X	
2	1804576-SS760-S2	3/9/2020	12:55	Soil	1	BFM			X	X	
3	1804576-SS761-S1	3/9/2020	13:51	Soil	1	BFM			X	X	
4	1804576-SS761-S2	3/9/2020	13:57	Soil	1	BFM			X	X	
5	1804576-SS762-S2	3/9/2020	12:21	Soil	1	BFM			X	X	
6	1804576-SS762-S3	3/9/2020	12:37	Soil	1	BFM			X	X	
7	1804576-SS763-S1	3/9/2020	12:33	Soil	1	BFM			X	X	
8	1804576-SS763-S2	3/9/2020	14:40	Soil	1	BFM			X	X	
9	1804576-SS764-S2	3/9/2020	15:22	Soil	1	BFM			X	X	

Sample Handling

Samples Field Filtered: YES NO (NA)

Sampled Shipped With Ice: (YES) NO

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

	Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1.		3/9/20		1. GEI Sample Fridge
2.	Relinquished by: (signature) 2. GEI Sample Fridge	3/11/20	1210	Received by: (signature) 2.
3.	Relinquished by: (signature) 3.	3/11/20	1210	Received by: (signature) 3.
4.	Relinquished by: (signature) 4.	3/11	17:47	Received by: (signature) 4. 3/11 17:47

Turnaround Time (Business days)

Normal __X__ Other ____

10-Day ____ 7-Day ____

5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks

**Parent and Alkylated MAHs & PAHs (34) by GC/MS/SIM/SCAN

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

Shipped/Delivered Via: ESS Courier

ESS Project ID: F200013
Date Received: 3/11/2020
Project Due Date: 3/18/2020
Days for Project: 10 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 0.3 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes 3/12/20
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / (NA)
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / (No)
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / (No)
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1					4 oz. Jar	NP	
2					4 oz. Jar	NP	
3					4 oz. Jar	NP	
4					4 oz. Jar	NP	
5					4 oz. Jar	NP	
6					4 oz. Jar	NP	
7					4 oz. Jar	NP	
8					4 oz. Jar	NP	
9					4 oz. Jar	NP	

2nd Review
Were all containers scanned into storage/lab? Initials
Are barcode labels on correct containers? (Yes) / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / (NA)
Are all Hex Chrome stickers attached? Yes / No / (NA)
Are all QC stickers attached? Yes / No / (NA)
Are VOA stickers attached if bubbles noted? Yes / No / (NA)

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

ESS Project ID: F200013

Date Received: 3/11/2020

Completed By: [signature]

Date & Time: 3/11/20 1931

Reviewed By: [signature]

Date & Time: 3/12/20 @ 08:41

Delivered By: [signature]

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: F200014

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 11:33 am, Apr 01, 2020

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses
ESS Laboratory - Cranston, RI TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200014

SAMPLE RECEIPT

The following samples were received on March 11, 2020 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F200014-01	1804576-SS766-S1	Soil	8270 Mod, TOC-LK
F200014-02	1804576-SS766-S2	Soil	8270 Mod, TOC-LK
F200014-03	1804576-SS766-S3	Soil	8270 Mod, TOC-LK
F200014-04	1804576-SS771-S1	Soil	8270 Mod, TOC-LK
F200014-05	1804576-SS772-S1	Soil	8270 Mod, TOC-LK
F200014-06	1804576-SS767-S1	Soil	8270 Mod, TOC-LK
F200014-07	1804576-SS767-S2	Soil	8270 Mod, TOC-LK
F200014-08	1804576-SS768-S2	Soil	8270 Mod, TOC-LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200014

PROJECT NARRATIVE

8270D (SIM) Semi-Volatile Organic Compounds

F0C0006-CCV2	**Continuing Calibration %Diff/Drift is above control limit (CD+).**
	Retene (27% @ 25%)
F0C0007-CCV3	**Continuing Calibration %Diff/Drift is below control limit (CD-).**
	Tetraethyl lead (27% @ 25%)
F200014-01	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , C-17 , C-18 , Phytane , Pristane
F200014-02	**Present in Method Blank (B).**
	C-18
F200014-03	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , C-17 , C-18 , Phytane , Pristane
F200014-04	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , C-17 , C-18 , Phytane , Pristane
F200014-05	**Present in Method Blank (B).**
	C-17 , C-18 , Phytane
F200014-07	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , C-17 , C-18 , Phytane , Pristane
F200014-08	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , C-17 , C-18 , Phytane , Pristane
FC01201-DUP3	**Relative percent difference for duplicate is outside of criteria (D+).**
	C1-Fluoranthenes/Pyrenes (99% @ 50%)

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200014

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS766-S1
Date Sampled: 03/10/20 11:40
Percent Solids: 61
Initial Volume: 4.95
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	J **4.10** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C1-Benzene	**76.9** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C2-Benzenes	**50.1** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C3-Benzenes	**10.7** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C4-Benzenes	**14.7** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C5-Benzenes	**8.77** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
Methylcyclohexane	ND (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
Toluene	**92.4** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
Ethylbenzene	J **3.44** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
m,p-Xylene	**72.1** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
Styrene	J **4.72** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
o-Xylene	J **3.63** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
Isopropylbenzene	ND (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
n-Propylbenzene	ND (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
1,3,5-Trimethylbenzene	ND (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
1,2,3-Trimethylbenzene	ND (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
1,2,4-Trimethylbenzene	J **4.70** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
t-Butylbenzene	ND (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
sec-Butylbenzene	ND (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
p-Isopropyltoluene	J **6.30** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
n-Butylbenzene	ND (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
trans-Decalin	**6.83** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
cis-Decalin	ND (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C1-Decalins	**12.9** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C2-Decalins	**18.3** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C3-Decalins	**16.9** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C4-Decalins	**26.9** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
Benzo(b)thiophene	ND (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C1-Benzo(b)thiophenes	J **5.88** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C2-Benzo(b)thiophenes	J **5.52** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C3-Benzo(b)thiophenes	J **3.72** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C4-Benzo(b)thiophenes	J **5.83** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS766-S1
Date Sampled: 03/10/20 11:40
Percent Solids: 61
Initial Volume: 4.95
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**20.8** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
2-Methylnaphthalene	**15.2** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
1-Methylnaphthalene	**11.1** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C1-Naphthalenes	**16.1** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C2-Naphthalenes	**41.9** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C3-Naphthalenes	**39.7** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C4-Naphthalenes	**30.3** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
Biphenyl	J **6.06** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
Acenaphthylene	**49.0** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
Acenaphthene	**38.5** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
Dibenzofuran	**9.67** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
Fluorene	**34.3** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C1-Fluorenes	**30.3** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C2-Fluorenes	**33.4** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C3-Fluorenes	**51.3** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
Dibenzothiophene	**27.2** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C1-Dibenzothiophenes	**39.0** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C2-Dibenzothiophenes	**51.1** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C3-Dibenzothiophenes	**44.7** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C4-Dibenzothiophenes	**31.2** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
Phenanthrene	**339** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
Anthracene	**122** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C1-Phenanthrenes/Anthracenes	**253** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C2-Phenanthrenes/Anthracenes	**176** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C3-Phenanthrenes/Anthracenes	**98.4** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C4-Phenanthrenes/Anthracenes	**55.0** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
Retene	**88.7** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
Benzo(b)naphtho(2,1-d)thiophene	**63.5** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C0-Benzonaphthothiophenes	**113** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C1-Benzonaphthothiophenes	**72.8** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C2-Benzonaphthothiophenes	**58.1** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C3-Benzonaphthothiophenes	**47.7** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS766-S1
Date Sampled: 03/10/20 11:40
Percent Solids: 61
Initial Volume: 4.95
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**24.3** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
Fluoranthene	**811** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
Pyrene	**942** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C1-Fluoranthenes/Pyrenes	**449** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C2-Fluoranthenes/Pyrenes	**224** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C3-Fluoranthenes/Pyrenes	**106** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
Benzo(b)fluorene	**45.7** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
Benzo(c)fluorene	**24.8** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
2-Methylpyrene	**62.6** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
4-Methylpyrene	**60.9** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
1-Methylpyrene	**48.6** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
Benz(a)anthracene	**442** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
Chrysene/triphenylene	**481** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C1-Benzo(a)anthracenes/Chrysenes	**288** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C2-Benzo(a)anthracenes/Chrysenes	**160** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C3-Benzo(a)anthracenes/Chrysenes	**96.7** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C4-Benzo(a)anthracenes/Chrysenes	**44.6** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
Benzo(b)fluoranthene	**327** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
Benzo(j/k)fluoranthene	**363** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
Benzo(e)pyrene	**325** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
Benzo(a)pyrene	**457** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
Perylene	**183** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
Indeno(1,2,3-cd)pyrene	**317** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
Dibenzo(a,h)anthracene	**76.0** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
Benzo(g,h,i)perylene	**278** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
Coronene	**96.3** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
Tetramethyl lead	ND (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
Trimethylethyl lead	ND (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
Dimethyldiethyl lead	ND (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
Methyltriethyl lead	ND (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
Tetraethyl lead	ND (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
2,6,10-trimethyldodecane (1380)	**14.5** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS766-S1
Date Sampled: 03/10/20 11:40
Percent Solids: 61
Initial Volume: 4.95
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**44.7** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
2,6,10-trimethylpentadecane (1650)	**B 36.6** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C-17	**B 124** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
Pristane	**B 90.2** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
C-18	**B 81.1** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
Phytane	**B 112** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
Carbazole	**18.7** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
2,6-Dimethylnaphthalene	**12.2** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
2,3,5-Trimethylnaphthene	ND (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
4-Methyldibenzothiophene	**15.4** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
2/3-Methyldibenzothiophene	**11.9** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
1-Methyldibenzothiophene	**J 4.96** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
3-Methylphenanthrene	**50.3** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
2-Methylphenanthrene	**56.2** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
2-Methylanthracene	**33.5** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
4/9-Methylphenanthrene	**63.4** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201
1-Methylphenanthrene	**41.3** (6.61)	3.31	8270 Mod		1	03/15/20 15:39	F0C0007	FC01201

	%Recovery	*Qualifier*	*Limits*
Surrogate: Toluene-D8	*73 %*		*50-120*
Surrogate: Naphthalene-d8	*69 %*		*50-120*
Surrogate: Phenanthrene-d10	*98 %*		*50-120*
Surrogate: Perylene-d12	*80 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS766-S1
Date Sampled: 03/10/20 11:40
Percent Solids: 61

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**20000** (94.1)		TOC-LK		1	CCP	03/16/20 19:57	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS766-S2
Date Sampled: 03/10/20 11:47
Percent Solids: 46
Initial Volume: 5
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C1-Benzene	**330** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C2-Benzenes	**259** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C3-Benzenes	**298** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C4-Benzenes	**1020** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C5-Benzenes	**478** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
Methylcyclohexane	**51.1** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
Toluene	**409** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
Ethylbenzene	**48.6** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
m,p-Xylene	**334** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
Styrene	**111** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
o-Xylene	**47.1** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
Isopropylbenzene	**18.5** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
n-Propylbenzene	**19.5** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
1,3,5-Trimethylbenzene	**63.6** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
1,2,3-Trimethylbenzene	**95.4** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
1,2,4-Trimethylbenzene	**167** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
t-Butylbenzene	ND (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
sec-Butylbenzene	**12.5** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
p-Isopropyltoluene	**29.3** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
n-Butylbenzene	ND (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
trans-Decalin	**195** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
cis-Decalin	**37.3** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C1-Decalins	**516** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C2-Decalins	**704** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C3-Decalins	**524** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C4-Decalins	**687** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
Benzo(b)thiophene	**195** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C1-Benzo(b)thiophenes	**557** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C2-Benzo(b)thiophenes	**1390** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C3-Benzo(b)thiophenes	**764** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C4-Benzo(b)thiophenes	**227** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS766-S2
Date Sampled: 03/10/20 11:47
Percent Solids: 46
Initial Volume: 5
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**2280** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
2-Methylnaphthalene	**1250** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
1-Methylnaphthalene	**4240** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C1-Naphthalenes	**3240** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C2-Naphthalenes	**7140** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C3-Naphthalenes	**3580** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C4-Naphthalenes	**1230** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
Biphenyl	**300** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
Acenaphthylene	**1390** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
Acenaphthene	**25900** (174)	86.9	8270 Mod		20	03/16/20 16:30	F0C0007	FC01201
Dibenzofuran	**433** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
Fluorene	**7870** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C1-Fluorenes	**2380** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C2-Fluorenes	**1550** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C3-Fluorenes	**1470** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
Dibenzothiophene	**3450** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C1-Dibenzothiophenes	**2510** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C2-Dibenzothiophenes	**1960** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C3-Dibenzothiophenes	**1600** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C4-Dibenzothiophenes	**949** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
Phenanthrene	**39100** (174)	86.9	8270 Mod		20	03/16/20 16:30	F0C0007	FC01201
Anthracene	**6610** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C1-Phenanthrenes/Anthracenes	**10000** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C2-Phenanthrenes/Anthracenes	**4330** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C3-Phenanthrenes/Anthracenes	**2210** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C4-Phenanthrenes/Anthracenes	**1180** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
Retene	**430** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
Benzo(b)naphtho(2,1-d)thiophene	**970** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C0-Benzonaphthothiophenes	**1960** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C1-Benzonaphthothiophenes	**1560** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C2-Benzonaphthothiophenes	**1440** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C3-Benzonaphthothiophenes	**1050** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS766-S2
Date Sampled: 03/10/20 11:47
Percent Solids: 46
Initial Volume: 5
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**527** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
Fluoranthene	**14900** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
Pyrene	**16800** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C1-Fluoranthenes/Pyrenes	**7260** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C2-Fluoranthenes/Pyrenes	**3050** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C3-Fluoranthenes/Pyrenes	**1740** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
Benzo(b)fluorene	**883** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
Benzo(c)fluorene	**394** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
2-Methylpyrene	**961** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
4-Methylpyrene	**889** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
1-Methylpyrene	**782** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
Benz(a)anthracene	**5370** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
Chrysene/triphenylene	**5970** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C1-Benzo(a)anthracenes/Chrysenes	**3680** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C2-Benzo(a)anthracenes/Chrysenes	**2250** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C3-Benzo(a)anthracenes/Chrysenes	**1320** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C4-Benzo(a)anthracenes/Chrysenes	**856** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
Benzo(b)fluoranthene	**4120** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
Benzo(j/k)fluoranthene	**4160** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
Benzo(e)pyrene	**3570** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
Benzo(a)pyrene	**5370** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
Perylene	**1100** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
Indeno(1,2,3-cd)pyrene	**4170** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
Dibenzo(a,h)anthracene	**935** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
Benzo(g,h,i)perylene	**3470** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
Coronene	**1360** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
Tetramethyl lead	ND (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
Trimethylethyl lead	ND (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
Dimethyldiethyl lead	ND (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
Methyltriethyl lead	ND (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
Tetraethyl lead	ND (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
2,6,10-trimethyldodecane (1380)	**897** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS766-S2
Date Sampled: 03/10/20 11:47
Percent Solids: 46
Initial Volume: 5
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**1370** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
2,6,10-trimethylpentadecane (1650)	**958** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C-17	**588** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
Pristane	**2300** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
C-18	**B 352** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
Phytane	**2600** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
Carbazole	**415** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
2,6-Dimethylnaphthalene	**980** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
2,3,5-Trimethylnaphthene	**225** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
4-Methyldibenzothiophene	**904** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
2/3-Methyldibenzothiophene	**814** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
1-Methyldibenzothiophene	**318** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
3-Methylphenanthrene	**2480** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
2-Methylphenanthrene	**2700** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
2-Methylanthracene	**887** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
4/9-Methylphenanthrene	**2240** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201
1-Methylphenanthrene	**1700** (8.69)	4.34	8270 Mod		1	03/16/20 10:56	F0C0007	FC01201

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*64 %*		*50-120*
Surrogate: Naphthalene-d8	*75 %*		*50-120*
Surrogate: Phenanthrene-d10	*79 %*		*50-120*
Surrogate: Perylene-d12	*58 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS766-S2
Date Sampled: 03/10/20 11:47
Percent Solids: 46

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**114000** (95.5)		TOC-LK		1	CCP	03/16/20 20:48	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS766-S3
Date Sampled: 03/10/20 11:56
Percent Solids: 62
Initial Volume: 5.87
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C1-Benzene	**9.35** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C2-Benzenes	**10.9** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C3-Benzenes	**6.84** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C4-Benzenes	**10.7** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C5-Benzenes	**7.60** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
Methylcyclohexane	ND (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
Toluene	**11.7** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
Ethylbenzene	J **3.25** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
m,p-Xylene	**12.7** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
Styrene	ND (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
o-Xylene	ND (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
Isopropylbenzene	ND (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
n-Propylbenzene	ND (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
1,3,5-Trimethylbenzene	ND (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
1,2,3-Trimethylbenzene	ND (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
1,2,4-Trimethylbenzene	ND (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
t-Butylbenzene	ND (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
sec-Butylbenzene	ND (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
p-Isopropyltoluene	ND (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
n-Butylbenzene	ND (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
trans-Decalin	ND (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
cis-Decalin	ND (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C1-Decalins	ND (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C2-Decalins	ND (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C3-Decalins	ND (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C4-Decalins	ND (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
Benzo(b)thiophene	ND (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C1-Benzo(b)thiophenes	**7.22** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C2-Benzo(b)thiophenes	**16.6** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C3-Benzo(b)thiophenes	**10.4** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C4-Benzo(b)thiophenes	J **3.52** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS766-S3
Date Sampled: 03/10/20 11:56
Percent Solids: 62
Initial Volume: 5.87
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**37.6** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
2-Methylnaphthalene	**11.0** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
1-Methylnaphthalene	**160** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C1-Naphthalenes	**100** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C2-Naphthalenes	**219** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C3-Naphthalenes	**97.3** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C4-Naphthalenes	**31.1** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
Biphenyl	**37.4** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
Acenaphthylene	**23.7** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
Acenaphthene	**506** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
Dibenzofuran	**18.0** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
Fluorene	**210** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C1-Fluorenes	**69.3** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C2-Fluorenes	**44.2** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C3-Fluorenes	**22.3** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
Dibenzothiophene	**74.4** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C1-Dibenzothiophenes	**56.0** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C2-Dibenzothiophenes	**34.7** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C3-Dibenzothiophenes	**19.1** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C4-Dibenzothiophenes	**13.8** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
Phenanthrene	**1030** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
Anthracene	**274** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C1-Phenanthrenes/Anthracenes	**371** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C2-Phenanthrenes/Anthracenes	**137** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C3-Phenanthrenes/Anthracenes	**41.3** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C4-Phenanthrenes/Anthracenes	**17.3** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
Retene	**17.6** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
Benzo(b)naphtho(2,1-d)thiophene	**22.7** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C0-Benzonaphthothiophenes	**22.4** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C1-Benzonaphthothiophenes	**23.3** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C2-Benzonaphthothiophenes	**13.0** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C3-Benzonaphthothiophenes	**7.29** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS766-S3
Date Sampled: 03/10/20 11:56
Percent Solids: 62
Initial Volume: 5.87
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
Fluoranthene	**468** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
Pyrene	**714** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C1-Fluoranthenes/Pyrenes	**284** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C2-Fluoranthenes/Pyrenes	**76.3** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C3-Fluoranthenes/Pyrenes	**28.9** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
Benzo(b)fluorene	**27.1** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
Benzo(c)fluorene	**18.8** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
2-Methylpyrene	**38.8** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
4-Methylpyrene	**30.5** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
1-Methylpyrene	**31.0** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
Benz(a)anthracene	**192** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
Chrysene/triphenylene	**188** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C1-Benzo(a)anthracenes/Chrysenes	**90.9** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C2-Benzo(a)anthracenes/Chrysenes	**34.4** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C3-Benzo(a)anthracenes/Chrysenes	**16.4** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C4-Benzo(a)anthracenes/Chrysenes	ND (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
Benzo(b)fluoranthene	**65.7** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
Benzo(j/k)fluoranthene	**95.0** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
Benzo(e)pyrene	**82.7** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
Benzo(a)pyrene	**147** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
Perylene	**354** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
Indeno(1,2,3-cd)pyrene	**77.8** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
Dibenzo(a,h)anthracene	**15.8** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
Benzo(g,h,i)perylene	**68.8** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
Coronene	**25.2** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
Tetramethyl lead	ND (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
Trimethylethyl lead	ND (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
Dimethyldiethyl lead	ND (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
Methyltriethyl lead	ND (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
Tetraethyl lead	ND (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
2,6,10-trimethyldodecane (1380)	**7.07** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS766-S3
Date Sampled: 03/10/20 11:56
Percent Solids: 62
Initial Volume: 5.87
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**13.0** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
2,6,10-trimethylpentadecane (1650)	B **26.0** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C-17	B **91.2** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
Pristane	B **63.2** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
C-18	B **58.9** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
Phytane	B **77.8** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
Carbazole	ND (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
2,6-Dimethylnaphthalene	**40.0** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
2,3,5-Trimethylnaphthene	**5.55** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
4-Methyldibenzothiophene	**22.1** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
2/3-Methyldibenzothiophene	**18.2** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
1-Methyldibenzothiophene	**5.74** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
3-Methylphenanthrene	**88.1** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
2-Methylphenanthrene	**93.8** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
2-Methylanthracene	**35.9** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
4/9-Methylphenanthrene	**79.3** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201
1-Methylphenanthrene	**59.4** (5.53)	2.77	8270 Mod		1	03/15/20 17:03	F0C0007	FC01201

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*60 %*		*50-120*
Surrogate: Naphthalene-d8	*58 %*		*50-120*
Surrogate: Phenanthrene-d10	*81 %*		*50-120*
Surrogate: Perylene-d12	*57 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS766-S3
Date Sampled: 03/10/20 11:56
Percent Solids: 62

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**34800** (104)		TOC-LK		1	CCP	03/16/20 21:04	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS771-S1
Date Sampled: 03/10/20 09:47
Percent Solids: 86
Initial Volume: 5.82
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C1-Benzene	**J 3.94** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C2-Benzenes	**11.9** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C3-Benzenes	**4.97** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C4-Benzenes	**7.98** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C5-Benzenes	**6.16** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
Methylcyclohexane	ND (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
Toluene	**5.77** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
Ethylbenzene	ND (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
m,p-Xylene	**14.9** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
Styrene	**J 3.90** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
o-Xylene	ND (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
Isopropylbenzene	ND (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
n-Propylbenzene	ND (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
1,3,5-Trimethylbenzene	ND (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
1,2,3-Trimethylbenzene	ND (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
1,2,4-Trimethylbenzene	ND (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
t-Butylbenzene	ND (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
sec-Butylbenzene	ND (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
p-Isopropyltoluene	ND (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
n-Butylbenzene	ND (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
trans-Decalin	**J 3.68** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
cis-Decalin	ND (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C1-Decalins	**5.71** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C2-Decalins	**8.62** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C3-Decalins	**7.49** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C4-Decalins	ND (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
Benzo(b)thiophene	ND (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C1-Benzo(b)thiophenes	**4.89** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C2-Benzo(b)thiophenes	**4.88** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C3-Benzo(b)thiophenes	**J 3.05** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C4-Benzo(b)thiophenes	**J 2.38** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS771-S1
Date Sampled: 03/10/20 09:47
Percent Solids: 86
Initial Volume: 5.82
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**14.8** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
2-Methylnaphthalene	**7.29** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
1-Methylnaphthalene	**8.64** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C1-Naphthalenes	**9.95** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C2-Naphthalenes	**31.6** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C3-Naphthalenes	**32.3** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C4-Naphthalenes	**18.3** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
Biphenyl	J **2.57** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
Acenaphthylene	**44.4** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
Acenaphthene	**142** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
Dibenzofuran	**18.2** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
Fluorene	**43.8** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C1-Fluorenes	**28.2** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C2-Fluorenes	**30.0** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C3-Fluorenes	**43.3** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
Dibenzothiophene	**35.7** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C1-Dibenzothiophenes	**33.0** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C2-Dibenzothiophenes	**37.4** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C3-Dibenzothiophenes	**29.8** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C4-Dibenzothiophenes	**18.7** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
Phenanthrene	**467** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
Anthracene	**137** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C1-Phenanthrenes/Anthracenes	**234** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C2-Phenanthrenes/Anthracenes	**131** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C3-Phenanthrenes/Anthracenes	**53.8** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C4-Phenanthrenes/Anthracenes	**21.1** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
Retene	**10.6** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
Benzo(b)naphtho(2,1-d)thiophene	**64.9** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C0-Benzonaphthothiophenes	**118** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C1-Benzonaphthothiophenes	**70.9** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C2-Benzonaphthothiophenes	**66.9** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C3-Benzonaphthothiophenes	**69.8** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS771-S1
Date Sampled: 03/10/20 09:47
Percent Solids: 86
Initial Volume: 5.82
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**50.8** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
Fluoranthene	**971** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
Pyrene	**831** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C1-Fluoranthenes/Pyrenes	**325** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C2-Fluoranthenes/Pyrenes	**202** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C3-Fluoranthenes/Pyrenes	**98.4** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
Benzo(b)fluorene	**30.7** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
Benzo(c)fluorene	**21.8** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
2-Methylpyrene	**43.1** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
4-Methylpyrene	**36.6** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
1-Methylpyrene	**29.0** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
Benz(a)anthracene	**449** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
Chrysene/triphenylene	**445** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C1-Benzo(a)anthracenes/Chrysenes	**214** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C2-Benzo(a)anthracenes/Chrysenes	**114** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C3-Benzo(a)anthracenes/Chrysenes	**75.8** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C4-Benzo(a)anthracenes/Chrysenes	**42.2** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
Benzo(b)fluoranthene	**347** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
Benzo(j/k)fluoranthene	**369** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
Benzo(e)pyrene	**276** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
Benzo(a)pyrene	**408** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
Perylene	**104** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
Indeno(1,2,3-cd)pyrene	**327** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
Dibenzo(a,h)anthracene	**77.4** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
Benzo(g,h,i)perylene	**252** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
Coronene	**80.3** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
Tetramethyl lead	ND (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
Trimethylethyl lead	ND (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
Dimethyldiethyl lead	ND (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
Methyltriethyl lead	ND (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
Tetraethyl lead	ND (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
2,6,10-trimethyldodecane (1380)	**19.6** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS771-S1
Date Sampled: 03/10/20 09:47
Percent Solids: 86
Initial Volume: 5.82
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**36.1** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
2,6,10-trimethylpentadecane (1650)	**B 37.9** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C-17	**B 129** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
Pristane	**B 83.2** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
C-18	**B 98.3** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
Phytane	**B 82.1** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
Carbazole	**50.8** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
2,6-Dimethylnaphthalene	**J 3.59** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
2,3,5-Trimethylnaphthene	**J 2.27** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
4-Methyldibenzothiophene	**10.8** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
2/3-Methyldibenzothiophene	**10.0** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
1-Methyldibenzothiophene	**4.25** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
3-Methylphenanthrene	**53.6** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
2-Methylphenanthrene	**60.2** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
2-Methylanthracene	**22.2** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
4/9-Methylphenanthrene	**50.2** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201
1-Methylphenanthrene	**39.1** (4.01)	2.01	8270 Mod		1	03/15/20 22:39	F0C0007	FC01201

	%Recovery	*Qualifier*	*Limits*
Surrogate: Toluene-D8	*75 %*		*50-120*
Surrogate: Naphthalene-d8	*66 %*		*50-120*
Surrogate: Phenanthrene-d10	*99 %*		*50-120*
Surrogate: Perylene-d12	*82 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS771-S1
Date Sampled: 03/10/20 09:47
Percent Solids: 86

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-04
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**9640** (98.7)		TOC-LK		1	CCP	03/16/20 21:21	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS772-S1
Date Sampled: 03/10/20 10:20
Percent Solids: 72
Initial Volume: 5.36
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C1-Benzene	**148** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C2-Benzenes	**179** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C3-Benzenes	**161** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C4-Benzenes	**205** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C5-Benzenes	**181** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
Methylcyclohexane	ND (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
Toluene	**182** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
Ethylbenzene	**116** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
m,p-Xylene	**179** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
Styrene	**67.1** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
o-Xylene	**27.8** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
Isopropylbenzene	**7.86** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
n-Propylbenzene	**23.6** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
1,3,5-Trimethylbenzene	**26.3** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
1,2,3-Trimethylbenzene	**11.4** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
1,2,4-Trimethylbenzene	**74.4** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
t-Butylbenzene	**11.3** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
sec-Butylbenzene	ND (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
p-Isopropyltoluene	**14.0** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
n-Butylbenzene	ND (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
trans-Decalin	**52.6** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
cis-Decalin	**9.72** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C1-Decalins	**81.9** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C2-Decalins	**82.5** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C3-Decalins	**50.7** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C4-Decalins	**101** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
Benzo(b)thiophene	**13.7** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C1-Benzo(b)thiophenes	**20.7** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C2-Benzo(b)thiophenes	**37.1** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C3-Benzo(b)thiophenes	**38.2** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C4-Benzo(b)thiophenes	**22.1** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS772-S1
Date Sampled: 03/10/20 10:20
Percent Solids: 72
Initial Volume: 5.36
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**1250** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
2-Methylnaphthalene	**750** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
1-Methylnaphthalene	**531** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C1-Naphthalenes	**783** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C2-Naphthalenes	**2990** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C3-Naphthalenes	**1970** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C4-Naphthalenes	**745** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
Biphenyl	**318** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
Acenaphthylene	**261** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
Acenaphthene	**3780** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
Dibenzofuran	**177** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
Fluorene	**2210** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C1-Fluorenes	**2160** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C2-Fluorenes	**1490** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C3-Fluorenes	**553** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
Dibenzothiophene	**248** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C1-Dibenzothiophenes	**453** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C2-Dibenzothiophenes	**403** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C3-Dibenzothiophenes	**249** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C4-Dibenzothiophenes	**125** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
Phenanthrene	**14600** (104)	52.1	8270 Mod		20	03/16/20 13:43	F0C0007	FC01201
Anthracene	**5320** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C1-Phenanthrenes/Anthracenes	**11500** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C2-Phenanthrenes/Anthracenes	**4690** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C3-Phenanthrenes/Anthracenes	**1800** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C4-Phenanthrenes/Anthracenes	**1380** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
Retene	**4320** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
Benzo(b)naphtho(2,1-d)thiophene	**368** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C0-Benzonaphthothiophenes	**368** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C1-Benzonaphthothiophenes	**708** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C2-Benzonaphthothiophenes	**459** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C3-Benzonaphthothiophenes	**297** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS772-S1
Date Sampled: 03/10/20 10:20
Percent Solids: 72
Initial Volume: 5.36
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**85.6** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
Fluoranthene	**12400** (104)	52.1	8270 Mod		20	03/16/20 13:43	F0C0007	FC01201
Pyrene	**19800** (104)	52.1	8270 Mod		20	03/16/20 13:43	F0C0007	FC01201
C1-Fluoranthenes/Pyrenes	**10800** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C2-Fluoranthenes/Pyrenes	**3840** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C3-Fluoranthenes/Pyrenes	**1540** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
Benzo(b)fluorene	**1350** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
Benzo(c)fluorene	**533** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
2-Methylpyrene	**1450** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
4-Methylpyrene	**1330** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
1-Methylpyrene	**1220** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
Benz(a)anthracene	**6550** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
Chrysene/triphenylene	**5530** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C1-Benzo(a)anthracenes/Chrysenes	**5090** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C2-Benzo(a)anthracenes/Chrysenes	**2590** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C3-Benzo(a)anthracenes/Chrysenes	**1240** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C4-Benzo(a)anthracenes/Chrysenes	**534** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
Benzo(b)fluoranthene	**3330** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
Benzo(j/k)fluoranthene	**3520** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
Benzo(e)pyrene	**3890** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
Benzo(a)pyrene	**6180** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
Perylene	**1040** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
Indeno(1,2,3-cd)pyrene	**3200** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
Dibenzo(a,h)anthracene	**954** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
Benzo(g,h,i)perylene	**3180** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
Coronene	**832** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
Tetramethyl lead	ND (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
Trimethylethyl lead	ND (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
Dimethyldiethyl lead	ND (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
Methyltriethyl lead	ND (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
Tetraethyl lead	ND (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
2,6,10-trimethyldodecane (1380)	**165** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS772-S1
Date Sampled: 03/10/20 10:20
Percent Solids: 72
Initial Volume: 5.36
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**294** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
2,6,10-trimethylpentadecane (1650)	**183** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C-17	**B 267** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
Pristane	**487** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
C-18	**B 173** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
Phytane	**B 240** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
Carbazole	**131** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
2,6-Dimethylnaphthalene	**677** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
2,3,5-Trimethylnaphthene	**131** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
4-Methyldibenzothiophene	**135** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
2/3-Methyldibenzothiophene	**146** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
1-Methyldibenzothiophene	**39.3** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
3-Methylphenanthrene	**2470** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
2-Methylphenanthrene	**2700** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
2-Methylanthracene	**1810** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
4/9-Methylphenanthrene	**2650** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201
1-Methylphenanthrene	**1780** (5.21)	2.61	8270 Mod		1	03/16/20 0:03	F0C0007	FC01201

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*71 %*		*50-120*
Surrogate: Naphthalene-d8	*77 %*		*50-120*
Surrogate: Phenanthrene-d10	*91 %*		*50-120*
Surrogate: Perylene-d12	*73 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS772-S1
Date Sampled: 03/10/20 10:20
Percent Solids: 72

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-05
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**107000** (96.9)		TOC-LK		1	CCP	03/16/20 21:42	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS767-S1
Date Sampled: 03/10/20 13:12
Percent Solids: 51
Initial Volume: 5.37
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C1-Benzene	**723** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C2-Benzenes	**105** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C3-Benzenes	**155** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C4-Benzenes	**419** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C5-Benzenes	**654** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
Methylcyclohexane	ND (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
Toluene	**883** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
Ethylbenzene	**33.5** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
m,p-Xylene	**103** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
Styrene	**75.9** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
o-Xylene	**18.2** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
Isopropylbenzene	**J 6.45** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
n-Propylbenzene	**16.0** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
1,3,5-Trimethylbenzene	**29.9** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
1,2,3-Trimethylbenzene	**19.4** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
1,2,4-Trimethylbenzene	**71.8** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
t-Butylbenzene	ND (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
sec-Butylbenzene	**J 4.42** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
p-Isopropyltoluene	**27.4** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
n-Butylbenzene	**23.2** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
trans-Decalin	**68.3** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
cis-Decalin	**32.6** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C1-Decalins	**234** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C2-Decalins	**487** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C3-Decalins	**834** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C4-Decalins	**1830** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
Benzo(b)thiophene	**39.2** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C1-Benzo(b)thiophenes	**127** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C2-Benzo(b)thiophenes	**442** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C3-Benzo(b)thiophenes	**544** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C4-Benzo(b)thiophenes	**272** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS767-S1
Date Sampled: 03/10/20 13:12
Percent Solids: 51
Initial Volume: 5.37
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**1450** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
2-Methylnaphthalene	**2220** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
1-Methylnaphthalene	**3860** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C1-Naphthalenes	**3630** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C2-Naphthalenes	**13600** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C3-Naphthalenes	**13800** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C4-Naphthalenes	**6850** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
Biphenyl	**565** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
Acenaphthylene	**1780** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
Acenaphthene	**6400** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
Dibenzofuran	**497** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
Fluorene	**6120** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C1-Fluorenes	**8150** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C2-Fluorenes	**9220** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C3-Fluorenes	**5770** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
Dibenzothiophene	**1710** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C1-Dibenzothiophenes	**4060** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C2-Dibenzothiophenes	**4490** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C3-Dibenzothiophenes	**2880** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C4-Dibenzothiophenes	**1120** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
Phenanthrene	**36100** (147)	73.3	8270 Mod		20	03/16/20 15:06	F0C0007	FC01201
Anthracene	**10100** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C1-Phenanthrenes/Anthracenes	**39400** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C2-Phenanthrenes/Anthracenes	**25400** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C3-Phenanthrenes/Anthracenes	**10400** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C4-Phenanthrenes/Anthracenes	**3650** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
Retene	**1510** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
Benzo(b)naphtho(2,1-d)thiophene	**1260** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C0-Benzonaphthothiophenes	**2150** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C1-Benzonaphthothiophenes	**2160** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C2-Benzonaphthothiophenes	**1340** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C3-Benzonaphthothiophenes	**697** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS767-S1
Date Sampled: 03/10/20 13:12
Percent Solids: 51
Initial Volume: 5.37
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**209** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
Fluoranthene	**21700** (147)	73.3	8270 Mod		20	03/16/20 15:06	F0C0007	FC01201
Pyrene	**32300** (147)	73.3	8270 Mod		20	03/16/20 15:06	F0C0007	FC01201
C1-Fluoranthenes/Pyrenes	**22600** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C2-Fluoranthenes/Pyrenes	**9760** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C3-Fluoranthenes/Pyrenes	**4220** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
Benzo(b)fluorene	**2150** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
Benzo(c)fluorene	**1070** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
2-Methylpyrene	**3190** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
4-Methylpyrene	**2890** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
1-Methylpyrene	**2710** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
Benz(a)anthracene	**9920** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
Chrysene/triphenylene	**10200** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C1-Benzo(a)anthracenes/Chrysenes	**10400** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C2-Benzo(a)anthracenes/Chrysenes	**5210** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C3-Benzo(a)anthracenes/Chrysenes	**2260** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C4-Benzo(a)anthracenes/Chrysenes	**931** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
Benzo(b)fluoranthene	**3980** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
Benzo(j/k)fluoranthene	**4330** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
Benzo(e)pyrene	**4440** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
Benzo(a)pyrene	**6500** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
Perylene	**1150** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
Indeno(1,2,3-cd)pyrene	**3770** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
Dibenzo(a,h)anthracene	**1080** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
Benzo(g,h,i)perylene	**3400** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
Coronene	**1000** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
Tetramethyl lead	ND (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
Trimethylethyl lead	ND (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
Dimethyldiethyl lead	ND (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
Methyltriethyl lead	ND (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
Tetraethyl lead	ND (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
2,6,10-trimethyldodecane (1380)	**1340** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS767-S1
Date Sampled: 03/10/20 13:12
Percent Solids: 51
Initial Volume: 5.37
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**2430** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
2,6,10-trimethylpentadecane (1650)	**3940** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C-17	**786** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
Pristane	**8560** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
C-18	**1010** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
Phytane	**8480** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
Carbazole	**105** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
2,6-Dimethylnaphthalene	**3200** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
2,3,5-Trimethylnaphthene	**1030** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
4-Methyldibenzothiophene	**1770** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
2/3-Methyldibenzothiophene	**1350** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
1-Methyldibenzothiophene	**324** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
3-Methylphenanthrene	**9030** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
2-Methylphenanthrene	**9910** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
2-Methylanthracene	**4130** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
4/9-Methylphenanthrene	**9420** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201
1-Methylphenanthrene	**6800** (7.33)	3.66	8270 Mod		1	03/16/20 1:27	F0C0007	FC01201

	%Recovery	*Qualifier*	*Limits*
Surrogate: Toluene-D8	*62 %*		*50-120*
Surrogate: Naphthalene-d8	*74 %*		*50-120*
Surrogate: Phenanthrene-d10	*82 %*		*50-120*
Surrogate: Perylene-d12	*63 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS767-S1
Date Sampled: 03/10/20 13:12
Percent Solids: 51

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-06
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**68300** (95.4)		TOC-LK		1	CCP	03/16/20 21:58	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS767-S2
Date Sampled: 03/10/20 13:20
Percent Solids: 55
Initial Volume: 5.12
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	J **6.06** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C1-Benzene	**114** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C2-Benzenes	**30.8** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C3-Benzenes	**20.6** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C4-Benzenes	**25.3** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C5-Benzenes	**9.82** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
Methylcyclohexane	J **4.06** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
Toluene	**137** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
Ethylbenzene	**7.36** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
m,p-Xylene	**36.6** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
Styrene	**13.5** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
o-Xylene	J **3.76** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
Isopropylbenzene	ND (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
n-Propylbenzene	ND (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
1,3,5-Trimethylbenzene	J **5.51** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
1,2,3-Trimethylbenzene	ND (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
1,2,4-Trimethylbenzene	**8.31** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
t-Butylbenzene	ND (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
sec-Butylbenzene	ND (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
p-Isopropyltoluene	**24.3** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
n-Butylbenzene	ND (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
trans-Decalin	**7.67** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
cis-Decalin	ND (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C1-Decalins	**16.8** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C2-Decalins	**26.2** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C3-Decalins	**22.8** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C4-Decalins	**28.4** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
Benzo(b)thiophene	ND (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C1-Benzo(b)thiophenes	**9.53** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C2-Benzo(b)thiophenes	**18.1** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C3-Benzo(b)thiophenes	**14.8** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C4-Benzo(b)thiophenes	**7.32** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS767-S2
Date Sampled: 03/10/20 13:20
Percent Solids: 55
Initial Volume: 5.12
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**102** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
2-Methylnaphthalene	**102** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
1-Methylnaphthalene	**78.0** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C1-Naphthalenes	**66.5** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C2-Naphthalenes	**197** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C3-Naphthalenes	**234** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C4-Naphthalenes	**153** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
Biphenyl	**35.9** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
Acenaphthylene	**90.4** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
Acenaphthene	**303** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
Dibenzofuran	**170** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
Fluorene	**334** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C1-Fluorenes	**208** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C2-Fluorenes	**234** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C3-Fluorenes	**177** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
Dibenzothiophene	**133** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C1-Dibenzothiophenes	**126** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C2-Dibenzothiophenes	**118** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C3-Dibenzothiophenes	**72.8** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C4-Dibenzothiophenes	**44.7** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
Phenanthrene	**2260** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
Anthracene	**790** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C1-Phenanthrenes/Anthracenes	**1720** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C2-Phenanthrenes/Anthracenes	**1010** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C3-Phenanthrenes/Anthracenes	**472** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C4-Phenanthrenes/Anthracenes	**254** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
Retene	**260** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
Benzo(b)naphtho(2,1-d)thiophene	**128** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C0-Benzonaphthothiophenes	**285** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C1-Benzonaphthothiophenes	**200** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C2-Benzonaphthothiophenes	**131** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C3-Benzonaphthothiophenes	**78.6** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS767-S2
Date Sampled: 03/10/20 13:20
Percent Solids: 55
Initial Volume: 5.12
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**23.3** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
Fluoranthene	**2200** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
Pyrene	**3190** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C1-Fluoranthenes/Pyrenes	**2010** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C2-Fluoranthenes/Pyrenes	**900** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C3-Fluoranthenes/Pyrenes	**429** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
Benzo(b)fluorene	**240** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
Benzo(c)fluorene	**130** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
2-Methylpyrene	**276** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
4-Methylpyrene	**245** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
1-Methylpyrene	**197** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
Benz(a)anthracene	**1600** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
Chrysene/triphenylene	**1420** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C1-Benzo(a)anthracenes/Chrysenes	**1190** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C2-Benzo(a)anthracenes/Chrysenes	**650** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C3-Benzo(a)anthracenes/Chrysenes	**350** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C4-Benzo(a)anthracenes/Chrysenes	**161** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
Benzo(b)fluoranthene	**787** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
Benzo(j/k)fluoranthene	**935** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
Benzo(e)pyrene	**801** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
Benzo(a)pyrene	**1300** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
Perylene	**533** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
Indeno(1,2,3-cd)pyrene	**712** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
Dibenzo(a,h)anthracene	**204** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
Benzo(g,h,i)perylene	**604** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
Coronene	**162** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
Tetramethyl lead	ND (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
Trimethylethyl lead	ND (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
Dimethyldiethyl lead	ND (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
Methyltriethyl lead	ND (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
Tetraethyl lead	ND (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
2,6,10-trimethyldodecane (1380)	**21.7** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS767-S2
Date Sampled: 03/10/20 13:20
Percent Solids: 55
Initial Volume: 5.12
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**60.1** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
2,6,10-trimethylpentadecane (1650)	**B 71.0** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C-17	**B 179** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
Pristane	**B 151** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
C-18	**B 112** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
Phytane	**B 135** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
Carbazole	**222** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
2,6-Dimethylnaphthalene	**43.2** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
2,3,5-Trimethylnaphthene	**18.4** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
4-Methyldibenzothiophene	**26.5** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
2/3-Methyldibenzothiophene	**41.2** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
1-Methyldibenzothiophene	**10.7** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
3-Methylphenanthrene	**383** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
2-Methylphenanthrene	**448** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
2-Methylanthracene	**273** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
4/9-Methylphenanthrene	**417** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201
1-Methylphenanthrene	**156** (7.12)	3.56	8270 Mod		1	03/15/20 18:28	F0C0007	FC01201

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*67 %*		*50-120*
Surrogate: Naphthalene-d8	*67 %*		*50-120*
Surrogate: Phenanthrene-d10	*92 %*		*50-120*
Surrogate: Perylene-d12	*77 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS767-S2
Date Sampled: 03/10/20 13:20
Percent Solids: 55

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-07
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**60700** (105)		TOC-LK		1	CCP	03/16/20 23:07	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS768-S2
Date Sampled: 03/10/20 12:37
Percent Solids: 67
Initial Volume: 4.71
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C1-Benzene	**12.8** (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C2-Benzenes	**14.2** (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C3-Benzenes	**J 3.57** (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C4-Benzenes	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C5-Benzenes	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
Methylcyclohexane	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
Toluene	**19.2** (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
Ethylbenzene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
m,p-Xylene	**18.4** (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
Styrene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
o-Xylene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
Isopropylbenzene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
n-Propylbenzene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
1,3,5-Trimethylbenzene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
1,2,3-Trimethylbenzene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
1,2,4-Trimethylbenzene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
t-Butylbenzene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
sec-Butylbenzene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
p-Isopropyltoluene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
n-Butylbenzene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
trans-Decalin	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
cis-Decalin	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C1-Decalins	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C2-Decalins	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C3-Decalins	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C4-Decalins	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
Benzo(b)thiophene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C1-Benzo(b)thiophenes	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C2-Benzo(b)thiophenes	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C3-Benzo(b)thiophenes	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C4-Benzo(b)thiophenes	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS768-S2
Date Sampled: 03/10/20 12:37
Percent Solids: 67
Initial Volume: 4.71
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
2-Methylnaphthalene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
1-Methylnaphthalene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C1-Naphthalenes	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C2-Naphthalenes	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C3-Naphthalenes	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C4-Naphthalenes	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
Biphenyl	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
Acenaphthylene	**J 5.33** (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
Acenaphthene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
Dibenzofuran	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
Fluorene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C1-Fluorenes	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C2-Fluorenes	**J 4.30** (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C3-Fluorenes	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
Dibenzothiophene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C1-Dibenzothiophenes	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C2-Dibenzothiophenes	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C3-Dibenzothiophenes	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C4-Dibenzothiophenes	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
Phenanthrene	**7.68** (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
Anthracene	**J 3.66** (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C1-Phenanthrenes/Anthracenes	**7.19** (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C2-Phenanthrenes/Anthracenes	**J 4.40** (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C3-Phenanthrenes/Anthracenes	**J 3.64** (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C4-Phenanthrenes/Anthracenes	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
Retene	**J 4.88** (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
Benzo(b)naphtho(2,1-d)thiophene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C0-Benzonaphthothiophenes	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C1-Benzonaphthothiophenes	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C2-Benzonaphthothiophenes	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C3-Benzonaphthothiophenes	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS768-S2
Date Sampled: 03/10/20 12:37
Percent Solids: 67
Initial Volume: 4.71
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
Fluoranthene	**8.94** (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
Pyrene	**12.1** (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C1-Fluoranthenes/Pyrenes	**12.8** (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C2-Fluoranthenes/Pyrenes	**J 6.33** (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C3-Fluoranthenes/Pyrenes	**J 6.12** (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
Benzo(b)fluorene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
Benzo(c)fluorene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
2-Methylpyrene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
4-Methylpyrene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
1-Methylpyrene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
Benz(a)anthracene	**J 5.46** (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
Chrysene/triphenylene	**J 5.20** (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C1-Benzo(a)anthracenes/Chrysenes	**J 5.08** (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C2-Benzo(a)anthracenes/Chrysenes	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C3-Benzo(a)anthracenes/Chrysenes	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C4-Benzo(a)anthracenes/Chrysenes	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
Benzo(b)fluoranthene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
Benzo(j/k)fluoranthene	**J 3.61** (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
Benzo(e)pyrene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
Benzo(a)pyrene	**J 4.78** (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
Perylene	**280** (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
Indeno(1,2,3-cd)pyrene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
Dibenzo(a,h)anthracene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
Benzo(g,h,i)perylene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
Coronene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
Tetramethyl lead	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
Trimethylethyl lead	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
Dimethyldiethyl lead	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
Methyltriethyl lead	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
Tetraethyl lead	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
2,6,10-trimethyldodecane (1380)	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS768-S2
Date Sampled: 03/10/20 12:37
Percent Solids: 67
Initial Volume: 4.71
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/12/20 9:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**7.24** (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
2,6,10-trimethylpentadecane (1650)	**B 15.6** (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C-17	**B 106** (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
Pristane	**B 44.0** (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
C-18	**B 51.6** (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
Phytane	**B 56.3** (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
Carbazole	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
2,6-Dimethylnaphthalene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
2,3,5-Trimethylnaphthene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
4-Methyldibenzothiophene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
2/3-Methyldibenzothiophene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
1-Methyldibenzothiophene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
3-Methylphenanthrene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
2-Methylphenanthrene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
2-Methylanthracene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
4/9-Methylphenanthrene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201
1-Methylphenanthrene	ND (6.36)	3.18	8270 Mod		1	03/15/20 19:52	F0C0007	FC01201

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*83 %*		*50-120*
Surrogate: Naphthalene-d8	*72 %*		*50-120*
Surrogate: Phenanthrene-d10	*96 %*		*50-120*
Surrogate: Perylene-d12	*70 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS768-S2
Date Sampled: 03/10/20 12:37
Percent Solids: 67

ESS Laboratory Work Order: F200014
ESS Laboratory Sample ID: F200014-08
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**19100** (105)		TOC-LK		1	CCP	03/16/20 23:24	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200014

Quality Control Data

Classical Chemistry

Batch DC01260 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	100	mg/kg							
Total Organic Carbon (2)	ND	100	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200014

Quality Control Data

Classical Chemistry

Batch DC01260 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9240	100	mg/kg	10000		92	80-120			
Total Organic Carbon (2)	8940	100	mg/kg	10000		89	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200014

Quality Control Data

Classical Chemistry

Batch DC01260 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9050	100	mg/kg	10000		91	80-120	2	20	
Total Organic Carbon (2)	9490	100	mg/kg	10000		95	80-120	6	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200014

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FC01201 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	ND	4.00	ug/Kg wet							
C1-Benzene	ND	4.00	ug/Kg wet							
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	ND	4.00	ug/Kg wet							
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	ND	4.00	ug/Kg wet							
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200014

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FC01201 - 3570

C1-Fluorenes	ND	4.00	ug/Kg wet
C2-Fluorenes	ND	4.00	ug/Kg wet
C3-Fluorenes	ND	4.00	ug/Kg wet
Dibenzothiophene	ND	4.00	ug/Kg wet
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet
Phenanthrene	ND	4.00	ug/Kg wet
Anthracene	ND	4.00	ug/Kg wet
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
Retene	ND	4.00	ug/Kg wet
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
Fluoranthene	ND	4.00	ug/Kg wet
Pyrene	ND	4.00	ug/Kg wet
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
Benzo(b)fluorene	ND	4.00	ug/Kg wet
Benzo(c)fluorene	ND	4.00	ug/Kg wet
2-Methylpyrene	ND	4.00	ug/Kg wet
4-Methylpyrene	ND	4.00	ug/Kg wet
1-Methylpyrene	ND	4.00	ug/Kg wet
Benz(a)anthracene	ND	4.00	ug/Kg wet
Chrysene/triphenylene	ND	4.00	ug/Kg wet
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet
Benzo(e)pyrene	ND	4.00	ug/Kg wet
Benzo(a)pyrene	ND	4.00	ug/Kg wet
Perylene	ND	4.00	ug/Kg wet
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet
Coronene	ND	4.00	ug/Kg wet
Tetramethyl lead	ND	4.00	ug/Kg wet
Trimethylethyl lead	ND	4.00	ug/Kg wet

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200014

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FC01201 - 3570						
Dimethyldiethyl lead	ND	4.00	ug/Kg wet			
Methyltriethyl lead	ND	4.00	ug/Kg wet			
Tetraethyl lead	ND	4.00	ug/Kg wet			
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet			
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet			
2,6,10-trimethylpentadecane (1650)	12.3	4.00	ug/Kg wet			
C-17	41.7	4.00	ug/Kg wet			
Pristane	33.7	4.00	ug/Kg wet			
C-18	35.2	4.00	ug/Kg wet			
Phytane	39.1	4.00	ug/Kg wet			
Carbazole	ND	4.00	ug/Kg wet			
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet			
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet			
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
3-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylanthracene	ND	4.00	ug/Kg wet			
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet			
1-Methylphenanthrene	ND	4.00	ug/Kg wet			
Surrogate: Toluene-D8	*357*		ug/Kg wet	*400.0*	*89*	*50-120*
Surrogate: Naphthalene-d8	*284*		ug/Kg wet	*400.0*	*71*	*50-120*
Surrogate: Phenanthrene-d10	*397*		ug/Kg wet	*400.0*	*99*	*50-120*
Surrogate: Perylene-d12	*430*		ug/Kg wet	*400.0*	*107*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200014

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FC01201 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	298	4.00	ug/Kg wet	400.0		74	60-130			
Methylcyclohexane	243	4.00	ug/Kg wet	400.0		61	60-130			
Toluene	349	4.00	ug/Kg wet	400.0		87	60-130			
Ethylbenzene	349	4.00	ug/Kg wet	400.0		87	60-130			
m,p-Xylene	348	4.00	ug/Kg wet	400.0		87	60-130			
Styrene	343	4.00	ug/Kg wet	400.0		86	60-130			
o-Xylene	349	4.00	ug/Kg wet	400.0		87	60-130			
Isopropylbenzene	353	4.00	ug/Kg wet	400.0		88	60-130			
n-Propylbenzene	338	4.00	ug/Kg wet	400.0		85	60-130			
1,3,5-Trimethylbenzene	351	4.00	ug/Kg wet	400.0		88	60-130			
1,2,3-Trimethylbenzene	347	4.00	ug/Kg wet	400.0		87	60-130			
1,2,4-Trimethylbenzene	346	4.00	ug/Kg wet	400.0		86	60-130			
t-Butylbenzene	361	4.00	ug/Kg wet	400.0		90	60-130			
sec-Butylbenzene	347	4.00	ug/Kg wet	400.0		87	60-130			
p-Isopropyltoluene	349	4.00	ug/Kg wet	400.0		87	60-130			
n-Butylbenzene	304	4.00	ug/Kg wet	400.0		76	60-130			
trans-Decalin	333	4.00	ug/Kg wet	400.0		83	60-130			
cis-Decalin	334	4.00	ug/Kg wet	400.0		83	60-130			
Benzo(b)thiophene	287	4.00	ug/Kg wet	400.0		72	60-130			
Naphthalene	296	4.00	ug/Kg wet	400.0		74	60-130			
2-Methylnaphthalene	327	4.00	ug/Kg wet	400.0		82	60-130			
1-Methylnaphthalene	335	4.00	ug/Kg wet	400.0		84	60-130			
Biphenyl	308	4.00	ug/Kg wet	400.0		77	60-130			
Acenaphthylene	357	4.00	ug/Kg wet	400.0		89	60-130			
Acenaphthene	357	4.00	ug/Kg wet	400.0		89	60-130			
Dibenzofuran	348	4.00	ug/Kg wet	400.0		87	60-130			
Fluorene	357	4.00	ug/Kg wet	400.0		89	60-130			
Dibenzothiophene	352	4.00	ug/Kg wet	400.0		88	60-130			
Phenanthrene	358	4.00	ug/Kg wet	400.0		89	60-130			
Anthracene	347	4.00	ug/Kg wet	400.0		87	60-130			
Retene	435	4.00	ug/Kg wet	400.0		109	60-130			
Benzo(b)naphtho(2,1-d)thiophene	402	4.00	ug/Kg wet	400.0		100	60-130			
Fluoranthene	396	4.00	ug/Kg wet	400.0		99	60-130			
Pyrene	397	4.00	ug/Kg wet	400.0		99	60-130			
Benz(a)anthracene	425	4.00	ug/Kg wet	400.0		106	60-130			
Chrysene/triphenylene	440	4.00	ug/Kg wet	400.0		110	60-130			
Benzo(b)fluoranthene	383	4.00	ug/Kg wet	400.0		96	60-130			
Benzo(j/k)fluoranthene	426	4.00	ug/Kg wet	400.0		106	60-130			
Benzo(e)pyrene	394	4.00	ug/Kg wet	400.0		98	60-130			
Benzo(a)pyrene	400	4.00	ug/Kg wet	400.0		100	60-130			
Perylene	393	4.00	ug/Kg wet	400.0		98	60-130			
Indeno(1,2,3-cd)pyrene	374	4.00	ug/Kg wet	400.0		94	60-130			
Dibenzo(a,h)anthracene	460	4.00	ug/Kg wet	400.0		115	60-130			
Benzo(g,h,i)perylene	390	4.00	ug/Kg wet	400.0		97	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200014

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FC01201 - 3570						
Coronene	409	4.00	ug/Kg wet	400.0	102	60-130
Tetraethyl lead	287	4.00	ug/Kg wet	400.0	72	60-130
Pristane	413	4.00	ug/Kg wet	400.0	103	60-130
Phytane	399	4.00	ug/Kg wet	400.0	100	60-130
Surrogate: Toluene-D8	*369*		ug/Kg wet	*400.0*	*92*	*50-120*
Surrogate: Naphthalene-d8	*316*		ug/Kg wet	*400.0*	*79*	*50-120*
Surrogate: Phenanthrene-d10	*411*		ug/Kg wet	*400.0*	*103*	*50-120*
Surrogate: Perylene-d12	*442*		ug/Kg wet	*400.0*	*111*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200014

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FC01201 - 3570

Duplicate **Source: F200014-08**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	ND	5.78	ug/Kg dry		ND				50	
C1-Benzene	11.3	5.78	ug/Kg dry		12.8			12	50	
C2-Benzenes	13.3	5.78	ug/Kg dry		14.2			7	50	
C3-Benzenes	ND	5.78	ug/Kg dry		3.57				50	
C4-Benzenes	ND	5.78	ug/Kg dry		ND				50	
C5-Benzenes	ND	5.78	ug/Kg dry		ND				50	
Methylcyclohexane	ND	5.78	ug/Kg dry		ND				50	
Toluene	15.0	5.78	ug/Kg dry		19.2			25	50	
Ethylbenzene	ND	5.78	ug/Kg dry		ND				50	
m,p-Xylene	15.5	5.78	ug/Kg dry		18.4			18	50	
Styrene	ND	5.78	ug/Kg dry		ND				50	
o-Xylene	ND	5.78	ug/Kg dry		ND				50	
Isopropylbenzene	ND	5.78	ug/Kg dry		ND				50	
n-Propylbenzene	ND	5.78	ug/Kg dry		ND				50	
1,3,5-Trimethylbenzene	ND	5.78	ug/Kg dry		ND				50	
1,2,3-Trimethylbenzene	ND	5.78	ug/Kg dry		ND				50	
1,2,4-Trimethylbenzene	ND	5.78	ug/Kg dry		ND				50	
t-Butylbenzene	ND	5.78	ug/Kg dry		ND				50	
sec-Butylbenzene	ND	5.78	ug/Kg dry		ND				50	
p-Isopropyltoluene	ND	5.78	ug/Kg dry		ND				50	
n-Butylbenzene	ND	5.78	ug/Kg dry		ND				50	
trans-Decalin	ND	5.78	ug/Kg dry		ND				50	
cis-Decalin	ND	5.78	ug/Kg dry		ND				50	
C1-Decalins	ND	5.78	ug/Kg dry		ND				50	
C2-Decalins	ND	5.78	ug/Kg dry		ND				50	
C3-Decalins	ND	5.78	ug/Kg dry		ND				50	
C4-Decalins	ND	5.78	ug/Kg dry		ND				50	
Benzo(b)thiophene	ND	5.78	ug/Kg dry		ND				50	
C1-Benzo(b)thiophenes	ND	5.78	ug/Kg dry		ND				50	
C2-Benzo(b)thiophenes	ND	5.78	ug/Kg dry		ND				50	
C3-Benzo(b)thiophenes	ND	5.78	ug/Kg dry		ND				50	
C4-Benzo(b)thiophenes	ND	5.78	ug/Kg dry		ND				50	
Naphthalene	ND	5.78	ug/Kg dry		ND				50	
2-Methylnaphthalene	ND	5.78	ug/Kg dry		ND				50	
1-Methylnaphthalene	ND	5.78	ug/Kg dry		ND				50	
C1-Naphthalenes	ND	5.78	ug/Kg dry		ND				50	
C2-Naphthalenes	ND	5.78	ug/Kg dry		ND				50	
C3-Naphthalenes	ND	5.78	ug/Kg dry		2.90				50	
C4-Naphthalenes	ND	5.78	ug/Kg dry		ND				50	
Biphenyl	ND	5.78	ug/Kg dry		ND				50	
Acenaphthylene	4.20	5.78	ug/Kg dry		5.33			24	50	J
Acenaphthene	ND	5.78	ug/Kg dry		ND				50	
Dibenzofuran	ND	5.78	ug/Kg dry		ND				50	
Fluorene	ND	5.78	ug/Kg dry		ND				50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200014

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FC01201 - 3570

C1-Fluorenes	ND	5.78	ug/Kg dry	ND		50	
C2-Fluorenes	ND	5.78	ug/Kg dry	4.30		50	
C3-Fluorenes	ND	5.78	ug/Kg dry	ND		50	
Dibenzothiophene	ND	5.78	ug/Kg dry	ND		50	
C1-Dibenzothiophenes	ND	5.78	ug/Kg dry	ND		50	
C2-Dibenzothiophenes	ND	5.78	ug/Kg dry	ND		50	
C3-Dibenzothiophenes	ND	5.78	ug/Kg dry	ND		50	
C4-Dibenzothiophenes	ND	5.78	ug/Kg dry	ND		50	
Phenanthrene	ND	5.78	ug/Kg dry	7.68		50	
Anthracene	ND	5.78	ug/Kg dry	3.66		50	
C1-Phenanthrenes/Anthracenes	ND	5.78	ug/Kg dry	7.19		50	
C2-Phenanthrenes/Anthracenes	ND	5.78	ug/Kg dry	4.40		50	
C3-Phenanthrenes/Anthracenes	ND	5.78	ug/Kg dry	3.64		50	
C4-Phenanthrenes/Anthracenes	ND	5.78	ug/Kg dry	3.13		50	
Retene	5.06	5.78	ug/Kg dry	4.88	4	50	J
Benzo(b)naphtho(2,1-d)thiophene	ND	5.78	ug/Kg dry	ND		50	
C0-Benzonaphthothiophenes	ND	5.78	ug/Kg dry	ND		50	
C1-Benzonaphthothiophenes	ND	5.78	ug/Kg dry	ND		50	
C2-Benzonaphthothiophenes	ND	5.78	ug/Kg dry	ND		50	
C3-Benzonaphthothiophenes	ND	5.78	ug/Kg dry	ND		50	
C4-Benzonaphthothiophenes	ND	5.78	ug/Kg dry	ND		50	
Fluoranthene	ND	5.78	ug/Kg dry	8.94		50	
Pyrene	ND	5.78	ug/Kg dry	12.1		50	
C1-Fluoranthenes/Pyrenes	4.32	5.78	ug/Kg dry	12.8	99	50	D+, J
C2-Fluoranthenes/Pyrenes	5.03	5.78	ug/Kg dry	6.33	23	50	J
C3-Fluoranthenes/Pyrenes	3.99	5.78	ug/Kg dry	6.12	42	50	J
Benzo(b)fluorene	ND	5.78	ug/Kg dry	ND		50	
Benzo(c)fluorene	ND	5.78	ug/Kg dry	ND		50	
2-Methylpyrene	ND	5.78	ug/Kg dry	ND		50	
4-Methylpyrene	ND	5.78	ug/Kg dry	ND		50	
1-Methylpyrene	ND	5.78	ug/Kg dry	ND		50	
Benz(a)anthracene	ND	5.78	ug/Kg dry	5.46		50	
Chrysene/triphenylene	ND	5.78	ug/Kg dry	5.20		50	
C1-Benzo(a)anthracenes/Chrysenes	ND	5.78	ug/Kg dry	5.08		50	
C2-Benzo(a)anthracenes/Chrysenes	ND	5.78	ug/Kg dry	ND		50	
C3-Benzo(a)anthracenes/Chrysenes	ND	5.78	ug/Kg dry	ND		50	
C4-Benzo(a)anthracenes/Chrysenes	ND	5.78	ug/Kg dry	ND		50	
Benzo(b)fluoranthene	ND	5.78	ug/Kg dry	ND		50	
Benzo(j/k)fluoranthene	ND	5.78	ug/Kg dry	3.61		50	
Benzo(e)pyrene	ND	5.78	ug/Kg dry	3.09		50	
Benzo(a)pyrene	ND	5.78	ug/Kg dry	4.78		50	
Perylene	193	5.78	ug/Kg dry	280	37	50	
Indeno(1,2,3-cd)pyrene	ND	5.78	ug/Kg dry	ND		50	
Dibenzo(a,h)anthracene	ND	5.78	ug/Kg dry	ND		50	
Benzo(g,h,i)perylene	ND	5.78	ug/Kg dry	ND		50	
Coronene	ND	5.78	ug/Kg dry	ND		50	
Tetramethyl lead	ND	5.78	ug/Kg dry	ND		50	
Trimethylethyl lead	ND	5.78	ug/Kg dry	ND		50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200014

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FC01201 - 3570									
Dimethyldiethyl lead	ND	5.78	ug/Kg dry	ND				50	
Methyltriethyl lead	ND	5.78	ug/Kg dry	ND				50	
Tetraethyl lead	ND	5.78	ug/Kg dry	ND				50	
2,6,10-trimethyldodecane (1380)	ND	5.78	ug/Kg dry	ND				50	
2,6,10-trimethyltridecane (1470)	5.69	5.78	ug/Kg dry	7.24			24	50	J
2,6,10-trimethylpentadecane (1650)	18.1	5.78	ug/Kg dry	15.6			15	50	
C-17	101	5.78	ug/Kg dry	106			5	50	
Pristane	50.0	5.78	ug/Kg dry	44.0			13	50	
C-18	59.9	5.78	ug/Kg dry	51.6			15	50	
Phytane	68.1	5.78	ug/Kg dry	56.3			19	50	
Carbazole	ND	5.78	ug/Kg dry	ND				50	
2,6-Dimethylnaphthalene	ND	5.78	ug/Kg dry	ND				50	
2,3,5-Trimethylnaphthene	ND	5.78	ug/Kg dry	ND				50	
4-Methyldibenzothiophene	ND	5.78	ug/Kg dry	ND				50	
2/3-Methyldibenzothiophene	ND	5.78	ug/Kg dry	ND				50	
1-Methyldibenzothiophene	ND	5.78	ug/Kg dry	ND				50	
3-Methylphenanthrene	ND	5.78	ug/Kg dry	ND				50	
2-Methylphenanthrene	ND	5.78	ug/Kg dry	ND				50	
2-Methylanthracene	ND	5.78	ug/Kg dry	ND				50	
4/9-Methylphenanthrene	ND	5.78	ug/Kg dry	ND				50	
1-Methylphenanthrene	ND	5.78	ug/Kg dry	ND				50	
Surrogate: Toluene-D8	*397*		ug/Kg dry	*578.4*		*69*	*50-120*		
Surrogate: Naphthalene-d8	*359*		ug/Kg dry	*578.4*		*62*	*50-120*		
Surrogate: Phenanthrene-d10	*485*		ug/Kg dry	*578.4*		*84*	*50-120*		
Surrogate: Perylene-d12	*342*		ug/Kg dry	*578.4*		*59*	*50-120*		

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F200014

Notes and Definitions

U	Analyte included in the analysis, but not detected
J	Reported between MDL and MRL
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
CD-	Continuing Calibration %Diff/Drift is below control limit (CD-).
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200014

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only): 2000335 / F200014

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY REQUIRED -- (YES) NO

If Yes, Are MCP Analytical Methods Required?	(YES)	NO	NA
Are Drinking Water Samples Submitted?	YES	(NO)	NA
If Yes, Have Drinking Water Sampling Requirements Been Met?	YES	NO	(NA)

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Preservative		Analysis						Sample Specific Remarks
							None	None	Parent and Alkylated MAHs & PAHs 8270**	TOCs by Lloyd-Kahn					
1	1804576-SS766-S1	3/10/2020	11:40	Soil	1	BFM			X	X					
2	1804576-SS766-S2	3/10/2020	11:47	Soil	1	BFM			X	X					
3	1804576-SS766-S3	3/10/2020	11:56	Soil	1	BFM			X	X					
4	1804576-SS771-S1	3/10/2020	9:47	Soil	1	BFM			X	X					
5	1804576-SS772-S1	3/10/2020	10:20	Soil	1	BFM			X	X					
6	1804576-SS767-S1	3/10/2020	13:12	Soil	1	BFM			X	X					
7	1804576-SS767-S2	3/10/2020	13:20	Soil	1	BFM			X	X					
8	1804576-SS768-S2	3/10/2020	12:37	Soil	1	BFM			X	X					

Sample Handling

Samples Field Filtered: YES NO (NA)

Sampled Shipped With Ice: (YES) NO

MCP Level Needed: GEI requires that within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

	Relinquished by: (signature)	Date:	Time:	Received by: (signature)
1		3/10/20	1650	1. GEI Sample Fridge
2	2. GEI Sample Fridge	3/11/20	1210	2.
3	3.	3/11/20	1210	3.
4	4.	3/11	17:47	4.

Turnaround Time (Business days):

Normal __X__ Other ____

10-Day ____ 7-Day ____

5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

**Parent and Alkylated MAHs & PAHs (34) by GC/MS/SIM/SCAN

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

Shipped/Delivered Via: ESS Courier

ESS Project ID: F200014
Date Received: 3/11/2020
Project Due Date: 3/18/2020
Days for Project: 10S Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 0.3 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? 3/12/20 Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / (NA)
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / (No)
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / (No)
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1					4 oz. Jar	NP	
2					4 oz. Jar	NP	
3					4 oz. Jar	NP	
4					4 oz. Jar	NP	
5					4 oz. Jar	NP	
6					4 oz. Jar	NP	
7					4 oz. Jar	NP	
8					4 oz. Jar	NP	

2nd Review
Were all containers scanned into storage/lab? Initials
Are barcode labels on correct containers? (Yes) / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / (NA)
Are all Hex Chrome stickers attached? Yes / No / (NA)
Are all QC stickers attached? Yes / No / (NA)
Are VOA stickers attached if bubbles noted? Yes / No / (NA)

Completed

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

ESS Project ID: F200014

Date Received: 3/11/2020

By: _____ Date & Time: 3/11/20 1931

Reviewed By: _____ Date & Time: 3/12/20 @ 08:58

Delivered By: _____

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: F200017

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 2:40 pm, Apr 02, 2020

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses
ESS Laboratory - Cranston, RI TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200017

SAMPLE RECEIPT

The following samples were received on March 13, 2020 for the analyses specified on the enclosed Chain of Custody Record.

Sample F200017-03 was originally extracted without surrogate spike, due to laboratory error. By the time re-extraction could be initiated (03/31/20) the sample was out of extraction hold time (03/25/20). Both data sets were reported.

Lab Number	Sample Name	Matrix	Analysis
F200017-01	1804576-SS765-S2	Soil	8270 Mod, TOC-LK
F200017-02	1804576-SS769-S1	Soil	8270 Mod, TOC-LK
F200017-03	1804576-SS770-S2	Soil	8270 Mod, TOC-LK
F200017-04	1804576-SS774-S2	Soil	8270 Mod, TOC-LK
F200017-05	1804576-SS774-S3	Soil	8270 Mod, TOC-LK
F200017-06	1804576-SS775-S2	Soil	8270 Mod, TOC-LK
F200017-07	1804576-SS775-S3	Soil	8270 Mod, TOC-LK
F200017-08	1804576-SS776-S1	Soil	8270 Mod, TOC-LK
F200017-09	1804576-SS776-S3	Soil	8270 Mod, TOC-LK
F200017-10	1804576-SS777-S2	Soil	8270 Mod, TOC-LK
F200017-11	1804576-SS777-S3	Soil	8270 Mod, TOC-LK
F200017-12	1804576-SS778-S2	Soil	8270 Mod, TOC-LK
F200017-13	1804576-SS778-S3	Soil	8270 Mod, TOC-LK
F200017-14	1804576-SS779-S1	Soil	8270 Mod, TOC-LK
F200017-15	1804576-SS779-S2	Soil	8270 Mod, TOC-LK
F200017-16	1804576-SS780-S1	Soil	8270 Mod, TOC-LK
F200017-17	1804576-SS780-S2	Soil	8270 Mod, TOC-LK
F200017-18	1804576-SS781-S1	Soil	8270 Mod, TOC-LK
F200017-19	1804576-SS782-S2	Soil	8270 Mod, TOC-LK
F200017-20	1804576-SS781(R1)-S1	Soil	8270 Mod, TOC-LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200017

PROJECT NARRATIVE

8270D (SIM) Semi-Volatile Organic Compounds

F0C0011-CCV4	**Continuing Calibration %Diff/Drift is below control limit (CD-).**
	Tetraethyl lead (27% @ 25%)
F0C0013-CCV3	**Continuing Calibration %Diff/Drift is above control limit (CD+).**
	Benzo(g,h,i)perylene (30% @ 25%), Dibenzo(a,h)anthracene (33% @ 25%), Indeno(1,2,3-cd)pyrene (34% @ 25%)
F0C0016-CCV2	**Continuing Calibration %Diff/Drift is below control limit (CD-).**
	Coronene (32% @ 25%)
F200017-01	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , C-17 , C-18 , Phytane , Pristane
F200017-03	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , C-17 , C-18 , Phytane , Pristane
F200017-03	**Surrogate recovery(ies) below lower control limit (S-).**
F200017-03RE1	**Estimated value. Sample hold times were exceeded (H).**
F200017-03RE1	**Present in Method Blank (B).**
	C-17 , C-18 , Coronene , Phytane , Pristane
F200017-09	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , C-17 , C-18 , Phytane , Pristane
F200017-11	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , C-17 , C-18 , Phytane , Pristane
F200017-13	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , C-17 , C-18 , Phytane , Pristane
F200017-14	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , C-17 , C-18 , Phytane , Pristane
F200017-15	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , C-17 , C-18 , Phytane , Pristane
F200017-17	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , C-17 , C-18 , Phytane , Pristane
F200017-19	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , C-17 , C-18 , Phytane , Pristane
F200017-20	**Present in Method Blank (B).**
	C-18
FC01601-BS2	**Blank Spike recovery is below lower control limit (B-).**
	Methylcyclohexane (44% @ 60-130%), Tetraethyl lead (42% @ 60-130%)
FC02301-BS2	**Blank Spike recovery is below lower control limit (B-).**
	Methylcyclohexane (54% @ 60-130%), Tetraethyl lead (52% @ 60-130%)

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200017

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS765-S2
Date Sampled: 03/10/20 14:05
Percent Solids: 60
Initial Volume: 5.02
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C1-Benzene	**11.3** (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C2-Benzenes	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C3-Benzenes	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C4-Benzenes	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C5-Benzenes	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
Methylcyclohexane	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
Toluene	**14.6** (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
Ethylbenzene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
m,p-Xylene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
Styrene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
o-Xylene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
Isopropylbenzene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
n-Propylbenzene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
1,3,5-Trimethylbenzene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
1,2,3-Trimethylbenzene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
1,2,4-Trimethylbenzene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
t-Butylbenzene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
sec-Butylbenzene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
p-Isopropyltoluene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
n-Butylbenzene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
trans-Decalin	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
cis-Decalin	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C1-Decalins	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C2-Decalins	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C3-Decalins	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C4-Decalins	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
Benzo(b)thiophene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C1-Benzo(b)thiophenes	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C2-Benzo(b)thiophenes	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C3-Benzo(b)thiophenes	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C4-Benzo(b)thiophenes	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS765-S2
Date Sampled: 03/10/20 14:05
Percent Solids: 60
Initial Volume: 5.02
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
2-Methylnaphthalene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
1-Methylnaphthalene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C1-Naphthalenes	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C2-Naphthalenes	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C3-Naphthalenes	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C4-Naphthalenes	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
Biphenyl	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
Acenaphthylene	**J 5.80** (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
Acenaphthene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
Dibenzofuran	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
Fluorene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C1-Fluorenes	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C2-Fluorenes	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C3-Fluorenes	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
Dibenzothiophene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C1-Dibenzothiophenes	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C2-Dibenzothiophenes	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C3-Dibenzothiophenes	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C4-Dibenzothiophenes	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
Phenanthrene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
Anthracene	**J 3.75** (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C1-Phenanthrenes/Anthracenes	**J 4.18** (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C2-Phenanthrenes/Anthracenes	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C3-Phenanthrenes/Anthracenes	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C4-Phenanthrenes/Anthracenes	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
Retene	**8.21** (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
Benzo(b)naphtho(2,1-d)thiophene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C0-Benzonaphthothiophenes	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C1-Benzonaphthothiophenes	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C2-Benzonaphthothiophenes	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C3-Benzonaphthothiophenes	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS765-S2
Date Sampled: 03/10/20 14:05
Percent Solids: 60
Initial Volume: 5.02
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
Fluoranthene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
Pyrene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C1-Fluoranthenes/Pyrenes	**7.00** (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C2-Fluoranthenes/Pyrenes	**J 4.95** (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C3-Fluoranthenes/Pyrenes	**J 4.01** (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
Benzo(b)fluorene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
Benzo(c)fluorene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
2-Methylpyrene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
4-Methylpyrene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
1-Methylpyrene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
Benz(a)anthracene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
Chrysene/triphenylene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C1-Benzo(a)anthracenes/Chrysenes	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C2-Benzo(a)anthracenes/Chrysenes	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C3-Benzo(a)anthracenes/Chrysenes	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C4-Benzo(a)anthracenes/Chrysenes	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
Benzo(b)fluoranthene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
Benzo(j/k)fluoranthene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
Benzo(e)pyrene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
Benzo(a)pyrene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
Perylene	**552** (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
Indeno(1,2,3-cd)pyrene	**12.7** (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
Dibenzo(a,h)anthracene	**J 3.84** (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
Benzo(g,h,i)perylene	**19.4** (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
Coronene	**15.6** (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
Tetramethyl lead	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
Trimethylethyl lead	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
Dimethyldiethyl lead	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
Methyltriethyl lead	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
Tetraethyl lead	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
2,6,10-trimethyldodecane (1380)	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS765-S2
Date Sampled: 03/10/20 14:05
Percent Solids: 60
Initial Volume: 5.02
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**J 5.19** (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
2,6,10-trimethylpentadecane (1650)	**B 16.7** (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C-17	**B 90.1** (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
Pristane	**B 44.9** (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
C-18	**B 54.4** (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
Phytane	**B 63.2** (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
Carbazole	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
2,6-Dimethylnaphthalene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
2,3,5-Trimethylnaphthene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
4-Methyldibenzothiophene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
2/3-Methyldibenzothiophene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
1-Methyldibenzothiophene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
3-Methylphenanthrene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
2-Methylphenanthrene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
2-Methylanthracene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
4/9-Methylphenanthrene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601
1-Methylphenanthrene	ND (6.67)	3.34	8270 Mod		1	03/22/20 0:23	F0C0011	FC01601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*75 %*		*50-120*
Surrogate: Naphthalene-d8	*87 %*		*50-120*
Surrogate: Phenanthrene-d10	*73 %*		*50-120*
Surrogate: Perylene-d12	*61 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS765-S2
Date Sampled: 03/10/20 14:05
Percent Solids: N/A

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**35600** (93.6)		TOC-LK		1	CCP	03/23/20 15:42	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS769-S1
Date Sampled: 03/11/20 09:21
Percent Solids: 50
Initial Volume: 5.26
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
C1-Benzene	**1850** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
C2-Benzenes	**683** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
C3-Benzenes	**2670** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
C4-Benzenes	**7940** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
C5-Benzenes	**3930** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
Methylcyclohexane	ND (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
Toluene	**2280** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
Ethylbenzene	**239** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
m,p-Xylene	**707** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
Styrene	**934** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
o-Xylene	**193** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
Isopropylbenzene	**228** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
n-Propylbenzene	**219** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
1,3,5-Trimethylbenzene	**573** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
1,2,3-Trimethylbenzene	**579** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
1,2,4-Trimethylbenzene	**1810** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
t-Butylbenzene	ND (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
sec-Butylbenzene	**J 66.5** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
p-Isopropyltoluene	**107** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
n-Butylbenzene	ND (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
trans-Decalin	**216** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
cis-Decalin	**J 39.7** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
C1-Decalins	**657** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
C2-Decalins	**1310** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
C3-Decalins	**1210** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
C4-Decalins	**2410** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
Benzo(b)thiophene	**1680** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
C1-Benzo(b)thiophenes	**2090** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
C2-Benzo(b)thiophenes	**3060** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
C3-Benzo(b)thiophenes	**1650** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
C4-Benzo(b)thiophenes	**708** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS769-S1
Date Sampled: 03/11/20 09:21
Percent Solids: 50
Initial Volume: 5.26
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**16900** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
2-Methylnaphthalene	**3880** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
1-Methylnaphthalene	**65100** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
C1-Naphthalenes	**40100** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
C2-Naphthalenes	**55700** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
C3-Naphthalenes	**29300** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
C4-Naphthalenes	**13100** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
Biphenyl	**2840** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
Acenaphthylene	**11200** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
Acenaphthene	**88500** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
Dibenzofuran	**3720** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
Fluorene	**51100** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
C1-Fluorenes	**28200** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
C2-Fluorenes	**18900** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
C3-Fluorenes	**7130** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
Dibenzothiophene	**20700** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
C1-Dibenzothiophenes	**19800** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
C2-Dibenzothiophenes	**11100** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
C3-Dibenzothiophenes	**4340** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
C4-Dibenzothiophenes	**1490** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
Phenanthrene	**736000** (1510)	755	8270 Mod		200	03/20/20 19:29	F0C0011	FC01601
Anthracene	**330000** (1510)	755	8270 Mod		200	03/20/20 19:29	F0C0011	FC01601
C1-Phenanthrenes/Anthracenes	**156000** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
C2-Phenanthrenes/Anthracenes	**42500** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
C3-Phenanthrenes/Anthracenes	**11100** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
C4-Phenanthrenes/Anthracenes	**3580** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
Retene	**941** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
Benzo(b)naphtho(2,1-d)thiophene	**19000** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
C0-Benzonaphthothiophenes	**33500** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
C1-Benzonaphthothiophenes	**10600** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
C2-Benzonaphthothiophenes	**4270** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
C3-Benzonaphthothiophenes	**5590** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS769-S1
Date Sampled: 03/11/20 09:21
Percent Solids: 50
Initial Volume: 5.26
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**639** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
Fluoranthene	**1190000** (1510)	755	8270 Mod		200	03/20/20 19:29	F0C0011	FC01601
Pyrene	**1520000** (1510)	755	8270 Mod		200	03/20/20 19:29	F0C0011	FC01601
C1-Fluoranthenes/Pyrenes	**158000** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
C2-Fluoranthenes/Pyrenes	**30000** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
C3-Fluoranthenes/Pyrenes	**8230** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
Benzo(b)fluorene	**23500** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
Benzo(c)fluorene	**8800** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
2-Methylpyrene	**20000** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
4-Methylpyrene	**16000** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
1-Methylpyrene	**19700** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
Benz(a)anthracene	**469000** (1510)	755	8270 Mod		200	03/20/20 19:29	F0C0011	FC01601
Chrysene/triphenylene	**469000** (1510)	755	8270 Mod		200	03/20/20 19:29	F0C0011	FC01601
C1-Benzo(a)anthracenes/Chrysenes	**52900** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
C2-Benzo(a)anthracenes/Chrysenes	**15100** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
C3-Benzo(a)anthracenes/Chrysenes	**4100** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
C4-Benzo(a)anthracenes/Chrysenes	**2310** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
Benzo(b)fluoranthene	**110000** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
Benzo(j/k)fluoranthene	**145000** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
Benzo(e)pyrene	**118000** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
Benzo(a)pyrene	**496000** (1510)	755	8270 Mod		200	03/20/20 19:29	F0C0011	FC01601
Perylene	**41700** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
Indeno(1,2,3-cd)pyrene	**95400** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
Dibenzo(a,h)anthracene	**15000** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
Benzo(g,h,i)perylene	**76900** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
Coronene	**14300** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
Tetramethyl lead	ND (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
Trimethylethyl lead	ND (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
Dimethyldiethyl lead	ND (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
Methyltriethyl lead	ND (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
Tetraethyl lead	ND (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
2,6,10-trimethyldodecane (1380)	**1850** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS769-S1
Date Sampled: 03/11/20 09:21
Percent Solids: 50
Initial Volume: 5.26
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**3940** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
2,6,10-trimethylpentadecane (1650)	**6490** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
C-17	**1300** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
Pristane	**14300** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
C-18	**1360** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
Phytane	**12500** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
Carbazole	**177** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
2,6-Dimethylnaphthalene	**11400** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
2,3,5-Trimethylnaphthene	**2230** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
4-Methyldibenzothiophene	**8980** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
2/3-Methyldibenzothiophene	**7150** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
1-Methyldibenzothiophene	**1580** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
3-Methylphenanthrene	**37000** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
2-Methylphenanthrene	**43500** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
2-Methylanthracene	**16400** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
4/9-Methylphenanthrene	**32800** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601
1-Methylphenanthrene	**26100** (75.5)	37.7	8270 Mod		10	03/22/20 16:50	F0C0011	FC01601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*100 %*		*50-120*
Surrogate: Naphthalene-d8	*95 %*		*50-120*
Surrogate: Phenanthrene-d10	*63 %*		*50-120*
Surrogate: Perylene-d12	*93 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS769-S1
Date Sampled: 03/11/20 09:21
Percent Solids: N/A

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**80900** (95.2)		TOC-LK		1	CCP	03/23/20 16:16	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS770-S2
Date Sampled: 03/11/20 10:03
Percent Solids: 71
Initial Volume: 5.23
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C1-Benzene	**J 2.91** (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C2-Benzenes	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C3-Benzenes	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C4-Benzenes	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C5-Benzenes	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
Methylcyclohexane	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
Toluene	**J 3.60** (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
Ethylbenzene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
m,p-Xylene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
Styrene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
o-Xylene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
Isopropylbenzene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
n-Propylbenzene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
1,3,5-Trimethylbenzene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
1,2,3-Trimethylbenzene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
1,2,4-Trimethylbenzene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
t-Butylbenzene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
sec-Butylbenzene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
p-Isopropyltoluene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
n-Butylbenzene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
trans-Decalin	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
cis-Decalin	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C1-Decalins	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C2-Decalins	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C3-Decalins	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C4-Decalins	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
Benzo(b)thiophene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C1-Benzo(b)thiophenes	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C2-Benzo(b)thiophenes	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C3-Benzo(b)thiophenes	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C4-Benzo(b)thiophenes	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS770-S2
Date Sampled: 03/11/20 10:03
Percent Solids: 71
Initial Volume: 5.23
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
2-Methylnaphthalene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
1-Methylnaphthalene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C1-Naphthalenes	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C2-Naphthalenes	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C3-Naphthalenes	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C4-Naphthalenes	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
Biphenyl	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
Acenaphthylene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
Acenaphthene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
Dibenzofuran	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
Fluorene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C1-Fluorenes	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C2-Fluorenes	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C3-Fluorenes	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
Dibenzothiophene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C1-Dibenzothiophenes	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C2-Dibenzothiophenes	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C3-Dibenzothiophenes	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C4-Dibenzothiophenes	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
Phenanthrene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
Anthracene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C1-Phenanthrenes/Anthracenes	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C2-Phenanthrenes/Anthracenes	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C3-Phenanthrenes/Anthracenes	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C4-Phenanthrenes/Anthracenes	**J 2.80** (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
Retene	**14.4** (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
Benzo(b)naphtho(2,1-d)thiophene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C0-Benzonaphthothiophenes	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C1-Benzonaphthothiophenes	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C2-Benzonaphthothiophenes	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C3-Benzonaphthothiophenes	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS770-S2
Date Sampled: 03/11/20 10:03
Percent Solids: 71
Initial Volume: 5.23
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
Fluoranthene	**J 3.34** (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
Pyrene	**J 4.00** (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C1-Fluoranthenes/Pyrenes	**J 2.86** (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C2-Fluoranthenes/Pyrenes	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C3-Fluoranthenes/Pyrenes	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
Benzo(b)fluorene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
Benzo(c)fluorene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
2-Methylpyrene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
4-Methylpyrene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
1-Methylpyrene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
Benz(a)anthracene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
Chrysene/triphenylene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C1-Benzo(a)anthracenes/Chrysenes	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C2-Benzo(a)anthracenes/Chrysenes	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C3-Benzo(a)anthracenes/Chrysenes	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C4-Benzo(a)anthracenes/Chrysenes	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
Benzo(b)fluoranthene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
Benzo(j/k)fluoranthene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
Benzo(e)pyrene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
Benzo(a)pyrene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
Perylene	**596** (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
Indeno(1,2,3-cd)pyrene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
Dibenzo(a,h)anthracene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
Benzo(g,h,i)perylene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
Coronene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
Tetramethyl lead	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
Trimethylethyl lead	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
Dimethyldiethyl lead	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
Methyltriethyl lead	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
Tetraethyl lead	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
2,6,10-trimethyldodecane (1380)	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS770-S2
Date Sampled: 03/11/20 10:03
Percent Solids: 71
Initial Volume: 5.23
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
2,6,10-trimethylpentadecane (1650)	**B 12.6** (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C-17	**B 69.3** (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
Pristane	**B 35.0** (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
C-18	**B 38.5** (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
Phytane	**B 44.6** (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
Carbazole	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
2,6-Dimethylnaphthalene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
2,3,5-Trimethylnaphthene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
4-Methyldibenzothiophene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
2/3-Methyldibenzothiophene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
1-Methyldibenzothiophene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
3-Methylphenanthrene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
2-Methylphenanthrene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
2-Methylanthracene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
4/9-Methylphenanthrene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601
1-Methylphenanthrene	ND (5.39)	2.69	8270 Mod		1	03/20/20 20:53	F0C0011	FC01601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	%		*50-120*
Surrogate: Naphthalene-d8	%		*50-120*
Surrogate: Phenanthrene-d10	%		*50-120*
Surrogate: Perylene-d12	%		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS770-S2
Date Sampled: 03/11/20 10:03
Percent Solids: N/A

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**15300** (93.7)		TOC-LK		1	CCP	03/23/20 17:22	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS770-S2
Date Sampled: 03/11/20 10:03
Percent Solids: 71
Initial Volume: 5.24
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-03RE1
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/31/20 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C1-Benzene	**J 3.82** (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C2-Benzenes	**J 4.77** (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C3-Benzenes	**J 3.14** (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C4-Benzenes	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C5-Benzenes	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Methylcyclohexane	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Toluene	**J 4.71** (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Ethylbenzene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
m,p-Xylene	**J 3.58** (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Styrene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
o-Xylene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Isopropylbenzene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
n-Propylbenzene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
1,3,5-Trimethylbenzene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
1,2,3-Trimethylbenzene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
1,2,4-Trimethylbenzene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
t-Butylbenzene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
sec-Butylbenzene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
p-Isopropyltoluene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
n-Butylbenzene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
trans-Decalin	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
cis-Decalin	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C1-Decalins	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C2-Decalins	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C3-Decalins	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C4-Decalins	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Benzo(b)thiophene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C1-Benzo(b)thiophenes	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C2-Benzo(b)thiophenes	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C3-Benzo(b)thiophenes	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C4-Benzo(b)thiophenes	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS770-S2
Date Sampled: 03/11/20 10:03
Percent Solids: 71
Initial Volume: 5.24
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-03RE1
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/31/20 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
2-Methylnaphthalene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
1-Methylnaphthalene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C1-Naphthalenes	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C2-Naphthalenes	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C3-Naphthalenes	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C4-Naphthalenes	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Biphenyl	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Acenaphthylene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Acenaphthene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Dibenzofuran	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Fluorene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C1-Fluorenes	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C2-Fluorenes	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C3-Fluorenes	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Dibenzothiophene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C1-Dibenzothiophenes	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C2-Dibenzothiophenes	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C3-Dibenzothiophenes	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C4-Dibenzothiophenes	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Phenanthrene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Anthracene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C1-Phenanthrenes/Anthracenes	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C2-Phenanthrenes/Anthracenes	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C3-Phenanthrenes/Anthracenes	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C4-Phenanthrenes/Anthracenes	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Retene	**J 3.76** (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Benzo(b)naphtho(2,1-d)thiophene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C0-Benzonaphthothiophenes	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C1-Benzonaphthothiophenes	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C2-Benzonaphthothiophenes	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C3-Benzonaphthothiophenes	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS770-S2
Date Sampled: 03/11/20 10:03
Percent Solids: 71
Initial Volume: 5.24
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-03RE1
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/31/20 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Fluoranthene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Pyrene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C1-Fluoranthenes/Pyrenes	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C2-Fluoranthenes/Pyrenes	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C3-Fluoranthenes/Pyrenes	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Benzo(b)fluorene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Benzo(c)fluorene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
2-Methylpyrene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
4-Methylpyrene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
1-Methylpyrene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Benz(a)anthracene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Chrysene/triphenylene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C1-Benzo(a)anthracenes/Chrysenes	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C2-Benzo(a)anthracenes/Chrysenes	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C3-Benzo(a)anthracenes/Chrysenes	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C4-Benzo(a)anthracenes/Chrysenes	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Benzo(b)fluoranthene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Benzo(j/k)fluoranthene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Benzo(e)pyrene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Benzo(a)pyrene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Perylene	**383** (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Indeno(1,2,3-cd)pyrene	**J 3.99** (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Dibenzo(a,h)anthracene	**J 3.47** (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Benzo(g,h,i)perylene	**7.69** (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Coronene	**B 45.3** (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Tetramethyl lead	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Trimethylethyl lead	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Dimethyldiethyl lead	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Methyltriethyl lead	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Tetraethyl lead	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Total Organic Lead	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS770-S2
Date Sampled: 03/11/20 10:03
Percent Solids: 71
Initial Volume: 5.24
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-03RE1
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/31/20 9:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyldodecane (1380)	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
2,6,10-trimethyltridecane (1470)	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
2,6,10-trimethylpentadecane (1650)	**J 3.44** (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C-17	**B 21.1** (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Pristane	**B 11.0** (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
C-18	**B 10.0** (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Phytane	**B 15.3** (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
Carbazole	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
2,6-Dimethylnaphthalene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
2,3,5-Trimethylnaphthene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
4-Methyldibenzothiophene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
2/3-Methyldibenzothiophene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
1-Methyldibenzothiophene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
3-Methylphenanthrene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
2-Methylphenanthrene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
2-Methylanthracene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
4/9-Methylphenanthrene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101
1-Methylphenanthrene	ND (5.38)	2.69	8270 Mod		1	03/31/20 17:22	F0C0016	FC03101

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*77 %*		*50-120*
Surrogate: Naphthalene-d8	*75 %*		*50-120*
Surrogate: Phenanthrene-d10	*69 %*		*50-120*
Surrogate: Perylene-d12	*55 %*		*50-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS774-S2
Date Sampled: 03/11/20 10:57
Percent Solids: 62
Initial Volume: 2.61
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C1-Benzene	**179** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C2-Benzenes	**43.9** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C3-Benzenes	**47.6** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C4-Benzenes	**121** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C5-Benzenes	**104** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
Methylcyclohexane	**24.0** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
Toluene	**214** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
Ethylbenzene	**J 11.1** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
m,p-Xylene	**43.5** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
Styrene	**J 7.28** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
o-Xylene	**16.1** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
Isopropylbenzene	ND (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
n-Propylbenzene	ND (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
1,3,5-Trimethylbenzene	**J 8.03** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
1,2,3-Trimethylbenzene	**12.6** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
1,2,4-Trimethylbenzene	**22.1** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
t-Butylbenzene	ND (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
sec-Butylbenzene	ND (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
p-Isopropyltoluene	**J 8.92** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
n-Butylbenzene	ND (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
trans-Decalin	**441** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
cis-Decalin	**56.1** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C1-Decalins	**522** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C2-Decalins	**233** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C3-Decalins	**151** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C4-Decalins	**259** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
Benzo(b)thiophene	**J 6.70** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C1-Benzo(b)thiophenes	**19.0** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C2-Benzo(b)thiophenes	**38.3** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C3-Benzo(b)thiophenes	**64.1** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C4-Benzo(b)thiophenes	**48.0** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS774-S2
Date Sampled: 03/11/20 10:57
Percent Solids: 62
Initial Volume: 2.61
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**134** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
2-Methylnaphthalene	**88.2** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
1-Methylnaphthalene	**48.6** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C1-Naphthalenes	**85.6** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C2-Naphthalenes	**250** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C3-Naphthalenes	**402** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C4-Naphthalenes	**319** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
Biphenyl	**23.4** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
Acenaphthylene	**48.5** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
Acenaphthene	**123** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
Dibenzofuran	**43.1** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
Fluorene	**155** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C1-Fluorenes	**130** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C2-Fluorenes	**232** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C3-Fluorenes	**220** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
Dibenzothiophene	**92.5** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C1-Dibenzothiophenes	**180** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C2-Dibenzothiophenes	**278** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C3-Dibenzothiophenes	**241** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C4-Dibenzothiophenes	**133** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
Phenanthrene	**987** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
Anthracene	**271** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C1-Phenanthrenes/Anthracenes	**796** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C2-Phenanthrenes/Anthracenes	**515** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C3-Phenanthrenes/Anthracenes	**355** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C4-Phenanthrenes/Anthracenes	**184** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
Retene	**51.9** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
Benzo(b)naphtho(2,1-d)thiophene	**132** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C0-Benzonaphthothiophenes	**260** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C1-Benzonaphthothiophenes	**195** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C2-Benzonaphthothiophenes	**184** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C3-Benzonaphthothiophenes	**137** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS774-S2
Date Sampled: 03/11/20 10:57
Percent Solids: 62
Initial Volume: 2.61
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**68.4** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
Fluoranthene	**1530** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
Pyrene	**1700** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C1-Fluoranthenes/Pyrenes	**1110** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C2-Fluoranthenes/Pyrenes	**541** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C3-Fluoranthenes/Pyrenes	**279** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
Benzo(b)fluorene	**146** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
Benzo(c)fluorene	**51.9** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
2-Methylpyrene	**146** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
4-Methylpyrene	**134** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
1-Methylpyrene	**107** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
Benz(a)anthracene	**925** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
Chrysene/triphenylene	**957** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C1-Benzo(a)anthracenes/Chrysenes	**684** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C2-Benzo(a)anthracenes/Chrysenes	**402** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C3-Benzo(a)anthracenes/Chrysenes	**228** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C4-Benzo(a)anthracenes/Chrysenes	**89.1** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
Benzo(b)fluoranthene	**662** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
Benzo(j/k)fluoranthene	**782** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
Benzo(e)pyrene	**601** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
Benzo(a)pyrene	**971** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
Perylene	**288** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
Indeno(1,2,3-cd)pyrene	**680** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
Dibenzo(a,h)anthracene	**152** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
Benzo(g,h,i)perylene	**548** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
Coronene	**132** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
Tetramethyl lead	ND (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
Trimethylethyl lead	ND (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
Dimethyldiethyl lead	ND (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
Methyltriethyl lead	ND (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
Tetraethyl lead	ND (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
2,6,10-trimethyldodecane (1380)	**334** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS774-S2
Date Sampled: 03/11/20 10:57
Percent Solids: 62
Initial Volume: 2.61
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**543** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
2,6,10-trimethylpentadecane (1650)	**485** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C-17	**266** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
Pristane	**1330** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
C-18	**217** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
Phytane	**1050** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
Carbazole	**37.9** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
2,6-Dimethylnaphthalene	**66.5** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
2,3,5-Trimethylnaphthene	**25.3** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
4-Methyldibenzothiophene	**81.3** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
2/3-Methyldibenzothiophene	**57.5** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
1-Methyldibenzothiophene	**22.2** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
3-Methylphenanthrene	**176** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
2-Methylphenanthrene	**191** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
2-Methylanthracene	**92.3** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
4/9-Methylphenanthrene	**193** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601
1-Methylphenanthrene	**135** (12.4)	6.18	8270 Mod		1	03/20/20 22:16	F0C0011	FC01601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*76 %*		*50-120*
Surrogate: Naphthalene-d8	*81 %*		*50-120*
Surrogate: Phenanthrene-d10	*81 %*		*50-120*
Surrogate: Perylene-d12	*58 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS774-S2
Date Sampled: 03/11/20 10:57
Percent Solids: N/A

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-04
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**32100** (93.2)		TOC-LK		1	CCP	03/23/20 17:39	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS774-S3
Date Sampled: 03/11/20 11:02
Percent Solids: 48
Initial Volume: 5.9
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**80.0** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C1-Benzene	**1860** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C2-Benzenes	**218** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C3-Benzenes	**478** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C4-Benzenes	**1600** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C5-Benzenes	**1530** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
Methylcyclohexane	**60.0** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
Toluene	**2240** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
Ethylbenzene	**101** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
m,p-Xylene	**183** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
Styrene	**137** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
o-Xylene	**65.7** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
Isopropylbenzene	**J 30.7** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
n-Propylbenzene	**J 26.6** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
1,3,5-Trimethylbenzene	**121** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
1,2,3-Trimethylbenzene	**129** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
1,2,4-Trimethylbenzene	**259** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
t-Butylbenzene	ND (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
sec-Butylbenzene	ND (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
p-Isopropyltoluene	**85.4** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
n-Butylbenzene	**59.9** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
trans-Decalin	**153** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
cis-Decalin	**43.8** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C1-Decalins	**553** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C2-Decalins	**1060** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C3-Decalins	**982** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C4-Decalins	**1670** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
Benzo(b)thiophene	**215** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C1-Benzo(b)thiophenes	**525** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C2-Benzo(b)thiophenes	**2290** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C3-Benzo(b)thiophenes	**2690** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C4-Benzo(b)thiophenes	**1150** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS774-S3
Date Sampled: 03/11/20 11:02
Percent Solids: 48
Initial Volume: 5.9
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**6030** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
2-Methylnaphthalene	**2180** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
1-Methylnaphthalene	**18400** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C1-Naphthalenes	**12000** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C2-Naphthalenes	**43700** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C3-Naphthalenes	**31800** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C4-Naphthalenes	**12200** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
Biphenyl	**1730** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
Acenaphthylene	**2790** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
Acenaphthene	**38100** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
Dibenzofuran	**2330** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
Fluorene	**26600** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C1-Fluorenes	**5880** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C2-Fluorenes	**16500** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C3-Fluorenes	**6760** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
Dibenzothiophene	**10600** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C1-Dibenzothiophenes	**14500** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C2-Dibenzothiophenes	**11600** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C3-Dibenzothiophenes	**5910** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C4-Dibenzothiophenes	**2210** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
Phenanthrene	**160000** (701)	351	8270 Mod		100	03/20/20 23:40	F0C0011	FC01601
Anthracene	**45100** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C1-Phenanthrenes/Anthracenes	**92600** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C2-Phenanthrenes/Anthracenes	**41500** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C3-Phenanthrenes/Anthracenes	**14200** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C4-Phenanthrenes/Anthracenes	**4860** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
Retene	**1090** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
Benzo(b)naphtho(2,1-d)thiophene	**6270** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C0-Benzonaphthothiophenes	**10900** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C1-Benzonaphthothiophenes	**7890** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C2-Benzonaphthothiophenes	**4310** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C3-Benzonaphthothiophenes	**2320** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS774-S3
Date Sampled: 03/11/20 11:02
Percent Solids: 48
Initial Volume: 5.9
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**559** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
Fluoranthene	**109000** (701)	351	8270 Mod		100	03/20/20 23:40	F0C0011	FC01601
Pyrene	**151000** (701)	351	8270 Mod		100	03/20/20 23:40	F0C0011	FC01601
C1-Fluoranthenes/Pyrenes	**66000** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C2-Fluoranthenes/Pyrenes	**24300** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C3-Fluoranthenes/Pyrenes	**9940** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
Benzo(b)fluorene	**6560** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
Benzo(c)fluorene	**3050** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
2-Methylpyrene	**8990** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
4-Methylpyrene	**7970** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
1-Methylpyrene	**8400** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
Benz(a)anthracene	**42300** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
Chrysene/triphenylene	**40100** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C1-Benzo(a)anthracenes/Chrysenes	**29200** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C2-Benzo(a)anthracenes/Chrysenes	**13300** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C3-Benzo(a)anthracenes/Chrysenes	**4900** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C4-Benzo(a)anthracenes/Chrysenes	**1670** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
Benzo(b)fluoranthene	**19500** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
Benzo(j/k)fluoranthene	**25400** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
Benzo(e)pyrene	**22700** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
Benzo(a)pyrene	**40100** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
Perylene	**6680** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
Indeno(1,2,3-cd)pyrene	**22200** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
Dibenzo(a,h)anthracene	**4340** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
Benzo(g,h,i)perylene	**19500** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
Coronene	**4310** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
Tetramethyl lead	ND (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
Trimethylethyl lead	ND (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
Dimethyldiethyl lead	ND (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
Methyltriethyl lead	ND (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
Tetraethyl lead	ND (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
2,6,10-trimethyldodecane (1380)	**2280** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS774-S3
Date Sampled: 03/11/20 11:02
Percent Solids: 48
Initial Volume: 5.9
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**4180** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
2,6,10-trimethylpentadecane (1650)	**5310** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C-17	**1170** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
Pristane	**9990** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
C-18	**1110** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
Phytane	**8370** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
Carbazole	**153** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
2,6-Dimethylnaphthalene	**8910** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
2,3,5-Trimethylnaphthene	**2300** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
4-Methyldibenzothiophene	**6290** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
2/3-Methyldibenzothiophene	**4910** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
1-Methyldibenzothiophene	**1450** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
3-Methylphenanthrene	**19900** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
2-Methylphenanthrene	**22600** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
2-Methylanthracene	**12100** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
4/9-Methylphenanthrene	**22500** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601
1-Methylphenanthrene	**15200** (35.1)	17.5	8270 Mod		5	03/22/20 10:02	F0C0011	FC01601

	%Recovery	*Qualifier*	*Limits*
Surrogate: Toluene-D8	*73 %*		*50-120*
Surrogate: Naphthalene-d8	*73 %*		*50-120*
Surrogate: Phenanthrene-d10	*63 %*		*50-120*
Surrogate: Perylene-d12	*84 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS774-S3
Date Sampled: 03/11/20 11:02
Percent Solids: N/A

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-05
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**86200** (94.7)		TOC-LK		1	CCP	03/23/20 17:55	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS775-S2
Date Sampled: 03/11/20 12:50
Percent Solids: 48
Initial Volume: 5.16
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/23/20 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C1-Benzene	**279** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C2-Benzenes	**109** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C3-Benzenes	**121** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C4-Benzenes	**185** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C5-Benzenes	**173** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
Methylcyclohexane	ND (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
Toluene	**327** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
Ethylbenzene	J **30.6** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
m,p-Xylene	**111** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
Styrene	J **27.9** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
o-Xylene	J **29.6** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
Isopropylbenzene	ND (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
n-Propylbenzene	ND (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
1,3,5-Trimethylbenzene	J **28.8** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
1,2,3-Trimethylbenzene	ND (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
1,2,4-Trimethylbenzene	**60.3** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
t-Butylbenzene	ND (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
sec-Butylbenzene	ND (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
p-Isopropyltoluene	ND (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
n-Butylbenzene	ND (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
trans-Decalin	**445** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
cis-Decalin	**58.1** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C1-Decalins	**763** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C2-Decalins	**621** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C3-Decalins	**445** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C4-Decalins	**710** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
Benzo(b)thiophene	J **26.8** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C1-Benzo(b)thiophenes	**53.9** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C2-Benzo(b)thiophenes	**187** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C3-Benzo(b)thiophenes	**227** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C4-Benzo(b)thiophenes	**170** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS775-S2
Date Sampled: 03/11/20 12:50
Percent Solids: 48
Initial Volume: 5.16
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/23/20 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**542** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
2-Methylnaphthalene	**323** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
1-Methylnaphthalene	**354** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C1-Naphthalenes	**415** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C2-Naphthalenes	**1640** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C3-Naphthalenes	**1650** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C4-Naphthalenes	**1000** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
Biphenyl	**131** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
Acenaphthylene	**617** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
Acenaphthene	**5430** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
Dibenzofuran	**223** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
Fluorene	**1280** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C1-Fluorenes	**1230** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C2-Fluorenes	**1190** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C3-Fluorenes	**1130** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
Dibenzothiophene	**1280** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C1-Dibenzothiophenes	**1770** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C2-Dibenzothiophenes	**2060** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C3-Dibenzothiophenes	**1730** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C4-Dibenzothiophenes	**1020** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
Phenanthrene	**15300** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
Anthracene	**3700** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C1-Phenanthrenes/Anthracenes	**8360** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C2-Phenanthrenes/Anthracenes	**4180** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C3-Phenanthrenes/Anthracenes	**2180** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C4-Phenanthrenes/Anthracenes	**1170** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
Retene	**359** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
Benzo(b)naphtho(2,1-d)thiophene	**1250** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C0-Benzonaphthothiophenes	**2350** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C1-Benzonaphthothiophenes	**1580** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C2-Benzonaphthothiophenes	**1380** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C3-Benzonaphthothiophenes	**1110** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS775-S2
Date Sampled: 03/11/20 12:50
Percent Solids: 48
Initial Volume: 5.16
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/23/20 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**516** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
Fluoranthene	**17200** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
Pyrene	**21300** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C1-Fluoranthenes/Pyrenes	**8700** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C2-Fluoranthenes/Pyrenes	**3430** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C3-Fluoranthenes/Pyrenes	**1760** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
Benzo(b)fluorene	**986** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
Benzo(c)fluorene	**464** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
2-Methylpyrene	**1240** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
4-Methylpyrene	**1100** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
1-Methylpyrene	**1020** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
Benz(a)anthracene	**7990** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
Chrysene/triphenylene	**7720** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C1-Benzo(a)anthracenes/Chrysenes	**4150** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C2-Benzo(a)anthracenes/Chrysenes	**2300** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C3-Benzo(a)anthracenes/Chrysenes	**1370** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C4-Benzo(a)anthracenes/Chrysenes	**694** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
Benzo(b)fluoranthene	**5090** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
Benzo(j/k)fluoranthene	**6410** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
Benzo(e)pyrene	**5490** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
Benzo(a)pyrene	**9140** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
Perylene	**1760** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
Indeno(1,2,3-cd)pyrene	**6130** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
Dibenzo(a,h)anthracene	**1120** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
Benzo(g,h,i)perylene	**5400** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
Coronene	**1360** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
Tetramethyl lead	ND (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
Trimethylethyl lead	ND (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
Dimethyldiethyl lead	ND (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
Methyltriethyl lead	ND (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
Tetraethyl lead	ND (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
2,6,10-trimethyldodecane (1380)	**980** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS775-S2
Date Sampled: 03/11/20 12:50
Percent Solids: 48
Initial Volume: 5.16
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/23/20 8:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**1630** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
2,6,10-trimethylpentadecane (1650)	**1750** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C-17	**304** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
Pristane	**3430** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
C-18	**299** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
Phytane	**3250** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
Carbazole	**264** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
2,6-Dimethylnaphthalene	**146** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
2,3,5-Trimethylnaphthene	**114** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
4-Methyldibenzothiophene	**684** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
2/3-Methyldibenzothiophene	**588** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
1-Methyldibenzothiophene	**234** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
3-Methylphenanthrene	**1920** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
2-Methylphenanthrene	**2250** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
2-Methylanthracene	**800** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
4/9-Methylphenanthrene	**1970** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301
1-Methylphenanthrene	**1260** (40.0)	20.0	8270 Mod		5	03/24/20 10:31	F0C0013	FC02301

	%Recovery	*Qualifier*	*Limits*
Surrogate: Toluene-D8	*72 %*		*50-120*
Surrogate: Naphthalene-d8	*72 %*		*50-120*
Surrogate: Phenanthrene-d10	*76 %*		*50-120*
Surrogate: Perylene-d12	*72 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS775-S2
Date Sampled: 03/11/20 12:50
Percent Solids: N/A

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-06
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**170000** (94.4)		TOC-LK		1	CCP	03/23/20 18:12	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS775-S3
Date Sampled: 03/11/20 12:56
Percent Solids: 63
Initial Volume: 5.75
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**8.86** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C1-Benzene	**514** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C2-Benzenes	**85.1** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C3-Benzenes	**106** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C4-Benzenes	**74.4** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C5-Benzenes	**59.0** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
Methylcyclohexane	**29.3** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
Toluene	**610** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
Ethylbenzene	**38.5** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
m,p-Xylene	**89.8** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
Styrene	**18.7** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
o-Xylene	**20.5** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
Isopropylbenzene	J **5.03** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
n-Propylbenzene	**13.2** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
1,3,5-Trimethylbenzene	**19.8** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
1,2,3-Trimethylbenzene	**9.43** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
1,2,4-Trimethylbenzene	**51.9** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
t-Butylbenzene	ND (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
sec-Butylbenzene	ND (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
p-Isopropyltoluene	**17.5** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
n-Butylbenzene	ND (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
trans-Decalin	**20.9** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
cis-Decalin	**8.18** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C1-Decalins	**84.6** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C2-Decalins	**256** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C3-Decalins	**278** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C4-Decalins	**584** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
Benzo(b)thiophene	**21.7** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C1-Benzo(b)thiophenes	**25.3** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C2-Benzo(b)thiophenes	**58.8** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C3-Benzo(b)thiophenes	**88.4** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C4-Benzo(b)thiophenes	**60.5** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS775-S3
Date Sampled: 03/11/20 12:56
Percent Solids: 63
Initial Volume: 5.75
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**818** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
2-Methylnaphthalene	**838** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
1-Methylnaphthalene	**390** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C1-Naphthalenes	**753** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C2-Naphthalenes	**1470** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C3-Naphthalenes	**1980** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C4-Naphthalenes	**1280** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
Biphenyl	**203** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
Acenaphthylene	**371** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
Acenaphthene	**540** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
Dibenzofuran	**129** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
Fluorene	**676** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C1-Fluorenes	**1300** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C2-Fluorenes	**1740** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C3-Fluorenes	**1250** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
Dibenzothiophene	**358** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C1-Dibenzothiophenes	**986** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C2-Dibenzothiophenes	**1310** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C3-Dibenzothiophenes	**860** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C4-Dibenzothiophenes	**358** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
Phenanthrene	**5710** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
Anthracene	**2040** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C1-Phenanthrenes/Anthracenes	**9180** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C2-Phenanthrenes/Anthracenes	**6580** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C3-Phenanthrenes/Anthracenes	**2900** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C4-Phenanthrenes/Anthracenes	**1140** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
Retene	**341** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
Benzo(b)naphtho(2,1-d)thiophene	**651** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C0-Benzonaphthothiophenes	**1130** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C1-Benzonaphthothiophenes	**1060** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C2-Benzonaphthothiophenes	**721** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C3-Benzonaphthothiophenes	**373** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS775-S3
Date Sampled: 03/11/20 12:56
Percent Solids: 63
Initial Volume: 5.75
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**105** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
Fluoranthene	**5470** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
Pyrene	**7700** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C1-Fluoranthenes/Pyrenes	**8300** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C2-Fluoranthenes/Pyrenes	**4190** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C3-Fluoranthenes/Pyrenes	**1850** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
Benzo(b)fluorene	**754** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
Benzo(c)fluorene	**426** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
2-Methylpyrene	**1200** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
4-Methylpyrene	**1090** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
1-Methylpyrene	**973** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
Benz(a)anthracene	**4590** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
Chrysene/triphenylene	**4730** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C1-Benzo(a)anthracenes/Chrysenes	**5000** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C2-Benzo(a)anthracenes/Chrysenes	**2870** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C3-Benzo(a)anthracenes/Chrysenes	**1230** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C4-Benzo(a)anthracenes/Chrysenes	**433** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
Benzo(b)fluoranthene	**2220** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
Benzo(j/k)fluoranthene	**2540** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
Benzo(e)pyrene	**2400** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
Benzo(a)pyrene	**3720** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
Perylene	**779** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
Indeno(1,2,3-cd)pyrene	**2240** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
Dibenzo(a,h)anthracene	**589** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
Benzo(g,h,i)perylene	**1920** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
Coronene	**426** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
Tetramethyl lead	ND (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
Trimethylethyl lead	ND (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
Dimethyldiethyl lead	ND (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
Methyltriethyl lead	ND (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
Tetraethyl lead	ND (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
2,6,10-trimethyldodecane (1380)	**288** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS775-S3
Date Sampled: 03/11/20 12:56
Percent Solids: 63
Initial Volume: 5.75
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**517** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
2,6,10-trimethylpentadecane (1650)	**999** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C-17	**431** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
Pristane	**2000** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
C-18	**416** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
Phytane	**2060** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
Carbazole	**49.2** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
2,6-Dimethylnaphthalene	**448** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
2,3,5-Trimethylnaphthene	**135** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
4-Methyldibenzothiophene	**434** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
2/3-Methyldibenzothiophene	**327** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
1-Methyldibenzothiophene	**83.4** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
3-Methylphenanthrene	**2000** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
2-Methylphenanthrene	**2340** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
2-Methylanthracene	**1040** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
4/9-Methylphenanthrene	**2330** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601
1-Methylphenanthrene	**1410** (5.56)	2.78	8270 Mod		1	03/21/20 21:36	F0C0011	FC01601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*78 %*		*50-120*
Surrogate: Naphthalene-d8	*81 %*		*50-120*
Surrogate: Phenanthrene-d10	*73 %*		*50-120*
Surrogate: Perylene-d12	*77 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS775-S3
Date Sampled: 03/11/20 12:56
Percent Solids: N/A

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-07
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**37400** (92.6)		TOC-LK		1	CCP	03/23/20 18:28	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS776-S1
Date Sampled: 03/11/20 14:01
Percent Solids: 70
Initial Volume: 3
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C1-Benzene	**182** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C2-Benzenes	**24.4** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C3-Benzenes	**31.8** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C4-Benzenes	**150** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C5-Benzenes	**253** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
Methylcyclohexane	**J 5.55** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
Toluene	**216** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
Ethylbenzene	**J 5.25** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
m,p-Xylene	**19.6** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
Styrene	ND (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
o-Xylene	**J 6.48** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
Isopropylbenzene	ND (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
n-Propylbenzene	**J 5.77** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
1,3,5-Trimethylbenzene	**J 5.87** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
1,2,3-Trimethylbenzene	**10.7** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
1,2,4-Trimethylbenzene	**18.3** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
t-Butylbenzene	ND (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
sec-Butylbenzene	ND (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
p-Isopropyltoluene	**J 5.32** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
n-Butylbenzene	**38.7** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
trans-Decalin	**1890** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
cis-Decalin	**247** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C1-Decalins	**2300** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C2-Decalins	**805** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C3-Decalins	**338** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C4-Decalins	**727** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
Benzo(b)thiophene	ND (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C1-Benzo(b)thiophenes	**15.4** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C2-Benzo(b)thiophenes	**40.3** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C3-Benzo(b)thiophenes	**91.5** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C4-Benzo(b)thiophenes	**88.7** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS776-S1
Date Sampled: 03/11/20 14:01
Percent Solids: 70
Initial Volume: 3
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**49.0** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
2-Methylnaphthalene	**48.6** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
1-Methylnaphthalene	**25.3** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C1-Naphthalenes	**46.1** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C2-Naphthalenes	**291** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C3-Naphthalenes	**764** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C4-Naphthalenes	**772** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
Biphenyl	**19.4** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
Acenaphthylene	**51.3** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
Acenaphthene	**75.8** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
Dibenzofuran	**38.5** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
Fluorene	**102** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C1-Fluorenes	**173** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C2-Fluorenes	**400** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C3-Fluorenes	**428** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
Dibenzothiophene	**83.9** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C1-Dibenzothiophenes	**302** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C2-Dibenzothiophenes	**590** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C3-Dibenzothiophenes	**722** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C4-Dibenzothiophenes	**488** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
Phenanthrene	**648** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
Anthracene	**148** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C1-Phenanthrenes/Anthracenes	**747** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C2-Phenanthrenes/Anthracenes	**807** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C3-Phenanthrenes/Anthracenes	**639** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C4-Phenanthrenes/Anthracenes	**369** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
Retene	**96.7** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
Benzo(b)naphtho(2,1-d)thiophene	**123** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C0-Benzonaphthothiophenes	**218** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C1-Benzonaphthothiophenes	**349** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C2-Benzonaphthothiophenes	**555** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C3-Benzonaphthothiophenes	**499** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS776-S1
Date Sampled: 03/11/20 14:01
Percent Solids: 70
Initial Volume: 3
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**263** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
Fluoranthene	**963** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
Pyrene	**1120** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C1-Fluoranthenes/Pyrenes	**661** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C2-Fluoranthenes/Pyrenes	**469** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C3-Fluoranthenes/Pyrenes	**361** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
Benzo(b)fluorene	**73.3** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
Benzo(c)fluorene	**31.7** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
2-Methylpyrene	**94.7** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
4-Methylpyrene	**105** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
1-Methylpyrene	**73.8** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
Benz(a)anthracene	**467** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
Chrysene/triphenylene	**594** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C1-Benzo(a)anthracenes/Chrysenes	**492** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C2-Benzo(a)anthracenes/Chrysenes	**412** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C3-Benzo(a)anthracenes/Chrysenes	**316** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C4-Benzo(a)anthracenes/Chrysenes	**189** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
Benzo(b)fluoranthene	**436** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
Benzo(j/k)fluoranthene	**405** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
Benzo(e)pyrene	**393** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
Benzo(a)pyrene	**501** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
Perylene	**255** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
Indeno(1,2,3-cd)pyrene	**525** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
Dibenzo(a,h)anthracene	**118** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
Benzo(g,h,i)perylene	**463** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
Coronene	**119** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
Tetramethyl lead	ND (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
Trimethylethyl lead	ND (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
Dimethyldiethyl lead	ND (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
Methyltriethyl lead	ND (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
Tetraethyl lead	ND (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
2,6,10-trimethyldodecane (1380)	**1090** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS776-S1
Date Sampled: 03/11/20 14:01
Percent Solids: 70
Initial Volume: 3
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**1840** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
2,6,10-trimethylpentadecane (1650)	**2600** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C-17	**271** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
Pristane	**6870** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
C-18	**281** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
Phytane	**5390** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
Carbazole	**33.1** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
2,6-Dimethylnaphthalene	**80.2** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
2,3,5-Trimethylnaphthene	**55.2** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
4-Methyldibenzothiophene	**140** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
2/3-Methyldibenzothiophene	**100** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
1-Methyldibenzothiophene	**34.6** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
3-Methylphenanthrene	**177** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
2-Methylphenanthrene	**193** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
2-Methylanthracene	**48.6** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
4/9-Methylphenanthrene	**181** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601
1-Methylphenanthrene	**123** (9.50)	4.75	8270 Mod		1	03/21/20 22:59	F0C0011	FC01601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*73 %*		*50-120*
Surrogate: Naphthalene-d8	*82 %*		*50-120*
Surrogate: Phenanthrene-d10	*88 %*		*50-120*
Surrogate: Perylene-d12	*90 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS776-S1
Date Sampled: 03/11/20 14:01
Percent Solids: N/A

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-08
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**19700** (92.7)		TOC-LK		1	CCP	03/23/20 19:18	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS776-S3
Date Sampled: 03/11/20 14:16
Percent Solids: 84
Initial Volume: 5.1
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C1-Benzene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C2-Benzenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C3-Benzenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C4-Benzenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C5-Benzenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
Methylcyclohexane	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
Toluene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
Ethylbenzene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
m,p-Xylene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
Styrene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
o-Xylene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
Isopropylbenzene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
n-Propylbenzene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
1,3,5-Trimethylbenzene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
1,2,3-Trimethylbenzene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
1,2,4-Trimethylbenzene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
t-Butylbenzene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
sec-Butylbenzene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
p-Isopropyltoluene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
n-Butylbenzene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
trans-Decalin	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
cis-Decalin	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C1-Decalins	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C2-Decalins	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C3-Decalins	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C4-Decalins	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
Benzo(b)thiophene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C1-Benzo(b)thiophenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C2-Benzo(b)thiophenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C3-Benzo(b)thiophenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C4-Benzo(b)thiophenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS776-S3
Date Sampled: 03/11/20 14:16
Percent Solids: 84
Initial Volume: 5.1
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
2-Methylnaphthalene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
1-Methylnaphthalene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C1-Naphthalenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C2-Naphthalenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C3-Naphthalenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C4-Naphthalenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
Biphenyl	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
Acenaphthylene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
Acenaphthene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
Dibenzofuran	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
Fluorene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C1-Fluorenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C2-Fluorenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C3-Fluorenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
Dibenzothiophene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C1-Dibenzothiophenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C2-Dibenzothiophenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C3-Dibenzothiophenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C4-Dibenzothiophenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
Phenanthrene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
Anthracene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C1-Phenanthrenes/Anthracenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C2-Phenanthrenes/Anthracenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C3-Phenanthrenes/Anthracenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C4-Phenanthrenes/Anthracenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
Retene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
Benzo(b)naphtho(2,1-d)thiophene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C0-Benzonaphthothiophenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C1-Benzonaphthothiophenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C2-Benzonaphthothiophenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C3-Benzonaphthothiophenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS776-S3
Date Sampled: 03/11/20 14:16
Percent Solids: 84
Initial Volume: 5.1
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
Fluoranthene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
Pyrene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C1-Fluoranthenes/Pyrenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C2-Fluoranthenes/Pyrenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C3-Fluoranthenes/Pyrenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
Benzo(b)fluorene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
Benzo(c)fluorene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
2-Methylpyrene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
4-Methylpyrene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
1-Methylpyrene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
Benz(a)anthracene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
Chrysene/triphenylene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C1-Benzo(a)anthracenes/Chrysenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C2-Benzo(a)anthracenes/Chrysenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C3-Benzo(a)anthracenes/Chrysenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C4-Benzo(a)anthracenes/Chrysenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
Benzo(b)fluoranthene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
Benzo(j/k)fluoranthene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
Benzo(e)pyrene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
Benzo(a)pyrene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
Perylene	**727** (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
Indeno(1,2,3-cd)pyrene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
Dibenzo(a,h)anthracene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
Benzo(g,h,i)perylene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
Coronene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
Tetramethyl lead	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
Trimethylethyl lead	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
Dimethyldiethyl lead	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
Methyltriethyl lead	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
Tetraethyl lead	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
2,6,10-trimethyldodecane (1380)	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS776-S3
Date Sampled: 03/11/20 14:16
Percent Solids: 84
Initial Volume: 5.1
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
2,6,10-trimethylpentadecane (1650)	**B 7.64** (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C-17	**B 27.4** (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
Pristane	**B 21.6** (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
C-18	**B 30.0** (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
Phytane	**B 29.8** (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
Carbazole	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
2,6-Dimethylnaphthalene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
2,3,5-Trimethylnaphthene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
4-Methyldibenzothiophene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
2/3-Methyldibenzothiophene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
1-Methyldibenzothiophene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
3-Methylphenanthrene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
2-Methylphenanthrene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
2-Methylanthracene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
4/9-Methylphenanthrene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601
1-Methylphenanthrene	ND (4.64)	2.32	8270 Mod		1	03/21/20 2:28	F0C0011	FC01601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*80 %*		*50-120*
Surrogate: Naphthalene-d8	*85 %*		*50-120*
Surrogate: Phenanthrene-d10	*90 %*		*50-120*
Surrogate: Perylene-d12	*63 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS776-S3
Date Sampled: 03/11/20 14:16
Percent Solids: N/A

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-09
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**2810** (92.5)		TOC-LK		1	CCP	03/23/20 19:35	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS777-S2
Date Sampled: 03/11/20 14:50
Percent Solids: 55
Initial Volume: 5.2
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
C1-Benzene	**895** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
C2-Benzenes	**369** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
C3-Benzenes	**526** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
C4-Benzenes	**796** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
C5-Benzenes	**830** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
Methylcyclohexane	**31.3** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
Toluene	**1090** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
Ethylbenzene	**262** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
m,p-Xylene	**333** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
Styrene	**77.5** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
o-Xylene	**58.7** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
Isopropylbenzene	**24.2** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
n-Propylbenzene	**63.4** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
1,3,5-Trimethylbenzene	**64.6** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
1,2,3-Trimethylbenzene	**50.3** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
1,2,4-Trimethylbenzene	**235** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
t-Butylbenzene	ND (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
sec-Butylbenzene	**7.83** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
p-Isopropyltoluene	**35.3** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
n-Butylbenzene	**45.5** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
trans-Decalin	**188** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
cis-Decalin	**50.1** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
C1-Decalins	**560** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
C2-Decalins	**1320** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
C3-Decalins	**1490** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
C4-Decalins	**2860** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
Benzo(b)thiophene	**137** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
C1-Benzo(b)thiophenes	**248** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
C2-Benzo(b)thiophenes	**605** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
C3-Benzo(b)thiophenes	**697** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
C4-Benzo(b)thiophenes	**346** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS777-S2
Date Sampled: 03/11/20 14:50
Percent Solids: 55
Initial Volume: 5.2
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**4030** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
2-Methylnaphthalene	**3180** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
1-Methylnaphthalene	**5530** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
C1-Naphthalenes	**5200** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
C2-Naphthalenes	**14300** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
C3-Naphthalenes	**15700** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
C4-Naphthalenes	**7410** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
Biphenyl	**858** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
Acenaphthylene	**1450** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
Acenaphthene	**10500** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
Dibenzofuran	**654** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
Fluorene	**6870** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
C1-Fluorenes	**9120** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
C2-Fluorenes	**9450** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
C3-Fluorenes	**3720** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
Dibenzothiophene	**2240** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
C1-Dibenzothiophenes	**5150** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
C2-Dibenzothiophenes	**4710** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
C3-Dibenzothiophenes	**2400** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
C4-Dibenzothiophenes	**864** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
Phenanthrene	**63300** (139)	69.7	8270 Mod		20	03/21/20 3:53	F0C0011	FC01601
Anthracene	**13700** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
C1-Phenanthrenes/Anthracenes	**46200** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
C2-Phenanthrenes/Anthracenes	**24100** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
C3-Phenanthrenes/Anthracenes	**8580** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
C4-Phenanthrenes/Anthracenes	**2930** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
Retene	**814** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
Benzo(b)naphtho(2,1-d)thiophene	**2280** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
C0-Benzonaphthothiophenes	**4100** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
C1-Benzonaphthothiophenes	**3960** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
C2-Benzonaphthothiophenes	**2290** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
C3-Benzonaphthothiophenes	**1100** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS777-S2
Date Sampled: 03/11/20 14:50
Percent Solids: 55
Initial Volume: 5.2
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**227** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
Fluoranthene	**40800** (139)	69.7	8270 Mod		20	03/21/20 3:53	F0C0011	FC01601
Pyrene	**59900** (139)	69.7	8270 Mod		20	03/21/20 3:53	F0C0011	FC01601
C1-Fluoranthenes/Pyrenes	**35500** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
C2-Fluoranthenes/Pyrenes	**16000** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
C3-Fluoranthenes/Pyrenes	**6390** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
Benzo(b)fluorene	**3390** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
Benzo(c)fluorene	**1980** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
2-Methylpyrene	**4620** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
4-Methylpyrene	**4070** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
1-Methylpyrene	**4390** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
Benz(a)anthracene	**27300** (139)	69.7	8270 Mod		20	03/21/20 3:53	F0C0011	FC01601
Chrysene/triphenylene	**25100** (139)	69.7	8270 Mod		20	03/21/20 3:53	F0C0011	FC01601
C1-Benzo(a)anthracenes/Chrysenes	**19100** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
C2-Benzo(a)anthracenes/Chrysenes	**9710** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
C3-Benzo(a)anthracenes/Chrysenes	**3440** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
C4-Benzo(a)anthracenes/Chrysenes	**1030** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
Benzo(b)fluoranthene	**6710** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
Benzo(j/k)fluoranthene	**8600** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
Benzo(e)pyrene	**7080** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
Benzo(a)pyrene	**13100** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
Perylene	**2190** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
Indeno(1,2,3-cd)pyrene	**5660** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
Dibenzo(a,h)anthracene	**1710** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
Benzo(g,h,i)perylene	**4430** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
Coronene	**830** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
Tetramethyl lead	ND (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
Trimethylethyl lead	ND (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
Dimethyldiethyl lead	ND (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
Methyltriethyl lead	ND (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
Tetraethyl lead	ND (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
2,6,10-trimethyldodecane (1380)	**1310** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS777-S2
Date Sampled: 03/11/20 14:50
Percent Solids: 55
Initial Volume: 5.2
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**1940** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
2,6,10-trimethylpentadecane (1650)	**2330** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
C-17	**404** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
Pristane	**4580** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
C-18	**318** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
Phytane	**3750** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
Carbazole	**73.7** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
2,6-Dimethylnaphthalene	**3480** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
2,3,5-Trimethylnaphthene	**1090** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
4-Methyldibenzothiophene	**2250** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
2/3-Methyldibenzothiophene	**1800** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
1-Methyldibenzothiophene	**432** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
3-Methylphenanthrene	**10300** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
2-Methylphenanthrene	**11300** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
2-Methylanthracene	**6040** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
4/9-Methylphenanthrene	**10800** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601
1-Methylphenanthrene	**7510** (6.97)	3.48	8270 Mod		1	03/22/20 11:23	F0C0011	FC01601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*88 %*		*50-120*
Surrogate: Naphthalene-d8	*94 %*		*50-120*
Surrogate: Phenanthrene-d10	*59 %*		*50-120*
Surrogate: Perylene-d12	*71 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS777-S2
Date Sampled: 03/11/20 14:50
Percent Solids: N/A

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-10
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**80000** (95.5)		TOC-LK		1	CCP	03/23/20 19:51	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS777-S3
Date Sampled: 03/11/20 14:59
Percent Solids: 80
Initial Volume: 5.25
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C1-Benzene	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C2-Benzenes	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C3-Benzenes	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C4-Benzenes	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C5-Benzenes	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
Methylcyclohexane	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
Toluene	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
Ethylbenzene	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
m,p-Xylene	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
Styrene	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
o-Xylene	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
Isopropylbenzene	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
n-Propylbenzene	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
1,3,5-Trimethylbenzene	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
1,2,3-Trimethylbenzene	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
1,2,4-Trimethylbenzene	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
t-Butylbenzene	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
sec-Butylbenzene	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
p-Isopropyltoluene	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
n-Butylbenzene	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
trans-Decalin	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
cis-Decalin	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C1-Decalins	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C2-Decalins	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C3-Decalins	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C4-Decalins	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
Benzo(b)thiophene	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C1-Benzo(b)thiophenes	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C2-Benzo(b)thiophenes	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C3-Benzo(b)thiophenes	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C4-Benzo(b)thiophenes	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS777-S3
Date Sampled: 03/11/20 14:59
Percent Solids: 80
Initial Volume: 5.25
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
2-Methylnaphthalene	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
1-Methylnaphthalene	**J 2.54** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C1-Naphthalenes	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C2-Naphthalenes	**7.14** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C3-Naphthalenes	**6.41** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C4-Naphthalenes	**J 4.25** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
Biphenyl	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
Acenaphthylene	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
Acenaphthene	**8.30** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
Dibenzofuran	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
Fluorene	**4.90** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C1-Fluorenes	**J 3.61** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C2-Fluorenes	**J 4.27** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C3-Fluorenes	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
Dibenzothiophene	**J 3.44** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C1-Dibenzothiophenes	**J 4.28** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C2-Dibenzothiophenes	**J 3.87** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C3-Dibenzothiophenes	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C4-Dibenzothiophenes	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
Phenanthrene	**54.6** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
Anthracene	**10.0** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C1-Phenanthrenes/Anthracenes	**23.4** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C2-Phenanthrenes/Anthracenes	**7.31** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C3-Phenanthrenes/Anthracenes	**J 2.86** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C4-Phenanthrenes/Anthracenes	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
Retene	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
Benzo(b)naphtho(2,1-d)thiophene	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C0-Benzonaphthothiophenes	**J 3.41** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C1-Benzonaphthothiophenes	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C2-Benzonaphthothiophenes	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C3-Benzonaphthothiophenes	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS777-S3
Date Sampled: 03/11/20 14:59
Percent Solids: 80
Initial Volume: 5.25
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
Fluoranthene	**33.8** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
Pyrene	**53.8** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C1-Fluoranthenes/Pyrenes	**16.8** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C2-Fluoranthenes/Pyrenes	**J 4.04** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C3-Fluoranthenes/Pyrenes	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
Benzo(b)fluorene	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
Benzo(c)fluorene	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
2-Methylpyrene	**J 2.38** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
4-Methylpyrene	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
1-Methylpyrene	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
Benz(a)anthracene	**10.2** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
Chrysene/triphenylene	**11.7** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C1-Benzo(a)anthracenes/Chrysenes	**5.01** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C2-Benzo(a)anthracenes/Chrysenes	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C3-Benzo(a)anthracenes/Chrysenes	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C4-Benzo(a)anthracenes/Chrysenes	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
Benzo(b)fluoranthene	**J 4.59** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
Benzo(j/k)fluoranthene	**7.12** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
Benzo(e)pyrene	**7.34** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
Benzo(a)pyrene	**9.71** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
Perylene	**J 2.57** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
Indeno(1,2,3-cd)pyrene	**5.00** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
Dibenzo(a,h)anthracene	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
Benzo(g,h,i)perylene	**6.81** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
Coronene	**J 3.08** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
Tetramethyl lead	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
Trimethylethyl lead	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
Dimethyldiethyl lead	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
Methyltriethyl lead	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
Tetraethyl lead	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
2,6,10-trimethyldodecane (1380)	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS777-S3
Date Sampled: 03/11/20 14:59
Percent Solids: 80
Initial Volume: 5.25
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**J 3.94** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
2,6,10-trimethylpentadecane (1650)	**B 12.9** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C-17	**B 37.3** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
Pristane	**B 31.5** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
C-18	**B 29.1** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
Phytane	**B 38.4** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
Carbazole	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
2,6-Dimethylnaphthalene	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
2,3,5-Trimethylnaphthene	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
4-Methyldibenzothiophene	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
2/3-Methyldibenzothiophene	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
1-Methyldibenzothiophene	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
3-Methylphenanthrene	**5.46** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
2-Methylphenanthrene	**5.82** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
2-Methylanthracene	ND (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
4/9-Methylphenanthrene	**5.29** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601
1-Methylphenanthrene	**J 4.02** (4.76)	2.38	8270 Mod		1	03/21/20 5:16	F0C0011	FC01601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*88 %*		*50-120*
Surrogate: Naphthalene-d8	*87 %*		*50-120*
Surrogate: Phenanthrene-d10	*92 %*		*50-120*
Surrogate: Perylene-d12	*70 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS777-S3
Date Sampled: 03/11/20 14:59
Percent Solids: N/A

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-11
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**762** (95.3)		TOC-LK		1	CCP	03/23/20 23:52	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS778-S2
Date Sampled: 03/11/20 15:36
Percent Solids: 61
Initial Volume: 5.13
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**1980** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
C1-Benzene	**829** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
C2-Benzenes	**245** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
C3-Benzenes	**473** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
C4-Benzenes	**2330** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
C5-Benzenes	**3030** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
Methylcyclohexane	**79.3** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
Toluene	**1020** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
Ethylbenzene	**134** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
m,p-Xylene	**249** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
Styrene	**252** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
o-Xylene	**58.0** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
Isopropylbenzene	J **26.0** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
n-Propylbenzene	**43.1** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
1,3,5-Trimethylbenzene	**84.7** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
1,2,3-Trimethylbenzene	**77.2** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
1,2,4-Trimethylbenzene	**266** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
t-Butylbenzene	ND (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
sec-Butylbenzene	J **18.3** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
p-Isopropyltoluene	**68.5** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
n-Butylbenzene	**77.9** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
trans-Decalin	**273** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
cis-Decalin	**69.4** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
C1-Decalins	**876** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
C2-Decalins	**1590** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
C3-Decalins	**1430** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
C4-Decalins	**2100** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
Benzo(b)thiophene	**335** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
C1-Benzo(b)thiophenes	**1130** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
C2-Benzo(b)thiophenes	**8920** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
C3-Benzo(b)thiophenes	**7140** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
C4-Benzo(b)thiophenes	**1920** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS778-S2
Date Sampled: 03/11/20 15:36
Percent Solids: 61
Initial Volume: 5.13
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**8910** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
2-Methylnaphthalene	**5200** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
1-Methylnaphthalene	**34200** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
C1-Naphthalenes	**23100** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
C2-Naphthalenes	**92400** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
C3-Naphthalenes	**39200** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
C4-Naphthalenes	**9310** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
Biphenyl	**3060** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
Acenaphthylene	**6830** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
Acenaphthene	**193000** (637)	319	8270 Mod		100	03/21/20 11:49	F0C0011	FC01601
Dibenzofuran	**7180** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
Fluorene	**104000** (637)	319	8270 Mod		100	03/21/20 11:49	F0C0011	FC01601
C1-Fluorenes	**28200** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
C2-Fluorenes	**13400** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
C3-Fluorenes	**5040** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
Dibenzothiophene	**31200** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
C1-Dibenzothiophenes	**21800** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
C2-Dibenzothiophenes	**11500** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
C3-Dibenzothiophenes	**4900** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
C4-Dibenzothiophenes	**1680** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
Phenanthrene	**497000** (637)	319	8270 Mod		100	03/21/20 11:49	F0C0011	FC01601
Anthracene	**121000** (637)	319	8270 Mod		100	03/21/20 11:49	F0C0011	FC01601
C1-Phenanthrenes/Anthracenes	**115000** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
C2-Phenanthrenes/Anthracenes	**32400** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
C3-Phenanthrenes/Anthracenes	**9300** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
C4-Phenanthrenes/Anthracenes	**3320** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
Retene	**1840** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
Benzo(b)naphtho(2,1-d)thiophene	**10300** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
C0-Benzonaphthothiophenes	**18800** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
C1-Benzonaphthothiophenes	**9520** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
C2-Benzonaphthothiophenes	**4210** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
C3-Benzonaphthothiophenes	**3090** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS778-S2
Date Sampled: 03/11/20 15:36
Percent Solids: 61
Initial Volume: 5.13
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**651** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
Fluoranthene	**209000** (637)	319	8270 Mod		100	03/21/20 11:49	F0C0011	FC01601
Pyrene	**309000** (637)	319	8270 Mod		100	03/21/20 11:49	F0C0011	FC01601
C1-Fluoranthenes/Pyrenes	**95800** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
C2-Fluoranthenes/Pyrenes	**23400** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
C3-Fluoranthenes/Pyrenes	**6900** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
Benzo(b)fluorene	**11300** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
Benzo(c)fluorene	**5860** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
2-Methylpyrene	**13200** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
4-Methylpyrene	**10700** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
1-Methylpyrene	**12400** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
Benz(a)anthracene	**71500** (637)	319	8270 Mod		100	03/21/20 11:49	F0C0011	FC01601
Chrysene/triphenylene	**67500** (637)	319	8270 Mod		100	03/21/20 11:49	F0C0011	FC01601
C1-Benzo(a)anthracenes/Chrysenes	**34300** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
C2-Benzo(a)anthracenes/Chrysenes	**11700** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
C3-Benzo(a)anthracenes/Chrysenes	**3840** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
C4-Benzo(a)anthracenes/Chrysenes	**1920** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
Benzo(b)fluoranthene	**40000** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
Benzo(j/k)fluoranthene	**52200** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
Benzo(e)pyrene	**49000** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
Benzo(a)pyrene	**77300** (637)	319	8270 Mod		100	03/21/20 11:49	F0C0011	FC01601
Perylene	**16000** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
Indeno(1,2,3-cd)pyrene	**58400** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
Dibenzo(a,h)anthracene	**11400** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
Benzo(g,h,i)perylene	**51200** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
Coronene	**10900** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
Tetramethyl lead	ND (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
Trimethylethyl lead	ND (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
Dimethyldiethyl lead	ND (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
Methyltriethyl lead	ND (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
Tetraethyl lead	ND (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
2,6,10-trimethyldodecane (1380)	**3990** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS778-S2
Date Sampled: 03/11/20 15:36
Percent Solids: 61
Initial Volume: 5.13
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**5000** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
2,6,10-trimethylpentadecane (1650)	**5060** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
C-17	**460** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
Pristane	**10800** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
C-18	**475** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
Phytane	**9420** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
Carbazole	**204** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
2,6-Dimethylnaphthalene	**18800** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
2,3,5-Trimethylnaphthene	**2050** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
4-Methyldibenzothiophene	**8490** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
2/3-Methyldibenzothiophene	**7670** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
1-Methyldibenzothiophene	**2210** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
3-Methylphenanthrene	**28000** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
2-Methylphenanthrene	**30300** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
2-Methylanthracene	**13800** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
4/9-Methylphenanthrene	**23700** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601
1-Methylphenanthrene	**18200** (31.9)	15.9	8270 Mod		5	03/22/20 18:12	F0C0011	FC01601

	%Recovery	*Qualifier*	*Limits*
Surrogate: Toluene-D8	*92 %*		*50-120*
Surrogate: Naphthalene-d8	*95 %*		*50-120*
Surrogate: Phenanthrene-d10	*82 %*		*50-120*
Surrogate: Perylene-d12	*134 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS778-S2
Date Sampled: 03/11/20 15:36
Percent Solids: N/A

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-12
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**178000** (91.9)		TOC-LK		1	CCP	03/23/20 20:25	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS778-S3
Date Sampled: 03/11/20 15:43
Percent Solids: 79
Initial Volume: 5.15
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-13
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C1-Benzene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C2-Benzenes	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C3-Benzenes	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C4-Benzenes	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C5-Benzenes	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
Methylcyclohexane	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
Toluene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
Ethylbenzene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
m,p-Xylene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
Styrene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
o-Xylene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
Isopropylbenzene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
n-Propylbenzene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
1,3,5-Trimethylbenzene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
1,2,3-Trimethylbenzene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
1,2,4-Trimethylbenzene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
t-Butylbenzene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
sec-Butylbenzene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
p-Isopropyltoluene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
n-Butylbenzene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
trans-Decalin	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
cis-Decalin	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C1-Decalins	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C2-Decalins	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C3-Decalins	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C4-Decalins	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
Benzo(b)thiophene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C1-Benzo(b)thiophenes	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C2-Benzo(b)thiophenes	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C3-Benzo(b)thiophenes	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C4-Benzo(b)thiophenes	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS778-S3
Date Sampled: 03/11/20 15:43
Percent Solids: 79
Initial Volume: 5.15
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-13
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
2-Methylnaphthalene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
1-Methylnaphthalene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C1-Naphthalenes	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C2-Naphthalenes	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C3-Naphthalenes	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C4-Naphthalenes	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
Biphenyl	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
Acenaphthylene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
Acenaphthene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
Dibenzofuran	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
Fluorene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C1-Fluorenes	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C2-Fluorenes	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C3-Fluorenes	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
Dibenzothiophene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C1-Dibenzothiophenes	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C2-Dibenzothiophenes	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C3-Dibenzothiophenes	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C4-Dibenzothiophenes	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
Phenanthrene	**6.45** (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
Anthracene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C1-Phenanthrenes/Anthracenes	**J 2.93** (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C2-Phenanthrenes/Anthracenes	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C3-Phenanthrenes/Anthracenes	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C4-Phenanthrenes/Anthracenes	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
Retene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
Benzo(b)naphtho(2,1-d)thiophene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C0-Benzonaphthothiophenes	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C1-Benzonaphthothiophenes	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C2-Benzonaphthothiophenes	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C3-Benzonaphthothiophenes	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS778-S3
Date Sampled: 03/11/20 15:43
Percent Solids: 79
Initial Volume: 5.15
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-13
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
Fluoranthene	J **4.02** (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
Pyrene	**5.67** (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C1-Fluoranthenes/Pyrenes	J **3.36** (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C2-Fluoranthenes/Pyrenes	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C3-Fluoranthenes/Pyrenes	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
Benzo(b)fluorene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
Benzo(c)fluorene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
2-Methylpyrene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
4-Methylpyrene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
1-Methylpyrene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
Benz(a)anthracene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
Chrysene/triphenylene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C1-Benzo(a)anthracenes/Chrysenes	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C2-Benzo(a)anthracenes/Chrysenes	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C3-Benzo(a)anthracenes/Chrysenes	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C4-Benzo(a)anthracenes/Chrysenes	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
Benzo(b)fluoranthene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
Benzo(j/k)fluoranthene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
Benzo(e)pyrene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
Benzo(a)pyrene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
Perylene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
Indeno(1,2,3-cd)pyrene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
Dibenzo(a,h)anthracene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
Benzo(g,h,i)perylene	J **2.56** (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
Coronene	**8.67** (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
Tetramethyl lead	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
Trimethylethyl lead	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
Dimethyldiethyl lead	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
Methyltriethyl lead	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
Tetraethyl lead	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
2,6,10-trimethyldodecane (1380)	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS778-S3
Date Sampled: 03/11/20 15:43
Percent Solids: 79
Initial Volume: 5.15
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-13
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
2,6,10-trimethylpentadecane (1650)	**B 7.52** (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C-17	**B 25.5** (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
Pristane	**B 21.7** (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
C-18	**B 20.0** (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
Phytane	**B 28.2** (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
Carbazole	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
2,6-Dimethylnaphthalene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
2,3,5-Trimethylnaphthene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
4-Methyldibenzothiophene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
2/3-Methyldibenzothiophene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
1-Methyldibenzothiophene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
3-Methylphenanthrene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
2-Methylphenanthrene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
2-Methylanthracene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
4/9-Methylphenanthrene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601
1-Methylphenanthrene	ND (4.94)	2.47	8270 Mod		1	03/21/20 13:14	F0C0011	FC01601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*72 %*		*50-120*
Surrogate: Naphthalene-d8	*73 %*		*50-120*
Surrogate: Phenanthrene-d10	*77 %*		*50-120*
Surrogate: Perylene-d12	*50 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS778-S3
Date Sampled: 03/11/20 15:43
Percent Solids: N/A

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-13
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**2450** (97.5)		TOC-LK		1	CCP	03/23/20 21:14	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS779-S1
Date Sampled: 03/11/20 16:01
Percent Solids: 66
Initial Volume: 5.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-14
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C1-Benzene	**J 3.56** (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C2-Benzenes	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C3-Benzenes	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C4-Benzenes	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C5-Benzenes	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
Methylcyclohexane	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
Toluene	**J 4.21** (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
Ethylbenzene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
m,p-Xylene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
Styrene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
o-Xylene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
Isopropylbenzene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
n-Propylbenzene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
1,3,5-Trimethylbenzene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
1,2,3-Trimethylbenzene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
1,2,4-Trimethylbenzene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
t-Butylbenzene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
sec-Butylbenzene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
p-Isopropyltoluene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
n-Butylbenzene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
trans-Decalin	**J 3.56** (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
cis-Decalin	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C1-Decalins	**J 4.27** (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C2-Decalins	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C3-Decalins	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C4-Decalins	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
Benzo(b)thiophene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C1-Benzo(b)thiophenes	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C2-Benzo(b)thiophenes	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C3-Benzo(b)thiophenes	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C4-Benzo(b)thiophenes	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS779-S1
Date Sampled: 03/11/20 16:01
Percent Solids: 66
Initial Volume: 5.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-14
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
2-Methylnaphthalene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
1-Methylnaphthalene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C1-Naphthalenes	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C2-Naphthalenes	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C3-Naphthalenes	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C4-Naphthalenes	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
Biphenyl	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
Acenaphthylene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
Acenaphthene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
Dibenzofuran	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
Fluorene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C1-Fluorenes	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C2-Fluorenes	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C3-Fluorenes	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
Dibenzothiophene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C1-Dibenzothiophenes	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C2-Dibenzothiophenes	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C3-Dibenzothiophenes	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C4-Dibenzothiophenes	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
Phenanthrene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
Anthracene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C1-Phenanthrenes/Anthracenes	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C2-Phenanthrenes/Anthracenes	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C3-Phenanthrenes/Anthracenes	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C4-Phenanthrenes/Anthracenes	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
Retene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
Benzo(b)naphtho(2,1-d)thiophene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C0-Benzonaphthothiophenes	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C1-Benzonaphthothiophenes	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C2-Benzonaphthothiophenes	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C3-Benzonaphthothiophenes	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS779-S1
Date Sampled: 03/11/20 16:01
Percent Solids: 66
Initial Volume: 5.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-14
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
Fluoranthene	**J 3.13** (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
Pyrene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C1-Fluoranthenes/Pyrenes	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C2-Fluoranthenes/Pyrenes	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C3-Fluoranthenes/Pyrenes	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
Benzo(b)fluorene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
Benzo(c)fluorene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
2-Methylpyrene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
4-Methylpyrene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
1-Methylpyrene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
Benz(a)anthracene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
Chrysene/triphenylene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C1-Benzo(a)anthracenes/Chrysenes	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C2-Benzo(a)anthracenes/Chrysenes	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C3-Benzo(a)anthracenes/Chrysenes	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C4-Benzo(a)anthracenes/Chrysenes	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
Benzo(b)fluoranthene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
Benzo(j/k)fluoranthene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
Benzo(e)pyrene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
Benzo(a)pyrene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
Perylene	**593** (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
Indeno(1,2,3-cd)pyrene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
Dibenzo(a,h)anthracene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
Benzo(g,h,i)perylene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
Coronene	**J 2.92** (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
Tetramethyl lead	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
Trimethylethyl lead	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
Dimethyldiethyl lead	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
Methyltriethyl lead	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
Tetraethyl lead	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
2,6,10-trimethyldodecane (1380)	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS779-S1
Date Sampled: 03/11/20 16:01
Percent Solids: 66
Initial Volume: 5.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-14
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**J 3.64** (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
2,6,10-trimethylpentadecane (1650)	**B 15.3** (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C-17	**B 90.2** (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
Pristane	**B 41.7** (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
C-18	**B 43.7** (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
Phytane	**B 56.8** (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
Carbazole	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
2,6-Dimethylnaphthalene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
2,3,5-Trimethylnaphthene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
4-Methyldibenzothiophene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
2/3-Methyldibenzothiophene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
1-Methyldibenzothiophene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
3-Methylphenanthrene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
2-Methylphenanthrene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
2-Methylanthracene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
4/9-Methylphenanthrene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601
1-Methylphenanthrene	ND (5.71)	2.86	8270 Mod		1	03/21/20 14:38	F0C0011	FC01601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*80 %*		*50-120*
Surrogate: Naphthalene-d8	*87 %*		*50-120*
Surrogate: Phenanthrene-d10	*89 %*		*50-120*
Surrogate: Perylene-d12	*50 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS779-S1
Date Sampled: 03/11/20 16:01
Percent Solids: N/A

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-14
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**23300** (96.1)		TOC-LK		1	CCP	03/23/20 21:31	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS779-S2
Date Sampled: 03/11/20 16:08
Percent Solids: 74
Initial Volume: 5.24
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-15
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C1-Benzene	**J 2.99** (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C2-Benzenes	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C3-Benzenes	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C4-Benzenes	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C5-Benzenes	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
Methylcyclohexane	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
Toluene	**J 3.59** (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
Ethylbenzene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
m,p-Xylene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
Styrene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
o-Xylene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
Isopropylbenzene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
n-Propylbenzene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
1,3,5-Trimethylbenzene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
1,2,3-Trimethylbenzene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
1,2,4-Trimethylbenzene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
t-Butylbenzene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
sec-Butylbenzene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
p-Isopropyltoluene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
n-Butylbenzene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
trans-Decalin	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
cis-Decalin	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C1-Decalins	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C2-Decalins	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C3-Decalins	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C4-Decalins	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
Benzo(b)thiophene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C1-Benzo(b)thiophenes	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C2-Benzo(b)thiophenes	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C3-Benzo(b)thiophenes	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C4-Benzo(b)thiophenes	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS779-S2
Date Sampled: 03/11/20 16:08
Percent Solids: 74
Initial Volume: 5.24
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-15
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
2-Methylnaphthalene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
1-Methylnaphthalene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C1-Naphthalenes	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C2-Naphthalenes	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C3-Naphthalenes	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C4-Naphthalenes	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
Biphenyl	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
Acenaphthylene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
Acenaphthene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
Dibenzofuran	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
Fluorene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C1-Fluorenes	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C2-Fluorenes	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C3-Fluorenes	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
Dibenzothiophene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C1-Dibenzothiophenes	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C2-Dibenzothiophenes	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C3-Dibenzothiophenes	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C4-Dibenzothiophenes	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
Phenanthrene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
Anthracene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C1-Phenanthrenes/Anthracenes	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C2-Phenanthrenes/Anthracenes	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C3-Phenanthrenes/Anthracenes	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C4-Phenanthrenes/Anthracenes	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
Retene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
Benzo(b)naphtho(2,1-d)thiophene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C0-Benzonaphthothiophenes	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C1-Benzonaphthothiophenes	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C2-Benzonaphthothiophenes	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C3-Benzonaphthothiophenes	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS779-S2
Date Sampled: 03/11/20 16:08
Percent Solids: 74
Initial Volume: 5.24
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-15
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
Fluoranthene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
Pyrene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C1-Fluoranthenes/Pyrenes	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C2-Fluoranthenes/Pyrenes	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C3-Fluoranthenes/Pyrenes	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
Benzo(b)fluorene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
Benzo(c)fluorene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
2-Methylpyrene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
4-Methylpyrene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
1-Methylpyrene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
Benz(a)anthracene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
Chrysene/triphenylene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C1-Benzo(a)anthracenes/Chrysenes	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C2-Benzo(a)anthracenes/Chrysenes	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C3-Benzo(a)anthracenes/Chrysenes	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C4-Benzo(a)anthracenes/Chrysenes	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
Benzo(b)fluoranthene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
Benzo(j/k)fluoranthene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
Benzo(e)pyrene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
Benzo(a)pyrene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
Perylene	**485** (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
Indeno(1,2,3-cd)pyrene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
Dibenzo(a,h)anthracene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
Benzo(g,h,i)perylene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
Coronene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
Tetramethyl lead	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
Trimethylethyl lead	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
Dimethyldiethyl lead	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
Methyltriethyl lead	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
Tetraethyl lead	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
2,6,10-trimethyldodecane (1380)	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS779-S2
Date Sampled: 03/11/20 16:08
Percent Solids: 74
Initial Volume: 5.24
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-15
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
2,6,10-trimethylpentadecane (1650)	**B 11.0** (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C-17	**B 48.6** (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
Pristane	**B 31.8** (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
C-18	**B 30.9** (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
Phytane	**B 40.6** (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
Carbazole	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
2,6-Dimethylnaphthalene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
2,3,5-Trimethylnaphthene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
4-Methyldibenzothiophene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
2/3-Methyldibenzothiophene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
1-Methyldibenzothiophene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
3-Methylphenanthrene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
2-Methylphenanthrene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
2-Methylanthracene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
4/9-Methylphenanthrene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601
1-Methylphenanthrene	ND (5.13)	2.57	8270 Mod		1	03/21/20 16:01	F0C0011	FC01601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*76 %*		*50-120*
Surrogate: Naphthalene-d8	*85 %*		*50-120*
Surrogate: Phenanthrene-d10	*88 %*		*50-120*
Surrogate: Perylene-d12	*66 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS779-S2
Date Sampled: 03/11/20 16:08
Percent Solids: N/A

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-15
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**13300** (93.5)		TOC-LK		1	CCP	03/23/20 21:48	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS780-S1
Date Sampled: 03/11/20 16:31
Percent Solids: 57
Initial Volume: 5.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-16
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C1-Benzene	**742** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C2-Benzenes	**112** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C3-Benzenes	**110** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C4-Benzenes	**91.1** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C5-Benzenes	**67.7** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
Methylcyclohexane	ND (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
Toluene	**910** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
Ethylbenzene	**39.2** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
m,p-Xylene	**100** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
Styrene	**73.9** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
o-Xylene	**J 23.1** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
Isopropylbenzene	ND (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
n-Propylbenzene	ND (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
1,3,5-Trimethylbenzene	**J 26.9** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
1,2,3-Trimethylbenzene	ND (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
1,2,4-Trimethylbenzene	**45.5** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
t-Butylbenzene	ND (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
sec-Butylbenzene	ND (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
p-Isopropyltoluene	**J 26.6** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
n-Butylbenzene	ND (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
trans-Decalin	**124** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
cis-Decalin	**J 23.5** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C1-Decalins	**314** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C2-Decalins	**589** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C3-Decalins	**520** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C4-Decalins	**705** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
Benzo(b)thiophene	**61.3** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C1-Benzo(b)thiophenes	**44.4** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C2-Benzo(b)thiophenes	**79.9** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C3-Benzo(b)thiophenes	**123** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C4-Benzo(b)thiophenes	**111** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS780-S1
Date Sampled: 03/11/20 16:31
Percent Solids: 57
Initial Volume: 5.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-16
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**1470** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
2-Methylnaphthalene	**860** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
1-Methylnaphthalene	**320** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C1-Naphthalenes	**727** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C2-Naphthalenes	**951** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C3-Naphthalenes	**1460** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C4-Naphthalenes	**998** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
Biphenyl	**358** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
Acenaphthylene	**1170** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
Acenaphthene	**484** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
Dibenzofuran	**218** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
Fluorene	**734** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C1-Fluorenes	**1290** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C2-Fluorenes	**1390** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C3-Fluorenes	**922** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
Dibenzothiophene	**758** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C1-Dibenzothiophenes	**1500** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C2-Dibenzothiophenes	**1670** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C3-Dibenzothiophenes	**1140** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C4-Dibenzothiophenes	**584** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
Phenanthrene	**6210** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
Anthracene	**2740** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C1-Phenanthrenes/Anthracenes	**8610** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C2-Phenanthrenes/Anthracenes	**5020** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C3-Phenanthrenes/Anthracenes	**2110** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C4-Phenanthrenes/Anthracenes	**971** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
Retene	**146** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
Benzo(b)naphtho(2,1-d)thiophene	**1800** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C0-Benzonaphthothiophenes	**3300** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C1-Benzonaphthothiophenes	**2000** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C2-Benzonaphthothiophenes	**1290** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C3-Benzonaphthothiophenes	**937** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS780-S1
Date Sampled: 03/11/20 16:31
Percent Solids: 57
Initial Volume: 5.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-16
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**277** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
Fluoranthene	**11400** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
Pyrene	**29300** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C1-Fluoranthenes/Pyrenes	**14800** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C2-Fluoranthenes/Pyrenes	**4640** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C3-Fluoranthenes/Pyrenes	**1740** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
Benzo(b)fluorene	**1650** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
Benzo(c)fluorene	**777** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
2-Methylpyrene	**2140** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
4-Methylpyrene	**1880** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
1-Methylpyrene	**1800** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
Benz(a)anthracene	**13300** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
Chrysene/triphenylene	**13500** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C1-Benzo(a)anthracenes/Chrysenes	**7130** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C2-Benzo(a)anthracenes/Chrysenes	**2850** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C3-Benzo(a)anthracenes/Chrysenes	**1230** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C4-Benzo(a)anthracenes/Chrysenes	**606** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
Benzo(b)fluoranthene	**8660** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
Benzo(j/k)fluoranthene	**10500** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
Benzo(e)pyrene	**9850** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
Benzo(a)pyrene	**16400** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
Perylene	**2830** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
Indeno(1,2,3-cd)pyrene	**10400** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
Dibenzo(a,h)anthracene	**1890** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
Benzo(g,h,i)perylene	**9480** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
Coronene	**2280** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
Tetramethyl lead	ND (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
Trimethylethyl lead	ND (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
Dimethyldiethyl lead	ND (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
Methyltriethyl lead	ND (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
Tetraethyl lead	ND (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
2,6,10-trimethyldodecane (1380)	**601** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS780-S1
Date Sampled: 03/11/20 16:31
Percent Solids: 57
Initial Volume: 5.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-16
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**983** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
2,6,10-trimethylpentadecane (1650)	**977** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C-17	**757** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
Pristane	**1750** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
C-18	**498** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
Phytane	**1920** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
Carbazole	**95.7** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
2,6-Dimethylnaphthalene	**238** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
2,3,5-Trimethylnaphthene	**114** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
4-Methyldibenzothiophene	**603** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
2/3-Methyldibenzothiophene	**509** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
1-Methyldibenzothiophene	**164** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
3-Methylphenanthrene	**2120** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
2-Methylphenanthrene	**2560** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
2-Methylanthracene	**629** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
4/9-Methylphenanthrene	**2520** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601
1-Methylphenanthrene	**733** (33.2)	16.6	8270 Mod		5	03/22/20 8:41	F0C0011	FC01601

	%Recovery	*Qualifier*	*Limits*
Surrogate: Toluene-D8	*90 %*		*50-120*
Surrogate: Naphthalene-d8	*89 %*		*50-120*
Surrogate: Phenanthrene-d10	*78 %*		*50-120*
Surrogate: Perylene-d12	*84 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS780-S1
Date Sampled: 03/11/20 16:31
Percent Solids: N/A

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-16
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**78900** (96.3)		TOC-LK		1	CCP	03/23/20 22:04	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS780-S2
Date Sampled: 03/11/20 16:39
Percent Solids: 74
Initial Volume: 5.83
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-17
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C1-Benzene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C2-Benzenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C3-Benzenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C4-Benzenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C5-Benzenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
Methylcyclohexane	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
Toluene	**J 2.51** (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
Ethylbenzene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
m,p-Xylene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
Styrene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
o-Xylene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
Isopropylbenzene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
n-Propylbenzene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
1,3,5-Trimethylbenzene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
1,2,3-Trimethylbenzene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
1,2,4-Trimethylbenzene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
t-Butylbenzene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
sec-Butylbenzene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
p-Isopropyltoluene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
n-Butylbenzene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
trans-Decalin	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
cis-Decalin	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C1-Decalins	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C2-Decalins	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C3-Decalins	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C4-Decalins	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
Benzo(b)thiophene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C1-Benzo(b)thiophenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C2-Benzo(b)thiophenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C3-Benzo(b)thiophenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C4-Benzo(b)thiophenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS780-S2
Date Sampled: 03/11/20 16:39
Percent Solids: 74
Initial Volume: 5.83
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-17
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
2-Methylnaphthalene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
1-Methylnaphthalene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C1-Naphthalenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C2-Naphthalenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C3-Naphthalenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C4-Naphthalenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
Biphenyl	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
Acenaphthylene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
Acenaphthene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
Dibenzofuran	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
Fluorene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C1-Fluorenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C2-Fluorenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C3-Fluorenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
Dibenzothiophene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C1-Dibenzothiophenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C2-Dibenzothiophenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C3-Dibenzothiophenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C4-Dibenzothiophenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
Phenanthrene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
Anthracene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C1-Phenanthrenes/Anthracenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C2-Phenanthrenes/Anthracenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C3-Phenanthrenes/Anthracenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C4-Phenanthrenes/Anthracenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
Retene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
Benzo(b)naphtho(2,1-d)thiophene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C0-Benzonaphthothiophenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C1-Benzonaphthothiophenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C2-Benzonaphthothiophenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C3-Benzonaphthothiophenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS780-S2
Date Sampled: 03/11/20 16:39
Percent Solids: 74
Initial Volume: 5.83
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-17
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
Fluoranthene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
Pyrene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C1-Fluoranthenes/Pyrenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C2-Fluoranthenes/Pyrenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C3-Fluoranthenes/Pyrenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
Benzo(b)fluorene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
Benzo(c)fluorene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
2-Methylpyrene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
4-Methylpyrene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
1-Methylpyrene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
Benz(a)anthracene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
Chrysene/triphenylene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C1-Benzo(a)anthracenes/Chrysenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C2-Benzo(a)anthracenes/Chrysenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C3-Benzo(a)anthracenes/Chrysenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C4-Benzo(a)anthracenes/Chrysenes	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
Benzo(b)fluoranthene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
Benzo(j/k)fluoranthene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
Benzo(e)pyrene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
Benzo(a)pyrene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
Perylene	**416** (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
Indeno(1,2,3-cd)pyrene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
Dibenzo(a,h)anthracene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
Benzo(g,h,i)perylene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
Coronene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
Tetramethyl lead	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
Trimethylethyl lead	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
Dimethyldiethyl lead	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
Methyltriethyl lead	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
Tetraethyl lead	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
2,6,10-trimethyldodecane (1380)	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS780-S2
Date Sampled: 03/11/20 16:39
Percent Solids: 74
Initial Volume: 5.83
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-17
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
2,6,10-trimethylpentadecane (1650)	**B 7.86** (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C-17	**B 39.0** (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
Pristane	**B 23.8** (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
C-18	**B 22.2** (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
Phytane	**B 29.9** (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
Carbazole	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
2,6-Dimethylnaphthalene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
2,3,5-Trimethylnaphthene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
4-Methyldibenzothiophene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
2/3-Methyldibenzothiophene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
1-Methyldibenzothiophene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
3-Methylphenanthrene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
2-Methylphenanthrene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
2-Methylanthracene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
4/9-Methylphenanthrene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601
1-Methylphenanthrene	ND (4.64)	2.32	8270 Mod		1	03/21/20 18:49	F0C0011	FC01601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*86 %*		*50-120*
Surrogate: Naphthalene-d8	*91 %*		*50-120*
Surrogate: Phenanthrene-d10	*93 %*		*50-120*
Surrogate: Perylene-d12	*70 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS780-S2
Date Sampled: 03/11/20 16:39
Percent Solids: N/A

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-17
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**17700** (96.2)		TOC-LK		1	CCP	03/23/20 22:21	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS781-S1
Date Sampled: 03/11/20 15:01
Percent Solids: 54
Initial Volume: 2.29
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-18
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C1-Benzene	**330** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C2-Benzenes	**52.4** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C3-Benzenes	**67.3** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C4-Benzenes	**625** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C5-Benzenes	**905** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
Methylcyclohexane	ND (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
Toluene	**396** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
Ethylbenzene	**J 11.9** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
m,p-Xylene	**42.0** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
Styrene	ND (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
o-Xylene	**J 15.8** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
Isopropylbenzene	ND (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
n-Propylbenzene	**J 9.28** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
1,3,5-Trimethylbenzene	**J 9.13** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
1,2,3-Trimethylbenzene	**23.1** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
1,2,4-Trimethylbenzene	**33.1** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
t-Butylbenzene	**J 9.69** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
sec-Butylbenzene	ND (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
p-Isopropyltoluene	**J 8.76** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
n-Butylbenzene	**66.8** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
trans-Decalin	**3630** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
cis-Decalin	**469** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C1-Decalins	**4130** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C2-Decalins	**1810** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C3-Decalins	**1520** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C4-Decalins	**2960** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
Benzo(b)thiophene	ND (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C1-Benzo(b)thiophenes	**188** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C2-Benzo(b)thiophenes	**1310** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C3-Benzo(b)thiophenes	**2210** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C4-Benzo(b)thiophenes	**1600** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS781-S1
Date Sampled: 03/11/20 15:01
Percent Solids: 54
Initial Volume: 2.29
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-18
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**80.4** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
2-Methylnaphthalene	**101** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
1-Methylnaphthalene	**473** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C1-Naphthalenes	**340** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C2-Naphthalenes	**6170** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C3-Naphthalenes	**10200** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C4-Naphthalenes	**5860** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
Biphenyl	**25.7** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
Acenaphthylene	**50.0** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
Acenaphthene	**258** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
Dibenzofuran	**64.6** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
Fluorene	**494** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C1-Fluorenes	**1460** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C2-Fluorenes	**2160** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C3-Fluorenes	**1480** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
Dibenzothiophene	**892** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C1-Dibenzothiophenes	**2450** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C2-Dibenzothiophenes	**2950** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C3-Dibenzothiophenes	**2320** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C4-Dibenzothiophenes	**1350** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
Phenanthrene	**1950** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
Anthracene	**216** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C1-Phenanthrenes/Anthracenes	**3470** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C2-Phenanthrenes/Anthracenes	**2920** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C3-Phenanthrenes/Anthracenes	**1730** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C4-Phenanthrenes/Anthracenes	**894** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
Retene	**277** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
Benzo(b)naphtho(2,1-d)thiophene	**239** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C0-Benzonaphthothiophenes	**398** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C1-Benzonaphthothiophenes	**866** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C2-Benzonaphthothiophenes	**1390** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C3-Benzonaphthothiophenes	**1250** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS781-S1
Date Sampled: 03/11/20 15:01
Percent Solids: 54
Initial Volume: 2.29
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-18
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**639** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
Fluoranthene	**824** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
Pyrene	**1170** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C1-Fluoranthenes/Pyrenes	**1000** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C2-Fluoranthenes/Pyrenes	**1000** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C3-Fluoranthenes/Pyrenes	**891** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
Benzo(b)fluorene	**77.9** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
Benzo(c)fluorene	**44.7** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
2-Methylpyrene	**171** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
4-Methylpyrene	**200** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
1-Methylpyrene	**145** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
Benz(a)anthracene	**466** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
Chrysene/triphenylene	**646** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C1-Benzo(a)anthracenes/Chrysenes	**845** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C2-Benzo(a)anthracenes/Chrysenes	**972** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C3-Benzo(a)anthracenes/Chrysenes	**807** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C4-Benzo(a)anthracenes/Chrysenes	**417** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
Benzo(b)fluoranthene	**362** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
Benzo(j/k)fluoranthene	**371** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
Benzo(e)pyrene	**401** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
Benzo(a)pyrene	**476** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
Perylene	**261** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
Indeno(1,2,3-cd)pyrene	**395** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
Dibenzo(a,h)anthracene	**132** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
Benzo(g,h,i)perylene	**358** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
Coronene	**242** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
Tetramethyl lead	ND (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
Trimethylethyl lead	ND (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
Dimethyldiethyl lead	ND (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
Methyltriethyl lead	ND (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
Tetraethyl lead	ND (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
2,6,10-trimethyldodecane (1380)	**5830** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS781-S1
Date Sampled: 03/11/20 15:01
Percent Solids: 54
Initial Volume: 2.29
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-18
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**8040** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
2,6,10-trimethylpentadecane (1650)	**7900** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C-17	ND (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
Pristane	**14900** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
C-18	ND (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
Phytane	**10200** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
Carbazole	**45.1** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
2,6-Dimethylnaphthalene	**2090** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
2,3,5-Trimethylnaphthene	**760** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
4-Methyldibenzothiophene	**1090** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
2/3-Methyldibenzothiophene	**862** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
1-Methyldibenzothiophene	**327** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
3-Methylphenanthrene	**880** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
2-Methylphenanthrene	**1040** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
2-Methylanthracene	**131** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
4/9-Methylphenanthrene	**811** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601
1-Methylphenanthrene	**522** (16.2)	8.11	8270 Mod		1	03/22/20 5:55	F0C0011	FC01601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*80 %*		*50-120*
Surrogate: Naphthalene-d8	*85 %*		*50-120*
Surrogate: Phenanthrene-d10	*72 %*		*50-120*
Surrogate: Perylene-d12	*69 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS781-S1
Date Sampled: 03/11/20 15:01
Percent Solids: N/A

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-18
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**34200** (93.8)		TOC-LK		1	CCP	03/23/20 23:11	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS782-S2
Date Sampled: 03/11/20 15:27
Percent Solids: 63
Initial Volume: 5.29
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-19
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C1-Benzene	**57.4** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C2-Benzenes	**6.44** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C3-Benzenes	**7.75** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C4-Benzenes	**9.83** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C5-Benzenes	**J 5.11** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
Methylcyclohexane	ND (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
Toluene	**69.8** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
Ethylbenzene	ND (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
m,p-Xylene	**6.04** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
Styrene	ND (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
o-Xylene	ND (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
Isopropylbenzene	ND (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
n-Propylbenzene	ND (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
1,3,5-Trimethylbenzene	ND (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
1,2,3-Trimethylbenzene	ND (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
1,2,4-Trimethylbenzene	**J 3.69** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
t-Butylbenzene	ND (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
sec-Butylbenzene	ND (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
p-Isopropyltoluene	**10.9** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
n-Butylbenzene	ND (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
trans-Decalin	ND (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
cis-Decalin	ND (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C1-Decalins	ND (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C2-Decalins	ND (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C3-Decalins	ND (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C4-Decalins	ND (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
Benzo(b)thiophene	ND (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C1-Benzo(b)thiophenes	ND (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C2-Benzo(b)thiophenes	**J 3.03** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C3-Benzo(b)thiophenes	ND (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C4-Benzo(b)thiophenes	ND (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS782-S2
Date Sampled: 03/11/20 15:27
Percent Solids: 63
Initial Volume: 5.29
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-19
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**9.90** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
2-Methylnaphthalene	**6.54** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
1-Methylnaphthalene	**J 3.56** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C1-Naphthalenes	**6.35** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C2-Naphthalenes	**18.9** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C3-Naphthalenes	**23.1** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C4-Naphthalenes	**16.8** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
Biphenyl	ND (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
Acenaphthylene	ND (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
Acenaphthene	**J 3.43** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
Dibenzofuran	**7.18** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
Fluorene	**7.30** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C1-Fluorenes	**8.11** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C2-Fluorenes	**15.0** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C3-Fluorenes	**16.2** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
Dibenzothiophene	**J 3.46** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C1-Dibenzothiophenes	**7.98** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C2-Dibenzothiophenes	**10.3** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C3-Dibenzothiophenes	**7.77** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C4-Dibenzothiophenes	**8.05** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
Phenanthrene	**49.1** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
Anthracene	**21.6** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C1-Phenanthrenes/Anthracenes	**76.9** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C2-Phenanthrenes/Anthracenes	**93.2** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C3-Phenanthrenes/Anthracenes	**54.1** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C4-Phenanthrenes/Anthracenes	**49.1** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
Retene	**65.7** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
Benzo(b)naphtho(2,1-d)thiophene	**7.08** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C0-Benzonaphthothiophenes	**16.2** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C1-Benzonaphthothiophenes	**14.3** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C2-Benzonaphthothiophenes	**9.76** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C3-Benzonaphthothiophenes	**J 4.73** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS782-S2
Date Sampled: 03/11/20 15:27
Percent Solids: 63
Initial Volume: 5.29
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-19
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
Fluoranthene	**108** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
Pyrene	**92.2** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C1-Fluoranthenes/Pyrenes	**89.3** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C2-Fluoranthenes/Pyrenes	**48.1** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C3-Fluoranthenes/Pyrenes	**28.7** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
Benzo(b)fluorene	**11.2** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
Benzo(c)fluorene	**J 6.00** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
2-Methylpyrene	**11.6** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
4-Methylpyrene	**8.61** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
1-Methylpyrene	**6.38** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
Benz(a)anthracene	**64.1** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
Chrysene/triphenylene	**63.5** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C1-Benzo(a)anthracenes/Chrysenes	**59.5** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C2-Benzo(a)anthracenes/Chrysenes	**39.7** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C3-Benzo(a)anthracenes/Chrysenes	**22.1** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C4-Benzo(a)anthracenes/Chrysenes	ND (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
Benzo(b)fluoranthene	**36.8** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
Benzo(j/k)fluoranthene	**48.4** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
Benzo(e)pyrene	**30.8** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
Benzo(a)pyrene	**47.5** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
Perylene	**95.5** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
Indeno(1,2,3-cd)pyrene	**22.6** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
Dibenzo(a,h)anthracene	**7.54** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
Benzo(g,h,i)perylene	**19.9** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
Coronene	**J 4.30** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
Tetramethyl lead	ND (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
Trimethylethyl lead	ND (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
Dimethyldiethyl lead	ND (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
Methyltriethyl lead	ND (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
Tetraethyl lead	ND (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
2,6,10-trimethyldodecane (1380)	**J 3.75** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS782-S2
Date Sampled: 03/11/20 15:27
Percent Solids: 63
Initial Volume: 5.29
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-19
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**14.7** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
2,6,10-trimethylpentadecane (1650)	**B 17.8** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C-17	**B 170** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
Pristane	**B 56.0** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
C-18	**B 40.9** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
Phytane	**B 52.8** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
Carbazole	ND (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
2,6-Dimethylnaphthalene	ND (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
2,3,5-Trimethylnaphthene	ND (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
4-Methyldibenzothiophene	ND (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
2/3-Methyldibenzothiophene	ND (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
1-Methyldibenzothiophene	ND (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
3-Methylphenanthrene	**14.3** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
2-Methylphenanthrene	**23.0** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
2-Methylanthracene	**7.27** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
4/9-Methylphenanthrene	**16.1** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601
1-Methylphenanthrene	**13.8** (6.03)	3.01	8270 Mod		1	03/21/20 20:13	F0C0011	FC01601

	%Recovery	*Qualifier*	*Limits*
Surrogate: Toluene-D8	*75 %*		*50-120*
Surrogate: Naphthalene-d8	*90 %*		*50-120*
Surrogate: Phenanthrene-d10	*84 %*		*50-120*
Surrogate: Perylene-d12	*64 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS782-S2
Date Sampled: 03/11/20 15:27
Percent Solids: N/A

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-19
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**28500** (94.2)		TOC-LK		1	CCP	03/23/20 23:27	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS781(R1)-S1
Date Sampled: 03/12/20 08:59
Percent Solids: 57
Initial Volume: 5.28
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-20
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C1-Benzene	**523** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C2-Benzenes	**101** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C3-Benzenes	**93.9** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C4-Benzenes	**541** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C5-Benzenes	**456** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
Methylcyclohexane	**13.2** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
Toluene	**640** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
Ethylbenzene	**15.2** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
m,p-Xylene	**83.0** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
Styrene	**8.06** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
o-Xylene	**52.3** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
Isopropylbenzene	**J 4.36** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
n-Propylbenzene	**14.0** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
1,3,5-Trimethylbenzene	**15.7** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
1,2,3-Trimethylbenzene	**33.3** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
1,2,4-Trimethylbenzene	**63.0** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
t-Butylbenzene	**J 4.88** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
sec-Butylbenzene	**9.31** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
p-Isopropyltoluene	**12.6** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
n-Butylbenzene	**82.7** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
trans-Decalin	**2390** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
cis-Decalin	**258** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C1-Decalins	**2310** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C2-Decalins	**661** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C3-Decalins	**285** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C4-Decalins	**455** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
Benzo(b)thiophene	ND (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C1-Benzo(b)thiophenes	**18.7** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C2-Benzo(b)thiophenes	**35.9** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C3-Benzo(b)thiophenes	**34.6** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C4-Benzo(b)thiophenes	**30.0** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS781(R1)-S1
Date Sampled: 03/12/20 08:59
Percent Solids: 57
Initial Volume: 5.28
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-20
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**127** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
2-Methylnaphthalene	**75.1** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
1-Methylnaphthalene	**40.0** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C1-Naphthalenes	**71.5** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C2-Naphthalenes	**270** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C3-Naphthalenes	**379** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C4-Naphthalenes	**279** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
Biphenyl	**34.7** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
Acenaphthylene	**81.6** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
Acenaphthene	**153** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
Dibenzofuran	**68.1** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
Fluorene	**160** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C1-Fluorenes	**109** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C2-Fluorenes	**166** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C3-Fluorenes	**189** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
Dibenzothiophene	**69.2** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C1-Dibenzothiophenes	**122** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C2-Dibenzothiophenes	**186** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C3-Dibenzothiophenes	**196** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C4-Dibenzothiophenes	**154** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
Phenanthrene	**805** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
Anthracene	**255** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C1-Phenanthrenes/Anthracenes	**585** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C2-Phenanthrenes/Anthracenes	**436** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C3-Phenanthrenes/Anthracenes	**284** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C4-Phenanthrenes/Anthracenes	**175** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
Retene	**81.6** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
Benzo(b)naphtho(2,1-d)thiophene	**105** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C0-Benzonaphthothiophenes	**199** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C1-Benzonaphthothiophenes	**173** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C2-Benzonaphthothiophenes	**197** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C3-Benzonaphthothiophenes	**185** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS781(R1)-S1
Date Sampled: 03/12/20 08:59
Percent Solids: 57
Initial Volume: 5.28
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-20
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**88.0** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
Fluoranthene	**1110** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
Pyrene	**1270** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C1-Fluoranthenes/Pyrenes	**699** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C2-Fluoranthenes/Pyrenes	**374** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C3-Fluoranthenes/Pyrenes	**225** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
Benzo(b)fluorene	**84.5** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
Benzo(c)fluorene	**36.4** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
2-Methylpyrene	**92.1** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
4-Methylpyrene	**94.6** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
1-Methylpyrene	**71.3** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
Benz(a)anthracene	**619** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
Chrysene/triphenylene	**699** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C1-Benzo(a)anthracenes/Chrysenes	**460** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C2-Benzo(a)anthracenes/Chrysenes	**295** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C3-Benzo(a)anthracenes/Chrysenes	**205** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C4-Benzo(a)anthracenes/Chrysenes	**128** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
Benzo(b)fluoranthene	**540** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
Benzo(j/k)fluoranthene	**583** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
Benzo(e)pyrene	**521** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
Benzo(a)pyrene	**737** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
Perylene	**353** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
Indeno(1,2,3-cd)pyrene	**1220** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
Dibenzo(a,h)anthracene	**232** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
Benzo(g,h,i)perylene	**1150** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
Coronene	**471** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
Tetramethyl lead	ND (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
Trimethylethyl lead	ND (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
Dimethyldiethyl lead	ND (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
Methyltriethyl lead	ND (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
Tetraethyl lead	ND (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
2,6,10-trimethyldodecane (1380)	**630** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS781(R1)-S1
Date Sampled: 03/12/20 08:59
Percent Solids: 57
Initial Volume: 5.28
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-20
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/16/20 13:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**944** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
2,6,10-trimethylpentadecane (1650)	**753** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C-17	**214** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
Pristane	**2070** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
C-18	**B 133** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
Phytane	**1580** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
Carbazole	**53.1** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
2,6-Dimethylnaphthalene	**79.9** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
2,3,5-Trimethylnaphthene	**26.6** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
4-Methyldibenzothiophene	**50.9** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
2/3-Methyldibenzothiophene	**42.0** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
1-Methyldibenzothiophene	**14.8** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
3-Methylphenanthrene	**123** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
2-Methylphenanthrene	**144** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
2-Methylanthracene	**53.8** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
4/9-Methylphenanthrene	**131** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601
1-Methylphenanthrene	**97.8** (6.61)	3.30	8270 Mod		1	03/22/20 20:55	F0C0011	FC01601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*85 %*		*50-120*
Surrogate: Naphthalene-d8	*96 %*		*50-120*
Surrogate: Phenanthrene-d10	*77 %*		*50-120*
Surrogate: Perylene-d12	*77 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS781(R1)-S1
Date Sampled: 03/12/20 08:59
Percent Solids: N/A

ESS Laboratory Work Order: F200017
ESS Laboratory Sample ID: F200017-20
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**38900** (93.9)		TOC-LK		1	CCP	03/23/20 23:44	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200017

Quality Control Data

Classical Chemistry

Batch DC01727 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	100	mg/kg							
Total Organic Carbon (2)	ND	100	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200017

Quality Control Data

Classical Chemistry

Batch DC01727 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9720	100	mg/kg	10000		97	80-120			
Total Organic Carbon (2)	10100	100	mg/kg	10000		101	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200017

Quality Control Data

Classical Chemistry

Batch DC01727 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	10100	100	mg/kg	10000		101	80-120	4	20	
Total Organic Carbon (2)	9970	100	mg/kg	10000		100	80-120	1	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200017

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FC01601 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	ND	4.00	ug/Kg wet							
C1-Benzene	ND	4.00	ug/Kg wet							
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	ND	4.00	ug/Kg wet							
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	ND	4.00	ug/Kg wet							
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200017

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FC01601 - 3570

C1-Fluorenes	ND	4.00	ug/Kg wet
C2-Fluorenes	ND	4.00	ug/Kg wet
C3-Fluorenes	ND	4.00	ug/Kg wet
Dibenzothiophene	ND	4.00	ug/Kg wet
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet
Phenanthrene	ND	4.00	ug/Kg wet
Anthracene	ND	4.00	ug/Kg wet
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
Retene	ND	4.00	ug/Kg wet
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
Fluoranthene	ND	4.00	ug/Kg wet
Pyrene	ND	4.00	ug/Kg wet
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
Benzo(b)fluorene	ND	4.00	ug/Kg wet
Benzo(c)fluorene	ND	4.00	ug/Kg wet
2-Methylpyrene	ND	4.00	ug/Kg wet
4-Methylpyrene	ND	4.00	ug/Kg wet
1-Methylpyrene	ND	4.00	ug/Kg wet
Benz(a)anthracene	ND	4.00	ug/Kg wet
Chrysene/triphenylene	ND	4.00	ug/Kg wet
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet
Benzo(e)pyrene	ND	4.00	ug/Kg wet
Benzo(a)pyrene	ND	4.00	ug/Kg wet
Perylene	ND	4.00	ug/Kg wet
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet
Coronene	ND	4.00	ug/Kg wet
Tetramethyl lead	ND	4.00	ug/Kg wet
Trimethylethyl lead	ND	4.00	ug/Kg wet

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200017

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FC01601 - 3570						
Dimethyldiethyl lead	ND	4.00	ug/Kg wet			
Methyltriethyl lead	ND	4.00	ug/Kg wet			
Tetraethyl lead	ND	4.00	ug/Kg wet			
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet			
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet			
2,6,10-trimethylpentadecane (1650)	4.22	4.00	ug/Kg wet			
C-17	18.1	4.00	ug/Kg wet			
Pristane	14.6	4.00	ug/Kg wet			
C-18	14.3	4.00	ug/Kg wet			
Phytane	20.9	4.00	ug/Kg wet			
Carbazole	ND	4.00	ug/Kg wet			
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet			
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet			
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
3-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylanthracene	ND	4.00	ug/Kg wet			
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet			
1-Methylphenanthrene	ND	4.00	ug/Kg wet			
Surrogate: Toluene-D8	*328*		ug/Kg wet	*400.0*	*82*	*50-120*
Surrogate: Naphthalene-d8	*322*		ug/Kg wet	*400.0*	*81*	*50-120*
Surrogate: Phenanthrene-d10	*352*		ug/Kg wet	*400.0*	*88*	*50-120*
Surrogate: Perylene-d12	*277*		ug/Kg wet	*400.0*	*69*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200017

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FC01601 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	269	4.00	ug/Kg wet	400.0		67	60-130			
Methylcyclohexane	175	4.00	ug/Kg wet	400.0		44	60-130			B-
Toluene	295	4.00	ug/Kg wet	400.0		74	60-130			
Ethylbenzene	320	4.00	ug/Kg wet	400.0		80	60-130			
m,p-Xylene	323	4.00	ug/Kg wet	400.0		81	60-130			
Styrene	299	4.00	ug/Kg wet	400.0		75	60-130			
o-Xylene	326	4.00	ug/Kg wet	400.0		82	60-130			
Isopropylbenzene	341	4.00	ug/Kg wet	400.0		85	60-130			
n-Propylbenzene	324	4.00	ug/Kg wet	400.0		81	60-130			
1,3,5-Trimethylbenzene	344	4.00	ug/Kg wet	400.0		86	60-130			
1,2,3-Trimethylbenzene	351	4.00	ug/Kg wet	400.0		88	60-130			
1,2,4-Trimethylbenzene	345	4.00	ug/Kg wet	400.0		86	60-130			
t-Butylbenzene	358	4.00	ug/Kg wet	400.0		90	60-130			
sec-Butylbenzene	343	4.00	ug/Kg wet	400.0		86	60-130			
p-Isopropyltoluene	354	4.00	ug/Kg wet	400.0		88	60-130			
n-Butylbenzene	315	4.00	ug/Kg wet	400.0		79	60-130			
trans-Decalin	329	4.00	ug/Kg wet	400.0		82	60-130			
cis-Decalin	332	4.00	ug/Kg wet	400.0		83	60-130			
Benzo(b)thiophene	313	4.00	ug/Kg wet	400.0		78	60-130			
Naphthalene	330	4.00	ug/Kg wet	400.0		83	60-130			
2-Methylnaphthalene	323	4.00	ug/Kg wet	400.0		81	60-130			
1-Methylnaphthalene	340	4.00	ug/Kg wet	400.0		85	60-130			
Biphenyl	315	4.00	ug/Kg wet	400.0		79	60-130			
Acenaphthylene	341	4.00	ug/Kg wet	400.0		85	60-130			
Acenaphthene	358	4.00	ug/Kg wet	400.0		89	60-130			
Dibenzofuran	321	4.00	ug/Kg wet	400.0		80	60-130			
Fluorene	345	4.00	ug/Kg wet	400.0		86	60-130			
Dibenzothiophene	329	4.00	ug/Kg wet	400.0		82	60-130			
Phenanthrene	348	4.00	ug/Kg wet	400.0		87	60-130			
Anthracene	300	4.00	ug/Kg wet	400.0		75	60-130			
Retene	379	4.00	ug/Kg wet	400.0		95	60-130			
Benzo(b)naphtho(2,1-d)thiophene	326	4.00	ug/Kg wet	400.0		82	60-130			
Fluoranthene	352	4.00	ug/Kg wet	400.0		88	60-130			
Pyrene	352	4.00	ug/Kg wet	400.0		88	60-130			
Benz(a)anthracene	297	4.00	ug/Kg wet	400.0		74	60-130			
Chrysene/triphenylene	331	4.00	ug/Kg wet	400.0		83	60-130			
Benzo(b)fluoranthene	264	4.00	ug/Kg wet	400.0		66	60-130			
Benzo(j/k)fluoranthene	276	4.00	ug/Kg wet	400.0		69	60-130			
Benzo(e)pyrene	270	4.00	ug/Kg wet	400.0		68	60-130			
Benzo(a)pyrene	240	4.00	ug/Kg wet	400.0		60	60-130			
Perylene	254	4.00	ug/Kg wet	400.0		64	60-130			
Indeno(1,2,3-cd)pyrene	269	4.00	ug/Kg wet	400.0		67	60-130			
Dibenzo(a,h)anthracene	289	4.00	ug/Kg wet	400.0		72	60-130			
Benzo(g,h,i)perylene	282	4.00	ug/Kg wet	400.0		71	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200017

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FC01601 - 3570							
Coronene	328	4.00	ug/Kg wet	400.0	82	60-130	
Tetraethyl lead	166	4.00	ug/Kg wet	400.0	42	60-130	B-
Pristane	437	4.00	ug/Kg wet	400.0	109	60-130	
Phytane	438	4.00	ug/Kg wet	400.0	110	60-130	
Surrogate: Toluene-D8	*323*		ug/Kg wet	*400.0*	*81*	*50-120*	
Surrogate: Naphthalene-d8	*364*		ug/Kg wet	*400.0*	*91*	*50-120*	
Surrogate: Phenanthrene-d10	*392*		ug/Kg wet	*400.0*	*98*	*50-120*	
Surrogate: Perylene-d12	*288*		ug/Kg wet	*400.0*	*72*	*50-120*	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200017

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FC02301 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	ND	4.00	ug/Kg wet							
C1-Benzene	ND	4.00	ug/Kg wet							
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	ND	4.00	ug/Kg wet							
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	ND	4.00	ug/Kg wet							
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200017

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FC02301 - 3570

C1-Fluorenes	ND	4.00	ug/Kg wet
C2-Fluorenes	ND	4.00	ug/Kg wet
C3-Fluorenes	ND	4.00	ug/Kg wet
Dibenzothiophene	ND	4.00	ug/Kg wet
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet
Phenanthrene	ND	4.00	ug/Kg wet
Anthracene	ND	4.00	ug/Kg wet
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
Retene	ND	4.00	ug/Kg wet
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
Fluoranthene	ND	4.00	ug/Kg wet
Pyrene	ND	4.00	ug/Kg wet
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
Benzo(b)fluorene	ND	4.00	ug/Kg wet
Benzo(c)fluorene	ND	4.00	ug/Kg wet
2-Methylpyrene	ND	4.00	ug/Kg wet
4-Methylpyrene	ND	4.00	ug/Kg wet
1-Methylpyrene	ND	4.00	ug/Kg wet
Benz(a)anthracene	ND	4.00	ug/Kg wet
Chrysene/triphenylene	ND	4.00	ug/Kg wet
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet
Benzo(e)pyrene	ND	4.00	ug/Kg wet
Benzo(a)pyrene	ND	4.00	ug/Kg wet
Perylene	ND	4.00	ug/Kg wet
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet
Coronene	ND	4.00	ug/Kg wet
Tetramethyl lead	ND	4.00	ug/Kg wet
Trimethylethyl lead	ND	4.00	ug/Kg wet

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200017

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FC02301 - 3570							
Dimethyldiethyl lead	ND	4.00	ug/Kg wet				
Methyltriethyl lead	ND	4.00	ug/Kg wet				
Tetraethyl lead	ND	4.00	ug/Kg wet				
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet				
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet				
2,6,10-trimethylpentadecane (1650)	2.79	4.00	ug/Kg wet				J
C-17	8.12	4.00	ug/Kg wet				
Pristane	6.28	4.00	ug/Kg wet				
C-18	7.58	4.00	ug/Kg wet				
Phytane	10.2	4.00	ug/Kg wet				
Carbazole	ND	4.00	ug/Kg wet				
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet				
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet				
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
3-Methylphenanthrene	ND	4.00	ug/Kg wet				
2-Methylphenanthrene	ND	4.00	ug/Kg wet				
2-Methylanthracene	ND	4.00	ug/Kg wet				
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet				
1-Methylphenanthrene	ND	4.00	ug/Kg wet				
Surrogate: Toluene-D8	*311*		ug/Kg wet	*400.0*	*78*	*50-120*	
Surrogate: Naphthalene-d8	*289*		ug/Kg wet	*400.0*	*72*	*50-120*	
Surrogate: Phenanthrene-d10	*303*		ug/Kg wet	*400.0*	*76*	*50-120*	
Surrogate: Perylene-d12	*248*		ug/Kg wet	*400.0*	*62*	*50-120*	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200017

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FC02301 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	266	4.00	ug/Kg wet	400.0		67	60-130			
Methylcyclohexane	217	4.00	ug/Kg wet	400.0		54	60-130			B-
Toluene	296	4.00	ug/Kg wet	400.0		74	60-130			
Ethylbenzene	310	4.00	ug/Kg wet	400.0		78	60-130			
m,p-Xylene	310	4.00	ug/Kg wet	400.0		78	60-130			
Styrene	330	4.00	ug/Kg wet	400.0		82	60-130			
o-Xylene	315	4.00	ug/Kg wet	400.0		79	60-130			
Isopropylbenzene	354	4.00	ug/Kg wet	400.0		88	60-130			
n-Propylbenzene	316	4.00	ug/Kg wet	400.0		79	60-130			
1,3,5-Trimethylbenzene	360	4.00	ug/Kg wet	400.0		90	60-130			
1,2,3-Trimethylbenzene	364	4.00	ug/Kg wet	400.0		91	60-130			
1,2,4-Trimethylbenzene	358	4.00	ug/Kg wet	400.0		90	60-130			
t-Butylbenzene	356	4.00	ug/Kg wet	400.0		89	60-130			
sec-Butylbenzene	360	4.00	ug/Kg wet	400.0		90	60-130			
p-Isopropyltoluene	357	4.00	ug/Kg wet	400.0		89	60-130			
n-Butylbenzene	321	4.00	ug/Kg wet	400.0		80	60-130			
trans-Decalin	329	4.00	ug/Kg wet	400.0		82	60-130			
cis-Decalin	330	4.00	ug/Kg wet	400.0		83	60-130			
Benzo(b)thiophene	313	4.00	ug/Kg wet	400.0		78	60-130			
Naphthalene	333	4.00	ug/Kg wet	400.0		83	60-130			
2-Methylnaphthalene	336	4.00	ug/Kg wet	400.0		84	60-130			
1-Methylnaphthalene	344	4.00	ug/Kg wet	400.0		86	60-130			
Biphenyl	348	4.00	ug/Kg wet	400.0		87	60-130			
Acenaphthylene	361	4.00	ug/Kg wet	400.0		90	60-130			
Acenaphthene	377	4.00	ug/Kg wet	400.0		94	60-130			
Dibenzofuran	323	4.00	ug/Kg wet	400.0		81	60-130			
Fluorene	347	4.00	ug/Kg wet	400.0		87	60-130			
Dibenzothiophene	334	4.00	ug/Kg wet	400.0		84	60-130			
Phenanthrene	349	4.00	ug/Kg wet	400.0		87	60-130			
Anthracene	317	4.00	ug/Kg wet	400.0		79	60-130			
Retene	314	4.00	ug/Kg wet	400.0		78	60-130			
Benzo(b)naphtho(2,1-d)thiophene	262	4.00	ug/Kg wet	400.0		66	60-130			
Fluoranthene	315	4.00	ug/Kg wet	400.0		79	60-130			
Pyrene	306	4.00	ug/Kg wet	400.0		77	60-130			
Benz(a)anthracene	281	4.00	ug/Kg wet	400.0		70	60-130			
Chrysene/triphenylene	282	4.00	ug/Kg wet	400.0		71	60-130			
Benzo(b)fluoranthene	266	4.00	ug/Kg wet	400.0		66	60-130			
Benzo(j/k)fluoranthene	274	4.00	ug/Kg wet	400.0		69	60-130			
Benzo(e)pyrene	272	4.00	ug/Kg wet	400.0		68	60-130			
Benzo(a)pyrene	268	4.00	ug/Kg wet	400.0		67	60-130			
Perylene	280	4.00	ug/Kg wet	400.0		70	60-130			
Indeno(1,2,3-cd)pyrene	291	4.00	ug/Kg wet	400.0		73	60-130			
Dibenzo(a,h)anthracene	309	4.00	ug/Kg wet	400.0		77	60-130			
Benzo(g,h,i)perylene	303	4.00	ug/Kg wet	400.0		76	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200017

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FC02301 - 3570							
Coronene	284	4.00	ug/Kg wet	400.0	71	60-130	
Tetraethyl lead	208	4.00	ug/Kg wet	400.0	52	60-130	B-
Pristane	442	4.00	ug/Kg wet	400.0	110	60-130	
Phytane	439	4.00	ug/Kg wet	400.0	110	60-130	
Surrogate: Toluene-D8	*336*		ug/Kg wet	*400.0*	*84*	*50-120*	
Surrogate: Naphthalene-d8	*374*		ug/Kg wet	*400.0*	*93*	*50-120*	
Surrogate: Phenanthrene-d10	*394*		ug/Kg wet	*400.0*	*99*	*50-120*	
Surrogate: Perylene-d12	*304*		ug/Kg wet	*400.0*	*76*	*50-120*	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200017

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FC03101 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	ND	4.00	ug/Kg wet							
C1-Benzene	ND	4.00	ug/Kg wet							
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	ND	4.00	ug/Kg wet							
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	ND	4.00	ug/Kg wet							
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200017

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FC03101 - 3570

C1-Fluorenes	ND	4.00	ug/Kg wet	
C2-Fluorenes	ND	4.00	ug/Kg wet	
C3-Fluorenes	ND	4.00	ug/Kg wet	
Dibenzothiophene	ND	4.00	ug/Kg wet	
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet	
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet	
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet	
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet	
Phenanthrene	ND	4.00	ug/Kg wet	
Anthracene	ND	4.00	ug/Kg wet	
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet	
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet	
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet	
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet	
Retene	ND	4.00	ug/Kg wet	
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet	
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet	
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet	
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet	
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet	
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet	
Fluoranthene	ND	4.00	ug/Kg wet	
Pyrene	ND	4.00	ug/Kg wet	
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet	
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet	
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet	
Benzo(b)fluorene	ND	4.00	ug/Kg wet	
Benzo(c)fluorene	ND	4.00	ug/Kg wet	
2-Methylpyrene	ND	4.00	ug/Kg wet	
4-Methylpyrene	ND	4.00	ug/Kg wet	
1-Methylpyrene	ND	4.00	ug/Kg wet	
Benz(a)anthracene	ND	4.00	ug/Kg wet	
Chrysene/triphenylene	ND	4.00	ug/Kg wet	
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet	
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet	
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet	
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet	
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet	
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet	
Benzo(e)pyrene	ND	4.00	ug/Kg wet	
Benzo(a)pyrene	ND	4.00	ug/Kg wet	
Perylene	ND	4.00	ug/Kg wet	
Indeno(1,2,3-cd)pyrene	2.01	4.00	ug/Kg wet	J
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet	
Benzo(g,h,i)perylene	3.56	4.00	ug/Kg wet	J
Coronene	69.2	4.00	ug/Kg wet	
Tetramethyl lead	ND	4.00	ug/Kg wet	
Trimethylethyl lead	ND	4.00	ug/Kg wet	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200017

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FC03101 - 3570							
Dimethyldiethyl lead	ND	4.00	ug/Kg wet				
Methyltriethyl lead	ND	4.00	ug/Kg wet				
Tetraethyl lead	ND	4.00	ug/Kg wet				
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet				
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet				
2,6,10-trimethylpentadecane (1650)	2.50	4.00	ug/Kg wet				J
C-17	8.37	4.00	ug/Kg wet				
Pristane	6.35	4.00	ug/Kg wet				
C-18	6.06	4.00	ug/Kg wet				
Phytane	9.69	4.00	ug/Kg wet				
Carbazole	ND	4.00	ug/Kg wet				
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet				
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet				
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
3-Methylphenanthrene	ND	4.00	ug/Kg wet				
2-Methylphenanthrene	ND	4.00	ug/Kg wet				
2-Methylanthracene	ND	4.00	ug/Kg wet				
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet				
1-Methylphenanthrene	ND	4.00	ug/Kg wet				
Surrogate: Toluene-D8	*352*		ug/Kg wet	*400.0*	*88*	*50-120*	
Surrogate: Naphthalene-d8	*340*		ug/Kg wet	*400.0*	*85*	*50-120*	
Surrogate: Phenanthrene-d10	*359*		ug/Kg wet	*400.0*	*90*	*50-120*	
Surrogate: Perylene-d12	*300*		ug/Kg wet	*400.0*	*75*	*50-150*	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200017

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FC03101 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	379	4.00	ug/Kg wet	400.0		95	60-130			
Methylcyclohexane	244	4.00	ug/Kg wet	400.0		61	60-130			
Toluene	334	4.00	ug/Kg wet	400.0		84	60-130			
Ethylbenzene	342	4.00	ug/Kg wet	400.0		85	60-130			
m,p-Xylene	341	4.00	ug/Kg wet	400.0		85	60-130			
Styrene	356	4.00	ug/Kg wet	400.0		89	60-130			
o-Xylene	344	4.00	ug/Kg wet	400.0		86	60-130			
Isopropylbenzene	385	4.00	ug/Kg wet	400.0		96	60-130			
n-Propylbenzene	340	4.00	ug/Kg wet	400.0		85	60-130			
1,3,5-Trimethylbenzene	388	4.00	ug/Kg wet	400.0		97	60-130			
1,2,3-Trimethylbenzene	388	4.00	ug/Kg wet	400.0		97	60-130			
1,2,4-Trimethylbenzene	384	4.00	ug/Kg wet	400.0		96	60-130			
t-Butylbenzene	384	4.00	ug/Kg wet	400.0		96	60-130			
sec-Butylbenzene	384	4.00	ug/Kg wet	400.0		96	60-130			
p-Isopropyltoluene	380	4.00	ug/Kg wet	400.0		95	60-130			
n-Butylbenzene	332	4.00	ug/Kg wet	400.0		83	60-130			
trans-Decalin	357	4.00	ug/Kg wet	400.0		89	60-130			
cis-Decalin	358	4.00	ug/Kg wet	400.0		89	60-130			
Benzo(b)thiophene	331	4.00	ug/Kg wet	400.0		83	60-130			
Naphthalene	352	4.00	ug/Kg wet	400.0		88	60-130			
2-Methylnaphthalene	353	4.00	ug/Kg wet	400.0		88	60-130			
1-Methylnaphthalene	363	4.00	ug/Kg wet	400.0		91	60-130			
Biphenyl	362	4.00	ug/Kg wet	400.0		90	60-130			
Acenaphthylene	378	4.00	ug/Kg wet	400.0		95	60-130			
Acenaphthene	397	4.00	ug/Kg wet	400.0		99	60-130			
Dibenzofuran	337	4.00	ug/Kg wet	400.0		84	60-130			
Fluorene	359	4.00	ug/Kg wet	400.0		90	60-130			
Dibenzothiophene	347	4.00	ug/Kg wet	400.0		87	60-130			
Phenanthrene	366	4.00	ug/Kg wet	400.0		91	60-130			
Anthracene	343	4.00	ug/Kg wet	400.0		86	60-130			
Retene	328	4.00	ug/Kg wet	400.0		82	60-130			
Benzo(b)naphtho(2,1-d)thiophene	283	4.00	ug/Kg wet	400.0		71	60-130			
Fluoranthene	326	4.00	ug/Kg wet	400.0		82	60-130			
Pyrene	321	4.00	ug/Kg wet	400.0		80	60-130			
Benz(a)anthracene	299	4.00	ug/Kg wet	400.0		75	60-130			
Chrysene/triphenylene	317	4.00	ug/Kg wet	400.0		79	60-130			
Benzo(b)fluoranthene	281	4.00	ug/Kg wet	400.0		70	60-130			
Benzo(j/k)fluoranthene	306	4.00	ug/Kg wet	400.0		77	60-130			
Benzo(e)pyrene	291	4.00	ug/Kg wet	400.0		73	60-130			
Benzo(a)pyrene	290	4.00	ug/Kg wet	400.0		72	60-130			
Perylene	302	4.00	ug/Kg wet	400.0		75	60-130			
Indeno(1,2,3-cd)pyrene	319	4.00	ug/Kg wet	400.0		80	60-130			
Dibenzo(a,h)anthracene	313	4.00	ug/Kg wet	400.0		78	60-130			
Benzo(g,h,i)perylene	319	4.00	ug/Kg wet	400.0		80	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200017

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FC03101 - 3570						
Coronene	271	4.00	ug/Kg wet	400.0	68	60-130
Tetraethyl lead	279	4.00	ug/Kg wet	400.0	70	60-130
Pristane	450	4.00	ug/Kg wet	400.0	112	60-130
Phytane	436	4.00	ug/Kg wet	400.0	109	60-130
Surrogate: Toluene-D8	*354*		ug/Kg wet	*400.0*	*88*	*50-120*
Surrogate: Naphthalene-d8	*354*		ug/Kg wet	*400.0*	*88*	*50-120*
Surrogate: Phenanthrene-d10	*364*		ug/Kg wet	*400.0*	*91*	*50-120*
Surrogate: Perylene-d12	*295*		ug/Kg wet	*400.0*	*74*	*50-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F200017

Notes and Definitions

U	Analyte included in the analysis, but not detected
S-	Surrogate recovery(ies) below lower control limit (S-).
J	Reported between MDL and MRL
H	Estimated value. Sample hold times were exceeded (H).
D	Diluted.
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
CD-	Continuing Calibration %Diff/Drift is below control limit (CD-).
B-	Blank Spike recovery is below lower control limit (B-).
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200017

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 2000482 | F2000D

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY REQUIRED -- (YES) NO

If Yes, Are MCP Analytical Methods Required? (YES) NO NA

Are Drinking Water Samples Submitted? YES (NO) NA

If Yes, Have Drinking Water Sampling Requirements Been Met? YES NO (NA)

Preservative

None | None

Sample Handling

Samples Field Filtered: YES NO (NA)

Sampled Shipped With Ice: (YES) NO

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Analysis: Parent and Alkylated MAHs & PAHs 8270**	Analysis: TOCs by Lloyd-Kahn	Sample Specific Remarks
1	1804576-SS765-S2	3/10/2020	1405	Soil	1	BFM	X	X	
2	1804576-SS769-S1	3/11/2020	921	Soil	1	BFM	X	X	
3	1804576-SS770-S2	3/11/2020	1003	Soil	1	BFM	X	X	
4	1804576-SS774-S2	3/11/2020	1057	Soil	1	BFM	X	X	
5	1804576-SS774-S3	3/11/2020	1102	Soil	1	BFM	X	X	
6	1804576-SS775-S2	3/11/2020	1250	Soil	1	BFM	X	X	
7	1804576-SS775-S3	3/11/2020	1256	Soil	1	BFM	X	X	
8	1804576-SS776-S1	3/11/2020	1401	Soil	1	BFM	X	X	
9	1804576-SS776-S3	3/11/2020	1416	Soil	1	BFM	X	X	
10	1804576-SS777-S2	3/11/2020	1450	Soil	1	BFM	X	X	
11	1804576-SS777-S3	3/11/2020	1459	Soil	1	BFM	X	X	
12	1804576-SS778-S2	3/11/2020	1536	Soil	1	BFM	X	X	
13	1804576-SS778-S3	3/11/2020	1543	Soil	1	BFM	X	X	
14	1804576-SS779-S1	3/11/2020	1601	Soil	1	BFM	X	X	

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

	Relinquished by: (signature)	Date:	Time:	Received by: (signature)
1.		3/12/20	1600	1. GEI Sample Fridge
2.	Relinquished by: (signature) 2. GEI Sample Fridge	3/13/20	1400	2.
3.	Relinquished by: (signature)	3/13/20	1400	3.
4.	Relinquished by: (signature)	3/13/20	1907	4.

Turnaround Time (Business days):

Normal __X__ Other ____

10-Day ____ 7-Day ____

5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

**Parent and Alkylated MAHs & PAHs (34) by GC/MS/SIM/SCAN

3.6

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 20C0482/F20017

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY REQUIRED -- (YES) NO

If Yes, Are MCP Analytical Methods Required? (YES) NO NA

Are Drinking Water Samples Submitted? YES (NO) NA

If Yes, Have Drinking Water Sampling Requirements Been Met? YES NO (NA)

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Preservative: None	Preservative: None	Analysis: Parent and Alkylated MAHs & PAHs 8270**	Analysis: TOCs by Lloyd-Kahn	Sample Specific Remarks
15	1804576-SS779-S2	3/11/2020	16:08	Soil	1	BFM			X	X	
16	1804576-SS780-S1	3/11/2020	16:31	Soil	1	BFM			X	X	
17	1804576-SS780-S2	3/11/2020	16:39	Soil	1	BFM			X	X	
18	1804576-SS781-S1	3/11/2020	15:01	Soil	1	BFM			X	X	
19	1804576-SS782-S2	3/11/2020	15:27	Soil	1	BFM			X	X	
20	1804576-SS781(R1)-S1	3/12/2020	8:59	Soil	1	BFM			X	X	

Sample Handling

Samples Field Filtered: YES NO (NA)

Sampled Shipped With Ice: (YES) NO

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1. Patrick Scott	03/12/20	16:00	1. GEI Sample Fridge
Relinquished by: (signature)	Date:	Time:	Received by: (signature)
2. GEI Sample Fridge	3/13/20	1400	2.
Relinquished by: (signature)	Date:	Time:	Received by: (signature)
3.	3/13/20	1400	3.
Relinquished by: (signature)	Date:	Time:	Received by: (signature)
4.	3/13/20	19:07	4.

Turnaround Time (Business days):

Normal __X__ Other ____

10-Day ____ 7-Day ____

5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

**Parent and Alkylated MAHs & PAHs (34) by GC/MS/SIM/SCAN

3.6

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

Shipped/Delivered Via: ESS Courier

ESS Project ID: 20C0482
Date Received: 3/13/2020
Project Due Date: 3/20/2020
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: ~~3.9~~ 3.6 Iced with: None
   3/13/20
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA
13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1	23845	Yes	N/A	Yes	4 oz. Jar	NP	
2	23846	Yes	N/A	Yes	4 oz. Jar	NP	
3	23847	Yes	N/A	Yes	4 oz. Jar	NP	
4	23848	Yes	N/A	Yes	4 oz. Jar	NP	
5	23849	Yes	N/A	Yes	4 oz. Jar	NP	
6	23850	Yes	N/A	Yes	4 oz. Jar	NP	
7	23851	Yes	N/A	Yes	4 oz. Jar	NP	
8	23852	Yes	N/A	Yes	4 oz. Jar	NP	
9	23853	Yes	N/A	Yes	4 oz. Jar	NP	
10	23854	Yes	N/A	Yes	4 oz. Jar	NP	
11	23855	Yes	N/A	Yes	4 oz. Jar	NP	
12	23856	Yes	N/A	Yes	4 oz. Jar	NP	
13	23857	Yes	N/A	Yes	4 oz. Jar	NP	
14	23858	Yes	N/A	Yes	4 oz. Jar	NP	
15	23859	Yes	N/A	Yes	4 oz. Jar	NP	
16	23860	Yes	N/A	Yes	4 oz. Jar	NP	
17	23861	Yes	N/A	Yes	4 oz. Jar	NP	

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

ESS Project ID: 20C0482
Date Received: 3/13/2020

18	23862	Yes	N/A	Yes	4 oz. Jar	NP
19	23863	Yes	N/A	Yes	4 oz. Jar	NP
20	23864	Yes	N/A	Yes	4 oz. Jar	NP

2nd Review

Were all containers scanned into storage/lab? Initials _____ Yes / No

Are barcode labels on correct containers? Yes / No

Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA

Are all Hex Chrome stickers attached? Yes / No / NA

Are all QC stickers attached? Yes / No / NA

Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: _____ Date & Time: 3/13/20 1010

Reviewed By: _____ Date & Time: 3/23/20 @ 10:20

Delivered By: _____

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: F200019

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 12:38 pm, Mar 31, 2020

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses
ESS Laboratory - Cranston, RI TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200019

SAMPLE RECEIPT

The following samples were received on March 22, 2020 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F200019-01	1804576-SS783-S1	Soil	8270 Mod, LK
F200019-02	1804576-SS783-S2	Soil	8270 Mod, LK
F200019-03	1804576-SS784-S1	Soil	8270 Mod, LK
F200019-04	1804576-SS784-S2	Soil	8270 Mod, LK
F200019-05	1804576-SS785-S1	Soil	8270 Mod, LK
F200019-06	1804576-SS785-S2	Soil	8270 Mod, LK
F200019-07	1804576-SS786-S2	Soil	8270 Mod, LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200019

PROJECT NARRATIVE

8270D (SIM) Semi-Volatile Organic Compounds

F0C0013-CCV3	**Continuing Calibration %Diff/Drift is above control limit (CD+).**
	Benzo(g,h,i)perylene (30% @ 25%), Dibenzo(a,h)anthracene (33% @ 25%), Indeno(1,2,3-cd)pyrene (34% @ 25%)
F200019-01	**Present in Method Blank (B).**
	C-17 , C-18
F200019-02	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , C-17 , C-18 , Phytane , Pristane
F200019-03	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , C-17 , C-18 , Phytane , Pristane
F200019-04	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , C-17 , C-18 , Phytane , Pristane
F200019-05	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , C-17 , C-18 , Phytane , Pristane
F200019-06	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , C-17 , C-18 , Phytane , Pristane
F200019-07	**Present in Method Blank (B).**
	2,6,10-trimethylpentadecane (1650) , C-17 , C-18 , Phytane , Pristane
FC01801-BS2	**Blank Spike recovery is below lower control limit (B-).**
	Methylcyclohexane (52% @ 60-130%), Tetraethyl lead (59% @ 60-130%)
FC01801-DUP2	**Relative percent difference for duplicate is outside of criteria (D+).**
	Coronene (84% @ 50%)

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200019

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS783-S1
Date Sampled: 03/16/20 10:37
Percent Solids: 50
Initial Volume: 5.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200019
ESS Laboratory Sample ID: F200019-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/18/20 6:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C1-Benzene	**217** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C2-Benzenes	**24.2** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C3-Benzenes	**28.4** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C4-Benzenes	**37.5** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C5-Benzenes	**31.3** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
Methylcyclohexane	ND (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
Toluene	**257** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
Ethylbenzene	**J 4.31** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
m,p-Xylene	**22.9** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
Styrene	ND (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
o-Xylene	**J 4.81** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
Isopropylbenzene	ND (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
n-Propylbenzene	ND (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
1,3,5-Trimethylbenzene	**J 4.47** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
1,2,3-Trimethylbenzene	**J 5.62** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
1,2,4-Trimethylbenzene	**17.7** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
t-Butylbenzene	ND (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
sec-Butylbenzene	ND (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
p-Isopropyltoluene	ND (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
n-Butylbenzene	ND (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
trans-Decalin	**190** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
cis-Decalin	**30.7** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C1-Decalins	**361** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C2-Decalins	**311** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C3-Decalins	**212** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C4-Decalins	**342** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
Benzo(b)thiophene	ND (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C1-Benzo(b)thiophenes	**J 6.88** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C2-Benzo(b)thiophenes	**17.4** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C3-Benzo(b)thiophenes	**15.9** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C4-Benzo(b)thiophenes	**12.0** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS783-S1
Date Sampled: 03/16/20 10:37
Percent Solids: 50
Initial Volume: 5.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200019
ESS Laboratory Sample ID: F200019-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/18/20 6:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**35.6** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
2-Methylnaphthalene	**30.0** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
1-Methylnaphthalene	**14.6** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C1-Naphthalenes	**28.0** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C2-Naphthalenes	**77.3** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C3-Naphthalenes	**144** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C4-Naphthalenes	**174** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
Biphenyl	**15.0** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
Acenaphthylene	**36.0** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
Acenaphthene	**31.1** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
Dibenzofuran	**23.9** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
Fluorene	**41.0** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C1-Fluorenes	**53.1** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C2-Fluorenes	**122** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C3-Fluorenes	**146** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
Dibenzothiophene	**31.4** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C1-Dibenzothiophenes	**85.2** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C2-Dibenzothiophenes	**155** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C3-Dibenzothiophenes	**156** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C4-Dibenzothiophenes	**96.5** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
Phenanthrene	**280** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
Anthracene	**65.7** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C1-Phenanthrenes/Anthracenes	**334** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C2-Phenanthrenes/Anthracenes	**348** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C3-Phenanthrenes/Anthracenes	**224** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C4-Phenanthrenes/Anthracenes	**134** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
Retene	**56.3** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
Benzo(b)naphtho(2,1-d)thiophene	**63.8** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C0-Benzonaphthothiophenes	**121** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C1-Benzonaphthothiophenes	**122** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C2-Benzonaphthothiophenes	**136** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C3-Benzonaphthothiophenes	**105** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS783-S1
Date Sampled: 03/16/20 10:37
Percent Solids: 50
Initial Volume: 5.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200019
ESS Laboratory Sample ID: F200019-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/18/20 6:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**52.7** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
Fluoranthene	**659** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
Pyrene	**765** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C1-Fluoranthenes/Pyrenes	**441** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C2-Fluoranthenes/Pyrenes	**268** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C3-Fluoranthenes/Pyrenes	**158** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
Benzo(b)fluorene	**45.5** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
Benzo(c)fluorene	**20.3** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
2-Methylpyrene	**63.8** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
4-Methylpyrene	**66.4** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
1-Methylpyrene	**47.0** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
Benz(a)anthracene	**319** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
Chrysene/triphenylene	**441** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C1-Benzo(a)anthracenes/Chrysenes	**312** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C2-Benzo(a)anthracenes/Chrysenes	**227** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C3-Benzo(a)anthracenes/Chrysenes	**141** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C4-Benzo(a)anthracenes/Chrysenes	**68.1** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
Benzo(b)fluoranthene	**329** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
Benzo(j/k)fluoranthene	**329** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
Benzo(e)pyrene	**299** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
Benzo(a)pyrene	**365** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
Perylene	**456** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
Indeno(1,2,3-cd)pyrene	**304** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
Dibenzo(a,h)anthracene	**60.3** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
Benzo(g,h,i)perylene	**261** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
Coronene	**79.6** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
Tetramethyl lead	ND (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
Trimethylethyl lead	ND (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
Dimethyldiethyl lead	ND (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
Methyltriethyl lead	ND (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
Tetraethyl lead	ND (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
2,6,10-trimethyldodecane (1380)	**504** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS783-S1
Date Sampled: 03/16/20 10:37
Percent Solids: 50
Initial Volume: 5.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200019
ESS Laboratory Sample ID: F200019-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/18/20 6:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**702** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
2,6,10-trimethylpentadecane (1650)	**509** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C-17	**B 194** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
Pristane	**1290** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
C-18	**B 94.8** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
Phytane	**1050** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
Carbazole	**15.2** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
2,6-Dimethylnaphthalene	**21.2** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
2,3,5-Trimethylnaphthene	**9.94** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
4-Methyldibenzothiophene	**38.5** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
2/3-Methyldibenzothiophene	**26.2** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
1-Methyldibenzothiophene	**10.3** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
3-Methylphenanthrene	**80.2** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
2-Methylphenanthrene	**87.9** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
2-Methylanthracene	**22.3** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
4/9-Methylphenanthrene	**87.7** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801
1-Methylphenanthrene	**52.7** (7.55)	3.78	8270 Mod		1	03/23/20 18:03	F0C0013	FC01801

	%Recovery	*Qualifier*	*Limits*
Surrogate: Toluene-D8	*72 %*		*50-120*
Surrogate: Naphthalene-d8	*78 %*		*50-120*
Surrogate: Phenanthrene-d10	*78 %*		*50-120*
Surrogate: Perylene-d12	*80 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS783-S1
Date Sampled: 03/16/20 10:37
Percent Solids: 50

ESS Laboratory Work Order: F200019
ESS Laboratory Sample ID: F200019-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**41700** (99.2)		LK		1	CCP	03/26/20 15:24	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS783-S2
Date Sampled: 03/16/20 10:44
Percent Solids: 75
Initial Volume: 5.41
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200019
ESS Laboratory Sample ID: F200019-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/18/20 6:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C1-Benzene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C2-Benzenes	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C3-Benzenes	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C4-Benzenes	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C5-Benzenes	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
Methylcyclohexane	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
Toluene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
Ethylbenzene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
m,p-Xylene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
Styrene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
o-Xylene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
Isopropylbenzene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
n-Propylbenzene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
1,3,5-Trimethylbenzene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
1,2,3-Trimethylbenzene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
1,2,4-Trimethylbenzene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
t-Butylbenzene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
sec-Butylbenzene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
p-Isopropyltoluene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
n-Butylbenzene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
trans-Decalin	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
cis-Decalin	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C1-Decalins	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C2-Decalins	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C3-Decalins	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C4-Decalins	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
Benzo(b)thiophene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C1-Benzo(b)thiophenes	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C2-Benzo(b)thiophenes	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C3-Benzo(b)thiophenes	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C4-Benzo(b)thiophenes	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS783-S2
Date Sampled: 03/16/20 10:44
Percent Solids: 75
Initial Volume: 5.41
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200019
ESS Laboratory Sample ID: F200019-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/18/20 6:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
2-Methylnaphthalene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
1-Methylnaphthalene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C1-Naphthalenes	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C2-Naphthalenes	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C3-Naphthalenes	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C4-Naphthalenes	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
Biphenyl	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
Acenaphthylene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
Acenaphthene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
Dibenzofuran	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
Fluorene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C1-Fluorenes	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C2-Fluorenes	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C3-Fluorenes	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
Dibenzothiophene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C1-Dibenzothiophenes	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C2-Dibenzothiophenes	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C3-Dibenzothiophenes	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C4-Dibenzothiophenes	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
Phenanthrene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
Anthracene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C1-Phenanthrenes/Anthracenes	**J 3.07** (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C2-Phenanthrenes/Anthracenes	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C3-Phenanthrenes/Anthracenes	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C4-Phenanthrenes/Anthracenes	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
Retene	**12.0** (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
Benzo(b)naphtho(2,1-d)thiophene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C0-Benzonaphthothiophenes	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C1-Benzonaphthothiophenes	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C2-Benzonaphthothiophenes	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C3-Benzonaphthothiophenes	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS783-S2
Date Sampled: 03/16/20 10:44
Percent Solids: 75
Initial Volume: 5.41
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200019
ESS Laboratory Sample ID: F200019-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/18/20 6:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
Fluoranthene	**J 3.70** (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
Pyrene	**J 4.17** (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C1-Fluoranthenes/Pyrenes	**J 4.37** (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C2-Fluoranthenes/Pyrenes	**J 2.68** (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C3-Fluoranthenes/Pyrenes	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
Benzo(b)fluorene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
Benzo(c)fluorene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
2-Methylpyrene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
4-Methylpyrene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
1-Methylpyrene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
Benz(a)anthracene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
Chrysene/triphenylene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C1-Benzo(a)anthracenes/Chrysenes	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C2-Benzo(a)anthracenes/Chrysenes	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C3-Benzo(a)anthracenes/Chrysenes	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C4-Benzo(a)anthracenes/Chrysenes	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
Benzo(b)fluoranthene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
Benzo(j/k)fluoranthene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
Benzo(e)pyrene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
Benzo(a)pyrene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
Perylene	**826** (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
Indeno(1,2,3-cd)pyrene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
Dibenzo(a,h)anthracene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
Benzo(g,h,i)perylene	**J 2.70** (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
Coronene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
Tetramethyl lead	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
Trimethylethyl lead	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
Dimethyldiethyl lead	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
Methyltriethyl lead	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
Tetraethyl lead	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
2,6,10-trimethyldodecane (1380)	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS783-S2
Date Sampled: 03/16/20 10:44
Percent Solids: 75
Initial Volume: 5.41
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200019
ESS Laboratory Sample ID: F200019-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/18/20 6:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**J 3.26** (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
2,6,10-trimethylpentadecane (1650)	**B 10.4** (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C-17	**B 55.2** (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
Pristane	**B 28.6** (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
C-18	**B 33.4** (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
Phytane	**B 38.6** (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
Carbazole	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
2,6-Dimethylnaphthalene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
2,3,5-Trimethylnaphthene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
4-Methyldibenzothiophene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
2/3-Methyldibenzothiophene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
1-Methyldibenzothiophene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
3-Methylphenanthrene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
2-Methylphenanthrene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
2-Methylanthracene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
4/9-Methylphenanthrene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801
1-Methylphenanthrene	ND (4.92)	2.46	8270 Mod		1	03/23/20 19:26	F0C0013	FC01801

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*73 %*		*50-120*
Surrogate: Naphthalene-d8	*75 %*		*50-120*
Surrogate: Phenanthrene-d10	*80 %*		*50-120*
Surrogate: Perylene-d12	*68 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS783-S2
Date Sampled: 03/16/20 10:44
Percent Solids: 75

ESS Laboratory Work Order: F200019
ESS Laboratory Sample ID: F200019-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**19900** (96.3)		LK		1	CCP	03/26/20 16:14	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS784-S1
Date Sampled: 03/16/20 11:01
Percent Solids: 56
Initial Volume: 5.28
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200019
ESS Laboratory Sample ID: F200019-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/18/20 6:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C1-Benzene	**112** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C2-Benzenes	**21.8** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C3-Benzenes	**18.4** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C4-Benzenes	**24.2** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C5-Benzenes	**20.8** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
Methylcyclohexane	**J 5.91** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
Toluene	**136** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
Ethylbenzene	**J 5.08** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
m,p-Xylene	**20.9** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
Styrene	**J 4.66** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
o-Xylene	**J 4.05** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
Isopropylbenzene	ND (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
n-Propylbenzene	ND (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
1,3,5-Trimethylbenzene	ND (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
1,2,3-Trimethylbenzene	ND (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
1,2,4-Trimethylbenzene	**7.89** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
t-Butylbenzene	ND (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
sec-Butylbenzene	ND (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
p-Isopropyltoluene	ND (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
n-Butylbenzene	ND (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
trans-Decalin	**69.9** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
cis-Decalin	**J 6.14** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C1-Decalins	**87.8** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C2-Decalins	**80.9** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C3-Decalins	**58.0** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C4-Decalins	**104** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
Benzo(b)thiophene	ND (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C1-Benzo(b)thiophenes	**J 4.96** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C2-Benzo(b)thiophenes	**9.38** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C3-Benzo(b)thiophenes	**13.1** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C4-Benzo(b)thiophenes	**J 6.63** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS784-S1
Date Sampled: 03/16/20 11:01
Percent Solids: 56
Initial Volume: 5.28
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200019
ESS Laboratory Sample ID: F200019-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/18/20 6:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**33.6** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
2-Methylnaphthalene	**23.3** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
1-Methylnaphthalene	**13.1** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C1-Naphthalenes	**22.5** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C2-Naphthalenes	**53.3** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C3-Naphthalenes	**76.6** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C4-Naphthalenes	**68.2** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
Biphenyl	**10.4** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
Acenaphthylene	**63.3** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
Acenaphthene	**44.1** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
Dibenzofuran	**19.2** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
Fluorene	**51.7** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C1-Fluorenes	**41.2** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C2-Fluorenes	**66.7** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C3-Fluorenes	**83.8** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
Dibenzothiophene	**37.4** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C1-Dibenzothiophenes	**61.1** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C2-Dibenzothiophenes	**89.5** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C3-Dibenzothiophenes	**85.4** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C4-Dibenzothiophenes	**65.4** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
Phenanthrene	**406** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
Anthracene	**175** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C1-Phenanthrenes/Anthracenes	**325** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C2-Phenanthrenes/Anthracenes	**256** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C3-Phenanthrenes/Anthracenes	**149** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C4-Phenanthrenes/Anthracenes	**89.1** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
Retene	**41.1** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
Benzo(b)naphtho(2,1-d)thiophene	**92.6** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C0-Benzonaphthothiophenes	**177** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C1-Benzonaphthothiophenes	**128** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C2-Benzonaphthothiophenes	**123** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C3-Benzonaphthothiophenes	**106** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS784-S1
Date Sampled: 03/16/20 11:01
Percent Solids: 56
Initial Volume: 5.28
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200019
ESS Laboratory Sample ID: F200019-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/18/20 6:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**52.0** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
Fluoranthene	**1110** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
Pyrene	**1290** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C1-Fluoranthenes/Pyrenes	**627** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C2-Fluoranthenes/Pyrenes	**329** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C3-Fluoranthenes/Pyrenes	**168** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
Benzo(b)fluorene	**68.9** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
Benzo(c)fluorene	**32.5** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
2-Methylpyrene	**91.5** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
4-Methylpyrene	**87.4** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
1-Methylpyrene	**69.7** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
Benz(a)anthracene	**637** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
Chrysene/triphenylene	**682** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C1-Benzo(a)anthracenes/Chrysenes	**415** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C2-Benzo(a)anthracenes/Chrysenes	**248** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C3-Benzo(a)anthracenes/Chrysenes	**131** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C4-Benzo(a)anthracenes/Chrysenes	**69.1** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
Benzo(b)fluoranthene	**535** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
Benzo(j/k)fluoranthene	**527** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
Benzo(e)pyrene	**498** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
Benzo(a)pyrene	**710** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
Perylene	**317** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
Indeno(1,2,3-cd)pyrene	**562** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
Dibenzo(a,h)anthracene	**110** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
Benzo(g,h,i)perylene	**487** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
Coronene	**141** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
Tetramethyl lead	ND (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
Trimethylethyl lead	ND (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
Dimethyldiethyl lead	ND (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
Methyltriethyl lead	ND (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
Tetraethyl lead	ND (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
2,6,10-trimethyldodecane (1380)	**65.4** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS784-S1
Date Sampled: 03/16/20 11:01
Percent Solids: 56
Initial Volume: 5.28
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200019
ESS Laboratory Sample ID: F200019-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/18/20 6:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**138** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
2,6,10-trimethylpentadecane (1650)	**B 97.7** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C-17	**B 102** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
Pristane	**B 246** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
C-18	**B 75.9** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
Phytane	**B 247** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
Carbazole	**26.7** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
2,6-Dimethylnaphthalene	**13.9** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
2,3,5-Trimethylnaphthene	**J 5.36** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
4-Methyldibenzothiophene	**23.5** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
2/3-Methyldibenzothiophene	**18.6** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
1-Methyldibenzothiophene	**7.49** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
3-Methylphenanthrene	**80.0** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
2-Methylphenanthrene	**79.6** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
2-Methylanthracene	**37.4** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
4/9-Methylphenanthrene	**87.2** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801
1-Methylphenanthrene	**48.7** (6.76)	3.38	8270 Mod		1	03/23/20 20:48	F0C0013	FC01801

	%Recovery	*Qualifier*	*Limits*
Surrogate: Toluene-D8	*66 %*		*50-120*
Surrogate: Naphthalene-d8	*71 %*		*50-120*
Surrogate: Phenanthrene-d10	*73 %*		*50-120*
Surrogate: Perylene-d12	*74 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS784-S1
Date Sampled: 03/16/20 11:01
Percent Solids: 56

ESS Laboratory Work Order: F200019
ESS Laboratory Sample ID: F200019-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**36500** (96.2)		LK		1	CCP	03/26/20 17:20	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS784-S2
Date Sampled: 03/16/20 11:09
Percent Solids: 75
Initial Volume: 5.16
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200019
ESS Laboratory Sample ID: F200019-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/18/20 6:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C1-Benzene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C2-Benzenes	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C3-Benzenes	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C4-Benzenes	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C5-Benzenes	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
Methylcyclohexane	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
Toluene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
Ethylbenzene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
m,p-Xylene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
Styrene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
o-Xylene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
Isopropylbenzene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
n-Propylbenzene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
1,3,5-Trimethylbenzene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
1,2,3-Trimethylbenzene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
1,2,4-Trimethylbenzene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
t-Butylbenzene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
sec-Butylbenzene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
p-Isopropyltoluene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
n-Butylbenzene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
trans-Decalin	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
cis-Decalin	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C1-Decalins	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C2-Decalins	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C3-Decalins	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C4-Decalins	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
Benzo(b)thiophene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C1-Benzo(b)thiophenes	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C2-Benzo(b)thiophenes	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C3-Benzo(b)thiophenes	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C4-Benzo(b)thiophenes	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS784-S2
Date Sampled: 03/16/20 11:09
Percent Solids: 75
Initial Volume: 5.16
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200019
ESS Laboratory Sample ID: F200019-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/18/20 6:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
2-Methylnaphthalene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
1-Methylnaphthalene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C1-Naphthalenes	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C2-Naphthalenes	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C3-Naphthalenes	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C4-Naphthalenes	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
Biphenyl	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
Acenaphthylene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
Acenaphthene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
Dibenzofuran	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
Fluorene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C1-Fluorenes	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C2-Fluorenes	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C3-Fluorenes	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
Dibenzothiophene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C1-Dibenzothiophenes	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C2-Dibenzothiophenes	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C3-Dibenzothiophenes	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C4-Dibenzothiophenes	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
Phenanthrene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
Anthracene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C1-Phenanthrenes/Anthracenes	**J 2.67** (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C2-Phenanthrenes/Anthracenes	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C3-Phenanthrenes/Anthracenes	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C4-Phenanthrenes/Anthracenes	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
Retene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
Benzo(b)naphtho(2,1-d)thiophene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C0-Benzonaphthothiophenes	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C1-Benzonaphthothiophenes	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C2-Benzonaphthothiophenes	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C3-Benzonaphthothiophenes	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS784-S2
Date Sampled: 03/16/20 11:09
Percent Solids: 75
Initial Volume: 5.16
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200019
ESS Laboratory Sample ID: F200019-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/18/20 6:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
Fluoranthene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
Pyrene	**J 3.43** (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C1-Fluoranthenes/Pyrenes	**J 2.61** (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C2-Fluoranthenes/Pyrenes	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C3-Fluoranthenes/Pyrenes	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
Benzo(b)fluorene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
Benzo(c)fluorene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
2-Methylpyrene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
4-Methylpyrene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
1-Methylpyrene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
Benz(a)anthracene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
Chrysene/triphenylene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C1-Benzo(a)anthracenes/Chrysenes	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C2-Benzo(a)anthracenes/Chrysenes	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C3-Benzo(a)anthracenes/Chrysenes	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C4-Benzo(a)anthracenes/Chrysenes	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
Benzo(b)fluoranthene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
Benzo(j/k)fluoranthene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
Benzo(e)pyrene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
Benzo(a)pyrene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
Perylene	**160** (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
Indeno(1,2,3-cd)pyrene	**J 3.18** (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
Dibenzo(a,h)anthracene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
Benzo(g,h,i)perylene	**J 3.83** (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
Coronene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
Tetramethyl lead	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
Trimethylethyl lead	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
Dimethyldiethyl lead	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
Methyltriethyl lead	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
Tetraethyl lead	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
2,6,10-trimethyldodecane (1380)	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS784-S2
Date Sampled: 03/16/20 11:09
Percent Solids: 75
Initial Volume: 5.16
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200019
ESS Laboratory Sample ID: F200019-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/18/20 6:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	J **3.17** (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
2,6,10-trimethylpentadecane (1650)	B **7.77** (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C-17	B **36.9** (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
Pristane	B **23.0** (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
C-18	B **24.5** (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
Phytane	B **32.4** (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
Carbazole	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
2,6-Dimethylnaphthalene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
2,3,5-Trimethylnaphthene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
4-Methyldibenzothiophene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
2/3-Methyldibenzothiophene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
1-Methyldibenzothiophene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
3-Methylphenanthrene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
2-Methylphenanthrene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
2-Methylanthracene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
4/9-Methylphenanthrene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801
1-Methylphenanthrene	ND (5.16)	2.58	8270 Mod		1	03/23/20 22:11	F0C0013	FC01801

	%Recovery	*Qualifier*	*Limits*
Surrogate: Toluene-D8	*66 %*		*50-120*
Surrogate: Naphthalene-d8	*71 %*		*50-120*
Surrogate: Phenanthrene-d10	*75 %*		*50-120*
Surrogate: Perylene-d12	*57 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS784-S2
Date Sampled: 03/16/20 11:09
Percent Solids: 75

ESS Laboratory Work Order: F200019
ESS Laboratory Sample ID: F200019-04
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**9450** (96.1)		LK		1	CCP	03/26/20 17:37	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS785-S1
Date Sampled: 03/16/20 11:36
Percent Solids: 62
Initial Volume: 5.37
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200019
ESS Laboratory Sample ID: F200019-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/18/20 6:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C1-Benzene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C2-Benzenes	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C3-Benzenes	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C4-Benzenes	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C5-Benzenes	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
Methylcyclohexane	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
Toluene	**J 3.20** (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
Ethylbenzene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
m,p-Xylene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
Styrene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
o-Xylene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
Isopropylbenzene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
n-Propylbenzene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
1,3,5-Trimethylbenzene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
1,2,3-Trimethylbenzene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
1,2,4-Trimethylbenzene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
t-Butylbenzene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
sec-Butylbenzene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
p-Isopropyltoluene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
n-Butylbenzene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
trans-Decalin	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
cis-Decalin	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C1-Decalins	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C2-Decalins	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C3-Decalins	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C4-Decalins	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
Benzo(b)thiophene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C1-Benzo(b)thiophenes	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C2-Benzo(b)thiophenes	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C3-Benzo(b)thiophenes	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C4-Benzo(b)thiophenes	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS785-S1
Date Sampled: 03/16/20 11:36
Percent Solids: 62
Initial Volume: 5.37
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200019
ESS Laboratory Sample ID: F200019-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/18/20 6:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
2-Methylnaphthalene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
1-Methylnaphthalene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C1-Naphthalenes	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C2-Naphthalenes	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C3-Naphthalenes	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C4-Naphthalenes	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
Biphenyl	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
Acenaphthylene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
Acenaphthene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
Dibenzofuran	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
Fluorene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C1-Fluorenes	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C2-Fluorenes	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C3-Fluorenes	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
Dibenzothiophene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C1-Dibenzothiophenes	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C2-Dibenzothiophenes	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C3-Dibenzothiophenes	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C4-Dibenzothiophenes	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
Phenanthrene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
Anthracene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C1-Phenanthrenes/Anthracenes	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C2-Phenanthrenes/Anthracenes	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C3-Phenanthrenes/Anthracenes	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C4-Phenanthrenes/Anthracenes	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
Retene	**125** (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
Benzo(b)naphtho(2,1-d)thiophene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C0-Benzonaphthothiophenes	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C1-Benzonaphthothiophenes	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C2-Benzonaphthothiophenes	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C3-Benzonaphthothiophenes	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS785-S1
Date Sampled: 03/16/20 11:36
Percent Solids: 62
Initial Volume: 5.37
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200019
ESS Laboratory Sample ID: F200019-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/18/20 6:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
Fluoranthene	**J 5.60** (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
Pyrene	**J 3.64** (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C1-Fluoranthenes/Pyrenes	**J 4.72** (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C2-Fluoranthenes/Pyrenes	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C3-Fluoranthenes/Pyrenes	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
Benzo(b)fluorene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
Benzo(c)fluorene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
2-Methylpyrene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
4-Methylpyrene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
1-Methylpyrene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
Benz(a)anthracene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
Chrysene/triphenylene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C1-Benzo(a)anthracenes/Chrysenes	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C2-Benzo(a)anthracenes/Chrysenes	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C3-Benzo(a)anthracenes/Chrysenes	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C4-Benzo(a)anthracenes/Chrysenes	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
Benzo(b)fluoranthene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
Benzo(j/k)fluoranthene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
Benzo(e)pyrene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
Benzo(a)pyrene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
Perylene	**789** (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
Indeno(1,2,3-cd)pyrene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
Dibenzo(a,h)anthracene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
Benzo(g,h,i)perylene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
Coronene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
Tetramethyl lead	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
Trimethylethyl lead	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
Dimethyldiethyl lead	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
Methyltriethyl lead	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
Tetraethyl lead	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
2,6,10-trimethyldodecane (1380)	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS785-S1
Date Sampled: 03/16/20 11:36
Percent Solids: 62
Initial Volume: 5.37
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200019
ESS Laboratory Sample ID: F200019-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/18/20 6:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**J 4.06** (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
2,6,10-trimethylpentadecane (1650)	**B 13.8** (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C-17	**B 87.7** (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
Pristane	**B 34.4** (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
C-18	**B 39.4** (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
Phytane	**B 49.7** (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
Carbazole	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
2,6-Dimethylnaphthalene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
2,3,5-Trimethylnaphthene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
4-Methyldibenzothiophene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
2/3-Methyldibenzothiophene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
1-Methyldibenzothiophene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
3-Methylphenanthrene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
2-Methylphenanthrene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
2-Methylanthracene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
4/9-Methylphenanthrene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801
1-Methylphenanthrene	ND (6.05)	3.02	8270 Mod		1	03/23/20 23:34	F0C0013	FC01801

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*70 %*		*50-120*
Surrogate: Naphthalene-d8	*75 %*		*50-120*
Surrogate: Phenanthrene-d10	*76 %*		*50-120*
Surrogate: Perylene-d12	*55 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS785-S1
Date Sampled: 03/16/20 11:36
Percent Solids: 62

ESS Laboratory Work Order: F200019
ESS Laboratory Sample ID: F200019-05
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**26400** (93.4)		LK		1	CCP	03/26/20 17:53	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS785-S2
Date Sampled: 03/16/20 11:41
Percent Solids: 61
Initial Volume: 5.18
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200019
ESS Laboratory Sample ID: F200019-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/18/20 6:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C1-Benzene	**J 3.34** (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C2-Benzenes	**J 3.71** (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C3-Benzenes	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C4-Benzenes	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C5-Benzenes	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
Methylcyclohexane	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
Toluene	**J 4.98** (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
Ethylbenzene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
m,p-Xylene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
Styrene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
o-Xylene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
Isopropylbenzene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
n-Propylbenzene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
1,3,5-Trimethylbenzene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
1,2,3-Trimethylbenzene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
1,2,4-Trimethylbenzene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
t-Butylbenzene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
sec-Butylbenzene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
p-Isopropyltoluene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
n-Butylbenzene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
trans-Decalin	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
cis-Decalin	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C1-Decalins	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C2-Decalins	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C3-Decalins	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C4-Decalins	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
Benzo(b)thiophene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C1-Benzo(b)thiophenes	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C2-Benzo(b)thiophenes	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C3-Benzo(b)thiophenes	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C4-Benzo(b)thiophenes	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS785-S2
Date Sampled: 03/16/20 11:41
Percent Solids: 61
Initial Volume: 5.18
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200019
ESS Laboratory Sample ID: F200019-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/18/20 6:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
2-Methylnaphthalene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
1-Methylnaphthalene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C1-Naphthalenes	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C2-Naphthalenes	**J 3.51** (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C3-Naphthalenes	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C4-Naphthalenes	**J 3.59** (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
Biphenyl	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
Acenaphthylene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
Acenaphthene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
Dibenzofuran	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
Fluorene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C1-Fluorenes	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C2-Fluorenes	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C3-Fluorenes	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
Dibenzothiophene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C1-Dibenzothiophenes	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C2-Dibenzothiophenes	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C3-Dibenzothiophenes	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C4-Dibenzothiophenes	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
Phenanthrene	**8.25** (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
Anthracene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C1-Phenanthrenes/Anthracenes	**6.94** (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C2-Phenanthrenes/Anthracenes	**J 4.00** (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C3-Phenanthrenes/Anthracenes	**J 4.40** (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C4-Phenanthrenes/Anthracenes	**10.0** (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
Retene	**24.2** (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
Benzo(b)naphtho(2,1-d)thiophene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C0-Benzonaphthothiophenes	**J 3.19** (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C1-Benzonaphthothiophenes	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C2-Benzonaphthothiophenes	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C3-Benzonaphthothiophenes	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS785-S2
Date Sampled: 03/16/20 11:41
Percent Solids: 61
Initial Volume: 5.18
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200019
ESS Laboratory Sample ID: F200019-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/18/20 6:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
Fluoranthene	**20.5** (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
Pyrene	**20.4** (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C1-Fluoranthenes/Pyrenes	**9.37** (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C2-Fluoranthenes/Pyrenes	**J 6.01** (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C3-Fluoranthenes/Pyrenes	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
Benzo(b)fluorene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
Benzo(c)fluorene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
2-Methylpyrene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
4-Methylpyrene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
1-Methylpyrene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
Benz(a)anthracene	**8.10** (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
Chrysene/triphenylene	**10.2** (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C1-Benzo(a)anthracenes/Chrysenes	**J 5.58** (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C2-Benzo(a)anthracenes/Chrysenes	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C3-Benzo(a)anthracenes/Chrysenes	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C4-Benzo(a)anthracenes/Chrysenes	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
Benzo(b)fluoranthene	**7.77** (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
Benzo(j/k)fluoranthene	**8.05** (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
Benzo(e)pyrene	**7.70** (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
Benzo(a)pyrene	**8.22** (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
Perylene	**250** (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
Indeno(1,2,3-cd)pyrene	**8.34** (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
Dibenzo(a,h)anthracene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
Benzo(g,h,i)perylene	**7.83** (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
Coronene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
Tetramethyl lead	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
Trimethylethyl lead	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
Dimethyldiethyl lead	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
Methyltriethyl lead	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
Tetraethyl lead	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
2,6,10-trimethyldodecane (1380)	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS785-S2
Date Sampled: 03/16/20 11:41
Percent Solids: 61
Initial Volume: 5.18
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200019
ESS Laboratory Sample ID: F200019-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/18/20 6:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**J 6.30** (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
2,6,10-trimethylpentadecane (1650)	**B 17.3** (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C-17	**B 81.8** (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
Pristane	**B 49.1** (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
C-18	**B 60.3** (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
Phytane	**B 67.3** (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
Carbazole	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
2,6-Dimethylnaphthalene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
2,3,5-Trimethylnaphthene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
4-Methyldibenzothiophene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
2/3-Methyldibenzothiophene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
1-Methyldibenzothiophene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
3-Methylphenanthrene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
2-Methylphenanthrene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
2-Methylanthracene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
4/9-Methylphenanthrene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801
1-Methylphenanthrene	ND (6.34)	3.17	8270 Mod		1	03/24/20 0:56	F0C0013	FC01801

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*66 %*		*50-120*
Surrogate: Naphthalene-d8	*72 %*		*50-120*
Surrogate: Phenanthrene-d10	*77 %*		*50-120*
Surrogate: Perylene-d12	*59 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS785-S2
Date Sampled: 03/16/20 11:41
Percent Solids: 61

ESS Laboratory Work Order: F200019
ESS Laboratory Sample ID: F200019-06
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**31100** (93.5)		LK		1	CCP	03/26/20 18:10	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS786-S2
Date Sampled: 03/16/20 12:05
Percent Solids: 60
Initial Volume: 5.32
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200019
ESS Laboratory Sample ID: F200019-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/18/20 6:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C1-Benzene	**J 3.40** (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C2-Benzenes	**J 4.31** (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C3-Benzenes	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C4-Benzenes	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C5-Benzenes	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
Methylcyclohexane	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
Toluene	**J 4.22** (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
Ethylbenzene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
m,p-Xylene	**J 3.26** (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
Styrene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
o-Xylene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
Isopropylbenzene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
n-Propylbenzene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
1,3,5-Trimethylbenzene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
1,2,3-Trimethylbenzene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
1,2,4-Trimethylbenzene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
t-Butylbenzene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
sec-Butylbenzene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
p-Isopropyltoluene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
n-Butylbenzene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
trans-Decalin	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
cis-Decalin	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C1-Decalins	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C2-Decalins	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C3-Decalins	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C4-Decalins	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
Benzo(b)thiophene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C1-Benzo(b)thiophenes	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C2-Benzo(b)thiophenes	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C3-Benzo(b)thiophenes	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C4-Benzo(b)thiophenes	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS786-S2
Date Sampled: 03/16/20 12:05
Percent Solids: 60
Initial Volume: 5.32
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200019
ESS Laboratory Sample ID: F200019-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/18/20 6:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
2-Methylnaphthalene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
1-Methylnaphthalene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C1-Naphthalenes	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C2-Naphthalenes	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C3-Naphthalenes	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C4-Naphthalenes	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
Biphenyl	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
Acenaphthylene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
Acenaphthene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
Dibenzofuran	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
Fluorene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C1-Fluorenes	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C2-Fluorenes	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C3-Fluorenes	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
Dibenzothiophene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C1-Dibenzothiophenes	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C2-Dibenzothiophenes	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C3-Dibenzothiophenes	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C4-Dibenzothiophenes	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
Phenanthrene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
Anthracene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C1-Phenanthrenes/Anthracenes	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C2-Phenanthrenes/Anthracenes	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C3-Phenanthrenes/Anthracenes	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C4-Phenanthrenes/Anthracenes	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
Retene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
Benzo(b)naphtho(2,1-d)thiophene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C0-Benzonaphthothiophenes	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C1-Benzonaphthothiophenes	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C2-Benzonaphthothiophenes	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C3-Benzonaphthothiophenes	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS786-S2
Date Sampled: 03/16/20 12:05
Percent Solids: 60
Initial Volume: 5.32
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200019
ESS Laboratory Sample ID: F200019-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/18/20 6:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
Fluoranthene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
Pyrene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C1-Fluoranthenes/Pyrenes	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C2-Fluoranthenes/Pyrenes	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C3-Fluoranthenes/Pyrenes	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
Benzo(b)fluorene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
Benzo(c)fluorene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
2-Methylpyrene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
4-Methylpyrene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
1-Methylpyrene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
Benz(a)anthracene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
Chrysene/triphenylene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C1-Benzo(a)anthracenes/Chrysenes	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C2-Benzo(a)anthracenes/Chrysenes	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C3-Benzo(a)anthracenes/Chrysenes	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C4-Benzo(a)anthracenes/Chrysenes	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
Benzo(b)fluoranthene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
Benzo(j/k)fluoranthene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
Benzo(e)pyrene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
Benzo(a)pyrene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
Perylene	**336** (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
Indeno(1,2,3-cd)pyrene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
Dibenzo(a,h)anthracene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
Benzo(g,h,i)perylene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
Coronene	**15.8** (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
Tetramethyl lead	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
Trimethylethyl lead	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
Dimethyldiethyl lead	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
Methyltriethyl lead	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
Tetraethyl lead	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
2,6,10-trimethyldodecane (1380)	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS786-S2
Date Sampled: 03/16/20 12:05
Percent Solids: 60
Initial Volume: 5.32
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200019
ESS Laboratory Sample ID: F200019-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 3/18/20 6:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**J 4.02** (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
2,6,10-trimethylpentadecane (1650)	**B 11.9** (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C-17	**B 94.3** (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
Pristane	**B 29.5** (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
C-18	**B 38.5** (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
Phytane	**B 49.4** (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
Carbazole	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
2,6-Dimethylnaphthalene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
2,3,5-Trimethylnaphthene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
4-Methyldibenzothiophene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
2/3-Methyldibenzothiophene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
1-Methyldibenzothiophene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
3-Methylphenanthrene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
2-Methylphenanthrene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
2-Methylanthracene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
4/9-Methylphenanthrene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801
1-Methylphenanthrene	ND (6.26)	3.13	8270 Mod		1	03/24/20 6:25	F0C0013	FC01801

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*66 %*		*50-120*
Surrogate: Naphthalene-d8	*72 %*		*50-120*
Surrogate: Phenanthrene-d10	*75 %*		*50-120*
Surrogate: Perylene-d12	*64 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS786-S2
Date Sampled: 03/16/20 12:05
Percent Solids: 60

ESS Laboratory Work Order: F200019
ESS Laboratory Sample ID: F200019-07
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**36100** (93.2)		LK		1	CCP	03/26/20 18:27	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200019

Quality Control Data

Classical Chemistry

Batch DC02449 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	100	mg/kg							
Total Organic Carbon (2)	ND	100	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200019

Quality Control Data

Classical Chemistry

Batch DC02449 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9990	100	mg/kg	10000		100	80-120			
Total Organic Carbon (2)	10400	100	mg/kg	10000		104	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200019

Quality Control Data

Classical Chemistry

Batch DC02449 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9770	100	mg/kg	10000		98	80-120	2	20	
Total Organic Carbon (2)	9860	100	mg/kg	10000		99	80-120	5	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200019

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FC01801 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	ND	4.00	ug/Kg wet							
C1-Benzene	ND	4.00	ug/Kg wet							
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	ND	4.00	ug/Kg wet							
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	ND	4.00	ug/Kg wet							
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200019

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FC01801 - 3570

C1-Fluorenes	ND	4.00	ug/Kg wet	
C2-Fluorenes	ND	4.00	ug/Kg wet	
C3-Fluorenes	ND	4.00	ug/Kg wet	
Dibenzothiophene	ND	4.00	ug/Kg wet	
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet	
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet	
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet	
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet	
Phenanthrene	ND	4.00	ug/Kg wet	
Anthracene	ND	4.00	ug/Kg wet	
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet	
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet	
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet	
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet	
Retene	ND	4.00	ug/Kg wet	
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet	
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet	
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet	
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet	
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet	
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet	
Fluoranthene	ND	4.00	ug/Kg wet	
Pyrene	2.47	4.00	ug/Kg wet	J
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet	
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet	
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet	
Benzo(b)fluorene	ND	4.00	ug/Kg wet	
Benzo(c)fluorene	ND	4.00	ug/Kg wet	
2-Methylpyrene	ND	4.00	ug/Kg wet	
4-Methylpyrene	ND	4.00	ug/Kg wet	
1-Methylpyrene	ND	4.00	ug/Kg wet	
Benz(a)anthracene	ND	4.00	ug/Kg wet	
Chrysene/triphenylene	ND	4.00	ug/Kg wet	
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet	
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet	
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet	
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet	
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet	
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet	
Benzo(e)pyrene	ND	4.00	ug/Kg wet	
Benzo(a)pyrene	ND	4.00	ug/Kg wet	
Perylene	ND	4.00	ug/Kg wet	
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet	
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet	
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet	
Coronene	ND	4.00	ug/Kg wet	
Tetramethyl lead	ND	4.00	ug/Kg wet	
Trimethylethyl lead	ND	4.00	ug/Kg wet	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200019

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FC01801 - 3570						
Dimethyldiethyl lead	ND	4.00	ug/Kg wet			
Methyltriethyl lead	ND	4.00	ug/Kg wet			
Tetraethyl lead	ND	4.00	ug/Kg wet			
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet			
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet			
2,6,10-trimethylpentadecane (1650)	7.56	4.00	ug/Kg wet			
C-17	24.3	4.00	ug/Kg wet			
Pristane	19.0	4.00	ug/Kg wet			
C-18	19.1	4.00	ug/Kg wet			
Phytane	25.2	4.00	ug/Kg wet			
Carbazole	ND	4.00	ug/Kg wet			
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet			
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet			
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
3-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylanthracene	ND	4.00	ug/Kg wet			
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet			
1-Methylphenanthrene	ND	4.00	ug/Kg wet			
Surrogate: Toluene-D8	*326*		ug/Kg wet	*400.0*	*82*	*50-120*
Surrogate: Naphthalene-d8	*328*		ug/Kg wet	*400.0*	*82*	*50-120*
Surrogate: Phenanthrene-d10	*357*		ug/Kg wet	*400.0*	*89*	*50-120*
Surrogate: Perylene-d12	*315*		ug/Kg wet	*400.0*	*79*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200019

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FC01801 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	257	4.00	ug/Kg wet	400.0		64	60-130			
Methylcyclohexane	208	4.00	ug/Kg wet	400.0		52	60-130			B-
Toluene	297	4.00	ug/Kg wet	400.0		74	60-130			
Ethylbenzene	305	4.00	ug/Kg wet	400.0		76	60-130			
m,p-Xylene	306	4.00	ug/Kg wet	400.0		76	60-130			
Styrene	297	4.00	ug/Kg wet	400.0		74	60-130			
o-Xylene	309	4.00	ug/Kg wet	400.0		77	60-130			
Isopropylbenzene	321	4.00	ug/Kg wet	400.0		80	60-130			
n-Propylbenzene	304	4.00	ug/Kg wet	400.0		76	60-130			
1,3,5-Trimethylbenzene	322	4.00	ug/Kg wet	400.0		81	60-130			
1,2,3-Trimethylbenzene	328	4.00	ug/Kg wet	400.0		82	60-130			
1,2,4-Trimethylbenzene	323	4.00	ug/Kg wet	400.0		81	60-130			
t-Butylbenzene	334	4.00	ug/Kg wet	400.0		83	60-130			
sec-Butylbenzene	321	4.00	ug/Kg wet	400.0		80	60-130			
p-Isopropyltoluene	332	4.00	ug/Kg wet	400.0		83	60-130			
n-Butylbenzene	298	4.00	ug/Kg wet	400.0		75	60-130			
trans-Decalin	307	4.00	ug/Kg wet	400.0		77	60-130			
cis-Decalin	309	4.00	ug/Kg wet	400.0		77	60-130			
Benzo(b)thiophene	302	4.00	ug/Kg wet	400.0		75	60-130			
Naphthalene	316	4.00	ug/Kg wet	400.0		79	60-130			
2-Methylnaphthalene	316	4.00	ug/Kg wet	400.0		79	60-130			
1-Methylnaphthalene	327	4.00	ug/Kg wet	400.0		82	60-130			
Biphenyl	310	4.00	ug/Kg wet	400.0		77	60-130			
Acenaphthylene	343	4.00	ug/Kg wet	400.0		86	60-130			
Acenaphthene	345	4.00	ug/Kg wet	400.0		86	60-130			
Dibenzofuran	316	4.00	ug/Kg wet	400.0		79	60-130			
Fluorene	345	4.00	ug/Kg wet	400.0		86	60-130			
Dibenzothiophene	331	4.00	ug/Kg wet	400.0		83	60-130			
Phenanthrene	351	4.00	ug/Kg wet	400.0		88	60-130			
Anthracene	331	4.00	ug/Kg wet	400.0		83	60-130			
Retene	410	4.00	ug/Kg wet	400.0		102	60-130			
Benzo(b)naphtho(2,1-d)thiophene	377	4.00	ug/Kg wet	400.0		94	60-130			
Fluoranthene	371	4.00	ug/Kg wet	400.0		93	60-130			
Pyrene	374	4.00	ug/Kg wet	400.0		94	60-130			
Benz(a)anthracene	375	4.00	ug/Kg wet	400.0		94	60-130			
Chrysene/triphenylene	379	4.00	ug/Kg wet	400.0		95	60-130			
Benzo(b)fluoranthene	361	4.00	ug/Kg wet	400.0		90	60-130			
Benzo(j/k)fluoranthene	379	4.00	ug/Kg wet	400.0		95	60-130			
Benzo(e)pyrene	362	4.00	ug/Kg wet	400.0		90	60-130			
Benzo(a)pyrene	356	4.00	ug/Kg wet	400.0		89	60-130			
Perylene	364	4.00	ug/Kg wet	400.0		91	60-130			
Indeno(1,2,3-cd)pyrene	373	4.00	ug/Kg wet	400.0		93	60-130			
Dibenzo(a,h)anthracene	384	4.00	ug/Kg wet	400.0		96	60-130			
Benzo(g,h,i)perylene	363	4.00	ug/Kg wet	400.0		91	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200019

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FC01801 - 3570							
Coronene	372	4.00	ug/Kg wet	400.0	93	60-130	
Tetraethyl lead	236	4.00	ug/Kg wet	400.0	59	60-130	B-
Pristane	397	4.00	ug/Kg wet	400.0	99	60-130	
Phytane	399	4.00	ug/Kg wet	400.0	100	60-130	
Surrogate: Toluene-D8	*307*		ug/Kg wet	*400.0*	*77*	*50-120*	
Surrogate: Naphthalene-d8	*322*		ug/Kg wet	*400.0*	*80*	*50-120*	
Surrogate: Phenanthrene-d10	*355*		ug/Kg wet	*400.0*	*89*	*50-120*	
Surrogate: Perylene-d12	*384*		ug/Kg wet	*400.0*	*96*	*50-120*	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200019

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FC01801 - 3570

Duplicate **Source: F200019-07**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	ND	6.30	ug/Kg dry		ND				50	
C1-Benzene	3.47	6.30	ug/Kg dry		3.40			2	50	J
C2-Benzenes	ND	6.30	ug/Kg dry		4.31				50	
C3-Benzenes	ND	6.30	ug/Kg dry		ND				50	
C4-Benzenes	ND	6.30	ug/Kg dry		ND				50	
C5-Benzenes	ND	6.30	ug/Kg dry		ND				50	
Methylcyclohexane	ND	6.30	ug/Kg dry		ND				50	
Toluene	4.00	6.30	ug/Kg dry		4.22			5	50	J
Ethylbenzene	ND	6.30	ug/Kg dry		ND				50	
m,p-Xylene	3.24	6.30	ug/Kg dry		3.26			0.6	50	J
Styrene	ND	6.30	ug/Kg dry		ND				50	
o-Xylene	ND	6.30	ug/Kg dry		ND				50	
Isopropylbenzene	ND	6.30	ug/Kg dry		ND				50	
n-Propylbenzene	ND	6.30	ug/Kg dry		ND				50	
1,3,5-Trimethylbenzene	ND	6.30	ug/Kg dry		ND				50	
1,2,3-Trimethylbenzene	ND	6.30	ug/Kg dry		ND				50	
1,2,4-Trimethylbenzene	ND	6.30	ug/Kg dry		ND				50	
t-Butylbenzene	ND	6.30	ug/Kg dry		ND				50	
sec-Butylbenzene	ND	6.30	ug/Kg dry		ND				50	
p-Isopropyltoluene	ND	6.30	ug/Kg dry		ND				50	
n-Butylbenzene	ND	6.30	ug/Kg dry		ND				50	
trans-Decalin	ND	6.30	ug/Kg dry		ND				50	
cis-Decalin	ND	6.30	ug/Kg dry		ND				50	
C1-Decalins	ND	6.30	ug/Kg dry		ND				50	
C2-Decalins	ND	6.30	ug/Kg dry		ND				50	
C3-Decalins	ND	6.30	ug/Kg dry		ND				50	
C4-Decalins	ND	6.30	ug/Kg dry		ND				50	
Benzo(b)thiophene	ND	6.30	ug/Kg dry		ND				50	
C1-Benzo(b)thiophenes	ND	6.30	ug/Kg dry		ND				50	
C2-Benzo(b)thiophenes	ND	6.30	ug/Kg dry		ND				50	
C3-Benzo(b)thiophenes	ND	6.30	ug/Kg dry		ND				50	
C4-Benzo(b)thiophenes	ND	6.30	ug/Kg dry		ND				50	
Naphthalene	ND	6.30	ug/Kg dry		ND				50	
2-Methylnaphthalene	ND	6.30	ug/Kg dry		ND				50	
1-Methylnaphthalene	ND	6.30	ug/Kg dry		ND				50	
C1-Naphthalenes	ND	6.30	ug/Kg dry		ND				50	
C2-Naphthalenes	ND	6.30	ug/Kg dry		ND				50	
C3-Naphthalenes	ND	6.30	ug/Kg dry		ND				50	
C4-Naphthalenes	ND	6.30	ug/Kg dry		ND				50	
Biphenyl	ND	6.30	ug/Kg dry		ND				50	
Acenaphthylene	ND	6.30	ug/Kg dry		ND				50	
Acenaphthene	ND	6.30	ug/Kg dry		ND				50	
Dibenzofuran	ND	6.30	ug/Kg dry		ND				50	
Fluorene	ND	6.30	ug/Kg dry		ND				50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200019

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FC01801 - 3570

C1-Fluorenes	ND	6.30	ug/Kg dry	ND		50	
C2-Fluorenes	ND	6.30	ug/Kg dry	ND		50	
C3-Fluorenes	ND	6.30	ug/Kg dry	ND		50	
Dibenzothiophene	ND	6.30	ug/Kg dry	ND		50	
C1-Dibenzothiophenes	ND	6.30	ug/Kg dry	ND		50	
C2-Dibenzothiophenes	ND	6.30	ug/Kg dry	ND		50	
C3-Dibenzothiophenes	ND	6.30	ug/Kg dry	ND		50	
C4-Dibenzothiophenes	ND	6.30	ug/Kg dry	ND		50	
Phenanthrene	ND	6.30	ug/Kg dry	ND		50	
Anthracene	ND	6.30	ug/Kg dry	ND		50	
C1-Phenanthrenes/Anthracenes	ND	6.30	ug/Kg dry	ND		50	
C2-Phenanthrenes/Anthracenes	ND	6.30	ug/Kg dry	ND		50	
C3-Phenanthrenes/Anthracenes	ND	6.30	ug/Kg dry	ND		50	
C4-Phenanthrenes/Anthracenes	ND	6.30	ug/Kg dry	ND		50	
Retene	ND	6.30	ug/Kg dry	ND		50	
Benzo(b)naphtho(2,1-d)thiophene	ND	6.30	ug/Kg dry	ND		50	
C0-Benzonaphthothiophenes	ND	6.30	ug/Kg dry	ND		50	
C1-Benzonaphthothiophenes	ND	6.30	ug/Kg dry	ND		50	
C2-Benzonaphthothiophenes	ND	6.30	ug/Kg dry	ND		50	
C3-Benzonaphthothiophenes	ND	6.30	ug/Kg dry	ND		50	
C4-Benzonaphthothiophenes	ND	6.30	ug/Kg dry	ND		50	
Fluoranthene	6.64	6.30	ug/Kg dry	ND		50	
Pyrene	8.22	6.30	ug/Kg dry	ND		50	
C1-Fluoranthenes/Pyrenes	6.17	6.30	ug/Kg dry	ND		50	J
C2-Fluoranthenes/Pyrenes	ND	6.30	ug/Kg dry	ND		50	
C3-Fluoranthenes/Pyrenes	ND	6.30	ug/Kg dry	ND		50	
Benzo(b)fluorene	ND	6.30	ug/Kg dry	ND		50	
Benzo(c)fluorene	ND	6.30	ug/Kg dry	ND		50	
2-Methylpyrene	ND	6.30	ug/Kg dry	ND		50	
4-Methylpyrene	ND	6.30	ug/Kg dry	ND		50	
1-Methylpyrene	ND	6.30	ug/Kg dry	ND		50	
Benz(a)anthracene	4.47	6.30	ug/Kg dry	ND		50	J
Chrysene/triphenylene	4.55	6.30	ug/Kg dry	ND		50	J
C1-Benzo(a)anthracenes/Chrysenes	ND	6.30	ug/Kg dry	ND		50	
C2-Benzo(a)anthracenes/Chrysenes	ND	6.30	ug/Kg dry	ND		50	
C3-Benzo(a)anthracenes/Chrysenes	ND	6.30	ug/Kg dry	ND		50	
C4-Benzo(a)anthracenes/Chrysenes	ND	6.30	ug/Kg dry	ND		50	
Benzo(b)fluoranthene	ND	6.30	ug/Kg dry	ND		50	
Benzo(j/k)fluoranthene	ND	6.30	ug/Kg dry	ND		50	
Benzo(e)pyrene	3.28	6.30	ug/Kg dry	ND		50	J
Benzo(a)pyrene	4.37	6.30	ug/Kg dry	ND		50	J
Perylene	314	6.30	ug/Kg dry	336	7	50	
Indeno(1,2,3-cd)pyrene	3.16	6.30	ug/Kg dry	ND		50	J
Dibenzo(a,h)anthracene	ND	6.30	ug/Kg dry	ND		50	
Benzo(g,h,i)perylene	3.31	6.30	ug/Kg dry	ND		50	J
Coronene	6.46	6.30	ug/Kg dry	15.8	84	50	D+
Tetramethyl lead	ND	6.30	ug/Kg dry	ND		50	
Trimethylethyl lead	ND	6.30	ug/Kg dry	ND		50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200019

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FC01801 - 3570									
Dimethyldiethyl lead	ND	6.30	ug/Kg dry	ND				50	
Methyltriethyl lead	ND	6.30	ug/Kg dry	ND				50	
Tetraethyl lead	ND	6.30	ug/Kg dry	ND				50	
2,6,10-trimethyldodecane (1380)	ND	6.30	ug/Kg dry	ND				50	
2,6,10-trimethyltridecane (1470)	4.20	6.30	ug/Kg dry	4.02			4	50	J
2,6,10-trimethylpentadecane (1650)	12.2	6.30	ug/Kg dry	11.9			3	50	
C-17	95.8	6.30	ug/Kg dry	94.3			2	50	
Pristane	34.1	6.30	ug/Kg dry	29.5			15	50	
C-18	40.6	6.30	ug/Kg dry	38.5			5	50	
Phytane	57.2	6.30	ug/Kg dry	49.4			15	50	
Carbazole	ND	6.30	ug/Kg dry	ND				50	
2,6-Dimethylnaphthalene	ND	6.30	ug/Kg dry	ND				50	
2,3,5-Trimethylnaphthene	ND	6.30	ug/Kg dry	ND				50	
4-Methyldibenzothiophene	ND	6.30	ug/Kg dry	ND				50	
2/3-Methyldibenzothiophene	ND	6.30	ug/Kg dry	ND				50	
1-Methyldibenzothiophene	ND	6.30	ug/Kg dry	ND				50	
3-Methylphenanthrene	ND	6.30	ug/Kg dry	ND				50	
2-Methylphenanthrene	ND	6.30	ug/Kg dry	ND				50	
2-Methylanthracene	ND	6.30	ug/Kg dry	ND				50	
4/9-Methylphenanthrene	ND	6.30	ug/Kg dry	ND				50	
1-Methylphenanthrene	ND	6.30	ug/Kg dry	ND				50	
Surrogate: Toluene-D8	*402*		ug/Kg dry	*630.0*		*64*	*50-120*		
Surrogate: Naphthalene-d8	*443*		ug/Kg dry	*630.0*		*70*	*50-120*		
Surrogate: Phenanthrene-d10	*446*		ug/Kg dry	*630.0*		*71*	*50-120*		
Surrogate: Perylene-d12	*391*		ug/Kg dry	*630.0*		*62*	*50-120*		

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F200019

Notes and Definitions

U	Analyte included in the analysis, but not detected
J	Reported between MDL and MRL
D+	Relative percent difference for duplicate is outside of criteria (D+).
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
B-	Blank Spike recovery is below lower control limit (B-).
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200019

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Chain-of-Custody Record

Laboratory: ESS | Laboratory Job # (Labuse only): 200639 | F200019

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP
Project Location: Amesbury, MA
Project Number: 1804576
Project Manager: Ryan Hoffman
Send Report to: Ryan Hoffman
Send EDD to: labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY REQUIRED: (YES) NO

If Yes, Are MCP Analytical Methods Required?	(YES)	NO	NA
Are Drinking Water Samples Submitted?	YES	(NO)	NA
If Yes, Have Drinking Water Sampling Requirements Been Met?	YES	NO	(NA)

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Preservative: None	Preservative: None	Analysis: Parent and Alkylated MAHs & PAHs 8270**	Analysis: TOCs by Lloyd-Kahn	Sample Specific Remarks
1	1804576-SS783-S1	3/16/20	1037	Soil	1	BFM			X	X	
2	1804576-SS783-S2	3/16/20	1044	Soil	1	BFM			X	X	
3	1804576-SS784-S1	3/16/20	1101	Soil	1	BFM			X	X	
4	1804576-SS784-S2	3/16/20	1109	Soil	1	BFM			X	X	
5	1804576-SS785-S1	3/16/20	1136	Soil	1	BFM			X	X	
6	1804576-SS785-S2	3/16/20	1141	Soil	1	BFM			X	X	
7	1804576-SS786-S2	3/16/20	1205	Soil	1	BFM			X	X	

Sample Handling

Samples Field Filtered: YES NO (NA)

Sampled Shipped With Ice: (YES) NO

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

Relinquished by Sampler: (signature)	Date:	Time:	Received by: (signature)
1.	3/16/20	1530	1. GEI Sample Fridge
Relinquished by: (signature) 2. GEI Sample Fridge	Date: 3/17/20	Time: 1325	Received by: (signature) 2.
Relinquished by: (signature) 3.	Date: 3/17/20	Time: 1325	Received by: (signature) 3. 3/17/20 13:48
Relinquished by: (signature) 4.	Date: 3/17/20	Time: 1642	Received by: (signature) 4.

Turnaround Time (Business days):

Normal __X__ Other ____
10-Day ____ 7-Day ____
5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

**Parent and Alkylated MAHs & PAHs (34) by GC/MS/SIM/SCAN

KCkemp: 0.6

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

Shipped/Delivered Via: ESS Courier

ESS Project ID: 20C0539
Date Received: 3/17/2020
Project Due Date: 3/24/2020
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 0.6 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA
13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1	24338	Yes	N/A	Yes	4 oz. Jar	NP	
2	24339	Yes	N/A	Yes	4 oz. Jar	NP	
3	24340	Yes	N/A	Yes	4 oz. Jar	NP	
4	24341	Yes	N/A	Yes	4 oz. Jar	NP	
5	24342	Yes	N/A	Yes	4 oz. Jar	NP	
6	24343	Yes	N/A	Yes	4 oz. Jar	NP	
7	24344	Yes	N/A	Yes	4 oz. Jar	NP	

2nd Review
Were all containers scanned into storage/lab? Initials
Are barcode labels on correct containers? Yes / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By:
Reviewed
Date & Time: 3/17/20 1958

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

ESS Project ID: 20C0539

Date Received: 3/17/2020

By:

Date & Time: 3/17/20 2021

Delivered By:

3/17/20 2027

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: F200033

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 10:59 am, Jul 22, 2020

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses
ESS Laboratory - Cranston, RI TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200033

SAMPLE RECEIPT

The following samples were received on July 07, 2020 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F200033-01	1804576-SS795-S2	Soil	8270 Mod, TOC-LK
F200033-02	1804576-SS789-S1	Soil	8270 Mod, TOC-LK
F200033-03	1804576-SS790-S1	Soil	8270 Mod, TOC-LK
F200033-04	1804576-SS790-S2	Soil	8270 Mod, TOC-LK
F200033-05	1804576-SS796-S1	Soil	8270 Mod, TOC-LK
F200033-06	1804576-SS788-S1	Soil	8270 Mod, TOC-LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200033

PROJECT NARRATIVE

8270D (SIM) Semi-Volatile Organic Compounds

F200033-02 **Present in Method Blank (B).**
C-18

F200033-04 **Present in Method Blank (B).**
C-17 , C-18 , Phytane , Pristane

F200033-05 **Present in Method Blank (B).**
Phytane , Pristane

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200033

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS795-S2
Date Sampled: 07/06/20 13:16
Percent Solids: 35
Initial Volume: 4.66
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200033
ESS Laboratory Sample ID: F200033-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**1980** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C1-Benzene	**958** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C2-Benzenes	**1860** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C3-Benzenes	**678** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C4-Benzenes	**1020** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C5-Benzenes	**354** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
Methylcyclohexane	**126** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
Toluene	**2210** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
Ethylbenzene	**2300** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
m,p-Xylene	**3520** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
Styrene	**651** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
o-Xylene	**345** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
Isopropylbenzene	**89.0** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
n-Propylbenzene	**91.2** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
1,3,5-Trimethylbenzene	**250** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
1,2,3-Trimethylbenzene	**239** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
1,2,4-Trimethylbenzene	**633** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
t-Butylbenzene	ND (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
sec-Butylbenzene	ND (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
p-Isopropyltoluene	**211** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
n-Butylbenzene	ND (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
trans-Decalin	**121** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
cis-Decalin	**J 34.2** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C1-Decalins	**532** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C2-Decalins	**1530** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C3-Decalins	**1820** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C4-Decalins	**3130** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
Benzo(b)thiophene	**6730** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C1-Benzo(b)thiophenes	**7690** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C2-Benzo(b)thiophenes	**8070** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C3-Benzo(b)thiophenes	**1550** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C4-Benzo(b)thiophenes	**386** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS795-S2
Date Sampled: 07/06/20 13:16
Percent Solids: 35
Initial Volume: 4.66
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200033
ESS Laboratory Sample ID: F200033-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**49800** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
2-Methylnaphthalene	**13100** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
1-Methylnaphthalene	**64400** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C1-Naphthalenes	**44900** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C2-Naphthalenes	**49700** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C3-Naphthalenes	**7350** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C4-Naphthalenes	**2360** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
Biphenyl	**9650** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
Acenaphthylene	**6070** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
Acenaphthene	**369000** (1230)	614	8270 Mod		100	07/15/20 10:08	F0G0003	FG01303
Dibenzofuran	**12000** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
Fluorene	**86300** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C1-Fluorenes	**7600** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C2-Fluorenes	**3020** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C3-Fluorenes	**2870** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
Dibenzothiophene	**41500** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C1-Dibenzothiophenes	**6620** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C2-Dibenzothiophenes	**3420** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C3-Dibenzothiophenes	**2800** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C4-Dibenzothiophenes	**2230** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
Phenanthrene	**253000** (1230)	614	8270 Mod		100	07/15/20 10:08	F0G0003	FG01303
Anthracene	**41800** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C1-Phenanthrenes/Anthracenes	**27500** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C2-Phenanthrenes/Anthracenes	**9440** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C3-Phenanthrenes/Anthracenes	**5210** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C4-Phenanthrenes/Anthracenes	**3540** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
Retene	**941** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
Benzo(b)naphtho(2,1-d)thiophene	**3270** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C0-Benzonaphthothiophenes	**6130** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C1-Benzonaphthothiophenes	**3460** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C2-Benzonaphthothiophenes	**3130** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C3-Benzonaphthothiophenes	**2450** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS795-S2
Date Sampled: 07/06/20 13:16
Percent Solids: 35
Initial Volume: 4.66
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200033
ESS Laboratory Sample ID: F200033-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**1130** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
Fluoranthene	**61500** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
Pyrene	**78200** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C1-Fluoranthenes/Pyrenes	**27900** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C2-Fluoranthenes/Pyrenes	**8220** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C3-Fluoranthenes/Pyrenes	**4180** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
Benzo(b)fluorene	**3700** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
Benzo(c)fluorene	**1590** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
2-Methylpyrene	**3820** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
4-Methylpyrene	**3710** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
1-Methylpyrene	**3100** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
Benz(a)anthracene	**19800** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
Chrysene/triphenylene	**23600** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C1-Benzo(a)anthracenes/Chrysenes	**10600** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C2-Benzo(a)anthracenes/Chrysenes	**5590** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C3-Benzo(a)anthracenes/Chrysenes	**3170** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C4-Benzo(a)anthracenes/Chrysenes	**2010** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
Benzo(b)fluoranthene	**20200** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
Benzo(j/k)fluoranthene	**19400** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
Benzo(e)pyrene	**20500** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
Benzo(a)pyrene	**26400** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
Perylene	**5100** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
Indeno(1,2,3-cd)pyrene	**17400** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
Dibenzo(a,h)anthracene	**3630** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
Benzo(g,h,i)perylene	**17200** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
Coronene	**5180** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
Tetramethyl lead	ND (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
Trimethylethyl lead	ND (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
Dimethyldiethyl lead	ND (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
Methyltriethyl lead	ND (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
Tetraethyl lead	ND (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
2,6,10-trimethyldodecane (1380)	**2200** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS795-S2
Date Sampled: 07/06/20 13:16
Percent Solids: 35
Initial Volume: 4.66
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200033
ESS Laboratory Sample ID: F200033-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**3500** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
2,6,10-trimethylpentadecane (1650)	**4750** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C-17	**916** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
Pristane	**13100** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
C-18	**910** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
Phytane	**14700** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
Carbazole	**2220** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
2,6-Dimethylnaphthalene	**9440** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
2,3,5-Trimethylnaphthene	**410** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
4-Methyldibenzothiophene	**2340** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
2/3-Methyldibenzothiophene	**2280** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
1-Methyldibenzothiophene	**797** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
3-Methylphenanthrene	**6780** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
2-Methylphenanthrene	**7210** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
2-Methylanthracene	**2430** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
4/9-Methylphenanthrene	**6570** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303
1-Methylphenanthrene	**4490** (61.4)	30.7	8270 Mod		5	07/13/20 21:24	F0G0003	FG01303

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*75 %*		*50-120*
Surrogate: Naphthalene-d8	*80 %*		*50-120*
Surrogate: Phenanthrene-d10	*88 %*		*50-120*
Surrogate: Perylene-d12	*99 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS795-S2
Date Sampled: 07/06/20 13:16
Percent Solids: 35

ESS Laboratory Work Order: F200033
ESS Laboratory Sample ID: F200033-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**130000** (96.9)		TOC-LK		1	CCP	07/09/20 18:08	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS789-S1
Date Sampled: 07/06/20 13:55
Percent Solids: 79
Initial Volume: 5.48
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200033
ESS Laboratory Sample ID: F200033-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**73.9** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C1-Benzene	**22.1** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C2-Benzenes	**24.0** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C3-Benzenes	**15.1** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C4-Benzenes	**30.9** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C5-Benzenes	**32.5** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
Methylcyclohexane	**13.6** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
Toluene	**48.2** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
Ethylbenzene	**8.38** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
m,p-Xylene	**54.7** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
Styrene	**47.8** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
o-Xylene	**6.72** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
Isopropylbenzene	ND (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
n-Propylbenzene	**6.04** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
1,3,5-Trimethylbenzene	**J 3.53** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
1,2,3-Trimethylbenzene	**5.61** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
1,2,4-Trimethylbenzene	**9.86** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
t-Butylbenzene	ND (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
sec-Butylbenzene	**7.16** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
p-Isopropyltoluene	**J 4.22** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
n-Butylbenzene	**18.8** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
trans-Decalin	**189** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
cis-Decalin	**23.7** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C1-Decalins	**222** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C2-Decalins	**74.1** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C3-Decalins	**46.1** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C4-Decalins	**66.2** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
Benzo(b)thiophene	**4.87** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C1-Benzo(b)thiophenes	**19.0** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C2-Benzo(b)thiophenes	**24.5** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C3-Benzo(b)thiophenes	**22.9** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C4-Benzo(b)thiophenes	**15.9** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS789-S1
Date Sampled: 07/06/20 13:55
Percent Solids: 79
Initial Volume: 5.48
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200033
ESS Laboratory Sample ID: F200033-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**55.6** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
2-Methylnaphthalene	**34.1** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
1-Methylnaphthalene	**31.8** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C1-Naphthalenes	**38.7** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C2-Naphthalenes	**117** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C3-Naphthalenes	**143** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C4-Naphthalenes	**81.8** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
Biphenyl	**18.1** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
Acenaphthylene	**158** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
Acenaphthene	**300** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
Dibenzofuran	**43.9** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
Fluorene	**115** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C1-Fluorenes	**116** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C2-Fluorenes	**88.1** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C3-Fluorenes	**110** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
Dibenzothiophene	**127** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C1-Dibenzothiophenes	**104** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C2-Dibenzothiophenes	**120** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C3-Dibenzothiophenes	**104** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C4-Dibenzothiophenes	**80.5** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
Phenanthrene	**1210** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
Anthracene	**466** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C1-Phenanthrenes/Anthracenes	**578** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C2-Phenanthrenes/Anthracenes	**350** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C3-Phenanthrenes/Anthracenes	**174** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C4-Phenanthrenes/Anthracenes	**86.8** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
Retene	**32.1** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
Benzo(b)naphtho(2,1-d)thiophene	**114** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C0-Benzonaphthothiophenes	**213** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C1-Benzonaphthothiophenes	**195** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C2-Benzonaphthothiophenes	**308** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C3-Benzonaphthothiophenes	**343** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS789-S1
Date Sampled: 07/06/20 13:55
Percent Solids: 79
Initial Volume: 5.48
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200033
ESS Laboratory Sample ID: F200033-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**229** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
Fluoranthene	**1550** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
Pyrene	**1500** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C1-Fluoranthenes/Pyrenes	**793** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C2-Fluoranthenes/Pyrenes	**409** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C3-Fluoranthenes/Pyrenes	**237** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
Benzo(b)fluorene	**96.3** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
Benzo(c)fluorene	**43.4** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
2-Methylpyrene	**104** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
4-Methylpyrene	**96.6** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
1-Methylpyrene	**75.5** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
Benz(a)anthracene	**752** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
Chrysene/triphenylene	**759** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C1-Benzo(a)anthracenes/Chrysenes	**433** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C2-Benzo(a)anthracenes/Chrysenes	**336** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C3-Benzo(a)anthracenes/Chrysenes	**272** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C4-Benzo(a)anthracenes/Chrysenes	**177** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
Benzo(b)fluoranthene	**622** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
Benzo(j/k)fluoranthene	**609** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
Benzo(e)pyrene	**526** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
Benzo(a)pyrene	**739** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
Perylene	**187** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
Indeno(1,2,3-cd)pyrene	**447** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
Dibenzo(a,h)anthracene	**119** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
Benzo(g,h,i)perylene	**409** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
Coronene	**107** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
Tetramethyl lead	ND (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
Trimethylethyl lead	ND (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
Dimethyldiethyl lead	ND (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
Methyltriethyl lead	ND (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
Tetraethyl lead	ND (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
2,6,10-trimethyldodecane (1380)	**47.3** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS789-S1
Date Sampled: 07/06/20 13:55
Percent Solids: 79
Initial Volume: 5.48
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200033
ESS Laboratory Sample ID: F200033-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**76.3** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
2,6,10-trimethylpentadecane (1650)	**69.5** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C-17	**143** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
Pristane	**197** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
C-18	**B 124** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
Phytane	**191** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
Carbazole	**71.9** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
2,6-Dimethylnaphthalene	**17.2** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
2,3,5-Trimethylnaphthene	**9.94** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
4-Methyldibenzothiophene	**35.1** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
2/3-Methyldibenzothiophene	**35.4** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
1-Methyldibenzothiophene	**15.4** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
3-Methylphenanthrene	**141** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
2-Methylphenanthrene	**154** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
2-Methylanthracene	**69.1** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
4/9-Methylphenanthrene	**134** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303
1-Methylphenanthrene	**76.2** (4.59)	2.30	8270 Mod		1	07/15/20 8:46	F0G0003	FG01303

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*74 %*		*50-120*
Surrogate: Naphthalene-d8	*78 %*		*50-120*
Surrogate: Phenanthrene-d10	*83 %*		*50-120*
Surrogate: Perylene-d12	*88 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS789-S1
Date Sampled: 07/06/20 13:55
Percent Solids: 79

ESS Laboratory Work Order: F200033
ESS Laboratory Sample ID: F200033-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**7610** (93.2)		TOC-LK		1	CCP	07/09/20 18:41	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS790-S1
Date Sampled: 07/06/20 14:31
Percent Solids: 50
Initial Volume: 5.39
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200033
ESS Laboratory Sample ID: F200033-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**1070** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C1-Benzene	**298** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C2-Benzenes	**487** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C3-Benzenes	**121** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C4-Benzenes	**184** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C5-Benzenes	**308** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
Methylcyclohexane	**J 32.3** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
Toluene	**672** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
Ethylbenzene	**77.0** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
m,p-Xylene	**1350** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
Styrene	**509** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
o-Xylene	**51.4** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
Isopropylbenzene	**41.1** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
n-Propylbenzene	**63.6** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
1,3,5-Trimethylbenzene	**J 26.1** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
1,2,3-Trimethylbenzene	**48.8** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
1,2,4-Trimethylbenzene	**66.6** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
t-Butylbenzene	ND (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
sec-Butylbenzene	ND (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
p-Isopropyltoluene	**55.3** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
n-Butylbenzene	**186** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
trans-Decalin	**9260** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
cis-Decalin	**1510** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C1-Decalins	**13300** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C2-Decalins	**3810** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C3-Decalins	**1320** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C4-Decalins	**1920** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
Benzo(b)thiophene	**J 18.7** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C1-Benzo(b)thiophenes	**110** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C2-Benzo(b)thiophenes	**143** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C3-Benzo(b)thiophenes	**159** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C4-Benzo(b)thiophenes	**240** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS790-S1
Date Sampled: 07/06/20 14:31
Percent Solids: 50
Initial Volume: 5.39
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200033
ESS Laboratory Sample ID: F200033-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**236** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
2-Methylnaphthalene	**129** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
1-Methylnaphthalene	**97.9** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C1-Naphthalenes	**139** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C2-Naphthalenes	**670** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C3-Naphthalenes	**1820** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C4-Naphthalenes	**2470** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
Biphenyl	**250** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
Acenaphthylene	**849** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
Acenaphthene	**862** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
Dibenzofuran	**163** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
Fluorene	**745** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C1-Fluorenes	**774** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C2-Fluorenes	**1440** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C3-Fluorenes	**1530** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
Dibenzothiophene	**626** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C1-Dibenzothiophenes	**973** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C2-Dibenzothiophenes	**1790** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C3-Dibenzothiophenes	**1380** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C4-Dibenzothiophenes	**731** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
Phenanthrene	**3420** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
Anthracene	**1990** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C1-Phenanthrenes/Anthracenes	**2650** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C2-Phenanthrenes/Anthracenes	**3120** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C3-Phenanthrenes/Anthracenes	**1750** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C4-Phenanthrenes/Anthracenes	**749** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
Retene	**253** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
Benzo(b)naphtho(2,1-d)thiophene	**810** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C0-Benzonaphthothiophenes	**1480** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C1-Benzonaphthothiophenes	**984** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C2-Benzonaphthothiophenes	**937** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C3-Benzonaphthothiophenes	**771** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS790-S1
Date Sampled: 07/06/20 14:31
Percent Solids: 50
Initial Volume: 5.39
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200033
ESS Laboratory Sample ID: F200033-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**432** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
Fluoranthene	**11300** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
Pyrene	**10500** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C1-Fluoranthenes/Pyrenes	**5500** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C2-Fluoranthenes/Pyrenes	**2670** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C3-Fluoranthenes/Pyrenes	**1420** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
Benzo(b)fluorene	**716** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
Benzo(c)fluorene	**353** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
2-Methylpyrene	**699** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
4-Methylpyrene	**642** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
1-Methylpyrene	**507** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
Benz(a)anthracene	**5190** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
Chrysene/triphenylene	**5300** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C1-Benzo(a)anthracenes/Chrysenes	**2700** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C2-Benzo(a)anthracenes/Chrysenes	**1630** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C3-Benzo(a)anthracenes/Chrysenes	**985** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C4-Benzo(a)anthracenes/Chrysenes	**589** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
Benzo(b)fluoranthene	**4330** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
Benzo(j/k)fluoranthene	**4290** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
Benzo(e)pyrene	**3500** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
Benzo(a)pyrene	**5010** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
Perylene	**1350** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
Indeno(1,2,3-cd)pyrene	**3140** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
Dibenzo(a,h)anthracene	**821** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
Benzo(g,h,i)perylene	**2780** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
Coronene	**713** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
Tetramethyl lead	ND (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
Trimethylethyl lead	ND (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
Dimethyldiethyl lead	ND (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
Methyltriethyl lead	ND (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
Tetraethyl lead	ND (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
2,6,10-trimethyldodecane (1380)	**2600** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS790-S1
Date Sampled: 07/06/20 14:31
Percent Solids: 50
Initial Volume: 5.39
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200033
ESS Laboratory Sample ID: F200033-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**3640** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
2,6,10-trimethylpentadecane (1650)	**3200** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C-17	**322** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
Pristane	**9550** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
C-18	**264** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
Phytane	**6700** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
Carbazole	**433** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
2,6-Dimethylnaphthalene	**176** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
2,3,5-Trimethylnaphthene	**79.5** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
4-Methyldibenzothiophene	**454** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
2/3-Methyldibenzothiophene	**309** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
1-Methyldibenzothiophene	**131** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
3-Methylphenanthrene	**511** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
2-Methylphenanthrene	**508** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
2-Methylanthracene	**442** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
4/9-Methylphenanthrene	**629** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303
1-Methylphenanthrene	**516** (37.4)	18.7	8270 Mod		5	07/14/20 0:06	F0G0003	FG01303

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*76 %*		*50-120*
Surrogate: Naphthalene-d8	*80 %*		*50-120*
Surrogate: Phenanthrene-d10	*86 %*		*50-120*
Surrogate: Perylene-d12	*92 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS790-S1
Date Sampled: 07/06/20 14:31
Percent Solids: 50

ESS Laboratory Work Order: F200033
ESS Laboratory Sample ID: F200033-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**55000** (92.9)		TOC-LK		1	CCP	07/09/20 19:47	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS790-S2
Date Sampled: 07/06/20 14:37
Percent Solids: 76
Initial Volume: 5.64
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200033
ESS Laboratory Sample ID: F200033-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C1-Benzene	**11.7** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C2-Benzenes	**8.94** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C3-Benzenes	**J 2.36** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C4-Benzenes	**J 3.81** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C5-Benzenes	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
Methylcyclohexane	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
Toluene	**28.1** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
Ethylbenzene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
m,p-Xylene	**21.0** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
Styrene	**19.9** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
o-Xylene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
Isopropylbenzene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
n-Propylbenzene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
1,3,5-Trimethylbenzene	**J 3.18** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
1,2,3-Trimethylbenzene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
1,2,4-Trimethylbenzene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
t-Butylbenzene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
sec-Butylbenzene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
p-Isopropyltoluene	**J 2.57** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
n-Butylbenzene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
trans-Decalin	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
cis-Decalin	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C1-Decalins	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C2-Decalins	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C3-Decalins	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C4-Decalins	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
Benzo(b)thiophene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C1-Benzo(b)thiophenes	**7.38** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C2-Benzo(b)thiophenes	**5.09** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C3-Benzo(b)thiophenes	**J 2.90** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C4-Benzo(b)thiophenes	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS790-S2
Date Sampled: 07/06/20 14:37
Percent Solids: 76
Initial Volume: 5.64
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200033
ESS Laboratory Sample ID: F200033-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**5.18** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
2-Methylnaphthalene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
1-Methylnaphthalene	**J 3.94** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C1-Naphthalenes	**J 3.81** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C2-Naphthalenes	**6.97** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C3-Naphthalenes	**J 4.23** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C4-Naphthalenes	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
Biphenyl	**J 2.57** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
Acenaphthylene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
Acenaphthene	**J 4.29** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
Dibenzofuran	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
Fluorene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C1-Fluorenes	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C2-Fluorenes	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C3-Fluorenes	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
Dibenzothiophene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C1-Dibenzothiophenes	**J 2.68** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C2-Dibenzothiophenes	**J 4.48** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C3-Dibenzothiophenes	**J 3.25** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C4-Dibenzothiophenes	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
Phenanthrene	**J 3.38** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
Anthracene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C1-Phenanthrenes/Anthracenes	**4.92** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C2-Phenanthrenes/Anthracenes	**J 3.29** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C3-Phenanthrenes/Anthracenes	**J 3.44** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C4-Phenanthrenes/Anthracenes	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
Retene	**5.05** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
Benzo(b)naphtho(2,1-d)thiophene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C0-Benzonaphthothiophenes	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C1-Benzonaphthothiophenes	**J 2.97** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C2-Benzonaphthothiophenes	**J 2.59** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C3-Benzonaphthothiophenes	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS790-S2
Date Sampled: 07/06/20 14:37
Percent Solids: 76
Initial Volume: 5.64
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200033
ESS Laboratory Sample ID: F200033-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
Fluoranthene	J **3.86** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
Pyrene	J **3.95** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C1-Fluoranthenes/Pyrenes	**4.83** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C2-Fluoranthenes/Pyrenes	J **3.27** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C3-Fluoranthenes/Pyrenes	J **3.24** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
Benzo(b)fluorene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
Benzo(c)fluorene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
2-Methylpyrene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
4-Methylpyrene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
1-Methylpyrene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
Benz(a)anthracene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
Chrysene/triphenylene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C1-Benzo(a)anthracenes/Chrysenes	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C2-Benzo(a)anthracenes/Chrysenes	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C3-Benzo(a)anthracenes/Chrysenes	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C4-Benzo(a)anthracenes/Chrysenes	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
Benzo(b)fluoranthene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
Benzo(j/k)fluoranthene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
Benzo(e)pyrene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
Benzo(a)pyrene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
Perylene	**243** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
Indeno(1,2,3-cd)pyrene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
Dibenzo(a,h)anthracene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
Benzo(g,h,i)perylene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
Coronene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
Tetramethyl lead	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
Trimethylethyl lead	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
Dimethyldiethyl lead	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
Methyltriethyl lead	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
Tetraethyl lead	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
2,6,10-trimethyldodecane (1380)	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS790-S2
Date Sampled: 07/06/20 14:37
Percent Solids: 76
Initial Volume: 5.64
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200033
ESS Laboratory Sample ID: F200033-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**6.47** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
2,6,10-trimethylpentadecane (1650)	**6.64** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C-17	**B 40.7** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
Pristane	**B 21.5** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
C-18	**B 36.3** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
Phytane	**B 32.3** (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
Carbazole	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
2,6-Dimethylnaphthalene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
2,3,5-Trimethylnaphthene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
4-Methyldibenzothiophene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
2/3-Methyldibenzothiophene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
1-Methyldibenzothiophene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
3-Methylphenanthrene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
2-Methylphenanthrene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
2-Methylanthracene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
4/9-Methylphenanthrene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303
1-Methylphenanthrene	ND (4.67)	2.34	8270 Mod		1	07/14/20 1:28	F0G0003	FG01303

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*82 %*		*50-120*
Surrogate: Naphthalene-d8	*85 %*		*50-120*
Surrogate: Phenanthrene-d10	*92 %*		*50-120*
Surrogate: Perylene-d12	*99 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS790-S2
Date Sampled: 07/06/20 14:37
Percent Solids: 76

ESS Laboratory Work Order: F200033
ESS Laboratory Sample ID: F200033-04
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**17100** (92.8)		TOC-LK		1	CCP	07/09/20 20:04	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS796-S1
Date Sampled: 07/06/20 15:50
Percent Solids: 51
Initial Volume: 4.88
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200033
ESS Laboratory Sample ID: F200033-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C1-Benzene	**52.8** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C2-Benzenes	**37.1** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C3-Benzenes	**11.0** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C4-Benzenes	**17.5** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C5-Benzenes	**J 7.02** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
Methylcyclohexane	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
Toluene	**120** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
Ethylbenzene	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
m,p-Xylene	**88.3** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
Styrene	**32.0** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
o-Xylene	**J 4.24** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
Isopropylbenzene	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
n-Propylbenzene	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
1,3,5-Trimethylbenzene	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
1,2,3-Trimethylbenzene	**J 4.39** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
1,2,4-Trimethylbenzene	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
t-Butylbenzene	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
sec-Butylbenzene	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
p-Isopropyltoluene	**19.4** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
n-Butylbenzene	**J 6.47** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
trans-Decalin	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
cis-Decalin	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C1-Decalins	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C2-Decalins	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C3-Decalins	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C4-Decalins	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
Benzo(b)thiophene	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C1-Benzo(b)thiophenes	**10.9** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C2-Benzo(b)thiophenes	**10.4** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C3-Benzo(b)thiophenes	**J 6.89** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C4-Benzo(b)thiophenes	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS796-S1
Date Sampled: 07/06/20 15:50
Percent Solids: 51
Initial Volume: 4.88
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200033
ESS Laboratory Sample ID: F200033-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	J **5.99** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
2-Methylnaphthalene	J **4.09** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
1-Methylnaphthalene	J **4.38** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C1-Naphthalenes	J **5.01** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C2-Naphthalenes	**21.0** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C3-Naphthalenes	**19.0** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C4-Naphthalenes	**12.4** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
Biphenyl	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
Acenaphthylene	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
Acenaphthene	**9.02** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
Dibenzofuran	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
Fluorene	J **4.61** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C1-Fluorenes	**12.1** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C2-Fluorenes	**17.7** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C3-Fluorenes	**12.8** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
Dibenzothiophene	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C1-Dibenzothiophenes	J **5.27** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C2-Dibenzothiophenes	**9.13** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C3-Dibenzothiophenes	J **6.25** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C4-Dibenzothiophenes	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
Phenanthrene	**14.0** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
Anthracene	J **5.61** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C1-Phenanthrenes/Anthracenes	**18.5** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C2-Phenanthrenes/Anthracenes	**15.9** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C3-Phenanthrenes/Anthracenes	**26.1** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C4-Phenanthrenes/Anthracenes	**59.1** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
Retene	**178** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
Benzo(b)naphtho(2,1-d)thiophene	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C0-Benzonaphthothiophenes	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C1-Benzonaphthothiophenes	J **6.90** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C2-Benzonaphthothiophenes	J **5.87** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C3-Benzonaphthothiophenes	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS796-S1
Date Sampled: 07/06/20 15:50
Percent Solids: 51
Initial Volume: 4.88
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200033
ESS Laboratory Sample ID: F200033-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
Fluoranthene	**23.7** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
Pyrene	**23.8** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C1-Fluoranthenes/Pyrenes	**18.8** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C2-Fluoranthenes/Pyrenes	**J 7.94** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C3-Fluoranthenes/Pyrenes	**J 4.90** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
Benzo(b)fluorene	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
Benzo(c)fluorene	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
2-Methylpyrene	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
4-Methylpyrene	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
1-Methylpyrene	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
Benz(a)anthracene	**J 4.85** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
Chrysene/triphenylene	**8.11** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C1-Benzo(a)anthracenes/Chrysenes	**J 6.26** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C2-Benzo(a)anthracenes/Chrysenes	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C3-Benzo(a)anthracenes/Chrysenes	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C4-Benzo(a)anthracenes/Chrysenes	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
Benzo(b)fluoranthene	**J 6.39** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
Benzo(j/k)fluoranthene	**J 5.59** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
Benzo(e)pyrene	**J 6.03** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
Benzo(a)pyrene	**J 4.61** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
Perylene	**248** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
Indeno(1,2,3-cd)pyrene	**J 5.21** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
Dibenzo(a,h)anthracene	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
Benzo(g,h,i)perylene	**J 4.68** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
Coronene	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
Tetramethyl lead	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
Trimethylethyl lead	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
Dimethyldiethyl lead	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
Methyltriethyl lead	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
Tetraethyl lead	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
2,6,10-trimethyldodecane (1380)	**10.5** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS796-S1
Date Sampled: 07/06/20 15:50
Percent Solids: 51
Initial Volume: 4.88
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200033
ESS Laboratory Sample ID: F200033-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**40.9** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
2,6,10-trimethylpentadecane (1650)	**10.3** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C-17	**223** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
Pristane	**B 40.9** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
C-18	**341** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
Phytane	**B 67.0** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
Carbazole	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
2,6-Dimethylnaphthalene	**J 4.39** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
2,3,5-Trimethylnaphthene	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
4-Methyldibenzothiophene	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
2/3-Methyldibenzothiophene	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
1-Methyldibenzothiophene	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
3-Methylphenanthrene	**J 4.47** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
2-Methylphenanthrene	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
2-Methylanthracene	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
4/9-Methylphenanthrene	**J 5.86** (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303
1-Methylphenanthrene	ND (8.10)	4.05	8270 Mod		1	07/14/20 2:49	F0G0003	FG01303

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*84 %*		*50-120*
Surrogate: Naphthalene-d8	*83 %*		*50-120*
Surrogate: Phenanthrene-d10	*88 %*		*50-120*
Surrogate: Perylene-d12	*94 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS796-S1
Date Sampled: 07/06/20 15:50
Percent Solids: 51

ESS Laboratory Work Order: F200033
ESS Laboratory Sample ID: F200033-05
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**61800** (92.5)		TOC-LK		1	CCP	07/09/20 20:20	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS788-S1
Date Sampled: 07/06/20 16:17
Percent Solids: 56
Initial Volume: 3.11
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200033
ESS Laboratory Sample ID: F200033-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**546** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C1-Benzene	**183** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C2-Benzenes	**344** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C3-Benzenes	**239** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C4-Benzenes	**2690** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C5-Benzenes	**1900** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
Methylcyclohexane	**179** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
Toluene	**426** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
Ethylbenzene	**86.9** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
m,p-Xylene	**931** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
Styrene	**284** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
o-Xylene	**39.3** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
Isopropylbenzene	**67.3** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
n-Propylbenzene	**205** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
1,3,5-Trimethylbenzene	**52.9** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
1,2,3-Trimethylbenzene	**59.7** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
1,2,4-Trimethylbenzene	**231** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
t-Butylbenzene	**54.4** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
sec-Butylbenzene	**1290** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
p-Isopropyltoluene	**50.6** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
n-Butylbenzene	**1090** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
trans-Decalin	**11000** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
cis-Decalin	**1110** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C1-Decalins	**9060** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C2-Decalins	**1940** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C3-Decalins	**625** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C4-Decalins	**954** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
Benzo(b)thiophene	**13.0** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C1-Benzo(b)thiophenes	**89.0** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C2-Benzo(b)thiophenes	**208** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C3-Benzo(b)thiophenes	**219** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C4-Benzo(b)thiophenes	**170** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS788-S1
Date Sampled: 07/06/20 16:17
Percent Solids: 56
Initial Volume: 3.11
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200033
ESS Laboratory Sample ID: F200033-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**203** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
2-Methylnaphthalene	**115** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
1-Methylnaphthalene	**116** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C1-Naphthalenes	**142** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C2-Naphthalenes	**1800** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C3-Naphthalenes	**2780** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C4-Naphthalenes	**1990** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
Biphenyl	**313** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
Acenaphthylene	**506** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
Acenaphthene	**698** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
Dibenzofuran	**85.3** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
Fluorene	**737** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C1-Fluorenes	**785** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C2-Fluorenes	**1060** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C3-Fluorenes	**926** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
Dibenzothiophene	**427** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C1-Dibenzothiophenes	**802** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C2-Dibenzothiophenes	**1070** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C3-Dibenzothiophenes	**831** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C4-Dibenzothiophenes	**473** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
Phenanthrene	**4180** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
Anthracene	**1260** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C1-Phenanthrenes/Anthracenes	**3350** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C2-Phenanthrenes/Anthracenes	**2570** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C3-Phenanthrenes/Anthracenes	**1310** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C4-Phenanthrenes/Anthracenes	**657** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
Retene	**508** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
Benzo(b)naphtho(2,1-d)thiophene	**411** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C0-Benzonaphthothiophenes	**740** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C1-Benzonaphthothiophenes	**575** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C2-Benzonaphthothiophenes	**604** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C3-Benzonaphthothiophenes	**483** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS788-S1
Date Sampled: 07/06/20 16:17
Percent Solids: 56
Initial Volume: 3.11
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200033
ESS Laboratory Sample ID: F200033-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**266** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
Fluoranthene	**4770** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
Pyrene	**5220** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C1-Fluoranthenes/Pyrenes	**3070** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C2-Fluoranthenes/Pyrenes	**1440** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C3-Fluoranthenes/Pyrenes	**712** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
Benzo(b)fluorene	**356** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
Benzo(c)fluorene	**185** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
2-Methylpyrene	**425** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
4-Methylpyrene	**406** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
1-Methylpyrene	**336** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
Benz(a)anthracene	**2330** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
Chrysene/triphenylene	**2530** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C1-Benzo(a)anthracenes/Chrysenes	**1470** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C2-Benzo(a)anthracenes/Chrysenes	**880** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C3-Benzo(a)anthracenes/Chrysenes	**543** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C4-Benzo(a)anthracenes/Chrysenes	**314** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
Benzo(b)fluoranthene	**1730** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
Benzo(j/k)fluoranthene	**1840** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
Benzo(e)pyrene	**1570** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
Benzo(a)pyrene	**2170** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
Perylene	**979** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
Indeno(1,2,3-cd)pyrene	**1320** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
Dibenzo(a,h)anthracene	**339** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
Benzo(g,h,i)perylene	**1230** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
Coronene	**326** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
Tetramethyl lead	ND (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
Trimethylethyl lead	ND (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
Dimethyldiethyl lead	ND (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
Methyltriethyl lead	ND (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
Tetraethyl lead	ND (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
2,6,10-trimethyldodecane (1380)	**1420** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS788-S1
Date Sampled: 07/06/20 16:17
Percent Solids: 56
Initial Volume: 3.11
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200033
ESS Laboratory Sample ID: F200033-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**2010** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
2,6,10-trimethylpentadecane (1650)	**2180** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C-17	**473** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
Pristane	**6490** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
C-18	**527** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
Phytane	**4780** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
Carbazole	**141** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
2,6-Dimethylnaphthalene	**612** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
2,3,5-Trimethylnaphthene	**158** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
4-Methyldibenzothiophene	**338** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
2/3-Methyldibenzothiophene	**294** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
1-Methyldibenzothiophene	**93.7** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
3-Methylphenanthrene	**787** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
2-Methylphenanthrene	**898** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
2-Methylanthracene	**285** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
4/9-Methylphenanthrene	**775** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303
1-Methylphenanthrene	**526** (11.6)	5.79	8270 Mod		1	07/14/20 4:10	F0G0003	FG01303

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*74 %*		*50-120*
Surrogate: Naphthalene-d8	*83 %*		*50-120*
Surrogate: Phenanthrene-d10	*88 %*		*50-120*
Surrogate: Perylene-d12	*92 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS788-S1
Date Sampled: 07/06/20 16:17
Percent Solids: 56

ESS Laboratory Work Order: F200033
ESS Laboratory Sample ID: F200033-06
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**50100** (96.0)		TOC-LK		1	CCP	07/09/20 20:37	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200033

Quality Control Data

Classical Chemistry

Batch DG00749 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	100	mg/kg							
Total Organic Carbon (2)	ND	100	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200033

Quality Control Data

Classical Chemistry

Batch DG00749 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9640	100	mg/kg	10000		96	80-120			
Total Organic Carbon (2)	9300	100	mg/kg	10000		93	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200033

Quality Control Data

Classical Chemistry

Batch DG00749 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9360	100	mg/kg	10000		94	80-120	3	20	
Total Organic Carbon (2)	9660	100	mg/kg	10000		97	80-120	4	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200033

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FG01303 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	ND	4.00	ug/Kg wet							
C1-Benzene	ND	4.00	ug/Kg wet							
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	2.60	4.00	ug/Kg wet							J
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	3.89	4.00	ug/Kg wet							J
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200033

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FG01303 - 3570

C1-Fluorenes	ND	4.00	ug/Kg wet
C2-Fluorenes	ND	4.00	ug/Kg wet
C3-Fluorenes	ND	4.00	ug/Kg wet
Dibenzothiophene	ND	4.00	ug/Kg wet
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet
Phenanthrene	ND	4.00	ug/Kg wet
Anthracene	ND	4.00	ug/Kg wet
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
Retene	ND	4.00	ug/Kg wet
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
Fluoranthene	ND	4.00	ug/Kg wet
Pyrene	ND	4.00	ug/Kg wet
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
Benzo(b)fluorene	ND	4.00	ug/Kg wet
Benzo(c)fluorene	ND	4.00	ug/Kg wet
2-Methylpyrene	ND	4.00	ug/Kg wet
4-Methylpyrene	ND	4.00	ug/Kg wet
1-Methylpyrene	ND	4.00	ug/Kg wet
Benz(a)anthracene	ND	4.00	ug/Kg wet
Chrysene/triphenylene	ND	4.00	ug/Kg wet
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet
Benzo(e)pyrene	ND	4.00	ug/Kg wet
Benzo(a)pyrene	ND	4.00	ug/Kg wet
Perylene	ND	4.00	ug/Kg wet
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet
Coronene	ND	4.00	ug/Kg wet
Tetramethyl lead	ND	4.00	ug/Kg wet
Trimethylethyl lead	ND	4.00	ug/Kg wet

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200033

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FG01303 - 3570						
Dimethyldiethyl lead	ND	4.00	ug/Kg wet			
Methyltriethyl lead	ND	4.00	ug/Kg wet			
Tetraethyl lead	ND	4.00	ug/Kg wet			
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet			
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet			
2,6,10-trimethylpentadecane (1650)	ND	4.00	ug/Kg wet			
C-17	10.7	4.00	ug/Kg wet			
Pristane	7.76	4.00	ug/Kg wet			
C-18	12.4	4.00	ug/Kg wet			
Phytane	12.9	4.00	ug/Kg wet			
Carbazole	ND	4.00	ug/Kg wet			
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet			
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet			
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
3-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylanthracene	ND	4.00	ug/Kg wet			
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet			
1-Methylphenanthrene	ND	4.00	ug/Kg wet			
Surrogate: Toluene-D8	*390*		ug/Kg wet	*400.0*	*97*	*50-120*
Surrogate: Naphthalene-d8	*360*		ug/Kg wet	*400.0*	*90*	*50-120*
Surrogate: Phenanthrene-d10	*388*		ug/Kg wet	*400.0*	*97*	*50-120*
Surrogate: Perylene-d12	*398*		ug/Kg wet	*400.0*	*100*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200033

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FG01303 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	375	4.00	ug/Kg wet	400.0		94	60-130			
Methylcyclohexane	243	4.00	ug/Kg wet	400.0		61	60-130			
Toluene	346	4.00	ug/Kg wet	400.0		86	60-130			
Ethylbenzene	367	4.00	ug/Kg wet	400.0		92	60-130			
m,p-Xylene	361	4.00	ug/Kg wet	400.0		90	60-130			
Styrene	401	4.00	ug/Kg wet	400.0		100	60-130			
o-Xylene	364	4.00	ug/Kg wet	400.0		91	60-130			
Isopropylbenzene	370	4.00	ug/Kg wet	400.0		92	60-130			
n-Propylbenzene	368	4.00	ug/Kg wet	400.0		92	60-130			
1,3,5-Trimethylbenzene	363	4.00	ug/Kg wet	400.0		91	60-130			
1,2,3-Trimethylbenzene	360	4.00	ug/Kg wet	400.0		90	60-130			
1,2,4-Trimethylbenzene	361	4.00	ug/Kg wet	400.0		90	60-130			
t-Butylbenzene	358	4.00	ug/Kg wet	400.0		89	60-130			
sec-Butylbenzene	361	4.00	ug/Kg wet	400.0		90	60-130			
p-Isopropyltoluene	361	4.00	ug/Kg wet	400.0		90	60-130			
n-Butylbenzene	346	4.00	ug/Kg wet	400.0		86	60-130			
trans-Decalin	359	4.00	ug/Kg wet	400.0		90	60-130			
cis-Decalin	351	4.00	ug/Kg wet	400.0		88	60-130			
Benzo(b)thiophene	357	4.00	ug/Kg wet	400.0		89	60-130			
Naphthalene	358	4.00	ug/Kg wet	400.0		90	60-130			
2-Methylnaphthalene	351	4.00	ug/Kg wet	400.0		88	60-130			
1-Methylnaphthalene	350	4.00	ug/Kg wet	400.0		88	60-130			
Biphenyl	357	4.00	ug/Kg wet	400.0		89	60-130			
Acenaphthylene	378	4.00	ug/Kg wet	400.0		94	60-130			
Acenaphthene	384	4.00	ug/Kg wet	400.0		96	60-130			
Dibenzofuran	362	4.00	ug/Kg wet	400.0		91	60-130			
Fluorene	369	4.00	ug/Kg wet	400.0		92	60-130			
Dibenzothiophene	382	4.00	ug/Kg wet	400.0		95	60-130			
Phenanthrene	375	4.00	ug/Kg wet	400.0		94	60-130			
Anthracene	367	4.00	ug/Kg wet	400.0		92	60-130			
Retene	390	4.00	ug/Kg wet	400.0		97	60-130			
Benzo(b)naphtho(2,1-d)thiophene	395	4.00	ug/Kg wet	400.0		99	60-130			
Fluoranthene	396	4.00	ug/Kg wet	400.0		99	60-130			
Pyrene	396	4.00	ug/Kg wet	400.0		99	60-130			
Benz(a)anthracene	398	4.00	ug/Kg wet	400.0		99	60-130			
Chrysene/triphenylene	385	4.00	ug/Kg wet	400.0		96	60-130			
Benzo(b)fluoranthene	393	4.00	ug/Kg wet	400.0		98	60-130			
Benzo(j/k)fluoranthene	396	4.00	ug/Kg wet	400.0		99	60-130			
Benzo(e)pyrene	387	4.00	ug/Kg wet	400.0		97	60-130			
Benzo(a)pyrene	389	4.00	ug/Kg wet	400.0		97	60-130			
Perylene	389	4.00	ug/Kg wet	400.0		97	60-130			
Indeno(1,2,3-cd)pyrene	361	4.00	ug/Kg wet	400.0		90	60-130			
Dibenzo(a,h)anthracene	380	4.00	ug/Kg wet	400.0		95	60-130			
Benzo(g,h,i)perylene	366	4.00	ug/Kg wet	400.0		91	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200033

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FG01303 - 3570						
Coronene	361	4.00	ug/Kg wet	400.0	90	60-130
Tetraethyl lead	275	4.00	ug/Kg wet	400.0	69	60-130
Pristane	411	4.00	ug/Kg wet	400.0	103	60-130
Phytane	434	4.00	ug/Kg wet	400.0	109	60-130
Surrogate: Toluene-D8	*375*		ug/Kg wet	*400.0*	*94*	*50-120*
Surrogate: Naphthalene-d8	*375*		ug/Kg wet	*400.0*	*94*	*50-120*
Surrogate: Phenanthrene-d10	*396*		ug/Kg wet	*400.0*	*99*	*50-120*
Surrogate: Perylene-d12	*405*		ug/Kg wet	*400.0*	*101*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200033

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FG01303 - 3570

Duplicate **Source: F200033-06**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	558	11.8	ug/Kg dry		546			2	50	
C1-Benzene	201	11.8	ug/Kg dry		183			9	50	
C2-Benzenes	357	11.8	ug/Kg dry		344			4	50	
C3-Benzenes	180	11.8	ug/Kg dry		239			28	50	
C4-Benzenes	2130	11.8	ug/Kg dry		2690			23	50	
C5-Benzenes	1460	11.8	ug/Kg dry		1900			26	50	
Methylcyclohexane	164	11.8	ug/Kg dry		179			9	50	
Toluene	466	11.8	ug/Kg dry		426			9	50	
Ethylbenzene	67.4	11.8	ug/Kg dry		86.9			25	50	
m,p-Xylene	982	11.8	ug/Kg dry		931			5	50	
Styrene	250	11.8	ug/Kg dry		284			13	50	
o-Xylene	35.1	11.8	ug/Kg dry		39.3			11	50	
Isopropylbenzene	44.0	11.8	ug/Kg dry		67.3			42	50	
n-Propylbenzene	168	11.8	ug/Kg dry		205			20	50	
1,3,5-Trimethylbenzene	35.3	11.8	ug/Kg dry		52.9			40	50	
1,2,3-Trimethylbenzene	53.3	11.8	ug/Kg dry		59.7			11	50	
1,2,4-Trimethylbenzene	167	11.8	ug/Kg dry		231			32	50	
t-Butylbenzene	43.5	11.8	ug/Kg dry		54.4			22	50	
sec-Butylbenzene	1030	11.8	ug/Kg dry		1290			22	50	
p-Isopropyltoluene	51.2	11.8	ug/Kg dry		50.6			1	50	
n-Butylbenzene	840	11.8	ug/Kg dry		1090			26	50	
trans-Decalin	8310	11.8	ug/Kg dry		11000			28	50	
cis-Decalin	796	11.8	ug/Kg dry		1110			33	50	
C1-Decalins	6520	11.8	ug/Kg dry		9060			33	50	
C2-Decalins	1410	11.8	ug/Kg dry		1940			32	50	
C3-Decalins	457	11.8	ug/Kg dry		625			31	50	
C4-Decalins	665	11.8	ug/Kg dry		954			36	50	
Benzo(b)thiophene	14.2	11.8	ug/Kg dry		13.0			9	50	
C1-Benzo(b)thiophenes	84.5	11.8	ug/Kg dry		89.0			5	50	
C2-Benzo(b)thiophenes	194	11.8	ug/Kg dry		208			7	50	
C3-Benzo(b)thiophenes	183	11.8	ug/Kg dry		219			18	50	
C4-Benzo(b)thiophenes	154	11.8	ug/Kg dry		170			10	50	
Naphthalene	180	11.8	ug/Kg dry		203			12	50	
2-Methylnaphthalene	96.7	11.8	ug/Kg dry		115			18	50	
1-Methylnaphthalene	107	11.8	ug/Kg dry		116			8	50	
C1-Naphthalenes	127	11.8	ug/Kg dry		142			11	50	
C2-Naphthalenes	1740	11.8	ug/Kg dry		1800			4	50	
C3-Naphthalenes	2340	11.8	ug/Kg dry		2780			17	50	
C4-Naphthalenes	1650	11.8	ug/Kg dry		1990			19	50	
Biphenyl	332	11.8	ug/Kg dry		313			6	50	
Acenaphthylene	384	11.8	ug/Kg dry		506			27	50	
Acenaphthene	616	11.8	ug/Kg dry		698			12	50	
Dibenzofuran	74.2	11.8	ug/Kg dry		85.3			14	50	
Fluorene	658	11.8	ug/Kg dry		737			11	50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200033

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FG01303 - 3570						
C1-Fluorenes	693	11.8	ug/Kg dry	785	13	50
C2-Fluorenes	906	11.8	ug/Kg dry	1060	16	50
C3-Fluorenes	807	11.8	ug/Kg dry	926	14	50
Dibenzothiophene	383	11.8	ug/Kg dry	427	11	50
C1-Dibenzothiophenes	713	11.8	ug/Kg dry	802	12	50
C2-Dibenzothiophenes	927	11.8	ug/Kg dry	1070	15	50
C3-Dibenzothiophenes	734	11.8	ug/Kg dry	831	12	50
C4-Dibenzothiophenes	385	11.8	ug/Kg dry	473	21	50
Phenanthrene	3800	11.8	ug/Kg dry	4180	10	50
Anthracene	1010	11.8	ug/Kg dry	1260	22	50
C1-Phenanthrenes/Anthracenes	3010	11.8	ug/Kg dry	3350	11	50
C2-Phenanthrenes/Anthracenes	2280	11.8	ug/Kg dry	2570	12	50
C3-Phenanthrenes/Anthracenes	1130	11.8	ug/Kg dry	1310	14	50
C4-Phenanthrenes/Anthracenes	580	11.8	ug/Kg dry	657	12	50
Retene	589	11.8	ug/Kg dry	508	15	50
Benzo(b)naphtho(2,1-d)thiophene	307	11.8	ug/Kg dry	411	29	50
C0-Benzonaphthothiophenes	561	11.8	ug/Kg dry	740	28	50
C1-Benzonaphthothiophenes	437	11.8	ug/Kg dry	575	27	50
C2-Benzonaphthothiophenes	431	11.8	ug/Kg dry	604	33	50
C3-Benzonaphthothiophenes	330	11.8	ug/Kg dry	483	38	50
C4-Benzonaphthothiophenes	191	11.8	ug/Kg dry	266	33	50
Fluoranthene	3960	11.8	ug/Kg dry	4770	19	50
Pyrene	4600	11.8	ug/Kg dry	5220	13	50
C1-Fluoranthenes/Pyrenes	2570	11.8	ug/Kg dry	3070	18	50
C2-Fluoranthenes/Pyrenes	1110	11.8	ug/Kg dry	1440	26	50
C3-Fluoranthenes/Pyrenes	539	11.8	ug/Kg dry	712	28	50
Benzo(b)fluorene	310	11.8	ug/Kg dry	356	14	50
Benzo(c)fluorene	118	11.8	ug/Kg dry	185	44	50
2-Methylpyrene	356	11.8	ug/Kg dry	425	18	50
4-Methylpyrene	344	11.8	ug/Kg dry	406	16	50
1-Methylpyrene	276	11.8	ug/Kg dry	336	20	50
Benz(a)anthracene	1640	11.8	ug/Kg dry	2330	35	50
Chrysene/triphenylene	1870	11.8	ug/Kg dry	2530	30	50
C1-Benzo(a)anthracenes/Chrysenes	1110	11.8	ug/Kg dry	1470	28	50
C2-Benzo(a)anthracenes/Chrysenes	650	11.8	ug/Kg dry	880	30	50
C3-Benzo(a)anthracenes/Chrysenes	356	11.8	ug/Kg dry	543	42	50
C4-Benzo(a)anthracenes/Chrysenes	251	11.8	ug/Kg dry	314	22	50
Benzo(b)fluoranthene	1150	11.8	ug/Kg dry	1730	40	50
Benzo(j/k)fluoranthene	1210	11.8	ug/Kg dry	1840	42	50
Benzo(e)pyrene	1040	11.8	ug/Kg dry	1570	41	50
Benzo(a)pyrene	1440	11.8	ug/Kg dry	2170	41	50
Perylene	1020	11.8	ug/Kg dry	979	4	50
Indeno(1,2,3-cd)pyrene	843	11.8	ug/Kg dry	1320	44	50
Dibenzo(a,h)anthracene	209	11.8	ug/Kg dry	339	47	50
Benzo(g,h,i)perylene	795	11.8	ug/Kg dry	1230	43	50
Coronene	211	11.8	ug/Kg dry	326	43	50
Tetramethyl lead	ND	11.8	ug/Kg dry	ND		50
Trimethylethyl lead	ND	11.8	ug/Kg dry	ND		50

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200033

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FG01303 - 3570								
Dimethyldiethyl lead	ND	11.8	ug/Kg dry	ND				50
Methyltriethyl lead	ND	11.8	ug/Kg dry	ND				50
Tetraethyl lead	ND	11.8	ug/Kg dry	ND				50
2,6,10-trimethyldodecane (1380)	998	11.8	ug/Kg dry	1420			35	50
2,6,10-trimethyltridecane (1470)	1590	11.8	ug/Kg dry	2010			24	50
2,6,10-trimethylpentadecane (1650)	1910	11.8	ug/Kg dry	2180			13	50
C-17	434	11.8	ug/Kg dry	473			9	50
Pristane	5590	11.8	ug/Kg dry	6490			15	50
C-18	452	11.8	ug/Kg dry	527			15	50
Phytane	4240	11.8	ug/Kg dry	4780			12	50
Carbazole	125	11.8	ug/Kg dry	141			12	50
2,6-Dimethylnaphthalene	573	11.8	ug/Kg dry	612			7	50
2,3,5-Trimethylnaphthene	136	11.8	ug/Kg dry	158			15	50
4-Methyldibenzothiophene	305	11.8	ug/Kg dry	338			10	50
2/3-Methyldibenzothiophene	254	11.8	ug/Kg dry	294			15	50
1-Methyldibenzothiophene	83.3	11.8	ug/Kg dry	93.7			12	50
3-Methylphenanthrene	718	11.8	ug/Kg dry	787			9	50
2-Methylphenanthrene	815	11.8	ug/Kg dry	898			10	50
2-Methylanthracene	243	11.8	ug/Kg dry	285			16	50
4/9-Methylphenanthrene	692	11.8	ug/Kg dry	775			11	50
1-Methylphenanthrene	488	11.8	ug/Kg dry	526			8	50
Surrogate: Toluene-D8	*943*		ug/Kg dry	*1180*	*80*	*50-120*		
Surrogate: Naphthalene-d8	*1060*		ug/Kg dry	*1180*	*90*	*50-120*		
Surrogate: Phenanthrene-d10	*1110*		ug/Kg dry	*1180*	*94*	*50-120*		
Surrogate: Perylene-d12	*1160*		ug/Kg dry	*1180*	*99*	*50-120*		

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F200033

Notes and Definitions

U	Analyte included in the analysis, but not detected
J	Reported between MDL and MRL
D	Diluted.
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200033

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 200G0164 / FC033

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY REQUIRED – (YES) NO

If Yes, Are MCP Analytical Methods Required? (YES) NO NA

Are Drinking Water Samples Submitted? YES (NO) NA

If Yes, Have Drinking Water Sampling Requirements Been Met? YES NO (NA)

Preservative

None	None						

Analysis

Sample Handling

Samples Field Filtered: YES NO (NA)

Sampled Shipped With Ice: (YES) NO

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Parent and Alkylated MAHs & PAHs 8270**	TOCs by Lloyd-Kahn	Sample Specific Remarks
1	1804576-SS795-S2	7/6/2020	13:16	Soil	1	BFM	X	X	
2	1804576-SS789-S1	7/6/2020	13:55	Soil	1	BFM	X	X	
3	1804576-SS790-S1	7/6/2020	14:31	Soil	1	BFM	X	X	
4	1804576-SS790-S2	7/6/2020	14:37	Soil	1	BFM	X	X	
5	1804576-SS796-S1	7/6/2020	15:50	Soil	1	BFM	X	X	
6	1804576-SS788-S1	7/6/2020	16:17	Soil	1	BFM	X	X	

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

	Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1.		7/6/20	1920	1. GEI Sample Fridge
2.	GEI Sample Fridge	7/7/20	1305	2.
3.		7/7/20	1305	3.
4.		7/7/20	15:21	4.

Turnaround Time (Business days):

Normal __X__ Other ____

10-Day ____ 7-Day ____

5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

**Parent and Alkylated MAHs & PAHs (34) by GC/MS/SIM/SCAN

ICE temp: 0.6

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

Shipped/Delivered Via: ESS Courier

ESS Project ID: 20G0164
Date Received: 7/7/2020
Project Due Date: 7/14/2020
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 0.6 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA
13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1	62003	Yes	N/A	Yes	8 oz jar	NP	
2	62004	Yes	N/A	Yes	8 oz jar	NP	
3	62005	Yes	N/A	Yes	8 oz jar	NP	
4	62006	Yes	N/A	Yes	8 oz jar	NP	
5	62007	Yes	N/A	Yes	8 oz jar	NP	
6	62008	Yes	N/A	Yes	8 oz jar	NP	

2nd Review
Were all containers scanned into storage/lab? Initials Yes / No
Are barcode labels on correct containers? Yes / No / NA
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: Date & Time: 7/7/20 1622
Reviewed By: Date & Time: 7/7/20 1647

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

ESS Project ID: 20G0164

Date Received: 7/7/2020

Delivered By: 7/7/20 1647

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: F200035

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 11:04 am, Jul 22, 2020

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses
ESS Laboratory - Cranston, RI TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200035

SAMPLE RECEIPT

The following samples were received on July 09, 2020 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F200035-01	1804576-SS801-S2	Soil	8270 Mod, TOC-LK
F200035-02	1804576-SS800-S1	Soil	8270 Mod, TOC-LK
F200035-03	1804576-SS800-S2	Soil	8270 Mod, TOC-LK
F200035-04	1804576-SS799-S2	Soil	8270 Mod, TOC-LK
F200035-05	1804576-SS798-S2	Soil	8270 Mod, TOC-LK
F200035-06	1804576-SS804-S1	Soil	8270 Mod, TOC-LK
F200035-07	1804576-SS804-S2	Soil	8270 Mod, TOC-LK
F200035-08	1804576-SS804-S3	Soil	8270 Mod, TOC-LK
F200035-09	1804576-SS805-S1	Soil	8270 Mod, TOC-LK
F200035-10	1804576-SS805-S3	Soil	8270 Mod, TOC-LK
F200035-11	1804576-SS806-S2	Soil	8270 Mod, TOC-LK
F200035-12	1804576-SS804-S2D	Soil	8270 Mod, TOC-LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200035

PROJECT NARRATIVE

8270D (SIM) Semi-Volatile Organic Compounds

F200035-01 **Present in Method Blank (B).**
C-17 , C-18 , Phytane , Pristane

F200035-02 **Present in Method Blank (B).**
Phytane , Pristane

F200035-04 **Present in Method Blank (B).**
C-18 , Phytane , Pristane

F200035-06 **Present in Method Blank (B).**
C-18 , Phytane , Pristane

F200035-08 **Present in Method Blank (B).**
C-17 , C-18 , Phytane , Pristane

F200035-09 **Present in Method Blank (B).**
C-17 , C-18 , Phytane

F200035-10 **Present in Method Blank (B).**
C-17 , C-18 , Phytane , Pristane

F200035-11 **Present in Method Blank (B).**
C-17 , C-18 , Phytane , Pristane

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200035

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS801-S2
Date Sampled: 07/07/20 15:23
Percent Solids: 69
Initial Volume: 4.8
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C1-Benzene	**17.9** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C2-Benzenes	**16.0** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C3-Benzenes	**J 4.70** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C4-Benzenes	**6.96** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C5-Benzenes	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
Methylcyclohexane	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
Toluene	**39.3** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
Ethylbenzene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
m,p-Xylene	**31.0** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
Styrene	**33.2** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
o-Xylene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
Isopropylbenzene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
n-Propylbenzene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
1,3,5-Trimethylbenzene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
1,2,3-Trimethylbenzene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
1,2,4-Trimethylbenzene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
t-Butylbenzene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
sec-Butylbenzene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
p-Isopropyltoluene	**J 3.38** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
n-Butylbenzene	**J 4.29** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
trans-Decalin	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
cis-Decalin	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C1-Decalins	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C2-Decalins	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C3-Decalins	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C4-Decalins	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
Benzo(b)thiophene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C1-Benzo(b)thiophenes	**7.85** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C2-Benzo(b)thiophenes	**7.65** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C3-Benzo(b)thiophenes	**J 5.71** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C4-Benzo(b)thiophenes	**J 3.77** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS801-S2
Date Sampled: 07/07/20 15:23
Percent Solids: 69
Initial Volume: 4.8
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	J **3.26** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
2-Methylnaphthalene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
1-Methylnaphthalene	J **4.59** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C1-Naphthalenes	J **4.61** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C2-Naphthalenes	**9.32** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C3-Naphthalenes	**6.73** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C4-Naphthalenes	J **4.93** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
Biphenyl	J **5.78** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
Acenaphthylene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
Acenaphthene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
Dibenzofuran	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
Fluorene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C1-Fluorenes	**7.35** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C2-Fluorenes	J **5.57** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C3-Fluorenes	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
Dibenzothiophene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C1-Dibenzothiophenes	J **4.14** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C2-Dibenzothiophenes	**6.14** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C3-Dibenzothiophenes	J **5.55** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C4-Dibenzothiophenes	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
Phenanthrene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
Anthracene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C1-Phenanthrenes/Anthracenes	**6.36** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C2-Phenanthrenes/Anthracenes	**9.39** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C3-Phenanthrenes/Anthracenes	**8.28** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C4-Phenanthrenes/Anthracenes	**10.3** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
Retene	**29.4** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
Benzo(b)naphtho(2,1-d)thiophene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C0-Benzonaphthothiophenes	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C1-Benzonaphthothiophenes	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C2-Benzonaphthothiophenes	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C3-Benzonaphthothiophenes	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS801-S2
Date Sampled: 07/07/20 15:23
Percent Solids: 69
Initial Volume: 4.8
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
Fluoranthene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
Pyrene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C1-Fluoranthenes/Pyrenes	**J 5.22** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C2-Fluoranthenes/Pyrenes	**J 4.52** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C3-Fluoranthenes/Pyrenes	**J 3.65** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
Benzo(b)fluorene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
Benzo(c)fluorene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
2-Methylpyrene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
4-Methylpyrene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
1-Methylpyrene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
Benz(a)anthracene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
Chrysene/triphenylene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C1-Benzo(a)anthracenes/Chrysenes	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C2-Benzo(a)anthracenes/Chrysenes	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C3-Benzo(a)anthracenes/Chrysenes	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C4-Benzo(a)anthracenes/Chrysenes	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
Benzo(b)fluoranthene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
Benzo(j/k)fluoranthene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
Benzo(e)pyrene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
Benzo(a)pyrene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
Perylene	**681** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
Indeno(1,2,3-cd)pyrene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
Dibenzo(a,h)anthracene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
Benzo(g,h,i)perylene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
Coronene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
Tetramethyl lead	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
Trimethylethyl lead	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
Dimethyldiethyl lead	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
Methyltriethyl lead	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
Tetraethyl lead	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
2,6,10-trimethyldodecane (1380)	**J 4.45** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS801-S2
Date Sampled: 07/07/20 15:23
Percent Solids: 69
Initial Volume: 4.8
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**14.6** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
2,6,10-trimethylpentadecane (1650)	**11.3** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C-17	**B 68.1** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
Pristane	**B 31.4** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
C-18	**B 67.6** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
Phytane	**B 50.9** (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
Carbazole	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
2,6-Dimethylnaphthalene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
2,3,5-Trimethylnaphthene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
4-Methyldibenzothiophene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
2/3-Methyldibenzothiophene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
1-Methyldibenzothiophene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
3-Methylphenanthrene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
2-Methylphenanthrene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
2-Methylanthracene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
4/9-Methylphenanthrene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303
1-Methylphenanthrene	ND (6.06)	3.03	8270 Mod		1	07/14/20 6:53	F0G0003	FG01303

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*87 %*		*50-120*
Surrogate: Naphthalene-d8	*85 %*		*50-120*
Surrogate: Phenanthrene-d10	*91 %*		*50-120*
Surrogate: Perylene-d12	*99 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS801-S2
Date Sampled: 07/07/20 15:23
Percent Solids: 69

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**18600** (96.4)		TOC-LK		1	CCP	07/15/20 17:55	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS800-S1
Date Sampled: 07/07/20 16:16
Percent Solids: 74
Initial Volume: 5.23
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C1-Benzene	**39.6** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C2-Benzenes	**17.9** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C3-Benzenes	**5.86** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C4-Benzenes	**18.5** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C5-Benzenes	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
Methylcyclohexane	**J 4.59** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
Toluene	**93.3** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
Ethylbenzene	**J 3.17** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
m,p-Xylene	**39.1** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
Styrene	**13.4** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
o-Xylene	**J 3.59** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
Isopropylbenzene	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
n-Propylbenzene	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
1,3,5-Trimethylbenzene	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
1,2,3-Trimethylbenzene	**J 4.34** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
1,2,4-Trimethylbenzene	**J 2.93** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
t-Butylbenzene	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
sec-Butylbenzene	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
p-Isopropyltoluene	**50.8** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
n-Butylbenzene	**J 4.97** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
trans-Decalin	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
cis-Decalin	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C1-Decalins	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C2-Decalins	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C3-Decalins	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C4-Decalins	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
Benzo(b)thiophene	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C1-Benzo(b)thiophenes	**6.69** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C2-Benzo(b)thiophenes	**J 4.32** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C3-Benzo(b)thiophenes	**J 4.90** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C4-Benzo(b)thiophenes	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS800-S1
Date Sampled: 07/07/20 16:16
Percent Solids: 74
Initial Volume: 5.23
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	J **4.46** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
2-Methylnaphthalene	**5.74** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
1-Methylnaphthalene	J **5.02** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C1-Naphthalenes	**6.85** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C2-Naphthalenes	**12.9** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C3-Naphthalenes	**10.9** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C4-Naphthalenes	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
Biphenyl	J **3.92** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
Acenaphthylene	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
Acenaphthene	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
Dibenzofuran	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
Fluorene	J **2.70** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C1-Fluorenes	J **4.69** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C2-Fluorenes	**7.02** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C3-Fluorenes	**7.27** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
Dibenzothiophene	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C1-Dibenzothiophenes	J **3.30** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C2-Dibenzothiophenes	**5.35** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C3-Dibenzothiophenes	J **4.18** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C4-Dibenzothiophenes	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
Phenanthrene	**10.2** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
Anthracene	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C1-Phenanthrenes/Anthracenes	**16.2** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C2-Phenanthrenes/Anthracenes	**22.7** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C3-Phenanthrenes/Anthracenes	**12.3** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C4-Phenanthrenes/Anthracenes	**210** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
Retene	**857** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
Benzo(b)naphtho(2,1-d)thiophene	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C0-Benzonaphthothiophenes	J **3.24** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C1-Benzonaphthothiophenes	J **4.51** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C2-Benzonaphthothiophenes	J **3.05** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C3-Benzonaphthothiophenes	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS800-S1
Date Sampled: 07/07/20 16:16
Percent Solids: 74
Initial Volume: 5.23
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
Fluoranthene	**8.55** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
Pyrene	**9.14** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C1-Fluoranthenes/Pyrenes	**17.1** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C2-Fluoranthenes/Pyrenes	**7.78** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C3-Fluoranthenes/Pyrenes	**6.45** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
Benzo(b)fluorene	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
Benzo(c)fluorene	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
2-Methylpyrene	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
4-Methylpyrene	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
1-Methylpyrene	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
Benz(a)anthracene	**J 3.29** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
Chrysene/triphenylene	**J 4.80** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C1-Benzo(a)anthracenes/Chrysenes	**5.50** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C2-Benzo(a)anthracenes/Chrysenes	**13.0** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C3-Benzo(a)anthracenes/Chrysenes	**9.57** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C4-Benzo(a)anthracenes/Chrysenes	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
Benzo(b)fluoranthene	**J 3.74** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
Benzo(j/k)fluoranthene	**J 3.51** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
Benzo(e)pyrene	**J 3.77** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
Benzo(a)pyrene	**J 3.76** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
Perylene	**101** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
Indeno(1,2,3-cd)pyrene	**J 3.38** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
Dibenzo(a,h)anthracene	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
Benzo(g,h,i)perylene	**J 3.08** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
Coronene	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
Tetramethyl lead	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
Trimethylethyl lead	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
Dimethyldiethyl lead	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
Methyltriethyl lead	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
Tetraethyl lead	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
2,6,10-trimethyldodecane (1380)	**6.50** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS800-S1
Date Sampled: 07/07/20 16:16
Percent Solids: 74
Initial Volume: 5.23
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**19.7** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
2,6,10-trimethylpentadecane (1650)	**8.18** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C-17	**134** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
Pristane	**B 33.8** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
C-18	**125** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
Phytane	**B 35.6** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
Carbazole	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
2,6-Dimethylnaphthalene	**J 3.25** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
2,3,5-Trimethylnaphthene	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
4-Methyldibenzothiophene	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
2/3-Methyldibenzothiophene	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
1-Methyldibenzothiophene	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
3-Methylphenanthrene	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
2-Methylphenanthrene	**J 3.69** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
2-Methylanthracene	ND (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
4/9-Methylphenanthrene	**J 3.09** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303
1-Methylphenanthrene	**6.32** (5.19)	2.59	8270 Mod		1	07/14/20 12:18	F0G0003	FG01303

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*90 %*		*50-120*
Surrogate: Naphthalene-d8	*90 %*		*50-120*
Surrogate: Phenanthrene-d10	*95 %*		*50-120*
Surrogate: Perylene-d12	*101 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS800-S1
Date Sampled: 07/07/20 16:16
Percent Solids: 74

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**23000** (96.3)		TOC-LK		1	CCP	07/15/20 18:28	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS800-S2
Date Sampled: 07/07/20 16:22
Percent Solids: 64
Initial Volume: 5.29
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**53.0** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C1-Benzene	**111** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C2-Benzenes	**66.3** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C3-Benzenes	**24.5** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C4-Benzenes	**25.5** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C5-Benzenes	**22.4** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
Methylcyclohexane	J **5.44** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
Toluene	**246** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
Ethylbenzene	**15.6** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
m,p-Xylene	**165** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
Styrene	**117** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
o-Xylene	**13.3** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
Isopropylbenzene	ND (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
n-Propylbenzene	**6.85** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
1,3,5-Trimethylbenzene	**8.53** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
1,2,3-Trimethylbenzene	J **5.77** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
1,2,4-Trimethylbenzene	**19.9** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
t-Butylbenzene	ND (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
sec-Butylbenzene	ND (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
p-Isopropyltoluene	**12.1** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
n-Butylbenzene	**9.12** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
trans-Decalin	**11.8** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
cis-Decalin	ND (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C1-Decalins	**36.5** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C2-Decalins	**70.3** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C3-Decalins	**55.9** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C4-Decalins	**87.4** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
Benzo(b)thiophene	J **3.30** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C1-Benzo(b)thiophenes	**12.8** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C2-Benzo(b)thiophenes	**16.1** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C3-Benzo(b)thiophenes	**11.9** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C4-Benzo(b)thiophenes	**6.88** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS800-S2
Date Sampled: 07/07/20 16:22
Percent Solids: 64
Initial Volume: 5.29
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**212** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
2-Methylnaphthalene	**218** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
1-Methylnaphthalene	**113** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C1-Naphthalenes	**198** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C2-Naphthalenes	**609** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C3-Naphthalenes	**635** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C4-Naphthalenes	**372** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
Biphenyl	**80.7** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
Acenaphthylene	**450** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
Acenaphthene	**374** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
Dibenzofuran	**42.5** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
Fluorene	**485** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C1-Fluorenes	**666** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C2-Fluorenes	**612** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C3-Fluorenes	**409** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
Dibenzothiophene	**71.3** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C1-Dibenzothiophenes	**96.0** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C2-Dibenzothiophenes	**143** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C3-Dibenzothiophenes	**132** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C4-Dibenzothiophenes	**84.3** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
Phenanthrene	**3080** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
Anthracene	**1080** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C1-Phenanthrenes/Anthracenes	**3130** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C2-Phenanthrenes/Anthracenes	ND (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C3-Phenanthrenes/Anthracenes	**1080** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C4-Phenanthrenes/Anthracenes	**506** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
Retene	**139** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
Benzo(b)naphtho(2,1-d)thiophene	**117** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C0-Benzonaphthothiophenes	**232** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C1-Benzonaphthothiophenes	**255** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C2-Benzonaphthothiophenes	**228** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C3-Benzonaphthothiophenes	**179** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS800-S2
Date Sampled: 07/07/20 16:22
Percent Solids: 64
Initial Volume: 5.29
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**52.3** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
Fluoranthene	**2810** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
Pyrene	**5220** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C1-Fluoranthenes/Pyrenes	**4870** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C2-Fluoranthenes/Pyrenes	**2180** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C3-Fluoranthenes/Pyrenes	**975** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
Benzo(b)fluorene	**388** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
Benzo(c)fluorene	**191** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
2-Methylpyrene	**750** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
4-Methylpyrene	**874** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
1-Methylpyrene	**685** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
Benz(a)anthracene	**2420** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
Chrysene/triphenylene	**2430** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C1-Benzo(a)anthracenes/Chrysenes	**2660** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C2-Benzo(a)anthracenes/Chrysenes	**1560** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C3-Benzo(a)anthracenes/Chrysenes	**792** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C4-Benzo(a)anthracenes/Chrysenes	**348** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
Benzo(b)fluoranthene	**1630** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
Benzo(j/k)fluoranthene	**1620** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
Benzo(e)pyrene	**2380** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
Benzo(a)pyrene	**3120** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
Perylene	**572** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
Indeno(1,2,3-cd)pyrene	**1380** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
Dibenzo(a,h)anthracene	**434** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
Benzo(g,h,i)perylene	**1790** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
Coronene	**403** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
Tetramethyl lead	ND (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
Trimethylethyl lead	ND (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
Dimethyldiethyl lead	ND (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
Methyltriethyl lead	ND (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
Tetraethyl lead	ND (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
2,6,10-trimethyldodecane (1380)	**93.1** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS800-S2
Date Sampled: 07/07/20 16:22
Percent Solids: 64
Initial Volume: 5.29
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**246** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
2,6,10-trimethylpentadecane (1650)	**238** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C-17	**350** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
Pristane	**474** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
C-18	**214** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
Phytane	**414** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
Carbazole	**24.3** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
2,6-Dimethylnaphthalene	**82.6** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
2,3,5-Trimethylnaphthene	**35.9** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
4-Methyldibenzothiophene	**39.5** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
2/3-Methyldibenzothiophene	**28.3** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
1-Methyldibenzothiophene	**7.09** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
3-Methylphenanthrene	**691** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
2-Methylphenanthrene	**709** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
2-Methylanthracene	**373** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
4/9-Methylphenanthrene	**978** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303
1-Methylphenanthrene	**385** (5.88)	2.94	8270 Mod		1	07/14/20 13:40	F0G0003	FG01303

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*82 %*		*50-120*
Surrogate: Naphthalene-d8	*88 %*		*50-120*
Surrogate: Phenanthrene-d10	*95 %*		*50-120*
Surrogate: Perylene-d12	*107 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS800-S2
Date Sampled: 07/07/20 16:22
Percent Solids: 64

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**26600** (96.3)		TOC-LK		1	CCP	07/15/20 19:35	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS799-S2
Date Sampled: 07/07/20 16:56
Percent Solids: 53
Initial Volume: 5.18
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C1-Benzene	**51.8** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C2-Benzenes	**40.7** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C3-Benzenes	**J 6.23** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C4-Benzenes	**8.32** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C5-Benzenes	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
Methylcyclohexane	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
Toluene	**120** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
Ethylbenzene	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
m,p-Xylene	**102** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
Styrene	**12.4** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
o-Xylene	**J 4.68** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
Isopropylbenzene	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
n-Propylbenzene	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
1,3,5-Trimethylbenzene	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
1,2,3-Trimethylbenzene	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
1,2,4-Trimethylbenzene	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
t-Butylbenzene	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
sec-Butylbenzene	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
p-Isopropyltoluene	**J 5.94** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
n-Butylbenzene	**J 4.99** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
trans-Decalin	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
cis-Decalin	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C1-Decalins	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C2-Decalins	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C3-Decalins	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C4-Decalins	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
Benzo(b)thiophene	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C1-Benzo(b)thiophenes	**8.52** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C2-Benzo(b)thiophenes	**J 6.55** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C3-Benzo(b)thiophenes	**J 4.21** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C4-Benzo(b)thiophenes	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS799-S2
Date Sampled: 07/07/20 16:56
Percent Solids: 53
Initial Volume: 5.18
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	J **3.75** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
2-Methylnaphthalene	J **4.10** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
1-Methylnaphthalene	J **4.39** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C1-Naphthalenes	J **5.32** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C2-Naphthalenes	**16.7** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C3-Naphthalenes	**8.54** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C4-Naphthalenes	J **6.80** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
Biphenyl	**7.42** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
Acenaphthylene	J **4.78** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
Acenaphthene	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
Dibenzofuran	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
Fluorene	J **3.79** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C1-Fluorenes	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C2-Fluorenes	**9.82** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C3-Fluorenes	**8.54** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
Dibenzothiophene	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C1-Dibenzothiophenes	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C2-Dibenzothiophenes	J **4.73** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C3-Dibenzothiophenes	J **4.58** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C4-Dibenzothiophenes	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
Phenanthrene	J **6.70** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
Anthracene	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C1-Phenanthrenes/Anthracenes	**15.1** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C2-Phenanthrenes/Anthracenes	**13.3** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C3-Phenanthrenes/Anthracenes	**8.83** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C4-Phenanthrenes/Anthracenes	**18.2** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
Retene	**12.3** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
Benzo(b)naphtho(2,1-d)thiophene	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C0-Benzonaphthothiophenes	J **5.46** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C1-Benzonaphthothiophenes	J **6.89** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C2-Benzonaphthothiophenes	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C3-Benzonaphthothiophenes	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS799-S2
Date Sampled: 07/07/20 16:56
Percent Solids: 53
Initial Volume: 5.18
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
Fluoranthene	**15.8** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
Pyrene	**15.9** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C1-Fluoranthenes/Pyrenes	**22.2** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C2-Fluoranthenes/Pyrenes	**12.0** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C3-Fluoranthenes/Pyrenes	**21.7** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
Benzo(b)fluorene	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
Benzo(c)fluorene	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
2-Methylpyrene	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
4-Methylpyrene	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
1-Methylpyrene	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
Benz(a)anthracene	**8.46** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
Chrysene/triphenylene	**9.13** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C1-Benzo(a)anthracenes/Chrysenes	**18.3** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C2-Benzo(a)anthracenes/Chrysenes	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C3-Benzo(a)anthracenes/Chrysenes	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C4-Benzo(a)anthracenes/Chrysenes	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
Benzo(b)fluoranthene	**J 7.21** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
Benzo(j/k)fluoranthene	**J 6.95** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
Benzo(e)pyrene	**7.77** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
Benzo(a)pyrene	**11.6** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
Perylene	**846** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
Indeno(1,2,3-cd)pyrene	**J 6.27** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
Dibenzo(a,h)anthracene	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
Benzo(g,h,i)perylene	**J 6.94** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
Coronene	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
Tetramethyl lead	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
Trimethylethyl lead	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
Dimethyldiethyl lead	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
Methyltriethyl lead	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
Tetraethyl lead	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
2,6,10-trimethyldodecane (1380)	**J 6.82** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS799-S2
Date Sampled: 07/07/20 16:56
Percent Solids: 53
Initial Volume: 5.18
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**25.9** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
2,6,10-trimethylpentadecane (1650)	**11.9** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C-17	**129** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
Pristane	**B 39.1** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
C-18	**B 124** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
Phytane	**B 65.0** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
Carbazole	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
2,6-Dimethylnaphthalene	**J 6.43** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
2,3,5-Trimethylnaphthene	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
4-Methyldibenzothiophene	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
2/3-Methyldibenzothiophene	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
1-Methyldibenzothiophene	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
3-Methylphenanthrene	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
2-Methylphenanthrene	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
2-Methylanthracene	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
4/9-Methylphenanthrene	**J 3.75** (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303
1-Methylphenanthrene	ND (7.33)	3.66	8270 Mod		1	07/14/20 15:01	F0G0003	FG01303

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*91 %*		*50-120*
Surrogate: Naphthalene-d8	*91 %*		*50-120*
Surrogate: Phenanthrene-d10	*98 %*		*50-120*
Surrogate: Perylene-d12	*107 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS799-S2
Date Sampled: 07/07/20 16:56
Percent Solids: 53

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-04
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**26600** (96.4)		TOC-LK		1	CCP	07/15/20 20:04	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS798-S2
Date Sampled: 07/07/20 17:31
Percent Solids: 56
Initial Volume: 4.65
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C1-Benzene	**68.9** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C2-Benzenes	**43.8** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C3-Benzenes	**15.2** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C4-Benzenes	**15.8** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C5-Benzenes	**10.6** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
Methylcyclohexane	ND (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
Toluene	**160** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
Ethylbenzene	**J 6.97** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
m,p-Xylene	**112** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
Styrene	**40.6** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
o-Xylene	**J 6.95** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
Isopropylbenzene	ND (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
n-Propylbenzene	**J 4.05** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
1,3,5-Trimethylbenzene	ND (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
1,2,3-Trimethylbenzene	**J 5.13** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
1,2,4-Trimethylbenzene	**9.59** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
t-Butylbenzene	ND (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
sec-Butylbenzene	ND (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
p-Isopropyltoluene	**9.42** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
n-Butylbenzene	**9.62** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
trans-Decalin	**35.4** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
cis-Decalin	**J 5.20** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C1-Decalins	**73.6** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C2-Decalins	**66.1** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C3-Decalins	**53.8** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C4-Decalins	**79.5** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
Benzo(b)thiophene	ND (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C1-Benzo(b)thiophenes	**10.7** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C2-Benzo(b)thiophenes	**12.3** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C3-Benzo(b)thiophenes	**8.10** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C4-Benzo(b)thiophenes	**J 6.42** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS798-S2
Date Sampled: 07/07/20 17:31
Percent Solids: 56
Initial Volume: 4.65
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**40.2** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
2-Methylnaphthalene	**30.8** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
1-Methylnaphthalene	**15.9** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C1-Naphthalenes	**28.3** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C2-Naphthalenes	**65.9** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C3-Naphthalenes	**63.5** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C4-Naphthalenes	**59.7** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
Biphenyl	**19.2** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
Acenaphthylene	**123** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
Acenaphthene	**16.5** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
Dibenzofuran	**15.5** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
Fluorene	**29.5** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C1-Fluorenes	**42.5** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C2-Fluorenes	**68.6** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C3-Fluorenes	**80.2** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
Dibenzothiophene	**22.5** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C1-Dibenzothiophenes	**44.9** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C2-Dibenzothiophenes	**76.1** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C3-Dibenzothiophenes	**75.9** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C4-Dibenzothiophenes	**51.2** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
Phenanthrene	**188** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
Anthracene	**118** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C1-Phenanthrenes/Anthracenes	**252** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C2-Phenanthrenes/Anthracenes	**274** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C3-Phenanthrenes/Anthracenes	**186** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C4-Phenanthrenes/Anthracenes	**116** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
Retene	**92.1** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
Benzo(b)naphtho(2,1-d)thiophene	**56.8** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C0-Benzonaphthothiophenes	**112** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C1-Benzonaphthothiophenes	**101** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C2-Benzonaphthothiophenes	**91.3** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C3-Benzonaphthothiophenes	**59.7** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS798-S2
Date Sampled: 07/07/20 17:31
Percent Solids: 56
Initial Volume: 4.65
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**25.4** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
Fluoranthene	**557** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
Pyrene	**693** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C1-Fluoranthenes/Pyrenes	**553** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C2-Fluoranthenes/Pyrenes	**292** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C3-Fluoranthenes/Pyrenes	**153** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
Benzo(b)fluorene	**57.9** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
Benzo(c)fluorene	**22.0** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
2-Methylpyrene	**75.6** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
4-Methylpyrene	**79.7** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
1-Methylpyrene	**56.9** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
Benz(a)anthracene	**366** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
Chrysene/triphenylene	**425** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C1-Benzo(a)anthracenes/Chrysenes	**330** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C2-Benzo(a)anthracenes/Chrysenes	**213** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C3-Benzo(a)anthracenes/Chrysenes	**118** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C4-Benzo(a)anthracenes/Chrysenes	**75.3** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
Benzo(b)fluoranthene	**324** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
Benzo(j/k)fluoranthene	**342** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
Benzo(e)pyrene	**306** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
Benzo(a)pyrene	**422** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
Perylene	**539** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
Indeno(1,2,3-cd)pyrene	**252** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
Dibenzo(a,h)anthracene	**65.1** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
Benzo(g,h,i)perylene	**240** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
Coronene	**63.1** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
Tetramethyl lead	ND (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
Trimethylethyl lead	ND (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
Dimethyldiethyl lead	ND (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
Methyltriethyl lead	ND (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
Tetraethyl lead	ND (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
2,6,10-trimethyldodecane (1380)	**35.7** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS798-S2
Date Sampled: 07/07/20 17:31
Percent Solids: 56
Initial Volume: 4.65
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**90.2** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
2,6,10-trimethylpentadecane (1650)	**75.8** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C-17	**226** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
Pristane	**186** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
C-18	**191** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
Phytane	**228** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
Carbazole	**17.5** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
2,6-Dimethylnaphthalene	**17.9** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
2,3,5-Trimethylnaphthene	ND (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
4-Methyldibenzothiophene	**16.5** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
2/3-Methyldibenzothiophene	**13.1** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
1-Methyldibenzothiophene	**J 6.15** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
3-Methylphenanthrene	**59.3** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
2-Methylphenanthrene	**46.7** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
2-Methylanthracene	**34.9** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
4/9-Methylphenanthrene	**78.0** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303
1-Methylphenanthrene	**30.2** (7.71)	3.85	8270 Mod		1	07/14/20 16:22	F0G0003	FG01303

	%Recovery	*Qualifier*	*Limits*
Surrogate: Toluene-D8	*81 %*		*50-120*
Surrogate: Naphthalene-d8	*87 %*		*50-120*
Surrogate: Phenanthrene-d10	*94 %*		*50-120*
Surrogate: Perylene-d12	*102 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS798-S2
Date Sampled: 07/07/20 17:31
Percent Solids: 56

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-05
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**51800** (96.8)		TOC-LK		1	CCP	07/15/20 20:20	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS804-S1
Date Sampled: 07/07/20 19:03
Percent Solids: 63
Initial Volume: 4.94
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**108** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C1-Benzene	**47.7** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C2-Benzenes	**85.9** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C3-Benzenes	**13.4** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C4-Benzenes	**9.62** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C5-Benzenes	**6.69** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
Methylcyclohexane	**J 3.23** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
Toluene	**106** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
Ethylbenzene	**10.1** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
m,p-Xylene	**241** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
Styrene	**39.9** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
o-Xylene	**8.47** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
Isopropylbenzene	ND (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
n-Propylbenzene	**8.46** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
1,3,5-Trimethylbenzene	ND (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
1,2,3-Trimethylbenzene	**J 5.82** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
1,2,4-Trimethylbenzene	**J 6.17** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
t-Butylbenzene	ND (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
sec-Butylbenzene	ND (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
p-Isopropyltoluene	**J 5.96** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
n-Butylbenzene	**10.4** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
trans-Decalin	ND (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
cis-Decalin	ND (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C1-Decalins	ND (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C2-Decalins	ND (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C3-Decalins	ND (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C4-Decalins	ND (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
Benzo(b)thiophene	ND (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C1-Benzo(b)thiophenes	**12.8** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C2-Benzo(b)thiophenes	**13.7** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C3-Benzo(b)thiophenes	**J 5.61** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C4-Benzo(b)thiophenes	**7.65** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS804-S1
Date Sampled: 07/07/20 19:03
Percent Solids: 63
Initial Volume: 4.94
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**20.0** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
2-Methylnaphthalene	**14.2** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
1-Methylnaphthalene	**10.3** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C1-Naphthalenes	**15.1** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C2-Naphthalenes	**44.5** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C3-Naphthalenes	**30.8** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C4-Naphthalenes	**19.2** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
Biphenyl	**14.4** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
Acenaphthylene	**113** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
Acenaphthene	**19.6** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
Dibenzofuran	**12.6** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
Fluorene	**35.1** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C1-Fluorenes	**20.4** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C2-Fluorenes	ND (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C3-Fluorenes	**19.1** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
Dibenzothiophene	**23.6** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C1-Dibenzothiophenes	**29.7** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C2-Dibenzothiophenes	**42.7** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C3-Dibenzothiophenes	**29.6** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C4-Dibenzothiophenes	**20.3** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
Phenanthrene	**256** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
Anthracene	**125** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C1-Phenanthrenes/Anthracenes	**189** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C2-Phenanthrenes/Anthracenes	**107** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C3-Phenanthrenes/Anthracenes	**56.9** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C4-Phenanthrenes/Anthracenes	**27.6** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
Retene	**20.5** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
Benzo(b)naphtho(2,1-d)thiophene	**68.1** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C0-Benzonaphthothiophenes	**125** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C1-Benzonaphthothiophenes	**76.5** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C2-Benzonaphthothiophenes	**70.4** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C3-Benzonaphthothiophenes	**66.1** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS804-S1
Date Sampled: 07/07/20 19:03
Percent Solids: 63
Initial Volume: 4.94
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**41.5** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
Fluoranthene	**831** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
Pyrene	**718** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C1-Fluoranthenes/Pyrenes	**339** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C2-Fluoranthenes/Pyrenes	**209** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C3-Fluoranthenes/Pyrenes	**90.0** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
Benzo(b)fluorene	**52.4** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
Benzo(c)fluorene	**19.1** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
2-Methylpyrene	**43.0** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
4-Methylpyrene	**36.9** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
1-Methylpyrene	**27.4** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
Benz(a)anthracene	**338** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
Chrysene/triphenylene	**447** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C1-Benzo(a)anthracenes/Chrysenes	**186** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C2-Benzo(a)anthracenes/Chrysenes	**106** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C3-Benzo(a)anthracenes/Chrysenes	**61.3** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C4-Benzo(a)anthracenes/Chrysenes	**43.6** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
Benzo(b)fluoranthene	**447** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
Benzo(j/k)fluoranthene	**439** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
Benzo(e)pyrene	**359** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
Benzo(a)pyrene	**443** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
Perylene	**154** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
Indeno(1,2,3-cd)pyrene	**335** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
Dibenzo(a,h)anthracene	**76.8** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
Benzo(g,h,i)perylene	**298** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
Coronene	**85.0** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
Tetramethyl lead	ND (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
Trimethylethyl lead	ND (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
Dimethyldiethyl lead	ND (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
Methyltriethyl lead	ND (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
Tetraethyl lead	ND (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
2,6,10-trimethyldodecane (1380)	**13.9** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS804-S1
Date Sampled: 07/07/20 19:03
Percent Solids: 63
Initial Volume: 4.94
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**47.8** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
2,6,10-trimethylpentadecane (1650)	**22.4** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C-17	**158** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
Pristane	**B 63.9** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
C-18	**B 110** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
Phytane	**B 95.1** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
Carbazole	**32.5** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
2,6-Dimethylnaphthalene	**21.0** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
2,3,5-Trimethylnaphthene	ND (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
4-Methyldibenzothiophene	**10.2** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
2/3-Methyldibenzothiophene	**9.85** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
1-Methyldibenzothiophene	**J 5.37** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
3-Methylphenanthrene	**38.8** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
2-Methylphenanthrene	**44.8** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
2-Methylanthracene	**21.0** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
4/9-Methylphenanthrene	**40.5** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303
1-Methylphenanthrene	**33.5** (6.38)	3.19	8270 Mod		1	07/14/20 17:44	F0G0003	FG01303

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*91 %*		*50-120*
Surrogate: Naphthalene-d8	*96 %*		*50-120*
Surrogate: Phenanthrene-d10	*105 %*		*50-120*
Surrogate: Perylene-d12	*107 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS804-S1
Date Sampled: 07/07/20 19:03
Percent Solids: 63

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-06
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**27400** (97.9)		TOC-LK		1	CCP	07/15/20 20:37	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS804-S2
Date Sampled: 07/07/20 19:11
Percent Solids: 51
Initial Volume: 4.26
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**521** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C1-Benzene	**458** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C2-Benzenes	**340** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C3-Benzenes	**92.9** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C4-Benzenes	**88.2** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C5-Benzenes	**76.8** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
Methylcyclohexane	ND (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
Toluene	**1030** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
Ethylbenzene	**52.8** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
m,p-Xylene	**908** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
Styrene	**573** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
o-Xylene	**59.0** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
Isopropylbenzene	ND (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
n-Propylbenzene	**50.5** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
1,3,5-Trimethylbenzene	ND (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
1,2,3-Trimethylbenzene	**J 43.4** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
1,2,4-Trimethylbenzene	**46.2** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
t-Butylbenzene	ND (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
sec-Butylbenzene	ND (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
p-Isopropyltoluene	**J 28.4** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
n-Butylbenzene	**73.4** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
trans-Decalin	**446** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
cis-Decalin	**54.0** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C1-Decalins	**876** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C2-Decalins	**661** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C3-Decalins	**451** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C4-Decalins	**807** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
Benzo(b)thiophene	ND (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C1-Benzo(b)thiophenes	**85.5** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C2-Benzo(b)thiophenes	**89.4** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C3-Benzo(b)thiophenes	**J 35.9** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C4-Benzo(b)thiophenes	**82.6** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS804-S2
Date Sampled: 07/07/20 19:11
Percent Solids: 51
Initial Volume: 4.26
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**98.4** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
2-Methylnaphthalene	**98.7** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
1-Methylnaphthalene	**65.9** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C1-Naphthalenes	**99.5** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C2-Naphthalenes	**450** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C3-Naphthalenes	**288** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C4-Naphthalenes	**316** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
Biphenyl	**216** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
Acenaphthylene	**346** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
Acenaphthene	**62.4** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
Dibenzofuran	**51.3** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
Fluorene	**115** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C1-Fluorenes	**130** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C2-Fluorenes	**235** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C3-Fluorenes	**280** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
Dibenzothiophene	**71.3** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C1-Dibenzothiophenes	**165** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C2-Dibenzothiophenes	**298** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C3-Dibenzothiophenes	**357** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C4-Dibenzothiophenes	**217** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
Phenanthrene	**608** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
Anthracene	**346** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C1-Phenanthrenes/Anthracenes	**717** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C2-Phenanthrenes/Anthracenes	**674** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C3-Phenanthrenes/Anthracenes	**508** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C4-Phenanthrenes/Anthracenes	**308** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
Retene	**225** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
Benzo(b)naphtho(2,1-d)thiophene	**129** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C0-Benzonaphthothiophenes	**259** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C1-Benzonaphthothiophenes	**261** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C2-Benzonaphthothiophenes	**298** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C3-Benzonaphthothiophenes	**264** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS804-S2
Date Sampled: 07/07/20 19:11
Percent Solids: 51
Initial Volume: 4.26
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**156** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
Fluoranthene	**1130** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
Pyrene	**1410** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C1-Fluoranthenes/Pyrenes	**949** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C2-Fluoranthenes/Pyrenes	**563** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C3-Fluoranthenes/Pyrenes	**313** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
Benzo(b)fluorene	**95.5** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
Benzo(c)fluorene	J **38.0** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
2-Methylpyrene	**137** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
4-Methylpyrene	**157** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
1-Methylpyrene	**108** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
Benz(a)anthracene	**621** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
Chrysene/triphenylene	**828** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C1-Benzo(a)anthracenes/Chrysenes	**607** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C2-Benzo(a)anthracenes/Chrysenes	**460** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C3-Benzo(a)anthracenes/Chrysenes	**278** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C4-Benzo(a)anthracenes/Chrysenes	**158** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
Benzo(b)fluoranthene	**652** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
Benzo(j/k)fluoranthene	**708** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
Benzo(e)pyrene	**618** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
Benzo(a)pyrene	**747** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
Perylene	**379** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
Indeno(1,2,3-cd)pyrene	**532** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
Dibenzo(a,h)anthracene	**122** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
Benzo(g,h,i)perylene	**502** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
Coronene	**125** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
Tetramethyl lead	ND (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
Trimethylethyl lead	ND (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
Dimethyldiethyl lead	ND (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
Methyltriethyl lead	ND (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
Tetraethyl lead	ND (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
2,6,10-trimethyldodecane (1380)	**679** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS804-S2
Date Sampled: 07/07/20 19:11
Percent Solids: 51
Initial Volume: 4.26
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**1220** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
2,6,10-trimethylpentadecane (1650)	**923** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C-17	**485** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
Pristane	**2910** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
C-18	**2390** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
Phytane	**2730** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
Carbazole	**48.5** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
2,6-Dimethylnaphthalene	**252** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
2,3,5-Trimethylnaphthene	ND (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
4-Methyldibenzothiophene	**61.0** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
2/3-Methyldibenzothiophene	**47.7** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
1-Methyldibenzothiophene	**J 26.8** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
3-Methylphenanthrene	**126** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
2-Methylphenanthrene	**159** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
2-Methylanthracene	**85.4** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
4/9-Methylphenanthrene	**183** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303
1-Methylphenanthrene	**137** (46.0)	23.0	8270 Mod		5	07/14/20 19:06	F0G0003	FG01303

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*94 %*		*50-120*
Surrogate: Naphthalene-d8	*95 %*		*50-120*
Surrogate: Phenanthrene-d10	*110 %*		*50-120*
Surrogate: Perylene-d12	*105 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS804-S2
Date Sampled: 07/07/20 19:11
Percent Solids: 51

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-07
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**51200** (98.5)		TOC-LK		1	CCP	07/15/20 20:54	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS804-S3
Date Sampled: 07/07/20 19:19
Percent Solids: 84
Initial Volume: 5.96
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C1-Benzene	**11.4** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C2-Benzenes	**5.08** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C3-Benzenes	**J 2.80** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C4-Benzenes	**J 3.09** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C5-Benzenes	ND (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
Methylcyclohexane	ND (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
Toluene	**25.4** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
Ethylbenzene	ND (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
m,p-Xylene	**11.3** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
Styrene	**27.7** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
o-Xylene	ND (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
Isopropylbenzene	ND (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
n-Propylbenzene	ND (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
1,3,5-Trimethylbenzene	ND (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
1,2,3-Trimethylbenzene	ND (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
1,2,4-Trimethylbenzene	ND (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
t-Butylbenzene	ND (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
sec-Butylbenzene	ND (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
p-Isopropyltoluene	ND (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
n-Butylbenzene	**J 2.22** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
trans-Decalin	ND (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
cis-Decalin	ND (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C1-Decalins	ND (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C2-Decalins	ND (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C3-Decalins	ND (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C4-Decalins	ND (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
Benzo(b)thiophene	ND (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C1-Benzo(b)thiophenes	**4.33** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C2-Benzo(b)thiophenes	**J 3.95** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C3-Benzo(b)thiophenes	**J 2.15** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C4-Benzo(b)thiophenes	ND (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS804-S3
Date Sampled: 07/07/20 19:19
Percent Solids: 84
Initial Volume: 5.96
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**11.1** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
2-Methylnaphthalene	**9.18** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
1-Methylnaphthalene	**5.48** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C1-Naphthalenes	**9.16** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C2-Naphthalenes	**14.5** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C3-Naphthalenes	**11.7** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C4-Naphthalenes	**10.5** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
Biphenyl	**6.33** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
Acenaphthylene	**56.8** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
Acenaphthene	**J 3.82** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
Dibenzofuran	**J 2.91** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
Fluorene	**7.72** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C1-Fluorenes	**12.8** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C2-Fluorenes	**18.2** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C3-Fluorenes	**22.0** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
Dibenzothiophene	**5.07** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C1-Dibenzothiophenes	**9.33** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C2-Dibenzothiophenes	**21.4** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C3-Dibenzothiophenes	**23.7** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C4-Dibenzothiophenes	**13.1** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
Phenanthrene	**45.0** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
Anthracene	**32.4** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C1-Phenanthrenes/Anthracenes	**55.1** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C2-Phenanthrenes/Anthracenes	**74.4** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C3-Phenanthrenes/Anthracenes	**54.6** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C4-Phenanthrenes/Anthracenes	**29.0** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
Retene	**7.35** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
Benzo(b)naphtho(2,1-d)thiophene	**18.8** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C0-Benzonaphthothiophenes	**35.9** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C1-Benzonaphthothiophenes	**38.4** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C2-Benzonaphthothiophenes	**28.8** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C3-Benzonaphthothiophenes	**18.0** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS804-S3
Date Sampled: 07/07/20 19:19
Percent Solids: 84
Initial Volume: 5.96
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**6.84** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
Fluoranthene	**87.9** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
Pyrene	**182** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C1-Fluoranthenes/Pyrenes	**200** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C2-Fluoranthenes/Pyrenes	**107** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C3-Fluoranthenes/Pyrenes	**53.0** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
Benzo(b)fluorene	**16.9** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
Benzo(c)fluorene	**8.88** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
2-Methylpyrene	**29.0** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
4-Methylpyrene	**30.9** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
1-Methylpyrene	**24.1** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
Benz(a)anthracene	**135** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
Chrysene/triphenylene	**126** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C1-Benzo(a)anthracenes/Chrysenes	**137** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C2-Benzo(a)anthracenes/Chrysenes	**81.9** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C3-Benzo(a)anthracenes/Chrysenes	**37.9** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C4-Benzo(a)anthracenes/Chrysenes	**18.4** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
Benzo(b)fluoranthene	**97.6** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
Benzo(j/k)fluoranthene	**107** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
Benzo(e)pyrene	**104** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
Benzo(a)pyrene	**156** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
Perylene	**67.6** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
Indeno(1,2,3-cd)pyrene	**79.9** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
Dibenzo(a,h)anthracene	**21.1** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
Benzo(g,h,i)perylene	**79.9** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
Coronene	**21.1** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
Tetramethyl lead	ND (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
Trimethylethyl lead	ND (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
Dimethyldiethyl lead	ND (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
Methyltriethyl lead	ND (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
Tetraethyl lead	ND (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
2,6,10-trimethyldodecane (1380)	**5.62** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS804-S3
Date Sampled: 07/07/20 19:19
Percent Solids: 84
Initial Volume: 5.96
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**14.1** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
2,6,10-trimethylpentadecane (1650)	**16.6** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C-17	**B 50.0** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
Pristane	**B 43.1** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
C-18	**B 58.8** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
Phytane	**B 55.6** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
Carbazole	**J 3.08** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
2,6-Dimethylnaphthalene	**J 3.60** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
2,3,5-Trimethylnaphthene	ND (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
4-Methyldibenzothiophene	**J 3.39** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
2/3-Methyldibenzothiophene	**J 2.41** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
1-Methyldibenzothiophene	ND (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
3-Methylphenanthrene	**10.2** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
2-Methylphenanthrene	**11.5** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
2-Methylanthracene	**10.1** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
4/9-Methylphenanthrene	**15.3** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303
1-Methylphenanthrene	**7.92** (3.98)	1.99	8270 Mod		1	07/14/20 20:28	F0G0003	FG01303

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*98 %*		*50-120*
Surrogate: Naphthalene-d8	*99 %*		*50-120*
Surrogate: Phenanthrene-d10	*108 %*		*50-120*
Surrogate: Perylene-d12	*116 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS804-S3
Date Sampled: 07/07/20 19:19
Percent Solids: 84

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-08
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**5280** (93.6)		TOC-LK		1	CCP	07/15/20 21:43	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS805-S1
Date Sampled: 07/07/20 19:40
Percent Solids: 82
Initial Volume: 5.32
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C1-Benzene	**23.6** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C2-Benzenes	**10.0** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C3-Benzenes	**5.66** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C4-Benzenes	**5.84** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C5-Benzenes	**J 4.44** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
Methylcyclohexane	ND (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
Toluene	**52.4** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
Ethylbenzene	**J 3.00** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
m,p-Xylene	**23.3** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
Styrene	**31.8** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
o-Xylene	ND (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
Isopropylbenzene	ND (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
n-Propylbenzene	ND (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
1,3,5-Trimethylbenzene	ND (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
1,2,3-Trimethylbenzene	ND (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
1,2,4-Trimethylbenzene	**J 2.34** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
t-Butylbenzene	ND (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
sec-Butylbenzene	ND (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
p-Isopropyltoluene	ND (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
n-Butylbenzene	**J 3.34** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
trans-Decalin	**13.7** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
cis-Decalin	ND (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C1-Decalins	**33.7** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C2-Decalins	**31.1** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C3-Decalins	**24.2** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C4-Decalins	**37.0** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
Benzo(b)thiophene	ND (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C1-Benzo(b)thiophenes	**6.72** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C2-Benzo(b)thiophenes	**5.30** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C3-Benzo(b)thiophenes	**J 3.07** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C4-Benzo(b)thiophenes	**J 3.49** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS805-S1
Date Sampled: 07/07/20 19:40
Percent Solids: 82
Initial Volume: 5.32
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**17.8** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
2-Methylnaphthalene	**13.8** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
1-Methylnaphthalene	**9.20** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C1-Naphthalenes	**13.7** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C2-Naphthalenes	**26.3** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C3-Naphthalenes	**29.8** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C4-Naphthalenes	**30.2** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
Biphenyl	**8.36** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
Acenaphthylene	**54.4** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
Acenaphthene	**7.54** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
Dibenzofuran	**6.82** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
Fluorene	**15.3** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C1-Fluorenes	**17.5** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C2-Fluorenes	**31.4** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C3-Fluorenes	**42.0** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
Dibenzothiophene	**10.8** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C1-Dibenzothiophenes	**20.5** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C2-Dibenzothiophenes	**38.5** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C3-Dibenzothiophenes	**36.0** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C4-Dibenzothiophenes	**22.0** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
Phenanthrene	**111** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
Anthracene	**59.0** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C1-Phenanthrenes/Anthracenes	**123** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C2-Phenanthrenes/Anthracenes	**147** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C3-Phenanthrenes/Anthracenes	**98.2** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C4-Phenanthrenes/Anthracenes	**50.5** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
Retene	**12.1** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
Benzo(b)naphtho(2,1-d)thiophene	**30.5** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C0-Benzonaphthothiophenes	**58.5** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C1-Benzonaphthothiophenes	**51.3** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C2-Benzonaphthothiophenes	**39.6** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C3-Benzonaphthothiophenes	**22.8** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS805-S1
Date Sampled: 07/07/20 19:40
Percent Solids: 82
Initial Volume: 5.32
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**12.9** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
Fluoranthene	**322** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
Pyrene	**363** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C1-Fluoranthenes/Pyrenes	**281** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C2-Fluoranthenes/Pyrenes	**153** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C3-Fluoranthenes/Pyrenes	**78.9** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
Benzo(b)fluorene	**28.1** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
Benzo(c)fluorene	**11.8** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
2-Methylpyrene	**42.6** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
4-Methylpyrene	**42.2** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
1-Methylpyrene	**31.6** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
Benz(a)anthracene	**218** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
Chrysene/triphenylene	**223** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C1-Benzo(a)anthracenes/Chrysenes	**182** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C2-Benzo(a)anthracenes/Chrysenes	**104** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C3-Benzo(a)anthracenes/Chrysenes	**52.9** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C4-Benzo(a)anthracenes/Chrysenes	**27.5** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
Benzo(b)fluoranthene	**172** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
Benzo(j/k)fluoranthene	**181** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
Benzo(e)pyrene	**157** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
Benzo(a)pyrene	**222** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
Perylene	**112** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
Indeno(1,2,3-cd)pyrene	**125** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
Dibenzo(a,h)anthracene	**30.9** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
Benzo(g,h,i)perylene	**115** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
Coronene	**28.9** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
Tetramethyl lead	ND (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
Trimethylethyl lead	ND (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
Dimethyldiethyl lead	ND (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
Methyltriethyl lead	ND (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
Tetraethyl lead	ND (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
2,6,10-trimethyldodecane (1380)	**21.8** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS805-S1
Date Sampled: 07/07/20 19:40
Percent Solids: 82
Initial Volume: 5.32
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**37.9** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
2,6,10-trimethylpentadecane (1650)	**34.3** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C-17	**B 64.9** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
Pristane	**82.5** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
C-18	**B 60.3** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
Phytane	**B 87.3** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
Carbazole	**8.44** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
2,6-Dimethylnaphthalene	**7.16** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
2,3,5-Trimethylnaphthene	ND (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
4-Methyldibenzothiophene	**6.92** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
2/3-Methyldibenzothiophene	**6.29** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
1-Methyldibenzothiophene	**J 3.17** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
3-Methylphenanthrene	**28.7** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
2-Methylphenanthrene	**27.6** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
2-Methylanthracene	**17.9** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
4/9-Methylphenanthrene	**34.0** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303
1-Methylphenanthrene	**14.5** (4.58)	2.29	8270 Mod		1	07/14/20 21:50	F0G0003	FG01303

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*77 %*		*50-120*
Surrogate: Naphthalene-d8	*81 %*		*50-120*
Surrogate: Phenanthrene-d10	*84 %*		*50-120*
Surrogate: Perylene-d12	*90 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS805-S1
Date Sampled: 07/07/20 19:40
Percent Solids: 82

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-09
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**5220** (95.6)		TOC-LK		1	CCP	07/15/20 22:00	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS805-S3
Date Sampled: 07/07/20 19:53
Percent Solids: 88
Initial Volume: 5.59
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C1-Benzene	**5.20** (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C2-Benzenes	**4.99** (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C3-Benzenes	**J 2.48** (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C4-Benzenes	**J 3.43** (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C5-Benzenes	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
Methylcyclohexane	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
Toluene	**12.6** (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
Ethylbenzene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
m,p-Xylene	**8.95** (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
Styrene	**18.5** (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
o-Xylene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
Isopropylbenzene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
n-Propylbenzene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
1,3,5-Trimethylbenzene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
1,2,3-Trimethylbenzene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
1,2,4-Trimethylbenzene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
t-Butylbenzene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
sec-Butylbenzene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
p-Isopropyltoluene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
n-Butylbenzene	**J 2.81** (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
trans-Decalin	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
cis-Decalin	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C1-Decalins	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C2-Decalins	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C3-Decalins	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C4-Decalins	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
Benzo(b)thiophene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C1-Benzo(b)thiophenes	**J 3.24** (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C2-Benzo(b)thiophenes	**J 2.36** (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C3-Benzo(b)thiophenes	**J 3.21** (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C4-Benzo(b)thiophenes	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS805-S3
Date Sampled: 07/07/20 19:53
Percent Solids: 88
Initial Volume: 5.59
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
2-Methylnaphthalene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
1-Methylnaphthalene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C1-Naphthalenes	**J 2.79** (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C2-Naphthalenes	**J 4.04** (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C3-Naphthalenes	**J 3.27** (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C4-Naphthalenes	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
Biphenyl	**J 3.45** (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
Acenaphthylene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
Acenaphthene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
Dibenzofuran	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
Fluorene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C1-Fluorenes	**J 2.41** (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C2-Fluorenes	**J 2.80** (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C3-Fluorenes	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
Dibenzothiophene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C1-Dibenzothiophenes	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C2-Dibenzothiophenes	**J 2.06** (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C3-Dibenzothiophenes	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C4-Dibenzothiophenes	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
Phenanthrene	**J 2.52** (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
Anthracene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C1-Phenanthrenes/Anthracenes	**J 3.77** (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C2-Phenanthrenes/Anthracenes	**J 3.43** (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C3-Phenanthrenes/Anthracenes	**J 3.85** (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C4-Phenanthrenes/Anthracenes	**6.29** (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
Retene	**16.2** (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
Benzo(b)naphtho(2,1-d)thiophene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C0-Benzonaphthothiophenes	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C1-Benzonaphthothiophenes	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C2-Benzonaphthothiophenes	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C3-Benzonaphthothiophenes	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS805-S3
Date Sampled: 07/07/20 19:53
Percent Solids: 88
Initial Volume: 5.59
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
Fluoranthene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
Pyrene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C1-Fluoranthenes/Pyrenes	**J 3.60** (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C2-Fluoranthenes/Pyrenes	**J 3.31** (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C3-Fluoranthenes/Pyrenes	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
Benzo(b)fluorene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
Benzo(c)fluorene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
2-Methylpyrene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
4-Methylpyrene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
1-Methylpyrene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
Benz(a)anthracene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
Chrysene/triphenylene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C1-Benzo(a)anthracenes/Chrysenes	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C2-Benzo(a)anthracenes/Chrysenes	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C3-Benzo(a)anthracenes/Chrysenes	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C4-Benzo(a)anthracenes/Chrysenes	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
Benzo(b)fluoranthene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
Benzo(j/k)fluoranthene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
Benzo(e)pyrene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
Benzo(a)pyrene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
Perylene	**97.5** (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
Indeno(1,2,3-cd)pyrene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
Dibenzo(a,h)anthracene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
Benzo(g,h,i)perylene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
Coronene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
Tetramethyl lead	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
Trimethylethyl lead	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
Dimethyldiethyl lead	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
Methyltriethyl lead	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
Tetraethyl lead	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
2,6,10-trimethyldodecane (1380)	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS805-S3
Date Sampled: 07/07/20 19:53
Percent Solids: 88
Initial Volume: 5.59
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**6.71** (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
2,6,10-trimethylpentadecane (1650)	**4.28** (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C-17	**B 33.4** (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
Pristane	**B 11.8** (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
C-18	**B 33.2** (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
Phytane	**B 17.2** (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
Carbazole	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
2,6-Dimethylnaphthalene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
2,3,5-Trimethylnaphthene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
4-Methyldibenzothiophene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
2/3-Methyldibenzothiophene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
1-Methyldibenzothiophene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
3-Methylphenanthrene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
2-Methylphenanthrene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
2-Methylanthracene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
4/9-Methylphenanthrene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303
1-Methylphenanthrene	ND (4.07)	2.04	8270 Mod		1	07/14/20 23:13	F0G0003	FG01303

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*78 %*		*50-120*
Surrogate: Naphthalene-d8	*79 %*		*50-120*
Surrogate: Phenanthrene-d10	*84 %*		*50-120*
Surrogate: Perylene-d12	*87 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS805-S3
Date Sampled: 07/07/20 19:53
Percent Solids: 88

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-10
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**3760** (94.8)		TOC-LK		1	CCP	07/15/20 22:17	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS806-S2
Date Sampled: 07/07/20 20:13
Percent Solids: 90
Initial Volume: 5.26
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C1-Benzene	**5.07** (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C2-Benzenes	**J 3.20** (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C3-Benzenes	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C4-Benzenes	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C5-Benzenes	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
Methylcyclohexane	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
Toluene	**11.7** (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
Ethylbenzene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
m,p-Xylene	**6.42** (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
Styrene	**13.7** (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
o-Xylene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
Isopropylbenzene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
n-Propylbenzene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
1,3,5-Trimethylbenzene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
1,2,3-Trimethylbenzene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
1,2,4-Trimethylbenzene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
t-Butylbenzene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
sec-Butylbenzene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
p-Isopropyltoluene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
n-Butylbenzene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
trans-Decalin	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
cis-Decalin	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C1-Decalins	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C2-Decalins	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C3-Decalins	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C4-Decalins	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
Benzo(b)thiophene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C1-Benzo(b)thiophenes	**J 2.77** (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C2-Benzo(b)thiophenes	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C3-Benzo(b)thiophenes	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C4-Benzo(b)thiophenes	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS806-S2
Date Sampled: 07/07/20 20:13
Percent Solids: 90
Initial Volume: 5.26
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	J **2.18** (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
2-Methylnaphthalene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
1-Methylnaphthalene	J **2.20** (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C1-Naphthalenes	J **2.75** (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C2-Naphthalenes	**5.15** (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C3-Naphthalenes	J **3.51** (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C4-Naphthalenes	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
Biphenyl	J **3.54** (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
Acenaphthylene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
Acenaphthene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
Dibenzofuran	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
Fluorene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C1-Fluorenes	J **3.15** (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C2-Fluorenes	**4.27** (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C3-Fluorenes	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
Dibenzothiophene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C1-Dibenzothiophenes	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C2-Dibenzothiophenes	J **2.51** (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C3-Dibenzothiophenes	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C4-Dibenzothiophenes	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
Phenanthrene	J **2.71** (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
Anthracene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C1-Phenanthrenes/Anthracenes	J **3.36** (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C2-Phenanthrenes/Anthracenes	J **3.91** (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C3-Phenanthrenes/Anthracenes	J **2.92** (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C4-Phenanthrenes/Anthracenes	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
Retene	J **3.61** (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
Benzo(b)naphtho(2,1-d)thiophene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C0-Benzonaphthothiophenes	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C1-Benzonaphthothiophenes	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C2-Benzonaphthothiophenes	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C3-Benzonaphthothiophenes	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS806-S2
Date Sampled: 07/07/20 20:13
Percent Solids: 90
Initial Volume: 5.26
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
Fluoranthene	**J 2.21** (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
Pyrene	**J 2.71** (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C1-Fluoranthenes/Pyrenes	**J 4.12** (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C2-Fluoranthenes/Pyrenes	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C3-Fluoranthenes/Pyrenes	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
Benzo(b)fluorene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
Benzo(c)fluorene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
2-Methylpyrene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
4-Methylpyrene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
1-Methylpyrene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
Benz(a)anthracene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
Chrysene/triphenylene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C1-Benzo(a)anthracenes/Chrysenes	**J 2.28** (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C2-Benzo(a)anthracenes/Chrysenes	**J 2.82** (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C3-Benzo(a)anthracenes/Chrysenes	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C4-Benzo(a)anthracenes/Chrysenes	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
Benzo(b)fluoranthene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
Benzo(j/k)fluoranthene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
Benzo(e)pyrene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
Benzo(a)pyrene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
Perylene	**13.0** (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
Indeno(1,2,3-cd)pyrene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
Dibenzo(a,h)anthracene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
Benzo(g,h,i)perylene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
Coronene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
Tetramethyl lead	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
Trimethylethyl lead	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
Dimethyldiethyl lead	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
Methyltriethyl lead	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
Tetraethyl lead	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
2,6,10-trimethyldodecane (1380)	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS806-S2
Date Sampled: 07/07/20 20:13
Percent Solids: 90
Initial Volume: 5.26
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**6.66** (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
2,6,10-trimethylpentadecane (1650)	**8.61** (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C-17	**B 39.7** (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
Pristane	**B 26.2** (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
C-18	**B 44.8** (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
Phytane	**B 34.7** (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
Carbazole	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
2,6-Dimethylnaphthalene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
2,3,5-Trimethylnaphthene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
4-Methyldibenzothiophene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
2/3-Methyldibenzothiophene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
1-Methyldibenzothiophene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
3-Methylphenanthrene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
2-Methylphenanthrene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
2-Methylanthracene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
4/9-Methylphenanthrene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303
1-Methylphenanthrene	ND (4.24)	2.12	8270 Mod		1	07/15/20 0:35	F0G0003	FG01303

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*83 %*		*50-120*
Surrogate: Naphthalene-d8	*84 %*		*50-120*
Surrogate: Phenanthrene-d10	*89 %*		*50-120*
Surrogate: Perylene-d12	*90 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS806-S2
Date Sampled: 07/07/20 20:13
Percent Solids: 90

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-11
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**2060** (98.8)		TOC-LK		1	CCP	07/15/20 22:33	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS804-S2D
Date Sampled: 07/07/20 12:00
Percent Solids: 49
Initial Volume: 5.16
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**456** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C1-Benzene	**371** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C2-Benzenes	**273** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C3-Benzenes	**84.2** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C4-Benzenes	**77.3** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C5-Benzenes	**64.9** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
Methylcyclohexane	ND (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
Toluene	**864** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
Ethylbenzene	**43.1** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
m,p-Xylene	**711** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
Styrene	**501** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
o-Xylene	**47.7** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
Isopropylbenzene	ND (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
n-Propylbenzene	**42.4** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
1,3,5-Trimethylbenzene	ND (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
1,2,3-Trimethylbenzene	**J 35.6** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
1,2,4-Trimethylbenzene	**40.7** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
t-Butylbenzene	ND (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
sec-Butylbenzene	ND (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
p-Isopropyltoluene	**J 21.1** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
n-Butylbenzene	**64.2** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
trans-Decalin	**403** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
cis-Decalin	**64.0** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C1-Decalins	**746** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C2-Decalins	**531** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C3-Decalins	**438** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C4-Decalins	**751** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
Benzo(b)thiophene	ND (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C1-Benzo(b)thiophenes	**73.2** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C2-Benzo(b)thiophenes	**57.2** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C3-Benzo(b)thiophenes	**44.1** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C4-Benzo(b)thiophenes	**50.1** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS804-S2D
Date Sampled: 07/07/20 12:00
Percent Solids: 49
Initial Volume: 5.16
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**89.5** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
2-Methylnaphthalene	**88.6** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
1-Methylnaphthalene	**59.8** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C1-Naphthalenes	**88.5** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C2-Naphthalenes	**368** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C3-Naphthalenes	**251** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C4-Naphthalenes	**296** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
Biphenyl	**214** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
Acenaphthylene	**290** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
Acenaphthene	**53.9** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
Dibenzofuran	**42.4** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
Fluorene	**101** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C1-Fluorenes	**112** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C2-Fluorenes	**179** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C3-Fluorenes	**262** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
Dibenzothiophene	**55.8** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C1-Dibenzothiophenes	**140** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C2-Dibenzothiophenes	**262** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C3-Dibenzothiophenes	**323** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C4-Dibenzothiophenes	**188** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
Phenanthrene	**542** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
Anthracene	**292** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C1-Phenanthrenes/Anthracenes	**594** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C2-Phenanthrenes/Anthracenes	**598** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C3-Phenanthrenes/Anthracenes	**447** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C4-Phenanthrenes/Anthracenes	**244** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
Retene	**211** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
Benzo(b)naphtho(2,1-d)thiophene	**113** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C0-Benzonaphthothiophenes	**217** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C1-Benzonaphthothiophenes	**225** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C2-Benzonaphthothiophenes	**282** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C3-Benzonaphthothiophenes	**221** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS804-S2D
Date Sampled: 07/07/20 12:00
Percent Solids: 49
Initial Volume: 5.16
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**140** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
Fluoranthene	**994** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
Pyrene	**1230** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C1-Fluoranthenes/Pyrenes	**802** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C2-Fluoranthenes/Pyrenes	**493** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C3-Fluoranthenes/Pyrenes	**265** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
Benzo(b)fluorene	**81.7** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
Benzo(c)fluorene	**J 29.2** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
2-Methylpyrene	**117** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
4-Methylpyrene	**135** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
1-Methylpyrene	**93.8** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
Benz(a)anthracene	**523** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
Chrysene/triphenylene	**705** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C1-Benzo(a)anthracenes/Chrysenes	**523** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C2-Benzo(a)anthracenes/Chrysenes	**373** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C3-Benzo(a)anthracenes/Chrysenes	**238** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C4-Benzo(a)anthracenes/Chrysenes	**191** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
Benzo(b)fluoranthene	**578** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
Benzo(j/k)fluoranthene	**574** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
Benzo(e)pyrene	**519** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
Benzo(a)pyrene	**618** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
Perylene	**316** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
Indeno(1,2,3-cd)pyrene	**426** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
Dibenzo(a,h)anthracene	**117** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
Benzo(g,h,i)perylene	**415** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
Coronene	**160** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
Tetramethyl lead	ND (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
Trimethylethyl lead	ND (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
Dimethyldiethyl lead	ND (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
Methyltriethyl lead	ND (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
Tetraethyl lead	ND (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
2,6,10-trimethyldodecane (1380)	**563** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS804-S2D
Date Sampled: 07/07/20 12:00
Percent Solids: 49
Initial Volume: 5.16
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/13/20 8:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**995** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
2,6,10-trimethylpentadecane (1650)	**836** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C-17	**474** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
Pristane	**2530** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
C-18	**360** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
Phytane	**2390** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
Carbazole	**47.7** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
2,6-Dimethylnaphthalene	**200** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
2,3,5-Trimethylnaphthene	ND (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
4-Methyldibenzothiophene	**51.9** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
2/3-Methyldibenzothiophene	**40.4** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
1-Methyldibenzothiophene	ND (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
3-Methylphenanthrene	**123** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
2-Methylphenanthrene	**130** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
2-Methylanthracene	**75.0** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
4/9-Methylphenanthrene	**137** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303
1-Methylphenanthrene	**114** (39.6)	19.8	8270 Mod		5	07/15/20 6:02	F0G0003	FG01303

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*80 %*		*50-120*
Surrogate: Naphthalene-d8	*77 %*		*50-120*
Surrogate: Phenanthrene-d10	*92 %*		*50-120*
Surrogate: Perylene-d12	*82 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS804-S2D
Date Sampled: 07/07/20 12:00
Percent Solids: 49

ESS Laboratory Work Order: F200035
ESS Laboratory Sample ID: F200035-12
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**51400** (95.1)		TOC-LK		1	CCP	07/15/20 22:50	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200035

Quality Control Data

Classical Chemistry

Batch DG01043 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	100	mg/kg							
Total Organic Carbon (4)	ND	100	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200035

Quality Control Data

Classical Chemistry

Batch DG01043 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9930	100	mg/kg	10000		99	80-120			
Total Organic Carbon (2)	9940	100	mg/kg	10000		99	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200035

Quality Control Data

Classical Chemistry

Batch DG01043 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	10300	100	mg/kg	10000		103	80-120	4	20	
Total Organic Carbon (2)	10400	100	mg/kg	10000		104	80-120	5	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200035

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FG01303 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	ND	4.00	ug/Kg wet							
C1-Benzene	ND	4.00	ug/Kg wet							
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	2.60	4.00	ug/Kg wet							J
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	3.89	4.00	ug/Kg wet							J
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200035

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FG01303 - 3570

C1-Fluorenes	ND	4.00	ug/Kg wet
C2-Fluorenes	ND	4.00	ug/Kg wet
C3-Fluorenes	ND	4.00	ug/Kg wet
Dibenzothiophene	ND	4.00	ug/Kg wet
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet
Phenanthrene	ND	4.00	ug/Kg wet
Anthracene	ND	4.00	ug/Kg wet
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
Retene	ND	4.00	ug/Kg wet
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
Fluoranthene	ND	4.00	ug/Kg wet
Pyrene	ND	4.00	ug/Kg wet
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
Benzo(b)fluorene	ND	4.00	ug/Kg wet
Benzo(c)fluorene	ND	4.00	ug/Kg wet
2-Methylpyrene	ND	4.00	ug/Kg wet
4-Methylpyrene	ND	4.00	ug/Kg wet
1-Methylpyrene	ND	4.00	ug/Kg wet
Benz(a)anthracene	ND	4.00	ug/Kg wet
Chrysene/triphenylene	ND	4.00	ug/Kg wet
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet
Benzo(e)pyrene	ND	4.00	ug/Kg wet
Benzo(a)pyrene	ND	4.00	ug/Kg wet
Perylene	ND	4.00	ug/Kg wet
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet
Coronene	ND	4.00	ug/Kg wet
Tetramethyl lead	ND	4.00	ug/Kg wet
Trimethylethyl lead	ND	4.00	ug/Kg wet

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200035

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FG01303 - 3570						
Dimethyldiethyl lead	ND	4.00	ug/Kg wet			
Methyltriethyl lead	ND	4.00	ug/Kg wet			
Tetraethyl lead	ND	4.00	ug/Kg wet			
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet			
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet			
2,6,10-trimethylpentadecane (1650)	ND	4.00	ug/Kg wet			
C-17	10.7	4.00	ug/Kg wet			
Pristane	7.76	4.00	ug/Kg wet			
C-18	12.4	4.00	ug/Kg wet			
Phytane	12.9	4.00	ug/Kg wet			
Carbazole	ND	4.00	ug/Kg wet			
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet			
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet			
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
3-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylanthracene	ND	4.00	ug/Kg wet			
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet			
1-Methylphenanthrene	ND	4.00	ug/Kg wet			
Surrogate: Toluene-D8	*390*		ug/Kg wet	*400.0*	*97*	*50-120*
Surrogate: Naphthalene-d8	*360*		ug/Kg wet	*400.0*	*90*	*50-120*
Surrogate: Phenanthrene-d10	*388*		ug/Kg wet	*400.0*	*97*	*50-120*
Surrogate: Perylene-d12	*398*		ug/Kg wet	*400.0*	*100*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200035

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FG01303 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	375	4.00	ug/Kg wet	400.0		94	60-130			
Methylcyclohexane	243	4.00	ug/Kg wet	400.0		61	60-130			
Toluene	346	4.00	ug/Kg wet	400.0		86	60-130			
Ethylbenzene	367	4.00	ug/Kg wet	400.0		92	60-130			
m,p-Xylene	361	4.00	ug/Kg wet	400.0		90	60-130			
Styrene	401	4.00	ug/Kg wet	400.0		100	60-130			
o-Xylene	364	4.00	ug/Kg wet	400.0		91	60-130			
Isopropylbenzene	370	4.00	ug/Kg wet	400.0		92	60-130			
n-Propylbenzene	368	4.00	ug/Kg wet	400.0		92	60-130			
1,3,5-Trimethylbenzene	363	4.00	ug/Kg wet	400.0		91	60-130			
1,2,3-Trimethylbenzene	360	4.00	ug/Kg wet	400.0		90	60-130			
1,2,4-Trimethylbenzene	361	4.00	ug/Kg wet	400.0		90	60-130			
t-Butylbenzene	358	4.00	ug/Kg wet	400.0		89	60-130			
sec-Butylbenzene	361	4.00	ug/Kg wet	400.0		90	60-130			
p-Isopropyltoluene	361	4.00	ug/Kg wet	400.0		90	60-130			
n-Butylbenzene	346	4.00	ug/Kg wet	400.0		86	60-130			
trans-Decalin	359	4.00	ug/Kg wet	400.0		90	60-130			
cis-Decalin	351	4.00	ug/Kg wet	400.0		88	60-130			
Benzo(b)thiophene	357	4.00	ug/Kg wet	400.0		89	60-130			
Naphthalene	358	4.00	ug/Kg wet	400.0		90	60-130			
2-Methylnaphthalene	351	4.00	ug/Kg wet	400.0		88	60-130			
1-Methylnaphthalene	350	4.00	ug/Kg wet	400.0		88	60-130			
Biphenyl	357	4.00	ug/Kg wet	400.0		89	60-130			
Acenaphthylene	378	4.00	ug/Kg wet	400.0		94	60-130			
Acenaphthene	384	4.00	ug/Kg wet	400.0		96	60-130			
Dibenzofuran	362	4.00	ug/Kg wet	400.0		91	60-130			
Fluorene	369	4.00	ug/Kg wet	400.0		92	60-130			
Dibenzothiophene	382	4.00	ug/Kg wet	400.0		95	60-130			
Phenanthrene	375	4.00	ug/Kg wet	400.0		94	60-130			
Anthracene	367	4.00	ug/Kg wet	400.0		92	60-130			
Retene	390	4.00	ug/Kg wet	400.0		97	60-130			
Benzo(b)naphtho(2,1-d)thiophene	395	4.00	ug/Kg wet	400.0		99	60-130			
Fluoranthene	396	4.00	ug/Kg wet	400.0		99	60-130			
Pyrene	396	4.00	ug/Kg wet	400.0		99	60-130			
Benz(a)anthracene	398	4.00	ug/Kg wet	400.0		99	60-130			
Chrysene/triphenylene	385	4.00	ug/Kg wet	400.0		96	60-130			
Benzo(b)fluoranthene	393	4.00	ug/Kg wet	400.0		98	60-130			
Benzo(j/k)fluoranthene	396	4.00	ug/Kg wet	400.0		99	60-130			
Benzo(e)pyrene	387	4.00	ug/Kg wet	400.0		97	60-130			
Benzo(a)pyrene	389	4.00	ug/Kg wet	400.0		97	60-130			
Perylene	389	4.00	ug/Kg wet	400.0		97	60-130			
Indeno(1,2,3-cd)pyrene	361	4.00	ug/Kg wet	400.0		90	60-130			
Dibenzo(a,h)anthracene	380	4.00	ug/Kg wet	400.0		95	60-130			
Benzo(g,h,i)perylene	366	4.00	ug/Kg wet	400.0		91	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200035

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FG01303 - 3570						
Coronene	361	4.00	ug/Kg wet	400.0	90	60-130
Tetraethyl lead	275	4.00	ug/Kg wet	400.0	69	60-130
Pristane	411	4.00	ug/Kg wet	400.0	103	60-130
Phytane	434	4.00	ug/Kg wet	400.0	109	60-130
Surrogate: Toluene-D8	*375*		ug/Kg wet	*400.0*	*94*	*50-120*
Surrogate: Naphthalene-d8	*375*		ug/Kg wet	*400.0*	*94*	*50-120*
Surrogate: Phenanthrene-d10	*396*		ug/Kg wet	*400.0*	*99*	*50-120*
Surrogate: Perylene-d12	*405*		ug/Kg wet	*400.0*	*101*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200035

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FG01303 - 3570

Duplicate **Source: F200035-12**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	466	42.3	ug/Kg dry		456			2	50	
C1-Benzene	417	42.3	ug/Kg dry		371			12	50	
C2-Benzenes	302	42.3	ug/Kg dry		273			10	50	
C3-Benzenes	90.1	42.3	ug/Kg dry		84.2			7	50	
C4-Benzenes	82.2	42.3	ug/Kg dry		77.3			6	50	
C5-Benzenes	71.1	42.3	ug/Kg dry		64.9			9	50	
Methylcyclohexane	ND	42.3	ug/Kg dry		ND				50	
Toluene	913	42.3	ug/Kg dry		864			5	50	
Ethylbenzene	51.8	42.3	ug/Kg dry		43.1			18	50	
m,p-Xylene	801	42.3	ug/Kg dry		711			12	50	
Styrene	702	42.3	ug/Kg dry		501			33	50	
o-Xylene	53.4	42.3	ug/Kg dry		47.7			11	50	
Isopropylbenzene	ND	42.3	ug/Kg dry		ND				50	
n-Propylbenzene	49.7	42.3	ug/Kg dry		42.4			16	50	
1,3,5-Trimethylbenzene	ND	42.3	ug/Kg dry		ND				50	
1,2,3-Trimethylbenzene	42.1	42.3	ug/Kg dry		35.6			17	50	J
1,2,4-Trimethylbenzene	38.7	42.3	ug/Kg dry		40.7			5	50	J
t-Butylbenzene	ND	42.3	ug/Kg dry		ND				50	
sec-Butylbenzene	ND	42.3	ug/Kg dry		ND				50	
p-Isopropyltoluene	22.4	42.3	ug/Kg dry		ND			6	50	J
n-Butylbenzene	63.3	42.3	ug/Kg dry		64.2			1	50	
trans-Decalin	443	42.3	ug/Kg dry		403			9	50	
cis-Decalin	55.4	42.3	ug/Kg dry		64.0			14	50	
C1-Decalins	812	42.3	ug/Kg dry		746			8	50	
C2-Decalins	584	42.3	ug/Kg dry		531			10	50	
C3-Decalins	428	42.3	ug/Kg dry		438			2	50	
C4-Decalins	867	42.3	ug/Kg dry		751			14	50	
Benzo(b)thiophene	ND	42.3	ug/Kg dry		ND				50	
C1-Benzo(b)thiophenes	73.9	42.3	ug/Kg dry		73.2			0.9	50	
C2-Benzo(b)thiophenes	64.2	42.3	ug/Kg dry		57.2			12	50	
C3-Benzo(b)thiophenes	47.7	42.3	ug/Kg dry		44.1			8	50	
C4-Benzo(b)thiophenes	60.9	42.3	ug/Kg dry		50.1			20	50	
Naphthalene	93.7	42.3	ug/Kg dry		89.5			5	50	
2-Methylnaphthalene	96.1	42.3	ug/Kg dry		88.6			8	50	
1-Methylnaphthalene	66.3	42.3	ug/Kg dry		59.8			10	50	
C1-Naphthalenes	96.2	42.3	ug/Kg dry		88.5			8	50	
C2-Naphthalenes	393	42.3	ug/Kg dry		368			7	50	
C3-Naphthalenes	267	42.3	ug/Kg dry		251			6	50	
C4-Naphthalenes	309	42.3	ug/Kg dry		296			4	50	
Biphenyl	229	42.3	ug/Kg dry		214			7	50	
Acenaphthylene	292	42.3	ug/Kg dry		290			0.9	50	
Acenaphthene	54.7	42.3	ug/Kg dry		53.9			1	50	
Dibenzofuran	43.1	42.3	ug/Kg dry		42.4			2	50	
Fluorene	110	42.3	ug/Kg dry		101			8	50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200035

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FG01303 - 3570							
C1-Fluorenes	138	42.3	ug/Kg dry	112	20	50	
C2-Fluorenes	193	42.3	ug/Kg dry	179	7	50	
C3-Fluorenes	294	42.3	ug/Kg dry	262	11	50	
Dibenzothiophene	61.9	42.3	ug/Kg dry	55.8	10	50	
C1-Dibenzothiophenes	149	42.3	ug/Kg dry	140	6	50	
C2-Dibenzothiophenes	271	42.3	ug/Kg dry	262	3	50	
C3-Dibenzothiophenes	347	42.3	ug/Kg dry	323	7	50	
C4-Dibenzothiophenes	201	42.3	ug/Kg dry	188	7	50	
Phenanthrene	560	42.3	ug/Kg dry	542	3	50	
Anthracene	294	42.3	ug/Kg dry	292	0.6	50	
C1-Phenanthrenes/Anthracenes	713	42.3	ug/Kg dry	594	18	50	
C2-Phenanthrenes/Anthracenes	566	42.3	ug/Kg dry	598	5	50	
C3-Phenanthrenes/Anthracenes	465	42.3	ug/Kg dry	447	4	50	
C4-Phenanthrenes/Anthracenes	268	42.3	ug/Kg dry	244	9	50	
Retene	263	42.3	ug/Kg dry	211	22	50	
Benzo(b)naphtho(2,1-d)thiophene	113	42.3	ug/Kg dry	113	0.5	50	
C0-Benzonaphthothiophenes	232	42.3	ug/Kg dry	217	6	50	
C1-Benzonaphthothiophenes	232	42.3	ug/Kg dry	225	3	50	
C2-Benzonaphthothiophenes	272	42.3	ug/Kg dry	282	3	50	
C3-Benzonaphthothiophenes	230	42.3	ug/Kg dry	221	4	50	
C4-Benzonaphthothiophenes	165	42.3	ug/Kg dry	140	16	50	
Fluoranthene	1020	42.3	ug/Kg dry	994	2	50	
Pyrene	1280	42.3	ug/Kg dry	1230	4	50	
C1-Fluoranthenes/Pyrenes	837	42.3	ug/Kg dry	802	4	50	
C2-Fluoranthenes/Pyrenes	503	42.3	ug/Kg dry	493	2	50	
C3-Fluoranthenes/Pyrenes	317	42.3	ug/Kg dry	265	18	50	
Benzo(b)fluorene	77.8	42.3	ug/Kg dry	81.7	5	50	
Benzo(c)fluorene	38.1	42.3	ug/Kg dry	29.2	27	50	J
2-Methylpyrene	119	42.3	ug/Kg dry	117	2	50	
4-Methylpyrene	138	42.3	ug/Kg dry	135	2	50	
1-Methylpyrene	99.9	42.3	ug/Kg dry	93.8	6	50	
Benz(a)anthracene	544	42.3	ug/Kg dry	523	4	50	
Chrysene/triphenylene	729	42.3	ug/Kg dry	705	3	50	
C1-Benzo(a)anthracenes/Chrysenes	533	42.3	ug/Kg dry	523	2	50	
C2-Benzo(a)anthracenes/Chrysenes	394	42.3	ug/Kg dry	373	5	50	
C3-Benzo(a)anthracenes/Chrysenes	243	42.3	ug/Kg dry	238	2	50	
C4-Benzo(a)anthracenes/Chrysenes	176	42.3	ug/Kg dry	191	8	50	
Benzo(b)fluoranthene	603	42.3	ug/Kg dry	578	4	50	
Benzo(j/k)fluoranthene	582	42.3	ug/Kg dry	574	1	50	
Benzo(e)pyrene	534	42.3	ug/Kg dry	519	3	50	
Benzo(a)pyrene	621	42.3	ug/Kg dry	618	0.4	50	
Perylene	343	42.3	ug/Kg dry	316	8	50	
Indeno(1,2,3-cd)pyrene	434	42.3	ug/Kg dry	426	2	50	
Dibenzo(a,h)anthracene	107	42.3	ug/Kg dry	117	9	50	
Benzo(g,h,i)perylene	418	42.3	ug/Kg dry	415	0.6	50	
Coronene	124	42.3	ug/Kg dry	160	25	50	
Tetramethyl lead	ND	42.3	ug/Kg dry	ND		50	
Trimethylethyl lead	ND	42.3	ug/Kg dry	ND		50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200035

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FG01303 - 3570								
Dimethyldiethyl lead	ND	42.3	ug/Kg dry		ND			50
Methyltriethyl lead	ND	42.3	ug/Kg dry		ND			50
Tetraethyl lead	ND	42.3	ug/Kg dry		ND			50
2,6,10-trimethyldodecane (1380)	586	42.3	ug/Kg dry		563		4	50
2,6,10-trimethyltridecane (1470)	1030	42.3	ug/Kg dry		995		3	50
2,6,10-trimethylpentadecane (1650)	827	42.3	ug/Kg dry		836		1	50
C-17	466	42.3	ug/Kg dry		474		2	50
Pristane	2650	42.3	ug/Kg dry		2530		4	50
C-18	402	42.3	ug/Kg dry		360		11	50
Phytane	2570	42.3	ug/Kg dry		2390		7	50
Carbazole	45.7	42.3	ug/Kg dry		47.7		4	50
2,6-Dimethylnaphthalene	217	42.3	ug/Kg dry		200		8	50
2,3,5-Trimethylnaphthene	ND	42.3	ug/Kg dry		ND			50
4-Methyldibenzothiophene	55.0	42.3	ug/Kg dry		51.9		6	50
2/3-Methyldibenzothiophene	48.2	42.3	ug/Kg dry		40.4		18	50
1-Methyldibenzothiophene	ND	42.3	ug/Kg dry		ND			50
3-Methylphenanthrene	117	42.3	ug/Kg dry		123		6	50
2-Methylphenanthrene	157	42.3	ug/Kg dry		130		19	50
2-Methylanthracene	97.7	42.3	ug/Kg dry		75.0		26	50
4/9-Methylphenanthrene	170	42.3	ug/Kg dry		137		22	50
1-Methylphenanthrene	118	42.3	ug/Kg dry		114		4	50
Surrogate: Toluene-D8	*557*		ug/Kg dry	*846.0*		*66*	*50-120*	
Surrogate: Naphthalene-d8	*566*		ug/Kg dry	*846.0*		*67*	*50-120*	
Surrogate: Phenanthrene-d10	*675*		ug/Kg dry	*846.0*		*80*	*50-120*	
Surrogate: Perylene-d12	*593*		ug/Kg dry	*846.0*		*70*	*50-120*	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F200035

Notes and Definitions

U	Analyte included in the analysis, but not detected
J	Reported between MDL and MRL
D	Diluted.
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200035

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 2060255

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman

Send Report to: Rhoffman@geiconsultants.com

Send EDD to: labdata@geiconsultants.com, Efarrington@geiconsultants.com

Preservative

None | None

Analysis

Sample Handling

Samples Field Filtered: YES NO (NA)

Sampled Shipped With Ice: (YES) NO

MCP PRESUMPTIVE CERTAINTY REQUIRED – (YES) NO

If Yes, Are MCP Analytical Methods Required? (YES) NO NA

Are Drinking Water Samples Submitted? YES (NO) NA

If Yes, Have Drinking Water Sampling Requirements Been Met? YES NO (NA)

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Parent and Alkylated MAHs & PAHs 8270**	TOCs by Lloyd-Kahn	Sample Specific Remarks
1	1804576-SS801-S2	7/7/2020	15:23	Soil	1	BFM	X	X	
2	1804576-SS800-S1	7/7/2020	16:16	Soil	1	BFM	X	X	
3	1804576-SS800-S2	7/7/2020	16:22	Soil	1	BFM	X	X	
4	1804576-SS799-S2	7/7/2020	16:56	Soil	1	BFM	X	X	
5	1804576-SS798-S2	7/7/2020	17:31	Soil	1	BFM	X	X	
6	1804576-SS804-S1	7/7/2020	19:03	Soil	1	BFM	X	X	
7	1804576-SS804-S2	7/7/2020	19:11	Soil	1	BFM	X	X	
8	1804576-SS804-S3	7/7/2020	19:19	Soil	1	BFM	X	X	
9	1804576-SS805-S1	7/7/2020	19:40	Soil	1	BFM	X	X	
10	1804576-SS805-S3	7/7/2020	19:53	Soil	1	BFM	X	X	
11	1804576-SS806-S2	7/7/2020	20:13	Soil	1	BFM	X	X	
12	1804576-SS804-S2D	7/7/2020	12:00	Soil	1	BFM	X	X	

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

Relinquished by sampler: (Signature)	Date:	Time:	Received by: (signature)
1.	7/7/20	21:45	1. GEI Sample Fridge
Relinquished by: (signature) 2. GEI Sample Fridge	Date: 7/8/20	Time: 1345	Received by: (signature) 2.
Relinquished by: (signature) 3.	Date: 7/8/20	Time: 1345	Received by: (signature) 3.
Relinquished by: (signature) 4.	Date: 7/9/20	Time: 16:00	Received by: (signature) 4. Amber Garcia

Turnaround Time (Business days):

Normal __X__ Other ____

10-Day ____ 7-Day ____

5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

**Parent and Alkylated MAHs & PAHs (34) by GC/MS/SIM/SCAN

ICE temp: 2.8

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

Shipped/Delivered Via: ESS Courier

ESS Project ID: 20G0255
Date Received: 7/9/2020
Project Due Date: 7/16/2020
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 2.8 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No (NA)
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes (No)
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No (NA)

13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

COC = SS805-S1 ; Label = SS805-S2

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / (No)
    Who was contacted: Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1	62715	Yes	N/A	Yes	8 oz jar	NP	
2	62716	Yes	N/A	Yes	8 oz jar	NP	
3	62717	Yes	N/A	Yes	8 oz jar	NP	
4	62718	Yes	N/A	Yes	8 oz jar	NP	
5	62719	Yes	N/A	Yes	8 oz jar	NP	
6	62720	Yes	N/A	Yes	8 oz jar	NP	
7	62721	Yes	N/A	Yes	8 oz jar	NP	
8	62722	Yes	N/A	Yes	8 oz jar	NP	
9	62723	Yes	N/A	Yes	8 oz jar	NP	
10	62724	Yes	N/A	Yes	8 oz jar	NP	
11	62725	Yes	N/A	Yes	8 oz jar	NP	
12	62726	Yes	N/A	Yes	8 oz jar	NP	

2nd Review
Were all containers scanned into storage/lab? Initials AG
Are barcode labels on correct containers? (Yes) / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No (NA)
Are all Hex Chrome stickers attached? Yes / No (NA)

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

ESS Project ID: 20G0255
Date Received: 7/9/2020

Are all QC stickers attached? Yes / No / (NA)
Are VOA stickers attached if bubbles noted? Yes / No / (NA)

Completed By: Andrea Garcia Date & Time: 7/9/20 17:39
Reviewed By: Date & Time: 7/9/20 1756
Delivered By: 7/9/20 1756

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: F200036

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 11:25 am, Jul 30, 2020

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses
ESS Laboratory - Cranston, RI TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200036

SAMPLE RECEIPT

The following samples were received on July 09, 2020 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F200036-01	1804576-SS794-S1	Soil	8270 Mod, TOC-LK
F200036-02	1804576-SS794-S2	Soil	8270 Mod, TOC-LK
F200036-03	1804576-SS793-S1	Soil	8270 Mod, TOC-LK
F200036-04	1804576-SS793-S2	Soil	8270 Mod, TOC-LK
F200036-05	1804576-SS807-S1	Soil	8270 Mod, TOC-LK
F200036-06	1804576-SS807-S2	Soil	8270 Mod, TOC-LK
F200036-07	1804576-SS802-S1	Soil	8270 Mod, TOC-LK
F200036-08	1804576-SS803-S1	Soil	8270 Mod, TOC-LK
F200036-09	1804576-SS797-S1	Soil	8270 Mod, TOC-LK
F200036-10	1804576-SS792-S1	Soil	8270 Mod, TOC-LK
F200036-11	1804576-SS791-S1	Soil	8270 Mod, TOC-LK
F200036-12	1804576-SS797-S1D	Soil	8270 Mod, TOC-LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200036

PROJECT NARRATIVE

8270D (SIM) Semi-Volatile Organic Compounds

F200036-05 **Present in Method Blank (B).**
Phytane

F200036-06 **Present in Method Blank (B).**
Phytane

F200036-07 **Present in Method Blank (B).**
C-17 , C-18 , Phytane , Pristane

F200036-08 **Present in Method Blank (B).**
C-17 , C-18 , Phytane , Pristane

F200036-10 **Present in Method Blank (B).**
C-17 , C-18 , Phytane , Pristane

F200036-11 **Present in Method Blank (B).**
C-17 , C-18 , Phytane , Pristane

FG01402-DUP2 **Relative percent difference for duplicate is outside of criteria (D+).**
1,3,5-Trimethylbenzene (153% @ 50%), Benz(a)anthracene (71% @ 50%), Benzo(a)pyrene (75% @ 50%), C2-Benzo(b)thiophenes (63% @ 50%), Chrysene/triphenylene (73% @ 50%), Fluoranthene (110% @ 50%), Phenanthrene (54% @ 50%), p-Isopropyltoluene (68% @ 50%), Pyrene (95% @ 50%)

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200036

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS794-S1
Date Sampled: 07/08/20 13:00
Percent Solids: 24
Initial Volume: 4.42
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**2180** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C1-Benzene	**1420** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C2-Benzenes	**1430** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C3-Benzenes	**547** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C4-Benzenes	**308** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C5-Benzenes	**142** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
Methylcyclohexane	**177** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
Toluene	**3160** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
Ethylbenzene	**851** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
m,p-Xylene	**3210** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
Styrene	**3820** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
o-Xylene	**431** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
Isopropylbenzene	ND (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
n-Propylbenzene	**111** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
1,3,5-Trimethylbenzene	**177** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
1,2,3-Trimethylbenzene	**208** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
1,2,4-Trimethylbenzene	**513** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
t-Butylbenzene	ND (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
sec-Butylbenzene	ND (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
p-Isopropyltoluene	**114** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
n-Butylbenzene	**149** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
trans-Decalin	**318** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
cis-Decalin	ND (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C1-Decalins	**929** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C2-Decalins	**1570** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C3-Decalins	**2480** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C4-Decalins	**4030** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
Benzo(b)thiophene	**3630** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C1-Benzo(b)thiophenes	**1280** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C2-Benzo(b)thiophenes	**1040** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C3-Benzo(b)thiophenes	**460** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C4-Benzo(b)thiophenes	**400** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS794-S1
Date Sampled: 07/08/20 13:00
Percent Solids: 24
Initial Volume: 4.42
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**23000** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
2-Methylnaphthalene	**8640** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
1-Methylnaphthalene	**3050** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C1-Naphthalenes	**7150** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C2-Naphthalenes	**5090** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C3-Naphthalenes	**2590** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C4-Naphthalenes	**1710** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
Biphenyl	**3310** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
Acenaphthylene	**45100** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
Acenaphthene	**3530** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
Dibenzofuran	**1220** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
Fluorene	**4940** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C1-Fluorenes	**2760** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C2-Fluorenes	**3230** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C3-Fluorenes	**3910** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
Dibenzothiophene	**4370** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C1-Dibenzothiophenes	**5240** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C2-Dibenzothiophenes	**7990** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C3-Dibenzothiophenes	**6200** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C4-Dibenzothiophenes	**2600** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
Phenanthrene	**19100** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
Anthracene	**20900** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C1-Phenanthrenes/Anthracenes	**22300** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C2-Phenanthrenes/Anthracenes	**18800** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C3-Phenanthrenes/Anthracenes	**8050** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C4-Phenanthrenes/Anthracenes	**2840** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
Retene	**634** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
Benzo(b)naphtho(2,1-d)thiophene	**20600** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C0-Benzonaphthothiophenes	**41500** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C1-Benzonaphthothiophenes	**22100** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C2-Benzonaphthothiophenes	**9080** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C3-Benzonaphthothiophenes	**6080** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS794-S1
Date Sampled: 07/08/20 13:00
Percent Solids: 24
Initial Volume: 4.42
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**1630** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
Fluoranthene	**99100** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
Pyrene	**145000** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C1-Fluoranthenes/Pyrenes	**137000** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C2-Fluoranthenes/Pyrenes	**38500** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C3-Fluoranthenes/Pyrenes	**11100** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
Benzo(b)fluorene	**15300** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
Benzo(c)fluorene	**2880** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
2-Methylpyrene	**18300** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
4-Methylpyrene	**21100** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
1-Methylpyrene	**18800** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
Benz(a)anthracene	**122000** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
Chrysene/triphenylene	**109000** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C1-Benzo(a)anthracenes/Chrysenes	**58300** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C2-Benzo(a)anthracenes/Chrysenes	**19800** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C3-Benzo(a)anthracenes/Chrysenes	**6170** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C4-Benzo(a)anthracenes/Chrysenes	**4710** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
Benzo(b)fluoranthene	**99900** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
Benzo(j/k)fluoranthene	**106000** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
Benzo(e)pyrene	**105000** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
Benzo(a)pyrene	**181000** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
Perylene	**33300** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
Indeno(1,2,3-cd)pyrene	**91600** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
Dibenzo(a,h)anthracene	**22300** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
Benzo(g,h,i)perylene	**93700** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
Coronene	**30100** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
Tetramethyl lead	ND (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
Trimethylethyl lead	ND (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
Dimethyldiethyl lead	ND (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
Methyltriethyl lead	ND (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
Tetraethyl lead	ND (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
2,6,10-trimethyldodecane (1380)	**1720** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS794-S1
Date Sampled: 07/08/20 13:00
Percent Solids: 24
Initial Volume: 4.42
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**1900** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
2,6,10-trimethylpentadecane (1650)	**1210** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C-17	**1220** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
Pristane	**2360** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
C-18	**1100** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
Phytane	**2720** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
Carbazole	**1550** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
2,6-Dimethylnaphthalene	**1280** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
2,3,5-Trimethylnaphthene	**96.4** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
4-Methyldibenzothiophene	**1990** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
2/3-Methyldibenzothiophene	**1610** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
1-Methyldibenzothiophene	**701** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
3-Methylphenanthrene	**3270** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
2-Methylphenanthrene	**3380** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
2-Methylanthracene	**4660** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
4/9-Methylphenanthrene	**7030** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402
1-Methylphenanthrene	**3930** (92.8)	46.4	8270 Mod		5	07/15/20 19:40	F0G0003	FG01402

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*83 %*		*50-120*
Surrogate: Naphthalene-d8	*82 %*		*50-120*
Surrogate: Phenanthrene-d10	*87 %*		*50-120*
Surrogate: Perylene-d12	*117 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS794-S1
Date Sampled: 07/08/20 13:00
Percent Solids: 24

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**274000** (98.2)		TOC-LK		1	CCP	07/20/20 15:08	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS794-S2
Date Sampled: 07/08/20 13:04
Percent Solids: 20
Initial Volume: 4.62
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**1520** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C1-Benzene	**1060** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C2-Benzenes	**1220** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C3-Benzenes	**512** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C4-Benzenes	**344** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C5-Benzenes	**175** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
Methylcyclohexane	**152** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
Toluene	**2370** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
Ethylbenzene	**875** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
m,p-Xylene	**2580** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
Styrene	**1280** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
o-Xylene	**322** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
Isopropylbenzene	ND (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
n-Propylbenzene	**J 106** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
1,3,5-Trimethylbenzene	**133** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
1,2,3-Trimethylbenzene	**185** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
1,2,4-Trimethylbenzene	**390** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
t-Butylbenzene	ND (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
sec-Butylbenzene	ND (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
p-Isopropyltoluene	**153** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
n-Butylbenzene	**149** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
trans-Decalin	**134** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
cis-Decalin	ND (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C1-Decalins	**441** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C2-Decalins	**515** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C3-Decalins	**478** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C4-Decalins	**555** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
Benzo(b)thiophene	**1860** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C1-Benzo(b)thiophenes	**641** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C2-Benzo(b)thiophenes	**759** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C3-Benzo(b)thiophenes	**335** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C4-Benzo(b)thiophenes	**170** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS794-S2
Date Sampled: 07/08/20 13:04
Percent Solids: 20
Initial Volume: 4.62
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**10000** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
2-Methylnaphthalene	**3650** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
1-Methylnaphthalene	**1540** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C1-Naphthalenes	**3160** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C2-Naphthalenes	**2660** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C3-Naphthalenes	**1110** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C4-Naphthalenes	**721** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
Biphenyl	**1400** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
Acenaphthylene	**10300** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
Acenaphthene	**2030** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
Dibenzofuran	**652** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
Fluorene	**2400** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C1-Fluorenes	**1070** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C2-Fluorenes	**1210** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C3-Fluorenes	**1430** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
Dibenzothiophene	**1730** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C1-Dibenzothiophenes	**1730** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C2-Dibenzothiophenes	**2130** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C3-Dibenzothiophenes	**1440** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C4-Dibenzothiophenes	**753** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
Phenanthrene	**7230** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
Anthracene	**7300** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C1-Phenanthrenes/Anthracenes	**7060** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C2-Phenanthrenes/Anthracenes	**5580** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C3-Phenanthrenes/Anthracenes	**2340** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C4-Phenanthrenes/Anthracenes	**1020** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
Retene	**426** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
Benzo(b)naphtho(2,1-d)thiophene	**3780** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C0-Benzonaphthothiophenes	**7630** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C1-Benzonaphthothiophenes	**3990** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C2-Benzonaphthothiophenes	**2170** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C3-Benzonaphthothiophenes	**1640** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS794-S2
Date Sampled: 07/08/20 13:04
Percent Solids: 20
Initial Volume: 4.62
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**584** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
Fluoranthene	**30500** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
Pyrene	**42800** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C1-Fluoranthenes/Pyrenes	**28000** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C2-Fluoranthenes/Pyrenes	**8270** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C3-Fluoranthenes/Pyrenes	**2860** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
Benzo(b)fluorene	**3150** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
Benzo(c)fluorene	**920** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
2-Methylpyrene	**3550** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
4-Methylpyrene	**4330** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
1-Methylpyrene	**3490** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
Benz(a)anthracene	**23400** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
Chrysene/triphenylene	**22600** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C1-Benzo(a)anthracenes/Chrysenes	**10800** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C2-Benzo(a)anthracenes/Chrysenes	**4280** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C3-Benzo(a)anthracenes/Chrysenes	**1850** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C4-Benzo(a)anthracenes/Chrysenes	**1410** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
Benzo(b)fluoranthene	**19500** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
Benzo(j/k)fluoranthene	**22300** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
Benzo(e)pyrene	**22000** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
Benzo(a)pyrene	**35800** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
Perylene	**6140** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
Indeno(1,2,3-cd)pyrene	**19100** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
Dibenzo(a,h)anthracene	**4520** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
Benzo(g,h,i)perylene	**19400** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
Coronene	**6130** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
Tetramethyl lead	ND (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
Trimethylethyl lead	ND (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
Dimethyldiethyl lead	ND (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
Methyltriethyl lead	ND (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
Tetraethyl lead	ND (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
2,6,10-trimethyldodecane (1380)	**350** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS794-S2
Date Sampled: 07/08/20 13:04
Percent Solids: 20
Initial Volume: 4.62
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**559** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
2,6,10-trimethylpentadecane (1650)	**415** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C-17	**1140** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
Pristane	**1050** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
C-18	**1180** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
Phytane	**1340** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
Carbazole	**753** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
2,6-Dimethylnaphthalene	**727** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
2,3,5-Trimethylnaphthene	ND (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
4-Methyldibenzothiophene	**650** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
2/3-Methyldibenzothiophene	**520** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
1-Methyldibenzothiophene	**235** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
3-Methylphenanthrene	**1260** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
2-Methylphenanthrene	**1080** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
2-Methylanthracene	**1300** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
4/9-Methylphenanthrene	**2160** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402
1-Methylphenanthrene	**1220** (109)	54.7	8270 Mod		5	07/15/20 22:23	F0G0003	FG01402

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*69 %*		*50-120*
Surrogate: Naphthalene-d8	*68 %*		*50-120*
Surrogate: Phenanthrene-d10	*71 %*		*50-120*
Surrogate: Perylene-d12	*80 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS794-S2
Date Sampled: 07/08/20 13:04
Percent Solids: 20

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**297000** (96.9)		TOC-LK		1	CCP	07/20/20 15:41	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS793-S1
Date Sampled: 07/08/20 13:59
Percent Solids: 13
Initial Volume: 4.81
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**392** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C1-Benzene	**259** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C2-Benzenes	**294** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C3-Benzenes	**165** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C4-Benzenes	**222** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C5-Benzenes	**173** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
Methylcyclohexane	**52.2** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
Toluene	**623** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
Ethylbenzene	**131** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
m,p-Xylene	**697** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
Styrene	**206** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
o-Xylene	**47.9** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
Isopropylbenzene	ND (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
n-Propylbenzene	**250** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
1,3,5-Trimethylbenzene	**35.5** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
1,2,3-Trimethylbenzene	**49.2** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
1,2,4-Trimethylbenzene	**84.1** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
t-Butylbenzene	ND (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
sec-Butylbenzene	ND (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
p-Isopropyltoluene	**31.9** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
n-Butylbenzene	**735** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
trans-Decalin	**34.9** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
cis-Decalin	ND (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C1-Decalins	ND (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C2-Decalins	ND (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C3-Decalins	ND (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C4-Decalins	ND (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
Benzo(b)thiophene	**42.8** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C1-Benzo(b)thiophenes	**111** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C2-Benzo(b)thiophenes	**66.4** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C3-Benzo(b)thiophenes	**49.2** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C4-Benzo(b)thiophenes	**44.1** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS793-S1
Date Sampled: 07/08/20 13:59
Percent Solids: 13
Initial Volume: 4.81
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**296** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
2-Methylnaphthalene	**162** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
1-Methylnaphthalene	**107** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C1-Naphthalenes	**168** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C2-Naphthalenes	**237** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C3-Naphthalenes	**163** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C4-Naphthalenes	**138** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
Biphenyl	**111** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
Acenaphthylene	**723** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
Acenaphthene	**149** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
Dibenzofuran	**77.5** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
Fluorene	**163** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C1-Fluorenes	**85.4** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C2-Fluorenes	**156** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C3-Fluorenes	**288** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
Dibenzothiophene	**127** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C1-Dibenzothiophenes	**135** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C2-Dibenzothiophenes	**166** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C3-Dibenzothiophenes	**130** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C4-Dibenzothiophenes	**74.9** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
Phenanthrene	**1220** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
Anthracene	**599** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C1-Phenanthrenes/Anthracenes	**736** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C2-Phenanthrenes/Anthracenes	**500** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C3-Phenanthrenes/Anthracenes	**228** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C4-Phenanthrenes/Anthracenes	**96.1** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
Retene	**38.0** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
Benzo(b)naphtho(2,1-d)thiophene	**288** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C0-Benzonaphthothiophenes	**528** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C1-Benzonaphthothiophenes	**307** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C2-Benzonaphthothiophenes	**267** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C3-Benzonaphthothiophenes	**243** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS793-S1
Date Sampled: 07/08/20 13:59
Percent Solids: 13
Initial Volume: 4.81
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**143** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
Fluoranthene	**3020** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
Pyrene	**3000** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C1-Fluoranthenes/Pyrenes	**1420** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C2-Fluoranthenes/Pyrenes	**856** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C3-Fluoranthenes/Pyrenes	**422** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
Benzo(b)fluorene	**144** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
Benzo(c)fluorene	**48.8** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
2-Methylpyrene	**196** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
4-Methylpyrene	**197** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
1-Methylpyrene	**144** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
Benz(a)anthracene	**1440** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
Chrysene/triphenylene	**1860** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C1-Benzo(a)anthracenes/Chrysenes	**809** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C2-Benzo(a)anthracenes/Chrysenes	**479** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C3-Benzo(a)anthracenes/Chrysenes	**286** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C4-Benzo(a)anthracenes/Chrysenes	**245** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
Benzo(b)fluoranthene	**1920** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
Benzo(j/k)fluoranthene	**1740** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
Benzo(e)pyrene	**1700** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
Benzo(a)pyrene	**1970** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
Perylene	**443** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
Indeno(1,2,3-cd)pyrene	**1520** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
Dibenzo(a,h)anthracene	**419** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
Benzo(g,h,i)perylene	**1430** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
Coronene	**563** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
Tetramethyl lead	ND (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
Trimethylethyl lead	ND (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
Dimethyldiethyl lead	ND (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
Methyltriethyl lead	ND (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
Tetraethyl lead	ND (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
2,6,10-trimethyldodecane (1380)	**59.2** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS793-S1
Date Sampled: 07/08/20 13:59
Percent Solids: 13
Initial Volume: 4.81
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**166** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
2,6,10-trimethylpentadecane (1650)	**66.4** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C-17	**671** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
Pristane	**205** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
C-18	**533** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
Phytane	**268** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
Carbazole	**180** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
2,6-Dimethylnaphthalene	**74.2** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
2,3,5-Trimethylnaphthene	ND (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
4-Methyldibenzothiophene	**46.9** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
2/3-Methyldibenzothiophene	**41.7** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
1-Methyldibenzothiophene	**J 21.4** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
3-Methylphenanthrene	**150** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
2-Methylphenanthrene	**192** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
2-Methylanthracene	**95.9** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
4/9-Methylphenanthrene	**182** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402
1-Methylphenanthrene	**116** (31.1)	15.6	8270 Mod		1	07/16/20 9:13	F0G0003	FG01402

	%Recovery	*Qualifier*	*Limits*
Surrogate: Toluene-D8	*68 %*		*50-120*
Surrogate: Naphthalene-d8	*73 %*		*50-120*
Surrogate: Phenanthrene-d10	*76 %*		*50-120*
Surrogate: Perylene-d12	*79 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS793-S1
Date Sampled: 07/08/20 13:59
Percent Solids: 13

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**233000** (97.6)		TOC-LK		1	CCP	07/20/20 16:47	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS793-S2
Date Sampled: 07/08/20 14:04
Percent Solids: 19
Initial Volume: 4.99
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**690** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C1-Benzene	**605** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C2-Benzenes	**862** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C3-Benzenes	**827** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C4-Benzenes	**614** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C5-Benzenes	**187** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
Methylcyclohexane	**131** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
Toluene	**1370** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
Ethylbenzene	**307** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
m,p-Xylene	**2050** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
Styrene	**427** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
o-Xylene	**312** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
Isopropylbenzene	**36.6** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
n-Propylbenzene	**152** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
1,3,5-Trimethylbenzene	**198** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
1,2,3-Trimethylbenzene	**606** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
1,2,4-Trimethylbenzene	**726** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
t-Butylbenzene	ND (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
sec-Butylbenzene	**35.0** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
p-Isopropyltoluene	**227** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
n-Butylbenzene	**284** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
trans-Decalin	**269** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
cis-Decalin	**J 12.6** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C1-Decalins	**129** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C2-Decalins	**160** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C3-Decalins	**172** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C4-Decalins	**312** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
Benzo(b)thiophene	**894** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C1-Benzo(b)thiophenes	**264** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C2-Benzo(b)thiophenes	**827** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C3-Benzo(b)thiophenes	**530** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C4-Benzo(b)thiophenes	**110** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS793-S2
Date Sampled: 07/08/20 14:04
Percent Solids: 19
Initial Volume: 4.99
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**3420** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
2-Methylnaphthalene	**1400** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
1-Methylnaphthalene	**538** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C1-Naphthalenes	**1170** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C2-Naphthalenes	**1180** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C3-Naphthalenes	**573** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C4-Naphthalenes	**469** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
Biphenyl	**491** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
Acenaphthylene	**2930** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
Acenaphthene	**554** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
Dibenzofuran	**445** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
Fluorene	**874** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C1-Fluorenes	**616** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C2-Fluorenes	**638** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C3-Fluorenes	**1030** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
Dibenzothiophene	**500** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C1-Dibenzothiophenes	**511** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C2-Dibenzothiophenes	**692** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C3-Dibenzothiophenes	**625** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C4-Dibenzothiophenes	**505** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
Phenanthrene	**3740** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
Anthracene	**2540** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C1-Phenanthrenes/Anthracenes	**2880** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C2-Phenanthrenes/Anthracenes	**2290** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C3-Phenanthrenes/Anthracenes	**1220** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C4-Phenanthrenes/Anthracenes	**683** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
Retene	**310** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
Benzo(b)naphtho(2,1-d)thiophene	**956** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C0-Benzonaphthothiophenes	**1840** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C1-Benzonaphthothiophenes	**1260** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C2-Benzonaphthothiophenes	**1180** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C3-Benzonaphthothiophenes	**1060** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS793-S2
Date Sampled: 07/08/20 14:04
Percent Solids: 19
Initial Volume: 4.99
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**539** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
Fluoranthene	**9590** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
Pyrene	**11300** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C1-Fluoranthenes/Pyrenes	**7760** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C2-Fluoranthenes/Pyrenes	**3680** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C3-Fluoranthenes/Pyrenes	**1820** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
Benzo(b)fluorene	**792** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
Benzo(c)fluorene	**329** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
2-Methylpyrene	**984** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
4-Methylpyrene	**1270** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
1-Methylpyrene	**837** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
Benz(a)anthracene	**6340** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
Chrysene/triphenylene	**7660** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C1-Benzo(a)anthracenes/Chrysenes	**4130** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C2-Benzo(a)anthracenes/Chrysenes	**2430** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C3-Benzo(a)anthracenes/Chrysenes	**1390** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C4-Benzo(a)anthracenes/Chrysenes	**920** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
Benzo(b)fluoranthene	**7980** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
Benzo(j/k)fluoranthene	**8010** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
Benzo(e)pyrene	**8840** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
Benzo(a)pyrene	**10100** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
Perylene	**2160** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
Indeno(1,2,3-cd)pyrene	**7550** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
Dibenzo(a,h)anthracene	**1550** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
Benzo(g,h,i)perylene	**7480** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
Coronene	**2270** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
Tetramethyl lead	ND (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
Trimethylethyl lead	ND (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
Dimethyldiethyl lead	ND (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
Methyltriethyl lead	ND (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
Tetraethyl lead	ND (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
2,6,10-trimethyldodecane (1380)	**175** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS793-S2
Date Sampled: 07/08/20 14:04
Percent Solids: 19
Initial Volume: 4.99
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**383** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
2,6,10-trimethylpentadecane (1650)	**262** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C-17	**879** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
Pristane	**605** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
C-18	**813** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
Phytane	**949** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
Carbazole	**468** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
2,6-Dimethylnaphthalene	**325** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
2,3,5-Trimethylnaphthene	**36.6** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
4-Methyldibenzothiophene	**181** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
2/3-Methyldibenzothiophene	**159** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
1-Methyldibenzothiophene	**60.0** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
3-Methylphenanthrene	**591** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
2-Methylphenanthrene	**616** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
2-Methylanthracene	**427** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
4/9-Methylphenanthrene	**761** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402
1-Methylphenanthrene	**440** (20.7)	10.3	8270 Mod		1	07/16/20 10:34	F0G0003	FG01402

	%Recovery	*Qualifier*	*Limits*
Surrogate: Toluene-D8	*71 %*		*50-120*
Surrogate: Naphthalene-d8	*77 %*		*50-120*
Surrogate: Phenanthrene-d10	*80 %*		*50-120*
Surrogate: Perylene-d12	*87 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS793-S2
Date Sampled: 07/08/20 14:04
Percent Solids: 19

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-04
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**233000** (94.8)		TOC-LK		1	CCP	07/20/20 17:04	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS807-S1
Date Sampled: 07/08/20 14:44
Percent Solids: 45
Initial Volume: 6.11
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**137** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C1-Benzene	**71.1** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C2-Benzenes	**72.0** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C3-Benzenes	**47.6** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C4-Benzenes	**37.2** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C5-Benzenes	**30.4** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
Methylcyclohexane	**154** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
Toluene	**160** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
Ethylbenzene	**25.8** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
m,p-Xylene	**151** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
Styrene	**25.8** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
o-Xylene	**42.8** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
Isopropylbenzene	**J 5.65** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
n-Propylbenzene	**29.4** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
1,3,5-Trimethylbenzene	**34.6** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
1,2,3-Trimethylbenzene	**19.4** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
1,2,4-Trimethylbenzene	**33.3** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
t-Butylbenzene	ND (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
sec-Butylbenzene	ND (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
p-Isopropyltoluene	**10.4** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
n-Butylbenzene	**75.2** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
trans-Decalin	**20.9** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
cis-Decalin	ND (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C1-Decalins	**26.3** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C2-Decalins	**22.3** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C3-Decalins	**10.5** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C4-Decalins	**18.8** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
Benzo(b)thiophene	**J 6.30** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C1-Benzo(b)thiophenes	**41.7** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C2-Benzo(b)thiophenes	**14.6** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C3-Benzo(b)thiophenes	**9.14** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C4-Benzo(b)thiophenes	**7.80** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS807-S1
Date Sampled: 07/08/20 14:44
Percent Solids: 45
Initial Volume: 6.11
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**126** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
2-Methylnaphthalene	**122** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
1-Methylnaphthalene	**99.8** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C1-Naphthalenes	**132** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C2-Naphthalenes	**180** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C3-Naphthalenes	**143** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C4-Naphthalenes	**79.4** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
Biphenyl	**36.8** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
Acenaphthylene	**157** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
Acenaphthene	**37.1** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
Dibenzofuran	**42.1** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
Fluorene	**41.6** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C1-Fluorenes	**44.9** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C2-Fluorenes	**114** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C3-Fluorenes	**151** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
Dibenzothiophene	**47.4** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C1-Dibenzothiophenes	**72.1** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C2-Dibenzothiophenes	**71.4** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C3-Dibenzothiophenes	**40.4** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C4-Dibenzothiophenes	**17.5** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
Phenanthrene	**594** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
Anthracene	**194** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C1-Phenanthrenes/Anthracenes	**477** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C2-Phenanthrenes/Anthracenes	**397** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C3-Phenanthrenes/Anthracenes	**144** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C4-Phenanthrenes/Anthracenes	**56.7** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
Retene	**23.3** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
Benzo(b)naphtho(2,1-d)thiophene	**119** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C0-Benzonaphthothiophenes	**204** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C1-Benzonaphthothiophenes	**137** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C2-Benzonaphthothiophenes	**97.8** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C3-Benzonaphthothiophenes	**53.6** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS807-S1
Date Sampled: 07/08/20 14:44
Percent Solids: 45
Initial Volume: 6.11
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**21.9** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
Fluoranthene	**1240** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
Pyrene	**1430** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C1-Fluoranthenes/Pyrenes	**616** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C2-Fluoranthenes/Pyrenes	**430** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C3-Fluoranthenes/Pyrenes	**259** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
Benzo(b)fluorene	**41.2** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
Benzo(c)fluorene	**24.4** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
2-Methylpyrene	**93.7** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
4-Methylpyrene	**84.3** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
1-Methylpyrene	**69.6** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
Benz(a)anthracene	**654** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
Chrysene/triphenylene	**767** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C1-Benzo(a)anthracenes/Chrysenes	**380** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C2-Benzo(a)anthracenes/Chrysenes	**231** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C3-Benzo(a)anthracenes/Chrysenes	**128** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C4-Benzo(a)anthracenes/Chrysenes	**87.3** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
Benzo(b)fluoranthene	**643** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
Benzo(j/k)fluoranthene	**616** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
Benzo(e)pyrene	**553** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
Benzo(a)pyrene	**692** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
Perylene	**156** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
Indeno(1,2,3-cd)pyrene	**461** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
Dibenzo(a,h)anthracene	**110** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
Benzo(g,h,i)perylene	**433** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
Coronene	**117** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
Tetramethyl lead	ND (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
Trimethylethyl lead	ND (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
Dimethyldiethyl lead	ND (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
Methyltriethyl lead	ND (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
Tetraethyl lead	ND (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
2,6,10-trimethyldodecane (1380)	**40.1** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS807-S1
Date Sampled: 07/08/20 14:44
Percent Solids: 45
Initial Volume: 6.11
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**82.0** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
2,6,10-trimethylpentadecane (1650)	**40.5** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C-17	**192** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
Pristane	**154** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
C-18	**175** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
Phytane	**B 87.0** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
Carbazole	**47.1** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
2,6-Dimethylnaphthalene	**43.1** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
2,3,5-Trimethylnaphthene	**10.1** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
4-Methyldibenzothiophene	**30.3** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
2/3-Methyldibenzothiophene	**25.8** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
1-Methyldibenzothiophene	**7.59** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
3-Methylphenanthrene	**106** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
2-Methylphenanthrene	**137** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
2-Methylanthracene	**36.1** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
4/9-Methylphenanthrene	**114** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402
1-Methylphenanthrene	**76.4** (7.35)	3.68	8270 Mod		1	07/15/20 23:44	F0G0003	FG01402

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*78 %*		*50-120*
Surrogate: Naphthalene-d8	*82 %*		*50-120*
Surrogate: Phenanthrene-d10	*86 %*		*50-120*
Surrogate: Perylene-d12	*91 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS807-S1
Date Sampled: 07/08/20 14:44
Percent Solids: 45

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-05
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**118000** (93.9)		TOC-LK		1	CCP	07/20/20 23:19	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS807-S2
Date Sampled: 07/08/20 14:49
Percent Solids: 63
Initial Volume: 5.43
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**156** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C1-Benzene	**96.2** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C2-Benzenes	**107** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C3-Benzenes	**62.3** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C4-Benzenes	**41.4** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C5-Benzenes	**25.0** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
Methylcyclohexane	**198** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
Toluene	**221** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
Ethylbenzene	**25.6** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
m,p-Xylene	**244** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
Styrene	**28.0** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
o-Xylene	**63.3** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
Isopropylbenzene	**8.72** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
n-Propylbenzene	**14.7** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
1,3,5-Trimethylbenzene	**48.3** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
1,2,3-Trimethylbenzene	**27.3** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
1,2,4-Trimethylbenzene	**44.3** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
t-Butylbenzene	ND (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
sec-Butylbenzene	**J 5.14** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
p-Isopropyltoluene	**12.5** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
n-Butylbenzene	**16.2** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
trans-Decalin	**33.3** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
cis-Decalin	ND (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C1-Decalins	**40.5** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C2-Decalins	**38.8** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C3-Decalins	**24.5** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C4-Decalins	**30.6** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
Benzo(b)thiophene	**31.1** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C1-Benzo(b)thiophenes	**26.2** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C2-Benzo(b)thiophenes	**20.3** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C3-Benzo(b)thiophenes	**10.6** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C4-Benzo(b)thiophenes	**8.00** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS807-S2
Date Sampled: 07/08/20 14:49
Percent Solids: 63
Initial Volume: 5.43
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**153** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
2-Methylnaphthalene	**151** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
1-Methylnaphthalene	**124** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C1-Naphthalenes	**164** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C2-Naphthalenes	**256** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C3-Naphthalenes	**214** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C4-Naphthalenes	**111** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
Biphenyl	**46.5** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
Acenaphthylene	**185** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
Acenaphthene	**132** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
Dibenzofuran	**81.0** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
Fluorene	**154** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C1-Fluorenes	**73.2** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C2-Fluorenes	**153** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C3-Fluorenes	**211** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
Dibenzothiophene	**122** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C1-Dibenzothiophenes	**104** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C2-Dibenzothiophenes	**98.8** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C3-Dibenzothiophenes	**50.8** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C4-Dibenzothiophenes	**29.5** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
Phenanthrene	**873** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
Anthracene	**311** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C1-Phenanthrenes/Anthracenes	**664** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C2-Phenanthrenes/Anthracenes	**497** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C3-Phenanthrenes/Anthracenes	**212** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C4-Phenanthrenes/Anthracenes	**96.8** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
Retene	**100** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
Benzo(b)naphtho(2,1-d)thiophene	**160** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C0-Benzonaphthothiophenes	**281** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C1-Benzonaphthothiophenes	**196** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C2-Benzonaphthothiophenes	**134** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C3-Benzonaphthothiophenes	**75.2** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS807-S2
Date Sampled: 07/08/20 14:49
Percent Solids: 63
Initial Volume: 5.43
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**31.6** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
Fluoranthene	**1670** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
Pyrene	**1780** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C1-Fluoranthenes/Pyrenes	**773** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C2-Fluoranthenes/Pyrenes	**608** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C3-Fluoranthenes/Pyrenes	**368** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
Benzo(b)fluorene	**57.8** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
Benzo(c)fluorene	**33.0** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
2-Methylpyrene	**115** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
4-Methylpyrene	**107** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
1-Methylpyrene	**80.2** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
Benz(a)anthracene	**847** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
Chrysene/triphenylene	**975** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C1-Benzo(a)anthracenes/Chrysenes	**542** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C2-Benzo(a)anthracenes/Chrysenes	**451** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C3-Benzo(a)anthracenes/Chrysenes	**201** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C4-Benzo(a)anthracenes/Chrysenes	**123** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
Benzo(b)fluoranthene	**850** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
Benzo(j/k)fluoranthene	**806** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
Benzo(e)pyrene	**698** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
Benzo(a)pyrene	**856** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
Perylene	**199** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
Indeno(1,2,3-cd)pyrene	**564** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
Dibenzo(a,h)anthracene	**150** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
Benzo(g,h,i)perylene	**512** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
Coronene	**139** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
Tetramethyl lead	ND (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
Trimethylethyl lead	ND (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
Dimethyldiethyl lead	ND (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
Methyltriethyl lead	ND (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
Tetraethyl lead	ND (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
2,6,10-trimethyldodecane (1380)	**52.5** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS807-S2
Date Sampled: 07/08/20 14:49
Percent Solids: 63
Initial Volume: 5.43
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**115** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
2,6,10-trimethylpentadecane (1650)	**51.8** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C-17	**240** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
Pristane	**222** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
C-18	**235** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
Phytane	**B 113** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
Carbazole	**77.1** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
2,6-Dimethylnaphthalene	**63.3** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
2,3,5-Trimethylnaphthene	**18.6** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
4-Methyldibenzothiophene	**44.7** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
2/3-Methyldibenzothiophene	**36.4** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
1-Methyldibenzothiophene	**9.40** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
3-Methylphenanthrene	**150** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
2-Methylphenanthrene	**197** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
2-Methylanthracene	**54.7** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
4/9-Methylphenanthrene	**154** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402
1-Methylphenanthrene	**105** (5.87)	2.94	8270 Mod		1	07/16/20 1:05	F0G0003	FG01402

	%Recovery	*Qualifier*	*Limits*
Surrogate: Toluene-D8	*80 %*		*50-120*
Surrogate: Naphthalene-d8	*82 %*		*50-120*
Surrogate: Phenanthrene-d10	*88 %*		*50-120*
Surrogate: Perylene-d12	*91 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS807-S2
Date Sampled: 07/08/20 14:49
Percent Solids: 63

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-06
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**114000** (94.3)		TOC-LK		1	CCP	07/20/20 17:37	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS802-S1
Date Sampled: 07/08/20 15:14
Percent Solids: 82
Initial Volume: 5.01
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C1-Benzene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C2-Benzenes	**J 2.66** (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C3-Benzenes	**5.16** (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C4-Benzenes	**5.22** (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C5-Benzenes	**J 3.85** (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
Methylcyclohexane	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
Toluene	**J 4.09** (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
Ethylbenzene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
m,p-Xylene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
Styrene	**7.52** (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
o-Xylene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
Isopropylbenzene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
n-Propylbenzene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
1,3,5-Trimethylbenzene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
1,2,3-Trimethylbenzene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
1,2,4-Trimethylbenzene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
t-Butylbenzene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
sec-Butylbenzene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
p-Isopropyltoluene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
n-Butylbenzene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
trans-Decalin	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
cis-Decalin	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C1-Decalins	**J 4.13** (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C2-Decalins	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C3-Decalins	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C4-Decalins	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
Benzo(b)thiophene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C1-Benzo(b)thiophenes	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C2-Benzo(b)thiophenes	**J 3.50** (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C3-Benzo(b)thiophenes	**J 2.53** (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C4-Benzo(b)thiophenes	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS802-S1
Date Sampled: 07/08/20 15:14
Percent Solids: 82
Initial Volume: 5.01
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**J 2.95** (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
2-Methylnaphthalene	**J 3.33** (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
1-Methylnaphthalene	**J 2.89** (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C1-Naphthalenes	**J 4.35** (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C2-Naphthalenes	**5.59** (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C3-Naphthalenes	**J 4.74** (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C4-Naphthalenes	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
Biphenyl	**J 4.64** (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
Acenaphthylene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
Acenaphthene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
Dibenzofuran	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
Fluorene	**J 3.20** (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C1-Fluorenes	**J 3.12** (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C2-Fluorenes	**J 3.77** (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C3-Fluorenes	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
Dibenzothiophene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C1-Dibenzothiophenes	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C2-Dibenzothiophenes	**J 3.87** (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C3-Dibenzothiophenes	**J 2.70** (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C4-Dibenzothiophenes	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
Phenanthrene	**J 3.43** (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
Anthracene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C1-Phenanthrenes/Anthracenes	**J 4.56** (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C2-Phenanthrenes/Anthracenes	**J 4.15** (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C3-Phenanthrenes/Anthracenes	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C4-Phenanthrenes/Anthracenes	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
Retene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
Benzo(b)naphtho(2,1-d)thiophene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C0-Benzonaphthothiophenes	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C1-Benzonaphthothiophenes	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C2-Benzonaphthothiophenes	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C3-Benzonaphthothiophenes	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS802-S1
Date Sampled: 07/08/20 15:14
Percent Solids: 82
Initial Volume: 5.01
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
Fluoranthene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
Pyrene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C1-Fluoranthenes/Pyrenes	**J 4.12** (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C2-Fluoranthenes/Pyrenes	**J 2.47** (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C3-Fluoranthenes/Pyrenes	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
Benzo(b)fluorene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
Benzo(c)fluorene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
2-Methylpyrene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
4-Methylpyrene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
1-Methylpyrene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
Benz(a)anthracene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
Chrysene/triphenylene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C1-Benzo(a)anthracenes/Chrysenes	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C2-Benzo(a)anthracenes/Chrysenes	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C3-Benzo(a)anthracenes/Chrysenes	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C4-Benzo(a)anthracenes/Chrysenes	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
Benzo(b)fluoranthene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
Benzo(j/k)fluoranthene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
Benzo(e)pyrene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
Benzo(a)pyrene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
Perylene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
Indeno(1,2,3-cd)pyrene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
Dibenzo(a,h)anthracene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
Benzo(g,h,i)perylene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
Coronene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
Tetramethyl lead	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
Trimethylethyl lead	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
Dimethyldiethyl lead	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
Methyltriethyl lead	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
Tetraethyl lead	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
2,6,10-trimethyldodecane (1380)	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS802-S1
Date Sampled: 07/08/20 15:14
Percent Solids: 82
Initial Volume: 5.01
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**6.88** (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
2,6,10-trimethylpentadecane (1650)	**8.45** (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C-17	**B 42.0** (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
Pristane	**B 24.1** (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
C-18	**B 48.7** (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
Phytane	**B 38.7** (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
Carbazole	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
2,6-Dimethylnaphthalene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
2,3,5-Trimethylnaphthene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
4-Methyldibenzothiophene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
2/3-Methyldibenzothiophene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
1-Methyldibenzothiophene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
3-Methylphenanthrene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
2-Methylphenanthrene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
2-Methylanthracene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
4/9-Methylphenanthrene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402
1-Methylphenanthrene	ND (4.84)	2.42	8270 Mod		1	07/16/20 2:27	F0G0003	FG01402

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*82 %*		*50-120*
Surrogate: Naphthalene-d8	*77 %*		*50-120*
Surrogate: Phenanthrene-d10	*83 %*		*50-120*
Surrogate: Perylene-d12	*80 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS802-S1
Date Sampled: 07/08/20 15:14
Percent Solids: 82

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-07
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**445** (96.3)		TOC-LK		1	CCP	07/21/20 0:26	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS803-S1
Date Sampled: 07/08/20 16:19
Percent Solids: 82
Initial Volume: 5
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C1-Benzene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C2-Benzenes	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C3-Benzenes	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C4-Benzenes	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C5-Benzenes	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
Methylcyclohexane	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
Toluene	**J 3.60** (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
Ethylbenzene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
m,p-Xylene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
Styrene	**5.82** (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
o-Xylene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
Isopropylbenzene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
n-Propylbenzene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
1,3,5-Trimethylbenzene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
1,2,3-Trimethylbenzene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
1,2,4-Trimethylbenzene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
t-Butylbenzene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
sec-Butylbenzene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
p-Isopropyltoluene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
n-Butylbenzene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
trans-Decalin	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
cis-Decalin	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C1-Decalins	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C2-Decalins	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C3-Decalins	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C4-Decalins	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
Benzo(b)thiophene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C1-Benzo(b)thiophenes	**J 4.57** (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C2-Benzo(b)thiophenes	**J 3.12** (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C3-Benzo(b)thiophenes	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C4-Benzo(b)thiophenes	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS803-S1
Date Sampled: 07/08/20 16:19
Percent Solids: 82
Initial Volume: 5
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**J 2.65** (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
2-Methylnaphthalene	**J 3.45** (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
1-Methylnaphthalene	**J 2.88** (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C1-Naphthalenes	**J 3.90** (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C2-Naphthalenes	**5.34** (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C3-Naphthalenes	**J 4.54** (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C4-Naphthalenes	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
Biphenyl	**J 3.86** (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
Acenaphthylene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
Acenaphthene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
Dibenzofuran	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
Fluorene	**J 2.49** (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C1-Fluorenes	**J 2.97** (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C2-Fluorenes	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C3-Fluorenes	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
Dibenzothiophene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C1-Dibenzothiophenes	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C2-Dibenzothiophenes	**J 3.84** (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C3-Dibenzothiophenes	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C4-Dibenzothiophenes	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
Phenanthrene	**J 3.00** (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
Anthracene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C1-Phenanthrenes/Anthracenes	**J 4.47** (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C2-Phenanthrenes/Anthracenes	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C3-Phenanthrenes/Anthracenes	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C4-Phenanthrenes/Anthracenes	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
Retene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
Benzo(b)naphtho(2,1-d)thiophene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C0-Benzonaphthothiophenes	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C1-Benzonaphthothiophenes	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C2-Benzonaphthothiophenes	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C3-Benzonaphthothiophenes	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS803-S1
Date Sampled: 07/08/20 16:19
Percent Solids: 82
Initial Volume: 5
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
Fluoranthene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
Pyrene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C1-Fluoranthenes/Pyrenes	**J 3.84** (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C2-Fluoranthenes/Pyrenes	**J 2.76** (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C3-Fluoranthenes/Pyrenes	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
Benzo(b)fluorene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
Benzo(c)fluorene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
2-Methylpyrene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
4-Methylpyrene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
1-Methylpyrene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
Benz(a)anthracene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
Chrysene/triphenylene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C1-Benzo(a)anthracenes/Chrysenes	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C2-Benzo(a)anthracenes/Chrysenes	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C3-Benzo(a)anthracenes/Chrysenes	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C4-Benzo(a)anthracenes/Chrysenes	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
Benzo(b)fluoranthene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
Benzo(j/k)fluoranthene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
Benzo(e)pyrene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
Benzo(a)pyrene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
Perylene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
Indeno(1,2,3-cd)pyrene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
Dibenzo(a,h)anthracene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
Benzo(g,h,i)perylene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
Coronene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
Tetramethyl lead	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
Trimethylethyl lead	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
Dimethyldiethyl lead	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
Methyltriethyl lead	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
Tetraethyl lead	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
2,6,10-trimethyldodecane (1380)	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS803-S1
Date Sampled: 07/08/20 16:19
Percent Solids: 82
Initial Volume: 5
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**5.43** (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
2,6,10-trimethylpentadecane (1650)	**6.47** (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C-17	**B 32.4** (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
Pristane	**B 17.9** (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
C-18	**B 36.3** (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
Phytane	**B 28.1** (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
Carbazole	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
2,6-Dimethylnaphthalene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
2,3,5-Trimethylnaphthene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
4-Methyldibenzothiophene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
2/3-Methyldibenzothiophene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
1-Methyldibenzothiophene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
3-Methylphenanthrene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
2-Methylphenanthrene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
2-Methylanthracene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
4/9-Methylphenanthrene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402
1-Methylphenanthrene	ND (4.89)	2.44	8270 Mod		1	07/16/20 3:48	F0G0003	FG01402

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*76 %*		*50-120*
Surrogate: Naphthalene-d8	*77 %*		*50-120*
Surrogate: Phenanthrene-d10	*83 %*		*50-120*
Surrogate: Perylene-d12	*76 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS803-S1
Date Sampled: 07/08/20 16:19
Percent Solids: 82

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-08
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	ND (94.7)		TOC-LK		1	CCP	07/20/20 18:43	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS797-S1
Date Sampled: 07/08/20 16:37
Percent Solids: 63
Initial Volume: 3.56
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**468** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C1-Benzene	**254** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C2-Benzenes	**564** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C3-Benzenes	**121** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C4-Benzenes	**50.1** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C5-Benzenes	**33.1** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
Methylcyclohexane	**17.2** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
Toluene	**572** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
Ethylbenzene	**444** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
m,p-Xylene	**1170** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
Styrene	**64.9** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
o-Xylene	**229** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
Isopropylbenzene	**80.8** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
n-Propylbenzene	**110** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
1,3,5-Trimethylbenzene	**17.0** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
1,2,3-Trimethylbenzene	**33.5** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
1,2,4-Trimethylbenzene	**94.1** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
t-Butylbenzene	ND (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
sec-Butylbenzene	ND (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
p-Isopropyltoluene	**17.9** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
n-Butylbenzene	**35.1** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
trans-Decalin	**75.1** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
cis-Decalin	**11.8** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C1-Decalins	**161** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C2-Decalins	**321** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C3-Decalins	**404** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C4-Decalins	**728** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
Benzo(b)thiophene	**49.8** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C1-Benzo(b)thiophenes	**40.8** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C2-Benzo(b)thiophenes	**65.8** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C3-Benzo(b)thiophenes	**48.3** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C4-Benzo(b)thiophenes	**38.9** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS797-S1
Date Sampled: 07/08/20 16:37
Percent Solids: 63
Initial Volume: 3.56
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**212** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
2-Methylnaphthalene	**76.8** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
1-Methylnaphthalene	**49.4** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C1-Naphthalenes	**77.1** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C2-Naphthalenes	**207** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C3-Naphthalenes	**298** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C4-Naphthalenes	**336** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
Biphenyl	**43.8** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
Acenaphthylene	**534** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
Acenaphthene	**282** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
Dibenzofuran	**69.6** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
Fluorene	**224** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C1-Fluorenes	**286** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C2-Fluorenes	**254** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C3-Fluorenes	**381** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
Dibenzothiophene	**212** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C1-Dibenzothiophenes	**214** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C2-Dibenzothiophenes	**335** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C3-Dibenzothiophenes	**390** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C4-Dibenzothiophenes	**289** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
Phenanthrene	**1390** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
Anthracene	**739** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C1-Phenanthrenes/Anthracenes	**885** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C2-Phenanthrenes/Anthracenes	**933** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C3-Phenanthrenes/Anthracenes	**709** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C4-Phenanthrenes/Anthracenes	**404** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
Retene	**79.8** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
Benzo(b)naphtho(2,1-d)thiophene	**173** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C0-Benzonaphthothiophenes	**352** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C1-Benzonaphthothiophenes	**328** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C2-Benzonaphthothiophenes	**364** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C3-Benzonaphthothiophenes	**277** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS797-S1
Date Sampled: 07/08/20 16:37
Percent Solids: 63
Initial Volume: 3.56
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**156** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
Fluoranthene	**3120** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
Pyrene	**3800** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C1-Fluoranthenes/Pyrenes	**2220** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C2-Fluoranthenes/Pyrenes	**1040** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C3-Fluoranthenes/Pyrenes	**578** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
Benzo(b)fluorene	**253** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
Benzo(c)fluorene	**105** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
2-Methylpyrene	**312** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
4-Methylpyrene	**343** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
1-Methylpyrene	**250** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
Benz(a)anthracene	**1430** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
Chrysene/triphenylene	**1510** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C1-Benzo(a)anthracenes/Chrysenes	**1110** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C2-Benzo(a)anthracenes/Chrysenes	**804** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C3-Benzo(a)anthracenes/Chrysenes	**445** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C4-Benzo(a)anthracenes/Chrysenes	**273** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
Benzo(b)fluoranthene	**1160** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
Benzo(j/k)fluoranthene	**1220** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
Benzo(e)pyrene	**1240** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
Benzo(a)pyrene	**1660** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
Perylene	**373** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
Indeno(1,2,3-cd)pyrene	**945** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
Dibenzo(a,h)anthracene	**241** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
Benzo(g,h,i)perylene	**957** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
Coronene	**258** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
Tetramethyl lead	ND (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
Trimethylethyl lead	ND (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
Dimethyldiethyl lead	ND (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
Methyltriethyl lead	ND (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
Tetraethyl lead	ND (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
2,6,10-trimethyldodecane (1380)	**43.6** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS797-S1
Date Sampled: 07/08/20 16:37
Percent Solids: 63
Initial Volume: 3.56
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**308** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
2,6,10-trimethylpentadecane (1650)	**166** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C-17	**275** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
Pristane	**454** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
C-18	**304** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
Phytane	**595** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
Carbazole	**94.0** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
2,6-Dimethylnaphthalene	**50.5** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
2,3,5-Trimethylnaphthene	**18.5** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
4-Methyldibenzothiophene	**86.1** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
2/3-Methyldibenzothiophene	**57.8** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
1-Methyldibenzothiophene	**32.9** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
3-Methylphenanthrene	**172** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
2-Methylphenanthrene	**182** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
2-Methylanthracene	**150** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
4/9-Methylphenanthrene	**248** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402
1-Methylphenanthrene	**121** (8.90)	4.45	8270 Mod		1	07/16/20 11:56	F0G0003	FG01402

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*77 %*		*50-120*
Surrogate: Naphthalene-d8	*82 %*		*50-120*
Surrogate: Phenanthrene-d10	*85 %*		*50-120*
Surrogate: Perylene-d12	*89 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS797-S1
Date Sampled: 07/08/20 16:37
Percent Solids: 63

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-09
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**34200** (96.5)		TOC-LK		1	CCP	07/20/20 23:36	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS792-S1
Date Sampled: 07/08/20 17:14
Percent Solids: 59
Initial Volume: 4.98
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**63.8** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C1-Benzene	**76.4** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C2-Benzenes	**24.4** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C3-Benzenes	**14.6** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C4-Benzenes	**25.0** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C5-Benzenes	**12.3** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
Methylcyclohexane	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
Toluene	**174** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
Ethylbenzene	**13.3** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
m,p-Xylene	**49.3** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
Styrene	**35.4** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
o-Xylene	**J 4.82** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
Isopropylbenzene	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
n-Propylbenzene	**11.1** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
1,3,5-Trimethylbenzene	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
1,2,3-Trimethylbenzene	**J 4.85** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
1,2,4-Trimethylbenzene	**J 4.86** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
t-Butylbenzene	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
sec-Butylbenzene	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
p-Isopropyltoluene	**31.4** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
n-Butylbenzene	**36.6** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
trans-Decalin	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
cis-Decalin	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C1-Decalins	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C2-Decalins	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C3-Decalins	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C4-Decalins	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
Benzo(b)thiophene	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C1-Benzo(b)thiophenes	**9.53** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C2-Benzo(b)thiophenes	**10.1** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C3-Benzo(b)thiophenes	**8.43** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C4-Benzo(b)thiophenes	**J 4.06** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS792-S1
Date Sampled: 07/08/20 17:14
Percent Solids: 59
Initial Volume: 4.98
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**8.45** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
2-Methylnaphthalene	J **6.63** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
1-Methylnaphthalene	J **6.31** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C1-Naphthalenes	**7.73** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C2-Naphthalenes	**16.2** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C3-Naphthalenes	**11.1** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C4-Naphthalenes	**8.08** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
Biphenyl	**12.5** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
Acenaphthylene	J **5.17** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
Acenaphthene	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
Dibenzofuran	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
Fluorene	J **5.54** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C1-Fluorenes	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C2-Fluorenes	**9.26** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C3-Fluorenes	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
Dibenzothiophene	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C1-Dibenzothiophenes	J **5.79** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C2-Dibenzothiophenes	**9.68** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C3-Dibenzothiophenes	**10.4** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C4-Dibenzothiophenes	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
Phenanthrene	**6.87** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
Anthracene	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C1-Phenanthrenes/Anthracenes	**12.4** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C2-Phenanthrenes/Anthracenes	**13.2** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C3-Phenanthrenes/Anthracenes	**6.89** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C4-Phenanthrenes/Anthracenes	**95.5** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
Retene	**360** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
Benzo(b)naphtho(2,1-d)thiophene	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C0-Benzonaphthothiophenes	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C1-Benzonaphthothiophenes	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C2-Benzonaphthothiophenes	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C3-Benzonaphthothiophenes	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS792-S1
Date Sampled: 07/08/20 17:14
Percent Solids: 59
Initial Volume: 4.98
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
Fluoranthene	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
Pyrene	J **3.48** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C1-Fluoranthenes/Pyrenes	**13.7** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C2-Fluoranthenes/Pyrenes	**7.67** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C3-Fluoranthenes/Pyrenes	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
Benzo(b)fluorene	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
Benzo(c)fluorene	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
2-Methylpyrene	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
4-Methylpyrene	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
1-Methylpyrene	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
Benz(a)anthracene	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
Chrysene/triphenylene	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C1-Benzo(a)anthracenes/Chrysenes	J **4.45** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C2-Benzo(a)anthracenes/Chrysenes	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C3-Benzo(a)anthracenes/Chrysenes	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C4-Benzo(a)anthracenes/Chrysenes	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
Benzo(b)fluoranthene	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
Benzo(j/k)fluoranthene	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
Benzo(e)pyrene	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
Benzo(a)pyrene	J **3.73** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
Perylene	**249** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
Indeno(1,2,3-cd)pyrene	J **3.83** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
Dibenzo(a,h)anthracene	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
Benzo(g,h,i)perylene	J **3.75** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
Coronene	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
Tetramethyl lead	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
Trimethylethyl lead	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
Dimethyldiethyl lead	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
Methyltriethyl lead	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
Tetraethyl lead	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
2,6,10-trimethyldodecane (1380)	**7.07** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS792-S1
Date Sampled: 07/08/20 17:14
Percent Solids: 59
Initial Volume: 4.98
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**18.8** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
2,6,10-trimethylpentadecane (1650)	**17.0** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C-17	**B 101** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
Pristane	**B 42.4** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
C-18	**B 101** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
Phytane	**B 68.0** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
Carbazole	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
2,6-Dimethylnaphthalene	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
2,3,5-Trimethylnaphthene	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
4-Methyldibenzothiophene	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
2/3-Methyldibenzothiophene	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
1-Methyldibenzothiophene	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
3-Methylphenanthrene	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
2-Methylphenanthrene	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
2-Methylanthracene	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
4/9-Methylphenanthrene	ND (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402
1-Methylphenanthrene	**J 4.61** (6.84)	3.42	8270 Mod		1	07/16/20 13:17	F0G0003	FG01402

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*84 %*		*50-120*
Surrogate: Naphthalene-d8	*85 %*		*50-120*
Surrogate: Phenanthrene-d10	*88 %*		*50-120*
Surrogate: Perylene-d12	*91 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS792-S1
Date Sampled: 07/08/20 17:14
Percent Solids: 59

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-10
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**29200** (96.2)		TOC-LK		1	CCP	07/21/20 0:34	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS791-S1
Date Sampled: 07/08/20 17:24
Percent Solids: 61
Initial Volume: 5.31
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C1-Benzene	**36.7** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C2-Benzenes	**21.4** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C3-Benzenes	**20.2** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C4-Benzenes	**22.9** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C5-Benzenes	**7.83** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
Methylcyclohexane	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
Toluene	**83.2** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
Ethylbenzene	**9.01** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
m,p-Xylene	**45.7** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
Styrene	**22.6** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
o-Xylene	**J 3.77** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
Isopropylbenzene	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
n-Propylbenzene	**J 5.52** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
1,3,5-Trimethylbenzene	**25.6** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
1,2,3-Trimethylbenzene	**J 4.36** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
1,2,4-Trimethylbenzene	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
t-Butylbenzene	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
sec-Butylbenzene	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
p-Isopropyltoluene	**26.8** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
n-Butylbenzene	**22.0** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
trans-Decalin	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
cis-Decalin	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C1-Decalins	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C2-Decalins	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C3-Decalins	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C4-Decalins	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
Benzo(b)thiophene	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C1-Benzo(b)thiophenes	**8.57** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C2-Benzo(b)thiophenes	**13.0** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C3-Benzo(b)thiophenes	**10.8** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C4-Benzo(b)thiophenes	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS791-S1
Date Sampled: 07/08/20 17:24
Percent Solids: 61
Initial Volume: 5.31
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**10.4** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
2-Methylnaphthalene	**6.73** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
1-Methylnaphthalene	J **5.77** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C1-Naphthalenes	**7.86** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C2-Naphthalenes	**14.4** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C3-Naphthalenes	**12.0** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C4-Naphthalenes	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
Biphenyl	**10.4** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
Acenaphthylene	J **3.47** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
Acenaphthene	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
Dibenzofuran	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
Fluorene	J **5.50** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C1-Fluorenes	**8.51** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C2-Fluorenes	**8.70** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C3-Fluorenes	**10.1** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
Dibenzothiophene	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C1-Dibenzothiophenes	J **5.40** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C2-Dibenzothiophenes	**10.1** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C3-Dibenzothiophenes	**9.40** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C4-Dibenzothiophenes	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
Phenanthrene	**12.2** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
Anthracene	J **3.35** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C1-Phenanthrenes/Anthracenes	**14.6** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C2-Phenanthrenes/Anthracenes	**19.8** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C3-Phenanthrenes/Anthracenes	**9.05** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C4-Phenanthrenes/Anthracenes	**230** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
Retene	**938** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
Benzo(b)naphtho(2,1-d)thiophene	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C0-Benzonaphthothiophenes	**7.84** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C1-Benzonaphthothiophenes	J **5.49** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C2-Benzonaphthothiophenes	J **5.01** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C3-Benzonaphthothiophenes	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS791-S1
Date Sampled: 07/08/20 17:24
Percent Solids: 61
Initial Volume: 5.31
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
Fluoranthene	**15.4** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
Pyrene	**15.6** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C1-Fluoranthenes/Pyrenes	**22.6** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C2-Fluoranthenes/Pyrenes	**12.2** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C3-Fluoranthenes/Pyrenes	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
Benzo(b)fluorene	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
Benzo(c)fluorene	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
2-Methylpyrene	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
4-Methylpyrene	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
1-Methylpyrene	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
Benz(a)anthracene	**7.86** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
Chrysene/triphenylene	**8.06** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C1-Benzo(a)anthracenes/Chrysenes	**7.05** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C2-Benzo(a)anthracenes/Chrysenes	**9.68** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C3-Benzo(a)anthracenes/Chrysenes	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C4-Benzo(a)anthracenes/Chrysenes	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
Benzo(b)fluoranthene	**6.66** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
Benzo(j/k)fluoranthene	**J 5.91** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
Benzo(e)pyrene	**6.29** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
Benzo(a)pyrene	**7.95** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
Perylene	**139** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
Indeno(1,2,3-cd)pyrene	**J 4.94** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
Dibenzo(a,h)anthracene	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
Benzo(g,h,i)perylene	**J 4.98** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
Coronene	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
Tetramethyl lead	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
Trimethylethyl lead	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
Dimethyldiethyl lead	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
Methyltriethyl lead	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
Tetraethyl lead	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
2,6,10-trimethyldodecane (1380)	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS791-S1
Date Sampled: 07/08/20 17:24
Percent Solids: 61
Initial Volume: 5.31
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**19.8** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
2,6,10-trimethylpentadecane (1650)	**14.6** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C-17	**B 88.2** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
Pristane	**B 36.6** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
C-18	**B 92.3** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
Phytane	**B 57.3** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
Carbazole	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
2,6-Dimethylnaphthalene	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
2,3,5-Trimethylnaphthene	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
4-Methyldibenzothiophene	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
2/3-Methyldibenzothiophene	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
1-Methyldibenzothiophene	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
3-Methylphenanthrene	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
2-Methylphenanthrene	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
2-Methylanthracene	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
4/9-Methylphenanthrene	ND (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402
1-Methylphenanthrene	**J 4.38** (6.13)	3.06	8270 Mod		1	07/16/20 14:38	F0G0003	FG01402

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*82 %*		*50-120*
Surrogate: Naphthalene-d8	*83 %*		*50-120*
Surrogate: Phenanthrene-d10	*86 %*		*50-120*
Surrogate: Perylene-d12	*88 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS791-S1
Date Sampled: 07/08/20 17:24
Percent Solids: 61

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-11
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**45500** (94.9)		TOC-LK		1	CCP	07/20/20 19:33	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS797-S1D
Date Sampled: 07/08/20 12:00
Percent Solids: 64
Initial Volume: 5.63
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**508** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C1-Benzene	**262** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C2-Benzenes	**477** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C3-Benzenes	**83.0** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C4-Benzenes	**35.4** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C5-Benzenes	**23.8** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
Methylcyclohexane	**12.4** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
Toluene	**589** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
Ethylbenzene	**493** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
m,p-Xylene	**913** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
Styrene	**39.0** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
o-Xylene	**173** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
Isopropylbenzene	**58.4** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
n-Propylbenzene	**78.0** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
1,3,5-Trimethylbenzene	**10.9** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
1,2,3-Trimethylbenzene	**19.9** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
1,2,4-Trimethylbenzene	**58.9** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
t-Butylbenzene	ND (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
sec-Butylbenzene	ND (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
p-Isopropyltoluene	**16.2** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
n-Butylbenzene	**23.4** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
trans-Decalin	**63.2** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
cis-Decalin	**5.71** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C1-Decalins	**113** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C2-Decalins	**209** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C3-Decalins	**308** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C4-Decalins	**568** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
Benzo(b)thiophene	**34.6** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C1-Benzo(b)thiophenes	**27.1** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C2-Benzo(b)thiophenes	**40.0** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C3-Benzo(b)thiophenes	**30.6** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C4-Benzo(b)thiophenes	**28.8** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS797-S1D
Date Sampled: 07/08/20 12:00
Percent Solids: 64
Initial Volume: 5.63
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**131** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
2-Methylnaphthalene	**53.5** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
1-Methylnaphthalene	**35.4** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C1-Naphthalenes	**54.8** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C2-Naphthalenes	**140** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C3-Naphthalenes	**213** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C4-Naphthalenes	**239** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
Biphenyl	**32.6** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
Acenaphthylene	**274** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
Acenaphthene	**179** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
Dibenzofuran	**33.6** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
Fluorene	**102** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C1-Fluorenes	**185** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C2-Fluorenes	**164** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C3-Fluorenes	**232** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
Dibenzothiophene	**128** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C1-Dibenzothiophenes	**133** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C2-Dibenzothiophenes	**216** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C3-Dibenzothiophenes	**254** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C4-Dibenzothiophenes	**184** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
Phenanthrene	**454** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
Anthracene	**325** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C1-Phenanthrenes/Anthracenes	**485** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C2-Phenanthrenes/Anthracenes	**555** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C3-Phenanthrenes/Anthracenes	**447** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C4-Phenanthrenes/Anthracenes	**262** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
Retene	**54.9** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
Benzo(b)naphtho(2,1-d)thiophene	**84.4** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C0-Benzonaphthothiophenes	**172** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C1-Benzonaphthothiophenes	**200** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C2-Benzonaphthothiophenes	**244** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C3-Benzonaphthothiophenes	**213** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS797-S1D
Date Sampled: 07/08/20 12:00
Percent Solids: 64
Initial Volume: 5.63
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**117** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
Fluoranthene	**1490** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
Pyrene	**2010** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C1-Fluoranthenes/Pyrenes	**1180** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C2-Fluoranthenes/Pyrenes	**597** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C3-Fluoranthenes/Pyrenes	**374** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
Benzo(b)fluorene	**117** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
Benzo(c)fluorene	**51.1** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
2-Methylpyrene	**172** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
4-Methylpyrene	**202** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
1-Methylpyrene	**135** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
Benz(a)anthracene	**608** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
Chrysene/triphenylene	**687** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C1-Benzo(a)anthracenes/Chrysenes	**578** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C2-Benzo(a)anthracenes/Chrysenes	**502** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C3-Benzo(a)anthracenes/Chrysenes	**305** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C4-Benzo(a)anthracenes/Chrysenes	**188** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
Benzo(b)fluoranthene	**539** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
Benzo(j/k)fluoranthene	**541** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
Benzo(e)pyrene	**601** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
Benzo(a)pyrene	**702** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
Perylene	**271** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
Indeno(1,2,3-cd)pyrene	**445** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
Dibenzo(a,h)anthracene	**114** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
Benzo(g,h,i)perylene	**458** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
Coronene	**119** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
Tetramethyl lead	ND (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
Trimethylethyl lead	ND (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
Dimethyldiethyl lead	ND (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
Methyltriethyl lead	ND (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
Tetraethyl lead	ND (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
2,6,10-trimethyldodecane (1380)	**53.8** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS797-S1D
Date Sampled: 07/08/20 12:00
Percent Solids: 64
Initial Volume: 5.63
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/14/20 12:30

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**241** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
2,6,10-trimethylpentadecane (1650)	**131** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C-17	**166** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
Pristane	**267** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
C-18	**211** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
Phytane	**410** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
Carbazole	**40.2** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
2,6-Dimethylnaphthalene	**35.1** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
2,3,5-Trimethylnaphthene	**9.62** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
4-Methyldibenzothiophene	**54.7** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
2/3-Methyldibenzothiophene	**35.1** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
1-Methyldibenzothiophene	**20.5** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
3-Methylphenanthrene	**86.9** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
2-Methylphenanthrene	**88.2** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
2-Methylanthracene	**72.2** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
4/9-Methylphenanthrene	**133** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402
1-Methylphenanthrene	**53.6** (5.54)	2.77	8270 Mod		1	07/16/20 17:20	F0G0003	FG01402

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*76 %*		*50-120*
Surrogate: Naphthalene-d8	*82 %*		*50-120*
Surrogate: Phenanthrene-d10	*85 %*		*50-120*
Surrogate: Perylene-d12	*85 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS797-S1D
Date Sampled: 07/08/20 12:00
Percent Solids: 64

ESS Laboratory Work Order: F200036
ESS Laboratory Sample ID: F200036-12
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**43800** (96.8)		TOC-LK		1	CCP	07/20/20 19:50	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200036

Quality Control Data

Classical Chemistry

Batch DG01546 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	100	mg/kg							
Total Organic Carbon (2)	ND	100	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200036

Quality Control Data

Classical Chemistry

Batch DG01546 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	10500	100	mg/kg	10000		105	80-120			
Total Organic Carbon (2)	10700	100	mg/kg	10000		107	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200036

Quality Control Data

Classical Chemistry

Batch DG01546 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	11400	100	mg/kg	10000		114	80-120	8	20	
Total Organic Carbon (2)	11100	100	mg/kg	10000		111	80-120	4	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200036

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FG01402 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	ND	4.00	ug/Kg wet							
C1-Benzene	ND	4.00	ug/Kg wet							
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	2.10	4.00	ug/Kg wet							J
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	3.48	4.00	ug/Kg wet							J
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200036

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FG01402 - 3570

C1-Fluorenes	ND	4.00	ug/Kg wet
C2-Fluorenes	ND	4.00	ug/Kg wet
C3-Fluorenes	ND	4.00	ug/Kg wet
Dibenzothiophene	ND	4.00	ug/Kg wet
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet
Phenanthrene	ND	4.00	ug/Kg wet
Anthracene	ND	4.00	ug/Kg wet
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
Retene	ND	4.00	ug/Kg wet
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
Fluoranthene	ND	4.00	ug/Kg wet
Pyrene	ND	4.00	ug/Kg wet
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
Benzo(b)fluorene	ND	4.00	ug/Kg wet
Benzo(c)fluorene	ND	4.00	ug/Kg wet
2-Methylpyrene	ND	4.00	ug/Kg wet
4-Methylpyrene	ND	4.00	ug/Kg wet
1-Methylpyrene	ND	4.00	ug/Kg wet
Benz(a)anthracene	ND	4.00	ug/Kg wet
Chrysene/triphenylene	ND	4.00	ug/Kg wet
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet
Benzo(e)pyrene	ND	4.00	ug/Kg wet
Benzo(a)pyrene	ND	4.00	ug/Kg wet
Perylene	ND	4.00	ug/Kg wet
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet
Coronene	ND	4.00	ug/Kg wet
Tetramethyl lead	ND	4.00	ug/Kg wet
Trimethylethyl lead	ND	4.00	ug/Kg wet

CERTIFICATE OF ANALYSIS

Client Name: GEI
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ESS Laboratory Work Order: F200036

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FG01402 - 3570						
Dimethyldiethyl lead	ND	4.00	ug/Kg wet			
Methyltriethyl lead	ND	4.00	ug/Kg wet			
Tetraethyl lead	ND	4.00	ug/Kg wet			
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet			
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet			
2,6,10-trimethylpentadecane (1650)	ND	4.00	ug/Kg wet			
C-17	15.0	4.00	ug/Kg wet			
Pristane	13.3	4.00	ug/Kg wet			
C-18	17.4	4.00	ug/Kg wet			
Phytane	20.4	4.00	ug/Kg wet			
Carbazole	ND	4.00	ug/Kg wet			
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet			
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet			
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
3-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylanthracene	ND	4.00	ug/Kg wet			
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet			
1-Methylphenanthrene	ND	4.00	ug/Kg wet			
Surrogate: Toluene-D8	*353*		ug/Kg wet	*400.0*	*88*	*50-120*
Surrogate: Naphthalene-d8	*300*		ug/Kg wet	*400.0*	*75*	*50-120*
Surrogate: Phenanthrene-d10	*334*		ug/Kg wet	*400.0*	*84*	*50-120*
Surrogate: Perylene-d12	*350*		ug/Kg wet	*400.0*	*87*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200036

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FG01402 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	388	4.00	ug/Kg wet	400.0		97	60-130			
Methylcyclohexane	263	4.00	ug/Kg wet	400.0		66	60-130			
Toluene	368	4.00	ug/Kg wet	400.0		92	60-130			
Ethylbenzene	382	4.00	ug/Kg wet	400.0		95	60-130			
m,p-Xylene	374	4.00	ug/Kg wet	400.0		93	60-130			
Styrene	422	4.00	ug/Kg wet	400.0		105	60-130			
o-Xylene	376	4.00	ug/Kg wet	400.0		94	60-130			
Isopropylbenzene	379	4.00	ug/Kg wet	400.0		95	60-130			
n-Propylbenzene	377	4.00	ug/Kg wet	400.0		94	60-130			
1,3,5-Trimethylbenzene	368	4.00	ug/Kg wet	400.0		92	60-130			
1,2,3-Trimethylbenzene	367	4.00	ug/Kg wet	400.0		92	60-130			
1,2,4-Trimethylbenzene	367	4.00	ug/Kg wet	400.0		92	60-130			
t-Butylbenzene	363	4.00	ug/Kg wet	400.0		91	60-130			
sec-Butylbenzene	366	4.00	ug/Kg wet	400.0		91	60-130			
p-Isopropyltoluene	364	4.00	ug/Kg wet	400.0		91	60-130			
n-Butylbenzene	349	4.00	ug/Kg wet	400.0		87	60-130			
trans-Decalin	365	4.00	ug/Kg wet	400.0		91	60-130			
cis-Decalin	357	4.00	ug/Kg wet	400.0		89	60-130			
Benzo(b)thiophene	355	4.00	ug/Kg wet	400.0		89	60-130			
Naphthalene	359	4.00	ug/Kg wet	400.0		90	60-130			
2-Methylnaphthalene	355	4.00	ug/Kg wet	400.0		89	60-130			
1-Methylnaphthalene	353	4.00	ug/Kg wet	400.0		88	60-130			
Biphenyl	356	4.00	ug/Kg wet	400.0		89	60-130			
Acenaphthylene	387	4.00	ug/Kg wet	400.0		97	60-130			
Acenaphthene	383	4.00	ug/Kg wet	400.0		96	60-130			
Dibenzofuran	360	4.00	ug/Kg wet	400.0		90	60-130			
Fluorene	370	4.00	ug/Kg wet	400.0		93	60-130			
Dibenzothiophene	377	4.00	ug/Kg wet	400.0		94	60-130			
Phenanthrene	370	4.00	ug/Kg wet	400.0		92	60-130			
Anthracene	365	4.00	ug/Kg wet	400.0		91	60-130			
Retene	401	4.00	ug/Kg wet	400.0		100	60-130			
Benzo(b)naphtho(2,1-d)thiophene	382	4.00	ug/Kg wet	400.0		96	60-130			
Fluoranthene	394	4.00	ug/Kg wet	400.0		99	60-130			
Pyrene	396	4.00	ug/Kg wet	400.0		99	60-130			
Benz(a)anthracene	386	4.00	ug/Kg wet	400.0		96	60-130			
Chrysene/triphenylene	374	4.00	ug/Kg wet	400.0		93	60-130			
Benzo(b)fluoranthene	374	4.00	ug/Kg wet	400.0		93	60-130			
Benzo(j/k)fluoranthene	376	4.00	ug/Kg wet	400.0		94	60-130			
Benzo(e)pyrene	374	4.00	ug/Kg wet	400.0		94	60-130			
Benzo(a)pyrene	359	4.00	ug/Kg wet	400.0		90	60-130			
Perylene	363	4.00	ug/Kg wet	400.0		91	60-130			
Indeno(1,2,3-cd)pyrene	327	4.00	ug/Kg wet	400.0		82	60-130			
Dibenzo(a,h)anthracene	326	4.00	ug/Kg wet	400.0		81	60-130			
Benzo(g,h,i)perylene	330	4.00	ug/Kg wet	400.0		82	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200036

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FG01402 - 3570						
Coronene	318	4.00	ug/Kg wet	400.0	79	60-130
Tetraethyl lead	275	4.00	ug/Kg wet	400.0	69	60-130
Pristane	419	4.00	ug/Kg wet	400.0	105	60-130
Phytane	445	4.00	ug/Kg wet	400.0	111	60-130
Surrogate: Toluene-D8	*370*		ug/Kg wet	*400.0*	*93*	*50-120*
Surrogate: Naphthalene-d8	*351*		ug/Kg wet	*400.0*	*88*	*50-120*
Surrogate: Phenanthrene-d10	*359*		ug/Kg wet	*400.0*	*90*	*50-120*
Surrogate: Perylene-d12	*354*		ug/Kg wet	*400.0*	*88*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200036

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FG01402 - 3570

Duplicate **Source: F200036-11**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	ND	5.96	ug/Kg dry		ND				50	
C1-Benzene	40.1	5.96	ug/Kg dry		36.7			9	50	
C2-Benzenes	18.4	5.96	ug/Kg dry		21.4			15	50	
C3-Benzenes	15.5	5.96	ug/Kg dry		20.2			26	50	
C4-Benzenes	27.6	5.96	ug/Kg dry		22.9			19	50	
C5-Benzenes	8.47	5.96	ug/Kg dry		7.83			8	50	
Methylcyclohexane	ND	5.96	ug/Kg dry		ND				50	
Toluene	91.1	5.96	ug/Kg dry		83.2			9	50	
Ethylbenzene	10.1	5.96	ug/Kg dry		9.01			11	50	
m,p-Xylene	38.0	5.96	ug/Kg dry		45.7			18	50	
Styrene	23.9	5.96	ug/Kg dry		22.6			6	50	
o-Xylene	3.39	5.96	ug/Kg dry		3.77			11	50	J
Isopropylbenzene	ND	5.96	ug/Kg dry		ND				50	
n-Propylbenzene	5.51	5.96	ug/Kg dry		5.52			0.2	50	J
1,3,5-Trimethylbenzene	3.43	5.96	ug/Kg dry		25.6			153	50	D+, J
1,2,3-Trimethylbenzene	5.14	5.96	ug/Kg dry		4.36			16	50	J
1,2,4-Trimethylbenzene	ND	5.96	ug/Kg dry		ND				50	
t-Butylbenzene	ND	5.96	ug/Kg dry		ND				50	
sec-Butylbenzene	ND	5.96	ug/Kg dry		ND				50	
p-Isopropyltoluene	54.7	5.96	ug/Kg dry		26.8			68	50	D+
n-Butylbenzene	20.6	5.96	ug/Kg dry		22.0			7	50	
trans-Decalin	ND	5.96	ug/Kg dry		ND				50	
cis-Decalin	ND	5.96	ug/Kg dry		ND				50	
C1-Decalins	ND	5.96	ug/Kg dry		ND				50	
C2-Decalins	ND	5.96	ug/Kg dry		ND				50	
C3-Decalins	ND	5.96	ug/Kg dry		ND				50	
C4-Decalins	ND	5.96	ug/Kg dry		ND				50	
Benzo(b)thiophene	ND	5.96	ug/Kg dry		ND				50	
C1-Benzo(b)thiophenes	8.21	5.96	ug/Kg dry		8.57			4	50	
C2-Benzo(b)thiophenes	6.73	5.96	ug/Kg dry		13.0			63	50	D+
C3-Benzo(b)thiophenes	9.52	5.96	ug/Kg dry		10.8			12	50	
C4-Benzo(b)thiophenes	ND	5.96	ug/Kg dry		ND				50	
Naphthalene	8.51	5.96	ug/Kg dry		10.4			20	50	
2-Methylnaphthalene	6.45	5.96	ug/Kg dry		6.73			4	50	
1-Methylnaphthalene	5.39	5.96	ug/Kg dry		5.77			7	50	J
C1-Naphthalenes	7.46	5.96	ug/Kg dry		7.86			5	50	
C2-Naphthalenes	13.4	5.96	ug/Kg dry		14.4			7	50	
C3-Naphthalenes	11.3	5.96	ug/Kg dry		12.0			6	50	
C4-Naphthalenes	ND	5.96	ug/Kg dry		ND				50	
Biphenyl	10.7	5.96	ug/Kg dry		10.4			3	50	
Acenaphthylene	ND	5.96	ug/Kg dry		3.47				50	
Acenaphthene	ND	5.96	ug/Kg dry		ND				50	
Dibenzofuran	ND	5.96	ug/Kg dry		ND				50	
Fluorene	4.92	5.96	ug/Kg dry		5.50			11	50	J

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200036

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FG01402 - 3570

C1-Fluorenes	9.26	5.96	ug/Kg dry	8.51	8	50	
C2-Fluorenes	8.60	5.96	ug/Kg dry	8.70	1	50	
C3-Fluorenes	7.25	5.96	ug/Kg dry	10.1	32	50	
Dibenzothiophene	ND	5.96	ug/Kg dry	ND		50	
C1-Dibenzothiophenes	4.28	5.96	ug/Kg dry	5.40	23	50	J
C2-Dibenzothiophenes	9.12	5.96	ug/Kg dry	10.1	10	50	
C3-Dibenzothiophenes	9.23	5.96	ug/Kg dry	9.40	2	50	
C4-Dibenzothiophenes	ND	5.96	ug/Kg dry	ND		50	
Phenanthrene	7.00	5.96	ug/Kg dry	12.2	54	50	D+
Anthracene	ND	5.96	ug/Kg dry	3.35		50	
C1-Phenanthrenes/Anthracenes	11.6	5.96	ug/Kg dry	14.6	23	50	
C2-Phenanthrenes/Anthracenes	17.6	5.96	ug/Kg dry	19.8	11	50	
C3-Phenanthrenes/Anthracenes	7.63	5.96	ug/Kg dry	9.05	17	50	
C4-Phenanthrenes/Anthracenes	262	5.96	ug/Kg dry	230	13	50	
Retene	1070	5.96	ug/Kg dry	938	14	50	
Benzo(b)naphtho(2,1-d)thiophene	ND	5.96	ug/Kg dry	ND		50	
C0-Benzonaphthothiophenes	5.82	5.96	ug/Kg dry	7.84	29	50	J
C1-Benzonaphthothiophenes	5.25	5.96	ug/Kg dry	5.49	4	50	J
C2-Benzonaphthothiophenes	5.32	5.96	ug/Kg dry	5.01	6	50	J
C3-Benzonaphthothiophenes	ND	5.96	ug/Kg dry	ND		50	
C4-Benzonaphthothiophenes	ND	5.96	ug/Kg dry	ND		50	
Fluoranthene	4.48	5.96	ug/Kg dry	15.4	110	50	D+, J
Pyrene	5.51	5.96	ug/Kg dry	15.6	95	50	D+, J
C1-Fluoranthenes/Pyrenes	19.1	5.96	ug/Kg dry	22.6	17	50	
C2-Fluoranthenes/Pyrenes	9.14	5.96	ug/Kg dry	12.2	28	50	
C3-Fluoranthenes/Pyrenes	ND	5.96	ug/Kg dry	ND		50	
Benzo(b)fluorene	ND	5.96	ug/Kg dry	ND		50	
Benzo(c)fluorene	ND	5.96	ug/Kg dry	ND		50	
2-Methylpyrene	ND	5.96	ug/Kg dry	ND		50	
4-Methylpyrene	ND	5.96	ug/Kg dry	ND		50	
1-Methylpyrene	ND	5.96	ug/Kg dry	ND		50	
Benz(a)anthracene	3.73	5.96	ug/Kg dry	7.86	71	50	D+, J
Chrysene/triphenylene	3.75	5.96	ug/Kg dry	8.06	73	50	D+, J
C1-Benzo(a)anthracenes/Chrysenes	4.96	5.96	ug/Kg dry	7.05	35	50	J
C2-Benzo(a)anthracenes/Chrysenes	7.50	5.96	ug/Kg dry	9.68	25	50	
C3-Benzo(a)anthracenes/Chrysenes	ND	5.96	ug/Kg dry	ND		50	
C4-Benzo(a)anthracenes/Chrysenes	ND	5.96	ug/Kg dry	ND		50	
Benzo(b)fluoranthene	ND	5.96	ug/Kg dry	6.66		50	
Benzo(j/k)fluoranthene	ND	5.96	ug/Kg dry	5.91		50	
Benzo(e)pyrene	3.78	5.96	ug/Kg dry	6.29	50	50	J
Benzo(a)pyrene	3.61	5.96	ug/Kg dry	7.95	75	50	D+, J
Perylene	122	5.96	ug/Kg dry	139	13	50	
Indeno(1,2,3-cd)pyrene	ND	5.96	ug/Kg dry	4.94		50	
Dibenzo(a,h)anthracene	ND	5.96	ug/Kg dry	ND		50	
Benzo(g,h,i)perylene	ND	5.96	ug/Kg dry	4.98		50	
Coronene	ND	5.96	ug/Kg dry	ND		50	
Tetramethyl lead	ND	5.96	ug/Kg dry	ND		50	
Trimethylethyl lead	ND	5.96	ug/Kg dry	ND		50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200036

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FG01402 - 3570										
Dimethyldiethyl lead	ND	5.96	ug/Kg dry		ND				50	
Methyltriethyl lead	ND	5.96	ug/Kg dry		ND				50	
Tetraethyl lead	ND	5.96	ug/Kg dry		ND				50	
2,6,10-trimethyldodecane (1380)	ND	5.96	ug/Kg dry		ND				50	
2,6,10-trimethyltridecane (1470)	18.9	5.96	ug/Kg dry		19.8			5	50	
2,6,10-trimethylpentadecane (1650)	13.2	5.96	ug/Kg dry		14.6			10	50	
C-17	84.9	5.96	ug/Kg dry		88.2			4	50	
Pristane	32.3	5.96	ug/Kg dry		36.6			12	50	
C-18	80.3	5.96	ug/Kg dry		92.3			14	50	
Phytane	50.3	5.96	ug/Kg dry		57.3			13	50	
Carbazole	ND	5.96	ug/Kg dry		ND				50	
2,6-Dimethylnaphthalene	ND	5.96	ug/Kg dry		ND				50	
2,3,5-Trimethylnaphthene	ND	5.96	ug/Kg dry		ND				50	
4-Methyldibenzothiophene	ND	5.96	ug/Kg dry		ND				50	
2/3-Methyldibenzothiophene	ND	5.96	ug/Kg dry		ND				50	
1-Methyldibenzothiophene	ND	5.96	ug/Kg dry		ND				50	
3-Methylphenanthrene	ND	5.96	ug/Kg dry		ND				50	
2-Methylphenanthrene	ND	5.96	ug/Kg dry		ND				50	
2-Methylanthracene	ND	5.96	ug/Kg dry		ND				50	
4/9-Methylphenanthrene	ND	5.96	ug/Kg dry		ND				50	
1-Methylphenanthrene	3.88	5.96	ug/Kg dry		4.38			12	50	J
Surrogate: Toluene-D8	*431*		ug/Kg dry	*595.8*		*72*	*50-120*			
Surrogate: Naphthalene-d8	*443*		ug/Kg dry	*595.8*		*74*	*50-120*			
Surrogate: Phenanthrene-d10	*463*		ug/Kg dry	*595.8*		*78*	*50-120*			
Surrogate: Perylene-d12	*458*		ug/Kg dry	*595.8*		*77*	*50-120*			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F200036

Notes and Definitions

U	Analyte included in the analysis, but not detected
J	Reported between MDL and MRL
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200036

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

F200036

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 2060256

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman

Send Report to: Rhoffman@geiconsultants.com

Send EDD to: labdata@geiconsultants.com, Efarrington@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY REQUIRED – (YES) NO

If Yes, Are MCP Analytical Methods Required? (YES) NO NA

Are Drinking Water Samples Submitted? YES (NO) NA

If Yes, Have Drinking Water Sampling Requirements Been Met? YES NO (NA)

Preservative

None	None						

Analysis

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Parent and Alkylated MAHs & PAHs 8270**	TOCs by Lloyd-Kahn							Sample Specific Remarks
1	1804576-SS794-S1	7/8/2020	13:00	Soil	1	BFM	X	X							
2	1804576-SS794-S2	7/8/2020	13:04	Soil	1	BFM	X	X							
3	1804576-SS793-S1	7/8/2020	13:59	Soil	1	BFM	X	X							
4	1804576-SS793-S2	7/8/2020	14:04	Soil	1	BFM	X	X							
5	1804576-SS807-S1	7/8/2020	14:44	Soil	1	BFM	X	X							
6	1804576-SS807-S2	7/8/2020	14:49	Soil	1	BFM	X	X							
7	1804576-SS802-S1	7/8/2020	15:14	Soil	1	BFM	X	X							
8	1804576-SS803-S1	7/8/2020	16:19	Soil	1	BFM	X	X							
9	1804576-SS797-S1	7/8/2020	16:37	Soil	1	BFM	X	X							
10	1804576-SS792-S1	7/8/2020	17:14	Soil	1	BFM	X	X							
11	1804576-SS791-S1	7/8/2020	17:24	Soil	1	BFM	X	X							
12	1804576-SS797-S1D	7/8/2020	12:00	Soil	1	BFM	X	X							

Sample Handling

Samples Field Filtered: YES NO (NA)

Sampled Shipped With Ice: (YES) NO

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1.	7/8/20	1900	1. GEI Sample Fridge
Relinquished by: (signature) 2. GEI Sample Fridge	7/9/20	1345	2.
Relinquished by: (signature) 3.	7/9/20	13:45	3.
Relinquished by: (signature) 4.	7/9/20	16:00	4. Amber Garcia

Turnaround Time (Business days):

Normal __X__ Other ____

10-Day ____ 7-Day ____

5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

**Parent and Alkylated MAHs & PAHs (34) by GC/MS/SIM/SCAN

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

Shipped/Delivered Via: ESS Courier

ESS Project ID: 20G0256
Date Received: 7/9/2020
Project Due Date: 7/16/2020
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 2.8 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No (NA)
10. Were any analyses received outside of hold time? Yes (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / (No)
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No (NA)

13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / (No)
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1	62727	Yes	N/A	Yes	8 oz jar	NP	
2	62728	Yes	N/A	Yes	8 oz jar	NP	
3	62729	Yes	N/A	Yes	8 oz jar	NP	
4	62730	Yes	N/A	Yes	8 oz jar	NP	
5	62731	Yes	N/A	Yes	8 oz jar	NP	
6	62732	Yes	N/A	Yes	8 oz jar	NP	
7	62733	Yes	N/A	Yes	8 oz jar	NP	
8	62734	Yes	N/A	Yes	8 oz jar	NP	
9	62735	Yes	N/A	Yes	8 oz jar	NP	
10	62736	Yes	N/A	Yes	8 oz jar	NP	
11	62737	Yes	N/A	Yes	8 oz jar	NP	
12	62738	Yes	N/A	Yes	8 oz jar	NP	

2nd Review
Were all containers scanned into storage/lab? Initials AG (Yes) / No
Are barcode labels on correct containers? Yes / No (NA)
Are all Flashpoint stickers attached/container ID # circled? Yes / No (NA)
Are all Hex Chrome stickers attached?

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

ESS Project ID: 20G0256

Date Received: 7/9/2020

Are all QC stickers attached? Yes / No / NA

Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: Amber Garcia Date & Time: 7/9/20 17:40

Reviewed By: Date & Time: 7/9/20 1805

Delivered By: 7/9/20 1805

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: F200037

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 11:37 am, Jul 31, 2020

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses
ESS Laboratory - Cranston, RI TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200037

SAMPLE RECEIPT

The following samples were received on July 15, 2020 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F200037-01	1804576-SS787-S1	Soil	8270 Mod, LK
F200037-02	1804576-SS787-S2	Soil	8270 Mod, LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200037

PROJECT NARRATIVE

8270D (SIM) Semi-Volatile Organic Compounds

F200037-02 **Present in Method Blank (B).**
C-17 , C-18 , Phytane , Pristane

FG01601-DUP2 **Relative percent difference for duplicate is outside of criteria (D+).**
2-Methylnaphthalene (61% @ 50%), C1-Naphthalenes (53% @ 50%), Methylcyclohexane (90% @ 50%), Retene (96% @ 50%)

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200037

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS787-S1
Date Sampled: 07/06/20 16:40
Percent Solids: 66
Initial Volume: 5.46
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200037
ESS Laboratory Sample ID: F200037-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/16/20 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**316** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C1-Benzene	**341** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C2-Benzenes	**150** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C3-Benzenes	**121** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C4-Benzenes	**121** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C5-Benzenes	**91.1** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
Methylcyclohexane	**124** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
Toluene	**770** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
Ethylbenzene	**63.1** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
m,p-Xylene	**348** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
Styrene	**209** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
o-Xylene	**46.4** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
Isopropylbenzene	J **14.1** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
n-Propylbenzene	**34.8** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
1,3,5-Trimethylbenzene	**41.3** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
1,2,3-Trimethylbenzene	**44.8** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
1,2,4-Trimethylbenzene	**99.0** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
t-Butylbenzene	ND (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
sec-Butylbenzene	ND (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
p-Isopropyltoluene	**38.7** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
n-Butylbenzene	**56.8** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
trans-Decalin	**194** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
cis-Decalin	**31.1** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C1-Decalins	**339** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C2-Decalins	**328** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C3-Decalins	**248** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C4-Decalins	**290** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
Benzo(b)thiophene	**322** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C1-Benzo(b)thiophenes	**231** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C2-Benzo(b)thiophenes	**294** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C3-Benzo(b)thiophenes	**222** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C4-Benzo(b)thiophenes	**149** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS787-S1
Date Sampled: 07/06/20 16:40
Percent Solids: 66
Initial Volume: 5.46
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200037
ESS Laboratory Sample ID: F200037-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/16/20 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**7120** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
2-Methylnaphthalene	**3040** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
1-Methylnaphthalene	**2440** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C1-Naphthalenes	**3270** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C2-Naphthalenes	**3890** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C3-Naphthalenes	**3000** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C4-Naphthalenes	**1580** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
Biphenyl	**991** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
Acenaphthylene	**1790** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
Acenaphthene	**11300** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
Dibenzofuran	**8220** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
Fluorene	**9380** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C1-Fluorenes	**2750** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C2-Fluorenes	**2540** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C3-Fluorenes	**4350** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
Dibenzothiophene	**7430** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C1-Dibenzothiophenes	**3610** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C2-Dibenzothiophenes	**2790** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C3-Dibenzothiophenes	**1920** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C4-Dibenzothiophenes	**1090** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
Phenanthrene	**101000** (554)	277	8270 Mod		100	07/17/20 15:45	F0G0008	FG01601
Anthracene	**22600** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C1-Phenanthrenes/Anthracenes	**26600** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C2-Phenanthrenes/Anthracenes	**11400** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C3-Phenanthrenes/Anthracenes	**4460** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C4-Phenanthrenes/Anthracenes	**1800** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
Retene	**399** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
Benzo(b)naphtho(2,1-d)thiophene	**6740** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C0-Benzonaphthothiophenes	**12700** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C1-Benzonaphthothiophenes	**5240** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C2-Benzonaphthothiophenes	**3690** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C3-Benzonaphthothiophenes	**2770** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS787-S1
Date Sampled: 07/06/20 16:40
Percent Solids: 66
Initial Volume: 5.46
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200037
ESS Laboratory Sample ID: F200037-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/16/20 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**1320** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
Fluoranthene	**108000** (554)	277	8270 Mod		100	07/17/20 15:45	F0G0008	FG01601
Pyrene	**90200** (554)	277	8270 Mod		100	07/17/20 15:45	F0G0008	FG01601
C1-Fluoranthenes/Pyrenes	**27300** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C2-Fluoranthenes/Pyrenes	**19600** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C3-Fluoranthenes/Pyrenes	**8150** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
Benzo(b)fluorene	**2620** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
Benzo(c)fluorene	**1280** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
2-Methylpyrene	**4080** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
4-Methylpyrene	**2920** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
1-Methylpyrene	**2530** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
Benz(a)anthracene	**40900** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
Chrysene/triphenylene	**38200** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C1-Benzo(a)anthracenes/Chrysenes	**16500** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C2-Benzo(a)anthracenes/Chrysenes	**8140** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C3-Benzo(a)anthracenes/Chrysenes	**4960** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C4-Benzo(a)anthracenes/Chrysenes	**2700** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
Benzo(b)fluoranthene	**32700** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
Benzo(j/k)fluoranthene	**28500** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
Benzo(e)pyrene	**24500** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
Benzo(a)pyrene	**36800** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
Perylene	**10300** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
Indeno(1,2,3-cd)pyrene	**22200** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
Dibenzo(a,h)anthracene	**6350** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
Benzo(g,h,i)perylene	**19300** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
Coronene	**4700** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
Tetramethyl lead	ND (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
Trimethylethyl lead	ND (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
Dimethyldiethyl lead	ND (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
Methyltriethyl lead	ND (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
Tetraethyl lead	ND (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
2,6,10-trimethyldodecane (1380)	**314** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS787-S1
Date Sampled: 07/06/20 16:40
Percent Solids: 66
Initial Volume: 5.46
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200037
ESS Laboratory Sample ID: F200037-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/16/20 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**464** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
2,6,10-trimethylpentadecane (1650)	**489** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C-17	**479** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
Pristane	**1190** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
C-18	**479** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
Phytane	**1090** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
Carbazole	**10800** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
2,6-Dimethylnaphthalene	**849** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
2,3,5-Trimethylnaphthene	**234** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
4-Methyldibenzothiophene	**896** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
2/3-Methyldibenzothiophene	**1210** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
1-Methyldibenzothiophene	**356** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
3-Methylphenanthrene	**6060** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
2-Methylphenanthrene	**7490** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
2-Methylanthracene	**3540** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
4/9-Methylphenanthrene	**5290** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601
1-Methylphenanthrene	**3900** (27.7)	13.8	8270 Mod		5	07/17/20 14:24	F0G0008	FG01601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*65 %*		*50-120*
Surrogate: Naphthalene-d8	*67 %*		*50-120*
Surrogate: Phenanthrene-d10	*74 %*		*50-120*
Surrogate: Perylene-d12	*106 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS787-S1
Date Sampled: 07/06/20 16:40
Percent Solids: 66

ESS Laboratory Work Order: F200037
ESS Laboratory Sample ID: F200037-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**41800** (92.5)		LK		1	CCP	07/20/20 22:52	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS787-S2
Date Sampled: 07/06/20 16:49
Percent Solids: 64
Initial Volume: 5.19
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200037
ESS Laboratory Sample ID: F200037-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/16/20 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Benzene	**28.1** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C1-Benzene	**53.6** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C2-Benzenes	**107** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C3-Benzenes	**16.1** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C4-Benzenes	**17.9** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C5-Benzenes	**11.0** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
Methylcyclohexane	**22.4** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
Toluene	**129** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
Ethylbenzene	J **4.65** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
m,p-Xylene	**293** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
Styrene	**8.68** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
o-Xylene	J **4.84** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
Isopropylbenzene	ND (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
n-Propylbenzene	ND (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
1,3,5-Trimethylbenzene	**7.55** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
1,2,3-Trimethylbenzene	**7.29** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
1,2,4-Trimethylbenzene	**6.81** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
t-Butylbenzene	ND (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
sec-Butylbenzene	ND (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
p-Isopropyltoluene	**23.1** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
n-Butylbenzene	J **3.98** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
trans-Decalin	**7.05** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
cis-Decalin	ND (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C1-Decalins	**16.7** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C2-Decalins	**25.1** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C3-Decalins	**26.3** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C4-Decalins	**33.3** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
Benzo(b)thiophene	J **3.49** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C1-Benzo(b)thiophenes	**8.51** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C2-Benzo(b)thiophenes	**14.5** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C3-Benzo(b)thiophenes	**9.21** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C4-Benzo(b)thiophenes	**15.6** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS787-S2
Date Sampled: 07/06/20 16:49
Percent Solids: 64
Initial Volume: 5.19
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200037
ESS Laboratory Sample ID: F200037-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/16/20 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
Naphthalene	**59.8** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
2-Methylnaphthalene	**33.2** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
1-Methylnaphthalene	**31.9** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C1-Naphthalenes	**39.6** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C2-Naphthalenes	**98.0** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C3-Naphthalenes	**89.5** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C4-Naphthalenes	**49.7** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
Biphenyl	**12.8** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
Acenaphthylene	**100** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
Acenaphthene	**123** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
Dibenzofuran	**32.8** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
Fluorene	**90.6** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C1-Fluorenes	**67.3** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C2-Fluorenes	**71.0** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C3-Fluorenes	**73.2** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
Dibenzothiophene	**72.2** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C1-Dibenzothiophenes	**65.9** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C2-Dibenzothiophenes	**78.3** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C3-Dibenzothiophenes	**66.7** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C4-Dibenzothiophenes	**37.6** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
Phenanthrene	**963** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
Anthracene	**253** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C1-Phenanthrenes/Anthracenes	**401** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C2-Phenanthrenes/Anthracenes	**261** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C3-Phenanthrenes/Anthracenes	**130** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C4-Phenanthrenes/Anthracenes	**72.1** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
Retene	**91.5** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
Benzo(b)naphtho(2,1-d)thiophene	**71.7** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C0-Benzonaphthothiophenes	**129** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C1-Benzonaphthothiophenes	**91.1** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C2-Benzonaphthothiophenes	**76.8** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C3-Benzonaphthothiophenes	**54.7** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS787-S2
Date Sampled: 07/06/20 16:49
Percent Solids: 64
Initial Volume: 5.19
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200037
ESS Laboratory Sample ID: F200037-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/16/20 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**20.3** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
Fluoranthene	**894** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
Pyrene	**995** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C1-Fluoranthenes/Pyrenes	**543** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C2-Fluoranthenes/Pyrenes	**253** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C3-Fluoranthenes/Pyrenes	**125** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
Benzo(b)fluorene	**67.0** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
Benzo(c)fluorene	**24.8** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
2-Methylpyrene	**75.2** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
4-Methylpyrene	**68.1** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
1-Methylpyrene	**60.0** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
Benz(a)anthracene	**506** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
Chrysene/triphenylene	**518** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C1-Benzo(a)anthracenes/Chrysenes	**279** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C2-Benzo(a)anthracenes/Chrysenes	**148** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C3-Benzo(a)anthracenes/Chrysenes	**80.7** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C4-Benzo(a)anthracenes/Chrysenes	**47.3** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
Benzo(b)fluoranthene	**374** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
Benzo(j/k)fluoranthene	**384** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
Benzo(e)pyrene	**350** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
Benzo(a)pyrene	**579** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
Perylene	**738** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
Indeno(1,2,3-cd)pyrene	**305** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
Dibenzo(a,h)anthracene	**70.8** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
Benzo(g,h,i)perylene	**301** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
Coronene	**88.5** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
Tetramethyl lead	ND (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
Trimethylethyl lead	ND (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
Dimethyldiethyl lead	ND (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
Methyltriethyl lead	ND (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
Tetraethyl lead	ND (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
2,6,10-trimethyldodecane (1380)	**39.4** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS787-S2
Date Sampled: 07/06/20 16:49
Percent Solids: 64
Initial Volume: 5.19
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F200037
ESS Laboratory Sample ID: F200037-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/16/20 12:00

8270D (SIM) Semi-Volatile Organic Compounds

Analyte			Method	Limit	DF	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**63.9** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
2,6,10-trimethylpentadecane (1650)	**64.8** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C-17	**B 58.6** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
Pristane	**B 139** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
C-18	**B 68.7** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
Phytane	**B 144** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
Carbazole	**34.3** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
2,6-Dimethylnaphthalene	**19.7** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
2,3,5-Trimethylnaphthene	**J 5.86** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
4-Methyldibenzothiophene	**24.1** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
2/3-Methyldibenzothiophene	**21.7** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
1-Methyldibenzothiophene	**8.77** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
3-Methylphenanthrene	**93.4** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
2-Methylphenanthrene	**109** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
2-Methylanthracene	**42.8** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
4/9-Methylphenanthrene	**91.5** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601
1-Methylphenanthrene	**56.1** (6.03)	3.01	8270 Mod		1	07/17/20 17:07	F0G0008	FG01601

	%Recovery	*Qualifier*	*Limits*
Surrogate: Toluene-D8	*79 %*		*50-120*
Surrogate: Naphthalene-d8	*77 %*		*50-120*
Surrogate: Phenanthrene-d10	*82 %*		*50-120*
Surrogate: Perylene-d12	*90 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS787-S2
Date Sampled: 07/06/20 16:49
Percent Solids: 64

ESS Laboratory Work Order: F200037
ESS Laboratory Sample ID: F200037-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**247000** (96.6)		LK		1	CCP	07/20/20 23:11	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200037

Quality Control Data

Classical Chemistry

Batch DG01546 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	100	mg/kg							
Total Organic Carbon (2)	ND	100	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200037

Quality Control Data

Classical Chemistry

Batch DG01546 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	10500	100	mg/kg	10000		105	80-120			
Total Organic Carbon (2)	10700	100	mg/kg	10000		107	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200037

Quality Control Data

Classical Chemistry

Batch DG01546 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	11400	100	mg/kg	10000		114	80-120	8	20	
Total Organic Carbon (2)	11100	100	mg/kg	10000		111	80-120	4	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200037

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FG01601 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	ND	4.00	ug/Kg wet							
C1-Benzene	ND	4.00	ug/Kg wet							
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	2.04	4.00	ug/Kg wet							J
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	2.53	4.00	ug/Kg wet							J
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200037

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FG01601 - 3570

C1-Fluorenes	ND	4.00	ug/Kg wet
C2-Fluorenes	ND	4.00	ug/Kg wet
C3-Fluorenes	ND	4.00	ug/Kg wet
Dibenzothiophene	ND	4.00	ug/Kg wet
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet
Phenanthrene	ND	4.00	ug/Kg wet
Anthracene	ND	4.00	ug/Kg wet
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
Retene	ND	4.00	ug/Kg wet
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
Fluoranthene	ND	4.00	ug/Kg wet
Pyrene	ND	4.00	ug/Kg wet
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
Benzo(b)fluorene	ND	4.00	ug/Kg wet
Benzo(c)fluorene	ND	4.00	ug/Kg wet
2-Methylpyrene	ND	4.00	ug/Kg wet
4-Methylpyrene	ND	4.00	ug/Kg wet
1-Methylpyrene	ND	4.00	ug/Kg wet
Benz(a)anthracene	ND	4.00	ug/Kg wet
Chrysene/triphenylene	ND	4.00	ug/Kg wet
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet
Benzo(e)pyrene	ND	4.00	ug/Kg wet
Benzo(a)pyrene	ND	4.00	ug/Kg wet
Perylene	ND	4.00	ug/Kg wet
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet
Coronene	ND	4.00	ug/Kg wet
Tetramethyl lead	ND	4.00	ug/Kg wet
Trimethylethyl lead	ND	4.00	ug/Kg wet

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200037

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FG01601 - 3570							
Dimethyldiethyl lead	ND	4.00	ug/Kg wet				
Methyltriethyl lead	ND	4.00	ug/Kg wet				
Tetraethyl lead	ND	4.00	ug/Kg wet				
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet				
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet				
2,6,10-trimethylpentadecane (1650)	2.41	4.00	ug/Kg wet				J
C-17	18.0	4.00	ug/Kg wet				
Pristane	14.6	4.00	ug/Kg wet				
C-18	20.3	4.00	ug/Kg wet				
Phytane	24.2	4.00	ug/Kg wet				
Carbazole	ND	4.00	ug/Kg wet				
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet				
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet				
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
3-Methylphenanthrene	ND	4.00	ug/Kg wet				
2-Methylphenanthrene	ND	4.00	ug/Kg wet				
2-Methylanthracene	ND	4.00	ug/Kg wet				
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet				
1-Methylphenanthrene	ND	4.00	ug/Kg wet				
Surrogate: Toluene-D8	*350*		ug/Kg wet	*400.0*	*88*	*50-120*	
Surrogate: Naphthalene-d8	*322*		ug/Kg wet	*400.0*	*81*	*50-120*	
Surrogate: Phenanthrene-d10	*355*		ug/Kg wet	*400.0*	*89*	*50-120*	
Surrogate: Perylene-d12	*380*		ug/Kg wet	*400.0*	*95*	*50-120*	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200037

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FG01601 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	361	4.00	ug/Kg wet	400.0		90	60-130			
Methylcyclohexane	241	4.00	ug/Kg wet	400.0		60	60-130			
Toluene	333	4.00	ug/Kg wet	400.0		83	60-130			
Ethylbenzene	356	4.00	ug/Kg wet	400.0		89	60-130			
m,p-Xylene	351	4.00	ug/Kg wet	400.0		88	60-130			
Styrene	390	4.00	ug/Kg wet	400.0		98	60-130			
o-Xylene	356	4.00	ug/Kg wet	400.0		89	60-130			
Isopropylbenzene	360	4.00	ug/Kg wet	400.0		90	60-130			
n-Propylbenzene	360	4.00	ug/Kg wet	400.0		90	60-130			
1,3,5-Trimethylbenzene	356	4.00	ug/Kg wet	400.0		89	60-130			
1,2,3-Trimethylbenzene	352	4.00	ug/Kg wet	400.0		88	60-130			
1,2,4-Trimethylbenzene	354	4.00	ug/Kg wet	400.0		89	60-130			
t-Butylbenzene	350	4.00	ug/Kg wet	400.0		87	60-130			
sec-Butylbenzene	353	4.00	ug/Kg wet	400.0		88	60-130			
p-Isopropyltoluene	355	4.00	ug/Kg wet	400.0		89	60-130			
n-Butylbenzene	341	4.00	ug/Kg wet	400.0		85	60-130			
trans-Decalin	352	4.00	ug/Kg wet	400.0		88	60-130			
cis-Decalin	345	4.00	ug/Kg wet	400.0		86	60-130			
Benzo(b)thiophene	334	4.00	ug/Kg wet	400.0		83	60-130			
Naphthalene	339	4.00	ug/Kg wet	400.0		85	60-130			
2-Methylnaphthalene	337	4.00	ug/Kg wet	400.0		84	60-130			
1-Methylnaphthalene	338	4.00	ug/Kg wet	400.0		85	60-130			
Biphenyl	339	4.00	ug/Kg wet	400.0		85	60-130			
Acenaphthylene	367	4.00	ug/Kg wet	400.0		92	60-130			
Acenaphthene	368	4.00	ug/Kg wet	400.0		92	60-130			
Dibenzofuran	342	4.00	ug/Kg wet	400.0		86	60-130			
Fluorene	355	4.00	ug/Kg wet	400.0		89	60-130			
Dibenzothiophene	363	4.00	ug/Kg wet	400.0		91	60-130			
Phenanthrene	360	4.00	ug/Kg wet	400.0		90	60-130			
Anthracene	356	4.00	ug/Kg wet	400.0		89	60-130			
Retene	381	4.00	ug/Kg wet	400.0		95	60-130			
Benzo(b)naphtho(2,1-d)thiophene	363	4.00	ug/Kg wet	400.0		91	60-130			
Fluoranthene	377	4.00	ug/Kg wet	400.0		94	60-130			
Pyrene	373	4.00	ug/Kg wet	400.0		93	60-130			
Benz(a)anthracene	374	4.00	ug/Kg wet	400.0		93	60-130			
Chrysene/triphenylene	364	4.00	ug/Kg wet	400.0		91	60-130			
Benzo(b)fluoranthene	367	4.00	ug/Kg wet	400.0		92	60-130			
Benzo(j/k)fluoranthene	373	4.00	ug/Kg wet	400.0		93	60-130			
Benzo(e)pyrene	362	4.00	ug/Kg wet	400.0		91	60-130			
Benzo(a)pyrene	368	4.00	ug/Kg wet	400.0		92	60-130			
Perylene	359	4.00	ug/Kg wet	400.0		90	60-130			
Indeno(1,2,3-cd)pyrene	345	4.00	ug/Kg wet	400.0		86	60-130			
Dibenzo(a,h)anthracene	361	4.00	ug/Kg wet	400.0		90	60-130			
Benzo(g,h,i)perylene	343	4.00	ug/Kg wet	400.0		86	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200037

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FG01601 - 3570						
Coronene	341	4.00	ug/Kg wet	400.0	85	60-130
Tetraethyl lead	259	4.00	ug/Kg wet	400.0	65	60-130
Pristane	407	4.00	ug/Kg wet	400.0	102	60-130
Phytane	431	4.00	ug/Kg wet	400.0	108	60-130
Surrogate: Toluene-D8	*338*		ug/Kg wet	*400.0*	*85*	*50-120*
Surrogate: Naphthalene-d8	*334*		ug/Kg wet	*400.0*	*84*	*50-120*
Surrogate: Phenanthrene-d10	*355*		ug/Kg wet	*400.0*	*89*	*50-120*
Surrogate: Perylene-d12	*356*		ug/Kg wet	*400.0*	*89*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200037

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FG01601 - 3570

Duplicate **Source: F200037-02**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	37.8	5.54	ug/Kg dry		28.1			30	50	
C1-Benzene	83.4	5.54	ug/Kg dry		53.6			43	50	
C2-Benzenes	104	5.54	ug/Kg dry		107			3	50	
C3-Benzenes	18.6	5.54	ug/Kg dry		16.1			14	50	
C4-Benzenes	19.3	5.54	ug/Kg dry		17.9			8	50	
C5-Benzenes	11.2	5.54	ug/Kg dry		11.0			2	50	
Methylcyclohexane	59.0	5.54	ug/Kg dry		22.4			90	50	D+
Toluene	192	5.54	ug/Kg dry		129			39	50	
Ethylbenzene	7.35	5.54	ug/Kg dry		4.65			45	50	
m,p-Xylene	282	5.54	ug/Kg dry		293			4	50	
Styrene	11.0	5.54	ug/Kg dry		8.68			24	50	
o-Xylene	6.90	5.54	ug/Kg dry		4.84			35	50	
Isopropylbenzene	ND	5.54	ug/Kg dry		ND				50	
n-Propylbenzene	ND	5.54	ug/Kg dry		ND				50	
1,3,5-Trimethylbenzene	12.5	5.54	ug/Kg dry		7.55			49	50	
1,2,3-Trimethylbenzene	8.69	5.54	ug/Kg dry		7.29			18	50	
1,2,4-Trimethylbenzene	9.83	5.54	ug/Kg dry		6.81			36	50	
t-Butylbenzene	ND	5.54	ug/Kg dry		ND				50	
sec-Butylbenzene	ND	5.54	ug/Kg dry		ND				50	
p-Isopropyltoluene	22.6	5.54	ug/Kg dry		23.1			2	50	
n-Butylbenzene	4.02	5.54	ug/Kg dry		3.98			0.9	50	J
trans-Decalin	11.8	5.54	ug/Kg dry		7.05			50	50	
cis-Decalin	ND	5.54	ug/Kg dry		ND				50	
C1-Decalins	21.5	5.54	ug/Kg dry		16.7			25	50	
C2-Decalins	27.3	5.54	ug/Kg dry		25.1			9	50	
C3-Decalins	23.7	5.54	ug/Kg dry		26.3			10	50	
C4-Decalins	32.7	5.54	ug/Kg dry		33.3			2	50	
Benzo(b)thiophene	4.85	5.54	ug/Kg dry		3.49			33	50	J
C1-Benzo(b)thiophenes	9.37	5.54	ug/Kg dry		8.51			10	50	
C2-Benzo(b)thiophenes	13.2	5.54	ug/Kg dry		14.5			9	50	
C3-Benzo(b)thiophenes	8.13	5.54	ug/Kg dry		9.21			12	50	
C4-Benzo(b)thiophenes	14.6	5.54	ug/Kg dry		15.6			7	50	
Naphthalene	88.3	5.54	ug/Kg dry		59.8			38	50	
2-Methylnaphthalene	62.5	5.54	ug/Kg dry		33.2			61	50	D+
1-Methylnaphthalene	50.5	5.54	ug/Kg dry		31.9			45	50	
C1-Naphthalenes	67.8	5.54	ug/Kg dry		39.6			53	50	D+
C2-Naphthalenes	131	5.54	ug/Kg dry		98.0			29	50	
C3-Naphthalenes	110	5.54	ug/Kg dry		89.5			21	50	
C4-Naphthalenes	59.2	5.54	ug/Kg dry		49.7			17	50	
Biphenyl	18.0	5.54	ug/Kg dry		12.8			34	50	
Acenaphthylene	107	5.54	ug/Kg dry		100			7	50	
Acenaphthene	144	5.54	ug/Kg dry		123			16	50	
Dibenzofuran	44.1	5.54	ug/Kg dry		32.8			29	50	
Fluorene	120	5.54	ug/Kg dry		90.6			28	50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200037

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FG01601 - 3570							
C1-Fluorenes	92.7	5.54	ug/Kg dry	67.3	32	50	
C2-Fluorenes	112	5.54	ug/Kg dry	71.0	45	50	
C3-Fluorenes	94.4	5.54	ug/Kg dry	73.2	25	50	
Dibenzothiophene	77.2	5.54	ug/Kg dry	72.2	7	50	
C1-Dibenzothiophenes	83.9	5.54	ug/Kg dry	65.9	24	50	
C2-Dibenzothiophenes	94.8	5.54	ug/Kg dry	78.3	19	50	
C3-Dibenzothiophenes	69.3	5.54	ug/Kg dry	66.7	4	50	
C4-Dibenzothiophenes	37.8	5.54	ug/Kg dry	37.6	0.5	50	
Phenanthrene	1040	5.54	ug/Kg dry	963	7	50	
Anthracene	300	5.54	ug/Kg dry	253	17	50	
C1-Phenanthrenes/Anthracenes	520	5.54	ug/Kg dry	401	26	50	
C2-Phenanthrenes/Anthracenes	355	5.54	ug/Kg dry	261	31	50	
C3-Phenanthrenes/Anthracenes	149	5.54	ug/Kg dry	130	14	50	
C4-Phenanthrenes/Anthracenes	65.0	5.54	ug/Kg dry	72.1	10	50	
Retene	32.1	5.54	ug/Kg dry	91.5	96	50	D+
Benzo(b)naphtho(2,1-d)thiophene	98.1	5.54	ug/Kg dry	71.7	31	50	
C0-Benzonaphthothiophenes	170	5.54	ug/Kg dry	129	27	50	
C1-Benzonaphthothiophenes	123	5.54	ug/Kg dry	91.1	29	50	
C2-Benzonaphthothiophenes	88.7	5.54	ug/Kg dry	76.8	14	50	
C3-Benzonaphthothiophenes	54.4	5.54	ug/Kg dry	54.7	0.6	50	
C4-Benzonaphthothiophenes	18.9	5.54	ug/Kg dry	20.3	7	50	
Fluoranthene	1100	5.54	ug/Kg dry	894	21	50	
Pyrene	1220	5.54	ug/Kg dry	995	21	50	
C1-Fluoranthenes/Pyrenes	712	5.54	ug/Kg dry	543	27	50	
C2-Fluoranthenes/Pyrenes	306	5.54	ug/Kg dry	253	19	50	
C3-Fluoranthenes/Pyrenes	162	5.54	ug/Kg dry	125	26	50	
Benzo(b)fluorene	98.0	5.54	ug/Kg dry	67.0	38	50	
Benzo(c)fluorene	34.3	5.54	ug/Kg dry	24.8	32	50	
2-Methylpyrene	93.6	5.54	ug/Kg dry	75.2	22	50	
4-Methylpyrene	79.7	5.54	ug/Kg dry	68.1	16	50	
1-Methylpyrene	72.2	5.54	ug/Kg dry	60.0	18	50	
Benz(a)anthracene	636	5.54	ug/Kg dry	506	23	50	
Chrysene/triphenylene	647	5.54	ug/Kg dry	518	22	50	
C1-Benzo(a)anthracenes/Chrysenes	355	5.54	ug/Kg dry	279	24	50	
C2-Benzo(a)anthracenes/Chrysenes	184	5.54	ug/Kg dry	148	22	50	
C3-Benzo(a)anthracenes/Chrysenes	92.9	5.54	ug/Kg dry	80.7	14	50	
C4-Benzo(a)anthracenes/Chrysenes	55.9	5.54	ug/Kg dry	47.3	17	50	
Benzo(b)fluoranthene	461	5.54	ug/Kg dry	374	21	50	
Benzo(j/k)fluoranthene	460	5.54	ug/Kg dry	384	18	50	
Benzo(e)pyrene	405	5.54	ug/Kg dry	350	15	50	
Benzo(a)pyrene	680	5.54	ug/Kg dry	579	16	50	
Perylene	851	5.54	ug/Kg dry	738	14	50	
Indeno(1,2,3-cd)pyrene	362	5.54	ug/Kg dry	305	17	50	
Dibenzo(a,h)anthracene	89.6	5.54	ug/Kg dry	70.8	24	50	
Benzo(g,h,i)perylene	342	5.54	ug/Kg dry	301	13	50	
Coronene	97.2	5.54	ug/Kg dry	88.5	9	50	
Tetramethyl lead	ND	5.54	ug/Kg dry	ND		50	
Trimethylethyl lead	ND	5.54	ug/Kg dry	ND		50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200037

Quality Control Data

8270D (SIM) Semi-Volatile Organic Compounds

Batch FG01601 - 3570								
Dimethyldiethyl lead	ND	5.54	ug/Kg dry		ND			50
Methyltriethyl lead	ND	5.54	ug/Kg dry		ND			50
Tetraethyl lead	ND	5.54	ug/Kg dry		ND			50
2,6,10-trimethyldodecane (1380)	34.7	5.54	ug/Kg dry		39.4		13	50
2,6,10-trimethyltridecane (1470)	61.7	5.54	ug/Kg dry		63.9		4	50
2,6,10-trimethylpentadecane (1650)	63.0	5.54	ug/Kg dry		64.8		3	50
C-17	71.8	5.54	ug/Kg dry		58.6		20	50
Pristane	134	5.54	ug/Kg dry		139		4	50
C-18	82.4	5.54	ug/Kg dry		68.7		18	50
Phytane	145	5.54	ug/Kg dry		144		1	50
Carbazole	46.4	5.54	ug/Kg dry		34.3		30	50
2,6-Dimethylnaphthalene	31.9	5.54	ug/Kg dry		19.7		47	50
2,3,5-Trimethylnaphthene	8.57	5.54	ug/Kg dry		5.86		38	50
4-Methyldibenzothiophene	32.7	5.54	ug/Kg dry		24.1		30	50
2/3-Methyldibenzothiophene	30.3	5.54	ug/Kg dry		21.7		33	50
1-Methyldibenzothiophene	9.01	5.54	ug/Kg dry		8.77		3	50
3-Methylphenanthrene	121	5.54	ug/Kg dry		93.4		26	50
2-Methylphenanthrene	150	5.54	ug/Kg dry		109		32	50
2-Methylanthracene	55.8	5.54	ug/Kg dry		42.8		26	50
4/9-Methylphenanthrene	116	5.54	ug/Kg dry		91.5		24	50
1-Methylphenanthrene	71.6	5.54	ug/Kg dry		56.1		24	50
Surrogate: Toluene-D8	*417*		ug/Kg dry	*554.5*		*75*	*50-120*	
Surrogate: Naphthalene-d8	*410*		ug/Kg dry	*554.5*		*74*	*50-120*	
Surrogate: Phenanthrene-d10	*431*		ug/Kg dry	*554.5*		*78*	*50-120*	
Surrogate: Perylene-d12	*481*		ug/Kg dry	*554.5*		*87*	*50-120*	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F200037

Notes and Definitions

U	Analyte included in the analysis, but not detected
J	Reported between MDL and MRL
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F200037

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

FD00037 FD00037

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 20050408

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman

Send Report to: Rhoffman@geiconsultants.com

Send EDD to: labdata@geiconsultants.com, Efarrington@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY REQUIRED -- (YES) NO

If Yes, Are MCP Analytical Methods Required? (YES) NO NA

Are Drinking Water Samples Submitted? YES (NO) NA

If Yes, Have Drinking Water Sampling Requirements Been Met? YES NO (NA)

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Preservative	Preservative	Analysis: Parent and Alkylated MAHs & PAHs 8270**	Analysis: TOCs by Lloyd-Kahn						Sample Specific Remarks
							None	None								
1	1804576-SS787-S1	7/6/2020	16:40	Soil	1	BFM			X	X						
2	1804576-SS787-S2	7/6/2020	16:49	Soil	1	BFM			X	X						

Sample Handling

Samples Field Filtered: YES NO (NA)

Sampled Shipped With Ice: (YES) NO

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1.	7/6/20	1930	1. GEI Sample Fridge
Relinquished by: (signature) 2. GEI Sample Fridge	7-15-20	1310	2.
Relinquished by: (signature) 3.	7-15-20	1310	3.
Relinquished by: (signature) 4.	7/15/20	15.35	4.

Turnaround Time (Business days):

Normal __X__ Other ____

10-Day ____ 7-Day ____

5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

**Parent and Alkylated MAHs & PAHs (34) by GC/MS/SIM/SCAN

temp; 2.6

ESS Laboratory Sample and Cooler Receipt Checklist

7/16/20

Client: GEI Consultants, Inc. - TB

Shipped/Delivered Via: ESS Courier

ESS Project ID: ~~F00037~~ F200037
Date Received: 7/15/2020
Project Due Date: ~~7/22/2020~~ 7/27/2020
Days for Project: 10 5 Day
7/16/20

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 2.6 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes (No)
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? (Yes) No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes (No)
    a. Was there a need to contact the client? Yes (No)
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1		Yes	N/A	Yes	8 oz jar	NP	
2		Yes	N/A	Yes	8 oz jar	NP	

2nd Review
Were all containers scanned into storage/lab? Initials AG
Are barcode labels on correct containers? Yes / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: Amber Garcia Date & Time: 7/15/20 16:16
Reviewed By: Norman Lawrence Date & Time: 7/16/20 @ 11:40
Delivered By:

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: F220065

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 12:32 pm, Oct 31, 2022

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses

ESS - Cranston, RI	TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F220065

SAMPLE RECEIPT

The following samples were received on October 13, 2022 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F220065-01	1804576-SS808-S1	Soil	8270 Mod, LK
F220065-02	1804576-SS808-S2	Soil	8270 Mod, LK
F220065-03	1804576-SS809-S1	Soil	8270 Mod, LK
F220065-04	1804576-SS809-S2	Soil	8270 Mod, LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F220065

PROJECT NARRATIVE

Alkylated PAHs

F220065-02	**Present in Method Blank (B).**
	C1-Benzene , Toluene
F220065-04	**Present in Method Blank (B).**
	C1-Benzene , Phytane , Toluene
FJ22001-BS2	**Blank Spike recovery is below lower control limit (B-).**
	Methylcyclohexane (46% @ 60-130%)

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F220065

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS808-S1
Date Sampled: 10/12/22 12:00
Percent Solids: 21
Initial Volume: 5.36
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F220065
ESS Laboratory Sample ID: F220065-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/20/22 12:15

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**3370** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C1-Benzene	**1650** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C2-Benzenes	**7210** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C3-Benzenes	**929** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C4-Benzenes	**393** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C5-Benzenes	**367** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
Methylcyclohexane	**175** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
Toluene	**1940** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
Ethylbenzene	**4780** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
m,p-Xylene	**3840** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
Styrene	**87.8** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
o-Xylene	**2680** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
Isopropylbenzene	**103** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
n-Propylbenzene	**28.1** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
1,3,5-Trimethylbenzene	**166** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
1,2,3-Trimethylbenzene	**180** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
1,2,4-Trimethylbenzene	**514** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
t-Butylbenzene	ND (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
sec-Butylbenzene	ND (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
p-Isopropyltoluene	**265** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
n-Butylbenzene	**18.4** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
trans-Decalin	**25.1** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
cis-Decalin	ND (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C1-Decalins	**56.7** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C2-Decalins	**88.8** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C3-Decalins	**76.9** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C4-Decalins	**119** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
Benzo(b)thiophene	**391** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C1-Benzo(b)thiophenes	**219** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C2-Benzo(b)thiophenes	**505** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C3-Benzo(b)thiophenes	**277** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C4-Benzo(b)thiophenes	**34.9** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS808-S1
Date Sampled: 10/12/22 12:00
Percent Solids: 21
Initial Volume: 5.36
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F220065
ESS Laboratory Sample ID: F220065-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/20/22 12:15

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**1530** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
2-Methylnaphthalene	**506** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
1-Methylnaphthalene	**214** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C1-Naphthalenes	**450** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C2-Naphthalenes	**698** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C3-Naphthalenes	**459** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C4-Naphthalenes	**445** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
Biphenyl	**140** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
Acenaphthylene	**766** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
Acenaphthene	**270** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
Dibenzofuran	**182** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
Fluorene	**375** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C1-Fluorenes	**362** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C2-Fluorenes	**547** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C3-Fluorenes	**508** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
Dibenzothiophene	**226** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C1-Dibenzothiophenes	**305** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C2-Dibenzothiophenes	**369** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C3-Dibenzothiophenes	**282** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C4-Dibenzothiophenes	**197** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
Phenanthrene	**1510** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
Anthracene	**983** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C1-Phenanthrenes/Anthracenes	**2290** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C2-Phenanthrenes/Anthracenes	**2100** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C3-Phenanthrenes/Anthracenes	**1070** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C4-Phenanthrenes/Anthracenes	**489** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
Retene	**386** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
Benzo(b)naphtho(2,1-d)thiophene	**403** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C0-Benzonaphthothiophenes	**867** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C1-Benzonaphthothiophenes	**746** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C2-Benzonaphthothiophenes	**552** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C3-Benzonaphthothiophenes	**316** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001

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Extraction Method: 3570

ESS Laboratory Work Order: F220065
ESS Laboratory Sample ID: F220065-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/20/22 12:15

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**108** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
Fluoranthene	**4510** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
Pyrene	**4620** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C1-Fluoranthenes/Pyrenes	**4280** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C2-Fluoranthenes/Pyrenes	**2300** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C3-Fluoranthenes/Pyrenes	**1210** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
Benzo(b)fluorene	**561** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
Benzo(c)fluorene	**259** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
2-Methylpyrene	**518** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
4-Methylpyrene	**499** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
1-Methylpyrene	**355** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
2-Methylfluoranthene	ND (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
Benz(a)anthracene	**2890** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
Chrysene	ND (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
Chrysene/triphenylene	**3090** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C1-Benzo(a)anthracenes/Chrysenes	**2410** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C2-Benzo(a)anthracenes/Chrysenes	**1390** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C3-Benzo(a)anthracenes/Chrysenes	**733** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C4-Benzo(a)anthracenes/Chrysenes	**433** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
Benzo(b)fluoranthene	**2580** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
Benzo(j/k)fluoranthene	**2410** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
Benzo(e)pyrene	**2090** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
Benzo(a)pyrene	**2940** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
Perylene	**627** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
Indeno(1,2,3-cd)pyrene	**2260** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
Dibenzo(a,h)anthracene	**567** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
Benzo(g,h,i)perylene	**1710** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
Coronene	**564** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
Tetramethyl lead	ND (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
Trimethylethyl lead	ND (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
Dimethyldiethyl lead	ND (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
Methyltriethyl lead	ND (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001

CERTIFICATE OF ANALYSIS

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Initial Volume: 5.36
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F220065
ESS Laboratory Sample ID: F220065-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/20/22 12:15

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Tetraethyl lead	ND (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
2,6,10-trimethyldodecane (1380)	**87.3** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
2,6,10-trimethyltridecane (1470)	**173** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
2,6,10-trimethylpentadecane (1650)	**106** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C-17	**542** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
Pristane	**306** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
C-18	**385** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
Phytane	**253** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
Carbazole	**157** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
2,6-Dimethylnaphthalene	**145** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
2,3,5-Trimethylnaphthene	**35.3** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
4-Methyldibenzothiophene	**101** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
2/3-Methyldibenzothiophene	**102** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
1-Methyldibenzothiophene	**27.0** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
3-Methylphenanthrene	**473** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
2-Methylphenanthrene	**535** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
2-Methylanthracene	**383** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
4/9-Methylphenanthrene	**564** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001
1-Methylphenanthrene	**314** (17.9)	8.93	8270 Mod		1	IBM	10/24/22 17:03	F2J0009	FJ22001

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*57 %*		*50-120*
Surrogate: Naphthalene-d8	*60 %*		*50-120*
Surrogate: Phenanthrene-d10	*59 %*		*50-120*
Surrogate: Perylene-d12	*59 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS808-S1
Date Sampled: 10/12/22 12:00
Percent Solids: N/A

ESS Laboratory Work Order: F220065
ESS Laboratory Sample ID: F220065-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**148000** (92.6)		LK		1	CCP	10/20/22 14:51	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS808-S2
Date Sampled: 10/12/22 12:15
Percent Solids: 26
Initial Volume: 4.91
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F220065
ESS Laboratory Sample ID: F220065-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/20/22 12:15

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**445** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C1-Benzene	**B 266** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C2-Benzenes	**198** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C3-Benzenes	**33.8** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C4-Benzenes	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C5-Benzenes	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
Methylcyclohexane	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
Toluene	**B 317** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
Ethylbenzene	**22.6** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
m,p-Xylene	**187** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
Styrene	**J 13.6** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
o-Xylene	**48.4** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
Isopropylbenzene	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
n-Propylbenzene	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
1,3,5-Trimethylbenzene	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
1,2,3-Trimethylbenzene	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
1,2,4-Trimethylbenzene	**J 10.4** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
t-Butylbenzene	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
sec-Butylbenzene	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
p-Isopropyltoluene	**J 15.1** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
n-Butylbenzene	**J 8.13** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
trans-Decalin	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
cis-Decalin	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C1-Decalins	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C2-Decalins	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C3-Decalins	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C4-Decalins	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
Benzo(b)thiophene	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C1-Benzo(b)thiophenes	**J 11.8** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C2-Benzo(b)thiophenes	**111** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C3-Benzo(b)thiophenes	**59.0** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C4-Benzo(b)thiophenes	**J 9.93** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001

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Units: ug/Kg dry
Analyst: IBM
Prepared: 10/20/22 12:15

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	J **9.06** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
2-Methylnaphthalene	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
1-Methylnaphthalene	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C1-Naphthalenes	J **8.33** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C2-Naphthalenes	**48.4** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C3-Naphthalenes	**26.3** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C4-Naphthalenes	**57.5** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
Biphenyl	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
Acenaphthylene	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
Acenaphthene	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
Dibenzofuran	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
Fluorene	J **9.08** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C1-Fluorenes	J **14.3** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C2-Fluorenes	**29.7** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C3-Fluorenes	**25.9** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
Dibenzothiophene	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C1-Dibenzothiophenes	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C2-Dibenzothiophenes	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C3-Dibenzothiophenes	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C4-Dibenzothiophenes	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
Phenanthrene	**17.7** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
Anthracene	J **10.2** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C1-Phenanthrenes/Anthracenes	**26.2** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C2-Phenanthrenes/Anthracenes	**23.5** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C3-Phenanthrenes/Anthracenes	**25.4** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C4-Phenanthrenes/Anthracenes	**30.6** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
Retene	**73.1** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
Benzo(b)naphtho(2,1-d)thiophene	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C0-Benzonaphthothiophenes	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C1-Benzonaphthothiophenes	J **12.8** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C2-Benzonaphthothiophenes	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C3-Benzonaphthothiophenes	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS808-S2
Date Sampled: 10/12/22 12:15
Percent Solids: 26
Initial Volume: 4.91
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F220065
ESS Laboratory Sample ID: F220065-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/20/22 12:15

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
Fluoranthene	**36.8** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
Pyrene	**33.6** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C1-Fluoranthenes/Pyrenes	**30.9** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C2-Fluoranthenes/Pyrenes	**J 11.9** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C3-Fluoranthenes/Pyrenes	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
Benzo(b)fluorene	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
Benzo(c)fluorene	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
2-Methylpyrene	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
4-Methylpyrene	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
1-Methylpyrene	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
2-Methylfluoranthene	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
Benz(a)anthracene	**J 10.4** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
Chrysene	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
Chrysene/triphenylene	**J 13.3** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C1-Benzo(a)anthracenes/Chrysenes	**J 10.0** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C2-Benzo(a)anthracenes/Chrysenes	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C3-Benzo(a)anthracenes/Chrysenes	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C4-Benzo(a)anthracenes/Chrysenes	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
Benzo(b)fluoranthene	**J 15.4** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
Benzo(j/k)fluoranthene	**J 11.3** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
Benzo(e)pyrene	**J 12.5** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
Benzo(a)pyrene	**J 11.8** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
Perylene	**295** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
Indeno(1,2,3-cd)pyrene	**J 14.1** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
Dibenzo(a,h)anthracene	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
Benzo(g,h,i)perylene	**J 10.6** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
Coronene	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
Tetramethyl lead	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
Trimethylethyl lead	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
Dimethyldiethyl lead	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
Methyltriethyl lead	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS808-S2
Date Sampled: 10/12/22 12:15
Percent Solids: 26
Initial Volume: 4.91
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F220065
ESS Laboratory Sample ID: F220065-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/20/22 12:15

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Tetraethyl lead	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
2,6,10-trimethyldodecane (1380)	**15.7** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
2,6,10-trimethyltridecane (1470)	**66.9** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
2,6,10-trimethylpentadecane (1650)	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C-17	**818** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
Pristane	**29.1** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
C-18	**142** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
Phytane	**71.2** (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
Carbazole	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
2,6-Dimethylnaphthalene	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
2,3,5-Trimethylnaphthene	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
4-Methyldibenzothiophene	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
2/3-Methyldibenzothiophene	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
1-Methyldibenzothiophene	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
3-Methylphenanthrene	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
2-Methylphenanthrene	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
2-Methylanthracene	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
4/9-Methylphenanthrene	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001
1-Methylphenanthrene	ND (15.6)	7.79	8270 Mod		1	IBM	10/24/22 18:23	F2J0009	FJ22001

	%Recovery	*Qualifier*	*Limits*
Surrogate: Toluene-D8	*76 %*		*50-120*
Surrogate: Naphthalene-d8	*80 %*		*50-120*
Surrogate: Phenanthrene-d10	*73 %*		*50-120*
Surrogate: Perylene-d12	*72 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS808-S2
Date Sampled: 10/12/22 12:15
Percent Solids: N/A

ESS Laboratory Work Order: F220065
ESS Laboratory Sample ID: F220065-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**64100** (94.0)		LK		1	CCP	10/20/22 16:05	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS809-S1
Date Sampled: 10/12/22 12:45
Percent Solids: 27
Initial Volume: 4.92
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F220065
ESS Laboratory Sample ID: F220065-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/20/22 12:15

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**5750** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C1-Benzene	**2060** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C2-Benzenes	**5490** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C3-Benzenes	**2250** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C4-Benzenes	**847** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C5-Benzenes	**259** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
Methylcyclohexane	**598** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
Toluene	**2370** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
Ethylbenzene	**1170** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
m,p-Xylene	**4600** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
Styrene	**128** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
o-Xylene	**2320** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
Isopropylbenzene	**117** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
n-Propylbenzene	**96.2** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
1,3,5-Trimethylbenzene	**487** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
1,2,3-Trimethylbenzene	**332** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
1,2,4-Trimethylbenzene	**1130** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
t-Butylbenzene	ND (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
sec-Butylbenzene	**18.2** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
p-Isopropyltoluene	**178** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
n-Butylbenzene	**55.8** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
trans-Decalin	**59.3** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
cis-Decalin	ND (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C1-Decalins	**94.7** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C2-Decalins	**113** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C3-Decalins	**68.6** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C4-Decalins	**84.7** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
Benzo(b)thiophene	**347** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C1-Benzo(b)thiophenes	**83.0** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C2-Benzo(b)thiophenes	**247** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C3-Benzo(b)thiophenes	**94.4** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C4-Benzo(b)thiophenes	**24.2** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS809-S1
Date Sampled: 10/12/22 12:45
Percent Solids: 27
Initial Volume: 4.92
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F220065
ESS Laboratory Sample ID: F220065-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/20/22 12:15

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**2290** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
2-Methylnaphthalene	**618** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
1-Methylnaphthalene	**394** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C1-Naphthalenes	**627** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C2-Naphthalenes	**1050** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C3-Naphthalenes	**662** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C4-Naphthalenes	**373** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
Biphenyl	**205** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
Acenaphthylene	**540** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
Acenaphthene	**212** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
Dibenzofuran	**315** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
Fluorene	**465** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C1-Fluorenes	**378** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C2-Fluorenes	**533** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C3-Fluorenes	**594** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
Dibenzothiophene	**242** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C1-Dibenzothiophenes	**337** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C2-Dibenzothiophenes	**325** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C3-Dibenzothiophenes	**182** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C4-Dibenzothiophenes	**115** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
Phenanthrene	**2150** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
Anthracene	**772** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C1-Phenanthrenes/Anthracenes	**1730** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C2-Phenanthrenes/Anthracenes	ND (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C3-Phenanthrenes/Anthracenes	**614** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C4-Phenanthrenes/Anthracenes	**250** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
Retene	**129** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
Benzo(b)naphtho(2,1-d)thiophene	**338** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C0-Benzonaphthothiophenes	**614** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C1-Benzonaphthothiophenes	**534** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C2-Benzonaphthothiophenes	**464** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C3-Benzonaphthothiophenes	**305** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS809-S1
Date Sampled: 10/12/22 12:45
Percent Solids: 27
Initial Volume: 4.92
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F220065
ESS Laboratory Sample ID: F220065-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/20/22 12:15

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**137** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
Fluoranthene	**3460** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
Pyrene	**3330** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C1-Fluoranthenes/Pyrenes	**1850** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C2-Fluoranthenes/Pyrenes	**1360** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C3-Fluoranthenes/Pyrenes	**893** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
Benzo(b)fluorene	**206** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
Benzo(c)fluorene	**109** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
2-Methylpyrene	**246** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
4-Methylpyrene	**235** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
1-Methylpyrene	**159** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
2-Methylfluoranthene	ND (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
Benz(a)anthracene	**1680** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
Chrysene	ND (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
Chrysene/triphenylene	**2040** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C1-Benzo(a)anthracenes/Chrysenes	**1280** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C2-Benzo(a)anthracenes/Chrysenes	**859** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C3-Benzo(a)anthracenes/Chrysenes	**553** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C4-Benzo(a)anthracenes/Chrysenes	**361** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
Benzo(b)fluoranthene	**2130** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
Benzo(j/k)fluoranthene	**1620** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
Benzo(e)pyrene	**1810** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
Benzo(a)pyrene	**2000** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
Perylene	**527** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
Indeno(1,2,3-cd)pyrene	**2070** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
Dibenzo(a,h)anthracene	**452** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
Benzo(g,h,i)perylene	**1610** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
Coronene	**573** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
Tetramethyl lead	ND (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
Trimethylethyl lead	ND (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
Dimethyldiethyl lead	ND (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
Methyltriethyl lead	ND (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS809-S1
Date Sampled: 10/12/22 12:45
Percent Solids: 27
Initial Volume: 4.92
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F220065
ESS Laboratory Sample ID: F220065-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/20/22 12:15

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Tetraethyl lead	ND (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
2,6,10-trimethyldodecane (1380)	**80.1** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
2,6,10-trimethyltridecane (1470)	**189** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
2,6,10-trimethylpentadecane (1650)	**87.4** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C-17	**641** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
Pristane	**314** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
C-18	**522** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
Phytane	**207** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
Carbazole	**271** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
2,6-Dimethylnaphthalene	**281** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
2,3,5-Trimethylnaphthene	**50.5** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
4-Methyldibenzothiophene	**141** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
2/3-Methyldibenzothiophene	**127** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
1-Methyldibenzothiophene	**24.6** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
3-Methylphenanthrene	**442** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
2-Methylphenanthrene	**528** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
2-Methylanthracene	**132** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
4/9-Methylphenanthrene	**382** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001
1-Methylphenanthrene	**239** (15.1)	7.53	8270 Mod		1	IBM	10/24/22 19:44	F2J0009	FJ22001

	%Recovery	*Qualifier*	*Limits*
Surrogate: Toluene-D8	*68 %*		*50-120*
Surrogate: Naphthalene-d8	*72 %*		*50-120*
Surrogate: Phenanthrene-d10	*66 %*		*50-120*
Surrogate: Perylene-d12	*64 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS809-S1
Date Sampled: 10/12/22 12:45
Percent Solids: N/A

ESS Laboratory Work Order: F220065
ESS Laboratory Sample ID: F220065-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**130000** (95.2)		LK		1	CCP	10/20/22 16:22	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS809-S2
Date Sampled: 10/12/22 13:00
Percent Solids: 41
Initial Volume: 5.05
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F220065
ESS Laboratory Sample ID: F220065-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/20/22 12:15

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**399** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C1-Benzene	**B 280** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C2-Benzenes	**215** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C3-Benzenes	**53.4** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C4-Benzenes	**68.5** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C5-Benzenes	**43.1** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
Methylcyclohexane	ND (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
Toluene	**B 332** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
Ethylbenzene	**33.1** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
m,p-Xylene	**229** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
Styrene	**17.0** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
o-Xylene	**33.4** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
Isopropylbenzene	ND (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
n-Propylbenzene	**J 7.27** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
1,3,5-Trimethylbenzene	**J 7.58** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
1,2,3-Trimethylbenzene	**J 7.93** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
1,2,4-Trimethylbenzene	**11.4** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
t-Butylbenzene	ND (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
sec-Butylbenzene	ND (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
p-Isopropyltoluene	**31.2** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
n-Butylbenzene	**11.5** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
trans-Decalin	ND (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
cis-Decalin	ND (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C1-Decalins	ND (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C2-Decalins	ND (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C3-Decalins	ND (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C4-Decalins	ND (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
Benzo(b)thiophene	ND (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C1-Benzo(b)thiophenes	**12.9** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C2-Benzo(b)thiophenes	ND (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C3-Benzo(b)thiophenes	ND (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C4-Benzo(b)thiophenes	**17.8** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS809-S2
Date Sampled: 10/12/22 13:00
Percent Solids: 41
Initial Volume: 5.05
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F220065
ESS Laboratory Sample ID: F220065-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/20/22 12:15

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**37.4** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
2-Methylnaphthalene	**22.2** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
1-Methylnaphthalene	**15.2** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C1-Naphthalenes	**23.9** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C2-Naphthalenes	**112** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C3-Naphthalenes	**101** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C4-Naphthalenes	**168** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
Biphenyl	**12.5** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
Acenaphthylene	**81.3** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
Acenaphthene	**J 8.93** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
Dibenzofuran	**21.3** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
Fluorene	**45.6** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C1-Fluorenes	**80.2** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C2-Fluorenes	**180** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C3-Fluorenes	**146** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
Dibenzothiophene	**21.9** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C1-Dibenzothiophenes	**65.7** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C2-Dibenzothiophenes	**113** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C3-Dibenzothiophenes	**80.3** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C4-Dibenzothiophenes	**81.2** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
Phenanthrene	**119** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
Anthracene	**209** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C1-Phenanthrenes/Anthracenes	**644** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C2-Phenanthrenes/Anthracenes	**732** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C3-Phenanthrenes/Anthracenes	**362** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C4-Phenanthrenes/Anthracenes	**153** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
Retene	**152** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
Benzo(b)naphtho(2,1-d)thiophene	**91.8** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C0-Benzonaphthothiophenes	**264** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C1-Benzonaphthothiophenes	**242** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C2-Benzonaphthothiophenes	**170** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C3-Benzonaphthothiophenes	**85.7** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS809-S2
Date Sampled: 10/12/22 13:00
Percent Solids: 41
Initial Volume: 5.05
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F220065
ESS Laboratory Sample ID: F220065-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/20/22 12:15

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**30.9** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
Fluoranthene	**1120** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
Pyrene	**980** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C1-Fluoranthenes/Pyrenes	**1550** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C2-Fluoranthenes/Pyrenes	**876** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C3-Fluoranthenes/Pyrenes	**426** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
Benzo(b)fluorene	**258** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
Benzo(c)fluorene	**86.9** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
2-Methylpyrene	**173** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
4-Methylpyrene	**137** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
1-Methylpyrene	**109** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
2-Methylfluoranthene	ND (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
Benz(a)anthracene	**918** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
Chrysene	ND (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
Chrysene/triphenylene	**808** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C1-Benzo(a)anthracenes/Chrysenes	**884** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C2-Benzo(a)anthracenes/Chrysenes	**499** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C3-Benzo(a)anthracenes/Chrysenes	**263** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C4-Benzo(a)anthracenes/Chrysenes	**136** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
Benzo(b)fluoranthene	**578** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
Benzo(j/k)fluoranthene	**578** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
Benzo(e)pyrene	**363** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
Benzo(a)pyrene	**657** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
Perylene	**239** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
Indeno(1,2,3-cd)pyrene	**356** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
Dibenzo(a,h)anthracene	**122** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
Benzo(g,h,i)perylene	**226** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
Coronene	**58.6** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
Tetramethyl lead	ND (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
Trimethylethyl lead	ND (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
Dimethyldiethyl lead	ND (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
Methyltriethyl lead	ND (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS809-S2
Date Sampled: 10/12/22 13:00
Percent Solids: 41
Initial Volume: 5.05
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F220065
ESS Laboratory Sample ID: F220065-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 10/20/22 12:15

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Tetraethyl lead	ND (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
2,6,10-trimethyldodecane (1380)	**19.9** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
2,6,10-trimethyltridecane (1470)	**52.6** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
2,6,10-trimethylpentadecane (1650)	**20.2** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C-17	**186** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
Pristane	**50.9** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
C-18	**192** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
Phytane	**B 38.7** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
Carbazole	**18.0** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
2,6-Dimethylnaphthalene	**12.5** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
2,3,5-Trimethylnaphthene	**J 7.49** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
4-Methyldibenzothiophene	**9.95** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
2/3-Methyldibenzothiophene	**19.1** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
1-Methyldibenzothiophene	**J 5.05** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
3-Methylphenanthrene	**114** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
2-Methylphenanthrene	**84.1** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
2-Methylanthracene	**169** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
4/9-Methylphenanthrene	**167** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001
1-Methylphenanthrene	**70.7** (9.56)	4.78	8270 Mod		1	IBM	10/24/22 21:05	F2J0009	FJ22001

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*70 %*		*50-120*
Surrogate: Naphthalene-d8	*76 %*		*50-120*
Surrogate: Phenanthrene-d10	*71 %*		*50-120*
Surrogate: Perylene-d12	*70 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SS809-S2
Date Sampled: 10/12/22 13:00
Percent Solids: N/A

ESS Laboratory Work Order: F220065
ESS Laboratory Sample ID: F220065-04
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**30700** (94.2)		LK		1	CCP	10/20/22 16:38	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F220065

Quality Control Data

Classical Chemistry

Batch DJ21853 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	100	mg/kg							
Total Organic Carbon (2)	ND	100	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F220065

Quality Control Data

Classical Chemistry

Batch DJ21853 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9630	100	mg/kg	10000		96	80-120			
Total Organic Carbon (2)	9440	100	mg/kg	10000		94	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F220065

Quality Control Data

Classical Chemistry

Batch DJ21853 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9710	100	mg/kg	10000		97	80-120	0.9	25	
Total Organic Carbon (2)	9760	100	mg/kg	10000		98	80-120	3	25	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F220065

Quality Control Data

Alkylated PAHs

Batch FJ22001 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	7.84	4.00	ug/Kg wet							
C1-Benzene	38.4	4.00	ug/Kg wet							
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	45.2	4.00	ug/Kg wet							
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	ND	4.00	ug/Kg wet							
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F220065

Quality Control Data

Alkylated PAHs

Batch FJ22001 - 3570			
C1-Fluorenes	ND	4.00	ug/Kg wet
C2-Fluorenes	ND	4.00	ug/Kg wet
C3-Fluorenes	ND	4.00	ug/Kg wet
Dibenzothiophene	ND	4.00	ug/Kg wet
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet
Phenanthrene	ND	4.00	ug/Kg wet
Anthracene	ND	4.00	ug/Kg wet
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
Retene	ND	4.00	ug/Kg wet
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
Fluoranthene	ND	4.00	ug/Kg wet
Pyrene	ND	4.00	ug/Kg wet
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
Benzo(b)fluorene	ND	4.00	ug/Kg wet
Benzo(c)fluorene	ND	4.00	ug/Kg wet
2-Methylpyrene	ND	4.00	ug/Kg wet
4-Methylpyrene	ND	4.00	ug/Kg wet
1-Methylpyrene	ND	4.00	ug/Kg wet
Benz(a)anthracene	ND	4.00	ug/Kg wet
Chrysene/triphenylene	ND	4.00	ug/Kg wet
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet
Benzo(e)pyrene	ND	4.00	ug/Kg wet
Benzo(a)pyrene	ND	4.00	ug/Kg wet
Perylene	ND	4.00	ug/Kg wet
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet
Coronene	ND	4.00	ug/Kg wet
Tetramethyl lead	ND	4.00	ug/Kg wet
Trimethylethyl lead	ND	4.00	ug/Kg wet

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F220065

Quality Control Data

Alkylated PAHs

Batch FJ22001 - 3570							
Dimethyldiethyl lead	ND	4.00	ug/Kg wet				
Methyltriethyl lead	ND	4.00	ug/Kg wet				
Tetraethyl lead	ND	4.00	ug/Kg wet				
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet				
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet				
2,6,10-trimethylpentadecane (1650)	ND	4.00	ug/Kg wet				
C-17	5.90	4.00	ug/Kg wet				
Pristane	3.43	4.00	ug/Kg wet				J
C-18	13.2	4.00	ug/Kg wet				
Phytane	5.67	4.00	ug/Kg wet				
Carbazole	ND	4.00	ug/Kg wet				
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet				
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet				
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
3-Methylphenanthrene	ND	4.00	ug/Kg wet				
2-Methylphenanthrene	ND	4.00	ug/Kg wet				
2-Methylanthracene	ND	4.00	ug/Kg wet				
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet				
1-Methylphenanthrene	ND	4.00	ug/Kg wet				
Surrogate: Toluene-D8	*332*		ug/Kg wet	*400.0*	*83*	*50-120*	
Surrogate: Naphthalene-d8	*328*		ug/Kg wet	*400.0*	*82*	*50-120*	
Surrogate: Phenanthrene-d10	*334*		ug/Kg wet	*400.0*	*83*	*50-120*	
Surrogate: Perylene-d12	*307*		ug/Kg wet	*400.0*	*77*	*50-120*	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F220065

Quality Control Data

Alkylated PAHs

Batch FJ22001 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	261	4.00	ug/Kg wet	400.0		65	60-130			
Methylcyclohexane	182	4.00	ug/Kg wet	400.0		46	60-130			B-
Toluene	325	4.00	ug/Kg wet	400.0		81	60-130			
Ethylbenzene	296	4.00	ug/Kg wet	400.0		74	60-130			
m,p-Xylene	290	4.00	ug/Kg wet	400.0		73	60-130			
Styrene	321	4.00	ug/Kg wet	400.0		80	60-130			
o-Xylene	299	4.00	ug/Kg wet	400.0		75	60-130			
Isopropylbenzene	322	4.00	ug/Kg wet	400.0		80	60-130			
n-Propylbenzene	300	4.00	ug/Kg wet	400.0		75	60-130			
1,3,5-Trimethylbenzene	319	4.00	ug/Kg wet	400.0		80	60-130			
1,2,3-Trimethylbenzene	327	4.00	ug/Kg wet	400.0		82	60-130			
1,2,4-Trimethylbenzene	322	4.00	ug/Kg wet	400.0		81	60-130			
t-Butylbenzene	335	4.00	ug/Kg wet	400.0		84	60-130			
sec-Butylbenzene	324	4.00	ug/Kg wet	400.0		81	60-130			
p-Isopropyltoluene	346	4.00	ug/Kg wet	400.0		86	60-130			
n-Butylbenzene	304	4.00	ug/Kg wet	400.0		76	60-130			
trans-Decalin	309	4.00	ug/Kg wet	400.0		77	60-130			
cis-Decalin	316	4.00	ug/Kg wet	400.0		79	60-130			
Benzo(b)thiophene	348	4.00	ug/Kg wet	400.0		87	60-130			
Naphthalene	345	4.00	ug/Kg wet	400.0		86	60-130			
2-Methylnaphthalene	333	4.00	ug/Kg wet	400.0		83	60-130			
1-Methylnaphthalene	336	4.00	ug/Kg wet	400.0		84	60-130			
Biphenyl	308	4.00	ug/Kg wet	400.0		77	60-130			
Acenaphthylene	361	4.00	ug/Kg wet	400.0		90	60-130			
Acenaphthene	348	4.00	ug/Kg wet	400.0		87	60-130			
Dibenzofuran	335	4.00	ug/Kg wet	400.0		84	60-130			
Fluorene	352	4.00	ug/Kg wet	400.0		88	60-130			
Dibenzothiophene	336	4.00	ug/Kg wet	400.0		84	60-130			
Phenanthrene	340	4.00	ug/Kg wet	400.0		85	60-130			
Anthracene	297	4.00	ug/Kg wet	400.0		74	60-130			
Retene	366	4.00	ug/Kg wet	400.0		91	60-130			
Benzo(b)naphtho(2,1-d)thiophene	350	4.00	ug/Kg wet	400.0		88	60-130			
Fluoranthene	350	4.00	ug/Kg wet	400.0		88	60-130			
Pyrene	350	4.00	ug/Kg wet	400.0		88	60-130			
Benz(a)anthracene	355	4.00	ug/Kg wet	400.0		89	60-130			
Chrysene/triphenylene	340	4.00	ug/Kg wet	400.0		85	60-130			
Benzo(b)fluoranthene	362	4.00	ug/Kg wet	400.0		91	60-130			
Benzo(j/k)fluoranthene	316	4.00	ug/Kg wet	400.0		79	60-130			
Benzo(e)pyrene	310	4.00	ug/Kg wet	400.0		78	60-130			
Benzo(a)pyrene	322	4.00	ug/Kg wet	400.0		81	60-130			
Perylene	307	4.00	ug/Kg wet	400.0		77	60-130			
Indeno(1,2,3-cd)pyrene	380	4.00	ug/Kg wet	400.0		95	60-130			
Dibenzo(a,h)anthracene	371	4.00	ug/Kg wet	400.0		93	60-130			
Benzo(g,h,i)perylene	310	4.00	ug/Kg wet	400.0		77	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F220065

Quality Control Data

Alkylated PAHs

Batch FJ22001 - 3570						
Coronene	347	4.00	ug/Kg wet	400.0	87	60-130
Surrogate: Toluene-D8	*327*		ug/Kg wet	*400.0*	*82*	*50-120*
Surrogate: Naphthalene-d8	*340*		ug/Kg wet	*400.0*	*85*	*50-120*
Surrogate: Phenanthrene-d10	*330*		ug/Kg wet	*400.0*	*83*	*50-120*
Surrogate: Perylene-d12	*308*		ug/Kg wet	*400.0*	*77*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F220065

Notes and Definitions

U	Analyte included in the analysis, but not detected
J	Reported between MDL and MRL
B-	Blank Spike recovery is below lower control limit (B-).
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F220065

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) F22065.

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000

Project Information

Project Name: Amesbury Former MGP

Project Number: 1804576

Send Report to: Ryan Hoffman

labdata@geiconsultants.com

Project Location: Amesbury, MA

Project Manager: Ryan Hoffman

781-721-4091 rhoffman@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY AND MCP ANALYTICAL METHODS REQUIRED: (YES) NO

STATE AND FEDERAL REGULATORY REQUIREMENTS/REPORT LIMITS

State/Federal Program: (MA) 401WQC Other _____ NH RI CT NY ME

MA MCP Criteria are Method 1 S-1 and GW-2/GW-3. Circle if GW-1 is required.

Preservative

None	None								

Analysis

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Parent and Alkylated MAHs * PAHs 8270**	TOCs by Lloyd-Kahn	Sample Specific Remarks
1	1804576-SS[illegible]-S1	10/12/22	1200	Soil	2	JES	X	X	
2	1804576-SS808-S2	10/12/22	1215	Soil	2	JES	X	X	
3	1804576-SS809-S1	10/12/22	1245	Soil	2	DJM	X	X	
4	1804576-SS809-S2	10/12/22	1300	Soil	2	DJM	X	X	

Sample Handling

Samples Field Filtered: YES NO (NA)

Sampled Shipped With Ice: (YES) NO

Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1. Dave Mills	10/12/2022	15:00	1. GEI Sample Fridge
Relinquished by sampler: (signature) 2. GEI Sample Fridge	Date: 10/13/22	Time: 1237	Received by: (signature) 2.
Relinquished by: (signature) 3.	Date: 10/13/22	Time: 1237	Received by: (signature) 3.
Relinquished by: (signature) 4.	Date: 10/13/22	Time: 17:57	Received by: (signature) 4.
Relinquished by: (signature) 5.	Date:	Time:	Received by: (signature) 5.

Turnaround Time (Business days):

5-Day X 4-Day ____ 3-Day ____

2-Day ____ 1-Day ____ Other ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

** Parent and Alkylated MAHs and PAHs (34) by GC/MS/SIM/SCAN

Sample Matrix Abbreviations: SO = Soil GW = Groundwater SW = Surface Water SD = Sediment CO = Concrete PC = Paint Chip CLK = Caulk

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants

Shipped/Delivered Via: ESS Courier

ESS Project ID: F220065
Date Received: 10/13/2022
Project Due Date: 10/20/2022
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 1.5 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By/Acid Lot#:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Resolution:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1	346	Yes	N/A	Yes	4 oz. Jar	NP	
2	347	Yes	N/A	Yes	4 oz. Jar	NP	
3	348	Yes	N/A	Yes	4 oz. Jar	NP	
4	349	Yes	N/A	Yes	4 oz. Jar	NP	

2nd Review

Were all containers scanned into storage/lab? Initials TD

Are barcode labels on correct containers? Yes / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: Lauren Davis Date & Time: 10/13/22 1850.
Reviewed By: DA Date & Time: 10/13/22 2027

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: F230018

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 2:11 pm, Jul 10, 2023

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses

ESS - Cranston, RI	TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230018

SAMPLE RECEIPT

The following samples were received on June 20, 2023 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F230018-01	1804576-817-S1	Soil	8270 Mod, LK
F230018-02	1804576-819-S1	Soil	8270 Mod, LK
F230018-03	1804576-810-S1	Soil	8270 Mod, LK
F230018-04	1804576-810-S2	Soil	8270 Mod, LK
F230018-05	1804576-811-S1	Soil	8270 Mod, LK
F230018-06	1804576-811-S2	Soil	8270 Mod, LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230018

PROJECT NARRATIVE

Alkylated PAHs

F230018-03	**Present in Method Blank (B).**
	Benzene , C-17 , C-18
F230018-04	**Present in Method Blank (B).**
	Benzene , C-17 , C-18
F230018-05	**Present in Method Blank (B).**
	Benzene , C-18
F230018-06	**Present in Method Blank (B).**
	Benzene , C-17 , C-18
F3F0012-CCV2	**Continuing Calibration %Diff/Drift is above control limit (CD+).**
	Tetraethyl lead (31% @ 25%)
F3F0012-CCV4	**Continuing Calibration %Diff/Drift is above control limit (CD+).**
	Tetraethyl lead (26% @ 25%)
FF32201-BS2	**Blank Spike recovery is below lower control limit (B-).**
	Methylcyclohexane (53% @ 60-130%)
FF32201-DUP2	**Relative percent difference for duplicate is outside of criteria (D+).**

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230018

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-817-S1
Date Sampled: 06/19/23 13:30
Percent Solids: 76
Initial Volume: 4.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230018
ESS Laboratory Sample ID: F230018-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/22/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**93.3** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C1-Benzene	**199** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C2-Benzenes	**313** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C3-Benzenes	**363** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C4-Benzenes	**722** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C5-Benzenes	**525** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
Methylcyclohexane	**29.2** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
Toluene	**246** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
Ethylbenzene	**192** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
m,p-Xylene	**273** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
Styrene	**318** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
o-Xylene	**54.1** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
Isopropylbenzene	**32.7** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
n-Propylbenzene	**39.9** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
1,3,5-Trimethylbenzene	**47.7** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
1,2,3-Trimethylbenzene	**45.3** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
1,2,4-Trimethylbenzene	**153** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
t-Butylbenzene	ND (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
sec-Butylbenzene	**10.5** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
p-Isopropyltoluene	**36.3** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
n-Butylbenzene	ND (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
trans-Decalin	**138** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
cis-Decalin	**30.5** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C1-Decalins	**507** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C2-Decalins	**400** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C3-Decalins	**311** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C4-Decalins	**479** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
Benzo(b)thiophene	**281** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C1-Benzo(b)thiophenes	**428** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C2-Benzo(b)thiophenes	**716** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C3-Benzo(b)thiophenes	**465** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C4-Benzo(b)thiophenes	**146** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-817-S1
Date Sampled: 06/19/23 13:30
Percent Solids: 76
Initial Volume: 4.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230018
ESS Laboratory Sample ID: F230018-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/22/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**6370** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
2-Methylnaphthalene	**2240** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
1-Methylnaphthalene	**6210** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C1-Naphthalenes	**5280** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C2-Naphthalenes	**7720** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C3-Naphthalenes	**2750** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C4-Naphthalenes	**981** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
Biphenyl	**392** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
Acenaphthylene	**2400** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
Acenaphthene	**25700** (123)	61.5	8270 Mod		20	IBM	07/04/23 6:32	F3F0012	FF32201
Dibenzofuran	**724** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
Fluorene	**6180** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C1-Fluorenes	**1810** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C2-Fluorenes	**1340** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C3-Fluorenes	**903** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
Dibenzothiophene	**2360** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C1-Dibenzothiophenes	**2120** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C2-Dibenzothiophenes	**1600** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C3-Dibenzothiophenes	**846** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C4-Dibenzothiophenes	**397** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
Phenanthrene	**27700** (123)	61.5	8270 Mod		20	IBM	07/04/23 6:32	F3F0012	FF32201
Anthracene	**7660** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C1-Phenanthrenes/Anthracenes	**9690** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C2-Phenanthrenes/Anthracenes	**4060** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C3-Phenanthrenes/Anthracenes	**1570** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C4-Phenanthrenes/Anthracenes	**910** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
Retene	**2040** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
Benzo(b)naphtho(2,1-d)thiophene	**1470** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C0-Benzonaphthothiophenes	**2780** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C1-Benzonaphthothiophenes	**1520** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C2-Benzonaphthothiophenes	**1020** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C3-Benzonaphthothiophenes	**681** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-817-S1
Date Sampled: 06/19/23 13:30
Percent Solids: 76
Initial Volume: 4.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230018
ESS Laboratory Sample ID: F230018-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/22/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**251** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
Fluoranthene	**21800** (123)	61.5	8270 Mod		20	IBM	07/04/23 6:32	F3F0012	FF32201
Pyrene	**27700** (123)	61.5	8270 Mod		20	IBM	07/04/23 6:32	F3F0012	FF32201
C1-Fluoranthenes/Pyrenes	**11000** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C2-Fluoranthenes/Pyrenes	**3630** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C3-Fluoranthenes/Pyrenes	**1420** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
Benzo(b)fluorene	**1340** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
Benzo(c)fluorene	**616** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
2-Methylpyrene	**1460** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
4-Methylpyrene	**1270** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
1-Methylpyrene	**1330** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
Benz(a)anthracene	**8930** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
Chrysene/triphenylene	**8860** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C1-Benzo(a)anthracenes/Chrysenes	**4280** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C2-Benzo(a)anthracenes/Chrysenes	**1890** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C3-Benzo(a)anthracenes/Chrysenes	**841** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C4-Benzo(a)anthracenes/Chrysenes	**435** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
Benzo(b)fluoranthene	**5750** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
Benzo(j/k)fluoranthene	**6340** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
Benzo(e)pyrene	**5450** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
Benzo(a)pyrene	**10200** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
Perylene	**2040** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
Indeno(1,2,3-cd)pyrene	**6180** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
Dibenzo(a,h)anthracene	**1240** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
Benzo(g,h,i)perylene	**5260** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
Coronene	**1770** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
Tetramethyl lead	ND (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
Trimethylethyl lead	ND (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
Dimethyldiethyl lead	ND (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
Methyltriethyl lead	ND (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
Tetraethyl lead	ND (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
2,6,10-trimethyldodecane (1380)	**337** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-817-S1
Date Sampled: 06/19/23 13:30
Percent Solids: 76
Initial Volume: 4.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230018
ESS Laboratory Sample ID: F230018-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/22/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**460** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
2,6,10-trimethylpentadecane (1650)	**407** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C-17	**174** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
Pristane	**816** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
C-18	**157** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
Phytane	**761** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
Carbazole	**699** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
2,6-Dimethylnaphthalene	**1290** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
2,3,5-Trimethylnaphthene	**158** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
4-Methyldibenzothiophene	**755** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
2/3-Methyldibenzothiophene	**693** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
1-Methyldibenzothiophene	**234** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
3-Methylphenanthrene	**2240** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
2-Methylphenanthrene	**2470** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
2-Methylanthracene	**1220** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
4/9-Methylphenanthrene	**2150** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201
1-Methylphenanthrene	**1520** (6.15)	3.08	8270 Mod		1	IBM	06/27/23 21:28	F3F0012	FF32201

	%Recovery	*Qualifier*	*Limits*
Surrogate: Toluene-D8	*67 %*		*50-120*
Surrogate: Naphthalene-d8	*72 %*		*50-120*
Surrogate: Phenanthrene-d10	*74 %*		*50-120*
Surrogate: Perylene-d12	*84 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-817-S1
Date Sampled: 06/19/23 13:30
Percent Solids: 76

ESS Laboratory Work Order: F230018
ESS Laboratory Sample ID: F230018-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**44400** (476)		LK		1	CCP	06/28/23 11:22	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-819-S1
Date Sampled: 06/19/23 14:00
Percent Solids: 73
Initial Volume: 6.37
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230018
ESS Laboratory Sample ID: F230018-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/22/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**106** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C1-Benzene	**90.5** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C2-Benzenes	**134** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C3-Benzenes	**37.0** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C4-Benzenes	**30.8** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C5-Benzenes	**25.3** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
Methylcyclohexane	**J 3.20** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
Toluene	**111** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
Ethylbenzene	**10.2** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
m,p-Xylene	**189** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
Styrene	**26.0** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
o-Xylene	**8.69** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
Isopropylbenzene	ND (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
n-Propylbenzene	**8.37** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
1,3,5-Trimethylbenzene	**J 4.33** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
1,2,3-Trimethylbenzene	**6.78** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
1,2,4-Trimethylbenzene	**12.0** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
t-Butylbenzene	ND (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
sec-Butylbenzene	ND (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
p-Isopropyltoluene	**5.16** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
n-Butylbenzene	**11.5** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
trans-Decalin	ND (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
cis-Decalin	ND (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C1-Decalins	**11.3** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C2-Decalins	**18.6** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C3-Decalins	**15.1** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C4-Decalins	**22.7** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
Benzo(b)thiophene	**4.99** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C1-Benzo(b)thiophenes	**15.0** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C2-Benzo(b)thiophenes	**16.6** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C3-Benzo(b)thiophenes	**9.95** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C4-Benzo(b)thiophenes	**6.16** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-819-S1
Date Sampled: 06/19/23 14:00
Percent Solids: 73
Initial Volume: 6.37
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230018
ESS Laboratory Sample ID: F230018-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/22/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**77.6** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
2-Methylnaphthalene	**43.1** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
1-Methylnaphthalene	**26.6** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C1-Naphthalenes	**44.9** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C2-Naphthalenes	**85.0** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C3-Naphthalenes	**62.1** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C4-Naphthalenes	**41.5** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
Biphenyl	**17.5** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
Acenaphthylene	**254** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
Acenaphthene	**93.7** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
Dibenzofuran	**37.5** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
Fluorene	**66.1** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C1-Fluorenes	**45.1** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C2-Fluorenes	**36.0** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C3-Fluorenes	**94.6** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
Dibenzothiophene	**62.8** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C1-Dibenzothiophenes	**56.2** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C2-Dibenzothiophenes	**71.7** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C3-Dibenzothiophenes	**63.6** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C4-Dibenzothiophenes	**43.5** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
Phenanthrene	**545** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
Anthracene	**338** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C1-Phenanthrenes/Anthracenes	**336** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C2-Phenanthrenes/Anthracenes	**221** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C3-Phenanthrenes/Anthracenes	**111** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C4-Phenanthrenes/Anthracenes	**44.2** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
Retene	**19.2** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
Benzo(b)naphtho(2,1-d)thiophene	**142** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C0-Benzonaphthothiophenes	**259** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C1-Benzonaphthothiophenes	**142** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C2-Benzonaphthothiophenes	**148** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C3-Benzonaphthothiophenes	**148** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-819-S1
Date Sampled: 06/19/23 14:00
Percent Solids: 73
Initial Volume: 6.37
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230018
ESS Laboratory Sample ID: F230018-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/22/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**91.8** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
Fluoranthene	**1730** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
Pyrene	**1540** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C1-Fluoranthenes/Pyrenes	**734** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C2-Fluoranthenes/Pyrenes	**411** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C3-Fluoranthenes/Pyrenes	**158** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
Benzo(b)fluorene	**91.1** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
Benzo(c)fluorene	**42.8** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
2-Methylpyrene	**97.1** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
4-Methylpyrene	**83.2** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
1-Methylpyrene	**64.7** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
Benz(a)anthracene	**908** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
Chrysene/triphenylene	**946** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C1-Benzo(a)anthracenes/Chrysenes	**412** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C2-Benzo(a)anthracenes/Chrysenes	**210** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C3-Benzo(a)anthracenes/Chrysenes	**127** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C4-Benzo(a)anthracenes/Chrysenes	**73.5** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
Benzo(b)fluoranthene	**824** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
Benzo(j/k)fluoranthene	**832** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
Benzo(e)pyrene	**694** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
Benzo(a)pyrene	**1090** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
Perylene	**336** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
Indeno(1,2,3-cd)pyrene	**800** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
Dibenzo(a,h)anthracene	**169** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
Benzo(g,h,i)perylene	**653** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
Coronene	**194** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
Tetramethyl lead	ND (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
Trimethylethyl lead	ND (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
Dimethyldiethyl lead	ND (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
Methyltriethyl lead	ND (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
Tetraethyl lead	ND (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
2,6,10-trimethyldodecane (1380)	**12.8** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-819-S1
Date Sampled: 06/19/23 14:00
Percent Solids: 73
Initial Volume: 6.37
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230018
ESS Laboratory Sample ID: F230018-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/22/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**34.2** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
2,6,10-trimethylpentadecane (1650)	**19.4** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C-17	**134** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
Pristane	**37.2** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
C-18	**60.6** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
Phytane	**54.7** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
Carbazole	**71.5** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
2,6-Dimethylnaphthalene	**34.1** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
2,3,5-Trimethylnaphthene	**4.42** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
4-Methyldibenzothiophene	**18.9** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
2/3-Methyldibenzothiophene	**17.2** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
1-Methyldibenzothiophene	**9.94** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
3-Methylphenanthrene	**72.5** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
2-Methylphenanthrene	**73.4** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
2-Methylanthracene	**53.0** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
4/9-Methylphenanthrene	**83.6** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201
1-Methylphenanthrene	**50.1** (4.33)	2.16	8270 Mod		1	IBM	06/27/23 22:50	F3F0012	FF32201

	%Recovery	*Qualifier*	*Limits*
Surrogate: Toluene-D8	*69 %*		*50-120*
Surrogate: Naphthalene-d8	*76 %*		*50-120*
Surrogate: Phenanthrene-d10	*77 %*		*50-120*
Surrogate: Perylene-d12	*82 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-819-S1
Date Sampled: 06/19/23 14:00
Percent Solids: 73

ESS Laboratory Work Order: F230018
ESS Laboratory Sample ID: F230018-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**17800** (492)		LK		1	CCP	06/28/23 12:31	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-810-S1
Date Sampled: 06/19/23 09:15
Percent Solids: 86
Initial Volume: 4.95
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230018
ESS Laboratory Sample ID: F230018-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/22/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**B 46.6** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C1-Benzene	**24.7** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C2-Benzenes	**20.1** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C3-Benzenes	**13.0** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C4-Benzenes	**13.1** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C5-Benzenes	**10.3** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
Methylcyclohexane	**9.78** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
Toluene	**30.2** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
Ethylbenzene	**J 3.23** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
m,p-Xylene	**21.5** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
Styrene	**15.7** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
o-Xylene	**J 3.25** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
Isopropylbenzene	ND (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
n-Propylbenzene	ND (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
1,3,5-Trimethylbenzene	**J 2.80** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
1,2,3-Trimethylbenzene	ND (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
1,2,4-Trimethylbenzene	**J 3.54** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
t-Butylbenzene	ND (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
sec-Butylbenzene	ND (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
p-Isopropyltoluene	ND (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
n-Butylbenzene	**5.26** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
trans-Decalin	ND (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
cis-Decalin	ND (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C1-Decalins	**5.17** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C2-Decalins	ND (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C3-Decalins	ND (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C4-Decalins	ND (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
Benzo(b)thiophene	**8.85** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C1-Benzo(b)thiophenes	**7.42** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C2-Benzo(b)thiophenes	**10.1** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C3-Benzo(b)thiophenes	**9.61** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C4-Benzo(b)thiophenes	**5.26** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-810-S1
Date Sampled: 06/19/23 09:15
Percent Solids: 86
Initial Volume: 4.95
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230018
ESS Laboratory Sample ID: F230018-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/22/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**123** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
2-Methylnaphthalene	**28.0** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
1-Methylnaphthalene	**15.3** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C1-Naphthalenes	**28.1** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C2-Naphthalenes	**58.1** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C3-Naphthalenes	**96.7** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C4-Naphthalenes	**64.3** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
Biphenyl	**12.3** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
Acenaphthylene	**258** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
Acenaphthene	**25.6** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
Dibenzofuran	**53.1** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
Fluorene	**65.2** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C1-Fluorenes	**59.5** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C2-Fluorenes	**84.7** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C3-Fluorenes	**155** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
Dibenzothiophene	**86.1** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C1-Dibenzothiophenes	**95.3** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C2-Dibenzothiophenes	**86.1** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C3-Dibenzothiophenes	**45.9** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C4-Dibenzothiophenes	**24.1** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
Phenanthrene	**1610** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
Anthracene	**573** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C1-Phenanthrenes/Anthracenes	**949** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C2-Phenanthrenes/Anthracenes	**536** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C3-Phenanthrenes/Anthracenes	**201** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C4-Phenanthrenes/Anthracenes	**60.3** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
Retene	**23.4** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
Benzo(b)naphtho(2,1-d)thiophene	**284** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C0-Benzonaphthothiophenes	**568** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C1-Benzonaphthothiophenes	**204** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C2-Benzonaphthothiophenes	**99.3** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C3-Benzonaphthothiophenes	**57.9** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-810-S1
Date Sampled: 06/19/23 09:15
Percent Solids: 86
Initial Volume: 4.95
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230018
ESS Laboratory Sample ID: F230018-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/22/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**12.3** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
Fluoranthene	**4540** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
Pyrene	**4010** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C1-Fluoranthenes/Pyrenes	**1410** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C2-Fluoranthenes/Pyrenes	**985** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C3-Fluoranthenes/Pyrenes	**377** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
Benzo(b)fluorene	**112** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
Benzo(c)fluorene	**44.0** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
2-Methylpyrene	**229** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
4-Methylpyrene	**163** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
1-Methylpyrene	**128** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
Benz(a)anthracene	**2730** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
Chrysene/triphenylene	**2470** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C1-Benzo(a)anthracenes/Chrysenes	**934** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C2-Benzo(a)anthracenes/Chrysenes	**398** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C3-Benzo(a)anthracenes/Chrysenes	**217** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C4-Benzo(a)anthracenes/Chrysenes	**104** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
Benzo(b)fluoranthene	**2130** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
Benzo(j/k)fluoranthene	**2190** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
Benzo(e)pyrene	**1680** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
Benzo(a)pyrene	**2950** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
Perylene	**821** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
Indeno(1,2,3-cd)pyrene	**2200** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
Dibenzo(a,h)anthracene	**437** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
Benzo(g,h,i)perylene	**1690** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
Coronene	**504** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
Tetramethyl lead	ND (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
Trimethylethyl lead	ND (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
Dimethyldiethyl lead	ND (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
Methyltriethyl lead	ND (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
Tetraethyl lead	ND (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
2,6,10-trimethyldodecane (1380)	**5.40** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-810-S1
Date Sampled: 06/19/23 09:15
Percent Solids: 86
Initial Volume: 4.95
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230018
ESS Laboratory Sample ID: F230018-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/22/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**12.4** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
2,6,10-trimethylpentadecane (1650)	**9.55** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C-17	**B 48.7** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
Pristane	**17.6** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
C-18	**B 50.3** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
Phytane	**12.4** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
Carbazole	**91.0** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
2,6-Dimethylnaphthalene	**12.8** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
2,3,5-Trimethylnaphthene	**9.16** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
4-Methyldibenzothiophene	**24.7** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
2/3-Methyldibenzothiophene	**29.4** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
1-Methyldibenzothiophene	**11.8** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
3-Methylphenanthrene	**198** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
2-Methylphenanthrene	**271** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
2-Methylanthracene	**133** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
4/9-Methylphenanthrene	**190** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201
1-Methylphenanthrene	**148** (4.68)	2.34	8270 Mod		1	IBM	06/28/23 0:13	F3F0012	FF32201

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*69 %*		*50-120*
Surrogate: Naphthalene-d8	*74 %*		*50-120*
Surrogate: Phenanthrene-d10	*78 %*		*50-120*
Surrogate: Perylene-d12	*85 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-810-S1
Date Sampled: 06/19/23 09:15
Percent Solids: 86

ESS Laboratory Work Order: F230018
ESS Laboratory Sample ID: F230018-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**43400** (477)		LK		1	CCP	06/28/23 13:20	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-810-S2
Date Sampled: 06/19/23 09:16
Percent Solids: 73
Initial Volume: 5.04
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230018
ESS Laboratory Sample ID: F230018-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/22/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**B 21.8** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C1-Benzene	**9.50** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C2-Benzenes	**10.1** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C3-Benzenes	**12.3** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C4-Benzenes	**13.3** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C5-Benzenes	ND (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
Methylcyclohexane	**11.7** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
Toluene	**11.7** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
Ethylbenzene	ND (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
m,p-Xylene	**9.68** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
Styrene	**8.84** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
o-Xylene	**J 2.77** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
Isopropylbenzene	ND (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
n-Propylbenzene	ND (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
1,3,5-Trimethylbenzene	**J 4.19** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
1,2,3-Trimethylbenzene	ND (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
1,2,4-Trimethylbenzene	**J 2.98** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
t-Butylbenzene	ND (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
sec-Butylbenzene	ND (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
p-Isopropyltoluene	ND (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
n-Butylbenzene	**J 5.44** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
trans-Decalin	**J 3.46** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
cis-Decalin	ND (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C1-Decalins	**6.94** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C2-Decalins	**9.92** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C3-Decalins	ND (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C4-Decalins	ND (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
Benzo(b)thiophene	ND (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C1-Benzo(b)thiophenes	**5.60** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C2-Benzo(b)thiophenes	**5.52** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C3-Benzo(b)thiophenes	**J 5.05** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C4-Benzo(b)thiophenes	ND (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-810-S2
Date Sampled: 06/19/23 09:16
Percent Solids: 73
Initial Volume: 5.04
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230018
ESS Laboratory Sample ID: F230018-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/22/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**37.8** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
2-Methylnaphthalene	**13.7** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
1-Methylnaphthalene	**10.1** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C1-Naphthalenes	**15.8** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C2-Naphthalenes	**32.7** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C3-Naphthalenes	**40.6** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C4-Naphthalenes	**24.8** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
Biphenyl	**7.04** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
Acenaphthylene	**65.7** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
Acenaphthene	**11.2** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
Dibenzofuran	**20.2** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
Fluorene	**24.9** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C1-Fluorenes	**20.5** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C2-Fluorenes	**37.9** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C3-Fluorenes	**65.0** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
Dibenzothiophene	**26.9** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C1-Dibenzothiophenes	**30.9** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C2-Dibenzothiophenes	**30.1** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C3-Dibenzothiophenes	**17.0** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C4-Dibenzothiophenes	**8.01** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
Phenanthrene	**508** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
Anthracene	**142** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C1-Phenanthrenes/Anthracenes	**292** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C2-Phenanthrenes/Anthracenes	**169** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C3-Phenanthrenes/Anthracenes	**67.0** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C4-Phenanthrenes/Anthracenes	**20.1** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
Retene	J **4.50** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
Benzo(b)naphtho(2,1-d)thiophene	**71.1** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C0-Benzonaphthothiophenes	**139** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C1-Benzonaphthothiophenes	**63.7** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C2-Benzonaphthothiophenes	**41.9** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C3-Benzonaphthothiophenes	**20.3** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-810-S2
Date Sampled: 06/19/23 09:16
Percent Solids: 73
Initial Volume: 5.04
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230018
ESS Laboratory Sample ID: F230018-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/22/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
Fluoranthene	**1300** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
Pyrene	**1110** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C1-Fluoranthenes/Pyrenes	**379** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C2-Fluoranthenes/Pyrenes	**267** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C3-Fluoranthenes/Pyrenes	**116** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
Benzo(b)fluorene	**30.9** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
Benzo(c)fluorene	**17.0** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
2-Methylpyrene	**58.6** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
4-Methylpyrene	**42.9** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
1-Methylpyrene	**32.9** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
Benz(a)anthracene	**658** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
Chrysene/triphenylene	**625** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C1-Benzo(a)anthracenes/Chrysenes	**249** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C2-Benzo(a)anthracenes/Chrysenes	**121** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C3-Benzo(a)anthracenes/Chrysenes	**66.2** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C4-Benzo(a)anthracenes/Chrysenes	**42.4** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
Benzo(b)fluoranthene	**536** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
Benzo(j/k)fluoranthene	**533** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
Benzo(e)pyrene	**412** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
Benzo(a)pyrene	**704** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
Perylene	**180** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
Indeno(1,2,3-cd)pyrene	**527** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
Dibenzo(a,h)anthracene	**101** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
Benzo(g,h,i)perylene	**399** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
Coronene	**117** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
Tetramethyl lead	ND (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
Trimethylethyl lead	ND (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
Dimethyldiethyl lead	ND (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
Methyltriethyl lead	ND (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
Tetraethyl lead	ND (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
2,6,10-trimethyldodecane (1380)	**6.21** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-810-S2
Date Sampled: 06/19/23 09:16
Percent Solids: 73
Initial Volume: 5.04
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230018
ESS Laboratory Sample ID: F230018-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/22/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**12.8** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
2,6,10-trimethylpentadecane (1650)	**7.52** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C-17	**B 31.1** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
Pristane	**15.3** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
C-18	**B 29.7** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
Phytane	**6.89** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
Carbazole	**34.1** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
2,6-Dimethylnaphthalene	**7.02** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
2,3,5-Trimethylnaphthene	**J 4.02** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
4-Methyldibenzothiophene	**9.38** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
2/3-Methyldibenzothiophene	**9.29** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
1-Methyldibenzothiophene	**J 3.91** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
3-Methylphenanthrene	**64.4** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
2-Methylphenanthrene	**88.7** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
2-Methylanthracene	**32.4** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
4/9-Methylphenanthrene	**59.0** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201
1-Methylphenanthrene	**45.4** (5.47)	2.74	8270 Mod		1	IBM	06/28/23 2:58	F3F0012	FF32201

	%Recovery	*Qualifier*	*Limits*
Surrogate: Toluene-D8	*68 %*		*50-120*
Surrogate: Naphthalene-d8	*74 %*		*50-120*
Surrogate: Phenanthrene-d10	*79 %*		*50-120*
Surrogate: Perylene-d12	*84 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-810-S2
Date Sampled: 06/19/23 09:16
Percent Solids: 73

ESS Laboratory Work Order: F230018
ESS Laboratory Sample ID: F230018-04
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**22300** (466)		LK		1	CCP	06/28/23 13:37	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-811-S1
Date Sampled: 06/19/23 09:20
Percent Solids: 74
Initial Volume: 5.18
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230018
ESS Laboratory Sample ID: F230018-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/22/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**B 20.8** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C1-Benzene	**16.4** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C2-Benzenes	**30.2** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C3-Benzenes	**34.3** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C4-Benzenes	**26.9** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C5-Benzenes	**20.6** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
Methylcyclohexane	**47.0** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
Toluene	**20.7** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
Ethylbenzene	**5.55** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
m,p-Xylene	**29.6** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
Styrene	**20.6** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
o-Xylene	**12.3** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
Isopropylbenzene	ND (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
n-Propylbenzene	**J 3.54** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
1,3,5-Trimethylbenzene	**12.9** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
1,2,3-Trimethylbenzene	**5.49** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
1,2,4-Trimethylbenzene	**12.1** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
t-Butylbenzene	ND (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
sec-Butylbenzene	ND (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
p-Isopropyltoluene	ND (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
n-Butylbenzene	**J 4.02** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
trans-Decalin	**6.32** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
cis-Decalin	ND (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C1-Decalins	**12.1** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C2-Decalins	**16.8** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C3-Decalins	ND (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C4-Decalins	ND (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
Benzo(b)thiophene	**J 3.60** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C1-Benzo(b)thiophenes	**7.72** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C2-Benzo(b)thiophenes	**6.88** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C3-Benzo(b)thiophenes	**8.07** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C4-Benzo(b)thiophenes	**J 3.32** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-811-S1
Date Sampled: 06/19/23 09:20
Percent Solids: 74
Initial Volume: 5.18
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230018
ESS Laboratory Sample ID: F230018-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/22/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**75.5** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
2-Methylnaphthalene	**52.1** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
1-Methylnaphthalene	**43.3** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C1-Naphthalenes	**60.9** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C2-Naphthalenes	**91.0** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C3-Naphthalenes	**85.8** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C4-Naphthalenes	**49.7** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
Biphenyl	**15.9** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
Acenaphthylene	**212** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
Acenaphthene	**71.5** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
Dibenzofuran	**56.5** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
Fluorene	**66.3** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C1-Fluorenes	**45.1** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C2-Fluorenes	**72.7** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C3-Fluorenes	**135** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
Dibenzothiophene	**59.3** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C1-Dibenzothiophenes	**75.1** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C2-Dibenzothiophenes	**81.8** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C3-Dibenzothiophenes	**48.9** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C4-Dibenzothiophenes	**24.2** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
Phenanthrene	**982** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
Anthracene	**323** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C1-Phenanthrenes/Anthracenes	**541** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C2-Phenanthrenes/Anthracenes	**351** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C3-Phenanthrenes/Anthracenes	**148** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C4-Phenanthrenes/Anthracenes	**52.1** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
Retene	**20.1** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
Benzo(b)naphtho(2,1-d)thiophene	**149** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C0-Benzonaphthothiophenes	**293** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C1-Benzonaphthothiophenes	**162** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C2-Benzonaphthothiophenes	**103** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C3-Benzonaphthothiophenes	**56.5** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-811-S1
Date Sampled: 06/19/23 09:20
Percent Solids: 74
Initial Volume: 5.18
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230018
ESS Laboratory Sample ID: F230018-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/22/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**14.8** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
Fluoranthene	**2000** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
Pyrene	**1910** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C1-Fluoranthenes/Pyrenes	**831** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C2-Fluoranthenes/Pyrenes	**567** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C3-Fluoranthenes/Pyrenes	**240** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
Benzo(b)fluorene	**67.4** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
Benzo(c)fluorene	**33.9** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
2-Methylpyrene	**126** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
4-Methylpyrene	**103** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
1-Methylpyrene	**79.4** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
Benz(a)anthracene	**1150** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
Chrysene/triphenylene	**1180** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C1-Benzo(a)anthracenes/Chrysenes	**547** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C2-Benzo(a)anthracenes/Chrysenes	**284** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C3-Benzo(a)anthracenes/Chrysenes	**155** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C4-Benzo(a)anthracenes/Chrysenes	**84.6** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
Benzo(b)fluoranthene	**1020** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
Benzo(j/k)fluoranthene	**1020** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
Benzo(e)pyrene	**809** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
Benzo(a)pyrene	**1340** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
Perylene	**314** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
Indeno(1,2,3-cd)pyrene	**1010** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
Dibenzo(a,h)anthracene	**218** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
Benzo(g,h,i)perylene	**775** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
Coronene	**247** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
Tetramethyl lead	ND (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
Trimethylethyl lead	ND (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
Dimethyldiethyl lead	ND (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
Methyltriethyl lead	ND (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
Tetraethyl lead	ND (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
2,6,10-trimethyldodecane (1380)	**12.0** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-811-S1
Date Sampled: 06/19/23 09:20
Percent Solids: 74
Initial Volume: 5.18
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230018
ESS Laboratory Sample ID: F230018-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/22/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**25.8** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
2,6,10-trimethylpentadecane (1650)	**14.4** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C-17	**58.3** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
Pristane	**42.2** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
C-18	**B 53.8** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
Phytane	**17.8** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
Carbazole	**134** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
2,6-Dimethylnaphthalene	**20.1** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
2,3,5-Trimethylnaphthene	**6.78** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
4-Methyldibenzothiophene	**24.9** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
2/3-Methyldibenzothiophene	**23.6** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
1-Methyldibenzothiophene	**9.96** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
3-Methylphenanthrene	**116** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
2-Methylphenanthrene	**154** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
2-Methylanthracene	**56.6** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
4/9-Methylphenanthrene	**122** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201
1-Methylphenanthrene	**90.6** (5.25)	2.62	8270 Mod		1	IBM	06/28/23 4:22	F3F0012	FF32201

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*69 %*		*50-120*
Surrogate: Naphthalene-d8	*78 %*		*50-120*
Surrogate: Phenanthrene-d10	*83 %*		*50-120*
Surrogate: Perylene-d12	*89 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-811-S1
Date Sampled: 06/19/23 09:20
Percent Solids: 74

ESS Laboratory Work Order: F230018
ESS Laboratory Sample ID: F230018-05
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**10300** (482)		LK		1	CCP	06/28/23 13:54	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-811-S2
Date Sampled: 06/19/23 09:21
Percent Solids: 70
Initial Volume: 6.01
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230018
ESS Laboratory Sample ID: F230018-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/22/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**B 16.9** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C1-Benzene	**9.76** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C2-Benzenes	**10.3** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C3-Benzenes	**15.1** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C4-Benzenes	**9.83** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C5-Benzenes	ND (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
Methylcyclohexane	**16.5** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
Toluene	**11.9** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
Ethylbenzene	ND (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
m,p-Xylene	**9.78** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
Styrene	**5.75** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
o-Xylene	ND (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
Isopropylbenzene	ND (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
n-Propylbenzene	ND (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
1,3,5-Trimethylbenzene	**8.89** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
1,2,3-Trimethylbenzene	ND (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
1,2,4-Trimethylbenzene	ND (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
t-Butylbenzene	ND (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
sec-Butylbenzene	ND (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
p-Isopropyltoluene	ND (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
n-Butylbenzene	ND (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
trans-Decalin	ND (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
cis-Decalin	ND (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C1-Decalins	**J 3.95** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C2-Decalins	ND (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C3-Decalins	ND (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C4-Decalins	ND (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
Benzo(b)thiophene	ND (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C1-Benzo(b)thiophenes	**J 3.68** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C2-Benzo(b)thiophenes	**J 3.13** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C3-Benzo(b)thiophenes	**J 2.57** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C4-Benzo(b)thiophenes	ND (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-811-S2
Date Sampled: 06/19/23 09:21
Percent Solids: 70
Initial Volume: 6.01
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230018
ESS Laboratory Sample ID: F230018-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/22/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**6.92** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
2-Methylnaphthalene	**7.40** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
1-Methylnaphthalene	**7.18** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C1-Naphthalenes	**9.27** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C2-Naphthalenes	**20.4** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C3-Naphthalenes	**12.2** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C4-Naphthalenes	**6.72** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
Biphenyl	**5.01** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
Acenaphthylene	**14.1** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
Acenaphthene	ND (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
Dibenzofuran	ND (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
Fluorene	**J 2.97** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C1-Fluorenes	**5.67** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C2-Fluorenes	**10.2** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C3-Fluorenes	**10.8** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
Dibenzothiophene	**J 3.40** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C1-Dibenzothiophenes	**7.97** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C2-Dibenzothiophenes	**8.83** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C3-Dibenzothiophenes	**5.11** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C4-Dibenzothiophenes	ND (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
Phenanthrene	**30.6** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
Anthracene	**8.24** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C1-Phenanthrenes/Anthracenes	**32.6** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C2-Phenanthrenes/Anthracenes	**26.7** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C3-Phenanthrenes/Anthracenes	**11.3** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C4-Phenanthrenes/Anthracenes	**J 4.26** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
Retene	ND (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
Benzo(b)naphtho(2,1-d)thiophene	**5.35** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C0-Benzonaphthothiophenes	**9.23** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C1-Benzonaphthothiophenes	**10.7** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C2-Benzonaphthothiophenes	**10.6** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C3-Benzonaphthothiophenes	**7.70** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-811-S2
Date Sampled: 06/19/23 09:21
Percent Solids: 70
Initial Volume: 6.01
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230018
ESS Laboratory Sample ID: F230018-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/22/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
Fluoranthene	**42.0** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
Pyrene	**52.7** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C1-Fluoranthenes/Pyrenes	**46.3** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C2-Fluoranthenes/Pyrenes	**33.1** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C3-Fluoranthenes/Pyrenes	**19.6** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
Benzo(b)fluorene	**J 2.69** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
Benzo(c)fluorene	ND (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
2-Methylpyrene	**7.24** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
4-Methylpyrene	**9.03** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
1-Methylpyrene	**5.60** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
Benz(a)anthracene	**29.0** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
Chrysene/triphenylene	**41.7** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C1-Benzo(a)anthracenes/Chrysenes	**36.0** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C2-Benzo(a)anthracenes/Chrysenes	**22.1** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C3-Benzo(a)anthracenes/Chrysenes	**11.3** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C4-Benzo(a)anthracenes/Chrysenes	ND (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
Benzo(b)fluoranthene	**32.4** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
Benzo(j/k)fluoranthene	**30.9** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
Benzo(e)pyrene	**51.9** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
Benzo(a)pyrene	**45.1** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
Perylene	**8.68** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
Indeno(1,2,3-cd)pyrene	**40.6** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
Dibenzo(a,h)anthracene	**10.1** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
Benzo(g,h,i)perylene	**44.9** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
Coronene	**13.1** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
Tetramethyl lead	ND (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
Trimethylethyl lead	ND (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
Dimethyldiethyl lead	ND (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
Methyltriethyl lead	ND (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
Tetraethyl lead	ND (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
2,6,10-trimethyldodecane (1380)	**J 2.55** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-811-S2
Date Sampled: 06/19/23 09:21
Percent Solids: 70
Initial Volume: 6.01
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230018
ESS Laboratory Sample ID: F230018-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/22/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**7.14** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
2,6,10-trimethylpentadecane (1650)	**J 4.49** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C-17	**B 23.3** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
Pristane	**10.3** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
C-18	**B 21.1** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
Phytane	**5.23** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
Carbazole	**J 4.67** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
2,6-Dimethylnaphthalene	**5.69** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
2,3,5-Trimethylnaphthene	ND (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
4-Methyldibenzothiophene	**J 3.46** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
2/3-Methyldibenzothiophene	**J 2.62** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
1-Methyldibenzothiophene	ND (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
3-Methylphenanthrene	**7.55** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
2-Methylphenanthrene	**10.2** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
2-Methylanthracene	**J 2.49** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
4/9-Methylphenanthrene	**7.12** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201
1-Methylphenanthrene	**J 4.61** (4.78)	2.39	8270 Mod		1	IBM	06/28/23 5:43	F3F0012	FF32201

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*70 %*		*50-120*
Surrogate: Naphthalene-d8	*75 %*		*50-120*
Surrogate: Phenanthrene-d10	*80 %*		*50-120*
Surrogate: Perylene-d12	*85 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-811-S2
Date Sampled: 06/19/23 09:21
Percent Solids: 70

ESS Laboratory Work Order: F230018
ESS Laboratory Sample ID: F230018-06
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**50800** (481)		LK		1	CCP	06/28/23 14:10	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230018

Quality Control Data

Classical Chemistry

Batch DF32734 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	500	mg/kg							
Total Organic Carbon (2)	ND	500	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230018

Quality Control Data

Classical Chemistry

Batch DF32734 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	10000	500	mg/kg	10010		100	80-120			
Total Organic Carbon (2)	10000	500	mg/kg	10010		100	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230018

Quality Control Data

Classical Chemistry

Batch DF32734 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9970	500	mg/kg	10010		100	80-120	0.5	25	
Total Organic Carbon (2)	9890	500	mg/kg	10010		99	80-120	2	25	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230018

Quality Control Data

Alkylated PAHs

Batch FF32201 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	8.85	4.00	ug/Kg wet							
C1-Benzene	ND	4.00	ug/Kg wet							
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	2.34	4.00	ug/Kg wet							J
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	3.68	4.00	ug/Kg wet							J
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230018

Quality Control Data

Alkylated PAHs

Batch FF32201 - 3570

C1-Fluorenes	ND	4.00	ug/Kg wet
C2-Fluorenes	ND	4.00	ug/Kg wet
C3-Fluorenes	ND	4.00	ug/Kg wet
Dibenzothiophene	ND	4.00	ug/Kg wet
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet
Phenanthrene	ND	4.00	ug/Kg wet
Anthracene	ND	4.00	ug/Kg wet
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
Retene	ND	4.00	ug/Kg wet
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
Fluoranthene	ND	4.00	ug/Kg wet
Pyrene	ND	4.00	ug/Kg wet
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
Benzo(b)fluorene	ND	4.00	ug/Kg wet
Benzo(c)fluorene	ND	4.00	ug/Kg wet
2-Methylpyrene	ND	4.00	ug/Kg wet
4-Methylpyrene	ND	4.00	ug/Kg wet
1-Methylpyrene	ND	4.00	ug/Kg wet
Benz(a)anthracene	ND	4.00	ug/Kg wet
Chrysene/triphenylene	ND	4.00	ug/Kg wet
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet
Benzo(e)pyrene	ND	4.00	ug/Kg wet
Benzo(a)pyrene	ND	4.00	ug/Kg wet
Perylene	ND	4.00	ug/Kg wet
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet
Coronene	ND	4.00	ug/Kg wet
Tetramethyl lead	ND	4.00	ug/Kg wet
Trimethylethyl lead	ND	4.00	ug/Kg wet

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230018

Quality Control Data

Alkylated PAHs

Batch FF32201 - 3570							
Dimethyldiethyl lead	ND	4.00	ug/Kg wet				
Methyltriethyl lead	ND	4.00	ug/Kg wet				
Tetraethyl lead	ND	4.00	ug/Kg wet				
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet				
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet				
2,6,10-trimethylpentadecane (1650)	ND	4.00	ug/Kg wet				
C-17	5.03	4.00	ug/Kg wet				
Pristane	2.35	4.00	ug/Kg wet				J
C-18	5.53	4.00	ug/Kg wet				
Phytane	ND	4.00	ug/Kg wet				
Carbazole	ND	4.00	ug/Kg wet				
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet				
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet				
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
3-Methylphenanthrene	ND	4.00	ug/Kg wet				
2-Methylphenanthrene	ND	4.00	ug/Kg wet				
2-Methylanthracene	ND	4.00	ug/Kg wet				
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet				
1-Methylphenanthrene	ND	4.00	ug/Kg wet				
Surrogate: Toluene-D8	*299*		ug/Kg wet	*400.0*	*75*	*50-120*	
Surrogate: Naphthalene-d8	*315*		ug/Kg wet	*400.0*	*79*	*50-120*	
Surrogate: Phenanthrene-d10	*336*		ug/Kg wet	*400.0*	*84*	*50-120*	
Surrogate: Perylene-d12	*346*		ug/Kg wet	*400.0*	*86*	*50-120*	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230018

Quality Control Data

Alkylated PAHs

Batch FF32201 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	280	4.00	ug/Kg wet	400.0		70	60-130			
Methylcyclohexane	213	4.00	ug/Kg wet	400.0		53	60-130			B-
Toluene	279	4.00	ug/Kg wet	400.0		70	60-130			
Ethylbenzene	304	4.00	ug/Kg wet	400.0		76	60-130			
m,p-Xylene	300	4.00	ug/Kg wet	400.0		75	60-130			
Styrene	284	4.00	ug/Kg wet	400.0		71	60-130			
o-Xylene	312	4.00	ug/Kg wet	400.0		78	60-130			
Isopropylbenzene	307	4.00	ug/Kg wet	400.0		77	60-130			
n-Propylbenzene	309	4.00	ug/Kg wet	400.0		77	60-130			
1,3,5-Trimethylbenzene	318	4.00	ug/Kg wet	400.0		79	60-130			
1,2,3-Trimethylbenzene	316	4.00	ug/Kg wet	400.0		79	60-130			
1,2,4-Trimethylbenzene	316	4.00	ug/Kg wet	400.0		79	60-130			
t-Butylbenzene	311	4.00	ug/Kg wet	400.0		78	60-130			
sec-Butylbenzene	312	4.00	ug/Kg wet	400.0		78	60-130			
p-Isopropyltoluene	319	4.00	ug/Kg wet	400.0		80	60-130			
n-Butylbenzene	310	4.00	ug/Kg wet	400.0		78	60-130			
trans-Decalin	293	4.00	ug/Kg wet	400.0		73	60-130			
cis-Decalin	295	4.00	ug/Kg wet	400.0		74	60-130			
Benzo(b)thiophene	300	4.00	ug/Kg wet	400.0		75	60-130			
Naphthalene	300	4.00	ug/Kg wet	400.0		75	60-130			
2-Methylnaphthalene	300	4.00	ug/Kg wet	400.0		75	60-130			
1-Methylnaphthalene	297	4.00	ug/Kg wet	400.0		74	60-130			
Biphenyl	277	4.00	ug/Kg wet	400.0		69	60-130			
Acenaphthylene	327	4.00	ug/Kg wet	400.0		82	60-130			
Acenaphthene	318	4.00	ug/Kg wet	400.0		80	60-130			
Dibenzofuran	315	4.00	ug/Kg wet	400.0		79	60-130			
Fluorene	315	4.00	ug/Kg wet	400.0		79	60-130			
Dibenzothiophene	311	4.00	ug/Kg wet	400.0		78	60-130			
Phenanthrene	304	4.00	ug/Kg wet	400.0		76	60-130			
Anthracene	329	4.00	ug/Kg wet	400.0		82	60-130			
Retene	351	4.00	ug/Kg wet	400.0		88	60-130			
Benzo(b)naphtho(2,1-d)thiophene	346	4.00	ug/Kg wet	400.0		86	60-130			
Fluoranthene	334	4.00	ug/Kg wet	400.0		83	60-130			
Pyrene	337	4.00	ug/Kg wet	400.0		84	60-130			
Benz(a)anthracene	367	4.00	ug/Kg wet	400.0		92	60-130			
Chrysene/triphenylene	350	4.00	ug/Kg wet	400.0		87	60-130			
Benzo(b)fluoranthene	342	4.00	ug/Kg wet	400.0		85	60-130			
Benzo(j/k)fluoranthene	350	4.00	ug/Kg wet	400.0		88	60-130			
Benzo(e)pyrene	323	4.00	ug/Kg wet	400.0		81	60-130			
Benzo(a)pyrene	354	4.00	ug/Kg wet	400.0		89	60-130			
Perylene	353	4.00	ug/Kg wet	400.0		88	60-130			
Indeno(1,2,3-cd)pyrene	392	4.00	ug/Kg wet	400.0		98	60-130			
Dibenzo(a,h)anthracene	366	4.00	ug/Kg wet	400.0		91	60-130			
Benzo(g,h,i)perylene	338	4.00	ug/Kg wet	400.0		85	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230018

Quality Control Data

Alkylated PAHs

Batch FF32201 - 3570						
Coronene	356	4.00	ug/Kg wet	400.0	89	60-130
Surrogate: Toluene-D8	*297*		ug/Kg wet	*400.0*	*74*	*50-120*
Surrogate: Naphthalene-d8	*310*		ug/Kg wet	*400.0*	*77*	*50-120*
Surrogate: Phenanthrene-d10	*332*		ug/Kg wet	*400.0*	*83*	*50-120*
Surrogate: Perylene-d12	*344*		ug/Kg wet	*400.0*	*86*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230018

Quality Control Data

Alkylated PAHs

Batch FF32201 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	ND	4.00	ug/Kg wet				60-130			
Methylcyclohexane	ND	4.00	ug/Kg wet				60-130			
Toluene	ND	4.00	ug/Kg wet				60-130			
Ethylbenzene	ND	4.00	ug/Kg wet				60-130			
m,p-Xylene	ND	4.00	ug/Kg wet				60-130			
Styrene	ND	4.00	ug/Kg wet				60-130			
o-Xylene	ND	4.00	ug/Kg wet				60-130			
Isopropylbenzene	ND	4.00	ug/Kg wet				60-130			
n-Propylbenzene	ND	4.00	ug/Kg wet				60-130			
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet				60-130			
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet				60-130			
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet				60-130			
t-Butylbenzene	ND	4.00	ug/Kg wet				60-130			
sec-Butylbenzene	ND	4.00	ug/Kg wet				60-130			
p-Isopropyltoluene	ND	4.00	ug/Kg wet				60-130			
n-Butylbenzene	ND	4.00	ug/Kg wet				60-130			
trans-Decalin	ND	4.00	ug/Kg wet				60-130			
cis-Decalin	ND	4.00	ug/Kg wet				60-130			
Benzo(b)thiophene	ND	4.00	ug/Kg wet				60-130			
Naphthalene	ND	4.00	ug/Kg wet				60-130			
2-Methylnaphthalene	ND	4.00	ug/Kg wet				60-130			
1-Methylnaphthalene	ND	4.00	ug/Kg wet				60-130			
Biphenyl	ND	4.00	ug/Kg wet				60-130			
Acenaphthylene	ND	4.00	ug/Kg wet				60-130			
Acenaphthene	ND	4.00	ug/Kg wet				60-130			
Dibenzofuran	ND	4.00	ug/Kg wet				60-130			
Fluorene	ND	4.00	ug/Kg wet				60-130			
Dibenzothiophene	ND	4.00	ug/Kg wet				60-130			
Phenanthrene	ND	4.00	ug/Kg wet				60-130			
Anthracene	ND	4.00	ug/Kg wet				60-130			
Retene	ND	4.00	ug/Kg wet				60-130			
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet				60-130			
Fluoranthene	ND	4.00	ug/Kg wet				60-130			
Pyrene	ND	4.00	ug/Kg wet				60-130			
Benz(a)anthracene	ND	4.00	ug/Kg wet				60-130			
Chrysene/triphenylene	ND	4.00	ug/Kg wet				60-130			
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet				60-130			
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet				60-130			
Benzo(e)pyrene	ND	4.00	ug/Kg wet				60-130			
Benzo(a)pyrene	ND	4.00	ug/Kg wet				60-130			
Perylene	ND	4.00	ug/Kg wet				60-130			
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet				60-130			
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet				60-130			
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet				60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230018

Quality Control Data

Alkylated PAHs

Batch FF32201 - 3570						
Coronene	ND	4.00	ug/Kg wet			60-130
Tetraethyl lead	370	4.00	ug/Kg wet	400.0	92	60-130
Surrogate: Toluene-D8	*301*		ug/Kg wet	*400.0*	*75*	*50-120*
Surrogate: Naphthalene-d8	*316*		ug/Kg wet	*400.0*	*79*	*50-120*
Surrogate: Phenanthrene-d10	*332*		ug/Kg wet	*400.0*	*83*	*50-120*
Surrogate: Perylene-d12	*342*		ug/Kg wet	*400.0*	*85*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230018

Quality Control Data

Alkylated PAHs

Batch FF32201 - 3570

Duplicate **Source: F230018-03** **D+**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	93.4	4.61	ug/Kg dry		46.6			67	50	
C1-Benzene	52.3	4.61	ug/Kg dry		24.7			72	50	
C2-Benzenes	31.1	4.61	ug/Kg dry		20.1			43	50	
C3-Benzenes	21.3	4.61	ug/Kg dry		13.0			49	50	
C4-Benzenes	18.3	4.61	ug/Kg dry		13.1			33	50	
C5-Benzenes	14.4	4.61	ug/Kg dry		10.3			34	50	
Methylcyclohexane	15.2	4.61	ug/Kg dry		9.78			43	50	
Toluene	64.6	4.61	ug/Kg dry		30.2			73	50	
Ethylbenzene	5.97	4.61	ug/Kg dry		3.23			59	50	
m,p-Xylene	37.0	4.61	ug/Kg dry		21.5			53	50	
Styrene	25.6	4.61	ug/Kg dry		15.7			48	50	
o-Xylene	5.85	4.61	ug/Kg dry		3.25			57	50	
Isopropylbenzene	ND	4.61	ug/Kg dry		ND				50	
n-Propylbenzene	4.15	4.61	ug/Kg dry		ND				50	J
1,3,5-Trimethylbenzene	4.87	4.61	ug/Kg dry		2.80			54	50	
1,2,3-Trimethylbenzene	2.63	4.61	ug/Kg dry		ND				50	J
1,2,4-Trimethylbenzene	6.17	4.61	ug/Kg dry		3.54			54	50	
t-Butylbenzene	ND	4.61	ug/Kg dry		ND				50	
sec-Butylbenzene	ND	4.61	ug/Kg dry		ND				50	
p-Isopropyltoluene	ND	4.61	ug/Kg dry		ND				50	
n-Butylbenzene	6.97	4.61	ug/Kg dry		5.26			28	50	
trans-Decalin	ND	4.61	ug/Kg dry		ND				50	
cis-Decalin	ND	4.61	ug/Kg dry		ND				50	
C1-Decalins	5.91	4.61	ug/Kg dry		5.17			13	50	
C2-Decalins	10.5	4.61	ug/Kg dry		ND				50	
C3-Decalins	ND	4.61	ug/Kg dry		ND				50	
C4-Decalins	ND	4.61	ug/Kg dry		ND				50	
Benzo(b)thiophene	23.8	4.61	ug/Kg dry		8.85			91	50	
C1-Benzo(b)thiophenes	14.8	4.61	ug/Kg dry		7.42			66	50	
C2-Benzo(b)thiophenes	17.7	4.61	ug/Kg dry		10.1			54	50	
C3-Benzo(b)thiophenes	14.8	4.61	ug/Kg dry		9.61			43	50	
C4-Benzo(b)thiophenes	6.83	4.61	ug/Kg dry		5.26			26	50	
Naphthalene	481	4.61	ug/Kg dry		123			119	50	
2-Methylnaphthalene	188	4.61	ug/Kg dry		28.0			148	50	
1-Methylnaphthalene	135	4.61	ug/Kg dry		15.3			159	50	
C1-Naphthalenes	208	4.61	ug/Kg dry		28.1			152	50	
C2-Naphthalenes	265	4.61	ug/Kg dry		58.1			128	50	
C3-Naphthalenes	282	4.61	ug/Kg dry		96.7			98	50	
C4-Naphthalenes	167	4.61	ug/Kg dry		64.3			89	50	
Biphenyl	72.6	4.61	ug/Kg dry		12.3			142	50	
Acenaphthylene	979	4.61	ug/Kg dry		258			116	50	
Acenaphthene	181	4.61	ug/Kg dry		25.6			150	50	
Dibenzofuran	498	4.61	ug/Kg dry		53.1			161	50	
Fluorene	554	4.61	ug/Kg dry		65.2			158	50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230018

Quality Control Data

Alkylated PAHs

Batch FF32201 - 3570

C1-Fluorenes	246	4.61	ug/Kg dry	59.5	122	50
C2-Fluorenes	277	4.61	ug/Kg dry	84.7	106	50
C3-Fluorenes	480	4.61	ug/Kg dry	155	102	50
Dibenzothiophene	487	4.61	ug/Kg dry	86.1	140	50
C1-Dibenzothiophenes	345	4.61	ug/Kg dry	95.3	113	50
C2-Dibenzothiophenes	261	4.61	ug/Kg dry	86.1	101	50
C3-Dibenzothiophenes	129	4.61	ug/Kg dry	45.9	95	50
C4-Dibenzothiophenes	58.3	4.61	ug/Kg dry	24.1	83	50
Phenanthrene	7830	4.61	ug/Kg dry	1610	132	50
Anthracene	3060	4.61	ug/Kg dry	573	137	50
C1-Phenanthrenes/Anthracenes	3680	4.61	ug/Kg dry	949	118	50
C2-Phenanthrenes/Anthracenes	1750	4.61	ug/Kg dry	536	106	50
C3-Phenanthrenes/Anthracenes	617	4.61	ug/Kg dry	201	102	50
C4-Phenanthrenes/Anthracenes	169	4.61	ug/Kg dry	60.3	95	50
Retene	31.4	4.61	ug/Kg dry	23.4	29	50
Benzo(b)naphtho(2,1-d)thiophene	881	4.61	ug/Kg dry	284	103	50
C0-Benzonaphthothiophenes	1780	4.61	ug/Kg dry	568	103	50
C1-Benzonaphthothiophenes	599	4.61	ug/Kg dry	204	98	50
C2-Benzonaphthothiophenes	275	4.61	ug/Kg dry	99.3	94	50
C3-Benzonaphthothiophenes	163	4.61	ug/Kg dry	57.9	95	50
C4-Benzonaphthothiophenes	30.9	4.61	ug/Kg dry	12.3	86	50
Fluoranthene	18300	92.3	ug/Kg dry	4540	121	50
Pyrene	15800	92.3	ug/Kg dry	4010	119	50
C1-Fluoranthenes/Pyrenes	4650	4.61	ug/Kg dry	1410	107	50
C2-Fluoranthenes/Pyrenes	3040	4.61	ug/Kg dry	985	102	50
C3-Fluoranthenes/Pyrenes	1060	4.61	ug/Kg dry	377	95	50
Benzo(b)fluorene	430	4.61	ug/Kg dry	112	117	50
Benzo(c)fluorene	171	4.61	ug/Kg dry	44.0	118	50
2-Methylpyrene	718	4.61	ug/Kg dry	229	103	50
4-Methylpyrene	501	4.61	ug/Kg dry	163	102	50
1-Methylpyrene	402	4.61	ug/Kg dry	128	104	50
Benz(a)anthracene	7910	4.61	ug/Kg dry	2730	97	50
Chrysene/triphenylene	7130	4.61	ug/Kg dry	2470	97	50
C1-Benzo(a)anthracenes/Chrysenes	2780	4.61	ug/Kg dry	934	99	50
C2-Benzo(a)anthracenes/Chrysenes	1150	4.61	ug/Kg dry	398	97	50
C3-Benzo(a)anthracenes/Chrysenes	612	4.61	ug/Kg dry	217	95	50
C4-Benzo(a)anthracenes/Chrysenes	292	4.61	ug/Kg dry	104	95	50
Benzo(b)fluoranthene	6090	4.61	ug/Kg dry	2130	96	50
Benzo(j/k)fluoranthene	5850	4.61	ug/Kg dry	2190	91	50
Benzo(e)pyrene	4700	4.61	ug/Kg dry	1680	95	50
Benzo(a)pyrene	8200	4.61	ug/Kg dry	2950	94	50
Perylene	2400	4.61	ug/Kg dry	821	98	50
Indeno(1,2,3-cd)pyrene	6080	4.61	ug/Kg dry	2200	94	50
Dibenzo(a,h)anthracene	1140	4.61	ug/Kg dry	437	89	50
Benzo(g,h,i)perylene	4690	4.61	ug/Kg dry	1690	94	50
Coronene	1430	4.61	ug/Kg dry	504	96	50
Tetramethyl lead	ND	4.61	ug/Kg dry	ND		50
Trimethylethyl lead	ND	4.61	ug/Kg dry	ND		50

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230018

Quality Control Data

Alkylated PAHs

Batch FF32201 - 3570								
Dimethyldiethyl lead	ND	4.61	ug/Kg dry		ND			50
Methyltriethyl lead	ND	4.61	ug/Kg dry		ND			50
Tetraethyl lead	ND	4.61	ug/Kg dry		ND			50
2,6,10-trimethyldodecane (1380)	4.89	4.61	ug/Kg dry		5.40		10	50
2,6,10-trimethyltridecane (1470)	12.3	4.61	ug/Kg dry		12.4		0.3	50
2,6,10-trimethylpentadecane (1650)	15.2	4.61	ug/Kg dry		9.55		46	50
C-17	84.0	4.61	ug/Kg dry		48.7		53	50
Pristane	22.0	4.61	ug/Kg dry		17.6		22	50
C-18	64.3	4.61	ug/Kg dry		50.3		24	50
Phytane	16.0	4.61	ug/Kg dry		12.4		25	50
Carbazole	677	4.61	ug/Kg dry		91.0		153	50
2,6-Dimethylnaphthalene	65.4	4.61	ug/Kg dry		12.8		135	50
2,3,5-Trimethylnaphthene	23.8	4.61	ug/Kg dry		9.16		89	50
4-Methyldibenzothiophene	83.2	4.61	ug/Kg dry		24.7		109	50
2/3-Methyldibenzothiophene	113	4.61	ug/Kg dry		29.4		118	50
1-Methyldibenzothiophene	32.4	4.61	ug/Kg dry		11.8		93	50
3-Methylphenanthrene	801	4.61	ug/Kg dry		198		121	50
2-Methylphenanthrene	1070	4.61	ug/Kg dry		271		119	50
2-Methylanthracene	551	4.61	ug/Kg dry		133		122	50
4/9-Methylphenanthrene	692	4.61	ug/Kg dry		190		114	50
1-Methylphenanthrene	543	4.61	ug/Kg dry		148		115	50
Surrogate: Toluene-D8	*331*		ug/Kg dry	*461.3*		*72*	*50-120*	
Surrogate: Naphthalene-d8	*354*		ug/Kg dry	*461.3*		*77*	*50-120*	
Surrogate: Phenanthrene-d10	*368*		ug/Kg dry	*461.3*		*80*	*50-120*	
Surrogate: Perylene-d12	*423*		ug/Kg dry	*461.3*		*92*	*50-120*	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F230018

Notes and Definitions

U	Analyte included in the analysis, but not detected
J	Reported between MDL and MRL
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
B-	Blank Spike recovery is below lower control limit (B-).
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230018

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

F230018

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) ~~23F0700~~

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman
781-721-4091 rhoffman@geiconsultants.com

Send Report to: Ryan Hoffman
labdata@geiconsultants.com

Page 1 of 1

Preservative: None | None

Analysis: Parent and Alkylated MAHs * PAHs 8270* | TOCs by Lloyd-Kahn

MCP PRESUMPTIVE CERTAINTY AND MCP ANALYTICAL METHODS REQUIRED: YES NO

STATE AND FEDERAL REGULATORY REQUIREMENTS/REPORT LIMITS

State/Federal Program: MA 401WQC Other _____ NH RI CT NY ME

MA MCP Criteria are Method 1 S-1 and GW-2/GW-3. Circle if GW-1 is required.

Sample Handling

Samples Field Filtered: YES NO NA

Sampled Shipped With Ice: YES NO

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Parent and Alkylated MAHs * PAHs 8270*	TOCs by Lloyd-Kahn	Sample Specific Remarks
1	1804576-817-S1	6/19/2023	13:30	SOIL	1	JES	X	X	
2	1804576-819-S1	6/19/2023	14:00	SOIL	1	JES	X	X	
3	1804576-810-S1	6/19/2023	9:15	SOIL	1	JES	X	X	
4	1804576-810-S2	6/19/2023	9:16	SOIL	1	JES	X	X	
5	1804576-811-S1	6/19/2023	9:20	SOIL	1	JES	X	X	
6	1804576-811-S2	6/19/2023	9:21	SOIL	1	JES	X	X	

Relinquished by sampler (signature)	Date	Time	Received by (signature)
1. [signature]	6/19/2023	16:00	1. GEI SAMPLE FRIDGE
2. GEI Fridge	6/20/23	1246	2. [signature]
3. [signature]	6/20/23	1246	3. [signature] 6/20/23 1246
4. [signature] -3.8 on ice	6/20/23	1837	4. [signature]
5.			5.

Turnaround Time (Business days):

5-Day X 4-Day ____ 3-Day ____
2-Day ____ 1-Day ____ Other ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

** Parent and Alkylated MAHs and PAHs (34) by GC/MS/SIM/SCAN

Sample Matrix Abbreviations: SO = Soil GW = Groundwater SW = Surface Water SD = Sediment CO = Concrete PC = Paint Chip CLK = Caulk

ESS Laboratory Sample and Cooler Receipt Checklist

F230018

Client: GEI Consultants, Inc. - TB

Shipped/Delivered Via: ESS Courier

ESS Project ID: 23F0700
Date Received: 6/20/2023
Project Due Date: 6/27/2023
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 3.8 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / (NA)
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By/Acid Lot#:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / (No)
    Who was contacted? Date: Time: By:

Resolution:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1	444441	Yes	N/A	Yes	8 oz jar	NP	
2	444442	Yes	N/A	Yes	8 oz jar	NP	
3	444443	Yes	N/A	Yes	8 oz jar	NP	
4	444444	Yes	N/A	Yes	8 oz jar	NP	
5	444445	Yes	N/A	Yes	8 oz jar	NP	
6	444446	Yes	N/A	Yes	8 oz jar	NP	

2nd Review

Were all containers scanned into storage/lab? Initials BB
Are barcode labels on correct containers? (Yes) / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / (NA)
Are all Hex Chrome stickers attached? Yes / No / (NA)
Are all QC stickers attached? Yes / No / (NA)
Are VOA stickers attached if bubbles noted? Yes / No / (NA)

Completed By:
Reviewed

Date & Time: 6/20/23 19:10

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

By: [signature]

ESS Project ID: 23F0700

Date Received: 6/20/2023

Date & Time: 6/20/23 1941

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: F230019

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 2:14 pm, Jul 10, 2023

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses

ESS - Cranston, RI	TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230019

SAMPLE RECEIPT

The following samples were received on June 22, 2023 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F230019-01	1804576-820-S1	Soil	8270 Mod, LK
F230019-02	1804576-823-S1	Soil	8270 Mod, LK
F230019-03	1804576-823-S2	Soil	8270 Mod, LK
F230019-04	1804576-824-S1	Soil	8270 Mod, LK
F230019-05	1804576-829-S1	Soil	8270 Mod, LK
F230019-06	1804576-827-S1	Soil	8270 Mod, LK
F230019-07	1804576-827-S2	Soil	8270 Mod, LK
F230019-08	1804576-818-S1	Soil	8270 Mod, LK
F230019-09	1804576-818-S2	Soil	8270 Mod, LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230019

PROJECT NARRATIVE

Alkylated PAHs

F230019-04	**Present in Method Blank (B).**
	C-18
F230019-06	**Present in Method Blank (B).**
	Benzene , C-17 , C-18
F230019-07	**Present in Method Blank (B).**
	Benzene , C-17 , C-18
F230019-08	**Present in Method Blank (B).**
	Benzene
F230019-09	**Present in Method Blank (B).**
	Benzene , C-17 , C-18
F3F0012-CCV2	**Continuing Calibration %Diff/Drift is above control limit (CD+).**
	Tetraethyl lead (31% @ 25%)
F3F0012-CCV4	**Continuing Calibration %Diff/Drift is above control limit (CD+).**
	Tetraethyl lead (26% @ 25%)
FF32603-BS2	**Blank Spike recovery is below lower control limit (B-).**
	Methylcyclohexane (59% @ 60-130%)
FF32603-DUP2	**Relative percent difference for duplicate is outside of criteria (D+).**
	Retene (164% @ 50%)

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230019

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-820-S1
Date Sampled: 06/20/23 10:00
Percent Solids: 40
Initial Volume: 5.97
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**366** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C1-Benzene	**294** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C2-Benzenes	**548** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C3-Benzenes	**75.0** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C4-Benzenes	**68.1** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C5-Benzenes	**56.3** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
Methylcyclohexane	**8.59** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
Toluene	**373** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
Ethylbenzene	**39.4** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
m,p-Xylene	**782** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
Styrene	**45.5** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
o-Xylene	**26.4** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
Isopropylbenzene	ND (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
n-Propylbenzene	**34.8** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
1,3,5-Trimethylbenzene	**J 6.91** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
1,2,3-Trimethylbenzene	**15.8** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
1,2,4-Trimethylbenzene	**18.4** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
t-Butylbenzene	ND (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
sec-Butylbenzene	ND (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
p-Isopropyltoluene	**18.9** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
n-Butylbenzene	**48.2** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
trans-Decalin	**J 6.97** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
cis-Decalin	ND (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C1-Decalins	**27.9** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C2-Decalins	**26.6** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C3-Decalins	ND (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C4-Decalins	ND (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
Benzo(b)thiophene	**13.6** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C1-Benzo(b)thiophenes	**32.6** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C2-Benzo(b)thiophenes	**47.9** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C3-Benzo(b)thiophenes	**24.0** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C4-Benzo(b)thiophenes	**9.78** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-820-S1
Date Sampled: 06/20/23 10:00
Percent Solids: 40
Initial Volume: 5.97
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**79.6** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
2-Methylnaphthalene	**40.2** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
1-Methylnaphthalene	**30.0** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C1-Naphthalenes	**46.2** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C2-Naphthalenes	**190** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C3-Naphthalenes	**121** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C4-Naphthalenes	**77.8** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
Biphenyl	**32.3** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
Acenaphthylene	**254** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
Acenaphthene	**154** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
Dibenzofuran	**57.5** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
Fluorene	**120** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C1-Fluorenes	**75.5** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C2-Fluorenes	**39.4** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C3-Fluorenes	**227** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
Dibenzothiophene	**104** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C1-Dibenzothiophenes	**100** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C2-Dibenzothiophenes	**106** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C3-Dibenzothiophenes	**81.6** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C4-Dibenzothiophenes	**54.9** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
Phenanthrene	**1420** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
Anthracene	**589** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C1-Phenanthrenes/Anthracenes	**788** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C2-Phenanthrenes/Anthracenes	**447** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C3-Phenanthrenes/Anthracenes	**220** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C4-Phenanthrenes/Anthracenes	**105** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
Retene	**157** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
Benzo(b)naphtho(2,1-d)thiophene	**372** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C0-Benzonaphthothiophenes	**640** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C1-Benzonaphthothiophenes	**271** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C2-Benzonaphthothiophenes	**216** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C3-Benzonaphthothiophenes	**193** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-820-S1
Date Sampled: 06/20/23 10:00
Percent Solids: 40
Initial Volume: 5.97
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**111** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
Fluoranthene	**4480** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
Pyrene	**3810** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C1-Fluoranthenes/Pyrenes	**1500** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C2-Fluoranthenes/Pyrenes	**1040** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C3-Fluoranthenes/Pyrenes	**364** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
Benzo(b)fluorene	**194** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
Benzo(c)fluorene	**89.0** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
2-Methylpyrene	**202** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
4-Methylpyrene	**163** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
1-Methylpyrene	**128** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
Benz(a)anthracene	**2060** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
Chrysene/triphenylene	**2400** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C1-Benzo(a)anthracenes/Chrysenes	**835** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C2-Benzo(a)anthracenes/Chrysenes	**422** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C3-Benzo(a)anthracenes/Chrysenes	**240** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C4-Benzo(a)anthracenes/Chrysenes	**136** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
Benzo(b)fluoranthene	**2020** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
Benzo(j/k)fluoranthene	**2000** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
Benzo(e)pyrene	**1660** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
Benzo(a)pyrene	**2460** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
Perylene	**739** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
Indeno(1,2,3-cd)pyrene	**1940** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
Dibenzo(a,h)anthracene	**392** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
Benzo(g,h,i)perylene	**1570** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
Coronene	**454** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
Tetramethyl lead	ND (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
Trimethylethyl lead	ND (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
Dimethyldiethyl lead	ND (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
Methyltriethyl lead	ND (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
Tetraethyl lead	ND (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
2,6,10-trimethyldodecane (1380)	**30.4** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-820-S1
Date Sampled: 06/20/23 10:00
Percent Solids: 40
Initial Volume: 5.97
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**105** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
2,6,10-trimethylpentadecane (1650)	**29.3** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C-17	**333** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
Pristane	**60.4** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
C-18	**97.7** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
Phytane	**76.7** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
Carbazole	**161** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
2,6-Dimethylnaphthalene	**103** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
2,3,5-Trimethylnaphthene	**J 6.52** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
4-Methyldibenzothiophene	**30.8** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
2/3-Methyldibenzothiophene	**33.3** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
1-Methyldibenzothiophene	**14.6** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
3-Methylphenanthrene	**160** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
2-Methylphenanthrene	**191** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
2-Methylanthracene	**106** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
4/9-Methylphenanthrene	**175** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603
1-Methylphenanthrene	**126** (8.28)	4.14	8270 Mod		1	IBM	07/04/23 10:37	F3G0001	FF32603

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*65 %*		*50-120*
Surrogate: Naphthalene-d8	*71 %*		*50-120*
Surrogate: Phenanthrene-d10	*70 %*		*50-120*
Surrogate: Perylene-d12	*75 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-820-S1
Date Sampled: 06/20/23 10:00
Percent Solids: 40

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**38900** (465)		LK		1	CCP	06/28/23 15:38	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-823-S1
Date Sampled: 06/20/23 10:15
Percent Solids: 40
Initial Volume: 5.59
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**309** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C1-Benzene	**296** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C2-Benzenes	**530** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C3-Benzenes	**189** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C4-Benzenes	**122** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C5-Benzenes	**93.8** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
Methylcyclohexane	**30.6** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
Toluene	**372** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
Ethylbenzene	**80.8** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
m,p-Xylene	**707** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
Styrene	**354** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
o-Xylene	**27.2** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
Isopropylbenzene	**139** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
n-Propylbenzene	**74.4** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
1,3,5-Trimethylbenzene	**16.7** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
1,2,3-Trimethylbenzene	**17.5** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
1,2,4-Trimethylbenzene	**30.2** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
t-Butylbenzene	ND (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
sec-Butylbenzene	ND (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
p-Isopropyltoluene	**27.8** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
n-Butylbenzene	**114** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
trans-Decalin	**11.4** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
cis-Decalin	ND (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C1-Decalins	**37.6** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C2-Decalins	**39.5** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C3-Decalins	**30.1** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C4-Decalins	**44.6** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
Benzo(b)thiophene	**14.5** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C1-Benzo(b)thiophenes	**56.7** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C2-Benzo(b)thiophenes	**55.3** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C3-Benzo(b)thiophenes	**27.9** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C4-Benzo(b)thiophenes	**12.4** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-823-S1
Date Sampled: 06/20/23 10:15
Percent Solids: 40
Initial Volume: 5.59
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**159** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
2-Methylnaphthalene	**91.8** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
1-Methylnaphthalene	**67.5** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C1-Naphthalenes	**103** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C2-Naphthalenes	**248** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C3-Naphthalenes	**182** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C4-Naphthalenes	**109** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
Biphenyl	**58.1** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
Acenaphthylene	**587** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
Acenaphthene	**251** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
Dibenzofuran	**133** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
Fluorene	**219** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C1-Fluorenes	**124** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C2-Fluorenes	**126** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C3-Fluorenes	**339** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
Dibenzothiophene	**273** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C1-Dibenzothiophenes	**228** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C2-Dibenzothiophenes	**195** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C3-Dibenzothiophenes	**110** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C4-Dibenzothiophenes	**71.3** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
Phenanthrene	**2820** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
Anthracene	**1500** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C1-Phenanthrenes/Anthracenes	**1280** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C2-Phenanthrenes/Anthracenes	**679** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C3-Phenanthrenes/Anthracenes	**305** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C4-Phenanthrenes/Anthracenes	**128** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
Retene	**130** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
Benzo(b)naphtho(2,1-d)thiophene	**495** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C0-Benzonaphthothiophenes	**963** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C1-Benzonaphthothiophenes	**437** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C2-Benzonaphthothiophenes	**302** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C3-Benzonaphthothiophenes	**243** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-823-S1
Date Sampled: 06/20/23 10:15
Percent Solids: 40
Initial Volume: 5.59
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**118** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
Fluoranthene	**5520** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
Pyrene	**5750** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C1-Fluoranthenes/Pyrenes	**2250** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C2-Fluoranthenes/Pyrenes	**1160** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C3-Fluoranthenes/Pyrenes	**499** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
Benzo(b)fluorene	**271** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
Benzo(c)fluorene	**107** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
2-Methylpyrene	**318** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
4-Methylpyrene	**271** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
1-Methylpyrene	**251** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
Benz(a)anthracene	**2770** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
Chrysene/triphenylene	**2870** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C1-Benzo(a)anthracenes/Chrysenes	**1150** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C2-Benzo(a)anthracenes/Chrysenes	**549** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C3-Benzo(a)anthracenes/Chrysenes	**320** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C4-Benzo(a)anthracenes/Chrysenes	**193** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
Benzo(b)fluoranthene	**2350** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
Benzo(j/k)fluoranthene	**2410** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
Benzo(e)pyrene	**2100** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
Benzo(a)pyrene	**3500** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
Perylene	**816** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
Indeno(1,2,3-cd)pyrene	**2410** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
Dibenzo(a,h)anthracene	**502** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
Benzo(g,h,i)perylene	**2020** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
Coronene	**621** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
Tetramethyl lead	ND (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
Trimethylethyl lead	ND (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
Dimethyldiethyl lead	ND (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
Methyltriethyl lead	ND (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
Tetraethyl lead	ND (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
2,6,10-trimethyldodecane (1380)	**49.5** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-823-S1
Date Sampled: 06/20/23 10:15
Percent Solids: 40
Initial Volume: 5.59
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**147** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
2,6,10-trimethylpentadecane (1650)	**54.6** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C-17	**344** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
Pristane	**121** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
C-18	**162** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
Phytane	**114** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
Carbazole	**329** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
2,6-Dimethylnaphthalene	**95.1** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
2,3,5-Trimethylnaphthene	**13.6** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
4-Methyldibenzothiophene	**75.7** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
2/3-Methyldibenzothiophene	**77.5** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
1-Methyldibenzothiophene	**30.2** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
3-Methylphenanthrene	**285** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
2-Methylphenanthrene	**335** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
2-Methylanthracene	**168** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
4/9-Methylphenanthrene	**273** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603
1-Methylphenanthrene	**201** (8.94)	4.47	8270 Mod		1	IBM	07/04/23 12:00	F3G0001	FF32603

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*62 %*		*50-120*
Surrogate: Naphthalene-d8	*65 %*		*50-120*
Surrogate: Phenanthrene-d10	*65 %*		*50-120*
Surrogate: Perylene-d12	*69 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-823-S1
Date Sampled: 06/20/23 10:15
Percent Solids: 40

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**40900** (463)		LK		1	CCP	06/28/23 15:55	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-823-S2
Date Sampled: 06/20/23 10:16
Percent Solids: 45
Initial Volume: 4.05
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**541** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C1-Benzene	**1140** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C2-Benzenes	**1120** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C3-Benzenes	**3780** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C4-Benzenes	**11300** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C5-Benzenes	**6890** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
Methylcyclohexane	**130** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
Toluene	**1410** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
Ethylbenzene	**332** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
m,p-Xylene	**1130** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
Styrene	**808** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
o-Xylene	**269** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
Isopropylbenzene	**293** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
n-Propylbenzene	**178** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
1,3,5-Trimethylbenzene	**687** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
1,2,3-Trimethylbenzene	**909** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
1,2,4-Trimethylbenzene	**1870** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
t-Butylbenzene	ND (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
sec-Butylbenzene	**J 55.9** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
p-Isopropyltoluene	**293** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
n-Butylbenzene	ND (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
trans-Decalin	**384** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
cis-Decalin	**135** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C1-Decalins	**2520** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C2-Decalins	**6080** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C3-Decalins	**6940** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C4-Decalins	**10600** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
Benzo(b)thiophene	**2420** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C1-Benzo(b)thiophenes	**4520** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C2-Benzo(b)thiophenes	**9320** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C3-Benzo(b)thiophenes	**5400** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C4-Benzo(b)thiophenes	**1730** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-823-S2
Date Sampled: 06/20/23 10:16
Percent Solids: 45
Initial Volume: 4.05
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**30900** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
2-Methylnaphthalene	**8200** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
1-Methylnaphthalene	**123000** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C1-Naphthalenes	**80800** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C2-Naphthalenes	**158000** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C3-Naphthalenes	**61500** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C4-Naphthalenes	**18400** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
Biphenyl	**3600** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
Acenaphthylene	**21300** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
Acenaphthene	**189000** (1100)	548	8270 Mod		100	IBM	07/04/23 9:15	F3F0012	FF32603
Dibenzofuran	**15500** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
Fluorene	**139000** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C1-Fluorenes	**44500** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C2-Fluorenes	**23500** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C3-Fluorenes	**9010** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
Dibenzothiophene	**55000** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C1-Dibenzothiophenes	**33100** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C2-Dibenzothiophenes	**18300** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C3-Dibenzothiophenes	**8440** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C4-Dibenzothiophenes	**3360** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
Phenanthrene	**343000** (1100)	548	8270 Mod		100	IBM	07/04/23 9:15	F3F0012	FF32603
Anthracene	**121000** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C1-Phenanthrenes/Anthracenes	**197000** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C2-Phenanthrenes/Anthracenes	**58200** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C3-Phenanthrenes/Anthracenes	**16100** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C4-Phenanthrenes/Anthracenes	**5170** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
Retene	**2180** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
Benzo(b)naphtho(2,1-d)thiophene	**16400** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C0-Benzonaphthothiophenes	**30500** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C1-Benzonaphthothiophenes	**13600** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C2-Benzonaphthothiophenes	**6510** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C3-Benzonaphthothiophenes	**4590** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-823-S2
Date Sampled: 06/20/23 10:16
Percent Solids: 45
Initial Volume: 4.05
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**1150** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
Fluoranthene	**149000** (1100)	548	8270 Mod		100	IBM	07/04/23 9:15	F3F0012	FF32603
Pyrene	**221000** (1100)	548	8270 Mod		100	IBM	07/04/23 9:15	F3F0012	FF32603
C1-Fluoranthenes/Pyrenes	**169000** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C2-Fluoranthenes/Pyrenes	**36400** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C3-Fluoranthenes/Pyrenes	**10500** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
Benzo(b)fluorene	**18400** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
Benzo(c)fluorene	**10500** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
2-Methylpyrene	**22500** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
4-Methylpyrene	**18800** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
1-Methylpyrene	**21600** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
Benz(a)anthracene	**120000** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
Chrysene/triphenylene	**107000** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C1-Benzo(a)anthracenes/Chrysenes	**48400** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C2-Benzo(a)anthracenes/Chrysenes	**15900** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C3-Benzo(a)anthracenes/Chrysenes	**5400** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C4-Benzo(a)anthracenes/Chrysenes	**2620** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
Benzo(b)fluoranthene	**59500** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
Benzo(j/k)fluoranthene	**75900** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
Benzo(e)pyrene	**67700** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
Benzo(a)pyrene	**136000** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
Perylene	**22500** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
Indeno(1,2,3-cd)pyrene	**70400** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
Dibenzo(a,h)anthracene	**13200** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
Benzo(g,h,i)perylene	**64800** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
Coronene	**21800** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
Tetramethyl lead	ND (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
Trimethylethyl lead	ND (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
Dimethyldiethyl lead	ND (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
Methyltriethyl lead	ND (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
Tetraethyl lead	ND (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
2,6,10-trimethyldodecane (1380)	**12700** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-823-S2
Date Sampled: 06/20/23 10:16
Percent Solids: 45
Initial Volume: 4.05
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**15900** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
2,6,10-trimethylpentadecane (1650)	**15600** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C-17	ND (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
Pristane	**30900** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
C-18	ND (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
Phytane	**25800** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
Carbazole	**707** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
2,6-Dimethylnaphthalene	**30800** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
2,3,5-Trimethylnaphthene	**3330** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
4-Methyldibenzothiophene	**13300** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
2/3-Methyldibenzothiophene	**11900** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
1-Methyldibenzothiophene	**2960** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
3-Methylphenanthrene	**50600** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
2-Methylphenanthrene	**52600** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
2-Methylanthracene	**21400** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
4/9-Methylphenanthrene	**40100** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603
1-Methylphenanthrene	**29300** (110)	54.8	8270 Mod		10	IBM	06/28/23 19:34	F3F0012	FF32603

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*77 %*		*50-120*
Surrogate: Naphthalene-d8	*77 %*		*50-120*
Surrogate: Phenanthrene-d10	*81 %*		*50-120*
Surrogate: Perylene-d12	*116 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-823-S2
Date Sampled: 06/20/23 10:16
Percent Solids: 45

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**70500** (473)		LK		1	CCP	06/28/23 16:12	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-824-S1
Date Sampled: 06/20/23 11:45
Percent Solids: 59
Initial Volume: 5.12
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**122** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C1-Benzene	**173** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C2-Benzenes	**224** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C3-Benzenes	**58.9** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C4-Benzenes	**66.4** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C5-Benzenes	**48.5** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
Methylcyclohexane	**12.1** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
Toluene	**210** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
Ethylbenzene	**16.9** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
m,p-Xylene	**312** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
Styrene	**58.7** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
o-Xylene	**16.1** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
Isopropylbenzene	ND (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
n-Propylbenzene	**11.9** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
1,3,5-Trimethylbenzene	**J 6.48** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
1,2,3-Trimethylbenzene	**9.58** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
1,2,4-Trimethylbenzene	**18.5** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
t-Butylbenzene	ND (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
sec-Butylbenzene	ND (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
p-Isopropyltoluene	**16.1** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
n-Butylbenzene	**17.5** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
trans-Decalin	**31.5** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
cis-Decalin	**6.65** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C1-Decalins	**65.3** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C2-Decalins	**67.4** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C3-Decalins	**51.2** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C4-Decalins	**125** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
Benzo(b)thiophene	**8.48** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C1-Benzo(b)thiophenes	**21.3** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C2-Benzo(b)thiophenes	**27.6** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C3-Benzo(b)thiophenes	**18.5** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C4-Benzo(b)thiophenes	**18.1** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-824-S1
Date Sampled: 06/20/23 11:45
Percent Solids: 59
Initial Volume: 5.12
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**96.6** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
2-Methylnaphthalene	**77.1** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
1-Methylnaphthalene	**51.3** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C1-Naphthalenes	**84.4** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C2-Naphthalenes	**157** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C3-Naphthalenes	**138** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C4-Naphthalenes	**114** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
Biphenyl	**36.5** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
Acenaphthylene	**282** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
Acenaphthene	**207** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
Dibenzofuran	**104** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
Fluorene	**209** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C1-Fluorenes	**109** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C2-Fluorenes	**160** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C3-Fluorenes	**335** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
Dibenzothiophene	**141** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C1-Dibenzothiophenes	**163** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C2-Dibenzothiophenes	**218** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C3-Dibenzothiophenes	**142** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C4-Dibenzothiophenes	**101** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
Phenanthrene	**1910** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
Anthracene	**692** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C1-Phenanthrenes/Anthracenes	**1120** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C2-Phenanthrenes/Anthracenes	**812** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C3-Phenanthrenes/Anthracenes	**388** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C4-Phenanthrenes/Anthracenes	**148** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
Retene	**76.0** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
Benzo(b)naphtho(2,1-d)thiophene	**341** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C0-Benzonaphthothiophenes	**625** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C1-Benzonaphthothiophenes	**388** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C2-Benzonaphthothiophenes	**308** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C3-Benzonaphthothiophenes	**215** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-824-S1
Date Sampled: 06/20/23 11:45
Percent Solids: 59
Initial Volume: 5.12
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**97.5** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
Fluoranthene	**3660** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
Pyrene	**3400** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C1-Fluoranthenes/Pyrenes	**2190** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C2-Fluoranthenes/Pyrenes	**1180** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C3-Fluoranthenes/Pyrenes	**476** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
Benzo(b)fluorene	**350** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
Benzo(c)fluorene	**88.9** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
2-Methylpyrene	**269** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
4-Methylpyrene	**232** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
1-Methylpyrene	**190** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
Benz(a)anthracene	**2220** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
Chrysene/triphenylene	**2400** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C1-Benzo(a)anthracenes/Chrysenes	**1240** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C2-Benzo(a)anthracenes/Chrysenes	**671** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C3-Benzo(a)anthracenes/Chrysenes	**376** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C4-Benzo(a)anthracenes/Chrysenes	**192** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
Benzo(b)fluoranthene	**1600** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
Benzo(j/k)fluoranthene	**1780** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
Benzo(e)pyrene	**1380** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
Benzo(a)pyrene	**2280** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
Perylene	**570** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
Indeno(1,2,3-cd)pyrene	**1510** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
Dibenzo(a,h)anthracene	**351** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
Benzo(g,h,i)perylene	**1210** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
Coronene	**348** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
Tetramethyl lead	ND (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
Trimethylethyl lead	ND (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
Dimethyldiethyl lead	ND (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
Methyltriethyl lead	ND (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
Tetraethyl lead	ND (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
2,6,10-trimethyldodecane (1380)	**43.6** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-824-S1
Date Sampled: 06/20/23 11:45
Percent Solids: 59
Initial Volume: 5.12
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**101** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
2,6,10-trimethylpentadecane (1650)	**54.4** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C-17	**160** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
Pristane	**136** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
C-18	**B 84.3** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
Phytane	**118** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
Carbazole	**258** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
2,6-Dimethylnaphthalene	**53.4** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
2,3,5-Trimethylnaphthene	**9.48** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
4-Methyldibenzothiophene	**56.0** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
2/3-Methyldibenzothiophene	**54.8** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
1-Methyldibenzothiophene	**19.4** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
3-Methylphenanthrene	**221** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
2-Methylphenanthrene	**274** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
2-Methylanthracene	**218** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
4/9-Methylphenanthrene	**231** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603
1-Methylphenanthrene	**169** (6.61)	3.31	8270 Mod		1	IBM	06/28/23 20:59	F3F0012	FF32603

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*62 %*		*50-120*
Surrogate: Naphthalene-d8	*70 %*		*50-120*
Surrogate: Phenanthrene-d10	*73 %*		*50-120*
Surrogate: Perylene-d12	*79 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-824-S1
Date Sampled: 06/20/23 11:45
Percent Solids: 59

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-04
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**16900** (485)		LK		1	CCP	06/28/23 16:28	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-829-S1
Date Sampled: 06/20/23 12:15
Percent Solids: 50
Initial Volume: 5.32
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**122** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C1-Benzene	**212** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C2-Benzenes	**303** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C3-Benzenes	**71.1** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C4-Benzenes	**70.0** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C5-Benzenes	**53.1** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
Methylcyclohexane	**14.0** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
Toluene	**261** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
Ethylbenzene	**20.8** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
m,p-Xylene	**419** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
Styrene	**90.4** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
o-Xylene	**26.7** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
Isopropylbenzene	ND (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
n-Propylbenzene	**13.9** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
1,3,5-Trimethylbenzene	**8.20** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
1,2,3-Trimethylbenzene	**12.1** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
1,2,4-Trimethylbenzene	**22.0** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
t-Butylbenzene	ND (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
sec-Butylbenzene	ND (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
p-Isopropyltoluene	**14.8** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
n-Butylbenzene	**19.8** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
trans-Decalin	**11.0** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
cis-Decalin	ND (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C1-Decalins	**47.7** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C2-Decalins	**74.9** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C3-Decalins	**73.0** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C4-Decalins	**133** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
Benzo(b)thiophene	**7.75** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C1-Benzo(b)thiophenes	**25.6** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C2-Benzo(b)thiophenes	**33.8** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C3-Benzo(b)thiophenes	**20.4** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C4-Benzo(b)thiophenes	**20.3** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-829-S1
Date Sampled: 06/20/23 12:15
Percent Solids: 50
Initial Volume: 5.32
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**107** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
2-Methylnaphthalene	**69.3** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
1-Methylnaphthalene	**48.9** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C1-Naphthalenes	**76.5** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C2-Naphthalenes	**168** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C3-Naphthalenes	**134** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C4-Naphthalenes	**94.2** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
Biphenyl	**35.7** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
Acenaphthylene	**425** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
Acenaphthene	**176** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
Dibenzofuran	**88.5** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
Fluorene	**159** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C1-Fluorenes	**94.9** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C2-Fluorenes	**111** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C3-Fluorenes	**230** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
Dibenzothiophene	**125** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C1-Dibenzothiophenes	**144** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C2-Dibenzothiophenes	**176** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C3-Dibenzothiophenes	**132** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C4-Dibenzothiophenes	**98.9** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
Phenanthrene	**1490** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
Anthracene	**604** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C1-Phenanthrenes/Anthracenes	**832** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C2-Phenanthrenes/Anthracenes	**553** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C3-Phenanthrenes/Anthracenes	**269** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C4-Phenanthrenes/Anthracenes	**126** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
Retene	**49.5** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
Benzo(b)naphtho(2,1-d)thiophene	**291** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C0-Benzonaphthothiophenes	**544** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C1-Benzonaphthothiophenes	**325** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C2-Benzonaphthothiophenes	**289** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C3-Benzonaphthothiophenes	**239** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-829-S1
Date Sampled: 06/20/23 12:15
Percent Solids: 50
Initial Volume: 5.32
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**131** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
Fluoranthene	**3300** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
Pyrene	**3250** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C1-Fluoranthenes/Pyrenes	**1630** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C2-Fluoranthenes/Pyrenes	**898** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C3-Fluoranthenes/Pyrenes	**406** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
Benzo(b)fluorene	**185** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
Benzo(c)fluorene	**73.6** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
2-Methylpyrene	**226** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
4-Methylpyrene	**205** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
1-Methylpyrene	**165** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
Benz(a)anthracene	**1850** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
Chrysene/triphenylene	**2030** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C1-Benzo(a)anthracenes/Chrysenes	**959** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C2-Benzo(a)anthracenes/Chrysenes	**490** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C3-Benzo(a)anthracenes/Chrysenes	**292** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C4-Benzo(a)anthracenes/Chrysenes	**172** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
Benzo(b)fluoranthene	**1710** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
Benzo(j/k)fluoranthene	**1660** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
Benzo(e)pyrene	**1470** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
Benzo(a)pyrene	**2340** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
Perylene	**693** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
Indeno(1,2,3-cd)pyrene	**1690** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
Dibenzo(a,h)anthracene	**361** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
Benzo(g,h,i)perylene	**1410** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
Coronene	**430** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
Tetramethyl lead	ND (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
Trimethylethyl lead	ND (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
Dimethyldiethyl lead	ND (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
Methyltriethyl lead	ND (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
Tetraethyl lead	ND (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
2,6,10-trimethyldodecane (1380)	**41.5** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-829-S1
Date Sampled: 06/20/23 12:15
Percent Solids: 50
Initial Volume: 5.32
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**101** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
2,6,10-trimethylpentadecane (1650)	**53.5** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C-17	**285** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
Pristane	**124** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
C-18	**102** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
Phytane	**145** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
Carbazole	**216** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
2,6-Dimethylnaphthalene	**64.2** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
2,3,5-Trimethylnaphthene	**8.48** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
4-Methyldibenzothiophene	**47.3** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
2/3-Methyldibenzothiophene	**43.1** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
1-Methyldibenzothiophene	**19.1** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
3-Methylphenanthrene	**183** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
2-Methylphenanthrene	**201** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
2-Methylanthracene	**112** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
4/9-Methylphenanthrene	**200** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603
1-Methylphenanthrene	**128** (7.52)	3.76	8270 Mod		1	IBM	06/28/23 22:23	F3F0012	FF32603

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*65 %*		*50-120*
Surrogate: Naphthalene-d8	*70 %*		*50-120*
Surrogate: Phenanthrene-d10	*74 %*		*50-120*
Surrogate: Perylene-d12	*78 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-829-S1
Date Sampled: 06/20/23 12:15
Percent Solids: 50

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-05
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**32400** (483)		LK		1	CCP	06/28/23 16:45	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-827-S1
Date Sampled: 06/20/23 13:40
Percent Solids: 58
Initial Volume: 5.08
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**B 28.7** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C1-Benzene	**70.9** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C2-Benzenes	**40.6** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C3-Benzenes	**15.8** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C4-Benzenes	**21.6** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C5-Benzenes	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
Methylcyclohexane	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
Toluene	**87.1** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
Ethylbenzene	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
m,p-Xylene	**46.0** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
Styrene	**46.9** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
o-Xylene	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
Isopropylbenzene	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
n-Propylbenzene	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
1,3,5-Trimethylbenzene	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
1,2,3-Trimethylbenzene	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
1,2,4-Trimethylbenzene	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
t-Butylbenzene	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
sec-Butylbenzene	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
p-Isopropyltoluene	**15.3** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
n-Butylbenzene	**J 5.49** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
trans-Decalin	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
cis-Decalin	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C1-Decalins	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C2-Decalins	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C3-Decalins	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C4-Decalins	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
Benzo(b)thiophene	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C1-Benzo(b)thiophenes	**8.24** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C2-Benzo(b)thiophenes	**11.7** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C3-Benzo(b)thiophenes	**7.16** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C4-Benzo(b)thiophenes	**J 4.37** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-827-S1
Date Sampled: 06/20/23 13:40
Percent Solids: 58
Initial Volume: 5.08
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**7.44** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
2-Methylnaphthalene	**J 5.47** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
1-Methylnaphthalene	**J 3.97** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C1-Naphthalenes	**J 6.69** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C2-Naphthalenes	**13.9** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C3-Naphthalenes	**9.81** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C4-Naphthalenes	**7.26** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
Biphenyl	**8.29** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
Acenaphthylene	**J 3.81** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
Acenaphthene	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
Dibenzofuran	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
Fluorene	**J 4.01** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C1-Fluorenes	**J 6.32** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C2-Fluorenes	**J 6.43** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C3-Fluorenes	**J 5.95** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
Dibenzothiophene	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C1-Dibenzothiophenes	**7.16** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C2-Dibenzothiophenes	**10.3** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C3-Dibenzothiophenes	**8.99** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C4-Dibenzothiophenes	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
Phenanthrene	**J 6.58** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
Anthracene	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C1-Phenanthrenes/Anthracenes	**8.71** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C2-Phenanthrenes/Anthracenes	**11.6** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C3-Phenanthrenes/Anthracenes	**14.6** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C4-Phenanthrenes/Anthracenes	**20.2** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
Retene	**58.8** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
Benzo(b)naphtho(2,1-d)thiophene	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C0-Benzonaphthothiophenes	**J 4.40** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C1-Benzonaphthothiophenes	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C2-Benzonaphthothiophenes	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C3-Benzonaphthothiophenes	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-827-S1
Date Sampled: 06/20/23 13:40
Percent Solids: 58
Initial Volume: 5.08
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
Fluoranthene	**J 4.29** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
Pyrene	**J 4.48** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C1-Fluoranthenes/Pyrenes	**12.1** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C2-Fluoranthenes/Pyrenes	**7.45** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C3-Fluoranthenes/Pyrenes	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
Benzo(b)fluorene	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
Benzo(c)fluorene	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
2-Methylpyrene	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
4-Methylpyrene	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
1-Methylpyrene	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
Benz(a)anthracene	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
Chrysene/triphenylene	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C1-Benzo(a)anthracenes/Chrysenes	**J 4.32** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C2-Benzo(a)anthracenes/Chrysenes	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C3-Benzo(a)anthracenes/Chrysenes	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C4-Benzo(a)anthracenes/Chrysenes	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
Benzo(b)fluoranthene	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
Benzo(j/k)fluoranthene	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
Benzo(e)pyrene	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
Benzo(a)pyrene	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
Perylene	**446** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
Indeno(1,2,3-cd)pyrene	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
Dibenzo(a,h)anthracene	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
Benzo(g,h,i)perylene	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
Coronene	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
Tetramethyl lead	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
Trimethylethyl lead	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
Dimethyldiethyl lead	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
Methyltriethyl lead	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
Tetraethyl lead	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
2,6,10-trimethyldodecane (1380)	**7.20** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-827-S1
Date Sampled: 06/20/23 13:40
Percent Solids: 58
Initial Volume: 5.08
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**18.3** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
2,6,10-trimethylpentadecane (1650)	**8.70** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C-17	**B 87.4** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
Pristane	**10.1** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
C-18	**B 58.9** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
Phytane	**19.8** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
Carbazole	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
2,6-Dimethylnaphthalene	**J 3.97** (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
2,3,5-Trimethylnaphthene	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
4-Methyldibenzothiophene	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
2/3-Methyldibenzothiophene	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
1-Methyldibenzothiophene	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
3-Methylphenanthrene	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
2-Methylphenanthrene	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
2-Methylanthracene	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
4/9-Methylphenanthrene	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603
1-Methylphenanthrene	ND (6.79)	3.40	8270 Mod		1	IBM	06/28/23 23:45	F3F0012	FF32603

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*68 %*		*50-120*
Surrogate: Naphthalene-d8	*71 %*		*50-120*
Surrogate: Phenanthrene-d10	*76 %*		*50-120*
Surrogate: Perylene-d12	*78 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-827-S1
Date Sampled: 06/20/23 13:40
Percent Solids: 58

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-06
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**33900** (484)		LK		1	CCP	06/28/23 17:35	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-827-S2
Date Sampled: 06/20/23 13:41
Percent Solids: 77
Initial Volume: 5.9
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**B 12.2** (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C1-Benzene	**16.9** (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C2-Benzenes	**15.1** (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C3-Benzenes	**5.47** (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C4-Benzenes	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C5-Benzenes	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
Methylcyclohexane	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
Toluene	**20.8** (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
Ethylbenzene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
m,p-Xylene	**16.1** (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
Styrene	**26.4** (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
o-Xylene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
Isopropylbenzene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
n-Propylbenzene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
1,3,5-Trimethylbenzene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
1,2,3-Trimethylbenzene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
1,2,4-Trimethylbenzene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
t-Butylbenzene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
sec-Butylbenzene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
p-Isopropyltoluene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
n-Butylbenzene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
trans-Decalin	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
cis-Decalin	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C1-Decalins	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C2-Decalins	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C3-Decalins	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C4-Decalins	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
Benzo(b)thiophene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C1-Benzo(b)thiophenes	**J 4.28** (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C2-Benzo(b)thiophenes	**4.49** (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C3-Benzo(b)thiophenes	**J 2.90** (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C4-Benzo(b)thiophenes	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-827-S2
Date Sampled: 06/20/23 13:41
Percent Solids: 77
Initial Volume: 5.9
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
2-Methylnaphthalene	**J 2.22** (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
1-Methylnaphthalene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C1-Naphthalenes	**J 3.18** (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C2-Naphthalenes	**6.98** (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C3-Naphthalenes	**J 3.29** (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C4-Naphthalenes	**J 2.41** (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
Biphenyl	**J 3.25** (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
Acenaphthylene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
Acenaphthene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
Dibenzofuran	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
Fluorene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C1-Fluorenes	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C2-Fluorenes	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C3-Fluorenes	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
Dibenzothiophene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C1-Dibenzothiophenes	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C2-Dibenzothiophenes	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C3-Dibenzothiophenes	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C4-Dibenzothiophenes	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
Phenanthrene	**J 2.94** (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
Anthracene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C1-Phenanthrenes/Anthracenes	**4.57** (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C2-Phenanthrenes/Anthracenes	**J 2.64** (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C3-Phenanthrenes/Anthracenes	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C4-Phenanthrenes/Anthracenes	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
Retene	**J 3.06** (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
Benzo(b)naphtho(2,1-d)thiophene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C0-Benzonaphthothiophenes	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C1-Benzonaphthothiophenes	**J 3.06** (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C2-Benzonaphthothiophenes	**J 3.26** (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C3-Benzonaphthothiophenes	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-827-S2
Date Sampled: 06/20/23 13:41
Percent Solids: 77
Initial Volume: 5.9
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
Fluoranthene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
Pyrene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C1-Fluoranthenes/Pyrenes	**4.98** (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C2-Fluoranthenes/Pyrenes	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C3-Fluoranthenes/Pyrenes	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
Benzo(b)fluorene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
Benzo(c)fluorene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
2-Methylpyrene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
4-Methylpyrene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
1-Methylpyrene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
Benz(a)anthracene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
Chrysene/triphenylene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C1-Benzo(a)anthracenes/Chrysenes	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C2-Benzo(a)anthracenes/Chrysenes	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C3-Benzo(a)anthracenes/Chrysenes	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C4-Benzo(a)anthracenes/Chrysenes	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
Benzo(b)fluoranthene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
Benzo(j/k)fluoranthene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
Benzo(e)pyrene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
Benzo(a)pyrene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
Perylene	**731** (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
Indeno(1,2,3-cd)pyrene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
Dibenzo(a,h)anthracene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
Benzo(g,h,i)perylene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
Coronene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
Tetramethyl lead	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
Trimethylethyl lead	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
Dimethyldiethyl lead	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
Methyltriethyl lead	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
Tetraethyl lead	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
2,6,10-trimethyldodecane (1380)	**J 4.16** (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-827-S2
Date Sampled: 06/20/23 13:41
Percent Solids: 77
Initial Volume: 5.9
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**10.4** (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
2,6,10-trimethylpentadecane (1650)	**4.57** (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C-17	**B 42.5** (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
Pristane	**J 4.35** (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
C-18	**B 30.7** (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
Phytane	**4.89** (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
Carbazole	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
2,6-Dimethylnaphthalene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
2,3,5-Trimethylnaphthene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
4-Methyldibenzothiophene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
2/3-Methyldibenzothiophene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
1-Methyldibenzothiophene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
3-Methylphenanthrene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
2-Methylphenanthrene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
2-Methylanthracene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
4/9-Methylphenanthrene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603
1-Methylphenanthrene	ND (4.42)	2.21	8270 Mod		1	IBM	06/29/23 1:08	F3F0012	FF32603

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*69 %*		*50-120*
Surrogate: Naphthalene-d8	*75 %*		*50-120*
Surrogate: Phenanthrene-d10	*81 %*		*50-120*
Surrogate: Perylene-d12	*85 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-827-S2
Date Sampled: 06/20/23 13:41
Percent Solids: 77

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-07
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**7610** (485)		LK		1	CCP	06/28/23 17:51	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-818-S1
Date Sampled: 06/20/23 14:00
Percent Solids: 49
Initial Volume: 5.05
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**B 41.3** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C1-Benzene	**177** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C2-Benzenes	**119** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C3-Benzenes	**47.2** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C4-Benzenes	**59.2** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C5-Benzenes	**63.4** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
Methylcyclohexane	**J 4.64** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
Toluene	**217** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
Ethylbenzene	**8.36** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
m,p-Xylene	**160** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
Styrene	**87.2** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
o-Xylene	**10.7** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
Isopropylbenzene	ND (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
n-Propylbenzene	**J 7.31** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
1,3,5-Trimethylbenzene	**J 4.87** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
1,2,3-Trimethylbenzene	**J 7.80** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
1,2,4-Trimethylbenzene	**16.7** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
t-Butylbenzene	ND (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
sec-Butylbenzene	ND (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
p-Isopropyltoluene	**10.0** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
n-Butylbenzene	**16.7** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
trans-Decalin	**367** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
cis-Decalin	**45.9** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C1-Decalins	**631** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C2-Decalins	**270** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C3-Decalins	**171** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C4-Decalins	**291** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
Benzo(b)thiophene	ND (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C1-Benzo(b)thiophenes	**15.1** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C2-Benzo(b)thiophenes	**25.7** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C3-Benzo(b)thiophenes	**18.9** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C4-Benzo(b)thiophenes	**21.3** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-818-S1
Date Sampled: 06/20/23 14:00
Percent Solids: 49
Initial Volume: 5.05
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**54.3** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
2-Methylnaphthalene	**43.6** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
1-Methylnaphthalene	**22.4** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C1-Naphthalenes	**43.6** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C2-Naphthalenes	**116** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C3-Naphthalenes	**216** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C4-Naphthalenes	**246** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
Biphenyl	**26.9** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
Acenaphthylene	**156** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
Acenaphthene	**22.9** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
Dibenzofuran	**23.0** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
Fluorene	**38.0** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C1-Fluorenes	**74.9** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C2-Fluorenes	**163** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C3-Fluorenes	**183** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
Dibenzothiophene	**44.8** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C1-Dibenzothiophenes	**105** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C2-Dibenzothiophenes	**180** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C3-Dibenzothiophenes	**173** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C4-Dibenzothiophenes	**106** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
Phenanthrene	**234** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
Anthracene	**168** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C1-Phenanthrenes/Anthracenes	**397** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C2-Phenanthrenes/Anthracenes	**415** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C3-Phenanthrenes/Anthracenes	**264** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C4-Phenanthrenes/Anthracenes	**130** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
Retene	**31.0** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
Benzo(b)naphtho(2,1-d)thiophene	**75.2** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C0-Benzonaphthothiophenes	**144** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C1-Benzonaphthothiophenes	**140** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C2-Benzonaphthothiophenes	**155** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C3-Benzonaphthothiophenes	**118** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-818-S1
Date Sampled: 06/20/23 14:00
Percent Solids: 49
Initial Volume: 5.05
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**56.7** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
Fluoranthene	**492** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
Pyrene	**926** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C1-Fluoranthenes/Pyrenes	**601** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C2-Fluoranthenes/Pyrenes	**326** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C3-Fluoranthenes/Pyrenes	**185** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
Benzo(b)fluorene	**68.6** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
Benzo(c)fluorene	**25.5** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
2-Methylpyrene	**84.6** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
4-Methylpyrene	**90.4** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
1-Methylpyrene	**67.8** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
Benz(a)anthracene	**407** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
Chrysene/triphenylene	**515** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C1-Benzo(a)anthracenes/Chrysenes	**383** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C2-Benzo(a)anthracenes/Chrysenes	**245** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C3-Benzo(a)anthracenes/Chrysenes	**148** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C4-Benzo(a)anthracenes/Chrysenes	**89.4** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
Benzo(b)fluoranthene	**363** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
Benzo(j/k)fluoranthene	**404** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
Benzo(e)pyrene	**370** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
Benzo(a)pyrene	**530** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
Perylene	**1090** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
Indeno(1,2,3-cd)pyrene	**370** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
Dibenzo(a,h)anthracene	**82.4** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
Benzo(g,h,i)perylene	**324** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
Coronene	**94.6** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
Tetramethyl lead	ND (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
Trimethylethyl lead	ND (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
Dimethyldiethyl lead	ND (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
Methyltriethyl lead	ND (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
Tetraethyl lead	ND (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
2,6,10-trimethyldodecane (1380)	**162** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-818-S1
Date Sampled: 06/20/23 14:00
Percent Solids: 49
Initial Volume: 5.05
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**301** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
2,6,10-trimethylpentadecane (1650)	**295** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C-17	**193** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
Pristane	**714** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
C-18	**127** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
Phytane	**675** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
Carbazole	**24.8** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
2,6-Dimethylnaphthalene	**33.5** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
2,3,5-Trimethylnaphthene	**14.3** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
4-Methyldibenzothiophene	**39.4** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
2/3-Methyldibenzothiophene	**38.5** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
1-Methyldibenzothiophene	**13.3** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
3-Methylphenanthrene	**100** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
2-Methylphenanthrene	**107** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
2-Methylanthracene	**42.4** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
4/9-Methylphenanthrene	**111** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603
1-Methylphenanthrene	**28.0** (8.01)	4.01	8270 Mod		1	IBM	06/29/23 2:30	F3F0012	FF32603

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*65 %*		*50-120*
Surrogate: Naphthalene-d8	*70 %*		*50-120*
Surrogate: Phenanthrene-d10	*74 %*		*50-120*
Surrogate: Perylene-d12	*78 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-818-S1
Date Sampled: 06/20/23 14:00
Percent Solids: 49

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-08
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**47400** (486)		LK		1	CCP	06/28/23 18:08	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-818-S2
Date Sampled: 06/20/23 14:01
Percent Solids: 64
Initial Volume: 5.16
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**B 20.2** (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C1-Benzene	**57.8** (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C2-Benzenes	**69.9** (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C3-Benzenes	**12.1** (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C4-Benzenes	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C5-Benzenes	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
Methylcyclohexane	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
Toluene	**74.2** (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
Ethylbenzene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
m,p-Xylene	**75.6** (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
Styrene	**10.4** (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
o-Xylene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
Isopropylbenzene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
n-Propylbenzene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
1,3,5-Trimethylbenzene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
1,2,3-Trimethylbenzene	**J 3.17** (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
1,2,4-Trimethylbenzene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
t-Butylbenzene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
sec-Butylbenzene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
p-Isopropyltoluene	**11.2** (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
n-Butylbenzene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
trans-Decalin	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
cis-Decalin	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C1-Decalins	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C2-Decalins	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C3-Decalins	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C4-Decalins	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
Benzo(b)thiophene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C1-Benzo(b)thiophenes	**6.56** (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C2-Benzo(b)thiophenes	**J 4.02** (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C3-Benzo(b)thiophenes	**J 3.57** (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C4-Benzo(b)thiophenes	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-818-S2
Date Sampled: 06/20/23 14:01
Percent Solids: 64
Initial Volume: 5.16
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
2-Methylnaphthalene	**J 3.66** (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
1-Methylnaphthalene	**J 3.10** (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C1-Naphthalenes	**J 4.99** (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C2-Naphthalenes	**16.0** (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C3-Naphthalenes	**8.65** (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C4-Naphthalenes	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
Biphenyl	**J 5.88** (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
Acenaphthylene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
Acenaphthene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
Dibenzofuran	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
Fluorene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C1-Fluorenes	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C2-Fluorenes	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C3-Fluorenes	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
Dibenzothiophene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C1-Dibenzothiophenes	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C2-Dibenzothiophenes	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C3-Dibenzothiophenes	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C4-Dibenzothiophenes	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
Phenanthrene	**J 4.42** (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
Anthracene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C1-Phenanthrenes/Anthracenes	**6.25** (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C2-Phenanthrenes/Anthracenes	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C3-Phenanthrenes/Anthracenes	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C4-Phenanthrenes/Anthracenes	**11.6** (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
Retene	**52.7** (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
Benzo(b)naphtho(2,1-d)thiophene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C0-Benzonaphthothiophenes	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C1-Benzonaphthothiophenes	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C2-Benzonaphthothiophenes	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C3-Benzonaphthothiophenes	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-818-S2
Date Sampled: 06/20/23 14:01
Percent Solids: 64
Initial Volume: 5.16
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
Fluoranthene	**J 4.95** (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
Pyrene	**J 3.41** (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C1-Fluoranthenes/Pyrenes	**7.55** (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C2-Fluoranthenes/Pyrenes	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C3-Fluoranthenes/Pyrenes	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
Benzo(b)fluorene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
Benzo(c)fluorene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
2-Methylpyrene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
4-Methylpyrene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
1-Methylpyrene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
Benz(a)anthracene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
Chrysene/triphenylene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C1-Benzo(a)anthracenes/Chrysenes	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C2-Benzo(a)anthracenes/Chrysenes	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C3-Benzo(a)anthracenes/Chrysenes	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C4-Benzo(a)anthracenes/Chrysenes	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
Benzo(b)fluoranthene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
Benzo(j/k)fluoranthene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
Benzo(e)pyrene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
Benzo(a)pyrene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
Perylene	**1150** (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
Indeno(1,2,3-cd)pyrene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
Dibenzo(a,h)anthracene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
Benzo(g,h,i)perylene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
Coronene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
Tetramethyl lead	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
Trimethylethyl lead	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
Dimethyldiethyl lead	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
Methyltriethyl lead	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
Tetraethyl lead	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
2,6,10-trimethyldodecane (1380)	**J 5.36** (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-818-S2
Date Sampled: 06/20/23 14:01
Percent Solids: 64
Initial Volume: 5.16
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**18.9** (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
2,6,10-trimethylpentadecane (1650)	**6.86** (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C-17	**B 59.5** (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
Pristane	**6.74** (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
C-18	**B 42.6** (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
Phytane	**7.07** (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
Carbazole	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
2,6-Dimethylnaphthalene	**J 4.81** (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
2,3,5-Trimethylnaphthene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
4-Methyldibenzothiophene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
2/3-Methyldibenzothiophene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
1-Methyldibenzothiophene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
3-Methylphenanthrene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
2-Methylphenanthrene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
2-Methylanthracene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
4/9-Methylphenanthrene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603
1-Methylphenanthrene	ND (6.09)	3.05	8270 Mod		1	IBM	06/29/23 9:22	F3F0012	FF32603

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*72 %*		*50-120*
Surrogate: Naphthalene-d8	*75 %*		*50-120*
Surrogate: Phenanthrene-d10	*81 %*		*50-120*
Surrogate: Perylene-d12	*83 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-818-S2
Date Sampled: 06/20/23 14:01
Percent Solids: 64

ESS Laboratory Work Order: F230019
ESS Laboratory Sample ID: F230019-09
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**22000** (485)		LK		1	CCP	06/28/23 18:24	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230019

Quality Control Data

Classical Chemistry

Batch DF32734 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	500	mg/kg							
Total Organic Carbon (2)	ND	500	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230019

Quality Control Data

Classical Chemistry

Batch DF32734 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	10000	500	mg/kg	10010		100	80-120			
Total Organic Carbon (2)	10000	500	mg/kg	10010		100	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230019

Quality Control Data

Classical Chemistry

Batch DF32734 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9970	500	mg/kg	10010		100	80-120	0.5	25	
Total Organic Carbon (2)	9890	500	mg/kg	10010		99	80-120	2	25	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230019

Quality Control Data

Alkylated PAHs

Batch FF32603 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	7.94	4.00	ug/Kg wet							
C1-Benzene	ND	4.00	ug/Kg wet							
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	2.19	4.00	ug/Kg wet							J
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	ND	4.00	ug/Kg wet							
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230019

Quality Control Data

Alkylated PAHs

Batch FF32603 - 3570			
C1-Fluorenes	ND	4.00	ug/Kg wet
C2-Fluorenes	ND	4.00	ug/Kg wet
C3-Fluorenes	ND	4.00	ug/Kg wet
Dibenzothiophene	ND	4.00	ug/Kg wet
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet
Phenanthrene	ND	4.00	ug/Kg wet
Anthracene	ND	4.00	ug/Kg wet
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
Retene	ND	4.00	ug/Kg wet
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
Fluoranthene	ND	4.00	ug/Kg wet
Pyrene	ND	4.00	ug/Kg wet
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
Benzo(b)fluorene	ND	4.00	ug/Kg wet
Benzo(c)fluorene	ND	4.00	ug/Kg wet
2-Methylpyrene	ND	4.00	ug/Kg wet
4-Methylpyrene	ND	4.00	ug/Kg wet
1-Methylpyrene	ND	4.00	ug/Kg wet
Benz(a)anthracene	ND	4.00	ug/Kg wet
Chrysene/triphenylene	ND	4.00	ug/Kg wet
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet
Benzo(e)pyrene	ND	4.00	ug/Kg wet
Benzo(a)pyrene	ND	4.00	ug/Kg wet
Perylene	ND	4.00	ug/Kg wet
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet
Coronene	ND	4.00	ug/Kg wet
Tetramethyl lead	ND	4.00	ug/Kg wet
Trimethylethyl lead	ND	4.00	ug/Kg wet

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230019

Quality Control Data

Alkylated PAHs

Batch FF32603 - 3570							
Dimethyldiethyl lead	ND	4.00	ug/Kg wet				
Methyltriethyl lead	ND	4.00	ug/Kg wet				
Tetraethyl lead	ND	4.00	ug/Kg wet				
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet				
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet				
2,6,10-trimethylpentadecane (1650)	ND	4.00	ug/Kg wet				
C-17	9.03	4.00	ug/Kg wet				
Pristane	2.22	4.00	ug/Kg wet				J
C-18	9.29	4.00	ug/Kg wet				
Phytane	ND	4.00	ug/Kg wet				
Carbazole	ND	4.00	ug/Kg wet				
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet				
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet				
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
3-Methylphenanthrene	ND	4.00	ug/Kg wet				
2-Methylphenanthrene	ND	4.00	ug/Kg wet				
2-Methylanthracene	ND	4.00	ug/Kg wet				
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet				
1-Methylphenanthrene	ND	4.00	ug/Kg wet				
Surrogate: Toluene-D8	*268*		ug/Kg wet	*400.0*	*67*	*50-120*	
Surrogate: Naphthalene-d8	*279*		ug/Kg wet	*400.0*	*70*	*50-120*	
Surrogate: Phenanthrene-d10	*317*		ug/Kg wet	*400.0*	*79*	*50-120*	
Surrogate: Perylene-d12	*313*		ug/Kg wet	*400.0*	*78*	*50-120*	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230019

Quality Control Data

Alkylated PAHs

Batch FF32603 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	307	4.00	ug/Kg wet	400.0		77	60-130			
Methylcyclohexane	234	4.00	ug/Kg wet	400.0		59	60-130			B-
Toluene	307	4.00	ug/Kg wet	400.0		77	60-130			
Ethylbenzene	332	4.00	ug/Kg wet	400.0		83	60-130			
m,p-Xylene	327	4.00	ug/Kg wet	400.0		82	60-130			
Styrene	303	4.00	ug/Kg wet	400.0		76	60-130			
o-Xylene	340	4.00	ug/Kg wet	400.0		85	60-130			
Isopropylbenzene	334	4.00	ug/Kg wet	400.0		84	60-130			
n-Propylbenzene	334	4.00	ug/Kg wet	400.0		83	60-130			
1,3,5-Trimethylbenzene	341	4.00	ug/Kg wet	400.0		85	60-130			
1,2,3-Trimethylbenzene	338	4.00	ug/Kg wet	400.0		84	60-130			
1,2,4-Trimethylbenzene	339	4.00	ug/Kg wet	400.0		85	60-130			
t-Butylbenzene	336	4.00	ug/Kg wet	400.0		84	60-130			
sec-Butylbenzene	333	4.00	ug/Kg wet	400.0		83	60-130			
p-Isopropyltoluene	339	4.00	ug/Kg wet	400.0		85	60-130			
n-Butylbenzene	329	4.00	ug/Kg wet	400.0		82	60-130			
trans-Decalin	319	4.00	ug/Kg wet	400.0		80	60-130			
cis-Decalin	321	4.00	ug/Kg wet	400.0		80	60-130			
Benzo(b)thiophene	319	4.00	ug/Kg wet	400.0		80	60-130			
Naphthalene	317	4.00	ug/Kg wet	400.0		79	60-130			
2-Methylnaphthalene	319	4.00	ug/Kg wet	400.0		80	60-130			
1-Methylnaphthalene	317	4.00	ug/Kg wet	400.0		79	60-130			
Biphenyl	294	4.00	ug/Kg wet	400.0		74	60-130			
Acenaphthylene	354	4.00	ug/Kg wet	400.0		89	60-130			
Acenaphthene	335	4.00	ug/Kg wet	400.0		84	60-130			
Dibenzofuran	334	4.00	ug/Kg wet	400.0		83	60-130			
Fluorene	335	4.00	ug/Kg wet	400.0		84	60-130			
Dibenzothiophene	331	4.00	ug/Kg wet	400.0		83	60-130			
Phenanthrene	323	4.00	ug/Kg wet	400.0		81	60-130			
Anthracene	349	4.00	ug/Kg wet	400.0		87	60-130			
Retene	376	4.00	ug/Kg wet	400.0		94	60-130			
Benzo(b)naphtho(2,1-d)thiophene	366	4.00	ug/Kg wet	400.0		91	60-130			
Fluoranthene	355	4.00	ug/Kg wet	400.0		89	60-130			
Pyrene	355	4.00	ug/Kg wet	400.0		89	60-130			
Benz(a)anthracene	388	4.00	ug/Kg wet	400.0		97	60-130			
Chrysene/triphenylene	368	4.00	ug/Kg wet	400.0		92	60-130			
Benzo(b)fluoranthene	363	4.00	ug/Kg wet	400.0		91	60-130			
Benzo(j/k)fluoranthene	367	4.00	ug/Kg wet	400.0		92	60-130			
Benzo(e)pyrene	339	4.00	ug/Kg wet	400.0		85	60-130			
Benzo(a)pyrene	369	4.00	ug/Kg wet	400.0		92	60-130			
Perylene	367	4.00	ug/Kg wet	400.0		92	60-130			
Indeno(1,2,3-cd)pyrene	387	4.00	ug/Kg wet	400.0		97	60-130			
Dibenzo(a,h)anthracene	364	4.00	ug/Kg wet	400.0		91	60-130			
Benzo(g,h,i)perylene	342	4.00	ug/Kg wet	400.0		86	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230019

Quality Control Data

Alkylated PAHs

Batch FF32603 - 3570						
Coronene	342	4.00	ug/Kg wet	400.0	85	60-130
Surrogate: Toluene-D8	*321*		ug/Kg wet	*400.0*	*80*	*50-120*
Surrogate: Naphthalene-d8	*320*		ug/Kg wet	*400.0*	*80*	*50-120*
Surrogate: Phenanthrene-d10	*342*		ug/Kg wet	*400.0*	*86*	*50-120*
Surrogate: Perylene-d12	*351*		ug/Kg wet	*400.0*	*88*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230019

Quality Control Data

Alkylated PAHs

Batch FF32603 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	ND	4.00	ug/Kg wet				60-130			
Methylcyclohexane	ND	4.00	ug/Kg wet				60-130			
Toluene	ND	4.00	ug/Kg wet				60-130			
Ethylbenzene	ND	4.00	ug/Kg wet				60-130			
m,p-Xylene	ND	4.00	ug/Kg wet				60-130			
Styrene	ND	4.00	ug/Kg wet				60-130			
o-Xylene	ND	4.00	ug/Kg wet				60-130			
Isopropylbenzene	ND	4.00	ug/Kg wet				60-130			
n-Propylbenzene	ND	4.00	ug/Kg wet				60-130			
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet				60-130			
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet				60-130			
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet				60-130			
t-Butylbenzene	ND	4.00	ug/Kg wet				60-130			
sec-Butylbenzene	ND	4.00	ug/Kg wet				60-130			
p-Isopropyltoluene	ND	4.00	ug/Kg wet				60-130			
n-Butylbenzene	ND	4.00	ug/Kg wet				60-130			
trans-Decalin	ND	4.00	ug/Kg wet				60-130			
cis-Decalin	ND	4.00	ug/Kg wet				60-130			
Benzo(b)thiophene	ND	4.00	ug/Kg wet				60-130			
Naphthalene	ND	4.00	ug/Kg wet				60-130			
2-Methylnaphthalene	ND	4.00	ug/Kg wet				60-130			
1-Methylnaphthalene	ND	4.00	ug/Kg wet				60-130			
Biphenyl	ND	4.00	ug/Kg wet				60-130			
Acenaphthylene	ND	4.00	ug/Kg wet				60-130			
Acenaphthene	ND	4.00	ug/Kg wet				60-130			
Dibenzofuran	ND	4.00	ug/Kg wet				60-130			
Fluorene	ND	4.00	ug/Kg wet				60-130			
Dibenzothiophene	ND	4.00	ug/Kg wet				60-130			
Phenanthrene	ND	4.00	ug/Kg wet				60-130			
Anthracene	ND	4.00	ug/Kg wet				60-130			
Retene	ND	4.00	ug/Kg wet				60-130			
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet				60-130			
Fluoranthene	ND	4.00	ug/Kg wet				60-130			
Pyrene	ND	4.00	ug/Kg wet				60-130			
Benz(a)anthracene	ND	4.00	ug/Kg wet				60-130			
Chrysene/triphenylene	ND	4.00	ug/Kg wet				60-130			
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet				60-130			
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet				60-130			
Benzo(e)pyrene	ND	4.00	ug/Kg wet				60-130			
Benzo(a)pyrene	ND	4.00	ug/Kg wet				60-130			
Perylene	ND	4.00	ug/Kg wet				60-130			
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet				60-130			
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet				60-130			
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet				60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230019

Quality Control Data

Alkylated PAHs

Batch FF32603 - 3570						
Coronene	ND	4.00	ug/Kg wet			60-130
Tetraethyl lead	391	4.00	ug/Kg wet	400.0	98	60-130
Surrogate: Toluene-D8	*305*		ug/Kg wet	*400.0*	*76*	*50-120*
Surrogate: Naphthalene-d8	*304*		ug/Kg wet	*400.0*	*76*	*50-120*
Surrogate: Phenanthrene-d10	*325*		ug/Kg wet	*400.0*	*81*	*50-120*
Surrogate: Perylene-d12	*322*		ug/Kg wet	*400.0*	*81*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230019

Quality Control Data

Alkylated PAHs

Batch FF32603 - 3570

Duplicate **Source: F230019-09**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	20.2	6.32	ug/Kg dry		20.2			0.02	50	
C1-Benzene	52.3	6.32	ug/Kg dry		57.8			10	50	
C2-Benzenes	56.9	6.32	ug/Kg dry		69.9			21	50	
C3-Benzenes	11.1	6.32	ug/Kg dry		12.1			9	50	
C4-Benzenes	ND	6.32	ug/Kg dry		ND				50	
C5-Benzenes	ND	6.32	ug/Kg dry		ND				50	
Methylcyclohexane	ND	6.32	ug/Kg dry		ND				50	
Toluene	66.5	6.32	ug/Kg dry		74.2			11	50	
Ethylbenzene	ND	6.32	ug/Kg dry		ND				50	
m,p-Xylene	66.9	6.32	ug/Kg dry		75.6			12	50	
Styrene	8.79	6.32	ug/Kg dry		10.4			17	50	
o-Xylene	ND	6.32	ug/Kg dry		ND				50	
Isopropylbenzene	ND	6.32	ug/Kg dry		ND				50	
n-Propylbenzene	ND	6.32	ug/Kg dry		ND				50	
1,3,5-Trimethylbenzene	ND	6.32	ug/Kg dry		ND				50	
1,2,3-Trimethylbenzene	ND	6.32	ug/Kg dry		3.17				50	
1,2,4-Trimethylbenzene	ND	6.32	ug/Kg dry		ND				50	
t-Butylbenzene	ND	6.32	ug/Kg dry		ND				50	
sec-Butylbenzene	ND	6.32	ug/Kg dry		ND				50	
p-Isopropyltoluene	9.12	6.32	ug/Kg dry		11.2			21	50	
n-Butylbenzene	ND	6.32	ug/Kg dry		ND				50	
trans-Decalin	ND	6.32	ug/Kg dry		ND				50	
cis-Decalin	ND	6.32	ug/Kg dry		ND				50	
C1-Decalins	ND	6.32	ug/Kg dry		ND				50	
C2-Decalins	ND	6.32	ug/Kg dry		ND				50	
C3-Decalins	ND	6.32	ug/Kg dry		ND				50	
C4-Decalins	ND	6.32	ug/Kg dry		ND				50	
Benzo(b)thiophene	ND	6.32	ug/Kg dry		ND				50	
C1-Benzo(b)thiophenes	7.01	6.32	ug/Kg dry		6.56			7	50	
C2-Benzo(b)thiophenes	4.52	6.32	ug/Kg dry		4.02			12	50	J
C3-Benzo(b)thiophenes	3.60	6.32	ug/Kg dry		3.57			0.7	50	J
C4-Benzo(b)thiophenes	ND	6.32	ug/Kg dry		ND				50	
Naphthalene	3.69	6.32	ug/Kg dry		ND				50	J
2-Methylnaphthalene	3.82	6.32	ug/Kg dry		3.66			4	50	J
1-Methylnaphthalene	3.84	6.32	ug/Kg dry		ND			21	50	J
C1-Naphthalenes	5.03	6.32	ug/Kg dry		4.99			0.8	50	J
C2-Naphthalenes	15.4	6.32	ug/Kg dry		16.0			4	50	
C3-Naphthalenes	8.35	6.32	ug/Kg dry		8.65			3	50	
C4-Naphthalenes	ND	6.32	ug/Kg dry		ND				50	
Biphenyl	7.31	6.32	ug/Kg dry		5.88			22	50	
Acenaphthylene	ND	6.32	ug/Kg dry		ND				50	
Acenaphthene	ND	6.32	ug/Kg dry		ND				50	
Dibenzofuran	ND	6.32	ug/Kg dry		ND				50	
Fluorene	3.37	6.32	ug/Kg dry		ND				50	J

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230019

Quality Control Data

Alkylated PAHs

Batch FF32603 - 3570							
C1-Fluorenes	ND	6.32	ug/Kg dry	ND		50	
C2-Fluorenes	ND	6.32	ug/Kg dry	ND		50	
C3-Fluorenes	ND	6.32	ug/Kg dry	ND		50	
Dibenzothiophene	ND	6.32	ug/Kg dry	ND		50	
C1-Dibenzothiophenes	ND	6.32	ug/Kg dry	ND		50	
C2-Dibenzothiophenes	ND	6.32	ug/Kg dry	ND		50	
C3-Dibenzothiophenes	ND	6.32	ug/Kg dry	ND		50	
C4-Dibenzothiophenes	ND	6.32	ug/Kg dry	ND		50	
Phenanthrene	5.21	6.32	ug/Kg dry	4.42	16	50	J
Anthracene	ND	6.32	ug/Kg dry	ND		50	
C1-Phenanthrenes/Anthracenes	7.09	6.32	ug/Kg dry	6.25	13	50	
C2-Phenanthrenes/Anthracenes	ND	6.32	ug/Kg dry	ND		50	
C3-Phenanthrenes/Anthracenes	ND	6.32	ug/Kg dry	ND		50	
C4-Phenanthrenes/Anthracenes	ND	6.32	ug/Kg dry	11.6		50	
Retene	5.16	6.32	ug/Kg dry	52.7	164	50	D+, J
Benzo(b)naphtho(2,1-d)thiophene	ND	6.32	ug/Kg dry	ND		50	
C0-Benzonaphthothiophenes	ND	6.32	ug/Kg dry	ND		50	
C1-Benzonaphthothiophenes	ND	6.32	ug/Kg dry	ND		50	
C2-Benzonaphthothiophenes	ND	6.32	ug/Kg dry	ND		50	
C3-Benzonaphthothiophenes	ND	6.32	ug/Kg dry	ND		50	
C4-Benzonaphthothiophenes	ND	6.32	ug/Kg dry	ND		50	
Fluoranthene	5.04	6.32	ug/Kg dry	4.95	2	50	J
Pyrene	3.36	6.32	ug/Kg dry	3.41	2	50	J
C1-Fluoranthenes/Pyrenes	8.14	6.32	ug/Kg dry	7.55	8	50	
C2-Fluoranthenes/Pyrenes	ND	6.32	ug/Kg dry	ND		50	
C3-Fluoranthenes/Pyrenes	ND	6.32	ug/Kg dry	ND		50	
Benzo(b)fluorene	ND	6.32	ug/Kg dry	ND		50	
Benzo(c)fluorene	ND	6.32	ug/Kg dry	ND		50	
2-Methylpyrene	ND	6.32	ug/Kg dry	ND		50	
4-Methylpyrene	ND	6.32	ug/Kg dry	ND		50	
1-Methylpyrene	ND	6.32	ug/Kg dry	ND		50	
Benz(a)anthracene	ND	6.32	ug/Kg dry	ND		50	
Chrysene/triphenylene	ND	6.32	ug/Kg dry	ND		50	
C1-Benzo(a)anthracenes/Chrysenes	ND	6.32	ug/Kg dry	ND		50	
C2-Benzo(a)anthracenes/Chrysenes	ND	6.32	ug/Kg dry	ND		50	
C3-Benzo(a)anthracenes/Chrysenes	ND	6.32	ug/Kg dry	ND		50	
C4-Benzo(a)anthracenes/Chrysenes	ND	6.32	ug/Kg dry	ND		50	
Benzo(b)fluoranthene	ND	6.32	ug/Kg dry	ND		50	
Benzo(j/k)fluoranthene	ND	6.32	ug/Kg dry	ND		50	
Benzo(e)pyrene	ND	6.32	ug/Kg dry	ND		50	
Benzo(a)pyrene	ND	6.32	ug/Kg dry	ND		50	
Perylene	1090	6.32	ug/Kg dry	1150	5	50	
Indeno(1,2,3-cd)pyrene	ND	6.32	ug/Kg dry	ND		50	
Dibenzo(a,h)anthracene	ND	6.32	ug/Kg dry	ND		50	
Benzo(g,h,i)perylene	ND	6.32	ug/Kg dry	ND		50	
Coronene	ND	6.32	ug/Kg dry	ND		50	
Tetramethyl lead	ND	6.32	ug/Kg dry	ND		50	
Trimethylethyl lead	ND	6.32	ug/Kg dry	ND		50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230019

Quality Control Data

Alkylated PAHs

Batch FF32603 - 3570									
Dimethyldiethyl lead	ND	6.32	ug/Kg dry	ND				50	
Methyltriethyl lead	ND	6.32	ug/Kg dry	ND				50	
Tetraethyl lead	ND	6.32	ug/Kg dry	ND				50	
2,6,10-trimethyldodecane (1380)	6.49	6.32	ug/Kg dry	5.36			19	50	
2,6,10-trimethyltridecane (1470)	21.8	6.32	ug/Kg dry	18.9			14	50	
2,6,10-trimethylpentadecane (1650)	10.2	6.32	ug/Kg dry	6.86			39	50	
C-17	68.3	6.32	ug/Kg dry	59.5			14	50	
Pristane	6.58	6.32	ug/Kg dry	6.74			2	50	
C-18	48.1	6.32	ug/Kg dry	42.6			12	50	
Phytane	7.82	6.32	ug/Kg dry	7.07			10	50	
Carbazole	ND	6.32	ug/Kg dry	ND				50	
2,6-Dimethylnaphthalene	4.77	6.32	ug/Kg dry	4.81			0.7	50	J
2,3,5-Trimethylnaphthene	ND	6.32	ug/Kg dry	ND				50	
4-Methyldibenzothiophene	ND	6.32	ug/Kg dry	ND				50	
2/3-Methyldibenzothiophene	ND	6.32	ug/Kg dry	ND				50	
1-Methyldibenzothiophene	ND	6.32	ug/Kg dry	ND				50	
3-Methylphenanthrene	ND	6.32	ug/Kg dry	ND				50	
2-Methylphenanthrene	ND	6.32	ug/Kg dry	ND				50	
2-Methylanthracene	ND	6.32	ug/Kg dry	ND				50	
4/9-Methylphenanthrene	ND	6.32	ug/Kg dry	ND				50	
1-Methylphenanthrene	ND	6.32	ug/Kg dry	ND				50	
Surrogate: Toluene-D8	*481*		ug/Kg dry	*632.4*		*76*	*50-120*		
Surrogate: Naphthalene-d8	*502*		ug/Kg dry	*632.4*		*79*	*50-120*		
Surrogate: Phenanthrene-d10	*535*		ug/Kg dry	*632.4*		*85*	*50-120*		
Surrogate: Perylene-d12	*549*		ug/Kg dry	*632.4*		*87*	*50-120*		

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F230019

Notes and Definitions

U	Analyte included in the analysis, but not detected
J	Reported between MDL and MRL
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
B-	Blank Spike recovery is below lower control limit (B-).
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230019

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 23F0798 / F230019

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000

Project Information

Project Name: Amesbury Former MGP
Project Number: 1804576
Project Location: Amesbury, MA
Project Manager: Ryan Hoffman
781-721-4091 rhoffman@geiconsultants.com

Send Report to: Ryan Hoffman
labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY AND MCP ANALYTICAL METHODS REQUIRED: (YES) NO

STATE AND FEDERAL REGULATORY REQUIREMENTS/REPORT LIMITS

State/Federal Program: (MA) 401WQC Other _____ NH RI CT NY ME

MA MCP Criteria are (Method 1 S-1 and GW-2/GW-3). Circle if GW-1 is required.

Preservative

None	None								

Analysis

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Parent and Alkylated MAHs * PAHs 8270*	TOCs by Lloyd-Kahn	Sample Specific Remarks
1	1804576-820-S1	6/20/2023	10:00	SOIL	1	JES	X	X	
2	1804576-823-S1	6/20/2023	10:15	SOIL	1	JES	X	X	
3	1804576-823-S2	6/20/2023	10:16	SOIL	1	JES	X	X	
4	1804576-824-S1	6/20/2023	11:45	SOIL	1	JES	X	X	
5	1804576-829-S1	6/20/2023	12:15	SOIL	1	JES	X	X	
6	1804576-827-S1	6/20/2023	13:40	SOIL	1	JES	X	X	
7	1804576-827-S2	6/20/2023	13:41	SOIL	1	JES	X	X	
8	1804576-818-S1	6/20/2023	14:00	SOIL	1	JES	X	X	
9	1804576-818-S2	6/20/2023	14:01	SOIL	1	JES	X	X	

Sample Handling

Samples Field Filtered: YES NO (NA)

Sampled Shipped With Ice: (YES) NO

	Relinquished by sampler: (signature)	Date	Time	Received by: (signature)
1.	David Mill	6/20/2023	1600	1. GEI SAMPLE FRIDGE
2.	GEI Sample	6/22/23	1400	2. M. dlsta
3.	M. dlsta	6/22/23	1400	3. AD 6/22/23 1402
4.	10 0.2 on ice	6/22/23	2009	4.
5.				5.

Turnaround Time (Business days):

5-Day X 4-Day ____ 3-Day ____
2-Day ____ 1-Day ____ Other ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

** Parent and Alkylated MAHs and PAHs (34) by GC/MS/SIM/SCAN

Sample Matrix Abbreviations: SO = Soil GW = Groundwater SW = Surface Water SD = Sediment CO = Concrete PC = Paint Chip CLK = Caulk

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants

Shipped/Delivered Via: ESS Courier

ESS Project ID: F230019
Date Received: 6/22/2023
Project Due Date: 6/29/2023
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 0.2 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / (NA)
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / (No)
    a. Air bubbles in aqueous VOAs? Yes / (No)
    b. Does methanol cover soil completely? Yes / No / (NA)

13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By/Acid Lot#:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / (No)
    Who was contacted? Date: Time: By:

Resolution:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1	480	Yes	N/A	Yes	8 oz jar	NP	
2	481	Yes	N/A	Yes	8 oz jar	NP	
3	482	Yes	N/A	Yes	8 oz jar	NP	
4	483	Yes	N/A	Yes	8 oz jar	NP	
5	484	Yes	N/A	Yes	8 oz jar	NP	
6	485	Yes	N/A	Yes	8 oz jar	NP	
7	486	Yes	N/A	Yes	8 oz jar	NP	
8	487	Yes	N/A	Yes	8 oz jar	NP	
9	488	Yes	N/A	Yes	8 oz jar	NP	

2nd Review

Were all containers scanned into storage/lab? Initials BB
Are barcode labels on correct containers? (Yes) / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants

ESS Project ID: F230019

Date Received: 6/22/2023

Completed By: _____ Date & Time: 6/23/23 9:30

Reviewed By: Mary Davis Date & Time: 6/23/23 1000

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: F230020

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 6:42 am, Jul 19, 2023

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses

ESS - Cranston, RI	TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230020

SAMPLE RECEIPT

The following samples were received on June 22, 2023 for the analyses specified on the enclosed Chain of Custody Record.

Revision 1 includes Corrected Sample ID for sample F230020-06.

Lab Number	Sample Name	Matrix	Analysis
F230020-01	1804576-837-S1	Soil	8270 Mod, LK
F230020-02	1804576-837-S2	Soil	8270 Mod, LK
F230020-03	1804576-837-S3	Soil	8270 Mod, LK
F230020-04	1804576-838-S1	Soil	8270 Mod, LK
F230020-05	1804576-838-S2	Soil	8270 Mod, LK
F230020-06	1804576-838-S3	Soil	8270 Mod, LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230020

PROJECT NARRATIVE

Alkylated PAHs

F230020-01	**Present in Method Blank (B).**
	Benzene , C-17 , C-18
F230020-02	**Present in Method Blank (B).**
	Benzene , C-17 , C-18
F230020-03	**Present in Method Blank (B).**
	Benzene , C-17 , C-18
F230020-04	**Present in Method Blank (B).**
	Benzene , C-17 , C-18
F230020-06	**Present in Method Blank (B).**
	Benzene , C-18
F3F0012-CCV2	**Continuing Calibration %Diff/Drift is above control limit (CD+).**
	Tetraethyl lead (31% @ 25%)
F3F0012-CCV4	**Continuing Calibration %Diff/Drift is above control limit (CD+).**
	Tetraethyl lead (26% @ 25%)
FF32603-BS2	**Blank Spike recovery is below lower control limit (B-).**
	Methylcyclohexane (59% @ 60-130%)

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230020

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-837-S1
Date Sampled: 06/22/23 11:15
Percent Solids: 79
Initial Volume: 5.14
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230020
ESS Laboratory Sample ID: F230020-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**B 17.1** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C1-Benzene	**16.4** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C2-Benzenes	**20.4** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C3-Benzenes	**6.71** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C4-Benzenes	ND (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C5-Benzenes	ND (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
Methylcyclohexane	ND (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
Toluene	**20.2** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
Ethylbenzene	ND (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
m,p-Xylene	**25.4** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
Styrene	**6.76** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
o-Xylene	ND (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
Isopropylbenzene	ND (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
n-Propylbenzene	ND (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
1,3,5-Trimethylbenzene	ND (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
1,2,3-Trimethylbenzene	ND (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
1,2,4-Trimethylbenzene	ND (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
t-Butylbenzene	ND (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
sec-Butylbenzene	ND (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
p-Isopropyltoluene	ND (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
n-Butylbenzene	**J 2.64** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
trans-Decalin	ND (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
cis-Decalin	ND (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C1-Decalins	ND (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C2-Decalins	ND (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C3-Decalins	ND (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C4-Decalins	ND (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
Benzo(b)thiophene	ND (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C1-Benzo(b)thiophenes	**5.07** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C2-Benzo(b)thiophenes	**J 3.32** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C3-Benzo(b)thiophenes	ND (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C4-Benzo(b)thiophenes	ND (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-837-S1
Date Sampled: 06/22/23 11:15
Percent Solids: 79
Initial Volume: 5.14
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230020
ESS Laboratory Sample ID: F230020-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**5.56** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
2-Methylnaphthalene	**5.16** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
1-Methylnaphthalene	**J 4.12** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C1-Naphthalenes	**6.65** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C2-Naphthalenes	**10.3** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C3-Naphthalenes	**7.98** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C4-Naphthalenes	**4.99** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
Biphenyl	**6.99** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
Acenaphthylene	**7.51** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
Acenaphthene	ND (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
Dibenzofuran	ND (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
Fluorene	**5.19** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C1-Fluorenes	**J 4.69** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C2-Fluorenes	**5.65** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C3-Fluorenes	**6.06** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
Dibenzothiophene	**J 2.98** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C1-Dibenzothiophenes	**5.20** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C2-Dibenzothiophenes	**9.31** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C3-Dibenzothiophenes	**7.29** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C4-Dibenzothiophenes	**5.10** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
Phenanthrene	**17.4** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
Anthracene	**11.1** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C1-Phenanthrenes/Anthracenes	**17.0** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C2-Phenanthrenes/Anthracenes	**15.4** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C3-Phenanthrenes/Anthracenes	**14.3** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C4-Phenanthrenes/Anthracenes	**8.14** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
Retene	**7.47** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
Benzo(b)naphtho(2,1-d)thiophene	**J 3.83** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C0-Benzonaphthothiophenes	**9.46** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C1-Benzonaphthothiophenes	**10.1** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C2-Benzonaphthothiophenes	**7.56** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C3-Benzonaphthothiophenes	**6.07** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-837-S1
Date Sampled: 06/22/23 11:15
Percent Solids: 79
Initial Volume: 5.14
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230020
ESS Laboratory Sample ID: F230020-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
Fluoranthene	**63.6** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
Pyrene	**79.3** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C1-Fluoranthenes/Pyrenes	**48.0** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C2-Fluoranthenes/Pyrenes	**23.1** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C3-Fluoranthenes/Pyrenes	**13.3** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
Benzo(b)fluorene	**5.54** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
Benzo(c)fluorene	ND (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
2-Methylpyrene	**7.45** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
4-Methylpyrene	**7.13** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
1-Methylpyrene	**5.81** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
Benz(a)anthracene	**35.4** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
Chrysene/triphenylene	**28.1** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C1-Benzo(a)anthracenes/Chrysenes	**25.2** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C2-Benzo(a)anthracenes/Chrysenes	**14.1** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C3-Benzo(a)anthracenes/Chrysenes	ND (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C4-Benzo(a)anthracenes/Chrysenes	ND (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
Benzo(b)fluoranthene	**24.4** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
Benzo(j/k)fluoranthene	**28.5** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
Benzo(e)pyrene	**23.6** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
Benzo(a)pyrene	**34.4** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
Perylene	**78.7** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
Indeno(1,2,3-cd)pyrene	**21.5** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
Dibenzo(a,h)anthracene	**J 4.89** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
Benzo(g,h,i)perylene	**18.0** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
Coronene	**5.10** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
Tetramethyl lead	ND (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
Trimethylethyl lead	ND (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
Dimethyldiethyl lead	ND (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
Methyltriethyl lead	ND (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
Tetraethyl lead	ND (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
2,6,10-trimethyldodecane (1380)	**J 4.21** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-837-S1
Date Sampled: 06/22/23 11:15
Percent Solids: 79
Initial Volume: 5.14
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230020
ESS Laboratory Sample ID: F230020-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**15.4** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
2,6,10-trimethylpentadecane (1650)	**10.1** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C-17	**B 53.9** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
Pristane	**11.5** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
C-18	**B 42.8** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
Phytane	**10.3** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
Carbazole	ND (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
2,6-Dimethylnaphthalene	ND (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
2,3,5-Trimethylnaphthene	ND (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
4-Methyldibenzothiophene	ND (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
2/3-Methyldibenzothiophene	ND (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
1-Methyldibenzothiophene	ND (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
3-Methylphenanthrene	**J 3.07** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
2-Methylphenanthrene	**J 3.55** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
2-Methylanthracene	**J 2.82** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
4/9-Methylphenanthrene	**J 4.57** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603
1-Methylphenanthrene	**J 2.95** (4.91)	2.45	8270 Mod		1	IBM	06/29/23 12:09	F3F0012	FF32603

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*72 %*		*50-120*
Surrogate: Naphthalene-d8	*75 %*		*50-120*
Surrogate: Phenanthrene-d10	*82 %*		*50-120*
Surrogate: Perylene-d12	*83 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-837-S1
Date Sampled: 06/22/23 11:15
Percent Solids: 79

ESS Laboratory Work Order: F230020
ESS Laboratory Sample ID: F230020-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**1860** (477)		LK		1	CCP	06/29/23 11:20	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-837-S2
Date Sampled: 06/22/23 11:16
Percent Solids: 82
Initial Volume: 5.19
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230020
ESS Laboratory Sample ID: F230020-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**B 11.2** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C1-Benzene	**5.04** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C2-Benzenes	**5.10** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C3-Benzenes	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C4-Benzenes	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C5-Benzenes	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
Methylcyclohexane	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
Toluene	**6.28** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
Ethylbenzene	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
m,p-Xylene	**J 3.34** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
Styrene	**J 4.07** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
o-Xylene	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
Isopropylbenzene	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
n-Propylbenzene	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
1,3,5-Trimethylbenzene	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
1,2,3-Trimethylbenzene	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
1,2,4-Trimethylbenzene	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
t-Butylbenzene	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
sec-Butylbenzene	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
p-Isopropyltoluene	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
n-Butylbenzene	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
trans-Decalin	**J 3.23** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
cis-Decalin	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C1-Decalins	**8.43** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C2-Decalins	**12.0** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C3-Decalins	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C4-Decalins	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
Benzo(b)thiophene	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C1-Benzo(b)thiophenes	**J 3.80** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C2-Benzo(b)thiophenes	**J 2.61** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C3-Benzo(b)thiophenes	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C4-Benzo(b)thiophenes	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-837-S2
Date Sampled: 06/22/23 11:16
Percent Solids: 82
Initial Volume: 5.19
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230020
ESS Laboratory Sample ID: F230020-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
2-Methylnaphthalene	**J 2.79** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
1-Methylnaphthalene	**J 2.63** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C1-Naphthalenes	**J 3.67** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C2-Naphthalenes	**8.81** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C3-Naphthalenes	**21.3** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C4-Naphthalenes	**27.2** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
Biphenyl	**5.08** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
Acenaphthylene	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
Acenaphthene	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
Dibenzofuran	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
Fluorene	**J 3.06** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C1-Fluorenes	**7.19** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C2-Fluorenes	**11.6** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C3-Fluorenes	**5.63** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
Dibenzothiophene	**J 2.45** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C1-Dibenzothiophenes	**J 4.41** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C2-Dibenzothiophenes	**5.22** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C3-Dibenzothiophenes	**J 2.41** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C4-Dibenzothiophenes	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
Phenanthrene	**5.53** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
Anthracene	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C1-Phenanthrenes/Anthracenes	**10.7** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C2-Phenanthrenes/Anthracenes	**7.50** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C3-Phenanthrenes/Anthracenes	**J 4.01** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C4-Phenanthrenes/Anthracenes	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
Retene	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
Benzo(b)naphtho(2,1-d)thiophene	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C0-Benzonaphthothiophenes	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C1-Benzonaphthothiophenes	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C2-Benzonaphthothiophenes	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C3-Benzonaphthothiophenes	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-837-S2
Date Sampled: 06/22/23 11:16
Percent Solids: 82
Initial Volume: 5.19
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230020
ESS Laboratory Sample ID: F230020-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
Fluoranthene	**7.59** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
Pyrene	**8.81** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C1-Fluoranthenes/Pyrenes	**7.04** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C2-Fluoranthenes/Pyrenes	**5.37** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C3-Fluoranthenes/Pyrenes	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
Benzo(b)fluorene	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
Benzo(c)fluorene	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
2-Methylpyrene	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
4-Methylpyrene	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
1-Methylpyrene	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
Benz(a)anthracene	**J 3.08** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
Chrysene/triphenylene	**J 4.00** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C1-Benzo(a)anthracenes/Chrysenes	**J 2.76** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C2-Benzo(a)anthracenes/Chrysenes	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C3-Benzo(a)anthracenes/Chrysenes	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C4-Benzo(a)anthracenes/Chrysenes	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
Benzo(b)fluoranthene	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
Benzo(j/k)fluoranthene	**J 2.44** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
Benzo(e)pyrene	**J 2.35** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
Benzo(a)pyrene	**J 2.78** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
Perylene	**36.7** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
Indeno(1,2,3-cd)pyrene	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
Dibenzo(a,h)anthracene	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
Benzo(g,h,i)perylene	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
Coronene	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
Tetramethyl lead	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
Trimethylethyl lead	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
Dimethyldiethyl lead	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
Methyltriethyl lead	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
Tetraethyl lead	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
2,6,10-trimethyldodecane (1380)	**J 4.39** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-837-S2
Date Sampled: 06/22/23 11:16
Percent Solids: 82
Initial Volume: 5.19
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230020
ESS Laboratory Sample ID: F230020-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**12.9** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
2,6,10-trimethylpentadecane (1650)	**10.3** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C-17	**B 33.0** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
Pristane	**18.1** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
C-18	**B 27.3** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
Phytane	**10.2** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
Carbazole	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
2,6-Dimethylnaphthalene	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
2,3,5-Trimethylnaphthene	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
4-Methyldibenzothiophene	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
2/3-Methyldibenzothiophene	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
1-Methyldibenzothiophene	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
3-Methylphenanthrene	**J 3.11** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
2-Methylphenanthrene	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
2-Methylanthracene	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
4/9-Methylphenanthrene	**J 3.21** (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603
1-Methylphenanthrene	ND (4.70)	2.35	8270 Mod		1	IBM	06/29/23 13:32	F3F0012	FF32603

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*71 %*		*50-120*
Surrogate: Naphthalene-d8	*76 %*		*50-120*
Surrogate: Phenanthrene-d10	*83 %*		*50-120*
Surrogate: Perylene-d12	*78 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-837-S2
Date Sampled: 06/22/23 11:16
Percent Solids: 82

ESS Laboratory Work Order: F230020
ESS Laboratory Sample ID: F230020-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**701** (485)		LK		1	CCP	06/29/23 18:59	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-837-S3
Date Sampled: 06/22/23 11:17
Percent Solids: 73
Initial Volume: 5.22
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230020
ESS Laboratory Sample ID: F230020-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	B **19.7** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C1-Benzene	**31.0** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C2-Benzenes	**24.2** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C3-Benzenes	**16.2** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C4-Benzenes	**17.6** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C5-Benzenes	**19.5** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
Methylcyclohexane	ND (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
Toluene	**39.4** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
Ethylbenzene	J **3.65** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
m,p-Xylene	**26.5** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
Styrene	**11.8** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
o-Xylene	ND (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
Isopropylbenzene	ND (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
n-Propylbenzene	ND (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
1,3,5-Trimethylbenzene	ND (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
1,2,3-Trimethylbenzene	ND (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
1,2,4-Trimethylbenzene	J **4.08** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
t-Butylbenzene	ND (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
sec-Butylbenzene	ND (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
p-Isopropyltoluene	ND (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
n-Butylbenzene	J **3.79** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
trans-Decalin	**30.9** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
cis-Decalin	ND (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C1-Decalins	**78.8** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C2-Decalins	**68.5** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C3-Decalins	**56.7** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C4-Decalins	**90.6** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
Benzo(b)thiophene	ND (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C1-Benzo(b)thiophenes	**9.06** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C2-Benzo(b)thiophenes	**9.96** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C3-Benzo(b)thiophenes	**5.88** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C4-Benzo(b)thiophenes	**5.44** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-837-S3
Date Sampled: 06/22/23 11:17
Percent Solids: 73
Initial Volume: 5.22
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230020
ESS Laboratory Sample ID: F230020-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**51.0** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
2-Methylnaphthalene	**36.5** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
1-Methylnaphthalene	**25.0** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C1-Naphthalenes	**39.0** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C2-Naphthalenes	**49.6** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C3-Naphthalenes	**30.3** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C4-Naphthalenes	**41.4** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
Biphenyl	**22.4** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
Acenaphthylene	**66.2** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
Acenaphthene	**23.2** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
Dibenzofuran	**10.5** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
Fluorene	**80.4** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C1-Fluorenes	**60.5** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C2-Fluorenes	**83.8** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C3-Fluorenes	**72.0** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
Dibenzothiophene	**53.3** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C1-Dibenzothiophenes	**51.8** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C2-Dibenzothiophenes	**81.5** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C3-Dibenzothiophenes	**57.5** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C4-Dibenzothiophenes	**29.6** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
Phenanthrene	**136** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
Anthracene	**84.2** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C1-Phenanthrenes/Anthracenes	**128** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C2-Phenanthrenes/Anthracenes	**180** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C3-Phenanthrenes/Anthracenes	**118** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C4-Phenanthrenes/Anthracenes	**51.4** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
Retene	**12.5** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
Benzo(b)naphtho(2,1-d)thiophene	**43.2** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C0-Benzonaphthothiophenes	**78.8** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C1-Benzonaphthothiophenes	**63.5** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C2-Benzonaphthothiophenes	**48.0** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C3-Benzonaphthothiophenes	**31.2** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-837-S3
Date Sampled: 06/22/23 11:17
Percent Solids: 73
Initial Volume: 5.22
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230020
ESS Laboratory Sample ID: F230020-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**12.5** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
Fluoranthene	**550** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
Pyrene	**779** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C1-Fluoranthenes/Pyrenes	**453** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C2-Fluoranthenes/Pyrenes	**170** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C3-Fluoranthenes/Pyrenes	**74.4** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
Benzo(b)fluorene	**45.6** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
Benzo(c)fluorene	**24.6** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
2-Methylpyrene	**66.4** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
4-Methylpyrene	**62.0** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
1-Methylpyrene	**54.9** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
Benz(a)anthracene	**278** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
Chrysene/triphenylene	**290** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C1-Benzo(a)anthracenes/Chrysenes	**197** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C2-Benzo(a)anthracenes/Chrysenes	**96.4** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C3-Benzo(a)anthracenes/Chrysenes	**40.4** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C4-Benzo(a)anthracenes/Chrysenes	**22.2** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
Benzo(b)fluoranthene	**150** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
Benzo(j/k)fluoranthene	**189** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
Benzo(e)pyrene	**165** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
Benzo(a)pyrene	**260** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
Perylene	**177** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
Indeno(1,2,3-cd)pyrene	**138** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
Dibenzo(a,h)anthracene	**30.8** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
Benzo(g,h,i)perylene	**123** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
Coronene	**34.7** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
Tetramethyl lead	ND (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
Trimethylethyl lead	ND (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
Dimethyldiethyl lead	ND (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
Methyltriethyl lead	ND (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
Tetraethyl lead	ND (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
2,6,10-trimethyldodecane (1380)	**41.9** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-837-S3
Date Sampled: 06/22/23 11:17
Percent Solids: 73
Initial Volume: 5.22
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230020
ESS Laboratory Sample ID: F230020-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**79.6** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
2,6,10-trimethylpentadecane (1650)	**74.5** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C-17	**B 71.2** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
Pristane	**143** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
C-18	**B 46.7** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
Phytane	**127** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
Carbazole	**J 5.11** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
2,6-Dimethylnaphthalene	**13.8** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
2,3,5-Trimethylnaphthene	ND (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
4-Methyldibenzothiophene	**27.3** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
2/3-Methyldibenzothiophene	**12.3** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
1-Methyldibenzothiophene	**7.20** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
3-Methylphenanthrene	**21.5** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
2-Methylphenanthrene	**22.5** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
2-Methylanthracene	**19.6** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
4/9-Methylphenanthrene	**44.4** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603
1-Methylphenanthrene	**20.0** (5.25)	2.62	8270 Mod		1	IBM	06/29/23 14:56	F3F0012	FF32603

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*70 %*		*50-120*
Surrogate: Naphthalene-d8	*74 %*		*50-120*
Surrogate: Phenanthrene-d10	*80 %*		*50-120*
Surrogate: Perylene-d12	*83 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-837-S3
Date Sampled: 06/22/23 11:17
Percent Solids: 73

ESS Laboratory Work Order: F230020
ESS Laboratory Sample ID: F230020-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**3620** (474)		LK		1	CCP	06/29/23 13:16	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-838-S1
Date Sampled: 06/22/23 11:00
Percent Solids: 72
Initial Volume: 5.33
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230020
ESS Laboratory Sample ID: F230020-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	B **24.4** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C1-Benzene	**169** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C2-Benzenes	**37.7** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C3-Benzenes	**23.5** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C4-Benzenes	**31.9** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C5-Benzenes	**22.7** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
Methylcyclohexane	J **5.10** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
Toluene	**210** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
Ethylbenzene	**6.68** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
m,p-Xylene	**42.9** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
Styrene	**14.0** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
o-Xylene	J **4.25** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
Isopropylbenzene	ND (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
n-Propylbenzene	J **3.10** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
1,3,5-Trimethylbenzene	ND (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
1,2,3-Trimethylbenzene	J **3.03** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
1,2,4-Trimethylbenzene	**7.15** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
t-Butylbenzene	ND (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
sec-Butylbenzene	ND (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
p-Isopropyltoluene	**13.9** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
n-Butylbenzene	**6.89** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
trans-Decalin	J **2.80** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
cis-Decalin	ND (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C1-Decalins	**9.14** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C2-Decalins	**21.1** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C3-Decalins	**26.4** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C4-Decalins	**36.3** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
Benzo(b)thiophene	J **3.64** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C1-Benzo(b)thiophenes	**9.41** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C2-Benzo(b)thiophenes	**11.0** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C3-Benzo(b)thiophenes	**7.88** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C4-Benzo(b)thiophenes	**6.16** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-838-S1
Date Sampled: 06/22/23 11:00
Percent Solids: 72
Initial Volume: 5.33
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230020
ESS Laboratory Sample ID: F230020-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**75.5** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
2-Methylnaphthalene	**46.1** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
1-Methylnaphthalene	**24.5** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C1-Naphthalenes	**45.4** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C2-Naphthalenes	**61.4** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C3-Naphthalenes	**59.7** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C4-Naphthalenes	**58.4** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
Biphenyl	**20.0** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
Acenaphthylene	**122** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
Acenaphthene	**23.8** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
Dibenzofuran	**19.3** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
Fluorene	**51.9** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C1-Fluorenes	**51.2** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C2-Fluorenes	**75.2** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C3-Fluorenes	**66.6** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
Dibenzothiophene	**49.2** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C1-Dibenzothiophenes	**58.6** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C2-Dibenzothiophenes	**84.4** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C3-Dibenzothiophenes	**54.5** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C4-Dibenzothiophenes	**25.8** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
Phenanthrene	**224** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
Anthracene	**122** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C1-Phenanthrenes/Anthracenes	**263** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C2-Phenanthrenes/Anthracenes	**257** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C3-Phenanthrenes/Anthracenes	**129** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C4-Phenanthrenes/Anthracenes	**56.4** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
Retene	**37.4** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
Benzo(b)naphtho(2,1-d)thiophene	**59.3** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C0-Benzonaphthothiophenes	**119** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C1-Benzonaphthothiophenes	**88.4** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C2-Benzonaphthothiophenes	**57.4** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C3-Benzonaphthothiophenes	**37.2** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-838-S1
Date Sampled: 06/22/23 11:00
Percent Solids: 72
Initial Volume: 5.33
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230020
ESS Laboratory Sample ID: F230020-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**11.0** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
Fluoranthene	**822** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
Pyrene	**1140** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C1-Fluoranthenes/Pyrenes	**786** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C2-Fluoranthenes/Pyrenes	**316** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C3-Fluoranthenes/Pyrenes	**112** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
Benzo(b)fluorene	**75.5** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
Benzo(c)fluorene	**38.0** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
2-Methylpyrene	**119** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
4-Methylpyrene	**116** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
1-Methylpyrene	**99.8** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
Benz(a)anthracene	**621** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
Chrysene/triphenylene	**551** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C1-Benzo(a)anthracenes/Chrysenes	**407** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C2-Benzo(a)anthracenes/Chrysenes	**177** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C3-Benzo(a)anthracenes/Chrysenes	**73.0** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C4-Benzo(a)anthracenes/Chrysenes	**35.1** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
Benzo(b)fluoranthene	**362** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
Benzo(j/k)fluoranthene	**441** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
Benzo(e)pyrene	**449** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
Benzo(a)pyrene	**767** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
Perylene	**476** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
Indeno(1,2,3-cd)pyrene	**385** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
Dibenzo(a,h)anthracene	**88.1** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
Benzo(g,h,i)perylene	**380** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
Coronene	**101** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
Tetramethyl lead	ND (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
Trimethylethyl lead	ND (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
Dimethyldiethyl lead	ND (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
Methyltriethyl lead	ND (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
Tetraethyl lead	ND (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
2,6,10-trimethyldodecane (1380)	**18.5** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-838-S1
Date Sampled: 06/22/23 11:00
Percent Solids: 72
Initial Volume: 5.33
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230020
ESS Laboratory Sample ID: F230020-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**38.2** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
2,6,10-trimethylpentadecane (1650)	**28.6** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C-17	**B 89.8** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
Pristane	**46.4** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
C-18	**B 65.5** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
Phytane	**44.9** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
Carbazole	**10.5** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
2,6-Dimethylnaphthalene	**14.3** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
2,3,5-Trimethylnaphthene	**J 3.44** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
4-Methyldibenzothiophene	**25.1** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
2/3-Methyldibenzothiophene	**17.3** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
1-Methyldibenzothiophene	**7.72** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
3-Methylphenanthrene	**44.6** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
2-Methylphenanthrene	**55.6** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
2-Methylanthracene	**47.8** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
4/9-Methylphenanthrene	**72.8** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603
1-Methylphenanthrene	**40.8** (5.20)	2.60	8270 Mod		1	IBM	06/29/23 16:19	F3F0012	FF32603

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*71 %*		*50-120*
Surrogate: Naphthalene-d8	*76 %*		*50-120*
Surrogate: Phenanthrene-d10	*83 %*		*50-120*
Surrogate: Perylene-d12	*86 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-838-S1
Date Sampled: 06/22/23 11:00
Percent Solids: 72

ESS Laboratory Work Order: F230020
ESS Laboratory Sample ID: F230020-04
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**4340** (483)		LK		1	CCP	06/29/23 13:33	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-838-S2
Date Sampled: 06/22/23 11:01
Percent Solids: 51
Initial Volume: 5.13
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230020
ESS Laboratory Sample ID: F230020-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**174** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C1-Benzene	**212** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C2-Benzenes	**288** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C3-Benzenes	**58.7** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C4-Benzenes	**94.8** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C5-Benzenes	**117** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
Methylcyclohexane	**J 4.98** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
Toluene	**257** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
Ethylbenzene	**18.7** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
m,p-Xylene	**413** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
Styrene	**58.9** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
o-Xylene	**14.8** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
Isopropylbenzene	ND (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
n-Propylbenzene	**17.5** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
1,3,5-Trimethylbenzene	**J 4.60** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
1,2,3-Trimethylbenzene	**9.02** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
1,2,4-Trimethylbenzene	**16.1** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
t-Butylbenzene	ND (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
sec-Butylbenzene	ND (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
p-Isopropyltoluene	**15.2** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
n-Butylbenzene	**35.1** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
trans-Decalin	**150** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
cis-Decalin	**22.3** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C1-Decalins	**334** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C2-Decalins	**270** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C3-Decalins	**168** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C4-Decalins	**276** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
Benzo(b)thiophene	**J 5.52** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C1-Benzo(b)thiophenes	**21.9** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C2-Benzo(b)thiophenes	**34.6** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C3-Benzo(b)thiophenes	**15.7** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C4-Benzo(b)thiophenes	**17.1** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-838-S2
Date Sampled: 06/22/23 11:01
Percent Solids: 51
Initial Volume: 5.13
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230020
ESS Laboratory Sample ID: F230020-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**60.5** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
2-Methylnaphthalene	**49.8** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
1-Methylnaphthalene	**27.0** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C1-Naphthalenes	**50.5** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C2-Naphthalenes	**196** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C3-Naphthalenes	**270** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C4-Naphthalenes	**226** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
Biphenyl	**76.7** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
Acenaphthylene	**128** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
Acenaphthene	**58.4** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
Dibenzofuran	**27.6** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
Fluorene	**76.2** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C1-Fluorenes	**83.0** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C2-Fluorenes	**118** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C3-Fluorenes	**139** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
Dibenzothiophene	**39.8** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C1-Dibenzothiophenes	**77.9** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C2-Dibenzothiophenes	**118** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C3-Dibenzothiophenes	**105** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C4-Dibenzothiophenes	**63.3** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
Phenanthrene	**334** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
Anthracene	**173** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C1-Phenanthrenes/Anthracenes	**371** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C2-Phenanthrenes/Anthracenes	**350** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C3-Phenanthrenes/Anthracenes	**213** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C4-Phenanthrenes/Anthracenes	**115** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
Retene	**86.8** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
Benzo(b)naphtho(2,1-d)thiophene	**63.4** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C0-Benzonaphthothiophenes	**122** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C1-Benzonaphthothiophenes	**115** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C2-Benzonaphthothiophenes	**105** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C3-Benzonaphthothiophenes	**73.2** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-838-S2
Date Sampled: 06/22/23 11:01
Percent Solids: 51
Initial Volume: 5.13
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230020
ESS Laboratory Sample ID: F230020-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**32.0** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
Fluoranthene	**658** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
Pyrene	**779** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C1-Fluoranthenes/Pyrenes	**544** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C2-Fluoranthenes/Pyrenes	**279** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C3-Fluoranthenes/Pyrenes	**147** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
Benzo(b)fluorene	**54.8** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
Benzo(c)fluorene	**28.9** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
2-Methylpyrene	**74.8** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
4-Methylpyrene	**75.9** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
1-Methylpyrene	**57.4** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
Benz(a)anthracene	**376** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
Chrysene/triphenylene	**449** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C1-Benzo(a)anthracenes/Chrysenes	**324** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C2-Benzo(a)anthracenes/Chrysenes	**198** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C3-Benzo(a)anthracenes/Chrysenes	**108** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C4-Benzo(a)anthracenes/Chrysenes	**60.7** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
Benzo(b)fluoranthene	**314** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
Benzo(j/k)fluoranthene	**336** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
Benzo(e)pyrene	**292** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
Benzo(a)pyrene	**437** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
Perylene	**1080** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
Indeno(1,2,3-cd)pyrene	**297** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
Dibenzo(a,h)anthracene	**68.2** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
Benzo(g,h,i)perylene	**248** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
Coronene	**73.8** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
Tetramethyl lead	ND (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
Trimethylethyl lead	ND (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
Dimethyldiethyl lead	ND (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
Methyltriethyl lead	ND (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
Tetraethyl lead	ND (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
2,6,10-trimethyldodecane (1380)	**165** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-838-S2
Date Sampled: 06/22/23 11:01
Percent Solids: 51
Initial Volume: 5.13
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230020
ESS Laboratory Sample ID: F230020-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**289** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
2,6,10-trimethylpentadecane (1650)	**259** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C-17	**331** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
Pristane	**601** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
C-18	**158** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
Phytane	**477** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
Carbazole	**23.3** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
2,6-Dimethylnaphthalene	**71.1** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
2,3,5-Trimethylnaphthene	**19.6** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
4-Methyldibenzothiophene	**32.1** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
2/3-Methyldibenzothiophene	**23.0** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
1-Methyldibenzothiophene	**10.1** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
3-Methylphenanthrene	**78.8** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
2-Methylphenanthrene	**68.4** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
2-Methylanthracene	**49.6** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
4/9-Methylphenanthrene	**98.9** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603
1-Methylphenanthrene	**67.1** (7.62)	3.81	8270 Mod		1	IBM	06/29/23 17:41	F3F0012	FF32603

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*72 %*		*50-120*
Surrogate: Naphthalene-d8	*77 %*		*50-120*
Surrogate: Phenanthrene-d10	*81 %*		*50-120*
Surrogate: Perylene-d12	*84 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-838-S2
Date Sampled: 06/22/23 11:01
Percent Solids: 51

ESS Laboratory Work Order: F230020
ESS Laboratory Sample ID: F230020-05
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**49000** (469)		LK		1	CCP	06/29/23 13:49	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-838-S3
Date Sampled: 06/22/23 11:02
Percent Solids: 68
Initial Volume: 5.25
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230020
ESS Laboratory Sample ID: F230020-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	B **21.9** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C1-Benzene	**38.5** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C2-Benzenes	**36.4** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C3-Benzenes	**12.5** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C4-Benzenes	**16.9** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C5-Benzenes	**19.1** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
Methylcyclohexane	ND (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
Toluene	**48.3** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
Ethylbenzene	ND (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
m,p-Xylene	**43.7** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
Styrene	**10.3** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
o-Xylene	ND (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
Isopropylbenzene	ND (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
n-Propylbenzene	ND (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
1,3,5-Trimethylbenzene	ND (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
1,2,3-Trimethylbenzene	ND (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
1,2,4-Trimethylbenzene	J **2.82** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
t-Butylbenzene	ND (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
sec-Butylbenzene	ND (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
p-Isopropyltoluene	**6.37** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
n-Butylbenzene	J **5.14** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
trans-Decalin	ND (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
cis-Decalin	ND (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C1-Decalins	ND (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C2-Decalins	ND (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C3-Decalins	ND (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C4-Decalins	ND (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
Benzo(b)thiophene	ND (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C1-Benzo(b)thiophenes	**6.46** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C2-Benzo(b)thiophenes	**8.21** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C3-Benzo(b)thiophenes	ND (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C4-Benzo(b)thiophenes	ND (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-838-S3
Date Sampled: 06/22/23 11:02
Percent Solids: 68
Initial Volume: 5.25
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230020
ESS Laboratory Sample ID: F230020-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**9.16** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
2-Methylnaphthalene	**8.33** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
1-Methylnaphthalene	**J 4.83** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C1-Naphthalenes	**9.06** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C2-Naphthalenes	**18.8** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C3-Naphthalenes	**14.6** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C4-Naphthalenes	**12.1** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
Biphenyl	**11.9** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
Acenaphthylene	**8.07** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
Acenaphthene	ND (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
Dibenzofuran	**J 3.35** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
Fluorene	**7.61** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C1-Fluorenes	**8.83** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C2-Fluorenes	**16.0** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C3-Fluorenes	**19.8** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
Dibenzothiophene	ND (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C1-Dibenzothiophenes	**5.69** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C2-Dibenzothiophenes	**6.59** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C3-Dibenzothiophenes	**5.80** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C4-Dibenzothiophenes	ND (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
Phenanthrene	**22.4** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
Anthracene	**12.6** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C1-Phenanthrenes/Anthracenes	**46.5** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C2-Phenanthrenes/Anthracenes	**43.4** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C3-Phenanthrenes/Anthracenes	**29.7** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C4-Phenanthrenes/Anthracenes	**27.9** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
Retene	**59.0** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
Benzo(b)naphtho(2,1-d)thiophene	**J 4.43** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C0-Benzonaphthothiophenes	**11.1** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C1-Benzonaphthothiophenes	**10.2** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C2-Benzonaphthothiophenes	**7.21** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C3-Benzonaphthothiophenes	**J 4.65** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-838-S3
Date Sampled: 06/22/23 11:02
Percent Solids: 68
Initial Volume: 5.25
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230020
ESS Laboratory Sample ID: F230020-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
Fluoranthene	**68.5** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
Pyrene	**95.3** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C1-Fluoranthenes/Pyrenes	**81.6** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C2-Fluoranthenes/Pyrenes	**42.4** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C3-Fluoranthenes/Pyrenes	**23.9** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
Benzo(b)fluorene	**8.77** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
Benzo(c)fluorene	**J 4.42** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
2-Methylpyrene	**11.3** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
4-Methylpyrene	**12.1** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
1-Methylpyrene	**9.52** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
Benz(a)anthracene	**51.2** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
Chrysene/triphenylene	**52.4** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C1-Benzo(a)anthracenes/Chrysenes	**47.3** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C2-Benzo(a)anthracenes/Chrysenes	**30.2** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C3-Benzo(a)anthracenes/Chrysenes	**15.5** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C4-Benzo(a)anthracenes/Chrysenes	ND (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
Benzo(b)fluoranthene	**30.4** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
Benzo(j/k)fluoranthene	**34.8** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
Benzo(e)pyrene	**36.6** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
Benzo(a)pyrene	**53.4** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
Perylene	**724** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
Indeno(1,2,3-cd)pyrene	**27.3** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
Dibenzo(a,h)anthracene	**6.79** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
Benzo(g,h,i)perylene	**26.9** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
Coronene	**6.74** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
Tetramethyl lead	ND (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
Trimethylethyl lead	ND (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
Dimethyldiethyl lead	ND (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
Methyltriethyl lead	ND (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
Tetraethyl lead	ND (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
2,6,10-trimethyldodecane (1380)	**5.76** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-838-S3
Date Sampled: 06/22/23 11:02
Percent Solids: 68
Initial Volume: 5.25
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230020
ESS Laboratory Sample ID: F230020-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**19.5** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
2,6,10-trimethylpentadecane (1650)	**10.3** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C-17	**99.8** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
Pristane	**13.4** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
C-18	**B 65.6** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
Phytane	**14.3** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
Carbazole	ND (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
2,6-Dimethylnaphthalene	**J 3.96** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
2,3,5-Trimethylnaphthene	ND (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
4-Methyldibenzothiophene	ND (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
2/3-Methyldibenzothiophene	ND (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
1-Methyldibenzothiophene	ND (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
3-Methylphenanthrene	**12.3** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
2-Methylphenanthrene	**8.26** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
2-Methylanthracene	**6.44** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
4/9-Methylphenanthrene	**15.4** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603
1-Methylphenanthrene	**J 3.52** (5.62)	2.81	8270 Mod		1	IBM	06/29/23 19:05	F3F0012	FF32603

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*72 %*		*50-120*
Surrogate: Naphthalene-d8	*77 %*		*50-120*
Surrogate: Phenanthrene-d10	*82 %*		*50-120*
Surrogate: Perylene-d12	*84 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-838-S3
Date Sampled: 06/22/23 11:02
Percent Solids: 68

ESS Laboratory Work Order: F230020
ESS Laboratory Sample ID: F230020-06
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**21400** (490)		LK		1	CCP	06/29/23 14:06	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230020

Quality Control Data

Classical Chemistry

Batch DF32735 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	500	mg/kg							
Total Organic Carbon (2)	ND	500	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230020

Quality Control Data

Classical Chemistry

Batch DF32735 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9990	500	mg/kg	10010		100	80-120			
Total Organic Carbon (2)	10000	500	mg/kg	10010		100	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230020

Quality Control Data

Classical Chemistry

Batch DF32735 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	10200	500	mg/kg	10010		102	80-120	2	25	
Total Organic Carbon (2)	10300	500	mg/kg	10010		103	80-120	3	25	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230020

Quality Control Data

Alkylated PAHs

Batch FF32603 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	7.94	4.00	ug/Kg wet							
C1-Benzene	ND	4.00	ug/Kg wet							
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	2.19	4.00	ug/Kg wet							J
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	ND	4.00	ug/Kg wet							
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230020

Quality Control Data

Alkylated PAHs

Batch FF32603 - 3570

C1-Fluorenes	ND	4.00	ug/Kg wet
C2-Fluorenes	ND	4.00	ug/Kg wet
C3-Fluorenes	ND	4.00	ug/Kg wet
Dibenzothiophene	ND	4.00	ug/Kg wet
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet
Phenanthrene	ND	4.00	ug/Kg wet
Anthracene	ND	4.00	ug/Kg wet
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
Retene	ND	4.00	ug/Kg wet
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
Fluoranthene	ND	4.00	ug/Kg wet
Pyrene	ND	4.00	ug/Kg wet
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
Benzo(b)fluorene	ND	4.00	ug/Kg wet
Benzo(c)fluorene	ND	4.00	ug/Kg wet
2-Methylpyrene	ND	4.00	ug/Kg wet
4-Methylpyrene	ND	4.00	ug/Kg wet
1-Methylpyrene	ND	4.00	ug/Kg wet
Benz(a)anthracene	ND	4.00	ug/Kg wet
Chrysene/triphenylene	ND	4.00	ug/Kg wet
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet
Benzo(e)pyrene	ND	4.00	ug/Kg wet
Benzo(a)pyrene	ND	4.00	ug/Kg wet
Perylene	ND	4.00	ug/Kg wet
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet
Coronene	ND	4.00	ug/Kg wet
Tetramethyl lead	ND	4.00	ug/Kg wet
Trimethylethyl lead	ND	4.00	ug/Kg wet

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230020

Quality Control Data

Alkylated PAHs

Batch FF32603 - 3570							
Dimethyldiethyl lead	ND	4.00	ug/Kg wet				
Methyltriethyl lead	ND	4.00	ug/Kg wet				
Tetraethyl lead	ND	4.00	ug/Kg wet				
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet				
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet				
2,6,10-trimethylpentadecane (1650)	ND	4.00	ug/Kg wet				
C-17	9.03	4.00	ug/Kg wet				
Pristane	2.22	4.00	ug/Kg wet				J
C-18	9.29	4.00	ug/Kg wet				
Phytane	ND	4.00	ug/Kg wet				
Carbazole	ND	4.00	ug/Kg wet				
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet				
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet				
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
3-Methylphenanthrene	ND	4.00	ug/Kg wet				
2-Methylphenanthrene	ND	4.00	ug/Kg wet				
2-Methylanthracene	ND	4.00	ug/Kg wet				
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet				
1-Methylphenanthrene	ND	4.00	ug/Kg wet				
Surrogate: Toluene-D8	*268*		ug/Kg wet	*400.0*	*67*	*50-120*	
Surrogate: Naphthalene-d8	*279*		ug/Kg wet	*400.0*	*70*	*50-120*	
Surrogate: Phenanthrene-d10	*317*		ug/Kg wet	*400.0*	*79*	*50-120*	
Surrogate: Perylene-d12	*313*		ug/Kg wet	*400.0*	*78*	*50-120*	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230020

Quality Control Data

Alkylated PAHs

Batch FF32603 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	307	4.00	ug/Kg wet	400.0		77	60-130			
Methylcyclohexane	234	4.00	ug/Kg wet	400.0		59	60-130			B-
Toluene	307	4.00	ug/Kg wet	400.0		77	60-130			
Ethylbenzene	332	4.00	ug/Kg wet	400.0		83	60-130			
m,p-Xylene	327	4.00	ug/Kg wet	400.0		82	60-130			
Styrene	303	4.00	ug/Kg wet	400.0		76	60-130			
o-Xylene	340	4.00	ug/Kg wet	400.0		85	60-130			
Isopropylbenzene	334	4.00	ug/Kg wet	400.0		84	60-130			
n-Propylbenzene	334	4.00	ug/Kg wet	400.0		83	60-130			
1,3,5-Trimethylbenzene	341	4.00	ug/Kg wet	400.0		85	60-130			
1,2,3-Trimethylbenzene	338	4.00	ug/Kg wet	400.0		84	60-130			
1,2,4-Trimethylbenzene	339	4.00	ug/Kg wet	400.0		85	60-130			
t-Butylbenzene	336	4.00	ug/Kg wet	400.0		84	60-130			
sec-Butylbenzene	333	4.00	ug/Kg wet	400.0		83	60-130			
p-Isopropyltoluene	339	4.00	ug/Kg wet	400.0		85	60-130			
n-Butylbenzene	329	4.00	ug/Kg wet	400.0		82	60-130			
trans-Decalin	319	4.00	ug/Kg wet	400.0		80	60-130			
cis-Decalin	321	4.00	ug/Kg wet	400.0		80	60-130			
Benzo(b)thiophene	319	4.00	ug/Kg wet	400.0		80	60-130			
Naphthalene	317	4.00	ug/Kg wet	400.0		79	60-130			
2-Methylnaphthalene	319	4.00	ug/Kg wet	400.0		80	60-130			
1-Methylnaphthalene	317	4.00	ug/Kg wet	400.0		79	60-130			
Biphenyl	294	4.00	ug/Kg wet	400.0		74	60-130			
Acenaphthylene	354	4.00	ug/Kg wet	400.0		89	60-130			
Acenaphthene	335	4.00	ug/Kg wet	400.0		84	60-130			
Dibenzofuran	334	4.00	ug/Kg wet	400.0		83	60-130			
Fluorene	335	4.00	ug/Kg wet	400.0		84	60-130			
Dibenzothiophene	331	4.00	ug/Kg wet	400.0		83	60-130			
Phenanthrene	323	4.00	ug/Kg wet	400.0		81	60-130			
Anthracene	349	4.00	ug/Kg wet	400.0		87	60-130			
Retene	376	4.00	ug/Kg wet	400.0		94	60-130			
Benzo(b)naphtho(2,1-d)thiophene	366	4.00	ug/Kg wet	400.0		91	60-130			
Fluoranthene	355	4.00	ug/Kg wet	400.0		89	60-130			
Pyrene	355	4.00	ug/Kg wet	400.0		89	60-130			
Benz(a)anthracene	388	4.00	ug/Kg wet	400.0		97	60-130			
Chrysene/triphenylene	368	4.00	ug/Kg wet	400.0		92	60-130			
Benzo(b)fluoranthene	363	4.00	ug/Kg wet	400.0		91	60-130			
Benzo(j/k)fluoranthene	367	4.00	ug/Kg wet	400.0		92	60-130			
Benzo(e)pyrene	339	4.00	ug/Kg wet	400.0		85	60-130			
Benzo(a)pyrene	369	4.00	ug/Kg wet	400.0		92	60-130			
Perylene	367	4.00	ug/Kg wet	400.0		92	60-130			
Indeno(1,2,3-cd)pyrene	387	4.00	ug/Kg wet	400.0		97	60-130			
Dibenzo(a,h)anthracene	364	4.00	ug/Kg wet	400.0		91	60-130			
Benzo(g,h,i)perylene	342	4.00	ug/Kg wet	400.0		86	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230020

Quality Control Data

Alkylated PAHs

Batch FF32603 - 3570						
Coronene	342	4.00	ug/Kg wet	400.0	85	60-130
Surrogate: Toluene-D8	*321*		ug/Kg wet	*400.0*	*80*	*50-120*
Surrogate: Naphthalene-d8	*320*		ug/Kg wet	*400.0*	*80*	*50-120*
Surrogate: Phenanthrene-d10	*342*		ug/Kg wet	*400.0*	*86*	*50-120*
Surrogate: Perylene-d12	*351*		ug/Kg wet	*400.0*	*88*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230020

Quality Control Data

Alkylated PAHs

Batch FF32603 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	ND	4.00	ug/Kg wet				60-130			
Methylcyclohexane	ND	4.00	ug/Kg wet				60-130			
Toluene	ND	4.00	ug/Kg wet				60-130			
Ethylbenzene	ND	4.00	ug/Kg wet				60-130			
m,p-Xylene	ND	4.00	ug/Kg wet				60-130			
Styrene	ND	4.00	ug/Kg wet				60-130			
o-Xylene	ND	4.00	ug/Kg wet				60-130			
Isopropylbenzene	ND	4.00	ug/Kg wet				60-130			
n-Propylbenzene	ND	4.00	ug/Kg wet				60-130			
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet				60-130			
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet				60-130			
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet				60-130			
t-Butylbenzene	ND	4.00	ug/Kg wet				60-130			
sec-Butylbenzene	ND	4.00	ug/Kg wet				60-130			
p-Isopropyltoluene	ND	4.00	ug/Kg wet				60-130			
n-Butylbenzene	ND	4.00	ug/Kg wet				60-130			
trans-Decalin	ND	4.00	ug/Kg wet				60-130			
cis-Decalin	ND	4.00	ug/Kg wet				60-130			
Benzo(b)thiophene	ND	4.00	ug/Kg wet				60-130			
Naphthalene	ND	4.00	ug/Kg wet				60-130			
2-Methylnaphthalene	ND	4.00	ug/Kg wet				60-130			
1-Methylnaphthalene	ND	4.00	ug/Kg wet				60-130			
Biphenyl	ND	4.00	ug/Kg wet				60-130			
Acenaphthylene	ND	4.00	ug/Kg wet				60-130			
Acenaphthene	ND	4.00	ug/Kg wet				60-130			
Dibenzofuran	ND	4.00	ug/Kg wet				60-130			
Fluorene	ND	4.00	ug/Kg wet				60-130			
Dibenzothiophene	ND	4.00	ug/Kg wet				60-130			
Phenanthrene	ND	4.00	ug/Kg wet				60-130			
Anthracene	ND	4.00	ug/Kg wet				60-130			
Retene	ND	4.00	ug/Kg wet				60-130			
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet				60-130			
Fluoranthene	ND	4.00	ug/Kg wet				60-130			
Pyrene	ND	4.00	ug/Kg wet				60-130			
Benz(a)anthracene	ND	4.00	ug/Kg wet				60-130			
Chrysene/triphenylene	ND	4.00	ug/Kg wet				60-130			
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet				60-130			
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet				60-130			
Benzo(e)pyrene	ND	4.00	ug/Kg wet				60-130			
Benzo(a)pyrene	ND	4.00	ug/Kg wet				60-130			
Perylene	ND	4.00	ug/Kg wet				60-130			
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet				60-130			
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet				60-130			
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet				60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230020

Quality Control Data

Alkylated PAHs

Batch FF32603 - 3570						
Coronene	ND	4.00	ug/Kg wet			60-130
Tetraethyl lead	391	4.00	ug/Kg wet	400.0	98	60-130
Surrogate: Toluene-D8	*305*		ug/Kg wet	*400.0*	*76*	*50-120*
Surrogate: Naphthalene-d8	*304*		ug/Kg wet	*400.0*	*76*	*50-120*
Surrogate: Phenanthrene-d10	*325*		ug/Kg wet	*400.0*	*81*	*50-120*
Surrogate: Perylene-d12	*322*		ug/Kg wet	*400.0*	*81*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F230020

Notes and Definitions

U	Analyte included in the analysis, but not detected
J	Reported between MDL and MRL
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
B-	Blank Spike recovery is below lower control limit (B-).
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230020

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 23F0799 / F230020

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000

Project Information

Project Name: Amesbury Former MGP
Project Number: 1804576
Project Location: Amesbury, MA
Project Manager: Ryan Hoffman
781-721-4091 rhoffman@geiconsultants.com

Send Report to: Ryan Hoffman
labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY AND MCP ANALYTICAL METHODS REQUIRED: (YES) NO

STATE AND FEDERAL REGULATORY REQUIREMENTS/REPORT LIMITS

State/Federal Program: (MA) 401WQC Other _____ NH RI CT NY ME

MA MCP Criteria are (Method 1 S-1 and GW-2/GW-3). Circle if GW-1 is required.

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Preservative: None	Analysis: Parent and Alkylated MAHs * PAHs 8270*	Analysis: TOCs by Lloyd-Kahn	Sample Specific Remarks
1	1804576-837-S1	6/22/2023	11:15	SOIL	1	JES		X	X	
2	1804576-837-S2	6/22/2023	11:16	SOIL	1	JES		X	X	
3	1804576-837-S3	6/22/2023	11:17	SOIL	1	JES		X	X	
4	1804576-838-S1	6/22/2023	11:00	SOIL	1	JES		X	X	
5	1804576-838-S2	6/22/2023	11:01	SOIL	1	JES		X	X	
6	1804576-838-S3	6/22/2023	11:02	SOIL	1	JES		X	X	

Sample Handling

Samples Field Filtered: YES NO (NA)

Sampled Shipped With Ice: (YES) NO

	Relinquished by sampler: (signature)	Date	Time	Received by: (signature)
1.	[signature]	6/22/2023	13:45	1. GEI SAMPLE FRIDGE
2.	GEI Fridge	6/22/23	1401	2. M. Clark
3.	M. Clark	6/22/23	1401	3. AO 6/22/23 1401
4.	AO 0.2 on ice	6/22/23	2009	4.
5.				5.

Turnaround Time (Business days):

5-Day X 4-Day ____ 3-Day ____
2-Day ____ 1-Day ____ Other ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

Sample Matrix Abbreviations: SO = Soil GW = Groundwater SW = Surface Water SD = Sediment CO = Concrete PC = Paint Chip CLK = Caulk

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants

Shipped/Delivered Via: ESS Courier

ESS Project ID: F230020
Date Received: 6/22/2023
Project Due Date: 6/29/2023
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 0.2 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / (NA)
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By/Acid Lot#:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / (No)
    Who was contacted? Date: Time: By:

Resolution:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1	489	Yes	N/A	Yes	8 oz jar	NP	
2	490	Yes	N/A	Yes	8 oz jar	NP	
3	491	Yes	N/A	Yes	8 oz jar	NP	
4	492	Yes	N/A	Yes	8 oz jar	NP	
5	493	Yes	N/A	Yes	8 oz jar	NP	
6	494	Yes	N/A	Yes	8 oz jar	NP	

2nd Review
Were all containers scanned into storage/lab? Initials BB
Are barcode labels on correct containers? Yes / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By:
Reviewed

Date & Time: 6/23/23 9:20

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants

By: [signature]

Date & Time: 6/23/23 1003

ESS Project ID: F230020

Date Received: 6/22/2023

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: F230021

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 2:18 pm, Jul 10, 2023

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses

ESS - Cranston, RI	TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230021

SAMPLE RECEIPT

The following samples were received on June 22, 2023 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F230021-01	1804576-815-S1	Soil	8270 Mod, LK
F230021-02	1804576-815-S3	Soil	8270 Mod, LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230021

PROJECT NARRATIVE

Alkylated PAHs

F230021-02	**Present in Method Blank (B).**
	Benzene , C-18
F3F0012-CCV2	**Continuing Calibration %Diff/Drift is above control limit (CD+).**
	Tetraethyl lead (31% @ 25%)
F3F0012-CCV4	**Continuing Calibration %Diff/Drift is above control limit (CD+).**
	Tetraethyl lead (26% @ 25%)
FF32603-BS2	**Blank Spike recovery is below lower control limit (B-).**
	Methylcyclohexane (59% @ 60-130%)

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230021

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-815-S1
Date Sampled: 06/21/23 11:00
Percent Solids: 65
Initial Volume: 6.32
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230021
ESS Laboratory Sample ID: F230021-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**130** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C1-Benzene	**105** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C2-Benzenes	**145** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C3-Benzenes	**38.2** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C4-Benzenes	**44.8** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C5-Benzenes	**36.1** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
Methylcyclohexane	**6.38** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
Toluene	**131** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
Ethylbenzene	**17.4** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
m,p-Xylene	**192** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
Styrene	**63.1** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
o-Xylene	**9.90** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
Isopropylbenzene	ND (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
n-Propylbenzene	**17.1** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
1,3,5-Trimethylbenzene	**J 2.98** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
1,2,3-Trimethylbenzene	**6.52** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
1,2,4-Trimethylbenzene	**8.96** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
t-Butylbenzene	ND (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
sec-Butylbenzene	ND (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
p-Isopropyltoluene	**8.77** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
n-Butylbenzene	**29.0** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
trans-Decalin	**6.75** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
cis-Decalin	ND (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C1-Decalins	**15.4** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C2-Decalins	**20.5** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C3-Decalins	ND (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C4-Decalins	ND (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
Benzo(b)thiophene	**6.01** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C1-Benzo(b)thiophenes	**16.4** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C2-Benzo(b)thiophenes	**20.9** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C3-Benzo(b)thiophenes	**14.3** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C4-Benzo(b)thiophenes	**9.20** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-815-S1
Date Sampled: 06/21/23 11:00
Percent Solids: 65
Initial Volume: 6.32
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230021
ESS Laboratory Sample ID: F230021-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**67.8** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
2-Methylnaphthalene	**40.1** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
1-Methylnaphthalene	**32.3** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C1-Naphthalenes	**47.3** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C2-Naphthalenes	**107** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C3-Naphthalenes	**83.2** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C4-Naphthalenes	**56.5** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
Biphenyl	**20.4** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
Acenaphthylene	**198** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
Acenaphthene	**94.9** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
Dibenzofuran	**55.2** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
Fluorene	**103** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C1-Fluorenes	**67.8** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C2-Fluorenes	**68.0** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C3-Fluorenes	**128** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
Dibenzothiophene	**79.9** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C1-Dibenzothiophenes	**93.6** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C2-Dibenzothiophenes	**106** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C3-Dibenzothiophenes	**64.6** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C4-Dibenzothiophenes	**42.7** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
Phenanthrene	**1060** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
Anthracene	**494** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C1-Phenanthrenes/Anthracenes	**667** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C2-Phenanthrenes/Anthracenes	**403** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C3-Phenanthrenes/Anthracenes	**170** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C4-Phenanthrenes/Anthracenes	**70.2** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
Retene	**40.3** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
Benzo(b)naphtho(2,1-d)thiophene	**243** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C0-Benzonaphthothiophenes	**442** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C1-Benzonaphthothiophenes	**238** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C2-Benzonaphthothiophenes	**165** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C3-Benzonaphthothiophenes	**138** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-815-S1
Date Sampled: 06/21/23 11:00
Percent Solids: 65
Initial Volume: 6.32
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230021
ESS Laboratory Sample ID: F230021-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**75.8** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
Fluoranthene	**2700** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
Pyrene	**2400** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C1-Fluoranthenes/Pyrenes	**1210** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C2-Fluoranthenes/Pyrenes	**714** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C3-Fluoranthenes/Pyrenes	**304** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
Benzo(b)fluorene	**153** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
Benzo(c)fluorene	**72.1** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
2-Methylpyrene	**162** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
4-Methylpyrene	**122** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
1-Methylpyrene	**98.3** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
Benz(a)anthracene	**1710** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
Chrysene/triphenylene	**1640** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C1-Benzo(a)anthracenes/Chrysenes	**732** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C2-Benzo(a)anthracenes/Chrysenes	**352** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C3-Benzo(a)anthracenes/Chrysenes	**205** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C4-Benzo(a)anthracenes/Chrysenes	**105** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
Benzo(b)fluoranthene	**1380** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
Benzo(j/k)fluoranthene	**1350** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
Benzo(e)pyrene	**1070** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
Benzo(a)pyrene	**1790** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
Perylene	**540** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
Indeno(1,2,3-cd)pyrene	**1250** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
Dibenzo(a,h)anthracene	**296** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
Benzo(g,h,i)perylene	**949** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
Coronene	**254** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
Tetramethyl lead	ND (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
Trimethylethyl lead	ND (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
Dimethyldiethyl lead	ND (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
Methyltriethyl lead	ND (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
Tetraethyl lead	ND (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
2,6,10-trimethyldodecane (1380)	**18.8** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-815-S1
Date Sampled: 06/21/23 11:00
Percent Solids: 65
Initial Volume: 6.32
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230021
ESS Laboratory Sample ID: F230021-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**53.4** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
2,6,10-trimethylpentadecane (1650)	**56.7** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C-17	**284** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
Pristane	**238** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
C-18	**361** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
Phytane	**320** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
Carbazole	**121** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
2,6-Dimethylnaphthalene	**38.6** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
2,3,5-Trimethylnaphthene	**6.49** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
4-Methyldibenzothiophene	**29.9** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
2/3-Methyldibenzothiophene	**31.1** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
1-Methyldibenzothiophene	**14.1** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
3-Methylphenanthrene	**141** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
2-Methylphenanthrene	**171** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
2-Methylanthracene	**107** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
4/9-Methylphenanthrene	**150** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603
1-Methylphenanthrene	**106** (4.86)	2.43	8270 Mod		1	IBM	07/04/23 13:22	F3G0001	FF32603

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*72 %*		*50-120*
Surrogate: Naphthalene-d8	*74 %*		*50-120*
Surrogate: Phenanthrene-d10	*74 %*		*50-120*
Surrogate: Perylene-d12	*79 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-815-S1
Date Sampled: 06/21/23 11:00
Percent Solids: 65

ESS Laboratory Work Order: F230021
ESS Laboratory Sample ID: F230021-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**14600** (479)		LK		1	CCP	06/29/23 14:23	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-815-S3
Date Sampled: 06/21/23 11:02
Percent Solids: 51
Initial Volume: 5.39
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230021
ESS Laboratory Sample ID: F230021-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**B 36.5** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C1-Benzene	**196** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C2-Benzenes	**107** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C3-Benzenes	**56.0** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C4-Benzenes	**65.6** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C5-Benzenes	**40.1** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
Methylcyclohexane	**13.8** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
Toluene	**241** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
Ethylbenzene	**18.0** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
m,p-Xylene	**127** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
Styrene	**35.3** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
o-Xylene	**8.08** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
Isopropylbenzene	ND (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
n-Propylbenzene	**J 6.43** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
1,3,5-Trimethylbenzene	**11.1** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
1,2,3-Trimethylbenzene	**J 6.35** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
1,2,4-Trimethylbenzene	**18.1** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
t-Butylbenzene	ND (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
sec-Butylbenzene	ND (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
p-Isopropyltoluene	**38.6** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
n-Butylbenzene	**12.0** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
trans-Decalin	**J 6.01** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
cis-Decalin	ND (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C1-Decalins	**19.0** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C2-Decalins	**33.6** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C3-Decalins	**32.1** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C4-Decalins	**31.5** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
Benzo(b)thiophene	**J 5.02** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C1-Benzo(b)thiophenes	**12.5** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C2-Benzo(b)thiophenes	**13.6** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C3-Benzo(b)thiophenes	**7.77** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C4-Benzo(b)thiophenes	**J 4.64** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-815-S3
Date Sampled: 06/21/23 11:02
Percent Solids: 51
Initial Volume: 5.39
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230021
ESS Laboratory Sample ID: F230021-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**133** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
2-Methylnaphthalene	**116** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
1-Methylnaphthalene	**58.5** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C1-Naphthalenes	**114** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C2-Naphthalenes	**167** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C3-Naphthalenes	**132** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C4-Naphthalenes	**103** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
Biphenyl	**46.0** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
Acenaphthylene	**165** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
Acenaphthene	**74.5** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
Dibenzofuran	**46.7** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
Fluorene	**103** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C1-Fluorenes	**109** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C2-Fluorenes	**169** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C3-Fluorenes	**124** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
Dibenzothiophene	**35.9** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C1-Dibenzothiophenes	**57.3** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C2-Dibenzothiophenes	**82.8** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C3-Dibenzothiophenes	**60.6** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C4-Dibenzothiophenes	**39.3** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
Phenanthrene	**600** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
Anthracene	**322** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C1-Phenanthrenes/Anthracenes	**776** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C2-Phenanthrenes/Anthracenes	**691** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C3-Phenanthrenes/Anthracenes	**352** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C4-Phenanthrenes/Anthracenes	**175** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
Retene	**150** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
Benzo(b)naphtho(2,1-d)thiophene	**98.6** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C0-Benzonaphthothiophenes	**210** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C1-Benzonaphthothiophenes	**164** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C2-Benzonaphthothiophenes	**124** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C3-Benzonaphthothiophenes	**76.2** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-815-S3
Date Sampled: 06/21/23 11:02
Percent Solids: 51
Initial Volume: 5.39
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230021
ESS Laboratory Sample ID: F230021-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**23.8** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
Fluoranthene	**985** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
Pyrene	**2010** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C1-Fluoranthenes/Pyrenes	**1740** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C2-Fluoranthenes/Pyrenes	**771** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C3-Fluoranthenes/Pyrenes	**330** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
Benzo(b)fluorene	**192** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
Benzo(c)fluorene	**89.5** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
2-Methylpyrene	**245** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
4-Methylpyrene	**237** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
1-Methylpyrene	**195** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
Benz(a)anthracene	**1210** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
Chrysene/triphenylene	**1110** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C1-Benzo(a)anthracenes/Chrysenes	**906** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C2-Benzo(a)anthracenes/Chrysenes	**505** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C3-Benzo(a)anthracenes/Chrysenes	**280** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C4-Benzo(a)anthracenes/Chrysenes	**145** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
Benzo(b)fluoranthene	**633** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
Benzo(j/k)fluoranthene	**746** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
Benzo(e)pyrene	**700** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
Benzo(a)pyrene	**1180** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
Perylene	**743** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
Indeno(1,2,3-cd)pyrene	**573** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
Dibenzo(a,h)anthracene	**142** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
Benzo(g,h,i)perylene	**525** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
Coronene	**122** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
Tetramethyl lead	ND (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
Trimethylethyl lead	ND (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
Dimethyldiethyl lead	ND (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
Methyltriethyl lead	ND (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
Tetraethyl lead	ND (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
2,6,10-trimethyldodecane (1380)	**16.2** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-815-S3
Date Sampled: 06/21/23 11:02
Percent Solids: 51
Initial Volume: 5.39
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230021
ESS Laboratory Sample ID: F230021-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/26/23 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**50.1** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
2,6,10-trimethylpentadecane (1650)	**34.9** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C-17	**157** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
Pristane	**59.8** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
C-18	**B 84.6** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
Phytane	**48.0** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
Carbazole	**30.6** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
2,6-Dimethylnaphthalene	**45.1** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
2,3,5-Trimethylnaphthene	**8.05** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
4-Methyldibenzothiophene	**15.9** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
2/3-Methyldibenzothiophene	**20.7** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
1-Methyldibenzothiophene	**J 6.69** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
3-Methylphenanthrene	**159** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
2-Methylphenanthrene	**166** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
2-Methylanthracene	**155** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
4/9-Methylphenanthrene	**213** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603
1-Methylphenanthrene	**77.0** (7.34)	3.67	8270 Mod		1	IBM	06/29/23 21:51	F3F0012	FF32603

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*68 %*		*50-120*
Surrogate: Naphthalene-d8	*77 %*		*50-120*
Surrogate: Phenanthrene-d10	*82 %*		*50-120*
Surrogate: Perylene-d12	*86 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-815-S3
Date Sampled: 06/21/23 11:02
Percent Solids: 51

ESS Laboratory Work Order: F230021
ESS Laboratory Sample ID: F230021-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**13700** (480)		LK		1	CCP	06/29/23 19:25	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230021

Quality Control Data

Classical Chemistry

Batch DF32735 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	500	mg/kg							
Total Organic Carbon (2)	ND	500	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230021

Quality Control Data

Classical Chemistry

Batch DF32735 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9990	500	mg/kg	10010		100	80-120			
Total Organic Carbon (2)	10000	500	mg/kg	10010		100	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230021

Quality Control Data

Classical Chemistry

Batch DF32735 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	10200	500	mg/kg	10010		102	80-120	2	25	
Total Organic Carbon (2)	10300	500	mg/kg	10010		103	80-120	3	25	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230021

Quality Control Data

Alkylated PAHs

Batch FF32603 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	7.94	4.00	ug/Kg wet							
C1-Benzene	ND	4.00	ug/Kg wet							
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	2.19	4.00	ug/Kg wet							J
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	ND	4.00	ug/Kg wet							
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230021

Quality Control Data

Alkylated PAHs

Batch FF32603 - 3570

C1-Fluorenes	ND	4.00	ug/Kg wet
C2-Fluorenes	ND	4.00	ug/Kg wet
C3-Fluorenes	ND	4.00	ug/Kg wet
Dibenzothiophene	ND	4.00	ug/Kg wet
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet
Phenanthrene	ND	4.00	ug/Kg wet
Anthracene	ND	4.00	ug/Kg wet
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
Retene	ND	4.00	ug/Kg wet
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
Fluoranthene	ND	4.00	ug/Kg wet
Pyrene	ND	4.00	ug/Kg wet
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
Benzo(b)fluorene	ND	4.00	ug/Kg wet
Benzo(c)fluorene	ND	4.00	ug/Kg wet
2-Methylpyrene	ND	4.00	ug/Kg wet
4-Methylpyrene	ND	4.00	ug/Kg wet
1-Methylpyrene	ND	4.00	ug/Kg wet
Benz(a)anthracene	ND	4.00	ug/Kg wet
Chrysene/triphenylene	ND	4.00	ug/Kg wet
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet
Benzo(e)pyrene	ND	4.00	ug/Kg wet
Benzo(a)pyrene	ND	4.00	ug/Kg wet
Perylene	ND	4.00	ug/Kg wet
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet
Coronene	ND	4.00	ug/Kg wet
Tetramethyl lead	ND	4.00	ug/Kg wet
Trimethylethyl lead	ND	4.00	ug/Kg wet

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230021

Quality Control Data

Alkylated PAHs

Batch FF32603 - 3570							
Dimethyldiethyl lead	ND	4.00	ug/Kg wet				
Methyltriethyl lead	ND	4.00	ug/Kg wet				
Tetraethyl lead	ND	4.00	ug/Kg wet				
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet				
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet				
2,6,10-trimethylpentadecane (1650)	ND	4.00	ug/Kg wet				
C-17	9.03	4.00	ug/Kg wet				
Pristane	2.22	4.00	ug/Kg wet				J
C-18	9.29	4.00	ug/Kg wet				
Phytane	ND	4.00	ug/Kg wet				
Carbazole	ND	4.00	ug/Kg wet				
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet				
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet				
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
3-Methylphenanthrene	ND	4.00	ug/Kg wet				
2-Methylphenanthrene	ND	4.00	ug/Kg wet				
2-Methylanthracene	ND	4.00	ug/Kg wet				
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet				
1-Methylphenanthrene	ND	4.00	ug/Kg wet				
Surrogate: Toluene-D8	*268*		ug/Kg wet	*400.0*	*67*	*50-120*	
Surrogate: Naphthalene-d8	*279*		ug/Kg wet	*400.0*	*70*	*50-120*	
Surrogate: Phenanthrene-d10	*317*		ug/Kg wet	*400.0*	*79*	*50-120*	
Surrogate: Perylene-d12	*313*		ug/Kg wet	*400.0*	*78*	*50-120*	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230021

Quality Control Data

Alkylated PAHs

Batch FF32603 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	307	4.00	ug/Kg wet	400.0		77	60-130			
Methylcyclohexane	234	4.00	ug/Kg wet	400.0		59	60-130			B-
Toluene	307	4.00	ug/Kg wet	400.0		77	60-130			
Ethylbenzene	332	4.00	ug/Kg wet	400.0		83	60-130			
m,p-Xylene	327	4.00	ug/Kg wet	400.0		82	60-130			
Styrene	303	4.00	ug/Kg wet	400.0		76	60-130			
o-Xylene	340	4.00	ug/Kg wet	400.0		85	60-130			
Isopropylbenzene	334	4.00	ug/Kg wet	400.0		84	60-130			
n-Propylbenzene	334	4.00	ug/Kg wet	400.0		83	60-130			
1,3,5-Trimethylbenzene	341	4.00	ug/Kg wet	400.0		85	60-130			
1,2,3-Trimethylbenzene	338	4.00	ug/Kg wet	400.0		84	60-130			
1,2,4-Trimethylbenzene	339	4.00	ug/Kg wet	400.0		85	60-130			
t-Butylbenzene	336	4.00	ug/Kg wet	400.0		84	60-130			
sec-Butylbenzene	333	4.00	ug/Kg wet	400.0		83	60-130			
p-Isopropyltoluene	339	4.00	ug/Kg wet	400.0		85	60-130			
n-Butylbenzene	329	4.00	ug/Kg wet	400.0		82	60-130			
trans-Decalin	319	4.00	ug/Kg wet	400.0		80	60-130			
cis-Decalin	321	4.00	ug/Kg wet	400.0		80	60-130			
Benzo(b)thiophene	319	4.00	ug/Kg wet	400.0		80	60-130			
Naphthalene	317	4.00	ug/Kg wet	400.0		79	60-130			
2-Methylnaphthalene	319	4.00	ug/Kg wet	400.0		80	60-130			
1-Methylnaphthalene	317	4.00	ug/Kg wet	400.0		79	60-130			
Biphenyl	294	4.00	ug/Kg wet	400.0		74	60-130			
Acenaphthylene	354	4.00	ug/Kg wet	400.0		89	60-130			
Acenaphthene	335	4.00	ug/Kg wet	400.0		84	60-130			
Dibenzofuran	334	4.00	ug/Kg wet	400.0		83	60-130			
Fluorene	335	4.00	ug/Kg wet	400.0		84	60-130			
Dibenzothiophene	331	4.00	ug/Kg wet	400.0		83	60-130			
Phenanthrene	323	4.00	ug/Kg wet	400.0		81	60-130			
Anthracene	349	4.00	ug/Kg wet	400.0		87	60-130			
Retene	376	4.00	ug/Kg wet	400.0		94	60-130			
Benzo(b)naphtho(2,1-d)thiophene	366	4.00	ug/Kg wet	400.0		91	60-130			
Fluoranthene	355	4.00	ug/Kg wet	400.0		89	60-130			
Pyrene	355	4.00	ug/Kg wet	400.0		89	60-130			
Benz(a)anthracene	388	4.00	ug/Kg wet	400.0		97	60-130			
Chrysene/triphenylene	368	4.00	ug/Kg wet	400.0		92	60-130			
Benzo(b)fluoranthene	363	4.00	ug/Kg wet	400.0		91	60-130			
Benzo(j/k)fluoranthene	367	4.00	ug/Kg wet	400.0		92	60-130			
Benzo(e)pyrene	339	4.00	ug/Kg wet	400.0		85	60-130			
Benzo(a)pyrene	369	4.00	ug/Kg wet	400.0		92	60-130			
Perylene	367	4.00	ug/Kg wet	400.0		92	60-130			
Indeno(1,2,3-cd)pyrene	387	4.00	ug/Kg wet	400.0		97	60-130			
Dibenzo(a,h)anthracene	364	4.00	ug/Kg wet	400.0		91	60-130			
Benzo(g,h,i)perylene	342	4.00	ug/Kg wet	400.0		86	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230021

Quality Control Data

Alkylated PAHs

Batch FF32603 - 3570						
Coronene	342	4.00	ug/Kg wet	400.0	85	60-130
Surrogate: Toluene-D8	*321*		ug/Kg wet	*400.0*	*80*	*50-120*
Surrogate: Naphthalene-d8	*320*		ug/Kg wet	*400.0*	*80*	*50-120*
Surrogate: Phenanthrene-d10	*342*		ug/Kg wet	*400.0*	*86*	*50-120*
Surrogate: Perylene-d12	*351*		ug/Kg wet	*400.0*	*88*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230021

Quality Control Data

Alkylated PAHs

Batch FF32603 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	ND	4.00	ug/Kg wet				60-130			
Methylcyclohexane	ND	4.00	ug/Kg wet				60-130			
Toluene	ND	4.00	ug/Kg wet				60-130			
Ethylbenzene	ND	4.00	ug/Kg wet				60-130			
m,p-Xylene	ND	4.00	ug/Kg wet				60-130			
Styrene	ND	4.00	ug/Kg wet				60-130			
o-Xylene	ND	4.00	ug/Kg wet				60-130			
Isopropylbenzene	ND	4.00	ug/Kg wet				60-130			
n-Propylbenzene	ND	4.00	ug/Kg wet				60-130			
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet				60-130			
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet				60-130			
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet				60-130			
t-Butylbenzene	ND	4.00	ug/Kg wet				60-130			
sec-Butylbenzene	ND	4.00	ug/Kg wet				60-130			
p-Isopropyltoluene	ND	4.00	ug/Kg wet				60-130			
n-Butylbenzene	ND	4.00	ug/Kg wet				60-130			
trans-Decalin	ND	4.00	ug/Kg wet				60-130			
cis-Decalin	ND	4.00	ug/Kg wet				60-130			
Benzo(b)thiophene	ND	4.00	ug/Kg wet				60-130			
Naphthalene	ND	4.00	ug/Kg wet				60-130			
2-Methylnaphthalene	ND	4.00	ug/Kg wet				60-130			
1-Methylnaphthalene	ND	4.00	ug/Kg wet				60-130			
Biphenyl	ND	4.00	ug/Kg wet				60-130			
Acenaphthylene	ND	4.00	ug/Kg wet				60-130			
Acenaphthene	ND	4.00	ug/Kg wet				60-130			
Dibenzofuran	ND	4.00	ug/Kg wet				60-130			
Fluorene	ND	4.00	ug/Kg wet				60-130			
Dibenzothiophene	ND	4.00	ug/Kg wet				60-130			
Phenanthrene	ND	4.00	ug/Kg wet				60-130			
Anthracene	ND	4.00	ug/Kg wet				60-130			
Retene	ND	4.00	ug/Kg wet				60-130			
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet				60-130			
Fluoranthene	ND	4.00	ug/Kg wet				60-130			
Pyrene	ND	4.00	ug/Kg wet				60-130			
Benz(a)anthracene	ND	4.00	ug/Kg wet				60-130			
Chrysene/triphenylene	ND	4.00	ug/Kg wet				60-130			
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet				60-130			
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet				60-130			
Benzo(e)pyrene	ND	4.00	ug/Kg wet				60-130			
Benzo(a)pyrene	ND	4.00	ug/Kg wet				60-130			
Perylene	ND	4.00	ug/Kg wet				60-130			
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet				60-130			
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet				60-130			
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet				60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230021

Quality Control Data

Alkylated PAHs

Batch FF32603 - 3570						
Coronene	ND	4.00	ug/Kg wet			60-130
Tetraethyl lead	391	4.00	ug/Kg wet	400.0	98	60-130
Surrogate: Toluene-D8	*305*		ug/Kg wet	*400.0*	*76*	*50-120*
Surrogate: Naphthalene-d8	*304*		ug/Kg wet	*400.0*	*76*	*50-120*
Surrogate: Phenanthrene-d10	*325*		ug/Kg wet	*400.0*	*81*	*50-120*
Surrogate: Perylene-d12	*322*		ug/Kg wet	*400.0*	*81*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F230021

Notes and Definitions

U	Analyte included in the analysis, but not detected
J	Reported between MDL and MRL
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
B-	Blank Spike recovery is below lower control limit (B-).
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230021

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 23F0800 / F230021

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000

Project Information

Project Name: Amesbury Former MGP
Project Number: 1804576
Project Location: Amesbury, MA
Project Manager: Ryan Hoffman
781-721-4091 rhoffman@geiconsultants.com

Send Report to: Ryan Hoffman
labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY AND MCP ANALYTICAL METHODS REQUIRED: (YES) NO

STATE AND FEDERAL REGULATORY REQUIREMENTS/REPORT LIMITS

State/Federal Program: (MA) 401WQC Other _____ NH RI CT NY ME

MA MCP Criteria are (Method 1 S-1 and GW-2/GW-3. Circle if GW-1 is required.

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Preservative: None	Preservative: None	Analysis: Parent and Alkylated MAHs * PAHs 8270*	Analysis: TOCs by Lloyd-Kahn	Sample Specific Remarks
1	1804576-815-S1	6/21/2023	11:00	SOIL	1	JES			X	X	
2	1804576-815-S3	6/21/2023	11:02	SOIL	1	JES			X	X	

Sample Handling

Samples Field Filtered: YES NO (NA)

Sampled Shipped With Ice: (YES) NO

	Relinquished by sampler: (signature)	Date	Time	Received by: (signature)
1.	Dan Hill	6/21/2023	16:00	1. GEI SAMPLE FRIDGE
2.	GEI Fridge	6/22/23	1402	2. M. deSilva
3.	M. deSilva	6/22/23	1402	3. FO 6/22/23 1402
4.	FO Ice	6/22/23	2009	4.
5.				5.

Turnaround Time (Business days):

5-Day X 4-Day ____ 3-Day ____
2-Day ____ 1-Day ____ Other ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

** Parent and Alkylated MAHs and PAHs (34) by GC/MS/SIM/SCAN

Sample Matrix Abbreviations: SO = Soil GW = Groundwater SW = Surface Water SD = Sediment CO = Concrete PC = Paint Chip CLK = Caulk

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants

Shipped/Delivered Via: ESS Courier

ESS Project ID: F230021
Date Received: 6/22/2023
Project Due Date: 6/29/2023
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 0.2 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / (NA)
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / (No)
    a. Air bubbles in aqueous VOAs? Yes / (No)
    b. Does methanol cover soil completely? Yes / No / (NA)

13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By/Acid Lot#:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / (No)
    Who was contacted? Date: Time: By:

Resolution:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1	498	Yes	N/A	Yes	8 oz jar	NP	
2	499	Yes	N/A	Yes	8 oz jar	NP	

2nd Review
Were all containers scanned into storage/lab? Initials BB
Are barcode labels on correct containers? (Yes) / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: Date & Time: 6/23/23 9:23
Reviewed By: Date & Time: 6/23/23

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: F230024

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 11:41 am, Aug 25, 2023

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses

ESS - Cranston, RI	TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230024

SAMPLE RECEIPT

The following samples were received on August 15, 2023 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F230024-01	1804576-842-S1	Soil	8270 Mod, LK
F230024-02	1804576-842-S2	Soil	8270 Mod, LK
F230024-03	1804576-842-S3	Soil	8270 Mod, LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230024

PROJECT NARRATIVE

Alkylated PAHs

F230024-01	**Present in Method Blank (B).**
	Benzene , C-17 , C-18 , Phytane , Pristane , Styrene , Toluene
F230024-02	**Present in Method Blank (B).**
	Benzene , Styrene
FH31601-BS2	**Blank Spike recovery is below lower control limit (B-).**
	Methylcyclohexane (54% @ 60-130%)
FH31601-DUP2	**Relative percent difference for duplicate is outside of criteria (D+).**
	Carbazole (61% @ 50%), Styrene (52% @ 50%)

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230024

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-842-S1
Date Sampled: 08/14/23 15:30
Percent Solids: 87
Initial Volume: 5.96
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230024
ESS Laboratory Sample ID: F230024-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/16/23 7:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**B 10.9** (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C1-Benzene	**J 2.84** (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C2-Benzenes	**J 2.00** (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C3-Benzenes	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C4-Benzenes	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C5-Benzenes	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
Methylcyclohexane	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
Toluene	**B, J 3.61** (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
Ethylbenzene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
m,p-Xylene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
Styrene	**B 5.04** (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
o-Xylene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
Isopropylbenzene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
n-Propylbenzene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
1,3,5-Trimethylbenzene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
1,2,3-Trimethylbenzene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
1,2,4-Trimethylbenzene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
t-Butylbenzene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
sec-Butylbenzene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
p-Isopropyltoluene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
n-Butylbenzene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
trans-Decalin	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
cis-Decalin	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C1-Decalins	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C2-Decalins	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C3-Decalins	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C4-Decalins	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
Benzo(b)thiophene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C1-Benzo(b)thiophenes	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C2-Benzo(b)thiophenes	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C3-Benzo(b)thiophenes	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C4-Benzo(b)thiophenes	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-842-S1
Date Sampled: 08/14/23 15:30
Percent Solids: 87
Initial Volume: 5.96
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230024
ESS Laboratory Sample ID: F230024-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/16/23 7:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
2-Methylnaphthalene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
1-Methylnaphthalene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C1-Naphthalenes	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C2-Naphthalenes	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C3-Naphthalenes	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C4-Naphthalenes	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
Biphenyl	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
Acenaphthylene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
Acenaphthene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
Dibenzofuran	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
Fluorene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C1-Fluorenes	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C2-Fluorenes	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C3-Fluorenes	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
Dibenzothiophene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C1-Dibenzothiophenes	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C2-Dibenzothiophenes	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C3-Dibenzothiophenes	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C4-Dibenzothiophenes	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
Phenanthrene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
Anthracene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C1-Phenanthrenes/Anthracenes	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C2-Phenanthrenes/Anthracenes	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C3-Phenanthrenes/Anthracenes	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C4-Phenanthrenes/Anthracenes	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
Retene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
Benzo(b)naphtho(2,1-d)thiophene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C0-Benzonaphthothiophenes	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C1-Benzonaphthothiophenes	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C2-Benzonaphthothiophenes	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C3-Benzonaphthothiophenes	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-842-S1
Date Sampled: 08/14/23 15:30
Percent Solids: 87
Initial Volume: 5.96
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230024
ESS Laboratory Sample ID: F230024-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/16/23 7:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
Fluoranthene	**J 1.99** (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
Pyrene	**J 2.66** (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C1-Fluoranthenes/Pyrenes	**5.18** (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C2-Fluoranthenes/Pyrenes	**J 3.01** (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C3-Fluoranthenes/Pyrenes	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
Benzo(b)fluorene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
Benzo(c)fluorene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
2-Methylpyrene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
4-Methylpyrene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
1-Methylpyrene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
Benz(a)anthracene	**4.37** (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
Chrysene/triphenylene	**5.16** (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C1-Benzo(a)anthracenes/Chrysenes	**5.36** (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C2-Benzo(a)anthracenes/Chrysenes	**J 2.45** (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C3-Benzo(a)anthracenes/Chrysenes	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C4-Benzo(a)anthracenes/Chrysenes	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
Benzo(b)fluoranthene	**J 3.38** (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
Benzo(j/k)fluoranthene	**4.16** (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
Benzo(e)pyrene	**6.30** (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
Benzo(a)pyrene	**9.70** (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
Perylene	**7.40** (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
Indeno(1,2,3-cd)pyrene	**4.18** (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
Dibenzo(a,h)anthracene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
Benzo(g,h,i)perylene	**5.16** (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
Coronene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
Tetramethyl lead	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
Trimethylethyl lead	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
Dimethyldiethyl lead	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
Methyltriethyl lead	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
Tetraethyl lead	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
2,6,10-trimethyldodecane (1380)	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-842-S1
Date Sampled: 08/14/23 15:30
Percent Solids: 87
Initial Volume: 5.96
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230024
ESS Laboratory Sample ID: F230024-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/16/23 7:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
2,6,10-trimethylpentadecane (1650)	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C-17	**B 7.59** (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
Pristane	**B 5.45** (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
C-18	**B 8.82** (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
Phytane	**B 4.95** (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
Carbazole	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
2,6-Dimethylnaphthalene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
2,3,5-Trimethylnaphthene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
4-Methyldibenzothiophene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
2/3-Methyldibenzothiophene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
1-Methyldibenzothiophene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
3-Methylphenanthrene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
2-Methylphenanthrene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
2-Methylanthracene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
4/9-Methylphenanthrene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601
1-Methylphenanthrene	ND (3.88)	1.94	8270 Mod		1	IBM	08/16/23 17:50	F3H0002	FH31601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*79 %*		*50-120*
Surrogate: Naphthalene-d8	*76 %*		*50-120*
Surrogate: Phenanthrene-d10	*83 %*		*50-120*
Surrogate: Perylene-d12	*85 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-842-S1
Date Sampled: 08/14/23 15:30
Percent Solids: 87

ESS Laboratory Work Order: F230024
ESS Laboratory Sample ID: F230024-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**529** (488)		LK		1	CCP	08/23/23 12:22	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-842-S2
Date Sampled: 08/14/23 15:31
Percent Solids: 46
Initial Volume: 5
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230024
ESS Laboratory Sample ID: F230024-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/16/23 7:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	B **62.7** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C1-Benzene	**230** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C2-Benzenes	**190** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C3-Benzenes	**70.8** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C4-Benzenes	**151** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C5-Benzenes	**180** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
Methylcyclohexane	**14.6** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
Toluene	**284** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
Ethylbenzene	**15.7** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
m,p-Xylene	**253** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
Styrene	B **77.6** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
o-Xylene	**16.3** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
Isopropylbenzene	ND (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
n-Propylbenzene	J **8.33** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
1,3,5-Trimethylbenzene	J **7.03** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
1,2,3-Trimethylbenzene	**12.4** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
1,2,4-Trimethylbenzene	**21.1** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
t-Butylbenzene	ND (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
sec-Butylbenzene	ND (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
p-Isopropyltoluene	**19.1** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
n-Butylbenzene	**19.3** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
trans-Decalin	**293** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
cis-Decalin	**41.4** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C1-Decalins	**563** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C2-Decalins	**408** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C3-Decalins	**316** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C4-Decalins	**513** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
Benzo(b)thiophene	**11.7** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C1-Benzo(b)thiophenes	**28.7** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C2-Benzo(b)thiophenes	**90.1** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C3-Benzo(b)thiophenes	**93.3** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C4-Benzo(b)thiophenes	**56.7** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-842-S2
Date Sampled: 08/14/23 15:31
Percent Solids: 46
Initial Volume: 5
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230024
ESS Laboratory Sample ID: F230024-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/16/23 7:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**287** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
2-Methylnaphthalene	**198** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
1-Methylnaphthalene	**161** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C1-Naphthalenes	**230** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C2-Naphthalenes	**1150** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C3-Naphthalenes	**1230** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C4-Naphthalenes	**733** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
Biphenyl	**94.1** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
Acenaphthylene	**602** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
Acenaphthene	**1280** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
Dibenzofuran	**99.7** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
Fluorene	**861** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C1-Fluorenes	**712** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C2-Fluorenes	**754** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C3-Fluorenes	**500** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
Dibenzothiophene	**401** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C1-Dibenzothiophenes	**607** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C2-Dibenzothiophenes	**637** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C3-Dibenzothiophenes	**419** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C4-Dibenzothiophenes	**208** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
Phenanthrene	**4730** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
Anthracene	**1750** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C1-Phenanthrenes/Anthracenes	**3690** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C2-Phenanthrenes/Anthracenes	**2190** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C3-Phenanthrenes/Anthracenes	**953** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C4-Phenanthrenes/Anthracenes	**346** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
Retene	**144** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
Benzo(b)naphtho(2,1-d)thiophene	**349** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C0-Benzonaphthothiophenes	**643** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C1-Benzonaphthothiophenes	**483** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C2-Benzonaphthothiophenes	**326** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C3-Benzonaphthothiophenes	**214** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-842-S2
Date Sampled: 08/14/23 15:31
Percent Solids: 46
Initial Volume: 5
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230024
ESS Laboratory Sample ID: F230024-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/16/23 7:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**83.5** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
Fluoranthene	**4540** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
Pyrene	**6180** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C1-Fluoranthenes/Pyrenes	**3740** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C2-Fluoranthenes/Pyrenes	**1340** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C3-Fluoranthenes/Pyrenes	**492** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
Benzo(b)fluorene	**393** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
Benzo(c)fluorene	**216** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
2-Methylpyrene	**525** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
4-Methylpyrene	**480** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
1-Methylpyrene	**442** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
Benz(a)anthracene	**2240** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
Chrysene/triphenylene	**2460** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C1-Benzo(a)anthracenes/Chrysenes	**1490** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C2-Benzo(a)anthracenes/Chrysenes	**712** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C3-Benzo(a)anthracenes/Chrysenes	**326** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C4-Benzo(a)anthracenes/Chrysenes	**163** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
Benzo(b)fluoranthene	**1160** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
Benzo(j/k)fluoranthene	**1470** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
Benzo(e)pyrene	**1270** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
Benzo(a)pyrene	**2120** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
Perylene	**1260** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
Indeno(1,2,3-cd)pyrene	**1200** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
Dibenzo(a,h)anthracene	**267** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
Benzo(g,h,i)perylene	**1040** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
Coronene	**328** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
Tetramethyl lead	ND (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
Trimethylethyl lead	ND (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
Dimethyldiethyl lead	ND (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
Methyltriethyl lead	ND (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
Tetraethyl lead	ND (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
2,6,10-trimethyldodecane (1380)	**384** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-842-S2
Date Sampled: 08/14/23 15:31
Percent Solids: 46
Initial Volume: 5
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230024
ESS Laboratory Sample ID: F230024-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/16/23 7:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**635** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
2,6,10-trimethylpentadecane (1650)	**613** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C-17	**270** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
Pristane	**1390** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
C-18	**154** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
Phytane	**1200** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
Carbazole	**42.1** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
2,6-Dimethylnaphthalene	**298** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
2,3,5-Trimethylnaphthene	**78.5** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
4-Methyldibenzothiophene	**251** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
2/3-Methyldibenzothiophene	**197** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
1-Methyldibenzothiophene	**63.6** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
3-Methylphenanthrene	**826** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
2-Methylphenanthrene	**893** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
2-Methylanthracene	**394** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
4/9-Methylphenanthrene	**921** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601
1-Methylphenanthrene	**642** (8.70)	4.35	8270 Mod		1	IBM	08/16/23 23:24	F3H0002	FH31601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*71 %*		*50-120*
Surrogate: Naphthalene-d8	*73 %*		*50-120*
Surrogate: Phenanthrene-d10	*74 %*		*50-120*
Surrogate: Perylene-d12	*80 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-842-S2
Date Sampled: 08/14/23 15:31
Percent Solids: 46

ESS Laboratory Work Order: F230024
ESS Laboratory Sample ID: F230024-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**69100** (471)		LK		1	CCP	08/23/23 11:16	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-842-S3
Date Sampled: 08/14/23 15:32
Percent Solids: 61
Initial Volume: 5.15
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230024
ESS Laboratory Sample ID: F230024-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/16/23 7:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**159** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
C1-Benzene	**1260** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
C2-Benzenes	**399** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
C3-Benzenes	**225** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
C4-Benzenes	**370** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
C5-Benzenes	**351** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
Methylcyclohexane	**32.8** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
Toluene	**1530** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
Ethylbenzene	**51.8** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
m,p-Xylene	**500** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
Styrene	**211** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
o-Xylene	**37.4** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
Isopropylbenzene	**11.4** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
n-Propylbenzene	**21.6** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
1,3,5-Trimethylbenzene	**43.2** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
1,2,3-Trimethylbenzene	**47.3** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
1,2,4-Trimethylbenzene	**75.5** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
t-Butylbenzene	ND (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
sec-Butylbenzene	**J 3.71** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
p-Isopropyltoluene	**46.7** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
n-Butylbenzene	**33.1** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
trans-Decalin	**73.7** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
cis-Decalin	**21.1** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
C1-Decalins	**519** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
C2-Decalins	**1000** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
C3-Decalins	**957** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
C4-Decalins	**1570** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
Benzo(b)thiophene	**78.0** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
C1-Benzo(b)thiophenes	**94.1** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
C2-Benzo(b)thiophenes	**254** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
C3-Benzo(b)thiophenes	**337** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
C4-Benzo(b)thiophenes	**248** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-842-S3
Date Sampled: 08/14/23 15:32
Percent Solids: 61
Initial Volume: 5.15
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230024
ESS Laboratory Sample ID: F230024-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/16/23 7:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**1660** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
2-Methylnaphthalene	**1140** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
1-Methylnaphthalene	**1780** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
C1-Naphthalenes	**1840** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
C2-Naphthalenes	**5220** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
C3-Naphthalenes	**5230** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
C4-Naphthalenes	**3370** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
Biphenyl	**500** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
Acenaphthylene	**4510** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
Acenaphthene	**4830** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
Dibenzofuran	**461** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
Fluorene	**3640** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
C1-Fluorenes	**3700** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
C2-Fluorenes	**4290** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
C3-Fluorenes	**2570** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
Dibenzothiophene	**2050** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
C1-Dibenzothiophenes	**4020** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
C2-Dibenzothiophenes	**4250** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
C3-Dibenzothiophenes	**2350** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
C4-Dibenzothiophenes	**990** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
Phenanthrene	**27700** (127)	63.7	8270 Mod		20	IBM	08/17/23 10:19	F3H0002	FH31601
Anthracene	**10800** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
C1-Phenanthrenes/Anthracenes	**23500** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
C2-Phenanthrenes/Anthracenes	**13900** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
C3-Phenanthrenes/Anthracenes	**5460** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
C4-Phenanthrenes/Anthracenes	**1900** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
Retene	**639** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
Benzo(b)naphtho(2,1-d)thiophene	**2560** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
C0-Benzonaphthothiophenes	**4680** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
C1-Benzonaphthothiophenes	**3340** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
C2-Benzonaphthothiophenes	**1890** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
C3-Benzonaphthothiophenes	**1060** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-842-S3
Date Sampled: 08/14/23 15:32
Percent Solids: 61
Initial Volume: 5.15
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230024
ESS Laboratory Sample ID: F230024-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/16/23 7:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**310** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
Fluoranthene	**33700** (127)	63.7	8270 Mod		20	IBM	08/17/23 10:19	F3H0002	FH31601
Pyrene	**48700** (127)	63.7	8270 Mod		20	IBM	08/17/23 10:19	F3H0002	FH31601
C1-Fluoranthenes/Pyrenes	**27500** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
C2-Fluoranthenes/Pyrenes	**9120** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
C3-Fluoranthenes/Pyrenes	**3190** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
Benzo(b)fluorene	**3470** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
Benzo(c)fluorene	**1130** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
2-Methylpyrene	**3810** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
4-Methylpyrene	**3600** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
1-Methylpyrene	**3430** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
Benz(a)anthracene	**19500** (127)	63.7	8270 Mod		20	IBM	08/17/23 10:19	F3H0002	FH31601
Chrysene/triphenylene	**20600** (127)	63.7	8270 Mod		20	IBM	08/17/23 10:19	F3H0002	FH31601
C1-Benzo(a)anthracenes/Chrysenes	**10800** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
C2-Benzo(a)anthracenes/Chrysenes	**4800** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
C3-Benzo(a)anthracenes/Chrysenes	**1930** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
C4-Benzo(a)anthracenes/Chrysenes	**807** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
Benzo(b)fluoranthene	**9760** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
Benzo(j/k)fluoranthene	**8630** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
Benzo(e)pyrene	**9230** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
Benzo(a)pyrene	**20200** (127)	63.7	8270 Mod		20	IBM	08/17/23 10:19	F3H0002	FH31601
Perylene	**2750** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
Indeno(1,2,3-cd)pyrene	**8450** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
Dibenzo(a,h)anthracene	**1990** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
Benzo(g,h,i)perylene	**7930** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
Coronene	**2600** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
Tetramethyl lead	ND (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
Trimethylethyl lead	ND (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
Dimethyldiethyl lead	ND (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
Methyltriethyl lead	ND (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
Tetraethyl lead	ND (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
2,6,10-trimethyldodecane (1380)	**978** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-842-S3
Date Sampled: 08/14/23 15:32
Percent Solids: 61
Initial Volume: 5.15
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230024
ESS Laboratory Sample ID: F230024-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/16/23 7:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**1460** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
2,6,10-trimethylpentadecane (1650)	**1470** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
C-17	**664** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
Pristane	**3220** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
C-18	**585** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
Phytane	**3390** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
Carbazole	**152** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
2,6-Dimethylnaphthalene	**1100** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
2,3,5-Trimethylnaphthene	**306** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
4-Methyldibenzothiophene	**1730** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
2/3-Methyldibenzothiophene	**1300** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
1-Methyldibenzothiophene	**393** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
3-Methylphenanthrene	**5150** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
2-Methylphenanthrene	**5750** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
2-Methylanthracene	**2710** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
4/9-Methylphenanthrene	**6130** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601
1-Methylphenanthrene	**3530** (6.37)	3.19	8270 Mod		1	IBM	08/17/23 0:47	F3H0002	FH31601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*74 %*		*50-120*
Surrogate: Naphthalene-d8	*75 %*		*50-120*
Surrogate: Phenanthrene-d10	*74 %*		*50-120*
Surrogate: Perylene-d12	*88 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-842-S3
Date Sampled: 08/14/23 15:32
Percent Solids: 61

ESS Laboratory Work Order: F230024
ESS Laboratory Sample ID: F230024-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**49600** (466)		LK		1	CCP	08/23/23 13:12	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230024

Quality Control Data

Classical Chemistry

Batch DH31630 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	500	mg/kg							
Total Organic Carbon (2)	ND	500	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230024

Quality Control Data

Classical Chemistry

Batch DH31630 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9410	500	mg/kg	10010		94	80-120			
Total Organic Carbon (2)	9630	500	mg/kg	10010		96	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230024

Quality Control Data

Classical Chemistry

Batch DH31630 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9980	500	mg/kg	10010		100	80-120	6	25	
Total Organic Carbon (2)	9640	500	mg/kg	10010		96	80-120	0.2	25	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230024

Quality Control Data

Alkylated PAHs

Batch FH31601 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	11.7	4.00	ug/Kg wet							
C1-Benzene	ND	4.00	ug/Kg wet							
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	2.57	4.00	ug/Kg wet							J
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	9.65	4.00	ug/Kg wet							
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230024

Quality Control Data

Alkylated PAHs

Batch FH31601 - 3570			
C1-Fluorenes	ND	4.00	ug/Kg wet
C2-Fluorenes	ND	4.00	ug/Kg wet
C3-Fluorenes	ND	4.00	ug/Kg wet
Dibenzothiophene	ND	4.00	ug/Kg wet
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet
Phenanthrene	ND	4.00	ug/Kg wet
Anthracene	ND	4.00	ug/Kg wet
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
Retene	ND	4.00	ug/Kg wet
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
Fluoranthene	ND	4.00	ug/Kg wet
Pyrene	ND	4.00	ug/Kg wet
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
Benzo(b)fluorene	ND	4.00	ug/Kg wet
Benzo(c)fluorene	ND	4.00	ug/Kg wet
2-Methylpyrene	ND	4.00	ug/Kg wet
4-Methylpyrene	ND	4.00	ug/Kg wet
1-Methylpyrene	ND	4.00	ug/Kg wet
Benz(a)anthracene	ND	4.00	ug/Kg wet
Chrysene/triphenylene	ND	4.00	ug/Kg wet
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet
Benzo(e)pyrene	ND	4.00	ug/Kg wet
Benzo(a)pyrene	ND	4.00	ug/Kg wet
Perylene	ND	4.00	ug/Kg wet
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet
Coronene	ND	4.00	ug/Kg wet
Tetramethyl lead	ND	4.00	ug/Kg wet
Trimethylethyl lead	ND	4.00	ug/Kg wet

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230024

Quality Control Data

Alkylated PAHs

Batch FH31601 - 3570							
Dimethyldiethyl lead	ND	4.00	ug/Kg wet				
Methyltriethyl lead	ND	4.00	ug/Kg wet				
Tetraethyl lead	ND	4.00	ug/Kg wet				
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet				
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet				
2,6,10-trimethylpentadecane (1650)	ND	4.00	ug/Kg wet				
C-17	7.23	4.00	ug/Kg wet				
Pristane	3.70	4.00	ug/Kg wet				J
C-18	9.96	4.00	ug/Kg wet				
Phytane	4.36	4.00	ug/Kg wet				
Carbazole	ND	4.00	ug/Kg wet				
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet				
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet				
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
3-Methylphenanthrene	ND	4.00	ug/Kg wet				
2-Methylphenanthrene	ND	4.00	ug/Kg wet				
2-Methylanthracene	ND	4.00	ug/Kg wet				
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet				
1-Methylphenanthrene	ND	4.00	ug/Kg wet				
Surrogate: Toluene-D8	*346*		ug/Kg wet	*400.0*	*87*	*50-120*	
Surrogate: Naphthalene-d8	*322*		ug/Kg wet	*400.0*	*80*	*50-120*	
Surrogate: Phenanthrene-d10	*341*		ug/Kg wet	*400.0*	*85*	*50-120*	
Surrogate: Perylene-d12	*348*		ug/Kg wet	*400.0*	*87*	*50-120*	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230024

Quality Control Data

Alkylated PAHs

Batch FH31601 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	280	4.00	ug/Kg wet	400.0		70	60-130			
Methylcyclohexane	216	4.00	ug/Kg wet	400.0		54	60-130			B-
Toluene	285	4.00	ug/Kg wet	400.0		71	60-130			
Ethylbenzene	305	4.00	ug/Kg wet	400.0		76	60-130			
m,p-Xylene	297	4.00	ug/Kg wet	400.0		74	60-130			
Styrene	297	4.00	ug/Kg wet	400.0		74	60-130			
o-Xylene	310	4.00	ug/Kg wet	400.0		77	60-130			
Isopropylbenzene	307	4.00	ug/Kg wet	400.0		77	60-130			
n-Propylbenzene	308	4.00	ug/Kg wet	400.0		77	60-130			
1,3,5-Trimethylbenzene	312	4.00	ug/Kg wet	400.0		78	60-130			
1,2,3-Trimethylbenzene	311	4.00	ug/Kg wet	400.0		78	60-130			
1,2,4-Trimethylbenzene	309	4.00	ug/Kg wet	400.0		77	60-130			
t-Butylbenzene	305	4.00	ug/Kg wet	400.0		76	60-130			
sec-Butylbenzene	311	4.00	ug/Kg wet	400.0		78	60-130			
p-Isopropyltoluene	314	4.00	ug/Kg wet	400.0		79	60-130			
n-Butylbenzene	304	4.00	ug/Kg wet	400.0		76	60-130			
trans-Decalin	299	4.00	ug/Kg wet	400.0		75	60-130			
cis-Decalin	298	4.00	ug/Kg wet	400.0		74	60-130			
Benzo(b)thiophene	292	4.00	ug/Kg wet	400.0		73	60-130			
Naphthalene	290	4.00	ug/Kg wet	400.0		73	60-130			
2-Methylnaphthalene	282	4.00	ug/Kg wet	400.0		70	60-130			
1-Methylnaphthalene	282	4.00	ug/Kg wet	400.0		71	60-130			
Biphenyl	262	4.00	ug/Kg wet	400.0		66	60-130			
Acenaphthylene	311	4.00	ug/Kg wet	400.0		78	60-130			
Acenaphthene	302	4.00	ug/Kg wet	400.0		75	60-130			
Dibenzofuran	298	4.00	ug/Kg wet	400.0		75	60-130			
Fluorene	297	4.00	ug/Kg wet	400.0		74	60-130			
Dibenzothiophene	296	4.00	ug/Kg wet	400.0		74	60-130			
Phenanthrene	286	4.00	ug/Kg wet	400.0		72	60-130			
Anthracene	312	4.00	ug/Kg wet	400.0		78	60-130			
Retene	316	4.00	ug/Kg wet	400.0		79	60-130			
Benzo(b)naphtho(2,1-d)thiophene	317	4.00	ug/Kg wet	400.0		79	60-130			
Fluoranthene	308	4.00	ug/Kg wet	400.0		77	60-130			
Pyrene	309	4.00	ug/Kg wet	400.0		77	60-130			
Benz(a)anthracene	330	4.00	ug/Kg wet	400.0		83	60-130			
Chrysene/triphenylene	321	4.00	ug/Kg wet	400.0		80	60-130			
Benzo(b)fluoranthene	309	4.00	ug/Kg wet	400.0		77	60-130			
Benzo(j/k)fluoranthene	319	4.00	ug/Kg wet	400.0		80	60-130			
Benzo(e)pyrene	293	4.00	ug/Kg wet	400.0		73	60-130			
Benzo(a)pyrene	321	4.00	ug/Kg wet	400.0		80	60-130			
Perylene	319	4.00	ug/Kg wet	400.0		80	60-130			
Indeno(1,2,3-cd)pyrene	354	4.00	ug/Kg wet	400.0		89	60-130			
Dibenzo(a,h)anthracene	329	4.00	ug/Kg wet	400.0		82	60-130			
Benzo(g,h,i)perylene	307	4.00	ug/Kg wet	400.0		77	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230024

Quality Control Data

Alkylated PAHs

Batch FH31601 - 3570						
Coronene	322	4.00	ug/Kg wet	400.0	80	60-130
Tetraethyl lead	68.0	4.00	ug/Kg wet	400.0	17	60-130
Surrogate: Toluene-D8	*303*		ug/Kg wet	*400.0*	*76*	*50-120*
Surrogate: Naphthalene-d8	*302*		ug/Kg wet	*400.0*	*76*	*50-120*
Surrogate: Phenanthrene-d10	*314*		ug/Kg wet	*400.0*	*79*	*50-120*
Surrogate: Perylene-d12	*318*		ug/Kg wet	*400.0*	*79*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230024

Quality Control Data

Alkylated PAHs

Batch FH31601 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	ND	4.00	ug/Kg wet				60-130			
Methylcyclohexane	ND	4.00	ug/Kg wet				60-130			
Toluene	ND	4.00	ug/Kg wet				60-130			
Ethylbenzene	ND	4.00	ug/Kg wet				60-130			
m,p-Xylene	ND	4.00	ug/Kg wet				60-130			
Styrene	ND	4.00	ug/Kg wet				60-130			
o-Xylene	ND	4.00	ug/Kg wet				60-130			
Isopropylbenzene	ND	4.00	ug/Kg wet				60-130			
n-Propylbenzene	ND	4.00	ug/Kg wet				60-130			
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet				60-130			
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet				60-130			
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet				60-130			
t-Butylbenzene	ND	4.00	ug/Kg wet				60-130			
sec-Butylbenzene	ND	4.00	ug/Kg wet				60-130			
p-Isopropyltoluene	ND	4.00	ug/Kg wet				60-130			
n-Butylbenzene	ND	4.00	ug/Kg wet				60-130			
trans-Decalin	ND	4.00	ug/Kg wet				60-130			
cis-Decalin	ND	4.00	ug/Kg wet				60-130			
Benzo(b)thiophene	ND	4.00	ug/Kg wet				60-130			
Naphthalene	ND	4.00	ug/Kg wet				60-130			
2-Methylnaphthalene	ND	4.00	ug/Kg wet				60-130			
1-Methylnaphthalene	ND	4.00	ug/Kg wet				60-130			
Biphenyl	ND	4.00	ug/Kg wet				60-130			
Acenaphthylene	ND	4.00	ug/Kg wet				60-130			
Acenaphthene	ND	4.00	ug/Kg wet				60-130			
Dibenzofuran	ND	4.00	ug/Kg wet				60-130			
Fluorene	ND	4.00	ug/Kg wet				60-130			
Dibenzothiophene	ND	4.00	ug/Kg wet				60-130			
Phenanthrene	ND	4.00	ug/Kg wet				60-130			
Anthracene	ND	4.00	ug/Kg wet				60-130			
Retene	ND	4.00	ug/Kg wet				60-130			
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet				60-130			
Fluoranthene	ND	4.00	ug/Kg wet				60-130			
Pyrene	ND	4.00	ug/Kg wet				60-130			
Benz(a)anthracene	ND	4.00	ug/Kg wet				60-130			
Chrysene/triphenylene	ND	4.00	ug/Kg wet				60-130			
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet				60-130			
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet				60-130			
Benzo(e)pyrene	ND	4.00	ug/Kg wet				60-130			
Benzo(a)pyrene	ND	4.00	ug/Kg wet				60-130			
Perylene	ND	4.00	ug/Kg wet				60-130			
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet				60-130			
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet				60-130			
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet				60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230024

Quality Control Data

Alkylated PAHs

Batch FH31601 - 3570						
Coronene	ND	4.00	ug/Kg wet			60-130
Tetraethyl lead	348	4.00	ug/Kg wet	400.0	87	60-130
Surrogate: Toluene-D8	*333*		ug/Kg wet	*400.0*	*83*	*50-120*
Surrogate: Naphthalene-d8	*310*		ug/Kg wet	*400.0*	*77*	*50-120*
Surrogate: Phenanthrene-d10	*325*		ug/Kg wet	*400.0*	*81*	*50-120*
Surrogate: Perylene-d12	*332*		ug/Kg wet	*400.0*	*83*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230024

Quality Control Data

Alkylated PAHs

Batch FH31601 - 3570

Duplicate **Source: F230024-03**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	176	6.44	ug/Kg dry		159			10	50	
C1-Benzene	1250	6.44	ug/Kg dry		1260			0.7	50	
C2-Benzenes	413	6.44	ug/Kg dry		399			4	50	
C3-Benzenes	255	6.44	ug/Kg dry		225			12	50	
C4-Benzenes	390	6.44	ug/Kg dry		370			5	50	
C5-Benzenes	355	6.44	ug/Kg dry		351			1	50	
Methylcyclohexane	33.1	6.44	ug/Kg dry		32.8			1	50	
Toluene	1530	6.44	ug/Kg dry		1530			0.1	50	
Ethylbenzene	64.6	6.44	ug/Kg dry		51.8			22	50	
m,p-Xylene	494	6.44	ug/Kg dry		500			1	50	
Styrene	359	6.44	ug/Kg dry		211			52	50	D+
o-Xylene	40.0	6.44	ug/Kg dry		37.4			7	50	
Isopropylbenzene	11.5	6.44	ug/Kg dry		11.4			1	50	
n-Propylbenzene	21.0	6.44	ug/Kg dry		21.6			3	50	
1,3,5-Trimethylbenzene	45.5	6.44	ug/Kg dry		43.2			5	50	
1,2,3-Trimethylbenzene	48.2	6.44	ug/Kg dry		47.3			2	50	
1,2,4-Trimethylbenzene	78.3	6.44	ug/Kg dry		75.5			4	50	
t-Butylbenzene	ND	6.44	ug/Kg dry		ND				50	
sec-Butylbenzene	4.42	6.44	ug/Kg dry		3.71			17	50	J
p-Isopropyltoluene	48.4	6.44	ug/Kg dry		46.7			3	50	
n-Butylbenzene	32.3	6.44	ug/Kg dry		33.1			3	50	
trans-Decalin	73.8	6.44	ug/Kg dry		73.7			0.2	50	
cis-Decalin	19.8	6.44	ug/Kg dry		21.1			6	50	
C1-Decalins	527	6.44	ug/Kg dry		519			1	50	
C2-Decalins	1040	6.44	ug/Kg dry		1000			4	50	
C3-Decalins	1060	6.44	ug/Kg dry		957			10	50	
C4-Decalins	1810	6.44	ug/Kg dry		1570			14	50	
Benzo(b)thiophene	80.3	6.44	ug/Kg dry		78.0			3	50	
C1-Benzo(b)thiophenes	99.3	6.44	ug/Kg dry		94.1			5	50	
C2-Benzo(b)thiophenes	263	6.44	ug/Kg dry		254			3	50	
C3-Benzo(b)thiophenes	349	6.44	ug/Kg dry		337			4	50	
C4-Benzo(b)thiophenes	255	6.44	ug/Kg dry		248			3	50	
Naphthalene	1740	6.44	ug/Kg dry		1660			5	50	
2-Methylnaphthalene	1230	6.44	ug/Kg dry		1140			8	50	
1-Methylnaphthalene	1860	6.44	ug/Kg dry		1780			5	50	
C1-Naphthalenes	1950	6.44	ug/Kg dry		1840			6	50	
C2-Naphthalenes	5580	6.44	ug/Kg dry		5220			7	50	
C3-Naphthalenes	5460	6.44	ug/Kg dry		5230			4	50	
C4-Naphthalenes	3510	6.44	ug/Kg dry		3370			4	50	
Biphenyl	515	6.44	ug/Kg dry		500			3	50	
Acenaphthylene	6070	6.44	ug/Kg dry		4510			29	50	
Acenaphthene	5070	6.44	ug/Kg dry		4830			5	50	
Dibenzofuran	525	6.44	ug/Kg dry		461			13	50	
Fluorene	3810	6.44	ug/Kg dry		3640			4	50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230024

Quality Control Data

Alkylated PAHs

Batch FH31601 - 3570

C1-Fluorenes	3940	6.44	ug/Kg dry	3700	6	50
C2-Fluorenes	5070	6.44	ug/Kg dry	4290	17	50
C3-Fluorenes	3000	6.44	ug/Kg dry	2570	16	50
Dibenzothiophene	2120	6.44	ug/Kg dry	2050	3	50
C1-Dibenzothiophenes	4070	6.44	ug/Kg dry	4020	1	50
C2-Dibenzothiophenes	4660	6.44	ug/Kg dry	4250	9	50
C3-Dibenzothiophenes	2840	6.44	ug/Kg dry	2350	19	50
C4-Dibenzothiophenes	1250	6.44	ug/Kg dry	990	24	50
Phenanthrene	26600	129	ug/Kg dry	27700	4	50
Anthracene	11500	6.44	ug/Kg dry	10800	6	50
C1-Phenanthrenes/Anthracenes	24700	6.44	ug/Kg dry	23500	5	50
C2-Phenanthrenes/Anthracenes	16000	6.44	ug/Kg dry	13900	14	50
C3-Phenanthrenes/Anthracenes	6700	6.44	ug/Kg dry	5460	20	50
C4-Phenanthrenes/Anthracenes	2320	6.44	ug/Kg dry	1900	20	50
Retene	633	6.44	ug/Kg dry	639	0.8	50
Benzo(b)naphtho(2,1-d)thiophene	2990	6.44	ug/Kg dry	2560	15	50
C0-Benzonaphthothiophenes	5450	6.44	ug/Kg dry	4680	15	50
C1-Benzonaphthothiophenes	4210	6.44	ug/Kg dry	3340	23	50
C2-Benzonaphthothiophenes	2510	6.44	ug/Kg dry	1890	28	50
C3-Benzonaphthothiophenes	1360	6.44	ug/Kg dry	1060	25	50
C4-Benzonaphthothiophenes	372	6.44	ug/Kg dry	310	18	50
Fluoranthene	32600	129	ug/Kg dry	33700	3	50
Pyrene	46600	129	ug/Kg dry	48700	5	50
C1-Fluoranthenes/Pyrenes	31400	6.44	ug/Kg dry	27500	14	50
C2-Fluoranthenes/Pyrenes	11800	6.44	ug/Kg dry	9120	25	50
C3-Fluoranthenes/Pyrenes	4290	6.44	ug/Kg dry	3190	30	50
Benzo(b)fluorene	3910	6.44	ug/Kg dry	3470	12	50
Benzo(c)fluorene	1230	6.44	ug/Kg dry	1130	9	50
2-Methylpyrene	4330	6.44	ug/Kg dry	3810	13	50
4-Methylpyrene	4190	6.44	ug/Kg dry	3600	15	50
1-Methylpyrene	3920	6.44	ug/Kg dry	3430	13	50
Benz(a)anthracene	20800	129	ug/Kg dry	19500	6	50
Chrysene/triphenylene	22500	129	ug/Kg dry	20600	9	50
C1-Benzo(a)anthracenes/Chrysenes	13600	6.44	ug/Kg dry	10800	24	50
C2-Benzo(a)anthracenes/Chrysenes	6290	6.44	ug/Kg dry	4800	27	50
C3-Benzo(a)anthracenes/Chrysenes	2520	6.44	ug/Kg dry	1930	27	50
C4-Benzo(a)anthracenes/Chrysenes	1020	6.44	ug/Kg dry	807	24	50
Benzo(b)fluoranthene	12100	6.44	ug/Kg dry	9760	21	50
Benzo(j/k)fluoranthene	9780	6.44	ug/Kg dry	8630	12	50
Benzo(e)pyrene	11200	6.44	ug/Kg dry	9230	19	50
Benzo(a)pyrene	22600	129	ug/Kg dry	20200	11	50
Perylene	3330	6.44	ug/Kg dry	2750	19	50
Indeno(1,2,3-cd)pyrene	10400	6.44	ug/Kg dry	8450	20	50
Dibenzo(a,h)anthracene	2420	6.44	ug/Kg dry	1990	20	50
Benzo(g,h,i)perylene	9700	6.44	ug/Kg dry	7930	20	50
Coronene	3080	6.44	ug/Kg dry	2600	17	50
Tetramethyl lead	ND	6.44	ug/Kg dry	ND		50
Trimethylethyl lead	ND	6.44	ug/Kg dry	ND		50

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230024

Quality Control Data

Alkylated PAHs

Batch FH31601 - 3570									
Dimethyldiethyl lead	ND	6.44	ug/Kg dry		ND			50	
Methyltriethyl lead	ND	6.44	ug/Kg dry		ND			50	
Tetraethyl lead	ND	6.44	ug/Kg dry		ND			50	
2,6,10-trimethyldodecane (1380)	1080	6.44	ug/Kg dry		978		10	50	
2,6,10-trimethyltridecane (1470)	1650	6.44	ug/Kg dry		1460		13	50	
2,6,10-trimethylpentadecane (1650)	1860	6.44	ug/Kg dry		1470		23	50	
C-17	691	6.44	ug/Kg dry		664		4	50	
Pristane	3890	6.44	ug/Kg dry		3220		19	50	
C-18	708	6.44	ug/Kg dry		585		19	50	
Phytane	4050	6.44	ug/Kg dry		3390		18	50	
Carbazole	286	6.44	ug/Kg dry		152		61	50	D+
2,6-Dimethylnaphthalene	1140	6.44	ug/Kg dry		1100		3	50	
2,3,5-Trimethylnaphthene	341	6.44	ug/Kg dry		306		11	50	
4-Methyldibenzothiophene	1740	6.44	ug/Kg dry		1730		0.8	50	
2/3-Methyldibenzothiophene	1300	6.44	ug/Kg dry		1300		0.2	50	
1-Methyldibenzothiophene	401	6.44	ug/Kg dry		393		2	50	
3-Methylphenanthrene	5340	6.44	ug/Kg dry		5150		4	50	
2-Methylphenanthrene	5940	6.44	ug/Kg dry		5750		3	50	
2-Methylanthracene	3090	6.44	ug/Kg dry		2710		13	50	
4/9-Methylphenanthrene	6410	6.44	ug/Kg dry		6130		4	50	
1-Methylphenanthrene	3870	6.44	ug/Kg dry		3530		9	50	
Surrogate: Toluene-D8	*482*		ug/Kg dry	*643.7*		*75*	*50-120*		
Surrogate: Naphthalene-d8	*482*		ug/Kg dry	*643.7*		*75*	*50-120*		
Surrogate: Phenanthrene-d10	*473*		ug/Kg dry	*643.7*		*73*	*50-120*		
Surrogate: Perylene-d12	*573*		ug/Kg dry	*643.7*		*89*	*50-120*		

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F230024

Notes and Definitions

U	Analyte included in the analysis, but not detected
J	Reported between MDL and MRL
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
B-	Blank Spike recovery is below lower control limit (B-).
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230024

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 23H0540 / F230024

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000

Project Information

Project Name: Amesbury Former MGP

Project Number: 1804576

Project Location: Amesbury, MA

Project Manager: Ryan Hoffman
781-721-4091 rhoffman@geiconsultants.com

Send Report to: Ryan Hoffman
labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY AND MCP ANALYTICAL METHODS REQUIRED: (YES) NO

STATE AND FEDERAL REGULATORY REQUIREMENTS/REPORT LIMITS

State/Federal Program: (MA) 401WQC Other _____ NH RI CT NY ME

MA MCP Criteria are ~~Method 1 S-1 and~~ GW-2/GW-3. Circle if GW-1 is required.

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Preservative: None	Analysis: Parent and Alkylated MAHs + PAHs 8270*	Analysis: TOCs by Lloyd-Kahn	Sample Specific Remarks
1	1804576-842-S1	8/14/23	1530	Soil	1	JES		X	X	
2	1804576-842-S2	8/14/23	1531	Soil	1	JES		X	X	
3	1804576-842-S3	8/14/23	1532	Soil	1	JES		X	X	

Sample Handling

Samples Field Filtered: YES NO (NA)

Sampled Shipped With Ice: (YES) NO

	Relinquished by sampler: (signature)	Date	Time	Received by: (signature)
1.	David Hill	8/14/23	17:00	1. GEI SAMPLE FRIDGE
2.	Marty Fry	8/15/23	11:25	2.
3.	1.8 ICE	8/15/23	16:11	3.
4.				4.
5.				5.

Turnaround Time (Business days):

5-Day X 4-Day ____ 3-Day ____
2-Day ____ 1-Day ____ Other ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

Sample Matrix Abbreviations: SO = Soil GW = Groundwater SW = Surface Water SD = Sediment CO = Concrete PC = Paint Chip CLK = Caulk

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

Shipped/Delivered Via: ESS Courier

ESS Project ID: 23H0540
Date Received: 8/15/2023
Project Due Date: 8/22/2023
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 1.8 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / (NA)
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / (No)
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA
13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By/Acid Lot#:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Resolution:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1	463341	Yes	N/A	Yes	4 oz. Jar	NP	
2	463342	Yes	N/A	Yes	4 oz. Jar	NP	
3	463343	Yes	N/A	Yes	4 oz. Jar	NP	

2nd Review

Were all containers scanned into storage/lab? Initials: Yes / No
Are barcode labels on correct containers? Yes / No / NA
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: Date & Time: 8/15/23 1639
Reviewed By: Taylor Davis Date & Time: 8/15/23 1705

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: F230025

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 11:43 am, Aug 25, 2023

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses

ESS - Cranston, RI	TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230025

SAMPLE RECEIPT

The following samples were received on August 15, 2023 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F230025-01	1804576-841-S1	Soil	8270 Mod, LK
F230025-02	1804576-841-S2	Soil	8270 Mod, LK
F230025-03	1804576-841-S3	Soil	8270 Mod, LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230025

PROJECT NARRATIVE

Alkylated PAHs

F230025-01	**Present in Method Blank (B).**
	Benzene , C-17 , C-18 , Phytane , Pristane , Styrene , Toluene
F230025-02	**Present in Method Blank (B).**
	Benzene , C-17 , C-18 , Phytane , Pristane , Styrene , Toluene
F230025-03	**Present in Method Blank (B).**
	Benzene , Styrene
FH31601-BS2	**Blank Spike recovery is below lower control limit (B-).**
	Methylcyclohexane (54% @ 60-130%)

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230025

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-841-S1
Date Sampled: 08/14/23 13:30
Percent Solids: 92
Initial Volume: 5.38
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230025
ESS Laboratory Sample ID: F230025-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/16/23 7:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**B 15.1** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C1-Benzene	**14.3** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C2-Benzenes	**14.4** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C3-Benzenes	**J 3.66** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C4-Benzenes	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C5-Benzenes	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
Methylcyclohexane	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
Toluene	**B 17.5** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
Ethylbenzene	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
m,p-Xylene	**20.2** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
Styrene	**B 8.75** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
o-Xylene	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
Isopropylbenzene	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
n-Propylbenzene	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
1,3,5-Trimethylbenzene	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
1,2,3-Trimethylbenzene	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
1,2,4-Trimethylbenzene	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
t-Butylbenzene	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
sec-Butylbenzene	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
p-Isopropyltoluene	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
n-Butylbenzene	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
trans-Decalin	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
cis-Decalin	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C1-Decalins	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C2-Decalins	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C3-Decalins	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C4-Decalins	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
Benzo(b)thiophene	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C1-Benzo(b)thiophenes	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C2-Benzo(b)thiophenes	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C3-Benzo(b)thiophenes	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C4-Benzo(b)thiophenes	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-841-S1
Date Sampled: 08/14/23 13:30
Percent Solids: 92
Initial Volume: 5.38
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230025
ESS Laboratory Sample ID: F230025-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/16/23 7:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**J 2.75** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
2-Methylnaphthalene	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
1-Methylnaphthalene	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C1-Naphthalenes	**J 2.08** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C2-Naphthalenes	**4.42** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C3-Naphthalenes	**8.23** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C4-Naphthalenes	**14.8** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
Biphenyl	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
Acenaphthylene	**14.7** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
Acenaphthene	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
Dibenzofuran	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
Fluorene	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C1-Fluorenes	**5.61** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C2-Fluorenes	**24.0** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C3-Fluorenes	**21.3** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
Dibenzothiophene	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C1-Dibenzothiophenes	**9.55** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C2-Dibenzothiophenes	**22.0** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C3-Dibenzothiophenes	**12.5** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C4-Dibenzothiophenes	**10.5** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
Phenanthrene	**12.6** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
Anthracene	**23.2** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C1-Phenanthrenes/Anthracenes	**137** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C2-Phenanthrenes/Anthracenes	**178** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C3-Phenanthrenes/Anthracenes	**87.7** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C4-Phenanthrenes/Anthracenes	**30.1** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
Retene	**8.37** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
Benzo(b)naphtho(2,1-d)thiophene	**19.8** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C0-Benzonaphthothiophenes	**54.1** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C1-Benzonaphthothiophenes	**57.3** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C2-Benzonaphthothiophenes	**37.0** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C3-Benzonaphthothiophenes	**18.8** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-841-S1
Date Sampled: 08/14/23 13:30
Percent Solids: 92
Initial Volume: 5.38
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230025
ESS Laboratory Sample ID: F230025-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/16/23 7:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**6.33** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
Fluoranthene	**136** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
Pyrene	**125** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C1-Fluoranthenes/Pyrenes	**307** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C2-Fluoranthenes/Pyrenes	**192** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C3-Fluoranthenes/Pyrenes	**97.6** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
Benzo(b)fluorene	**45.5** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
Benzo(c)fluorene	**16.2** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
2-Methylpyrene	**35.2** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
4-Methylpyrene	**27.9** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
1-Methylpyrene	**25.3** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
Benz(a)anthracene	**195** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
Chrysene/triphenylene	**165** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C1-Benzo(a)anthracenes/Chrysenes	**203** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C2-Benzo(a)anthracenes/Chrysenes	**129** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C3-Benzo(a)anthracenes/Chrysenes	**80.0** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C4-Benzo(a)anthracenes/Chrysenes	**40.7** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
Benzo(b)fluoranthene	**79.2** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
Benzo(j/k)fluoranthene	**108** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
Benzo(e)pyrene	**64.2** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
Benzo(a)pyrene	**137** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
Perylene	**32.3** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
Indeno(1,2,3-cd)pyrene	**55.7** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
Dibenzo(a,h)anthracene	**19.0** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
Benzo(g,h,i)perylene	**39.6** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
Coronene	**8.87** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
Tetramethyl lead	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
Trimethylethyl lead	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
Dimethyldiethyl lead	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
Methyltriethyl lead	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
Tetraethyl lead	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
2,6,10-trimethyldodecane (1380)	**10.1** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-841-S1
Date Sampled: 08/14/23 13:30
Percent Solids: 92
Initial Volume: 5.38
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230025
ESS Laboratory Sample ID: F230025-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/16/23 7:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**18.9** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
2,6,10-trimethylpentadecane (1650)	**8.07** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C-17	**B 31.0** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
Pristane	**B 27.5** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
C-18	**B 29.8** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
Phytane	**B 10.6** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
Carbazole	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
2,6-Dimethylnaphthalene	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
2,3,5-Trimethylnaphthene	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
4-Methyldibenzothiophene	**J 2.40** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
2/3-Methyldibenzothiophene	**J 3.21** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
1-Methyldibenzothiophene	ND (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
3-Methylphenanthrene	**14.5** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
2-Methylphenanthrene	**23.3** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
2-Methylanthracene	**47.2** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
4/9-Methylphenanthrene	**29.6** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601
1-Methylphenanthrene	**19.2** (4.03)	2.02	8270 Mod		1	IBM	08/16/23 19:13	F3H0002	FH31601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*82 %*		*50-120*
Surrogate: Naphthalene-d8	*80 %*		*50-120*
Surrogate: Phenanthrene-d10	*81 %*		*50-120*
Surrogate: Perylene-d12	*88 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-841-S1
Date Sampled: 08/14/23 13:30
Percent Solids: 92

ESS Laboratory Work Order: F230025
ESS Laboratory Sample ID: F230025-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**1980** (470)		LK		1	CCP	08/23/23 13:29	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-841-S2
Date Sampled: 08/14/23 13:31
Percent Solids: 81
Initial Volume: 5.45
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230025
ESS Laboratory Sample ID: F230025-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/16/23 7:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**B 13.1** (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C1-Benzene	**J 2.70** (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C2-Benzenes	**J 2.57** (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C3-Benzenes	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C4-Benzenes	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C5-Benzenes	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
Methylcyclohexane	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
Toluene	**B, J 3.30** (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
Ethylbenzene	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
m,p-Xylene	**J 2.28** (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
Styrene	**B 5.12** (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
o-Xylene	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
Isopropylbenzene	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
n-Propylbenzene	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
1,3,5-Trimethylbenzene	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
1,2,3-Trimethylbenzene	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
1,2,4-Trimethylbenzene	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
t-Butylbenzene	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
sec-Butylbenzene	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
p-Isopropyltoluene	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
n-Butylbenzene	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
trans-Decalin	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
cis-Decalin	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C1-Decalins	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C2-Decalins	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C3-Decalins	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C4-Decalins	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
Benzo(b)thiophene	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C1-Benzo(b)thiophenes	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C2-Benzo(b)thiophenes	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C3-Benzo(b)thiophenes	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C4-Benzo(b)thiophenes	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-841-S2
Date Sampled: 08/14/23 13:31
Percent Solids: 81
Initial Volume: 5.45
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230025
ESS Laboratory Sample ID: F230025-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/16/23 7:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
2-Methylnaphthalene	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
1-Methylnaphthalene	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C1-Naphthalenes	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C2-Naphthalenes	**J 4.01** (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C3-Naphthalenes	**J 3.72** (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C4-Naphthalenes	**J 2.47** (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
Biphenyl	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
Acenaphthylene	**J 2.84** (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
Acenaphthene	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
Dibenzofuran	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
Fluorene	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C1-Fluorenes	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C2-Fluorenes	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C3-Fluorenes	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
Dibenzothiophene	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C1-Dibenzothiophenes	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C2-Dibenzothiophenes	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C3-Dibenzothiophenes	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C4-Dibenzothiophenes	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
Phenanthrene	**6.88** (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
Anthracene	**J 2.54** (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C1-Phenanthrenes/Anthracenes	**8.36** (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C2-Phenanthrenes/Anthracenes	**J 4.40** (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C3-Phenanthrenes/Anthracenes	**J 2.34** (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C4-Phenanthrenes/Anthracenes	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
Retene	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
Benzo(b)naphtho(2,1-d)thiophene	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C0-Benzonaphthothiophenes	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C1-Benzonaphthothiophenes	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C2-Benzonaphthothiophenes	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C3-Benzonaphthothiophenes	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-841-S2
Date Sampled: 08/14/23 13:31
Percent Solids: 81
Initial Volume: 5.45
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230025
ESS Laboratory Sample ID: F230025-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/16/23 7:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
Fluoranthene	**10.8** (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
Pyrene	**17.2** (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C1-Fluoranthenes/Pyrenes	**9.97** (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C2-Fluoranthenes/Pyrenes	**J 3.06** (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C3-Fluoranthenes/Pyrenes	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
Benzo(b)fluorene	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
Benzo(c)fluorene	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
2-Methylpyrene	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
4-Methylpyrene	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
1-Methylpyrene	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
Benz(a)anthracene	**6.25** (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
Chrysene/triphenylene	**7.70** (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C1-Benzo(a)anthracenes/Chrysenes	**J 4.02** (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C2-Benzo(a)anthracenes/Chrysenes	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C3-Benzo(a)anthracenes/Chrysenes	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C4-Benzo(a)anthracenes/Chrysenes	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
Benzo(b)fluoranthene	**5.27** (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
Benzo(j/k)fluoranthene	**6.83** (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
Benzo(e)pyrene	**6.84** (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
Benzo(a)pyrene	**11.6** (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
Perylene	**5.27** (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
Indeno(1,2,3-cd)pyrene	**8.48** (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
Dibenzo(a,h)anthracene	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
Benzo(g,h,i)perylene	**8.14** (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
Coronene	**J 2.79** (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
Tetramethyl lead	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
Trimethylethyl lead	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
Dimethyldiethyl lead	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
Methyltriethyl lead	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
Tetraethyl lead	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
2,6,10-trimethyldodecane (1380)	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-841-S2
Date Sampled: 08/14/23 13:31
Percent Solids: 81
Initial Volume: 5.45
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230025
ESS Laboratory Sample ID: F230025-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/16/23 7:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
2,6,10-trimethylpentadecane (1650)	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C-17	**B 11.2** (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
Pristane	**B 8.15** (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
C-18	**B 14.4** (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
Phytane	**B 7.72** (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
Carbazole	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
2,6-Dimethylnaphthalene	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
2,3,5-Trimethylnaphthene	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
4-Methyldibenzothiophene	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
2/3-Methyldibenzothiophene	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
1-Methyldibenzothiophene	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
3-Methylphenanthrene	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
2-Methylphenanthrene	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
2-Methylanthracene	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
4/9-Methylphenanthrene	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601
1-Methylphenanthrene	ND (4.55)	2.27	8270 Mod		1	IBM	08/16/23 20:37	F3H0002	FH31601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*75 %*		*50-120*
Surrogate: Naphthalene-d8	*72 %*		*50-120*
Surrogate: Phenanthrene-d10	*77 %*		*50-120*
Surrogate: Perylene-d12	*79 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-841-S2
Date Sampled: 08/14/23 13:31
Percent Solids: 81

ESS Laboratory Work Order: F230025
ESS Laboratory Sample ID: F230025-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	ND (468)		LK		1	CCP	08/23/23 13:45	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-841-S3
Date Sampled: 08/14/23 13:32
Percent Solids: 58
Initial Volume: 4.95
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230025
ESS Laboratory Sample ID: F230025-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/16/23 7:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	B **80.0** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C1-Benzene	**906** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C2-Benzenes	**294** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C3-Benzenes	**218** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C4-Benzenes	**497** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C5-Benzenes	**568** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
Methylcyclohexane	**43.6** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
Toluene	**1110** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
Ethylbenzene	**28.5** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
m,p-Xylene	**377** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
Styrene	B **83.7** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
o-Xylene	**34.3** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
Isopropylbenzene	**7.60** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
n-Propylbenzene	**18.4** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
1,3,5-Trimethylbenzene	**38.1** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
1,2,3-Trimethylbenzene	**22.8** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
1,2,4-Trimethylbenzene	**111** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
t-Butylbenzene	ND (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
sec-Butylbenzene	ND (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
p-Isopropyltoluene	**33.8** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
n-Butylbenzene	**30.2** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
trans-Decalin	**43.9** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
cis-Decalin	**15.4** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C1-Decalins	**256** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C2-Decalins	**598** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C3-Decalins	**630** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C4-Decalins	**1190** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
Benzo(b)thiophene	**48.0** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C1-Benzo(b)thiophenes	**107** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C2-Benzo(b)thiophenes	**328** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C3-Benzo(b)thiophenes	**286** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C4-Benzo(b)thiophenes	**147** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-841-S3
Date Sampled: 08/14/23 13:32
Percent Solids: 58
Initial Volume: 4.95
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230025
ESS Laboratory Sample ID: F230025-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/16/23 7:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**907** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
2-Methylnaphthalene	**1310** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
1-Methylnaphthalene	**3270** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C1-Naphthalenes	**2870** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C2-Naphthalenes	**7510** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C3-Naphthalenes	**6200** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C4-Naphthalenes	**3330** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
Biphenyl	**285** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
Acenaphthylene	**1720** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
Acenaphthene	**3690** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
Dibenzofuran	**354** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
Fluorene	**2810** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C1-Fluorenes	**3190** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C2-Fluorenes	**3830** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C3-Fluorenes	**2460** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
Dibenzothiophene	**852** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C1-Dibenzothiophenes	**1750** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C2-Dibenzothiophenes	**2000** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C3-Dibenzothiophenes	**1240** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C4-Dibenzothiophenes	**503** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
Phenanthrene	**11200** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
Anthracene	**4640** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C1-Phenanthrenes/Anthracenes	**15200** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C2-Phenanthrenes/Anthracenes	**10800** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C3-Phenanthrenes/Anthracenes	**4620** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C4-Phenanthrenes/Anthracenes	**1620** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
Retene	**446** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
Benzo(b)naphtho(2,1-d)thiophene	**725** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C0-Benzonaphthothiophenes	**1260** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C1-Benzonaphthothiophenes	**1220** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C2-Benzonaphthothiophenes	**840** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C3-Benzonaphthothiophenes	**455** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-841-S3
Date Sampled: 08/14/23 13:32
Percent Solids: 58
Initial Volume: 4.95
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230025
ESS Laboratory Sample ID: F230025-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/16/23 7:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**133** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
Fluoranthene	**7800** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
Pyrene	**10600** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C1-Fluoranthenes/Pyrenes	**10500** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C2-Fluoranthenes/Pyrenes	**4770** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C3-Fluoranthenes/Pyrenes	**2150** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
Benzo(b)fluorene	**1040** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
Benzo(c)fluorene	**468** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
2-Methylpyrene	**1470** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
4-Methylpyrene	**1410** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
1-Methylpyrene	**1240** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
Benz(a)anthracene	**4850** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
Chrysene/triphenylene	**5460** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C1-Benzo(a)anthracenes/Chrysenes	**4880** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C2-Benzo(a)anthracenes/Chrysenes	**2790** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C3-Benzo(a)anthracenes/Chrysenes	**1340** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C4-Benzo(a)anthracenes/Chrysenes	**604** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
Benzo(b)fluoranthene	**2550** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
Benzo(j/k)fluoranthene	**2630** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
Benzo(e)pyrene	**2550** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
Benzo(a)pyrene	**3810** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
Perylene	**822** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
Indeno(1,2,3-cd)pyrene	**2210** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
Dibenzo(a,h)anthracene	**549** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
Benzo(g,h,i)perylene	**1860** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
Coronene	**543** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
Tetramethyl lead	ND (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
Trimethylethyl lead	ND (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
Dimethyldiethyl lead	ND (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
Methyltriethyl lead	ND (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
Tetraethyl lead	ND (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
2,6,10-trimethyldodecane (1380)	**467** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-841-S3
Date Sampled: 08/14/23 13:32
Percent Solids: 58
Initial Volume: 4.95
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230025
ESS Laboratory Sample ID: F230025-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/16/23 7:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**833** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
2,6,10-trimethylpentadecane (1650)	**1010** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C-17	**478** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
Pristane	**1980** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
C-18	**442** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
Phytane	**2470** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
Carbazole	**94.0** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
2,6-Dimethylnaphthalene	**1880** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
2,3,5-Trimethylnaphthene	**399** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
4-Methyldibenzothiophene	**760** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
2/3-Methyldibenzothiophene	**545** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
1-Methyldibenzothiophene	**144** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
3-Methylphenanthrene	**3470** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
2-Methylphenanthrene	**3700** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
2-Methylanthracene	**1630** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
4/9-Methylphenanthrene	**4040** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601
1-Methylphenanthrene	**2310** (6.99)	3.50	8270 Mod		1	IBM	08/16/23 22:00	F3H0002	FH31601

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*73 %*		*50-120*
Surrogate: Naphthalene-d8	*75 %*		*50-120*
Surrogate: Phenanthrene-d10	*75 %*		*50-120*
Surrogate: Perylene-d12	*83 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-841-S3
Date Sampled: 08/14/23 13:32
Percent Solids: 58

ESS Laboratory Work Order: F230025
ESS Laboratory Sample ID: F230025-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**40700** (462)		LK		1	CCP	08/23/23 14:02	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230025

Quality Control Data

Classical Chemistry

Batch DH31630 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	500	mg/kg							
Total Organic Carbon (2)	ND	500	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230025

Quality Control Data

Classical Chemistry

Batch DH31630 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9410	500	mg/kg	10010		94	80-120			
Total Organic Carbon (2)	9630	500	mg/kg	10010		96	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230025

Quality Control Data

Classical Chemistry

Batch DH31630 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9980	500	mg/kg	10010		100	80-120	6	25	
Total Organic Carbon (2)	9640	500	mg/kg	10010		96	80-120	0.2	25	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230025

Quality Control Data

Alkylated PAHs

Batch FH31601 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	11.7	4.00	ug/Kg wet							
C1-Benzene	ND	4.00	ug/Kg wet							
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	2.57	4.00	ug/Kg wet							J
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	9.65	4.00	ug/Kg wet							
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230025

Quality Control Data

Alkylated PAHs

Batch FH31601 - 3570			
C1-Fluorenes	ND	4.00	ug/Kg wet
C2-Fluorenes	ND	4.00	ug/Kg wet
C3-Fluorenes	ND	4.00	ug/Kg wet
Dibenzothiophene	ND	4.00	ug/Kg wet
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet
Phenanthrene	ND	4.00	ug/Kg wet
Anthracene	ND	4.00	ug/Kg wet
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
Retene	ND	4.00	ug/Kg wet
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
Fluoranthene	ND	4.00	ug/Kg wet
Pyrene	ND	4.00	ug/Kg wet
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
Benzo(b)fluorene	ND	4.00	ug/Kg wet
Benzo(c)fluorene	ND	4.00	ug/Kg wet
2-Methylpyrene	ND	4.00	ug/Kg wet
4-Methylpyrene	ND	4.00	ug/Kg wet
1-Methylpyrene	ND	4.00	ug/Kg wet
Benz(a)anthracene	ND	4.00	ug/Kg wet
Chrysene/triphenylene	ND	4.00	ug/Kg wet
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet
Benzo(e)pyrene	ND	4.00	ug/Kg wet
Benzo(a)pyrene	ND	4.00	ug/Kg wet
Perylene	ND	4.00	ug/Kg wet
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet
Coronene	ND	4.00	ug/Kg wet
Tetramethyl lead	ND	4.00	ug/Kg wet
Trimethylethyl lead	ND	4.00	ug/Kg wet

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230025

Quality Control Data

Alkylated PAHs

Batch FH31601 - 3570							
Dimethyldiethyl lead	ND	4.00	ug/Kg wet				
Methyltriethyl lead	ND	4.00	ug/Kg wet				
Tetraethyl lead	ND	4.00	ug/Kg wet				
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet				
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet				
2,6,10-trimethylpentadecane (1650)	ND	4.00	ug/Kg wet				
C-17	7.23	4.00	ug/Kg wet				
Pristane	3.70	4.00	ug/Kg wet				J
C-18	9.96	4.00	ug/Kg wet				
Phytane	4.36	4.00	ug/Kg wet				
Carbazole	ND	4.00	ug/Kg wet				
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet				
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet				
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
3-Methylphenanthrene	ND	4.00	ug/Kg wet				
2-Methylphenanthrene	ND	4.00	ug/Kg wet				
2-Methylanthracene	ND	4.00	ug/Kg wet				
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet				
1-Methylphenanthrene	ND	4.00	ug/Kg wet				
Surrogate: Toluene-D8	*346*		ug/Kg wet	*400.0*	*87*	*50-120*	
Surrogate: Naphthalene-d8	*322*		ug/Kg wet	*400.0*	*80*	*50-120*	
Surrogate: Phenanthrene-d10	*341*		ug/Kg wet	*400.0*	*85*	*50-120*	
Surrogate: Perylene-d12	*348*		ug/Kg wet	*400.0*	*87*	*50-120*	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230025

Quality Control Data

Alkylated PAHs

Batch FH31601 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	280	4.00	ug/Kg wet	400.0		70	60-130			
Methylcyclohexane	216	4.00	ug/Kg wet	400.0		54	60-130			B-
Toluene	285	4.00	ug/Kg wet	400.0		71	60-130			
Ethylbenzene	305	4.00	ug/Kg wet	400.0		76	60-130			
m,p-Xylene	297	4.00	ug/Kg wet	400.0		74	60-130			
Styrene	297	4.00	ug/Kg wet	400.0		74	60-130			
o-Xylene	310	4.00	ug/Kg wet	400.0		77	60-130			
Isopropylbenzene	307	4.00	ug/Kg wet	400.0		77	60-130			
n-Propylbenzene	308	4.00	ug/Kg wet	400.0		77	60-130			
1,3,5-Trimethylbenzene	312	4.00	ug/Kg wet	400.0		78	60-130			
1,2,3-Trimethylbenzene	311	4.00	ug/Kg wet	400.0		78	60-130			
1,2,4-Trimethylbenzene	309	4.00	ug/Kg wet	400.0		77	60-130			
t-Butylbenzene	305	4.00	ug/Kg wet	400.0		76	60-130			
sec-Butylbenzene	311	4.00	ug/Kg wet	400.0		78	60-130			
p-Isopropyltoluene	314	4.00	ug/Kg wet	400.0		79	60-130			
n-Butylbenzene	304	4.00	ug/Kg wet	400.0		76	60-130			
trans-Decalin	299	4.00	ug/Kg wet	400.0		75	60-130			
cis-Decalin	298	4.00	ug/Kg wet	400.0		74	60-130			
Benzo(b)thiophene	292	4.00	ug/Kg wet	400.0		73	60-130			
Naphthalene	290	4.00	ug/Kg wet	400.0		73	60-130			
2-Methylnaphthalene	282	4.00	ug/Kg wet	400.0		70	60-130			
1-Methylnaphthalene	282	4.00	ug/Kg wet	400.0		71	60-130			
Biphenyl	262	4.00	ug/Kg wet	400.0		66	60-130			
Acenaphthylene	311	4.00	ug/Kg wet	400.0		78	60-130			
Acenaphthene	302	4.00	ug/Kg wet	400.0		75	60-130			
Dibenzofuran	298	4.00	ug/Kg wet	400.0		75	60-130			
Fluorene	297	4.00	ug/Kg wet	400.0		74	60-130			
Dibenzothiophene	296	4.00	ug/Kg wet	400.0		74	60-130			
Phenanthrene	286	4.00	ug/Kg wet	400.0		72	60-130			
Anthracene	312	4.00	ug/Kg wet	400.0		78	60-130			
Retene	316	4.00	ug/Kg wet	400.0		79	60-130			
Benzo(b)naphtho(2,1-d)thiophene	317	4.00	ug/Kg wet	400.0		79	60-130			
Fluoranthene	308	4.00	ug/Kg wet	400.0		77	60-130			
Pyrene	309	4.00	ug/Kg wet	400.0		77	60-130			
Benz(a)anthracene	330	4.00	ug/Kg wet	400.0		83	60-130			
Chrysene/triphenylene	321	4.00	ug/Kg wet	400.0		80	60-130			
Benzo(b)fluoranthene	309	4.00	ug/Kg wet	400.0		77	60-130			
Benzo(j/k)fluoranthene	319	4.00	ug/Kg wet	400.0		80	60-130			
Benzo(e)pyrene	293	4.00	ug/Kg wet	400.0		73	60-130			
Benzo(a)pyrene	321	4.00	ug/Kg wet	400.0		80	60-130			
Perylene	319	4.00	ug/Kg wet	400.0		80	60-130			
Indeno(1,2,3-cd)pyrene	354	4.00	ug/Kg wet	400.0		89	60-130			
Dibenzo(a,h)anthracene	329	4.00	ug/Kg wet	400.0		82	60-130			
Benzo(g,h,i)perylene	307	4.00	ug/Kg wet	400.0		77	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230025

Quality Control Data

Alkylated PAHs

Batch FH31601 - 3570						
Coronene	322	4.00	ug/Kg wet	400.0	80	60-130
Tetraethyl lead	68.0	4.00	ug/Kg wet	400.0	17	60-130
Surrogate: Toluene-D8	*303*		ug/Kg wet	*400.0*	*76*	*50-120*
Surrogate: Naphthalene-d8	*302*		ug/Kg wet	*400.0*	*76*	*50-120*
Surrogate: Phenanthrene-d10	*314*		ug/Kg wet	*400.0*	*79*	*50-120*
Surrogate: Perylene-d12	*318*		ug/Kg wet	*400.0*	*79*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230025

Quality Control Data

Alkylated PAHs

Batch FH31601 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	ND	4.00	ug/Kg wet				60-130			
Methylcyclohexane	ND	4.00	ug/Kg wet				60-130			
Toluene	ND	4.00	ug/Kg wet				60-130			
Ethylbenzene	ND	4.00	ug/Kg wet				60-130			
m,p-Xylene	ND	4.00	ug/Kg wet				60-130			
Styrene	ND	4.00	ug/Kg wet				60-130			
o-Xylene	ND	4.00	ug/Kg wet				60-130			
Isopropylbenzene	ND	4.00	ug/Kg wet				60-130			
n-Propylbenzene	ND	4.00	ug/Kg wet				60-130			
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet				60-130			
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet				60-130			
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet				60-130			
t-Butylbenzene	ND	4.00	ug/Kg wet				60-130			
sec-Butylbenzene	ND	4.00	ug/Kg wet				60-130			
p-Isopropyltoluene	ND	4.00	ug/Kg wet				60-130			
n-Butylbenzene	ND	4.00	ug/Kg wet				60-130			
trans-Decalin	ND	4.00	ug/Kg wet				60-130			
cis-Decalin	ND	4.00	ug/Kg wet				60-130			
Benzo(b)thiophene	ND	4.00	ug/Kg wet				60-130			
Naphthalene	ND	4.00	ug/Kg wet				60-130			
2-Methylnaphthalene	ND	4.00	ug/Kg wet				60-130			
1-Methylnaphthalene	ND	4.00	ug/Kg wet				60-130			
Biphenyl	ND	4.00	ug/Kg wet				60-130			
Acenaphthylene	ND	4.00	ug/Kg wet				60-130			
Acenaphthene	ND	4.00	ug/Kg wet				60-130			
Dibenzofuran	ND	4.00	ug/Kg wet				60-130			
Fluorene	ND	4.00	ug/Kg wet				60-130			
Dibenzothiophene	ND	4.00	ug/Kg wet				60-130			
Phenanthrene	ND	4.00	ug/Kg wet				60-130			
Anthracene	ND	4.00	ug/Kg wet				60-130			
Retene	ND	4.00	ug/Kg wet				60-130			
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet				60-130			
Fluoranthene	ND	4.00	ug/Kg wet				60-130			
Pyrene	ND	4.00	ug/Kg wet				60-130			
Benz(a)anthracene	ND	4.00	ug/Kg wet				60-130			
Chrysene/triphenylene	ND	4.00	ug/Kg wet				60-130			
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet				60-130			
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet				60-130			
Benzo(e)pyrene	ND	4.00	ug/Kg wet				60-130			
Benzo(a)pyrene	ND	4.00	ug/Kg wet				60-130			
Perylene	ND	4.00	ug/Kg wet				60-130			
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet				60-130			
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet				60-130			
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet				60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230025

Quality Control Data

Alkylated PAHs

Batch FH31601 - 3570						
Coronene	ND	4.00	ug/Kg wet			60-130
Tetraethyl lead	348	4.00	ug/Kg wet	400.0	87	60-130
Surrogate: Toluene-D8	*333*		ug/Kg wet	*400.0*	*83*	*50-120*
Surrogate: Naphthalene-d8	*310*		ug/Kg wet	*400.0*	*77*	*50-120*
Surrogate: Phenanthrene-d10	*325*		ug/Kg wet	*400.0*	*81*	*50-120*
Surrogate: Perylene-d12	*332*		ug/Kg wet	*400.0*	*83*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F230025

Notes and Definitions

U	Analyte included in the analysis, but not detected
J	Reported between MDL and MRL
B-	Blank Spike recovery is below lower control limit (B-).
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230025

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 23H0541 / F230025

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000

Project Information

Project Name: Amesbury Former MGP

Project Number: 1804576

Send Report to: Ryan Hoffman

labdata@geiconsultants.com

Project Location: Amesbury, MA

Project Manager: Ryan Hoffman
781-721-4091 rhoffman@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY AND MCP ANALYTICAL METHODS REQUIRED: (YES) NO

STATE AND FEDERAL REGULATORY REQUIREMENTS/REPORT LIMITS

State/Federal Program: (MA) 401WQC Other _____ NH RI CT NY ME

MA MCP Criteria are (Method 1 S-1 and GW-2/GW-3). Circle if GW-1 is required.

Preservative: None

Analysis: Parent and Alkylated MAHs + PAHs 8270*; TOCs by Lloyd-Kahn

Sample Handling: Samples Field Filtered — YES NO (NA)

Sampled Shipped With Ice — (YES) NO

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Parent and Alkylated MAHs + PAHs 8270*	TOCs by Lloyd-Kahn	Sample Specific Remarks
1	1804576-841-S1	8/14/23	1330	Soil	1	JES	X	X	
2	1804576-841-S2	8/14/23	1331	Soil	1	JES	X	X	
3	1804576-841-S3	8/14/23	1332	Soil	1	JES	X	X	

Relinquished by sampler: (signature)	Date	Time	Received by: (signature)
1.	8/14/23	17:00	1. GEI SAMPLE FRIDGE
2.	8/15/23	11:25	2.
3.	8/15/23	16:11	3.
4.			4.
5.			5.

Turnaround Time (Business days):

5-Day X 4-Day ____ 3-Day ____
2-Day ____ 1-Day ____ Other ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

Sample Matrix Abbreviations: SO = Soil GW = Groundwater SW = Surface Water SD = Sediment CO = Concrete PC = Paint Chip CLK = Caulk

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

Shipped/Delivered Via: ESS Courier

ESS Project ID: 23H0541
Date Received: 8/15/2023
Project Due Date: 8/22/2023
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 1.8 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / (NA)
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / (No)
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By/Acid Lot#:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Resolution:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1	463344	Yes	N/A	Yes	4 oz. Jar	NP	
2	463345	Yes	N/A	Yes	4 oz. Jar	NP	
3	463346	Yes	N/A	Yes	4 oz. Jar	NP	

2nd Review

Were all containers scanned into storage/lab? Initials: AL
Are barcode labels on correct containers? (Yes) / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: Date & Time: 8/15/23 1639
Reviewed By: Taylor Davies Date & Time: 8/15/23 1703

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: F230026

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 9:53 am, Aug 28, 2023

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses

ESS - Cranston, RI	TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230026

SAMPLE RECEIPT

The following samples were received on August 18, 2023 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F230026-01	1804576-848-S1	Soil	8270 Mod, LK
F230026-02	1804576-848-S2	Soil	8270 Mod, LK
F230026-03	1804576-853-S1	Soil	8270 Mod, LK
F230026-04	1804576-853-S2	Soil	8270 Mod, LK
F230026-05	1804576-853-S3	Soil	8270 Mod, LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230026

PROJECT NARRATIVE

Alkylated PAHs

F230026-01	**Present in Method Blank (B).**
	C-18 , Styrene
F230026-02	**Present in Method Blank (B).**
	Benzene , C-17 , C-18 , Styrene
F230026-03	**Present in Method Blank (B).**
	Benzene , C-18 , Styrene
F230026-04	**Present in Method Blank (B).**
	C-18
F230026-05	**Present in Method Blank (B).**
	Benzene , C-17 , C-18 , C1-Benzene , Styrene , Toluene
FH32101-BS2	**Blank Spike recovery is below lower control limit (B-).**
	Methylcyclohexane (56% @ 60-130%)

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230026

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-848-S1
Date Sampled: 08/17/23 11:30
Percent Solids: 65
Initial Volume: 4.42
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230026
ESS Laboratory Sample ID: F230026-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/21/23 9:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**149** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C1-Benzene	**223** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C2-Benzenes	**215** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C3-Benzenes	**60.0** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C4-Benzenes	**152** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C5-Benzenes	**190** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
Methylcyclohexane	**7.00** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
Toluene	**276** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
Ethylbenzene	**14.2** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
m,p-Xylene	**302** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
Styrene	**B 108** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
o-Xylene	**10.4** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
Isopropylbenzene	ND (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
n-Propylbenzene	**10.4** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
1,3,5-Trimethylbenzene	**J 5.27** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
1,2,3-Trimethylbenzene	**10.6** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
1,2,4-Trimethylbenzene	**15.5** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
t-Butylbenzene	ND (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
sec-Butylbenzene	ND (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
p-Isopropyltoluene	**37.0** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
n-Butylbenzene	**28.5** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
trans-Decalin	**564** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
cis-Decalin	**73.1** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C1-Decalins	**1030** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C2-Decalins	**370** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C3-Decalins	**197** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C4-Decalins	**352** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
Benzo(b)thiophene	**J 4.32** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C1-Benzo(b)thiophenes	**30.2** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C2-Benzo(b)thiophenes	**41.3** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C3-Benzo(b)thiophenes	**21.1** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C4-Benzo(b)thiophenes	**24.6** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-848-S1
Date Sampled: 08/17/23 11:30
Percent Solids: 65
Initial Volume: 4.42
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230026
ESS Laboratory Sample ID: F230026-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/21/23 9:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**55.2** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
2-Methylnaphthalene	**36.3** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
1-Methylnaphthalene	**20.9** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C1-Naphthalenes	**37.6** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C2-Naphthalenes	**142** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C3-Naphthalenes	**243** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C4-Naphthalenes	**248** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
Biphenyl	**38.2** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
Acenaphthylene	**164** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
Acenaphthene	**66.3** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
Dibenzofuran	**29.1** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
Fluorene	**79.4** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C1-Fluorenes	**84.0** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C2-Fluorenes	**143** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C3-Fluorenes	**175** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
Dibenzothiophene	**57.5** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C1-Dibenzothiophenes	**107** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C2-Dibenzothiophenes	**179** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C3-Dibenzothiophenes	**171** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C4-Dibenzothiophenes	**118** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
Phenanthrene	**470** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
Anthracene	**241** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C1-Phenanthrenes/Anthracenes	**423** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C2-Phenanthrenes/Anthracenes	**412** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C3-Phenanthrenes/Anthracenes	**286** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C4-Phenanthrenes/Anthracenes	**272** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
Retene	**200** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
Benzo(b)naphtho(2,1-d)thiophene	**96.0** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C0-Benzonaphthothiophenes	**183** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C1-Benzonaphthothiophenes	**142** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C2-Benzonaphthothiophenes	**141** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C3-Benzonaphthothiophenes	**117** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-848-S1
Date Sampled: 08/17/23 11:30
Percent Solids: 65
Initial Volume: 4.42
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230026
ESS Laboratory Sample ID: F230026-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/21/23 9:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**65.0** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
Fluoranthene	**1100** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
Pyrene	**1200** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C1-Fluoranthenes/Pyrenes	**683** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C2-Fluoranthenes/Pyrenes	**349** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C3-Fluoranthenes/Pyrenes	**166** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
Benzo(b)fluorene	**75.1** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
Benzo(c)fluorene	**36.0** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
2-Methylpyrene	**95.8** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
4-Methylpyrene	**98.3** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
1-Methylpyrene	**72.3** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
Benz(a)anthracene	**594** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
Chrysene/triphenylene	**652** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C1-Benzo(a)anthracenes/Chrysenes	**383** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C2-Benzo(a)anthracenes/Chrysenes	**275** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C3-Benzo(a)anthracenes/Chrysenes	**174** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C4-Benzo(a)anthracenes/Chrysenes	**85.4** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
Benzo(b)fluoranthene	**461** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
Benzo(j/k)fluoranthene	**502** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
Benzo(e)pyrene	**431** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
Benzo(a)pyrene	**661** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
Perylene	**248** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
Indeno(1,2,3-cd)pyrene	**445** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
Dibenzo(a,h)anthracene	**103** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
Benzo(g,h,i)perylene	**378** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
Coronene	**110** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
Tetramethyl lead	ND (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
Trimethylethyl lead	ND (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
Dimethyldiethyl lead	ND (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
Methyltriethyl lead	ND (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
Tetraethyl lead	ND (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
2,6,10-trimethyldodecane (1380)	**205** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-848-S1
Date Sampled: 08/17/23 11:30
Percent Solids: 65
Initial Volume: 4.42
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230026
ESS Laboratory Sample ID: F230026-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/21/23 9:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**319** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
2,6,10-trimethylpentadecane (1650)	**231** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C-17	**142** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
Pristane	**653** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
C-18	**B 103** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
Phytane	**572** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
Carbazole	**63.0** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
2,6-Dimethylnaphthalene	**40.5** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
2,3,5-Trimethylnaphthene	**14.8** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
4-Methyldibenzothiophene	**44.4** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
2/3-Methyldibenzothiophene	**34.5** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
1-Methyldibenzothiophene	**13.0** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
3-Methylphenanthrene	**96.4** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
2-Methylphenanthrene	**93.6** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
2-Methylanthracene	**54.4** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
4/9-Methylphenanthrene	**105** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101
1-Methylphenanthrene	**63.0** (6.92)	3.46	8270 Mod		1	IBM	08/22/23 20:03	F3H0003	FH32101

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*73 %*		*50-120*
Surrogate: Naphthalene-d8	*73 %*		*50-120*
Surrogate: Phenanthrene-d10	*75 %*		*50-120*
Surrogate: Perylene-d12	*78 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-848-S1
Date Sampled: 08/17/23 11:30
Percent Solids: 65

ESS Laboratory Work Order: F230026
ESS Laboratory Sample ID: F230026-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**34300** (483)		LK		1	CCP	08/23/23 16:18	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-848-S2
Date Sampled: 08/17/23 11:31
Percent Solids: 72
Initial Volume: 5.36
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230026
ESS Laboratory Sample ID: F230026-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/21/23 9:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	B **69.2** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C1-Benzene	**280** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C2-Benzenes	**99.9** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C3-Benzenes	**39.6** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C4-Benzenes	**70.0** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C5-Benzenes	**61.8** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
Methylcyclohexane	**8.29** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
Toluene	**350** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
Ethylbenzene	**11.8** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
m,p-Xylene	**130** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
Styrene	B **64.5** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
o-Xylene	**9.58** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
Isopropylbenzene	ND (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
n-Propylbenzene	**7.34** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
1,3,5-Trimethylbenzene	J **4.19** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
1,2,3-Trimethylbenzene	**6.77** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
1,2,4-Trimethylbenzene	**15.0** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
t-Butylbenzene	ND (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
sec-Butylbenzene	ND (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
p-Isopropyltoluene	**12.3** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
n-Butylbenzene	**16.1** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
trans-Decalin	**196** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
cis-Decalin	**24.1** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C1-Decalins	**378** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C2-Decalins	**189** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C3-Decalins	**104** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C4-Decalins	**168** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
Benzo(b)thiophene	J **4.64** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C1-Benzo(b)thiophenes	**16.2** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C2-Benzo(b)thiophenes	**17.4** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C3-Benzo(b)thiophenes	**13.4** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C4-Benzo(b)thiophenes	**15.1** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-848-S2
Date Sampled: 08/17/23 11:31
Percent Solids: 72
Initial Volume: 5.36
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230026
ESS Laboratory Sample ID: F230026-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/21/23 9:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**80.6** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
2-Methylnaphthalene	**48.4** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
1-Methylnaphthalene	**31.0** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C1-Naphthalenes	**51.6** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C2-Naphthalenes	**132** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C3-Naphthalenes	**174** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C4-Naphthalenes	**150** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
Biphenyl	**41.3** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
Acenaphthylene	**170** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
Acenaphthene	**65.8** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
Dibenzofuran	**48.2** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
Fluorene	**79.4** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C1-Fluorenes	**73.4** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C2-Fluorenes	**103** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C3-Fluorenes	**145** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
Dibenzothiophene	**54.3** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C1-Dibenzothiophenes	**84.7** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C2-Dibenzothiophenes	**117** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C3-Dibenzothiophenes	**93.7** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C4-Dibenzothiophenes	**58.2** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
Phenanthrene	**672** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
Anthracene	**187** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C1-Phenanthrenes/Anthracenes	**474** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C2-Phenanthrenes/Anthracenes	**361** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C3-Phenanthrenes/Anthracenes	**193** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C4-Phenanthrenes/Anthracenes	**90.0** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
Retene	**54.6** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
Benzo(b)naphtho(2,1-d)thiophene	**82.3** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C0-Benzonaphthothiophenes	**160** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C1-Benzonaphthothiophenes	**109** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C2-Benzonaphthothiophenes	**89.7** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C3-Benzonaphthothiophenes	**71.3** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-848-S2
Date Sampled: 08/17/23 11:31
Percent Solids: 72
Initial Volume: 5.36
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230026
ESS Laboratory Sample ID: F230026-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/21/23 9:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**29.5** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
Fluoranthene	**1000** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
Pyrene	**1150** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C1-Fluoranthenes/Pyrenes	**741** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C2-Fluoranthenes/Pyrenes	**324** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C3-Fluoranthenes/Pyrenes	**129** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
Benzo(b)fluorene	**84.2** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
Benzo(c)fluorene	**38.3** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
2-Methylpyrene	**103** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
4-Methylpyrene	**103** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
1-Methylpyrene	**84.4** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
Benz(a)anthracene	**604** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
Chrysene/triphenylene	**688** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C1-Benzo(a)anthracenes/Chrysenes	**383** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C2-Benzo(a)anthracenes/Chrysenes	**196** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C3-Benzo(a)anthracenes/Chrysenes	**101** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C4-Benzo(a)anthracenes/Chrysenes	**55.8** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
Benzo(b)fluoranthene	**475** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
Benzo(j/k)fluoranthene	**548** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
Benzo(e)pyrene	**484** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
Benzo(a)pyrene	**856** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
Perylene	**273** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
Indeno(1,2,3-cd)pyrene	**533** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
Dibenzo(a,h)anthracene	**106** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
Benzo(g,h,i)perylene	**477** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
Coronene	**150** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
Tetramethyl lead	ND (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
Trimethylethyl lead	ND (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
Dimethyldiethyl lead	ND (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
Methyltriethyl lead	ND (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
Tetraethyl lead	ND (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
2,6,10-trimethyldodecane (1380)	**85.1** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-848-S2
Date Sampled: 08/17/23 11:31
Percent Solids: 72
Initial Volume: 5.36
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230026
ESS Laboratory Sample ID: F230026-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/21/23 9:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**168** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
2,6,10-trimethylpentadecane (1650)	**195** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C-17	**B 74.8** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
Pristane	**499** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
C-18	**B 51.4** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
Phytane	**382** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
Carbazole	**46.8** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
2,6-Dimethylnaphthalene	**33.8** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
2,3,5-Trimethylnaphthene	**13.8** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
4-Methyldibenzothiophene	**32.5** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
2/3-Methyldibenzothiophene	**28.7** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
1-Methyldibenzothiophene	**9.95** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
3-Methylphenanthrene	**101** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
2-Methylphenanthrene	**122** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
2-Methylanthracene	**57.5** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
4/9-Methylphenanthrene	**117** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101
1-Methylphenanthrene	**68.1** (5.21)	2.61	8270 Mod		1	IBM	08/22/23 21:25	F3H0003	FH32101

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*72 %*		*50-120*
Surrogate: Naphthalene-d8	*71 %*		*50-120*
Surrogate: Phenanthrene-d10	*72 %*		*50-120*
Surrogate: Perylene-d12	*76 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-848-S2
Date Sampled: 08/17/23 11:31
Percent Solids: 72

ESS Laboratory Work Order: F230026
ESS Laboratory Sample ID: F230026-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**7080** (492)		LK		1	CCP	08/23/23 17:19	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-853-S1
Date Sampled: 08/17/23 14:20
Percent Solids: 58
Initial Volume: 5.09
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230026
ESS Laboratory Sample ID: F230026-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/21/23 9:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	B **60.3** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C1-Benzene	**219** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C2-Benzenes	**156** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C3-Benzenes	**37.9** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C4-Benzenes	**59.6** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C5-Benzenes	**46.7** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
Methylcyclohexane	J **4.65** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
Toluene	**273** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
Ethylbenzene	**8.84** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
m,p-Xylene	**211** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
Styrene	B **84.2** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
o-Xylene	**10.6** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
Isopropylbenzene	ND (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
n-Propylbenzene	**7.27** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
1,3,5-Trimethylbenzene	J **3.52** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
1,2,3-Trimethylbenzene	**8.54** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
1,2,4-Trimethylbenzene	**10.9** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
t-Butylbenzene	ND (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
sec-Butylbenzene	ND (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
p-Isopropyltoluene	**29.3** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
n-Butylbenzene	**14.6** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
trans-Decalin	**101** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
cis-Decalin	**12.8** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C1-Decalins	**223** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C2-Decalins	**112** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C3-Decalins	**69.0** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C4-Decalins	**129** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
Benzo(b)thiophene	ND (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C1-Benzo(b)thiophenes	**20.3** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C2-Benzo(b)thiophenes	**20.3** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C3-Benzo(b)thiophenes	**13.6** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C4-Benzo(b)thiophenes	**16.2** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-853-S1
Date Sampled: 08/17/23 14:20
Percent Solids: 58
Initial Volume: 5.09
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230026
ESS Laboratory Sample ID: F230026-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/21/23 9:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**29.6** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
2-Methylnaphthalene	**22.7** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
1-Methylnaphthalene	**14.5** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C1-Naphthalenes	**25.3** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C2-Naphthalenes	**86.9** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C3-Naphthalenes	**96.7** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C4-Naphthalenes	**86.3** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
Biphenyl	**15.6** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
Acenaphthylene	**89.5** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
Acenaphthene	**37.9** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
Dibenzofuran	**17.8** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
Fluorene	**39.9** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C1-Fluorenes	**36.1** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C2-Fluorenes	**56.2** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C3-Fluorenes	**70.4** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
Dibenzothiophene	**29.2** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C1-Dibenzothiophenes	**52.0** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C2-Dibenzothiophenes	**84.0** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C3-Dibenzothiophenes	**79.1** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C4-Dibenzothiophenes	**52.0** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
Phenanthrene	**265** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
Anthracene	**133** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C1-Phenanthrenes/Anthracenes	**216** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C2-Phenanthrenes/Anthracenes	**189** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C3-Phenanthrenes/Anthracenes	**133** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C4-Phenanthrenes/Anthracenes	**94.4** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
Retene	**125** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
Benzo(b)naphtho(2,1-d)thiophene	**54.9** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C0-Benzonaphthothiophenes	**107** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C1-Benzonaphthothiophenes	**90.0** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C2-Benzonaphthothiophenes	**86.7** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C3-Benzonaphthothiophenes	**65.0** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-853-S1
Date Sampled: 08/17/23 14:20
Percent Solids: 58
Initial Volume: 5.09
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230026
ESS Laboratory Sample ID: F230026-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/21/23 9:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**31.6** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
Fluoranthene	**572** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
Pyrene	**596** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C1-Fluoranthenes/Pyrenes	**377** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C2-Fluoranthenes/Pyrenes	**194** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C3-Fluoranthenes/Pyrenes	**90.6** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
Benzo(b)fluorene	**45.6** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
Benzo(c)fluorene	**20.8** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
2-Methylpyrene	**49.3** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
4-Methylpyrene	**49.4** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
1-Methylpyrene	**37.1** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
Benz(a)anthracene	**319** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
Chrysene/triphenylene	**352** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C1-Benzo(a)anthracenes/Chrysenes	**219** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C2-Benzo(a)anthracenes/Chrysenes	**142** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C3-Benzo(a)anthracenes/Chrysenes	**75.6** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C4-Benzo(a)anthracenes/Chrysenes	**47.0** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
Benzo(b)fluoranthene	**255** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
Benzo(j/k)fluoranthene	**274** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
Benzo(e)pyrene	**225** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
Benzo(a)pyrene	**350** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
Perylene	**320** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
Indeno(1,2,3-cd)pyrene	**238** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
Dibenzo(a,h)anthracene	**55.6** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
Benzo(g,h,i)perylene	**194** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
Coronene	**58.8** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
Tetramethyl lead	ND (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
Trimethylethyl lead	ND (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
Dimethyldiethyl lead	ND (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
Methyltriethyl lead	ND (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
Tetraethyl lead	ND (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
2,6,10-trimethyldodecane (1380)	**70.5** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-853-S1
Date Sampled: 08/17/23 14:20
Percent Solids: 58
Initial Volume: 5.09
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230026
ESS Laboratory Sample ID: F230026-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/21/23 9:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**136** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
2,6,10-trimethylpentadecane (1650)	**78.7** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C-17	**133** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
Pristane	**219** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
C-18	**B 46.5** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
Phytane	**215** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
Carbazole	**30.1** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
2,6-Dimethylnaphthalene	**31.8** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
2,3,5-Trimethylnaphthene	**J 5.81** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
4-Methyldibenzothiophene	**19.4** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
2/3-Methyldibenzothiophene	**16.9** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
1-Methyldibenzothiophene	**6.82** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
3-Methylphenanthrene	**49.2** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
2-Methylphenanthrene	**47.5** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
2-Methylanthracene	**28.8** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
4/9-Methylphenanthrene	**54.2** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101
1-Methylphenanthrene	**30.5** (6.81)	3.41	8270 Mod		1	IBM	08/22/23 22:48	F3H0003	FH32101

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*65 %*		*50-120*
Surrogate: Naphthalene-d8	*69 %*		*50-120*
Surrogate: Phenanthrene-d10	*73 %*		*50-120*
Surrogate: Perylene-d12	*77 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-853-S1
Date Sampled: 08/17/23 14:20
Percent Solids: 58

ESS Laboratory Work Order: F230026
ESS Laboratory Sample ID: F230026-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**24500** (482)		LK		1	CCP	08/23/23 17:36	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-853-S2
Date Sampled: 08/17/23 14:21
Percent Solids: 62
Initial Volume: 4.09
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230026
ESS Laboratory Sample ID: F230026-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/21/23 9:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**215** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C1-Benzene	**506** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C2-Benzenes	**384** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C3-Benzenes	**88.0** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C4-Benzenes	**324** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C5-Benzenes	**482** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
Methylcyclohexane	**8.51** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
Toluene	**623** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
Ethylbenzene	**29.9** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
m,p-Xylene	**539** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
Styrene	**284** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
o-Xylene	**18.3** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
Isopropylbenzene	ND (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
n-Propylbenzene	**25.7** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
1,3,5-Trimethylbenzene	**J 7.34** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
1,2,3-Trimethylbenzene	**20.1** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
1,2,4-Trimethylbenzene	**28.3** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
t-Butylbenzene	ND (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
sec-Butylbenzene	**J 4.70** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
p-Isopropyltoluene	**17.5** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
n-Butylbenzene	**76.8** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
trans-Decalin	**2230** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
cis-Decalin	**288** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C1-Decalins	**4090** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C2-Decalins	**1180** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C3-Decalins	**395** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C4-Decalins	**657** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
Benzo(b)thiophene	**J 7.00** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C1-Benzo(b)thiophenes	**38.8** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C2-Benzo(b)thiophenes	**88.0** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C3-Benzo(b)thiophenes	**97.1** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C4-Benzo(b)thiophenes	**79.2** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-853-S2
Date Sampled: 08/17/23 14:21
Percent Solids: 62
Initial Volume: 4.09
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230026
ESS Laboratory Sample ID: F230026-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/21/23 9:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**50.5** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
2-Methylnaphthalene	**51.6** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
1-Methylnaphthalene	**28.8** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C1-Naphthalenes	**53.3** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C2-Naphthalenes	**467** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C3-Naphthalenes	**757** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C4-Naphthalenes	**519** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
Biphenyl	**140** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
Acenaphthylene	**158** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
Acenaphthene	**68.8** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
Dibenzofuran	**38.0** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
Fluorene	**102** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C1-Fluorenes	**143** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C2-Fluorenes	**204** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C3-Fluorenes	**229** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
Dibenzothiophene	**72.6** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C1-Dibenzothiophenes	**171** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C2-Dibenzothiophenes	**258** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C3-Dibenzothiophenes	**231** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C4-Dibenzothiophenes	**141** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
Phenanthrene	**505** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
Anthracene	**213** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C1-Phenanthrenes/Anthracenes	**588** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C2-Phenanthrenes/Anthracenes	**527** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C3-Phenanthrenes/Anthracenes	**334** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C4-Phenanthrenes/Anthracenes	**166** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
Retene	**138** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
Benzo(b)naphtho(2,1-d)thiophene	**84.8** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C0-Benzonaphthothiophenes	**161** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C1-Benzonaphthothiophenes	**161** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C2-Benzonaphthothiophenes	**173** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C3-Benzonaphthothiophenes	**140** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-853-S2
Date Sampled: 08/17/23 14:21
Percent Solids: 62
Initial Volume: 4.09
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230026
ESS Laboratory Sample ID: F230026-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/21/23 9:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**71.0** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
Fluoranthene	**747** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
Pyrene	**946** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C1-Fluoranthenes/Pyrenes	**665** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C2-Fluoranthenes/Pyrenes	**323** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C3-Fluoranthenes/Pyrenes	**166** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
Benzo(b)fluorene	**81.1** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
Benzo(c)fluorene	**29.3** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
2-Methylpyrene	**92.1** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
4-Methylpyrene	**97.8** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
1-Methylpyrene	**76.3** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
Benz(a)anthracene	**452** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
Chrysene/triphenylene	**550** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C1-Benzo(a)anthracenes/Chrysenes	**378** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C2-Benzo(a)anthracenes/Chrysenes	**232** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C3-Benzo(a)anthracenes/Chrysenes	**140** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C4-Benzo(a)anthracenes/Chrysenes	**87.4** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
Benzo(b)fluoranthene	**344** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
Benzo(j/k)fluoranthene	**363** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
Benzo(e)pyrene	**320** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
Benzo(a)pyrene	**465** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
Perylene	**278** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
Indeno(1,2,3-cd)pyrene	**310** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
Dibenzo(a,h)anthracene	**72.6** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
Benzo(g,h,i)perylene	**261** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
Coronene	**77.9** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
Tetramethyl lead	ND (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
Trimethylethyl lead	ND (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
Dimethyldiethyl lead	ND (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
Methyltriethyl lead	ND (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
Tetraethyl lead	ND (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
2,6,10-trimethyldodecane (1380)	**508** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-853-S2
Date Sampled: 08/17/23 14:21
Percent Solids: 62
Initial Volume: 4.09
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230026
ESS Laboratory Sample ID: F230026-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/21/23 9:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**695** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
2,6,10-trimethylpentadecane (1650)	**609** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C-17	**147** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
Pristane	**1660** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
C-18	**B 86.5** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
Phytane	**1400** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
Carbazole	**26.5** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
2,6-Dimethylnaphthalene	**168** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
2,3,5-Trimethylnaphthene	**56.7** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
4-Methyldibenzothiophene	**72.0** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
2/3-Methyldibenzothiophene	**59.5** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
1-Methyldibenzothiophene	**21.9** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
3-Methylphenanthrene	**124** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
2-Methylphenanthrene	**145** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
2-Methylanthracene	**57.6** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
4/9-Methylphenanthrene	**139** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101
1-Methylphenanthrene	**92.0** (7.89)	3.95	8270 Mod		1	IBM	08/23/23 0:11	F3H0003	FH32101

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*70 %*		*50-120*
Surrogate: Naphthalene-d8	*73 %*		*50-120*
Surrogate: Phenanthrene-d10	*78 %*		*50-120*
Surrogate: Perylene-d12	*77 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-853-S2
Date Sampled: 08/17/23 14:21
Percent Solids: 62

ESS Laboratory Work Order: F230026
ESS Laboratory Sample ID: F230026-04
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**27800** (474)		LK		1	CCP	08/23/23 17:52	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-853-S3
Date Sampled: 08/17/23 14:22
Percent Solids: 74
Initial Volume: 5.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230026
ESS Laboratory Sample ID: F230026-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/21/23 9:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**B 25.4** (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C1-Benzene	**B 18.7** (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C2-Benzenes	**13.1** (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C3-Benzenes	**J 2.71** (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C4-Benzenes	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C5-Benzenes	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
Methylcyclohexane	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
Toluene	**B 24.0** (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
Ethylbenzene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
m,p-Xylene	**15.3** (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
Styrene	**B 8.50** (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
o-Xylene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
Isopropylbenzene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
n-Propylbenzene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
1,3,5-Trimethylbenzene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
1,2,3-Trimethylbenzene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
1,2,4-Trimethylbenzene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
t-Butylbenzene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
sec-Butylbenzene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
p-Isopropyltoluene	**J 4.46** (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
n-Butylbenzene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
trans-Decalin	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
cis-Decalin	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C1-Decalins	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C2-Decalins	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C3-Decalins	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C4-Decalins	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
Benzo(b)thiophene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C1-Benzo(b)thiophenes	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C2-Benzo(b)thiophenes	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C3-Benzo(b)thiophenes	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C4-Benzo(b)thiophenes	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-853-S3
Date Sampled: 08/17/23 14:22
Percent Solids: 74
Initial Volume: 5.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230026
ESS Laboratory Sample ID: F230026-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/21/23 9:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
2-Methylnaphthalene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
1-Methylnaphthalene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C1-Naphthalenes	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C2-Naphthalenes	**J 3.33** (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C3-Naphthalenes	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C4-Naphthalenes	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
Biphenyl	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
Acenaphthylene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
Acenaphthene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
Dibenzofuran	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
Fluorene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C1-Fluorenes	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C2-Fluorenes	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C3-Fluorenes	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
Dibenzothiophene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C1-Dibenzothiophenes	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C2-Dibenzothiophenes	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C3-Dibenzothiophenes	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C4-Dibenzothiophenes	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
Phenanthrene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
Anthracene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C1-Phenanthrenes/Anthracenes	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C2-Phenanthrenes/Anthracenes	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C3-Phenanthrenes/Anthracenes	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C4-Phenanthrenes/Anthracenes	**8.32** (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
Retene	**31.6** (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
Benzo(b)naphtho(2,1-d)thiophene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C0-Benzonaphthothiophenes	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C1-Benzonaphthothiophenes	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C2-Benzonaphthothiophenes	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C3-Benzonaphthothiophenes	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-853-S3
Date Sampled: 08/17/23 14:22
Percent Solids: 74
Initial Volume: 5.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230026
ESS Laboratory Sample ID: F230026-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/21/23 9:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
Fluoranthene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
Pyrene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C1-Fluoranthenes/Pyrenes	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C2-Fluoranthenes/Pyrenes	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C3-Fluoranthenes/Pyrenes	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
Benzo(b)fluorene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
Benzo(c)fluorene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
2-Methylpyrene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
4-Methylpyrene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
1-Methylpyrene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
Benz(a)anthracene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
Chrysene/triphenylene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C1-Benzo(a)anthracenes/Chrysenes	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C2-Benzo(a)anthracenes/Chrysenes	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C3-Benzo(a)anthracenes/Chrysenes	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C4-Benzo(a)anthracenes/Chrysenes	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
Benzo(b)fluoranthene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
Benzo(j/k)fluoranthene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
Benzo(e)pyrene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
Benzo(a)pyrene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
Perylene	**527** (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
Indeno(1,2,3-cd)pyrene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
Dibenzo(a,h)anthracene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
Benzo(g,h,i)perylene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
Coronene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
Tetramethyl lead	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
Trimethylethyl lead	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
Dimethyldiethyl lead	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
Methyltriethyl lead	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
Tetraethyl lead	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
2,6,10-trimethyldodecane (1380)	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-853-S3
Date Sampled: 08/17/23 14:22
Percent Solids: 74
Initial Volume: 5.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230026
ESS Laboratory Sample ID: F230026-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/21/23 9:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**5.56** (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
2,6,10-trimethylpentadecane (1650)	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C-17	**B 22.9** (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
Pristane	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
C-18	**B 8.44** (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
Phytane	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
Carbazole	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
2,6-Dimethylnaphthalene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
2,3,5-Trimethylnaphthene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
4-Methyldibenzothiophene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
2/3-Methyldibenzothiophene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
1-Methyldibenzothiophene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
3-Methylphenanthrene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
2-Methylphenanthrene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
2-Methylanthracene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
4/9-Methylphenanthrene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101
1-Methylphenanthrene	ND (5.11)	2.56	8270 Mod		1	IBM	08/22/23 17:17	F3H0003	FH32101

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*79 %*		*50-120*
Surrogate: Naphthalene-d8	*79 %*		*50-120*
Surrogate: Phenanthrene-d10	*84 %*		*50-120*
Surrogate: Perylene-d12	*88 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-853-S3
Date Sampled: 08/17/23 14:22
Percent Solids: 74

ESS Laboratory Work Order: F230026
ESS Laboratory Sample ID: F230026-05
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**9490** (482)		LK		1	CCP	08/23/23 18:09	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230026

Quality Control Data

Classical Chemistry

Batch DH31630 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	500	mg/kg							
Total Organic Carbon (2)	ND	500	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230026

Quality Control Data

Classical Chemistry

Batch DH31630 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9410	500	mg/kg	10010		94	80-120			
Total Organic Carbon (2)	9630	500	mg/kg	10010		96	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230026

Quality Control Data

Classical Chemistry

Batch DH31630 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9980	500	mg/kg	10010		100	80-120	6	25	
Total Organic Carbon (2)	9640	500	mg/kg	10010		96	80-120	0.2	25	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230026

Quality Control Data

Alkylated PAHs

Batch FH32101 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	12.6	4.00	ug/Kg wet							
C1-Benzene	2.10	4.00	ug/Kg wet							J
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	2.59	4.00	ug/Kg wet							J
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	19.3	4.00	ug/Kg wet							
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230026

Quality Control Data

Alkylated PAHs

Batch FH32101 - 3570

C1-Fluorenes	ND	4.00	ug/Kg wet
C2-Fluorenes	ND	4.00	ug/Kg wet
C3-Fluorenes	ND	4.00	ug/Kg wet
Dibenzothiophene	ND	4.00	ug/Kg wet
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet
Phenanthrene	ND	4.00	ug/Kg wet
Anthracene	ND	4.00	ug/Kg wet
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
Retene	ND	4.00	ug/Kg wet
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
Fluoranthene	ND	4.00	ug/Kg wet
Pyrene	ND	4.00	ug/Kg wet
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
Benzo(b)fluorene	ND	4.00	ug/Kg wet
Benzo(c)fluorene	ND	4.00	ug/Kg wet
2-Methylpyrene	ND	4.00	ug/Kg wet
4-Methylpyrene	ND	4.00	ug/Kg wet
1-Methylpyrene	ND	4.00	ug/Kg wet
Benz(a)anthracene	ND	4.00	ug/Kg wet
Chrysene/triphenylene	ND	4.00	ug/Kg wet
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet
Benzo(e)pyrene	ND	4.00	ug/Kg wet
Benzo(a)pyrene	ND	4.00	ug/Kg wet
Perylene	ND	4.00	ug/Kg wet
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet
Coronene	ND	4.00	ug/Kg wet
Tetramethyl lead	ND	4.00	ug/Kg wet
Trimethylethyl lead	ND	4.00	ug/Kg wet

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230026

Quality Control Data

Alkylated PAHs

Batch FH32101 - 3570						
Dimethyldiethyl lead	ND	4.00	ug/Kg wet			
Methyltriethyl lead	ND	4.00	ug/Kg wet			
Tetraethyl lead	ND	4.00	ug/Kg wet			
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet			
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet			
2,6,10-trimethylpentadecane (1650)	ND	4.00	ug/Kg wet			
C-17	9.29	4.00	ug/Kg wet			
Pristane	4.38	4.00	ug/Kg wet			
C-18	13.2	4.00	ug/Kg wet			
Phytane	5.53	4.00	ug/Kg wet			
Carbazole	ND	4.00	ug/Kg wet			
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet			
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet			
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
3-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylanthracene	ND	4.00	ug/Kg wet			
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet			
1-Methylphenanthrene	ND	4.00	ug/Kg wet			
Surrogate: Toluene-D8	*335*		ug/Kg wet	*400.0*	*84*	*50-120*
Surrogate: Naphthalene-d8	*318*		ug/Kg wet	*400.0*	*80*	*50-120*
Surrogate: Phenanthrene-d10	*339*		ug/Kg wet	*400.0*	*85*	*50-120*
Surrogate: Perylene-d12	*347*		ug/Kg wet	*400.0*	*87*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230026

Quality Control Data

Alkylated PAHs

Batch FH32101 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	295	4.00	ug/Kg wet	400.0		74	60-130			
Methylcyclohexane	225	4.00	ug/Kg wet	400.0		56	60-130			B-
Toluene	302	4.00	ug/Kg wet	400.0		76	60-130			
Ethylbenzene	322	4.00	ug/Kg wet	400.0		80	60-130			
m,p-Xylene	313	4.00	ug/Kg wet	400.0		78	60-130			
Styrene	302	4.00	ug/Kg wet	400.0		76	60-130			
o-Xylene	327	4.00	ug/Kg wet	400.0		82	60-130			
Isopropylbenzene	324	4.00	ug/Kg wet	400.0		81	60-130			
n-Propylbenzene	324	4.00	ug/Kg wet	400.0		81	60-130			
1,3,5-Trimethylbenzene	329	4.00	ug/Kg wet	400.0		82	60-130			
1,2,3-Trimethylbenzene	326	4.00	ug/Kg wet	400.0		82	60-130			
1,2,4-Trimethylbenzene	326	4.00	ug/Kg wet	400.0		82	60-130			
t-Butylbenzene	324	4.00	ug/Kg wet	400.0		81	60-130			
sec-Butylbenzene	327	4.00	ug/Kg wet	400.0		82	60-130			
p-Isopropyltoluene	331	4.00	ug/Kg wet	400.0		83	60-130			
n-Butylbenzene	319	4.00	ug/Kg wet	400.0		80	60-130			
trans-Decalin	314	4.00	ug/Kg wet	400.0		78	60-130			
cis-Decalin	315	4.00	ug/Kg wet	400.0		79	60-130			
Benzo(b)thiophene	308	4.00	ug/Kg wet	400.0		77	60-130			
Naphthalene	306	4.00	ug/Kg wet	400.0		76	60-130			
2-Methylnaphthalene	298	4.00	ug/Kg wet	400.0		75	60-130			
1-Methylnaphthalene	299	4.00	ug/Kg wet	400.0		75	60-130			
Biphenyl	274	4.00	ug/Kg wet	400.0		69	60-130			
Acenaphthylene	331	4.00	ug/Kg wet	400.0		83	60-130			
Acenaphthene	317	4.00	ug/Kg wet	400.0		79	60-130			
Dibenzofuran	312	4.00	ug/Kg wet	400.0		78	60-130			
Fluorene	311	4.00	ug/Kg wet	400.0		78	60-130			
Dibenzothiophene	311	4.00	ug/Kg wet	400.0		78	60-130			
Phenanthrene	298	4.00	ug/Kg wet	400.0		75	60-130			
Anthracene	327	4.00	ug/Kg wet	400.0		82	60-130			
Retene	338	4.00	ug/Kg wet	400.0		85	60-130			
Benzo(b)naphtho(2,1-d)thiophene	336	4.00	ug/Kg wet	400.0		84	60-130			
Fluoranthene	323	4.00	ug/Kg wet	400.0		81	60-130			
Pyrene	323	4.00	ug/Kg wet	400.0		81	60-130			
Benz(a)anthracene	350	4.00	ug/Kg wet	400.0		88	60-130			
Chrysene/triphenylene	338	4.00	ug/Kg wet	400.0		84	60-130			
Benzo(b)fluoranthene	325	4.00	ug/Kg wet	400.0		81	60-130			
Benzo(j/k)fluoranthene	337	4.00	ug/Kg wet	400.0		84	60-130			
Benzo(e)pyrene	309	4.00	ug/Kg wet	400.0		77	60-130			
Benzo(a)pyrene	342	4.00	ug/Kg wet	400.0		85	60-130			
Perylene	337	4.00	ug/Kg wet	400.0		84	60-130			
Indeno(1,2,3-cd)pyrene	352	4.00	ug/Kg wet	400.0		88	60-130			
Dibenzo(a,h)anthracene	350	4.00	ug/Kg wet	400.0		88	60-130			
Benzo(g,h,i)perylene	324	4.00	ug/Kg wet	400.0		81	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230026

Quality Control Data

Alkylated PAHs

Batch FH32101 - 3570						
Coronene	342	4.00	ug/Kg wet	400.0	86	60-130
Surrogate: Toluene-D8	*346*		ug/Kg wet	*400.0*	*86*	*50-120*
Surrogate: Naphthalene-d8	*336*		ug/Kg wet	*400.0*	*84*	*50-120*
Surrogate: Phenanthrene-d10	*349*		ug/Kg wet	*400.0*	*87*	*50-120*
Surrogate: Perylene-d12	*360*		ug/Kg wet	*400.0*	*90*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230026

Quality Control Data

Alkylated PAHs

Batch FH32101 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Tetraethyl lead	370	4.00	ug/Kg wet	400.0		92	60-130			
Surrogate: Toluene-D8	*336*		ug/Kg wet	*400.0*		*84*	*50-120*			
Surrogate: Naphthalene-d8	*320*		ug/Kg wet	*400.0*		*80*	*50-120*			
Surrogate: Phenanthrene-d10	*337*		ug/Kg wet	*400.0*		*84*	*50-120*			
Surrogate: Perylene-d12	*348*		ug/Kg wet	*400.0*		*87*	*50-120*			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230026

Quality Control Data

Alkylated PAHs

Batch FH32101 - 3570

Duplicate **Source: F230026-05**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	19.3	4.99	ug/Kg dry		25.4			28	50	
C1-Benzene	16.8	4.99	ug/Kg dry		18.7			11	50	
C2-Benzenes	10.9	4.99	ug/Kg dry		13.1			18	50	
C3-Benzenes	ND	4.99	ug/Kg dry		2.71				50	
C4-Benzenes	ND	4.99	ug/Kg dry		ND				50	
C5-Benzenes	ND	4.99	ug/Kg dry		ND				50	
Methylcyclohexane	ND	4.99	ug/Kg dry		ND				50	
Toluene	21.4	4.99	ug/Kg dry		24.0			11	50	
Ethylbenzene	ND	4.99	ug/Kg dry		ND				50	
m,p-Xylene	13.2	4.99	ug/Kg dry		15.3			15	50	
Styrene	7.86	4.99	ug/Kg dry		8.50			8	50	
o-Xylene	ND	4.99	ug/Kg dry		ND				50	
Isopropylbenzene	ND	4.99	ug/Kg dry		ND				50	
n-Propylbenzene	ND	4.99	ug/Kg dry		ND				50	
1,3,5-Trimethylbenzene	ND	4.99	ug/Kg dry		ND				50	
1,2,3-Trimethylbenzene	ND	4.99	ug/Kg dry		ND				50	
1,2,4-Trimethylbenzene	ND	4.99	ug/Kg dry		ND				50	
t-Butylbenzene	ND	4.99	ug/Kg dry		ND				50	
sec-Butylbenzene	ND	4.99	ug/Kg dry		ND				50	
p-Isopropyltoluene	3.63	4.99	ug/Kg dry		4.46			20	50	J
n-Butylbenzene	ND	4.99	ug/Kg dry		ND				50	
trans-Decalin	ND	4.99	ug/Kg dry		ND				50	
cis-Decalin	ND	4.99	ug/Kg dry		ND				50	
C1-Decalins	ND	4.99	ug/Kg dry		ND				50	
C2-Decalins	ND	4.99	ug/Kg dry		ND				50	
C3-Decalins	ND	4.99	ug/Kg dry		ND				50	
C4-Decalins	ND	4.99	ug/Kg dry		ND				50	
Benzo(b)thiophene	ND	4.99	ug/Kg dry		ND				50	
C1-Benzo(b)thiophenes	ND	4.99	ug/Kg dry		ND				50	
C2-Benzo(b)thiophenes	ND	4.99	ug/Kg dry		ND				50	
C3-Benzo(b)thiophenes	ND	4.99	ug/Kg dry		ND				50	
C4-Benzo(b)thiophenes	ND	4.99	ug/Kg dry		ND				50	
Naphthalene	ND	4.99	ug/Kg dry		ND				50	
2-Methylnaphthalene	ND	4.99	ug/Kg dry		ND				50	
1-Methylnaphthalene	ND	4.99	ug/Kg dry		ND				50	
C1-Naphthalenes	ND	4.99	ug/Kg dry		ND				50	
C2-Naphthalenes	3.92	4.99	ug/Kg dry		3.33			16	50	J
C3-Naphthalenes	ND	4.99	ug/Kg dry		ND				50	
C4-Naphthalenes	ND	4.99	ug/Kg dry		ND				50	
Biphenyl	ND	4.99	ug/Kg dry		ND				50	
Acenaphthylene	ND	4.99	ug/Kg dry		ND				50	
Acenaphthene	ND	4.99	ug/Kg dry		ND				50	
Dibenzofuran	ND	4.99	ug/Kg dry		ND				50	
Fluorene	ND	4.99	ug/Kg dry		ND				50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
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ESS Laboratory Work Order: F230026

Quality Control Data

Alkylated PAHs

Batch FH32101 - 3570

C1-Fluorenes	ND	4.99	ug/Kg dry	ND		50	
C2-Fluorenes	ND	4.99	ug/Kg dry	ND		50	
C3-Fluorenes	ND	4.99	ug/Kg dry	ND		50	
Dibenzothiophene	ND	4.99	ug/Kg dry	ND		50	
C1-Dibenzothiophenes	ND	4.99	ug/Kg dry	ND		50	
C2-Dibenzothiophenes	ND	4.99	ug/Kg dry	ND		50	
C3-Dibenzothiophenes	ND	4.99	ug/Kg dry	ND		50	
C4-Dibenzothiophenes	ND	4.99	ug/Kg dry	ND		50	
Phenanthrene	ND	4.99	ug/Kg dry	ND		50	
Anthracene	ND	4.99	ug/Kg dry	ND		50	
C1-Phenanthrenes/Anthracenes	ND	4.99	ug/Kg dry	ND		50	
C2-Phenanthrenes/Anthracenes	ND	4.99	ug/Kg dry	ND		50	
C3-Phenanthrenes/Anthracenes	ND	4.99	ug/Kg dry	ND		50	
C4-Phenanthrenes/Anthracenes	7.53	4.99	ug/Kg dry	8.32	10	50	
Retene	31.8	4.99	ug/Kg dry	31.6	0.4	50	
Benzo(b)naphtho(2,1-d)thiophene	ND	4.99	ug/Kg dry	ND		50	
C0-Benzonaphthothiophenes	ND	4.99	ug/Kg dry	ND		50	
C1-Benzonaphthothiophenes	ND	4.99	ug/Kg dry	ND		50	
C2-Benzonaphthothiophenes	ND	4.99	ug/Kg dry	ND		50	
C3-Benzonaphthothiophenes	ND	4.99	ug/Kg dry	ND		50	
C4-Benzonaphthothiophenes	ND	4.99	ug/Kg dry	ND		50	
Fluoranthene	ND	4.99	ug/Kg dry	2.50		50	
Pyrene	ND	4.99	ug/Kg dry	ND		50	
C1-Fluoranthenes/Pyrenes	2.70	4.99	ug/Kg dry	ND		50	J
C2-Fluoranthenes/Pyrenes	ND	4.99	ug/Kg dry	ND		50	
C3-Fluoranthenes/Pyrenes	ND	4.99	ug/Kg dry	ND		50	
Benzo(b)fluorene	ND	4.99	ug/Kg dry	ND		50	
Benzo(c)fluorene	ND	4.99	ug/Kg dry	ND		50	
2-Methylpyrene	ND	4.99	ug/Kg dry	ND		50	
4-Methylpyrene	ND	4.99	ug/Kg dry	ND		50	
1-Methylpyrene	ND	4.99	ug/Kg dry	ND		50	
Benz(a)anthracene	ND	4.99	ug/Kg dry	ND		50	
Chrysene/triphenylene	ND	4.99	ug/Kg dry	ND		50	
C1-Benzo(a)anthracenes/Chrysenes	ND	4.99	ug/Kg dry	ND		50	
C2-Benzo(a)anthracenes/Chrysenes	ND	4.99	ug/Kg dry	ND		50	
C3-Benzo(a)anthracenes/Chrysenes	ND	4.99	ug/Kg dry	ND		50	
C4-Benzo(a)anthracenes/Chrysenes	ND	4.99	ug/Kg dry	ND		50	
Benzo(b)fluoranthene	ND	4.99	ug/Kg dry	ND		50	
Benzo(j/k)fluoranthene	ND	4.99	ug/Kg dry	ND		50	
Benzo(e)pyrene	ND	4.99	ug/Kg dry	ND		50	
Benzo(a)pyrene	ND	4.99	ug/Kg dry	ND		50	
Perylene	471	4.99	ug/Kg dry	527	11	50	
Indeno(1,2,3-cd)pyrene	ND	4.99	ug/Kg dry	ND		50	
Dibenzo(a,h)anthracene	ND	4.99	ug/Kg dry	ND		50	
Benzo(g,h,i)perylene	ND	4.99	ug/Kg dry	ND		50	
Coronene	ND	4.99	ug/Kg dry	ND		50	
Tetramethyl lead	ND	4.99	ug/Kg dry	ND		50	
Trimethylethyl lead	ND	4.99	ug/Kg dry	ND		50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230026

Quality Control Data

Alkylated PAHs

Batch FH32101 - 3570								
Dimethyldiethyl lead	ND	4.99	ug/Kg dry		ND			50
Methyltriethyl lead	ND	4.99	ug/Kg dry		ND			50
Tetraethyl lead	ND	4.99	ug/Kg dry		ND			50
2,6,10-trimethyldodecane (1380)	ND	4.99	ug/Kg dry		ND			50
2,6,10-trimethyltridecane (1470)	5.08	4.99	ug/Kg dry		5.56		9	50
2,6,10-trimethylpentadecane (1650)	ND	4.99	ug/Kg dry		ND			50
C-17	25.2	4.99	ug/Kg dry		22.9		10	50
Pristane	ND	4.99	ug/Kg dry		ND			50
C-18	11.2	4.99	ug/Kg dry		8.44		28	50
Phytane	ND	4.99	ug/Kg dry		ND			50
Carbazole	ND	4.99	ug/Kg dry		ND			50
2,6-Dimethylnaphthalene	ND	4.99	ug/Kg dry		ND			50
2,3,5-Trimethylnaphthene	ND	4.99	ug/Kg dry		ND			50
4-Methyldibenzothiophene	ND	4.99	ug/Kg dry		ND			50
2/3-Methyldibenzothiophene	ND	4.99	ug/Kg dry		ND			50
1-Methyldibenzothiophene	ND	4.99	ug/Kg dry		ND			50
3-Methylphenanthrene	ND	4.99	ug/Kg dry		ND			50
2-Methylphenanthrene	ND	4.99	ug/Kg dry		ND			50
2-Methylanthracene	ND	4.99	ug/Kg dry		ND			50
4/9-Methylphenanthrene	ND	4.99	ug/Kg dry		ND			50
1-Methylphenanthrene	ND	4.99	ug/Kg dry		ND			50
Surrogate: Toluene-D8	*358*		ug/Kg dry	*498.8*		*72*	*50-120*	
Surrogate: Naphthalene-d8	*354*		ug/Kg dry	*498.8*		*71*	*50-120*	
Surrogate: Phenanthrene-d10	*377*		ug/Kg dry	*498.8*		*76*	*50-120*	
Surrogate: Perylene-d12	*400*		ug/Kg dry	*498.8*		*80*	*50-120*	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F230026

Notes and Definitions

U	Analyte included in the analysis, but not detected
J	Reported between MDL and MRL
B-	Blank Spike recovery is below lower control limit (B-).
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230026

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 23H0710 / F23C026

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000

Project Information

Project Name: Amesbury Former MGP
Project Number: 1804576
Send Report to: Ryan Hoffman, Jeremy Smalley
labdata@geiconsultants.com

Project Location: Amesbury, MA
Project Manager: Ryan Hoffman
781-721-4091 rhoffman@geiconsultants.com

Page 1 of 1

MCP PRESUMPTIVE CERTAINTY AND MCP ANALYTICAL METHODS REQUIRED: (YES) NO

STATE AND FEDERAL REGULATORY REQUIREMENTS/REPORT LIMITS

State/Federal Program: (MA) 401WQC Other _____ NH RI CT NY ME

MA MCP Criteria are (Method 1 S-1) and GW-2/GW-3. Circle if GW-1 is required.

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Preservative: none	Preservative: none	Analysis: Parent and Alkylated MAHs * PAHs 8270*	Analysis: TOCs by Lloyd-Kahn	Sample Specific Remarks
1	1804576-848-S1	8/17/23	11:30	SD	1	JES			X	X	
2	1804576-848-S2		11:31						X	X	
3	1804576-853-S1		14:20						X	X	
4	1804576-853-S2		14:21						X	X	
5	1804576-853-S3		14:22						X	X	

Sample Handling
Samples Field Filtered: YES NO (NA)
Sampled Shipped With Ice: (YES) NO

	Relinquished by sampler: (signature)	Date	Time	Received by: (signature)
1.	David Mill	8/17/23	18:30	GEI Fedex
2.	GEI Fedex	8/18/23	12:25	David Mill
3.	David Mill	8/18/23	12:25	
4.	3.8 ice	8/18/23	15:32	
5.				

Turnaround Time (Business days):
5-Day X 4-Day ____ 3-Day ____
2-Day ____ 1-Day ____ Other ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

Sample Matrix Abbreviations: SO = Soil GW = Groundwater SW = Surface Water SD = Sediment CO = Concrete PC = Paint Chip CLK = Caulk

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants

Shipped/Delivered Via: ESS Courier

ESS Project ID: F230026
Date Received: 8/18/2023
Project Due Date: 8/25/2023
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 3.8 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By/Acid Lot#:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Resolution:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1	517	Yes	N/A	Yes	4 oz. Jar	NP	
2	518	Yes	N/A	Yes	4 oz. Jar	NP	
3	519	Yes	N/A	Yes	4 oz. Jar	NP	
4	520	Yes	N/A	Yes	4 oz. Jar	NP	
5	521	Yes	N/A	Yes	4 oz. Jar	NP	

2nd Review
Were all containers scanned into storage/lab? Initials
Are barcode labels on correct containers? Yes / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: Date & Time: 8/18/23 16:17
Reviewed By: Date & Time: 8/18/23 1706

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: F230027

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 9:55 am, Aug 28, 2023

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses

ESS - Cranston, RI	TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230027

SAMPLE RECEIPT

The following samples were received on August 18, 2023 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F230027-01	1804576-839-S1	Soil	8270 Mod, LK
F230027-02	1804576-839-S2	Soil	8270 Mod, LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230027

PROJECT NARRATIVE

Alkylated PAHs
FH32101-BS2 **Blank Spike recovery is below lower control limit (B-).**
Methylcyclohexane (56% @ 60-130%)

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230027

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-839-S1
Date Sampled: 08/17/23 10:00
Percent Solids: 17
Initial Volume: 5.36
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230027
ESS Laboratory Sample ID: F230027-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/21/23 9:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**259** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C1-Benzene	**354** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C2-Benzenes	**586** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C3-Benzenes	**301** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C4-Benzenes	**277** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C5-Benzenes	**163** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
Methylcyclohexane	**109** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
Toluene	**437** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
Ethylbenzene	**134** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
m,p-Xylene	**665** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
Styrene	**422** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
o-Xylene	**103** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
Isopropylbenzene	**J 14.0** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
n-Propylbenzene	**56.6** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
1,3,5-Trimethylbenzene	**55.0** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
1,2,3-Trimethylbenzene	**55.0** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
1,2,4-Trimethylbenzene	**112** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
t-Butylbenzene	ND (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
sec-Butylbenzene	ND (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
p-Isopropyltoluene	**47.4** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
n-Butylbenzene	**108** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
trans-Decalin	**25.0** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
cis-Decalin	ND (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C1-Decalins	**42.3** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C2-Decalins	**61.6** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C3-Decalins	ND (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C4-Decalins	ND (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
Benzo(b)thiophene	**69.5** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C1-Benzo(b)thiophenes	**116** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C2-Benzo(b)thiophenes	**99.3** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C3-Benzo(b)thiophenes	**43.1** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C4-Benzo(b)thiophenes	**J 17.1** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-839-S1
Date Sampled: 08/17/23 10:00
Percent Solids: 17
Initial Volume: 5.36
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230027
ESS Laboratory Sample ID: F230027-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/21/23 9:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**362** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
2-Methylnaphthalene	**181** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
1-Methylnaphthalene	**122** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C1-Naphthalenes	**196** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C2-Naphthalenes	**319** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C3-Naphthalenes	**233** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C4-Naphthalenes	**151** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
Biphenyl	**77.6** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
Acenaphthylene	**700** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
Acenaphthene	**106** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
Dibenzofuran	**121** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
Fluorene	**166** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C1-Fluorenes	**133** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C2-Fluorenes	**217** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C3-Fluorenes	**338** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
Dibenzothiophene	**127** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C1-Dibenzothiophenes	**176** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C2-Dibenzothiophenes	**197** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C3-Dibenzothiophenes	**145** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C4-Dibenzothiophenes	**89.0** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
Phenanthrene	**1290** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
Anthracene	**608** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C1-Phenanthrenes/Anthracenes	**920** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C2-Phenanthrenes/Anthracenes	**627** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C3-Phenanthrenes/Anthracenes	**313** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C4-Phenanthrenes/Anthracenes	**132** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
Retene	**80.4** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
Benzo(b)naphtho(2,1-d)thiophene	**273** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C0-Benzonaphthothiophenes	**524** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C1-Benzonaphthothiophenes	**378** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C2-Benzonaphthothiophenes	**329** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C3-Benzonaphthothiophenes	**274** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-839-S1
Date Sampled: 08/17/23 10:00
Percent Solids: 17
Initial Volume: 5.36
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230027
ESS Laboratory Sample ID: F230027-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/21/23 9:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**140** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
Fluoranthene	**2700** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
Pyrene	**2800** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C1-Fluoranthenes/Pyrenes	**1490** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C2-Fluoranthenes/Pyrenes	**961** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C3-Fluoranthenes/Pyrenes	**463** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
Benzo(b)fluorene	**143** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
Benzo(c)fluorene	**73.4** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
2-Methylpyrene	**203** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
4-Methylpyrene	**210** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
1-Methylpyrene	**148** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
Benz(a)anthracene	**1400** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
Chrysene/triphenylene	**1850** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C1-Benzo(a)anthracenes/Chrysenes	**934** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C2-Benzo(a)anthracenes/Chrysenes	**557** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C3-Benzo(a)anthracenes/Chrysenes	**355** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C4-Benzo(a)anthracenes/Chrysenes	**197** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
Benzo(b)fluoranthene	**1700** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
Benzo(j/k)fluoranthene	**1550** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
Benzo(e)pyrene	**1580** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
Benzo(a)pyrene	**1930** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
Perylene	**487** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
Indeno(1,2,3-cd)pyrene	**1760** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
Dibenzo(a,h)anthracene	**365** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
Benzo(g,h,i)perylene	**1450** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
Coronene	**503** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
Tetramethyl lead	ND (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
Trimethylethyl lead	ND (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
Dimethyldiethyl lead	ND (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
Methyltriethyl lead	ND (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
Tetraethyl lead	ND (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
2,6,10-trimethyldodecane (1380)	**65.9** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-839-S1
Date Sampled: 08/17/23 10:00
Percent Solids: 17
Initial Volume: 5.36
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230027
ESS Laboratory Sample ID: F230027-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/21/23 9:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**183** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
2,6,10-trimethylpentadecane (1650)	**60.9** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C-17	**386** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
Pristane	**107** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
C-18	**246** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
Phytane	**69.0** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
Carbazole	**192** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
2,6-Dimethylnaphthalene	**93.6** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
2,3,5-Trimethylnaphthene	**J 18.2** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
4-Methyldibenzothiophene	**62.2** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
2/3-Methyldibenzothiophene	**58.5** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
1-Methyldibenzothiophene	**J 19.7** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
3-Methylphenanthrene	**198** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
2-Methylphenanthrene	**239** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
2-Methylanthracene	**99.6** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
4/9-Methylphenanthrene	**221** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101
1-Methylphenanthrene	**143** (21.8)	10.9	8270 Mod		1	IBM	08/23/23 1:33	F3H0003	FH32101

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*74 %*		*50-120*
Surrogate: Naphthalene-d8	*76 %*		*50-120*
Surrogate: Phenanthrene-d10	*77 %*		*50-120*
Surrogate: Perylene-d12	*82 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-839-S1
Date Sampled: 08/17/23 10:00
Percent Solids: 17

ESS Laboratory Work Order: F230027
ESS Laboratory Sample ID: F230027-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**146000** (471)		LK		1	CCP	08/23/23 18:25	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-839-S2
Date Sampled: 08/17/23 10:01
Percent Solids: 16
Initial Volume: 5.33
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230027
ESS Laboratory Sample ID: F230027-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/21/23 9:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**694** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C1-Benzene	**718** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C2-Benzenes	**1360** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C3-Benzenes	**503** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C4-Benzenes	**354** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C5-Benzenes	**201** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
Methylcyclohexane	**227** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
Toluene	**887** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
Ethylbenzene	**317** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
m,p-Xylene	**1540** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
Styrene	**393** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
o-Xylene	**301** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
Isopropylbenzene	**26.8** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
n-Propylbenzene	**75.8** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
1,3,5-Trimethylbenzene	**124** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
1,2,3-Trimethylbenzene	**91.7** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
1,2,4-Trimethylbenzene	**200** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
t-Butylbenzene	ND (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
sec-Butylbenzene	ND (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
p-Isopropyltoluene	**74.1** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
n-Butylbenzene	**100** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
trans-Decalin	**31.2** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
cis-Decalin	ND (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C1-Decalins	**66.6** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C2-Decalins	**86.5** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C3-Decalins	ND (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C4-Decalins	ND (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
Benzo(b)thiophene	**119** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C1-Benzo(b)thiophenes	**106** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C2-Benzo(b)thiophenes	**162** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C3-Benzo(b)thiophenes	**68.8** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C4-Benzo(b)thiophenes	**J 20.7** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-839-S2
Date Sampled: 08/17/23 10:01
Percent Solids: 16
Initial Volume: 5.33
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230027
ESS Laboratory Sample ID: F230027-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/21/23 9:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**599** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
2-Methylnaphthalene	**265** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
1-Methylnaphthalene	**166** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C1-Naphthalenes	**276** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C2-Naphthalenes	**488** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C3-Naphthalenes	**334** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C4-Naphthalenes	**224** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
Biphenyl	**114** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
Acenaphthylene	**592** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
Acenaphthene	**118** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
Dibenzofuran	**157** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
Fluorene	**226** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C1-Fluorenes	**184** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C2-Fluorenes	**290** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C3-Fluorenes	**404** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
Dibenzothiophene	**148** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C1-Dibenzothiophenes	**194** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C2-Dibenzothiophenes	**232** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C3-Dibenzothiophenes	**155** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C4-Dibenzothiophenes	**105** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
Phenanthrene	**1350** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
Anthracene	**638** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C1-Phenanthrenes/Anthracenes	**1060** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C2-Phenanthrenes/Anthracenes	**784** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C3-Phenanthrenes/Anthracenes	**400** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C4-Phenanthrenes/Anthracenes	**158** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
Retene	**74.4** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
Benzo(b)naphtho(2,1-d)thiophene	**282** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C0-Benzonaphthothiophenes	**533** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C1-Benzonaphthothiophenes	**418** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C2-Benzonaphthothiophenes	**374** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C3-Benzonaphthothiophenes	**274** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-839-S2
Date Sampled: 08/17/23 10:01
Percent Solids: 16
Initial Volume: 5.33
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230027
ESS Laboratory Sample ID: F230027-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/21/23 9:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**126** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
Fluoranthene	**2830** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
Pyrene	**2750** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C1-Fluoranthenes/Pyrenes	**1610** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C2-Fluoranthenes/Pyrenes	**1130** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C3-Fluoranthenes/Pyrenes	**576** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
Benzo(b)fluorene	**164** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
Benzo(c)fluorene	**86.2** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
2-Methylpyrene	**216** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
4-Methylpyrene	**217** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
1-Methylpyrene	**146** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
Benz(a)anthracene	**1540** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
Chrysene/triphenylene	**2000** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C1-Benzo(a)anthracenes/Chrysenes	**1100** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C2-Benzo(a)anthracenes/Chrysenes	**662** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C3-Benzo(a)anthracenes/Chrysenes	**438** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C4-Benzo(a)anthracenes/Chrysenes	**245** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
Benzo(b)fluoranthene	**1790** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
Benzo(j/k)fluoranthene	**1650** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
Benzo(e)pyrene	**1650** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
Benzo(a)pyrene	**2020** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
Perylene	**660** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
Indeno(1,2,3-cd)pyrene	**1830** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
Dibenzo(a,h)anthracene	**395** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
Benzo(g,h,i)perylene	**1500** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
Coronene	**502** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
Tetramethyl lead	ND (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
Trimethylethyl lead	ND (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
Dimethyldiethyl lead	ND (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
Methyltriethyl lead	ND (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
Tetraethyl lead	ND (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
2,6,10-trimethyldodecane (1380)	**98.6** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-839-S2
Date Sampled: 08/17/23 10:01
Percent Solids: 16
Initial Volume: 5.33
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230027
ESS Laboratory Sample ID: F230027-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/21/23 9:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**249** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
2,6,10-trimethylpentadecane (1650)	**96.0** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C-17	**518** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
Pristane	**152** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
C-18	**357** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
Phytane	**88.5** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
Carbazole	**216** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
2,6-Dimethylnaphthalene	**169** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
2,3,5-Trimethylnaphthene	**25.5** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
4-Methyldibenzothiophene	**71.4** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
2/3-Methyldibenzothiophene	**68.8** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
1-Methyldibenzothiophene	**J 20.5** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
3-Methylphenanthrene	**234** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
2-Methylphenanthrene	**287** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
2-Methylanthracene	**120** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
4/9-Methylphenanthrene	**244** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101
1-Methylphenanthrene	**153** (22.7)	11.4	8270 Mod		1	IBM	08/23/23 2:56	F3H0003	FH32101

	%Recovery	*Qualifier*	*Limits*
Surrogate: Toluene-D8	*77 %*		*50-120*
Surrogate: Naphthalene-d8	*79 %*		*50-120*
Surrogate: Phenanthrene-d10	*80 %*		*50-120*
Surrogate: Perylene-d12	*85 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-839-S2
Date Sampled: 08/17/23 10:01
Percent Solids: 16

ESS Laboratory Work Order: F230027
ESS Laboratory Sample ID: F230027-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**165000** (479)		LK		1	CCP	08/23/23 19:55	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230027

Quality Control Data

Classical Chemistry

Batch DH31630 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	500	mg/kg							
Total Organic Carbon (2)	ND	500	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230027

Quality Control Data

Classical Chemistry

Batch DH31630 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9410	500	mg/kg	10010		94	80-120			
Total Organic Carbon (2)	9630	500	mg/kg	10010		96	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230027

Quality Control Data

Classical Chemistry

Batch DH31630 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9980	500	mg/kg	10010		100	80-120	6	25	
Total Organic Carbon (2)	9640	500	mg/kg	10010		96	80-120	0.2	25	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230027

Quality Control Data

Alkylated PAHs

Batch FH32101 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	12.6	4.00	ug/Kg wet							
C1-Benzene	2.10	4.00	ug/Kg wet							J
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	2.59	4.00	ug/Kg wet							J
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	19.3	4.00	ug/Kg wet							
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230027

Quality Control Data

Alkylated PAHs

Batch FH32101 - 3570

C1-Fluorenes	ND	4.00	ug/Kg wet
C2-Fluorenes	ND	4.00	ug/Kg wet
C3-Fluorenes	ND	4.00	ug/Kg wet
Dibenzothiophene	ND	4.00	ug/Kg wet
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet
Phenanthrene	ND	4.00	ug/Kg wet
Anthracene	ND	4.00	ug/Kg wet
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
Retene	ND	4.00	ug/Kg wet
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
Fluoranthene	ND	4.00	ug/Kg wet
Pyrene	ND	4.00	ug/Kg wet
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
Benzo(b)fluorene	ND	4.00	ug/Kg wet
Benzo(c)fluorene	ND	4.00	ug/Kg wet
2-Methylpyrene	ND	4.00	ug/Kg wet
4-Methylpyrene	ND	4.00	ug/Kg wet
1-Methylpyrene	ND	4.00	ug/Kg wet
Benz(a)anthracene	ND	4.00	ug/Kg wet
Chrysene/triphenylene	ND	4.00	ug/Kg wet
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet
Benzo(e)pyrene	ND	4.00	ug/Kg wet
Benzo(a)pyrene	ND	4.00	ug/Kg wet
Perylene	ND	4.00	ug/Kg wet
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet
Coronene	ND	4.00	ug/Kg wet
Tetramethyl lead	ND	4.00	ug/Kg wet
Trimethylethyl lead	ND	4.00	ug/Kg wet

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230027

Quality Control Data

Alkylated PAHs

Batch FH32101 - 3570						
Dimethyldiethyl lead	ND	4.00	ug/Kg wet			
Methyltriethyl lead	ND	4.00	ug/Kg wet			
Tetraethyl lead	ND	4.00	ug/Kg wet			
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet			
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet			
2,6,10-trimethylpentadecane (1650)	ND	4.00	ug/Kg wet			
C-17	9.29	4.00	ug/Kg wet			
Pristane	4.38	4.00	ug/Kg wet			
C-18	13.2	4.00	ug/Kg wet			
Phytane	5.53	4.00	ug/Kg wet			
Carbazole	ND	4.00	ug/Kg wet			
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet			
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet			
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
3-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylanthracene	ND	4.00	ug/Kg wet			
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet			
1-Methylphenanthrene	ND	4.00	ug/Kg wet			
Surrogate: Toluene-D8	*335*		ug/Kg wet	*400.0*	*84*	*50-120*
Surrogate: Naphthalene-d8	*318*		ug/Kg wet	*400.0*	*80*	*50-120*
Surrogate: Phenanthrene-d10	*339*		ug/Kg wet	*400.0*	*85*	*50-120*
Surrogate: Perylene-d12	*347*		ug/Kg wet	*400.0*	*87*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230027

Quality Control Data

Alkylated PAHs

Batch FH32101 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	295	4.00	ug/Kg wet	400.0		74	60-130			
Methylcyclohexane	225	4.00	ug/Kg wet	400.0		56	60-130			B-
Toluene	302	4.00	ug/Kg wet	400.0		76	60-130			
Ethylbenzene	322	4.00	ug/Kg wet	400.0		80	60-130			
m,p-Xylene	313	4.00	ug/Kg wet	400.0		78	60-130			
Styrene	302	4.00	ug/Kg wet	400.0		76	60-130			
o-Xylene	327	4.00	ug/Kg wet	400.0		82	60-130			
Isopropylbenzene	324	4.00	ug/Kg wet	400.0		81	60-130			
n-Propylbenzene	324	4.00	ug/Kg wet	400.0		81	60-130			
1,3,5-Trimethylbenzene	329	4.00	ug/Kg wet	400.0		82	60-130			
1,2,3-Trimethylbenzene	326	4.00	ug/Kg wet	400.0		82	60-130			
1,2,4-Trimethylbenzene	326	4.00	ug/Kg wet	400.0		82	60-130			
t-Butylbenzene	324	4.00	ug/Kg wet	400.0		81	60-130			
sec-Butylbenzene	327	4.00	ug/Kg wet	400.0		82	60-130			
p-Isopropyltoluene	331	4.00	ug/Kg wet	400.0		83	60-130			
n-Butylbenzene	319	4.00	ug/Kg wet	400.0		80	60-130			
trans-Decalin	314	4.00	ug/Kg wet	400.0		78	60-130			
cis-Decalin	315	4.00	ug/Kg wet	400.0		79	60-130			
Benzo(b)thiophene	308	4.00	ug/Kg wet	400.0		77	60-130			
Naphthalene	306	4.00	ug/Kg wet	400.0		76	60-130			
2-Methylnaphthalene	298	4.00	ug/Kg wet	400.0		75	60-130			
1-Methylnaphthalene	299	4.00	ug/Kg wet	400.0		75	60-130			
Biphenyl	274	4.00	ug/Kg wet	400.0		69	60-130			
Acenaphthylene	331	4.00	ug/Kg wet	400.0		83	60-130			
Acenaphthene	317	4.00	ug/Kg wet	400.0		79	60-130			
Dibenzofuran	312	4.00	ug/Kg wet	400.0		78	60-130			
Fluorene	311	4.00	ug/Kg wet	400.0		78	60-130			
Dibenzothiophene	311	4.00	ug/Kg wet	400.0		78	60-130			
Phenanthrene	298	4.00	ug/Kg wet	400.0		75	60-130			
Anthracene	327	4.00	ug/Kg wet	400.0		82	60-130			
Retene	338	4.00	ug/Kg wet	400.0		85	60-130			
Benzo(b)naphtho(2,1-d)thiophene	336	4.00	ug/Kg wet	400.0		84	60-130			
Fluoranthene	323	4.00	ug/Kg wet	400.0		81	60-130			
Pyrene	323	4.00	ug/Kg wet	400.0		81	60-130			
Benz(a)anthracene	350	4.00	ug/Kg wet	400.0		88	60-130			
Chrysene/triphenylene	338	4.00	ug/Kg wet	400.0		84	60-130			
Benzo(b)fluoranthene	325	4.00	ug/Kg wet	400.0		81	60-130			
Benzo(j/k)fluoranthene	337	4.00	ug/Kg wet	400.0		84	60-130			
Benzo(e)pyrene	309	4.00	ug/Kg wet	400.0		77	60-130			
Benzo(a)pyrene	342	4.00	ug/Kg wet	400.0		85	60-130			
Perylene	337	4.00	ug/Kg wet	400.0		84	60-130			
Indeno(1,2,3-cd)pyrene	352	4.00	ug/Kg wet	400.0		88	60-130			
Dibenzo(a,h)anthracene	350	4.00	ug/Kg wet	400.0		88	60-130			
Benzo(g,h,i)perylene	324	4.00	ug/Kg wet	400.0		81	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230027

Quality Control Data

Alkylated PAHs

Batch FH32101 - 3570						
Coronene	342	4.00	ug/Kg wet	400.0	86	60-130
Surrogate: Toluene-D8	*346*		ug/Kg wet	*400.0*	*86*	*50-120*
Surrogate: Naphthalene-d8	*336*		ug/Kg wet	*400.0*	*84*	*50-120*
Surrogate: Phenanthrene-d10	*349*		ug/Kg wet	*400.0*	*87*	*50-120*
Surrogate: Perylene-d12	*360*		ug/Kg wet	*400.0*	*90*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230027

Quality Control Data

Alkylated PAHs

Batch FH32101 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Tetraethyl lead	370	4.00	ug/Kg wet	400.0		92	60-130			
Surrogate: Toluene-D8	*336*		ug/Kg wet	*400.0*		*84*	*50-120*			
Surrogate: Naphthalene-d8	*320*		ug/Kg wet	*400.0*		*80*	*50-120*			
Surrogate: Phenanthrene-d10	*337*		ug/Kg wet	*400.0*		*84*	*50-120*			
Surrogate: Perylene-d12	*348*		ug/Kg wet	*400.0*		*87*	*50-120*			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F230027

Notes and Definitions

U	Analyte included in the analysis, but not detected
J	Reported between MDL and MRL
B-	Blank Spike recovery is below lower control limit (B-).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230027

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 2316711 / F230027

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman
781-721-4091 rhoffman@geiconsultants.com

Send Report to: Ryan Hoffman, Jeremy Smalley
labdata@geiconsultants.com

Page 1 of 1

Preservative: none | none

Analysis: Parent and Alkylated MAHs * PAHs 8270* | TOCs by Lloyd-Kahn

Sample Handling

Samples Field Filtered: YES NO (NA)

Sampled Shipped With Ice: (YES) NO

MCP PRESUMPTIVE CERTAINTY AND MCP ANALYTICAL METHODS REQUIRED: (YES) NO

STATE AND FEDERAL REGULATORY REQUIREMENTS/REPORT LIMITS

State/Federal Program: (MA) 401WQC Other _____ NH RI CT NY ME

MA MCP Criteria are (Method 1 S-1) and GW-2/GW-3. Circle if GW-1 is required.

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Parent and Alkylated MAHs * PAHs 8270*	TOCs by Lloyd-Kahn	Sample Specific Remarks
1	1804576-839-S1	8/17/23	10:00	SO	1	JES	X	X	
2	1804576-839-S2	8/17/23	10:01	SO	1	JES	X	X	

Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1. David Mill	8/17/23	18:30	1. GEI Fridge
2. GEI Fridge	8/18/23	12:25	2. David Mill
3. David Mill	8/18/23	12:25	3. [signature]
4. [signature] 3-8 ia	8/18/23	15:32	4. [signature]
5.			5.

Turnaround Time (Business days):

5-Day X 4-Day ____ 3-Day ____
2-Day ____ 1-Day ____ Other ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

Sample Matrix Abbreviations: SO = Soil GW = Groundwater SW = Surface Water SD = Sediment CO = Concrete PC = Paint Chip CLK = Caulk

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants

Shipped/Delivered Via: ESS Courier

ESS Project ID: F230027
Date Received: 8/18/2023
Project Due Date: 8/25/2023
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 3.8 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA
13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By/Acid Lot#:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Resolution:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1	515	Yes	N/A	Yes	4 oz. Jar	NP	
2	516	Yes	N/A	Yes	4 oz. Jar	NP	

2nd Review
Were all containers scanned into storage/lab? Initials: [illegible]
Are barcode labels on correct containers? Yes / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: [illegible] Date & Time: 8/18/23 1628
Reviewed By: [illegible] Date & Time: 8/18/23 1705.

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: F230029

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 12:58 pm, Sep 14, 2023

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses

ESS - Cranston, RI	TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230029

SAMPLE RECEIPT

The following samples were received on August 29, 2023 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F230029-01	1804576-845-S1	Soil	8270 Mod, LK
F230029-02	1804576-845-S2	Soil	8270 Mod, LK
F230029-03	1804576-847-S1	Soil	8270 Mod, LK
F230029-04	1804576-847-S2	Soil	8270 Mod, LK
F230029-05	1804576-846-S1	Soil	8270 Mod, LK
F230029-06	1804576-846-S2	Soil	8270 Mod, LK
F230029-07	1804576-846-S3	Soil	8270 Mod, LK
F230029-08	1804576-854-S1	Soil	8270 Mod, LK
F230029-09	1804576-854-S2	Soil	8270 Mod, LK
F230029-10	1804576-843-S1	Soil	8270 Mod, LK
F230029-11	1804576-843-S2	Soil	8270 Mod, LK
F230029-12	1804576-844-S1	Soil	8270 Mod, LK
F230029-13	1804576-844-S2	Soil	8270 Mod, LK
F230029-14	1804576-844-S3	Soil	8270 Mod, LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230029

PROJECT NARRATIVE

Alkylated PAHs

F230029-01	**Present in Method Blank (B).**
	Benzene , Styrene
F230029-02	**Present in Method Blank (B).**
	Benzene , C-18 , Styrene
F230029-03	**Present in Method Blank (B).**
	Benzene , Styrene
F230029-05	**Present in Method Blank (B).**
	Styrene
F230029-08	**Present in Method Blank (B).**
	Benzene , Styrene
F230029-09	**Present in Method Blank (B).**
	Benzene , Styrene
F3I0001-CCV2	**Continuing Calibration %Diff/Drift is above control limit (CD+).**
	Tetraethyl lead (27% @ 25%)
FH33102-BS2	**Blank Spike recovery is below lower control limit (B-).**
	Methylcyclohexane (52% @ 60-130%)
FH33102-DUP2	**Relative percent difference for duplicate is outside of criteria (D+).**
	cis-Decalin (52% @ 50%), n-Butylbenzene (55% @ 50%), Retene (75% @ 50%)

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230029

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-845-S1
Date Sampled: 08/28/23 10:00
Percent Solids: 47
Initial Volume: 5.4
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**B 66.1** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C1-Benzene	**158** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C2-Benzenes	**167** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C3-Benzenes	**30.3** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C4-Benzenes	**41.9** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C5-Benzenes	**48.6** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
Methylcyclohexane	**J 4.45** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
Toluene	**201** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
Ethylbenzene	**J 6.78** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
m,p-Xylene	**236** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
Styrene	**B 36.6** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
o-Xylene	**J 7.35** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
Isopropylbenzene	ND (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
n-Propylbenzene	**J 6.44** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
1,3,5-Trimethylbenzene	ND (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
1,2,3-Trimethylbenzene	**J 4.65** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
1,2,4-Trimethylbenzene	**9.58** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
t-Butylbenzene	ND (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
sec-Butylbenzene	ND (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
p-Isopropyltoluene	**13.5** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
n-Butylbenzene	**14.6** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
trans-Decalin	**59.8** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
cis-Decalin	**15.3** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C1-Decalins	**144** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C2-Decalins	**252** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C3-Decalins	**254** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C4-Decalins	**535** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
Benzo(b)thiophene	ND (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C1-Benzo(b)thiophenes	**16.5** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C2-Benzo(b)thiophenes	**26.2** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C3-Benzo(b)thiophenes	**26.6** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C4-Benzo(b)thiophenes	**34.5** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-845-S1
Date Sampled: 08/28/23 10:00
Percent Solids: 47
Initial Volume: 5.4
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**43.7** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
2-Methylnaphthalene	**34.4** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
1-Methylnaphthalene	**19.3** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C1-Naphthalenes	**36.0** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C2-Naphthalenes	**112** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C3-Naphthalenes	**273** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C4-Naphthalenes	**569** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
Biphenyl	**18.0** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
Acenaphthylene	**104** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
Acenaphthene	**20.1** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
Dibenzofuran	**14.8** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
Fluorene	**29.2** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C1-Fluorenes	**133** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C2-Fluorenes	**310** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C3-Fluorenes	**227** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
Dibenzothiophene	**82.7** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C1-Dibenzothiophenes	**103** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C2-Dibenzothiophenes	**181** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C3-Dibenzothiophenes	**129** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C4-Dibenzothiophenes	**64.2** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
Phenanthrene	**146** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
Anthracene	**110** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C1-Phenanthrenes/Anthracenes	**223** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C2-Phenanthrenes/Anthracenes	**268** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C3-Phenanthrenes/Anthracenes	**195** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C4-Phenanthrenes/Anthracenes	**92.3** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
Retene	**29.7** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
Benzo(b)naphtho(2,1-d)thiophene	**63.2** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C0-Benzonaphthothiophenes	**119** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C1-Benzonaphthothiophenes	**93.3** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C2-Benzonaphthothiophenes	**89.9** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C3-Benzonaphthothiophenes	**80.0** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-845-S1
Date Sampled: 08/28/23 10:00
Percent Solids: 47
Initial Volume: 5.4
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**45.3** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
Fluoranthene	**454** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
Pyrene	**912** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C1-Fluoranthenes/Pyrenes	**527** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C2-Fluoranthenes/Pyrenes	**244** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C3-Fluoranthenes/Pyrenes	**123** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
Benzo(b)fluorene	**58.6** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
Benzo(c)fluorene	**30.2** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
2-Methylpyrene	**73.3** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
4-Methylpyrene	**73.8** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
1-Methylpyrene	**58.9** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
Benz(a)anthracene	**348** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
Chrysene/triphenylene	**423** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C1-Benzo(a)anthracenes/Chrysenes	**256** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C2-Benzo(a)anthracenes/Chrysenes	**152** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C3-Benzo(a)anthracenes/Chrysenes	**90.6** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C4-Benzo(a)anthracenes/Chrysenes	**58.4** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
Benzo(b)fluoranthene	**267** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
Benzo(j/k)fluoranthene	**303** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
Benzo(e)pyrene	**257** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
Benzo(a)pyrene	**382** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
Perylene	**1150** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
Indeno(1,2,3-cd)pyrene	**265** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
Dibenzo(a,h)anthracene	**59.0** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
Benzo(g,h,i)perylene	**223** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
Coronene	**67.6** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
Tetramethyl lead	ND (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
Trimethylethyl lead	ND (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
Dimethyldiethyl lead	ND (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
Methyltriethyl lead	ND (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
Tetraethyl lead	ND (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
2,6,10-trimethyldodecane (1380)	**121** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-845-S1
Date Sampled: 08/28/23 10:00
Percent Solids: 47
Initial Volume: 5.4
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**542** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
2,6,10-trimethylpentadecane (1650)	**966** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C-17	**1980** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
Pristane	**2300** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
C-18	**92.9** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
Phytane	**1340** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
Carbazole	**20.2** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
2,6-Dimethylnaphthalene	**35.1** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
2,3,5-Trimethylnaphthene	**9.37** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
4-Methyldibenzothiophene	**46.1** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
2/3-Methyldibenzothiophene	**30.7** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
1-Methyldibenzothiophene	**15.3** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
3-Methylphenanthrene	**42.4** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
2-Methylphenanthrene	**39.9** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
2-Methylanthracene	**47.6** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
4/9-Methylphenanthrene	**72.5** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102
1-Methylphenanthrene	**18.6** (7.84)	3.92	8270 Mod		1	IBM	09/05/23 19:27	F3I0001	FH33102

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*73 %*		*50-120*
Surrogate: Naphthalene-d8	*74 %*		*50-120*
Surrogate: Phenanthrene-d10	*74 %*		*50-120*
Surrogate: Perylene-d12	*81 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-845-S1
Date Sampled: 08/28/23 10:00
Percent Solids: 47

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**49200** (481)		LK		1	CCP	09/01/23 17:41	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-845-S2
Date Sampled: 08/28/23 10:01
Percent Solids: 55
Initial Volume: 5.46
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	B **23.2** (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C1-Benzene	**61.8** (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C2-Benzenes	**54.3** (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C3-Benzenes	**8.37** (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C4-Benzenes	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C5-Benzenes	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
Methylcyclohexane	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
Toluene	**79.1** (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
Ethylbenzene	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
m,p-Xylene	**63.2** (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
Styrene	B **13.4** (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
o-Xylene	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
Isopropylbenzene	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
n-Propylbenzene	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
1,3,5-Trimethylbenzene	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
1,2,3-Trimethylbenzene	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
1,2,4-Trimethylbenzene	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
t-Butylbenzene	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
sec-Butylbenzene	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
p-Isopropyltoluene	J **3.57** (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
n-Butylbenzene	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
trans-Decalin	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
cis-Decalin	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C1-Decalins	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C2-Decalins	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C3-Decalins	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C4-Decalins	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
Benzo(b)thiophene	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C1-Benzo(b)thiophenes	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C2-Benzo(b)thiophenes	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C3-Benzo(b)thiophenes	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C4-Benzo(b)thiophenes	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-845-S2
Date Sampled: 08/28/23 10:01
Percent Solids: 55
Initial Volume: 5.46
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
2-Methylnaphthalene	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
1-Methylnaphthalene	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C1-Naphthalenes	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C2-Naphthalenes	**10.4** (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C3-Naphthalenes	**J 5.13** (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C4-Naphthalenes	**J 6.49** (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
Biphenyl	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
Acenaphthylene	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
Acenaphthene	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
Dibenzofuran	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
Fluorene	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C1-Fluorenes	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C2-Fluorenes	**7.65** (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C3-Fluorenes	**J 4.57** (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
Dibenzothiophene	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C1-Dibenzothiophenes	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C2-Dibenzothiophenes	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C3-Dibenzothiophenes	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C4-Dibenzothiophenes	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
Phenanthrene	**J 3.44** (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
Anthracene	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C1-Phenanthrenes/Anthracenes	**J 5.30** (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C2-Phenanthrenes/Anthracenes	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C3-Phenanthrenes/Anthracenes	**J 3.47** (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C4-Phenanthrenes/Anthracenes	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
Retene	**J 6.07** (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
Benzo(b)naphtho(2,1-d)thiophene	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C0-Benzonaphthothiophenes	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C1-Benzonaphthothiophenes	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C2-Benzonaphthothiophenes	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C3-Benzonaphthothiophenes	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-845-S2
Date Sampled: 08/28/23 10:01
Percent Solids: 55
Initial Volume: 5.46
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
Fluoranthene	**8.33** (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
Pyrene	**12.2** (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C1-Fluoranthenes/Pyrenes	**8.06** (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C2-Fluoranthenes/Pyrenes	**7.33** (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C3-Fluoranthenes/Pyrenes	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
Benzo(b)fluorene	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
Benzo(c)fluorene	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
2-Methylpyrene	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
4-Methylpyrene	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
1-Methylpyrene	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
Benz(a)anthracene	**J 4.49** (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
Chrysene/triphenylene	**J 5.60** (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C1-Benzo(a)anthracenes/Chrysenes	**J 4.10** (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C2-Benzo(a)anthracenes/Chrysenes	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C3-Benzo(a)anthracenes/Chrysenes	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C4-Benzo(a)anthracenes/Chrysenes	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
Benzo(b)fluoranthene	**J 4.88** (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
Benzo(j/k)fluoranthene	**J 4.24** (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
Benzo(e)pyrene	**J 3.80** (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
Benzo(a)pyrene	**J 5.15** (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
Perylene	**496** (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
Indeno(1,2,3-cd)pyrene	**J 3.98** (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
Dibenzo(a,h)anthracene	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
Benzo(g,h,i)perylene	**J 3.40** (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
Coronene	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
Tetramethyl lead	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
Trimethylethyl lead	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
Dimethyldiethyl lead	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
Methyltriethyl lead	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
Tetraethyl lead	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
2,6,10-trimethyldodecane (1380)	**J 5.14** (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-845-S2
Date Sampled: 08/28/23 10:01
Percent Solids: 55
Initial Volume: 5.46
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**16.2** (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
2,6,10-trimethylpentadecane (1650)	**J 5.71** (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C-17	**101** (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
Pristane	**11.0** (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
C-18	**B 45.3** (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
Phytane	**9.59** (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
Carbazole	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
2,6-Dimethylnaphthalene	**J 3.75** (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
2,3,5-Trimethylnaphthene	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
4-Methyldibenzothiophene	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
2/3-Methyldibenzothiophene	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
1-Methyldibenzothiophene	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
3-Methylphenanthrene	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
2-Methylphenanthrene	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
2-Methylanthracene	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
4/9-Methylphenanthrene	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102
1-Methylphenanthrene	ND (6.66)	3.33	8270 Mod		1	IBM	09/05/23 20:49	F3I0001	FH33102

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*75 %*		*50-120*
Surrogate: Naphthalene-d8	*76 %*		*50-120*
Surrogate: Phenanthrene-d10	*79 %*		*50-120*
Surrogate: Perylene-d12	*84 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-845-S2
Date Sampled: 08/28/23 10:01
Percent Solids: 55

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**50100** (464)		LK		1	CCP	09/01/23 17:58	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-847-S1
Date Sampled: 08/28/23 11:00
Percent Solids: 60
Initial Volume: 5.44
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	B **81.4** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C1-Benzene	**143** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C2-Benzenes	**200** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C3-Benzenes	**35.0** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C4-Benzenes	**40.2** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C5-Benzenes	**33.1** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
Methylcyclohexane	**7.18** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
Toluene	**179** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
Ethylbenzene	**10.6** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
m,p-Xylene	**290** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
Styrene	B **34.6** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
o-Xylene	**9.98** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
Isopropylbenzene	ND (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
n-Propylbenzene	**7.89** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
1,3,5-Trimethylbenzene	J **4.82** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
1,2,3-Trimethylbenzene	**7.12** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
1,2,4-Trimethylbenzene	**11.1** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
t-Butylbenzene	ND (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
sec-Butylbenzene	ND (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
p-Isopropyltoluene	**8.48** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
n-Butylbenzene	**11.1** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
trans-Decalin	J **5.34** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
cis-Decalin	ND (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C1-Decalins	**21.0** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C2-Decalins	**26.9** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C3-Decalins	**28.4** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C4-Decalins	**35.5** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
Benzo(b)thiophene	J **4.89** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C1-Benzo(b)thiophenes	**15.8** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C2-Benzo(b)thiophenes	**17.3** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C3-Benzo(b)thiophenes	**9.00** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C4-Benzo(b)thiophenes	J **4.53** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-847-S1
Date Sampled: 08/28/23 11:00
Percent Solids: 60
Initial Volume: 5.44
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**80.4** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
2-Methylnaphthalene	**44.0** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
1-Methylnaphthalene	**35.6** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C1-Naphthalenes	**50.6** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C2-Naphthalenes	**113** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C3-Naphthalenes	**87.1** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C4-Naphthalenes	**53.1** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
Biphenyl	**19.9** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
Acenaphthylene	**201** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
Acenaphthene	**187** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
Dibenzofuran	**88.3** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
Fluorene	**143** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C1-Fluorenes	**64.5** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C2-Fluorenes	**71.9** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C3-Fluorenes	**147** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
Dibenzothiophene	**99.7** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C1-Dibenzothiophenes	**83.5** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C2-Dibenzothiophenes	**91.3** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C3-Dibenzothiophenes	**60.2** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C4-Dibenzothiophenes	**43.3** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
Phenanthrene	**1360** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
Anthracene	**455** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C1-Phenanthrenes/Anthracenes	**579** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C2-Phenanthrenes/Anthracenes	**353** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C3-Phenanthrenes/Anthracenes	**157** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C4-Phenanthrenes/Anthracenes	**60.0** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
Retene	**23.3** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
Benzo(b)naphtho(2,1-d)thiophene	**195** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C0-Benzonaphthothiophenes	**361** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C1-Benzonaphthothiophenes	**181** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C2-Benzonaphthothiophenes	**143** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C3-Benzonaphthothiophenes	**118** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-847-S1
Date Sampled: 08/28/23 11:00
Percent Solids: 60
Initial Volume: 5.44
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**61.4** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
Fluoranthene	**2470** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
Pyrene	**2300** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C1-Fluoranthenes/Pyrenes	**1070** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C2-Fluoranthenes/Pyrenes	**588** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C3-Fluoranthenes/Pyrenes	**229** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
Benzo(b)fluorene	**134** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
Benzo(c)fluorene	**51.4** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
2-Methylpyrene	**148** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
4-Methylpyrene	**124** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
1-Methylpyrene	**104** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
Benz(a)anthracene	**1350** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
Chrysene/triphenylene	**1380** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C1-Benzo(a)anthracenes/Chrysenes	**597** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C2-Benzo(a)anthracenes/Chrysenes	**310** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C3-Benzo(a)anthracenes/Chrysenes	**159** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C4-Benzo(a)anthracenes/Chrysenes	**92.5** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
Benzo(b)fluoranthene	**1120** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
Benzo(j/k)fluoranthene	**1190** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
Benzo(e)pyrene	**962** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
Benzo(a)pyrene	**1570** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
Perylene	**442** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
Indeno(1,2,3-cd)pyrene	**1100** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
Dibenzo(a,h)anthracene	**251** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
Benzo(g,h,i)perylene	**885** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
Coronene	**259** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
Tetramethyl lead	ND (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
Trimethylethyl lead	ND (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
Dimethyldiethyl lead	ND (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
Methyltriethyl lead	ND (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
Tetraethyl lead	ND (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
2,6,10-trimethyldodecane (1380)	**17.5** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-847-S1
Date Sampled: 08/28/23 11:00
Percent Solids: 60
Initial Volume: 5.44
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**54.1** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
2,6,10-trimethylpentadecane (1650)	**22.4** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C-17	**164** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
Pristane	**47.7** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
C-18	**72.3** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
Phytane	**52.5** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
Carbazole	**191** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
2,6-Dimethylnaphthalene	**40.5** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
2,3,5-Trimethylnaphthene	**6.63** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
4-Methyldibenzothiophene	**27.9** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
2/3-Methyldibenzothiophene	**28.8** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
1-Methyldibenzothiophene	**10.5** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
3-Methylphenanthrene	**130** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
2-Methylphenanthrene	**152** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
2-Methylanthracene	**76.8** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
4/9-Methylphenanthrene	**131** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102
1-Methylphenanthrene	**88.4** (6.08)	3.04	8270 Mod		1	IBM	09/05/23 22:12	F3I0001	FH33102

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*68 %*		*50-120*
Surrogate: Naphthalene-d8	*72 %*		*50-120*
Surrogate: Phenanthrene-d10	*72 %*		*50-120*
Surrogate: Perylene-d12	*77 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-847-S1
Date Sampled: 08/28/23 11:00
Percent Solids: 60

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**32200** (478)		LK		1	CCP	09/01/23 18:14	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-847-S2
Date Sampled: 08/28/23 11:01
Percent Solids: 57
Initial Volume: 5.52
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**141** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C1-Benzene	**374** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C2-Benzenes	**266** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C3-Benzenes	**82.0** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C4-Benzenes	**117** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C5-Benzenes	**70.3** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
Methylcyclohexane	**16.2** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
Toluene	**467** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
Ethylbenzene	**26.9** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
m,p-Xylene	**359** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
Styrene	**140** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
o-Xylene	**23.3** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
Isopropylbenzene	**J 3.83** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
n-Propylbenzene	**14.4** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
1,3,5-Trimethylbenzene	**9.70** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
1,2,3-Trimethylbenzene	**14.4** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
1,2,4-Trimethylbenzene	**29.2** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
t-Butylbenzene	ND (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
sec-Butylbenzene	ND (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
p-Isopropyltoluene	**23.9** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
n-Butylbenzene	**22.3** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
trans-Decalin	**54.8** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
cis-Decalin	**12.6** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C1-Decalins	**225** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C2-Decalins	**293** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C3-Decalins	**271** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C4-Decalins	**449** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
Benzo(b)thiophene	**7.64** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C1-Benzo(b)thiophenes	**23.1** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C2-Benzo(b)thiophenes	**30.7** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C3-Benzo(b)thiophenes	**17.5** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C4-Benzo(b)thiophenes	**10.8** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-847-S2
Date Sampled: 08/28/23 11:01
Percent Solids: 57
Initial Volume: 5.52
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**106** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
2-Methylnaphthalene	**74.0** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
1-Methylnaphthalene	**43.9** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C1-Naphthalenes	**76.3** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C2-Naphthalenes	**162** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C3-Naphthalenes	**149** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C4-Naphthalenes	**131** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
Biphenyl	**40.7** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
Acenaphthylene	**306** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
Acenaphthene	**129** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
Dibenzofuran	**55.7** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
Fluorene	**102** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C1-Fluorenes	**96.7** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C2-Fluorenes	**119** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C3-Fluorenes	**185** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
Dibenzothiophene	**89.3** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C1-Dibenzothiophenes	**133** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C2-Dibenzothiophenes	**177** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C3-Dibenzothiophenes	**178** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C4-Dibenzothiophenes	**127** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
Phenanthrene	**1030** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
Anthracene	**781** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C1-Phenanthrenes/Anthracenes	**761** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C2-Phenanthrenes/Anthracenes	**520** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C3-Phenanthrenes/Anthracenes	**313** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C4-Phenanthrenes/Anthracenes	**168** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
Retene	**105** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
Benzo(b)naphtho(2,1-d)thiophene	**162** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C0-Benzonaphthothiophenes	**309** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C1-Benzonaphthothiophenes	**230** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C2-Benzonaphthothiophenes	**227** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C3-Benzonaphthothiophenes	**171** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-847-S2
Date Sampled: 08/28/23 11:01
Percent Solids: 57
Initial Volume: 5.52
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**101** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
Fluoranthene	**2250** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
Pyrene	**2670** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C1-Fluoranthenes/Pyrenes	**1250** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C2-Fluoranthenes/Pyrenes	**622** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C3-Fluoranthenes/Pyrenes	**261** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
Benzo(b)fluorene	**132** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
Benzo(c)fluorene	**70.2** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
2-Methylpyrene	**175** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
4-Methylpyrene	**168** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
1-Methylpyrene	**141** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
Benz(a)anthracene	**1110** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
Chrysene/triphenylene	**1220** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C1-Benzo(a)anthracenes/Chrysenes	**687** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C2-Benzo(a)anthracenes/Chrysenes	**381** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C3-Benzo(a)anthracenes/Chrysenes	**237** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C4-Benzo(a)anthracenes/Chrysenes	**123** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
Benzo(b)fluoranthene	**916** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
Benzo(j/k)fluoranthene	**968** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
Benzo(e)pyrene	**862** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
Benzo(a)pyrene	**1340** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
Perylene	**438** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
Indeno(1,2,3-cd)pyrene	**928** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
Dibenzo(a,h)anthracene	**206** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
Benzo(g,h,i)perylene	**800** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
Coronene	**247** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
Tetramethyl lead	ND (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
Trimethylethyl lead	ND (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
Dimethyldiethyl lead	ND (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
Methyltriethyl lead	ND (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
Tetraethyl lead	ND (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
2,6,10-trimethyldodecane (1380)	**187** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-847-S2
Date Sampled: 08/28/23 11:01
Percent Solids: 57
Initial Volume: 5.52
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**326** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
2,6,10-trimethylpentadecane (1650)	**196** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C-17	**226** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
Pristane	**395** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
C-18	**102** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
Phytane	**409** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
Carbazole	**97.7** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
2,6-Dimethylnaphthalene	**53.9** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
2,3,5-Trimethylnaphthene	**10.8** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
4-Methyldibenzothiophene	**45.4** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
2/3-Methyldibenzothiophene	**45.8** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
1-Methyldibenzothiophene	**16.1** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
3-Methylphenanthrene	**174** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
2-Methylphenanthrene	**206** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
2-Methylanthracene	**102** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
4/9-Methylphenanthrene	**192** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102
1-Methylphenanthrene	**81.6** (6.39)	3.19	8270 Mod		1	IBM	09/05/23 23:35	F3I0001	FH33102

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*74 %*		*50-120*
Surrogate: Naphthalene-d8	*76 %*		*50-120*
Surrogate: Phenanthrene-d10	*75 %*		*50-120*
Surrogate: Perylene-d12	*79 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-847-S2
Date Sampled: 08/28/23 11:01
Percent Solids: 57

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-04
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**45200** (474)		LK		1	CCP	09/01/23 18:31	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-846-S1
Date Sampled: 08/28/23 12:00
Percent Solids: 51
Initial Volume: 5.34
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**151** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C1-Benzene	**198** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C2-Benzenes	**431** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C3-Benzenes	**51.4** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C4-Benzenes	**45.9** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C5-Benzenes	**35.2** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
Methylcyclohexane	**7.79** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
Toluene	**246** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
Ethylbenzene	**17.1** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
m,p-Xylene	**633** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
Styrene	**B 72.1** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
o-Xylene	**17.1** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
Isopropylbenzene	ND (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
n-Propylbenzene	**16.8** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
1,3,5-Trimethylbenzene	**J 6.86** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
1,2,3-Trimethylbenzene	**10.8** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
1,2,4-Trimethylbenzene	**15.2** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
t-Butylbenzene	ND (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
sec-Butylbenzene	ND (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
p-Isopropyltoluene	**13.0** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
n-Butylbenzene	**27.0** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
trans-Decalin	**J 6.07** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
cis-Decalin	ND (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C1-Decalins	**28.4** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C2-Decalins	**21.3** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C3-Decalins	**14.1** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C4-Decalins	ND (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
Benzo(b)thiophene	**J 5.39** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C1-Benzo(b)thiophenes	**18.2** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C2-Benzo(b)thiophenes	**37.5** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C3-Benzo(b)thiophenes	**13.2** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C4-Benzo(b)thiophenes	**7.35** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-846-S1
Date Sampled: 08/28/23 12:00
Percent Solids: 51
Initial Volume: 5.34
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**74.9** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
2-Methylnaphthalene	**40.8** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
1-Methylnaphthalene	**29.1** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C1-Naphthalenes	**46.3** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C2-Naphthalenes	**123** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C3-Naphthalenes	**81.5** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C4-Naphthalenes	**61.8** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
Biphenyl	**24.7** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
Acenaphthylene	**403** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
Acenaphthene	**85.6** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
Dibenzofuran	**44.4** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
Fluorene	**102** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C1-Fluorenes	**61.0** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C2-Fluorenes	**69.9** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C3-Fluorenes	**148** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
Dibenzothiophene	**88.3** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C1-Dibenzothiophenes	**94.8** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C2-Dibenzothiophenes	**133** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C3-Dibenzothiophenes	**82.7** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C4-Dibenzothiophenes	**51.8** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
Phenanthrene	**852** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
Anthracene	**447** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C1-Phenanthrenes/Anthracenes	**589** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C2-Phenanthrenes/Anthracenes	**463** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C3-Phenanthrenes/Anthracenes	**208** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C4-Phenanthrenes/Anthracenes	**83.6** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
Retene	**48.6** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
Benzo(b)naphtho(2,1-d)thiophene	**263** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C0-Benzonaphthothiophenes	**482** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C1-Benzonaphthothiophenes	**254** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C2-Benzonaphthothiophenes	**170** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C3-Benzonaphthothiophenes	**142** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-846-S1
Date Sampled: 08/28/23 12:00
Percent Solids: 51
Initial Volume: 5.34
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**63.4** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
Fluoranthene	**2690** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
Pyrene	**3100** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C1-Fluoranthenes/Pyrenes	**1960** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C2-Fluoranthenes/Pyrenes	**807** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C3-Fluoranthenes/Pyrenes	**300** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
Benzo(b)fluorene	**213** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
Benzo(c)fluorene	**97.3** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
2-Methylpyrene	**293** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
4-Methylpyrene	**264** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
1-Methylpyrene	**234** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
Benz(a)anthracene	**2100** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
Chrysene/triphenylene	**2190** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C1-Benzo(a)anthracenes/Chrysenes	**1010** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C2-Benzo(a)anthracenes/Chrysenes	**415** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C3-Benzo(a)anthracenes/Chrysenes	**191** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C4-Benzo(a)anthracenes/Chrysenes	**94.4** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
Benzo(b)fluoranthene	**1630** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
Benzo(j/k)fluoranthene	**1770** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
Benzo(e)pyrene	**1580** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
Benzo(a)pyrene	**2600** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
Perylene	**574** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
Indeno(1,2,3-cd)pyrene	**1680** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
Dibenzo(a,h)anthracene	**357** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
Benzo(g,h,i)perylene	**1440** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
Coronene	**439** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
Tetramethyl lead	ND (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
Trimethylethyl lead	ND (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
Dimethyldiethyl lead	ND (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
Methyltriethyl lead	ND (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
Tetraethyl lead	ND (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
2,6,10-trimethyldodecane (1380)	**22.5** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-846-S1
Date Sampled: 08/28/23 12:00
Percent Solids: 51
Initial Volume: 5.34
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**65.2** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
2,6,10-trimethylpentadecane (1650)	**32.5** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C-17	**260** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
Pristane	**66.4** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
C-18	**103** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
Phytane	**73.6** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
Carbazole	**125** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
2,6-Dimethylnaphthalene	**53.9** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
2,3,5-Trimethylnaphthene	**J 5.02** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
4-Methyldibenzothiophene	**34.9** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
2/3-Methyldibenzothiophene	**30.2** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
1-Methyldibenzothiophene	**12.5** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
3-Methylphenanthrene	**113** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
2-Methylphenanthrene	**141** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
2-Methylanthracene	**96.2** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
4/9-Methylphenanthrene	**140** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102
1-Methylphenanthrene	**90.3** (7.31)	3.65	8270 Mod		1	IBM	09/06/23 0:58	F3I0001	FH33102

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*71 %*		*50-120*
Surrogate: Naphthalene-d8	*74 %*		*50-120*
Surrogate: Phenanthrene-d10	*74 %*		*50-120*
Surrogate: Perylene-d12	*79 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-846-S1
Date Sampled: 08/28/23 12:00
Percent Solids: 51

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-05
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**29500** (486)		LK		1	CCP	09/06/23 11:01	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-846-S2
Date Sampled: 08/28/23 12:01
Percent Solids: 59
Initial Volume: 5.41
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**132** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C1-Benzene	**188** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C2-Benzenes	**168** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C3-Benzenes	**61.9** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C4-Benzenes	**48.1** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C5-Benzenes	**38.6** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
Methylcyclohexane	**19.6** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
Toluene	**231** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
Ethylbenzene	**17.0** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
m,p-Xylene	**221** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
Styrene	**102** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
o-Xylene	**17.6** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
Isopropylbenzene	**J 4.11** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
n-Propylbenzene	**11.8** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
1,3,5-Trimethylbenzene	**8.48** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
1,2,3-Trimethylbenzene	**11.2** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
1,2,4-Trimethylbenzene	**20.5** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
t-Butylbenzene	ND (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
sec-Butylbenzene	ND (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
p-Isopropyltoluene	**11.0** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
n-Butylbenzene	**14.3** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
trans-Decalin	**10.6** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
cis-Decalin	ND (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C1-Decalins	**43.1** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C2-Decalins	**61.4** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C3-Decalins	**61.9** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C4-Decalins	**131** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
Benzo(b)thiophene	**7.03** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C1-Benzo(b)thiophenes	**20.7** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C2-Benzo(b)thiophenes	**26.1** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C3-Benzo(b)thiophenes	**13.3** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C4-Benzo(b)thiophenes	**8.51** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-846-S2
Date Sampled: 08/28/23 12:01
Percent Solids: 59
Initial Volume: 5.41
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**101** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
2-Methylnaphthalene	**62.4** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
1-Methylnaphthalene	**40.6** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C1-Naphthalenes	**67.3** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C2-Naphthalenes	**135** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C3-Naphthalenes	**113** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C4-Naphthalenes	**79.2** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
Biphenyl	**34.5** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
Acenaphthylene	**333** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
Acenaphthene	**112** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
Dibenzofuran	**64.7** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
Fluorene	**115** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C1-Fluorenes	**73.5** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C2-Fluorenes	**88.2** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C3-Fluorenes	**170** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
Dibenzothiophene	**84.8** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C1-Dibenzothiophenes	**103** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C2-Dibenzothiophenes	**137** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C3-Dibenzothiophenes	**113** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C4-Dibenzothiophenes	**76.2** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
Phenanthrene	**979** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
Anthracene	**419** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C1-Phenanthrenes/Anthracenes	**585** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C2-Phenanthrenes/Anthracenes	**422** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C3-Phenanthrenes/Anthracenes	**227** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C4-Phenanthrenes/Anthracenes	**95.6** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
Retene	**50.1** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
Benzo(b)naphtho(2,1-d)thiophene	**189** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C0-Benzonaphthothiophenes	**350** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C1-Benzonaphthothiophenes	**220** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C2-Benzonaphthothiophenes	**176** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C3-Benzonaphthothiophenes	**149** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-846-S2
Date Sampled: 08/28/23 12:01
Percent Solids: 59
Initial Volume: 5.41
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**78.1** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
Fluoranthene	**2160** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
Pyrene	**2160** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C1-Fluoranthenes/Pyrenes	**1150** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C2-Fluoranthenes/Pyrenes	**639** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C3-Fluoranthenes/Pyrenes	**273** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
Benzo(b)fluorene	**134** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
Benzo(c)fluorene	**48.2** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
2-Methylpyrene	**162** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
4-Methylpyrene	**154** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
1-Methylpyrene	**118** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
Benz(a)anthracene	**1250** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
Chrysene/triphenylene	**1350** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C1-Benzo(a)anthracenes/Chrysenes	**682** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C2-Benzo(a)anthracenes/Chrysenes	**351** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C3-Benzo(a)anthracenes/Chrysenes	**206** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C4-Benzo(a)anthracenes/Chrysenes	**105** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
Benzo(b)fluoranthene	**1070** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
Benzo(j/k)fluoranthene	**1170** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
Benzo(e)pyrene	**970** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
Benzo(a)pyrene	**1540** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
Perylene	**461** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
Indeno(1,2,3-cd)pyrene	**1110** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
Dibenzo(a,h)anthracene	**232** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
Benzo(g,h,i)perylene	**921** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
Coronene	**284** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
Tetramethyl lead	ND (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
Trimethylethyl lead	ND (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
Dimethyldiethyl lead	ND (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
Methyltriethyl lead	ND (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
Tetraethyl lead	ND (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
2,6,10-trimethyldodecane (1380)	**45.0** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-846-S2
Date Sampled: 08/28/23 12:01
Percent Solids: 59
Initial Volume: 5.41
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**103** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
2,6,10-trimethylpentadecane (1650)	**58.9** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C-17	**216** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
Pristane	**122** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
C-18	**93.8** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
Phytane	**156** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
Carbazole	**130** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
2,6-Dimethylnaphthalene	**48.4** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
2,3,5-Trimethylnaphthene	**6.99** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
4-Methyldibenzothiophene	**36.1** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
2/3-Methyldibenzothiophene	**32.1** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
1-Methyldibenzothiophene	**14.1** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
3-Methylphenanthrene	**128** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
2-Methylphenanthrene	**141** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
2-Methylanthracene	**80.4** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
4/9-Methylphenanthrene	**142** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102
1-Methylphenanthrene	**92.0** (6.29)	3.14	8270 Mod		1	IBM	09/06/23 2:20	F3I0001	FH33102

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*72 %*		*50-120*
Surrogate: Naphthalene-d8	*74 %*		*50-120*
Surrogate: Phenanthrene-d10	*75 %*		*50-120*
Surrogate: Perylene-d12	*80 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-846-S2
Date Sampled: 08/28/23 12:01
Percent Solids: 59

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-06
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**31700** (466)		LK		1	CCP	09/06/23 11:45	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-846-S3
Date Sampled: 08/28/23 12:02
Percent Solids: 58
Initial Volume: 5.31
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**135** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C1-Benzene	**309** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C2-Benzenes	**264** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C3-Benzenes	**180** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C4-Benzenes	**429** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C5-Benzenes	**266** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
Methylcyclohexane	**51.4** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
Toluene	**376** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
Ethylbenzene	**40.2** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
m,p-Xylene	**325** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
Styrene	**175** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
o-Xylene	**42.4** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
Isopropylbenzene	**J 5.29** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
n-Propylbenzene	**24.1** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
1,3,5-Trimethylbenzene	**26.9** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
1,2,3-Trimethylbenzene	**33.2** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
1,2,4-Trimethylbenzene	**78.3** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
t-Butylbenzene	**J 5.13** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
sec-Butylbenzene	**J 6.04** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
p-Isopropyltoluene	**29.4** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
n-Butylbenzene	**45.8** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
trans-Decalin	**1450** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
cis-Decalin	**257** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C1-Decalins	**3890** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C2-Decalins	**1170** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C3-Decalins	**436** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C4-Decalins	**666** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
Benzo(b)thiophene	**26.0** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C1-Benzo(b)thiophenes	**46.1** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C2-Benzo(b)thiophenes	**93.1** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C3-Benzo(b)thiophenes	**68.2** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C4-Benzo(b)thiophenes	**36.4** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-846-S3
Date Sampled: 08/28/23 12:02
Percent Solids: 58
Initial Volume: 5.31
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**458** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
2-Methylnaphthalene	**232** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
1-Methylnaphthalene	**154** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C1-Naphthalenes	**250** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C2-Naphthalenes	**573** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C3-Naphthalenes	**633** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C4-Naphthalenes	**564** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
Biphenyl	**98.6** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
Acenaphthylene	**1230** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
Acenaphthene	**867** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
Dibenzofuran	**197** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
Fluorene	**433** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C1-Fluorenes	**417** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C2-Fluorenes	**539** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C3-Fluorenes	**685** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
Dibenzothiophene	**397** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C1-Dibenzothiophenes	**551** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C2-Dibenzothiophenes	**747** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C3-Dibenzothiophenes	**648** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C4-Dibenzothiophenes	**380** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
Phenanthrene	**3830** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
Anthracene	**1700** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C1-Phenanthrenes/Anthracenes	**2690** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C2-Phenanthrenes/Anthracenes	**2030** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C3-Phenanthrenes/Anthracenes	**1190** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C4-Phenanthrenes/Anthracenes	**519** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
Retene	**89.3** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
Benzo(b)naphtho(2,1-d)thiophene	**677** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C0-Benzonaphthothiophenes	**1250** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C1-Benzonaphthothiophenes	**878** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C2-Benzonaphthothiophenes	**761** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C3-Benzonaphthothiophenes	**534** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-846-S3
Date Sampled: 08/28/23 12:02
Percent Solids: 58
Initial Volume: 5.31
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**249** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
Fluoranthene	**6500** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
Pyrene	**6940** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C1-Fluoranthenes/Pyrenes	**4540** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C2-Fluoranthenes/Pyrenes	**2120** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C3-Fluoranthenes/Pyrenes	**902** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
Benzo(b)fluorene	**577** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
Benzo(c)fluorene	**179** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
2-Methylpyrene	**617** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
4-Methylpyrene	**596** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
1-Methylpyrene	**491** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
Benz(a)anthracene	**4050** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
Chrysene/triphenylene	**4420** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C1-Benzo(a)anthracenes/Chrysenes	**2360** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C2-Benzo(a)anthracenes/Chrysenes	**1230** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C3-Benzo(a)anthracenes/Chrysenes	**657** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C4-Benzo(a)anthracenes/Chrysenes	**344** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
Benzo(b)fluoranthene	**3290** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
Benzo(j/k)fluoranthene	**3360** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
Benzo(e)pyrene	**3020** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
Benzo(a)pyrene	**5120** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
Perylene	**1110** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
Indeno(1,2,3-cd)pyrene	**3340** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
Dibenzo(a,h)anthracene	**713** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
Benzo(g,h,i)perylene	**2880** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
Coronene	**903** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
Tetramethyl lead	ND (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
Trimethylethyl lead	ND (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
Dimethyldiethyl lead	ND (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
Methyltriethyl lead	ND (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
Tetraethyl lead	ND (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
2,6,10-trimethyldodecane (1380)	**386** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-846-S3
Date Sampled: 08/28/23 12:02
Percent Solids: 58
Initial Volume: 5.31
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**554** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
2,6,10-trimethylpentadecane (1650)	**353** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C-17	**268** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
Pristane	**951** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
C-18	**190** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
Phytane	**1040** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
Carbazole	**344** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
2,6-Dimethylnaphthalene	**113** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
2,3,5-Trimethylnaphthene	**42.7** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
4-Methyldibenzothiophene	**194** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
2/3-Methyldibenzothiophene	**196** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
1-Methyldibenzothiophene	**70.1** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
3-Methylphenanthrene	**610** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
2-Methylphenanthrene	**739** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
2-Methylanthracene	**324** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
4/9-Methylphenanthrene	**679** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102
1-Methylphenanthrene	**332** (6.49)	3.25	8270 Mod		1	IBM	09/06/23 3:43	F3I0001	FH33102

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*74 %*		*50-120*
Surrogate: Naphthalene-d8	*76 %*		*50-120*
Surrogate: Phenanthrene-d10	*77 %*		*50-120*
Surrogate: Perylene-d12	*83 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-846-S3
Date Sampled: 08/28/23 12:02
Percent Solids: 58

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-07
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**124000** (475)		LK		1	CCP	09/06/23 12:35	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-854-S1
Date Sampled: 08/28/23 13:00
Percent Solids: 78
Initial Volume: 5.63
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	B **79.0** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C1-Benzene	**66.5** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C2-Benzenes	**74.4** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C3-Benzenes	**41.6** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C4-Benzenes	**48.2** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C5-Benzenes	**33.8** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
Methylcyclohexane	**7.72** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
Toluene	**81.9** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
Ethylbenzene	**12.2** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
m,p-Xylene	**90.6** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
Styrene	B **75.0** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
o-Xylene	**8.80** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
Isopropylbenzene	ND (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
n-Propylbenzene	**10.1** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
1,3,5-Trimethylbenzene	**4.83** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
1,2,3-Trimethylbenzene	**6.03** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
1,2,4-Trimethylbenzene	**11.5** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
t-Butylbenzene	ND (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
sec-Butylbenzene	ND (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
p-Isopropyltoluene	**7.15** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
n-Butylbenzene	**15.7** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
trans-Decalin	**22.5** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
cis-Decalin	ND (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C1-Decalins	**46.7** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C2-Decalins	**37.9** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C3-Decalins	**33.1** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C4-Decalins	**66.9** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
Benzo(b)thiophene	**13.4** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C1-Benzo(b)thiophenes	**21.6** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C2-Benzo(b)thiophenes	**32.9** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C3-Benzo(b)thiophenes	**21.7** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C4-Benzo(b)thiophenes	**11.1** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-854-S1
Date Sampled: 08/28/23 13:00
Percent Solids: 78
Initial Volume: 5.63
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**339** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
2-Methylnaphthalene	**155** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
1-Methylnaphthalene	**115** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C1-Naphthalenes	**173** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C2-Naphthalenes	**208** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C3-Naphthalenes	**190** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C4-Naphthalenes	**117** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
Biphenyl	**46.1** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
Acenaphthylene	**282** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
Acenaphthene	**628** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
Dibenzofuran	**357** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
Fluorene	**483** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C1-Fluorenes	**144** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C2-Fluorenes	**152** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C3-Fluorenes	**386** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
Dibenzothiophene	**339** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C1-Dibenzothiophenes	**200** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C2-Dibenzothiophenes	**196** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C3-Dibenzothiophenes	**121** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C4-Dibenzothiophenes	**66.7** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
Phenanthrene	**4010** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
Anthracene	**1100** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C1-Phenanthrenes/Anthracenes	**1370** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C2-Phenanthrenes/Anthracenes	**707** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C3-Phenanthrenes/Anthracenes	**296** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C4-Phenanthrenes/Anthracenes	**111** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
Retene	**76.1** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
Benzo(b)naphtho(2,1-d)thiophene	**462** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C0-Benzonaphthothiophenes	**829** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C1-Benzonaphthothiophenes	**328** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C2-Benzonaphthothiophenes	**236** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C3-Benzonaphthothiophenes	**177** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-854-S1
Date Sampled: 08/28/23 13:00
Percent Solids: 78
Initial Volume: 5.63
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**93.9** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
Fluoranthene	**5520** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
Pyrene	**4520** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C1-Fluoranthenes/Pyrenes	**1860** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C2-Fluoranthenes/Pyrenes	**1330** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C3-Fluoranthenes/Pyrenes	**447** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
Benzo(b)fluorene	**196** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
Benzo(c)fluorene	**98.6** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
2-Methylpyrene	**261** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
4-Methylpyrene	**194** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
1-Methylpyrene	**162** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
Benz(a)anthracene	**2730** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
Chrysene/triphenylene	**2750** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C1-Benzo(a)anthracenes/Chrysenes	**1030** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C2-Benzo(a)anthracenes/Chrysenes	**504** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C3-Benzo(a)anthracenes/Chrysenes	**259** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C4-Benzo(a)anthracenes/Chrysenes	**133** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
Benzo(b)fluoranthene	**2070** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
Benzo(j/k)fluoranthene	**2030** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
Benzo(e)pyrene	**1480** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
Benzo(a)pyrene	**2470** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
Perylene	**644** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
Indeno(1,2,3-cd)pyrene	**1730** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
Dibenzo(a,h)anthracene	**422** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
Benzo(g,h,i)perylene	**1260** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
Coronene	**340** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
Tetramethyl lead	ND (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
Trimethylethyl lead	ND (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
Dimethyldiethyl lead	ND (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
Methyltriethyl lead	ND (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
Tetraethyl lead	ND (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
2,6,10-trimethyldodecane (1380)	**31.5** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-854-S1
Date Sampled: 08/28/23 13:00
Percent Solids: 78
Initial Volume: 5.63
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**60.3** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
2,6,10-trimethylpentadecane (1650)	**56.0** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C-17	**129** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
Pristane	**116** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
C-18	**76.6** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
Phytane	**116** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
Carbazole	**699** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
2,6-Dimethylnaphthalene	**54.7** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
2,3,5-Trimethylnaphthene	**14.7** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
4-Methyldibenzothiophene	**63.3** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
2/3-Methyldibenzothiophene	**69.1** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
1-Methyldibenzothiophene	**28.2** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
3-Methylphenanthrene	**319** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
2-Methylphenanthrene	**407** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
2-Methylanthracene	**157** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
4/9-Methylphenanthrene	**277** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102
1-Methylphenanthrene	**212** (4.54)	2.27	8270 Mod		1	IBM	09/07/23 12:45	F3I0001	FH33102

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*74 %*		*50-120*
Surrogate: Naphthalene-d8	*72 %*		*50-120*
Surrogate: Phenanthrene-d10	*78 %*		*50-120*
Surrogate: Perylene-d12	*84 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-854-S1
Date Sampled: 08/28/23 13:00
Percent Solids: 78

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-08
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**25800** (476)		LK		1	CCP	09/06/23 12:52	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-854-S2
Date Sampled: 08/28/23 13:01
Percent Solids: 85
Initial Volume: 5.28
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	B **57.7** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C1-Benzene	**49.4** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C2-Benzenes	**55.7** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C3-Benzenes	**42.6** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C4-Benzenes	**80.0** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C5-Benzenes	**91.0** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
Methylcyclohexane	**5.35** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
Toluene	**60.8** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
Ethylbenzene	**12.3** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
m,p-Xylene	**62.5** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
Styrene	B **36.7** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
o-Xylene	**9.87** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
Isopropylbenzene	ND (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
n-Propylbenzene	**7.15** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
1,3,5-Trimethylbenzene	**4.58** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
1,2,3-Trimethylbenzene	**6.23** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
1,2,4-Trimethylbenzene	**16.3** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
t-Butylbenzene	ND (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
sec-Butylbenzene	J **2.86** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
p-Isopropyltoluene	J **4.33** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
n-Butylbenzene	**18.4** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
trans-Decalin	**383** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
cis-Decalin	**49.7** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C1-Decalins	**643** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C2-Decalins	**224** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C3-Decalins	**100** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C4-Decalins	**189** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
Benzo(b)thiophene	**5.34** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C1-Benzo(b)thiophenes	**11.8** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C2-Benzo(b)thiophenes	**21.2** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C3-Benzo(b)thiophenes	**24.7** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C4-Benzo(b)thiophenes	**15.8** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-854-S2
Date Sampled: 08/28/23 13:01
Percent Solids: 85
Initial Volume: 5.28
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**78.0** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
2-Methylnaphthalene	**47.1** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
1-Methylnaphthalene	**28.5** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C1-Naphthalenes	**49.0** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C2-Naphthalenes	**186** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C3-Naphthalenes	**274** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C4-Naphthalenes	**215** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
Biphenyl	**30.1** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
Acenaphthylene	**301** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
Acenaphthene	**157** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
Dibenzofuran	**48.3** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
Fluorene	**171** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C1-Fluorenes	**166** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C2-Fluorenes	**178** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C3-Fluorenes	**167** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
Dibenzothiophene	**125** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C1-Dibenzothiophenes	**177** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C2-Dibenzothiophenes	**212** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C3-Dibenzothiophenes	**173** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C4-Dibenzothiophenes	**100** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
Phenanthrene	**1440** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
Anthracene	**623** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C1-Phenanthrenes/Anthracenes	**995** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C2-Phenanthrenes/Anthracenes	**599** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C3-Phenanthrenes/Anthracenes	**271** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C4-Phenanthrenes/Anthracenes	**113** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
Retene	**32.6** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
Benzo(b)naphtho(2,1-d)thiophene	**156** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C0-Benzonaphthothiophenes	**287** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C1-Benzonaphthothiophenes	**215** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C2-Benzonaphthothiophenes	**212** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C3-Benzonaphthothiophenes	**173** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-854-S2
Date Sampled: 08/28/23 13:01
Percent Solids: 85
Initial Volume: 5.28
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**88.1** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
Fluoranthene	**1950** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
Pyrene	**2030** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C1-Fluoranthenes/Pyrenes	**1140** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C2-Fluoranthenes/Pyrenes	**530** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C3-Fluoranthenes/Pyrenes	**212** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
Benzo(b)fluorene	**131** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
Benzo(c)fluorene	**64.8** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
2-Methylpyrene	**155** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
4-Methylpyrene	**139** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
1-Methylpyrene	**117** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
Benz(a)anthracene	**1050** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
Chrysene/triphenylene	**1050** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C1-Benzo(a)anthracenes/Chrysenes	**583** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C2-Benzo(a)anthracenes/Chrysenes	**317** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C3-Benzo(a)anthracenes/Chrysenes	**189** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C4-Benzo(a)anthracenes/Chrysenes	**97.7** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
Benzo(b)fluoranthene	**748** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
Benzo(j/k)fluoranthene	**837** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
Benzo(e)pyrene	**654** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
Benzo(a)pyrene	**1120** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
Perylene	**264** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
Indeno(1,2,3-cd)pyrene	**748** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
Dibenzo(a,h)anthracene	**174** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
Benzo(g,h,i)perylene	**589** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
Coronene	**167** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
Tetramethyl lead	ND (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
Trimethylethyl lead	ND (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
Dimethyldiethyl lead	ND (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
Methyltriethyl lead	ND (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
Tetraethyl lead	ND (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
2,6,10-trimethyldodecane (1380)	**101** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-854-S2
Date Sampled: 08/28/23 13:01
Percent Solids: 85
Initial Volume: 5.28
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**153** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
2,6,10-trimethylpentadecane (1650)	**114** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C-17	**86.3** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
Pristane	**293** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
C-18	**72.9** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
Phytane	**286** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
Carbazole	**52.2** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
2,6-Dimethylnaphthalene	**40.4** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
2,3,5-Trimethylnaphthene	**17.9** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
4-Methyldibenzothiophene	**66.7** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
2/3-Methyldibenzothiophene	**61.8** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
1-Methyldibenzothiophene	**22.1** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
3-Methylphenanthrene	**222** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
2-Methylphenanthrene	**265** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
2-Methylanthracene	**122** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
4/9-Methylphenanthrene	**235** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102
1-Methylphenanthrene	**146** (4.43)	2.22	8270 Mod		1	IBM	09/06/23 11:59	F3I0001	FH33102

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*75 %*		*50-120*
Surrogate: Naphthalene-d8	*75 %*		*50-120*
Surrogate: Phenanthrene-d10	*79 %*		*50-120*
Surrogate: Perylene-d12	*85 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-854-S2
Date Sampled: 08/28/23 13:01
Percent Solids: 85

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-09
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**9370** (475)		LK		1	CCP	09/06/23 18:27	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-843-S1
Date Sampled: 08/28/23 13:15
Percent Solids: 59
Initial Volume: 5.57
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**434** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C1-Benzene	**506** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C2-Benzenes	**1180** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C3-Benzenes	**972** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C4-Benzenes	**388** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C5-Benzenes	**149** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
Methylcyclohexane	**65.2** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
Toluene	**631** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
Ethylbenzene	**973** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
m,p-Xylene	**868** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
Styrene	**512** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
o-Xylene	**201** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
Isopropylbenzene	**913** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
n-Propylbenzene	**431** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
1,3,5-Trimethylbenzene	**81.4** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
1,2,3-Trimethylbenzene	**44.8** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
1,2,4-Trimethylbenzene	**122** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
t-Butylbenzene	ND (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
sec-Butylbenzene	**91.8** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
p-Isopropyltoluene	**61.5** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
n-Butylbenzene	**48.7** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
trans-Decalin	**48.8** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
cis-Decalin	ND (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C1-Decalins	**81.3** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C2-Decalins	**87.0** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C3-Decalins	**57.8** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C4-Decalins	ND (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
Benzo(b)thiophene	**44.2** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C1-Benzo(b)thiophenes	**2310** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C2-Benzo(b)thiophenes	**78.5** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C3-Benzo(b)thiophenes	**54.5** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C4-Benzo(b)thiophenes	**J 24.1** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-843-S1
Date Sampled: 08/28/23 13:15
Percent Solids: 59
Initial Volume: 5.57
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**1130** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
2-Methylnaphthalene	**469** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
1-Methylnaphthalene	**395** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C1-Naphthalenes	**552** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C2-Naphthalenes	**726** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C3-Naphthalenes	**577** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C4-Naphthalenes	**323** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
Biphenyl	**162** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
Acenaphthylene	**594** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
Acenaphthene	**1290** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
Dibenzofuran	**1030** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
Fluorene	**1250** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C1-Fluorenes	**419** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C2-Fluorenes	**457** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C3-Fluorenes	**842** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
Dibenzothiophene	**925** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C1-Dibenzothiophenes	**616** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C2-Dibenzothiophenes	**549** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C3-Dibenzothiophenes	**299** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C4-Dibenzothiophenes	**167** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
Phenanthrene	**13700** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
Anthracene	**3440** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C1-Phenanthrenes/Anthracenes	**4620** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C2-Phenanthrenes/Anthracenes	**2350** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C3-Phenanthrenes/Anthracenes	**967** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C4-Phenanthrenes/Anthracenes	**387** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
Retene	**143** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
Benzo(b)naphtho(2,1-d)thiophene	**1050** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C0-Benzonaphthothiophenes	**2000** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C1-Benzonaphthothiophenes	**922** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C2-Benzonaphthothiophenes	**604** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C3-Benzonaphthothiophenes	**439** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-843-S1
Date Sampled: 08/28/23 13:15
Percent Solids: 59
Initial Volume: 5.57
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**184** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
Fluoranthene	**16400** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
Pyrene	**14600** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C1-Fluoranthenes/Pyrenes	**5510** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C2-Fluoranthenes/Pyrenes	**3640** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C3-Fluoranthenes/Pyrenes	**1380** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
Benzo(b)fluorene	**455** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
Benzo(c)fluorene	**230** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
2-Methylpyrene	**801** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
4-Methylpyrene	**700** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
1-Methylpyrene	**621** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
Benz(a)anthracene	**7760** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
Chrysene/triphenylene	**7920** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C1-Benzo(a)anthracenes/Chrysenes	**3420** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C2-Benzo(a)anthracenes/Chrysenes	**1780** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C3-Benzo(a)anthracenes/Chrysenes	**956** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C4-Benzo(a)anthracenes/Chrysenes	**445** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
Benzo(b)fluoranthene	**6080** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
Benzo(j/k)fluoranthene	**6100** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
Benzo(e)pyrene	**5180** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
Benzo(a)pyrene	**8520** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
Perylene	**2220** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
Indeno(1,2,3-cd)pyrene	**5840** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
Dibenzo(a,h)anthracene	**1310** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
Benzo(g,h,i)perylene	**4840** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
Coronene	**1290** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
Tetramethyl lead	ND (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
Trimethylethyl lead	ND (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
Dimethyldiethyl lead	ND (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
Methyltriethyl lead	ND (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
Tetraethyl lead	ND (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
2,6,10-trimethyldodecane (1380)	**48.9** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-843-S1
Date Sampled: 08/28/23 13:15
Percent Solids: 59
Initial Volume: 5.57
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**127** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
2,6,10-trimethylpentadecane (1650)	**64.0** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C-17	**348** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
Pristane	**107** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
C-18	**187** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
Phytane	**107** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
Carbazole	**2020** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
2,6-Dimethylnaphthalene	**183** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
2,3,5-Trimethylnaphthene	**50.2** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
4-Methyldibenzothiophene	**184** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
2/3-Methyldibenzothiophene	**214** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
1-Methyldibenzothiophene	**76.5** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
3-Methylphenanthrene	**1040** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
2-Methylphenanthrene	**1300** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
2-Methylanthracene	**578** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
4/9-Methylphenanthrene	**951** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102
1-Methylphenanthrene	**709** (24.5)	12.3	8270 Mod		4	IBM	09/06/23 13:24	F3I0001	FH33102

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*75 %*		*50-120*
Surrogate: Naphthalene-d8	*75 %*		*50-120*
Surrogate: Phenanthrene-d10	*78 %*		*50-120*
Surrogate: Perylene-d12	*88 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-843-S1
Date Sampled: 08/28/23 13:15
Percent Solids: 59

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-10
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**86300** (468)		LK		1	CCP	09/06/23 13:25	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-843-S2
Date Sampled: 08/28/23 13:16
Percent Solids: 77
Initial Volume: 4.83
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**130** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C1-Benzene	**415** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C2-Benzenes	**471** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C3-Benzenes	**297** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C4-Benzenes	**509** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C5-Benzenes	**308** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
Methylcyclohexane	**74.5** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
Toluene	**508** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
Ethylbenzene	**84.4** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
m,p-Xylene	**598** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
Styrene	**357** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
o-Xylene	**59.4** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
Isopropylbenzene	ND (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
n-Propylbenzene	**26.4** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
1,3,5-Trimethylbenzene	**39.1** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
1,2,3-Trimethylbenzene	**45.4** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
1,2,4-Trimethylbenzene	**117** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
t-Butylbenzene	ND (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
sec-Butylbenzene	ND (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
p-Isopropyltoluene	**33.1** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
n-Butylbenzene	**39.7** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
trans-Decalin	**126** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
cis-Decalin	**25.8** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C1-Decalins	**507** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C2-Decalins	**619** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C3-Decalins	**414** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C4-Decalins	**557** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
Benzo(b)thiophene	**195** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C1-Benzo(b)thiophenes	**463** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C2-Benzo(b)thiophenes	**648** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C3-Benzo(b)thiophenes	**343** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C4-Benzo(b)thiophenes	**125** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-843-S2
Date Sampled: 08/28/23 13:16
Percent Solids: 77
Initial Volume: 4.83
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**2880** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
2-Methylnaphthalene	**1170** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
1-Methylnaphthalene	**1630** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C1-Naphthalenes	**1770** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C2-Naphthalenes	**3230** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C3-Naphthalenes	**1650** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C4-Naphthalenes	**855** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
Biphenyl	**298** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
Acenaphthylene	**2140** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
Acenaphthene	**6720** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
Dibenzofuran	**354** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
Fluorene	**2770** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C1-Fluorenes	**1070** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C2-Fluorenes	**972** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C3-Fluorenes	**898** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
Dibenzothiophene	**1390** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C1-Dibenzothiophenes	**1420** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C2-Dibenzothiophenes	**1410** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C3-Dibenzothiophenes	**1090** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C4-Dibenzothiophenes	**671** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
Phenanthrene	**12300** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
Anthracene	**4140** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C1-Phenanthrenes/Anthracenes	**5920** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C2-Phenanthrenes/Anthracenes	**3100** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C3-Phenanthrenes/Anthracenes	**1560** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C4-Phenanthrenes/Anthracenes	**733** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
Retene	**285** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
Benzo(b)naphtho(2,1-d)thiophene	**1060** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C0-Benzonaphthothiophenes	**2010** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C1-Benzonaphthothiophenes	**1360** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C2-Benzonaphthothiophenes	**1190** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C3-Benzonaphthothiophenes	**934** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-843-S2
Date Sampled: 08/28/23 13:16
Percent Solids: 77
Initial Volume: 4.83
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**447** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
Fluoranthene	**12200** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
Pyrene	**14700** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C1-Fluoranthenes/Pyrenes	**7770** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C2-Fluoranthenes/Pyrenes	**2910** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C3-Fluoranthenes/Pyrenes	**1250** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
Benzo(b)fluorene	**920** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
Benzo(c)fluorene	**431** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
2-Methylpyrene	**1040** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
4-Methylpyrene	**992** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
1-Methylpyrene	**894** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
Benz(a)anthracene	**6390** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
Chrysene/triphenylene	**6570** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C1-Benzo(a)anthracenes/Chrysenes	**3320** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C2-Benzo(a)anthracenes/Chrysenes	**1710** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C3-Benzo(a)anthracenes/Chrysenes	**981** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C4-Benzo(a)anthracenes/Chrysenes	**542** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
Benzo(b)fluoranthene	**4370** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
Benzo(j/k)fluoranthene	**5030** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
Benzo(e)pyrene	**4210** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
Benzo(a)pyrene	**7510** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
Perylene	**1470** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
Indeno(1,2,3-cd)pyrene	**4670** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
Dibenzo(a,h)anthracene	**1010** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
Benzo(g,h,i)perylene	**3910** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
Coronene	**1180** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
Tetramethyl lead	ND (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
Trimethylethyl lead	ND (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
Dimethyldiethyl lead	ND (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
Methyltriethyl lead	ND (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
Tetraethyl lead	ND (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
2,6,10-trimethyldodecane (1380)	**451** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-843-S2
Date Sampled: 08/28/23 13:16
Percent Solids: 77
Initial Volume: 4.83
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**635** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
2,6,10-trimethylpentadecane (1650)	**549** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C-17	**317** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
Pristane	**1120** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
C-18	**244** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
Phytane	**1380** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
Carbazole	**350** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
2,6-Dimethylnaphthalene	**669** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
2,3,5-Trimethylnaphthene	**97.9** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
4-Methyldibenzothiophene	**508** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
2/3-Methyldibenzothiophene	**476** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
1-Methyldibenzothiophene	**185** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
3-Methylphenanthrene	**1330** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
2-Methylphenanthrene	**1530** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
2-Methylanthracene	**655** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
4/9-Methylphenanthrene	**1410** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102
1-Methylphenanthrene	**988** (21.5)	10.7	8270 Mod		4	IBM	09/06/23 14:48	F3I0001	FH33102

	%Recovery	*Qualifier*	*Limits*
Surrogate: Toluene-D8	*80 %*		*50-120*
Surrogate: Naphthalene-d8	*78 %*		*50-120*
Surrogate: Phenanthrene-d10	*82 %*		*50-120*
Surrogate: Perylene-d12	*92 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-843-S2
Date Sampled: 08/28/23 13:16
Percent Solids: 77

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-11
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**72800** (468)		LK		1	CCP	09/06/23 13:42	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-844-S1
Date Sampled: 08/28/23 14:15
Percent Solids: 59
Initial Volume: 5.93
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**201** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C1-Benzene	**341** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C2-Benzenes	**432** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C3-Benzenes	**120** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C4-Benzenes	**119** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C5-Benzenes	**71.5** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
Methylcyclohexane	**J 15.1** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
Toluene	**426** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
Ethylbenzene	**196** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
m,p-Xylene	**431** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
Styrene	**2070** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
o-Xylene	**35.4** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
Isopropylbenzene	**J 17.2** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
n-Propylbenzene	**35.1** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
1,3,5-Trimethylbenzene	**J 11.6** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
1,2,3-Trimethylbenzene	**J 15.2** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
1,2,4-Trimethylbenzene	**30.8** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
t-Butylbenzene	ND (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
sec-Butylbenzene	ND (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
p-Isopropyltoluene	**65.4** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
n-Butylbenzene	**48.3** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
trans-Decalin	ND (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
cis-Decalin	ND (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C1-Decalins	**36.3** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C2-Decalins	ND (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C3-Decalins	ND (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C4-Decalins	ND (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
Benzo(b)thiophene	**J 18.4** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C1-Benzo(b)thiophenes	**96.3** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C2-Benzo(b)thiophenes	**59.8** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C3-Benzo(b)thiophenes	**36.8** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C4-Benzo(b)thiophenes	**J 17.9** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-844-S1
Date Sampled: 08/28/23 14:15
Percent Solids: 59
Initial Volume: 5.93
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**276** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
2-Methylnaphthalene	**177** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
1-Methylnaphthalene	**100** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C1-Naphthalenes	**179** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C2-Naphthalenes	**269** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C3-Naphthalenes	**218** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C4-Naphthalenes	**107** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
Biphenyl	**70.6** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
Acenaphthylene	**502** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
Acenaphthene	**491** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
Dibenzofuran	**186** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
Fluorene	**384** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C1-Fluorenes	**187** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C2-Fluorenes	**142** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C3-Fluorenes	**212** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
Dibenzothiophene	**323** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C1-Dibenzothiophenes	**257** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C2-Dibenzothiophenes	**195** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C3-Dibenzothiophenes	**104** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C4-Dibenzothiophenes	**85.1** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
Phenanthrene	**3340** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
Anthracene	**1160** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C1-Phenanthrenes/Anthracenes	**1370** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C2-Phenanthrenes/Anthracenes	**627** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C3-Phenanthrenes/Anthracenes	**299** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C4-Phenanthrenes/Anthracenes	**277** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
Retene	**851** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
Benzo(b)naphtho(2,1-d)thiophene	**370** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C0-Benzonaphthothiophenes	**751** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C1-Benzonaphthothiophenes	**305** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C2-Benzonaphthothiophenes	**207** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C3-Benzonaphthothiophenes	**157** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-844-S1
Date Sampled: 08/28/23 14:15
Percent Solids: 59
Initial Volume: 5.93
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**79.6** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
Fluoranthene	**4830** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
Pyrene	**5130** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C1-Fluoranthenes/Pyrenes	**2110** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C2-Fluoranthenes/Pyrenes	**826** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C3-Fluoranthenes/Pyrenes	**334** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
Benzo(b)fluorene	**289** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
Benzo(c)fluorene	**117** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
2-Methylpyrene	**271** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
4-Methylpyrene	**229** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
1-Methylpyrene	**217** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
Benz(a)anthracene	**2520** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
Chrysene/triphenylene	**2330** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C1-Benzo(a)anthracenes/Chrysenes	**940** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C2-Benzo(a)anthracenes/Chrysenes	**474** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C3-Benzo(a)anthracenes/Chrysenes	**250** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C4-Benzo(a)anthracenes/Chrysenes	**124** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
Benzo(b)fluoranthene	**1770** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
Benzo(j/k)fluoranthene	**1960** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
Benzo(e)pyrene	**1570** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
Benzo(a)pyrene	**2840** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
Perylene	**617** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
Indeno(1,2,3-cd)pyrene	**1780** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
Dibenzo(a,h)anthracene	**378** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
Benzo(g,h,i)perylene	**1470** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
Coronene	**438** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
Tetramethyl lead	ND (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
Trimethylethyl lead	ND (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
Dimethyldiethyl lead	ND (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
Methyltriethyl lead	ND (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
Tetraethyl lead	ND (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
2,6,10-trimethyldodecane (1380)	**26.5** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-844-S1
Date Sampled: 08/28/23 14:15
Percent Solids: 59
Initial Volume: 5.93
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**79.2** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
2,6,10-trimethylpentadecane (1650)	**34.8** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C-17	**239** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
Pristane	**62.8** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
C-18	**131** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
Phytane	**68.2** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
Carbazole	**267** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
2,6-Dimethylnaphthalene	**85.4** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
2,3,5-Trimethylnaphthene	**J 17.1** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
4-Methyldibenzothiophene	**77.5** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
2/3-Methyldibenzothiophene	**82.2** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
1-Methyldibenzothiophene	**32.2** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
3-Methylphenanthrene	**301** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
2-Methylphenanthrene	**356** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
2-Methylanthracene	**192** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
4/9-Methylphenanthrene	**300** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102
1-Methylphenanthrene	**207** (23.0)	11.5	8270 Mod		4	IBM	09/06/23 16:11	F3I0001	FH33102

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*62 %*		*50-120*
Surrogate: Naphthalene-d8	*58 %*		*50-120*
Surrogate: Phenanthrene-d10	*63 %*		*50-120*
Surrogate: Perylene-d12	*68 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-844-S1
Date Sampled: 08/28/23 14:15
Percent Solids: 59

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-12
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**26700** (479)		LK		1	CCP	09/06/23 14:31	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-844-S2
Date Sampled: 08/28/23 14:16
Percent Solids: 58
Initial Volume: 5.21
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-13
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**277** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C1-Benzene	**390** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C2-Benzenes	**613** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C3-Benzenes	**321** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C4-Benzenes	**702** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C5-Benzenes	**650** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
Methylcyclohexane	**45.3** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
Toluene	**476** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
Ethylbenzene	**38.4** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
m,p-Xylene	**849** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
Styrene	**1590** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
o-Xylene	**38.7** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
Isopropylbenzene	**J 13.8** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
n-Propylbenzene	**51.1** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
1,3,5-Trimethylbenzene	**46.4** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
1,2,3-Trimethylbenzene	**54.9** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
1,2,4-Trimethylbenzene	**173** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
t-Butylbenzene	ND (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
sec-Butylbenzene	ND (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
p-Isopropyltoluene	**50.6** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
n-Butylbenzene	**109** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
trans-Decalin	**1820** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
cis-Decalin	**205** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C1-Decalins	**2670** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C2-Decalins	**905** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C3-Decalins	**450** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C4-Decalins	**890** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
Benzo(b)thiophene	**J 13.8** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C1-Benzo(b)thiophenes	**100** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C2-Benzo(b)thiophenes	**95.6** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C3-Benzo(b)thiophenes	**68.8** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C4-Benzo(b)thiophenes	**68.5** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-844-S2
Date Sampled: 08/28/23 14:16
Percent Solids: 58
Initial Volume: 5.21
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-13
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**227** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
2-Methylnaphthalene	**153** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
1-Methylnaphthalene	**109** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C1-Naphthalenes	**171** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C2-Naphthalenes	**432** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C3-Naphthalenes	**594** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C4-Naphthalenes	**560** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
Biphenyl	**125** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
Acenaphthylene	**603** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
Acenaphthene	**359** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
Dibenzofuran	**135** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
Fluorene	**353** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C1-Fluorenes	**252** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C2-Fluorenes	**423** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C3-Fluorenes	**566** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
Dibenzothiophene	**240** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C1-Dibenzothiophenes	**373** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C2-Dibenzothiophenes	**555** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C3-Dibenzothiophenes	**525** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C4-Dibenzothiophenes	**347** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
Phenanthrene	**2580** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
Anthracene	**1030** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C1-Phenanthrenes/Anthracenes	**1790** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C2-Phenanthrenes/Anthracenes	**1440** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C3-Phenanthrenes/Anthracenes	**850** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C4-Phenanthrenes/Anthracenes	**453** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
Retene	**396** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
Benzo(b)naphtho(2,1-d)thiophene	**419** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C0-Benzonaphthothiophenes	**798** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C1-Benzonaphthothiophenes	**593** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C2-Benzonaphthothiophenes	**619** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C3-Benzonaphthothiophenes	**516** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-844-S2
Date Sampled: 08/28/23 14:16
Percent Solids: 58
Initial Volume: 5.21
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-13
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**277** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
Fluoranthene	**4760** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
Pyrene	**4920** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C1-Fluoranthenes/Pyrenes	**2840** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C2-Fluoranthenes/Pyrenes	**1620** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C3-Fluoranthenes/Pyrenes	**772** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
Benzo(b)fluorene	**313** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
Benzo(c)fluorene	**130** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
2-Methylpyrene	**393** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
4-Methylpyrene	**393** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
1-Methylpyrene	**312** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
Benz(a)anthracene	**2650** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
Chrysene/triphenylene	**2880** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C1-Benzo(a)anthracenes/Chrysenes	**1750** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C2-Benzo(a)anthracenes/Chrysenes	**1130** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C3-Benzo(a)anthracenes/Chrysenes	**635** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C4-Benzo(a)anthracenes/Chrysenes	**320** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
Benzo(b)fluoranthene	**2050** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
Benzo(j/k)fluoranthene	**2300** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
Benzo(e)pyrene	**1930** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
Benzo(a)pyrene	**3040** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
Perylene	**882** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
Indeno(1,2,3-cd)pyrene	**2050** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
Dibenzo(a,h)anthracene	**459** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
Benzo(g,h,i)perylene	**1730** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
Coronene	**501** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
Tetramethyl lead	ND (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
Trimethylethyl lead	ND (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
Dimethyldiethyl lead	ND (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
Methyltriethyl lead	ND (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
Tetraethyl lead	ND (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
2,6,10-trimethyldodecane (1380)	**482** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-844-S2
Date Sampled: 08/28/23 14:16
Percent Solids: 58
Initial Volume: 5.21
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-13
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**818** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
2,6,10-trimethylpentadecane (1650)	**698** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C-17	**300** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
Pristane	**1740** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
C-18	**187** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
Phytane	**1520** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
Carbazole	**267** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
2,6-Dimethylnaphthalene	**106** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
2,3,5-Trimethylnaphthene	**36.1** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
4-Methyldibenzothiophene	**139** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
2/3-Methyldibenzothiophene	**127** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
1-Methyldibenzothiophene	**51.4** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
3-Methylphenanthrene	**379** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
2-Methylphenanthrene	**431** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
2-Methylanthracene	**208** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
4/9-Methylphenanthrene	**426** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102
1-Methylphenanthrene	**282** (26.4)	13.2	8270 Mod		4	IBM	09/06/23 17:32	F3I0001	FH33102

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*80 %*		*50-120*
Surrogate: Naphthalene-d8	*75 %*		*50-120*
Surrogate: Phenanthrene-d10	*82 %*		*50-120*
Surrogate: Perylene-d12	*87 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-844-S2
Date Sampled: 08/28/23 14:16
Percent Solids: 58

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-13
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**32200** (485)		LK		1	CCP	09/06/23 14:48	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-844-S3
Date Sampled: 08/28/23 14:17
Percent Solids: 44
Initial Volume: 4.94
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-14
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**311** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C1-Benzene	**2710** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C2-Benzenes	**1290** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C3-Benzenes	**2250** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C4-Benzenes	**3280** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C5-Benzenes	**2270** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
Methylcyclohexane	**186** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
Toluene	**3330** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
Ethylbenzene	**176** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
m,p-Xylene	**1570** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
Styrene	**1900** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
o-Xylene	**256** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
Isopropylbenzene	**61.5** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
n-Propylbenzene	**309** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
1,3,5-Trimethylbenzene	**380** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
1,2,3-Trimethylbenzene	**345** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
1,2,4-Trimethylbenzene	**1690** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
t-Butylbenzene	**79.3** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
sec-Butylbenzene	**47.7** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
p-Isopropyltoluene	**161** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
n-Butylbenzene	**360** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
trans-Decalin	**1410** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
cis-Decalin	**263** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C1-Decalins	**4860** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C2-Decalins	**5820** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C3-Decalins	**4340** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C4-Decalins	**5380** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
Benzo(b)thiophene	**159** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C1-Benzo(b)thiophenes	**349** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C2-Benzo(b)thiophenes	**716** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C3-Benzo(b)thiophenes	**681** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C4-Benzo(b)thiophenes	**629** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-844-S3
Date Sampled: 08/28/23 14:17
Percent Solids: 44
Initial Volume: 4.94
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-14
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**2930** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
2-Methylnaphthalene	**2040** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
1-Methylnaphthalene	**1370** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C1-Naphthalenes	**2210** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C2-Naphthalenes	**5240** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C3-Naphthalenes	**5890** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C4-Naphthalenes	**3800** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
Biphenyl	**700** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
Acenaphthylene	**4100** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
Acenaphthene	**6270** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
Dibenzofuran	**723** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
Fluorene	**2810** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C1-Fluorenes	**2320** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C2-Fluorenes	**2660** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C3-Fluorenes	**2590** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
Dibenzothiophene	**2270** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C1-Dibenzothiophenes	**3310** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C2-Dibenzothiophenes	**3830** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C3-Dibenzothiophenes	**3160** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C4-Dibenzothiophenes	**1870** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
Phenanthrene	**21400** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
Anthracene	**8730** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C1-Phenanthrenes/Anthracenes	**13400** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C2-Phenanthrenes/Anthracenes	**8660** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C3-Phenanthrenes/Anthracenes	**4800** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C4-Phenanthrenes/Anthracenes	**2240** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
Retene	**520** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
Benzo(b)naphtho(2,1-d)thiophene	**2680** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C0-Benzonaphthothiophenes	**4910** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C1-Benzonaphthothiophenes	**3440** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C2-Benzonaphthothiophenes	**2880** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C3-Benzonaphthothiophenes	**2110** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-844-S3
Date Sampled: 08/28/23 14:17
Percent Solids: 44
Initial Volume: 4.94
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-14
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**876** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
Fluoranthene	**27700** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
Pyrene	**35000** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C1-Fluoranthenes/Pyrenes	**19800** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C2-Fluoranthenes/Pyrenes	**7170** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C3-Fluoranthenes/Pyrenes	**3080** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
Benzo(b)fluorene	**2490** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
Benzo(c)fluorene	**943** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
2-Methylpyrene	**2630** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
4-Methylpyrene	**2490** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
1-Methylpyrene	**2280** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
Benz(a)anthracene	**16700** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
Chrysene/triphenylene	**17700** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C1-Benzo(a)anthracenes/Chrysenes	**9050** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C2-Benzo(a)anthracenes/Chrysenes	**4630** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C3-Benzo(a)anthracenes/Chrysenes	**2480** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C4-Benzo(a)anthracenes/Chrysenes	**1290** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
Benzo(b)fluoranthene	**11400** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
Benzo(j/k)fluoranthene	**13300** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
Benzo(e)pyrene	**11600** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
Benzo(a)pyrene	**20000** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
Perylene	**3920** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
Indeno(1,2,3-cd)pyrene	**12300** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
Dibenzo(a,h)anthracene	**2610** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
Benzo(g,h,i)perylene	**10600** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
Coronene	**3360** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
Tetramethyl lead	ND (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
Trimethylethyl lead	ND (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
Dimethyldiethyl lead	ND (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
Methyltriethyl lead	ND (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
Tetraethyl lead	ND (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
2,6,10-trimethyldodecane (1380)	**8910** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-844-S3
Date Sampled: 08/28/23 14:17
Percent Solids: 44
Initial Volume: 4.94
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-14
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**10900** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
2,6,10-trimethylpentadecane (1650)	**10200** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C-17	**634** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
Pristane	**18900** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
C-18	**643** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
Phytane	**16600** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
Carbazole	**645** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
2,6-Dimethylnaphthalene	**1080** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
2,3,5-Trimethylnaphthene	**367** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
4-Methyldibenzothiophene	**1230** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
2/3-Methyldibenzothiophene	**1080** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
1-Methyldibenzothiophene	**417** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
3-Methylphenanthrene	**2900** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
2-Methylphenanthrene	**3450** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
2-Methylanthracene	**1560** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
4/9-Methylphenanthrene	**3280** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102
1-Methylphenanthrene	**2080** (37.2)	18.6	8270 Mod		4	IBM	09/06/23 18:54	F3I0001	FH33102

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*71 %*		*50-120*
Surrogate: Naphthalene-d8	*75 %*		*50-120*
Surrogate: Phenanthrene-d10	*77 %*		*50-120*
Surrogate: Perylene-d12	*88 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-844-S3
Date Sampled: 08/28/23 14:17
Percent Solids: 44

ESS Laboratory Work Order: F230029
ESS Laboratory Sample ID: F230029-14
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**106000** (466)		LK		1	CCP	09/06/23 15:04	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230029

Quality Control Data

Classical Chemistry

Batch DH32831 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	500	mg/kg							
Total Organic Carbon (2)	ND	500	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230029

Quality Control Data

Classical Chemistry

Batch DH32831 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9670	500	mg/kg	10010		97	80-120			
Total Organic Carbon (2)	9430	500	mg/kg	10010		94	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230029

Quality Control Data

Classical Chemistry

Batch DH32831 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9700	500	mg/kg	10010		97	80-120	0.3	25	
Total Organic Carbon (2)	9660	500	mg/kg	10010		97	80-120	2	25	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230029

Quality Control Data

Classical Chemistry

Batch DH33045 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	500	mg/kg							
Total Organic Carbon (2)	ND	500	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230029

Quality Control Data

Classical Chemistry

Batch DH33045 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9840	500	mg/kg	10010		98	80-120			
Total Organic Carbon (2)	9840	500	mg/kg	10010		98	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230029

Quality Control Data

Classical Chemistry

Batch DH33045 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9830	500	mg/kg	10010		98	80-120	0.06	25	
Total Organic Carbon (2)	9880	500	mg/kg	10010		99	80-120	0.4	25	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230029

Quality Control Data

Alkylated PAHs

Batch FH33102 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	10.0	4.00	ug/Kg wet							
C1-Benzene	2.11	4.00	ug/Kg wet							J
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	2.63	4.00	ug/Kg wet							J
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	7.75	4.00	ug/Kg wet							
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230029

Quality Control Data

Alkylated PAHs

Batch FH33102 - 3570			
C1-Fluorenes	ND	4.00	ug/Kg wet
C2-Fluorenes	ND	4.00	ug/Kg wet
C3-Fluorenes	ND	4.00	ug/Kg wet
Dibenzothiophene	ND	4.00	ug/Kg wet
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet
Phenanthrene	ND	4.00	ug/Kg wet
Anthracene	ND	4.00	ug/Kg wet
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
Retene	ND	4.00	ug/Kg wet
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
Fluoranthene	ND	4.00	ug/Kg wet
Pyrene	ND	4.00	ug/Kg wet
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
Benzo(b)fluorene	ND	4.00	ug/Kg wet
Benzo(c)fluorene	ND	4.00	ug/Kg wet
2-Methylpyrene	ND	4.00	ug/Kg wet
4-Methylpyrene	ND	4.00	ug/Kg wet
1-Methylpyrene	ND	4.00	ug/Kg wet
Benz(a)anthracene	ND	4.00	ug/Kg wet
Chrysene/triphenylene	ND	4.00	ug/Kg wet
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet
Benzo(e)pyrene	ND	4.00	ug/Kg wet
Benzo(a)pyrene	ND	4.00	ug/Kg wet
Perylene	ND	4.00	ug/Kg wet
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet
Coronene	ND	4.00	ug/Kg wet
Tetramethyl lead	ND	4.00	ug/Kg wet
Trimethylethyl lead	ND	4.00	ug/Kg wet

CERTIFICATE OF ANALYSIS

Client Name: GEI
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Quality Control Data

Alkylated PAHs

Batch FH33102 - 3570						
Dimethyldiethyl lead	ND	4.00	ug/Kg wet			
Methyltriethyl lead	ND	4.00	ug/Kg wet			
Tetraethyl lead	ND	4.00	ug/Kg wet			
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet			
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet			
2,6,10-trimethylpentadecane (1650)	ND	4.00	ug/Kg wet			
C-17	4.81	4.00	ug/Kg wet			
Pristane	ND	4.00	ug/Kg wet			
C-18	5.28	4.00	ug/Kg wet			
Phytane	ND	4.00	ug/Kg wet			
Carbazole	ND	4.00	ug/Kg wet			
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet			
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet			
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
3-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylanthracene	ND	4.00	ug/Kg wet			
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet			
1-Methylphenanthrene	ND	4.00	ug/Kg wet			
Surrogate: Toluene-D8	*322*		ug/Kg wet	*400.0*	*81*	*50-120*
Surrogate: Naphthalene-d8	*305*		ug/Kg wet	*400.0*	*76*	*50-120*
Surrogate: Phenanthrene-d10	*332*		ug/Kg wet	*400.0*	*83*	*50-120*
Surrogate: Perylene-d12	*343*		ug/Kg wet	*400.0*	*86*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230029

Quality Control Data

Alkylated PAHs

Batch FH33102 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	280	4.00	ug/Kg wet	400.0		70	60-130			
Methylcyclohexane	208	4.00	ug/Kg wet	400.0		52	60-130			B-
Toluene	296	4.00	ug/Kg wet	400.0		74	60-130			
Ethylbenzene	324	4.00	ug/Kg wet	400.0		81	60-130			
m,p-Xylene	317	4.00	ug/Kg wet	400.0		79	60-130			
Styrene	313	4.00	ug/Kg wet	400.0		78	60-130			
o-Xylene	332	4.00	ug/Kg wet	400.0		83	60-130			
Isopropylbenzene	328	4.00	ug/Kg wet	400.0		82	60-130			
n-Propylbenzene	330	4.00	ug/Kg wet	400.0		82	60-130			
1,3,5-Trimethylbenzene	338	4.00	ug/Kg wet	400.0		85	60-130			
1,2,3-Trimethylbenzene	336	4.00	ug/Kg wet	400.0		84	60-130			
1,2,4-Trimethylbenzene	336	4.00	ug/Kg wet	400.0		84	60-130			
t-Butylbenzene	332	4.00	ug/Kg wet	400.0		83	60-130			
sec-Butylbenzene	334	4.00	ug/Kg wet	400.0		83	60-130			
p-Isopropyltoluene	339	4.00	ug/Kg wet	400.0		85	60-130			
n-Butylbenzene	334	4.00	ug/Kg wet	400.0		84	60-130			
trans-Decalin	319	4.00	ug/Kg wet	400.0		80	60-130			
cis-Decalin	320	4.00	ug/Kg wet	400.0		80	60-130			
Benzo(b)thiophene	315	4.00	ug/Kg wet	400.0		79	60-130			
Naphthalene	313	4.00	ug/Kg wet	400.0		78	60-130			
2-Methylnaphthalene	308	4.00	ug/Kg wet	400.0		77	60-130			
1-Methylnaphthalene	309	4.00	ug/Kg wet	400.0		77	60-130			
Biphenyl	285	4.00	ug/Kg wet	400.0		71	60-130			
Acenaphthylene	343	4.00	ug/Kg wet	400.0		86	60-130			
Acenaphthene	328	4.00	ug/Kg wet	400.0		82	60-130			
Dibenzofuran	324	4.00	ug/Kg wet	400.0		81	60-130			
Fluorene	326	4.00	ug/Kg wet	400.0		81	60-130			
Dibenzothiophene	322	4.00	ug/Kg wet	400.0		80	60-130			
Phenanthrene	310	4.00	ug/Kg wet	400.0		78	60-130			
Anthracene	338	4.00	ug/Kg wet	400.0		85	60-130			
Retene	360	4.00	ug/Kg wet	400.0		90	60-130			
Benzo(b)naphtho(2,1-d)thiophene	355	4.00	ug/Kg wet	400.0		89	60-130			
Fluoranthene	340	4.00	ug/Kg wet	400.0		85	60-130			
Pyrene	340	4.00	ug/Kg wet	400.0		85	60-130			
Benz(a)anthracene	371	4.00	ug/Kg wet	400.0		93	60-130			
Chrysene/triphenylene	354	4.00	ug/Kg wet	400.0		88	60-130			
Benzo(b)fluoranthene	350	4.00	ug/Kg wet	400.0		88	60-130			
Benzo(j/k)fluoranthene	354	4.00	ug/Kg wet	400.0		88	60-130			
Benzo(e)pyrene	327	4.00	ug/Kg wet	400.0		82	60-130			
Benzo(a)pyrene	358	4.00	ug/Kg wet	400.0		90	60-130			
Perylene	356	4.00	ug/Kg wet	400.0		89	60-130			
Indeno(1,2,3-cd)pyrene	367	4.00	ug/Kg wet	400.0		92	60-130			
Dibenzo(a,h)anthracene	375	4.00	ug/Kg wet	400.0		94	60-130			
Benzo(g,h,i)perylene	343	4.00	ug/Kg wet	400.0		86	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230029

Quality Control Data

Alkylated PAHs

Batch FH33102 - 3570						
Coronene	362	4.00	ug/Kg wet	400.0	91	60-130
Tetraethyl lead	62.5	4.00	ug/Kg wet	400.0	16	60-130
Surrogate: Toluene-D8	*311*		ug/Kg wet	*400.0*	*78*	*50-120*
Surrogate: Naphthalene-d8	*324*		ug/Kg wet	*400.0*	*81*	*50-120*
Surrogate: Phenanthrene-d10	*342*		ug/Kg wet	*400.0*	*86*	*50-120*
Surrogate: Perylene-d12	*358*		ug/Kg wet	*400.0*	*89*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230029

Quality Control Data

Alkylated PAHs

Batch FH33102 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	ND	4.00	ug/Kg wet				60-130			
Methylcyclohexane	ND	4.00	ug/Kg wet				60-130			
Toluene	ND	4.00	ug/Kg wet				60-130			
Ethylbenzene	ND	4.00	ug/Kg wet				60-130			
m,p-Xylene	ND	4.00	ug/Kg wet				60-130			
Styrene	ND	4.00	ug/Kg wet				60-130			
o-Xylene	ND	4.00	ug/Kg wet				60-130			
Isopropylbenzene	ND	4.00	ug/Kg wet				60-130			
n-Propylbenzene	ND	4.00	ug/Kg wet				60-130			
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet				60-130			
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet				60-130			
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet				60-130			
t-Butylbenzene	ND	4.00	ug/Kg wet				60-130			
sec-Butylbenzene	ND	4.00	ug/Kg wet				60-130			
p-Isopropyltoluene	ND	4.00	ug/Kg wet				60-130			
n-Butylbenzene	ND	4.00	ug/Kg wet				60-130			
trans-Decalin	ND	4.00	ug/Kg wet				60-130			
cis-Decalin	ND	4.00	ug/Kg wet				60-130			
Benzo(b)thiophene	ND	4.00	ug/Kg wet				60-130			
Naphthalene	ND	4.00	ug/Kg wet				60-130			
2-Methylnaphthalene	ND	4.00	ug/Kg wet				60-130			
1-Methylnaphthalene	ND	4.00	ug/Kg wet				60-130			
Biphenyl	ND	4.00	ug/Kg wet				60-130			
Acenaphthylene	ND	4.00	ug/Kg wet				60-130			
Acenaphthene	ND	4.00	ug/Kg wet				60-130			
Dibenzofuran	ND	4.00	ug/Kg wet				60-130			
Fluorene	ND	4.00	ug/Kg wet				60-130			
Dibenzothiophene	ND	4.00	ug/Kg wet				60-130			
Phenanthrene	ND	4.00	ug/Kg wet				60-130			
Anthracene	ND	4.00	ug/Kg wet				60-130			
Retene	ND	4.00	ug/Kg wet				60-130			
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet				60-130			
Fluoranthene	ND	4.00	ug/Kg wet				60-130			
Pyrene	ND	4.00	ug/Kg wet				60-130			
Benz(a)anthracene	ND	4.00	ug/Kg wet				60-130			
Chrysene/triphenylene	ND	4.00	ug/Kg wet				60-130			
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet				60-130			
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet				60-130			
Benzo(e)pyrene	ND	4.00	ug/Kg wet				60-130			
Benzo(a)pyrene	ND	4.00	ug/Kg wet				60-130			
Perylene	ND	4.00	ug/Kg wet				60-130			
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet				60-130			
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet				60-130			
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet				60-130			

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Alkylated PAHs

Batch FH33102 - 3570						
Coronene	ND	4.00	ug/Kg wet			60-130
Tetraethyl lead	368	4.00	ug/Kg wet	400.0	92	60-130
Surrogate: Toluene-D8	*317*		ug/Kg wet	*400.0*	*79*	*50-120*
Surrogate: Naphthalene-d8	*297*		ug/Kg wet	*400.0*	*74*	*50-120*
Surrogate: Phenanthrene-d10	*318*		ug/Kg wet	*400.0*	*80*	*50-120*
Surrogate: Perylene-d12	*332*		ug/Kg wet	*400.0*	*83*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230029

Quality Control Data

Alkylated PAHs

Batch FH33102 - 3570

Duplicate **Source: F230029-14**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	416	36.9	ug/Kg dry		311			29	50	
C1-Benzene	2510	36.9	ug/Kg dry		2710			7	50	
C2-Benzenes	1140	36.9	ug/Kg dry		1290			13	50	
C3-Benzenes	2010	36.9	ug/Kg dry		2250			11	50	
C4-Benzenes	3970	36.9	ug/Kg dry		3280			19	50	
C5-Benzenes	3090	36.9	ug/Kg dry		2270			30	50	
Methylcyclohexane	159	36.9	ug/Kg dry		186			16	50	
Toluene	3110	36.9	ug/Kg dry		3330			7	50	
Ethylbenzene	253	36.9	ug/Kg dry		176			36	50	
m,p-Xylene	1320	36.9	ug/Kg dry		1570			18	50	
Styrene	1900	36.9	ug/Kg dry		1900			0.2	50	
o-Xylene	219	36.9	ug/Kg dry		256			15	50	
Isopropylbenzene	58.1	36.9	ug/Kg dry		61.5			6	50	
n-Propylbenzene	393	36.9	ug/Kg dry		309			24	50	
1,3,5-Trimethylbenzene	319	36.9	ug/Kg dry		380			17	50	
1,2,3-Trimethylbenzene	292	36.9	ug/Kg dry		345			17	50	
1,2,4-Trimethylbenzene	1370	36.9	ug/Kg dry		1690			21	50	
t-Butylbenzene	105	36.9	ug/Kg dry		79.3			28	50	
sec-Butylbenzene	47.8	36.9	ug/Kg dry		47.7			0.3	50	
p-Isopropyltoluene	202	36.9	ug/Kg dry		161			23	50	
n-Butylbenzene	632	36.9	ug/Kg dry		360			55	50	D+
trans-Decalin	2300	36.9	ug/Kg dry		1410			48	50	
cis-Decalin	447	36.9	ug/Kg dry		263			52	50	D+
C1-Decalins	7780	36.9	ug/Kg dry		4860			46	50	
C2-Decalins	7930	36.9	ug/Kg dry		5820			31	50	
C3-Decalins	5310	36.9	ug/Kg dry		4340			20	50	
C4-Decalins	5580	36.9	ug/Kg dry		5380			4	50	
Benzo(b)thiophene	130	36.9	ug/Kg dry		159			20	50	
C1-Benzo(b)thiophenes	333	36.9	ug/Kg dry		349			5	50	
C2-Benzo(b)thiophenes	686	36.9	ug/Kg dry		716			4	50	
C3-Benzo(b)thiophenes	813	36.9	ug/Kg dry		681			18	50	
C4-Benzo(b)thiophenes	603	36.9	ug/Kg dry		629			4	50	
Naphthalene	2300	36.9	ug/Kg dry		2930			24	50	
2-Methylnaphthalene	1460	36.9	ug/Kg dry		2040			33	50	
1-Methylnaphthalene	1140	36.9	ug/Kg dry		1370			18	50	
C1-Naphthalenes	1660	36.9	ug/Kg dry		2210			28	50	
C2-Naphthalenes	5050	36.9	ug/Kg dry		5240			4	50	
C3-Naphthalenes	6330	36.9	ug/Kg dry		5890			7	50	
C4-Naphthalenes	3930	36.9	ug/Kg dry		3800			4	50	
Biphenyl	507	36.9	ug/Kg dry		700			32	50	
Acenaphthylene	3270	36.9	ug/Kg dry		4100			23	50	
Acenaphthene	5480	36.9	ug/Kg dry		6270			13	50	
Dibenzofuran	520	36.9	ug/Kg dry		723			33	50	
Fluorene	1940	36.9	ug/Kg dry		2810			36	50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230029

Quality Control Data

Alkylated PAHs

Batch FH33102 - 3570

C1-Fluorenes	2040	36.9	ug/Kg dry	2320	13	50	
C2-Fluorenes	2530	36.9	ug/Kg dry	2660	5	50	
C3-Fluorenes	2370	36.9	ug/Kg dry	2590	9	50	
Dibenzothiophene	1870	36.9	ug/Kg dry	2270	20	50	
C1-Dibenzothiophenes	2780	36.9	ug/Kg dry	3310	17	50	
C2-Dibenzothiophenes	3460	36.9	ug/Kg dry	3830	10	50	
C3-Dibenzothiophenes	3060	36.9	ug/Kg dry	3160	3	50	
C4-Dibenzothiophenes	1820	36.9	ug/Kg dry	1870	3	50	
Phenanthrene	17900	36.9	ug/Kg dry	21400	17	50	
Anthracene	6970	36.9	ug/Kg dry	8730	23	50	
C1-Phenanthrenes/Anthracenes	11400	36.9	ug/Kg dry	13400	16	50	
C2-Phenanthrenes/Anthracenes	7250	36.9	ug/Kg dry	8660	18	50	
C3-Phenanthrenes/Anthracenes	4480	36.9	ug/Kg dry	4800	7	50	
C4-Phenanthrenes/Anthracenes	2330	36.9	ug/Kg dry	2240	4	50	
Retene	1140	36.9	ug/Kg dry	520	75	50	D+
Benzo(b)naphtho(2,1-d)thiophene	2170	36.9	ug/Kg dry	2680	21	50	
C0-Benzonaphthothiophenes	4110	36.9	ug/Kg dry	4910	18	50	
C1-Benzonaphthothiophenes	2950	36.9	ug/Kg dry	3440	15	50	
C2-Benzonaphthothiophenes	2640	36.9	ug/Kg dry	2880	9	50	
C3-Benzonaphthothiophenes	1950	36.9	ug/Kg dry	2110	8	50	
C4-Benzonaphthothiophenes	916	36.9	ug/Kg dry	876	4	50	
Fluoranthene	23600	36.9	ug/Kg dry	27700	16	50	
Pyrene	29200	36.9	ug/Kg dry	35000	18	50	
C1-Fluoranthenes/Pyrenes	16100	36.9	ug/Kg dry	19800	21	50	
C2-Fluoranthenes/Pyrenes	6120	36.9	ug/Kg dry	7170	16	50	
C3-Fluoranthenes/Pyrenes	2950	36.9	ug/Kg dry	3080	4	50	
Benzo(b)fluorene	2090	36.9	ug/Kg dry	2490	17	50	
Benzo(c)fluorene	757	36.9	ug/Kg dry	943	22	50	
2-Methylpyrene	2210	36.9	ug/Kg dry	2630	17	50	
4-Methylpyrene	2110	36.9	ug/Kg dry	2490	17	50	
1-Methylpyrene	1890	36.9	ug/Kg dry	2280	19	50	
Benz(a)anthracene	13300	36.9	ug/Kg dry	16700	23	50	
Chrysene/triphenylene	14100	36.9	ug/Kg dry	17700	23	50	
C1-Benzo(a)anthracenes/Chrysenes	7330	36.9	ug/Kg dry	9050	21	50	
C2-Benzo(a)anthracenes/Chrysenes	4100	36.9	ug/Kg dry	4630	12	50	
C3-Benzo(a)anthracenes/Chrysenes	2220	36.9	ug/Kg dry	2480	11	50	
C4-Benzo(a)anthracenes/Chrysenes	1230	36.9	ug/Kg dry	1290	5	50	
Benzo(b)fluoranthene	8950	36.9	ug/Kg dry	11400	25	50	
Benzo(j/k)fluoranthene	9990	36.9	ug/Kg dry	13300	28	50	
Benzo(e)pyrene	8880	36.9	ug/Kg dry	11600	27	50	
Benzo(a)pyrene	15200	36.9	ug/Kg dry	20000	27	50	
Perylene	2960	36.9	ug/Kg dry	3920	28	50	
Indeno(1,2,3-cd)pyrene	9170	36.9	ug/Kg dry	12300	29	50	
Dibenzo(a,h)anthracene	1960	36.9	ug/Kg dry	2610	28	50	
Benzo(g,h,i)perylene	7890	36.9	ug/Kg dry	10600	29	50	
Coronene	2470	36.9	ug/Kg dry	3360	30	50	
Tetramethyl lead	ND	36.9	ug/Kg dry	ND		50	
Trimethylethyl lead	ND	36.9	ug/Kg dry	ND		50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230029

Quality Control Data

Alkylated PAHs

Batch FH33102 - 3570								
Dimethyldiethyl lead	ND	36.9	ug/Kg dry		ND			50
Methyltriethyl lead	ND	36.9	ug/Kg dry		ND			50
Tetraethyl lead	ND	36.9	ug/Kg dry		ND			50
2,6,10-trimethyldodecane (1380)	10000	36.9	ug/Kg dry		8910		12	50
2,6,10-trimethyltridecane (1470)	12000	36.9	ug/Kg dry		10900		9	50
2,6,10-trimethylpentadecane (1650)	10100	36.9	ug/Kg dry		10200		1	50
C-17	552	36.9	ug/Kg dry		634		14	50
Pristane	18500	36.9	ug/Kg dry		18900		2	50
C-18	518	36.9	ug/Kg dry		643		22	50
Phytane	15500	36.9	ug/Kg dry		16600		7	50
Carbazole	441	36.9	ug/Kg dry		645		38	50
2,6-Dimethylnaphthalene	824	36.9	ug/Kg dry		1080		27	50
2,3,5-Trimethylnaphthene	408	36.9	ug/Kg dry		367		11	50
4-Methyldibenzothiophene	1050	36.9	ug/Kg dry		1230		16	50
2/3-Methyldibenzothiophene	897	36.9	ug/Kg dry		1080		19	50
1-Methyldibenzothiophene	360	36.9	ug/Kg dry		417		15	50
3-Methylphenanthrene	2470	36.9	ug/Kg dry		2900		16	50
2-Methylphenanthrene	2920	36.9	ug/Kg dry		3450		17	50
2-Methylanthracene	1250	36.9	ug/Kg dry		1560		22	50
4/9-Methylphenanthrene	2760	36.9	ug/Kg dry		3280		17	50
1-Methylphenanthrene	1850	36.9	ug/Kg dry		2080		12	50
Surrogate: Toluene-D8	*632*		ug/Kg dry	*922.6*		*69*	*50-120*	
Surrogate: Naphthalene-d8	*610*		ug/Kg dry	*922.6*		*66*	*50-120*	
Surrogate: Phenanthrene-d10	*633*		ug/Kg dry	*922.6*		*69*	*50-120*	
Surrogate: Perylene-d12	*718*		ug/Kg dry	*922.6*		*78*	*50-120*	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F230029

Notes and Definitions

U	Analyte included in the analysis, but not detected
J	Reported between MDL and MRL
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
B-	Blank Spike recovery is below lower control limit (B-).
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230029

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 23F1032/F230029

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman
781-721-4091 rhoffman@geiconsultants.com

Send Report to: Ryan Hoffman
labdata@geiconsultants.com

Page 1 of 2

Preservative: None | none

Analysis

MCP PRESUMPTIVE CERTAINTY AND MCP ANALYTICAL METHODS REQUIRED: YES NO

STATE AND FEDERAL REGULATORY REQUIREMENTS/REPORT LIMITS
State/Federal Program: MA 401WQC Other _____ NH RI CT NY ME
MA MCP Criteria are Method 1 S-1 and GW-2/GW-3. Circle if GW-1 is required.

Sample Handling
Samples Field Filtered: YES NO NA
Sampled Shipped With Ice: YES NO

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Parent and Alkylated MAHs * PAHs 8270*	TOCs by Lloyd-Kahn	Sample Specific Remarks
1	1804576-845-S1	8/28/23	1000	SD	1	JES	X	X	
2	1804576-845-S2	8/28/23	1001	SD	1	JES	X	X	
3	1804576-847-S1	8/28/23	1100	SD	1	JES	X	X	
4	1804576-847-S2	8/28/23	1101	SD	1	JES	X	X	
5	1804576-846-S1	8/28/23	1200	SD	1	JES	X	X	
6	1804576-846-S2	8/28/23	1201	SD	1	JES	X	X	
7	1804576-846-S3	8/28/23	1202	SD	1	JES	X	X	
8	1804576-854-S1	8/28/23	1300	SD	1	JES	X	X	
9	1804576-854-S2	8/28/23	1301	SD	1	JES	X	X	
10	1804576-843-S1	8/28/23	1315	SD	1	JES	X	X	
11	1804576-843-S2	8/28/23	1316	SD	1	JES	X	X	

Relinquished by sampler (signature)	Date	Time	Received by (signature)
1. [signature]	8/28/23	1700	1. GEI SAMPLE FRIDGE
2. GEI Fridge	8/29/23	1029	2. [signature]
3. [signature]	8/29/23	1029	3. [signature] 8/29/23 1029
4. [signature] 0.03 Ice	8/29/23	1625	4. [signature]
5.			5.

Turnaround Time (Business days):
5-Day X 4-Day ____ 3-Day ____
2-Day ____ 1-Day ____ Other ____

Before submitting rush turnaround samples, you must notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

Sample Matrix Abbreviations: SO = Soil GW = Groundwater SW = Surface Water SD = Sediment CO = Concrete PC = Paint Chip CLK = Caulk

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 23F1032/F230029

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman
781-721-4091 rhoffman@geiconsultants.com

Send Report to: Ryan Hoffman
labdata@geiconsultants.com

Page 2 of 2

Preservative: None none

Analysis: Parent and Alkylated MAHs * PAHs 8270*; TOCs by Lloyd-Kahn

MCP PRESUMPTIVE CERTAINTY AND MCP ANALYTICAL METHODS REQUIRED: YES NO

STATE AND FEDERAL REGULATORY REQUIREMENTS/REPORT LIMITS
State/Federal Program: MA 401WQC Other _____ NH RI CT NY ME
MA MCP Criteria are Method 1 S-1 and GW-2/GW-3. Circle if GW-1 is required.

Sample Handling
Samples Field Filtered: YES NO NA
Sampled Shipped With Ice: YES NO

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Parent and Alkylated MAHs * PAHs 8270*	TOCs by Lloyd-Kahn	Sample Specific Remarks
12	1804576-844-S1	8/28/23	1415	SD	1	JES	X	X	
13	1804576-844-S2	8/28/23	1416	SD	1	JES	X	X	
14	1804576-844-S3	8/28/23	1417	SD	1	JES	X	X	

Relinquished by sampler (signature)	Date	Time	Received by (signature)
1. [signature]	8/28/23	1700	1. GEI SAMPLE FRIDGE
2. GEI Fridge	8/29/23	1029	2. M. [signature]
3. M [signature]	8/29/23	1029	3. AO 8/29/23 1029
4. AO 0.03 on ice	8/29/23	1625	4. [signature]
5.			5.

Turnaround Time (Business days):
5-Day X 4-Day ____ 3-Day ____
2-Day ____ 1-Day ____ Other ____

Before submitting rush turnaround samples, you must notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

Sample Matrix Abbreviations: SO = Soil GW = Groundwater SW = Surface Water SD = Sediment CO = Concrete PC = Paint Chip CLK = Caulk

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants

Shipped/Delivered Via: ESS Courier

ESS Project ID: F230029
Date Received: 8/29/2023
Project Due Date: 9/5/2023
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 0.3 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / (NA)
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / (No)
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? (Yes) No
    a. If metals preserved upon receipt: Date: Time: By/Acid Lot#:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Resolution:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1	523	Yes	N/A	Yes	4 oz. Jar	NP	
2	524	Yes	N/A	Yes	4 oz. Jar	NP	
3	525	Yes	N/A	Yes	4 oz. Jar	NP	
4	526	Yes	N/A	Yes	4 oz. Jar	NP	
5	527	Yes	N/A	Yes	4 oz. Jar	NP	
6	528	Yes	N/A	Yes	4 oz. Jar	NP	
7	529	Yes	N/A	Yes	4 oz. Jar	NP	
8	530	Yes	N/A	Yes	4 oz. Jar	NP	
9	531	Yes	N/A	Yes	4 oz. Jar	NP	
10	532	Yes	N/A	Yes	4 oz. Jar	NP	
11	533	Yes	N/A	Yes	4 oz. Jar	NP	
12	534	Yes	N/A	Yes	4 oz. Jar	NP	
13	535	Yes	N/A	Yes	4 oz. Jar	NP	
14	536	Yes	N/A	Yes	4 oz. Jar	NP	

2nd Review
Were all containers scanned into storage/lab? Initials

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants

ESS Project ID: F230029
Date Received: 8/29/2023

Are barcode labels on correct containers?	Yes / No
Are all Flashpoint stickers attached/container ID # circled?	Yes / No / NA
Are all Hex Chrome stickers attached?	Yes / No / NA
Are all QC stickers attached?	Yes / No / NA
Are VOA stickers attached if bubbles noted?	Yes / No / NA

Completed By: Taylor Dunn Date & Time: 8/29/23 1658

Reviewed By: [signature] Date & Time: 8/29/23 1743

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: F230030

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 1:04 pm, Sep 14, 2023

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses

ESS - Cranston, RI	TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230030

SAMPLE RECEIPT

The following samples were received on August 30, 2023 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F230030-01	1804576-852-S1	Soil	8270 Mod, LK
F230030-02	1804576-852-S2	Soil	8270 Mod, LK
F230030-03	1804576-851-S1	Soil	8270 Mod, LK
F230030-04	1804576-851-S2	Soil	8270 Mod, LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230030

PROJECT NARRATIVE

Alkylated PAHs

F230030-01	**Present in Method Blank (B).**
	Benzene
F230030-03	**Present in Method Blank (B).**
	Benzene
F3I0001-CCV2	**Continuing Calibration %Diff/Drift is above control limit (CD+).**
	Tetraethyl lead (27% @ 25%)
FH33102-BS2	**Blank Spike recovery is below lower control limit (B-).**
	Methylcyclohexane (52% @ 60-130%)

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230030

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-852-S1
Date Sampled: 08/29/23 09:30
Percent Solids: 82
Initial Volume: 5.69
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230030
ESS Laboratory Sample ID: F230030-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**B 54.0** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C1-Benzene	**47.2** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C2-Benzenes	**62.0** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C3-Benzenes	**61.9** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C4-Benzenes	**70.0** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C5-Benzenes	**77.9** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
Methylcyclohexane	ND (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
Toluene	**59.4** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
Ethylbenzene	**J 14.9** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
m,p-Xylene	**54.6** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
Styrene	**432** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
o-Xylene	ND (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
Isopropylbenzene	ND (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
n-Propylbenzene	ND (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
1,3,5-Trimethylbenzene	ND (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
1,2,3-Trimethylbenzene	ND (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
1,2,4-Trimethylbenzene	**J 8.70** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
t-Butylbenzene	ND (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
sec-Butylbenzene	ND (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
p-Isopropyltoluene	ND (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
n-Butylbenzene	**J 9.29** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
trans-Decalin	**J 11.1** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
cis-Decalin	ND (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C1-Decalins	**39.2** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C2-Decalins	**63.2** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C3-Decalins	**53.8** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C4-Decalins	**67.7** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
Benzo(b)thiophene	**46.6** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C1-Benzo(b)thiophenes	**98.4** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C2-Benzo(b)thiophenes	**321** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C3-Benzo(b)thiophenes	**310** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C4-Benzo(b)thiophenes	**153** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-852-S1
Date Sampled: 08/29/23 09:30
Percent Solids: 82
Initial Volume: 5.69
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230030
ESS Laboratory Sample ID: F230030-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**743** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
2-Methylnaphthalene	**656** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
1-Methylnaphthalene	**971** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C1-Naphthalenes	**1050** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C2-Naphthalenes	**3280** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C3-Naphthalenes	**3140** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C4-Naphthalenes	**1370** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
Biphenyl	**268** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
Acenaphthylene	**1360** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
Acenaphthene	**5130** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
Dibenzofuran	**2580** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
Fluorene	**6450** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C1-Fluorenes	**2800** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C2-Fluorenes	**1880** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C3-Fluorenes	**1890** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
Dibenzothiophene	**3880** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C1-Dibenzothiophenes	**3580** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C2-Dibenzothiophenes	**2560** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C3-Dibenzothiophenes	**1150** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C4-Dibenzothiophenes	**362** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
Phenanthrene	**56200** (345)	172	8270 Mod		80	IBM	09/07/23 4:32	F3I0001	FH33102
Anthracene	**20000** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C1-Phenanthrenes/Anthracenes	**20300** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C2-Phenanthrenes/Anthracenes	**8020** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C3-Phenanthrenes/Anthracenes	**2500** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C4-Phenanthrenes/Anthracenes	**690** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
Retene	**150** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
Benzo(b)naphtho(2,1-d)thiophene	**3760** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C0-Benzonaphthothiophenes	**7090** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C1-Benzonaphthothiophenes	**2850** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C2-Benzonaphthothiophenes	**1420** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C3-Benzonaphthothiophenes	**690** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-852-S1
Date Sampled: 08/29/23 09:30
Percent Solids: 82
Initial Volume: 5.69
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230030
ESS Laboratory Sample ID: F230030-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**215** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
Fluoranthene	**66100** (345)	172	8270 Mod		80	IBM	09/07/23 4:32	F3I0001	FH33102
Pyrene	**56300** (345)	172	8270 Mod		80	IBM	09/07/23 4:32	F3I0001	FH33102
C1-Fluoranthenes/Pyrenes	**21300** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C2-Fluoranthenes/Pyrenes	**6950** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C3-Fluoranthenes/Pyrenes	**2610** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
Benzo(b)fluorene	**3660** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
Benzo(c)fluorene	**1560** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
2-Methylpyrene	**2590** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
4-Methylpyrene	**1750** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
1-Methylpyrene	**1580** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
Benz(a)anthracene	**26200** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
Chrysene/triphenylene	**23600** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C1-Benzo(a)anthracenes/Chrysenes	**9630** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C2-Benzo(a)anthracenes/Chrysenes	**4000** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C3-Benzo(a)anthracenes/Chrysenes	**1820** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C4-Benzo(a)anthracenes/Chrysenes	**804** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
Benzo(b)fluoranthene	**18100** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
Benzo(j/k)fluoranthene	**16400** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
Benzo(e)pyrene	**13300** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
Benzo(a)pyrene	**24600** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
Perylene	**6440** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
Indeno(1,2,3-cd)pyrene	**15700** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
Dibenzo(a,h)anthracene	**3280** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
Benzo(g,h,i)perylene	**11800** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
Coronene	**3170** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
Tetramethyl lead	ND (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
Trimethylethyl lead	ND (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
Dimethyldiethyl lead	ND (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
Methyltriethyl lead	ND (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
Tetraethyl lead	ND (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
2,6,10-trimethyldodecane (1380)	**20.1** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-852-S1
Date Sampled: 08/29/23 09:30
Percent Solids: 82
Initial Volume: 5.69
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230030
ESS Laboratory Sample ID: F230030-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**63.7** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
2,6,10-trimethylpentadecane (1650)	**100** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C-17	**300** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
Pristane	**354** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
C-18	**272** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
Phytane	**104** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
Carbazole	**3040** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
2,6-Dimethylnaphthalene	**665** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
2,3,5-Trimethylnaphthene	**273** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
4-Methyldibenzothiophene	**1140** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
2/3-Methyldibenzothiophene	**1220** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
1-Methyldibenzothiophene	**429** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
3-Methylphenanthrene	**4500** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
2-Methylphenanthrene	**5410** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
2-Methylanthracene	**3150** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
4/9-Methylphenanthrene	**4110** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102
1-Methylphenanthrene	**2990** (17.2)	8.61	8270 Mod		4	IBM	09/07/23 3:10	F3I0001	FH33102

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*73 %*		*50-120*
Surrogate: Naphthalene-d8	*70 %*		*50-120*
Surrogate: Phenanthrene-d10	*78 %*		*50-120*
Surrogate: Perylene-d12	*101 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-852-S1
Date Sampled: 08/29/23 09:30
Percent Solids: 82

ESS Laboratory Work Order: F230030
ESS Laboratory Sample ID: F230030-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**15700** (476)		LK		1	CCP	09/06/23 16:38	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-852-S2
Date Sampled: 08/29/23 09:31
Percent Solids: 52
Initial Volume: 5.48
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230030
ESS Laboratory Sample ID: F230030-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**286** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C1-Benzene	**1430** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C2-Benzenes	**944** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C3-Benzenes	**735** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C4-Benzenes	**2360** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C5-Benzenes	**1210** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
Methylcyclohexane	**154** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
Toluene	**1770** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
Ethylbenzene	**104** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
m,p-Xylene	**1220** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
Styrene	**1060** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
o-Xylene	**122** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
Isopropylbenzene	**30.5** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
n-Propylbenzene	**59.6** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
1,3,5-Trimethylbenzene	**105** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
1,2,3-Trimethylbenzene	**119** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
1,2,4-Trimethylbenzene	**354** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
t-Butylbenzene	**J 21.5** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
sec-Butylbenzene	**35.5** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
p-Isopropyltoluene	**101** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
n-Butylbenzene	ND (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
trans-Decalin	**252** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
cis-Decalin	**44.4** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C1-Decalins	**866** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C2-Decalins	**954** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C3-Decalins	**695** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C4-Decalins	**938** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
Benzo(b)thiophene	**373** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C1-Benzo(b)thiophenes	**841** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C2-Benzo(b)thiophenes	**1190** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C3-Benzo(b)thiophenes	**551** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C4-Benzo(b)thiophenes	**311** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-852-S2
Date Sampled: 08/29/23 09:31
Percent Solids: 52
Initial Volume: 5.48
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230030
ESS Laboratory Sample ID: F230030-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**3570** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
2-Methylnaphthalene	**960** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
1-Methylnaphthalene	**5210** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C1-Naphthalenes	**3830** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C2-Naphthalenes	**7580** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C3-Naphthalenes	**3420** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C4-Naphthalenes	**1700** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
Biphenyl	**338** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
Acenaphthylene	**2210** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
Acenaphthene	**34300** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
Dibenzofuran	**642** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
Fluorene	**7770** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C1-Fluorenes	**1870** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C2-Fluorenes	**1580** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C3-Fluorenes	**1680** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
Dibenzothiophene	**2270** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C1-Dibenzothiophenes	**2080** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C2-Dibenzothiophenes	**2880** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C3-Dibenzothiophenes	**2850** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C4-Dibenzothiophenes	**1830** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
Phenanthrene	**21800** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
Anthracene	**6120** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C1-Phenanthrenes/Anthracenes	**8270** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C2-Phenanthrenes/Anthracenes	**5410** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C3-Phenanthrenes/Anthracenes	**3780** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C4-Phenanthrenes/Anthracenes	**1930** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
Retene	**1140** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
Benzo(b)naphtho(2,1-d)thiophene	**1350** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C0-Benzonaphthothiophenes	**2560** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C1-Benzonaphthothiophenes	**2320** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C2-Benzonaphthothiophenes	**2650** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C3-Benzonaphthothiophenes	**2110** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-852-S2
Date Sampled: 08/29/23 09:31
Percent Solids: 52
Initial Volume: 5.48
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230030
ESS Laboratory Sample ID: F230030-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**1030** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
Fluoranthene	**15800** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
Pyrene	**17600** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C1-Fluoranthenes/Pyrenes	**9510** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C2-Fluoranthenes/Pyrenes	**4480** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C3-Fluoranthenes/Pyrenes	**2530** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
Benzo(b)fluorene	**1190** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
Benzo(c)fluorene	**536** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
2-Methylpyrene	**1260** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
4-Methylpyrene	**1210** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
1-Methylpyrene	**1020** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
Benz(a)anthracene	**7740** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
Chrysene/triphenylene	**8420** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C1-Benzo(a)anthracenes/Chrysenes	**4990** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C2-Benzo(a)anthracenes/Chrysenes	**3440** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C3-Benzo(a)anthracenes/Chrysenes	**2250** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C4-Benzo(a)anthracenes/Chrysenes	**1310** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
Benzo(b)fluoranthene	**6090** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
Benzo(j/k)fluoranthene	**6100** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
Benzo(e)pyrene	**5350** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
Benzo(a)pyrene	**8930** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
Perylene	**1900** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
Indeno(1,2,3-cd)pyrene	**5760** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
Dibenzo(a,h)anthracene	**1260** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
Benzo(g,h,i)perylene	**4780** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
Coronene	**1420** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
Tetramethyl lead	ND (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
Trimethylethyl lead	ND (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
Dimethyldiethyl lead	ND (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
Methyltriethyl lead	ND (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
Tetraethyl lead	ND (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
2,6,10-trimethyldodecane (1380)	**878** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-852-S2
Date Sampled: 08/29/23 09:31
Percent Solids: 52
Initial Volume: 5.48
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230030
ESS Laboratory Sample ID: F230030-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**1390** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
2,6,10-trimethylpentadecane (1650)	**1330** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C-17	**406** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
Pristane	**2670** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
C-18	**288** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
Phytane	**3060** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
Carbazole	**484** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
2,6-Dimethylnaphthalene	**783** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
2,3,5-Trimethylnaphthene	**263** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
4-Methyldibenzothiophene	**749** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
2/3-Methyldibenzothiophene	**688** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
1-Methyldibenzothiophene	**276** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
3-Methylphenanthrene	**1910** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
2-Methylphenanthrene	**2170** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
2-Methylanthracene	**889** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
4/9-Methylphenanthrene	**1980** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102
1-Methylphenanthrene	**1250** (27.8)	13.9	8270 Mod		4	IBM	09/07/23 5:54	F3I0001	FH33102

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*71 %*		*50-120*
Surrogate: Naphthalene-d8	*67 %*		*50-120*
Surrogate: Phenanthrene-d10	*71 %*		*50-120*
Surrogate: Perylene-d12	*78 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-852-S2
Date Sampled: 08/29/23 09:31
Percent Solids: 52

ESS Laboratory Work Order: F230030
ESS Laboratory Sample ID: F230030-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**95600** (464)		LK		1	CCP	09/06/23 16:55	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-851-S1
Date Sampled: 08/29/23 13:00
Percent Solids: 85
Initial Volume: 5.28
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230030
ESS Laboratory Sample ID: F230030-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**B 35.6** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C1-Benzene	**32.6** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C2-Benzenes	**91.2** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C3-Benzenes	**42.3** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C4-Benzenes	**36.6** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C5-Benzenes	**29.8** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
Methylcyclohexane	**8.35** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
Toluene	**38.0** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
Ethylbenzene	**31.7** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
m,p-Xylene	**84.6** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
Styrene	**91.3** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
o-Xylene	**27.4** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
Isopropylbenzene	**J 2.88** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
n-Propylbenzene	**6.48** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
1,3,5-Trimethylbenzene	**J 4.42** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
1,2,3-Trimethylbenzene	**5.18** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
1,2,4-Trimethylbenzene	**13.7** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
t-Butylbenzene	ND (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
sec-Butylbenzene	ND (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
p-Isopropyltoluene	**J 4.03** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
n-Butylbenzene	**7.40** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
trans-Decalin	**11.5** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
cis-Decalin	ND (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C1-Decalins	**25.2** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C2-Decalins	**26.8** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C3-Decalins	**15.1** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C4-Decalins	**40.0** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
Benzo(b)thiophene	**7.55** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C1-Benzo(b)thiophenes	**15.1** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C2-Benzo(b)thiophenes	**24.4** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C3-Benzo(b)thiophenes	**23.9** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C4-Benzo(b)thiophenes	**13.1** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-851-S1
Date Sampled: 08/29/23 13:00
Percent Solids: 85
Initial Volume: 5.28
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230030
ESS Laboratory Sample ID: F230030-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**97.6** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
2-Methylnaphthalene	**66.4** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
1-Methylnaphthalene	**60.9** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C1-Naphthalenes	**81.9** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C2-Naphthalenes	**178** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C3-Naphthalenes	**215** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C4-Naphthalenes	**95.9** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
Biphenyl	**17.8** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
Acenaphthylene	**443** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
Acenaphthene	**198** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
Dibenzofuran	**83.8** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
Fluorene	**253** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C1-Fluorenes	**167** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C2-Fluorenes	**146** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C3-Fluorenes	**149** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
Dibenzothiophene	**157** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C1-Dibenzothiophenes	**224** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C2-Dibenzothiophenes	**209** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C3-Dibenzothiophenes	**107** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C4-Dibenzothiophenes	**66.5** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
Phenanthrene	**1760** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
Anthracene	**658** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C1-Phenanthrenes/Anthracenes	**1160** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C2-Phenanthrenes/Anthracenes	**587** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C3-Phenanthrenes/Anthracenes	**204** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C4-Phenanthrenes/Anthracenes	**62.7** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
Retene	**18.5** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
Benzo(b)naphtho(2,1-d)thiophene	**190** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C0-Benzonaphthothiophenes	**357** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C1-Benzonaphthothiophenes	**243** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C2-Benzonaphthothiophenes	**238** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C3-Benzonaphthothiophenes	**228** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-851-S1
Date Sampled: 08/29/23 13:00
Percent Solids: 85
Initial Volume: 5.28
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230030
ESS Laboratory Sample ID: F230030-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**176** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
Fluoranthene	**2440** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
Pyrene	**2160** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C1-Fluoranthenes/Pyrenes	**1320** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C2-Fluoranthenes/Pyrenes	**646** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C3-Fluoranthenes/Pyrenes	**259** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
Benzo(b)fluorene	**149** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
Benzo(c)fluorene	**81.5** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
2-Methylpyrene	**171** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
4-Methylpyrene	**154** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
1-Methylpyrene	**130** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
Benz(a)anthracene	**1240** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
Chrysene/triphenylene	**1190** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C1-Benzo(a)anthracenes/Chrysenes	**656** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C2-Benzo(a)anthracenes/Chrysenes	**340** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C3-Benzo(a)anthracenes/Chrysenes	**216** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C4-Benzo(a)anthracenes/Chrysenes	**115** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
Benzo(b)fluoranthene	**799** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
Benzo(j/k)fluoranthene	**934** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
Benzo(e)pyrene	**687** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
Benzo(a)pyrene	**1170** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
Perylene	**278** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
Indeno(1,2,3-cd)pyrene	**739** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
Dibenzo(a,h)anthracene	**174** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
Benzo(g,h,i)perylene	**573** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
Coronene	**154** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
Tetramethyl lead	ND (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
Trimethylethyl lead	ND (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
Dimethyldiethyl lead	ND (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
Methyltriethyl lead	ND (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
Tetraethyl lead	ND (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
2,6,10-trimethyldodecane (1380)	**20.8** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-851-S1
Date Sampled: 08/29/23 13:00
Percent Solids: 85
Initial Volume: 5.28
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230030
ESS Laboratory Sample ID: F230030-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**40.6** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
2,6,10-trimethylpentadecane (1650)	**25.5** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C-17	**246** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
Pristane	**47.5** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
C-18	**195** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
Phytane	**42.8** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
Carbazole	**87.0** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
2,6-Dimethylnaphthalene	**31.2** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
2,3,5-Trimethylnaphthene	**17.9** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
4-Methyldibenzothiophene	**78.7** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
2/3-Methyldibenzothiophene	**79.4** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
1-Methyldibenzothiophene	**30.9** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
3-Methylphenanthrene	**259** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
2-Methylphenanthrene	**308** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
2-Methylanthracene	**132** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
4/9-Methylphenanthrene	**253** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102
1-Methylphenanthrene	**201** (4.44)	2.22	8270 Mod		1	IBM	09/07/23 11:22	F3I0001	FH33102

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*75 %*		*50-120*
Surrogate: Naphthalene-d8	*71 %*		*50-120*
Surrogate: Phenanthrene-d10	*77 %*		*50-120*
Surrogate: Perylene-d12	*82 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-851-S1
Date Sampled: 08/29/23 13:00
Percent Solids: 85

ESS Laboratory Work Order: F230030
ESS Laboratory Sample ID: F230030-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**17500** (464)		LK		1	CCP	09/06/23 17:12	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-851-S2
Date Sampled: 08/29/23 13:01
Percent Solids: 74
Initial Volume: 2.74
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230030
ESS Laboratory Sample ID: F230030-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**379** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
C1-Benzene	**977** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
C2-Benzenes	**11900** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
C3-Benzenes	**34000** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
C4-Benzenes	**54500** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
C5-Benzenes	**23800** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
Methylcyclohexane	**134** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
Toluene	**1210** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
Ethylbenzene	**14000** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
m,p-Xylene	**4920** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
Styrene	**4930** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
o-Xylene	**2090** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
Isopropylbenzene	**3420** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
n-Propylbenzene	**1970** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
1,3,5-Trimethylbenzene	**4920** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
1,2,3-Trimethylbenzene	**6300** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
1,2,4-Trimethylbenzene	**18200** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
t-Butylbenzene	ND (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
sec-Butylbenzene	**270** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
p-Isopropyltoluene	**5240** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
n-Butylbenzene	ND (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
trans-Decalin	**699** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
cis-Decalin	**239** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
C1-Decalins	**3160** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
C2-Decalins	**5700** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
C3-Decalins	**5120** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
C4-Decalins	**8410** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
Benzo(b)thiophene	**6080** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
C1-Benzo(b)thiophenes	**10800** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
C2-Benzo(b)thiophenes	**16300** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
C3-Benzo(b)thiophenes	**10100** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
C4-Benzo(b)thiophenes	**3000** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-851-S2
Date Sampled: 08/29/23 13:01
Percent Solids: 74
Initial Volume: 2.74
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230030
ESS Laboratory Sample ID: F230030-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**171000** (1970)	985	8270 Mod		200	IBM	09/07/23 9:59	F3I0001	FH33102
2-Methylnaphthalene	**124000** (1970)	985	8270 Mod		200	IBM	09/07/23 9:59	F3I0001	FH33102
1-Methylnaphthalene	**354000** (1970)	985	8270 Mod		200	IBM	09/07/23 9:59	F3I0001	FH33102
C1-Naphthalenes	**300000** (1970)	985	8270 Mod		200	IBM	09/07/23 9:59	F3I0001	FH33102
C2-Naphthalenes	**348000** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
C3-Naphthalenes	**156000** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
C4-Naphthalenes	**46600** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
Biphenyl	**29200** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
Acenaphthylene	**34000** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
Acenaphthene	**561000** (1970)	985	8270 Mod		200	IBM	09/07/23 9:59	F3I0001	FH33102
Dibenzofuran	**21600** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
Fluorene	**188000** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
C1-Fluorenes	**102000** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
C2-Fluorenes	**63500** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
C3-Fluorenes	**23200** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
Dibenzothiophene	**58000** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
C1-Dibenzothiophenes	**51600** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
C2-Dibenzothiophenes	**34400** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
C3-Dibenzothiophenes	**14100** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
C4-Dibenzothiophenes	**4340** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
Phenanthrene	**838000** (1970)	985	8270 Mod		200	IBM	09/07/23 9:59	F3I0001	FH33102
Anthracene	**275000** (1970)	985	8270 Mod		200	IBM	09/07/23 9:59	F3I0001	FH33102
C1-Phenanthrenes/Anthracenes	**363000** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
C2-Phenanthrenes/Anthracenes	**148000** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
C3-Phenanthrenes/Anthracenes	**44600** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
C4-Phenanthrenes/Anthracenes	**13100** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
Retene	**6450** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
Benzo(b)naphtho(2,1-d)thiophene	**18800** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
C0-Benzonaphthothiophenes	**34200** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
C1-Benzonaphthothiophenes	**21200** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
C2-Benzonaphthothiophenes	**10100** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
C3-Benzonaphthothiophenes	**5400** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-851-S2
Date Sampled: 08/29/23 13:01
Percent Solids: 74
Initial Volume: 2.74
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230030
ESS Laboratory Sample ID: F230030-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**1070** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
Fluoranthene	**321000** (1970)	985	8270 Mod		200	IBM	09/07/23 9:59	F3I0001	FH33102
Pyrene	**475000** (1970)	985	8270 Mod		200	IBM	09/07/23 9:59	F3I0001	FH33102
C1-Fluoranthenes/Pyrenes	**275000** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
C2-Fluoranthenes/Pyrenes	**80800** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
C3-Fluoranthenes/Pyrenes	**23700** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
Benzo(b)fluorene	**27700** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
Benzo(c)fluorene	**14700** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
2-Methylpyrene	**34100** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
4-Methylpyrene	**30100** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
1-Methylpyrene	**34800** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
Benz(a)anthracene	**141000** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
Chrysene/triphenylene	**130000** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
C1-Benzo(a)anthracenes/Chrysenes	**87100** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
C2-Benzo(a)anthracenes/Chrysenes	**35400** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
C3-Benzo(a)anthracenes/Chrysenes	**12100** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
C4-Benzo(a)anthracenes/Chrysenes	**3710** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
Benzo(b)fluoranthene	**58500** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
Benzo(j/k)fluoranthene	**72300** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
Benzo(e)pyrene	**65700** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
Benzo(a)pyrene	**133000** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
Perylene	**21500** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
Indeno(1,2,3-cd)pyrene	**61300** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
Dibenzo(a,h)anthracene	**15300** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
Benzo(g,h,i)perylene	**55400** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
Coronene	**17200** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
Tetramethyl lead	ND (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
Trimethylethyl lead	ND (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
Dimethyldiethyl lead	ND (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
Methyltriethyl lead	ND (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
Tetraethyl lead	ND (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
2,6,10-trimethyldodecane (1380)	**4080** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-851-S2
Date Sampled: 08/29/23 13:01
Percent Solids: 74
Initial Volume: 2.74
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230030
ESS Laboratory Sample ID: F230030-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 8/31/23 13:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**6610** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
2,6,10-trimethylpentadecane (1650)	**8210** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
C-17	ND (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
Pristane	**14500** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
C-18	ND (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
Phytane	**13100** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
Carbazole	**2960** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
2,6-Dimethylnaphthalene	**68700** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
2,3,5-Trimethylnaphthene	**9240** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
4-Methyldibenzothiophene	**21500** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
2/3-Methyldibenzothiophene	**18200** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
1-Methyldibenzothiophene	**4650** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
3-Methylphenanthrene	**86300** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
2-Methylphenanthrene	**90900** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
2-Methylanthracene	**44900** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
4/9-Methylphenanthrene	**81100** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102
1-Methylphenanthrene	**55300** (98.5)	49.2	8270 Mod		10	IBM	09/07/23 8:36	F3I0001	FH33102

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*75 %*		*50-120*
Surrogate: Naphthalene-d8	*75 %*		*50-120*
Surrogate: Phenanthrene-d10	*80 %*		*50-120*
Surrogate: Perylene-d12	*126 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-851-S2
Date Sampled: 08/29/23 13:01
Percent Solids: 74

ESS Laboratory Work Order: F230030
ESS Laboratory Sample ID: F230030-04
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**45500** (480)		LK		1	CCP	09/06/23 17:29	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230030

Quality Control Data

Classical Chemistry

Batch DH33045 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	500	mg/kg							
Total Organic Carbon (2)	ND	500	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230030

Quality Control Data

Classical Chemistry

Batch DH33045 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9840	500	mg/kg	10010		98	80-120			
Total Organic Carbon (2)	9840	500	mg/kg	10010		98	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230030

Quality Control Data

Classical Chemistry

Batch DH33045 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9830	500	mg/kg	10010		98	80-120	0.06	25	
Total Organic Carbon (2)	9880	500	mg/kg	10010		99	80-120	0.4	25	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230030

Quality Control Data

Alkylated PAHs

Batch FH33102 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	10.0	4.00	ug/Kg wet							
C1-Benzene	2.11	4.00	ug/Kg wet							J
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	2.63	4.00	ug/Kg wet							J
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	7.75	4.00	ug/Kg wet							
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230030

Quality Control Data

Alkylated PAHs

Batch FH33102 - 3570			
C1-Fluorenes	ND	4.00	ug/Kg wet
C2-Fluorenes	ND	4.00	ug/Kg wet
C3-Fluorenes	ND	4.00	ug/Kg wet
Dibenzothiophene	ND	4.00	ug/Kg wet
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet
Phenanthrene	ND	4.00	ug/Kg wet
Anthracene	ND	4.00	ug/Kg wet
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
Retene	ND	4.00	ug/Kg wet
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
Fluoranthene	ND	4.00	ug/Kg wet
Pyrene	ND	4.00	ug/Kg wet
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
Benzo(b)fluorene	ND	4.00	ug/Kg wet
Benzo(c)fluorene	ND	4.00	ug/Kg wet
2-Methylpyrene	ND	4.00	ug/Kg wet
4-Methylpyrene	ND	4.00	ug/Kg wet
1-Methylpyrene	ND	4.00	ug/Kg wet
Benz(a)anthracene	ND	4.00	ug/Kg wet
Chrysene/triphenylene	ND	4.00	ug/Kg wet
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet
Benzo(e)pyrene	ND	4.00	ug/Kg wet
Benzo(a)pyrene	ND	4.00	ug/Kg wet
Perylene	ND	4.00	ug/Kg wet
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet
Coronene	ND	4.00	ug/Kg wet
Tetramethyl lead	ND	4.00	ug/Kg wet
Trimethylethyl lead	ND	4.00	ug/Kg wet

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230030

Quality Control Data

Alkylated PAHs

Batch FH33102 - 3570						
Dimethyldiethyl lead	ND	4.00	ug/Kg wet			
Methyltriethyl lead	ND	4.00	ug/Kg wet			
Tetraethyl lead	ND	4.00	ug/Kg wet			
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet			
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet			
2,6,10-trimethylpentadecane (1650)	ND	4.00	ug/Kg wet			
C-17	4.81	4.00	ug/Kg wet			
Pristane	ND	4.00	ug/Kg wet			
C-18	5.28	4.00	ug/Kg wet			
Phytane	ND	4.00	ug/Kg wet			
Carbazole	ND	4.00	ug/Kg wet			
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet			
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet			
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
3-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylanthracene	ND	4.00	ug/Kg wet			
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet			
1-Methylphenanthrene	ND	4.00	ug/Kg wet			
Surrogate: Toluene-D8	*322*		ug/Kg wet	*400.0*	*81*	*50-120*
Surrogate: Naphthalene-d8	*305*		ug/Kg wet	*400.0*	*76*	*50-120*
Surrogate: Phenanthrene-d10	*332*		ug/Kg wet	*400.0*	*83*	*50-120*
Surrogate: Perylene-d12	*343*		ug/Kg wet	*400.0*	*86*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230030

Quality Control Data

Alkylated PAHs

Batch FH33102 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	280	4.00	ug/Kg wet	400.0		70	60-130			
Methylcyclohexane	208	4.00	ug/Kg wet	400.0		52	60-130			B-
Toluene	296	4.00	ug/Kg wet	400.0		74	60-130			
Ethylbenzene	324	4.00	ug/Kg wet	400.0		81	60-130			
m,p-Xylene	317	4.00	ug/Kg wet	400.0		79	60-130			
Styrene	313	4.00	ug/Kg wet	400.0		78	60-130			
o-Xylene	332	4.00	ug/Kg wet	400.0		83	60-130			
Isopropylbenzene	328	4.00	ug/Kg wet	400.0		82	60-130			
n-Propylbenzene	330	4.00	ug/Kg wet	400.0		82	60-130			
1,3,5-Trimethylbenzene	338	4.00	ug/Kg wet	400.0		85	60-130			
1,2,3-Trimethylbenzene	336	4.00	ug/Kg wet	400.0		84	60-130			
1,2,4-Trimethylbenzene	336	4.00	ug/Kg wet	400.0		84	60-130			
t-Butylbenzene	332	4.00	ug/Kg wet	400.0		83	60-130			
sec-Butylbenzene	334	4.00	ug/Kg wet	400.0		83	60-130			
p-Isopropyltoluene	339	4.00	ug/Kg wet	400.0		85	60-130			
n-Butylbenzene	334	4.00	ug/Kg wet	400.0		84	60-130			
trans-Decalin	319	4.00	ug/Kg wet	400.0		80	60-130			
cis-Decalin	320	4.00	ug/Kg wet	400.0		80	60-130			
Benzo(b)thiophene	315	4.00	ug/Kg wet	400.0		79	60-130			
Naphthalene	313	4.00	ug/Kg wet	400.0		78	60-130			
2-Methylnaphthalene	308	4.00	ug/Kg wet	400.0		77	60-130			
1-Methylnaphthalene	309	4.00	ug/Kg wet	400.0		77	60-130			
Biphenyl	285	4.00	ug/Kg wet	400.0		71	60-130			
Acenaphthylene	343	4.00	ug/Kg wet	400.0		86	60-130			
Acenaphthene	328	4.00	ug/Kg wet	400.0		82	60-130			
Dibenzofuran	324	4.00	ug/Kg wet	400.0		81	60-130			
Fluorene	326	4.00	ug/Kg wet	400.0		81	60-130			
Dibenzothiophene	322	4.00	ug/Kg wet	400.0		80	60-130			
Phenanthrene	310	4.00	ug/Kg wet	400.0		78	60-130			
Anthracene	338	4.00	ug/Kg wet	400.0		85	60-130			
Retene	360	4.00	ug/Kg wet	400.0		90	60-130			
Benzo(b)naphtho(2,1-d)thiophene	355	4.00	ug/Kg wet	400.0		89	60-130			
Fluoranthene	340	4.00	ug/Kg wet	400.0		85	60-130			
Pyrene	340	4.00	ug/Kg wet	400.0		85	60-130			
Benz(a)anthracene	371	4.00	ug/Kg wet	400.0		93	60-130			
Chrysene/triphenylene	354	4.00	ug/Kg wet	400.0		88	60-130			
Benzo(b)fluoranthene	350	4.00	ug/Kg wet	400.0		88	60-130			
Benzo(j/k)fluoranthene	354	4.00	ug/Kg wet	400.0		88	60-130			
Benzo(e)pyrene	327	4.00	ug/Kg wet	400.0		82	60-130			
Benzo(a)pyrene	358	4.00	ug/Kg wet	400.0		90	60-130			
Perylene	356	4.00	ug/Kg wet	400.0		89	60-130			
Indeno(1,2,3-cd)pyrene	367	4.00	ug/Kg wet	400.0		92	60-130			
Dibenzo(a,h)anthracene	375	4.00	ug/Kg wet	400.0		94	60-130			
Benzo(g,h,i)perylene	343	4.00	ug/Kg wet	400.0		86	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230030

Quality Control Data

Alkylated PAHs

Batch FH33102 - 3570						
Coronene	362	4.00	ug/Kg wet	400.0	91	60-130
Tetraethyl lead	62.5	4.00	ug/Kg wet	400.0	16	60-130
Surrogate: Toluene-D8	*311*		ug/Kg wet	*400.0*	*78*	*50-120*
Surrogate: Naphthalene-d8	*324*		ug/Kg wet	*400.0*	*81*	*50-120*
Surrogate: Phenanthrene-d10	*342*		ug/Kg wet	*400.0*	*86*	*50-120*
Surrogate: Perylene-d12	*358*		ug/Kg wet	*400.0*	*89*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230030

Quality Control Data

Alkylated PAHs

Batch FH33102 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	ND	4.00	ug/Kg wet				60-130			
Methylcyclohexane	ND	4.00	ug/Kg wet				60-130			
Toluene	ND	4.00	ug/Kg wet				60-130			
Ethylbenzene	ND	4.00	ug/Kg wet				60-130			
m,p-Xylene	ND	4.00	ug/Kg wet				60-130			
Styrene	ND	4.00	ug/Kg wet				60-130			
o-Xylene	ND	4.00	ug/Kg wet				60-130			
Isopropylbenzene	ND	4.00	ug/Kg wet				60-130			
n-Propylbenzene	ND	4.00	ug/Kg wet				60-130			
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet				60-130			
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet				60-130			
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet				60-130			
t-Butylbenzene	ND	4.00	ug/Kg wet				60-130			
sec-Butylbenzene	ND	4.00	ug/Kg wet				60-130			
p-Isopropyltoluene	ND	4.00	ug/Kg wet				60-130			
n-Butylbenzene	ND	4.00	ug/Kg wet				60-130			
trans-Decalin	ND	4.00	ug/Kg wet				60-130			
cis-Decalin	ND	4.00	ug/Kg wet				60-130			
Benzo(b)thiophene	ND	4.00	ug/Kg wet				60-130			
Naphthalene	ND	4.00	ug/Kg wet				60-130			
2-Methylnaphthalene	ND	4.00	ug/Kg wet				60-130			
1-Methylnaphthalene	ND	4.00	ug/Kg wet				60-130			
Biphenyl	ND	4.00	ug/Kg wet				60-130			
Acenaphthylene	ND	4.00	ug/Kg wet				60-130			
Acenaphthene	ND	4.00	ug/Kg wet				60-130			
Dibenzofuran	ND	4.00	ug/Kg wet				60-130			
Fluorene	ND	4.00	ug/Kg wet				60-130			
Dibenzothiophene	ND	4.00	ug/Kg wet				60-130			
Phenanthrene	ND	4.00	ug/Kg wet				60-130			
Anthracene	ND	4.00	ug/Kg wet				60-130			
Retene	ND	4.00	ug/Kg wet				60-130			
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet				60-130			
Fluoranthene	ND	4.00	ug/Kg wet				60-130			
Pyrene	ND	4.00	ug/Kg wet				60-130			
Benz(a)anthracene	ND	4.00	ug/Kg wet				60-130			
Chrysene/triphenylene	ND	4.00	ug/Kg wet				60-130			
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet				60-130			
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet				60-130			
Benzo(e)pyrene	ND	4.00	ug/Kg wet				60-130			
Benzo(a)pyrene	ND	4.00	ug/Kg wet				60-130			
Perylene	ND	4.00	ug/Kg wet				60-130			
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet				60-130			
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet				60-130			
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet				60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230030

Quality Control Data

Alkylated PAHs

Batch FH33102 - 3570						
Coronene	ND	4.00	ug/Kg wet			60-130
Tetraethyl lead	368	4.00	ug/Kg wet	400.0	92	60-130
Surrogate: Toluene-D8	*317*		ug/Kg wet	*400.0*	*79*	*50-120*
Surrogate: Naphthalene-d8	*297*		ug/Kg wet	*400.0*	*74*	*50-120*
Surrogate: Phenanthrene-d10	*318*		ug/Kg wet	*400.0*	*80*	*50-120*
Surrogate: Perylene-d12	*332*		ug/Kg wet	*400.0*	*83*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F230030

Notes and Definitions

U	Analyte included in the analysis, but not detected
J	Reported between MDL and MRL
D	Diluted.
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
B-	Blank Spike recovery is below lower control limit (B-).
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230030

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

TO 8/30/23 -

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 23H1119 / E230030

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman 781-721-4091 rhoffman@geiconsultants.com

Send Report to: Ryan Hoffman, Jeremy Smalley labdata@geiconsultants.com

Page 1 of 1

MCP PRESUMPTIVE CERTAINTY AND MCP ANALYTICAL METHODS REQUIRED: YES NO

STATE AND FEDERAL REGULATORY REQUIREMENTS/REPORT LIMITS

State/Federal Program: MA 401WQC Other _____ NH RI CT NY ME

MA MCP Criteria are Method 1 S-1 and GW-2/GW-3. Circle if GW-1 is required.

Preservative: none | none

Sample Handling: Samples Field Filtered YES NO NA

Sampled Shipped With Ice YES NO

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Parent and Alkylated PAHs * PAHs 8270*	TOCs by Lloyd-Kahn	Sample Specific Remarks
1	1804576-852-S1	8/29/23	0930	SD	1	JES	X	X	
2	1804576-852-S2	8/29/23	0931	SD	1	JES	X	X	
3	1804576-851-S1	8/29/23	1300	SD	1	JES	X	X	
4	1804576-851-S2	8/29/23	1301	SD	1	JES	X	X	

Relinquished by sampler (signature)	Date	Time	Received by (signature)
1. Davis Hill	17:00	8/29/23	1. GEI Fridge
2. GEI Fridge	8/30/23	1435	2. AO 8/30/23 1435
3. AO 0.8 on ice	8/30/23	1831	3. Taylor Dewar
4.			4.
5.			5.

Turnaround Time (Business days): Normal X 4-Day ____ 3-Day ____ 2-Day ____ 1-Day ____ Other ____

Before submitting rush turnaround samples, you must notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

Sample Matrix Abbreviations: SO = Soil GW = Groundwater SW = Surface Water SD = Sediment CO = Concrete PC = Paint Chip CLK = Caulk

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants
Shipped/Delivered Via: ESS Courier

ESS Project ID: F230030
Date Received: 8/30/2023
Project Due Date: 9/6/2023
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 0.8 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By/Acid Lot#:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Resolution:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1	537	Yes	N/A	Yes	4 oz. Jar	NP	
2	538	Yes	N/A	Yes	4 oz. Jar	NP	
3	539	Yes	N/A	Yes	4 oz. Jar	NP	
4	540	Yes	N/A	Yes	4 oz. Jar	NP	

2nd Review

Were all containers scanned into storage/lab? Initials: TD
Are barcode labels on correct containers? Yes / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: Samuel Davis Date & Time: 8/30/23 1845
Reviewed By: Date & Time: 8/30/23 1903

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: F230037

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 12:10 pm, Nov 20, 2023

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses

ESS - Cranston, RI	TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230037

SAMPLE RECEIPT

The following samples were received on November 03, 2023 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F230037-01	1804576-857-S1	Soil	8270 Mod, LK
F230037-02	1804576-857-S3	Soil	8270 Mod, LK
F230037-03	1804576-858-S1	Soil	8270 Mod, LK
F230037-04	1804576-858-S3	Soil	8270 Mod, LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230037

PROJECT NARRATIVE

Alkylated PAHs

F230037-01	**Present in Method Blank (B).**
	Styrene
F230037-02	**Present in Method Blank (B).**
	Styrene
F230037-03	**Present in Method Blank (B).**
	Styrene
F230037-04	**Present in Method Blank (B).**
	Styrene
FK30701-BS2	**Blank Spike recovery is below lower control limit (B-).**
	Methylcyclohexane (52% @ 60-130%)
FK30701-DUP2	**Relative percent difference for duplicate is outside of criteria (D+).**
	p-Isopropyltoluene (76% @ 50%)

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230037

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-857-S1
Date Sampled: 11/02/23 13:00
Percent Solids: 74
Initial Volume: 5.07
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230037
ESS Laboratory Sample ID: F230037-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/7/23 8:15

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**68.9** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C1-Benzene	**191** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C2-Benzenes	**565** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C3-Benzenes	**876** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C4-Benzenes	**306** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C5-Benzenes	ND (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
Methylcyclohexane	**6.85** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
Toluene	**260** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
Ethylbenzene	**103** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
m,p-Xylene	**611** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
Styrene	**B 155** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
o-Xylene	**275** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
Isopropylbenzene	**38.0** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
n-Propylbenzene	**97.5** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
1,3,5-Trimethylbenzene	**230** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
1,2,3-Trimethylbenzene	**269** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
1,2,4-Trimethylbenzene	**428** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
t-Butylbenzene	ND (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
sec-Butylbenzene	**15.0** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
p-Isopropyltoluene	**48.7** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
n-Butylbenzene	**119** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
trans-Decalin	**53.4** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
cis-Decalin	**6.42** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C1-Decalins	**91.8** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C2-Decalins	**51.0** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C3-Decalins	**35.2** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C4-Decalins	**59.7** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
Benzo(b)thiophene	**8.08** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C1-Benzo(b)thiophenes	**18.7** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C2-Benzo(b)thiophenes	**21.8** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C3-Benzo(b)thiophenes	**38.5** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C4-Benzo(b)thiophenes	**21.7** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-857-S1
Date Sampled: 11/02/23 13:00
Percent Solids: 74
Initial Volume: 5.07
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230037
ESS Laboratory Sample ID: F230037-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/7/23 8:15

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**126** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
2-Methylnaphthalene	**116** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
1-Methylnaphthalene	**82.8** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C1-Naphthalenes	**123** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C2-Naphthalenes	**217** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C3-Naphthalenes	**364** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C4-Naphthalenes	**247** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
Biphenyl	**48.1** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
Acenaphthylene	**781** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
Acenaphthene	**209** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
Dibenzofuran	**320** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
Fluorene	**271** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C1-Fluorenes	**305** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C2-Fluorenes	**360** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C3-Fluorenes	**332** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
Dibenzothiophene	**281** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C1-Dibenzothiophenes	**399** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C2-Dibenzothiophenes	**451** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C3-Dibenzothiophenes	**261** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C4-Dibenzothiophenes	**111** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
Phenanthrene	**3550** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
Anthracene	**1220** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C1-Phenanthrenes/Anthracenes	**2220** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C2-Phenanthrenes/Anthracenes	**1260** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C3-Phenanthrenes/Anthracenes	**466** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C4-Phenanthrenes/Anthracenes	**139** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
Retene	**35.8** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
Benzo(b)naphtho(2,1-d)thiophene	**325** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C0-Benzonaphthothiophenes	**605** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C1-Benzonaphthothiophenes	**414** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C2-Benzonaphthothiophenes	**349** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C3-Benzonaphthothiophenes	**260** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-857-S1
Date Sampled: 11/02/23 13:00
Percent Solids: 74
Initial Volume: 5.07
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230037
ESS Laboratory Sample ID: F230037-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/7/23 8:15

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**139** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
Fluoranthene	**4220** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
Pyrene	**3710** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C1-Fluoranthenes/Pyrenes	**2190** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C2-Fluoranthenes/Pyrenes	**1310** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C3-Fluoranthenes/Pyrenes	**532** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
Benzo(b)fluorene	**212** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
Benzo(c)fluorene	**112** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
2-Methylpyrene	**304** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
4-Methylpyrene	**276** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
1-Methylpyrene	**241** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
Benz(a)anthracene	**2080** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
Chrysene/triphenylene	**2060** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C1-Benzo(a)anthracenes/Chrysenes	**1080** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C2-Benzo(a)anthracenes/Chrysenes	**614** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C3-Benzo(a)anthracenes/Chrysenes	**353** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C4-Benzo(a)anthracenes/Chrysenes	**156** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
Benzo(b)fluoranthene	**1570** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
Benzo(j/k)fluoranthene	**1490** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
Benzo(e)pyrene	**1270** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
Benzo(a)pyrene	**2020** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
Perylene	**499** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
Indeno(1,2,3-cd)pyrene	**1350** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
Dibenzo(a,h)anthracene	**321** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
Benzo(g,h,i)perylene	**1110** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
Coronene	**296** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
Tetramethyl lead	ND (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
Trimethylethyl lead	ND (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
Dimethyldiethyl lead	ND (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
Methyltriethyl lead	ND (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
Tetraethyl lead	ND (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
2,6,10-trimethyldodecane (1380)	**34.2** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-857-S1
Date Sampled: 11/02/23 13:00
Percent Solids: 74
Initial Volume: 5.07
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230037
ESS Laboratory Sample ID: F230037-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/7/23 8:15

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**68.1** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
2,6,10-trimethylpentadecane (1650)	**38.5** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C-17	**147** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
Pristane	**99.6** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
C-18	**65.1** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
Phytane	**76.7** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
Carbazole	**295** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
2,6-Dimethylnaphthalene	**56.5** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
2,3,5-Trimethylnaphthene	**24.3** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
4-Methyldibenzothiophene	**148** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
2/3-Methyldibenzothiophene	**139** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
1-Methyldibenzothiophene	**47.3** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
3-Methylphenanthrene	**477** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
2-Methylphenanthrene	**591** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
2-Methylanthracene	**294** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
4/9-Methylphenanthrene	**517** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701
1-Methylphenanthrene	**357** (5.36)	2.68	8270 Mod		1	IBM	11/10/23 3:02	F3K0001	FK30701

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*75 %*		*50-120*
Surrogate: Naphthalene-d8	*80 %*		*50-120*
Surrogate: Phenanthrene-d10	*86 %*		*50-120*
Surrogate: Perylene-d12	*101 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-857-S1
Date Sampled: 11/02/23 13:00
Percent Solids: 74

ESS Laboratory Work Order: F230037
ESS Laboratory Sample ID: F230037-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**22200** (476)		LK		1	CCP	11/08/23 15:57	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-857-S3
Date Sampled: 11/02/23 13:02
Percent Solids: 54
Initial Volume: 5.29
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230037
ESS Laboratory Sample ID: F230037-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/7/23 8:15

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**271** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C1-Benzene	**320** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C2-Benzenes	**791** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C3-Benzenes	**327** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C4-Benzenes	**2410** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C5-Benzenes	**3350** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
Methylcyclohexane	**391** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
Toluene	**415** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
Ethylbenzene	**95.0** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
m,p-Xylene	**1170** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
Styrene	**B 232** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
o-Xylene	**69.5** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
Isopropylbenzene	**15.7** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
n-Propylbenzene	**101** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
1,3,5-Trimethylbenzene	**46.3** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
1,2,3-Trimethylbenzene	**47.6** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
1,2,4-Trimethylbenzene	**160** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
t-Butylbenzene	**27.7** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
sec-Butylbenzene	**127** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
p-Isopropyltoluene	**35.8** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
n-Butylbenzene	ND (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
trans-Decalin	**12300** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
cis-Decalin	**1770** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C1-Decalins	**18900** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C2-Decalins	**6140** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C3-Decalins	**2450** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C4-Decalins	**4730** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
Benzo(b)thiophene	**52.1** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C1-Benzo(b)thiophenes	**282** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C2-Benzo(b)thiophenes	**287** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C3-Benzo(b)thiophenes	**472** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C4-Benzo(b)thiophenes	**468** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-857-S3
Date Sampled: 11/02/23 13:02
Percent Solids: 54
Initial Volume: 5.29
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230037
ESS Laboratory Sample ID: F230037-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/7/23 8:15

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**1550** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
2-Methylnaphthalene	**821** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
1-Methylnaphthalene	**677** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C1-Naphthalenes	**923** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C2-Naphthalenes	**2610** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C3-Naphthalenes	**6970** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C4-Naphthalenes	**6080** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
Biphenyl	**316** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
Acenaphthylene	**1100** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
Acenaphthene	**3950** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
Dibenzofuran	**1810** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
Fluorene	**3760** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C1-Fluorenes	**1890** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C2-Fluorenes	**3130** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C3-Fluorenes	**3860** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
Dibenzothiophene	**2030** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C1-Dibenzothiophenes	**2400** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C2-Dibenzothiophenes	**3120** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C3-Dibenzothiophenes	**2740** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C4-Dibenzothiophenes	**1610** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
Phenanthrene	**28900** (34.9)	17.4	8270 Mod		5	IBM	11/10/23 7:07	F3K0001	FK30701
Anthracene	**7300** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C1-Phenanthrenes/Anthracenes	**10500** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C2-Phenanthrenes/Anthracenes	**7010** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C3-Phenanthrenes/Anthracenes	**3510** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C4-Phenanthrenes/Anthracenes	**1490** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
Retene	ND (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
Benzo(b)naphtho(2,1-d)thiophene	**1960** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C0-Benzonaphthothiophenes	**3550** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C1-Benzonaphthothiophenes	**2210** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C2-Benzonaphthothiophenes	**2110** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C3-Benzonaphthothiophenes	**1610** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-857-S3
Date Sampled: 11/02/23 13:02
Percent Solids: 54
Initial Volume: 5.29
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230037
ESS Laboratory Sample ID: F230037-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/7/23 8:15

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**877** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
Fluoranthene	**32700** (34.9)	17.4	8270 Mod		5	IBM	11/10/23 7:07	F3K0001	FK30701
Pyrene	**27000** (34.9)	17.4	8270 Mod		5	IBM	11/10/23 7:07	F3K0001	FK30701
C1-Fluoranthenes/Pyrenes	**10600** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C2-Fluoranthenes/Pyrenes	**5670** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C3-Fluoranthenes/Pyrenes	**2660** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
Benzo(b)fluorene	**1690** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
Benzo(c)fluorene	**552** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
2-Methylpyrene	**1340** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
4-Methylpyrene	**1050** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
1-Methylpyrene	**860** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
Benz(a)anthracene	**11100** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
Chrysene/triphenylene	**11000** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C1-Benzo(a)anthracenes/Chrysenes	**4970** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C2-Benzo(a)anthracenes/Chrysenes	**3030** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C3-Benzo(a)anthracenes/Chrysenes	**1800** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C4-Benzo(a)anthracenes/Chrysenes	**982** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
Benzo(b)fluoranthene	**9430** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
Benzo(j/k)fluoranthene	**6970** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
Benzo(e)pyrene	**6710** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
Benzo(a)pyrene	**9910** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
Perylene	**2840** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
Indeno(1,2,3-cd)pyrene	**7790** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
Dibenzo(a,h)anthracene	**1750** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
Benzo(g,h,i)perylene	**6380** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
Coronene	**1750** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
Tetramethyl lead	ND (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
Trimethylethyl lead	ND (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
Dimethyldiethyl lead	ND (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
Methyltriethyl lead	ND (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
Tetraethyl lead	ND (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
2,6,10-trimethyldodecane (1380)	**4340** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-857-S3
Date Sampled: 11/02/23 13:02
Percent Solids: 54
Initial Volume: 5.29
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230037
ESS Laboratory Sample ID: F230037-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/7/23 8:15

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**5040** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
2,6,10-trimethylpentadecane (1650)	**4130** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C-17	ND (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
Pristane	**12600** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
C-18	ND (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
Phytane	**9180** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
Carbazole	**3970** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
2,6-Dimethylnaphthalene	**332** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
2,3,5-Trimethylnaphthene	**445** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
4-Methyldibenzothiophene	**926** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
2/3-Methyldibenzothiophene	**958** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
1-Methyldibenzothiophene	**277** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
3-Methylphenanthrene	**2590** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
2-Methylphenanthrene	**2940** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
2-Methylanthracene	**1090** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
4/9-Methylphenanthrene	**2310** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701
1-Methylphenanthrene	**1600** (6.97)	3.49	8270 Mod		1	IBM	11/11/23 18:40	F3K0001	FK30701

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*72 %*		*50-120*
Surrogate: Naphthalene-d8	*80 %*		*50-120*
Surrogate: Phenanthrene-d10	*85 %*		*50-120*
Surrogate: Perylene-d12	*90 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-857-S3
Date Sampled: 11/02/23 13:02
Percent Solids: 54

ESS Laboratory Work Order: F230037
ESS Laboratory Sample ID: F230037-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**47400** (478)		LK		1	CCP	11/08/23 14:50	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-858-S1
Date Sampled: 11/02/23 13:15
Percent Solids: 51
Initial Volume: 5.11
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230037
ESS Laboratory Sample ID: F230037-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/7/23 8:15

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**109** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C1-Benzene	**176** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C2-Benzenes	**604** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C3-Benzenes	**63.0** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C4-Benzenes	**65.0** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C5-Benzenes	**51.1** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
Methylcyclohexane	**9.69** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
Toluene	**245** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
Ethylbenzene	**24.3** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
m,p-Xylene	**985** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
Styrene	**B 69.0** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
o-Xylene	**14.6** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
Isopropylbenzene	ND (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
n-Propylbenzene	**25.2** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
1,3,5-Trimethylbenzene	**J 5.70** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
1,2,3-Trimethylbenzene	**11.7** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
1,2,4-Trimethylbenzene	**15.1** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
t-Butylbenzene	ND (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
sec-Butylbenzene	ND (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
p-Isopropyltoluene	**19.9** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
n-Butylbenzene	**46.9** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
trans-Decalin	**J 5.25** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
cis-Decalin	ND (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C1-Decalins	**19.3** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C2-Decalins	**24.7** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C3-Decalins	**16.4** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C4-Decalins	**34.3** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
Benzo(b)thiophene	**J 6.98** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C1-Benzo(b)thiophenes	**17.4** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C2-Benzo(b)thiophenes	**36.4** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C3-Benzo(b)thiophenes	**18.2** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C4-Benzo(b)thiophenes	**10.2** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-858-S1
Date Sampled: 11/02/23 13:15
Percent Solids: 51
Initial Volume: 5.11
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230037
ESS Laboratory Sample ID: F230037-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/7/23 8:15

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**66.1** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
2-Methylnaphthalene	**43.7** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
1-Methylnaphthalene	**33.2** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C1-Naphthalenes	**47.6** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C2-Naphthalenes	**128** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C3-Naphthalenes	**129** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C4-Naphthalenes	**71.7** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
Biphenyl	**20.3** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
Acenaphthylene	**642** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
Acenaphthene	**103** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
Dibenzofuran	**82.1** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
Fluorene	**148** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C1-Fluorenes	**106** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C2-Fluorenes	**137** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C3-Fluorenes	**196** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
Dibenzothiophene	**134** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C1-Dibenzothiophenes	**150** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C2-Dibenzothiophenes	**184** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C3-Dibenzothiophenes	**123** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C4-Dibenzothiophenes	**67.8** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
Phenanthrene	**1930** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
Anthracene	**832** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C1-Phenanthrenes/Anthracenes	**1090** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C2-Phenanthrenes/Anthracenes	**653** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C3-Phenanthrenes/Anthracenes	**261** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C4-Phenanthrenes/Anthracenes	**93.6** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
Retene	**39.4** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
Benzo(b)naphtho(2,1-d)thiophene	**293** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C0-Benzonaphthothiophenes	**539** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C1-Benzonaphthothiophenes	**337** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C2-Benzonaphthothiophenes	**288** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C3-Benzonaphthothiophenes	**261** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-858-S1
Date Sampled: 11/02/23 13:15
Percent Solids: 51
Initial Volume: 5.11
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230037
ESS Laboratory Sample ID: F230037-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/7/23 8:15

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**206** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
Fluoranthene	**3590** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
Pyrene	**3140** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C1-Fluoranthenes/Pyrenes	**1630** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C2-Fluoranthenes/Pyrenes	**1060** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C3-Fluoranthenes/Pyrenes	**444** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
Benzo(b)fluorene	**160** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
Benzo(c)fluorene	**76.6** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
2-Methylpyrene	**240** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
4-Methylpyrene	**210** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
1-Methylpyrene	**163** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
Benz(a)anthracene	**1900** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
Chrysene/triphenylene	**1950** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C1-Benzo(a)anthracenes/Chrysenes	**1030** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C2-Benzo(a)anthracenes/Chrysenes	**523** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C3-Benzo(a)anthracenes/Chrysenes	**287** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C4-Benzo(a)anthracenes/Chrysenes	**153** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
Benzo(b)fluoranthene	**1670** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
Benzo(j/k)fluoranthene	**1600** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
Benzo(e)pyrene	**1370** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
Benzo(a)pyrene	**2070** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
Perylene	**526** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
Indeno(1,2,3-cd)pyrene	**1460** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
Dibenzo(a,h)anthracene	**344** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
Benzo(g,h,i)perylene	**1200** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
Coronene	**313** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
Tetramethyl lead	ND (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
Trimethylethyl lead	ND (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
Dimethyldiethyl lead	ND (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
Methyltriethyl lead	ND (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
Tetraethyl lead	ND (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
2,6,10-trimethyldodecane (1380)	**15.6** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-858-S1
Date Sampled: 11/02/23 13:15
Percent Solids: 51
Initial Volume: 5.11
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230037
ESS Laboratory Sample ID: F230037-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/7/23 8:15

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**55.9** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
2,6,10-trimethylpentadecane (1650)	**26.8** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C-17	**177** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
Pristane	**58.4** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
C-18	**94.8** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
Phytane	**63.3** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
Carbazole	**189** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
2,6-Dimethylnaphthalene	**32.0** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
2,3,5-Trimethylnaphthene	**8.31** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
4-Methyldibenzothiophene	**48.5** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
2/3-Methyldibenzothiophene	**48.9** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
1-Methyldibenzothiophene	**19.7** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
3-Methylphenanthrene	**235** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
2-Methylphenanthrene	**289** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
2-Methylanthracene	**160** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
4/9-Methylphenanthrene	**243** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701
1-Methylphenanthrene	**165** (7.64)	3.82	8270 Mod		1	IBM	11/10/23 9:50	F3K0001	FK30701

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*77 %*		*50-120*
Surrogate: Naphthalene-d8	*83 %*		*50-120*
Surrogate: Phenanthrene-d10	*88 %*		*50-120*
Surrogate: Perylene-d12	*101 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-858-S1
Date Sampled: 11/02/23 13:15
Percent Solids: 51

ESS Laboratory Work Order: F230037
ESS Laboratory Sample ID: F230037-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**51000** (481)		LK		1	CCP	11/08/23 16:47	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-858-S3
Date Sampled: 11/02/23 13:17
Percent Solids: 85
Initial Volume: 5.39
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230037
ESS Laboratory Sample ID: F230037-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/7/23 8:15

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**61.8** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C1-Benzene	**53.6** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C2-Benzenes	**51.8** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C3-Benzenes	**54.8** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C4-Benzenes	**120** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C5-Benzenes	**84.1** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
Methylcyclohexane	**11.1** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
Toluene	**70.8** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
Ethylbenzene	**10.7** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
m,p-Xylene	**65.3** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
Styrene	**B 55.3** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
o-Xylene	**10.9** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
Isopropylbenzene	**J 2.49** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
n-Propylbenzene	**11.0** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
1,3,5-Trimethylbenzene	**5.91** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
1,2,3-Trimethylbenzene	**10.2** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
1,2,4-Trimethylbenzene	**22.9** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
t-Butylbenzene	ND (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
sec-Butylbenzene	**4.75** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
p-Isopropyltoluene	**23.9** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
n-Butylbenzene	**25.3** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
trans-Decalin	**153** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
cis-Decalin	**20.0** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C1-Decalins	**230** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C2-Decalins	**100** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C3-Decalins	**63.8** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C4-Decalins	**182** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
Benzo(b)thiophene	**9.40** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C1-Benzo(b)thiophenes	**18.4** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C2-Benzo(b)thiophenes	**33.3** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C3-Benzo(b)thiophenes	**25.4** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C4-Benzo(b)thiophenes	**11.9** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-858-S3
Date Sampled: 11/02/23 13:17
Percent Solids: 85
Initial Volume: 5.39
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230037
ESS Laboratory Sample ID: F230037-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/7/23 8:15

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**193** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
2-Methylnaphthalene	**124** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
1-Methylnaphthalene	**121** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C1-Naphthalenes	**150** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C2-Naphthalenes	**292** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C3-Naphthalenes	**267** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C4-Naphthalenes	**138** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
Biphenyl	**57.5** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
Acenaphthylene	**530** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
Acenaphthene	**533** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
Dibenzofuran	**283** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
Fluorene	**400** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C1-Fluorenes	**213** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C2-Fluorenes	**208** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C3-Fluorenes	**376** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
Dibenzothiophene	**351** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C1-Dibenzothiophenes	**292** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C2-Dibenzothiophenes	**290** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C3-Dibenzothiophenes	**220** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C4-Dibenzothiophenes	**149** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
Phenanthrene	**4180** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
Anthracene	**1330** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C1-Phenanthrenes/Anthracenes	**1850** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C2-Phenanthrenes/Anthracenes	**984** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C3-Phenanthrenes/Anthracenes	**443** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C4-Phenanthrenes/Anthracenes	**178** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
Retene	**41.8** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
Benzo(b)naphtho(2,1-d)thiophene	**488** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C0-Benzonaphthothiophenes	**911** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C1-Benzonaphthothiophenes	**498** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C2-Benzonaphthothiophenes	**405** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C3-Benzonaphthothiophenes	**296** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-858-S3
Date Sampled: 11/02/23 13:17
Percent Solids: 85
Initial Volume: 5.39
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230037
ESS Laboratory Sample ID: F230037-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/7/23 8:15

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**152** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
Fluoranthene	**5450** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
Pyrene	**4700** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C1-Fluoranthenes/Pyrenes	**2380** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C2-Fluoranthenes/Pyrenes	**1490** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C3-Fluoranthenes/Pyrenes	**659** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
Benzo(b)fluorene	**293** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
Benzo(c)fluorene	**117** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
2-Methylpyrene	**323** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
4-Methylpyrene	**266** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
1-Methylpyrene	**215** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
Benz(a)anthracene	**2940** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
Chrysene/triphenylene	**3050** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C1-Benzo(a)anthracenes/Chrysenes	**1370** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C2-Benzo(a)anthracenes/Chrysenes	**741** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C3-Benzo(a)anthracenes/Chrysenes	**433** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C4-Benzo(a)anthracenes/Chrysenes	**214** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
Benzo(b)fluoranthene	**2480** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
Benzo(j/k)fluoranthene	**2320** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
Benzo(e)pyrene	**1950** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
Benzo(a)pyrene	**3020** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
Perylene	**799** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
Indeno(1,2,3-cd)pyrene	**2110** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
Dibenzo(a,h)anthracene	**506** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
Benzo(g,h,i)perylene	**1690** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
Coronene	**443** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
Tetramethyl lead	ND (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
Trimethylethyl lead	ND (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
Dimethyldiethyl lead	ND (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
Methyltriethyl lead	ND (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
Tetraethyl lead	ND (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
2,6,10-trimethyldodecane (1380)	**48.7** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-858-S3
Date Sampled: 11/02/23 13:17
Percent Solids: 85
Initial Volume: 5.39
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230037
ESS Laboratory Sample ID: F230037-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/7/23 8:15

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**86.4** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
2,6,10-trimethylpentadecane (1650)	**81.3** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C-17	**197** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
Pristane	**211** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
C-18	**173** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
Phytane	**195** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
Carbazole	**586** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
2,6-Dimethylnaphthalene	**53.1** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
2,3,5-Trimethylnaphthene	**23.1** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
4-Methyldibenzothiophene	**90.0** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
2/3-Methyldibenzothiophene	**101** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
1-Methyldibenzothiophene	**30.0** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
3-Methylphenanthrene	**416** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
2-Methylphenanthrene	**512** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
2-Methylanthracene	**228** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
4/9-Methylphenanthrene	**400** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701
1-Methylphenanthrene	**278** (4.36)	2.18	8270 Mod		1	IBM	11/10/23 16:38	F3K0001	FK30701

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*77 %*		*50-120*
Surrogate: Naphthalene-d8	*85 %*		*50-120*
Surrogate: Phenanthrene-d10	*91 %*		*50-120*
Surrogate: Perylene-d12	*109 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-858-S3
Date Sampled: 11/02/23 13:17
Percent Solids: 85

ESS Laboratory Work Order: F230037
ESS Laboratory Sample ID: F230037-04
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**20900** (475)		LK		1	CCP	11/08/23 17:04	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230037

Quality Control Data

Classical Chemistry

Batch DK30661 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	500	mg/kg							
Total Organic Carbon (2)	ND	500	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230037

Quality Control Data

Classical Chemistry

Batch DK30661 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9790	500	mg/kg	10010		98	80-120			
Total Organic Carbon (2)	9960	500	mg/kg	10010		99	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230037

Quality Control Data

Classical Chemistry

Batch DK30661 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9900	500	mg/kg	10010		99	80-120	1	25	
Total Organic Carbon (2)	10100	500	mg/kg	10010		101	80-120	2	25	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230037

Quality Control Data

Alkylated PAHs

Batch FK30701 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	3.47	4.00	ug/Kg wet							J
C1-Benzene	2.77	4.00	ug/Kg wet							J
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	3.44	4.00	ug/Kg wet							J
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	23.6	4.00	ug/Kg wet							
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230037

Quality Control Data

Alkylated PAHs

Batch FK30701 - 3570

C1-Fluorenes	ND	4.00	ug/Kg wet
C2-Fluorenes	ND	4.00	ug/Kg wet
C3-Fluorenes	ND	4.00	ug/Kg wet
Dibenzothiophene	ND	4.00	ug/Kg wet
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet
Phenanthrene	ND	4.00	ug/Kg wet
Anthracene	ND	4.00	ug/Kg wet
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
Retene	ND	4.00	ug/Kg wet
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
Fluoranthene	ND	4.00	ug/Kg wet
Pyrene	ND	4.00	ug/Kg wet
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
Benzo(b)fluorene	ND	4.00	ug/Kg wet
Benzo(c)fluorene	ND	4.00	ug/Kg wet
2-Methylpyrene	ND	4.00	ug/Kg wet
4-Methylpyrene	ND	4.00	ug/Kg wet
1-Methylpyrene	ND	4.00	ug/Kg wet
Benz(a)anthracene	ND	4.00	ug/Kg wet
Chrysene/triphenylene	ND	4.00	ug/Kg wet
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet
Benzo(e)pyrene	ND	4.00	ug/Kg wet
Benzo(a)pyrene	ND	4.00	ug/Kg wet
Perylene	ND	4.00	ug/Kg wet
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet
Coronene	ND	4.00	ug/Kg wet
Tetramethyl lead	ND	4.00	ug/Kg wet
Trimethylethyl lead	ND	4.00	ug/Kg wet

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230037

Quality Control Data

Alkylated PAHs

Batch FK30701 - 3570							
Dimethyldiethyl lead	ND	4.00	ug/Kg wet				
Methyltriethyl lead	ND	4.00	ug/Kg wet				
Tetraethyl lead	ND	4.00	ug/Kg wet				
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet				
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet				
2,6,10-trimethylpentadecane (1650)	ND	4.00	ug/Kg wet				
C-17	5.23	4.00	ug/Kg wet				
Pristane	2.06	4.00	ug/Kg wet				J
C-18	4.90	4.00	ug/Kg wet				
Phytane	ND	4.00	ug/Kg wet				
Carbazole	ND	4.00	ug/Kg wet				
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet				
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet				
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
3-Methylphenanthrene	ND	4.00	ug/Kg wet				
2-Methylphenanthrene	ND	4.00	ug/Kg wet				
2-Methylanthracene	ND	4.00	ug/Kg wet				
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet				
1-Methylphenanthrene	ND	4.00	ug/Kg wet				
Surrogate: Toluene-D8	*346*		ug/Kg wet	*400.0*	*86*	*50-120*	
Surrogate: Naphthalene-d8	*354*		ug/Kg wet	*400.0*	*89*	*50-120*	
Surrogate: Phenanthrene-d10	*386*		ug/Kg wet	*400.0*	*96*	*50-120*	
Surrogate: Perylene-d12	*417*		ug/Kg wet	*400.0*	*104*	*50-120*	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230037

Quality Control Data

Alkylated PAHs

Batch FK30701 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	264	4.00	ug/Kg wet	400.0		66	60-130			
Methylcyclohexane	206	4.00	ug/Kg wet	400.0		52	60-130			B-
Toluene	304	4.00	ug/Kg wet	400.0		76	60-130			
Ethylbenzene	320	4.00	ug/Kg wet	400.0		80	60-130			
m,p-Xylene	321	4.00	ug/Kg wet	400.0		80	60-130			
Styrene	324	4.00	ug/Kg wet	400.0		81	60-130			
o-Xylene	323	4.00	ug/Kg wet	400.0		81	60-130			
Isopropylbenzene	326	4.00	ug/Kg wet	400.0		82	60-130			
n-Propylbenzene	326	4.00	ug/Kg wet	400.0		81	60-130			
1,3,5-Trimethylbenzene	327	4.00	ug/Kg wet	400.0		82	60-130			
1,2,3-Trimethylbenzene	328	4.00	ug/Kg wet	400.0		82	60-130			
1,2,4-Trimethylbenzene	329	4.00	ug/Kg wet	400.0		82	60-130			
t-Butylbenzene	327	4.00	ug/Kg wet	400.0		82	60-130			
sec-Butylbenzene	326	4.00	ug/Kg wet	400.0		81	60-130			
p-Isopropyltoluene	331	4.00	ug/Kg wet	400.0		83	60-130			
n-Butylbenzene	319	4.00	ug/Kg wet	400.0		80	60-130			
trans-Decalin	319	4.00	ug/Kg wet	400.0		80	60-130			
cis-Decalin	318	4.00	ug/Kg wet	400.0		80	60-130			
Benzo(b)thiophene	311	4.00	ug/Kg wet	400.0		78	60-130			
Naphthalene	316	4.00	ug/Kg wet	400.0		79	60-130			
2-Methylnaphthalene	324	4.00	ug/Kg wet	400.0		81	60-130			
1-Methylnaphthalene	325	4.00	ug/Kg wet	400.0		81	60-130			
Biphenyl	310	4.00	ug/Kg wet	400.0		77	60-130			
Acenaphthylene	336	4.00	ug/Kg wet	400.0		84	60-130			
Acenaphthene	323	4.00	ug/Kg wet	400.0		81	60-130			
Dibenzofuran	318	4.00	ug/Kg wet	400.0		79	60-130			
Fluorene	326	4.00	ug/Kg wet	400.0		81	60-130			
Dibenzothiophene	325	4.00	ug/Kg wet	400.0		81	60-130			
Phenanthrene	328	4.00	ug/Kg wet	400.0		82	60-130			
Anthracene	340	4.00	ug/Kg wet	400.0		85	60-130			
Retene	357	4.00	ug/Kg wet	400.0		89	60-130			
Benzo(b)naphtho(2,1-d)thiophene	338	4.00	ug/Kg wet	400.0		85	60-130			
Fluoranthene	346	4.00	ug/Kg wet	400.0		87	60-130			
Pyrene	341	4.00	ug/Kg wet	400.0		85	60-130			
Benz(a)anthracene	356	4.00	ug/Kg wet	400.0		89	60-130			
Chrysene/triphenylene	346	4.00	ug/Kg wet	400.0		86	60-130			
Benzo(b)fluoranthene	344	4.00	ug/Kg wet	400.0		86	60-130			
Benzo(j/k)fluoranthene	349	4.00	ug/Kg wet	400.0		87	60-130			
Benzo(e)pyrene	340	4.00	ug/Kg wet	400.0		85	60-130			
Benzo(a)pyrene	345	4.00	ug/Kg wet	400.0		86	60-130			
Perylene	347	4.00	ug/Kg wet	400.0		87	60-130			
Indeno(1,2,3-cd)pyrene	363	4.00	ug/Kg wet	400.0		91	60-130			
Dibenzo(a,h)anthracene	370	4.00	ug/Kg wet	400.0		92	60-130			
Benzo(g,h,i)perylene	348	4.00	ug/Kg wet	400.0		87	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230037

Quality Control Data

Alkylated PAHs

Batch FK30701 - 3570						
Coronene	355	4.00	ug/Kg wet	400.0	89	60-130
Tetraethyl lead	358	4.00	ug/Kg wet	400.0	90	60-130
Surrogate: Toluene-D8	*331*		ug/Kg wet	*400.0*	*83*	*50-120*
Surrogate: Naphthalene-d8	*349*		ug/Kg wet	*400.0*	*87*	*50-120*
Surrogate: Phenanthrene-d10	*372*		ug/Kg wet	*400.0*	*93*	*50-120*
Surrogate: Perylene-d12	*398*		ug/Kg wet	*400.0*	*100*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230037

Quality Control Data

Alkylated PAHs

Batch FK30701 - 3570

Duplicate **Source: F230037-04**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	49.9	4.04	ug/Kg dry		61.8			21	50	
C1-Benzene	34.3	4.04	ug/Kg dry		53.6			44	50	
C2-Benzenes	39.8	4.04	ug/Kg dry		51.8			26	50	
C3-Benzenes	46.8	4.04	ug/Kg dry		54.8			16	50	
C4-Benzenes	116	4.04	ug/Kg dry		120			4	50	
C5-Benzenes	82.2	4.04	ug/Kg dry		84.1			2	50	
Methylcyclohexane	7.96	4.04	ug/Kg dry		11.1			33	50	
Toluene	46.2	4.04	ug/Kg dry		70.8			42	50	
Ethylbenzene	8.19	4.04	ug/Kg dry		10.7			26	50	
m,p-Xylene	49.3	4.04	ug/Kg dry		65.3			28	50	
Styrene	37.9	4.04	ug/Kg dry		55.3			37	50	
o-Xylene	7.82	4.04	ug/Kg dry		10.9			33	50	
Isopropylbenzene	2.32	4.04	ug/Kg dry		2.49			7	50	J
n-Propylbenzene	8.28	4.04	ug/Kg dry		11.0			28	50	
1,3,5-Trimethylbenzene	5.81	4.04	ug/Kg dry		5.91			2	50	
1,2,3-Trimethylbenzene	9.90	4.04	ug/Kg dry		10.2			3	50	
1,2,4-Trimethylbenzene	20.2	4.04	ug/Kg dry		22.9			13	50	
t-Butylbenzene	ND	4.04	ug/Kg dry		ND				50	
sec-Butylbenzene	5.57	4.04	ug/Kg dry		4.75			16	50	
p-Isopropyltoluene	10.8	4.04	ug/Kg dry		23.9			76	50	D+
n-Butylbenzene	21.9	4.04	ug/Kg dry		25.3			15	50	
trans-Decalin	125	4.04	ug/Kg dry		153			20	50	
cis-Decalin	18.2	4.04	ug/Kg dry		20.0			9	50	
C1-Decalins	187	4.04	ug/Kg dry		230			20	50	
C2-Decalins	89.5	4.04	ug/Kg dry		100			11	50	
C3-Decalins	57.0	4.04	ug/Kg dry		63.8			11	50	
C4-Decalins	137	4.04	ug/Kg dry		182			28	50	
Benzo(b)thiophene	11.9	4.04	ug/Kg dry		9.40			24	50	
C1-Benzo(b)thiophenes	17.3	4.04	ug/Kg dry		18.4			6	50	
C2-Benzo(b)thiophenes	29.3	4.04	ug/Kg dry		33.3			13	50	
C3-Benzo(b)thiophenes	22.5	4.04	ug/Kg dry		25.4			12	50	
C4-Benzo(b)thiophenes	11.3	4.04	ug/Kg dry		11.9			5	50	
Naphthalene	288	4.04	ug/Kg dry		193			40	50	
2-Methylnaphthalene	159	4.04	ug/Kg dry		124			24	50	
1-Methylnaphthalene	141	4.04	ug/Kg dry		121			15	50	
C1-Naphthalenes	184	4.04	ug/Kg dry		150			20	50	
C2-Naphthalenes	280	4.04	ug/Kg dry		292			4	50	
C3-Naphthalenes	239	4.04	ug/Kg dry		267			11	50	
C4-Naphthalenes	122	4.04	ug/Kg dry		138			12	50	
Biphenyl	63.7	4.04	ug/Kg dry		57.5			10	50	
Acenaphthylene	332	4.04	ug/Kg dry		530			46	50	
Acenaphthene	770	4.04	ug/Kg dry		533			36	50	
Dibenzofuran	385	4.04	ug/Kg dry		283			31	50	
Fluorene	662	4.04	ug/Kg dry		400			49	50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230037

Quality Control Data

Alkylated PAHs

Batch FK30701 - 3570

C1-Fluorenes	213	4.04	ug/Kg dry	213	0.4	50
C2-Fluorenes	182	4.04	ug/Kg dry	208	14	50
C3-Fluorenes	361	4.04	ug/Kg dry	376	4	50
Dibenzothiophene	390	4.04	ug/Kg dry	351	11	50
C1-Dibenzothiophenes	268	4.04	ug/Kg dry	292	9	50
C2-Dibenzothiophenes	250	4.04	ug/Kg dry	290	15	50
C3-Dibenzothiophenes	172	4.04	ug/Kg dry	220	24	50
C4-Dibenzothiophenes	117	4.04	ug/Kg dry	149	25	50
Phenanthrene	5060	4.04	ug/Kg dry	4180	19	50
Anthracene	1620	4.04	ug/Kg dry	1330	20	50
C1-Phenanthrenes/Anthracenes	1840	4.04	ug/Kg dry	1850	0.7	50
C2-Phenanthrenes/Anthracenes	890	4.04	ug/Kg dry	984	10	50
C3-Phenanthrenes/Anthracenes	380	4.04	ug/Kg dry	443	15	50
C4-Phenanthrenes/Anthracenes	155	4.04	ug/Kg dry	178	13	50
Retene	29.0	4.04	ug/Kg dry	41.8	36	50
Benzo(b)naphtho(2,1-d)thiophene	481	4.04	ug/Kg dry	488	1	50
C0-Benzonaphthothiophenes	892	4.04	ug/Kg dry	911	2	50
C1-Benzonaphthothiophenes	433	4.04	ug/Kg dry	498	14	50
C2-Benzonaphthothiophenes	324	4.04	ug/Kg dry	405	22	50
C3-Benzonaphthothiophenes	242	4.04	ug/Kg dry	296	20	50
C4-Benzonaphthothiophenes	123	4.04	ug/Kg dry	152	21	50
Fluoranthene	6190	4.04	ug/Kg dry	5450	13	50
Pyrene	5190	4.04	ug/Kg dry	4700	10	50
C1-Fluoranthenes/Pyrenes	2380	4.04	ug/Kg dry	2380	0.2	50
C2-Fluoranthenes/Pyrenes	1380	4.04	ug/Kg dry	1490	7	50
C3-Fluoranthenes/Pyrenes	585	4.04	ug/Kg dry	659	12	50
Benzo(b)fluorene	327	4.04	ug/Kg dry	293	11	50
Benzo(c)fluorene	154	4.04	ug/Kg dry	117	27	50
2-Methylpyrene	311	4.04	ug/Kg dry	323	4	50
4-Methylpyrene	235	4.04	ug/Kg dry	266	13	50
1-Methylpyrene	196	4.04	ug/Kg dry	215	9	50
Benz(a)anthracene	3090	4.04	ug/Kg dry	2940	5	50
Chrysene/triphenylene	3030	4.04	ug/Kg dry	3050	0.7	50
C1-Benzo(a)anthracenes/Chrysenes	1290	4.04	ug/Kg dry	1370	6	50
C2-Benzo(a)anthracenes/Chrysenes	639	4.04	ug/Kg dry	741	15	50
C3-Benzo(a)anthracenes/Chrysenes	382	4.04	ug/Kg dry	433	13	50
C4-Benzo(a)anthracenes/Chrysenes	193	4.04	ug/Kg dry	214	10	50
Benzo(b)fluoranthene	2490	4.04	ug/Kg dry	2480	0.2	50
Benzo(j/k)fluoranthene	2490	4.04	ug/Kg dry	2320	7	50
Benzo(e)pyrene	1930	4.04	ug/Kg dry	1950	0.8	50
Benzo(a)pyrene	3110	4.04	ug/Kg dry	3020	3	50
Perylene	845	4.04	ug/Kg dry	799	6	50
Indeno(1,2,3-cd)pyrene	2180	4.04	ug/Kg dry	2110	3	50
Dibenzo(a,h)anthracene	541	4.04	ug/Kg dry	506	7	50
Benzo(g,h,i)perylene	1710	4.04	ug/Kg dry	1690	0.7	50
Coronene	436	4.04	ug/Kg dry	443	2	50
Tetramethyl lead	ND	4.04	ug/Kg dry	ND		50
Trimethylethyl lead	ND	4.04	ug/Kg dry	ND		50

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230037

Quality Control Data

Alkylated PAHs

Batch FK30701 - 3570								
Dimethyldiethyl lead	ND	4.04	ug/Kg dry		ND			50
Methyltriethyl lead	ND	4.04	ug/Kg dry		ND			50
Tetraethyl lead	ND	4.04	ug/Kg dry		ND			50
2,6,10-trimethyldodecane (1380)	49.8	4.04	ug/Kg dry		48.7		2	50
2,6,10-trimethyltridecane (1470)	87.7	4.04	ug/Kg dry		86.4		2	50
2,6,10-trimethylpentadecane (1650)	79.6	4.04	ug/Kg dry		81.3		2	50
C-17	159	4.04	ug/Kg dry		197		21	50
Pristane	218	4.04	ug/Kg dry		211		3	50
C-18	126	4.04	ug/Kg dry		173		31	50
Phytane	218	4.04	ug/Kg dry		195		11	50
Carbazole	786	4.04	ug/Kg dry		586		29	50
2,6-Dimethylnaphthalene	54.2	4.04	ug/Kg dry		53.1		2	50
2,3,5-Trimethylnaphthene	20.7	4.04	ug/Kg dry		23.1		11	50
4-Methyldibenzothiophene	81.3	4.04	ug/Kg dry		90.0		10	50
2/3-Methyldibenzothiophene	93.7	4.04	ug/Kg dry		101		8	50
1-Methyldibenzothiophene	28.7	4.04	ug/Kg dry		30.0		4	50
3-Methylphenanthrene	423	4.04	ug/Kg dry		416		2	50
2-Methylphenanthrene	534	4.04	ug/Kg dry		512		4	50
2-Methylanthracene	230	4.04	ug/Kg dry		228		0.9	50
4/9-Methylphenanthrene	372	4.04	ug/Kg dry		400		7	50
1-Methylphenanthrene	270	4.04	ug/Kg dry		278		3	50
Surrogate: Toluene-D8	*301*		ug/Kg dry	*403.8*		*75*	*50-120*	
Surrogate: Naphthalene-d8	*333*		ug/Kg dry	*403.8*		*82*	*50-120*	
Surrogate: Phenanthrene-d10	*357*		ug/Kg dry	*403.8*		*88*	*50-120*	
Surrogate: Perylene-d12	*426*		ug/Kg dry	*403.8*		*106*	*50-120*	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F230037

Notes and Definitions

U	Analyte included in the analysis, but not detected
J	Reported between MDL and MRL
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
B-	Blank Spike recovery is below lower control limit (B-).
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230037

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 23K0138 / F230037

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000

Project Information

Project Name: Amesbury Former MGP

Project Number: 1804576

Project Location: Amesbury, MA

Project Manager: Ryan Hoffman
781-721-4091 rhoffman@geiconsultants.com

Send Report to: Ryan Hoffman, Jeremy Smalley

labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY AND MCP ANALYTICAL METHODS REQUIRED: (YES) NO

STATE AND FEDERAL REGULATORY REQUIREMENTS/REPORT LIMITS

State/Federal Program: (MA) 401WQC Other _____ NH RI CT NY ME

MA MCP Criteria are (Method 1 S-1 and GW-2/GW-3). Circle if GW-1 is required.

Preservative

none	none								

Analysis

Parent and Alkylated MAHs * PAHs 8270*	TOCs by Lloyd-Kahn								

Sample Handling

Samples Field Filtered
YES NO (NA)

Sampled Shipped With Ice
(YES) NO

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Parent and Alkylated MAHs * PAHs 8270*	TOCs by Lloyd-Kahn	Sample Specific Remarks
1	1804576-857-S1	11/2/2023	13:00	SD	2	JES	x	x	
	1804576-857-S2	11/2/2023	13:01	SD	2	JES	x	x	Hold*
2	1804576-857-S3	11/2/2023	13:02	SD	2	JES	x	x	
	1804576-857-S4	11/2/2023	13:03	SD	2	JES	x	x	Hold*
3	1804576-858-S1	11/2/2023	13:15	SD	2	JES	x	x	
	1804576-858-S2	11/2/2023	13:16	SD	2	JES	x	x	Hold*
4	1804576-858-S3	11/2/2023	13:17	SD	2	JES	x	x	
	1804576-858-S4	11/2/2023	13:18	SD	2	JES	x	x	Hold*

	Relinquished by sampler: (signature)	Date	Time	Received by: (signature)
1.	Dawn Mill	11/2/23	17:00	GEI Fridge
2.	GEI Fridge	11/3/23	12:31	
3.		11/3/23	12:31	11/3/23 12:31
4.	AO 1.6 once	11/3/23	1655	
5.				

Turnaround Time (Business days):

5-Day X 4-Day ____ 3-Day ____
2-Day ____ 1-Day ____ Other ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

** Parent and Alkylated MAHs and PAHs (32) by GC/MS/SIM/SCAN

* Hold analysis until authorized by GEI

Sample Matrix Abbreviations: SO = Soil GW = Groundwater SW = Surface Water SD = Sediment CO = Concrete PC = Paint Chip CLK = Caulk

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants

Shipped/Delivered Via: ESS Courier

ESS Project ID: F230037
Date Received: 11/3/2023
Project Due Date: 11/10/2023
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 1.6 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / (NA)
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / (No)
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By/Acid Lot#:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Resolution:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1	554	Yes	N/A	Yes	4 oz. Jar	NP	
1	558	Yes	N/A	Yes	4 oz. Jar	NP	
2	555	Yes	N/A	Yes	4 oz. Jar	NP	
2	559	Yes	N/A	Yes	4 oz. Jar	NP	
3	556	Yes	N/A	Yes	4 oz. Jar	NP	
3	560	Yes	N/A	Yes	4 oz. Jar	NP	
4	557	Yes	N/A	Yes	4 oz. Jar	NP	
4	561	Yes	N/A	Yes	4 oz. Jar	NP	

2nd Review
Were all containers scanned into storage/lab? Initials
Are barcode labels on correct containers? (Yes) / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants

ESS Project ID: F230037

Date Received: 11/3/2023

By: [signature] Date & Time: 11/3/23 1738

Reviewed By: [signature] Date & Time: 11/3/23 1919

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: F230038

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 12:14 pm, Nov 20, 2023

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses

ESS - Cranston, RI	TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230038

SAMPLE RECEIPT

The following samples were received on November 03, 2023 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F230038-01	1804576-0857-S2	Soil	8270 Mod, LK
F230038-02	1804576-0857-S4	Soil	8270 Mod, LK
F230038-03	1804576-0858-S2	Soil	8270 Mod, LK
F230038-04	1804576-0858-S4	Soil	8270 Mod, LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230038

PROJECT NARRATIVE

Alkylated PAHs

F230038-01	**Present in Method Blank (B).**
	Styrene
F230038-02	**Present in Method Blank (B).**
	Styrene
F230038-03	**Present in Method Blank (B).**
	Styrene
F230038-04	**Present in Method Blank (B).**
	Styrene
FK30801-BS2	**Blank Spike recovery is below lower control limit (B-).**
	Methylcyclohexane (50% @ 60-130%)
FK30801-DUP2	**Relative percent difference for duplicate is outside of criteria (D+).**

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230038

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-0857-S2
Date Sampled: 11/02/23 13:01
Percent Solids: 77
Initial Volume: 5.16
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230038
ESS Laboratory Sample ID: F230038-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/8/23 6:45

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**77.8** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C1-Benzene	**78.2** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C2-Benzenes	**143** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C3-Benzenes	**98.4** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C4-Benzenes	**109** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C5-Benzenes	**90.0** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
Methylcyclohexane	**J 24.1** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
Toluene	**106** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
Ethylbenzene	**J 21.3** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
m,p-Xylene	**185** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
Styrene	**B 74.3** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
o-Xylene	**J 19.6** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
Isopropylbenzene	ND (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
n-Propylbenzene	**J 15.6** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
1,3,5-Trimethylbenzene	**J 13.3** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
1,2,3-Trimethylbenzene	**J 16.0** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
1,2,4-Trimethylbenzene	**38.9** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
t-Butylbenzene	ND (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
sec-Butylbenzene	ND (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
p-Isopropyltoluene	ND (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
n-Butylbenzene	**J 16.7** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
trans-Decalin	**75.7** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
cis-Decalin	**J 15.1** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C1-Decalins	**143** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C2-Decalins	**122** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C3-Decalins	**91.9** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C4-Decalins	**165** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
Benzo(b)thiophene	ND (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C1-Benzo(b)thiophenes	**31.5** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C2-Benzo(b)thiophenes	**46.9** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C3-Benzo(b)thiophenes	**36.7** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C4-Benzo(b)thiophenes	**J 25.1** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-0857-S2
Date Sampled: 11/02/23 13:01
Percent Solids: 77
Initial Volume: 5.16
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230038
ESS Laboratory Sample ID: F230038-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/8/23 6:45

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**122** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
2-Methylnaphthalene	**98.8** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
1-Methylnaphthalene	**75.9** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C1-Naphthalenes	**108** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C2-Naphthalenes	**212** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C3-Naphthalenes	**251** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C4-Naphthalenes	**195** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
Biphenyl	**40.6** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
Acenaphthylene	**359** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
Acenaphthene	**374** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
Dibenzofuran	**167** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
Fluorene	**290** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C1-Fluorenes	**173** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C2-Fluorenes	**197** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C3-Fluorenes	**335** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
Dibenzothiophene	**281** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C1-Dibenzothiophenes	**223** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C2-Dibenzothiophenes	**279** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C3-Dibenzothiophenes	**214** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C4-Dibenzothiophenes	**144** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
Phenanthrene	**2860** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
Anthracene	**911** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C1-Phenanthrenes/Anthracenes	**1180** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C2-Phenanthrenes/Anthracenes	**778** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C3-Phenanthrenes/Anthracenes	**367** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C4-Phenanthrenes/Anthracenes	**168** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
Retene	**46.5** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
Benzo(b)naphtho(2,1-d)thiophene	**355** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C0-Benzonaphthothiophenes	**662** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C1-Benzonaphthothiophenes	**379** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C2-Benzonaphthothiophenes	**362** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C3-Benzonaphthothiophenes	**353** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-0857-S2
Date Sampled: 11/02/23 13:01
Percent Solids: 77
Initial Volume: 5.16
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230038
ESS Laboratory Sample ID: F230038-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/8/23 6:45

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**214** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
Fluoranthene	**5190** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
Pyrene	**4360** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C1-Fluoranthenes/Pyrenes	**1740** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C2-Fluoranthenes/Pyrenes	**1120** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C3-Fluoranthenes/Pyrenes	**525** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
Benzo(b)fluorene	**181** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
Benzo(c)fluorene	**102** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
2-Methylpyrene	**244** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
4-Methylpyrene	**196** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
1-Methylpyrene	**157** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
Benz(a)anthracene	**2250** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
Chrysene/triphenylene	**2350** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C1-Benzo(a)anthracenes/Chrysenes	**996** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C2-Benzo(a)anthracenes/Chrysenes	**548** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C3-Benzo(a)anthracenes/Chrysenes	**362** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C4-Benzo(a)anthracenes/Chrysenes	**207** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
Benzo(b)fluoranthene	**1830** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
Benzo(j/k)fluoranthene	**1940** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
Benzo(e)pyrene	**1510** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
Benzo(a)pyrene	**2320** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
Perylene	**670** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
Indeno(1,2,3-cd)pyrene	**1630** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
Dibenzo(a,h)anthracene	**382** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
Benzo(g,h,i)perylene	**1330** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
Coronene	**347** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
Tetramethyl lead	ND (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
Trimethylethyl lead	ND (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
Dimethyldiethyl lead	ND (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
Methyltriethyl lead	ND (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
Tetraethyl lead	ND (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
2,6,10-trimethyldodecane (1380)	**75.4** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-0857-S2
Date Sampled: 11/02/23 13:01
Percent Solids: 77
Initial Volume: 5.16
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230038
ESS Laboratory Sample ID: F230038-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/8/23 6:45

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**145** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
2,6,10-trimethylpentadecane (1650)	**83.9** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C-17	**243** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
Pristane	**218** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
C-18	**199** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
Phytane	**216** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
Carbazole	**355** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
2,6-Dimethylnaphthalene	**50.1** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
2,3,5-Trimethylnaphthene	**J 15.8** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
4-Methyldibenzothiophene	**74.9** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
2/3-Methyldibenzothiophene	**70.3** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
1-Methyldibenzothiophene	**41.0** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
3-Methylphenanthrene	**256** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
2-Methylphenanthrene	**319** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
2-Methylanthracene	**156** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
4/9-Methylphenanthrene	**255** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801
1-Methylphenanthrene	**192** (25.2)	12.6	8270 Mod		5	IBM	11/10/23 22:11	F3K0001	FK30801

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*82 %*		*50-120*
Surrogate: Naphthalene-d8	*85 %*		*50-120*
Surrogate: Phenanthrene-d10	*95 %*		*50-120*
Surrogate: Perylene-d12	*111 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-0857-S2
Date Sampled: 11/02/23 13:01
Percent Solids: N/A

ESS Laboratory Work Order: F230038
ESS Laboratory Sample ID: F230038-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**22500** (468)		LK		1	CCP	11/14/23 13:38	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-0857-S4
Date Sampled: 11/02/23 13:03
Percent Solids: 70
Initial Volume: 5.02
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230038
ESS Laboratory Sample ID: F230038-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/8/23 6:45

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**139** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C1-Benzene	**351** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C2-Benzenes	**270** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C3-Benzenes	**229** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C4-Benzenes	**283** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C5-Benzenes	**229** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
Methylcyclohexane	**92.5** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
Toluene	**461** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
Ethylbenzene	**60.5** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
m,p-Xylene	**333** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
Styrene	B **64.8** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
o-Xylene	**75.0** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
Isopropylbenzene	**10.7** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
n-Propylbenzene	**23.1** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
1,3,5-Trimethylbenzene	**51.5** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
1,2,3-Trimethylbenzene	**53.9** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
1,2,4-Trimethylbenzene	**119** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
t-Butylbenzene	J **3.31** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
sec-Butylbenzene	**7.78** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
p-Isopropyltoluene	**95.7** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
n-Butylbenzene	**25.5** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
trans-Decalin	**117** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
cis-Decalin	**37.1** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C1-Decalins	**515** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C2-Decalins	**692** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C3-Decalins	**459** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C4-Decalins	**580** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
Benzo(b)thiophene	**81.2** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C1-Benzo(b)thiophenes	**66.8** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C2-Benzo(b)thiophenes	**108** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C3-Benzo(b)thiophenes	**106** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C4-Benzo(b)thiophenes	**90.3** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-0857-S4
Date Sampled: 11/02/23 13:03
Percent Solids: 70
Initial Volume: 5.02
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230038
ESS Laboratory Sample ID: F230038-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/8/23 6:45

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**1250** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
2-Methylnaphthalene	**604** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
1-Methylnaphthalene	**526** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C1-Naphthalenes	**692** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C2-Naphthalenes	**1090** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C3-Naphthalenes	**1050** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C4-Naphthalenes	**740** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
Biphenyl	**210** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
Acenaphthylene	**1190** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
Acenaphthene	**2250** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
Dibenzofuran	**1060** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
Fluorene	**1880** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C1-Fluorenes	**854** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C2-Fluorenes	**814** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C3-Fluorenes	**1230** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
Dibenzothiophene	**1170** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C1-Dibenzothiophenes	**1030** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C2-Dibenzothiophenes	**1180** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C3-Dibenzothiophenes	**995** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C4-Dibenzothiophenes	**640** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
Phenanthrene	**18200** (114)	57.2	8270 Mod		20	IBM	11/11/23 2:21	F3K0001	FK30801
Anthracene	**4530** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C1-Phenanthrenes/Anthracenes	**6600** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C2-Phenanthrenes/Anthracenes	**3890** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C3-Phenanthrenes/Anthracenes	**1960** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C4-Phenanthrenes/Anthracenes	**1000** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
Retene	**534** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
Benzo(b)naphtho(2,1-d)thiophene	**1400** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C0-Benzonaphthothiophenes	**2720** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C1-Benzonaphthothiophenes	**1540** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C2-Benzonaphthothiophenes	**1140** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C3-Benzonaphthothiophenes	**829** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-0857-S4
Date Sampled: 11/02/23 13:03
Percent Solids: 70
Initial Volume: 5.02
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230038
ESS Laboratory Sample ID: F230038-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/8/23 6:45

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**334** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
Fluoranthene	**25200** (114)	57.2	8270 Mod		20	IBM	11/11/23 2:21	F3K0001	FK30801
Pyrene	**24100** (114)	57.2	8270 Mod		20	IBM	11/11/23 2:21	F3K0001	FK30801
C1-Fluoranthenes/Pyrenes	**8900** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C2-Fluoranthenes/Pyrenes	**3790** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C3-Fluoranthenes/Pyrenes	**1850** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
Benzo(b)fluorene	**1170** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
Benzo(c)fluorene	**595** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
2-Methylpyrene	**1160** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
4-Methylpyrene	**920** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
1-Methylpyrene	**787** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
Benz(a)anthracene	**8860** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
Chrysene/triphenylene	**9280** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C1-Benzo(a)anthracenes/Chrysenes	**4310** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C2-Benzo(a)anthracenes/Chrysenes	**2360** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C3-Benzo(a)anthracenes/Chrysenes	**1360** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C4-Benzo(a)anthracenes/Chrysenes	**752** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
Benzo(b)fluoranthene	**7670** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
Benzo(j/k)fluoranthene	**7080** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
Benzo(e)pyrene	**6560** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
Benzo(a)pyrene	**10000** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
Perylene	**2640** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
Indeno(1,2,3-cd)pyrene	**7090** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
Dibenzo(a,h)anthracene	**1770** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
Benzo(g,h,i)perylene	**6160** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
Coronene	**1790** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
Tetramethyl lead	ND (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
Trimethylethyl lead	ND (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
Dimethyldiethyl lead	ND (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
Methyltriethyl lead	ND (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
Tetraethyl lead	ND (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
2,6,10-trimethyldodecane (1380)	**617** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-0857-S4
Date Sampled: 11/02/23 13:03
Percent Solids: 70
Initial Volume: 5.02
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230038
ESS Laboratory Sample ID: F230038-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/8/23 6:45

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**918** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
2,6,10-trimethylpentadecane (1650)	**1010** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C-17	**215** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
Pristane	**1810** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
C-18	**266** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
Phytane	**2080** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
Carbazole	**1610** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
2,6-Dimethylnaphthalene	**242** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
2,3,5-Trimethylnaphthene	**80.5** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
4-Methyldibenzothiophene	**301** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
2/3-Methyldibenzothiophene	**343** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
1-Methyldibenzothiophene	**103** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
3-Methylphenanthrene	**1470** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
2-Methylphenanthrene	**1780** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
2-Methylanthracene	**815** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
4/9-Methylphenanthrene	**1450** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801
1-Methylphenanthrene	**911** (5.72)	2.86	8270 Mod		1	IBM	11/11/23 0:57	F3K0001	FK30801

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*78 %*		*50-120*
Surrogate: Naphthalene-d8	*87 %*		*50-120*
Surrogate: Phenanthrene-d10	*92 %*		*50-120*
Surrogate: Perylene-d12	*112 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-0857-S4
Date Sampled: 11/02/23 13:03
Percent Solids: N/A

ESS Laboratory Work Order: F230038
ESS Laboratory Sample ID: F230038-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**67500** (476)		LK		1	CCP	11/14/23 14:45	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-0858-S2
Date Sampled: 11/02/23 13:16
Percent Solids: 73
Initial Volume: 5.21
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230038
ESS Laboratory Sample ID: F230038-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/8/23 6:45

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**115** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C1-Benzene	**158** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C2-Benzenes	**176** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C3-Benzenes	**134** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C4-Benzenes	**117** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C5-Benzenes	**94.1** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
Methylcyclohexane	**36.3** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
Toluene	**209** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
Ethylbenzene	**32.2** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
m,p-Xylene	**224** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
Styrene	**B 164** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
o-Xylene	**33.7** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
Isopropylbenzene	ND (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
n-Propylbenzene	**J 18.9** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
1,3,5-Trimethylbenzene	**J 18.7** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
1,2,3-Trimethylbenzene	**J 15.4** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
1,2,4-Trimethylbenzene	**47.9** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
t-Butylbenzene	ND (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
sec-Butylbenzene	ND (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
p-Isopropyltoluene	ND (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
n-Butylbenzene	**J 20.8** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
trans-Decalin	**56.6** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
cis-Decalin	ND (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C1-Decalins	**166** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C2-Decalins	**160** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C3-Decalins	**125** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C4-Decalins	**247** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
Benzo(b)thiophene	**J 16.5** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C1-Benzo(b)thiophenes	**39.9** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C2-Benzo(b)thiophenes	**55.1** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C3-Benzo(b)thiophenes	**44.2** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C4-Benzo(b)thiophenes	**26.9** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-0858-S2
Date Sampled: 11/02/23 13:16
Percent Solids: 73
Initial Volume: 5.21
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230038
ESS Laboratory Sample ID: F230038-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/8/23 6:45

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**297** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
2-Methylnaphthalene	**176** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
1-Methylnaphthalene	**151** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C1-Naphthalenes	**200** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C2-Naphthalenes	**339** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C3-Naphthalenes	**344** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C4-Naphthalenes	**240** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
Biphenyl	**72.7** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
Acenaphthylene	**589** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
Acenaphthene	**802** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
Dibenzofuran	**356** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
Fluorene	**635** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C1-Fluorenes	**278** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C2-Fluorenes	**316** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C3-Fluorenes	**561** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
Dibenzothiophene	**435** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C1-Dibenzothiophenes	**373** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C2-Dibenzothiophenes	**413** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C3-Dibenzothiophenes	**323** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C4-Dibenzothiophenes	**186** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
Phenanthrene	**6460** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
Anthracene	**1810** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C1-Phenanthrenes/Anthracenes	**2520** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C2-Phenanthrenes/Anthracenes	**1390** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C3-Phenanthrenes/Anthracenes	**626** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C4-Phenanthrenes/Anthracenes	**255** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
Retene	**98.0** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
Benzo(b)naphtho(2,1-d)thiophene	**652** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C0-Benzonaphthothiophenes	**1200** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C1-Benzonaphthothiophenes	**616** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C2-Benzonaphthothiophenes	**501** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C3-Benzonaphthothiophenes	**395** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-0858-S2
Date Sampled: 11/02/23 13:16
Percent Solids: 73
Initial Volume: 5.21
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230038
ESS Laboratory Sample ID: F230038-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/8/23 6:45

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**218** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
Fluoranthene	**9100** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
Pyrene	**7750** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C1-Fluoranthenes/Pyrenes	**3350** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C2-Fluoranthenes/Pyrenes	**1990** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C3-Fluoranthenes/Pyrenes	**879** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
Benzo(b)fluorene	**423** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
Benzo(c)fluorene	**175** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
2-Methylpyrene	**454** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
4-Methylpyrene	**352** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
1-Methylpyrene	**288** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
Benz(a)anthracene	**4380** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
Chrysene/triphenylene	**4390** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C1-Benzo(a)anthracenes/Chrysenes	**1900** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C2-Benzo(a)anthracenes/Chrysenes	**994** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C3-Benzo(a)anthracenes/Chrysenes	**613** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C4-Benzo(a)anthracenes/Chrysenes	**317** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
Benzo(b)fluoranthene	**3590** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
Benzo(j/k)fluoranthene	**3580** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
Benzo(e)pyrene	**2830** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
Benzo(a)pyrene	**4450** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
Perylene	**1190** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
Indeno(1,2,3-cd)pyrene	**3070** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
Dibenzo(a,h)anthracene	**737** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
Benzo(g,h,i)perylene	**2460** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
Coronene	**628** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
Tetramethyl lead	ND (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
Trimethylethyl lead	ND (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
Dimethyldiethyl lead	ND (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
Methyltriethyl lead	ND (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
Tetraethyl lead	ND (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
2,6,10-trimethyldodecane (1380)	**96.3** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-0858-S2
Date Sampled: 11/02/23 13:16
Percent Solids: 73
Initial Volume: 5.21
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230038
ESS Laboratory Sample ID: F230038-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/8/23 6:45

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**160** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
2,6,10-trimethylpentadecane (1650)	**125** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C-17	**255** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
Pristane	**337** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
C-18	**200** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
Phytane	**332** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
Carbazole	**818** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
2,6-Dimethylnaphthalene	**71.8** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
2,3,5-Trimethylnaphthene	**J 23.0** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
4-Methyldibenzothiophene	**124** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
2/3-Methyldibenzothiophene	**126** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
1-Methyldibenzothiophene	**48.2** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
3-Methylphenanthrene	**572** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
2-Methylphenanthrene	**720** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
2-Methylanthracene	**295** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
4/9-Methylphenanthrene	**528** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801
1-Methylphenanthrene	**400** (26.4)	13.2	8270 Mod		5	IBM	11/11/23 3:44	F3K0001	FK30801

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*74 %*		*50-120*
Surrogate: Naphthalene-d8	*78 %*		*50-120*
Surrogate: Phenanthrene-d10	*89 %*		*50-120*
Surrogate: Perylene-d12	*105 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-0858-S2
Date Sampled: 11/02/23 13:16
Percent Solids: N/A

ESS Laboratory Work Order: F230038
ESS Laboratory Sample ID: F230038-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**12200** (481)		LK		1	CCP	11/14/23 15:34	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-0858-S4
Date Sampled: 11/02/23 13:18
Percent Solids: 79
Initial Volume: 5.13
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230038
ESS Laboratory Sample ID: F230038-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/8/23 6:45

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**45.1** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C1-Benzene	**58.5** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C2-Benzenes	**87.4** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C3-Benzenes	**53.8** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C4-Benzenes	**76.2** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C5-Benzenes	**75.0** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
Methylcyclohexane	**14.8** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
Toluene	**74.1** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
Ethylbenzene	**15.5** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
m,p-Xylene	**117** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
Styrene	**B 80.9** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
o-Xylene	**13.3** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
Isopropylbenzene	ND (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
n-Propylbenzene	**7.54** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
1,3,5-Trimethylbenzene	**7.54** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
1,2,3-Trimethylbenzene	**8.85** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
1,2,4-Trimethylbenzene	**23.2** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
t-Butylbenzene	**J 2.56** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
sec-Butylbenzene	ND (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
p-Isopropyltoluene	**7.76** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
n-Butylbenzene	**10.2** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
trans-Decalin	**70.9** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
cis-Decalin	**24.2** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C1-Decalins	**386** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C2-Decalins	**346** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C3-Decalins	**113** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C4-Decalins	**146** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
Benzo(b)thiophene	**50.1** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C1-Benzo(b)thiophenes	**41.2** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C2-Benzo(b)thiophenes	**70.4** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C3-Benzo(b)thiophenes	**59.9** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C4-Benzo(b)thiophenes	**32.4** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-0858-S4
Date Sampled: 11/02/23 13:18
Percent Solids: 79
Initial Volume: 5.13
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230038
ESS Laboratory Sample ID: F230038-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/8/23 6:45

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**1220** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
2-Methylnaphthalene	**511** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
1-Methylnaphthalene	**447** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C1-Naphthalenes	**588** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C2-Naphthalenes	**837** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C3-Naphthalenes	**805** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C4-Naphthalenes	**427** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
Biphenyl	**171** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
Acenaphthylene	**1070** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
Acenaphthene	**2220** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
Dibenzofuran	**1390** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
Fluorene	**2160** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C1-Fluorenes	**789** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C2-Fluorenes	**702** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C3-Fluorenes	**1080** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
Dibenzothiophene	**1500** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C1-Dibenzothiophenes	**884** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C2-Dibenzothiophenes	**765** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C3-Dibenzothiophenes	**494** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C4-Dibenzothiophenes	**292** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
Phenanthrene	**25700** (98.8)	49.4	8270 Mod		20	IBM	11/11/23 14:34	F3K0001	FK30801
Anthracene	**5820** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C1-Phenanthrenes/Anthracenes	**6320** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C2-Phenanthrenes/Anthracenes	**2900** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C3-Phenanthrenes/Anthracenes	**1180** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C4-Phenanthrenes/Anthracenes	**449** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
Retene	**89.5** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
Benzo(b)naphtho(2,1-d)thiophene	**1620** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C0-Benzonaphthothiophenes	**3040** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C1-Benzonaphthothiophenes	**1240** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C2-Benzonaphthothiophenes	**789** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C3-Benzonaphthothiophenes	**513** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-0858-S4
Date Sampled: 11/02/23 13:18
Percent Solids: 79
Initial Volume: 5.13
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230038
ESS Laboratory Sample ID: F230038-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/8/23 6:45

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**209** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
Fluoranthene	**30700** (98.8)	49.4	8270 Mod		20	IBM	11/11/23 14:34	F3K0001	FK30801
Pyrene	**25000** (98.8)	49.4	8270 Mod		20	IBM	11/11/23 14:34	F3K0001	FK30801
C1-Fluoranthenes/Pyrenes	**7570** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C2-Fluoranthenes/Pyrenes	**4060** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C3-Fluoranthenes/Pyrenes	**1670** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
Benzo(b)fluorene	**1100** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
Benzo(c)fluorene	**502** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
2-Methylpyrene	**968** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
4-Methylpyrene	**707** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
1-Methylpyrene	**582** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
Benz(a)anthracene	**9430** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
Chrysene/triphenylene	**9150** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C1-Benzo(a)anthracenes/Chrysenes	**3860** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C2-Benzo(a)anthracenes/Chrysenes	**1890** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C3-Benzo(a)anthracenes/Chrysenes	**1050** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C4-Benzo(a)anthracenes/Chrysenes	**553** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
Benzo(b)fluoranthene	**7730** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
Benzo(j/k)fluoranthene	**6850** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
Benzo(e)pyrene	**6130** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
Benzo(a)pyrene	**9380** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
Perylene	**2830** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
Indeno(1,2,3-cd)pyrene	**6770** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
Dibenzo(a,h)anthracene	**1470** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
Benzo(g,h,i)perylene	**5680** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
Coronene	**1510** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
Tetramethyl lead	ND (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
Trimethylethyl lead	ND (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
Dimethyldiethyl lead	ND (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
Methyltriethyl lead	ND (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
Tetraethyl lead	ND (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
2,6,10-trimethyldodecane (1380)	**85.0** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-0858-S4
Date Sampled: 11/02/23 13:18
Percent Solids: 79
Initial Volume: 5.13
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230038
ESS Laboratory Sample ID: F230038-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/8/23 6:45

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**147** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
2,6,10-trimethylpentadecane (1650)	**113** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C-17	**220** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
Pristane	**310** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
C-18	**210** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
Phytane	**293** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
Carbazole	**3010** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
2,6-Dimethylnaphthalene	**164** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
2,3,5-Trimethylnaphthene	**70.3** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
4-Methyldibenzothiophene	**233** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
2/3-Methyldibenzothiophene	**297** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
1-Methyldibenzothiophene	**86.2** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
3-Methylphenanthrene	**1440** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
2-Methylphenanthrene	**1740** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
2-Methylanthracene	**852** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
4/9-Methylphenanthrene	**1250** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801
1-Methylphenanthrene	**951** (4.94)	2.47	8270 Mod		1	IBM	11/11/23 13:14	F3K0001	FK30801

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*68 %*		*50-120*
Surrogate: Naphthalene-d8	*78 %*		*50-120*
Surrogate: Phenanthrene-d10	*80 %*		*50-120*
Surrogate: Perylene-d12	*102 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-0858-S4
Date Sampled: 11/02/23 13:18
Percent Solids: N/A

ESS Laboratory Work Order: F230038
ESS Laboratory Sample ID: F230038-04
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**91600** (479)		LK		1	CCP	11/14/23 15:51	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230038

Quality Control Data

Classical Chemistry

Batch DK31362 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	500	mg/kg							
Total Organic Carbon (2)	ND	500	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230038

Quality Control Data

Classical Chemistry

Batch DK31362 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9050	500	mg/kg	10010		90	80-120			
Total Organic Carbon (2)	11100	500	mg/kg	10010		111	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230038

Quality Control Data

Classical Chemistry

Batch DK31362 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9580	500	mg/kg	10010		96	80-120	6	25	
Total Organic Carbon (2)	11600	500	mg/kg	10010		116	80-120	4	25	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230038

Quality Control Data

Alkylated PAHs

Batch FK30801 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	3.22	4.00	ug/Kg wet							J
C1-Benzene	2.43	4.00	ug/Kg wet							J
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	3.27	4.00	ug/Kg wet							J
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	18.6	4.00	ug/Kg wet							
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230038

Quality Control Data

Alkylated PAHs

Batch FK30801 - 3570			
C1-Fluorenes	ND	4.00	ug/Kg wet
C2-Fluorenes	ND	4.00	ug/Kg wet
C3-Fluorenes	ND	4.00	ug/Kg wet
Dibenzothiophene	ND	4.00	ug/Kg wet
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet
Phenanthrene	ND	4.00	ug/Kg wet
Anthracene	ND	4.00	ug/Kg wet
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
Retene	ND	4.00	ug/Kg wet
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
Fluoranthene	ND	4.00	ug/Kg wet
Pyrene	ND	4.00	ug/Kg wet
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
Benzo(b)fluorene	ND	4.00	ug/Kg wet
Benzo(c)fluorene	ND	4.00	ug/Kg wet
2-Methylpyrene	ND	4.00	ug/Kg wet
4-Methylpyrene	ND	4.00	ug/Kg wet
1-Methylpyrene	ND	4.00	ug/Kg wet
Benz(a)anthracene	ND	4.00	ug/Kg wet
Chrysene/triphenylene	ND	4.00	ug/Kg wet
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet
Benzo(e)pyrene	ND	4.00	ug/Kg wet
Benzo(a)pyrene	ND	4.00	ug/Kg wet
Perylene	ND	4.00	ug/Kg wet
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet
Coronene	ND	4.00	ug/Kg wet
Tetramethyl lead	ND	4.00	ug/Kg wet
Trimethylethyl lead	ND	4.00	ug/Kg wet

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230038

Quality Control Data

Alkylated PAHs

Batch FK30801 - 3570							
Dimethyldiethyl lead	ND	4.00	ug/Kg wet				
Methyltriethyl lead	ND	4.00	ug/Kg wet				
Tetraethyl lead	ND	4.00	ug/Kg wet				
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet				
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet				
2,6,10-trimethylpentadecane (1650)	ND	4.00	ug/Kg wet				
C-17	5.17	4.00	ug/Kg wet				
Pristane	2.49	4.00	ug/Kg wet				J
C-18	5.24	4.00	ug/Kg wet				
Phytane	ND	4.00	ug/Kg wet				
Carbazole	ND	4.00	ug/Kg wet				
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet				
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet				
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
3-Methylphenanthrene	ND	4.00	ug/Kg wet				
2-Methylphenanthrene	ND	4.00	ug/Kg wet				
2-Methylanthracene	ND	4.00	ug/Kg wet				
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet				
1-Methylphenanthrene	ND	4.00	ug/Kg wet				
Surrogate: Toluene-D8	*346*		ug/Kg wet	*400.0*	*86*	*50-120*	
Surrogate: Naphthalene-d8	*352*		ug/Kg wet	*400.0*	*88*	*50-120*	
Surrogate: Phenanthrene-d10	*382*		ug/Kg wet	*400.0*	*96*	*50-120*	
Surrogate: Perylene-d12	*409*		ug/Kg wet	*400.0*	*102*	*50-120*	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230038

Quality Control Data

Alkylated PAHs

Batch FK30801 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	270	4.00	ug/Kg wet	400.0		67	60-130			
Methylcyclohexane	200	4.00	ug/Kg wet	400.0		50	60-130			B-
Toluene	312	4.00	ug/Kg wet	400.0		78	60-130			
Ethylbenzene	323	4.00	ug/Kg wet	400.0		81	60-130			
m,p-Xylene	323	4.00	ug/Kg wet	400.0		81	60-130			
Styrene	321	4.00	ug/Kg wet	400.0		80	60-130			
o-Xylene	325	4.00	ug/Kg wet	400.0		81	60-130			
Isopropylbenzene	327	4.00	ug/Kg wet	400.0		82	60-130			
n-Propylbenzene	327	4.00	ug/Kg wet	400.0		82	60-130			
1,3,5-Trimethylbenzene	329	4.00	ug/Kg wet	400.0		82	60-130			
1,2,3-Trimethylbenzene	331	4.00	ug/Kg wet	400.0		83	60-130			
1,2,4-Trimethylbenzene	330	4.00	ug/Kg wet	400.0		82	60-130			
t-Butylbenzene	328	4.00	ug/Kg wet	400.0		82	60-130			
sec-Butylbenzene	327	4.00	ug/Kg wet	400.0		82	60-130			
p-Isopropyltoluene	334	4.00	ug/Kg wet	400.0		83	60-130			
n-Butylbenzene	320	4.00	ug/Kg wet	400.0		80	60-130			
trans-Decalin	321	4.00	ug/Kg wet	400.0		80	60-130			
cis-Decalin	317	4.00	ug/Kg wet	400.0		79	60-130			
Benzo(b)thiophene	313	4.00	ug/Kg wet	400.0		78	60-130			
Naphthalene	319	4.00	ug/Kg wet	400.0		80	60-130			
2-Methylnaphthalene	327	4.00	ug/Kg wet	400.0		82	60-130			
1-Methylnaphthalene	326	4.00	ug/Kg wet	400.0		82	60-130			
Biphenyl	313	4.00	ug/Kg wet	400.0		78	60-130			
Acenaphthylene	339	4.00	ug/Kg wet	400.0		85	60-130			
Acenaphthene	329	4.00	ug/Kg wet	400.0		82	60-130			
Dibenzofuran	323	4.00	ug/Kg wet	400.0		81	60-130			
Fluorene	330	4.00	ug/Kg wet	400.0		82	60-130			
Dibenzothiophene	329	4.00	ug/Kg wet	400.0		82	60-130			
Phenanthrene	334	4.00	ug/Kg wet	400.0		84	60-130			
Anthracene	346	4.00	ug/Kg wet	400.0		86	60-130			
Retene	365	4.00	ug/Kg wet	400.0		91	60-130			
Benzo(b)naphtho(2,1-d)thiophene	345	4.00	ug/Kg wet	400.0		86	60-130			
Fluoranthene	353	4.00	ug/Kg wet	400.0		88	60-130			
Pyrene	347	4.00	ug/Kg wet	400.0		87	60-130			
Benz(a)anthracene	363	4.00	ug/Kg wet	400.0		91	60-130			
Chrysene/triphenylene	355	4.00	ug/Kg wet	400.0		89	60-130			
Benzo(b)fluoranthene	352	4.00	ug/Kg wet	400.0		88	60-130			
Benzo(j/k)fluoranthene	357	4.00	ug/Kg wet	400.0		89	60-130			
Benzo(e)pyrene	346	4.00	ug/Kg wet	400.0		86	60-130			
Benzo(a)pyrene	351	4.00	ug/Kg wet	400.0		88	60-130			
Perylene	355	4.00	ug/Kg wet	400.0		89	60-130			
Indeno(1,2,3-cd)pyrene	371	4.00	ug/Kg wet	400.0		93	60-130			
Dibenzo(a,h)anthracene	378	4.00	ug/Kg wet	400.0		95	60-130			
Benzo(g,h,i)perylene	358	4.00	ug/Kg wet	400.0		90	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230038

Quality Control Data

Alkylated PAHs

Batch FK30801 - 3570						
Coronene	363	4.00	ug/Kg wet	400.0	91	60-130
Tetraethyl lead	364	4.00	ug/Kg wet	400.0	91	60-130
Surrogate: Toluene-D8	*352*		ug/Kg wet	*400.0*	*88*	*50-120*
Surrogate: Naphthalene-d8	*362*		ug/Kg wet	*400.0*	*91*	*50-120*
Surrogate: Phenanthrene-d10	*393*		ug/Kg wet	*400.0*	*98*	*50-120*
Surrogate: Perylene-d12	*421*		ug/Kg wet	*400.0*	*105*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230038

Quality Control Data

Alkylated PAHs

Batch FK30801 - 3570

Duplicate **Source: F230038-04** **D+**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	69.0	4.89	ug/Kg dry		45.1			42	50	
C1-Benzene	104	4.89	ug/Kg dry		58.5			56	50	
C2-Benzenes	179	4.89	ug/Kg dry		87.4			69	50	
C3-Benzenes	113	4.89	ug/Kg dry		53.8			71	50	
C4-Benzenes	113	4.89	ug/Kg dry		76.2			39	50	
C5-Benzenes	102	4.89	ug/Kg dry		75.0			31	50	
Methylcyclohexane	40.9	4.89	ug/Kg dry		14.8			94	50	
Toluene	138	4.89	ug/Kg dry		74.1			60	50	
Ethylbenzene	29.0	4.89	ug/Kg dry		15.5			61	50	
m,p-Xylene	248	4.89	ug/Kg dry		117			72	50	
Styrene	109	4.89	ug/Kg dry		80.9			30	50	
o-Xylene	31.4	4.89	ug/Kg dry		13.3			81	50	
Isopropylbenzene	4.02	4.89	ug/Kg dry		ND				50	J
n-Propylbenzene	12.3	4.89	ug/Kg dry		7.54			48	50	
1,3,5-Trimethylbenzene	41.0	4.89	ug/Kg dry		7.54			138	50	
1,2,3-Trimethylbenzene	16.2	4.89	ug/Kg dry		8.85			59	50	
1,2,4-Trimethylbenzene	49.5	4.89	ug/Kg dry		23.2			72	50	
t-Butylbenzene	4.21	4.89	ug/Kg dry		2.56			49	50	J
sec-Butylbenzene	2.79	4.89	ug/Kg dry		ND				50	J
p-Isopropyltoluene	15.6	4.89	ug/Kg dry		7.76			67	50	
n-Butylbenzene	12.4	4.89	ug/Kg dry		10.2			20	50	
trans-Decalin	117	4.89	ug/Kg dry		70.9			49	50	
cis-Decalin	32.3	4.89	ug/Kg dry		24.2			29	50	
C1-Decalins	551	4.89	ug/Kg dry		386			35	50	
C2-Decalins	445	4.89	ug/Kg dry		346			25	50	
C3-Decalins	177	4.89	ug/Kg dry		113			44	50	
C4-Decalins	297	4.89	ug/Kg dry		146			68	50	
Benzo(b)thiophene	20.5	4.89	ug/Kg dry		50.1			84	50	
C1-Benzo(b)thiophenes	29.9	4.89	ug/Kg dry		41.2			32	50	
C2-Benzo(b)thiophenes	55.1	4.89	ug/Kg dry		70.4			24	50	
C3-Benzo(b)thiophenes	58.9	4.89	ug/Kg dry		59.9			2	50	
C4-Benzo(b)thiophenes	37.6	4.89	ug/Kg dry		32.4			15	50	
Naphthalene	371	4.89	ug/Kg dry		1220			107	50	
2-Methylnaphthalene	238	4.89	ug/Kg dry		511			73	50	
1-Methylnaphthalene	199	4.89	ug/Kg dry		447			77	50	
C1-Naphthalenes	268	4.89	ug/Kg dry		588			75	50	
C2-Naphthalenes	601	4.89	ug/Kg dry		837			33	50	
C3-Naphthalenes	691	4.89	ug/Kg dry		805			15	50	
C4-Naphthalenes	424	4.89	ug/Kg dry		427			0.9	50	
Biphenyl	75.4	4.89	ug/Kg dry		171			78	50	
Acenaphthylene	1020	4.89	ug/Kg dry		1070			5	50	
Acenaphthene	776	4.89	ug/Kg dry		2220			96	50	
Dibenzofuran	355	4.89	ug/Kg dry		1390			119	50	
Fluorene	909	4.89	ug/Kg dry		2160			82	50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230038

Quality Control Data

Alkylated PAHs

Batch FK30801 - 3570

C1-Fluorenes	660	4.89	ug/Kg dry	789	18	50
C2-Fluorenes	636	4.89	ug/Kg dry	702	10	50
C3-Fluorenes	747	4.89	ug/Kg dry	1080	36	50
Dibenzothiophene	652	4.89	ug/Kg dry	1500	79	50
C1-Dibenzothiophenes	668	4.89	ug/Kg dry	884	28	50
C2-Dibenzothiophenes	744	4.89	ug/Kg dry	765	3	50
C3-Dibenzothiophenes	547	4.89	ug/Kg dry	494	10	50
C4-Dibenzothiophenes	339	4.89	ug/Kg dry	292	15	50
Phenanthrene	8060	4.89	ug/Kg dry	25700	104	50
Anthracene	2870	4.89	ug/Kg dry	5820	68	50
C1-Phenanthrenes/Anthracenes	4520	4.89	ug/Kg dry	6320	33	50
C2-Phenanthrenes/Anthracenes	2670	4.89	ug/Kg dry	2900	8	50
C3-Phenanthrenes/Anthracenes	1230	4.89	ug/Kg dry	1180	4	50
C4-Phenanthrenes/Anthracenes	522	4.89	ug/Kg dry	449	15	50
Retene	236	4.89	ug/Kg dry	89.5	90	50
Benzo(b)naphtho(2,1-d)thiophene	1060	4.89	ug/Kg dry	1620	42	50
C0-Benzonaphthothiophenes	1880	4.89	ug/Kg dry	3040	47	50
C1-Benzonaphthothiophenes	1090	4.89	ug/Kg dry	1240	12	50
C2-Benzonaphthothiophenes	828	4.89	ug/Kg dry	789	5	50
C3-Benzonaphthothiophenes	575	4.89	ug/Kg dry	513	11	50
C4-Benzonaphthothiophenes	269	4.89	ug/Kg dry	209	25	50
Fluoranthene	14900	97.9	ug/Kg dry	30700	69	50
Pyrene	9410	4.89	ug/Kg dry	25000	91	50
C1-Fluoranthenes/Pyrenes	6480	4.89	ug/Kg dry	7570	16	50
C2-Fluoranthenes/Pyrenes	3060	4.89	ug/Kg dry	4060	28	50
C3-Fluoranthenes/Pyrenes	1470	4.89	ug/Kg dry	1670	13	50
Benzo(b)fluorene	1020	4.89	ug/Kg dry	1100	7	50
Benzo(c)fluorene	427	4.89	ug/Kg dry	502	16	50
2-Methylpyrene	778	4.89	ug/Kg dry	968	22	50
4-Methylpyrene	636	4.89	ug/Kg dry	707	11	50
1-Methylpyrene	522	4.89	ug/Kg dry	582	11	50
Benz(a)anthracene	6020	4.89	ug/Kg dry	9430	44	50
Chrysene/triphenylene	6160	4.89	ug/Kg dry	9150	39	50
C1-Benzo(a)anthracenes/Chrysenes	3170	4.89	ug/Kg dry	3860	20	50
C2-Benzo(a)anthracenes/Chrysenes	1700	4.89	ug/Kg dry	1890	11	50
C3-Benzo(a)anthracenes/Chrysenes	960	4.89	ug/Kg dry	1050	9	50
C4-Benzo(a)anthracenes/Chrysenes	502	4.89	ug/Kg dry	553	10	50
Benzo(b)fluoranthene	4970	4.89	ug/Kg dry	7730	43	50
Benzo(j/k)fluoranthene	4590	4.89	ug/Kg dry	6850	39	50
Benzo(e)pyrene	4040	4.89	ug/Kg dry	6130	41	50
Benzo(a)pyrene	6120	4.89	ug/Kg dry	9380	42	50
Perylene	1550	4.89	ug/Kg dry	2830	58	50
Indeno(1,2,3-cd)pyrene	4180	4.89	ug/Kg dry	6770	47	50
Dibenzo(a,h)anthracene	1060	4.89	ug/Kg dry	1470	33	50
Benzo(g,h,i)perylene	3440	4.89	ug/Kg dry	5680	49	50
Coronene	933	4.89	ug/Kg dry	1510	47	50
Tetramethyl lead	ND	4.89	ug/Kg dry	ND		50
Trimethylethyl lead	ND	4.89	ug/Kg dry	ND		50

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230038

Quality Control Data

Alkylated PAHs

Batch FK30801 - 3570								
Dimethyldiethyl lead	ND	4.89	ug/Kg dry		ND			50
Methyltriethyl lead	ND	4.89	ug/Kg dry		ND			50
Tetraethyl lead	ND	4.89	ug/Kg dry		ND			50
2,6,10-trimethyldodecane (1380)	174	4.89	ug/Kg dry		85.0		69	50
2,6,10-trimethyltridecane (1470)	270	4.89	ug/Kg dry		147		59	50
2,6,10-trimethylpentadecane (1650)	154	4.89	ug/Kg dry		113		31	50
C-17	196	4.89	ug/Kg dry		220		11	50
Pristane	380	4.89	ug/Kg dry		310		20	50
C-18	165	4.89	ug/Kg dry		210		24	50
Phytane	372	4.89	ug/Kg dry		293		24	50
Carbazole	564	4.89	ug/Kg dry		3010		137	50
2,6-Dimethylnaphthalene	122	4.89	ug/Kg dry		164		29	50
2,3,5-Trimethylnaphthene	58.9	4.89	ug/Kg dry		70.3		18	50
4-Methyldibenzothiophene	220	4.89	ug/Kg dry		233		6	50
2/3-Methyldibenzothiophene	233	4.89	ug/Kg dry		297		24	50
1-Methyldibenzothiophene	71.6	4.89	ug/Kg dry		86.2		19	50
3-Methylphenanthrene	1040	4.89	ug/Kg dry		1440		33	50
2-Methylphenanthrene	1250	4.89	ug/Kg dry		1740		33	50
2-Methylanthracene	573	4.89	ug/Kg dry		852		39	50
4/9-Methylphenanthrene	957	4.89	ug/Kg dry		1250		27	50
1-Methylphenanthrene	682	4.89	ug/Kg dry		951		33	50
Surrogate: Toluene-D8	*350*		ug/Kg dry	*489.4*		*72*	*50-120*	
Surrogate: Naphthalene-d8	*389*		ug/Kg dry	*489.4*		*80*	*50-120*	
Surrogate: Phenanthrene-d10	*414*		ug/Kg dry	*489.4*		*85*	*50-120*	
Surrogate: Perylene-d12	*500*		ug/Kg dry	*489.4*		*102*	*50-120*	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F230038

Notes and Definitions

U	Analyte included in the analysis, but not detected
J	Reported between MDL and MRL
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
B-	Blank Spike recovery is below lower control limit (B-).
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230038

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 23K0139 / F230038

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000

Project Information

Project Name: Amesbury Former MGP

Project Number: 1804576

Project Location: Amesbury, MA

Project Manager: Ryan Hoffman
781-721-4091 rhoffman@geiconsultants.com

Send Report to: Ryan Hoffman, Jeremy Smalley

labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY AND MCP ANALYTICAL METHODS REQUIRED: (YES) NO

STATE AND FEDERAL REGULATORY REQUIREMENTS/REPORT LIMITS

State/Federal Program: (MA) 401WQC Other _____ NH RI CT NY ME

MA MCP Criteria are (Method 1 S-1 and GW-2/GW-3). Circle if GW-1 is required.

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Preservative	Preservative	Analysis: Parent and Alkylated MAHs * PAHs 8270*	Analysis: TOCs by Lloyd-Kahn	Sample Specific Remarks
							none	none			
	1804576-857-S1	11/2/2023	13:00	SD	2	JES			x	x	
1	1804576-857-S2	11/2/2023	13:01	SD	2	JES			x	x	Hold*
	1804576-857-S3	11/2/2023	13:02	SD	2	JES			x	x	
2	1804576-857-S4	11/2/2023	13:03	SD	2	JES			x	x	Hold*
	1804576-858-S1	11/2/2023	13:15	SD	2	JES			x	x	
3	1804576-858-S2	11/2/2023	13:16	SD	2	JES			x	x	Hold*
	1804576-858-S3	11/2/2023	13:17	SD	2	JES			x	x	
4	1804576-858-S4	11/2/2023	13:18	SD	2	JES			x	x	Hold*

Sample Handling

Samples Field Filtered: YES NO (NA)

Sampled Shipped With Ice: (YES) NO

Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1. Dawn Mill	11/2/23	17:00	1. GEI Fridge
2. GEI Fridge	11/3/23	12:31	2.
3.	11/3/23	12:31	3. 11/3/23 12:31
4. 1.6 Orica	11/3/23	1655	4.
5.			5.

Turnaround Time (Business days):

5-Day X 4-Day ____ 3-Day ____

2-Day ____ 1-Day ____ Other ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

** Parent and Alkylated MAHs and PAHs (32) by GC/MS/SIM/SCAN

* Hold analysis until authorized by GEI

Sample Matrix Abbreviations: SO = Soil GW = Groundwater SW = Surface Water SD = Sediment CO = Concrete PC = Paint Chip CLK = Caulk

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

Shipped/Delivered Via: ESS Courier

ESS Project ID: 23K0139
Date Received: 11/3/2023
Project Due Date: 12/3/2023
Days for Project: Hold

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 1.6 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / (NA)
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / (No)
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By/Acid Lot#:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / (No)
    Who was contacted: Date: Time: By:

Resolution:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1	489597	Yes	N/A	Yes	4 oz. Jar	NP	
1	489598	Yes	N/A	Yes	4 oz. Jar	NP	
2	489599	Yes	N/A	Yes	4 oz. Jar	NP	
2	489600	Yes	N/A	Yes	4 oz. Jar	NP	
3	489601	Yes	N/A	Yes	4 oz. Jar	NP	
3	489602	Yes	N/A	Yes	4 oz. Jar	NP	
4	489603	Yes	N/A	Yes	4 oz. Jar	NP	
4	489604	Yes	N/A	Yes	8 oz jar	NP	

2nd Review
Were all containers scanned into storage/lab? Initials
Are barcode labels on correct containers? (Yes) / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

ESS Project ID: 23K0139

Date Received: 11/3/2023

By: _____ Date & Time: 11/3/23 1735

Reviewed By: _____ Date & Time: 1918 11/3/23

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: F230041

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 12:44 pm, Dec 11, 2023

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses

ESS - Cranston, RI	TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230041

SAMPLE RECEIPT

The following samples were received on November 29, 2023 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F230041-01	1804576-861-S1	Soil	8270 Mod, LK
F230041-02	1804576-862-S1	Soil	8270 Mod, LK
F230041-03	1804576-869-S1	Soil	8270 Mod, LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230041

PROJECT NARRATIVE

Alkylated PAHs
FK33002-BS2 **Blank Spike recovery is below lower control limit (B-).**
Methylcyclohexane (54% @ 60-130%)

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230041

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-861-S1
Date Sampled: 11/27/23 11:00
Percent Solids: 26
Initial Volume: 6.18
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230041
ESS Laboratory Sample ID: F230041-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/30/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**280** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C1-Benzene	**369** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C2-Benzenes	**973** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C3-Benzenes	**141** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C4-Benzenes	**209** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C5-Benzenes	**191** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
Methylcyclohexane	**22.0** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
Toluene	**512** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
Ethylbenzene	**92.6** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
m,p-Xylene	**1550** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
Styrene	**33.9** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
o-Xylene	**27.0** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
Isopropylbenzene	ND (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
n-Propylbenzene	**163** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
1,3,5-Trimethylbenzene	**J 10.5** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
1,2,3-Trimethylbenzene	**18.8** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
1,2,4-Trimethylbenzene	**23.4** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
t-Butylbenzene	ND (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
sec-Butylbenzene	ND (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
p-Isopropyltoluene	**39.3** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
n-Butylbenzene	**352** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
trans-Decalin	**16.4** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
cis-Decalin	ND (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C1-Decalins	**33.7** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C2-Decalins	**40.4** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C3-Decalins	**31.5** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C4-Decalins	**49.3** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
Benzo(b)thiophene	**17.5** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C1-Benzo(b)thiophenes	**39.6** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C2-Benzo(b)thiophenes	**78.0** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C3-Benzo(b)thiophenes	**33.5** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C4-Benzo(b)thiophenes	**16.3** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-861-S1
Date Sampled: 11/27/23 11:00
Percent Solids: 26
Initial Volume: 6.18
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230041
ESS Laboratory Sample ID: F230041-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/30/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**650** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
2-Methylnaphthalene	**389** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
1-Methylnaphthalene	**338** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C1-Naphthalenes	**446** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C2-Naphthalenes	**581** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C3-Naphthalenes	**313** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C4-Naphthalenes	**147** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
Biphenyl	**125** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
Acenaphthylene	**424** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
Acenaphthene	**1590** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
Dibenzofuran	**820** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
Fluorene	**1590** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C1-Fluorenes	**343** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C2-Fluorenes	**222** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C3-Fluorenes	**434** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
Dibenzothiophene	**635** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C1-Dibenzothiophenes	**330** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C2-Dibenzothiophenes	**273** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C3-Dibenzothiophenes	**155** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C4-Dibenzothiophenes	**94.3** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
Phenanthrene	**9320** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
Anthracene	**3090** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C1-Phenanthrenes/Anthracenes	**2750** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C2-Phenanthrenes/Anthracenes	**1180** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C3-Phenanthrenes/Anthracenes	**464** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C4-Phenanthrenes/Anthracenes	**200** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
Retene	**265** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
Benzo(b)naphtho(2,1-d)thiophene	**831** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C0-Benzonaphthothiophenes	**1540** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C1-Benzonaphthothiophenes	**565** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C2-Benzonaphthothiophenes	**358** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C3-Benzonaphthothiophenes	**267** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-861-S1
Date Sampled: 11/27/23 11:00
Percent Solids: 26
Initial Volume: 6.18
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230041
ESS Laboratory Sample ID: F230041-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/30/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**145** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
Fluoranthene	**11400** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
Pyrene	**9350** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C1-Fluoranthenes/Pyrenes	**4500** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C2-Fluoranthenes/Pyrenes	**1960** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C3-Fluoranthenes/Pyrenes	**646** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
Benzo(b)fluorene	**800** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
Benzo(c)fluorene	**309** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
2-Methylpyrene	**521** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
4-Methylpyrene	**365** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
1-Methylpyrene	**299** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
Benz(a)anthracene	**5840** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
Chrysene/triphenylene	**5550** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C1-Benzo(a)anthracenes/Chrysenes	**2250** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C2-Benzo(a)anthracenes/Chrysenes	**2210** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C3-Benzo(a)anthracenes/Chrysenes	**536** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C4-Benzo(a)anthracenes/Chrysenes	**247** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
Benzo(b)fluoranthene	**4660** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
Benzo(j/k)fluoranthene	**4810** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
Benzo(e)pyrene	**3730** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
Benzo(a)pyrene	**6060** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
Perylene	**1730** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
Indeno(1,2,3-cd)pyrene	**4160** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
Dibenzo(a,h)anthracene	**977** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
Benzo(g,h,i)perylene	**3290** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
Coronene	**914** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
Tetramethyl lead	ND (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
Trimethylethyl lead	ND (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
Dimethyldiethyl lead	ND (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
Methyltriethyl lead	ND (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
Tetraethyl lead	ND (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
2,6,10-trimethyldodecane (1380)	**41.4** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-861-S1
Date Sampled: 11/27/23 11:00
Percent Solids: 26
Initial Volume: 6.18
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230041
ESS Laboratory Sample ID: F230041-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/30/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**240** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
2,6,10-trimethylpentadecane (1650)	**41.6** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C-17	**421** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
Pristane	**94.7** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
C-18	**126** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
Phytane	**126** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
Carbazole	**1520** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
2,6-Dimethylnaphthalene	**196** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
2,3,5-Trimethylnaphthene	**23.3** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
4-Methyldibenzothiophene	**101** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
2/3-Methyldibenzothiophene	**117** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
1-Methyldibenzothiophene	**32.2** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
3-Methylphenanthrene	**638** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
2-Methylphenanthrene	**795** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
2-Methylanthracene	**383** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
4/9-Methylphenanthrene	**527** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002
1-Methylphenanthrene	**396** (12.4)	6.22	8270 Mod		1	IBM	12/02/23 22:35	F3L0001	FK33002

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*77 %*		*50-120*
Surrogate: Naphthalene-d8	*81 %*		*50-120*
Surrogate: Phenanthrene-d10	*89 %*		*50-120*
Surrogate: Perylene-d12	*105 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-861-S1
Date Sampled: 11/27/23 11:00
Percent Solids: 26

ESS Laboratory Work Order: F230041
ESS Laboratory Sample ID: F230041-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**92500** (470)		LK		1	CCP	12/06/23 12:30	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-862-S1
Date Sampled: 11/27/23 10:45
Percent Solids: 33
Initial Volume: 5.62
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230041
ESS Laboratory Sample ID: F230041-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/30/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**170** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C1-Benzene	**324** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C2-Benzenes	**704** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C3-Benzenes	**119** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C4-Benzenes	**105** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C5-Benzenes	**75.5** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
Methylcyclohexane	**59.4** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
Toluene	**430** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
Ethylbenzene	**38.5** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
m,p-Xylene	**1100** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
Styrene	**70.8** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
o-Xylene	**42.2** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
Isopropylbenzene	ND (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
n-Propylbenzene	**24.0** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
1,3,5-Trimethylbenzene	**24.1** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
1,2,3-Trimethylbenzene	**22.3** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
1,2,4-Trimethylbenzene	**44.9** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
t-Butylbenzene	ND (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
sec-Butylbenzene	ND (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
p-Isopropyltoluene	**32.9** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
n-Butylbenzene	**44.2** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
trans-Decalin	**25.3** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
cis-Decalin	ND (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C1-Decalins	**54.4** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C2-Decalins	**63.7** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C3-Decalins	**41.2** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C4-Decalins	**86.1** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
Benzo(b)thiophene	**13.9** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C1-Benzo(b)thiophenes	**36.6** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C2-Benzo(b)thiophenes	**57.2** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C3-Benzo(b)thiophenes	**27.0** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C4-Benzo(b)thiophenes	**14.6** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-862-S1
Date Sampled: 11/27/23 10:45
Percent Solids: 33
Initial Volume: 5.62
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230041
ESS Laboratory Sample ID: F230041-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/30/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**266** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
2-Methylnaphthalene	**198** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
1-Methylnaphthalene	**132** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C1-Naphthalenes	**204** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C2-Naphthalenes	**395** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C3-Naphthalenes	**307** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C4-Naphthalenes	**208** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
Biphenyl	**95.3** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
Acenaphthylene	**1200** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
Acenaphthene	**456** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
Dibenzofuran	**232** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
Fluorene	**426** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C1-Fluorenes	**256** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C2-Fluorenes	**307** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C3-Fluorenes	**488** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
Dibenzothiophene	**280** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C1-Dibenzothiophenes	**293** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C2-Dibenzothiophenes	**342** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C3-Dibenzothiophenes	**221** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C4-Dibenzothiophenes	**134** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
Phenanthrene	**4100** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
Anthracene	**1820** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C1-Phenanthrenes/Anthracenes	**2490** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C2-Phenanthrenes/Anthracenes	**1620** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C3-Phenanthrenes/Anthracenes	**734** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C4-Phenanthrenes/Anthracenes	**360** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
Retene	**533** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
Benzo(b)naphtho(2,1-d)thiophene	**882** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C0-Benzonaphthothiophenes	**1550** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C1-Benzonaphthothiophenes	**791** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C2-Benzonaphthothiophenes	**620** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C3-Benzonaphthothiophenes	**461** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-862-S1
Date Sampled: 11/27/23 10:45
Percent Solids: 33
Initial Volume: 5.62
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230041
ESS Laboratory Sample ID: F230041-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/30/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**262** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
Fluoranthene	**9370** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
Pyrene	**8700** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C1-Fluoranthenes/Pyrenes	**4860** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C2-Fluoranthenes/Pyrenes	**2830** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C3-Fluoranthenes/Pyrenes	**1180** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
Benzo(b)fluorene	**603** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
Benzo(c)fluorene	**271** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
2-Methylpyrene	**648** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
4-Methylpyrene	**557** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
1-Methylpyrene	**432** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
Benz(a)anthracene	**5400** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
Chrysene/triphenylene	**5680** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C1-Benzo(a)anthracenes/Chrysenes	**2810** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C2-Benzo(a)anthracenes/Chrysenes	**1760** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C3-Benzo(a)anthracenes/Chrysenes	**826** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C4-Benzo(a)anthracenes/Chrysenes	**422** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
Benzo(b)fluoranthene	**4920** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
Benzo(j/k)fluoranthene	**4690** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
Benzo(e)pyrene	**4240** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
Benzo(a)pyrene	**6170** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
Perylene	**1680** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
Indeno(1,2,3-cd)pyrene	**4250** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
Dibenzo(a,h)anthracene	**1110** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
Benzo(g,h,i)perylene	**3670** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
Coronene	**993** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
Tetramethyl lead	ND (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
Trimethylethyl lead	ND (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
Dimethyldiethyl lead	ND (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
Methyltriethyl lead	ND (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
Tetraethyl lead	ND (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
2,6,10-trimethyldodecane (1380)	**50.2** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-862-S1
Date Sampled: 11/27/23 10:45
Percent Solids: 33
Initial Volume: 5.62
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230041
ESS Laboratory Sample ID: F230041-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/30/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**210** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
2,6,10-trimethylpentadecane (1650)	**62.9** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C-17	**520** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
Pristane	**152** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
C-18	**164** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
Phytane	**162** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
Carbazole	**510** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
2,6-Dimethylnaphthalene	**156** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
2,3,5-Trimethylnaphthene	**19.7** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
4-Methyldibenzothiophene	**97.0** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
2/3-Methyldibenzothiophene	**95.5** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
1-Methyldibenzothiophene	**28.6** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
3-Methylphenanthrene	**512** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
2-Methylphenanthrene	**643** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
2-Methylanthracene	**375** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
4/9-Methylphenanthrene	**580** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002
1-Methylphenanthrene	**390** (10.7)	5.34	8270 Mod		1	IBM	12/03/23 1:26	F3L0001	FK33002

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*74 %*		*50-120*
Surrogate: Naphthalene-d8	*79 %*		*50-120*
Surrogate: Phenanthrene-d10	*87 %*		*50-120*
Surrogate: Perylene-d12	*102 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-862-S1
Date Sampled: 11/27/23 10:45
Percent Solids: 33

ESS Laboratory Work Order: F230041
ESS Laboratory Sample ID: F230041-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**92500** (476)		LK		1	CCP	12/06/23 13:37	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-869-S1
Date Sampled: 11/27/23 12:45
Percent Solids: 63
Initial Volume: 5.7
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230041
ESS Laboratory Sample ID: F230041-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/30/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**78.6** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C1-Benzene	**187** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C2-Benzenes	**653** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C3-Benzenes	**325** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C4-Benzenes	**59.5** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C5-Benzenes	**38.7** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
Methylcyclohexane	**J 18.2** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
Toluene	**249** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
Ethylbenzene	**319** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
m,p-Xylene	**749** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
Styrene	**1990** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
o-Xylene	**85.7** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
Isopropylbenzene	**557** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
n-Propylbenzene	**48.0** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
1,3,5-Trimethylbenzene	ND (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
1,2,3-Trimethylbenzene	ND (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
1,2,4-Trimethylbenzene	**J 23.3** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
t-Butylbenzene	ND (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
sec-Butylbenzene	ND (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
p-Isopropyltoluene	**J 16.5** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
n-Butylbenzene	**J 15.8** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
trans-Decalin	**J 14.6** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
cis-Decalin	ND (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C1-Decalins	**40.5** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C2-Decalins	**46.0** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C3-Decalins	ND (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C4-Decalins	ND (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
Benzo(b)thiophene	ND (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C1-Benzo(b)thiophenes	**J 17.0** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C2-Benzo(b)thiophenes	**J 24.3** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C3-Benzo(b)thiophenes	**J 15.1** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C4-Benzo(b)thiophenes	ND (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-869-S1
Date Sampled: 11/27/23 12:45
Percent Solids: 63
Initial Volume: 5.7
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230041
ESS Laboratory Sample ID: F230041-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/30/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**181** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
2-Methylnaphthalene	**106** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
1-Methylnaphthalene	**80.8** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C1-Naphthalenes	**114** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C2-Naphthalenes	**211** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C3-Naphthalenes	**175** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C4-Naphthalenes	**119** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
Biphenyl	**65.2** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
Acenaphthylene	**297** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
Acenaphthene	**263** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
Dibenzofuran	**164** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
Fluorene	**287** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C1-Fluorenes	**148** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C2-Fluorenes	**187** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C3-Fluorenes	**248** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
Dibenzothiophene	**227** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C1-Dibenzothiophenes	**182** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C2-Dibenzothiophenes	**182** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C3-Dibenzothiophenes	**117** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C4-Dibenzothiophenes	**70.3** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
Phenanthrene	**2680** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
Anthracene	**948** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C1-Phenanthrenes/Anthracenes	**1220** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C2-Phenanthrenes/Anthracenes	**778** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C3-Phenanthrenes/Anthracenes	**345** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C4-Phenanthrenes/Anthracenes	**147** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
Retene	**138** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
Benzo(b)naphtho(2,1-d)thiophene	**288** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C0-Benzonaphthothiophenes	**544** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C1-Benzonaphthothiophenes	**369** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C2-Benzonaphthothiophenes	**284** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C3-Benzonaphthothiophenes	**243** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-869-S1
Date Sampled: 11/27/23 12:45
Percent Solids: 63
Initial Volume: 5.7
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230041
ESS Laboratory Sample ID: F230041-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/30/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**138** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
Fluoranthene	**4920** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
Pyrene	**4400** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C1-Fluoranthenes/Pyrenes	**1860** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C2-Fluoranthenes/Pyrenes	**1060** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C3-Fluoranthenes/Pyrenes	**460** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
Benzo(b)fluorene	**209** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
Benzo(c)fluorene	**90.5** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
2-Methylpyrene	**267** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
4-Methylpyrene	**229** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
1-Methylpyrene	**185** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
Benz(a)anthracene	**2140** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
Chrysene/triphenylene	**2200** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C1-Benzo(a)anthracenes/Chrysenes	**1000** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C2-Benzo(a)anthracenes/Chrysenes	**544** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C3-Benzo(a)anthracenes/Chrysenes	**326** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C4-Benzo(a)anthracenes/Chrysenes	**210** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
Benzo(b)fluoranthene	**1760** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
Benzo(j/k)fluoranthene	**1720** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
Benzo(e)pyrene	**1520** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
Benzo(a)pyrene	**2370** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
Perylene	**615** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
Indeno(1,2,3-cd)pyrene	**1570** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
Dibenzo(a,h)anthracene	**361** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
Benzo(g,h,i)perylene	**1370** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
Coronene	**392** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
Tetramethyl lead	ND (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
Trimethylethyl lead	ND (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
Dimethyldiethyl lead	ND (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
Methyltriethyl lead	ND (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
Tetraethyl lead	ND (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
2,6,10-trimethyldodecane (1380)	**J 20.8** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-869-S1
Date Sampled: 11/27/23 12:45
Percent Solids: 63
Initial Volume: 5.7
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230041
ESS Laboratory Sample ID: F230041-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/30/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**62.9** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
2,6,10-trimethylpentadecane (1650)	**33.0** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C-17	**218** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
Pristane	**72.7** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
C-18	**102** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
Phytane	**75.0** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
Carbazole	**313** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
2,6-Dimethylnaphthalene	**64.6** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
2,3,5-Trimethylnaphthene	ND (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
4-Methyldibenzothiophene	**66.0** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
2/3-Methyldibenzothiophene	**58.8** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
1-Methyldibenzothiophene	**J 20.4** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
3-Methylphenanthrene	**268** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
2-Methylphenanthrene	**299** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
2-Methylanthracene	**165** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
4/9-Methylphenanthrene	**281** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002
1-Methylphenanthrene	**198** (27.6)	13.8	8270 Mod		5	IBM	12/01/23 21:55	F3L0001	FK33002

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*76 %*		*50-120*
Surrogate: Naphthalene-d8	*73 %*		*50-120*
Surrogate: Phenanthrene-d10	*87 %*		*50-120*
Surrogate: Perylene-d12	*101 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
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Client Sample ID: 1804576-869-S1
Date Sampled: 11/27/23 12:45
Percent Solids: 63

ESS Laboratory Work Order: F230041
ESS Laboratory Sample ID: F230041-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**26600** (461)		LK		1	CCP	12/06/23 14:27	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230041

Quality Control Data

Classical Chemistry

Batch DL30448 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	500	mg/kg							
Total Organic Carbon (2)	ND	500	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230041

Quality Control Data

Classical Chemistry

Batch DL30448 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9280	500	mg/kg	10010		93	80-120			
Total Organic Carbon (2)	8970	500	mg/kg	10010		90	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230041

Quality Control Data

Classical Chemistry

Batch DL30448 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	8740	500	mg/kg	10010		87	80-120	6	25	
Total Organic Carbon (2)	8770	500	mg/kg	10010		88	80-120	2	25	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230041

Quality Control Data

Alkylated PAHs

Batch FK33002 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	2.33	4.00	ug/Kg wet							J
C1-Benzene	2.01	4.00	ug/Kg wet							J
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	2.66	4.00	ug/Kg wet							J
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	ND	4.00	ug/Kg wet							
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230041

Quality Control Data

Alkylated PAHs

Batch FK33002 - 3570			
C1-Fluorenes	ND	4.00	ug/Kg wet
C2-Fluorenes	ND	4.00	ug/Kg wet
C3-Fluorenes	ND	4.00	ug/Kg wet
Dibenzothiophene	ND	4.00	ug/Kg wet
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet
Phenanthrene	ND	4.00	ug/Kg wet
Anthracene	ND	4.00	ug/Kg wet
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
Retene	ND	4.00	ug/Kg wet
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
Fluoranthene	ND	4.00	ug/Kg wet
Pyrene	ND	4.00	ug/Kg wet
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
Benzo(b)fluorene	ND	4.00	ug/Kg wet
Benzo(c)fluorene	ND	4.00	ug/Kg wet
2-Methylpyrene	ND	4.00	ug/Kg wet
4-Methylpyrene	ND	4.00	ug/Kg wet
1-Methylpyrene	ND	4.00	ug/Kg wet
Benz(a)anthracene	ND	4.00	ug/Kg wet
Chrysene/triphenylene	ND	4.00	ug/Kg wet
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet
Benzo(e)pyrene	ND	4.00	ug/Kg wet
Benzo(a)pyrene	ND	4.00	ug/Kg wet
Perylene	ND	4.00	ug/Kg wet
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet
Coronene	ND	4.00	ug/Kg wet
Tetramethyl lead	ND	4.00	ug/Kg wet
Trimethylethyl lead	ND	4.00	ug/Kg wet

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230041

Quality Control Data

Alkylated PAHs

Batch FK33002 - 3570							
Dimethyldiethyl lead	ND	4.00	ug/Kg wet				
Methyltriethyl lead	ND	4.00	ug/Kg wet				
Tetraethyl lead	ND	4.00	ug/Kg wet				
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet				
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet				
2,6,10-trimethylpentadecane (1650)	ND	4.00	ug/Kg wet				
C-17	5.69	4.00	ug/Kg wet				
Pristane	2.71	4.00	ug/Kg wet				J
C-18	5.90	4.00	ug/Kg wet				
Phytane	ND	4.00	ug/Kg wet				
Carbazole	ND	4.00	ug/Kg wet				
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet				
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet				
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
3-Methylphenanthrene	ND	4.00	ug/Kg wet				
2-Methylphenanthrene	ND	4.00	ug/Kg wet				
2-Methylanthracene	ND	4.00	ug/Kg wet				
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet				
1-Methylphenanthrene	ND	4.00	ug/Kg wet				
Surrogate: Toluene-D8	*349*		ug/Kg wet	*400.0*	*87*	*50-120*	
Surrogate: Naphthalene-d8	*320*		ug/Kg wet	*400.0*	*80*	*50-120*	
Surrogate: Phenanthrene-d10	*374*		ug/Kg wet	*400.0*	*93*	*50-120*	
Surrogate: Perylene-d12	*429*		ug/Kg wet	*400.0*	*107*	*50-120*	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230041

Quality Control Data

Alkylated PAHs

Batch FK33002 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	274	4.00	ug/Kg wet	400.0		69	60-130			
Methylcyclohexane	214	4.00	ug/Kg wet	400.0		54	60-130			B-
Toluene	278	4.00	ug/Kg wet	400.0		69	60-130			
Ethylbenzene	288	4.00	ug/Kg wet	400.0		72	60-130			
m,p-Xylene	288	4.00	ug/Kg wet	400.0		72	60-130			
Styrene	267	4.00	ug/Kg wet	400.0		67	60-130			
o-Xylene	291	4.00	ug/Kg wet	400.0		73	60-130			
Isopropylbenzene	290	4.00	ug/Kg wet	400.0		73	60-130			
n-Propylbenzene	287	4.00	ug/Kg wet	400.0		72	60-130			
1,3,5-Trimethylbenzene	292	4.00	ug/Kg wet	400.0		73	60-130			
1,2,3-Trimethylbenzene	296	4.00	ug/Kg wet	400.0		74	60-130			
1,2,4-Trimethylbenzene	294	4.00	ug/Kg wet	400.0		73	60-130			
t-Butylbenzene	292	4.00	ug/Kg wet	400.0		73	60-130			
sec-Butylbenzene	290	4.00	ug/Kg wet	400.0		72	60-130			
p-Isopropyltoluene	297	4.00	ug/Kg wet	400.0		74	60-130			
n-Butylbenzene	280	4.00	ug/Kg wet	400.0		70	60-130			
trans-Decalin	288	4.00	ug/Kg wet	400.0		72	60-130			
cis-Decalin	285	4.00	ug/Kg wet	400.0		71	60-130			
Benzo(b)thiophene	271	4.00	ug/Kg wet	400.0		68	60-130			
Naphthalene	274	4.00	ug/Kg wet	400.0		68	60-130			
2-Methylnaphthalene	288	4.00	ug/Kg wet	400.0		72	60-130			
1-Methylnaphthalene	286	4.00	ug/Kg wet	400.0		72	60-130			
Biphenyl	270	4.00	ug/Kg wet	400.0		67	60-130			
Acenaphthylene	310	4.00	ug/Kg wet	400.0		78	60-130			
Acenaphthene	298	4.00	ug/Kg wet	400.0		74	60-130			
Dibenzofuran	286	4.00	ug/Kg wet	400.0		72	60-130			
Fluorene	300	4.00	ug/Kg wet	400.0		75	60-130			
Dibenzothiophene	298	4.00	ug/Kg wet	400.0		75	60-130			
Phenanthrene	302	4.00	ug/Kg wet	400.0		76	60-130			
Anthracene	321	4.00	ug/Kg wet	400.0		80	60-130			
Retene	340	4.00	ug/Kg wet	400.0		85	60-130			
Benzo(b)naphtho(2,1-d)thiophene	319	4.00	ug/Kg wet	400.0		80	60-130			
Fluoranthene	323	4.00	ug/Kg wet	400.0		81	60-130			
Pyrene	321	4.00	ug/Kg wet	400.0		80	60-130			
Benz(a)anthracene	336	4.00	ug/Kg wet	400.0		84	60-130			
Chrysene/triphenylene	330	4.00	ug/Kg wet	400.0		83	60-130			
Benzo(b)fluoranthene	330	4.00	ug/Kg wet	400.0		82	60-130			
Benzo(j/k)fluoranthene	343	4.00	ug/Kg wet	400.0		86	60-130			
Benzo(e)pyrene	328	4.00	ug/Kg wet	400.0		82	60-130			
Benzo(a)pyrene	345	4.00	ug/Kg wet	400.0		86	60-130			
Perylene	343	4.00	ug/Kg wet	400.0		86	60-130			
Indeno(1,2,3-cd)pyrene	350	4.00	ug/Kg wet	400.0		88	60-130			
Dibenzo(a,h)anthracene	359	4.00	ug/Kg wet	400.0		90	60-130			
Benzo(g,h,i)perylene	333	4.00	ug/Kg wet	400.0		83	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230041

Quality Control Data

Alkylated PAHs

Batch FK33002 - 3570						
Coronene	326	4.00	ug/Kg wet	400.0	82	60-130
Tetraethyl lead	374	4.00	ug/Kg wet	400.0	93	60-130
Surrogate: Toluene-D8	*332*		ug/Kg wet	*400.0*	*83*	*50-120*
Surrogate: Naphthalene-d8	*322*		ug/Kg wet	*400.0*	*80*	*50-120*
Surrogate: Phenanthrene-d10	*366*		ug/Kg wet	*400.0*	*92*	*50-120*
Surrogate: Perylene-d12	*416*		ug/Kg wet	*400.0*	*104*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F230041

Notes and Definitions

U	Analyte included in the analysis, but not detected
J	Reported between MDL and MRL
D	Diluted.
B-	Blank Spike recovery is below lower control limit (B-).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230041

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 23k0851/F230041

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000

Project Information

Project Name: Amesbury Former MGP

Project Number: 1804576

Project Location: Amesbury, MA

Project Manager: Ryan Hoffman
781-721-4091 rhoffman@geiconsultants.com

Send Report to: Ryan Hoffman and Jeremy Smalley

labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY AND MCP ANALYTICAL METHODS REQUIRED: (YES) NO

STATE AND FEDERAL REGULATORY REQUIREMENTS/REPORT LIMITS

State/Federal Program: (MA) 401WQC Other _____ NH RI CT NY ME

MA MCP Criteria are (Method 1 S-1 and GW-2/GW-3). Circle if GW-1 is required.

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Preservative	Preservative	Analysis: Parent and Alkylated MAHs + PAHs 8270*	Analysis: TOCs by Lloyd-Kahn								Sample Specific Remarks
							None	None										
1	1804576-861-S1	11/27/2023	11:00	SOIL	1	JES			X	X								
2	1804576-862-S1	11/27/2023	10:45	SOIL	1	JES			X	X								
3	1804576-869-S1	11/27/2026	12:45	SOIL	1	JES			X	X								

Sample Handling

Samples Field Filtered: YES NO (NA)

Sampled Shipped With Ice: (YES) NO

Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1. Nicholas Lavorato	11/27/2023	15:15	1. GEI SAMPLE FRIDGE
2.	11/29/23	1153	2. AO 11/29/23 1153
3. AO 4.4 on ice	11/29/23	1524	3.
4.			4.
5.			5.

Turnaround Time (Business days):

5-Day X 4-Day ____ 3-Day ____
2-Day ____ 1-Day ____ Other ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

Parent and Alkylated MAHs and PAHs by GC/MS/SIM/SCAN

Sample Matrix Abbreviations: SO = Soil GW = Groundwater SW = Surface Water SD = Sediment CO = Concrete PC = Paint Chip CLK = Caulk

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants

Shipped/Delivered Via: ESS Courier

ESS Project ID: F230041
Date Received: 11/29/2023
Project Due Date: 12/6/2023
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 4.4 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / (NA)
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / (No)
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By/Acid Lot#:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / (No)
    Who was contacted? Date: Time: By:

Resolution:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1	575	Yes	N/A	Yes	8 oz jar	NP	
2	576	Yes	N/A	Yes	8 oz jar	NP	
3	577	Yes	N/A	Yes	8 oz jar	NP	

2nd Review

Were all containers scanned into storage/lab? Initials BB
Are barcode labels on correct containers? (Yes) / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: Date & Time: 11/29/23 17:05
Reviewed By: Taylor Davis Date & Time: 1714 11/29/23

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: F230042

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 12:47 pm, Dec 11, 2023

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses

ESS - Cranston, RI	TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230042

SAMPLE RECEIPT

The following samples were received on November 29, 2023 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F230042-01	1804576-859-S1	Soil	8270 Mod, LK
F230042-02	1804576-859-S2	Soil	8270 Mod, LK
F230042-03	1804576-860-S1	Soil	8270 Mod, LK
F230042-04	1804576-860-S2	Soil	8270 Mod, LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230042

PROJECT NARRATIVE

Alkylated PAHs

F230042-01	**Surrogate recovery(ies) outside of criteria due to matrix (UCM/coelution/matrix is present) (SM).**
	Perylene-d12 (127% @ 50-120%)
F230042-02	**Present in Method Blank (B).**
	C-18
FK33002-BS2	**Blank Spike recovery is below lower control limit (B-).**
	Methylcyclohexane (54% @ 60-130%)
FK33002-DUP2	**Relative percent difference for duplicate is outside of criteria (D+).**

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230042

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-859-S1
Date Sampled: 11/28/23 10:40
Percent Solids: 61
Initial Volume: 5.33
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230042
ESS Laboratory Sample ID: F230042-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/30/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**225** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
C1-Benzene	**514** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
C2-Benzenes	**689** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
C3-Benzenes	**510** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
C4-Benzenes	**251** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
C5-Benzenes	**177** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
Methylcyclohexane	**12.8** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
Toluene	**677** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
Ethylbenzene	**444** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
m,p-Xylene	**668** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
Styrene	**662** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
o-Xylene	**85.2** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
Isopropylbenzene	**16.1** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
n-Propylbenzene	**70.9** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
1,3,5-Trimethylbenzene	**57.7** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
1,2,3-Trimethylbenzene	**20.6** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
1,2,4-Trimethylbenzene	**168** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
t-Butylbenzene	ND (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
sec-Butylbenzene	ND (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
p-Isopropyltoluene	**25.3** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
n-Butylbenzene	**41.4** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
trans-Decalin	**63.2** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
cis-Decalin	**24.3** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
C1-Decalins	**427** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
C2-Decalins	**748** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
C3-Decalins	**538** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
C4-Decalins	**581** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
Benzo(b)thiophene	**15.8** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
C1-Benzo(b)thiophenes	**27.4** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
C2-Benzo(b)thiophenes	**41.4** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
C3-Benzo(b)thiophenes	**43.5** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
C4-Benzo(b)thiophenes	**26.6** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-859-S1
Date Sampled: 11/28/23 10:40
Percent Solids: 61
Initial Volume: 5.33
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230042
ESS Laboratory Sample ID: F230042-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/30/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**2990** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
2-Methylnaphthalene	**2460** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
1-Methylnaphthalene	**811** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
C1-Naphthalenes	**2030** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
C2-Naphthalenes	**2630** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
C3-Naphthalenes	**3360** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
C4-Naphthalenes	**2560** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
Biphenyl	**980** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
Acenaphthylene	**2950** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
Acenaphthene	**1570** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
Dibenzofuran	**198** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
Fluorene	**1920** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
C1-Fluorenes	**4360** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
C2-Fluorenes	**5150** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
C3-Fluorenes	**2670** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
Dibenzothiophene	**243** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
C1-Dibenzothiophenes	**679** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
C2-Dibenzothiophenes	**1040** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
C3-Dibenzothiophenes	**850** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
C4-Dibenzothiophenes	**446** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
Phenanthrene	**9050** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
Anthracene	**7520** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
C1-Phenanthrenes/Anthracenes	**24100** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
C2-Phenanthrenes/Anthracenes	**19100** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
C3-Phenanthrenes/Anthracenes	**7340** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
C4-Phenanthrenes/Anthracenes	**2710** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
Retene	**1310** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
Benzo(b)naphtho(2,1-d)thiophene	**847** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
C0-Benzonaphthothiophenes	**1700** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
C1-Benzonaphthothiophenes	**2030** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
C2-Benzonaphthothiophenes	**1520** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
C3-Benzonaphthothiophenes	**1250** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-859-S1
Date Sampled: 11/28/23 10:40
Percent Solids: 61
Initial Volume: 5.33
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230042
ESS Laboratory Sample ID: F230042-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/30/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**380** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
Fluoranthene	**26000** (30.6)	15.3	8270 Mod		5	IBM	12/02/23 0:44	F3L0001	FK33002
Pyrene	**56400** (30.6)	15.3	8270 Mod		5	IBM	12/02/23 0:44	F3L0001	FK33002
C1-Fluoranthenes/Pyrenes	**49500** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
C2-Fluoranthenes/Pyrenes	**21200** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
C3-Fluoranthenes/Pyrenes	**7280** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
Benzo(b)fluorene	**4440** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
Benzo(c)fluorene	**1700** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
2-Methylpyrene	**7420** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
4-Methylpyrene	**8360** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
1-Methylpyrene	**7350** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
Benz(a)anthracene	**27600** (30.6)	15.3	8270 Mod		5	IBM	12/02/23 0:44	F3L0001	FK33002
Chrysene/triphenylene	**25900** (30.6)	15.3	8270 Mod		5	IBM	12/02/23 0:44	F3L0001	FK33002
C1-Benzo(a)anthracenes/Chrysenes	**23200** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
C2-Benzo(a)anthracenes/Chrysenes	**13600** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
C3-Benzo(a)anthracenes/Chrysenes	**5510** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
C4-Benzo(a)anthracenes/Chrysenes	**1930** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
Benzo(b)fluoranthene	**14600** (30.6)	15.3	8270 Mod		5	IBM	12/02/23 0:44	F3L0001	FK33002
Benzo(j/k)fluoranthene	**16300** (30.6)	15.3	8270 Mod		5	IBM	12/02/23 0:44	F3L0001	FK33002
Benzo(e)pyrene	**24500** (30.6)	15.3	8270 Mod		5	IBM	12/02/23 0:44	F3L0001	FK33002
Benzo(a)pyrene	**36500** (30.6)	15.3	8270 Mod		5	IBM	12/02/23 0:44	F3L0001	FK33002
Perylene	**5250** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
Indeno(1,2,3-cd)pyrene	**15400** (30.6)	15.3	8270 Mod		5	IBM	12/02/23 0:44	F3L0001	FK33002
Dibenzo(a,h)anthracene	**4510** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
Benzo(g,h,i)perylene	**19100** (30.6)	15.3	8270 Mod		5	IBM	12/02/23 0:44	F3L0001	FK33002
Coronene	**3830** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
Tetramethyl lead	ND (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
Trimethylethyl lead	ND (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
Dimethyldiethyl lead	ND (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
Methyltriethyl lead	ND (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
Tetraethyl lead	ND (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
2,6,10-trimethyldodecane (1380)	**766** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-859-S1
Date Sampled: 11/28/23 10:40
Percent Solids: 61
Initial Volume: 5.33
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230042
ESS Laboratory Sample ID: F230042-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/30/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**1230** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
2,6,10-trimethylpentadecane (1650)	**730** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
C-17	**453** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
Pristane	**1350** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
C-18	**228** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
Phytane	**943** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
Carbazole	**91.7** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
2,6-Dimethylnaphthalene	**371** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
2,3,5-Trimethylnaphthene	**184** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
4-Methyldibenzothiophene	**303** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
2/3-Methyldibenzothiophene	**195** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
1-Methyldibenzothiophene	**50.5** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
3-Methylphenanthrene	**5400** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
2-Methylphenanthrene	**3280** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
2-Methylanthracene	**4420** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
4/9-Methylphenanthrene	**7370** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002
1-Methylphenanthrene	**3450** (6.12)	3.06	8270 Mod		1	IBM	12/03/23 6:56	F3L0001	FK33002

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*70 %*		*50-120*
Surrogate: Naphthalene-d8	*77 %*		*50-120*
Surrogate: Phenanthrene-d10	*83 %*		*50-120*
Surrogate: Perylene-d12	*127 %*	*SM*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-859-S1
Date Sampled: 11/28/23 10:40
Percent Solids: N/A

ESS Laboratory Work Order: F230042
ESS Laboratory Sample ID: F230042-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**48600** (473)		LK		1	CCP	12/06/23 14:44	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-859-S2
Date Sampled: 11/28/23 10:41
Percent Solids: 72
Initial Volume: 5.75
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230042
ESS Laboratory Sample ID: F230042-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/30/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**15.8** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C1-Benzene	**122** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C2-Benzenes	**42.3** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C3-Benzenes	**71.8** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C4-Benzenes	**136** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C5-Benzenes	**79.2** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
Methylcyclohexane	**13.2** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
Toluene	**163** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
Ethylbenzene	**8.21** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
m,p-Xylene	**47.7** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
Styrene	**10.4** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
o-Xylene	**13.4** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
Isopropylbenzene	ND (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
n-Propylbenzene	**J 4.45** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
1,3,5-Trimethylbenzene	**10.7** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
1,2,3-Trimethylbenzene	**9.81** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
1,2,4-Trimethylbenzene	**38.6** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
t-Butylbenzene	ND (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
sec-Butylbenzene	ND (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
p-Isopropyltoluene	**65.8** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
n-Butylbenzene	**9.81** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
trans-Decalin	**7.50** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
cis-Decalin	ND (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C1-Decalins	**9.66** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C2-Decalins	**8.46** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C3-Decalins	**5.44** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C4-Decalins	**8.79** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
Benzo(b)thiophene	ND (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C1-Benzo(b)thiophenes	**7.33** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C2-Benzo(b)thiophenes	**10.4** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C3-Benzo(b)thiophenes	**7.57** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C4-Benzo(b)thiophenes	**J 2.68** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-859-S2
Date Sampled: 11/28/23 10:41
Percent Solids: 72
Initial Volume: 5.75
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230042
ESS Laboratory Sample ID: F230042-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/30/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**69.7** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
2-Methylnaphthalene	**51.4** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
1-Methylnaphthalene	**117** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C1-Naphthalenes	**101** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C2-Naphthalenes	**331** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C3-Naphthalenes	**170** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C4-Naphthalenes	**59.0** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
Biphenyl	**16.5** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
Acenaphthylene	**18.5** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
Acenaphthene	**553** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
Dibenzofuran	**14.9** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
Fluorene	**79.3** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C1-Fluorenes	**101** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C2-Fluorenes	**50.4** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C3-Fluorenes	**29.6** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
Dibenzothiophene	**10.2** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C1-Dibenzothiophenes	**18.3** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C2-Dibenzothiophenes	**15.4** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C3-Dibenzothiophenes	**12.0** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C4-Dibenzothiophenes	**11.8** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
Phenanthrene	**319** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
Anthracene	**128** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C1-Phenanthrenes/Anthracenes	**300** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C2-Phenanthrenes/Anthracenes	**187** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C3-Phenanthrenes/Anthracenes	**447** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C4-Phenanthrenes/Anthracenes	**1310** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
Retene	**5550** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
Benzo(b)naphtho(2,1-d)thiophene	**7.85** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C0-Benzonaphthothiophenes	**20.4** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C1-Benzonaphthothiophenes	**20.9** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C2-Benzonaphthothiophenes	**15.3** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C3-Benzonaphthothiophenes	**10.6** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-859-S2
Date Sampled: 11/28/23 10:41
Percent Solids: 72
Initial Volume: 5.75
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230042
ESS Laboratory Sample ID: F230042-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/30/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**7.80** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
Fluoranthene	**255** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
Pyrene	**480** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C1-Fluoranthenes/Pyrenes	**386** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C2-Fluoranthenes/Pyrenes	**126** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C3-Fluoranthenes/Pyrenes	**50.2** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
Benzo(b)fluorene	**31.2** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
Benzo(c)fluorene	**16.4** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
2-Methylpyrene	**51.6** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
4-Methylpyrene	**54.0** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
1-Methylpyrene	**48.1** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
Benz(a)anthracene	**188** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
Chrysene/triphenylene	**179** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C1-Benzo(a)anthracenes/Chrysenes	**141** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C2-Benzo(a)anthracenes/Chrysenes	**75.6** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C3-Benzo(a)anthracenes/Chrysenes	**32.0** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C4-Benzo(a)anthracenes/Chrysenes	**18.8** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
Benzo(b)fluoranthene	**94.1** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
Benzo(j/k)fluoranthene	**101** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
Benzo(e)pyrene	**147** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
Benzo(a)pyrene	**216** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
Perylene	**54.6** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
Indeno(1,2,3-cd)pyrene	**84.9** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
Dibenzo(a,h)anthracene	**25.9** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
Benzo(g,h,i)perylene	**105** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
Coronene	**22.5** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
Tetramethyl lead	ND (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
Trimethylethyl lead	ND (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
Dimethyldiethyl lead	ND (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
Methyltriethyl lead	ND (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
Tetraethyl lead	ND (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
2,6,10-trimethyldodecane (1380)	**11.9** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-859-S2
Date Sampled: 11/28/23 10:41
Percent Solids: 72
Initial Volume: 5.75
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230042
ESS Laboratory Sample ID: F230042-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/30/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**32.1** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
2,6,10-trimethylpentadecane (1650)	**11.2** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C-17	**85.3** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
Pristane	**64.4** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
C-18	**B 48.5** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
Phytane	**15.4** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
Carbazole	**J 3.70** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
2,6-Dimethylnaphthalene	**29.7** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
2,3,5-Trimethylnaphthene	**12.2** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
4-Methyldibenzothiophene	**5.27** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
2/3-Methyldibenzothiophene	**5.81** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
1-Methyldibenzothiophene	ND (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
3-Methylphenanthrene	**63.4** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
2-Methylphenanthrene	**62.0** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
2-Methylanthracene	**38.4** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
4/9-Methylphenanthrene	**78.4** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002
1-Methylphenanthrene	**55.1** (4.81)	2.40	8270 Mod		1	IBM	12/02/23 7:36	F3L0001	FK33002

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*75 %*		*50-120*
Surrogate: Naphthalene-d8	*76 %*		*50-120*
Surrogate: Phenanthrene-d10	*88 %*		*50-120*
Surrogate: Perylene-d12	*91 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-859-S2
Date Sampled: 11/28/23 10:41
Percent Solids: N/A

ESS Laboratory Work Order: F230042
ESS Laboratory Sample ID: F230042-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**34500** (464)		LK		1	CCP	12/06/23 15:01	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-860-S1
Date Sampled: 11/28/23 11:20
Percent Solids: 70
Initial Volume: 5.1
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230042
ESS Laboratory Sample ID: F230042-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/30/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**50.6** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C1-Benzene	**263** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C2-Benzenes	**194** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C3-Benzenes	**146** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C4-Benzenes	**141** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C5-Benzenes	**148** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
Methylcyclohexane	**J 5.09** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
Toluene	**350** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
Ethylbenzene	**29.2** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
m,p-Xylene	**260** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
Styrene	**23.9** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
o-Xylene	**35.7** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
Isopropylbenzene	**J 4.94** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
n-Propylbenzene	**10.7** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
1,3,5-Trimethylbenzene	**22.2** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
1,2,3-Trimethylbenzene	**14.2** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
1,2,4-Trimethylbenzene	**79.6** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
t-Butylbenzene	ND (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
sec-Butylbenzene	ND (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
p-Isopropyltoluene	**38.3** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
n-Butylbenzene	ND (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
trans-Decalin	**35.2** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
cis-Decalin	**14.1** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C1-Decalins	**97.1** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C2-Decalins	**219** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C3-Decalins	**152** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C4-Decalins	**167** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
Benzo(b)thiophene	**30.7** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C1-Benzo(b)thiophenes	**38.6** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C2-Benzo(b)thiophenes	**119** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C3-Benzo(b)thiophenes	**217** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C4-Benzo(b)thiophenes	**88.9** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-860-S1
Date Sampled: 11/28/23 11:20
Percent Solids: 70
Initial Volume: 5.1
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230042
ESS Laboratory Sample ID: F230042-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/30/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**602** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
2-Methylnaphthalene	**478** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
1-Methylnaphthalene	**329** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C1-Naphthalenes	**500** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C2-Naphthalenes	**2190** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C3-Naphthalenes	**3970** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C4-Naphthalenes	**2130** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
Biphenyl	**87.5** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
Acenaphthylene	**420** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
Acenaphthene	**2220** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
Dibenzofuran	**541** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
Fluorene	**1940** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C1-Fluorenes	**2400** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C2-Fluorenes	**2140** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C3-Fluorenes	**1100** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
Dibenzothiophene	**814** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C1-Dibenzothiophenes	**1410** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C2-Dibenzothiophenes	**1370** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C3-Dibenzothiophenes	**866** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C4-Dibenzothiophenes	**381** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
Phenanthrene	**10600** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
Anthracene	**6800** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C1-Phenanthrenes/Anthracenes	**14400** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C2-Phenanthrenes/Anthracenes	**9320** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C3-Phenanthrenes/Anthracenes	**3660** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C4-Phenanthrenes/Anthracenes	**1450** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
Retene	**1290** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
Benzo(b)naphtho(2,1-d)thiophene	**878** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C0-Benzonaphthothiophenes	**2430** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C1-Benzonaphthothiophenes	**1660** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C2-Benzonaphthothiophenes	**1090** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C3-Benzonaphthothiophenes	**499** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-860-S1
Date Sampled: 11/28/23 11:20
Percent Solids: 70
Initial Volume: 5.1
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230042
ESS Laboratory Sample ID: F230042-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/30/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**169** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
Fluoranthene	**20000** (112)	55.9	8270 Mod		20	IBM	12/02/23 11:37	F3L0001	FK33002
Pyrene	**15100** (112)	55.9	8270 Mod		20	IBM	12/02/23 11:37	F3L0001	FK33002
C1-Fluoranthenes/Pyrenes	**15900** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C2-Fluoranthenes/Pyrenes	**6520** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C3-Fluoranthenes/Pyrenes	**2630** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
Benzo(b)fluorene	**2830** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
Benzo(c)fluorene	**1160** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
2-Methylpyrene	**1650** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
4-Methylpyrene	**1220** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
1-Methylpyrene	**1150** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
Benz(a)anthracene	**8560** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
Chrysene/triphenylene	**6840** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C1-Benzo(a)anthracenes/Chrysenes	**6300** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C2-Benzo(a)anthracenes/Chrysenes	**3670** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C3-Benzo(a)anthracenes/Chrysenes	**2120** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C4-Benzo(a)anthracenes/Chrysenes	**1150** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
Benzo(b)fluoranthene	**3630** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
Benzo(j/k)fluoranthene	**5060** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
Benzo(e)pyrene	**2700** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
Benzo(a)pyrene	**5620** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
Perylene	**1170** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
Indeno(1,2,3-cd)pyrene	**2540** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
Dibenzo(a,h)anthracene	**880** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
Benzo(g,h,i)perylene	**1690** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
Coronene	**399** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
Tetramethyl lead	ND (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
Trimethylethyl lead	ND (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
Dimethyldiethyl lead	ND (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
Methyltriethyl lead	ND (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
Tetraethyl lead	ND (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
2,6,10-trimethyldodecane (1380)	**250** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-860-S1
Date Sampled: 11/28/23 11:20
Percent Solids: 70
Initial Volume: 5.1
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230042
ESS Laboratory Sample ID: F230042-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/30/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**397** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
2,6,10-trimethylpentadecane (1650)	**194** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C-17	**546** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
Pristane	**676** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
C-18	**154** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
Phytane	**154** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
Carbazole	**95.0** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
2,6-Dimethylnaphthalene	**358** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
2,3,5-Trimethylnaphthene	**340** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
4-Methyldibenzothiophene	**272** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
2/3-Methyldibenzothiophene	**446** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
1-Methyldibenzothiophene	**133** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
3-Methylphenanthrene	**2560** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
2-Methylphenanthrene	**3560** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
2-Methylanthracene	**3250** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
4/9-Methylphenanthrene	**2860** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002
1-Methylphenanthrene	**1980** (5.59)	2.79	8270 Mod		1	IBM	12/02/23 10:17	F3L0001	FK33002

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*77 %*		*50-120*
Surrogate: Naphthalene-d8	*80 %*		*50-120*
Surrogate: Phenanthrene-d10	*87 %*		*50-120*
Surrogate: Perylene-d12	*112 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-860-S1
Date Sampled: 11/28/23 11:20
Percent Solids: N/A

ESS Laboratory Work Order: F230042
ESS Laboratory Sample ID: F230042-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**47400** (473)		LK		1	CCP	12/06/23 15:17	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-860-S2
Date Sampled: 11/28/23 11:21
Percent Solids: 80
Initial Volume: 5.2
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230042
ESS Laboratory Sample ID: F230042-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/30/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**68.3** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C1-Benzene	**400** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C2-Benzenes	**357** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C3-Benzenes	**358** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C4-Benzenes	**211** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C5-Benzenes	**68.7** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
Methylcyclohexane	**11.3** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
Toluene	**531** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
Ethylbenzene	**123** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
m,p-Xylene	**423** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
Styrene	**20.1** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
o-Xylene	**93.2** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
Isopropylbenzene	**14.9** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
n-Propylbenzene	**22.1** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
1,3,5-Trimethylbenzene	**70.2** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
1,2,3-Trimethylbenzene	**32.7** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
1,2,4-Trimethylbenzene	**235** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
t-Butylbenzene	**29.7** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
sec-Butylbenzene	ND (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
p-Isopropyltoluene	**44.4** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
n-Butylbenzene	ND (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
trans-Decalin	**8.09** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
cis-Decalin	ND (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C1-Decalins	**18.4** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C2-Decalins	**27.6** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C3-Decalins	**20.9** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C4-Decalins	**33.6** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
Benzo(b)thiophene	**67.4** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C1-Benzo(b)thiophenes	**55.8** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C2-Benzo(b)thiophenes	**62.2** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C3-Benzo(b)thiophenes	**42.3** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C4-Benzo(b)thiophenes	**16.4** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-860-S2
Date Sampled: 11/28/23 11:21
Percent Solids: 80
Initial Volume: 5.2
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230042
ESS Laboratory Sample ID: F230042-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/30/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**1820** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
2-Methylnaphthalene	**1150** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
1-Methylnaphthalene	**729** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C1-Naphthalenes	**1150** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C2-Naphthalenes	**1140** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C3-Naphthalenes	**775** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C4-Naphthalenes	**395** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
Biphenyl	**209** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
Acenaphthylene	**202** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
Acenaphthene	**905** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
Dibenzofuran	**671** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
Fluorene	**1100** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C1-Fluorenes	**737** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C2-Fluorenes	**543** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C3-Fluorenes	**401** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
Dibenzothiophene	**386** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C1-Dibenzothiophenes	**362** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C2-Dibenzothiophenes	**287** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C3-Dibenzothiophenes	**173** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C4-Dibenzothiophenes	**91.2** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
Phenanthrene	**4920** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
Anthracene	**2280** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C1-Phenanthrenes/Anthracenes	**3490** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C2-Phenanthrenes/Anthracenes	**2120** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C3-Phenanthrenes/Anthracenes	**936** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C4-Phenanthrenes/Anthracenes	**369** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
Retene	**315** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
Benzo(b)naphtho(2,1-d)thiophene	**346** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C0-Benzonaphthothiophenes	**787** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C1-Benzonaphthothiophenes	**524** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C2-Benzonaphthothiophenes	**352** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C3-Benzonaphthothiophenes	**178** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-860-S2
Date Sampled: 11/28/23 11:21
Percent Solids: 80
Initial Volume: 5.2
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230042
ESS Laboratory Sample ID: F230042-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/30/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**57.4** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
Fluoranthene	**4830** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
Pyrene	**4470** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C1-Fluoranthenes/Pyrenes	**4440** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C2-Fluoranthenes/Pyrenes	**2150** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C3-Fluoranthenes/Pyrenes	**950** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
Benzo(b)fluorene	**708** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
Benzo(c)fluorene	**260** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
2-Methylpyrene	**513** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
4-Methylpyrene	**415** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
1-Methylpyrene	**349** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
Benz(a)anthracene	**3160** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
Chrysene/triphenylene	**2810** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C1-Benzo(a)anthracenes/Chrysenes	**2350** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C2-Benzo(a)anthracenes/Chrysenes	**1360** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C3-Benzo(a)anthracenes/Chrysenes	**754** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C4-Benzo(a)anthracenes/Chrysenes	**392** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
Benzo(b)fluoranthene	**1740** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
Benzo(j/k)fluoranthene	**2220** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
Benzo(e)pyrene	**1580** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
Benzo(a)pyrene	**2870** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
Perylene	**604** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
Indeno(1,2,3-cd)pyrene	**1420** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
Dibenzo(a,h)anthracene	**452** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
Benzo(g,h,i)perylene	**1150** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
Coronene	**276** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
Tetramethyl lead	ND (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
Trimethylethyl lead	ND (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
Dimethyldiethyl lead	ND (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
Methyltriethyl lead	ND (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
Tetraethyl lead	ND (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
2,6,10-trimethyldodecane (1380)	**36.2** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-860-S2
Date Sampled: 11/28/23 11:21
Percent Solids: 80
Initial Volume: 5.2
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F230042
ESS Laboratory Sample ID: F230042-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 11/30/23 12:00

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**74.9** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
2,6,10-trimethylpentadecane (1650)	**38.3** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C-17	**97.3** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
Pristane	**126** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
C-18	**76.4** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
Phytane	**33.1** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
Carbazole	**508** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
2,6-Dimethylnaphthalene	**328** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
2,3,5-Trimethylnaphthene	**57.6** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
4-Methyldibenzothiophene	**80.3** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
2/3-Methyldibenzothiophene	**119** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
1-Methyldibenzothiophene	**29.2** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
3-Methylphenanthrene	**698** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
2-Methylphenanthrene	**829** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
2-Methylanthracene	**753** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
4/9-Methylphenanthrene	**739** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002
1-Methylphenanthrene	**444** (4.82)	2.41	8270 Mod		1	IBM	12/02/23 12:57	F3L0001	FK33002

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*78 %*		*50-120*
Surrogate: Naphthalene-d8	*82 %*		*50-120*
Surrogate: Phenanthrene-d10	*91 %*		*50-120*
Surrogate: Perylene-d12	*107 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-860-S2
Date Sampled: 11/28/23 11:21
Percent Solids: N/A

ESS Laboratory Work Order: F230042
ESS Laboratory Sample ID: F230042-04
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**27500** (473)		LK		1	CCP	12/06/23 15:34	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230042

Quality Control Data

Classical Chemistry

Batch DL30448 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	500	mg/kg							
Total Organic Carbon (2)	ND	500	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230042

Quality Control Data

Classical Chemistry

Batch DL30448 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9280	500	mg/kg	10010		93	80-120			
Total Organic Carbon (2)	8970	500	mg/kg	10010		90	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230042

Quality Control Data

Classical Chemistry

Batch DL30448 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	8740	500	mg/kg	10010		87	80-120	6	25	
Total Organic Carbon (2)	8770	500	mg/kg	10010		88	80-120	2	25	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230042

Quality Control Data

Alkylated PAHs

Batch FK33002 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	2.33	4.00	ug/Kg wet							J
C1-Benzene	2.01	4.00	ug/Kg wet							J
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	2.66	4.00	ug/Kg wet							J
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	ND	4.00	ug/Kg wet							
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230042

Quality Control Data

Alkylated PAHs

Batch FK33002 - 3570

C1-Fluorenes	ND	4.00	ug/Kg wet
C2-Fluorenes	ND	4.00	ug/Kg wet
C3-Fluorenes	ND	4.00	ug/Kg wet
Dibenzothiophene	ND	4.00	ug/Kg wet
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet
Phenanthrene	ND	4.00	ug/Kg wet
Anthracene	ND	4.00	ug/Kg wet
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
Retene	ND	4.00	ug/Kg wet
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
Fluoranthene	ND	4.00	ug/Kg wet
Pyrene	ND	4.00	ug/Kg wet
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
Benzo(b)fluorene	ND	4.00	ug/Kg wet
Benzo(c)fluorene	ND	4.00	ug/Kg wet
2-Methylpyrene	ND	4.00	ug/Kg wet
4-Methylpyrene	ND	4.00	ug/Kg wet
1-Methylpyrene	ND	4.00	ug/Kg wet
Benz(a)anthracene	ND	4.00	ug/Kg wet
Chrysene/triphenylene	ND	4.00	ug/Kg wet
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet
Benzo(e)pyrene	ND	4.00	ug/Kg wet
Benzo(a)pyrene	ND	4.00	ug/Kg wet
Perylene	ND	4.00	ug/Kg wet
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet
Coronene	ND	4.00	ug/Kg wet
Tetramethyl lead	ND	4.00	ug/Kg wet
Trimethylethyl lead	ND	4.00	ug/Kg wet

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230042

Quality Control Data

Alkylated PAHs

Batch FK33002 - 3570							
Dimethyldiethyl lead	ND	4.00	ug/Kg wet				
Methyltriethyl lead	ND	4.00	ug/Kg wet				
Tetraethyl lead	ND	4.00	ug/Kg wet				
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet				
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet				
2,6,10-trimethylpentadecane (1650)	ND	4.00	ug/Kg wet				
C-17	5.69	4.00	ug/Kg wet				
Pristane	2.71	4.00	ug/Kg wet				J
C-18	5.90	4.00	ug/Kg wet				
Phytane	ND	4.00	ug/Kg wet				
Carbazole	ND	4.00	ug/Kg wet				
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet				
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet				
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
3-Methylphenanthrene	ND	4.00	ug/Kg wet				
2-Methylphenanthrene	ND	4.00	ug/Kg wet				
2-Methylanthracene	ND	4.00	ug/Kg wet				
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet				
1-Methylphenanthrene	ND	4.00	ug/Kg wet				
Surrogate: Toluene-D8	*349*		ug/Kg wet	*400.0*	*87*	*50-120*	
Surrogate: Naphthalene-d8	*320*		ug/Kg wet	*400.0*	*80*	*50-120*	
Surrogate: Phenanthrene-d10	*374*		ug/Kg wet	*400.0*	*93*	*50-120*	
Surrogate: Perylene-d12	*429*		ug/Kg wet	*400.0*	*107*	*50-120*	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230042

Quality Control Data

Alkylated PAHs

Batch FK33002 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	274	4.00	ug/Kg wet	400.0		69	60-130			
Methylcyclohexane	214	4.00	ug/Kg wet	400.0		54	60-130			B-
Toluene	278	4.00	ug/Kg wet	400.0		69	60-130			
Ethylbenzene	288	4.00	ug/Kg wet	400.0		72	60-130			
m,p-Xylene	288	4.00	ug/Kg wet	400.0		72	60-130			
Styrene	267	4.00	ug/Kg wet	400.0		67	60-130			
o-Xylene	291	4.00	ug/Kg wet	400.0		73	60-130			
Isopropylbenzene	290	4.00	ug/Kg wet	400.0		73	60-130			
n-Propylbenzene	287	4.00	ug/Kg wet	400.0		72	60-130			
1,3,5-Trimethylbenzene	292	4.00	ug/Kg wet	400.0		73	60-130			
1,2,3-Trimethylbenzene	296	4.00	ug/Kg wet	400.0		74	60-130			
1,2,4-Trimethylbenzene	294	4.00	ug/Kg wet	400.0		73	60-130			
t-Butylbenzene	292	4.00	ug/Kg wet	400.0		73	60-130			
sec-Butylbenzene	290	4.00	ug/Kg wet	400.0		72	60-130			
p-Isopropyltoluene	297	4.00	ug/Kg wet	400.0		74	60-130			
n-Butylbenzene	280	4.00	ug/Kg wet	400.0		70	60-130			
trans-Decalin	288	4.00	ug/Kg wet	400.0		72	60-130			
cis-Decalin	285	4.00	ug/Kg wet	400.0		71	60-130			
Benzo(b)thiophene	271	4.00	ug/Kg wet	400.0		68	60-130			
Naphthalene	274	4.00	ug/Kg wet	400.0		68	60-130			
2-Methylnaphthalene	288	4.00	ug/Kg wet	400.0		72	60-130			
1-Methylnaphthalene	286	4.00	ug/Kg wet	400.0		72	60-130			
Biphenyl	270	4.00	ug/Kg wet	400.0		67	60-130			
Acenaphthylene	310	4.00	ug/Kg wet	400.0		78	60-130			
Acenaphthene	298	4.00	ug/Kg wet	400.0		74	60-130			
Dibenzofuran	286	4.00	ug/Kg wet	400.0		72	60-130			
Fluorene	300	4.00	ug/Kg wet	400.0		75	60-130			
Dibenzothiophene	298	4.00	ug/Kg wet	400.0		75	60-130			
Phenanthrene	302	4.00	ug/Kg wet	400.0		76	60-130			
Anthracene	321	4.00	ug/Kg wet	400.0		80	60-130			
Retene	340	4.00	ug/Kg wet	400.0		85	60-130			
Benzo(b)naphtho(2,1-d)thiophene	319	4.00	ug/Kg wet	400.0		80	60-130			
Fluoranthene	323	4.00	ug/Kg wet	400.0		81	60-130			
Pyrene	321	4.00	ug/Kg wet	400.0		80	60-130			
Benz(a)anthracene	336	4.00	ug/Kg wet	400.0		84	60-130			
Chrysene/triphenylene	330	4.00	ug/Kg wet	400.0		83	60-130			
Benzo(b)fluoranthene	330	4.00	ug/Kg wet	400.0		82	60-130			
Benzo(j/k)fluoranthene	343	4.00	ug/Kg wet	400.0		86	60-130			
Benzo(e)pyrene	328	4.00	ug/Kg wet	400.0		82	60-130			
Benzo(a)pyrene	345	4.00	ug/Kg wet	400.0		86	60-130			
Perylene	343	4.00	ug/Kg wet	400.0		86	60-130			
Indeno(1,2,3-cd)pyrene	350	4.00	ug/Kg wet	400.0		88	60-130			
Dibenzo(a,h)anthracene	359	4.00	ug/Kg wet	400.0		90	60-130			
Benzo(g,h,i)perylene	333	4.00	ug/Kg wet	400.0		83	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230042

Quality Control Data

Alkylated PAHs

Batch FK33002 - 3570						
Coronene	326	4.00	ug/Kg wet	400.0	82	60-130
Tetraethyl lead	374	4.00	ug/Kg wet	400.0	93	60-130
Surrogate: Toluene-D8	*332*		ug/Kg wet	*400.0*	*83*	*50-120*
Surrogate: Naphthalene-d8	*322*		ug/Kg wet	*400.0*	*80*	*50-120*
Surrogate: Phenanthrene-d10	*366*		ug/Kg wet	*400.0*	*92*	*50-120*
Surrogate: Perylene-d12	*416*		ug/Kg wet	*400.0*	*104*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230042

Quality Control Data

Alkylated PAHs

Batch FK33002 - 3570

Duplicate **Source: F230042-04** **D+**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	21.4	4.61	ug/Kg dry		68.3			105	50	
C1-Benzene	211	4.61	ug/Kg dry		400			62	50	
C2-Benzenes	121	4.61	ug/Kg dry		357			99	50	
C3-Benzenes	123	4.61	ug/Kg dry		358			98	50	
C4-Benzenes	90.0	4.61	ug/Kg dry		211			80	50	
C5-Benzenes	35.5	4.61	ug/Kg dry		68.7			64	50	
Methylcyclohexane	17.5	4.61	ug/Kg dry		11.3			43	50	
Toluene	283	4.61	ug/Kg dry		531			61	50	
Ethylbenzene	28.1	4.61	ug/Kg dry		123			126	50	
m,p-Xylene	148	4.61	ug/Kg dry		423			96	50	
Styrene	6.07	4.61	ug/Kg dry		20.1			107	50	
o-Xylene	36.8	4.61	ug/Kg dry		93.2			87	50	
Isopropylbenzene	5.19	4.61	ug/Kg dry		14.9			97	50	
n-Propylbenzene	8.69	4.61	ug/Kg dry		22.1			87	50	
1,3,5-Trimethylbenzene	19.9	4.61	ug/Kg dry		70.2			112	50	
1,2,3-Trimethylbenzene	11.5	4.61	ug/Kg dry		32.7			96	50	
1,2,4-Trimethylbenzene	74.7	4.61	ug/Kg dry		235			103	50	
t-Butylbenzene	ND	4.61	ug/Kg dry		29.7				50	
sec-Butylbenzene	ND	4.61	ug/Kg dry		ND				50	
p-Isopropyltoluene	19.1	4.61	ug/Kg dry		44.4			80	50	
n-Butylbenzene	ND	4.61	ug/Kg dry		ND				50	
trans-Decalin	3.95	4.61	ug/Kg dry		8.09			69	50	J
cis-Decalin	ND	4.61	ug/Kg dry		ND				50	
C1-Decalins	6.53	4.61	ug/Kg dry		18.4			95	50	
C2-Decalins	11.5	4.61	ug/Kg dry		27.6			82	50	
C3-Decalins	8.98	4.61	ug/Kg dry		20.9			80	50	
C4-Decalins	12.7	4.61	ug/Kg dry		33.6			90	50	
Benzo(b)thiophene	17.4	4.61	ug/Kg dry		67.4			118	50	
C1-Benzo(b)thiophenes	15.0	4.61	ug/Kg dry		55.8			115	50	
C2-Benzo(b)thiophenes	20.5	4.61	ug/Kg dry		62.2			101	50	
C3-Benzo(b)thiophenes	16.5	4.61	ug/Kg dry		42.3			88	50	
C4-Benzo(b)thiophenes	6.90	4.61	ug/Kg dry		16.4			82	50	
Naphthalene	507	4.61	ug/Kg dry		1820			113	50	
2-Methylnaphthalene	292	4.61	ug/Kg dry		1150			119	50	
1-Methylnaphthalene	200	4.61	ug/Kg dry		729			114	50	
C1-Naphthalenes	302	4.61	ug/Kg dry		1150			117	50	
C2-Naphthalenes	379	4.61	ug/Kg dry		1140			100	50	
C3-Naphthalenes	299	4.61	ug/Kg dry		775			89	50	
C4-Naphthalenes	160	4.61	ug/Kg dry		395			84	50	
Biphenyl	53.0	4.61	ug/Kg dry		209			119	50	
Acenaphthylene	55.9	4.61	ug/Kg dry		202			113	50	
Acenaphthene	285	4.61	ug/Kg dry		905			104	50	
Dibenzofuran	143	4.61	ug/Kg dry		671			130	50	
Fluorene	252	4.61	ug/Kg dry		1100			125	50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230042

Quality Control Data

Alkylated PAHs

Batch FK33002 - 3570

C1-Fluorenes	240	4.61	ug/Kg dry	737	102	50
C2-Fluorenes	187	4.61	ug/Kg dry	543	98	50
C3-Fluorenes	103	4.61	ug/Kg dry	401	118	50
Dibenzothiophene	82.9	4.61	ug/Kg dry	386	129	50
C1-Dibenzothiophenes	ND	4.61	ug/Kg dry	362		50
C2-Dibenzothiophenes	89.3	4.61	ug/Kg dry	287	105	50
C3-Dibenzothiophenes	55.2	4.61	ug/Kg dry	173	103	50
C4-Dibenzothiophenes	29.0	4.61	ug/Kg dry	91.2	104	50
Phenanthrene	1000	4.61	ug/Kg dry	4920	132	50
Anthracene	612	4.61	ug/Kg dry	2280	115	50
C1-Phenanthrenes/Anthracenes	941	4.61	ug/Kg dry	3490	115	50
C2-Phenanthrenes/Anthracenes	673	4.61	ug/Kg dry	2120	103	50
C3-Phenanthrenes/Anthracenes	317	4.61	ug/Kg dry	936	99	50
C4-Phenanthrenes/Anthracenes	141	4.61	ug/Kg dry	369	89	50
Retene	155	4.61	ug/Kg dry	315	68	50
Benzo(b)naphtho(2,1-d)thiophene	73.2	4.61	ug/Kg dry	346	130	50
C0-Benzonaphthothiophenes	187	4.61	ug/Kg dry	787	123	50
C1-Benzonaphthothiophenes	141	4.61	ug/Kg dry	524	115	50
C2-Benzonaphthothiophenes	98.7	4.61	ug/Kg dry	352	112	50
C3-Benzonaphthothiophenes	50.2	4.61	ug/Kg dry	178	112	50
C4-Benzonaphthothiophenes	17.8	4.61	ug/Kg dry	57.4	105	50
Fluoranthene	1260	4.61	ug/Kg dry	4830	117	50
Pyrene	1060	4.61	ug/Kg dry	4470	124	50
C1-Fluoranthenes/Pyrenes	1240	4.61	ug/Kg dry	4440	112	50
C2-Fluoranthenes/Pyrenes	611	4.61	ug/Kg dry	2150	112	50
C3-Fluoranthenes/Pyrenes	270	4.61	ug/Kg dry	950	111	50
Benzo(b)fluorene	201	4.61	ug/Kg dry	708	112	50
Benzo(c)fluorene	87.7	4.61	ug/Kg dry	260	99	50
2-Methylpyrene	141	4.61	ug/Kg dry	513	114	50
4-Methylpyrene	105	4.61	ug/Kg dry	415	119	50
1-Methylpyrene	86.8	4.61	ug/Kg dry	349	120	50
Benz(a)anthracene	771	4.61	ug/Kg dry	3160	121	50
Chrysene/triphenylene	639	4.61	ug/Kg dry	2810	126	50
C1-Benzo(a)anthracenes/Chrysenes	637	4.61	ug/Kg dry	2350	115	50
C2-Benzo(a)anthracenes/Chrysenes	374	4.61	ug/Kg dry	1360	114	50
C3-Benzo(a)anthracenes/Chrysenes	235	4.61	ug/Kg dry	754	105	50
C4-Benzo(a)anthracenes/Chrysenes	108	4.61	ug/Kg dry	392	114	50
Benzo(b)fluoranthene	362	4.61	ug/Kg dry	1740	131	50
Benzo(j/k)fluoranthene	480	4.61	ug/Kg dry	2220	129	50
Benzo(e)pyrene	290	4.61	ug/Kg dry	1580	138	50
Benzo(a)pyrene	577	4.61	ug/Kg dry	2870	133	50
Perylene	151	4.61	ug/Kg dry	604	120	50
Indeno(1,2,3-cd)pyrene	259	4.61	ug/Kg dry	1420	138	50
Dibenzo(a,h)anthracene	89.8	4.61	ug/Kg dry	452	134	50
Benzo(g,h,i)perylene	186	4.61	ug/Kg dry	1150	144	50
Coronene	43.8	4.61	ug/Kg dry	276	145	50
Tetramethyl lead	ND	4.61	ug/Kg dry	ND		50
Trimethylethyl lead	ND	4.61	ug/Kg dry	ND		50

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230042

Quality Control Data

Alkylated PAHs

Batch FK33002 - 3570								
Dimethyldiethyl lead	ND	4.61	ug/Kg dry		ND			50
Methyltriethyl lead	ND	4.61	ug/Kg dry		ND			50
Tetraethyl lead	ND	4.61	ug/Kg dry		ND			50
2,6,10-trimethyldodecane (1380)	17.7	4.61	ug/Kg dry		36.2		69	50
2,6,10-trimethyltridecane (1470)	40.2	4.61	ug/Kg dry		74.9		60	50
2,6,10-trimethylpentadecane (1650)	18.7	4.61	ug/Kg dry		38.3		69	50
C-17	55.5	4.61	ug/Kg dry		97.3		55	50
Pristane	76.4	4.61	ug/Kg dry		126		49	50
C-18	41.2	4.61	ug/Kg dry		76.4		60	50
Phytane	19.1	4.61	ug/Kg dry		33.1		54	50
Carbazole	34.6	4.61	ug/Kg dry		508		175	50
2,6-Dimethylnaphthalene	92.8	4.61	ug/Kg dry		328		112	50
2,3,5-Trimethylnaphthene	22.1	4.61	ug/Kg dry		57.6		89	50
4-Methyldibenzothiophene	23.2	4.61	ug/Kg dry		80.3		110	50
2/3-Methyldibenzothiophene	34.3	4.61	ug/Kg dry		119		111	50
1-Methyldibenzothiophene	9.96	4.61	ug/Kg dry		29.2		98	50
3-Methylphenanthrene	184	4.61	ug/Kg dry		698		116	50
2-Methylphenanthrene	209	4.61	ug/Kg dry		829		119	50
2-Methylanthracene	219	4.61	ug/Kg dry		753		110	50
4/9-Methylphenanthrene	210	4.61	ug/Kg dry		739		112	50
1-Methylphenanthrene	113	4.61	ug/Kg dry		444		119	50
Surrogate: Toluene-D8	*359*		ug/Kg dry	*461.3*		*78*	*50-120*	
Surrogate: Naphthalene-d8	*383*		ug/Kg dry	*461.3*		*83*	*50-120*	
Surrogate: Phenanthrene-d10	*433*		ug/Kg dry	*461.3*		*94*	*50-120*	
Surrogate: Perylene-d12	*485*		ug/Kg dry	*461.3*		*105*	*50-120*	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F230042

Notes and Definitions

U	Analyte included in the analysis, but not detected
SM	Surrogate recovery(ies) outside of criteria due to matrix (UCM/coelution/matrix is present) (SM).
J	Reported between MDL and MRL
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
B-	Blank Spike recovery is below lower control limit (B-).
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F230042

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 23h0899 / 230042

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000

Project Information

Project Name: Amesbury Former MGP

Project Number: 1804576

Project Location: Amesbury, MA

Project Manager: Ryan Hoffman
781-721-4091 rhoffman@geiconsultants.com

Send Report to: Ryan Hoffman and Jeremy Smalley
labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY AND MCP ANALYTICAL METHODS REQUIRED: (YES) NO

STATE AND FEDERAL REGULATORY REQUIREMENTS/REPORT LIMITS

State/Federal Program: (MA) 401WQC Other _____ NH RI CT NY ME

MA MCP Criteria are (Method 1 S-1 and GW-2/GW-3). Circle if GW-1 is required.

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Preservative: None	Preservative: None	Analysis: Parent and Alkylated MAHs + PAHs 8270*	Analysis: TOCs by Lloyd-Kahn	Sample Specific Remarks
1	1804576-859-S1	11/28/2023	10:40	SOIL	1	NMT			X	X	
2	1804576-859-S2	11/28/2023	10:41	SOIL	1	NMT			X	X	
3	1804576-860-S1	11/28/2023	11:20	SOIL	2	NMT			X	X	
4	1804576-860-S2	11/28/2023	11:21	SOIL	2	NMT			X	X	

Sample Handling

Samples Field Filtered: YES NO (NA)

Sampled Shipped With Ice: (YES) NO

	Relinquished by sampler: (signature)	Date	Time	Received by: (signature)
1.	Nicholas Inocolo	11/28/2023	14:45	1. GEI SAMPLE FRIDGE
2.	[signature]	11/29/23	1153	2. [signature] 11/29/23 1153
3.	[signature] 4.4 on ice	11/29/23	1524	3. [signature]
4.				4.
5.				5.

Turnaround Time (Business days):

5-Day X 4-Day ____ 3-Day ____
2-Day ____ 1-Day ____ Other ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

Parent and Alkylated MAHs and PAHs by GC/MS/SIM/SCAN

Sample Matrix Abbreviations: SO = Soil GW = Groundwater SW = Surface Water SD = Sediment CO = Concrete PC = Paint Chip CLK = Caulk

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants

Shipped/Delivered Via: ESS Courier

ESS Project ID: F230042
Date Received: 11/29/2023
Project Due Date: 12/6/2023
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 4.4 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / (NA)
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / (No)
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By/Acid Lot#:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / (No)
    Who was contacted? Date: Time: By:

Resolution:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1	578	Yes	N/A	Yes	8 oz jar	NP	
2	579	Yes	N/A	Yes	8 oz jar	NP	
3	580	Yes	N/A	Yes	4 oz. Jar	NP	
3	581	Yes	N/A	Yes	4 oz. Jar	NP	
4	582	Yes	N/A	Yes	4 oz. Jar	NP	
4	583	Yes	N/A	Yes	4 oz. Jar	NP	

2nd Review
Were all containers scanned into storage/lab? Initials BB
Are barcode labels on correct containers? (Yes) / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By:
Reviewed
Date & Time: 11/29/23 17:08

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants

By: [signature]

ESS Project ID: F230042

Date Received: 11/29/2023

Date & Time: 11/29/23 1713.

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: F240018

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 10:45 am, Jun 20, 2024

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses

ESS - Cranston, RI	TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240018

SAMPLE RECEIPT

The following samples were received on June 04, 2024 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F240018-01	1804576-849-(3.78-3.98)	Sediment	8270 Mod, LK
F240018-02	1804576-850-(4.45-4.65)	Sediment	8270 Mod, LK
F240018-03	1804576-851-(3.80-4.00)	Sediment	8270 Mod, LK
F240018-04	1804576-852-(3.55-3.75)	Sediment	8270 Mod, LK
F240018-05	1804576-855-(4.10-4.30)	Sediment	8270 Mod, LK
F240018-06	1804576-856-(4.55-4.75)	Sediment	8270 Mod, LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240018

PROJECT NARRATIVE

Alkylated PAHs

F240018-02	**Surrogate recovery(ies) outside of criteria due to matrix (UCM/coelution/matrix is present) (SM).**
	Perylene-d12 (134% @ 50-120%)
F4F0002-CCV2	**Continuing Calibration %Diff/Drift is below control limit (CD-).**
	Styrene (26% @ 25%)
F4F0002-CCV3	**Continuing Calibration %Diff/Drift is below control limit (CD-).**
	Styrene (28% @ 25%)

Classical Chemistry

DF40653-MS1	**Matrix Spike recovery is above upper control limit (M+).**
	Total Organic Carbon (2) (189% @ 75-125%)
F240018-01	**Estimated value. Sample hold times were exceeded (H).**
F240018-02	**Estimated value. Sample hold times were exceeded (H).**
F240018-03	**Estimated value. Sample hold times were exceeded (H).**
F240018-04	**Estimated value. Sample hold times were exceeded (H).**
F240018-05	**Estimated value. Sample hold times were exceeded (H).**
F240018-06	**Estimated value. Sample hold times were exceeded (H).**

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240018

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-849-(3.78-3.98)
Date Sampled: 08/16/23 14:31
Percent Solids: 76
Initial Volume: 5.18
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240018
ESS Laboratory Sample ID: F240018-01
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/5/24 13:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**68.0** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C1-Benzene	**278** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C2-Benzenes	**128** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C3-Benzenes	**77.4** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C4-Benzenes	**70.8** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C5-Benzenes	**70.4** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
Methylcyclohexane	**29.1** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
Toluene	**389** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
Ethylbenzene	**62.9** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
m,p-Xylene	**152** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
Styrene	**149** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
o-Xylene	**14.4** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
Isopropylbenzene	**J 3.30** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
n-Propylbenzene	**9.15** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
1,3,5-Trimethylbenzene	**22.7** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
1,2,3-Trimethylbenzene	**6.27** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
1,2,4-Trimethylbenzene	**24.9** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
t-Butylbenzene	ND (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
sec-Butylbenzene	ND (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
p-Isopropyltoluene	**16.8** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
n-Butylbenzene	**17.3** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
trans-Decalin	**13.5** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
cis-Decalin	**6.67** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C1-Decalins	**169** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C2-Decalins	**521** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C3-Decalins	**615** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C4-Decalins	**1170** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
Benzo(b)thiophene	**71.7** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C1-Benzo(b)thiophenes	**89.9** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C2-Benzo(b)thiophenes	**310** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C3-Benzo(b)thiophenes	**221** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C4-Benzo(b)thiophenes	**106** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-849-(3.78-3.98)
Date Sampled: 08/16/23 14:31
Percent Solids: 76
Initial Volume: 5.18
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240018
ESS Laboratory Sample ID: F240018-01
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/5/24 13:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**1550** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
2-Methylnaphthalene	**642** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
1-Methylnaphthalene	**669** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C1-Naphthalenes	**815** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C2-Naphthalenes	**4680** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C3-Naphthalenes	**3600** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C4-Naphthalenes	**2330** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
Biphenyl	**523** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
Acenaphthylene	**2250** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
Acenaphthene	**12500** (102)	51.0	8270 Mod		20	IBM	06/07/24 15:48	F4F0002	FF40501
Dibenzofuran	**875** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
Fluorene	**8990** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C1-Fluorenes	**3660** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C2-Fluorenes	**3420** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C3-Fluorenes	**2250** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
Dibenzothiophene	**4500** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C1-Dibenzothiophenes	**2700** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C2-Dibenzothiophenes	**2560** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C3-Dibenzothiophenes	**1610** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C4-Dibenzothiophenes	**555** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
Phenanthrene	**52600** (102)	51.0	8270 Mod		20	IBM	06/07/24 15:48	F4F0002	FF40501
Anthracene	**9980** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C1-Phenanthrenes/Anthracenes	**20300** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C2-Phenanthrenes/Anthracenes	**13700** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C3-Phenanthrenes/Anthracenes	**5740** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C4-Phenanthrenes/Anthracenes	**1720** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
Retene	**680** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
Benzo(b)naphtho(2,1-d)thiophene	**1280** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C0-Benzonaphthothiophenes	**2260** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C1-Benzonaphthothiophenes	**1940** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C2-Benzonaphthothiophenes	**1070** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C3-Benzonaphthothiophenes	**518** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-849-(3.78-3.98)
Date Sampled: 08/16/23 14:31
Percent Solids: 76
Initial Volume: 5.18
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240018
ESS Laboratory Sample ID: F240018-01
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/5/24 13:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**132** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
Fluoranthene	**16400** (102)	51.0	8270 Mod		20	IBM	06/07/24 15:48	F4F0002	FF40501
Pyrene	**24100** (102)	51.0	8270 Mod		20	IBM	06/07/24 15:48	F4F0002	FF40501
C1-Fluoranthenes/Pyrenes	**19500** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C2-Fluoranthenes/Pyrenes	**8290** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C3-Fluoranthenes/Pyrenes	**2920** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
Benzo(b)fluorene	**2000** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
Benzo(c)fluorene	**926** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
2-Methylpyrene	**2650** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
4-Methylpyrene	**2400** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
1-Methylpyrene	**2440** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
Benz(a)anthracene	**9300** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
Chrysene/triphenylene	**9700** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C1-Benzo(a)anthracenes/Chrysenes	**8800** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C2-Benzo(a)anthracenes/Chrysenes	**3870** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C3-Benzo(a)anthracenes/Chrysenes	**1440** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C4-Benzo(a)anthracenes/Chrysenes	**444** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
Benzo(b)fluoranthene	**3910** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
Benzo(j/k)fluoranthene	**4680** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
Benzo(e)pyrene	**4340** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
Benzo(a)pyrene	**7770** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
Perylene	**1200** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
Indeno(1,2,3-cd)pyrene	**3120** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
Dibenzo(a,h)anthracene	**934** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
Benzo(g,h,i)perylene	**2700** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
Coronene	**663** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
Tetramethyl lead	ND (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
Trimethylethyl lead	ND (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
Dimethyldiethyl lead	ND (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
Methyltriethyl lead	ND (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
Tetraethyl lead	ND (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
Total Organic Lead	ND (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-849-(3.78-3.98)
Date Sampled: 08/16/23 14:31
Percent Solids: 76
Initial Volume: 5.18
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240018
ESS Laboratory Sample ID: F240018-01
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/5/24 13:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyldodecane (1380)	**385** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
2,6,10-trimethyltridecane (1470)	**622** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
2,6,10-trimethylpentadecane (1650)	**801** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C-17	**102** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
Pristane	**1710** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
C-18	**144** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
Phytane	**1640** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
Carbazole	**47.5** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
2,6-Dimethylnaphthalene	**1160** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
2,3,5-Trimethylnaphthene	**206** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
4-Methyldibenzothiophene	**1150** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
2/3-Methyldibenzothiophene	**936** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
1-Methyldibenzothiophene	**237** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
3-Methylphenanthrene	**4680** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
2-Methylphenanthrene	**5090** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
2-Methylanthracene	**2540** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
4/9-Methylphenanthrene	**4750** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501
1-Methylphenanthrene	**3200** (5.10)	2.55	8270 Mod		1	IBM	06/07/24 14:28	F4F0002	FF40501

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*79 %*		*50-120*
Surrogate: Perylene-d12	*103 %*		*50-120*
Surrogate: Phenanthrene-d10	*90 %*		*50-120*
Surrogate: Toluene-D8	*82 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-849-(3.78-3.98)
Date Sampled: 08/16/23 14:31
Percent Solids: N/A

ESS Laboratory Work Order: F240018
ESS Laboratory Sample ID: F240018-01
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**30000** (500)		LK		1	CCP	06/12/24 17:03	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-850-(4.45-4.65)
Date Sampled: 08/17/23 14:31
Percent Solids: 80
Initial Volume: 4.87
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240018
ESS Laboratory Sample ID: F240018-02
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/5/24 13:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**355** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
C1-Benzene	**199** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
C2-Benzenes	**466** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
C3-Benzenes	**1880** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
C4-Benzenes	**7110** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
C5-Benzenes	**3300** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
Methylcyclohexane	**78.4** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
Toluene	**365** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
Ethylbenzene	**565** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
m,p-Xylene	**404** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
Styrene	**331** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
o-Xylene	**102** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
Isopropylbenzene	**185** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
n-Propylbenzene	**126** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
1,3,5-Trimethylbenzene	**354** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
1,2,3-Trimethylbenzene	**440** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
1,2,4-Trimethylbenzene	**944** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
t-Butylbenzene	ND (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
sec-Butylbenzene	**34.5** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
p-Isopropyltoluene	**183** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
n-Butylbenzene	ND (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
trans-Decalin	**220** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
cis-Decalin	**63.6** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
C1-Decalins	**1330** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
C2-Decalins	**2550** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
C3-Decalins	**2500** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
C4-Decalins	**3440** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
Benzo(b)thiophene	**985** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
C1-Benzo(b)thiophenes	**2720** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
C2-Benzo(b)thiophenes	**4220** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
C3-Benzo(b)thiophenes	**2430** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
C4-Benzo(b)thiophenes	**792** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-850-(4.45-4.65)
Date Sampled: 08/17/23 14:31
Percent Solids: 80
Initial Volume: 4.87
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240018
ESS Laboratory Sample ID: F240018-02
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/5/24 13:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**25300** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
2-Methylnaphthalene	**7350** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
1-Methylnaphthalene	**96800** (515)	258	8270 Mod		100	IBM	06/07/24 18:27	F4F0002	FF40501
C1-Naphthalenes	**63300** (515)	258	8270 Mod		100	IBM	06/07/24 18:27	F4F0002	FF40501
C2-Naphthalenes	**79500** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
C3-Naphthalenes	**26300** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
C4-Naphthalenes	**8260** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
Biphenyl	**2460** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
Acenaphthylene	**10700** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
Acenaphthene	**219000** (515)	258	8270 Mod		100	IBM	06/07/24 18:27	F4F0002	FF40501
Dibenzofuran	**13100** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
Fluorene	**82300** (515)	258	8270 Mod		100	IBM	06/07/24 18:27	F4F0002	FF40501
C1-Fluorenes	**21200** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
C2-Fluorenes	**10500** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
C3-Fluorenes	**6800** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
Dibenzothiophene	**26400** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
C1-Dibenzothiophenes	**16900** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
C2-Dibenzothiophenes	**9470** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
C3-Dibenzothiophenes	**5370** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
C4-Dibenzothiophenes	**2520** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
Phenanthrene	**376000** (515)	258	8270 Mod		100	IBM	06/07/24 18:27	F4F0002	FF40501
Anthracene	**128000** (515)	258	8270 Mod		100	IBM	06/07/24 18:27	F4F0002	FF40501
C1-Phenanthrenes/Anthracenes	**106000** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
C2-Phenanthrenes/Anthracenes	**35600** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
C3-Phenanthrenes/Anthracenes	**12500** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
C4-Phenanthrenes/Anthracenes	**4730** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
Retene	**1310** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
Benzo(b)naphtho(2,1-d)thiophene	**12600** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
C0-Benzonaphthothiophenes	**23100** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
C1-Benzonaphthothiophenes	**9160** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
C2-Benzonaphthothiophenes	**4330** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
C3-Benzonaphthothiophenes	**2880** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-850-(4.45-4.65)
Date Sampled: 08/17/23 14:31
Percent Solids: 80
Initial Volume: 4.87
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240018
ESS Laboratory Sample ID: F240018-02
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/5/24 13:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**711** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
Fluoranthene	**226000** (515)	258	8270 Mod		100	IBM	06/07/24 18:27	F4F0002	FF40501
Pyrene	**290000** (515)	258	8270 Mod		100	IBM	06/07/24 18:27	F4F0002	FF40501
C1-Fluoranthenes/Pyrenes	**109000** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
C2-Fluoranthenes/Pyrenes	**23500** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
C3-Fluoranthenes/Pyrenes	**7950** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
Benzo(b)fluorene	**15900** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
Benzo(c)fluorene	**6220** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
2-Methylpyrene	**14100** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
4-Methylpyrene	**11000** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
1-Methylpyrene	**12900** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
Benz(a)anthracene	**95900** (515)	258	8270 Mod		100	IBM	06/07/24 18:27	F4F0002	FF40501
Chrysene/triphenylene	**90800** (515)	258	8270 Mod		100	IBM	06/07/24 18:27	F4F0002	FF40501
C1-Benzo(a)anthracenes/Chrysenes	**32900** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
C2-Benzo(a)anthracenes/Chrysenes	**10600** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
C3-Benzo(a)anthracenes/Chrysenes	**4510** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
C4-Benzo(a)anthracenes/Chrysenes	**1860** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
Benzo(b)fluoranthene	**49800** (515)	258	8270 Mod		100	IBM	06/07/24 18:27	F4F0002	FF40501
Benzo(j/k)fluoranthene	**56700** (515)	258	8270 Mod		100	IBM	06/07/24 18:27	F4F0002	FF40501
Benzo(e)pyrene	**51600** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
Benzo(a)pyrene	**95200** (515)	258	8270 Mod		100	IBM	06/07/24 18:27	F4F0002	FF40501
Perylene	**17300** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
Indeno(1,2,3-cd)pyrene	**47200** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
Dibenzo(a,h)anthracene	**12100** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
Benzo(g,h,i)perylene	**42500** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
Coronene	**12300** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
Tetramethyl lead	ND (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
Trimethylethyl lead	ND (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
Dimethyldiethyl lead	ND (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
Methyltriethyl lead	ND (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
Tetraethyl lead	ND (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
Total Organic Lead	ND (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-850-(4.45-4.65)
Date Sampled: 08/17/23 14:31
Percent Solids: 80
Initial Volume: 4.87
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240018
ESS Laboratory Sample ID: F240018-02
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/5/24 13:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyldodecane (1380)	**3460** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
2,6,10-trimethyltridecane (1470)	**4710** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
2,6,10-trimethylpentadecane (1650)	**7000** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
C-17	**1480** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
Pristane	**21100** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
C-18	**2210** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
Phytane	**15700** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
Carbazole	**8670** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
2,6-Dimethylnaphthalene	**15000** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
2,3,5-Trimethylnaphthene	**1470** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
4-Methyldibenzothiophene	**6500** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
2/3-Methyldibenzothiophene	**6000** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
1-Methyldibenzothiophene	**1630** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
3-Methylphenanthrene	**25700** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
2-Methylphenanthrene	**28600** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
2-Methylanthracene	**14400** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
4/9-Methylphenanthrene	**21800** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501
1-Methylphenanthrene	**15700** (25.8)	12.9	8270 Mod		5	IBM	06/07/24 17:08	F4F0002	FF40501

	%Recovery	*Qualifier*	*Limits*
Surrogate: Naphthalene-d8	*75 %*		*50-120*
Surrogate: Perylene-d12	*134 %*	*SM*	*50-120*
Surrogate: Phenanthrene-d10	*85 %*		*50-120*
Surrogate: Toluene-D8	*77 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-850-(4.45-4.65)
Date Sampled: 08/17/23 14:31
Percent Solids: N/A

ESS Laboratory Work Order: F240018
ESS Laboratory Sample ID: F240018-02
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**112000** (500)		LK		1	CCP	06/12/24 12:57	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-851-(3.80-4.00)
Date Sampled: 08/29/23 14:40
Percent Solids: 65
Initial Volume: 0.1
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240018
ESS Laboratory Sample ID: F240018-03
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/5/24 13:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	ND (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
C1-Benzene	ND (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
C2-Benzenes	**54200** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
C3-Benzenes	**134000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
C4-Benzenes	**290000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
C5-Benzenes	**131000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
Methylcyclohexane	**J 886** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
Toluene	**2740** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
Ethylbenzene	**69500** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
m,p-Xylene	**18700** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
Styrene	**13100** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
o-Xylene	**28800** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
Isopropylbenzene	**14600** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
n-Propylbenzene	**6380** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
1,3,5-Trimethylbenzene	**24000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
1,2,3-Trimethylbenzene	**35400** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
1,2,4-Trimethylbenzene	**79600** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
t-Butylbenzene	ND (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
sec-Butylbenzene	**J 1090** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
p-Isopropyltoluene	**28500** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
n-Butylbenzene	ND (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
trans-Decalin	**3650** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
cis-Decalin	**J 1330** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
C1-Decalins	**21600** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
C2-Decalins	**43900** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
C3-Decalins	**45300** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
C4-Decalins	**75400** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
Benzo(b)thiophene	**119000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
C1-Benzo(b)thiophenes	**192000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
C2-Benzo(b)thiophenes	**244000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
C3-Benzo(b)thiophenes	**145000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
C4-Benzo(b)thiophenes	**39200** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-851-(3.80-4.00)
Date Sampled: 08/29/23 14:40
Percent Solids: 65
Initial Volume: 0.1
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240018
ESS Laboratory Sample ID: F240018-03
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/5/24 13:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**7930000** (31000)	15500	8270 Mod		100	IBM	06/07/24 21:07	F4F0002	FF40501
2-Methylnaphthalene	**5800000** (31000)	15500	8270 Mod		100	IBM	06/07/24 21:07	F4F0002	FF40501
1-Methylnaphthalene	**4020000** (31000)	15500	8270 Mod		100	IBM	06/07/24 21:07	F4F0002	FF40501
C1-Naphthalenes	**6150000** (31000)	15500	8270 Mod		100	IBM	06/07/24 21:07	F4F0002	FF40501
C2-Naphthalenes	**3770000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
C3-Naphthalenes	**1320000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
C4-Naphthalenes	**356000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
Biphenyl	**307000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
Acenaphthylene	**487000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
Acenaphthene	**9260000** (31000)	15500	8270 Mod		100	IBM	06/07/24 21:07	F4F0002	FF40501
Dibenzofuran	**336000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
Fluorene	**3540000** (31000)	15500	8270 Mod		100	IBM	06/07/24 21:07	F4F0002	FF40501
C1-Fluorenes	**1080000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
C2-Fluorenes	**527000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
C3-Fluorenes	**183000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
Dibenzothiophene	**1180000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
C1-Dibenzothiophenes	**757000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
C2-Dibenzothiophenes	**378000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
C3-Dibenzothiophenes	**149000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
C4-Dibenzothiophenes	**40400** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
Phenanthrene	**16200000** (31000)	15500	8270 Mod		100	IBM	06/07/24 21:07	F4F0002	FF40501
Anthracene	**4020000** (31000)	15500	8270 Mod		100	IBM	06/07/24 21:07	F4F0002	FF40501
C1-Phenanthrenes/Anthracenes	**4760000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
C2-Phenanthrenes/Anthracenes	**1390000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
C3-Phenanthrenes/Anthracenes	**337000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
C4-Phenanthrenes/Anthracenes	**88400** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
Retene	**36300** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
Benzo(b)naphtho(2,1-d)thiophene	**333000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
C0-Benzonaphthothiophenes	**615000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
C1-Benzonaphthothiophenes	**262000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
C2-Benzonaphthothiophenes	**91700** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
C3-Benzonaphthothiophenes	**63800** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-851-(3.80-4.00)
Date Sampled: 08/29/23 14:40
Percent Solids: 65
Initial Volume: 0.1
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240018
ESS Laboratory Sample ID: F240018-03
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/5/24 13:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**11000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
Fluoranthene	**6740000** (31000)	15500	8270 Mod		100	IBM	06/07/24 21:07	F4F0002	FF40501
Pyrene	**10400000** (31000)	15500	8270 Mod		100	IBM	06/07/24 21:07	F4F0002	FF40501
C1-Fluoranthenes/Pyrenes	**3980000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
C2-Fluoranthenes/Pyrenes	**822000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
C3-Fluoranthenes/Pyrenes	**187000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
Benzo(b)fluorene	**457000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
Benzo(c)fluorene	**220000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
2-Methylpyrene	**531000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
4-Methylpyrene	**436000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
1-Methylpyrene	**531000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
Benz(a)anthracene	**2700000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
Chrysene/triphenylene	**2220000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
C1-Benzo(a)anthracenes/Chrysenes	**1040000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
C2-Benzo(a)anthracenes/Chrysenes	**293000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
C3-Benzo(a)anthracenes/Chrysenes	**82300** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
C4-Benzo(a)anthracenes/Chrysenes	**27700** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
Benzo(b)fluoranthene	**1320000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
Benzo(j/k)fluoranthene	**1490000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
Benzo(e)pyrene	**1500000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
Benzo(a)pyrene	**3050000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
Perylene	**434000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
Indeno(1,2,3-cd)pyrene	**1280000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
Dibenzo(a,h)anthracene	**285000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
Benzo(g,h,i)perylene	**1270000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
Coronene	**374000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
Tetramethyl lead	ND (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
Trimethylethyl lead	ND (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
Dimethyldiethyl lead	ND (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
Methyltriethyl lead	ND (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
Tetraethyl lead	ND (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
Total Organic Lead	ND (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-851-(3.80-4.00)
Date Sampled: 08/29/23 14:40
Percent Solids: 65
Initial Volume: 0.1
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240018
ESS Laboratory Sample ID: F240018-03
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/5/24 13:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyldodecane (1380)	**53900** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
2,6,10-trimethyltridecane (1470)	**89200** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
2,6,10-trimethylpentadecane (1650)	**88500** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
C-17	ND (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
Pristane	**152000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
C-18	ND (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
Phytane	**125000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
Carbazole	**55900** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
2,6-Dimethylnaphthalene	**711000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
2,3,5-Trimethylnaphthene	**70800** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
4-Methyldibenzothiophene	**311000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
2/3-Methyldibenzothiophene	**272000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
1-Methyldibenzothiophene	**68900** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
3-Methylphenanthrene	**1170000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
2-Methylphenanthrene	**1260000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
2-Methylanthracene	**550000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
4/9-Methylphenanthrene	**995000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501
1-Methylphenanthrene	**718000** (1550)	774	8270 Mod		5	IBM	06/07/24 19:47	F4F0002	FF40501

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*85 %*		*50-120*
Surrogate: Perylene-d12	*116 %*		*50-120*
Surrogate: Phenanthrene-d10	*95 %*		*50-120*
Surrogate: Toluene-D8	*86 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-851-(3.80-4.00)
Date Sampled: 08/29/23 14:40
Percent Solids: N/A

ESS Laboratory Work Order: F240018
ESS Laboratory Sample ID: F240018-03
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**317000** (500)		LK		1	CCP	06/12/24 13:48	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-852-(3.55-3.75)
Date Sampled: 08/29/23 11:45
Percent Solids: 68
Initial Volume: 0.26
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240018
ESS Laboratory Sample ID: F240018-04
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/5/24 13:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**4910** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
C1-Benzene	**1580** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
C2-Benzenes	**16600** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
C3-Benzenes	**32400** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
C4-Benzenes	**56900** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
C5-Benzenes	**18300** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
Methylcyclohexane	**J 545** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
Toluene	**4290** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
Ethylbenzene	**25200** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
m,p-Xylene	**6620** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
Styrene	**2830** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
o-Xylene	**5180** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
Isopropylbenzene	**3370** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
n-Propylbenzene	**983** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
1,3,5-Trimethylbenzene	**6520** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
1,2,3-Trimethylbenzene	**8080** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
1,2,4-Trimethylbenzene	**16500** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
t-Butylbenzene	ND (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
sec-Butylbenzene	ND (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
p-Isopropyltoluene	**9890** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
n-Butylbenzene	ND (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
trans-Decalin	**635** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
cis-Decalin	ND (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
C1-Decalins	**2860** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
C2-Decalins	**5940** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
C3-Decalins	**6010** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
C4-Decalins	**10800** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
Benzo(b)thiophene	**63700** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
C1-Benzo(b)thiophenes	**48800** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
C2-Benzo(b)thiophenes	**47900** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
C3-Benzo(b)thiophenes	**22700** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
C4-Benzo(b)thiophenes	**5250** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-852-(3.55-3.75)
Date Sampled: 08/29/23 11:45
Percent Solids: 68
Initial Volume: 0.26
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240018
ESS Laboratory Sample ID: F240018-04
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/5/24 13:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**3920000** (11300)	5670	8270 Mod		100	IBM	06/08/24 3:45	F4F0002	FF40501
2-Methylnaphthalene	**1660000** (11300)	5670	8270 Mod		100	IBM	06/08/24 3:45	F4F0002	FF40501
1-Methylnaphthalene	**1110000** (11300)	5670	8270 Mod		100	IBM	06/08/24 3:45	F4F0002	FF40501
C1-Naphthalenes	**1720000** (11300)	5670	8270 Mod		100	IBM	06/08/24 3:45	F4F0002	FF40501
C2-Naphthalenes	**927000** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
C3-Naphthalenes	**274000** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
C4-Naphthalenes	**67300** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
Biphenyl	**508000** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
Acenaphthylene	**136000** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
Acenaphthene	**3240000** (11300)	5670	8270 Mod		100	IBM	06/08/24 3:45	F4F0002	FF40501
Dibenzofuran	**111000** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
Fluorene	**1000000** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
C1-Fluorenes	**262000** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
C2-Fluorenes	**106000** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
C3-Fluorenes	**34900** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
Dibenzothiophene	**329000** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
C1-Dibenzothiophenes	**174000** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
C2-Dibenzothiophenes	**77500** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
C3-Dibenzothiophenes	**28000** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
C4-Dibenzothiophenes	**7010** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
Phenanthrene	**4860000** (11300)	5670	8270 Mod		100	IBM	06/08/24 3:45	F4F0002	FF40501
Anthracene	**707000** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
C1-Phenanthrenes/Anthracenes	**1160000** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
C2-Phenanthrenes/Anthracenes	**300000** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
C3-Phenanthrenes/Anthracenes	**65600** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
C4-Phenanthrenes/Anthracenes	**16900** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
Retene	**5240** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
Benzo(b)naphtho(2,1-d)thiophene	**78300** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
C0-Benzonaphthothiophenes	**145000** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
C1-Benzonaphthothiophenes	**54800** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
C2-Benzonaphthothiophenes	**18300** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
C3-Benzonaphthothiophenes	**15200** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-852-(3.55-3.75)
Date Sampled: 08/29/23 11:45
Percent Solids: 68
Initial Volume: 0.26
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240018
ESS Laboratory Sample ID: F240018-04
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/5/24 13:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**2380** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
Fluoranthene	**1980000** (11300)	5670	8270 Mod		100	IBM	06/08/24 3:45	F4F0002	FF40501
Pyrene	**2850000** (11300)	5670	8270 Mod		100	IBM	06/08/24 3:45	F4F0002	FF40501
C1-Fluoranthenes/Pyrenes	**948000** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
C2-Fluoranthenes/Pyrenes	**177000** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
C3-Fluoranthenes/Pyrenes	**33800** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
Benzo(b)fluorene	**104000** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
Benzo(c)fluorene	**57800** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
2-Methylpyrene	**128000** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
4-Methylpyrene	**104000** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
1-Methylpyrene	**124000** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
Benz(a)anthracene	**707000** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
Chrysene/triphenylene	**431000** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
C1-Benzo(a)anthracenes/Chrysenes	**229000** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
C2-Benzo(a)anthracenes/Chrysenes	**60500** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
C3-Benzo(a)anthracenes/Chrysenes	**16100** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
C4-Benzo(a)anthracenes/Chrysenes	**5920** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
Benzo(b)fluoranthene	**345000** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
Benzo(j/k)fluoranthene	**404000** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
Benzo(e)pyrene	**395000** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
Benzo(a)pyrene	**802000** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
Perylene	**116000** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
Indeno(1,2,3-cd)pyrene	**340000** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
Dibenzo(a,h)anthracene	**66400** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
Benzo(g,h,i)perylene	**338000** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
Coronene	**102000** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
Tetramethyl lead	ND (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
Trimethylethyl lead	ND (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
Dimethyldiethyl lead	ND (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
Methyltriethyl lead	ND (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
Tetraethyl lead	ND (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
Total Organic Lead	ND (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-852-(3.55-3.75)
Date Sampled: 08/29/23 11:45
Percent Solids: 68
Initial Volume: 0.26
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240018
ESS Laboratory Sample ID: F240018-04
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/5/24 13:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyldodecane (1380)	**5700** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
2,6,10-trimethyltridecane (1470)	**12500** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
2,6,10-trimethylpentadecane (1650)	**12700** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
C-17	ND (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
Pristane	**21100** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
C-18	ND (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
Phytane	**16500** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
Carbazole	**23700** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
2,6-Dimethylnaphthalene	**171000** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
2,3,5-Trimethylnaphthene	**18100** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
4-Methyldibenzothiophene	**71700** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
2/3-Methyldibenzothiophene	**62500** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
1-Methyldibenzothiophene	**15200** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
3-Methylphenanthrene	**288000** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
2-Methylphenanthrene	**311000** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
2-Methylanthracene	**136000** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
4/9-Methylphenanthrene	**241000** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501
1-Methylphenanthrene	**170000** (567)	284	8270 Mod		5	IBM	06/08/24 2:26	F4F0002	FF40501

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*81 %*		*50-120*
Surrogate: Perylene-d12	*101 %*		*50-120*
Surrogate: Phenanthrene-d10	*91 %*		*50-120*
Surrogate: Toluene-D8	*80 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-852-(3.55-3.75)
Date Sampled: 08/29/23 11:45
Percent Solids: N/A

ESS Laboratory Work Order: F240018
ESS Laboratory Sample ID: F240018-04
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**472000** (500)		LK		1	CCP	06/12/24 14:09	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-855-(4.10-4.30)
Date Sampled: 08/31/23 09:46
Percent Solids: 60
Initial Volume: 4.43
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240018
ESS Laboratory Sample ID: F240018-05
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/5/24 13:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**386** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
C1-Benzene	**1160** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
C2-Benzenes	**825** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
C3-Benzenes	**1580** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
C4-Benzenes	**3490** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
C5-Benzenes	**2620** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
Methylcyclohexane	**216** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
Toluene	**1570** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
Ethylbenzene	**640** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
m,p-Xylene	**831** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
Styrene	**747** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
o-Xylene	**173** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
Isopropylbenzene	**105** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
n-Propylbenzene	**122** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
1,3,5-Trimethylbenzene	**368** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
1,2,3-Trimethylbenzene	**270** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
1,2,4-Trimethylbenzene	**785** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
t-Butylbenzene	ND (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
sec-Butylbenzene	**J 22.1** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
p-Isopropyltoluene	**214** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
n-Butylbenzene	ND (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
trans-Decalin	**223** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
cis-Decalin	**58.0** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
C1-Decalins	**1100** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
C2-Decalins	**2510** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
C3-Decalins	**2890** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
C4-Decalins	**5030** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
Benzo(b)thiophene	**495** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
C1-Benzo(b)thiophenes	**944** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
C2-Benzo(b)thiophenes	**2080** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
C3-Benzo(b)thiophenes	**1560** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
C4-Benzo(b)thiophenes	**815** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-855-(4.10-4.30)
Date Sampled: 08/31/23 09:46
Percent Solids: 60
Initial Volume: 4.43
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240018
ESS Laboratory Sample ID: F240018-05
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/5/24 13:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**23200** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
2-Methylnaphthalene	**8660** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
1-Methylnaphthalene	**39000** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
C1-Naphthalenes	**29000** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
C2-Naphthalenes	**62200** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
C3-Naphthalenes	**37600** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
C4-Naphthalenes	**16500** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
Biphenyl	**3620** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
Acenaphthylene	**13400** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
Acenaphthene	**113000** (756)	378	8270 Mod		100	IBM	06/08/24 6:25	F4F0002	FF40501
Dibenzofuran	**5280** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
Fluorene	**49400** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
C1-Fluorenes	**25700** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
C2-Fluorenes	**19600** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
C3-Fluorenes	**9210** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
Dibenzothiophene	**15400** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
C1-Dibenzothiophenes	**14500** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
C2-Dibenzothiophenes	**11300** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
C3-Dibenzothiophenes	**6250** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
C4-Dibenzothiophenes	**2220** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
Phenanthrene	**268000** (756)	378	8270 Mod		100	IBM	06/08/24 6:25	F4F0002	FF40501
Anthracene	**83100** (756)	378	8270 Mod		100	IBM	06/08/24 6:25	F4F0002	FF40501
C1-Phenanthrenes/Anthracenes	**115000** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
C2-Phenanthrenes/Anthracenes	**56300** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
C3-Phenanthrenes/Anthracenes	**20700** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
C4-Phenanthrenes/Anthracenes	**6330** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
Retene	**1800** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
Benzo(b)naphtho(2,1-d)thiophene	**7360** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
C0-Benzonaphthothiophenes	**13200** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
C1-Benzonaphthothiophenes	**8400** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
C2-Benzonaphthothiophenes	**4400** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
C3-Benzonaphthothiophenes	**2500** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-855-(4.10-4.30)
Date Sampled: 08/31/23 09:46
Percent Solids: 60
Initial Volume: 4.43
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240018
ESS Laboratory Sample ID: F240018-05
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/5/24 13:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**591** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
Fluoranthene	**135000** (756)	378	8270 Mod		100	IBM	06/08/24 6:25	F4F0002	FF40501
Pyrene	**184000** (756)	378	8270 Mod		100	IBM	06/08/24 6:25	F4F0002	FF40501
C1-Fluoranthenes/Pyrenes	**98700** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
C2-Fluoranthenes/Pyrenes	**33400** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
C3-Fluoranthenes/Pyrenes	**11200** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
Benzo(b)fluorene	**11200** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
Benzo(c)fluorene	**5400** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
2-Methylpyrene	**12800** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
4-Methylpyrene	**11600** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
1-Methylpyrene	**12300** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
Benz(a)anthracene	**59800** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
Chrysene/triphenylene	**59300** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
C1-Benzo(a)anthracenes/Chrysenes	**35900** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
C2-Benzo(a)anthracenes/Chrysenes	**14700** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
C3-Benzo(a)anthracenes/Chrysenes	**5670** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
C4-Benzo(a)anthracenes/Chrysenes	**1890** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
Benzo(b)fluoranthene	**30100** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
Benzo(j/k)fluoranthene	**33400** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
Benzo(e)pyrene	**30800** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
Benzo(a)pyrene	**58800** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
Perylene	**9060** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
Indeno(1,2,3-cd)pyrene	**26200** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
Dibenzo(a,h)anthracene	**6600** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
Benzo(g,h,i)perylene	**23500** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
Coronene	**6520** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
Tetramethyl lead	ND (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
Trimethylethyl lead	ND (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
Dimethyldiethyl lead	ND (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
Methyltriethyl lead	ND (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
Tetraethyl lead	ND (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
Total Organic Lead	ND (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-855-(4.10-4.30)
Date Sampled: 08/31/23 09:46
Percent Solids: 60
Initial Volume: 4.43
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240018
ESS Laboratory Sample ID: F240018-05
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/5/24 13:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyldodecane (1380)	**2130** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
2,6,10-trimethyltridecane (1470)	**3500** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
2,6,10-trimethylpentadecane (1650)	**4820** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
C-17	ND (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
Pristane	**10400** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
C-18	ND (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
Phytane	**8980** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
Carbazole	**415** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
2,6-Dimethylnaphthalene	**12200** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
2,3,5-Trimethylnaphthene	**2140** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
4-Methyldibenzothiophene	**6260** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
2/3-Methyldibenzothiophene	**5030** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
1-Methyldibenzothiophene	**1320** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
3-Methylphenanthrene	**25900** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
2-Methylphenanthrene	**28600** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
2-Methylanthracene	**14000** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
4/9-Methylphenanthrene	**27200** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501
1-Methylphenanthrene	**19000** (37.8)	18.9	8270 Mod		5	IBM	06/08/24 5:05	F4F0002	FF40501

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*83 %*		*50-120*
Surrogate: Perylene-d12	*119 %*		*50-120*
Surrogate: Phenanthrene-d10	*95 %*		*50-120*
Surrogate: Toluene-D8	*88 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-855-(4.10-4.30)
Date Sampled: 08/31/23 09:46
Percent Solids: N/A

ESS Laboratory Work Order: F240018
ESS Laboratory Sample ID: F240018-05
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**163000** (500)		LK		1	CCP	06/12/24 14:29	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-856-(4.55-4.75)
Date Sampled: 08/31/23 14:01
Percent Solids: 57
Initial Volume: 5.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240018
ESS Laboratory Sample ID: F240018-06
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/5/24 13:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**733** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
C1-Benzene	**1500** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
C2-Benzenes	**2680** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
C3-Benzenes	**9680** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
C4-Benzenes	**28500** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
C5-Benzenes	**18100** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
Methylcyclohexane	**223** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
Toluene	**2350** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
Ethylbenzene	**2430** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
m,p-Xylene	**1940** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
Styrene	**3220** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
o-Xylene	**578** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
Isopropylbenzene	**749** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
n-Propylbenzene	**478** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
1,3,5-Trimethylbenzene	**1780** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
1,2,3-Trimethylbenzene	**1940** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
1,2,4-Trimethylbenzene	**4970** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
t-Butylbenzene	ND (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
sec-Butylbenzene	**176** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
p-Isopropyltoluene	**2030** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
n-Butylbenzene	ND (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
trans-Decalin	**1200** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
cis-Decalin	**365** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
C1-Decalins	**5360** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
C2-Decalins	**9430** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
C3-Decalins	**10100** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
C4-Decalins	**16700** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
Benzo(b)thiophene	**3160** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
C1-Benzo(b)thiophenes	**6490** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
C2-Benzo(b)thiophenes	**12100** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
C3-Benzo(b)thiophenes	**9290** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
C4-Benzo(b)thiophenes	**2930** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-856-(4.55-4.75)
Date Sampled: 08/31/23 14:01
Percent Solids: 57
Initial Volume: 5.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240018
ESS Laboratory Sample ID: F240018-06
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/5/24 13:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**228000** (1340)	668	8270 Mod		200	IBM	06/11/24 14:52	F4F0003	FF40501
2-Methylnaphthalene	**44400** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
1-Methylnaphthalene	**306000** (1340)	668	8270 Mod		200	IBM	06/11/24 14:52	F4F0003	FF40501
C1-Naphthalenes	**213000** (1340)	668	8270 Mod		200	IBM	06/11/24 14:52	F4F0003	FF40501
C2-Naphthalenes	**398000** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
C3-Naphthalenes	**187000** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
C4-Naphthalenes	**62300** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
Biphenyl	**7960** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
Acenaphthylene	**43000** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
Acenaphthene	**726000** (1340)	668	8270 Mod		200	IBM	06/11/24 14:52	F4F0003	FF40501
Dibenzofuran	**27700** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
Fluorene	**319000** (1340)	668	8270 Mod		200	IBM	06/11/24 14:52	F4F0003	FF40501
C1-Fluorenes	**129000** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
C2-Fluorenes	**80700** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
C3-Fluorenes	**29300** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
Dibenzothiophene	**72100** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
C1-Dibenzothiophenes	**59000** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
C2-Dibenzothiophenes	**37100** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
C3-Dibenzothiophenes	**17300** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
C4-Dibenzothiophenes	**5690** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
Phenanthrene	**1410000** (1340)	668	8270 Mod		200	IBM	06/11/24 14:52	F4F0003	FF40501
Anthracene	**444000** (1340)	668	8270 Mod		200	IBM	06/11/24 14:52	F4F0003	FF40501
C1-Phenanthrenes/Anthracenes	**484000** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
C2-Phenanthrenes/Anthracenes	**189000** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
C3-Phenanthrenes/Anthracenes	**55400** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
C4-Phenanthrenes/Anthracenes	**13300** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
Retene	**2780** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
Benzo(b)naphtho(2,1-d)thiophene	**24900** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
C0-Benzonaphthothiophenes	**44700** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
C1-Benzonaphthothiophenes	**22800** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
C2-Benzonaphthothiophenes	**11300** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
C3-Benzonaphthothiophenes	**7740** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-856-(4.55-4.75)
Date Sampled: 08/31/23 14:01
Percent Solids: 57
Initial Volume: 5.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240018
ESS Laboratory Sample ID: F240018-06
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/5/24 13:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**1640** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
Fluoranthene	**671000** (1340)	668	8270 Mod		200	IBM	06/11/24 14:52	F4F0003	FF40501
Pyrene	**927000** (1340)	668	8270 Mod		200	IBM	06/11/24 14:52	F4F0003	FF40501
C1-Fluoranthenes/Pyrenes	**389000** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
C2-Fluoranthenes/Pyrenes	**103000** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
C3-Fluoranthenes/Pyrenes	**28800** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
Benzo(b)fluorene	**44400** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
Benzo(c)fluorene	**21900** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
2-Methylpyrene	**46400** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
4-Methylpyrene	**42800** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
1-Methylpyrene	**49600** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
Benz(a)anthracene	**255000** (1340)	668	8270 Mod		200	IBM	06/11/24 14:52	F4F0003	FF40501
Chrysene/triphenylene	**243000** (1340)	668	8270 Mod		200	IBM	06/11/24 14:52	F4F0003	FF40501
C1-Benzo(a)anthracenes/Chrysenes	**129000** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
C2-Benzo(a)anthracenes/Chrysenes	**40700** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
C3-Benzo(a)anthracenes/Chrysenes	**14600** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
C4-Benzo(a)anthracenes/Chrysenes	**4920** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
Benzo(b)fluoranthene	**112000** (1340)	668	8270 Mod		200	IBM	06/11/24 14:52	F4F0003	FF40501
Benzo(j/k)fluoranthene	**145000** (1340)	668	8270 Mod		200	IBM	06/11/24 14:52	F4F0003	FF40501
Benzo(e)pyrene	**126000** (1340)	668	8270 Mod		200	IBM	06/11/24 14:52	F4F0003	FF40501
Benzo(a)pyrene	**258000** (1340)	668	8270 Mod		200	IBM	06/11/24 14:52	F4F0003	FF40501
Perylene	**42900** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
Indeno(1,2,3-cd)pyrene	**124000** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
Dibenzo(a,h)anthracene	**29900** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
Benzo(g,h,i)perylene	**115000** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
Coronene	**34900** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
Tetramethyl lead	ND (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
Trimethylethyl lead	ND (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
Dimethyldiethyl lead	ND (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
Methyltriethyl lead	ND (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
Tetraethyl lead	ND (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
Total Organic Lead	ND (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-856-(4.55-4.75)
Date Sampled: 08/31/23 14:01
Percent Solids: 57
Initial Volume: 5.27
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240018
ESS Laboratory Sample ID: F240018-06
Sample Matrix: Sediment
Units: ug/Kg dry
Analyst: IBM
Prepared: 6/5/24 13:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyldodecane (1380)	**6890** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
2,6,10-trimethyltridecane (1470)	**10700** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
2,6,10-trimethylpentadecane (1650)	**13400** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
C-17	**1620** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
Pristane	**25900** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
C-18	**1250** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
Phytane	**22700** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
Carbazole	**2740** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
2,6-Dimethylnaphthalene	**76200** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
2,3,5-Trimethylnaphthene	**11000** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
4-Methyldibenzothiophene	**24400** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
2/3-Methyldibenzothiophene	**20000** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
1-Methyldibenzothiophene	**5270** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
3-Methylphenanthrene	**114000** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
2-Methylphenanthrene	**115000** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
2-Methylanthracene	**55600** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
4/9-Methylphenanthrene	**103000** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501
1-Methylphenanthrene	**76600** (66.8)	33.4	8270 Mod		10	IBM	06/11/24 13:33	F4F0003	FF40501

	%Recovery	Qualifier	Limits
Surrogate: Naphthalene-d8	*77 %*		*50-120*
Surrogate: Perylene-d12	*61 %*		*50-120*
Surrogate: Phenanthrene-d10	*77 %*		*50-120*
Surrogate: Toluene-D8	*80 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-856-(4.55-4.75)
Date Sampled: 08/31/23 14:01
Percent Solids: N/A

ESS Laboratory Work Order: F240018
ESS Laboratory Sample ID: F240018-06
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**112000** (500)		LK		1	CCP	06/12/24 14:45	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240018

Quality Control Data

Classical Chemistry

Batch DF40653 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	500	mg/kg							
Total Organic Carbon (2)	ND	500	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240018

Quality Control Data

Classical Chemistry

Batch DF40653 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	8710	500	mg/kg	10010		87	80-120			
Total Organic Carbon (2)	8610	500	mg/kg	10010		86	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240018

Quality Control Data

Classical Chemistry

Batch DF40653 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	8800	500	mg/kg	10010		88	80-120	1	25	
Total Organic Carbon (2)	8820	500	mg/kg	10010		88	80-120	2	25	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240018

Quality Control Data

Classical Chemistry

Batch DF40653 - General Preparation

Duplicate **Source: F240018-01**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	31600	500	mg/kg		30600			3	25	
Total Organic Carbon (2)	25900	500	mg/kg		29300			13	25	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240018

Quality Control Data

Classical Chemistry

Batch DF40653 - General Preparation

Matrix Spike **Source: F240018-01**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	38700	500	mg/kg	10010	30600	81	75-125			
Total Organic Carbon (2)	48200	500	mg/kg	10010	29300	189	75-125			M+

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240018

Quality Control Data

Alkylated PAHs

Batch FF40501 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	ND	4.00	ug/Kg wet							
C1-Benzene	ND	4.00	ug/Kg wet							
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	2.74	4.00	ug/Kg wet							J
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	ND	4.00	ug/Kg wet							
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240018

Quality Control Data

Alkylated PAHs

Batch FF40501 - 3570			
C1-Fluorenes	ND	4.00	ug/Kg wet
C2-Fluorenes	ND	4.00	ug/Kg wet
C3-Fluorenes	ND	4.00	ug/Kg wet
Dibenzothiophene	ND	4.00	ug/Kg wet
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet
Phenanthrene	ND	4.00	ug/Kg wet
Anthracene	ND	4.00	ug/Kg wet
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
Retene	ND	4.00	ug/Kg wet
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
Fluoranthene	ND	4.00	ug/Kg wet
Pyrene	ND	4.00	ug/Kg wet
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
Benzo(b)fluorene	ND	4.00	ug/Kg wet
Benzo(c)fluorene	ND	4.00	ug/Kg wet
2-Methylpyrene	ND	4.00	ug/Kg wet
4-Methylpyrene	ND	4.00	ug/Kg wet
1-Methylpyrene	ND	4.00	ug/Kg wet
Benz(a)anthracene	ND	4.00	ug/Kg wet
Chrysene/triphenylene	ND	4.00	ug/Kg wet
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet
Benzo(e)pyrene	ND	4.00	ug/Kg wet
Benzo(a)pyrene	ND	4.00	ug/Kg wet
Perylene	ND	4.00	ug/Kg wet
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet
Coronene	ND	4.00	ug/Kg wet
Tetramethyl lead	ND	4.00	ug/Kg wet
Trimethylethyl lead	ND	4.00	ug/Kg wet

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240018

Quality Control Data

Alkylated PAHs

Batch FF40501 - 3570							
Dimethyldiethyl lead	ND	4.00	ug/Kg wet				
Methyltriethyl lead	ND	4.00	ug/Kg wet				
Tetraethyl lead	ND	4.00	ug/Kg wet				
Total Organic Lead	ND	4.00	ug/Kg wet				
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet				
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet				
2,6,10-trimethylpentadecane (1650)	ND	4.00	ug/Kg wet				
C-17	7.40	4.00	ug/Kg wet				
Pristane	3.88	4.00	ug/Kg wet				J
C-18	9.32	4.00	ug/Kg wet				
Phytane	4.91	4.00	ug/Kg wet				
Carbazole	ND	4.00	ug/Kg wet				
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet				
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet				
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
3-Methylphenanthrene	ND	4.00	ug/Kg wet				
2-Methylphenanthrene	ND	4.00	ug/Kg wet				
2-Methylanthracene	ND	4.00	ug/Kg wet				
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet				
1-Methylphenanthrene	ND	4.00	ug/Kg wet				
Surrogate: Naphthalene-d8	*298*		ug/Kg wet	*400.0*	*74*	*50-120*	
Surrogate: Perylene-d12	*356*		ug/Kg wet	*400.0*	*89*	*50-120*	
Surrogate: Phenanthrene-d10	*348*		ug/Kg wet	*400.0*	*87*	*50-120*	
Surrogate: Toluene-D8	*356*		ug/Kg wet	*400.0*	*89*	*50-120*	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240018

Quality Control Data

Alkylated PAHs

Batch FF40501 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	268	4.00	ug/Kg wet	400.0		67	60-130			
Methylcyclohexane	239	4.00	ug/Kg wet	400.0		60	60-130			
Toluene	305	4.00	ug/Kg wet	400.0		76	60-130			
Ethylbenzene	326	4.00	ug/Kg wet	400.0		82	60-130			
m,p-Xylene	336	4.00	ug/Kg wet	400.0		84	60-130			
Styrene	243	4.00	ug/Kg wet	400.0		61	60-130			
o-Xylene	333	4.00	ug/Kg wet	400.0		83	60-130			
Isopropylbenzene	330	4.00	ug/Kg wet	400.0		82	60-130			
n-Propylbenzene	326	4.00	ug/Kg wet	400.0		81	60-130			
1,3,5-Trimethylbenzene	327	4.00	ug/Kg wet	400.0		82	60-130			
1,2,3-Trimethylbenzene	346	4.00	ug/Kg wet	400.0		87	60-130			
1,2,4-Trimethylbenzene	335	4.00	ug/Kg wet	400.0		84	60-130			
t-Butylbenzene	337	4.00	ug/Kg wet	400.0		84	60-130			
sec-Butylbenzene	328	4.00	ug/Kg wet	400.0		82	60-130			
p-Isopropyltoluene	344	4.00	ug/Kg wet	400.0		86	60-130			
n-Butylbenzene	340	4.00	ug/Kg wet	400.0		85	60-130			
trans-Decalin	344	4.00	ug/Kg wet	400.0		86	60-130			
cis-Decalin	341	4.00	ug/Kg wet	400.0		85	60-130			
Benzo(b)thiophene	291	4.00	ug/Kg wet	400.0		73	60-130			
Naphthalene	293	4.00	ug/Kg wet	400.0		73	60-130			
2-Methylnaphthalene	291	4.00	ug/Kg wet	400.0		73	60-130			
1-Methylnaphthalene	291	4.00	ug/Kg wet	400.0		73	60-130			
Biphenyl	292	4.00	ug/Kg wet	400.0		73	60-130			
Acenaphthylene	313	4.00	ug/Kg wet	400.0		78	60-130			
Acenaphthene	325	4.00	ug/Kg wet	400.0		81	60-130			
Dibenzofuran	302	4.00	ug/Kg wet	400.0		75	60-130			
Fluorene	321	4.00	ug/Kg wet	400.0		80	60-130			
Dibenzothiophene	328	4.00	ug/Kg wet	400.0		82	60-130			
Phenanthrene	333	4.00	ug/Kg wet	400.0		83	60-130			
Anthracene	343	4.00	ug/Kg wet	400.0		86	60-130			
Retene	396	4.00	ug/Kg wet	400.0		99	60-130			
Benzo(b)naphtho(2,1-d)thiophene	358	4.00	ug/Kg wet	400.0		89	60-130			
Fluoranthene	363	4.00	ug/Kg wet	400.0		91	60-130			
Pyrene	364	4.00	ug/Kg wet	400.0		91	60-130			
Benz(a)anthracene	358	4.00	ug/Kg wet	400.0		89	60-130			
Chrysene/triphenylene	362	4.00	ug/Kg wet	400.0		91	60-130			
Benzo(b)fluoranthene	357	4.00	ug/Kg wet	400.0		89	60-130			
Benzo(j/k)fluoranthene	366	4.00	ug/Kg wet	400.0		91	60-130			
Benzo(e)pyrene	348	4.00	ug/Kg wet	400.0		87	60-130			
Benzo(a)pyrene	351	4.00	ug/Kg wet	400.0		88	60-130			
Perylene	354	4.00	ug/Kg wet	400.0		89	60-130			
Indeno(1,2,3-cd)pyrene	344	4.00	ug/Kg wet	400.0		86	60-130			
Dibenzo(a,h)anthracene	344	4.00	ug/Kg wet	400.0		86	60-130			
Benzo(g,h,i)perylene	313	4.00	ug/Kg wet	400.0		78	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240018

Quality Control Data

Alkylated PAHs

Batch FF40501 - 3570						
Coronene	319	4.00	ug/Kg wet	400.0	80	60-130
Surrogate: Naphthalene-d8	*309*		ug/Kg wet	*400.0*	*77*	*50-120*
Surrogate: Perylene-d12	*366*		ug/Kg wet	*400.0*	*92*	*50-120*
Surrogate: Phenanthrene-d10	*357*		ug/Kg wet	*400.0*	*89*	*50-120*
Surrogate: Toluene-D8	*332*		ug/Kg wet	*400.0*	*83*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F240018

Notes and Definitions

U	Analyte included in the analysis, but not detected
SM	Surrogate recovery(ies) outside of criteria due to matrix (UCM/coelution/matrix is present) (SM).
M+	Matrix Spike recovery is above upper control limit (M+).
J	Reported between MDL and MRL
H	Estimated value. Sample hold times were exceeded (H).
D	Diluted.
CD-	Continuing Calibration %Diff/Drift is below control limit (CD-).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240018

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

External Chain of Custody Record

6316 Windfern Road
Houston, TX 77040
Phone: 1-713-328-2673
Fax:

F24/0018

ECOC#: 11871
Date: 16-May-2024

Contact: Pamela Adams
Phone:
email: Pamela.Adams@corelab.com

Client: Core Laboratories 6316 Windfern Road Houston, Texas 77040 USA Front Desk (Receptionist) **Contact:** Pamela Adams **Phone:** 7133282673	**Consignee:** ESS Laboratory 185 Frances Avenue Cranston, Rhode Island 02910 USA **Contact:** Marc Levesque **Phone:** 401-580-8719

Rocks Samples

Job(202304481) has 6 Rock Samples

Well: Amesbury MGP

	Rock Sample#	Client Ref#	Depth1 (ft)	Depth2(ft)	Length	Sample Type
1	15_2	852-A-2-Vb	3.55	3.75		PLUG
2	33_2	849-A-2-Vb	3.78	3.98		PLUG
3	9_2	851-A-3-Vb	3.80	4.00		PLUG
4	21_1	855-A-2-Va	4.10	4.30		PLUG
5	2_1	850-A-2-Va	4.45	4.65		PLUG
6	27_2	856-A-2-Vb	4.55	4.75		PLUG
					Total:	Sample: 6

Prepared By : Pamela Adams
Date : 16 May 2024

Please sign, date, & return copy to Core Lab via e-mail, fax, or mail.

Total Rock Samples : 6; Total Fluid Samples : 0; Total Boxes : 0; Total Pallets : 0; Total Cylinders : 0

Received By: **Date:**

Notes :

IP 5.0

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

ESS Laboratory Sample and Cooler Receipt Checklist

Client: AECOM

Shipped/Delivered Via: FedEx

ESS Project ID: F240018
Date Received: 6/4/2024
Project Due Date: 6/11/2024
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: 7766 7769 2476
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 5 Iced with: Ice Pack
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA
13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By/Acid Lot#:
    b. If dissolved metals are requested, are they: Yes / No Field Filtered Yes / No To Be Lab Filtered
    c. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Resolution:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1	706	Yes	N/A	Yes	Other	NP	
2	707	Yes	N/A	Yes	Other	NP	
3	708	Yes	N/A	Yes	Other	NP	
4	709	Yes	N/A	Yes	Other	NP	
5	710	Yes	N/A	Yes	Other	NP	
6	711	Yes	N/A	Yes	Other	NP	

2nd Review

Initials

Were all containers scanned into storage/lab? Yes / No
Are barcode labels on correct containers? Yes / No / NA
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: Date & Time: 6/4/24 1547
Reviewed By: Date & Time: 6/4/24 1651

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only)

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman
781-721-4091 rhoffman@geiconsultants.com

Send Report to: Ryan Hoffman
labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY AND MCP ANALYTICAL METHODS REQUIRED: (YES) NO

STATE AND FEDERAL REGULATORY REQUIREMENTS/REPORT LIMITS

State/Federal Program: (MA) 401WQC Other _____ NH RI CT NY ME

MA MCP Criteria are Method 1 S-1 and GW-2/GW-3. Circle if GW-1 is required.

Preservative

None	None							

Analysis

Sample Handling

Samples Field Filtered
YES (NO) NA

Sampled Shipped With Ice
( ) YES NO

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Parent and Alkylated MAHs & PAHs 8270**	TOCs by Lloyd-Kahn							Sample Specific Remarks
	1804576-849-(3.78-3.98)	8/16/2023	14:31	Soil	1	JS	X	X							CoreLab client ref# = 849-A-2-Vb
	1804576-850-(4.45-4.65)	8/17/2023	14:31	Soil	1	JS	X	X							CoreLab client ref# = 850-A-2-Va
	1804576-851-(3.80-4.00)	8/29/2023	14:40	Soil	1	JS	X	X							CoreLab client ref# = 851-A-3-Vb
	1804576-852-(3.55-3.75)	8/29/2023	11:45	Soil	1	JS	X	X							CoreLab client ref# = 852-A-2-Vb
	1804576-855-(4.10-4.30)	8/31/2023	9:46	Soil	1	JS	X	X							CoreLab client ref# = 855-A-2-Va
	1804576-856-(4.55-4.75)	8/31/2023	14:01	Soil	1	JS	X	X							CoreLab client ref# = 856-A-2-Vb

Relinquished by sampler: (signature)	Date :	Time :	Received by: (signature)
1.			
Relinquished by sampler: (signature)	Date :	Time:	Received by: (signature)
2.			2.
Relinquished by: (signature)	Date :	Time:	Received by: (signature)
3.			3.
Relinquished by: (signature)	Date :	Time:	Received by: (signature)
4.			4.
Relinquished by: (signature)	Date :	Time:	Received by: (signature)
5.			5.

Turnaround Time (Business days):

Standard TAT X **4-Day** _____ **3-Day** _____
2-Day _____ **1-Day** _____ **Other** _____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

****Parent and Alkylated MAHs & PAHs (34) by GC/MS/SIM/SCAN**

Sample Matrix Abbreviations: SO = Soil GW = Groundwater SW = Surface Water SD = Sediment CO = Concrete PC = Paint Chip CLK = Caulk

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: F240020

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 9:21 am, Aug 08, 2024

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses

ESS - Cranston, RI	TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240020

SAMPLE RECEIPT

The following samples were received on July 23, 2024 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F240020-01	1804576-878-S1	Soil	8270 Mod, LK
F240020-02	1804576-878-S2	Soil	8270 Mod, LK
F240020-03	1804576-877-S1	Soil	8270 Mod, LK
F240020-04	1804576-877-S2	Soil	8270 Mod, LK
F240020-05	1804576-874-S1	Soil	8270 Mod, LK
F240020-06	1804576-874-S2	Soil	8270 Mod, LK
F240020-07	1804576-875-S1	Soil	8270 Mod, LK
F240020-08	1804576-875-S2	Soil	8270 Mod, LK
F240020-09	1804576-879-S1	Soil	8270 Mod, LK
F240020-10	1804576-879-S2	Soil	8270 Mod, LK
F240020-11	1804576-888-S1	Soil	8270 Mod, LK
F240020-12	1804576-888-S2	Soil	8270 Mod, LK
F240020-13	1804576-888-S3	Soil	8270 Mod, LK
F240020-14	1804576-876-S1	Soil	8270 Mod, LK
F240020-15	1804576-876-S2	Soil	8270 Mod, LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240020

PROJECT NARRATIVE

Alkylated PAHs

F240020-01 **Present in Method Blank (B).**
C-18 , Styrene

F240020-02 **Present in Method Blank (B).**
Styrene

F240020-03 **Present in Method Blank (B).**
Styrene

F240020-04 **Present in Method Blank (B).**
C-18 , Styrene

F240020-05 **Present in Method Blank (B).**
C-17 , C-18 , Phytane , Pristane , Styrene

F240020-06 **Present in Method Blank (B).**
C-18 , Pristane , Styrene

F240020-07 **Present in Method Blank (B).**
Styrene

F240020-08 **Present in Method Blank (B).**
C-18 , Styrene

F240020-09 **Present in Method Blank (B).**
C-18 , Phytane , Pristane , Styrene

F240020-10 **Present in Method Blank (B).**
C-18 , Phytane , Pristane , Styrene

F240020-11 **Present in Method Blank (B).**
C-17 , C-18 , Phytane , Pristane , Styrene

F240020-12 **Present in Method Blank (B).**
C-17 , C-18 , Phytane , Pristane , Styrene

F240020-13 **Present in Method Blank (B).**
C-17 , C-18 , Phytane , Pristane , Styrene

F240020-14 **Present in Method Blank (B).**
C-18 , Styrene

F240020-15 **Present in Method Blank (B).**
C-18

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-878-S1
Date Sampled: 07/22/24 11:45
Percent Solids: 53
Initial Volume: 4.35
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**179** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C1-Benzene	**116** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C2-Benzenes	**85.5** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C3-Benzenes	ND (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C4-Benzenes	**J 4.38** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C5-Benzenes	ND (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
Methylcyclohexane	**J 4.90** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
Toluene	**203** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
Ethylbenzene	**11.2** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
m,p-Xylene	**181** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
Styrene	**B 65.2** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
o-Xylene	**J 7.86** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
Isopropylbenzene	ND (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
n-Propylbenzene	**J 8.00** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
1,3,5-Trimethylbenzene	ND (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
1,2,3-Trimethylbenzene	**J 7.12** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
1,2,4-Trimethylbenzene	**J 7.78** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
t-Butylbenzene	ND (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
sec-Butylbenzene	ND (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
p-Isopropyltoluene	**10.9** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
n-Butylbenzene	**14.8** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
trans-Decalin	**95.2** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
cis-Decalin	**11.4** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C1-Decalins	**171** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C2-Decalins	**144** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C3-Decalins	**111** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C4-Decalins	**158** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
Benzo(b)thiophene	ND (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C1-Benzo(b)thiophenes	**J 8.56** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C2-Benzo(b)thiophenes	**18.7** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C3-Benzo(b)thiophenes	**14.1** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C4-Benzo(b)thiophenes	**10.8** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-878-S1
Date Sampled: 07/22/24 11:45
Percent Solids: 53
Initial Volume: 4.35
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**65.7** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
2-Methylnaphthalene	**30.0** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
1-Methylnaphthalene	**18.8** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C1-Naphthalenes	**30.6** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C2-Naphthalenes	**95.8** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C3-Naphthalenes	**132** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C4-Naphthalenes	**127** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
Biphenyl	**34.5** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
Acenaphthylene	**180** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
Acenaphthene	**34.2** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
Dibenzofuran	**19.8** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
Fluorene	**41.0** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C1-Fluorenes	**74.0** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C2-Fluorenes	**124** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C3-Fluorenes	**135** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
Dibenzothiophene	**44.4** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C1-Dibenzothiophenes	**88.3** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C2-Dibenzothiophenes	**149** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C3-Dibenzothiophenes	**142** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C4-Dibenzothiophenes	**81.6** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
Phenanthrene	**365** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
Anthracene	**191** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C1-Phenanthrenes/Anthracenes	**442** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C2-Phenanthrenes/Anthracenes	**468** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C3-Phenanthrenes/Anthracenes	**297** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C4-Phenanthrenes/Anthracenes	**140** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
Retene	**32.0** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
Benzo(b)naphtho(2,1-d)thiophene	**111** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C0-Benzonaphthothiophenes	**207** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C1-Benzonaphthothiophenes	**160** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C2-Benzonaphthothiophenes	**129** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C3-Benzonaphthothiophenes	**82.5** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-878-S1
Date Sampled: 07/22/24 11:45
Percent Solids: 53
Initial Volume: 4.35
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**42.1** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
Fluoranthene	**1130** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
Pyrene	**1440** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C1-Fluoranthenes/Pyrenes	**919** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C2-Fluoranthenes/Pyrenes	**431** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C3-Fluoranthenes/Pyrenes	**201** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
Benzo(b)fluorene	**104** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
Benzo(c)fluorene	**43.9** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
2-Methylpyrene	**126** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
4-Methylpyrene	**126** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
1-Methylpyrene	**99.4** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
Benz(a)anthracene	**717** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
Chrysene/triphenylene	**779** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C1-Benzo(a)anthracenes/Chrysenes	**497** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C2-Benzo(a)anthracenes/Chrysenes	**259** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C3-Benzo(a)anthracenes/Chrysenes	**125** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C4-Benzo(a)anthracenes/Chrysenes	**63.1** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
Benzo(b)fluoranthene	**531** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
Benzo(j/k)fluoranthene	**613** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
Benzo(e)pyrene	**531** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
Benzo(a)pyrene	**835** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
Perylene	**847** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
Indeno(1,2,3-cd)pyrene	**497** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
Dibenzo(a,h)anthracene	**120** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
Benzo(g,h,i)perylene	**441** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
Coronene	**125** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
Tetramethyl lead	ND (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
Trimethylethyl lead	ND (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
Dimethyldiethyl lead	ND (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
Methyltriethyl lead	ND (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
Tetraethyl lead	ND (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
2,6,10-trimethyldodecane (1380)	**51.2** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-878-S1
Date Sampled: 07/22/24 11:45
Percent Solids: 53
Initial Volume: 4.35
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**107** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
2,6,10-trimethylpentadecane (1650)	**62.5** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C-17	**199** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
Pristane	**143** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
C-18	**B 73.4** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
Phytane	**156** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
Carbazole	**30.7** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
2,6-Dimethylnaphthalene	**25.3** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
2,3,5-Trimethylnaphthene	**10.5** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
4-Methyldibenzothiophene	**32.8** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
2/3-Methyldibenzothiophene	**28.3** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
1-Methyldibenzothiophene	**12.5** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
3-Methylphenanthrene	**110** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
2-Methylphenanthrene	**88.3** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
2-Methylanthracene	**51.7** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
4/9-Methylphenanthrene	**138** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401
1-Methylphenanthrene	**45.9** (8.69)	4.35	8270 Mod		1	IBM	07/25/24 15:00	F4G0001	FG42401

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*80 %*		*50-120*
Surrogate: Naphthalene-d8	*74 %*		*50-120*
Surrogate: Phenanthrene-d10	*86 %*		*50-120*
Surrogate: Perylene-d12	*89 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-878-S1
Date Sampled: 07/22/24 11:45
Percent Solids: N/A

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**48800** (500)		LK		1	CCP	07/29/24 13:08	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-878-S2
Date Sampled: 07/22/24 11:46
Percent Solids: 64
Initial Volume: 5.31
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**30.1** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C1-Benzene	**541** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C2-Benzenes	**142** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C3-Benzenes	**55.5** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C4-Benzenes	**67.1** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C5-Benzenes	**45.3** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
Methylcyclohexane	**13.9** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
Toluene	**760** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
Ethylbenzene	**20.6** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
m,p-Xylene	**236** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
Styrene	**B 100** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
o-Xylene	**17.1** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
Isopropylbenzene	**J 3.17** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
n-Propylbenzene	**11.1** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
1,3,5-Trimethylbenzene	**14.5** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
1,2,3-Trimethylbenzene	**13.4** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
1,2,4-Trimethylbenzene	**30.8** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
t-Butylbenzene	ND (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
sec-Butylbenzene	ND (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
p-Isopropyltoluene	**70.0** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
n-Butylbenzene	**15.2** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
trans-Decalin	**205** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
cis-Decalin	**29.0** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C1-Decalins	**581** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C2-Decalins	**575** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C3-Decalins	**430** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C4-Decalins	**601** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
Benzo(b)thiophene	**10.7** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C1-Benzo(b)thiophenes	**16.5** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C2-Benzo(b)thiophenes	**39.3** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C3-Benzo(b)thiophenes	**46.0** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C4-Benzo(b)thiophenes	**34.1** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-878-S2
Date Sampled: 07/22/24 11:46
Percent Solids: 64
Initial Volume: 5.31
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**173** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
2-Methylnaphthalene	**126** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
1-Methylnaphthalene	**62.6** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C1-Naphthalenes	**121** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C2-Naphthalenes	**292** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C3-Naphthalenes	**361** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C4-Naphthalenes	**341** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
Biphenyl	**49.4** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
Acenaphthylene	**758** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
Acenaphthene	**104** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
Dibenzofuran	**60.0** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
Fluorene	**132** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C1-Fluorenes	**255** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C2-Fluorenes	**364** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C3-Fluorenes	**430** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
Dibenzothiophene	**153** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C1-Dibenzothiophenes	**352** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C2-Dibenzothiophenes	**576** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C3-Dibenzothiophenes	**668** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C4-Dibenzothiophenes	**426** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
Phenanthrene	**1150** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
Anthracene	**658** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C1-Phenanthrenes/Anthracenes	**1590** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C2-Phenanthrenes/Anthracenes	**1680** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C3-Phenanthrenes/Anthracenes	**2360** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C4-Phenanthrenes/Anthracenes	**4560** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
Retene	**18900** (59.2)	29.6	8270 Mod		10	IBM	07/26/24 16:15	F4G0001	FG42401
Benzo(b)naphtho(2,1-d)thiophene	**427** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C0-Benzonaphthothiophenes	**796** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C1-Benzonaphthothiophenes	**697** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C2-Benzonaphthothiophenes	**624** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C3-Benzonaphthothiophenes	**437** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-878-S2
Date Sampled: 07/22/24 11:46
Percent Solids: 64
Initial Volume: 5.31
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**208** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
Fluoranthene	**1990** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
Pyrene	**5000** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C1-Fluoranthenes/Pyrenes	**3450** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C2-Fluoranthenes/Pyrenes	**1530** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C3-Fluoranthenes/Pyrenes	**699** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
Benzo(b)fluorene	**355** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
Benzo(c)fluorene	**167** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
2-Methylpyrene	**462** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
4-Methylpyrene	**475** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
1-Methylpyrene	**378** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
Benz(a)anthracene	**2360** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
Chrysene/triphenylene	**2810** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C1-Benzo(a)anthracenes/Chrysenes	**1740** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C2-Benzo(a)anthracenes/Chrysenes	**1010** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C3-Benzo(a)anthracenes/Chrysenes	**574** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C4-Benzo(a)anthracenes/Chrysenes	**289** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
Benzo(b)fluoranthene	**2090** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
Benzo(j/k)fluoranthene	**2140** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
Benzo(e)pyrene	**2060** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
Benzo(a)pyrene	**3110** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
Perylene	**722** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
Indeno(1,2,3-cd)pyrene	**1950** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
Dibenzo(a,h)anthracene	**439** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
Benzo(g,h,i)perylene	**1740** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
Coronene	**489** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
Tetramethyl lead	ND (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
Trimethylethyl lead	ND (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
Dimethyldiethyl lead	ND (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
Methyltriethyl lead	ND (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
Tetraethyl lead	ND (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
2,6,10-trimethyldodecane (1380)	**339** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-878-S2
Date Sampled: 07/22/24 11:46
Percent Solids: 64
Initial Volume: 5.31
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**587** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
2,6,10-trimethylpentadecane (1650)	**433** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C-17	**249** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
Pristane	**899** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
C-18	**159** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
Phytane	**1070** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
Carbazole	**85.3** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
2,6-Dimethylnaphthalene	**82.9** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
2,3,5-Trimethylnaphthene	**23.9** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
4-Methyldibenzothiophene	**127** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
2/3-Methyldibenzothiophene	**124** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
1-Methyldibenzothiophene	**46.4** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
3-Methylphenanthrene	**382** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
2-Methylphenanthrene	**416** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
2-Methylanthracene	**173** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
4/9-Methylphenanthrene	**463** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401
1-Methylphenanthrene	**134** (5.92)	2.96	8270 Mod		1	IBM	07/25/24 16:20	F4G0001	FG42401

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*74 %*		*50-120*
Surrogate: Naphthalene-d8	*69 %*		*50-120*
Surrogate: Phenanthrene-d10	*78 %*		*50-120*
Surrogate: Perylene-d12	*91 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-878-S2
Date Sampled: 07/22/24 11:46
Percent Solids: N/A

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**43800** (500)		LK		1	CCP	07/29/24 13:25	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-877-S1
Date Sampled: 07/22/24 12:10
Percent Solids: 49
Initial Volume: 5.66
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**65.2** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C1-Benzene	**142** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C2-Benzenes	**180** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C3-Benzenes	**27.0** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C4-Benzenes	**16.2** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C5-Benzenes	**12.6** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
Methylcyclohexane	**8.74** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
Toluene	**227** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
Ethylbenzene	**16.4** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
m,p-Xylene	**313** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
Styrene	**B 133** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
o-Xylene	**15.6** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
Isopropylbenzene	ND (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
n-Propylbenzene	**10.9** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
1,3,5-Trimethylbenzene	**10.4** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
1,2,3-Trimethylbenzene	**9.72** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
1,2,4-Trimethylbenzene	**18.5** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
t-Butylbenzene	ND (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
sec-Butylbenzene	ND (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
p-Isopropyltoluene	**14.3** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
n-Butylbenzene	**16.7** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
trans-Decalin	**12.9** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
cis-Decalin	ND (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C1-Decalins	**32.1** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C2-Decalins	**52.9** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C3-Decalins	**65.2** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C4-Decalins	**110** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
Benzo(b)thiophene	**9.76** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C1-Benzo(b)thiophenes	**46.0** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C2-Benzo(b)thiophenes	**24.5** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C3-Benzo(b)thiophenes	**13.1** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C4-Benzo(b)thiophenes	**J 6.56** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-877-S1
Date Sampled: 07/22/24 12:10
Percent Solids: 49
Initial Volume: 5.66
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**123** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
2-Methylnaphthalene	**75.6** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
1-Methylnaphthalene	**39.4** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C1-Naphthalenes	**72.4** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C2-Naphthalenes	**161** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C3-Naphthalenes	**115** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C4-Naphthalenes	**101** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
Biphenyl	**37.7** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
Acenaphthylene	**617** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
Acenaphthene	**95.6** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
Dibenzofuran	**50.5** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
Fluorene	**90.0** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C1-Fluorenes	**105** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C2-Fluorenes	**173** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C3-Fluorenes	**224** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
Dibenzothiophene	**66.5** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C1-Dibenzothiophenes	**117** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C2-Dibenzothiophenes	**199** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C3-Dibenzothiophenes	**202** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C4-Dibenzothiophenes	**133** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
Phenanthrene	**972** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
Anthracene	**644** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C1-Phenanthrenes/Anthracenes	**1130** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C2-Phenanthrenes/Anthracenes	**1430** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C3-Phenanthrenes/Anthracenes	**864** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C4-Phenanthrenes/Anthracenes	**349** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
Retene	**89.7** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
Benzo(b)naphtho(2,1-d)thiophene	**370** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C0-Benzonaphthothiophenes	**842** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C1-Benzonaphthothiophenes	**701** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C2-Benzonaphthothiophenes	**483** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C3-Benzonaphthothiophenes	**289** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-877-S1
Date Sampled: 07/22/24 12:10
Percent Solids: 49
Initial Volume: 5.66
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**119** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
Fluoranthene	**2650** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
Pyrene	**2750** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C1-Fluoranthenes/Pyrenes	**3490** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C2-Fluoranthenes/Pyrenes	**2230** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C3-Fluoranthenes/Pyrenes	**1010** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
Benzo(b)fluorene	**517** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
Benzo(c)fluorene	**168** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
2-Methylpyrene	**423** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
4-Methylpyrene	**386** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
1-Methylpyrene	**282** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
Benz(a)anthracene	**3050** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
Chrysene/triphenylene	**2930** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C1-Benzo(a)anthracenes/Chrysenes	**2560** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C2-Benzo(a)anthracenes/Chrysenes	**1450** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C3-Benzo(a)anthracenes/Chrysenes	**831** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C4-Benzo(a)anthracenes/Chrysenes	**388** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
Benzo(b)fluoranthene	**2120** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
Benzo(j/k)fluoranthene	**2660** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
Benzo(e)pyrene	**1810** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
Benzo(a)pyrene	**3270** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
Perylene	**806** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
Indeno(1,2,3-cd)pyrene	**1750** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
Dibenzo(a,h)anthracene	**528** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
Benzo(g,h,i)perylene	**1350** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
Coronene	**366** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
Tetramethyl lead	ND (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
Trimethylethyl lead	ND (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
Dimethyldiethyl lead	ND (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
Methyltriethyl lead	ND (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
Tetraethyl lead	ND (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
2,6,10-trimethyldodecane (1380)	**93.8** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-877-S1
Date Sampled: 07/22/24 12:10
Percent Solids: 49
Initial Volume: 5.66
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**195** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
2,6,10-trimethylpentadecane (1650)	**89.2** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C-17	**354** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
Pristane	**290** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
C-18	**186** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
Phytane	**145** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
Carbazole	**112** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
2,6-Dimethylnaphthalene	**60.5** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
2,3,5-Trimethylnaphthene	**J 6.68** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
4-Methyldibenzothiophene	**38.2** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
2/3-Methyldibenzothiophene	**39.3** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
1-Methyldibenzothiophene	**13.4** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
3-Methylphenanthrene	**160** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
2-Methylphenanthrene	**214** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
2-Methylanthracene	**386** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
4/9-Methylphenanthrene	**240** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401
1-Methylphenanthrene	**140** (7.27)	3.63	8270 Mod		1	IBM	07/25/24 17:40	F4G0001	FG42401

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*70 %*		*50-120*
Surrogate: Naphthalene-d8	*69 %*		*50-120*
Surrogate: Phenanthrene-d10	*75 %*		*50-120*
Surrogate: Perylene-d12	*84 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-877-S1
Date Sampled: 07/22/24 12:10
Percent Solids: N/A

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**56800** (500)		LK		1	CCP	07/29/24 13:42	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-877-S2
Date Sampled: 07/22/24 12:11
Percent Solids: 68
Initial Volume: 5.25
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**19.5** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C1-Benzene	**241** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C2-Benzenes	**79.3** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C3-Benzenes	**15.8** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C4-Benzenes	**21.6** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C5-Benzenes	**20.8** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
Methylcyclohexane	**J 5.10** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
Toluene	**358** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
Ethylbenzene	**11.3** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
m,p-Xylene	**150** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
Styrene	**B 61.3** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
o-Xylene	**8.87** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
Isopropylbenzene	ND (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
n-Propylbenzene	**J 5.29** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
1,3,5-Trimethylbenzene	**6.59** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
1,2,3-Trimethylbenzene	**6.81** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
1,2,4-Trimethylbenzene	**12.8** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
t-Butylbenzene	ND (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
sec-Butylbenzene	ND (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
p-Isopropyltoluene	**11.1** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
n-Butylbenzene	**13.0** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
trans-Decalin	**379** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
cis-Decalin	**54.3** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C1-Decalins	**765** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C2-Decalins	**376** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C3-Decalins	**230** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C4-Decalins	**348** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
Benzo(b)thiophene	**J 3.88** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C1-Benzo(b)thiophenes	**8.50** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C2-Benzo(b)thiophenes	**21.5** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C3-Benzo(b)thiophenes	**20.0** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C4-Benzo(b)thiophenes	**13.5** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-877-S2
Date Sampled: 07/22/24 12:11
Percent Solids: 68
Initial Volume: 5.25
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**71.8** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
2-Methylnaphthalene	**57.0** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
1-Methylnaphthalene	**31.9** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C1-Naphthalenes	**56.2** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C2-Naphthalenes	**156** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C3-Naphthalenes	**260** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C4-Naphthalenes	**218** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
Biphenyl	**27.1** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
Acenaphthylene	**308** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
Acenaphthene	**50.3** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
Dibenzofuran	**29.7** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
Fluorene	**62.1** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C1-Fluorenes	**147** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C2-Fluorenes	**213** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C3-Fluorenes	**216** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
Dibenzothiophene	**58.1** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C1-Dibenzothiophenes	**144** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C2-Dibenzothiophenes	**236** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C3-Dibenzothiophenes	**245** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C4-Dibenzothiophenes	**152** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
Phenanthrene	**508** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
Anthracene	**295** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C1-Phenanthrenes/Anthracenes	**785** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C2-Phenanthrenes/Anthracenes	**774** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C3-Phenanthrenes/Anthracenes	**491** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C4-Phenanthrenes/Anthracenes	**234** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
Retene	**56.9** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
Benzo(b)naphtho(2,1-d)thiophene	**156** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C0-Benzonaphthothiophenes	**300** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C1-Benzonaphthothiophenes	**256** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C2-Benzonaphthothiophenes	**233** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C3-Benzonaphthothiophenes	**163** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-877-S2
Date Sampled: 07/22/24 12:11
Percent Solids: 68
Initial Volume: 5.25
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**69.9** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
Fluoranthene	**911** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
Pyrene	**2040** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C1-Fluoranthenes/Pyrenes	**1370** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C2-Fluoranthenes/Pyrenes	**691** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C3-Fluoranthenes/Pyrenes	**308** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
Benzo(b)fluorene	**149** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
Benzo(c)fluorene	**73.4** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
2-Methylpyrene	**189** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
4-Methylpyrene	**199** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
1-Methylpyrene	**157** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
Benz(a)anthracene	**1000** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
Chrysene/triphenylene	**1120** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C1-Benzo(a)anthracenes/Chrysenes	**785** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C2-Benzo(a)anthracenes/Chrysenes	**463** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C3-Benzo(a)anthracenes/Chrysenes	**222** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C4-Benzo(a)anthracenes/Chrysenes	**110** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
Benzo(b)fluoranthene	**851** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
Benzo(j/k)fluoranthene	**834** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
Benzo(e)pyrene	**815** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
Benzo(a)pyrene	**1270** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
Perylene	**592** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
Indeno(1,2,3-cd)pyrene	**775** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
Dibenzo(a,h)anthracene	**197** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
Benzo(g,h,i)perylene	**696** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
Coronene	**195** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
Tetramethyl lead	ND (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
Trimethylethyl lead	ND (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
Dimethyldiethyl lead	ND (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
Methyltriethyl lead	ND (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
Tetraethyl lead	ND (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
2,6,10-trimethyldodecane (1380)	**191** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-877-S2
Date Sampled: 07/22/24 12:11
Percent Solids: 68
Initial Volume: 5.25
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**302** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
2,6,10-trimethylpentadecane (1650)	**203** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C-17	**160** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
Pristane	**474** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
C-18	**B 105** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
Phytane	**504** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
Carbazole	**49.7** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
2,6-Dimethylnaphthalene	**37.2** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
2,3,5-Trimethylnaphthene	**20.8** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
4-Methyldibenzothiophene	**47.8** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
2/3-Methyldibenzothiophene	**49.6** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
1-Methyldibenzothiophene	**19.4** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
3-Methylphenanthrene	**194** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
2-Methylphenanthrene	**199** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
2-Methylanthracene	**85.1** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
4/9-Methylphenanthrene	**245** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401
1-Methylphenanthrene	**52.7** (5.59)	2.79	8270 Mod		1	IBM	07/25/24 19:00	F4G0001	FG42401

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*77 %*		*50-120*
Surrogate: Naphthalene-d8	*76 %*		*50-120*
Surrogate: Phenanthrene-d10	*86 %*		*50-120*
Surrogate: Perylene-d12	*95 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-877-S2
Date Sampled: 07/22/24 12:11
Percent Solids: N/A

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-04
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**17100** (500)		LK		1	CCP	07/29/24 13:58	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-874-S1
Date Sampled: 07/22/24 12:50
Percent Solids: 85
Initial Volume: 5.74
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**12.0** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C1-Benzene	ND (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C2-Benzenes	**23.5** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C3-Benzenes	ND (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C4-Benzenes	ND (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C5-Benzenes	ND (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
Methylcyclohexane	ND (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
Toluene	**20.2** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
Ethylbenzene	**J 2.54** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
m,p-Xylene	**60.0** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
Styrene	**B 13.7** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
o-Xylene	ND (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
Isopropylbenzene	ND (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
n-Propylbenzene	**J 2.18** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
1,3,5-Trimethylbenzene	ND (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
1,2,3-Trimethylbenzene	**J 2.19** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
1,2,4-Trimethylbenzene	ND (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
t-Butylbenzene	ND (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
sec-Butylbenzene	ND (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
p-Isopropyltoluene	ND (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
n-Butylbenzene	**J 3.84** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
trans-Decalin	ND (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
cis-Decalin	ND (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C1-Decalins	ND (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C2-Decalins	ND (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C3-Decalins	ND (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C4-Decalins	ND (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
Benzo(b)thiophene	ND (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C1-Benzo(b)thiophenes	**J 2.90** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C2-Benzo(b)thiophenes	**4.71** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C3-Benzo(b)thiophenes	**J 3.50** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C4-Benzo(b)thiophenes	**J 2.07** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-874-S1
Date Sampled: 07/22/24 12:50
Percent Solids: 85
Initial Volume: 5.74
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**5.11** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
2-Methylnaphthalene	**J 3.60** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
1-Methylnaphthalene	**J 3.44** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C1-Naphthalenes	**4.85** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C2-Naphthalenes	**11.0** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C3-Naphthalenes	**10.3** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C4-Naphthalenes	**6.47** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
Biphenyl	**5.29** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
Acenaphthylene	**16.5** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
Acenaphthene	**9.70** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
Dibenzofuran	**J 3.07** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
Fluorene	**6.36** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C1-Fluorenes	**7.06** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C2-Fluorenes	**6.85** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C3-Fluorenes	**10.7** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
Dibenzothiophene	**6.04** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C1-Dibenzothiophenes	**7.97** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C2-Dibenzothiophenes	**10.3** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C3-Dibenzothiophenes	**10.1** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C4-Dibenzothiophenes	**6.57** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
Phenanthrene	**45.7** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
Anthracene	**21.5** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C1-Phenanthrenes/Anthracenes	**36.8** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C2-Phenanthrenes/Anthracenes	**22.1** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C3-Phenanthrenes/Anthracenes	**14.8** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C4-Phenanthrenes/Anthracenes	**6.17** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
Retene	**6.15** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
Benzo(b)naphtho(2,1-d)thiophene	**10.8** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C0-Benzonaphthothiophenes	**21.5** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C1-Benzonaphthothiophenes	**14.9** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C2-Benzonaphthothiophenes	**16.1** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C3-Benzonaphthothiophenes	**14.4** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-874-S1
Date Sampled: 07/22/24 12:50
Percent Solids: 85
Initial Volume: 5.74
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**10.1** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
Fluoranthene	**187** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
Pyrene	**163** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C1-Fluoranthenes/Pyrenes	**65.3** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C2-Fluoranthenes/Pyrenes	**38.0** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C3-Fluoranthenes/Pyrenes	**16.9** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
Benzo(b)fluorene	**8.49** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
Benzo(c)fluorene	**J 3.63** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
2-Methylpyrene	**8.70** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
4-Methylpyrene	**7.27** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
1-Methylpyrene	**5.79** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
Benz(a)anthracene	**64.6** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
Chrysene/triphenylene	**71.6** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C1-Benzo(a)anthracenes/Chrysenes	**33.3** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C2-Benzo(a)anthracenes/Chrysenes	**21.9** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C3-Benzo(a)anthracenes/Chrysenes	**10.7** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C4-Benzo(a)anthracenes/Chrysenes	ND (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
Benzo(b)fluoranthene	**60.4** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
Benzo(j/k)fluoranthene	**60.5** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
Benzo(e)pyrene	**50.9** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
Benzo(a)pyrene	**71.8** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
Perylene	**54.6** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
Indeno(1,2,3-cd)pyrene	**48.7** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
Dibenzo(a,h)anthracene	**12.4** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
Benzo(g,h,i)perylene	**42.8** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
Coronene	**12.3** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
Tetramethyl lead	ND (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
Trimethylethyl lead	ND (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
Dimethyldiethyl lead	ND (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
Methyltriethyl lead	ND (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
Tetraethyl lead	ND (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
2,6,10-trimethyldodecane (1380)	**4.29** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-874-S1
Date Sampled: 07/22/24 12:50
Percent Solids: 85
Initial Volume: 5.74
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**11.6** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
2,6,10-trimethylpentadecane (1650)	**J 4.08** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C-17	**B 34.6** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
Pristane	**B 8.43** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
C-18	**B 26.4** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
Phytane	**B 7.39** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
Carbazole	**6.03** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
2,6-Dimethylnaphthalene	**J 2.38** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
2,3,5-Trimethylnaphthene	ND (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
4-Methyldibenzothiophene	**J 2.46** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
2/3-Methyldibenzothiophene	ND (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
1-Methyldibenzothiophene	ND (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
3-Methylphenanthrene	**7.28** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
2-Methylphenanthrene	**7.79** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
2-Methylanthracene	**5.62** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
4/9-Methylphenanthrene	**8.79** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401
1-Methylphenanthrene	**5.47** (4.11)	2.05	8270 Mod		1	IBM	07/25/24 20:20	F4G0001	FG42401

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*83 %*		*50-120*
Surrogate: Naphthalene-d8	*78 %*		*50-120*
Surrogate: Phenanthrene-d10	*86 %*		*50-120*
Surrogate: Perylene-d12	*88 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-874-S1
Date Sampled: 07/22/24 12:50
Percent Solids: N/A

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-05
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**1650** (500)		LK		1	CCP	07/29/24 14:15	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-874-S2
Date Sampled: 07/22/24 12:51
Percent Solids: 69
Initial Volume: 5.23
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**85.9** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C1-Benzene	**84.5** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C2-Benzenes	**211** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C3-Benzenes	**9.09** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C4-Benzenes	**J 4.99** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C5-Benzenes	**5.70** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
Methylcyclohexane	ND (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
Toluene	**142** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
Ethylbenzene	**10.1** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
m,p-Xylene	**376** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
Styrene	**B 29.0** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
o-Xylene	**8.79** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
Isopropylbenzene	ND (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
n-Propylbenzene	**9.86** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
1,3,5-Trimethylbenzene	**6.23** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
1,2,3-Trimethylbenzene	**9.78** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
1,2,4-Trimethylbenzene	**7.86** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
t-Butylbenzene	ND (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
sec-Butylbenzene	ND (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
p-Isopropyltoluene	**11.6** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
n-Butylbenzene	**14.2** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
trans-Decalin	ND (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
cis-Decalin	ND (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C1-Decalins	**19.3** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C2-Decalins	**26.0** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C3-Decalins	ND (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C4-Decalins	ND (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
Benzo(b)thiophene	**J 2.94** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C1-Benzo(b)thiophenes	**7.60** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C2-Benzo(b)thiophenes	**24.0** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C3-Benzo(b)thiophenes	**15.5** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C4-Benzo(b)thiophenes	**6.80** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-874-S2
Date Sampled: 07/22/24 12:51
Percent Solids: 69
Initial Volume: 5.23
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**19.6** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
2-Methylnaphthalene	**12.8** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
1-Methylnaphthalene	**9.93** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C1-Naphthalenes	**14.8** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C2-Naphthalenes	**71.2** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C3-Naphthalenes	**57.1** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C4-Naphthalenes	**47.6** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
Biphenyl	**13.8** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
Acenaphthylene	**105** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
Acenaphthene	**115** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
Dibenzofuran	**23.0** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
Fluorene	**47.3** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C1-Fluorenes	**50.6** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C2-Fluorenes	**17.2** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C3-Fluorenes	**67.0** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
Dibenzothiophene	**44.0** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C1-Dibenzothiophenes	**43.6** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C2-Dibenzothiophenes	**54.4** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C3-Dibenzothiophenes	**48.4** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C4-Dibenzothiophenes	**40.4** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
Phenanthrene	**294** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
Anthracene	**166** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C1-Phenanthrenes/Anthracenes	**196** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C2-Phenanthrenes/Anthracenes	**144** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C3-Phenanthrenes/Anthracenes	**75.8** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C4-Phenanthrenes/Anthracenes	**37.2** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
Retene	**17.8** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
Benzo(b)naphtho(2,1-d)thiophene	**67.5** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C0-Benzonaphthothiophenes	**125** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C1-Benzonaphthothiophenes	**81.9** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C2-Benzonaphthothiophenes	**105** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C3-Benzonaphthothiophenes	**106** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-874-S2
Date Sampled: 07/22/24 12:51
Percent Solids: 69
Initial Volume: 5.23
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**77.5** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
Fluoranthene	**1000** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
Pyrene	**861** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C1-Fluoranthenes/Pyrenes	**367** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C2-Fluoranthenes/Pyrenes	**204** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C3-Fluoranthenes/Pyrenes	**94.0** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
Benzo(b)fluorene	**50.5** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
Benzo(c)fluorene	**21.5** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
2-Methylpyrene	**46.6** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
4-Methylpyrene	**40.1** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
1-Methylpyrene	**29.5** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
Benz(a)anthracene	**386** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
Chrysene/triphenylene	**443** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C1-Benzo(a)anthracenes/Chrysenes	**189** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C2-Benzo(a)anthracenes/Chrysenes	**112** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C3-Benzo(a)anthracenes/Chrysenes	**79.0** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C4-Benzo(a)anthracenes/Chrysenes	**47.2** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
Benzo(b)fluoranthene	**385** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
Benzo(j/k)fluoranthene	**378** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
Benzo(e)pyrene	**322** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
Benzo(a)pyrene	**436** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
Perylene	**329** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
Indeno(1,2,3-cd)pyrene	**309** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
Dibenzo(a,h)anthracene	**74.5** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
Benzo(g,h,i)perylene	**267** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
Coronene	**77.7** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
Tetramethyl lead	ND (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
Trimethylethyl lead	ND (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
Dimethyldiethyl lead	ND (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
Methyltriethyl lead	ND (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
Tetraethyl lead	ND (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
2,6,10-trimethyldodecane (1380)	**18.0** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-874-S2
Date Sampled: 07/22/24 12:51
Percent Solids: 69
Initial Volume: 5.23
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**90.6** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
2,6,10-trimethylpentadecane (1650)	**18.2** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C-17	**155** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
Pristane	**B 42.9** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
C-18	**B 84.4** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
Phytane	**59.6** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
Carbazole	**31.7** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
2,6-Dimethylnaphthalene	**31.1** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
2,3,5-Trimethylnaphthene	**J 2.85** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
4-Methyldibenzothiophene	**15.4** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
2/3-Methyldibenzothiophene	**12.5** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
1-Methyldibenzothiophene	**8.37** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
3-Methylphenanthrene	**39.6** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
2-Methylphenanthrene	**39.7** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
2-Methylanthracene	**28.4** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
4/9-Methylphenanthrene	**42.3** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401
1-Methylphenanthrene	**32.0** (5.55)	2.77	8270 Mod		1	IBM	07/25/24 21:40	F4G0001	FG42401

	%Recovery	*Qualifier*	*Limits*
Surrogate: Toluene-D8	*76 %*		*50-120*
Surrogate: Naphthalene-d8	*72 %*		*50-120*
Surrogate: Phenanthrene-d10	*77 %*		*50-120*
Surrogate: Perylene-d12	*79 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-874-S2
Date Sampled: 07/22/24 12:51
Percent Solids: N/A

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-06
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**22900** (500)		LK		1	CCP	07/29/24 15:05	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-875-S1
Date Sampled: 07/22/24 13:55
Percent Solids: 36
Initial Volume: 5.34
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**11.6** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C1-Benzene	**32.6** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C2-Benzenes	**49.7** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C3-Benzenes	ND (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C4-Benzenes	ND (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C5-Benzenes	ND (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
Methylcyclohexane	**J 9.41** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
Toluene	**97.8** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
Ethylbenzene	**J 5.31** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
m,p-Xylene	**124** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
Styrene	**B 55.1** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
o-Xylene	**J 6.80** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
Isopropylbenzene	ND (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
n-Propylbenzene	**J 7.19** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
1,3,5-Trimethylbenzene	ND (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
1,2,3-Trimethylbenzene	**J 7.63** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
1,2,4-Trimethylbenzene	**J 6.73** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
t-Butylbenzene	ND (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
sec-Butylbenzene	ND (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
p-Isopropyltoluene	**22.8** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
n-Butylbenzene	**17.4** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
trans-Decalin	**38.4** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
cis-Decalin	ND (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C1-Decalins	**46.7** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C2-Decalins	**41.0** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C3-Decalins	ND (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C4-Decalins	ND (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
Benzo(b)thiophene	ND (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C1-Benzo(b)thiophenes	**J 9.37** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C2-Benzo(b)thiophenes	**24.2** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C3-Benzo(b)thiophenes	**J 10.2** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C4-Benzo(b)thiophenes	ND (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-875-S1
Date Sampled: 07/22/24 13:55
Percent Solids: 36
Initial Volume: 5.34
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	J **9.88** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
2-Methylnaphthalene	J **9.68** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
1-Methylnaphthalene	J **8.24** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C1-Naphthalenes	**11.4** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C2-Naphthalenes	**36.8** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C3-Naphthalenes	**31.6** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C4-Naphthalenes	**31.6** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
Biphenyl	**13.6** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
Acenaphthylene	**21.8** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
Acenaphthene	J **9.41** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
Dibenzofuran	ND (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
Fluorene	J **9.37** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C1-Fluorenes	**13.8** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C2-Fluorenes	**23.0** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C3-Fluorenes	**30.5** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
Dibenzothiophene	J **6.88** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C1-Dibenzothiophenes	**13.5** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C2-Dibenzothiophenes	**26.4** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C3-Dibenzothiophenes	**30.4** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C4-Dibenzothiophenes	**27.1** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
Phenanthrene	**50.6** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
Anthracene	**23.8** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C1-Phenanthrenes/Anthracenes	**51.2** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C2-Phenanthrenes/Anthracenes	**48.8** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C3-Phenanthrenes/Anthracenes	**51.4** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C4-Phenanthrenes/Anthracenes	**33.3** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
Retene	**24.1** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
Benzo(b)naphtho(2,1-d)thiophene	**19.6** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C0-Benzonaphthothiophenes	**36.3** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C1-Benzonaphthothiophenes	**25.9** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C2-Benzonaphthothiophenes	**27.6** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C3-Benzonaphthothiophenes	**20.7** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-875-S1
Date Sampled: 07/22/24 13:55
Percent Solids: 36
Initial Volume: 5.34
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	J **9.94** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
Fluoranthene	**197** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
Pyrene	**184** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C1-Fluoranthenes/Pyrenes	**99.4** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C2-Fluoranthenes/Pyrenes	**67.0** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C3-Fluoranthenes/Pyrenes	**40.3** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
Benzo(b)fluorene	**12.4** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
Benzo(c)fluorene	J **5.59** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
2-Methylpyrene	**12.4** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
4-Methylpyrene	**13.2** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
1-Methylpyrene	J **9.60** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
Benz(a)anthracene	**84.7** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
Chrysene/triphenylene	**117** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C1-Benzo(a)anthracenes/Chrysenes	**53.0** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C2-Benzo(a)anthracenes/Chrysenes	**38.5** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C3-Benzo(a)anthracenes/Chrysenes	**20.5** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C4-Benzo(a)anthracenes/Chrysenes	ND (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
Benzo(b)fluoranthene	**101** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
Benzo(j/k)fluoranthene	**93.0** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
Benzo(e)pyrene	**82.6** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
Benzo(a)pyrene	**107** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
Perylene	**896** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
Indeno(1,2,3-cd)pyrene	**82.8** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
Dibenzo(a,h)anthracene	**22.3** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
Benzo(g,h,i)perylene	**70.4** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
Coronene	**20.5** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
Tetramethyl lead	ND (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
Trimethylethyl lead	ND (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
Dimethyldiethyl lead	ND (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
Methyltriethyl lead	ND (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
Tetraethyl lead	ND (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
2,6,10-trimethyldodecane (1380)	**31.8** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-875-S1
Date Sampled: 07/22/24 13:55
Percent Solids: 36
Initial Volume: 5.34
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**92.7** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
2,6,10-trimethylpentadecane (1650)	**40.2** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C-17	**280** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
Pristane	**98.0** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
C-18	**157** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
Phytane	**99.4** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
Carbazole	**J 7.53** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
2,6-Dimethylnaphthalene	**J 7.37** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
2,3,5-Trimethylnaphthene	ND (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
4-Methyldibenzothiophene	**J 5.27** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
2/3-Methyldibenzothiophene	ND (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
1-Methyldibenzothiophene	ND (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
3-Methylphenanthrene	**J 10.1** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
2-Methylphenanthrene	**10.8** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
2-Methylanthracene	ND (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
4/9-Methylphenanthrene	**13.1** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401
1-Methylphenanthrene	**J 8.68** (10.4)	5.22	8270 Mod		1	IBM	07/26/24 4:19	F4G0001	FG42401

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*77 %*		*50-120*
Surrogate: Naphthalene-d8	*75 %*		*50-120*
Surrogate: Phenanthrene-d10	*85 %*		*50-120*
Surrogate: Perylene-d12	*87 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-875-S1
Date Sampled: 07/22/24 13:55
Percent Solids: N/A

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-07
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**79500** (500)		LK		1	CCP	07/29/24 15:21	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-875-S2
Date Sampled: 07/22/24 13:56
Percent Solids: 75
Initial Volume: 5.12
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**31.9** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C1-Benzene	**286** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C2-Benzenes	**91.1** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C3-Benzenes	**21.3** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C4-Benzenes	**32.7** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C5-Benzenes	**44.5** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
Methylcyclohexane	**13.5** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
Toluene	**414** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
Ethylbenzene	**11.3** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
m,p-Xylene	**162** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
Styrene	**B 113** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
o-Xylene	**9.11** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
Isopropylbenzene	**J 3.78** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
n-Propylbenzene	**7.29** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
1,3,5-Trimethylbenzene	**J 5.19** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
1,2,3-Trimethylbenzene	**9.00** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
1,2,4-Trimethylbenzene	**13.1** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
t-Butylbenzene	ND (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
sec-Butylbenzene	ND (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
p-Isopropyltoluene	**10.8** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
n-Butylbenzene	**17.9** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
trans-Decalin	**483** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
cis-Decalin	**73.3** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C1-Decalins	**971** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C2-Decalins	**542** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C3-Decalins	**312** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C4-Decalins	**457** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
Benzo(b)thiophene	**J 3.00** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C1-Benzo(b)thiophenes	**9.75** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C2-Benzo(b)thiophenes	**23.7** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C3-Benzo(b)thiophenes	**19.1** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C4-Benzo(b)thiophenes	**16.3** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-875-S2
Date Sampled: 07/22/24 13:56
Percent Solids: 75
Initial Volume: 5.12
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**38.9** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
2-Methylnaphthalene	**32.9** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
1-Methylnaphthalene	**17.5** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C1-Naphthalenes	**33.4** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C2-Naphthalenes	**123** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C3-Naphthalenes	**243** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C4-Naphthalenes	**280** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
Biphenyl	**33.1** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
Acenaphthylene	**166** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
Acenaphthene	**27.0** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
Dibenzofuran	**19.7** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
Fluorene	**34.5** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C1-Fluorenes	**67.7** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C2-Fluorenes	**163** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C3-Fluorenes	**194** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
Dibenzothiophene	**35.4** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C1-Dibenzothiophenes	**106** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C2-Dibenzothiophenes	**201** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C3-Dibenzothiophenes	**203** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C4-Dibenzothiophenes	**117** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
Phenanthrene	**258** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
Anthracene	**160** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C1-Phenanthrenes/Anthracenes	**429** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C2-Phenanthrenes/Anthracenes	**502** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C3-Phenanthrenes/Anthracenes	**319** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C4-Phenanthrenes/Anthracenes	**154** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
Retene	**54.6** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
Benzo(b)naphtho(2,1-d)thiophene	**86.2** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C0-Benzonaphthothiophenes	**160** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C1-Benzonaphthothiophenes	**152** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C2-Benzonaphthothiophenes	**148** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C3-Benzonaphthothiophenes	**112** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-875-S2
Date Sampled: 07/22/24 13:56
Percent Solids: 75
Initial Volume: 5.12
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**54.3** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
Fluoranthene	**801** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
Pyrene	**962** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C1-Fluoranthenes/Pyrenes	**683** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C2-Fluoranthenes/Pyrenes	**359** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C3-Fluoranthenes/Pyrenes	**188** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
Benzo(b)fluorene	**79.6** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
Benzo(c)fluorene	**29.5** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
2-Methylpyrene	**96.8** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
4-Methylpyrene	**101** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
1-Methylpyrene	**78.4** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
Benz(a)anthracene	**492** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
Chrysene/triphenylene	**586** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C1-Benzo(a)anthracenes/Chrysenes	**412** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C2-Benzo(a)anthracenes/Chrysenes	**245** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C3-Benzo(a)anthracenes/Chrysenes	**144** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C4-Benzo(a)anthracenes/Chrysenes	**79.4** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
Benzo(b)fluoranthene	**417** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
Benzo(j/k)fluoranthene	**450** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
Benzo(e)pyrene	**423** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
Benzo(a)pyrene	**616** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
Perylene	**537** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
Indeno(1,2,3-cd)pyrene	**385** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
Dibenzo(a,h)anthracene	**94.5** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
Benzo(g,h,i)perylene	**344** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
Coronene	**92.7** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
Tetramethyl lead	ND (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
Trimethylethyl lead	ND (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
Dimethyldiethyl lead	ND (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
Methyltriethyl lead	ND (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
Tetraethyl lead	ND (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
2,6,10-trimethyldodecane (1380)	**422** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-875-S2
Date Sampled: 07/22/24 13:56
Percent Solids: 75
Initial Volume: 5.12
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**580** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
2,6,10-trimethylpentadecane (1650)	**477** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C-17	**135** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
Pristane	**1200** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
C-18	**B 94.9** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
Phytane	**968** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
Carbazole	**18.8** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
2,6-Dimethylnaphthalene	**40.2** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
2,3,5-Trimethylnaphthene	**16.4** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
4-Methyldibenzothiophene	**42.5** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
2/3-Methyldibenzothiophene	**39.2** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
1-Methyldibenzothiophene	**13.9** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
3-Methylphenanthrene	**97.9** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
2-Methylphenanthrene	**109** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
2-Methylanthracene	**47.1** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
4/9-Methylphenanthrene	**116** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401
1-Methylphenanthrene	**41.1** (5.24)	2.62	8270 Mod		1	IBM	07/26/24 5:38	F4G0001	FG42401

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*77 %*		*50-120*
Surrogate: Naphthalene-d8	*75 %*		*50-120*
Surrogate: Phenanthrene-d10	*82 %*		*50-120*
Surrogate: Perylene-d12	*90 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-875-S2
Date Sampled: 07/22/24 13:56
Percent Solids: N/A

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-08
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**9380** (500)		LK		1	CCP	07/29/24 15:38	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-879-S1
Date Sampled: 07/22/24 14:35
Percent Solids: 49
Initial Volume: 5.17
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**15.8** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C1-Benzene	**62.8** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C2-Benzenes	**19.4** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C3-Benzenes	ND (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C4-Benzenes	**56.4** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C5-Benzenes	**26.3** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
Methylcyclohexane	ND (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
Toluene	**127** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
Ethylbenzene	**8.41** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
m,p-Xylene	**67.4** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
Styrene	**B 78.8** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
o-Xylene	**J 6.45** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
Isopropylbenzene	ND (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
n-Propylbenzene	**9.12** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
1,3,5-Trimethylbenzene	ND (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
1,2,3-Trimethylbenzene	**J 5.39** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
1,2,4-Trimethylbenzene	**J 6.45** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
t-Butylbenzene	ND (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
sec-Butylbenzene	ND (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
p-Isopropyltoluene	**45.2** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
n-Butylbenzene	**23.9** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
trans-Decalin	ND (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
cis-Decalin	ND (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C1-Decalins	ND (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C2-Decalins	ND (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C3-Decalins	ND (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C4-Decalins	ND (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
Benzo(b)thiophene	ND (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C1-Benzo(b)thiophenes	**8.20** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C2-Benzo(b)thiophenes	**21.4** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C3-Benzo(b)thiophenes	**20.8** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C4-Benzo(b)thiophenes	**8.98** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-879-S1
Date Sampled: 07/22/24 14:35
Percent Solids: 49
Initial Volume: 5.17
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**21.7** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
2-Methylnaphthalene	**15.5** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
1-Methylnaphthalene	**11.9** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C1-Naphthalenes	**18.7** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C2-Naphthalenes	**113** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C3-Naphthalenes	**148** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C4-Naphthalenes	**77.1** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
Biphenyl	**16.1** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
Acenaphthylene	**11.0** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
Acenaphthene	**21.0** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
Dibenzofuran	**J 6.90** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
Fluorene	**15.7** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C1-Fluorenes	**52.0** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C2-Fluorenes	**50.3** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C3-Fluorenes	**34.3** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
Dibenzothiophene	**16.5** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C1-Dibenzothiophenes	**37.2** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C2-Dibenzothiophenes	**32.9** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C3-Dibenzothiophenes	**18.6** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C4-Dibenzothiophenes	**34.1** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
Phenanthrene	**105** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
Anthracene	**62.9** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C1-Phenanthrenes/Anthracenes	**236** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C2-Phenanthrenes/Anthracenes	**157** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C3-Phenanthrenes/Anthracenes	**101** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C4-Phenanthrenes/Anthracenes	**181** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
Retene	**560** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
Benzo(b)naphtho(2,1-d)thiophene	**10.8** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C0-Benzonaphthothiophenes	**38.5** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C1-Benzonaphthothiophenes	**25.9** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C2-Benzonaphthothiophenes	**15.0** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C3-Benzonaphthothiophenes	**J 6.52** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-879-S1
Date Sampled: 07/22/24 14:35
Percent Solids: 49
Initial Volume: 5.17
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
Fluoranthene	**319** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
Pyrene	**257** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C1-Fluoranthenes/Pyrenes	**208** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C2-Fluoranthenes/Pyrenes	**71.8** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C3-Fluoranthenes/Pyrenes	**31.6** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
Benzo(b)fluorene	**31.3** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
Benzo(c)fluorene	**20.1** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
2-Methylpyrene	**20.2** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
4-Methylpyrene	**15.8** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
1-Methylpyrene	**13.2** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
Benz(a)anthracene	**87.9** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
Chrysene/triphenylene	**80.1** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C1-Benzo(a)anthracenes/Chrysenes	**59.2** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C2-Benzo(a)anthracenes/Chrysenes	**38.8** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C3-Benzo(a)anthracenes/Chrysenes	**22.3** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C4-Benzo(a)anthracenes/Chrysenes	ND (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
Benzo(b)fluoranthene	**34.3** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
Benzo(j/k)fluoranthene	**41.8** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
Benzo(e)pyrene	**27.4** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
Benzo(a)pyrene	**47.7** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
Perylene	**270** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
Indeno(1,2,3-cd)pyrene	**22.1** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
Dibenzo(a,h)anthracene	**J 7.13** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
Benzo(g,h,i)perylene	**18.9** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
Coronene	**J 4.77** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
Tetramethyl lead	ND (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
Trimethylethyl lead	ND (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
Dimethyldiethyl lead	ND (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
Methyltriethyl lead	ND (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
Tetraethyl lead	ND (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
2,6,10-trimethyldodecane (1380)	**11.6** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-879-S1
Date Sampled: 07/22/24 14:35
Percent Solids: 49
Initial Volume: 5.17
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**41.0** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
2,6,10-trimethylpentadecane (1650)	**14.3** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C-17	**163** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
Pristane	**B 18.2** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
C-18	**B 134** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
Phytane	**B 16.4** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
Carbazole	ND (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
2,6-Dimethylnaphthalene	**11.9** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
2,3,5-Trimethylnaphthene	**16.4** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
4-Methyldibenzothiophene	**8.16** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
2/3-Methyldibenzothiophene	**9.19** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
1-Methyldibenzothiophene	**J 6.44** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
3-Methylphenanthrene	**57.6** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
2-Methylphenanthrene	**57.5** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
2-Methylanthracene	**34.5** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
4/9-Methylphenanthrene	**62.2** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401
1-Methylphenanthrene	**19.9** (7.89)	3.94	8270 Mod		1	IBM	07/26/24 6:57	F4G0001	FG42401

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*81 %*		*50-120*
Surrogate: Naphthalene-d8	*78 %*		*50-120*
Surrogate: Phenanthrene-d10	*88 %*		*50-120*
Surrogate: Perylene-d12	*90 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-879-S1
Date Sampled: 07/22/24 14:35
Percent Solids: N/A

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-09
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**62000** (500)		LK		1	CCP	07/29/24 15:54	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-879-S2
Date Sampled: 07/22/24 14:36
Percent Solids: 58
Initial Volume: 5.06
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**6.98** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C1-Benzene	**32.8** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C2-Benzenes	**18.0** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C3-Benzenes	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C4-Benzenes	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C5-Benzenes	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
Methylcyclohexane	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
Toluene	**76.1** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
Ethylbenzene	**J 4.60** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
m,p-Xylene	**57.6** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
Styrene	**B 31.2** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
o-Xylene	**J 4.90** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
Isopropylbenzene	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
n-Propylbenzene	**6.88** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
1,3,5-Trimethylbenzene	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
1,2,3-Trimethylbenzene	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
1,2,4-Trimethylbenzene	**J 3.48** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
t-Butylbenzene	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
sec-Butylbenzene	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
p-Isopropyltoluene	**6.94** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
n-Butylbenzene	**14.7** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
trans-Decalin	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
cis-Decalin	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C1-Decalins	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C2-Decalins	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C3-Decalins	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C4-Decalins	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
Benzo(b)thiophene	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C1-Benzo(b)thiophenes	**J 4.69** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C2-Benzo(b)thiophenes	**12.8** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C3-Benzo(b)thiophenes	**8.27** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C4-Benzo(b)thiophenes	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-879-S2
Date Sampled: 07/22/24 14:36
Percent Solids: 58
Initial Volume: 5.06
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**8.26** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
2-Methylnaphthalene	**J 6.60** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
1-Methylnaphthalene	**J 6.12** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C1-Naphthalenes	**8.31** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C2-Naphthalenes	**41.3** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C3-Naphthalenes	**27.5** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C4-Naphthalenes	**17.0** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
Biphenyl	**10.9** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
Acenaphthylene	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
Acenaphthene	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
Dibenzofuran	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
Fluorene	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C1-Fluorenes	**12.5** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C2-Fluorenes	**11.3** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C3-Fluorenes	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
Dibenzothiophene	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C1-Dibenzothiophenes	**J 6.18** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C2-Dibenzothiophenes	**J 6.72** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C3-Dibenzothiophenes	**J 4.97** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C4-Dibenzothiophenes	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
Phenanthrene	**8.83** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
Anthracene	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C1-Phenanthrenes/Anthracenes	**16.5** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C2-Phenanthrenes/Anthracenes	**14.1** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C3-Phenanthrenes/Anthracenes	**13.8** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C4-Phenanthrenes/Anthracenes	**21.5** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
Retene	**29.0** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
Benzo(b)naphtho(2,1-d)thiophene	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C0-Benzonaphthothiophenes	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C1-Benzonaphthothiophenes	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C2-Benzonaphthothiophenes	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C3-Benzonaphthothiophenes	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-879-S2
Date Sampled: 07/22/24 14:36
Percent Solids: 58
Initial Volume: 5.06
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
Fluoranthene	**12.1** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
Pyrene	**11.4** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C1-Fluoranthenes/Pyrenes	**12.2** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C2-Fluoranthenes/Pyrenes	**8.86** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C3-Fluoranthenes/Pyrenes	**7.62** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
Benzo(b)fluorene	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
Benzo(c)fluorene	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
2-Methylpyrene	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
4-Methylpyrene	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
1-Methylpyrene	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
Benz(a)anthracene	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
Chrysene/triphenylene	**J 3.51** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C1-Benzo(a)anthracenes/Chrysenes	**J 5.82** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C2-Benzo(a)anthracenes/Chrysenes	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C3-Benzo(a)anthracenes/Chrysenes	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C4-Benzo(a)anthracenes/Chrysenes	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
Benzo(b)fluoranthene	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
Benzo(j/k)fluoranthene	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
Benzo(e)pyrene	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
Benzo(a)pyrene	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
Perylene	**372** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
Indeno(1,2,3-cd)pyrene	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
Dibenzo(a,h)anthracene	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
Benzo(g,h,i)perylene	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
Coronene	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
Tetramethyl lead	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
Trimethylethyl lead	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
Dimethyldiethyl lead	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
Methyltriethyl lead	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
Tetraethyl lead	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
2,6,10-trimethyldodecane (1380)	**8.79** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-879-S2
Date Sampled: 07/22/24 14:36
Percent Solids: 58
Initial Volume: 5.06
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**35.8** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
2,6,10-trimethylpentadecane (1650)	**13.5** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C-17	**155** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
Pristane	**B 9.40** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
C-18	**B 128** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
Phytane	**B 16.8** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
Carbazole	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
2,6-Dimethylnaphthalene	**J 4.75** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
2,3,5-Trimethylnaphthene	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
4-Methyldibenzothiophene	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
2/3-Methyldibenzothiophene	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
1-Methyldibenzothiophene	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
3-Methylphenanthrene	**J 3.59** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
2-Methylphenanthrene	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
2-Methylanthracene	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
4/9-Methylphenanthrene	**J 5.17** (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401
1-Methylphenanthrene	ND (6.83)	3.42	8270 Mod		1	IBM	07/26/24 8:17	F4G0001	FG42401

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*77 %*		*50-120*
Surrogate: Naphthalene-d8	*74 %*		*50-120*
Surrogate: Phenanthrene-d10	*84 %*		*50-120*
Surrogate: Perylene-d12	*86 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-879-S2
Date Sampled: 07/22/24 14:36
Percent Solids: N/A

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-10
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**64100** (500)		LK		1	CCP	07/29/24 16:11	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-888-S1
Date Sampled: 07/22/24 15:15
Percent Solids: 88
Initial Volume: 5.73
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**9.34** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C1-Benzene	ND (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C2-Benzenes	ND (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C3-Benzenes	ND (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C4-Benzenes	ND (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C5-Benzenes	ND (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
Methylcyclohexane	ND (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
Toluene	**17.8** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
Ethylbenzene	**J 3.86** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
m,p-Xylene	**16.2** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
Styrene	**B 13.5** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
o-Xylene	**J 2.77** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
Isopropylbenzene	ND (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
n-Propylbenzene	**J 2.72** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
1,3,5-Trimethylbenzene	**J 2.90** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
1,2,3-Trimethylbenzene	**J 2.84** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
1,2,4-Trimethylbenzene	**J 3.40** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
t-Butylbenzene	ND (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
sec-Butylbenzene	ND (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
p-Isopropyltoluene	**J 2.73** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
n-Butylbenzene	**J 3.35** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
trans-Decalin	ND (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
cis-Decalin	ND (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C1-Decalins	ND (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C2-Decalins	ND (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C3-Decalins	ND (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C4-Decalins	ND (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
Benzo(b)thiophene	ND (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C1-Benzo(b)thiophenes	**J 3.25** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C2-Benzo(b)thiophenes	**7.53** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C3-Benzo(b)thiophenes	**5.77** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C4-Benzo(b)thiophenes	**J 3.73** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-888-S1
Date Sampled: 07/22/24 15:15
Percent Solids: 88
Initial Volume: 5.73
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**17.3** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
2-Methylnaphthalene	**9.25** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
1-Methylnaphthalene	**8.10** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C1-Naphthalenes	**11.3** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C2-Naphthalenes	**23.0** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C3-Naphthalenes	**28.1** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C4-Naphthalenes	**19.5** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
Biphenyl	**7.19** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
Acenaphthylene	**101** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
Acenaphthene	**21.3** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
Dibenzofuran	**14.4** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
Fluorene	**24.3** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C1-Fluorenes	**23.3** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C2-Fluorenes	**23.3** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C3-Fluorenes	**47.8** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
Dibenzothiophene	**27.1** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C1-Dibenzothiophenes	**32.6** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C2-Dibenzothiophenes	**34.4** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C3-Dibenzothiophenes	**28.2** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C4-Dibenzothiophenes	**19.3** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
Phenanthrene	**363** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
Anthracene	**135** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C1-Phenanthrenes/Anthracenes	**217** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C2-Phenanthrenes/Anthracenes	**138** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C3-Phenanthrenes/Anthracenes	**61.5** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C4-Phenanthrenes/Anthracenes	**29.5** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
Retene	**33.7** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
Benzo(b)naphtho(2,1-d)thiophene	**64.0** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C0-Benzonaphthothiophenes	**121** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C1-Benzonaphthothiophenes	**60.9** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C2-Benzonaphthothiophenes	**60.9** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C3-Benzonaphthothiophenes	**68.1** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-888-S1
Date Sampled: 07/22/24 15:15
Percent Solids: 88
Initial Volume: 5.73
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**45.1** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
Fluoranthene	**905** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
Pyrene	**850** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C1-Fluoranthenes/Pyrenes	**357** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C2-Fluoranthenes/Pyrenes	**205** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C3-Fluoranthenes/Pyrenes	**78.6** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
Benzo(b)fluorene	**36.8** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
Benzo(c)fluorene	**18.8** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
2-Methylpyrene	**50.3** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
4-Methylpyrene	**42.3** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
1-Methylpyrene	**34.1** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
Benz(a)anthracene	**444** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
Chrysene/triphenylene	**466** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C1-Benzo(a)anthracenes/Chrysenes	**190** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C2-Benzo(a)anthracenes/Chrysenes	**93.2** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C3-Benzo(a)anthracenes/Chrysenes	**63.9** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C4-Benzo(a)anthracenes/Chrysenes	**30.9** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
Benzo(b)fluoranthene	**390** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
Benzo(j/k)fluoranthene	**392** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
Benzo(e)pyrene	**334** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
Benzo(a)pyrene	**519** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
Perylene	**129** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
Indeno(1,2,3-cd)pyrene	**336** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
Dibenzo(a,h)anthracene	**77.6** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
Benzo(g,h,i)perylene	**286** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
Coronene	**75.6** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
Tetramethyl lead	ND (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
Trimethylethyl lead	ND (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
Dimethyldiethyl lead	ND (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
Methyltriethyl lead	ND (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
Tetraethyl lead	ND (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
2,6,10-trimethyldodecane (1380)	**11.5** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-888-S1
Date Sampled: 07/22/24 15:15
Percent Solids: 88
Initial Volume: 5.73
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**25.5** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
2,6,10-trimethylpentadecane (1650)	**19.6** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C-17	**B 100** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
Pristane	**B 39.1** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
C-18	**B 75.7** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
Phytane	**B 34.5** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
Carbazole	**33.2** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
2,6-Dimethylnaphthalene	**4.69** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
2,3,5-Trimethylnaphthene	ND (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
4-Methyldibenzothiophene	**10.4** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
2/3-Methyldibenzothiophene	**10.1** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
1-Methyldibenzothiophene	**5.57** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
3-Methylphenanthrene	**46.9** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
2-Methylphenanthrene	**56.9** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
2-Methylanthracene	**27.0** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
4/9-Methylphenanthrene	**46.8** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401
1-Methylphenanthrene	**36.5** (3.98)	1.99	8270 Mod		1	IBM	07/26/24 9:36	F4G0001	FG42401

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*75 %*		*50-120*
Surrogate: Naphthalene-d8	*71 %*		*50-120*
Surrogate: Phenanthrene-d10	*79 %*		*50-120*
Surrogate: Perylene-d12	*82 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-888-S1
Date Sampled: 07/22/24 15:15
Percent Solids: N/A

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-11
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**6450** (500)		LK		1	CCP	07/29/24 17:01	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-888-S2
Date Sampled: 07/22/24 15:16
Percent Solids: 52
Initial Volume: 5.21
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**8.58** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C1-Benzene	**26.5** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C2-Benzenes	**9.16** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C3-Benzenes	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C4-Benzenes	**52.0** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C5-Benzenes	**27.3** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
Methylcyclohexane	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
Toluene	**69.5** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
Ethylbenzene	**8.45** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
m,p-Xylene	**43.1** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
Styrene	**B 56.2** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
o-Xylene	**J 3.76** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
Isopropylbenzene	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
n-Propylbenzene	**17.0** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
1,3,5-Trimethylbenzene	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
1,2,3-Trimethylbenzene	**J 3.76** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
1,2,4-Trimethylbenzene	**J 6.51** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
t-Butylbenzene	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
sec-Butylbenzene	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
p-Isopropyltoluene	**17.8** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
n-Butylbenzene	**33.9** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
trans-Decalin	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
cis-Decalin	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C1-Decalins	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C2-Decalins	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C3-Decalins	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C4-Decalins	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
Benzo(b)thiophene	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C1-Benzo(b)thiophenes	**J 6.53** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C2-Benzo(b)thiophenes	**17.8** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C3-Benzo(b)thiophenes	**8.62** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C4-Benzo(b)thiophenes	**J 4.17** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-888-S2
Date Sampled: 07/22/24 15:16
Percent Solids: 52
Initial Volume: 5.21
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**10.6** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
2-Methylnaphthalene	**J 6.70** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
1-Methylnaphthalene	**9.04** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C1-Naphthalenes	**9.99** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C2-Naphthalenes	**72.8** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C3-Naphthalenes	**23.5** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C4-Naphthalenes	**13.2** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
Biphenyl	**9.59** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
Acenaphthylene	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
Acenaphthene	**282** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
Dibenzofuran	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
Fluorene	**J 4.16** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C1-Fluorenes	**15.3** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C2-Fluorenes	**10.1** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C3-Fluorenes	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
Dibenzothiophene	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C1-Dibenzothiophenes	**7.62** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C2-Dibenzothiophenes	**12.5** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C3-Dibenzothiophenes	**9.09** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C4-Dibenzothiophenes	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
Phenanthrene	**J 6.50** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
Anthracene	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C1-Phenanthrenes/Anthracenes	**11.2** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C2-Phenanthrenes/Anthracenes	**15.7** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C3-Phenanthrenes/Anthracenes	**10.5** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C4-Phenanthrenes/Anthracenes	**395** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
Retene	**1640** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
Benzo(b)naphtho(2,1-d)thiophene	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C0-Benzonaphthothiophenes	**J 6.13** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C1-Benzonaphthothiophenes	**7.38** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C2-Benzonaphthothiophenes	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C3-Benzonaphthothiophenes	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-888-S2
Date Sampled: 07/22/24 15:16
Percent Solids: 52
Initial Volume: 5.21
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
Fluoranthene	**J 7.06** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
Pyrene	**7.48** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C1-Fluoranthenes/Pyrenes	**8.11** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C2-Fluoranthenes/Pyrenes	**9.14** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C3-Fluoranthenes/Pyrenes	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
Benzo(b)fluorene	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
Benzo(c)fluorene	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
2-Methylpyrene	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
4-Methylpyrene	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
1-Methylpyrene	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
Benz(a)anthracene	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
Chrysene/triphenylene	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C1-Benzo(a)anthracenes/Chrysenes	**J 4.35** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C2-Benzo(a)anthracenes/Chrysenes	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C3-Benzo(a)anthracenes/Chrysenes	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C4-Benzo(a)anthracenes/Chrysenes	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
Benzo(b)fluoranthene	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
Benzo(j/k)fluoranthene	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
Benzo(e)pyrene	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
Benzo(a)pyrene	**J 4.26** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
Perylene	**328** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
Indeno(1,2,3-cd)pyrene	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
Dibenzo(a,h)anthracene	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
Benzo(g,h,i)perylene	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
Coronene	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
Tetramethyl lead	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
Trimethylethyl lead	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
Dimethyldiethyl lead	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
Methyltriethyl lead	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
Tetraethyl lead	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
2,6,10-trimethyldodecane (1380)	**7.72** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-888-S2
Date Sampled: 07/22/24 15:16
Percent Solids: 52
Initial Volume: 5.21
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**28.0** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
2,6,10-trimethylpentadecane (1650)	**8.05** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C-17	**B 86.8** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
Pristane	**B 11.4** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
C-18	**B 72.2** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
Phytane	**B 12.6** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
Carbazole	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
2,6-Dimethylnaphthalene	**J 3.84** (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
2,3,5-Trimethylnaphthene	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
4-Methyldibenzothiophene	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
2/3-Methyldibenzothiophene	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
1-Methyldibenzothiophene	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
3-Methylphenanthrene	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
2-Methylphenanthrene	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
2-Methylanthracene	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
4/9-Methylphenanthrene	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401
1-Methylphenanthrene	ND (7.36)	3.68	8270 Mod		1	IBM	07/26/24 10:56	F4G0001	FG42401

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*77 %*		*50-120*
Surrogate: Naphthalene-d8	*74 %*		*50-120*
Surrogate: Phenanthrene-d10	*86 %*		*50-120*
Surrogate: Perylene-d12	*86 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-888-S2
Date Sampled: 07/22/24 15:16
Percent Solids: N/A

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-12
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**49900** (500)		LK		1	CCP	07/29/24 17:17	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-888-S3
Date Sampled: 07/22/24 15:17
Percent Solids: 78
Initial Volume: 5.15
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-13
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C1-Benzene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C2-Benzenes	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C3-Benzenes	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C4-Benzenes	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C5-Benzenes	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
Methylcyclohexane	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
Toluene	**6.34** (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
Ethylbenzene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
m,p-Xylene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
Styrene	**B 7.28** (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
o-Xylene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
Isopropylbenzene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
n-Propylbenzene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
1,3,5-Trimethylbenzene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
1,2,3-Trimethylbenzene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
1,2,4-Trimethylbenzene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
t-Butylbenzene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
sec-Butylbenzene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
p-Isopropyltoluene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
n-Butylbenzene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
trans-Decalin	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
cis-Decalin	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C1-Decalins	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C2-Decalins	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C3-Decalins	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C4-Decalins	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
Benzo(b)thiophene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C1-Benzo(b)thiophenes	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C2-Benzo(b)thiophenes	**J 4.13** (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C3-Benzo(b)thiophenes	**J 3.09** (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C4-Benzo(b)thiophenes	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-888-S3
Date Sampled: 07/22/24 15:17
Percent Solids: 78
Initial Volume: 5.15
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-13
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
2-Methylnaphthalene	**J 3.43** (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
1-Methylnaphthalene	**J 3.62** (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C1-Naphthalenes	**J 4.53** (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C2-Naphthalenes	**9.53** (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C3-Naphthalenes	**6.18** (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C4-Naphthalenes	**J 3.33** (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
Biphenyl	**J 4.88** (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
Acenaphthylene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
Acenaphthene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
Dibenzofuran	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
Fluorene	**J 2.54** (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C1-Fluorenes	**J 3.53** (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C2-Fluorenes	**J 4.23** (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C3-Fluorenes	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
Dibenzothiophene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C1-Dibenzothiophenes	**J 3.90** (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C2-Dibenzothiophenes	**5.43** (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C3-Dibenzothiophenes	**5.15** (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C4-Dibenzothiophenes	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
Phenanthrene	**J 3.37** (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
Anthracene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C1-Phenanthrenes/Anthracenes	**J 4.49** (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C2-Phenanthrenes/Anthracenes	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C3-Phenanthrenes/Anthracenes	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C4-Phenanthrenes/Anthracenes	**J 3.08** (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
Retene	**8.63** (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
Benzo(b)naphtho(2,1-d)thiophene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C0-Benzonaphthothiophenes	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C1-Benzonaphthothiophenes	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C2-Benzonaphthothiophenes	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C3-Benzonaphthothiophenes	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-888-S3
Date Sampled: 07/22/24 15:17
Percent Solids: 78
Initial Volume: 5.15
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-13
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
Fluoranthene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
Pyrene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C1-Fluoranthenes/Pyrenes	**J 3.89** (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C2-Fluoranthenes/Pyrenes	**J 2.83** (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C3-Fluoranthenes/Pyrenes	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
Benzo(b)fluorene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
Benzo(c)fluorene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
2-Methylpyrene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
4-Methylpyrene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
1-Methylpyrene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
Benz(a)anthracene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
Chrysene/triphenylene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C1-Benzo(a)anthracenes/Chrysenes	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C2-Benzo(a)anthracenes/Chrysenes	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C3-Benzo(a)anthracenes/Chrysenes	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C4-Benzo(a)anthracenes/Chrysenes	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
Benzo(b)fluoranthene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
Benzo(j/k)fluoranthene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
Benzo(e)pyrene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
Benzo(a)pyrene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
Perylene	**J 2.91** (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
Indeno(1,2,3-cd)pyrene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
Dibenzo(a,h)anthracene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
Benzo(g,h,i)perylene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
Coronene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
Tetramethyl lead	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
Trimethylethyl lead	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
Dimethyldiethyl lead	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
Methyltriethyl lead	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
Tetraethyl lead	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
2,6,10-trimethyldodecane (1380)	**J 4.46** (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-888-S3
Date Sampled: 07/22/24 15:17
Percent Solids: 78
Initial Volume: 5.15
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-13
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**8.83** (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
2,6,10-trimethylpentadecane (1650)	**5.37** (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C-17	**B 33.4** (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
Pristane	**B, J 3.84** (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
C-18	**B 36.8** (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
Phytane	**B 5.23** (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
Carbazole	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
2,6-Dimethylnaphthalene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
2,3,5-Trimethylnaphthene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
4-Methyldibenzothiophene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
2/3-Methyldibenzothiophene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
1-Methyldibenzothiophene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
3-Methylphenanthrene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
2-Methylphenanthrene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
2-Methylanthracene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
4/9-Methylphenanthrene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401
1-Methylphenanthrene	ND (4.95)	2.48	8270 Mod		1	IBM	07/26/24 12:16	F4G0001	FG42401

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*78 %*		*50-120*
Surrogate: Naphthalene-d8	*73 %*		*50-120*
Surrogate: Phenanthrene-d10	*87 %*		*50-120*
Surrogate: Perylene-d12	*78 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-888-S3
Date Sampled: 07/22/24 15:17
Percent Solids: N/A

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-13
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**4280** (500)		LK		1	CCP	07/29/24 19:01	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-876-S1
Date Sampled: 07/22/24 13:15
Percent Solids: 63
Initial Volume: 5.13
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-14
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**84.6** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C1-Benzene	**108** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C2-Benzenes	**132** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C3-Benzenes	**25.2** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C4-Benzenes	**34.5** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C5-Benzenes	**17.1** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
Methylcyclohexane	**8.63** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
Toluene	**176** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
Ethylbenzene	**17.3** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
m,p-Xylene	**231** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
Styrene	**B 137** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
o-Xylene	**13.6** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
Isopropylbenzene	ND (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
n-Propylbenzene	**11.8** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
1,3,5-Trimethylbenzene	**10.5** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
1,2,3-Trimethylbenzene	**11.6** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
1,2,4-Trimethylbenzene	**14.2** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
t-Butylbenzene	ND (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
sec-Butylbenzene	ND (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
p-Isopropyltoluene	**12.9** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
n-Butylbenzene	**16.4** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
trans-Decalin	**37.2** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
cis-Decalin	**6.78** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C1-Decalins	**132** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C2-Decalins	**166** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C3-Decalins	**151** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C4-Decalins	**258** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
Benzo(b)thiophene	**J 5.10** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C1-Benzo(b)thiophenes	**8.69** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C2-Benzo(b)thiophenes	**25.0** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C3-Benzo(b)thiophenes	**15.4** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C4-Benzo(b)thiophenes	**6.74** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-876-S1
Date Sampled: 07/22/24 13:15
Percent Solids: 63
Initial Volume: 5.13
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-14
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**60.6** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
2-Methylnaphthalene	**41.7** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
1-Methylnaphthalene	**31.7** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C1-Naphthalenes	**46.7** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C2-Naphthalenes	**109** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C3-Naphthalenes	**103** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C4-Naphthalenes	**91.3** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
Biphenyl	**31.6** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
Acenaphthylene	**318** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
Acenaphthene	**91.9** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
Dibenzofuran	**40.8** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
Fluorene	**80.5** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C1-Fluorenes	**70.5** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C2-Fluorenes	**101** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C3-Fluorenes	**170** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
Dibenzothiophene	**67.3** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C1-Dibenzothiophenes	**100** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C2-Dibenzothiophenes	**144** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C3-Dibenzothiophenes	**156** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C4-Dibenzothiophenes	**106** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
Phenanthrene	**843** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
Anthracene	**371** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C1-Phenanthrenes/Anthracenes	**583** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C2-Phenanthrenes/Anthracenes	**482** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C3-Phenanthrenes/Anthracenes	**291** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C4-Phenanthrenes/Anthracenes	**140** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
Retene	**58.1** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
Benzo(b)naphtho(2,1-d)thiophene	**180** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C0-Benzonaphthothiophenes	**331** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C1-Benzonaphthothiophenes	**226** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C2-Benzonaphthothiophenes	**203** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C3-Benzonaphthothiophenes	**157** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-876-S1
Date Sampled: 07/22/24 13:15
Percent Solids: 63
Initial Volume: 5.13
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-14
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**79.9** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
Fluoranthene	**2090** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
Pyrene	**2150** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C1-Fluoranthenes/Pyrenes	**1180** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C2-Fluoranthenes/Pyrenes	**657** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C3-Fluoranthenes/Pyrenes	**290** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
Benzo(b)fluorene	**121** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
Benzo(c)fluorene	**62.1** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
2-Methylpyrene	**167** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
4-Methylpyrene	**162** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
1-Methylpyrene	**128** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
Benz(a)anthracene	**1150** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
Chrysene/triphenylene	**1270** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C1-Benzo(a)anthracenes/Chrysenes	**713** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C2-Benzo(a)anthracenes/Chrysenes	**371** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C3-Benzo(a)anthracenes/Chrysenes	**201** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C4-Benzo(a)anthracenes/Chrysenes	**89.6** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
Benzo(b)fluoranthene	**1090** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
Benzo(j/k)fluoranthene	**1090** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
Benzo(e)pyrene	**993** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
Benzo(a)pyrene	**1490** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
Perylene	**440** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
Indeno(1,2,3-cd)pyrene	**951** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
Dibenzo(a,h)anthracene	**234** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
Benzo(g,h,i)perylene	**838** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
Coronene	**228** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
Tetramethyl lead	ND (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
Trimethylethyl lead	ND (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
Dimethyldiethyl lead	ND (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
Methyltriethyl lead	ND (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
Tetraethyl lead	ND (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
2,6,10-trimethyldodecane (1380)	**95.4** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-876-S1
Date Sampled: 07/22/24 13:15
Percent Solids: 63
Initial Volume: 5.13
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-14
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**189** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
2,6,10-trimethylpentadecane (1650)	**104** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C-17	**211** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
Pristane	**240** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
C-18	**B 98.6** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
Phytane	**249** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
Carbazole	**94.0** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
2,6-Dimethylnaphthalene	**37.4** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
2,3,5-Trimethylnaphthene	**7.42** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
4-Methyldibenzothiophene	**36.0** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
2/3-Methyldibenzothiophene	**33.6** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
1-Methyldibenzothiophene	**14.0** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
3-Methylphenanthrene	**130** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
2-Methylphenanthrene	**136** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
2-Methylanthracene	**80.1** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
4/9-Methylphenanthrene	**147** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401
1-Methylphenanthrene	**88.1** (6.15)	3.07	8270 Mod		1	IBM	07/26/24 13:35	F4G0001	FG42401

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*74 %*		*50-120*
Surrogate: Naphthalene-d8	*75 %*		*50-120*
Surrogate: Phenanthrene-d10	*83 %*		*50-120*
Surrogate: Perylene-d12	*89 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-876-S1
Date Sampled: 07/22/24 13:15
Percent Solids: N/A

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-14
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**20200** (500)		LK		1	CCP	07/30/24 11:08	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-876-S2
Date Sampled: 07/22/24 13:16
Percent Solids: 52
Initial Volume: 6.09
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-15
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**242** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C1-Benzene	**455** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C2-Benzenes	**370** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C3-Benzenes	**92.9** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C4-Benzenes	**389** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C5-Benzenes	**491** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
Methylcyclohexane	**13.4** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
Toluene	**643** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
Ethylbenzene	**34.7** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
m,p-Xylene	**609** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
Styrene	**328** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
o-Xylene	**25.4** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
Isopropylbenzene	**J 4.14** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
n-Propylbenzene	**29.1** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
1,3,5-Trimethylbenzene	**11.2** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
1,2,3-Trimethylbenzene	**28.7** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
1,2,4-Trimethylbenzene	**40.3** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
t-Butylbenzene	ND (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
sec-Butylbenzene	**J 5.07** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
p-Isopropyltoluene	**25.1** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
n-Butylbenzene	**91.9** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
trans-Decalin	**3250** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
cis-Decalin	**342** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C1-Decalins	**4420** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C2-Decalins	**1340** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C3-Decalins	**605** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C4-Decalins	**957** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
Benzo(b)thiophene	**9.52** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C1-Benzo(b)thiophenes	**23.0** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C2-Benzo(b)thiophenes	**75.1** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C3-Benzo(b)thiophenes	**56.1** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C4-Benzo(b)thiophenes	**43.3** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-876-S2
Date Sampled: 07/22/24 13:16
Percent Solids: 52
Initial Volume: 6.09
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-15
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**79.0** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
2-Methylnaphthalene	**66.6** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
1-Methylnaphthalene	**39.5** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C1-Naphthalenes	**68.8** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C2-Naphthalenes	**398** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C3-Naphthalenes	**802** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C4-Naphthalenes	**840** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
Biphenyl	**142** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
Acenaphthylene	**268** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
Acenaphthene	**162** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
Dibenzofuran	**39.1** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
Fluorene	**92.1** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C1-Fluorenes	**212** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C2-Fluorenes	**443** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C3-Fluorenes	**493** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
Dibenzothiophene	**100** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C1-Dibenzothiophenes	**287** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C2-Dibenzothiophenes	**462** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C3-Dibenzothiophenes	**483** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C4-Dibenzothiophenes	**320** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
Phenanthrene	**931** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
Anthracene	**380** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C1-Phenanthrenes/Anthracenes	**1060** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C2-Phenanthrenes/Anthracenes	**1080** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C3-Phenanthrenes/Anthracenes	**695** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C4-Phenanthrenes/Anthracenes	**330** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
Retene	**93.1** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
Benzo(b)naphtho(2,1-d)thiophene	**156** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C0-Benzonaphthothiophenes	**297** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C1-Benzonaphthothiophenes	**287** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C2-Benzonaphthothiophenes	**320** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C3-Benzonaphthothiophenes	**243** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-876-S2
Date Sampled: 07/22/24 13:16
Percent Solids: 52
Initial Volume: 6.09
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-15
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**131** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
Fluoranthene	**1550** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
Pyrene	**1930** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C1-Fluoranthenes/Pyrenes	**1180** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C2-Fluoranthenes/Pyrenes	**630** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C3-Fluoranthenes/Pyrenes	**331** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
Benzo(b)fluorene	**129** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
Benzo(c)fluorene	**63.0** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
2-Methylpyrene	**168** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
4-Methylpyrene	**172** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
1-Methylpyrene	**135** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
Benz(a)anthracene	**822** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
Chrysene/triphenylene	**998** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C1-Benzo(a)anthracenes/Chrysenes	**663** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C2-Benzo(a)anthracenes/Chrysenes	**426** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C3-Benzo(a)anthracenes/Chrysenes	**277** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C4-Benzo(a)anthracenes/Chrysenes	**132** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
Benzo(b)fluoranthene	**740** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
Benzo(j/k)fluoranthene	**769** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
Benzo(e)pyrene	**719** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
Benzo(a)pyrene	**998** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
Perylene	**591** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
Indeno(1,2,3-cd)pyrene	**639** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
Dibenzo(a,h)anthracene	**160** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
Benzo(g,h,i)perylene	**570** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
Coronene	**155** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
Tetramethyl lead	ND (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
Trimethylethyl lead	ND (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
Dimethyldiethyl lead	ND (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
Methyltriethyl lead	ND (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
Tetraethyl lead	ND (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
2,6,10-trimethyldodecane (1380)	**890** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-876-S2
Date Sampled: 07/22/24 13:16
Percent Solids: 52
Initial Volume: 6.09
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-15
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/24/24 7:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**1380** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
2,6,10-trimethylpentadecane (1650)	**1340** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C-17	ND (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
Pristane	**3650** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
C-18	**B 146** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
Phytane	**2750** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
Carbazole	**45.0** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
2,6-Dimethylnaphthalene	**97.0** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
2,3,5-Trimethylnaphthene	**54.9** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
4-Methyldibenzothiophene	**121** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
2/3-Methyldibenzothiophene	**107** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
1-Methyldibenzothiophene	**33.8** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
3-Methylphenanthrene	**243** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
2-Methylphenanthrene	**277** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
2-Methylanthracene	**91.5** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
4/9-Methylphenanthrene	**266** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401
1-Methylphenanthrene	**148** (6.37)	3.19	8270 Mod		1	IBM	07/26/24 14:55	F4G0001	FG42401

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*74 %*		*50-120*
Surrogate: Naphthalene-d8	*74 %*		*50-120*
Surrogate: Phenanthrene-d10	*81 %*		*50-120*
Surrogate: Perylene-d12	*91 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-876-S2
Date Sampled: 07/22/24 13:16
Percent Solids: N/A

ESS Laboratory Work Order: F240020
ESS Laboratory Sample ID: F240020-15
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**43600** (500)		LK		1	CCP	07/30/24 12:14	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240020

Quality Control Data

Classical Chemistry

Batch DG42254 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	500	mg/kg							
Total Organic Carbon (2)	ND	500	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240020

Quality Control Data

Classical Chemistry

Batch DG42254 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	8730	500	mg/kg	10010		87	80-120			
Total Organic Carbon (2)	8840	500	mg/kg	10010		88	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240020

Quality Control Data

Classical Chemistry

Batch DG42254 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	8420	500	mg/kg	10010		84	80-120	4	25	
Total Organic Carbon (2)	9130	500	mg/kg	10010		91	80-120	3	25	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240020

Quality Control Data

Classical Chemistry

Batch DG42537 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	500	mg/kg							
Total Organic Carbon (2)	ND	500	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240020

Quality Control Data

Classical Chemistry

Batch DG42537 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9680	500	mg/kg	10010		97	80-120			
Total Organic Carbon (2)	8720	500	mg/kg	10010		87	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240020

Quality Control Data

Classical Chemistry

Batch DG42537 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	8580	500	mg/kg	10010		86	80-120	12	25	
Total Organic Carbon (2)	8750	500	mg/kg	10010		87	80-120	0.3	25	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240020

Quality Control Data

Alkylated PAHs

Batch FG42401 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	2.26	4.00	ug/Kg wet							J
C1-Benzene	ND	4.00	ug/Kg wet							
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	3.61	4.00	ug/Kg wet							J
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	17.4	4.00	ug/Kg wet							
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240020

Quality Control Data

Alkylated PAHs

Batch FG42401 - 3570			
C1-Fluorenes	ND	4.00	ug/Kg wet
C2-Fluorenes	ND	4.00	ug/Kg wet
C3-Fluorenes	ND	4.00	ug/Kg wet
Dibenzothiophene	ND	4.00	ug/Kg wet
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet
Phenanthrene	ND	4.00	ug/Kg wet
Anthracene	ND	4.00	ug/Kg wet
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
Retene	ND	4.00	ug/Kg wet
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
Fluoranthene	ND	4.00	ug/Kg wet
Pyrene	ND	4.00	ug/Kg wet
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
Benzo(b)fluorene	ND	4.00	ug/Kg wet
Benzo(c)fluorene	ND	4.00	ug/Kg wet
2-Methylpyrene	ND	4.00	ug/Kg wet
4-Methylpyrene	ND	4.00	ug/Kg wet
1-Methylpyrene	ND	4.00	ug/Kg wet
Benz(a)anthracene	ND	4.00	ug/Kg wet
Chrysene/triphenylene	ND	4.00	ug/Kg wet
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet
Benzo(e)pyrene	ND	4.00	ug/Kg wet
Benzo(a)pyrene	ND	4.00	ug/Kg wet
Perylene	ND	4.00	ug/Kg wet
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet
Coronene	ND	4.00	ug/Kg wet
Tetramethyl lead	ND	4.00	ug/Kg wet
Trimethylethyl lead	ND	4.00	ug/Kg wet

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240020

Quality Control Data

Alkylated PAHs

Batch FG42401 - 3570						
Dimethyldiethyl lead	ND	4.00	ug/Kg wet			
Methyltriethyl lead	ND	4.00	ug/Kg wet			
Tetraethyl lead	ND	4.00	ug/Kg wet			
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet			
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet			
2,6,10-trimethylpentadecane (1650)	ND	4.00	ug/Kg wet			
C-17	12.0	4.00	ug/Kg wet			
Pristane	5.30	4.00	ug/Kg wet			
C-18	15.1	4.00	ug/Kg wet			
Phytane	6.92	4.00	ug/Kg wet			
Carbazole	ND	4.00	ug/Kg wet			
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet			
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet			
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet			
3-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylphenanthrene	ND	4.00	ug/Kg wet			
2-Methylanthracene	ND	4.00	ug/Kg wet			
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet			
1-Methylphenanthrene	ND	4.00	ug/Kg wet			
Surrogate: Toluene-D8	*354*		ug/Kg wet	*400.0*	*89*	*50-120*
Surrogate: Naphthalene-d8	*308*		ug/Kg wet	*400.0*	*77*	*50-120*
Surrogate: Phenanthrene-d10	*354*		ug/Kg wet	*400.0*	*88*	*50-120*
Surrogate: Perylene-d12	*356*		ug/Kg wet	*400.0*	*89*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240020

Quality Control Data

Alkylated PAHs

Batch FG42401 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	283	4.00	ug/Kg wet	400.0		71	60-130			
Methylcyclohexane	256	4.00	ug/Kg wet	400.0		64	60-130			
Toluene	319	4.00	ug/Kg wet	400.0		80	60-130			
Ethylbenzene	332	4.00	ug/Kg wet	400.0		83	60-130			
m,p-Xylene	326	4.00	ug/Kg wet	400.0		82	60-130			
Styrene	251	4.00	ug/Kg wet	400.0		63	60-130			
o-Xylene	341	4.00	ug/Kg wet	400.0		85	60-130			
Isopropylbenzene	331	4.00	ug/Kg wet	400.0		83	60-130			
n-Propylbenzene	329	4.00	ug/Kg wet	400.0		82	60-130			
1,3,5-Trimethylbenzene	331	4.00	ug/Kg wet	400.0		83	60-130			
1,2,3-Trimethylbenzene	340	4.00	ug/Kg wet	400.0		85	60-130			
1,2,4-Trimethylbenzene	335	4.00	ug/Kg wet	400.0		84	60-130			
t-Butylbenzene	337	4.00	ug/Kg wet	400.0		84	60-130			
sec-Butylbenzene	337	4.00	ug/Kg wet	400.0		84	60-130			
p-Isopropyltoluene	341	4.00	ug/Kg wet	400.0		85	60-130			
n-Butylbenzene	336	4.00	ug/Kg wet	400.0		84	60-130			
trans-Decalin	357	4.00	ug/Kg wet	400.0		89	60-130			
cis-Decalin	354	4.00	ug/Kg wet	400.0		88	60-130			
Benzo(b)thiophene	287	4.00	ug/Kg wet	400.0		72	60-130			
Naphthalene	301	4.00	ug/Kg wet	400.0		75	60-130			
2-Methylnaphthalene	300	4.00	ug/Kg wet	400.0		75	60-130			
1-Methylnaphthalene	309	4.00	ug/Kg wet	400.0		77	60-130			
Biphenyl	303	4.00	ug/Kg wet	400.0		76	60-130			
Acenaphthylene	314	4.00	ug/Kg wet	400.0		79	60-130			
Acenaphthene	330	4.00	ug/Kg wet	400.0		83	60-130			
Dibenzofuran	307	4.00	ug/Kg wet	400.0		77	60-130			
Fluorene	325	4.00	ug/Kg wet	400.0		81	60-130			
Dibenzothiophene	331	4.00	ug/Kg wet	400.0		83	60-130			
Phenanthrene	340	4.00	ug/Kg wet	400.0		85	60-130			
Anthracene	339	4.00	ug/Kg wet	400.0		85	60-130			
Retene	391	4.00	ug/Kg wet	400.0		98	60-130			
Benzo(b)naphtho(2,1-d)thiophene	357	4.00	ug/Kg wet	400.0		89	60-130			
Fluoranthene	361	4.00	ug/Kg wet	400.0		90	60-130			
Pyrene	357	4.00	ug/Kg wet	400.0		89	60-130			
Benz(a)anthracene	353	4.00	ug/Kg wet	400.0		88	60-130			
Chrysene/triphenylene	353	4.00	ug/Kg wet	400.0		88	60-130			
Benzo(b)fluoranthene	358	4.00	ug/Kg wet	400.0		89	60-130			
Benzo(j/k)fluoranthene	359	4.00	ug/Kg wet	400.0		90	60-130			
Benzo(e)pyrene	347	4.00	ug/Kg wet	400.0		87	60-130			
Benzo(a)pyrene	341	4.00	ug/Kg wet	400.0		85	60-130			
Perylene	345	4.00	ug/Kg wet	400.0		86	60-130			
Indeno(1,2,3-cd)pyrene	342	4.00	ug/Kg wet	400.0		85	60-130			
Dibenzo(a,h)anthracene	359	4.00	ug/Kg wet	400.0		90	60-130			
Benzo(g,h,i)perylene	324	4.00	ug/Kg wet	400.0		81	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240020

Quality Control Data

Alkylated PAHs

Batch FG42401 - 3570						
Coronene	323	4.00	ug/Kg wet	400.0	81	60-130
Tetraethyl lead	241	4.00	ug/Kg wet	400.0	60	60-130
Surrogate: Toluene-D8	*354*		ug/Kg wet	*400.0*	*88*	*50-120*
Surrogate: Naphthalene-d8	*321*		ug/Kg wet	*400.0*	*80*	*50-120*
Surrogate: Phenanthrene-d10	*371*		ug/Kg wet	*400.0*	*93*	*50-120*
Surrogate: Perylene-d12	*365*		ug/Kg wet	*400.0*	*91*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240020

Quality Control Data

Alkylated PAHs

Batch FG42401 - 3570

Duplicate **Source: F240020-06**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	84.2	5.44	ug/Kg dry		85.9			2	50	
C1-Benzene	83.8	5.44	ug/Kg dry		84.5			0.8	50	
C2-Benzenes	199	5.44	ug/Kg dry		211			6	50	
C3-Benzenes	11.4	5.44	ug/Kg dry		9.09			23	50	
C4-Benzenes	7.21	5.44	ug/Kg dry		4.99			36	50	
C5-Benzenes	2.94	5.44	ug/Kg dry		5.70			64	50	J
Methylcyclohexane	ND	5.44	ug/Kg dry		ND				50	
Toluene	137	5.44	ug/Kg dry		142			4	50	
Ethylbenzene	10.6	5.44	ug/Kg dry		10.1			5	50	
m,p-Xylene	356	5.44	ug/Kg dry		376			6	50	
Styrene	26.8	5.44	ug/Kg dry		29.0			8	50	
o-Xylene	9.02	5.44	ug/Kg dry		8.79			3	50	
Isopropylbenzene	ND	5.44	ug/Kg dry		ND				50	
n-Propylbenzene	10.0	5.44	ug/Kg dry		9.86			2	50	
1,3,5-Trimethylbenzene	6.09	5.44	ug/Kg dry		6.23			2	50	
1,2,3-Trimethylbenzene	10.1	5.44	ug/Kg dry		9.78			3	50	
1,2,4-Trimethylbenzene	6.88	5.44	ug/Kg dry		7.86			13	50	
t-Butylbenzene	ND	5.44	ug/Kg dry		ND				50	
sec-Butylbenzene	ND	5.44	ug/Kg dry		ND				50	
p-Isopropyltoluene	12.0	5.44	ug/Kg dry		11.6			4	50	
n-Butylbenzene	14.1	5.44	ug/Kg dry		14.2			0.9	50	
trans-Decalin	5.08	5.44	ug/Kg dry		ND				50	J
cis-Decalin	ND	5.44	ug/Kg dry		ND				50	
C1-Decalins	20.1	5.44	ug/Kg dry		19.3			4	50	
C2-Decalins	27.9	5.44	ug/Kg dry		26.0			7	50	
C3-Decalins	ND	5.44	ug/Kg dry		ND				50	
C4-Decalins	ND	5.44	ug/Kg dry		ND				50	
Benzo(b)thiophene	3.12	5.44	ug/Kg dry		2.94			6	50	J
C1-Benzo(b)thiophenes	8.46	5.44	ug/Kg dry		7.60			11	50	
C2-Benzo(b)thiophenes	24.9	5.44	ug/Kg dry		24.0			4	50	
C3-Benzo(b)thiophenes	19.1	5.44	ug/Kg dry		15.5			21	50	
C4-Benzo(b)thiophenes	8.16	5.44	ug/Kg dry		6.80			18	50	
Naphthalene	19.8	5.44	ug/Kg dry		19.6			1	50	
2-Methylnaphthalene	12.6	5.44	ug/Kg dry		12.8			1	50	
1-Methylnaphthalene	10.0	5.44	ug/Kg dry		9.93			1	50	
C1-Naphthalenes	15.2	5.44	ug/Kg dry		14.8			3	50	
C2-Naphthalenes	69.4	5.44	ug/Kg dry		71.2			3	50	
C3-Naphthalenes	56.7	5.44	ug/Kg dry		57.1			0.6	50	
C4-Naphthalenes	50.0	5.44	ug/Kg dry		47.6			5	50	
Biphenyl	13.5	5.44	ug/Kg dry		13.8			2	50	
Acenaphthylene	122	5.44	ug/Kg dry		105			14	50	
Acenaphthene	113	5.44	ug/Kg dry		115			2	50	
Dibenzofuran	20.8	5.44	ug/Kg dry		23.0			10	50	
Fluorene	41.6	5.44	ug/Kg dry		47.3			13	50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240020

Quality Control Data

Alkylated PAHs

Batch FG42401 - 3570						
C1-Fluorenes	48.6	5.44	ug/Kg dry	50.6	4	50
C2-Fluorenes	23.4	5.44	ug/Kg dry	17.2	31	50
C3-Fluorenes	62.4	5.44	ug/Kg dry	67.0	7	50
Dibenzothiophene	42.1	5.44	ug/Kg dry	44.0	4	50
C1-Dibenzothiophenes	47.4	5.44	ug/Kg dry	43.6	8	50
C2-Dibenzothiophenes	62.3	5.44	ug/Kg dry	54.4	14	50
C3-Dibenzothiophenes	54.3	5.44	ug/Kg dry	48.4	12	50
C4-Dibenzothiophenes	40.7	5.44	ug/Kg dry	40.4	0.8	50
Phenanthrene	256	5.44	ug/Kg dry	294	14	50
Anthracene	169	5.44	ug/Kg dry	166	1	50
C1-Phenanthrenes/Anthracenes	182	5.44	ug/Kg dry	196	7	50
C2-Phenanthrenes/Anthracenes	149	5.44	ug/Kg dry	144	3	50
C3-Phenanthrenes/Anthracenes	85.5	5.44	ug/Kg dry	75.8	12	50
C4-Phenanthrenes/Anthracenes	35.7	5.44	ug/Kg dry	37.2	4	50
Retene	17.7	5.44	ug/Kg dry	17.8	0.8	50
Benzo(b)naphtho(2,1-d)thiophene	77.2	5.44	ug/Kg dry	67.5	13	50
C0-Benzonaphthothiophenes	141	5.44	ug/Kg dry	125	12	50
C1-Benzonaphthothiophenes	89.1	5.44	ug/Kg dry	81.9	8	50
C2-Benzonaphthothiophenes	107	5.44	ug/Kg dry	105	2	50
C3-Benzonaphthothiophenes	105	5.44	ug/Kg dry	106	0.9	50
C4-Benzonaphthothiophenes	69.6	5.44	ug/Kg dry	77.5	11	50
Fluoranthene	981	5.44	ug/Kg dry	1000	2	50
Pyrene	840	5.44	ug/Kg dry	861	2	50
C1-Fluoranthenes/Pyrenes	393	5.44	ug/Kg dry	367	7	50
C2-Fluoranthenes/Pyrenes	215	5.44	ug/Kg dry	204	5	50
C3-Fluoranthenes/Pyrenes	92.0	5.44	ug/Kg dry	94.0	2	50
Benzo(b)fluorene	56.2	5.44	ug/Kg dry	50.5	11	50
Benzo(c)fluorene	24.7	5.44	ug/Kg dry	21.5	14	50
2-Methylpyrene	47.4	5.44	ug/Kg dry	46.6	2	50
4-Methylpyrene	43.7	5.44	ug/Kg dry	40.1	8	50
1-Methylpyrene	31.5	5.44	ug/Kg dry	29.5	7	50
Benz(a)anthracene	414	5.44	ug/Kg dry	386	7	50
Chrysene/triphenylene	500	5.44	ug/Kg dry	443	12	50
C1-Benzo(a)anthracenes/Chrysenes	210	5.44	ug/Kg dry	189	10	50
C2-Benzo(a)anthracenes/Chrysenes	123	5.44	ug/Kg dry	112	10	50
C3-Benzo(a)anthracenes/Chrysenes	78.0	5.44	ug/Kg dry	79.0	1	50
C4-Benzo(a)anthracenes/Chrysenes	46.2	5.44	ug/Kg dry	47.2	2	50
Benzo(b)fluoranthene	408	5.44	ug/Kg dry	385	6	50
Benzo(j/k)fluoranthene	413	5.44	ug/Kg dry	378	9	50
Benzo(e)pyrene	348	5.44	ug/Kg dry	322	8	50
Benzo(a)pyrene	473	5.44	ug/Kg dry	436	8	50
Perylene	330	5.44	ug/Kg dry	329	0.2	50
Indeno(1,2,3-cd)pyrene	336	5.44	ug/Kg dry	309	8	50
Dibenzo(a,h)anthracene	88.1	5.44	ug/Kg dry	74.5	17	50
Benzo(g,h,i)perylene	288	5.44	ug/Kg dry	267	8	50
Coronene	83.4	5.44	ug/Kg dry	77.7	7	50
Tetramethyl lead	ND	5.44	ug/Kg dry	ND		50
Trimethylethyl lead	ND	5.44	ug/Kg dry	ND		50

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240020

Quality Control Data

Alkylated PAHs

Batch FG42401 - 3570									
Dimethyldiethyl lead	ND	5.44	ug/Kg dry		ND			50	
Methyltriethyl lead	ND	5.44	ug/Kg dry		ND			50	
Tetraethyl lead	ND	5.44	ug/Kg dry		ND			50	
2,6,10-trimethyldodecane (1380)	18.0	5.44	ug/Kg dry		18.0		0.07	50	
2,6,10-trimethyltridecane (1470)	103	5.44	ug/Kg dry		90.6		13	50	
2,6,10-trimethylpentadecane (1650)	25.1	5.44	ug/Kg dry		18.2		32	50	
C-17	160	5.44	ug/Kg dry		155		3	50	
Pristane	43.1	5.44	ug/Kg dry		42.9		0.4	50	
C-18	90.7	5.44	ug/Kg dry		84.4		7	50	
Phytane	61.0	5.44	ug/Kg dry		59.6		2	50	
Carbazole	31.3	5.44	ug/Kg dry		31.7		1	50	
2,6-Dimethylnaphthalene	29.0	5.44	ug/Kg dry		31.1		7	50	
2,3,5-Trimethylnaphthene	2.93	5.44	ug/Kg dry		2.85		3	50	J
4-Methyldibenzothiophene	15.6	5.44	ug/Kg dry		15.4		1	50	
2/3-Methyldibenzothiophene	12.6	5.44	ug/Kg dry		12.5		0.9	50	
1-Methyldibenzothiophene	9.99	5.44	ug/Kg dry		8.37		18	50	
3-Methylphenanthrene	37.6	5.44	ug/Kg dry		39.6		5	50	
2-Methylphenanthrene	36.5	5.44	ug/Kg dry		39.7		8	50	
2-Methylanthracene	30.0	5.44	ug/Kg dry		28.4		5	50	
4/9-Methylphenanthrene	44.1	5.44	ug/Kg dry		42.3		4	50	
1-Methylphenanthrene	27.6	5.44	ug/Kg dry		32.0		15	50	
Surrogate: Toluene-D8	*380*		ug/Kg dry	*544.4*		*70*	*50-120*		
Surrogate: Naphthalene-d8	*367*		ug/Kg dry	*544.4*		*67*	*50-120*		
Surrogate: Phenanthrene-d10	*390*		ug/Kg dry	*544.4*		*72*	*50-120*		
Surrogate: Perylene-d12	*408*		ug/Kg dry	*544.4*		*75*	*50-120*		

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F240020

Notes and Definitions

U	Analyte included in the analysis, but not detected
J	Reported between MDL and MRL
D	Diluted.
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240020

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 2460834 / F240020

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman
781-721-4091 rhoffman@geiconsultants.com

Send Report to: Ryan Hoffman
labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY AND MCP ANALYTICAL METHODS REQUIRED: (YES) NO

STATE AND FEDERAL REGULATORY REQUIREMENTS/REPORT LIMITS

State/Federal Program: (MA) 401WQC Other ____ NH RI CT NY ME

MA MCP Criteria are Method 1 S-1 and GW-2/GW-3. Circle if GW-1 is required.

Preservative

Analysis

Sample Handling

Samples Field Filtered
YES (NO) NA

Sampled Shipped With Ice
(YES) NO

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Preservative: None	Preservative: None	Parent and Alkylated MAHs & PAHs 8270**	TOCs by Lloyd-Kahn
1	1804576-878-S1	7/22/2024	11:45	SO	1	SW			X	X
2	1804576-878-S2	7/22/2024	11:46	SO	1	SW			X	X
3	1804576-877-S1	7/22/2024	12:10	SO	1	SW			X	X
4	1804576-877-S2	7/22/2024	12:11	SO	1	SW			X	X
5	1804576-874-S1	7/22/2024	12:50	SO	1	SW			X	X
6	1804576-874-S2	7/22/2024	12:51	SO	1	SW			X	X
7	1804576-875-S1	7/22/2024	13:55	SO	1	SW			X	X
8	1804576-875-S2	7/22/2024	13:56	SO	1	SW			X	X
9	1804576-879-S1	7/22/2024	14:35	SO	1	SW			X	X
10	1804576-879-S2	7/22/2024	14:36	SO	1	SW			X	X
11	1804576-888-S1	7/22/2024	15:15	SO	1	SW			X	X
12	1804576-888-S2	7/22/2024	15:16	SO	1	SW			X	X

	Relinquished by sampler: (signature)	Date	Time	Received by: (signature)
1.	Dan Mill	7/22/24	17:45	GEI Field Room
2.	GEI Field Room	7/23/24	11:30	2.
3.		7/23/24	11:30	3. AO 7/23/24 11:30
4.	AO 2.0 onice	7/23/24	1615	4.
5.				5.

Turnaround Time (Business days):

Standard TAT X 4-Day ____ 3-Day ____
2-Day ____ 1-Day ____ Other ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

**Parent and Alkylated MAHs & PAHs (34) by GC/MS/SIM/SCAN

Sample Matrix Abbreviations: SO = Soil GW = Groundwater SW = Surface Water SD = Sediment CO = Concrete PC = Paint Chip CLK = Caulk

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 2460834 / F240020

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000

Project Information

Project Name: Amesbury Former MGP

Project Number: 1804576

Project Location: Amesbury, MA

Project Manager: Ryan Hoffman
781-721-4091 rhoffman@geiconsultants.com

Send Report to: Ryan Hoffman
labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY AND MCP ANALYTICAL METHODS REQUIRED: (YES) NO

STATE AND FEDERAL REGULATORY REQUIREMENTS/REPORT LIMITS

State/Federal Program: (MA) 401WQC Other ____ NH RI CT NY ME

MA MCP Criteria are Method 1 S-1 and GW-2/GW-3. Circle if GW-1 is required.

Sample Handling

Samples Field Filtered
YES (NO) NA

Sampled Shipped With Ice
(YES) NO

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Preservative: None	Preservative: None	Analysis: Parent and Alkylated MAHs & PAHs 8270**	Analysis: TOCs by Lloyd-Kahn
13	1804576-888-S3	7/22/2024	15:17	SO	1	SW			X	X
14	1804576-876-S1	7/22/2024	13:15	SO	1	SW			X	X
15	1804576-876-S2	7/22/2024	13:16	SO	1	SW			X	X

Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1. David Mill	7/22/24	17:45	GEI Field Room
Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
2. GEI Field Room	7/23/24	11:30	2.
Relinquished by: (signature)	Date:	Time:	Received by: (signature)
3.	7/23/24	11:30	3. AO 7/23/24 1130
Relinquished by: (signature)	Date:	Time:	Received by: (signature)
4. AO 2.0 ONICE	7/23/24	1615	4.
Relinquished by: (signature)	Date:	Time:	Received by: (signature)
5.			5.

Turnaround Time (Business days):

Standard TAT X 4-Day ____ 3-Day ____
2-Day ____ 1-Day ____ Other ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

**Parent and Alkylated MAHs & PAHs (34) by GC/MS/SIM/SCAN

Sample Matrix Abbreviations: SO = Soil GW = Groundwater SW = Surface Water SD = Sediment CO = Concrete PC = Paint Chip CLK = Caulk

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants

Shipped/Delivered Via: ESS Courier

ESS Project ID: F240020
Date Received: 7/23/2024
Project Due Date: 7/30/2024
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 2 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA
13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By/Acid Lot#:
    b. If dissolved metals are requested, are they: Yes / No Field Filtered Yes / No To Be Lab Filtered
    c. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Resolution:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1	719	Yes	N/A	Yes	4 oz. Jar	NP	
2	720	Yes	N/A	Yes	4 oz. Jar	NP	
3	721	Yes	N/A	Yes	4 oz. Jar	NP	
4	722	Yes	N/A	Yes	4 oz. Jar	NP	
5	723	Yes	N/A	Yes	4 oz. Jar	NP	
6	724	Yes	N/A	Yes	4 oz. Jar	NP	
7	725	Yes	N/A	Yes	4 oz. Jar	NP	
8	726	Yes	N/A	Yes	4 oz. Jar	NP	
9	727	Yes	N/A	Yes	4 oz. Jar	NP	
10	728	Yes	N/A	Yes	4 oz. Jar	NP	
11	729	Yes	N/A	Yes	4 oz. Jar	NP	
12	730	Yes	N/A	Yes	4 oz. Jar	NP	
13	731	Yes	N/A	Yes	4 oz. Jar	NP	
14	732	Yes	N/A	Yes	4 oz. Jar	NP	
15	733	Yes	N/A	Yes	4 oz. Jar	NP	

2nd Review
Were all containers scanned into storage/lab? Initials Yes / No
Are barcode labels on correct containers? Yes / No / NA
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached?

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants

ESS Project ID: F240020

Date Received: 7/23/2024

Are all QC stickers attached? Yes / No (NA)

Are VOA stickers attached if bubbles noted? Yes / No (NA)

Completed By: _____ Date & Time: 7/23/24 1727

Reviewed By: _____ Date & Time: 7/23/24 1731

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: F240021

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 2:35 pm, Aug 12, 2024

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses

ESS - Cranston, RI	TOC

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240021

SAMPLE RECEIPT

The following samples were received on July 24, 2024 for the analyses specified on the enclosed Chain of Custody Record.

Lab Number	Sample Name	Matrix	Analysis
F240021-01	1804576-871-S1	Soil	8270 Mod, LK
F240021-02	1804576-871-S2	Soil	8270 Mod, LK
F240021-03	1804576-872-S1	Soil	8270 Mod, LK
F240021-04	1804576-872-S2	Soil	8270 Mod, LK
F240021-05	1804576-882-S1	Soil	8270 Mod, LK
F240021-06	1804576-882-S2	Soil	8270 Mod, LK
F240021-07	1804576-880-S1	Soil	8270 Mod, LK
F240021-08	1804576-880-S2	Soil	8270 Mod, LK
F240021-09	1804576-881-S1	Soil	8270 Mod, LK
F240021-10	1804576-881-S2	Soil	8270 Mod, LK
F240021-11	1804576-873-S1	Soil	8270 Mod, LK
F240021-12	1804576-873-S2	Soil	8270 Mod, LK
F240021-13	1804576-889-S1	Soil	8270 Mod, LK
F240021-14	1804576-889-S2	Soil	8270 Mod, LK
F240021-15	1804576-889-S3	Soil	8270 Mod, LK

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240021

PROJECT NARRATIVE

Alkylated PAHs

F240021-11	**Present in Method Blank (B).**
	C-18
F240021-14	**Present in Method Blank (B).**
	C-17 , C-18
F240021-15	**Present in Method Blank (B).**
	C-17 , C-18
F4G0002-CCV3	**Continuing Calibration %Diff/Drift is below control limit (CD-).**
	Styrene (28% @ 25%)

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240021

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015B Mod - TPH by GCFID
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D Mod - Alkylated PAHs and Benzenes
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3511 - Microsolvent Extraction Aqueous
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3570 - Microsolvent Extraction Soild
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-871-S1
Date Sampled: 07/23/24 12:30
Percent Solids: 78
Initial Volume: 5.18
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**51.2** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C1-Benzene	**63.0** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C2-Benzenes	**54.9** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C3-Benzenes	**11.6** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C4-Benzenes	**7.65** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C5-Benzenes	ND (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
Methylcyclohexane	**10.6** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
Toluene	**111** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
Ethylbenzene	**7.80** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
m,p-Xylene	**109** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
Styrene	**22.8** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
o-Xylene	**7.11** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
Isopropylbenzene	ND (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
n-Propylbenzene	**5.23** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
1,3,5-Trimethylbenzene	**9.67** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
1,2,3-Trimethylbenzene	**5.26** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
1,2,4-Trimethylbenzene	**9.10** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
t-Butylbenzene	ND (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
sec-Butylbenzene	ND (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
p-Isopropyltoluene	**5.89** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
n-Butylbenzene	**8.36** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
trans-Decalin	**5.14** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
cis-Decalin	**7.90** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C1-Decalins	**8.64** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C2-Decalins	**16.3** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C3-Decalins	**18.9** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C4-Decalins	**29.8** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
Benzo(b)thiophene	**10.8** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C1-Benzo(b)thiophenes	**9.05** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C2-Benzo(b)thiophenes	**16.1** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C3-Benzo(b)thiophenes	**12.3** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C4-Benzo(b)thiophenes	**4.99** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-871-S1
Date Sampled: 07/23/24 12:30
Percent Solids: 78
Initial Volume: 5.18
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**226** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
2-Methylnaphthalene	**103** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
1-Methylnaphthalene	**76.3** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C1-Naphthalenes	**112** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C2-Naphthalenes	**164** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C3-Naphthalenes	**126** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C4-Naphthalenes	**68.8** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
Biphenyl	**44.5** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
Acenaphthylene	**330** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
Acenaphthene	**310** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
Dibenzofuran	**253** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
Fluorene	**283** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C1-Fluorenes	**96.8** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C2-Fluorenes	**102** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C3-Fluorenes	**275** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
Dibenzothiophene	**257** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C1-Dibenzothiophenes	**155** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C2-Dibenzothiophenes	**119** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C3-Dibenzothiophenes	**73.7** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C4-Dibenzothiophenes	**39.1** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
Phenanthrene	**3160** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
Anthracene	**856** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C1-Phenanthrenes/Anthracenes	**1110** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C2-Phenanthrenes/Anthracenes	**583** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C3-Phenanthrenes/Anthracenes	**234** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C4-Phenanthrenes/Anthracenes	**83.8** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
Retene	**33.2** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
Benzo(b)naphtho(2,1-d)thiophene	**298** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C0-Benzonaphthothiophenes	**553** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C1-Benzonaphthothiophenes	**211** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C2-Benzonaphthothiophenes	**135** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C3-Benzonaphthothiophenes	**108** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-871-S1
Date Sampled: 07/23/24 12:30
Percent Solids: 78
Initial Volume: 5.18
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**52.7** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
Fluoranthene	**4140** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
Pyrene	**3890** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C1-Fluoranthenes/Pyrenes	**1410** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C2-Fluoranthenes/Pyrenes	**917** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C3-Fluoranthenes/Pyrenes	**334** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
Benzo(b)fluorene	**117** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
Benzo(c)fluorene	**61.1** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
2-Methylpyrene	**226** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
4-Methylpyrene	**189** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
1-Methylpyrene	**158** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
Benz(a)anthracene	**1900** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
Chrysene/triphenylene	**1980** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C1-Benzo(a)anthracenes/Chrysenes	**790** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C2-Benzo(a)anthracenes/Chrysenes	**357** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C3-Benzo(a)anthracenes/Chrysenes	**177** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C4-Benzo(a)anthracenes/Chrysenes	**80.8** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
Benzo(b)fluoranthene	**1630** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
Benzo(j/k)fluoranthene	**1510** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
Benzo(e)pyrene	**1410** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
Benzo(a)pyrene	**2220** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
Perylene	**510** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
Indeno(1,2,3-cd)pyrene	**1400** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
Dibenzo(a,h)anthracene	**336** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
Benzo(g,h,i)perylene	**1220** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
Coronene	**334** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
Tetramethyl lead	ND (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
Trimethylethyl lead	ND (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
Dimethyldiethyl lead	ND (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
Methyltriethyl lead	ND (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
Tetraethyl lead	ND (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
2,6,10-trimethyldodecane (1380)	**23.6** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-871-S1
Date Sampled: 07/23/24 12:30
Percent Solids: 78
Initial Volume: 5.18
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-01
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**49.0** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
2,6,10-trimethylpentadecane (1650)	**27.9** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C-17	**151** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
Pristane	**67.2** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
C-18	**72.6** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
Phytane	**55.5** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
Carbazole	**447** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
2,6-Dimethylnaphthalene	**48.1** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
2,3,5-Trimethylnaphthene	**10.5** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
4-Methyldibenzothiophene	**46.9** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
2/3-Methyldibenzothiophene	**51.3** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
1-Methyldibenzothiophene	**19.2** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
3-Methylphenanthrene	**256** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
2-Methylphenanthrene	**309** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
2-Methylanthracene	**133** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
4/9-Methylphenanthrene	**243** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901
1-Methylphenanthrene	**176** (4.93)	2.46	8270 Mod		1	IBM	07/31/24 14:59	F4G0002	FG42901

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*83 %*		*50-120*
Surrogate: Naphthalene-d8	*80 %*		*50-120*
Surrogate: Phenanthrene-d10	*87 %*		*50-120*
Surrogate: Perylene-d12	*88 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-871-S1
Date Sampled: 07/23/24 12:30
Percent Solids: 78

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**15600** (500)		LK		1	CCP	07/30/24 13:04	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-871-S2
Date Sampled: 07/23/24 12:31
Percent Solids: 55
Initial Volume: 5.04
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**237** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C1-Benzene	**234** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C2-Benzenes	**318** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C3-Benzenes	**104** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C4-Benzenes	**83.1** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C5-Benzenes	**35.8** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
Methylcyclohexane	**18.2** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
Toluene	**351** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
Ethylbenzene	**30.9** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
m,p-Xylene	**523** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
Styrene	**106** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
o-Xylene	**30.0** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
Isopropylbenzene	**J 6.33** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
n-Propylbenzene	**35.8** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
1,3,5-Trimethylbenzene	**24.1** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
1,2,3-Trimethylbenzene	**26.5** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
1,2,4-Trimethylbenzene	**60.2** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
t-Butylbenzene	ND (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
sec-Butylbenzene	**J 3.99** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
p-Isopropyltoluene	**27.6** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
n-Butylbenzene	**50.4** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
trans-Decalin	**59.1** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
cis-Decalin	**7.28** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C1-Decalins	**131** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C2-Decalins	**93.3** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C3-Decalins	**72.3** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C4-Decalins	**173** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
Benzo(b)thiophene	**9.89** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C1-Benzo(b)thiophenes	**15.2** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C2-Benzo(b)thiophenes	**42.8** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C3-Benzo(b)thiophenes	**28.5** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C4-Benzo(b)thiophenes	**11.1** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-871-S2
Date Sampled: 07/23/24 12:31
Percent Solids: 55
Initial Volume: 5.04
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**141** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
2-Methylnaphthalene	**83.6** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
1-Methylnaphthalene	**57.5** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C1-Naphthalenes	**89.5** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C2-Naphthalenes	**243** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C3-Naphthalenes	**180** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C4-Naphthalenes	**130** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
Biphenyl	**78.2** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
Acenaphthylene	**545** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
Acenaphthene	**290** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
Dibenzofuran	**61.3** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
Fluorene	**169** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C1-Fluorenes	**129** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C2-Fluorenes	**144** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C3-Fluorenes	**208** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
Dibenzothiophene	**148** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C1-Dibenzothiophenes	**174** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C2-Dibenzothiophenes	**218** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C3-Dibenzothiophenes	**200** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C4-Dibenzothiophenes	**136** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
Phenanthrene	**1550** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
Anthracene	**756** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C1-Phenanthrenes/Anthracenes	**1020** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C2-Phenanthrenes/Anthracenes	**794** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C3-Phenanthrenes/Anthracenes	**429** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C4-Phenanthrenes/Anthracenes	**198** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
Retene	**96.4** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
Benzo(b)naphtho(2,1-d)thiophene	**272** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C0-Benzonaphthothiophenes	**488** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C1-Benzonaphthothiophenes	**389** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C2-Benzonaphthothiophenes	**404** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C3-Benzonaphthothiophenes	**362** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-871-S2
Date Sampled: 07/23/24 12:31
Percent Solids: 55
Initial Volume: 5.04
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**187** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
Fluoranthene	**2820** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
Pyrene	**3180** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C1-Fluoranthenes/Pyrenes	**1830** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C2-Fluoranthenes/Pyrenes	**1050** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C3-Fluoranthenes/Pyrenes	**535** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
Benzo(b)fluorene	**217** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
Benzo(c)fluorene	**79.1** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
2-Methylpyrene	**254** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
4-Methylpyrene	**259** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
1-Methylpyrene	**208** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
Benz(a)anthracene	**1660** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
Chrysene/triphenylene	**1940** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C1-Benzo(a)anthracenes/Chrysenes	**1360** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C2-Benzo(a)anthracenes/Chrysenes	**878** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C3-Benzo(a)anthracenes/Chrysenes	**465** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C4-Benzo(a)anthracenes/Chrysenes	**205** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
Benzo(b)fluoranthene	**1700** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
Benzo(j/k)fluoranthene	**1530** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
Benzo(e)pyrene	**1760** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
Benzo(a)pyrene	**2660** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
Perylene	**742** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
Indeno(1,2,3-cd)pyrene	**1630** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
Dibenzo(a,h)anthracene	**417** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
Benzo(g,h,i)perylene	**1590** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
Coronene	**432** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
Tetramethyl lead	ND (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
Trimethylethyl lead	ND (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
Dimethyldiethyl lead	ND (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
Methyltriethyl lead	ND (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
Tetraethyl lead	ND (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
2,6,10-trimethyldodecane (1380)	**62.8** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-871-S2
Date Sampled: 07/23/24 12:31
Percent Solids: 55
Initial Volume: 5.04
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-02
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**155** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
2,6,10-trimethylpentadecane (1650)	**89.6** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C-17	**307** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
Pristane	**194** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
C-18	**124** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
Phytane	**198** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
Carbazole	**77.2** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
2,6-Dimethylnaphthalene	**93.1** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
2,3,5-Trimethylnaphthene	**10.1** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
4-Methyldibenzothiophene	**66.2** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
2/3-Methyldibenzothiophene	**57.3** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
1-Methyldibenzothiophene	**23.2** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
3-Methylphenanthrene	**210** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
2-Methylphenanthrene	**236** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
2-Methylanthracene	**147** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
4/9-Methylphenanthrene	**253** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901
1-Methylphenanthrene	**151** (7.17)	3.59	8270 Mod		1	IBM	07/31/24 16:18	F4G0002	FG42901

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*81 %*		*50-120*
Surrogate: Naphthalene-d8	*77 %*		*50-120*
Surrogate: Phenanthrene-d10	*80 %*		*50-120*
Surrogate: Perylene-d12	*85 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-871-S2
Date Sampled: 07/23/24 12:31
Percent Solids: 55

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**58100** (500)		LK		1	CCP	07/30/24 13:21	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-872-S1
Date Sampled: 07/23/24 13:00
Percent Solids: 73
Initial Volume: 5.03
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**81.5** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
C1-Benzene	**149** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
C2-Benzenes	**120** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
C3-Benzenes	**123** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
C4-Benzenes	**303** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
C5-Benzenes	**192** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
Methylcyclohexane	**20.9** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
Toluene	**229** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
Ethylbenzene	**26.7** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
m,p-Xylene	**195** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
Styrene	**106** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
o-Xylene	**24.2** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
Isopropylbenzene	**9.45** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
n-Propylbenzene	**16.0** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
1,3,5-Trimethylbenzene	**27.7** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
1,2,3-Trimethylbenzene	**22.7** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
1,2,4-Trimethylbenzene	**85.5** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
t-Butylbenzene	ND (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
sec-Butylbenzene	**8.98** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
p-Isopropyltoluene	**26.1** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
n-Butylbenzene	ND (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
trans-Decalin	**470** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
cis-Decalin	**43.4** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
C1-Decalins	**612** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
C2-Decalins	**294** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
C3-Decalins	**200** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
C4-Decalins	**427** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
Benzo(b)thiophene	**81.6** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
C1-Benzo(b)thiophenes	**136** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
C2-Benzo(b)thiophenes	**177** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
C3-Benzo(b)thiophenes	**106** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
C4-Benzo(b)thiophenes	**56.6** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-872-S1
Date Sampled: 07/23/24 13:00
Percent Solids: 73
Initial Volume: 5.03
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**2010** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
2-Methylnaphthalene	**763** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
1-Methylnaphthalene	**1580** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
C1-Naphthalenes	**1440** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
C2-Naphthalenes	**1690** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
C3-Naphthalenes	**1200** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
C4-Naphthalenes	**695** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
Biphenyl	**237** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
Acenaphthylene	**899** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
Acenaphthene	**7070** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
Dibenzofuran	**1420** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
Fluorene	**2670** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
C1-Fluorenes	**888** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
C2-Fluorenes	**795** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
C3-Fluorenes	**1300** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
Dibenzothiophene	**1410** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
C1-Dibenzothiophenes	**1050** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
C2-Dibenzothiophenes	**835** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
C3-Dibenzothiophenes	**602** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
C4-Dibenzothiophenes	**303** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
Phenanthrene	**23300** (108)	54.2	8270 Mod		20	IBM	08/01/24 16:12	F4G0002	FG42901
Anthracene	**5290** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
C1-Phenanthrenes/Anthracenes	**6760** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
C2-Phenanthrenes/Anthracenes	**3260** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
C3-Phenanthrenes/Anthracenes	**1320** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
C4-Phenanthrenes/Anthracenes	**475** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
Retene	**96.8** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
Benzo(b)naphtho(2,1-d)thiophene	**1780** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
C0-Benzonaphthothiophenes	**3250** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
C1-Benzonaphthothiophenes	**1410** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
C2-Benzonaphthothiophenes	**862** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
C3-Benzonaphthothiophenes	**554** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-872-S1
Date Sampled: 07/23/24 13:00
Percent Solids: 73
Initial Volume: 5.03
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**215** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
Fluoranthene	**28500** (108)	54.2	8270 Mod		20	IBM	08/01/24 16:12	F4G0002	FG42901
Pyrene	**24300** (108)	54.2	8270 Mod		20	IBM	08/01/24 16:12	F4G0002	FG42901
C1-Fluoranthenes/Pyrenes	**8750** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
C2-Fluoranthenes/Pyrenes	**4900** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
C3-Fluoranthenes/Pyrenes	**1810** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
Benzo(b)fluorene	**1160** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
Benzo(c)fluorene	**588** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
2-Methylpyrene	**1140** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
4-Methylpyrene	**836** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
1-Methylpyrene	**733** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
Benz(a)anthracene	**13000** (108)	54.2	8270 Mod		20	IBM	08/01/24 16:12	F4G0002	FG42901
Chrysene/triphenylene	**12800** (108)	54.2	8270 Mod		20	IBM	08/01/24 16:12	F4G0002	FG42901
C1-Benzo(a)anthracenes/Chrysenes	**4880** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
C2-Benzo(a)anthracenes/Chrysenes	**2230** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
C3-Benzo(a)anthracenes/Chrysenes	**1130** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
C4-Benzo(a)anthracenes/Chrysenes	**473** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
Benzo(b)fluoranthene	**10400** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
Benzo(j/k)fluoranthene	**8730** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
Benzo(e)pyrene	**7480** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
Benzo(a)pyrene	**12300** (108)	54.2	8270 Mod		20	IBM	08/01/24 16:12	F4G0002	FG42901
Perylene	**3220** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
Indeno(1,2,3-cd)pyrene	**8240** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
Dibenzo(a,h)anthracene	**2120** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
Benzo(g,h,i)perylene	**6460** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
Coronene	**1660** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
Tetramethyl lead	ND (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
Trimethylethyl lead	ND (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
Dimethyldiethyl lead	ND (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
Methyltriethyl lead	ND (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
Tetraethyl lead	ND (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
2,6,10-trimethyldodecane (1380)	**377** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-872-S1
Date Sampled: 07/23/24 13:00
Percent Solids: 73
Initial Volume: 5.03
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-03
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**645** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
2,6,10-trimethylpentadecane (1650)	**561** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
C-17	**151** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
Pristane	**1540** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
C-18	**141** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
Phytane	**952** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
Carbazole	**2870** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
2,6-Dimethylnaphthalene	**292** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
2,3,5-Trimethylnaphthene	**77.1** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
4-Methyldibenzothiophene	**343** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
2/3-Methyldibenzothiophene	**367** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
1-Methyldibenzothiophene	**122** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
3-Methylphenanthrene	**1570** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
2-Methylphenanthrene	**1890** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
2-Methylanthracene	**799** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
4/9-Methylphenanthrene	**1420** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901
1-Methylphenanthrene	**982** (5.42)	2.71	8270 Mod		1	IBM	07/31/24 17:38	F4G0002	FG42901

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*70 %*		*50-120*
Surrogate: Naphthalene-d8	*74 %*		*50-120*
Surrogate: Phenanthrene-d10	*80 %*		*50-120*
Surrogate: Perylene-d12	*99 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-872-S1
Date Sampled: 07/23/24 13:00
Percent Solids: 73

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**61500** (500)		LK		1	CCP	07/30/24 13:38	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-872-S2
Date Sampled: 07/23/24 13:01
Percent Solids: 69
Initial Volume: 4.96
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**135** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C1-Benzene	**446** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C2-Benzenes	**841** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C3-Benzenes	**785** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C4-Benzenes	**1290** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C5-Benzenes	**777** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
Methylcyclohexane	**51.0** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
Toluene	**608** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
Ethylbenzene	**397** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
m,p-Xylene	**1080** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
Styrene	**423** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
o-Xylene	**109** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
Isopropylbenzene	**58.3** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
n-Propylbenzene	**87.8** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
1,3,5-Trimethylbenzene	**102** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
1,2,3-Trimethylbenzene	**73.1** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
1,2,4-Trimethylbenzene	**387** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
t-Butylbenzene	ND (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
sec-Butylbenzene	**18.4** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
p-Isopropyltoluene	**45.2** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
n-Butylbenzene	ND (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
trans-Decalin	**414** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
cis-Decalin	**67.3** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C1-Decalins	**995** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C2-Decalins	**784** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C3-Decalins	**552** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C4-Decalins	**686** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
Benzo(b)thiophene	**925** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C1-Benzo(b)thiophenes	**914** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C2-Benzo(b)thiophenes	**1810** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C3-Benzo(b)thiophenes	**966** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C4-Benzo(b)thiophenes	**207** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-872-S2
Date Sampled: 07/23/24 13:01
Percent Solids: 69
Initial Volume: 4.96
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**17300** (117)	58.3	8270 Mod		20	IBM	08/01/24 17:32	F4G0002	FG42901
2-Methylnaphthalene	**3640** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
1-Methylnaphthalene	**9450** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C1-Naphthalenes	**8020** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C2-Naphthalenes	**11400** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C3-Naphthalenes	**4050** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C4-Naphthalenes	**1220** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
Biphenyl	**569** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
Acenaphthylene	**2920** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
Acenaphthene	**34500** (117)	58.3	8270 Mod		20	IBM	08/01/24 17:32	F4G0002	FG42901
Dibenzofuran	**633** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
Fluorene	**9650** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C1-Fluorenes	**2560** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C2-Fluorenes	**1530** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C3-Fluorenes	**1220** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
Dibenzothiophene	**3820** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C1-Dibenzothiophenes	**2760** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C2-Dibenzothiophenes	**2020** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C3-Dibenzothiophenes	**1470** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C4-Dibenzothiophenes	**806** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
Phenanthrene	**42200** (117)	58.3	8270 Mod		20	IBM	08/01/24 17:32	F4G0002	FG42901
Anthracene	**9000** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C1-Phenanthrenes/Anthracenes	**11000** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C2-Phenanthrenes/Anthracenes	**5170** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C3-Phenanthrenes/Anthracenes	**2380** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C4-Phenanthrenes/Anthracenes	**1160** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
Retene	**968** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
Benzo(b)naphtho(2,1-d)thiophene	**1710** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C0-Benzonaphthothiophenes	**3210** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C1-Benzonaphthothiophenes	**2180** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C2-Benzonaphthothiophenes	**1660** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C3-Benzonaphthothiophenes	**1180** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-872-S2
Date Sampled: 07/23/24 13:01
Percent Solids: 69
Initial Volume: 4.96
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**502** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
Fluoranthene	**23700** (117)	58.3	8270 Mod		20	IBM	08/01/24 17:32	F4G0002	FG42901
Pyrene	**29000** (117)	58.3	8270 Mod		20	IBM	08/01/24 17:32	F4G0002	FG42901
C1-Fluoranthenes/Pyrenes	**12400** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C2-Fluoranthenes/Pyrenes	**4610** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C3-Fluoranthenes/Pyrenes	**2140** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
Benzo(b)fluorene	**1630** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
Benzo(c)fluorene	**597** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
2-Methylpyrene	**1610** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
4-Methylpyrene	**1500** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
1-Methylpyrene	**1400** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
Benz(a)anthracene	**9180** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
Chrysene/triphenylene	**9580** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C1-Benzo(a)anthracenes/Chrysenes	**5440** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C2-Benzo(a)anthracenes/Chrysenes	**2800** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C3-Benzo(a)anthracenes/Chrysenes	**1520** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C4-Benzo(a)anthracenes/Chrysenes	**691** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
Benzo(b)fluoranthene	**7960** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
Benzo(j/k)fluoranthene	**7120** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
Benzo(e)pyrene	**6960** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
Benzo(a)pyrene	**11500** (117)	58.3	8270 Mod		20	IBM	08/01/24 17:32	F4G0002	FG42901
Perylene	**2340** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
Indeno(1,2,3-cd)pyrene	**7050** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
Dibenzo(a,h)anthracene	**1850** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
Benzo(g,h,i)perylene	**6280** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
Coronene	**1800** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
Tetramethyl lead	ND (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
Trimethylethyl lead	ND (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
Dimethyldiethyl lead	ND (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
Methyltriethyl lead	ND (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
Tetraethyl lead	ND (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
2,6,10-trimethyldodecane (1380)	**684** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-872-S2
Date Sampled: 07/23/24 13:01
Percent Solids: 69
Initial Volume: 4.96
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-04
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**939** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
2,6,10-trimethylpentadecane (1650)	**564** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C-17	**315** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
Pristane	**1210** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
C-18	**265** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
Phytane	**1360** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
Carbazole	**317** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
2,6-Dimethylnaphthalene	**1960** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
2,3,5-Trimethylnaphthene	**257** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
4-Methyldibenzothiophene	**982** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
2/3-Methyldibenzothiophene	**892** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
1-Methyldibenzothiophene	**335** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
3-Methylphenanthrene	**2660** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
2-Methylphenanthrene	**2800** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
2-Methylanthracene	**1270** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
4/9-Methylphenanthrene	**2440** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901
1-Methylphenanthrene	**1650** (5.83)	2.92	8270 Mod		1	IBM	07/31/24 18:57	F4G0002	FG42901

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*76 %*		*50-120*
Surrogate: Naphthalene-d8	*77 %*		*50-120*
Surrogate: Phenanthrene-d10	*79 %*		*50-120*
Surrogate: Perylene-d12	*99 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-872-S2
Date Sampled: 07/23/24 13:01
Percent Solids: 69

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-04
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**54100** (500)		LK		1	CCP	07/30/24 13:54	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-882-S1
Date Sampled: 07/23/24 13:50
Percent Solids: 47
Initial Volume: 5.13
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**72.9** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C1-Benzene	**183** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C2-Benzenes	**133** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C3-Benzenes	**39.9** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C4-Benzenes	**65.8** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C5-Benzenes	**47.4** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
Methylcyclohexane	**9.35** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
Toluene	**281** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
Ethylbenzene	**22.1** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
m,p-Xylene	**240** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
Styrene	**72.6** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
o-Xylene	**12.9** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
Isopropylbenzene	ND (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
n-Propylbenzene	**17.4** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
1,3,5-Trimethylbenzene	**13.7** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
1,2,3-Trimethylbenzene	**11.3** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
1,2,4-Trimethylbenzene	**23.7** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
t-Butylbenzene	ND (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
sec-Butylbenzene	ND (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
p-Isopropyltoluene	**17.6** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
n-Butylbenzene	**35.4** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
trans-Decalin	**176** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
cis-Decalin	**25.2** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C1-Decalins	**382** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C2-Decalins	**281** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C3-Decalins	**201** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C4-Decalins	**313** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
Benzo(b)thiophene	**9.87** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C1-Benzo(b)thiophenes	**18.9** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C2-Benzo(b)thiophenes	**55.1** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C3-Benzo(b)thiophenes	**37.4** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C4-Benzo(b)thiophenes	**28.8** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-882-S1
Date Sampled: 07/23/24 13:50
Percent Solids: 47
Initial Volume: 5.13
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**187** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
2-Methylnaphthalene	**127** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
1-Methylnaphthalene	**118** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C1-Naphthalenes	**154** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C2-Naphthalenes	**313** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C3-Naphthalenes	**328** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C4-Naphthalenes	**288** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
Biphenyl	**67.4** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
Acenaphthylene	**370** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
Acenaphthene	**397** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
Dibenzofuran	**50.9** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
Fluorene	**242** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C1-Fluorenes	**192** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C2-Fluorenes	**260** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C3-Fluorenes	**301** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
Dibenzothiophene	**146** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C1-Dibenzothiophenes	**190** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C2-Dibenzothiophenes	**334** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C3-Dibenzothiophenes	**295** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C4-Dibenzothiophenes	**161** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
Phenanthrene	**1090** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
Anthracene	**618** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C1-Phenanthrenes/Anthracenes	**1020** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C2-Phenanthrenes/Anthracenes	**1050** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C3-Phenanthrenes/Anthracenes	**556** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C4-Phenanthrenes/Anthracenes	**246** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
Retene	**98.0** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
Benzo(b)naphtho(2,1-d)thiophene	**217** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C0-Benzonaphthothiophenes	**410** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C1-Benzonaphthothiophenes	**315** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C2-Benzonaphthothiophenes	**262** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C3-Benzonaphthothiophenes	**193** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-882-S1
Date Sampled: 07/23/24 13:50
Percent Solids: 47
Initial Volume: 5.13
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**84.2** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
Fluoranthene	**2300** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
Pyrene	**3050** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C1-Fluoranthenes/Pyrenes	**1860** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C2-Fluoranthenes/Pyrenes	**825** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C3-Fluoranthenes/Pyrenes	**387** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
Benzo(b)fluorene	**197** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
Benzo(c)fluorene	**97.4** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
2-Methylpyrene	**263** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
4-Methylpyrene	**261** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
1-Methylpyrene	**216** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
Benz(a)anthracene	**1310** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
Chrysene/triphenylene	**1520** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C1-Benzo(a)anthracenes/Chrysenes	**937** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C2-Benzo(a)anthracenes/Chrysenes	**505** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C3-Benzo(a)anthracenes/Chrysenes	**257** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C4-Benzo(a)anthracenes/Chrysenes	**112** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
Benzo(b)fluoranthene	**1020** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
Benzo(j/k)fluoranthene	**1090** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
Benzo(e)pyrene	**1020** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
Benzo(a)pyrene	**1540** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
Perylene	**934** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
Indeno(1,2,3-cd)pyrene	**945** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
Dibenzo(a,h)anthracene	**235** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
Benzo(g,h,i)perylene	**839** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
Coronene	**245** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
Tetramethyl lead	ND (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
Trimethylethyl lead	ND (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
Dimethyldiethyl lead	ND (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
Methyltriethyl lead	ND (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
Tetraethyl lead	ND (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
2,6,10-trimethyldodecane (1380)	**257** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-882-S1
Date Sampled: 07/23/24 13:50
Percent Solids: 47
Initial Volume: 5.13
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-05
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**462** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
2,6,10-trimethylpentadecane (1650)	**433** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C-17	**288** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
Pristane	**1090** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
C-18	**134** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
Phytane	**892** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
Carbazole	**46.8** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
2,6-Dimethylnaphthalene	**76.5** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
2,3,5-Trimethylnaphthene	**17.8** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
4-Methyldibenzothiophene	**94.4** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
2/3-Methyldibenzothiophene	**76.5** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
1-Methyldibenzothiophene	**30.3** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
3-Methylphenanthrene	**246** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
2-Methylphenanthrene	**209** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
2-Methylanthracene	**149** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
4/9-Methylphenanthrene	**277** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901
1-Methylphenanthrene	**127** (8.24)	4.12	8270 Mod		1	IBM	07/31/24 20:17	F4G0002	FG42901

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*67 %*		*50-120*
Surrogate: Naphthalene-d8	*66 %*		*50-120*
Surrogate: Phenanthrene-d10	*73 %*		*50-120*
Surrogate: Perylene-d12	*83 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-882-S1
Date Sampled: 07/23/24 13:50
Percent Solids: 47

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-05
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**56500** (500)		LK		1	CCP	07/30/24 14:13	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-882-S2
Date Sampled: 07/23/24 13:51
Percent Solids: 52
Initial Volume: 5.24
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**20.5** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C1-Benzene	**103** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C2-Benzenes	**47.0** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C3-Benzenes	**22.7** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C4-Benzenes	**61.3** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C5-Benzenes	**29.2** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
Methylcyclohexane	ND (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
Toluene	**176** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
Ethylbenzene	**10.7** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
m,p-Xylene	**108** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
Styrene	**44.7** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
o-Xylene	**9.60** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
Isopropylbenzene	ND (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
n-Propylbenzene	**11.7** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
1,3,5-Trimethylbenzene	ND (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
1,2,3-Trimethylbenzene	**8.96** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
1,2,4-Trimethylbenzene	**16.7** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
t-Butylbenzene	ND (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
sec-Butylbenzene	ND (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
p-Isopropyltoluene	**62.9** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
n-Butylbenzene	**26.6** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
trans-Decalin	**107** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
cis-Decalin	**13.9** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C1-Decalins	**177** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C2-Decalins	**90.4** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C3-Decalins	**56.2** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C4-Decalins	**87.1** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
Benzo(b)thiophene	ND (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C1-Benzo(b)thiophenes	**7.53** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C2-Benzo(b)thiophenes	**20.3** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C3-Benzo(b)thiophenes	**10.1** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C4-Benzo(b)thiophenes	**7.81** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-882-S2
Date Sampled: 07/23/24 13:51
Percent Solids: 52
Initial Volume: 5.24
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**23.1** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
2-Methylnaphthalene	**17.5** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
1-Methylnaphthalene	**10.6** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C1-Naphthalenes	**18.3** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C2-Naphthalenes	**80.9** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C3-Naphthalenes	**92.1** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C4-Naphthalenes	**67.1** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
Biphenyl	**17.4** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
Acenaphthylene	**42.8** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
Acenaphthene	**49.8** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
Dibenzofuran	**9.58** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
Fluorene	**35.5** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C1-Fluorenes	**41.4** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C2-Fluorenes	**53.3** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C3-Fluorenes	**51.9** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
Dibenzothiophene	**17.9** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C1-Dibenzothiophenes	**35.7** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C2-Dibenzothiophenes	**49.5** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C3-Dibenzothiophenes	**63.3** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C4-Dibenzothiophenes	**57.0** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
Phenanthrene	**146** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
Anthracene	**80.5** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C1-Phenanthrenes/Anthracenes	**200** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C2-Phenanthrenes/Anthracenes	**166** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C3-Phenanthrenes/Anthracenes	**128** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C4-Phenanthrenes/Anthracenes	**168** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
Retene	**455** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
Benzo(b)naphtho(2,1-d)thiophene	**55.3** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C0-Benzonaphthothiophenes	**51.6** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C1-Benzonaphthothiophenes	**49.1** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C2-Benzonaphthothiophenes	**45.1** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C3-Benzonaphthothiophenes	**32.2** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-882-S2
Date Sampled: 07/23/24 13:51
Percent Solids: 52
Initial Volume: 5.24
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**19.1** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
Fluoranthene	**328** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
Pyrene	**414** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C1-Fluoranthenes/Pyrenes	**286** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C2-Fluoranthenes/Pyrenes	**135** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C3-Fluoranthenes/Pyrenes	**61.5** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
Benzo(b)fluorene	**30.7** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
Benzo(c)fluorene	**15.8** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
2-Methylpyrene	**38.7** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
4-Methylpyrene	**39.8** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
1-Methylpyrene	**33.5** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
Benz(a)anthracene	**185** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
Chrysene/triphenylene	**202** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C1-Benzo(a)anthracenes/Chrysenes	**154** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C2-Benzo(a)anthracenes/Chrysenes	**90.6** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C3-Benzo(a)anthracenes/Chrysenes	**61.0** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C4-Benzo(a)anthracenes/Chrysenes	**24.8** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
Benzo(b)fluoranthene	**132** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
Benzo(j/k)fluoranthene	**152** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
Benzo(e)pyrene	**149** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
Benzo(a)pyrene	**222** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
Perylene	**510** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
Indeno(1,2,3-cd)pyrene	**125** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
Dibenzo(a,h)anthracene	**34.5** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
Benzo(g,h,i)perylene	**117** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
Coronene	**30.7** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
Tetramethyl lead	ND (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
Trimethylethyl lead	ND (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
Dimethyldiethyl lead	ND (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
Methyltriethyl lead	ND (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
Tetraethyl lead	ND (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
2,6,10-trimethyldodecane (1380)	**37.3** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-882-S2
Date Sampled: 07/23/24 13:51
Percent Solids: 52
Initial Volume: 5.24
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-06
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**81.3** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
2,6,10-trimethylpentadecane (1650)	**48.3** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C-17	**182** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
Pristane	**136** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
C-18	**72.2** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
Phytane	**143** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
Carbazole	**17.2** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
2,6-Dimethylnaphthalene	**15.4** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
2,3,5-Trimethylnaphthene	**J 6.11** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
4-Methyldibenzothiophene	**12.1** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
2/3-Methyldibenzothiophene	**10.6** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
1-Methyldibenzothiophene	**J 6.34** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
3-Methylphenanthrene	**49.5** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
2-Methylphenanthrene	**42.5** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
2-Methylanthracene	**24.7** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
4/9-Methylphenanthrene	**54.6** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901
1-Methylphenanthrene	**22.3** (7.41)	3.70	8270 Mod		1	IBM	07/31/24 21:37	F4G0002	FG42901

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*77 %*		*50-120*
Surrogate: Naphthalene-d8	*74 %*		*50-120*
Surrogate: Phenanthrene-d10	*84 %*		*50-120*
Surrogate: Perylene-d12	*88 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-882-S2
Date Sampled: 07/23/24 13:51
Percent Solids: 52

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-06
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**62400** (500)		LK		1	CCP	07/30/24 15:02	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-880-S1
Date Sampled: 07/23/24 14:45
Percent Solids: 48
Initial Volume: 4.93
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**33.2** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C1-Benzene	**157** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C2-Benzenes	**140** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C3-Benzenes	**23.2** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C4-Benzenes	**52.7** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C5-Benzenes	**9.54** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
Methylcyclohexane	**J 5.69** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
Toluene	**252** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
Ethylbenzene	**13.8** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
m,p-Xylene	**261** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
Styrene	**39.9** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
o-Xylene	**10.0** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
Isopropylbenzene	ND (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
n-Propylbenzene	**14.2** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
1,3,5-Trimethylbenzene	ND (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
1,2,3-Trimethylbenzene	**10.4** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
1,2,4-Trimethylbenzene	**10.0** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
t-Butylbenzene	ND (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
sec-Butylbenzene	ND (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
p-Isopropyltoluene	**83.0** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
n-Butylbenzene	**25.2** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
trans-Decalin	ND (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
cis-Decalin	ND (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C1-Decalins	**12.1** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C2-Decalins	ND (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C3-Decalins	ND (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C4-Decalins	ND (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
Benzo(b)thiophene	ND (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C1-Benzo(b)thiophenes	**J 7.51** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C2-Benzo(b)thiophenes	**27.3** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C3-Benzo(b)thiophenes	**12.4** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C4-Benzo(b)thiophenes	**J 5.74** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-880-S1
Date Sampled: 07/23/24 14:45
Percent Solids: 48
Initial Volume: 4.93
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**36.6** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
2-Methylnaphthalene	**24.5** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
1-Methylnaphthalene	**16.7** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C1-Naphthalenes	**27.4** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C2-Naphthalenes	**63.7** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C3-Naphthalenes	**51.3** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C4-Naphthalenes	**39.8** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
Biphenyl	**16.6** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
Acenaphthylene	**103** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
Acenaphthene	**38.5** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
Dibenzofuran	**24.2** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
Fluorene	**41.5** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C1-Fluorenes	**35.3** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C2-Fluorenes	**40.6** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C3-Fluorenes	**63.9** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
Dibenzothiophene	**29.4** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C1-Dibenzothiophenes	**40.3** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C2-Dibenzothiophenes	**53.3** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C3-Dibenzothiophenes	**55.2** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C4-Dibenzothiophenes	**48.4** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
Phenanthrene	**398** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
Anthracene	**147** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C1-Phenanthrenes/Anthracenes	**246** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C2-Phenanthrenes/Anthracenes	**197** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C3-Phenanthrenes/Anthracenes	**197** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C4-Phenanthrenes/Anthracenes	**374** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
Retene	**1340** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
Benzo(b)naphtho(2,1-d)thiophene	**78.8** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C0-Benzonaphthothiophenes	**153** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C1-Benzonaphthothiophenes	**87.2** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C2-Benzonaphthothiophenes	**76.6** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C3-Benzonaphthothiophenes	**58.4** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-880-S1
Date Sampled: 07/23/24 14:45
Percent Solids: 48
Initial Volume: 4.93
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**32.6** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
Fluoranthene	**926** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
Pyrene	**913** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C1-Fluoranthenes/Pyrenes	**503** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C2-Fluoranthenes/Pyrenes	**271** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C3-Fluoranthenes/Pyrenes	**124** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
Benzo(b)fluorene	**56.3** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
Benzo(c)fluorene	**23.6** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
2-Methylpyrene	**65.4** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
4-Methylpyrene	**62.6** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
1-Methylpyrene	**48.8** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
Benz(a)anthracene	**473** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
Chrysene/triphenylene	**567** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C1-Benzo(a)anthracenes/Chrysenes	**278** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C2-Benzo(a)anthracenes/Chrysenes	**158** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C3-Benzo(a)anthracenes/Chrysenes	**88.0** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C4-Benzo(a)anthracenes/Chrysenes	**36.8** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
Benzo(b)fluoranthene	**457** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
Benzo(j/k)fluoranthene	**480** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
Benzo(e)pyrene	**412** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
Benzo(a)pyrene	**573** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
Perylene	**277** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
Indeno(1,2,3-cd)pyrene	**413** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
Dibenzo(a,h)anthracene	**104** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
Benzo(g,h,i)perylene	**358** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
Coronene	**101** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
Tetramethyl lead	ND (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
Trimethylethyl lead	ND (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
Dimethyldiethyl lead	ND (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
Methyltriethyl lead	ND (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
Tetraethyl lead	ND (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
2,6,10-trimethyldodecane (1380)	**20.6** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-880-S1
Date Sampled: 07/23/24 14:45
Percent Solids: 48
Initial Volume: 4.93
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-07
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**84.3** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
2,6,10-trimethylpentadecane (1650)	**20.4** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C-17	**265** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
Pristane	**46.9** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
C-18	**115** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
Phytane	**60.6** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
Carbazole	**45.4** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
2,6-Dimethylnaphthalene	**17.7** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
2,3,5-Trimethylnaphthene	ND (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
4-Methyldibenzothiophene	**13.1** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
2/3-Methyldibenzothiophene	**12.1** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
1-Methyldibenzothiophene	**J 6.84** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
3-Methylphenanthrene	**52.0** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
2-Methylphenanthrene	**58.7** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
2-Methylanthracene	**31.2** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
4/9-Methylphenanthrene	**57.9** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901
1-Methylphenanthrene	**43.1** (8.38)	4.19	8270 Mod		1	IBM	07/31/24 22:56	F4G0002	FG42901

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*80 %*		*50-120*
Surrogate: Naphthalene-d8	*73 %*		*50-120*
Surrogate: Phenanthrene-d10	*84 %*		*50-120*
Surrogate: Perylene-d12	*86 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-880-S1
Date Sampled: 07/23/24 14:45
Percent Solids: 48

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-07
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**76200** (500)		LK		1	CCP	07/30/24 15:19	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-880-S2
Date Sampled: 07/23/24 14:46
Percent Solids: 56
Initial Volume: 5.14
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**13.8** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C1-Benzene	**125** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C2-Benzenes	**18.0** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C3-Benzenes	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C4-Benzenes	**67.2** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C5-Benzenes	**17.1** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
Methylcyclohexane	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
Toluene	**200** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
Ethylbenzene	**16.3** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
m,p-Xylene	**49.9** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
Styrene	**42.1** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
o-Xylene	**J 6.21** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
Isopropylbenzene	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
n-Propylbenzene	**13.1** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
1,3,5-Trimethylbenzene	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
1,2,3-Trimethylbenzene	**7.70** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
1,2,4-Trimethylbenzene	**J 6.42** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
t-Butylbenzene	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
sec-Butylbenzene	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
p-Isopropyltoluene	**105** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
n-Butylbenzene	**27.6** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
trans-Decalin	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
cis-Decalin	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C1-Decalins	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C2-Decalins	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C3-Decalins	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C4-Decalins	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
Benzo(b)thiophene	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C1-Benzo(b)thiophenes	**J 5.21** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C2-Benzo(b)thiophenes	**12.0** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C3-Benzo(b)thiophenes	**7.89** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C4-Benzo(b)thiophenes	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-880-S2
Date Sampled: 07/23/24 14:46
Percent Solids: 56
Initial Volume: 5.14
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**J 6.26** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
2-Methylnaphthalene	**J 5.77** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
1-Methylnaphthalene	**J 6.60** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C1-Naphthalenes	**8.74** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C2-Naphthalenes	**20.9** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C3-Naphthalenes	**16.4** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C4-Naphthalenes	**16.0** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
Biphenyl	**7.78** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
Acenaphthylene	**7.00** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
Acenaphthene	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
Dibenzofuran	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
Fluorene	**J 4.30** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C1-Fluorenes	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C2-Fluorenes	**J 6.38** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C3-Fluorenes	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
Dibenzothiophene	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C1-Dibenzothiophenes	**J 5.24** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C2-Dibenzothiophenes	**10.4** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C3-Dibenzothiophenes	**13.4** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C4-Dibenzothiophenes	**43.8** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
Phenanthrene	**13.5** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
Anthracene	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C1-Phenanthrenes/Anthracenes	**20.1** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C2-Phenanthrenes/Anthracenes	**30.7** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C3-Phenanthrenes/Anthracenes	**22.7** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C4-Phenanthrenes/Anthracenes	**370** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
Retene	**1490** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
Benzo(b)naphtho(2,1-d)thiophene	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C0-Benzonaphthothiophenes	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C1-Benzonaphthothiophenes	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C2-Benzonaphthothiophenes	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C3-Benzonaphthothiophenes	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-880-S2
Date Sampled: 07/23/24 14:46
Percent Solids: 56
Initial Volume: 5.14
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
Fluoranthene	**11.9** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
Pyrene	**13.9** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C1-Fluoranthenes/Pyrenes	**29.6** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C2-Fluoranthenes/Pyrenes	**9.61** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C3-Fluoranthenes/Pyrenes	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
Benzo(b)fluorene	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
Benzo(c)fluorene	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
2-Methylpyrene	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
4-Methylpyrene	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
1-Methylpyrene	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
Benz(a)anthracene	**J 4.89** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
Chrysene/triphenylene	**7.12** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C1-Benzo(a)anthracenes/Chrysenes	**8.11** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C2-Benzo(a)anthracenes/Chrysenes	**7.79** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C3-Benzo(a)anthracenes/Chrysenes	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C4-Benzo(a)anthracenes/Chrysenes	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
Benzo(b)fluoranthene	**J 5.07** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
Benzo(j/k)fluoranthene	**J 4.99** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
Benzo(e)pyrene	**J 5.46** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
Benzo(a)pyrene	**J 6.16** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
Perylene	**142** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
Indeno(1,2,3-cd)pyrene	**J 4.97** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
Dibenzo(a,h)anthracene	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
Benzo(g,h,i)perylene	**J 4.59** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
Coronene	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
Tetramethyl lead	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
Trimethylethyl lead	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
Dimethyldiethyl lead	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
Methyltriethyl lead	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
Tetraethyl lead	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
2,6,10-trimethyldodecane (1380)	**8.03** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-880-S2
Date Sampled: 07/23/24 14:46
Percent Solids: 56
Initial Volume: 5.14
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-08
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**25.2** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
2,6,10-trimethylpentadecane (1650)	**9.30** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C-17	**128** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
Pristane	**15.1** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
C-18	**85.4** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
Phytane	**18.3** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
Carbazole	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
2,6-Dimethylnaphthalene	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
2,3,5-Trimethylnaphthene	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
4-Methyldibenzothiophene	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
2/3-Methyldibenzothiophene	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
1-Methyldibenzothiophene	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
3-Methylphenanthrene	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
2-Methylphenanthrene	**J 3.50** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
2-Methylanthracene	ND (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
4/9-Methylphenanthrene	**J 3.70** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901
1-Methylphenanthrene	**8.81** (6.90)	3.45	8270 Mod		1	IBM	08/01/24 0:16	F4G0002	FG42901

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*80 %*		*50-120*
Surrogate: Naphthalene-d8	*74 %*		*50-120*
Surrogate: Phenanthrene-d10	*83 %*		*50-120*
Surrogate: Perylene-d12	*81 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-880-S2
Date Sampled: 07/23/24 14:46
Percent Solids: 56

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-08
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**46600** (500)		LK		1	CCP	07/30/24 15:35	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-881-S1
Date Sampled: 07/23/24 15:00
Percent Solids: 52
Initial Volume: 5.33
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**17.5** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C1-Benzene	**121** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C2-Benzenes	**80.5** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C3-Benzenes	ND (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C4-Benzenes	**11.2** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C5-Benzenes	ND (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
Methylcyclohexane	ND (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
Toluene	**194** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
Ethylbenzene	**J 6.75** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
m,p-Xylene	**163** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
Styrene	**17.5** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
o-Xylene	**8.06** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
Isopropylbenzene	ND (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
n-Propylbenzene	**J 6.59** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
1,3,5-Trimethylbenzene	ND (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
1,2,3-Trimethylbenzene	**J 7.08** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
1,2,4-Trimethylbenzene	**J 6.86** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
t-Butylbenzene	ND (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
sec-Butylbenzene	ND (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
p-Isopropyltoluene	**23.2** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
n-Butylbenzene	**12.4** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
trans-Decalin	ND (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
cis-Decalin	ND (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C1-Decalins	ND (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C2-Decalins	ND (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C3-Decalins	ND (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C4-Decalins	ND (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
Benzo(b)thiophene	ND (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C1-Benzo(b)thiophenes	**J 4.11** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C2-Benzo(b)thiophenes	**15.6** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C3-Benzo(b)thiophenes	**7.74** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C4-Benzo(b)thiophenes	ND (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-881-S1
Date Sampled: 07/23/24 15:00
Percent Solids: 52
Initial Volume: 5.33
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**11.2** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
2-Methylnaphthalene	**8.47** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
1-Methylnaphthalene	**J 6.85** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C1-Naphthalenes	**10.6** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C2-Naphthalenes	**41.2** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C3-Naphthalenes	**26.5** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C4-Naphthalenes	**23.2** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
Biphenyl	**12.0** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
Acenaphthylene	**25.7** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
Acenaphthene	**J 5.94** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
Dibenzofuran	**J 4.42** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
Fluorene	**9.04** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C1-Fluorenes	**12.6** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C2-Fluorenes	**22.6** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C3-Fluorenes	**18.5** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
Dibenzothiophene	**J 5.18** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C1-Dibenzothiophenes	**10.1** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C2-Dibenzothiophenes	**17.1** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C3-Dibenzothiophenes	**13.2** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C4-Dibenzothiophenes	**20.3** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
Phenanthrene	**54.0** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
Anthracene	**28.5** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C1-Phenanthrenes/Anthracenes	**66.4** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C2-Phenanthrenes/Anthracenes	**68.3** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C3-Phenanthrenes/Anthracenes	**76.9** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C4-Phenanthrenes/Anthracenes	**128** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
Retene	**375** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
Benzo(b)naphtho(2,1-d)thiophene	**14.2** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C0-Benzonaphthothiophenes	**33.0** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C1-Benzonaphthothiophenes	**27.1** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C2-Benzonaphthothiophenes	**29.6** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C3-Benzonaphthothiophenes	**17.1** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-881-S1
Date Sampled: 07/23/24 15:00
Percent Solids: 52
Initial Volume: 5.33
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**9.34** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
Fluoranthene	**167** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
Pyrene	**185** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C1-Fluoranthenes/Pyrenes	**127** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C2-Fluoranthenes/Pyrenes	**74.3** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C3-Fluoranthenes/Pyrenes	**37.5** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
Benzo(b)fluorene	**11.3** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
Benzo(c)fluorene	**7.61** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
2-Methylpyrene	**17.6** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
4-Methylpyrene	**20.0** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
1-Methylpyrene	**14.6** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
Benz(a)anthracene	**88.5** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
Chrysene/triphenylene	**119** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C1-Benzo(a)anthracenes/Chrysenes	**86.5** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C2-Benzo(a)anthracenes/Chrysenes	**61.1** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C3-Benzo(a)anthracenes/Chrysenes	**38.3** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C4-Benzo(a)anthracenes/Chrysenes	ND (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
Benzo(b)fluoranthene	**95.4** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
Benzo(j/k)fluoranthene	**102** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
Benzo(e)pyrene	**109** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
Benzo(a)pyrene	**130** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
Perylene	**336** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
Indeno(1,2,3-cd)pyrene	**102** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
Dibenzo(a,h)anthracene	**28.4** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
Benzo(g,h,i)perylene	**87.6** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
Coronene	**23.4** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
Tetramethyl lead	ND (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
Trimethylethyl lead	ND (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
Dimethyldiethyl lead	ND (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
Methyltriethyl lead	ND (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
Tetraethyl lead	ND (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
2,6,10-trimethyldodecane (1380)	**11.7** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-881-S1
Date Sampled: 07/23/24 15:00
Percent Solids: 52
Initial Volume: 5.33
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-09
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**56.5** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
2,6,10-trimethylpentadecane (1650)	**12.3** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C-17	**297** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
Pristane	**34.2** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
C-18	**190** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
Phytane	**46.0** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
Carbazole	**J 5.67** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
2,6-Dimethylnaphthalene	**14.8** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
2,3,5-Trimethylnaphthene	ND (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
4-Methyldibenzothiophene	ND (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
2/3-Methyldibenzothiophene	ND (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
1-Methyldibenzothiophene	ND (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
3-Methylphenanthrene	**12.6** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
2-Methylphenanthrene	**17.9** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
2-Methylanthracene	**J 6.97** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
4/9-Methylphenanthrene	**15.5** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901
1-Methylphenanthrene	**9.75** (7.23)	3.62	8270 Mod		1	IBM	08/01/24 5:35	F4G0002	FG42901

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*75 %*		*50-120*
Surrogate: Naphthalene-d8	*69 %*		*50-120*
Surrogate: Phenanthrene-d10	*82 %*		*50-120*
Surrogate: Perylene-d12	*83 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-881-S1
Date Sampled: 07/23/24 15:00
Percent Solids: 52

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-09
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**44900** (500)		LK		1	CCP	07/30/24 15:52	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-881-S2
Date Sampled: 07/23/24 15:01
Percent Solids: 59
Initial Volume: 4.98
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	J **3.70** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C1-Benzene	**40.8** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C2-Benzenes	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C3-Benzenes	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C4-Benzenes	**20.1** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C5-Benzenes	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
Methylcyclohexane	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
Toluene	**88.9** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
Ethylbenzene	J **4.66** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
m,p-Xylene	**23.1** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
Styrene	**14.7** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
o-Xylene	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
Isopropylbenzene	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
n-Propylbenzene	J **6.43** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
1,3,5-Trimethylbenzene	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
1,2,3-Trimethylbenzene	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
1,2,4-Trimethylbenzene	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
t-Butylbenzene	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
sec-Butylbenzene	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
p-Isopropyltoluene	**40.4** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
n-Butylbenzene	**12.8** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
trans-Decalin	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
cis-Decalin	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C1-Decalins	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C2-Decalins	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C3-Decalins	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C4-Decalins	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
Benzo(b)thiophene	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C1-Benzo(b)thiophenes	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C2-Benzo(b)thiophenes	J **6.39** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C3-Benzo(b)thiophenes	J **4.74** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C4-Benzo(b)thiophenes	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-881-S2
Date Sampled: 07/23/24 15:01
Percent Solids: 59
Initial Volume: 4.98
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**J 4.40** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
2-Methylnaphthalene	**J 3.86** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
1-Methylnaphthalene	**J 3.93** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C1-Naphthalenes	**J 4.68** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C2-Naphthalenes	**11.6** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C3-Naphthalenes	**10.1** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C4-Naphthalenes	**J 6.31** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
Biphenyl	**J 5.46** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
Acenaphthylene	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
Acenaphthene	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
Dibenzofuran	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
Fluorene	**J 3.54** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C1-Fluorenes	**9.05** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C2-Fluorenes	**J 4.84** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C3-Fluorenes	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
Dibenzothiophene	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C1-Dibenzothiophenes	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C2-Dibenzothiophenes	**7.24** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C3-Dibenzothiophenes	**7.93** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C4-Dibenzothiophenes	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
Phenanthrene	**6.89** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
Anthracene	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C1-Phenanthrenes/Anthracenes	**10.2** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C2-Phenanthrenes/Anthracenes	**17.4** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C3-Phenanthrenes/Anthracenes	**14.3** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C4-Phenanthrenes/Anthracenes	**99.6** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
Retene	**329** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
Benzo(b)naphtho(2,1-d)thiophene	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C0-Benzonaphthothiophenes	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C1-Benzonaphthothiophenes	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C2-Benzonaphthothiophenes	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C3-Benzonaphthothiophenes	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-881-S2
Date Sampled: 07/23/24 15:01
Percent Solids: 59
Initial Volume: 4.98
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
Fluoranthene	**J 6.65** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
Pyrene	**J 6.36** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C1-Fluoranthenes/Pyrenes	**12.6** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C2-Fluoranthenes/Pyrenes	**7.41** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C3-Fluoranthenes/Pyrenes	**J 4.30** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
Benzo(b)fluorene	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
Benzo(c)fluorene	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
2-Methylpyrene	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
4-Methylpyrene	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
1-Methylpyrene	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
Benz(a)anthracene	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
Chrysene/triphenylene	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C1-Benzo(a)anthracenes/Chrysenes	**J 4.58** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C2-Benzo(a)anthracenes/Chrysenes	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C3-Benzo(a)anthracenes/Chrysenes	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C4-Benzo(a)anthracenes/Chrysenes	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
Benzo(b)fluoranthene	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
Benzo(j/k)fluoranthene	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
Benzo(e)pyrene	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
Benzo(a)pyrene	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
Perylene	**196** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
Indeno(1,2,3-cd)pyrene	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
Dibenzo(a,h)anthracene	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
Benzo(g,h,i)perylene	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
Coronene	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
Tetramethyl lead	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
Trimethylethyl lead	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
Dimethyldiethyl lead	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
Methyltriethyl lead	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
Tetraethyl lead	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
2,6,10-trimethyldodecane (1380)	**7.26** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-881-S2
Date Sampled: 07/23/24 15:01
Percent Solids: 59
Initial Volume: 4.98
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-10
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**21.9** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
2,6,10-trimethylpentadecane (1650)	**7.48** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C-17	**96.5** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
Pristane	**11.6** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
C-18	**66.6** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
Phytane	**14.9** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
Carbazole	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
2,6-Dimethylnaphthalene	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
2,3,5-Trimethylnaphthene	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
4-Methyldibenzothiophene	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
2/3-Methyldibenzothiophene	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
1-Methyldibenzothiophene	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
3-Methylphenanthrene	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
2-Methylphenanthrene	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
2-Methylanthracene	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
4/9-Methylphenanthrene	ND (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901
1-Methylphenanthrene	**J 3.63** (6.86)	3.43	8270 Mod		1	IBM	08/01/24 6:55	F4G0002	FG42901

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*76 %*		*50-120*
Surrogate: Naphthalene-d8	*72 %*		*50-120*
Surrogate: Phenanthrene-d10	*84 %*		*50-120*
Surrogate: Perylene-d12	*81 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-881-S2
Date Sampled: 07/23/24 15:01
Percent Solids: 59

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-10
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**33300** (500)		LK		1	CCP	07/30/24 16:09	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-873-S1
Date Sampled: 07/23/24 15:30
Percent Solids: 76
Initial Volume: 5.23
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	ND (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C1-Benzene	**36.8** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C2-Benzenes	**19.2** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C3-Benzenes	ND (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C4-Benzenes	**5.20** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C5-Benzenes	ND (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
Methylcyclohexane	**6.51** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
Toluene	**75.3** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
Ethylbenzene	**5.61** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
m,p-Xylene	**51.3** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
Styrene	**9.18** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
o-Xylene	**J 3.50** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
Isopropylbenzene	ND (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
n-Propylbenzene	**J 3.03** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
1,3,5-Trimethylbenzene	**7.92** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
1,2,3-Trimethylbenzene	**J 3.44** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
1,2,4-Trimethylbenzene	**5.92** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
t-Butylbenzene	ND (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
sec-Butylbenzene	ND (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
p-Isopropyltoluene	**22.6** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
n-Butylbenzene	**J 4.75** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
trans-Decalin	**J 4.24** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
cis-Decalin	ND (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C1-Decalins	**17.0** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C2-Decalins	**27.0** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C3-Decalins	**22.7** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C4-Decalins	**23.8** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
Benzo(b)thiophene	ND (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C1-Benzo(b)thiophenes	**J 3.20** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C2-Benzo(b)thiophenes	**6.85** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C3-Benzo(b)thiophenes	**J 3.73** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C4-Benzo(b)thiophenes	**J 2.81** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-873-S1
Date Sampled: 07/23/24 15:30
Percent Solids: 76
Initial Volume: 5.23
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**54.0** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
2-Methylnaphthalene	**40.1** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
1-Methylnaphthalene	**21.5** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C1-Naphthalenes	**39.3** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C2-Naphthalenes	**63.8** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C3-Naphthalenes	**58.7** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C4-Naphthalenes	**48.1** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
Biphenyl	**17.2** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
Acenaphthylene	**124** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
Acenaphthene	**36.1** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
Dibenzofuran	**22.2** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
Fluorene	**48.7** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C1-Fluorenes	**47.6** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C2-Fluorenes	**72.6** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C3-Fluorenes	**65.9** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
Dibenzothiophene	**26.1** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C1-Dibenzothiophenes	**40.2** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C2-Dibenzothiophenes	**63.2** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C3-Dibenzothiophenes	**52.6** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C4-Dibenzothiophenes	**27.3** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
Phenanthrene	**410** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
Anthracene	**176** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C1-Phenanthrenes/Anthracenes	**406** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C2-Phenanthrenes/Anthracenes	**322** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C3-Phenanthrenes/Anthracenes	**148** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C4-Phenanthrenes/Anthracenes	**64.7** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
Retene	**44.9** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
Benzo(b)naphtho(2,1-d)thiophene	**86.7** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C0-Benzonaphthothiophenes	**168** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C1-Benzonaphthothiophenes	**105** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C2-Benzonaphthothiophenes	**66.6** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C3-Benzonaphthothiophenes	**44.0** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-873-S1
Date Sampled: 07/23/24 15:30
Percent Solids: 76
Initial Volume: 5.23
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**14.2** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
Fluoranthene	**835** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
Pyrene	**1250** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C1-Fluoranthenes/Pyrenes	**751** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C2-Fluoranthenes/Pyrenes	**328** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C3-Fluoranthenes/Pyrenes	**123** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
Benzo(b)fluorene	**65.0** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
Benzo(c)fluorene	**42.8** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
2-Methylpyrene	**112** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
4-Methylpyrene	**108** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
1-Methylpyrene	**86.5** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
Benz(a)anthracene	**652** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
Chrysene/triphenylene	**659** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C1-Benzo(a)anthracenes/Chrysenes	**392** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C2-Benzo(a)anthracenes/Chrysenes	**205** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C3-Benzo(a)anthracenes/Chrysenes	**100** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C4-Benzo(a)anthracenes/Chrysenes	**49.4** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
Benzo(b)fluoranthene	**477** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
Benzo(j/k)fluoranthene	**516** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
Benzo(e)pyrene	**505** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
Benzo(a)pyrene	**807** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
Perylene	**956** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
Indeno(1,2,3-cd)pyrene	**452** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
Dibenzo(a,h)anthracene	**112** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
Benzo(g,h,i)perylene	**423** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
Coronene	**111** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
Tetramethyl lead	ND (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
Trimethylethyl lead	ND (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
Dimethyldiethyl lead	ND (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
Methyltriethyl lead	ND (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
Tetraethyl lead	ND (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
2,6,10-trimethyldodecane (1380)	**9.77** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-873-S1
Date Sampled: 07/23/24 15:30
Percent Solids: 76
Initial Volume: 5.23
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-11
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**33.1** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
2,6,10-trimethylpentadecane (1650)	**24.9** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C-17	**98.5** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
Pristane	**41.6** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
C-18	**B 55.0** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
Phytane	**45.4** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
Carbazole	**31.3** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
2,6-Dimethylnaphthalene	**16.1** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
2,3,5-Trimethylnaphthene	**J 4.61** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
4-Methyldibenzothiophene	**12.4** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
2/3-Methyldibenzothiophene	**13.1** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
1-Methyldibenzothiophene	**5.36** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
3-Methylphenanthrene	**101** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
2-Methylphenanthrene	**90.3** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
2-Methylanthracene	**56.8** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
4/9-Methylphenanthrene	**115** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901
1-Methylphenanthrene	**38.8** (5.04)	2.52	8270 Mod		1	IBM	08/01/24 8:14	F4G0002	FG42901

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*77 %*		*50-120*
Surrogate: Naphthalene-d8	*73 %*		*50-120*
Surrogate: Phenanthrene-d10	*86 %*		*50-120*
Surrogate: Perylene-d12	*90 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-873-S1
Date Sampled: 07/23/24 15:30
Percent Solids: 76

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-11
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**13600** (500)		LK		1	CCP	07/30/24 19:42	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-873-S2
Date Sampled: 07/23/24 15:31
Percent Solids: 36
Initial Volume: 5.08
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**19.0** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C1-Benzene	**48.3** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C2-Benzenes	**39.0** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C3-Benzenes	ND (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C4-Benzenes	ND (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C5-Benzenes	ND (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
Methylcyclohexane	ND (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
Toluene	**124** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
Ethylbenzene	**J 10.4** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
m,p-Xylene	**112** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
Styrene	**44.8** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
o-Xylene	**J 6.84** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
Isopropylbenzene	ND (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
n-Propylbenzene	**J 5.68** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
1,3,5-Trimethylbenzene	ND (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
1,2,3-Trimethylbenzene	**J 6.24** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
1,2,4-Trimethylbenzene	**J 6.27** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
t-Butylbenzene	ND (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
sec-Butylbenzene	ND (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
p-Isopropyltoluene	**23.4** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
n-Butylbenzene	**15.2** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
trans-Decalin	ND (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
cis-Decalin	ND (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C1-Decalins	**19.3** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C2-Decalins	**40.8** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C3-Decalins	ND (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C4-Decalins	ND (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
Benzo(b)thiophene	ND (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C1-Benzo(b)thiophenes	**J 7.98** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C2-Benzo(b)thiophenes	**51.1** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C3-Benzo(b)thiophenes	**15.8** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C4-Benzo(b)thiophenes	**J 5.67** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-873-S2
Date Sampled: 07/23/24 15:31
Percent Solids: 36
Initial Volume: 5.08
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	J **7.54** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
2-Methylnaphthalene	J **8.21** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
1-Methylnaphthalene	J **7.45** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C1-Naphthalenes	J **10.1** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C2-Naphthalenes	**31.3** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C3-Naphthalenes	**37.4** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C4-Naphthalenes	**31.4** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
Biphenyl	**11.0** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
Acenaphthylene	J **6.85** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
Acenaphthene	ND (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
Dibenzofuran	ND (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
Fluorene	ND (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C1-Fluorenes	**54.7** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C2-Fluorenes	**45.9** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C3-Fluorenes	**61.3** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
Dibenzothiophene	ND (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C1-Dibenzothiophenes	J **10.4** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C2-Dibenzothiophenes	**13.0** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C3-Dibenzothiophenes	J **10.1** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C4-Dibenzothiophenes	ND (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
Phenanthrene	**20.3** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
Anthracene	J **6.52** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C1-Phenanthrenes/Anthracenes	**67.8** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C2-Phenanthrenes/Anthracenes	**46.5** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C3-Phenanthrenes/Anthracenes	**22.9** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C4-Phenanthrenes/Anthracenes	**607** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
Retene	**2520** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
Benzo(b)naphtho(2,1-d)thiophene	ND (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C0-Benzonaphthothiophenes	**12.7** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C1-Benzonaphthothiophenes	**12.4** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C2-Benzonaphthothiophenes	**16.7** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C3-Benzonaphthothiophenes	**12.9** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-873-S2
Date Sampled: 07/23/24 15:31
Percent Solids: 36
Initial Volume: 5.08
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
Fluoranthene	**36.4** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
Pyrene	**77.7** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C1-Fluoranthenes/Pyrenes	**75.1** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C2-Fluoranthenes/Pyrenes	**53.4** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C3-Fluoranthenes/Pyrenes	**29.4** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
Benzo(b)fluorene	ND (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
Benzo(c)fluorene	ND (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
2-Methylpyrene	**J 6.34** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
4-Methylpyrene	**J 8.12** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
1-Methylpyrene	**J 6.64** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
Benz(a)anthracene	**21.2** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
Chrysene/triphenylene	**25.0** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C1-Benzo(a)anthracenes/Chrysenes	**23.2** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C2-Benzo(a)anthracenes/Chrysenes	**18.8** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C3-Benzo(a)anthracenes/Chrysenes	**21.4** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C4-Benzo(a)anthracenes/Chrysenes	ND (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
Benzo(b)fluoranthene	**15.5** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
Benzo(j/k)fluoranthene	**14.1** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
Benzo(e)pyrene	**16.8** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
Benzo(a)pyrene	**23.2** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
Perylene	**3460** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
Indeno(1,2,3-cd)pyrene	**12.8** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
Dibenzo(a,h)anthracene	ND (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
Benzo(g,h,i)perylene	**13.0** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
Coronene	ND (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
Tetramethyl lead	ND (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
Trimethylethyl lead	ND (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
Dimethyldiethyl lead	ND (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
Methyltriethyl lead	ND (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
Tetraethyl lead	ND (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
2,6,10-trimethyldodecane (1380)	**22.7** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-873-S2
Date Sampled: 07/23/24 15:31
Percent Solids: 36
Initial Volume: 5.08
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-12
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**82.8** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
2,6,10-trimethylpentadecane (1650)	**23.2** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C-17	**175** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
Pristane	**23.2** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
C-18	**179** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
Phytane	**24.9** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
Carbazole	ND (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
2,6-Dimethylnaphthalene	ND (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
2,3,5-Trimethylnaphthene	ND (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
4-Methyldibenzothiophene	ND (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
2/3-Methyldibenzothiophene	ND (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
1-Methyldibenzothiophene	ND (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
3-Methylphenanthrene	**20.2** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
2-Methylphenanthrene	**13.7** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
2-Methylanthracene	ND (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
4/9-Methylphenanthrene	**21.4** (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901
1-Methylphenanthrene	ND (10.9)	5.47	8270 Mod		1	IBM	08/01/24 9:34	F4G0002	FG42901

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*76 %*		*50-120*
Surrogate: Naphthalene-d8	*71 %*		*50-120*
Surrogate: Phenanthrene-d10	*83 %*		*50-120*
Surrogate: Perylene-d12	*85 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-873-S2
Date Sampled: 07/23/24 15:31
Percent Solids: 36

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-12
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**133000** (500)		LK		1	CCP	07/30/24 17:15	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-889-S1
Date Sampled: 07/23/24 16:30
Percent Solids: 63
Initial Volume: 5.53
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-13
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	**42.7** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C1-Benzene	**349** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C2-Benzenes	**164** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C3-Benzenes	**246** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C4-Benzenes	**445** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C5-Benzenes	**228** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
Methylcyclohexane	**14.7** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
Toluene	**497** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
Ethylbenzene	**18.5** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
m,p-Xylene	**258** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
Styrene	**19.1** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
o-Xylene	**47.4** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
Isopropylbenzene	**J 5.16** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
n-Propylbenzene	**13.1** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
1,3,5-Trimethylbenzene	**53.4** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
1,2,3-Trimethylbenzene	**35.2** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
1,2,4-Trimethylbenzene	**172** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
t-Butylbenzene	ND (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
sec-Butylbenzene	**J 3.28** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
p-Isopropyltoluene	**98.9** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
n-Butylbenzene	**9.29** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
trans-Decalin	**40.1** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
cis-Decalin	**J 3.88** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C1-Decalins	**85.1** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C2-Decalins	**66.9** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C3-Decalins	**32.6** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C4-Decalins	**25.7** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
Benzo(b)thiophene	**11.6** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C1-Benzo(b)thiophenes	**21.0** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C2-Benzo(b)thiophenes	**36.6** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C3-Benzo(b)thiophenes	**32.6** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C4-Benzo(b)thiophenes	**13.7** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-889-S1
Date Sampled: 07/23/24 16:30
Percent Solids: 63
Initial Volume: 5.53
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-13
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**261** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
2-Methylnaphthalene	**248** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
1-Methylnaphthalene	**839** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C1-Naphthalenes	**661** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C2-Naphthalenes	**1660** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C3-Naphthalenes	**1190** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C4-Naphthalenes	**431** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
Biphenyl	**39.3** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
Acenaphthylene	**93.9** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
Acenaphthene	**1750** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
Dibenzofuran	**114** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
Fluorene	**398** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C1-Fluorenes	**889** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C2-Fluorenes	**447** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C3-Fluorenes	**244** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
Dibenzothiophene	**125** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C1-Dibenzothiophenes	**208** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C2-Dibenzothiophenes	**163** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C3-Dibenzothiophenes	**107** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C4-Dibenzothiophenes	**69.5** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
Phenanthrene	**4850** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
Anthracene	**1440** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C1-Phenanthrenes/Anthracenes	**2910** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C2-Phenanthrenes/Anthracenes	**1490** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C3-Phenanthrenes/Anthracenes	**619** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C4-Phenanthrenes/Anthracenes	**371** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
Retene	**573** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
Benzo(b)naphtho(2,1-d)thiophene	**122** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C0-Benzonaphthothiophenes	**315** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C1-Benzonaphthothiophenes	**253** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C2-Benzonaphthothiophenes	**135** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C3-Benzonaphthothiophenes	**64.7** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-889-S1
Date Sampled: 07/23/24 16:30
Percent Solids: 63
Initial Volume: 5.53
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-13
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	**30.6** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
Fluoranthene	**2880** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
Pyrene	**3210** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C1-Fluoranthenes/Pyrenes	**2290** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C2-Fluoranthenes/Pyrenes	**948** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C3-Fluoranthenes/Pyrenes	**359** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
Benzo(b)fluorene	**374** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
Benzo(c)fluorene	**151** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
2-Methylpyrene	**273** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
4-Methylpyrene	**205** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
1-Methylpyrene	**179** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
Benz(a)anthracene	**1270** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
Chrysene/triphenylene	**1100** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C1-Benzo(a)anthracenes/Chrysenes	**937** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C2-Benzo(a)anthracenes/Chrysenes	**500** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C3-Benzo(a)anthracenes/Chrysenes	**309** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C4-Benzo(a)anthracenes/Chrysenes	**139** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
Benzo(b)fluoranthene	**497** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
Benzo(j/k)fluoranthene	**690** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
Benzo(e)pyrene	**426** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
Benzo(a)pyrene	**780** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
Perylene	**177** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
Indeno(1,2,3-cd)pyrene	**336** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
Dibenzo(a,h)anthracene	**124** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
Benzo(g,h,i)perylene	**232** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
Coronene	**45.4** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
Tetramethyl lead	ND (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
Trimethylethyl lead	ND (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
Dimethyldiethyl lead	ND (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
Methyltriethyl lead	ND (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
Tetraethyl lead	ND (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
2,6,10-trimethyldodecane (1380)	**31.5** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-889-S1
Date Sampled: 07/23/24 16:30
Percent Solids: 63
Initial Volume: 5.53
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-13
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**128** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
2,6,10-trimethylpentadecane (1650)	**48.5** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C-17	**289** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
Pristane	**134** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
C-18	**167** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
Phytane	**63.6** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
Carbazole	**25.0** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
2,6-Dimethylnaphthalene	**191** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
2,3,5-Trimethylnaphthene	**81.1** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
4-Methyldibenzothiophene	**48.9** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
2/3-Methyldibenzothiophene	**65.1** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
1-Methyldibenzothiophene	**20.0** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
3-Methylphenanthrene	**666** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
2-Methylphenanthrene	**653** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
2-Methylanthracene	**399** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
4/9-Methylphenanthrene	**684** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901
1-Methylphenanthrene	**472** (5.71)	2.85	8270 Mod		1	IBM	08/01/24 10:54	F4G0002	FG42901

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*72 %*		*50-120*
Surrogate: Naphthalene-d8	*73 %*		*50-120*
Surrogate: Phenanthrene-d10	*83 %*		*50-120*
Surrogate: Perylene-d12	*86 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-889-S1
Date Sampled: 07/23/24 16:30
Percent Solids: 63

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-13
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**63200** (500)		LK		1	CCP	07/30/24 17:33	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-889-S2
Date Sampled: 07/23/24 16:31
Percent Solids: 87
Initial Volume: 5.66
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-14
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C1-Benzene	**99.7** (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C2-Benzenes	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C3-Benzenes	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C4-Benzenes	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C5-Benzenes	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
Methylcyclohexane	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
Toluene	**153** (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
Ethylbenzene	**J 2.33** (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
m,p-Xylene	**8.00** (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
Styrene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
o-Xylene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
Isopropylbenzene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
n-Propylbenzene	**J 2.07** (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
1,3,5-Trimethylbenzene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
1,2,3-Trimethylbenzene	**J 3.50** (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
1,2,4-Trimethylbenzene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
t-Butylbenzene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
sec-Butylbenzene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
p-Isopropyltoluene	**25.4** (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
n-Butylbenzene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
trans-Decalin	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
cis-Decalin	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C1-Decalins	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C2-Decalins	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C3-Decalins	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C4-Decalins	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
Benzo(b)thiophene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C1-Benzo(b)thiophenes	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C2-Benzo(b)thiophenes	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C3-Benzo(b)thiophenes	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C4-Benzo(b)thiophenes	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-889-S2
Date Sampled: 07/23/24 16:31
Percent Solids: 87
Initial Volume: 5.66
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-14
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	J **2.83** (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
2-Methylnaphthalene	J **2.69** (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
1-Methylnaphthalene	J **3.23** (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C1-Naphthalenes	J **3.79** (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C2-Naphthalenes	**8.27** (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C3-Naphthalenes	**6.86** (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C4-Naphthalenes	J **2.84** (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
Biphenyl	**4.71** (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
Acenaphthylene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
Acenaphthene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
Dibenzofuran	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
Fluorene	J **2.96** (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C1-Fluorenes	J **3.04** (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C2-Fluorenes	J **3.33** (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C3-Fluorenes	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
Dibenzothiophene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C1-Dibenzothiophenes	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C2-Dibenzothiophenes	J **3.14** (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C3-Dibenzothiophenes	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C4-Dibenzothiophenes	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
Phenanthrene	**4.75** (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
Anthracene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C1-Phenanthrenes/Anthracenes	**6.25** (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C2-Phenanthrenes/Anthracenes	**7.62** (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C3-Phenanthrenes/Anthracenes	**10.5** (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C4-Phenanthrenes/Anthracenes	**14.9** (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
Retene	**39.3** (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
Benzo(b)naphtho(2,1-d)thiophene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C0-Benzonaphthothiophenes	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C1-Benzonaphthothiophenes	J **4.02** (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C2-Benzonaphthothiophenes	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C3-Benzonaphthothiophenes	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-889-S2
Date Sampled: 07/23/24 16:31
Percent Solids: 87
Initial Volume: 5.66
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-14
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
Fluoranthene	**J 2.23** (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
Pyrene	**J 2.72** (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C1-Fluoranthenes/Pyrenes	**5.91** (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C2-Fluoranthenes/Pyrenes	**4.41** (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C3-Fluoranthenes/Pyrenes	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
Benzo(b)fluorene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
Benzo(c)fluorene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
2-Methylpyrene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
4-Methylpyrene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
1-Methylpyrene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
Benz(a)anthracene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
Chrysene/triphenylene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C1-Benzo(a)anthracenes/Chrysenes	**J 2.21** (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C2-Benzo(a)anthracenes/Chrysenes	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C3-Benzo(a)anthracenes/Chrysenes	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C4-Benzo(a)anthracenes/Chrysenes	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
Benzo(b)fluoranthene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
Benzo(j/k)fluoranthene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
Benzo(e)pyrene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
Benzo(a)pyrene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
Perylene	**21.0** (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
Indeno(1,2,3-cd)pyrene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
Dibenzo(a,h)anthracene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
Benzo(g,h,i)perylene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
Coronene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
Tetramethyl lead	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
Trimethylethyl lead	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
Dimethyldiethyl lead	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
Methyltriethyl lead	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
Tetraethyl lead	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
2,6,10-trimethyldodecane (1380)	**4.37** (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-889-S2
Date Sampled: 07/23/24 16:31
Percent Solids: 87
Initial Volume: 5.66
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-14
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**17.0** (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
2,6,10-trimethylpentadecane (1650)	**5.49** (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C-17	**B 48.6** (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
Pristane	**4.95** (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
C-18	**B 43.3** (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
Phytane	**J 3.64** (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
Carbazole	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
2,6-Dimethylnaphthalene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
2,3,5-Trimethylnaphthene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
4-Methyldibenzothiophene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
2/3-Methyldibenzothiophene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
1-Methyldibenzothiophene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
3-Methylphenanthrene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
2-Methylphenanthrene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
2-Methylanthracene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
4/9-Methylphenanthrene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901
1-Methylphenanthrene	ND (4.05)	2.02	8270 Mod		1	IBM	08/01/24 12:14	F4G0002	FG42901

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*91 %*		*50-120*
Surrogate: Naphthalene-d8	*74 %*		*50-120*
Surrogate: Phenanthrene-d10	*93 %*		*50-120*
Surrogate: Perylene-d12	*90 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-889-S2
Date Sampled: 07/23/24 16:31
Percent Solids: 87

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-14
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	**4320** (500)		LK		1	CCP	07/31/24 11:22	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-889-S3
Date Sampled: 07/23/24 16:32
Percent Solids: 79
Initial Volume: 4.66
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-15
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Benzene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C1-Benzene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C2-Benzenes	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C3-Benzenes	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C4-Benzenes	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C5-Benzenes	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
Methylcyclohexane	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
Toluene	**6.80** (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
Ethylbenzene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
m,p-Xylene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
Styrene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
o-Xylene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
Isopropylbenzene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
n-Propylbenzene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
1,3,5-Trimethylbenzene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
1,2,3-Trimethylbenzene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
1,2,4-Trimethylbenzene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
t-Butylbenzene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
sec-Butylbenzene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
p-Isopropyltoluene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
n-Butylbenzene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
trans-Decalin	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
cis-Decalin	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C1-Decalins	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C2-Decalins	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C3-Decalins	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C4-Decalins	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
Benzo(b)thiophene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C1-Benzo(b)thiophenes	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C2-Benzo(b)thiophenes	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C3-Benzo(b)thiophenes	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C4-Benzo(b)thiophenes	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-889-S3
Date Sampled: 07/23/24 16:32
Percent Solids: 79
Initial Volume: 4.66
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-15
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**J 4.62** (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
2-Methylnaphthalene	**J 3.60** (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
1-Methylnaphthalene	**J 3.87** (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C1-Naphthalenes	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C2-Naphthalenes	**6.97** (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C3-Naphthalenes	**5.83** (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C4-Naphthalenes	**J 3.06** (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
Biphenyl	**J 4.89** (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
Acenaphthylene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
Acenaphthene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
Dibenzofuran	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
Fluorene	**J 3.27** (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C1-Fluorenes	**J 3.09** (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C2-Fluorenes	**J 2.88** (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C3-Fluorenes	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
Dibenzothiophene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C1-Dibenzothiophenes	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C2-Dibenzothiophenes	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C3-Dibenzothiophenes	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C4-Dibenzothiophenes	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
Phenanthrene	**7.77** (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
Anthracene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C1-Phenanthrenes/Anthracenes	**6.08** (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C2-Phenanthrenes/Anthracenes	**J 5.23** (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C3-Phenanthrenes/Anthracenes	**5.87** (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C4-Phenanthrenes/Anthracenes	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
Retene	**J 4.54** (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
Benzo(b)naphtho(2,1-d)thiophene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C0-Benzonaphthothiophenes	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C1-Benzonaphthothiophenes	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C2-Benzonaphthothiophenes	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C3-Benzonaphthothiophenes	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-889-S3
Date Sampled: 07/23/24 16:32
Percent Solids: 79
Initial Volume: 4.66
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-15
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C4-Benzonaphthothiophenes	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
Fluoranthene	**J 5.04** (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
Pyrene	**6.91** (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C1-Fluoranthenes/Pyrenes	**6.13** (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C2-Fluoranthenes/Pyrenes	**J 4.26** (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C3-Fluoranthenes/Pyrenes	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
Benzo(b)fluorene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
Benzo(c)fluorene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
2-Methylpyrene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
4-Methylpyrene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
1-Methylpyrene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
Benz(a)anthracene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
Chrysene/triphenylene	**J 2.78** (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C1-Benzo(a)anthracenes/Chrysenes	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C2-Benzo(a)anthracenes/Chrysenes	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C3-Benzo(a)anthracenes/Chrysenes	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C4-Benzo(a)anthracenes/Chrysenes	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
Benzo(b)fluoranthene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
Benzo(j/k)fluoranthene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
Benzo(e)pyrene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
Benzo(a)pyrene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
Perylene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
Indeno(1,2,3-cd)pyrene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
Dibenzo(a,h)anthracene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
Benzo(g,h,i)perylene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
Coronene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
Tetramethyl lead	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
Trimethylethyl lead	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
Dimethyldiethyl lead	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
Methyltriethyl lead	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
Tetraethyl lead	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
2,6,10-trimethyldodecane (1380)	**J 4.88** (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-889-S3
Date Sampled: 07/23/24 16:32
Percent Solids: 79
Initial Volume: 4.66
Final Volume: 2
Extraction Method: 3570

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-15
Sample Matrix: Soil
Units: ug/Kg dry
Analyst: IBM
Prepared: 7/29/24 9:30

Alkylated PAHs

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
2,6,10-trimethyltridecane (1470)	**12.1** (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
2,6,10-trimethylpentadecane (1650)	**J 4.28** (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C-17	**B 35.3** (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
Pristane	**J 3.98** (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
C-18	**B 38.1** (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
Phytane	**J 5.11** (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
Carbazole	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
2,6-Dimethylnaphthalene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
2,3,5-Trimethylnaphthene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
4-Methyldibenzothiophene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
2/3-Methyldibenzothiophene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
1-Methyldibenzothiophene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
3-Methylphenanthrene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
2-Methylphenanthrene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
2-Methylanthracene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
4/9-Methylphenanthrene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901
1-Methylphenanthrene	ND (5.41)	2.70	8270 Mod		1	IBM	08/01/24 13:33	F4G0002	FG42901

	%Recovery	Qualifier	Limits
Surrogate: Toluene-D8	*80 %*		*50-120*
Surrogate: Naphthalene-d8	*67 %*		*50-120*
Surrogate: Phenanthrene-d10	*89 %*		*50-120*
Surrogate: Perylene-d12	*83 %*		*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-889-S3
Date Sampled: 07/23/24 16:32
Percent Solids: 79

ESS Laboratory Work Order: F240021
ESS Laboratory Sample ID: F240021-15
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (RL)	EDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Total Organic Carbon (Average)	ND (500)		LK		1	CCP	07/31/24 12:28	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240021

Quality Control Data

Classical Chemistry

Batch DG42537 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	500	mg/kg							
Total Organic Carbon (2)	ND	500	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240021

Quality Control Data

Classical Chemistry

Batch DG42537 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	9680	500	mg/kg	10010		97	80-120			
Total Organic Carbon (2)	8720	500	mg/kg	10010		87	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240021

Quality Control Data

Classical Chemistry

Batch DG42537 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	8580	500	mg/kg	10010		86	80-120	12	25	
Total Organic Carbon (2)	8750	500	mg/kg	10010		87	80-120	0.3	25	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240021

Quality Control Data

Classical Chemistry

Batch DG42952 - General Preparation

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	ND	500	mg/kg							
Total Organic Carbon (2)	ND	500	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240021

Quality Control Data

Classical Chemistry

Batch DG42952 - General Preparation

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	8850	500	mg/kg	10010		88	80-120			
Total Organic Carbon (2)	9530	500	mg/kg	10010		95	80-120			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240021

Quality Control Data

Classical Chemistry

Batch DG42952 - General Preparation

LCS Dup

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Organic Carbon (1)	8530	500	mg/kg	10010		85	80-120	4	25	
Total Organic Carbon (2)	9260	500	mg/kg	10010		92	80-120	3	25	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240021

Quality Control Data

Alkylated PAHs

Batch FG42901 - 3570

Blank

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	ND	4.00	ug/Kg wet							
C1-Benzene	ND	4.00	ug/Kg wet							
C2-Benzenes	ND	4.00	ug/Kg wet							
C3-Benzenes	ND	4.00	ug/Kg wet							
C4-Benzenes	ND	4.00	ug/Kg wet							
C5-Benzenes	ND	4.00	ug/Kg wet							
Methylcyclohexane	ND	4.00	ug/Kg wet							
Toluene	2.68	4.00	ug/Kg wet							J
Ethylbenzene	ND	4.00	ug/Kg wet							
m,p-Xylene	ND	4.00	ug/Kg wet							
Styrene	ND	4.00	ug/Kg wet							
o-Xylene	ND	4.00	ug/Kg wet							
Isopropylbenzene	ND	4.00	ug/Kg wet							
n-Propylbenzene	ND	4.00	ug/Kg wet							
1,3,5-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,3-Trimethylbenzene	ND	4.00	ug/Kg wet							
1,2,4-Trimethylbenzene	ND	4.00	ug/Kg wet							
t-Butylbenzene	ND	4.00	ug/Kg wet							
sec-Butylbenzene	ND	4.00	ug/Kg wet							
p-Isopropyltoluene	ND	4.00	ug/Kg wet							
n-Butylbenzene	ND	4.00	ug/Kg wet							
trans-Decalin	ND	4.00	ug/Kg wet							
cis-Decalin	ND	4.00	ug/Kg wet							
C1-Decalins	ND	4.00	ug/Kg wet							
C2-Decalins	ND	4.00	ug/Kg wet							
C3-Decalins	ND	4.00	ug/Kg wet							
C4-Decalins	ND	4.00	ug/Kg wet							
Benzo(b)thiophene	ND	4.00	ug/Kg wet							
C1-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C2-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C3-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
C4-Benzo(b)thiophenes	ND	4.00	ug/Kg wet							
Naphthalene	ND	4.00	ug/Kg wet							
2-Methylnaphthalene	ND	4.00	ug/Kg wet							
1-Methylnaphthalene	ND	4.00	ug/Kg wet							
C1-Naphthalenes	ND	4.00	ug/Kg wet							
C2-Naphthalenes	ND	4.00	ug/Kg wet							
C3-Naphthalenes	ND	4.00	ug/Kg wet							
C4-Naphthalenes	ND	4.00	ug/Kg wet							
Biphenyl	ND	4.00	ug/Kg wet							
Acenaphthylene	ND	4.00	ug/Kg wet							
Acenaphthene	ND	4.00	ug/Kg wet							
Dibenzofuran	ND	4.00	ug/Kg wet							
Fluorene	ND	4.00	ug/Kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240021

Quality Control Data

Alkylated PAHs

Batch FG42901 - 3570			
C1-Fluorenes	ND	4.00	ug/Kg wet
C2-Fluorenes	ND	4.00	ug/Kg wet
C3-Fluorenes	ND	4.00	ug/Kg wet
Dibenzothiophene	ND	4.00	ug/Kg wet
C1-Dibenzothiophenes	ND	4.00	ug/Kg wet
C2-Dibenzothiophenes	ND	4.00	ug/Kg wet
C3-Dibenzothiophenes	ND	4.00	ug/Kg wet
C4-Dibenzothiophenes	ND	4.00	ug/Kg wet
Phenanthrene	ND	4.00	ug/Kg wet
Anthracene	ND	4.00	ug/Kg wet
C1-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C2-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C3-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
C4-Phenanthrenes/Anthracenes	ND	4.00	ug/Kg wet
Retene	ND	4.00	ug/Kg wet
Benzo(b)naphtho(2,1-d)thiophene	ND	4.00	ug/Kg wet
C0-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C1-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C2-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C3-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
C4-Benzonaphthothiophenes	ND	4.00	ug/Kg wet
Fluoranthene	ND	4.00	ug/Kg wet
Pyrene	ND	4.00	ug/Kg wet
C1-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C2-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
C3-Fluoranthenes/Pyrenes	ND	4.00	ug/Kg wet
Benzo(b)fluorene	ND	4.00	ug/Kg wet
Benzo(c)fluorene	ND	4.00	ug/Kg wet
2-Methylpyrene	ND	4.00	ug/Kg wet
4-Methylpyrene	ND	4.00	ug/Kg wet
1-Methylpyrene	ND	4.00	ug/Kg wet
Benz(a)anthracene	ND	4.00	ug/Kg wet
Chrysene/triphenylene	ND	4.00	ug/Kg wet
C1-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C2-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C3-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
C4-Benzo(a)anthracenes/Chrysenes	ND	4.00	ug/Kg wet
Benzo(b)fluoranthene	ND	4.00	ug/Kg wet
Benzo(j/k)fluoranthene	ND	4.00	ug/Kg wet
Benzo(e)pyrene	ND	4.00	ug/Kg wet
Benzo(a)pyrene	ND	4.00	ug/Kg wet
Perylene	ND	4.00	ug/Kg wet
Indeno(1,2,3-cd)pyrene	ND	4.00	ug/Kg wet
Dibenzo(a,h)anthracene	ND	4.00	ug/Kg wet
Benzo(g,h,i)perylene	ND	4.00	ug/Kg wet
Coronene	ND	4.00	ug/Kg wet
Tetramethyl lead	ND	4.00	ug/Kg wet
Trimethylethyl lead	ND	4.00	ug/Kg wet

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240021

Quality Control Data

Alkylated PAHs

Batch FG42901 - 3570							
Dimethyldiethyl lead	ND	4.00	ug/Kg wet				
Methyltriethyl lead	ND	4.00	ug/Kg wet				
Tetraethyl lead	ND	4.00	ug/Kg wet				
2,6,10-trimethyldodecane (1380)	ND	4.00	ug/Kg wet				
2,6,10-trimethyltridecane (1470)	ND	4.00	ug/Kg wet				
2,6,10-trimethylpentadecane (1650)	ND	4.00	ug/Kg wet				
C-17	6.09	4.00	ug/Kg wet				
Pristane	3.00	4.00	ug/Kg wet				J
C-18	6.31	4.00	ug/Kg wet				
Phytane	ND	4.00	ug/Kg wet				
Carbazole	ND	4.00	ug/Kg wet				
2,6-Dimethylnaphthalene	ND	4.00	ug/Kg wet				
2,3,5-Trimethylnaphthene	ND	4.00	ug/Kg wet				
4-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
2/3-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
1-Methyldibenzothiophene	ND	4.00	ug/Kg wet				
3-Methylphenanthrene	ND	4.00	ug/Kg wet				
2-Methylphenanthrene	ND	4.00	ug/Kg wet				
2-Methylanthracene	ND	4.00	ug/Kg wet				
4/9-Methylphenanthrene	ND	4.00	ug/Kg wet				
1-Methylphenanthrene	ND	4.00	ug/Kg wet				
Surrogate: Toluene-D8	*356*		ug/Kg wet	*400.0*	*89*	*50-120*	
Surrogate: Naphthalene-d8	*319*		ug/Kg wet	*400.0*	*80*	*50-120*	
Surrogate: Phenanthrene-d10	*352*		ug/Kg wet	*400.0*	*88*	*50-120*	
Surrogate: Perylene-d12	*367*		ug/Kg wet	*400.0*	*92*	*50-120*	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240021

Quality Control Data

Alkylated PAHs

Batch FG42901 - 3570

LCS

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	282	4.00	ug/Kg wet	400.0		70	60-130			
Methylcyclohexane	256	4.00	ug/Kg wet	400.0		64	60-130			
Toluene	313	4.00	ug/Kg wet	400.0		78	60-130			
Ethylbenzene	325	4.00	ug/Kg wet	400.0		81	60-130			
m,p-Xylene	331	4.00	ug/Kg wet	400.0		83	60-130			
Styrene	247	4.00	ug/Kg wet	400.0		62	60-130			
o-Xylene	332	4.00	ug/Kg wet	400.0		83	60-130			
Isopropylbenzene	325	4.00	ug/Kg wet	400.0		81	60-130			
n-Propylbenzene	328	4.00	ug/Kg wet	400.0		82	60-130			
1,3,5-Trimethylbenzene	323	4.00	ug/Kg wet	400.0		81	60-130			
1,2,3-Trimethylbenzene	338	4.00	ug/Kg wet	400.0		84	60-130			
1,2,4-Trimethylbenzene	325	4.00	ug/Kg wet	400.0		81	60-130			
t-Butylbenzene	331	4.00	ug/Kg wet	400.0		83	60-130			
sec-Butylbenzene	327	4.00	ug/Kg wet	400.0		82	60-130			
p-Isopropyltoluene	337	4.00	ug/Kg wet	400.0		84	60-130			
n-Butylbenzene	334	4.00	ug/Kg wet	400.0		83	60-130			
trans-Decalin	342	4.00	ug/Kg wet	400.0		85	60-130			
cis-Decalin	344	4.00	ug/Kg wet	400.0		86	60-130			
Benzo(b)thiophene	287	4.00	ug/Kg wet	400.0		72	60-130			
Naphthalene	290	4.00	ug/Kg wet	400.0		73	60-130			
2-Methylnaphthalene	283	4.00	ug/Kg wet	400.0		71	60-130			
1-Methylnaphthalene	293	4.00	ug/Kg wet	400.0		73	60-130			
Biphenyl	297	4.00	ug/Kg wet	400.0		74	60-130			
Acenaphthylene	308	4.00	ug/Kg wet	400.0		77	60-130			
Acenaphthene	316	4.00	ug/Kg wet	400.0		79	60-130			
Dibenzofuran	292	4.00	ug/Kg wet	400.0		73	60-130			
Fluorene	308	4.00	ug/Kg wet	400.0		77	60-130			
Dibenzothiophene	312	4.00	ug/Kg wet	400.0		78	60-130			
Phenanthrene	319	4.00	ug/Kg wet	400.0		80	60-130			
Anthracene	326	4.00	ug/Kg wet	400.0		81	60-130			
Retene	376	4.00	ug/Kg wet	400.0		94	60-130			
Benzo(b)naphtho(2,1-d)thiophene	344	4.00	ug/Kg wet	400.0		86	60-130			
Fluoranthene	344	4.00	ug/Kg wet	400.0		86	60-130			
Pyrene	342	4.00	ug/Kg wet	400.0		85	60-130			
Benz(a)anthracene	343	4.00	ug/Kg wet	400.0		86	60-130			
Chrysene/triphenylene	340	4.00	ug/Kg wet	400.0		85	60-130			
Benzo(b)fluoranthene	333	4.00	ug/Kg wet	400.0		83	60-130			
Benzo(j/k)fluoranthene	353	4.00	ug/Kg wet	400.0		88	60-130			
Benzo(e)pyrene	327	4.00	ug/Kg wet	400.0		82	60-130			
Benzo(a)pyrene	332	4.00	ug/Kg wet	400.0		83	60-130			
Perylene	335	4.00	ug/Kg wet	400.0		84	60-130			
Indeno(1,2,3-cd)pyrene	340	4.00	ug/Kg wet	400.0		85	60-130			
Dibenzo(a,h)anthracene	354	4.00	ug/Kg wet	400.0		88	60-130			
Benzo(g,h,i)perylene	312	4.00	ug/Kg wet	400.0		78	60-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240021

Quality Control Data

Alkylated PAHs

Batch FG42901 - 3570						
Coronene	325	4.00	ug/Kg wet	400.0	81	60-130
Tetraethyl lead	256	4.00	ug/Kg wet	400.0	64	60-130
Surrogate: Toluene-D8	*362*		ug/Kg wet	*400.0*	*90*	*50-120*
Surrogate: Naphthalene-d8	*326*		ug/Kg wet	*400.0*	*82*	*50-120*
Surrogate: Phenanthrene-d10	*366*		ug/Kg wet	*400.0*	*91*	*50-120*
Surrogate: Perylene-d12	*371*		ug/Kg wet	*400.0*	*93*	*50-120*

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240021

Quality Control Data

Alkylated PAHs

Batch FG42901 - 3570

Duplicate **Source: F240021-15**

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Benzene	ND	4.87	ug/Kg dry		ND				50	
C1-Benzene	ND	4.87	ug/Kg dry		ND				50	
C2-Benzenes	ND	4.87	ug/Kg dry		ND				50	
C3-Benzenes	ND	4.87	ug/Kg dry		ND				50	
C4-Benzenes	ND	4.87	ug/Kg dry		ND				50	
C5-Benzenes	ND	4.87	ug/Kg dry		ND				50	
Methylcyclohexane	ND	4.87	ug/Kg dry		ND				50	
Toluene	5.06	4.87	ug/Kg dry		6.80			29	50	
Ethylbenzene	ND	4.87	ug/Kg dry		ND				50	
m,p-Xylene	ND	4.87	ug/Kg dry		ND				50	
Styrene	ND	4.87	ug/Kg dry		ND				50	
o-Xylene	ND	4.87	ug/Kg dry		ND				50	
Isopropylbenzene	ND	4.87	ug/Kg dry		ND				50	
n-Propylbenzene	ND	4.87	ug/Kg dry		ND				50	
1,3,5-Trimethylbenzene	ND	4.87	ug/Kg dry		ND				50	
1,2,3-Trimethylbenzene	ND	4.87	ug/Kg dry		ND				50	
1,2,4-Trimethylbenzene	ND	4.87	ug/Kg dry		ND				50	
t-Butylbenzene	ND	4.87	ug/Kg dry		ND				50	
sec-Butylbenzene	ND	4.87	ug/Kg dry		ND				50	
p-Isopropyltoluene	ND	4.87	ug/Kg dry		ND				50	
n-Butylbenzene	ND	4.87	ug/Kg dry		ND				50	
trans-Decalin	ND	4.87	ug/Kg dry		ND				50	
cis-Decalin	ND	4.87	ug/Kg dry		ND				50	
C1-Decalins	ND	4.87	ug/Kg dry		ND				50	
C2-Decalins	ND	4.87	ug/Kg dry		ND				50	
C3-Decalins	ND	4.87	ug/Kg dry		ND				50	
C4-Decalins	ND	4.87	ug/Kg dry		ND				50	
Benzo(b)thiophene	ND	4.87	ug/Kg dry		ND				50	
C1-Benzo(b)thiophenes	ND	4.87	ug/Kg dry		ND				50	
C2-Benzo(b)thiophenes	ND	4.87	ug/Kg dry		ND				50	
C3-Benzo(b)thiophenes	ND	4.87	ug/Kg dry		ND				50	
C4-Benzo(b)thiophenes	ND	4.87	ug/Kg dry		ND				50	
Naphthalene	3.68	4.87	ug/Kg dry		4.62			23	50	J
2-Methylnaphthalene	2.90	4.87	ug/Kg dry		3.60			21	50	J
1-Methylnaphthalene	3.29	4.87	ug/Kg dry		3.87			16	50	J
C1-Naphthalenes	4.03	4.87	ug/Kg dry		ND				50	J
C2-Naphthalenes	6.39	4.87	ug/Kg dry		6.97			9	50	
C3-Naphthalenes	4.67	4.87	ug/Kg dry		5.83			22	50	J
C4-Naphthalenes	2.46	4.87	ug/Kg dry		3.06			22	50	J
Biphenyl	4.68	4.87	ug/Kg dry		4.89			4	50	J
Acenaphthylene	ND	4.87	ug/Kg dry		ND				50	
Acenaphthene	ND	4.87	ug/Kg dry		ND				50	
Dibenzofuran	ND	4.87	ug/Kg dry		ND				50	
Fluorene	2.88	4.87	ug/Kg dry		3.27			13	50	J

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240021

Quality Control Data

Alkylated PAHs

Batch FG42901 - 3570							
C1-Fluorenes	2.57	4.87	ug/Kg dry	3.09	19	50	J
C2-Fluorenes	2.51	4.87	ug/Kg dry	2.88	14	50	J
C3-Fluorenes	ND	4.87	ug/Kg dry	ND		50	
Dibenzothiophene	ND	4.87	ug/Kg dry	ND		50	
C1-Dibenzothiophenes	ND	4.87	ug/Kg dry	ND		50	
C2-Dibenzothiophenes	ND	4.87	ug/Kg dry	ND		50	
C3-Dibenzothiophenes	ND	4.87	ug/Kg dry	ND		50	
C4-Dibenzothiophenes	ND	4.87	ug/Kg dry	ND		50	
Phenanthrene	7.03	4.87	ug/Kg dry	7.77	10	50	
Anthracene	ND	4.87	ug/Kg dry	ND		50	
C1-Phenanthrenes/Anthracenes	5.12	4.87	ug/Kg dry	6.08	17	50	
C2-Phenanthrenes/Anthracenes	3.50	4.87	ug/Kg dry	5.23	40	50	J
C3-Phenanthrenes/Anthracenes	4.36	4.87	ug/Kg dry	5.87	30	50	J
C4-Phenanthrenes/Anthracenes	ND	4.87	ug/Kg dry	2.68		50	
Retene	2.83	4.87	ug/Kg dry	4.54	46	50	J
Benzo(b)naphtho(2,1-d)thiophene	ND	4.87	ug/Kg dry	ND		50	
C0-Benzonaphthothiophenes	ND	4.87	ug/Kg dry	ND		50	
C1-Benzonaphthothiophenes	ND	4.87	ug/Kg dry	ND		50	
C2-Benzonaphthothiophenes	ND	4.87	ug/Kg dry	ND		50	
C3-Benzonaphthothiophenes	ND	4.87	ug/Kg dry	ND		50	
C4-Benzonaphthothiophenes	ND	4.87	ug/Kg dry	ND		50	
Fluoranthene	3.21	4.87	ug/Kg dry	5.04	44	50	J
Pyrene	4.93	4.87	ug/Kg dry	6.91	33	50	
C1-Fluoranthenes/Pyrenes	4.67	4.87	ug/Kg dry	6.13	27	50	J
C2-Fluoranthenes/Pyrenes	3.21	4.87	ug/Kg dry	4.26	28	50	J
C3-Fluoranthenes/Pyrenes	ND	4.87	ug/Kg dry	ND		50	
Benzo(b)fluorene	ND	4.87	ug/Kg dry	ND		50	
Benzo(c)fluorene	ND	4.87	ug/Kg dry	ND		50	
2-Methylpyrene	ND	4.87	ug/Kg dry	ND		50	
4-Methylpyrene	ND	4.87	ug/Kg dry	ND		50	
1-Methylpyrene	ND	4.87	ug/Kg dry	ND		50	
Benz(a)anthracene	ND	4.87	ug/Kg dry	ND		50	
Chrysene/triphenylene	ND	4.87	ug/Kg dry	2.78		50	
C1-Benzo(a)anthracenes/Chrysenes	ND	4.87	ug/Kg dry	ND		50	
C2-Benzo(a)anthracenes/Chrysenes	ND	4.87	ug/Kg dry	ND		50	
C3-Benzo(a)anthracenes/Chrysenes	ND	4.87	ug/Kg dry	ND		50	
C4-Benzo(a)anthracenes/Chrysenes	ND	4.87	ug/Kg dry	ND		50	
Benzo(b)fluoranthene	ND	4.87	ug/Kg dry	ND		50	
Benzo(j/k)fluoranthene	ND	4.87	ug/Kg dry	ND		50	
Benzo(e)pyrene	ND	4.87	ug/Kg dry	ND		50	
Benzo(a)pyrene	ND	4.87	ug/Kg dry	2.55		50	
Perylene	ND	4.87	ug/Kg dry	ND		50	
Indeno(1,2,3-cd)pyrene	ND	4.87	ug/Kg dry	ND		50	
Dibenzo(a,h)anthracene	ND	4.87	ug/Kg dry	ND		50	
Benzo(g,h,i)perylene	ND	4.87	ug/Kg dry	ND		50	
Coronene	ND	4.87	ug/Kg dry	ND		50	
Tetramethyl lead	ND	4.87	ug/Kg dry	ND		50	
Trimethylethyl lead	ND	4.87	ug/Kg dry	ND		50	

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240021

Quality Control Data

Alkylated PAHs

Batch FG42901 - 3570									
Dimethyldiethyl lead	ND	4.87	ug/Kg dry	ND				50	
Methyltriethyl lead	ND	4.87	ug/Kg dry	ND				50	
Tetraethyl lead	ND	4.87	ug/Kg dry	ND				50	
2,6,10-trimethyldodecane (1380)	4.59	4.87	ug/Kg dry	4.88			6	50	J
2,6,10-trimethyltridecane (1470)	8.43	4.87	ug/Kg dry	12.1			36	50	
2,6,10-trimethylpentadecane (1650)	3.36	4.87	ug/Kg dry	4.28			24	50	J
C-17	25.7	4.87	ug/Kg dry	35.3			32	50	
Pristane	4.48	4.87	ug/Kg dry	3.98			12	50	J
C-18	26.2	4.87	ug/Kg dry	38.1			37	50	
Phytane	3.19	4.87	ug/Kg dry	5.11			46	50	J
Carbazole	ND	4.87	ug/Kg dry	ND				50	
2,6-Dimethylnaphthalene	ND	4.87	ug/Kg dry	ND				50	
2,3,5-Trimethylnaphthene	ND	4.87	ug/Kg dry	ND				50	
4-Methyldibenzothiophene	ND	4.87	ug/Kg dry	ND				50	
2/3-Methyldibenzothiophene	ND	4.87	ug/Kg dry	ND				50	
1-Methyldibenzothiophene	ND	4.87	ug/Kg dry	ND				50	
3-Methylphenanthrene	ND	4.87	ug/Kg dry	ND				50	
2-Methylphenanthrene	ND	4.87	ug/Kg dry	ND				50	
2-Methylanthracene	ND	4.87	ug/Kg dry	ND				50	
4/9-Methylphenanthrene	ND	4.87	ug/Kg dry	ND				50	
1-Methylphenanthrene	ND	4.87	ug/Kg dry	ND				50	
Surrogate: Toluene-D8	*400*		ug/Kg dry	*487.3*		*82*	*50-120*		
Surrogate: Naphthalene-d8	*343*		ug/Kg dry	*487.3*		*70*	*50-120*		
Surrogate: Phenanthrene-d10	*440*		ug/Kg dry	*487.3*		*90*	*50-120*		
Surrogate: Perylene-d12	*387*		ug/Kg dry	*487.3*		*79*	*50-120*		

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: F240021

Notes and Definitions

U	Analyte included in the analysis, but not detected
J	Reported between MDL and MRL
D	Diluted.
CD-	Continuing Calibration %Diff/Drift is below control limit (CD-).
B	Present in Method Blank (B).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: F240021

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 2460907 / F240021 ~~2460021~~

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000

Project Information

Project Name: Amesbury Former MGP

Project Number: 1804576

Project Location: Amesbury, MA

Project Manager: Ryan Hoffman
781-721-4091 rhoffman@geiconsultants.com

Send Report to: Ryan Hoffman
labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY AND MCP ANALYTICAL METHODS REQUIRED: (YES) NO

STATE AND FEDERAL REGULATORY REQUIREMENTS/REPORT LIMITS

State/Federal Program: (MA) 401WQC Other ____ NH RI CT NY ME

MA MCP Criteria are (Method 1 S-1 and GW-2/GW-3). Circle if GW-1 is required.

Preservative

Analysis

Sample Handling

Samples Field Filtered
YES (NO) NA

Sampled Shipped With Ice
(YES) NO

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Preservative: None	Preservative: None	Analysis: Parent and Alkylated MAHs & PAHs 8270**	Analysis: TOCs by Lloyd-Kahn
1	1804576-871-S1	7/23/2024	12:30	SO	1	SW			X	X
2	1804576-871-S2	7/23/2024	12:31	SO	1	SW			X	X
3	1804576-872-S1	7/23/2024	13:00	SO	1	SW			X	X
4	1804576-872-S2	7/23/2024	13:01	SO	1	SW			X	X
5	1804576-882-S1	7/23/2024	13:50	SO	1	SW			X	X
6	1804576-882-S2	7/23/2024	13:51	SO	1	SW			X	X
7	1804576-880-S1	7/23/2024	14:45	SO	1	SW			X	X
8	1804576-880-S2	7/23/2024	14:46	SO	1	SW			X	X
9	1804576-881-S1	7/23/2024	15:00	SO	1	SW			X	X
10	1804576-881-S2	7/23/2024	15:01	SO	1	SW			X	X
11	1804576-873-S1	7/23/2024	15:30	SO	1	SW			X	X
12	1804576-873-S2	7/23/2024	15:31	SO	1	SW			X	X

	Relinquished by sampler: (signature)	Date	Time	Received by: (signature)
1.	[signature]	7/23/24	18:00	GEI Field Room
2.	GEI Field Room	7/24/24	1155	[signature]
3.	[signature]	7/24/24	1155	[signature] 7/24/24 1155
4.	[signature] 3.0 on ice	7/24/24	1550	[signature]
5.				

Turnaround Time (Business days):

Standard TAT X 4-Day ____ 3-Day ____
2-Day ____ 1-Day ____ Other ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

**Parent and Alkylated MAHs & PAHs (34) by GC/MS/SIM/SCAN

Sample Matrix Abbreviations: SO = Soil GW = Groundwater SW = Surface Water SD = Sediment CO = Concrete PC = Paint Chip CLK = Caulk

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 24G0107/~~24~~ F240021

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman
781-721-4091 rhoffman@geiconsultants.com

Send Report to: Ryan Hoffman
labdata@geiconsultants.com

Preservative: None | None

Analysis: Parent and Alkylated MAHs & PAHs 8270** | TOCs by Lloyd-Kahn

MCP PRESUMPTIVE CERTAINTY AND MCP ANALYTICAL METHODS REQUIRED: (YES) NO

STATE AND FEDERAL REGULATORY REQUIREMENTS/REPORT LIMITS

State/Federal Program: (MA) 401WQC Other ____ NH RI CT NY ME

MA MCP Criteria are Method 1 S-1 and GW-2/GW-3. Circle if GW-1 is required.

Sample Handling

Samples Field Filtered: YES (NO) NA

Sampled Shipped With Ice: (YES) NO

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Parent and Alkylated MAHs & PAHs 8270**	TOCs by Lloyd-Kahn
13	1804576-889-S1	7/23/2024	16:30	SO	1	SW	X	X
14	1804576-889-S2	7/23/2024	16:31	SO	1	SW	X	X
15	1804576-889-S3	7/23/2024	16:32	SO	1	SW	X	X

Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1. Davis Mill	7/23/24	18:00	GEI Field Room
2. GEI Field Room	7/24/24	1155	2. [signature]
3. [signature]	7/24/24	1155	3. AO 7/24/24 1155
4. AO 3.0 Ice	7/24/24	1550	4. [signature]
5.			5.

Turnaround Time (Business days):

Standard TAT X 4-Day ____ 3-Day ____ 2-Day ____ 1-Day ____ Other ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

**Parent and Alkylated MAHs & PAHs (34) by GC/MS/SIM/SCAN

Sample Matrix Abbreviations: SO = Soil GW = Groundwater SW = Surface Water SD = Sediment CO = Concrete PC = Paint Chip CLK = Caulk

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants

Shipped/Delivered Via: ESS Courier

ESS Project ID: F240021
Date Received: 7/24/2024
Project Due Date: 7/31/2024
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 3 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA
13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By/Acid Lot#:
    b. If dissolved metals are requested, are they: Yes / No Field Filtered Yes / No To Be Lab Filtered
    c. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Resolution:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1	734	Yes	N/A	Yes	4 oz. Jar	NP	
2	735	Yes	N/A	Yes	4 oz. Jar	NP	
3	736	Yes	N/A	Yes	4 oz. Jar	NP	
4	737	Yes	N/A	Yes	4 oz. Jar	NP	
5	738	Yes	N/A	Yes	4 oz. Jar	NP	
6	739	Yes	N/A	Yes	4 oz. Jar	NP	
7	740	Yes	N/A	Yes	4 oz. Jar	NP	
8	741	Yes	N/A	Yes	4 oz. Jar	NP	
9	742	Yes	N/A	Yes	4 oz. Jar	NP	
10	743	Yes	N/A	Yes	4 oz. Jar	NP	
11	744	Yes	N/A	Yes	4 oz. Jar	NP	
12	745	Yes	N/A	Yes	4 oz. Jar	NP	
13	746	Yes	N/A	Yes	4 oz. Jar	NP	
14	747	Yes	N/A	Yes	4 oz. Jar	NP	
15	748	Yes	N/A	Yes	4 oz. Jar	NP	

2nd Review
Were all containers scanned into storage/lab? Initials
Are barcode labels on correct containers? Yes / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants

ESS Project ID: F240021

Date Received: 7/24/2024

Are all QC stickers attached? Yes / No / NA

Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: [signature] Date & Time: 7/24/24 17:20

Reviewed By: [signature] Date & Time: 7/24/24 17:50

9/6/2024

GEI Consultants

MicroVision Labs Coal Ash Report, Job # 16737
GEI Consultants Project#: 1804576

Scope of Work:

This report covers the methods and findings of the Coal/Coal Ash analysis that MicroVision Laboratories, Inc. conducted on three soil samples submitted for testing. The purpose of this analysis was to detect and document any coal, coal ash, wood ash or asphalt that may be present in the submitted soil samples by use of a combination of microscopy techniques including SEM/EDS, PLM, and macroscopic inspection. The results presented in this report relate only to the samples examined and as received.

Methods:

MicroVision Labs is accredited to the ISO/IEC 17025:2017 standard. This analysis follows our in house SOP #MVL05 (Microscopic Analysis for Coal, Coal Ash and Wood Ash). This method is listed on our certificate of accreditation and has been validated.

Findings:

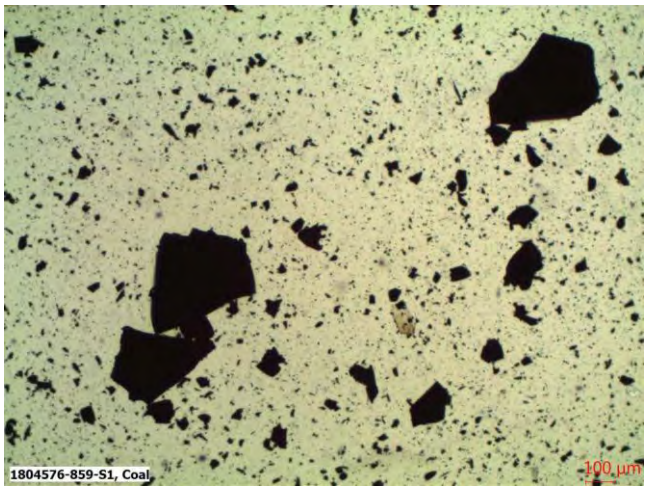
The following pages display the data for each particle type detected in the samples for this project. Each page contains a PLM image, SEM image, and EDS spectrum for the particle types detected for these samples as well as particle type descriptions and observations.

MicroVision Laboratories, Inc. 187 Billerica Road, Chelmsford, MA 01824
Phone: (978) 250-9909 Fax: (978) 250-9901 Email: Sales@MicroVisionLabs.com
www.MicroVisionLabs.com

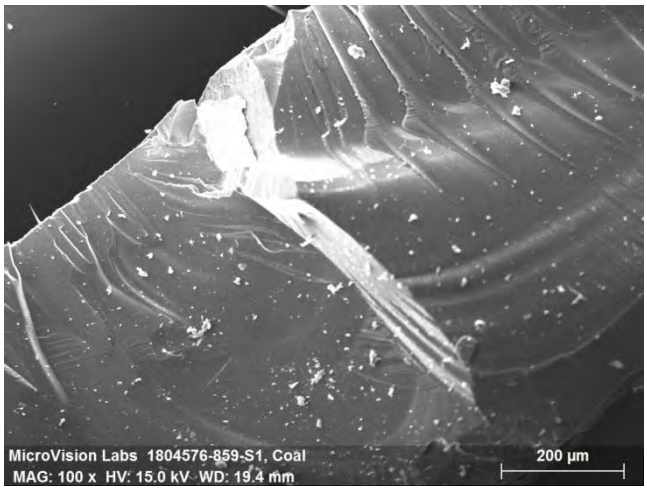
Sample: 1804576-859-S1

Number of Suspect Particle Types: Two

Coal: This particle type consisted of sixteen shiny, black grains approximately 1-6mm in diameter. The PLM examination indicated this particle type to be consistent with coal. The PLM and SEM images of this particle type show the angular edges and typical conchoidal fractures found in coal.

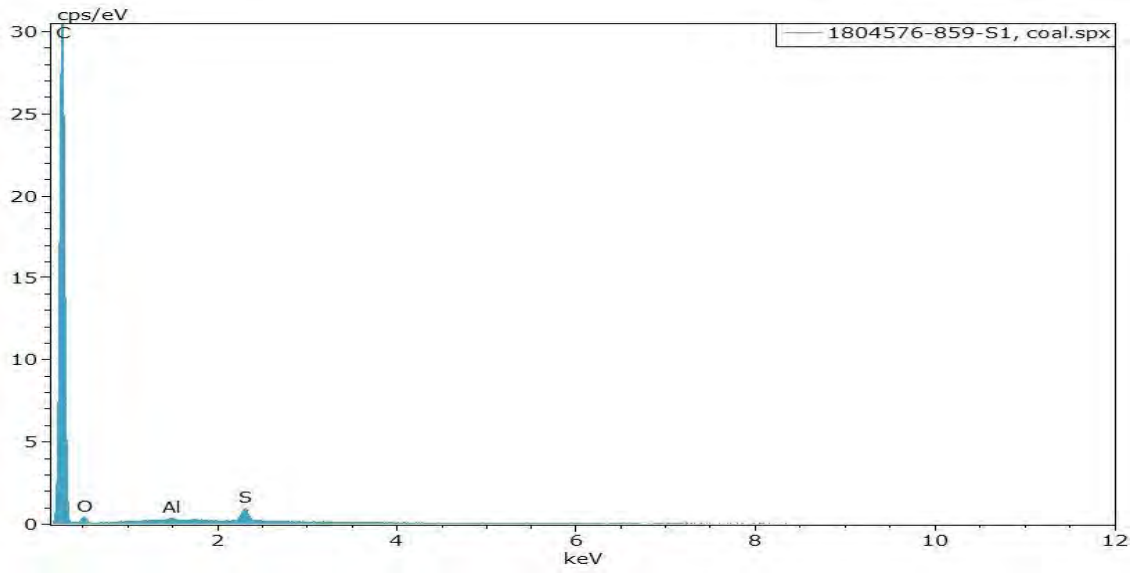


PLM Image

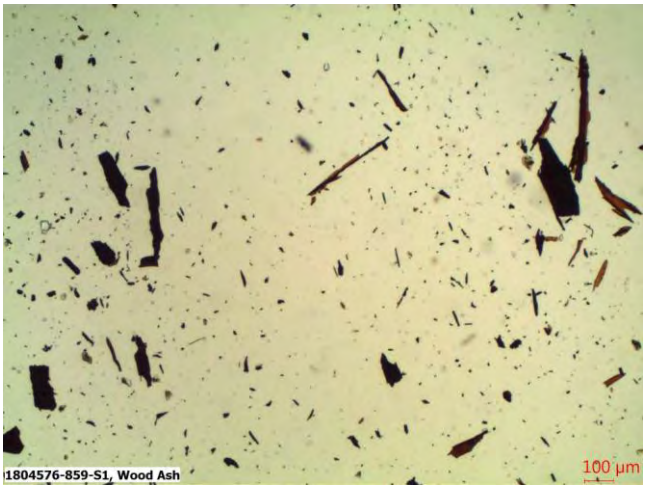


SEM Image

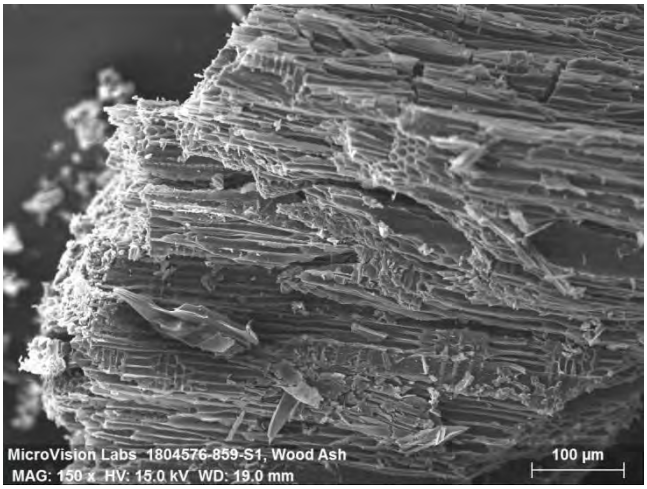
The EDS spectrum, shown below, confirms that this particle type is coal. The analysis for this particle shows concentrations of carbon, oxygen, aluminum, and sulfur.



Wood Ash: This particle type consisted of five friable, black grains approximately 2-4mm in length. The PLM examination indicated this particle type to be consistent with wood ash. The PLM and SEM photos show the cellular structure typical of wood still present in these grains.

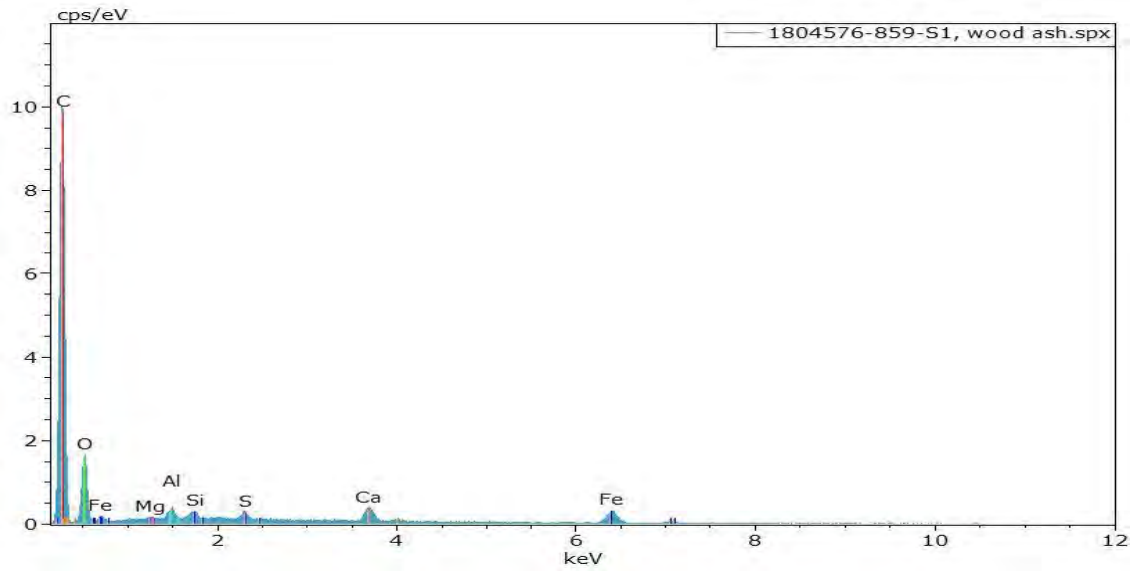


PLM Image



SEM Image

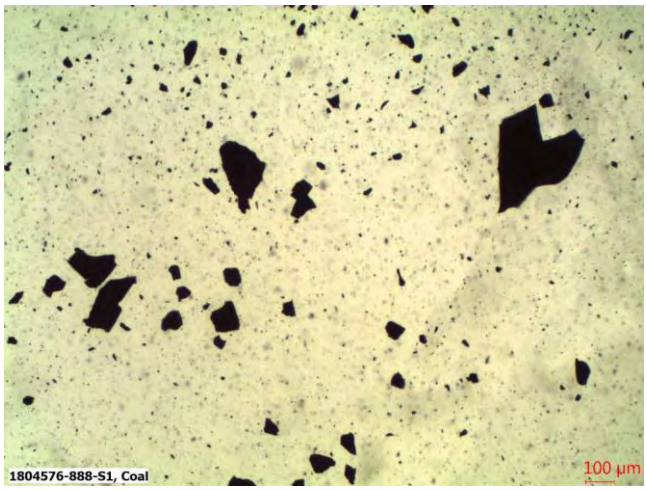
The EDS spectrum, shown below, indicates this particle type is wood ash. The analysis for this particle shows concentrations of carbon, oxygen, magnesium, aluminum, silicon, sulfur, calcium and iron.



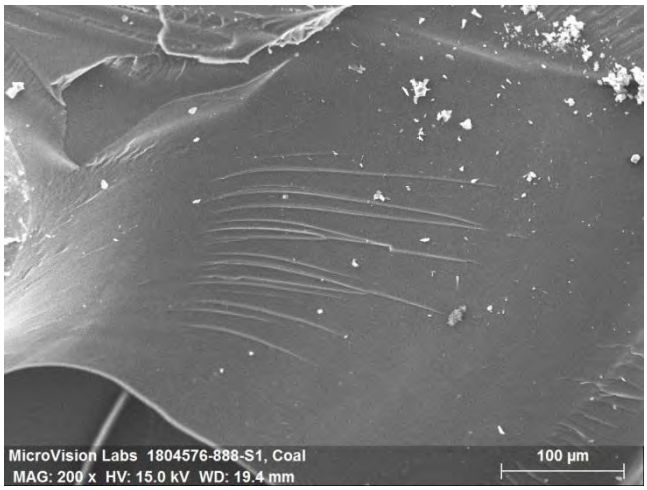
Sample: 1804576-888-S1

Number of Suspect Particle Types: Three

Coal: This particle type consisted of eleven shiny, black grains approximately 1-7mm in diameter. The PLM examination indicated this particle type to be consistent with coal. The PLM and SEM images of this particle type show the angular edges and typical conchoidal fractures found in coal.

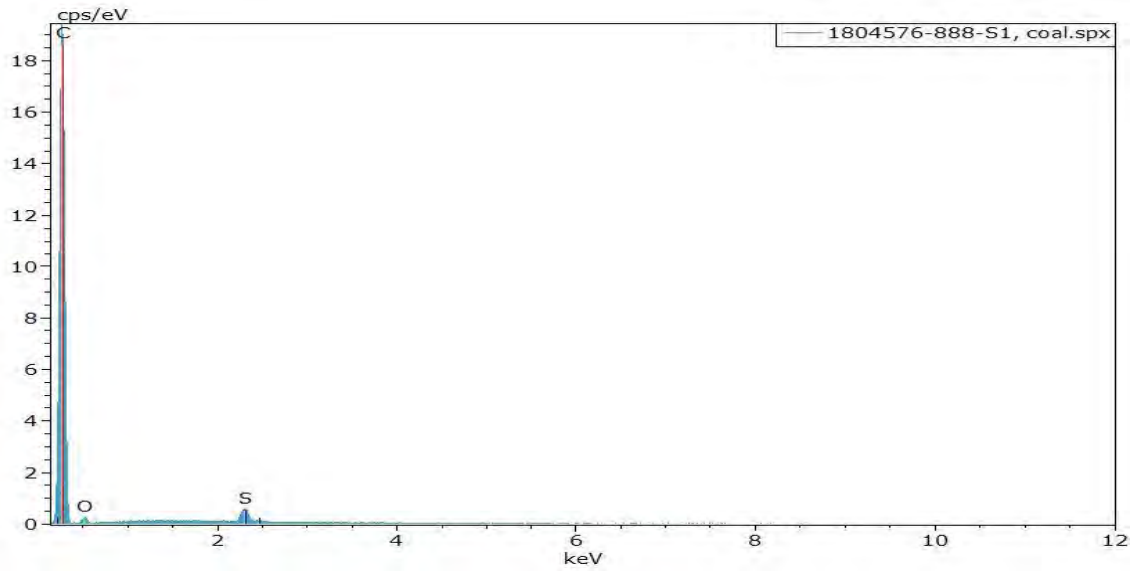


PLM Image

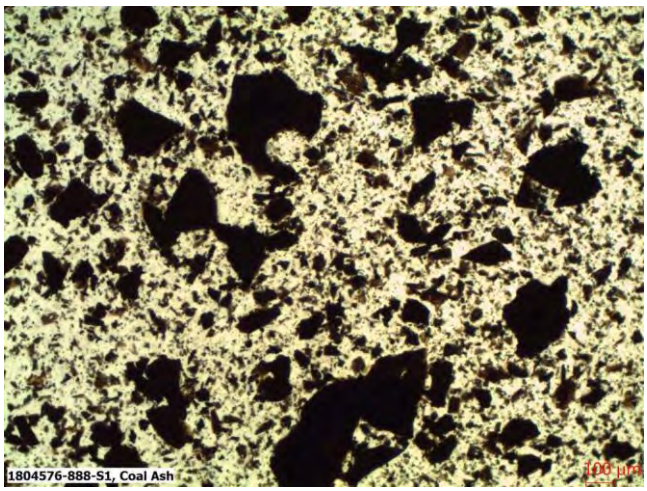


SEM Image

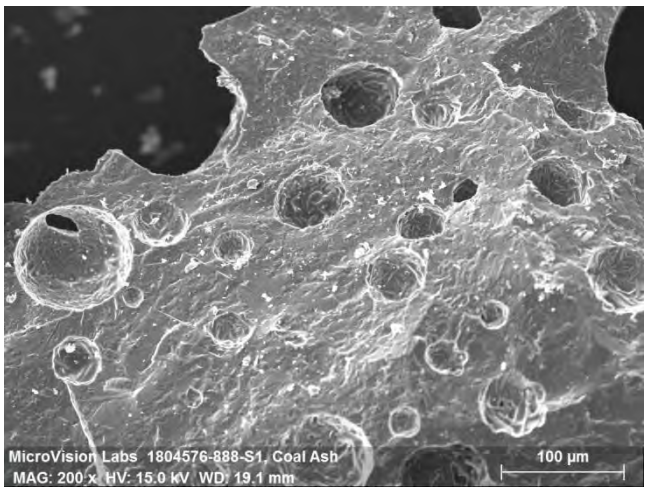
The EDS spectrum, shown below, confirms that this particle type is coal. The analysis for this particle shows concentrations of carbon, oxygen, and sulfur.



Coal Ash: This particle type consisted of six dark, porous grains approximately 2-15mm in diameter. The PLM examination indicated this particle type to be consistent with coal ash. The PLM and SEM images show the spherical gas voids that formed during combustion.

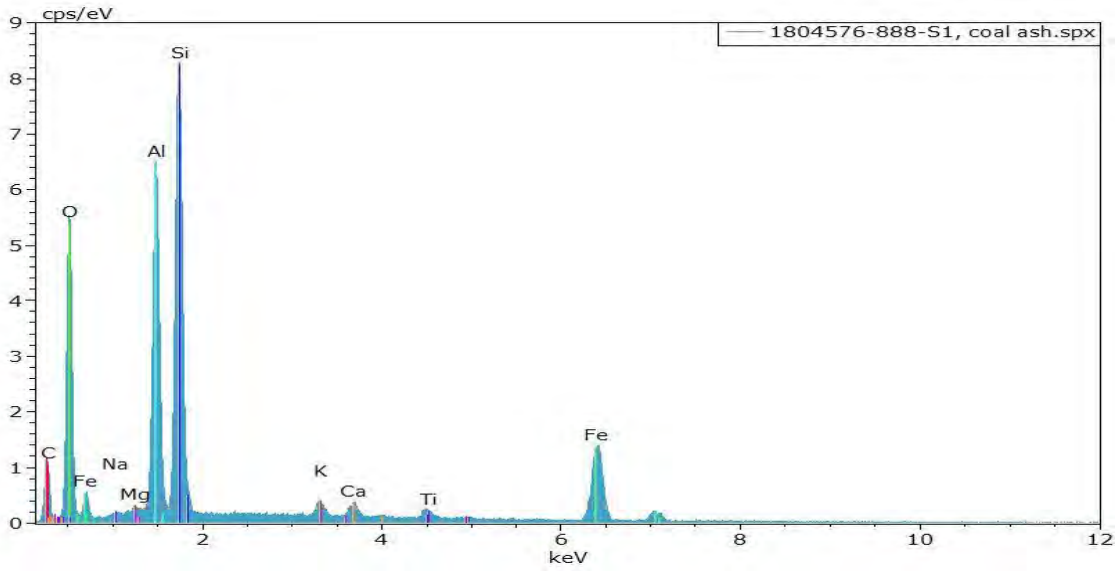


PLM Image

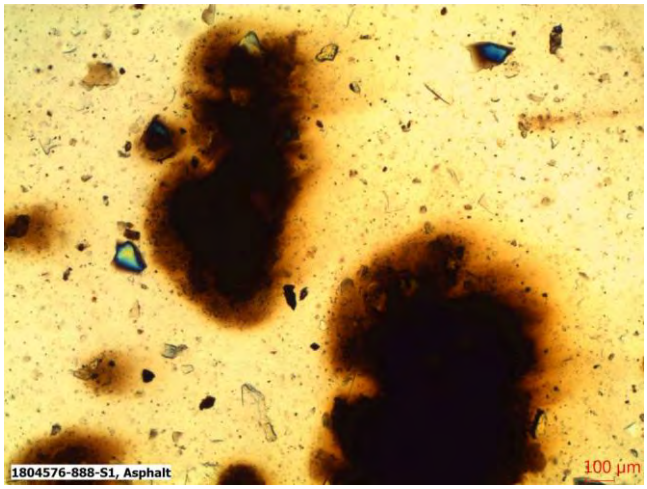


SEM Image

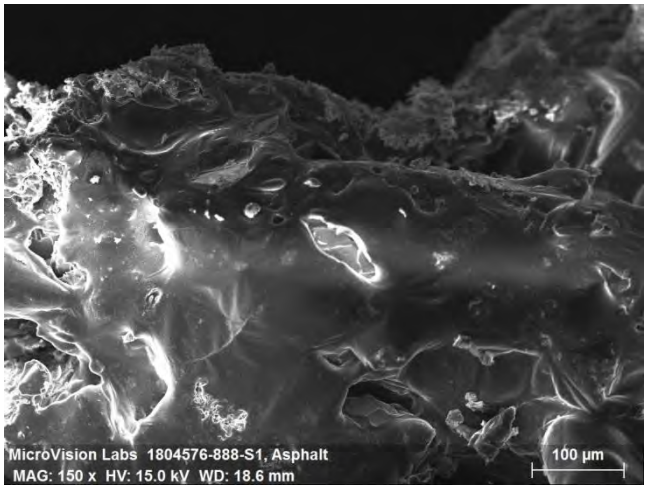
The EDS spectrum, shown below, indicates this particle type is coal ash. The analysis for this particle shows concentrations of carbon, oxygen, sodium, magnesium, aluminum, silicon, potassium, calcium, titanium and iron.



Asphalt: This particle type consisted of four ductile, black grains approximately 1-6mm in diameter. These grains had mineral matter embedded in and stuck to them. During the PLM examination, these particles slowly dissolved in the mounting oil which is a typical characteristic of asphalt. The PLM image shows the dissolving asphalt particles, and the SEM image illustrates the morphology of asphalt with the embedded mineral grains.

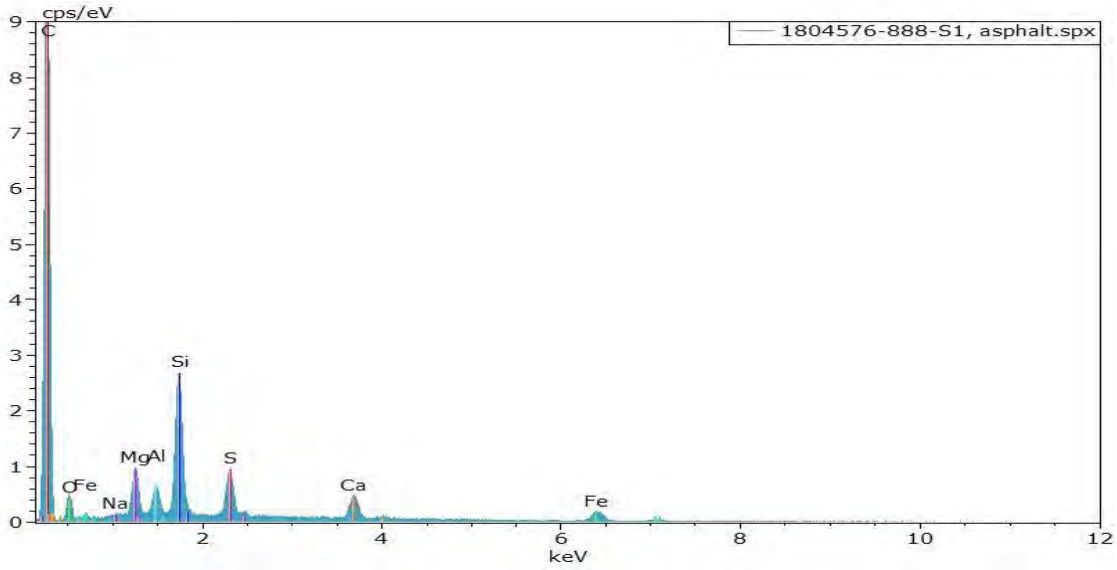


PLM Image



SEM Image

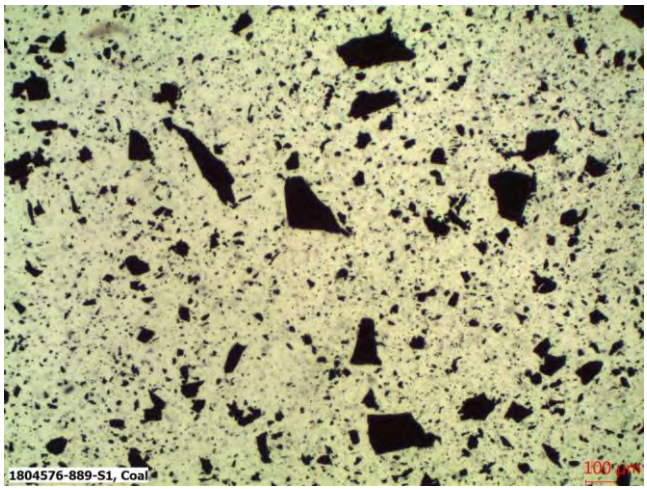
The EDS spectrum, shown below, indicates this particle type is asphalt. The analysis for this particle shows concentrations of carbon, oxygen, sodium, magnesium, aluminum, silicon, sulfur, calcium, and iron.



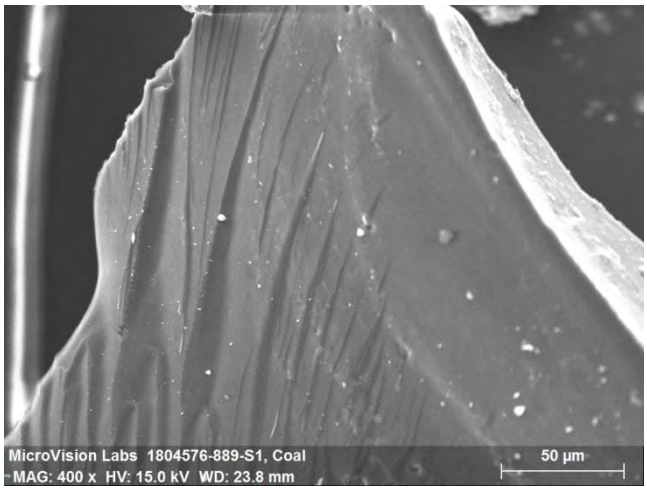
Sample: 1804576-889-S1

Number of Suspect Particle Types: Three

Coal: This particle type consisted of twenty-seven shiny, black grains approximately 1-6mm in diameter. The PLM examination indicated this particle type to be consistent with coal. The PLM and SEM images of this particle type show the angular edges and typical conchoidal fractures found in coal.

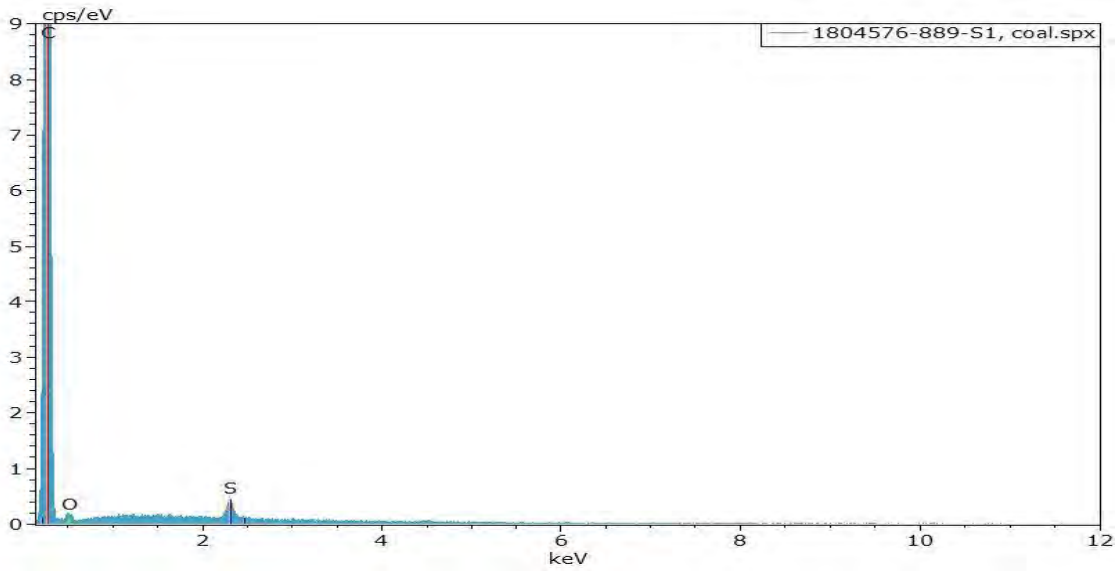


PLM Image

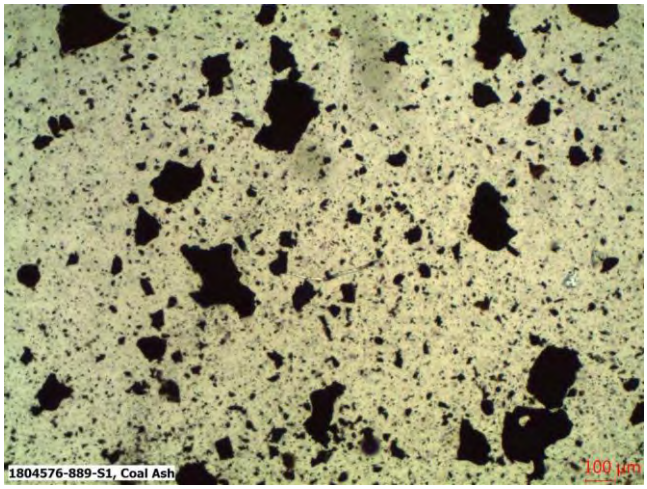


SEM Image

The EDS spectrum, shown below, confirms that this particle type is coal. The analysis for this particle shows concentrations of carbon, oxygen, and sulfur.



Coal Ash: This particle type consisted of eight dark, porous grains approximately 2-12mm in diameter. The PLM examination indicated this particle type to be consistent with coal ash. The PLM and SEM images show the spherical gas voids that formed during combustion.

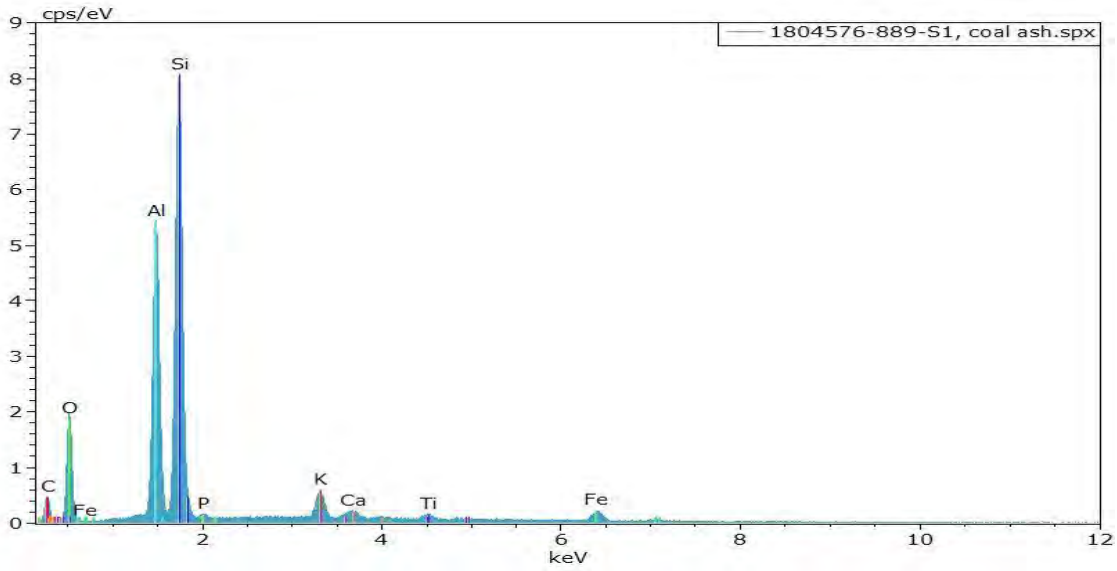


PLM Image

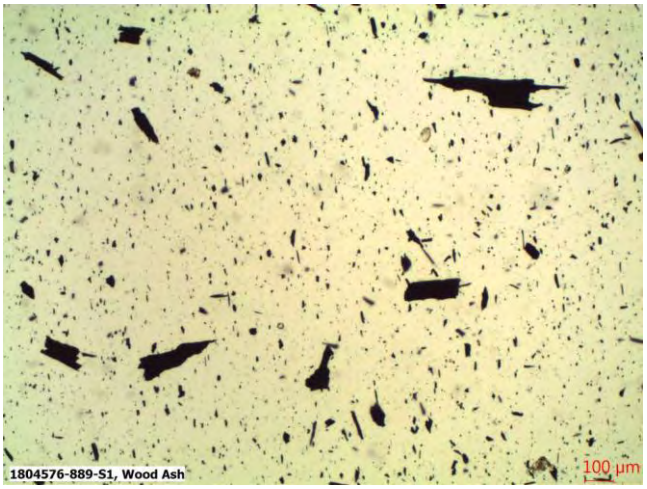


SEM Image

The EDS spectrum, shown below, indicates this particle type is coal ash. The analysis for this particle shows concentrations of carbon, oxygen, aluminum, silicon, phosphorus, potassium, calcium, titanium and iron.



Wood Ash: This particle type consisted of five friable, black grains approximately 2-6mm in length. The PLM examination indicated this particle type to be consistent with wood ash. The PLM and SEM photos show the cellular structure typical of wood still present in these grains.

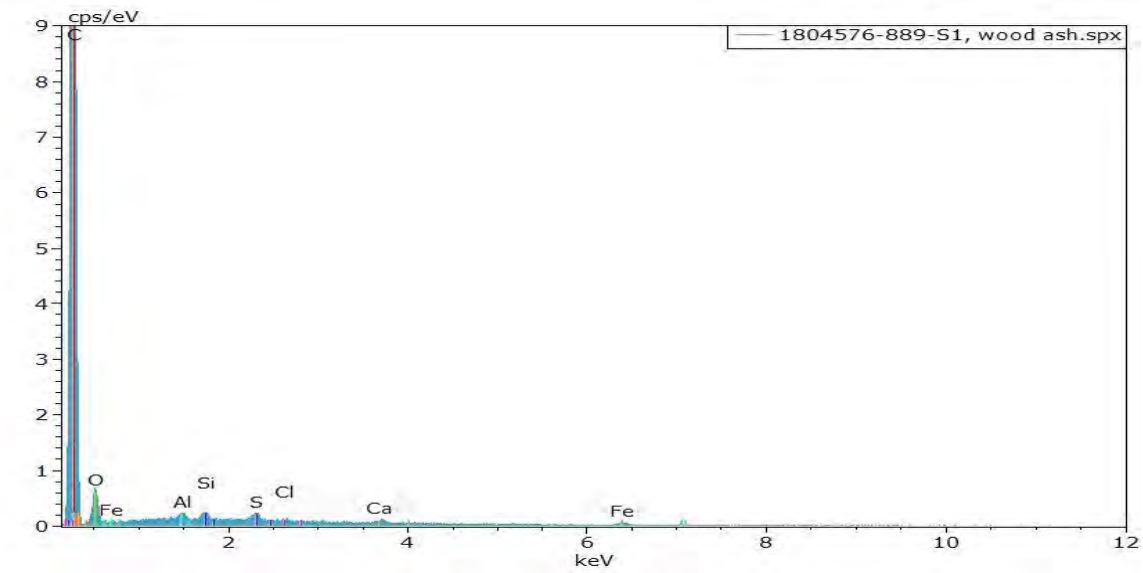


PLM Image



SEM Image

The EDS spectrum, shown below, indicates this particle type is wood ash. The analysis for this particle shows concentrations of carbon, oxygen, aluminum, silicon, sulfur, chlorine, calcium and iron.



Results Summary Table:

Sample Name	Material Detected
1804576-859-S1	**Coal (light), Wood Ash (light)**
1804576-888-S1	**Coal (light), Coal Ash (light), Asphalt (trace)**
1804576-889-S1	**Coal (moderate), Coal Ash (light), Wood Ash (trace)**

The concentrations of the particle types detected in these samples are listed in parenthesis in the table above and are based on the number of particles found and the relative difficulty in finding them. The concentration information is listed for informational purposes only and has no bearing on exemption status.

Please let us know if you have any questions about this analysis or if there is anything else we can do for you.

Sincerely,

Denise Weidler
Analytical Microscopist

Reviewed by: TW

MICROVISION LABS, INC.

Chain Of Custody

MicroVision Labs Job#: 16737

Client Information

Client: GEI Consultants
Billing Address: 400 Unicorn Park Drive
Woburn, MA
Phone: 781-721-4091
Email: rhuffman@geiconsultants.com

Project Information

Project Name: Amesbury MGP
Project Location: Amesbury, MA
Project Number: 1804576
Project Manager: Ryan Huffman
PO#:

Requested Analyses

Sample ID	Collected Date	Sampler's Initials	Coal Ash Test	Lead Paint Chips Analysis	SEM/EDS	Micro-FTIR	X-Ray Imaging	Micro-XRF	PLM/Light Microscopy	Soot ID	Unknown Material ID	Polished Cross Section	Membrane Autopsy	Particle Size Analysis	Other
1) 1804576-859-S1	8/16/24	NMT	X												
2) 1804576-888-S1	7/24/24	MS/SW	X												
3) 1804576-889-S1	7/25/24	MS/SW	X												
4)															
5)															
6)															
7)															
8)															
9)															
10)															

Turn Around Time and Notes:

Relinquished By: Charles DelMarco **Date/Time** 08/27/24 12:22
Received By: [signature] **Date/Time** 8/27/24 12:22

List any known Hazardous Materials:

Analytical Report Requested: (YES) / NO

MicroVision Laboratories, Inc.
187 Billerica Road, Chelmsford, MA 01824
Phone 978-250-9909 Fax 978-250-9901
microvisionlabs.com

Appendix H Laboratory Data Reports – Disposal Characterization

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP - 401WQ (1804576)
ESS Laboratory Work Order Number: 19I0437

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 4:53 pm, Oct 23, 2019

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses

CTS - Cranston, RI	Grain Size Analysis, Organic Content
Sterling Analytical Lab - West Springfield, MA	Sulfur

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0437

SAMPLE RECEIPT

The following samples were received on September 13, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Revision 1 October 2, 2019: This report has been revised to remove % Organic Matter D-2974-84. Analysis was not requested on COC.

Revision 2 October 8, 2019: This report has been revised to include Subwork for Volatile Solids (%).

Revision 3 October 23, 2019: This report has been revised to include TCLP Chromium for 19I0437-01.

Lab Number	Sample Name	Matrix	Analysis
19I0437-01	1804576-SS664-S1	Sediment	1010, 1311, 1311/6010C, 6010, 7.3.3.2, 7.3.4.1, 8081B, 8082A-Cong, 8100M, 8151A, 8260B Low, 8270D, 9014, 9030B, 9038, 9045, 9050A, EPH8270, EPH8270SIM, LK, MADEP-EPH, SUB
19I0437-02	1804576-SS664-S1 Dried	Sediment	6010C, 6020A, 7471B

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ ESS Laboratory Work Order: 19I0437

PROJECT NARRATIVE

5035/8260B Volatile Organic Compounds / Low Level

C9I0302-CCV1 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
Bromomethane (21% @ 20%)

C9I0302-CCV1 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
1,4-Dioxane (22% @ 20%)

CI91724-BSD1 **Relative percent difference for duplicate is outside of criteria (D+).**
2,2-Dichloropropane (26% @ 20%), Bromomethane (42% @ 20%)

8081B Organochlorine Pesticides

C9I0366-CCV3 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
Endrin Ketone [2C] (21% @ 20%)

8082 Polychlorinated Biphenyls (PCB) / Congeners

19I0437-01 **Lower value is used due to matrix interferences (LC).**
BZ#105 , BZ#187 , BZ#52 [2C]

19I0437-01 **Percent difference between primary and confirmation results exceeds 40% (P).**
BZ#105 , BZ#187 , BZ#52 [2C]

8151A Chlorinated Herbicides

19I0437-01 **Lower value is used due to matrix interferences (LC).**
2,4-DB

19I0437-01 **Percent difference between primary and confirmation results exceeds 40% (P).**
2,4-DB

CI91661-BS1 **Blank Spike recovery is below lower control limit (B-).**
Dinoseb (9% @ 10-100%)

CI91661-BSD1 **Blank Spike recovery is below lower control limit (B-).**
Dinoseb (9% @ 10-100%)

8270D Semi-Volatile Organic Compounds

C9I0257-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (97% @ 80-120%), Di-n-octylphthalate (109% @ 80-120%), Pentachlorophenol (92% @ 80-120%)

C9I0257-CCV1 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
2-Methylnaphthalene (21% @ 20%), 4-Nitrophenol (23% @ 20%)

C9I0290-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (93% @ 80-120%), Pentachlorophenol (92% @ 80-120%)

C9I0290-CCV1 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
2-Methylnaphthalene (23% @ 20%)

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ ESS Laboratory Work Order: 19I0437

DATA USABILITY LINKS

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Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS664-S1
Date Sampled: 09/11/19 13:55
Percent Solids: 57

ESS Laboratory Work Order: 19I0437
ESS Laboratory Sample ID: 19I0437-01
Sample Matrix: Sediment
Units: mg/L

Extraction Method: 3005A TCLP

1311 TCLP Metals

Analyte	Results (MRL)	MDL	Method	TCLP Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Chromium	ND (0.020)		1311/6010C		1	KJK	10/23/19 4:10	50	50	CJ92258

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS664-S1
Date Sampled: 09/11/19 13:55
Percent Solids: 57
Initial Volume: 7.1
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19I0437
ESS Laboratory Sample ID: 19I0437-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
1,1,1-Trichloroethane	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
1,1,2,2-Tetrachloroethane	ND (0.0025)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
1,1,2-Trichloroethane	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
1,1-Dichloroethane	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
1,1-Dichloroethene	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
1,1-Dichloropropene	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
1,2,3-Trichlorobenzene	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
1,2,3-Trichloropropane	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
1,2,4-Trichlorobenzene	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
1,2,4-Trimethylbenzene	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
1,2-Dibromo-3-Chloropropane	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
1,2-Dibromoethane	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
1,2-Dichlorobenzene	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
1,2-Dichloroethane	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
1,2-Dichloropropane	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
1,3,5-Trimethylbenzene	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
1,3-Dichlorobenzene	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
1,3-Dichloropropane	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
1,4-Dichlorobenzene	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
1,4-Dioxane	ND (0.124)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
2,2-Dichloropropane	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
2-Butanone	**0.0223** (0.0124)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
2-Chlorotoluene	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
2-Hexanone	ND (0.0124)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
4-Chlorotoluene	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
4-Isopropyltoluene	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
4-Methyl-2-Pentanone	ND (0.0124)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
Acetone	**0.190** (0.0124)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
Benzene	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
Bromobenzene	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
Bromochloromethane	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS664-S1
Date Sampled: 09/11/19 13:55
Percent Solids: 57
Initial Volume: 7.1
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19I0437
ESS Laboratory Sample ID: 19I0437-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromodichloromethane	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
Bromoform	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
Bromomethane	ND (0.0124)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
Carbon Disulfide	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
Carbon Tetrachloride	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
Chlorobenzene	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
Chloroethane	ND (0.0124)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
Chloroform	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
Chloromethane	ND (0.0124)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
cis-1,2-Dichloroethene	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
cis-1,3-Dichloropropene	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
Dibromochloromethane	ND (0.0025)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
Dibromomethane	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
Dichlorodifluoromethane	ND (0.0124)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
Diethyl Ether	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
Di-isopropyl ether	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
Ethyl tertiary-butyl ether	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
Ethylbenzene	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
Hexachlorobutadiene	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
Isopropylbenzene	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
Methyl tert-Butyl Ether	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
Methylene Chloride	ND (0.0124)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
Naphthalene	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
n-Butylbenzene	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
n-Propylbenzene	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
sec-Butylbenzene	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
Styrene	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
tert-Butylbenzene	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
Tertiary-amyl methyl ether	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
Tetrachloroethene	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
Tetrahydrofuran	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
Toluene	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS664-S1
Date Sampled: 09/11/19 13:55
Percent Solids: 57
Initial Volume: 7.1
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19I0437
ESS Laboratory Sample ID: 19I0437-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
trans-1,2-Dichloroethene	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
trans-1,3-Dichloropropene	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
Trichloroethene	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
Trichlorofluoromethane	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
Vinyl Chloride	**0.0196** (0.0124)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
Xylene O	ND (0.0062)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
Xylene P,M	ND (0.0124)		8260B Low		1	09/17/19 13:42	C9I0302	CI91724
Xylenes (Total)	ND (0.0124)		8260B Low		1	09/17/19 13:42		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*115 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*92 %*		*70-130*
Surrogate: Dibromofluoromethane	*102 %*		*70-130*
Surrogate: Toluene-d8	*104 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS664-S1
Date Sampled: 09/11/19 13:55
Percent Solids: 57
Initial Volume: 19
Final Volume: 5
Extraction Method: 3546

ESS Laboratory Work Order: 19I0437
ESS Laboratory Sample ID: 19I0437-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: DMC
Prepared: 9/18/19 13:15

8081B Organochlorine Pesticides

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
4,4´-DDD [2C]	**0.0108** (0.0046)		8081B		1	09/20/19 6:51	C9I0366	CI91812
4,4´-DDE [2C]	ND (0.0046)		8081B		1	09/20/19 6:51	C9I0366	CI91812
4,4´-DDT	ND (0.0046)		8081B		1	09/20/19 6:51	C9I0366	CI91812
Aldrin	ND (0.0046)		8081B		1	09/20/19 6:51	C9I0366	CI91812
alpha-BHC	ND (0.0046)		8081B		1	09/20/19 6:51	C9I0366	CI91812
alpha-Chlordane	ND (0.0046)		8081B		1	09/20/19 6:51	C9I0366	CI91812
beta-BHC	ND (0.0046)		8081B		1	09/20/19 6:51	C9I0366	CI91812
Chlordane (Total)	ND (0.0370)		8081B		1	09/20/19 6:51	C9I0366	CI91812
delta-BHC	ND (0.0046)		8081B		1	09/20/19 6:51	C9I0366	CI91812
Dieldrin	ND (0.0046)		8081B		1	09/20/19 6:51	C9I0366	CI91812
Endosulfan I	ND (0.0046)		8081B		1	09/20/19 6:51	C9I0366	CI91812
Endosulfan II	ND (0.0046)		8081B		1	09/20/19 6:51	C9I0366	CI91812
Endosulfan Sulfate	ND (0.0046)		8081B		1	09/20/19 6:51	C9I0366	CI91812
Endrin	ND (0.0046)		8081B		1	09/20/19 6:51	C9I0366	CI91812
Endrin Ketone	ND (0.0046)		8081B		1	09/20/19 6:51	C9I0366	CI91812
gamma-BHC (Lindane)	ND (0.0028)		8081B		1	09/20/19 6:51	C9I0366	CI91812
gamma-Chlordane	ND (0.0046)		8081B		1	09/20/19 6:51	C9I0366	CI91812
Heptachlor	ND (0.0046)		8081B		1	09/20/19 6:51	C9I0366	CI91812
Heptachlor Epoxide	ND (0.0046)		8081B		1	09/20/19 6:51	C9I0366	CI91812
Hexachlorobenzene	ND (0.0046)		8081B		1	09/20/19 6:51	C9I0366	CI91812
Methoxychlor	ND (0.0046)		8081B		1	09/20/19 6:51	C9I0366	CI91812
Toxaphene	ND (0.231)		8081B		1	09/20/19 6:51	C9I0366	CI91812

	%Recovery	*Qualifier*	*Limits*
Surrogate: Decachlorobiphenyl	*77 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*86 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*69 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*73 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS664-S1
Date Sampled: 09/11/19 13:55
Percent Solids: 57
Initial Volume: 29.2
Final Volume: 2
Extraction Method: 3540C

ESS Laboratory Work Order: 19I0437
ESS Laboratory Sample ID: 19I0437-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: DMC
Prepared: 9/18/19 16:22

8082 Polychlorinated Biphenyls (PCB) / Congeners

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
BZ#8 [2C]	**0.00148** (0.00049)		8082A-Cong		1	09/24/19 5:57	C9I0413	CI91811
BZ#18	ND (0.00049)		8082A-Cong		1	09/24/19 5:57	C9I0413	CI91811
BZ#28 [2C]	**0.00341** (0.00049)		8082A-Cong		1	09/24/19 5:57	C9I0413	CI91811
BZ#44 [2C]	**0.0201** (0.00244)		8082A-Cong		5	09/24/19 4:28	C9I0413	CI91811
BZ#52 [2C]	**P, LC 0.0446** (0.00244)		8082A-Cong		5	09/24/19 4:28	C9I0413	CI91811
BZ#66	ND (0.00049)		8082A-Cong		1	09/24/19 5:57	C9I0413	CI91811
BZ#101 [2C]	**0.0332** (0.00244)		8082A-Cong		5	09/24/19 4:28	C9I0413	CI91811
BZ#105	**P, LC 0.00265** (0.00049)		8082A-Cong		1	09/24/19 5:57	C9I0413	CI91811
BZ#118 [2C]	**0.0260** (0.00244)		8082A-Cong		5	09/24/19 4:28	C9I0413	CI91811
BZ#128 [2C]	**0.00479** (0.00049)		8082A-Cong		1	09/24/19 5:57	C9I0413	CI91811
BZ#138 [2C]	**0.0323** (0.00244)		8082A-Cong		5	09/24/19 4:28	C9I0413	CI91811
BZ#153	**0.0330** (0.00244)		8082A-Cong		5	09/24/19 4:28	C9I0413	CI91811
BZ#170 [2C]	**0.00336** (0.00049)		8082A-Cong		1	09/24/19 5:57	C9I0413	CI91811
BZ#180 [2C]	**0.00390** (0.00049)		8082A-Cong		1	09/24/19 5:57	C9I0413	CI91811
BZ#187	**P, LC 0.00236** (0.00049)		8082A-Cong		1	09/24/19 5:57	C9I0413	CI91811
BZ#195 [2C]	ND (0.00049)		8082A-Cong		1	09/24/19 5:57	C9I0413	CI91811
BZ#206	ND (0.00049)		8082A-Cong		1	09/24/19 5:57	C9I0413	CI91811
BZ#209	ND (0.00049)		8082A-Cong		1	09/24/19 5:57	C9I0413	CI91811

	%Recovery	Qualifier	Limits
Surrogate: Tetrachloro-m-xylene	*34 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*39 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS664-S1
Date Sampled: 09/11/19 13:55
Percent Solids: 57
Initial Volume: 19.2
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19I0437
ESS Laboratory Sample ID: 19I0437-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: CAD
Prepared: 9/17/19 12:43

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**388** (18.3)		8100M		1	09/17/19 22:19	C9I0280	CI91710

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*104 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS664-S1
Date Sampled: 09/11/19 13:55
Percent Solids: 57
Initial Volume: 10.2
Final Volume: 4
Extraction Method: 3546

ESS Laboratory Work Order: 19I0437
ESS Laboratory Sample ID: 19I0437-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: DMC
Prepared: 9/16/19 19:15

8151A Chlorinated Herbicides

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2,4,5-T [2C]	**0.029** (0.016)		8151A		1	09/18/19 12:15	C9I0308	CI91661
2,4,5-TP (Silvex)	ND (0.016)		8151A		1	09/18/19 12:15	C9I0308	CI91661
2,4-D	ND (0.081)		8151A		1	09/18/19 12:15	C9I0308	CI91661
2,4-DB	**P, LC 0.114** (0.082)		8151A		1	09/18/19 12:15	C9I0308	CI91661
Dalapon	ND (0.078)		8151A		1	09/18/19 12:15	C9I0308	CI91661
Dicamba	ND (0.016)		8151A		1	09/18/19 12:15	C9I0308	CI91661
Dichlorprop	ND (0.081)		8151A		1	09/18/19 12:15	C9I0308	CI91661
Dinoseb	ND (0.082)		8151A		1	09/18/19 12:15	C9I0308	CI91661
MCPA	ND (4.00)		8151A		1	09/18/19 12:15	C9I0308	CI91661
MCPP	ND (4.04)		8151A		1	09/18/19 12:15	C9I0308	CI91661

	%Recovery	*Qualifier*	*Limits*
Surrogate: DCAA	*100 %*		*30-150*
Surrogate: DCAA [2C]	*111 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS664-S1
Date Sampled: 09/11/19 13:55
Percent Solids: 57
Initial Volume: 14.3
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19I0437
ESS Laboratory Sample ID: 19I0437-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: TJ
Prepared: 9/16/19 11:15

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,2,4-Trichlorobenzene	ND (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
1,2-Dichlorobenzene	ND (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
1,3-Dichlorobenzene	ND (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
1,4-Dichlorobenzene	ND (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
2,4,5-Trichlorophenol	ND (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
2,4,6-Trichlorophenol	ND (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
2,4-Dichlorophenol	ND (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
2,4-Dimethylphenol	ND (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
2,4-Dinitrophenol	ND (1.23)		8270D		1	09/18/19 1:11	C9I0290	CI91618
2,4-Dinitrotoluene	ND (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
2,6-Dinitrotoluene	ND (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
2-Chloronaphthalene	ND (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
2-Chlorophenol	ND (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
2-Methylnaphthalene	ND (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
2-Methylphenol	ND (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
2-Nitrophenol	ND (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
3,3′-Dichlorobenzidine	ND (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
3+4-Methylphenol	ND (1.23)		8270D		1	09/18/19 1:11	C9I0290	CI91618
4-Bromophenyl-phenylether	ND (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
4-Chloroaniline	ND (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
4-Nitrophenol	ND (3.08)		8270D		1	09/18/19 1:11	C9I0290	CI91618
Acenaphthene	**2.20** (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
Acenaphthylene	**1.19** (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
Acetophenone	ND (1.23)		8270D		1	09/18/19 1:11	C9I0290	CI91618
Aniline	ND (3.08)		8270D		1	09/18/19 1:11	C9I0290	CI91618
Anthracene	**3.22** (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
Azobenzene	ND (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
Benzo(a)anthracene	**4.58** (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
Benzo(a)pyrene	**4.75** (0.308)		8270D		1	09/18/19 1:11	C9I0290	CI91618
Benzo(b)fluoranthene	**2.27** (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
Benzo(g,h,i)perylene	**2.67** (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
Benzo(k)fluoranthene	**3.13** (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS664-S1
Date Sampled: 09/11/19 13:55
Percent Solids: 57
Initial Volume: 14.3
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19I0437
ESS Laboratory Sample ID: 19I0437-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: TJ
Prepared: 9/16/19 11:15

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
bis(2-Chloroethoxy)methane	ND (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
bis(2-Chloroethyl)ether	ND (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
bis(2-chloroisopropyl)Ether	ND (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
bis(2-Ethylhexyl)phthalate	**0.754** (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
Butylbenzylphthalate	ND (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
Chrysene	**3.27** (0.308)		8270D		1	09/18/19 1:11	C9I0290	CI91618
Dibenzo(a,h)Anthracene	**0.561** (0.308)		8270D		1	09/18/19 1:11	C9I0290	CI91618
Dibenzofuran	ND (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
Diethylphthalate	ND (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
Dimethylphthalate	ND (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
Di-n-butylphthalate	ND (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
Di-n-octylphthalate	ND (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
Fluoranthene	**9.38** (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
Fluorene	**1.57** (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
Hexachlorobenzene	ND (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
Hexachlorobutadiene	ND (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
Hexachloroethane	ND (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
Indeno(1,2,3-cd)Pyrene	**2.18** (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
Isophorone	ND (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
Naphthalene	ND (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
Nitrobenzene	ND (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
N-Nitrosodimethylamine	ND (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
Pentachlorophenol	ND (1.23)		8270D		1	09/18/19 1:11	C9I0290	CI91618
Phenanthrene	**10.0** (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
Phenol	ND (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
Pyrene	**12.2** (0.613)		8270D		1	09/18/19 1:11	C9I0290	CI91618
Pyridine	ND (3.08)		8270D		1	09/18/19 1:11	C9I0290	CI91618

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichlorobenzene-d4	*66 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*80 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*69 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS664-S1
Date Sampled: 09/11/19 13:55
Percent Solids: 57
Initial Volume: 14.3
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19I0437
ESS Laboratory Sample ID: 19I0437-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: TJ
Prepared: 9/16/19 11:15

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Surrogate: 2-Fluorobiphenyl		*64 %*		*30-130*				
Surrogate: 2-Fluorophenol		*67 %*		*30-130*				
Surrogate: Nitrobenzene-d5		*67 %*		*30-130*				
Surrogate: Phenol-d6		*66 %*		*30-130*				
Surrogate: p-Terphenyl-d14		*77 %*		*30-130*				

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS664-S1
Date Sampled: 09/11/19 13:55
Percent Solids: 57

ESS Laboratory Work Order: 19I0437
ESS Laboratory Sample ID: 19I0437-01
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Conductivity	**WL 456** (5)		9050A		1	EEM	09/17/19 15:45	umhos/cm	CI91721
Corrosivity (pH)	**5.95** (N/A)		9045		1	JLK	09/13/19 20:39	S.U.	CI91341
Corrosivity (pH) Sample Temp	**Soil pH measured in water at 21.1 ºC.**								
Flashpoint	**> 200** (N/A)		1010		1	CCP	09/18/19 19:00	°F	CI91850
Reactive Cyanide	ND (2.0)		7.3.3.2		1	EEM	09/17/19 10:42	mg/kg	CI91711
Reactive Sulfide	ND (2.0)		7.3.4.1		1	EEM	09/17/19 10:42	mg/kg	CI91711
Sulfate	**WL 449** (87)		9038		1	JLK	09/17/19 15:38	mg/kg dry	CI91734
Sulfide	**WL** ND (0.9)		9030B		1	JLK	09/16/19 20:09	mg/kg dry	CI91645
Total Cyanide	**1.95** (1.73)		9014		1	EEM	09/16/19 12:20	mg/kg dry	CI91626
Total Organic Carbon (Average)	**47800** (111)		LK		1	CCP	09/19/19 14:50	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS664-S1
Date Sampled: 09/11/19 13:55
Percent Solids: 57
Initial Volume: 24.7
Final Volume: 3
Extraction Method: 3546

ESS Laboratory Work Order: 19I0437
ESS Laboratory Sample ID: 19I0437-01
Sample Matrix: Sediment
Units: mg/kg dry

Prepared: 9/19/19 16:00

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (80.0)		MADEP-EPH		1	CAD	09/20/19 0:30	C9I0350	CI91906
C19-C36 Aliphatics1	**318** (80.0)		MADEP-EPH		1	CAD	09/20/19 0:30	C9I0350	CI91906
C11-C22 Unadjusted Aromatics1	**426** (80.0)		EPH8270		1	VSC	09/19/19 23:40	C9I0342	CI91906
C11-C22 Aromatics1,2	**303** (84.3)		EPH8270			IBM	09/20/19 14:25		[CALC]
2-Methylnaphthalene	**0.214** (0.107)		EPH8270SIM		1	IBM	09/19/19 21:06	C9I0367	CI91906
Acenaphthene	**2.56** (0.107)		EPH8270SIM		1	IBM	09/19/19 21:06	C9I0367	CI91906
Naphthalene	**0.606** (0.107)		EPH8270SIM		1	IBM	09/19/19 21:06	C9I0367	CI91906
Phenanthrene	**19.4** (1.07)		EPH8270SIM		10	IBM	09/20/19 14:25	C9I0367	CI91906
Acenaphthylene	**1.27** (0.107)		EPH8270SIM		1	IBM	09/19/19 21:06	C9I0367	CI91906
Anthracene	**4.23** (0.043)		EPH8270SIM		1	IBM	09/19/19 21:06	C9I0367	CI91906
Benzo(a)anthracene	**6.97** (0.043)		EPH8270SIM		1	IBM	09/19/19 21:06	C9I0367	CI91906
Benzo(a)pyrene	**7.96** (0.043)		EPH8270SIM		1	IBM	09/19/19 21:06	C9I0367	CI91906
Benzo(b)fluoranthene	**6.67** (0.107)		EPH8270SIM		1	IBM	09/19/19 21:06	C9I0367	CI91906
Benzo(g,h,i)perylene	**4.69** (0.107)		EPH8270SIM		1	IBM	09/19/19 21:06	C9I0367	CI91906
Benzo(k)fluoranthene	**2.19** (0.107)		EPH8270SIM		1	IBM	09/19/19 21:06	C9I0367	CI91906
Chrysene	**5.60** (0.107)		EPH8270SIM		1	IBM	09/19/19 21:06	C9I0367	CI91906
Dibenzo(a,h)Anthracene	**1.01** (0.043)		EPH8270SIM		1	IBM	09/19/19 21:06	C9I0367	CI91906
Fluoranthene	**22.0** (1.07)		EPH8270SIM		10	IBM	09/20/19 14:25	C9I0367	CI91906
Fluorene	**1.70** (0.043)		EPH8270SIM		1	IBM	09/19/19 21:06	C9I0367	CI91906
Indeno(1,2,3-cd)Pyrene	**4.36** (0.107)		EPH8270SIM		1	IBM	09/19/19 21:06	C9I0367	CI91906
Pyrene	**31.8** (1.07)		EPH8270SIM		10	IBM	09/20/19 14:25	C9I0367	CI91906

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*93 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*110 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*99 %*		*40-140*
Surrogate: O-Terphenyl	*99 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS664-S1
Date Sampled: 09/11/19 13:55

ESS Laboratory Work Order: 19I0437
ESS Laboratory Sample ID: 19I0437-01
Sample Matrix: Sediment

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Grain Size	**See Attached** (N/A)								
Organic Content	**See Attached** (N/A)								
Sulfur	**2390** (100)		6010		1	SUB	09/23/19 9:56	mg/kg	CI92313

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS664-S1
Date Sampled: 09/11/19 13:55
Percent Solids: 57
Initial Volume: 100
Final Volume: 2000
Extraction Method: 1311

ESS Laboratory Work Order: 19I0437
ESS Laboratory Sample ID: 19I0437-01
Sample Matrix: Sediment
Units: °C
Analyst: BJV
Prepared: 10/21/19 16:45

TCLP Extraction by 1311

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Batch
Temperature (Min C)	**20.2** (N/A)		1311		1	BJV	10/22/19 8:55	CJ91842
Temperature (Max C)	**21.7** (N/A)		1311		1	BJV	10/22/19 8:55	CJ91842
Temperature (Range)	**Temperature is not within 23 +/-2 ºC.** (N/A)							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS664-S1 Dried
Date Sampled: 09/11/19 13:55
Percent Solids: 100

ESS Laboratory Work Order: 19I0437
ESS Laboratory Sample ID: 19I0437-02
Sample Matrix: Sediment
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Arsenic	**13.6** (0.99)		6010C		1	KJK	09/18/19 23:01	5.05	100	CI91662
Barium	**36.4** (0.99)		6010C		1	KJK	09/18/19 23:01	5.05	100	CI91662
Cadmium	**1.24** (0.20)		6010C		1	KJK	09/18/19 23:01	5.05	100	CI91662
Chromium	**120** (0.40)		6010C		1	KJK	09/18/19 23:01	5.05	100	CI91662
Copper	**156** (0.99)		6010C		1	KJK	09/18/19 23:01	5.05	100	CI91662
Lead	**86.2** (1.98)		6010C		1	KJK	09/18/19 23:01	5.05	100	CI91662
Mercury	**0.289** (0.085)		7471B		10	MKS	09/17/19 13:19	2.33	40	CI91663
Nickel	**105** (0.99)		6010C		1	KJK	09/18/19 23:01	5.05	100	CI91662
Selenium	ND (0.40)		6020A		1	NAR	09/20/19 14:30	5.05	100	CI91662
Silver	**4.62** (0.20)		6010C		1	KJK	09/18/19 23:01	5.05	100	CI91662
Zinc	**152** (0.99)		6010C		1	KJK	09/18/19 23:01	5.05	100	CI91662

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0437

Quality Control Data

Total Metals

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch CI91662 - 3050B										
Blank										
Arsenic	ND	2.50	mg/kg wet							
Barium	ND	2.50	mg/kg wet							
Cadmium	ND	0.50	mg/kg wet							
Chromium	ND	1.00	mg/kg wet							
Copper	ND	2.50	mg/kg wet							
Lead	ND	5.00	mg/kg wet							
Nickel	ND	2.50	mg/kg wet							
Silver	ND	1.00	mg/kg wet							
Zinc	ND	2.50	mg/kg wet							
Blank										
Selenium	ND	0.02	mg/kg wet							
LCS										
Arsenic	137	9.62	mg/kg wet	128.0		107	80-120			
Barium	565	9.62	mg/kg wet	536.0		105	80-120			
Cadmium	97.1	1.92	mg/kg wet	99.00		98	80-120			
Chromium	125	3.85	mg/kg wet	116.0		108	80-120			
Copper	88.9	9.62	mg/kg wet	89.60		99	80-120			
Lead	293	19.2	mg/kg wet	277.0		106	80-120			
Nickel	109	9.62	mg/kg wet	107.0		102	80-120			
Silver	67.5	3.85	mg/kg wet	64.30		105	80-120			
Zinc	563	9.62	mg/kg wet	561.0		100	80-120			
LCS										
Selenium	247	9.62	mg/kg wet	242.0		102	80-120			
LCS Dup										
Arsenic	139	7.35	mg/kg wet	128.0		109	80-120	2	20	
Barium	568	7.35	mg/kg wet	536.0		106	80-120	0.5	20	
Cadmium	98.6	1.47	mg/kg wet	99.00		100	80-120	2	20	
Chromium	126	2.94	mg/kg wet	116.0		109	80-120	1	20	
Copper	91.3	7.35	mg/kg wet	89.60		102	80-120	3	20	
Lead	298	14.7	mg/kg wet	277.0		108	80-120	2	20	
Nickel	109	7.35	mg/kg wet	107.0		102	80-120	0.7	20	
Silver	68.8	2.94	mg/kg wet	64.30		107	80-120	2	20	
Zinc	573	7.35	mg/kg wet	561.0		102	80-120	2	20	
LCS Dup										
Selenium	250	7.35	mg/kg wet	242.0		103	80-120	0.9	30	
Batch CI91663 - 7471B										
Blank										
Mercury	ND	0.033	mg/kg wet							
LCS										
Mercury	2.94	0.325	mg/kg wet	3.120		94	80-120			
LCS Dup										
Mercury	2.75	0.336	mg/kg wet	3.120		88	80-120	7	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
1311 TCLP Metals										
Batch CJ92258 - 3005A_TCLP										
Blank										
Chromium	ND	0.020	mg/L							
LCS										
Chromium	0.513	0.020	mg/L	0.5000		103	80-120			
LCS Dup										
Chromium	0.588	0.020	mg/L	0.5000		118	80-120	14	20	
5035/8260B Volatile Organic Compounds / Low Level										
Batch CI91724 - 5035										
Blank										
1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0020	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0100	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0100	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0100	mg/kg wet							
Acetone	ND	0.0100	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CI91724 - 5035										
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0020	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0100	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*0.0528*		mg/kg wet	*0.05000*		*106*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0456*		mg/kg wet	*0.05000*		*91*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0475*		mg/kg wet	*0.05000*		*95*	*70-130*			
Surrogate: Toluene-d8	*0.0500*		mg/kg wet	*0.05000*		*100*	*70-130*			
LCS										
1,1,1,2-Tetrachloroethane	0.0506	0.0050	mg/kg wet	0.05000		101	70-130			
1,1,1-Trichloroethane	0.0505	0.0050	mg/kg wet	0.05000		101	70-130			
1,1,2,2-Tetrachloroethane	0.0500	0.0020	mg/kg wet	0.05000		100	70-130			

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Quality Control Data

5035/8260B Volatile Organic Compounds / Low Level

Batch CI91724 - 5035

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
1,1,2-Trichloroethane	0.0502	0.0050	mg/kg wet	0.05000		100	70-130			
1,1-Dichloroethane	0.0517	0.0050	mg/kg wet	0.05000		103	70-130			
1,1-Dichloroethene	0.0487	0.0050	mg/kg wet	0.05000		97	70-130			
1,1-Dichloropropene	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
1,2,3-Trichlorobenzene	0.0522	0.0050	mg/kg wet	0.05000		104	70-130			
1,2,3-Trichloropropane	0.0481	0.0050	mg/kg wet	0.05000		96	70-130			
1,2,4-Trichlorobenzene	0.0528	0.0050	mg/kg wet	0.05000		106	70-130			
1,2,4-Trimethylbenzene	0.0516	0.0050	mg/kg wet	0.05000		103	70-130			
1,2-Dibromo-3-Chloropropane	0.0492	0.0050	mg/kg wet	0.05000		98	70-130			
1,2-Dibromoethane	0.0495	0.0050	mg/kg wet	0.05000		99	70-130			
1,2-Dichlorobenzene	0.0509	0.0050	mg/kg wet	0.05000		102	70-130			
1,2-Dichloroethane	0.0523	0.0050	mg/kg wet	0.05000		105	70-130			
1,2-Dichloropropane	0.0497	0.0050	mg/kg wet	0.05000		99	70-130			
1,3,5-Trimethylbenzene	0.0504	0.0050	mg/kg wet	0.05000		101	70-130			
1,3-Dichlorobenzene	0.0504	0.0050	mg/kg wet	0.05000		101	70-130			
1,3-Dichloropropane	0.0510	0.0050	mg/kg wet	0.05000		102	70-130			
1,4-Dichlorobenzene	0.0515	0.0050	mg/kg wet	0.05000		103	70-130			
1,4-Dioxane	0.970	0.100	mg/kg wet	1.000		97	70-130			
2,2-Dichloropropane	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			
2-Butanone	0.247	0.0100	mg/kg wet	0.2500		99	70-130			
2-Chlorotoluene	0.0498	0.0050	mg/kg wet	0.05000		100	70-130			
2-Hexanone	0.265	0.0100	mg/kg wet	0.2500		106	70-130			
4-Chlorotoluene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130			
4-Isopropyltoluene	0.0507	0.0050	mg/kg wet	0.05000		101	70-130			
4-Methyl-2-Pentanone	0.252	0.0100	mg/kg wet	0.2500		101	70-130			
Acetone	0.245	0.0100	mg/kg wet	0.2500		98	70-130			
Benzene	0.0479	0.0050	mg/kg wet	0.05000		96	70-130			
Bromobenzene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130			
Bromochloromethane	0.0499	0.0050	mg/kg wet	0.05000		100	70-130			
Bromodichloromethane	0.0505	0.0050	mg/kg wet	0.05000		101	70-130			
Bromoform	0.0497	0.0050	mg/kg wet	0.05000		99	70-130			
Bromomethane	0.0564	0.0100	mg/kg wet	0.05000		113	70-130			
Carbon Disulfide	0.0495	0.0050	mg/kg wet	0.05000		99	70-130			
Carbon Tetrachloride	0.0498	0.0050	mg/kg wet	0.05000		100	70-130			
Chlorobenzene	0.0487	0.0050	mg/kg wet	0.05000		97	70-130			
Chloroethane	0.0407	0.0100	mg/kg wet	0.05000		81	70-130			
Chloroform	0.0501	0.0050	mg/kg wet	0.05000		100	70-130			
Chloromethane	0.0410	0.0100	mg/kg wet	0.05000		82	70-130			
cis-1,2-Dichloroethene	0.0480	0.0050	mg/kg wet	0.05000		96	70-130			
cis-1,3-Dichloropropene	0.0498	0.0050	mg/kg wet	0.05000		100	70-130			
Dibromochloromethane	0.0516	0.0020	mg/kg wet	0.05000		103	70-130			
Dibromomethane	0.0510	0.0050	mg/kg wet	0.05000		102	70-130			
Dichlorodifluoromethane	0.0394	0.0100	mg/kg wet	0.05000		79	70-130			
Diethyl Ether	0.0490	0.0050	mg/kg wet	0.05000		98	70-130			
Di-isopropyl ether	0.0526	0.0050	mg/kg wet	0.05000		105	70-130			

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Client Name: GEI Consultants, Inc.
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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CI91724 - 5035										
Ethyl tertiary-butyl ether	0.0473	0.0050	mg/kg wet	0.05000		95	70-130			
Ethylbenzene	0.0490	0.0050	mg/kg wet	0.05000		98	70-130			
Hexachlorobutadiene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130			
Isopropylbenzene	0.0492	0.0050	mg/kg wet	0.05000		98	70-130			
Methyl tert-Butyl Ether	0.0482	0.0050	mg/kg wet	0.05000		96	70-130			
Methylene Chloride	0.0501	0.0100	mg/kg wet	0.05000		100	70-130			
Naphthalene	0.0502	0.0050	mg/kg wet	0.05000		100	70-130			
n-Butylbenzene	0.0523	0.0050	mg/kg wet	0.05000		105	70-130			
n-Propylbenzene	0.0503	0.0050	mg/kg wet	0.05000		101	70-130			
sec-Butylbenzene	0.0489	0.0050	mg/kg wet	0.05000		98	70-130			
Styrene	0.0504	0.0050	mg/kg wet	0.05000		101	70-130			
tert-Butylbenzene	0.0494	0.0050	mg/kg wet	0.05000		99	70-130			
Tertiary-amyl methyl ether	0.0475	0.0050	mg/kg wet	0.05000		95	70-130			
Tetrachloroethene	0.0442	0.0050	mg/kg wet	0.05000		88	70-130			
Tetrahydrofuran	0.0527	0.0050	mg/kg wet	0.05000		105	70-130			
Toluene	0.0479	0.0050	mg/kg wet	0.05000		96	70-130			
trans-1,2-Dichloroethene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130			
trans-1,3-Dichloropropene	0.0485	0.0050	mg/kg wet	0.05000		97	70-130			
Trichloroethene	0.0476	0.0050	mg/kg wet	0.05000		95	70-130			
Trichlorofluoromethane	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			
Vinyl Chloride	0.0405	0.0100	mg/kg wet	0.05000		81	70-130			
Xylene O	0.0478	0.0050	mg/kg wet	0.05000		96	70-130			
Xylene P,M	0.0953	0.0100	mg/kg wet	0.1000		95	70-130			
Surrogate: 1,2-Dichloroethane-d4	*0.0527*		mg/kg wet	*0.05000*		*105*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0498*		mg/kg wet	*0.05000*		*100*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0510*		mg/kg wet	*0.05000*		*102*	*70-130*			
Surrogate: Toluene-d8	*0.0489*		mg/kg wet	*0.05000*		*98*	*70-130*			
LCS Dup										
1,1,1,2-Tetrachloroethane	0.0529	0.0050	mg/kg wet	0.05000		106	70-130	4	20	
1,1,1-Trichloroethane	0.0520	0.0050	mg/kg wet	0.05000		104	70-130	3	20	
1,1,2,2-Tetrachloroethane	0.0521	0.0020	mg/kg wet	0.05000		104	70-130	4	20	
1,1,2-Trichloroethane	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	0.6	20	
1,1-Dichloroethane	0.0496	0.0050	mg/kg wet	0.05000		99	70-130	4	20	
1,1-Dichloroethene	0.0508	0.0050	mg/kg wet	0.05000		102	70-130	4	20	
1,1-Dichloropropene	0.0497	0.0050	mg/kg wet	0.05000		99	70-130	2	20	
1,2,3-Trichlorobenzene	0.0516	0.0050	mg/kg wet	0.05000		103	70-130	1	20	
1,2,3-Trichloropropane	0.0501	0.0050	mg/kg wet	0.05000		100	70-130	4	20	
1,2,4-Trichlorobenzene	0.0529	0.0050	mg/kg wet	0.05000		106	70-130	0.2	20	
1,2,4-Trimethylbenzene	0.0538	0.0050	mg/kg wet	0.05000		108	70-130	4	20	
1,2-Dibromo-3-Chloropropane	0.0496	0.0050	mg/kg wet	0.05000		99	70-130	0.8	20	
1,2-Dibromoethane	0.0518	0.0050	mg/kg wet	0.05000		104	70-130	5	20	
1,2-Dichlorobenzene	0.0523	0.0050	mg/kg wet	0.05000		105	70-130	3	20	
1,2-Dichloroethane	0.0527	0.0050	mg/kg wet	0.05000		105	70-130	0.8	20	
1,2-Dichloropropane	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	2	20	
1,3,5-Trimethylbenzene	0.0527	0.0050	mg/kg wet	0.05000		105	70-130	4	20	

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Client Name: GEI Consultants, Inc.
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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CI91724 - 5035										
1,3-Dichlorobenzene	0.0522	0.0050	mg/kg wet	0.05000		104	70-130	4	20	
1,3-Dichloropropane	0.0529	0.0050	mg/kg wet	0.05000		106	70-130	4	20	
1,4-Dichlorobenzene	0.0530	0.0050	mg/kg wet	0.05000		106	70-130	3	20	
1,4-Dioxane	0.936	0.100	mg/kg wet	1.000		94	70-130	4	20	
2,2-Dichloropropane	0.0364	0.0050	mg/kg wet	0.05000		73	70-130	26	20	D+
2-Butanone	0.248	0.0100	mg/kg wet	0.2500		99	70-130	0.2	20	
2-Chlorotoluene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130	5	20	
2-Hexanone	0.268	0.0100	mg/kg wet	0.2500		107	70-130	0.9	20	
4-Chlorotoluene	0.0529	0.0050	mg/kg wet	0.05000		106	70-130	5	20	
4-Isopropyltoluene	0.0522	0.0050	mg/kg wet	0.05000		104	70-130	3	20	
4-Methyl-2-Pentanone	0.250	0.0100	mg/kg wet	0.2500		100	70-130	0.7	20	
Acetone	0.231	0.0100	mg/kg wet	0.2500		92	70-130	6	20	
Benzene	0.0495	0.0050	mg/kg wet	0.05000		99	70-130	3	20	
Bromobenzene	0.0534	0.0050	mg/kg wet	0.05000		107	70-130	5	20	
Bromochloromethane	0.0470	0.0050	mg/kg wet	0.05000		94	70-130	6	20	
Bromodichloromethane	0.0524	0.0050	mg/kg wet	0.05000		105	70-130	4	20	
Bromoform	0.0529	0.0050	mg/kg wet	0.05000		106	70-130	6	20	
Bromomethane	0.0368	0.0100	mg/kg wet	0.05000		74	70-130	42	20	D+
Carbon Disulfide	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	2	20	
Carbon Tetrachloride	0.0523	0.0050	mg/kg wet	0.05000		105	70-130	5	20	
Chlorobenzene	0.0504	0.0050	mg/kg wet	0.05000		101	70-130	3	20	
Chloroethane	0.0484	0.0100	mg/kg wet	0.05000		97	70-130	17	20	
Chloroform	0.0513	0.0050	mg/kg wet	0.05000		103	70-130	2	20	
Chloromethane	0.0431	0.0100	mg/kg wet	0.05000		86	70-130	5	20	
cis-1,2-Dichloroethene	0.0502	0.0050	mg/kg wet	0.05000		100	70-130	5	20	
cis-1,3-Dichloropropene	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	0.04	20	
Dibromochloromethane	0.0548	0.0020	mg/kg wet	0.05000		110	70-130	6	20	
Dibromomethane	0.0508	0.0050	mg/kg wet	0.05000		102	70-130	0.4	20	
Dichlorodifluoromethane	0.0403	0.0100	mg/kg wet	0.05000		81	70-130	2	20	
Diethyl Ether	0.0508	0.0050	mg/kg wet	0.05000		102	70-130	4	20	
Di-isopropyl ether	0.0535	0.0050	mg/kg wet	0.05000		107	70-130	2	20	
Ethyl tertiary-butyl ether	0.0482	0.0050	mg/kg wet	0.05000		96	70-130	2	20	
Ethylbenzene	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	3	20	
Hexachlorobutadiene	0.0542	0.0050	mg/kg wet	0.05000		108	70-130	5	20	
Isopropylbenzene	0.0517	0.0050	mg/kg wet	0.05000		103	70-130	5	20	
Methyl tert-Butyl Ether	0.0489	0.0050	mg/kg wet	0.05000		98	70-130	1	20	
Methylene Chloride	0.0510	0.0100	mg/kg wet	0.05000		102	70-130	2	20	
Naphthalene	0.0437	0.0050	mg/kg wet	0.05000		87	70-130	14	20	
n-Butylbenzene	0.0529	0.0050	mg/kg wet	0.05000		106	70-130	1	20	
n-Propylbenzene	0.0526	0.0050	mg/kg wet	0.05000		105	70-130	4	20	
sec-Butylbenzene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	4	20	
Styrene	0.0517	0.0050	mg/kg wet	0.05000		103	70-130	2	20	
tert-Butylbenzene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130	5	20	
Tertiary-amyl methyl ether	0.0482	0.0050	mg/kg wet	0.05000		96	70-130	1	20	
Tetrachloroethene	0.0461	0.0050	mg/kg wet	0.05000		92	70-130	4	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ ESS Laboratory Work Order: 19I0437

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CI91724 - 5035										
Tetrahydrofuran	0.0521	0.0050	mg/kg wet	0.05000		104	70-130	1	20	
Toluene	0.0488	0.0050	mg/kg wet	0.05000		98	70-130	2	20	
trans-1,2-Dichloroethene	0.0519	0.0050	mg/kg wet	0.05000		104	70-130	3	20	
trans-1,3-Dichloropropene	0.0480	0.0050	mg/kg wet	0.05000		96	70-130	1	20	
Trichloroethene	0.0493	0.0050	mg/kg wet	0.05000		99	70-130	3	20	
Trichlorofluoromethane	0.0496	0.0050	mg/kg wet	0.05000		99	70-130	5	20	
Vinyl Chloride	0.0414	0.0100	mg/kg wet	0.05000		83	70-130	2	20	
Xylene O	0.0490	0.0050	mg/kg wet	0.05000		98	70-130	3	20	
Xylene P,M	0.0987	0.0100	mg/kg wet	0.1000		99	70-130	3	20	
Surrogate: 1,2-Dichloroethane-d4	*0.0514*		mg/kg wet	*0.05000*		*103*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0489*		mg/kg wet	*0.05000*		*98*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0501*		mg/kg wet	*0.05000*		*100*	*70-130*			
Surrogate: Toluene-d8	*0.0492*		mg/kg wet	*0.05000*		*98*	*70-130*			
8081B Organochlorine Pesticides										
Batch CI91812 - 3546										
Blank										
4,4´-DDD	ND	0.0025	mg/kg wet							
4,4´-DDD [2C]	ND	0.0025	mg/kg wet							
4,4´-DDE	ND	0.0025	mg/kg wet							
4,4´-DDE [2C]	ND	0.0025	mg/kg wet							
4,4´-DDT	ND	0.0025	mg/kg wet							
4,4´-DDT [2C]	ND	0.0025	mg/kg wet							
Aldrin	ND	0.0025	mg/kg wet							
Aldrin [2C]	ND	0.0025	mg/kg wet							
alpha-BHC	ND	0.0025	mg/kg wet							
alpha-BHC [2C]	ND	0.0025	mg/kg wet							
alpha-Chlordane	ND	0.0025	mg/kg wet							
alpha-Chlordane [2C]	ND	0.0025	mg/kg wet							
beta-BHC	ND	0.0025	mg/kg wet							
beta-BHC [2C]	ND	0.0025	mg/kg wet							
Chlordane (Total)	ND	0.0200	mg/kg wet							
Chlordane (Total) [2C]	ND	0.0200	mg/kg wet							
delta-BHC	ND	0.0025	mg/kg wet							
delta-BHC [2C]	ND	0.0025	mg/kg wet							
Dieldrin	ND	0.0025	mg/kg wet							
Dieldrin [2C]	ND	0.0025	mg/kg wet							
Endosulfan I	ND	0.0025	mg/kg wet							
Endosulfan I [2C]	ND	0.0025	mg/kg wet							
Endosulfan II	ND	0.0025	mg/kg wet							
Endosulfan II [2C]	ND	0.0025	mg/kg wet							
Endosulfan Sulfate	ND	0.0025	mg/kg wet							
Endosulfan Sulfate [2C]	ND	0.0025	mg/kg wet							
Endrin	ND	0.0025	mg/kg wet							
Endrin [2C]	ND	0.0025	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0437

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8081B Organochlorine Pesticides										
Batch CI91812 - 3546										
Endrin Ketone	ND	0.0025	mg/kg wet							
Endrin Ketone [2C]	ND	0.0025	mg/kg wet							
gamma-BHC (Lindane)	ND	0.0015	mg/kg wet							
gamma-BHC (Lindane) [2C]	ND	0.0015	mg/kg wet							
gamma-Chlordane	ND	0.0025	mg/kg wet							
gamma-Chlordane [2C]	ND	0.0025	mg/kg wet							
Heptachlor	ND	0.0025	mg/kg wet							
Heptachlor [2C]	ND	0.0025	mg/kg wet							
Heptachlor Epoxide	ND	0.0025	mg/kg wet							
Heptachlor Epoxide [2C]	ND	0.0025	mg/kg wet							
Hexachlorobenzene	ND	0.0025	mg/kg wet							
Hexachlorobenzene [2C]	ND	0.0025	mg/kg wet							
Methoxychlor	ND	0.0025	mg/kg wet							
Methoxychlor [2C]	ND	0.0025	mg/kg wet							
Toxaphene	ND	0.125	mg/kg wet							
Toxaphene [2C]	ND	0.125	mg/kg wet							
Surrogate: Decachlorobiphenyl	*0.0115*		mg/kg wet	*0.01250*		*92*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0117*		mg/kg wet	*0.01250*		*94*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0109*		mg/kg wet	*0.01250*		*87*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0104*		mg/kg wet	*0.01250*		*84*	*30-150*			
LCS										
4,4´-DDD	0.0114	0.0025	mg/kg wet	0.01250		91	40-140			
4,4´-DDD [2C]	0.0108	0.0025	mg/kg wet	0.01250		86	40-140			
4,4´-DDE	0.0106	0.0025	mg/kg wet	0.01250		85	40-140			
4,4´-DDE [2C]	0.0108	0.0025	mg/kg wet	0.01250		86	40-140			
4,4´-DDT	0.0131	0.0025	mg/kg wet	0.01250		105	40-140			
4,4´-DDT [2C]	0.0129	0.0025	mg/kg wet	0.01250		103	40-140			
Aldrin	0.0110	0.0025	mg/kg wet	0.01250		88	40-140			
Aldrin [2C]	0.0105	0.0025	mg/kg wet	0.01250		84	40-140			
alpha-BHC	0.0114	0.0025	mg/kg wet	0.01250		91	40-140			
alpha-BHC [2C]	0.0108	0.0025	mg/kg wet	0.01250		86	40-140			
alpha-Chlordane	0.0104	0.0025	mg/kg wet	0.01250		84	40-140			
alpha-Chlordane [2C]	0.0102	0.0025	mg/kg wet	0.01250		81	40-140			
beta-BHC	0.0107	0.0025	mg/kg wet	0.01250		85	40-140			
beta-BHC [2C]	0.0102	0.0025	mg/kg wet	0.01250		82	40-140			
delta-BHC	0.0079	0.0025	mg/kg wet	0.01250		63	40-140			
delta-BHC [2C]	0.0072	0.0025	mg/kg wet	0.01250		58	40-140			
Dieldrin	0.0118	0.0025	mg/kg wet	0.01250		94	40-140			
Dieldrin [2C]	0.0113	0.0025	mg/kg wet	0.01250		90	40-140			
Endosulfan I	0.0114	0.0025	mg/kg wet	0.01250		91	40-140			
Endosulfan I [2C]	0.0103	0.0025	mg/kg wet	0.01250		83	40-140			
Endosulfan II	0.0119	0.0025	mg/kg wet	0.01250		95	40-140			
Endosulfan II [2C]	0.0116	0.0025	mg/kg wet	0.01250		93	40-140			
Endosulfan Sulfate	0.0112	0.0025	mg/kg wet	0.01250		89	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0437

Quality Control Data

8081B Organochlorine Pesticides

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch CI91812 - 3546										
Endosulfan Sulfate [2C]	0.0111	0.0025	mg/kg wet	0.01250		89	40-140			
Endrin	0.0116	0.0025	mg/kg wet	0.01250		93	40-140			
Endrin [2C]	0.0112	0.0025	mg/kg wet	0.01250		89	40-140			
Endrin Ketone	0.0133	0.0025	mg/kg wet	0.01250		106	40-140			
Endrin Ketone [2C]	0.0131	0.0025	mg/kg wet	0.01250		104	40-140			
gamma-BHC (Lindane)	0.0111	0.0015	mg/kg wet	0.01250		88	40-140			
gamma-BHC (Lindane) [2C]	0.0104	0.0015	mg/kg wet	0.01250		83	40-140			
gamma-Chlordane	0.0109	0.0025	mg/kg wet	0.01250		87	40-140			
gamma-Chlordane [2C]	0.0102	0.0025	mg/kg wet	0.01250		82	40-140			
Heptachlor	0.0114	0.0025	mg/kg wet	0.01250		91	40-140			
Heptachlor [2C]	0.0106	0.0025	mg/kg wet	0.01250		85	40-140			
Heptachlor Epoxide	0.0116	0.0025	mg/kg wet	0.01250		93	40-140			
Heptachlor Epoxide [2C]	0.0111	0.0025	mg/kg wet	0.01250		88	40-140			
Hexachlorobenzene	0.0116	0.0025	mg/kg wet	0.01250		93	40-140			
Hexachlorobenzene [2C]	0.0109	0.0025	mg/kg wet	0.01250		87	40-140			
Methoxychlor	0.0127	0.0025	mg/kg wet	0.01250		102	40-140			
Methoxychlor [2C]	0.0122	0.0025	mg/kg wet	0.01250		97	40-140			
Surrogate: Decachlorobiphenyl	*0.0133*		mg/kg wet	*0.01250*		*106*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0137*		mg/kg wet	*0.01250*		*109*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0112*		mg/kg wet	*0.01250*		*90*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0109*		mg/kg wet	*0.01250*		*87*	*30-150*			
LCS Dup										
4,4´-DDD	0.0113	0.0025	mg/kg wet	0.01250		90	40-140	0.4	30	
4,4´-DDD [2C]	0.0108	0.0025	mg/kg wet	0.01250		86	40-140	0.07	30	
4,4´-DDE	0.0104	0.0025	mg/kg wet	0.01250		84	40-140	1	30	
4,4´-DDE [2C]	0.0109	0.0025	mg/kg wet	0.01250		87	40-140	0.7	30	
4,4´-DDT	0.0127	0.0025	mg/kg wet	0.01250		102	40-140	3	30	
4,4´-DDT [2C]	0.0125	0.0025	mg/kg wet	0.01250		100	40-140	3	30	
Aldrin	0.0109	0.0025	mg/kg wet	0.01250		87	40-140	1	30	
Aldrin [2C]	0.0104	0.0025	mg/kg wet	0.01250		83	40-140	1	30	
alpha-BHC	0.0112	0.0025	mg/kg wet	0.01250		90	40-140	2	30	
alpha-BHC [2C]	0.0102	0.0025	mg/kg wet	0.01250		81	40-140	6	30	
alpha-Chlordane	0.0104	0.0025	mg/kg wet	0.01250		83	40-140	0.9	30	
alpha-Chlordane [2C]	0.0102	0.0025	mg/kg wet	0.01250		81	40-140	0.08	30	
beta-BHC	0.0103	0.0025	mg/kg wet	0.01250		83	40-140	3	30	
beta-BHC [2C]	0.0103	0.0025	mg/kg wet	0.01250		83	40-140	1	30	
delta-BHC	0.0078	0.0025	mg/kg wet	0.01250		62	40-140	2	30	
delta-BHC [2C]	0.0072	0.0025	mg/kg wet	0.01250		57	40-140	0.9	30	
Dieldrin	0.0117	0.0025	mg/kg wet	0.01250		94	40-140	0.5	30	
Dieldrin [2C]	0.0114	0.0025	mg/kg wet	0.01250		91	40-140	1	30	
Endosulfan I	0.0114	0.0025	mg/kg wet	0.01250		91	40-140	0.5	30	
Endosulfan I [2C]	0.0103	0.0025	mg/kg wet	0.01250		83	40-140	0.07	30	
Endosulfan II	0.0118	0.0025	mg/kg wet	0.01250		94	40-140	0.9	30	
Endosulfan II [2C]	0.0116	0.0025	mg/kg wet	0.01250		93	40-140	0.1	30	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0437

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8081B Organochlorine Pesticides										
Batch CI91812 - 3546										
Endosulfan Sulfate	0.0111	0.0025	mg/kg wet	0.01250		89	40-140	0.6	30	
Endosulfan Sulfate [2C]	0.0110	0.0025	mg/kg wet	0.01250		88	40-140	0.7	30	
Endrin	0.0113	0.0025	mg/kg wet	0.01250		91	40-140	2	30	
Endrin [2C]	0.0110	0.0025	mg/kg wet	0.01250		88	40-140	2	30	
Endrin Ketone	0.0132	0.0025	mg/kg wet	0.01250		106	40-140	0.4	30	
Endrin Ketone [2C]	0.0130	0.0025	mg/kg wet	0.01250		104	40-140	0.3	30	
gamma-BHC (Lindane)	0.0109	0.0015	mg/kg wet	0.01250		87	40-140	1	30	
gamma-BHC (Lindane) [2C]	0.0104	0.0015	mg/kg wet	0.01250		83	40-140	0.03	30	
gamma-Chlordane	0.0109	0.0025	mg/kg wet	0.01250		87	40-140	0.7	30	
gamma-Chlordane [2C]	0.0102	0.0025	mg/kg wet	0.01250		81	40-140	0.2	30	
Heptachlor	0.0111	0.0025	mg/kg wet	0.01250		89	40-140	2	30	
Heptachlor [2C]	0.0107	0.0025	mg/kg wet	0.01250		85	40-140	0.3	30	
Heptachlor Epoxide	0.0115	0.0025	mg/kg wet	0.01250		92	40-140	1	30	
Heptachlor Epoxide [2C]	0.0110	0.0025	mg/kg wet	0.01250		88	40-140	0.4	30	
Hexachlorobenzene	0.0114	0.0025	mg/kg wet	0.01250		91	40-140	2	30	
Hexachlorobenzene [2C]	0.0107	0.0025	mg/kg wet	0.01250		85	40-140	2	30	
Methoxychlor	0.0124	0.0025	mg/kg wet	0.01250		99	40-140	3	30	
Methoxychlor [2C]	0.0118	0.0025	mg/kg wet	0.01250		94	40-140	3	30	
Surrogate: Decachlorobiphenyl	*0.0127*		mg/kg wet	*0.01250*		*102*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0131*		mg/kg wet	*0.01250*		*105*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0107*		mg/kg wet	*0.01250*		*85*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0104*		mg/kg wet	*0.01250*		*83*	*30-150*			
8082 Polychlorinated Biphenyls (PCB) / Congeners										
Batch CI91811 - 3540C										
Blank										
BZ#101	ND	0.00027	mg/kg wet							
BZ#101 [2C]	ND	0.00027	mg/kg wet							
BZ#105	ND	0.00027	mg/kg wet							
BZ#105 [2C]	ND	0.00027	mg/kg wet							
BZ#118	ND	0.00027	mg/kg wet							
BZ#118 [2C]	ND	0.00027	mg/kg wet							
BZ#128	ND	0.00027	mg/kg wet							
BZ#128 [2C]	ND	0.00027	mg/kg wet							
BZ#138	ND	0.00027	mg/kg wet							
BZ#138 [2C]	ND	0.00027	mg/kg wet							
BZ#153	ND	0.00027	mg/kg wet							
BZ#153 [2C]	ND	0.00027	mg/kg wet							
BZ#170	ND	0.00027	mg/kg wet							
BZ#170 [2C]	ND	0.00027	mg/kg wet							
BZ#18	ND	0.00027	mg/kg wet							
BZ#18 [2C]	ND	0.00027	mg/kg wet							
BZ#180	ND	0.00027	mg/kg wet							
BZ#180 [2C]	ND	0.00027	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ ESS Laboratory Work Order: 19I0437

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082 Polychlorinated Biphenyls (PCB) / Congeners										
Batch CI91811 - 3540C										
BZ#187	ND	0.00027	mg/kg wet							
BZ#187 [2C]	ND	0.00027	mg/kg wet							
BZ#195	ND	0.00027	mg/kg wet							
BZ#195 [2C]	ND	0.00027	mg/kg wet							
BZ#206	ND	0.00027	mg/kg wet							
BZ#206 [2C]	ND	0.00027	mg/kg wet							
BZ#209	ND	0.00027	mg/kg wet							
BZ#209 [2C]	ND	0.00027	mg/kg wet							
BZ#28	ND	0.00027	mg/kg wet							
BZ#28 [2C]	ND	0.00027	mg/kg wet							
BZ#44	ND	0.00027	mg/kg wet							
BZ#44 [2C]	ND	0.00027	mg/kg wet							
BZ#52	ND	0.00027	mg/kg wet							
BZ#52 [2C]	ND	0.00027	mg/kg wet							
BZ#66	ND	0.00027	mg/kg wet							
BZ#66 [2C]	ND	0.00027	mg/kg wet							
BZ#8	ND	0.00027	mg/kg wet							
BZ#8 [2C]	ND	0.00027	mg/kg wet							
Surrogate: Tetrachloro-m-xylene	*0.00221*		mg/kg wet	*0.003333*		*66*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.00225*		mg/kg wet	*0.003333*		*67*	*30-150*			
LCS										
BZ#101	0.00311	0.00027	mg/kg wet	0.003333		93	40-140			
BZ#101 [2C]	0.00300	0.00027	mg/kg wet	0.003333		90	40-140			
BZ#105	0.00330	0.00027	mg/kg wet	0.003333		99	40-140			
BZ#105 [2C]	0.00342	0.00027	mg/kg wet	0.003333		103	40-140			
BZ#118	0.00312	0.00027	mg/kg wet	0.003333		93	40-140			
BZ#118 [2C]	0.00302	0.00027	mg/kg wet	0.003333		91	40-140			
BZ#128	0.00323	0.00027	mg/kg wet	0.003333		97	40-140			
BZ#128 [2C]	0.00323	0.00027	mg/kg wet	0.003333		97	40-140			
BZ#138	0.00309	0.00027	mg/kg wet	0.003333		93	40-140			
BZ#138 [2C]	0.00318	0.00027	mg/kg wet	0.003333		95	40-140			
BZ#153	0.00303	0.00027	mg/kg wet	0.003333		91	40-140			
BZ#153 [2C]	0.00306	0.00027	mg/kg wet	0.003333		92	40-140			
BZ#170	0.00305	0.00027	mg/kg wet	0.003333		92	40-140			
BZ#170 [2C]	0.00326	0.00027	mg/kg wet	0.003333		98	40-140			
BZ#18	0.00308	0.00027	mg/kg wet	0.003333		92	40-140			
BZ#18 [2C]	0.00298	0.00027	mg/kg wet	0.003333		90	40-140			
BZ#180	0.00307	0.00027	mg/kg wet	0.003333		92	40-140			
BZ#180 [2C]	0.00326	0.00027	mg/kg wet	0.003333		98	40-140			
BZ#187	0.00300	0.00027	mg/kg wet	0.003333		90	40-140			
BZ#187 [2C]	0.00305	0.00027	mg/kg wet	0.003333		92	40-140			
BZ#195	0.00307	0.00027	mg/kg wet	0.003333		92	40-140			
BZ#195 [2C]	0.00323	0.00027	mg/kg wet	0.003333		97	40-140			
BZ#206	0.00301	0.00027	mg/kg wet	0.003333		90	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0437

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082 Polychlorinated Biphenyls (PCB) / Congeners										
Batch CI91811 - 3540C										
BZ#206 [2C]	0.00322	0.00027	mg/kg wet	0.003333		97	40-140			
BZ#209	0.00302	0.00027	mg/kg wet	0.003333		90	40-140			
BZ#209 [2C]	0.00308	0.00027	mg/kg wet	0.003333		92	40-140			
BZ#28	0.00329	0.00027	mg/kg wet	0.003333		99	40-140			
BZ#28 [2C]	0.00333	0.00027	mg/kg wet	0.003333		100	40-140			
BZ#44	0.00304	0.00027	mg/kg wet	0.003333		91	40-140			
BZ#44 [2C]	0.00305	0.00027	mg/kg wet	0.003333		92	40-140			
BZ#52	0.00287	0.00027	mg/kg wet	0.003333		86	40-140			
BZ#52 [2C]	0.00288	0.00027	mg/kg wet	0.003333		86	40-140			
BZ#66	0.00341	0.00027	mg/kg wet	0.003333		102	40-140			
BZ#66 [2C]	0.00317	0.00027	mg/kg wet	0.003333		95	40-140			
BZ#8	0.00308	0.00027	mg/kg wet	0.003333		92	40-140			
BZ#8 [2C]	0.00311	0.00027	mg/kg wet	0.003333		93	40-140			
Surrogate: Tetrachloro-m-xylene	*0.00256*		mg/kg wet	*0.003333*		*77*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.00262*		mg/kg wet	*0.003333*		*79*	*30-150*			
LCS Dup										
BZ#101	0.00317	0.00027	mg/kg wet	0.003333		95	40-140	2	50	
BZ#101 [2C]	0.00307	0.00027	mg/kg wet	0.003333		92	40-140	3	50	
BZ#105	0.00343	0.00027	mg/kg wet	0.003333		103	40-140	4	50	
BZ#105 [2C]	0.00340	0.00027	mg/kg wet	0.003333		102	40-140	0.8	50	
BZ#118	0.00321	0.00027	mg/kg wet	0.003333		96	40-140	3	50	
BZ#118 [2C]	0.00333	0.00027	mg/kg wet	0.003333		100	40-140	10	50	
BZ#128	0.00333	0.00027	mg/kg wet	0.003333		100	40-140	3	50	
BZ#128 [2C]	0.00336	0.00027	mg/kg wet	0.003333		101	40-140	4	50	
BZ#138	0.00319	0.00027	mg/kg wet	0.003333		96	40-140	3	50	
BZ#138 [2C]	0.00329	0.00027	mg/kg wet	0.003333		99	40-140	4	50	
BZ#153	0.00311	0.00027	mg/kg wet	0.003333		93	40-140	3	50	
BZ#153 [2C]	0.00316	0.00027	mg/kg wet	0.003333		95	40-140	3	50	
BZ#170	0.00313	0.00027	mg/kg wet	0.003333		94	40-140	2	50	
BZ#170 [2C]	0.00339	0.00027	mg/kg wet	0.003333		102	40-140	4	50	
BZ#18	0.00311	0.00027	mg/kg wet	0.003333		93	40-140	0.8	50	
BZ#18 [2C]	0.00302	0.00027	mg/kg wet	0.003333		91	40-140	1	50	
BZ#180	0.00319	0.00027	mg/kg wet	0.003333		96	40-140	4	50	
BZ#180 [2C]	0.00340	0.00027	mg/kg wet	0.003333		102	40-140	4	50	
BZ#187	0.00308	0.00027	mg/kg wet	0.003333		92	40-140	3	50	
BZ#187 [2C]	0.00315	0.00027	mg/kg wet	0.003333		94	40-140	3	50	
BZ#195	0.00319	0.00027	mg/kg wet	0.003333		96	40-140	4	50	
BZ#195 [2C]	0.00345	0.00027	mg/kg wet	0.003333		103	40-140	7	50	
BZ#206	0.00309	0.00027	mg/kg wet	0.003333		93	40-140	3	50	
BZ#206 [2C]	0.00337	0.00027	mg/kg wet	0.003333		101	40-140	4	50	
BZ#209	0.00310	0.00027	mg/kg wet	0.003333		93	40-140	3	50	
BZ#209 [2C]	0.00321	0.00027	mg/kg wet	0.003333		96	40-140	4	50	
BZ#28	0.00342	0.00027	mg/kg wet	0.003333		103	40-140	4	50	
BZ#28 [2C]	0.00341	0.00027	mg/kg wet	0.003333		102	40-140	2	50	

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082 Polychlorinated Biphenyls (PCB) / Congeners										
Batch CI91811 - 3540C										
BZ#44	0.00311	0.00027	mg/kg wet	0.003333		93	40-140	2	50	
BZ#44 [2C]	0.00306	0.00027	mg/kg wet	0.003333		92	40-140	0.3	50	
BZ#52	0.00298	0.00027	mg/kg wet	0.003333		89	40-140	4	50	
BZ#52 [2C]	0.00293	0.00027	mg/kg wet	0.003333		88	40-140	2	50	
BZ#66	0.00350	0.00027	mg/kg wet	0.003333		105	40-140	3	50	
BZ#66 [2C]	0.00325	0.00027	mg/kg wet	0.003333		98	40-140	2	50	
BZ#8	0.00316	0.00027	mg/kg wet	0.003333		95	40-140	2	50	
BZ#8 [2C]	0.00328	0.00027	mg/kg wet	0.003333		98	40-140	5	50	
Surrogate: Tetrachloro-m-xylene	*0.00256*		mg/kg wet	*0.003333*		*77*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.00262*		mg/kg wet	*0.003333*		*79*	*30-150*			
8100M Total Petroleum Hydrocarbons										
Batch CI91710 - 3546										
Blank										
Decane (C10)	ND	0.2	mg/kg wet							
Docosane (C22)	ND	0.2	mg/kg wet							
Dodecane (C12)	ND	0.2	mg/kg wet							
Eicosane (C20)	ND	0.2	mg/kg wet							
Hexacosane (C26)	ND	0.2	mg/kg wet							
Hexadecane (C16)	ND	0.2	mg/kg wet							
Hexatriacontane (C36)	ND	0.2	mg/kg wet							
Nonadecane (C19)	ND	0.2	mg/kg wet							
Nonane (C9)	ND	0.2	mg/kg wet							
Octacosane (C28)	ND	0.2	mg/kg wet							
Octadecane (C18)	ND	0.2	mg/kg wet							
Tetracosane (C24)	ND	0.2	mg/kg wet							
Tetradecane (C14)	ND	0.2	mg/kg wet							
Total Petroleum Hydrocarbons	ND	10.0	mg/kg wet							
Triacontane (C30)	ND	0.2	mg/kg wet							
Surrogate: O-Terphenyl	*4.74*		mg/kg wet	*5.000*		*95*	*40-140*			
LCS										
Decane (C10)	2.1	0.2	mg/kg wet	2.500		83	40-140			
Docosane (C22)	2.4	0.2	mg/kg wet	2.500		98	40-140			
Dodecane (C12)	2.2	0.2	mg/kg wet	2.500		87	40-140			
Eicosane (C20)	2.4	0.2	mg/kg wet	2.500		95	40-140			
Hexacosane (C26)	2.5	0.2	mg/kg wet	2.500		98	40-140			
Hexadecane (C16)	2.3	0.2	mg/kg wet	2.500		94	40-140			
Hexatriacontane (C36)	2.7	0.2	mg/kg wet	2.500		106	40-140			
Nonadecane (C19)	2.5	0.2	mg/kg wet	2.500		100	40-140			
Nonane (C9)	1.9	0.2	mg/kg wet	2.500		75	30-140			
Octacosane (C28)	2.5	0.2	mg/kg wet	2.500		100	40-140			
Octadecane (C18)	2.4	0.2	mg/kg wet	2.500		96	40-140			
Tetracosane (C24)	2.5	0.2	mg/kg wet	2.500		98	40-140			

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8100M Total Petroleum Hydrocarbons										
Batch CI91710 - 3546										
Tetradecane (C14)	2.3	0.2	mg/kg wet	2.500		92	40-140			
Total Petroleum Hydrocarbons	33.1	10.0	mg/kg wet	35.00		94	40-140			
Triacontane (C30)	2.5	0.2	mg/kg wet	2.500		100	40-140			
Surrogate: O-Terphenyl	*4.86*		mg/kg wet	*5.000*		*97*	*40-140*			
LCS Dup										
Decane (C10)	2.0	0.2	mg/kg wet	2.500		79	40-140	6	25	
Docosane (C22)	2.3	0.2	mg/kg wet	2.500		93	40-140	6	25	
Dodecane (C12)	2.1	0.2	mg/kg wet	2.500		83	40-140	5	25	
Eicosane (C20)	2.3	0.2	mg/kg wet	2.500		91	40-140	5	25	
Hexacosane (C26)	2.3	0.2	mg/kg wet	2.500		93	40-140	6	25	
Hexadecane (C16)	2.2	0.2	mg/kg wet	2.500		89	40-140	6	25	
Hexatriacontane (C36)	2.6	0.2	mg/kg wet	2.500		102	40-140	4	25	
Nonadecane (C19)	2.4	0.2	mg/kg wet	2.500		95	40-140	5	25	
Nonane (C9)	1.8	0.2	mg/kg wet	2.500		72	30-140	5	25	
Octacosane (C28)	2.4	0.2	mg/kg wet	2.500		94	40-140	6	25	
Octadecane (C18)	2.3	0.2	mg/kg wet	2.500		90	40-140	6	25	
Tetracosane (C24)	2.3	0.2	mg/kg wet	2.500		93	40-140	6	25	
Tetradecane (C14)	2.2	0.2	mg/kg wet	2.500		88	40-140	5	25	
Total Petroleum Hydrocarbons	31.3	10.0	mg/kg wet	35.00		90	40-140	5	25	
Triacontane (C30)	2.4	0.2	mg/kg wet	2.500		95	40-140	6	25	
Surrogate: O-Terphenyl	*4.64*		mg/kg wet	*5.000*		*93*	*40-140*			
8151A Chlorinated Herbicides										
Batch CI91661 - 3546										
Blank										
2,4,5-T	ND	0.010	mg/kg wet							
2,4,5-T [2C]	ND	0.010	mg/kg wet							
2,4,5-TP (Silvex)	ND	0.010	mg/kg wet							
2,4,5-TP (Silvex) [2C]	ND	0.010	mg/kg wet							
2,4-D	ND	0.047	mg/kg wet							
2,4-D [2C]	ND	0.047	mg/kg wet							
2,4-DB	ND	0.048	mg/kg wet							
2,4-DB [2C]	ND	0.048	mg/kg wet							
Dalapon	ND	0.046	mg/kg wet							
Dalapon [2C]	ND	0.046	mg/kg wet							
Dicamba	ND	0.009	mg/kg wet							
Dicamba [2C]	ND	0.009	mg/kg wet							
Dichlorprop	ND	0.047	mg/kg wet							
Dichlorprop [2C]	ND	0.047	mg/kg wet							
Dinoseb	ND	0.048	mg/kg wet							
Dinoseb [2C]	ND	0.048	mg/kg wet							
MCPA	ND	2.32	mg/kg wet							
MCPA [2C]	ND	2.32	mg/kg wet							

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8151A Chlorinated Herbicides										
Batch CI91661 - 3546										
MCPP	ND	2.35	mg/kg wet							
MCPP [2C]	ND	2.35	mg/kg wet							
Surrogate: DCAA	*0.180*		mg/kg wet	*0.2000*		*90*	*30-150*			
Surrogate: DCAA [2C]	*0.184*		mg/kg wet	*0.2000*		*92*	*30-150*			
LCS										
2,4,5-T	0.014	0.010	mg/kg wet	0.01900		74	40-140			
2,4,5-T [2C]	0.013	0.010	mg/kg wet	0.01900		66	40-140			
2,4,5-TP (Silvex)	0.015	0.010	mg/kg wet	0.01900		78	40-140			
2,4,5-TP (Silvex) [2C]	0.014	0.010	mg/kg wet	0.01900		72	40-140			
2,4-D	0.128	0.047	mg/kg wet	0.1880		68	40-140			
2,4-D [2C]	0.118	0.047	mg/kg wet	0.1880		63	40-140			
2,4-DB	0.141	0.048	mg/kg wet	0.1900		74	40-140			
2,4-DB [2C]	0.135	0.048	mg/kg wet	0.1900		71	40-140			
Dalapon	0.286	0.046	mg/kg wet	0.4550		63	40-140			
Dalapon [2C]	0.286	0.046	mg/kg wet	0.4550		63	40-140			
Dicamba	0.013	0.009	mg/kg wet	0.01880		70	40-140			
Dicamba [2C]	0.014	0.009	mg/kg wet	0.01880		76	40-140			
Dichlorprop	0.146	0.047	mg/kg wet	0.1880		78	40-140			
Dichlorprop [2C]	0.145	0.047	mg/kg wet	0.1880		77	40-140			
Dinoseb	0.008	0.048	mg/kg wet	0.09500		9	10-100			B-
Dinoseb [2C]	0.010	0.048	mg/kg wet	0.09500		10	10-100			
MCPA	14.0	2.32	mg/kg wet	18.60		75	40-140			
MCPA [2C]	14.1	2.32	mg/kg wet	18.60		76	40-140			
MCPP	15.3	2.35	mg/kg wet	18.80		81	40-140			
MCPP [2C]	15.4	2.35	mg/kg wet	18.80		82	40-140			
Surrogate: DCAA	*0.192*		mg/kg wet	*0.2000*		*96*	*30-150*			
Surrogate: DCAA [2C]	*0.181*		mg/kg wet	*0.2000*		*90*	*30-150*			
LCS Dup										
2,4,5-T	0.013	0.010	mg/kg wet	0.01900		70	40-140	6	30	
2,4,5-T [2C]	0.012	0.010	mg/kg wet	0.01900		62	40-140	6	30	
2,4,5-TP (Silvex)	0.014	0.010	mg/kg wet	0.01900		76	40-140	3	30	
2,4,5-TP (Silvex) [2C]	0.014	0.010	mg/kg wet	0.01900		72	40-140	0	30	
2,4-D	0.121	0.047	mg/kg wet	0.1880		64	40-140	6	30	
2,4-D [2C]	0.118	0.047	mg/kg wet	0.1880		63	40-140	0.6	30	
2,4-DB	0.135	0.048	mg/kg wet	0.1900		71	40-140	5	30	
2,4-DB [2C]	0.130	0.048	mg/kg wet	0.1900		68	40-140	4	30	
Dalapon	0.317	0.046	mg/kg wet	0.4550		70	40-140	10	30	
Dalapon [2C]	0.314	0.046	mg/kg wet	0.4550		69	40-140	9	30	
Dicamba	0.013	0.009	mg/kg wet	0.01880		68	40-140	3	30	
Dicamba [2C]	0.014	0.009	mg/kg wet	0.01880		76	40-140	0	30	
Dichlorprop	0.141	0.047	mg/kg wet	0.1880		75	40-140	3	30	
Dichlorprop [2C]	0.149	0.047	mg/kg wet	0.1880		79	40-140	3	30	
Dinoseb	0.009	0.048	mg/kg wet	0.09500		9	10-100	4	30	B-
Dinoseb [2C]	0.010	0.048	mg/kg wet	0.09500		10	10-100	0	30	

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8151A Chlorinated Herbicides										
Batch CI91661 - 3546										
MCPA	13.6	2.32	mg/kg wet	18.60		73	40-140	3	30	
MCPA [2C]	15.7	2.32	mg/kg wet	18.60		84	40-140	11	30	
MCPP	15.6	2.35	mg/kg wet	18.80		83	40-140	2	30	
MCPP [2C]	15.9	2.35	mg/kg wet	18.80		84	40-140	3	30	
Surrogate: DCAA	*0.179*		mg/kg wet	*0.2000*		*89*	*30-150*			
Surrogate: DCAA [2C]	*0.174*		mg/kg wet	*0.2000*		*87*	*30-150*			
8270D Semi-Volatile Organic Compounds										
Batch CI91618 - 3546										
Blank										
1,2,4-Trichlorobenzene	ND	0.167	mg/kg wet							
1,2-Dichlorobenzene	ND	0.333	mg/kg wet							
1,3-Dichlorobenzene	ND	0.167	mg/kg wet							
1,4-Dichlorobenzene	ND	0.100	mg/kg wet							
2,4,5-Trichlorophenol	ND	0.333	mg/kg wet							
2,4,6-Trichlorophenol	ND	0.100	mg/kg wet							
2,4-Dichlorophenol	ND	0.100	mg/kg wet							
2,4-Dimethylphenol	ND	0.100	mg/kg wet							
2,4-Dinitrophenol	ND	0.667	mg/kg wet							
2,4-Dinitrotoluene	ND	0.167	mg/kg wet							
2,6-Dinitrotoluene	ND	0.333	mg/kg wet							
2-Chloronaphthalene	ND	0.333	mg/kg wet							
2-Chlorophenol	ND	0.100	mg/kg wet							
2-Methylnaphthalene	ND	0.100	mg/kg wet							
2-Methylphenol	ND	0.333	mg/kg wet							
2-Nitrophenol	ND	0.333	mg/kg wet							
3,3´-Dichlorobenzidine	ND	0.167	mg/kg wet							
3+4-Methylphenol	ND	0.667	mg/kg wet							
4-Bromophenyl-phenylether	ND	0.333	mg/kg wet							
4-Chloroaniline	ND	0.167	mg/kg wet							
4-Nitrophenol	ND	1.67	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.167	mg/kg wet							
Acetophenone	ND	0.667	mg/kg wet							
Aniline	ND	1.67	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Azobenzene	ND	0.333	mg/kg wet							
Benzo(a)anthracene	ND	0.333	mg/kg wet							
Benzo(a)pyrene	ND	0.167	mg/kg wet							
Benzo(b)fluoranthene	ND	0.333	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.333	mg/kg wet							
Benzo(k)fluoranthene	ND	0.333	mg/kg wet							
bis(2-Chloroethoxy)methane	ND	0.333	mg/kg wet							
bis(2-Chloroethyl)ether	ND	0.100	mg/kg wet							

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CI91618 - 3546										
bis(2-chloroisopropyl)Ether	ND	0.100	mg/kg wet							
bis(2-Ethylhexyl)phthalate	ND	0.333	mg/kg wet							
Butylbenzylphthalate	ND	0.333	mg/kg wet							
Chrysene	ND	0.167	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.100	mg/kg wet							
Dibenzofuran	ND	0.333	mg/kg wet							
Diethylphthalate	ND	0.333	mg/kg wet							
Dimethylphthalate	ND	0.333	mg/kg wet							
Di-n-butylphthalate	ND	0.333	mg/kg wet							
Di-n-octylphthalate	ND	0.333	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Hexachlorobenzene	ND	0.100	mg/kg wet							
Hexachlorobutadiene	ND	0.333	mg/kg wet							
Hexachloroethane	ND	0.100	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.333	mg/kg wet							
Isophorone	ND	0.333	mg/kg wet							
Naphthalene	ND	0.333	mg/kg wet							
Nitrobenzene	ND	0.333	mg/kg wet							
N-Nitrosodimethylamine	ND	0.333	mg/kg wet							
Pentachlorophenol	ND	0.333	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Phenol	ND	0.167	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
Pyridine	ND	1.67	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	*2.28*		mg/kg wet	*3.333*		*69*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.40*		mg/kg wet	*5.000*		*88*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.62*		mg/kg wet	*5.000*		*72*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.27*		mg/kg wet	*3.333*		*68*	*30-130*			
Surrogate: 2-Fluorophenol	*3.59*		mg/kg wet	*5.000*		*72*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.36*		mg/kg wet	*3.333*		*71*	*30-130*			
Surrogate: Phenol-d6	*3.39*		mg/kg wet	*5.000*		*68*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.69*		mg/kg wet	*3.333*		*81*	*30-130*			
LCS										
1,2,4-Trichlorobenzene	2.55	0.167	mg/kg wet	3.333		76	40-140			
1,2-Dichlorobenzene	2.32	0.333	mg/kg wet	3.333		70	40-140			
1,3-Dichlorobenzene	2.27	0.167	mg/kg wet	3.333		68	40-140			
1,4-Dichlorobenzene	2.31	0.100	mg/kg wet	3.333		69	40-140			
2,4,5-Trichlorophenol	2.89	0.333	mg/kg wet	3.333		87	30-130			
2,4,6-Trichlorophenol	2.63	0.100	mg/kg wet	3.333		79	30-130			
2,4-Dichlorophenol	2.75	0.100	mg/kg wet	3.333		82	30-130			
2,4-Dimethylphenol	2.56	0.100	mg/kg wet	3.333		77	30-130			
2,4-Dinitrophenol	2.80	0.667	mg/kg wet	3.333		84	30-130			
2,4-Dinitrotoluene	3.08	0.167	mg/kg wet	3.333		93	40-140			
2,6-Dinitrotoluene	2.67	0.333	mg/kg wet	3.333		80	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0437

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CI91618 - 3546										
2-Chloronaphthalene	2.27	0.333	mg/kg wet	3.333		68	40-140			
2-Chlorophenol	2.34	0.100	mg/kg wet	3.333		70	30-130			
2-Methylnaphthalene	2.44	0.100	mg/kg wet	3.333		73	40-140			
2-Methylphenol	2.34	0.333	mg/kg wet	3.333		70	30-130			
2-Nitrophenol	2.42	0.333	mg/kg wet	3.333		73	30-130			
3,3´-Dichlorobenzidine	2.62	0.167	mg/kg wet	3.333		78	40-140			
3+4-Methylphenol	4.50	0.667	mg/kg wet	6.667		67	30-130			
4-Bromophenyl-phenylether	2.91	0.333	mg/kg wet	3.333		87	40-140			
4-Chloroaniline	1.91	0.167	mg/kg wet	3.333		57	40-140			
4-Nitrophenol	2.42	1.67	mg/kg wet	3.333		73	30-130			
Acenaphthene	2.36	0.333	mg/kg wet	3.333		71	40-140			
Acenaphthylene	2.33	0.167	mg/kg wet	3.333		70	40-140			
Acetophenone	2.15	0.667	mg/kg wet	3.333		65	40-140			
Aniline	1.62	1.67	mg/kg wet	3.333		49	40-140			
Anthracene	2.87	0.333	mg/kg wet	3.333		86	40-140			
Azobenzene	2.27	0.333	mg/kg wet	3.333		68	40-140			
Benzo(a)anthracene	3.03	0.333	mg/kg wet	3.333		91	40-140			
Benzo(a)pyrene	2.68	0.167	mg/kg wet	3.333		80	40-140			
Benzo(b)fluoranthene	2.83	0.333	mg/kg wet	3.333		85	40-140			
Benzo(g,h,i)perylene	2.87	0.333	mg/kg wet	3.333		86	40-140			
Benzo(k)fluoranthene	2.66	0.333	mg/kg wet	3.333		80	40-140			
bis(2-Chloroethoxy)methane	2.24	0.333	mg/kg wet	3.333		67	40-140			
bis(2-Chloroethyl)ether	2.14	0.100	mg/kg wet	3.333		64	40-140			
bis(2-chloroisopropyl)Ether	2.26	0.100	mg/kg wet	3.333		68	40-140			
bis(2-Ethylhexyl)phthalate	2.67	0.333	mg/kg wet	3.333		80	40-140			
Butylbenzylphthalate	2.60	0.333	mg/kg wet	3.333		78	40-140			
Chrysene	2.75	0.167	mg/kg wet	3.333		82	40-140			
Dibenzo(a,h)Anthracene	2.94	0.100	mg/kg wet	3.333		88	40-140			
Dibenzofuran	2.44	0.333	mg/kg wet	3.333		73	40-140			
Diethylphthalate	2.99	0.333	mg/kg wet	3.333		90	40-140			
Dimethylphthalate	2.83	0.333	mg/kg wet	3.333		85	40-140			
Di-n-butylphthalate	3.02	0.333	mg/kg wet	3.333		91	40-140			
Di-n-octylphthalate	2.67	0.333	mg/kg wet	3.333		80	40-140			
Fluoranthene	3.21	0.333	mg/kg wet	3.333		96	40-140			
Fluorene	2.74	0.333	mg/kg wet	3.333		82	40-140			
Hexachlorobenzene	3.01	0.100	mg/kg wet	3.333		90	40-140			
Hexachlorobutadiene	2.65	0.333	mg/kg wet	3.333		80	40-140			
Hexachloroethane	2.18	0.100	mg/kg wet	3.333		65	40-140			
Indeno(1,2,3-cd)Pyrene	2.96	0.333	mg/kg wet	3.333		89	40-140			
Isophorone	2.10	0.333	mg/kg wet	3.333		63	40-140			
Naphthalene	2.36	0.333	mg/kg wet	3.333		71	40-140			
Nitrobenzene	2.29	0.333	mg/kg wet	3.333		69	40-140			
N-Nitrosodimethylamine	2.18	0.333	mg/kg wet	3.333		65	40-140			
Pentachlorophenol	2.82	0.333	mg/kg wet	3.333		85	30-130			
Phenanthrene	2.62	0.333	mg/kg wet	3.333		79	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0437

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CI91618 - 3546										
Phenol	2.46	0.167	mg/kg wet	3.333		74	30-130			
Pyrene	2.65	0.333	mg/kg wet	3.333		80	40-140			
Pyridine	1.97	1.67	mg/kg wet	3.333		59	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	*2.32*		mg/kg wet	*3.333*		*70*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.86*		mg/kg wet	*5.000*		*97*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.82*		mg/kg wet	*5.000*		*76*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.45*		mg/kg wet	*3.333*		*73*	*30-130*			
Surrogate: 2-Fluorophenol	*3.84*		mg/kg wet	*5.000*		*77*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.52*		mg/kg wet	*3.333*		*75*	*30-130*			
Surrogate: Phenol-d6	*3.66*		mg/kg wet	*5.000*		*73*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.92*		mg/kg wet	*3.333*		*88*	*30-130*			
LCS Dup										
1,2,4-Trichlorobenzene	2.46	0.167	mg/kg wet	3.333		74	40-140	3	30	
1,2-Dichlorobenzene	2.17	0.333	mg/kg wet	3.333		65	40-140	7	30	
1,3-Dichlorobenzene	2.15	0.167	mg/kg wet	3.333		64	40-140	5	30	
1,4-Dichlorobenzene	2.19	0.100	mg/kg wet	3.333		66	40-140	6	30	
2,4,5-Trichlorophenol	2.64	0.333	mg/kg wet	3.333		79	30-130	9	30	
2,4,6-Trichlorophenol	2.50	0.100	mg/kg wet	3.333		75	30-130	5	30	
2,4-Dichlorophenol	2.59	0.100	mg/kg wet	3.333		78	30-130	6	30	
2,4-Dimethylphenol	2.48	0.100	mg/kg wet	3.333		74	30-130	3	30	
2,4-Dinitrophenol	2.60	0.667	mg/kg wet	3.333		78	30-130	7	30	
2,4-Dinitrotoluene	2.86	0.167	mg/kg wet	3.333		86	40-140	8	30	
2,6-Dinitrotoluene	2.51	0.333	mg/kg wet	3.333		75	40-140	6	30	
2-Chloronaphthalene	2.28	0.333	mg/kg wet	3.333		68	40-140	0.3	30	
2-Chlorophenol	2.22	0.100	mg/kg wet	3.333		67	30-130	5	30	
2-Methylnaphthalene	2.30	0.100	mg/kg wet	3.333		69	40-140	6	30	
2-Methylphenol	2.16	0.333	mg/kg wet	3.333		65	30-130	8	30	
2-Nitrophenol	2.35	0.333	mg/kg wet	3.333		71	30-130	3	30	
3,3´-Dichlorobenzidine	2.43	0.167	mg/kg wet	3.333		73	40-140	7	30	
3+4-Methylphenol	4.15	0.667	mg/kg wet	6.667		62	30-130	8	30	
4-Bromophenyl-phenylether	2.75	0.333	mg/kg wet	3.333		82	40-140	6	30	
4-Chloroaniline	1.87	0.167	mg/kg wet	3.333		56	40-140	2	30	
4-Nitrophenol	2.28	1.67	mg/kg wet	3.333		68	30-130	6	30	
Acenaphthene	2.30	0.333	mg/kg wet	3.333		69	40-140	2	30	
Acenaphthylene	2.30	0.167	mg/kg wet	3.333		69	40-140	1	30	
Acetophenone	2.02	0.667	mg/kg wet	3.333		61	40-140	6	30	
Aniline	1.56	1.67	mg/kg wet	3.333		47	40-140	4	30	
Anthracene	2.76	0.333	mg/kg wet	3.333		83	40-140	4	30	
Azobenzene	2.13	0.333	mg/kg wet	3.333		64	40-140	6	30	
Benzo(a)anthracene	2.94	0.333	mg/kg wet	3.333		88	40-140	3	30	
Benzo(a)pyrene	2.59	0.167	mg/kg wet	3.333		78	40-140	3	30	
Benzo(b)fluoranthene	2.85	0.333	mg/kg wet	3.333		86	40-140	0.6	30	
Benzo(g,h,i)perylene	2.79	0.333	mg/kg wet	3.333		84	40-140	3	30	
Benzo(k)fluoranthene	2.46	0.333	mg/kg wet	3.333		74	40-140	8	30	
bis(2-Chloroethoxy)methane	2.18	0.333	mg/kg wet	3.333		65	40-140	2	30	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0437

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CI91618 - 3546										
bis(2-Chloroethyl)ether	2.04	0.100	mg/kg wet	3.333		61	40-140	5	30	
bis(2-chloroisopropyl)Ether	2.08	0.100	mg/kg wet	3.333		62	40-140	8	30	
bis(2-Ethylhexyl)phthalate	2.56	0.333	mg/kg wet	3.333		77	40-140	4	30	
Butylbenzylphthalate	2.50	0.333	mg/kg wet	3.333		75	40-140	4	30	
Chrysene	2.59	0.167	mg/kg wet	3.333		78	40-140	6	30	
Dibenzo(a,h)Anthracene	2.87	0.100	mg/kg wet	3.333		86	40-140	2	30	
Dibenzofuran	2.33	0.333	mg/kg wet	3.333		70	40-140	5	30	
Diethylphthalate	2.72	0.333	mg/kg wet	3.333		82	40-140	9	30	
Dimethylphthalate	2.60	0.333	mg/kg wet	3.333		78	40-140	9	30	
Di-n-butylphthalate	2.94	0.333	mg/kg wet	3.333		88	40-140	3	30	
Di-n-octylphthalate	2.59	0.333	mg/kg wet	3.333		78	40-140	3	30	
Fluoranthene	3.07	0.333	mg/kg wet	3.333		92	40-140	5	30	
Fluorene	2.57	0.333	mg/kg wet	3.333		77	40-140	6	30	
Hexachlorobenzene	2.93	0.100	mg/kg wet	3.333		88	40-140	3	30	
Hexachlorobutadiene	2.61	0.333	mg/kg wet	3.333		78	40-140	2	30	
Hexachloroethane	2.08	0.100	mg/kg wet	3.333		62	40-140	5	30	
Indeno(1,2,3-cd)Pyrene	2.90	0.333	mg/kg wet	3.333		87	40-140	2	30	
Isophorone	1.98	0.333	mg/kg wet	3.333		60	40-140	6	30	
Naphthalene	2.28	0.333	mg/kg wet	3.333		69	40-140	3	30	
Nitrobenzene	2.21	0.333	mg/kg wet	3.333		66	40-140	3	30	
N-Nitrosodimethylamine	1.98	0.333	mg/kg wet	3.333		59	40-140	10	30	
Pentachlorophenol	2.71	0.333	mg/kg wet	3.333		81	30-130	4	30	
Phenanthrene	2.52	0.333	mg/kg wet	3.333		76	40-140	4	30	
Phenol	2.30	0.167	mg/kg wet	3.333		69	30-130	7	30	
Pyrene	2.57	0.333	mg/kg wet	3.333		77	40-140	3	30	
Pyridine	1.87	1.67	mg/kg wet	3.333		56	40-140	5	30	
Surrogate: 1,2-Dichlorobenzene-d4	*2.18*		mg/kg wet	*3.333*		*65*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.45*		mg/kg wet	*5.000*		*89*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.44*		mg/kg wet	*5.000*		*69*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.34*		mg/kg wet	*3.333*		*70*	*30-130*			
Surrogate: 2-Fluorophenol	*3.43*		mg/kg wet	*5.000*		*69*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.33*		mg/kg wet	*3.333*		*70*	*30-130*			
Surrogate: Phenol-d6	*3.22*		mg/kg wet	*5.000*		*64*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.75*		mg/kg wet	*3.333*		*83*	*30-130*			
Classical Chemistry										
Batch CI91626 - TCN Prep										
Blank										
Total Cyanide	ND	1.00	mg/kg wet							
LCS										
Total Cyanide	4.94	1.00	mg/kg wet	5.015		99	90-110			
Reference										
Total Cyanide	153	9.91	mg/kg wet	157.0		97	24-110			
Reference										

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
ESS Laboratory Work Order: 19I0437

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Classical Chemistry										
Batch CI91626 - TCN Prep										
Total Cyanide	153	9.87	mg/kg wet	157.0		97	24-110			
Batch CI91645 - General Preparation										
Blank										
Sulfide	ND	0.05	mg/kg wet							
LCS										
Sulfide	0.5		mg/L	0.5000		99	85-115			
Batch CI91711 - General Preparation										
Blank										
Reactive Cyanide	ND	2.0	mg/kg							
Reactive Sulfide	ND	2.0	mg/kg							
LCS										
Reactive Cyanide	3.9	2.0	mg/kg	100.3		4	0.68-5.41			
Reactive Sulfide	ND	2.0	mg/kg	10.00		0	0-44			
Batch CI91721 - General Preparation										
Blank										
Conductivity	ND	5	umhos/cm							
LCS										
Conductivity	1400		umhos/cm	1411		99	90-110			
Batch CI91734 - General Preparation										
Blank										
Sulfate	ND	5	mg/kg wet							
LCS										
Sulfate	10		mg/L	9.988		96	80-120			
Batch CI91848 - General Preparation										
Blank										
Total Organic Carbon (1)	ND	100	mg/kg							
Total Organic Carbon (2)	ND	100	mg/kg							
LCS										
Total Organic Carbon (1)	9680	100	mg/kg	10000		97	80-120			
Total Organic Carbon (2)	9990	100	mg/kg	10000		100	80-120			
LCS Dup										
Total Organic Carbon (1)	10100	100	mg/kg	10000		101	80-120	5	20	
Total Organic Carbon (2)	10200	100	mg/kg	10000		102	80-120	2	20	
Batch CI91850 - General Preparation										
Reference										
Flashpoint	80		°F	81.00		99	97.9-102.1			
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch CI91906 - 3546										
Blank										

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch CI91906 - 3546										
C19-C36 Aliphatics1	ND	15.0	mg/kg wet							
C9-C18 Aliphatics1	ND	15.0	mg/kg wet							
Decane (C10)	ND	0.5	mg/kg wet							
Docosane (C22)	ND	0.5	mg/kg wet							
Dodecane (C12)	ND	0.5	mg/kg wet							
Eicosane (C20)	ND	0.5	mg/kg wet							
Hexacosane (C26)	ND	0.5	mg/kg wet							
Hexadecane (C16)	ND	0.5	mg/kg wet							
Hexatriacontane (C36)	ND	0.5	mg/kg wet							
Nonadecane (C19)	ND	0.5	mg/kg wet							
Nonane (C9)	ND	0.5	mg/kg wet							
Octacosane (C28)	ND	0.5	mg/kg wet							
Octadecane (C18)	ND	0.5	mg/kg wet							
Tetracosane (C24)	ND	0.5	mg/kg wet							
Tetradecane (C14)	ND	0.5	mg/kg wet							
Triacontane (C30)	ND	0.5	mg/kg wet							
Surrogate: 1-Chlorooctadecane	*1.72*		mg/kg wet	*2.020*		*85*	*40-140*			
Blank										
C11-C22 Unadjusted Aromatics1	ND	15.0	mg/kg wet							
Surrogate: 2-Bromonaphthalene	*49.4*		mg/L	*50.00*		*99*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*48.0*		mg/L	*50.00*		*96*	*40-140*			
Surrogate: O-Terphenyl	*1.91*		mg/kg wet	*2.008*		*95*	*40-140*			
Blank										
2-Methylnaphthalene	ND	0.020	mg/kg wet							
Acenaphthene	ND	0.020	mg/kg wet							
Acenaphthylene	ND	0.020	mg/kg wet							
Anthracene	ND	0.008	mg/kg wet							
Benzo(a)anthracene	ND	0.008	mg/kg wet							
Benzo(a)pyrene	ND	0.008	mg/kg wet							
Benzo(b)fluoranthene	ND	0.020	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.020	mg/kg wet							
Benzo(k)fluoranthene	ND	0.020	mg/kg wet							
Chrysene	ND	0.020	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.008	mg/kg wet							
Fluoranthene	ND	0.020	mg/kg wet							
Fluorene	ND	0.008	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.020	mg/kg wet							
Naphthalene	ND	0.020	mg/kg wet							
Phenanthrene	ND	0.020	mg/kg wet							
Pyrene	ND	0.020	mg/kg wet							
LCS										
C19-C36 Aliphatics1	13.8	15.0	mg/kg wet	16.00		86	40-140			
C9-C18 Aliphatics1	8.0	15.0	mg/kg wet	12.00		67	40-140			

CERTIFICATE OF ANALYSIS

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch CI91906 - 3546										
Decane (C10)	1.0	0.5	mg/kg wet	2.000		49	40-140			
Docosane (C22)	1.7	0.5	mg/kg wet	2.000		84	40-140			
Dodecane (C12)	1.1	0.5	mg/kg wet	2.000		54	40-140			
Eicosane (C20)	1.6	0.5	mg/kg wet	2.000		82	40-140			
Hexacosane (C26)	1.6	0.5	mg/kg wet	2.000		81	40-140			
Hexadecane (C16)	1.4	0.5	mg/kg wet	2.000		72	40-140			
Hexatriacontane (C36)	1.5	0.5	mg/kg wet	2.000		76	40-140			
Nonadecane (C19)	1.6	0.5	mg/kg wet	2.000		81	40-140			
Nonane (C9)	0.8	0.5	mg/kg wet	2.000		40	30-140			
Octacosane (C28)	1.6	0.5	mg/kg wet	2.000		80	40-140			
Octadecane (C18)	1.6	0.5	mg/kg wet	2.000		82	40-140			
Tetracosane (C24)	1.7	0.5	mg/kg wet	2.000		83	40-140			
Tetradecane (C14)	1.2	0.5	mg/kg wet	2.000		61	40-140			
Triacontane (C30)	1.6	0.5	mg/kg wet	2.000		78	40-140			
Surrogate: 1-Chlorooctadecane	*1.60*		mg/kg wet	*2.020*		*79*	*40-140*			
LCS										
C11-C22 Unadjusted Aromatics1	29.4	15.0	mg/kg wet	34.00		87	40-140			
Surrogate: 2-Bromonaphthalene	*44.7*		mg/L	*50.00*		*89*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*43.8*		mg/L	*50.00*		*88*	*40-140*			
Surrogate: O-Terphenyl	*1.75*		mg/kg wet	*2.008*		*87*	*40-140*			
LCS										
2-Methylnaphthalene Breakthrough	0.0		%				0-5			
Naphthalene Breakthrough	0.0		%				0-5			
LCS										
2-Methylnaphthalene	1.40	0.100	mg/kg wet	2.000		70	40-140			
Acenaphthene	1.70	0.100	mg/kg wet	2.000		85	40-140			
Acenaphthylene	1.71	0.100	mg/kg wet	2.000		86	40-140			
Anthracene	1.81	0.040	mg/kg wet	2.000		91	40-140			
Benzo(a)anthracene	1.70	0.040	mg/kg wet	2.000		85	40-140			
Benzo(a)pyrene	1.75	0.040	mg/kg wet	2.000		87	40-140			
Benzo(b)fluoranthene	1.77	0.100	mg/kg wet	2.000		88	40-140			
Benzo(g,h,i)perylene	1.64	0.100	mg/kg wet	2.000		82	40-140			
Benzo(k)fluoranthene	1.76	0.100	mg/kg wet	2.000		88	40-140			
Chrysene	1.87	0.100	mg/kg wet	2.000		93	40-140			
Dibenzo(a,h)Anthracene	1.73	0.040	mg/kg wet	2.000		87	40-140			
Fluoranthene	1.80	0.100	mg/kg wet	2.000		90	40-140			
Fluorene	1.65	0.040	mg/kg wet	2.000		83	40-140			
Indeno(1,2,3-cd)Pyrene	1.71	0.100	mg/kg wet	2.000		85	40-140			
Naphthalene	1.37	0.100	mg/kg wet	2.000		69	40-140			
Phenanthrene	1.64	0.100	mg/kg wet	2.000		82	40-140			
Pyrene	1.90	0.100	mg/kg wet	2.000		95	40-140			
LCS Dup										
C19-C36 Aliphatics1	13.4	15.0	mg/kg wet	16.00		84	40-140	2	25	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0437

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch CI91906 - 3546										
C9-C18 Aliphatics1	7.7	15.0	mg/kg wet	12.00		65	40-140	4	25	
Decane (C10)	0.9	0.5	mg/kg wet	2.000		47	40-140	4	25	
Docosane (C22)	1.6	0.5	mg/kg wet	2.000		82	40-140	2	25	
Dodecane (C12)	1.0	0.5	mg/kg wet	2.000		52	40-140	4	25	
Eicosane (C20)	1.6	0.5	mg/kg wet	2.000		80	40-140	2	25	
Hexacosane (C26)	1.6	0.5	mg/kg wet	2.000		80	40-140	2	25	
Hexadecane (C16)	1.4	0.5	mg/kg wet	2.000		69	40-140	4	25	
Hexatriacontane (C36)	1.5	0.5	mg/kg wet	2.000		73	40-140	3	25	
Nonadecane (C19)	1.6	0.5	mg/kg wet	2.000		79	40-140	2	25	
Nonane (C9)	0.8	0.5	mg/kg wet	2.000		38	30-140	5	25	
Octacosane (C28)	1.6	0.5	mg/kg wet	2.000		79	40-140	2	25	
Octadecane (C18)	1.6	0.5	mg/kg wet	2.000		80	40-140	2	25	
Tetracosane (C24)	1.6	0.5	mg/kg wet	2.000		81	40-140	2	25	
Tetradecane (C14)	1.2	0.5	mg/kg wet	2.000		60	40-140	3	25	
Triacontane (C30)	1.5	0.5	mg/kg wet	2.000		77	40-140	2	25	
Surrogate: 1-Chlorooctadecane	*1.56*		mg/kg wet	*2.020*		*77*	*40-140*			
LCS Dup										
C11-C22 Unadjusted Aromatics1	31.7	15.0	mg/kg wet	34.00		93	40-140	8	25	
Surrogate: 2-Bromonaphthalene	*47.1*		mg/L	*50.00*		*94*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*45.4*		mg/L	*50.00*		*91*	*40-140*			
Surrogate: O-Terphenyl	*1.86*		mg/kg wet	*2.008*		*93*	*40-140*			
LCS Dup										
2-Methylnaphthalene Breakthrough	0.0		%				0-5		200	
Naphthalene Breakthrough	0.0		%				0-5		200	
LCS Dup										
2-Methylnaphthalene	1.42	0.100	mg/kg wet	2.000		71	40-140	1	30	
Acenaphthene	1.69	0.100	mg/kg wet	2.000		84	40-140	1	30	
Acenaphthylene	1.70	0.100	mg/kg wet	2.000		85	40-140	0.7	30	
Anthracene	1.86	0.040	mg/kg wet	2.000		93	40-140	2	30	
Benzo(a)anthracene	1.70	0.040	mg/kg wet	2.000		85	40-140	0.1	30	
Benzo(a)pyrene	1.76	0.040	mg/kg wet	2.000		88	40-140	0.6	30	
Benzo(b)fluoranthene	1.76	0.100	mg/kg wet	2.000		88	40-140	0.5	30	
Benzo(g,h,i)perylene	1.57	0.100	mg/kg wet	2.000		79	40-140	4	30	
Benzo(k)fluoranthene	1.73	0.100	mg/kg wet	2.000		87	40-140	2	30	
Chrysene	1.86	0.100	mg/kg wet	2.000		93	40-140	0.6	30	
Dibenzo(a,h)Anthracene	1.68	0.040	mg/kg wet	2.000		84	40-140	3	30	
Fluoranthene	1.87	0.100	mg/kg wet	2.000		93	40-140	3	30	
Fluorene	1.68	0.040	mg/kg wet	2.000		84	40-140	2	30	
Indeno(1,2,3-cd)Pyrene	1.63	0.100	mg/kg wet	2.000		82	40-140	5	30	
Naphthalene	1.36	0.100	mg/kg wet	2.000		68	40-140	0.8	30	
Phenanthrene	1.69	0.100	mg/kg wet	2.000		84	40-140	3	30	
Pyrene	1.83	0.100	mg/kg wet	2.000		92	40-140	4	30	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ ESS Laboratory Work Order: 19I0437

Notes and Definitions

Z18	Temperature is not within 23 +/-2 ºC.
Z-10	Soil pH measured in water at 21.1 ºC.
Z-08	See Attached
WL	Results obtained from a deionized water leach of the sample.
U	Analyte included in the analysis, but not detected
Q	Calibration required quadratic regression (Q).
P	Percent difference between primary and confirmation results exceeds 40% (P).
LC	Lower value is used due to matrix interferences (LC).
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
CD-	Continuing Calibration %Diff/Drift is below control limit (CD-).
B-	Blank Spike recovery is below lower control limit (B-).
>	Greater than.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0437

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

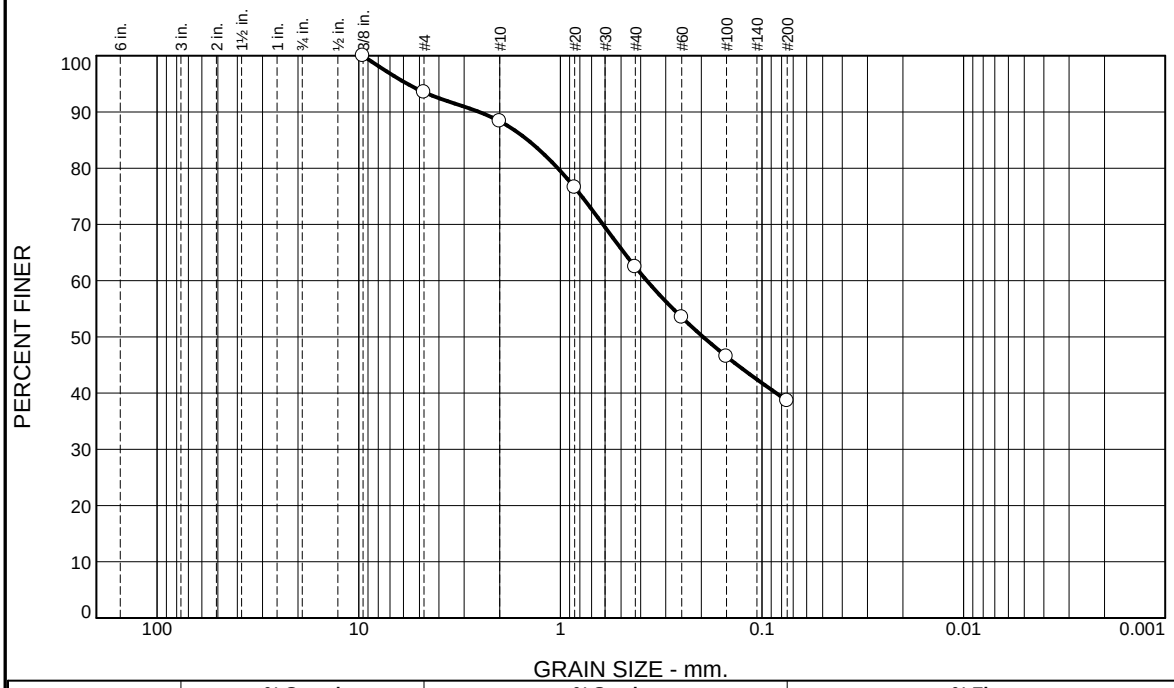
New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	6.5	5.1	26.0	23.8	38.6	

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
0.375"	100.0		
#4	93.5		
#10	88.4		
#20	76.6		
#40	62.4		
#60	53.5		
#100	46.5		
#200	38.6		

* (no specification provided)

Material Description

Dark Brown Organic silty sand

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= Pt **AASHTO (M 145)=** A-8

Coefficients

D_{90}= 2.5213 D_{85}= 1.4485 D_{60}= 0.3728
D_{50}= 0.1960 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Sample visually classified as plastic. Sample rolled to 1/4".

Date Received: 09.16.19 **Date Tested:** 09.19.19

Tested By: JM / IA

Checked By: Steven Accetta

Title: Laboratory Coordinator

Source of Sample: Grab **Date Sampled:** 09.11.19
Sample Number: 1804576-55664-S1

Thielsch Engineering Inc.

Cranston, RI

Client: GEI Consultants
Project: Amesbury Former MGP
Amesbury, MA
Project No: 19I0437 **Figure** 19I0437-01

THIELSCH ENGINEERING	195 Frances Avenue Cranston RI, 02910 Phone: (401)-467-6454 Fax: (401)-467-2398 thielsch.com *Let's Build a Solid Foundation*	Client Information: GEI Consultants Woburn, MA PM: Ryan Hoffman Assigned By: Ryan Hoffman Collected By: Client	Project Information: **Amesbury Former MGP** **Amesbury, MA** ESS Project Number: 19I0437 Summary Page: 1 of 1 Report Date: 10.07.19

LABORATORY TESTING DATA SHEET, Report No.: 7419-K-125

GEI Sample ID	ESS Sample ID	Depth (Ft)	Laboratory No.	Identification Tests								Proctor / CBR / Permeability Tests								Laboratory Log and Soil Description
				As Received Water Content %	LL %	PL %	Gravel %	Sand %	Fines %	Volatile Solids (%)	G_s	Dry unit wt. pcf	Test Water Content %	γ_d MAX (pcf) W_{opt} (%)	γ_d MAX (pcf) W_{opt} (%) (Corr.)	Target Test Setup as % of Proctor	CBR @ 0.1"	CBR @ 0.2"	Perme-ability cm/sec	
				D2216	D4318		D6913			D2974	D854			D1557						
1804576-SS64-S1	19I0437-01		19-S-2052	75.9						11.1										Brown

Date Received: *10.04.19*

Reviewed By:

Date Reviewed: *10.07.19*

Sterling Analytical, Inc.
15 Agawam Avenue
West Springfield, MA 01089
Phone (413) 214-6541 Fax (413) 214-6842
email-madhu@sterlinganalytical.com

Visit our website: www.sterlinganalytical.com

Mass Certification - MA-00071
Conn Certification - PH-0520

Report Date September 19, 2019

Customer	Contact	Laboratory Supervisor	eMail
ESS Laboratory	S. Morrell	Madhu Shah	customerservice@sterlinganalytical.com

Sample Description
Analysis of Soil Sample

Samples Analyzed

Enclosed are Report No(s): 68056

Blank = <0.05ppm

LCS Lo Check 0.100 = 0.092ppm

ICV 1.00 = 1.025ppm

Thank you for your business

madhu shah

Madhu Shah, Laboratory Supervisor

9/20/2019

Date

ALL the information contained in this report has been reviewed for accuracy and checked against all quality control requirements outlined in each applicable method.
This report may not be reproduced, except in full, without written approval from Sterling Analytical, Inc.

Sample	Description	Source	Taken/Time	Received
68056	19I0437-01	ESS Laboratory	9/11/19	9/17/19

Parameter	Results		RDL	Method	Analyzed/Time	Tech
Sulfur, Total	2,390	mg/kg	100.00	SW 846 6010	09/18/19	dfp

Chain-of-Custody Record

Laboratory: ~~AquaSurvey~~ ESS PSA 9/13

Laboratory Job # (Lab use only): 1910437

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

Page 1 of 1

Sample Handling

Samples Field Filtered: YES NO NA

Sampled Shipped With Ice: YES NO

MCP PRESUMPTIVE CERTAINTY REQUIRED – YES NO

If Yes, Are MCP Analytical Methods Required?	YES	NO	NA
Are Drinking Water Samples Submitted?	YES	NO	NA
If Yes, Have Drinking Water Sampling Requirements Been Met?	YES	NO	NA

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	VOCs 8260*	SVOCs 8270 by SIM**	TPH 8100M	PCB NOAA Summation of Congeners	RCRA8 metals + Cu, Ni, Zn***	EPH (fractions only)	Volatile solids (%)	Corrosivity, Ignit., React., Conductivity	Pesticides and Herbicides	Total cyanide	Total Sulfur, Total Sulfide, Total Sulfate	TOC by Lloyd-Kahn	Grain Size Analysis****	Sample Specific Remarks
							Preservative: H2O/MeOH	None	None	None	None	None	None	None	None	None	None	None	None	
1	1804576-SS664-S1	9/11/19	1355	Sed	10	BFM	X	X	X	X	X	X	X	X	X	X	X	X	X	[illegible] 9/11/19 @ 1700

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1. [signature]	9/12/19	1910	1. GEI Sample Fridge
2. GEI Sample Fridge	9/13/19	1205	2. [signature]
3. [signature]	9/13/19	1205	3. [signature] 9/13/19 1205
4. [signature]	9/13/19	14:46	4.

Turnaround Time (Business days):

Normal __X__ Other ____

10-Day ____ 7-Day ____

5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

*Run TCLP benzene if total >20X

**Include pyridine and toxaphene

***Run TCLP metals if total >20X

****Sieve Nos. 4, 10, 40, 60, and 200

ESS Laboratory — Sterling — CHAIN OF CUSTODY

Division of Thielsch Engineering, Inc.
185 Frances Avenue, Cranston, RI 02910-2211
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

ESS Lab # 19i0437

Turn Time **DUE DATE: _DUE 9/20/19_**

Regulatory State: **MA** RI CT NH NJ NY ME Other_____

Is this project for any of the following:(please circle)
MA-MCP Navy USACE CT DEP Other_____

Reporting Limits - _____

Electonic Deliverables Excel Access PDF

Co. Name	Project #	Project Name	
ESS LABORATORY		19i0437	
Contact Person	**Address**		
Shawn Morrell / Heather Masse			
City	**State**	**Zip**	**PO #**
			B02792
Tel.	**Email:** Smorrell@thielsch.com; Hmasse@thielsch.com		

ESS Lab ID	Date	Collection Time	Grab -G Composite-C	Matrix	Sample ID	Pres Code	# of Containers	Type of Container	Vol of Container	Analysis: Total Sulfur 6010 mg/Kg									
	9/11/19	**1355**	**G**	**Sediment**	**19i0437-01**					X									

Container Type: P-Poly G-Glass AG-Amber Glass S-Sterile V-VOA

Matrix: S-Soil SD-Solid D-Sludge WW-Wastewater GW-Groundwater SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filter

Cooler Present ✓ Yes ____No

Seals Intact ____Yes ____No NA:___

Cooler Temperature: _____

Internal Use Only
[ ] Pickup
[ ] Technician___

Preservation Code: 1-NP, 2-HCl, 3-H2SO4, 4-HNO3, 5-NaOH, 6-MeOH, 7-Asorbic Acid, 8-ZnAct, 9-_____

Sampled by :

Comments: **QC required MB and LCS**

Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)
9/17/19 12:19	9/17/19		
Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)

* By circling MA-MCP, client acknowledges samples were collected in accordance with MADEP CAM VIIA

Please fax to the laboratory all changes to Chain of Custody

1 (White) Lab Copy
2 (Yellow) Client Receipt

Chain-of-Custody Record

Laboratory: ~~AquaSurvey~~ ESS RH 9/13

Laboratory Job # (Lab use only) 1910437

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

Page 1 of 1

MCP PRESUMPTIVE CERTAINTY REQUIRED -- YES NO

If Yes, Are MCP Analytical Methods Required?	YES	NO	NA
Are Drinking Water Samples Submitted?	YES	NO	NA
If Yes, Have Drinking Water Sampling Requirements Been Met?	YES	NO	NA

Sample Handling

Samples Field Filtered: YES NO NA

Sampled Shipped With Ice: YES NO

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	VOCs 8260*	SVOCs 8270 by SIM**	TPH 8100M	PCB NOAA Summation of Congeners	RCRA8 metals + Cu, Ni, Zn***	EPH (fractions only)	Volatile solids (%)	Corrosivity, Ignit., React., Conductivity	Pesticides and Herbicides	Total cyanide	Total Sulfur, Total Sulfide, Total Sulfate	TOC by Lloyd-Kahn	Grain Size Analysis****	Sample Specific Remarks
							Preservative: H2O/MeOH	None	None	None	None	None	None	None	None	None	None	None	None	
1	1804576-SS664-S1	9/11/19	1355	Sed	10	BFM	X	X	X	X	~~X~~	X	X	X	X	X	X	X	X	VOC Frozen on 9/11/19 @ 1400
2	1804576-SS664-S1 Dried										X									

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1. [signature]	9/12/19	1910	1. GEI Sample Fridge
2. GEI Sample Fridge	9/13/19	1205	2. [signature]
3. [signature]	9/13/19	1205	3. [signature] 9/13/19 1205
4. [signature]	9/13/19	14:46	4. [signature] 9/13/19 1446

Turnaround Time (Business days):

Normal __X__ Other ____

10-Day ____ 7-Day ____

5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Sample 2 added for dried metals analysis 9/16/19 PRB

Additional Requirements/Comments/Remarks:

*Run TCLP benzene if total >20X

**Include pyridine and toxaphene

***Run TCLP metals if total >20X

****Sieve Nos. 4, 10, 40, 60, and 200

ice 3.1 m 9/11/19

Chain-of-Custody Record

Laboratory: ~~AquaSurvey~~ ESS (Rlk 9/13)

Laboratory Job # (Lab use only) 1910437

GEI Consultants

400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY REQUIRED -- YES NO

If Yes, Are MCP Analytical Methods Required? **YES** NO NA

Are Drinking Water Samples Submitted? YES **NO** NA

If Yes, Have Drinking Water Sampling Requirements Been Met? YES NO **NA**

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Preservative: H2O/MeOH	VOCs 8260*	SVOCs 8270 by SIM**	TPH 8100M	PCB NOAA Summation of Congeners	RCRA8 metals + Cu, Ni, Zn***	EPH (fractions only)	Volatile solids (%)	Corrosivity, Ignit., React., Conductivity	Pesticides and Herbicides	Total cyanide	Total Sulfur, Total Sulfide, Total Sulfate	TOC by Lloyd-Kahn	Grain Size Analysis****	Sample Specific Remarks
1	1804576-SS664-S1	9/11/19	1355	Sed	10	BFM	None	X	X	X	X	X	X	X	X	X	X	X	X	X	Hold frozen 9/14@ 1100

Preservative: None (all other columns)

Sample Handling: Samples Field Filtered — YES NO **NA**; Sampled Shipped With Ice — **YES** NO

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

Relinquished by: (signature)	Date:	Time:	Received by: (signature)
1.	9/12/19	1910	1. GEI Sample Fridge
2. GEI Sample Fridge	9/13/19	1205	2.
3.	9/13/19	1205	3. 9/13/19 1205
4.	9/13/19	14:46	4. 9/13/19 1446

Turnaround Time (Business days):

Normal __X__ Other ____

10-Day ____ 7-Day ____

5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

*Run TCLP benzene if total >20X

**Include pyridine and toxaphene

***Run TCLP metals if total >20X

****Sieve Nos. 4, 10, 40, 60, and 200

ice 3.1 °C/n/ice

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP - 401WQ (1804576)
ESS Laboratory Work Order Number: 19I0742

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 2:20 pm, Oct 09, 2019

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses

CTS - Cranston, RI	Grain Size Analysis, Organic Content
Sterling Analytical Lab - West Springfield, MA	Sulfur

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0742

SAMPLE RECEIPT

The following samples were received on September 24, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Low Level VOA vials were frozen by ESS Laboratory on 9/24/19 at 17:14.

Revision 1 October 9, 2019: This report has been revised to include TCLP Cr result and Subwork for Volatile Solids (%).

Lab Number	Sample Name	Matrix	Analysis
19I0742-01	1804576-SS669-S1	Sediment	1010, 1311, 1311/6010C, 6010, 7.3.3.2, 7.3.4.1, 8081B, 8082A-Cong, 8100M, 8151A, 8260B Low, 8270D, 9014, 9030B, 9038, 9045, 9050A, EPH8270, EPH8270SIM, LK, MADEP-EPH, SUB
19I0742-02	1804576-SS669-S1 Dried	Sediment	6010C, 6020A, 7471B

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ ESS Laboratory Work Order: 19I0742

PROJECT NARRATIVE

5035/8260B Volatile Organic Compounds / Low Level

C9I0448-CCV1 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
1,2-Dibromo-3-Chloropropane (23% @ 20%), 1,4-Dioxane (24% @ 20%), Bromoform (21% @ 20%), Tetrahydrofuran (26% @ 20%)

8081B Organochlorine Pesticides

19I0742-01 **Lower value is used due to matrix interferences (LC).**
Dieldrin

19I0742-01 **Percent difference between primary and confirmation results exceeds 40% (P).**
Dieldrin

8082 Polychlorinated Biphenyls (PCB) / Congeners

19I0742-01 **Percent difference between primary and confirmation results exceeds 40% (P).**
BZ#105 , BZ#170 , BZ#18 [2C] , BZ#187 , BZ#195 , BZ#209

8100M Total Petroleum Hydrocarbons

C9I0398-CCV7 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
Hexatriacontane (C36) (32% @ 25%)

8151A Chlorinated Herbicides

19I0742-01 **Lower value is used due to matrix interferences (LC).**
2,4-DB [2C]

19I0742-01 **Modified result**
MCPA , MCPP

19I0742-01 **Peaks found in the retention time window for MCPA & MCPP did not confirm by GC/MS.**

19I0742-01 **Percent difference between primary and confirmation results exceeds 40% (P).**
2,4-DB [2C]

8270D Semi-Volatile Organic Compounds

C9I0439-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (86% @ 80-120%)

C9I0477-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (101% @ 80-120%)

MADEP-EPH Extractable Petroleum Hydrocarbons

19I0742-01 **Elevated Method Reporting Limits due to sample matrix (EL).**

C9I0432-CCV2 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
Hexatriacontane (C36) (26% @ 25%)

C9I0432-CCV5 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
Hexatriacontane (C36) (30% @ 25%)

C9I0432-CCV6 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
Hexatriacontane (C36) (37% @ 25%)

C9I0432-CCV7 **Continuing Calibration %Diff/Drift is above control limit (CD+).**

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ ESS Laboratory Work Order: 19I0742

Hexatriacontane (C36) (27% @ 25%)

C9I0432-CCV8 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
Hexatriacontane (C36) (27% @ 25%)

Total Metals

CI92649-BSD3 **Blank Spike recovery is above upper control limit (B+).**
Selenium (108% @ 80-120%)

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0742

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS669-S1
Date Sampled: 09/23/19 10:32
Percent Solids: 76

ESS Laboratory Work Order: 19I0742
ESS Laboratory Sample ID: 19I0742-01
Sample Matrix: Sediment
Units: mg/L

Extraction Method: 3005A TCLP

1311 TCLP Metals

Analyte	Results (MRL)	MDL	Method	TCLP Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Chromium	**0.020** (0.020)		1311/6010C		1	KJK	10/02/19 14:58	50	50	CJ90124
Lead	**0.351** (0.050)		1311/6010C		1	KJK	10/02/19 14:58	50	50	CJ90124

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS669-S1
Date Sampled: 09/23/19 10:32
Percent Solids: 76
Initial Volume: 10.2
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19I0742
ESS Laboratory Sample ID: 19I0742-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
1,1,1-Trichloroethane	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
1,1,2,2-Tetrachloroethane	ND (0.0013)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
1,1,2-Trichloroethane	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
1,1-Dichloroethane	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
1,1-Dichloroethene	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
1,1-Dichloropropene	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
1,2,3-Trichlorobenzene	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
1,2,3-Trichloropropane	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
1,2,4-Trichlorobenzene	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
1,2,4-Trimethylbenzene	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
1,2-Dibromo-3-Chloropropane	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
1,2-Dibromoethane	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
1,2-Dichlorobenzene	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
1,2-Dichloroethane	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
1,2-Dichloropropane	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
1,3,5-Trimethylbenzene	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
1,3-Dichlorobenzene	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
1,3-Dichloropropane	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
1,4-Dichlorobenzene	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
1,4-Dioxane	ND (0.0646)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
2,2-Dichloropropane	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
2-Butanone	**0.0110** (0.0065)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
2-Chlorotoluene	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
2-Hexanone	ND (0.0065)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
4-Chlorotoluene	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
4-Isopropyltoluene	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
4-Methyl-2-Pentanone	ND (0.0065)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
Acetone	**0.0779** (0.0065)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
Benzene	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
Bromobenzene	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
Bromochloromethane	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS669-S1
Date Sampled: 09/23/19 10:32
Percent Solids: 76
Initial Volume: 10.2
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19I0742
ESS Laboratory Sample ID: 19I0742-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromodichloromethane	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
Bromoform	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
Bromomethane	ND (0.0065)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
Carbon Disulfide	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
Carbon Tetrachloride	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
Chlorobenzene	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
Chloroethane	ND (0.0065)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
Chloroform	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
Chloromethane	ND (0.0065)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
cis-1,2-Dichloroethene	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
cis-1,3-Dichloropropene	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
Dibromochloromethane	ND (0.0013)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
Dibromomethane	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
Dichlorodifluoromethane	ND (0.0065)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
Diethyl Ether	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
Di-isopropyl ether	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
Ethyl tertiary-butyl ether	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
Ethylbenzene	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
Hexachlorobutadiene	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
Isopropylbenzene	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
Methyl tert-Butyl Ether	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
Methylene Chloride	ND (0.0065)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
Naphthalene	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
n-Butylbenzene	**0.0058** (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
n-Propylbenzene	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
sec-Butylbenzene	**0.0059** (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
Styrene	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
tert-Butylbenzene	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
Tertiary-amyl methyl ether	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
Tetrachloroethene	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
Tetrahydrofuran	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
Toluene	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS669-S1
Date Sampled: 09/23/19 10:32
Percent Solids: 76
Initial Volume: 10.2
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 19I0742
ESS Laboratory Sample ID: 19I0742-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
trans-1,2-Dichloroethene	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
trans-1,3-Dichloropropene	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
Trichloroethene	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
Trichlorofluoromethane	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
Vinyl Chloride	ND (0.0065)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
Xylene O	ND (0.0032)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
Xylene P,M	ND (0.0065)		8260B Low		1	09/25/19 15:53	C9I0448	CI92519
Xylenes (Total)	ND (0.00646)		8260B Low		1	09/25/19 15:53		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*130 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*85 %*		*70-130*
Surrogate: Dibromofluoromethane	*112 %*		*70-130*
Surrogate: Toluene-d8	*101 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS669-S1
Date Sampled: 09/23/19 10:32
Percent Solids: 76
Initial Volume: 20.7
Final Volume: 5
Extraction Method: 3546

ESS Laboratory Work Order: 19I0742
ESS Laboratory Sample ID: 19I0742-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: DMC
Prepared: 9/25/19 9:35

8081B Organochlorine Pesticides

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
4,4´-DDD [2C]	**0.0248** (0.0032)		8081B		1	09/26/19 16:45	C9I0470	CI92417
4,4´-DDE [2C]	**0.0181** (0.0032)		8081B		1	09/26/19 16:45	C9I0470	CI92417
4,4´-DDT	ND (0.0032)		8081B		1	09/26/19 16:45	C9I0470	CI92417
Aldrin	ND (0.0032)		8081B		1	09/26/19 16:45	C9I0470	CI92417
alpha-BHC	ND (0.0032)		8081B		1	09/26/19 16:45	C9I0470	CI92417
alpha-Chlordane	ND (0.0032)		8081B		1	09/26/19 16:45	C9I0470	CI92417
beta-BHC	ND (0.0032)		8081B		1	09/26/19 16:45	C9I0470	CI92417
Chlordane (Total)	ND (0.0254)		8081B		1	09/26/19 16:45	C9I0470	CI92417
delta-BHC	ND (0.0032)		8081B		1	09/26/19 16:45	C9I0470	CI92417
Dieldrin	**P, LC 0.0034** (0.0032)		8081B		1	09/26/19 16:45	C9I0470	CI92417
Endosulfan I	ND (0.0032)		8081B		1	09/26/19 16:45	C9I0470	CI92417
Endosulfan II	ND (0.0032)		8081B		1	09/26/19 16:45	C9I0470	CI92417
Endosulfan Sulfate	ND (0.0032)		8081B		1	09/26/19 16:45	C9I0470	CI92417
Endrin	ND (0.0032)		8081B		1	09/26/19 16:45	C9I0470	CI92417
Endrin Ketone	ND (0.0032)		8081B		1	09/26/19 16:45	C9I0470	CI92417
gamma-BHC (Lindane)	ND (0.0019)		8081B		1	09/26/19 16:45	C9I0470	CI92417
gamma-Chlordane	ND (0.0032)		8081B		1	09/26/19 16:45	C9I0470	CI92417
Heptachlor	ND (0.0032)		8081B		1	09/26/19 16:45	C9I0470	CI92417
Heptachlor Epoxide	ND (0.0032)		8081B		1	09/26/19 16:45	C9I0470	CI92417
Hexachlorobenzene	ND (0.0032)		8081B		1	09/26/19 16:45	C9I0470	CI92417
Methoxychlor	ND (0.0032)		8081B		1	09/26/19 16:45	C9I0470	CI92417
Toxaphene	ND (0.159)		8081B		1	09/26/19 16:45	C9I0470	CI92417

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*60 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*77 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*68 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*74 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS669-S1
Date Sampled: 09/23/19 10:32
Percent Solids: 76
Initial Volume: 29.4
Final Volume: 2
Extraction Method: 3540C

ESS Laboratory Work Order: 19I0742
ESS Laboratory Sample ID: 19I0742-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: DMC
Prepared: 9/26/19 16:15

8082 Polychlorinated Biphenyls (PCB) / Congeners

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
BZ#8 [2C]	**0.00340** (0.00036)		8082A-Cong		1	09/30/19 13:25	C9I0521	CI92609
BZ#18 [2C]	**P 0.0182** (0.00181)		8082A-Cong		5	09/30/19 15:39	C9I0521	CI92609
BZ#28 [2C]	**0.0372** (0.00181)		8082A-Cong		5	09/30/19 15:39	C9I0521	CI92609
BZ#44 [2C]	**0.0213** (0.00181)		8082A-Cong		5	09/30/19 15:39	C9I0521	CI92609
BZ#52	**0.0367** (0.00181)		8082A-Cong		5	09/30/19 15:39	C9I0521	CI92609
BZ#66 [2C]	**0.0254** (0.00181)		8082A-Cong		5	09/30/19 15:39	C9I0521	CI92609
BZ#101	**0.0343** (0.00181)		8082A-Cong		5	09/30/19 15:39	C9I0521	CI92609
BZ#105	**P 0.00601** (0.00181)		8082A-Cong		5	09/30/19 15:39	C9I0521	CI92609
BZ#118	**0.0223** (0.00181)		8082A-Cong		5	09/30/19 15:39	C9I0521	CI92609
BZ#128 [2C]	**0.00526** (0.00036)		8082A-Cong		1	09/30/19 13:25	C9I0521	CI92609
BZ#138 [2C]	**0.0255** (0.00181)		8082A-Cong		5	09/30/19 15:39	C9I0521	CI92609
BZ#153	**0.0228** (0.00181)		8082A-Cong		5	09/30/19 15:39	C9I0521	CI92609
BZ#170	**P 0.00296** (0.00036)		8082A-Cong		1	09/30/19 13:25	C9I0521	CI92609
BZ#180 [2C]	**0.00644** (0.00036)		8082A-Cong		1	09/30/19 13:25	C9I0521	CI92609
BZ#187	**P 0.00243** (0.00036)		8082A-Cong		1	09/30/19 13:25	C9I0521	CI92609
BZ#195	**P 0.00055** (0.00036)		8082A-Cong		1	09/30/19 13:25	C9I0521	CI92609
BZ#206 [2C]	**0.00100** (0.00036)		8082A-Cong		1	09/30/19 13:25	C9I0521	CI92609
BZ#209	**P 0.00057** (0.00036)		8082A-Cong		1	09/30/19 13:25	C9I0521	CI92609

	%Recovery	Qualifier	Limits
Surrogate: Tetrachloro-m-xylene	*60 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*69 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS669-S1
Date Sampled: 09/23/19 10:32
Percent Solids: 76
Initial Volume: 10.2
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19I0742
ESS Laboratory Sample ID: 19I0742-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: CAD
Prepared: 9/24/19 20:48

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**2790** (25.8)		8100M		1	09/26/19 5:53	C9I0398	CI92440

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*94 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS669-S1
Date Sampled: 09/23/19 10:32
Percent Solids: 76
Initial Volume: 10.3
Final Volume: 4
Extraction Method: 3546

ESS Laboratory Work Order: 19I0742
ESS Laboratory Sample ID: 19I0742-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: DMC
Prepared: 9/25/19 15:35

8151A Chlorinated Herbicides

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2,4,5-T	ND (0.012)		8151A		1	09/27/19 14:13	C9I0495	CI92437
2,4,5-TP (Silvex)	ND (0.012)		8151A		1	09/27/19 14:13	C9I0495	CI92437
2,4-D	ND (0.060)		8151A		1	09/27/19 14:13	C9I0495	CI92437
2,4-DB [2C]	**P, LC 0.114** (0.061)		8151A		1	09/27/19 14:13	C9I0495	CI92437
Dalapon	ND (0.058)		8151A		1	09/27/19 14:13	C9I0495	CI92437
Dicamba	ND (0.012)		8151A		1	09/27/19 14:13	C9I0495	CI92437
Dichlorprop	**0.563** (0.060)		8151A		1	09/27/19 14:13	C9I0495	CI92437
Dinoseb	ND (0.061)		8151A		1	09/27/19 14:13	C9I0495	CI92437
MCPA	# ND (2.97)		8151A		1	09/27/19 14:13	C9I0495	CI92437
MCPP	# ND (3.00)		8151A		1	09/27/19 14:13	C9I0495	CI92437

	%Recovery	Qualifier	Limits
Surrogate: DCAA	*69 %*		*30-150*
Surrogate: DCAA [2C]	*119 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS669-S1
Date Sampled: 09/23/19 10:32
Percent Solids: 76
Initial Volume: 10.1
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19I0742
ESS Laboratory Sample ID: 19I0742-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: TJ
Prepared: 9/24/19 21:17

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,2,4-Trichlorobenzene	ND (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
1,2-Dichlorobenzene	ND (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
1,3-Dichlorobenzene	ND (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
1,4-Dichlorobenzene	ND (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
2,4,5-Trichlorophenol	ND (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
2,4,6-Trichlorophenol	ND (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
2,4-Dichlorophenol	ND (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
2,4-Dimethylphenol	ND (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
2,4-Dinitrophenol	ND (1.30)		8270D		1	09/26/19 23:51	C9I0477	CI92439
2,4-Dinitrotoluene	ND (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
2,6-Dinitrotoluene	ND (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
2-Chloronaphthalene	ND (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
2-Chlorophenol	ND (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
2-Methylnaphthalene	ND (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
2-Methylphenol	ND (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
2-Nitrophenol	ND (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
3,3′-Dichlorobenzidine	ND (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
3+4-Methylphenol	ND (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
4-Bromophenyl-phenylether	ND (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
4-Chloroaniline	ND (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
4-Nitrophenol	ND (3.27)		8270D		1	09/26/19 23:51	C9I0477	CI92439
Acenaphthene	**1.20** (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
Acenaphthylene	ND (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
Acetophenone	ND (1.30)		8270D		1	09/26/19 23:51	C9I0477	CI92439
Aniline	ND (3.27)		8270D		1	09/26/19 23:51	C9I0477	CI92439
Anthracene	**1.33** (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
Azobenzene	ND (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
Benzo(a)anthracene	**1.56** (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
Benzo(a)pyrene	**1.47** (0.327)		8270D		1	09/26/19 23:51	C9I0477	CI92439
Benzo(b)fluoranthene	**1.10** (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
Benzo(g,h,i)perylene	**0.793** (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
Benzo(k)fluoranthene	**1.03** (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS669-S1
Date Sampled: 09/23/19 10:32
Percent Solids: 76
Initial Volume: 10.1
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19I0742
ESS Laboratory Sample ID: 19I0742-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: TJ
Prepared: 9/24/19 21:17

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
bis(2-Chloroethoxy)methane	ND (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
bis(2-Chloroethyl)ether	ND (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
bis(2-chloroisopropyl)Ether	ND (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
bis(2-Ethylhexyl)phthalate	ND (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
Butylbenzylphthalate	ND (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
Chrysene	**1.57** (0.327)		8270D		1	09/26/19 23:51	C9I0477	CI92439
Dibenzo(a,h)Anthracene	ND (0.327)		8270D		1	09/26/19 23:51	C9I0477	CI92439
Dibenzofuran	ND (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
Diethylphthalate	ND (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
Dimethylphthalate	ND (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
Di-n-butylphthalate	ND (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
Di-n-octylphthalate	ND (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
Fluoranthene	**3.79** (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
Fluorene	**0.779** (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
Hexachlorobenzene	ND (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
Hexachlorobutadiene	ND (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
Hexachloroethane	ND (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
Indeno(1,2,3-cd)Pyrene	**0.691** (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
Isophorone	ND (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
Naphthalene	ND (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
Nitrobenzene	ND (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
N-Nitrosodimethylamine	ND (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
Pentachlorophenol	ND (1.30)		8270D		1	09/26/19 23:51	C9I0477	CI92439
Phenanthrene	**5.45** (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
Phenol	ND (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
Pyrene	**5.39** (0.651)		8270D		1	09/26/19 23:51	C9I0477	CI92439
Pyridine	ND (3.27)		8270D		1	09/26/19 23:51	C9I0477	CI92439

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichlorobenzene-d4	*77 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*97 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*83 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS669-S1
Date Sampled: 09/23/19 10:32
Percent Solids: 76
Initial Volume: 10.1
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19I0742
ESS Laboratory Sample ID: 19I0742-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: TJ
Prepared: 9/24/19 21:17

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Surrogate: 2-Fluorobiphenyl		*79 %*		*30-130*				
Surrogate: 2-Fluorophenol		*78 %*		*30-130*				
Surrogate: Nitrobenzene-d5		*76 %*		*30-130*				
Surrogate: Phenol-d6		*81 %*		*30-130*				
Surrogate: p-Terphenyl-d14		*109 %*		*30-130*				

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS669-S1
Date Sampled: 09/23/19 10:32
Percent Solids: 76

ESS Laboratory Work Order: 19I0742
ESS Laboratory Sample ID: 19I0742-01
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Conductivity	**WL 298** (5)		9050A		1	CCP	09/26/19 10:22	umhos/cm	CI92621
Corrosivity (pH)	**6.50** (N/A)		9045		1	CCP	09/24/19 18:45	S.U.	CI92415
Corrosivity (pH) Sample Temp	**Soil pH measured in water at 20.5 ºC.**								
Flashpoint	**> 200** (N/A)		1010		1	EEM	09/25/19 14:00	°F	CI92513
Reactive Cyanide	ND (2.0)		7.3.3.2		1	JLK	09/25/19 16:48	mg/kg	CI92541
Reactive Sulfide	ND (2.0)		7.3.4.1		1	JLK	09/25/19 16:48	mg/kg	CI92541
Sulfate	**WL** ND (65)		9038		1	EEM	09/26/19 14:25	mg/kg dry	CI92620
Sulfide	**WL** ND (0.7)		9030B		1	EEM	09/26/19 14:45	mg/kg dry	CI92619
Total Cyanide	**10.2** (1.24)		9014		1	EEM	09/26/19 11:25	mg/kg dry	CI92618
Total Organic Carbon (Average)	**35000** (100)		LK		1	CCP	09/30/19 14:37	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS669-S1
Date Sampled: 09/23/19 10:32
Percent Solids: 76
Initial Volume: 15
Final Volume: 2
Extraction Method: 3546

ESS Laboratory Work Order: 19I0742
ESS Laboratory Sample ID: 19I0742-01
Sample Matrix: Sediment
Units: mg/kg dry

Prepared: 9/26/19 15:05

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	**568** (65.8)		MADEP-EPH		1	CAD	09/27/19 20:38	C9I0432	CI92604
C19-C36 Aliphatics1	**1220** (65.8)		MADEP-EPH		1	CAD	09/27/19 20:38	C9I0432	CI92604
C11-C22 Unadjusted Aromatics1	**776** (65.8)		EPH8270		1	VSC	09/26/19 22:24	C9I0489	CI92604
C11-C22 Aromatics1,2	**730** (68.7)		EPH8270			IBM	10/03/19 17:20		[CALC]
2-Methylnaphthalene	**0.123** (0.088)		EPH8270SIM		1	IBM	10/02/19 20:15	C9J0071	CI92604
Acenaphthene	**2.15** (0.088)		EPH8270SIM		1	IBM	10/02/19 20:15	C9J0071	CI92604
Naphthalene	**0.235** (0.088)		EPH8270SIM		1	IBM	10/02/19 20:15	C9J0071	CI92604
Phenanthrene	**11.8** (0.878)		EPH8270SIM		10	IBM	10/03/19 17:20	C9J0071	CI92604
Acenaphthylene	**0.243** (0.088)		EPH8270SIM		1	IBM	10/02/19 20:15	C9J0071	CI92604
Anthracene	**2.09** (0.035)		EPH8270SIM		1	IBM	10/02/19 20:15	C9J0071	CI92604
Benzo(a)anthracene	**2.32** (0.035)		EPH8270SIM		1	IBM	10/02/19 20:15	C9J0071	CI92604
Benzo(a)pyrene	**2.00** (0.035)		EPH8270SIM		1	IBM	10/02/19 20:15	C9J0071	CI92604
Benzo(b)fluoranthene	**2.41** (0.088)		EPH8270SIM		1	IBM	10/02/19 20:15	C9J0071	CI92604
Benzo(g,h,i)perylene	**1.14** (0.088)		EPH8270SIM		1	IBM	10/02/19 20:15	C9J0071	CI92604
Benzo(k)fluoranthene	**0.844** (0.088)		EPH8270SIM		1	IBM	10/02/19 20:15	C9J0071	CI92604
Chrysene	**2.13** (0.088)		EPH8270SIM		1	IBM	10/02/19 20:15	C9J0071	CI92604
Dibenzo(a,h)Anthracene	**0.265** (0.035)		EPH8270SIM		1	IBM	10/02/19 20:15	C9J0071	CI92604
Fluoranthene	**5.98** (0.088)		EPH8270SIM		1	IBM	10/02/19 20:15	C9J0071	CI92604
Fluorene	**1.35** (0.035)		EPH8270SIM		1	IBM	10/02/19 20:15	C9J0071	CI92604
Indeno(1,2,3-cd)Pyrene	**1.17** (0.088)		EPH8270SIM		1	IBM	10/02/19 20:15	C9J0071	CI92604
Pyrene	**9.88** (0.878)		EPH8270SIM		10	IBM	10/03/19 17:20	C9J0071	CI92604

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1-Chlorooctadecane	*100 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*101 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*96 %*		*40-140*
Surrogate: O-Terphenyl	*84 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS669-S1
Date Sampled: 09/23/19 10:32

ESS Laboratory Work Order: 19I0742
ESS Laboratory Sample ID: 19I0742-01
Sample Matrix: Sediment

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Grain Size	**See Attached** (N/A)								
Organic Content	**See Attached** (N/A)								
Sulfur	**2970** (100)		6010		1	SUB	09/26/19 0:00	mg/kg	CI93038

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS669-S1
Date Sampled: 09/23/19 10:32
Percent Solids: 76
Initial Volume: 100
Final Volume: 2000
Extraction Method: 1311

ESS Laboratory Work Order: 19I0742
ESS Laboratory Sample ID: 19I0742-01
Sample Matrix: Sediment
Units: °C
Analyst: BJV
Prepared: 9/30/19 19:00

TCLP Extraction by 1311

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Batch
Temperature (Min C)	**20.9** (N/A)		1311		1	BJV	10/01/19 11:14	CI93057
Temperature (Max C)	**22.1** (N/A)		1311		1	BJV	10/01/19 11:14	CI93057
Temperature (Range)	**Temperature is not within 23 +/-2 ºC.** (N/A)							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS669-S1 Dried
Date Sampled: 09/23/19 10:32
Percent Solids: 100

ESS Laboratory Work Order: 19I0742
ESS Laboratory Sample ID: 19I0742-02
Sample Matrix: Sediment
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Arsenic	**9.44** (0.95)		6010C		1	KJK	09/27/19 1:35	5.27	100	CI92649
Barium	**40.9** (0.95)		6010C		1	KJK	09/27/19 1:35	5.27	100	CI92649
Cadmium	**2.39** (0.19)		6010C		1	KJK	09/27/19 1:35	5.27	100	CI92649
Chromium	**166** (0.38)		6010C		1	KJK	09/27/19 1:35	5.27	100	CI92649
Copper	**297** (0.95)		6010C		1	KJK	09/27/19 1:35	5.27	100	CI92649
Lead	**145** (1.90)		6010C		1	KJK	09/27/19 1:35	5.27	100	CI92649
Mercury	**0.320** (0.086)		7471B		10	MKS	09/27/19 12:16	2.32	40	CI92650
Nickel	**95.8** (0.95)		6010C		1	KJK	09/27/19 1:35	5.27	100	CI92649
Selenium	**0.28** (0.19)		6020A		1	NAR	10/01/19 12:45	5.27	100	CI92649
Silver	**4.65** (0.19)		6010C		1	KJK	09/27/19 1:35	5.27	100	CI92649
Zinc	**282** (0.95)		6010C		1	KJK	09/27/19 1:35	5.27	100	CI92649

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0742

Quality Control Data

Total Metals

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch CI92649 - 3050B										
Blank										
Arsenic	ND	2.50	mg/kg wet							
Barium	ND	2.50	mg/kg wet							
Cadmium	ND	0.50	mg/kg wet							
Chromium	ND	1.00	mg/kg wet							
Copper	ND	2.50	mg/kg wet							
Lead	ND	5.00	mg/kg wet							
Nickel	ND	2.50	mg/kg wet							
Silver	ND	0.50	mg/kg wet							
Zinc	ND	2.50	mg/kg wet							
Blank										
Selenium	ND	0.50	mg/kg wet							
LCS										
Arsenic	118	7.69	mg/kg wet	128.0		92	80-120			
Barium	581	7.69	mg/kg wet	536.0		108	80-120			
Cadmium	91.3	1.54	mg/kg wet	99.00		92	80-120			
Chromium	111	3.08	mg/kg wet	116.0		96	80-120			
Copper	87.9	7.69	mg/kg wet	89.60		98	80-120			
Lead	276	15.4	mg/kg wet	277.0		100	80-120			
Nickel	107	7.69	mg/kg wet	107.0		100	80-120			
Silver	62.2	1.54	mg/kg wet	64.30		97	80-120			
Zinc	534	7.69	mg/kg wet	561.0		95	80-120			
LCS										
Selenium	267	7.69	mg/kg wet	242.0		111	80-120			
LCS Dup										
Arsenic	114	5.68	mg/kg wet	128.0		89	80-120	3	20	
Barium	502	5.68	mg/kg wet	536.0		94	80-120	15	20	
Cadmium	87.4	1.14	mg/kg wet	99.00		88	80-120	4	20	
Chromium	106	2.27	mg/kg wet	116.0		91	80-120	4	20	
Copper	83.6	5.68	mg/kg wet	89.60		93	80-120	5	20	
Lead	254	11.4	mg/kg wet	277.0		92	80-120	8	20	
Nickel	101	5.68	mg/kg wet	107.0		94	80-120	6	20	
Silver	59.3	1.14	mg/kg wet	64.30		92	80-120	5	20	
Zinc	514	5.68	mg/kg wet	561.0		92	80-120	4	20	
LCS Dup										
Selenium	263	5.68	mg/kg wet	242.0		108	80-120	2	30	B+
Batch CI92650 - 7471B										
Blank										
Mercury	ND	0.033	mg/kg wet							
LCS										
Mercury	2.63	0.257	mg/kg wet	3.120		84	80-120			
LCS Dup										
Mercury	2.64	0.251	mg/kg wet	3.120		85	80-120	0.5	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0742

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
1311 TCLP Metals										
Batch CJ90124 - 3005A_TCLP										
Blank										
Chromium	ND	0.020	mg/L							
Lead	ND	0.050	mg/L							
Blank										
Chromium	ND	0.020	mg/L							
Lead	ND	0.050	mg/L							
LCS										
Chromium	0.489	0.020	mg/L	0.5000		98	80-120			
Lead	0.490	0.050	mg/L	0.5000		98	80-120			
LCS Dup										
Chromium	0.494	0.020	mg/L	0.5000		99	80-120	1	20	
Lead	0.483	0.050	mg/L	0.5000		97	80-120	2	20	
5035/8260B Volatile Organic Compounds / Low Level										
Batch CI92519 - 5035										
Blank										
1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0020	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0100	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0100	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0100	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CI92519 - 5035										
Acetone	ND	0.0100	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0020	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0100	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*0.0563*		mg/kg wet	*0.05000*		*113*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0509*		mg/kg wet	*0.05000*		*102*	*70-130*			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ ESS Laboratory Work Order: 19I0742

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CI92519 - 5035										
Surrogate: Dibromofluoromethane	*0.0495*		mg/kg wet	*0.05000*		*99*	*70-130*			
Surrogate: Toluene-d8	*0.0493*		mg/kg wet	*0.05000*		*99*	*70-130*			
LCS										
1,1,1,2-Tetrachloroethane	0.0465	0.0050	mg/kg wet	0.05000		93	70-130			
1,1,1-Trichloroethane	0.0538	0.0050	mg/kg wet	0.05000		108	70-130			
1,1,2,2-Tetrachloroethane	0.0451	0.0020	mg/kg wet	0.05000		90	70-130			
1,1,2-Trichloroethane	0.0456	0.0050	mg/kg wet	0.05000		91	70-130			
1,1-Dichloroethane	0.0521	0.0050	mg/kg wet	0.05000		104	70-130			
1,1-Dichloroethene	0.0507	0.0050	mg/kg wet	0.05000		101	70-130			
1,1-Dichloropropene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130			
1,2,3-Trichlorobenzene	0.0440	0.0050	mg/kg wet	0.05000		88	70-130			
1,2,3-Trichloropropane	0.0412	0.0050	mg/kg wet	0.05000		82	70-130			
1,2,4-Trichlorobenzene	0.0447	0.0050	mg/kg wet	0.05000		89	70-130			
1,2,4-Trimethylbenzene	0.0501	0.0050	mg/kg wet	0.05000		100	70-130			
1,2-Dibromo-3-Chloropropane	0.0421	0.0050	mg/kg wet	0.05000		84	70-130			
1,2-Dibromoethane	0.0468	0.0050	mg/kg wet	0.05000		94	70-130			
1,2-Dichlorobenzene	0.0464	0.0050	mg/kg wet	0.05000		93	70-130			
1,2-Dichloroethane	0.0530	0.0050	mg/kg wet	0.05000		106	70-130			
1,2-Dichloropropane	0.0463	0.0050	mg/kg wet	0.05000		93	70-130			
1,3,5-Trimethylbenzene	0.0499	0.0050	mg/kg wet	0.05000		100	70-130			
1,3-Dichlorobenzene	0.0462	0.0050	mg/kg wet	0.05000		92	70-130			
1,3-Dichloropropane	0.0491	0.0050	mg/kg wet	0.05000		98	70-130			
1,4-Dichlorobenzene	0.0464	0.0050	mg/kg wet	0.05000		93	70-130			
1,4-Dioxane	0.818	0.100	mg/kg wet	1.000		82	70-130			
2,2-Dichloropropane	0.0498	0.0050	mg/kg wet	0.05000		100	70-130			
2-Butanone	0.245	0.0100	mg/kg wet	0.2500		98	70-130			
2-Chlorotoluene	0.0488	0.0050	mg/kg wet	0.05000		98	70-130			
2-Hexanone	0.219	0.0100	mg/kg wet	0.2500		88	70-130			
4-Chlorotoluene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130			
4-Isopropyltoluene	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
4-Methyl-2-Pentanone	0.224	0.0100	mg/kg wet	0.2500		90	70-130			
Acetone	0.222	0.0100	mg/kg wet	0.2500		89	70-130			
Benzene	0.0477	0.0050	mg/kg wet	0.05000		95	70-130			
Bromobenzene	0.0480	0.0050	mg/kg wet	0.05000		96	70-130			
Bromochloromethane	0.0468	0.0050	mg/kg wet	0.05000		94	70-130			
Bromodichloromethane	0.0493	0.0050	mg/kg wet	0.05000		99	70-130			
Bromoform	0.0411	0.0050	mg/kg wet	0.05000		82	70-130			
Bromomethane	0.0413	0.0100	mg/kg wet	0.05000		83	70-130			
Carbon Disulfide	0.0497	0.0050	mg/kg wet	0.05000		99	70-130			
Carbon Tetrachloride	0.0511	0.0050	mg/kg wet	0.05000		102	70-130			
Chlorobenzene	0.0475	0.0050	mg/kg wet	0.05000		95	70-130			
Chloroethane	0.0417	0.0100	mg/kg wet	0.05000		83	70-130			
Chloroform	0.0514	0.0050	mg/kg wet	0.05000		103	70-130			
Chloromethane	0.0429	0.0100	mg/kg wet	0.05000		86	70-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CI92519 - 5035										
cis-1,2-Dichloroethene	0.0484	0.0050	mg/kg wet	0.05000		97	70-130			
cis-1,3-Dichloropropene	0.0462	0.0050	mg/kg wet	0.05000		92	70-130			
Dibromochloromethane	0.0474	0.0020	mg/kg wet	0.05000		95	70-130			
Dibromomethane	0.0490	0.0050	mg/kg wet	0.05000		98	70-130			
Dichlorodifluoromethane	0.0409	0.0100	mg/kg wet	0.05000		82	70-130			
Diethyl Ether	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
Di-isopropyl ether	0.0492	0.0050	mg/kg wet	0.05000		98	70-130			
Ethyl tertiary-butyl ether	0.0442	0.0050	mg/kg wet	0.05000		88	70-130			
Ethylbenzene	0.0497	0.0050	mg/kg wet	0.05000		99	70-130			
Hexachlorobutadiene	0.0481	0.0050	mg/kg wet	0.05000		96	70-130			
Isopropylbenzene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130			
Methyl tert-Butyl Ether	0.0471	0.0050	mg/kg wet	0.05000		94	70-130			
Methylene Chloride	0.0464	0.0100	mg/kg wet	0.05000		93	70-130			
Naphthalene	0.0415	0.0050	mg/kg wet	0.05000		83	70-130			
n-Butylbenzene	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
n-Propylbenzene	0.0501	0.0050	mg/kg wet	0.05000		100	70-130			
sec-Butylbenzene	0.0480	0.0050	mg/kg wet	0.05000		96	70-130			
Styrene	0.0479	0.0050	mg/kg wet	0.05000		96	70-130			
tert-Butylbenzene	0.0497	0.0050	mg/kg wet	0.05000		99	70-130			
Tertiary-amyl methyl ether	0.0444	0.0050	mg/kg wet	0.05000		89	70-130			
Tetrachloroethene	0.0492	0.0050	mg/kg wet	0.05000		98	70-130			
Tetrahydrofuran	0.0400	0.0050	mg/kg wet	0.05000		80	70-130			
Toluene	0.0472	0.0050	mg/kg wet	0.05000		94	70-130			
trans-1,2-Dichloroethene	0.0503	0.0050	mg/kg wet	0.05000		101	70-130			
trans-1,3-Dichloropropene	0.0448	0.0050	mg/kg wet	0.05000		90	70-130			
Trichloroethene	0.0487	0.0050	mg/kg wet	0.05000		97	70-130			
Trichlorofluoromethane	0.0531	0.0050	mg/kg wet	0.05000		106	70-130			
Vinyl Chloride	0.0458	0.0100	mg/kg wet	0.05000		92	70-130			
Xylene O	0.0493	0.0050	mg/kg wet	0.05000		99	70-130			
Xylene P,M	0.0974	0.0100	mg/kg wet	0.1000		97	70-130			
Surrogate: 1,2-Dichloroethane-d4	*0.0542*		mg/kg wet	*0.05000*		*108*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0516*		mg/kg wet	*0.05000*		*103*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0513*		mg/kg wet	*0.05000*		*103*	*70-130*			
Surrogate: Toluene-d8	*0.0503*		mg/kg wet	*0.05000*		*101*	*70-130*			
LCS Dup										
1,1,1,2-Tetrachloroethane	0.0515	0.0050	mg/kg wet	0.05000		103	70-130	10	20	
1,1,1-Trichloroethane	0.0601	0.0050	mg/kg wet	0.05000		120	70-130	11	20	
1,1,2,2-Tetrachloroethane	0.0487	0.0020	mg/kg wet	0.05000		97	70-130	8	20	
1,1,2-Trichloroethane	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	11	20	
1,1-Dichloroethane	0.0576	0.0050	mg/kg wet	0.05000		115	70-130	10	20	
1,1-Dichloroethene	0.0565	0.0050	mg/kg wet	0.05000		113	70-130	11	20	
1,1-Dichloropropene	0.0570	0.0050	mg/kg wet	0.05000		114	70-130	11	20	
1,2,3-Trichlorobenzene	0.0489	0.0050	mg/kg wet	0.05000		98	70-130	11	20	
1,2,3-Trichloropropane	0.0463	0.0050	mg/kg wet	0.05000		93	70-130	12	20	
1,2,4-Trichlorobenzene	0.0497	0.0050	mg/kg wet	0.05000		99	70-130	11	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CI92519 - 5035										
1,2,4-Trimethylbenzene	0.0548	0.0050	mg/kg wet	0.05000		110	70-130	9	20	
1,2-Dibromo-3-Chloropropane	0.0463	0.0050	mg/kg wet	0.05000		93	70-130	10	20	
1,2-Dibromoethane	0.0519	0.0050	mg/kg wet	0.05000		104	70-130	10	20	
1,2-Dichlorobenzene	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	9	20	
1,2-Dichloroethane	0.0591	0.0050	mg/kg wet	0.05000		118	70-130	11	20	
1,2-Dichloropropane	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	10	20	
1,3,5-Trimethylbenzene	0.0540	0.0050	mg/kg wet	0.05000		108	70-130	8	20	
1,3-Dichlorobenzene	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	9	20	
1,3-Dichloropropane	0.0541	0.0050	mg/kg wet	0.05000		108	70-130	10	20	
1,4-Dichlorobenzene	0.0509	0.0050	mg/kg wet	0.05000		102	70-130	9	20	
1,4-Dioxane	0.942	0.100	mg/kg wet	1.000		94	70-130	14	20	
2,2-Dichloropropane	0.0555	0.0050	mg/kg wet	0.05000		111	70-130	11	20	
2-Butanone	0.272	0.0100	mg/kg wet	0.2500		109	70-130	10	20	
2-Chlorotoluene	0.0530	0.0050	mg/kg wet	0.05000		106	70-130	8	20	
2-Hexanone	0.246	0.0100	mg/kg wet	0.2500		98	70-130	11	20	
4-Chlorotoluene	0.0543	0.0050	mg/kg wet	0.05000		109	70-130	9	20	
4-Isopropyltoluene	0.0534	0.0050	mg/kg wet	0.05000		107	70-130	9	20	
4-Methyl-2-Pentanone	0.252	0.0100	mg/kg wet	0.2500		101	70-130	11	20	
Acetone	0.253	0.0100	mg/kg wet	0.2500		101	70-130	13	20	
Benzene	0.0531	0.0050	mg/kg wet	0.05000		106	70-130	11	20	
Bromobenzene	0.0521	0.0050	mg/kg wet	0.05000		104	70-130	8	20	
Bromochloromethane	0.0515	0.0050	mg/kg wet	0.05000		103	70-130	10	20	
Bromodichloromethane	0.0557	0.0050	mg/kg wet	0.05000		111	70-130	12	20	
Bromoform	0.0463	0.0050	mg/kg wet	0.05000		93	70-130	12	20	
Bromomethane	0.0453	0.0100	mg/kg wet	0.05000		91	70-130	9	20	
Carbon Disulfide	0.0555	0.0050	mg/kg wet	0.05000		111	70-130	11	20	
Carbon Tetrachloride	0.0575	0.0050	mg/kg wet	0.05000		115	70-130	12	20	
Chlorobenzene	0.0518	0.0050	mg/kg wet	0.05000		104	70-130	9	20	
Chloroethane	0.0463	0.0100	mg/kg wet	0.05000		93	70-130	10	20	
Chloroform	0.0566	0.0050	mg/kg wet	0.05000		113	70-130	10	20	
Chloromethane	0.0473	0.0100	mg/kg wet	0.05000		95	70-130	10	20	
cis-1,2-Dichloroethene	0.0532	0.0050	mg/kg wet	0.05000		106	70-130	9	20	
cis-1,3-Dichloropropene	0.0515	0.0050	mg/kg wet	0.05000		103	70-130	11	20	
Dibromochloromethane	0.0529	0.0020	mg/kg wet	0.05000		106	70-130	11	20	
Dibromomethane	0.0533	0.0050	mg/kg wet	0.05000		107	70-130	9	20	
Dichlorodifluoromethane	0.0455	0.0100	mg/kg wet	0.05000		91	70-130	11	20	
Diethyl Ether	0.0543	0.0050	mg/kg wet	0.05000		109	70-130	11	20	
Di-isopropyl ether	0.0540	0.0050	mg/kg wet	0.05000		108	70-130	9	20	
Ethyl tertiary-butyl ether	0.0490	0.0050	mg/kg wet	0.05000		98	70-130	10	20	
Ethylbenzene	0.0548	0.0050	mg/kg wet	0.05000		110	70-130	10	20	
Hexachlorobutadiene	0.0531	0.0050	mg/kg wet	0.05000		106	70-130	10	20	
Isopropylbenzene	0.0541	0.0050	mg/kg wet	0.05000		108	70-130	9	20	
Methyl tert-Butyl Ether	0.0519	0.0050	mg/kg wet	0.05000		104	70-130	10	20	
Methylene Chloride	0.0516	0.0100	mg/kg wet	0.05000		103	70-130	11	20	
Naphthalene	0.0464	0.0050	mg/kg wet	0.05000		93	70-130	11	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ ESS Laboratory Work Order: 19I0742

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch CI92519 - 5035										
n-Butylbenzene	0.0535	0.0050	mg/kg wet	0.05000		107	70-130	9	20	
n-Propylbenzene	0.0546	0.0050	mg/kg wet	0.05000		109	70-130	9	20	
sec-Butylbenzene	0.0524	0.0050	mg/kg wet	0.05000		105	70-130	9	20	
Styrene	0.0532	0.0050	mg/kg wet	0.05000		106	70-130	11	20	
tert-Butylbenzene	0.0539	0.0050	mg/kg wet	0.05000		108	70-130	8	20	
Tertiary-amyl methyl ether	0.0490	0.0050	mg/kg wet	0.05000		98	70-130	10	20	
Tetrachloroethene	0.0542	0.0050	mg/kg wet	0.05000		108	70-130	10	20	
Tetrahydrofuran	0.0444	0.0050	mg/kg wet	0.05000		89	70-130	10	20	
Toluene	0.0524	0.0050	mg/kg wet	0.05000		105	70-130	10	20	
trans-1,2-Dichloroethene	0.0561	0.0050	mg/kg wet	0.05000		112	70-130	11	20	
trans-1,3-Dichloropropene	0.0497	0.0050	mg/kg wet	0.05000		99	70-130	10	20	
Trichloroethene	0.0543	0.0050	mg/kg wet	0.05000		109	70-130	11	20	
Trichlorofluoromethane	0.0591	0.0050	mg/kg wet	0.05000		118	70-130	11	20	
Vinyl Chloride	0.0513	0.0100	mg/kg wet	0.05000		103	70-130	11	20	
Xylene O	0.0535	0.0050	mg/kg wet	0.05000		107	70-130	8	20	
Xylene P,M	0.107	0.0100	mg/kg wet	0.1000		107	70-130	9	20	
Surrogate: 1,2-Dichloroethane-d4	*0.0555*		mg/kg wet	*0.05000*		*111*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0515*		mg/kg wet	*0.05000*		*103*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0518*		mg/kg wet	*0.05000*		*104*	*70-130*			
Surrogate: Toluene-d8	*0.0502*		mg/kg wet	*0.05000*		*100*	*70-130*			
8081B Organochlorine Pesticides										
Batch CI92417 - 3546										
Blank										
4,4´-DDD	ND	0.0025	mg/kg wet							
4,4´-DDD [2C]	ND	0.0025	mg/kg wet							
4,4´-DDE	ND	0.0025	mg/kg wet							
4,4´-DDE [2C]	ND	0.0025	mg/kg wet							
4,4´-DDT	ND	0.0025	mg/kg wet							
4,4´-DDT [2C]	ND	0.0025	mg/kg wet							
Aldrin	ND	0.0025	mg/kg wet							
Aldrin [2C]	ND	0.0025	mg/kg wet							
alpha-BHC	ND	0.0025	mg/kg wet							
alpha-BHC [2C]	ND	0.0025	mg/kg wet							
alpha-Chlordane	ND	0.0025	mg/kg wet							
alpha-Chlordane [2C]	ND	0.0025	mg/kg wet							
beta-BHC	ND	0.0025	mg/kg wet							
beta-BHC [2C]	ND	0.0025	mg/kg wet							
Chlordane (Total)	ND	0.0200	mg/kg wet							
Chlordane (Total) [2C]	ND	0.0200	mg/kg wet							
delta-BHC	ND	0.0025	mg/kg wet							
delta-BHC [2C]	ND	0.0025	mg/kg wet							
Dieldrin	ND	0.0025	mg/kg wet							
Dieldrin [2C]	ND	0.0025	mg/kg wet							
Endosulfan I	ND	0.0025	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ ESS Laboratory Work Order: 19I0742

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8081B Organochlorine Pesticides										
Batch CI92417 - 3546										
Endosulfan I [2C]	ND	0.0025	mg/kg wet							
Endosulfan II	ND	0.0025	mg/kg wet							
Endosulfan II [2C]	ND	0.0025	mg/kg wet							
Endosulfan Sulfate	ND	0.0025	mg/kg wet							
Endosulfan Sulfate [2C]	ND	0.0025	mg/kg wet							
Endrin	ND	0.0025	mg/kg wet							
Endrin [2C]	ND	0.0025	mg/kg wet							
Endrin Ketone	ND	0.0025	mg/kg wet							
Endrin Ketone [2C]	ND	0.0025	mg/kg wet							
gamma-BHC (Lindane)	ND	0.0015	mg/kg wet							
gamma-BHC (Lindane) [2C]	ND	0.0015	mg/kg wet							
gamma-Chlordane	ND	0.0025	mg/kg wet							
gamma-Chlordane [2C]	ND	0.0025	mg/kg wet							
Heptachlor	ND	0.0025	mg/kg wet							
Heptachlor [2C]	ND	0.0025	mg/kg wet							
Heptachlor Epoxide	ND	0.0025	mg/kg wet							
Heptachlor Epoxide [2C]	ND	0.0025	mg/kg wet							
Hexachlorobenzene	ND	0.0025	mg/kg wet							
Hexachlorobenzene [2C]	ND	0.0025	mg/kg wet							
Methoxychlor	ND	0.0025	mg/kg wet							
Methoxychlor [2C]	ND	0.0025	mg/kg wet							
Toxaphene	ND	0.125	mg/kg wet							
Toxaphene [2C]	ND	0.125	mg/kg wet							
Surrogate: Decachlorobiphenyl	*0.0114*		mg/kg wet	*0.01250*		*91*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0118*		mg/kg wet	*0.01250*		*94*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0113*		mg/kg wet	*0.01250*		*90*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0116*		mg/kg wet	*0.01250*		*93*	*30-150*			
LCS										
4,4´-DDD	0.0119	0.0025	mg/kg wet	0.01250		95	40-140			
4,4´-DDD [2C]	0.0118	0.0025	mg/kg wet	0.01250		95	40-140			
4,4´-DDE	0.0120	0.0025	mg/kg wet	0.01250		96	40-140			
4,4´-DDE [2C]	0.0128	0.0025	mg/kg wet	0.01250		102	40-140			
4,4´-DDT	0.0127	0.0025	mg/kg wet	0.01250		102	40-140			
4,4´-DDT [2C]	0.0134	0.0025	mg/kg wet	0.01250		107	40-140			
Aldrin	0.0115	0.0025	mg/kg wet	0.01250		92	40-140			
Aldrin [2C]	0.0121	0.0025	mg/kg wet	0.01250		97	40-140			
alpha-BHC	0.0114	0.0025	mg/kg wet	0.01250		91	40-140			
alpha-BHC [2C]	0.0119	0.0025	mg/kg wet	0.01250		95	40-140			
alpha-Chlordane	0.0112	0.0025	mg/kg wet	0.01250		89	40-140			
alpha-Chlordane [2C]	0.0120	0.0025	mg/kg wet	0.01250		96	40-140			
beta-BHC	0.0114	0.0025	mg/kg wet	0.01250		91	40-140			
beta-BHC [2C]	0.0117	0.0025	mg/kg wet	0.01250		94	40-140			
delta-BHC	0.0078	0.0025	mg/kg wet	0.01250		62	40-140			
delta-BHC [2C]	0.0081	0.0025	mg/kg wet	0.01250		65	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0742

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8081B Organochlorine Pesticides										
Batch CI92417 - 3546										
Dieldrin	0.0124	0.0025	mg/kg wet	0.01250		99	40-140			
Dieldrin [2C]	0.0131	0.0025	mg/kg wet	0.01250		104	40-140			
Endosulfan I	0.0115	0.0025	mg/kg wet	0.01250		92	40-140			
Endosulfan I [2C]	0.0121	0.0025	mg/kg wet	0.01250		96	40-140			
Endosulfan II	0.0126	0.0025	mg/kg wet	0.01250		100	40-140			
Endosulfan II [2C]	0.0135	0.0025	mg/kg wet	0.01250		108	40-140			
Endosulfan Sulfate	0.0114	0.0025	mg/kg wet	0.01250		91	40-140			
Endosulfan Sulfate [2C]	0.0119	0.0025	mg/kg wet	0.01250		95	40-140			
Endrin	0.0126	0.0025	mg/kg wet	0.01250		101	40-140			
Endrin [2C]	0.0134	0.0025	mg/kg wet	0.01250		107	40-140			
Endrin Ketone	0.0126	0.0025	mg/kg wet	0.01250		101	40-140			
Endrin Ketone [2C]	0.0131	0.0025	mg/kg wet	0.01250		105	40-140			
gamma-BHC (Lindane)	0.0114	0.0015	mg/kg wet	0.01250		91	40-140			
gamma-BHC (Lindane) [2C]	0.0118	0.0015	mg/kg wet	0.01250		95	40-140			
gamma-Chlordane	0.0116	0.0025	mg/kg wet	0.01250		93	40-140			
gamma-Chlordane [2C]	0.0120	0.0025	mg/kg wet	0.01250		96	40-140			
Heptachlor	0.0115	0.0025	mg/kg wet	0.01250		92	40-140			
Heptachlor [2C]	0.0119	0.0025	mg/kg wet	0.01250		95	40-140			
Heptachlor Epoxide	0.0123	0.0025	mg/kg wet	0.01250		98	40-140			
Heptachlor Epoxide [2C]	0.0128	0.0025	mg/kg wet	0.01250		102	40-140			
Hexachlorobenzene	0.0125	0.0025	mg/kg wet	0.01250		100	40-140			
Hexachlorobenzene [2C]	0.0128	0.0025	mg/kg wet	0.01250		102	40-140			
Methoxychlor	0.0121	0.0025	mg/kg wet	0.01250		97	40-140			
Methoxychlor [2C]	0.0122	0.0025	mg/kg wet	0.01250		98	40-140			
Surrogate: Decachlorobiphenyl	*0.0136*		mg/kg wet	*0.01250*		*109*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0141*		mg/kg wet	*0.01250*		*113*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0122*		mg/kg wet	*0.01250*		*97*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0128*		mg/kg wet	*0.01250*		*102*	*30-150*			
LCS Dup										
4,4´-DDD	0.0113	0.0025	mg/kg wet	0.01250		90	40-140	6	30	
4,4´-DDD [2C]	0.0112	0.0025	mg/kg wet	0.01250		89	40-140	6	30	
4,4´-DDE	0.0113	0.0025	mg/kg wet	0.01250		90	40-140	6	30	
4,4´-DDE [2C]	0.0121	0.0025	mg/kg wet	0.01250		97	40-140	5	30	
4,4´-DDT	0.0112	0.0025	mg/kg wet	0.01250		89	40-140	13	30	
4,4´-DDT [2C]	0.0117	0.0025	mg/kg wet	0.01250		94	40-140	14	30	
Aldrin	0.0109	0.0025	mg/kg wet	0.01250		87	40-140	5	30	
Aldrin [2C]	0.0114	0.0025	mg/kg wet	0.01250		92	40-140	6	30	
alpha-BHC	0.0108	0.0025	mg/kg wet	0.01250		87	40-140	5	30	
alpha-BHC [2C]	0.0115	0.0025	mg/kg wet	0.01250		92	40-140	3	30	
alpha-Chlordane	0.0107	0.0025	mg/kg wet	0.01250		85	40-140	5	30	
alpha-Chlordane [2C]	0.0115	0.0025	mg/kg wet	0.01250		92	40-140	4	30	
beta-BHC	0.0106	0.0025	mg/kg wet	0.01250		85	40-140	7	30	
beta-BHC [2C]	0.0112	0.0025	mg/kg wet	0.01250		89	40-140	5	30	
delta-BHC	0.0073	0.0025	mg/kg wet	0.01250		58	40-140	7	30	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0742

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8081B Organochlorine Pesticides										
Batch CI92417 - 3546										
delta-BHC [2C]	0.0075	0.0025	mg/kg wet	0.01250		60	40-140	7	30	
Dieldrin	0.0118	0.0025	mg/kg wet	0.01250		95	40-140	5	30	
Dieldrin [2C]	0.0125	0.0025	mg/kg wet	0.01250		100	40-140	5	30	
Endosulfan I	0.0110	0.0025	mg/kg wet	0.01250		88	40-140	4	30	
Endosulfan I [2C]	0.0115	0.0025	mg/kg wet	0.01250		92	40-140	4	30	
Endosulfan II	0.0118	0.0025	mg/kg wet	0.01250		94	40-140	6	30	
Endosulfan II [2C]	0.0128	0.0025	mg/kg wet	0.01250		102	40-140	6	30	
Endosulfan Sulfate	0.0103	0.0025	mg/kg wet	0.01250		83	40-140	9	30	
Endosulfan Sulfate [2C]	0.0109	0.0025	mg/kg wet	0.01250		87	40-140	9	30	
Endrin	0.0116	0.0025	mg/kg wet	0.01250		93	40-140	8	30	
Endrin [2C]	0.0123	0.0025	mg/kg wet	0.01250		99	40-140	8	30	
Endrin Ketone	0.0117	0.0025	mg/kg wet	0.01250		94	40-140	7	30	
Endrin Ketone [2C]	0.0122	0.0025	mg/kg wet	0.01250		98	40-140	7	30	
gamma-BHC (Lindane)	0.0108	0.0015	mg/kg wet	0.01250		86	40-140	6	30	
gamma-BHC (Lindane) [2C]	0.0112	0.0015	mg/kg wet	0.01250		90	40-140	5	30	
gamma-Chlordane	0.0111	0.0025	mg/kg wet	0.01250		89	40-140	5	30	
gamma-Chlordane [2C]	0.0115	0.0025	mg/kg wet	0.01250		92	40-140	4	30	
Heptachlor	0.0107	0.0025	mg/kg wet	0.01250		86	40-140	7	30	
Heptachlor [2C]	0.0113	0.0025	mg/kg wet	0.01250		90	40-140	5	30	
Heptachlor Epoxide	0.0118	0.0025	mg/kg wet	0.01250		94	40-140	4	30	
Heptachlor Epoxide [2C]	0.0123	0.0025	mg/kg wet	0.01250		98	40-140	4	30	
Hexachlorobenzene	0.0119	0.0025	mg/kg wet	0.01250		95	40-140	5	30	
Hexachlorobenzene [2C]	0.0122	0.0025	mg/kg wet	0.01250		98	40-140	4	30	
Methoxychlor	0.0104	0.0025	mg/kg wet	0.01250		83	40-140	15	30	
Methoxychlor [2C]	0.0107	0.0025	mg/kg wet	0.01250		86	40-140	13	30	
Surrogate: Decachlorobiphenyl	*0.0119*		mg/kg wet	*0.01250*		*95*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0124*		mg/kg wet	*0.01250*		*99*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0110*		mg/kg wet	*0.01250*		*88*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0117*		mg/kg wet	*0.01250*		*93*	*30-150*			
8082 Polychlorinated Biphenyls (PCB) / Congeners										
Batch CI92609 - 3540C										
Blank										
BZ#101	ND	0.00027	mg/kg wet							
BZ#101 [2C]	ND	0.00027	mg/kg wet							
BZ#105	ND	0.00027	mg/kg wet							
BZ#105 [2C]	ND	0.00027	mg/kg wet							
BZ#118	ND	0.00027	mg/kg wet							
BZ#118 [2C]	ND	0.00027	mg/kg wet							
BZ#128	ND	0.00027	mg/kg wet							
BZ#128 [2C]	ND	0.00027	mg/kg wet							
BZ#138	ND	0.00027	mg/kg wet							
BZ#138 [2C]	ND	0.00027	mg/kg wet							
BZ#153	ND	0.00027	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0742

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082 Polychlorinated Biphenyls (PCB) / Congeners										
Batch CI92609 - 3540C										
BZ#153 [2C]	ND	0.00027	mg/kg wet							
BZ#170	ND	0.00027	mg/kg wet							
BZ#170 [2C]	ND	0.00027	mg/kg wet							
BZ#18	ND	0.00027	mg/kg wet							
BZ#18 [2C]	ND	0.00027	mg/kg wet							
BZ#180	ND	0.00027	mg/kg wet							
BZ#180 [2C]	ND	0.00027	mg/kg wet							
BZ#187	ND	0.00027	mg/kg wet							
BZ#187 [2C]	ND	0.00027	mg/kg wet							
BZ#195	ND	0.00027	mg/kg wet							
BZ#195 [2C]	ND	0.00027	mg/kg wet							
BZ#206	ND	0.00027	mg/kg wet							
BZ#206 [2C]	ND	0.00027	mg/kg wet							
BZ#209	ND	0.00027	mg/kg wet							
BZ#209 [2C]	ND	0.00027	mg/kg wet							
BZ#28	ND	0.00027	mg/kg wet							
BZ#28 [2C]	ND	0.00027	mg/kg wet							
BZ#44	ND	0.00027	mg/kg wet							
BZ#44 [2C]	ND	0.00027	mg/kg wet							
BZ#52	ND	0.00027	mg/kg wet							
BZ#52 [2C]	ND	0.00027	mg/kg wet							
BZ#66	ND	0.00027	mg/kg wet							
BZ#66 [2C]	ND	0.00027	mg/kg wet							
BZ#8	ND	0.00027	mg/kg wet							
BZ#8 [2C]	ND	0.00027	mg/kg wet							
Surrogate: Tetrachloro-m-xylene	*0.00227*		mg/kg wet	*0.003333*		*68*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.00246*		mg/kg wet	*0.003333*		*74*	*30-150*			
LCS										
BZ#101	0.00304	0.00027	mg/kg wet	0.003333		91	40-140			
BZ#101 [2C]	0.00261	0.00027	mg/kg wet	0.003333		78	40-140			
BZ#105	0.00309	0.00027	mg/kg wet	0.003333		93	40-140			
BZ#105 [2C]	0.00339	0.00027	mg/kg wet	0.003333		102	40-140			
BZ#118	0.00316	0.00027	mg/kg wet	0.003333		95	40-140			
BZ#118 [2C]	0.00311	0.00027	mg/kg wet	0.003333		93	40-140			
BZ#128	0.00297	0.00027	mg/kg wet	0.003333		89	40-140			
BZ#128 [2C]	0.00327	0.00027	mg/kg wet	0.003333		98	40-140			
BZ#138	0.00304	0.00027	mg/kg wet	0.003333		91	40-140			
BZ#138 [2C]	0.00340	0.00027	mg/kg wet	0.003333		102	40-140			
BZ#153	0.00296	0.00027	mg/kg wet	0.003333		89	40-140			
BZ#153 [2C]	0.00316	0.00027	mg/kg wet	0.003333		95	40-140			
BZ#170	0.00293	0.00027	mg/kg wet	0.003333		88	40-140			
BZ#170 [2C]	0.00329	0.00027	mg/kg wet	0.003333		99	40-140			
BZ#18	0.00302	0.00027	mg/kg wet	0.003333		91	40-140			
BZ#18 [2C]	0.00301	0.00027	mg/kg wet	0.003333		90	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0742

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082 Polychlorinated Biphenyls (PCB) / Congeners										
Batch CI92609 - 3540C										
BZ#180	0.00293	0.00027	mg/kg wet	0.003333		88	40-140			
BZ#180 [2C]	0.00335	0.00027	mg/kg wet	0.003333		101	40-140			
BZ#187	0.00282	0.00027	mg/kg wet	0.003333		85	40-140			
BZ#187 [2C]	0.00310	0.00027	mg/kg wet	0.003333		93	40-140			
BZ#195	0.00294	0.00027	mg/kg wet	0.003333		88	40-140			
BZ#195 [2C]	0.00321	0.00027	mg/kg wet	0.003333		96	40-140			
BZ#206	0.00290	0.00027	mg/kg wet	0.003333		87	40-140			
BZ#206 [2C]	0.00320	0.00027	mg/kg wet	0.003333		96	40-140			
BZ#209	0.00291	0.00027	mg/kg wet	0.003333		87	40-140			
BZ#209 [2C]	0.00303	0.00027	mg/kg wet	0.003333		91	40-140			
BZ#28	0.00331	0.00027	mg/kg wet	0.003333		99	40-140			
BZ#28 [2C]	0.00336	0.00027	mg/kg wet	0.003333		101	40-140			
BZ#44	0.00296	0.00027	mg/kg wet	0.003333		89	40-140			
BZ#44 [2C]	0.00308	0.00027	mg/kg wet	0.003333		92	40-140			
BZ#52	0.00271	0.00027	mg/kg wet	0.003333		81	40-140			
BZ#52 [2C]	0.00295	0.00027	mg/kg wet	0.003333		89	40-140			
BZ#66	0.00331	0.00027	mg/kg wet	0.003333		99	40-140			
BZ#66 [2C]	0.00316	0.00027	mg/kg wet	0.003333		95	40-140			
BZ#8	0.00320	0.00027	mg/kg wet	0.003333		96	40-140			
BZ#8 [2C]	0.00325	0.00027	mg/kg wet	0.003333		98	40-140			
Surrogate: Tetrachloro-m-xylene	*0.00247*		mg/kg wet	*0.003333*		*74*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.00267*		mg/kg wet	*0.003333*		*80*	*30-150*			
LCS Dup										
BZ#101	0.00327	0.00027	mg/kg wet	0.003333		98	40-140	7	50	
BZ#101 [2C]	0.00278	0.00027	mg/kg wet	0.003333		83	40-140	6	50	
BZ#105	0.00354	0.00027	mg/kg wet	0.003333		106	40-140	14	50	
BZ#105 [2C]	0.00384	0.00027	mg/kg wet	0.003333		115	40-140	13	50	
BZ#118	0.00342	0.00027	mg/kg wet	0.003333		103	40-140	8	50	
BZ#118 [2C]	0.00338	0.00027	mg/kg wet	0.003333		102	40-140	8	50	
BZ#128	0.00317	0.00027	mg/kg wet	0.003333		95	40-140	6	50	
BZ#128 [2C]	0.00367	0.00027	mg/kg wet	0.003333		110	40-140	11	50	
BZ#138	0.00326	0.00027	mg/kg wet	0.003333		98	40-140	7	50	
BZ#138 [2C]	0.00360	0.00027	mg/kg wet	0.003333		108	40-140	6	50	
BZ#153	0.00319	0.00027	mg/kg wet	0.003333		96	40-140	7	50	
BZ#153 [2C]	0.00340	0.00027	mg/kg wet	0.003333		102	40-140	7	50	
BZ#170	0.00320	0.00027	mg/kg wet	0.003333		96	40-140	9	50	
BZ#170 [2C]	0.00368	0.00027	mg/kg wet	0.003333		110	40-140	11	50	
BZ#18	0.00328	0.00027	mg/kg wet	0.003333		98	40-140	8	50	
BZ#18 [2C]	0.00336	0.00027	mg/kg wet	0.003333		101	40-140	11	50	
BZ#180	0.00323	0.00027	mg/kg wet	0.003333		97	40-140	10	50	
BZ#180 [2C]	0.00371	0.00027	mg/kg wet	0.003333		111	40-140	10	50	
BZ#187	0.00315	0.00027	mg/kg wet	0.003333		95	40-140	11	50	
BZ#187 [2C]	0.00344	0.00027	mg/kg wet	0.003333		103	40-140	10	50	
BZ#195	0.00327	0.00027	mg/kg wet	0.003333		98	40-140	11	50	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0742

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082 Polychlorinated Biphenyls (PCB) / Congeners										
Batch CI92609 - 3540C										
BZ#195 [2C]	0.00357	0.00027	mg/kg wet	0.003333		107	40-140	10	50	
BZ#206	0.00321	0.00027	mg/kg wet	0.003333		96	40-140	10	50	
BZ#206 [2C]	0.00356	0.00027	mg/kg wet	0.003333		107	40-140	11	50	
BZ#209	0.00322	0.00027	mg/kg wet	0.003333		97	40-140	10	50	
BZ#209 [2C]	0.00338	0.00027	mg/kg wet	0.003333		101	40-140	11	50	
BZ#28	0.00371	0.00027	mg/kg wet	0.003333		111	40-140	11	50	
BZ#28 [2C]	0.00380	0.00027	mg/kg wet	0.003333		114	40-140	12	50	
BZ#44	0.00326	0.00027	mg/kg wet	0.003333		98	40-140	10	50	
BZ#44 [2C]	0.00342	0.00027	mg/kg wet	0.003333		102	40-140	10	50	
BZ#52	0.00311	0.00027	mg/kg wet	0.003333		93	40-140	14	50	
BZ#52 [2C]	0.00328	0.00027	mg/kg wet	0.003333		98	40-140	11	50	
BZ#66	0.00367	0.00027	mg/kg wet	0.003333		110	40-140	10	50	
BZ#66 [2C]	0.00358	0.00027	mg/kg wet	0.003333		108	40-140	13	50	
BZ#8	0.00360	0.00027	mg/kg wet	0.003333		108	40-140	12	50	
BZ#8 [2C]	0.00371	0.00027	mg/kg wet	0.003333		111	40-140	13	50	
Surrogate: Tetrachloro-m-xylene	*0.00266*		mg/kg wet	*0.003333*		*80*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.00290*		mg/kg wet	*0.003333*		*87*	*30-150*			
8100M Total Petroleum Hydrocarbons										
Batch CI92440 - 3546										
Blank										
Decane (C10)	ND	0.2	mg/kg wet							
Docosane (C22)	ND	0.2	mg/kg wet							
Dodecane (C12)	ND	0.2	mg/kg wet							
Eicosane (C20)	ND	0.2	mg/kg wet							
Hexacosane (C26)	ND	0.2	mg/kg wet							
Hexadecane (C16)	ND	0.2	mg/kg wet							
Hexatriacontane (C36)	ND	0.2	mg/kg wet							
Nonadecane (C19)	ND	0.2	mg/kg wet							
Nonane (C9)	ND	0.2	mg/kg wet							
Octacosane (C28)	ND	0.2	mg/kg wet							
Octadecane (C18)	ND	0.2	mg/kg wet							
Tetracosane (C24)	ND	0.2	mg/kg wet							
Tetradecane (C14)	ND	0.2	mg/kg wet							
Total Petroleum Hydrocarbons	ND	10.0	mg/kg wet							
Triacontane (C30)	ND	0.2	mg/kg wet							
Surrogate: O-Terphenyl	*4.21*		mg/kg wet	*5.000*		*84*	*40-140*			
LCS										
Decane (C10)	1.9	0.2	mg/kg wet	2.500		78	40-140			
Docosane (C22)	2.5	0.2	mg/kg wet	2.500		99	40-140			
Dodecane (C12)	2.1	0.2	mg/kg wet	2.500		86	40-140			
Eicosane (C20)	2.4	0.2	mg/kg wet	2.500		97	40-140			
Hexacosane (C26)	2.5	0.2	mg/kg wet	2.500		99	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8100M Total Petroleum Hydrocarbons										
Batch CI92440 - 3546										
Hexadecane (C16)	2.3	0.2	mg/kg wet	2.500		92	40-140			
Hexatriacontane (C36)	2.3	0.2	mg/kg wet	2.500		93	40-140			
Nonadecane (C19)	2.5	0.2	mg/kg wet	2.500		101	40-140			
Nonane (C9)	1.8	0.2	mg/kg wet	2.500		72	30-140			
Octacosane (C28)	2.5	0.2	mg/kg wet	2.500		99	40-140			
Octadecane (C18)	2.4	0.2	mg/kg wet	2.500		95	40-140			
Tetracosane (C24)	2.5	0.2	mg/kg wet	2.500		99	40-140			
Tetradecane (C14)	2.2	0.2	mg/kg wet	2.500		87	40-140			
Total Petroleum Hydrocarbons	32.4	10.0	mg/kg wet	35.00		93	40-140			
Triacontane (C30)	2.5	0.2	mg/kg wet	2.500		99	40-140			
Surrogate: O-Terphenyl	*4.63*		mg/kg wet	*5.000*		*93*	*40-140*			
LCS Dup										
Decane (C10)	2.1	0.2	mg/kg wet	2.500		82	40-140	6	25	
Docosane (C22)	2.4	0.2	mg/kg wet	2.500		97	40-140	1	25	
Dodecane (C12)	2.2	0.2	mg/kg wet	2.500		89	40-140	3	25	
Eicosane (C20)	2.4	0.2	mg/kg wet	2.500		95	40-140	2	25	
Hexacosane (C26)	2.4	0.2	mg/kg wet	2.500		98	40-140	1	25	
Hexadecane (C16)	2.3	0.2	mg/kg wet	2.500		92	40-140	0.06	25	
Hexatriacontane (C36)	2.3	0.2	mg/kg wet	2.500		92	40-140	0.8	25	
Nonadecane (C19)	2.5	0.2	mg/kg wet	2.500		100	40-140	1	25	
Nonane (C9)	1.9	0.2	mg/kg wet	2.500		77	30-140	7	25	
Octacosane (C28)	2.5	0.2	mg/kg wet	2.500		98	40-140	1	25	
Octadecane (C18)	2.3	0.2	mg/kg wet	2.500		94	40-140	0.8	25	
Tetracosane (C24)	2.4	0.2	mg/kg wet	2.500		97	40-140	1	25	
Tetradecane (C14)	2.3	0.2	mg/kg wet	2.500		90	40-140	3	25	
Total Petroleum Hydrocarbons	32.5	10.0	mg/kg wet	35.00		93	40-140	0.4	25	
Triacontane (C30)	2.5	0.2	mg/kg wet	2.500		98	40-140	1	25	
Surrogate: O-Terphenyl	*4.48*		mg/kg wet	*5.000*		*90*	*40-140*			
8151A Chlorinated Herbicides										
Batch CI92437 - 3546										
Blank										
2,4,5-T	ND	0.010	mg/kg wet							
2,4,5-T [2C]	ND	0.010	mg/kg wet							
2,4,5-TP (Silvex)	ND	0.010	mg/kg wet							
2,4,5-TP (Silvex) [2C]	ND	0.010	mg/kg wet							
2,4-D	ND	0.047	mg/kg wet							
2,4-D [2C]	ND	0.047	mg/kg wet							
2,4-DB	ND	0.048	mg/kg wet							
2,4-DB [2C]	ND	0.048	mg/kg wet							
Dalapon	ND	0.046	mg/kg wet							
Dalapon [2C]	ND	0.046	mg/kg wet							
Dicamba	ND	0.009	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8151A Chlorinated Herbicides										
Batch CI92437 - 3546										
Dicamba [2C]	ND	0.009	mg/kg wet							
Dichlorprop	ND	0.047	mg/kg wet							
Dichlorprop [2C]	ND	0.047	mg/kg wet							
Dinoseb	ND	0.048	mg/kg wet							
Dinoseb [2C]	ND	0.048	mg/kg wet							
MCPA	ND	2.32	mg/kg wet							
MCPA [2C]	ND	2.32	mg/kg wet							
MCPP	ND	2.35	mg/kg wet							
MCPP [2C]	ND	2.35	mg/kg wet							
Surrogate: DCAA	*0.201*		mg/kg wet	*0.2000*		*100*	*30-150*			
Surrogate: DCAA [2C]	*0.211*		mg/kg wet	*0.2000*		*105*	*30-150*			
LCS										
2,4,5-T	0.016	0.010	mg/kg wet	0.01900		84	40-140			
2,4,5-T [2C]	0.014	0.010	mg/kg wet	0.01900		74	40-140			
2,4,5-TP (Silvex)	0.018	0.010	mg/kg wet	0.01900		94	40-140			
2,4,5-TP (Silvex) [2C]	0.016	0.010	mg/kg wet	0.01900		84	40-140			
2,4-D	0.131	0.047	mg/kg wet	0.1880		70	40-140			
2,4-D [2C]	0.128	0.047	mg/kg wet	0.1880		68	40-140			
2,4-DB	0.162	0.048	mg/kg wet	0.1900		85	40-140			
2,4-DB [2C]	0.152	0.048	mg/kg wet	0.1900		80	40-140			
Dalapon	0.301	0.046	mg/kg wet	0.4550		66	40-140			
Dalapon [2C]	0.338	0.046	mg/kg wet	0.4550		74	40-140			
Dicamba	0.016	0.009	mg/kg wet	0.01880		84	40-140			
Dicamba [2C]	0.017	0.009	mg/kg wet	0.01880		88	40-140			
Dichlorprop	0.164	0.047	mg/kg wet	0.1880		87	40-140			
Dichlorprop [2C]	0.170	0.047	mg/kg wet	0.1880		90	40-140			
Dinoseb	0.022	0.048	mg/kg wet	0.09500		23	10-100			
Dinoseb [2C]	0.023	0.048	mg/kg wet	0.09500		24	10-100			
MCPA	15.9	2.32	mg/kg wet	18.60		86	40-140			
MCPA [2C]	15.7	2.32	mg/kg wet	18.60		84	40-140			
MCPP	17.4	2.35	mg/kg wet	18.80		93	40-140			
MCPP [2C]	18.3	2.35	mg/kg wet	18.80		97	40-140			
Surrogate: DCAA	*0.227*		mg/kg wet	*0.2000*		*114*	*30-150*			
Surrogate: DCAA [2C]	*0.227*		mg/kg wet	*0.2000*		*114*	*30-150*			
LCS Dup										
2,4,5-T	0.017	0.010	mg/kg wet	0.01900		92	40-140	9	30	
2,4,5-T [2C]	0.016	0.010	mg/kg wet	0.01900		84	40-140	13	30	
2,4,5-TP (Silvex)	0.019	0.010	mg/kg wet	0.01900		102	40-140	8	30	
2,4,5-TP (Silvex) [2C]	0.018	0.010	mg/kg wet	0.01900		96	40-140	13	30	
2,4-D	0.150	0.047	mg/kg wet	0.1880		80	40-140	14	30	
2,4-D [2C]	0.147	0.047	mg/kg wet	0.1880		78	40-140	14	30	
2,4-DB	0.176	0.048	mg/kg wet	0.1900		92	40-140	8	30	
2,4-DB [2C]	0.170	0.048	mg/kg wet	0.1900		90	40-140	11	30	
Dalapon	0.338	0.046	mg/kg wet	0.4550		74	40-140	11	30	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0742

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8151A Chlorinated Herbicides										
Batch CI92437 - 3546										
Dalapon [2C]	0.373	0.046	mg/kg wet	0.4550		82	40-140	10	30	
Dicamba	0.019	0.009	mg/kg wet	0.01880		100	40-140	17	30	
Dicamba [2C]	0.020	0.009	mg/kg wet	0.01880		106	40-140	19	30	
Dichlorprop	0.182	0.047	mg/kg wet	0.1880		97	40-140	10	30	
Dichlorprop [2C]	0.197	0.047	mg/kg wet	0.1880		105	40-140	15	30	
Dinoseb	0.024	0.048	mg/kg wet	0.09500		25	10-100	7	30	
Dinoseb [2C]	0.024	0.048	mg/kg wet	0.09500		25	10-100	3	30	
MCPA	18.6	2.32	mg/kg wet	18.60		100	40-140	16	30	
MCPA [2C]	18.5	2.32	mg/kg wet	18.60		100	40-140	16	30	
MCPP	20.1	2.35	mg/kg wet	18.80		107	40-140	15	30	
MCPP [2C]	19.8	2.35	mg/kg wet	18.80		105	40-140	8	30	
Surrogate: DCAA	*0.236*		mg/kg wet	*0.2000*		*118*	*30-150*			
Surrogate: DCAA [2C]	*0.236*		mg/kg wet	*0.2000*		*118*	*30-150*			
8270D Semi-Volatile Organic Compounds										
Batch CI92439 - 3546										
Blank										
1,2,4-Trichlorobenzene	ND	0.333	mg/kg wet							
1,2-Dichlorobenzene	ND	0.333	mg/kg wet							
1,3-Dichlorobenzene	ND	0.333	mg/kg wet							
1,4-Dichlorobenzene	ND	0.333	mg/kg wet							
2,4,5-Trichlorophenol	ND	0.333	mg/kg wet							
2,4,6-Trichlorophenol	ND	0.333	mg/kg wet							
2,4-Dichlorophenol	ND	0.333	mg/kg wet							
2,4-Dimethylphenol	ND	0.333	mg/kg wet							
2,4-Dinitrophenol	ND	0.667	mg/kg wet							
2,4-Dinitrotoluene	ND	0.333	mg/kg wet							
2,6-Dinitrotoluene	ND	0.333	mg/kg wet							
2-Chloronaphthalene	ND	0.333	mg/kg wet							
2-Chlorophenol	ND	0.333	mg/kg wet							
2-Methylnaphthalene	ND	0.333	mg/kg wet							
2-Methylphenol	ND	0.333	mg/kg wet							
2-Nitrophenol	ND	0.333	mg/kg wet							
3,3´-Dichlorobenzidine	ND	0.333	mg/kg wet							
3+4-Methylphenol	ND	0.667	mg/kg wet							
4-Bromophenyl-phenylether	ND	0.333	mg/kg wet							
4-Chloroaniline	ND	0.333	mg/kg wet							
4-Nitrophenol	ND	1.67	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							
Acetophenone	ND	0.667	mg/kg wet							
Aniline	ND	1.67	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Azobenzene	ND	0.333	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0742

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CI92439 - 3546										
Benzo(a)anthracene	ND	0.333	mg/kg wet							
Benzo(a)pyrene	ND	0.167	mg/kg wet							
Benzo(b)fluoranthene	ND	0.333	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.333	mg/kg wet							
Benzo(k)fluoranthene	ND	0.333	mg/kg wet							
bis(2-Chloroethoxy)methane	ND	0.333	mg/kg wet							
bis(2-Chloroethyl)ether	ND	0.333	mg/kg wet							
bis(2-chloroisopropyl)Ether	ND	0.333	mg/kg wet							
bis(2-Ethylhexyl)phthalate	ND	0.333	mg/kg wet							
Butylbenzylphthalate	ND	0.333	mg/kg wet							
Chrysene	ND	0.167	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.167	mg/kg wet							
Dibenzofuran	ND	0.333	mg/kg wet							
Diethylphthalate	ND	0.333	mg/kg wet							
Dimethylphthalate	ND	0.333	mg/kg wet							
Di-n-butylphthalate	ND	0.333	mg/kg wet							
Di-n-octylphthalate	ND	0.333	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Hexachlorobenzene	ND	0.333	mg/kg wet							
Hexachlorobutadiene	ND	0.333	mg/kg wet							
Hexachloroethane	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.333	mg/kg wet							
Isophorone	ND	0.333	mg/kg wet							
Naphthalene	ND	0.333	mg/kg wet							
Nitrobenzene	ND	0.333	mg/kg wet							
N-Nitrosodimethylamine	ND	0.333	mg/kg wet							
Pentachlorophenol	ND	0.667	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Phenol	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
Pyridine	ND	1.67	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	*2.37*		mg/kg wet	*3.333*		*71*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.19*		mg/kg wet	*5.000*		*84*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.69*		mg/kg wet	*5.000*		*74*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.46*		mg/kg wet	*3.333*		*74*	*30-130*			
Surrogate: 2-Fluorophenol	*3.69*		mg/kg wet	*5.000*		*74*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.42*		mg/kg wet	*3.333*		*73*	*30-130*			
Surrogate: Phenol-d6	*3.66*		mg/kg wet	*5.000*		*73*	*30-130*			
Surrogate: p-Terphenyl-d14	*3.23*		mg/kg wet	*3.333*		*97*	*30-130*			
LCS										
1,2,4-Trichlorobenzene	2.51	0.333	mg/kg wet	3.333		75	40-140			
1,2-Dichlorobenzene	2.50	0.333	mg/kg wet	3.333		75	40-140			
1,3-Dichlorobenzene	2.50	0.333	mg/kg wet	3.333		75	40-140			
1,4-Dichlorobenzene	2.49	0.333	mg/kg wet	3.333		75	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0742

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CI92439 - 3546										
2,4,5-Trichlorophenol	2.75	0.333	mg/kg wet	3.333		82	30-130			
2,4,6-Trichlorophenol	2.69	0.333	mg/kg wet	3.333		81	30-130			
2,4-Dichlorophenol	2.69	0.333	mg/kg wet	3.333		81	30-130			
2,4-Dimethylphenol	2.63	0.333	mg/kg wet	3.333		79	30-130			
2,4-Dinitrophenol	2.47	0.667	mg/kg wet	3.333		74	30-130			
2,4-Dinitrotoluene	2.45	0.333	mg/kg wet	3.333		74	40-140			
2,6-Dinitrotoluene	2.39	0.333	mg/kg wet	3.333		72	40-140			
2-Chloronaphthalene	2.38	0.333	mg/kg wet	3.333		72	40-140			
2-Chlorophenol	2.56	0.333	mg/kg wet	3.333		77	30-130			
2-Methylnaphthalene	2.54	0.333	mg/kg wet	3.333		76	40-140			
2-Methylphenol	2.59	0.333	mg/kg wet	3.333		78	30-130			
2-Nitrophenol	2.44	0.333	mg/kg wet	3.333		73	30-130			
3,3´-Dichlorobenzidine	2.33	0.333	mg/kg wet	3.333		70	40-140			
3+4-Methylphenol	5.43	0.667	mg/kg wet	6.667		81	30-130			
4-Bromophenyl-phenylether	2.69	0.333	mg/kg wet	3.333		81	40-140			
4-Chloroaniline	2.20	0.333	mg/kg wet	3.333		66	40-140			
4-Nitrophenol	2.21	1.67	mg/kg wet	3.333		66	30-130			
Acenaphthene	2.44	0.333	mg/kg wet	3.333		73	40-140			
Acenaphthylene	2.56	0.333	mg/kg wet	3.333		77	40-140			
Acetophenone	2.61	0.667	mg/kg wet	3.333		78	40-140			
Aniline	2.17	1.67	mg/kg wet	3.333		65	40-140			
Anthracene	2.58	0.333	mg/kg wet	3.333		77	40-140			
Azobenzene	2.45	0.333	mg/kg wet	3.333		74	40-140			
Benzo(a)anthracene	2.65	0.333	mg/kg wet	3.333		80	40-140			
Benzo(a)pyrene	2.44	0.167	mg/kg wet	3.333		73	40-140			
Benzo(b)fluoranthene	2.45	0.333	mg/kg wet	3.333		74	40-140			
Benzo(g,h,i)perylene	2.60	0.333	mg/kg wet	3.333		78	40-140			
Benzo(k)fluoranthene	2.57	0.333	mg/kg wet	3.333		77	40-140			
bis(2-Chloroethoxy)methane	2.50	0.333	mg/kg wet	3.333		75	40-140			
bis(2-Chloroethyl)ether	2.50	0.333	mg/kg wet	3.333		75	40-140			
bis(2-chloroisopropyl)Ether	2.45	0.333	mg/kg wet	3.333		73	40-140			
bis(2-Ethylhexyl)phthalate	2.38	0.333	mg/kg wet	3.333		71	40-140			
Butylbenzylphthalate	2.30	0.333	mg/kg wet	3.333		69	40-140			
Chrysene	2.54	0.167	mg/kg wet	3.333		76	40-140			
Dibenzo(a,h)Anthracene	2.54	0.167	mg/kg wet	3.333		76	40-140			
Dibenzofuran	2.49	0.333	mg/kg wet	3.333		75	40-140			
Diethylphthalate	2.52	0.333	mg/kg wet	3.333		75	40-140			
Dimethylphthalate	2.47	0.333	mg/kg wet	3.333		74	40-140			
Di-n-butylphthalate	2.42	0.333	mg/kg wet	3.333		73	40-140			
Di-n-octylphthalate	2.16	0.333	mg/kg wet	3.333		65	40-140			
Fluoranthene	2.58	0.333	mg/kg wet	3.333		78	40-140			
Fluorene	2.61	0.333	mg/kg wet	3.333		78	40-140			
Hexachlorobenzene	2.76	0.333	mg/kg wet	3.333		83	40-140			
Hexachlorobutadiene	2.59	0.333	mg/kg wet	3.333		78	40-140			
Hexachloroethane	2.44	0.333	mg/kg wet	3.333		73	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0742

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CI92439 - 3546										
Indeno(1,2,3-cd)Pyrene	2.56	0.333	mg/kg wet	3.333		77	40-140			
Isophorone	2.31	0.333	mg/kg wet	3.333		69	40-140			
Naphthalene	2.49	0.333	mg/kg wet	3.333		75	40-140			
Nitrobenzene	2.49	0.333	mg/kg wet	3.333		75	40-140			
N-Nitrosodimethylamine	2.28	0.333	mg/kg wet	3.333		68	40-140			
Pentachlorophenol	2.85	0.667	mg/kg wet	3.333		86	30-130			
Phenanthrene	2.51	0.333	mg/kg wet	3.333		75	40-140			
Phenol	2.58	0.333	mg/kg wet	3.333		77	30-130			
Pyrene	2.57	0.333	mg/kg wet	3.333		77	40-140			
Pyridine	2.25	1.67	mg/kg wet	3.333		68	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	*2.85*		mg/kg wet	*3.333*		*86*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.85*		mg/kg wet	*5.000*		*97*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*4.47*		mg/kg wet	*5.000*		*89*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.87*		mg/kg wet	*3.333*		*86*	*30-130*			
Surrogate: 2-Fluorophenol	*4.49*		mg/kg wet	*5.000*		*90*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.87*		mg/kg wet	*3.333*		*86*	*30-130*			
Surrogate: Phenol-d6	*4.49*		mg/kg wet	*5.000*		*90*	*30-130*			
Surrogate: p-Terphenyl-d14	*3.13*		mg/kg wet	*3.333*		*94*	*30-130*			
LCS Dup										
1,2,4-Trichlorobenzene	2.22	0.333	mg/kg wet	3.333		67	40-140	12	30	
1,2-Dichlorobenzene	2.22	0.333	mg/kg wet	3.333		67	40-140	12	30	
1,3-Dichlorobenzene	2.21	0.333	mg/kg wet	3.333		66	40-140	12	30	
1,4-Dichlorobenzene	2.17	0.333	mg/kg wet	3.333		65	40-140	14	30	
2,4,5-Trichlorophenol	2.49	0.333	mg/kg wet	3.333		75	30-130	10	30	
2,4,6-Trichlorophenol	2.39	0.333	mg/kg wet	3.333		72	30-130	12	30	
2,4-Dichlorophenol	2.36	0.333	mg/kg wet	3.333		71	30-130	13	30	
2,4-Dimethylphenol	2.31	0.333	mg/kg wet	3.333		69	30-130	13	30	
2,4-Dinitrophenol	2.25	0.667	mg/kg wet	3.333		68	30-130	9	30	
2,4-Dinitrotoluene	2.18	0.333	mg/kg wet	3.333		66	40-140	12	30	
2,6-Dinitrotoluene	2.17	0.333	mg/kg wet	3.333		65	40-140	10	30	
2-Chloronaphthalene	2.11	0.333	mg/kg wet	3.333		63	40-140	12	30	
2-Chlorophenol	2.29	0.333	mg/kg wet	3.333		69	30-130	11	30	
2-Methylnaphthalene	2.19	0.333	mg/kg wet	3.333		66	40-140	15	30	
2-Methylphenol	2.29	0.333	mg/kg wet	3.333		69	30-130	12	30	
2-Nitrophenol	2.10	0.333	mg/kg wet	3.333		63	30-130	15	30	
3,3´-Dichlorobenzidine	2.10	0.333	mg/kg wet	3.333		63	40-140	10	30	
3+4-Methylphenol	4.78	0.667	mg/kg wet	6.667		72	30-130	13	30	
4-Bromophenyl-phenylether	2.41	0.333	mg/kg wet	3.333		72	40-140	11	30	
4-Chloroaniline	1.87	0.333	mg/kg wet	3.333		56	40-140	16	30	
4-Nitrophenol	2.06	1.67	mg/kg wet	3.333		62	30-130	7	30	
Acenaphthene	2.17	0.333	mg/kg wet	3.333		65	40-140	12	30	
Acenaphthylene	2.26	0.333	mg/kg wet	3.333		68	40-140	12	30	
Acetophenone	2.30	0.667	mg/kg wet	3.333		69	40-140	12	30	
Aniline	1.92	1.67	mg/kg wet	3.333		58	40-140	12	30	
Anthracene	2.33	0.333	mg/kg wet	3.333		70	40-140	10	30	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0742

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CI92439 - 3546										
Azobenzene	2.23	0.333	mg/kg wet	3.333		67	40-140	9	30	
Benzo(a)anthracene	2.50	0.333	mg/kg wet	3.333		75	40-140	6	30	
Benzo(a)pyrene	2.30	0.167	mg/kg wet	3.333		69	40-140	6	30	
Benzo(b)fluoranthene	2.39	0.333	mg/kg wet	3.333		72	40-140	2	30	
Benzo(g,h,i)perylene	2.46	0.333	mg/kg wet	3.333		74	40-140	6	30	
Benzo(k)fluoranthene	2.37	0.333	mg/kg wet	3.333		71	40-140	8	30	
bis(2-Chloroethoxy)methane	2.18	0.333	mg/kg wet	3.333		65	40-140	14	30	
bis(2-Chloroethyl)ether	2.22	0.333	mg/kg wet	3.333		67	40-140	12	30	
bis(2-chloroisopropyl)Ether	2.16	0.333	mg/kg wet	3.333		65	40-140	12	30	
bis(2-Ethylhexyl)phthalate	2.24	0.333	mg/kg wet	3.333		67	40-140	6	30	
Butylbenzylphthalate	2.17	0.333	mg/kg wet	3.333		65	40-140	6	30	
Chrysene	2.36	0.167	mg/kg wet	3.333		71	40-140	7	30	
Dibenzo(a,h)Anthracene	2.40	0.167	mg/kg wet	3.333		72	40-140	6	30	
Dibenzofuran	2.26	0.333	mg/kg wet	3.333		68	40-140	10	30	
Diethylphthalate	2.32	0.333	mg/kg wet	3.333		70	40-140	8	30	
Dimethylphthalate	2.27	0.333	mg/kg wet	3.333		68	40-140	9	30	
Di-n-butylphthalate	2.27	0.333	mg/kg wet	3.333		68	40-140	7	30	
Di-n-octylphthalate	2.08	0.333	mg/kg wet	3.333		62	40-140	4	30	
Fluoranthene	2.37	0.333	mg/kg wet	3.333		71	40-140	9	30	
Fluorene	2.32	0.333	mg/kg wet	3.333		70	40-140	12	30	
Hexachlorobenzene	2.47	0.333	mg/kg wet	3.333		74	40-140	11	30	
Hexachlorobutadiene	2.28	0.333	mg/kg wet	3.333		68	40-140	13	30	
Hexachloroethane	2.14	0.333	mg/kg wet	3.333		64	40-140	13	30	
Indeno(1,2,3-cd)Pyrene	2.41	0.333	mg/kg wet	3.333		72	40-140	6	30	
Isophorone	2.01	0.333	mg/kg wet	3.333		60	40-140	14	30	
Naphthalene	2.20	0.333	mg/kg wet	3.333		66	40-140	12	30	
Nitrobenzene	2.20	0.333	mg/kg wet	3.333		66	40-140	12	30	
N-Nitrosodimethylamine	2.04	0.333	mg/kg wet	3.333		61	40-140	11	30	
Pentachlorophenol	2.58	0.667	mg/kg wet	3.333		77	30-130	10	30	
Phenanthrene	2.26	0.333	mg/kg wet	3.333		68	40-140	11	30	
Phenol	2.30	0.333	mg/kg wet	3.333		69	30-130	12	30	
Pyrene	2.38	0.333	mg/kg wet	3.333		72	40-140	7	30	
Pyridine	1.99	1.67	mg/kg wet	3.333		60	40-140	12	30	
Surrogate: 1,2-Dichlorobenzene-d4	*2.41*		mg/kg wet	*3.333*		*72*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.17*		mg/kg wet	*5.000*		*83*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.80*		mg/kg wet	*5.000*		*76*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.48*		mg/kg wet	*3.333*		*74*	*30-130*			
Surrogate: 2-Fluorophenol	*3.84*		mg/kg wet	*5.000*		*77*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.46*		mg/kg wet	*3.333*		*74*	*30-130*			
Surrogate: Phenol-d6	*3.81*		mg/kg wet	*5.000*		*76*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.82*		mg/kg wet	*3.333*		*85*	*30-130*			
Classical Chemistry										
Batch CI92513 - General Preparation										
Reference										

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0742

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Classical Chemistry										
Batch CI92513 - General Preparation										
Flashpoint	81		°F	81.00		100	97.9-102.1			
Batch CI92541 - General Preparation										
Blank										
Reactive Cyanide	ND	2.0	mg/kg							
Reactive Sulfide	ND	2.0	mg/kg							
LCS										
Reactive Cyanide	3.8	2.0	mg/kg	100.3		4	0.68-5.41			
Reactive Sulfide	ND	2.0	mg/kg	10.00		0	0-44			
Batch CI92618 - TCN Prep										
Blank										
Total Cyanide	ND	1.00	mg/kg wet							
LCS										
Total Cyanide	4.99	1.00	mg/kg wet	5.015		99	90-110			
Reference										
Total Cyanide	154	9.92	mg/kg wet	157.0		98	24-110			
Reference										
Total Cyanide	152	9.97	mg/kg wet	157.0		97	24-110			
Batch CI92619 - General Preparation										
Blank										
Sulfide	ND	0.05	mg/kg wet							
LCS										
Sulfide	0.5		mg/L	0.5000		99	85-115			
Batch CI92620 - General Preparation										
Blank										
Sulfate	ND	5	mg/kg wet							
LCS										
Sulfate	10		mg/L	9.988		96	80-120			
Batch CI92621 - General Preparation										
Blank										
Conductivity	ND	5	umhos/cm							
LCS										
Conductivity	1360		umhos/cm	1411		97	90-110			
Batch CI92634 - General Preparation										
Blank										
Total Organic Carbon (1)	ND	100	mg/kg							
Total Organic Carbon (2)	ND	100	mg/kg							
LCS										
Total Organic Carbon (1)	9630	100	mg/kg	10000		96	80-120			
Total Organic Carbon (2)	9940	100	mg/kg	10000		99	80-120			
LCS Dup										

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0742

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Classical Chemistry										
Batch CI92634 - General Preparation										
Total Organic Carbon (1)	9660	100	mg/kg	10000		97	80-120	0.4	20	
Total Organic Carbon (2)	9800	100	mg/kg	10000		98	80-120	1	20	
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch CI92604 - 3546										
Blank										
C19-C36 Aliphatics1	ND	15.0	mg/kg wet							
C9-C18 Aliphatics1	ND	15.0	mg/kg wet							
Decane (C10)	ND	0.5	mg/kg wet							
Docosane (C22)	ND	0.5	mg/kg wet							
Dodecane (C12)	ND	0.5	mg/kg wet							
Eicosane (C20)	ND	0.5	mg/kg wet							
Hexacosane (C26)	ND	0.5	mg/kg wet							
Hexadecane (C16)	ND	0.5	mg/kg wet							
Hexatriacontane (C36)	ND	0.5	mg/kg wet							
Nonadecane (C19)	ND	0.5	mg/kg wet							
Nonane (C9)	ND	0.5	mg/kg wet							
Octacosane (C28)	ND	0.5	mg/kg wet							
Octadecane (C18)	ND	0.5	mg/kg wet							
Tetracosane (C24)	ND	0.5	mg/kg wet							
Tetradecane (C14)	ND	0.5	mg/kg wet							
Triacontane (C30)	ND	0.5	mg/kg wet							
Surrogate: 1-Chlorooctadecane	*1.62*		mg/kg wet	*2.020*		*80*	*40-140*			
Blank										
C11-C22 Unadjusted Aromatics1	ND	15.0	mg/kg wet							
Surrogate: 2-Bromonaphthalene	*44.1*		mg/L	*50.00*		*88*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*42.2*		mg/L	*50.00*		*84*	*40-140*			
Surrogate: O-Terphenyl	*1.57*		mg/kg wet	*2.008*		*78*	*40-140*			
Blank										
2-Methylnaphthalene	ND	0.020	mg/kg wet							
Acenaphthene	ND	0.020	mg/kg wet							
Acenaphthylene	ND	0.020	mg/kg wet							
Anthracene	ND	0.008	mg/kg wet							
Benzo(a)anthracene	ND	0.008	mg/kg wet							
Benzo(a)pyrene	ND	0.008	mg/kg wet							
Benzo(b)fluoranthene	ND	0.020	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.020	mg/kg wet							
Benzo(k)fluoranthene	ND	0.020	mg/kg wet							
Chrysene	ND	0.020	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.008	mg/kg wet							
Fluoranthene	ND	0.020	mg/kg wet							
Fluorene	ND	0.008	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.020	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0742

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch CI92604 - 3546										
Naphthalene	ND	0.020	mg/kg wet							
Phenanthrene	ND	0.020	mg/kg wet							
Pyrene	ND	0.020	mg/kg wet							
LCS										
C19-C36 Aliphatics1	14.8	15.0	mg/kg wet	16.00		92	40-140			
C9-C18 Aliphatics1	9.2	15.0	mg/kg wet	12.00		77	40-140			
Decane (C10)	1.2	0.5	mg/kg wet	2.000		58	40-140			
Docosane (C22)	1.8	0.5	mg/kg wet	2.000		88	40-140			
Dodecane (C12)	1.3	0.5	mg/kg wet	2.000		67	40-140			
Eicosane (C20)	1.7	0.5	mg/kg wet	2.000		87	40-140			
Hexacosane (C26)	1.7	0.5	mg/kg wet	2.000		86	40-140			
Hexadecane (C16)	1.7	0.5	mg/kg wet	2.000		85	40-140			
Hexatriacontane (C36)	1.9	0.5	mg/kg wet	2.000		94	40-140			
Nonadecane (C19)	1.7	0.5	mg/kg wet	2.000		87	40-140			
Nonane (C9)	0.9	0.5	mg/kg wet	2.000		46	30-140			
Octacosane (C28)	1.7	0.5	mg/kg wet	2.000		85	40-140			
Octadecane (C18)	1.7	0.5	mg/kg wet	2.000		87	40-140			
Tetracosane (C24)	1.7	0.5	mg/kg wet	2.000		87	40-140			
Tetradecane (C14)	1.5	0.5	mg/kg wet	2.000		75	40-140			
Triacontane (C30)	1.7	0.5	mg/kg wet	2.000		84	40-140			
Surrogate: 1-Chlorooctadecane	*1.69*		mg/kg wet	*2.020*		*84*	*40-140*			
LCS										
C11-C22 Unadjusted Aromatics1	30.3	15.0	mg/kg wet	34.00		89	40-140			
Surrogate: 2-Bromonaphthalene	*42.7*		mg/L	*50.00*		*85*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*39.2*		mg/L	*50.00*		*78*	*40-140*			
Surrogate: O-Terphenyl	*1.49*		mg/kg wet	*2.008*		*74*	*40-140*			
LCS										
2-Methylnaphthalene Breakthrough	0.0		%				0-5			
Naphthalene Breakthrough	0.0		%				0-5			
LCS										
2-Methylnaphthalene	1.40	0.100	mg/kg wet	2.000		70	40-140			
Acenaphthene	1.69	0.100	mg/kg wet	2.000		85	40-140			
Acenaphthylene	1.73	0.100	mg/kg wet	2.000		87	40-140			
Anthracene	1.71	0.040	mg/kg wet	2.000		86	40-140			
Benzo(a)anthracene	1.80	0.040	mg/kg wet	2.000		90	40-140			
Benzo(a)pyrene	1.81	0.040	mg/kg wet	2.000		91	40-140			
Benzo(b)fluoranthene	1.82	0.100	mg/kg wet	2.000		91	40-140			
Benzo(g,h,i)perylene	1.70	0.100	mg/kg wet	2.000		85	40-140			
Benzo(k)fluoranthene	1.71	0.100	mg/kg wet	2.000		85	40-140			
Chrysene	1.79	0.100	mg/kg wet	2.000		90	40-140			
Dibenzo(a,h)Anthracene	1.89	0.040	mg/kg wet	2.000		94	40-140			
Fluoranthene	1.75	0.100	mg/kg wet	2.000		88	40-140			
Fluorene	1.69	0.040	mg/kg wet	2.000		84	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0742

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch CI92604 - 3546										
Indeno(1,2,3-cd)Pyrene	1.88	0.100	mg/kg wet	2.000		94	40-140			
Naphthalene	1.34	0.100	mg/kg wet	2.000		67	40-140			
Phenanthrene	1.65	0.100	mg/kg wet	2.000		83	40-140			
Pyrene	1.86	0.100	mg/kg wet	2.000		93	40-140			
LCS Dup										
C19-C36 Aliphatics1	15.1	15.0	mg/kg wet	16.00		94	40-140	2	25	
C9-C18 Aliphatics1	8.9	15.0	mg/kg wet	12.00		74	40-140	3	25	
Decane (C10)	1.1	0.5	mg/kg wet	2.000		56	40-140	4	25	
Docosane (C22)	1.8	0.5	mg/kg wet	2.000		90	40-140	2	25	
Dodecane (C12)	1.3	0.5	mg/kg wet	2.000		63	40-140	6	25	
Eicosane (C20)	1.8	0.5	mg/kg wet	2.000		89	40-140	2	25	
Hexacosane (C26)	1.8	0.5	mg/kg wet	2.000		88	40-140	2	25	
Hexadecane (C16)	1.7	0.5	mg/kg wet	2.000		83	40-140	3	25	
Hexatriacontane (C36)	1.9	0.5	mg/kg wet	2.000		97	40-140	3	25	
Nonadecane (C19)	1.8	0.5	mg/kg wet	2.000		89	40-140	2	25	
Nonane (C9)	0.9	0.5	mg/kg wet	2.000		45	30-140	3	25	
Octacosane (C28)	1.7	0.5	mg/kg wet	2.000		87	40-140	3	25	
Octadecane (C18)	1.8	0.5	mg/kg wet	2.000		88	40-140	1	25	
Tetracosane (C24)	1.8	0.5	mg/kg wet	2.000		89	40-140	3	25	
Tetradecane (C14)	1.4	0.5	mg/kg wet	2.000		71	40-140	6	25	
Triacontane (C30)	1.7	0.5	mg/kg wet	2.000		86	40-140	3	25	
Surrogate: 1-Chlorooctadecane	*1.71*		mg/kg wet	*2.020*		*85*	*40-140*			
LCS Dup										
C11-C22 Unadjusted Aromatics1	30.9	15.0	mg/kg wet	34.00		91	40-140	2	25	
Surrogate: 2-Bromonaphthalene	*45.3*		mg/L	*50.00*		*91*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*43.5*		mg/L	*50.00*		*87*	*40-140*			
Surrogate: O-Terphenyl	*1.60*		mg/kg wet	*2.008*		*80*	*40-140*			
LCS Dup										
2-Methylnaphthalene Breakthrough	0.0		%				0-5		200	
Naphthalene Breakthrough	0.0		%				0-5		200	
LCS Dup										
2-Methylnaphthalene	1.56	0.100	mg/kg wet	2.000		78	40-140	11	30	
Acenaphthene	1.86	0.100	mg/kg wet	2.000		93	40-140	9	30	
Acenaphthylene	1.91	0.100	mg/kg wet	2.000		96	40-140	10	30	
Anthracene	1.78	0.040	mg/kg wet	2.000		89	40-140	4	30	
Benzo(a)anthracene	1.87	0.040	mg/kg wet	2.000		93	40-140	4	30	
Benzo(a)pyrene	1.91	0.040	mg/kg wet	2.000		95	40-140	5	30	
Benzo(b)fluoranthene	1.88	0.100	mg/kg wet	2.000		94	40-140	4	30	
Benzo(g,h,i)perylene	1.81	0.100	mg/kg wet	2.000		91	40-140	6	30	
Benzo(k)fluoranthene	1.78	0.100	mg/kg wet	2.000		89	40-140	4	30	
Chrysene	1.90	0.100	mg/kg wet	2.000		95	40-140	6	30	
Dibenzo(a,h)Anthracene	1.99	0.040	mg/kg wet	2.000		99	40-140	5	30	
Fluoranthene	1.83	0.100	mg/kg wet	2.000		91	40-140	4	30	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0742

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch CI92604 - 3546										
Fluorene	1.84	0.040	mg/kg wet	2.000		92	40-140	8	30	
Indeno(1,2,3-cd)Pyrene	1.97	0.100	mg/kg wet	2.000		98	40-140	5	30	
Naphthalene	1.49	0.100	mg/kg wet	2.000		75	40-140	11	30	
Phenanthrene	1.73	0.100	mg/kg wet	2.000		86	40-140	4	30	
Pyrene	1.98	0.100	mg/kg wet	2.000		99	40-140	6	30	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ ESS Laboratory Work Order: 19I0742

Notes and Definitions

Q	Calibration required quadratic regression (Q).
>	Greater than.
B+	Blank Spike recovery is above upper control limit (B+).
CD-	Continuing Calibration %Diff/Drift is below control limit (CD-).
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
D	Diluted.
EL	Elevated Method Reporting Limits due to sample matrix (EL).
#	Modified result
P	Percent difference between primary and confirmation results exceeds 40% (P).
Z18	Temperature is not within 23 +/-2 ºC.
U	Analyte included in the analysis, but not detected
WL	Results obtained from a deionized water leach of the sample.
XH	Peaks found in the retention time window for MCPA & MCPP did not confirm by GC/MS.
Z-08	See Attached
Z-09	ND
Z-10	Soil pH measured in water at 20.5 ºC.
LC	Lower value is used due to matrix interferences (LC).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0742

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

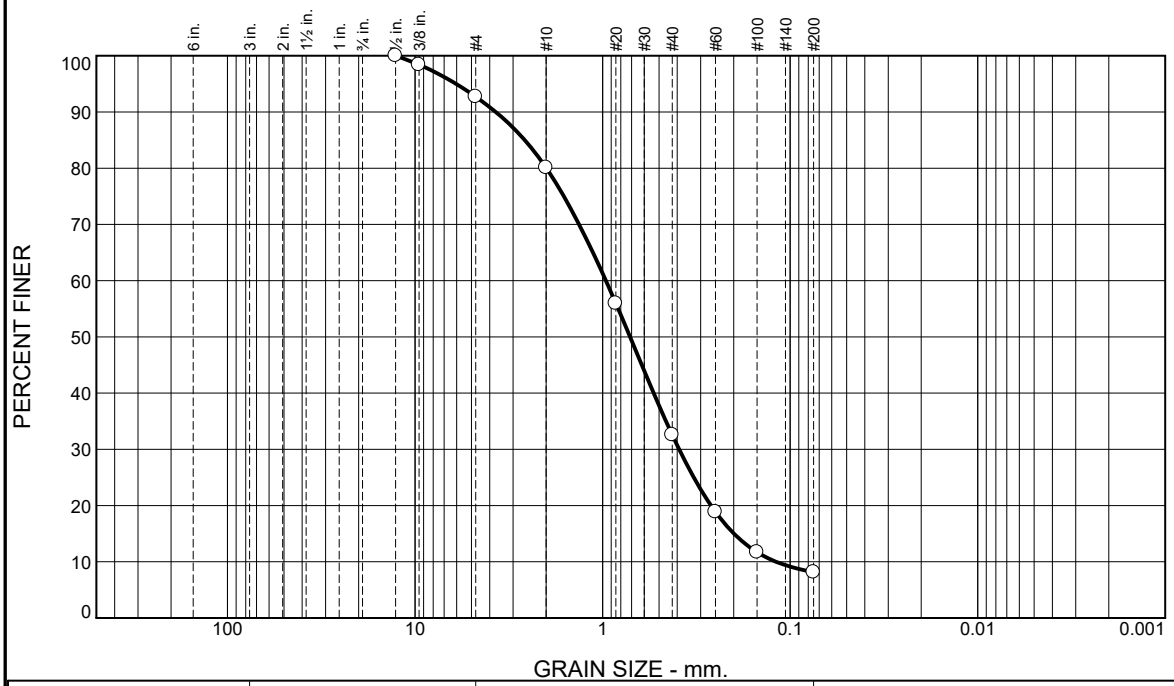
New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	7.3	12.6	47.5	24.5	8.1	

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
0.5"	100.0		
0.375"	98.4		
#4	92.7		
#10	80.1		
#20	56.0		
#40	32.6		
#60	18.9		
#100	11.7		
#200	8.1		

* (no specification provided)

Material Description

Very Dark Gray well-graded sand with silt

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= SW-SM **AASHTO (M 145)=** A-1-b

Coefficients

D_{90}= 3.7123 D_{85}= 2.6020 D_{60}= 0.9607
D_{50}= 0.7141 D_{30}= 0.3905 D_{15}= 0.1992
D_{10}= 0.1188 C_u= 8.09 C_c= 1.34

Remarks

Date Received: 09.25.19 **Date Tested:** 09.30.19

Tested By: JM / IA

Checked By: Steven Accetta

Title: Laboratory Coordinator

Source of Sample: Grab **Date Sampled:** 09.23.19
Sample Number: 1804586-SS669-S1

Thielsch Engineering Inc.

Cranston, RI

Client: GEI Consultant
Project: Amesbury Former MGP
Amesbury, MA
Project No: 19I0742 **Figure** 19I0742-01

THIELSCH ENGINEERING
195 Frances Avenue
Cranston RI, 02910
Phone: (401)-467-6454
Fax: (401)-467-2398
thielsch.com
Let's Build a Solid Foundation

Client Information:
GEI Consultants
Woburn, MA
PM: Ryan Hoffman
Assigned By: Ryan Hoffman
Collected By: Client

Project Information:
Amesbury Former MGP
Amesbury, MA
ESS Project Number: 19I0742
Summary Page: 1 of 1
Report Date: 10.07.19

LABORATORY TESTING DATA SHEET, Report No.: 7419-K-124

GEI Sample ID	ESS Sample ID	Depth (Ft)	Laboratory No.	Identification Tests								Proctor / CBR / Permeability Tests								Laboratory Log and Soil Description
				As Received Water Content %	LL %	PL %	Gravel %	Sand %	Fines %	Volatile Solids (%)	G_s	Dry unit wt. pcf	Test Water Content %	γ_d MAX (pcf) W_{opt} (%)	γ_d MAX (pcf) W_{opt} (%) (Corr.)	Target Test Setup as % of Proctor	CBR @ 0.1"	CBR @ 0.2"	Perme-ability cm/sec	
				D2216	D4318		D6913			D2974	D854			D1557						
1804576-SS669-S1	19I0742-01		19-S-2051	27.6						4.2										Brown

Date Received: 10.04.19

Reviewed By:

Date Reviewed: 10.07.19

Chain-of-Custody Record

CTS

Laboratory: ESS

Laboratory Job # 19-7412

GEI Consultants

400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Name: Amesbury Former MGP

Project Number: 1804576

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

Project Information

Project Location: Amesbury, MA

Project Manager: Ryan Hoffman

MCP PRESUMPTIVE CERTAINTY REQUIRED: (YES) NO

If Yes, Are MCP Analytical Methods Required? (YES) NO NA

Are Drinking Water Samples Submitted? YES (NO) NA

If Yes, Have Drinking Water Sampling Requirements Been Met? YES NO (NA)

Lab Sample ID Number	GEI Sample ID	Collection Date	Collection Time	Matrix	Number of Bottles	Sampled By (Initials)	VOCs 8260*	SVOCs 8270 by SIM**	TPH 8100M	PCB NOAA Summation of Congeners	RCRA8 metals + Cu, Ni, Zn***	EPH (fractions only)	Volatile solids (%)	Corrosivity, Ignit., React., Conductivity	Pesticides and Herbicides	Total cyanide	Total Sulfur, Total Sulfide, Total Sulfate	TOC by Lloyd-Kahn	Grain Size Analysis****	Sample Specific Remarks
Preservative							H2O/MeOH	None	None	None	None	None	None	None	None	None	None	None	None	
1	1804576-SS69-S1	9/23/19	1032	Sediment	6	BFM	X	X	X	X	X	X	X	X	X	X	X	X	X	

Sample Handling

Samples Field Filtered: YES NO (NA)

Sampled Shipped With Ice: (YES) NO

MCP Level Needed: GEI requires that, within the specified protocol, the most stringent Method / MCP standard be met for all analytes, whenever possible.

Turnaround Time (Business days)

Normal X Other ____

10-Day ____ 7-Day ____

5-Day X 3-Day ____

Before submitting rush turnaround samples, you must notify the laboratory to confirm that the TAT can be achieved.

Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1.	9/23/19	1600	1. GEI Sample Fridge
Relinquished by: (signature)	Date:	Time:	Received by: (signature)
2. GEI Sample Fridge	9/24/19	1225	2.
Relinquished by: (signature)	Date:	Time:	Received by: (signature)
3.	9/24/19	1225	3.
Relinquished by: (signature)	Date:	Time:	Received by: (signature)
4.	9/24	16:48	4.

Additional Requirements/Comments/Remarks

*Run TCLP benzene if total >20X

**Include pyridine and toxaphene

***Run TCLP metals if total >20X

****Sieve Nos. 4, 10, 40, 60, and 200

Ice temp. 2.9

09.25.19 13:17

09/25/19 1317

10/4/19 1520

TAT 10.04.19 15:20

Sterling Analytical, Inc.
15 Agawam Avenue
West Springfield, MA 01089
Phone (413) 214-6541 Fax (413) 214-6842
email-madhu@sterlinganalytical.com

Visit our website: www.sterlinganalytical.com

Mass Certification - MA-00071
Conn Certification - PH-0520

Report Date September 30, 2019

Customer	Contact	Laboratory Supervisor	eMail
ESS Laboratory	S. Morrell	Madhu Shah	customerservice@sterlinganalytical.com

Sample Description
Analysis of Solid Sample

Samples Analyzed

Enclosed are Report No(s): 68155

Sulfur Total Blank = <0.05ppm

LCS Lo Check 0.100 = 0.092ppm

ICV 1.00 = 1.017ppm

Thank you for your business

madhu shah

Madhu Shah, Laboratory Supervisor

9/30/2019

Date

ALL the information contained in this report has been reviewed for accuracy and checked against all quality control requirements outlined in each applicable method.
This report may not be reproduced, except in full, without written approval from Sterling Analytical, Inc.

Sample	Description	Source	Taken/Time	Received
68155	19i0742-01	ESS Laboratory	9/23/19 10:32	9/25/19

Parameter	Results		RDL	Method	Analyzed/Time	Tech
Sulfur, Total	2,970	mg/kg	100.00	SW 846 6010	09/26/19	dfp

ESS Laboratory — Sterling

Division of Thielsch Engineering, Inc.

185 Frances Avenue, Cranston, RI 02910-2211
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 19i0742

Turn Time **DUE DATE: 10/1/19**

Regulatory State: **MA** RI CT NH NJ NY ME Other_____

Is this project for any of the following:(please circle)
MA-MCP Navy USACE CT DEP Other_____

Reporting Limits - _____

Electonic Deliverables Excel Access PDF

Co. Name: ESS LABORATORY	Project #:	Project Name: 19i0742	
Contact Person: Shawn Morrell / Heather Masse	Address:		
City:	State:	Zip:	PO #: B02792
Tel.:	Email: Smorrell@thielsch.com; Hmasse@thielsch.com		

ESS Lab ID	Date	Collection Time	Grab -G Composite-C	Matrix	Sample ID	Pres Code	# of Containers	Type of Container	Vol of Container	Analysis: Total Sulfur 6010 mg/Kg
	9/23/19	1032	G	Sediment	19i0742-01					X

Container Type: P-Poly G-Glass AG-Amber Glass S-Sterile V-VOA

Matrix S-Soil SD-Solid D-Sludge WW-Wastewater GW-Groundwater SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filter

Cooler Present _____Yes _____No

Seals Intact ____ Yes _____No NA:___

Cooler Temperature: _____

Internal Use Only

[ ] Pickup

[ ] Technician___

Preservation Code: 1-NP, 2-HCl, 3-H2SO4, 4-HNO3, 5-NaOH, 6-MeOH, 7-Asorbic Acid, 8-ZnAct, 9-_____

Sampled by :

Comments: **QC required MB and LCS**

Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)
9/25/19 12:17	9-25-19 12:17		
Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)

* By circling MA-MCP, client acknowledges samples were collected in accordance with MADEP CAM VIIA

Please fax to the laboratory all changes to Chain of Custody

1 (White) Lab Copy
2 (Yellow) Client Receipt

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 191742

GEI Consultants

400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Number: 1804576

Project Location: Amesbury, MA

Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY REQUIRED -- (YES) NO

If Yes, Are MCP Analytical Methods Required? (YES) NO NA

Are Drinking Water Samples Submitted? YES (NO) NA

If Yes, Have Drinking Water Sampling Requirements Been Met? YES NO (NA)

Sample Handling

Samples Field Filtered: YES NO (NA)

Sampled Shipped With Ice: (YES) NO

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Preservative	VOCs 8260*	SVOCs 8270 by SIM**	TPH 8100M	PCB NOAA Summation of Congeners	RCRA8 metals + Cu, Ni, Zn***	EPH (fractions only)	Volatile solids (%)	Corrosivity, Ignit., React., Conductivity	Pesticides and Herbicides	Total cyanide	Total Sulfur, Total Sulfide, Total Sulfate	TOC by Lloyd-Kahn	Grain Size Analysis****	Sample Specific Remarks
							H2O/MeOH	None	None	None	None	None	None	None	None	None	None	None	None	None	
1	1804576-SS669-S1	9/23/19	1032	Sediment	GB	BFM		X	X	X	X	~~X~~	X	X	X	X	X	X	X	X	
2	1804576-SS669-S1 Dried	9/23/19	10:32	Sed								X									

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

	Date	Time	
Relinquished by sampler: (signature) 1	9/23/19	1600	Received by: (signature) 1. GEI Sample Fridge
Relinquished by: (signature) 2. GEI Sample Fridge	9/24/19	1225	Received by: (signature) 2.
Relinquished by: (signature) 3.	9/24/19	1225	Received by: (signature) 3.
Relinquished by: (signature) 4.	9/24	16:48	Received by: (signature) 4.

Ice temp, 2.9

Turnaround Time (Business days):

Normal __X__ Other ____

10-Day ____ 7-Day ____

5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

*Metals air dried 9/26/19 LLB

*Run TCLP benzene if total >20X

**Include pyridine and toxaphene

***Run TCLP metals if total >20X

****Sieve Nos. 4, 10, 40, 60, and 200

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 191742

GEI Consultants

400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Number: 1804576

Project Location: Amesbury, MA

Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY REQUIRED -- (YES) NO

If Yes, Are MCP Analytical Methods Required? (YES) NO NA

Are Drinking Water Samples Submitted? YES (NO) NA

If Yes, Have Drinking Water Sampling Requirements Been Met? YES NO (NA)

Sample Handling

Samples Field Filtered: YES NO (NA)

Sampled Shipped With Ice: (YES) NO

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Preservative	VOCs 8260*	SVOCs 8270 by SIM**	TPH 8100M	PCB NOAA Summation of Congeners	RCRA8 metals + Cu, Ni, Zn***	EPH (fractions only)	Volatile solids (%)	Corrosivity, Ignit., React., Conductivity	Pesticides and Herbicides	Total cyanide	Total Sulfur, Total Sulfide, Total Sulfate	TOC by Lloyd-Kahn	Grain Size Analysis****	Sample Specific Remarks
							H2O/MeOH	None	None	None	None	None	None	None	None	None	None	None	None	None	
							Analysis														
1	1804576-SS69-S1	9/23/19	1032	Sediment	6	BFM		X	X	X	X	X	X	X	X	X	X	X	X	X	

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

Turnaround Time (Business days):

Normal __X__ Other ____

10-Day ____ 7-Day ____

5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

	Date	Time	
Relinquished by sampler: (signature) 1.	9/23/19	1600	Received by: (signature) 1. GEI Sample Fridge
Relinquished by: (signature) 2. GEI Sample Fridge	9/24/19	1225	Received by: (signature) 2.
Relinquished by: (signature) 3.	9/24/19	1225	Received by: (signature) 3.
Relinquished by: (signature) 4.	9/24	16:48	Received by: (signature) 4.

Ice temp, 2.9

Additional Requirements/Comments/Remarks:

*Run TCLP benzene if total >20X

**Include pyridine and toxaphene

***Run TCLP metals if total >20X

****Sieve Nos. 4, 10, 40, 60, and 200

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP - 401WQ (1804576)
ESS Laboratory Work Order Number: 19I0860

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 2:37 pm, Oct 08, 2019

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses

CTS - Cranston, RI	Grain Size Analysis, Organic Content
Sterling Analytical Lab - West Springfield, MA	Sulfur

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0860

SAMPLE RECEIPT

The following samples were received on September 26, 2019 for the analyses specified on the enclosed Chain of Custody Record.

Low Level VOA vials were frozen by ESS Laboratory on 9/26/19 at 20:44.

Question I: All samples for EPH and Metals were analyzed for a subset of the required MCP list per the client's request.

Lab Number	Sample Name	Matrix	Analysis
19I0860-01	1804576-SS692-S4	Sediment	6010, 8100M, 8260B, 8270D, 9030B, 9038, LK, SUB
19I0860-02	1804576-SS692R-S1	Sediment	1010, 1311, 1311/6010C, 7.3.3.2, 7.3.4.1, 8081B, 8082A-Cong, 8151A, 9014, 9045, 9050A, EPH8270, EPH8270SIM, MADEP-EPH, SUB
19I0860-03	1804576-SS692R-S1 Dried	Sediment	6010C, 6020A, 7471B

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0860

PROJECT NARRATIVE

5035/8260B Volatile Organic Compounds / Methanol

19I0860-01 **Surrogate recovery(ies) outside of criteria. Reextraction/Reanalysis confirms results (SC).**
4-Bromofluorobenzene (31% @ 70-130%), Toluene-d8 (46% @ 70-130%)

C9I0502-CCV1 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
1,2-Dibromo-3-Chloropropane (22% @ 20%), 2-Hexanone (26% @ 20%), Tetrachloroethene (25% @ 20%)

C9I0529-CCV1 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
Tetrachloroethene (31% @ 20%)

CI92728-BS1 **Blank Spike recovery is below lower control limit (B-).**
Dichlorodifluoromethane (67% @ 70-130%), Tetrachloroethene (64% @ 70-130%)

CI92728-BSD1 **Blank Spike recovery is below lower control limit (B-).**
Tetrachloroethene (68% @ 70-130%)

8082 Polychlorinated Biphenyls (PCB) / Congeners

19I0860-02 **Elevated Method Reporting Limits due to sample matrix (EL).**

8100M Total Petroleum Hydrocarbons

19I0860-01 **Surrogate recovery(ies) outside of criteria due to matrix (UCM/coelution/matrix is present) (SM).**
O-Terphenyl (202% @ 40-140%)

8151A Chlorinated Herbicides

19I0860-02 **Modified result**
MCPP

19I0860-02 **Peaks found in the retention time window for MCPP did not confirm by GC/MS.**

CI93058-BSD1 **Relative percent difference for duplicate is outside of criteria (D+).**
2,4-D (31% @ 30%), Dinoseb (64% @ 30%), Dinoseb [2C] (69% @ 30%)

8270D Semi-Volatile Organic Compounds

19I0860-01 **Elevated Method Reporting Limits due to sample matrix (EL).**

19I0860-01 **Surrogate recovery(ies) above upper control limit (S+).**
2,4,6-Tribromophenol (186% @ 30-130%)

C9I0507-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (99% @ 80-120%)

C9J0009-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (112% @ 80-120%), Pentachlorophenol (108% @ 80-120%)

MADEP-EPH Extractable Petroleum Hydrocarbons

19I0860-02 **Elevated Method Reporting Limits due to sample matrix (EL).**

C9I0432-CCV2 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
Hexatriacontane (C36) (26% @ 25%)

C9I0432-CCV5 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
Hexatriacontane (C36) (30% @ 25%)

C9I0432-CCV6 **Continuing Calibration %Diff/Drift is above control limit (CD+).**

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ ESS Laboratory Work Order: 19I0860

Hexatriacontane (C36) (37% @ 25%)

C9I0432-CCV7 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
Hexatriacontane (C36) (27% @ 25%)

C9I0432-CCV8 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
Hexatriacontane (C36) (27% @ 25%)

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0860

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS692-S4
Date Sampled: 09/24/19 16:10
Percent Solids: 48
Initial Volume: 16.7
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 19I0860
ESS Laboratory Sample ID: 19I0860-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
1,1,1-Trichloroethane	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
1,1,2,2-Tetrachloroethane	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
1,1,2-Trichloroethane	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
1,1-Dichloroethane	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
1,1-Dichloroethene	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
1,1-Dichloropropene	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
1,2,3-Trichlorobenzene	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
1,2,3-Trichloropropane	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
1,2,4-Trichlorobenzene	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
1,2,4-Trimethylbenzene	**25.6** (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
1,2-Dibromo-3-Chloropropane	ND (2.96)		8260B		1	09/27/19 19:51	C9I0502	CI92728
1,2-Dibromoethane	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
1,2-Dichlorobenzene	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
1,2-Dichloroethane	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
1,2-Dichloropropane	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
1,3,5-Trimethylbenzene	**5.79** (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
1,3-Dichlorobenzene	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
1,3-Dichloropropane	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
1,4-Dichlorobenzene	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
1,4-Dioxane - Screen	ND (119)		8260B		1	09/27/19 19:51	C9I0502	CI92728
2,2-Dichloropropane	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
2-Butanone	ND (2.96)		8260B		1	09/27/19 19:51	C9I0502	CI92728
2-Chlorotoluene	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
2-Hexanone	ND (2.96)		8260B		1	09/27/19 19:51	C9I0502	CI92728
4-Chlorotoluene	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
4-Isopropyltoluene	**5.02** (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
4-Methyl-2-Pentanone	ND (2.96)		8260B		1	09/27/19 19:51	C9I0502	CI92728
Acetone	ND (2.96)		8260B		1	09/27/19 19:51	C9I0502	CI92728
Benzene	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
Bromobenzene	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
Bromochloromethane	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS692-S4
Date Sampled: 09/24/19 16:10
Percent Solids: 48
Initial Volume: 16.7
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 19I0860
ESS Laboratory Sample ID: 19I0860-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromodichloromethane	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
Bromoform	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
Bromomethane	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
Carbon Disulfide	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
Carbon Tetrachloride	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
Chlorobenzene	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
Chloroethane	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
Chloroform	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
Chloromethane	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
cis-1,2-Dichloroethene	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
cis-1,3-Dichloropropene	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
Dibromochloromethane	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
Dibromomethane	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
Dichlorodifluoromethane	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
Diethyl Ether	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
Di-isopropyl ether	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
Ethyl tertiary-butyl ether	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
Ethylbenzene	**37.7** (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
Hexachlorobutadiene	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
Isopropylbenzene	**6.60** (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
Methyl tert-Butyl Ether	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
Methylene Chloride	ND (1.19)		8260B		1	09/27/19 19:51	C9I0502	CI92728
Naphthalene	**1470** (59.3)		8260B		100	09/30/19 13:51	C9I0502	CI92728
n-Butylbenzene	**3.90** (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
n-Propylbenzene	**1.90** (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
sec-Butylbenzene	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
Styrene	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
tert-Butylbenzene	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
Tertiary-amyl methyl ether	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
Tetrachloroethene	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
Tetrahydrofuran	ND (2.96)		8260B		1	09/27/19 19:51	C9I0502	CI92728
Toluene	**0.901** (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS692-S4
Date Sampled: 09/24/19 16:10
Percent Solids: 48
Initial Volume: 16.7
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 19I0860
ESS Laboratory Sample ID: 19I0860-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
trans-1,2-Dichloroethene	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
trans-1,3-Dichloropropene	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
Trichloroethene	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
Trichlorofluoromethane	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
Vinyl Chloride	ND (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
Xylene O	**14.6** (0.593)		8260B		1	09/27/19 19:51	C9I0502	CI92728
Xylene P,M	**11.1** (1.19)		8260B		1	09/27/19 19:51	C9I0502	CI92728
Xylenes (Total)	**25.8** (1.19)		8260B		1	09/27/19 19:51		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*80 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*31 %*	*SC*	*70-130*
Surrogate: Dibromofluoromethane	*82 %*		*70-130*
Surrogate: Toluene-d8	*46 %*	*SC*	*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS692-S4
Date Sampled: 09/24/19 16:10
Percent Solids: 48
Initial Volume: 2
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 19I0860
ESS Laboratory Sample ID: 19I0860-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: CAD
Prepared: 9/27/19 15:39

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**103000** (1040)		8100M		5	10/01/19 7:57	C9I0519	CI92707

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*202 %*	*SM*	*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS692-S4
Date Sampled: 09/24/19 16:10
Percent Solids: 48
Initial Volume: 2.11
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19I0860
ESS Laboratory Sample ID: 19I0860-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: TJ
Prepared: 9/27/19 15:31

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,2,4-Trichlorobenzene	ND (4.94)		8270D		1	10/01/19 22:09	C9J0009	CI92706
1,2-Dichlorobenzene	ND (4.94)		8270D		1	10/01/19 22:09	C9J0009	CI92706
1,3-Dichlorobenzene	ND (4.94)		8270D		1	10/01/19 22:09	C9J0009	CI92706
1,4-Dichlorobenzene	ND (4.94)		8270D		1	10/01/19 22:09	C9J0009	CI92706
2,4,5-Trichlorophenol	ND (4.94)		8270D		1	10/01/19 22:09	C9J0009	CI92706
2,4,6-Trichlorophenol	ND (4.94)		8270D		1	10/01/19 22:09	C9J0009	CI92706
2,4-Dichlorophenol	ND (4.94)		8270D		1	10/01/19 22:09	C9J0009	CI92706
2,4-Dimethylphenol	ND (4.94)		8270D		1	10/01/19 22:09	C9J0009	CI92706
2,4-Dinitrophenol	ND (24.8)		8270D		1	10/01/19 22:09	C9J0009	CI92706
2,4-Dinitrotoluene	ND (4.94)		8270D		1	10/01/19 22:09	C9J0009	CI92706
2,6-Dinitrotoluene	ND (4.94)		8270D		1	10/01/19 22:09	C9J0009	CI92706
2-Chloronaphthalene	ND (4.94)		8270D		1	10/01/19 22:09	C9J0009	CI92706
2-Chlorophenol	ND (4.94)		8270D		1	10/01/19 22:09	C9J0009	CI92706
2-Methylnaphthalene	**2540** (494)		8270D		100	10/02/19 17:47	C9J0009	CI92706
2-Methylphenol	ND (4.94)		8270D		1	10/01/19 22:09	C9J0009	CI92706
2-Nitrophenol	ND (4.94)		8270D		1	10/01/19 22:09	C9J0009	CI92706
3,3′-Dichlorobenzidine	ND (9.90)		8270D		1	10/01/19 22:09	C9J0009	CI92706
3+4-Methylphenol	ND (9.90)		8270D		1	10/01/19 22:09	C9J0009	CI92706
4-Bromophenyl-phenylether	ND (4.94)		8270D		1	10/01/19 22:09	C9J0009	CI92706
4-Chloroaniline	ND (9.90)		8270D		1	10/01/19 22:09	C9J0009	CI92706
4-Nitrophenol	ND (24.8)		8270D		1	10/01/19 22:09	C9J0009	CI92706
Acenaphthene	**2430** (494)		8270D		100	10/02/19 17:47	C9J0009	CI92706
Acenaphthylene	**77.1** (4.94)		8270D		1	10/01/19 22:09	C9J0009	CI92706
Acetophenone	ND (9.90)		8270D		1	10/01/19 22:09	C9J0009	CI92706
Aniline	ND (24.8)		8270D		1	10/01/19 22:09	C9J0009	CI92706
Anthracene	**794** (49.4)		8270D		10	10/02/19 17:21	C9J0009	CI92706
Azobenzene	ND (4.94)		8270D		1	10/01/19 22:09	C9J0009	CI92706
Benzo(a)anthracene	**569** (49.4)		8270D		10	10/02/19 17:21	C9J0009	CI92706
Benzo(a)pyrene	**382** (24.8)		8270D		10	10/02/19 17:21	C9J0009	CI92706
Benzo(b)fluoranthene	**201** (49.4)		8270D		10	10/02/19 17:21	C9J0009	CI92706
Benzo(g,h,i)perylene	**172** (49.4)		8270D		10	10/02/19 17:21	C9J0009	CI92706
Benzo(k)fluoranthene	**212** (49.4)		8270D		10	10/02/19 17:21	C9J0009	CI92706

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS692-S4
Date Sampled: 09/24/19 16:10
Percent Solids: 48
Initial Volume: 2.11
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19I0860
ESS Laboratory Sample ID: 19I0860-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: TJ
Prepared: 9/27/19 15:31

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
bis(2-Chloroethoxy)methane	ND (4.94)		8270D		1	10/01/19 22:09	C9J0009	CI92706
bis(2-Chloroethyl)ether	ND (4.94)		8270D		1	10/01/19 22:09	C9J0009	CI92706
bis(2-chloroisopropyl)Ether	ND (4.94)		8270D		1	10/01/19 22:09	C9J0009	CI92706
bis(2-Ethylhexyl)phthalate	ND (4.94)		8270D		1	10/01/19 22:09	C9J0009	CI92706
Butylbenzylphthalate	ND (4.94)		8270D		1	10/01/19 22:09	C9J0009	CI92706
Chrysene	**480** (24.8)		8270D		10	10/02/19 17:21	C9J0009	CI92706
Dibenzo(a,h)Anthracene	**55.3** (2.48)		8270D		1	10/01/19 22:09	C9J0009	CI92706
Dibenzofuran	**68.2** (4.94)		8270D		1	10/01/19 22:09	C9J0009	CI92706
Diethylphthalate	ND (4.94)		8270D		1	10/01/19 22:09	C9J0009	CI92706
Dimethylphthalate	ND (4.94)		8270D		1	10/01/19 22:09	C9J0009	CI92706
Di-n-butylphthalate	ND (4.94)		8270D		1	10/01/19 22:09	C9J0009	CI92706
Di-n-octylphthalate	ND (4.94)		8270D		1	10/01/19 22:09	C9J0009	CI92706
Fluoranthene	**1070** (49.4)		8270D		10	10/02/19 17:21	C9J0009	CI92706
Fluorene	**1100** (49.4)		8270D		10	10/02/19 17:21	C9J0009	CI92706
Hexachlorobenzene	ND (4.94)		8270D		1	10/01/19 22:09	C9J0009	CI92706
Hexachlorobutadiene	ND (4.94)		8270D		1	10/01/19 22:09	C9J0009	CI92706
Hexachloroethane	ND (4.94)		8270D		1	10/01/19 22:09	C9J0009	CI92706
Indeno(1,2,3-cd)Pyrene	**98.1** (4.94)		8270D		1	10/01/19 22:09	C9J0009	CI92706
Isophorone	ND (4.94)		8270D		1	10/01/19 22:09	C9J0009	CI92706
Naphthalene	**3090** (494)		8270D		100	10/02/19 17:47	C9J0009	CI92706
Nitrobenzene	ND (4.94)		8270D		1	10/01/19 22:09	C9J0009	CI92706
N-Nitrosodimethylamine	ND (4.94)		8270D		1	10/01/19 22:09	C9J0009	CI92706
Pentachlorophenol	ND (24.8)		8270D		1	10/01/19 22:09	C9J0009	CI92706
Phenanthrene	**3140** (494)		8270D		100	10/02/19 17:47	C9J0009	CI92706
Phenol	ND (4.94)		8270D		1	10/01/19 22:09	C9J0009	CI92706
Pyrene	**1470** (494)		8270D		100	10/02/19 17:47	C9J0009	CI92706
Pyridine	ND (24.8)		8270D		1	10/01/19 22:09	C9J0009	CI92706

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*54 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*186 %*	*S+*	*30-130*
Surrogate: 2-Chlorophenol-d4	*55 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS692-S4
Date Sampled: 09/24/19 16:10
Percent Solids: 48
Initial Volume: 2.11
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 19I0860
ESS Laboratory Sample ID: 19I0860-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: TJ
Prepared: 9/27/19 15:31

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Surrogate: 2-Fluorobiphenyl		*65 %*		*30-130*				
Surrogate: 2-Fluorophenol		*48 %*		*30-130*				
Surrogate: Nitrobenzene-d5		*101 %*		*30-130*				
Surrogate: Phenol-d6		*56 %*		*30-130*				
Surrogate: p-Terphenyl-d14		*127 %*		*30-130*				

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS692-S4
Date Sampled: 09/24/19 16:10
Percent Solids: 48

ESS Laboratory Work Order: 19I0860
ESS Laboratory Sample ID: 19I0860-01
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Sulfate	**WL** ND (103)		9038		1	EEM	10/01/19 12:45	mg/kg dry	CJ90119
Sulfide	**WL** ND (1.0)		9030B		1	JLK	09/30/19 19:37	mg/kg dry	CI93047
Total Organic Carbon (Average)	**133000** (122)		LK		1	CCP	10/03/19 14:45	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS692-S4
Date Sampled: 09/24/19 16:10

ESS Laboratory Work Order: 19I0860
ESS Laboratory Sample ID: 19I0860-01
Sample Matrix: Sediment

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Grain Size	**See Attached** (N/A)								
Sulfur	**2590** (100)		6010		1	SUB	10/03/19 0:00	mg/kg	CJ90361

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS692R-S1
Date Sampled: 09/25/19 17:40
Percent Solids: 57

ESS Laboratory Work Order: 19I0860
ESS Laboratory Sample ID: 19I0860-02
Sample Matrix: Sediment
Units: mg/L

Extraction Method: 1311

1311 TCLP Metals

Analyte	Results (MRL)	MDL	Method	TCLP Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Lead	**0.642** (0.050)		1311/6010C		1	KJK	10/04/19 7:57	50	50	CJ90356

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS692R-S1
Date Sampled: 09/25/19 17:40
Percent Solids: 57
Initial Volume: 2.03
Final Volume: 5
Extraction Method: 3546

ESS Laboratory Work Order: 19I0860
ESS Laboratory Sample ID: 19I0860-02
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: DMC
Prepared: 9/30/19 14:05

8081B Organochlorine Pesticides

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
4,4´-DDD	ND (0.0430)		8081B		1	10/01/19 15:00	C9J0005	CI93018
4,4´-DDE	ND (0.0430)		8081B		1	10/01/19 15:00	C9J0005	CI93018
4,4´-DDT	ND (0.0430)		8081B		1	10/01/19 15:00	C9J0005	CI93018
Aldrin	ND (0.0430)		8081B		1	10/01/19 15:00	C9J0005	CI93018
alpha-BHC	ND (0.0430)		8081B		1	10/01/19 15:00	C9J0005	CI93018
alpha-Chlordane	ND (0.0430)		8081B		1	10/01/19 15:00	C9J0005	CI93018
beta-BHC	ND (0.0430)		8081B		1	10/01/19 15:00	C9J0005	CI93018
Chlordane (Total)	ND (0.344)		8081B		1	10/01/19 15:00	C9J0005	CI93018
delta-BHC	ND (0.0430)		8081B		1	10/01/19 15:00	C9J0005	CI93018
Dieldrin	ND (0.0430)		8081B		1	10/01/19 15:00	C9J0005	CI93018
Endosulfan I	ND (0.0430)		8081B		1	10/01/19 15:00	C9J0005	CI93018
Endosulfan II	ND (0.0430)		8081B		1	10/01/19 15:00	C9J0005	CI93018
Endosulfan Sulfate	ND (0.0430)		8081B		1	10/01/19 15:00	C9J0005	CI93018
Endrin	ND (0.0430)		8081B		1	10/01/19 15:00	C9J0005	CI93018
Endrin Ketone	ND (0.0430)		8081B		1	10/01/19 15:00	C9J0005	CI93018
gamma-BHC (Lindane)	ND (0.0258)		8081B		1	10/01/19 15:00	C9J0005	CI93018
gamma-Chlordane	ND (0.0430)		8081B		1	10/01/19 15:00	C9J0005	CI93018
Heptachlor	ND (0.0430)		8081B		1	10/01/19 15:00	C9J0005	CI93018
Heptachlor Epoxide	ND (0.0430)		8081B		1	10/01/19 15:00	C9J0005	CI93018
Hexachlorobenzene	ND (0.0430)		8081B		1	10/01/19 15:00	C9J0005	CI93018
Methoxychlor	ND (0.0430)		8081B		1	10/01/19 15:00	C9J0005	CI93018
Toxaphene	ND (2.15)		8081B		1	10/01/19 15:00	C9J0005	CI93018

	%Recovery	*Qualifier*	*Limits*
Surrogate: Decachlorobiphenyl	*66 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*67 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*64 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*71 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS692R-S1
Date Sampled: 09/25/19 17:40
Percent Solids: 57
Initial Volume: 5.57
Final Volume: 2
Extraction Method: 3540C

ESS Laboratory Work Order: 19I0860
ESS Laboratory Sample ID: 19I0860-02
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: DMC
Prepared: 9/27/19 15:55

8082 Polychlorinated Biphenyls (PCB) / Congeners

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
BZ#8	ND (0.00254)		8082A-Cong		1	09/30/19 14:54	C9I0521	CI92609
BZ#18	ND (0.00254)		8082A-Cong		1	09/30/19 14:54	C9I0521	CI92609
BZ#28	ND (0.00254)		8082A-Cong		1	09/30/19 14:54	C9I0521	CI92609
BZ#44	ND (0.00254)		8082A-Cong		1	09/30/19 14:54	C9I0521	CI92609
BZ#52 [2C]	ND (0.00254)		8082A-Cong		1	09/30/19 14:54	C9I0521	CI92609
BZ#66	ND (0.00254)		8082A-Cong		1	09/30/19 14:54	C9I0521	CI92609
BZ#101	ND (0.00254)		8082A-Cong		1	09/30/19 14:54	C9I0521	CI92609
BZ#105	ND (0.00254)		8082A-Cong		1	09/30/19 14:54	C9I0521	CI92609
BZ#118	ND (0.00254)		8082A-Cong		1	09/30/19 14:54	C9I0521	CI92609
BZ#128	ND (0.00254)		8082A-Cong		1	09/30/19 14:54	C9I0521	CI92609
BZ#138	ND (0.00254)		8082A-Cong		1	09/30/19 14:54	C9I0521	CI92609
BZ#153	ND (0.00254)		8082A-Cong		1	09/30/19 14:54	C9I0521	CI92609
BZ#170	ND (0.00254)		8082A-Cong		1	09/30/19 14:54	C9I0521	CI92609
BZ#180	ND (0.00254)		8082A-Cong		1	09/30/19 14:54	C9I0521	CI92609
BZ#187	ND (0.00254)		8082A-Cong		1	09/30/19 14:54	C9I0521	CI92609
BZ#195	ND (0.00254)		8082A-Cong		1	09/30/19 14:54	C9I0521	CI92609
BZ#206	ND (0.00254)		8082A-Cong		1	09/30/19 14:54	C9I0521	CI92609
BZ#209	ND (0.00254)		8082A-Cong		1	09/30/19 14:54	C9I0521	CI92609

	%Recovery	Qualifier	Limits
Surrogate: Tetrachloro-m-xylene	*72 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*76 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS692R-S1
Date Sampled: 09/25/19 17:40
Percent Solids: 57
Initial Volume: 5.03
Final Volume: 4
Extraction Method: 3546

ESS Laboratory Work Order: 19I0860
ESS Laboratory Sample ID: 19I0860-02
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: DMC
Prepared: 9/30/19 17:10

8151A Chlorinated Herbicides

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2,4,5-T [2C]	ND (0.033)		8151A		1	10/03/19 11:37	C9J0058	CI93058
2,4,5-TP (Silvex)	ND (0.033)		8151A		1	10/03/19 11:37	C9J0058	CI93058
2,4-D	ND (0.163)		8151A		1	10/03/19 11:37	C9J0058	CI93058
2,4-DB	ND (0.165)		8151A		1	10/03/19 11:37	C9J0058	CI93058
Dalapon	ND (0.158)		8151A		1	10/03/19 11:37	C9J0058	CI93058
Dicamba	ND (0.033)		8151A		1	10/03/19 11:37	C9J0058	CI93058
Dichlorprop	ND (0.163)		8151A		1	10/03/19 11:37	C9J0058	CI93058
Dinoseb	ND (0.165)		8151A		1	10/03/19 11:37	C9J0058	CI93058
MCPA	ND (8.06)		8151A		1	10/03/19 11:37	C9J0058	CI93058
MCPP	# ND (8.15)		8151A		1	10/03/19 11:37	C9J0058	CI93058

	%Recovery	Qualifier	Limits
Surrogate: DCAA	*129 %*		*30-150*
Surrogate: DCAA [2C]	*129 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS692R-S1
Date Sampled: 09/25/19 17:40
Percent Solids: 57

ESS Laboratory Work Order: 19I0860
ESS Laboratory Sample ID: 19I0860-02
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Conductivity	**WL 149** (5)		9050A		1	CCP	09/30/19 10:14	umhos/cm	CI93026
Corrosivity (pH)	**5.83** (N/A)		9045		1	JLK	09/26/19 21:41	S.U.	CI92623
Corrosivity (pH) Sample Temp	**Soil pH measured in water at 20.5 ºC.**								
Flashpoint	**> 200** (N/A)		1010		1	JLK	10/01/19 16:18	°F	CI93046
Reactive Cyanide	ND (2.0)		7.3.3.2		1	EEM	09/27/19 10:58	mg/kg	CI92616
Reactive Sulfide	ND (2.0)		7.3.4.1		1	EEM	09/27/19 10:58	mg/kg	CI92616
Total Cyanide	ND (1.73)		9014		1	EEM	09/30/19 11:25	mg/kg dry	CI93024

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS692R-S1
Date Sampled: 09/25/19 17:40
Percent Solids: 57
Initial Volume: 5.34
Final Volume: 2
Extraction Method: 3546

ESS Laboratory Work Order: 19I0860
ESS Laboratory Sample ID: 19I0860-02
Sample Matrix: Sediment
Units: mg/kg dry

Prepared: 9/27/19 10:30

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	**844** (245)		MADEP-EPH		1	CAD	09/28/19 5:59	C9I0432	CI92604
C19-C36 Aliphatics1	**878** (245)		MADEP-EPH		1	CAD	09/28/19 5:59	C9I0432	CI92604
C11-C22 Unadjusted Aromatics1	**4500** (245)		EPH8270		1	VSC	09/28/19 7:05	C9I0491	CI92604
C11-C22 Aromatics1,2	**1450** (340)		EPH8270			IBM	10/02/19 23:27		[CALC]
2-Methylnaphthalene	**244** (3.27)		EPH8270SIM		10	IBM	10/02/19 22:39	C9J0071	CI92604
Acenaphthene	**725** (32.7)		EPH8270SIM		100	IBM	10/02/19 23:27	C9J0071	CI92604
Naphthalene	**175** (3.27)		EPH8270SIM		10	IBM	10/02/19 22:39	C9J0071	CI92604
Phenanthrene	**928** (32.7)		EPH8270SIM		100	IBM	10/02/19 23:27	C9J0071	CI92604
Acenaphthylene	**8.43** (0.327)		EPH8270SIM		1	IBM	10/02/19 21:52	C9J0071	CI92604
Anthracene	**152** (1.31)		EPH8270SIM		10	IBM	10/02/19 22:39	C9J0071	CI92604
Benzo(a)anthracene	**72.9** (1.31)		EPH8270SIM		10	IBM	10/02/19 22:39	C9J0071	CI92604
Benzo(a)pyrene	**48.7** (1.31)		EPH8270SIM		10	IBM	10/02/19 22:39	C9J0071	CI92604
Benzo(b)fluoranthene	**38.0** (3.27)		EPH8270SIM		10	IBM	10/02/19 22:39	C9J0071	CI92604
Benzo(g,h,i)perylene	**19.3** (0.327)		EPH8270SIM		1	IBM	10/02/19 21:52	C9J0071	CI92604
Benzo(k)fluoranthene	**11.3** (0.327)		EPH8270SIM		1	IBM	10/02/19 21:52	C9J0071	CI92604
Chrysene	**70.1** (3.27)		EPH8270SIM		10	IBM	10/02/19 22:39	C9J0071	CI92604
Dibenzo(a,h)Anthracene	**5.93** (0.131)		EPH8270SIM		1	IBM	10/02/19 21:52	C9J0071	CI92604
Fluoranthene	**143** (3.27)		EPH8270SIM		10	IBM	10/02/19 22:39	C9J0071	CI92604
Fluorene	**162** (1.31)		EPH8270SIM		10	IBM	10/02/19 22:39	C9J0071	CI92604
Indeno(1,2,3-cd)Pyrene	**17.5** (3.27)		EPH8270SIM		10	IBM	10/02/19 22:39	C9J0071	CI92604
Pyrene	**227** (3.27)		EPH8270SIM		10	IBM	10/02/19 22:39	C9J0071	CI92604

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1-Chlorooctadecane	*80 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*88 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*77 %*		*40-140*
Surrogate: O-Terphenyl	*58 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS692R-S1
Date Sampled: 09/25/19 17:40

ESS Laboratory Work Order: 19I0860
ESS Laboratory Sample ID: 19I0860-02
Sample Matrix: Sediment

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Organic Content	**See Attached** (N/A)								

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS692R-S1
Date Sampled: 09/25/19 17:40
Percent Solids: 57
Initial Volume: 100
Final Volume: 2000
Extraction Method: 1311

ESS Laboratory Work Order: 19I0860
ESS Laboratory Sample ID: 19I0860-02
Sample Matrix: Sediment
Units: °C
Analyst: BJV
Prepared: 10/2/19 18:45

TCLP Extraction by 1311

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Batch
Temperature (Min C)	**19.9** (N/A)		1311		1	BJV	10/03/19 11:00	CJ90249
Temperature (Max C)	**21.5** (N/A)		1311		1	BJV	10/03/19 11:00	CJ90249
Temperature (Range)	**Temperature is not within 23 +/-2 ºC.** (N/A)							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS692R-S1 Dried
Date Sampled: 09/25/19 17:40
Percent Solids: 100

ESS Laboratory Work Order: 19I0860
ESS Laboratory Sample ID: 19I0860-03
Sample Matrix: Sediment
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Arsenic	**11.1** (0.84)		6010C		1	KJK	10/01/19 18:09	5.94	100	CI93053
Barium	**64.9** (0.84)		6010C		1	KJK	10/01/19 18:09	5.94	100	CI93053
Cadmium	**0.38** (0.17)		6010C		1	KJK	10/01/19 18:09	5.94	100	CI93053
Chromium	**24.6** (0.34)		6010C		1	KJK	10/01/19 18:09	5.94	100	CI93053
Copper	**169** (0.84)		6010C		1	KJK	10/01/19 18:09	5.94	100	CI93053
Lead	**268** (1.69)		6010C		1	KJK	10/01/19 18:09	5.94	100	CI93053
Mercury	**0.814** (0.209)		7471B		25	MKS	10/01/19 11:59	2.37	40	CI93054
Nickel	**13.2** (0.84)		6010C		1	KJK	10/01/19 18:09	5.94	100	CI93053
Selenium	**0.62** (0.17)		6020A		1	KJK	10/03/19 18:18	5.94	100	CI93053
Silver	**3.71** (0.17)		6010C		1	KJK	10/01/19 18:09	5.94	100	CI93053
Zinc	**182** (0.84)		6010C		1	KJK	10/01/19 18:09	5.94	100	CI93053

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0860

Quality Control Data

Total Metals

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch CI93053 - 3050B										
Blank										
Arsenic	ND	2.50	mg/kg wet							
Barium	ND	2.50	mg/kg wet							
Cadmium	ND	0.50	mg/kg wet							
Chromium	ND	1.00	mg/kg wet							
Copper	ND	2.50	mg/kg wet							
Lead	ND	5.00	mg/kg wet							
Nickel	ND	2.50	mg/kg wet							
Silver	ND	0.50	mg/kg wet							
Zinc	ND	2.50	mg/kg wet							
Blank										
Selenium	ND	0.50	mg/kg wet							
LCS										
Arsenic	137	8.62	mg/kg wet	128.0		107	80-120			
Barium	490	8.62	mg/kg wet	536.0		91	80-120			
Cadmium	92.9	1.72	mg/kg wet	99.00		94	80-120			
Chromium	118	3.45	mg/kg wet	116.0		102	80-120			
Copper	90.6	8.62	mg/kg wet	89.60		101	80-120			
Lead	298	17.2	mg/kg wet	277.0		107	80-120			
Nickel	111	8.62	mg/kg wet	107.0		104	80-120			
Silver	62.6	1.72	mg/kg wet	64.30		97	80-120			
Zinc	558	8.62	mg/kg wet	561.0		99	80-120			
LCS										
Selenium	237	7.81	mg/kg wet	281.0		84	80-120			
LCS Dup										
Arsenic	138	8.77	mg/kg wet	128.0		108	80-120	0.2	20	
Barium	560	8.77	mg/kg wet	536.0		104	80-120	13	20	
Cadmium	93.1	1.75	mg/kg wet	99.00		94	80-120	0.1	20	
Chromium	118	3.51	mg/kg wet	116.0		102	80-120	0.4	20	
Copper	91.3	8.77	mg/kg wet	89.60		102	80-120	0.8	20	
Lead	300	17.5	mg/kg wet	277.0		108	80-120	0.9	20	
Nickel	111	8.77	mg/kg wet	107.0		104	80-120	0.3	20	
Silver	62.6	1.75	mg/kg wet	64.30		97	80-120	0.02	20	
Zinc	557	8.77	mg/kg wet	561.0		99	80-120	0.2	20	
LCS Dup										
Selenium	259	8.06	mg/kg wet	281.0		92	80-120	9	30	
Batch CI93054 - 7471B										
Blank										
Mercury	ND	0.033	mg/kg wet							
LCS										
Mercury	2.84	0.309	mg/kg wet	3.120		91	80-120			
LCS Dup										
Mercury	3.32	0.309	mg/kg wet	3.120		106	80-120	16	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0860

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
1311 TCLP Metals										
Batch CJ90356 - 1311										
Blank										
Lead	ND	0.050	mg/L							
LCS										
Lead	0.498	0.050	mg/L	0.5000		100	80-120			
LCS Dup										
Lead	0.522	0.050	mg/L	0.5000		104	80-120	5	20	
5035/8260B Volatile Organic Compounds / Methanol										
Batch CI92728 - 5035										
Blank										
1,1,1,2-Tetrachloroethane	ND	0.200	mg/kg wet							
1,1,1-Trichloroethane	ND	0.200	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.200	mg/kg wet							
1,1,2-Trichloroethane	ND	0.200	mg/kg wet							
1,1-Dichloroethane	ND	0.200	mg/kg wet							
1,1-Dichloroethene	ND	0.200	mg/kg wet							
1,1-Dichloropropene	ND	0.200	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.200	mg/kg wet							
1,2,3-Trichloropropane	ND	0.200	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.200	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.200	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	1.00	mg/kg wet							
1,2-Dibromoethane	ND	0.200	mg/kg wet							
1,2-Dichlorobenzene	ND	0.200	mg/kg wet							
1,2-Dichloroethane	ND	0.200	mg/kg wet							
1,2-Dichloropropane	ND	0.200	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.200	mg/kg wet							
1,3-Dichlorobenzene	ND	0.200	mg/kg wet							
1,3-Dichloropropane	ND	0.200	mg/kg wet							
1,4-Dichlorobenzene	ND	0.200	mg/kg wet							
1,4-Dioxane - Screen	ND	40.0	mg/kg wet							
2,2-Dichloropropane	ND	0.200	mg/kg wet							
2-Butanone	ND	1.00	mg/kg wet							
2-Chlorotoluene	ND	0.200	mg/kg wet							
2-Hexanone	ND	1.00	mg/kg wet							
4-Chlorotoluene	ND	0.200	mg/kg wet							
4-Isopropyltoluene	ND	0.200	mg/kg wet							
4-Methyl-2-Pentanone	ND	1.00	mg/kg wet							
Acetone	ND	1.00	mg/kg wet							
Benzene	ND	0.200	mg/kg wet							
Bromobenzene	ND	0.200	mg/kg wet							
Bromochloromethane	ND	0.200	mg/kg wet							
Bromodichloromethane	ND	0.200	mg/kg wet							
Bromoform	ND	0.200	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ ESS Laboratory Work Order: 19I0860

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch CI92728 - 5035										
Bromomethane	ND	0.200	mg/kg wet							
Carbon Disulfide	ND	0.200	mg/kg wet							
Carbon Tetrachloride	ND	0.200	mg/kg wet							
Chlorobenzene	ND	0.200	mg/kg wet							
Chloroethane	ND	0.200	mg/kg wet							
Chloroform	ND	0.200	mg/kg wet							
Chloromethane	ND	0.200	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.200	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.200	mg/kg wet							
Dibromochloromethane	ND	0.200	mg/kg wet							
Dibromomethane	ND	0.200	mg/kg wet							
Dichlorodifluoromethane	ND	0.200	mg/kg wet							
Diethyl Ether	ND	0.200	mg/kg wet							
Di-isopropyl ether	ND	0.200	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.200	mg/kg wet							
Ethylbenzene	ND	0.200	mg/kg wet							
Hexachlorobutadiene	ND	0.200	mg/kg wet							
Isopropylbenzene	ND	0.200	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.200	mg/kg wet							
Methylene Chloride	ND	0.400	mg/kg wet							
Naphthalene	ND	0.200	mg/kg wet							
n-Butylbenzene	ND	0.200	mg/kg wet							
n-Propylbenzene	ND	0.200	mg/kg wet							
sec-Butylbenzene	ND	0.200	mg/kg wet							
Styrene	ND	0.200	mg/kg wet							
tert-Butylbenzene	ND	0.200	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.200	mg/kg wet							
Tetrachloroethene	ND	0.200	mg/kg wet							
Tetrahydrofuran	ND	1.00	mg/kg wet							
Toluene	ND	0.200	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.200	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.200	mg/kg wet							
Trichloroethene	ND	0.200	mg/kg wet							
Trichlorofluoromethane	ND	0.200	mg/kg wet							
Vinyl Chloride	ND	0.200	mg/kg wet							
Xylene O	ND	0.200	mg/kg wet							
Xylene P,M	ND	0.400	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*4.61*		mg/kg wet	*5.000*		*92*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*4.24*		mg/kg wet	*5.000*		*85*	*70-130*			
Surrogate: Dibromofluoromethane	*4.64*		mg/kg wet	*5.000*		*93*	*70-130*			
Surrogate: Toluene-d8	*4.19*		mg/kg wet	*5.000*		*84*	*70-130*			
LCS										
1,1,1,2-Tetrachloroethane	1.56	0.200	mg/kg wet	2.000		78	70-130			
1,1,1-Trichloroethane	2.19	0.200	mg/kg wet	2.000		110	70-130			
1,1,2,2-Tetrachloroethane	2.01	0.200	mg/kg wet	2.000		100	70-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0860

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch CI92728 - 5035										
1,1,2-Trichloroethane	1.94	0.200	mg/kg wet	2.000		97	70-130			
1,1-Dichloroethane	1.98	0.200	mg/kg wet	2.000		99	70-130			
1,1-Dichloroethene	2.10	0.200	mg/kg wet	2.000		105	70-130			
1,1-Dichloropropene	2.02	0.200	mg/kg wet	2.000		101	70-130			
1,2,3-Trichlorobenzene	1.90	0.200	mg/kg wet	2.000		95	70-130			
1,2,3-Trichloropropane	1.55	0.200	mg/kg wet	2.000		78	70-130			
1,2,4-Trichlorobenzene	1.87	0.200	mg/kg wet	2.000		94	70-130			
1,2,4-Trimethylbenzene	1.95	0.200	mg/kg wet	2.000		97	70-130			
1,2-Dibromo-3-Chloropropane	1.54	1.00	mg/kg wet	2.000		77	70-130			
1,2-Dibromoethane	1.80	0.200	mg/kg wet	2.000		90	70-130			
1,2-Dichlorobenzene	1.78	0.200	mg/kg wet	2.000		89	70-130			
1,2-Dichloroethane	1.99	0.200	mg/kg wet	2.000		100	70-130			
1,2-Dichloropropane	1.82	0.200	mg/kg wet	2.000		91	70-130			
1,3,5-Trimethylbenzene	1.92	0.200	mg/kg wet	2.000		96	70-130			
1,3-Dichlorobenzene	1.82	0.200	mg/kg wet	2.000		91	70-130			
1,3-Dichloropropane	1.84	0.200	mg/kg wet	2.000		92	70-130			
1,4-Dichlorobenzene	1.87	0.200	mg/kg wet	2.000		94	70-130			
1,4-Dioxane - Screen	64.3	40.0	mg/kg wet	40.00		161	44-241			
2,2-Dichloropropane	2.11	0.200	mg/kg wet	2.000		105	70-130			
2-Butanone	9.63	1.00	mg/kg wet	10.00		96	70-130			
2-Chlorotoluene	1.95	0.200	mg/kg wet	2.000		98	70-130			
2-Hexanone	8.04	1.00	mg/kg wet	10.00		80	70-130			
4-Chlorotoluene	1.90	0.200	mg/kg wet	2.000		95	70-130			
4-Isopropyltoluene	1.99	0.200	mg/kg wet	2.000		100	70-130			
4-Methyl-2-Pentanone	8.78	1.00	mg/kg wet	10.00		88	70-130			
Acetone	8.84	1.00	mg/kg wet	10.00		88	70-130			
Benzene	2.00	0.200	mg/kg wet	2.000		100	70-130			
Bromobenzene	1.87	0.200	mg/kg wet	2.000		94	70-130			
Bromochloromethane	1.96	0.200	mg/kg wet	2.000		98	70-130			
Bromodichloromethane	1.73	0.200	mg/kg wet	2.000		86	70-130			
Bromoform	1.70	0.200	mg/kg wet	2.000		85	70-130			
Bromomethane	1.79	0.200	mg/kg wet	2.000		90	70-130			
Carbon Disulfide	2.07	0.200	mg/kg wet	2.000		104	70-130			
Carbon Tetrachloride	1.99	0.200	mg/kg wet	2.000		99	70-130			
Chlorobenzene	1.81	0.200	mg/kg wet	2.000		91	70-130			
Chloroethane	1.55	0.200	mg/kg wet	2.000		78	70-130			
Chloroform	2.07	0.200	mg/kg wet	2.000		103	70-130			
Chloromethane	1.63	0.200	mg/kg wet	2.000		82	70-130			
cis-1,2-Dichloroethene	1.92	0.200	mg/kg wet	2.000		96	70-130			
cis-1,3-Dichloropropene	1.67	0.200	mg/kg wet	2.000		84	70-130			
Dibromochloromethane	1.73	0.200	mg/kg wet	2.000		87	70-130			
Dibromomethane	1.94	0.200	mg/kg wet	2.000		97	70-130			
Dichlorodifluoromethane	1.34	0.200	mg/kg wet	2.000		67	70-130			B-
Diethyl Ether	1.67	0.200	mg/kg wet	2.000		84	70-130			
Di-isopropyl ether	1.91	0.200	mg/kg wet	2.000		95	70-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0860

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch CI92728 - 5035										
Ethyl tertiary-butyl ether	1.79	0.200	mg/kg wet	2.000		89	70-130			
Ethylbenzene	1.83	0.200	mg/kg wet	2.000		92	70-130			
Hexachlorobutadiene	1.86	0.200	mg/kg wet	2.000		93	70-130			
Isopropylbenzene	1.88	0.200	mg/kg wet	2.000		94	70-130			
Methyl tert-Butyl Ether	1.93	0.200	mg/kg wet	2.000		97	70-130			
Methylene Chloride	1.99	0.400	mg/kg wet	2.000		100	70-130			
Naphthalene	1.96	0.200	mg/kg wet	2.000		98	70-130			
n-Butylbenzene	2.02	0.200	mg/kg wet	2.000		101	70-130			
n-Propylbenzene	1.97	0.200	mg/kg wet	2.000		99	70-130			
sec-Butylbenzene	1.96	0.200	mg/kg wet	2.000		98	70-130			
Styrene	1.81	0.200	mg/kg wet	2.000		90	70-130			
tert-Butylbenzene	1.99	0.200	mg/kg wet	2.000		100	70-130			
Tertiary-amyl methyl ether	1.89	0.200	mg/kg wet	2.000		94	70-130			
Tetrachloroethene	1.29	0.200	mg/kg wet	2.000		64	70-130			B-
Tetrahydrofuran	1.94	1.00	mg/kg wet	2.000		97	70-130			
Toluene	2.03	0.200	mg/kg wet	2.000		101	70-130			
trans-1,2-Dichloroethene	2.14	0.200	mg/kg wet	2.000		107	70-130			
trans-1,3-Dichloropropene	1.66	0.200	mg/kg wet	2.000		83	70-130			
Trichloroethene	2.00	0.200	mg/kg wet	2.000		100	70-130			
Trichlorofluoromethane	1.99	0.200	mg/kg wet	2.000		100	70-130			
Vinyl Chloride	1.72	0.200	mg/kg wet	2.000		86	70-130			
Xylene O	1.78	0.200	mg/kg wet	2.000		89	70-130			
Xylene P,M	3.69	0.400	mg/kg wet	4.000		92	70-130			
Surrogate: 1,2-Dichloroethane-d4	*5.43*		mg/kg wet	*5.000*		*109*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*4.91*		mg/kg wet	*5.000*		*98*	*70-130*			
Surrogate: Dibromofluoromethane	*5.37*		mg/kg wet	*5.000*		*107*	*70-130*			
Surrogate: Toluene-d8	*4.72*		mg/kg wet	*5.000*		*94*	*70-130*			
LCS Dup										
1,1,1,2-Tetrachloroethane	1.58	0.200	mg/kg wet	2.000		79	70-130	1	20	
1,1,1-Trichloroethane	2.16	0.200	mg/kg wet	2.000		108	70-130	2	20	
1,1,2,2-Tetrachloroethane	2.00	0.200	mg/kg wet	2.000		100	70-130	0.1	20	
1,1,2-Trichloroethane	2.07	0.200	mg/kg wet	2.000		104	70-130	7	20	
1,1-Dichloroethane	2.12	0.200	mg/kg wet	2.000		106	70-130	7	20	
1,1-Dichloroethene	2.15	0.200	mg/kg wet	2.000		108	70-130	3	20	
1,1-Dichloropropene	2.04	0.200	mg/kg wet	2.000		102	70-130	0.9	20	
1,2,3-Trichlorobenzene	1.67	0.200	mg/kg wet	2.000		84	70-130	13	20	
1,2,3-Trichloropropane	1.57	0.200	mg/kg wet	2.000		78	70-130	1	20	
1,2,4-Trichlorobenzene	1.88	0.200	mg/kg wet	2.000		94	70-130	0.6	20	
1,2,4-Trimethylbenzene	1.97	0.200	mg/kg wet	2.000		99	70-130	1	20	
1,2-Dibromo-3-Chloropropane	1.56	1.00	mg/kg wet	2.000		78	70-130	2	20	
1,2-Dibromoethane	1.94	0.200	mg/kg wet	2.000		97	70-130	7	20	
1,2-Dichlorobenzene	1.81	0.200	mg/kg wet	2.000		90	70-130	1	20	
1,2-Dichloroethane	2.03	0.200	mg/kg wet	2.000		101	70-130	2	20	
1,2-Dichloropropane	1.86	0.200	mg/kg wet	2.000		93	70-130	2	20	
1,3,5-Trimethylbenzene	1.90	0.200	mg/kg wet	2.000		95	70-130	1	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0860

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch CI92728 - 5035										
1,3-Dichlorobenzene	1.87	0.200	mg/kg wet	2.000		93	70-130	2	20	
1,3-Dichloropropane	1.88	0.200	mg/kg wet	2.000		94	70-130	2	20	
1,4-Dichlorobenzene	1.99	0.200	mg/kg wet	2.000		99	70-130	6	20	
1,4-Dioxane - Screen	55.8	40.0	mg/kg wet	40.00		139	44-241	14	200	
2,2-Dichloropropane	2.19	0.200	mg/kg wet	2.000		109	70-130	4	20	
2-Butanone	10.0	1.00	mg/kg wet	10.00		100	70-130	4	20	
2-Chlorotoluene	1.89	0.200	mg/kg wet	2.000		95	70-130	3	20	
2-Hexanone	7.52	1.00	mg/kg wet	10.00		75	70-130	7	20	
4-Chlorotoluene	1.93	0.200	mg/kg wet	2.000		96	70-130	2	20	
4-Isopropyltoluene	1.88	0.200	mg/kg wet	2.000		94	70-130	6	20	
4-Methyl-2-Pentanone	8.63	1.00	mg/kg wet	10.00		86	70-130	2	20	
Acetone	8.90	1.00	mg/kg wet	10.00		89	70-130	0.6	20	
Benzene	1.97	0.200	mg/kg wet	2.000		98	70-130	2	20	
Bromobenzene	1.90	0.200	mg/kg wet	2.000		95	70-130	2	20	
Bromochloromethane	1.93	0.200	mg/kg wet	2.000		97	70-130	2	20	
Bromodichloromethane	1.78	0.200	mg/kg wet	2.000		89	70-130	3	20	
Bromoform	1.71	0.200	mg/kg wet	2.000		86	70-130	0.9	20	
Bromomethane	1.86	0.200	mg/kg wet	2.000		93	70-130	4	20	
Carbon Disulfide	2.12	0.200	mg/kg wet	2.000		106	70-130	2	20	
Carbon Tetrachloride	1.91	0.200	mg/kg wet	2.000		96	70-130	4	20	
Chlorobenzene	1.84	0.200	mg/kg wet	2.000		92	70-130	1	20	
Chloroethane	1.48	0.200	mg/kg wet	2.000		74	70-130	5	20	
Chloroform	2.04	0.200	mg/kg wet	2.000		102	70-130	1	20	
Chloromethane	1.72	0.200	mg/kg wet	2.000		86	70-130	5	20	
cis-1,2-Dichloroethene	2.09	0.200	mg/kg wet	2.000		105	70-130	9	20	
cis-1,3-Dichloropropene	1.70	0.200	mg/kg wet	2.000		85	70-130	2	20	
Dibromochloromethane	1.80	0.200	mg/kg wet	2.000		90	70-130	4	20	
Dibromomethane	2.00	0.200	mg/kg wet	2.000		100	70-130	3	20	
Dichlorodifluoromethane	1.40	0.200	mg/kg wet	2.000		70	70-130	4	20	
Diethyl Ether	1.82	0.200	mg/kg wet	2.000		91	70-130	9	20	
Di-isopropyl ether	1.96	0.200	mg/kg wet	2.000		98	70-130	3	20	
Ethyl tertiary-butyl ether	1.82	0.200	mg/kg wet	2.000		91	70-130	2	20	
Ethylbenzene	1.90	0.200	mg/kg wet	2.000		95	70-130	4	20	
Hexachlorobutadiene	1.83	0.200	mg/kg wet	2.000		91	70-130	2	20	
Isopropylbenzene	1.84	0.200	mg/kg wet	2.000		92	70-130	2	20	
Methyl tert-Butyl Ether	2.06	0.200	mg/kg wet	2.000		103	70-130	7	20	
Methylene Chloride	2.08	0.400	mg/kg wet	2.000		104	70-130	4	20	
Naphthalene	1.84	0.200	mg/kg wet	2.000		92	70-130	6	20	
n-Butylbenzene	1.94	0.200	mg/kg wet	2.000		97	70-130	4	20	
n-Propylbenzene	1.96	0.200	mg/kg wet	2.000		98	70-130	0.7	20	
sec-Butylbenzene	1.94	0.200	mg/kg wet	2.000		97	70-130	1	20	
Styrene	1.91	0.200	mg/kg wet	2.000		96	70-130	6	20	
tert-Butylbenzene	1.90	0.200	mg/kg wet	2.000		95	70-130	5	20	
Tertiary-amyl methyl ether	2.00	0.200	mg/kg wet	2.000		100	70-130	6	20	
Tetrachloroethene	1.36	0.200	mg/kg wet	2.000		68	70-130	6	20	B-

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ ESS Laboratory Work Order: 19I0860

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch CI92728 - 5035										
Tetrahydrofuran	1.98	1.00	mg/kg wet	2.000		99	70-130	2	20	
Toluene	2.01	0.200	mg/kg wet	2.000		101	70-130	0.6	20	
trans-1,2-Dichloroethene	2.25	0.200	mg/kg wet	2.000		112	70-130	5	20	
trans-1,3-Dichloropropene	1.61	0.200	mg/kg wet	2.000		81	70-130	3	20	
Trichloroethene	1.94	0.200	mg/kg wet	2.000		97	70-130	3	20	
Trichlorofluoromethane	1.98	0.200	mg/kg wet	2.000		99	70-130	0.6	20	
Vinyl Chloride	1.70	0.200	mg/kg wet	2.000		85	70-130	2	20	
Xylene O	1.83	0.200	mg/kg wet	2.000		91	70-130	2	20	
Xylene P,M	3.86	0.400	mg/kg wet	4.000		96	70-130	5	20	
Surrogate: 1,2-Dichloroethane-d4	*5.44*		mg/kg wet	*5.000*		*109*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*5.02*		mg/kg wet	*5.000*		*100*	*70-130*			
Surrogate: Dibromofluoromethane	*5.42*		mg/kg wet	*5.000*		*108*	*70-130*			
Surrogate: Toluene-d8	*4.94*		mg/kg wet	*5.000*		*99*	*70-130*			
8081B Organochlorine Pesticides										
Batch CI93018 - 3546										
Blank										
4,4´-DDD	ND	0.0025	mg/kg wet							
4,4´-DDD [2C]	ND	0.0025	mg/kg wet							
4,4´-DDE	ND	0.0025	mg/kg wet							
4,4´-DDE [2C]	ND	0.0025	mg/kg wet							
4,4´-DDT	ND	0.0025	mg/kg wet							
4,4´-DDT [2C]	ND	0.0025	mg/kg wet							
Aldrin	ND	0.0025	mg/kg wet							
Aldrin [2C]	ND	0.0025	mg/kg wet							
alpha-BHC	ND	0.0025	mg/kg wet							
alpha-BHC [2C]	ND	0.0025	mg/kg wet							
alpha-Chlordane	ND	0.0025	mg/kg wet							
alpha-Chlordane [2C]	ND	0.0025	mg/kg wet							
beta-BHC	ND	0.0025	mg/kg wet							
beta-BHC [2C]	ND	0.0025	mg/kg wet							
Chlordane (Total)	ND	0.0200	mg/kg wet							
Chlordane (Total) [2C]	ND	0.0200	mg/kg wet							
delta-BHC	ND	0.0025	mg/kg wet							
delta-BHC [2C]	ND	0.0025	mg/kg wet							
Dieldrin	ND	0.0025	mg/kg wet							
Dieldrin [2C]	ND	0.0025	mg/kg wet							
Endosulfan I	ND	0.0025	mg/kg wet							
Endosulfan I [2C]	ND	0.0025	mg/kg wet							
Endosulfan II	ND	0.0025	mg/kg wet							
Endosulfan II [2C]	ND	0.0025	mg/kg wet							
Endosulfan Sulfate	ND	0.0025	mg/kg wet							
Endosulfan Sulfate [2C]	ND	0.0025	mg/kg wet							
Endrin	ND	0.0025	mg/kg wet							
Endrin [2C]	ND	0.0025	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0860

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8081B Organochlorine Pesticides										
Batch CI93018 - 3546										
Endrin Ketone	ND	0.0025	mg/kg wet							
Endrin Ketone [2C]	ND	0.0025	mg/kg wet							
gamma-BHC (Lindane)	ND	0.0015	mg/kg wet							
gamma-BHC (Lindane) [2C]	ND	0.0015	mg/kg wet							
gamma-Chlordane	ND	0.0025	mg/kg wet							
gamma-Chlordane [2C]	ND	0.0025	mg/kg wet							
Heptachlor	ND	0.0025	mg/kg wet							
Heptachlor [2C]	ND	0.0025	mg/kg wet							
Heptachlor Epoxide	ND	0.0025	mg/kg wet							
Heptachlor Epoxide [2C]	ND	0.0025	mg/kg wet							
Hexachlorobenzene	ND	0.0025	mg/kg wet							
Hexachlorobenzene [2C]	ND	0.0025	mg/kg wet							
Methoxychlor	ND	0.0025	mg/kg wet							
Methoxychlor [2C]	ND	0.0025	mg/kg wet							
Toxaphene	ND	0.125	mg/kg wet							
Toxaphene [2C]	ND	0.125	mg/kg wet							
Surrogate: Decachlorobiphenyl	*0.00929*		mg/kg wet	*0.01250*		*74*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.00948*		mg/kg wet	*0.01250*		*76*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.00975*		mg/kg wet	*0.01250*		*78*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.00980*		mg/kg wet	*0.01250*		*78*	*30-150*			
LCS										
4,4´-DDD	0.0097	0.0025	mg/kg wet	0.01250		78	40-140			
4,4´-DDD [2C]	0.0101	0.0025	mg/kg wet	0.01250		81	40-140			
4,4´-DDE	0.0100	0.0025	mg/kg wet	0.01250		80	40-140			
4,4´-DDE [2C]	0.0102	0.0025	mg/kg wet	0.01250		82	40-140			
4,4´-DDT	0.0091	0.0025	mg/kg wet	0.01250		72	40-140			
4,4´-DDT [2C]	0.0096	0.0025	mg/kg wet	0.01250		77	40-140			
Aldrin	0.0098	0.0025	mg/kg wet	0.01250		78	40-140			
Aldrin [2C]	0.0101	0.0025	mg/kg wet	0.01250		81	40-140			
alpha-BHC	0.0092	0.0025	mg/kg wet	0.01250		74	40-140			
alpha-BHC [2C]	0.0095	0.0025	mg/kg wet	0.01250		76	40-140			
alpha-Chlordane	0.0092	0.0025	mg/kg wet	0.01250		74	40-140			
alpha-Chlordane [2C]	0.0097	0.0025	mg/kg wet	0.01250		78	40-140			
beta-BHC	0.0093	0.0025	mg/kg wet	0.01250		74	40-140			
beta-BHC [2C]	0.0094	0.0025	mg/kg wet	0.01250		75	40-140			
delta-BHC	0.0068	0.0025	mg/kg wet	0.01250		54	40-140			
delta-BHC [2C]	0.0067	0.0025	mg/kg wet	0.01250		53	40-140			
Dieldrin	0.0102	0.0025	mg/kg wet	0.01250		81	40-140			
Dieldrin [2C]	0.0104	0.0025	mg/kg wet	0.01250		83	40-140			
Endosulfan I	0.0094	0.0025	mg/kg wet	0.01250		75	40-140			
Endosulfan I [2C]	0.0097	0.0025	mg/kg wet	0.01250		77	40-140			
Endosulfan II	0.0100	0.0025	mg/kg wet	0.01250		80	40-140			
Endosulfan II [2C]	0.0105	0.0025	mg/kg wet	0.01250		84	40-140			
Endosulfan Sulfate	0.0090	0.0025	mg/kg wet	0.01250		72	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0860

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8081B Organochlorine Pesticides										
Batch CI93018 - 3546										
Endosulfan Sulfate [2C]	0.0094	0.0025	mg/kg wet	0.01250		75	40-140			
Endrin	0.0103	0.0025	mg/kg wet	0.01250		82	40-140			
Endrin [2C]	0.0106	0.0025	mg/kg wet	0.01250		85	40-140			
Endrin Ketone	0.0097	0.0025	mg/kg wet	0.01250		78	40-140			
Endrin Ketone [2C]	0.0099	0.0025	mg/kg wet	0.01250		79	40-140			
gamma-BHC (Lindane)	0.0094	0.0015	mg/kg wet	0.01250		75	40-140			
gamma-BHC (Lindane) [2C]	0.0096	0.0015	mg/kg wet	0.01250		77	40-140			
gamma-Chlordane	0.0096	0.0025	mg/kg wet	0.01250		77	40-140			
gamma-Chlordane [2C]	0.0097	0.0025	mg/kg wet	0.01250		77	40-140			
Heptachlor	0.0093	0.0025	mg/kg wet	0.01250		74	40-140			
Heptachlor [2C]	0.0095	0.0025	mg/kg wet	0.01250		76	40-140			
Heptachlor Epoxide	0.0102	0.0025	mg/kg wet	0.01250		82	40-140			
Heptachlor Epoxide [2C]	0.0104	0.0025	mg/kg wet	0.01250		83	40-140			
Hexachlorobenzene	0.0104	0.0025	mg/kg wet	0.01250		83	40-140			
Hexachlorobenzene [2C]	0.0106	0.0025	mg/kg wet	0.01250		85	40-140			
Methoxychlor	0.0088	0.0025	mg/kg wet	0.01250		70	40-140			
Methoxychlor [2C]	0.0088	0.0025	mg/kg wet	0.01250		70	40-140			
Surrogate: Decachlorobiphenyl	*0.00936*		mg/kg wet	*0.01250*		*75*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.00951*		mg/kg wet	*0.01250*		*76*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.00958*		mg/kg wet	*0.01250*		*77*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.00994*		mg/kg wet	*0.01250*		*80*	*30-150*			
LCS Dup										
4,4´-DDD	0.0100	0.0025	mg/kg wet	0.01250		80	40-140	3	30	
4,4´-DDD [2C]	0.0105	0.0025	mg/kg wet	0.01250		84	40-140	3	30	
4,4´-DDE	0.0103	0.0025	mg/kg wet	0.01250		82	40-140	3	30	
4,4´-DDE [2C]	0.0106	0.0025	mg/kg wet	0.01250		85	40-140	4	30	
4,4´-DDT	0.0095	0.0025	mg/kg wet	0.01250		76	40-140	4	30	
4,4´-DDT [2C]	0.0101	0.0025	mg/kg wet	0.01250		81	40-140	5	30	
Aldrin	0.0103	0.0025	mg/kg wet	0.01250		83	40-140	6	30	
Aldrin [2C]	0.0106	0.0025	mg/kg wet	0.01250		85	40-140	5	30	
alpha-BHC	0.0098	0.0025	mg/kg wet	0.01250		78	40-140	6	30	
alpha-BHC [2C]	0.0099	0.0025	mg/kg wet	0.01250		79	40-140	3	30	
alpha-Chlordane	0.0096	0.0025	mg/kg wet	0.01250		77	40-140	4	30	
alpha-Chlordane [2C]	0.0101	0.0025	mg/kg wet	0.01250		81	40-140	4	30	
beta-BHC	0.0097	0.0025	mg/kg wet	0.01250		78	40-140	4	30	
beta-BHC [2C]	0.0098	0.0025	mg/kg wet	0.01250		78	40-140	4	30	
delta-BHC	0.0067	0.0025	mg/kg wet	0.01250		54	40-140	0.8	30	
delta-BHC [2C]	0.0069	0.0025	mg/kg wet	0.01250		55	40-140	4	30	
Dieldrin	0.0106	0.0025	mg/kg wet	0.01250		84	40-140	4	30	
Dieldrin [2C]	0.0108	0.0025	mg/kg wet	0.01250		87	40-140	4	30	
Endosulfan I	0.0098	0.0025	mg/kg wet	0.01250		78	40-140	3	30	
Endosulfan I [2C]	0.0101	0.0025	mg/kg wet	0.01250		81	40-140	4	30	
Endosulfan II	0.0104	0.0025	mg/kg wet	0.01250		83	40-140	4	30	
Endosulfan II [2C]	0.0109	0.0025	mg/kg wet	0.01250		87	40-140	4	30	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0860

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8081B Organochlorine Pesticides										
Batch CI93018 - 3546										
Endosulfan Sulfate	0.0094	0.0025	mg/kg wet	0.01250		75	40-140	4	30	
Endosulfan Sulfate [2C]	0.0097	0.0025	mg/kg wet	0.01250		78	40-140	3	30	
Endrin	0.0107	0.0025	mg/kg wet	0.01250		86	40-140	4	30	
Endrin [2C]	0.0111	0.0025	mg/kg wet	0.01250		89	40-140	4	30	
Endrin Ketone	0.0101	0.0025	mg/kg wet	0.01250		81	40-140	4	30	
Endrin Ketone [2C]	0.0103	0.0025	mg/kg wet	0.01250		82	40-140	4	30	
gamma-BHC (Lindane)	0.0099	0.0015	mg/kg wet	0.01250		79	40-140	5	30	
gamma-BHC (Lindane) [2C]	0.0101	0.0015	mg/kg wet	0.01250		81	40-140	5	30	
gamma-Chlordane	0.0100	0.0025	mg/kg wet	0.01250		80	40-140	4	30	
gamma-Chlordane [2C]	0.0101	0.0025	mg/kg wet	0.01250		81	40-140	4	30	
Heptachlor	0.0098	0.0025	mg/kg wet	0.01250		78	40-140	5	30	
Heptachlor [2C]	0.0100	0.0025	mg/kg wet	0.01250		80	40-140	5	30	
Heptachlor Epoxide	0.0107	0.0025	mg/kg wet	0.01250		86	40-140	4	30	
Heptachlor Epoxide [2C]	0.0109	0.0025	mg/kg wet	0.01250		87	40-140	5	30	
Hexachlorobenzene	0.0109	0.0025	mg/kg wet	0.01250		87	40-140	4	30	
Hexachlorobenzene [2C]	0.0110	0.0025	mg/kg wet	0.01250		88	40-140	4	30	
Methoxychlor	0.0092	0.0025	mg/kg wet	0.01250		73	40-140	4	30	
Methoxychlor [2C]	0.0092	0.0025	mg/kg wet	0.01250		74	40-140	5	30	
Surrogate: Decachlorobiphenyl	*0.00946*		mg/kg wet	*0.01250*		*76*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.00964*		mg/kg wet	*0.01250*		*77*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.00969*		mg/kg wet	*0.01250*		*78*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0101*		mg/kg wet	*0.01250*		*81*	*30-150*			
8082 Polychlorinated Biphenyls (PCB) / Congeners										
Batch CI92609 - 3540C										
Blank										
BZ#101	ND	0.00027	mg/kg wet							
BZ#101 [2C]	ND	0.00027	mg/kg wet							
BZ#105	ND	0.00027	mg/kg wet							
BZ#105 [2C]	ND	0.00027	mg/kg wet							
BZ#118	ND	0.00027	mg/kg wet							
BZ#118 [2C]	ND	0.00027	mg/kg wet							
BZ#128	ND	0.00027	mg/kg wet							
BZ#128 [2C]	ND	0.00027	mg/kg wet							
BZ#138	ND	0.00027	mg/kg wet							
BZ#138 [2C]	ND	0.00027	mg/kg wet							
BZ#153	ND	0.00027	mg/kg wet							
BZ#153 [2C]	ND	0.00027	mg/kg wet							
BZ#170	ND	0.00027	mg/kg wet							
BZ#170 [2C]	ND	0.00027	mg/kg wet							
BZ#18	ND	0.00027	mg/kg wet							
BZ#18 [2C]	ND	0.00027	mg/kg wet							
BZ#180	ND	0.00027	mg/kg wet							
BZ#180 [2C]	ND	0.00027	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0860

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082 Polychlorinated Biphenyls (PCB) / Congeners										
Batch CI92609 - 3540C										
BZ#187	ND	0.00027	mg/kg wet							
BZ#187 [2C]	ND	0.00027	mg/kg wet							
BZ#195	ND	0.00027	mg/kg wet							
BZ#195 [2C]	ND	0.00027	mg/kg wet							
BZ#206	ND	0.00027	mg/kg wet							
BZ#206 [2C]	ND	0.00027	mg/kg wet							
BZ#209	ND	0.00027	mg/kg wet							
BZ#209 [2C]	ND	0.00027	mg/kg wet							
BZ#28	ND	0.00027	mg/kg wet							
BZ#28 [2C]	ND	0.00027	mg/kg wet							
BZ#44	ND	0.00027	mg/kg wet							
BZ#44 [2C]	ND	0.00027	mg/kg wet							
BZ#52	ND	0.00027	mg/kg wet							
BZ#52 [2C]	ND	0.00027	mg/kg wet							
BZ#66	ND	0.00027	mg/kg wet							
BZ#66 [2C]	ND	0.00027	mg/kg wet							
BZ#8	ND	0.00027	mg/kg wet							
BZ#8 [2C]	ND	0.00027	mg/kg wet							
Surrogate: Tetrachloro-m-xylene	*0.00227*		mg/kg wet	*0.003333*		*68*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.00246*		mg/kg wet	*0.003333*		*74*	*30-150*			
LCS										
BZ#101	0.00304	0.00027	mg/kg wet	0.003333		91	40-140			
BZ#101 [2C]	0.00261	0.00027	mg/kg wet	0.003333		78	40-140			
BZ#105	0.00309	0.00027	mg/kg wet	0.003333		93	40-140			
BZ#105 [2C]	0.00339	0.00027	mg/kg wet	0.003333		102	40-140			
BZ#118	0.00316	0.00027	mg/kg wet	0.003333		95	40-140			
BZ#118 [2C]	0.00311	0.00027	mg/kg wet	0.003333		93	40-140			
BZ#128	0.00297	0.00027	mg/kg wet	0.003333		89	40-140			
BZ#128 [2C]	0.00327	0.00027	mg/kg wet	0.003333		98	40-140			
BZ#138	0.00304	0.00027	mg/kg wet	0.003333		91	40-140			
BZ#138 [2C]	0.00340	0.00027	mg/kg wet	0.003333		102	40-140			
BZ#153	0.00296	0.00027	mg/kg wet	0.003333		89	40-140			
BZ#153 [2C]	0.00316	0.00027	mg/kg wet	0.003333		95	40-140			
BZ#170	0.00293	0.00027	mg/kg wet	0.003333		88	40-140			
BZ#170 [2C]	0.00329	0.00027	mg/kg wet	0.003333		99	40-140			
BZ#18	0.00302	0.00027	mg/kg wet	0.003333		91	40-140			
BZ#18 [2C]	0.00301	0.00027	mg/kg wet	0.003333		90	40-140			
BZ#180	0.00293	0.00027	mg/kg wet	0.003333		88	40-140			
BZ#180 [2C]	0.00335	0.00027	mg/kg wet	0.003333		101	40-140			
BZ#187	0.00282	0.00027	mg/kg wet	0.003333		85	40-140			
BZ#187 [2C]	0.00310	0.00027	mg/kg wet	0.003333		93	40-140			
BZ#195	0.00294	0.00027	mg/kg wet	0.003333		88	40-140			
BZ#195 [2C]	0.00321	0.00027	mg/kg wet	0.003333		96	40-140			
BZ#206	0.00290	0.00027	mg/kg wet	0.003333		87	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0860

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082 Polychlorinated Biphenyls (PCB) / Congeners										
Batch CI92609 - 3540C										
BZ#206 [2C]	0.00320	0.00027	mg/kg wet	0.003333		96	40-140			
BZ#209	0.00291	0.00027	mg/kg wet	0.003333		87	40-140			
BZ#209 [2C]	0.00303	0.00027	mg/kg wet	0.003333		91	40-140			
BZ#28	0.00331	0.00027	mg/kg wet	0.003333		99	40-140			
BZ#28 [2C]	0.00336	0.00027	mg/kg wet	0.003333		101	40-140			
BZ#44	0.00296	0.00027	mg/kg wet	0.003333		89	40-140			
BZ#44 [2C]	0.00308	0.00027	mg/kg wet	0.003333		92	40-140			
BZ#52	0.00271	0.00027	mg/kg wet	0.003333		81	40-140			
BZ#52 [2C]	0.00295	0.00027	mg/kg wet	0.003333		89	40-140			
BZ#66	0.00331	0.00027	mg/kg wet	0.003333		99	40-140			
BZ#66 [2C]	0.00316	0.00027	mg/kg wet	0.003333		95	40-140			
BZ#8	0.00320	0.00027	mg/kg wet	0.003333		96	40-140			
BZ#8 [2C]	0.00325	0.00027	mg/kg wet	0.003333		98	40-140			
Surrogate: Tetrachloro-m-xylene	*0.00247*		mg/kg wet	*0.003333*		*74*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.00267*		mg/kg wet	*0.003333*		*80*	*30-150*			
LCS Dup										
BZ#101	0.00327	0.00027	mg/kg wet	0.003333		98	40-140	7	50	
BZ#101 [2C]	0.00278	0.00027	mg/kg wet	0.003333		83	40-140	6	50	
BZ#105	0.00354	0.00027	mg/kg wet	0.003333		106	40-140	14	50	
BZ#105 [2C]	0.00384	0.00027	mg/kg wet	0.003333		115	40-140	13	50	
BZ#118	0.00342	0.00027	mg/kg wet	0.003333		103	40-140	8	50	
BZ#118 [2C]	0.00338	0.00027	mg/kg wet	0.003333		102	40-140	8	50	
BZ#128	0.00317	0.00027	mg/kg wet	0.003333		95	40-140	6	50	
BZ#128 [2C]	0.00367	0.00027	mg/kg wet	0.003333		110	40-140	11	50	
BZ#138	0.00326	0.00027	mg/kg wet	0.003333		98	40-140	7	50	
BZ#138 [2C]	0.00360	0.00027	mg/kg wet	0.003333		108	40-140	6	50	
BZ#153	0.00319	0.00027	mg/kg wet	0.003333		96	40-140	7	50	
BZ#153 [2C]	0.00340	0.00027	mg/kg wet	0.003333		102	40-140	7	50	
BZ#170	0.00320	0.00027	mg/kg wet	0.003333		96	40-140	9	50	
BZ#170 [2C]	0.00368	0.00027	mg/kg wet	0.003333		110	40-140	11	50	
BZ#18	0.00328	0.00027	mg/kg wet	0.003333		98	40-140	8	50	
BZ#18 [2C]	0.00336	0.00027	mg/kg wet	0.003333		101	40-140	11	50	
BZ#180	0.00323	0.00027	mg/kg wet	0.003333		97	40-140	10	50	
BZ#180 [2C]	0.00371	0.00027	mg/kg wet	0.003333		111	40-140	10	50	
BZ#187	0.00315	0.00027	mg/kg wet	0.003333		95	40-140	11	50	
BZ#187 [2C]	0.00344	0.00027	mg/kg wet	0.003333		103	40-140	10	50	
BZ#195	0.00327	0.00027	mg/kg wet	0.003333		98	40-140	11	50	
BZ#195 [2C]	0.00357	0.00027	mg/kg wet	0.003333		107	40-140	10	50	
BZ#206	0.00321	0.00027	mg/kg wet	0.003333		96	40-140	10	50	
BZ#206 [2C]	0.00356	0.00027	mg/kg wet	0.003333		107	40-140	11	50	
BZ#209	0.00322	0.00027	mg/kg wet	0.003333		97	40-140	10	50	
BZ#209 [2C]	0.00338	0.00027	mg/kg wet	0.003333		101	40-140	11	50	
BZ#28	0.00371	0.00027	mg/kg wet	0.003333		111	40-140	11	50	
BZ#28 [2C]	0.00380	0.00027	mg/kg wet	0.003333		114	40-140	12	50	

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Client Name: GEI Consultants, Inc.
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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082 Polychlorinated Biphenyls (PCB) / Congeners										
Batch CI92609 - 3540C										
BZ#44	0.00326	0.00027	mg/kg wet	0.003333		98	40-140	10	50	
BZ#44 [2C]	0.00342	0.00027	mg/kg wet	0.003333		102	40-140	10	50	
BZ#52	0.00311	0.00027	mg/kg wet	0.003333		93	40-140	14	50	
BZ#52 [2C]	0.00328	0.00027	mg/kg wet	0.003333		98	40-140	11	50	
BZ#66	0.00367	0.00027	mg/kg wet	0.003333		110	40-140	10	50	
BZ#66 [2C]	0.00358	0.00027	mg/kg wet	0.003333		108	40-140	13	50	
BZ#8	0.00360	0.00027	mg/kg wet	0.003333		108	40-140	12	50	
BZ#8 [2C]	0.00371	0.00027	mg/kg wet	0.003333		111	40-140	13	50	
Surrogate: Tetrachloro-m-xylene	*0.00266*		mg/kg wet	*0.003333*		*80*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.00290*		mg/kg wet	*0.003333*		*87*	*30-150*			
8100M Total Petroleum Hydrocarbons										
Batch CI92707 - 3546										
Blank										
Decane (C10)	ND	0.2	mg/kg wet							
Docosane (C22)	ND	0.2	mg/kg wet							
Dodecane (C12)	ND	0.2	mg/kg wet							
Eicosane (C20)	ND	0.2	mg/kg wet							
Hexacosane (C26)	ND	0.2	mg/kg wet							
Hexadecane (C16)	ND	0.2	mg/kg wet							
Hexatriacontane (C36)	ND	0.2	mg/kg wet							
Nonadecane (C19)	ND	0.2	mg/kg wet							
Nonane (C9)	ND	0.2	mg/kg wet							
Octacosane (C28)	ND	0.2	mg/kg wet							
Octadecane (C18)	ND	0.2	mg/kg wet							
Tetracosane (C24)	ND	0.2	mg/kg wet							
Tetradecane (C14)	ND	0.2	mg/kg wet							
Total Petroleum Hydrocarbons	ND	10.0	mg/kg wet							
Triacontane (C30)	ND	0.2	mg/kg wet							
Surrogate: O-Terphenyl	*3.94*		mg/kg wet	*5.000*		*79*	*40-140*			
LCS										
Decane (C10)	1.8	0.2	mg/kg wet	2.500		72	40-140			
Docosane (C22)	2.1	0.2	mg/kg wet	2.500		85	40-140			
Dodecane (C12)	1.9	0.2	mg/kg wet	2.500		76	40-140			
Eicosane (C20)	2.1	0.2	mg/kg wet	2.500		84	40-140			
Hexacosane (C26)	2.1	0.2	mg/kg wet	2.500		84	40-140			
Hexadecane (C16)	2.0	0.2	mg/kg wet	2.500		81	40-140			
Hexatriacontane (C36)	2.3	0.2	mg/kg wet	2.500		91	40-140			
Nonadecane (C19)	2.2	0.2	mg/kg wet	2.500		88	40-140			
Nonane (C9)	1.6	0.2	mg/kg wet	2.500		65	30-140			
Octacosane (C28)	2.1	0.2	mg/kg wet	2.500		85	40-140			
Octadecane (C18)	2.1	0.2	mg/kg wet	2.500		84	40-140			
Tetracosane (C24)	2.1	0.2	mg/kg wet	2.500		84	40-140			

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Client Name: GEI Consultants, Inc.
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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8100M Total Petroleum Hydrocarbons										
Batch CI92707 - 3546										
Tetradecane (C14)	2.0	0.2	mg/kg wet	2.500		79	40-140			
Total Petroleum Hydrocarbons	28.5	10.0	mg/kg wet	35.00		81	40-140			
Triacontane (C30)	2.1	0.2	mg/kg wet	2.500		84	40-140			
Surrogate: O-Terphenyl	*4.46*		mg/kg wet	*5.000*		*89*	*40-140*			
LCS Dup										
Decane (C10)	1.8	0.2	mg/kg wet	2.500		72	40-140	1	25	
Docosane (C22)	2.2	0.2	mg/kg wet	2.500		86	40-140	2	25	
Dodecane (C12)	1.9	0.2	mg/kg wet	2.500		77	40-140	1	25	
Eicosane (C20)	2.1	0.2	mg/kg wet	2.500		85	40-140	2	25	
Hexacosane (C26)	2.1	0.2	mg/kg wet	2.500		86	40-140	2	25	
Hexadecane (C16)	2.1	0.2	mg/kg wet	2.500		83	40-140	3	25	
Hexatriacontane (C36)	2.3	0.2	mg/kg wet	2.500		93	40-140	2	25	
Nonadecane (C19)	2.2	0.2	mg/kg wet	2.500		90	40-140	2	25	
Nonane (C9)	1.6	0.2	mg/kg wet	2.500		66	30-140	1	25	
Octacosane (C28)	2.2	0.2	mg/kg wet	2.500		86	40-140	2	25	
Octadecane (C18)	2.1	0.2	mg/kg wet	2.500		85	40-140	2	25	
Tetracosane (C24)	2.1	0.2	mg/kg wet	2.500		86	40-140	2	25	
Tetradecane (C14)	2.0	0.2	mg/kg wet	2.500		79	40-140	0.7	25	
Total Petroleum Hydrocarbons	29.0	10.0	mg/kg wet	35.00		83	40-140	2	25	
Triacontane (C30)	2.1	0.2	mg/kg wet	2.500		86	40-140	2	25	
Surrogate: O-Terphenyl	*4.46*		mg/kg wet	*5.000*		*89*	*40-140*			
8151A Chlorinated Herbicides										
Batch CI93058 - 3546										
Blank										
2,4,5-T	ND	0.010	mg/kg wet							
2,4,5-T [2C]	ND	0.010	mg/kg wet							
2,4,5-TP (Silvex)	ND	0.010	mg/kg wet							
2,4,5-TP (Silvex) [2C]	ND	0.010	mg/kg wet							
2,4-D	ND	0.047	mg/kg wet							
2,4-D [2C]	ND	0.047	mg/kg wet							
2,4-DB	ND	0.048	mg/kg wet							
2,4-DB [2C]	ND	0.048	mg/kg wet							
Dalapon	ND	0.046	mg/kg wet							
Dalapon [2C]	ND	0.046	mg/kg wet							
Dicamba	ND	0.009	mg/kg wet							
Dicamba [2C]	ND	0.009	mg/kg wet							
Dichlorprop	ND	0.047	mg/kg wet							
Dichlorprop [2C]	ND	0.047	mg/kg wet							
Dinoseb	ND	0.048	mg/kg wet							
Dinoseb [2C]	ND	0.048	mg/kg wet							
MCPA	ND	2.32	mg/kg wet							
MCPA [2C]	ND	2.32	mg/kg wet							

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Client Name: GEI Consultants, Inc.
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Quality Control Data

8151A Chlorinated Herbicides

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch CI93058 - 3546										
MCPP	ND	2.35	mg/kg wet							
MCPP [2C]	ND	2.35	mg/kg wet							
Surrogate: DCAA	*0.210*		mg/kg wet	*0.2000*		*105*	*30-150*			
Surrogate: DCAA [2C]	*0.212*		mg/kg wet	*0.2000*		*106*	*30-150*			
LCS										
2,4,5-T	0.018	0.010	mg/kg wet	0.01900		96	40-140			
2,4,5-T [2C]	0.016	0.010	mg/kg wet	0.01900		86	40-140			
2,4,5-TP (Silvex)	0.019	0.010	mg/kg wet	0.01900		100	40-140			
2,4,5-TP (Silvex) [2C]	0.019	0.010	mg/kg wet	0.01900		100	40-140			
2,4-D	0.143	0.047	mg/kg wet	0.1880		76	40-140			
2,4-D [2C]	0.153	0.047	mg/kg wet	0.1880		81	40-140			
2,4-DB	0.178	0.048	mg/kg wet	0.1900		94	40-140			
2,4-DB [2C]	0.172	0.048	mg/kg wet	0.1900		91	40-140			
Dalapon	0.375	0.046	mg/kg wet	0.4550		82	40-140			
Dalapon [2C]	0.401	0.046	mg/kg wet	0.4550		88	40-140			
Dicamba	0.017	0.009	mg/kg wet	0.01880		90	40-140			
Dicamba [2C]	0.018	0.009	mg/kg wet	0.01880		98	40-140			
Dichlorprop	0.179	0.047	mg/kg wet	0.1880		95	40-140			
Dichlorprop [2C]	0.186	0.047	mg/kg wet	0.1880		99	40-140			
Dinoseb	0.021	0.048	mg/kg wet	0.09500		22	10-100			
Dinoseb [2C]	0.022	0.048	mg/kg wet	0.09500		23	10-100			
MCPA	17.9	2.32	mg/kg wet	18.60		96	40-140			
MCPA [2C]	17.5	2.32	mg/kg wet	18.60		94	40-140			
MCPP	19.8	2.35	mg/kg wet	18.80		105	40-140			
MCPP [2C]	18.9	2.35	mg/kg wet	18.80		101	40-140			
Surrogate: DCAA	*0.246*		mg/kg wet	*0.2000*		*123*	*30-150*			
Surrogate: DCAA [2C]	*0.248*		mg/kg wet	*0.2000*		*124*	*30-150*			
LCS Dup										
2,4,5-T	0.021	0.010	mg/kg wet	0.01900		110	40-140	14	30	
2,4,5-T [2C]	0.022	0.010	mg/kg wet	0.01900		114	40-140	28	30	
2,4,5-TP (Silvex)	0.024	0.010	mg/kg wet	0.01900		124	40-140	21	30	
2,4,5-TP (Silvex) [2C]	0.023	0.010	mg/kg wet	0.01900		122	40-140	20	30	
2,4-D	0.195	0.047	mg/kg wet	0.1880		104	40-140	31	30	D+
2,4-D [2C]	0.199	0.047	mg/kg wet	0.1880		106	40-140	26	30	
2,4-DB	0.188	0.048	mg/kg wet	0.1900		99	40-140	6	30	
2,4-DB [2C]	0.231	0.048	mg/kg wet	0.1900		122	40-140	29	30	
Dalapon	0.481	0.046	mg/kg wet	0.4550		106	40-140	25	30	
Dalapon [2C]	0.498	0.046	mg/kg wet	0.4550		109	40-140	22	30	
Dicamba	0.021	0.009	mg/kg wet	0.01880		114	40-140	24	30	
Dicamba [2C]	0.024	0.009	mg/kg wet	0.01880		128	40-140	27	30	
Dichlorprop	0.214	0.047	mg/kg wet	0.1880		114	40-140	18	30	
Dichlorprop [2C]	0.246	0.047	mg/kg wet	0.1880		131	40-140	28	30	
Dinoseb	0.040	0.048	mg/kg wet	0.09500		42	10-100	64	30	D+
Dinoseb [2C]	0.045	0.048	mg/kg wet	0.09500		48	10-100	69	30	D+

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8151A Chlorinated Herbicides										
Batch CI93058 - 3546										
MCPA	23.7	2.32	mg/kg wet	18.60		127	40-140	28	30	
MCPA [2C]	22.6	2.32	mg/kg wet	18.60		122	40-140	25	30	
MCPP	24.9	2.35	mg/kg wet	18.80		132	40-140	23	30	
MCPP [2C]	23.5	2.35	mg/kg wet	18.80		125	40-140	22	30	
Surrogate: DCAA	*0.262*		mg/kg wet	*0.2000*		*131*	*30-150*			
Surrogate: DCAA [2C]	*0.271*		mg/kg wet	*0.2000*		*135*	*30-150*			
8270D Semi-Volatile Organic Compounds										
Batch CI92706 - 3546										
Blank										
1,2,4-Trichlorobenzene	ND	0.333	mg/kg wet							
1,2-Dichlorobenzene	ND	0.333	mg/kg wet							
1,3-Dichlorobenzene	ND	0.333	mg/kg wet							
1,4-Dichlorobenzene	ND	0.167	mg/kg wet							
2,4,5-Trichlorophenol	ND	0.333	mg/kg wet							
2,4,6-Trichlorophenol	ND	0.167	mg/kg wet							
2,4-Dichlorophenol	ND	0.167	mg/kg wet							
2,4-Dimethylphenol	ND	0.167	mg/kg wet							
2,4-Dinitrophenol	ND	0.667	mg/kg wet							
2,4-Dinitrotoluene	ND	0.167	mg/kg wet							
2,6-Dinitrotoluene	ND	0.333	mg/kg wet							
2-Chloronaphthalene	ND	0.333	mg/kg wet							
2-Chlorophenol	ND	0.333	mg/kg wet							
2-Methylnaphthalene	ND	0.167	mg/kg wet							
2-Methylphenol	ND	0.333	mg/kg wet							
2-Nitrophenol	ND	0.333	mg/kg wet							
3,3´-Dichlorobenzidine	ND	0.333	mg/kg wet							
3+4-Methylphenol	ND	0.667	mg/kg wet							
4-Bromophenyl-phenylether	ND	0.333	mg/kg wet							
4-Chloroaniline	ND	0.333	mg/kg wet							
4-Nitrophenol	ND	1.67	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							
Acetophenone	ND	0.667	mg/kg wet							
Aniline	ND	1.67	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Azobenzene	ND	0.333	mg/kg wet							
Benzo(a)anthracene	ND	0.333	mg/kg wet							
Benzo(a)pyrene	ND	0.167	mg/kg wet							
Benzo(b)fluoranthene	ND	0.333	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.333	mg/kg wet							
Benzo(k)fluoranthene	ND	0.333	mg/kg wet							
bis(2-Chloroethoxy)methane	ND	0.333	mg/kg wet							
bis(2-Chloroethyl)ether	ND	0.167	mg/kg wet							

CERTIFICATE OF ANALYSIS

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CI92706 - 3546										
bis(2-chloroisopropyl)Ether	ND	0.167	mg/kg wet							
bis(2-Ethylhexyl)phthalate	ND	0.333	mg/kg wet							
Butylbenzylphthalate	ND	0.333	mg/kg wet							
Chrysene	ND	0.167	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.167	mg/kg wet							
Dibenzofuran	ND	0.333	mg/kg wet							
Diethylphthalate	ND	0.333	mg/kg wet							
Dimethylphthalate	ND	0.333	mg/kg wet							
Di-n-butylphthalate	ND	0.333	mg/kg wet							
Di-n-octylphthalate	ND	0.333	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Hexachlorobenzene	ND	0.167	mg/kg wet							
Hexachlorobutadiene	ND	0.333	mg/kg wet							
Hexachloroethane	ND	0.167	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.333	mg/kg wet							
Isophorone	ND	0.333	mg/kg wet							
Naphthalene	ND	0.333	mg/kg wet							
Nitrobenzene	ND	0.333	mg/kg wet							
N-Nitrosodimethylamine	ND	0.333	mg/kg wet							
Pentachlorophenol	ND	0.667	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Phenol	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
Pyridine	ND	1.67	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	*2.16*		mg/kg wet	*3.333*		*65*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*3.45*		mg/kg wet	*5.000*		*69*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.49*		mg/kg wet	*5.000*		*70*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.11*		mg/kg wet	*3.333*		*63*	*30-130*			
Surrogate: 2-Fluorophenol	*3.58*		mg/kg wet	*5.000*		*72*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.16*		mg/kg wet	*3.333*		*65*	*30-130*			
Surrogate: Phenol-d6	*3.51*		mg/kg wet	*5.000*		*70*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.71*		mg/kg wet	*3.333*		*81*	*30-130*			
LCS										
1,2,4-Trichlorobenzene	1.87	0.333	mg/kg wet	3.333		56	40-140			
1,2-Dichlorobenzene	1.91	0.333	mg/kg wet	3.333		57	40-140			
1,3-Dichlorobenzene	1.89	0.333	mg/kg wet	3.333		57	40-140			
1,4-Dichlorobenzene	1.89	0.333	mg/kg wet	3.333		57	40-140			
2,4,5-Trichlorophenol	2.81	0.333	mg/kg wet	3.333		84	30-130			
2,4,6-Trichlorophenol	2.51	0.333	mg/kg wet	3.333		75	30-130			
2,4-Dichlorophenol	2.33	0.333	mg/kg wet	3.333		70	30-130			
2,4-Dimethylphenol	2.20	0.333	mg/kg wet	3.333		66	30-130			
2,4-Dinitrophenol	2.70	1.67	mg/kg wet	3.333		81	30-130			
2,4-Dinitrotoluene	2.89	0.333	mg/kg wet	3.333		87	40-140			
2,6-Dinitrotoluene	2.67	0.333	mg/kg wet	3.333		80	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0860

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CI92706 - 3546										
2-Chloronaphthalene	1.93	0.333	mg/kg wet	3.333		58	40-140			
2-Chlorophenol	2.08	0.333	mg/kg wet	3.333		62	30-130			
2-Methylnaphthalene	2.07	0.333	mg/kg wet	3.333		62	40-140			
2-Methylphenol	2.21	0.333	mg/kg wet	3.333		66	30-130			
2-Nitrophenol	1.87	0.333	mg/kg wet	3.333		56	30-130			
3,3´-Dichlorobenzidine	2.49	0.667	mg/kg wet	3.333		75	40-140			
3+4-Methylphenol	4.90	0.667	mg/kg wet	6.667		73	30-130			
4-Bromophenyl-phenylether	2.57	0.333	mg/kg wet	3.333		77	40-140			
4-Chloroaniline	1.75	0.667	mg/kg wet	3.333		53	40-140			
4-Nitrophenol	2.65	1.67	mg/kg wet	3.333		80	30-130			
Acenaphthene	2.23	0.333	mg/kg wet	3.333		67	40-140			
Acenaphthylene	2.31	0.333	mg/kg wet	3.333		69	40-140			
Acetophenone	2.17	0.667	mg/kg wet	3.333		65	40-140			
Aniline	1.74	1.67	mg/kg wet	3.333		52	40-140			
Anthracene	2.72	0.333	mg/kg wet	3.333		82	40-140			
Azobenzene	2.54	0.333	mg/kg wet	3.333		76	40-140			
Benzo(a)anthracene	2.95	0.333	mg/kg wet	3.333		88	40-140			
Benzo(a)pyrene	2.70	0.167	mg/kg wet	3.333		81	40-140			
Benzo(b)fluoranthene	2.93	0.333	mg/kg wet	3.333		88	40-140			
Benzo(g,h,i)perylene	2.80	0.333	mg/kg wet	3.333		84	40-140			
Benzo(k)fluoranthene	2.65	0.333	mg/kg wet	3.333		80	40-140			
bis(2-Chloroethoxy)methane	1.92	0.333	mg/kg wet	3.333		58	40-140			
bis(2-Chloroethyl)ether	1.97	0.333	mg/kg wet	3.333		59	40-140			
bis(2-chloroisopropyl)Ether	1.91	0.333	mg/kg wet	3.333		57	40-140			
bis(2-Ethylhexyl)phthalate	2.69	0.333	mg/kg wet	3.333		81	40-140			
Butylbenzylphthalate	2.57	0.333	mg/kg wet	3.333		77	40-140			
Chrysene	2.79	0.167	mg/kg wet	3.333		84	40-140			
Dibenzo(a,h)Anthracene	2.81	0.167	mg/kg wet	3.333		84	40-140			
Dibenzofuran	2.38	0.333	mg/kg wet	3.333		71	40-140			
Diethylphthalate	2.90	0.333	mg/kg wet	3.333		87	40-140			
Dimethylphthalate	2.74	0.333	mg/kg wet	3.333		82	40-140			
Di-n-butylphthalate	2.68	0.333	mg/kg wet	3.333		80	40-140			
Di-n-octylphthalate	2.59	0.333	mg/kg wet	3.333		78	40-140			
Fluoranthene	2.94	0.333	mg/kg wet	3.333		88	40-140			
Fluorene	2.75	0.333	mg/kg wet	3.333		83	40-140			
Hexachlorobenzene	2.68	0.333	mg/kg wet	3.333		81	40-140			
Hexachlorobutadiene	1.85	0.333	mg/kg wet	3.333		56	40-140			
Hexachloroethane	1.81	0.333	mg/kg wet	3.333		54	40-140			
Indeno(1,2,3-cd)Pyrene	2.79	0.333	mg/kg wet	3.333		84	40-140			
Isophorone	1.91	0.333	mg/kg wet	3.333		57	40-140			
Naphthalene	1.87	0.333	mg/kg wet	3.333		56	40-140			
Nitrobenzene	1.85	0.333	mg/kg wet	3.333		56	40-140			
N-Nitrosodimethylamine	1.69	0.333	mg/kg wet	3.333		51	40-140			
Pentachlorophenol	2.90	1.67	mg/kg wet	3.333		87	30-130			
Phenanthrene	2.61	0.333	mg/kg wet	3.333		78	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0860

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CI92706 - 3546										
Phenol	2.17	0.333	mg/kg wet	3.333		65	30-130			
Pyrene	2.71	0.333	mg/kg wet	3.333		81	40-140			
Pyridine	1.59	1.67	mg/kg wet	3.333		48	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	*1.88*		mg/kg wet	*3.333*		*56*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.11*		mg/kg wet	*5.000*		*82*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.16*		mg/kg wet	*5.000*		*63*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*1.97*		mg/kg wet	*3.333*		*59*	*30-130*			
Surrogate: 2-Fluorophenol	*3.12*		mg/kg wet	*5.000*		*62*	*30-130*			
Surrogate: Nitrobenzene-d5	*1.87*		mg/kg wet	*3.333*		*56*	*30-130*			
Surrogate: Phenol-d6	*3.32*		mg/kg wet	*5.000*		*66*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.73*		mg/kg wet	*3.333*		*82*	*30-130*			
LCS Dup										
1,2,4-Trichlorobenzene	2.04	0.333	mg/kg wet	3.333		61	40-140	9	30	
1,2-Dichlorobenzene	2.07	0.333	mg/kg wet	3.333		62	40-140	8	30	
1,3-Dichlorobenzene	2.01	0.333	mg/kg wet	3.333		60	40-140	6	30	
1,4-Dichlorobenzene	2.03	0.333	mg/kg wet	3.333		61	40-140	7	30	
2,4,5-Trichlorophenol	2.89	0.333	mg/kg wet	3.333		87	30-130	3	30	
2,4,6-Trichlorophenol	2.55	0.333	mg/kg wet	3.333		76	30-130	2	30	
2,4-Dichlorophenol	2.40	0.333	mg/kg wet	3.333		72	30-130	3	30	
2,4-Dimethylphenol	2.31	0.333	mg/kg wet	3.333		69	30-130	5	30	
2,4-Dinitrophenol	2.73	1.67	mg/kg wet	3.333		82	30-130	0.9	30	
2,4-Dinitrotoluene	2.93	0.333	mg/kg wet	3.333		88	40-140	1	30	
2,6-Dinitrotoluene	2.66	0.333	mg/kg wet	3.333		80	40-140	0.08	30	
2-Chloronaphthalene	1.98	0.333	mg/kg wet	3.333		59	40-140	2	30	
2-Chlorophenol	2.20	0.333	mg/kg wet	3.333		66	30-130	6	30	
2-Methylnaphthalene	2.18	0.333	mg/kg wet	3.333		66	40-140	5	30	
2-Methylphenol	2.31	0.333	mg/kg wet	3.333		69	30-130	5	30	
2-Nitrophenol	2.01	0.333	mg/kg wet	3.333		60	30-130	7	30	
3,3´-Dichlorobenzidine	2.45	0.667	mg/kg wet	3.333		73	40-140	2	30	
3+4-Methylphenol	4.97	0.667	mg/kg wet	6.667		74	30-130	1	30	
4-Bromophenyl-phenylether	2.55	0.333	mg/kg wet	3.333		76	40-140	0.9	30	
4-Chloroaniline	1.86	0.667	mg/kg wet	3.333		56	40-140	6	30	
4-Nitrophenol	2.73	1.67	mg/kg wet	3.333		82	30-130	3	30	
Acenaphthene	2.26	0.333	mg/kg wet	3.333		68	40-140	1	30	
Acenaphthylene	2.34	0.333	mg/kg wet	3.333		70	40-140	1	30	
Acetophenone	2.25	0.667	mg/kg wet	3.333		67	40-140	3	30	
Aniline	1.81	1.67	mg/kg wet	3.333		54	40-140	4	30	
Anthracene	2.69	0.333	mg/kg wet	3.333		81	40-140	0.8	30	
Azobenzene	2.58	0.333	mg/kg wet	3.333		77	40-140	1	30	
Benzo(a)anthracene	2.90	0.333	mg/kg wet	3.333		87	40-140	2	30	
Benzo(a)pyrene	2.73	0.167	mg/kg wet	3.333		82	40-140	1	30	
Benzo(b)fluoranthene	2.96	0.333	mg/kg wet	3.333		89	40-140	1	30	
Benzo(g,h,i)perylene	2.78	0.333	mg/kg wet	3.333		83	40-140	0.7	30	
Benzo(k)fluoranthene	2.62	0.333	mg/kg wet	3.333		79	40-140	1	30	
bis(2-Chloroethoxy)methane	2.07	0.333	mg/kg wet	3.333		62	40-140	7	30	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0860

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CI92706 - 3546										
bis(2-Chloroethyl)ether	2.12	0.333	mg/kg wet	3.333		64	40-140	7	30	
bis(2-chloroisopropyl)Ether	2.04	0.333	mg/kg wet	3.333		61	40-140	7	30	
bis(2-Ethylhexyl)phthalate	2.66	0.333	mg/kg wet	3.333		80	40-140	1	30	
Butylbenzylphthalate	2.58	0.333	mg/kg wet	3.333		77	40-140	0.4	30	
Chrysene	2.80	0.167	mg/kg wet	3.333		84	40-140	0.2	30	
Dibenzo(a,h)Anthracene	2.81	0.167	mg/kg wet	3.333		84	40-140	0.2	30	
Dibenzofuran	2.43	0.333	mg/kg wet	3.333		73	40-140	2	30	
Diethylphthalate	2.95	0.333	mg/kg wet	3.333		88	40-140	2	30	
Dimethylphthalate	2.70	0.333	mg/kg wet	3.333		81	40-140	1	30	
Di-n-butylphthalate	2.71	0.333	mg/kg wet	3.333		81	40-140	1	30	
Di-n-octylphthalate	2.55	0.333	mg/kg wet	3.333		76	40-140	1	30	
Fluoranthene	2.97	0.333	mg/kg wet	3.333		89	40-140	0.8	30	
Fluorene	2.78	0.333	mg/kg wet	3.333		83	40-140	0.9	30	
Hexachlorobenzene	2.71	0.333	mg/kg wet	3.333		81	40-140	1	30	
Hexachlorobutadiene	2.02	0.333	mg/kg wet	3.333		60	40-140	8	30	
Hexachloroethane	1.98	0.333	mg/kg wet	3.333		59	40-140	9	30	
Indeno(1,2,3-cd)Pyrene	2.80	0.333	mg/kg wet	3.333		84	40-140	0.6	30	
Isophorone	2.00	0.333	mg/kg wet	3.333		60	40-140	4	30	
Naphthalene	2.04	0.333	mg/kg wet	3.333		61	40-140	9	30	
Nitrobenzene	2.01	0.333	mg/kg wet	3.333		60	40-140	8	30	
N-Nitrosodimethylamine	1.78	0.333	mg/kg wet	3.333		53	40-140	5	30	
Pentachlorophenol	2.89	1.67	mg/kg wet	3.333		87	30-130	0.5	30	
Phenanthrene	2.58	0.333	mg/kg wet	3.333		77	40-140	1	30	
Phenol	2.27	0.333	mg/kg wet	3.333		68	30-130	4	30	
Pyrene	2.67	0.333	mg/kg wet	3.333		80	40-140	2	30	
Pyridine	1.69	1.67	mg/kg wet	3.333		51	40-140	6	30	
Surrogate: 1,2-Dichlorobenzene-d4	*2.01*		mg/kg wet	*3.333*		*60*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.15*		mg/kg wet	*5.000*		*83*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.36*		mg/kg wet	*5.000*		*67*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*1.99*		mg/kg wet	*3.333*		*60*	*30-130*			
Surrogate: 2-Fluorophenol	*3.32*		mg/kg wet	*5.000*		*66*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.00*		mg/kg wet	*3.333*		*60*	*30-130*			
Surrogate: Phenol-d6	*3.41*		mg/kg wet	*5.000*		*68*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.72*		mg/kg wet	*3.333*		*82*	*30-130*			
Classical Chemistry										
Batch CI92616 - General Preparation										
Blank										
Reactive Cyanide	ND	2.0	mg/kg							
Reactive Sulfide	ND	2.0	mg/kg							
LCS										
Reactive Cyanide	3.9	2.0	mg/kg	100.3		4	0.68-5.41			
Reactive Sulfide	ND	2.0	mg/kg	10.00		0	0-44			
Batch CI93024 - TCN Prep										

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0860

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Classical Chemistry										
Batch CI93024 - TCN Prep										
Blank										
Total Cyanide	ND	1.00	mg/kg wet							
LCS										
Total Cyanide	4.94	1.00	mg/kg wet	5.015		98	90-110			
Reference										
Total Cyanide	151	9.88	mg/kg wet	157.0		96	24-110			
Reference										
Total Cyanide	151	9.93	mg/kg wet	157.0		96	24-110			
Batch CI93026 - General Preparation										
Blank										
Conductivity	ND	5	umhos/cm							
LCS										
Conductivity	1370		umhos/cm	1411		97	90-110			
Batch CI93046 - General Preparation										
Reference										
Flashpoint	81		°F	81.00		100	97.9-102.1			
Batch CI93047 - General Preparation										
Blank										
Sulfide	ND	0.05	mg/kg wet							
LCS										
Sulfide	0.5		mg/L	0.5000		99	85-115			
Batch CJ90119 - General Preparation										
Blank										
Sulfate	ND	5	mg/kg wet							
LCS										
Sulfate	10		mg/L	9.988		96	80-120			
Batch CJ90245 - General Preparation										
Blank										
Total Organic Carbon (1)	ND	100	mg/kg							
Total Organic Carbon (2)	ND	100	mg/kg							
LCS										
Total Organic Carbon (1)	9560	100	mg/kg	10000		96	80-120			
Total Organic Carbon (2)	9570	100	mg/kg	10000		96	80-120			
LCS Dup										
Total Organic Carbon (1)	9540	100	mg/kg	10000		95	80-120	0.2	20	
Total Organic Carbon (2)	9910	100	mg/kg	10000		99	80-120	3	20	
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch CI92604 - 3546										
Blank										

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0860

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch CI92604 - 3546										
C19-C36 Aliphatics1	ND	15.0	mg/kg wet							
C9-C18 Aliphatics1	ND	15.0	mg/kg wet							
Decane (C10)	ND	0.5	mg/kg wet							
Docosane (C22)	ND	0.5	mg/kg wet							
Dodecane (C12)	ND	0.5	mg/kg wet							
Eicosane (C20)	ND	0.5	mg/kg wet							
Hexacosane (C26)	ND	0.5	mg/kg wet							
Hexadecane (C16)	ND	0.5	mg/kg wet							
Hexatriacontane (C36)	ND	0.5	mg/kg wet							
Nonadecane (C19)	ND	0.5	mg/kg wet							
Nonane (C9)	ND	0.5	mg/kg wet							
Octacosane (C28)	ND	0.5	mg/kg wet							
Octadecane (C18)	ND	0.5	mg/kg wet							
Tetracosane (C24)	ND	0.5	mg/kg wet							
Tetradecane (C14)	ND	0.5	mg/kg wet							
Triacontane (C30)	ND	0.5	mg/kg wet							
Surrogate: 1-Chlorooctadecane	*1.62*		mg/kg wet	*2.020*		*80*	*40-140*			
Blank										
C11-C22 Unadjusted Aromatics1	ND	15.0	mg/kg wet							
Surrogate: 2-Bromonaphthalene	*44.1*		mg/L	*50.00*		*88*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*42.2*		mg/L	*50.00*		*84*	*40-140*			
Surrogate: O-Terphenyl	*1.57*		mg/kg wet	*2.008*		*78*	*40-140*			
Blank										
2-Methylnaphthalene	ND	0.020	mg/kg wet							
Acenaphthene	ND	0.020	mg/kg wet							
Acenaphthylene	ND	0.020	mg/kg wet							
Anthracene	ND	0.008	mg/kg wet							
Benzo(a)anthracene	ND	0.008	mg/kg wet							
Benzo(a)pyrene	ND	0.008	mg/kg wet							
Benzo(b)fluoranthene	ND	0.020	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.020	mg/kg wet							
Benzo(k)fluoranthene	ND	0.020	mg/kg wet							
Chrysene	ND	0.020	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.008	mg/kg wet							
Fluoranthene	ND	0.020	mg/kg wet							
Fluorene	ND	0.008	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.020	mg/kg wet							
Naphthalene	ND	0.020	mg/kg wet							
Phenanthrene	ND	0.020	mg/kg wet							
Pyrene	ND	0.020	mg/kg wet							
LCS										
C19-C36 Aliphatics1	14.8	15.0	mg/kg wet	16.00		92	40-140			
C9-C18 Aliphatics1	9.2	15.0	mg/kg wet	12.00		77	40-140			

CERTIFICATE OF ANALYSIS

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch CI92604 - 3546										
Decane (C10)	1.2	0.5	mg/kg wet	2.000		58	40-140			
Docosane (C22)	1.8	0.5	mg/kg wet	2.000		88	40-140			
Dodecane (C12)	1.3	0.5	mg/kg wet	2.000		67	40-140			
Eicosane (C20)	1.7	0.5	mg/kg wet	2.000		87	40-140			
Hexacosane (C26)	1.7	0.5	mg/kg wet	2.000		86	40-140			
Hexadecane (C16)	1.7	0.5	mg/kg wet	2.000		85	40-140			
Hexatriacontane (C36)	1.9	0.5	mg/kg wet	2.000		94	40-140			
Nonadecane (C19)	1.7	0.5	mg/kg wet	2.000		87	40-140			
Nonane (C9)	0.9	0.5	mg/kg wet	2.000		46	30-140			
Octacosane (C28)	1.7	0.5	mg/kg wet	2.000		85	40-140			
Octadecane (C18)	1.7	0.5	mg/kg wet	2.000		87	40-140			
Tetracosane (C24)	1.7	0.5	mg/kg wet	2.000		87	40-140			
Tetradecane (C14)	1.5	0.5	mg/kg wet	2.000		75	40-140			
Triacontane (C30)	1.7	0.5	mg/kg wet	2.000		84	40-140			
Surrogate: 1-Chlorooctadecane	*1.69*		mg/kg wet	*2.020*		*84*	*40-140*			
LCS										
C11-C22 Unadjusted Aromatics1	30.3	15.0	mg/kg wet	34.00		89	40-140			
Surrogate: 2-Bromonaphthalene	*42.7*		mg/L	*50.00*		*85*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*39.2*		mg/L	*50.00*		*78*	*40-140*			
Surrogate: O-Terphenyl	*1.49*		mg/kg wet	*2.008*		*74*	*40-140*			
LCS										
2-Methylnaphthalene Breakthrough	0.0		%				0-5			
Naphthalene Breakthrough	0.0		%				0-5			
LCS										
2-Methylnaphthalene	1.40	0.100	mg/kg wet	2.000		70	40-140			
Acenaphthene	1.69	0.100	mg/kg wet	2.000		85	40-140			
Acenaphthylene	1.73	0.100	mg/kg wet	2.000		87	40-140			
Anthracene	1.71	0.040	mg/kg wet	2.000		86	40-140			
Benzo(a)anthracene	1.80	0.040	mg/kg wet	2.000		90	40-140			
Benzo(a)pyrene	1.81	0.040	mg/kg wet	2.000		91	40-140			
Benzo(b)fluoranthene	1.82	0.100	mg/kg wet	2.000		91	40-140			
Benzo(g,h,i)perylene	1.70	0.100	mg/kg wet	2.000		85	40-140			
Benzo(k)fluoranthene	1.71	0.100	mg/kg wet	2.000		85	40-140			
Chrysene	1.79	0.100	mg/kg wet	2.000		90	40-140			
Dibenzo(a,h)Anthracene	1.89	0.040	mg/kg wet	2.000		94	40-140			
Fluoranthene	1.75	0.100	mg/kg wet	2.000		88	40-140			
Fluorene	1.69	0.040	mg/kg wet	2.000		84	40-140			
Indeno(1,2,3-cd)Pyrene	1.88	0.100	mg/kg wet	2.000		94	40-140			
Naphthalene	1.34	0.100	mg/kg wet	2.000		67	40-140			
Phenanthrene	1.65	0.100	mg/kg wet	2.000		83	40-140			
Pyrene	1.86	0.100	mg/kg wet	2.000		93	40-140			
LCS Dup										
C19-C36 Aliphatics1	15.1	15.0	mg/kg wet	16.00		94	40-140	2	25	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0860

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch CI92604 - 3546										
C9-C18 Aliphatics1	8.9	15.0	mg/kg wet	12.00		74	40-140	3	25	
Decane (C10)	1.1	0.5	mg/kg wet	2.000		56	40-140	4	25	
Docosane (C22)	1.8	0.5	mg/kg wet	2.000		90	40-140	2	25	
Dodecane (C12)	1.3	0.5	mg/kg wet	2.000		63	40-140	6	25	
Eicosane (C20)	1.8	0.5	mg/kg wet	2.000		89	40-140	2	25	
Hexacosane (C26)	1.8	0.5	mg/kg wet	2.000		88	40-140	2	25	
Hexadecane (C16)	1.7	0.5	mg/kg wet	2.000		83	40-140	3	25	
Hexatriacontane (C36)	1.9	0.5	mg/kg wet	2.000		97	40-140	3	25	
Nonadecane (C19)	1.8	0.5	mg/kg wet	2.000		89	40-140	2	25	
Nonane (C9)	0.9	0.5	mg/kg wet	2.000		45	30-140	3	25	
Octacosane (C28)	1.7	0.5	mg/kg wet	2.000		87	40-140	3	25	
Octadecane (C18)	1.8	0.5	mg/kg wet	2.000		88	40-140	1	25	
Tetracosane (C24)	1.8	0.5	mg/kg wet	2.000		89	40-140	3	25	
Tetradecane (C14)	1.4	0.5	mg/kg wet	2.000		71	40-140	6	25	
Triacontane (C30)	1.7	0.5	mg/kg wet	2.000		86	40-140	3	25	
Surrogate: 1-Chlorooctadecane	*1.71*		mg/kg wet	*2.020*		*85*	*40-140*			
LCS Dup										
C11-C22 Unadjusted Aromatics1	30.9	15.0	mg/kg wet	34.00		91	40-140	2	25	
Surrogate: 2-Bromonaphthalene	*45.3*		mg/L	*50.00*		*91*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*43.5*		mg/L	*50.00*		*87*	*40-140*			
Surrogate: O-Terphenyl	*1.60*		mg/kg wet	*2.008*		*80*	*40-140*			
LCS Dup										
2-Methylnaphthalene Breakthrough	0.0		%				0-5		200	
Naphthalene Breakthrough	0.0		%				0-5		200	
LCS Dup										
2-Methylnaphthalene	1.56	0.100	mg/kg wet	2.000		78	40-140	11	30	
Acenaphthene	1.86	0.100	mg/kg wet	2.000		93	40-140	9	30	
Acenaphthylene	1.91	0.100	mg/kg wet	2.000		96	40-140	10	30	
Anthracene	1.78	0.040	mg/kg wet	2.000		89	40-140	4	30	
Benzo(a)anthracene	1.87	0.040	mg/kg wet	2.000		93	40-140	4	30	
Benzo(a)pyrene	1.91	0.040	mg/kg wet	2.000		95	40-140	5	30	
Benzo(b)fluoranthene	1.88	0.100	mg/kg wet	2.000		94	40-140	4	30	
Benzo(g,h,i)perylene	1.81	0.100	mg/kg wet	2.000		91	40-140	6	30	
Benzo(k)fluoranthene	1.78	0.100	mg/kg wet	2.000		89	40-140	4	30	
Chrysene	1.90	0.100	mg/kg wet	2.000		95	40-140	6	30	
Dibenzo(a,h)Anthracene	1.99	0.040	mg/kg wet	2.000		99	40-140	5	30	
Fluoranthene	1.83	0.100	mg/kg wet	2.000		91	40-140	4	30	
Fluorene	1.84	0.040	mg/kg wet	2.000		92	40-140	8	30	
Indeno(1,2,3-cd)Pyrene	1.97	0.100	mg/kg wet	2.000		98	40-140	5	30	
Naphthalene	1.49	0.100	mg/kg wet	2.000		75	40-140	11	30	
Phenanthrene	1.73	0.100	mg/kg wet	2.000		86	40-140	4	30	
Pyrene	1.98	0.100	mg/kg wet	2.000		99	40-140	6	30	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ ESS Laboratory Work Order: 19I0860

Notes and Definitions

SC	Surrogate recovery(ies) outside of criteria. Reextraction/Reanalysis confirms results (SC).
>	Greater than.
B-	Blank Spike recovery is below lower control limit (B-).
CD-	Continuing Calibration %Diff/Drift is below control limit (CD-).
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
D	Diluted.
D+	Relative percent difference for duplicate is outside of criteria (D+).
EL	Elevated Method Reporting Limits due to sample matrix (EL).
#	Modified result
S+	Surrogate recovery(ies) above upper control limit (S+).
Z18	Temperature is not within 23 +/-2 ºC.
SM	Surrogate recovery(ies) outside of criteria due to matrix (UCM/coelution/matrix is present) (SM).
U	Analyte included in the analysis, but not detected
WL	Results obtained from a deionized water leach of the sample.
XH	Peaks found in the retention time window for MCPP did not confirm by GC/MS.
Z-08	See Attached
Z-09	ND
Z-10	Soil pH measured in water at 20.5 ºC.
Q	Calibration required quadratic regression (Q).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 19I0860

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

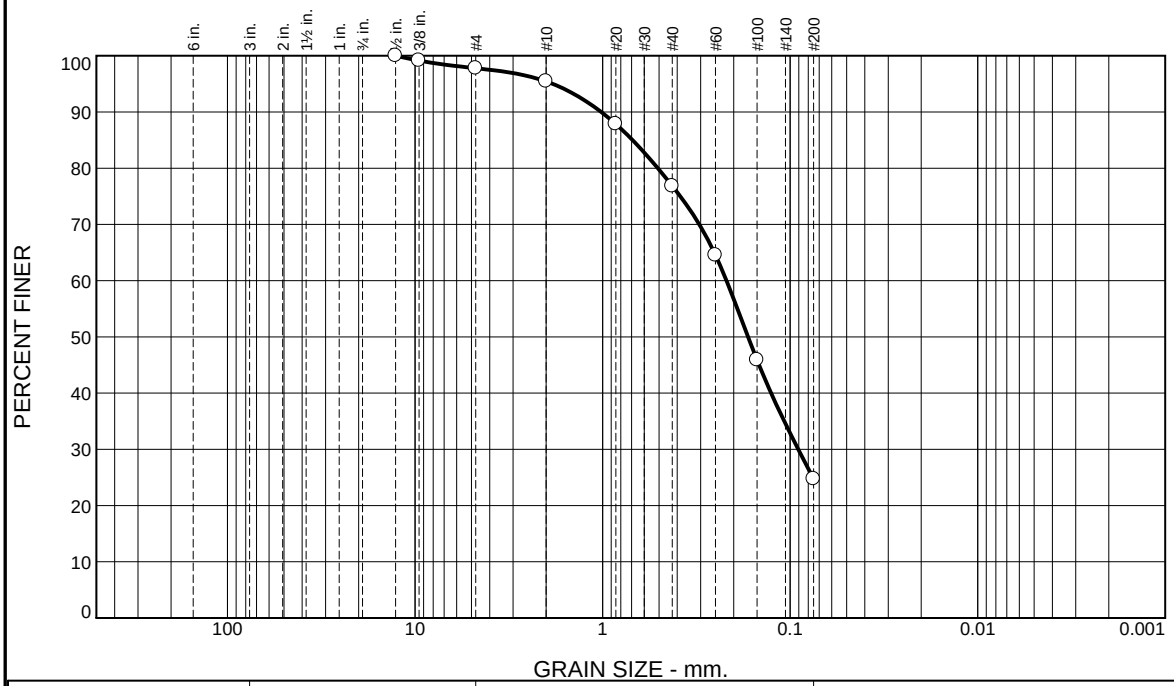
New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.2	2.4	18.6	52.1	24.7	

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
0.5"	100.0		
0.375"	99.1		
#4	97.8		
#10	95.4		
#20	87.8		
#40	76.8		
#60	64.6		
#100	45.9		
#200	24.7		

* (no specification provided)

Material Description

Very Dark Gray silty sand

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= SM **AASHTO (M 145)=** A-2-4(0)

Coefficients

D_{90}= 1.0165 D_{85}= 0.6925 D_{60}= 0.2185
D_{50}= 0.1676 D_{30}= 0.0905 D_{15}=
D_{10}= C_u= C_c=

Remarks

Date Received: 09.27.19 **Date Tested:** 10.01.19

Tested By: MN / IA / JM

Checked By: Steven Accetta

Title: Laboratory Coordinator

Source of Sample: Grab **Date Sampled:** 09.24.19
Sample Number: 1804576-SS692-S4

Thielsch Engineering Inc.

Cranston, RI

Client: GEI Consultant
Project: Amesbury Former MGP
Amesbury, MA
Project No: 19I0860 **Figure** 19I0860-01

THIELSCH ENGINEERING	195 Frances Avenue Cranston RI, 02910 Phone: (401)-467-6454 Fax: (401)-467-2398 thielsch.com *Let's Build a Solid Foundation*	Client Information: GEI Consultants Woburn, MA PM: Ryan Hoffman Assigned By: Ryan Hoffman Collected By: Client	Project Information: **Amesbury Former MGP** **Amesbury, MA** ESS Project Number: 19I0860 Summary Page: 1 of 1 Report Date: 10.07.19

LABORATORY TESTING DATA SHEET, Report No.: 7419-K-124

GEI Sample ID	ESS Sample ID	Depth (Ft)	Laboratory No.	Identification Tests								Proctor / CBR / Permeability Tests								Laboratory Log and Soil Description
				As Received Water Content %	LL %	PL %	Gravel %	Sand %	Fines %	Volatile Solids (%)	G_s	Dry unit wt. pcf	Test Water Content %	γ_d MAX (pcf) W_{opt} (%)	γ_d MAX (pcf) W_{opt} (%) (Corr.)	Target Test Setup as % of Proctor	CBR @ 0.1"	CBR @ 0.2"	Perme-ability cm/sec	
				D2216	D4318		D6913			D2974	D854			D1557						
1804576-SS692R-S1	19I0860-02		19-S-2050	72.2						16.3										Brown

Date Received: 10.04.19 Reviewed By: Date Reviewed: 10.07.19

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 19I0860

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Number: 1804576

Project Location: Amesbury, MA

Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY REQUIRED – (YES) NO

If Yes, Are MCP Analytical Methods Required? (YES) NO NA

Are Drinking Water Samples Submitted? YES (NO) NA

If Yes, Have Drinking Water Sampling Requirements Been Met? YES NO (NA)

Sample Handling

Samples Field Filtered: YES NO (NA)

Sampled Shipped With Ice: (YES) NO

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials
1	1804576-SS692-S4	9/24/19	1610	Sed	7	RFM
2	1804576-SS692RS1	9/25/19	1740	Sed	4	BFM
3	1804576-SS692R-S1	9/25/19	1740	Sed		

	VOCs 8260*	SVOCs 8270 by SIM**	TPH 8100M	PCB NOAA Summation of Congeners	RCRA8 metals + Cu, Ni, Zn***	EPH (fractions only)	Volatile solids (%)	Corrosivity, Ignit., React., Conductivity	Pesticides and Herbicides	Total cyanide	Total Sulfur, Total Sulfide, Total Sulfate	TOC by Lloyd-Kahn	Grain Size Analysis****	Sample-Specific Remarks
Preservative	H2O/MeOH	None	None	None	None	None	None	None	None	None	None	None	None	
1	X	X	X								X	X	X	
2				X	X	X	X	X	X	X				*
3					X									

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

Turnaround Time (Business days):

Normal __X__ Other ____

10-Day ____ 7-Day ____

5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you must notify the laboratory to confirm that the TAT can be achieved.

Relinquished by: (signature)	Date:	Time:	Received by: (signature)
1.	9/25/19	1400	1. GEI Sample Fridge
2. GEI Sample Fridge	9/26/19	1345	2. James Zemaitis
3. James Zemaitis	9/26/19	1345	3.
4.	9/26	18:55	4. 9/26/19 1924

Additional Requirements/Comments/Remarks:

*Sample dried for metals 9/27/19 LLB

*Run TCLP benzene if total >20X

**Include pyridine and toxaphene

***Run TCLP metals if total >20X

****Sieve Nos. 4, 10, 40, 60, and 200

Cooler Temp: 3.9

M Glover 10/9/19 1520

10.04.19 15:20

CTS

Run

Sterling Analytical, Inc.
15 Agawam Avenue
West Springfield, MA 01089
Phone (413) 214-6541 Fax (413) 214-6842
email-madhu@sterlinganalytical.com

Visit our website: www.sterlinganalytical.com

Mass Certification - MA-00071
Conn Certification - PH-0520

Report Date October 3, 2019

Customer	Contact	Laboratory Supervisor	eMail
ESS Laboratory	S. Morrell	Madhu Shah	customerservice@sterlinganalytical.com

Sample Description
Analysis of Solid Sample

Samples Analyzed

Enclosed are Report No(s): 68212

*Results reported on 'Dry Basis'.

Sulfur Total Blank = <0.05ppm

LCS Lo Check 0.100 = 0.101ppm

ICV 1.00 = 1.025ppm

Thank you for your business

madhu shah

Madhu Shah, Laboratory Supervisor

10/3/2019

Date

ALL the information contained in this report has been reviewed for accuracy and checked against all quality control requirements outlined in each applicable method.
This report may not be reproduced, except in full, without written approval from Sterling Analytical, Inc.

Sample	Description	Source	Taken/Time	Received
68212	19I0860-01	ESS Laboratory	9/24/19	9/27/19

Parameter	Results		RDL	Method	Analyzed/Time	Tech
Sulfur, Total	2,590	mg/kg	100.00	SW 846 6010	10/03/19	dfp

ESS Laboratory — Sterling

Division of Thielsch Engineering, Inc.

185 Frances Avenue, Cranston, RI 02910-2211
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 19i0860

Turn Time **DUE DATE: _DUE 10/3/19_____**

Regulatory State: **MA** RI CT NH NJ NY ME Other_____

Is this project for any of the following:(please circle)
MA-MCP Navy USACE CT DEP Other_____

Reporting Limits - _____

Electonic Deliverables Excel Access PDF

Co. Name: ESS LABORATORY	Project #:	Project Name: 19i0860	
Contact Person: Shawn Morrell / Heather Masse	Address:		
City:	State:	Zip:	PO #: B02792
Tel.	Email: Smorrell@thielsch.com; Hmasse@thielsch.com		

ESS Lab ID	Date	Collection Time	Grab -G Composite-C	Matrix	Sample ID	Pres Code	# of Containers	Type of Container	Vol of Container	Analysis: Total Sulfur 6010 mg/Kg									
	9/24/19	1610	G	Sed	19i0860-01					X									

Container Type: P-Poly G-Glass AG-Amber Glass S-Sterile V-VOA

Matrix: S-Soil SD-Solid D-Sludge WW-Wastewater GW-Groundwater SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filter

Cooler Present _____Yes _____No

Seals Intact ____ Yes _____No NA:___

Cooler Temperature: 4.3

Internal Use Only

[ ] Pickup

[ ] Technician___

Preservation Code: 1-NP, 2-HCl, 3-H2SO4, 4-HNO3, 5-NaOH, 6-MeOH, 7-Asorbic Acid, 8-ZnAct, 9-_____

Sampled by :

Comments: **QC required MB and LCS**

Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)
9/27/19 1440	9/27/19	9/27/19	
Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time) 3:22	Received by: (Signature, Date & Time)

* By circling MA-MCP, client acknowledges samples were collected in accordance with MADEP CAM VIIA

Please fax to the laboratory all changes to Chain of Custody

1 (White) Lab Copy
2 (Yellow) Client Receipt

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

Shipped/Delivered Via: ESS Courier

ESS Project ID: 19I0860
Date Received: 9/26/2019
Project Due Date: 10/3/2019
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 3.9 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** (Yes) / No / NA
10. Were any analyses received outside of hold time? Yes (No)

11. Any Subcontracting needed? (Yes) / No
    ESS Sample IDs: 1
    Analysis: Grain Size, Total Sulfur
    TAT: STD
12. Were VOAs received? (Yes) / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? (Yes) / No / NA
13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: 9/26/19 Time: 2044 By: JM

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	391946	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
01	391953	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
01	391954	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
01	391955	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
01	392157	Yes	NA	Yes	Driller Jar	NP	
01	392161	Yes	NA	Yes	VOA Vial - Other	Other	
01	392162	Yes	NA	Yes	VOA Vial - Other	Other	
02	391949	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
02	391950	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
02	391951	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
02	391952	Yes	NA	Yes	8 oz. Jar - Unpres	NP	

2nd Review
Were all containers scanned into storage/lab? Initials
Are barcode labels on correct containers? Yes / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed

ESS Laboratory Sample and Cooler Receipt Checklist

Client:	GEI Consultants, Inc. - TB/MM	ESS Project ID:	1910860
		Date Received:	9/26/2019
By:		Date & Time:	9/26/19 1939
Reviewed By:		Date & Time:	9/26/19 2044
Delivered By:			9/26/19 2044

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 1910860

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Number: 1804576

Project Location: Amesbury, MA

Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY REQUIRED – (YES) NO

If Yes, Are MCP Analytical Methods Required? (YES) NO NA

Are Drinking Water Samples Submitted? YES (NO) NA

If Yes, Have Drinking Water Sampling Requirements Been Met? YES NO (NA)

Sample Handling

Samples Field Filtered: YES NO (NA)

Sampled Shipped With Ice: (YES) NO

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Preservative	VOCs 8260*	SVOCs 8270 by SIM**	TPH 8100M	PCB NOAA Summation of Congeners	RCRA8 metals + Cu, Ni, Zn***	EPH (fractions only)	Volatile solids (%)	Corrosivity, Ignit., React., Conductivity	Pesticides and Herbicides	Total cyanide	Total Sulfur, Total Sulfide, Total Sulfate	TOC by Lloyd-Kahn	Grain Size Analysis****	Sample-Specific Remarks
1	1804576-SS692-S4	9/24/19	1610	Sed	7	BFM	H2O/MeOH	X	X	X								X	X	X	
2	1804576-SS692RS1	9/25/19	1740	Sed	4	BFM	None				X	X	X	X	X	X	X				
							None														
							None														
							None														
							None														
							None														
							None														
							None														
							None														
							None														
							None														

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

Relinquished by: (signature)	Date:	Time:	Received by: (signature)
1.	9/25/19	1900	1. GEI Sample Fridge
2. GEI Sample Fridge	9/26/19	1345	2. James Zemaitis
3. James Zemaitis	9/26/19	1345	3.
4.	9/26/19	1855	4. 9/26/19 1924

Turnaround Time (Business days):

Normal __X__ Other ____

10-Day ____ 7-Day ____

5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

*Run TCLP benzene if total >20X

**Include pyridine and toxaphene

***Run TCLP metals if total >20X

****Sieve Nos. 4, 10, 40, 60, and 200

Cooler Temp: 3.9

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP - 401WQ (1804576)
ESS Laboratory Work Order Number: 20C0331

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 2:34 pm, Mar 30, 2020

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses

CTS - Cranston, RI	Grain Size Analysis, Organic Content
Sterling Analytical Lab - West Springfield, MA	Sulfur

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 20C0331

SAMPLE RECEIPT

The following samples were received on March 11, 2020 for the analyses specified on the enclosed Chain of Custody Record.

Question I: All samples for EPH and Metals were analyzed for a subset of the required MCP list per the client's request.

Low Level VOA vials were frozen by ESS Laboratory on March 11, 2020 at 1948.

Lab Number	Sample Name	Matrix	Analysis
20C0331-01	1804576-SS773-S1	Sediment	1010, 1311, 1311/6010C, 6010, 7.3.3.2, 7.3.4.1, 8081B, 8082A Cong, 8100M, 8151A, 8260B, 8270D, 9014, 9030B, 9038, 9045, 9050A, EPH8270, LK, MADEP-EPH, SUB
20C0331-02	1804576-SS766-S2	Sediment	1010, 1311, 1311/6010C, 1311/7470A, 6010, 7.3.3.2, 7.3.4.1, 8081B, 8082A Cong, 8100M, 8151A, 8260B, 8260B Low, 8270D, 9014, 9030B, 9038, 9045, 9050A, EPH8270, LK, MADEP-EPH, SUB
20C0331-03	1804576-SS773-S1 Oven Dried	Sediment	6010C, 7471B
20C0331-04	1804576-SS766-S2 Oven Dried	Sediment	6010C, 7471B

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ ESS Laboratory Work Order: 20C0331

PROJECT NARRATIVE

5035/8260B Volatile Organic Compounds / Low Level

20C0331-02 **Reported above the quantitation limit; Estimated value (E).**
Naphthalene

D0C0358-CCV1 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
Bromomethane (22% @ 20%)

5035/8260B Volatile Organic Compounds / Methanol

D0C0324-CCV1 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
1,2-Dibromo-3-Chloropropane (21% @ 20%), 1,4-Dioxane - Screen (55% @ 20%)

8081B Organochlorine Pesticides

20C0331-01 **Lower value is used due to matrix interferences (LC).**
4,4′-DDD [2C]

20C0331-01 **Percent difference between primary and confirmation results exceeds 40% (P).**
4,4′-DDD [2C]

20C0331-02 **Lower value is used due to matrix interferences (LC).**
4,4′-DDD [2C]

20C0331-02 **Percent difference between primary and confirmation results exceeds 40% (P).**
4,4′-DDD [2C]

8082 Polychlorinated Biphenyls (PCB) / Congeners

20C0331-02 **Lower value is used due to matrix interferences (LC).**
BZ#105 , BZ#170 , BZ#195

20C0331-02 **Percent difference between primary and confirmation results exceeds 40% (P).**
BZ#105 , BZ#170 , BZ#195

D0C0389-CCV3 **Continuing Calibration %Diff/Drift is above control limit (CD+).**
BZ#52 (25% @ 20%)

8151A Chlorinated Herbicides

20C0331-01 **Lower value is used due to matrix interferences (LC).**
Dicamba [2C]

20C0331-01 **Modified result**
MCPP , MCPP [2C]

20C0331-01 **Peaks found in the retention time window for MCPP did not confirm by GC/MS.**
MCPP , MCPP [2C]

20C0331-01 **Percent difference between primary and confirmation results exceeds 40% (P).**
Dicamba [2C]

20C0331-02 **Lower value is used due to matrix interferences (LC).**
Dicamba [2C]

20C0331-02 **Modified result**
MCPA , MCPA [2C] , MCPP , MCPP [2C]

20C0331-02 **Peaks found in the retention time window for MCPA did not confirm by GC/MS.**
MCPA , MCPA [2C]

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ ESS Laboratory Work Order: 20C0331

20C0331-02 **Peaks found in the retention time window for MCPP did not confirm by GC/MS.**
MCPP , MCPP [2C]

20C0331-02 **Percent difference between primary and confirmation results exceeds 40% (P).**
Dicamba [2C]

8270D Semi-Volatile Organic Compounds

D0C0256-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (92% @ 80-120%), Pentachlorophenol (110% @ 80-120%)

D0C0318-CCV1 **Calibration required quadratic regression (Q).**
2,4-Dinitrophenol (106% @ 80-120%), Pentachlorophenol (103% @ 80-120%)

DC01210-BSD1 **Relative percent difference for duplicate is outside of criteria (D+).**
4-Chloroaniline (44% @ 30%)

MADEP-EPH Extractable Petroleum Hydrocarbons

D0C0264-CCV4 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
Naphthalene (21% @ 20%)

Total Metals

DC01343-SRM1 **Standard Reference Material is biased low (R-).**
Lead (67% @ 83-113%)

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 20C0331

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS773-S1
Date Sampled: 03/10/20 10:58
Percent Solids: 50

ESS Laboratory Work Order: 20C0331
ESS Laboratory Sample ID: 20C0331-01
Sample Matrix: Sediment
Units: mg/L

Extraction Method: 3005A TCLP

1311 TCLP Metals

Analyte	Results (MRL)	MDL	Method	TCLP Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Chromium	ND (0.020)		1311/6010C		1	KJK	03/19/20 20:27	50	50	DC01937
Lead	**0.673** (0.050)		1311/6010C		1	KJK	03/19/20 20:27	50	50	DC01937

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS773-S1
Date Sampled: 03/10/20 10:58
Percent Solids: 50
Initial Volume: 24
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 20C0331
ESS Laboratory Sample ID: 20C0331-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
1,1,1-Trichloroethane	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
1,1,2,2-Tetrachloroethane	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
1,1,2-Trichloroethane	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
1,1-Dichloroethane	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
1,1-Dichloroethene	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
1,1-Dichloropropene	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
1,2,3-Trichlorobenzene	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
1,2,3-Trichloropropane	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
1,2,4-Trichlorobenzene	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
1,2,4-Trimethylbenzene	**5.66** (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
1,2-Dibromo-3-Chloropropane	ND (2.27)		8260B		1	03/18/20 13:58	D0C0324	DC01823
1,2-Dibromoethane	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
1,2-Dichlorobenzene	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
1,2-Dichloroethane	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
1,2-Dichloropropane	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
1,3,5-Trimethylbenzene	**1.48** (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
1,3-Dichlorobenzene	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
1,3-Dichloropropane	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
1,4-Dichlorobenzene	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
1,4-Dioxane - Screen	ND (90.8)		8260B		1	03/18/20 13:58	D0C0324	DC01823
2,2-Dichloropropane	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
2-Butanone	ND (2.27)		8260B		1	03/18/20 13:58	D0C0324	DC01823
2-Chlorotoluene	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
2-Hexanone	ND (2.27)		8260B		1	03/18/20 13:58	D0C0324	DC01823
4-Chlorotoluene	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
4-Isopropyltoluene	**1.14** (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
4-Methyl-2-Pentanone	ND (2.27)		8260B		1	03/18/20 13:58	D0C0324	DC01823
Acetone	ND (2.27)		8260B		1	03/18/20 13:58	D0C0324	DC01823
Benzene	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
Bromobenzene	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
Bromochloromethane	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS773-S1
Date Sampled: 03/10/20 10:58
Percent Solids: 50
Initial Volume: 24
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 20C0331
ESS Laboratory Sample ID: 20C0331-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromodichloromethane	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
Bromoform	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
Bromomethane	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
Carbon Disulfide	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
Carbon Tetrachloride	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
Chlorobenzene	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
Chloroethane	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
Chloroform	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
Chloromethane	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
cis-1,2-Dichloroethene	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
cis-1,3-Dichloropropene	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
Dibromochloromethane	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
Dibromomethane	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
Dichlorodifluoromethane	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
Diethyl Ether	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
Di-isopropyl ether	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
Ethyl tertiary-butyl ether	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
Ethylbenzene	**2.62** (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
Hexachlorobutadiene	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
Isopropylbenzene	**1.02** (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
Methyl tert-Butyl Ether	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
Methylene Chloride	ND (0.908)		8260B		1	03/18/20 13:58	D0C0324	DC01823
Naphthalene	**84.8** (4.54)		8260B		10	03/18/20 16:11	D0C0324	DC01823
n-Butylbenzene	**0.985** (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
n-Propylbenzene	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
sec-Butylbenzene	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
Styrene	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
tert-Butylbenzene	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
Tertiary-amyl methyl ether	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
Tetrachloroethene	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
Tetrahydrofuran	ND (2.27)		8260B		1	03/18/20 13:58	D0C0324	DC01823
Toluene	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS773-S1
Date Sampled: 03/10/20 10:58
Percent Solids: 50
Initial Volume: 24
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 20C0331
ESS Laboratory Sample ID: 20C0331-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
trans-1,2-Dichloroethene	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
trans-1,3-Dichloropropene	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
Trichloroethene	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
Trichlorofluoromethane	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
Vinyl Chloride	ND (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
Xylene O	**0.831** (0.454)		8260B		1	03/18/20 13:58	D0C0324	DC01823
Xylene P,M	ND (0.908)		8260B		1	03/18/20 13:58	D0C0324	DC01823
Xylenes (Total)	ND (0.908)		8260B		1	03/18/20 13:58		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*106 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*84 %*		*70-130*
Surrogate: Dibromofluoromethane	*97 %*		*70-130*
Surrogate: Toluene-d8	*88 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS773-S1
Date Sampled: 03/10/20 10:58
Percent Solids: 50
Initial Volume: 19
Final Volume: 5
Extraction Method: 3546

ESS Laboratory Work Order: 20C0331
ESS Laboratory Sample ID: 20C0331-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: DMC
Prepared: 3/13/20 10:50

8081B Organochlorine Pesticides

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
4,4´-DDD [2C]	**P, LC 0.0064** (0.0053)		8081B		1	03/17/20 11:07	D0C0290	DC01305
4,4´-DDE [2C]	ND (0.0053)		8081B		1	03/17/20 11:07	D0C0290	DC01305
4,4´-DDT	ND (0.0053)		8081B		1	03/17/20 11:07	D0C0290	DC01305
Aldrin	ND (0.0053)		8081B		1	03/17/20 11:07	D0C0290	DC01305
alpha-BHC	ND (0.0053)		8081B		1	03/17/20 11:07	D0C0290	DC01305
alpha-Chlordane	ND (0.0053)		8081B		1	03/17/20 11:07	D0C0290	DC01305
beta-BHC	ND (0.0053)		8081B		1	03/17/20 11:07	D0C0290	DC01305
Chlordane (Total)	ND (0.0424)		8081B		1	03/17/20 11:07	D0C0290	DC01305
delta-BHC	ND (0.0053)		8081B		1	03/17/20 11:07	D0C0290	DC01305
Dieldrin	ND (0.0053)		8081B		1	03/17/20 11:07	D0C0290	DC01305
Endosulfan I	ND (0.0053)		8081B		1	03/17/20 11:07	D0C0290	DC01305
Endosulfan II	ND (0.0053)		8081B		1	03/17/20 11:07	D0C0290	DC01305
Endosulfan Sulfate	ND (0.0053)		8081B		1	03/17/20 11:07	D0C0290	DC01305
Endrin	ND (0.0053)		8081B		1	03/17/20 11:07	D0C0290	DC01305
Endrin Ketone	ND (0.0053)		8081B		1	03/17/20 11:07	D0C0290	DC01305
gamma-BHC (Lindane)	ND (0.0032)		8081B		1	03/17/20 11:07	D0C0290	DC01305
gamma-Chlordane	ND (0.0053)		8081B		1	03/17/20 11:07	D0C0290	DC01305
Heptachlor	ND (0.0053)		8081B		1	03/17/20 11:07	D0C0290	DC01305
Heptachlor Epoxide	ND (0.0053)		8081B		1	03/17/20 11:07	D0C0290	DC01305
Hexachlorobenzene	ND (0.0053)		8081B		1	03/17/20 11:07	D0C0290	DC01305
Methoxychlor	ND (0.0053)		8081B		1	03/17/20 11:07	D0C0290	DC01305
Toxaphene	ND (0.265)		8081B		1	03/17/20 11:07	D0C0290	DC01305

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*69 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*76 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*94 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*90 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS773-S1
Date Sampled: 03/10/20 10:58
Percent Solids: 50
Initial Volume: 30
Final Volume: 2
Extraction Method: 3540C

ESS Laboratory Work Order: 20C0331
ESS Laboratory Sample ID: 20C0331-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: DMC
Prepared: 3/16/20 14:15

8082 Polychlorinated Biphenyls (PCB) / Congeners

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
BZ#8	ND (0.00054)		8082A Cong		1	03/24/20 1:53	D0C0389	DC01607
BZ#18	ND (0.00054)		8082A Cong		1	03/24/20 1:53	D0C0389	DC01607
BZ#28	ND (0.00054)		8082A Cong		1	03/24/20 1:53	D0C0389	DC01607
BZ#44	ND (0.00054)		8082A Cong		1	03/24/20 1:53	D0C0389	DC01607
BZ#52	ND (0.00054)		8082A Cong		1	03/24/20 1:53	D0C0389	DC01607
BZ#66	ND (0.00054)		8082A Cong		1	03/24/20 1:53	D0C0389	DC01607
BZ#101	**0.00298** (0.00054)		8082A Cong		1	03/24/20 1:53	D0C0389	DC01607
BZ#105	ND (0.00054)		8082A Cong		1	03/24/20 1:53	D0C0389	DC01607
BZ#118	**0.00106** (0.00054)		8082A Cong		1	03/24/20 1:53	D0C0389	DC01607
BZ#128	ND (0.00054)		8082A Cong		1	03/24/20 1:53	D0C0389	DC01607
BZ#138 [2C]	**0.00182** (0.00054)		8082A Cong		1	03/24/20 1:53	D0C0389	DC01607
BZ#153	**0.00303** (0.00054)		8082A Cong		1	03/24/20 1:53	D0C0389	DC01607
BZ#170	ND (0.00054)		8082A Cong		1	03/24/20 1:53	D0C0389	DC01607
BZ#180 [2C]	**0.00085** (0.00054)		8082A Cong		1	03/24/20 1:53	D0C0389	DC01607
BZ#187	**0.00087** (0.00054)		8082A Cong		1	03/24/20 1:53	D0C0389	DC01607
BZ#195	ND (0.00054)		8082A Cong		1	03/24/20 1:53	D0C0389	DC01607
BZ#206	ND (0.00054)		8082A Cong		1	03/24/20 1:53	D0C0389	DC01607
BZ#209	ND (0.00054)		8082A Cong		1	03/24/20 1:53	D0C0389	DC01607

	%Recovery	Qualifier	Limits
Surrogate: Tetrachloro-m-xylene	*83 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*86 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS773-S1
Date Sampled: 03/10/20 10:58
Percent Solids: 50
Initial Volume: 10.4
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 20C0331
ESS Laboratory Sample ID: 20C0331-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: ZLC
Prepared: 3/12/20 10:25

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**6030** (38.7)		8100M		1	03/13/20 18:27	D0C0211	DC01160

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*120 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS773-S1
Date Sampled: 03/10/20 10:58
Percent Solids: 50
Initial Volume: 10.3
Final Volume: 4
Extraction Method: 3546

ESS Laboratory Work Order: 20C0331
ESS Laboratory Sample ID: 20C0331-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: DMC
Prepared: 3/12/20 15:20

8151A Chlorinated Herbicides

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2,4,5-T	ND (0.019)		8151A		1	03/14/20 23:41	D0C0260	DC01155
2,4,5-TP (Silvex)	ND (0.019)		8151A		1	03/14/20 23:41	D0C0260	DC01155
2,4-D	ND (0.092)		8151A		1	03/14/20 23:41	D0C0260	DC01155
2,4-DB	ND (0.093)		8151A		1	03/14/20 23:41	D0C0260	DC01155
Dalapon	ND (0.089)		8151A		1	03/14/20 23:41	D0C0260	DC01155
Dicamba [2C]	**P, LC 0.063** (0.018)		8151A		1	03/14/20 23:41	D0C0260	DC01155
Dichlorprop	ND (0.092)		8151A		1	03/14/20 23:41	D0C0260	DC01155
Dinoseb	ND (0.093)		8151A		1	03/14/20 23:41	D0C0260	DC01155
MCPA	ND (4.54)		8151A		1	03/14/20 23:41	D0C0260	DC01155
MCPP	**#, XHa** ND (4.59)		8151A		1	03/14/20 23:41	D0C0260	DC01155

	%Recovery	Qualifier	Limits
Surrogate: DCAA	*97 %*		*30-150*
Surrogate: DCAA [2C]	*76 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS773-S1
Date Sampled: 03/10/20 10:58
Percent Solids: 50
Initial Volume: 14.5
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 20C0331
ESS Laboratory Sample ID: 20C0331-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: TJ
Prepared: 3/12/20 12:02

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,2,4-Trichlorobenzene	ND (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
1,2-Dichlorobenzene	ND (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
1,3-Dichlorobenzene	ND (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
1,4-Dichlorobenzene	ND (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
2,4,5-Trichlorophenol	ND (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
2,4,6-Trichlorophenol	ND (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
2,4-Dichlorophenol	ND (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
2,4-Dimethylphenol	ND (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
2,4-Dinitrophenol	ND (1.39)		8270D		1	03/13/20 17:23	D0C0256	DC01210
2,4-Dinitrotoluene	ND (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
2,6-Dinitrotoluene	ND (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
2-Chloronaphthalene	ND (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
2-Chlorophenol	ND (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
2-Methylnaphthalene	**8.54** (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
2-Methylphenol	ND (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
2-Nitrophenol	ND (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
3,3′-Dichlorobenzidine	ND (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
3+4-Methylphenol	ND (1.39)		8270D		1	03/13/20 17:23	D0C0256	DC01210
4-Bromophenyl-phenylether	ND (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
4-Chloroaniline	ND (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
4-Nitrophenol	ND (3.48)		8270D		1	03/13/20 17:23	D0C0256	DC01210
Acenaphthene	**48.6** (6.93)		8270D		10	03/13/20 20:01	D0C0256	DC01210
Acenaphthylene	**4.94** (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
Acetophenone	ND (1.39)		8270D		1	03/13/20 17:23	D0C0256	DC01210
Aniline	ND (3.48)		8270D		1	03/13/20 17:23	D0C0256	DC01210
Anthracene	**33.0** (6.93)		8270D		10	03/13/20 20:01	D0C0256	DC01210
Azobenzene	ND (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
Benzo(a)anthracene	**21.8** (6.93)		8270D		10	03/13/20 20:01	D0C0256	DC01210
Benzo(a)pyrene	**17.1** (0.348)		8270D		1	03/13/20 17:23	D0C0256	DC01210
Benzo(b)fluoranthene	**10.2** (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
Benzo(g,h,i)perylene	**8.13** (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
Benzo(k)fluoranthene	**8.44** (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS773-S1
Date Sampled: 03/10/20 10:58
Percent Solids: 50
Initial Volume: 14.5
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 20C0331
ESS Laboratory Sample ID: 20C0331-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: TJ
Prepared: 3/12/20 12:02

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
bis(2-Chloroethoxy)methane	ND (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
bis(2-Chloroethyl)ether	ND (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
bis(2-chloroisopropyl)Ether	ND (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
bis(2-Ethylhexyl)phthalate	ND (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
Butylbenzylphthalate	ND (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
Chrysene	**21.4** (3.48)		8270D		10	03/13/20 20:01	D0C0256	DC01210
Dibenzo(a,h)Anthracene	**2.46** (0.348)		8270D		1	03/13/20 17:23	D0C0256	DC01210
Dibenzofuran	**2.47** (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
Diethylphthalate	ND (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
Dimethylphthalate	ND (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
Di-n-butylphthalate	ND (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
Di-n-octylphthalate	ND (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
Fluoranthene	**41.5** (6.93)		8270D		10	03/13/20 20:01	D0C0256	DC01210
Fluorene	**29.8** (6.93)		8270D		10	03/13/20 20:01	D0C0256	DC01210
Hexachlorobenzene	ND (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
Hexachlorobutadiene	ND (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
Hexachloroethane	ND (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
Indeno(1,2,3-cd)Pyrene	**6.75** (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
Isophorone	ND (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
Naphthalene	**46.8** (6.93)		8270D		10	03/13/20 20:01	D0C0256	DC01210
Nitrobenzene	ND (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
N-Nitrosodimethylamine	ND (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
Pentachlorophenol	ND (1.39)		8270D		1	03/13/20 17:23	D0C0256	DC01210
Phenanthrene	**97.2** (6.93)		8270D		10	03/13/20 20:01	D0C0256	DC01210
Phenol	ND (0.693)		8270D		1	03/13/20 17:23	D0C0256	DC01210
Pyrene	**58.7** (6.93)		8270D		10	03/13/20 20:01	D0C0256	DC01210
Pyridine	ND (3.48)		8270D		1	03/13/20 17:23	D0C0256	DC01210

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*56 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*78 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*57 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS773-S1
Date Sampled: 03/10/20 10:58
Percent Solids: 50
Initial Volume: 14.5
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 20C0331
ESS Laboratory Sample ID: 20C0331-01
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: TJ
Prepared: 3/12/20 12:02

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Surrogate: 2-Fluorobiphenyl		*60 %*		*30-130*				
Surrogate: 2-Fluorophenol		*56 %*		*30-130*				
Surrogate: Nitrobenzene-d5		*63 %*		*30-130*				
Surrogate: Phenol-d6		*58 %*		*30-130*				
Surrogate: p-Terphenyl-d14		*77 %*		*30-130*				

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS773-S1
Date Sampled: 03/10/20 10:58
Percent Solids: 50

ESS Laboratory Work Order: 20C0331
ESS Laboratory Sample ID: 20C0331-01
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Conductivity	**WL 144** (5)		9050A		1	CCP	03/12/20 14:30	umhos/cm	DC01230
Corrosivity (pH)	**6.44** (N/A)		9045		1	JLK	03/11/20 21:00	S.U.	DC01129
Corrosivity (pH) Sample Temp	**Soil pH measured in water at 19.4 ºC.**								
Flashpoint	**> 200** (N/A)		1010		1	CCP	03/12/20 15:30	°F	DC01234
Reactive Cyanide	ND (2.0)		7.3.3.2		1	JLK	03/12/20 14:50	mg/kg	DC01228
Reactive Sulfide	ND (2.0)		7.3.4.1		1	JLK	03/12/20 14:50	mg/kg	DC01228
Sulfate	**WL 228** (100)		9038		1	EEM	03/12/20 17:00	mg/kg dry	DC01220
Sulfide	**WL** ND (1.0)		9030B		1	EEM	03/13/20 11:50	mg/kg dry	DC01318
Total Cyanide	**2.41** (1.87)		9014		1	EEM	03/12/20 12:30	mg/kg dry	DC01225
Total Organic Carbon (Average)	**134000** (95.9)		LK		1	CCP	03/16/20 15:47	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS773-S1
Date Sampled: 03/10/20 10:58
Percent Solids: 50
Initial Volume: 25.9
Final Volume: 2
Extraction Method: 3546

ESS Laboratory Work Order: 20C0331
ESS Laboratory Sample ID: 20C0331-01
Sample Matrix: Sediment
Units: mg/kg dry

Prepared: 3/12/20 13:15

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	**196** (58.3)		MADEP-EPH		1	CAD	03/12/20 22:08	D0C0221	DC01205
C19-C36 Aliphatics1	**289** (58.3)		MADEP-EPH		1	CAD	03/12/20 22:08	D0C0221	DC01205
C11-C22 Unadjusted Aromatics1	**1150** (291)		EPH8270		5	VSC	03/16/20 15:45	D0C0284	DC01205
C11-C22 Aromatics1,2	**777** (291)		EPH8270			VSC	03/16/20 16:58		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*79 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*89 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*79 %*		*40-140*
Surrogate: O-Terphenyl	*71 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS773-S1
Date Sampled: 03/10/20 10:58

ESS Laboratory Work Order: 20C0331
ESS Laboratory Sample ID: 20C0331-01
Sample Matrix: Sediment

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Grain Size	**See Attached** (N/A)								
Organic Content	**See Attached** (N/A)								
Sulfur	**3450** (100)		6010		1	SUB	03/18/20 0:00	mg/kg	DC01928

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS773-S1
Date Sampled: 03/10/20 10:58
Percent Solids: 50
Initial Volume: 100
Final Volume: 2000
Extraction Method: 1311

ESS Laboratory Work Order: 20C0331
ESS Laboratory Sample ID: 20C0331-01
Sample Matrix: Sediment
Units: °C
Analyst: MKS
Prepared: 3/18/20 20:15

TCLP Extraction by 1311

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Batch
Temperature (Min C)	**19.8** (N/A)		1311		1	MKS	03/19/20 12:20	DC01824
Temperature (Max C)	**21.4** (N/A)		1311		1	MKS	03/19/20 12:20	DC01824
Temperature (Range)	**Temperature is not within 23 +/-2 ºC.** (N/A)							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS766-S2
Date Sampled: 03/10/20 11:47
Percent Solids: 58

ESS Laboratory Work Order: 20C0331
ESS Laboratory Sample ID: 20C0331-02
Sample Matrix: Sediment
Units: mg/L

Extraction Method: 3005A TCLP

1311 TCLP Metals

Analyte	Results (MRL)	MDL	Method	TCLP Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Chromium	ND (0.020)		1311/6010C		1	KJK	03/19/20 20:31	50	50	DC01937
Lead	**0.801** (0.050)		1311/6010C		1	KJK	03/19/20 20:31	50	50	DC01937
Mercury	ND (0.00050)		1311/7470A		1	MKS	03/20/20 9:06	20	40	DC01936

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS766-S2
Date Sampled: 03/10/20 11:47
Percent Solids: 58
Initial Volume: 10.8
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 20C0331
ESS Laboratory Sample ID: 20C0331-02
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
1,1,1-Trichloroethane	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
1,1,2,2-Tetrachloroethane	ND (0.0016)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
1,1,2-Trichloroethane	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
1,1-Dichloroethane	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
1,1-Dichloroethene	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
1,1-Dichloropropene	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
1,2,3-Trichlorobenzene	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
1,2,3-Trichloropropane	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
1,2,4-Trichlorobenzene	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
1,2,4-Trimethylbenzene	**0.0190** (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
1,2-Dibromo-3-Chloropropane	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
1,2-Dibromoethane	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
1,2-Dichlorobenzene	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
1,2-Dichloroethane	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
1,2-Dichloropropane	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
1,3,5-Trimethylbenzene	**0.0075** (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
1,3-Dichlorobenzene	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
1,3-Dichloropropane	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
1,4-Dichlorobenzene	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
1,4-Dioxane	ND (0.0797)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
2,2-Dichloropropane	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
2-Butanone	**0.0269** (0.0080)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
2-Chlorotoluene	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
2-Hexanone	ND (0.0080)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
4-Chlorotoluene	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
4-Isopropyltoluene	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
4-Methyl-2-Pentanone	ND (0.0080)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
Acetone	**0.197** (0.0080)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
Benzene	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
Bromobenzene	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
Bromochloromethane	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS766-S2
Date Sampled: 03/10/20 11:47
Percent Solids: 58
Initial Volume: 10.8
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 20C0331
ESS Laboratory Sample ID: 20C0331-02
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromodichloromethane	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
Bromoform	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
Bromomethane	ND (0.0080)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
Carbon Disulfide	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
Carbon Tetrachloride	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
Chlorobenzene	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
Chloroethane	ND (0.0080)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
Chloroform	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
Chloromethane	ND (0.0080)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
cis-1,2-Dichloroethene	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
cis-1,3-Dichloropropene	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
Dibromochloromethane	ND (0.0016)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
Dibromomethane	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
Dichlorodifluoromethane	ND (0.0080)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
Diethyl Ether	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
Di-isopropyl ether	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
Ethyl tertiary-butyl ether	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
Ethylbenzene	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
Hexachlorobutadiene	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
Isopropylbenzene	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
Methyl tert-Butyl Ether	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
Methylene Chloride	ND (0.0080)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
Naphthalene	**E 0.214** (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
n-Butylbenzene	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
n-Propylbenzene	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
sec-Butylbenzene	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
Styrene	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
tert-Butylbenzene	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
Tertiary-amyl methyl ether	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
Tetrachloroethene	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
Tetrahydrofuran	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
Toluene	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS766-S2
Date Sampled: 03/10/20 11:47
Percent Solids: 58
Initial Volume: 10.8
Final Volume: 10
Extraction Method: 5035

ESS Laboratory Work Order: 20C0331
ESS Laboratory Sample ID: 20C0331-02
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MEK

5035/8260B Volatile Organic Compounds / Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
trans-1,2-Dichloroethene	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
trans-1,3-Dichloropropene	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
Trichloroethene	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
Trichlorofluoromethane	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
Vinyl Chloride	ND (0.0080)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
Xylene O	ND (0.0040)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
Xylene P,M	ND (0.0080)		8260B Low		1	03/19/20 23:47	D0C0358	DC01938
Xylenes (Total)	ND (0.00797)		8260B Low		1	03/19/20 23:47		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*110 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*88 %*		*70-130*
Surrogate: Dibromofluoromethane	*106 %*		*70-130*
Surrogate: Toluene-d8	*103 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS766-S2
Date Sampled: 03/10/20 11:47
Percent Solids: 58
Initial Volume: 19.1
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 20C0331
ESS Laboratory Sample ID: 20C0331-02
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
1,1,1-Trichloroethane	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
1,1,2,2-Tetrachloroethane	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
1,1,2-Trichloroethane	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
1,1-Dichloroethane	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
1,1-Dichloroethene	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
1,1-Dichloropropene	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
1,2,3-Trichlorobenzene	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
1,2,3-Trichloropropane	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
1,2,4-Trichlorobenzene	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
1,2,4-Trimethylbenzene	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
1,2-Dibromo-3-Chloropropane	ND (2.08)		8260B		1	03/18/20 15:45	D0C0324	DC01823
1,2-Dibromoethane	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
1,2-Dichlorobenzene	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
1,2-Dichloroethane	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
1,2-Dichloropropane	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
1,3,5-Trimethylbenzene	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
1,3-Dichlorobenzene	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
1,3-Dichloropropane	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
1,4-Dichlorobenzene	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
1,4-Dioxane - Screen	ND (83.0)		8260B		1	03/18/20 15:45	D0C0324	DC01823
2,2-Dichloropropane	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
2-Butanone	ND (2.08)		8260B		1	03/18/20 15:45	D0C0324	DC01823
2-Chlorotoluene	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
2-Hexanone	ND (2.08)		8260B		1	03/18/20 15:45	D0C0324	DC01823
4-Chlorotoluene	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
4-Isopropyltoluene	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
4-Methyl-2-Pentanone	ND (2.08)		8260B		1	03/18/20 15:45	D0C0324	DC01823
Acetone	ND (2.08)		8260B		1	03/18/20 15:45	D0C0324	DC01823
Benzene	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
Bromobenzene	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
Bromochloromethane	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS766-S2
Date Sampled: 03/10/20 11:47
Percent Solids: 58
Initial Volume: 19.1
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 20C0331
ESS Laboratory Sample ID: 20C0331-02
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromodichloromethane	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
Bromoform	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
Bromomethane	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
Carbon Disulfide	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
Carbon Tetrachloride	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
Chlorobenzene	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
Chloroethane	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
Chloroform	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
Chloromethane	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
cis-1,2-Dichloroethene	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
cis-1,3-Dichloropropene	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
Dibromochloromethane	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
Dibromomethane	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
Dichlorodifluoromethane	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
Diethyl Ether	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
Di-isopropyl ether	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
Ethyl tertiary-butyl ether	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
Ethylbenzene	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
Hexachlorobutadiene	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
Isopropylbenzene	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
Methyl tert-Butyl Ether	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
Methylene Chloride	ND (0.830)		8260B		1	03/18/20 15:45	D0C0324	DC01823
Naphthalene	**4.76** (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
n-Butylbenzene	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
n-Propylbenzene	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
sec-Butylbenzene	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
Styrene	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
tert-Butylbenzene	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
Tertiary-amyl methyl ether	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
Tetrachloroethene	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
Tetrahydrofuran	ND (2.08)		8260B		1	03/18/20 15:45	D0C0324	DC01823
Toluene	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS766-S2
Date Sampled: 03/10/20 11:47
Percent Solids: 58
Initial Volume: 19.1
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 20C0331
ESS Laboratory Sample ID: 20C0331-02
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
trans-1,2-Dichloroethene	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
trans-1,3-Dichloropropene	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
Trichloroethene	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
Trichlorofluoromethane	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
Vinyl Chloride	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
Xylene O	ND (0.415)		8260B		1	03/18/20 15:45	D0C0324	DC01823
Xylene P,M	ND (0.830)		8260B		1	03/18/20 15:45	D0C0324	DC01823
Xylenes (Total)	ND (0.830)		8260B		1	03/18/20 15:45		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*103 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*81 %*		*70-130*
Surrogate: Dibromofluoromethane	*96 %*		*70-130*
Surrogate: Toluene-d8	*88 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS766-S2
Date Sampled: 03/10/20 11:47
Percent Solids: 58
Initial Volume: 19.8
Final Volume: 5
Extraction Method: 3546

ESS Laboratory Work Order: 20C0331
ESS Laboratory Sample ID: 20C0331-02
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: DMC
Prepared: 3/13/20 10:50

8081B Organochlorine Pesticides

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
4,4´-DDD [2C]	**P, LC 0.0081** (0.0043)		8081B		1	03/17/20 12:02	D0C0290	DC01305
4,4´-DDE	ND (0.0043)		8081B		1	03/17/20 12:02	D0C0290	DC01305
4,4´-DDT	ND (0.0043)		8081B		1	03/17/20 12:02	D0C0290	DC01305
Aldrin	ND (0.0043)		8081B		1	03/17/20 12:02	D0C0290	DC01305
alpha-BHC	ND (0.0043)		8081B		1	03/17/20 12:02	D0C0290	DC01305
alpha-Chlordane	ND (0.0043)		8081B		1	03/17/20 12:02	D0C0290	DC01305
beta-BHC	ND (0.0043)		8081B		1	03/17/20 12:02	D0C0290	DC01305
Chlordane (Total)	ND (0.0348)		8081B		1	03/17/20 12:02	D0C0290	DC01305
delta-BHC	ND (0.0043)		8081B		1	03/17/20 12:02	D0C0290	DC01305
Dieldrin	ND (0.0043)		8081B		1	03/17/20 12:02	D0C0290	DC01305
Endosulfan I	ND (0.0043)		8081B		1	03/17/20 12:02	D0C0290	DC01305
Endosulfan II	ND (0.0043)		8081B		1	03/17/20 12:02	D0C0290	DC01305
Endosulfan Sulfate [2C]	ND (0.0043)		8081B		1	03/17/20 12:02	D0C0290	DC01305
Endrin	ND (0.0043)		8081B		1	03/17/20 12:02	D0C0290	DC01305
Endrin Ketone	ND (0.0043)		8081B		1	03/17/20 12:02	D0C0290	DC01305
gamma-BHC (Lindane)	ND (0.0026)		8081B		1	03/17/20 12:02	D0C0290	DC01305
gamma-Chlordane	ND (0.0043)		8081B		1	03/17/20 12:02	D0C0290	DC01305
Heptachlor	ND (0.0043)		8081B		1	03/17/20 12:02	D0C0290	DC01305
Heptachlor Epoxide	ND (0.0043)		8081B		1	03/17/20 12:02	D0C0290	DC01305
Hexachlorobenzene [2C]	ND (0.0043)		8081B		1	03/17/20 12:02	D0C0290	DC01305
Methoxychlor [2C]	ND (0.0043)		8081B		1	03/17/20 12:02	D0C0290	DC01305
Toxaphene	ND (0.217)		8081B		1	03/17/20 12:02	D0C0290	DC01305

	%Recovery	*Qualifier*	*Limits*
Surrogate: Decachlorobiphenyl	*92 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*98 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*78 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*87 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS766-S2
Date Sampled: 03/10/20 11:47
Percent Solids: 58
Initial Volume: 30
Final Volume: 2
Extraction Method: 3540C

ESS Laboratory Work Order: 20C0331
ESS Laboratory Sample ID: 20C0331-02
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: DMC
Prepared: 3/16/20 14:15

8082 Polychlorinated Biphenyls (PCB) / Congeners

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
BZ#8 [2C]	**0.00200** (0.00047)		8082A Cong		1	03/24/20 3:18	D0C0389	DC01607
BZ#18	ND (0.00047)		8082A Cong		1	03/24/20 3:18	D0C0389	DC01607
BZ#28	ND (0.00047)		8082A Cong		1	03/24/20 3:18	D0C0389	DC01607
BZ#44 [2C]	**0.00404** (0.00047)		8082A Cong		1	03/24/20 3:18	D0C0389	DC01607
BZ#52	**0.0107** (0.00047)		8082A Cong		1	03/24/20 3:18	D0C0389	DC01607
BZ#66	ND (0.00047)		8082A Cong		1	03/24/20 3:18	D0C0389	DC01607
BZ#101	**0.00708** (0.00047)		8082A Cong		1	03/24/20 3:18	D0C0389	DC01607
BZ#105	**P, LC 0.00139** (0.00047)		8082A Cong		1	03/24/20 3:18	D0C0389	DC01607
BZ#118	**0.00558** (0.00047)		8082A Cong		1	03/24/20 3:18	D0C0389	DC01607
BZ#128	**0.00098** (0.00047)		8082A Cong		1	03/24/20 3:18	D0C0389	DC01607
BZ#138 [2C]	**0.00700** (0.00047)		8082A Cong		1	03/24/20 3:18	D0C0389	DC01607
BZ#153	**0.00526** (0.00047)		8082A Cong		1	03/24/20 3:18	D0C0389	DC01607
BZ#170	**P, LC 0.00119** (0.00047)		8082A Cong		1	03/24/20 3:18	D0C0389	DC01607
BZ#180	**0.00213** (0.00047)		8082A Cong		1	03/24/20 3:18	D0C0389	DC01607
BZ#187 [2C]	**0.00181** (0.00047)		8082A Cong		1	03/24/20 3:18	D0C0389	DC01607
BZ#195	**P, LC 0.00126** (0.00047)		8082A Cong		1	03/24/20 3:18	D0C0389	DC01607
BZ#206 [2C]	**0.0147** (0.00186)		8082A Cong		4	03/24/20 2:35	D0C0389	DC01607
BZ#209 [2C]	**0.0256** (0.00186)		8082A Cong		4	03/24/20 2:35	D0C0389	DC01607

	%Recovery	Qualifier	Limits
Surrogate: Tetrachloro-m-xylene	*80 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*86 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS766-S2
Date Sampled: 03/10/20 11:47
Percent Solids: 58
Initial Volume: 10.1
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 20C0331
ESS Laboratory Sample ID: 20C0331-02
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: ZLC
Prepared: 3/12/20 10:25

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**5380** (34.1)		8100M		1	03/13/20 19:03	D0C0211	DC01160

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*122 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS766-S2
Date Sampled: 03/10/20 11:47
Percent Solids: 58
Initial Volume: 10.2
Final Volume: 4
Extraction Method: 3546

ESS Laboratory Work Order: 20C0331
ESS Laboratory Sample ID: 20C0331-02
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: DMC
Prepared: 3/12/20 15:20

8151A Chlorinated Herbicides

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2,4,5-T	ND (0.016)		8151A		1	03/15/20 0:10	D0C0260	DC01155
2,4,5-TP (Silvex)	ND (0.016)		8151A		1	03/15/20 0:10	D0C0260	DC01155
2,4-D	ND (0.079)		8151A		1	03/15/20 0:10	D0C0260	DC01155
2,4-DB	ND (0.080)		8151A		1	03/15/20 0:10	D0C0260	DC01155
Dalapon	ND (0.077)		8151A		1	03/15/20 0:10	D0C0260	DC01155
Dicamba [2C]	**P, LC 0.060** (0.016)		8151A		1	03/15/20 0:10	D0C0260	DC01155
Dichlorprop	ND (0.079)		8151A		1	03/15/20 0:10	D0C0260	DC01155
Dinoseb	ND (0.080)		8151A		1	03/15/20 0:10	D0C0260	DC01155
MCPA	**#, XH** ND (3.93)		8151A		1	03/15/20 0:10	D0C0260	DC01155
MCPP	**#, XHa** ND (3.97)		8151A		1	03/15/20 0:10	D0C0260	DC01155

	%Recovery	Qualifier	Limits
Surrogate: DCAA	*116 %*		*30-150*
Surrogate: DCAA [2C]	*85 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS766-S2
Date Sampled: 03/10/20 11:47
Percent Solids: 58
Initial Volume: 14.8
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 20C0331
ESS Laboratory Sample ID: 20C0331-02
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: TJ
Prepared: 3/12/20 12:02

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,2,4-Trichlorobenzene	ND (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
1,2-Dichlorobenzene	ND (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
1,3-Dichlorobenzene	ND (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
1,4-Dichlorobenzene	ND (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
2,4,5-Trichlorophenol	ND (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
2,4,6-Trichlorophenol	ND (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
2,4-Dichlorophenol	ND (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
2,4-Dimethylphenol	ND (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
2,4-Dinitrophenol	ND (1.16)		8270D		1	03/13/20 17:49	D0C0256	DC01210
2,4-Dinitrotoluene	ND (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
2,6-Dinitrotoluene	ND (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
2-Chloronaphthalene	ND (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
2-Chlorophenol	ND (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
2-Methylnaphthalene	**1.52** (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
2-Methylphenol	ND (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
2-Nitrophenol	ND (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
3,3′-Dichlorobenzidine	ND (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
3+4-Methylphenol	ND (1.16)		8270D		1	03/13/20 17:49	D0C0256	DC01210
4-Bromophenyl-phenylether	ND (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
4-Chloroaniline	ND (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
4-Nitrophenol	ND (2.92)		8270D		1	03/13/20 17:49	D0C0256	DC01210
Acenaphthene	**42.3** (5.81)		8270D		10	03/13/20 20:28	D0C0256	DC01210
Acenaphthylene	**4.83** (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
Acetophenone	ND (1.16)		8270D		1	03/13/20 17:49	D0C0256	DC01210
Aniline	ND (2.92)		8270D		1	03/13/20 17:49	D0C0256	DC01210
Anthracene	**31.2** (5.81)		8270D		10	03/13/20 20:28	D0C0256	DC01210
Azobenzene	ND (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
Benzo(a)anthracene	**27.8** (5.81)		8270D		10	03/13/20 20:28	D0C0256	DC01210
Benzo(a)pyrene	**31.0** (2.92)		8270D		10	03/13/20 20:28	D0C0256	DC01210
Benzo(b)fluoranthene	**17.9** (5.81)		8270D		10	03/13/20 20:28	D0C0256	DC01210
Benzo(g,h,i)perylene	**14.5** (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
Benzo(k)fluoranthene	**13.6** (5.81)		8270D		10	03/13/20 20:28	D0C0256	DC01210

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS766-S2
Date Sampled: 03/10/20 11:47
Percent Solids: 58
Initial Volume: 14.8
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 20C0331
ESS Laboratory Sample ID: 20C0331-02
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: TJ
Prepared: 3/12/20 12:02

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
bis(2-Chloroethoxy)methane	ND (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
bis(2-Chloroethyl)ether	ND (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
bis(2-chloroisopropyl)Ether	ND (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
bis(2-Ethylhexyl)phthalate	ND (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
Butylbenzylphthalate	ND (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
Chrysene	**24.5** (2.92)		8270D		10	03/13/20 20:28	D0C0256	DC01210
Dibenzo(a,h)Anthracene	**3.73** (0.292)		8270D		1	03/13/20 17:49	D0C0256	DC01210
Dibenzofuran	**2.46** (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
Diethylphthalate	ND (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
Dimethylphthalate	ND (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
Di-n-butylphthalate	ND (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
Di-n-octylphthalate	ND (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
Fluoranthene	**58.1** (5.81)		8270D		10	03/13/20 20:28	D0C0256	DC01210
Fluorene	**23.9** (5.81)		8270D		10	03/13/20 20:28	D0C0256	DC01210
Hexachlorobenzene	ND (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
Hexachlorobutadiene	ND (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
Hexachloroethane	ND (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
Indeno(1,2,3-cd)Pyrene	**11.5** (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
Isophorone	ND (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
Naphthalene	**5.17** (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
Nitrobenzene	ND (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
N-Nitrosodimethylamine	ND (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
Pentachlorophenol	ND (1.16)		8270D		1	03/13/20 17:49	D0C0256	DC01210
Phenanthrene	**104** (5.81)		8270D		10	03/13/20 20:28	D0C0256	DC01210
Phenol	ND (0.581)		8270D		1	03/13/20 17:49	D0C0256	DC01210
Pyrene	**80.9** (5.81)		8270D		10	03/13/20 20:28	D0C0256	DC01210
Pyridine	ND (2.92)		8270D		1	03/13/20 17:49	D0C0256	DC01210

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*53 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*90 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*57 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS766-S2
Date Sampled: 03/10/20 11:47
Percent Solids: 58
Initial Volume: 14.8
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 20C0331
ESS Laboratory Sample ID: 20C0331-02
Sample Matrix: Sediment
Units: mg/kg dry
Analyst: TJ
Prepared: 3/12/20 12:02

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Surrogate: 2-Fluorobiphenyl		*64 %*		*30-130*				
Surrogate: 2-Fluorophenol		*52 %*		*30-130*				
Surrogate: Nitrobenzene-d5		*62 %*		*30-130*				
Surrogate: Phenol-d6		*61 %*		*30-130*				
Surrogate: p-Terphenyl-d14		*93 %*		*30-130*				

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS766-S2
Date Sampled: 03/10/20 11:47
Percent Solids: 58

ESS Laboratory Work Order: 20C0331
ESS Laboratory Sample ID: 20C0331-02
Sample Matrix: Sediment

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Conductivity	**WL 104** (5)		9050A		1	CCP	03/12/20 14:30	umhos/cm	DC01230
Corrosivity (pH)	**6.24** (N/A)		9045		1	JLK	03/11/20 21:00	S.U.	DC01129
Corrosivity (pH) Sample Temp	**Soil pH measured in water at 19.1 ºC.**								
Flashpoint	**> 200** (N/A)		1010		1	CCP	03/12/20 15:30	°F	DC01234
Reactive Cyanide	ND (2.0)		7.3.3.2		1	JLK	03/12/20 14:50	mg/kg	DC01228
Reactive Sulfide	ND (2.0)		7.3.4.1		1	JLK	03/12/20 14:50	mg/kg	DC01228
Sulfate	**WL 103** (86)		9038		1	EEM	03/12/20 17:00	mg/kg dry	DC01220
Sulfide	**WL** ND (0.9)		9030B		1	EEM	03/13/20 11:50	mg/kg dry	DC01318
Total Cyanide	**3.65** (1.67)		9014		1	EEM	03/12/20 12:30	mg/kg dry	DC01225
Total Organic Carbon (Average)	**179000** (94.6)		LK		1	CCP	03/16/20 14:53	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS766-S2
Date Sampled: 03/10/20 11:47
Percent Solids: 58
Initial Volume: 24.8
Final Volume: 2
Extraction Method: 3546

ESS Laboratory Work Order: 20C0331
ESS Laboratory Sample ID: 20C0331-02
Sample Matrix: Sediment
Units: mg/kg dry

Prepared: 3/12/20 13:15

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	**129** (52.1)		MADEP-EPH		1	CAD	03/12/20 23:04	D0C0221	DC01205
C19-C36 Aliphatics1	**453** (52.1)		MADEP-EPH		1	CAD	03/12/20 23:04	D0C0221	DC01205
C11-C22 Unadjusted Aromatics1	**1450** (260)		EPH8270		5	VSC	03/16/20 16:22	D0C0284	DC01205
C11-C22 Aromatics1,2	**909** (260)		EPH8270			VSC	03/16/20 17:34		[CALC]

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1-Chlorooctadecane	*96 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*110 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*103 %*		*40-140*
Surrogate: O-Terphenyl	*105 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS766-S2
Date Sampled: 03/10/20 11:47

ESS Laboratory Work Order: 20C0331
ESS Laboratory Sample ID: 20C0331-02
Sample Matrix: Sediment

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Grain Size	**See Attached** (N/A)								
Organic Content	**See Attached** (N/A)								
Sulfur	**3580** (100)		6010		1	SUB	03/18/20 0:00	mg/kg	DC01928

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS766-S2
Date Sampled: 03/10/20 11:47
Percent Solids: 58
Initial Volume: 100
Final Volume: 2000
Extraction Method: 1311

ESS Laboratory Work Order: 20C0331
ESS Laboratory Sample ID: 20C0331-02
Sample Matrix: Sediment
Units: °C
Analyst: MKS
Prepared: 3/18/20 20:15

TCLP Extraction by 1311

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Batch
Temperature (Min C)	**19.8** (N/A)		1311		1	MKS	03/19/20 12:20	DC01824
Temperature (Max C)	**21.4** (N/A)		1311		1	MKS	03/19/20 12:20	DC01824
Temperature (Range)	**Temperature is not within 23 +/-2 ºC.** (N/A)							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS773-S1 Oven Dried
Date Sampled: 03/10/20 10:58
Percent Solids: 98

ESS Laboratory Work Order: 20C0331
ESS Laboratory Sample ID: 20C0331-03
Sample Matrix: Sediment
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Arsenic	**25.4** (0.96)		6010C		1	KJK	03/14/20 4:37	5.28	100	DC01343
Barium	**89.6** (0.96)		6010C		1	KJK	03/14/20 4:37	5.28	100	DC01343
Cadmium	**2.16** (0.19)		6010C		1	KJK	03/14/20 4:37	5.28	100	DC01343
Chromium	**120** (0.39)		6010C		1	KJK	03/14/20 4:37	5.28	100	DC01343
Copper	**374** (0.96)		6010C		1	KJK	03/14/20 4:37	5.28	100	DC01343
Lead	**367** (1.93)		6010C		1	KJK	03/14/20 4:37	5.28	100	DC01343
Mercury	**2.53** (0.478)		7471B		50	MKS	03/16/20 13:28	2.11	40	DC01347
Nickel	**18.4** (0.96)		6010C		1	KJK	03/14/20 4:37	5.28	100	DC01343
Selenium	ND (1.93)		6010C		1	KJK	03/14/20 4:37	5.28	100	DC01343
Silver	**5.21** (0.19)		6010C		1	KJK	03/14/20 4:37	5.28	100	DC01343
Zinc	**334** (0.96)		6010C		1	KJK	03/14/20 4:37	5.28	100	DC01343

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ
Client Sample ID: 1804576-SS766-S2 Oven Dried
Date Sampled: 03/10/20 10:58
Percent Solids: 99

ESS Laboratory Work Order: 20C0331
ESS Laboratory Sample ID: 20C0331-04
Sample Matrix: Sediment
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Arsenic	**11.1** (0.96)		6010C		1	KJK	03/14/20 4:43	5.26	100	DC01343
Barium	**118** (0.96)		6010C		1	KJK	03/14/20 4:43	5.26	100	DC01343
Cadmium	**3.41** (0.19)		6010C		1	KJK	03/14/20 4:43	5.26	100	DC01343
Chromium	**179** (0.38)		6010C		1	KJK	03/14/20 4:43	5.26	100	DC01343
Copper	**266** (0.96)		6010C		1	KJK	03/14/20 4:43	5.26	100	DC01343
Lead	**339** (1.92)		6010C		1	KJK	03/14/20 4:43	5.26	100	DC01343
Mercury	**6.45** (0.913)		7471B		100	MKS	03/16/20 13:26	2.19	40	DC01347
Nickel	**19.0** (0.96)		6010C		1	KJK	03/14/20 4:43	5.26	100	DC01343
Selenium	ND (1.92)		6010C		1	KJK	03/14/20 4:43	5.26	100	DC01343
Silver	**1.22** (0.19)		6010C		1	KJK	03/14/20 4:43	5.26	100	DC01343
Zinc	**342** (0.96)		6010C		1	KJK	03/14/20 4:43	5.26	100	DC01343

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 20C0331

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch DC01343 - 3050B										
Blank										
Arsenic	ND	2.50	mg/kg wet							
Barium	ND	2.50	mg/kg wet							
Cadmium	ND	0.50	mg/kg wet							
Chromium	ND	1.00	mg/kg wet							
Copper	ND	2.50	mg/kg wet							
Lead	ND	5.00	mg/kg wet							
Nickel	ND	2.50	mg/kg wet							
Selenium	ND	5.00	mg/kg wet							
Silver	ND	0.50	mg/kg wet							
Zinc	ND	2.50	mg/kg wet							
LCS										
Arsenic	190	6.25	mg/kg wet	202.0		94	80-120			
Barium	308	6.25	mg/kg wet	343.0		90	80-120			
Cadmium	129	1.25	mg/kg wet	149.0		87	80-120			
Chromium	173	2.50	mg/kg wet	182.0		95	80-120			
Copper	220	6.25	mg/kg wet	225.0		98	80-120			
Lead	301	12.5	mg/kg wet	333.0		90	80-120			
Nickel	157	6.25	mg/kg wet	167.0		94	80-120			
Selenium	161	12.5	mg/kg wet	169.0		96	80-120			
Silver	45.7	1.25	mg/kg wet	48.90		94	80-120			
Zinc	414	6.25	mg/kg wet	459.0		90	80-120			
LCS Dup										
Arsenic	177	6.41	mg/kg wet	202.0		88	80-120	7	20	
Barium	314	6.41	mg/kg wet	343.0		92	80-120	2	20	
Cadmium	124	1.28	mg/kg wet	149.0		83	80-120	4	20	
Chromium	166	2.56	mg/kg wet	182.0		91	80-120	4	20	
Copper	210	6.41	mg/kg wet	225.0		93	80-120	5	20	
Lead	300	12.8	mg/kg wet	333.0		90	80-120	0.1	20	
Nickel	152	6.41	mg/kg wet	167.0		91	80-120	3	20	
Selenium	153	12.8	mg/kg wet	169.0		91	80-120	5	20	
Silver	43.4	1.28	mg/kg wet	48.90		89	80-120	5	20	
Zinc	397	6.41	mg/kg wet	459.0		87	80-120	4	20	
Reference										
Lead	3020	18.9	mg/kg wet	4490		67	83-113			R-
Batch DC01347 - 7471B										
Blank										
Mercury	ND	0.033	mg/kg wet							
LCS										
Mercury	8.02	0.535	mg/kg wet	7.760		103	80-120			
LCS Dup										
Mercury	8.90	0.528	mg/kg wet	7.760		115	80-120	10	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ ESS Laboratory Work Order: 20C0331

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
1311 TCLP Metals										
Batch DC01936 - 245.1/7470A										
Blank										
Mercury	ND	0.00050	mg/L							
LCS										
Mercury	0.00573	0.00050	mg/L	0.006042		95	80-120			
LCS Dup										
Mercury	0.00577	0.00050	mg/L	0.006042		96	80-120	0.6	20	
Batch DC01937 - 3005A_TCLP										
Blank										
Chromium	ND	0.020	mg/L							
Lead	ND	0.050	mg/L							
LCS										
Chromium	0.479	0.020	mg/L	0.5000		96	80-120			
Lead	0.469	0.050	mg/L	0.5000		94	80-120			
LCS Dup										
Chromium	0.466	0.020	mg/L	0.5000		93	80-120	3	20	
Lead	0.472	0.050	mg/L	0.5000		94	80-120	0.7	20	
5035/8260B Volatile Organic Compounds / Low Level										
Batch DC01938 - 5035										
Blank										
1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0020	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0100	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 20C0331

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch DC01938 - 5035										
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0100	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0100	mg/kg wet							
Acetone	ND	0.0100	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0020	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0100	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0050	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 20C0331

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch DC01938 - 5035										
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*0.0551*		mg/kg wet	*0.05000*		*110*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0492*		mg/kg wet	*0.05000*		*98*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0531*		mg/kg wet	*0.05000*		*106*	*70-130*			
Surrogate: Toluene-d8	*0.0486*		mg/kg wet	*0.05000*		*97*	*70-130*			
LCS										
1,1,1,2-Tetrachloroethane	0.0457	0.0050	mg/kg wet	0.05000		91	70-130			
1,1,1-Trichloroethane	0.0500	0.0050	mg/kg wet	0.05000		100	70-130			
1,1,2,2-Tetrachloroethane	0.0478	0.0020	mg/kg wet	0.05000		96	70-130			
1,1,2-Trichloroethane	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			
1,1-Dichloroethane	0.0505	0.0050	mg/kg wet	0.05000		101	70-130			
1,1-Dichloroethene	0.0508	0.0050	mg/kg wet	0.05000		102	70-130			
1,1-Dichloropropene	0.0531	0.0050	mg/kg wet	0.05000		106	70-130			
1,2,3-Trichlorobenzene	0.0442	0.0050	mg/kg wet	0.05000		88	70-130			
1,2,3-Trichloropropane	0.0422	0.0050	mg/kg wet	0.05000		84	70-130			
1,2,4-Trichlorobenzene	0.0431	0.0050	mg/kg wet	0.05000		86	70-130			
1,2,4-Trimethylbenzene	0.0492	0.0050	mg/kg wet	0.05000		98	70-130			
1,2-Dibromo-3-Chloropropane	0.0387	0.0050	mg/kg wet	0.05000		77	70-130			
1,2-Dibromoethane	0.0458	0.0050	mg/kg wet	0.05000		92	70-130			
1,2-Dichlorobenzene	0.0461	0.0050	mg/kg wet	0.05000		92	70-130			
1,2-Dichloroethane	0.0511	0.0050	mg/kg wet	0.05000		102	70-130			
1,2-Dichloropropane	0.0514	0.0050	mg/kg wet	0.05000		103	70-130			
1,3,5-Trimethylbenzene	0.0484	0.0050	mg/kg wet	0.05000		97	70-130			
1,3-Dichlorobenzene	0.0469	0.0050	mg/kg wet	0.05000		94	70-130			
1,3-Dichloropropane	0.0488	0.0050	mg/kg wet	0.05000		98	70-130			
1,4-Dichlorobenzene	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			
1,4-Dioxane	0.850	0.100	mg/kg wet	1.000		85	70-130			
2,2-Dichloropropane	0.0480	0.0050	mg/kg wet	0.05000		96	70-130			
2-Butanone	0.249	0.0100	mg/kg wet	0.2500		100	70-130			
2-Chlorotoluene	0.0488	0.0050	mg/kg wet	0.05000		98	70-130			
2-Hexanone	0.221	0.0100	mg/kg wet	0.2500		88	70-130			
4-Chlorotoluene	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
4-Isopropyltoluene	0.0475	0.0050	mg/kg wet	0.05000		95	70-130			
4-Methyl-2-Pentanone	0.236	0.0100	mg/kg wet	0.2500		95	70-130			
Acetone	0.244	0.0100	mg/kg wet	0.2500		97	70-130			
Benzene	0.0507	0.0050	mg/kg wet	0.05000		101	70-130			
Bromobenzene	0.0455	0.0050	mg/kg wet	0.05000		91	70-130			
Bromochloromethane	0.0471	0.0050	mg/kg wet	0.05000		94	70-130			
Bromodichloromethane	0.0535	0.0050	mg/kg wet	0.05000		107	70-130			
Bromoform	0.0379	0.0050	mg/kg wet	0.05000		76	70-130			
Bromomethane	0.0578	0.0100	mg/kg wet	0.05000		116	70-130			
Carbon Disulfide	0.0531	0.0050	mg/kg wet	0.05000		106	70-130			
Carbon Tetrachloride	0.0494	0.0050	mg/kg wet	0.05000		99	70-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ ESS Laboratory Work Order: 20C0331

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch DC01938 - 5035										
Chlorobenzene	0.0467	0.0050	mg/kg wet	0.05000		93	70-130			
Chloroethane	0.0494	0.0100	mg/kg wet	0.05000		99	70-130			
Chloroform	0.0517	0.0050	mg/kg wet	0.05000		103	70-130			
Chloromethane	0.0472	0.0100	mg/kg wet	0.05000		94	70-130			
cis-1,2-Dichloroethene	0.0509	0.0050	mg/kg wet	0.05000		102	70-130			
cis-1,3-Dichloropropene	0.0523	0.0050	mg/kg wet	0.05000		105	70-130			
Dibromochloromethane	0.0440	0.0020	mg/kg wet	0.05000		88	70-130			
Dibromomethane	0.0483	0.0050	mg/kg wet	0.05000		97	70-130			
Dichlorodifluoromethane	0.0504	0.0100	mg/kg wet	0.05000		101	70-130			
Diethyl Ether	0.0491	0.0050	mg/kg wet	0.05000		98	70-130			
Di-isopropyl ether	0.0513	0.0050	mg/kg wet	0.05000		103	70-130			
Ethyl tertiary-butyl ether	0.0467	0.0050	mg/kg wet	0.05000		93	70-130			
Ethylbenzene	0.0482	0.0050	mg/kg wet	0.05000		96	70-130			
Hexachlorobutadiene	0.0470	0.0050	mg/kg wet	0.05000		94	70-130			
Isopropylbenzene	0.0490	0.0050	mg/kg wet	0.05000		98	70-130			
Methyl tert-Butyl Ether	0.0474	0.0050	mg/kg wet	0.05000		95	70-130			
Methylene Chloride	0.0472	0.0100	mg/kg wet	0.05000		94	70-130			
Naphthalene	0.0440	0.0050	mg/kg wet	0.05000		88	70-130			
n-Butylbenzene	0.0488	0.0050	mg/kg wet	0.05000		98	70-130			
n-Propylbenzene	0.0497	0.0050	mg/kg wet	0.05000		99	70-130			
sec-Butylbenzene	0.0484	0.0050	mg/kg wet	0.05000		97	70-130			
Styrene	0.0470	0.0050	mg/kg wet	0.05000		94	70-130			
tert-Butylbenzene	0.0481	0.0050	mg/kg wet	0.05000		96	70-130			
Tertiary-amyl methyl ether	0.0482	0.0050	mg/kg wet	0.05000		96	70-130			
Tetrachloroethene	0.0464	0.0050	mg/kg wet	0.05000		93	70-130			
Tetrahydrofuran	0.0434	0.0050	mg/kg wet	0.05000		87	70-130			
Toluene	0.0495	0.0050	mg/kg wet	0.05000		99	70-130			
trans-1,2-Dichloroethene	0.0504	0.0050	mg/kg wet	0.05000		101	70-130			
trans-1,3-Dichloropropene	0.0470	0.0050	mg/kg wet	0.05000		94	70-130			
Trichloroethene	0.0511	0.0050	mg/kg wet	0.05000		102	70-130			
Trichlorofluoromethane	0.0541	0.0050	mg/kg wet	0.05000		108	70-130			
Vinyl Chloride	0.0521	0.0100	mg/kg wet	0.05000		104	70-130			
Xylene O	0.0487	0.0050	mg/kg wet	0.05000		97	70-130			
Xylene P,M	0.0971	0.0100	mg/kg wet	0.1000		97	70-130			
Surrogate: 1,2-Dichloroethane-d4	*0.0514*		mg/kg wet	*0.05000*		*103*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0499*		mg/kg wet	*0.05000*		*100*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0512*		mg/kg wet	*0.05000*		*102*	*70-130*			
Surrogate: Toluene-d8	*0.0496*		mg/kg wet	*0.05000*		*99*	*70-130*			
LCS Dup										
1,1,1,2-Tetrachloroethane	0.0477	0.0050	mg/kg wet	0.05000		95	70-130	4	20	
1,1,1-Trichloroethane	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	1	20	
1,1,2,2-Tetrachloroethane	0.0505	0.0020	mg/kg wet	0.05000		101	70-130	5	20	
1,1,2-Trichloroethane	0.0503	0.0050	mg/kg wet	0.05000		101	70-130	6	20	
1,1-Dichloroethane	0.0520	0.0050	mg/kg wet	0.05000		104	70-130	3	20	
1,1-Dichloroethene	0.0522	0.0050	mg/kg wet	0.05000		104	70-130	3	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 20C0331

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch DC01938 - 5035										
1,1-Dichloropropene	0.0546	0.0050	mg/kg wet	0.05000		109	70-130	3	20	
1,2,3-Trichlorobenzene	0.0473	0.0050	mg/kg wet	0.05000		95	70-130	7	20	
1,2,3-Trichloropropane	0.0450	0.0050	mg/kg wet	0.05000		90	70-130	6	20	
1,2,4-Trichlorobenzene	0.0464	0.0050	mg/kg wet	0.05000		93	70-130	7	20	
1,2,4-Trimethylbenzene	0.0514	0.0050	mg/kg wet	0.05000		103	70-130	4	20	
1,2-Dibromo-3-Chloropropane	0.0416	0.0050	mg/kg wet	0.05000		83	70-130	7	20	
1,2-Dibromoethane	0.0483	0.0050	mg/kg wet	0.05000		97	70-130	5	20	
1,2-Dichlorobenzene	0.0489	0.0050	mg/kg wet	0.05000		98	70-130	6	20	
1,2-Dichloroethane	0.0530	0.0050	mg/kg wet	0.05000		106	70-130	4	20	
1,2-Dichloropropane	0.0526	0.0050	mg/kg wet	0.05000		105	70-130	2	20	
1,3,5-Trimethylbenzene	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	5	20	
1,3-Dichlorobenzene	0.0489	0.0050	mg/kg wet	0.05000		98	70-130	4	20	
1,3-Dichloropropane	0.0513	0.0050	mg/kg wet	0.05000		103	70-130	5	20	
1,4-Dichlorobenzene	0.0502	0.0050	mg/kg wet	0.05000		100	70-130	6	20	
1,4-Dioxane	0.942	0.100	mg/kg wet	1.000		94	70-130	10	20	
2,2-Dichloropropane	0.0495	0.0050	mg/kg wet	0.05000		99	70-130	3	20	
2-Butanone	0.259	0.0100	mg/kg wet	0.2500		104	70-130	4	20	
2-Chlorotoluene	0.0504	0.0050	mg/kg wet	0.05000		101	70-130	3	20	
2-Hexanone	0.227	0.0100	mg/kg wet	0.2500		91	70-130	3	20	
4-Chlorotoluene	0.0508	0.0050	mg/kg wet	0.05000		102	70-130	4	20	
4-Isopropyltoluene	0.0491	0.0050	mg/kg wet	0.05000		98	70-130	3	20	
4-Methyl-2-Pentanone	0.246	0.0100	mg/kg wet	0.2500		98	70-130	4	20	
Acetone	0.240	0.0100	mg/kg wet	0.2500		96	70-130	1	20	
Benzene	0.0522	0.0050	mg/kg wet	0.05000		104	70-130	3	20	
Bromobenzene	0.0482	0.0050	mg/kg wet	0.05000		96	70-130	6	20	
Bromochloromethane	0.0499	0.0050	mg/kg wet	0.05000		100	70-130	6	20	
Bromodichloromethane	0.0562	0.0050	mg/kg wet	0.05000		112	70-130	5	20	
Bromoform	0.0401	0.0050	mg/kg wet	0.05000		80	70-130	6	20	
Bromomethane	0.0605	0.0100	mg/kg wet	0.05000		121	70-130	5	20	
Carbon Disulfide	0.0541	0.0050	mg/kg wet	0.05000		108	70-130	2	20	
Carbon Tetrachloride	0.0504	0.0050	mg/kg wet	0.05000		101	70-130	2	20	
Chlorobenzene	0.0487	0.0050	mg/kg wet	0.05000		97	70-130	4	20	
Chloroethane	0.0505	0.0100	mg/kg wet	0.05000		101	70-130	2	20	
Chloroform	0.0533	0.0050	mg/kg wet	0.05000		107	70-130	3	20	
Chloromethane	0.0484	0.0100	mg/kg wet	0.05000		97	70-130	2	20	
cis-1,2-Dichloroethene	0.0529	0.0050	mg/kg wet	0.05000		106	70-130	4	20	
cis-1,3-Dichloropropene	0.0546	0.0050	mg/kg wet	0.05000		109	70-130	4	20	
Dibromochloromethane	0.0466	0.0020	mg/kg wet	0.05000		93	70-130	6	20	
Dibromomethane	0.0515	0.0050	mg/kg wet	0.05000		103	70-130	6	20	
Dichlorodifluoromethane	0.0512	0.0100	mg/kg wet	0.05000		102	70-130	2	20	
Diethyl Ether	0.0514	0.0050	mg/kg wet	0.05000		103	70-130	5	20	
Di-isopropyl ether	0.0534	0.0050	mg/kg wet	0.05000		107	70-130	4	20	
Ethyl tertiary-butyl ether	0.0490	0.0050	mg/kg wet	0.05000		98	70-130	5	20	
Ethylbenzene	0.0494	0.0050	mg/kg wet	0.05000		99	70-130	2	20	
Hexachlorobutadiene	0.0487	0.0050	mg/kg wet	0.05000		97	70-130	3	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ ESS Laboratory Work Order: 20C0331

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Low Level										
Batch DC01938 - 5035										
Isopropylbenzene	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	3	20	
Methyl tert-Butyl Ether	0.0496	0.0050	mg/kg wet	0.05000		99	70-130	5	20	
Methylene Chloride	0.0492	0.0100	mg/kg wet	0.05000		98	70-130	4	20	
Naphthalene	0.0475	0.0050	mg/kg wet	0.05000		95	70-130	8	20	
n-Butylbenzene	0.0510	0.0050	mg/kg wet	0.05000		102	70-130	4	20	
n-Propylbenzene	0.0514	0.0050	mg/kg wet	0.05000		103	70-130	3	20	
sec-Butylbenzene	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	3	20	
Styrene	0.0486	0.0050	mg/kg wet	0.05000		97	70-130	3	20	
tert-Butylbenzene	0.0500	0.0050	mg/kg wet	0.05000		100	70-130	4	20	
Tertiary-amyl methyl ether	0.0504	0.0050	mg/kg wet	0.05000		101	70-130	5	20	
Tetrachloroethene	0.0481	0.0050	mg/kg wet	0.05000		96	70-130	4	20	
Tetrahydrofuran	0.0452	0.0050	mg/kg wet	0.05000		90	70-130	4	20	
Toluene	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	2	20	
trans-1,2-Dichloroethene	0.0518	0.0050	mg/kg wet	0.05000		104	70-130	3	20	
trans-1,3-Dichloropropene	0.0497	0.0050	mg/kg wet	0.05000		99	70-130	6	20	
Trichloroethene	0.0522	0.0050	mg/kg wet	0.05000		104	70-130	2	20	
Trichlorofluoromethane	0.0547	0.0050	mg/kg wet	0.05000		109	70-130	1	20	
Vinyl Chloride	0.0525	0.0100	mg/kg wet	0.05000		105	70-130	0.8	20	
Xylene O	0.0499	0.0050	mg/kg wet	0.05000		100	70-130	2	20	
Xylene P,M	0.101	0.0100	mg/kg wet	0.1000		101	70-130	4	20	
Surrogate: 1,2-Dichloroethane-d4	*0.0501*		mg/kg wet	*0.05000*		*100*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0497*		mg/kg wet	*0.05000*		*99*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0507*		mg/kg wet	*0.05000*		*101*	*70-130*			
Surrogate: Toluene-d8	*0.0496*		mg/kg wet	*0.05000*		*99*	*70-130*			
5035/8260B Volatile Organic Compounds / Methanol										
Batch DC01823 - 5035										
Blank										
1,1,1,2-Tetrachloroethane	ND	0.200	mg/kg wet							
1,1,1-Trichloroethane	ND	0.200	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.200	mg/kg wet							
1,1,2-Trichloroethane	ND	0.200	mg/kg wet							
1,1-Dichloroethane	ND	0.200	mg/kg wet							
1,1-Dichloroethene	ND	0.200	mg/kg wet							
1,1-Dichloropropene	ND	0.200	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.200	mg/kg wet							
1,2,3-Trichloropropane	ND	0.200	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.200	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.200	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	1.00	mg/kg wet							
1,2-Dibromoethane	ND	0.200	mg/kg wet							
1,2-Dichlorobenzene	ND	0.200	mg/kg wet							
1,2-Dichloroethane	ND	0.200	mg/kg wet							
1,2-Dichloropropane	ND	0.200	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.200	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 20C0331

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch DC01823 - 5035										
1,3-Dichlorobenzene	ND	0.200	mg/kg wet							
1,3-Dichloropropane	ND	0.200	mg/kg wet							
1,4-Dichlorobenzene	ND	0.200	mg/kg wet							
1,4-Dioxane - Screen	ND	40.0	mg/kg wet							
2,2-Dichloropropane	ND	0.200	mg/kg wet							
2-Butanone	ND	1.00	mg/kg wet							
2-Chlorotoluene	ND	0.200	mg/kg wet							
2-Hexanone	ND	1.00	mg/kg wet							
4-Chlorotoluene	ND	0.200	mg/kg wet							
4-Isopropyltoluene	ND	0.200	mg/kg wet							
4-Methyl-2-Pentanone	ND	1.00	mg/kg wet							
Acetone	ND	1.00	mg/kg wet							
Benzene	ND	0.200	mg/kg wet							
Bromobenzene	ND	0.200	mg/kg wet							
Bromochloromethane	ND	0.200	mg/kg wet							
Bromodichloromethane	ND	0.200	mg/kg wet							
Bromoform	ND	0.200	mg/kg wet							
Bromomethane	ND	0.200	mg/kg wet							
Carbon Disulfide	ND	0.200	mg/kg wet							
Carbon Tetrachloride	ND	0.200	mg/kg wet							
Chlorobenzene	ND	0.200	mg/kg wet							
Chloroethane	ND	0.200	mg/kg wet							
Chloroform	ND	0.200	mg/kg wet							
Chloromethane	ND	0.200	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.200	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.200	mg/kg wet							
Dibromochloromethane	ND	0.200	mg/kg wet							
Dibromomethane	ND	0.200	mg/kg wet							
Dichlorodifluoromethane	ND	0.200	mg/kg wet							
Diethyl Ether	ND	0.200	mg/kg wet							
Di-isopropyl ether	ND	0.200	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.200	mg/kg wet							
Ethylbenzene	ND	0.200	mg/kg wet							
Hexachlorobutadiene	ND	0.200	mg/kg wet							
Isopropylbenzene	ND	0.200	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.200	mg/kg wet							
Methylene Chloride	ND	0.400	mg/kg wet							
Naphthalene	ND	0.200	mg/kg wet							
n-Butylbenzene	ND	0.200	mg/kg wet							
n-Propylbenzene	ND	0.200	mg/kg wet							
sec-Butylbenzene	ND	0.200	mg/kg wet							
Styrene	ND	0.200	mg/kg wet							
tert-Butylbenzene	ND	0.200	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.200	mg/kg wet							
Tetrachloroethene	ND	0.200	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ ESS Laboratory Work Order: 20C0331

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch DC01823 - 5035										
Tetrahydrofuran	ND	1.00	mg/kg wet							
Toluene	ND	0.200	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.200	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.200	mg/kg wet							
Trichloroethene	ND	0.200	mg/kg wet							
Trichlorofluoromethane	ND	0.200	mg/kg wet							
Vinyl Chloride	ND	0.200	mg/kg wet							
Xylene O	ND	0.200	mg/kg wet							
Xylene P,M	ND	0.400	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*5.00*		mg/kg wet	*5.000*		*100*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*5.00*		mg/kg wet	*5.000*		*100*	*70-130*			
Surrogate: Dibromofluoromethane	*5.00*		mg/kg wet	*5.000*		*100*	*70-130*			
Surrogate: Toluene-d8	*5.00*		mg/kg wet	*5.000*		*100*	*70-130*			
LCS										
1,1,1,2-Tetrachloroethane	1.80	0.200	mg/kg wet	2.000		90	70-130			
1,1,1-Trichloroethane	1.85	0.200	mg/kg wet	2.000		92	70-130			
1,1,2,2-Tetrachloroethane	1.89	0.200	mg/kg wet	2.000		95	70-130			
1,1,2-Trichloroethane	1.90	0.200	mg/kg wet	2.000		95	70-130			
1,1-Dichloroethane	1.84	0.200	mg/kg wet	2.000		92	70-130			
1,1-Dichloroethene	1.84	0.200	mg/kg wet	2.000		92	70-130			
1,1-Dichloropropene	1.98	0.200	mg/kg wet	2.000		99	70-130			
1,2,3-Trichlorobenzene	1.91	0.200	mg/kg wet	2.000		95	70-130			
1,2,3-Trichloropropane	1.94	0.200	mg/kg wet	2.000		97	70-130			
1,2,4-Trichlorobenzene	1.97	0.200	mg/kg wet	2.000		98	70-130			
1,2,4-Trimethylbenzene	1.95	0.200	mg/kg wet	2.000		97	70-130			
1,2-Dibromo-3-Chloropropane	1.70	1.00	mg/kg wet	2.000		85	70-130			
1,2-Dibromoethane	1.86	0.200	mg/kg wet	2.000		93	70-130			
1,2-Dichlorobenzene	2.05	0.200	mg/kg wet	2.000		102	70-130			
1,2-Dichloroethane	2.01	0.200	mg/kg wet	2.000		101	70-130			
1,2-Dichloropropane	1.87	0.200	mg/kg wet	2.000		93	70-130			
1,3,5-Trimethylbenzene	1.90	0.200	mg/kg wet	2.000		95	70-130			
1,3-Dichlorobenzene	1.88	0.200	mg/kg wet	2.000		94	70-130			
1,3-Dichloropropane	2.06	0.200	mg/kg wet	2.000		103	70-130			
1,4-Dichlorobenzene	2.05	0.200	mg/kg wet	2.000		102	70-130			
1,4-Dioxane - Screen	60.4	40.0	mg/kg wet	40.00		151	44-241			
2,2-Dichloropropane	1.82	0.200	mg/kg wet	2.000		91	70-130			
2-Butanone	9.74	1.00	mg/kg wet	10.00		97	70-130			
2-Chlorotoluene	1.94	0.200	mg/kg wet	2.000		97	70-130			
2-Hexanone	9.11	1.00	mg/kg wet	10.00		91	70-130			
4-Chlorotoluene	1.92	0.200	mg/kg wet	2.000		96	70-130			
4-Isopropyltoluene	1.90	0.200	mg/kg wet	2.000		95	70-130			
4-Methyl-2-Pentanone	9.42	1.00	mg/kg wet	10.00		94	70-130			
Acetone	8.77	1.00	mg/kg wet	10.00		88	70-130			
Benzene	1.94	0.200	mg/kg wet	2.000		97	70-130			
Bromobenzene	1.92	0.200	mg/kg wet	2.000		96	70-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 20C0331

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch DC01823 - 5035										
Bromochloromethane	1.96	0.200	mg/kg wet	2.000		98	70-130			
Bromodichloromethane	1.89	0.200	mg/kg wet	2.000		95	70-130			
Bromoform	1.53	0.200	mg/kg wet	2.000		76	70-130			
Bromomethane	1.90	0.200	mg/kg wet	2.000		95	70-130			
Carbon Disulfide	1.94	0.200	mg/kg wet	2.000		97	70-130			
Carbon Tetrachloride	1.84	0.200	mg/kg wet	2.000		92	70-130			
Chlorobenzene	1.87	0.200	mg/kg wet	2.000		94	70-130			
Chloroethane	1.84	0.200	mg/kg wet	2.000		92	70-130			
Chloroform	1.98	0.200	mg/kg wet	2.000		99	70-130			
Chloromethane	1.84	0.200	mg/kg wet	2.000		92	70-130			
cis-1,2-Dichloroethene	1.84	0.200	mg/kg wet	2.000		92	70-130			
cis-1,3-Dichloropropene	1.98	0.200	mg/kg wet	2.000		99	70-130			
Dibromochloromethane	1.62	0.200	mg/kg wet	2.000		81	70-130			
Dibromomethane	1.79	0.200	mg/kg wet	2.000		90	70-130			
Dichlorodifluoromethane	1.90	0.200	mg/kg wet	2.000		95	70-130			
Diethyl Ether	1.76	0.200	mg/kg wet	2.000		88	70-130			
Di-isopropyl ether	1.93	0.200	mg/kg wet	2.000		97	70-130			
Ethyl tertiary-butyl ether	1.81	0.200	mg/kg wet	2.000		91	70-130			
Ethylbenzene	1.96	0.200	mg/kg wet	2.000		98	70-130			
Hexachlorobutadiene	2.30	0.200	mg/kg wet	2.000		115	70-130			
Isopropylbenzene	1.86	0.200	mg/kg wet	2.000		93	70-130			
Methyl tert-Butyl Ether	1.98	0.200	mg/kg wet	2.000		99	70-130			
Methylene Chloride	1.87	0.400	mg/kg wet	2.000		93	70-130			
Naphthalene	2.06	0.200	mg/kg wet	2.000		103	70-130			
n-Butylbenzene	1.91	0.200	mg/kg wet	2.000		96	70-130			
n-Propylbenzene	1.93	0.200	mg/kg wet	2.000		97	70-130			
sec-Butylbenzene	1.89	0.200	mg/kg wet	2.000		95	70-130			
Styrene	1.90	0.200	mg/kg wet	2.000		95	70-130			
tert-Butylbenzene	2.03	0.200	mg/kg wet	2.000		102	70-130			
Tertiary-amyl methyl ether	1.82	0.200	mg/kg wet	2.000		91	70-130			
Tetrachloroethene	1.80	0.200	mg/kg wet	2.000		90	70-130			
Tetrahydrofuran	1.73	1.00	mg/kg wet	2.000		86	70-130			
Toluene	1.89	0.200	mg/kg wet	2.000		95	70-130			
trans-1,2-Dichloroethene	1.82	0.200	mg/kg wet	2.000		91	70-130			
trans-1,3-Dichloropropene	1.65	0.200	mg/kg wet	2.000		83	70-130			
Trichloroethene	1.83	0.200	mg/kg wet	2.000		91	70-130			
Trichlorofluoromethane	2.14	0.200	mg/kg wet	2.000		107	70-130			
Vinyl Chloride	1.68	0.200	mg/kg wet	2.000		84	70-130			
Xylene O	1.94	0.200	mg/kg wet	2.000		97	70-130			
Xylene P,M	3.75	0.400	mg/kg wet	4.000		94	70-130			
Surrogate: 1,2-Dichloroethane-d4	*4.97*		mg/kg wet	*5.000*		*99*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*4.81*		mg/kg wet	*5.000*		*96*	*70-130*			
Surrogate: Dibromofluoromethane	*5.06*		mg/kg wet	*5.000*		*101*	*70-130*			
Surrogate: Toluene-d8	*4.92*		mg/kg wet	*5.000*		*98*	*70-130*			
LCS Dup										

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 20C0331

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch DC01823 - 5035										
1,1,1,2-Tetrachloroethane	1.84	0.200	mg/kg wet	2.000		92	70-130	2	20	
1,1,1-Trichloroethane	1.86	0.200	mg/kg wet	2.000		93	70-130	0.4	20	
1,1,2,2-Tetrachloroethane	1.97	0.200	mg/kg wet	2.000		98	70-130	4	20	
1,1,2-Trichloroethane	1.77	0.200	mg/kg wet	2.000		88	70-130	7	20	
1,1-Dichloroethane	1.76	0.200	mg/kg wet	2.000		88	70-130	4	20	
1,1-Dichloroethene	1.77	0.200	mg/kg wet	2.000		88	70-130	4	20	
1,1-Dichloropropene	2.00	0.200	mg/kg wet	2.000		100	70-130	0.7	20	
1,2,3-Trichlorobenzene	1.92	0.200	mg/kg wet	2.000		96	70-130	0.5	20	
1,2,3-Trichloropropane	1.86	0.200	mg/kg wet	2.000		93	70-130	4	20	
1,2,4-Trichlorobenzene	1.93	0.200	mg/kg wet	2.000		97	70-130	2	20	
1,2,4-Trimethylbenzene	1.92	0.200	mg/kg wet	2.000		96	70-130	1	20	
1,2-Dibromo-3-Chloropropane	1.68	1.00	mg/kg wet	2.000		84	70-130	1	20	
1,2-Dibromoethane	2.10	0.200	mg/kg wet	2.000		105	70-130	12	20	
1,2-Dichlorobenzene	1.97	0.200	mg/kg wet	2.000		99	70-130	4	20	
1,2-Dichloroethane	2.01	0.200	mg/kg wet	2.000		101	70-130	0.1	20	
1,2-Dichloropropane	1.87	0.200	mg/kg wet	2.000		93	70-130	0.1	20	
1,3,5-Trimethylbenzene	1.86	0.200	mg/kg wet	2.000		93	70-130	2	20	
1,3-Dichlorobenzene	1.89	0.200	mg/kg wet	2.000		95	70-130	0.8	20	
1,3-Dichloropropane	2.11	0.200	mg/kg wet	2.000		106	70-130	2	20	
1,4-Dichlorobenzene	1.95	0.200	mg/kg wet	2.000		98	70-130	5	20	
1,4-Dioxane - Screen	41.1	40.0	mg/kg wet	40.00		103	44-241	38	200	
2,2-Dichloropropane	1.81	0.200	mg/kg wet	2.000		90	70-130	0.6	20	
2-Butanone	9.96	1.00	mg/kg wet	10.00		100	70-130	2	20	
2-Chlorotoluene	1.91	0.200	mg/kg wet	2.000		95	70-130	2	20	
2-Hexanone	9.64	1.00	mg/kg wet	10.00		96	70-130	6	20	
4-Chlorotoluene	1.93	0.200	mg/kg wet	2.000		96	70-130	0.6	20	
4-Isopropyltoluene	1.89	0.200	mg/kg wet	2.000		94	70-130	0.8	20	
4-Methyl-2-Pentanone	10.7	1.00	mg/kg wet	10.00		107	70-130	13	20	
Acetone	9.34	1.00	mg/kg wet	10.00		93	70-130	6	20	
Benzene	1.98	0.200	mg/kg wet	2.000		99	70-130	2	20	
Bromobenzene	1.91	0.200	mg/kg wet	2.000		95	70-130	0.8	20	
Bromochloromethane	1.90	0.200	mg/kg wet	2.000		95	70-130	3	20	
Bromodichloromethane	1.90	0.200	mg/kg wet	2.000		95	70-130	0.2	20	
Bromoform	1.62	0.200	mg/kg wet	2.000		81	70-130	6	20	
Bromomethane	1.85	0.200	mg/kg wet	2.000		93	70-130	2	20	
Carbon Disulfide	1.98	0.200	mg/kg wet	2.000		99	70-130	2	20	
Carbon Tetrachloride	1.81	0.200	mg/kg wet	2.000		91	70-130	1	20	
Chlorobenzene	2.08	0.200	mg/kg wet	2.000		104	70-130	10	20	
Chloroethane	1.93	0.200	mg/kg wet	2.000		97	70-130	5	20	
Chloroform	1.98	0.200	mg/kg wet	2.000		99	70-130	0.2	20	
Chloromethane	1.76	0.200	mg/kg wet	2.000		88	70-130	4	20	
cis-1,2-Dichloroethene	1.83	0.200	mg/kg wet	2.000		92	70-130	0.5	20	
cis-1,3-Dichloropropene	1.98	0.200	mg/kg wet	2.000		99	70-130	0.3	20	
Dibromochloromethane	1.73	0.200	mg/kg wet	2.000		86	70-130	6	20	
Dibromomethane	1.82	0.200	mg/kg wet	2.000		91	70-130	2	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 20C0331

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch DC01823 - 5035										
Dichlorodifluoromethane	1.92	0.200	mg/kg wet	2.000		96	70-130	0.7	20	
Diethyl Ether	1.80	0.200	mg/kg wet	2.000		90	70-130	2	20	
Di-isopropyl ether	1.94	0.200	mg/kg wet	2.000		97	70-130	0.3	20	
Ethyl tertiary-butyl ether	1.74	0.200	mg/kg wet	2.000		87	70-130	4	20	
Ethylbenzene	2.03	0.200	mg/kg wet	2.000		102	70-130	4	20	
Hexachlorobutadiene	2.12	0.200	mg/kg wet	2.000		106	70-130	8	20	
Isopropylbenzene	1.85	0.200	mg/kg wet	2.000		92	70-130	1	20	
Methyl tert-Butyl Ether	2.00	0.200	mg/kg wet	2.000		100	70-130	0.8	20	
Methylene Chloride	1.94	0.400	mg/kg wet	2.000		97	70-130	4	20	
Naphthalene	2.10	0.200	mg/kg wet	2.000		105	70-130	2	20	
n-Butylbenzene	1.99	0.200	mg/kg wet	2.000		100	70-130	4	20	
n-Propylbenzene	1.92	0.200	mg/kg wet	2.000		96	70-130	0.5	20	
sec-Butylbenzene	1.88	0.200	mg/kg wet	2.000		94	70-130	0.6	20	
Styrene	1.99	0.200	mg/kg wet	2.000		100	70-130	5	20	
tert-Butylbenzene	2.02	0.200	mg/kg wet	2.000		101	70-130	0.6	20	
Tertiary-amyl methyl ether	1.91	0.200	mg/kg wet	2.000		96	70-130	5	20	
Tetrachloroethene	1.88	0.200	mg/kg wet	2.000		94	70-130	4	20	
Tetrahydrofuran	1.97	1.00	mg/kg wet	2.000		98	70-130	13	20	
Toluene	1.91	0.200	mg/kg wet	2.000		95	70-130	0.6	20	
trans-1,2-Dichloroethene	1.90	0.200	mg/kg wet	2.000		95	70-130	5	20	
trans-1,3-Dichloropropene	1.60	0.200	mg/kg wet	2.000		80	70-130	3	20	
Trichloroethene	1.95	0.200	mg/kg wet	2.000		97	70-130	6	20	
Trichlorofluoromethane	2.13	0.200	mg/kg wet	2.000		107	70-130	0.2	20	
Vinyl Chloride	1.73	0.200	mg/kg wet	2.000		87	70-130	3	20	
Xylene O	1.97	0.200	mg/kg wet	2.000		98	70-130	1	20	
Xylene P,M	3.93	0.400	mg/kg wet	4.000		98	70-130	5	20	
Surrogate: 1,2-Dichloroethane-d4	*5.07*		mg/kg wet	*5.000*		*101*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*4.95*		mg/kg wet	*5.000*		*99*	*70-130*			
Surrogate: Dibromofluoromethane	*5.04*		mg/kg wet	*5.000*		*101*	*70-130*			
Surrogate: Toluene-d8	*5.03*		mg/kg wet	*5.000*		*101*	*70-130*			
8081B Organochlorine Pesticides										
Batch DC01305 - 3546										
Blank										
4,4´-DDD	ND	0.0025	mg/kg wet							
4,4´-DDD [2C]	ND	0.0025	mg/kg wet							
4,4´-DDE	ND	0.0025	mg/kg wet							
4,4´-DDE [2C]	ND	0.0025	mg/kg wet							
4,4´-DDT	ND	0.0025	mg/kg wet							
4,4´-DDT [2C]	ND	0.0025	mg/kg wet							
Aldrin	ND	0.0025	mg/kg wet							
Aldrin [2C]	ND	0.0025	mg/kg wet							
alpha-BHC	ND	0.0025	mg/kg wet							
alpha-BHC [2C]	ND	0.0025	mg/kg wet							
alpha-Chlordane	ND	0.0025	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 20C0331

Quality Control Data

8081B Organochlorine Pesticides

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch DC01305 - 3546										
alpha-Chlordane [2C]	ND	0.0025	mg/kg wet							
beta-BHC	ND	0.0025	mg/kg wet							
beta-BHC [2C]	ND	0.0025	mg/kg wet							
Chlordane (Total)	ND	0.0200	mg/kg wet							
Chlordane (Total) [2C]	ND	0.0200	mg/kg wet							
delta-BHC	ND	0.0025	mg/kg wet							
delta-BHC [2C]	ND	0.0025	mg/kg wet							
Dieldrin	ND	0.0025	mg/kg wet							
Dieldrin [2C]	ND	0.0025	mg/kg wet							
Endosulfan I	ND	0.0025	mg/kg wet							
Endosulfan I [2C]	ND	0.0025	mg/kg wet							
Endosulfan II	ND	0.0025	mg/kg wet							
Endosulfan II [2C]	ND	0.0025	mg/kg wet							
Endosulfan Sulfate	ND	0.0025	mg/kg wet							
Endosulfan Sulfate [2C]	ND	0.0025	mg/kg wet							
Endrin	ND	0.0025	mg/kg wet							
Endrin [2C]	ND	0.0025	mg/kg wet							
Endrin Ketone	ND	0.0025	mg/kg wet							
Endrin Ketone [2C]	ND	0.0025	mg/kg wet							
gamma-BHC (Lindane)	ND	0.0015	mg/kg wet							
gamma-BHC (Lindane) [2C]	ND	0.0015	mg/kg wet							
gamma-Chlordane	ND	0.0025	mg/kg wet							
gamma-Chlordane [2C]	ND	0.0025	mg/kg wet							
Heptachlor	ND	0.0025	mg/kg wet							
Heptachlor [2C]	ND	0.0025	mg/kg wet							
Heptachlor Epoxide	ND	0.0025	mg/kg wet							
Heptachlor Epoxide [2C]	ND	0.0025	mg/kg wet							
Hexachlorobenzene	ND	0.0025	mg/kg wet							
Hexachlorobenzene [2C]	ND	0.0025	mg/kg wet							
Methoxychlor	ND	0.0025	mg/kg wet							
Methoxychlor [2C]	ND	0.0025	mg/kg wet							
Toxaphene	ND	0.125	mg/kg wet							
Toxaphene [2C]	ND	0.125	mg/kg wet							
Surrogate: Decachlorobiphenyl	*0.00919*		mg/kg wet	*0.01250*		*74*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.00999*		mg/kg wet	*0.01250*		*80*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0122*		mg/kg wet	*0.01250*		*97*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0119*		mg/kg wet	*0.01250*		*95*	*30-150*			
LCS										
4,4´-DDD	0.0120	0.0025	mg/kg wet	0.01250		96	40-140			
4,4´-DDD [2C]	0.0118	0.0025	mg/kg wet	0.01250		94	40-140			
4,4´-DDE	0.0123	0.0025	mg/kg wet	0.01250		98	40-140			
4,4´-DDE [2C]	0.0123	0.0025	mg/kg wet	0.01250		98	40-140			
4,4´-DDT	0.0120	0.0025	mg/kg wet	0.01250		96	40-140			
4,4´-DDT [2C]	0.0120	0.0025	mg/kg wet	0.01250		96	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8081B Organochlorine Pesticides										
Batch DC01305 - 3546										
Aldrin	0.0124	0.0025	mg/kg wet	0.01250		99	40-140			
Aldrin [2C]	0.0117	0.0025	mg/kg wet	0.01250		94	40-140			
alpha-BHC	0.0129	0.0025	mg/kg wet	0.01250		103	40-140			
alpha-BHC [2C]	0.0123	0.0025	mg/kg wet	0.01250		98	40-140			
alpha-Chlordane	0.0113	0.0025	mg/kg wet	0.01250		90	40-140			
alpha-Chlordane [2C]	0.0107	0.0025	mg/kg wet	0.01250		85	40-140			
beta-BHC	0.0123	0.0025	mg/kg wet	0.01250		98	40-140			
beta-BHC [2C]	0.0125	0.0025	mg/kg wet	0.01250		100	40-140			
delta-BHC	0.0124	0.0025	mg/kg wet	0.01250		99	40-140			
delta-BHC [2C]	0.0119	0.0025	mg/kg wet	0.01250		95	40-140			
Dieldrin	0.0121	0.0025	mg/kg wet	0.01250		97	40-140			
Dieldrin [2C]	0.0120	0.0025	mg/kg wet	0.01250		96	40-140			
Endosulfan I	0.0115	0.0025	mg/kg wet	0.01250		92	40-140			
Endosulfan I [2C]	0.0112	0.0025	mg/kg wet	0.01250		90	40-140			
Endosulfan II	0.0126	0.0025	mg/kg wet	0.01250		100	40-140			
Endosulfan II [2C]	0.0132	0.0025	mg/kg wet	0.01250		105	40-140			
Endosulfan Sulfate	0.0102	0.0025	mg/kg wet	0.01250		81	40-140			
Endosulfan Sulfate [2C]	0.0113	0.0025	mg/kg wet	0.01250		90	40-140			
Endrin	0.0121	0.0025	mg/kg wet	0.01250		97	40-140			
Endrin [2C]	0.0120	0.0025	mg/kg wet	0.01250		96	40-140			
Endrin Ketone	0.0102	0.0025	mg/kg wet	0.01250		82	40-140			
Endrin Ketone [2C]	0.0116	0.0025	mg/kg wet	0.01250		93	40-140			
gamma-BHC (Lindane)	0.0125	0.0015	mg/kg wet	0.01250		100	40-140			
gamma-BHC (Lindane) [2C]	0.0121	0.0015	mg/kg wet	0.01250		97	40-140			
gamma-Chlordane	0.0117	0.0025	mg/kg wet	0.01250		94	40-140			
gamma-Chlordane [2C]	0.0110	0.0025	mg/kg wet	0.01250		88	40-140			
Heptachlor	0.0124	0.0025	mg/kg wet	0.01250		99	40-140			
Heptachlor [2C]	0.0118	0.0025	mg/kg wet	0.01250		95	40-140			
Heptachlor Epoxide	0.0125	0.0025	mg/kg wet	0.01250		100	40-140			
Heptachlor Epoxide [2C]	0.0113	0.0025	mg/kg wet	0.01250		91	40-140			
Hexachlorobenzene	0.0125	0.0025	mg/kg wet	0.01250		100	40-140			
Hexachlorobenzene [2C]	0.0123	0.0025	mg/kg wet	0.01250		98	40-140			
Methoxychlor	0.0116	0.0025	mg/kg wet	0.01250		93	40-140			
Methoxychlor [2C]	0.0112	0.0025	mg/kg wet	0.01250		89	40-140			
Surrogate: Decachlorobiphenyl	*0.0113*		mg/kg wet	*0.01250*		*90*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0114*		mg/kg wet	*0.01250*		*91*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0122*		mg/kg wet	*0.01250*		*98*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0124*		mg/kg wet	*0.01250*		*100*	*30-150*			
LCS Dup										
4,4´-DDD	0.0128	0.0025	mg/kg wet	0.01250		102	40-140	7	30	
4,4´-DDD [2C]	0.0123	0.0025	mg/kg wet	0.01250		99	40-140	5	30	
4,4´-DDE	0.0129	0.0025	mg/kg wet	0.01250		103	40-140	5	30	
4,4´-DDE [2C]	0.0129	0.0025	mg/kg wet	0.01250		104	40-140	5	30	
4,4´-DDT	0.0126	0.0025	mg/kg wet	0.01250		101	40-140	4	30	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 20C0331

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8081B Organochlorine Pesticides										
Batch DC01305 - 3546										
4,4´-DDT [2C]	0.0123	0.0025	mg/kg wet	0.01250		99	40-140	3	30	
Aldrin	0.0129	0.0025	mg/kg wet	0.01250		103	40-140	4	30	
Aldrin [2C]	0.0125	0.0025	mg/kg wet	0.01250		100	40-140	6	30	
alpha-BHC	0.0134	0.0025	mg/kg wet	0.01250		107	40-140	4	30	
alpha-BHC [2C]	0.0126	0.0025	mg/kg wet	0.01250		101	40-140	3	30	
alpha-Chlordane	0.0119	0.0025	mg/kg wet	0.01250		95	40-140	5	30	
alpha-Chlordane [2C]	0.0116	0.0025	mg/kg wet	0.01250		93	40-140	8	30	
beta-BHC	0.0127	0.0025	mg/kg wet	0.01250		101	40-140	3	30	
beta-BHC [2C]	0.0125	0.0025	mg/kg wet	0.01250		100	40-140	0.03	30	
delta-BHC	0.0132	0.0025	mg/kg wet	0.01250		106	40-140	6	30	
delta-BHC [2C]	0.0122	0.0025	mg/kg wet	0.01250		98	40-140	3	30	
Dieldrin	0.0129	0.0025	mg/kg wet	0.01250		103	40-140	6	30	
Dieldrin [2C]	0.0126	0.0025	mg/kg wet	0.01250		101	40-140	5	30	
Endosulfan I	0.0121	0.0025	mg/kg wet	0.01250		97	40-140	5	30	
Endosulfan I [2C]	0.0120	0.0025	mg/kg wet	0.01250		96	40-140	7	30	
Endosulfan II	0.0132	0.0025	mg/kg wet	0.01250		106	40-140	5	30	
Endosulfan II [2C]	0.0139	0.0025	mg/kg wet	0.01250		111	40-140	6	30	
Endosulfan Sulfate	0.0117	0.0025	mg/kg wet	0.01250		94	40-140	14	30	
Endosulfan Sulfate [2C]	0.0119	0.0025	mg/kg wet	0.01250		95	40-140	5	30	
Endrin	0.0128	0.0025	mg/kg wet	0.01250		102	40-140	5	30	
Endrin [2C]	0.0124	0.0025	mg/kg wet	0.01250		100	40-140	4	30	
Endrin Ketone	0.0119	0.0025	mg/kg wet	0.01250		95	40-140	15	30	
Endrin Ketone [2C]	0.0123	0.0025	mg/kg wet	0.01250		98	40-140	6	30	
gamma-BHC (Lindane)	0.0129	0.0015	mg/kg wet	0.01250		104	40-140	4	30	
gamma-BHC (Lindane) [2C]	0.0126	0.0015	mg/kg wet	0.01250		101	40-140	4	30	
gamma-Chlordane	0.0122	0.0025	mg/kg wet	0.01250		98	40-140	4	30	
gamma-Chlordane [2C]	0.0119	0.0025	mg/kg wet	0.01250		95	40-140	7	30	
Heptachlor	0.0129	0.0025	mg/kg wet	0.01250		103	40-140	4	30	
Heptachlor [2C]	0.0122	0.0025	mg/kg wet	0.01250		98	40-140	3	30	
Heptachlor Epoxide	0.0131	0.0025	mg/kg wet	0.01250		105	40-140	4	30	
Heptachlor Epoxide [2C]	0.0124	0.0025	mg/kg wet	0.01250		99	40-140	9	30	
Hexachlorobenzene	0.0130	0.0025	mg/kg wet	0.01250		104	40-140	4	30	
Hexachlorobenzene [2C]	0.0127	0.0025	mg/kg wet	0.01250		102	40-140	4	30	
Methoxychlor	0.0117	0.0025	mg/kg wet	0.01250		94	40-140	1	30	
Methoxychlor [2C]	0.0116	0.0025	mg/kg wet	0.01250		93	40-140	4	30	
Surrogate: Decachlorobiphenyl	*0.0103*		mg/kg wet	*0.01250*		*82*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0115*		mg/kg wet	*0.01250*		*92*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0122*		mg/kg wet	*0.01250*		*98*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0127*		mg/kg wet	*0.01250*		*101*	*30-150*			
8082 Polychlorinated Biphenyls (PCB) / Congeners										
Batch DC01607 - 3540C										
Blank										
BZ#101	ND	0.00040	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082 Polychlorinated Biphenyls (PCB) / Congeners										
Batch DC01607 - 3540C										
BZ#101 [2C]	ND	0.00040	mg/kg wet							
BZ#105	ND	0.00040	mg/kg wet							
BZ#105 [2C]	ND	0.00040	mg/kg wet							
BZ#118	ND	0.00040	mg/kg wet							
BZ#118 [2C]	ND	0.00040	mg/kg wet							
BZ#128	ND	0.00040	mg/kg wet							
BZ#128 [2C]	ND	0.00040	mg/kg wet							
BZ#138	ND	0.00040	mg/kg wet							
BZ#138 [2C]	ND	0.00040	mg/kg wet							
BZ#153	ND	0.00040	mg/kg wet							
BZ#153 [2C]	ND	0.00040	mg/kg wet							
BZ#170	ND	0.00040	mg/kg wet							
BZ#170 [2C]	ND	0.00040	mg/kg wet							
BZ#18	ND	0.00040	mg/kg wet							
BZ#18 [2C]	ND	0.00040	mg/kg wet							
BZ#180	ND	0.00040	mg/kg wet							
BZ#180 [2C]	ND	0.00040	mg/kg wet							
BZ#187	ND	0.00040	mg/kg wet							
BZ#187 [2C]	ND	0.00040	mg/kg wet							
BZ#195	ND	0.00040	mg/kg wet							
BZ#195 [2C]	ND	0.00040	mg/kg wet							
BZ#206	ND	0.00040	mg/kg wet							
BZ#206 [2C]	ND	0.00040	mg/kg wet							
BZ#209	ND	0.00040	mg/kg wet							
BZ#209 [2C]	ND	0.00040	mg/kg wet							
BZ#28	ND	0.00040	mg/kg wet							
BZ#28 [2C]	ND	0.00040	mg/kg wet							
BZ#44	ND	0.00040	mg/kg wet							
BZ#44 [2C]	ND	0.00040	mg/kg wet							
BZ#52	ND	0.00040	mg/kg wet							
BZ#52 [2C]	ND	0.00040	mg/kg wet							
BZ#66	ND	0.00040	mg/kg wet							
BZ#66 [2C]	ND	0.00040	mg/kg wet							
BZ#8	ND	0.00040	mg/kg wet							
BZ#8 [2C]	ND	0.00040	mg/kg wet							
Surrogate: Tetrachloro-m-xylene	*0.00389*		mg/kg wet	*0.005000*		*78*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.00397*		mg/kg wet	*0.005000*		*79*	*30-150*			
LCS										
BZ#101	0.00453	0.00040	mg/kg wet	0.005000		91	40-140			
BZ#101 [2C]	0.00432	0.00040	mg/kg wet	0.005000		86	40-140			
BZ#105	0.00465	0.00040	mg/kg wet	0.005000		93	40-140			
BZ#105 [2C]	0.00464	0.00040	mg/kg wet	0.005000		93	40-140			
BZ#118	0.00437	0.00040	mg/kg wet	0.005000		87	40-140			
BZ#118 [2C]	0.00496	0.00040	mg/kg wet	0.005000		99	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 20C0331

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082 Polychlorinated Biphenyls (PCB) / Congeners										
Batch DC01607 - 3540C										
BZ#128	0.00442	0.00040	mg/kg wet	0.005000		88	40-140			
BZ#128 [2C]	0.00464	0.00040	mg/kg wet	0.005000		93	40-140			
BZ#138	0.00425	0.00040	mg/kg wet	0.005000		85	40-140			
BZ#138 [2C]	0.00484	0.00040	mg/kg wet	0.005000		97	40-140			
BZ#153	0.00428	0.00040	mg/kg wet	0.005000		86	40-140			
BZ#153 [2C]	0.00446	0.00040	mg/kg wet	0.005000		89	40-140			
BZ#170	0.00452	0.00040	mg/kg wet	0.005000		90	40-140			
BZ#170 [2C]	0.00477	0.00040	mg/kg wet	0.005000		95	40-140			
BZ#18	0.00462	0.00040	mg/kg wet	0.005000		92	40-140			
BZ#18 [2C]	0.00444	0.00040	mg/kg wet	0.005000		89	40-140			
BZ#180	0.00444	0.00040	mg/kg wet	0.005000		89	40-140			
BZ#180 [2C]	0.00462	0.00040	mg/kg wet	0.005000		92	40-140			
BZ#187	0.00422	0.00040	mg/kg wet	0.005000		84	40-140			
BZ#187 [2C]	0.00448	0.00040	mg/kg wet	0.005000		90	40-140			
BZ#195	0.00456	0.00040	mg/kg wet	0.005000		91	40-140			
BZ#195 [2C]	0.00475	0.00040	mg/kg wet	0.005000		95	40-140			
BZ#206	0.00472	0.00040	mg/kg wet	0.005000		94	40-140			
BZ#206 [2C]	0.00463	0.00040	mg/kg wet	0.005000		93	40-140			
BZ#209	0.00441	0.00040	mg/kg wet	0.005000		88	40-140			
BZ#209 [2C]	0.00439	0.00040	mg/kg wet	0.005000		88	40-140			
BZ#28	0.00449	0.00040	mg/kg wet	0.005000		90	40-140			
BZ#28 [2C]	0.00478	0.00040	mg/kg wet	0.005000		96	40-140			
BZ#44	0.00403	0.00040	mg/kg wet	0.005000		81	40-140			
BZ#44 [2C]	0.00396	0.00040	mg/kg wet	0.005000		79	40-140			
BZ#52	0.00497	0.00040	mg/kg wet	0.005000		99	40-140			
BZ#52 [2C]	0.00441	0.00040	mg/kg wet	0.005000		88	40-140			
BZ#66	0.00446	0.00040	mg/kg wet	0.005000		89	40-140			
BZ#66 [2C]	0.00439	0.00040	mg/kg wet	0.005000		88	40-140			
BZ#8	0.00577	0.00040	mg/kg wet	0.005000		115	40-140			
BZ#8 [2C]	0.00560	0.00040	mg/kg wet	0.005000		112	40-140			
Surrogate: Tetrachloro-m-xylene	*0.00432*		mg/kg wet	*0.005000*		*86*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.00445*		mg/kg wet	*0.005000*		*89*	*30-150*			
LCS Dup										
BZ#101	0.00535	0.00040	mg/kg wet	0.005000		107	40-140	17	50	
BZ#101 [2C]	0.00543	0.00040	mg/kg wet	0.005000		109	40-140	23	50	
BZ#105	0.00552	0.00040	mg/kg wet	0.005000		110	40-140	17	50	
BZ#105 [2C]	0.00570	0.00040	mg/kg wet	0.005000		114	40-140	21	50	
BZ#118	0.00522	0.00040	mg/kg wet	0.005000		104	40-140	18	50	
BZ#118 [2C]	0.00596	0.00040	mg/kg wet	0.005000		119	40-140	18	50	
BZ#128	0.00528	0.00040	mg/kg wet	0.005000		106	40-140	18	50	
BZ#128 [2C]	0.00537	0.00040	mg/kg wet	0.005000		107	40-140	15	50	
BZ#138	0.00503	0.00040	mg/kg wet	0.005000		101	40-140	17	50	
BZ#138 [2C]	0.00581	0.00040	mg/kg wet	0.005000		116	40-140	18	50	
BZ#153	0.00502	0.00040	mg/kg wet	0.005000		100	40-140	16	50	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 20C0331

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082 Polychlorinated Biphenyls (PCB) / Congeners										
Batch DC01607 - 3540C										
BZ#153 [2C]	0.00533	0.00040	mg/kg wet	0.005000		107	40-140	18	50	
BZ#170	0.00554	0.00040	mg/kg wet	0.005000		111	40-140	20	50	
BZ#170 [2C]	0.00576	0.00040	mg/kg wet	0.005000		115	40-140	19	50	
BZ#18	0.00532	0.00040	mg/kg wet	0.005000		106	40-140	14	50	
BZ#18 [2C]	0.00506	0.00040	mg/kg wet	0.005000		101	40-140	13	50	
BZ#180	0.00529	0.00040	mg/kg wet	0.005000		106	40-140	17	50	
BZ#180 [2C]	0.00557	0.00040	mg/kg wet	0.005000		111	40-140	19	50	
BZ#187	0.00494	0.00040	mg/kg wet	0.005000		99	40-140	16	50	
BZ#187 [2C]	0.00532	0.00040	mg/kg wet	0.005000		106	40-140	17	50	
BZ#195	0.00547	0.00040	mg/kg wet	0.005000		109	40-140	18	50	
BZ#195 [2C]	0.00576	0.00040	mg/kg wet	0.005000		115	40-140	19	50	
BZ#206	0.00573	0.00040	mg/kg wet	0.005000		115	40-140	19	50	
BZ#206 [2C]	0.00556	0.00040	mg/kg wet	0.005000		111	40-140	18	50	
BZ#209	0.00523	0.00040	mg/kg wet	0.005000		105	40-140	17	50	
BZ#209 [2C]	0.00527	0.00040	mg/kg wet	0.005000		105	40-140	18	50	
BZ#28	0.00541	0.00040	mg/kg wet	0.005000		108	40-140	18	50	
BZ#28 [2C]	0.00562	0.00040	mg/kg wet	0.005000		112	40-140	16	50	
BZ#44	0.00468	0.00040	mg/kg wet	0.005000		94	40-140	15	50	
BZ#44 [2C]	0.00456	0.00040	mg/kg wet	0.005000		91	40-140	14	50	
BZ#52	0.00578	0.00040	mg/kg wet	0.005000		116	40-140	15	50	
BZ#52 [2C]	0.00510	0.00040	mg/kg wet	0.005000		102	40-140	15	50	
BZ#66	0.00517	0.00040	mg/kg wet	0.005000		103	40-140	15	50	
BZ#66 [2C]	0.00547	0.00040	mg/kg wet	0.005000		109	40-140	22	50	
BZ#8	0.00653	0.00040	mg/kg wet	0.005000		131	40-140	12	50	
BZ#8 [2C]	0.00665	0.00040	mg/kg wet	0.005000		133	40-140	17	50	
Surrogate: Tetrachloro-m-xylene	*0.00490*		mg/kg wet	*0.005000*		*98*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.00505*		mg/kg wet	*0.005000*		*101*	*30-150*			
8100M Total Petroleum Hydrocarbons										
Batch DC01160 - 3546										
Blank										
Decane (C10)	ND	0.2	mg/kg wet							
Docosane (C22)	ND	0.2	mg/kg wet							
Dodecane (C12)	ND	0.2	mg/kg wet							
Eicosane (C20)	ND	0.2	mg/kg wet							
Hexacosane (C26)	ND	0.2	mg/kg wet							
Hexadecane (C16)	ND	0.2	mg/kg wet							
Hexatriacontane (C36)	ND	0.2	mg/kg wet							
Nonadecane (C19)	ND	0.2	mg/kg wet							
Nonane (C9)	ND	0.2	mg/kg wet							
Octacosane (C28)	ND	0.2	mg/kg wet							
Octadecane (C18)	ND	0.2	mg/kg wet							
Tetracosane (C24)	ND	0.2	mg/kg wet							
Tetradecane (C14)	ND	0.2	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 20C0331

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8100M Total Petroleum Hydrocarbons										
Batch DC01160 - 3546										
Total Petroleum Hydrocarbons	ND	10.0	mg/kg wet							
Triacontane (C30)	ND	0.2	mg/kg wet							
Surrogate: O-Terphenyl	*4.86*		mg/kg wet	*5.000*		*97*	*40-140*			
LCS										
Decane (C10)	1.8	0.2	mg/kg wet	2.500		70	40-140			
Docosane (C22)	2.5	0.2	mg/kg wet	2.500		98	40-140			
Dodecane (C12)	1.9	0.2	mg/kg wet	2.500		77	40-140			
Eicosane (C20)	2.4	0.2	mg/kg wet	2.500		97	40-140			
Hexacosane (C26)	2.5	0.2	mg/kg wet	2.500		100	40-140			
Hexadecane (C16)	2.2	0.2	mg/kg wet	2.500		86	40-140			
Hexatriacontane (C36)	2.6	0.2	mg/kg wet	2.500		105	40-140			
Nonadecane (C19)	2.5	0.2	mg/kg wet	2.500		100	40-140			
Nonane (C9)	1.4	0.2	mg/kg wet	2.500		56	30-140			
Octacosane (C28)	2.5	0.2	mg/kg wet	2.500		102	40-140			
Octadecane (C18)	2.3	0.2	mg/kg wet	2.500		92	40-140			
Tetracosane (C24)	2.5	0.2	mg/kg wet	2.500		98	40-140			
Tetradecane (C14)	2.0	0.2	mg/kg wet	2.500		81	40-140			
Total Petroleum Hydrocarbons	31.3	10.0	mg/kg wet	35.00		89	40-140			
Triacontane (C30)	2.5	0.2	mg/kg wet	2.500		100	40-140			
Surrogate: O-Terphenyl	*5.03*		mg/kg wet	*5.000*		*101*	*40-140*			
LCS Dup										
Decane (C10)	1.8	0.2	mg/kg wet	2.500		71	40-140	2	25	
Docosane (C22)	2.5	0.2	mg/kg wet	2.500		98	40-140	0.08	25	
Dodecane (C12)	1.9	0.2	mg/kg wet	2.500		78	40-140	0.7	25	
Eicosane (C20)	2.4	0.2	mg/kg wet	2.500		97	40-140	0.4	25	
Hexacosane (C26)	2.5	0.2	mg/kg wet	2.500		100	40-140	0.08	25	
Hexadecane (C16)	2.2	0.2	mg/kg wet	2.500		88	40-140	2	25	
Hexatriacontane (C36)	2.7	0.2	mg/kg wet	2.500		106	40-140	0.9	25	
Nonadecane (C19)	2.6	0.2	mg/kg wet	2.500		103	40-140	3	25	
Nonane (C9)	1.5	0.2	mg/kg wet	2.500		61	30-140	9	25	
Octacosane (C28)	2.5	0.2	mg/kg wet	2.500		102	40-140	0.06	25	
Octadecane (C18)	2.3	0.2	mg/kg wet	2.500		92	40-140	0.6	25	
Tetracosane (C24)	2.5	0.2	mg/kg wet	2.500		99	40-140	0.6	25	
Tetradecane (C14)	2.1	0.2	mg/kg wet	2.500		83	40-140	2	25	
Total Petroleum Hydrocarbons	31.7	10.0	mg/kg wet	35.00		91	40-140	1	25	
Triacontane (C30)	2.5	0.2	mg/kg wet	2.500		100	40-140	0.08	25	
Surrogate: O-Terphenyl	*4.82*		mg/kg wet	*5.000*		*96*	*40-140*			
8151A Chlorinated Herbicides										
Batch DC01155 - 3546										
Blank										
2,4,5-T	ND	0.010	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 20C0331

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8151A Chlorinated Herbicides										
Batch DC01155 - 3546										
2,4,5-T [2C]	ND	0.010	mg/kg wet							
2,4,5-TP (Silvex)	ND	0.010	mg/kg wet							
2,4,5-TP (Silvex) [2C]	ND	0.010	mg/kg wet							
2,4-D	ND	0.047	mg/kg wet							
2,4-D [2C]	ND	0.047	mg/kg wet							
2,4-DB	ND	0.048	mg/kg wet							
2,4-DB [2C]	ND	0.048	mg/kg wet							
Dalapon	ND	0.046	mg/kg wet							
Dalapon [2C]	ND	0.046	mg/kg wet							
Dicamba	ND	0.009	mg/kg wet							
Dicamba [2C]	ND	0.009	mg/kg wet							
Dichlorprop	ND	0.047	mg/kg wet							
Dichlorprop [2C]	ND	0.047	mg/kg wet							
Dinoseb	ND	0.048	mg/kg wet							
Dinoseb [2C]	ND	0.048	mg/kg wet							
MCPA	ND	2.32	mg/kg wet							
MCPA [2C]	ND	2.32	mg/kg wet							
MCPP	ND	2.35	mg/kg wet							
MCPP [2C]	ND	2.35	mg/kg wet							
Surrogate: DCAA	*0.172*		mg/kg wet	*0.2000*		*86*	*30-150*			
Surrogate: DCAA [2C]	*0.158*		mg/kg wet	*0.2000*		*79*	*30-150*			
LCS										
2,4,5-T	0.013	0.010	mg/kg wet	0.01900		68	40-140			
2,4,5-T [2C]	0.013	0.010	mg/kg wet	0.01900		68	40-140			
2,4,5-TP (Silvex)	0.013	0.010	mg/kg wet	0.01900		70	40-140			
2,4,5-TP (Silvex) [2C]	0.013	0.010	mg/kg wet	0.01900		70	40-140			
2,4-D	0.127	0.047	mg/kg wet	0.1880		68	40-140			
2,4-D [2C]	0.136	0.047	mg/kg wet	0.1880		72	40-140			
2,4-DB	0.134	0.048	mg/kg wet	0.1900		70	40-140			
2,4-DB [2C]	0.134	0.048	mg/kg wet	0.1900		71	40-140			
Dalapon	0.274	0.046	mg/kg wet	0.4550		60	40-140			
Dalapon [2C]	0.300	0.046	mg/kg wet	0.4550		66	40-140			
Dicamba	0.013	0.009	mg/kg wet	0.01880		68	40-140			
Dicamba [2C]	0.014	0.009	mg/kg wet	0.01880		74	40-140			
Dichlorprop	0.139	0.047	mg/kg wet	0.1880		74	40-140			
Dichlorprop [2C]	0.139	0.047	mg/kg wet	0.1880		74	40-140			
Dinoseb	0.012	0.048	mg/kg wet	0.09500		12	10-100			
Dinoseb [2C]	0.014	0.048	mg/kg wet	0.09500		15	10-100			
MCPA	13.2	2.32	mg/kg wet	18.60		71	40-140			
MCPA [2C]	14.0	2.32	mg/kg wet	18.60		75	40-140			
MCPP	14.1	2.35	mg/kg wet	18.80		75	40-140			
MCPP [2C]	14.2	2.35	mg/kg wet	18.80		75	40-140			
Surrogate: DCAA	*0.193*		mg/kg wet	*0.2000*		*96*	*30-150*			
Surrogate: DCAA [2C]	*0.174*		mg/kg wet	*0.2000*		*87*	*30-150*			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 20C0331

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8151A Chlorinated Herbicides										
Batch DC01155 - 3546										
LCS Dup										
2,4,5-T	0.015	0.010	mg/kg wet	0.01900		78	40-140	14	30	
2,4,5-T [2C]	0.014	0.010	mg/kg wet	0.01900		76	40-140	11	30	
2,4,5-TP (Silvex)	0.015	0.010	mg/kg wet	0.01900		78	40-140	11	30	
2,4,5-TP (Silvex) [2C]	0.016	0.010	mg/kg wet	0.01900		82	40-140	16	30	
2,4-D	0.145	0.047	mg/kg wet	0.1880		77	40-140	13	30	
2,4-D [2C]	0.156	0.047	mg/kg wet	0.1880		83	40-140	13	30	
2,4-DB	0.151	0.048	mg/kg wet	0.1900		79	40-140	12	30	
2,4-DB [2C]	0.155	0.048	mg/kg wet	0.1900		81	40-140	14	30	
Dalapon	0.319	0.046	mg/kg wet	0.4550		70	40-140	15	30	
Dalapon [2C]	0.355	0.046	mg/kg wet	0.4550		78	40-140	17	30	
Dicamba	0.015	0.009	mg/kg wet	0.01880		78	40-140	14	30	
Dicamba [2C]	0.016	0.009	mg/kg wet	0.01880		84	40-140	13	30	
Dichlorprop	0.157	0.047	mg/kg wet	0.1880		83	40-140	12	30	
Dichlorprop [2C]	0.162	0.047	mg/kg wet	0.1880		86	40-140	16	30	
Dinoseb	0.014	0.048	mg/kg wet	0.09500		15	10-100	20	30	
Dinoseb [2C]	0.017	0.048	mg/kg wet	0.09500		18	10-100	15	30	
MCPA	14.8	2.32	mg/kg wet	18.60		80	40-140	12	30	
MCPA [2C]	16.1	2.32	mg/kg wet	18.60		87	40-140	14	30	
MCPP	16.4	2.35	mg/kg wet	18.80		87	40-140	15	30	
MCPP [2C]	16.0	2.35	mg/kg wet	18.80		85	40-140	12	30	
Surrogate: DCAA	*0.194*		mg/kg wet	*0.2000*		*97*	*30-150*			
Surrogate: DCAA [2C]	*0.178*		mg/kg wet	*0.2000*		*89*	*30-150*			
8270D Semi-Volatile Organic Compounds										
Batch DC01210 - 3546										
Blank										
1,2,4-Trichlorobenzene	ND	0.333	mg/kg wet							
1,2-Dichlorobenzene	ND	0.333	mg/kg wet							
1,3-Dichlorobenzene	ND	0.333	mg/kg wet							
1,4-Dichlorobenzene	ND	0.333	mg/kg wet							
2,4,5-Trichlorophenol	ND	0.333	mg/kg wet							
2,4,6-Trichlorophenol	ND	0.333	mg/kg wet							
2,4-Dichlorophenol	ND	0.333	mg/kg wet							
2,4-Dimethylphenol	ND	0.333	mg/kg wet							
2,4-Dinitrophenol	ND	0.667	mg/kg wet							
2,4-Dinitrotoluene	ND	0.333	mg/kg wet							
2,6-Dinitrotoluene	ND	0.333	mg/kg wet							
2-Chloronaphthalene	ND	0.333	mg/kg wet							
2-Chlorophenol	ND	0.333	mg/kg wet							
2-Methylnaphthalene	ND	0.333	mg/kg wet							
2-Methylphenol	ND	0.333	mg/kg wet							
2-Nitrophenol	ND	0.333	mg/kg wet							
3,3´-Dichlorobenzidine	ND	0.333	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 20C0331

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch DC01210 - 3546										
3+4-Methylphenol	ND	0.667	mg/kg wet							
4-Bromophenyl-phenylether	ND	0.333	mg/kg wet							
4-Chloroaniline	ND	0.333	mg/kg wet							
4-Nitrophenol	ND	1.67	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							
Acetophenone	ND	0.667	mg/kg wet							
Aniline	ND	1.67	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Azobenzene	ND	0.333	mg/kg wet							
Benzo(a)anthracene	ND	0.333	mg/kg wet							
Benzo(a)pyrene	ND	0.167	mg/kg wet							
Benzo(b)fluoranthene	ND	0.333	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.333	mg/kg wet							
Benzo(k)fluoranthene	ND	0.333	mg/kg wet							
bis(2-Chloroethoxy)methane	ND	0.333	mg/kg wet							
bis(2-Chloroethyl)ether	ND	0.333	mg/kg wet							
bis(2-chloroisopropyl)Ether	ND	0.333	mg/kg wet							
bis(2-Ethylhexyl)phthalate	ND	0.333	mg/kg wet							
Butylbenzylphthalate	ND	0.333	mg/kg wet							
Chrysene	ND	0.167	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.167	mg/kg wet							
Dibenzofuran	ND	0.333	mg/kg wet							
Diethylphthalate	ND	0.333	mg/kg wet							
Dimethylphthalate	ND	0.333	mg/kg wet							
Di-n-butylphthalate	ND	0.333	mg/kg wet							
Di-n-octylphthalate	ND	0.333	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Hexachlorobenzene	ND	0.333	mg/kg wet							
Hexachlorobutadiene	ND	0.333	mg/kg wet							
Hexachloroethane	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.333	mg/kg wet							
Isophorone	ND	0.333	mg/kg wet							
Naphthalene	ND	0.333	mg/kg wet							
Nitrobenzene	ND	0.333	mg/kg wet							
N-Nitrosodimethylamine	ND	0.333	mg/kg wet							
Pentachlorophenol	ND	0.667	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Phenol	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
Pyridine	ND	1.67	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	*2.11*		mg/kg wet	*3.333*		*63*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.15*		mg/kg wet	*5.000*		*83*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.29*		mg/kg wet	*5.000*		*66*	*30-130*			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 20C0331

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch DC01210 - 3546										
Surrogate: 2-Fluorobiphenyl	*2.26*		mg/kg wet	*3.333*		*68*	*30-130*			
Surrogate: 2-Fluorophenol	*3.26*		mg/kg wet	*5.000*		*65*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.30*		mg/kg wet	*3.333*		*69*	*30-130*			
Surrogate: Phenol-d6	*3.41*		mg/kg wet	*5.000*		*68*	*30-130*			
Surrogate: p-Terphenyl-d14	*3.23*		mg/kg wet	*3.333*		*97*	*30-130*			
LCS										
1,2,4-Trichlorobenzene	2.14	0.333	mg/kg wet	3.333		64	40-140			
1,2-Dichlorobenzene	2.11	0.333	mg/kg wet	3.333		63	40-140			
1,3-Dichlorobenzene	2.12	0.333	mg/kg wet	3.333		64	40-140			
1,4-Dichlorobenzene	2.11	0.333	mg/kg wet	3.333		63	40-140			
2,4,5-Trichlorophenol	3.06	0.333	mg/kg wet	3.333		92	30-130			
2,4,6-Trichlorophenol	2.90	0.333	mg/kg wet	3.333		87	30-130			
2,4-Dichlorophenol	2.53	0.333	mg/kg wet	3.333		76	30-130			
2,4-Dimethylphenol	2.51	0.333	mg/kg wet	3.333		75	30-130			
2,4-Dinitrophenol	4.14	0.667	mg/kg wet	3.333		124	30-130			
2,4-Dinitrotoluene	3.42	0.333	mg/kg wet	3.333		103	40-140			
2,6-Dinitrotoluene	3.01	0.333	mg/kg wet	3.333		90	40-140			
2-Chloronaphthalene	2.38	0.333	mg/kg wet	3.333		71	40-140			
2-Chlorophenol	2.24	0.333	mg/kg wet	3.333		67	30-130			
2-Methylnaphthalene	2.22	0.333	mg/kg wet	3.333		67	40-140			
2-Methylphenol	2.27	0.333	mg/kg wet	3.333		68	30-130			
2-Nitrophenol	2.30	0.333	mg/kg wet	3.333		69	30-130			
3,3´-Dichlorobenzidine	2.75	0.333	mg/kg wet	3.333		83	40-140			
3+4-Methylphenol	4.64	0.667	mg/kg wet	6.667		70	30-130			
4-Bromophenyl-phenylether	2.98	0.333	mg/kg wet	3.333		90	40-140			
4-Chloroaniline	1.36	0.333	mg/kg wet	3.333		41	40-140			
4-Nitrophenol	3.53	1.67	mg/kg wet	3.333		106	30-130			
Acenaphthene	2.62	0.333	mg/kg wet	3.333		79	40-140			
Acenaphthylene	2.43	0.333	mg/kg wet	3.333		73	40-140			
Acetophenone	2.12	0.667	mg/kg wet	3.333		64	40-140			
Aniline	1.54	1.67	mg/kg wet	3.333		46	40-140			
Anthracene	3.11	0.333	mg/kg wet	3.333		93	40-140			
Azobenzene	3.00	0.333	mg/kg wet	3.333		90	40-140			
Benzo(a)anthracene	3.27	0.333	mg/kg wet	3.333		98	40-140			
Benzo(a)pyrene	3.50	0.167	mg/kg wet	3.333		105	40-140			
Benzo(b)fluoranthene	3.53	0.333	mg/kg wet	3.333		106	40-140			
Benzo(g,h,i)perylene	3.54	0.333	mg/kg wet	3.333		106	40-140			
Benzo(k)fluoranthene	2.91	0.333	mg/kg wet	3.333		87	40-140			
bis(2-Chloroethoxy)methane	2.27	0.333	mg/kg wet	3.333		68	40-140			
bis(2-Chloroethyl)ether	2.19	0.333	mg/kg wet	3.333		66	40-140			
bis(2-chloroisopropyl)Ether	2.11	0.333	mg/kg wet	3.333		63	40-140			
bis(2-Ethylhexyl)phthalate	3.51	0.333	mg/kg wet	3.333		105	40-140			
Butylbenzylphthalate	3.41	0.333	mg/kg wet	3.333		102	40-140			
Chrysene	3.24	0.167	mg/kg wet	3.333		97	40-140			
Dibenzo(a,h)Anthracene	3.64	0.167	mg/kg wet	3.333		109	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 20C0331

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch DC01210 - 3546										
Dibenzofuran	2.71	0.333	mg/kg wet	3.333		81	40-140			
Diethylphthalate	3.05	0.333	mg/kg wet	3.333		92	40-140			
Dimethylphthalate	2.92	0.333	mg/kg wet	3.333		88	40-140			
Di-n-butylphthalate	3.30	0.333	mg/kg wet	3.333		99	40-140			
Di-n-octylphthalate	3.23	0.333	mg/kg wet	3.333		97	40-140			
Fluoranthene	3.26	0.333	mg/kg wet	3.333		98	40-140			
Fluorene	3.02	0.333	mg/kg wet	3.333		91	40-140			
Hexachlorobenzene	2.95	0.333	mg/kg wet	3.333		89	40-140			
Hexachlorobutadiene	2.13	0.333	mg/kg wet	3.333		64	40-140			
Hexachloroethane	2.12	0.333	mg/kg wet	3.333		64	40-140			
Indeno(1,2,3-cd)Pyrene	3.60	0.333	mg/kg wet	3.333		108	40-140			
Isophorone	1.97	0.333	mg/kg wet	3.333		59	40-140			
Naphthalene	2.19	0.333	mg/kg wet	3.333		66	40-140			
Nitrobenzene	2.25	0.333	mg/kg wet	3.333		68	40-140			
N-Nitrosodimethylamine	2.05	0.333	mg/kg wet	3.333		62	40-140			
Pentachlorophenol	3.40	0.667	mg/kg wet	3.333		102	30-130			
Phenanthrene	3.10	0.333	mg/kg wet	3.333		93	40-140			
Phenol	2.35	0.333	mg/kg wet	3.333		70	30-130			
Pyrene	3.08	0.333	mg/kg wet	3.333		92	40-140			
Pyridine	1.94	1.67	mg/kg wet	3.333		58	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	*2.21*		mg/kg wet	*3.333*		*66*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.84*		mg/kg wet	*5.000*		*97*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.49*		mg/kg wet	*5.000*		*70*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.53*		mg/kg wet	*3.333*		*76*	*30-130*			
Surrogate: 2-Fluorophenol	*3.52*		mg/kg wet	*5.000*		*70*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.43*		mg/kg wet	*3.333*		*73*	*30-130*			
Surrogate: Phenol-d6	*3.62*		mg/kg wet	*5.000*		*72*	*30-130*			
Surrogate: p-Terphenyl-d14	*3.19*		mg/kg wet	*3.333*		*96*	*30-130*			
LCS Dup										
1,2,4-Trichlorobenzene	2.00	0.333	mg/kg wet	3.333		60	40-140	6	30	
1,2-Dichlorobenzene	1.91	0.333	mg/kg wet	3.333		57	40-140	10	30	
1,3-Dichlorobenzene	1.92	0.333	mg/kg wet	3.333		58	40-140	10	30	
1,4-Dichlorobenzene	1.91	0.333	mg/kg wet	3.333		57	40-140	10	30	
2,4,5-Trichlorophenol	2.95	0.333	mg/kg wet	3.333		89	30-130	4	30	
2,4,6-Trichlorophenol	2.83	0.333	mg/kg wet	3.333		85	30-130	2	30	
2,4-Dichlorophenol	2.46	0.333	mg/kg wet	3.333		74	30-130	3	30	
2,4-Dimethylphenol	2.44	0.333	mg/kg wet	3.333		73	30-130	3	30	
2,4-Dinitrophenol	4.15	0.667	mg/kg wet	3.333		124	30-130	0.2	30	
2,4-Dinitrotoluene	3.42	0.333	mg/kg wet	3.333		102	40-140	0.06	30	
2,6-Dinitrotoluene	2.99	0.333	mg/kg wet	3.333		90	40-140	0.8	30	
2-Chloronaphthalene	2.32	0.333	mg/kg wet	3.333		69	40-140	3	30	
2-Chlorophenol	2.08	0.333	mg/kg wet	3.333		63	30-130	7	30	
2-Methylnaphthalene	2.18	0.333	mg/kg wet	3.333		65	40-140	2	30	
2-Methylphenol	2.19	0.333	mg/kg wet	3.333		66	30-130	4	30	
2-Nitrophenol	2.16	0.333	mg/kg wet	3.333		65	30-130	6	30	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 20C0331

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch DC01210 - 3546										
3,3´-Dichlorobenzidine	3.46	0.333	mg/kg wet	3.333		104	40-140	23	30	
3+4-Methylphenol	4.56	0.667	mg/kg wet	6.667		68	30-130	2	30	
4-Bromophenyl-phenylether	2.89	0.333	mg/kg wet	3.333		87	40-140	3	30	
4-Chloroaniline	2.14	0.333	mg/kg wet	3.333		64	40-140	44	30	D+
4-Nitrophenol	3.39	1.67	mg/kg wet	3.333		102	30-130	4	30	
Acenaphthene	2.58	0.333	mg/kg wet	3.333		77	40-140	2	30	
Acenaphthylene	2.38	0.333	mg/kg wet	3.333		71	40-140	2	30	
Acetophenone	2.01	0.667	mg/kg wet	3.333		60	40-140	5	30	
Aniline	1.83	1.67	mg/kg wet	3.333		55	40-140	17	30	
Anthracene	3.02	0.333	mg/kg wet	3.333		91	40-140	3	30	
Azobenzene	2.89	0.333	mg/kg wet	3.333		87	40-140	4	30	
Benzo(a)anthracene	3.18	0.333	mg/kg wet	3.333		96	40-140	3	30	
Benzo(a)pyrene	3.37	0.167	mg/kg wet	3.333		101	40-140	4	30	
Benzo(b)fluoranthene	3.53	0.333	mg/kg wet	3.333		106	40-140	0.08	30	
Benzo(g,h,i)perylene	3.34	0.333	mg/kg wet	3.333		100	40-140	6	30	
Benzo(k)fluoranthene	2.73	0.333	mg/kg wet	3.333		82	40-140	6	30	
bis(2-Chloroethoxy)methane	2.18	0.333	mg/kg wet	3.333		65	40-140	4	30	
bis(2-Chloroethyl)ether	2.04	0.333	mg/kg wet	3.333		61	40-140	7	30	
bis(2-chloroisopropyl)Ether	1.94	0.333	mg/kg wet	3.333		58	40-140	8	30	
bis(2-Ethylhexyl)phthalate	3.51	0.333	mg/kg wet	3.333		105	40-140	0.07	30	
Butylbenzylphthalate	3.41	0.333	mg/kg wet	3.333		102	40-140	0.08	30	
Chrysene	3.16	0.167	mg/kg wet	3.333		95	40-140	2	30	
Dibenzo(a,h)Anthracene	3.48	0.167	mg/kg wet	3.333		104	40-140	5	30	
Dibenzofuran	2.67	0.333	mg/kg wet	3.333		80	40-140	1	30	
Diethylphthalate	3.06	0.333	mg/kg wet	3.333		92	40-140	0.4	30	
Dimethylphthalate	2.90	0.333	mg/kg wet	3.333		87	40-140	0.7	30	
Di-n-butylphthalate	3.28	0.333	mg/kg wet	3.333		99	40-140	0.6	30	
Di-n-octylphthalate	3.21	0.333	mg/kg wet	3.333		96	40-140	0.5	30	
Fluoranthene	3.16	0.333	mg/kg wet	3.333		95	40-140	3	30	
Fluorene	2.94	0.333	mg/kg wet	3.333		88	40-140	3	30	
Hexachlorobenzene	2.83	0.333	mg/kg wet	3.333		85	40-140	4	30	
Hexachlorobutadiene	1.98	0.333	mg/kg wet	3.333		59	40-140	7	30	
Hexachloroethane	1.92	0.333	mg/kg wet	3.333		58	40-140	10	30	
Indeno(1,2,3-cd)Pyrene	3.43	0.333	mg/kg wet	3.333		103	40-140	5	30	
Isophorone	1.93	0.333	mg/kg wet	3.333		58	40-140	2	30	
Naphthalene	2.05	0.333	mg/kg wet	3.333		61	40-140	7	30	
Nitrobenzene	2.09	0.333	mg/kg wet	3.333		63	40-140	8	30	
N-Nitrosodimethylamine	1.81	0.333	mg/kg wet	3.333		54	40-140	13	30	
Pentachlorophenol	3.30	0.667	mg/kg wet	3.333		99	30-130	3	30	
Phenanthrene	2.99	0.333	mg/kg wet	3.333		90	40-140	4	30	
Phenol	2.21	0.333	mg/kg wet	3.333		66	30-130	6	30	
Pyrene	3.04	0.333	mg/kg wet	3.333		91	40-140	1	30	
Pyridine	1.70	1.67	mg/kg wet	3.333		51	40-140	13	30	
Surrogate: 1,2-Dichlorobenzene-d4	*1.97*		mg/kg wet	*3.333*		*59*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.55*		mg/kg wet	*5.000*		*91*	*30-130*			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 20C0331

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch DC01210 - 3546										
Surrogate: 2-Chlorophenol-d4	*3.18*		mg/kg wet	*5.000*		*64*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.41*		mg/kg wet	*3.333*		*72*	*30-130*			
Surrogate: 2-Fluorophenol	*3.11*		mg/kg wet	*5.000*		*62*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.20*		mg/kg wet	*3.333*		*66*	*30-130*			
Surrogate: Phenol-d6	*3.33*		mg/kg wet	*5.000*		*67*	*30-130*			
Surrogate: p-Terphenyl-d14	*3.10*		mg/kg wet	*3.333*		*93*	*30-130*			
Classical Chemistry										
Batch DC01220 - General Preparation										
Blank										
Sulfate	ND	5	mg/kg wet							
LCS										
Sulfate	10		mg/L	9.988		97	80-120			
Batch DC01225 - TCN Prep										
Blank										
Total Cyanide	ND	1.00	mg/kg wet							
LCS										
Total Cyanide	4.93	1.00	mg/kg wet	5.015		98	90-110			
Reference										
Total Cyanide	141	9.79	mg/kg wet	157.0		90	24-110			
Reference										
Total Cyanide	145	9.86	mg/kg wet	157.0		92	24-110			
Batch DC01228 - General Preparation										
Blank										
Reactive Cyanide	ND	2.0	mg/kg							
Reactive Sulfide	ND	2.0	mg/kg							
LCS										
Reactive Cyanide	4.0	2.0	mg/kg	100.3		4	0.68-5.41			
Reactive Sulfide	ND	2.0	mg/kg	10.00		0	0-44			
Batch DC01230 - General Preparation										
Blank										
Conductivity	ND	5	umhos/cm							
LCS										
Conductivity	1360		umhos/cm	1411		97	90-110			
Batch DC01234 - General Preparation										
Reference										
Flashpoint	81		°F	81.00		100	97.9-102.1			
Batch DC01260 - General Preparation										
Blank										
Total Organic Carbon (1)	ND	100	mg/kg							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 20C0331

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Classical Chemistry										
Batch DC01260 - General Preparation										
Total Organic Carbon (2)	ND	100	mg/kg							
LCS										
Total Organic Carbon (1)	9240	100	mg/kg	10000		92	80-120			
Total Organic Carbon (2)	8940	100	mg/kg	10000		89	80-120			
LCS Dup										
Total Organic Carbon (1)	9050	100	mg/kg	10000		91	80-120	2	20	
Total Organic Carbon (2)	9490	100	mg/kg	10000		95	80-120	6	20	
Batch DC01318 - General Preparation										
Blank										
Sulfide	ND	0.05	mg/kg wet							
LCS										
Sulfide	0.5		mg/L	0.5000		104	85-115			
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch DC01205 - 3546										
Blank										
C19-C36 Aliphatics1	ND	15.0	mg/kg wet							
C9-C18 Aliphatics1	ND	15.0	mg/kg wet							
Decane (C10)	ND	0.5	mg/kg wet							
Docosane (C22)	ND	0.5	mg/kg wet							
Dodecane (C12)	ND	0.5	mg/kg wet							
Eicosane (C20)	ND	0.5	mg/kg wet							
Hexacosane (C26)	ND	0.5	mg/kg wet							
Hexadecane (C16)	ND	0.5	mg/kg wet							
Hexatriacontane (C36)	ND	0.5	mg/kg wet							
Nonadecane (C19)	ND	0.5	mg/kg wet							
Nonane (C9)	ND	0.5	mg/kg wet							
Octacosane (C28)	ND	0.5	mg/kg wet							
Octadecane (C18)	ND	0.5	mg/kg wet							
Tetracosane (C24)	ND	0.5	mg/kg wet							
Tetradecane (C14)	ND	0.5	mg/kg wet							
Triacontane (C30)	ND	0.5	mg/kg wet							
Surrogate: 1-Chlorooctadecane	*1.51*		mg/kg wet	*2.020*		*75*	*40-140*			
Blank										
2-Methylnaphthalene	ND	0.20	mg/kg wet							
Acenaphthene	ND	0.40	mg/kg wet							
Acenaphthylene	ND	0.20	mg/kg wet							
Anthracene	ND	0.40	mg/kg wet							
Benzo(a)anthracene	ND	0.40	mg/kg wet							
Benzo(a)pyrene	ND	0.40	mg/kg wet							
Benzo(b)fluoranthene	ND	0.40	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.40	mg/kg wet							
Benzo(k)fluoranthene	ND	0.40	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ ESS Laboratory Work Order: 20C0331

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch DC01205 - 3546										
C11-C22 Unadjusted Aromatics1	ND	15.0	mg/kg wet							
Chrysene	ND	0.40	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.20	mg/kg wet							
Fluoranthene	ND	0.40	mg/kg wet							
Fluorene	ND	0.40	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.40	mg/kg wet							
Naphthalene	ND	0.40	mg/kg wet							
Phenanthrene	ND	0.40	mg/kg wet							
Pyrene	ND	0.40	mg/kg wet							
Surrogate: 2-Bromonaphthalene	*2.13*		mg/kg wet	*2.000*		*107*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*2.02*		mg/kg wet	*2.000*		*101*	*40-140*			
Surrogate: O-Terphenyl	*2.17*		mg/kg wet	*2.008*		*108*	*40-140*			
LCS										
C19-C36 Aliphatics1	14.9	15.0	mg/kg wet	16.00		93	40-140			
C9-C18 Aliphatics1	7.5	15.0	mg/kg wet	12.00		62	40-140			
Decane (C10)	0.9	0.5	mg/kg wet	2.000		45	40-140			
Docosane (C22)	1.8	0.5	mg/kg wet	2.000		88	40-140			
Dodecane (C12)	1.0	0.5	mg/kg wet	2.000		50	40-140			
Eicosane (C20)	1.7	0.5	mg/kg wet	2.000		87	40-140			
Hexacosane (C26)	1.8	0.5	mg/kg wet	2.000		88	40-140			
Hexadecane (C16)	1.5	0.5	mg/kg wet	2.000		74	40-140			
Hexatriacontane (C36)	1.7	0.5	mg/kg wet	2.000		84	40-140			
Nonadecane (C19)	1.7	0.5	mg/kg wet	2.000		83	40-140			
Nonane (C9)	0.8	0.5	mg/kg wet	2.000		38	30-140			
Octacosane (C28)	1.8	0.5	mg/kg wet	2.000		89	40-140			
Octadecane (C18)	1.7	0.5	mg/kg wet	2.000		83	40-140			
Tetracosane (C24)	1.8	0.5	mg/kg wet	2.000		89	40-140			
Tetradecane (C14)	1.2	0.5	mg/kg wet	2.000		60	40-140			
Triacontane (C30)	1.7	0.5	mg/kg wet	2.000		86	40-140			
Surrogate: 1-Chlorooctadecane	*1.62*		mg/kg wet	*2.020*		*80*	*40-140*			
LCS										
2-Methylnaphthalene	1.82	0.20	mg/kg wet	2.000		91	40-140			
Acenaphthene	2.00	0.40	mg/kg wet	2.000		100	40-140			
Acenaphthylene	2.03	0.20	mg/kg wet	2.000		102	40-140			
Anthracene	2.34	0.40	mg/kg wet	2.000		117	40-140			
Benzo(a)anthracene	2.14	0.40	mg/kg wet	2.000		107	40-140			
Benzo(a)pyrene	2.11	0.40	mg/kg wet	2.000		106	40-140			
Benzo(b)fluoranthene	2.13	0.40	mg/kg wet	2.000		107	40-140			
Benzo(g,h,i)perylene	1.89	0.40	mg/kg wet	2.000		94	40-140			
Benzo(k)fluoranthene	2.17	0.40	mg/kg wet	2.000		108	40-140			
C11-C22 Unadjusted Aromatics1	34.9	15.0	mg/kg wet	34.00		103	40-140			
Chrysene	2.45	0.40	mg/kg wet	2.000		123	40-140			
Dibenzo(a,h)Anthracene	1.98	0.20	mg/kg wet	2.000		99	40-140			
Fluoranthene	2.38	0.40	mg/kg wet	2.000		119	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ ESS Laboratory Work Order: 20C0331

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch DC01205 - 3546										
Fluorene	2.12	0.40	mg/kg wet	2.000		106	40-140			
Indeno(1,2,3-cd)Pyrene	1.93	0.40	mg/kg wet	2.000		96	40-140			
Naphthalene	1.64	0.40	mg/kg wet	2.000		82	40-140			
Phenanthrene	2.19	0.40	mg/kg wet	2.000		110	40-140			
Pyrene	2.37	0.40	mg/kg wet	2.000		118	40-140			
Surrogate: 2-Bromonaphthalene	*2.17*		mg/kg wet	*2.000*		*108*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*2.05*		mg/kg wet	*2.000*		*102*	*40-140*			
Surrogate: O-Terphenyl	*2.20*		mg/kg wet	*2.008*		*109*	*40-140*			
LCS										
2-Methylnaphthalene Breakthrough	0.0		%				0-5			
Naphthalene Breakthrough	0.0		%				0-5			
LCS Dup										
C19-C36 Aliphatics1	15.1	15.0	mg/kg wet	16.00		95	40-140	2	25	
C9-C18 Aliphatics1	7.6	15.0	mg/kg wet	12.00		64	40-140	2	25	
Decane (C10)	0.9	0.5	mg/kg wet	2.000		46	40-140	2	25	
Docosane (C22)	1.8	0.5	mg/kg wet	2.000		89	40-140	2	25	
Dodecane (C12)	1.0	0.5	mg/kg wet	2.000		52	40-140	2	25	
Eicosane (C20)	1.8	0.5	mg/kg wet	2.000		89	40-140	2	25	
Hexacosane (C26)	1.8	0.5	mg/kg wet	2.000		90	40-140	2	25	
Hexadecane (C16)	1.5	0.5	mg/kg wet	2.000		74	40-140	1	25	
Hexatriacontane (C36)	1.7	0.5	mg/kg wet	2.000		86	40-140	2	25	
Nonadecane (C19)	1.7	0.5	mg/kg wet	2.000		85	40-140	1	25	
Nonane (C9)	0.8	0.5	mg/kg wet	2.000		38	30-140	0.5	25	
Octacosane (C28)	1.8	0.5	mg/kg wet	2.000		91	40-140	2	25	
Octadecane (C18)	1.7	0.5	mg/kg wet	2.000		84	40-140	2	25	
Tetracosane (C24)	1.8	0.5	mg/kg wet	2.000		91	40-140	2	25	
Tetradecane (C14)	1.2	0.5	mg/kg wet	2.000		61	40-140	2	25	
Triacontane (C30)	1.8	0.5	mg/kg wet	2.000		88	40-140	2	25	
Surrogate: 1-Chlorooctadecane	*1.71*		mg/kg wet	*2.020*		*85*	*40-140*			
LCS Dup										
2-Methylnaphthalene	1.83	0.20	mg/kg wet	2.000		91	40-140	0.7	30	
Acenaphthene	2.09	0.40	mg/kg wet	2.000		105	40-140	4	30	
Acenaphthylene	2.12	0.20	mg/kg wet	2.000		106	40-140	5	30	
Anthracene	2.59	0.40	mg/kg wet	2.000		129	40-140	10	30	
Benzo(a)anthracene	2.33	0.40	mg/kg wet	2.000		117	40-140	8	30	
Benzo(a)pyrene	2.33	0.40	mg/kg wet	2.000		117	40-140	10	30	
Benzo(b)fluoranthene	2.31	0.40	mg/kg wet	2.000		116	40-140	8	30	
Benzo(g,h,i)perylene	2.07	0.40	mg/kg wet	2.000		103	40-140	9	30	
Benzo(k)fluoranthene	2.37	0.40	mg/kg wet	2.000		118	40-140	9	30	
C11-C22 Unadjusted Aromatics1	37.3	15.0	mg/kg wet	34.00		110	40-140	7	25	
Chrysene	2.66	0.40	mg/kg wet	2.000		133	40-140	8	30	
Dibenzo(a,h)Anthracene	2.19	0.20	mg/kg wet	2.000		110	40-140	10	30	
Fluoranthene	2.57	0.40	mg/kg wet	2.000		129	40-140	8	30	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 20C0331

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch DC01205 - 3546										
Fluorene	2.27	0.40	mg/kg wet	2.000		114	40-140	7	30	
Indeno(1,2,3-cd)Pyrene	2.11	0.40	mg/kg wet	2.000		106	40-140	9	30	
Naphthalene	1.60	0.40	mg/kg wet	2.000		80	40-140	2	30	
Phenanthrene	2.39	0.40	mg/kg wet	2.000		119	40-140	9	30	
Pyrene	2.60	0.40	mg/kg wet	2.000		130	40-140	9	30	
Surrogate: 2-Bromonaphthalene	*2.34*		mg/kg wet	*2.000*		*117*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*2.21*		mg/kg wet	*2.000*		*111*	*40-140*			
Surrogate: O-Terphenyl	*2.34*		mg/kg wet	*2.008*		*117*	*40-140*			
LCS Dup										
2-Methylnaphthalene Breakthrough	0.0		%				0-5		200	
Naphthalene Breakthrough	0.0		%				0-5		200	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ ESS Laboratory Work Order: 20C0331

Notes and Definitions

R-	Standard Reference Material is biased low (R-).
>	Greater than.
CD-	Continuing Calibration %Diff/Drift is below control limit (CD-).
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
D	Diluted.
D+	Relative percent difference for duplicate is outside of criteria (D+).
E	Reported above the quantitation limit; Estimated value (E).
LC	Lower value is used due to matrix interferences (LC).
#	Modified result
Q	Calibration required quadratic regression (Q).
Z18	Temperature is not within 23 +/-2 ºC.
U	Analyte included in the analysis, but not detected
WL	Results obtained from a deionized water leach of the sample.
XH	Peaks found in the retention time window for MCPA did not confirm by GC/MS.
XHa	Peaks found in the retention time window for MCPP did not confirm by GC/MS.
Z-08	See Attached
Z-09	ND
Z-10	Soil pH measured in water at 19.1 ºC.
Z-10a	Soil pH measured in water at 19.4 ºC.
P	Percent difference between primary and confirmation results exceeds 40% (P).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ

ESS Laboratory Work Order: 20C0331

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

THIELSCH ENGINEERING
195 Frances Avenue
Cranston RI, 02910
Phone: (401)-467-6454
Fax: (401)-467-2398
thielsch.com
Let's Build a Solid Foundation

Client Information:
GEI Consultants
Woburn, MA
PM: Ryan Hoffman
Assigned By: Ryan Hoffman
Collected By: Client

Project Information:
Amesbury Former MGP
Amesbury, MA
ESS Project Number: 20C0331
Summary Page: 1 of 1
Report Date: 03.19.2020

LABORATORY TESTING DATA SHEET, Report No.: 7420-C-129

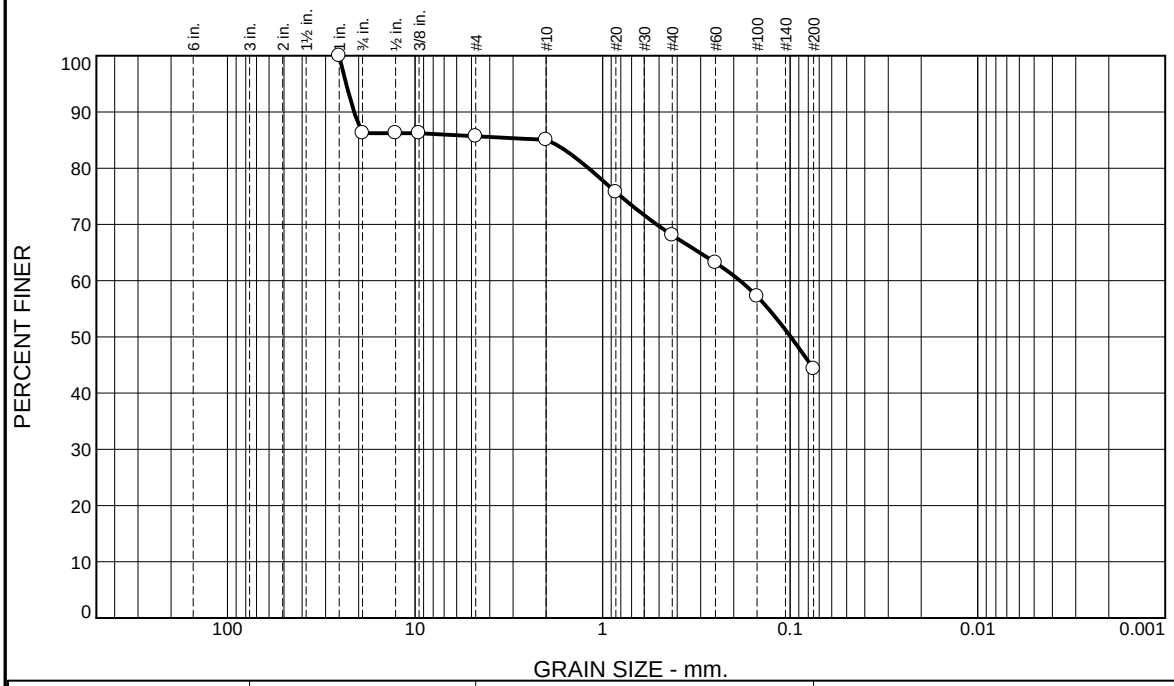
GEI Sample No.	ESS Laboratory No.	Identification Tests								Proctor / CBR / Permeability Tests								Laboratory Log and Soil Description
		As Received Water Content %	LL %	PL %	Gravel %	Sand %	Fines %	Org. %	G_s	Dry unit wt. pcf	Test Water Content %	γ_d MAX (pcf) W_{opt} (%)	γ_d MAX (pcf) W_{opt} (%) (Corr.)	Target Test Setup as % of Proctor	CBR @ 0.1"	CBR @ 0.2"	Permeability cm/sec	
		D2216	D4318		D6913			D2974	D854			D1557						
1804576-SS773-S1	20C0331-01				14.3	41.4	44.3											Dark Gray Organic silty sand
1804576-SS766-S2	20C0331-02				1.3	62.4	36.3											Dark Gray Organic silty sand

Date Received: *03.17.2020*

Reviewed By: Sth

Date Reviewed: *03.19.2020*

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	13.8	0.5	0.7	16.9	23.8	44.3	

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1"	100.0		
0.75"	86.2		
0.5"	86.2		
0.375"	86.2		
#4	85.7		
#10	85.0		
#20	75.7		
#40	68.1		
#60	63.2		
#100	57.2		
#200	44.3		

* (no specification provided)

Material Description

Dark Gray Organic silty sand

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= SM **AASHTO (M 145)=** A-4(0)

Coefficients

D_{90}= 21.1235 D_{85}= 1.9838 D_{60}= 0.1850
D_{50}= 0.0993 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Sample visually classified as plastic. Sample rolled to 1/8".

Date Received: 03.17.2020 **Date Tested:** 03.19.2020

Tested By: IA

Checked By: Steven Accetta

Title: Laboratory Coordinator

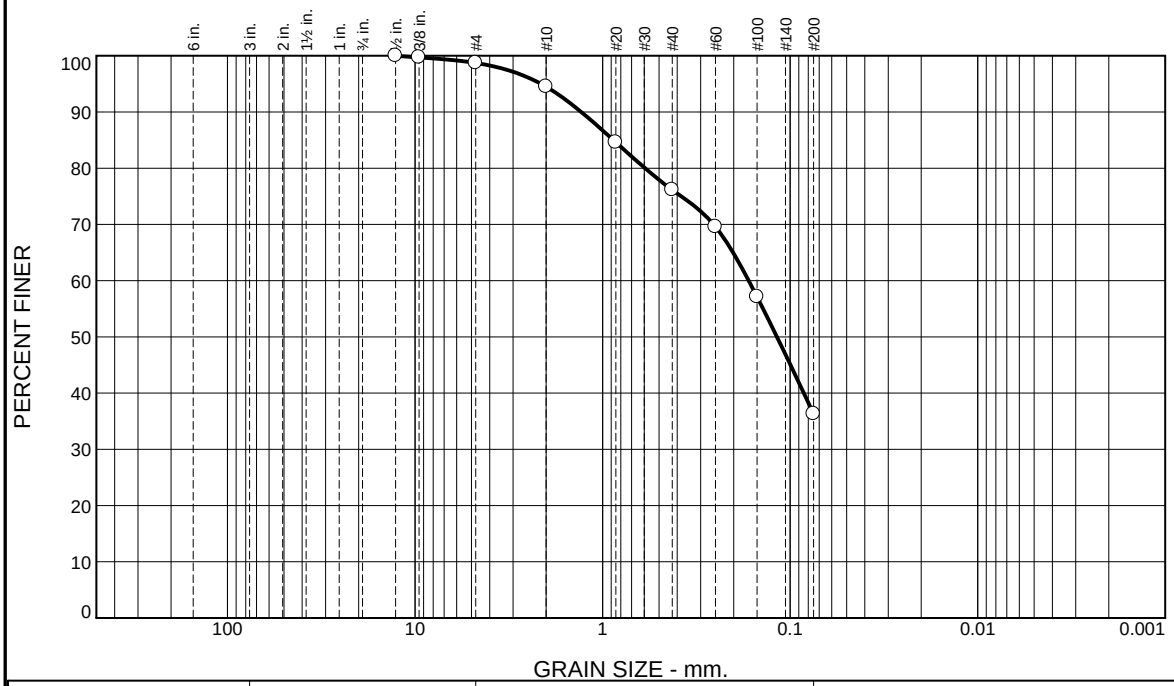
Source of Sample: Grab **Date Sampled:** 03.10.2020
Sample Number: 1804576-SS773-S1

Thielsch Engineering Inc.

Cranston, RI

Client: GEI Consultants
Project: Amesbury Former MGP
Amesbury, MA
Project No: 20C0331 **Figure** 20C0331-01

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.3	4.2	18.4	39.8	36.3	

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
0.5"	100.0		
0.375"	99.7		
#4	98.7		
#10	94.5		
#20	84.6		
#40	76.1		
#60	69.6		
#100	57.1		
#200	36.3		

* (no specification provided)

Material Description

Dark Gray Organic silty sand

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= SM **AASHTO (M 145)=** A-4(0)

Coefficients

D_{90}= 1.2993 D_{85}= 0.8760 D_{60}= 0.1662
D_{50}= 0.1176 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Sample visually classified as plastic. Sample rolled to 1/8".

Date Received: 03.17.2020 **Date Tested:** 03.19.2020

Tested By: IA

Checked By: Steven Accetta

Title: Laboratory Coordinator

Source of Sample: Grab **Date Sampled:** 03.10.2020
Sample Number: 1804576-SS766-S2

Thielsch Engineering Inc.

Cranston, RI

Client: GEI Consultants
Project: Amesbury Former MGP
Amesbury, MA
Project No: 20C0331 **Figure** 20C0331-02

Chain-of-Custody Record

CTS

Laboratory: ESS

Laboratory Job # (Lab use only) 20C0331

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP
Project Location: Amesbury, MA
Project Number: 1804576
Project Manager: Ryan Hoffman
Send Report to: Ryan Hoffman
Send EDD to: labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY REQUIRED -- (YES) NO

If Yes, Are MCP Analytical Methods Required? (YES) NO NA
Are Drinking Water Samples Submitted? YES (NO) NA
If Yes, Have Drinking Water Sampling Requirements Been Met? YES NO (NA)

Sample Handling
Samples Field Filtered: YES NO (NA)
Sampled Shipped With Ice: (YES) NO

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) initials	Preservative	VOCs 8260*	SVOCs 8270 by SIM**	TPH 8100M	PCB NOAA Summation of Congeners	RCRA8 metals + Cu, Ni, Zn***	EPH (fractions only)	Volatile solids (%)	Corrosivity, Ignit., React., Conductivity	Pesticides and Herbicides	Total cyanide	Total Sulfur, Total Sulfide, Total Sulfate	TOC by Lloyd-Kahn	Grain Size Analysis****	Sample Specific Remarks
							H2O/MeOH	None	None	None	None	None	None	None	None	None	None	None	None	None	
							Analysis														
1	1804576-SS773-S1	3/10/2020	10:58	Soil	9	BFM		X	X	X	X	X	X	X	X	X	X	X	X	X	
2	1804576-SS766-S2	3/10/2020	14:47	Soil	9	BFM		X	X	X	X	X	X	X	X	X	X	X	X	X	

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

	Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1.		3/10/20	1650	1. GEI Sample Fridge
2.	2. GEI Sample Fridge	3/11/20	1210	2.
3.	3.	3/11/20	1216	3.
4.	4.	3/11	17:47	4.

0317.2020 0838

Turnaround Time (Business days):
Normal __X__ Other ____
10-Day ____ 7-Day ____
5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you must notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

*Run TCLP benzene if total >20X
**Include pyridine and toxaphene
***Run TCLP metals if total >20X
****Sieve Nos. 4, 10, 40, 60, and 200

ice temp: 0.3

Sterling Analytical, Inc.
15 Agawam Avenue
West Springfield, MA 01089
Phone (413) 214-6541 Fax (413) 214-6842
email-madhu@sterlinganalytical.com

Visit our website: www.sterlinganalytical.com

Mass Certification - MA-00071
Conn Certification - PH-0520

Report Date March 19, 2020

Customer	Contact	Laboratory Supervisor	eMail
ESS Laboratory	S. Morrell	Madhu Shah	customerservice@sterlinganalytical.com

Sample Description
Analysis of Soil Samples

Samples Analyzed

Enclosed are Report No(s): 70141, 70142

*Results reported on 'Dry Basis'.

Sulfur Total Blank = <0.05ppm

LCS Lo Check 0.100 = 0.087ppm

ICV 1.00 = 1.014ppm

Thank you for your business

madhu shah

Madhu Shah, Laboratory Supervisor

3/19/2020

Date

ALL the information contained in this report has been reviewed for accuracy and checked against all quality control requirements outlined in each applicable method.
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Sample	Description	Source	Taken/Time	Received
70141	20C0331-01	ESS Laboratory	3/10/20	3/13/20

Parameter	Results		RDL	Method	Analyzed/Time	Tech
Sulfur, Total	3,450	mg/kg	100.00	SW 846 6010	03/18/20	dfp

Sample	Description	Source	Taken/Time	Received
70142	20C0331-02	ESS Laboratory	3/10/20	3/13/20

Parameter	Results		RDL	Method	Analyzed/Time	Tech
Sulfur, Total	3,580	mg/kg	100.00	SW 846 6010	03/18/20	dfp

ESS Laboratory — Sterling — CHAIN OF CUSTODY

ESS Lab # 20C0331

Division of Thielsch Engineering, Inc.

185 Frances Avenue, Cranston, RI 02910-2211
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

Turn Time **DUE DATE: _3/19/20__**

Regulatory State: **MA** RI CT NH NJ NY ME Other_____

Is this project for any of the following:(please circle)
MA-MCP Navy USACE CT DEP Other_____

Reporting Limits - _____

Electonic Deliverables Excel Access PDF

Co. Name	Project #	Project Name	
ESS LABORATORY		20C0331	
Contact Person	**Address**		
Shawn Morrell / Heather Masse			
City	**State**	**Zip**	**PO #**
			B03046
Tel.	**Email: Smorrell@thielsch.com; Hmasse@thielsch.com**		

Analysis

ESS Lab ID	Date	Collection Time	Grab -G Composite-C	Matrix	Sample ID	Pres Code	# of Containers	Type of Container	Vol of Container	Total Sulfur 6010 mg/Kg									
	3/10/20	**1058**	**G**	**S**	**20C0331-01**					**X**									
	3/10/20	**1447**	**G**	**S**	**20C0331-02**					**X**									

Container Type: P-Poly G-Glass AG-Amber Glass S-Sterile V-VOA

Matrix: S-Soil SD-Solid D-Sludge WW-Wastewater GW-Groundwater SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filter

Cooler Present _____Yes _____No Internal Use Only

Seals Intact ____ Yes _____No NA:___ [ ] Pickup

Cooler Temperature: _____ [ ] Technician___

Preservation Code: 1-NP, 2-HCl, 3-H2SO4, 4-HNO3, 5-NaOH, 6-MeOH, 7-Asorbic Acid, 8-ZnAct, 9-_____

Sampled by :

Comments: **QC required MB and LCS**

Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)
Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)

* By circling MA-MCP, client acknowledges samples were collected in accordance with MADEP CAM VIIA

Please fax to the laboratory all changes to Chain of Custody

1 (White) Lab Copy
2 (Yellow) Client Receipt

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

Shipped/Delivered Via: ESS Courier

ESS Project ID: 20C0331
Date Received: 3/11/2020
Project Due Date: 3/18/2020
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 0.3 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs: **1--2**
    Analysis: **grain size, total sulfur**
    TAT: **std**
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA
13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: 3/11/20 Time: 1948 By: M

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1	22866	Yes	N/A	Yes	8 oz jar	NP	
1	22867	Yes	N/A	Yes	8 oz jar	NP	
1	22868	Yes	N/A	Yes	8 oz jar	NP	
1	22869	Yes	N/A	Yes	8 oz jar	NP	
1	22874	Yes	N/A	Yes	4 oz. Jar	NP	
1	22876	Yes	N/A	Yes	8 oz jar	NP	
1	22877	Yes	N/A	Yes	VOA Vial	MeOH	
1	22879	Yes	N/A	Yes	VOA Vial	DI Water	
1	22880	Yes	N/A	Yes	VOA Vial	DI Water	
2	22870	Yes	N/A	Yes	8 oz jar	NP	
2	22871	Yes	N/A	Yes	8 oz jar	NP	
2	22872	Yes	N/A	Yes	8 oz jar	NP	
2	22873	Yes	N/A	Yes	8 oz jar	NP	
2	22875	Yes	N/A	Yes	4 oz. Jar	NP	
2	22878	Yes	N/A	Yes	VOA Vial	MeOH	
2	22881	Yes	N/A	Yes	VOA Vial	DI Water	
2	22882	Yes	N/A	Yes	VOA Vial	DI Water	
1	22901	Yes	N/A	Yes	4oz Jar	NP	m 3/11/20

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

ESS Project ID: 20C0331
Date Received: 3/11/2020

2nd Review
Were all containers scanned into storage/lab? Initials
Are barcode labels on correct containers? Yes / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: Date & Time: 3/11/20 1937
Reviewed By: Date & Time: 3/11/20 1948
Delivered By: 3/11/20 1948

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 20C0331

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY REQUIRED -- YES NO

If Yes, Are MCP Analytical Methods Required? YES NO NA

Are Drinking Water Samples Submitted? YES NO NA

If Yes, Have Drinking Water Sampling Requirements Been Met? YES NO NA

Sample Handling

Samples Field Filtered: YES NO NA

Sampled Shipped With Ice: YES NO

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Preservative	VOCs 8260*	SVOCs 8270 by SIM**	TPH 8100M	PCB NOAA Summation of Congeners	RCRA8 metals + Cu, Ni, Zn***	EPH (fractions only)	Volatile solids (%)	Corrosivity, Ignit., React., Conductivity	Pesticides and Herbicides	Total cyanide	Total Sulfur, Total Sulfide, Total Sulfate	TOC by Lloyd-Kahn	Grain Size Analysis****	Sample Specific Remarks
							H2O/MeOH	None	None	None	None	None	None	None	None	None	None	None	None	None	
							Analysis														
1	1804576-SS773-S1	3/10/2020	10:58	Soil	9	BFM		X	X	X	X	X	X	X	X	X	X	X	X	X	
2	1804576-SS766-S2	3/10/2020	~~14:47~~ 11:47*	Soil	9	BFM		X	X	X	X	X	X	X	X	X	X	X	X	X	

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

	Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1.		3/10/20	1650	1. GEI Sample Fridge
2.	GEI Sample Fridge	3/11/20	1210	2.
3.		3/11/20	1216	3.
4.		3/11	17:47	4.

Turnaround Time (Business days):

Normal __X__ Other ____

10-Day ____ 7-Day ____

5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

*Run TCLP benzene if total >20X — per email from client - 3/12/20 mlp

**include pyridine and toxaphene

***Run TCLP metals if total >20X

****Sieve Nos. 4, 10, 40, 60, and 200

icetemp: 0.3

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 20C0331

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY REQUIRED -- (YES) NO

If Yes, Are MCP Analytical Methods Required? (YES) NO NA

Are Drinking Water Samples Submitted? YES (NO) NA

If Yes, Have Drinking Water Sampling Requirements Been Met? YES NO (NA)

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Preservative	VOCs 8260*	SVOCs 8270 by SIM**	TPH 8100M	PCB NOAA Summation of Congeners	RCRA8 metals + Cu, Ni, Zn***	EPH (fractions only)	Volatile solids (%)	Corrosivity, Ignit., React., Conductivity	Pesticides and Herbicides	Total cyanide	Total Sulfur, Total Sulfide, Total Sulfate	TOC by Lloyd-Kahn	Grain Size Analysis****	Sample Specific Remarks
							H2O/MeOH	None	None	None	None	None	None	None	None	None	None	None	None	None	
							Analysis														
1	1804576-SS773-S1	3/10/2020	10:58	Soil	9	BFM		X	X	X	X	X	X	X	X	X	X	X	X	X	
2	1804576-SS766-S2	3/10/2020	14:47	Soil	9	BFM		X	X	X	X	X	X	X	X	X	X	X	X	X	

Sample Handling

Samples Field Filtered: YES NO (NA)

Sampled Shipped With Ice: (YES) NO

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1.	3/10/20	1650	1. GEI Sample Fridge
Relinquished by: (signature) 2. GEI Sample Fridge	3/11/20	1210	2.
Relinquished by: (signature) 3.	3/11/20	1216	3.
Relinquished by: (signature) 4.	3/11	17:47	4.

Turnaround Time (Business days):

Normal __X__ Other ____

10-Day ____ 7-Day ____

5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

*Run TCLP benzene if total >20X

**Include pyridine and toxaphene

***Run TCLP metals if total >20X

****Sieve Nos. 4, 10, 40, 60, and 200

icetemp: 0.3

ESS Laboratory
DIVISION OF THE RISE GROUP

BAL Laboratory Analytical Balance

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP - 401WQ - MCP (1804576)
ESS Laboratory Work Order Number: 24G0835

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 1:49 pm, Aug 28, 2024

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses

Sterling Analytical Lab - West Springfield, MA	Sulfur, Sulfur (Subcontracted)

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0835

SAMPLE RECEIPT

The following samples were received on July 23, 2024 for the analyses specified on the enclosed Chain of Custody Record.

To achieve CAM compliance for MCP data, ESS Laboratory has reviewed all QA/QC Requirements and Performance Standards listed in each method. Holding times and preservation have also been reviewed. All CAM requirements have been performed and achieved unless noted in the project narrative.

Each method has been set-up in the laboratory to reach required MCP standards. The methods for aqueous VOA and Soil Methanol VOA have known limitations for certain analytes. The regulatory standards may not be achieved due to these limitations. In addition, for all methods, matrix interferences, dilutions, and %Solids may elevate method reporting limits above regulatory standards. ESS Laboratory can provide, upon request, a Limit Checker (regulatory standard comparison spreadsheet) electronic deliverable which will highlight these exceedances.

Low Level VOA vials were frozen by ESS Laboratory on July 23, 2024 17:32.
Tetrahydrofuran is reported above the MA CAM reporting limit of 0.010 mg/kg.

For VOA analysis on sample 24G0835-02, the low level run has trans-1,2-Dichloroethene over calibration and is being reported with an 'E' qualifier. The high level vial was run and the compound is ND. Both runs are being reported.

Samples for Metals were oven dried at 60 degrees Celsius prior to digestion and relogged in as Sample IDs 24G0835-09 through -12. This was done to increase the dry weight of the sample digested which decreases variability of results and lowers the detection limits for samples with high water content.

Question I: All samples for Metals were analyzed for a subset of the required MCP list per the client's request.

Revision 1 August 9, 2024: This report has been revised to include Hexavalent Chromium and TCLP Chromium on sample 24G0835-03.

Revision 2 August 19, 2024: This report has been revised to include corrected Client Sample IDs on 24G0835-07 and 24G0835-12.

Revision 3 August 28, 2024: This report has been revised to include TCLP Vinyl Chloride to sample 24G0835-02, per the client's request.

Lab Number	Sample Name	Matrix	Analysis

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0835

24G0835-01	1804576-883-0-2ft	Soil	1010A, 2550B, 6010, 6010D, 7.3.3.2, 7.3.4.1, 7471B, 8082A Cong, 8270E, 9014, 9030B, 9038, 9045, 9050A, EPH8270, EPH8270SIM, LK, MADEP-EPH
24G0835-02	1804576-883-0.5ft	Soil	1311, 1311/8260D, 8260D, 8260D Low
24G0835-03	1804576-877-0-2ft	Soil	1010A, 1311, 1311/6010D, 2550B, 2580, 6010, 6010D, 7.3.3.2, 7.3.4.1, 7196A, 7471B, 8082A Cong, 8270E, 9014, 9030B, 9038, 9045, 9050A, EPH8270, EPH8270SIM, LK, MADEP-EPH
24G0835-04	1804576-877-0.5ft	Soil	8260D Low
24G0835-05	1804576-874-0-2ft	Soil	1010A, 2550B, 6010, 6010D, 7.3.3.2, 7.3.4.1, 7471B, 8082A Cong, 8270E, 9014, 9030B, 9038, 9045, 9050A, EPH8270, EPH8270SIM, LK, MADEP-EPH
24G0835-06	1804576-874-0.5ft	Soil	8260D Low
24G0835-07	1804576-884-0-2ft	Soil	1010A, 2550B, 6010, 6010D, 7.3.3.2, 7.3.4.1, 7471B, 8082A Cong, 8270E, 9014, 9030B, 9038, 9045, 9050A, EPH8270, EPH8270SIM, LK, MADEP-EPH
24G0835-08	1804576-884-0.5ft	Soil	8260D, 8260D Low
24G0835-09	1804576-883-0-2ft - Oven Dried	Soil	6010D, 7471B
24G0835-10	1804576-877-0-2ft - Oven Dried	Soil	6010D, 7471B
24G0835-11	1804576-874-0-2ft - Oven Dried	Soil	6010D, 7471B
24G0835-12	1804576-884-0-2ft - Oven Dried	Soil	6010D, 7471B

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0835

PROJECT NARRATIVE

8082 Polychlorinated Biphenyls (PCB) / Congeners

24G0835-03	**Lower value is used due to matrix interferences (LC).**
	BZ#105
24G0835-03	**Percent difference between primary and confirmation results exceeds 40% (P).**
	BZ#105
24G0835-05	**Lower value is used due to matrix interferences (LC).**
	BZ#105 , BZ#138 , BZ#170
24G0835-05	**Percent difference between primary and confirmation results exceeds 40% (P).**
	BZ#105 , BZ#138 , BZ#170
24G0835-07	**Lower value is used due to matrix interferences (LC).**
	BZ#105 , BZ#170 , BZ#180 , BZ#187
24G0835-07	**Percent difference between primary and confirmation results exceeds 40% (P).**
	BZ#105 , BZ#170 , BZ#180 , BZ#187

Classical Chemistry

24G0835-03	**Estimated value. Sample hold times were exceeded (H).**
	Eh (ORP)
24G0835-03	**Test performed from a previously opened container**
	Hexavalent Chromium

MADEP-EPH Extractable Petroleum Hydrocarbons

24G0835-01	**Present in Method Blank (B).**
	Phenanthrene
24G0835-03	**Present in Method Blank (B).**
	Phenanthrene
24G0835-05	**Present in Method Blank (B).**
	Phenanthrene
24G0835-07	**Present in Method Blank (B).**
	Phenanthrene

Semi-Volatile Organic Compounds

D4G0517-CCV1	**Analyte does not meet the Relative Response Factor (RRF) criteria in the calibration**
	2,4-Dinitrophenol (107% @ 40-160%)
D4G0517-CCV1	**Calibration required quadratic regression (Q).**
	2,4-Dinitrophenol (107% @ 40-160%), Pentachlorophenol (88% @ 40-160%)
D4G0517-CCV1	**Continuing Calibration %Diff/Drift is above control limit (CD+).**
	Di-n-octylphthalate (28% @ 20%)
D4G0517-TUN1	**Benzidine tailing factor >2.**
DG42407-BS1	**Blank Spike recovery is above upper control limit (B+).**
	Di-n-octylphthalate (152% @ 40-140%)

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0835

Total Metals

DG42411-BSD2 **Blank Spike recovery is below lower control limit (B-).**
Barium (72% @ 80-120%), Cadmium (68% @ 80-120%), Copper (71% @ 80-120%), Lead (76% @ 80-120%), Nickel (74% @ 80-120%), Selenium (74% @ 80-120%), Zinc (71% @ 80-120%)

Volatile Organics Low Level

24G0835-02 **Reported above the quantitation limit; Estimated value (E).**
cis-1,2-Dichloroethene , trans-1,2-Dichloroethene , Vinyl Chloride

24G0835-08 **Reported above the quantitation limit; Estimated value (E).**
Naphthalene

DG42526-BS1 **Blank Spike recovery is above upper control limit (B+).**
Isopropylbenzene (141% @ 70-130%)

DG42526-BSD1 **Blank Spike recovery is above upper control limit (B+).**
Isopropylbenzene (140% @ 70-130%)

DG42526-BSD1 **Relative percent difference for duplicate is outside of criteria (D+).**
Acetone (37% @ 20%)

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0835

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010D - ICP
6020B - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260D - VOA
8270E - SVOA
8270E SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 19-2.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0835

MassDEP Analytical Protocol Certification Form

MADEP RTN: _____

This form provides certification for the following data set: **24G0835-01 through 24G0835-12**

Matrices: ( ) Ground Water/Surface Water (x) Soil/Sediment ( ) Drinking Water ( ) Air ( ) Other:_____

CAM Protocol (check all that apply below):

(x) 8260 VOC CAM II A	(x) 7470/7471 Hg CAM III B	( ) MassDEP VPH (GC/PID/FID) CAM IV A	(x) 8082 PCB CAM V A	(x) 9014 Total Cyanide/PAC CAM VI A	( ) 6860 Perchlorate CAM VIII B
(x) 8270 SVOC CAM II B	( ) 7010 Metals CAM III C	( ) MassDEP VPH (GC/MS) CAM IV C	( ) 8081 Pesticides CAM V B	(x) 7196 Hex Cr CAM VI B	( ) MassDEP APH CAM IX A
(x) 6010 Metals CAM III A	( ) 6020 Metals CAM III D	(x) MassDEP EPH CAM IV B	( ) 8151 Herbicides CAM V C	( ) Explosives CAM VIII A	( ) TO-15 VOC CAM IX B

Affirmative responses to questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	Yes ( ) No (x)
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	Yes (x) No ( )
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	Yes (x) No ( )
D	Does the laboratory report comply with all the reporting requirements specified in the CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	Yes (x) No ( )
E	VPH, EPH, APH and TO-15 only: a. Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	Yes (x) No ( )
	b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	Yes ( ) No ( )
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	Yes (x) No ( )

Responses to Questions G, H and I below are required for '"Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocols(s)?	Yes ( ) No (x)*
	***Data User Note:** Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.*	
H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	Yes ( ) No (x)*
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	Yes ( ) No (x)*

All negative responses must be addressed in an attached laboratory narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature: _____ Date: August 28, 2024
Printed Name: Laurel Stoddard Position: Laboratory Director

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-883-0-2ft
Date Sampled: 07/22/24 08:30
Percent Solids: 49

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-01
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	IV / FV		Batch
Arsenic	**10.9** (2.02)	---	6010D	---	1	KJB	07/24/24 13:46	2	100	DG42411
Barium	**50.6** (2.02)	---	6010D	---	1	KJB	07/24/24 13:46	2	100	DG42411
Cadmium	ND (1.01)	---	6010D	---	1	KJB	07/24/24 13:46	2	100	DG42411
Chromium	**34.6** (2.02)	---	6010D	---	1	KJB	07/24/24 13:46	2	100	DG42411
Copper	**36.7** (5.06)	---	6010D	---	1	KJB	07/24/24 13:46	2	100	DG42411
Lead	**33.2** (10.1)	---	6010D	---	1	KJB	07/24/24 13:46	2	100	DG42411
Mercury	**0.100** (0.066)	---	7471B	---	1	AFV	07/24/24 18:12	0.61	40	DG42412
Nickel	**17.4** (2.02)	---	6010D	---	1	KJB	07/24/24 13:46	2	100	DG42411
Selenium	ND (10.1)	---	6010D	---	1	KJB	07/24/24 13:46	2	100	DG42411
Silver	ND (1.01)	---	6010D	---	1	KJB	07/24/24 13:46	2	100	DG42411
Zinc	**71.8** (5.06)	---	6010D	---	1	KJB	07/24/24 13:46	2	100	DG42411

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-883-0-2ft
Date Sampled: 07/22/24 08:30
Percent Solids: 49
Initial Volume: 19g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 7/24/24 9:00

Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.053)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
1,2,4-Trichlorobenzene	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
1,2-Dichlorobenzene	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
1,3-Dichlorobenzene	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
1,4-Dichlorobenzene	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
2,4,5-Trichlorophenol	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
2,4,6-Trichlorophenol	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
2,4-Dichlorophenol	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
2,4-Dimethylphenol	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
2,4-Dinitrophenol	ND (2.13)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
2,4-Dinitrotoluene	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
2,6-Dinitrotoluene	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
2-Chloronaphthalene	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
2-Chlorophenol	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
2-Methylnaphthalene	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
2-Methylphenol	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
2-Nitrophenol	ND (1.06)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
3,3´-Dichlorobenzidine	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
3+4-Methylphenol	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
4-Bromophenyl-phenylether	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
4-Chloroaniline	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
4-Nitrophenol	ND (2.13)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
Acenaphthene	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
Acenaphthylene	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
Acetophenone	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
Aniline	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
Anthracene	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-883-0-2ft
Date Sampled: 07/22/24 08:30
Percent Solids: 49
Initial Volume: 19g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 7/24/24 9:00

Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Azobenzene	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
Benzo(a)anthracene	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
Benzo(a)pyrene	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
Benzo(b)fluoranthene	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
Benzo(g,h,i)perylene	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
Benzo(k)fluoranthene	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
bis(2-Chloroethoxy)methane	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
bis(2-Chloroethyl)ether	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
bis(2-chloroisopropyl)Ether	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
bis(2-Ethylhexyl)phthalate	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
Butylbenzylphthalate	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
Chrysene	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
Dibenzo(a,h)Anthracene	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
Dibenzofuran	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
Diethylphthalate	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
Dimethylphthalate	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
Di-n-butylphthalate	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
Di-n-octylphthalate	ND (1.06)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
Fluoranthene	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
Fluorene	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
Hexachlorobenzene	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
Hexachlorobutadiene	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
Hexachloroethane	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
Indeno(1,2,3-cd)Pyrene	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
Isophorone	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
Naphthalene	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
Nitrobenzene	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-883-0-2ft
Date Sampled: 07/22/24 08:30
Percent Solids: 49
Initial Volume: 19g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 7/24/24 9:00

Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
N-Nitrosodimethylamine	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
Pentachlorophenol	ND (2.13)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
Phenanthrene	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
Phenol	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
Pyrene	**0.607** (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407
Pyridine	ND (0.532)	---	8270E	---	1	TJ	07/24/24 21:16	D4G0517	DG42407

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*71 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*61 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*77 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*75 %*		*30-130*
Surrogate: 2-Fluorophenol	*67 %*		*30-130*
Surrogate: Nitrobenzene-d5	*69 %*		*30-130*
Surrogate: Phenol-d6	*68 %*		*30-130*
Surrogate: p-Terphenyl-d14	*94 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-883-0-2ft
Date Sampled: 07/22/24 08:30
Percent Solids: 49
Initial Volume: 24.2g
Final Volume: 1ml
Extraction Method: 3510C

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-01
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 7/23/24 18:08

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (31.3)	---	MADEP-EPH	---	1	JDN	07/25/24 6:44	D4G0514	DG42305
C19-C36 Aliphatics1	ND (31.3)	---	MADEP-EPH	---	1	JDN	07/25/24 6:44	D4G0514	DG42305
C11-C22 Unadjusted Aromatics1	ND (31.3)	---	EPH8270	---	1	IBM	07/24/24 17:23	D4G0431	DG42305
C11-C22 Aromatics1,2	ND (31.6)	---	EPH8270	---		TJ	07/24/24 19:53	---	[CALC]
2-Methylnaphthalene	ND (0.017)	---	EPH8270SIM	---	1	TJ	07/24/24 19:53	D4G0510	DG42305
Acenaphthene	ND (0.017)	---	EPH8270SIM	---	1	TJ	07/24/24 19:53	D4G0510	DG42305
Naphthalene	ND (0.017)	---	EPH8270SIM	---	1	TJ	07/24/24 19:53	D4G0510	DG42305
Phenanthrene	**B 0.158** (0.017)	---	EPH8270SIM	---	1	TJ	07/24/24 19:53	D4G0510	DG42305
Acenaphthylene	ND (0.017)	---	EPH8270SIM	---	1	TJ	07/24/24 19:53	D4G0510	DG42305
Anthracene	**0.068** (0.017)	---	EPH8270SIM	---	1	TJ	07/24/24 19:53	D4G0510	DG42305
Benzo(a)anthracene	**0.129** (0.017)	---	EPH8270SIM	---	1	TJ	07/24/24 19:53	D4G0510	DG42305
Benzo(a)pyrene	**0.213** (0.017)	---	EPH8270SIM	---	1	TJ	07/24/24 19:53	D4G0510	DG42305
Benzo(b)fluoranthene	**0.072** (0.017)	---	EPH8270SIM	---	1	TJ	07/24/24 19:53	D4G0510	DG42305
Benzo(g,h,i)perylene	**0.143** (0.017)	---	EPH8270SIM	---	1	TJ	07/24/24 19:53	D4G0510	DG42305
Benzo(k)fluoranthene	**0.155** (0.017)	---	EPH8270SIM	---	1	TJ	07/24/24 19:53	D4G0510	DG42305
Chrysene	**0.116** (0.017)	---	EPH8270SIM	---	1	TJ	07/24/24 19:53	D4G0510	DG42305
Dibenzo(a,h)Anthracene	**0.054** (0.017)	---	EPH8270SIM	---	1	TJ	07/24/24 19:53	D4G0510	DG42305
Fluoranthene	**0.417** (0.017)	---	EPH8270SIM	---	1	TJ	07/24/24 19:53	D4G0510	DG42305
Fluorene	ND (0.017)	---	EPH8270SIM	---	1	TJ	07/24/24 19:53	D4G0510	DG42305
Indeno(1,2,3-cd)Pyrene	**0.103** (0.017)	---	EPH8270SIM	---	1	TJ	07/24/24 19:53	D4G0510	DG42305
Pyrene	**0.476** (0.017)	---	EPH8270SIM	---	1	TJ	07/24/24 19:53	D4G0510	DG42305

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*75 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*85 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*85 %*		*40-140*
Surrogate: O-Terphenyl	*78 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-883-0-2ft
Date Sampled: 07/22/24 08:30
Percent Solids: 49

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Conductivity	**WL 235** (5)	---	9050A	---	1	EAM	07/24/24 15:46	umhos/cm	DG42435
Corrosivity (pH)	**5.81** (N/A)	---	9045	---	1	JLK	07/23/24 19:21	S.U.	DG42330
Corrosivity (pH) Sample Temp	**20.8**	---	2550B	---	1	JLK	07/23/24 19:21	°C	DG42330
Flashpoint	**> 200** (N/A)	---	1010A	---	1	JLK	07/24/24 19:54	°F	DG42451
Reactive Cyanide	ND (2.0)	---	7.3.3.2	---	1	EAM	07/25/24 18:00	mg/kg	DG42545
Reactive Sulfide	ND (2.0)	---	7.3.4.1	---	1	EAM	07/25/24 18:00	mg/kg	DG42545
Sulfate	**WL** ND (100)	---	9038	---	1	JLK	07/25/24 15:51	mg/kg dry	DG42539
Sulfide	**WL** ND (1.0)	---	9030B	---	1	JLK	07/24/24 21:40	mg/kg dry	DG42442
Total Cyanide	ND (1.84)	---	9014	---	1	EEM	07/24/24 14:15	mg/kg dry	DG42420
Total Organic Carbon (Average)	**59000** (500)	---	LK	---	1	CCP	07/31/24 13:18	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-883-0-2ft
Date Sampled: 07/22/24 08:30
Percent Solids: 49
Initial Volume: 1g
Final Volume: 1g
Extraction Method: General Subbed Prep

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-01
Sample Matrix: Soil

Analyst: SUB
Prepared: 7/31/24 0:00

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Sulfur	**1980** (100)	---	6010	---	1	SUB	07/31/24 0:00	mg/kg	DH40223

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-883-0-2ft
Date Sampled: 07/22/24 08:30
Percent Solids: 49
Initial Volume: 30.1g
Final Volume: 2ml
Extraction Method: 3540C

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 7/24/24 12:09

8082 Polychlorinated Biphenyls (PCB) / Congeners

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
BZ#8	ND (0.00054)	---	8082A Cong	---	1	07/27/24 0:30	D4G0576	DG42401
BZ#18	ND (0.00054)	---	8082A Cong	---	1	07/27/24 0:30	D4G0576	DG42401
BZ#28	ND (0.00054)	---	8082A Cong	---	1	07/27/24 0:30	D4G0576	DG42401
BZ#44	ND (0.00054)	---	8082A Cong	---	1	07/27/24 0:30	D4G0576	DG42401
BZ#52	ND (0.00054)	---	8082A Cong	---	1	07/27/24 0:30	D4G0576	DG42401
BZ#66	ND (0.00054)	---	8082A Cong	---	1	07/27/24 0:30	D4G0576	DG42401
BZ#101	ND (0.00054)	---	8082A Cong	---	1	07/27/24 0:30	D4G0576	DG42401
BZ#105	ND (0.00054)	---	8082A Cong	---	1	07/27/24 0:30	D4G0576	DG42401
BZ#118	ND (0.00054)	---	8082A Cong	---	1	07/27/24 0:30	D4G0576	DG42401
BZ#128	ND (0.00054)	---	8082A Cong	---	1	07/27/24 0:30	D4G0576	DG42401
BZ#138	ND (0.00054)	---	8082A Cong	---	1	07/27/24 0:30	D4G0576	DG42401
BZ#153	ND (0.00054)	---	8082A Cong	---	1	07/27/24 0:30	D4G0576	DG42401
BZ#170	ND (0.00054)	---	8082A Cong	---	1	07/27/24 0:30	D4G0576	DG42401
BZ#180	ND (0.00054)	---	8082A Cong	---	1	07/27/24 0:30	D4G0576	DG42401
BZ#187	ND (0.00054)	---	8082A Cong	---	1	07/27/24 0:30	D4G0576	DG42401
BZ#195	ND (0.00054)	---	8082A Cong	---	1	07/27/24 0:30	D4G0576	DG42401
BZ#206	ND (0.00054)	---	8082A Cong	---	1	07/27/24 0:30	D4G0576	DG42401
BZ#209	ND (0.00054)	---	8082A Cong	---	1	07/27/24 0:30	D4G0576	DG42401

	%Recovery	Qualifier	Limits
Surrogate: Tetrachloro-m-xylene	*70 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-883-0.5ft
Date Sampled: 07/22/24 08:31
Percent Solids: 63
Initial Volume: 6.4g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 7/24/24 8:00

Volatile Organics Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
1,1,1-Trichloroethane	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
1,1,2,2-Tetrachloroethane	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
1,1,2-Trichloroethane	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
1,1-Dichloroethane	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
1,1-Dichloroethene	**0.0411** (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
1,1-Dichloropropene	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
1,2,3-Trichlorobenzene	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
1,2,3-Trichloropropane	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
1,2,4-Trichlorobenzene	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
1,2,4-Trimethylbenzene	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
1,2-Dibromo-3-Chloropropane	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
1,2-Dibromoethane	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
1,2-Dichlorobenzene	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
1,2-Dichloroethane	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
1,2-Dichloropropane	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
1,3,5-Trimethylbenzene	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
1,3-Dichlorobenzene	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
1,3-Dichloropropane	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
1,4-Dichlorobenzene	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
1,4-Dioxane	ND (0.123)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
2,2-Dichloropropane	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
2-Butanone	ND (0.0616)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
2-Chlorotoluene	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
2-Hexanone	ND (0.0616)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
4-Chlorotoluene	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
4-Isopropyltoluene	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-883-0.5ft
Date Sampled: 07/22/24 08:31
Percent Solids: 63
Initial Volume: 6.4g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 7/24/24 8:00

Volatile Organics Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
4-Methyl-2-Pentanone	ND (0.0616)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
Acetone	**0.0900** (0.0616)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
Benzene	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
Bromobenzene	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
Bromochloromethane	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
Bromodichloromethane	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
Bromoform	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
Bromomethane	ND (0.0123)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
Carbon Disulfide	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
Carbon Tetrachloride	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
Chlorobenzene	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
Chloroethane	ND (0.0123)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
Chloroform	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
Chloromethane	ND (0.0123)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
cis-1,2-Dichloroethene	**E 13.3** (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
cis-1,3-Dichloropropene	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
Dibromochloromethane	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
Dibromomethane	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
Dichlorodifluoromethane	ND (0.0123)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
Diethyl Ether	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
Di-isopropyl ether	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
Ethyl tertiary-butyl ether	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
Ethylbenzene	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
Hexachlorobutadiene	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
Isopropylbenzene	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
Methyl tert-Butyl Ether	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
Methylene Chloride	ND (0.0308)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-883-0.5ft
Date Sampled: 07/22/24 08:31
Percent Solids: 63
Initial Volume: 6.4g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 7/24/24 8:00

Volatile Organics Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
n-Butylbenzene	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
n-Propylbenzene	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
sec-Butylbenzene	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
Styrene	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
tert-Butylbenzene	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
Tertiary-amyl methyl ether	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
Tetrachloroethene	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
Tetrahydrofuran	ND (0.0246)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
Toluene	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
trans-1,2-Dichloroethene	**E 0.295** (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
trans-1,3-Dichloropropene	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
Trichloroethene	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
Trichlorofluoromethane	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
Vinyl Chloride	**E 7.46** (0.0123)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
Xylene O	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
Xylene P,M	ND (0.0123)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421
Xylenes (Total)	ND (0.0123)	---	8260D Low	---	1	MEK	07/24/24 13:32	D4G0503	DG42421

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*123 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*90 %*		*70-130*
Surrogate: Dibromofluoromethane	*114 %*		*70-130*
Surrogate: Toluene-d8	*102 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-883-0.5ft
Date Sampled: 07/22/24 08:31
Percent Solids: 63
Initial Volume: 13.1g
Final Volume: 15ml
Extraction Method: 5035

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD
Prepared: 7/26/24 8:00

Volatile Organics

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
1,1,1-Trichloroethane	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
1,1,2,2-Tetrachloroethane	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
1,1,2-Trichloroethane	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
1,1-Dichloroethane	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
1,1-Dichloroethene	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
1,1-Dichloropropene	ND (0.952)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
1,2,3-Trichlorobenzene	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
1,2,3-Trichloropropane	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
1,2,4-Trichlorobenzene	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
1,2,4-Trimethylbenzene	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
1,2-Dibromo-3-Chloropropane	ND (2.38)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
1,2-Dibromoethane	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
1,2-Dichlorobenzene	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
1,2-Dichloroethane	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
1,2-Dichloropropane	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
1,3,5-Trimethylbenzene	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
1,3-Dichlorobenzene	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
1,3-Dichloropropane	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
1,4-Dichlorobenzene	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
1,4-Dioxane - Screen	ND (47.6)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
2,2-Dichloropropane	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
2-Butanone	ND (2.38)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
2-Chlorotoluene	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
2-Hexanone	ND (2.38)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
4-Chlorotoluene	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
4-Isopropyltoluene	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-883-0.5ft
Date Sampled: 07/22/24 08:31
Percent Solids: 63
Initial Volume: 13.1g
Final Volume: 15ml
Extraction Method: 5035

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD
Prepared: 7/26/24 8:00

Volatile Organics

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
4-Methyl-2-Pentanone	ND (2.38)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
Acetone	ND (2.38)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
Benzene	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
Bromobenzene	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
Bromochloromethane	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
Bromodichloromethane	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
Bromoform	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
Bromomethane	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
Carbon Disulfide	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
Carbon Tetrachloride	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
Chlorobenzene	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
Chloroethane	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
Chloroform	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
Chloromethane	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
cis-1,2-Dichloroethene	**81.9** (4.76)	---	8260D	---	10	MD	07/29/24 12:38	D4G0578	DG42637
cis-1,3-Dichloropropene	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
Dibromochloromethane	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
Dibromomethane	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
Dichlorodifluoromethane	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
Diethyl Ether	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
Di-isopropyl ether	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
Ethyl tertiary-butyl ether	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
Ethylbenzene	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
Hexachlorobutadiene	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
Hexachloroethane	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
Isopropylbenzene	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
Methyl tert-Butyl Ether	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-883-0.5ft
Date Sampled: 07/22/24 08:31
Percent Solids: 63
Initial Volume: 13.1g
Final Volume: 15ml
Extraction Method: 5035

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD
Prepared: 7/26/24 8:00

Volatile Organics

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Methylene Chloride	ND (0.952)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
Naphthalene	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
n-Butylbenzene	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
n-Propylbenzene	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
sec-Butylbenzene	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
Styrene	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
tert-Butylbenzene	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
Tertiary-amyl methyl ether	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
Tetrachloroethene	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
Tetrahydrofuran	ND (2.38)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
Toluene	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
trans-1,2-Dichloroethene	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
trans-1,3-Dichloropropene	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
Trichloroethene	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
Trichlorofluoromethane	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
Vinyl Chloride	**13.2** (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
Xylene O	ND (0.476)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
Xylene P,M	ND (0.952)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637
Xylenes (Total)	ND (0.952)	---	8260D	---	1	MD	07/26/24 18:00	D4G0578	DG42637

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*103 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*104 %*		*70-130*
Surrogate: Dibromofluoromethane	*102 %*		*70-130*
Surrogate: Toluene-d8	*102 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-883-0.5ft
Date Sampled: 07/22/24 08:31
Percent Solids: 63
Initial Volume: 5ml
Final Volume: 5ml
Extraction Method: 5030B

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-02
Sample Matrix: Soil
Units: mg/L
Analyst: MD
Prepared: 8/26/24 8:00

Volatile TCLP Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Vinyl Chloride	ND (0.100)	---	1311/8260D	---	1	MD	08/26/24 14:54	D4H0525	DH42625

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*112 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*96 %*		*70-130*
Surrogate: Dibromofluoromethane	*101 %*		*70-130*
Surrogate: Toluene-d8	*100 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-883-0.5ft
Date Sampled: 07/22/24 08:31
Percent Solids: 63
Initial Volume: 25ml
Final Volume: 500ml
Extraction Method: 5030B TCLP

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-02
Sample Matrix: Soil
Units: °C
Analyst: MD
Prepared: 8/22/24 14:52

ZHE Extraction by 1311

Analyte	Results (MRL)	MDL	Method	TCLP Limit	DF	Analyst	Analyzed	Sequence	Batch
Temperature (Min C)	**21.5** (N/A)	---	1311	---	1	MD	08/23/24 7:48	---	DH42729
Temperature (Max C)	**22.0** (N/A)	---	1311	---	1	MD	08/23/24 7:48	---	DH42729
Temperature (Range)	**Temperature is within 23 +/-2 °C.** (N/A)								

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-877-0-2ft
Date Sampled: 07/22/24 12:13
Percent Solids: 64

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-03
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	IV / FV	Batch
Arsenic	**8.59** (1.53)	---	6010D	---	1	KJB	07/24/24 13:52	2.03 100	DG42411
Barium	**36.6** (1.53)	---	6010D	---	1	KJB	07/24/24 13:52	2.03 100	DG42411
Cadmium	**0.81** (0.77)	---	6010D	---	1	KJB	07/24/24 13:52	2.03 100	DG42411
Chromium	**62.7** (1.53)	---	6010D	---	1	KJB	07/24/24 13:52	2.03 100	DG42411
Copper	**35.6** (3.83)	---	6010D	---	1	KJB	07/24/24 13:52	2.03 100	DG42411
Lead	**43.3** (7.65)	---	6010D	---	1	KJB	07/24/24 13:52	2.03 100	DG42411
Mercury	**0.508** (0.045)	---	7471B	---	1	AFV	07/24/24 18:14	0.68 40	DG42412
Nickel	**10.1** (1.53)	---	6010D	---	1	KJB	07/24/24 13:52	2.03 100	DG42411
Selenium	ND (7.65)	---	6010D	---	1	KJB	07/24/24 13:52	2.03 100	DG42411
Silver	ND (0.77)	---	6010D	---	1	KJB	07/24/24 13:52	2.03 100	DG42411
Zinc	**96.9** (3.83)	---	6010D	---	1	KJB	07/24/24 13:52	2.03 100	DG42411

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-877-0-2ft
Date Sampled: 07/22/24 12:13
Percent Solids: 64

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-03
Sample Matrix: Soil
Units: mg/L

Extraction Method: 3005A TCLP

1311 TCLP Metals

Analyte	Results (MRL)	MDL	Method	TCLP Limit	DF	Analyst	Analyzed	IV / FV	Batch
Chromium	ND (0.02)	---	1311/6010D	5	1	KJB	08/07/24 14:53	50 50	DH40717

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-877-0-2ft
Date Sampled: 07/22/24 12:13
Percent Solids: 64
Initial Volume: 20.1g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 7/24/24 9:00

Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.039)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
1,2,4-Trichlorobenzene	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
1,2-Dichlorobenzene	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
1,3-Dichlorobenzene	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
1,4-Dichlorobenzene	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
2,4,5-Trichlorophenol	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
2,4,6-Trichlorophenol	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
2,4-Dichlorophenol	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
2,4-Dimethylphenol	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
2,4-Dinitrophenol	ND (1.55)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
2,4-Dinitrotoluene	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
2,6-Dinitrotoluene	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
2-Chloronaphthalene	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
2-Chlorophenol	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
2-Methylnaphthalene	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
2-Methylphenol	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
2-Nitrophenol	ND (0.773)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
3,3´-Dichlorobenzidine	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
3+4-Methylphenol	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
4-Bromophenyl-phenylether	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
4-Chloroaniline	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
4-Nitrophenol	ND (1.55)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
Acenaphthene	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
Acenaphthylene	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
Acetophenone	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
Aniline	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
Anthracene	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-877-0-2ft
Date Sampled: 07/22/24 12:13
Percent Solids: 64
Initial Volume: 20.1g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 7/24/24 9:00

Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Azobenzene	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
Benzo(a)anthracene	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
Benzo(a)pyrene	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
Benzo(b)fluoranthene	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
Benzo(g,h,i)perylene	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
Benzo(k)fluoranthene	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
bis(2-Chloroethoxy)methane	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
bis(2-Chloroethyl)ether	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
bis(2-chloroisopropyl)Ether	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
bis(2-Ethylhexyl)phthalate	**0.521** (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
Butylbenzylphthalate	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
Chrysene	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
Dibenzo(a,h)Anthracene	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
Dibenzofuran	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
Diethylphthalate	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
Dimethylphthalate	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
Di-n-butylphthalate	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
Di-n-octylphthalate	ND (0.773)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
Fluoranthene	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
Fluorene	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
Hexachlorobenzene	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
Hexachlorobutadiene	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
Hexachloroethane	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
Indeno(1,2,3-cd)Pyrene	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
Isophorone	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
Naphthalene	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
Nitrobenzene	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-877-0-2ft
Date Sampled: 07/22/24 12:13
Percent Solids: 64
Initial Volume: 20.1g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 7/24/24 9:00

Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
N-Nitrosodimethylamine	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
Pentachlorophenol	ND (1.55)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
Phenanthrene	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
Phenol	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
Pyrene	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407
Pyridine	ND (0.386)	---	8270E	---	1	TJ	07/24/24 21:46	D4G0517	DG42407

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*72 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*72 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*80 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*77 %*		*30-130*
Surrogate: 2-Fluorophenol	*71 %*		*30-130*
Surrogate: Nitrobenzene-d5	*70 %*		*30-130*
Surrogate: Phenol-d6	*75 %*		*30-130*
Surrogate: p-Terphenyl-d14	*94 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-877-0-2ft
Date Sampled: 07/22/24 12:13
Percent Solids: 64
Initial Volume: 24.8g
Final Volume: 1ml
Extraction Method: 3510C

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-03
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 7/23/24 18:08

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (23.5)	---	MADEP-EPH	---	1	JDN	07/25/24 7:19	D4G0514	DG42305
C19-C36 Aliphatics1	ND (23.5)	---	MADEP-EPH	---	1	JDN	07/25/24 7:19	D4G0514	DG42305
C11-C22 Unadjusted Aromatics1	ND (23.5)	---	EPH8270	---	1	IBM	07/24/24 17:59	D4G0431	DG42305
C11-C22 Aromatics1,2	ND (23.7)	---	EPH8270	---		TJ	07/24/24 20:14	---	[CALC]
2-Methylnaphthalene	ND (0.013)	---	EPH8270SIM	---	1	TJ	07/24/24 20:14	D4G0510	DG42305
Acenaphthene	ND (0.013)	---	EPH8270SIM	---	1	TJ	07/24/24 20:14	D4G0510	DG42305
Naphthalene	**0.023** (0.013)	---	EPH8270SIM	---	1	TJ	07/24/24 20:14	D4G0510	DG42305
Phenanthrene	**B 0.076** (0.013)	---	EPH8270SIM	---	1	TJ	07/24/24 20:14	D4G0510	DG42305
Acenaphthylene	**0.020** (0.013)	---	EPH8270SIM	---	1	TJ	07/24/24 20:14	D4G0510	DG42305
Anthracene	**0.028** (0.013)	---	EPH8270SIM	---	1	TJ	07/24/24 20:14	D4G0510	DG42305
Benzo(a)anthracene	**0.102** (0.013)	---	EPH8270SIM	---	1	TJ	07/24/24 20:14	D4G0510	DG42305
Benzo(a)pyrene	**0.140** (0.013)	---	EPH8270SIM	---	1	TJ	07/24/24 20:14	D4G0510	DG42305
Benzo(b)fluoranthene	**0.070** (0.013)	---	EPH8270SIM	---	1	TJ	07/24/24 20:14	D4G0510	DG42305
Benzo(g,h,i)perylene	**0.087** (0.013)	---	EPH8270SIM	---	1	TJ	07/24/24 20:14	D4G0510	DG42305
Benzo(k)fluoranthene	**0.109** (0.013)	---	EPH8270SIM	---	1	TJ	07/24/24 20:14	D4G0510	DG42305
Chrysene	**0.119** (0.013)	---	EPH8270SIM	---	1	TJ	07/24/24 20:14	D4G0510	DG42305
Dibenzo(a,h)Anthracene	**0.035** (0.013)	---	EPH8270SIM	---	1	TJ	07/24/24 20:14	D4G0510	DG42305
Fluoranthene	**0.154** (0.013)	---	EPH8270SIM	---	1	TJ	07/24/24 20:14	D4G0510	DG42305
Fluorene	ND (0.013)	---	EPH8270SIM	---	1	TJ	07/24/24 20:14	D4G0510	DG42305
Indeno(1,2,3-cd)Pyrene	**0.069** (0.013)	---	EPH8270SIM	---	1	TJ	07/24/24 20:14	D4G0510	DG42305
Pyrene	**0.201** (0.013)	---	EPH8270SIM	---	1	TJ	07/24/24 20:14	D4G0510	DG42305

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*70 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*85 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*85 %*		*40-140*
Surrogate: O-Terphenyl	*84 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-877-0-2ft
Date Sampled: 07/22/24 12:13
Percent Solids: 64

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Conductivity	**WL 100** (5)	---	9050A	---	1	EAM	07/24/24 15:46	umhos/cm	DG42435
Corrosivity (pH)	**6.92** (N/A)	---	9045	---	1	JLK	07/23/24 19:21	S.U.	DG42330
Corrosivity (pH) Sample Temp	**21.0**	---	2550B	---	1	JLK	07/23/24 19:21	°C	DG42330
Eh (ORP)	**H 410** (N/A)	---	2580	---	1	JLK	08/05/24 19:10	mv	DH40547
Flashpoint	**> 200** (N/A)	---	1010A	---	1	JLK	07/24/24 19:54	°F	DG42451
Hexavalent Chromium	**O** ND (0.7)	---	7196A	---	1	CCP	08/06/24 15:30	mg/kg dry	DH40640
Reactive Cyanide	ND (2.0)	---	7.3.3.2	---	1	EAM	07/25/24 18:00	mg/kg	DG42545
Reactive Sulfide	ND (2.0)	---	7.3.4.1	---	1	EAM	07/25/24 18:00	mg/kg	DG42545
Sulfate	**WL** ND (77)	---	9038	---	1	JLK	07/25/24 15:51	mg/kg dry	DG42539
Sulfide	**WL** ND (0.8)	---	9030B	---	1	JLK	07/24/24 21:40	mg/kg dry	DG42442
Total Cyanide	ND (1.41)	---	9014	---	1	EEM	07/24/24 14:15	mg/kg dry	DG42420
Total Organic Carbon (Average)	**31500** (500)	---	LK	---	1	CCP	07/31/24 13:35	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-877-0-2ft
Date Sampled: 07/22/24 12:13
Percent Solids: 64
Initial Volume: 1g
Final Volume: 1g
Extraction Method: General Subbed Prep

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-03
Sample Matrix: Soil

Analyst: SUB
Prepared: 7/31/24 0:00

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Sulfur	**2480** (100)	---	6010	---	1	SUB	07/31/24 0:00	mg/kg	DH40223

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-877-0-2ft
Date Sampled: 07/22/24 12:13
Percent Solids: 64

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-03
Sample Matrix: Soil
Units: °C

Extraction Method: 1311

TCLP Extraction by 1311 - Metals

Analyte	Results (MRL)	MDL	Method	TCLP Limit	DF	Analyst	Analyzed	IV / FV	Batch
Temperature (Min C)	**20.7** (N/A)	---	1311	---	1	RAP	08/07/24 8:10		DH40620
Temperature (Max C)	**21.8** (N/A)	---	1311	---	1	RAP	08/07/24 8:10		DH40620
Temperature (Range)	**Temperature is not within 23 +/-2 °C.** (N/A)								

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-877-0-2ft
Date Sampled: 07/22/24 12:13
Percent Solids: 64
Initial Volume: 30.4g
Final Volume: 2ml
Extraction Method: 3540C

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 7/24/24 12:09

8082 Polychlorinated Biphenyls (PCB) / Congeners

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
BZ#8	**0.00493** (0.00041)	---	8082A Cong	---	1	07/27/24 1:00	D4G0576	DG42401
BZ#18 [2C]	**0.0138** (0.00207)	---	8082A Cong	---	5	07/29/24 11:00	D4G0576	DG42401
BZ#28 [2C]	**0.0200** (0.00207)	---	8082A Cong	---	5	07/29/24 11:00	D4G0576	DG42401
BZ#44 [2C]	**0.00685** (0.00041)	---	8082A Cong	---	1	07/27/24 1:00	D4G0576	DG42401
BZ#52 [2C]	**0.00998** (0.00041)	---	8082A Cong	---	1	07/27/24 1:00	D4G0576	DG42401
BZ#66 [2C]	**0.00834** (0.00041)	---	8082A Cong	---	1	07/27/24 1:00	D4G0576	DG42401
BZ#101	**0.00712** (0.00041)	---	8082A Cong	---	1	07/27/24 1:00	D4G0576	DG42401
BZ#105	**P, LC 0.00105** (0.00041)	---	8082A Cong	---	1	07/27/24 1:00	D4G0576	DG42401
BZ#118	**0.00368** (0.00041)	---	8082A Cong	---	1	07/27/24 1:00	D4G0576	DG42401
BZ#128	**0.00078** (0.00041)	---	8082A Cong	---	1	07/27/24 1:00	D4G0576	DG42401
BZ#138 [2C]	**0.00361** (0.00041)	---	8082A Cong	---	1	07/27/24 1:00	D4G0576	DG42401
BZ#153	**0.00419** (0.00041)	---	8082A Cong	---	1	07/27/24 1:00	D4G0576	DG42401
BZ#170	**0.00081** (0.00041)	---	8082A Cong	---	1	07/27/24 1:00	D4G0576	DG42401
BZ#180	**0.00139** (0.00041)	---	8082A Cong	---	1	07/27/24 1:00	D4G0576	DG42401
BZ#187 [2C]	**0.00098** (0.00041)	---	8082A Cong	---	1	07/27/24 1:00	D4G0576	DG42401
BZ#195 [2C]	ND (0.00041)	---	8082A Cong	---	1	07/27/24 1:00	D4G0576	DG42401
BZ#206 [2C]	**0.00109** (0.00041)	---	8082A Cong	---	1	07/27/24 1:00	D4G0576	DG42401
BZ#209 [2C]	**0.00130** (0.00041)	---	8082A Cong	---	1	07/27/24 1:00	D4G0576	DG42401

	%Recovery	*Qualifier*	*Limits*
Surrogate: Tetrachloro-m-xylene [2C]	*60 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-877-0.5ft
Date Sampled: 07/22/24 12:12
Percent Solids: 56
Initial Volume: 7.5g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 7/25/24 8:00

Volatile Organics Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
1,1,1-Trichloroethane	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
1,1,2,2-Tetrachloroethane	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
1,1,2-Trichloroethane	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
1,1-Dichloroethane	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
1,1-Dichloroethene	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
1,1-Dichloropropene	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
1,2,3-Trichlorobenzene	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
1,2,3-Trichloropropane	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
1,2,4-Trichlorobenzene	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
1,2,4-Trimethylbenzene	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
1,2-Dibromo-3-Chloropropane	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
1,2-Dibromoethane	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
1,2-Dichlorobenzene	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
1,2-Dichloroethane	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
1,2-Dichloropropane	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
1,3,5-Trimethylbenzene	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
1,3-Dichlorobenzene	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
1,3-Dichloropropane	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
1,4-Dichlorobenzene	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
1,4-Dioxane	ND (0.119)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
2,2-Dichloropropane	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
2-Butanone	ND (0.0597)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
2-Chlorotoluene	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
2-Hexanone	ND (0.0597)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
4-Chlorotoluene	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
4-Isopropyltoluene	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-877-0.5ft
Date Sampled: 07/22/24 12:12
Percent Solids: 56
Initial Volume: 7.5g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 7/25/24 8:00

Volatile Organics Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
4-Methyl-2-Pentanone	ND (0.0597)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
Acetone	**0.0623** (0.0597)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
Benzene	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
Bromobenzene	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
Bromochloromethane	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
Bromodichloromethane	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
Bromoform	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
Bromomethane	ND (0.0119)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
Carbon Disulfide	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
Carbon Tetrachloride	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
Chlorobenzene	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
Chloroethane	ND (0.0119)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
Chloroform	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
Chloromethane	ND (0.0119)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
cis-1,2-Dichloroethene	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
cis-1,3-Dichloropropene	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
Dibromochloromethane	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
Dibromomethane	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
Dichlorodifluoromethane	ND (0.0119)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
Diethyl Ether	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
Di-isopropyl ether	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
Ethyl tertiary-butyl ether	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
Ethylbenzene	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
Hexachlorobutadiene	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
Isopropylbenzene	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
Methyl tert-Butyl Ether	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
Methylene Chloride	ND (0.0299)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-877-0.5ft
Date Sampled: 07/22/24 12:12
Percent Solids: 56
Initial Volume: 7.5g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 7/25/24 8:00

Volatile Organics Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
n-Butylbenzene	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
n-Propylbenzene	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
sec-Butylbenzene	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
Styrene	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
tert-Butylbenzene	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
Tertiary-amyl methyl ether	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
Tetrachloroethene	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
Tetrahydrofuran	ND (0.0239)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
Toluene	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
trans-1,2-Dichloroethene	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
trans-1,3-Dichloropropene	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
Trichloroethene	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
Trichlorofluoromethane	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
Vinyl Chloride	ND (0.0119)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
Xylene O	ND (0.0060)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
Xylene P,M	ND (0.0119)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526
Xylenes (Total)	ND (0.0119)	---	8260D Low	---	1	MEK	07/25/24 13:00	D4G0531	DG42526

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*99 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*95 %*		*70-130*
Surrogate: Dibromofluoromethane	*96 %*		*70-130*
Surrogate: Toluene-d8	*98 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-874-0-2ft
Date Sampled: 07/22/24 12:52
Percent Solids: 84

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-05
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	IV / FV	Batch
Arsenic	**6.61** (1.16)	---	6010D	---	1	KJB	07/24/24 13:55	2.06 100	DG42411
Barium	**13.5** (1.16)	---	6010D	---	1	KJB	07/24/24 13:55	2.06 100	DG42411
Cadmium	ND (0.58)	---	6010D	---	1	KJB	07/24/24 13:55	2.06 100	DG42411
Chromium	**14.4** (1.16)	---	6010D	---	1	KJB	07/24/24 13:55	2.06 100	DG42411
Copper	**11.0** (2.90)	---	6010D	---	1	KJB	07/24/24 13:55	2.06 100	DG42411
Lead	**17.4** (5.80)	---	6010D	---	1	KJB	07/24/24 13:55	2.06 100	DG42411
Mercury	**0.034** (0.033)	---	7471B	---	1	AFV	07/24/24 18:16	0.71 40	DG42412
Nickel	**9.46** (1.16)	---	6010D	---	1	KJB	07/24/24 13:55	2.06 100	DG42411
Selenium	ND (5.80)	---	6010D	---	1	KJB	07/24/24 13:55	2.06 100	DG42411
Silver	ND (0.58)	---	6010D	---	1	KJB	07/24/24 13:55	2.06 100	DG42411
Zinc	**36.3** (2.90)	---	6010D	---	1	KJB	07/24/24 13:55	2.06 100	DG42411

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-874-0-2ft
Date Sampled: 07/22/24 12:52
Percent Solids: 84
Initial Volume: 19.5g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 7/24/24 9:00

Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.031)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
1,2,4-Trichlorobenzene	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
1,2-Dichlorobenzene	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
1,3-Dichlorobenzene	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
1,4-Dichlorobenzene	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
2,4,5-Trichlorophenol	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
2,4,6-Trichlorophenol	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
2,4-Dichlorophenol	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
2,4-Dimethylphenol	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
2,4-Dinitrophenol	ND (1.23)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
2,4-Dinitrotoluene	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
2,6-Dinitrotoluene	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
2-Chloronaphthalene	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
2-Chlorophenol	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
2-Methylnaphthalene	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
2-Methylphenol	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
2-Nitrophenol	ND (0.613)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
3,3´-Dichlorobenzidine	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
3+4-Methylphenol	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
4-Bromophenyl-phenylether	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
4-Chloroaniline	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
4-Nitrophenol	ND (1.23)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
Acenaphthene	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
Acenaphthylene	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
Acetophenone	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
Aniline	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
Anthracene	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-874-0-2ft
Date Sampled: 07/22/24 12:52
Percent Solids: 84
Initial Volume: 19.5g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 7/24/24 9:00

Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Azobenzene	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
Benzo(a)anthracene	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
Benzo(a)pyrene	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
Benzo(b)fluoranthene	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
Benzo(g,h,i)perylene	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
Benzo(k)fluoranthene	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
bis(2-Chloroethoxy)methane	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
bis(2-Chloroethyl)ether	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
bis(2-chloroisopropyl)Ether	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
bis(2-Ethylhexyl)phthalate	**1.09** (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
Butylbenzylphthalate	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
Chrysene	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
Dibenzo(a,h)Anthracene	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
Dibenzofuran	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
Diethylphthalate	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
Dimethylphthalate	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
Di-n-butylphthalate	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
Di-n-octylphthalate	ND (0.613)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
Fluoranthene	**0.376** (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
Fluorene	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
Hexachlorobenzene	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
Hexachlorobutadiene	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
Hexachloroethane	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
Indeno(1,2,3-cd)Pyrene	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
Isophorone	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
Naphthalene	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
Nitrobenzene	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-874-0-2ft
Date Sampled: 07/22/24 12:52
Percent Solids: 84
Initial Volume: 19.5g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 7/24/24 9:00

Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
N-Nitrosodimethylamine	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
Pentachlorophenol	ND (1.23)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
Phenanthrene	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
Phenol	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
Pyrene	**0.397** (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407
Pyridine	ND (0.306)	---	8270E	---	1	TJ	07/24/24 22:17	D4G0517	DG42407

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*64 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*62 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*72 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*68 %*		*30-130*
Surrogate: 2-Fluorophenol	*66 %*		*30-130*
Surrogate: Nitrobenzene-d5	*59 %*		*30-130*
Surrogate: Phenol-d6	*63 %*		*30-130*
Surrogate: p-Terphenyl-d14	*90 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-874-0-2ft
Date Sampled: 07/22/24 12:52
Percent Solids: 84
Initial Volume: 24.3g
Final Volume: 1ml
Extraction Method: 3510C

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-05
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 7/23/24 18:08

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (18.4)	---	MADEP-EPH	---	1	JDN	07/25/24 7:53	D4G0514	DG42305
C19-C36 Aliphatics1	**22.9** (18.4)	---	MADEP-EPH	---	1	JDN	07/25/24 7:53	D4G0514	DG42305
C11-C22 Unadjusted Aromatics1	**21.9** (18.4)	---	EPH8270	---	1	IBM	07/24/24 19:46	D4G0431	DG42305
C11-C22 Aromatics1,2	**19.5** (18.6)	---	EPH8270	---		TJ	07/24/24 20:35	---	[CALC]
2-Methylnaphthalene	ND (0.010)	---	EPH8270SIM	---	1	TJ	07/24/24 20:35	D4G0510	DG42305
Acenaphthene	**0.041** (0.010)	---	EPH8270SIM	---	1	TJ	07/24/24 20:35	D4G0510	DG42305
Naphthalene	**0.018** (0.010)	---	EPH8270SIM	---	1	TJ	07/24/24 20:35	D4G0510	DG42305
Phenanthrene	**B 0.261** (0.010)	---	EPH8270SIM	---	1	TJ	07/24/24 20:35	D4G0510	DG42305
Acenaphthylene	**0.037** (0.010)	---	EPH8270SIM	---	1	TJ	07/24/24 20:35	D4G0510	DG42305
Anthracene	**0.078** (0.010)	---	EPH8270SIM	---	1	TJ	07/24/24 20:35	D4G0510	DG42305
Benzo(a)anthracene	**0.179** (0.010)	---	EPH8270SIM	---	1	TJ	07/24/24 20:35	D4G0510	DG42305
Benzo(a)pyrene	**0.160** (0.010)	---	EPH8270SIM	---	1	TJ	07/24/24 20:35	D4G0510	DG42305
Benzo(b)fluoranthene	**0.158** (0.010)	---	EPH8270SIM	---	1	TJ	07/24/24 20:35	D4G0510	DG42305
Benzo(g,h,i)perylene	**0.098** (0.010)	---	EPH8270SIM	---	1	TJ	07/24/24 20:35	D4G0510	DG42305
Benzo(k)fluoranthene	**0.141** (0.010)	---	EPH8270SIM	---	1	TJ	07/24/24 20:35	D4G0510	DG42305
Chrysene	**0.176** (0.010)	---	EPH8270SIM	---	1	TJ	07/24/24 20:35	D4G0510	DG42305
Dibenzo(a,h)Anthracene	**0.046** (0.010)	---	EPH8270SIM	---	1	TJ	07/24/24 20:35	D4G0510	DG42305
Fluoranthene	**0.542** (0.010)	---	EPH8270SIM	---	1	TJ	07/24/24 20:35	D4G0510	DG42305
Fluorene	**0.032** (0.010)	---	EPH8270SIM	---	1	TJ	07/24/24 20:35	D4G0510	DG42305
Indeno(1,2,3-cd)Pyrene	**0.087** (0.010)	---	EPH8270SIM	---	1	TJ	07/24/24 20:35	D4G0510	DG42305
Pyrene	**0.370** (0.010)	---	EPH8270SIM	---	1	TJ	07/24/24 20:35	D4G0510	DG42305

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*63 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*89 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*87 %*		*40-140*
Surrogate: O-Terphenyl	*80 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-874-0-2ft
Date Sampled: 07/22/24 12:52
Percent Solids: 84

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-05
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Conductivity	**WL 91** (5)	---	9050A	---	1	EAM	07/24/24 15:46	umhos/cm	DG42435
Corrosivity (pH)	**6.64** (N/A)	---	9045	---	1	JLK	07/23/24 19:21	S.U.	DG42330
Corrosivity (pH) Sample Temp	**21.0**	---	2550B	---	1	JLK	07/23/24 19:21	°C	DG42330
Flashpoint	**> 200** (N/A)	---	1010A	---	1	JLK	07/24/24 19:54	°F	DG42451
Reactive Cyanide	ND (2.0)	---	7.3.3.2	---	1	EAM	07/25/24 18:00	mg/kg	DG42545
Reactive Sulfide	ND (2.0)	---	7.3.4.1	---	1	EAM	07/25/24 18:00	mg/kg	DG42545
Sulfate	**WL** ND (60)	---	9038	---	1	JLK	07/25/24 15:51	mg/kg dry	DG42539
Sulfide	**WL** ND (0.6)	---	9030B	---	1	JLK	07/24/24 21:40	mg/kg dry	DG42442
Total Cyanide	ND (1.09)	---	9014	---	1	EEM	07/24/24 14:15	mg/kg dry	DG42420
Total Organic Carbon (Average)	**10000** (500)	---	LK	---	1	CCP	07/31/24 13:51	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-874-0-2ft
Date Sampled: 07/22/24 12:52
Percent Solids: 84
Initial Volume: 1g
Final Volume: 1g
Extraction Method: General Subbed Prep

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-05
Sample Matrix: Soil

Analyst: SUB
Prepared: 7/31/24 0:00

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Sulfur	**795** (100)	---	6010	---	1	SUB	07/31/24 0:00	mg/kg	DH40223

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-874-0-2ft
Date Sampled: 07/22/24 12:52
Percent Solids: 84
Initial Volume: 30.2g
Final Volume: 2ml
Extraction Method: 3540C

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 7/24/24 12:09

8082 Polychlorinated Biphenyls (PCB) / Congeners

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
BZ#8 [2C]	ND (0.00032)	---	8082A Cong	---	1	07/27/24 1:31	D4G0576	DG42401
BZ#18 [2C]	**0.00045** (0.00032)	---	8082A Cong	---	1	07/27/24 1:31	D4G0576	DG42401
BZ#28 [2C]	**0.00055** (0.00032)	---	8082A Cong	---	1	07/27/24 1:31	D4G0576	DG42401
BZ#44	**0.00057** (0.00032)	---	8082A Cong	---	1	07/27/24 1:31	D4G0576	DG42401
BZ#52	**0.00114** (0.00032)	---	8082A Cong	---	1	07/27/24 1:31	D4G0576	DG42401
BZ#66	ND (0.00032)	---	8082A Cong	---	1	07/27/24 1:31	D4G0576	DG42401
BZ#101	**0.00163** (0.00032)	---	8082A Cong	---	1	07/27/24 1:31	D4G0576	DG42401
BZ#105	**P, LC 0.00057** (0.00032)	---	8082A Cong	---	1	07/27/24 1:31	D4G0576	DG42401
BZ#118 [2C]	**0.00111** (0.00032)	---	8082A Cong	---	1	07/27/24 1:31	D4G0576	DG42401
BZ#128	ND (0.00032)	---	8082A Cong	---	1	07/27/24 1:31	D4G0576	DG42401
BZ#138	**P, LC 0.00161** (0.00032)	---	8082A Cong	---	1	07/27/24 1:31	D4G0576	DG42401
BZ#153	**0.00225** (0.00032)	---	8082A Cong	---	1	07/27/24 1:31	D4G0576	DG42401
BZ#170	**P, LC 0.00113** (0.00032)	---	8082A Cong	---	1	07/27/24 1:31	D4G0576	DG42401
BZ#180 [2C]	**0.00249** (0.00032)	---	8082A Cong	---	1	07/27/24 1:31	D4G0576	DG42401
BZ#187 [2C]	**0.00147** (0.00032)	---	8082A Cong	---	1	07/27/24 1:31	D4G0576	DG42401
BZ#195	**0.00041** (0.00032)	---	8082A Cong	---	1	07/27/24 1:31	D4G0576	DG42401
BZ#206 [2C]	**0.00058** (0.00032)	---	8082A Cong	---	1	07/27/24 1:31	D4G0576	DG42401
BZ#209 [2C]	ND (0.00032)	---	8082A Cong	---	1	07/27/24 1:31	D4G0576	DG42401

	%Recovery	*Qualifier*	*Limits*
Surrogate: Tetrachloro-m-xylene [2C]	*67 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-874-0.5ft
Date Sampled: 07/22/24 12:53
Percent Solids: 85
Initial Volume: 8.9g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 7/24/24 8:00

Volatile Organics Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
1,1,1-Trichloroethane	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
1,1,2,2-Tetrachloroethane	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
1,1,2-Trichloroethane	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
1,1-Dichloroethane	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
1,1-Dichloroethene	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
1,1-Dichloropropene	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
1,2,3-Trichlorobenzene	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
1,2,3-Trichloropropane	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
1,2,4-Trichlorobenzene	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
1,2,4-Trimethylbenzene	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
1,2-Dibromo-3-Chloropropane	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
1,2-Dibromoethane	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
1,2-Dichlorobenzene	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
1,2-Dichloroethane	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
1,2-Dichloropropane	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
1,3,5-Trimethylbenzene	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
1,3-Dichlorobenzene	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
1,3-Dichloropropane	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
1,4-Dichlorobenzene	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
1,4-Dioxane	ND (0.0663)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
2,2-Dichloropropane	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
2-Butanone	ND (0.0331)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
2-Chlorotoluene	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
2-Hexanone	ND (0.0331)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
4-Chlorotoluene	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
4-Isopropyltoluene	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-874-0.5ft
Date Sampled: 07/22/24 12:53
Percent Solids: 85
Initial Volume: 8.9g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 7/24/24 8:00

Volatile Organics Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
4-Methyl-2-Pentanone	ND (0.0331)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
Acetone	**0.0688** (0.0331)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
Benzene	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
Bromobenzene	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
Bromochloromethane	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
Bromodichloromethane	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
Bromoform	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
Bromomethane	ND (0.0066)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
Carbon Disulfide	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
Carbon Tetrachloride	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
Chlorobenzene	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
Chloroethane	ND (0.0066)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
Chloroform	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
Chloromethane	ND (0.0066)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
cis-1,2-Dichloroethene	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
cis-1,3-Dichloropropene	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
Dibromochloromethane	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
Dibromomethane	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
Dichlorodifluoromethane	ND (0.0066)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
Diethyl Ether	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
Di-isopropyl ether	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
Ethyl tertiary-butyl ether	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
Ethylbenzene	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
Hexachlorobutadiene	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
Isopropylbenzene	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
Methyl tert-Butyl Ether	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
Methylene Chloride	ND (0.0166)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-874-0.5ft
Date Sampled: 07/22/24 12:53
Percent Solids: 85
Initial Volume: 8.9g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 7/24/24 8:00

Volatile Organics Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
n-Butylbenzene	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
n-Propylbenzene	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
sec-Butylbenzene	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
Styrene	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
tert-Butylbenzene	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
Tertiary-amyl methyl ether	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
Tetrachloroethene	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
Tetrahydrofuran	ND (0.0133)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
Toluene	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
trans-1,2-Dichloroethene	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
trans-1,3-Dichloropropene	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
Trichloroethene	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
Trichlorofluoromethane	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
Vinyl Chloride	ND (0.0066)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
Xylene O	ND (0.0033)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
Xylene P,M	ND (0.0066)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421
Xylenes (Total)	ND (0.0066)	---	8260D Low	---	1	MEK	07/24/24 14:22	D4G0503	DG42421

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*119 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*98 %*		*70-130*
Surrogate: Dibromofluoromethane	*110 %*		*70-130*
Surrogate: Toluene-d8	*97 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-884-0-2ft
Date Sampled: 07/22/24 15:40
Percent Solids: 65

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-07
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	IV / FV	Batch
Arsenic	**12.2** (1.35)	---	6010D	---	1	KJB	07/24/24 13:57	2.3 100	DG42411
Barium	**44.8** (1.35)	---	6010D	---	1	KJB	07/24/24 13:57	2.3 100	DG42411
Cadmium	ND (0.67)	---	6010D	---	1	KJB	07/24/24 13:57	2.3 100	DG42411
Chromium	**48.5** (1.35)	---	6010D	---	1	KJB	07/24/24 13:57	2.3 100	DG42411
Copper	**38.5** (3.37)	---	6010D	---	1	KJB	07/24/24 13:57	2.3 100	DG42411
Lead	**70.5** (6.73)	---	6010D	---	1	KJB	07/24/24 13:57	2.3 100	DG42411
Mercury	**0.316** (0.050)	---	7471B	---	1	AFV	07/24/24 18:18	0.61 40	DG42412
Nickel	**14.5** (1.35)	---	6010D	---	1	KJB	07/24/24 13:57	2.3 100	DG42411
Selenium	ND (6.73)	---	6010D	---	1	KJB	07/24/24 13:57	2.3 100	DG42411
Silver	ND (0.67)	---	6010D	---	1	KJB	07/24/24 13:57	2.3 100	DG42411
Zinc	**81.5** (3.37)	---	6010D	---	1	KJB	07/24/24 13:57	2.3 100	DG42411

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-884-0-2ft
Date Sampled: 07/22/24 15:40
Percent Solids: 65
Initial Volume: 20.1g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-07
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 7/24/24 9:00

Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.039)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
1,2,4-Trichlorobenzene	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
1,2-Dichlorobenzene	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
1,3-Dichlorobenzene	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
1,4-Dichlorobenzene	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
2,4,5-Trichlorophenol	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
2,4,6-Trichlorophenol	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
2,4-Dichlorophenol	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
2,4-Dimethylphenol	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
2,4-Dinitrophenol	ND (1.54)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
2,4-Dinitrotoluene	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
2,6-Dinitrotoluene	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
2-Chloronaphthalene	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
2-Chlorophenol	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
2-Methylnaphthalene	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
2-Methylphenol	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
2-Nitrophenol	ND (0.770)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
3,3′-Dichlorobenzidine	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
3+4-Methylphenol	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
4-Bromophenyl-phenylether	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
4-Chloroaniline	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
4-Nitrophenol	ND (1.54)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
Acenaphthene	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
Acenaphthylene	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
Acetophenone	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
Aniline	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
Anthracene	**0.492** (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-884-0-2ft
Date Sampled: 07/22/24 15:40
Percent Solids: 65
Initial Volume: 20.1g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-07
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 7/24/24 9:00

Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Azobenzene	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
Benzo(a)anthracene	**0.670** (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
Benzo(a)pyrene	**0.612** (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
Benzo(b)fluoranthene	**0.502** (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
Benzo(g,h,i)perylene	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
Benzo(k)fluoranthene	**0.480** (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
bis(2-Chloroethoxy)methane	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
bis(2-Chloroethyl)ether	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
bis(2-chloroisopropyl)Ether	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
bis(2-Ethylhexyl)phthalate	**0.494** (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
Butylbenzylphthalate	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
Chrysene	**0.635** (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
Dibenzo(a,h)Anthracene	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
Dibenzofuran	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
Diethylphthalate	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
Dimethylphthalate	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
Di-n-butylphthalate	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
Di-n-octylphthalate	ND (0.770)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
Fluoranthene	**1.33** (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
Fluorene	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
Hexachlorobenzene	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
Hexachlorobutadiene	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
Hexachloroethane	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
Indeno(1,2,3-cd)Pyrene	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
Isophorone	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
Naphthalene	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
Nitrobenzene	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-884-0-2ft
Date Sampled: 07/22/24 15:40
Percent Solids: 65
Initial Volume: 20.1g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-07
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 7/24/24 9:00

Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
N-Nitrosodimethylamine	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
Pentachlorophenol	ND (1.54)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
Phenanthrene	**1.14** (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
Phenol	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
Pyrene	**1.53** (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407
Pyridine	ND (0.385)	---	8270E	---	1	TJ	07/24/24 22:47	D4G0517	DG42407

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*79 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*74 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*82 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*81 %*		*30-130*
Surrogate: 2-Fluorophenol	*78 %*		*30-130*
Surrogate: Nitrobenzene-d5	*76 %*		*30-130*
Surrogate: Phenol-d6	*77 %*		*30-130*
Surrogate: p-Terphenyl-d14	*106 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-884-0-2ft
Date Sampled: 07/22/24 15:40
Percent Solids: 65
Initial Volume: 25.3g
Final Volume: 1ml
Extraction Method: 3510C

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-07
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 7/23/24 18:08

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (23.0)	---	MADEP-EPH	---	1	JDN	07/25/24 7:53	D4G0516	DG42305
C19-C36 Aliphatics1	ND (23.0)	---	MADEP-EPH	---	1	JDN	07/25/24 7:53	D4G0516	DG42305
C11-C22 Unadjusted Aromatics1	ND (23.0)	---	EPH8270	---	1	IBM	07/24/24 20:22	D4G0431	DG42305
C11-C22 Aromatics1,2	ND (23.2)	---	EPH8270	---		TJ	07/24/24 20:55	---	[CALC]
2-Methylnaphthalene	**0.041** (0.012)	---	EPH8270SIM	---	1	TJ	07/24/24 20:55	D4G0510	DG42305
Acenaphthene	**0.133** (0.012)	---	EPH8270SIM	---	1	TJ	07/24/24 20:55	D4G0510	DG42305
Naphthalene	**0.111** (0.012)	---	EPH8270SIM	---	1	TJ	07/24/24 20:55	D4G0510	DG42305
Phenanthrene	**B 0.433** (0.012)	---	EPH8270SIM	---	1	TJ	07/24/24 20:55	D4G0510	DG42305
Acenaphthylene	**0.033** (0.012)	---	EPH8270SIM	---	1	TJ	07/24/24 20:55	D4G0510	DG42305
Anthracene	**0.160** (0.012)	---	EPH8270SIM	---	1	TJ	07/24/24 20:55	D4G0510	DG42305
Benzo(a)anthracene	**0.187** (0.012)	---	EPH8270SIM	---	1	TJ	07/24/24 20:55	D4G0510	DG42305
Benzo(a)pyrene	**0.221** (0.012)	---	EPH8270SIM	---	1	TJ	07/24/24 20:55	D4G0510	DG42305
Benzo(b)fluoranthene	**0.154** (0.012)	---	EPH8270SIM	---	1	TJ	07/24/24 20:55	D4G0510	DG42305
Benzo(g,h,i)perylene	**0.131** (0.012)	---	EPH8270SIM	---	1	TJ	07/24/24 20:55	D4G0510	DG42305
Benzo(k)fluoranthene	**0.175** (0.012)	---	EPH8270SIM	---	1	TJ	07/24/24 20:55	D4G0510	DG42305
Chrysene	**0.199** (0.012)	---	EPH8270SIM	---	1	TJ	07/24/24 20:55	D4G0510	DG42305
Dibenzo(a,h)Anthracene	**0.055** (0.012)	---	EPH8270SIM	---	1	TJ	07/24/24 20:55	D4G0510	DG42305
Fluoranthene	**0.474** (0.012)	---	EPH8270SIM	---	1	TJ	07/24/24 20:55	D4G0510	DG42305
Fluorene	**0.067** (0.012)	---	EPH8270SIM	---	1	TJ	07/24/24 20:55	D4G0510	DG42305
Indeno(1,2,3-cd)Pyrene	**0.108** (0.012)	---	EPH8270SIM	---	1	TJ	07/24/24 20:55	D4G0510	DG42305
Pyrene	**0.436** (0.012)	---	EPH8270SIM	---	1	TJ	07/24/24 20:55	D4G0510	DG42305

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*63 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*84 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*82 %*		*40-140*
Surrogate: O-Terphenyl	*76 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-884-0-2ft
Date Sampled: 07/22/24 15:40
Percent Solids: 65

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-07
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Conductivity	**WL 98** (5)	---	9050A	---	1	EAM	07/24/24 15:46	umhos/cm	DG42435
Corrosivity (pH)	**6.88** (N/A)	---	9045	---	1	JLK	07/23/24 19:21	S.U.	DG42330
Corrosivity (pH) Sample Temp	**21.0**	---	2550B	---	1	JLK	07/23/24 19:21	°C	DG42330
Flashpoint	**> 200** (N/A)	---	1010A	---	1	JLK	07/24/24 19:54	°F	DG42451
Reactive Cyanide	ND (2.0)	---	7.3.3.2	---	1	EAM	07/25/24 18:00	mg/kg	DG42545
Reactive Sulfide	ND (2.0)	---	7.3.4.1	---	1	EAM	07/25/24 18:00	mg/kg	DG42545
Sulfate	**WL** ND (78)	---	9038	---	1	JLK	07/25/24 15:51	mg/kg dry	DG42539
Sulfide	**WL** ND (0.8)	---	9030B	---	1	JLK	07/24/24 21:40	mg/kg dry	DG42442
Total Cyanide	ND (1.55)	---	9014	---	1	EEM	07/24/24 14:15	mg/kg dry	DG42420
Total Organic Carbon (Average)	**22300** (500)	---	LK	---	1	CCP	07/31/24 17:58	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-884-0-2ft
Date Sampled: 07/22/24 15:40
Percent Solids: 65
Initial Volume: 1g
Final Volume: 1g
Extraction Method: General Subbed Prep

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-07
Sample Matrix: Soil

Analyst: SUB
Prepared: 7/31/24 0:00

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Sulfur	**1710** (100)	---	6010	---	1	SUB	07/31/24 0:00	mg/kg	DH40223

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-884-0-2ft
Date Sampled: 07/22/24 15:40
Percent Solids: 65
Initial Volume: 30.6g
Final Volume: 2ml
Extraction Method: 3540C

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-07
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 7/24/24 12:09

8082 Polychlorinated Biphenyls (PCB) / Congeners

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
BZ#8 [2C]	**0.00233** (0.00041)	---	8082A Cong	---	1	07/27/24 2:01	D4G0576	DG42401
BZ#18	ND (0.00041)	---	8082A Cong	---	1	07/27/24 2:01	D4G0576	DG42401
BZ#28 [2C]	**0.00401** (0.00041)	---	8082A Cong	---	1	07/27/24 2:01	D4G0576	DG42401
BZ#44 [2C]	**0.00492** (0.00041)	---	8082A Cong	---	1	07/27/24 2:01	D4G0576	DG42401
BZ#52 [2C]	**0.0115** (0.00082)	---	8082A Cong	---	2	07/29/24 11:31	D4G0576	DG42401
BZ#66 [2C]	**0.00415** (0.00041)	---	8082A Cong	---	1	07/27/24 2:01	D4G0576	DG42401
BZ#101	**0.00982** (0.00041)	---	8082A Cong	---	1	07/27/24 2:01	D4G0576	DG42401
BZ#105	**P, LC 0.00261** (0.00041)	---	8082A Cong	---	1	07/27/24 2:01	D4G0576	DG42401
BZ#118	**0.00565** (0.00041)	---	8082A Cong	---	1	07/27/24 2:01	D4G0576	DG42401
BZ#128	**0.00139** (0.00041)	---	8082A Cong	---	1	07/27/24 2:01	D4G0576	DG42401
BZ#138 [2C]	**0.00679** (0.00041)	---	8082A Cong	---	1	07/27/24 2:01	D4G0576	DG42401
BZ#153	**0.00576** (0.00041)	---	8082A Cong	---	1	07/27/24 2:01	D4G0576	DG42401
BZ#170	**P, LC 0.00114** (0.00041)	---	8082A Cong	---	1	07/27/24 2:01	D4G0576	DG42401
BZ#180	**P, LC 0.00209** (0.00041)	---	8082A Cong	---	1	07/27/24 2:01	D4G0576	DG42401
BZ#187	**P, LC 0.00212** (0.00041)	---	8082A Cong	---	1	07/27/24 2:01	D4G0576	DG42401
BZ#195	ND (0.00041)	---	8082A Cong	---	1	07/27/24 2:01	D4G0576	DG42401
BZ#206	ND (0.00041)	---	8082A Cong	---	1	07/27/24 2:01	D4G0576	DG42401
BZ#209	ND (0.00041)	---	8082A Cong	---	1	07/27/24 2:01	D4G0576	DG42401

	%Recovery	*Qualifier*	*Limits*
Surrogate: Tetrachloro-m-xylene [2C]	*56 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-884-0.5ft
Date Sampled: 07/22/24 15:51
Percent Solids: 80
Initial Volume: 10.1g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-08
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 7/24/24 8:00

Volatile Organics Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
1,1,1-Trichloroethane	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
1,1,2,2-Tetrachloroethane	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
1,1,2-Trichloroethane	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
1,1-Dichloroethane	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
1,1-Dichloroethene	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
1,1-Dichloropropene	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
1,2,3-Trichlorobenzene	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
1,2,3-Trichloropropane	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
1,2,4-Trichlorobenzene	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
1,2,4-Trimethylbenzene	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
1,2-Dibromo-3-Chloropropane	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
1,2-Dibromoethane	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
1,2-Dichlorobenzene	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
1,2-Dichloroethane	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
1,2-Dichloropropane	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
1,3,5-Trimethylbenzene	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
1,3-Dichlorobenzene	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
1,3-Dichloropropane	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
1,4-Dichlorobenzene	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
1,4-Dioxane	ND (0.0619)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
2,2-Dichloropropane	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
2-Butanone	ND (0.0309)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
2-Chlorotoluene	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
2-Hexanone	ND (0.0309)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
4-Chlorotoluene	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
4-Isopropyltoluene	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-884-0.5ft
Date Sampled: 07/22/24 15:51
Percent Solids: 80
Initial Volume: 10.1g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-08
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 7/24/24 8:00

Volatile Organics Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
4-Methyl-2-Pentanone	ND (0.0309)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
Acetone	**0.0675** (0.0309)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
Benzene	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
Bromobenzene	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
Bromochloromethane	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
Bromodichloromethane	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
Bromoform	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
Bromomethane	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
Carbon Disulfide	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
Carbon Tetrachloride	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
Chlorobenzene	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
Chloroethane	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
Chloroform	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
Chloromethane	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
cis-1,2-Dichloroethene	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
cis-1,3-Dichloropropene	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
Dibromochloromethane	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
Dibromomethane	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
Dichlorodifluoromethane	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
Diethyl Ether	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
Di-isopropyl ether	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
Ethyl tertiary-butyl ether	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
Ethylbenzene	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
Hexachlorobutadiene	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
Isopropylbenzene	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
Methyl tert-Butyl Ether	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
Methylene Chloride	ND (0.0155)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-884-0.5ft
Date Sampled: 07/22/24 15:51
Percent Solids: 80
Initial Volume: 10.1g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-08
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 7/24/24 8:00

Volatile Organics Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	**E 0.190** (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
n-Butylbenzene	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
n-Propylbenzene	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
sec-Butylbenzene	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
Styrene	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
tert-Butylbenzene	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
Tertiary-amyl methyl ether	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
Tetrachloroethene	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
Tetrahydrofuran	ND (0.0124)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
Toluene	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
trans-1,2-Dichloroethene	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
trans-1,3-Dichloropropene	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
Trichloroethene	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
Trichlorofluoromethane	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
Vinyl Chloride	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
Xylene O	ND (0.0031)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
Xylene P,M	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421
Xylenes (Total)	ND (0.0062)	---	8260D Low	---	1	MEK	07/24/24 14:48	D4G0503	DG42421

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*117 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*95 %*		*70-130*
Surrogate: Dibromofluoromethane	*112 %*		*70-130*
Surrogate: Toluene-d8	*99 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-884-0.5ft
Date Sampled: 07/22/24 15:51
Percent Solids: 80
Initial Volume: 22.5g
Final Volume: 15ml
Extraction Method: 5035

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-08
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD
Prepared: 7/26/24 8:00

Volatile Organics

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
1,1,1-Trichloroethane	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
1,1,2,2-Tetrachloroethane	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
1,1,2-Trichloroethane	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
1,1-Dichloroethane	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
1,1-Dichloroethene	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
1,1-Dichloropropene	ND (0.433)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
1,2,3-Trichlorobenzene	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
1,2,3-Trichloropropane	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
1,2,4-Trichlorobenzene	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
1,2,4-Trimethylbenzene	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
1,2-Dibromo-3-Chloropropane	ND (1.08)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
1,2-Dibromoethane	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
1,2-Dichlorobenzene	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
1,2-Dichloroethane	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
1,2-Dichloropropane	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
1,3,5-Trimethylbenzene	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
1,3-Dichlorobenzene	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
1,3-Dichloropropane	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
1,4-Dichlorobenzene	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
1,4-Dioxane - Screen	ND (21.7)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
2,2-Dichloropropane	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
2-Butanone	ND (1.08)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
2-Chlorotoluene	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
2-Hexanone	ND (1.08)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
4-Chlorotoluene	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
4-Isopropyltoluene	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-884-0.5ft
Date Sampled: 07/22/24 15:51
Percent Solids: 80
Initial Volume: 22.5g
Final Volume: 15ml
Extraction Method: 5035

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-08
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD
Prepared: 7/26/24 8:00

Volatile Organics

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
4-Methyl-2-Pentanone	ND (1.08)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
Acetone	ND (1.08)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
Benzene	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
Bromobenzene	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
Bromochloromethane	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
Bromodichloromethane	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
Bromoform	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
Bromomethane	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
Carbon Disulfide	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
Carbon Tetrachloride	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
Chlorobenzene	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
Chloroethane	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
Chloroform	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
Chloromethane	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
cis-1,2-Dichloroethene	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
cis-1,3-Dichloropropene	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
Dibromochloromethane	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
Dibromomethane	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
Dichlorodifluoromethane	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
Diethyl Ether	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
Di-isopropyl ether	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
Ethyl tertiary-butyl ether	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
Ethylbenzene	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
Hexachlorobutadiene	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
Hexachloroethane	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
Isopropylbenzene	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
Methyl tert-Butyl Ether	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-884-0.5ft
Date Sampled: 07/22/24 15:51
Percent Solids: 80
Initial Volume: 22.5g
Final Volume: 15ml
Extraction Method: 5035

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-08
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD
Prepared: 7/26/24 8:00

Volatile Organics

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Methylene Chloride	ND (0.433)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
Naphthalene	**0.438** (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
n-Butylbenzene	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
n-Propylbenzene	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
sec-Butylbenzene	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
Styrene	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
tert-Butylbenzene	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
Tertiary-amyl methyl ether	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
Tetrachloroethene	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
Tetrahydrofuran	ND (1.08)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
Toluene	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
trans-1,2-Dichloroethene	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
trans-1,3-Dichloropropene	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
Trichloroethene	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
Trichlorofluoromethane	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
Vinyl Chloride	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
Xylene O	ND (0.217)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
Xylene P,M	ND (0.433)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637
Xylenes (Total)	ND (0.433)	---	8260D	---	1	MD	07/26/24 17:10	D4G0578	DG42637

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*107 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*107 %*		*70-130*
Surrogate: Dibromofluoromethane	*105 %*		*70-130*
Surrogate: Toluene-d8	*106 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-883-0-2ft - Oven Dried
Date Sampled: 07/22/24 08:30
Percent Solids: 100

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-09
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	IV / FV	Batch
Arsenic	**12.8** (0.39)	---	6010D	---	1	KJB	07/30/24 11:07	5.17 100	DG42609
Cadmium	ND (0.10)	---	6010D	---	1	KJB	07/29/24 11:10	5.17 100	DG42609
Chromium	**36.4** (0.39)	---	6010D	---	1	KJB	07/29/24 11:10	5.17 100	DG42609
Copper	**17.9** (1.93)	---	6010D	---	2	KJB	07/30/24 10:56	5.17 100	DG42609
Lead	**21.6** (3.87)	---	6010D	---	2	KJB	07/30/24 10:56	5.17 100	DG42609
Mercury	**0.085** (0.031)	---	7471B	---	1	AFV	07/26/24 18:16	0.63 40	DG42632
Nickel	**17.8** (0.97)	---	6010D	---	1	KJB	07/29/24 11:10	5.17 100	DG42609
Zinc	**55.2** (0.97)	---	6010D	---	1	KJB	07/29/24 11:10	5.17 100	DG42609

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-877-0-2ft - Oven Dried
Date Sampled: 07/22/24 12:13
Percent Solids: 95

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-10
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	IV / FV	Batch
Arsenic	**9.02** (0.36)	---	6010D	---	1	KJB	07/30/24 11:09	5.87 100	DG42609
Cadmium	**1.76** (0.09)	---	6010D	---	1	KJB	07/29/24 11:13	5.87 100	DG42609
Chromium	**106** (0.36)	---	6010D	---	1	KJB	07/29/24 11:13	5.87 100	DG42609
Copper	**80.9** (1.79)	---	6010D	---	2	KJB	07/30/24 10:59	5.87 100	DG42609
Lead	**98.7** (3.58)	---	6010D	---	2	KJB	07/30/24 10:59	5.87 100	DG42609
Mercury	**1.76** (0.285)	---	7471B	---	10	AFV	07/26/24 20:27	0.73 40	DG42632
Nickel	**14.0** (0.89)	---	6010D	---	1	KJB	07/29/24 11:13	5.87 100	DG42609
Zinc	**150** (0.89)	---	6010D	---	1	KJB	07/29/24 11:13	5.87 100	DG42609

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-874-0-2ft - Oven Dried
Date Sampled: 07/22/24 12:52
Percent Solids: 100

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-11
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	IV / FV	Batch
Arsenic	**13.2** (0.39)	---	6010D	---	1	KJB	07/30/24 11:11	5.14 100	DG42609
Cadmium	**0.55** (0.10)	---	6010D	---	1	KJB	07/29/24 11:15	5.14 100	DG42609
Chromium	**63.7** (0.39)	---	6010D	---	1	KJB	07/29/24 11:15	5.14 100	DG42609
Copper	**53.3** (1.95)	---	6010D	---	2	KJB	07/30/24 11:01	5.14 100	DG42609
Lead	**80.5** (3.89)	---	6010D	---	2	KJB	07/30/24 11:01	5.14 100	DG42609
Mercury	**0.403** (0.031)	---	7471B	---	1	AFV	07/26/24 18:21	0.63 40	DG42632
Nickel	**15.9** (0.97)	---	6010D	---	1	KJB	07/29/24 11:15	5.14 100	DG42609
Zinc	**123** (0.97)	---	6010D	---	1	KJB	07/29/24 11:15	5.14 100	DG42609

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-884-0-2ft - Oven Dried
Date Sampled: 07/22/24 15:40
Percent Solids: 98

ESS Laboratory Work Order: 24G0835
ESS Laboratory Sample ID: 24G0835-12
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	IV / FV	Batch
Arsenic	**10.2** (0.39)	---	6010D	---	1	KJB	07/30/24 11:13	5.17 100	DG42609
Cadmium	**0.41** (0.10)	---	6010D	---	1	KJB	07/29/24 11:21	5.17 100	DG42609
Chromium	**47.6** (0.39)	---	6010D	---	1	KJB	07/29/24 11:21	5.17 100	DG42609
Copper	**47.3** (2.95)	---	6010D	---	3	KJB	07/30/24 11:05	5.17 100	DG42609
Lead	**80.5** (1.97)	---	6010D	---	1	KJB	07/29/24 11:21	5.17 100	DG42609
Mercury	**0.458** (0.030)	---	7471B	---	1	AFV	07/26/24 18:23	0.67 40	DG42632
Nickel	**15.6** (0.98)	---	6010D	---	1	KJB	07/29/24 11:21	5.17 100	DG42609
Zinc	**98.0** (0.98)	---	6010D	---	1	KJB	07/29/24 11:21	5.17 100	DG42609

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0835

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch DG42411 - 3050B										
Blank										
Arsenic	ND	0.97	mg/kg wet							
Barium	ND	0.97	mg/kg wet							
Cadmium	ND	0.48	mg/kg wet							
Chromium	ND	0.97	mg/kg wet							
Lead	ND	4.83	mg/kg wet							
Nickel	ND	0.97	mg/kg wet							
Selenium	ND	4.83	mg/kg wet							
Silver	ND	0.48	mg/kg wet							
Zinc	ND	2.42	mg/kg wet							
LCS										
Arsenic	291	3.12	mg/kg wet	360.0		81	80-120			
Barium	289	3.12	mg/kg wet	332.0		87	80-120			
Cadmium	197	1.56	mg/kg wet	238.0		83	80-120			
Chromium	172	3.12	mg/kg wet	199.0		86	80-120			
Lead	87.3	15.6	mg/kg wet	100.0		87	80-120			
Nickel	300	3.12	mg/kg wet	342.0		88	80-120			
Selenium	148	15.6	mg/kg wet	170.0		87	80-120			
Silver	76.6	1.56	mg/kg wet	88.60		86	80-120			
Zinc	154	7.81	mg/kg wet	183.0		84	80-120			
LCS Dup										
Barium	239	3.12	mg/kg wet	332.0		72	80-120	19	30	B-
Cadmium	162	1.56	mg/kg wet	238.0		68	80-120	20	30	B-
Chromium	142	3.12	mg/kg wet	199.0		72	80-120	19	30	
Copper	160	7.81	mg/kg wet	227.0		71	80-120	200	30	B-
Lead	75.6	15.6	mg/kg wet	100.0		76	80-120	14	30	B-
Nickel	253	3.12	mg/kg wet	342.0		74	80-120	17	30	B-
Selenium	125	15.6	mg/kg wet	170.0		74	80-120	16	30	B-
Silver	66.9	1.56	mg/kg wet	88.60		75	80-120	14	30	
Zinc	130	7.81	mg/kg wet	183.0		71	80-120	16	30	B-
Batch DG42412 - 7471B										
Blank										
Mercury	ND	0.032	mg/kg wet							
LCS										
Mercury	12.5	3.30	mg/kg wet	14.40		87	80-120			
LCS Dup										
Mercury	11.9	3.30	mg/kg wet	14.40		83	80-120	5	30	
Batch DG42609 - 3050B										
Blank										
Arsenic	ND	0.94	mg/kg wet							
Cadmium	ND	0.23	mg/kg wet							
Chromium	ND	0.94	mg/kg wet							
Copper	ND	2.35	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0835

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch DG42609 - 3050B										
Lead	ND	4.69	mg/kg wet							
Nickel	ND	2.35	mg/kg wet							
Zinc	ND	2.35	mg/kg wet							
LCS										
Arsenic	304	3.28	mg/kg wet	360.0		84	80-120			
Cadmium	200	0.82	mg/kg wet	238.0		84	80-120			
Chromium	176	3.28	mg/kg wet	199.0		89	80-120			
Copper	198	8.20	mg/kg wet	227.0		87	80-120			
Lead	91.1	16.4	mg/kg wet	100.0		91	80-120			
Nickel	306	8.20	mg/kg wet	342.0		90	80-120			
Zinc	160	8.20	mg/kg wet	183.0		88	80-120			
LCS Dup										
Arsenic	344	3.03	mg/kg wet	360.0		96	80-120	13	30	
Cadmium	228	0.76	mg/kg wet	238.0		96	80-120	13	30	
Chromium	201	3.03	mg/kg wet	199.0		101	80-120	13	30	
Copper	224	7.58	mg/kg wet	227.0		99	80-120	12	30	
Lead	102	15.2	mg/kg wet	100.0		102	80-120	11	30	
Nickel	347	7.58	mg/kg wet	342.0		102	80-120	13	30	
Zinc	181	7.58	mg/kg wet	183.0		99	80-120	12	30	
Batch DG42632 - 7471B										
Blank										
Mercury	ND	0.031	mg/kg wet							
LCS										
Mercury	12.8	3.19	mg/kg wet	14.40		89	80-120			
LCS Dup										
Mercury	12.5	3.14	mg/kg wet	14.40		87	80-120	3	30	
1311 TCLP Metals										
Batch DH40717 - 3005A_TCLP										
Blank										
Chromium	ND	0.02	mg/L							
LCS										
Chromium	0.49	0.02	mg/L	0.5000		97	80-120			
LCS Dup										
Chromium	0.49	0.02	mg/L	0.5000		97	80-120	0.06	20	
Volatile Organics Low Level										
Batch DG42421 - 5035										
Blank										
1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0835

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile Organics Low Level										
Batch DG42421 - 5035										
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0500	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							
Acetone	ND	0.0500	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0835

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile Organics Low Level										
Batch DG42421 - 5035										
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0200	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*0.0552*		mg/kg wet	*0.05000*		*110*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0451*		mg/kg wet	*0.05000*		*90*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0533*		mg/kg wet	*0.05000*		*107*	*70-130*			
Surrogate: Toluene-d8	*0.0495*		mg/kg wet	*0.05000*		*99*	*70-130*			
LCS										
1,1,1,2-Tetrachloroethane	0.0541	0.0050	mg/kg wet	0.05000		108	70-130			
1,1,1-Trichloroethane	0.0549	0.0050	mg/kg wet	0.05000		110	70-130			
1,1,2,2-Tetrachloroethane	0.0506	0.0050	mg/kg wet	0.05000		101	40-160			
1,1,2-Trichloroethane	0.0541	0.0050	mg/kg wet	0.05000		108	70-130			
1,1-Dichloroethane	0.0541	0.0050	mg/kg wet	0.05000		108	70-130			
1,1-Dichloroethene	0.0585	0.0050	mg/kg wet	0.05000		117	70-130			
1,1-Dichloropropene	0.0552	0.0050	mg/kg wet	0.05000		110	70-130			
1,2,3-Trichlorobenzene	0.0526	0.0050	mg/kg wet	0.05000		105	70-130			
1,2,3-Trichloropropane	0.0497	0.0050	mg/kg wet	0.05000		99	70-130			
1,2,4-Trichlorobenzene	0.0535	0.0050	mg/kg wet	0.05000		107	70-130			
1,2,4-Trimethylbenzene	0.0542	0.0050	mg/kg wet	0.05000		108	70-130			
1,2-Dibromo-3-Chloropropane	0.0527	0.0050	mg/kg wet	0.05000		105	70-130			
1,2-Dibromoethane	0.0528	0.0050	mg/kg wet	0.05000		106	70-130			
1,2-Dichlorobenzene	0.0497	0.0050	mg/kg wet	0.05000		99	70-130			
1,2-Dichloroethane	0.0552	0.0050	mg/kg wet	0.05000		110	70-130			
1,2-Dichloropropane	0.0541	0.0050	mg/kg wet	0.05000		108	70-130			
1,3,5-Trimethylbenzene	0.0534	0.0050	mg/kg wet	0.05000		107	70-130			
1,3-Dichlorobenzene	0.0491	0.0050	mg/kg wet	0.05000		98	70-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0835

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile Organics Low Level										
Batch DG42421 - 5035										
1,3-Dichloropropane	0.0549	0.0050	mg/kg wet	0.05000		110	70-130			
1,4-Dichlorobenzene	0.0501	0.0050	mg/kg wet	0.05000		100	70-130			
1,4-Dioxane	1.03	0.100	mg/kg wet	1.000		103	70-130			
2,2-Dichloropropane	0.0553	0.0050	mg/kg wet	0.05000		111	70-130			
2-Butanone	0.275	0.0500	mg/kg wet	0.2500		110	40-160			
2-Chlorotoluene	0.0522	0.0050	mg/kg wet	0.05000		104	70-130			
2-Hexanone	0.244	0.0500	mg/kg wet	0.2500		97	40-160			
4-Chlorotoluene	0.0515	0.0050	mg/kg wet	0.05000		103	70-130			
4-Isopropyltoluene	0.0509	0.0050	mg/kg wet	0.05000		102	70-130			
4-Methyl-2-Pentanone	0.257	0.0500	mg/kg wet	0.2500		103	40-160			
Acetone	0.237	0.0500	mg/kg wet	0.2500		95	40-160			
Benzene	0.0548	0.0050	mg/kg wet	0.05000		110	70-130			
Bromobenzene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130			
Bromochloromethane	0.0558	0.0050	mg/kg wet	0.05000		112	70-130			
Bromodichloromethane	0.0601	0.0050	mg/kg wet	0.05000		120	70-130			
Bromoform	0.0425	0.0050	mg/kg wet	0.05000		85	40-160			
Bromomethane	0.0556	0.0100	mg/kg wet	0.05000		111	40-160			
Carbon Disulfide	0.0577	0.0050	mg/kg wet	0.05000		115	70-130			
Carbon Tetrachloride	0.0554	0.0050	mg/kg wet	0.05000		111	70-130			
Chlorobenzene	0.0515	0.0050	mg/kg wet	0.05000		103	70-130			
Chloroethane	0.0646	0.0100	mg/kg wet	0.05000		129	40-160			
Chloroform	0.0537	0.0050	mg/kg wet	0.05000		107	70-130			
Chloromethane	0.0592	0.0100	mg/kg wet	0.05000		118	40-160			
cis-1,2-Dichloroethene	0.0562	0.0050	mg/kg wet	0.05000		112	70-130			
cis-1,3-Dichloropropene	0.0589	0.0050	mg/kg wet	0.05000		118	40-160			
Dibromochloromethane	0.0492	0.0050	mg/kg wet	0.05000		98	40-160			
Dibromomethane	0.0566	0.0050	mg/kg wet	0.05000		113	70-130			
Dichlorodifluoromethane	0.0441	0.0100	mg/kg wet	0.05000		88	40-160			
Diethyl Ether	0.0573	0.0050	mg/kg wet	0.05000		115	70-130			
Di-isopropyl ether	0.0579	0.0050	mg/kg wet	0.05000		116	70-130			
Ethyl tertiary-butyl ether	0.0564	0.0050	mg/kg wet	0.05000		113	70-130			
Ethylbenzene	0.0545	0.0050	mg/kg wet	0.05000		109	70-130			
Hexachlorobutadiene	0.0494	0.0050	mg/kg wet	0.05000		99	40-160			
Isopropylbenzene	0.0591	0.0050	mg/kg wet	0.05000		118	70-130			
Methyl tert-Butyl Ether	0.0562	0.0050	mg/kg wet	0.05000		112	70-130			
Methylene Chloride	0.0527	0.0250	mg/kg wet	0.05000		105	70-130			
Naphthalene	0.0558	0.0050	mg/kg wet	0.05000		112	40-160			
n-Butylbenzene	0.0542	0.0050	mg/kg wet	0.05000		108	70-130			
n-Propylbenzene	0.0530	0.0050	mg/kg wet	0.05000		106	70-130			
sec-Butylbenzene	0.0502	0.0050	mg/kg wet	0.05000		100	70-130			
Styrene	0.0548	0.0050	mg/kg wet	0.05000		110	40-160			
tert-Butylbenzene	0.0531	0.0050	mg/kg wet	0.05000		106	70-130			
Tertiary-amyl methyl ether	0.0566	0.0050	mg/kg wet	0.05000		113	70-130			
Tetrachloroethene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130			
Tetrahydrofuran	0.0539	0.0200	mg/kg wet	0.05000		108	70-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0835

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile Organics Low Level										
Batch DG42421 - 5035										
Toluene	0.0545	0.0050	mg/kg wet	0.05000		109	70-130			
trans-1,2-Dichloroethene	0.0560	0.0050	mg/kg wet	0.05000		112	70-130			
trans-1,3-Dichloropropene	0.0556	0.0050	mg/kg wet	0.05000		111	70-130			
Trichloroethene	0.0526	0.0050	mg/kg wet	0.05000		105	70-130			
Trichlorofluoromethane	0.0567	0.0050	mg/kg wet	0.05000		113	40-160			
Vinyl Chloride	0.0614	0.0100	mg/kg wet	0.05000		123	70-130			
Xylene O	0.0569	0.0050	mg/kg wet	0.05000		114	70-130			
Xylene P,M	0.112	0.0100	mg/kg wet	0.1000		112	70-130			
Surrogate: 1,2-Dichloroethane-d4	*0.0519*		mg/kg wet	*0.05000*		*104*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0506*		mg/kg wet	*0.05000*		*101*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0509*		mg/kg wet	*0.05000*		*102*	*70-130*			
Surrogate: Toluene-d8	*0.0490*		mg/kg wet	*0.05000*		*98*	*70-130*			
LCS Dup										
1,1,1,2-Tetrachloroethane	0.0539	0.0050	mg/kg wet	0.05000		108	70-130	0.4	20	
1,1,1-Trichloroethane	0.0540	0.0050	mg/kg wet	0.05000		108	70-130	2	20	
1,1,2,2-Tetrachloroethane	0.0503	0.0050	mg/kg wet	0.05000		101	40-160	0.6	20	
1,1,2-Trichloroethane	0.0523	0.0050	mg/kg wet	0.05000		105	70-130	3	20	
1,1-Dichloroethane	0.0531	0.0050	mg/kg wet	0.05000		106	70-130	2	20	
1,1-Dichloroethene	0.0577	0.0050	mg/kg wet	0.05000		115	70-130	1	20	
1,1-Dichloropropene	0.0539	0.0050	mg/kg wet	0.05000		108	70-130	2	20	
1,2,3-Trichlorobenzene	0.0536	0.0050	mg/kg wet	0.05000		107	70-130	2	20	
1,2,3-Trichloropropane	0.0494	0.0050	mg/kg wet	0.05000		99	70-130	0.7	20	
1,2,4-Trichlorobenzene	0.0536	0.0050	mg/kg wet	0.05000		107	70-130	0.3	20	
1,2,4-Trimethylbenzene	0.0545	0.0050	mg/kg wet	0.05000		109	70-130	0.6	20	
1,2-Dibromo-3-Chloropropane	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	3	20	
1,2-Dibromoethane	0.0511	0.0050	mg/kg wet	0.05000		102	70-130	3	20	
1,2-Dichlorobenzene	0.0502	0.0050	mg/kg wet	0.05000		100	70-130	1	20	
1,2-Dichloroethane	0.0538	0.0050	mg/kg wet	0.05000		108	70-130	2	20	
1,2-Dichloropropane	0.0536	0.0050	mg/kg wet	0.05000		107	70-130	0.9	20	
1,3,5-Trimethylbenzene	0.0544	0.0050	mg/kg wet	0.05000		109	70-130	2	20	
1,3-Dichlorobenzene	0.0503	0.0050	mg/kg wet	0.05000		101	70-130	2	20	
1,3-Dichloropropane	0.0540	0.0050	mg/kg wet	0.05000		108	70-130	2	20	
1,4-Dichlorobenzene	0.0499	0.0050	mg/kg wet	0.05000		100	70-130	0.4	20	
1,4-Dioxane	0.993	0.100	mg/kg wet	1.000		99	70-130	4	20	
2,2-Dichloropropane	0.0545	0.0050	mg/kg wet	0.05000		109	70-130	1	20	
2-Butanone	0.267	0.0500	mg/kg wet	0.2500		107	40-160	3	20	
2-Chlorotoluene	0.0530	0.0050	mg/kg wet	0.05000		106	70-130	2	20	
2-Hexanone	0.232	0.0500	mg/kg wet	0.2500		93	40-160	5	20	
4-Chlorotoluene	0.0523	0.0050	mg/kg wet	0.05000		105	70-130	2	20	
4-Isopropyltoluene	0.0512	0.0050	mg/kg wet	0.05000		102	70-130	0.6	20	
4-Methyl-2-Pentanone	0.244	0.0500	mg/kg wet	0.2500		98	40-160	5	20	
Acetone	0.233	0.0500	mg/kg wet	0.2500		93	40-160	2	20	
Benzene	0.0540	0.0050	mg/kg wet	0.05000		108	70-130	1	20	
Bromobenzene	0.0529	0.0050	mg/kg wet	0.05000		106	70-130	2	20	
Bromochloromethane	0.0541	0.0050	mg/kg wet	0.05000		108	70-130	3	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0835

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile Organics Low Level										
Batch DG42421 - 5035										
Bromodichloromethane	0.0593	0.0050	mg/kg wet	0.05000		119	70-130	1	20	
Bromoform	0.0416	0.0050	mg/kg wet	0.05000		83	40-160	2	20	
Bromomethane	0.0559	0.0100	mg/kg wet	0.05000		112	40-160	0.6	20	
Carbon Disulfide	0.0565	0.0050	mg/kg wet	0.05000		113	70-130	2	20	
Carbon Tetrachloride	0.0547	0.0050	mg/kg wet	0.05000		109	70-130	1	20	
Chlorobenzene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	2	20	
Chloroethane	0.0650	0.0100	mg/kg wet	0.05000		130	40-160	0.6	20	
Chloroform	0.0527	0.0050	mg/kg wet	0.05000		105	70-130	2	20	
Chloromethane	0.0587	0.0100	mg/kg wet	0.05000		117	40-160	0.8	20	
cis-1,2-Dichloroethene	0.0556	0.0050	mg/kg wet	0.05000		111	70-130	1	20	
cis-1,3-Dichloropropene	0.0576	0.0050	mg/kg wet	0.05000		115	40-160	2	20	
Dibromochloromethane	0.0483	0.0050	mg/kg wet	0.05000		97	40-160	2	20	
Dibromomethane	0.0557	0.0050	mg/kg wet	0.05000		111	70-130	2	20	
Dichlorodifluoromethane	0.0424	0.0100	mg/kg wet	0.05000		85	40-160	4	20	
Diethyl Ether	0.0572	0.0050	mg/kg wet	0.05000		114	70-130	0.3	20	
Di-isopropyl ether	0.0570	0.0050	mg/kg wet	0.05000		114	70-130	2	20	
Ethyl tertiary-butyl ether	0.0559	0.0050	mg/kg wet	0.05000		112	70-130	0.8	20	
Ethylbenzene	0.0535	0.0050	mg/kg wet	0.05000		107	70-130	2	20	
Hexachlorobutadiene	0.0495	0.0050	mg/kg wet	0.05000		99	40-160	0.1	20	
Isopropylbenzene	0.0602	0.0050	mg/kg wet	0.05000		120	70-130	2	20	
Methyl tert-Butyl Ether	0.0551	0.0050	mg/kg wet	0.05000		110	70-130	2	20	
Methylene Chloride	0.0518	0.0250	mg/kg wet	0.05000		104	70-130	2	20	
Naphthalene	0.0560	0.0050	mg/kg wet	0.05000		112	40-160	0.5	20	
n-Butylbenzene	0.0549	0.0050	mg/kg wet	0.05000		110	70-130	1	20	
n-Propylbenzene	0.0533	0.0050	mg/kg wet	0.05000		107	70-130	0.5	20	
sec-Butylbenzene	0.0509	0.0050	mg/kg wet	0.05000		102	70-130	1	20	
Styrene	0.0542	0.0050	mg/kg wet	0.05000		108	40-160	1	20	
tert-Butylbenzene	0.0534	0.0050	mg/kg wet	0.05000		107	70-130	0.6	20	
Tertiary-amyl methyl ether	0.0561	0.0050	mg/kg wet	0.05000		112	70-130	0.9	20	
Tetrachloroethene	0.0500	0.0050	mg/kg wet	0.05000		100	70-130	3	20	
Tetrahydrofuran	0.0507	0.0200	mg/kg wet	0.05000		101	70-130	6	20	
Toluene	0.0533	0.0050	mg/kg wet	0.05000		107	70-130	2	20	
trans-1,2-Dichloroethene	0.0556	0.0050	mg/kg wet	0.05000		111	70-130	0.6	20	
trans-1,3-Dichloropropene	0.0548	0.0050	mg/kg wet	0.05000		110	70-130	1	20	
Trichloroethene	0.0521	0.0050	mg/kg wet	0.05000		104	70-130	1	20	
Trichlorofluoromethane	0.0552	0.0050	mg/kg wet	0.05000		110	40-160	3	20	
Vinyl Chloride	0.0608	0.0100	mg/kg wet	0.05000		122	70-130	1	20	
Xylene O	0.0559	0.0050	mg/kg wet	0.05000		112	70-130	2	20	
Xylene P,M	0.110	0.0100	mg/kg wet	0.1000		110	70-130	2	20	
Surrogate: 1,2-Dichloroethane-d4	*0.0511*		mg/kg wet	*0.05000*		*102*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0486*		mg/kg wet	*0.05000*		*97*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0502*		mg/kg wet	*0.05000*		*100*	*70-130*			
Surrogate: Toluene-d8	*0.0484*		mg/kg wet	*0.05000*		*97*	*70-130*			
Batch DG42526 - 5035										

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0835

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile Organics Low Level										
Batch DG42526 - 5035										
Blank										
1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0500	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							
Acetone	ND	0.0500	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0050	mg/kg wet							

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Client Name: GEI Consultants, Inc.
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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile Organics Low Level										
Batch DG42526 - 5035										
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0200	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*0.0454*		mg/kg wet	*0.05000*		*91*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0443*		mg/kg wet	*0.05000*		*89*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0460*		mg/kg wet	*0.05000*		*92*	*70-130*			
Surrogate: Toluene-d8	*0.0486*		mg/kg wet	*0.05000*		*97*	*70-130*			
LCS										
1,1,1,2-Tetrachloroethane	0.0533	0.0050	mg/kg wet	0.05000		107	70-130			
1,1,1-Trichloroethane	0.0501	0.0050	mg/kg wet	0.05000		100	70-130			
1,1,2,2-Tetrachloroethane	0.0588	0.0050	mg/kg wet	0.05000		118	40-160			
1,1,2-Trichloroethane	0.0496	0.0050	mg/kg wet	0.05000		99	70-130			
1,1-Dichloroethane	0.0498	0.0050	mg/kg wet	0.05000		100	70-130			
1,1-Dichloroethene	0.0564	0.0050	mg/kg wet	0.05000		113	70-130			
1,1-Dichloropropene	0.0516	0.0050	mg/kg wet	0.05000		103	70-130			
1,2,3-Trichlorobenzene	0.0618	0.0050	mg/kg wet	0.05000		124	70-130			
1,2,3-Trichloropropane	0.0588	0.0050	mg/kg wet	0.05000		118	70-130			
1,2,4-Trichlorobenzene	0.0634	0.0050	mg/kg wet	0.05000		127	70-130			
1,2,4-Trimethylbenzene	0.0648	0.0050	mg/kg wet	0.05000		130	70-130			
1,2-Dibromo-3-Chloropropane	0.0564	0.0050	mg/kg wet	0.05000		113	70-130			
1,2-Dibromoethane	0.0521	0.0050	mg/kg wet	0.05000		104	70-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0835

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile Organics Low Level										
Batch DG42526 - 5035										
1,2-Dichlorobenzene	0.0585	0.0050	mg/kg wet	0.05000		117	70-130			
1,2-Dichloroethane	0.0464	0.0050	mg/kg wet	0.05000		93	70-130			
1,2-Dichloropropane	0.0515	0.0050	mg/kg wet	0.05000		103	70-130			
1,3,5-Trimethylbenzene	0.0637	0.0050	mg/kg wet	0.05000		127	70-130			
1,3-Dichlorobenzene	0.0581	0.0050	mg/kg wet	0.05000		116	70-130			
1,3-Dichloropropane	0.0540	0.0050	mg/kg wet	0.05000		108	70-130			
1,4-Dichlorobenzene	0.0595	0.0050	mg/kg wet	0.05000		119	70-130			
1,4-Dioxane	1.04	0.100	mg/kg wet	1.000		104	70-130			
2,2-Dichloropropane	0.0546	0.0050	mg/kg wet	0.05000		109	70-130			
2-Butanone	0.252	0.0500	mg/kg wet	0.2500		101	40-160			
2-Chlorotoluene	0.0613	0.0050	mg/kg wet	0.05000		123	70-130			
2-Hexanone	0.237	0.0500	mg/kg wet	0.2500		95	40-160			
4-Chlorotoluene	0.0604	0.0050	mg/kg wet	0.05000		121	70-130			
4-Isopropyltoluene	0.0603	0.0050	mg/kg wet	0.05000		121	70-130			
4-Methyl-2-Pentanone	0.239	0.0500	mg/kg wet	0.2500		96	40-160			
Acetone	0.217	0.0500	mg/kg wet	0.2500		87	40-160			
Benzene	0.0524	0.0050	mg/kg wet	0.05000		105	70-130			
Bromobenzene	0.0635	0.0050	mg/kg wet	0.05000		127	70-130			
Bromochloromethane	0.0526	0.0050	mg/kg wet	0.05000		105	70-130			
Bromodichloromethane	0.0526	0.0050	mg/kg wet	0.05000		105	70-130			
Bromoform	0.0409	0.0050	mg/kg wet	0.05000		82	40-160			
Bromomethane	0.0460	0.0100	mg/kg wet	0.05000		92	40-160			
Carbon Disulfide	0.0532	0.0050	mg/kg wet	0.05000		106	70-130			
Carbon Tetrachloride	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
Chlorobenzene	0.0519	0.0050	mg/kg wet	0.05000		104	70-130			
Chloroethane	0.0557	0.0100	mg/kg wet	0.05000		111	40-160			
Chloroform	0.0481	0.0050	mg/kg wet	0.05000		96	70-130			
Chloromethane	0.0477	0.0100	mg/kg wet	0.05000		95	40-160			
cis-1,2-Dichloroethene	0.0538	0.0050	mg/kg wet	0.05000		108	70-130			
cis-1,3-Dichloropropene	0.0563	0.0050	mg/kg wet	0.05000		113	40-160			
Dibromochloromethane	0.0471	0.0050	mg/kg wet	0.05000		94	40-160			
Dibromomethane	0.0508	0.0050	mg/kg wet	0.05000		102	70-130			
Dichlorodifluoromethane	0.0346	0.0100	mg/kg wet	0.05000		69	40-160			
Diethyl Ether	0.0558	0.0050	mg/kg wet	0.05000		112	70-130			
Di-isopropyl ether	0.0549	0.0050	mg/kg wet	0.05000		110	70-130			
Ethyl tertiary-butyl ether	0.0571	0.0050	mg/kg wet	0.05000		114	70-130			
Ethylbenzene	0.0545	0.0050	mg/kg wet	0.05000		109	70-130			
Hexachlorobutadiene	0.0565	0.0050	mg/kg wet	0.05000		113	40-160			
Isopropylbenzene	0.0705	0.0050	mg/kg wet	0.05000		141	70-130			B+
Methyl tert-Butyl Ether	0.0553	0.0050	mg/kg wet	0.05000		111	70-130			
Methylene Chloride	0.0554	0.0250	mg/kg wet	0.05000		111	70-130			
Naphthalene	0.0651	0.0050	mg/kg wet	0.05000		130	40-160			
n-Butylbenzene	0.0635	0.0050	mg/kg wet	0.05000		127	70-130			
n-Propylbenzene	0.0632	0.0050	mg/kg wet	0.05000		126	70-130			
sec-Butylbenzene	0.0596	0.0050	mg/kg wet	0.05000		119	70-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0835

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile Organics Low Level										
Batch DG42526 - 5035										
Styrene	0.0562	0.0050	mg/kg wet	0.05000		112	40-160			
tert-Butylbenzene	0.0631	0.0050	mg/kg wet	0.05000		126	70-130			
Tertiary-amyl methyl ether	0.0599	0.0050	mg/kg wet	0.05000		120	70-130			
Tetrachloroethene	0.0523	0.0050	mg/kg wet	0.05000		105	70-130			
Tetrahydrofuran	0.0519	0.0200	mg/kg wet	0.05000		104	70-130			
Toluene	0.0522	0.0050	mg/kg wet	0.05000		104	70-130			
trans-1,2-Dichloroethene	0.0548	0.0050	mg/kg wet	0.05000		110	70-130			
trans-1,3-Dichloropropene	0.0535	0.0050	mg/kg wet	0.05000		107	70-130			
Trichloroethene	0.0501	0.0050	mg/kg wet	0.05000		100	70-130			
Trichlorofluoromethane	0.0491	0.0050	mg/kg wet	0.05000		98	40-160			
Vinyl Chloride	0.0509	0.0100	mg/kg wet	0.05000		102	70-130			
Xylene O	0.0573	0.0050	mg/kg wet	0.05000		115	70-130			
Xylene P,M	0.114	0.0100	mg/kg wet	0.1000		114	70-130			
Surrogate: 1,2-Dichloroethane-d4	*0.0432*		mg/kg wet	*0.05000*		*86*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0453*		mg/kg wet	*0.05000*		*91*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0461*		mg/kg wet	*0.05000*		*92*	*70-130*			
Surrogate: Toluene-d8	*0.0497*		mg/kg wet	*0.05000*		*99*	*70-130*			
LCS Dup										
1,1,1,2-Tetrachloroethane	0.0539	0.0050	mg/kg wet	0.05000		108	70-130	1	20	
1,1,1-Trichloroethane	0.0495	0.0050	mg/kg wet	0.05000		99	70-130	1	20	
1,1,2,2-Tetrachloroethane	0.0577	0.0050	mg/kg wet	0.05000		115	40-160	2	20	
1,1,2-Trichloroethane	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	2	20	
1,1-Dichloroethane	0.0498	0.0050	mg/kg wet	0.05000		100	70-130	0.04	20	
1,1-Dichloroethene	0.0556	0.0050	mg/kg wet	0.05000		111	70-130	1	20	
1,1-Dichloropropene	0.0505	0.0050	mg/kg wet	0.05000		101	70-130	2	20	
1,2,3-Trichlorobenzene	0.0637	0.0050	mg/kg wet	0.05000		127	70-130	3	20	
1,2,3-Trichloropropane	0.0566	0.0050	mg/kg wet	0.05000		113	70-130	4	20	
1,2,4-Trichlorobenzene	0.0647	0.0050	mg/kg wet	0.05000		129	70-130	2	20	
1,2,4-Trimethylbenzene	0.0647	0.0050	mg/kg wet	0.05000		129	70-130	0.1	20	
1,2-Dibromo-3-Chloropropane	0.0554	0.0050	mg/kg wet	0.05000		111	70-130	2	20	
1,2-Dibromoethane	0.0521	0.0050	mg/kg wet	0.05000		104	70-130	0.08	20	
1,2-Dichlorobenzene	0.0592	0.0050	mg/kg wet	0.05000		118	70-130	1	20	
1,2-Dichloroethane	0.0472	0.0050	mg/kg wet	0.05000		94	70-130	2	20	
1,2-Dichloropropane	0.0523	0.0050	mg/kg wet	0.05000		105	70-130	2	20	
1,3,5-Trimethylbenzene	0.0628	0.0050	mg/kg wet	0.05000		126	70-130	1	20	
1,3-Dichlorobenzene	0.0584	0.0050	mg/kg wet	0.05000		117	70-130	0.6	20	
1,3-Dichloropropane	0.0548	0.0050	mg/kg wet	0.05000		110	70-130	1	20	
1,4-Dichlorobenzene	0.0597	0.0050	mg/kg wet	0.05000		119	70-130	0.2	20	
1,4-Dioxane	0.980	0.100	mg/kg wet	1.000		98	70-130	6	20	
2,2-Dichloropropane	0.0539	0.0050	mg/kg wet	0.05000		108	70-130	1	20	
2-Butanone	0.278	0.0500	mg/kg wet	0.2500		111	40-160	10	20	
2-Chlorotoluene	0.0609	0.0050	mg/kg wet	0.05000		122	70-130	0.7	20	
2-Hexanone	0.251	0.0500	mg/kg wet	0.2500		100	40-160	6	20	
4-Chlorotoluene	0.0601	0.0050	mg/kg wet	0.05000		120	70-130	0.6	20	
4-Isopropyltoluene	0.0596	0.0050	mg/kg wet	0.05000		119	70-130	1	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0835

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile Organics Low Level										
Batch DG42526 - 5035										
4-Methyl-2-Pentanone	0.235	0.0500	mg/kg wet	0.2500		94	40-160	2	20	
Acetone	0.314	0.0500	mg/kg wet	0.2500		126	40-160	37	20	D+
Benzene	0.0526	0.0050	mg/kg wet	0.05000		105	70-130	0.4	20	
Bromobenzene	0.0634	0.0050	mg/kg wet	0.05000		127	70-130	0.1	20	
Bromochloromethane	0.0537	0.0050	mg/kg wet	0.05000		107	70-130	2	20	
Bromodichloromethane	0.0536	0.0050	mg/kg wet	0.05000		107	70-130	2	20	
Bromoform	0.0412	0.0050	mg/kg wet	0.05000		82	40-160	0.7	20	
Bromomethane	0.0461	0.0100	mg/kg wet	0.05000		92	40-160	0.3	20	
Carbon Disulfide	0.0525	0.0050	mg/kg wet	0.05000		105	70-130	1	20	
Carbon Tetrachloride	0.0477	0.0050	mg/kg wet	0.05000		95	70-130	2	20	
Chlorobenzene	0.0522	0.0050	mg/kg wet	0.05000		104	70-130	0.7	20	
Chloroethane	0.0553	0.0100	mg/kg wet	0.05000		111	40-160	0.7	20	
Chloroform	0.0480	0.0050	mg/kg wet	0.05000		96	70-130	0.1	20	
Chloromethane	0.0473	0.0100	mg/kg wet	0.05000		95	40-160	0.9	20	
cis-1,2-Dichloroethene	0.0546	0.0050	mg/kg wet	0.05000		109	70-130	1	20	
cis-1,3-Dichloropropene	0.0575	0.0050	mg/kg wet	0.05000		115	40-160	2	20	
Dibromochloromethane	0.0478	0.0050	mg/kg wet	0.05000		96	40-160	2	20	
Dibromomethane	0.0519	0.0050	mg/kg wet	0.05000		104	70-130	2	20	
Dichlorodifluoromethane	0.0328	0.0100	mg/kg wet	0.05000		66	40-160	5	20	
Diethyl Ether	0.0564	0.0050	mg/kg wet	0.05000		113	70-130	1	20	
Di-isopropyl ether	0.0559	0.0050	mg/kg wet	0.05000		112	70-130	2	20	
Ethyl tertiary-butyl ether	0.0580	0.0050	mg/kg wet	0.05000		116	70-130	2	20	
Ethylbenzene	0.0545	0.0050	mg/kg wet	0.05000		109	70-130	0.04	20	
Hexachlorobutadiene	0.0569	0.0050	mg/kg wet	0.05000		114	40-160	0.6	20	
Isopropylbenzene	0.0700	0.0050	mg/kg wet	0.05000		140	70-130	0.7	20	B+
Methyl tert-Butyl Ether	0.0559	0.0050	mg/kg wet	0.05000		112	70-130	1	20	
Methylene Chloride	0.0561	0.0250	mg/kg wet	0.05000		112	70-130	1	20	
Naphthalene	0.0666	0.0050	mg/kg wet	0.05000		133	40-160	2	20	
n-Butylbenzene	0.0628	0.0050	mg/kg wet	0.05000		126	70-130	1	20	
n-Propylbenzene	0.0619	0.0050	mg/kg wet	0.05000		124	70-130	2	20	
sec-Butylbenzene	0.0583	0.0050	mg/kg wet	0.05000		117	70-130	2	20	
Styrene	0.0571	0.0050	mg/kg wet	0.05000		114	40-160	2	20	
tert-Butylbenzene	0.0622	0.0050	mg/kg wet	0.05000		124	70-130	2	20	
Tertiary-amyl methyl ether	0.0609	0.0050	mg/kg wet	0.05000		122	70-130	2	20	
Tetrachloroethene	0.0518	0.0050	mg/kg wet	0.05000		104	70-130	0.9	20	
Tetrahydrofuran	0.0498	0.0200	mg/kg wet	0.05000		100	70-130	4	20	
Toluene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130	0.6	20	
trans-1,2-Dichloroethene	0.0546	0.0050	mg/kg wet	0.05000		109	70-130	0.4	20	
trans-1,3-Dichloropropene	0.0544	0.0050	mg/kg wet	0.05000		109	70-130	2	20	
Trichloroethene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130	1	20	
Trichlorofluoromethane	0.0481	0.0050	mg/kg wet	0.05000		96	40-160	2	20	
Vinyl Chloride	0.0498	0.0100	mg/kg wet	0.05000		100	70-130	2	20	
Xylene O	0.0575	0.0050	mg/kg wet	0.05000		115	70-130	0.4	20	
Xylene P,M	0.115	0.0100	mg/kg wet	0.1000		115	70-130	0.03	20	
Surrogate: 1,2-Dichloroethane-d4	*0.0430*		mg/kg wet	*0.05000*		*86*	*70-130*			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile Organics Low Level										
Batch DG42526 - 5035										
Surrogate: 4-Bromofluorobenzene	*0.0449*		mg/kg wet	*0.05000*		*90*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0462*		mg/kg wet	*0.05000*		*92*	*70-130*			
Surrogate: Toluene-d8	*0.0492*		mg/kg wet	*0.05000*		*98*	*70-130*			
Volatile Organics										
Batch DG42637 - 5035										
Blank										
1,1,1,2-Tetrachloroethane	ND	0.200	mg/kg wet							
1,1,1-Trichloroethane	ND	0.200	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.200	mg/kg wet							
1,1,2-Trichloroethane	ND	0.200	mg/kg wet							
1,1-Dichloroethane	ND	0.200	mg/kg wet							
1,1-Dichloroethene	ND	0.200	mg/kg wet							
1,1-Dichloropropene	ND	0.400	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.200	mg/kg wet							
1,2,3-Trichloropropane	ND	0.200	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.200	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.200	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	1.00	mg/kg wet							
1,2-Dibromoethane	ND	0.200	mg/kg wet							
1,2-Dichlorobenzene	ND	0.200	mg/kg wet							
1,2-Dichloroethane	ND	0.200	mg/kg wet							
1,2-Dichloropropane	ND	0.200	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.200	mg/kg wet							
1,3-Dichlorobenzene	ND	0.200	mg/kg wet							
1,3-Dichloropropane	ND	0.200	mg/kg wet							
1,4-Dichlorobenzene	ND	0.200	mg/kg wet							
1,4-Dioxane - Screen	ND	20.0	mg/kg wet							
2,2-Dichloropropane	ND	0.200	mg/kg wet							
2-Butanone	ND	1.00	mg/kg wet							
2-Chlorotoluene	ND	0.200	mg/kg wet							
2-Hexanone	ND	1.00	mg/kg wet							
4-Chlorotoluene	ND	0.200	mg/kg wet							
4-Isopropyltoluene	ND	0.200	mg/kg wet							
4-Methyl-2-Pentanone	ND	1.00	mg/kg wet							
Acetone	ND	1.00	mg/kg wet							
Benzene	ND	0.200	mg/kg wet							
Bromobenzene	ND	0.200	mg/kg wet							
Bromochloromethane	ND	0.200	mg/kg wet							
Bromodichloromethane	ND	0.200	mg/kg wet							
Bromoform	ND	0.200	mg/kg wet							
Bromomethane	ND	0.200	mg/kg wet							
Carbon Disulfide	ND	0.200	mg/kg wet							
Carbon Tetrachloride	ND	0.200	mg/kg wet							
Chlorobenzene	ND	0.200	mg/kg wet							

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile Organics										
Batch DG42637 - 5035										
Chloroethane	ND	0.200	mg/kg wet							
Chloroform	ND	0.200	mg/kg wet							
Chloromethane	ND	0.200	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.200	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.200	mg/kg wet							
Dibromochloromethane	ND	0.200	mg/kg wet							
Dibromomethane	ND	0.200	mg/kg wet							
Dichlorodifluoromethane	ND	0.200	mg/kg wet							
Diethyl Ether	ND	0.200	mg/kg wet							
Di-isopropyl ether	ND	0.200	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.200	mg/kg wet							
Ethylbenzene	ND	0.200	mg/kg wet							
Hexachlorobutadiene	ND	0.200	mg/kg wet							
Hexachloroethane	ND	0.200	mg/kg wet							
Isopropylbenzene	ND	0.200	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.200	mg/kg wet							
Methylene Chloride	ND	0.400	mg/kg wet							
Naphthalene	ND	0.200	mg/kg wet							
n-Butylbenzene	ND	0.200	mg/kg wet							
n-Propylbenzene	ND	0.200	mg/kg wet							
sec-Butylbenzene	ND	0.200	mg/kg wet							
Styrene	ND	0.200	mg/kg wet							
tert-Butylbenzene	ND	0.200	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.200	mg/kg wet							
Tetrachloroethene	ND	0.200	mg/kg wet							
Tetrahydrofuran	ND	1.00	mg/kg wet							
Toluene	ND	0.200	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.200	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.200	mg/kg wet							
Trichloroethene	ND	0.200	mg/kg wet							
Trichlorofluoromethane	ND	0.200	mg/kg wet							
Vinyl Chloride	ND	0.200	mg/kg wet							
Xylene O	ND	0.200	mg/kg wet							
Xylene P,M	ND	0.400	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*5.00*		mg/kg wet	*5.000*		*100*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*5.00*		mg/kg wet	*5.000*		*100*	*70-130*			
Surrogate: Dibromofluoromethane	*5.00*		mg/kg wet	*5.000*		*100*	*70-130*			
Surrogate: Toluene-d8	*5.00*		mg/kg wet	*5.000*		*100*	*70-130*			
LCS										
1,1,1,2-Tetrachloroethane	1.89	0.200	mg/kg wet	2.000		94	70-130			
1,1,1-Trichloroethane	1.95	0.200	mg/kg wet	2.000		98	70-130			
1,1,2,2-Tetrachloroethane	2.17	0.200	mg/kg wet	2.000		109	40-160			
1,1,2-Trichloroethane	1.80	0.200	mg/kg wet	2.000		90	70-130			
1,1-Dichloroethane	1.93	0.200	mg/kg wet	2.000		97	70-130			
1,1-Dichloroethene	2.06	0.200	mg/kg wet	2.000		103	70-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile Organics										
Batch DG42637 - 5035										
1,1-Dichloropropene	2.21	0.400	mg/kg wet	2.000		110	70-130			
1,2,3-Trichlorobenzene	1.79	0.200	mg/kg wet	2.000		90	70-130			
1,2,3-Trichloropropane	1.82	0.200	mg/kg wet	2.000		91	70-130			
1,2,4-Trichlorobenzene	1.79	0.200	mg/kg wet	2.000		90	70-130			
1,2,4-Trimethylbenzene	2.08	0.200	mg/kg wet	2.000		104	70-130			
1,2-Dibromo-3-Chloropropane	1.70	1.00	mg/kg wet	2.000		85	70-130			
1,2-Dibromoethane	1.95	0.200	mg/kg wet	2.000		97	70-130			
1,2-Dichlorobenzene	1.81	0.200	mg/kg wet	2.000		91	70-130			
1,2-Dichloroethane	1.74	0.200	mg/kg wet	2.000		87	70-130			
1,2-Dichloropropane	1.92	0.200	mg/kg wet	2.000		96	70-130			
1,3,5-Trimethylbenzene	2.18	0.200	mg/kg wet	2.000		109	70-130			
1,3-Dichlorobenzene	1.87	0.200	mg/kg wet	2.000		93	70-130			
1,3-Dichloropropane	1.96	0.200	mg/kg wet	2.000		98	70-130			
1,4-Dichlorobenzene	1.82	0.200	mg/kg wet	2.000		91	70-130			
1,4-Dioxane - Screen	36.7	20.0	mg/kg wet	40.00		92	40-160			
2,2-Dichloropropane	1.98	0.200	mg/kg wet	2.000		99	70-130			
2-Butanone	9.64	1.00	mg/kg wet	10.00		96	40-160			
2-Chlorotoluene	2.28	0.200	mg/kg wet	2.000		114	70-130			
2-Hexanone	9.39	1.00	mg/kg wet	10.00		94	40-160			
4-Chlorotoluene	2.17	0.200	mg/kg wet	2.000		108	70-130			
4-Isopropyltoluene	1.95	0.200	mg/kg wet	2.000		98	70-130			
4-Methyl-2-Pentanone	8.64	1.00	mg/kg wet	10.00		86	40-160			
Acetone	10.5	1.00	mg/kg wet	10.00		105	40-160			
Benzene	2.01	0.200	mg/kg wet	2.000		100	70-130			
Bromobenzene	2.13	0.200	mg/kg wet	2.000		107	70-130			
Bromochloromethane	2.13	0.200	mg/kg wet	2.000		107	70-130			
Bromodichloromethane	1.91	0.200	mg/kg wet	2.000		96	70-130			
Bromoform	1.58	0.200	mg/kg wet	2.000		79	40-160			
Bromomethane	2.39	0.200	mg/kg wet	2.000		119	40-160			
Carbon Disulfide	1.95	0.200	mg/kg wet	2.000		97	70-130			
Carbon Tetrachloride	1.88	0.200	mg/kg wet	2.000		94	70-130			
Chlorobenzene	1.87	0.200	mg/kg wet	2.000		93	70-130			
Chloroethane	2.34	0.200	mg/kg wet	2.000		117	40-160			
Chloroform	1.92	0.200	mg/kg wet	2.000		96	70-130			
Chloromethane	2.43	0.200	mg/kg wet	2.000		122	40-160			
cis-1,2-Dichloroethene	2.06	0.200	mg/kg wet	2.000		103	70-130			
cis-1,3-Dichloropropene	1.94	0.200	mg/kg wet	2.000		97	40-160			
Dibromochloromethane	1.78	0.200	mg/kg wet	2.000		89	40-160			
Dibromomethane	1.90	0.200	mg/kg wet	2.000		95	70-130			
Dichlorodifluoromethane	1.28	0.200	mg/kg wet	2.000		64	40-160			
Diethyl Ether	1.94	0.200	mg/kg wet	2.000		97	70-130			
Di-isopropyl ether	2.03	0.200	mg/kg wet	2.000		101	70-130			
Ethyl tertiary-butyl ether	2.05	0.200	mg/kg wet	2.000		102	70-130			
Ethylbenzene	2.01	0.200	mg/kg wet	2.000		100	70-130			
Hexachlorobutadiene	1.81	0.200	mg/kg wet	2.000		90	40-160			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0835

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile Organics										
Batch DG42637 - 5035										
Hexachloroethane	1.80	0.200	mg/kg wet	2.000		90	70-130			
Isopropylbenzene	2.53	0.200	mg/kg wet	2.000		127	70-130			
Methyl tert-Butyl Ether	1.93	0.200	mg/kg wet	2.000		96	70-130			
Methylene Chloride	1.89	0.400	mg/kg wet	2.000		94	70-130			
Naphthalene	1.92	0.200	mg/kg wet	2.000		96	40-160			
n-Butylbenzene	2.05	0.200	mg/kg wet	2.000		102	70-130			
n-Propylbenzene	2.38	0.200	mg/kg wet	2.000		119	70-130			
sec-Butylbenzene	2.00	0.200	mg/kg wet	2.000		100	70-130			
Styrene	1.94	0.200	mg/kg wet	2.000		97	40-160			
tert-Butylbenzene	2.09	0.200	mg/kg wet	2.000		104	70-130			
Tertiary-amyl methyl ether	1.99	0.200	mg/kg wet	2.000		99	70-130			
Tetrachloroethene	1.73	0.200	mg/kg wet	2.000		86	70-130			
Tetrahydrofuran	1.74	1.00	mg/kg wet	2.000		87	70-130			
Toluene	1.97	0.200	mg/kg wet	2.000		98	70-130			
trans-1,2-Dichloroethene	2.03	0.200	mg/kg wet	2.000		101	70-130			
trans-1,3-Dichloropropene	1.74	0.200	mg/kg wet	2.000		87	70-130			
Trichloroethene	1.91	0.200	mg/kg wet	2.000		96	70-130			
Trichlorofluoromethane	2.02	0.200	mg/kg wet	2.000		101	40-160			
Vinyl Chloride	2.05	0.200	mg/kg wet	2.000		103	70-130			
Xylene O	2.06	0.200	mg/kg wet	2.000		103	70-130			
Xylene P,M	4.05	0.400	mg/kg wet	4.000		101	70-130			
Surrogate: 1,2-Dichloroethane-d4	*4.72*		mg/kg wet	*5.000*		*94*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*4.91*		mg/kg wet	*5.000*		*98*	*70-130*			
Surrogate: Dibromofluoromethane	*4.97*		mg/kg wet	*5.000*		*99*	*70-130*			
Surrogate: Toluene-d8	*5.03*		mg/kg wet	*5.000*		*101*	*70-130*			
LCS Dup										
1,1,1,2-Tetrachloroethane	1.92	0.200	mg/kg wet	2.000		96	70-130	1	20	
1,1,1-Trichloroethane	1.93	0.200	mg/kg wet	2.000		96	70-130	1	20	
1,1,2,2-Tetrachloroethane	2.24	0.200	mg/kg wet	2.000		112	40-160	3	20	
1,1,2-Trichloroethane	1.92	0.200	mg/kg wet	2.000		96	70-130	7	20	
1,1-Dichloroethane	1.95	0.200	mg/kg wet	2.000		97	70-130	0.8	20	
1,1-Dichloroethene	2.21	0.200	mg/kg wet	2.000		111	70-130	7	20	
1,1-Dichloropropene	2.08	0.400	mg/kg wet	2.000		104	70-130	6	20	
1,2,3-Trichlorobenzene	1.88	0.200	mg/kg wet	2.000		94	70-130	5	20	
1,2,3-Trichloropropane	1.91	0.200	mg/kg wet	2.000		95	70-130	5	20	
1,2,4-Trichlorobenzene	1.82	0.200	mg/kg wet	2.000		91	70-130	2	20	
1,2,4-Trimethylbenzene	2.12	0.200	mg/kg wet	2.000		106	70-130	2	20	
1,2-Dibromo-3-Chloropropane	1.89	1.00	mg/kg wet	2.000		94	70-130	11	20	
1,2-Dibromoethane	2.02	0.200	mg/kg wet	2.000		101	70-130	4	20	
1,2-Dichlorobenzene	1.84	0.200	mg/kg wet	2.000		92	70-130	2	20	
1,2-Dichloroethane	1.81	0.200	mg/kg wet	2.000		91	70-130	4	20	
1,2-Dichloropropane	1.97	0.200	mg/kg wet	2.000		99	70-130	3	20	
1,3,5-Trimethylbenzene	2.20	0.200	mg/kg wet	2.000		110	70-130	0.8	20	
1,3-Dichlorobenzene	1.88	0.200	mg/kg wet	2.000		94	70-130	0.5	20	
1,3-Dichloropropane	2.02	0.200	mg/kg wet	2.000		101	70-130	3	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0835

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile Organics										
Batch DG42637 - 5035										
1,4-Dichlorobenzene	1.84	0.200	mg/kg wet	2.000		92	70-130	1	20	
1,4-Dioxane - Screen	38.3	20.0	mg/kg wet	40.00		96	40-160	4	20	
2,2-Dichloropropane	1.99	0.200	mg/kg wet	2.000		100	70-130	0.8	20	
2-Butanone	10.4	1.00	mg/kg wet	10.00		104	40-160	7	20	
2-Chlorotoluene	2.18	0.200	mg/kg wet	2.000		109	70-130	4	20	
2-Hexanone	10.5	1.00	mg/kg wet	10.00		105	40-160	11	20	
4-Chlorotoluene	2.06	0.200	mg/kg wet	2.000		103	70-130	5	20	
4-Isopropyltoluene	1.98	0.200	mg/kg wet	2.000		99	70-130	2	20	
4-Methyl-2-Pentanone	8.93	1.00	mg/kg wet	10.00		89	40-160	3	20	
Acetone	11.8	1.00	mg/kg wet	10.00		118	40-160	12	20	
Benzene	2.04	0.200	mg/kg wet	2.000		102	70-130	1	20	
Bromobenzene	2.16	0.200	mg/kg wet	2.000		108	70-130	1	20	
Bromochloromethane	2.07	0.200	mg/kg wet	2.000		104	70-130	3	20	
Bromodichloromethane	1.92	0.200	mg/kg wet	2.000		96	70-130	0.4	20	
Bromoform	1.66	0.200	mg/kg wet	2.000		83	40-160	5	20	
Bromomethane	2.12	0.200	mg/kg wet	2.000		106	40-160	12	20	
Carbon Disulfide	2.03	0.200	mg/kg wet	2.000		101	70-130	4	20	
Carbon Tetrachloride	1.91	0.200	mg/kg wet	2.000		95	70-130	2	20	
Chlorobenzene	1.92	0.200	mg/kg wet	2.000		96	70-130	3	20	
Chloroethane	2.37	0.200	mg/kg wet	2.000		118	40-160	1	20	
Chloroform	1.87	0.200	mg/kg wet	2.000		93	70-130	3	20	
Chloromethane	2.18	0.200	mg/kg wet	2.000		109	40-160	11	20	
cis-1,2-Dichloroethene	2.21	0.200	mg/kg wet	2.000		110	70-130	7	20	
cis-1,3-Dichloropropene	1.99	0.200	mg/kg wet	2.000		100	40-160	3	20	
Dibromochloromethane	1.85	0.200	mg/kg wet	2.000		92	40-160	4	20	
Dibromomethane	1.96	0.200	mg/kg wet	2.000		98	70-130	3	20	
Dichlorodifluoromethane	1.31	0.200	mg/kg wet	2.000		66	40-160	2	20	
Diethyl Ether	2.03	0.200	mg/kg wet	2.000		102	70-130	5	20	
Di-isopropyl ether	2.07	0.200	mg/kg wet	2.000		103	70-130	2	20	
Ethyl tertiary-butyl ether	2.09	0.200	mg/kg wet	2.000		105	70-130	2	20	
Ethylbenzene	2.05	0.200	mg/kg wet	2.000		102	70-130	2	20	
Hexachlorobutadiene	1.85	0.200	mg/kg wet	2.000		92	40-160	2	20	
Hexachloroethane	1.84	0.200	mg/kg wet	2.000		92	70-130	2	20	
Isopropylbenzene	2.57	0.200	mg/kg wet	2.000		129	70-130	1	20	
Methyl tert-Butyl Ether	1.94	0.200	mg/kg wet	2.000		97	70-130	0.9	20	
Methylene Chloride	1.89	0.400	mg/kg wet	2.000		95	70-130	0.3	20	
Naphthalene	1.96	0.200	mg/kg wet	2.000		98	40-160	2	20	
n-Butylbenzene	2.06	0.200	mg/kg wet	2.000		103	70-130	0.8	20	
n-Propylbenzene	2.22	0.200	mg/kg wet	2.000		111	70-130	7	20	
sec-Butylbenzene	2.02	0.200	mg/kg wet	2.000		101	70-130	0.8	20	
Styrene	1.99	0.200	mg/kg wet	2.000		100	40-160	2	20	
tert-Butylbenzene	2.12	0.200	mg/kg wet	2.000		106	70-130	2	20	
Tertiary-amyl methyl ether	2.00	0.200	mg/kg wet	2.000		100	70-130	0.8	20	
Tetrachloroethene	1.87	0.200	mg/kg wet	2.000		94	70-130	8	20	
Tetrahydrofuran	1.77	1.00	mg/kg wet	2.000		89	70-130	2	20	

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Client Name: GEI Consultants, Inc.
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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile Organics										
Batch DG42637 - 5035										
Toluene	2.01	0.200	mg/kg wet	2.000		101	70-130	2	20	
trans-1,2-Dichloroethene	2.04	0.200	mg/kg wet	2.000		102	70-130	0.6	20	
trans-1,3-Dichloropropene	1.80	0.200	mg/kg wet	2.000		90	70-130	3	20	
Trichloroethene	1.90	0.200	mg/kg wet	2.000		95	70-130	0.7	20	
Trichlorofluoromethane	1.98	0.200	mg/kg wet	2.000		99	40-160	2	20	
Vinyl Chloride	1.96	0.200	mg/kg wet	2.000		98	70-130	5	20	
Xylene O	2.08	0.200	mg/kg wet	2.000		104	70-130	1	20	
Xylene P,M	4.10	0.400	mg/kg wet	4.000		102	70-130	1	20	
Surrogate: 1,2-Dichloroethane-d4	*4.74*		mg/kg wet	*5.000*		*95*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*4.91*		mg/kg wet	*5.000*		*98*	*70-130*			
Surrogate: Dibromofluoromethane	*4.90*		mg/kg wet	*5.000*		*98*	*70-130*			
Surrogate: Toluene-d8	*5.05*		mg/kg wet	*5.000*		*101*	*70-130*			
Volatile TCLP Compounds										
Batch DH42625 - 5030B										
Blank										
Vinyl Chloride	ND	0.0010	mg/L							
Surrogate: 1,2-Dichloroethane-d4	*0.0278*		mg/L	*0.02500*		*111*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0241*		mg/L	*0.02500*		*96*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0254*		mg/L	*0.02500*		*102*	*70-130*			
Surrogate: Toluene-d8	*0.0251*		mg/L	*0.02500*		*100*	*70-130*			
Blank										
Vinyl Chloride	ND	0.0050	mg/L							
Surrogate: 1,2-Dichloroethane-d4	*0.0274*		mg/L	*0.02500*		*110*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0241*		mg/L	*0.02500*		*96*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0255*		mg/L	*0.02500*		*102*	*70-130*			
Surrogate: Toluene-d8	*0.0250*		mg/L	*0.02500*		*100*	*70-130*			
LCS										
Vinyl Chloride	0.0117	0.0010	mg/L	0.01000		117	70-130			
Surrogate: 1,2-Dichloroethane-d4	*0.0276*		mg/L	*0.02500*		*111*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0246*		mg/L	*0.02500*		*98*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0262*		mg/L	*0.02500*		*105*	*70-130*			
Surrogate: Toluene-d8	*0.0247*		mg/L	*0.02500*		*99*	*70-130*			
LCS Dup										
Vinyl Chloride	0.0126	0.0010	mg/L	0.01000		126	70-130	7	20	
Surrogate: 1,2-Dichloroethane-d4	*0.0275*		mg/L	*0.02500*		*110*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0246*		mg/L	*0.02500*		*98*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0260*		mg/L	*0.02500*		*104*	*70-130*			
Surrogate: Toluene-d8	*0.0247*		mg/L	*0.02500*		*99*	*70-130*			
Semi-Volatile Organic Compounds										
Batch DG42407 - 3546										
Blank										
1,1-Biphenyl	ND	0.025	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.250	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Semi-Volatile Organic Compounds										
Batch DG42407 - 3546										
1,2-Dichlorobenzene	ND	0.250	mg/kg wet							
1,3-Dichlorobenzene	ND	0.250	mg/kg wet							
1,4-Dichlorobenzene	ND	0.250	mg/kg wet							
2,4,5-Trichlorophenol	ND	0.250	mg/kg wet							
2,4,6-Trichlorophenol	ND	0.250	mg/kg wet							
2,4-Dichlorophenol	ND	0.250	mg/kg wet							
2,4-Dimethylphenol	ND	0.250	mg/kg wet							
2,4-Dinitrophenol	ND	1.00	mg/kg wet							
2,4-Dinitrotoluene	ND	0.250	mg/kg wet							
2,6-Dinitrotoluene	ND	0.250	mg/kg wet							
2-Chloronaphthalene	ND	0.250	mg/kg wet							
2-Chlorophenol	ND	0.250	mg/kg wet							
2-Methylnaphthalene	ND	0.250	mg/kg wet							
2-Methylphenol	ND	0.250	mg/kg wet							
2-Nitrophenol	ND	0.500	mg/kg wet							
3,3´-Dichlorobenzidine	ND	0.250	mg/kg wet							
3+4-Methylphenol	ND	0.250	mg/kg wet							
4-Bromophenyl-phenylether	ND	0.250	mg/kg wet							
4-Chloroaniline	ND	0.250	mg/kg wet							
4-Nitrophenol	ND	1.00	mg/kg wet							
Acenaphthene	ND	0.250	mg/kg wet							
Acenaphthylene	ND	0.250	mg/kg wet							
Acetophenone	ND	0.250	mg/kg wet							
Aniline	ND	0.250	mg/kg wet							
Anthracene	ND	0.250	mg/kg wet							
Azobenzene	ND	0.250	mg/kg wet							
Benzo(a)anthracene	ND	0.250	mg/kg wet							
Benzo(a)pyrene	ND	0.250	mg/kg wet							
Benzo(b)fluoranthene	ND	0.250	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.250	mg/kg wet							
Benzo(k)fluoranthene	ND	0.250	mg/kg wet							
bis(2-Chloroethoxy)methane	ND	0.250	mg/kg wet							
bis(2-Chloroethyl)ether	ND	0.250	mg/kg wet							
bis(2-chloroisopropyl)Ether	ND	0.250	mg/kg wet							
bis(2-Ethylhexyl)phthalate	ND	0.250	mg/kg wet							
Butylbenzylphthalate	ND	0.250	mg/kg wet							
Chrysene	ND	0.250	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.250	mg/kg wet							
Dibenzofuran	ND	0.250	mg/kg wet							
Diethylphthalate	ND	0.250	mg/kg wet							
Dimethylphthalate	ND	0.250	mg/kg wet							
Di-n-butylphthalate	ND	0.250	mg/kg wet							
Di-n-octylphthalate	ND	0.500	mg/kg wet							
Fluoranthene	ND	0.250	mg/kg wet							
Fluorene	ND	0.250	mg/kg wet							

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Semi-Volatile Organic Compounds										
Batch DG42407 - 3546										
Hexachlorobenzene	ND	0.250	mg/kg wet							
Hexachlorobutadiene	ND	0.250	mg/kg wet							
Hexachloroethane	ND	0.250	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.250	mg/kg wet							
Isophorone	ND	0.250	mg/kg wet							
Naphthalene	ND	0.250	mg/kg wet							
Nitrobenzene	ND	0.250	mg/kg wet							
N-Nitrosodimethylamine	ND	0.250	mg/kg wet							
Pentachlorophenol	ND	1.00	mg/kg wet							
Phenanthrene	ND	0.250	mg/kg wet							
Phenol	ND	0.250	mg/kg wet							
Pyrene	ND	0.250	mg/kg wet							
Pyridine	ND	0.250	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	*2.24*		mg/kg wet	*2.500*		*89*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*2.99*		mg/kg wet	*3.750*		*80*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.67*		mg/kg wet	*3.750*		*98*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.28*		mg/kg wet	*2.500*		*91*	*30-130*			
Surrogate: 2-Fluorophenol	*3.44*		mg/kg wet	*3.750*		*92*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.21*		mg/kg wet	*2.500*		*88*	*30-130*			
Surrogate: Phenol-d6	*3.52*		mg/kg wet	*3.750*		*94*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.68*		mg/kg wet	*2.500*		*107*	*30-130*			
LCS										
1,1-Biphenyl	2.38	0.025	mg/kg wet	2.500		95	40-140			
1,2,4-Trichlorobenzene	1.89	0.250	mg/kg wet	2.500		75	40-140			
1,2-Dichlorobenzene	2.18	0.250	mg/kg wet	2.500		87	40-140			
1,3-Dichlorobenzene	2.08	0.250	mg/kg wet	2.500		83	40-140			
1,4-Dichlorobenzene	2.15	0.250	mg/kg wet	2.500		86	40-140			
2,4,5-Trichlorophenol	2.51	0.250	mg/kg wet	2.500		101	30-130			
2,4,6-Trichlorophenol	2.40	0.250	mg/kg wet	2.500		96	30-130			
2,4-Dichlorophenol	2.03	0.250	mg/kg wet	2.500		81	30-130			
2,4-Dimethylphenol	2.00	0.250	mg/kg wet	2.500		80	30-130			
2,4-Dinitrophenol	1.63	1.00	mg/kg wet	2.500		65	15-140			
2,4-Dinitrotoluene	2.36	0.250	mg/kg wet	2.500		95	40-140			
2,6-Dinitrotoluene	2.45	0.250	mg/kg wet	2.500		98	40-140			
2-Chloronaphthalene	2.42	0.250	mg/kg wet	2.500		97	40-140			
2-Chlorophenol	2.37	0.250	mg/kg wet	2.500		95	30-130			
2-Methylnaphthalene	1.88	0.250	mg/kg wet	2.500		75	40-140			
2-Methylphenol	2.17	0.250	mg/kg wet	2.500		87	15-140			
2-Nitrophenol	2.12	0.500	mg/kg wet	2.500		85	30-130			
3,3´-Dichlorobenzidine	2.05	0.250	mg/kg wet	2.500		82	40-140			
3+4-Methylphenol	4.40	0.250	mg/kg wet	5.000		88	15-140			
4-Bromophenyl-phenylether	2.43	0.250	mg/kg wet	2.500		97	40-140			
4-Chloroaniline	1.91	0.250	mg/kg wet	2.500		76	15-140			
4-Nitrophenol	1.84	1.00	mg/kg wet	2.500		73	15-140			
Acenaphthene	2.21	0.250	mg/kg wet	2.500		89	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0835

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Semi-Volatile Organic Compounds										
Batch DG42407 - 3546										
Acenaphthylene	2.36	0.250	mg/kg wet	2.500		94	40-140			
Acetophenone	2.16	0.250	mg/kg wet	2.500		86	40-140			
Aniline	1.83	0.250	mg/kg wet	2.500		73	40-140			
Anthracene	2.52	0.250	mg/kg wet	2.500		101	40-140			
Azobenzene	2.25	0.250	mg/kg wet	2.500		90	40-140			
Benzo(a)anthracene	2.50	0.250	mg/kg wet	2.500		100	40-140			
Benzo(a)pyrene	2.62	0.250	mg/kg wet	2.500		105	40-140			
Benzo(b)fluoranthene	2.65	0.250	mg/kg wet	2.500		106	40-140			
Benzo(g,h,i)perylene	2.37	0.250	mg/kg wet	2.500		95	40-140			
Benzo(k)fluoranthene	2.50	0.250	mg/kg wet	2.500		100	40-140			
bis(2-Chloroethoxy)methane	1.82	0.250	mg/kg wet	2.500		73	40-140			
bis(2-Chloroethyl)ether	2.11	0.250	mg/kg wet	2.500		84	40-140			
bis(2-chloroisopropyl)Ether	1.94	0.250	mg/kg wet	2.500		77	40-140			
bis(2-Ethylhexyl)phthalate	2.74	0.250	mg/kg wet	2.500		109	40-140			
Butylbenzylphthalate	2.91	0.250	mg/kg wet	2.500		116	40-140			
Chrysene	2.44	0.250	mg/kg wet	2.500		98	40-140			
Dibenzo(a,h)Anthracene	2.41	0.250	mg/kg wet	2.500		96	40-140			
Dibenzofuran	2.17	0.250	mg/kg wet	2.500		87	40-140			
Diethylphthalate	2.47	0.250	mg/kg wet	2.500		99	40-140			
Dimethylphthalate	2.47	0.250	mg/kg wet	2.500		99	15-140			
Di-n-butylphthalate	2.79	0.250	mg/kg wet	2.500		112	40-140			
Di-n-octylphthalate	3.81	0.500	mg/kg wet	2.500		152	40-140			B+
Fluoranthene	2.49	0.250	mg/kg wet	2.500		100	40-140			
Fluorene	2.39	0.250	mg/kg wet	2.500		96	40-140			
Hexachlorobenzene	2.09	0.250	mg/kg wet	2.500		83	40-140			
Hexachlorobutadiene	1.90	0.250	mg/kg wet	2.500		76	40-140			
Hexachloroethane	2.15	0.250	mg/kg wet	2.500		86	40-140			
Indeno(1,2,3-cd)Pyrene	2.30	0.250	mg/kg wet	2.500		92	40-140			
Isophorone	1.74	0.250	mg/kg wet	2.500		69	40-140			
Naphthalene	1.87	0.250	mg/kg wet	2.500		75	40-140			
Nitrobenzene	1.77	0.250	mg/kg wet	2.500		71	40-140			
N-Nitrosodimethylamine	1.93	0.250	mg/kg wet	2.500		77	40-140			
Pentachlorophenol	1.70	1.00	mg/kg wet	2.500		68	15-140			
Phenanthrene	2.36	0.250	mg/kg wet	2.500		94	40-140			
Phenol	2.21	0.250	mg/kg wet	2.500		88	15-140			
Pyrene	2.83	0.250	mg/kg wet	2.500		113	40-140			
Pyridine	1.55	0.250	mg/kg wet	2.500		62	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	*2.21*		mg/kg wet	*2.500*		*88*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*3.29*		mg/kg wet	*3.750*		*88*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.69*		mg/kg wet	*3.750*		*98*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.37*		mg/kg wet	*2.500*		*95*	*30-130*			
Surrogate: 2-Fluorophenol	*3.29*		mg/kg wet	*3.750*		*88*	*30-130*			
Surrogate: Nitrobenzene-d5	*1.97*		mg/kg wet	*2.500*		*79*	*30-130*			
Surrogate: Phenol-d6	*3.46*		mg/kg wet	*3.750*		*92*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.69*		mg/kg wet	*2.500*		*108*	*30-130*			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0835

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Semi-Volatile Organic Compounds										
Batch DG42407 - 3546										
LCS Dup										
1,1-Biphenyl	2.28	0.025	mg/kg wet	2.500		91	40-140	4	30	
1,2,4-Trichlorobenzene	1.81	0.250	mg/kg wet	2.500		73	40-140	4	30	
1,2-Dichlorobenzene	2.07	0.250	mg/kg wet	2.500		83	40-140	5	30	
1,3-Dichlorobenzene	1.97	0.250	mg/kg wet	2.500		79	40-140	5	30	
1,4-Dichlorobenzene	2.02	0.250	mg/kg wet	2.500		81	40-140	6	30	
2,4,5-Trichlorophenol	2.28	0.250	mg/kg wet	2.500		91	30-130	10	30	
2,4,6-Trichlorophenol	2.23	0.250	mg/kg wet	2.500		89	30-130	8	30	
2,4-Dichlorophenol	1.88	0.250	mg/kg wet	2.500		75	30-130	8	30	
2,4-Dimethylphenol	1.81	0.250	mg/kg wet	2.500		72	30-130	10	30	
2,4-Dinitrophenol	1.32	1.00	mg/kg wet	2.500		53	15-140	21	30	
2,4-Dinitrotoluene	2.15	0.250	mg/kg wet	2.500		86	40-140	10	30	
2,6-Dinitrotoluene	2.24	0.250	mg/kg wet	2.500		89	40-140	9	30	
2-Chloronaphthalene	2.30	0.250	mg/kg wet	2.500		92	40-140	5	30	
2-Chlorophenol	2.16	0.250	mg/kg wet	2.500		86	30-130	9	30	
2-Methylnaphthalene	1.74	0.250	mg/kg wet	2.500		70	40-140	8	30	
2-Methylphenol	1.97	0.250	mg/kg wet	2.500		79	15-140	10	30	
2-Nitrophenol	1.98	0.500	mg/kg wet	2.500		79	30-130	7	30	
3,3´-Dichlorobenzidine	1.96	0.250	mg/kg wet	2.500		78	40-140	5	30	
3+4-Methylphenol	3.98	0.250	mg/kg wet	5.000		80	15-140	10	30	
4-Bromophenyl-phenylether	2.34	0.250	mg/kg wet	2.500		94	40-140	3	30	
4-Chloroaniline	1.77	0.250	mg/kg wet	2.500		71	15-140	8	30	
4-Nitrophenol	1.43	1.00	mg/kg wet	2.500		57	15-140	25	30	
Acenaphthene	2.11	0.250	mg/kg wet	2.500		85	40-140	5	30	
Acenaphthylene	2.20	0.250	mg/kg wet	2.500		88	40-140	7	30	
Acetophenone	1.96	0.250	mg/kg wet	2.500		79	40-140	9	30	
Aniline	1.66	0.250	mg/kg wet	2.500		66	40-140	10	30	
Anthracene	2.36	0.250	mg/kg wet	2.500		94	40-140	7	30	
Azobenzene	2.18	0.250	mg/kg wet	2.500		87	40-140	3	30	
Benzo(a)anthracene	2.36	0.250	mg/kg wet	2.500		94	40-140	6	30	
Benzo(a)pyrene	2.45	0.250	mg/kg wet	2.500		98	40-140	7	30	
Benzo(b)fluoranthene	2.29	0.250	mg/kg wet	2.500		92	40-140	15	30	
Benzo(g,h,i)perylene	2.36	0.250	mg/kg wet	2.500		95	40-140	0.2	30	
Benzo(k)fluoranthene	2.39	0.250	mg/kg wet	2.500		96	40-140	5	30	
bis(2-Chloroethoxy)methane	1.72	0.250	mg/kg wet	2.500		69	40-140	6	30	
bis(2-Chloroethyl)ether	1.96	0.250	mg/kg wet	2.500		79	40-140	7	30	
bis(2-chloroisopropyl)Ether	1.78	0.250	mg/kg wet	2.500		71	40-140	8	30	
bis(2-Ethylhexyl)phthalate	2.84	0.250	mg/kg wet	2.500		114	40-140	4	30	
Butylbenzylphthalate	2.87	0.250	mg/kg wet	2.500		115	40-140	1	30	
Chrysene	2.28	0.250	mg/kg wet	2.500		91	40-140	7	30	
Dibenzo(a,h)Anthracene	2.37	0.250	mg/kg wet	2.500		95	40-140	2	30	
Dibenzofuran	2.03	0.250	mg/kg wet	2.500		81	40-140	7	30	
Diethylphthalate	2.29	0.250	mg/kg wet	2.500		92	40-140	8	30	
Dimethylphthalate	2.27	0.250	mg/kg wet	2.500		91	15-140	8	30	
Di-n-butylphthalate	2.56	0.250	mg/kg wet	2.500		102	40-140	9	30	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0835

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Semi-Volatile Organic Compounds										
Batch DG42407 - 3546										
Di-n-octylphthalate	3.48	0.500	mg/kg wet	2.500		139	40-140	9	30	
Fluoranthene	2.12	0.250	mg/kg wet	2.500		85	40-140	16	30	
Fluorene	2.20	0.250	mg/kg wet	2.500		88	40-140	8	30	
Hexachlorobenzene	2.04	0.250	mg/kg wet	2.500		82	40-140	2	30	
Hexachlorobutadiene	1.82	0.250	mg/kg wet	2.500		73	40-140	4	30	
Hexachloroethane	2.03	0.250	mg/kg wet	2.500		81	40-140	6	30	
Indeno(1,2,3-cd)Pyrene	2.27	0.250	mg/kg wet	2.500		91	40-140	1	30	
Isophorone	1.63	0.250	mg/kg wet	2.500		65	40-140	6	30	
Naphthalene	1.76	0.250	mg/kg wet	2.500		70	40-140	6	30	
Nitrobenzene	1.64	0.250	mg/kg wet	2.500		66	40-140	8	30	
N-Nitrosodimethylamine	1.84	0.250	mg/kg wet	2.500		73	40-140	5	30	
Pentachlorophenol	1.46	1.00	mg/kg wet	2.500		58	15-140	15	30	
Phenanthrene	2.21	0.250	mg/kg wet	2.500		88	40-140	7	30	
Phenol	2.01	0.250	mg/kg wet	2.500		80	15-140	10	30	
Pyrene	2.96	0.250	mg/kg wet	2.500		118	40-140	4	30	
Pyridine	1.48	0.250	mg/kg wet	2.500		59	40-140	5	30	
Surrogate: 1,2-Dichlorobenzene-d4	*2.04*		mg/kg wet	*2.500*		*81*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*2.89*		mg/kg wet	*3.750*		*77*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.28*		mg/kg wet	*3.750*		*87*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.14*		mg/kg wet	*2.500*		*86*	*30-130*			
Surrogate: 2-Fluorophenol	*2.89*		mg/kg wet	*3.750*		*77*	*30-130*			
Surrogate: Nitrobenzene-d5	*1.76*		mg/kg wet	*2.500*		*70*	*30-130*			
Surrogate: Phenol-d6	*2.99*		mg/kg wet	*3.750*		*80*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.75*		mg/kg wet	*2.500*		*110*	*30-130*			
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch DG42305 - 3510C										
Blank										
C19-C36 Aliphatics1	ND	15.0	mg/kg wet							
C9-C18 Aliphatics1	ND	15.0	mg/kg wet							
Surrogate: 1-Chlorooctadecane	*1.53*		mg/kg wet	*2.000*		*77*	*40-140*			
Blank										
C11-C22 Unadjusted Aromatics1	ND	15.0	mg/kg wet							
Surrogate: 2-Bromonaphthalene	*1.93*		mg/kg wet	*2.000*		*97*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*1.96*		mg/kg wet	*2.000*		*98*	*40-140*			
Surrogate: O-Terphenyl	*1.67*		mg/kg wet	*2.000*		*84*	*40-140*			
Blank										
2-Methylnaphthalene	ND	0.008	mg/kg wet							
Acenaphthene	ND	0.008	mg/kg wet							
Acenaphthylene	ND	0.008	mg/kg wet							
Anthracene	ND	0.008	mg/kg wet							
Benzo(a)anthracene	ND	0.008	mg/kg wet							
Benzo(a)pyrene	ND	0.008	mg/kg wet							
Benzo(b)fluoranthene	ND	0.008	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.008	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0835

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch DG42305 - 3510C										
Benzo(k)fluoranthene	ND	0.008	mg/kg wet							
Chrysene	ND	0.008	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.008	mg/kg wet							
Fluoranthene	ND	0.008	mg/kg wet							
Fluorene	ND	0.008	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.008	mg/kg wet							
Naphthalene	ND	0.008	mg/kg wet							
Phenanthrene	0.009	0.008	mg/kg wet							
Pyrene	ND	0.008	mg/kg wet							
LCS										
C19-C36 Aliphatics1	15.8	15.0	mg/kg wet	16.00		99	40-140			
C9-C18 Aliphatics1	8.8	15.0	mg/kg wet	12.00		73	40-140			
Surrogate: 1-Chlorooctadecane	*1.66*		mg/kg wet	*2.000*		*83*	*40-140*			
LCS										
C11-C22 Unadjusted Aromatics1	31.2	15.0	mg/kg wet	34.00		92	40-140			
Surrogate: 2-Bromonaphthalene	*1.93*		mg/kg wet	*2.000*		*96*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*1.95*		mg/kg wet	*2.000*		*98*	*40-140*			
Surrogate: O-Terphenyl	*1.84*		mg/kg wet	*2.000*		*92*	*40-140*			
LCS										
2-Methylnaphthalene Breakthrough	0.0		%				0-5			
Naphthalene Breakthrough	0.0		%				0-5			
LCS										
2-Methylnaphthalene	1.29	0.040	mg/kg wet	2.000		65	40-140			
Acenaphthene	1.50	0.040	mg/kg wet	2.000		75	40-140			
Acenaphthylene	1.59	0.040	mg/kg wet	2.000		79	40-140			
Anthracene	1.66	0.040	mg/kg wet	2.000		83	40-140			
Benzo(a)anthracene	1.47	0.040	mg/kg wet	2.000		73	40-140			
Benzo(a)pyrene	1.64	0.040	mg/kg wet	2.000		82	40-140			
Benzo(b)fluoranthene	1.54	0.040	mg/kg wet	2.000		77	40-140			
Benzo(g,h,i)perylene	1.85	0.040	mg/kg wet	2.000		92	40-140			
Benzo(k)fluoranthene	1.62	0.040	mg/kg wet	2.000		81	40-140			
Chrysene	1.60	0.040	mg/kg wet	2.000		80	40-140			
Dibenzo(a,h)Anthracene	1.87	0.040	mg/kg wet	2.000		94	40-140			
Fluoranthene	1.80	0.040	mg/kg wet	2.000		90	40-140			
Fluorene	1.54	0.040	mg/kg wet	2.000		77	40-140			
Indeno(1,2,3-cd)Pyrene	1.83	0.040	mg/kg wet	2.000		91	40-140			
Naphthalene	1.46	0.040	mg/kg wet	2.000		73	40-140			
Phenanthrene	1.45	0.040	mg/kg wet	2.000		73	40-140			
Pyrene	1.49	0.040	mg/kg wet	2.000		74	40-140			
LCS Dup										
C19-C36 Aliphatics1	16.3	15.0	mg/kg wet	16.00		102	40-140	3	25	
C9-C18 Aliphatics1	9.4	15.0	mg/kg wet	12.00		79	40-140	7	25	
Surrogate: 1-Chlorooctadecane	*1.40*		mg/kg wet	*2.000*		*70*	*40-140*			
LCS Dup										

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch DG42305 - 3510C										
C11-C22 Unadjusted Aromatics1	33.2	15.0	mg/kg wet	34.00		98	40-140	6	25	
Surrogate: 2-Bromonaphthalene	*1.87*		mg/kg wet	*2.000*		*94*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*1.92*		mg/kg wet	*2.000*		*96*	*40-140*			
Surrogate: O-Terphenyl	*1.88*		mg/kg wet	*2.000*		*94*	*40-140*			
LCS Dup										
2-Methylnaphthalene Breakthrough	0.0		%				0-5		200	
Naphthalene Breakthrough	0.0		%				0-5		200	
LCS Dup										
2-Methylnaphthalene	1.48	0.040	mg/kg wet	2.000		74	40-140	14	30	
Acenaphthene	1.61	0.040	mg/kg wet	2.000		81	40-140	7	30	
Acenaphthylene	1.65	0.040	mg/kg wet	2.000		82	40-140	4	30	
Anthracene	1.78	0.040	mg/kg wet	2.000		89	40-140	7	30	
Benzo(a)anthracene	1.60	0.040	mg/kg wet	2.000		80	40-140	9	30	
Benzo(a)pyrene	1.77	0.040	mg/kg wet	2.000		88	40-140	8	30	
Benzo(b)fluoranthene	1.73	0.040	mg/kg wet	2.000		87	40-140	12	30	
Benzo(g,h,i)perylene	1.89	0.040	mg/kg wet	2.000		95	40-140	2	30	
Benzo(k)fluoranthene	1.81	0.040	mg/kg wet	2.000		90	40-140	11	30	
Chrysene	1.77	0.040	mg/kg wet	2.000		88	40-140	10	30	
Dibenzo(a,h)Anthracene	1.96	0.040	mg/kg wet	2.000		98	40-140	5	30	
Fluoranthene	1.91	0.040	mg/kg wet	2.000		95	40-140	6	30	
Fluorene	1.71	0.040	mg/kg wet	2.000		86	40-140	11	30	
Indeno(1,2,3-cd)Pyrene	1.90	0.040	mg/kg wet	2.000		95	40-140	4	30	
Naphthalene	1.58	0.040	mg/kg wet	2.000		79	40-140	8	30	
Phenanthrene	1.56	0.040	mg/kg wet	2.000		78	40-140	7	30	
Pyrene	1.78	0.040	mg/kg wet	2.000		89	40-140	18	30	
Classical Chemistry										
Batch DG42420 - TCN Prep										
Blank										
Total Cyanide	ND	1.00	mg/kg wet							
LCS										
Total Cyanide	4.92	1.00	mg/kg wet	5.015		98	90-110			
Reference										
Total Cyanide	183	25.0	mg/kg wet	183.0		100	22-121			
Reference										
Total Cyanide	185	25.0	mg/kg wet	183.0		101	22-121			
Batch DG42435 - General Preparation										
Blank										
Conductivity	ND	5	umhos/cm							
LCS										
Conductivity	1280		umhos/cm	1410		91	90-110			
Batch DG42442 - General Preparation										
Blank										

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0835

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Classical Chemistry										
Batch DG42442 - General Preparation										
Sulfide	ND	0.05	mg/kg wet							
LCS										
Sulfide	0.5		mg/L	0.5000		99	85-115			
Batch DG42451 - General Preparation										
Reference										
Flashpoint	81		°F	81.00		100	97.9-102.1			
Batch DG42539 - General Preparation										
Blank										
Sulfate	ND	5	mg/kg wet							
LCS										
Sulfate	10		mg/L	9.988		98	80-120			
Batch DG42545 - General Preparation										
Blank										
Reactive Cyanide	ND	2.0	mg/kg							
Reactive Sulfide	ND	2.0	mg/kg							
LCS										
Reactive Cyanide	4.1	2.0	mg/kg	100.3		4	0.68-5.41			
Reactive Sulfide	2.2	2.0	mg/kg	10.00		22	0-44			
Batch DG42952 - General Preparation										
Blank										
Total Organic Carbon (1)	ND	500	mg/kg							
Total Organic Carbon (2)	ND	500	mg/kg							
LCS										
Total Organic Carbon (1)	8850	500	mg/kg	10010		88	80-120			
Total Organic Carbon (2)	9530	500	mg/kg	10010		95	80-120			
LCS Dup										
Total Organic Carbon (1)	8530	500	mg/kg	10010		85	80-120	4	25	
Total Organic Carbon (2)	9260	500	mg/kg	10010		92	80-120	3	25	
Batch DH40640 - General Preparation										
Blank										
Hexavalent Chromium	ND	0.7	mg/kg wet							
LCS										
Hexavalent Chromium	31.5	0.7	mg/kg wet	33.32		95	80-120			
LCS Dup										
Hexavalent Chromium	31.6	0.7	mg/kg wet	33.32		95	80-120	0.4	20	
Reference										
Hexavalent Chromium	360	7.9	mg/kg wet	384.3		94	62-138			
8082 Polychlorinated Biphenyls (PCB) / Congeners										
Batch DG42401 - 3540C										
Blank										

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0835

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082 Polychlorinated Biphenyls (PCB) / Congeners										
Batch DG42401 - 3540C										
BZ#101	ND	0.00027	mg/kg wet							
BZ#101 [2C]	ND	0.00027	mg/kg wet							
BZ#105	ND	0.00027	mg/kg wet							
BZ#105 [2C]	ND	0.00027	mg/kg wet							
BZ#118	ND	0.00027	mg/kg wet							
BZ#118 [2C]	ND	0.00027	mg/kg wet							
BZ#128	ND	0.00027	mg/kg wet							
BZ#128 [2C]	ND	0.00027	mg/kg wet							
BZ#138	ND	0.00027	mg/kg wet							
BZ#138 [2C]	ND	0.00027	mg/kg wet							
BZ#153	ND	0.00027	mg/kg wet							
BZ#153 [2C]	ND	0.00027	mg/kg wet							
BZ#170	ND	0.00027	mg/kg wet							
BZ#170 [2C]	ND	0.00027	mg/kg wet							
BZ#18	ND	0.00027	mg/kg wet							
BZ#18 [2C]	ND	0.00027	mg/kg wet							
BZ#180	ND	0.00027	mg/kg wet							
BZ#180 [2C]	ND	0.00027	mg/kg wet							
BZ#187	ND	0.00027	mg/kg wet							
BZ#187 [2C]	ND	0.00027	mg/kg wet							
BZ#195	ND	0.00027	mg/kg wet							
BZ#195 [2C]	ND	0.00027	mg/kg wet							
BZ#206	ND	0.00027	mg/kg wet							
BZ#206 [2C]	ND	0.00027	mg/kg wet							
BZ#209	ND	0.00027	mg/kg wet							
BZ#209 [2C]	ND	0.00027	mg/kg wet							
BZ#28	ND	0.00027	mg/kg wet							
BZ#28 [2C]	ND	0.00027	mg/kg wet							
BZ#44	ND	0.00027	mg/kg wet							
BZ#44 [2C]	ND	0.00027	mg/kg wet							
BZ#52	ND	0.00027	mg/kg wet							
BZ#52 [2C]	ND	0.00027	mg/kg wet							
BZ#66	ND	0.00027	mg/kg wet							
BZ#66 [2C]	ND	0.00027	mg/kg wet							
BZ#8	ND	0.00027	mg/kg wet							
BZ#8 [2C]	ND	0.00027	mg/kg wet							
Surrogate: Tetrachloro-m-xylene	*0.00234*		mg/kg wet	*0.003333*		*70*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.00241*		mg/kg wet	*0.003333*		*72*	*30-150*			
LCS										
BZ#101	0.00235	0.00027	mg/kg wet	0.003333		71	40-140			
BZ#101 [2C]	0.00241	0.00027	mg/kg wet	0.003333		72	40-140			
BZ#105	0.00274	0.00027	mg/kg wet	0.003333		82	40-140			
BZ#105 [2C]	0.00275	0.00027	mg/kg wet	0.003333		83	40-140			
BZ#118	0.00251	0.00027	mg/kg wet	0.003333		75	40-140			
BZ#118 [2C]	0.00255	0.00027	mg/kg wet	0.003333		77	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0835

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082 Polychlorinated Biphenyls (PCB) / Congeners										
Batch DG42401 - 3540C										
BZ#128	0.00257	0.00027	mg/kg wet	0.003333		77	40-140			
BZ#128 [2C]	0.00259	0.00027	mg/kg wet	0.003333		78	40-140			
BZ#138	0.00253	0.00027	mg/kg wet	0.003333		76	40-140			
BZ#138 [2C]	0.00259	0.00027	mg/kg wet	0.003333		78	40-140			
BZ#153	0.00245	0.00027	mg/kg wet	0.003333		74	40-140			
BZ#153 [2C]	0.00251	0.00027	mg/kg wet	0.003333		75	40-140			
BZ#170	0.00262	0.00027	mg/kg wet	0.003333		79	40-140			
BZ#170 [2C]	0.00264	0.00027	mg/kg wet	0.003333		79	40-140			
BZ#18	0.00239	0.00027	mg/kg wet	0.003333		72	40-140			
BZ#18 [2C]	0.00237	0.00027	mg/kg wet	0.003333		71	40-140			
BZ#180	0.00258	0.00027	mg/kg wet	0.003333		77	40-140			
BZ#180 [2C]	0.00264	0.00027	mg/kg wet	0.003333		79	40-140			
BZ#187	0.00248	0.00027	mg/kg wet	0.003333		74	40-140			
BZ#187 [2C]	0.00248	0.00027	mg/kg wet	0.003333		74	40-140			
BZ#195	0.00256	0.00027	mg/kg wet	0.003333		77	40-140			
BZ#195 [2C]	0.00260	0.00027	mg/kg wet	0.003333		78	40-140			
BZ#206	0.00260	0.00027	mg/kg wet	0.003333		78	40-140			
BZ#206 [2C]	0.00257	0.00027	mg/kg wet	0.003333		77	40-140			
BZ#209	0.00253	0.00027	mg/kg wet	0.003333		76	40-140			
BZ#209 [2C]	0.00243	0.00027	mg/kg wet	0.003333		73	40-140			
BZ#28	0.00263	0.00027	mg/kg wet	0.003333		79	40-140			
BZ#28 [2C]	0.00264	0.00027	mg/kg wet	0.003333		79	40-140			
BZ#44	0.00242	0.00027	mg/kg wet	0.003333		72	40-140			
BZ#44 [2C]	0.00243	0.00027	mg/kg wet	0.003333		73	40-140			
BZ#52	0.00242	0.00027	mg/kg wet	0.003333		73	40-140			
BZ#52 [2C]	0.00277	0.00027	mg/kg wet	0.003333		83	40-140			
BZ#66	0.00261	0.00027	mg/kg wet	0.003333		78	40-140			
BZ#66 [2C]	0.00246	0.00027	mg/kg wet	0.003333		74	40-140			
BZ#8	0.00236	0.00027	mg/kg wet	0.003333		71	40-140			
BZ#8 [2C]	0.00269	0.00027	mg/kg wet	0.003333		81	40-140			
Surrogate: Tetrachloro-m-xylene	*0.00236*		mg/kg wet	*0.003333*		*71*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.00244*		mg/kg wet	*0.003333*		*73*	*30-150*			
LCS Dup										
BZ#101	0.00233	0.00027	mg/kg wet	0.003333		70	40-140	1	30	
BZ#101 [2C]	0.00239	0.00027	mg/kg wet	0.003333		72	40-140	1	30	
BZ#105	0.00265	0.00027	mg/kg wet	0.003333		80	40-140	3	30	
BZ#105 [2C]	0.00261	0.00027	mg/kg wet	0.003333		78	40-140	5	30	
BZ#118	0.00246	0.00027	mg/kg wet	0.003333		74	40-140	2	30	
BZ#118 [2C]	0.00248	0.00027	mg/kg wet	0.003333		74	40-140	3	30	
BZ#128	0.00251	0.00027	mg/kg wet	0.003333		75	40-140	3	30	
BZ#128 [2C]	0.00254	0.00027	mg/kg wet	0.003333		76	40-140	2	30	
BZ#138	0.00248	0.00027	mg/kg wet	0.003333		74	40-140	2	30	
BZ#138 [2C]	0.00252	0.00027	mg/kg wet	0.003333		76	40-140	2	30	
BZ#153	0.00241	0.00027	mg/kg wet	0.003333		72	40-140	2	30	
BZ#153 [2C]	0.00240	0.00027	mg/kg wet	0.003333		72	40-140	4	30	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0835

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082 Polychlorinated Biphenyls (PCB) / Congeners										
Batch DG42401 - 3540C										
BZ#170	0.00255	0.00027	mg/kg wet	0.003333		76	40-140	3	30	
BZ#170 [2C]	0.00256	0.00027	mg/kg wet	0.003333		77	40-140	3	30	
BZ#18	0.00236	0.00027	mg/kg wet	0.003333		71	40-140	1	30	
BZ#18 [2C]	0.00229	0.00027	mg/kg wet	0.003333		69	40-140	4	30	
BZ#180	0.00251	0.00027	mg/kg wet	0.003333		75	40-140	2	30	
BZ#180 [2C]	0.00258	0.00027	mg/kg wet	0.003333		78	40-140	2	30	
BZ#187	0.00244	0.00027	mg/kg wet	0.003333		73	40-140	1	30	
BZ#187 [2C]	0.00245	0.00027	mg/kg wet	0.003333		73	40-140	1	30	
BZ#195	0.00249	0.00027	mg/kg wet	0.003333		75	40-140	3	30	
BZ#195 [2C]	0.00254	0.00027	mg/kg wet	0.003333		76	40-140	2	30	
BZ#206	0.00250	0.00027	mg/kg wet	0.003333		75	40-140	4	30	
BZ#206 [2C]	0.00246	0.00027	mg/kg wet	0.003333		74	40-140	4	30	
BZ#209	0.00243	0.00027	mg/kg wet	0.003333		73	40-140	4	30	
BZ#209 [2C]	0.00236	0.00027	mg/kg wet	0.003333		71	40-140	3	30	
BZ#28	0.00249	0.00027	mg/kg wet	0.003333		75	40-140	5	30	
BZ#28 [2C]	0.00259	0.00027	mg/kg wet	0.003333		78	40-140	2	30	
BZ#44	0.00238	0.00027	mg/kg wet	0.003333		71	40-140	1	30	
BZ#44 [2C]	0.00240	0.00027	mg/kg wet	0.003333		72	40-140	1	30	
BZ#52	0.00234	0.00027	mg/kg wet	0.003333		70	40-140	3	30	
BZ#52 [2C]	0.00273	0.00027	mg/kg wet	0.003333		82	40-140	1	30	
BZ#66	0.00259	0.00027	mg/kg wet	0.003333		78	40-140	0.8	30	
BZ#66 [2C]	0.00243	0.00027	mg/kg wet	0.003333		73	40-140	1	30	
BZ#8	0.00241	0.00027	mg/kg wet	0.003333		72	40-140	2	30	
BZ#8 [2C]	0.00268	0.00027	mg/kg wet	0.003333		80	40-140	0.7	30	
Surrogate: Tetrachloro-m-xylene	*0.00230*		mg/kg wet	*0.003333*		*69*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.00239*		mg/kg wet	*0.003333*		*72*	*30-150*			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0835

Notes and Definitions

LC	Lower value is used due to matrix interferences (LC).
B	Present in Method Blank (B).
B-	Blank Spike recovery is below lower control limit (B-).
B+	Blank Spike recovery is above upper control limit (B+).
BT	Benzidine tailing factor >2.
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
D	Diluted.
D+	Relative percent difference for duplicate is outside of criteria (D+).
>	Greater than.
H	Estimated value. Sample hold times were exceeded (H).
Z18	Temperature is not within 23 +/-2 ºC.
O	Test performed from a previously opened container
P	Percent difference between primary and confirmation results exceeds 40% (P).
Q	Calibration required quadratic regression (Q).
RRF	Analyte does not meet the Relative Response Factor (RRF) criteria in the calibration
U	Analyte included in the analysis, but not detected
WL	Results obtained from a deionized water leach of the sample.
Z17	Temperature is within 23 +/-2 ºC.
E	Reported above the quantitation limit; Estimated value (E).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probable Number
TNTC	Too numerous to Count
CFU	Colony Forming Units

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0835

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Sterling Analytical, Inc.
15 Agawam Avenue
West Springfield, MA 01089
Phone (413) 214-6541 Fax (413) 214-6842

Visit our website: www.sterlinganalytical.com

Report Date August 2, 2024

Customer	Contact	Laboratory Supervisor	eMail
ESS Laboratory	S. Morrell	Dale Percoski	customerservice@sterlinganalytical.com

Sample Description
Analysis of Soil Samples

Samples Analyzed

Enclosed are Report No(s): 83665..83668

*Results reported on 'Dry Basis'.

Sulfur Total Blank = <0.05ppm

LCS Lo Check 0.100 = 0.106ppm

ICV 1.00 = 1.050ppm

Thank you for your business

Dale Percoski

Dale Percoski, Laboratory Supervisor

8/2/2024

Date

ALL the information contained in this report has been reviewed for accuracy and checked against all quality control requirements outlined in each applicable method.
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Sample	Description	Source	Taken/Time	Received
83665	24G0835-01	ESS Laboratory	7/22/24 08:30	7/24/24

Parameter	Results		RDL	Method	Analyzed/Time	Tech
Sulfur, Total	1,980	mg/kg	100.00	SW 846 6010	07/31/24	dfp

Sample	Description	Source	Taken/Time	Received
83666	24G0835-03	ESS Laboratory	7/22/24 12:13	7/24/24

Parameter	Results		RDL	Method	Analyzed/Time	Tech
Sulfur, Total	2,480	mg/kg	100.00	SW 846 6010	07/31/24	dfp

Sample	Description	Source	Taken/Time	Received
83667	24G0835-05	ESS Laboratory	7/22/24 12:52	7/24/24

Parameter	Results		RDL	Method	Analyzed/Time	Tech
Sulfur, Total	795	mg/kg	100.00	SW 846 6010	07/31/24	dfp

Sample	Description	Source	Taken/Time	Received
83668	24G0835-07	ESS Laboratory	7/22/24 15:40	7/24/24

Parameter	Results		RDL	Method	Analyzed/Time	Tech
Sulfur, Total	1,710	mg/kg	100.00	SW 846 6010	07/31/24	dfp

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

Shipped/Delivered Via: ESS Courier

ESS Project ID: 24G0835
Date Received: 7/23/2024
Project Due Date: 7/30/2024
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 2 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** (Yes) / No / NA
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? (Yes) / No
    ESS Sample IDs: **1,3,5,7**
    Analysis: **T. Sulfur**
    TAT: **5 day**
12. Were VOAs received? (Yes) / No
    a. Air bubbles in aqueous VOAs? Yes / (No)
    b. Does methanol cover soil completely? (Yes) / No / NA
13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: _____ Time: _____ By/Acid Lot#: _____
    b. If dissolved metals are requested, are they: Yes / No Field Filtered Yes / No To Be Lab Filtered
    c. Low Level VOA vials frozen: Date: 7/23/24 Time: 1732 By: [signature]

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / No
    Who was contacted? _____ Date: _____ Time: _____ By: _____

Resolution:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1	574843	Yes	N/A	Yes	8 oz jar	NP	
1	574844	Yes	N/A	Yes	8 oz jar	NP	
1	575071	Yes	N/A	Yes	4 oz. Jar	NP	
2	574827	Yes	N/A	Yes	VOA Vial	DI Water	
2	574828	Yes	N/A	Yes	VOA Vial	DI Water	
2	574835	Yes	N/A	Yes	VOA Vial	MeOH	
2	574839	Yes	N/A	Yes	4 oz. Jar	NP	
3	574845	Yes	N/A	Yes	8 oz jar	NP	
3	574846	Yes	N/A	Yes	8 oz jar	NP	
3	575072	Yes	N/A	Yes	4 oz. Jar	NP	
4	574829	Yes	N/A	Yes	VOA Vial	DI Water	
4	574830	Yes	N/A	Yes	VOA Vial	DI Water	
4	574836	Yes	N/A	Yes	VOA Vial	MeOH	
4	574840	Yes	N/A	Yes	4 oz. Jar	NP	
5	574847	Yes	N/A	Yes	8 oz jar	NP	
5	574848	Yes	N/A	Yes	8 oz jar	NP	
5	575073	Yes	N/A	Yes	4 oz. Jar	NP	
6	574831	Yes	N/A	Yes	VOA Vial	DI Water	
6	574832	Yes	N/A	Yes	VOA Vial	DI Water	
6	574837	Yes	N/A	Yes	VOA Vial	MeOH	

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

ESS Project ID: 24G0835
Date Received: 7/23/2024

6	574841	Yes	N/A	Yes	4 oz. Jar	NP
7	574849	Yes	N/A	Yes	8 oz jar	NP
7	574850	Yes	N/A	Yes	8 oz jar	NP
7	575074	Yes	N/A	Yes	4 oz. Jar	NP
8	574833	Yes	N/A	Yes	VOA Vial	DI Water
8	574834	Yes	N/A	Yes	VOA Vial	DI Water
8	574838	Yes	N/A	Yes	VOA Vial	MeOH
8	574842	Yes	N/A	Yes	4 oz. Jar	NP

2nd Review

Were all containers scanned into storage/lab? Initials TD

Are barcode labels on correct containers? Yes / No

Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA

Are all Hex Chrome stickers attached? Yes / No / NA

Are all QC stickers attached? Yes / No / NA

Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: [signature] Date & Time: 7/23/24 1719.

Reviewed By: [signature] Date & Time: 7/23/24 1732

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 24G0835

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman
781-721-4091 rhoffman@geiconsultants.com

Send Report to: Ryan Hoffman
labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY AND MCP ANALYTICAL METHODS REQUIRED: (YES) NO

STATE AND FEDERAL REGULATORY REQUIREMENTS/REPORT LIMITS

State/Federal Program: (MA) 401WQC Other _____ NH RI CT NY ME

MA MCP Criteria are Method 1 S-1 and GW-2/GW-3. Circle if GW-1 is required.

Sample Handling

Samples Field Filtered: YES (NO) NA

Sampled Shipped With Ice: (YES) NO

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Preservative: H2O/MeOH	None	None	None	None	None	None	None	None	Analysis: VOCs 8260*	SVOCs 8270 by SIM**	PCB NOAA Summation of Congeners	RCRA 8 Metals + Cu, Ni, Zn***	EPH (fractions only)	Corrosivity, Ignit., React., Conductivity	Total Cyanide	Total Sulfur, Total Sulfide, Total Sulfate	TOC by Lloyd-Kahn
1	1804576-883-0-2'	7/22/2024	8:30	SO	3	SW		X	X	X	X	X	X	X	X
2	1804576-883-0.5'	7/22/2024	8:31	SO	4	SW	X								
3	1804576-877-0-2' *	7/22/2024	12:13	SO	3	SW		X	X	X	X	X	X	X	X
4	1804576-877-0.5'	7/22/2024	12:12	SO	4	SW	X								
5	1804576-874-0-2'	7/22/2024	12:52	SO	3	SW		X	X	X	X	X	X	X	X
6	1804576-874-0.5'	7/22/2024	12:53	SO	4	SW	X								
7	1804576-884-0-2'	7/22/2024	15:40	SO	3	SW		X	X	X	X	X	X	X	X
8	1804576-884-0.5'	7/22/2024	15:51	SO	4	SW	X								

ML - 8/23/24
Add TCLP VOC (vinyl chloride)
Add HexCr and TCLP Cr to 24G0835-03
8/5/24 MLP

Relinquished by sampler: (signature) 1. Daniel Hill	Date: 7/22/24	Time: 17:45	Received by: (signature) GEI Field Room
Relinquished by sampler: (signature) 2. GEI Field Room	Date: 7/23/24	Time: 1130	Received by: (signature) 2.
Relinquished by: (signature) 3.	Date: 7/23/24	Time: 1130	Received by: (signature) 3. 7/23/24 1130
Relinquished by: (signature) 4. 2.0 ona	Date: 7/23/24	Time: 1615	Received by: (signature) 4.
Relinquished by: (signature) 5.	Date:	Time:	Received by: (signature) 5.

Turnaround Time (Business days):

ndard TAT X 4-Day ____ 3-Day ____
-Day ____ 1-Day ____ Other ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

*** Run TCLP benzene if total >20x**

**** Include pyridene and ~~toxaphene~~** DJM 7/23/24

*****Run TCLP metals if total >20x**

Sample Matrix Abbreviations: SO = Soil GW = Groundwater SW = Surface Water SD = Sediment CO = Concrete PC = Paint Chip CLK = Caulk

ESS Laboratory
DIVISION OF THE RISE GROUP

BAL Laboratory Analytical Balance

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP - 401WQ - MCP (1804576)
ESS Laboratory Work Order Number: 24G0906

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 3:25 pm, Aug 09, 2024

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses

Sterling Analytical Lab - West Springfield, MA	Sulfur, Sulfur (Subcontracted)

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0906

SAMPLE RECEIPT

The following samples were received on July 24, 2024 for the analyses specified on the enclosed Chain of Custody Record.

To achieve CAM compliance for MCP data, ESS Laboratory has reviewed all QA/QC Requirements and Performance Standards listed in each method. Holding times and preservation have also been reviewed. All CAM requirements have been performed and achieved unless noted in the project narrative.

Each method has been set-up in the laboratory to reach required MCP standards. The methods for aqueous VOA and Soil Methanol VOA have known limitations for certain analytes. The regulatory standards may not be achieved due to these limitations. In addition, for all methods, matrix interferences, dilutions, and %Solids may elevate method reporting limits above regulatory standards. ESS Laboratory can provide, upon request, a Limit Checker (regulatory standard comparison spreadsheet) electronic deliverable which will highlight these exceedances.

Low Level VOA vials were frozen by ESS Laboratory on July 24, 2024 at 17:44.

Sample ID(s) 24G0906-01, 24G0906-03 and 24G0906-05 for Metals were oven dried at 60 degrees Celsius prior to digestion and relogged in as Sample ID(s) 24G0906-07, 24G0906-08 and 24G0906-09. This was done to increase the dry weight of the sample digested which decreases variability of results and lowers the detection limits for samples with high water content.

Question I: All samples for Metals were analyzed for a subset of the required MCP list per the client's request.

Revision 1 August 9, 2024: This report has been revised to include Hexavalent Chromium and TCLP Chromium on sample 24G0906-03.

Lab Number	Sample Name	Matrix	Analysis
24G0906-01	1804576-886 0-2ft	Soil	1010A, 1311, 1311/6010D, 2550B, 6010, 6010D, 7.3.3.2, 7.3.4.1, 7471B, 8082A Cong, 8270E, 9014, 9030B, 9038, 9045, 9050A, EPH8270, EPH8270SIM, LK, MADEP-EPH
24G0906-02	1804576-886 0.5ft	Soil	8260D Low
24G0906-03	1804576-885 0-2ft	Soil	1010A, 1311, 1311/6010D, 2550B, 2580, 6010, 6010D, 7.3.3.2, 7.3.4.1, 7196A, 7471B, 8082A Cong, 8270E, 9014, 9030B, 9038, 9045, 9050A, EPH8270, EPH8270SIM, LK, MADEP-EPH
24G0906-04	1804576-885 0.5ft	Soil	8260D Low

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0906

24G0906-05	1804576-887 0-2ft	Soil	1010A, 1311, 1311/6010D, 2550B, 6010, 6010D, 7.3.3.2, 7.3.4.1, 7471B, 8082A Cong, 8270E, 9014, 9030B, 9038, 9045, 9050A, EPH8270, EPH8270SIM, LK, MADEP-EPH
24G0906-06	1804576-887 0.5ft	Soil	8260D Low
24G0906-07	1804576-886 0-2ft - Oven Dried	Soil	6010D, 7471B
24G0906-08	1804576-885 0-2ft - Oven Dried	Soil	6010D, 7471B
24G0906-09	1804576-887 0-2ft - Oven Dried	Soil	6010D, 7471B

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0906

PROJECT NARRATIVE

8082 Polychlorinated Biphenyls (PCB) / Congeners

24G0906-01	**Lower value is used due to matrix interferences (LC).**
	BZ#105 , BZ#18 [2C] , BZ#8 [2C]
24G0906-01	**Percent difference between primary and confirmation results exceeds 40% (P).**
	BZ#105 , BZ#18 [2C] , BZ#8 [2C]
24G0906-03	**Lower value is used due to matrix interferences (LC).**
	BZ#105 , BZ#170 , BZ#195 [2C]
24G0906-03	**Percent difference between primary and confirmation results exceeds 40% (P).**
	BZ#105 , BZ#170 , BZ#195 [2C]
24G0906-05	**Lower value is used due to matrix interferences (LC).**
	BZ#105 , BZ#138 , BZ#170 , BZ#187 , BZ#206
24G0906-05	**Percent difference between primary and confirmation results exceeds 40% (P).**
	BZ#105 , BZ#138 , BZ#170 , BZ#18 [2C] , BZ#187 , BZ#206

Classical Chemistry

24G0906-03	**Estimated value. Sample hold times were exceeded (H).**
	Eh (ORP)
24G0906-03	**Test performed from a previously opened container**
	Hexavalent Chromium

Semi-Volatile Organic Compounds

D4G0572-CCV1	**Analyte does not meet the Relative Response Factor (RRF) criteria in the calibration**
	2,4-Dinitrophenol (88% @ 40-160%)
D4G0572-CCV1	**Calibration required quadratic regression (Q).**
	2,4-Dinitrophenol (88% @ 40-160%), Pentachlorophenol (95% @ 40-160%)
D4G0572-CCV1	**Continuing Calibration %Diff/Drift is above control limit (CD+).**
	Fluoranthene (20% @ 20%)
D4G0572-TUN1	**Benzidine tailing factor >2.**
D4G0572-TUN1	**Pentachlorophenol tailing factor > 2.**

Volatile Organics Low Level

D4G0616-CCV1	**Calibration required quadratic regression (Q).**
	1,2-Dibromo-3-Chloropropane (116% @ 80-120%), Naphthalene (109% @ 40-160%)
DG42927-BSD1	**Relative percent difference for duplicate is outside of criteria (D+).**
	Acetone (22% @ 20%)

No other observations noted.

End of Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0906

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010D - ICP
6020B - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260D - VOA
8270E - SVOA
8270E SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 19-2.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0906

MassDEP Analytical Protocol Certification Form

MADEP RTN: _____

This form provides certification for the following data set: **24G0906-01 through 24G0906-09**

Matrices: ( ) Ground Water/Surface Water (X) Soil/Sediment ( ) Drinking Water ( ) Air ( ) Other:_____

CAM Protocol (check all that apply below):

(X) 8260 VOC CAM II A	(X) 7470/7471 Hg CAM III B	( ) MassDEP VPH (GC/PID/FID) CAM IV A	(X) 8082 PCB CAM V A	(X) 9014 Total Cyanide/PAC CAM VI A	( ) 6860 Perchlorate CAM VIII B
(X) 8270 SVOC CAM II B	( ) 7010 Metals CAM III C	( ) MassDEP VPH (GC/MS) CAM IV C	( ) 8081 Pesticides CAM V B	(X) 7196 Hex Cr CAM VI B	( ) MassDEP APH CAM IX A
(X) 6010 Metals CAM III A	( ) 6020 Metals CAM III D	(X) MassDEP EPH CAM IV B	( ) 8151 Herbicides CAM V C	( ) Explosives CAM VIII A	( ) TO-15 VOC CAM IX B

Affirmative responses to questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	Yes ( ) No (X)
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	Yes (X) No ( )
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	Yes (X) No ( )
D	Does the laboratory report comply with all the reporting requirements specified in the CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	Yes (X) No ( )
E	VPH, EPH, APH and TO-15 only: a. Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	Yes (X) No ( )
	b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	Yes ( ) No ( )
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	Yes (X) No ( )

Responses to Questions G, H and I below are required for "'Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocols(s)?	Yes ( ) No (X)*
	***Data User Note:* Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.**	
H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	Yes ( ) No (X)*
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	Yes ( ) No (X)*

All negative responses must be addressed in an attached laboratory narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature: _____ Date: August 09, 2024
Printed Name: Laurel Stoddard Position: Laboratory Director

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-886 0-2ft
Date Sampled: 07/23/24 13:15
Percent Solids: 67

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-01
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	IV / FV	Batch
Arsenic	**11.3** (1.45)	---	6010D	---	1	KJB	07/26/24 12:37	2.07 100	DG42509
Barium	**49.5** (1.45)	---	6010D	---	1	KJB	07/26/24 12:37	2.07 100	DG42509
Cadmium	**1.02** (0.72)	---	6010D	---	1	KJB	07/26/24 12:37	2.07 100	DG42509
Chromium	**31.1** (1.45)	---	6010D	---	1	KJB	07/26/24 12:37	2.07 100	DG42509
Copper	**66.7** (3.62)	---	6010D	---	1	KJB	07/26/24 12:37	2.07 100	DG42509
Lead	**202** (7.25)	---	6010D	---	1	KJB	07/26/24 12:37	2.07 100	DG42509
Mercury	**0.728** (0.045)	---	7471B	---	1	AFV	07/25/24 20:03	0.66 40	DG42510
Nickel	**15.4** (1.45)	---	6010D	---	1	KJB	07/26/24 12:37	2.07 100	DG42509
Selenium	ND (7.25)	---	6010D	---	1	KJB	07/26/24 12:37	2.07 100	DG42509
Silver	ND (0.72)	---	6010D	---	1	KJB	07/26/24 12:37	2.07 100	DG42509
Zinc	**125** (3.62)	---	6010D	---	1	KJB	07/26/24 12:37	2.07 100	DG42509

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-886 0-2ft
Date Sampled: 07/23/24 13:15
Percent Solids: 67

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-01
Sample Matrix: Soil
Units: mg/L

Extraction Method: 3005A TCLP

1311 TCLP Metals

Analyte	Results (MRL)	MDL	Method	TCLP Limit	DF	Analyst	Analyzed	IV / FV	Batch
Lead	**0.47** (0.05)	---	1311/6010D	5	1	KJB	07/31/24 11:58	50 50	DG43023

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-886 0-2ft
Date Sampled: 07/23/24 13:15
Percent Solids: 67
Initial Volume: 19.8g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 7/26/24 9:00

Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
1,1-Biphenyl	**0.084** (0.038)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
1,2,4-Trichlorobenzene	ND (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
1,2-Dichlorobenzene	ND (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
1,3-Dichlorobenzene	ND (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
1,4-Dichlorobenzene	ND (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
2,4,5-Trichlorophenol	ND (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
2,4,6-Trichlorophenol	ND (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
2,4-Dichlorophenol	ND (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
2,4-Dimethylphenol	ND (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
2,4-Dinitrophenol	ND (1.52)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
2,4-Dinitrotoluene	ND (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
2,6-Dinitrotoluene	ND (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
2-Chloronaphthalene	ND (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
2-Chlorophenol	ND (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
2-Methylnaphthalene	ND (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
2-Methylphenol	ND (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
2-Nitrophenol	ND (0.758)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
3,3´-Dichlorobenzidine	ND (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
3+4-Methylphenol	ND (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
4-Bromophenyl-phenylether	ND (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
4-Chloroaniline	ND (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
4-Nitrophenol	ND (1.52)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
Acenaphthene	**1.06** (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
Acenaphthylene	ND (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
Acetophenone	ND (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
Aniline	ND (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
Anthracene	**2.13** (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-886 0-2ft
Date Sampled: 07/23/24 13:15
Percent Solids: 67
Initial Volume: 19.8g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 7/26/24 9:00

Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Azobenzene	ND (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
Benzo(a)anthracene	**4.15** (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
Benzo(a)pyrene	**3.91** (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
Benzo(b)fluoranthene	**3.28** (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
Benzo(g,h,i)perylene	**1.64** (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
Benzo(k)fluoranthene	**3.05** (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
bis(2-Chloroethoxy)methane	ND (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
bis(2-Chloroethyl)ether	ND (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
bis(2-chloroisopropyl)Ether	ND (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
bis(2-Ethylhexyl)phthalate	**1.47** (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
Butylbenzylphthalate	**0.652** (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
Chrysene	**3.91** (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
Dibenzo(a,h)Anthracene	**0.456** (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
Dibenzofuran	**0.542** (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
Diethylphthalate	ND (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
Dimethylphthalate	ND (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
Di-n-butylphthalate	ND (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
Di-n-octylphthalate	ND (0.758)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
Fluoranthene	**8.61** (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
Fluorene	**0.983** (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
Hexachlorobenzene	ND (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
Hexachlorobutadiene	ND (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
Hexachloroethane	ND (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
Indeno(1,2,3-cd)Pyrene	**1.91** (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
Isophorone	ND (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
Naphthalene	**0.622** (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
Nitrobenzene	ND (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-886 0-2ft
Date Sampled: 07/23/24 13:15
Percent Solids: 67
Initial Volume: 19.8g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 7/26/24 9:00

Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
N-Nitrosodimethylamine	ND (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
Pentachlorophenol	ND (1.52)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
Phenanthrene	**7.58** (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
Phenol	**0.437** (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
Pyrene	**10.2** (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604
Pyridine	ND (0.379)	---	8270E	---	1	TJ	07/27/24 1:21	D4G0572	DG42604

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*70 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*67 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*83 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*70 %*		*30-130*
Surrogate: 2-Fluorophenol	*69 %*		*30-130*
Surrogate: Nitrobenzene-d5	*66 %*		*30-130*
Surrogate: Phenol-d6	*75 %*		*30-130*
Surrogate: p-Terphenyl-d14	*107 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-886 0-2ft
Date Sampled: 07/23/24 13:15
Percent Solids: 67
Initial Volume: 24.5g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-01
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 7/25/24 18:30

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (23.0)	---	MADEP-EPH	---	1	JDN	07/27/24 3:29	D4G0541	DG42541
C19-C36 Aliphatics1	**88.1** (23.0)	---	MADEP-EPH	---	1	JDN	07/27/24 3:29	D4G0541	DG42541
C11-C22 Unadjusted Aromatics1	**138** (23.0)	---	EPH8270	---	1	IBM	07/26/24 16:19	D4G0528	DG42541
C11-C22 Aromatics1,2	**106** (23.3)	---	EPH8270	---		TJ	07/30/24 21:12	---	[CALC]
2-Methylnaphthalene	**0.079** (0.012)	---	EPH8270SIM	---	1	TJ	07/30/24 3:43	D4G0620	DG42541
Acenaphthene	**0.329** (0.012)	---	EPH8270SIM	---	1	TJ	07/30/24 3:43	D4G0620	DG42541
Naphthalene	**0.148** (0.012)	---	EPH8270SIM	---	1	TJ	07/30/24 3:43	D4G0620	DG42541
Phenanthrene	**3.00** (0.061)	---	EPH8270SIM	---	5	TJ	07/30/24 21:12	D4G0620	DG42541
Acenaphthylene	**0.215** (0.012)	---	EPH8270SIM	---	1	TJ	07/30/24 3:43	D4G0620	DG42541
Anthracene	**0.868** (0.012)	---	EPH8270SIM	---	1	TJ	07/30/24 3:43	D4G0620	DG42541
Benzo(a)anthracene	**2.96** (0.012)	---	EPH8270SIM	---	1	TJ	07/30/24 3:43	D4G0620	DG42541
Benzo(a)pyrene	**2.67** (0.012)	---	EPH8270SIM	---	1	TJ	07/30/24 3:43	D4G0620	DG42541
Benzo(b)fluoranthene	**1.85** (0.012)	---	EPH8270SIM	---	1	TJ	07/30/24 3:43	D4G0620	DG42541
Benzo(g,h,i)perylene	**1.55** (0.012)	---	EPH8270SIM	---	1	TJ	07/30/24 3:43	D4G0620	DG42541
Benzo(k)fluoranthene	**1.87** (0.012)	---	EPH8270SIM	---	1	TJ	07/30/24 3:43	D4G0620	DG42541
Chrysene	**2.59** (0.012)	---	EPH8270SIM	---	1	TJ	07/30/24 3:43	D4G0620	DG42541
Dibenzo(a,h)Anthracene	**0.663** (0.012)	---	EPH8270SIM	---	1	TJ	07/30/24 3:43	D4G0620	DG42541
Fluoranthene	**5.08** (0.061)	---	EPH8270SIM	---	5	TJ	07/30/24 21:12	D4G0620	DG42541
Fluorene	**0.318** (0.012)	---	EPH8270SIM	---	1	TJ	07/30/24 3:43	D4G0620	DG42541
Indeno(1,2,3-cd)Pyrene	**1.34** (0.012)	---	EPH8270SIM	---	1	TJ	07/30/24 3:43	D4G0620	DG42541
Pyrene	**5.71** (0.061)	---	EPH8270SIM	---	5	TJ	07/30/24 21:12	D4G0620	DG42541

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1-Chlorooctadecane	*67 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*88 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*90 %*		*40-140*
Surrogate: O-Terphenyl	*70 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-886 0-2ft
Date Sampled: 07/23/24 13:15
Percent Solids: 67

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Conductivity	**WL 67** (5)	---	9050A	---	1	EAM	07/24/24 21:06	umhos/cm	DG42435
Corrosivity (pH)	**6.95** (N/A)	---	9045	---	1	EAM	07/24/24 20:00	S.U.	DG42453
Corrosivity (pH) Sample Temp	**21.4**	---	2550B	---	1	EAM	07/24/24 20:00	°C	DG42453
Flashpoint	**> 200** (N/A)	---	1010A	---	1	JLK	07/24/24 19:54	°F	DG42451
Reactive Cyanide	ND (2.0)	---	7.3.3.2	---	1	EAM	07/25/24 18:00	mg/kg	DG42545
Reactive Sulfide	ND (2.0)	---	7.3.4.1	---	1	EAM	07/25/24 18:00	mg/kg	DG42545
Sulfate	**WL 194** (75)	---	9038	---	1	JLK	07/25/24 15:51	mg/kg dry	DG42539
Sulfide	**WL** ND (0.8)	---	9030B	---	1	JLK	07/24/24 21:40	mg/kg dry	DG42442
Total Cyanide	ND (1.43)	---	9014	---	1	EEM	07/26/24 12:45	mg/kg dry	DG42625
Total Organic Carbon (Average)	**47600** (500)	---	LK	---	1	CCP	07/31/24 18:15	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-886 0-2ft
Date Sampled: 07/23/24 13:15
Percent Solids: 67
Initial Volume: 1g
Final Volume: 1g
Extraction Method: General Subbed Prep

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-01
Sample Matrix: Soil

Analyst: SUB
Prepared: 7/31/24 0:00

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Sulfur	**1110** (100)	---	6010	---	1	SUB	07/31/24 0:00	mg/kg	DH40131

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-886 0-2ft
Date Sampled: 07/23/24 13:15
Percent Solids: 67

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-01
Sample Matrix: Soil
Units: °C

Extraction Method: 1311

TCLP Extraction by 1311 - Metals

Analyte	Results (MRL)	MDL	Method	TCLP Limit	DF	Analyst	Analyzed	IV / FV	Batch
Temperature (Min C)	**20.2** (N/A)	---	1311	---	1	RAP	07/30/24 8:18		DG42929
Temperature (Max C)	**22.0** (N/A)	---	1311	---	1	RAP	07/30/24 8:18		DG42929
Temperature (Range)	**Temperature is not within 23 +/-2 °C.** (N/A)								

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-886 0-2ft
Date Sampled: 07/23/24 13:15
Percent Solids: 67
Initial Volume: 30.2g
Final Volume: 2ml
Extraction Method: 3540C

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 7/25/24 11:15

8082 Polychlorinated Biphenyls (PCB) / Congeners

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
BZ#8 [2C]	**P, LC 0.00060** (0.00040)	---	8082A Cong	---	1	07/27/24 2:32	D4G0576	DG42401
BZ#18 [2C]	**P, LC 0.00214** (0.00040)	---	8082A Cong	---	1	07/27/24 2:32	D4G0576	DG42401
BZ#28 [2C]	**0.00732** (0.00040)	---	8082A Cong	---	1	07/27/24 2:32	D4G0576	DG42401
BZ#44 [2C]	**0.00557** (0.00040)	---	8082A Cong	---	1	07/27/24 2:32	D4G0576	DG42401
BZ#52	**0.0153** (0.00201)	---	8082A Cong	---	5	07/29/24 12:01	D4G0576	DG42401
BZ#66	**0.00524** (0.00040)	---	8082A Cong	---	1	07/27/24 2:32	D4G0576	DG42401
BZ#101	**0.0199** (0.00201)	---	8082A Cong	---	5	07/29/24 12:01	D4G0576	DG42401
BZ#105	**P, LC 0.00312** (0.00040)	---	8082A Cong	---	1	07/27/24 2:32	D4G0576	DG42401
BZ#118	**0.00786** (0.00040)	---	8082A Cong	---	1	07/27/24 2:32	D4G0576	DG42401
BZ#128 [2C]	**0.00256** (0.00040)	---	8082A Cong	---	1	07/27/24 2:32	D4G0576	DG42401
BZ#138 [2C]	**0.0133** (0.00201)	---	8082A Cong	---	5	07/29/24 12:01	D4G0576	DG42401
BZ#153	**0.00882** (0.00040)	---	8082A Cong	---	1	07/27/24 2:32	D4G0576	DG42401
BZ#170 [2C]	**0.00307** (0.00040)	---	8082A Cong	---	1	07/27/24 2:32	D4G0576	DG42401
BZ#180 [2C]	**0.00336** (0.00040)	---	8082A Cong	---	1	07/27/24 2:32	D4G0576	DG42401
BZ#187 [2C]	**0.00246** (0.00040)	---	8082A Cong	---	1	07/27/24 2:32	D4G0576	DG42401
BZ#195 [2C]	ND (0.00040)	---	8082A Cong	---	1	07/27/24 2:32	D4G0576	DG42401
BZ#206	**0.00104** (0.00040)	---	8082A Cong	---	1	07/27/24 2:32	D4G0576	DG42401
BZ#209	ND (0.00040)	---	8082A Cong	---	1	07/27/24 2:32	D4G0576	DG42401

	%Recovery	*Qualifier*	*Limits*
Surrogate: Tetrachloro-m-xylene [2C]	*59 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-886 0.5ft
Date Sampled: 07/23/24 13:16
Percent Solids: 74
Initial Volume: 12.3g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 7/29/24 8:00

Volatile Organics Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
1,1,1-Trichloroethane	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
1,1,2,2-Tetrachloroethane	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
1,1,2-Trichloroethane	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
1,1-Dichloroethane	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
1,1-Dichloroethene	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
1,1-Dichloropropene	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
1,2,3-Trichlorobenzene	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
1,2,3-Trichloropropane	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
1,2,4-Trichlorobenzene	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
1,2,4-Trimethylbenzene	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
1,2-Dibromo-3-Chloropropane	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
1,2-Dibromoethane	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
1,2-Dichlorobenzene	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
1,2-Dichloroethane	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
1,2-Dichloropropane	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
1,3,5-Trimethylbenzene	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
1,3-Dichlorobenzene	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
1,3-Dichloropropane	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
1,4-Dichlorobenzene	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
1,4-Dioxane	ND (0.0548)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
2,2-Dichloropropane	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
2-Butanone	ND (0.0274)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
2-Chlorotoluene	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
2-Hexanone	ND (0.0274)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
4-Chlorotoluene	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
4-Isopropyltoluene	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-886 0.5ft
Date Sampled: 07/23/24 13:16
Percent Solids: 74
Initial Volume: 12.3g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 7/29/24 8:00

Volatile Organics Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
4-Methyl-2-Pentanone	ND (0.0274)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
Acetone	**0.0368** (0.0274)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
Benzene	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
Bromobenzene	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
Bromochloromethane	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
Bromodichloromethane	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
Bromoform	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
Bromomethane	ND (0.0055)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
Carbon Disulfide	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
Carbon Tetrachloride	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
Chlorobenzene	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
Chloroethane	ND (0.0055)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
Chloroform	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
Chloromethane	ND (0.0055)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
cis-1,2-Dichloroethene	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
cis-1,3-Dichloropropene	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
Dibromochloromethane	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
Dibromomethane	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
Dichlorodifluoromethane	ND (0.0055)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
Diethyl Ether	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
Di-isopropyl ether	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
Ethyl tertiary-butyl ether	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
Ethylbenzene	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
Hexachlorobutadiene	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
Isopropylbenzene	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
Methyl tert-Butyl Ether	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
Methylene Chloride	ND (0.0137)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-886 0.5ft
Date Sampled: 07/23/24 13:16
Percent Solids: 74
Initial Volume: 12.3g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 7/29/24 8:00

Volatile Organics Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
n-Butylbenzene	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
n-Propylbenzene	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
sec-Butylbenzene	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
Styrene	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
tert-Butylbenzene	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
Tertiary-amyl methyl ether	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
Tetrachloroethene	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
Tetrahydrofuran	ND (0.0110)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
Toluene	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
trans-1,2-Dichloroethene	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
trans-1,3-Dichloropropene	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
Trichloroethene	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
Trichlorofluoromethane	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
Vinyl Chloride	ND (0.0055)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
Xylene O	ND (0.0027)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
Xylene P,M	ND (0.0055)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927
Xylenes (Total)	ND (0.0055)	---	8260D Low	---	1	MEK	07/29/24 13:03	D4G0616	DG42927

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*118 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*87 %*		*70-130*
Surrogate: Dibromofluoromethane	*110 %*		*70-130*
Surrogate: Toluene-d8	*103 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-885 0-2ft
Date Sampled: 07/23/24 15:45
Percent Solids: 54

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-03
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	IV / FV	Batch
Arsenic	**11.7** (1.83)	---	6010D	---	1	KJB	07/26/24 12:40	2.01 100	DG42509
Barium	**76.5** (1.83)	---	6010D	---	1	KJB	07/26/24 12:40	2.01 100	DG42509
Cadmium	**2.28** (0.92)	---	6010D	---	1	KJB	07/26/24 12:40	2.01 100	DG42509
Chromium	**227** (1.83)	---	6010D	---	1	KJB	07/26/24 12:40	2.01 100	DG42509
Copper	**163** (4.58)	---	6010D	---	1	KJB	07/26/24 12:40	2.01 100	DG42509
Lead	**274** (9.16)	---	6010D	---	1	KJB	07/26/24 12:40	2.01 100	DG42509
Mercury	**1.27** (0.299)	---	7471B	---	5	AFV	07/25/24 21:10	0.61 40	DG42510
Nickel	**19.5** (1.83)	---	6010D	---	1	KJB	07/26/24 12:40	2.01 100	DG42509
Selenium	ND (9.16)	---	6010D	---	1	KJB	07/26/24 12:40	2.01 100	DG42509
Silver	**3.16** (0.92)	---	6010D	---	1	KJB	07/26/24 12:40	2.01 100	DG42509
Zinc	**236** (4.58)	---	6010D	---	1	KJB	07/26/24 12:40	2.01 100	DG42509

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-885 0-2ft
Date Sampled: 07/23/24 15:45
Percent Solids: 54

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-03
Sample Matrix: Soil
Units: mg/L

Extraction Method: 3005A TCLP

1311 TCLP Metals

Analyte	Results (MRL)	MDL	Method	TCLP Limit	DF	Analyst	Analyzed	IV / FV	Batch
Chromium	ND (0.02)	---	1311/6010D	5	1	KJB	07/31/24 12:05	50 50	DG43023
Lead	**0.22** (0.05)	---	1311/6010D	5	1	KJB	07/31/24 12:05	50 50	DG43023

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-885 0-2ft
Date Sampled: 07/23/24 15:45
Percent Solids: 54
Initial Volume: 19.7g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 7/26/24 9:00

Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.047)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
1,2,4-Trichlorobenzene	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
1,2-Dichlorobenzene	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
1,3-Dichlorobenzene	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
1,4-Dichlorobenzene	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
2,4,5-Trichlorophenol	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
2,4,6-Trichlorophenol	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
2,4-Dichlorophenol	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
2,4-Dimethylphenol	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
2,4-Dinitrophenol	ND (1.87)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
2,4-Dinitrotoluene	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
2,6-Dinitrotoluene	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
2-Chloronaphthalene	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
2-Chlorophenol	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
2-Methylnaphthalene	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
2-Methylphenol	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
2-Nitrophenol	ND (0.935)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
3,3´-Dichlorobenzidine	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
3+4-Methylphenol	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
4-Bromophenyl-phenylether	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
4-Chloroaniline	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
4-Nitrophenol	ND (1.87)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
Acenaphthene	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
Acenaphthylene	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
Acetophenone	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
Aniline	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
Anthracene	**0.842** (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-885 0-2ft
Date Sampled: 07/23/24 15:45
Percent Solids: 54
Initial Volume: 19.7g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 7/26/24 9:00

Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Azobenzene	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
Benzo(a)anthracene	**2.57** (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
Benzo(a)pyrene	**2.56** (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
Benzo(b)fluoranthene	**2.09** (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
Benzo(g,h,i)perylene	**1.11** (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
Benzo(k)fluoranthene	**2.10** (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
bis(2-Chloroethoxy)methane	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
bis(2-Chloroethyl)ether	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
bis(2-chloroisopropyl)Ether	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
bis(2-Ethylhexyl)phthalate	**3.60** (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
Butylbenzylphthalate	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
Chrysene	**2.50** (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
Dibenzo(a,h)Anthracene	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
Dibenzofuran	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
Diethylphthalate	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
Dimethylphthalate	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
Di-n-butylphthalate	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
Di-n-octylphthalate	ND (0.935)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
Fluoranthene	**5.15** (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
Fluorene	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
Hexachlorobenzene	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
Hexachlorobutadiene	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
Hexachloroethane	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
Indeno(1,2,3-cd)Pyrene	**1.26** (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
Isophorone	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
Naphthalene	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
Nitrobenzene	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-885 0-2ft
Date Sampled: 07/23/24 15:45
Percent Solids: 54
Initial Volume: 19.7g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 7/26/24 9:00

Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
N-Nitrosodimethylamine	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
Pentachlorophenol	ND (1.87)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
Phenanthrene	**2.98** (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
Phenol	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
Pyrene	**6.63** (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604
Pyridine	ND (0.467)	---	8270E	---	1	TJ	07/27/24 1:51	D4G0572	DG42604

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*71 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*69 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*82 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*71 %*		*30-130*
Surrogate: 2-Fluorophenol	*69 %*		*30-130*
Surrogate: Nitrobenzene-d5	*66 %*		*30-130*
Surrogate: Phenol-d6	*77 %*		*30-130*
Surrogate: p-Terphenyl-d14	*111 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-885 0-2ft
Date Sampled: 07/23/24 15:45
Percent Solids: 54
Initial Volume: 24.3g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-03
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 7/25/24 18:30

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (28.4)	---	MADEP-EPH	---	1	JDN	07/26/24 17:08	D4G0543	DG42541
C19-C36 Aliphatics1	**59.7** (28.4)	---	MADEP-EPH	---	1	JDN	07/26/24 17:08	D4G0543	DG42541
C11-C22 Unadjusted Aromatics1	**101** (28.4)	---	EPH8270	---	1	IBM	07/26/24 16:54	D4G0528	DG42541
C11-C22 Aromatics1,2	**81.1** (28.7)	---	EPH8270	---		TJ	07/30/24 21:32	---	[CALC]
2-Methylnaphthalene	**0.056** (0.015)	---	EPH8270SIM	---	1	TJ	07/30/24 4:04	D4G0620	DG42541
Acenaphthene	**0.343** (0.015)	---	EPH8270SIM	---	1	TJ	07/30/24 4:04	D4G0620	DG42541
Naphthalene	**0.074** (0.015)	---	EPH8270SIM	---	1	TJ	07/30/24 4:04	D4G0620	DG42541
Phenanthrene	**2.72** (0.015)	---	EPH8270SIM	---	1	TJ	07/30/24 4:04	D4G0620	DG42541
Acenaphthylene	**0.056** (0.015)	---	EPH8270SIM	---	1	TJ	07/30/24 4:04	D4G0620	DG42541
Anthracene	**0.648** (0.015)	---	EPH8270SIM	---	1	TJ	07/30/24 4:04	D4G0620	DG42541
Benzo(a)anthracene	**1.62** (0.015)	---	EPH8270SIM	---	1	TJ	07/30/24 4:04	D4G0620	DG42541
Benzo(a)pyrene	**1.46** (0.015)	---	EPH8270SIM	---	1	TJ	07/30/24 4:04	D4G0620	DG42541
Benzo(b)fluoranthene	**1.14** (0.015)	---	EPH8270SIM	---	1	TJ	07/30/24 4:04	D4G0620	DG42541
Benzo(g,h,i)perylene	**0.946** (0.015)	---	EPH8270SIM	---	1	TJ	07/30/24 4:04	D4G0620	DG42541
Benzo(k)fluoranthene	**1.02** (0.015)	---	EPH8270SIM	---	1	TJ	07/30/24 4:04	D4G0620	DG42541
Chrysene	**1.52** (0.015)	---	EPH8270SIM	---	1	TJ	07/30/24 4:04	D4G0620	DG42541
Dibenzo(a,h)Anthracene	**0.433** (0.015)	---	EPH8270SIM	---	1	TJ	07/30/24 4:04	D4G0620	DG42541
Fluoranthene	**3.05** (0.015)	---	EPH8270SIM	---	1	TJ	07/30/24 4:04	D4G0620	DG42541
Fluorene	**0.248** (0.015)	---	EPH8270SIM	---	1	TJ	07/30/24 4:04	D4G0620	DG42541
Indeno(1,2,3-cd)Pyrene	**0.796** (0.015)	---	EPH8270SIM	---	1	TJ	07/30/24 4:04	D4G0620	DG42541
Pyrene	**3.61** (0.076)	---	EPH8270SIM	---	5	TJ	07/30/24 21:32	D4G0620	DG42541

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1-Chlorooctadecane	*66 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*87 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*90 %*		*40-140*
Surrogate: O-Terphenyl	*73 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-885 0-2ft
Date Sampled: 07/23/24 15:45
Percent Solids: 54

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Conductivity	**WL 81** (5)	---	9050A	---	1	EAM	07/24/24 21:06	umhos/cm	DG42435
Corrosivity (pH)	**6.57** (N/A)	---	9045	---	1	EAM	07/24/24 20:00	S.U.	DG42453
Corrosivity (pH) Sample Temp	**21.4**	---	2550B	---	1	EAM	07/24/24 20:00	°C	DG42453
Eh (ORP)	**H 339** (N/A)	---	2580	---	1	JLK	08/05/24 19:10	mv	DH40547
Flashpoint	**> 200** (N/A)	---	1010A	---	1	JLK	07/24/24 19:54	°F	DG42451
Hexavalent Chromium	**O** ND (0.9)	---	7196A	---	1	CCP	08/06/24 15:30	mg/kg dry	DH40640
Reactive Cyanide	ND (2.0)	---	7.3.3.2	---	1	EAM	07/25/24 18:00	mg/kg	DG42545
Reactive Sulfide	ND (2.0)	---	7.3.4.1	---	1	EAM	07/25/24 18:00	mg/kg	DG42545
Sulfate	**WL** ND (93)	---	9038	---	1	JLK	07/25/24 15:51	mg/kg dry	DG42539
Sulfide	**WL** ND (0.9)	---	9030B	---	1	JLK	07/24/24 21:40	mg/kg dry	DG42442
Total Cyanide	ND (1.70)	---	9014	---	1	EEM	07/26/24 12:45	mg/kg dry	DG42625
Total Organic Carbon (Average)	**53500** (500)	---	LK	---	1	CCP	07/31/24 15:14	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-885 0-2ft
Date Sampled: 07/23/24 15:45
Percent Solids: 54
Initial Volume: 1g
Final Volume: 1g
Extraction Method: General Subbed Prep

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-03
Sample Matrix: Soil

Analyst: SUB
Prepared: 7/31/24 0:00

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Sulfur	**2250** (100)	---	6010	---	1	SUB	07/31/24 0:00	mg/kg	DH40131

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-885 0-2ft
Date Sampled: 07/23/24 15:45
Percent Solids: 54

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-03
Sample Matrix: Soil
Units: °C

Extraction Method: 1311

TCLP Extraction by 1311 - Metals

Analyte	Results (MRL)	MDL	Method	TCLP Limit	DF	Analyst	Analyzed	IV / FV	Batch
Temperature (Min C)	**20.2** (N/A)	---	1311	---	1	RAP	07/30/24 8:18		DG42929
Temperature (Max C)	**22.0** (N/A)	---	1311	---	1	RAP	07/30/24 8:18		DG42929
Temperature (Range)	**Temperature is not within 23 +/-2 °C.** (N/A)								

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-885 0-2ft
Date Sampled: 07/23/24 15:45
Percent Solids: 54
Initial Volume: 30.6g
Final Volume: 2ml
Extraction Method: 3540C

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 7/25/24 11:15

8082 Polychlorinated Biphenyls (PCB) / Congeners

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
BZ#8	**0.00550** (0.00049)	---	8082A Cong	---	1	07/27/24 3:03	D4G0576	DG42401
BZ#18 [2C]	**0.0262** (0.00244)	---	8082A Cong	---	5	07/29/24 12:32	D4G0576	DG42401
BZ#28 [2C]	**0.0424** (0.00244)	---	8082A Cong	---	5	07/29/24 12:32	D4G0576	DG42401
BZ#44 [2C]	**0.0322** (0.00244)	---	8082A Cong	---	5	07/29/24 12:32	D4G0576	DG42401
BZ#52 [2C]	**0.0558** (0.00244)	---	8082A Cong	---	5	07/29/24 12:32	D4G0576	DG42401
BZ#66 [2C]	**0.0327** (0.00244)	---	8082A Cong	---	5	07/29/24 12:32	D4G0576	DG42401
BZ#101	**0.0550** (0.00244)	---	8082A Cong	---	5	07/29/24 12:32	D4G0576	DG42401
BZ#105	**P, LC 0.00907** (0.00244)	---	8082A Cong	---	5	07/29/24 12:32	D4G0576	DG42401
BZ#118 [2C]	**0.0300** (0.00244)	---	8082A Cong	---	5	07/29/24 12:32	D4G0576	DG42401
BZ#128 [2C]	**0.00556** (0.00049)	---	8082A Cong	---	1	07/27/24 3:03	D4G0576	DG42401
BZ#138 [2C]	**0.0361** (0.00244)	---	8082A Cong	---	5	07/29/24 12:32	D4G0576	DG42401
BZ#153	**0.0254** (0.00244)	---	8082A Cong	---	5	07/29/24 12:32	D4G0576	DG42401
BZ#170	**P, LC 0.00382** (0.00049)	---	8082A Cong	---	1	07/27/24 3:03	D4G0576	DG42401
BZ#180 [2C]	**0.00664** (0.00049)	---	8082A Cong	---	1	07/27/24 3:03	D4G0576	DG42401
BZ#187 [2C]	**0.00478** (0.00049)	---	8082A Cong	---	1	07/27/24 3:03	D4G0576	DG42401
BZ#195 [2C]	**P, LC 0.00057** (0.00049)	---	8082A Cong	---	1	07/27/24 3:03	D4G0576	DG42401
BZ#206 [2C]	**0.00433** (0.00049)	---	8082A Cong	---	1	07/27/24 3:03	D4G0576	DG42401
BZ#209 [2C]	**0.00548** (0.00049)	---	8082A Cong	---	1	07/27/24 3:03	D4G0576	DG42401

	%Recovery	*Qualifier*	*Limits*
Surrogate: Tetrachloro-m-xylene [2C]	*46 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-885 0.5ft
Date Sampled: 07/23/24 15:46
Percent Solids: 71
Initial Volume: 7.7g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 7/29/24 8:00

Volatile Organics Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
1,1,1-Trichloroethane	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
1,1,2,2-Tetrachloroethane	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
1,1,2-Trichloroethane	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
1,1-Dichloroethane	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
1,1-Dichloroethene	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
1,1-Dichloropropene	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
1,2,3-Trichlorobenzene	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
1,2,3-Trichloropropane	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
1,2,4-Trichlorobenzene	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
1,2,4-Trimethylbenzene	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
1,2-Dibromo-3-Chloropropane	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
1,2-Dibromoethane	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
1,2-Dichlorobenzene	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
1,2-Dichloroethane	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
1,2-Dichloropropane	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
1,3,5-Trimethylbenzene	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
1,3-Dichlorobenzene	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
1,3-Dichloropropane	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
1,4-Dichlorobenzene	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
1,4-Dioxane	ND (0.0915)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
2,2-Dichloropropane	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
2-Butanone	ND (0.0457)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
2-Chlorotoluene	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
2-Hexanone	ND (0.0457)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
4-Chlorotoluene	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
4-Isopropyltoluene	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-885 0.5ft
Date Sampled: 07/23/24 15:46
Percent Solids: 71
Initial Volume: 7.7g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 7/29/24 8:00

Volatile Organics Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
4-Methyl-2-Pentanone	ND (0.0457)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
Acetone	**0.0858** (0.0457)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
Benzene	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
Bromobenzene	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
Bromochloromethane	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
Bromodichloromethane	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
Bromoform	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
Bromomethane	ND (0.0091)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
Carbon Disulfide	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
Carbon Tetrachloride	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
Chlorobenzene	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
Chloroethane	ND (0.0091)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
Chloroform	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
Chloromethane	ND (0.0091)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
cis-1,2-Dichloroethene	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
cis-1,3-Dichloropropene	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
Dibromochloromethane	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
Dibromomethane	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
Dichlorodifluoromethane	ND (0.0091)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
Diethyl Ether	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
Di-isopropyl ether	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
Ethyl tertiary-butyl ether	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
Ethylbenzene	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
Hexachlorobutadiene	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
Isopropylbenzene	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
Methyl tert-Butyl Ether	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
Methylene Chloride	ND (0.0229)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-885 0.5ft
Date Sampled: 07/23/24 15:46
Percent Solids: 71
Initial Volume: 7.7g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 7/29/24 8:00

Volatile Organics Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
n-Butylbenzene	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
n-Propylbenzene	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
sec-Butylbenzene	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
Styrene	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
tert-Butylbenzene	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
Tertiary-amyl methyl ether	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
Tetrachloroethene	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
Tetrahydrofuran	ND (0.0183)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
Toluene	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
trans-1,2-Dichloroethene	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
trans-1,3-Dichloropropene	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
Trichloroethene	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
Trichlorofluoromethane	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
Vinyl Chloride	ND (0.0091)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
Xylene O	ND (0.0046)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
Xylene P,M	ND (0.0091)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927
Xylenes (Total)	ND (0.0091)	---	8260D Low	---	1	MEK	07/29/24 13:29	D4G0616	DG42927

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*119 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*87 %*		*70-130*
Surrogate: Dibromofluoromethane	*113 %*		*70-130*
Surrogate: Toluene-d8	*104 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-887 0-2ft
Date Sampled: 07/23/24 16:15
Percent Solids: 46

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-05
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	IV / FV	Batch
Arsenic	**16.9** (2.05)	---	6010D	---	1	KJB	07/26/24 12:42	2.11 100	DG42509
Barium	**69.3** (2.05)	---	6010D	---	1	KJB	07/26/24 12:42	2.11 100	DG42509
Cadmium	**1.08** (1.03)	---	6010D	---	1	KJB	07/26/24 12:42	2.11 100	DG42509
Chromium	**46.5** (2.05)	---	6010D	---	1	KJB	07/26/24 12:42	2.11 100	DG42509
Copper	**95.8** (5.13)	---	6010D	---	1	KJB	07/26/24 12:42	2.11 100	DG42509
Lead	**179** (10.3)	---	6010D	---	1	KJB	07/26/24 12:42	2.11 100	DG42509
Mercury	**0.759** (0.067)	---	7471B	---	1	AFV	07/25/24 20:07	0.64 40	DG42510
Nickel	**19.9** (2.05)	---	6010D	---	1	KJB	07/26/24 12:42	2.11 100	DG42509
Selenium	ND (10.3)	---	6010D	---	1	KJB	07/26/24 12:42	2.11 100	DG42509
Silver	ND (1.03)	---	6010D	---	1	KJB	07/26/24 12:42	2.11 100	DG42509
Zinc	**242** (5.13)	---	6010D	---	1	KJB	07/26/24 12:42	2.11 100	DG42509

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-887 0-2ft
Date Sampled: 07/23/24 16:15
Percent Solids: 46

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-05
Sample Matrix: Soil
Units: mg/L

Extraction Method: 3005A TCLP

1311 TCLP Metals

Analyte	Results (MRL)	MDL	Method	TCLP Limit	DF	Analyst	Analyzed	IV / FV	Batch
Lead	**0.11** (0.05)	---	1311/6010D	5	1	KJB	07/31/24 12:08	50 50	DG43023

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-887 0-2ft
Date Sampled: 07/23/24 16:15
Percent Solids: 46
Initial Volume: 19.5g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 7/26/24 9:00

Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.055)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
1,2,4-Trichlorobenzene	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
1,2-Dichlorobenzene	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
1,3-Dichlorobenzene	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
1,4-Dichlorobenzene	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
2,4,5-Trichlorophenol	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
2,4,6-Trichlorophenol	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
2,4-Dichlorophenol	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
2,4-Dimethylphenol	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
2,4-Dinitrophenol	ND (2.22)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
2,4-Dinitrotoluene	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
2,6-Dinitrotoluene	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
2-Chloronaphthalene	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
2-Chlorophenol	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
2-Methylnaphthalene	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
2-Methylphenol	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
2-Nitrophenol	ND (1.11)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
3,3´-Dichlorobenzidine	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
3+4-Methylphenol	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
4-Bromophenyl-phenylether	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
4-Chloroaniline	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
4-Nitrophenol	ND (2.22)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
Acenaphthene	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
Acenaphthylene	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
Acetophenone	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
Aniline	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
Anthracene	**1.00** (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-887 0-2ft
Date Sampled: 07/23/24 16:15
Percent Solids: 46
Initial Volume: 19.5g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 7/26/24 9:00

Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Azobenzene	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
Benzo(a)anthracene	**2.12** (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
Benzo(a)pyrene	**2.01** (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
Benzo(b)fluoranthene	**1.74** (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
Benzo(g,h,i)perylene	**0.853** (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
Benzo(k)fluoranthene	**1.54** (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
bis(2-Chloroethoxy)methane	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
bis(2-Chloroethyl)ether	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
bis(2-chloroisopropyl)Ether	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
bis(2-Ethylhexyl)phthalate	**5.76** (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
Butylbenzylphthalate	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
Chrysene	**1.99** (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
Dibenzo(a,h)Anthracene	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
Dibenzofuran	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
Diethylphthalate	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
Dimethylphthalate	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
Di-n-butylphthalate	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
Di-n-octylphthalate	ND (1.11)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
Fluoranthene	**4.80** (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
Fluorene	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
Hexachlorobenzene	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
Hexachlorobutadiene	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
Hexachloroethane	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
Indeno(1,2,3-cd)Pyrene	**0.974** (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
Isophorone	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
Naphthalene	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
Nitrobenzene	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-887 0-2ft
Date Sampled: 07/23/24 16:15
Percent Solids: 46
Initial Volume: 19.5g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 7/26/24 9:00

Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
N-Nitrosodimethylamine	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
Pentachlorophenol	ND (2.22)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
Phenanthrene	**3.71** (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
Phenol	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
Pyrene	**5.67** (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604
Pyridine	ND (0.555)	---	8270E	---	1	TJ	07/27/24 2:21	D4G0572	DG42604

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*73 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*69 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*84 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*73 %*		*30-130*
Surrogate: 2-Fluorophenol	*71 %*		*30-130*
Surrogate: Nitrobenzene-d5	*71 %*		*30-130*
Surrogate: Phenol-d6	*79 %*		*30-130*
Surrogate: p-Terphenyl-d14	*113 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-887 0-2ft
Date Sampled: 07/23/24 16:15
Percent Solids: 46
Initial Volume: 24.9g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-05
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 7/25/24 18:30

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (32.6)	---	MADEP-EPH	---	1	JDN	07/26/24 17:43	D4G0543	DG42541
C19-C36 Aliphatics1	**56.8** (32.6)	---	MADEP-EPH	---	1	JDN	07/26/24 17:43	D4G0543	DG42541
C11-C22 Unadjusted Aromatics1	**123** (32.6)	---	EPH8270	---	1	IBM	07/26/24 17:30	D4G0528	DG42541
C11-C22 Aromatics1,2	**95.6** (33.0)	---	EPH8270	---		TJ	07/30/24 21:53	---	[CALC]
2-Methylnaphthalene	**0.080** (0.017)	---	EPH8270SIM	---	1	TJ	07/30/24 4:25	D4G0620	DG42541
Acenaphthene	**0.318** (0.017)	---	EPH8270SIM	---	1	TJ	07/30/24 4:25	D4G0620	DG42541
Naphthalene	**0.204** (0.017)	---	EPH8270SIM	---	1	TJ	07/30/24 4:25	D4G0620	DG42541
Phenanthrene	**3.14** (0.017)	---	EPH8270SIM	---	1	TJ	07/30/24 4:25	D4G0620	DG42541
Acenaphthylene	**0.134** (0.017)	---	EPH8270SIM	---	1	TJ	07/30/24 4:25	D4G0620	DG42541
Anthracene	**0.784** (0.017)	---	EPH8270SIM	---	1	TJ	07/30/24 4:25	D4G0620	DG42541
Benzo(a)anthracene	**2.44** (0.017)	---	EPH8270SIM	---	1	TJ	07/30/24 4:25	D4G0620	DG42541
Benzo(a)pyrene	**2.39** (0.017)	---	EPH8270SIM	---	1	TJ	07/30/24 4:25	D4G0620	DG42541
Benzo(b)fluoranthene	**1.94** (0.017)	---	EPH8270SIM	---	1	TJ	07/30/24 4:25	D4G0620	DG42541
Benzo(g,h,i)perylene	**1.56** (0.017)	---	EPH8270SIM	---	1	TJ	07/30/24 4:25	D4G0620	DG42541
Benzo(k)fluoranthene	**1.63** (0.017)	---	EPH8270SIM	---	1	TJ	07/30/24 4:25	D4G0620	DG42541
Chrysene	**2.30** (0.017)	---	EPH8270SIM	---	1	TJ	07/30/24 4:25	D4G0620	DG42541
Dibenzo(a,h)Anthracene	**0.691** (0.017)	---	EPH8270SIM	---	1	TJ	07/30/24 4:25	D4G0620	DG42541
Fluoranthene	**4.25** (0.087)	---	EPH8270SIM	---	5	TJ	07/30/24 21:53	D4G0620	DG42541
Fluorene	**0.324** (0.017)	---	EPH8270SIM	---	1	TJ	07/30/24 4:25	D4G0620	DG42541
Indeno(1,2,3-cd)Pyrene	**1.32** (0.017)	---	EPH8270SIM	---	1	TJ	07/30/24 4:25	D4G0620	DG42541
Pyrene	**4.08** (0.087)	---	EPH8270SIM	---	5	TJ	07/30/24 21:53	D4G0620	DG42541

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1-Chlorooctadecane	*67 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*86 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*89 %*		*40-140*
Surrogate: O-Terphenyl	*74 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-887 0-2ft
Date Sampled: 07/23/24 16:15
Percent Solids: 46

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-05
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Conductivity	**WL 118** (5)	---	9050A	---	1	EAM	07/24/24 21:06	umhos/cm	DG42435
Corrosivity (pH)	**6.50** (N/A)	---	9045	---	1	EAM	07/24/24 20:00	S.U.	DG42453
Corrosivity (pH) Sample Temp	**21.3**	---	2550B	---	1	EAM	07/24/24 20:00	°C	DG42453
Flashpoint	**> 200** (N/A)	---	1010A	---	1	JLK	07/24/24 19:54	°F	DG42451
Reactive Cyanide	ND (2.0)	---	7.3.3.2	---	1	EAM	07/25/24 18:00	mg/kg	DG42545
Reactive Sulfide	ND (2.0)	---	7.3.4.1	---	1	EAM	07/25/24 18:00	mg/kg	DG42545
Sulfate	**WL** ND (109)	---	9038	---	1	JLK	07/25/24 15:51	mg/kg dry	DG42539
Sulfide	**WL** ND (1.1)	---	9030B	---	1	JLK	07/24/24 21:40	mg/kg dry	DG42442
Total Cyanide	ND (2.03)	---	9014	---	1	EEM	07/26/24 12:45	mg/kg dry	DG42625
Total Organic Carbon (Average)	**62000** (500)	---	LK	---	1	CCP	07/31/24 15:31	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-887 0-2ft
Date Sampled: 07/23/24 16:15
Percent Solids: 46
Initial Volume: 1g
Final Volume: 1g
Extraction Method: General Subbed Prep

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-05
Sample Matrix: Soil

Analyst: SUB
Prepared: 7/31/24 0:00

Subcontracted Analysis

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Sulfur	**3590** (100)	---	6010	---	1	SUB	07/31/24 0:00	mg/kg	DH40131

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-887 0-2ft
Date Sampled: 07/23/24 16:15
Percent Solids: 46

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-05
Sample Matrix: Soil
Units: °C

Extraction Method: 1311

TCLP Extraction by 1311 - Metals

Analyte	Results (MRL)	MDL	Method	TCLP Limit	DF	Analyst	Analyzed	IV / FV	Batch
Temperature (Min C)	**20.2** (N/A)	---	1311	---	1	RAP	07/30/24 8:18		DG42929
Temperature (Max C)	**22.0** (N/A)	---	1311	---	1	RAP	07/30/24 8:18		DG42929
Temperature (Range)	**Temperature is not within 23 +/-2 °C.** (N/A)								

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-887 0-2ft
Date Sampled: 07/23/24 16:15
Percent Solids: 46
Initial Volume: 30.5g
Final Volume: 2ml
Extraction Method: 3540C

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: DMC
Prepared: 7/25/24 11:15

8082 Polychlorinated Biphenyls (PCB) / Congeners

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
BZ#8 [2C]	ND (0.00057)	---	8082A Cong	---	1	07/27/24 3:33	D4G0576	DG42401
BZ#18 [2C]	**P 0.00117** (0.00057)	---	8082A Cong	---	1	07/27/24 3:33	D4G0576	DG42401
BZ#28 [2C]	**0.00224** (0.00057)	---	8082A Cong	---	1	07/27/24 3:33	D4G0576	DG42401
BZ#44 [2C]	**0.00229** (0.00057)	---	8082A Cong	---	1	07/27/24 3:33	D4G0576	DG42401
BZ#52	**0.00511** (0.00057)	---	8082A Cong	---	1	07/27/24 3:33	D4G0576	DG42401
BZ#66	ND (0.00057)	---	8082A Cong	---	1	07/27/24 3:33	D4G0576	DG42401
BZ#101	**0.00636** (0.00057)	---	8082A Cong	---	1	07/27/24 3:33	D4G0576	DG42401
BZ#105	**P, LC 0.00196** (0.00057)	---	8082A Cong	---	1	07/27/24 3:33	D4G0576	DG42401
BZ#118	**0.00459** (0.00057)	---	8082A Cong	---	1	07/27/24 3:33	D4G0576	DG42401
BZ#128	**0.00132** (0.00057)	---	8082A Cong	---	1	07/27/24 3:33	D4G0576	DG42401
BZ#138	**P, LC 0.00450** (0.00057)	---	8082A Cong	---	1	07/27/24 3:33	D4G0576	DG42401
BZ#153	**0.00467** (0.00057)	---	8082A Cong	---	1	07/27/24 3:33	D4G0576	DG42401
BZ#170	**P, LC 0.00095** (0.00057)	---	8082A Cong	---	1	07/27/24 3:33	D4G0576	DG42401
BZ#180 [2C]	**0.00189** (0.00057)	---	8082A Cong	---	1	07/27/24 3:33	D4G0576	DG42401
BZ#187	**P, LC 0.00099** (0.00057)	---	8082A Cong	---	1	07/27/24 3:33	D4G0576	DG42401
BZ#195	ND (0.00057)	---	8082A Cong	---	1	07/27/24 3:33	D4G0576	DG42401
BZ#206	**P, LC 0.00061** (0.00057)	---	8082A Cong	---	1	07/27/24 3:33	D4G0576	DG42401
BZ#209	ND (0.00057)	---	8082A Cong	---	1	07/27/24 3:33	D4G0576	DG42401

	%Recovery	*Qualifier*	*Limits*
Surrogate: Tetrachloro-m-xylene [2C]	*66 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-887 0.5ft
Date Sampled: 07/23/24 16:16
Percent Solids: 34
Initial Volume: 7.4g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 7/29/24 8:00

Volatile Organics Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
1,1,1-Trichloroethane	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
1,1,2,2-Tetrachloroethane	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
1,1,2-Trichloroethane	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
1,1-Dichloroethane	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
1,1-Dichloroethene	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
1,1-Dichloropropene	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
1,2,3-Trichlorobenzene	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
1,2,3-Trichloropropane	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
1,2,4-Trichlorobenzene	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
1,2,4-Trimethylbenzene	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
1,2-Dibromo-3-Chloropropane	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
1,2-Dibromoethane	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
1,2-Dichlorobenzene	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
1,2-Dichloroethane	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
1,2-Dichloropropane	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
1,3,5-Trimethylbenzene	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
1,3-Dichlorobenzene	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
1,3-Dichloropropane	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
1,4-Dichlorobenzene	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
1,4-Dioxane	ND (0.196)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
2,2-Dichloropropane	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
2-Butanone	ND (0.0982)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
2-Chlorotoluene	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
2-Hexanone	ND (0.0982)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
4-Chlorotoluene	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
4-Isopropyltoluene	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-887 0.5ft
Date Sampled: 07/23/24 16:16
Percent Solids: 34
Initial Volume: 7.4g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 7/29/24 8:00

Volatile Organics Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
4-Methyl-2-Pentanone	ND (0.0982)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
Acetone	**0.170** (0.0982)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
Benzene	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
Bromobenzene	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
Bromochloromethane	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
Bromodichloromethane	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
Bromoform	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
Bromomethane	ND (0.0196)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
Carbon Disulfide	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
Carbon Tetrachloride	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
Chlorobenzene	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
Chloroethane	ND (0.0196)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
Chloroform	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
Chloromethane	ND (0.0196)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
cis-1,2-Dichloroethene	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
cis-1,3-Dichloropropene	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
Dibromochloromethane	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
Dibromomethane	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
Dichlorodifluoromethane	ND (0.0196)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
Diethyl Ether	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
Di-isopropyl ether	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
Ethyl tertiary-butyl ether	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
Ethylbenzene	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
Hexachlorobutadiene	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
Isopropylbenzene	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
Methyl tert-Butyl Ether	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
Methylene Chloride	ND (0.0491)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-887 0.5ft
Date Sampled: 07/23/24 16:16
Percent Solids: 34
Initial Volume: 7.4g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 7/29/24 8:00

Volatile Organics Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Naphthalene	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
n-Butylbenzene	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
n-Propylbenzene	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
sec-Butylbenzene	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
Styrene	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
tert-Butylbenzene	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
Tertiary-amyl methyl ether	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
Tetrachloroethene	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
Tetrahydrofuran	ND (0.0393)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
Toluene	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
trans-1,2-Dichloroethene	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
trans-1,3-Dichloropropene	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
Trichloroethene	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
Trichlorofluoromethane	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
Vinyl Chloride	ND (0.0196)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
Xylene O	ND (0.0098)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
Xylene P,M	ND (0.0196)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927
Xylenes (Total)	ND (0.0196)	---	8260D Low	---	1	MEK	07/29/24 13:54	D4G0616	DG42927

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*113 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*90 %*		*70-130*
Surrogate: Dibromofluoromethane	*109 %*		*70-130*
Surrogate: Toluene-d8	*103 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-886 0-2ft - Oven Dried
Date Sampled: 07/23/24 13:15
Percent Solids: 100

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-07
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	IV / FV	Batch
Arsenic	**6.38** (0.38)	---	6010D	---	1	KJB	07/31/24 14:39	5.25 100	DG43012
Cadmium	**0.26** (0.10)	---	6010D	---	1	KJB	07/30/24 15:19	5.25 100	DG43012
Chromium	**23.5** (0.38)	---	6010D	---	1	KJB	07/31/24 14:39	5.25 100	DG43012
Copper	**48.6** (0.95)	---	6010D	---	1	KJB	07/30/24 15:19	5.25 100	DG43012
Lead	**129** (1.90)	---	6010D	---	1	KJB	07/31/24 14:39	5.25 100	DG43012
Mercury	**0.576** (0.090)	---	7471B	---	10	AFV	07/30/24 19:26	2.21 40	DG43013
Nickel	**10.6** (0.95)	---	6010D	---	1	KJB	07/31/24 14:39	5.25 100	DG43012
Zinc	**96.0** (0.95)	---	6010D	---	1	KJB	07/31/24 14:39	5.25 100	DG43012

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-885 0-2ft - Oven Dried
Date Sampled: 07/23/24 15:45
Percent Solids: 100

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-08
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	IV / FV	Batch
Arsenic	**7.36** (0.38)	---	6010D	---	1	KJB	07/31/24 14:41	5.21 100	DG43012
Cadmium	**1.01** (0.10)	---	6010D	---	1	KJB	07/30/24 15:21	5.21 100	DG43012
Chromium	**63.1** (0.38)	---	6010D	---	1	KJB	07/31/24 14:41	5.21 100	DG43012
Copper	**86.3** (0.96)	---	6010D	---	1	KJB	07/30/24 15:21	5.21 100	DG43012
Lead	**161** (1.92)	---	6010D	---	1	KJB	07/31/24 14:41	5.21 100	DG43012
Mercury	**0.946** (0.095)	---	7471B	---	10	AFV	07/30/24 19:28	2.08 40	DG43013
Nickel	**12.8** (0.96)	---	6010D	---	1	KJB	07/31/24 14:41	5.21 100	DG43012
Zinc	**125** (0.96)	---	6010D	---	1	KJB	07/31/24 14:41	5.21 100	DG43012

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP
Client Sample ID: 1804576-887 0-2ft - Oven Dried
Date Sampled: 07/23/24 16:15
Percent Solids: 100

ESS Laboratory Work Order: 24G0906
ESS Laboratory Sample ID: 24G0906-09
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	IV / FV	Batch
Arsenic	**13.8** (0.37)	---	6010D	---	1	KJB	07/31/24 14:43	5.43 100	DG43012
Cadmium	**0.74** (0.09)	---	6010D	---	1	KJB	07/30/24 15:28	5.43 100	DG43012
Chromium	**36.6** (0.37)	---	6010D	---	1	KJB	07/31/24 14:43	5.43 100	DG43012
Copper	**79.3** (0.92)	---	6010D	---	1	KJB	07/30/24 15:28	5.43 100	DG43012
Lead	**139** (1.84)	---	6010D	---	1	KJB	07/31/24 14:43	5.43 100	DG43012
Mercury	**1.10** (0.180)	---	7471B	---	20	AFV	07/30/24 19:30	2.2 40	DG43013
Nickel	**15.1** (0.92)	---	6010D	---	1	KJB	07/31/24 14:43	5.43 100	DG43012
Zinc	**160** (0.92)	---	6010D	---	1	KJB	07/31/24 14:43	5.43 100	DG43012

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0906

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch DG42509 - 3050B										
Blank										
Arsenic	ND	0.87	mg/kg wet							
Barium	ND	0.87	mg/kg wet							
Cadmium	ND	0.44	mg/kg wet							
Chromium	ND	0.87	mg/kg wet							
Copper	ND	2.18	mg/kg wet							
Lead	ND	4.37	mg/kg wet							
Nickel	ND	0.87	mg/kg wet							
Selenium	ND	4.37	mg/kg wet							
Silver	ND	0.44	mg/kg wet							
Zinc	ND	2.18	mg/kg wet							
LCS										
Arsenic	304	3.33	mg/kg wet	360.0		84	80-120			
Barium	300	3.33	mg/kg wet	332.0		91	80-120			
Cadmium	201	1.67	mg/kg wet	238.0		85	80-120			
Chromium	179	3.33	mg/kg wet	199.0		90	80-120			
Copper	200	8.33	mg/kg wet	227.0		88	80-120			
Lead	92.0	16.7	mg/kg wet	100.0		92	80-120			
Nickel	314	3.33	mg/kg wet	342.0		92	80-120			
Selenium	155	16.7	mg/kg wet	170.0		91	80-120			
Silver	81.4	1.67	mg/kg wet	88.60		92	80-120			
Zinc	162	8.33	mg/kg wet	183.0		88	80-120			
LCS Dup										
Arsenic	317	3.33	mg/kg wet	360.0		88	80-120	4	30	
Barium	300	3.33	mg/kg wet	332.0		90	80-120	0.2	30	
Cadmium	210	1.67	mg/kg wet	238.0		88	80-120	4	30	
Chromium	183	3.33	mg/kg wet	199.0		92	80-120	3	30	
Copper	210	8.33	mg/kg wet	227.0		92	80-120	5	30	
Lead	94.3	16.7	mg/kg wet	100.0		94	80-120	2	30	
Nickel	326	3.33	mg/kg wet	342.0		95	80-120	4	30	
Selenium	160	16.7	mg/kg wet	170.0		94	80-120	3	30	
Silver	84.0	1.67	mg/kg wet	88.60		95	80-120	3	30	
Zinc	168	8.33	mg/kg wet	183.0		92	80-120	4	30	
Batch DG42510 - 7471B										
Blank										
Mercury	ND	0.030	mg/kg wet							
LCS										
Mercury	12.9	3.25	mg/kg wet	14.40		89	80-120			
LCS Dup										
Mercury	12.9	3.19	mg/kg wet	14.40		90	80-120	0.6	30	
Batch DG43012 - 3050B										
Blank										
Arsenic	ND	0.94	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0906

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch DG43012 - 3050B										
Cadmium	ND	0.23	mg/kg wet							
Chromium	ND	0.94	mg/kg wet							
Copper	ND	2.35	mg/kg wet							
Lead	ND	4.69	mg/kg wet							
Nickel	ND	2.35	mg/kg wet							
Zinc	ND	2.35	mg/kg wet							
LCS										
Arsenic	325	7.46	mg/kg wet	360.0		90	80-120			
Cadmium	203	1.49	mg/kg wet	238.0		85	80-120			
Chromium	189	2.99	mg/kg wet	199.0		95	80-120			
Copper	209	7.46	mg/kg wet	227.0		92	80-120			
Lead	96.5	14.9	mg/kg wet	100.0		96	80-120			
Nickel	331	7.46	mg/kg wet	342.0		97	80-120			
Zinc	170	7.46	mg/kg wet	183.0		93	80-120			
LCS Dup										
Arsenic	323	7.58	mg/kg wet	360.0		90	80-120	0.5	30	
Cadmium	205	1.52	mg/kg wet	238.0		86	80-120	0.9	30	
Chromium	185	3.03	mg/kg wet	199.0		93	80-120	2	30	
Copper	205	7.58	mg/kg wet	227.0		90	80-120	2	30	
Lead	97.7	15.2	mg/kg wet	100.0		98	80-120	1	30	
Nickel	326	7.58	mg/kg wet	342.0		95	80-120	1	30	
Zinc	169	7.58	mg/kg wet	183.0		92	80-120	0.6	30	
Batch DG43013 - 7471B										
Blank										
Mercury	ND	0.029	mg/kg wet							
LCS										
Mercury	13.9	2.91	mg/kg wet	14.40		96	80-120			
LCS Dup										
Mercury	13.8	2.91	mg/kg wet	14.40		96	80-120	0.9	30	
1311 TCLP Metals										
Batch DG43023 - 3005A_TCLP										
Blank										
Chromium	ND	0.02	mg/L							
Lead	ND	0.05	mg/L							
LCS										
Chromium	0.49	0.02	mg/L	0.5000		98	80-120			
Lead	0.47	0.05	mg/L	0.5000		94	80-120			
LCS Dup										
Chromium	0.49	0.02	mg/L	0.5000		97	80-120	1	20	
Lead	0.48	0.05	mg/L	0.5000		95	80-120	1	20	
Volatile Organics Low Level										
Batch DG42927 - 5035										

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0906

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile Organics Low Level										
Batch DG42927 - 5035										
Blank										
1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0500	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							
Acetone	ND	0.0500	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0050	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0906

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile Organics Low Level										
Batch DG42927 - 5035										
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0200	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*0.0548*		mg/kg wet	*0.05000*		*110*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0433*		mg/kg wet	*0.05000*		*87*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0524*		mg/kg wet	*0.05000*		*105*	*70-130*			
Surrogate: Toluene-d8	*0.0504*		mg/kg wet	*0.05000*		*101*	*70-130*			
LCS										
1,1,1,2-Tetrachloroethane	0.0569	0.0050	mg/kg wet	0.05000		114	70-130			
1,1,1-Trichloroethane	0.0535	0.0050	mg/kg wet	0.05000		107	70-130			
1,1,2,2-Tetrachloroethane	0.0504	0.0050	mg/kg wet	0.05000		101	40-160			
1,1,2-Trichloroethane	0.0509	0.0050	mg/kg wet	0.05000		102	70-130			
1,1-Dichloroethane	0.0523	0.0050	mg/kg wet	0.05000		105	70-130			
1,1-Dichloroethene	0.0584	0.0050	mg/kg wet	0.05000		117	70-130			
1,1-Dichloropropene	0.0537	0.0050	mg/kg wet	0.05000		107	70-130			
1,2,3-Trichlorobenzene	0.0562	0.0050	mg/kg wet	0.05000		112	70-130			
1,2,3-Trichloropropane	0.0487	0.0050	mg/kg wet	0.05000		97	70-130			
1,2,4-Trichlorobenzene	0.0571	0.0050	mg/kg wet	0.05000		114	70-130			
1,2,4-Trimethylbenzene	0.0580	0.0050	mg/kg wet	0.05000		116	70-130			
1,2-Dibromo-3-Chloropropane	0.0512	0.0050	mg/kg wet	0.05000		102	70-130			
1,2-Dibromoethane	0.0547	0.0050	mg/kg wet	0.05000		109	70-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0906

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile Organics Low Level										
Batch DG42927 - 5035										
1,2-Dichlorobenzene	0.0528	0.0050	mg/kg wet	0.05000		106	70-130			
1,2-Dichloroethane	0.0509	0.0050	mg/kg wet	0.05000		102	70-130			
1,2-Dichloropropane	0.0524	0.0050	mg/kg wet	0.05000		105	70-130			
1,3,5-Trimethylbenzene	0.0574	0.0050	mg/kg wet	0.05000		115	70-130			
1,3-Dichlorobenzene	0.0524	0.0050	mg/kg wet	0.05000		105	70-130			
1,3-Dichloropropane	0.0562	0.0050	mg/kg wet	0.05000		112	70-130			
1,4-Dichlorobenzene	0.0521	0.0050	mg/kg wet	0.05000		104	70-130			
1,4-Dioxane	0.974	0.100	mg/kg wet	1.000		97	70-130			
2,2-Dichloropropane	0.0568	0.0050	mg/kg wet	0.05000		114	70-130			
2-Butanone	0.260	0.0500	mg/kg wet	0.2500		104	40-160			
2-Chlorotoluene	0.0544	0.0050	mg/kg wet	0.05000		109	70-130			
2-Hexanone	0.228	0.0500	mg/kg wet	0.2500		91	40-160			
4-Chlorotoluene	0.0549	0.0050	mg/kg wet	0.05000		110	70-130			
4-Isopropyltoluene	0.0538	0.0050	mg/kg wet	0.05000		108	70-130			
4-Methyl-2-Pentanone	0.226	0.0500	mg/kg wet	0.2500		90	40-160			
Acetone	0.215	0.0500	mg/kg wet	0.2500		86	40-160			
Benzene	0.0531	0.0050	mg/kg wet	0.05000		106	70-130			
Bromobenzene	0.0561	0.0050	mg/kg wet	0.05000		112	70-130			
Bromochloromethane	0.0540	0.0050	mg/kg wet	0.05000		108	70-130			
Bromodichloromethane	0.0566	0.0050	mg/kg wet	0.05000		113	70-130			
Bromoform	0.0502	0.0050	mg/kg wet	0.05000		100	40-160			
Bromomethane	0.0537	0.0100	mg/kg wet	0.05000		107	40-160			
Carbon Disulfide	0.0548	0.0050	mg/kg wet	0.05000		110	70-130			
Carbon Tetrachloride	0.0538	0.0050	mg/kg wet	0.05000		108	70-130			
Chlorobenzene	0.0542	0.0050	mg/kg wet	0.05000		108	70-130			
Chloroethane	0.0622	0.0100	mg/kg wet	0.05000		124	40-160			
Chloroform	0.0517	0.0050	mg/kg wet	0.05000		103	70-130			
Chloromethane	0.0556	0.0100	mg/kg wet	0.05000		111	40-160			
cis-1,2-Dichloroethene	0.0553	0.0050	mg/kg wet	0.05000		111	70-130			
cis-1,3-Dichloropropene	0.0577	0.0050	mg/kg wet	0.05000		115	40-160			
Dibromochloromethane	0.0586	0.0050	mg/kg wet	0.05000		117	40-160			
Dibromomethane	0.0529	0.0050	mg/kg wet	0.05000		106	70-130			
Dichlorodifluoromethane	0.0369	0.0100	mg/kg wet	0.05000		74	40-160			
Diethyl Ether	0.0559	0.0050	mg/kg wet	0.05000		112	70-130			
Di-isopropyl ether	0.0561	0.0050	mg/kg wet	0.05000		112	70-130			
Ethyl tertiary-butyl ether	0.0561	0.0050	mg/kg wet	0.05000		112	70-130			
Ethylbenzene	0.0575	0.0050	mg/kg wet	0.05000		115	70-130			
Hexachlorobutadiene	0.0515	0.0050	mg/kg wet	0.05000		103	40-160			
Isopropylbenzene	0.0639	0.0050	mg/kg wet	0.05000		128	70-130			
Methyl tert-Butyl Ether	0.0547	0.0050	mg/kg wet	0.05000		109	70-130			
Methylene Chloride	0.0594	0.0250	mg/kg wet	0.05000		119	70-130			
Naphthalene	0.0535	0.0050	mg/kg wet	0.05000		107	40-160			
n-Butylbenzene	0.0576	0.0050	mg/kg wet	0.05000		115	70-130			
n-Propylbenzene	0.0567	0.0050	mg/kg wet	0.05000		113	70-130			
sec-Butylbenzene	0.0536	0.0050	mg/kg wet	0.05000		107	70-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile Organics Low Level										
Batch DG42927 - 5035										
Styrene	0.0593	0.0050	mg/kg wet	0.05000		119	40-160			
tert-Butylbenzene	0.0567	0.0050	mg/kg wet	0.05000		113	70-130			
Tertiary-amyl methyl ether	0.0558	0.0050	mg/kg wet	0.05000		112	70-130			
Tetrachloroethene	0.0534	0.0050	mg/kg wet	0.05000		107	70-130			
Tetrahydrofuran	0.0461	0.0200	mg/kg wet	0.05000		92	70-130			
Toluene	0.0536	0.0050	mg/kg wet	0.05000		107	70-130			
trans-1,2-Dichloroethene	0.0553	0.0050	mg/kg wet	0.05000		111	70-130			
trans-1,3-Dichloropropene	0.0553	0.0050	mg/kg wet	0.05000		111	70-130			
Trichloroethene	0.0518	0.0050	mg/kg wet	0.05000		104	70-130			
Trichlorofluoromethane	0.0542	0.0050	mg/kg wet	0.05000		108	40-160			
Vinyl Chloride	0.0560	0.0100	mg/kg wet	0.05000		112	70-130			
Xylene O	0.0609	0.0050	mg/kg wet	0.05000		122	70-130			
Xylene P,M	0.121	0.0100	mg/kg wet	0.1000		121	70-130			
Surrogate: 1,2-Dichloroethane-d4	*0.0482*		mg/kg wet	*0.05000*		*96*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0504*		mg/kg wet	*0.05000*		*101*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0481*		mg/kg wet	*0.05000*		*96*	*70-130*			
Surrogate: Toluene-d8	*0.0506*		mg/kg wet	*0.05000*		*101*	*70-130*			
LCS Dup										
1,1,1,2-Tetrachloroethane	0.0555	0.0050	mg/kg wet	0.05000		111	70-130	3	20	
1,1,1-Trichloroethane	0.0518	0.0050	mg/kg wet	0.05000		104	70-130	3	20	
1,1,2,2-Tetrachloroethane	0.0549	0.0050	mg/kg wet	0.05000		110	40-160	9	20	
1,1,2-Trichloroethane	0.0534	0.0050	mg/kg wet	0.05000		107	70-130	5	20	
1,1-Dichloroethane	0.0509	0.0050	mg/kg wet	0.05000		102	70-130	3	20	
1,1-Dichloroethene	0.0568	0.0050	mg/kg wet	0.05000		114	70-130	3	20	
1,1-Dichloropropene	0.0521	0.0050	mg/kg wet	0.05000		104	70-130	3	20	
1,2,3-Trichlorobenzene	0.0571	0.0050	mg/kg wet	0.05000		114	70-130	1	20	
1,2,3-Trichloropropane	0.0527	0.0050	mg/kg wet	0.05000		105	70-130	8	20	
1,2,4-Trichlorobenzene	0.0578	0.0050	mg/kg wet	0.05000		116	70-130	1	20	
1,2,4-Trimethylbenzene	0.0577	0.0050	mg/kg wet	0.05000		115	70-130	0.6	20	
1,2-Dibromo-3-Chloropropane	0.0557	0.0050	mg/kg wet	0.05000		111	70-130	8	20	
1,2-Dibromoethane	0.0560	0.0050	mg/kg wet	0.05000		112	70-130	2	20	
1,2-Dichlorobenzene	0.0530	0.0050	mg/kg wet	0.05000		106	70-130	0.5	20	
1,2-Dichloroethane	0.0514	0.0050	mg/kg wet	0.05000		103	70-130	1	20	
1,2-Dichloropropane	0.0520	0.0050	mg/kg wet	0.05000		104	70-130	0.8	20	
1,3,5-Trimethylbenzene	0.0568	0.0050	mg/kg wet	0.05000		114	70-130	1	20	
1,3-Dichlorobenzene	0.0521	0.0050	mg/kg wet	0.05000		104	70-130	0.5	20	
1,3-Dichloropropane	0.0567	0.0050	mg/kg wet	0.05000		113	70-130	0.7	20	
1,4-Dichlorobenzene	0.0525	0.0050	mg/kg wet	0.05000		105	70-130	0.7	20	
1,4-Dioxane	0.988	0.100	mg/kg wet	1.000		99	70-130	1	20	
2,2-Dichloropropane	0.0548	0.0050	mg/kg wet	0.05000		110	70-130	4	20	
2-Butanone	0.278	0.0500	mg/kg wet	0.2500		111	40-160	7	20	
2-Chlorotoluene	0.0552	0.0050	mg/kg wet	0.05000		110	70-130	1	20	
2-Hexanone	0.252	0.0500	mg/kg wet	0.2500		101	40-160	10	20	
4-Chlorotoluene	0.0536	0.0050	mg/kg wet	0.05000		107	70-130	2	20	
4-Isopropyltoluene	0.0531	0.0050	mg/kg wet	0.05000		106	70-130	1	20	

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Client Name: GEI Consultants, Inc.
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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile Organics Low Level										
Batch DG42927 - 5035										
4-Methyl-2-Pentanone	0.248	0.0500	mg/kg wet	0.2500		99	40-160	9	20	
Acetone	0.267	0.0500	mg/kg wet	0.2500		107	40-160	22	20	D+
Benzene	0.0523	0.0050	mg/kg wet	0.05000		105	70-130	2	20	
Bromobenzene	0.0571	0.0050	mg/kg wet	0.05000		114	70-130	2	20	
Bromochloromethane	0.0540	0.0050	mg/kg wet	0.05000		108	70-130	0.04	20	
Bromodichloromethane	0.0564	0.0050	mg/kg wet	0.05000		113	70-130	0.2	20	
Bromoform	0.0513	0.0050	mg/kg wet	0.05000		103	40-160	2	20	
Bromomethane	0.0520	0.0100	mg/kg wet	0.05000		104	40-160	3	20	
Carbon Disulfide	0.0533	0.0050	mg/kg wet	0.05000		107	70-130	3	20	
Carbon Tetrachloride	0.0521	0.0050	mg/kg wet	0.05000		104	70-130	3	20	
Chlorobenzene	0.0522	0.0050	mg/kg wet	0.05000		104	70-130	4	20	
Chloroethane	0.0604	0.0100	mg/kg wet	0.05000		121	40-160	3	20	
Chloroform	0.0506	0.0050	mg/kg wet	0.05000		101	70-130	2	20	
Chloromethane	0.0531	0.0100	mg/kg wet	0.05000		106	40-160	5	20	
cis-1,2-Dichloroethene	0.0544	0.0050	mg/kg wet	0.05000		109	70-130	2	20	
cis-1,3-Dichloropropene	0.0579	0.0050	mg/kg wet	0.05000		116	40-160	0.3	20	
Dibromochloromethane	0.0589	0.0050	mg/kg wet	0.05000		118	40-160	0.5	20	
Dibromomethane	0.0547	0.0050	mg/kg wet	0.05000		109	70-130	3	20	
Dichlorodifluoromethane	0.0346	0.0100	mg/kg wet	0.05000		69	40-160	6	20	
Diethyl Ether	0.0576	0.0050	mg/kg wet	0.05000		115	70-130	3	20	
Di-isopropyl ether	0.0561	0.0050	mg/kg wet	0.05000		112	70-130	0.04	20	
Ethyl tertiary-butyl ether	0.0572	0.0050	mg/kg wet	0.05000		114	70-130	2	20	
Ethylbenzene	0.0555	0.0050	mg/kg wet	0.05000		111	70-130	3	20	
Hexachlorobutadiene	0.0513	0.0050	mg/kg wet	0.05000		103	40-160	0.5	20	
Isopropylbenzene	0.0633	0.0050	mg/kg wet	0.05000		127	70-130	0.9	20	
Methyl tert-Butyl Ether	0.0572	0.0050	mg/kg wet	0.05000		114	70-130	5	20	
Methylene Chloride	0.0584	0.0250	mg/kg wet	0.05000		117	70-130	2	20	
Naphthalene	0.0569	0.0050	mg/kg wet	0.05000		114	40-160	6	20	
n-Butylbenzene	0.0562	0.0050	mg/kg wet	0.05000		112	70-130	2	20	
n-Propylbenzene	0.0561	0.0050	mg/kg wet	0.05000		112	70-130	1	20	
sec-Butylbenzene	0.0527	0.0050	mg/kg wet	0.05000		105	70-130	2	20	
Styrene	0.0577	0.0050	mg/kg wet	0.05000		115	40-160	3	20	
tert-Butylbenzene	0.0566	0.0050	mg/kg wet	0.05000		113	70-130	0.2	20	
Tertiary-amyl methyl ether	0.0576	0.0050	mg/kg wet	0.05000		115	70-130	3	20	
Tetrachloroethene	0.0509	0.0050	mg/kg wet	0.05000		102	70-130	5	20	
Tetrahydrofuran	0.0522	0.0200	mg/kg wet	0.05000		104	70-130	12	20	
Toluene	0.0526	0.0050	mg/kg wet	0.05000		105	70-130	2	20	
trans-1,2-Dichloroethene	0.0541	0.0050	mg/kg wet	0.05000		108	70-130	2	20	
trans-1,3-Dichloropropene	0.0564	0.0050	mg/kg wet	0.05000		113	70-130	2	20	
Trichloroethene	0.0512	0.0050	mg/kg wet	0.05000		102	70-130	1	20	
Trichlorofluoromethane	0.0523	0.0050	mg/kg wet	0.05000		105	40-160	4	20	
Vinyl Chloride	0.0540	0.0100	mg/kg wet	0.05000		108	70-130	4	20	
Xylene O	0.0589	0.0050	mg/kg wet	0.05000		118	70-130	3	20	
Xylene P,M	0.116	0.0100	mg/kg wet	0.1000		116	70-130	4	20	
Surrogate: 1,2-Dichloroethane-d4	*0.0493*		mg/kg wet	*0.05000*		*99*	*70-130*			

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Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0906

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile Organics Low Level										
Batch DG42927 - 5035										
Surrogate: 4-Bromofluorobenzene	*0.0483*		mg/kg wet	*0.05000*		*97*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0497*		mg/kg wet	*0.05000*		*99*	*70-130*			
Surrogate: Toluene-d8	*0.0498*		mg/kg wet	*0.05000*		*100*	*70-130*			
Semi-Volatile Organic Compounds										
Batch DG42604 - 3546										
Blank										
1,1-Biphenyl	ND	0.025	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.250	mg/kg wet							
1,2-Dichlorobenzene	ND	0.250	mg/kg wet							
1,3-Dichlorobenzene	ND	0.250	mg/kg wet							
1,4-Dichlorobenzene	ND	0.250	mg/kg wet							
2,4,5-Trichlorophenol	ND	0.250	mg/kg wet							
2,4,6-Trichlorophenol	ND	0.250	mg/kg wet							
2,4-Dichlorophenol	ND	0.250	mg/kg wet							
2,4-Dimethylphenol	ND	0.250	mg/kg wet							
2,4-Dinitrophenol	ND	1.00	mg/kg wet							
2,4-Dinitrotoluene	ND	0.250	mg/kg wet							
2,6-Dinitrotoluene	ND	0.250	mg/kg wet							
2-Chloronaphthalene	ND	0.250	mg/kg wet							
2-Chlorophenol	ND	0.250	mg/kg wet							
2-Methylnaphthalene	ND	0.250	mg/kg wet							
2-Methylphenol	ND	0.250	mg/kg wet							
2-Nitrophenol	ND	0.500	mg/kg wet							
3,3´-Dichlorobenzidine	ND	0.250	mg/kg wet							
3+4-Methylphenol	ND	0.250	mg/kg wet							
4-Bromophenyl-phenylether	ND	0.250	mg/kg wet							
4-Chloroaniline	ND	0.250	mg/kg wet							
4-Nitrophenol	ND	1.00	mg/kg wet							
Acenaphthene	ND	0.250	mg/kg wet							
Acenaphthylene	ND	0.250	mg/kg wet							
Acetophenone	ND	0.250	mg/kg wet							
Aniline	ND	0.250	mg/kg wet							
Anthracene	ND	0.250	mg/kg wet							
Azobenzene	ND	0.250	mg/kg wet							
Benzo(a)anthracene	ND	0.250	mg/kg wet							
Benzo(a)pyrene	ND	0.250	mg/kg wet							
Benzo(b)fluoranthene	ND	0.250	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.250	mg/kg wet							
Benzo(k)fluoranthene	ND	0.250	mg/kg wet							
bis(2-Chloroethoxy)methane	ND	0.250	mg/kg wet							
bis(2-Chloroethyl)ether	ND	0.250	mg/kg wet							
bis(2-chloroisopropyl)Ether	ND	0.250	mg/kg wet							
bis(2-Ethylhexyl)phthalate	ND	0.250	mg/kg wet							
Butylbenzylphthalate	ND	0.250	mg/kg wet							

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Semi-Volatile Organic Compounds										
Batch DG42604 - 3546										
Chrysene	ND	0.250	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.250	mg/kg wet							
Dibenzofuran	ND	0.250	mg/kg wet							
Diethylphthalate	ND	0.250	mg/kg wet							
Dimethylphthalate	ND	0.250	mg/kg wet							
Di-n-butylphthalate	ND	0.250	mg/kg wet							
Di-n-octylphthalate	ND	0.500	mg/kg wet							
Fluoranthene	ND	0.250	mg/kg wet							
Fluorene	ND	0.250	mg/kg wet							
Hexachlorobenzene	ND	0.250	mg/kg wet							
Hexachlorobutadiene	ND	0.250	mg/kg wet							
Hexachloroethane	ND	0.250	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.250	mg/kg wet							
Isophorone	ND	0.250	mg/kg wet							
Naphthalene	ND	0.250	mg/kg wet							
Nitrobenzene	ND	0.250	mg/kg wet							
N-Nitrosodimethylamine	ND	0.250	mg/kg wet							
Pentachlorophenol	ND	1.00	mg/kg wet							
Phenanthrene	ND	0.250	mg/kg wet							
Phenol	ND	0.250	mg/kg wet							
Pyrene	ND	0.250	mg/kg wet							
Pyridine	ND	0.250	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	*2.16*		mg/kg wet	*2.500*		*87*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*3.17*		mg/kg wet	*3.750*		*84*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.58*		mg/kg wet	*3.750*		*95*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.16*		mg/kg wet	*2.500*		*86*	*30-130*			
Surrogate: 2-Fluorophenol	*3.20*		mg/kg wet	*3.750*		*85*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.13*		mg/kg wet	*2.500*		*85*	*30-130*			
Surrogate: Phenol-d6	*3.30*		mg/kg wet	*3.750*		*88*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.44*		mg/kg wet	*2.500*		*98*	*30-130*			
LCS										
1,1-Biphenyl	2.21	0.025	mg/kg wet	2.500		89	40-140			
1,2,4-Trichlorobenzene	1.79	0.250	mg/kg wet	2.500		71	40-140			
1,2-Dichlorobenzene	2.11	0.250	mg/kg wet	2.500		85	40-140			
1,3-Dichlorobenzene	1.97	0.250	mg/kg wet	2.500		79	40-140			
1,4-Dichlorobenzene	2.03	0.250	mg/kg wet	2.500		81	40-140			
2,4,5-Trichlorophenol	2.34	0.250	mg/kg wet	2.500		93	30-130			
2,4,6-Trichlorophenol	2.25	0.250	mg/kg wet	2.500		90	30-130			
2,4-Dichlorophenol	1.93	0.250	mg/kg wet	2.500		77	30-130			
2,4-Dimethylphenol	1.94	0.250	mg/kg wet	2.500		77	30-130			
2,4-Dinitrophenol	1.11	1.00	mg/kg wet	2.500		44	15-140			
2,4-Dinitrotoluene	2.52	0.250	mg/kg wet	2.500		101	40-140			
2,6-Dinitrotoluene	2.46	0.250	mg/kg wet	2.500		99	40-140			
2-Chloronaphthalene	2.25	0.250	mg/kg wet	2.500		90	40-140			
2-Chlorophenol	2.24	0.250	mg/kg wet	2.500		90	30-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0906

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Semi-Volatile Organic Compounds										
Batch DG42604 - 3546										
2-Methylnaphthalene	1.87	0.250	mg/kg wet	2.500		75	40-140			
2-Methylphenol	2.14	0.250	mg/kg wet	2.500		86	15-140			
2-Nitrophenol	2.04	0.500	mg/kg wet	2.500		82	30-130			
3,3´-Dichlorobenzidine	2.37	0.250	mg/kg wet	2.500		95	40-140			
3+4-Methylphenol	4.30	0.250	mg/kg wet	5.000		86	15-140			
4-Bromophenyl-phenylether	2.18	0.250	mg/kg wet	2.500		87	40-140			
4-Chloroaniline	1.72	0.250	mg/kg wet	2.500		69	15-140			
4-Nitrophenol	1.93	1.00	mg/kg wet	2.500		77	15-140			
Acenaphthene	2.15	0.250	mg/kg wet	2.500		86	40-140			
Acenaphthylene	2.22	0.250	mg/kg wet	2.500		89	40-140			
Acetophenone	2.14	0.250	mg/kg wet	2.500		86	40-140			
Aniline	1.19	0.250	mg/kg wet	2.500		47	40-140			
Anthracene	2.50	0.250	mg/kg wet	2.500		100	40-140			
Azobenzene	2.10	0.250	mg/kg wet	2.500		84	40-140			
Benzo(a)anthracene	2.45	0.250	mg/kg wet	2.500		98	40-140			
Benzo(a)pyrene	2.47	0.250	mg/kg wet	2.500		99	40-140			
Benzo(b)fluoranthene	2.27	0.250	mg/kg wet	2.500		91	40-140			
Benzo(g,h,i)perylene	2.67	0.250	mg/kg wet	2.500		107	40-140			
Benzo(k)fluoranthene	2.38	0.250	mg/kg wet	2.500		95	40-140			
bis(2-Chloroethoxy)methane	1.66	0.250	mg/kg wet	2.500		66	40-140			
bis(2-Chloroethyl)ether	1.79	0.250	mg/kg wet	2.500		72	40-140			
bis(2-chloroisopropyl)Ether	1.85	0.250	mg/kg wet	2.500		74	40-140			
bis(2-Ethylhexyl)phthalate	2.46	0.250	mg/kg wet	2.500		99	40-140			
Butylbenzylphthalate	2.58	0.250	mg/kg wet	2.500		103	40-140			
Chrysene	2.44	0.250	mg/kg wet	2.500		98	40-140			
Dibenzo(a,h)Anthracene	2.61	0.250	mg/kg wet	2.500		104	40-140			
Dibenzofuran	2.17	0.250	mg/kg wet	2.500		87	40-140			
Diethylphthalate	2.44	0.250	mg/kg wet	2.500		98	40-140			
Dimethylphthalate	2.34	0.250	mg/kg wet	2.500		94	15-140			
Di-n-butylphthalate	2.69	0.250	mg/kg wet	2.500		108	40-140			
Di-n-octylphthalate	2.77	0.500	mg/kg wet	2.500		111	40-140			
Fluoranthene	2.57	0.250	mg/kg wet	2.500		103	40-140			
Fluorene	2.34	0.250	mg/kg wet	2.500		93	40-140			
Hexachlorobenzene	2.10	0.250	mg/kg wet	2.500		84	40-140			
Hexachlorobutadiene	1.66	0.250	mg/kg wet	2.500		66	40-140			
Hexachloroethane	2.01	0.250	mg/kg wet	2.500		80	40-140			
Indeno(1,2,3-cd)Pyrene	2.51	0.250	mg/kg wet	2.500		101	40-140			
Isophorone	1.71	0.250	mg/kg wet	2.500		69	40-140			
Naphthalene	1.80	0.250	mg/kg wet	2.500		72	40-140			
Nitrobenzene	1.66	0.250	mg/kg wet	2.500		66	40-140			
N-Nitrosodimethylamine	1.77	0.250	mg/kg wet	2.500		71	40-140			
Pentachlorophenol	1.85	1.00	mg/kg wet	2.500		74	15-140			
Phenanthrene	2.32	0.250	mg/kg wet	2.500		93	40-140			
Phenol	2.25	0.250	mg/kg wet	2.500		90	15-140			
Pyrene	2.52	0.250	mg/kg wet	2.500		101	40-140			

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Semi-Volatile Organic Compounds										
Batch DG42604 - 3546										
Pyridine	1.44	0.250	mg/kg wet	2.500		58	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	*2.09*		mg/kg wet	*2.500*		*84*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*3.13*		mg/kg wet	*3.750*		*84*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.43*		mg/kg wet	*3.750*		*91*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.09*		mg/kg wet	*2.500*		*84*	*30-130*			
Surrogate: 2-Fluorophenol	*2.78*		mg/kg wet	*3.750*		*74*	*30-130*			
Surrogate: Nitrobenzene-d5	*1.83*		mg/kg wet	*2.500*		*73*	*30-130*			
Surrogate: Phenol-d6	*3.28*		mg/kg wet	*3.750*		*87*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.36*		mg/kg wet	*2.500*		*95*	*30-130*			
LCS Dup										
1,1-Biphenyl	2.23	0.025	mg/kg wet	2.500		89	40-140	0.5	30	
1,2,4-Trichlorobenzene	1.73	0.250	mg/kg wet	2.500		69	40-140	3	30	
1,2-Dichlorobenzene	2.05	0.250	mg/kg wet	2.500		82	40-140	3	30	
1,3-Dichlorobenzene	1.97	0.250	mg/kg wet	2.500		79	40-140	0.3	30	
1,4-Dichlorobenzene	2.03	0.250	mg/kg wet	2.500		81	40-140	0.07	30	
2,4,5-Trichlorophenol	2.40	0.250	mg/kg wet	2.500		96	30-130	3	30	
2,4,6-Trichlorophenol	2.29	0.250	mg/kg wet	2.500		92	30-130	2	30	
2,4-Dichlorophenol	1.88	0.250	mg/kg wet	2.500		75	30-130	3	30	
2,4-Dimethylphenol	1.87	0.250	mg/kg wet	2.500		75	30-130	4	30	
2,4-Dinitrophenol	1.19	1.00	mg/kg wet	2.500		47	15-140	6	30	
2,4-Dinitrotoluene	2.53	0.250	mg/kg wet	2.500		101	40-140	0.2	30	
2,6-Dinitrotoluene	2.48	0.250	mg/kg wet	2.500		99	40-140	0.8	30	
2-Chloronaphthalene	2.24	0.250	mg/kg wet	2.500		90	40-140	0.4	30	
2-Chlorophenol	2.21	0.250	mg/kg wet	2.500		88	30-130	1	30	
2-Methylnaphthalene	1.84	0.250	mg/kg wet	2.500		74	40-140	1	30	
2-Methylphenol	2.09	0.250	mg/kg wet	2.500		84	15-140	2	30	
2-Nitrophenol	2.01	0.500	mg/kg wet	2.500		81	30-130	2	30	
3,3´-Dichlorobenzidine	2.38	0.250	mg/kg wet	2.500		95	40-140	0.8	30	
3+4-Methylphenol	4.26	0.250	mg/kg wet	5.000		85	15-140	0.9	30	
4-Bromophenyl-phenylether	2.24	0.250	mg/kg wet	2.500		90	40-140	3	30	
4-Chloroaniline	1.69	0.250	mg/kg wet	2.500		68	15-140	2	30	
4-Nitrophenol	1.98	1.00	mg/kg wet	2.500		79	15-140	2	30	
Acenaphthene	2.16	0.250	mg/kg wet	2.500		86	40-140	0.4	30	
Acenaphthylene	2.24	0.250	mg/kg wet	2.500		90	40-140	1	30	
Acetophenone	2.11	0.250	mg/kg wet	2.500		84	40-140	1	30	
Aniline	1.00	0.250	mg/kg wet	2.500		40	40-140	17	30	
Anthracene	2.55	0.250	mg/kg wet	2.500		102	40-140	2	30	
Azobenzene	2.20	0.250	mg/kg wet	2.500		88	40-140	5	30	
Benzo(a)anthracene	2.47	0.250	mg/kg wet	2.500		99	40-140	0.9	30	
Benzo(a)pyrene	2.50	0.250	mg/kg wet	2.500		100	40-140	1	30	
Benzo(b)fluoranthene	2.40	0.250	mg/kg wet	2.500		96	40-140	6	30	
Benzo(g,h,i)perylene	2.77	0.250	mg/kg wet	2.500		111	40-140	4	30	
Benzo(k)fluoranthene	2.32	0.250	mg/kg wet	2.500		93	40-140	3	30	
bis(2-Chloroethoxy)methane	1.61	0.250	mg/kg wet	2.500		64	40-140	3	30	
bis(2-Chloroethyl)ether	1.96	0.250	mg/kg wet	2.500		78	40-140	9	30	

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Semi-Volatile Organic Compounds										
Batch DG42604 - 3546										
bis(2-chloroisopropyl)Ether	1.82	0.250	mg/kg wet	2.500		73	40-140	2	30	
bis(2-Ethylhexyl)phthalate	2.48	0.250	mg/kg wet	2.500		99	40-140	0.5	30	
Butylbenzylphthalate	2.57	0.250	mg/kg wet	2.500		103	40-140	0.3	30	
Chrysene	2.43	0.250	mg/kg wet	2.500		97	40-140	0.5	30	
Dibenzo(a,h)Anthracene	2.69	0.250	mg/kg wet	2.500		107	40-140	3	30	
Dibenzofuran	2.20	0.250	mg/kg wet	2.500		88	40-140	2	30	
Diethylphthalate	2.43	0.250	mg/kg wet	2.500		97	40-140	0.2	30	
Dimethylphthalate	2.38	0.250	mg/kg wet	2.500		95	15-140	2	30	
Di-n-butylphthalate	2.69	0.250	mg/kg wet	2.500		108	40-140	0.07	30	
Di-n-octylphthalate	2.72	0.500	mg/kg wet	2.500		109	40-140	2	30	
Fluoranthene	2.57	0.250	mg/kg wet	2.500		103	40-140	0.07	30	
Fluorene	2.40	0.250	mg/kg wet	2.500		96	40-140	3	30	
Hexachlorobenzene	2.10	0.250	mg/kg wet	2.500		84	40-140	0.06	30	
Hexachlorobutadiene	1.67	0.250	mg/kg wet	2.500		67	40-140	0.9	30	
Hexachloroethane	1.98	0.250	mg/kg wet	2.500		79	40-140	1	30	
Indeno(1,2,3-cd)Pyrene	2.61	0.250	mg/kg wet	2.500		104	40-140	4	30	
Isophorone	1.70	0.250	mg/kg wet	2.500		68	40-140	0.5	30	
Naphthalene	1.72	0.250	mg/kg wet	2.500		69	40-140	4	30	
Nitrobenzene	1.62	0.250	mg/kg wet	2.500		65	40-140	2	30	
N-Nitrosodimethylamine	1.65	0.250	mg/kg wet	2.500		66	40-140	7	30	
Pentachlorophenol	2.02	1.00	mg/kg wet	2.500		81	15-140	9	30	
Phenanthrene	2.35	0.250	mg/kg wet	2.500		94	40-140	1	30	
Phenol	2.26	0.250	mg/kg wet	2.500		91	15-140	0.8	30	
Pyrene	2.52	0.250	mg/kg wet	2.500		101	40-140	0.07	30	
Pyridine	1.41	0.250	mg/kg wet	2.500		56	40-140	2	30	
Surrogate: 1,2-Dichlorobenzene-d4	*2.06*		mg/kg wet	*2.500*		*82*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*3.10*		mg/kg wet	*3.750*		*83*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.29*		mg/kg wet	*3.750*		*88*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.04*		mg/kg wet	*2.500*		*81*	*30-130*			
Surrogate: 2-Fluorophenol	*2.77*		mg/kg wet	*3.750*		*74*	*30-130*			
Surrogate: Nitrobenzene-d5	*1.75*		mg/kg wet	*2.500*		*70*	*30-130*			
Surrogate: Phenol-d6	*3.11*		mg/kg wet	*3.750*		*83*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.30*		mg/kg wet	*2.500*		*92*	*30-130*			
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch DG42541 - 3546										
Blank										
C19-C36 Aliphatics1	ND	15.0	mg/kg wet							
C9-C18 Aliphatics1	ND	15.0	mg/kg wet							
Surrogate: 1-Chlorooctadecane	*1.53*		mg/kg wet	*2.000*		*77*	*40-140*			
Blank										
C11-C22 Unadjusted Aromatics1	ND	15.0	mg/kg wet							
Surrogate: 2-Bromonaphthalene	*1.71*		mg/kg wet	*2.000*		*85*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*1.71*		mg/kg wet	*2.000*		*86*	*40-140*			
Surrogate: O-Terphenyl	*1.60*		mg/kg wet	*2.000*		*80*	*40-140*			

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch DG42541 - 3546										
Blank										
2-Methylnaphthalene	ND	0.008	mg/kg wet							
Acenaphthene	ND	0.008	mg/kg wet							
Acenaphthylene	ND	0.008	mg/kg wet							
Anthracene	ND	0.008	mg/kg wet							
Benzo(a)anthracene	ND	0.008	mg/kg wet							
Benzo(a)pyrene	ND	0.008	mg/kg wet							
Benzo(b)fluoranthene	ND	0.008	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.008	mg/kg wet							
Benzo(k)fluoranthene	ND	0.008	mg/kg wet							
Chrysene	ND	0.008	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.008	mg/kg wet							
Fluoranthene	ND	0.008	mg/kg wet							
Fluorene	ND	0.008	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.008	mg/kg wet							
Naphthalene	ND	0.008	mg/kg wet							
Phenanthrene	ND	0.008	mg/kg wet							
Pyrene	ND	0.008	mg/kg wet							
LCS										
C19-C36 Aliphatics1	13.7	15.0	mg/kg wet	16.00		86	40-140			
C9-C18 Aliphatics1	7.9	15.0	mg/kg wet	12.00		66	40-140			
Surrogate: 1-Chlorooctadecane	*1.47*		mg/kg wet	*2.000*		*73*	*40-140*			
LCS										
C11-C22 Unadjusted Aromatics1	28.8	15.0	mg/kg wet	34.00		85	40-140			
Surrogate: 2-Bromonaphthalene	*1.67*		mg/kg wet	*2.000*		*84*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*1.77*		mg/kg wet	*2.000*		*88*	*40-140*			
Surrogate: O-Terphenyl	*1.59*		mg/kg wet	*2.000*		*80*	*40-140*			
LCS										
2-Methylnaphthalene Breakthrough	0.0		%				0-5			
Naphthalene Breakthrough	0.0		%				0-5			
LCS										
2-Methylnaphthalene	1.30	0.040	mg/kg wet	2.000		65	40-140			
Acenaphthene	1.49	0.040	mg/kg wet	2.000		75	40-140			
Acenaphthylene	1.57	0.040	mg/kg wet	2.000		79	40-140			
Anthracene	1.62	0.040	mg/kg wet	2.000		81	40-140			
Benzo(a)anthracene	1.43	0.040	mg/kg wet	2.000		71	40-140			
Benzo(a)pyrene	1.60	0.040	mg/kg wet	2.000		80	40-140			
Benzo(b)fluoranthene	1.51	0.040	mg/kg wet	2.000		76	40-140			
Benzo(g,h,i)perylene	1.71	0.040	mg/kg wet	2.000		86	40-140			
Benzo(k)fluoranthene	1.68	0.040	mg/kg wet	2.000		84	40-140			
Chrysene	1.55	0.040	mg/kg wet	2.000		78	40-140			
Dibenzo(a,h)Anthracene	1.76	0.040	mg/kg wet	2.000		88	40-140			
Fluoranthene	1.70	0.040	mg/kg wet	2.000		85	40-140			
Fluorene	1.48	0.040	mg/kg wet	2.000		74	40-140			

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch DG42541 - 3546										
Indeno(1,2,3-cd)Pyrene	1.69	0.040	mg/kg wet	2.000		85	40-140			
Naphthalene	1.46	0.040	mg/kg wet	2.000		73	40-140			
Phenanthrene	1.42	0.040	mg/kg wet	2.000		71	40-140			
Pyrene	1.55	0.040	mg/kg wet	2.000		77	40-140			
LCS Dup										
C19-C36 Aliphatics1	15.1	15.0	mg/kg wet	16.00		94	40-140	9	25	
C9-C18 Aliphatics1	8.6	15.0	mg/kg wet	12.00		71	40-140	9	25	
Surrogate: 1-Chlorooctadecane	*1.52*		mg/kg wet	*2.000*		*76*	*40-140*			
LCS Dup										
C11-C22 Unadjusted Aromatics1	28.6	15.0	mg/kg wet	34.00		84	40-140	0.5	25	
Surrogate: 2-Bromonaphthalene	*1.70*		mg/kg wet	*2.000*		*85*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*1.79*		mg/kg wet	*2.000*		*90*	*40-140*			
Surrogate: O-Terphenyl	*1.54*		mg/kg wet	*2.000*		*77*	*40-140*			
LCS Dup										
2-Methylnaphthalene Breakthrough	0.0		%				0-5		200	
Naphthalene Breakthrough	0.0		%				0-5		200	
LCS Dup										
2-Methylnaphthalene	1.36	0.040	mg/kg wet	2.000		68	40-140	4	30	
Acenaphthene	1.57	0.040	mg/kg wet	2.000		79	40-140	5	30	
Acenaphthylene	1.64	0.040	mg/kg wet	2.000		82	40-140	5	30	
Anthracene	1.72	0.040	mg/kg wet	2.000		86	40-140	6	30	
Benzo(a)anthracene	1.55	0.040	mg/kg wet	2.000		78	40-140	8	30	
Benzo(a)pyrene	1.78	0.040	mg/kg wet	2.000		89	40-140	11	30	
Benzo(b)fluoranthene	1.63	0.040	mg/kg wet	2.000		82	40-140	8	30	
Benzo(g,h,i)perylene	1.88	0.040	mg/kg wet	2.000		94	40-140	10	30	
Benzo(k)fluoranthene	1.82	0.040	mg/kg wet	2.000		91	40-140	8	30	
Chrysene	1.72	0.040	mg/kg wet	2.000		86	40-140	10	30	
Dibenzo(a,h)Anthracene	1.91	0.040	mg/kg wet	2.000		95	40-140	8	30	
Fluoranthene	1.79	0.040	mg/kg wet	2.000		90	40-140	5	30	
Fluorene	1.57	0.040	mg/kg wet	2.000		79	40-140	6	30	
Indeno(1,2,3-cd)Pyrene	1.87	0.040	mg/kg wet	2.000		94	40-140	10	30	
Naphthalene	1.50	0.040	mg/kg wet	2.000		75	40-140	3	30	
Phenanthrene	1.50	0.040	mg/kg wet	2.000		75	40-140	5	30	
Pyrene	1.70	0.040	mg/kg wet	2.000		85	40-140	10	30	
Classical Chemistry										
Batch DG42435 - General Preparation										
Blank										
Conductivity	ND	5	umhos/cm							
LCS										
Conductivity	1280		umhos/cm	1410		91	90-110			
Batch DG42442 - General Preparation										
Blank										

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Classical Chemistry										
Batch DG42442 - General Preparation										
Sulfide	ND	0.05	mg/kg wet							
LCS										
Sulfide	0.5		mg/L	0.5000		99	85-115			
Batch DG42451 - General Preparation										
Reference										
Flashpoint	81		°F	81.00		100	97.9-102.1			
Batch DG42539 - General Preparation										
Blank										
Sulfate	ND	5	mg/kg wet							
LCS										
Sulfate	10		mg/L	9.988		98	80-120			
Batch DG42545 - General Preparation										
Blank										
Reactive Cyanide	ND	2.0	mg/kg							
Reactive Sulfide	ND	2.0	mg/kg							
LCS										
Reactive Cyanide	4.1	2.0	mg/kg	100.3		4	0.68-5.41			
Reactive Sulfide	2.2	2.0	mg/kg	10.00		22	0-44			
Batch DG42625 - TCN Prep										
Blank										
Total Cyanide	ND	1.00	mg/kg wet							
LCS										
Total Cyanide	5.02	1.00	mg/kg wet	5.015		100	90-110			
Reference										
Total Cyanide	176	24.6	mg/kg wet	183.0		96	22-121			
Reference										
Total Cyanide	181	24.7	mg/kg wet	183.0		99	22-121			
Batch DG42952 - General Preparation										
Blank										
Total Organic Carbon (1)	ND	500	mg/kg							
Total Organic Carbon (2)	ND	500	mg/kg							
LCS										
Total Organic Carbon (1)	8850	500	mg/kg	10010		88	80-120			
Total Organic Carbon (2)	9530	500	mg/kg	10010		95	80-120			
LCS Dup										
Total Organic Carbon (1)	8530	500	mg/kg	10010		85	80-120	4	25	
Total Organic Carbon (2)	9260	500	mg/kg	10010		92	80-120	3	25	
Batch DH40640 - General Preparation										
Blank										
Hexavalent Chromium	ND	0.7	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0906

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Classical Chemistry										
Batch DH40640 - General Preparation										
LCS										
Hexavalent Chromium	31.5	0.7	mg/kg wet	33.32		95	80-120			
LCS Dup										
Hexavalent Chromium	31.6	0.7	mg/kg wet	33.32		95	80-120	0.4	20	
Reference										
Hexavalent Chromium	360	7.9	mg/kg wet	384.3		94	62-138			
8082 Polychlorinated Biphenyls (PCB) / Congeners										
Batch DG42401 - 3540C										
Blank										
BZ#101	ND	0.00027	mg/kg wet							
BZ#101 [2C]	ND	0.00027	mg/kg wet							
BZ#105	ND	0.00027	mg/kg wet							
BZ#105 [2C]	ND	0.00027	mg/kg wet							
BZ#118	ND	0.00027	mg/kg wet							
BZ#118 [2C]	ND	0.00027	mg/kg wet							
BZ#128	ND	0.00027	mg/kg wet							
BZ#128 [2C]	ND	0.00027	mg/kg wet							
BZ#138	ND	0.00027	mg/kg wet							
BZ#138 [2C]	ND	0.00027	mg/kg wet							
BZ#153	ND	0.00027	mg/kg wet							
BZ#153 [2C]	ND	0.00027	mg/kg wet							
BZ#170	ND	0.00027	mg/kg wet							
BZ#170 [2C]	ND	0.00027	mg/kg wet							
BZ#18	ND	0.00027	mg/kg wet							
BZ#18 [2C]	ND	0.00027	mg/kg wet							
BZ#180	ND	0.00027	mg/kg wet							
BZ#180 [2C]	ND	0.00027	mg/kg wet							
BZ#187	ND	0.00027	mg/kg wet							
BZ#187 [2C]	ND	0.00027	mg/kg wet							
BZ#195	ND	0.00027	mg/kg wet							
BZ#195 [2C]	ND	0.00027	mg/kg wet							
BZ#206	ND	0.00027	mg/kg wet							
BZ#206 [2C]	ND	0.00027	mg/kg wet							
BZ#209	ND	0.00027	mg/kg wet							
BZ#209 [2C]	ND	0.00027	mg/kg wet							
BZ#28	ND	0.00027	mg/kg wet							
BZ#28 [2C]	ND	0.00027	mg/kg wet							
BZ#44	ND	0.00027	mg/kg wet							
BZ#44 [2C]	ND	0.00027	mg/kg wet							
BZ#52	ND	0.00027	mg/kg wet							
BZ#52 [2C]	ND	0.00027	mg/kg wet							
BZ#66	ND	0.00027	mg/kg wet							
BZ#66 [2C]	ND	0.00027	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0906

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082 Polychlorinated Biphenyls (PCB) / Congeners										
Batch DG42401 - 3540C										
BZ#8	ND	0.00027	mg/kg wet							
BZ#8 [2C]	ND	0.00027	mg/kg wet							
Surrogate: Tetrachloro-m-xylene	*0.00234*		mg/kg wet	*0.003333*		*70*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.00241*		mg/kg wet	*0.003333*		*72*	*30-150*			
LCS										
BZ#101	0.00235	0.00027	mg/kg wet	0.003333		71	40-140			
BZ#101 [2C]	0.00241	0.00027	mg/kg wet	0.003333		72	40-140			
BZ#105	0.00274	0.00027	mg/kg wet	0.003333		82	40-140			
BZ#105 [2C]	0.00275	0.00027	mg/kg wet	0.003333		83	40-140			
BZ#118	0.00251	0.00027	mg/kg wet	0.003333		75	40-140			
BZ#118 [2C]	0.00255	0.00027	mg/kg wet	0.003333		77	40-140			
BZ#128	0.00257	0.00027	mg/kg wet	0.003333		77	40-140			
BZ#128 [2C]	0.00259	0.00027	mg/kg wet	0.003333		78	40-140			
BZ#138	0.00253	0.00027	mg/kg wet	0.003333		76	40-140			
BZ#138 [2C]	0.00259	0.00027	mg/kg wet	0.003333		78	40-140			
BZ#153	0.00245	0.00027	mg/kg wet	0.003333		74	40-140			
BZ#153 [2C]	0.00251	0.00027	mg/kg wet	0.003333		75	40-140			
BZ#170	0.00262	0.00027	mg/kg wet	0.003333		79	40-140			
BZ#170 [2C]	0.00264	0.00027	mg/kg wet	0.003333		79	40-140			
BZ#18	0.00239	0.00027	mg/kg wet	0.003333		72	40-140			
BZ#18 [2C]	0.00237	0.00027	mg/kg wet	0.003333		71	40-140			
BZ#180	0.00258	0.00027	mg/kg wet	0.003333		77	40-140			
BZ#180 [2C]	0.00264	0.00027	mg/kg wet	0.003333		79	40-140			
BZ#187	0.00248	0.00027	mg/kg wet	0.003333		74	40-140			
BZ#187 [2C]	0.00248	0.00027	mg/kg wet	0.003333		74	40-140			
BZ#195	0.00256	0.00027	mg/kg wet	0.003333		77	40-140			
BZ#195 [2C]	0.00260	0.00027	mg/kg wet	0.003333		78	40-140			
BZ#206	0.00260	0.00027	mg/kg wet	0.003333		78	40-140			
BZ#206 [2C]	0.00257	0.00027	mg/kg wet	0.003333		77	40-140			
BZ#209	0.00253	0.00027	mg/kg wet	0.003333		76	40-140			
BZ#209 [2C]	0.00243	0.00027	mg/kg wet	0.003333		73	40-140			
BZ#28	0.00263	0.00027	mg/kg wet	0.003333		79	40-140			
BZ#28 [2C]	0.00264	0.00027	mg/kg wet	0.003333		79	40-140			
BZ#44	0.00242	0.00027	mg/kg wet	0.003333		72	40-140			
BZ#44 [2C]	0.00243	0.00027	mg/kg wet	0.003333		73	40-140			
BZ#52	0.00242	0.00027	mg/kg wet	0.003333		73	40-140			
BZ#52 [2C]	0.00277	0.00027	mg/kg wet	0.003333		83	40-140			
BZ#66	0.00261	0.00027	mg/kg wet	0.003333		78	40-140			
BZ#66 [2C]	0.00246	0.00027	mg/kg wet	0.003333		74	40-140			
BZ#8	0.00236	0.00027	mg/kg wet	0.003333		71	40-140			
BZ#8 [2C]	0.00269	0.00027	mg/kg wet	0.003333		81	40-140			
Surrogate: Tetrachloro-m-xylene	*0.00236*		mg/kg wet	*0.003333*		*71*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.00244*		mg/kg wet	*0.003333*		*73*	*30-150*			
LCS Dup										

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0906

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082 Polychlorinated Biphenyls (PCB) / Congeners										
Batch DG42401 - 3540C										
BZ#101	0.00233	0.00027	mg/kg wet	0.003333		70	40-140	1	30	
BZ#101 [2C]	0.00239	0.00027	mg/kg wet	0.003333		72	40-140	1	30	
BZ#105	0.00265	0.00027	mg/kg wet	0.003333		80	40-140	3	30	
BZ#105 [2C]	0.00261	0.00027	mg/kg wet	0.003333		78	40-140	5	30	
BZ#118	0.00246	0.00027	mg/kg wet	0.003333		74	40-140	2	30	
BZ#118 [2C]	0.00248	0.00027	mg/kg wet	0.003333		74	40-140	3	30	
BZ#128	0.00251	0.00027	mg/kg wet	0.003333		75	40-140	3	30	
BZ#128 [2C]	0.00254	0.00027	mg/kg wet	0.003333		76	40-140	2	30	
BZ#138	0.00248	0.00027	mg/kg wet	0.003333		74	40-140	2	30	
BZ#138 [2C]	0.00252	0.00027	mg/kg wet	0.003333		76	40-140	2	30	
BZ#153	0.00241	0.00027	mg/kg wet	0.003333		72	40-140	2	30	
BZ#153 [2C]	0.00240	0.00027	mg/kg wet	0.003333		72	40-140	4	30	
BZ#170	0.00255	0.00027	mg/kg wet	0.003333		76	40-140	3	30	
BZ#170 [2C]	0.00256	0.00027	mg/kg wet	0.003333		77	40-140	3	30	
BZ#18	0.00236	0.00027	mg/kg wet	0.003333		71	40-140	1	30	
BZ#18 [2C]	0.00229	0.00027	mg/kg wet	0.003333		69	40-140	4	30	
BZ#180	0.00251	0.00027	mg/kg wet	0.003333		75	40-140	2	30	
BZ#180 [2C]	0.00258	0.00027	mg/kg wet	0.003333		78	40-140	2	30	
BZ#187	0.00244	0.00027	mg/kg wet	0.003333		73	40-140	1	30	
BZ#187 [2C]	0.00245	0.00027	mg/kg wet	0.003333		73	40-140	1	30	
BZ#195	0.00249	0.00027	mg/kg wet	0.003333		75	40-140	3	30	
BZ#195 [2C]	0.00254	0.00027	mg/kg wet	0.003333		76	40-140	2	30	
BZ#206	0.00250	0.00027	mg/kg wet	0.003333		75	40-140	4	30	
BZ#206 [2C]	0.00246	0.00027	mg/kg wet	0.003333		74	40-140	4	30	
BZ#209	0.00243	0.00027	mg/kg wet	0.003333		73	40-140	4	30	
BZ#209 [2C]	0.00236	0.00027	mg/kg wet	0.003333		71	40-140	3	30	
BZ#28	0.00249	0.00027	mg/kg wet	0.003333		75	40-140	5	30	
BZ#28 [2C]	0.00259	0.00027	mg/kg wet	0.003333		78	40-140	2	30	
BZ#44	0.00238	0.00027	mg/kg wet	0.003333		71	40-140	1	30	
BZ#44 [2C]	0.00240	0.00027	mg/kg wet	0.003333		72	40-140	1	30	
BZ#52	0.00234	0.00027	mg/kg wet	0.003333		70	40-140	3	30	
BZ#52 [2C]	0.00273	0.00027	mg/kg wet	0.003333		82	40-140	1	30	
BZ#66	0.00259	0.00027	mg/kg wet	0.003333		78	40-140	0.8	30	
BZ#66 [2C]	0.00243	0.00027	mg/kg wet	0.003333		73	40-140	1	30	
BZ#8	0.00241	0.00027	mg/kg wet	0.003333		72	40-140	2	30	
BZ#8 [2C]	0.00268	0.00027	mg/kg wet	0.003333		80	40-140	0.7	30	
Surrogate: Tetrachloro-m-xylene	*0.00230*		mg/kg wet	*0.003333*		*69*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.00239*		mg/kg wet	*0.003333*		*72*	*30-150*			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0906

Notes and Definitions

Z18	Temperature is not within 23 +/-2 ºC.
WL	Results obtained from a deionized water leach of the sample.
U	Analyte included in the analysis, but not detected
RRF	Analyte does not meet the Relative Response Factor (RRF) criteria in the calibration
Q	Calibration required quadratic regression (Q).
PT	Pentachlorophenol tailing factor > 2.
P	Percent difference between primary and confirmation results exceeds 40% (P).
O	Test performed from a previously opened container
LC	Lower value is used due to matrix interferences (LC).
H	Estimated value. Sample hold times were exceeded (H).
D+	Relative percent difference for duplicate is outside of criteria (D+).
D	Diluted.
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
BT	Benzidine tailing factor >2.
>	Greater than.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probable Number
TNTC	Too numerous to Count
CFU	Colony Forming Units

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP - 401WQ - MCP ESS Laboratory Work Order: 24G0906

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

Sterling Analytical, Inc.
15 Agawam Avenue
West Springfield, MA 01089
Phone (413) 214-6541 Fax (413) 214-6842

Visit our website: www.sterlinganalytical.com

Report Date July 31, 2024

Customer	Contact	Laboratory Supervisor	eMail
Analytical Balance Corp.	S. Morrell	Dale Percoski	customerservice@sterlinganalytical.com

Sample Description
Analysis of Soil Samples

Samples Analyzed

Enclosed are Report No(s): 83681..83683

*Results reported on 'Dry Basis'.

Sulfur Total Blank = <0.05ppm

LCS Lo Check 0.100 = 0.106ppm

ICV 1.00 = 1.050ppm

Thank you for your business

Dale Percoski

Dale Percoski, Laboratory Supervisor

7/31/2024

Date

ALL the information contained in this report has been reviewed for accuracy and checked against all quality control requirements outlined in each applicable method.
This report may not be reproduced, except in full, without written approval from Sterling Analytical, Inc.

Sample	Description	Source	Taken/Time	Received
83681	24G0906-01	Analytical Balance Corp.	7/23/24 13:15	7/25/24

Parameter	Results		RDL	Method	Analyzed/Time	Tech
Sulfur, Total	1,110	mg/kg	100.00	SW 846 6010	07/31/24	dfp

Sample	Description	Source	Taken/Time	Received
83682	24G0906-03	Analytical Balance Corp.	7/23/24 15:45	7/25/24

Parameter	Results		RDL	Method	Analyzed/Time	Tech
Sulfur, Total	2,250	mg/kg	100.00	SW 846 6010	07/31/24	dfp

Sample	Description	Source	Taken/Time	Received
83683	24G0906-05	Analytical Balance Corp.	7/23/24 16:15	7/25/24

Parameter	Results		RDL	Method	Analyzed/Time	Tech
Sulfur, Total	3,590	mg/kg	100.00	SW 846 6010	07/31/24	dfp

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

Shipped/Delivered Via: ESS Courier

ESS Project ID: 24G0906
Date Received: 7/24/2024
Project Due Date: 7/31/2024
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 3 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** (Yes) / No / NA
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? (Yes) / No
    ESS Sample IDs: **1,3,5**
    Analysis: **T. Sulfur**
    TAT: **5 day**
12. Were VOAs received? (Yes) / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? (Yes) / No / NA
13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: _____ Time: _____ By/Acid Lot#: _____
    b. If dissolved metals are requested, are they: Yes / No Field Filtered
    c. Low Level VOA vials frozen: Date: 7/24/24 Time: 2:44 Yes / No To Be Lab Filtered By: /

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / No
    Who was contacted? _____ Date: _____ Time: _____ By: _____

Resolution:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1	575560	Yes	N/A	Yes	4 oz. Jar	NP	
1	575563	Yes	N/A	Yes	8 oz jar	NP	
1	575564	Yes	N/A	Yes	8 oz jar	NP	
2	575548	Yes	N/A	Yes	VOA Vial	DI Water	
2	575549	Yes	N/A	Yes	VOA Vial	DI Water	
2	575554	Yes	N/A	Yes	VOA Vial	MeOH	
2	575557	Yes	N/A	Yes	4 oz. Jar	NP	
3	575561	Yes	N/A	Yes	4 oz. Jar	NP	
3	575565	Yes	N/A	Yes	8 oz jar	NP	
3	575566	Yes	N/A	Yes	8 oz jar	NP	
4	575550	Yes	N/A	Yes	VOA Vial	DI Water	
4	575551	Yes	N/A	Yes	VOA Vial	DI Water	
4	575555	Yes	N/A	Yes	VOA Vial	MeOH	
4	575558	Yes	N/A	Yes	4 oz. Jar	NP	
5	575562	Yes	N/A	Yes	4 oz. Jar	NP	
5	575567	Yes	N/A	Yes	8 oz jar	NP	
5	575568	Yes	N/A	Yes	8 oz jar	NP	
6	575552	Yes	N/A	Yes	VOA Vial	DI Water	
6	575553	Yes	N/A	Yes	VOA Vial	DI Water	
6	575556	Yes	N/A	Yes	VOA Vial	MeOH	

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

ESS Project ID: 24G0906
Date Received: 7/24/2024

6	575559	Yes	N/A	Yes	4 oz. Jar	NP

2nd Review

Were all containers scanned into storage/lab? Initials _____ Yes / No
Are barcode labels on correct containers? Yes / No / NA
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: _____ Date & Time: 7/24/24 17:46
Reviewed By: _____ Date & Time: 7/24/24 17:46

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # 24G0906 (Lab use only)

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman
781-721-4091 rhoffman@geiconsultants.com

Send Report to: Ryan Hoffman
labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY AND MCP ANALYTICAL METHODS REQUIRED: YES NO

STATE AND FEDERAL REGULATORY REQUIREMENTS/REPORT LIMITS

State/Federal Program: MA 401WQC Other _____ NH RI CT NY ME

MA MCP Criteria are Method 1 S-1 and GW-2/GW-3. Circle if GW-1 is required.

Preservative

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	VOCs 8260*	SVOCs 8270 by SIM**	PCB NOAA Summation of Congeners	RCRA 8 Metals + Cu, Ni, Zn***	EPH (fractions only)	Corrosivity, Ignit., React., Conductivity	Total Cyanide	Total Sulfur, Total Sulfide, Total Sulfate	TOC by Lloyd-Kahn
							H2O/ MeOH	None	None	None	None	None	None	None	None
1	1804576-886-0-2'	7/23/2024	13:15	SO	3	SW		X	X	X	X	X	X	X	X
2	1804576-886-0.5'	7/23/2024	13:16	SO	4	SW	X								
3	1804576-885-0-2' *	7/23/2024	15:45	SO	3	SW		X	X	X	X	X	X	X	X
4	1804576-885-0.5'	7/23/2024	15:46	SO	4	SW	X								
5	1804576-887-0-2'	7/23/2024	16:15	SO	3	SW		X	X	X	X	X	X	X	X
6	1804576-887-0.5'	7/23/2024	16:16	SO	4	SW	X								

Sample Handling

Samples Field Filtered: YES NO NA

Sampled Shipped With Ice: YES NO

*Add HexCr and TCLP Cr to 24G0906-03 - 8/5/24 MLP

Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1. [signature]	7/23/24	18:00	GEI Field Room
2. GEI Field Room	7/24/24	1155	2. [signature]
3. [signature]	7/24/24	1155	3. [signature] 7/24/24 1155
4. [signature] 3.0 on ice	7/24/24	1550	4. [signature]
5.			5.

Turnaround Time (Business days):

ndard TAT X 4-Day ____ 3-Day ____
-Day ____ 1-Day ____ Other ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

*** Run TCLP benzene if total >20x**
**** Include pyridene**
*****Run TCLP metals if total >20x**

Sample Matrix Abbreviations: SO = Soil GW = Groundwater SW = Surface Water SD = Sediment CO = Concrete PC = Paint Chip CLK = Caulk

ESS Laboratory
DIVISION OF THE RISE GROUP

BAL Laboratory Analytical Balance

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: 24I0052

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 2:01 pm, Sep 17, 2024

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: 24I0052

SAMPLE RECEIPT

The following samples were received on September 04, 2024 for the analyses specified on the enclosed Chain of Custody Record.

To achieve CAM compliance for MCP data, ESS Laboratory has reviewed all QA/QC Requirements and Performance Standards listed in each method. Holding times and preservation have also been reviewed. All CAM requirements have been performed and achieved unless noted in the project narrative.

Each method has been set-up in the laboratory to reach required MCP standards. The methods for aqueous VOA and Soil Methanol VOA have known limitations for certain analytes. The regulatory standards may not be achieved due to these limitations. In addition, for all methods, matrix interferences, dilutions, and %Solids may elevate method reporting limits above regulatory standards. ESS Laboratory can provide, upon request, a Limit Checker (regulatory standard comparison spreadsheet) electronic deliverable which will highlight these exceedances.

Low Level VOA vials were frozen by ESS Laboratory on 9/04/24 at 17:22.

Revision 1 September 19, 2024: This report has been revised to include TCLP Vinyl Chloride on 24I0052-03.

Lab Number	Sample Name	Matrix	Analysis
24I0052-01	1804576-883R-0-0.5ft	Soil	1311, 1311/8260D, 8260D
24I0052-02	1804576-883R-0.5-1.5ft	Soil	8260D
24I0052-03	1804576-883R-1.5-2.5ft	Soil	1311, 1311/8260D, 8260D
24I0052-04	1804576-890-0-0.5ft	Soil	8260D Low
24I0052-05	1804576-890-0.5-1.5ft	Soil	8260D Low
24I0052-06	1804576-890-1.5-2.5ft	Soil	8260D Low
24I0052-07	1804576-891-0-0.5ft	Soil	8260D Low
24I0052-08	1804576-891-0.5-1.5ft	Soil	8260D Low
24I0052-09	1804576-891-1.5-2.5ft	Soil	8260D Low
24I0052-10	1804576-892-0-0.5ft	Soil	8260D Low
24I0052-11	1804576-892-0.5-1.5ft	Soil	8260D Low
24I0052-12	1804576-892-1.5-2.5ft	Soil	8260D Low
24I0052-13	1804576-893-0-0.5ft	Soil	8260D Low
24I0052-14	1804576-893-0.5-1.5ft	Soil	8260D Low
24I0052-15	1804576-893-1.5-2.5ft	Soil	8260D Low

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: 24I0052

PROJECT NARRATIVE

Volatile Organics Low Level

24I0052-07	**Internal Standard(s) outside of criteria. Sample was reanalyzed to confirm (IC).**
	1,4-Dichlorobenzene-D4 (1320% @ 50-200%)
24I0052-07RE1	**Internal Standard(s) outside of criteria. Sample was reanalyzed to confirm (IC).**
	1,4-Dichlorobenzene-D4 (34% @ 50-200%)
24I0052-07RE1	**Surrogate recovery(ies) above upper control limit (S+).**
	1,2-Dichloroethane-d4 (135% @ 70-130%)

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: 24I0052

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010D - ICP
6020B - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260D - VOA
8270E - SVOA
8270E SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 19-2.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: 24I0052

MassDEP Analytical Protocol Certification Form

MADEP RTN: _____

This form provides certification for the following data set: **24I0052-01 through 24I0052-15**

Matrices: ( ) Ground Water/Surface Water (x) Soil/Sediment ( ) Drinking Water ( ) Air ( ) Other:_____

CAM Protocol (check all that apply below):

(X) 8260 VOC CAM II A	( ) 7470/7471 Hg CAM III B	( ) MassDEP VPH (GC/PID/FID) CAM IV A	( ) 8082 PCB CAM V A	( ) 9014 Total Cyanide/PAC CAM VI A	( ) 6860 Perchlorate CAM VIII B
( ) 8270 SVOC CAM II B	( ) 7010 Metals CAM III C	( ) MassDEP VPH (GC/MS) CAM IV C	( ) 8081 Pesticides CAM V B	( ) 7196 Hex Cr CAM VI B	( ) MassDEP APH CAM IX A
( ) 6010 Metals CAM III A	( ) 6020 Metals CAM III D	( ) MassDEP EPH CAM IV B	( ) 8151 Herbicides CAM V C	( ) Explosives CAM VIII A	( ) TO-15 VOC CAM IX B

Affirmative responses to questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	Yes (X) No ( )
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	Yes (X) No ( )
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	Yes (X) No ( )
D	Does the laboratory report comply with all the reporting requirements specified in the CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	Yes (X) No ( )
E	VPH, EPH, APH and TO-15 only: a. Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	Yes ( ) No ( )
	b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	Yes ( ) No ( )
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	Yes (X) No ( )

Responses to Questions G, H and I below are required for '"Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocols(s)?	Yes (X) No ( )*
	***Data User Note:* Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.**	
H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	Yes ( ) No (X)*
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	Yes ( ) No (X)*

All negative responses must be addressed in an attached laboratory narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature: _____ Date: September 12, 2024
Printed Name: Laurel Stoddard Position: Laboratory Director

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-883R-0-0.5ft
Date Sampled: 09/03/24 11:00
Percent Solids: 64
Initial Volume: 9.2g
Final Volume: 15ml
Extraction Method: 5035

ESS Laboratory Work Order: 24I0052
ESS Laboratory Sample ID: 24I0052-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD
Prepared: 9/12/24 8:00

Volatile Organics

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Vinyl Chloride	**4.52** (0.617)	---	8260D	---	1	MD	09/12/24 12:27	D4I0206	DI41227

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*100 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*101 %*		*70-130*
Surrogate: Dibromofluoromethane	*102 %*		*70-130*
Surrogate: Toluene-d8	*101 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-883R-0-0.5ft
Date Sampled: 09/03/24 11:00
Percent Solids: 64
Initial Volume: 5ml
Final Volume: 5ml
Extraction Method: 5030B

ESS Laboratory Work Order: 24I0052
ESS Laboratory Sample ID: 24I0052-01
Sample Matrix: Soil
Units: mg/L
Analyst: MD
Prepared: 9/6/24 8:00

Volatile TCLP Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Vinyl Chloride	**0.264** (0.100)	---	1311/8260D	---	1	MD	09/06/24 19:03	D4I0107	DI40636

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*102 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*99 %*		*70-130*
Surrogate: Dibromofluoromethane	*100 %*		*70-130*
Surrogate: Toluene-d8	*101 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-883R-0-0.5ft
Date Sampled: 09/03/24 11:00
Percent Solids: 64
Initial Volume: 25ml
Final Volume: 500ml
Extraction Method: 5030B TCLP

ESS Laboratory Work Order: 24I0052
ESS Laboratory Sample ID: 24I0052-01
Sample Matrix: Soil
Units: °C
Analyst: MD
Prepared: 9/5/24 14:58

ZHE Extraction by 1311

Analyte	Results (MRL)	MDL	Method	TCLP Limit	DF	Analyst	Analyzed	Sequence	Batch
Temperature (Min C)	**21.5** (N/A)	---	1311	---	1	MD	09/06/24 7:02	---	DI40925
Temperature (Max C)	**22.0** (N/A)	---	1311	---	1	MD	09/06/24 7:02	---	DI40925
Temperature (Range)	**Temperature is within 23 +/-2 °C.** (N/A)								

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-883R-0.5-1.5ft
Date Sampled: 09/03/24 11:02
Percent Solids: 59
Initial Volume: 6.4g
Final Volume: 15ml
Extraction Method: 5035

ESS Laboratory Work Order: 24I0052
ESS Laboratory Sample ID: 24I0052-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD
Prepared: 9/12/24 8:00

Volatile Organics

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Vinyl Chloride	**3.89** (0.929)	---	8260D	---	1	MD	09/12/24 12:02	D4I0206	DI41227

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*102 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*104 %*		*70-130*
Surrogate: Dibromofluoromethane	*103 %*		*70-130*
Surrogate: Toluene-d8	*104 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-883R-1.5-2.5ft
Date Sampled: 09/03/24 11:04
Percent Solids: 57
Initial Volume: 6.4g
Final Volume: 15ml
Extraction Method: 5035

ESS Laboratory Work Order: 24I0052
ESS Laboratory Sample ID: 24I0052-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD
Prepared: 9/12/24 8:00

Volatile Organics

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Vinyl Chloride	**4.07** (0.967)	---	8260D	---	1	MD	09/12/24 11:37	D4I0206	DI41227

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*99 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*101 %*		*70-130*
Surrogate: Dibromofluoromethane	*101 %*		*70-130*
Surrogate: Toluene-d8	*100 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-883R-1.5-2.5ft
Date Sampled: 09/03/24 11:04
Percent Solids: 57
Initial Volume: 5ml
Final Volume: 5ml
Extraction Method: 5030B

ESS Laboratory Work Order: 24I0052
ESS Laboratory Sample ID: 24I0052-03
Sample Matrix: Soil
Units: mg/L
Analyst: MD
Prepared: 9/16/24 8:00

Volatile TCLP Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Vinyl Chloride	ND (0.100)	---	1311/8260D	---	1	MD	09/16/24 14:27	D4I0268	DI41626

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*101 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*99 %*		*70-130*
Surrogate: Dibromofluoromethane	*99 %*		*70-130*
Surrogate: Toluene-d8	*100 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-883R-1.5-2.5ft
Date Sampled: 09/03/24 11:04
Percent Solids: 57
Initial Volume: 25ml
Final Volume: 500ml
Extraction Method: 5030B TCLP

ESS Laboratory Work Order: 24I0052
ESS Laboratory Sample ID: 24I0052-03
Sample Matrix: Soil
Units: °C
Analyst: MD
Prepared: 9/15/24 13:56

ZHE Extraction by 1311

Analyte	Results (MRL)	MDL	Method	TCLP Limit	DF	Analyst	Analyzed	Sequence	Batch
Temperature (Min C)	**21.0** (N/A)	---	1311	---	1	MD	09/16/24 6:24	---	DI41660
Temperature (Max C)	**22.0** (N/A)	---	1311	---	1	MD	09/16/24 6:24	---	DI41660
Temperature (Range)	**Temperature is within 23 +/-2 °C.** (N/A)								

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-890-0-0.5ft
Date Sampled: 09/03/24 11:06
Percent Solids: 49
Initial Volume: 4.8g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24I0052
ESS Laboratory Sample ID: 24I0052-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 9/5/24 8:00

Volatile Organics Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Vinyl Chloride	ND (0.0213)	---	8260D Low	---	1	MEK	09/05/24 11:55	D4I0060	DI40515

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*103 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*86 %*		*70-130*
Surrogate: Dibromofluoromethane	*101 %*		*70-130*
Surrogate: Toluene-d8	*111 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-890-0.5-1.5ft
Date Sampled: 09/03/24 11:08
Percent Solids: 69
Initial Volume: 6.2g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24I0052
ESS Laboratory Sample ID: 24I0052-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 9/5/24 8:00

Volatile Organics Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Vinyl Chloride	**0.0120** (0.0117)	---	8260D Low	---	1	MEK	09/05/24 12:21	D4I0060	DI40515

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*103 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*92 %*		*70-130*
Surrogate: Dibromofluoromethane	*100 %*		*70-130*
Surrogate: Toluene-d8	*105 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-890-1.5-2.5ft
Date Sampled: 09/03/24 11:10
Percent Solids: 74
Initial Volume: 4.2g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24I0052
ESS Laboratory Sample ID: 24I0052-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 9/5/24 8:00

Volatile Organics Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Vinyl Chloride	ND (0.0160)	---	8260D Low	---	1	MEK	09/05/24 12:47	D4I0060	DI40515

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*102 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*89 %*		*70-130*
Surrogate: Dibromofluoromethane	*100 %*		*70-130*
Surrogate: Toluene-d8	*107 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-891-0-0.5ft
Date Sampled: 09/03/24 11:12
Percent Solids: 51
Initial Volume: 2g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24I0052
ESS Laboratory Sample ID: 24I0052-07
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 9/5/24 8:00

Volatile Organics Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Vinyl Chloride	ND (0.0491)	---	8260D Low	---	1	MEK	09/05/24 14:23	D4I0061	DI40516

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*88 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*99 %*		*70-130*
Surrogate: Dibromofluoromethane	*87 %*		*70-130*
Surrogate: Toluene-d8	*97 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-891-0-0.5ft
Date Sampled: 09/03/24 11:12
Percent Solids: 51
Initial Volume: 2.5g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24I0052
ESS Laboratory Sample ID: 24I0052-07RE1
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 9/6/24 8:00

Volatile Organics Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Vinyl Chloride	ND (0.0393)	---	8260D Low	---	1	MEK	09/06/24 10:38	D4I0091	DI40617

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*135 %*	*S+*	*70-130*
Surrogate: 4-Bromofluorobenzene	*78 %*		*70-130*
Surrogate: Dibromofluoromethane	*129 %*		*70-130*
Surrogate: Toluene-d8	*126 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-891-0.5-1.5ft
Date Sampled: 09/03/24 11:14
Percent Solids: 49
Initial Volume: 4.8g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24I0052
ESS Laboratory Sample ID: 24I0052-08
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 9/5/24 8:00

Volatile Organics Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Vinyl Chloride	ND (0.0211)	---	8260D Low	---	1	MEK	09/05/24 13:13	D4I0060	DI40515

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*104 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*88 %*		*70-130*
Surrogate: Dibromofluoromethane	*101 %*		*70-130*
Surrogate: Toluene-d8	*108 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-891-1.5-2.5ft
Date Sampled: 09/03/24 11:16
Percent Solids: 54
Initial Volume: 5.5g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24I0052
ESS Laboratory Sample ID: 24I0052-09
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 9/5/24 8:00

Volatile Organics Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Vinyl Chloride	ND (0.0167)	---	8260D Low	---	1	MEK	09/05/24 13:38	D4I0060	DI40515

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*100 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*90 %*		*70-130*
Surrogate: Dibromofluoromethane	*96 %*		*70-130*
Surrogate: Toluene-d8	*108 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-892-0-0.5ft
Date Sampled: 09/03/24 11:18
Percent Solids: 72
Initial Volume: 10.7g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24I0052
ESS Laboratory Sample ID: 24I0052-10
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 9/5/24 8:00

Volatile Organics Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Vinyl Chloride	ND (0.0065)	---	8260D Low	---	1	MEK	09/05/24 14:04	D4I0060	DI40515

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*98 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*95 %*		*70-130*
Surrogate: Dibromofluoromethane	*96 %*		*70-130*
Surrogate: Toluene-d8	*103 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-892-0.5-1.5ft
Date Sampled: 09/03/24 11:20
Percent Solids: 80
Initial Volume: 8.1g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24I0052
ESS Laboratory Sample ID: 24I0052-11
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 9/5/24 8:00

Volatile Organics Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Vinyl Chloride	ND (0.0077)	---	8260D Low	---	1	MEK	09/05/24 14:30	D4I0060	DI40515

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*99 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*95 %*		*70-130*
Surrogate: Dibromofluoromethane	*96 %*		*70-130*
Surrogate: Toluene-d8	*103 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-892-1.5-2.5ft
Date Sampled: 09/03/24 11:22
Percent Solids: 52
Initial Volume: 4.4g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24I0052
ESS Laboratory Sample ID: 24I0052-12
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 9/5/24 8:00

Volatile Organics Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Vinyl Chloride	**0.0258** (0.0219)	---	8260D Low	---	1	MEK	09/05/24 14:55	D4I0060	DI40515

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*98 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*88 %*		*70-130*
Surrogate: Dibromofluoromethane	*96 %*		*70-130*
Surrogate: Toluene-d8	*110 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-893-0-0.5ft
Date Sampled: 09/03/24 11:24
Percent Solids: 34
Initial Volume: 4.9g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24I0052
ESS Laboratory Sample ID: 24I0052-13
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 9/5/24 8:00

Volatile Organics Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Vinyl Chloride	ND (0.0299)	---	8260D Low	---	1	MEK	09/05/24 13:32	D4I0061	DI40516

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*105 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*89 %*		*70-130*
Surrogate: Dibromofluoromethane	*99 %*		*70-130*
Surrogate: Toluene-d8	*101 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-893-0.5-1.5ft
Date Sampled: 09/03/24 11:26
Percent Solids: 55
Initial Volume: 4.4g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24I0052
ESS Laboratory Sample ID: 24I0052-14
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 9/6/24 8:00

Volatile Organics Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Vinyl Chloride	**0.0603** (0.0206)	---	8260D Low	---	1	MEK	09/06/24 11:03	D4I0091	DI40617

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*91 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*78 %*		*70-130*
Surrogate: Dibromofluoromethane	*92 %*		*70-130*
Surrogate: Toluene-d8	*128 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-893-1.5-2.5ft
Date Sampled: 09/03/24 11:28
Percent Solids: 58
Initial Volume: 9.2g
Final Volume: 10ml
Extraction Method: 5035

ESS Laboratory Work Order: 24I0052
ESS Laboratory Sample ID: 24I0052-15
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Prepared: 9/5/24 8:00

Volatile Organics Low Level

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Vinyl Chloride	ND (0.0093)	---	8260D Low	---	1	MEK	09/05/24 13:07	D4I0061	DI40516

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*98 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*91 %*		*70-130*
Surrogate: Dibromofluoromethane	*93 %*		*70-130*
Surrogate: Toluene-d8	*100 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: 24I0052

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile Organics Low Level										
Batch DI40515 - 5035										
Blank										
Vinyl Chloride	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*0.0490*		mg/kg wet	*0.05000*		*98*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0488*		mg/kg wet	*0.05000*		*98*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0479*		mg/kg wet	*0.05000*		*96*	*70-130*			
Surrogate: Toluene-d8	*0.0508*		mg/kg wet	*0.05000*		*102*	*70-130*			
LCS										
Vinyl Chloride	0.0411	0.0100	mg/kg wet	0.05000		82	70-130			
Surrogate: 1,2-Dichloroethane-d4	*0.0470*		mg/kg wet	*0.05000*		*94*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0495*		mg/kg wet	*0.05000*		*99*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0489*		mg/kg wet	*0.05000*		*98*	*70-130*			
Surrogate: Toluene-d8	*0.0497*		mg/kg wet	*0.05000*		*99*	*70-130*			
LCS Dup										
Vinyl Chloride	0.0470	0.0100	mg/kg wet	0.05000		94	70-130	13	20	
Surrogate: 1,2-Dichloroethane-d4	*0.0454*		mg/kg wet	*0.05000*		*91*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0491*		mg/kg wet	*0.05000*		*98*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0477*		mg/kg wet	*0.05000*		*95*	*70-130*			
Surrogate: Toluene-d8	*0.0505*		mg/kg wet	*0.05000*		*101*	*70-130*			
Batch DI40516 - 5035										
Blank										
Vinyl Chloride	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*0.0455*		mg/kg wet	*0.05000*		*91*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0455*		mg/kg wet	*0.05000*		*91*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0442*		mg/kg wet	*0.05000*		*88*	*70-130*			
Surrogate: Toluene-d8	*0.0490*		mg/kg wet	*0.05000*		*98*	*70-130*			
LCS										
Vinyl Chloride	0.0452	0.0100	mg/kg wet	0.05000		90	70-130			
Surrogate: 1,2-Dichloroethane-d4	*0.0402*		mg/kg wet	*0.05000*		*80*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0492*		mg/kg wet	*0.05000*		*98*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0415*		mg/kg wet	*0.05000*		*83*	*70-130*			
Surrogate: Toluene-d8	*0.0494*		mg/kg wet	*0.05000*		*99*	*70-130*			
LCS Dup										
Vinyl Chloride	0.0484	0.0100	mg/kg wet	0.05000		97	70-130	7	20	
Surrogate: 1,2-Dichloroethane-d4	*0.0411*		mg/kg wet	*0.05000*		*82*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0476*		mg/kg wet	*0.05000*		*95*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0422*		mg/kg wet	*0.05000*		*84*	*70-130*			
Surrogate: Toluene-d8	*0.0486*		mg/kg wet	*0.05000*		*97*	*70-130*			
Batch DI40617 - 5035										
Blank										
Vinyl Chloride	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*0.0473*		mg/kg wet	*0.05000*		*95*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0484*		mg/kg wet	*0.05000*		*97*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0461*		mg/kg wet	*0.05000*		*92*	*70-130*			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: 24I0052

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile Organics Low Level										
Batch DI40617 - 5035										
Surrogate: Toluene-d8	*0.0512*		mg/kg wet	*0.05000*		*102*	*70-130*			
LCS										
Vinyl Chloride	0.0515	0.0100	mg/kg wet	0.05000		103	70-130			
Surrogate: 1,2-Dichloroethane-d4	*0.0470*		mg/kg wet	*0.05000*		*94*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0495*		mg/kg wet	*0.05000*		*99*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0483*		mg/kg wet	*0.05000*		*97*	*70-130*			
Surrogate: Toluene-d8	*0.0494*		mg/kg wet	*0.05000*		*99*	*70-130*			
LCS Dup										
Vinyl Chloride	0.0446	0.0100	mg/kg wet	0.05000		89	70-130	14	20	
Surrogate: 1,2-Dichloroethane-d4	*0.0455*		mg/kg wet	*0.05000*		*91*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0488*		mg/kg wet	*0.05000*		*98*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0480*		mg/kg wet	*0.05000*		*96*	*70-130*			
Surrogate: Toluene-d8	*0.0505*		mg/kg wet	*0.05000*		*101*	*70-130*			
Volatile Organics										
Batch DI41227 - 5035										
Blank										
Vinyl Chloride	ND	0.200	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*5.00*		mg/kg wet	*5.000*		*100*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*5.00*		mg/kg wet	*5.000*		*100*	*70-130*			
Surrogate: Dibromofluoromethane	*5.00*		mg/kg wet	*5.000*		*100*	*70-130*			
Surrogate: Toluene-d8	*5.00*		mg/kg wet	*5.000*		*100*	*70-130*			
LCS										
Vinyl Chloride	2.21	0.200	mg/kg wet	2.000		111	70-130			
Surrogate: 1,2-Dichloroethane-d4	*5.12*		mg/kg wet	*5.000*		*102*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*5.14*		mg/kg wet	*5.000*		*103*	*70-130*			
Surrogate: Dibromofluoromethane	*5.10*		mg/kg wet	*5.000*		*102*	*70-130*			
Surrogate: Toluene-d8	*4.81*		mg/kg wet	*5.000*		*96*	*70-130*			
LCS Dup										
Vinyl Chloride	2.19	0.200	mg/kg wet	2.000		109	70-130	1	20	
Surrogate: 1,2-Dichloroethane-d4	*5.05*		mg/kg wet	*5.000*		*101*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*5.11*		mg/kg wet	*5.000*		*102*	*70-130*			
Surrogate: Dibromofluoromethane	*5.05*		mg/kg wet	*5.000*		*101*	*70-130*			
Surrogate: Toluene-d8	*4.82*		mg/kg wet	*5.000*		*96*	*70-130*			
Volatile TCLP Compounds										
Batch DI40636 - 5030B										
Blank										
Vinyl Chloride	ND	0.0050	mg/L							
Surrogate: 1,2-Dichloroethane-d4	*0.0252*		mg/L	*0.02500*		*101*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0250*		mg/L	*0.02500*		*100*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0245*		mg/L	*0.02500*		*98*	*70-130*			
Surrogate: Toluene-d8	*0.0253*		mg/L	*0.02500*		*101*	*70-130*			
LCS										
Vinyl Chloride	0.0098	0.0010	mg/L	0.01000		98	70-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: 24I0052

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile TCLP Compounds										
Batch DI40636 - 5030B										
Surrogate: 1,2-Dichloroethane-d4	*0.0253*		mg/L	*0.02500*		*101*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0248*		mg/L	*0.02500*		*99*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0249*		mg/L	*0.02500*		*100*	*70-130*			
Surrogate: Toluene-d8	*0.0252*		mg/L	*0.02500*		*101*	*70-130*			
LCS Dup										
Vinyl Chloride	0.0108	0.0010	mg/L	0.01000		108	70-130	10	20	
Surrogate: 1,2-Dichloroethane-d4	*0.0252*		mg/L	*0.02500*		*101*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0246*		mg/L	*0.02500*		*99*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0250*		mg/L	*0.02500*		*100*	*70-130*			
Surrogate: Toluene-d8	*0.0252*		mg/L	*0.02500*		*101*	*70-130*			
Batch DI41626 - 5030B										
Blank										
Vinyl Chloride	ND	0.0050	mg/L							
Surrogate: 1,2-Dichloroethane-d4	*0.0250*		mg/L	*0.02500*		*100*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0248*		mg/L	*0.02500*		*99*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0247*		mg/L	*0.02500*		*99*	*70-130*			
Surrogate: Toluene-d8	*0.0250*		mg/L	*0.02500*		*100*	*70-130*			
LCS										
Vinyl Chloride	0.0099	0.0010	mg/L	0.01000		99	70-130			
Surrogate: 1,2-Dichloroethane-d4	*0.0250*		mg/L	*0.02500*		*100*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0245*		mg/L	*0.02500*		*98*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0249*		mg/L	*0.02500*		*100*	*70-130*			
Surrogate: Toluene-d8	*0.0246*		mg/L	*0.02500*		*98*	*70-130*			
LCS Dup										
Vinyl Chloride	0.0102	0.0010	mg/L	0.01000		102	70-130	4	20	
Surrogate: 1,2-Dichloroethane-d4	*0.0250*		mg/L	*0.02500*		*100*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*0.0247*		mg/L	*0.02500*		*99*	*70-130*			
Surrogate: Dibromofluoromethane	*0.0249*		mg/L	*0.02500*		*100*	*70-130*			
Surrogate: Toluene-d8	*0.0247*		mg/L	*0.02500*		*99*	*70-130*			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: 24I0052

Notes and Definitions

Z17	Temperature is within 23 +/-2 ºC.
U	Analyte included in the analysis, but not detected
S+	Surrogate recovery(ies) above upper control limit (S+).
IC	Internal Standard(s) outside of criteria. Sample was reanalyzed to confirm (IC).
D	Diluted.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probable Number
TNTC	Too numerous to Count
CFU	Colony Forming Units

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: 24I0052

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

Shipped/Delivered Via: ESS Courier

ESS Project ID: 2410052
Date Received: 9/4/2024
Project Due Date: 9/11/2024
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 1 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA
13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By/Acid Lot#:
    b. If dissolved metals are requested, are they: Yes / No Field Filtered Yes / No To Be Lab Filtered
    c. Low Level VOA vials frozen: Date: 9/4/24 Time: 1722 By: MA

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Resolution:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1	588071	Yes	N/A	Yes	VOA Vial	DI Water	
1	588072	Yes	N/A	Yes	VOA Vial	DI Water	
1	588101	Yes	N/A	Yes	VOA Vial	MeOH	
1	588266	Yes	N/A	Yes	4 oz. Jar	NP	
1	588267	Yes	N/A	Yes	4 oz. Jar	NP	
2	588073	Yes	N/A	Yes	VOA Vial	DI Water	
2	588074	Yes	N/A	Yes	VOA Vial	DI Water	
2	588102	Yes	N/A	Yes	VOA Vial	MeOH	
2	588268	Yes	N/A	Yes	4 oz. Jar	NP	
2	588269	Yes	N/A	Yes	4 oz. Jar	NP	
3	588075	Yes	N/A	Yes	VOA Vial	DI Water	
3	588076	Yes	N/A	Yes	VOA Vial	DI Water	
3	588103	Yes	N/A	Yes	VOA Vial	MeOH	
3	588270	Yes	N/A	Yes	4 oz. Jar	NP	
3	588271	Yes	N/A	Yes	4 oz. Jar	NP	
4	588077	Yes	N/A	Yes	VOA Vial	DI Water	
4	588078	Yes	N/A	Yes	VOA Vial	DI Water	
4	588104	Yes	N/A	Yes	VOA Vial	MeOH	
4	588272	Yes	N/A	Yes	4 oz. Jar	NP	
4	588273	Yes	N/A	Yes	4 oz. Jar	NP	

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

ESS Project ID: 24I0052
Date Received: 9/4/2024

5	588079	Yes	N/A	Yes	VOA Vial	DI Water
5	588080	Yes	N/A	Yes	VOA Vial	DI Water
5	588105	Yes	N/A	Yes	VOA Vial	MeOH
5	588274	Yes	N/A	Yes	4 oz. Jar	NP
5	588275	Yes	N/A	Yes	4 oz. Jar	NP
6	588081	Yes	N/A	Yes	VOA Vial	DI Water
6	588082	Yes	N/A	Yes	VOA Vial	DI Water
6	588106	Yes	N/A	Yes	VOA Vial	MeOH
6	588276	Yes	N/A	Yes	4 oz. Jar	NP
6	588277	Yes	N/A	Yes	4 oz. Jar	NP
7	588083	Yes	N/A	Yes	VOA Vial	DI Water
7	588084	Yes	N/A	Yes	VOA Vial	DI Water
7	588107	Yes	N/A	Yes	VOA Vial	MeOH
7	588278	Yes	N/A	Yes	4 oz. Jar	NP
7	588279	Yes	N/A	Yes	4 oz. Jar	NP
8	588085	Yes	N/A	Yes	VOA Vial	DI Water
8	588086	Yes	N/A	Yes	VOA Vial	DI Water
8	588108	Yes	N/A	Yes	VOA Vial	MeOH
8	588280	Yes	N/A	Yes	4 oz. Jar	NP
8	588281	Yes	N/A	Yes	4 oz. Jar	NP
9	588087	Yes	N/A	Yes	VOA Vial	DI Water
9	588088	Yes	N/A	Yes	VOA Vial	DI Water
9	588109	Yes	N/A	Yes	VOA Vial	MeOH
9	588282	Yes	N/A	Yes	4 oz. Jar	NP
9	588283	Yes	N/A	Yes	4 oz. Jar	NP
10	588089	Yes	N/A	Yes	VOA Vial	DI Water
10	588090	Yes	N/A	Yes	VOA Vial	DI Water
10	588110	Yes	N/A	Yes	VOA Vial	MeOH
10	588284	Yes	N/A	Yes	4 oz. Jar	NP
10	588285	Yes	N/A	Yes	4 oz. Jar	NP
11	588091	Yes	N/A	Yes	VOA Vial	DI Water
11	588092	Yes	N/A	Yes	VOA Vial	DI Water
11	588111	Yes	N/A	Yes	VOA Vial	MeOH
11	588286	Yes	N/A	Yes	4 oz. Jar	NP
11	588287	Yes	N/A	Yes	4 oz. Jar	NP
12	588093	Yes	N/A	Yes	VOA Vial	DI Water
12	588094	Yes	N/A	Yes	VOA Vial	DI Water
12	588112	Yes	N/A	Yes	VOA Vial	MeOH
12	588288	Yes	N/A	Yes	4 oz. Jar	NP
12	588289	Yes	N/A	Yes	4 oz. Jar	NP
13	588095	Yes	N/A	Yes	VOA Vial	DI Water
13	588096	Yes	N/A	Yes	VOA Vial	DI Water
13	588113	Yes	N/A	Yes	VOA Vial	MeOH
13	588290	Yes	N/A	Yes	4 oz. Jar	NP
13	588291	Yes	N/A	Yes	4 oz. Jar	NP
14	588097	Yes	N/A	Yes	VOA Vial	DI Water
14	588098	Yes	N/A	Yes	VOA Vial	DI Water
14	588114	Yes	N/A	Yes	VOA Vial	MeOH
14	588292	Yes	N/A	Yes	4 oz. Jar	NP
14	588293	Yes	N/A	Yes	4 oz. Jar	NP
15	588099	Yes	N/A	Yes	VOA Vial	DI Water
15	588100	Yes	N/A	Yes	VOA Vial	DI Water
15	588115	Yes	N/A	Yes	VOA Vial	MeOH
15	588294	Yes	N/A	Yes	4 oz. Jar	NP
15	588295	Yes	N/A	Yes	4 oz. Jar	NP

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

ESS Project ID: 24I0052

Date Received: 9/4/2024

2nd Review

Were all containers scanned into storage/lab? Initials TD

Are barcode labels on correct containers? Yes / No

Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA

Are all Hex Chrome stickers attached? Yes / No / NA

Are all QC stickers attached? Yes / No / NA

Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: [signature] Date & Time: 9/4/24 1704

Reviewed By: [signature] Date & Time: 9/4/24 ~~1714~~ 1722 9/4/24

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 2410052

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000

Project Information

Project Name: Amesbury Former MGP

Project Number: 1804576

Project Location: Amesbury, MA

Project Manager: Ryan Hoffman
781-721-4091 rhoffman@geiconsultants.com

Send Report to: Ryan Hoffman
labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY AND MCP ANALYTICAL METHODS REQUIRED: (YES) NO

STATE AND FEDERAL REGULATORY REQUIREMENTS/REPORT LIMITS

State/Federal Program: (MA) 401WQC Other _____ NH RI CT NY ME

MA MCP Criteria are Method 1 S-1 and GW-2/GW-3. Circle if GW-1 is required.

Sample Handling

Samples Field Filtered: YES (NO) NA

Sampled Shipped With Ice: (YES) NO

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Preservative: H2O/MeOH	Preservative: none	Analysis: Vinyl Chloride by Method 8260	Analysis: TCLP Vinyl Chloride							
1	1804576-883R-0-0.5'	9/3/2024	11:00	SO	5	CED			X	X							
2	1804576-883R-0.5-1.5'	9/3/2024	11:02	SO	5	CED			X								**
3	1804576-883R-1.5-2.5'	9/3/2024	11:04	SO	5	CED			X	X							** ML - 9/13/24
4	1804576-890-0-0.5'	9/3/2024	11:06	SO	5	CED			X								**
5	1804576-890-0.5-01.5'	9/3/2024	11:08	SO	5	CED			X								**
6	1804576-890-1.5-2.5'	9/3/2024	11:10	SO	5	CED			X								**
7	1804576-891-0-0.5'	9/3/2024	11:12	SO	5	CED			X								**
8	1804576-891-0.5-1.5'	9/3/2024	11:14	SO	5	CED			X								**
9	1804576-891-1.5-2.5'	9/3/2024	11:16	SO	5	CED			X								**
10	1804576-892-0-0.5'	9/3/2024	11:18	SO	5	CED			X								**
11	1804576-892-0.5-1.5'	9/3/2024	11:20	SO	5	CED			X								**
12	1804576-892-1.5-2.5'	9/3/2024	11:22	SO	5	CED			X								**

Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1. David Miller	9/3/2024	14:00	GEI Fridge
Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
2. GEI Fridge	9/4/24	13:20	2.
Relinquished by: (signature)	Date:	Time:	Received by: (signature)
3.	9/4/24	13:20	3. 9/4/24 1320
Relinquished by: (signature)	Date:	Time:	Received by: (signature)
4. AO 1.0 ORICO	9/4/24	1617	4.
Relinquished by: (signature)	Date:	Time:	Received by: (signature)
5.			5.

Turnaround Time (Business days):

Standard TAT X 4-Day ____ 3-Day ____
2-Day ____ 1-Day ____ Other ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

** Run TCLP Vinyl Chloride if total >20x

Sample Matrix Abbreviations: SO = Soil GW = Groundwater SW = Surface Water SD = Sediment CO = Concrete PC = Paint Chip CLK = Caulk

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 2410052

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman
781-721-4091 rhoffman@geiconsultants.com

Send Report to: Ryan Hoffman

labdata@geiconsultants.com

Preservative

H2O/ MeOH	none							

Analysis

MCP PRESUMPTIVE CERTAINTY AND MCP ANALYTICAL METHODS REQUIRED: (YES) NO

STATE AND FEDERAL REGULATORY REQUIREMENTS/REPORT LIMITS

State/Federal Program: (MA) 401WQC Other _____ NH RI CT NY ME

MA MCP Criteria are Method 1 S-1 and GW-2/GW-3. Circle if GW-1 is required.

Sample Handling

Samples Field Filtered
YES (NO) NA

Sampled Shipped With Ice
(YES) NO

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Vinyl Chloride by Method 8260	TCLP Vinyl Chloride							
11	1804576-893-0-0.5'	9/3/2024	11:24	SO	5	CED	X								**
12	1804576-893-0.5-1.5'	9/3/2024	11:26	SO	5	CED	X								**
13	1804576-893-1.5-2.5'	9/3/2024	11:28	SO	5	CED	X								**

Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1. David Mill	9/3/2024	14:00	GEI Fridge
Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
2. GEI Fridge	9/4/24	13:20	2.
Relinquished by: (signature)	Date:	Time:	Received by: (signature)
3.	9/4/24	13:20	3. 9/4/24 320
Relinquished by: (signature)	Date:	Time:	Received by: (signature)
4. GEI Office	9/4/24	1617	4.
Relinquished by: (signature)	Date:	Time:	Received by: (signature)
5.			5.

Turnaround Time (Business days):

Standard TAT X 4-Day ____ 3-Day ____
2-Day ____ 1-Day ____ Other ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

** Run TCLP Vinyl Chloride if total >20x

Sample Matrix Abbreviations: SO = Soil GW = Groundwater SW = Surface Water SD = Sediment CO = Concrete PC = Paint Chip CLK = Caulk

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury (044752)
ESS Laboratory Work Order Number: 1711282

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 4:58 pm, Nov 27, 2017

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses

CTS - Cranston, RI	Grain Size Analysis
Sterling Analytical Lab - West Springfield, MA	Sulfur

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1711282

SAMPLE RECEIPT

The following samples were received on November 09, 2017 for the analyses specified on the enclosed Chain of Custody Record.

To achieve CAM compliance for MCP data, ESS Laboratory has reviewed all QA/QC Requirements and Performance Standards listed in each method. Holding times and preservation have also been reviewed. All CAM requirements have been performed and achieved unless noted in the project narrative.

Each method has been set-up in the laboratory to reach required MCP standards. The methods for aqueous VOA and Soil Methanol VOA have known limitations for certain analytes. The regulatory standards may not be achieved due to these limitations. In addition, for all methods, matrix interferences, dilutions, and %Solids may elevate method reporting limits above regulatory standards. ESS Laboratory can provide, upon request, a Limit Checker (regulatory standard comparison spreadsheet) electronic deliverable which will highlight these exceedances.

Question I: All samples for Metals were analyzed for a subset of the required MCP list per the client's request.

Lab Number	Sample Name	Matrix	Analysis
1711282-01	044752-SS610R-LT	Soil	§, 2540 G, 6010C, 6020A, 7.3.3.2, 7.3.4.1, 7471B, 8081B, 8082, 8100M, 8151A, 8260B, 8270D, 9014, 9045, D4239, EPH8270, EPH8270SIM, LK, MADEP-EPH
1711282-02	044752-SS611R-LT	Soil	§, 2540 G, 6010C, 6020A, 7.3.3.2, 7.3.4.1, 7471B, 8081B, 8082, 8100M, 8151A, 8260B, 8270D, 9014, 9045, D4239, EPH8270, EPH8270SIM, LK, MADEP-EPH

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1711282

PROJECT NARRATIVE

5035/8260B Volatile Organic Compounds / Methanol

1711282-01	**Elevated Method Reporting Limits due to sample matrix (EL).**
1711282-01	**Surrogate recovery(ies) outside of criteria. Reextraction/Reanalysis confirms results (SC).**
	4-Bromofluorobenzene (57% @ 70-130%)
1711282-01RE1	**Elevated Method Reporting Limits due to sample matrix (EL).**
1711282-01RE1	**Surrogate recovery(ies) outside of criteria. Reextraction/Reanalysis confirms results (SC).**
	4-Bromofluorobenzene (50% @ 70-130%), Toluene-d8 (62% @ 70-130%)
1711282-02	**Elevated Method Reporting Limits due to sample matrix (EL).**
1711282-02	**Surrogate recovery(ies) outside of criteria. Reextraction/Reanalysis confirms results (SC).**
	4-Bromofluorobenzene (58% @ 70-130%), Toluene-d8 (69% @ 70-130%)
1711282-02RE1	**Elevated Method Reporting Limits due to sample matrix (EL).**
1711282-02RE1	**Surrogate recovery(ies) outside of criteria. Reextraction/Reanalysis confirms results (SC).**
	4-Bromofluorobenzene (48% @ 70-130%), Toluene-d8 (59% @ 70-130%)
C7K0232-CCV1	**Continuing Calibration %Diff/Drift is below control limit (CD-).**
	1,4-Dioxane - Screen (22% @ 20%)
C7K0306-CCV1	**Continuing Calibration %Diff/Drift is above control limit (CD+).**
	1,4-Dioxane - Screen (32% @ 20%), Methyl tert-Butyl Ether (28% @ 20%)
CK71435-BS1	**Blank Spike recovery is above upper control limit (B+).**
	Hexachlorobutadiene (131% @ 70-130%)
CK71435-BSD1	**Relative percent difference for duplicate is outside of criteria (D+).**
	Tetrahydrofuran (26% @ 20%)
CK71715-BS1	**Continuing Calibration %Diff/Drift is above control limit (CD+).**
	Hexachlorobutadiene (34% @ 20%)

8081B Organochlorine Pesticides

1711282-02	**Lower value is used due to matrix interferences (LC).**
	gamma-Chlordane
1711282-02	**Percent difference between primary and confirmation results exceeds 40% (P).**
	4,4´-DDT [2C] , gamma-Chlordane
1711282-02	**Surrogate recovery(ies) outside of criteria due to matrix (UCM/coelution/matrix is present) (SM).**
	Decachlorobiphenyl [2C] (189% @ 30-150%), Tetrachloro-m-xylene (171% @ 30-150%)
C7K0218-CCV1	**Continuing Calibration %Diff/Drift is above control limit (CD+).**
	Endosulfan Sulfate (23% @ 20%), Endrin Ketone (21% @ 20%)
C7K0218-CCV3	**Continuing Calibration %Diff/Drift is above control limit (CD+).**
	Heptachlor [2C] (21% @ 20%)

8082 Polychlorinated Biphenyls (PCB) / Congeners

1711282-01	**Lower value is used due to matrix interferences (LC).**
	BZ#101 , BZ#105 , BZ#118 , BZ#138 , BZ#170 , BZ#187 , BZ#44 , BZ#66 , BZ#8
1711282-01	**Percent difference between primary and confirmation results exceeds 40% (P).**
	BZ#101 , BZ#105 , BZ#118 , BZ#128 [2C] , BZ#138 , BZ#170 , BZ#180 [2C] , BZ#187 , BZ#28 [2C] , BZ#44 , BZ#52 [2C] , BZ#66 , BZ#8

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury ESS Laboratory Work Order: 1711282

1711282-01	**Surrogate recovery(ies) outside of criteria due to matrix (UCM/coelution/matrix is present) (SM).**
	Tetrachloro-m-xylene [2C] (273% @ 30-150%)
1711282-02	**Lower value is used due to matrix interferences (LC).**
	BZ#118 , BZ#138 , BZ#44 , BZ#52 , BZ#66
1711282-02	**Percent difference between primary and confirmation results exceeds 40% (P).**
	BZ#101 [2C] , BZ#118 , BZ#138 , BZ#28 [2C] , BZ#44 , BZ#52 , BZ#66
1711282-02	**Surrogate recovery(ies) outside of criteria due to matrix (UCM/coelution/matrix is present) (SM).**
	Tetrachloro-m-xylene [2C] (347% @ 30-150%)

8151A Chlorinated Herbicides

1711282-01	**Elevated Method Reporting Limits due to sample matrix (EL).**
1711282-01	**Lower value is used due to matrix interferences (LC).**
	Dicamba
1711282-01	**Modified result**
	MCPP , MCPP [2C]
1711282-01	**Peaks found in the retention time window for MCPP did not confirm by GC/MS.**
	MCPP , MCPP [2C]
1711282-01	**Percent difference between primary and confirmation results exceeds 40% (P).**
	Dicamba
1711282-02	**Elevated Method Reporting Limits due to sample matrix (EL).**
1711282-02	**Lower value is used due to matrix interferences (LC).**
	2,4,5-T , 2,4-DB [2C] , Dicamba [2C]
1711282-02	**Modified result**
	MCPP , MCPP [2C]
1711282-02	**Peaks found in the retention time window for MCPP did not confirm by GC/MS.**
	MCPP , MCPP [2C]
1711282-02	**Percent difference between primary and confirmation results exceeds 40% (P).**
	2,4,5-T , 2,4-DB [2C] , Dicamba [2C]
1711282-02	**Surrogate recovery(ies) outside of criteria due to matrix (UCM/coelution/matrix is present) (SM).**
	DCAA [2C] (1720% @ 30-150%)
C7K0198-CCV2	**Continuing Calibration %Diff/Drift is below control limit (CD-).**
	2,4,5-T [2C] (22% @ 15%), 2,4,5-TP (Silvex) [2C] (18% @ 15%), Dicamba [2C] (18% @ 15%), Dichlorprop [2C] (19% @ 15%), Dinoseb [2C] (19% @ 15%)
CK70954-BSD1	**Relative percent difference for duplicate is outside of criteria (D+).**
	Dinoseb (36% @ 30%)

8270D Semi-Volatile Organic Compounds

C7K0219-CCV1	**Calibration required quadratic regression (Q).**
	2,4-Dinitrophenol (81% @ 80-120%)
C7K0219-CCV1	**Continuing Calibration %Diff/Drift is above control limit (CD+).**
	2-Methylphenol (27% @ 20%)
C7K0238-CCV1	**Calibration required quadratic regression (Q).**
	2,4-Dinitrophenol (71% @ 80-120%)
C7K0238-CCV1	**Continuing Calibration %Diff/Drift is above control limit (CD+).**
	2-Methylphenol (22% @ 20%)
C7K0238-CCV1	**Continuing Calibration %Diff/Drift is below control limit (CD-).**
	2,4-Dinitrophenol (29% @ 20%), 4-Nitrophenol (28% @ 20%)

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury ESS Laboratory Work Order: 1711282

MADEP-EPH Extractable Petroleum Hydrocarbons

CK71307-BSD1 **Blank Spike recovery is below lower control limit (B-).**
Decane (C10) (33% @ 40-140%), Dodecane (C12) (37% @ 40-140%), Nonane (C9) (27% @ 30-140%)

CK71307-BSD1 **Relative percent difference for duplicate is outside of criteria (D+).**
C19-C36 Aliphatics1 (28% @ 25%), C9-C18 Aliphatics1 (38% @ 25%), Decane (C10) (62% @ 25%), Docosane (C22) (30% @ 25%), Dodecane (C12) (60% @ 25%), Hexadecane (C16) (31% @ 25%), Nonane (C9) (61% @ 25%), Tetradecane (C14) (45% @ 25%)

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1711282

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1711282

MassDEP Analytical Protocol Certification Form

MADEP RTN: _____

This form provides certification for the following data set: **1711282-01 through 1711282-02RE1**

Matrices: ( ) Ground Water/Surface Water (X) Soil/Sediment ( ) Drinking Water ( ) Air ( ) Other:_____

CAM Protocol (check all that apply below):

(X) 8260 VOC CAM II A	(X) 7470/7471 Hg CAM III B	( ) MassDEP VPH (GC/PID/FID) CAM IV A	(X) 8082 PCB CAM V A	(X) 9014 Total Cyanide/PAC CAM VI A	( ) 6860 Perchlorate CAM VIII B
(X) 8270 SVOC CAM II B	( ) 7010 Metals CAM III C	( ) MassDEP VPH (GC/MS) CAM IV B	(X) 8081 Pesticides CAM V C	( ) 7196 Hex Cr CAM VI B	( ) MassDEP APH CAM IX A
(X) 6010 Metals CAM III A	(X) 6020 Metals CAM III D	(X) MassDEP EPH CAM IV B	(X) 8151 Herbicides CAM V C	( ) Explosives CAM VIII A	( ) TO-15 VOC CAM IX B

Affirmative responses to questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	Yes (X) No ( )
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	Yes (X) No ( )
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	Yes (X) No ( )
D	Does the laboratory report comply with all the reporting requirements specified in the CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	Yes (X) No ( )
E	VPH, EPH, APH and TO-15 only: a. Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	Yes (X) No ( )
	b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	Yes ( ) No ( )
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	Yes (X) No ( )

Responses to Questions G, H and I below are required for '"Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocols(s)?	Yes ( ) No (X)*
	***Data User Note:** Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.*	
H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	Yes ( ) No (X)*
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	Yes ( ) No (X)*

All negative responses must be addressed in an attached laboratory narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature: Laurel Stoddard Date: November 27, 2017

Printed Name: Laurel Stoddard Position: Laboratory Director

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS610R-LT
Date Sampled: 11/08/17 10:00
Percent Solids: 35

ESS Laboratory Work Order: 1711282
ESS Laboratory Sample ID: 1711282-01
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Arsenic	**41.1** (2.63)		6010C		1	KJK	11/13/17 16:35	5.44	100	CK71043
Barium	**73.0** (2.63)		6010C		1	KJK	11/13/17 16:35	5.44	100	CK71043
Cadmium	**7.46** (0.53)		6010C		1	KJK	11/13/17 16:35	5.44	100	CK71043
Chromium	**254** (1.05)		6010C		1	KJK	11/13/17 16:35	5.44	100	CK71043
Copper	**509** (2.63)		6010C		1	KJK	11/13/17 16:35	5.44	100	CK71043
Lead	**310** (5.25)		6010C		1	KJK	11/13/17 16:35	5.44	100	CK71043
Mercury	**0.991** (0.212)		7471B		10	MJV	11/14/17 15:31	2.67	40	CK71044
Nickel	**90.5** (2.63)		6010C		1	KJK	11/13/17 16:35	5.44	100	CK71043
Selenium	**3.71** (0.53)		6020A		20	NAR	11/13/17 22:54	5.44	100	CK71043
Silver	**11.2** (0.53)		6010C		1	KJK	11/13/17 16:35	5.44	100	CK71043
Zinc	**535** (2.63)		6010C		1	KJK	11/13/17 16:35	5.44	100	CK71043

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS610R-LT
Date Sampled: 11/08/17 10:00
Percent Solids: 35
Initial Volume: 17.9
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1711282
ESS Laboratory Sample ID: 1711282-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
1,1,1-Trichloroethane	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
1,1,2,2-Tetrachloroethane	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
1,1,2-Trichloroethane	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
1,1-Dichloroethane	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
1,1-Dichloroethene	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
1,1-Dichloropropene	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
1,2,3-Trichlorobenzene	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
1,2,3-Trichloropropane	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
1,2,4-Trichlorobenzene	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
1,2,4-Trimethylbenzene	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
1,2-Dibromo-3-Chloropropane	ND (4.25)		8260B		1	11/14/17 19:48	C7K0232	CK71435
1,2-Dibromoethane	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
1,2-Dichlorobenzene	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
1,2-Dichloroethane	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
1,2-Dichloropropane	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
1,3,5-Trimethylbenzene	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
1,3-Dichlorobenzene	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
1,3-Dichloropropane	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
1,4-Dichlorobenzene	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
1,4-Dioxane - Screen	ND (170)		8260B		1	11/14/17 19:48	C7K0232	CK71435
2,2-Dichloropropane	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
2-Butanone	ND (4.25)		8260B		1	11/14/17 19:48	C7K0232	CK71435
2-Chlorotoluene	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
2-Hexanone	ND (4.25)		8260B		1	11/14/17 19:48	C7K0232	CK71435
4-Chlorotoluene	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
4-Isopropyltoluene	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
4-Methyl-2-Pentanone	ND (4.25)		8260B		1	11/14/17 19:48	C7K0232	CK71435
Acetone	ND (4.25)		8260B		1	11/14/17 19:48	C7K0232	CK71435
Benzene	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
Bromobenzene	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
Bromochloromethane	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS610R-LT
Date Sampled: 11/08/17 10:00
Percent Solids: 35
Initial Volume: 17.9
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1711282
ESS Laboratory Sample ID: 1711282-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromodichloromethane	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
Bromoform	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
Bromomethane	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
Carbon Disulfide	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
Carbon Tetrachloride	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
Chlorobenzene	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
Chloroethane	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
Chloroform	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
Chloromethane	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
cis-1,2-Dichloroethene	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
cis-1,3-Dichloropropene	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
Dibromochloromethane	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
Dibromomethane	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
Dichlorodifluoromethane	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
Diethyl Ether	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
Di-isopropyl ether	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
Ethyl tertiary-butyl ether	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
Ethylbenzene	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
Hexachlorobutadiene	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
Isopropylbenzene	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
Methyl tert-Butyl Ether	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
Methylene Chloride	ND (1.70)		8260B		1	11/14/17 19:48	C7K0232	CK71435
Naphthalene	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
n-Butylbenzene	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
n-Propylbenzene	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
sec-Butylbenzene	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
Styrene	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
tert-Butylbenzene	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
Tertiary-amyl methyl ether	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
Tetrachloroethene	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
Tetrahydrofuran	ND (4.25)		8260B		1	11/14/17 19:48	C7K0232	CK71435
Toluene	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS610R-LT
Date Sampled: 11/08/17 10:00
Percent Solids: 35
Initial Volume: 17.9
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1711282
ESS Laboratory Sample ID: 1711282-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
trans-1,2-Dichloroethene	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
trans-1,3-Dichloropropene	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
Trichloroethene	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
Trichlorofluoromethane	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
Vinyl Chloride	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
Xylene O	ND (0.851)		8260B		1	11/14/17 19:48	C7K0232	CK71435
Xylene P,M	ND (1.70)		8260B		1	11/14/17 19:48	C7K0232	CK71435
Xylenes (Total)	ND (1.70)		8260B		1	11/14/17 19:48		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*87 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*57 %*	*SC*	*70-130*
Surrogate: Dibromofluoromethane	*85 %*		*70-130*
Surrogate: Toluene-d8	*74 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS610R-LT
Date Sampled: 11/08/17 10:00
Percent Solids: 35
Initial Volume: 20.3
Final Volume: 5
Extraction Method: 3546

ESS Laboratory Work Order: 1711282
ESS Laboratory Sample ID: 1711282-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: NXL
Prepared: 11/10/17 10:40

8081B Organochlorine Pesticides

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
4,4′-DDD [2C]	ND (0.0070)		8081B		1	11/14/17 19:39	C7K0218	CK71351
4,4′-DDE [2C]	ND (0.0070)		8081B		1	11/14/17 19:39	C7K0218	CK71351
4,4′-DDT	ND (0.0070)		8081B		1	11/14/17 19:39	C7K0218	CK71351
Aldrin	ND (0.0070)		8081B		1	11/14/17 19:39	C7K0218	CK71351
alpha-BHC	ND (0.0070)		8081B		1	11/14/17 19:39	C7K0218	CK71351
alpha-Chlordane	ND (0.0070)		8081B		1	11/14/17 19:39	C7K0218	CK71351
beta-BHC	ND (0.0070)		8081B		1	11/14/17 19:39	C7K0218	CK71351
Chlordane (Total)	ND (0.0563)		8081B		1	11/14/17 19:39	C7K0218	CK71351
delta-BHC	ND (0.0070)		8081B		1	11/14/17 19:39	C7K0218	CK71351
Dieldrin	ND (0.0070)		8081B		1	11/14/17 19:39	C7K0218	CK71351
Endosulfan I	ND (0.0070)		8081B		1	11/14/17 19:39	C7K0218	CK71351
Endosulfan II	ND (0.0070)		8081B		1	11/14/17 19:39	C7K0218	CK71351
Endosulfan Sulfate	ND (0.0070)		8081B		1	11/14/17 19:39	C7K0218	CK71351
Endrin	ND (0.0070)		8081B		1	11/14/17 19:39	C7K0218	CK71351
Endrin Ketone	ND (0.0070)		8081B		1	11/14/17 19:39	C7K0218	CK71351
gamma-BHC (Lindane)	ND (0.0028)		8081B		1	11/14/17 19:39	C7K0218	CK71351
gamma-Chlordane	ND (0.0070)		8081B		1	11/14/17 19:39	C7K0218	CK71351
Heptachlor	ND (0.0070)		8081B		1	11/14/17 19:39	C7K0218	CK71351
Heptachlor Epoxide	ND (0.0070)		8081B		1	11/14/17 19:39	C7K0218	CK71351
Hexachlorobenzene	ND (0.0070)		8081B		1	11/14/17 19:39	C7K0218	CK71351
Methoxychlor	ND (0.0070)		8081B		1	11/14/17 19:39	C7K0218	CK71351
Toxaphene	ND (0.352)		8081B		1	11/14/17 19:39	C7K0218	CK71351

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*92 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*93 %*		*30-150*
Surrogate: Tetrachloro-m-xylene	*111 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*78 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS610R-LT
Date Sampled: 11/08/17 10:00
Percent Solids: 35
Initial Volume: 29.6
Final Volume: 2
Extraction Method: 3540C

ESS Laboratory Work Order: 1711282
ESS Laboratory Sample ID: 1711282-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/13/17 16:02

8082 Polychlorinated Biphenyls (PCB) / Congeners

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
BZ#8	**LC, P 0.00386** (0.00078)		8082		1	11/14/17 18:28	C7K0217	CK71333
BZ#18	**0.00467** (0.00078)		8082		1	11/14/17 18:28	C7K0217	CK71333
BZ#28 [2C]	**P 0.00449** (0.00078)		8082		1	11/14/17 18:28	C7K0217	CK71333
BZ#44	**LC, P 0.00229** (0.00078)		8082		1	11/14/17 18:28	C7K0217	CK71333
BZ#52 [2C]	**P 0.00801** (0.00078)		8082		1	11/14/17 18:28	C7K0217	CK71333
BZ#66	**LC, P 0.00279** (0.00078)		8082		1	11/14/17 18:28	C7K0217	CK71333
BZ#101	**LC, P 0.00649** (0.00078)		8082		1	11/14/17 18:28	C7K0217	CK71333
BZ#105	**LC, P 0.00165** (0.00078)		8082		1	11/14/17 18:28	C7K0217	CK71333
BZ#118	**LC, P 0.00433** (0.00078)		8082		1	11/14/17 18:28	C7K0217	CK71333
BZ#128 [2C]	**P 0.00246** (0.00078)		8082		1	11/14/17 18:28	C7K0217	CK71333
BZ#138	**LC, P 0.00591** (0.00078)		8082		1	11/14/17 18:28	C7K0217	CK71333
BZ#153 [2C]	**0.00717** (0.00078)		8082		1	11/14/17 18:28	C7K0217	CK71333
BZ#170	**LC, P 0.00108** (0.00078)		8082		1	11/14/17 18:28	C7K0217	CK71333
BZ#180 [2C]	**P 0.00299** (0.00078)		8082		1	11/14/17 18:28	C7K0217	CK71333
BZ#187	**LC, P 0.00130** (0.00078)		8082		1	11/14/17 18:28	C7K0217	CK71333
BZ#195	ND (0.00078)		8082		1	11/14/17 18:28	C7K0217	CK71333
BZ#206	ND (0.00078)		8082		1	11/14/17 18:28	C7K0217	CK71333
BZ#209	ND (0.00078)		8082		1	11/14/17 18:28	C7K0217	CK71333

	%Recovery	Qualifier	Limits
Surrogate: Tetrachloro-m-xylene	*36 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*273 %*	*SM*	*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS610R-LT
Date Sampled: 11/08/17 10:00
Percent Solids: 35
Initial Volume: 20.1
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1711282
ESS Laboratory Sample ID: 1711282-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: SMR
Prepared: 11/10/17 12:13

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**2150** (28.4)		8100M		1	11/11/17 10:14	C7K0178	CK71009

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	*107 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS610R-LT
Date Sampled: 11/08/17 10:00
Percent Solids: 35
Initial Volume: 10
Final Volume: 4
Extraction Method: 3546

ESS Laboratory Work Order: 1711282
ESS Laboratory Sample ID: 1711282-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: IBM
Prepared: 11/10/17 15:45

8151A Chlorinated Herbicides

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2,4,5-T	ND (0.027)		8151A		1	11/14/17 23:33	C7K0231	CK70954
2,4,5-TP (Silvex)	**0.036** (0.027)		8151A		1	11/14/17 23:33	C7K0231	CK70954
2,4-D	ND (0.134)		8151A		1	11/14/17 23:33	C7K0231	CK70954
2,4-DB	ND (0.136)		8151A		1	11/14/17 23:33	C7K0231	CK70954
Dalapon	ND (0.130)		8151A		1	11/14/17 23:33	C7K0231	CK70954
Dicamba	**LC, P 0.051** (0.027)		8151A		1	11/14/17 23:33	C7K0231	CK70954
Dichlorprop	ND (0.134)		8151A		1	11/14/17 23:33	C7K0231	CK70954
Dinoseb	ND (0.136)		8151A		1	11/14/17 23:33	C7K0231	CK70954
MCPA	ND (6.65)		8151A		1	11/14/17 23:33	C7K0231	CK70954
MCPP	**#, XH** ND (6.72)		8151A		1	11/14/17 23:33	C7K0231	CK70954

	%Recovery	Qualifier	Limits
Surrogate: DCAA	*102 %*		*30-150*
Surrogate: DCAA [2C]	*109 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS610R-LT
Date Sampled: 11/08/17 10:00
Percent Solids: 35
Initial Volume: 25.2
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1711282
ESS Laboratory Sample ID: 1711282-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/13/17 15:45

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,2,4-Trichlorobenzene	ND (0.567)		8270D		1	11/15/17 0:35	C7K0238	CK71309
1,2-Dichlorobenzene	ND (0.567)		8270D		1	11/15/17 0:35	C7K0238	CK71309
1,3-Dichlorobenzene	ND (0.567)		8270D		1	11/15/17 0:35	C7K0238	CK71309
1,4-Dichlorobenzene	ND (0.567)		8270D		1	11/15/17 0:35	C7K0238	CK71309
2,4,5-Trichlorophenol	ND (0.567)		8270D		1	11/15/17 0:35	C7K0238	CK71309
2,4,6-Trichlorophenol	ND (0.567)		8270D		1	11/15/17 0:35	C7K0238	CK71309
2,4-Dichlorophenol	ND (0.567)		8270D		1	11/15/17 0:35	C7K0238	CK71309
2,4-Dimethylphenol	ND (0.567)		8270D		1	11/15/17 0:35	C7K0238	CK71309
2,4-Dinitrophenol	ND (2.84)		8270D		1	11/15/17 0:35	C7K0238	CK71309
2,4-Dinitrotoluene	ND (0.567)		8270D		1	11/15/17 0:35	C7K0238	CK71309
2,6-Dinitrotoluene	ND (0.567)		8270D		1	11/15/17 0:35	C7K0238	CK71309
2-Chloronaphthalene	ND (0.567)		8270D		1	11/15/17 0:35	C7K0238	CK71309
2-Chlorophenol	ND (0.567)		8270D		1	11/15/17 0:35	C7K0238	CK71309
2-Methylnaphthalene	**2.67** (0.567)		8270D		1	11/15/17 0:35	C7K0238	CK71309
2-Methylphenol	ND (0.567)		8270D		1	11/15/17 0:35	C7K0238	CK71309
2-Nitrophenol	ND (0.567)		8270D		1	11/15/17 0:35	C7K0238	CK71309
3,3′-Dichlorobenzidine	ND (0.567)		8270D		1	11/15/17 0:35	C7K0238	CK71309
3+4-Methylphenol	ND (1.13)		8270D		1	11/15/17 0:35	C7K0238	CK71309
4-Bromophenyl-phenylether	ND (0.567)		8270D		1	11/15/17 0:35	C7K0238	CK71309
4-Chloroaniline	ND (0.567)		8270D		1	11/15/17 0:35	C7K0238	CK71309
4-Nitrophenol	ND (2.84)		8270D		1	11/15/17 0:35	C7K0238	CK71309
Acenaphthene	**47.3** (5.67)		8270D		10	11/15/17 22:57	C7K0238	CK71309
Acenaphthylene	**8.97** (0.567)		8270D		1	11/15/17 0:35	C7K0238	CK71309
Acetophenone	ND (1.13)		8270D		1	11/15/17 0:35	C7K0238	CK71309
Aniline	ND (2.84)		8270D		1	11/15/17 0:35	C7K0238	CK71309
Anthracene	**86.6** (5.67)		8270D		10	11/15/17 22:57	C7K0238	CK71309
Azobenzene	ND (0.567)		8270D		1	11/15/17 0:35	C7K0238	CK71309
Benzo(a)anthracene	**88.7** (5.67)		8270D		10	11/15/17 22:57	C7K0238	CK71309
Benzo(a)pyrene	**92.4** (2.84)		8270D		10	11/15/17 22:57	C7K0238	CK71309
Benzo(b)fluoranthene	**43.5** (5.67)		8270D		10	11/15/17 22:57	C7K0238	CK71309
Benzo(g,h,i)perylene	**69.0** (5.67)		8270D		10	11/15/17 22:57	C7K0238	CK71309
Benzo(k)fluoranthene	**50.2** (5.67)		8270D		10	11/15/17 22:57	C7K0238	CK71309

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS610R-LT
Date Sampled: 11/08/17 10:00
Percent Solids: 35
Initial Volume: 25.2
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1711282
ESS Laboratory Sample ID: 1711282-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/13/17 15:45

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
bis(2-Chloroethoxy)methane	ND (0.567)		8270D		1	11/15/17 0:35	C7K0238	CK71309
bis(2-Chloroethyl)ether	ND (0.567)		8270D		1	11/15/17 0:35	C7K0238	CK71309
bis(2-chloroisopropyl)Ether	ND (0.567)		8270D		1	11/15/17 0:35	C7K0238	CK71309
bis(2-Ethylhexyl)phthalate	ND (0.567)		8270D		1	11/15/17 0:35	C7K0238	CK71309
Butylbenzylphthalate	**1.35** (0.567)		8270D		1	11/15/17 0:35	C7K0238	CK71309
Chrysene	**72.0** (2.84)		8270D		10	11/15/17 22:57	C7K0238	CK71309
Dibenzo(a,h)Anthracene	**11.2** (0.284)		8270D		1	11/15/17 0:35	C7K0238	CK71309
Dibenzofuran	**2.76** (0.567)		8270D		1	11/15/17 0:35	C7K0238	CK71309
Diethylphthalate	ND (0.567)		8270D		1	11/15/17 0:35	C7K0238	CK71309
Dimethylphthalate	ND (0.567)		8270D		1	11/15/17 0:35	C7K0238	CK71309
Di-n-butylphthalate	ND (0.567)		8270D		1	11/15/17 0:35	C7K0238	CK71309
Di-n-octylphthalate	ND (0.567)		8270D		1	11/15/17 0:35	C7K0238	CK71309
Fluoranthene	**173** (56.7)		8270D		100	11/15/17 23:32	C7K0238	CK71309
Fluorene	**35.2** (5.67)		8270D		10	11/15/17 22:57	C7K0238	CK71309
Hexachlorobenzene	ND (0.567)		8270D		1	11/15/17 0:35	C7K0238	CK71309
Hexachlorobutadiene	ND (0.567)		8270D		1	11/15/17 0:35	C7K0238	CK71309
Hexachloroethane	ND (0.567)		8270D		1	11/15/17 0:35	C7K0238	CK71309
Indeno(1,2,3-cd)Pyrene	**50.1** (5.67)		8270D		10	11/15/17 22:57	C7K0238	CK71309
Isophorone	ND (0.567)		8270D		1	11/15/17 0:35	C7K0238	CK71309
Naphthalene	**9.87** (0.567)		8270D		1	11/15/17 0:35	C7K0238	CK71309
Nitrobenzene	ND (0.567)		8270D		1	11/15/17 0:35	C7K0238	CK71309
N-Nitrosodimethylamine	ND (0.567)		8270D		1	11/15/17 0:35	C7K0238	CK71309
Pentachlorophenol	ND (2.84)		8270D		1	11/15/17 0:35	C7K0238	CK71309
Phenanthrene	**220** (56.7)		8270D		100	11/15/17 23:32	C7K0238	CK71309
Phenol	ND (0.567)		8270D		1	11/15/17 0:35	C7K0238	CK71309
Pyrene	**267** (56.7)		8270D		100	11/15/17 23:32	C7K0238	CK71309
Pyridine	ND (2.84)		8270D		1	11/15/17 0:35	C7K0238	CK71309

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichlorobenzene-d4	*59 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*81 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*61 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS610R-LT
Date Sampled: 11/08/17 10:00
Percent Solids: 35
Initial Volume: 25.2
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1711282
ESS Laboratory Sample ID: 1711282-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/13/17 15:45

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Surrogate: 2-Fluorobiphenyl		*60 %*		*30-130*				
Surrogate: 2-Fluorophenol		*54 %*		*30-130*				
Surrogate: Nitrobenzene-d5		*59 %*		*30-130*				
Surrogate: Phenol-d6		*60 %*		*30-130*				
Surrogate: p-Terphenyl-d14		*114 %*		*30-130*				

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS610R-LT
Date Sampled: 11/08/17 10:00
Percent Solids: 35

ESS Laboratory Work Order: 1711282
ESS Laboratory Sample ID: 1711282-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Corrosivity (pH)	**5.88** (N/A)		9045		1	BCA	11/09/17 22:55	S.U.	CK70951
Corrosivity (pH) Sample Temp	**Soil pH measured in water at 19.0 °C.**								
Grain Size	**See Attached** (N/A)								
Percent Volatile Solids	**24** (1)		2540 G		1	EEM	11/14/17 17:25	%	CK71416
Reactive Cyanide	ND (2.0)		7.3.3.2		1	JLK	11/13/17 16:05	mg/kg	CK71347
Reactive Sulfide	ND (2.0)		7.3.4.1		1	JLK	11/13/17 16:05	mg/kg	CK71347
Sulfur, Total, WT PCT	**0.13** (0.01)		D4239		1	SUB	11/17/17 0:00	wt %	CK72002
Total Cyanide	ND (2.81)		9014		1	EEM	11/14/17 12:20	mg/kg dry	CK71415
Total Organic Carbon (Average)	**79700** (113)		LK		1	DEL	11/14/17 21:30	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS610R-LT
Date Sampled: 11/08/17 10:00
Percent Solids: 35
Initial Volume: 30.4
Final Volume: 2
Extraction Method: 3546

ESS Laboratory Work Order: 1711282
ESS Laboratory Sample ID: 1711282-01
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 11/13/17 14:00

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (70.5)		MADEP-EPH		1	ZLC	11/14/17 15:47	C7K0222	CK71307
C19-C36 Aliphatics1	**109** (70.5)		MADEP-EPH		1	ZLC	11/14/17 15:47	C7K0222	CK71307
C11-C22 Unadjusted Aromatics1	**1070** (70.5)		EPH8270		1	ZLC	11/16/17 3:54	C7K0266	CK71307
C11-C22 Aromatics1,2	**414** (105)		EPH8270			VSC	11/16/17 9:51		[CALC]
2-Methylnaphthalene	**1.43** (0.094)		EPH8270SIM		1	VSC	11/15/17 10:36	C7K0251	CK71307
Acenaphthene	**29.3** (0.940)		EPH8270SIM		10	VSC	11/16/17 9:03	C7K0251	CK71307
Naphthalene	**5.01** (0.094)		EPH8270SIM		1	VSC	11/15/17 10:36	C7K0251	CK71307
Phenanthrene	**132** (9.40)		EPH8270SIM		100	VSC	11/16/17 9:51	C7K0251	CK71307
Acenaphthylene	**4.46** (0.094)		EPH8270SIM		1	VSC	11/15/17 10:36	C7K0251	CK71307
Anthracene	**47.1** (0.376)		EPH8270SIM		10	VSC	11/16/17 9:03	C7K0251	CK71307
Benzo(a)anthracene	**34.1** (0.376)		EPH8270SIM		10	VSC	11/16/17 9:03	C7K0251	CK71307
Benzo(a)pyrene	**38.8** (0.376)		EPH8270SIM		10	VSC	11/16/17 9:03	C7K0251	CK71307
Benzo(b)fluoranthene	**29.3** (0.940)		EPH8270SIM		10	VSC	11/16/17 9:03	C7K0251	CK71307
Benzo(g,h,i)perylene	**18.2** (0.940)		EPH8270SIM		10	VSC	11/16/17 9:03	C7K0251	CK71307
Benzo(k)fluoranthene	**6.85** (0.094)		EPH8270SIM		1	VSC	11/15/17 10:36	C7K0251	CK71307
Chrysene	**30.7** (0.940)		EPH8270SIM		10	VSC	11/16/17 9:03	C7K0251	CK71307
Dibenzo(a,h)Anthracene	**4.99** (0.038)		EPH8270SIM		1	VSC	11/15/17 10:36	C7K0251	CK71307
Fluoranthene	**114** (9.40)		EPH8270SIM		100	VSC	11/16/17 9:51	C7K0251	CK71307
Fluorene	**23.0** (0.376)		EPH8270SIM		10	VSC	11/16/17 9:03	C7K0251	CK71307
Indeno(1,2,3-cd)Pyrene	**18.2** (0.940)		EPH8270SIM		10	VSC	11/16/17 9:03	C7K0251	CK71307
Pyrene	**115** (9.40)		EPH8270SIM		100	VSC	11/16/17 9:51	C7K0251	CK71307

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*61 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*86 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*100 %*		*40-140*
Surrogate: O-Terphenyl	*45 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS610R-LT
Date Sampled: 11/08/17 10:00
Percent Solids: 35
Initial Volume: 17.9
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1711282
ESS Laboratory Sample ID: 1711282-01RE1
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
1,1,1-Trichloroethane	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
1,1,2,2-Tetrachloroethane	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
1,1,2-Trichloroethane	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
1,1-Dichloroethane	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
1,1-Dichloroethene	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
1,1-Dichloropropene	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
1,2,3-Trichlorobenzene	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
1,2,3-Trichloropropane	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
1,2,4-Trichlorobenzene	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
1,2,4-Trimethylbenzene	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
1,2-Dibromo-3-Chloropropane	ND (4.25)		8260B		1	11/17/17 12:11	C7K0306	CK71715
1,2-Dibromoethane	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
1,2-Dichlorobenzene	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
1,2-Dichloroethane	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
1,2-Dichloropropane	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
1,3,5-Trimethylbenzene	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
1,3-Dichlorobenzene	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
1,3-Dichloropropane	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
1,4-Dichlorobenzene	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
1,4-Dioxane - Screen	ND (170)		8260B		1	11/17/17 12:11	C7K0306	CK71715
2,2-Dichloropropane	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
2-Butanone	ND (4.25)		8260B		1	11/17/17 12:11	C7K0306	CK71715
2-Chlorotoluene	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
2-Hexanone	ND (4.25)		8260B		1	11/17/17 12:11	C7K0306	CK71715
4-Chlorotoluene	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
4-Isopropyltoluene	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
4-Methyl-2-Pentanone	ND (4.25)		8260B		1	11/17/17 12:11	C7K0306	CK71715
Acetone	ND (4.25)		8260B		1	11/17/17 12:11	C7K0306	CK71715
Benzene	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
Bromobenzene	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
Bromochloromethane	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS610R-LT
Date Sampled: 11/08/17 10:00
Percent Solids: 35
Initial Volume: 17.9
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1711282
ESS Laboratory Sample ID: 1711282-01RE1
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromodichloromethane	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
Bromoform	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
Bromomethane	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
Carbon Disulfide	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
Carbon Tetrachloride	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
Chlorobenzene	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
Chloroethane	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
Chloroform	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
Chloromethane	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
cis-1,2-Dichloroethene	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
cis-1,3-Dichloropropene	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
Dibromochloromethane	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
Dibromomethane	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
Dichlorodifluoromethane	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
Diethyl Ether	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
Di-isopropyl ether	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
Ethyl tertiary-butyl ether	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
Ethylbenzene	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
Hexachlorobutadiene	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
Isopropylbenzene	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
Methyl tert-Butyl Ether	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
Methylene Chloride	ND (1.70)		8260B		1	11/17/17 12:11	C7K0306	CK71715
Naphthalene	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
n-Butylbenzene	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
n-Propylbenzene	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
sec-Butylbenzene	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
Styrene	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
tert-Butylbenzene	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
Tertiary-amyl methyl ether	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
Tetrachloroethene	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
Tetrahydrofuran	ND (4.25)		8260B		1	11/17/17 12:11	C7K0306	CK71715
Toluene	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS610R-LT
Date Sampled: 11/08/17 10:00
Percent Solids: 35
Initial Volume: 17.9
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1711282
ESS Laboratory Sample ID: 1711282-01RE1
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
trans-1,2-Dichloroethene	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
trans-1,3-Dichloropropene	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
Trichloroethene	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
Trichlorofluoromethane	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
Vinyl Chloride	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
Xylene O	ND (0.851)		8260B		1	11/17/17 12:11	C7K0306	CK71715
Xylene P,M	ND (1.70)		8260B		1	11/17/17 12:11	C7K0306	CK71715
Xylenes (Total)	ND (1.70)		8260B		1	11/17/17 12:11		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*80 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*50 %*	*SC*	*70-130*
Surrogate: Dibromofluoromethane	*77 %*		*70-130*
Surrogate: Toluene-d8	*62 %*	*SC*	*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS611R-LT
Date Sampled: 11/08/17 10:45
Percent Solids: 30

ESS Laboratory Work Order: 1711282
ESS Laboratory Sample ID: 1711282-02
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Arsenic	**70.6** (2.92)		6010C		1	KJK	11/13/17 16:39	5.76	100	CK71043
Barium	**107** (2.92)		6010C		1	KJK	11/13/17 16:39	5.76	100	CK71043
Cadmium	**2.88** (0.58)		6010C		1	KJK	11/13/17 16:39	5.76	100	CK71043
Chromium	**196** (1.17)		6010C		1	KJK	11/13/17 16:39	5.76	100	CK71043
Copper	**398** (2.92)		6010C		1	KJK	11/13/17 16:39	5.76	100	CK71043
Lead	**350** (5.84)		6010C		1	KJK	11/13/17 16:39	5.76	100	CK71043
Mercury	**1.46** (0.254)		7471B		10	MJV	11/14/17 15:33	2.62	40	CK71044
Nickel	**70.7** (2.92)		6010C		1	KJK	11/13/17 16:39	5.76	100	CK71043
Selenium	**3.82** (0.58)		6020A		20	NAR	11/13/17 23:00	5.76	100	CK71043
Silver	**10.5** (0.58)		6010C		1	KJK	11/13/17 16:39	5.76	100	CK71043
Zinc	**518** (2.92)		6010C		1	KJK	11/13/17 16:39	5.76	100	CK71043

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS611R-LT
Date Sampled: 11/08/17 10:45
Percent Solids: 30
Initial Volume: 16.7
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1711282
ESS Laboratory Sample ID: 1711282-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
1,1,1-Trichloroethane	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
1,1,2,2-Tetrachloroethane	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
1,1,2-Trichloroethane	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
1,1-Dichloroethane	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
1,1-Dichloroethene	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
1,1-Dichloropropene	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
1,2,3-Trichlorobenzene	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
1,2,3-Trichloropropane	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
1,2,4-Trichlorobenzene	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
1,2,4-Trimethylbenzene	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
1,2-Dibromo-3-Chloropropane	ND (5.38)		8260B		1	11/14/17 20:15	C7K0232	CK71435
1,2-Dibromoethane	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
1,2-Dichlorobenzene	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
1,2-Dichloroethane	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
1,2-Dichloropropane	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
1,3,5-Trimethylbenzene	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
1,3-Dichlorobenzene	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
1,3-Dichloropropane	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
1,4-Dichlorobenzene	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
1,4-Dioxane - Screen	ND (215)		8260B		1	11/14/17 20:15	C7K0232	CK71435
2,2-Dichloropropane	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
2-Butanone	ND (5.38)		8260B		1	11/14/17 20:15	C7K0232	CK71435
2-Chlorotoluene	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
2-Hexanone	ND (5.38)		8260B		1	11/14/17 20:15	C7K0232	CK71435
4-Chlorotoluene	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
4-Isopropyltoluene	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
4-Methyl-2-Pentanone	ND (5.38)		8260B		1	11/14/17 20:15	C7K0232	CK71435
Acetone	ND (5.38)		8260B		1	11/14/17 20:15	C7K0232	CK71435
Benzene	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
Bromobenzene	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
Bromochloromethane	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS611R-LT
Date Sampled: 11/08/17 10:45
Percent Solids: 30
Initial Volume: 16.7
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1711282
ESS Laboratory Sample ID: 1711282-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromodichloromethane	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
Bromoform	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
Bromomethane	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
Carbon Disulfide	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
Carbon Tetrachloride	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
Chlorobenzene	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
Chloroethane	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
Chloroform	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
Chloromethane	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
cis-1,2-Dichloroethene	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
cis-1,3-Dichloropropene	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
Dibromochloromethane	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
Dibromomethane	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
Dichlorodifluoromethane	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
Diethyl Ether	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
Di-isopropyl ether	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
Ethyl tertiary-butyl ether	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
Ethylbenzene	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
Hexachlorobutadiene	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
Isopropylbenzene	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
Methyl tert-Butyl Ether	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
Methylene Chloride	ND (2.15)		8260B		1	11/14/17 20:15	C7K0232	CK71435
Naphthalene	**44.5** (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
n-Butylbenzene	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
n-Propylbenzene	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
sec-Butylbenzene	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
Styrene	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
tert-Butylbenzene	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
Tertiary-amyl methyl ether	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
Tetrachloroethene	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
Tetrahydrofuran	ND (5.38)		8260B		1	11/14/17 20:15	C7K0232	CK71435
Toluene	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS611R-LT
Date Sampled: 11/08/17 10:45
Percent Solids: 30
Initial Volume: 16.7
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1711282
ESS Laboratory Sample ID: 1711282-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
trans-1,2-Dichloroethene	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
trans-1,3-Dichloropropene	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
Trichloroethene	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
Trichlorofluoromethane	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
Vinyl Chloride	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
Xylene O	ND (1.08)		8260B		1	11/14/17 20:15	C7K0232	CK71435
Xylene P,M	ND (2.15)		8260B		1	11/14/17 20:15	C7K0232	CK71435
Xylenes (Total)	ND (2.15)		8260B		1	11/14/17 20:15		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*84 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*58 %*	*SC*	*70-130*
Surrogate: Dibromofluoromethane	*82 %*		*70-130*
Surrogate: Toluene-d8	*69 %*	*SC*	*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS611R-LT
Date Sampled: 11/08/17 10:45
Percent Solids: 30
Initial Volume: 19.9
Final Volume: 5
Extraction Method: 3546

ESS Laboratory Work Order: 1711282
ESS Laboratory Sample ID: 1711282-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: NXL
Prepared: 11/10/17 10:40

8081B Organochlorine Pesticides

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
4,4´-DDD	ND (0.0084)		8081B		1	11/14/17 20:09	C7K0218	CK71351
4,4´-DDE [2C]	ND (0.0084)		8081B		1	11/14/17 20:09	C7K0218	CK71351
4,4´-DDT [2C]	**P 0.0242** (0.0084)		8081B		1	11/14/17 20:09	C7K0218	CK71351
Aldrin	ND (0.0084)		8081B		1	11/14/17 20:09	C7K0218	CK71351
alpha-BHC [2C]	**0.0115** (0.0084)		8081B		1	11/14/17 20:09	C7K0218	CK71351
alpha-Chlordane	ND (0.0084)		8081B		1	11/14/17 20:09	C7K0218	CK71351
beta-BHC	ND (0.0084)		8081B		1	11/14/17 20:09	C7K0218	CK71351
Chlordane (Total)	ND (0.0676)		8081B		1	11/14/17 20:09	C7K0218	CK71351
delta-BHC	ND (0.0084)		8081B		1	11/14/17 20:09	C7K0218	CK71351
Dieldrin	ND (0.0084)		8081B		1	11/14/17 20:09	C7K0218	CK71351
Endosulfan I	ND (0.0084)		8081B		1	11/14/17 20:09	C7K0218	CK71351
Endosulfan II	ND (0.0084)		8081B		1	11/14/17 20:09	C7K0218	CK71351
Endosulfan Sulfate	ND (0.0084)		8081B		1	11/14/17 20:09	C7K0218	CK71351
Endrin	ND (0.0084)		8081B		1	11/14/17 20:09	C7K0218	CK71351
Endrin Ketone	ND (0.0084)		8081B		1	11/14/17 20:09	C7K0218	CK71351
gamma-BHC (Lindane)	ND (0.0027)		8081B		1	11/14/17 20:09	C7K0218	CK71351
gamma-Chlordane	**LC, P 0.0269** (0.0084)		8081B		1	11/14/17 20:09	C7K0218	CK71351
Heptachlor	ND (0.0084)		8081B		1	11/14/17 20:09	C7K0218	CK71351
Heptachlor Epoxide	ND (0.0084)		8081B		1	11/14/17 20:09	C7K0218	CK71351
Hexachlorobenzene	ND (0.0084)		8081B		1	11/14/17 20:09	C7K0218	CK71351
Methoxychlor	ND (0.0084)		8081B		1	11/14/17 20:09	C7K0218	CK71351
Toxaphene	ND (0.422)		8081B		1	11/14/17 20:09	C7K0218	CK71351

	%Recovery	Qualifier	Limits
Surrogate: Decachlorobiphenyl	*112 %*		*30-150*
Surrogate: Decachlorobiphenyl [2C]	*189 %*	*SM*	*30-150*
Surrogate: Tetrachloro-m-xylene	*171 %*	*SM*	*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*78 %*		*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS611R-LT
Date Sampled: 11/08/17 10:45
Percent Solids: 30
Initial Volume: 29.4
Final Volume: 2
Extraction Method: 3540C

ESS Laboratory Work Order: 1711282
ESS Laboratory Sample ID: 1711282-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/13/17 16:02

8082 Polychlorinated Biphenyls (PCB) / Congeners

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
BZ#8	ND (0.00093)		8082		1	11/14/17 19:01	C7K0217	CK71333
BZ#18	**0.00143** (0.00093)		8082		1	11/14/17 19:01	C7K0217	CK71333
BZ#28 [2C]	**P 0.00194** (0.00093)		8082		1	11/14/17 19:01	C7K0217	CK71333
BZ#44	**LC, P 0.00108** (0.00093)		8082		1	11/14/17 19:01	C7K0217	CK71333
BZ#52	**LC, P 0.00204** (0.00093)		8082		1	11/14/17 19:01	C7K0217	CK71333
BZ#66	**LC, P 0.00145** (0.00093)		8082		1	11/14/17 19:01	C7K0217	CK71333
BZ#101 [2C]	**P 0.00555** (0.00093)		8082		1	11/14/17 19:01	C7K0217	CK71333
BZ#105	ND (0.00093)		8082		1	11/14/17 19:01	C7K0217	CK71333
BZ#118	**LC, P 0.00206** (0.00093)		8082		1	11/14/17 19:01	C7K0217	CK71333
BZ#128	ND (0.00093)		8082		1	11/14/17 19:01	C7K0217	CK71333
BZ#138	**LC, P 0.00234** (0.00093)		8082		1	11/14/17 19:01	C7K0217	CK71333
BZ#153 [2C]	**0.00297** (0.00093)		8082		1	11/14/17 19:01	C7K0217	CK71333
BZ#170	ND (0.00093)		8082		1	11/14/17 19:01	C7K0217	CK71333
BZ#180	ND (0.00093)		8082		1	11/14/17 19:01	C7K0217	CK71333
BZ#187	ND (0.00093)		8082		1	11/14/17 19:01	C7K0217	CK71333
BZ#195	ND (0.00093)		8082		1	11/14/17 19:01	C7K0217	CK71333
BZ#206	ND (0.00093)		8082		1	11/14/17 19:01	C7K0217	CK71333
BZ#209	ND (0.00093)		8082		1	11/14/17 19:01	C7K0217	CK71333

	%Recovery	Qualifier	Limits
Surrogate: Tetrachloro-m-xylene	*38 %*		*30-150*
Surrogate: Tetrachloro-m-xylene [2C]	*347 %*	*SM*	*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS611R-LT
Date Sampled: 11/08/17 10:45
Percent Solids: 30
Initial Volume: 20
Final Volume: 1
Extraction Method: 3546

ESS Laboratory Work Order: 1711282
ESS Laboratory Sample ID: 1711282-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: SMR
Prepared: 11/10/17 12:13

8100M Total Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Total Petroleum Hydrocarbons	**1750** (33.6)		8100M		1	11/11/17 10:49	C7K0178	CK71009

	%Recovery	Qualifier	Limits
Surrogate: O-Terphenyl	96 %		40-140

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS611R-LT
Date Sampled: 11/08/17 10:45
Percent Solids: 30
Initial Volume: 10.2
Final Volume: 4
Extraction Method: 3546

ESS Laboratory Work Order: 1711282
ESS Laboratory Sample ID: 1711282-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: IBM
Prepared: 11/10/17 15:45

8151A Chlorinated Herbicides

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2,4,5-T	**LC, P 0.039** (0.031)		8151A		1	11/15/17 0:01	C7K0231	CK70954
2,4,5-TP (Silvex)	ND (0.031)		8151A		1	11/15/17 0:01	C7K0231	CK70954
2,4-D	ND (0.155)		8151A		1	11/15/17 0:01	C7K0231	CK70954
2,4-DB [2C]	**LC, P 0.184** (0.157)		8151A		1	11/15/17 0:01	C7K0231	CK70954
Dalapon	ND (0.150)		8151A		1	11/15/17 0:01	C7K0231	CK70954
Dicamba [2C]	**LC, P 0.064** (0.031)		8151A		1	11/15/17 0:01	C7K0231	CK70954
Dichlorprop	ND (0.155)		8151A		1	11/15/17 0:01	C7K0231	CK70954
Dinoseb	ND (0.157)		8151A		1	11/15/17 0:01	C7K0231	CK70954
MCPA	ND (7.66)		8151A		1	11/15/17 0:01	C7K0231	CK70954
MCPP	**#, XH** ND (7.75)		8151A		1	11/15/17 0:01	C7K0231	CK70954

	%Recovery	Qualifier	Limits
Surrogate: DCAA	*118 %*		*30-150*
Surrogate: DCAA [2C]	*1720 %*	*SM*	*30-150*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS611R-LT
Date Sampled: 11/08/17 10:45
Percent Solids: 30
Initial Volume: 25.2
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1711282
ESS Laboratory Sample ID: 1711282-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/13/17 15:45

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,2,4-Trichlorobenzene	ND (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
1,2-Dichlorobenzene	ND (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
1,3-Dichlorobenzene	ND (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
1,4-Dichlorobenzene	ND (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
2,4,5-Trichlorophenol	ND (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
2,4,6-Trichlorophenol	ND (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
2,4-Dichlorophenol	ND (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
2,4-Dimethylphenol	ND (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
2,4-Dinitrophenol	ND (1.33)		8270D		1	11/15/17 1:09	C7K0238	CK71309
2,4-Dinitrotoluene	ND (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
2,6-Dinitrotoluene	ND (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
2-Chloronaphthalene	ND (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
2-Chlorophenol	ND (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
2-Methylnaphthalene	**4.20** (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
2-Methylphenol	ND (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
2-Nitrophenol	ND (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
3,3′-Dichlorobenzidine	ND (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
3+4-Methylphenol	ND (1.33)		8270D		1	11/15/17 1:09	C7K0238	CK71309
4-Bromophenyl-phenylether	ND (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
4-Chloroaniline	ND (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
4-Nitrophenol	ND (3.34)		8270D		1	11/15/17 1:09	C7K0238	CK71309
Acenaphthene	**55.9** (6.66)		8270D		10	11/16/17 0:07	C7K0238	CK71309
Acenaphthylene	**5.66** (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
Acetophenone	ND (1.33)		8270D		1	11/15/17 1:09	C7K0238	CK71309
Aniline	ND (3.34)		8270D		1	11/15/17 1:09	C7K0238	CK71309
Anthracene	**42.3** (6.66)		8270D		10	11/16/17 0:07	C7K0238	CK71309
Azobenzene	ND (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
Benzo(a)anthracene	**50.8** (6.66)		8270D		10	11/16/17 0:07	C7K0238	CK71309
Benzo(a)pyrene	**56.5** (3.34)		8270D		10	11/16/17 0:07	C7K0238	CK71309
Benzo(b)fluoranthene	**28.3** (6.66)		8270D		10	11/16/17 0:07	C7K0238	CK71309
Benzo(g,h,i)perylene	**15.6** (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
Benzo(k)fluoranthene	**29.8** (6.66)		8270D		10	11/16/17 0:07	C7K0238	CK71309

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS611R-LT
Date Sampled: 11/08/17 10:45
Percent Solids: 30
Initial Volume: 25.2
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1711282
ESS Laboratory Sample ID: 1711282-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/13/17 15:45

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
bis(2-Chloroethoxy)methane	ND (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
bis(2-Chloroethyl)ether	ND (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
bis(2-chloroisopropyl)Ether	ND (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
bis(2-Ethylhexyl)phthalate	ND (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
Butylbenzylphthalate	ND (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
Chrysene	**41.2** (3.34)		8270D		10	11/16/17 0:07	C7K0238	CK71309
Dibenzo(a,h)Anthracene	**6.56** (0.334)		8270D		1	11/15/17 1:09	C7K0238	CK71309
Dibenzofuran	**2.35** (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
Diethylphthalate	ND (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
Dimethylphthalate	ND (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
Di-n-butylphthalate	ND (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
Di-n-octylphthalate	ND (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
Fluoranthene	**110** (6.66)		8270D		10	11/16/17 0:07	C7K0238	CK71309
Fluorene	**26.4** (6.66)		8270D		10	11/16/17 0:07	C7K0238	CK71309
Hexachlorobenzene	ND (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
Hexachlorobutadiene	ND (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
Hexachloroethane	ND (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
Indeno(1,2,3-cd)Pyrene	**11.9** (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
Isophorone	ND (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
Naphthalene	**16.2** (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
Nitrobenzene	ND (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
N-Nitrosodimethylamine	ND (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
Pentachlorophenol	ND (1.33)		8270D		1	11/15/17 1:09	C7K0238	CK71309
Phenanthrene	**145** (6.66)		8270D		10	11/16/17 0:07	C7K0238	CK71309
Phenol	ND (0.666)		8270D		1	11/15/17 1:09	C7K0238	CK71309
Pyrene	**167** (66.6)		8270D		100	11/16/17 0:42	C7K0238	CK71309
Pyridine	ND (3.34)		8270D		1	11/15/17 1:09	C7K0238	CK71309

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichlorobenzene-d4	*43 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*74 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*46 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS611R-LT
Date Sampled: 11/08/17 10:45
Percent Solids: 30
Initial Volume: 25.2
Final Volume: 0.5
Extraction Method: 3546

ESS Laboratory Work Order: 1711282
ESS Laboratory Sample ID: 1711282-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/13/17 15:45

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Surrogate: 2-Fluorobiphenyl		*54 %*		*30-130*				
Surrogate: 2-Fluorophenol		*40 %*		*30-130*				
Surrogate: Nitrobenzene-d5		*45 %*		*30-130*				
Surrogate: Phenol-d6		*45 %*		*30-130*				
Surrogate: p-Terphenyl-d14		*79 %*		*30-130*				

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS611R-LT
Date Sampled: 11/08/17 10:45
Percent Solids: 30

ESS Laboratory Work Order: 1711282
ESS Laboratory Sample ID: 1711282-02
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Corrosivity (pH)	**6.11** (N/A)		9045		1	BCA	11/09/17 22:55	S.U.	CK70951
Corrosivity (pH) Sample Temp	**Soil pH measured in water at 18.7 ºC.**								
Grain Size	**See Attached** (N/A)								
Percent Volatile Solids	**27** (1)		2540 G		1	EEM	11/14/17 17:25	%	CK71416
Reactive Cyanide	ND (2.0)		7.3.3.2		1	JLK	11/13/17 16:05	mg/kg	CK71347
Reactive Sulfide	ND (2.0)		7.3.4.1		1	JLK	11/13/17 16:05	mg/kg	CK71347
Sulfur, Total, WT PCT	**0.23** (0.01)		D4239		1	SUB	11/17/17 0:00	wt %	CK72002
Total Cyanide	ND (3.11)		9014		1	EEM	11/14/17 12:20	mg/kg dry	CK71415
Total Organic Carbon (Average)	**142000** (154)		LK		1	DEL	11/14/17 22:20	mg/kg	[CALC]

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS611R-LT
Date Sampled: 11/08/17 10:45
Percent Solids: 30
Initial Volume: 35
Final Volume: 2
Extraction Method: 3546

ESS Laboratory Work Order: 1711282
ESS Laboratory Sample ID: 1711282-02
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 11/13/17 14:00

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (72.0)		MADEP-EPH		1	ZLC	11/14/17 16:34	C7K0222	CK71307
C19-C36 Aliphatics1	**184** (72.0)		MADEP-EPH		1	ZLC	11/14/17 16:34	C7K0222	CK71307
C11-C22 Unadjusted Aromatics1	**1090** (72.0)		EPH8270		1	ZLC	11/16/17 4:28	C7K0266	CK71307
C11-C22 Aromatics1,2	**438** (108)		EPH8270			VSC	11/16/17 11:30		[CALC]
2-Methylnaphthalene	**4.03** (0.096)		EPH8270SIM		1	VSC	11/15/17 11:25	C7K0251	CK71307
Acenaphthene	**58.5** (0.961)		EPH8270SIM		10	VSC	11/16/17 10:40	C7K0251	CK71307
Naphthalene	**11.6** (0.961)		EPH8270SIM		10	VSC	11/16/17 10:40	C7K0251	CK71307
Phenanthrene	**134** (9.61)		EPH8270SIM		100	VSC	11/16/17 11:30	C7K0251	CK71307
Acenaphthylene	**3.82** (0.096)		EPH8270SIM		1	VSC	11/15/17 11:25	C7K0251	CK71307
Anthracene	**37.3** (0.384)		EPH8270SIM		10	VSC	11/16/17 10:40	C7K0251	CK71307
Benzo(a)anthracene	**28.8** (0.384)		EPH8270SIM		10	VSC	11/16/17 10:40	C7K0251	CK71307
Benzo(a)pyrene	**32.2** (0.384)		EPH8270SIM		10	VSC	11/16/17 10:40	C7K0251	CK71307
Benzo(b)fluoranthene	**23.8** (0.961)		EPH8270SIM		10	VSC	11/16/17 10:40	C7K0251	CK71307
Benzo(g,h,i)perylene	**15.2** (0.961)		EPH8270SIM		10	VSC	11/16/17 10:40	C7K0251	CK71307
Benzo(k)fluoranthene	**8.45** (0.096)		EPH8270SIM		1	VSC	11/15/17 11:25	C7K0251	CK71307
Chrysene	**25.0** (0.961)		EPH8270SIM		10	VSC	11/16/17 10:40	C7K0251	CK71307
Dibenzo(a,h)Anthracene	**4.75** (0.038)		EPH8270SIM		1	VSC	11/15/17 11:25	C7K0251	CK71307
Fluoranthene	**108** (9.61)		EPH8270SIM		100	VSC	11/16/17 11:30	C7K0251	CK71307
Fluorene	**27.8** (0.384)		EPH8270SIM		10	VSC	11/16/17 10:40	C7K0251	CK71307
Indeno(1,2,3-cd)Pyrene	**15.3** (0.961)		EPH8270SIM		10	VSC	11/16/17 10:40	C7K0251	CK71307
Pyrene	**109** (9.61)		EPH8270SIM		100	VSC	11/16/17 11:30	C7K0251	CK71307

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*75 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*84 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*109 %*		*40-140*
Surrogate: O-Terphenyl	*61 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS611R-LT
Date Sampled: 11/08/17 10:45
Percent Solids: 30
Initial Volume: 16.7
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1711282
ESS Laboratory Sample ID: 1711282-02RE1
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
1,1,1-Trichloroethane	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
1,1,2,2-Tetrachloroethane	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
1,1,2-Trichloroethane	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
1,1-Dichloroethane	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
1,1-Dichloroethene	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
1,1-Dichloropropene	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
1,2,3-Trichlorobenzene	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
1,2,3-Trichloropropane	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
1,2,4-Trichlorobenzene	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
1,2,4-Trimethylbenzene	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
1,2-Dibromo-3-Chloropropane	ND (5.38)		8260B		1	11/17/17 12:38	C7K0306	CK71715
1,2-Dibromoethane	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
1,2-Dichlorobenzene	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
1,2-Dichloroethane	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
1,2-Dichloropropane	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
1,3,5-Trimethylbenzene	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
1,3-Dichlorobenzene	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
1,3-Dichloropropane	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
1,4-Dichlorobenzene	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
1,4-Dioxane - Screen	ND (215)		8260B		1	11/17/17 12:38	C7K0306	CK71715
2,2-Dichloropropane	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
2-Butanone	ND (5.38)		8260B		1	11/17/17 12:38	C7K0306	CK71715
2-Chlorotoluene	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
2-Hexanone	ND (5.38)		8260B		1	11/17/17 12:38	C7K0306	CK71715
4-Chlorotoluene	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
4-Isopropyltoluene	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
4-Methyl-2-Pentanone	ND (5.38)		8260B		1	11/17/17 12:38	C7K0306	CK71715
Acetone	ND (5.38)		8260B		1	11/17/17 12:38	C7K0306	CK71715
Benzene	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
Bromobenzene	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
Bromochloromethane	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS611R-LT
Date Sampled: 11/08/17 10:45
Percent Solids: 30
Initial Volume: 16.7
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1711282
ESS Laboratory Sample ID: 1711282-02RE1
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Bromodichloromethane	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
Bromoform	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
Bromomethane	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
Carbon Disulfide	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
Carbon Tetrachloride	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
Chlorobenzene	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
Chloroethane	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
Chloroform	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
Chloromethane	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
cis-1,2-Dichloroethene	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
cis-1,3-Dichloropropene	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
Dibromochloromethane	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
Dibromomethane	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
Dichlorodifluoromethane	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
Diethyl Ether	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
Di-isopropyl ether	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
Ethyl tertiary-butyl ether	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
Ethylbenzene	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
Hexachlorobutadiene	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
Isopropylbenzene	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
Methyl tert-Butyl Ether	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
Methylene Chloride	ND (2.15)		8260B		1	11/17/17 12:38	C7K0306	CK71715
Naphthalene	**41.7** (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
n-Butylbenzene	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
n-Propylbenzene	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
sec-Butylbenzene	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
Styrene	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
tert-Butylbenzene	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
Tertiary-amyl methyl ether	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
Tetrachloroethene	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
Tetrahydrofuran	ND (5.38)		8260B		1	11/17/17 12:38	C7K0306	CK71715
Toluene	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury
Client Sample ID: 044752-SS611R-LT
Date Sampled: 11/08/17 10:45
Percent Solids: 30
Initial Volume: 16.7
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1711282
ESS Laboratory Sample ID: 1711282-02RE1
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
trans-1,2-Dichloroethene	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
trans-1,3-Dichloropropene	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
Trichloroethene	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
Trichlorofluoromethane	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
Vinyl Chloride	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
Xylene O	ND (1.08)		8260B		1	11/17/17 12:38	C7K0306	CK71715
Xylene P,M	ND (2.15)		8260B		1	11/17/17 12:38	C7K0306	CK71715
Xylenes (Total)	ND (2.15)		8260B		1	11/17/17 12:38		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichloroethane-d4	*82 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*48 %*	*SC*	*70-130*
Surrogate: Dibromofluoromethane	*77 %*		*70-130*
Surrogate: Toluene-d8	*59 %*	*SC*	*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1711282

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch CK71043 - 3050B										
Blank										
Arsenic	ND	2.50	mg/kg wet							
Barium	ND	2.50	mg/kg wet							
Cadmium	ND	0.50	mg/kg wet							
Chromium	ND	1.00	mg/kg wet							
Copper	ND	2.50	mg/kg wet							
Lead	ND	5.00	mg/kg wet							
Nickel	ND	2.50	mg/kg wet							
Silver	ND	0.50	mg/kg wet							
Zinc	ND	2.50	mg/kg wet							
LCS										
Arsenic	117	7.69	mg/kg wet	123.0		95	80-120			
Barium	240	7.69	mg/kg wet	253.0		95	66-134			
Cadmium	194	1.54	mg/kg wet	224.0		87	80-120			
Chromium	172	3.08	mg/kg wet	179.0		96	80-120			
Copper	76.6	7.69	mg/kg wet	78.90		97	80-120			
Lead	139	15.4	mg/kg wet	145.0		96	80-120			
Nickel	127	7.69	mg/kg wet	143.0		89	80-120			
Selenium	47.6	3.85	mg/kg wet	42.40		112	80-120			
Silver	83.0	1.54	mg/kg wet	81.60		102	80-120			
Zinc	701	7.69	mg/kg wet	770.0		91	80-120			
LCS Dup										
Arsenic	117	7.46	mg/kg wet	123.0		95	80-120	0.2	20	
Barium	197	7.46	mg/kg wet	253.0		78	66-134	20	20	
Cadmium	190	1.49	mg/kg wet	224.0		85	80-120	2	20	
Chromium	169	2.99	mg/kg wet	179.0		94	80-120	2	20	
Copper	75.5	7.46	mg/kg wet	78.90		96	80-120	1	20	
Lead	139	14.9	mg/kg wet	145.0		96	80-120	0.2	20	
Nickel	125	7.46	mg/kg wet	143.0		88	80-120	2	20	
Selenium	45.4	3.73	mg/kg wet	42.40		107	80-120	5	30	
Silver	80.5	1.49	mg/kg wet	81.60		99	80-120	3	20	
Zinc	685	7.46	mg/kg wet	770.0		89	80-120	2	20	
Reference										
Lead	3850	14.5	mg/kg wet	4490		86	83-113			
Batch CK71044 - 7471B										
Blank										
Mercury	ND	0.033	mg/kg wet							
LCS										
Mercury	2.97	0.629	mg/kg wet	2.900		102	80-120			
LCS Dup										
Mercury	2.99	0.649	mg/kg wet	2.900		103	80-120	0.8	20	
5035/8260B Volatile Organic Compounds / Methanol										

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1711282

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch CK71435 - 5035										
Blank										
1,1,1,2-Tetrachloroethane	ND	0.200	mg/kg wet							
1,1,1-Trichloroethane	ND	0.200	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.200	mg/kg wet							
1,1,2-Trichloroethane	ND	0.200	mg/kg wet							
1,1-Dichloroethane	ND	0.200	mg/kg wet							
1,1-Dichloroethene	ND	0.200	mg/kg wet							
1,1-Dichloropropene	ND	0.200	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.200	mg/kg wet							
1,2,3-Trichloropropane	ND	0.200	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.200	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.200	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	1.00	mg/kg wet							
1,2-Dibromoethane	ND	0.200	mg/kg wet							
1,2-Dichlorobenzene	ND	0.200	mg/kg wet							
1,2-Dichloroethane	ND	0.200	mg/kg wet							
1,2-Dichloropropane	ND	0.200	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.200	mg/kg wet							
1,3-Dichlorobenzene	ND	0.200	mg/kg wet							
1,3-Dichloropropane	ND	0.200	mg/kg wet							
1,4-Dichlorobenzene	ND	0.200	mg/kg wet							
1,4-Dioxane - Screen	ND	40.0	mg/kg wet							
2,2-Dichloropropane	ND	0.200	mg/kg wet							
2-Butanone	ND	1.00	mg/kg wet							
2-Chlorotoluene	ND	0.200	mg/kg wet							
2-Hexanone	ND	1.00	mg/kg wet							
4-Chlorotoluene	ND	0.200	mg/kg wet							
4-Isopropyltoluene	ND	0.200	mg/kg wet							
4-Methyl-2-Pentanone	ND	1.00	mg/kg wet							
Acetone	ND	1.00	mg/kg wet							
Benzene	ND	0.200	mg/kg wet							
Bromobenzene	ND	0.200	mg/kg wet							
Bromochloromethane	ND	0.200	mg/kg wet							
Bromodichloromethane	ND	0.200	mg/kg wet							
Bromoform	ND	0.200	mg/kg wet							
Bromomethane	ND	0.200	mg/kg wet							
Carbon Disulfide	ND	0.200	mg/kg wet							
Carbon Tetrachloride	ND	0.200	mg/kg wet							
Chlorobenzene	ND	0.200	mg/kg wet							
Chloroethane	ND	0.200	mg/kg wet							
Chloroform	ND	0.200	mg/kg wet							
Chloromethane	ND	0.200	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.200	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.200	mg/kg wet							
Dibromochloromethane	ND	0.200	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1711282

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch CK71435 - 5035										
Dibromomethane	ND	0.200	mg/kg wet							
Dichlorodifluoromethane	ND	0.200	mg/kg wet							
Diethyl Ether	ND	0.200	mg/kg wet							
Di-isopropyl ether	ND	0.200	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.200	mg/kg wet							
Ethylbenzene	ND	0.200	mg/kg wet							
Hexachlorobutadiene	ND	0.200	mg/kg wet							
Isopropylbenzene	ND	0.200	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.200	mg/kg wet							
Methylene Chloride	ND	0.400	mg/kg wet							
Naphthalene	ND	0.200	mg/kg wet							
n-Butylbenzene	ND	0.200	mg/kg wet							
n-Propylbenzene	ND	0.200	mg/kg wet							
sec-Butylbenzene	ND	0.200	mg/kg wet							
Styrene	ND	0.200	mg/kg wet							
tert-Butylbenzene	ND	0.200	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.200	mg/kg wet							
Tetrachloroethene	ND	0.200	mg/kg wet							
Tetrahydrofuran	ND	1.00	mg/kg wet							
Toluene	ND	0.200	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.200	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.200	mg/kg wet							
Trichloroethene	ND	0.200	mg/kg wet							
Trichlorofluoromethane	ND	0.200	mg/kg wet							
Vinyl Chloride	ND	0.200	mg/kg wet							
Xylene O	ND	0.200	mg/kg wet							
Xylene P,M	ND	0.400	mg/kg wet							
Xylenes (Total)	ND	0.400	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*5.06*		mg/kg wet	*5.000*		*101*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*4.47*		mg/kg wet	*5.000*		*89*	*70-130*			
Surrogate: Dibromofluoromethane	*4.99*		mg/kg wet	*5.000*		*100*	*70-130*			
Surrogate: Toluene-d8	*4.84*		mg/kg wet	*5.000*		*97*	*70-130*			
LCS										
1,1,1,2-Tetrachloroethane	1.90	0.200	mg/kg wet	2.000		95	70-130			
1,1,1-Trichloroethane	1.98	0.200	mg/kg wet	2.000		99	70-130			
1,1,2,2-Tetrachloroethane	2.18	0.200	mg/kg wet	2.000		109	70-130			
1,1,2-Trichloroethane	1.69	0.200	mg/kg wet	2.000		85	70-130			
1,1-Dichloroethane	1.95	0.200	mg/kg wet	2.000		98	70-130			
1,1-Dichloroethene	2.13	0.200	mg/kg wet	2.000		106	70-130			
1,1-Dichloropropene	2.05	0.200	mg/kg wet	2.000		102	70-130			
1,2,3-Trichlorobenzene	2.42	0.200	mg/kg wet	2.000		121	70-130			
1,2,3-Trichloropropane	2.06	0.200	mg/kg wet	2.000		103	70-130			
1,2,4-Trichlorobenzene	2.24	0.200	mg/kg wet	2.000		112	70-130			
1,2,4-Trimethylbenzene	2.07	0.200	mg/kg wet	2.000		104	70-130			
1,2-Dibromo-3-Chloropropane	2.23	1.00	mg/kg wet	2.000		112	70-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1711282

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch CK71435 - 5035										
1,2-Dibromoethane	1.87	0.200	mg/kg wet	2.000		94	70-130			
1,2-Dichlorobenzene	2.22	0.200	mg/kg wet	2.000		111	70-130			
1,2-Dichloroethane	1.98	0.200	mg/kg wet	2.000		99	70-130			
1,2-Dichloropropane	1.97	0.200	mg/kg wet	2.000		99	70-130			
1,3,5-Trimethylbenzene	2.00	0.200	mg/kg wet	2.000		100	70-130			
1,3-Dichlorobenzene	2.07	0.200	mg/kg wet	2.000		104	70-130			
1,3-Dichloropropane	1.89	0.200	mg/kg wet	2.000		94	70-130			
1,4-Dichlorobenzene	2.14	0.200	mg/kg wet	2.000		107	70-130			
1,4-Dioxane - Screen	90.0	40.0	mg/kg wet	40.00		225	44-241			
2,2-Dichloropropane	1.98	0.200	mg/kg wet	2.000		99	70-130			
2-Butanone	10.6	1.00	mg/kg wet	10.00		106	70-130			
2-Chlorotoluene	2.01	0.200	mg/kg wet	2.000		101	70-130			
2-Hexanone	10.0	1.00	mg/kg wet	10.00		100	70-130			
4-Chlorotoluene	2.02	0.200	mg/kg wet	2.000		101	70-130			
4-Isopropyltoluene	2.13	0.200	mg/kg wet	2.000		106	70-130			
4-Methyl-2-Pentanone	9.70	1.00	mg/kg wet	10.00		97	70-130			
Acetone	10.3	1.00	mg/kg wet	10.00		103	70-130			
Benzene	2.03	0.200	mg/kg wet	2.000		102	70-130			
Bromobenzene	2.03	0.200	mg/kg wet	2.000		102	70-130			
Bromochloromethane	2.02	0.200	mg/kg wet	2.000		101	70-130			
Bromodichloromethane	1.69	0.200	mg/kg wet	2.000		85	70-130			
Bromoform	1.78	0.200	mg/kg wet	2.000		89	70-130			
Bromomethane	2.05	0.200	mg/kg wet	2.000		103	70-130			
Carbon Disulfide	2.30	0.200	mg/kg wet	2.000		115	70-130			
Carbon Tetrachloride	1.94	0.200	mg/kg wet	2.000		97	70-130			
Chlorobenzene	1.90	0.200	mg/kg wet	2.000		95	70-130			
Chloroethane	1.73	0.200	mg/kg wet	2.000		86	70-130			
Chloroform	1.89	0.200	mg/kg wet	2.000		94	70-130			
Chloromethane	1.80	0.200	mg/kg wet	2.000		90	70-130			
cis-1,2-Dichloroethene	2.00	0.200	mg/kg wet	2.000		100	70-130			
cis-1,3-Dichloropropene	1.94	0.200	mg/kg wet	2.000		97	70-130			
Dibromochloromethane	1.79	0.200	mg/kg wet	2.000		90	70-130			
Dibromomethane	1.85	0.200	mg/kg wet	2.000		92	70-130			
Dichlorodifluoromethane	1.72	0.200	mg/kg wet	2.000		86	70-130			
Diethyl Ether	2.09	0.200	mg/kg wet	2.000		104	70-130			
Di-isopropyl ether	2.37	0.200	mg/kg wet	2.000		119	70-130			
Ethyl tertiary-butyl ether	2.25	0.200	mg/kg wet	2.000		112	70-130			
Ethylbenzene	1.90	0.200	mg/kg wet	2.000		95	70-130			
Hexachlorobutadiene	2.62	0.200	mg/kg wet	2.000		131	70-130			B+
Isopropylbenzene	1.89	0.200	mg/kg wet	2.000		94	70-130			
Methyl tert-Butyl Ether	2.61	0.200	mg/kg wet	2.000		130	70-130			
Methylene Chloride	1.93	0.400	mg/kg wet	2.000		97	70-130			
Naphthalene	2.29	0.200	mg/kg wet	2.000		114	70-130			
n-Butylbenzene	2.11	0.200	mg/kg wet	2.000		106	70-130			
n-Propylbenzene	2.02	0.200	mg/kg wet	2.000		101	70-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1711282

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch CK71435 - 5035										
sec-Butylbenzene	2.10	0.200	mg/kg wet	2.000		105	70-130			
Styrene	1.90	0.200	mg/kg wet	2.000		95	70-130			
tert-Butylbenzene	2.13	0.200	mg/kg wet	2.000		107	70-130			
Tertiary-amyl methyl ether	2.05	0.200	mg/kg wet	2.000		102	70-130			
Tetrachloroethene	1.59	0.200	mg/kg wet	2.000		79	70-130			
Tetrahydrofuran	2.25	1.00	mg/kg wet	2.000		113	70-130			
Toluene	1.90	0.200	mg/kg wet	2.000		95	70-130			
trans-1,2-Dichloroethene	2.02	0.200	mg/kg wet	2.000		101	70-130			
trans-1,3-Dichloropropene	1.92	0.200	mg/kg wet	2.000		96	70-130			
Trichloroethene	2.05	0.200	mg/kg wet	2.000		102	70-130			
Trichlorofluoromethane	2.01	0.200	mg/kg wet	2.000		101	70-130			
Vinyl Chloride	1.88	0.200	mg/kg wet	2.000		94	70-130			
Xylene O	1.94	0.200	mg/kg wet	2.000		97	70-130			
Xylene P,M	3.85	0.400	mg/kg wet	4.000		96	70-130			
Xylenes (Total)	5.79	0.400	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*4.81*		mg/kg wet	*5.000*		*96*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*4.63*		mg/kg wet	*5.000*		*93*	*70-130*			
Surrogate: Dibromofluoromethane	*4.90*		mg/kg wet	*5.000*		*98*	*70-130*			
Surrogate: Toluene-d8	*4.97*		mg/kg wet	*5.000*		*99*	*70-130*			
LCS Dup										
1,1,1,2-Tetrachloroethane	1.87	0.200	mg/kg wet	2.000		94	70-130	1	20	
1,1,1-Trichloroethane	1.87	0.200	mg/kg wet	2.000		93	70-130	6	20	
1,1,2,2-Tetrachloroethane	2.03	0.200	mg/kg wet	2.000		101	70-130	7	20	
1,1,2-Trichloroethane	1.64	0.200	mg/kg wet	2.000		82	70-130	3	20	
1,1-Dichloroethane	1.88	0.200	mg/kg wet	2.000		94	70-130	4	20	
1,1-Dichloroethene	2.18	0.200	mg/kg wet	2.000		109	70-130	3	20	
1,1-Dichloropropene	2.05	0.200	mg/kg wet	2.000		102	70-130	0.2	20	
1,2,3-Trichlorobenzene	2.24	0.200	mg/kg wet	2.000		112	70-130	8	20	
1,2,3-Trichloropropane	2.05	0.200	mg/kg wet	2.000		103	70-130	0.4	20	
1,2,4-Trichlorobenzene	2.18	0.200	mg/kg wet	2.000		109	70-130	3	20	
1,2,4-Trimethylbenzene	2.00	0.200	mg/kg wet	2.000		100	70-130	3	20	
1,2-Dibromo-3-Chloropropane	2.05	1.00	mg/kg wet	2.000		103	70-130	8	20	
1,2-Dibromoethane	1.80	0.200	mg/kg wet	2.000		90	70-130	4	20	
1,2-Dichlorobenzene	2.13	0.200	mg/kg wet	2.000		106	70-130	4	20	
1,2-Dichloroethane	1.96	0.200	mg/kg wet	2.000		98	70-130	1	20	
1,2-Dichloropropane	1.87	0.200	mg/kg wet	2.000		93	70-130	6	20	
1,3,5-Trimethylbenzene	2.02	0.200	mg/kg wet	2.000		101	70-130	0.6	20	
1,3-Dichlorobenzene	2.03	0.200	mg/kg wet	2.000		102	70-130	2	20	
1,3-Dichloropropane	1.92	0.200	mg/kg wet	2.000		96	70-130	2	20	
1,4-Dichlorobenzene	2.08	0.200	mg/kg wet	2.000		104	70-130	3	20	
1,4-Dioxane - Screen	65.9	40.0	mg/kg wet	40.00		165	44-241	31	200	
2,2-Dichloropropane	1.95	0.200	mg/kg wet	2.000		98	70-130	1	20	
2-Butanone	10.1	1.00	mg/kg wet	10.00		101	70-130	5	20	
2-Chlorotoluene	1.91	0.200	mg/kg wet	2.000		96	70-130	5	20	
2-Hexanone	9.06	1.00	mg/kg wet	10.00		91	70-130	10	20	

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch CK71435 - 5035										
4-Chlorotoluene	1.96	0.200	mg/kg wet	2.000		98	70-130	3	20	
4-Isopropyltoluene	2.07	0.200	mg/kg wet	2.000		104	70-130	3	20	
4-Methyl-2-Pentanone	9.07	1.00	mg/kg wet	10.00		91	70-130	7	20	
Acetone	9.24	1.00	mg/kg wet	10.00		92	70-130	11	20	
Benzene	2.04	0.200	mg/kg wet	2.000		102	70-130	0.5	20	
Bromobenzene	1.98	0.200	mg/kg wet	2.000		99	70-130	2	20	
Bromochloromethane	1.98	0.200	mg/kg wet	2.000		99	70-130	2	20	
Bromodichloromethane	1.62	0.200	mg/kg wet	2.000		81	70-130	4	20	
Bromoform	1.66	0.200	mg/kg wet	2.000		83	70-130	7	20	
Bromomethane	2.02	0.200	mg/kg wet	2.000		101	70-130	2	20	
Carbon Disulfide	2.29	0.200	mg/kg wet	2.000		115	70-130	0.09	20	
Carbon Tetrachloride	1.91	0.200	mg/kg wet	2.000		96	70-130	1	20	
Chlorobenzene	1.89	0.200	mg/kg wet	2.000		95	70-130	0.5	20	
Chloroethane	1.69	0.200	mg/kg wet	2.000		85	70-130	2	20	
Chloroform	1.86	0.200	mg/kg wet	2.000		93	70-130	2	20	
Chloromethane	1.67	0.200	mg/kg wet	2.000		83	70-130	8	20	
cis-1,2-Dichloroethene	1.89	0.200	mg/kg wet	2.000		95	70-130	5	20	
cis-1,3-Dichloropropene	1.91	0.200	mg/kg wet	2.000		96	70-130	1	20	
Dibromochloromethane	1.74	0.200	mg/kg wet	2.000		87	70-130	3	20	
Dibromomethane	1.75	0.200	mg/kg wet	2.000		87	70-130	6	20	
Dichlorodifluoromethane	1.70	0.200	mg/kg wet	2.000		85	70-130	1	20	
Diethyl Ether	2.00	0.200	mg/kg wet	2.000		100	70-130	4	20	
Di-isopropyl ether	2.33	0.200	mg/kg wet	2.000		117	70-130	2	20	
Ethyl tertiary-butyl ether	2.21	0.200	mg/kg wet	2.000		111	70-130	2	20	
Ethylbenzene	1.87	0.200	mg/kg wet	2.000		93	70-130	2	20	
Hexachlorobutadiene	2.42	0.200	mg/kg wet	2.000		121	70-130	8	20	
Isopropylbenzene	1.81	0.200	mg/kg wet	2.000		90	70-130	5	20	
Methyl tert-Butyl Ether	2.59	0.200	mg/kg wet	2.000		130	70-130	0.7	20	
Methylene Chloride	1.88	0.400	mg/kg wet	2.000		94	70-130	3	20	
Naphthalene	2.15	0.200	mg/kg wet	2.000		108	70-130	6	20	
n-Butylbenzene	2.09	0.200	mg/kg wet	2.000		105	70-130	1	20	
n-Propylbenzene	1.95	0.200	mg/kg wet	2.000		97	70-130	4	20	
sec-Butylbenzene	2.03	0.200	mg/kg wet	2.000		102	70-130	3	20	
Styrene	1.88	0.200	mg/kg wet	2.000		94	70-130	1	20	
tert-Butylbenzene	2.07	0.200	mg/kg wet	2.000		103	70-130	3	20	
Tertiary-amyl methyl ether	1.94	0.200	mg/kg wet	2.000		97	70-130	5	20	
Tetrachloroethene	1.56	0.200	mg/kg wet	2.000		78	70-130	2	20	
Tetrahydrofuran	1.74	1.00	mg/kg wet	2.000		87	70-130	26	20	D+
Toluene	1.92	0.200	mg/kg wet	2.000		96	70-130	0.9	20	
trans-1,2-Dichloroethene	1.96	0.200	mg/kg wet	2.000		98	70-130	3	20	
trans-1,3-Dichloropropene	1.86	0.200	mg/kg wet	2.000		93	70-130	3	20	
Trichloroethene	1.88	0.200	mg/kg wet	2.000		94	70-130	9	20	
Trichlorofluoromethane	1.94	0.200	mg/kg wet	2.000		97	70-130	4	20	
Vinyl Chloride	1.82	0.200	mg/kg wet	2.000		91	70-130	3	20	
Xylene O	1.89	0.200	mg/kg wet	2.000		94	70-130	2	20	

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Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch CK71435 - 5035										
Xylene P,M	3.80	0.400	mg/kg wet	4.000		95	70-130	1	20	
Xylenes (Total)	5.69	0.400	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*4.85*		mg/kg wet	*5.000*		*97*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*4.67*		mg/kg wet	*5.000*		*93*	*70-130*			
Surrogate: Dibromofluoromethane	*4.93*		mg/kg wet	*5.000*		*99*	*70-130*			
Surrogate: Toluene-d8	*5.07*		mg/kg wet	*5.000*		*101*	*70-130*			
Batch CK71715 - 5035										
Blank										
1,1,1,2-Tetrachloroethane	ND	0.200	mg/kg wet							
1,1,1-Trichloroethane	ND	0.200	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.200	mg/kg wet							
1,1,2-Trichloroethane	ND	0.200	mg/kg wet							
1,1-Dichloroethane	ND	0.200	mg/kg wet							
1,1-Dichloroethene	ND	0.200	mg/kg wet							
1,1-Dichloropropene	ND	0.200	mg/kg wet							
1,2,3-Trichlorobenzene	ND	0.200	mg/kg wet							
1,2,3-Trichloropropane	ND	0.200	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.200	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.200	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	1.00	mg/kg wet							
1,2-Dibromoethane	ND	0.200	mg/kg wet							
1,2-Dichlorobenzene	ND	0.200	mg/kg wet							
1,2-Dichloroethane	ND	0.200	mg/kg wet							
1,2-Dichloropropane	ND	0.200	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.200	mg/kg wet							
1,3-Dichlorobenzene	ND	0.200	mg/kg wet							
1,3-Dichloropropane	ND	0.200	mg/kg wet							
1,4-Dichlorobenzene	ND	0.200	mg/kg wet							
1,4-Dioxane - Screen	ND	40.0	mg/kg wet							
2,2-Dichloropropane	ND	0.200	mg/kg wet							
2-Butanone	ND	1.00	mg/kg wet							
2-Chlorotoluene	ND	0.200	mg/kg wet							
2-Hexanone	ND	1.00	mg/kg wet							
4-Chlorotoluene	ND	0.200	mg/kg wet							
4-Isopropyltoluene	ND	0.200	mg/kg wet							
4-Methyl-2-Pentanone	ND	1.00	mg/kg wet							
Acetone	ND	1.00	mg/kg wet							
Benzene	ND	0.200	mg/kg wet							
Bromobenzene	ND	0.200	mg/kg wet							
Bromochloromethane	ND	0.200	mg/kg wet							
Bromodichloromethane	ND	0.200	mg/kg wet							
Bromoform	ND	0.200	mg/kg wet							
Bromomethane	ND	0.200	mg/kg wet							
Carbon Disulfide	ND	0.200	mg/kg wet							
Carbon Tetrachloride	ND	0.200	mg/kg wet							

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Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch CK71715 - 5035										
Chlorobenzene	ND	0.200	mg/kg wet							
Chloroethane	ND	0.200	mg/kg wet							
Chloroform	ND	0.200	mg/kg wet							
Chloromethane	ND	0.200	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.200	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.200	mg/kg wet							
Dibromochloromethane	ND	0.200	mg/kg wet							
Dibromomethane	ND	0.200	mg/kg wet							
Dichlorodifluoromethane	ND	0.200	mg/kg wet							
Diethyl Ether	ND	0.200	mg/kg wet							
Di-isopropyl ether	ND	0.200	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.200	mg/kg wet							
Ethylbenzene	ND	0.200	mg/kg wet							
Hexachlorobutadiene	ND	0.200	mg/kg wet							
Isopropylbenzene	ND	0.200	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.200	mg/kg wet							
Methylene Chloride	ND	0.400	mg/kg wet							
Naphthalene	ND	0.200	mg/kg wet							
n-Butylbenzene	ND	0.200	mg/kg wet							
n-Propylbenzene	ND	0.200	mg/kg wet							
sec-Butylbenzene	ND	0.200	mg/kg wet							
Styrene	ND	0.200	mg/kg wet							
tert-Butylbenzene	ND	0.200	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.200	mg/kg wet							
Tetrachloroethene	ND	0.200	mg/kg wet							
Tetrahydrofuran	ND	1.00	mg/kg wet							
Toluene	ND	0.200	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.200	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.200	mg/kg wet							
Trichloroethene	ND	0.200	mg/kg wet							
Trichlorofluoromethane	ND	0.200	mg/kg wet							
Vinyl Chloride	ND	0.200	mg/kg wet							
Xylene O	ND	0.200	mg/kg wet							
Xylene P,M	ND	0.400	mg/kg wet							
Xylenes (Total)	ND	0.400	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*5.16*		mg/kg wet	*5.000*		*103*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*4.34*		mg/kg wet	*5.000*		*87*	*70-130*			
Surrogate: Dibromofluoromethane	*4.82*		mg/kg wet	*5.000*		*96*	*70-130*			
Surrogate: Toluene-d8	*4.70*		mg/kg wet	*5.000*		*94*	*70-130*			
LCS										
1,1,1,2-Tetrachloroethane	1.90	0.200	mg/kg wet	2.000		95	70-130			
1,1,1-Trichloroethane	1.92	0.200	mg/kg wet	2.000		96	70-130			
1,1,2,2-Tetrachloroethane	2.10	0.200	mg/kg wet	2.000		105	70-130			
1,1,2-Trichloroethane	1.62	0.200	mg/kg wet	2.000		81	70-130			
1,1-Dichloroethane	1.79	0.200	mg/kg wet	2.000		90	70-130			

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Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch CK71715 - 5035										
1,1-Dichloroethene	2.07	0.200	mg/kg wet	2.000		103	70-130			
1,1-Dichloropropene	1.98	0.200	mg/kg wet	2.000		99	70-130			
1,2,3-Trichlorobenzene	2.36	0.200	mg/kg wet	2.000		118	70-130			
1,2,3-Trichloropropane	2.03	0.200	mg/kg wet	2.000		101	70-130			
1,2,4-Trichlorobenzene	2.23	0.200	mg/kg wet	2.000		111	70-130			
1,2,4-Trimethylbenzene	2.00	0.200	mg/kg wet	2.000		100	70-130			
1,2-Dibromo-3-Chloropropane	2.05	1.00	mg/kg wet	2.000		103	70-130			
1,2-Dibromoethane	1.84	0.200	mg/kg wet	2.000		92	70-130			
1,2-Dichlorobenzene	2.13	0.200	mg/kg wet	2.000		106	70-130			
1,2-Dichloroethane	2.05	0.200	mg/kg wet	2.000		103	70-130			
1,2-Dichloropropane	1.76	0.200	mg/kg wet	2.000		88	70-130			
1,3,5-Trimethylbenzene	1.89	0.200	mg/kg wet	2.000		95	70-130			
1,3-Dichlorobenzene	2.11	0.200	mg/kg wet	2.000		106	70-130			
1,3-Dichloropropane	1.82	0.200	mg/kg wet	2.000		91	70-130			
1,4-Dichlorobenzene	2.06	0.200	mg/kg wet	2.000		103	70-130			
1,4-Dioxane - Screen	94.0	40.0	mg/kg wet	40.00		235	44-241			
2,2-Dichloropropane	1.96	0.200	mg/kg wet	2.000		98	70-130			
2-Butanone	10.6	1.00	mg/kg wet	10.00		106	70-130			
2-Chlorotoluene	1.86	0.200	mg/kg wet	2.000		93	70-130			
2-Hexanone	9.64	1.00	mg/kg wet	10.00		96	70-130			
4-Chlorotoluene	1.94	0.200	mg/kg wet	2.000		97	70-130			
4-Isopropyltoluene	2.03	0.200	mg/kg wet	2.000		102	70-130			
4-Methyl-2-Pentanone	9.23	1.00	mg/kg wet	10.00		92	70-130			
Acetone	9.79	1.00	mg/kg wet	10.00		98	70-130			
Benzene	2.00	0.200	mg/kg wet	2.000		100	70-130			
Bromobenzene	2.04	0.200	mg/kg wet	2.000		102	70-130			
Bromochloromethane	2.00	0.200	mg/kg wet	2.000		100	70-130			
Bromodichloromethane	1.58	0.200	mg/kg wet	2.000		79	70-130			
Bromoform	1.60	0.200	mg/kg wet	2.000		80	70-130			
Bromomethane	1.94	0.200	mg/kg wet	2.000		97	70-130			
Carbon Disulfide	2.10	0.200	mg/kg wet	2.000		105	70-130			
Carbon Tetrachloride	1.95	0.200	mg/kg wet	2.000		98	70-130			
Chlorobenzene	1.83	0.200	mg/kg wet	2.000		92	70-130			
Chloroethane	1.66	0.200	mg/kg wet	2.000		83	70-130			
Chloroform	1.79	0.200	mg/kg wet	2.000		89	70-130			
Chloromethane	1.60	0.200	mg/kg wet	2.000		80	70-130			
cis-1,2-Dichloroethene	1.82	0.200	mg/kg wet	2.000		91	70-130			
cis-1,3-Dichloropropene	1.83	0.200	mg/kg wet	2.000		92	70-130			
Dibromochloromethane	1.74	0.200	mg/kg wet	2.000		87	70-130			
Dibromomethane	1.83	0.200	mg/kg wet	2.000		92	70-130			
Dichlorodifluoromethane	1.77	0.200	mg/kg wet	2.000		89	70-130			
Diethyl Ether	1.98	0.200	mg/kg wet	2.000		99	70-130			
Di-isopropyl ether	2.23	0.200	mg/kg wet	2.000		111	70-130			
Ethyl tertiary-butyl ether	2.20	0.200	mg/kg wet	2.000		110	70-130			
Ethylbenzene	1.82	0.200	mg/kg wet	2.000		91	70-130			

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Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch CK71715 - 5035										
Hexachlorobutadiene	2.68	0.200	mg/kg wet	2.000		134	70-130			CD+
Isopropylbenzene	1.81	0.200	mg/kg wet	2.000		90	70-130			
Methyl tert-Butyl Ether	2.59	0.200	mg/kg wet	2.000		130	70-130			
Methylene Chloride	1.87	0.400	mg/kg wet	2.000		94	70-130			
Naphthalene	2.30	0.200	mg/kg wet	2.000		115	70-130			
n-Butylbenzene	2.04	0.200	mg/kg wet	2.000		102	70-130			
n-Propylbenzene	1.92	0.200	mg/kg wet	2.000		96	70-130			
sec-Butylbenzene	2.01	0.200	mg/kg wet	2.000		100	70-130			
Styrene	1.81	0.200	mg/kg wet	2.000		91	70-130			
tert-Butylbenzene	2.06	0.200	mg/kg wet	2.000		103	70-130			
Tertiary-amyl methyl ether	2.01	0.200	mg/kg wet	2.000		100	70-130			
Tetrachloroethene	1.56	0.200	mg/kg wet	2.000		78	70-130			
Tetrahydrofuran	2.09	1.00	mg/kg wet	2.000		105	70-130			
Toluene	1.82	0.200	mg/kg wet	2.000		91	70-130			
trans-1,2-Dichloroethene	1.95	0.200	mg/kg wet	2.000		98	70-130			
trans-1,3-Dichloropropene	1.84	0.200	mg/kg wet	2.000		92	70-130			
Trichloroethene	2.02	0.200	mg/kg wet	2.000		101	70-130			
Trichlorofluoromethane	1.93	0.200	mg/kg wet	2.000		96	70-130			
Vinyl Chloride	1.78	0.200	mg/kg wet	2.000		89	70-130			
Xylene O	1.88	0.200	mg/kg wet	2.000		94	70-130			
Xylene P,M	3.72	0.400	mg/kg wet	4.000		93	70-130			
Xylenes (Total)	5.60	0.400	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*5.00*		mg/kg wet	*5.000*		*100*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*4.53*		mg/kg wet	*5.000*		*91*	*70-130*			
Surrogate: Dibromofluoromethane	*5.06*		mg/kg wet	*5.000*		*101*	*70-130*			
Surrogate: Toluene-d8	*4.88*		mg/kg wet	*5.000*		*98*	*70-130*			
LCS Dup										
1,1,1,2-Tetrachloroethane	1.81	0.200	mg/kg wet	2.000		90	70-130	5	20	
1,1,1-Trichloroethane	1.92	0.200	mg/kg wet	2.000		96	70-130	0	20	
1,1,2,2-Tetrachloroethane	2.05	0.200	mg/kg wet	2.000		102	70-130	3	20	
1,1,2-Trichloroethane	1.62	0.200	mg/kg wet	2.000		81	70-130	0.1	20	
1,1-Dichloroethane	1.86	0.200	mg/kg wet	2.000		93	70-130	4	20	
1,1-Dichloroethene	2.05	0.200	mg/kg wet	2.000		102	70-130	0.8	20	
1,1-Dichloropropene	1.98	0.200	mg/kg wet	2.000		99	70-130	0.2	20	
1,2,3-Trichlorobenzene	2.28	0.200	mg/kg wet	2.000		114	70-130	4	20	
1,2,3-Trichloropropane	1.99	0.200	mg/kg wet	2.000		100	70-130	2	20	
1,2,4-Trichlorobenzene	2.11	0.200	mg/kg wet	2.000		106	70-130	5	20	
1,2,4-Trimethylbenzene	1.95	0.200	mg/kg wet	2.000		98	70-130	2	20	
1,2-Dibromo-3-Chloropropane	2.10	1.00	mg/kg wet	2.000		105	70-130	2	20	
1,2-Dibromoethane	1.83	0.200	mg/kg wet	2.000		92	70-130	0.4	20	
1,2-Dichlorobenzene	2.12	0.200	mg/kg wet	2.000		106	70-130	0.09	20	
1,2-Dichloroethane	1.99	0.200	mg/kg wet	2.000		99	70-130	3	20	
1,2-Dichloropropane	1.73	0.200	mg/kg wet	2.000		86	70-130	2	20	
1,3,5-Trimethylbenzene	1.89	0.200	mg/kg wet	2.000		94	70-130	0.4	20	
1,3-Dichlorobenzene	2.04	0.200	mg/kg wet	2.000		102	70-130	3	20	

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch CK71715 - 5035										
1,3-Dichloropropane	1.91	0.200	mg/kg wet	2.000		95	70-130	4	20	
1,4-Dichlorobenzene	2.09	0.200	mg/kg wet	2.000		104	70-130	1	20	
1,4-Dioxane - Screen	87.4	40.0	mg/kg wet	40.00		218	44-241	7	200	
2,2-Dichloropropane	1.89	0.200	mg/kg wet	2.000		95	70-130	3	20	
2-Butanone	10.4	1.00	mg/kg wet	10.00		104	70-130	1	20	
2-Chlorotoluene	1.84	0.200	mg/kg wet	2.000		92	70-130	1	20	
2-Hexanone	9.83	1.00	mg/kg wet	10.00		98	70-130	2	20	
4-Chlorotoluene	1.94	0.200	mg/kg wet	2.000		97	70-130	0.3	20	
4-Isopropyltoluene	1.94	0.200	mg/kg wet	2.000		97	70-130	4	20	
4-Methyl-2-Pentanone	9.08	1.00	mg/kg wet	10.00		91	70-130	2	20	
Acetone	10.3	1.00	mg/kg wet	10.00		103	70-130	5	20	
Benzene	1.96	0.200	mg/kg wet	2.000		98	70-130	2	20	
Bromobenzene	2.07	0.200	mg/kg wet	2.000		104	70-130	1	20	
Bromochloromethane	1.95	0.200	mg/kg wet	2.000		98	70-130	2	20	
Bromodichloromethane	1.60	0.200	mg/kg wet	2.000		80	70-130	2	20	
Bromoform	1.68	0.200	mg/kg wet	2.000		84	70-130	5	20	
Bromomethane	1.97	0.200	mg/kg wet	2.000		98	70-130	2	20	
Carbon Disulfide	2.18	0.200	mg/kg wet	2.000		109	70-130	4	20	
Carbon Tetrachloride	1.98	0.200	mg/kg wet	2.000		99	70-130	1	20	
Chlorobenzene	1.83	0.200	mg/kg wet	2.000		92	70-130	0.1	20	
Chloroethane	1.70	0.200	mg/kg wet	2.000		85	70-130	3	20	
Chloroform	1.78	0.200	mg/kg wet	2.000		89	70-130	0.2	20	
Chloromethane	1.69	0.200	mg/kg wet	2.000		84	70-130	6	20	
cis-1,2-Dichloroethene	1.82	0.200	mg/kg wet	2.000		91	70-130	0.1	20	
cis-1,3-Dichloropropene	1.87	0.200	mg/kg wet	2.000		94	70-130	2	20	
Dibromochloromethane	1.70	0.200	mg/kg wet	2.000		85	70-130	2	20	
Dibromomethane	1.84	0.200	mg/kg wet	2.000		92	70-130	0.4	20	
Dichlorodifluoromethane	1.70	0.200	mg/kg wet	2.000		85	70-130	4	20	
Diethyl Ether	1.97	0.200	mg/kg wet	2.000		98	70-130	0.4	20	
Di-isopropyl ether	2.27	0.200	mg/kg wet	2.000		114	70-130	2	20	
Ethyl tertiary-butyl ether	2.17	0.200	mg/kg wet	2.000		109	70-130	1	20	
Ethylbenzene	1.79	0.200	mg/kg wet	2.000		90	70-130	1	20	
Hexachlorobutadiene	2.46	0.200	mg/kg wet	2.000		123	70-130	9	20	
Isopropylbenzene	1.74	0.200	mg/kg wet	2.000		87	70-130	4	20	
Methyl tert-Butyl Ether	2.56	0.200	mg/kg wet	2.000		128	70-130	1	20	
Methylene Chloride	1.85	0.400	mg/kg wet	2.000		92	70-130	1	20	
Naphthalene	2.11	0.200	mg/kg wet	2.000		106	70-130	9	20	
n-Butylbenzene	1.92	0.200	mg/kg wet	2.000		96	70-130	6	20	
n-Propylbenzene	1.88	0.200	mg/kg wet	2.000		94	70-130	2	20	
sec-Butylbenzene	1.98	0.200	mg/kg wet	2.000		99	70-130	2	20	
Styrene	1.83	0.200	mg/kg wet	2.000		92	70-130	1	20	
tert-Butylbenzene	2.06	0.200	mg/kg wet	2.000		103	70-130	0.1	20	
Tertiary-amyl methyl ether	2.00	0.200	mg/kg wet	2.000		100	70-130	0.5	20	
Tetrachloroethene	1.60	0.200	mg/kg wet	2.000		80	70-130	2	20	
Tetrahydrofuran	2.42	1.00	mg/kg wet	2.000		121	70-130	15	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1711282

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
5035/8260B Volatile Organic Compounds / Methanol										
Batch CK71715 - 5035										
Toluene	1.88	0.200	mg/kg wet	2.000		94	70-130	3	20	
trans-1,2-Dichloroethene	1.94	0.200	mg/kg wet	2.000		97	70-130	0.5	20	
trans-1,3-Dichloropropene	1.78	0.200	mg/kg wet	2.000		89	70-130	3	20	
Trichloroethene	1.98	0.200	mg/kg wet	2.000		99	70-130	2	20	
Trichlorofluoromethane	2.04	0.200	mg/kg wet	2.000		102	70-130	6	20	
Vinyl Chloride	1.78	0.200	mg/kg wet	2.000		89	70-130	0.1	20	
Xylene O	1.85	0.200	mg/kg wet	2.000		93	70-130	1	20	
Xylene P,M	3.69	0.400	mg/kg wet	4.000		92	70-130	0.6	20	
Xylenes (Total)	5.55	0.400	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	*5.25*		mg/kg wet	*5.000*		*105*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*4.63*		mg/kg wet	*5.000*		*93*	*70-130*			
Surrogate: Dibromofluoromethane	*5.07*		mg/kg wet	*5.000*		*101*	*70-130*			
Surrogate: Toluene-d8	*4.95*		mg/kg wet	*5.000*		*99*	*70-130*			
8081B Organochlorine Pesticides										
Batch CK71351 - 3546										
Blank										
4,4´-DDD	ND	0.0025	mg/kg wet							
4,4´-DDD [2C]	ND	0.0025	mg/kg wet							
4,4´-DDE	ND	0.0025	mg/kg wet							
4,4´-DDE [2C]	ND	0.0025	mg/kg wet							
4,4´-DDT	ND	0.0025	mg/kg wet							
4,4´-DDT [2C]	ND	0.0025	mg/kg wet							
Aldrin	ND	0.0025	mg/kg wet							
Aldrin [2C]	ND	0.0025	mg/kg wet							
alpha-BHC	ND	0.0025	mg/kg wet							
alpha-BHC [2C]	ND	0.0025	mg/kg wet							
alpha-Chlordane	ND	0.0025	mg/kg wet							
alpha-Chlordane [2C]	ND	0.0025	mg/kg wet							
beta-BHC	ND	0.0025	mg/kg wet							
beta-BHC [2C]	ND	0.0025	mg/kg wet							
delta-BHC	ND	0.0025	mg/kg wet							
delta-BHC [2C]	ND	0.0025	mg/kg wet							
Dieldrin	ND	0.0025	mg/kg wet							
Dieldrin [2C]	ND	0.0025	mg/kg wet							
Endosulfan I	ND	0.0025	mg/kg wet							
Endosulfan I [2C]	ND	0.0025	mg/kg wet							
Endosulfan II	ND	0.0025	mg/kg wet							
Endosulfan II [2C]	ND	0.0025	mg/kg wet							
Endosulfan Sulfate	ND	0.0025	mg/kg wet							
Endosulfan Sulfate [2C]	ND	0.0025	mg/kg wet							
Endrin	ND	0.0025	mg/kg wet							
Endrin [2C]	ND	0.0025	mg/kg wet							
Endrin Ketone	ND	0.0025	mg/kg wet							
Endrin Ketone [2C]	ND	0.0025	mg/kg wet							

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Client Name: GEI Consultants, Inc.
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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8081B Organochlorine Pesticides										
Batch CK71351 - 3546										
gamma-BHC (Lindane)	ND	0.0015	mg/kg wet							
gamma-BHC (Lindane) [2C]	ND	0.0015	mg/kg wet							
gamma-Chlordane	ND	0.0025	mg/kg wet							
gamma-Chlordane [2C]	ND	0.0025	mg/kg wet							
Heptachlor	ND	0.0025	mg/kg wet							
Heptachlor [2C]	ND	0.0025	mg/kg wet							
Heptachlor Epoxide	ND	0.0025	mg/kg wet							
Heptachlor Epoxide [2C]	ND	0.0025	mg/kg wet							
Hexachlorobenzene	ND	0.0025	mg/kg wet							
Hexachlorobenzene [2C]	ND	0.0025	mg/kg wet							
Methoxychlor	ND	0.0025	mg/kg wet							
Methoxychlor [2C]	ND	0.0025	mg/kg wet							
Toxaphene	ND	0.125	mg/kg wet							
Toxaphene [2C]	ND	0.125	mg/kg wet							
Surrogate: Decachlorobiphenyl	*0.0144*		mg/kg wet	*0.01250*		*115*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0144*		mg/kg wet	*0.01250*		*115*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0120*		mg/kg wet	*0.01250*		*96*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0111*		mg/kg wet	*0.01250*		*89*	*30-150*			
LCS										
4,4´-DDD	0.0116	0.0025	mg/kg wet	0.01250		93	40-140			
4,4´-DDD [2C]	0.0110	0.0025	mg/kg wet	0.01250		88	40-140			
4,4´-DDE	0.0118	0.0025	mg/kg wet	0.01250		94	40-140			
4,4´-DDE [2C]	0.0115	0.0025	mg/kg wet	0.01250		92	40-140			
4,4´-DDT	0.0117	0.0025	mg/kg wet	0.01250		93	40-140			
4,4´-DDT [2C]	0.0112	0.0025	mg/kg wet	0.01250		89	40-140			
Aldrin	0.0105	0.0025	mg/kg wet	0.01250		84	40-140			
Aldrin [2C]	0.0100	0.0025	mg/kg wet	0.01250		80	40-140			
alpha-BHC	0.0109	0.0025	mg/kg wet	0.01250		87	40-140			
alpha-BHC [2C]	0.0117	0.0025	mg/kg wet	0.01250		93	40-140			
alpha-Chlordane	0.0118	0.0025	mg/kg wet	0.01250		94	40-140			
alpha-Chlordane [2C]	0.0112	0.0025	mg/kg wet	0.01250		90	40-140			
beta-BHC	0.0110	0.0025	mg/kg wet	0.01250		88	40-140			
beta-BHC [2C]	0.0110	0.0025	mg/kg wet	0.01250		88	40-140			
delta-BHC	0.0109	0.0025	mg/kg wet	0.01250		88	40-140			
delta-BHC [2C]	0.0117	0.0025	mg/kg wet	0.01250		93	40-140			
Dieldrin	0.0122	0.0025	mg/kg wet	0.01250		98	40-140			
Dieldrin [2C]	0.0117	0.0025	mg/kg wet	0.01250		94	40-140			
Endosulfan I	0.0118	0.0025	mg/kg wet	0.01250		94	40-140			
Endosulfan I [2C]	0.0115	0.0025	mg/kg wet	0.01250		92	40-140			
Endosulfan II	0.0108	0.0025	mg/kg wet	0.01250		87	40-140			
Endosulfan II [2C]	0.0102	0.0025	mg/kg wet	0.01250		82	40-140			
Endosulfan Sulfate	0.0110	0.0025	mg/kg wet	0.01250		88	40-140			
Endosulfan Sulfate [2C]	0.0107	0.0025	mg/kg wet	0.01250		86	40-140			
Endrin	0.0118	0.0025	mg/kg wet	0.01250		94	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
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ESS Laboratory Work Order: 1711282

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8081B Organochlorine Pesticides										
Batch CK71351 - 3546										
Endrin [2C]	0.0118	0.0025	mg/kg wet	0.01250		94	40-140			
Endrin Ketone	0.0119	0.0025	mg/kg wet	0.01250		95	40-140			
Endrin Ketone [2C]	0.0114	0.0025	mg/kg wet	0.01250		91	40-140			
gamma-BHC (Lindane)	0.0109	0.0015	mg/kg wet	0.01250		87	40-140			
gamma-BHC (Lindane) [2C]	0.0116	0.0015	mg/kg wet	0.01250		93	40-140			
gamma-Chlordane	0.0119	0.0025	mg/kg wet	0.01250		95	40-140			
gamma-Chlordane [2C]	0.0115	0.0025	mg/kg wet	0.01250		92	40-140			
Heptachlor	0.0110	0.0025	mg/kg wet	0.01250		88	40-140			
Heptachlor [2C]	0.0116	0.0025	mg/kg wet	0.01250		93	40-140			
Heptachlor Epoxide	0.0124	0.0025	mg/kg wet	0.01250		99	40-140			
Heptachlor Epoxide [2C]	0.0120	0.0025	mg/kg wet	0.01250		96	40-140			
Hexachlorobenzene	0.0136	0.0025	mg/kg wet	0.01250		109	40-140			
Hexachlorobenzene [2C]	0.0135	0.0025	mg/kg wet	0.01250		108	40-140			
Methoxychlor	0.0105	0.0025	mg/kg wet	0.01250		84	40-140			
Methoxychlor [2C]	0.0109	0.0025	mg/kg wet	0.01250		87	40-140			
Surrogate: Decachlorobiphenyl	*0.0143*		mg/kg wet	*0.01250*		*114*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0145*		mg/kg wet	*0.01250*		*116*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0130*		mg/kg wet	*0.01250*		*104*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0117*		mg/kg wet	*0.01250*		*93*	*30-150*			
LCS Dup										
4,4´-DDD	0.0123	0.0025	mg/kg wet	0.01250		99	40-140	6	30	
4,4´-DDD [2C]	0.0118	0.0025	mg/kg wet	0.01250		95	40-140	7	30	
4,4´-DDE	0.0125	0.0025	mg/kg wet	0.01250		100	40-140	6	30	
4,4´-DDE [2C]	0.0123	0.0025	mg/kg wet	0.01250		98	40-140	7	30	
4,4´-DDT	0.0123	0.0025	mg/kg wet	0.01250		99	40-140	6	30	
4,4´-DDT [2C]	0.0120	0.0025	mg/kg wet	0.01250		96	40-140	7	30	
Aldrin	0.0115	0.0025	mg/kg wet	0.01250		92	40-140	9	30	
Aldrin [2C]	0.0112	0.0025	mg/kg wet	0.01250		89	40-140	11	30	
alpha-BHC	0.0113	0.0025	mg/kg wet	0.01250		90	40-140	3	30	
alpha-BHC [2C]	0.0121	0.0025	mg/kg wet	0.01250		97	40-140	4	30	
alpha-Chlordane	0.0122	0.0025	mg/kg wet	0.01250		98	40-140	4	30	
alpha-Chlordane [2C]	0.0119	0.0025	mg/kg wet	0.01250		95	40-140	5	30	
beta-BHC	0.0114	0.0025	mg/kg wet	0.01250		92	40-140	4	30	
beta-BHC [2C]	0.0114	0.0025	mg/kg wet	0.01250		92	40-140	4	30	
delta-BHC	0.0113	0.0025	mg/kg wet	0.01250		90	40-140	3	30	
delta-BHC [2C]	0.0124	0.0025	mg/kg wet	0.01250		100	40-140	6	30	
Dieldrin	0.0128	0.0025	mg/kg wet	0.01250		102	40-140	4	30	
Dieldrin [2C]	0.0125	0.0025	mg/kg wet	0.01250		100	40-140	6	30	
Endosulfan I	0.0123	0.0025	mg/kg wet	0.01250		98	40-140	4	30	
Endosulfan I [2C]	0.0122	0.0025	mg/kg wet	0.01250		97	40-140	5	30	
Endosulfan II	0.0118	0.0025	mg/kg wet	0.01250		95	40-140	9	30	
Endosulfan II [2C]	0.0113	0.0025	mg/kg wet	0.01250		90	40-140	10	30	
Endosulfan Sulfate	0.0122	0.0025	mg/kg wet	0.01250		97	40-140	10	30	
Endosulfan Sulfate [2C]	0.0118	0.0025	mg/kg wet	0.01250		94	40-140	10	30	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1711282

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8081B Organochlorine Pesticides										
Batch CK71351 - 3546										
Endrin	0.0125	0.0025	mg/kg wet	0.01250		100	40-140	6	30	
Endrin [2C]	0.0126	0.0025	mg/kg wet	0.01250		101	40-140	7	30	
Endrin Ketone	0.0131	0.0025	mg/kg wet	0.01250		105	40-140	10	30	
Endrin Ketone [2C]	0.0124	0.0025	mg/kg wet	0.01250		99	40-140	9	30	
gamma-BHC (Lindane)	0.0113	0.0015	mg/kg wet	0.01250		90	40-140	3	30	
gamma-BHC (Lindane) [2C]	0.0120	0.0015	mg/kg wet	0.01250		96	40-140	4	30	
gamma-Chlordane	0.0124	0.0025	mg/kg wet	0.01250		100	40-140	4	30	
gamma-Chlordane [2C]	0.0122	0.0025	mg/kg wet	0.01250		97	40-140	6	30	
Heptachlor	0.0113	0.0025	mg/kg wet	0.01250		90	40-140	3	30	
Heptachlor [2C]	0.0121	0.0025	mg/kg wet	0.01250		97	40-140	4	30	
Heptachlor Epoxide	0.0130	0.0025	mg/kg wet	0.01250		104	40-140	5	30	
Heptachlor Epoxide [2C]	0.0126	0.0025	mg/kg wet	0.01250		101	40-140	5	30	
Hexachlorobenzene	0.0138	0.0025	mg/kg wet	0.01250		111	40-140	2	30	
Hexachlorobenzene [2C]	0.0139	0.0025	mg/kg wet	0.01250		111	40-140	3	30	
Methoxychlor	0.0120	0.0025	mg/kg wet	0.01250		96	40-140	13	30	
Methoxychlor [2C]	0.0124	0.0025	mg/kg wet	0.01250		99	40-140	13	30	
Surrogate: Decachlorobiphenyl	*0.0150*		mg/kg wet	*0.01250*		*120*	*30-150*			
Surrogate: Decachlorobiphenyl [2C]	*0.0152*		mg/kg wet	*0.01250*		*121*	*30-150*			
Surrogate: Tetrachloro-m-xylene	*0.0127*		mg/kg wet	*0.01250*		*102*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.0117*		mg/kg wet	*0.01250*		*94*	*30-150*			
8082 Polychlorinated Biphenyls (PCB) / Congeners										
Batch CK71333 - 3540C										
Blank										
BZ#101	ND	0.00027	mg/kg wet							
BZ#101 [2C]	ND	0.00027	mg/kg wet							
BZ#105	ND	0.00027	mg/kg wet							
BZ#105 [2C]	ND	0.00027	mg/kg wet							
BZ#118	ND	0.00027	mg/kg wet							
BZ#118 [2C]	ND	0.00027	mg/kg wet							
BZ#128	ND	0.00027	mg/kg wet							
BZ#128 [2C]	ND	0.00027	mg/kg wet							
BZ#138	ND	0.00027	mg/kg wet							
BZ#138 [2C]	ND	0.00027	mg/kg wet							
BZ#153	ND	0.00027	mg/kg wet							
BZ#153 [2C]	ND	0.00027	mg/kg wet							
BZ#170	ND	0.00027	mg/kg wet							
BZ#170 [2C]	ND	0.00027	mg/kg wet							
BZ#18	ND	0.00027	mg/kg wet							
BZ#18 [2C]	ND	0.00027	mg/kg wet							
BZ#180	ND	0.00027	mg/kg wet							
BZ#180 [2C]	ND	0.00027	mg/kg wet							
BZ#187	ND	0.00027	mg/kg wet							
BZ#187 [2C]	ND	0.00027	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082 Polychlorinated Biphenyls (PCB) / Congeners										
Batch CK71333 - 3540C										
BZ#195	ND	0.00027	mg/kg wet							
BZ#195 [2C]	ND	0.00027	mg/kg wet							
BZ#206	ND	0.00027	mg/kg wet							
BZ#206 [2C]	ND	0.00027	mg/kg wet							
BZ#209	ND	0.00027	mg/kg wet							
BZ#209 [2C]	ND	0.00027	mg/kg wet							
BZ#28	ND	0.00027	mg/kg wet							
BZ#28 [2C]	ND	0.00027	mg/kg wet							
BZ#44	ND	0.00027	mg/kg wet							
BZ#44 [2C]	ND	0.00027	mg/kg wet							
BZ#52	ND	0.00027	mg/kg wet							
BZ#52 [2C]	ND	0.00027	mg/kg wet							
BZ#66	ND	0.00027	mg/kg wet							
BZ#66 [2C]	ND	0.00027	mg/kg wet							
BZ#8	ND	0.00027	mg/kg wet							
BZ#8 [2C]	ND	0.00027	mg/kg wet							
Surrogate: Tetrachloro-m-xylene	*0.00236*		mg/kg wet	*0.003333*		*71*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.00239*		mg/kg wet	*0.003333*		*72*	*30-150*			
LCS										
BZ#101	0.00298	0.00027	mg/kg wet	0.003333		89	40-140			
BZ#101 [2C]	0.00311	0.00027	mg/kg wet	0.003333		93	40-140			
BZ#105	0.00312	0.00027	mg/kg wet	0.003333		94	40-140			
BZ#105 [2C]	0.00311	0.00027	mg/kg wet	0.003333		93	40-140			
BZ#118	0.00287	0.00027	mg/kg wet	0.003333		86	40-140			
BZ#118 [2C]	0.00329	0.00027	mg/kg wet	0.003333		99	40-140			
BZ#128	0.00286	0.00027	mg/kg wet	0.003333		86	40-140			
BZ#128 [2C]	0.00309	0.00027	mg/kg wet	0.003333		93	40-140			
BZ#138	0.00287	0.00027	mg/kg wet	0.003333		86	40-140			
BZ#138 [2C]	0.00309	0.00027	mg/kg wet	0.003333		93	40-140			
BZ#153	0.00287	0.00027	mg/kg wet	0.003333		86	40-140			
BZ#153 [2C]	0.00319	0.00027	mg/kg wet	0.003333		96	40-140			
BZ#170	0.00286	0.00027	mg/kg wet	0.003333		86	40-140			
BZ#170 [2C]	0.00315	0.00027	mg/kg wet	0.003333		94	40-140			
BZ#18	0.00292	0.00027	mg/kg wet	0.003333		88	40-140			
BZ#18 [2C]	0.00297	0.00027	mg/kg wet	0.003333		89	40-140			
BZ#180	0.00294	0.00027	mg/kg wet	0.003333		88	40-140			
BZ#180 [2C]	0.00319	0.00027	mg/kg wet	0.003333		96	40-140			
BZ#187	0.00283	0.00027	mg/kg wet	0.003333		85	40-140			
BZ#187 [2C]	0.00311	0.00027	mg/kg wet	0.003333		93	40-140			
BZ#195	0.00279	0.00027	mg/kg wet	0.003333		84	40-140			
BZ#195 [2C]	0.00302	0.00027	mg/kg wet	0.003333		91	40-140			
BZ#206	0.00278	0.00027	mg/kg wet	0.003333		83	40-140			
BZ#206 [2C]	0.00298	0.00027	mg/kg wet	0.003333		89	40-140			
BZ#209	0.00264	0.00027	mg/kg wet	0.003333		79	40-140			

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082 Polychlorinated Biphenyls (PCB) / Congeners										
Batch CK71333 - 3540C										
BZ#209 [2C]	0.00288	0.00027	mg/kg wet	0.003333		86	40-140			
BZ#28	0.00296	0.00027	mg/kg wet	0.003333		89	40-140			
BZ#28 [2C]	0.00295	0.00027	mg/kg wet	0.003333		88	40-140			
BZ#44	0.00280	0.00027	mg/kg wet	0.003333		84	40-140			
BZ#44 [2C]	0.00307	0.00027	mg/kg wet	0.003333		92	40-140			
BZ#52	0.00281	0.00027	mg/kg wet	0.003333		84	40-140			
BZ#52 [2C]	0.00297	0.00027	mg/kg wet	0.003333		89	40-140			
BZ#66	0.00308	0.00027	mg/kg wet	0.003333		92	40-140			
BZ#66 [2C]	0.00307	0.00027	mg/kg wet	0.003333		92	40-140			
BZ#8	0.00320	0.00027	mg/kg wet	0.003333		96	40-140			
BZ#8 [2C]	0.00354	0.00027	mg/kg wet	0.003333		106	40-140			
Surrogate: Tetrachloro-m-xylene	*0.00230*		mg/kg wet	*0.003333*		*69*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.00241*		mg/kg wet	*0.003333*		*72*	*30-150*			
LCS Dup										
BZ#101	0.00319	0.00027	mg/kg wet	0.003333		96	40-140	7	50	
BZ#101 [2C]	0.00333	0.00027	mg/kg wet	0.003333		100	40-140	7	50	
BZ#105	0.00337	0.00027	mg/kg wet	0.003333		101	40-140	8	50	
BZ#105 [2C]	0.00340	0.00027	mg/kg wet	0.003333		102	40-140	9	50	
BZ#118	0.00313	0.00027	mg/kg wet	0.003333		94	40-140	8	50	
BZ#118 [2C]	0.00355	0.00027	mg/kg wet	0.003333		107	40-140	8	50	
BZ#128	0.00327	0.00027	mg/kg wet	0.003333		98	40-140	13	50	
BZ#128 [2C]	0.00332	0.00027	mg/kg wet	0.003333		100	40-140	7	50	
BZ#138	0.00313	0.00027	mg/kg wet	0.003333		94	40-140	9	50	
BZ#138 [2C]	0.00333	0.00027	mg/kg wet	0.003333		100	40-140	8	50	
BZ#153	0.00310	0.00027	mg/kg wet	0.003333		93	40-140	8	50	
BZ#153 [2C]	0.00348	0.00027	mg/kg wet	0.003333		104	40-140	9	50	
BZ#170	0.00312	0.00027	mg/kg wet	0.003333		94	40-140	9	50	
BZ#170 [2C]	0.00339	0.00027	mg/kg wet	0.003333		102	40-140	7	50	
BZ#18	0.00308	0.00027	mg/kg wet	0.003333		92	40-140	5	50	
BZ#18 [2C]	0.00307	0.00027	mg/kg wet	0.003333		92	40-140	3	50	
BZ#180	0.00319	0.00027	mg/kg wet	0.003333		96	40-140	8	50	
BZ#180 [2C]	0.00345	0.00027	mg/kg wet	0.003333		104	40-140	8	50	
BZ#187	0.00309	0.00027	mg/kg wet	0.003333		93	40-140	9	50	
BZ#187 [2C]	0.00336	0.00027	mg/kg wet	0.003333		101	40-140	8	50	
BZ#195	0.00302	0.00027	mg/kg wet	0.003333		91	40-140	8	50	
BZ#195 [2C]	0.00330	0.00027	mg/kg wet	0.003333		99	40-140	9	50	
BZ#206	0.00297	0.00027	mg/kg wet	0.003333		89	40-140	7	50	
BZ#206 [2C]	0.00320	0.00027	mg/kg wet	0.003333		96	40-140	7	50	
BZ#209	0.00287	0.00027	mg/kg wet	0.003333		86	40-140	8	50	
BZ#209 [2C]	0.00313	0.00027	mg/kg wet	0.003333		94	40-140	9	50	
BZ#28	0.00307	0.00027	mg/kg wet	0.003333		92	40-140	4	50	
BZ#28 [2C]	0.00311	0.00027	mg/kg wet	0.003333		93	40-140	5	50	
BZ#44	0.00299	0.00027	mg/kg wet	0.003333		90	40-140	7	50	
BZ#44 [2C]	0.00324	0.00027	mg/kg wet	0.003333		97	40-140	5	50	

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8082 Polychlorinated Biphenyls (PCB) / Congeners										
Batch CK71333 - 3540C										
BZ#52	0.00301	0.00027	mg/kg wet	0.003333		90	40-140	7	50	
BZ#52 [2C]	0.00315	0.00027	mg/kg wet	0.003333		94	40-140	6	50	
BZ#66	0.00329	0.00027	mg/kg wet	0.003333		99	40-140	7	50	
BZ#66 [2C]	0.00331	0.00027	mg/kg wet	0.003333		99	40-140	7	50	
BZ#8	0.00338	0.00027	mg/kg wet	0.003333		102	40-140	6	50	
BZ#8 [2C]	0.00362	0.00027	mg/kg wet	0.003333		109	40-140	2	50	
Surrogate: Tetrachloro-m-xylene	*0.00241*		mg/kg wet	*0.003333*		*72*	*30-150*			
Surrogate: Tetrachloro-m-xylene [2C]	*0.00242*		mg/kg wet	*0.003333*		*73*	*30-150*			
8100M Total Petroleum Hydrocarbons										
Batch CK71009 - 3546										
Blank										
Decane (C10)	ND	0.2	mg/kg wet							
Docosane (C22)	ND	0.2	mg/kg wet							
Dodecane (C12)	ND	0.2	mg/kg wet							
Eicosane (C20)	ND	0.2	mg/kg wet							
Hexacosane (C26)	ND	0.2	mg/kg wet							
Hexadecane (C16)	ND	0.2	mg/kg wet							
Hexatriacontane (C36)	ND	0.2	mg/kg wet							
Nonadecane (C19)	ND	0.2	mg/kg wet							
Nonane (C9)	ND	0.2	mg/kg wet							
Octacosane (C28)	ND	0.2	mg/kg wet							
Octadecane (C18)	ND	0.2	mg/kg wet							
Tetracosane (C24)	ND	0.2	mg/kg wet							
Tetradecane (C14)	ND	0.2	mg/kg wet							
Total Petroleum Hydrocarbons	ND	10.0	mg/kg wet							
Triacontane (C30)	ND	0.2	mg/kg wet							
Surrogate: O-Terphenyl	*3.96*		mg/kg wet	*5.000*		*79*	*40-140*			
LCS										
Decane (C10)	1.8	0.2	mg/kg wet	2.500		70	40-140			
Docosane (C22)	2.0	0.2	mg/kg wet	2.500		80	40-140			
Dodecane (C12)	1.9	0.2	mg/kg wet	2.500		75	40-140			
Eicosane (C20)	2.0	0.2	mg/kg wet	2.500		79	40-140			
Hexacosane (C26)	2.0	0.2	mg/kg wet	2.500		80	40-140			
Hexadecane (C16)	1.9	0.2	mg/kg wet	2.500		78	40-140			
Hexatriacontane (C36)	2.1	0.2	mg/kg wet	2.500		85	40-140			
Nonadecane (C19)	2.1	0.2	mg/kg wet	2.500		85	40-140			
Nonane (C9)	1.4	0.2	mg/kg wet	2.500		58	30-140			
Octacosane (C28)	2.0	0.2	mg/kg wet	2.500		80	40-140			
Octadecane (C18)	1.9	0.2	mg/kg wet	2.500		77	40-140			
Tetracosane (C24)	2.0	0.2	mg/kg wet	2.500		80	40-140			
Tetradecane (C14)	1.9	0.2	mg/kg wet	2.500		75	40-140			
Total Petroleum Hydrocarbons	26.4	10.0	mg/kg wet	35.00		76	40-140			

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Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8100M Total Petroleum Hydrocarbons										
Batch CK71009 - 3546										
Triacontane (C30)	2.0	0.2	mg/kg wet	2.500		80	40-140			
Surrogate: O-Terphenyl	*3.84*		mg/kg wet	*5.000*		*77*	*40-140*			
LCS Dup										
Decane (C10)	1.9	0.2	mg/kg wet	2.500		75	40-140	7	25	
Docosane (C22)	2.3	0.2	mg/kg wet	2.500		90	40-140	12	25	
Dodecane (C12)	2.0	0.2	mg/kg wet	2.500		82	40-140	9	25	
Eicosane (C20)	2.2	0.2	mg/kg wet	2.500		89	40-140	12	25	
Hexacosane (C26)	2.3	0.2	mg/kg wet	2.500		90	40-140	12	25	
Hexadecane (C16)	2.2	0.2	mg/kg wet	2.500		86	40-140	10	25	
Hexatriacontane (C36)	2.4	0.2	mg/kg wet	2.500		96	40-140	12	25	
Nonadecane (C19)	2.4	0.2	mg/kg wet	2.500		95	40-140	11	25	
Nonane (C9)	1.5	0.2	mg/kg wet	2.500		60	30-140	4	25	
Octacosane (C28)	2.3	0.2	mg/kg wet	2.500		91	40-140	12	25	
Octadecane (C18)	2.1	0.2	mg/kg wet	2.500		86	40-140	11	25	
Tetracosane (C24)	2.3	0.2	mg/kg wet	2.500		90	40-140	12	25	
Tetradecane (C14)	2.1	0.2	mg/kg wet	2.500		82	40-140	10	25	
Total Petroleum Hydrocarbons	29.5	10.0	mg/kg wet	35.00		84	40-140	11	25	
Triacontane (C30)	2.3	0.2	mg/kg wet	2.500		91	40-140	12	25	
Surrogate: O-Terphenyl	*4.25*		mg/kg wet	*5.000*		*85*	*40-140*			
8151A Chlorinated Herbicides										
Batch CK70954 - 3546										
Blank										
2,4,5-T	ND	0.010	mg/kg wet							
2,4,5-T [2C]	ND	0.010	mg/kg wet							
2,4,5-TP (Silvex)	ND	0.010	mg/kg wet							
2,4,5-TP (Silvex) [2C]	ND	0.010	mg/kg wet							
2,4-D	ND	0.047	mg/kg wet							
2,4-D [2C]	ND	0.047	mg/kg wet							
2,4-DB	ND	0.048	mg/kg wet							
2,4-DB [2C]	ND	0.048	mg/kg wet							
Dalapon	ND	0.046	mg/kg wet							
Dalapon [2C]	ND	0.046	mg/kg wet							
Dicamba	ND	0.009	mg/kg wet							
Dicamba [2C]	ND	0.009	mg/kg wet							
Dichlorprop	ND	0.047	mg/kg wet							
Dichlorprop [2C]	ND	0.047	mg/kg wet							
Dinoseb	ND	0.048	mg/kg wet							
Dinoseb [2C]	ND	0.048	mg/kg wet							
MCPA	ND	2.32	mg/kg wet							
MCPA [2C]	ND	2.32	mg/kg wet							
MCPP	ND	2.35	mg/kg wet							
MCPP [2C]	ND	2.35	mg/kg wet							

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Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8151A Chlorinated Herbicides										
Batch CK70954 - 3546										
Surrogate: DCAA	*0.212*		mg/kg wet	*0.2000*		*106*	*30-150*			
Surrogate: DCAA [2C]	*0.171*		mg/kg wet	*0.2000*		*85*	*30-150*			
LCS										
2,4,5-T	0.014	0.010	mg/kg wet	0.01900		76	40-140			
2,4,5-T [2C]	0.013	0.010	mg/kg wet	0.01900		66	40-140			
2,4,5-TP (Silvex)	0.016	0.010	mg/kg wet	0.01900		82	40-140			
2,4,5-TP (Silvex) [2C]	0.012	0.010	mg/kg wet	0.01900		64	40-140			
2,4-D	0.154	0.047	mg/kg wet	0.1880		82	40-140			
2,4-D [2C]	0.129	0.047	mg/kg wet	0.1880		69	40-140			
2,4-DB	0.155	0.048	mg/kg wet	0.1900		82	40-140			
2,4-DB [2C]	0.127	0.048	mg/kg wet	0.1900		67	40-140			
Dalapon	0.260	0.046	mg/kg wet	0.4550		57	40-140			
Dalapon [2C]	0.257	0.046	mg/kg wet	0.4550		57	40-140			
Dicamba	0.014	0.009	mg/kg wet	0.01880		76	40-140			
Dicamba [2C]	0.013	0.009	mg/kg wet	0.01880		70	40-140			
Dichlorprop	0.174	0.047	mg/kg wet	0.1880		93	40-140			
Dichlorprop [2C]	0.130	0.047	mg/kg wet	0.1880		69	40-140			
Dinoseb	0.014	0.048	mg/kg wet	0.09500		14	10-100			
Dinoseb [2C]	0.020	0.048	mg/kg wet	0.09500		21	10-100			
MCPA	17.1	2.32	mg/kg wet	18.60		92	40-140			
MCPA [2C]	14.6	2.32	mg/kg wet	18.60		78	40-140			
MCPP	15.8	2.35	mg/kg wet	18.80		84	40-140			
MCPP [2C]	15.4	2.35	mg/kg wet	18.80		82	40-140			
Surrogate: DCAA	*0.193*		mg/kg wet	*0.2000*		*96*	*30-150*			
Surrogate: DCAA [2C]	*0.156*		mg/kg wet	*0.2000*		*78*	*30-150*			
LCS Dup										
2,4,5-T	0.017	0.010	mg/kg wet	0.01900		88	40-140	15	30	
2,4,5-T [2C]	0.014	0.010	mg/kg wet	0.01900		76	40-140	14	30	
2,4,5-TP (Silvex)	0.018	0.010	mg/kg wet	0.01900		94	40-140	14	30	
2,4,5-TP (Silvex) [2C]	0.014	0.010	mg/kg wet	0.01900		76	40-140	17	30	
2,4-D	0.183	0.047	mg/kg wet	0.1880		98	40-140	17	30	
2,4-D [2C]	0.161	0.047	mg/kg wet	0.1880		85	40-140	22	30	
2,4-DB	0.166	0.048	mg/kg wet	0.1900		87	40-140	7	30	
2,4-DB [2C]	0.140	0.048	mg/kg wet	0.1900		74	40-140	9	30	
Dalapon	0.310	0.046	mg/kg wet	0.4550		68	40-140	18	30	
Dalapon [2C]	0.298	0.046	mg/kg wet	0.4550		66	40-140	15	30	
Dicamba	0.016	0.009	mg/kg wet	0.01880		86	40-140	12	30	
Dicamba [2C]	0.016	0.009	mg/kg wet	0.01880		86	40-140	21	30	
Dichlorprop	0.204	0.047	mg/kg wet	0.1880		109	40-140	16	30	
Dichlorprop [2C]	0.155	0.047	mg/kg wet	0.1880		82	40-140	18	30	
Dinoseb	0.020	0.048	mg/kg wet	0.09500		21	10-100	36	30	D+
Dinoseb [2C]	0.024	0.048	mg/kg wet	0.09500		25	10-100	18	30	
MCPA	20.5	2.32	mg/kg wet	18.60		110	40-140	18	30	
MCPA [2C]	15.6	2.32	mg/kg wet	18.60		84	40-140	7	30	

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8151A Chlorinated Herbicides										
Batch CK70954 - 3546										
MCPP	18.5	2.35	mg/kg wet	18.80		98	40-140	16	30	
MCPP [2C]	18.0	2.35	mg/kg wet	18.80		96	40-140	15	30	
Surrogate: DCAA	*0.215*		mg/kg wet	*0.2000*		*108*	*30-150*			
Surrogate: DCAA [2C]	*0.168*		mg/kg wet	*0.2000*		*84*	*30-150*			
8270D Semi-Volatile Organic Compounds										
Batch CK71309 - 3546										
Blank										
1,2,4-Trichlorobenzene	ND	0.333	mg/kg wet							
1,2-Dichlorobenzene	ND	0.333	mg/kg wet							
1,3-Dichlorobenzene	ND	0.333	mg/kg wet							
1,4-Dichlorobenzene	ND	0.333	mg/kg wet							
2,4,5-Trichlorophenol	ND	0.333	mg/kg wet							
2,4,6-Trichlorophenol	ND	0.333	mg/kg wet							
2,4-Dichlorophenol	ND	0.333	mg/kg wet							
2,4-Dimethylphenol	ND	0.333	mg/kg wet							
2,4-Dinitrophenol	ND	0.667	mg/kg wet							
2,4-Dinitrotoluene	ND	0.333	mg/kg wet							
2,6-Dinitrotoluene	ND	0.333	mg/kg wet							
2-Chloronaphthalene	ND	0.333	mg/kg wet							
2-Chlorophenol	ND	0.333	mg/kg wet							
2-Methylnaphthalene	ND	0.333	mg/kg wet							
2-Methylphenol	ND	0.333	mg/kg wet							
2-Nitrophenol	ND	0.333	mg/kg wet							
3,3´-Dichlorobenzidine	ND	0.333	mg/kg wet							
3+4-Methylphenol	ND	0.667	mg/kg wet							
4-Bromophenyl-phenylether	ND	0.333	mg/kg wet							
4-Chloroaniline	ND	0.333	mg/kg wet							
4-Nitrophenol	ND	1.67	mg/kg wet							
Acenaphthene	ND	0.333	mg/kg wet							
Acenaphthylene	ND	0.333	mg/kg wet							
Acetophenone	ND	0.667	mg/kg wet							
Aniline	ND	1.67	mg/kg wet							
Anthracene	ND	0.333	mg/kg wet							
Azobenzene	ND	0.333	mg/kg wet							
Benzo(a)anthracene	ND	0.333	mg/kg wet							
Benzo(a)pyrene	ND	0.167	mg/kg wet							
Benzo(b)fluoranthene	ND	0.333	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.333	mg/kg wet							
Benzo(k)fluoranthene	ND	0.333	mg/kg wet							
bis(2-Chloroethoxy)methane	ND	0.333	mg/kg wet							
bis(2-Chloroethyl)ether	ND	0.333	mg/kg wet							
bis(2-chloroisopropyl)Ether	ND	0.333	mg/kg wet							
bis(2-Ethylhexyl)phthalate	ND	0.333	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1711282

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CK71309 - 3546										
Butylbenzylphthalate	ND	0.333	mg/kg wet							
Chrysene	ND	0.167	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.167	mg/kg wet							
Dibenzofuran	ND	0.333	mg/kg wet							
Diethylphthalate	ND	0.333	mg/kg wet							
Dimethylphthalate	ND	0.333	mg/kg wet							
Di-n-butylphthalate	ND	0.333	mg/kg wet							
Di-n-octylphthalate	ND	0.333	mg/kg wet							
Fluoranthene	ND	0.333	mg/kg wet							
Fluorene	ND	0.333	mg/kg wet							
Hexachlorobenzene	ND	0.333	mg/kg wet							
Hexachlorobutadiene	ND	0.333	mg/kg wet							
Hexachloroethane	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.333	mg/kg wet							
Isophorone	ND	0.333	mg/kg wet							
Naphthalene	ND	0.333	mg/kg wet							
Nitrobenzene	ND	0.333	mg/kg wet							
N-Nitrosodimethylamine	ND	0.333	mg/kg wet							
Pentachlorophenol	ND	0.667	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Phenol	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
Pyridine	ND	1.67	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	*2.50*		mg/kg wet	*3.333*		*75*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*3.70*		mg/kg wet	*5.000*		*74*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.86*		mg/kg wet	*5.000*		*77*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.77*		mg/kg wet	*3.333*		*83*	*30-130*			
Surrogate: 2-Fluorophenol	*3.63*		mg/kg wet	*5.000*		*73*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.54*		mg/kg wet	*3.333*		*76*	*30-130*			
Surrogate: Phenol-d6	*3.93*		mg/kg wet	*5.000*		*79*	*30-130*			
Surrogate: p-Terphenyl-d14	*3.69*		mg/kg wet	*3.333*		*111*	*30-130*			
LCS										
1,2,4-Trichlorobenzene	2.19	0.333	mg/kg wet	3.333		66	40-140			
1,2-Dichlorobenzene	2.00	0.333	mg/kg wet	3.333		60	40-140			
1,3-Dichlorobenzene	1.96	0.333	mg/kg wet	3.333		59	40-140			
1,4-Dichlorobenzene	1.96	0.333	mg/kg wet	3.333		59	40-140			
2,4,5-Trichlorophenol	2.78	0.333	mg/kg wet	3.333		83	30-130			
2,4,6-Trichlorophenol	2.72	0.333	mg/kg wet	3.333		82	30-130			
2,4-Dichlorophenol	2.46	0.333	mg/kg wet	3.333		74	30-130			
2,4-Dimethylphenol	2.35	0.333	mg/kg wet	3.333		71	30-130			
2,4-Dinitrophenol	2.14	1.67	mg/kg wet	3.333		64	30-130			
2,4-Dinitrotoluene	2.85	0.333	mg/kg wet	3.333		86	40-140			
2,6-Dinitrotoluene	2.71	0.333	mg/kg wet	3.333		81	40-140			
2-Chloronaphthalene	2.44	0.333	mg/kg wet	3.333		73	40-140			
2-Chlorophenol	2.02	0.333	mg/kg wet	3.333		61	30-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1711282

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CK71309 - 3546										
2-Methylnaphthalene	2.39	0.333	mg/kg wet	3.333		72	40-140			
2-Methylphenol	2.38	0.333	mg/kg wet	3.333		71	30-130			
2-Nitrophenol	2.13	0.333	mg/kg wet	3.333		64	30-130			
3,3´-Dichlorobenzidine	2.45	0.667	mg/kg wet	3.333		73	40-140			
3+4-Methylphenol	4.72	0.667	mg/kg wet	6.667		71	30-130			
4-Bromophenyl-phenylether	2.97	0.333	mg/kg wet	3.333		89	40-140			
4-Chloroaniline	2.15	0.667	mg/kg wet	3.333		64	40-140			
4-Nitrophenol	2.55	1.67	mg/kg wet	3.333		77	30-130			
Acenaphthene	2.56	0.333	mg/kg wet	3.333		77	40-140			
Acenaphthylene	2.74	0.333	mg/kg wet	3.333		82	40-140			
Acetophenone	2.18	0.667	mg/kg wet	3.333		65	40-140			
Aniline	1.59	1.67	mg/kg wet	3.333		48	40-140			
Anthracene	2.99	0.333	mg/kg wet	3.333		90	40-140			
Azobenzene	2.55	0.333	mg/kg wet	3.333		76	40-140			
Benzo(a)anthracene	3.05	0.333	mg/kg wet	3.333		92	40-140			
Benzo(a)pyrene	3.00	0.167	mg/kg wet	3.333		90	40-140			
Benzo(b)fluoranthene	3.39	0.333	mg/kg wet	3.333		102	40-140			
Benzo(g,h,i)perylene	3.21	0.333	mg/kg wet	3.333		96	40-140			
Benzo(k)fluoranthene	2.46	0.333	mg/kg wet	3.333		74	40-140			
bis(2-Chloroethoxy)methane	2.18	0.333	mg/kg wet	3.333		65	40-140			
bis(2-Chloroethyl)ether	1.88	0.333	mg/kg wet	3.333		56	40-140			
bis(2-chloroisopropyl)Ether	1.94	0.333	mg/kg wet	3.333		58	40-140			
bis(2-Ethylhexyl)phthalate	3.00	0.333	mg/kg wet	3.333		90	40-140			
Butylbenzylphthalate	2.85	0.333	mg/kg wet	3.333		85	40-140			
Chrysene	2.98	0.167	mg/kg wet	3.333		89	40-140			
Dibenzo(a,h)Anthracene	3.16	0.167	mg/kg wet	3.333		95	40-140			
Dibenzofuran	2.67	0.333	mg/kg wet	3.333		80	40-140			
Diethylphthalate	3.12	0.333	mg/kg wet	3.333		94	40-140			
Dimethylphthalate	2.91	0.333	mg/kg wet	3.333		87	40-140			
Di-n-butylphthalate	3.05	0.333	mg/kg wet	3.333		92	40-140			
Di-n-octylphthalate	3.53	0.333	mg/kg wet	3.333		106	40-140			
Fluoranthene	3.25	0.333	mg/kg wet	3.333		97	40-140			
Fluorene	3.08	0.333	mg/kg wet	3.333		92	40-140			
Hexachlorobenzene	3.00	0.333	mg/kg wet	3.333		90	40-140			
Hexachlorobutadiene	2.20	0.333	mg/kg wet	3.333		66	40-140			
Hexachloroethane	1.91	0.333	mg/kg wet	3.333		57	40-140			
Indeno(1,2,3-cd)Pyrene	3.14	0.333	mg/kg wet	3.333		94	40-140			
Isophorone	2.08	0.333	mg/kg wet	3.333		62	40-140			
Naphthalene	2.17	0.333	mg/kg wet	3.333		65	40-140			
Nitrobenzene	2.03	0.333	mg/kg wet	3.333		61	40-140			
N-Nitrosodimethylamine	1.58	0.333	mg/kg wet	3.333		48	40-140			
Pentachlorophenol	2.80	1.67	mg/kg wet	3.333		84	30-130			
Phenanthrene	2.83	0.333	mg/kg wet	3.333		85	40-140			
Phenol	2.04	0.333	mg/kg wet	3.333		61	30-130			
Pyrene	2.93	0.333	mg/kg wet	3.333		88	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1711282

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CK71309 - 3546										
Pyridine	1.52	1.67	mg/kg wet	3.333		45	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	*2.06*		mg/kg wet	*3.333*		*62*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.69*		mg/kg wet	*5.000*		*94*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.34*		mg/kg wet	*5.000*		*67*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.82*		mg/kg wet	*3.333*		*85*	*30-130*			
Surrogate: 2-Fluorophenol	*3.03*		mg/kg wet	*5.000*		*61*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.23*		mg/kg wet	*3.333*		*67*	*30-130*			
Surrogate: Phenol-d6	*3.41*		mg/kg wet	*5.000*		*68*	*30-130*			
Surrogate: p-Terphenyl-d14	*3.39*		mg/kg wet	*3.333*		*102*	*30-130*			
LCS Dup										
1,2,4-Trichlorobenzene	2.75	0.333	mg/kg wet	3.333		83	40-140	23	30	
1,2-Dichlorobenzene	2.57	0.333	mg/kg wet	3.333		77	40-140	25	30	
1,3-Dichlorobenzene	2.56	0.333	mg/kg wet	3.333		77	40-140	26	30	
1,4-Dichlorobenzene	2.53	0.333	mg/kg wet	3.333		76	40-140	25	30	
2,4,5-Trichlorophenol	3.02	0.333	mg/kg wet	3.333		91	30-130	8	30	
2,4,6-Trichlorophenol	2.97	0.333	mg/kg wet	3.333		89	30-130	9	30	
2,4-Dichlorophenol	2.92	0.333	mg/kg wet	3.333		87	30-130	17	30	
2,4-Dimethylphenol	2.71	0.333	mg/kg wet	3.333		81	30-130	14	30	
2,4-Dinitrophenol	2.26	1.67	mg/kg wet	3.333		68	30-130	5	30	
2,4-Dinitrotoluene	3.04	0.333	mg/kg wet	3.333		91	40-140	6	30	
2,6-Dinitrotoluene	2.90	0.333	mg/kg wet	3.333		87	40-140	7	30	
2-Chloronaphthalene	2.72	0.333	mg/kg wet	3.333		81	40-140	11	30	
2-Chlorophenol	2.57	0.333	mg/kg wet	3.333		77	30-130	24	30	
2-Methylnaphthalene	2.89	0.333	mg/kg wet	3.333		87	40-140	19	30	
2-Methylphenol	2.95	0.333	mg/kg wet	3.333		89	30-130	22	30	
2-Nitrophenol	2.64	0.333	mg/kg wet	3.333		79	30-130	21	30	
3,3´-Dichlorobenzidine	2.41	0.667	mg/kg wet	3.333		72	40-140	2	30	
3+4-Methylphenol	5.64	0.667	mg/kg wet	6.667		85	30-130	18	30	
4-Bromophenyl-phenylether	3.15	0.333	mg/kg wet	3.333		95	40-140	6	30	
4-Chloroaniline	2.47	0.667	mg/kg wet	3.333		74	40-140	14	30	
4-Nitrophenol	2.69	1.67	mg/kg wet	3.333		81	30-130	5	30	
Acenaphthene	2.83	0.333	mg/kg wet	3.333		85	40-140	10	30	
Acenaphthylene	3.00	0.333	mg/kg wet	3.333		90	40-140	9	30	
Acetophenone	2.72	0.667	mg/kg wet	3.333		82	40-140	22	30	
Aniline	1.94	1.67	mg/kg wet	3.333		58	40-140	20	30	
Anthracene	3.14	0.333	mg/kg wet	3.333		94	40-140	5	30	
Azobenzene	2.71	0.333	mg/kg wet	3.333		81	40-140	6	30	
Benzo(a)anthracene	3.10	0.333	mg/kg wet	3.333		93	40-140	2	30	
Benzo(a)pyrene	3.26	0.167	mg/kg wet	3.333		98	40-140	8	30	
Benzo(b)fluoranthene	3.26	0.333	mg/kg wet	3.333		98	40-140	4	30	
Benzo(g,h,i)perylene	3.28	0.333	mg/kg wet	3.333		98	40-140	2	30	
Benzo(k)fluoranthene	2.87	0.333	mg/kg wet	3.333		86	40-140	16	30	
bis(2-Chloroethoxy)methane	2.64	0.333	mg/kg wet	3.333		79	40-140	19	30	
bis(2-Chloroethyl)ether	2.43	0.333	mg/kg wet	3.333		73	40-140	25	30	
bis(2-chloroisopropyl)Ether	2.46	0.333	mg/kg wet	3.333		74	40-140	23	30	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch CK71309 - 3546										
bis(2-Ethylhexyl)phthalate	3.12	0.333	mg/kg wet	3.333		94	40-140	4	30	
Butylbenzylphthalate	2.98	0.333	mg/kg wet	3.333		89	40-140	5	30	
Chrysene	3.10	0.167	mg/kg wet	3.333		93	40-140	4	30	
Dibenzo(a,h)Anthracene	3.32	0.167	mg/kg wet	3.333		100	40-140	5	30	
Dibenzofuran	2.95	0.333	mg/kg wet	3.333		88	40-140	10	30	
Diethylphthalate	3.33	0.333	mg/kg wet	3.333		100	40-140	6	30	
Dimethylphthalate	3.13	0.333	mg/kg wet	3.333		94	40-140	7	30	
Di-n-butylphthalate	3.18	0.333	mg/kg wet	3.333		95	40-140	4	30	
Di-n-octylphthalate	3.71	0.333	mg/kg wet	3.333		111	40-140	5	30	
Fluoranthene	3.34	0.333	mg/kg wet	3.333		100	40-140	3	30	
Fluorene	3.29	0.333	mg/kg wet	3.333		99	40-140	7	30	
Hexachlorobenzene	3.16	0.333	mg/kg wet	3.333		95	40-140	5	30	
Hexachlorobutadiene	2.78	0.333	mg/kg wet	3.333		83	40-140	23	30	
Hexachloroethane	2.51	0.333	mg/kg wet	3.333		75	40-140	27	30	
Indeno(1,2,3-cd)Pyrene	3.30	0.333	mg/kg wet	3.333		99	40-140	5	30	
Isophorone	2.55	0.333	mg/kg wet	3.333		76	40-140	20	30	
Naphthalene	2.75	0.333	mg/kg wet	3.333		83	40-140	24	30	
Nitrobenzene	2.57	0.333	mg/kg wet	3.333		77	40-140	24	30	
N-Nitrosodimethylamine	1.99	0.333	mg/kg wet	3.333		60	40-140	22	30	
Pentachlorophenol	2.92	1.67	mg/kg wet	3.333		88	30-130	4	30	
Phenanthrene	2.99	0.333	mg/kg wet	3.333		90	40-140	5	30	
Phenol	2.55	0.333	mg/kg wet	3.333		76	30-130	22	30	
Pyrene	3.13	0.333	mg/kg wet	3.333		94	40-140	6	30	
Pyridine	1.98	1.67	mg/kg wet	3.333		59	40-140	27	30	
Surrogate: 1,2-Dichlorobenzene-d4	*2.58*		mg/kg wet	*3.333*		*78*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*4.82*		mg/kg wet	*5.000*		*96*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*4.11*		mg/kg wet	*5.000*		*82*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*3.00*		mg/kg wet	*3.333*		*90*	*30-130*			
Surrogate: 2-Fluorophenol	*3.78*		mg/kg wet	*5.000*		*76*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.74*		mg/kg wet	*3.333*		*82*	*30-130*			
Surrogate: Phenol-d6	*4.14*		mg/kg wet	*5.000*		*83*	*30-130*			
Surrogate: p-Terphenyl-d14	*3.49*		mg/kg wet	*3.333*		*105*	*30-130*			
Classical Chemistry										
Batch CK71347 - General Preparation										
Blank										
Reactive Cyanide	ND	2.0	mg/kg							
Reactive Sulfide	ND	2.0	mg/kg							
LCS										
Reactive Cyanide	3.9	2.0	mg/kg	100.3		4	0.68-5.41			
Reactive Sulfide	ND	2.0	mg/kg	10.00		0	0-44			
Batch CK71415 - TCN Prep										
Blank										
Total Cyanide	ND	1.00	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Classical Chemistry										
Batch CK71415 - TCN Prep										
LCS										
Total Cyanide	5.09	1.00	mg/kg wet	5.015		102	90-110			
Reference										
Total Cyanide	51.2	4.98	mg/kg wet	48.40		106	36.1577-206.612			
Reference										
Total Cyanide	51.3	4.96	mg/kg wet	48.40		106	36.1577-206.612			
Batch CK71448 - General Preparation										
Blank										
Total Organic Carbon (1)	ND	200	mg/kg							
Total Organic Carbon (2)	ND	200	mg/kg							
Total Organic Carbon (Average)	ND	200	mg/kg							
LCS										
Total Organic Carbon (1)	9630	200	mg/kg	10000		96	80-120			
Total Organic Carbon (2)	10300	200	mg/kg	10000		103	80-120			
Total Organic Carbon (Average)	9950	200	mg/kg							
LCS Dup										
Total Organic Carbon (1)	9700	200	mg/kg	10000		97	80-120	0.8	200	
Total Organic Carbon (2)	9420	200	mg/kg	10000		94	80-120	9	200	
Total Organic Carbon (Average)	9560	200	mg/kg							
Reference										
Total Organic Carbon (Average)	1.40		mg/kg							
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch CK71307 - 3546										
Blank										
C19-C36 Aliphatics1	ND	8.0	mg/kg wet							
C9-C18 Aliphatics1	ND	8.0	mg/kg wet							
Decane (C10)	ND	0.5	mg/kg wet							
Docosane (C22)	ND	0.5	mg/kg wet							
Dodecane (C12)	ND	0.5	mg/kg wet							
Eicosane (C20)	ND	0.5	mg/kg wet							
Hexacosane (C26)	ND	0.5	mg/kg wet							
Hexadecane (C16)	ND	0.5	mg/kg wet							
Hexatriacontane (C36)	ND	0.5	mg/kg wet							
Nonadecane (C19)	ND	0.5	mg/kg wet							
Nonane (C9)	ND	0.5	mg/kg wet							
Octacosane (C28)	ND	0.5	mg/kg wet							
Octadecane (C18)	ND	0.5	mg/kg wet							
Tetracosane (C24)	ND	0.5	mg/kg wet							
Tetradecane (C14)	ND	0.5	mg/kg wet							
Triacontane (C30)	ND	0.5	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch CK71307 - 3546										
Surrogate: 1-Chlorooctadecane	*1.91*		mg/kg wet	*2.000*		*96*	*40-140*			
Blank										
C11-C22 Aromatics1,2	ND	12.5	mg/kg wet							
C11-C22 Unadjusted Aromatics1	ND	12.5	mg/kg wet							
Surrogate: 2-Bromonaphthalene	*1.84*		mg/kg wet	*2.000*		*92*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*2.25*		mg/kg wet	*2.000*		*113*	*40-140*			
Surrogate: O-Terphenyl	*1.69*		mg/kg wet	*2.000*		*85*	*40-140*			
Blank										
2-Methylnaphthalene	ND	0.008	mg/kg wet							
Acenaphthene	ND	0.008	mg/kg wet							
Acenaphthylene	ND	0.008	mg/kg wet							
Anthracene	ND	0.008	mg/kg wet							
Benzo(a)anthracene	ND	0.008	mg/kg wet							
Benzo(a)pyrene	ND	0.008	mg/kg wet							
Benzo(b)fluoranthene	ND	0.008	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.008	mg/kg wet							
Benzo(k)fluoranthene	ND	0.008	mg/kg wet							
C11-C22 Aromatics1,2	ND	0.136	mg/kg wet							
Chrysene	ND	0.008	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.008	mg/kg wet							
Fluoranthene	ND	0.008	mg/kg wet							
Fluorene	ND	0.008	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.008	mg/kg wet							
Naphthalene	ND	0.008	mg/kg wet							
Phenanthrene	ND	0.008	mg/kg wet							
Pyrene	ND	0.008	mg/kg wet							
LCS										
C19-C36 Aliphatics1	16.6	8.0	mg/kg wet	16.00		104	40-140			
C9-C18 Aliphatics1	9.9	8.0	mg/kg wet	12.00		83	40-140			
Decane (C10)	1.3	0.5	mg/kg wet	2.000		63	40-140			
Docosane (C22)	1.9	0.5	mg/kg wet	2.000		94	40-140			
Dodecane (C12)	1.4	0.5	mg/kg wet	2.000		68	40-140			
Eicosane (C20)	1.7	0.5	mg/kg wet	2.000		84	40-140			
Hexacosane (C26)	1.7	0.5	mg/kg wet	2.000		86	40-140			
Hexadecane (C16)	1.6	0.5	mg/kg wet	2.000		80	40-140			
Hexatriacontane (C36)	1.8	0.5	mg/kg wet	2.000		89	40-140			
Nonadecane (C19)	1.7	0.5	mg/kg wet	2.000		85	40-140			
Nonane (C9)	1.0	0.5	mg/kg wet	2.000		51	30-140			
Octacosane (C28)	1.7	0.5	mg/kg wet	2.000		87	40-140			
Octadecane (C18)	1.6	0.5	mg/kg wet	2.000		80	40-140			
Tetracosane (C24)	1.7	0.5	mg/kg wet	2.000		85	40-140			
Tetradecane (C14)	1.4	0.5	mg/kg wet	2.000		72	40-140			
Triacontane (C30)	1.8	0.5	mg/kg wet	2.000		88	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1711282

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch CK71307 - 3546										
Surrogate: 1-Chlorooctadecane	*1.92*		mg/kg wet	*2.000*		*96*	*40-140*			
LCS										
C11-C22 Aromatics1,2	25.5	12.5	mg/kg wet							
C11-C22 Unadjusted Aromatics1	25.5	12.5	mg/kg wet	34.00		75	40-140			
Surrogate: 2-Bromonaphthalene	*1.60*		mg/kg wet	*2.000*		*80*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*1.95*		mg/kg wet	*2.000*		*97*	*40-140*			
Surrogate: O-Terphenyl	*1.45*		mg/kg wet	*2.000*		*73*	*40-140*			
LCS										
2-Methylnaphthalene Breakthrough	0.0		%				0-5			
Naphthalene Breakthrough	0.0		%				0-5			
LCS										
2-Methylnaphthalene	1.36	0.016	mg/kg wet	2.000		68	40-140			
Acenaphthene	1.76	0.016	mg/kg wet	2.000		88	40-140			
Acenaphthylene	1.84	0.016	mg/kg wet	2.000		92	40-140			
Anthracene	2.15	0.016	mg/kg wet	2.000		108	40-140			
Benzo(a)anthracene	1.91	0.016	mg/kg wet	2.000		95	40-140			
Benzo(a)pyrene	2.32	0.016	mg/kg wet	2.000		116	40-140			
Benzo(b)fluoranthene	2.20	0.016	mg/kg wet	2.000		110	40-140			
Benzo(g,h,i)perylene	2.25	0.016	mg/kg wet	2.000		112	40-140			
Benzo(k)fluoranthene	2.15	0.016	mg/kg wet	2.000		107	40-140			
C11-C22 Aromatics1,2	ND	0.272	mg/kg wet							
Chrysene	2.07	0.016	mg/kg wet	2.000		103	40-140			
Dibenzo(a,h)Anthracene	2.72	0.016	mg/kg wet	2.000		136	40-140			
Fluoranthene	2.44	0.016	mg/kg wet	2.000		122	40-140			
Fluorene	2.06	0.016	mg/kg wet	2.000		103	40-140			
Indeno(1,2,3-cd)Pyrene	2.70	0.016	mg/kg wet	2.000		135	40-140			
Naphthalene	1.35	0.016	mg/kg wet	2.000		68	40-140			
Phenanthrene	1.98	0.016	mg/kg wet	2.000		99	40-140			
Pyrene	1.73	0.016	mg/kg wet	2.000		86	40-140			
LCS Dup										
C19-C36 Aliphatics1	12.6	8.0	mg/kg wet	16.00		79	40-140	28	25	D+
C9-C18 Aliphatics1	6.7	8.0	mg/kg wet	12.00		56	40-140	38	25	D+
Decane (C10)	0.7	0.5	mg/kg wet	2.000		33	40-140	62	25	B-, D+
Docosane (C22)	1.4	0.5	mg/kg wet	2.000		70	40-140	30	25	D+
Dodecane (C12)	0.7	0.5	mg/kg wet	2.000		37	40-140	60	25	B-, D+
Eicosane (C20)	1.4	0.5	mg/kg wet	2.000		69	40-140	20	25	
Hexacosane (C26)	1.4	0.5	mg/kg wet	2.000		70	40-140	20	25	
Hexadecane (C16)	1.2	0.5	mg/kg wet	2.000		59	40-140	31	25	D+
Hexatriacontane (C36)	1.5	0.5	mg/kg wet	2.000		75	40-140	17	25	
Nonadecane (C19)	1.4	0.5	mg/kg wet	2.000		70	40-140	20	25	
Nonane (C9)	0.5	0.5	mg/kg wet	2.000		27	30-140	61	25	D+, B-
Octacosane (C28)	1.4	0.5	mg/kg wet	2.000		71	40-140	20	25	
Octadecane (C18)	1.3	0.5	mg/kg wet	2.000		65	40-140	21	25	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1711282

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch CK71307 - 3546										
Tetracosane (C24)	1.4	0.5	mg/kg wet	2.000		70	40-140	20	25	
Tetradecane (C14)	0.9	0.5	mg/kg wet	2.000		46	40-140	45	25	D+
Triacontane (C30)	1.4	0.5	mg/kg wet	2.000		72	40-140	19	25	
Surrogate: 1-Chlorooctadecane	*1.60*		mg/kg wet	*2.000*		*80*	*40-140*			
LCS Dup										
C11-C22 Aromatics1,2	32.1	12.5	mg/kg wet							
C11-C22 Unadjusted Aromatics1	32.1	12.5	mg/kg wet	34.00		94	40-140	23	25	
Surrogate: 2-Bromonaphthalene	*2.05*		mg/kg wet	*2.000*		*102*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*2.18*		mg/kg wet	*2.000*		*109*	*40-140*			
Surrogate: O-Terphenyl	*1.93*		mg/kg wet	*2.000*		*96*	*40-140*			
LCS Dup										
2-Methylnaphthalene Breakthrough	0.0		%				0-5		200	
Naphthalene Breakthrough	0.0		%				0-5		200	
LCS Dup										
2-Methylnaphthalene	1.68	0.016	mg/kg wet	2.000		84	40-140	21	30	
Acenaphthene	2.10	0.016	mg/kg wet	2.000		105	40-140	18	30	
Acenaphthylene	2.24	0.016	mg/kg wet	2.000		112	40-140	20	30	
Anthracene	2.39	0.016	mg/kg wet	2.000		119	40-140	10	30	
Benzo(a)anthracene	2.12	0.016	mg/kg wet	2.000		106	40-140	11	30	
Benzo(a)pyrene	2.51	0.016	mg/kg wet	2.000		126	40-140	8	30	
Benzo(b)fluoranthene	2.47	0.016	mg/kg wet	2.000		123	40-140	11	30	
Benzo(g,h,i)perylene	2.32	0.016	mg/kg wet	2.000		116	40-140	3	30	
Benzo(k)fluoranthene	2.47	0.016	mg/kg wet	2.000		123	40-140	14	30	
C11-C22 Aromatics1,2	ND	0.272	mg/kg wet							
Chrysene	2.21	0.016	mg/kg wet	2.000		111	40-140	7	30	
Dibenzo(a,h)Anthracene	2.60	0.016	mg/kg wet	2.000		130	40-140	5	30	
Fluoranthene	2.80	0.016	mg/kg wet	2.000		140	40-140	14	30	
Fluorene	2.37	0.016	mg/kg wet	2.000		118	40-140	14	30	
Indeno(1,2,3-cd)Pyrene	2.67	0.016	mg/kg wet	2.000		134	40-140	0.9	30	
Naphthalene	1.73	0.016	mg/kg wet	2.000		87	40-140	24	30	
Phenanthrene	2.17	0.016	mg/kg wet	2.000		109	40-140	9	30	
Pyrene	1.92	0.016	mg/kg wet	2.000		96	40-140	10	30	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1711282

Notes and Definitions

Q	Calibration required quadratic regression (Q).
B-	Blank Spike recovery is below lower control limit (B-).
B+	Blank Spike recovery is above upper control limit (B+).
CD-	Continuing Calibration %Diff/Drift is below control limit (CD-).
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
D	Diluted.
D+	Relative percent difference for duplicate is outside of criteria (D+).
EL	Elevated Method Reporting Limits due to sample matrix (EL).
#	Modified result
P	Percent difference between primary and confirmation results exceeds 40% (P).
Z-10a	Soil pH measured in water at 19.0 ºC.
SC	Surrogate recovery(ies) outside of criteria. Reextraction/Reanalysis confirms results (SC).
SM	Surrogate recovery(ies) outside of criteria due to matrix (UCM/coelution/matrix is present) (SM).
U	Analyte included in the analysis, but not detected
XH	Peaks found in the retention time window for MCPP did not confirm by GC/MS.
Z-08	See Attached
Z-09	ND
Z-10	Soil pH measured in water at 18.7 ºC.
LC	Lower value is used due to matrix interferences (LC).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury

ESS Laboratory Work Order: 1711282

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

PESTICIDES BREAKDOWN CHECK SUMMARY

Data File Name GM009006.D
Data File Path Q:\SVOA\GC11_GM\DATA\GM1117\111417\
Date Acquired 11-14-2017 04:14:04 PM
Sample Name **C7K0218-PEM1**
Instrument Name SVOAGC11

#	Name	Ret Time 1	Ret Time 2	Response 1	Response 2
1)	Tetrachloro-m-xylene	5.31	6.91	434629133.7	259320484
13)	4,4'-DDE	10.66	13.01	7288490.152	2930500.185
16)	Endrin	11.65	14.01	736511681.3	416877969.6
17)	4,4'-DDD	11.81	14.17	23506660.44	15966136.26
19)	4,4'-DDT	12.35	14.84	555489752	326349724.8
20)	Endrin Aldehyde	12.89	15.19	3848601.306	2733478.95
23)	Endrin Ketone	14.26	17.34	9708026.114	5191717.333
29)	Decachlorobiphenyl	16.60	22.14	249847236	173907667.7

Breakdown Column 1	**Endrin:**	**1.81 %**	**PASS**
	4,4'-DDT:	**5.25 %**	**PASS**
Breakdown Column 2	**Endrin:**	**1.87 %**	**PASS**
	4,4'-DDT:	**5.47 %**	**PASS**

Passing Criteria (for each column):
Individual breakdown is not to exceed 15.0%

Sterling Analytical, Inc.
15 Agawam Avenue
West Springfield, MA 01089
Phone (413) 214-6541 Fax (413) 214-6842
email-madhu@sterlinganalytical.com

Visit our website: www.sterlinganalytical.com

Mass Certification - MA-00071
Conn Certification - PH-0520

Report Date November 20, 2017

Customer	Contact	Laboratory Supervisor	eMail
ESS Laboratory	S. Morrell	Madhu Shah	customerservice@sterlinganalytical.com

Sample Description
Analysis of Solid Samples

Samples Analyzed

Enclosed are Report No(s): 61755, 61756

****Results reported on 'dry basis'.**

Blank = <0.05ppm

LCS Lo Check 0.100 = 0.085ppm

ICV 1.00 = 1.008ppm

Thank you for your business

madhu shah — 11/20/2017

Madhu Shah, Laboratory Supervisor **Date**

ALL the information contained in this report has been reviewed for accuracy and checked against all quality control requirements outlined in each applicable method.
This report may not be reproduced, except in full, without written approval from Sterling Analytical, Inc.

Sample	Description	Source	Taken/Time	Received
61755	1711282-01	ESS Laboratory	11/8/17	11/13/17

Parameter	Results		MDL	Method	Analyzed/Time	Tech
Sulfur, Total	1,270	mg/kg	100.00	SW 846 6010	11/17/17	dfp

Sample	Description	Source	Taken/Time	Received
61756	1711282-02	ESS Laboratory	11/8/17	11/13/17

Parameter	Results		MDL	Method	Analyzed/Time	Tech
Sulfur, Total	2,260	mg/kg	100.00	SW 846 6010	11/17/17	dfp

ESS Laboratory — Sterling

Division of Thielsch Engineering, Inc.

185 Frances Avenue, Cranston, RI 02910-2211
Tel. (401) 461-7181 Fax (401) 461-4486
www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab # 1711282

Turn Time **Standard** Other_____

Regulatory State: MA RI CT NH NJ NY ME Other_____

Is this project for any of the following:(please circle)
MA-MCP Navy USACE CT DEP Other_____

Reporting Limits - _____

Electonic Deliverables Excel Access PDF

Co. Name: ESS LABORATORY	Project #:	Project Name: 1711282	
Contact Person: Shawn Morrell	Address:		
City:	State:	Zip:	PO #: B02409
Tel:	email: smorrell@thielsch.com		

ESS Lab ID	Date	Collection Time	Grab -G Composite-C	Matrix	Sample ID	Pres Code	# of Containers	Type of Container	Vol of Container	Analysis: Total Sulfur 6010 mg/Kg
	11/8/17	1000		S	1711282-01	1				X
	11/8/17	1045		S	1711282-02	1				X

Container Type: P-Poly G-Glass AG-Amber Glass S-Sterile V-VOA

Matrix: S-Soil SD-Solid D-Sludge WW-Wastewater GW-Groundwater SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filter

Cooler Present ✓ Yes _____No

Seals Intact ____ Yes _____No NA:___

Cooler Temperature: _____

Internal Use Only
[ ] Pickup
[ ] Technician___

Preservation Code: 1-NP, 2-HCl, 3-H2SO4, 4-HNO3, 5-NaOH, 6-MeOH, 7-Asorbic Acid, 8-ZnAct, 9-_____

Sampled by :

Comments: **QC required MB and LCS**

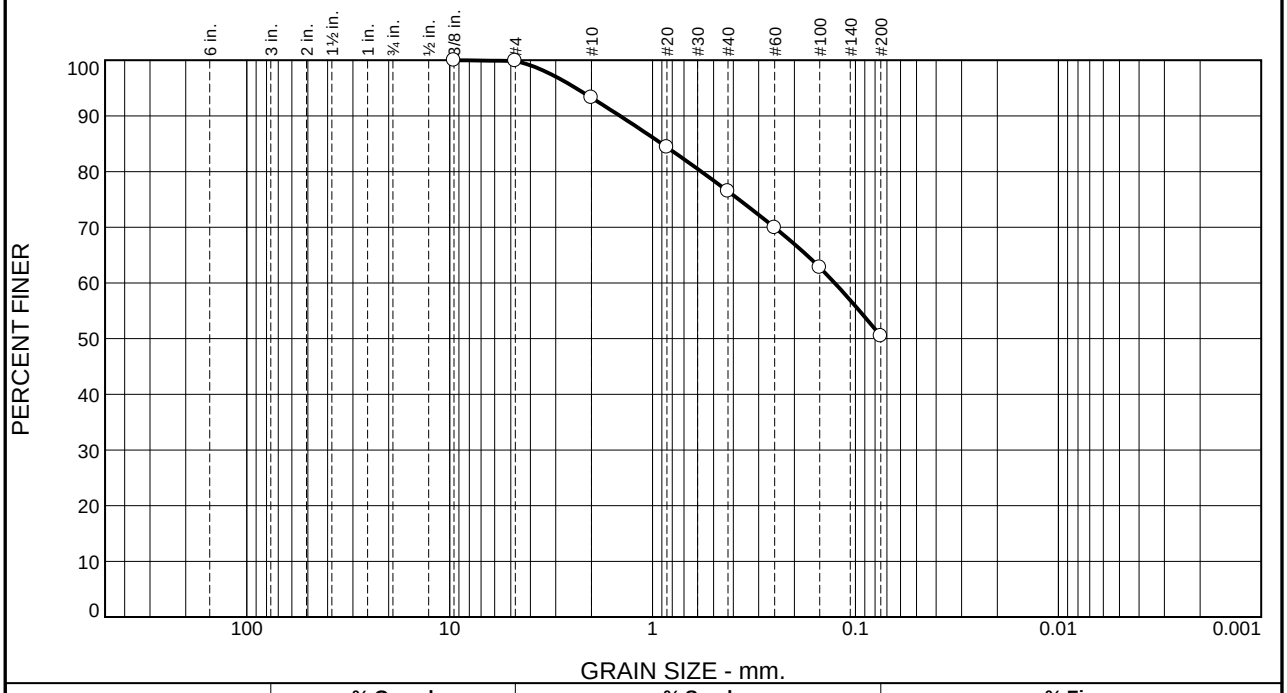
Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)
11/13/17 11:39	11/13/17		
Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)

* By circling MA-MCP, client acknowledges samples were

Please fax to the laboratory all changes to Chain of Custody

1 (White) Lab Copy

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	6.6	16.8	26.0	50.5	

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
0.375"	100.0		
#4	99.9		
#10	93.3		
#20	84.4		
#40	76.5		
#60	69.9		
#100	62.8		
#200	50.5		

* (no specification provided)

Material Description

Very dark brown sandy silt (ML)

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= CL **AASHTO (M 145)=** A-4

Coefficients

D_{90}= 1.4467 D_{85}= 0.8999 D_{60}= 0.1266
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Sample was visually checked for plasticity and appeared plastic.
Reserved 200g for Atterberg Limits.

Date Received: 11/9/17 **Date Tested:** 11/14/17

Tested By: RR / JAL

Checked By: Matthew Colman P.E.

Title: Laboratory Manager

Source of Sample: Borings **Date Sampled:** 11/8/17

Sample Number: 044752-SS610R-LT

Thielsch Engineering Inc.

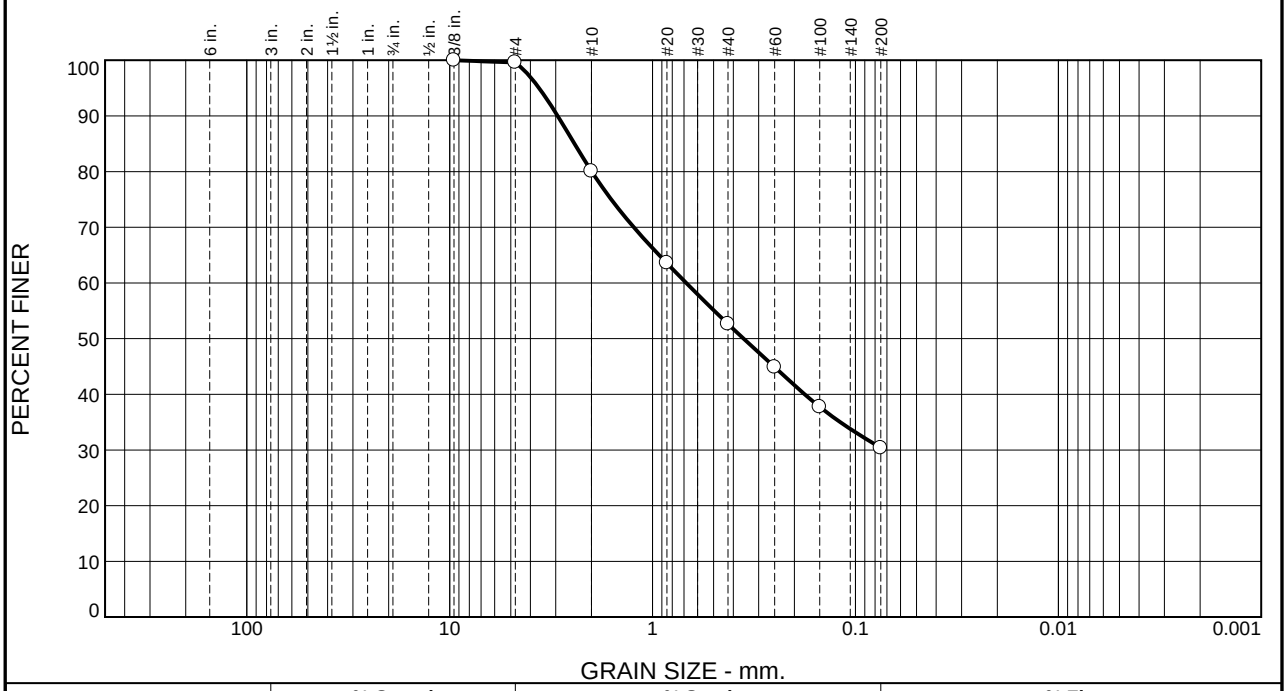
Cranston, RI

Client: ESS / GEI

Project: Amesbury

Project No: 1711282 **Figure** 1711282-01

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.4	19.5	27.5	22.2	30.4	

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
0.375"	100.0		
#4	99.6		
#10	80.1		
#20	63.6		
#40	52.6		
#60	44.9		
#100	37.7		
#200	30.4		

* (no specification provided)

Material Description

Very dark brown silty sand (SM)

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= SC **AASHTO (M 145)=** A-2-4

Coefficients

D_{90}= 2.9366 D_{85}= 2.4254 D_{60}= 0.6823
D_{50}= 0.3557 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Remarks

Sample was visually checked for plasticity and appeared plastic.
Reserved 200g for Atterberg Limits.

Date Received: 11/10/17 **Date Tested:** 11/14/17

Tested By: RR / JAL

Checked By: Matthew Colman P.E.

Title: Laboratory Manager

Source of Sample: Borings **Date Sampled:** 11/8/17

Sample Number: 04475-SS611R-LT

Thielsch Engineering Inc.

Cranston, RI

Client: ESS / GEI

Project: Amesbury

Project No: 1711282 **Figure** 1711282-02

SOILS LABORATORY TESTING ASSIGNMENT SHEET

THIELSCH ENGINEERING
195 Frances Ave., Cranston, RI 02910
401-467-6454

Project Name **Amesbury**
ESS Project No. 1711282
Project Manager Michelle Mirenda
Date Received 11/9/2017 (by)

Client Company GEI
Client Email
Site Location
Date Assigned

Collected By
Date Required 11/14/2017

Sample Information				Lab No.	Identification Tests								Permeability		Compaction			Soil Strength			Consol.		Notes
Boring/ Test Pit No.	Sample or depth	Sample date	ESS Sample ID		Water Cont. %	LL & PL %	Org. %	Bulk	Sieve -200 %	Hyd -2μ %	G_s	Tube Den-sity	Sand	Clay	Mod.	Std.	CBR	Un-con-fined	UU	CIU	Stand ard	E.O.P.	
					D2216	D4318	D2974		D422		D854		D2434	D5084	D1557	D698	D1883	D2166	D2850	D4767	D2435	D2435	#
044752-SS610R-LT		11/8/17	1711282-01						X														**
044752-SS611R-LT		11/8/17	1711282-02						X														**

Notes: ** = Sieves 4, 10, 40 , 60, 200

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

Shipped/Delivered Via: ESS Courier

ESS Project ID: 1711282
Date Received: 11/9/2017
Project Due Date: 11/16/2017
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 1.1 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? No
7. Is COC complete and correct? No
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** (Yes) / No / NA
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? (Yes) / No
    ESS Sample IDs: 1-2
    Analysis: Total Sulfur, grain size
    TAT: 5 day
12. Were VOAs received? (Yes) / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA
13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: 11/9/17 Time: 2348 By:

Sample Receiving Notes:

COC = 12 containers per sample; recd ID at 11/9/17

14. Was there a need to contact Project Manager? (Yes) / No
    a. Was there a need to contact the client? ~~Yes~~ / No
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	180706	Yes	NA	Yes	Driller Jar	NP	
01	180707	Yes	NA	Yes	2 oz. Jar - Unpres	NP	
01	180708	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
01	180709	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
01	180710	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
01	180711	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
01	180712	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
01	180713	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
01	180714	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
01	180716	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
02	180697	Yes	NA	Yes	Driller Jar	NP	
02	180698	Yes	NA	Yes	2 oz. Jar - Unpres	NP	
02	180699	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
02	180700	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
02	180701	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
02	180702	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
02	180703	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
02	180704	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
02	180705	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
02	180715	Yes	NA	Yes	VOA Vial - Methanol	MeOH	

2nd Review
Are barcode labels on correct containers? (Yes) / No

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

ESS Project ID: 1711282
Date Received: 11/9/2017

Completed By: _____ Date & Time: 11/9/17 2230
Reviewed By: _____ Date & Time: 11/9/17 2339
Delivered By: _____ 11/9/17 2339

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 1711282

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury
Project Number: 044752
Project Location: Amesbury, MA
Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman
Send EDD to: labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY REQUIRED -- YES NO

If Yes, Are MCP Analytical Methods Required?	**YES**	NO	NA
Are Drinking Water Samples Submitted?	YES	**NO**	NA
If Yes, Have Drinking Water Sampling Requirements Been Met?	YES	NO	**NA**

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Preservative	VOCs 8620 High	SVOCs 8270 SIM*	TPH 8100M	PCBs NOAA Summation of Congeners	EPH fractions only	RCRA8 metals + Cu, Ni, Zn	Pesticides and Herbicides	Reactivity, Corrosivity,	Total Sulfur 6010	Total Cyanide 9010	Volatile Solids (percent)	Total Organic Carbon (Lloyd Kahn)	Grain Size (Sieve Nos. 4, 10, 40, 60, and 200)	Sample Specific Remarks
							MeOH														
1	044752-SS610R LT	11/8/2017	1000	Soil	12	LLT		X	X	X	X	X	X	X	X	X	X	X	X	X	
2	044752-SS611R LT	11/8/2017	1045	Soil	12	LLT		X	X	X	X	X	X	X	X	X	X	X	X	X	

Sample Handling

Samples Field Filtered: YES NO **NA**

Sampled Shipped With Ice: YES NO

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

	Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1.	[signature]	11/8/17	1325	1. GEI Sample Fridge
2.	GEI Sample Fridge	11/9/17	1157	2. [signature]
3.	[signature]	11/9/17	1157	3. [signature]
4.	[signature]	11/9/17	20:19	4. [signature] 11/9/17 2201

Ice temp: 1.1

Turnaround Time (Business days):

Normal ____ Other ____
10-Day ____ 7-Day ____
5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

Special pricing - see Tim Byrne
*For 8270, also report pyridine and toxaphene

Appendix I Laboratory Data Reports – Porewater

ESS Laboratory
DIVISION OF THE RISE GROUP

BAL Laboratory Analytical Balance

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: 24G0971

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 6:15 pm, Aug 01, 2024

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: 24G0971

SAMPLE RECEIPT

The following samples were received on July 25, 2024 for the analyses specified on the enclosed Chain of Custody Record.

To achieve CAM compliance for MCP data, ESS Laboratory has reviewed all QA/QC Requirements and Performance Standards listed in each method. Holding times and preservation have also been reviewed. All CAM requirements have been performed and achieved unless noted in the project narrative.

Each method has been set-up in the laboratory to reach required MCP standards. The methods for aqueous VOA and Soil Methanol VOA have known limitations for certain analytes. The regulatory standards may not be achieved due to these limitations. In addition, for all methods, matrix interferences, dilutions, and %Solids may elevate method reporting limits above regulatory standards. ESS Laboratory can provide, upon request, a Limit Checker (regulatory standard comparison spreadsheet) electronic deliverable which will highlight these exceedances.

Lab Number	Sample Name	Matrix	Analysis
24G0971-01	1804576-846R	Ground Water	8260D
24G0971-02	1804576-854R	Ground Water	8260D
24G0971-03	1804576-844R	Ground Water	8260D
24G0971-04	1804574-853R	Ground Water	8260D

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: 24G0971

PROJECT NARRATIVE

Volatile Organics
D4G0580-CCV1 **Calibration required quadratic regression (Q).**
1,1,1,2-Tetrachloroethane (99% @ 80-120%), 1,2,3-Trichlorobenzene (98% @ 80-120%), Bromoform (103% @ 40-160%), Carbon Tetrachloride (99% @ 80-120%), Dibromochloromethane (100% @ 40-160%), Hexachloroethane (102% @ 80-120%), Naphthalene (101% @ 40-160%), trans-1,3-Dichloropropene (101% @ 80-120%)

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: 24G0971

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010D - ICP
6020B - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260D - VOA
8270E - SVOA
8270E SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 19-2.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: 24G0971

MassDEP Analytical Protocol Certification Form

MADEP RTN: _____

This form provides certification for the following data set: **24G0971-01 through 24G0971-04**

Matrices: (X) Ground Water/Surface Water ( ) Soil/Sediment ( ) Drinking Water ( ) Air ( ) Other:_____

CAM Protocol (check all that apply below):

(X) 8260 VOC CAM II A	( ) 7470/7471 Hg CAM III B	( ) MassDEP VPH (GC/PID/FID) CAM IV A	( ) 8082 PCB CAM V A	( ) 9014 Total Cyanide/PAC CAM VI A	( ) 6860 Perchlorate CAM VIII B
( ) 8270 SVOC CAM II B	( ) 7010 Metals CAM III C	( ) MassDEP VPH (GC/MS) CAM IV C	( ) 8081 Pesticides CAM V B	( ) 7196 Hex Cr CAM VI B	( ) MassDEP APH CAM IX A
( ) 6010 Metals CAM III A	( ) 6020 Metals CAM III D	( ) MassDEP EPH CAM IV B	( ) 8151 Herbicides CAM V C	( ) Explosives CAM VIII A	( ) TO-15 VOC CAM IX B

Affirmative responses to questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	Yes (X) No ( )
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	Yes (X) No ( )
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	Yes (X) No ( )
D	Does the laboratory report comply with all the reporting requirements specified in the CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	Yes (X) No ( )
E	VPH, EPH, APH and TO-15 only: a. Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	Yes ( ) No ( )
	b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	Yes ( ) No ( )
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	Yes (X) No ( )

Responses to Questions G, H and I below are required for '"Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocols(s)?	Yes (X) No ( )*
	***Data User Note:* Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.**	
H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	Yes (X) No ( )*
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	Yes (X) No ( )*

All negative responses must be addressed in an attached laboratory narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature: _____ Date: August 01, 2024
Printed Name: Laurel Stoddard Position: Laboratory Director

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-846R
Date Sampled: 07/24/24 10:30
Percent Solids: N/A
Initial Volume: 5ml
Final Volume: 5ml
Extraction Method: 5030B

ESS Laboratory Work Order: 24G0971
ESS Laboratory Sample ID: 24G0971-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: MD
Prepared: 7/26/24 8:00

Volatile Organics

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
1,1,1-Trichloroethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
1,1,2,2-Tetrachloroethane	ND (0.5)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
1,1,2-Trichloroethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
1,1-Dichloroethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
1,1-Dichloroethene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
1,1-Dichloropropene	ND (2.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
1,2,3-Trichlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
1,2,3-Trichloropropane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
1,2,4-Trichlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
1,2,4-Trimethylbenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
1,2-Dibromo-3-Chloropropane	ND (5.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
1,2-Dibromoethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
1,2-Dichlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
1,2-Dichloroethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
1,2-Dichloropropane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
1,3,5-Trimethylbenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
1,3-Dichlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
1,3-Dichloropropane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
1,4-Dichlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
1,4-Dioxane - Screen	ND (100)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
2,2-Dichloropropane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
2-Butanone	ND (10.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
2-Chlorotoluene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
2-Hexanone	ND (10.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
4-Chlorotoluene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
4-Isopropyltoluene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-846R
Date Sampled: 07/24/24 10:30
Percent Solids: N/A
Initial Volume: 5ml
Final Volume: 5ml
Extraction Method: 5030B

ESS Laboratory Work Order: 24G0971
ESS Laboratory Sample ID: 24G0971-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: MD
Prepared: 7/26/24 8:00

Volatile Organics

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
4-Methyl-2-Pentanone	ND (10.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
Acetone	**35.7** (10.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
Benzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
Bromobenzene	ND (2.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
Bromochloromethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
Bromodichloromethane	ND (0.6)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
Bromoform	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
Bromomethane	ND (2.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
Carbon Disulfide	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
Carbon Tetrachloride	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
Chlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
Chloroethane	ND (2.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
Chloroform	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
Chloromethane	ND (2.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
cis-1,2-Dichloroethene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
cis-1,3-Dichloropropene	ND (0.4)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
Dibromochloromethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
Dibromomethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
Dichlorodifluoromethane	ND (2.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
Diethyl Ether	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
Di-isopropyl ether	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
Ethyl tertiary-butyl ether	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
Ethylbenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
Hexachlorobutadiene	ND (0.6)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
Hexachloroethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
Isopropylbenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
Methyl tert-Butyl Ether	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-846R
Date Sampled: 07/24/24 10:30
Percent Solids: N/A
Initial Volume: 5ml
Final Volume: 5ml
Extraction Method: 5030B

ESS Laboratory Work Order: 24G0971
ESS Laboratory Sample ID: 24G0971-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: MD
Prepared: 7/26/24 8:00

Volatile Organics

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Methylene Chloride	ND (2.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
Naphthalene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
n-Butylbenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
n-Propylbenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
sec-Butylbenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
Styrene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
tert-Butylbenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
Tertiary-amyl methyl ether	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
Tetrachloroethene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
Tetrahydrofuran	ND (5.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
Toluene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
trans-1,2-Dichloroethene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
trans-1,3-Dichloropropene	ND (0.4)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
Trichloroethene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
Trichlorofluoromethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
Vinyl Chloride	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
Xylene O	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
Xylene P,M	ND (2.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639
Xylenes (Total)	ND (2.0)	---	8260D	---	1	MD	07/26/24 22:04	D4G0580	DG42639

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichloroethane-d4	*104 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*102 %*		*70-130*
Surrogate: Dibromofluoromethane	*98 %*		*70-130*
Surrogate: Toluene-d8	*100 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-854R
Date Sampled: 07/24/24 14:00
Percent Solids: N/A
Initial Volume: 5ml
Final Volume: 5ml
Extraction Method: 5030B

ESS Laboratory Work Order: 24G0971
ESS Laboratory Sample ID: 24G0971-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: MD
Prepared: 7/26/24 8:00

Volatile Organics

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
1,1,1-Trichloroethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
1,1,2,2-Tetrachloroethane	ND (0.5)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
1,1,2-Trichloroethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
1,1-Dichloroethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
1,1-Dichloroethene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
1,1-Dichloropropene	ND (2.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
1,2,3-Trichlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
1,2,3-Trichloropropane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
1,2,4-Trichlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
1,2,4-Trimethylbenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
1,2-Dibromo-3-Chloropropane	ND (5.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
1,2-Dibromoethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
1,2-Dichlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
1,2-Dichloroethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
1,2-Dichloropropane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
1,3,5-Trimethylbenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
1,3-Dichlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
1,3-Dichloropropane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
1,4-Dichlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
1,4-Dioxane - Screen	ND (100)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
2,2-Dichloropropane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
2-Butanone	ND (10.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
2-Chlorotoluene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
2-Hexanone	ND (10.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
4-Chlorotoluene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
4-Isopropyltoluene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-854R
Date Sampled: 07/24/24 14:00
Percent Solids: N/A
Initial Volume: 5ml
Final Volume: 5ml
Extraction Method: 5030B

ESS Laboratory Work Order: 24G0971
ESS Laboratory Sample ID: 24G0971-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: MD
Prepared: 7/26/24 8:00

Volatile Organics

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
4-Methyl-2-Pentanone	ND (10.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
Acetone	ND (10.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
Benzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
Bromobenzene	ND (2.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
Bromochloromethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
Bromodichloromethane	ND (0.6)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
Bromoform	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
Bromomethane	ND (2.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
Carbon Disulfide	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
Carbon Tetrachloride	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
Chlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
Chloroethane	ND (2.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
Chloroform	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
Chloromethane	ND (2.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
cis-1,2-Dichloroethene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
cis-1,3-Dichloropropene	ND (0.4)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
Dibromochloromethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
Dibromomethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
Dichlorodifluoromethane	ND (2.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
Diethyl Ether	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
Di-isopropyl ether	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
Ethyl tertiary-butyl ether	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
Ethylbenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
Hexachlorobutadiene	ND (0.6)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
Hexachloroethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
Isopropylbenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
Methyl tert-Butyl Ether	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-854R
Date Sampled: 07/24/24 14:00
Percent Solids: N/A
Initial Volume: 5ml
Final Volume: 5ml
Extraction Method: 5030B

ESS Laboratory Work Order: 24G0971
ESS Laboratory Sample ID: 24G0971-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: MD
Prepared: 7/26/24 8:00

Volatile Organics

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Methylene Chloride	ND (2.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
Naphthalene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
n-Butylbenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
n-Propylbenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
sec-Butylbenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
Styrene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
tert-Butylbenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
Tertiary-amyl methyl ether	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
Tetrachloroethene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
Tetrahydrofuran	ND (5.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
Toluene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
trans-1,2-Dichloroethene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
trans-1,3-Dichloropropene	ND (0.4)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
Trichloroethene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
Trichlorofluoromethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
Vinyl Chloride	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
Xylene O	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
Xylene P,M	ND (2.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639
Xylenes (Total)	ND (2.0)	---	8260D	---	1	MD	07/26/24 22:29	D4G0580	DG42639

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichloroethane-d4	*104 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*99 %*		*70-130*
Surrogate: Dibromofluoromethane	*99 %*		*70-130*
Surrogate: Toluene-d8	*101 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-844R
Date Sampled: 07/24/24 11:50
Percent Solids: N/A
Initial Volume: 5ml
Final Volume: 5ml
Extraction Method: 5030B

ESS Laboratory Work Order: 24G0971
ESS Laboratory Sample ID: 24G0971-03
Sample Matrix: Ground Water
Units: ug/L
Analyst: MD
Prepared: 7/26/24 8:00

Volatile Organics

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
1,1,1-Trichloroethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
1,1,2,2-Tetrachloroethane	ND (0.5)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
1,1,2-Trichloroethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
1,1-Dichloroethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
1,1-Dichloroethene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
1,1-Dichloropropene	ND (2.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
1,2,3-Trichlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
1,2,3-Trichloropropane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
1,2,4-Trichlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
1,2,4-Trimethylbenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
1,2-Dibromo-3-Chloropropane	ND (5.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
1,2-Dibromoethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
1,2-Dichlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
1,2-Dichloroethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
1,2-Dichloropropane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
1,3,5-Trimethylbenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
1,3-Dichlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
1,3-Dichloropropane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
1,4-Dichlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
1,4-Dioxane - Screen	ND (100)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
2,2-Dichloropropane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
2-Butanone	ND (10.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
2-Chlorotoluene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
2-Hexanone	ND (10.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
4-Chlorotoluene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
4-Isopropyltoluene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-844R
Date Sampled: 07/24/24 11:50
Percent Solids: N/A
Initial Volume: 5ml
Final Volume: 5ml
Extraction Method: 5030B

ESS Laboratory Work Order: 24G0971
ESS Laboratory Sample ID: 24G0971-03
Sample Matrix: Ground Water
Units: ug/L
Analyst: MD
Prepared: 7/26/24 8:00

Volatile Organics

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
4-Methyl-2-Pentanone	ND (10.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
Acetone	ND (10.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
Benzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
Bromobenzene	ND (2.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
Bromochloromethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
Bromodichloromethane	ND (0.6)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
Bromoform	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
Bromomethane	ND (2.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
Carbon Disulfide	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
Carbon Tetrachloride	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
Chlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
Chloroethane	ND (2.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
Chloroform	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
Chloromethane	ND (2.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
cis-1,2-Dichloroethene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
cis-1,3-Dichloropropene	ND (0.4)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
Dibromochloromethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
Dibromomethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
Dichlorodifluoromethane	ND (2.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
Diethyl Ether	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
Di-isopropyl ether	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
Ethyl tertiary-butyl ether	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
Ethylbenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
Hexachlorobutadiene	ND (0.6)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
Hexachloroethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
Isopropylbenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
Methyl tert-Butyl Ether	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-844R
Date Sampled: 07/24/24 11:50
Percent Solids: N/A
Initial Volume: 5ml
Final Volume: 5ml
Extraction Method: 5030B

ESS Laboratory Work Order: 24G0971
ESS Laboratory Sample ID: 24G0971-03
Sample Matrix: Ground Water
Units: ug/L
Analyst: MD
Prepared: 7/26/24 8:00

Volatile Organics

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Methylene Chloride	ND (2.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
Naphthalene	**1.2** (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
n-Butylbenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
n-Propylbenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
sec-Butylbenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
Styrene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
tert-Butylbenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
Tertiary-amyl methyl ether	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
Tetrachloroethene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
Tetrahydrofuran	ND (5.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
Toluene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
trans-1,2-Dichloroethene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
trans-1,3-Dichloropropene	ND (0.4)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
Trichloroethene	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
Trichlorofluoromethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
Vinyl Chloride	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
Xylene O	ND (1.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
Xylene P,M	ND (2.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639
Xylenes (Total)	ND (2.0)	---	8260D	---	1	MD	07/26/24 22:54	D4G0580	DG42639

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichloroethane-d4	*102 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*102 %*		*70-130*
Surrogate: Dibromofluoromethane	*98 %*		*70-130*
Surrogate: Toluene-d8	*100 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804574-853R
Date Sampled: 07/24/24 15:30
Percent Solids: N/A
Initial Volume: 5ml
Final Volume: 5ml
Extraction Method: 5030B

ESS Laboratory Work Order: 24G0971
ESS Laboratory Sample ID: 24G0971-04
Sample Matrix: Ground Water
Units: ug/L
Analyst: MD
Prepared: 7/26/24 8:00

Volatile Organics

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
1,1,1-Trichloroethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
1,1,2,2-Tetrachloroethane	ND (0.5)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
1,1,2-Trichloroethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
1,1-Dichloroethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
1,1-Dichloroethene	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
1,1-Dichloropropene	ND (2.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
1,2,3-Trichlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
1,2,3-Trichloropropane	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
1,2,4-Trichlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
1,2,4-Trimethylbenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
1,2-Dibromo-3-Chloropropane	ND (5.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
1,2-Dibromoethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
1,2-Dichlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
1,2-Dichloroethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
1,2-Dichloropropane	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
1,3,5-Trimethylbenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
1,3-Dichlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
1,3-Dichloropropane	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
1,4-Dichlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
1,4-Dioxane - Screen	ND (100)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
2,2-Dichloropropane	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
2-Butanone	ND (10.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
2-Chlorotoluene	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
2-Hexanone	ND (10.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
4-Chlorotoluene	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
4-Isopropyltoluene	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804574-853R
Date Sampled: 07/24/24 15:30
Percent Solids: N/A
Initial Volume: 5ml
Final Volume: 5ml
Extraction Method: 5030B

ESS Laboratory Work Order: 24G0971
ESS Laboratory Sample ID: 24G0971-04
Sample Matrix: Ground Water
Units: ug/L
Analyst: MD
Prepared: 7/26/24 8:00

Volatile Organics

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
4-Methyl-2-Pentanone	ND (10.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
Acetone	ND (10.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
Benzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
Bromobenzene	ND (2.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
Bromochloromethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
Bromodichloromethane	ND (0.6)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
Bromoform	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
Bromomethane	ND (2.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
Carbon Disulfide	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
Carbon Tetrachloride	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
Chlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
Chloroethane	ND (2.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
Chloroform	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
Chloromethane	ND (2.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
cis-1,2-Dichloroethene	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
cis-1,3-Dichloropropene	ND (0.4)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
Dibromochloromethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
Dibromomethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
Dichlorodifluoromethane	ND (2.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
Diethyl Ether	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
Di-isopropyl ether	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
Ethyl tertiary-butyl ether	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
Ethylbenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
Hexachlorobutadiene	ND (0.6)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
Hexachloroethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
Isopropylbenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
Methyl tert-Butyl Ether	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804574-853R
Date Sampled: 07/24/24 15:30
Percent Solids: N/A
Initial Volume: 5ml
Final Volume: 5ml
Extraction Method: 5030B

ESS Laboratory Work Order: 24G0971
ESS Laboratory Sample ID: 24G0971-04
Sample Matrix: Ground Water
Units: ug/L
Analyst: MD
Prepared: 7/26/24 8:00

Volatile Organics

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Methylene Chloride	ND (2.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
Naphthalene	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
n-Butylbenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
n-Propylbenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
sec-Butylbenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
Styrene	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
tert-Butylbenzene	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
Tertiary-amyl methyl ether	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
Tetrachloroethene	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
Tetrahydrofuran	ND (5.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
Toluene	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
trans-1,2-Dichloroethene	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
trans-1,3-Dichloropropene	ND (0.4)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
Trichloroethene	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
Trichlorofluoromethane	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
Vinyl Chloride	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
Xylene O	ND (1.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
Xylene P,M	ND (2.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639
Xylenes (Total)	ND (2.0)	---	8260D	---	1	MD	07/26/24 23:19	D4G0580	DG42639

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichloroethane-d4	*102 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*102 %*		*70-130*
Surrogate: Dibromofluoromethane	*97 %*		*70-130*
Surrogate: Toluene-d8	*100 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 24G0971

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile Organics										
Batch DG42639 - 5030B										
Blank										
1,1,1,2-Tetrachloroethane	ND	1.0	ug/L							
1,1,1-Trichloroethane	ND	1.0	ug/L							
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L							
1,1,2-Trichloroethane	ND	1.0	ug/L							
1,1-Dichloroethane	ND	1.0	ug/L							
1,1-Dichloroethene	ND	1.0	ug/L							
1,1-Dichloropropene	ND	2.0	ug/L							
1,2,3-Trichlorobenzene	ND	1.0	ug/L							
1,2,3-Trichloropropane	ND	1.0	ug/L							
1,2,4-Trichlorobenzene	ND	1.0	ug/L							
1,2,4-Trimethylbenzene	ND	1.0	ug/L							
1,2-Dibromo-3-Chloropropane	ND	5.0	ug/L							
1,2-Dibromoethane	ND	1.0	ug/L							
1,2-Dichlorobenzene	ND	1.0	ug/L							
1,2-Dichloroethane	ND	1.0	ug/L							
1,2-Dichloropropane	ND	1.0	ug/L							
1,3,5-Trimethylbenzene	ND	1.0	ug/L							
1,3-Dichlorobenzene	ND	1.0	ug/L							
1,3-Dichloropropane	ND	1.0	ug/L							
1,4-Dichlorobenzene	ND	1.0	ug/L							
1,4-Dioxane - Screen	ND	100	ug/L							
2,2-Dichloropropane	ND	1.0	ug/L							
2-Butanone	ND	10.0	ug/L							
2-Chlorotoluene	ND	1.0	ug/L							
2-Hexanone	ND	10.0	ug/L							
4-Chlorotoluene	ND	1.0	ug/L							
4-Isopropyltoluene	ND	1.0	ug/L							
4-Methyl-2-Pentanone	ND	10.0	ug/L							
Acetone	ND	10.0	ug/L							
Benzene	ND	1.0	ug/L							
Bromobenzene	ND	2.0	ug/L							
Bromochloromethane	ND	1.0	ug/L							
Bromodichloromethane	ND	0.6	ug/L							
Bromoform	ND	1.0	ug/L							
Bromomethane	ND	2.0	ug/L							
Carbon Disulfide	ND	1.0	ug/L							
Carbon Tetrachloride	ND	1.0	ug/L							
Chlorobenzene	ND	1.0	ug/L							
Chloroethane	ND	2.0	ug/L							
Chloroform	ND	1.0	ug/L							
Chloromethane	ND	2.0	ug/L							
cis-1,2-Dichloroethene	ND	1.0	ug/L							
cis-1,3-Dichloropropene	ND	0.4	ug/L							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 24G0971

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile Organics										
Batch DG42639 - 5030B										
Dibromochloromethane	ND	1.0	ug/L							
Dibromomethane	ND	1.0	ug/L							
Dichlorodifluoromethane	ND	2.0	ug/L							
Diethyl Ether	ND	1.0	ug/L							
Di-isopropyl ether	ND	1.0	ug/L							
Ethyl tertiary-butyl ether	ND	1.0	ug/L							
Ethylbenzene	ND	1.0	ug/L							
Hexachlorobutadiene	ND	0.6	ug/L							
Hexachloroethane	ND	1.0	ug/L							
Isopropylbenzene	ND	1.0	ug/L							
Methyl tert-Butyl Ether	ND	1.0	ug/L							
Methylene Chloride	ND	2.0	ug/L							
Naphthalene	ND	1.0	ug/L							
n-Butylbenzene	ND	1.0	ug/L							
n-Propylbenzene	ND	1.0	ug/L							
sec-Butylbenzene	ND	1.0	ug/L							
Styrene	ND	1.0	ug/L							
tert-Butylbenzene	ND	1.0	ug/L							
Tertiary-amyl methyl ether	ND	1.0	ug/L							
Tetrachloroethene	ND	1.0	ug/L							
Tetrahydrofuran	ND	5.0	ug/L							
Toluene	ND	1.0	ug/L							
trans-1,2-Dichloroethene	ND	1.0	ug/L							
trans-1,3-Dichloropropene	ND	0.4	ug/L							
Trichloroethene	ND	1.0	ug/L							
Trichlorofluoromethane	ND	1.0	ug/L							
Vinyl Chloride	ND	1.0	ug/L							
Xylene O	ND	1.0	ug/L							
Xylene P,M	ND	2.0	ug/L							
Surrogate: 1,2-Dichloroethane-d4	*25.6*		ug/L	*25.00*		*102*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*24.6*		ug/L	*25.00*		*98*	*70-130*			
Surrogate: Dibromofluoromethane	*24.4*		ug/L	*25.00*		*98*	*70-130*			
Surrogate: Toluene-d8	*25.3*		ug/L	*25.00*		*101*	*70-130*			
LCS										
1,1,1,2-Tetrachloroethane	10.2	1.0	ug/L	10.00		102	70-130			
1,1,1-Trichloroethane	9.9	1.0	ug/L	10.00		99	70-130			
1,1,2,2-Tetrachloroethane	10.3	0.5	ug/L	10.00		103	40-160			
1,1,2-Trichloroethane	9.8	1.0	ug/L	10.00		98	70-130			
1,1-Dichloroethane	9.6	1.0	ug/L	10.00		96	70-130			
1,1-Dichloroethene	10.2	1.0	ug/L	10.00		102	70-130			
1,1-Dichloropropene	10.2	2.0	ug/L	10.00		102	70-130			
1,2,3-Trichlorobenzene	11.1	1.0	ug/L	10.00		111	70-130			
1,2,3-Trichloropropane	10.1	1.0	ug/L	10.00		101	70-130			
1,2,4-Trichlorobenzene	9.6	1.0	ug/L	10.00		96	70-130			
1,2,4-Trimethylbenzene	10.6	1.0	ug/L	10.00		106	70-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: 24G0971

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile Organics										
Batch DG42639 - 5030B										
1,2-Dibromo-3-Chloropropane	10.2	5.0	ug/L	10.00		102	70-130			
1,2-Dibromoethane	9.8	1.0	ug/L	10.00		98	70-130			
1,2-Dichlorobenzene	10.1	1.0	ug/L	10.00		101	70-130			
1,2-Dichloroethane	9.4	1.0	ug/L	10.00		94	70-130			
1,2-Dichloropropane	9.5	1.0	ug/L	10.00		95	70-130			
1,3,5-Trimethylbenzene	10.5	1.0	ug/L	10.00		105	70-130			
1,3-Dichlorobenzene	10.0	1.0	ug/L	10.00		100	70-130			
1,3-Dichloropropane	10.1	1.0	ug/L	10.00		101	70-130			
1,4-Dichlorobenzene	10.2	1.0	ug/L	10.00		102	70-130			
1,4-Dioxane - Screen	229	100	ug/L	200.0		114	40-160			
2,2-Dichloropropane	10.4	1.0	ug/L	10.00		104	70-130			
2-Butanone	53.0	10.0	ug/L	50.00		106	40-160			
2-Chlorotoluene	10.4	1.0	ug/L	10.00		104	70-130			
2-Hexanone	53.4	10.0	ug/L	50.00		107	40-160			
4-Chlorotoluene	10.4	1.0	ug/L	10.00		104	70-130			
4-Isopropyltoluene	10.4	1.0	ug/L	10.00		104	70-130			
4-Methyl-2-Pentanone	49.0	10.0	ug/L	50.00		98	40-160			
Acetone	52.6	10.0	ug/L	50.00		105	40-160			
Benzene	9.8	1.0	ug/L	10.00		98	70-130			
Bromobenzene	10.6	2.0	ug/L	10.00		106	70-130			
Bromochloromethane	9.9	1.0	ug/L	10.00		99	70-130			
Bromodichloromethane	10.7	0.6	ug/L	10.00		107	70-130			
Bromoform	9.1	1.0	ug/L	10.00		91	40-160			
Bromomethane	11.1	2.0	ug/L	10.00		111	40-160			
Carbon Disulfide	10.8	1.0	ug/L	10.00		108	70-130			
Carbon Tetrachloride	9.9	1.0	ug/L	10.00		99	70-130			
Chlorobenzene	9.7	1.0	ug/L	10.00		97	70-130			
Chloroethane	10.9	2.0	ug/L	10.00		109	40-160			
Chloroform	9.4	1.0	ug/L	10.00		94	70-130			
Chloromethane	9.5	2.0	ug/L	10.00		95	40-160			
cis-1,2-Dichloroethene	10.0	1.0	ug/L	10.00		100	70-130			
cis-1,3-Dichloropropene	10.3	0.4	ug/L	10.00		103	40-160			
Dibromochloromethane	9.9	1.0	ug/L	10.00		99	40-160			
Dibromomethane	10.0	1.0	ug/L	10.00		100	70-130			
Dichlorodifluoromethane	6.7	2.0	ug/L	10.00		67	40-160			
Diethyl Ether	9.9	1.0	ug/L	10.00		99	70-130			
Di-isopropyl ether	10.1	1.0	ug/L	10.00		101	70-130			
Ethyl tertiary-butyl ether	10.1	1.0	ug/L	10.00		101	70-130			
Ethylbenzene	10.2	1.0	ug/L	10.00		102	70-130			
Hexachlorobutadiene	10.8	0.6	ug/L	10.00		108	40-160			
Hexachloroethane	10.5	1.0	ug/L	10.00		105	70-130			
Isopropylbenzene	11.5	1.0	ug/L	10.00		115	70-130			
Methyl tert-Butyl Ether	9.9	1.0	ug/L	10.00		99	70-130			
Methylene Chloride	9.3	2.0	ug/L	10.00		93	70-130			
Naphthalene	10.4	1.0	ug/L	10.00		104	40-160			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 24G0971

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile Organics										
Batch DG42639 - 5030B										
n-Butylbenzene	11.1	1.0	ug/L	10.00		111	70-130			
n-Propylbenzene	10.5	1.0	ug/L	10.00		105	70-130			
sec-Butylbenzene	10.1	1.0	ug/L	10.00		101	70-130			
Styrene	10.2	1.0	ug/L	10.00		102	40-160			
tert-Butylbenzene	10.5	1.0	ug/L	10.00		105	70-130			
Tertiary-amyl methyl ether	10.2	1.0	ug/L	10.00		102	70-130			
Tetrachloroethene	7.8	1.0	ug/L	10.00		78	70-130			
Tetrahydrofuran	10.5	5.0	ug/L	10.00		105	70-130			
Toluene	9.9	1.0	ug/L	10.00		99	70-130			
trans-1,2-Dichloroethene	9.9	1.0	ug/L	10.00		99	70-130			
trans-1,3-Dichloropropene	9.2	0.4	ug/L	10.00		92	70-130			
Trichloroethene	9.6	1.0	ug/L	10.00		96	70-130			
Trichlorofluoromethane	10.0	1.0	ug/L	10.00		100	40-160			
Vinyl Chloride	10.5	1.0	ug/L	10.00		105	70-130			
Xylene O	10.4	1.0	ug/L	10.00		104	70-130			
Xylene P,M	20.5	2.0	ug/L	20.00		103	70-130			
Surrogate: 1,2-Dichloroethane-d4	*24.7*		ug/L	*25.00*		*99*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*25.2*		ug/L	*25.00*		*101*	*70-130*			
Surrogate: Dibromofluoromethane	*25.2*		ug/L	*25.00*		*101*	*70-130*			
Surrogate: Toluene-d8	*24.8*		ug/L	*25.00*		*99*	*70-130*			
LCS Dup										
1,1,1,2-Tetrachloroethane	10.2	1.0	ug/L	10.00		102	70-130	0.3	20	
1,1,1-Trichloroethane	10.0	1.0	ug/L	10.00		100	70-130	0.3	20	
1,1,2,2-Tetrachloroethane	10.1	0.5	ug/L	10.00		101	40-160	1	20	
1,1,2-Trichloroethane	9.9	1.0	ug/L	10.00		99	70-130	1	20	
1,1-Dichloroethane	9.8	1.0	ug/L	10.00		98	70-130	2	20	
1,1-Dichloroethene	10.5	1.0	ug/L	10.00		105	70-130	3	20	
1,1-Dichloropropene	10.3	2.0	ug/L	10.00		103	70-130	1	20	
1,2,3-Trichlorobenzene	10.8	1.0	ug/L	10.00		108	70-130	3	20	
1,2,3-Trichloropropane	9.9	1.0	ug/L	10.00		99	70-130	2	20	
1,2,4-Trichlorobenzene	9.7	1.0	ug/L	10.00		97	70-130	0.9	20	
1,2,4-Trimethylbenzene	10.6	1.0	ug/L	10.00		106	70-130	0.09	20	
1,2-Dibromo-3-Chloropropane	10.3	5.0	ug/L	10.00		103	70-130	0.6	20	
1,2-Dibromoethane	10.2	1.0	ug/L	10.00		102	70-130	4	20	
1,2-Dichlorobenzene	10.2	1.0	ug/L	10.00		102	70-130	1	20	
1,2-Dichloroethane	9.6	1.0	ug/L	10.00		96	70-130	2	20	
1,2-Dichloropropane	9.8	1.0	ug/L	10.00		98	70-130	3	20	
1,3,5-Trimethylbenzene	10.5	1.0	ug/L	10.00		105	70-130	0.7	20	
1,3-Dichlorobenzene	9.9	1.0	ug/L	10.00		99	70-130	0.8	20	
1,3-Dichloropropane	10.0	1.0	ug/L	10.00		100	70-130	1	20	
1,4-Dichlorobenzene	10.4	1.0	ug/L	10.00		104	70-130	2	20	
1,4-Dioxane - Screen	212	100	ug/L	200.0		106	40-160	7	200	
2,2-Dichloropropane	10.5	1.0	ug/L	10.00		105	70-130	0.7	20	
2-Butanone	51.1	10.0	ug/L	50.00		102	40-160	3	20	
2-Chlorotoluene	10.4	1.0	ug/L	10.00		104	70-130	0.4	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 24G0971

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile Organics										
Batch DG42639 - 5030B										
2-Hexanone	53.2	10.0	ug/L	50.00		106	40-160	0.3	20	
4-Chlorotoluene	10.4	1.0	ug/L	10.00		104	70-130	0.1	20	
4-Isopropyltoluene	10.3	1.0	ug/L	10.00		103	70-130	1	20	
4-Methyl-2-Pentanone	49.9	10.0	ug/L	50.00		100	40-160	2	20	
Acetone	47.1	10.0	ug/L	50.00		94	40-160	11	20	
Benzene	10.1	1.0	ug/L	10.00		101	70-130	3	20	
Bromobenzene	10.5	2.0	ug/L	10.00		105	70-130	1	20	
Bromochloromethane	10.0	1.0	ug/L	10.00		100	70-130	2	20	
Bromodichloromethane	10.7	0.6	ug/L	10.00		107	70-130	0.6	20	
Bromoform	9.2	1.0	ug/L	10.00		92	40-160	1	20	
Bromomethane	10.9	2.0	ug/L	10.00		109	40-160	2	20	
Carbon Disulfide	10.8	1.0	ug/L	10.00		108	70-130	0.6	20	
Carbon Tetrachloride	9.9	1.0	ug/L	10.00		99	70-130	0.2	20	
Chlorobenzene	10.0	1.0	ug/L	10.00		100	70-130	3	20	
Chloroethane	11.2	2.0	ug/L	10.00		112	40-160	3	20	
Chloroform	9.6	1.0	ug/L	10.00		96	70-130	2	20	
Chloromethane	9.7	2.0	ug/L	10.00		97	40-160	1	20	
cis-1,2-Dichloroethene	10.2	1.0	ug/L	10.00		102	70-130	2	20	
cis-1,3-Dichloropropene	10.2	0.4	ug/L	10.00		102	40-160	0.5	20	
Dibromochloromethane	10.0	1.0	ug/L	10.00		100	40-160	2	20	
Dibromomethane	10.2	1.0	ug/L	10.00		102	70-130	3	20	
Dichlorodifluoromethane	6.8	2.0	ug/L	10.00		68	40-160	2	20	
Diethyl Ether	10.2	1.0	ug/L	10.00		102	70-130	3	20	
Di-isopropyl ether	10.2	1.0	ug/L	10.00		102	70-130	0.8	20	
Ethyl tertiary-butyl ether	10.2	1.0	ug/L	10.00		102	70-130	1	20	
Ethylbenzene	10.6	1.0	ug/L	10.00		106	70-130	4	20	
Hexachlorobutadiene	10.7	0.6	ug/L	10.00		107	40-160	2	20	
Hexachloroethane	10.2	1.0	ug/L	10.00		102	70-130	3	20	
Isopropylbenzene	11.5	1.0	ug/L	10.00		115	70-130	0	20	
Methyl tert-Butyl Ether	10.0	1.0	ug/L	10.00		100	70-130	1	20	
Methylene Chloride	9.3	2.0	ug/L	10.00		93	70-130	0.3	20	
Naphthalene	10.1	1.0	ug/L	10.00		101	40-160	3	20	
n-Butylbenzene	11.1	1.0	ug/L	10.00		111	70-130	0.2	20	
n-Propylbenzene	10.5	1.0	ug/L	10.00		105	70-130	0.1	20	
sec-Butylbenzene	10.2	1.0	ug/L	10.00		102	70-130	0.3	20	
Styrene	10.6	1.0	ug/L	10.00		106	40-160	3	20	
tert-Butylbenzene	10.5	1.0	ug/L	10.00		105	70-130	0.5	20	
Tertiary-amyl methyl ether	10.3	1.0	ug/L	10.00		103	70-130	0.4	20	
Tetrachloroethene	8.1	1.0	ug/L	10.00		81	70-130	4	20	
Tetrahydrofuran	10.6	5.0	ug/L	10.00		106	70-130	0.7	20	
Toluene	10.1	1.0	ug/L	10.00		101	70-130	2	20	
trans-1,2-Dichloroethene	10.2	1.0	ug/L	10.00		102	70-130	2	20	
trans-1,3-Dichloropropene	9.3	0.4	ug/L	10.00		93	70-130	1	20	
Trichloroethene	9.6	1.0	ug/L	10.00		96	70-130	0.3	20	
Trichlorofluoromethane	10.1	1.0	ug/L	10.00		101	40-160	1	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: 24G0971

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile Organics										
Batch DG42639 - 5030B										
Vinyl Chloride	10.8	1.0	ug/L	10.00		108	70-130	3	20	
Xylene O	10.8	1.0	ug/L	10.00		108	70-130	5	20	
Xylene P,M	21.1	2.0	ug/L	20.00		105	70-130	3	20	
Surrogate: 1,2-Dichloroethane-d4	*24.8*		ug/L	*25.00*		*99*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*25.7*		ug/L	*25.00*		*103*	*70-130*			
Surrogate: Dibromofluoromethane	*25.0*		ug/L	*25.00*		*100*	*70-130*			
Surrogate: Toluene-d8	*25.1*		ug/L	*25.00*		*100*	*70-130*			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: 24G0971

Notes and Definitions

U	Analyte included in the analysis, but not detected
Q	Calibration required quadratic regression (Q).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probable Number
TNTC	Too numerous to Count
CFU	Colony Forming Units

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: 24G0971

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

Shipped/Delivered Via: ESS Courier

ESS Project ID: 24G0971
Date Received: 7/25/2024
Project Due Date: 8/1/2024
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 1 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / (NA)
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? (Yes) / No
    a. Air bubbles in aqueous VOAs? Yes / (No)
    b. Does methanol cover soil completely? Yes / No / NA
13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By/Acid Lot#:
    b. If dissolved metals are requested, are they: Yes / No Field Filtered — Yes / No To Be Lab Filtered
    c. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Resolution:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
~~4~~	~~576096~~	~~Yes~~	~~No~~	~~Yes~~	~~VOA Vial~~	~~HCl~~	7/25/24
1	576097	Yes	No	Yes	VOA Vial	HCl	
1	576098	Yes	No	Yes	VOA Vial	HCl	
2	576099	Yes	No	Yes	VOA Vial	HCl	
2	576100	Yes	No	Yes	VOA Vial	HCl	
2	576101	Yes	No	Yes	VOA Vial	HCl	
3	576102	Yes	No	Yes	VOA Vial	HCl	
3	576103	Yes	No	Yes	VOA Vial	HCl	
3	576104	Yes	No	Yes	VOA Vial	HCl	
4	576105	Yes	No	Yes	VOA Vial	HCl	
4	576106	Yes	No	Yes	VOA Vial	HCl	
4	576107	Yes	No	Yes	VOA Vial	HCl	

2nd Review
Were all containers scanned into storage/lab? Initials: Yes / No
Are barcode labels on correct containers? Yes / No / NA
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

ESS Project ID: 24G0971

Date Received: 7/25/2024

Completed By: [signature] Date & Time: 7/25/24 1805

Reviewed By: [signature] Date & Time: 7/25/24 18:08

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 2460971

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman
781-721-4091 rhoffman@geiconsultants.com

Send Report to: Ryan Hoffman
labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY AND MCP ANALYTICAL METHODS REQUIRED: (YES) NO

STATE AND FEDERAL REGULATORY REQUIREMENTS/REPORT LIMITS

State/Federal Program: (MA) 401WQC Other _____ NH RI CT NY ME

MA MCP Criteria are (Method 1 S-1 and GW-2/GW-3. Circle if GW-1 is required.)

Sample Handling

Samples Field Filtered
YES (NO) NA

Sampled Shipped With Ice
(YES) NO

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Preservative: HCL	Analysis: VOCs 8260
1	1804576-846R	7/24/24	10:30	GW	2	DJM		X
2	1804576-854R	↓ ↓	14:00	GW	3	DJM		X
3	1804576-814R	↓ ↓	11:50	↓ ↓	3	↓ ↓		X
4	1804574-853R	↓ ↓	15:30	↓ ↓	3	↓ ↓		X

	Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1.		7/24	1650	GEI fridge
2.	GEI fridge	7/25/24	1230	
3.		7/25/24	1230	7/25/24 1230
4.	1.0	7/25/24	1727	
5.				

Turnaround Time (Business days):

Standard TAT X 4-Day ____ 3-Day ____
2-Day ____ 1-Day ____ Other ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

Sample Matrix Abbreviations: SO = Soil GW = Groundwater SW = Surface Water SD = Sediment CO = Concrete PC = Paint Chip CLK = Caulk

ESS Laboratory
DIVISION OF THE RISE GROUP

BAL Laboratory Analytical Balance

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: 24G1024

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 6:53 pm, Aug 02, 2024

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: 24G1024

SAMPLE RECEIPT

The following samples were received on July 26, 2024 for the analyses specified on the enclosed Chain of Custody Record.

To achieve CAM compliance for MCP data, ESS Laboratory has reviewed all QA/QC Requirements and Performance Standards listed in each method. Holding times and preservation have also been reviewed. All CAM requirements have been performed and achieved unless noted in the project narrative.

Each method has been set-up in the laboratory to reach required MCP standards. The methods for aqueous VOA and Soil Methanol VOA have known limitations for certain analytes. The regulatory standards may not be achieved due to these limitations. In addition, for all methods, matrix interferences, dilutions, and %Solids may elevate method reporting limits above regulatory standards. ESS Laboratory can provide, upon request, a Limit Checker (regulatory standard comparison spreadsheet) electronic deliverable which will highlight these exceedances.

Lab Number	Sample Name	Matrix	Analysis
24G1024-01	1804576-843 R	Ground Water	8260D
24G1024-02	1804576-852 R	Ground Water	8260D
24G1024-03	1804576-851 R	Ground Water	8260D

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: 24G1024

PROJECT NARRATIVE

Volatile Organics

D4G0604-CCV1 **Calibration required quadratic regression (Q).**
1,1,1,2-Tetrachloroethane (96% @ 80-120%), 1,2,3-Trichlorobenzene (92% @ 80-120%), Bromoform (101% @ 40-160%), Carbon Tetrachloride (97% @ 80-120%), Dibromochloromethane (98% @ 40-160%), Hexachloroethane (105% @ 80-120%), Naphthalene (92% @ 40-160%), trans-1,3-Dichloropropene (101% @ 80-120%)

D4G0604-CCV1 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
Tetrachloroethene (32% @ 20%)

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: 24G1024

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010D - ICP
6020B - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260D - VOA
8270E - SVOA
8270E SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 19-2.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: 24G1024

MassDEP Analytical Protocol Certification Form

MADEP RTN: _____

This form provides certification for the following data set: **24G1024-01 through 24G1024-03**

Matrices: (X) Ground Water/Surface Water ( ) Soil/Sediment ( ) Drinking Water ( ) Air ( ) Other:_____

CAM Protocol (check all that apply below):

(X) 8260 VOC CAM II A	( ) 7470/7471 Hg CAM III B	( ) MassDEP VPH (GC/PID/FID) CAM IV A	( ) 8082 PCB CAM V A	( ) 9014 Total Cyanide/PAC CAM VI A	( ) 6860 Perchlorate CAM VIII B
( ) 8270 SVOC CAM II B	( ) 7010 Metals CAM III C	( ) MassDEP VPH (GC/MS) CAM IV C	( ) 8081 Pesticides CAM V B	( ) 7196 Hex Cr CAM VI B	( ) MassDEP APH CAM IX A
( ) 6010 Metals CAM III A	( ) 6020 Metals CAM III D	( ) MassDEP EPH CAM IV B	( ) 8151 Herbicides CAM V C	( ) Explosives CAM VIII A	( ) TO-15 VOC CAM IX B

Affirmative responses to questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	Yes (X) No ( )
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	Yes (X) No ( )
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	Yes (X) No ( )
D	Does the laboratory report comply with all the reporting requirements specified in the CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	Yes (X) No ( )
E	VPH, EPH, APH and TO-15 only: a. Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	Yes ( ) No ( )
	b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	Yes ( ) No ( )
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	Yes (X) No ( )

Responses to Questions G, H and I below are required for '"Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocols(s)? ***Data User Note:** Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.*	Yes (X) No ( )*
H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	Yes ( ) No (X)*
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	Yes (X) No ( )*

****All negative responses must be addressed in an attached laboratory narrative.***

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature: _____ Date: August 02, 2024
Printed Name: Laurel Stoddard Position: Laboratory Director

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-843 R
Date Sampled: 07/25/24 08:00
Percent Solids: N/A
Initial Volume: 5ml
Final Volume: 5ml
Extraction Method: 5030B

ESS Laboratory Work Order: 24G1024
ESS Laboratory Sample ID: 24G1024-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: MD
Prepared: 7/29/24 8:00

Volatile Organics

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
1,1,1-Trichloroethane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
1,1,2,2-Tetrachloroethane	ND (0.5)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
1,1,2-Trichloroethane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
1,1-Dichloroethane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
1,1-Dichloroethene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
1,1-Dichloropropene	ND (2.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
1,2,3-Trichlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
1,2,3-Trichloropropane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
1,2,4-Trichlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
1,2,4-Trimethylbenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
1,2-Dibromo-3-Chloropropane	ND (5.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
1,2-Dibromoethane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
1,2-Dichlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
1,2-Dichloroethane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
1,2-Dichloropropane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
1,3,5-Trimethylbenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
1,3-Dichlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
1,3-Dichloropropane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
1,4-Dichlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
1,4-Dioxane - Screen	ND (100)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
2,2-Dichloropropane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
2-Butanone	ND (10.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
2-Chlorotoluene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
2-Hexanone	ND (10.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
4-Chlorotoluene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
4-Isopropyltoluene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-843 R
Date Sampled: 07/25/24 08:00
Percent Solids: N/A
Initial Volume: 5ml
Final Volume: 5ml
Extraction Method: 5030B

ESS Laboratory Work Order: 24G1024
ESS Laboratory Sample ID: 24G1024-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: MD
Prepared: 7/29/24 8:00

Volatile Organics

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
4-Methyl-2-Pentanone	ND (10.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
Acetone	ND (10.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
Benzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
Bromobenzene	ND (2.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
Bromochloromethane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
Bromodichloromethane	ND (0.6)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
Bromoform	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
Bromomethane	ND (2.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
Carbon Disulfide	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
Carbon Tetrachloride	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
Chlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
Chloroethane	ND (2.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
Chloroform	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
Chloromethane	ND (2.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
cis-1,2-Dichloroethene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
cis-1,3-Dichloropropene	ND (0.4)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
Dibromochloromethane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
Dibromomethane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
Dichlorodifluoromethane	ND (2.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
Diethyl Ether	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
Di-isopropyl ether	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
Ethyl tertiary-butyl ether	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
Ethylbenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
Hexachlorobutadiene	ND (0.6)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
Hexachloroethane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
Isopropylbenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
Methyl tert-Butyl Ether	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-843 R
Date Sampled: 07/25/24 08:00
Percent Solids: N/A
Initial Volume: 5ml
Final Volume: 5ml
Extraction Method: 5030B

ESS Laboratory Work Order: 24G1024
ESS Laboratory Sample ID: 24G1024-01
Sample Matrix: Ground Water
Units: ug/L
Analyst: MD
Prepared: 7/29/24 8:00

Volatile Organics

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Methylene Chloride	ND (2.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
Naphthalene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
n-Butylbenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
n-Propylbenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
sec-Butylbenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
Styrene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
tert-Butylbenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
Tertiary-amyl methyl ether	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
Tetrachloroethene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
Tetrahydrofuran	ND (5.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
Toluene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
trans-1,2-Dichloroethene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
trans-1,3-Dichloropropene	ND (0.4)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
Trichloroethene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
Trichlorofluoromethane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
Vinyl Chloride	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
Xylene O	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
Xylene P,M	ND (2.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921
Xylenes (Total)	ND (2.0)	---	8260D	---	1	MD	07/29/24 13:02	D4G0604	DG42921

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichloroethane-d4	*103 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*99 %*		*70-130*
Surrogate: Dibromofluoromethane	*99 %*		*70-130*
Surrogate: Toluene-d8	*100 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-852 R
Date Sampled: 07/25/24 08:40
Percent Solids: N/A
Initial Volume: 5ml
Final Volume: 5ml
Extraction Method: 5030B

ESS Laboratory Work Order: 24G1024
ESS Laboratory Sample ID: 24G1024-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: MD
Prepared: 7/29/24 8:00

Volatile Organics

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
1,1,1-Trichloroethane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
1,1,2,2-Tetrachloroethane	ND (0.5)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
1,1,2-Trichloroethane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
1,1-Dichloroethane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
1,1-Dichloroethene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
1,1-Dichloropropene	ND (2.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
1,2,3-Trichlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
1,2,3-Trichloropropane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
1,2,4-Trichlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
1,2,4-Trimethylbenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
1,2-Dibromo-3-Chloropropane	ND (5.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
1,2-Dibromoethane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
1,2-Dichlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
1,2-Dichloroethane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
1,2-Dichloropropane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
1,3,5-Trimethylbenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
1,3-Dichlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
1,3-Dichloropropane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
1,4-Dichlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
1,4-Dioxane - Screen	ND (100)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
2,2-Dichloropropane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
2-Butanone	ND (10.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
2-Chlorotoluene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
2-Hexanone	ND (10.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
4-Chlorotoluene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
4-Isopropyltoluene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-852 R
Date Sampled: 07/25/24 08:40
Percent Solids: N/A
Initial Volume: 5ml
Final Volume: 5ml
Extraction Method: 5030B

ESS Laboratory Work Order: 24G1024
ESS Laboratory Sample ID: 24G1024-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: MD
Prepared: 7/29/24 8:00

Volatile Organics

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
4-Methyl-2-Pentanone	ND (10.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
Acetone	ND (10.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
Benzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
Bromobenzene	ND (2.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
Bromochloromethane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
Bromodichloromethane	ND (0.6)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
Bromoform	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
Bromomethane	ND (2.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
Carbon Disulfide	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
Carbon Tetrachloride	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
Chlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
Chloroethane	ND (2.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
Chloroform	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
Chloromethane	ND (2.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
cis-1,2-Dichloroethene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
cis-1,3-Dichloropropene	ND (0.4)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
Dibromochloromethane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
Dibromomethane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
Dichlorodifluoromethane	ND (2.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
Diethyl Ether	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
Di-isopropyl ether	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
Ethyl tertiary-butyl ether	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
Ethylbenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
Hexachlorobutadiene	ND (0.6)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
Hexachloroethane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
Isopropylbenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
Methyl tert-Butyl Ether	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-852 R
Date Sampled: 07/25/24 08:40
Percent Solids: N/A
Initial Volume: 5ml
Final Volume: 5ml
Extraction Method: 5030B

ESS Laboratory Work Order: 24G1024
ESS Laboratory Sample ID: 24G1024-02
Sample Matrix: Ground Water
Units: ug/L
Analyst: MD
Prepared: 7/29/24 8:00

Volatile Organics

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Methylene Chloride	ND (2.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
Naphthalene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
n-Butylbenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
n-Propylbenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
sec-Butylbenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
Styrene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
tert-Butylbenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
Tertiary-amyl methyl ether	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
Tetrachloroethene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
Tetrahydrofuran	ND (5.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
Toluene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
trans-1,2-Dichloroethene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
trans-1,3-Dichloropropene	ND (0.4)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
Trichloroethene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
Trichlorofluoromethane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
Vinyl Chloride	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
Xylene O	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
Xylene P,M	ND (2.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921
Xylenes (Total)	ND (2.0)	---	8260D	---	1	MD	07/29/24 13:27	D4G0604	DG42921

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichloroethane-d4	*105 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*97 %*		*70-130*
Surrogate: Dibromofluoromethane	*101 %*		*70-130*
Surrogate: Toluene-d8	*100 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-851 R
Date Sampled: 07/25/24 09:25
Percent Solids: N/A
Initial Volume: 5ml
Final Volume: 5ml
Extraction Method: 5030B

ESS Laboratory Work Order: 24G1024
ESS Laboratory Sample ID: 24G1024-03
Sample Matrix: Ground Water
Units: ug/L
Analyst: MD
Prepared: 7/29/24 8:00

Volatile Organics

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
1,1,1,2-Tetrachloroethane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
1,1,1-Trichloroethane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
1,1,2,2-Tetrachloroethane	ND (0.5)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
1,1,2-Trichloroethane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
1,1-Dichloroethane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
1,1-Dichloroethene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
1,1-Dichloropropene	ND (2.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
1,2,3-Trichlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
1,2,3-Trichloropropane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
1,2,4-Trichlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
1,2,4-Trimethylbenzene	**1.4** (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
1,2-Dibromo-3-Chloropropane	ND (5.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
1,2-Dibromoethane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
1,2-Dichlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
1,2-Dichloroethane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
1,2-Dichloropropane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
1,3,5-Trimethylbenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
1,3-Dichlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
1,3-Dichloropropane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
1,4-Dichlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
1,4-Dioxane - Screen	ND (100)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
2,2-Dichloropropane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
2-Butanone	ND (10.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
2-Chlorotoluene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
2-Hexanone	ND (10.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
4-Chlorotoluene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
4-Isopropyltoluene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-851 R
Date Sampled: 07/25/24 09:25
Percent Solids: N/A
Initial Volume: 5ml
Final Volume: 5ml
Extraction Method: 5030B

ESS Laboratory Work Order: 24G1024
ESS Laboratory Sample ID: 24G1024-03
Sample Matrix: Ground Water
Units: ug/L
Analyst: MD
Prepared: 7/29/24 8:00

Volatile Organics

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
4-Methyl-2-Pentanone	ND (10.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
Acetone	ND (10.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
Benzene	**1.2** (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
Bromobenzene	ND (2.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
Bromochloromethane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
Bromodichloromethane	ND (0.6)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
Bromoform	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
Bromomethane	ND (2.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
Carbon Disulfide	**5.6** (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
Carbon Tetrachloride	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
Chlorobenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
Chloroethane	ND (2.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
Chloroform	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
Chloromethane	ND (2.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
cis-1,2-Dichloroethene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
cis-1,3-Dichloropropene	ND (0.4)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
Dibromochloromethane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
Dibromomethane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
Dichlorodifluoromethane	ND (2.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
Diethyl Ether	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
Di-isopropyl ether	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
Ethyl tertiary-butyl ether	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
Ethylbenzene	**2.7** (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
Hexachlorobutadiene	ND (0.6)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
Hexachloroethane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
Isopropylbenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
Methyl tert-Butyl Ether	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-851 R
Date Sampled: 07/25/24 09:25
Percent Solids: N/A
Initial Volume: 5ml
Final Volume: 5ml
Extraction Method: 5030B

ESS Laboratory Work Order: 24G1024
ESS Laboratory Sample ID: 24G1024-03
Sample Matrix: Ground Water
Units: ug/L
Analyst: MD
Prepared: 7/29/24 8:00

Volatile Organics

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
Methylene Chloride	ND (2.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
Naphthalene	**1.6** (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
n-Butylbenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
n-Propylbenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
sec-Butylbenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
Styrene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
tert-Butylbenzene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
Tertiary-amyl methyl ether	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
Tetrachloroethene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
Tetrahydrofuran	ND (5.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
Toluene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
trans-1,2-Dichloroethene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
trans-1,3-Dichloropropene	ND (0.4)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
Trichloroethene	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
Trichlorofluoromethane	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
Vinyl Chloride	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
Xylene O	ND (1.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
Xylene P,M	ND (2.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921
Xylenes (Total)	ND (2.0)	---	8260D	---	1	MD	07/29/24 13:52	D4G0604	DG42921

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichloroethane-d4	*104 %*		*70-130*
Surrogate: 4-Bromofluorobenzene	*99 %*		*70-130*
Surrogate: Dibromofluoromethane	*100 %*		*70-130*
Surrogate: Toluene-d8	*100 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 24G1024

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile Organics										
Batch DG42921 - 5030B										
Blank										
1,1,1,2-Tetrachloroethane	ND	1.0	ug/L							
1,1,1-Trichloroethane	ND	1.0	ug/L							
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L							
1,1,2-Trichloroethane	ND	1.0	ug/L							
1,1-Dichloroethane	ND	1.0	ug/L							
1,1-Dichloroethene	ND	1.0	ug/L							
1,1-Dichloropropene	ND	2.0	ug/L							
1,2,3-Trichlorobenzene	ND	1.0	ug/L							
1,2,3-Trichloropropane	ND	1.0	ug/L							
1,2,4-Trichlorobenzene	ND	1.0	ug/L							
1,2,4-Trimethylbenzene	ND	1.0	ug/L							
1,2-Dibromo-3-Chloropropane	ND	5.0	ug/L							
1,2-Dibromoethane	ND	1.0	ug/L							
1,2-Dichlorobenzene	ND	1.0	ug/L							
1,2-Dichloroethane	ND	1.0	ug/L							
1,2-Dichloropropane	ND	1.0	ug/L							
1,3,5-Trimethylbenzene	ND	1.0	ug/L							
1,3-Dichlorobenzene	ND	1.0	ug/L							
1,3-Dichloropropane	ND	1.0	ug/L							
1,4-Dichlorobenzene	ND	1.0	ug/L							
1,4-Dioxane - Screen	ND	100	ug/L							
2,2-Dichloropropane	ND	1.0	ug/L							
2-Butanone	ND	10.0	ug/L							
2-Chlorotoluene	ND	1.0	ug/L							
2-Hexanone	ND	10.0	ug/L							
4-Chlorotoluene	ND	1.0	ug/L							
4-Isopropyltoluene	ND	1.0	ug/L							
4-Methyl-2-Pentanone	ND	10.0	ug/L							
Acetone	ND	10.0	ug/L							
Benzene	ND	1.0	ug/L							
Bromobenzene	ND	2.0	ug/L							
Bromochloromethane	ND	1.0	ug/L							
Bromodichloromethane	ND	0.6	ug/L							
Bromoform	ND	1.0	ug/L							
Bromomethane	ND	2.0	ug/L							
Carbon Disulfide	ND	1.0	ug/L							
Carbon Tetrachloride	ND	1.0	ug/L							
Chlorobenzene	ND	1.0	ug/L							
Chloroethane	ND	2.0	ug/L							
Chloroform	ND	1.0	ug/L							
Chloromethane	ND	2.0	ug/L							
cis-1,2-Dichloroethene	ND	1.0	ug/L							
cis-1,3-Dichloropropene	ND	0.4	ug/L							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: 24G1024

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile Organics										
Batch DG42921 - 5030B										
Dibromochloromethane	ND	1.0	ug/L							
Dibromomethane	ND	1.0	ug/L							
Dichlorodifluoromethane	ND	2.0	ug/L							
Diethyl Ether	ND	1.0	ug/L							
Di-isopropyl ether	ND	1.0	ug/L							
Ethyl tertiary-butyl ether	ND	1.0	ug/L							
Ethylbenzene	ND	1.0	ug/L							
Hexachlorobutadiene	ND	0.6	ug/L							
Hexachloroethane	ND	1.0	ug/L							
Isopropylbenzene	ND	1.0	ug/L							
Methyl tert-Butyl Ether	ND	1.0	ug/L							
Methylene Chloride	ND	2.0	ug/L							
Naphthalene	ND	1.0	ug/L							
n-Butylbenzene	ND	1.0	ug/L							
n-Propylbenzene	ND	1.0	ug/L							
sec-Butylbenzene	ND	1.0	ug/L							
Styrene	ND	1.0	ug/L							
tert-Butylbenzene	ND	1.0	ug/L							
Tertiary-amyl methyl ether	ND	1.0	ug/L							
Tetrachloroethene	ND	1.0	ug/L							
Tetrahydrofuran	ND	5.0	ug/L							
Toluene	ND	1.0	ug/L							
trans-1,2-Dichloroethene	ND	1.0	ug/L							
trans-1,3-Dichloropropene	ND	0.4	ug/L							
Trichloroethene	ND	1.0	ug/L							
Trichlorofluoromethane	ND	1.0	ug/L							
Vinyl Chloride	ND	1.0	ug/L							
Xylene O	ND	1.0	ug/L							
Xylene P,M	ND	2.0	ug/L							
Surrogate: 1,2-Dichloroethane-d4	*25.5*		ug/L	*25.00*		*102*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*24.4*		ug/L	*25.00*		*98*	*70-130*			
Surrogate: Dibromofluoromethane	*24.7*		ug/L	*25.00*		*99*	*70-130*			
Surrogate: Toluene-d8	*25.0*		ug/L	*25.00*		*100*	*70-130*			
LCS										
1,1,1,2-Tetrachloroethane	9.7	1.0	ug/L	10.00		97	70-130			
1,1,1-Trichloroethane	9.8	1.0	ug/L	10.00		98	70-130			
1,1,2,2-Tetrachloroethane	9.0	0.5	ug/L	10.00		90	40-160			
1,1,2-Trichloroethane	9.4	1.0	ug/L	10.00		94	70-130			
1,1-Dichloroethane	9.4	1.0	ug/L	10.00		94	70-130			
1,1-Dichloroethene	10.0	1.0	ug/L	10.00		100	70-130			
1,1-Dichloropropene	9.8	2.0	ug/L	10.00		98	70-130			
1,2,3-Trichlorobenzene	10.2	1.0	ug/L	10.00		102	70-130			
1,2,3-Trichloropropane	8.9	1.0	ug/L	10.00		89	70-130			
1,2,4-Trichlorobenzene	8.4	1.0	ug/L	10.00		84	70-130			
1,2,4-Trimethylbenzene	9.5	1.0	ug/L	10.00		95	70-130			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: 24G1024

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile Organics										
Batch DG42921 - 5030B										
1,2-Dibromo-3-Chloropropane	9.4	5.0	ug/L	10.00		94	70-130			
1,2-Dibromoethane	9.0	1.0	ug/L	10.00		90	70-130			
1,2-Dichlorobenzene	9.2	1.0	ug/L	10.00		92	70-130			
1,2-Dichloroethane	8.9	1.0	ug/L	10.00		89	70-130			
1,2-Dichloropropane	9.3	1.0	ug/L	10.00		93	70-130			
1,3,5-Trimethylbenzene	9.4	1.0	ug/L	10.00		94	70-130			
1,3-Dichlorobenzene	9.0	1.0	ug/L	10.00		90	70-130			
1,3-Dichloropropane	9.0	1.0	ug/L	10.00		90	70-130			
1,4-Dichlorobenzene	9.0	1.0	ug/L	10.00		90	70-130			
1,4-Dioxane - Screen	ND	100	ug/L	200.0		0	40-160			
2,2-Dichloropropane	10.6	1.0	ug/L	10.00		106	70-130			
2-Butanone	50.8	10.0	ug/L	50.00		102	40-160			
2-Chlorotoluene	9.2	1.0	ug/L	10.00		92	70-130			
2-Hexanone	46.7	10.0	ug/L	50.00		93	40-160			
4-Chlorotoluene	9.3	1.0	ug/L	10.00		93	70-130			
4-Isopropyltoluene	9.1	1.0	ug/L	10.00		91	70-130			
4-Methyl-2-Pentanone	44.9	10.0	ug/L	50.00		90	40-160			
Acetone	52.8	10.0	ug/L	50.00		106	40-160			
Benzene	9.5	1.0	ug/L	10.00		95	70-130			
Bromobenzene	9.4	2.0	ug/L	10.00		94	70-130			
Bromochloromethane	9.6	1.0	ug/L	10.00		96	70-130			
Bromodichloromethane	10.3	0.6	ug/L	10.00		103	70-130			
Bromoform	9.0	1.0	ug/L	10.00		90	40-160			
Bromomethane	10.2	2.0	ug/L	10.00		102	40-160			
Carbon Disulfide	10.7	1.0	ug/L	10.00		107	70-130			
Carbon Tetrachloride	9.8	1.0	ug/L	10.00		98	70-130			
Chlorobenzene	8.8	1.0	ug/L	10.00		88	70-130			
Chloroethane	10.6	2.0	ug/L	10.00		106	40-160			
Chloroform	9.0	1.0	ug/L	10.00		90	70-130			
Chloromethane	8.9	2.0	ug/L	10.00		89	40-160			
cis-1,2-Dichloroethene	9.7	1.0	ug/L	10.00		97	70-130			
cis-1,3-Dichloropropene	10.4	0.4	ug/L	10.00		104	40-160			
Dibromochloromethane	9.6	1.0	ug/L	10.00		96	40-160			
Dibromomethane	9.6	1.0	ug/L	10.00		96	70-130			
Dichlorodifluoromethane	6.3	2.0	ug/L	10.00		63	40-160			
Diethyl Ether	9.5	1.0	ug/L	10.00		95	70-130			
Di-isopropyl ether	9.7	1.0	ug/L	10.00		97	70-130			
Ethyl tertiary-butyl ether	9.7	1.0	ug/L	10.00		97	70-130			
Ethylbenzene	9.2	1.0	ug/L	10.00		92	70-130			
Hexachlorobutadiene	9.6	0.6	ug/L	10.00		96	40-160			
Hexachloroethane	10.4	1.0	ug/L	10.00		104	70-130			
Isopropylbenzene	10.2	1.0	ug/L	10.00		102	70-130			
Methyl tert-Butyl Ether	9.3	1.0	ug/L	10.00		93	70-130			
Methylene Chloride	9.6	2.0	ug/L	10.00		96	70-130			
Naphthalene	8.8	1.0	ug/L	10.00		88	40-160			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: 24G1024

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile Organics										
Batch DG42921 - 5030B										
n-Butylbenzene	9.8	1.0	ug/L	10.00		98	70-130			
n-Propylbenzene	9.3	1.0	ug/L	10.00		93	70-130			
sec-Butylbenzene	9.0	1.0	ug/L	10.00		90	70-130			
Styrene	9.2	1.0	ug/L	10.00		92	40-160			
tert-Butylbenzene	9.2	1.0	ug/L	10.00		92	70-130			
Tertiary-amyl methyl ether	9.9	1.0	ug/L	10.00		99	70-130			
Tetrachloroethene	7.0	1.0	ug/L	10.00		70	70-130			
Tetrahydrofuran	8.9	5.0	ug/L	10.00		89	70-130			
Toluene	9.5	1.0	ug/L	10.00		95	70-130			
trans-1,2-Dichloroethene	9.6	1.0	ug/L	10.00		96	70-130			
trans-1,3-Dichloropropene	9.3	0.4	ug/L	10.00		93	70-130			
Trichloroethene	9.2	1.0	ug/L	10.00		92	70-130			
Trichlorofluoromethane	9.6	1.0	ug/L	10.00		96	40-160			
Vinyl Chloride	10.0	1.0	ug/L	10.00		100	70-130			
Xylene O	9.4	1.0	ug/L	10.00		94	70-130			
Xylene P,M	18.5	2.0	ug/L	20.00		93	70-130			
Surrogate: 1,2-Dichloroethane-d4	*24.0*		ug/L	*25.00*		*96*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*24.9*		ug/L	*25.00*		*100*	*70-130*			
Surrogate: Dibromofluoromethane	*25.2*		ug/L	*25.00*		*101*	*70-130*			
Surrogate: Toluene-d8	*24.7*		ug/L	*25.00*		*99*	*70-130*			
LCS Dup										
1,1,1,2-Tetrachloroethane	10.0	1.0	ug/L	10.00		100	70-130	3	20	
1,1,1-Trichloroethane	9.7	1.0	ug/L	10.00		97	70-130	0.8	20	
1,1,2,2-Tetrachloroethane	9.1	0.5	ug/L	10.00		91	40-160	1	20	
1,1,2-Trichloroethane	9.4	1.0	ug/L	10.00		94	70-130	0.9	20	
1,1-Dichloroethane	9.4	1.0	ug/L	10.00		94	70-130	0.3	20	
1,1-Dichloroethene	10.0	1.0	ug/L	10.00		100	70-130	0.1	20	
1,1-Dichloropropene	9.8	2.0	ug/L	10.00		98	70-130	0.3	20	
1,2,3-Trichlorobenzene	9.7	1.0	ug/L	10.00		97	70-130	5	20	
1,2,3-Trichloropropane	9.1	1.0	ug/L	10.00		91	70-130	2	20	
1,2,4-Trichlorobenzene	8.3	1.0	ug/L	10.00		83	70-130	2	20	
1,2,4-Trimethylbenzene	9.7	1.0	ug/L	10.00		97	70-130	2	20	
1,2-Dibromo-3-Chloropropane	9.8	5.0	ug/L	10.00		98	70-130	4	20	
1,2-Dibromoethane	9.4	1.0	ug/L	10.00		94	70-130	4	20	
1,2-Dichlorobenzene	9.1	1.0	ug/L	10.00		91	70-130	1	20	
1,2-Dichloroethane	9.0	1.0	ug/L	10.00		90	70-130	1	20	
1,2-Dichloropropane	9.5	1.0	ug/L	10.00		95	70-130	2	20	
1,3,5-Trimethylbenzene	9.6	1.0	ug/L	10.00		96	70-130	3	20	
1,3-Dichlorobenzene	9.1	1.0	ug/L	10.00		91	70-130	0.2	20	
1,3-Dichloropropane	9.4	1.0	ug/L	10.00		94	70-130	4	20	
1,4-Dichlorobenzene	9.3	1.0	ug/L	10.00		93	70-130	3	20	
1,4-Dioxane - Screen	ND	100	ug/L	200.0		0	40-160		200	
2,2-Dichloropropane	10.6	1.0	ug/L	10.00		106	70-130	0.6	20	
2-Butanone	51.1	10.0	ug/L	50.00		102	40-160	0.6	20	
2-Chlorotoluene	9.6	1.0	ug/L	10.00		96	70-130	4	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 24G1024

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile Organics										
Batch DG42921 - 5030B										
2-Hexanone	48.3	10.0	ug/L	50.00		97	40-160	3	20	
4-Chlorotoluene	9.5	1.0	ug/L	10.00		95	70-130	2	20	
4-Isopropyltoluene	9.3	1.0	ug/L	10.00		93	70-130	2	20	
4-Methyl-2-Pentanone	45.1	10.0	ug/L	50.00		90	40-160	0.5	20	
Acetone	51.8	10.0	ug/L	50.00		104	40-160	2	20	
Benzene	9.7	1.0	ug/L	10.00		97	70-130	2	20	
Bromobenzene	9.7	2.0	ug/L	10.00		97	70-130	3	20	
Bromochloromethane	9.8	1.0	ug/L	10.00		98	70-130	2	20	
Bromodichloromethane	10.7	0.6	ug/L	10.00		107	70-130	4	20	
Bromoform	9.1	1.0	ug/L	10.00		91	40-160	1	20	
Bromomethane	10.3	2.0	ug/L	10.00		103	40-160	0.4	20	
Carbon Disulfide	10.8	1.0	ug/L	10.00		108	70-130	1	20	
Carbon Tetrachloride	9.7	1.0	ug/L	10.00		97	70-130	0.7	20	
Chlorobenzene	9.1	1.0	ug/L	10.00		91	70-130	3	20	
Chloroethane	10.9	2.0	ug/L	10.00		109	40-160	2	20	
Chloroform	9.2	1.0	ug/L	10.00		92	70-130	2	20	
Chloromethane	9.0	2.0	ug/L	10.00		90	40-160	0.9	20	
cis-1,2-Dichloroethene	9.9	1.0	ug/L	10.00		99	70-130	2	20	
cis-1,3-Dichloropropene	10.6	0.4	ug/L	10.00		106	40-160	1	20	
Dibromochloromethane	9.6	1.0	ug/L	10.00		96	40-160	0.8	20	
Dibromomethane	9.8	1.0	ug/L	10.00		98	70-130	2	20	
Dichlorodifluoromethane	6.2	2.0	ug/L	10.00		62	40-160	0.2	20	
Diethyl Ether	9.6	1.0	ug/L	10.00		96	70-130	1	20	
Di-isopropyl ether	9.8	1.0	ug/L	10.00		98	70-130	1	20	
Ethyl tertiary-butyl ether	9.8	1.0	ug/L	10.00		98	70-130	0.7	20	
Ethylbenzene	9.5	1.0	ug/L	10.00		95	70-130	3	20	
Hexachlorobutadiene	9.4	0.6	ug/L	10.00		94	40-160	2	20	
Hexachloroethane	10.6	1.0	ug/L	10.00		106	70-130	2	20	
Isopropylbenzene	10.6	1.0	ug/L	10.00		106	70-130	3	20	
Methyl tert-Butyl Ether	9.5	1.0	ug/L	10.00		95	70-130	2	20	
Methylene Chloride	9.7	2.0	ug/L	10.00		97	70-130	0.9	20	
Naphthalene	8.7	1.0	ug/L	10.00		87	40-160	2	20	
n-Butylbenzene	9.8	1.0	ug/L	10.00		98	70-130	0.4	20	
n-Propylbenzene	9.6	1.0	ug/L	10.00		96	70-130	3	20	
sec-Butylbenzene	9.2	1.0	ug/L	10.00		92	70-130	2	20	
Styrene	9.5	1.0	ug/L	10.00		95	40-160	3	20	
tert-Butylbenzene	9.5	1.0	ug/L	10.00		95	70-130	3	20	
Tertiary-amyl methyl ether	10.0	1.0	ug/L	10.00		100	70-130	0.6	20	
Tetrachloroethene	7.7	1.0	ug/L	10.00		77	70-130	8	20	
Tetrahydrofuran	9.5	5.0	ug/L	10.00		95	70-130	7	20	
Toluene	9.7	1.0	ug/L	10.00		97	70-130	2	20	
trans-1,2-Dichloroethene	9.7	1.0	ug/L	10.00		97	70-130	0.7	20	
trans-1,3-Dichloropropene	9.5	0.4	ug/L	10.00		95	70-130	2	20	
Trichloroethene	9.2	1.0	ug/L	10.00		92	70-130	0	20	
Trichlorofluoromethane	9.6	1.0	ug/L	10.00		96	40-160	0	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: 24G1024

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Volatile Organics										
Batch DG42921 - 5030B										
Vinyl Chloride	10.1	1.0	ug/L	10.00		101	70-130	0.7	20	
Xylene O	9.6	1.0	ug/L	10.00		96	70-130	3	20	
Xylene P,M	18.9	2.0	ug/L	20.00		95	70-130	2	20	
Surrogate: 1,2-Dichloroethane-d4	*24.1*		ug/L	*25.00*		*97*	*70-130*			
Surrogate: 4-Bromofluorobenzene	*24.8*		ug/L	*25.00*		*99*	*70-130*			
Surrogate: Dibromofluoromethane	*25.1*		ug/L	*25.00*		*100*	*70-130*			
Surrogate: Toluene-d8	*24.8*		ug/L	*25.00*		*99*	*70-130*			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: 24G1024

Notes and Definitions

U	Analyte included in the analysis, but not detected
Q	Calibration required quadratic regression (Q).
CD-	Continuing Calibration %Diff/Drift is below control limit (CD-).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probable Number
TNTC	Too numerous to Count
CFU	Colony Forming Units

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: 24G1024

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

Shipped/Delivered Via: ESS Courier

ESS Project ID: 24G1024
Date Received: 7/26/2024
Project Due Date: 8/2/2024
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 1.6 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? (Yes) / No
    a. Air bubbles in aqueous VOAs? Yes / (No)
    b. Does methanol cover soil completely? Yes / No / NA
13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By/Acid Lot#:
    b. If dissolved metals are requested, are they: Yes / No Field Filtered Yes / No To Be Lab Filtered
    c. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Resolution:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1	576362	Yes	No	Yes	VOA Vial	HCl	
1	576363	Yes	No	Yes	VOA Vial	HCl	
1	576364	Yes	No	Yes	VOA Vial	HCl	
2	576365	Yes	No	Yes	VOA Vial	HCl	
2	576366	Yes	No	Yes	VOA Vial	HCl	
2	576367	Yes	No	Yes	VOA Vial	HCl	
3	576368	Yes	No	Yes	VOA Vial	HCl	
3	576369	Yes	No	Yes	VOA Vial	HCl	
3	576370	Yes	No	Yes	VOA Vial	HCl	

2nd Review
Were all containers scanned into storage/lab? Initials MM
Are barcode labels on correct containers? Yes / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

Completed By: Date & Time: 7/26/24 1610
Reviewed

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

By: [signature]

ESS Project ID: 24G1024

Date Received: 7/26/2024

Date & Time: 7/26/24 16:26

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 24G1024

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman
781-721-4091 rhoffman@geiconsultants.com

Send Report to: Ryan Hoffman
labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY AND MCP ANALYTICAL METHODS REQUIRED: (YES) NO

STATE AND FEDERAL REGULATORY REQUIREMENTS/REPORT LIMITS

State/Federal Program: (MA) 401WQC Other _____ NH RI CT NY ME

MA MCP Criteria are Method 1 S-1 and GW-2/GW-3. Circle if GW-1 is required.

Preservative

Analysis

Sample Handling

Samples Field Filtered
YES (NO) NA

Sampled Shipped With Ice
(YES) NO

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	VOCs 8260 (HCL)
1	1804576-843R	7/25/24	0800	GW	3	DJM	X
2	1804576-852R	7/25/24	0840	GW	3	DJM	X
3	1804576-851R	7/25/24	0925	GW	3	DJM	X

	Relinquished by sampler: (signature)	Date	Time	Received by: (signature)
1.	Charles DeMayo	7/25/24	1500	GEI Fridge
2.	GEI Fridge	7/26/24	1300	David Mill
3.	David Mill	7/26/24	1302	7/26/24 1355
4.	1.6 mi	7/26/24	1551	
5.				

Turnaround Time (Business days):

Standard TAT X 4-Day ____ 3-Day ____
2-Day ____ 1-Day ____ Other ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

Sample Matrix Abbreviations: SO = Soil GW = Groundwater SW = Surface Water SD = Sediment CO = Concrete PC = Paint Chip CLK = Caulk

Appendix J Laboratory Data Reports – Upland Soil

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: 23K0140

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 5:40 pm, Nov 14, 2023

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 23K0140

SAMPLE RECEIPT

The following samples were received on November 03, 2023 for the analyses specified on the enclosed Chain of Custody Record.

To achieve CAM compliance for MCP data, ESS Laboratory has reviewed all QA/QC Requirements and Performance Standards listed in each method. Holding times and preservation have also been reviewed. All CAM requirements have been performed and achieved unless noted in the project narrative.

Each method has been set-up in the laboratory to reach required MCP standards. The methods for aqueous VOA and Soil Methanol VOA have known limitations for certain analytes. The regulatory standards may not be achieved due to these limitations. In addition, for all methods, matrix interferences, dilutions, and %Solids may elevate method reporting limits above regulatory standards. ESS Laboratory can provide, upon request, a Limit Checker (regulatory standard comparison spreadsheet) electronic deliverable which will highlight these exceedances.

Question I: All samples for metals were analyzed for a subset of the required MCP list per the client's request.

Lab Number	Sample Name	Matrix	Analysis
23K0140-01	1804576-HA101-Comp	Soil	6010C, 7471B, 8270D, EPH8270, MA PAC, MADEP-EPH
23K0140-02	1804576-HA101-Grab	Soil	MA-VPH-2.1
23K0140-03	1804576-HA102-Comp	Soil	6010C, 7471B, 8270D, EPH8270, MA PAC, MADEP-EPH
23K0140-04	1804576-HA102-Grab	Soil	MA-VPH-2.1
23K0140-05	1804576-HA103-Comp	Soil	6010C, 6020A, 7471B, 8270D, EPH8270, MA PAC, MADEP-EPH
23K0140-06	1804576-HA103-Grab	Soil	MA-VPH-2.1
23K0140-07	1804576-HA104-Comp	Soil	6010C, 7471B, 8270D, EPH8270, MA PAC, MADEP-EPH
23K0140-08	1804576-HA104-Grab	Soil	MA-VPH-2.1
23K0140-09	1804576-HA105-Comp	Soil	6010C, 7471B, 8270D, EPH8270, MA PAC, MADEP-EPH
23K0140-10	1804576-HA105-Grab	Soil	MA-VPH-2.1

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 23K0140

PROJECT NARRATIVE

8270D Semi-Volatile Organic Compounds

23K0140-01	**Elevated Method Reporting Limits due to sample matrix (EL).**
23K0140-03	**Elevated Method Reporting Limits due to sample matrix (EL).**
D3K0112-CCV1	**Calibration required quadratic regression (Q).**
	2,4-Dinitrophenol (112% @ 80-120%), Di-n-octylphthalate (95% @ 80-120%)
D3K0112-CCV1	**Continuing Calibration %Diff/Drift is above control limit (CD+).**
	3,3´-Dichlorobenzidine (21% @ 20%), Dibenzo(a,h)Anthracene (24% @ 20%)
D3K0151-CCV1	**Calibration required quadratic regression (Q).**
	2,4-Dinitrophenol (93% @ 80-120%)
D3K0151-CCV1	**Continuing Calibration %Diff/Drift is above control limit (CD+).**
	2,4,5-Trichlorophenol (22% @ 20%), 3,3´-Dichlorobenzidine (21% @ 20%), bis(2-Ethylhexyl)phthalate (22% @ 20%), Butylbenzylphthalate (22% @ 20%), Di-n-octylphthalate (21% @ 20%)

MADEP-EPH Extractable Petroleum Hydrocarbons

D3K0090-CCV3	**Continuing Calibration %Diff/Drift is above control limit (CD+).**
	1-Chlorooctadecane (27% @ 25%)
D3K0102-CCV9	**Continuing Calibration %Diff/Drift is below control limit (CD-).**
	Benzo(g,h,i)perylene (25% @ 20%), Indeno(1,2,3-cd)Pyrene (25% @ 20%)

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 23K0140

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 23K0140

MassDEP Analytical Protocol Certification Form

MADEP RTN: _____

This form provides certification for the following data set: **23K0140-01 through 23K0140-10**

Matrices: ( ) Ground Water/Surface Water (X) Soil/Sediment ( ) Drinking Water ( ) Air ( ) Other:_____

CAM Protocol (check all that apply below):

( ) 8260 VOC CAM II A	(X) 7470/7471 Hg CAM III B	(X) MassDEP VPH (GC/PID/FID) CAM IV A	( ) 8082 PCB CAM V A	(X) 9014 Total Cyanide/PAC CAM VI A	( ) 6860 Perchlorate CAM VIII B
(X) 8270 SVOC CAM II B	( ) 7010 Metals CAM III C	( ) MassDEP VPH (GC/MS) CAM IV C	( ) 8081 Pesticides CAM V B	( ) 7196 Hex Cr CAM VI B	( ) MassDEP APH CAM IX A
(X) 6010 Metals CAM III A	(X) 6020 Metals CAM III D	(X) MassDEP EPH CAM IV B	( ) 8151 Herbicides CAM V C	( ) Explosives CAM VIII A	( ) TO-15 VOC CAM IX B

Affirmative responses to questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	Yes (X) No ( )
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	Yes (X) No ( )
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	Yes (X) No ( )
D	Does the laboratory report comply with all the reporting requirements specified in the CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	Yes (X) No ( )
E	VPH, EPH, APH and TO-15 only: a. Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	Yes (X) No ( )
	b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	Yes ( ) No ( )
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	Yes (X) No ( )

Responses to Questions G, H and I below are required for "'Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocols(s)?	Yes ( ) No (X)*
	***Data User Note:* Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.**	
H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	Yes ( ) No (X)*
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	Yes ( ) No (X)*

All negative responses must be addressed in an attached laboratory narrative.

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature: _____ Date: November 14, 2023
Printed Name: Laur[illegible] Position: Laboratory Director

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-HA101-Comp
Date Sampled: 11/02/23 12:15
Percent Solids: 89

ESS Laboratory Work Order: 23K0140
ESS Laboratory Sample ID: 23K0140-01
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Arsenic	**15.2** (2.28)		6010C		1	CEV	11/07/23 14:47	2.47	100	DK30614
Barium	**75.6** (2.28)		6010C		1	CEV	11/07/23 14:47	2.47	100	DK30614
Cadmium	**1.11** (0.46)		6010C		1	CEV	11/07/23 14:47	2.47	100	DK30614
Chromium	**23.7** (0.91)		6010C		1	CEV	11/07/23 14:47	2.47	100	DK30614
Lead	**204** (4.13)		6010C		1	CEV	11/14/23 11:20	2.73	100	DK31344
Mercury	**7.32** (0.697)		7471B		20	AFV	11/07/23 17:36	0.64	40	DK30612
Selenium	ND (4.56)		6010C		1	CEV	11/07/23 14:47	2.47	100	DK30614
Silver	ND (0.46)		6010C		1	CEV	11/07/23 14:47	2.47	100	DK30614

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-HA101-Comp
Date Sampled: 11/02/23 12:15
Percent Solids: 89
Initial Volume: 20.6g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0140
ESS Laboratory Sample ID: 23K0140-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/6/23 11:30

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	**0.101** (0.055)		8270D		2	11/07/23 0:07	D3K0112	DK30606
1,2,4-Trichlorobenzene	ND (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
1,2-Dichlorobenzene	ND (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
1,3-Dichlorobenzene	ND (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
1,4-Dichlorobenzene	ND (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
2,4,5-Trichlorophenol	ND (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
2,4,6-Trichlorophenol	ND (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
2,4-Dichlorophenol	ND (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
2,4-Dimethylphenol	ND (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
2,4-Dinitrophenol	ND (2.19)		8270D		2	11/07/23 0:07	D3K0112	DK30606
2,4-Dinitrotoluene	ND (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
2,6-Dinitrotoluene	ND (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
2-Chloronaphthalene	ND (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
2-Chlorophenol	ND (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
2-Methylnaphthalene	ND (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
2-Methylphenol	ND (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
2-Nitrophenol	ND (1.09)		8270D		2	11/07/23 0:07	D3K0112	DK30606
3,3´-Dichlorobenzidine	ND (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
3+4-Methylphenol	ND (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
4-Bromophenyl-phenylether	ND (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
4-Chloroaniline	ND (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
4-Nitrophenol	ND (2.19)		8270D		2	11/07/23 0:07	D3K0112	DK30606
Acenaphthene	ND (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
Acenaphthylene	**1.10** (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
Acetophenone	ND (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
Aniline	ND (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
Anthracene	**2.10** (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
Azobenzene	ND (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
Benzo(a)anthracene	**8.64** (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
Benzo(a)pyrene	**9.13** (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
Benzo(b)fluoranthene	**9.15** (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
Benzo(g,h,i)perylene	**9.94** (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-HA101-Comp
Date Sampled: 11/02/23 12:15
Percent Solids: 89
Initial Volume: 20.6g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0140
ESS Laboratory Sample ID: 23K0140-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/6/23 11:30

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzo(k)fluoranthene	**7.73** (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
bis(2-Chloroethoxy)methane	ND (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
bis(2-Chloroethyl)ether	ND (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
bis(2-chloroisopropyl)Ether	ND (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
bis(2-Ethylhexyl)phthalate	ND (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
Butylbenzylphthalate	ND (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
Chrysene	**9.18** (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
Dibenzo(a,h)Anthracene	**1.42** (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
Dibenzofuran	ND (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
Diethylphthalate	ND (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
Dimethylphthalate	ND (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
Di-n-butylphthalate	ND (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
Di-n-octylphthalate	ND (1.09)		8270D		2	11/07/23 0:07	D3K0112	DK30606
Fluoranthene	**18.9** (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
Fluorene	**0.580** (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
Hexachlorobenzene	ND (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
Hexachlorobutadiene	ND (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
Hexachloroethane	ND (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
Indeno(1,2,3-cd)Pyrene	**9.03** (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
Isophorone	ND (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
Naphthalene	**0.735** (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
Nitrobenzene	ND (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
N-Nitrosodimethylamine	ND (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
Pentachlorophenol	ND (2.19)		8270D		2	11/07/23 0:07	D3K0112	DK30606
Phenanthrene	**8.66** (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
Phenol	ND (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606
Pyrene	**24.7** (0.547)		8270D		2	11/07/23 0:07	D3K0112	DK30606

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*75 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*84 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*79 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-HA101-Comp
Date Sampled: 11/02/23 12:15
Percent Solids: 89
Initial Volume: 20.6g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0140
ESS Laboratory Sample ID: 23K0140-01
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/6/23 11:30

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Surrogate: 2-Fluorobiphenyl		*75 %*		*30-130*				
Surrogate: 2-Fluorophenol		*71 %*		*30-130*				
Surrogate: Nitrobenzene-d5		*73 %*		*30-130*				
Surrogate: Phenol-d6		*78 %*		*30-130*				
Surrogate: p-Terphenyl-d14		*103 %*		*30-130*				

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-HA101-Comp
Date Sampled: 11/02/23 12:15
Percent Solids: 89

ESS Laboratory Work Order: 23K0140
ESS Laboratory Sample ID: 23K0140-01
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Cyanide (PAC)	ND (1.13)		MA PAC		1	EEM	11/07/23 12:00	mg/kg dry	DK30718

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-HA101-Comp
Date Sampled: 11/02/23 12:15
Percent Solids: 89
Initial Volume: 25.1g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0140
ESS Laboratory Sample ID: 23K0140-01
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 11/3/23 20:18

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (16.8)		MADEP-EPH		1	KXB	11/07/23 13:04	D3K0125	DK30349
C19-C36 Aliphatics1	**51.5** (16.8)		MADEP-EPH		1	KXB	11/07/23 13:04	D3K0125	DK30349
C11-C22 Unadjusted Aromatics1	**205** (16.8)		EPH8270		1	KXB	11/07/23 18:27	D3K0131	DK30349
C11-C22 Aromatics1,2	**135** (16.8)		EPH8270			KXB	11/07/23 18:27		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*50 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*90 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*93 %*		*40-140*
Surrogate: O-Terphenyl	*66 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-HA101-Grab
Date Sampled: 11/02/23 12:16
Percent Solids: 89
Initial Volume: 15.9g
Final Volume: 15ml
Extraction Method: 5030B
Column Type: Restek RTX-502.2 - 3µ film thickness 0.53mm X 105m

ESS Laboratory Work Order: 23K0140
ESS Laboratory Sample ID: 23K0140-02
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Trap Type: Supelco K Vocarb 3000 Trap

MADEP-VPH Volatile Petroleum Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
C9-C10 Aromatics	ND (11.9)		MA-VPH-2.1		1	11/07/23 12:50	D3K0140	DK30724
C5-C8 Aliphatics1,2	**23.1** (12.4)		MA-VPH-2.1		1	11/07/23 12:50		[CALC]
C9-C12 Aliphatics2,3	ND (24.7)		MA-VPH-2.1		1	11/07/23 12:50		[CALC]
Benzene	**0.30** (0.24)		MA-VPH-2.1		1	11/07/23 12:50	D3K0140	DK30724
Ethylbenzene	ND (0.24)		MA-VPH-2.1		1	11/07/23 12:50	D3K0140	DK30724
Methyl tert-Butyl Ether	ND (0.06)		MA-VPH-2.1		1	11/07/23 12:50	D3K0140	DK30724
Naphthalene	ND (0.24)		MA-VPH-2.1		1	11/07/23 12:50	D3K0140	DK30724
Toluene	ND (0.24)		MA-VPH-2.1		1	11/07/23 12:50	D3K0140	DK30724
Xylene O	ND (0.24)		MA-VPH-2.1		1	11/07/23 12:50	D3K0140	DK30724
Xylene P,M	ND (0.48)		MA-VPH-2.1		1	11/07/23 12:50	D3K0140	DK30724
1:1 Methanol/Soil Ratio %D	**6** (N/A)		MA-VPH-2.1			11/07/23 8:00		DK30724
Preservative:	**MeOH - covered**		MA-VPH-2.1					DK30724

	%Recovery	Qualifier	Limits
Surrogate: 2,5-Dibromotoluene - FID	*95 %*		*70-130*
Surrogate: 2,5-Dibromotoluene - PID	*96 %*		*70-130*
Surrogate: Trifluorotoluene - FID	*98 %*		*70-130*
Surrogate: Trifluorotoluene - PID	*97 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-HA102-Comp
Date Sampled: 11/02/23 14:30
Percent Solids: 83

ESS Laboratory Work Order: 23K0140
ESS Laboratory Sample ID: 23K0140-03
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Arsenic	**8.75** (2.37)		6010C		1	CEV	11/07/23 14:49	2.543	100	DK30614
Barium	**151** (2.37)		6010C		1	CEV	11/07/23 14:49	2.543	100	DK30614
Cadmium	ND (0.47)		6010C		1	CEV	11/07/23 14:49	2.543	100	DK30614
Chromium	**49.1** (0.95)		6010C		1	CEV	11/07/23 14:49	2.543	100	DK30614
Lead	**58.5** (4.74)		6010C		1	CEV	11/14/23 11:39	2.54	100	DK31344
Mercury	**3.04** (0.931)		7471B		25	AFV	11/06/23 21:51	0.64	40	DK30612
Selenium	ND (4.74)		6010C		1	CEV	11/07/23 14:49	2.543	100	DK30614
Silver	ND (0.47)		6010C		1	CEV	11/07/23 14:49	2.543	100	DK30614

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-HA102-Comp
Date Sampled: 11/02/23 14:30
Percent Solids: 83
Initial Volume: 19g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0140
ESS Laboratory Sample ID: 23K0140-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/6/23 11:30

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.063)		8270D		2	11/07/23 0:38	D3K0112	DK30606
1,2,4-Trichlorobenzene	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
1,2-Dichlorobenzene	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
1,3-Dichlorobenzene	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
1,4-Dichlorobenzene	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
2,4,5-Trichlorophenol	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
2,4,6-Trichlorophenol	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
2,4-Dichlorophenol	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
2,4-Dimethylphenol	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
2,4-Dinitrophenol	ND (2.54)		8270D		2	11/07/23 0:38	D3K0112	DK30606
2,4-Dinitrotoluene	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
2,6-Dinitrotoluene	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
2-Chloronaphthalene	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
2-Chlorophenol	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
2-Methylnaphthalene	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
2-Methylphenol	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
2-Nitrophenol	ND (1.27)		8270D		2	11/07/23 0:38	D3K0112	DK30606
3,3´-Dichlorobenzidine	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
3+4-Methylphenol	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
4-Bromophenyl-phenylether	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
4-Chloroaniline	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
4-Nitrophenol	ND (2.54)		8270D		2	11/07/23 0:38	D3K0112	DK30606
Acenaphthene	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
Acenaphthylene	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
Acetophenone	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
Aniline	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
Anthracene	**1.04** (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
Azobenzene	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
Benzo(a)anthracene	**5.35** (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
Benzo(a)pyrene	**6.65** (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
Benzo(b)fluoranthene	**7.72** (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
Benzo(g,h,i)perylene	**4.81** (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-HA102-Comp
Date Sampled: 11/02/23 14:30
Percent Solids: 83
Initial Volume: 19g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0140
ESS Laboratory Sample ID: 23K0140-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/6/23 11:30

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzo(k)fluoranthene	**5.69** (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
bis(2-Chloroethoxy)methane	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
bis(2-Chloroethyl)ether	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
bis(2-chloroisopropyl)Ether	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
bis(2-Ethylhexyl)phthalate	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
Butylbenzylphthalate	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
Chrysene	**7.57** (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
Dibenzo(a,h)Anthracene	**1.09** (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
Dibenzofuran	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
Diethylphthalate	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
Dimethylphthalate	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
Di-n-butylphthalate	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
Di-n-octylphthalate	ND (1.27)		8270D		2	11/07/23 0:38	D3K0112	DK30606
Fluoranthene	**16.2** (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
Fluorene	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
Hexachlorobenzene	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
Hexachlorobutadiene	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
Hexachloroethane	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
Indeno(1,2,3-cd)Pyrene	**5.08** (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
Isophorone	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
Naphthalene	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
Nitrobenzene	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
N-Nitrosodimethylamine	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
Pentachlorophenol	ND (2.54)		8270D		2	11/07/23 0:38	D3K0112	DK30606
Phenanthrene	**8.31** (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
Phenol	ND (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606
Pyrene	**16.0** (0.634)		8270D		2	11/07/23 0:38	D3K0112	DK30606

	%Recovery	*Qualifier*	*Limits*
Surrogate: 1,2-Dichlorobenzene-d4	*75 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*84 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*78 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-HA102-Comp
Date Sampled: 11/02/23 14:30
Percent Solids: 83
Initial Volume: 19g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0140
ESS Laboratory Sample ID: 23K0140-03
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/6/23 11:30

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Surrogate: 2-Fluorobiphenyl		*77 %*		*30-130*				
Surrogate: 2-Fluorophenol		*70 %*		*30-130*				
Surrogate: Nitrobenzene-d5		*73 %*		*30-130*				
Surrogate: Phenol-d6		*76 %*		*30-130*				
Surrogate: p-Terphenyl-d14		*101 %*		*30-130*				

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-HA102-Comp
Date Sampled: 11/02/23 14:30
Percent Solids: 83

ESS Laboratory Work Order: 23K0140
ESS Laboratory Sample ID: 23K0140-03
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Cyanide (PAC)	ND (1.20)		MA PAC		1	EEM	11/07/23 12:00	mg/kg dry	DK30718

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-HA102-Comp
Date Sampled: 11/02/23 14:30
Percent Solids: 83
Initial Volume: 24.6g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0140
ESS Laboratory Sample ID: 23K0140-03
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 11/8/23 19:25

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (18.4)		MADEP-EPH		1	KXB	11/09/23 13:04	D3K0191	DK30847
C19-C36 Aliphatics1	**24.1** (18.4)		MADEP-EPH		1	KXB	11/09/23 13:04	D3K0191	DK30847
C11-C22 Unadjusted Aromatics1	**177** (18.4)		EPH8270		1	KXB	11/09/23 17:52	D3K0166	DK30847
C11-C22 Aromatics1,2	**110** (18.4)		EPH8270			KXB	11/10/23 9:02		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*50 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*94 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*95 %*		*40-140*
Surrogate: O-Terphenyl	*71 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-HA102-Grab
Date Sampled: 11/02/23 14:31
Percent Solids: 83
Initial Volume: 7.2g
Final Volume: 15ml
Extraction Method: 5030B
Column Type: Restek RTX-502.2 - 3µ film thickness 0.53mm X 105m

ESS Laboratory Work Order: 23K0140
ESS Laboratory Sample ID: 23K0140-04
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Trap Type: Supelco K Vocarb 3000 Trap

MADEP-VPH Volatile Petroleum Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
C9-C10 Aromatics	ND (27.1)		MA-VPH-2.1		1	11/07/23 13:21	D3K0140	DK30724
C5-C8 Aliphatics1,2	**64.4** (28.4)		MA-VPH-2.1		1	11/07/23 13:21		[CALC]
C9-C12 Aliphatics2,3	ND (56.4)		MA-VPH-2.1		1	11/07/23 13:21		[CALC]
Benzene	ND (0.54)		MA-VPH-2.1		1	11/07/23 13:21	D3K0140	DK30724
Ethylbenzene	ND (0.54)		MA-VPH-2.1		1	11/07/23 13:21	D3K0140	DK30724
Methyl tert-Butyl Ether	ND (0.14)		MA-VPH-2.1		1	11/07/23 13:21	D3K0140	DK30724
Naphthalene	ND (0.54)		MA-VPH-2.1		1	11/07/23 13:21	D3K0140	DK30724
Toluene	ND (0.54)		MA-VPH-2.1		1	11/07/23 13:21	D3K0140	DK30724
Xylene O	ND (0.54)		MA-VPH-2.1		1	11/07/23 13:21	D3K0140	DK30724
Xylene P,M	ND (1.09)		MA-VPH-2.1		1	11/07/23 13:21	D3K0140	DK30724
1:1 Methanol/Soil Ratio %D	**52** (N/A)		MA-VPH-2.1			11/07/23 8:00		DK30724
Preservative:	**MeOH - covered**		MA-VPH-2.1					DK30724

	%Recovery	Qualifier	Limits
Surrogate: 2,5-Dibromotoluene - FID	*100 %*		*70-130*
Surrogate: 2,5-Dibromotoluene - PID	*102 %*		*70-130*
Surrogate: Trifluorotoluene - FID	*91 %*		*70-130*
Surrogate: Trifluorotoluene - PID	*93 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-HA103-Comp
Date Sampled: 11/02/23 15:00
Percent Solids: 89

ESS Laboratory Work Order: 23K0140
ESS Laboratory Sample ID: 23K0140-05
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Arsenic	**19.0** (2.17)		6010C		1	CEV	11/07/23 14:51	2.59	100	DK30614
Barium	**129** (2.17)		6010C		1	CEV	11/07/23 14:51	2.59	100	DK30614
Cadmium	**1.43** (0.43)		6010C		1	CEV	11/07/23 14:51	2.59	100	DK30614
Chromium	**44.1** (0.87)		6010C		1	CEV	11/07/23 14:51	2.59	100	DK30614
Lead	**243** (4.45)		6010C		1	CEV	11/14/23 11:41	2.53	100	DK31344
Mercury	**0.652** (0.034)		7471B		1	AFV	11/06/23 20:53	0.65	40	DK30612
Selenium	ND (4.34)		6020A		1	BJV	11/09/23 15:58	2.59	100	DK30614
Silver	**0.67** (0.43)		6010C		1	CEV	11/07/23 14:51	2.59	100	DK30614

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-HA103-Comp
Date Sampled: 11/02/23 15:00
Percent Solids: 89
Initial Volume: 20.1g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0140
ESS Laboratory Sample ID: 23K0140-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/6/23 11:30

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.028)		8270D		1	11/08/23 1:58	D3K0151	DK30606
1,2,4-Trichlorobenzene	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
1,2-Dichlorobenzene	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
1,3-Dichlorobenzene	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
1,4-Dichlorobenzene	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
2,4,5-Trichlorophenol	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
2,4,6-Trichlorophenol	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
2,4-Dichlorophenol	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
2,4-Dimethylphenol	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
2,4-Dinitrophenol	ND (1.12)		8270D		1	11/08/23 1:58	D3K0151	DK30606
2,4-Dinitrotoluene	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
2,6-Dinitrotoluene	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
2-Chloronaphthalene	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
2-Chlorophenol	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
2-Methylnaphthalene	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
2-Methylphenol	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
2-Nitrophenol	ND (0.560)		8270D		1	11/08/23 1:58	D3K0151	DK30606
3,3´-Dichlorobenzidine	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
3+4-Methylphenol	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
4-Bromophenyl-phenylether	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
4-Chloroaniline	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
4-Nitrophenol	ND (1.12)		8270D		1	11/08/23 1:58	D3K0151	DK30606
Acenaphthene	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
Acenaphthylene	**0.439** (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
Acetophenone	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
Aniline	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
Anthracene	**0.678** (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
Azobenzene	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
Benzo(a)anthracene	**3.16** (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
Benzo(a)pyrene	**3.70** (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
Benzo(b)fluoranthene	**4.08** (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
Benzo(g,h,i)perylene	**2.16** (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-HA103-Comp
Date Sampled: 11/02/23 15:00
Percent Solids: 89
Initial Volume: 20.1g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0140
ESS Laboratory Sample ID: 23K0140-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/6/23 11:30

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzo(k)fluoranthene	**3.04** (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
bis(2-Chloroethoxy)methane	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
bis(2-Chloroethyl)ether	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
bis(2-chloroisopropyl)Ether	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
bis(2-Ethylhexyl)phthalate	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
Butylbenzylphthalate	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
Chrysene	**3.87** (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
Dibenzo(a,h)Anthracene	**0.572** (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
Dibenzofuran	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
Diethylphthalate	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
Dimethylphthalate	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
Di-n-butylphthalate	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
Di-n-octylphthalate	ND (0.560)		8270D		1	11/08/23 1:58	D3K0151	DK30606
Fluoranthene	**4.42** (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
Fluorene	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
Hexachlorobenzene	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
Hexachlorobutadiene	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
Hexachloroethane	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
Indeno(1,2,3-cd)Pyrene	**2.50** (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
Isophorone	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
Naphthalene	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
Nitrobenzene	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
N-Nitrosodimethylamine	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
Pentachlorophenol	ND (1.12)		8270D		1	11/08/23 1:58	D3K0151	DK30606
Phenanthrene	**1.76** (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
Phenol	ND (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606
Pyrene	**5.57** (0.280)		8270D		1	11/08/23 1:58	D3K0151	DK30606

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*84 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*93 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*88 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-HA103-Comp
Date Sampled: 11/02/23 15:00
Percent Solids: 89
Initial Volume: 20.1g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0140
ESS Laboratory Sample ID: 23K0140-05
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/6/23 11:30

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Surrogate: 2-Fluorobiphenyl		*84 %*		*30-130*				
Surrogate: 2-Fluorophenol		*89 %*		*30-130*				
Surrogate: Nitrobenzene-d5		*85 %*		*30-130*				
Surrogate: Phenol-d6		*90 %*		*30-130*				
Surrogate: p-Terphenyl-d14		*103 %*		*30-130*				

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-HA103-Comp
Date Sampled: 11/02/23 15:00
Percent Solids: 89

ESS Laboratory Work Order: 23K0140
ESS Laboratory Sample ID: 23K0140-05
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Cyanide (PAC)	ND (1.12)		MA PAC		1	EEM	11/07/23 12:00	mg/kg dry	DK30718

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-HA103-Comp
Date Sampled: 11/02/23 15:00
Percent Solids: 89
Initial Volume: 24.2g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0140
ESS Laboratory Sample ID: 23K0140-05
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 11/3/23 20:18

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (17.4)		MADEP-EPH		1	KXB	11/08/23 17:40	D3K0159	DK30349
C19-C36 Aliphatics1	**21.2** (17.4)		MADEP-EPH		1	KXB	11/08/23 17:40	D3K0159	DK30349
C11-C22 Unadjusted Aromatics1	**105** (17.4)		EPH8270		1	KXB	11/07/23 19:04	D3K0131	DK30349
C11-C22 Aromatics1,2	**74.9** (17.4)		EPH8270			KXB	11/07/23 19:04		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*68 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*88 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*91 %*		*40-140*
Surrogate: O-Terphenyl	*72 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-HA103-Grab
Date Sampled: 11/02/23 15:01
Percent Solids: 89
Initial Volume: 8.8g
Final Volume: 15ml
Extraction Method: 5030B
Column Type: Restek RTX-502.2 - 3µ film thickness 0.53mm X 105m

ESS Laboratory Work Order: 23K0140
ESS Laboratory Sample ID: 23K0140-06
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Trap Type: Supelco K Vocarb 3000 Trap

MADEP-VPH Volatile Petroleum Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
C9-C10 Aromatics	ND (20.4)		MA-VPH-2.1		1	11/07/23 13:52	D3K0140	DK30724
C5-C8 Aliphatics1,2	ND (21.3)		MA-VPH-2.1		1	11/07/23 13:52		[CALC]
C9-C12 Aliphatics2,3	ND (42.5)		MA-VPH-2.1		1	11/07/23 13:52		[CALC]
Benzene	ND (0.41)		MA-VPH-2.1		1	11/07/23 13:52	D3K0140	DK30724
Ethylbenzene	ND (0.41)		MA-VPH-2.1		1	11/07/23 13:52	D3K0140	DK30724
Methyl tert-Butyl Ether	ND (0.10)		MA-VPH-2.1		1	11/07/23 13:52	D3K0140	DK30724
Naphthalene	ND (0.41)		MA-VPH-2.1		1	11/07/23 13:52	D3K0140	DK30724
Toluene	ND (0.41)		MA-VPH-2.1		1	11/07/23 13:52	D3K0140	DK30724
Xylene O	ND (0.41)		MA-VPH-2.1		1	11/07/23 13:52	D3K0140	DK30724
Xylene P,M	ND (0.82)		MA-VPH-2.1		1	11/07/23 13:52	D3K0140	DK30724
1:1 Methanol/Soil Ratio %D	**41** (N/A)		MA-VPH-2.1			11/07/23 8:00		DK30724
Preservative:	**MeOH - covered**		MA-VPH-2.1					DK30724

	%Recovery	Qualifier	Limits
Surrogate: 2,5-Dibromotoluene - FID	*97 %*		*70-130*
Surrogate: 2,5-Dibromotoluene - PID	*95 %*		*70-130*
Surrogate: Trifluorotoluene - FID	*102 %*		*70-130*
Surrogate: Trifluorotoluene - PID	*115 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-HA104-Comp
Date Sampled: 11/02/23 15:25
Percent Solids: 86

ESS Laboratory Work Order: 23K0140
ESS Laboratory Sample ID: 23K0140-07
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Arsenic	**12.7** (2.11)		6010C		1	CEV	11/07/23 15:00	2.77	100	DK30614
Barium	**110** (2.11)		6010C		1	CEV	11/07/23 15:00	2.77	100	DK30614
Cadmium	**1.22** (0.42)		6010C		1	CEV	11/07/23 15:00	2.77	100	DK30614
Chromium	**36.9** (0.84)		6010C		1	CEV	11/07/23 15:00	2.77	100	DK30614
Lead	**338** (4.12)		6010C		1	CEV	11/14/23 11:43	2.83	100	DK31344
Mercury	**0.250** (0.035)		7471B		1	AFV	11/06/23 20:55	0.66	40	DK30612
Selenium	ND (4.21)		6010C		1	CEV	11/07/23 15:00	2.77	100	DK30614
Silver	ND (0.42)		6010C		1	CEV	11/07/23 15:00	2.77	100	DK30614

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-HA104-Comp
Date Sampled: 11/02/23 15:25
Percent Solids: 86
Initial Volume: 20.9g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0140
ESS Laboratory Sample ID: 23K0140-07
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/6/23 11:30

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.028)		8270D		1	11/08/23 2:29	D3K0151	DK30606
1,2,4-Trichlorobenzene	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
1,2-Dichlorobenzene	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
1,3-Dichlorobenzene	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
1,4-Dichlorobenzene	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
2,4,5-Trichlorophenol	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
2,4,6-Trichlorophenol	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
2,4-Dichlorophenol	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
2,4-Dimethylphenol	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
2,4-Dinitrophenol	ND (1.12)		8270D		1	11/08/23 2:29	D3K0151	DK30606
2,4-Dinitrotoluene	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
2,6-Dinitrotoluene	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
2-Chloronaphthalene	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
2-Chlorophenol	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
2-Methylnaphthalene	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
2-Methylphenol	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
2-Nitrophenol	ND (0.558)		8270D		1	11/08/23 2:29	D3K0151	DK30606
3,3´-Dichlorobenzidine	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
3+4-Methylphenol	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
4-Bromophenyl-phenylether	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
4-Chloroaniline	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
4-Nitrophenol	ND (1.12)		8270D		1	11/08/23 2:29	D3K0151	DK30606
Acenaphthene	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
Acenaphthylene	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
Acetophenone	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
Aniline	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
Anthracene	**0.309** (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
Azobenzene	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
Benzo(a)anthracene	**1.64** (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
Benzo(a)pyrene	**2.03** (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
Benzo(b)fluoranthene	**2.29** (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
Benzo(g,h,i)perylene	**1.58** (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-HA104-Comp
Date Sampled: 11/02/23 15:25
Percent Solids: 86
Initial Volume: 20.9g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0140
ESS Laboratory Sample ID: 23K0140-07
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/6/23 11:30

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzo(k)fluoranthene	**1.68** (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
bis(2-Chloroethoxy)methane	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
bis(2-Chloroethyl)ether	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
bis(2-chloroisopropyl)Ether	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
bis(2-Ethylhexyl)phthalate	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
Butylbenzylphthalate	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
Chrysene	**2.17** (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
Dibenzo(a,h)Anthracene	**0.352** (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
Dibenzofuran	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
Diethylphthalate	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
Dimethylphthalate	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
Di-n-butylphthalate	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
Di-n-octylphthalate	ND (0.558)		8270D		1	11/08/23 2:29	D3K0151	DK30606
Fluoranthene	**4.81** (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
Fluorene	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
Hexachlorobenzene	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
Hexachlorobutadiene	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
Hexachloroethane	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
Indeno(1,2,3-cd)Pyrene	**1.75** (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
Isophorone	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
Naphthalene	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
Nitrobenzene	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
N-Nitrosodimethylamine	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
Pentachlorophenol	ND (1.12)		8270D		1	11/08/23 2:29	D3K0151	DK30606
Phenanthrene	**2.13** (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
Phenol	ND (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606
Pyrene	**4.26** (0.279)		8270D		1	11/08/23 2:29	D3K0151	DK30606

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*86 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*88 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*87 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-HA104-Comp
Date Sampled: 11/02/23 15:25
Percent Solids: 86
Initial Volume: 20.9g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0140
ESS Laboratory Sample ID: 23K0140-07
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/6/23 11:30

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Surrogate: 2-Fluorobiphenyl		*84 %*		*30-130*				
Surrogate: 2-Fluorophenol		*87 %*		*30-130*				
Surrogate: Nitrobenzene-d5		*82 %*		*30-130*				
Surrogate: Phenol-d6		*86 %*		*30-130*				
Surrogate: p-Terphenyl-d14		*99 %*		*30-130*				

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-HA104-Comp
Date Sampled: 11/02/23 15:25
Percent Solids: 86

ESS Laboratory Work Order: 23K0140
ESS Laboratory Sample ID: 23K0140-07
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Cyanide (PAC)	ND (1.17)		MA PAC		1	EEM	11/07/23 12:00	mg/kg dry	DK30718

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-HA104-Comp
Date Sampled: 11/02/23 15:25
Percent Solids: 86
Initial Volume: 24.6g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0140
ESS Laboratory Sample ID: 23K0140-07
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 11/3/23 20:18

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (17.8)		MADEP-EPH		1	KXB	11/07/23 14:48	D3K0125	DK30349
C19-C36 Aliphatics1	ND (17.8)		MADEP-EPH		1	KXB	11/07/23 14:48	D3K0125	DK30349
C11-C22 Unadjusted Aromatics1	**83.1** (17.8)		EPH8270		1	KXB	11/07/23 19:40	D3K0131	DK30349
C11-C22 Aromatics1,2	**56.1** (17.8)		EPH8270			KXB	11/07/23 19:40		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*62 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*89 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*92 %*		*40-140*
Surrogate: O-Terphenyl	*70 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-HA104-Grab
Date Sampled: 11/02/23 15:26
Percent Solids: 86
Initial Volume: 9.2g
Final Volume: 15ml
Extraction Method: 5030B
Column Type: Restek RTX-502.2 - 3µ film thickness 0.53mm X 105m

ESS Laboratory Work Order: 23K0140
ESS Laboratory Sample ID: 23K0140-08
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Trap Type: Supelco K Vocarb 3000 Trap

MADEP-VPH Volatile Petroleum Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
C9-C10 Aromatics	ND (20.7)		MA-VPH-2.1		1	11/07/23 14:24	D3K0140	DK30724
C5-C8 Aliphatics1,2	ND (21.6)		MA-VPH-2.1		1	11/07/23 14:24		[CALC]
C9-C12 Aliphatics2,3	ND (43.0)		MA-VPH-2.1		1	11/07/23 14:24		[CALC]
Benzene	ND (0.41)		MA-VPH-2.1		1	11/07/23 14:24	D3K0140	DK30724
Ethylbenzene	ND (0.41)		MA-VPH-2.1		1	11/07/23 14:24	D3K0140	DK30724
Methyl tert-Butyl Ether	ND (0.10)		MA-VPH-2.1		1	11/07/23 14:24	D3K0140	DK30724
Naphthalene	ND (0.41)		MA-VPH-2.1		1	11/07/23 14:24	D3K0140	DK30724
Toluene	ND (0.41)		MA-VPH-2.1		1	11/07/23 14:24	D3K0140	DK30724
Xylene O	ND (0.41)		MA-VPH-2.1		1	11/07/23 14:24	D3K0140	DK30724
Xylene P,M	ND (0.83)		MA-VPH-2.1		1	11/07/23 14:24	D3K0140	DK30724
1:1 Methanol/Soil Ratio %D	**39** (N/A)		MA-VPH-2.1			11/07/23 8:00		DK30724
Preservative:	**MeOH - covered**		MA-VPH-2.1					DK30724

	%Recovery	Qualifier	Limits
Surrogate: 2,5-Dibromotoluene - FID	*101 %*		*70-130*
Surrogate: 2,5-Dibromotoluene - PID	*98 %*		*70-130*
Surrogate: Trifluorotoluene - FID	*101 %*		*70-130*
Surrogate: Trifluorotoluene - PID	*110 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-HA105-Comp
Date Sampled: 11/02/23 15:45
Percent Solids: 85

ESS Laboratory Work Order: 23K0140
ESS Laboratory Sample ID: 23K0140-09
Sample Matrix: Soil
Units: mg/kg dry

Extraction Method: 3050B

Total Metals

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	I/V	F/V	Batch
Arsenic	**21.0** (2.13)		6010C		1	CEV	11/07/23 15:10	2.76	100	DK30614
Barium	**124** (2.13)		6010C		1	CEV	11/07/23 15:10	2.76	100	DK30614
Cadmium	**1.26** (0.43)		6010C		1	CEV	11/07/23 15:10	2.76	100	DK30614
Chromium	**38.1** (0.85)		6010C		1	CEV	11/07/23 15:10	2.76	100	DK30614
Lead	**183** (4.67)		6010C		1	CEV	11/14/23 11:45	2.52	100	DK31344
Mercury	**0.386** (0.038)		7471B		1	AFV	11/06/23 20:59	0.62	40	DK30612
Selenium	ND (4.26)		6010C		1	CEV	11/07/23 15:10	2.76	100	DK30614
Silver	**2.46** (0.43)		6010C		1	CEV	11/07/23 15:10	2.76	100	DK30614

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-HA105-Comp
Date Sampled: 11/02/23 15:45
Percent Solids: 85
Initial Volume: 19.9g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0140
ESS Laboratory Sample ID: 23K0140-09
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/6/23 11:30

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
1,1-Biphenyl	ND (0.030)		8270D		1	11/08/23 3:00	D3K0151	DK30606
1,2,4-Trichlorobenzene	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
1,2-Dichlorobenzene	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
1,3-Dichlorobenzene	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
1,4-Dichlorobenzene	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
2,4,5-Trichlorophenol	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
2,4,6-Trichlorophenol	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
2,4-Dichlorophenol	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
2,4-Dimethylphenol	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
2,4-Dinitrophenol	ND (1.18)		8270D		1	11/08/23 3:00	D3K0151	DK30606
2,4-Dinitrotoluene	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
2,6-Dinitrotoluene	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
2-Chloronaphthalene	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
2-Chlorophenol	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
2-Methylnaphthalene	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
2-Methylphenol	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
2-Nitrophenol	ND (0.591)		8270D		1	11/08/23 3:00	D3K0151	DK30606
3,3´-Dichlorobenzidine	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
3+4-Methylphenol	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
4-Bromophenyl-phenylether	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
4-Chloroaniline	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
4-Nitrophenol	ND (1.18)		8270D		1	11/08/23 3:00	D3K0151	DK30606
Acenaphthene	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
Acenaphthylene	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
Acetophenone	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
Aniline	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
Anthracene	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
Azobenzene	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
Benzo(a)anthracene	**0.701** (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
Benzo(a)pyrene	**0.740** (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
Benzo(b)fluoranthene	**0.691** (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
Benzo(g,h,i)perylene	**0.514** (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-HA105-Comp
Date Sampled: 11/02/23 15:45
Percent Solids: 85
Initial Volume: 19.9g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0140
ESS Laboratory Sample ID: 23K0140-09
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/6/23 11:30

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Benzo(k)fluoranthene	**0.572** (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
bis(2-Chloroethoxy)methane	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
bis(2-Chloroethyl)ether	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
bis(2-chloroisopropyl)Ether	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
bis(2-Ethylhexyl)phthalate	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
Butylbenzylphthalate	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
Chrysene	**0.708** (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
Dibenzo(a,h)Anthracene	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
Dibenzofuran	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
Diethylphthalate	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
Dimethylphthalate	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
Di-n-butylphthalate	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
Di-n-octylphthalate	ND (0.591)		8270D		1	11/08/23 3:00	D3K0151	DK30606
Fluoranthene	**1.36** (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
Fluorene	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
Hexachlorobenzene	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
Hexachlorobutadiene	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
Hexachloroethane	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
Indeno(1,2,3-cd)Pyrene	**0.555** (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
Isophorone	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
Naphthalene	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
Nitrobenzene	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
N-Nitrosodimethylamine	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
Pentachlorophenol	ND (1.18)		8270D		1	11/08/23 3:00	D3K0151	DK30606
Phenanthrene	**0.748** (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
Phenol	ND (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606
Pyrene	**1.31** (0.296)		8270D		1	11/08/23 3:00	D3K0151	DK30606

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*90 %*		*30-130*
Surrogate: 2,4,6-Tribromophenol	*99 %*		*30-130*
Surrogate: 2-Chlorophenol-d4	*96 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-HA105-Comp
Date Sampled: 11/02/23 15:45
Percent Solids: 85
Initial Volume: 19.9g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0140
ESS Laboratory Sample ID: 23K0140-09
Sample Matrix: Soil
Units: mg/kg dry
Analyst: TJ
Prepared: 11/6/23 11:30

8270D Semi-Volatile Organic Compounds

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
Surrogate: 2-Fluorobiphenyl		*93 %*		*30-130*				
Surrogate: 2-Fluorophenol		*95 %*		*30-130*				
Surrogate: Nitrobenzene-d5		*90 %*		*30-130*				
Surrogate: Phenol-d6		*96 %*		*30-130*				
Surrogate: p-Terphenyl-d14		*111 %*		*30-130*				

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-HA105-Comp
Date Sampled: 11/02/23 15:45
Percent Solids: 85

ESS Laboratory Work Order: 23K0140
ESS Laboratory Sample ID: 23K0140-09
Sample Matrix: Soil

Classical Chemistry

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Units	Batch
Cyanide (PAC)	ND (1.07)		MA PAC		1	EEM	11/07/23 12:00	mg/kg dry	DK30718

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-HA105-Comp
Date Sampled: 11/02/23 15:45
Percent Solids: 85
Initial Volume: 24.2g
Final Volume: 1ml
Extraction Method: 3546

ESS Laboratory Work Order: 23K0140
ESS Laboratory Sample ID: 23K0140-09
Sample Matrix: Soil
Units: mg/kg dry

Prepared: 11/3/23 20:18

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (18.2)		MADEP-EPH		1	KXB	11/07/23 15:22	D3K0125	DK30349
C19-C36 Aliphatics1	ND (18.2)		MADEP-EPH		1	KXB	11/07/23 15:22	D3K0125	DK30349
C11-C22 Unadjusted Aromatics1	**42.5** (18.2)		EPH8270		1	KXB	11/07/23 20:17	D3K0131	DK30349
C11-C22 Aromatics1,2	**33.6** (18.2)		EPH8270			KXB	11/07/23 20:17		[CALC]

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*55 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*91 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*94 %*		*40-140*
Surrogate: O-Terphenyl	*82 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-HA105-Grab
Date Sampled: 11/02/23 15:46
Percent Solids: 85
Initial Volume: 6.4g
Final Volume: 15ml
Extraction Method: 5030B
Column Type: Restek RTX-502.2 - 3µ film thickness 0.53mm X 105m

ESS Laboratory Work Order: 23K0140
ESS Laboratory Sample ID: 23K0140-10
Sample Matrix: Soil
Units: mg/kg dry
Analyst: MEK
Trap Type: Supelco K Vocarb 3000 Trap

MADEP-VPH Volatile Petroleum Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
C9-C10 Aromatics	ND (29.3)		MA-VPH-2.1		1	11/07/23 14:55	D3K0140	DK30724
C5-C8 Aliphatics1,2	ND (30.7)		MA-VPH-2.1		1	11/07/23 14:55		[CALC]
C9-C12 Aliphatics2,3	ND (61.0)		MA-VPH-2.1		1	11/07/23 14:55		[CALC]
Benzene	ND (0.59)		MA-VPH-2.1		1	11/07/23 14:55	D3K0140	DK30724
Ethylbenzene	ND (0.59)		MA-VPH-2.1		1	11/07/23 14:55	D3K0140	DK30724
Methyl tert-Butyl Ether	ND (0.15)		MA-VPH-2.1		1	11/07/23 14:55	D3K0140	DK30724
Naphthalene	ND (0.59)		MA-VPH-2.1		1	11/07/23 14:55	D3K0140	DK30724
Toluene	ND (0.59)		MA-VPH-2.1		1	11/07/23 14:55	D3K0140	DK30724
Xylene O	ND (0.59)		MA-VPH-2.1		1	11/07/23 14:55	D3K0140	DK30724
Xylene P,M	ND (1.17)		MA-VPH-2.1		1	11/07/23 14:55	D3K0140	DK30724
1:1 Methanol/Soil Ratio %D	**57** (N/A)		MA-VPH-2.1			11/07/23 8:00		DK30724
Preservative:	**MeOH - covered**		MA-VPH-2.1					DK30724

	%Recovery	Qualifier	Limits
Surrogate: 2,5-Dibromotoluene - FID	*96 %*		*70-130*
Surrogate: 2,5-Dibromotoluene - PID	*94 %*		*70-130*
Surrogate: Trifluorotoluene - FID	*95 %*		*70-130*
Surrogate: Trifluorotoluene - PID	*112 %*		*70-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 23K0140

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Total Metals										
Batch DK30612 - 7471B										
Blank										
Mercury	ND	0.032	mg/kg wet							
LCS										
Mercury	10.6	2.96	mg/kg wet	17.10		62	33.1-86.55			
LCS Dup										
Mercury	10.7	3.19	mg/kg wet	17.10		62	33.1-86.55	0.3	30	
Batch DK30614 - 3050B										
Blank										
Arsenic	ND	2.50	mg/kg wet							
Barium	ND	2.50	mg/kg wet							
Cadmium	ND	0.50	mg/kg wet							
Chromium	ND	1.00	mg/kg wet							
Selenium	ND	5.00	mg/kg wet							
Silver	ND	0.50	mg/kg wet							
Blank										
Selenium	ND	5.00	mg/kg wet							
LCS										
Arsenic	275	8.06	mg/kg wet	258.0		106	80-120			
Barium	869	8.06	mg/kg wet	809.0		107	80-120			
Cadmium	323	1.61	mg/kg wet	321.0		101	80-120			
Chromium	133	3.23	mg/kg wet	133.0		100	80-120			
Selenium	54.4	16.1	mg/kg wet	49.40		110	80-120			
Silver	23.7	1.61	mg/kg wet	22.70		105	80-120			
LCS										
Selenium	48.2	80.6	mg/kg wet	49.40		98	80-120			,
LCS Dup										
Arsenic	252	7.94	mg/kg wet	258.0		98	80-120	8	30	
Barium	900	7.94	mg/kg wet	809.0		111	80-120	3	30	
Cadmium	297	1.59	mg/kg wet	321.0		92	80-120	8	30	
Chromium	124	3.17	mg/kg wet	133.0		93	80-120	7	30	
Selenium	49.0	15.9	mg/kg wet	49.40		99	80-120	10	30	
Silver	21.9	1.59	mg/kg wet	22.70		97	80-120	8	30	
LCS Dup										
Selenium	44.0	79.4	mg/kg wet	49.40		89	80-120	9	30	,
Batch DK31344 - 3050B										
Blank										
Lead	ND	4.29	mg/kg wet							
LCS										
Lead	104	15.4	mg/kg wet	102.0		102	80-120			
LCS Dup										
Lead	106	15.6	mg/kg wet	102.0		104	80-120	3	20	

8270D Semi-Volatile Organic Compounds

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 23K0140

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch DK30606 - 3546										
Blank										
1,1-Biphenyl	ND	0.025	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.250	mg/kg wet							
1,2-Dichlorobenzene	ND	0.250	mg/kg wet							
1,3-Dichlorobenzene	ND	0.250	mg/kg wet							
1,4-Dichlorobenzene	ND	0.250	mg/kg wet							
2,4,5-Trichlorophenol	ND	0.250	mg/kg wet							
2,4,6-Trichlorophenol	ND	0.250	mg/kg wet							
2,4-Dichlorophenol	ND	0.250	mg/kg wet							
2,4-Dimethylphenol	ND	0.250	mg/kg wet							
2,4-Dinitrophenol	ND	1.00	mg/kg wet							
2,4-Dinitrotoluene	ND	0.250	mg/kg wet							
2,6-Dinitrotoluene	ND	0.250	mg/kg wet							
2-Chloronaphthalene	ND	0.250	mg/kg wet							
2-Chlorophenol	ND	0.250	mg/kg wet							
2-Methylnaphthalene	ND	0.250	mg/kg wet							
2-Methylphenol	ND	0.250	mg/kg wet							
2-Nitrophenol	ND	0.500	mg/kg wet							
3,3´-Dichlorobenzidine	ND	0.250	mg/kg wet							
3+4-Methylphenol	ND	0.250	mg/kg wet							
4-Bromophenyl-phenylether	ND	0.250	mg/kg wet							
4-Chloroaniline	ND	0.250	mg/kg wet							
4-Nitrophenol	ND	1.00	mg/kg wet							
Acenaphthene	ND	0.250	mg/kg wet							
Acenaphthylene	ND	0.250	mg/kg wet							
Acetophenone	ND	0.250	mg/kg wet							
Aniline	ND	0.250	mg/kg wet							
Anthracene	ND	0.250	mg/kg wet							
Azobenzene	ND	0.250	mg/kg wet							
Benzo(a)anthracene	ND	0.250	mg/kg wet							
Benzo(a)pyrene	ND	0.250	mg/kg wet							
Benzo(b)fluoranthene	ND	0.250	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.250	mg/kg wet							
Benzo(k)fluoranthene	ND	0.250	mg/kg wet							
bis(2-Chloroethoxy)methane	ND	0.250	mg/kg wet							
bis(2-Chloroethyl)ether	ND	0.250	mg/kg wet							
bis(2-chloroisopropyl)Ether	ND	0.250	mg/kg wet							
bis(2-Ethylhexyl)phthalate	ND	0.250	mg/kg wet							
Butylbenzylphthalate	ND	0.250	mg/kg wet							
Chrysene	ND	0.250	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.250	mg/kg wet							
Dibenzofuran	ND	0.250	mg/kg wet							
Diethylphthalate	ND	0.250	mg/kg wet							
Dimethylphthalate	ND	0.250	mg/kg wet							
Di-n-butylphthalate	ND	0.250	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 23K0140

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch DK30606 - 3546										
Di-n-octylphthalate	ND	0.500	mg/kg wet							
Fluoranthene	ND	0.250	mg/kg wet							
Fluorene	ND	0.250	mg/kg wet							
Hexachlorobenzene	ND	0.250	mg/kg wet							
Hexachlorobutadiene	ND	0.250	mg/kg wet							
Hexachloroethane	ND	0.250	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.250	mg/kg wet							
Isophorone	ND	0.250	mg/kg wet							
Naphthalene	ND	0.250	mg/kg wet							
Nitrobenzene	ND	0.250	mg/kg wet							
N-Nitrosodimethylamine	ND	0.250	mg/kg wet							
Pentachlorophenol	ND	1.00	mg/kg wet							
Phenanthrene	ND	0.250	mg/kg wet							
Phenol	ND	0.250	mg/kg wet							
Pyrene	ND	0.250	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	*2.43*		mg/kg wet	*2.500*		*97*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*3.48*		mg/kg wet	*3.750*		*93*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.64*		mg/kg wet	*3.750*		*97*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.57*		mg/kg wet	*2.500*		*103*	*30-130*			
Surrogate: 2-Fluorophenol	*3.58*		mg/kg wet	*3.750*		*96*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.51*		mg/kg wet	*2.500*		*100*	*30-130*			
Surrogate: Phenol-d6	*3.58*		mg/kg wet	*3.750*		*95*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.82*		mg/kg wet	*2.500*		*113*	*30-130*			
LCS										
1,1-Biphenyl	2.20	0.025	mg/kg wet	2.500		88	40-140			
1,2,4-Trichlorobenzene	1.98	0.250	mg/kg wet	2.500		79	40-140			
1,2-Dichlorobenzene	2.12	0.250	mg/kg wet	2.500		85	40-140			
1,3-Dichlorobenzene	2.19	0.250	mg/kg wet	2.500		88	40-140			
1,4-Dichlorobenzene	2.19	0.250	mg/kg wet	2.500		88	40-140			
2,4,5-Trichlorophenol	2.41	0.250	mg/kg wet	2.500		96	30-130			
2,4,6-Trichlorophenol	2.35	0.250	mg/kg wet	2.500		94	30-130			
2,4-Dichlorophenol	2.08	0.250	mg/kg wet	2.500		83	30-130			
2,4-Dimethylphenol	2.55	0.250	mg/kg wet	2.500		102	30-130			
2,4-Dinitrophenol	2.43	1.00	mg/kg wet	2.500		97	30-130			
2,4-Dinitrotoluene	2.68	0.250	mg/kg wet	2.500		107	40-140			
2,6-Dinitrotoluene	2.52	0.250	mg/kg wet	2.500		101	40-140			
2-Chloronaphthalene	2.36	0.250	mg/kg wet	2.500		94	40-140			
2-Chlorophenol	2.21	0.250	mg/kg wet	2.500		88	30-130			
2-Methylnaphthalene	1.99	0.250	mg/kg wet	2.500		80	40-140			
2-Methylphenol	2.25	0.250	mg/kg wet	2.500		90	30-130			
2-Nitrophenol	2.08	0.500	mg/kg wet	2.500		83	30-130			
3,3´-Dichlorobenzidine	2.14	0.250	mg/kg wet	2.500		86	40-140			
3+4-Methylphenol	4.62	0.250	mg/kg wet	5.000		92	30-130			
4-Bromophenyl-phenylether	2.38	0.250	mg/kg wet	2.500		95	40-140			
4-Chloroaniline	1.46	0.250	mg/kg wet	2.500		59	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 23K0140

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch DK30606 - 3546										
4-Nitrophenol	2.22	1.00	mg/kg wet	2.500		89	30-130			
Acenaphthene	2.25	0.250	mg/kg wet	2.500		90	40-140			
Acenaphthylene	2.24	0.250	mg/kg wet	2.500		90	40-140			
Acetophenone	2.15	0.250	mg/kg wet	2.500		86	40-140			
Aniline	1.54	0.250	mg/kg wet	2.500		62	40-140			
Anthracene	2.43	0.250	mg/kg wet	2.500		97	40-140			
Azobenzene	2.18	0.250	mg/kg wet	2.500		87	40-140			
Benzo(a)anthracene	2.51	0.250	mg/kg wet	2.500		100	40-140			
Benzo(a)pyrene	2.71	0.250	mg/kg wet	2.500		108	40-140			
Benzo(b)fluoranthene	2.53	0.250	mg/kg wet	2.500		101	40-140			
Benzo(g,h,i)perylene	2.63	0.250	mg/kg wet	2.500		105	40-140			
Benzo(k)fluoranthene	2.58	0.250	mg/kg wet	2.500		103	40-140			
bis(2-Chloroethoxy)methane	1.83	0.250	mg/kg wet	2.500		73	40-140			
bis(2-Chloroethyl)ether	1.98	0.250	mg/kg wet	2.500		79	40-140			
bis(2-chloroisopropyl)Ether	1.84	0.250	mg/kg wet	2.500		74	40-140			
bis(2-Ethylhexyl)phthalate	2.49	0.250	mg/kg wet	2.500		100	40-140			
Butylbenzylphthalate	2.63	0.250	mg/kg wet	2.500		105	40-140			
Chrysene	2.51	0.250	mg/kg wet	2.500		101	40-140			
Dibenzo(a,h)Anthracene	2.68	0.250	mg/kg wet	2.500		107	40-140			
Dibenzofuran	2.27	0.250	mg/kg wet	2.500		91	40-140			
Diethylphthalate	2.42	0.250	mg/kg wet	2.500		97	40-140			
Dimethylphthalate	2.39	0.250	mg/kg wet	2.500		96	40-140			
Di-n-butylphthalate	2.47	0.250	mg/kg wet	2.500		99	40-140			
Di-n-octylphthalate	2.45	0.500	mg/kg wet	2.500		98	40-140			
Fluoranthene	2.42	0.250	mg/kg wet	2.500		97	40-140			
Fluorene	2.37	0.250	mg/kg wet	2.500		95	40-140			
Hexachlorobenzene	2.43	0.250	mg/kg wet	2.500		97	40-140			
Hexachlorobutadiene	1.95	0.250	mg/kg wet	2.500		78	40-140			
Hexachloroethane	2.10	0.250	mg/kg wet	2.500		84	40-140			
Indeno(1,2,3-cd)Pyrene	2.56	0.250	mg/kg wet	2.500		103	40-140			
Isophorone	1.80	0.250	mg/kg wet	2.500		72	40-140			
Naphthalene	1.92	0.250	mg/kg wet	2.500		77	40-140			
Nitrobenzene	1.99	0.250	mg/kg wet	2.500		80	40-140			
N-Nitrosodimethylamine	2.01	0.250	mg/kg wet	2.500		80	40-140			
Pentachlorophenol	1.95	1.00	mg/kg wet	2.500		78	30-130			
Phenanthrene	2.35	0.250	mg/kg wet	2.500		94	40-140			
Phenol	2.26	0.250	mg/kg wet	2.500		90	30-130			
Pyrene	2.80	0.250	mg/kg wet	2.500		112	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	*2.16*		mg/kg wet	*2.500*		*86*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*3.76*		mg/kg wet	*3.750*		*100*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.38*		mg/kg wet	*3.750*		*90*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.27*		mg/kg wet	*2.500*		*91*	*30-130*			
Surrogate: 2-Fluorophenol	*3.29*		mg/kg wet	*3.750*		*88*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.03*		mg/kg wet	*2.500*		*81*	*30-130*			
Surrogate: Phenol-d6	*3.40*		mg/kg wet	*3.750*		*91*	*30-130*			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 23K0140

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch DK30606 - 3546										
Surrogate: p-Terphenyl-d14	*2.81*		mg/kg wet	*2.500*		*112*	*30-130*			
LCS Dup										
1,1-Biphenyl	2.23	0.025	mg/kg wet	2.500		89	40-140	1	30	
1,2,4-Trichlorobenzene	2.00	0.250	mg/kg wet	2.500		80	40-140	1	30	
1,2-Dichlorobenzene	2.12	0.250	mg/kg wet	2.500		85	40-140	0.08	30	
1,3-Dichlorobenzene	2.10	0.250	mg/kg wet	2.500		84	40-140	4	30	
1,4-Dichlorobenzene	2.11	0.250	mg/kg wet	2.500		85	40-140	4	30	
2,4,5-Trichlorophenol	2.46	0.250	mg/kg wet	2.500		98	30-130	2	30	
2,4,6-Trichlorophenol	2.39	0.250	mg/kg wet	2.500		96	30-130	2	30	
2,4-Dichlorophenol	2.03	0.250	mg/kg wet	2.500		81	30-130	2	30	
2,4-Dimethylphenol	2.48	0.250	mg/kg wet	2.500		99	30-130	3	30	
2,4-Dinitrophenol	2.25	1.00	mg/kg wet	2.500		90	30-130	8	30	
2,4-Dinitrotoluene	2.62	0.250	mg/kg wet	2.500		105	40-140	2	30	
2,6-Dinitrotoluene	2.53	0.250	mg/kg wet	2.500		101	40-140	0.6	30	
2-Chloronaphthalene	2.37	0.250	mg/kg wet	2.500		95	40-140	0.6	30	
2-Chlorophenol	2.13	0.250	mg/kg wet	2.500		85	30-130	3	30	
2-Methylnaphthalene	1.97	0.250	mg/kg wet	2.500		79	40-140	1	30	
2-Methylphenol	2.12	0.250	mg/kg wet	2.500		85	30-130	6	30	
2-Nitrophenol	2.05	0.500	mg/kg wet	2.500		82	30-130	1	30	
3,3´-Dichlorobenzidine	2.23	0.250	mg/kg wet	2.500		89	40-140	4	30	
3+4-Methylphenol	4.34	0.250	mg/kg wet	5.000		87	30-130	6	30	
4-Bromophenyl-phenylether	2.46	0.250	mg/kg wet	2.500		98	40-140	3	30	
4-Chloroaniline	1.50	0.250	mg/kg wet	2.500		60	40-140	3	30	
4-Nitrophenol	2.21	1.00	mg/kg wet	2.500		88	30-130	0.5	30	
Acenaphthene	2.32	0.250	mg/kg wet	2.500		93	40-140	3	30	
Acenaphthylene	2.26	0.250	mg/kg wet	2.500		91	40-140	0.8	30	
Acetophenone	2.00	0.250	mg/kg wet	2.500		80	40-140	7	30	
Aniline	1.43	0.250	mg/kg wet	2.500		57	40-140	7	30	
Anthracene	2.46	0.250	mg/kg wet	2.500		99	40-140	2	30	
Azobenzene	2.24	0.250	mg/kg wet	2.500		90	40-140	3	30	
Benzo(a)anthracene	2.54	0.250	mg/kg wet	2.500		101	40-140	1	30	
Benzo(a)pyrene	2.69	0.250	mg/kg wet	2.500		107	40-140	0.9	30	
Benzo(b)fluoranthene	2.56	0.250	mg/kg wet	2.500		103	40-140	1	30	
Benzo(g,h,i)perylene	2.62	0.250	mg/kg wet	2.500		105	40-140	0.4	30	
Benzo(k)fluoranthene	2.50	0.250	mg/kg wet	2.500		100	40-140	3	30	
bis(2-Chloroethoxy)methane	1.77	0.250	mg/kg wet	2.500		71	40-140	4	30	
bis(2-Chloroethyl)ether	1.93	0.250	mg/kg wet	2.500		77	40-140	3	30	
bis(2-chloroisopropyl)Ether	1.77	0.250	mg/kg wet	2.500		71	40-140	4	30	
bis(2-Ethylhexyl)phthalate	2.44	0.250	mg/kg wet	2.500		98	40-140	2	30	
Butylbenzylphthalate	2.49	0.250	mg/kg wet	2.500		100	40-140	5	30	
Chrysene	2.55	0.250	mg/kg wet	2.500		102	40-140	1	30	
Dibenzo(a,h)Anthracene	2.65	0.250	mg/kg wet	2.500		106	40-140	1	30	
Dibenzofuran	2.26	0.250	mg/kg wet	2.500		90	40-140	0.7	30	
Diethylphthalate	2.43	0.250	mg/kg wet	2.500		97	40-140	0.4	30	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 23K0140

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D Semi-Volatile Organic Compounds										
Batch DK30606 - 3546										
Dimethylphthalate	2.42	0.250	mg/kg wet	2.500		97	40-140	1	30	
Di-n-butylphthalate	2.51	0.250	mg/kg wet	2.500		100	40-140	2	30	
Di-n-octylphthalate	2.34	0.500	mg/kg wet	2.500		93	40-140	5	30	
Fluoranthene	2.50	0.250	mg/kg wet	2.500		100	40-140	4	30	
Fluorene	2.39	0.250	mg/kg wet	2.500		96	40-140	0.8	30	
Hexachlorobenzene	2.48	0.250	mg/kg wet	2.500		99	40-140	2	30	
Hexachlorobutadiene	1.99	0.250	mg/kg wet	2.500		80	40-140	2	30	
Hexachloroethane	2.08	0.250	mg/kg wet	2.500		83	40-140	1	30	
Indeno(1,2,3-cd)Pyrene	2.58	0.250	mg/kg wet	2.500		103	40-140	0.5	30	
Isophorone	1.78	0.250	mg/kg wet	2.500		71	40-140	0.8	30	
Naphthalene	1.88	0.250	mg/kg wet	2.500		75	40-140	2	30	
Nitrobenzene	1.98	0.250	mg/kg wet	2.500		79	40-140	0.5	30	
N-Nitrosodimethylamine	1.94	0.250	mg/kg wet	2.500		78	40-140	3	30	
Pentachlorophenol	2.01	1.00	mg/kg wet	2.500		80	30-130	3	30	
Phenanthrene	2.40	0.250	mg/kg wet	2.500		96	40-140	2	30	
Phenol	2.16	0.250	mg/kg wet	2.500		86	30-130	5	30	
Pyrene	2.55	0.250	mg/kg wet	2.500		102	40-140	9	30	
Surrogate: 1,2-Dichlorobenzene-d4	*2.09*		mg/kg wet	*2.500*		*84*	*30-130*			
Surrogate: 2,4,6-Tribromophenol	*3.73*		mg/kg wet	*3.750*		*99*	*30-130*			
Surrogate: 2-Chlorophenol-d4	*3.14*		mg/kg wet	*3.750*		*84*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*2.27*		mg/kg wet	*2.500*		*91*	*30-130*			
Surrogate: 2-Fluorophenol	*3.11*		mg/kg wet	*3.750*		*83*	*30-130*			
Surrogate: Nitrobenzene-d5	*1.99*		mg/kg wet	*2.500*		*80*	*30-130*			
Surrogate: Phenol-d6	*3.18*		mg/kg wet	*3.750*		*85*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.52*		mg/kg wet	*2.500*		*101*	*30-130*			
Classical Chemistry										
Batch DK30718 - TCN Prep										
Blank										
Cyanide (PAC)	ND	1.00	mg/kg wet							
LCS										
Cyanide (PAC)	4.92	1.00	mg/kg wet	5.015		98	80-120			
LCS										
Cyanide (PAC)	20.3	1.00	mg/kg wet	20.06		101	80-120			
LCS Dup										
Cyanide (PAC)	20.2	1.00	mg/kg wet	20.06		101	80-120	0.5	20	
Reference										
Cyanide (PAC)	2.79	1.00	mg/kg wet	76.30		4	0-10			
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch DK30349 - 3546										
Blank										
C19-C36 Aliphatics1	ND	15.0	mg/kg wet							
C9-C18 Aliphatics1	ND	15.0	mg/kg wet							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 23K0140

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch DK30349 - 3546										
Surrogate: 1-Chlorooctadecane	*1.13*		mg/kg wet	*2.000*		*57*	*40-140*			
Blank										
2-Methylnaphthalene	ND	0.20	mg/kg wet							
Acenaphthene	ND	0.40	mg/kg wet							
Acenaphthylene	ND	0.20	mg/kg wet							
Anthracene	ND	0.40	mg/kg wet							
Benzo(a)anthracene	ND	0.40	mg/kg wet							
Benzo(a)pyrene	ND	0.40	mg/kg wet							
Benzo(b)fluoranthene	ND	0.40	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.40	mg/kg wet							
Benzo(k)fluoranthene	ND	0.40	mg/kg wet							
C11-C22 Unadjusted Aromatics1	ND	15.0	mg/kg wet							
Chrysene	ND	0.40	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.20	mg/kg wet							
Fluoranthene	ND	0.40	mg/kg wet							
Fluorene	ND	0.40	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.40	mg/kg wet							
Naphthalene	ND	0.40	mg/kg wet							
Phenanthrene	ND	0.40	mg/kg wet							
Pyrene	ND	0.40	mg/kg wet							
Surrogate: 2-Bromonaphthalene	*1.81*		mg/kg wet	*2.000*		*90*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*1.97*		mg/kg wet	*2.000*		*98*	*40-140*			
Surrogate: O-Terphenyl	*1.56*		mg/kg wet	*2.000*		*78*	*40-140*			
LCS										
C19-C36 Aliphatics1	11.7	15.0	mg/kg wet	16.00		73	40-140			
C9-C18 Aliphatics1	6.9	15.0	mg/kg wet	12.00		58	40-140			
Surrogate: 1-Chlorooctadecane	*1.21*		mg/kg wet	*2.000*		*61*	*40-140*			
LCS										
2-Methylnaphthalene	1.59	0.20	mg/kg wet	2.000		80	40-140			
Acenaphthene	1.67	0.40	mg/kg wet	2.000		83	40-140			
Acenaphthylene	1.72	0.20	mg/kg wet	2.000		86	40-140			
Anthracene	2.17	0.40	mg/kg wet	2.000		108	40-140			
Benzo(a)anthracene	1.89	0.40	mg/kg wet	2.000		94	40-140			
Benzo(a)pyrene	2.19	0.40	mg/kg wet	2.000		109	40-140			
Benzo(b)fluoranthene	1.77	0.40	mg/kg wet	2.000		89	40-140			
Benzo(g,h,i)perylene	1.58	0.40	mg/kg wet	2.000		79	40-140			
Benzo(k)fluoranthene	1.68	0.40	mg/kg wet	2.000		84	40-140			
C11-C22 Unadjusted Aromatics1	32.0	15.0	mg/kg wet	34.00		94	40-140			
Chrysene	1.90	0.40	mg/kg wet	2.000		95	40-140			
Dibenzo(a,h)Anthracene	1.78	0.20	mg/kg wet	2.000		89	40-140			
Fluoranthene	1.89	0.40	mg/kg wet	2.000		95	40-140			

CERTIFICATE OF ANALYSIS

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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch DK30349 - 3546										
Fluorene	1.70	0.40	mg/kg wet	2.000		85	40-140			
Indeno(1,2,3-cd)Pyrene	1.72	0.40	mg/kg wet	2.000		86	40-140			
Naphthalene	1.59	0.40	mg/kg wet	2.000		80	40-140			
Phenanthrene	1.83	0.40	mg/kg wet	2.000		91	40-140			
Pyrene	1.84	0.40	mg/kg wet	2.000		92	40-140			
Surrogate: 2-Bromonaphthalene	*1.82*		mg/kg wet	*2.000*		*91*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*1.94*		mg/kg wet	*2.000*		*97*	*40-140*			
Surrogate: O-Terphenyl	*1.79*		mg/kg wet	*2.000*		*89*	*40-140*			
LCS										
2-Methylnaphthalene Breakthrough	0.0		%				0-5			
Naphthalene Breakthrough	0.0		%				0-5			
LCS Dup										
C19-C36 Aliphatics1	13.8	15.0	mg/kg wet	16.00		86	40-140	17	25	
C9-C18 Aliphatics1	8.4	15.0	mg/kg wet	12.00		70	40-140	19	25	
Surrogate: 1-Chlorooctadecane	*1.45*		mg/kg wet	*2.000*		*73*	*40-140*			
LCS Dup										
2-Methylnaphthalene	1.64	0.20	mg/kg wet	2.000		82	40-140	3	30	
Acenaphthene	1.69	0.40	mg/kg wet	2.000		85	40-140	2	30	
Acenaphthylene	1.77	0.20	mg/kg wet	2.000		88	40-140	3	30	
Anthracene	2.24	0.40	mg/kg wet	2.000		112	40-140	3	30	
Benzo(a)anthracene	1.90	0.40	mg/kg wet	2.000		95	40-140	0.5	30	
Benzo(a)pyrene	2.19	0.40	mg/kg wet	2.000		110	40-140	0.3	30	
Benzo(b)fluoranthene	1.82	0.40	mg/kg wet	2.000		91	40-140	2	30	
Benzo(g,h,i)perylene	1.60	0.40	mg/kg wet	2.000		80	40-140	1	30	
Benzo(k)fluoranthene	1.64	0.40	mg/kg wet	2.000		82	40-140	2	30	
C11-C22 Unadjusted Aromatics1	32.6	15.0	mg/kg wet	34.00		96	40-140	2	25	
Chrysene	1.93	0.40	mg/kg wet	2.000		96	40-140	1	30	
Dibenzo(a,h)Anthracene	1.72	0.20	mg/kg wet	2.000		86	40-140	3	30	
Fluoranthene	1.89	0.40	mg/kg wet	2.000		95	40-140	0.05	30	
Fluorene	1.71	0.40	mg/kg wet	2.000		86	40-140	1	30	
Indeno(1,2,3-cd)Pyrene	1.66	0.40	mg/kg wet	2.000		83	40-140	3	30	
Naphthalene	1.64	0.40	mg/kg wet	2.000		82	40-140	3	30	
Phenanthrene	1.80	0.40	mg/kg wet	2.000		90	40-140	1	30	
Pyrene	1.90	0.40	mg/kg wet	2.000		95	40-140	3	30	
Surrogate: 2-Bromonaphthalene	*1.80*		mg/kg wet	*2.000*		*90*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*1.94*		mg/kg wet	*2.000*		*97*	*40-140*			
Surrogate: O-Terphenyl	*1.77*		mg/kg wet	*2.000*		*89*	*40-140*			
LCS Dup										
2-Methylnaphthalene Breakthrough	0.0		%				0-5		200	
Naphthalene Breakthrough	0.0		%				0-5		200	
Batch DK30847 - 3546										

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 23K0140

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch DK30847 - 3546										
Blank										
C19-C36 Aliphatics1	ND	15.0	mg/kg wet							
C9-C18 Aliphatics1	ND	15.0	mg/kg wet							
Surrogate: 1-Chlorooctadecane	*1.16*		mg/kg wet	*2.000*		*58*	*40-140*			
Blank										
2-Methylnaphthalene	ND	0.20	mg/kg wet							
Acenaphthene	ND	0.40	mg/kg wet							
Acenaphthylene	ND	0.20	mg/kg wet							
Anthracene	ND	0.40	mg/kg wet							
Benzo(a)anthracene	ND	0.40	mg/kg wet							
Benzo(a)pyrene	ND	0.40	mg/kg wet							
Benzo(b)fluoranthene	ND	0.40	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.40	mg/kg wet							
Benzo(k)fluoranthene	ND	0.40	mg/kg wet							
C11-C22 Unadjusted Aromatics1	ND	15.0	mg/kg wet							
Chrysene	ND	0.40	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.20	mg/kg wet							
Fluoranthene	ND	0.40	mg/kg wet							
Fluorene	ND	0.40	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.40	mg/kg wet							
Naphthalene	ND	0.40	mg/kg wet							
Phenanthrene	ND	0.40	mg/kg wet							
Pyrene	ND	0.40	mg/kg wet							
Surrogate: 2-Bromonaphthalene	*1.51*		mg/kg wet	*2.000*		*76*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*1.61*		mg/kg wet	*2.000*		*81*	*40-140*			
Surrogate: O-Terphenyl	*1.53*		mg/kg wet	*2.000*		*77*	*40-140*			
LCS										
C19-C36 Aliphatics1	13.4	15.0	mg/kg wet	16.00		84	40-140			
C9-C18 Aliphatics1	8.2	15.0	mg/kg wet	12.00		68	40-140			
Surrogate: 1-Chlorooctadecane	*1.41*		mg/kg wet	*2.000*		*71*	*40-140*			
LCS										
2-Methylnaphthalene	1.43	0.20	mg/kg wet	2.000		72	40-140			
Acenaphthene	1.65	0.40	mg/kg wet	2.000		82	40-140			
Acenaphthylene	1.71	0.20	mg/kg wet	2.000		86	40-140			
Anthracene	2.16	0.40	mg/kg wet	2.000		108	40-140			
Benzo(a)anthracene	1.83	0.40	mg/kg wet	2.000		91	40-140			
Benzo(a)pyrene	2.10	0.40	mg/kg wet	2.000		105	40-140			
Benzo(b)fluoranthene	1.70	0.40	mg/kg wet	2.000		85	40-140			
Benzo(g,h,i)perylene	1.60	0.40	mg/kg wet	2.000		80	40-140			
Benzo(k)fluoranthene	1.96	0.40	mg/kg wet	2.000		98	40-140			
C11-C22 Unadjusted Aromatics1	36.3	15.0	mg/kg wet	34.00		107	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 23K0140

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch DK30847 - 3546										
Chrysene	2.06	0.40	mg/kg wet	2.000		103	40-140			
Dibenzo(a,h)Anthracene	1.77	0.20	mg/kg wet	2.000		88	40-140			
Fluoranthene	1.91	0.40	mg/kg wet	2.000		95	40-140			
Fluorene	1.73	0.40	mg/kg wet	2.000		87	40-140			
Indeno(1,2,3-cd)Pyrene	1.71	0.40	mg/kg wet	2.000		85	40-140			
Naphthalene	1.38	0.40	mg/kg wet	2.000		69	40-140			
Phenanthrene	1.87	0.40	mg/kg wet	2.000		93	40-140			
Pyrene	1.86	0.40	mg/kg wet	2.000		93	40-140			
Surrogate: 2-Bromonaphthalene	*1.76*		mg/kg wet	*2.000*		*88*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*1.93*		mg/kg wet	*2.000*		*97*	*40-140*			
Surrogate: O-Terphenyl	*1.81*		mg/kg wet	*2.000*		*90*	*40-140*			
LCS										
2-Methylnaphthalene Breakthrough	0.0		%				0-5			
Naphthalene Breakthrough	0.0		%				0-5			
LCS Dup										
C19-C36 Aliphatics1	14.5	15.0	mg/kg wet	16.00		91	40-140	8	25	
C9-C18 Aliphatics1	9.1	15.0	mg/kg wet	12.00		76	40-140	10	25	
Surrogate: 1-Chlorooctadecane	*1.53*		mg/kg wet	*2.000*		*76*	*40-140*			
LCS Dup										
2-Methylnaphthalene	1.54	0.20	mg/kg wet	2.000		77	40-140	7	30	
Acenaphthene	1.76	0.40	mg/kg wet	2.000		88	40-140	7	30	
Acenaphthylene	1.83	0.20	mg/kg wet	2.000		91	40-140	7	30	
Anthracene	2.35	0.40	mg/kg wet	2.000		118	40-140	9	30	
Benzo(a)anthracene	1.98	0.40	mg/kg wet	2.000		99	40-140	8	30	
Benzo(a)pyrene	2.31	0.40	mg/kg wet	2.000		116	40-140	10	30	
Benzo(b)fluoranthene	1.83	0.40	mg/kg wet	2.000		92	40-140	8	30	
Benzo(g,h,i)perylene	1.76	0.40	mg/kg wet	2.000		88	40-140	10	30	
Benzo(k)fluoranthene	2.12	0.40	mg/kg wet	2.000		106	40-140	8	30	
C11-C22 Unadjusted Aromatics1	38.6	15.0	mg/kg wet	34.00		113	40-140	6	25	
Chrysene	2.23	0.40	mg/kg wet	2.000		112	40-140	8	30	
Dibenzo(a,h)Anthracene	1.90	0.20	mg/kg wet	2.000		95	40-140	7	30	
Fluoranthene	2.04	0.40	mg/kg wet	2.000		102	40-140	7	30	
Fluorene	1.85	0.40	mg/kg wet	2.000		93	40-140	7	30	
Indeno(1,2,3-cd)Pyrene	1.87	0.40	mg/kg wet	2.000		93	40-140	9	30	
Naphthalene	1.48	0.40	mg/kg wet	2.000		74	40-140	7	30	
Phenanthrene	2.03	0.40	mg/kg wet	2.000		101	40-140	8	30	
Pyrene	1.99	0.40	mg/kg wet	2.000		99	40-140	7	30	
Surrogate: 2-Bromonaphthalene	*1.77*		mg/kg wet	*2.000*		*89*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*1.97*		mg/kg wet	*2.000*		*98*	*40-140*			
Surrogate: O-Terphenyl	*1.90*		mg/kg wet	*2.000*		*95*	*40-140*			
LCS Dup										

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 23K0140

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch DK30847 - 3546										
2-Methylnaphthalene Breakthrough	0.0		%				0-5		200	
Naphthalene Breakthrough	0.0		%				0-5		200	
MADEP-VPH Volatile Petroleum Hydrocarbon										
Batch DK30724 - 5030B										
Blank										
Benzene	ND	0.20	mg/kg wet							
C5-C8 Unadjusted Aliphatics	ND	10.0	mg/kg wet							
C9-C10 Aromatics	ND	10.0	mg/kg wet							
C9-C12 Unadjusted Aliphatics	ND	10.0	mg/kg wet							
Ethylbenzene	ND	0.20	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.05	mg/kg wet							
Naphthalene	ND	0.20	mg/kg wet							
Toluene	ND	0.20	mg/kg wet							
Xylene O	ND	0.20	mg/kg wet							
Xylene P,M	ND	0.40	mg/kg wet							
Surrogate: 2,5-Dibromotoluene - FID	*4.83*		mg/kg wet	*5.000*		*97*	*70-130*			
Surrogate: 2,5-Dibromotoluene - PID	*4.86*		mg/kg wet	*5.000*		*97*	*70-130*			
Surrogate: Trifluorotoluene - FID	*5.55*		mg/kg wet	*5.333*		*104*	*70-130*			
Surrogate: Trifluorotoluene - PID	*5.53*		mg/kg wet	*5.333*		*104*	*70-130*			
LCS										
Benzene	4.79	0.20	mg/kg wet	5.000		96	70-130			
C5-C8 Unadjusted Aliphatics	46.1	10.0	mg/kg wet	40.00		115	70-130			
C9-C10 Aromatics	8.69	10.0	mg/kg wet	10.00		87	70-130			
C9-C12 Unadjusted Aliphatics	24.3	10.0	mg/kg wet	30.00		81	70-130			
Ethylbenzene	4.84	0.20	mg/kg wet	5.000		97	70-130			
Methyl tert-Butyl Ether	11.8	0.05	mg/kg wet	15.00		79	70-130			
Naphthalene	9.97	0.20	mg/kg wet	10.00		100	70-130			
Toluene	12.6	0.20	mg/kg wet	15.00		84	70-130			
Xylene O	8.39	0.20	mg/kg wet	10.00		84	70-130			
Xylene P,M	17.0	0.40	mg/kg wet	20.00		85	70-130			
Surrogate: 2,5-Dibromotoluene - FID	*5.52*		mg/kg wet	*5.000*		*110*	*70-130*			
Surrogate: 2,5-Dibromotoluene - PID	*5.90*		mg/kg wet	*5.000*		*118*	*70-130*			
Surrogate: Trifluorotoluene - FID	*5.56*		mg/kg wet	*5.333*		*104*	*70-130*			
Surrogate: Trifluorotoluene - PID	*5.19*		mg/kg wet	*5.333*		*97*	*70-130*			
LCS Dup										
Benzene	5.08	0.20	mg/kg wet	5.000		102	70-130	6	25	
C5-C8 Unadjusted Aliphatics	45.2	10.0	mg/kg wet	40.00		113	70-130	2	25	
C9-C10 Aromatics	9.08	10.0	mg/kg wet	10.00		91	70-130	4	25	
C9-C12 Unadjusted Aliphatics	25.3	10.0	mg/kg wet	30.00		84	70-130	4	25	
Ethylbenzene	5.02	0.20	mg/kg wet	5.000		100	70-130	4	25	
Methyl tert-Butyl Ether	13.4	0.05	mg/kg wet	15.00		89	70-130	12	25	
Naphthalene	10.0	0.20	mg/kg wet	10.00		100	70-130	0.8	25	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 23K0140

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-VPH Volatile Petroleum Hydrocarbon										
Batch DK30724 - 5030B										
Toluene	13.7	0.20	mg/kg wet	15.00		92	70-130	9	25	
Xylene O	8.62	0.20	mg/kg wet	10.00		86	70-130	3	25	
Xylene P,M	17.8	0.40	mg/kg wet	20.00		89	70-130	5	25	
Surrogate: 2,5-Dibromotoluene - FID	*5.69*		mg/kg wet	*5.000*		*114*	*70-130*			
Surrogate: 2,5-Dibromotoluene - PID	*5.71*		mg/kg wet	*5.000*		*114*	*70-130*			
Surrogate: Trifluorotoluene - FID	*5.28*		mg/kg wet	*5.333*		*99*	*70-130*			
Surrogate: Trifluorotoluene - PID	*7.98*		mg/kg wet	*5.333*		*150*	*70-130*			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: 23K0140

Notes and Definitions

Z-04	MeOH - covered
U	Analyte included in the analysis, but not detected
Q	Calibration required quadratic regression (Q).
EL	Elevated Method Reporting Limits due to sample matrix (EL).
D	Diluted.
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
CD-	Continuing Calibration %Diff/Drift is below control limit (CD-).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probable Number
TNTC	Too numerous to Count
CFU	Colony Forming Units

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 23K0140

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

Shipped/Delivered Via: ESS Courier

ESS Project ID: 23K0140
Date Received: 11/3/2023
Project Due Date: 11/10/2023
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 1.6 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / (NA)
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? (Yes) / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? (Yes) / No / NA

13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By/Acid Lot#:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Resolution:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1	489621	Yes	N/A	Yes	8 oz jar	NP	
2	489626	Yes	N/A	Yes	VOA Vial	MeOH	
3	489622	Yes	N/A	Yes	8 oz jar	NP	
4	489627	Yes	N/A	Yes	VOA Vial	MeOH	
5	489623	Yes	N/A	Yes	8 oz jar	NP	
6	489628	Yes	N/A	Yes	VOA Vial	MeOH	
7	489624	Yes	N/A	Yes	8 oz jar	NP	
8	489629	Yes	N/A	Yes	VOA Vial	MeOH	
9	489625	Yes	N/A	Yes	8 oz jar	NP	
10	489630	Yes	N/A	Yes	VOA Vial	MeOH	

2nd Review
Were all containers scanned into storage/lab? Initials: W
Are barcode labels on correct containers? (Yes) / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

ESS Project ID: 23K0140

Date Received: 11/3/2023

Completed By: [signature]

Date & Time: 11/3/23 1737

Reviewed By: [signature]

Date & Time: 11/3/23 19:42

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 23K0140

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000

Project Information

Project Name: Amesbury Former MGP
Project Number: 1804576
Project Location: Amesbury, MA
Project Manager: Ryan Hoffman
781-721-4091 rhoffman@geiconsultants.com

Send Report to: Ryan Hoffman, Jeremy Smalley
labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY AND MCP ANALYTICAL METHODS REQUIRED: (YES) NO

STATE AND FEDERAL REGULATORY REQUIREMENTS/REPORT LIMITS

State/Federal Program: (MA) 401WQC Other _____ NH RI CT NY ME

MA MCP Criteria are (Method 1 S-1 and GW-2/GW-3). Circle if GW-1 is required.

Sample Handling: Samples Field Filtered — YES NO (NA)

Sampled Shipped With Ice — (YES) NO

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Preservative	SVOCs 8270	EPH - fractions	RCRA 8 Metals	PACN	VPH - targets and fractions	Sample Specific Remarks
								Analysis					
1	1804576-HA101-comp	11/2/2023	12:15	SO	2	JES	none	x	x	x	x		
2	1804576-HA101-grab	11/2/2023	12:16	SO	2	JES	none					x	
3	1804576-HA102-comp	11/2/2023	14:30	SO	2	JES	none	x	x	x	x		
4	1804576-HA102-grab	11/2/2023	14:31	SO	2	JES	none					x	
5	1804576-HA103-comp	11/2/2023	15:00	SO	2	JES	none	x	x	x	x		
6	1804576-HA103-grab	11/2/2023	15:01	SO	2	JES	none					x	
7	1804576-HA104-comp	11/2/2023	15:25	SO	2	JES	none	x	x	x	x		
8	1804576-HA104-grab	11/2/2023	15:26	SO	2	JES	none					x	
9	1804576-HA105-comp	11/2/2023	15:45	SO	2	JES	none	x	x	x	x		
10	1804576-HA105-grab	11/2/2023	15:46	SO	2	JES	none					x	

	Relinquished by sampler: (signature)	Date	Time	Received by: (signature)
1.	Daniel Mill	11/2/23	17:00	GEI Fridge
2.	GEI Fridge	11/3/23	1231	
3.		11/3/23	1231	11/3/23 1231
4.	Ice 1.6	11/3/23	1655	
5.				

Turnaround Time (Business days):

5-Day X 4-Day ____ 3-Day ____
2-Day ____ 1-Day ____ Other ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

Sample Matrix Abbreviations: SO = Soil GW = Groundwater SW = Surface Water SD = Sediment CO = Concrete PC = Paint Chip CLK = Caulk

Appendix K Laboratory Data Reports – Surface Water

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: 19I0164

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 3:01 pm, Sep 13, 2019

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 19I0164

SAMPLE RECEIPT

The following samples were received on September 06, 2019 for the analyses specified on the enclosed Chain of Custody Record.

To achieve CAM compliance for MCP data, ESS Laboratory has reviewed all QA/QC Requirements and Performance Standards listed in each method. Holding times and preservation have also been reviewed. All CAM requirements have been performed and achieved unless noted in the project narrative.

Each method has been set-up in the laboratory to reach required MCP standards. The methods for aqueous VOA and Soil Methanol VOA have known limitations for certain analytes. The regulatory standards may not be achieved due to these limitations. In addition, for all methods, matrix interferences, dilutions, and %Solids may elevate method reporting limits above regulatory standards. ESS Laboratory can provide, upon request, a Limit Checker (regulatory standard comparison spreadsheet) electronic deliverable which will highlight these exceedances.

Question I: All samples for SVOA were analyzed for a subset of the required MCP list per the client's request.

Lab Number	Sample Name	Matrix	Analysis
19I0164-01	1804576-SW501	Surface Water	8270D SIM PAH, EPH8270, MADEP-EPH
19I0164-02	1804576-SW502	Surface Water	8270D SIM PAH, EPH8270, MADEP-EPH
19I0164-03	1804576-SW503	Surface Water	8270D SIM PAH, EPH8270, MADEP-EPH

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: 19I0164

PROJECT NARRATIVE

8270D(SIM) Polynuclear Aromatic Hydrocarbon

C9I0177-TUN1 **Benzidine tailing factor >2.**

CI91117-BSD1 **Relative percent difference for duplicate is outside of criteria (D+).**
2-Methylnaphthalene (21% @ 20%), Naphthalene (23% @ 20%)

MADEP-EPH Extractable Petroleum Hydrocarbons

C9I0120-CCV6 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
Indeno(1,2,3-cd)Pyrene (23% @ 20%)

C9I0157-CCV1 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
Hexatriacontane (C36) (38% @ 25%)

C9I0157-CCV2 **Continuing Calibration %Diff/Drift is below control limit (CD-).**
Hexatriacontane (C36) (40% @ 25%)

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 19I0164

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 19I0164

MassDEP Analytical Protocol Certification Form

MADEP RTN: _____

This form provides certification for the following data set: **19I0164-01 through 19I0164-03**

Matrices: (X) Ground Water/Surface Water ( ) Soil/Sediment ( ) Drinking Water ( ) Air ( ) Other:_____

CAM Protocol (check all that apply below):

( ) 8260 VOC CAM II A	( ) 7470/7471 Hg CAM III B	( ) MassDEP VPH (GC/PID/FID) CAM IV A	( ) 8082 PCB CAM V A	( ) 9014 Total Cyanide/PAC CAM VI A	( ) 6860 Perchlorate CAM VIII B
(X) 8270 SVOC CAM II B	( ) 7010 Metals CAM III C	( ) MassDEP VPH (GC/MS) CAM IV C	( ) 8081 Pesticides CAM V B	( ) 7196 Hex Cr CAM VI B	( ) MassDEP APH CAM IX A
( ) 6010 Metals CAM III A	( ) 6020 Metals CAM III D	(X) MassDEP EPH CAM IV B	( ) 8151 Herbicides CAM V C	( ) Explosives CAM VIII A	( ) TO-15 VOC CAM IX B

Affirmative responses to questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	Yes (X) No ( )
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	Yes (X) No ( )
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	Yes (X) No ( )
D	Does the laboratory report comply with all the reporting requirements specified in the CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	Yes (X) No ( )
E	VPH, EPH, APH and TO-15 only: a. Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	Yes (X) No ( )
	b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	Yes ( ) No ( )
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	Yes (X) No ( )

Responses to Questions G, H and I below are required for "'Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocols(s)?	Yes (X) No ( )*
	***Data User Note:* Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.**	
H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	Yes ( ) No (X)*
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	Yes ( ) No (X)*

****All negative responses must be addressed in an attached laboratory narrative.***

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature: Laurel Stoddard Date: September 13, 2019

Printed Name: Laurel Stoddard Position: Laboratory Director

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SW501
Date Sampled: 09/05/19 10:30
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 0.25
Extraction Method: 3510C

ESS Laboratory Work Order: 19I0164
ESS Laboratory Sample ID: 19I0164-01
Sample Matrix: Surface Water
Units: ug/L
Analyst: VSC
Prepared: 9/11/19 13:33

8270D(SIM) Polynuclear Aromatic Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	ND (0.19)		8270D SIM PAH		1	09/11/19 17:18	C9I0177	CI91117
Acenaphthene	ND (0.19)		8270D SIM PAH		1	09/11/19 17:18	C9I0177	CI91117
Acenaphthylene	ND (0.19)		8270D SIM PAH		1	09/11/19 17:18	C9I0177	CI91117
Anthracene	ND (0.19)		8270D SIM PAH		1	09/11/19 17:18	C9I0177	CI91117
Benzo(a)anthracene	ND (0.05)		8270D SIM PAH		1	09/11/19 17:18	C9I0177	CI91117
Benzo(a)pyrene	ND (0.05)		8270D SIM PAH		1	09/11/19 17:18	C9I0177	CI91117
Benzo(b)fluoranthene	ND (0.05)		8270D SIM PAH		1	09/11/19 17:18	C9I0177	CI91117
Benzo(g,h,i)perylene	ND (0.19)		8270D SIM PAH		1	09/11/19 17:18	C9I0177	CI91117
Benzo(k)fluoranthene	ND (0.05)		8270D SIM PAH		1	09/11/19 17:18	C9I0177	CI91117
Chrysene	ND (0.05)		8270D SIM PAH		1	09/11/19 17:18	C9I0177	CI91117
Dibenzo(a,h)Anthracene	ND (0.05)		8270D SIM PAH		1	09/11/19 17:18	C9I0177	CI91117
Fluoranthene	ND (0.19)		8270D SIM PAH		1	09/11/19 17:18	C9I0177	CI91117
Fluorene	ND (0.19)		8270D SIM PAH		1	09/11/19 17:18	C9I0177	CI91117
Indeno(1,2,3-cd)Pyrene	ND (0.05)		8270D SIM PAH		1	09/11/19 17:18	C9I0177	CI91117
Naphthalene	ND (0.19)		8270D SIM PAH		1	09/11/19 17:18	C9I0177	CI91117
Phenanthrene	ND (0.19)		8270D SIM PAH		1	09/11/19 17:18	C9I0177	CI91117
Pyrene	ND (0.19)		8270D SIM PAH		1	09/11/19 17:18	C9I0177	CI91117

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*49 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*62 %*		*30-130*
Surrogate: Nitrobenzene-d5	*81 %*		*30-130*
Surrogate: p-Terphenyl-d14	*93 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SW501
Date Sampled: 09/05/19 10:30
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3510C

ESS Laboratory Work Order: 19I0164
ESS Laboratory Sample ID: 19I0164-01
Sample Matrix: Surface Water
Units: ug/L

Prepared: 9/9/19 15:45

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (93)		MADEP-EPH		1	CAD	09/11/19 0:41	C9I0157	CI90904
C19-C36 Aliphatics1	ND (93)		MADEP-EPH		1	CAD	09/11/19 0:41	C9I0157	CI90904
C11-C22 Unadjusted Aromatics1	ND (93.5)		EPH8270		1	VSC	09/10/19 10:57	C9I0120	CI90904
C11-C22 Aromatics1,2	ND (93.5)		EPH8270			VSC	09/10/19 10:57		[CALC]
Preservative:	**pH <= 2**		MADEP-EPH			CAD			CI90904

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*73 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*103 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*96 %*		*40-140*
Surrogate: O-Terphenyl	*92 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SW502
Date Sampled: 09/05/19 10:50
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 0.25
Extraction Method: 3510C

ESS Laboratory Work Order: 19I0164
ESS Laboratory Sample ID: 19I0164-02
Sample Matrix: Surface Water
Units: ug/L
Analyst: VSC
Prepared: 9/11/19 13:33

8270D(SIM) Polynuclear Aromatic Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	ND (0.19)		8270D SIM PAH		1	09/11/19 18:04	C9I0177	CI91117
Acenaphthene	ND (0.19)		8270D SIM PAH		1	09/11/19 18:04	C9I0177	CI91117
Acenaphthylene	ND (0.19)		8270D SIM PAH		1	09/11/19 18:04	C9I0177	CI91117
Anthracene	ND (0.19)		8270D SIM PAH		1	09/11/19 18:04	C9I0177	CI91117
Benzo(a)anthracene	ND (0.05)		8270D SIM PAH		1	09/11/19 18:04	C9I0177	CI91117
Benzo(a)pyrene	ND (0.05)		8270D SIM PAH		1	09/11/19 18:04	C9I0177	CI91117
Benzo(b)fluoranthene	ND (0.05)		8270D SIM PAH		1	09/11/19 18:04	C9I0177	CI91117
Benzo(g,h,i)perylene	ND (0.19)		8270D SIM PAH		1	09/11/19 18:04	C9I0177	CI91117
Benzo(k)fluoranthene	ND (0.05)		8270D SIM PAH		1	09/11/19 18:04	C9I0177	CI91117
Chrysene	ND (0.05)		8270D SIM PAH		1	09/11/19 18:04	C9I0177	CI91117
Dibenzo(a,h)Anthracene	ND (0.05)		8270D SIM PAH		1	09/11/19 18:04	C9I0177	CI91117
Fluoranthene	ND (0.19)		8270D SIM PAH		1	09/11/19 18:04	C9I0177	CI91117
Fluorene	ND (0.19)		8270D SIM PAH		1	09/11/19 18:04	C9I0177	CI91117
Indeno(1,2,3-cd)Pyrene	ND (0.05)		8270D SIM PAH		1	09/11/19 18:04	C9I0177	CI91117
Naphthalene	ND (0.19)		8270D SIM PAH		1	09/11/19 18:04	C9I0177	CI91117
Phenanthrene	ND (0.19)		8270D SIM PAH		1	09/11/19 18:04	C9I0177	CI91117
Pyrene	ND (0.19)		8270D SIM PAH		1	09/11/19 18:04	C9I0177	CI91117

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*47 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*63 %*		*30-130*
Surrogate: Nitrobenzene-d5	*91 %*		*30-130*
Surrogate: p-Terphenyl-d14	*91 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SW502
Date Sampled: 09/05/19 10:50
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3510C

ESS Laboratory Work Order: 19I0164
ESS Laboratory Sample ID: 19I0164-02
Sample Matrix: Surface Water
Units: ug/L

Prepared: 9/9/19 15:45

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (93)		MADEP-EPH		1	CAD	09/11/19 1:28	C9I0157	CI90904
C19-C36 Aliphatics1	ND (93)		MADEP-EPH		1	CAD	09/11/19 1:28	C9I0157	CI90904
C11-C22 Unadjusted Aromatics1	ND (93.5)		EPH8270		1	VSC	09/10/19 11:40	C9I0120	CI90904
C11-C22 Aromatics1,2	ND (93.5)		EPH8270			VSC	09/10/19 11:40		[CALC]
Preservative:	**pH <= 2**		MADEP-EPH			CAD			CI90904

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*69 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*103 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*98 %*		*40-140*
Surrogate: O-Terphenyl	*89 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SW503
Date Sampled: 09/05/19 11:10
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 0.25
Extraction Method: 3510C

ESS Laboratory Work Order: 19I0164
ESS Laboratory Sample ID: 19I0164-03
Sample Matrix: Surface Water
Units: ug/L
Analyst: VSC
Prepared: 9/11/19 13:33

8270D(SIM) Polynuclear Aromatic Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	ND (0.19)		8270D SIM PAH		1	09/11/19 18:50	C9I0177	CI91117
Acenaphthene	ND (0.19)		8270D SIM PAH		1	09/11/19 18:50	C9I0177	CI91117
Acenaphthylene	ND (0.19)		8270D SIM PAH		1	09/11/19 18:50	C9I0177	CI91117
Anthracene	ND (0.19)		8270D SIM PAH		1	09/11/19 18:50	C9I0177	CI91117
Benzo(a)anthracene	ND (0.05)		8270D SIM PAH		1	09/11/19 18:50	C9I0177	CI91117
Benzo(a)pyrene	ND (0.05)		8270D SIM PAH		1	09/11/19 18:50	C9I0177	CI91117
Benzo(b)fluoranthene	ND (0.05)		8270D SIM PAH		1	09/11/19 18:50	C9I0177	CI91117
Benzo(g,h,i)perylene	ND (0.19)		8270D SIM PAH		1	09/11/19 18:50	C9I0177	CI91117
Benzo(k)fluoranthene	ND (0.05)		8270D SIM PAH		1	09/11/19 18:50	C9I0177	CI91117
Chrysene	ND (0.05)		8270D SIM PAH		1	09/11/19 18:50	C9I0177	CI91117
Dibenzo(a,h)Anthracene	ND (0.05)		8270D SIM PAH		1	09/11/19 18:50	C9I0177	CI91117
Fluoranthene	ND (0.19)		8270D SIM PAH		1	09/11/19 18:50	C9I0177	CI91117
Fluorene	ND (0.19)		8270D SIM PAH		1	09/11/19 18:50	C9I0177	CI91117
Indeno(1,2,3-cd)Pyrene	ND (0.05)		8270D SIM PAH		1	09/11/19 18:50	C9I0177	CI91117
Naphthalene	ND (0.19)		8270D SIM PAH		1	09/11/19 18:50	C9I0177	CI91117
Phenanthrene	ND (0.19)		8270D SIM PAH		1	09/11/19 18:50	C9I0177	CI91117
Pyrene	ND (0.19)		8270D SIM PAH		1	09/11/19 18:50	C9I0177	CI91117

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*53 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*67 %*		*30-130*
Surrogate: Nitrobenzene-d5	*97 %*		*30-130*
Surrogate: p-Terphenyl-d14	*97 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SW503
Date Sampled: 09/05/19 11:10
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3510C

ESS Laboratory Work Order: 19I0164
ESS Laboratory Sample ID: 19I0164-03
Sample Matrix: Surface Water
Units: ug/L

Prepared: 9/9/19 15:45

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (93)		MADEP-EPH		1	CAD	09/11/19 2:15	C9I0157	CI90904
C19-C36 Aliphatics1	ND (93)		MADEP-EPH		1	CAD	09/11/19 2:15	C9I0157	CI90904
C11-C22 Unadjusted Aromatics1	ND (93.5)		EPH8270		1	VSC	09/10/19 12:24	C9I0120	CI90904
C11-C22 Aromatics1,2	ND (93.5)		EPH8270			VSC	09/10/19 12:24		[CALC]
Preservative:	**pH <= 2**		MADEP-EPH			CAD			CI90904

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*73 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*102 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*99 %*		*40-140*
Surrogate: O-Terphenyl	*94 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 19I0164

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D(SIM) Polynuclear Aromatic Hydrocarbon										
Batch CI91117 - 3510C										
Blank										
2-Methylnaphthalene	ND	0.20	ug/L							
Acenaphthene	ND	0.20	ug/L							
Acenaphthylene	ND	0.20	ug/L							
Anthracene	ND	0.20	ug/L							
Benzo(a)anthracene	ND	0.05	ug/L							
Benzo(a)pyrene	ND	0.05	ug/L							
Benzo(b)fluoranthene	ND	0.05	ug/L							
Benzo(g,h,i)perylene	ND	0.20	ug/L							
Benzo(k)fluoranthene	ND	0.05	ug/L							
Chrysene	ND	0.05	ug/L							
Dibenzo(a,h)Anthracene	ND	0.05	ug/L							
Fluoranthene	ND	0.20	ug/L							
Fluorene	ND	0.20	ug/L							
Indeno(1,2,3-cd)Pyrene	ND	0.05	ug/L							
Naphthalene	ND	0.20	ug/L							
Phenanthrene	ND	0.20	ug/L							
Pyrene	ND	0.20	ug/L							
Surrogate: 1,2-Dichlorobenzene-d4	*0.993*		ug/L	*2.500*		*40*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*1.27*		ug/L	*2.500*		*51*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.15*		ug/L	*2.500*		*86*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.32*		ug/L	*2.500*		*93*	*30-130*			
LCS										
2-Methylnaphthalene	2.89	0.20	ug/L	4.000		72	40-140			
Acenaphthene	2.67	0.20	ug/L	4.000		67	40-140			
Acenaphthylene	2.65	0.20	ug/L	4.000		66	40-140			
Anthracene	3.29	0.20	ug/L	4.000		82	40-140			
Benzo(a)anthracene	3.04	0.05	ug/L	4.000		76	40-140			
Benzo(a)pyrene	3.08	0.05	ug/L	4.000		77	40-140			
Benzo(b)fluoranthene	3.20	0.05	ug/L	4.000		80	40-140			
Benzo(g,h,i)perylene	2.88	0.20	ug/L	4.000		72	40-140			
Benzo(k)fluoranthene	3.21	0.05	ug/L	4.000		80	40-140			
Chrysene	3.14	0.05	ug/L	4.000		79	40-140			
Dibenzo(a,h)Anthracene	3.16	0.05	ug/L	4.000		79	40-140			
Fluoranthene	3.29	0.20	ug/L	4.000		82	40-140			
Fluorene	2.91	0.20	ug/L	4.000		73	40-140			
Indeno(1,2,3-cd)Pyrene	2.81	0.05	ug/L	4.000		70	40-140			
Naphthalene	1.94	0.20	ug/L	4.000		49	40-140			
Phenanthrene	3.16	0.20	ug/L	4.000		79	40-140			
Pyrene	3.19	0.20	ug/L	4.000		80	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	*0.943*		ug/L	*2.500*		*38*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*1.39*		ug/L	*2.500*		*56*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.11*		ug/L	*2.500*		*85*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.25*		ug/L	*2.500*		*90*	*30-130*			
LCS Dup										

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 19I0164

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D(SIM) Polynuclear Aromatic Hydrocarbon										
Batch CI91117 - 3510C										
2-Methylnaphthalene	3.56	0.20	ug/L	4.000		89	40-140	21	20	D+
Acenaphthene	3.20	0.20	ug/L	4.000		80	40-140	18	20	
Acenaphthylene	3.21	0.20	ug/L	4.000		80	40-140	19	20	
Anthracene	3.78	0.20	ug/L	4.000		94	40-140	14	20	
Benzo(a)anthracene	3.59	0.05	ug/L	4.000		90	40-140	17	20	
Benzo(a)pyrene	3.51	0.05	ug/L	4.000		88	40-140	13	20	
Benzo(b)fluoranthene	3.64	0.05	ug/L	4.000		91	40-140	13	20	
Benzo(g,h,i)perylene	3.27	0.20	ug/L	4.000		82	40-140	13	20	
Benzo(k)fluoranthene	3.68	0.05	ug/L	4.000		92	40-140	14	20	
Chrysene	3.64	0.05	ug/L	4.000		91	40-140	15	20	
Dibenzo(a,h)Anthracene	3.61	0.05	ug/L	4.000		90	40-140	13	20	
Fluoranthene	3.78	0.20	ug/L	4.000		95	40-140	14	20	
Fluorene	3.39	0.20	ug/L	4.000		85	40-140	15	20	
Indeno(1,2,3-cd)Pyrene	3.25	0.05	ug/L	4.000		81	40-140	15	20	
Naphthalene	2.46	0.20	ug/L	4.000		61	40-140	23	20	D+
Phenanthrene	3.65	0.20	ug/L	4.000		91	40-140	14	20	
Pyrene	3.79	0.20	ug/L	4.000		95	40-140	17	20	
Surrogate: 1,2-Dichlorobenzene-d4	*1.13*		ug/L	*2.500*		*45*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*1.68*		ug/L	*2.500*		*67*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.66*		ug/L	*2.500*		*106*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.57*		ug/L	*2.500*		*103*	*30-130*			
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch CI90904 - 3510C										
Blank										
C19-C36 Aliphatics1	ND	100	ug/L							
C9-C18 Aliphatics1	ND	100	ug/L							
Decane (C10)	ND	5	ug/L							
Docosane (C22)	ND	5	ug/L							
Dodecane (C12)	ND	5	ug/L							
Eicosane (C20)	ND	5	ug/L							
Hexacosane (C26)	ND	5	ug/L							
Hexadecane (C16)	ND	5	ug/L							
Hexatriacontane (C36)	ND	5	ug/L							
Nonadecane (C19)	ND	5	ug/L							
Nonane (C9)	ND	5	ug/L							
Octacosane (C28)	ND	5	ug/L							
Octadecane (C18)	ND	5	ug/L							
Tetracosane (C24)	ND	5	ug/L							
Tetradecane (C14)	ND	5	ug/L							
Triacontane (C30)	ND	5	ug/L							
Surrogate: 1-Chlorooctadecane	*42.5*		ug/L	*50.50*		*84*	*40-140*			
Blank										
2-Methylnaphthalene	ND	5.0	ug/L							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 19I0164

Quality Control Data

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch CI90904 - 3510C										
Acenaphthene	ND	5.0	ug/L							
Acenaphthylene	ND	5.0	ug/L							
Anthracene	ND	5.0	ug/L							
Benzo(a)anthracene	ND	5.0	ug/L							
Benzo(a)pyrene	ND	10.0	ug/L							
Benzo(b)fluoranthene	ND	5.0	ug/L							
Benzo(g,h,i)perylene	ND	10.0	ug/L							
Benzo(k)fluoranthene	ND	10.0	ug/L							
C11-C22 Unadjusted Aromatics1	ND	100	ug/L							
Chrysene	ND	10.0	ug/L							
Dibenzo(a,h)Anthracene	ND	5.0	ug/L							
Fluoranthene	ND	10.0	ug/L							
Fluorene	ND	5.0	ug/L							
Indeno(1,2,3-cd)Pyrene	ND	5.0	ug/L							
Naphthalene	ND	10.0	ug/L							
Phenanthrene	ND	5.0	ug/L							
Pyrene	ND	5.0	ug/L							
Surrogate: 2-Bromonaphthalene	*52.0*		mg/L	*50.00*		*104*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*48.9*		mg/L	*50.00*		*98*	*40-140*			
Surrogate: O-Terphenyl	*48.6*		ug/L	*50.20*		*97*	*40-140*			
LCS										
C19-C36 Aliphatics1	361	100	ug/L	400.0		90	40-140			
C9-C18 Aliphatics1	213	100	ug/L	300.0		71	40-140			
Decane (C10)	24	5	ug/L	50.00		48	40-140			
Docosane (C22)	45	5	ug/L	50.00		91	40-140			
Dodecane (C12)	30	5	ug/L	50.00		60	40-140			
Eicosane (C20)	44	5	ug/L	50.00		89	40-140			
Hexacosane (C26)	45	5	ug/L	50.00		90	40-140			
Hexadecane (C16)	43	5	ug/L	50.00		86	40-140			
Hexatriacontane (C36)	34	5	ug/L	50.00		68	40-140			
Nonadecane (C19)	44	5	ug/L	50.00		89	40-140			
Nonane (C9)	18	5	ug/L	50.00		36	30-140			
Octacosane (C28)	45	5	ug/L	50.00		90	40-140			
Octadecane (C18)	44	5	ug/L	50.00		89	40-140			
Tetracosane (C24)	45	5	ug/L	50.00		91	40-140			
Tetradecane (C14)	38	5	ug/L	50.00		76	40-140			
Triacontane (C30)	44	5	ug/L	50.00		88	40-140			
Surrogate: 1-Chlorooctadecane	*43.5*		ug/L	*50.50*		*86*	*40-140*			
LCS										
2-Methylnaphthalene	39.3	5.0	ug/L	50.00		79	40-140			
Acenaphthene	40.8	5.0	ug/L	50.00		82	40-140			
Acenaphthylene	42.0	5.0	ug/L	50.00		84	40-140			
Anthracene	42.8	5.0	ug/L	50.00		86	40-140			
Benzo(a)anthracene	47.0	5.0	ug/L	50.00		94	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 19I0164

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch CI90904 - 3510C										
Benzo(a)pyrene	49.5	10.0	ug/L	50.00		99	40-140			
Benzo(b)fluoranthene	46.1	5.0	ug/L	50.00		92	40-140			
Benzo(g,h,i)perylene	38.6	10.0	ug/L	50.00		77	40-140			
Benzo(k)fluoranthene	56.7	10.0	ug/L	50.00		113	40-140			
C11-C22 Unadjusted Aromatics1	804	100	ug/L	850.0		95	40-140			
Chrysene	52.9	10.0	ug/L	50.00		106	40-140			
Dibenzo(a,h)Anthracene	43.3	5.0	ug/L	50.00		87	40-140			
Fluoranthene	50.5	10.0	ug/L	50.00		101	40-140			
Fluorene	44.1	5.0	ug/L	50.00		88	40-140			
Indeno(1,2,3-cd)Pyrene	39.6	5.0	ug/L	50.00		79	40-140			
Naphthalene	36.4	10.0	ug/L	50.00		73	40-140			
Phenanthrene	46.4	5.0	ug/L	50.00		93	40-140			
Pyrene	47.8	5.0	ug/L	50.00		96	40-140			
Surrogate: 2-Bromonaphthalene	*50.3*		mg/L	*50.00*		*101*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*50.4*		mg/L	*50.00*		*101*	*40-140*			
Surrogate: O-Terphenyl	*49.5*		ug/L	*50.20*		*99*	*40-140*			
LCS										
2-Methylnaphthalene Breakthrough	0.0		%				0-5			
Naphthalene Breakthrough	0.0		%				0-5			
LCS Dup										
C19-C36 Aliphatics1	364	100	ug/L	400.0		91	40-140	0.8	25	
C9-C18 Aliphatics1	213	100	ug/L	300.0		71	40-140	0.07	25	
Decane (C10)	24	5	ug/L	50.00		47	40-140	2	25	
Docosane (C22)	45	5	ug/L	50.00		91	40-140	0.3	25	
Dodecane (C12)	29	5	ug/L	50.00		59	40-140	2	25	
Eicosane (C20)	44	5	ug/L	50.00		89	40-140	0.3	25	
Hexacosane (C26)	45	5	ug/L	50.00		91	40-140	0.4	25	
Hexadecane (C16)	43	5	ug/L	50.00		86	40-140	0.7	25	
Hexatriacontane (C36)	36	5	ug/L	50.00		72	40-140	6	25	
Nonadecane (C19)	45	5	ug/L	50.00		89	40-140	0.3	25	
Nonane (C9)	18	5	ug/L	50.00		35	30-140	3	25	
Octacosane (C28)	45	5	ug/L	50.00		91	40-140	0.4	25	
Octadecane (C18)	45	5	ug/L	50.00		90	40-140	0.7	25	
Tetracosane (C24)	46	5	ug/L	50.00		91	40-140	0.3	25	
Tetradecane (C14)	38	5	ug/L	50.00		75	40-140	0.3	25	
Triacontane (C30)	45	5	ug/L	50.00		89	40-140	0.7	25	
Surrogate: 1-Chlorooctadecane	*44.3*		ug/L	*50.50*		*88*	*40-140*			
LCS Dup										
2-Methylnaphthalene	39.9	5.0	ug/L	50.00		80	40-140	2	20	
Acenaphthene	41.3	5.0	ug/L	50.00		83	40-140	1	20	
Acenaphthylene	42.8	5.0	ug/L	50.00		86	40-140	2	20	
Anthracene	42.5	5.0	ug/L	50.00		85	40-140	0.5	20	
Benzo(a)anthracene	47.3	5.0	ug/L	50.00		95	40-140	0.6	20	
Benzo(a)pyrene	49.9	10.0	ug/L	50.00		100	40-140	0.8	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 19I0164

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch CI90904 - 3510C										
Benzo(b)fluoranthene	46.4	5.0	ug/L	50.00		93	40-140	0.6	20	
Benzo(g,h,i)perylene	39.8	10.0	ug/L	50.00		80	40-140	3	20	
Benzo(k)fluoranthene	56.9	10.0	ug/L	50.00		114	40-140	0.4	20	
C11-C22 Unadjusted Aromatics1	816	100	ug/L	850.0		96	40-140	1	25	
Chrysene	53.1	10.0	ug/L	50.00		106	40-140	0.4	20	
Dibenzo(a,h)Anthracene	43.7	5.0	ug/L	50.00		87	40-140	0.9	20	
Fluoranthene	49.5	10.0	ug/L	50.00		99	40-140	2	20	
Fluorene	44.3	5.0	ug/L	50.00		89	40-140	0.5	20	
Indeno(1,2,3-cd)Pyrene	39.7	5.0	ug/L	50.00		79	40-140	0.4	20	
Naphthalene	37.0	10.0	ug/L	50.00		74	40-140	1	20	
Phenanthrene	47.2	5.0	ug/L	50.00		94	40-140	2	20	
Pyrene	48.0	5.0	ug/L	50.00		96	40-140	0.5	20	
Surrogate: 2-Bromonaphthalene	*49.8*		mg/L	*50.00*		*100*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*51.5*		mg/L	*50.00*		*103*	*40-140*			
Surrogate: O-Terphenyl	*48.5*		ug/L	*50.20*		*97*	*40-140*			
LCS Dup										
2-Methylnaphthalene Breakthrough	0.0		%				0-5		200	
Naphthalene Breakthrough	0.0		%				0-5		200	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: 19I0164

Notes and Definitions

Z-06	pH <= 2
U	Analyte included in the analysis, but not detected
D+	Relative percent difference for duplicate is outside of criteria (D+).
CD-	Continuing Calibration %Diff/Drift is below control limit (CD-).
BT	Benzidine tailing factor >2.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 19I0164

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

Shipped/Delivered Via: ESS Courier

ESS Project ID: 1910164
Date Received: 9/6/2019
Project Due Date: 9/13/2019
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 1.4 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No (NA)
10. Were any analyses received outside of hold time? Yes (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / (No)
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? (Yes) / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / (No)
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	385175	Yes	NA	Yes	1L Amber - HCl	HCl	
01	385176	Yes	NA	Yes	1L Amber - HCl	HCl	
01	385181	Yes	NA	Yes	1L Amber - Unpres	NP	
01	385182	Yes	NA	Yes	1L Amber - Unpres	NP	
02	385173	Yes	NA	Yes	1L Amber - HCl	HCl	
02	385174	Yes	NA	Yes	1L Amber - HCl	HCl	
02	385179	Yes	NA	Yes	1L Amber - Unpres	NP	
02	385180	Yes	NA	Yes	1L Amber - Unpres	NP	
03	385171	Yes	NA	Yes	1L Amber - HCl	HCl	
03	385172	Yes	NA	Yes	1L Amber - HCl	HCl	
03	385177	Yes	NA	Yes	1L Amber - Unpres	NP	
03	385178	Yes	NA	Yes	1L Amber - Unpres	NP	

2nd Review

Were all containers scanned into storage/lab? Initials (Yes) / No
Are barcode labels on correct containers? Yes / No / NA
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB/MM

ESS Project ID: 1910164

Date Received: 9/6/2019

Completed By: _____ Date & Time: 9/6/19 2156

Reviewed By: _____ Date & Time: 9/6/19 2220

Delivered By: _____ 9/6/19 2220

19J0164

Chain-of-Custody Record

Laboratory: ES5

Laboratory Job # (Lab Use Only)

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman

Send Report to: Molly Greer

Send EDD to: labdata@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY REQUIRED (YES / NO)

If Yes, Are MCP Analytical Methods Required? (YES) NO NA

Are Drinking Water Samples Submitted? YES (NO) NA

If Yes, Have Drinking Water Sampling Requirements Been Met? YES NO (NA)

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler (s) Initials	Preservative: HCl	Preservative: None	Analysis: EPH Fractions	Analysis: PAHs by 8270 SIM	Sample Specific Remarks
1	1804576-SW501	9/5/2019	1030	Surface Water	4	CWS			x	x	
2	1804576-SW502	9/5/2019	1050	Surface Water	4	CWS			x	x	
3	1804576-SW503	9/5/2019	1110	Surface Water	4	CWS			x	x	

Sample Handling

Samples Field Filtered: YES NO (NA)

Sampled Shipped With Ice: (YES) NO

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

Turnaround Time (Business days)?

Normal: X Other: ___

10-Day ___ 7-Day ___

5-Day ___ 3-Day ___

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1.	9/5/2019	1545	1. GEI Refrigerator
Relinquished by: (signature)	Date:	Time:	Received by: (signature)
2. GEI Refrigerator	9/6/2019	9:17	2. Madison Alt
Relinquished by: (signature)	Date:	Time:	Received by: (signature)
3. Madison Alt	9/6	14:18	3.
Relinquished by: (signature)	Date:	Time:	Received by: (signature)
4.	9/6	19:36	4. 9/6/19 1936

Additional Requirements/Comments/Remarks:

Ice temp: 1.4

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: 20G0165

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 6:19 pm, Jul 15, 2020

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 20G0165

SAMPLE RECEIPT

The following samples were received on July 07, 2020 for the analyses specified on the enclosed Chain of Custody Record.

To achieve CAM compliance for MCP data, ESS Laboratory has reviewed all QA/QC Requirements and Performance Standards listed in each method. Holding times and preservation have also been reviewed. All CAM requirements have been performed and achieved unless noted in the project narrative.

Each method has been set-up in the laboratory to reach required MCP standards. The methods for aqueous VOA and Soil Methanol VOA have known limitations for certain analytes. The regulatory standards may not be achieved due to these limitations. In addition, for all methods, matrix interferences, dilutions, and %Solids may elevate method reporting limits above regulatory standards. ESS Laboratory can provide, upon request, a Limit Checker (regulatory standard comparison spreadsheet) electronic deliverable which will highlight these exceedances.

Question I: All samples for SVOC were analyzed for a subset of the required MCP list per the client's request.

Lab Number	Sample Name	Matrix	Analysis
20G0165-01	1804576-SW610	Aqueous	8270D SIM PAH, EPH8270, MADEP-EPH
20G0165-02	1804576-SW609	Aqueous	8270D SIM PAH, EPH8270, MADEP-EPH
20G0165-03	1804576-SW608	Aqueous	8270D SIM PAH, EPH8270, MADEP-EPH
20G0165-04	1804576-SW607	Aqueous	8270D SIM PAH, EPH8270, MADEP-EPH
20G0165-05	1804576-SW606	Aqueous	8270D SIM PAH, EPH8270, MADEP-EPH

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 20G0165

PROJECT NARRATIVE

8270D(SIM) Polynuclear Aromatic Hydrocarbon

D0G0142-TUN1 **Benzidine tailing factor >2.**

D0G0142-TUN1 **Pentachlorophenol tailing factor > 2.**

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 20G0165

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 20G0165

MassDEP Analytical Protocol Certification Form

MADEP RTN: _____

This form provides certification for the following data set: **20G0165-01 through 20G0165-05**

Matrices: (X) Ground Water/Surface Water ( ) Soil/Sediment ( ) Drinking Water ( ) Air ( ) Other:_____

CAM Protocol (check all that apply below):

( ) 8260 VOC CAM II A	( ) 7470/7471 Hg CAM III B	( ) MassDEP VPH (GC/PID/FID) CAM IV A	( ) 8082 PCB CAM V A	( ) 9014 Total Cyanide/PAC CAM VI A	( ) 6860 Perchlorate CAM VIII B
(X) 8270 SVOC CAM II B	( ) 7010 Metals CAM III C	( ) MassDEP VPH (GC/MS) CAM IV C	( ) 8081 Pesticides CAM V B	( ) 7196 Hex Cr CAM VI B	( ) MassDEP APH CAM IX A
( ) 6010 Metals CAM III A	( ) 6020 Metals CAM III D	(X) MassDEP EPH CAM IV B	( ) 8151 Herbicides CAM V C	( ) Explosives CAM VIII A	( ) TO-15 VOC CAM IX B

Affirmative responses to questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	Yes (X) No ( )
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	Yes (X) No ( )
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	Yes (X) No ( )
D	Does the laboratory report comply with all the reporting requirements specified in the CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	Yes (X) No ( )
E	VPH, EPH, APH and TO-15 only: a. Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	Yes (X) No ( )
	b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	Yes ( ) No ( )
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	Yes (X) No ( )

Responses to Questions G, H and I below are required for "'Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocols(s)?	Yes (X) No ( )*
	***Data User Note:* Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.**	
H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	Yes ( ) No (X)*
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	Yes ( ) No (X)*

****All negative responses must be addressed in an attached laboratory narrative.***

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature: Laurel Stoddard Date: July 15, 2020

Printed Name: Laurel Stoddard Position: Laboratory Director

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SW610
Date Sampled: 07/06/20 10:35
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 0.25
Extraction Method: 3510C

ESS Laboratory Work Order: 20G0165
ESS Laboratory Sample ID: 20G0165-01
Sample Matrix: Aqueous
Units: ug/L
Analyst: VSC
Prepared: 7/9/20 13:45

8270D(SIM) Polynuclear Aromatic Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	**1.30** (0.19)		8270D SIM PAH		1	07/09/20 20:55	D0G0142	DG00910
Acenaphthene	**8.13** (0.19)		8270D SIM PAH		1	07/09/20 20:55	D0G0142	DG00910
Acenaphthylene	ND (0.19)		8270D SIM PAH		1	07/09/20 20:55	D0G0142	DG00910
Anthracene	**0.43** (0.19)		8270D SIM PAH		1	07/09/20 20:55	D0G0142	DG00910
Benzo(a)anthracene	ND (0.05)		8270D SIM PAH		1	07/09/20 20:55	D0G0142	DG00910
Benzo(a)pyrene	ND (0.05)		8270D SIM PAH		1	07/09/20 20:55	D0G0142	DG00910
Benzo(b)fluoranthene	ND (0.05)		8270D SIM PAH		1	07/09/20 20:55	D0G0142	DG00910
Benzo(g,h,i)perylene	ND (0.19)		8270D SIM PAH		1	07/09/20 20:55	D0G0142	DG00910
Benzo(k)fluoranthene	ND (0.05)		8270D SIM PAH		1	07/09/20 20:55	D0G0142	DG00910
Chrysene	**0.05** (0.05)		8270D SIM PAH		1	07/09/20 20:55	D0G0142	DG00910
Dibenzo(a,h)Anthracene	ND (0.05)		8270D SIM PAH		1	07/09/20 20:55	D0G0142	DG00910
Fluoranthene	**0.52** (0.19)		8270D SIM PAH		1	07/09/20 20:55	D0G0142	DG00910
Fluorene	**2.17** (0.19)		8270D SIM PAH		1	07/09/20 20:55	D0G0142	DG00910
Indeno(1,2,3-cd)Pyrene	ND (0.05)		8270D SIM PAH		1	07/09/20 20:55	D0G0142	DG00910
Naphthalene	**9.07** (0.19)		8270D SIM PAH		1	07/09/20 20:55	D0G0142	DG00910
Phenanthrene	**3.42** (0.19)		8270D SIM PAH		1	07/09/20 20:55	D0G0142	DG00910
Pyrene	**0.67** (0.19)		8270D SIM PAH		1	07/09/20 20:55	D0G0142	DG00910

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*47 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*66 %*		*30-130*
Surrogate: Nitrobenzene-d5	*80 %*		*30-130*
Surrogate: p-Terphenyl-d14	*82 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SW610
Date Sampled: 07/06/20 10:35
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3510C

ESS Laboratory Work Order: 20G0165
ESS Laboratory Sample ID: 20G0165-01
Sample Matrix: Aqueous
Units: ug/L

Prepared: 7/8/20 17:06

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (93)		MADEP-EPH		1	MJV	07/10/20 20:23	D0G0158	DG00832
C19-C36 Aliphatics1	ND (93)		MADEP-EPH		1	MJV	07/10/20 20:23	D0G0158	DG00832
C11-C22 Unadjusted Aromatics1	ND (93.5)		EPH8270		1	VSC	07/10/20 15:27	D0G0139	DG00832
C11-C22 Aromatics1,2	ND (93.5)		EPH8270			VSC	07/10/20 15:27		[CALC]
Preservative:	**pH <= 2**		MADEP-EPH			IBM			DG00832

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*53 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*104 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*109 %*		*40-140*
Surrogate: O-Terphenyl	*93 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SW609
Date Sampled: 07/06/20 10:45
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 0.25
Extraction Method: 3510C

ESS Laboratory Work Order: 20G0165
ESS Laboratory Sample ID: 20G0165-02
Sample Matrix: Aqueous
Units: ug/L
Analyst: VSC
Prepared: 7/9/20 13:45

8270D(SIM) Polynuclear Aromatic Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	**0.88** (0.19)		8270D SIM PAH		1	07/09/20 21:42	D0G0142	DG00910
Acenaphthene	**5.26** (0.19)		8270D SIM PAH		1	07/09/20 21:42	D0G0142	DG00910
Acenaphthylene	ND (0.19)		8270D SIM PAH		1	07/09/20 21:42	D0G0142	DG00910
Anthracene	**0.28** (0.19)		8270D SIM PAH		1	07/09/20 21:42	D0G0142	DG00910
Benzo(a)anthracene	ND (0.05)		8270D SIM PAH		1	07/09/20 21:42	D0G0142	DG00910
Benzo(a)pyrene	ND (0.05)		8270D SIM PAH		1	07/09/20 21:42	D0G0142	DG00910
Benzo(b)fluoranthene	ND (0.05)		8270D SIM PAH		1	07/09/20 21:42	D0G0142	DG00910
Benzo(g,h,i)perylene	ND (0.19)		8270D SIM PAH		1	07/09/20 21:42	D0G0142	DG00910
Benzo(k)fluoranthene	ND (0.05)		8270D SIM PAH		1	07/09/20 21:42	D0G0142	DG00910
Chrysene	ND (0.05)		8270D SIM PAH		1	07/09/20 21:42	D0G0142	DG00910
Dibenzo(a,h)Anthracene	ND (0.05)		8270D SIM PAH		1	07/09/20 21:42	D0G0142	DG00910
Fluoranthene	**0.31** (0.19)		8270D SIM PAH		1	07/09/20 21:42	D0G0142	DG00910
Fluorene	**1.46** (0.19)		8270D SIM PAH		1	07/09/20 21:42	D0G0142	DG00910
Indeno(1,2,3-cd)Pyrene	ND (0.05)		8270D SIM PAH		1	07/09/20 21:42	D0G0142	DG00910
Naphthalene	**5.84** (0.19)		8270D SIM PAH		1	07/09/20 21:42	D0G0142	DG00910
Phenanthrene	**2.14** (0.19)		8270D SIM PAH		1	07/09/20 21:42	D0G0142	DG00910
Pyrene	**0.40** (0.19)		8270D SIM PAH		1	07/09/20 21:42	D0G0142	DG00910

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*51 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*68 %*		*30-130*
Surrogate: Nitrobenzene-d5	*83 %*		*30-130*
Surrogate: p-Terphenyl-d14	*84 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SW609
Date Sampled: 07/06/20 10:45
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3510C

ESS Laboratory Work Order: 20G0165
ESS Laboratory Sample ID: 20G0165-02
Sample Matrix: Aqueous
Units: ug/L

Prepared: 7/8/20 17:06

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (93)		MADEP-EPH		1	MJV	07/10/20 21:12	D0G0158	DG00832
C19-C36 Aliphatics1	ND (93)		MADEP-EPH		1	MJV	07/10/20 21:12	D0G0158	DG00832
C11-C22 Unadjusted Aromatics1	ND (93.5)		EPH8270		1	VSC	07/10/20 0:08	D0G0139	DG00832
C11-C22 Aromatics1,2	ND (93.5)		EPH8270			VSC	07/10/20 0:08		[CALC]
Preservative:	**pH <= 2**		MADEP-EPH			IBM			DG00832

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*50 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*114 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*111 %*		*40-140*
Surrogate: O-Terphenyl	*87 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SW608
Date Sampled: 07/06/20 11:10
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 0.25
Extraction Method: 3510C

ESS Laboratory Work Order: 20G0165
ESS Laboratory Sample ID: 20G0165-03
Sample Matrix: Aqueous
Units: ug/L
Analyst: VSC
Prepared: 7/9/20 13:45

8270D(SIM) Polynuclear Aromatic Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	**0.78** (0.19)		8270D SIM PAH		1	07/09/20 22:29	D0G0142	DG00910
Acenaphthene	**4.50** (0.19)		8270D SIM PAH		1	07/09/20 22:29	D0G0142	DG00910
Acenaphthylene	ND (0.19)		8270D SIM PAH		1	07/09/20 22:29	D0G0142	DG00910
Anthracene	**0.25** (0.19)		8270D SIM PAH		1	07/09/20 22:29	D0G0142	DG00910
Benzo(a)anthracene	ND (0.05)		8270D SIM PAH		1	07/09/20 22:29	D0G0142	DG00910
Benzo(a)pyrene	ND (0.05)		8270D SIM PAH		1	07/09/20 22:29	D0G0142	DG00910
Benzo(b)fluoranthene	ND (0.05)		8270D SIM PAH		1	07/09/20 22:29	D0G0142	DG00910
Benzo(g,h,i)perylene	ND (0.19)		8270D SIM PAH		1	07/09/20 22:29	D0G0142	DG00910
Benzo(k)fluoranthene	ND (0.05)		8270D SIM PAH		1	07/09/20 22:29	D0G0142	DG00910
Chrysene	ND (0.05)		8270D SIM PAH		1	07/09/20 22:29	D0G0142	DG00910
Dibenzo(a,h)Anthracene	ND (0.05)		8270D SIM PAH		1	07/09/20 22:29	D0G0142	DG00910
Fluoranthene	**0.27** (0.19)		8270D SIM PAH		1	07/09/20 22:29	D0G0142	DG00910
Fluorene	**1.23** (0.19)		8270D SIM PAH		1	07/09/20 22:29	D0G0142	DG00910
Indeno(1,2,3-cd)Pyrene	ND (0.05)		8270D SIM PAH		1	07/09/20 22:29	D0G0142	DG00910
Naphthalene	**5.65** (0.19)		8270D SIM PAH		1	07/09/20 22:29	D0G0142	DG00910
Phenanthrene	**1.77** (0.19)		8270D SIM PAH		1	07/09/20 22:29	D0G0142	DG00910
Pyrene	**0.36** (0.19)		8270D SIM PAH		1	07/09/20 22:29	D0G0142	DG00910

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*44 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*59 %*		*30-130*
Surrogate: Nitrobenzene-d5	*74 %*		*30-130*
Surrogate: p-Terphenyl-d14	*79 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SW608
Date Sampled: 07/06/20 11:10
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3510C

ESS Laboratory Work Order: 20G0165
ESS Laboratory Sample ID: 20G0165-03
Sample Matrix: Aqueous
Units: ug/L

Prepared: 7/8/20 17:06

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (93)		MADEP-EPH		1	MJV	07/10/20 22:01	D0G0158	DG00832
C19-C36 Aliphatics1	ND (93)		MADEP-EPH		1	MJV	07/10/20 22:01	D0G0158	DG00832
C11-C22 Unadjusted Aromatics1	ND (93.5)		EPH8270		1	VSC	07/10/20 0:45	D0G0139	DG00832
C11-C22 Aromatics1,2	ND (93.5)		EPH8270			VSC	07/10/20 0:45		[CALC]
Preservative:	**pH <= 2**		MADEP-EPH			IBM			DG00832

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*51 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*111 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*103 %*		*40-140*
Surrogate: O-Terphenyl	*87 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SW607
Date Sampled: 07/06/20 11:20
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 0.25
Extraction Method: 3510C

ESS Laboratory Work Order: 20G0165
ESS Laboratory Sample ID: 20G0165-04
Sample Matrix: Aqueous
Units: ug/L
Analyst: VSC
Prepared: 7/9/20 13:45

8270D(SIM) Polynuclear Aromatic Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	**0.97** (0.19)		8270D SIM PAH		1	07/09/20 23:16	D0G0142	DG00910
Acenaphthene	**4.82** (0.19)		8270D SIM PAH		1	07/09/20 23:16	D0G0142	DG00910
Acenaphthylene	ND (0.19)		8270D SIM PAH		1	07/09/20 23:16	D0G0142	DG00910
Anthracene	**0.22** (0.19)		8270D SIM PAH		1	07/09/20 23:16	D0G0142	DG00910
Benzo(a)anthracene	ND (0.05)		8270D SIM PAH		1	07/09/20 23:16	D0G0142	DG00910
Benzo(a)pyrene	ND (0.05)		8270D SIM PAH		1	07/09/20 23:16	D0G0142	DG00910
Benzo(b)fluoranthene	ND (0.05)		8270D SIM PAH		1	07/09/20 23:16	D0G0142	DG00910
Benzo(g,h,i)perylene	ND (0.19)		8270D SIM PAH		1	07/09/20 23:16	D0G0142	DG00910
Benzo(k)fluoranthene	ND (0.05)		8270D SIM PAH		1	07/09/20 23:16	D0G0142	DG00910
Chrysene	ND (0.05)		8270D SIM PAH		1	07/09/20 23:16	D0G0142	DG00910
Dibenzo(a,h)Anthracene	ND (0.05)		8270D SIM PAH		1	07/09/20 23:16	D0G0142	DG00910
Fluoranthene	**0.22** (0.19)		8270D SIM PAH		1	07/09/20 23:16	D0G0142	DG00910
Fluorene	**1.28** (0.19)		8270D SIM PAH		1	07/09/20 23:16	D0G0142	DG00910
Indeno(1,2,3-cd)Pyrene	ND (0.05)		8270D SIM PAH		1	07/09/20 23:16	D0G0142	DG00910
Naphthalene	**8.80** (0.19)		8270D SIM PAH		1	07/09/20 23:16	D0G0142	DG00910
Phenanthrene	**1.68** (0.19)		8270D SIM PAH		1	07/09/20 23:16	D0G0142	DG00910
Pyrene	**0.28** (0.19)		8270D SIM PAH		1	07/09/20 23:16	D0G0142	DG00910

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*38 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*57 %*		*30-130*
Surrogate: Nitrobenzene-d5	*79 %*		*30-130*
Surrogate: p-Terphenyl-d14	*87 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SW607
Date Sampled: 07/06/20 11:20
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3510C

ESS Laboratory Work Order: 20G0165
ESS Laboratory Sample ID: 20G0165-04
Sample Matrix: Aqueous
Units: ug/L

Prepared: 7/8/20 17:06

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (93)		MADEP-EPH		1	MJV	07/10/20 22:49	D0G0158	DG00832
C19-C36 Aliphatics1	ND (93)		MADEP-EPH		1	MJV	07/10/20 22:49	D0G0158	DG00832
C11-C22 Unadjusted Aromatics1	ND (93.5)		EPH8270		1	VSC	07/10/20 1:22	D0G0139	DG00832
C11-C22 Aromatics1,2	ND (93.5)		EPH8270			VSC	07/10/20 1:22		[CALC]
Preservative:	**pH <= 2**		MADEP-EPH			IBM			DG00832

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*50 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*108 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*108 %*		*40-140*
Surrogate: O-Terphenyl	*86 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SW606
Date Sampled: 07/06/20 11:30
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 0.25
Extraction Method: 3510C

ESS Laboratory Work Order: 20G0165
ESS Laboratory Sample ID: 20G0165-05
Sample Matrix: Aqueous
Units: ug/L
Analyst: VSC
Prepared: 7/9/20 13:45

8270D(SIM) Polynuclear Aromatic Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	ND (0.19)		8270D SIM PAH		1	07/10/20 0:03	D0G0142	DG00910
Acenaphthene	ND (0.19)		8270D SIM PAH		1	07/10/20 0:03	D0G0142	DG00910
Acenaphthylene	ND (0.19)		8270D SIM PAH		1	07/10/20 0:03	D0G0142	DG00910
Anthracene	ND (0.19)		8270D SIM PAH		1	07/10/20 0:03	D0G0142	DG00910
Benzo(a)anthracene	ND (0.05)		8270D SIM PAH		1	07/10/20 0:03	D0G0142	DG00910
Benzo(a)pyrene	ND (0.05)		8270D SIM PAH		1	07/10/20 0:03	D0G0142	DG00910
Benzo(b)fluoranthene	ND (0.05)		8270D SIM PAH		1	07/10/20 0:03	D0G0142	DG00910
Benzo(g,h,i)perylene	ND (0.19)		8270D SIM PAH		1	07/10/20 0:03	D0G0142	DG00910
Benzo(k)fluoranthene	ND (0.05)		8270D SIM PAH		1	07/10/20 0:03	D0G0142	DG00910
Chrysene	ND (0.05)		8270D SIM PAH		1	07/10/20 0:03	D0G0142	DG00910
Dibenzo(a,h)Anthracene	ND (0.05)		8270D SIM PAH		1	07/10/20 0:03	D0G0142	DG00910
Fluoranthene	ND (0.19)		8270D SIM PAH		1	07/10/20 0:03	D0G0142	DG00910
Fluorene	ND (0.19)		8270D SIM PAH		1	07/10/20 0:03	D0G0142	DG00910
Indeno(1,2,3-cd)Pyrene	ND (0.05)		8270D SIM PAH		1	07/10/20 0:03	D0G0142	DG00910
Naphthalene	ND (0.19)		8270D SIM PAH		1	07/10/20 0:03	D0G0142	DG00910
Phenanthrene	ND (0.19)		8270D SIM PAH		1	07/10/20 0:03	D0G0142	DG00910
Pyrene	ND (0.19)		8270D SIM PAH		1	07/10/20 0:03	D0G0142	DG00910

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*37 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*50 %*		*30-130*
Surrogate: Nitrobenzene-d5	*64 %*		*30-130*
Surrogate: p-Terphenyl-d14	*76 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SW606
Date Sampled: 07/06/20 11:30
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3510C

ESS Laboratory Work Order: 20G0165
ESS Laboratory Sample ID: 20G0165-05
Sample Matrix: Aqueous
Units: ug/L

Prepared: 7/8/20 17:06

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (93)		MADEP-EPH		1	MJV	07/10/20 23:38	D0G0158	DG00832
C19-C36 Aliphatics1	ND (93)		MADEP-EPH		1	MJV	07/10/20 23:38	D0G0158	DG00832
C11-C22 Unadjusted Aromatics1	ND (93.5)		EPH8270		1	VSC	07/10/20 1:59	D0G0139	DG00832
C11-C22 Aromatics1,2	ND (93.5)		EPH8270			VSC	07/10/20 1:59		[CALC]
Preservative:	**pH <= 2**		MADEP-EPH			IBM			DG00832

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*50 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*117 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*113 %*		*40-140*
Surrogate: O-Terphenyl	*92 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 20G0165

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D(SIM) Polynuclear Aromatic Hydrocarbon										
Batch DG00910 - 3510C										
Blank										
2-Methylnaphthalene	ND	0.20	ug/L							
Acenaphthene	ND	0.20	ug/L							
Acenaphthylene	ND	0.20	ug/L							
Anthracene	ND	0.20	ug/L							
Benzo(a)anthracene	ND	0.05	ug/L							
Benzo(a)pyrene	ND	0.05	ug/L							
Benzo(b)fluoranthene	ND	0.05	ug/L							
Benzo(g,h,i)perylene	ND	0.20	ug/L							
Benzo(k)fluoranthene	ND	0.05	ug/L							
Chrysene	ND	0.05	ug/L							
Dibenzo(a,h)Anthracene	ND	0.05	ug/L							
Fluoranthene	ND	0.20	ug/L							
Fluorene	ND	0.20	ug/L							
Indeno(1,2,3-cd)Pyrene	ND	0.05	ug/L							
Naphthalene	ND	0.20	ug/L							
Phenanthrene	ND	0.20	ug/L							
Pyrene	ND	0.20	ug/L							
Surrogate: 1,2-Dichlorobenzene-d4	*1.17*		ug/L	*2.500*		*47*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*1.48*		ug/L	*2.500*		*59*	*30-130*			
Surrogate: Nitrobenzene-d5	*1.94*		ug/L	*2.500*		*77*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.07*		ug/L	*2.500*		*83*	*30-130*			
LCS										
2-Methylnaphthalene	2.75	0.20	ug/L	4.000		69	40-140			
Acenaphthene	3.12	0.20	ug/L	4.000		78	40-140			
Acenaphthylene	3.33	0.20	ug/L	4.000		83	40-140			
Anthracene	3.35	0.20	ug/L	4.000		84	40-140			
Benzo(a)anthracene	3.19	0.05	ug/L	4.000		80	40-140			
Benzo(a)pyrene	3.43	0.05	ug/L	4.000		86	40-140			
Benzo(b)fluoranthene	3.31	0.05	ug/L	4.000		83	40-140			
Benzo(g,h,i)perylene	2.96	0.20	ug/L	4.000		74	40-140			
Benzo(k)fluoranthene	3.34	0.05	ug/L	4.000		84	40-140			
Chrysene	3.42	0.05	ug/L	4.000		86	40-140			
Dibenzo(a,h)Anthracene	2.99	0.05	ug/L	4.000		75	40-140			
Fluoranthene	3.65	0.20	ug/L	4.000		91	40-140			
Fluorene	3.31	0.20	ug/L	4.000		83	40-140			
Indeno(1,2,3-cd)Pyrene	2.92	0.05	ug/L	4.000		73	40-140			
Naphthalene	2.62	0.20	ug/L	4.000		66	40-140			
Phenanthrene	3.32	0.20	ug/L	4.000		83	40-140			
Pyrene	4.12	0.20	ug/L	4.000		103	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	*1.13*		ug/L	*2.500*		*45*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*1.75*		ug/L	*2.500*		*70*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.23*		ug/L	*2.500*		*89*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.09*		ug/L	*2.500*		*84*	*30-130*			
LCS Dup										

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 20G0165

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D(SIM) Polynuclear Aromatic Hydrocarbon										
Batch DG00910 - 3510C										
2-Methylnaphthalene	2.71	0.20	ug/L	4.000		68	40-140	1	20	
Acenaphthene	3.01	0.20	ug/L	4.000		75	40-140	4	20	
Acenaphthylene	3.18	0.20	ug/L	4.000		79	40-140	5	20	
Anthracene	3.25	0.20	ug/L	4.000		81	40-140	3	20	
Benzo(a)anthracene	3.09	0.05	ug/L	4.000		77	40-140	3	20	
Benzo(a)pyrene	3.39	0.05	ug/L	4.000		85	40-140	1	20	
Benzo(b)fluoranthene	3.30	0.05	ug/L	4.000		83	40-140	0.2	20	
Benzo(g,h,i)perylene	3.08	0.20	ug/L	4.000		77	40-140	4	20	
Benzo(k)fluoranthene	3.26	0.05	ug/L	4.000		82	40-140	2	20	
Chrysene	3.26	0.05	ug/L	4.000		82	40-140	5	20	
Dibenzo(a,h)Anthracene	3.06	0.05	ug/L	4.000		76	40-140	2	20	
Fluoranthene	3.51	0.20	ug/L	4.000		88	40-140	4	20	
Fluorene	3.19	0.20	ug/L	4.000		80	40-140	4	20	
Indeno(1,2,3-cd)Pyrene	3.09	0.05	ug/L	4.000		77	40-140	6	20	
Naphthalene	2.61	0.20	ug/L	4.000		65	40-140	0.7	20	
Phenanthrene	3.22	0.20	ug/L	4.000		81	40-140	3	20	
Pyrene	3.88	0.20	ug/L	4.000		97	40-140	6	20	
Surrogate: 1,2-Dichlorobenzene-d4	*1.15*		ug/L	*2.500*		*46*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*1.63*		ug/L	*2.500*		*65*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.14*		ug/L	*2.500*		*86*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.03*		ug/L	*2.500*		*81*	*30-130*			
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch DG00832 - 3510C										
Blank										
C19-C36 Aliphatics1	ND	100	ug/L							
C9-C18 Aliphatics1	ND	100	ug/L							
Decane (C10)	ND	5	ug/L							
Docosane (C22)	ND	5	ug/L							
Dodecane (C12)	ND	5	ug/L							
Eicosane (C20)	ND	5	ug/L							
Hexacosane (C26)	ND	5	ug/L							
Hexadecane (C16)	ND	5	ug/L							
Hexatriacontane (C36)	ND	5	ug/L							
Nonadecane (C19)	ND	5	ug/L							
Nonane (C9)	ND	5	ug/L							
Octacosane (C28)	ND	5	ug/L							
Octadecane (C18)	ND	5	ug/L							
Tetracosane (C24)	ND	5	ug/L							
Tetradecane (C14)	ND	5	ug/L							
Triacontane (C30)	ND	5	ug/L							
Surrogate: 1-Chlorooctadecane	*25.5*		ug/L	*50.00*		*51*	*40-140*			
Blank										
2-Methylnaphthalene	ND	5.0	ug/L							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 20G0165

Quality Control Data

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch DG00832 - 3510C										
Acenaphthene	ND	5.0	ug/L							
Acenaphthylene	ND	5.0	ug/L							
Anthracene	ND	5.0	ug/L							
Benzo(a)anthracene	ND	5.0	ug/L							
Benzo(a)pyrene	ND	10.0	ug/L							
Benzo(b)fluoranthene	ND	5.0	ug/L							
Benzo(g,h,i)perylene	ND	10.0	ug/L							
Benzo(k)fluoranthene	ND	10.0	ug/L							
C11-C22 Unadjusted Aromatics1	ND	100	ug/L							
Chrysene	ND	10.0	ug/L							
Dibenzo(a,h)Anthracene	ND	5.0	ug/L							
Fluoranthene	ND	10.0	ug/L							
Fluorene	ND	5.0	ug/L							
Indeno(1,2,3-cd)Pyrene	ND	5.0	ug/L							
Naphthalene	ND	10.0	ug/L							
Phenanthrene	ND	5.0	ug/L							
Pyrene	ND	5.0	ug/L							
Surrogate: 2-Bromonaphthalene	*55.1*		mg/L	*50.00*		*110*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*51.5*		mg/L	*50.00*		*103*	*40-140*			
Surrogate: O-Terphenyl	*47.4*		ug/L	*50.00*		*95*	*40-140*			
LCS										
C19-C36 Aliphatics1	354	100	ug/L	400.0		89	40-140			
C9-C18 Aliphatics1	203	100	ug/L	300.0		68	40-140			
Decane (C10)	25	5	ug/L	50.00		50	40-140			
Docosane (C22)	41	5	ug/L	50.00		81	40-140			
Dodecane (C12)	30	5	ug/L	50.00		59	40-140			
Eicosane (C20)	41	5	ug/L	50.00		81	40-140			
Hexacosane (C26)	40	5	ug/L	50.00		81	40-140			
Hexadecane (C16)	39	5	ug/L	50.00		78	40-140			
Hexatriacontane (C36)	45	5	ug/L	50.00		89	40-140			
Nonadecane (C19)	40	5	ug/L	50.00		80	40-140			
Nonane (C9)	19	5	ug/L	50.00		39	30-140			
Octacosane (C28)	42	5	ug/L	50.00		83	40-140			
Octadecane (C18)	40	5	ug/L	50.00		79	40-140			
Tetracosane (C24)	41	5	ug/L	50.00		82	40-140			
Tetradecane (C14)	35	5	ug/L	50.00		70	40-140			
Triacontane (C30)	41	5	ug/L	50.00		82	40-140			
Surrogate: 1-Chlorooctadecane	*30.4*		ug/L	*50.00*		*61*	*40-140*			
LCS										
2-Methylnaphthalene	43.4	5.0	ug/L	50.00		87	40-140			
Acenaphthene	47.4	5.0	ug/L	50.00		95	40-140			
Acenaphthylene	46.2	5.0	ug/L	50.00		92	40-140			
Anthracene	56.0	5.0	ug/L	50.00		112	40-140			
Benzo(a)anthracene	54.4	5.0	ug/L	50.00		109	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 20G0165

Quality Control Data

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
Batch DG00832 - 3510C										
Benzo(a)pyrene	55.1	10.0	ug/L	50.00		110	40-140			
Benzo(b)fluoranthene	52.7	5.0	ug/L	50.00		105	40-140			
Benzo(g,h,i)perylene	52.3	10.0	ug/L	50.00		105	40-140			
Benzo(k)fluoranthene	66.5	10.0	ug/L	50.00		133	40-140			
C11-C22 Unadjusted Aromatics1	847	100	ug/L	850.0		100	40-140			
Chrysene	62.6	10.0	ug/L	50.00		125	40-140			
Dibenzo(a,h)Anthracene	51.7	5.0	ug/L	50.00		103	40-140			
Fluoranthene	62.7	10.0	ug/L	50.00		125	40-140			
Fluorene	52.6	5.0	ug/L	50.00		105	40-140			
Indeno(1,2,3-cd)Pyrene	55.5	5.0	ug/L	50.00		111	40-140			
Naphthalene	36.7	10.0	ug/L	50.00		73	40-140			
Phenanthrene	57.2	5.0	ug/L	50.00		114	40-140			
Pyrene	61.2	5.0	ug/L	50.00		122	40-140			
Surrogate: 2-Bromonaphthalene	*53.0*		mg/L	*50.00*		*106*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*52.0*		mg/L	*50.00*		*104*	*40-140*			
Surrogate: O-Terphenyl	*49.1*		ug/L	*50.00*		*98*	*40-140*			
LCS										
2-Methylnaphthalene Breakthrough	0.0		%				0-5			
Naphthalene Breakthrough	0.0		%				0-5			
LCS Dup										
C19-C36 Aliphatics1	360	100	ug/L	400.0		90	40-140	2	25	
C9-C18 Aliphatics1	197	100	ug/L	300.0		66	40-140	3	25	
Decane (C10)	25	5	ug/L	50.00		49	40-140	2	25	
Docosane (C22)	41	5	ug/L	50.00		81	40-140	0.2	25	
Dodecane (C12)	29	5	ug/L	50.00		58	40-140	3	25	
Eicosane (C20)	40	5	ug/L	50.00		80	40-140	1	25	
Hexacosane (C26)	41	5	ug/L	50.00		82	40-140	1	25	
Hexadecane (C16)	38	5	ug/L	50.00		76	40-140	3	25	
Hexatriacontane (C36)	48	5	ug/L	50.00		95	40-140	6	25	
Nonadecane (C19)	39	5	ug/L	50.00		79	40-140	2	25	
Nonane (C9)	19	5	ug/L	50.00		38	30-140	3	25	
Octacosane (C28)	42	5	ug/L	50.00		85	40-140	2	25	
Octadecane (C18)	39	5	ug/L	50.00		78	40-140	2	25	
Tetracosane (C24)	41	5	ug/L	50.00		82	40-140	0.4	25	
Tetradecane (C14)	34	5	ug/L	50.00		67	40-140	3	25	
Triacontane (C30)	42	5	ug/L	50.00		84	40-140	3	25	
Surrogate: 1-Chlorooctadecane	*29.5*		ug/L	*50.00*		*59*	*40-140*			
LCS Dup										
2-Methylnaphthalene	43.4	5.0	ug/L	50.00		87	40-140	0.1	20	
Acenaphthene	48.3	5.0	ug/L	50.00		97	40-140	2	20	
Acenaphthylene	48.2	5.0	ug/L	50.00		96	40-140	4	20	
Anthracene	56.6	5.0	ug/L	50.00		113	40-140	0.9	20	
Benzo(a)anthracene	53.0	5.0	ug/L	50.00		106	40-140	3	20	
Benzo(a)pyrene	55.0	10.0	ug/L	50.00		110	40-140	0.2	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 20G0165

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch DG00832 - 3510C										
Benzo(b)fluoranthene	54.0	5.0	ug/L	50.00		108	40-140	2	20	
Benzo(g,h,i)perylene	49.7	10.0	ug/L	50.00		99	40-140	5	20	
Benzo(k)fluoranthene	68.7	10.0	ug/L	50.00		137	40-140	3	20	
C11-C22 Unadjusted Aromatics1	863	100	ug/L	850.0		102	40-140	2	25	
Chrysene	62.3	10.0	ug/L	50.00		125	40-140	0.5	20	
Dibenzo(a,h)Anthracene	50.3	5.0	ug/L	50.00		101	40-140	3	20	
Fluoranthene	61.9	10.0	ug/L	50.00		124	40-140	1	20	
Fluorene	52.7	5.0	ug/L	50.00		105	40-140	0.2	20	
Indeno(1,2,3-cd)Pyrene	53.3	5.0	ug/L	50.00		107	40-140	4	20	
Naphthalene	37.9	10.0	ug/L	50.00		76	40-140	3	20	
Phenanthrene	58.4	5.0	ug/L	50.00		117	40-140	2	20	
Pyrene	59.1	5.0	ug/L	50.00		118	40-140	3	20	
Surrogate: 2-Bromonaphthalene	*55.1*		mg/L	*50.00*		*110*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*56.0*		mg/L	*50.00*		*112*	*40-140*			
Surrogate: O-Terphenyl	*48.7*		ug/L	*50.00*		*97*	*40-140*			
LCS Dup										
2-Methylnaphthalene Breakthrough	0.0		%				0-5		200	
Naphthalene Breakthrough	0.0		%				0-5		200	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: 20G0165

Notes and Definitions

Z-06	pH <= 2
U	Analyte included in the analysis, but not detected
PT	Pentachlorophenol tailing factor > 2.
BT	Benzidine tailing factor >2.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 20G0165

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

Shipped/Delivered Via: ESS Courier

ESS Project ID: 20G0165
Date Received: 7/7/2020
Project Due Date: 7/14/2020
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 0.6 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / NA
10. Were any analyses received outside of hold time? Yes / No

11. Any Subcontracting needed? Yes / No
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / No
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA
13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

14. Was there a need to contact Project Manager? Yes / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted? Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1	61993	Yes	N/A	Yes	1L Amber	HCl	
1	61994	Yes	N/A	Yes	1L Amber	HCl	
2	61995	Yes	N/A	Yes	1L Amber	HCl	
2	61996	Yes	N/A	Yes	1L Amber	HCl	
3	61997	Yes	N/A	Yes	1L Amber	HCl	
3	61998	Yes	N/A	Yes	1L Amber	HCl	
4	61999	Yes	N/A	Yes	1L Amber	HCl	
4	62000	Yes	N/A	Yes	1L Amber	HCl	
5	62001	Yes	N/A	Yes	1L Amber	HCl	
5	62002	Yes	N/A	Yes	1L Amber	HCl	

2nd Review
Were all containers scanned into storage/lab? Initials Yes / No
Are barcode labels on correct containers? Yes / No
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

ESS Project ID: 20G0165
Date Received: 7/7/2020

Completed By: 
Date & Time: 7/7/20 1625

Reviewed By:
Date & Time: 7/7/20 1649

Delivered By:
7/7/20 1649

Chain-of-Custody Record

Laboratory: ESS

Laboratory Job # (Lab use only) 20G0163

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

Preservative

None | None

Analysis

Sample Handling

Samples Field Filtered: YES (NO) NA

Sampled Shipped With Ice: (YES) NO

MCP PRESUMPTIVE CERTAINTY REQUIRED – (YES) NO

If Yes, Are MCP Analytical Methods Required?	(YES)	NO	NA
Are Drinking Water Samples Submitted?	YES	(NO)	NA
If Yes, Have Drinking Water Sampling Requirements Been Met?	YES	NO	(NA)

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	PAH17 8270D SIM	EPH fractions only	Sample Specific Remarks
1	1804576-SW610	7/6/2020	10:35	Aqueous	2	BFM	X	X	
2	1804576-SW609	7/6/2020	10:45	Aqueous	2	BFM	X	X	
3	1804576-SW608	7/6/2020	11:10	Aqueous	2	BFM	X	X	
4	1804576-SW607	7/6/2020	11:20	Aqueous	2	BFM	X	X	
5	1804576-SW606	7/6/2020	11:30	Aqueous	2	BFM	X	X	

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

	Date	Time	
Relinquished by sampler: (signature) 1.	07/06/20	19:30	Received by: (signature) 1. GEI Sample Fridge
Relinquished by: (signature) 2. GEI Sample Fridge	7/7/20	13:05	Received by: (signature) 2. Chad Faylor
Relinquished by: (signature) 3. Chad Faylor	7/7/20	13:05	Received by: (signature) 3.
Relinquished by: (signature) 4.	7/7/20	15:21	Received by: (signature) 4.

Turnaround Time (Business days):

Normal __X__ Other ____

10-Day ____ 7-Day ____

5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

CERTIFICATE OF ANALYSIS

Ryan Hoffman
GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801

RE: Amesbury Former MGP (1804576)
ESS Laboratory Work Order Number: 20G0197

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laurel Stoddard
Laboratory Director

REVIEWED
By ESS Laboratory at 4:18 pm, Jul 16, 2020

Analytical Summary
The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 20G0197

SAMPLE RECEIPT

The following samples were received on July 08, 2020 for the analyses specified on the enclosed Chain of Custody Record.

To achieve CAM compliance for MCP data, ESS Laboratory has reviewed all QA/QC Requirements and Performance Standards listed in each method. Holding times and preservation have also been reviewed. All CAM requirements have been performed and achieved unless noted in the project narrative.

Each method has been set-up in the laboratory to reach required MCP standards. The methods for aqueous VOA and Soil Methanol VOA have known limitations for certain analytes. The regulatory standards may not be achieved due to these limitations. In addition, for all methods, matrix interferences, dilutions, and %Solids may elevate method reporting limits above regulatory standards. ESS Laboratory can provide, upon request, a Limit Checker (regulatory standard comparison spreadsheet) electronic deliverable which will highlight these exceedances.

Question I: All samples for SVOA were analyzed for a subset of the required MCP list per the client's request.

Lab Number	Sample Name	Matrix	Analysis
20G0197-01	1804576-SW605	Surface Water	8270D SIM PAH, EPH8270, MADEP-EPH
20G0197-02	1804576-SW604	Surface Water	8270D SIM PAH, EPH8270, MADEP-EPH
20G0197-03	1804576-SW603	Surface Water	8270D SIM PAH, EPH8270, MADEP-EPH
20G0197-04	1804576-SW602	Surface Water	8270D SIM PAH, EPH8270, MADEP-EPH
20G0197-05	1804576-SW601	Surface Water	8270D SIM PAH, EPH8270, MADEP-EPH

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 20G0197

PROJECT NARRATIVE

8270D(SIM) Polynuclear Aromatic Hydrocarbon

20G0197-05 **Surrogate recovery(ies) above upper control limit (S+).**
Nitrobenzene-d5 (161% @ 30-130%), p-Terphenyl-d14 (156% @ 30-130%)

D0G0142-TUN1 **Benzidine tailing factor >2.**

D0G0142-TUN1 **Pentachlorophenol tailing factor > 2.**

MADEP-EPH Extractable Petroleum Hydrocarbons

20G0197-02 **Surrogate recovery(ies) outside of criteria. Insufficient sample volume for re-extraction (SI).**
1-Chlorooctadecane (39% @ 40-140%)

20G0197-03 **Surrogate recovery(ies) outside of criteria. Insufficient sample volume for re-extraction (SI).**
1-Chlorooctadecane (38% @ 40-140%)

20G0197-04 **Surrogate recovery(ies) outside of criteria. Insufficient sample volume for re-extraction (SI).**
1-Chlorooctadecane (38% @ 40-140%)

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 20G0197

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH
MADEP 18-2.1 - VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 20G0197

MassDEP Analytical Protocol Certification Form

MADEP RTN: _____

This form provides certification for the following data set: **20G0197-01 through 20G0197-05**

Matrices: (x) Ground Water/Surface Water ( ) Soil/Sediment ( ) Drinking Water ( ) Air ( ) Other:_____

CAM Protocol (check all that apply below):

( ) 8260 VOC CAM II A	( ) 7470/7471 Hg CAM III B	( ) MassDEP VPH (GC/PID/FID) CAM IV A	( ) 8082 PCB CAM V A	( ) 9014 Total Cyanide/PAC CAM VI A	( ) 6860 Perchlorate CAM VIII B
(x) 8270 SVOC CAM II B	( ) 7010 Metals CAM III C	( ) MassDEP VPH (GC/MS) CAM IV C	( ) 8081 Pesticides CAM V B	( ) 7196 Hex Cr CAM VI B	( ) MassDEP APH CAM IX A
( ) 6010 Metals CAM III A	( ) 6020 Metals CAM III D	(x) MassDEP EPH CAM IV B	( ) 8151 Herbicides CAM V C	( ) Explosives CAM VIII A	( ) TO-15 VOC CAM IX B

Affirmative responses to questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	Yes (x) No ( )
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	Yes (x) No ( )
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	Yes (x) No ( )
D	Does the laboratory report comply with all the reporting requirements specified in the CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	Yes (x) No ( )
E	VPH, EPH, APH and TO-15 only: a. Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	Yes (x) No ( )
	b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	Yes ( ) No ( )
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	Yes (x) No ( )

Responses to Questions G, H and I below are required for "'Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocols(s)?	Yes (x) No ( )*
	***Data User Note:* Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.**	
H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	Yes ( ) No (X)*
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	Yes ( ) No (X)*

****All negative responses must be addressed in an attached laboratory narrative.***

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.

Signature: Laurel Stoddard Date: July 16, 2020

Printed Name: Laurel Stoddard Position: Laboratory Director

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SW605
Date Sampled: 07/07/20 09:25
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 0.25
Extraction Method: 3510C

ESS Laboratory Work Order: 20G0197
ESS Laboratory Sample ID: 20G0197-01
Sample Matrix: Surface Water
Units: ug/L
Analyst: VSC
Prepared: 7/9/20 13:45

8270D(SIM) Polynuclear Aromatic Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	ND (0.19)		8270D SIM PAH		1	07/10/20 0:50	D0G0142	DG00910
Acenaphthene	ND (0.19)		8270D SIM PAH		1	07/10/20 0:50	D0G0142	DG00910
Acenaphthylene	ND (0.19)		8270D SIM PAH		1	07/10/20 0:50	D0G0142	DG00910
Anthracene	ND (0.19)		8270D SIM PAH		1	07/10/20 0:50	D0G0142	DG00910
Benzo(a)anthracene	ND (0.05)		8270D SIM PAH		1	07/10/20 0:50	D0G0142	DG00910
Benzo(a)pyrene	ND (0.05)		8270D SIM PAH		1	07/10/20 0:50	D0G0142	DG00910
Benzo(b)fluoranthene	ND (0.05)		8270D SIM PAH		1	07/10/20 0:50	D0G0142	DG00910
Benzo(g,h,i)perylene	ND (0.19)		8270D SIM PAH		1	07/10/20 0:50	D0G0142	DG00910
Benzo(k)fluoranthene	ND (0.05)		8270D SIM PAH		1	07/10/20 0:50	D0G0142	DG00910
Chrysene	ND (0.05)		8270D SIM PAH		1	07/10/20 0:50	D0G0142	DG00910
Dibenzo(a,h)Anthracene	ND (0.05)		8270D SIM PAH		1	07/10/20 0:50	D0G0142	DG00910
Fluoranthene	ND (0.19)		8270D SIM PAH		1	07/10/20 0:50	D0G0142	DG00910
Fluorene	ND (0.19)		8270D SIM PAH		1	07/10/20 0:50	D0G0142	DG00910
Indeno(1,2,3-cd)Pyrene	ND (0.05)		8270D SIM PAH		1	07/10/20 0:50	D0G0142	DG00910
Naphthalene	ND (0.19)		8270D SIM PAH		1	07/10/20 0:50	D0G0142	DG00910
Phenanthrene	ND (0.19)		8270D SIM PAH		1	07/10/20 0:50	D0G0142	DG00910
Pyrene	ND (0.19)		8270D SIM PAH		1	07/10/20 0:50	D0G0142	DG00910

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*41 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*53 %*		*30-130*
Surrogate: Nitrobenzene-d5	*74 %*		*30-130*
Surrogate: p-Terphenyl-d14	*87 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SW605
Date Sampled: 07/07/20 09:25
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3510C

ESS Laboratory Work Order: 20G0197
ESS Laboratory Sample ID: 20G0197-01
Sample Matrix: Surface Water
Units: ug/L

Prepared: 7/9/20 13:25

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (93)		MADEP-EPH		1	MJV	07/15/20 13:36	D0G0217	DG00832
C19-C36 Aliphatics1	ND (93)		MADEP-EPH		1	MJV	07/15/20 13:36	D0G0217	DG00832
C11-C22 Unadjusted Aromatics1	ND (93.5)		EPH8270		1	VSC	07/10/20 8:06	D0G0139	DG00832
C11-C22 Aromatics1,2	ND (93.5)		EPH8270			VSC	07/10/20 8:06		[CALC]
Preservative:	**pH <= 2**		MADEP-EPH			IBM			DG00832

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*47 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*110 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*112 %*		*40-140*
Surrogate: O-Terphenyl	*90 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SW604
Date Sampled: 07/07/20 09:35
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 0.25
Extraction Method: 3510C

ESS Laboratory Work Order: 20G0197
ESS Laboratory Sample ID: 20G0197-02
Sample Matrix: Surface Water
Units: ug/L
Analyst: VSC
Prepared: 7/9/20 13:45

8270D(SIM) Polynuclear Aromatic Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	ND (0.19)		8270D SIM PAH		1	07/10/20 1:36	D0G0142	DG00910
Acenaphthene	ND (0.19)		8270D SIM PAH		1	07/10/20 1:36	D0G0142	DG00910
Acenaphthylene	ND (0.19)		8270D SIM PAH		1	07/10/20 1:36	D0G0142	DG00910
Anthracene	ND (0.19)		8270D SIM PAH		1	07/10/20 1:36	D0G0142	DG00910
Benzo(a)anthracene	ND (0.05)		8270D SIM PAH		1	07/10/20 1:36	D0G0142	DG00910
Benzo(a)pyrene	ND (0.05)		8270D SIM PAH		1	07/10/20 1:36	D0G0142	DG00910
Benzo(b)fluoranthene	ND (0.05)		8270D SIM PAH		1	07/10/20 1:36	D0G0142	DG00910
Benzo(g,h,i)perylene	ND (0.19)		8270D SIM PAH		1	07/10/20 1:36	D0G0142	DG00910
Benzo(k)fluoranthene	ND (0.05)		8270D SIM PAH		1	07/10/20 1:36	D0G0142	DG00910
Chrysene	ND (0.05)		8270D SIM PAH		1	07/10/20 1:36	D0G0142	DG00910
Dibenzo(a,h)Anthracene	ND (0.05)		8270D SIM PAH		1	07/10/20 1:36	D0G0142	DG00910
Fluoranthene	ND (0.19)		8270D SIM PAH		1	07/10/20 1:36	D0G0142	DG00910
Fluorene	ND (0.19)		8270D SIM PAH		1	07/10/20 1:36	D0G0142	DG00910
Indeno(1,2,3-cd)Pyrene	ND (0.05)		8270D SIM PAH		1	07/10/20 1:36	D0G0142	DG00910
Naphthalene	ND (0.19)		8270D SIM PAH		1	07/10/20 1:36	D0G0142	DG00910
Phenanthrene	ND (0.19)		8270D SIM PAH		1	07/10/20 1:36	D0G0142	DG00910
Pyrene	ND (0.19)		8270D SIM PAH		1	07/10/20 1:36	D0G0142	DG00910

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*32 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*47 %*		*30-130*
Surrogate: Nitrobenzene-d5	*69 %*		*30-130*
Surrogate: p-Terphenyl-d14	*76 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SW604
Date Sampled: 07/07/20 09:35
Percent Solids: N/A
Initial Volume: 1050
Final Volume: 1
Extraction Method: 3510C

ESS Laboratory Work Order: 20G0197
ESS Laboratory Sample ID: 20G0197-02
Sample Matrix: Surface Water
Units: ug/L

Prepared: 7/9/20 13:25

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (95)		MADEP-EPH		1	MJV	07/15/20 14:25	D0G0217	DG00832
C19-C36 Aliphatics1	ND (95)		MADEP-EPH		1	MJV	07/15/20 14:25	D0G0217	DG00832
C11-C22 Unadjusted Aromatics1	ND (95.2)		EPH8270		1	VSC	07/10/20 8:43	D0G0139	DG00832
C11-C22 Aromatics1,2	ND (95.2)		EPH8270			VSC	07/10/20 8:43		[CALC]
Preservative:	**pH <= 2**		MADEP-EPH			IBM			DG00832

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*39 %*	*SI*	*40-140*
Surrogate: 2-Bromonaphthalene	*107 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*106 %*		*40-140*
Surrogate: O-Terphenyl	*91 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SW603
Date Sampled: 07/07/20 09:45
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 0.25
Extraction Method: 3510C

ESS Laboratory Work Order: 20G0197
ESS Laboratory Sample ID: 20G0197-03
Sample Matrix: Surface Water
Units: ug/L
Analyst: VSC
Prepared: 7/9/20 13:45

8270D(SIM) Polynuclear Aromatic Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	ND (0.19)		8270D SIM PAH		1	07/10/20 2:23	D0G0142	DG00910
Acenaphthene	ND (0.19)		8270D SIM PAH		1	07/10/20 2:23	D0G0142	DG00910
Acenaphthylene	ND (0.19)		8270D SIM PAH		1	07/10/20 2:23	D0G0142	DG00910
Anthracene	ND (0.19)		8270D SIM PAH		1	07/10/20 2:23	D0G0142	DG00910
Benzo(a)anthracene	ND (0.05)		8270D SIM PAH		1	07/10/20 2:23	D0G0142	DG00910
Benzo(a)pyrene	ND (0.05)		8270D SIM PAH		1	07/10/20 2:23	D0G0142	DG00910
Benzo(b)fluoranthene	ND (0.05)		8270D SIM PAH		1	07/10/20 2:23	D0G0142	DG00910
Benzo(g,h,i)perylene	ND (0.19)		8270D SIM PAH		1	07/10/20 2:23	D0G0142	DG00910
Benzo(k)fluoranthene	ND (0.05)		8270D SIM PAH		1	07/10/20 2:23	D0G0142	DG00910
Chrysene	ND (0.05)		8270D SIM PAH		1	07/10/20 2:23	D0G0142	DG00910
Dibenzo(a,h)Anthracene	ND (0.05)		8270D SIM PAH		1	07/10/20 2:23	D0G0142	DG00910
Fluoranthene	ND (0.19)		8270D SIM PAH		1	07/10/20 2:23	D0G0142	DG00910
Fluorene	ND (0.19)		8270D SIM PAH		1	07/10/20 2:23	D0G0142	DG00910
Indeno(1,2,3-cd)Pyrene	ND (0.05)		8270D SIM PAH		1	07/10/20 2:23	D0G0142	DG00910
Naphthalene	ND (0.19)		8270D SIM PAH		1	07/10/20 2:23	D0G0142	DG00910
Phenanthrene	ND (0.19)		8270D SIM PAH		1	07/10/20 2:23	D0G0142	DG00910
Pyrene	ND (0.19)		8270D SIM PAH		1	07/10/20 2:23	D0G0142	DG00910

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*40 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*60 %*		*30-130*
Surrogate: Nitrobenzene-d5	*88 %*		*30-130*
Surrogate: p-Terphenyl-d14	*84 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SW603
Date Sampled: 07/07/20 09:45
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3510C

ESS Laboratory Work Order: 20G0197
ESS Laboratory Sample ID: 20G0197-03
Sample Matrix: Surface Water
Units: ug/L

Prepared: 7/9/20 13:25

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (93)		MADEP-EPH		1	MJV	07/15/20 15:13	D0G0217	DG00832
C19-C36 Aliphatics1	ND (93)		MADEP-EPH		1	MJV	07/15/20 15:13	D0G0217	DG00832
C11-C22 Unadjusted Aromatics1	ND (93.5)		EPH8270		1	VSC	07/10/20 9:20	D0G0139	DG00832
C11-C22 Aromatics1,2	ND (93.5)		EPH8270			VSC	07/10/20 9:20		[CALC]
Preservative:	**pH <= 2**		MADEP-EPH			IBM			DG00832

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*38 %*	*SI*	*40-140*
Surrogate: 2-Bromonaphthalene	*108 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*105 %*		*40-140*
Surrogate: O-Terphenyl	*94 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SW602
Date Sampled: 07/07/20 09:55
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 0.25
Extraction Method: 3510C

ESS Laboratory Work Order: 20G0197
ESS Laboratory Sample ID: 20G0197-04
Sample Matrix: Surface Water
Units: ug/L
Analyst: VSC
Prepared: 7/9/20 13:45

8270D(SIM) Polynuclear Aromatic Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	ND (0.19)		8270D SIM PAH		1	07/10/20 3:10	D0G0142	DG00910
Acenaphthene	ND (0.19)		8270D SIM PAH		1	07/10/20 3:10	D0G0142	DG00910
Acenaphthylene	ND (0.19)		8270D SIM PAH		1	07/10/20 3:10	D0G0142	DG00910
Anthracene	ND (0.19)		8270D SIM PAH		1	07/10/20 3:10	D0G0142	DG00910
Benzo(a)anthracene	ND (0.05)		8270D SIM PAH		1	07/10/20 3:10	D0G0142	DG00910
Benzo(a)pyrene	ND (0.05)		8270D SIM PAH		1	07/10/20 3:10	D0G0142	DG00910
Benzo(b)fluoranthene	ND (0.05)		8270D SIM PAH		1	07/10/20 3:10	D0G0142	DG00910
Benzo(g,h,i)perylene	ND (0.19)		8270D SIM PAH		1	07/10/20 3:10	D0G0142	DG00910
Benzo(k)fluoranthene	ND (0.05)		8270D SIM PAH		1	07/10/20 3:10	D0G0142	DG00910
Chrysene	ND (0.05)		8270D SIM PAH		1	07/10/20 3:10	D0G0142	DG00910
Dibenzo(a,h)Anthracene	ND (0.05)		8270D SIM PAH		1	07/10/20 3:10	D0G0142	DG00910
Fluoranthene	ND (0.19)		8270D SIM PAH		1	07/10/20 3:10	D0G0142	DG00910
Fluorene	ND (0.19)		8270D SIM PAH		1	07/10/20 3:10	D0G0142	DG00910
Indeno(1,2,3-cd)Pyrene	ND (0.05)		8270D SIM PAH		1	07/10/20 3:10	D0G0142	DG00910
Naphthalene	ND (0.19)		8270D SIM PAH		1	07/10/20 3:10	D0G0142	DG00910
Phenanthrene	ND (0.19)		8270D SIM PAH		1	07/10/20 3:10	D0G0142	DG00910
Pyrene	ND (0.19)		8270D SIM PAH		1	07/10/20 3:10	D0G0142	DG00910

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*37 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*55 %*		*30-130*
Surrogate: Nitrobenzene-d5	*80 %*		*30-130*
Surrogate: p-Terphenyl-d14	*81 %*		*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SW602
Date Sampled: 07/07/20 09:55
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3510C

ESS Laboratory Work Order: 20G0197
ESS Laboratory Sample ID: 20G0197-04
Sample Matrix: Surface Water
Units: ug/L

Prepared: 7/9/20 13:25

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (93)		MADEP-EPH		1	MJV	07/15/20 16:02	D0G0217	DG00832
C19-C36 Aliphatics1	ND (93)		MADEP-EPH		1	MJV	07/15/20 16:02	D0G0217	DG00832
C11-C22 Unadjusted Aromatics1	ND (93.5)		EPH8270		1	VSC	07/10/20 9:57	D0G0139	DG00832
C11-C22 Aromatics1,2	ND (93.5)		EPH8270			VSC	07/10/20 9:57		[CALC]
Preservative:	**pH <= 2**		MADEP-EPH			IBM			DG00832

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*38 %*	*SI*	*40-140*
Surrogate: 2-Bromonaphthalene	*116 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*113 %*		*40-140*
Surrogate: O-Terphenyl	*93 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SW601
Date Sampled: 07/07/20 10:05
Percent Solids: N/A
Initial Volume: 1050
Final Volume: 0.25
Extraction Method: 3510C

ESS Laboratory Work Order: 20G0197
ESS Laboratory Sample ID: 20G0197-05
Sample Matrix: Surface Water
Units: ug/L
Analyst: VSC
Prepared: 7/9/20 13:45

8270D(SIM) Polynuclear Aromatic Hydrocarbon

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyzed	Sequence	Batch
2-Methylnaphthalene	ND (0.19)		8270D SIM PAH		1	07/10/20 3:57	D0G0142	DG00910
Acenaphthene	ND (0.19)		8270D SIM PAH		1	07/10/20 3:57	D0G0142	DG00910
Acenaphthylene	ND (0.19)		8270D SIM PAH		1	07/10/20 3:57	D0G0142	DG00910
Anthracene	ND (0.19)		8270D SIM PAH		1	07/10/20 3:57	D0G0142	DG00910
Benzo(a)anthracene	ND (0.05)		8270D SIM PAH		1	07/10/20 3:57	D0G0142	DG00910
Benzo(a)pyrene	ND (0.05)		8270D SIM PAH		1	07/10/20 3:57	D0G0142	DG00910
Benzo(b)fluoranthene	ND (0.05)		8270D SIM PAH		1	07/10/20 3:57	D0G0142	DG00910
Benzo(g,h,i)perylene	ND (0.19)		8270D SIM PAH		1	07/10/20 3:57	D0G0142	DG00910
Benzo(k)fluoranthene	ND (0.05)		8270D SIM PAH		1	07/10/20 3:57	D0G0142	DG00910
Chrysene	ND (0.05)		8270D SIM PAH		1	07/10/20 3:57	D0G0142	DG00910
Dibenzo(a,h)Anthracene	ND (0.05)		8270D SIM PAH		1	07/10/20 3:57	D0G0142	DG00910
Fluoranthene	ND (0.19)		8270D SIM PAH		1	07/10/20 3:57	D0G0142	DG00910
Fluorene	ND (0.19)		8270D SIM PAH		1	07/10/20 3:57	D0G0142	DG00910
Indeno(1,2,3-cd)Pyrene	ND (0.05)		8270D SIM PAH		1	07/10/20 3:57	D0G0142	DG00910
Naphthalene	ND (0.19)		8270D SIM PAH		1	07/10/20 3:57	D0G0142	DG00910
Phenanthrene	ND (0.19)		8270D SIM PAH		1	07/10/20 3:57	D0G0142	DG00910
Pyrene	ND (0.19)		8270D SIM PAH		1	07/10/20 3:57	D0G0142	DG00910

	%Recovery	Qualifier	Limits
Surrogate: 1,2-Dichlorobenzene-d4	*83 %*		*30-130*
Surrogate: 2-Fluorobiphenyl	*111 %*		*30-130*
Surrogate: Nitrobenzene-d5	*161 %*	*S+*	*30-130*
Surrogate: p-Terphenyl-d14	*156 %*	*S+*	*30-130*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP
Client Sample ID: 1804576-SW601
Date Sampled: 07/07/20 10:05
Percent Solids: N/A
Initial Volume: 1070
Final Volume: 1
Extraction Method: 3510C

ESS Laboratory Work Order: 20G0197
ESS Laboratory Sample ID: 20G0197-05
Sample Matrix: Surface Water
Units: ug/L

Prepared: 7/9/20 13:25

MADEP-EPH Extractable Petroleum Hydrocarbons

Analyte	Results (MRL)	MDL	Method	Limit	DF	Analyst	Analyzed	Sequence	Batch
C9-C18 Aliphatics1	ND (93)		MADEP-EPH		1	MJV	07/15/20 16:50	D0G0217	DG00832
C19-C36 Aliphatics1	ND (93)		MADEP-EPH		1	MJV	07/15/20 16:50	D0G0217	DG00832
C11-C22 Unadjusted Aromatics1	ND (93.5)		EPH8270		1	VSC	07/10/20 10:34	D0G0139	DG00832
C11-C22 Aromatics1,2	ND (93.5)		EPH8270			VSC	07/10/20 10:34		[CALC]
Preservative:	**pH <= 2**		MADEP-EPH			IBM			DG00832

	%Recovery	Qualifier	Limits
Surrogate: 1-Chlorooctadecane	*42 %*		*40-140*
Surrogate: 2-Bromonaphthalene	*108 %*		*40-140*
Surrogate: 2-Fluorobiphenyl	*108 %*		*40-140*
Surrogate: O-Terphenyl	*100 %*		*40-140*

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 20G0197

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D(SIM) Polynuclear Aromatic Hydrocarbon										
Batch DG00910 - 3510C										
Blank										
2-Methylnaphthalene	ND	0.20	ug/L							
Acenaphthene	ND	0.20	ug/L							
Acenaphthylene	ND	0.20	ug/L							
Anthracene	ND	0.20	ug/L							
Benzo(a)anthracene	ND	0.05	ug/L							
Benzo(a)pyrene	ND	0.05	ug/L							
Benzo(b)fluoranthene	ND	0.05	ug/L							
Benzo(g,h,i)perylene	ND	0.20	ug/L							
Benzo(k)fluoranthene	ND	0.05	ug/L							
Chrysene	ND	0.05	ug/L							
Dibenzo(a,h)Anthracene	ND	0.05	ug/L							
Fluoranthene	ND	0.20	ug/L							
Fluorene	ND	0.20	ug/L							
Indeno(1,2,3-cd)Pyrene	ND	0.05	ug/L							
Naphthalene	ND	0.20	ug/L							
Phenanthrene	ND	0.20	ug/L							
Pyrene	ND	0.20	ug/L							
Surrogate: 1,2-Dichlorobenzene-d4	*1.17*		ug/L	*2.500*		*47*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*1.48*		ug/L	*2.500*		*59*	*30-130*			
Surrogate: Nitrobenzene-d5	*1.94*		ug/L	*2.500*		*77*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.07*		ug/L	*2.500*		*83*	*30-130*			
LCS										
2-Methylnaphthalene	2.75	0.20	ug/L	4.000		69	40-140			
Acenaphthene	3.12	0.20	ug/L	4.000		78	40-140			
Acenaphthylene	3.33	0.20	ug/L	4.000		83	40-140			
Anthracene	3.35	0.20	ug/L	4.000		84	40-140			
Benzo(a)anthracene	3.19	0.05	ug/L	4.000		80	40-140			
Benzo(a)pyrene	3.43	0.05	ug/L	4.000		86	40-140			
Benzo(b)fluoranthene	3.31	0.05	ug/L	4.000		83	40-140			
Benzo(g,h,i)perylene	2.96	0.20	ug/L	4.000		74	40-140			
Benzo(k)fluoranthene	3.34	0.05	ug/L	4.000		84	40-140			
Chrysene	3.42	0.05	ug/L	4.000		86	40-140			
Dibenzo(a,h)Anthracene	2.99	0.05	ug/L	4.000		75	40-140			
Fluoranthene	3.65	0.20	ug/L	4.000		91	40-140			
Fluorene	3.31	0.20	ug/L	4.000		83	40-140			
Indeno(1,2,3-cd)Pyrene	2.92	0.05	ug/L	4.000		73	40-140			
Naphthalene	2.62	0.20	ug/L	4.000		66	40-140			
Phenanthrene	3.32	0.20	ug/L	4.000		83	40-140			
Pyrene	4.12	0.20	ug/L	4.000		103	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	*1.13*		ug/L	*2.500*		*45*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*1.75*		ug/L	*2.500*		*70*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.23*		ug/L	*2.500*		*89*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.09*		ug/L	*2.500*		*84*	*30-130*			
LCS Dup										

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 20G0197

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
8270D(SIM) Polynuclear Aromatic Hydrocarbon										
Batch DG00910 - 3510C										
2-Methylnaphthalene	2.71	0.20	ug/L	4.000		68	40-140	1	20	
Acenaphthene	3.01	0.20	ug/L	4.000		75	40-140	4	20	
Acenaphthylene	3.18	0.20	ug/L	4.000		79	40-140	5	20	
Anthracene	3.25	0.20	ug/L	4.000		81	40-140	3	20	
Benzo(a)anthracene	3.09	0.05	ug/L	4.000		77	40-140	3	20	
Benzo(a)pyrene	3.39	0.05	ug/L	4.000		85	40-140	1	20	
Benzo(b)fluoranthene	3.30	0.05	ug/L	4.000		83	40-140	0.2	20	
Benzo(g,h,i)perylene	3.08	0.20	ug/L	4.000		77	40-140	4	20	
Benzo(k)fluoranthene	3.26	0.05	ug/L	4.000		82	40-140	2	20	
Chrysene	3.26	0.05	ug/L	4.000		82	40-140	5	20	
Dibenzo(a,h)Anthracene	3.06	0.05	ug/L	4.000		76	40-140	2	20	
Fluoranthene	3.51	0.20	ug/L	4.000		88	40-140	4	20	
Fluorene	3.19	0.20	ug/L	4.000		80	40-140	4	20	
Indeno(1,2,3-cd)Pyrene	3.09	0.05	ug/L	4.000		77	40-140	6	20	
Naphthalene	2.61	0.20	ug/L	4.000		65	40-140	0.7	20	
Phenanthrene	3.22	0.20	ug/L	4.000		81	40-140	3	20	
Pyrene	3.88	0.20	ug/L	4.000		97	40-140	6	20	
Surrogate: 1,2-Dichlorobenzene-d4	*1.15*		ug/L	*2.500*		*46*	*30-130*			
Surrogate: 2-Fluorobiphenyl	*1.63*		ug/L	*2.500*		*65*	*30-130*			
Surrogate: Nitrobenzene-d5	*2.14*		ug/L	*2.500*		*86*	*30-130*			
Surrogate: p-Terphenyl-d14	*2.03*		ug/L	*2.500*		*81*	*30-130*			
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch DG00832 - 3510C										
Blank										
C19-C36 Aliphatics1	ND	100	ug/L							
C9-C18 Aliphatics1	ND	100	ug/L							
Decane (C10)	ND	5	ug/L							
Docosane (C22)	ND	5	ug/L							
Dodecane (C12)	ND	5	ug/L							
Eicosane (C20)	ND	5	ug/L							
Hexacosane (C26)	ND	5	ug/L							
Hexadecane (C16)	ND	5	ug/L							
Hexatriacontane (C36)	ND	5	ug/L							
Nonadecane (C19)	ND	5	ug/L							
Nonane (C9)	ND	5	ug/L							
Octacosane (C28)	ND	5	ug/L							
Octadecane (C18)	ND	5	ug/L							
Tetracosane (C24)	ND	5	ug/L							
Tetradecane (C14)	ND	5	ug/L							
Triacontane (C30)	ND	5	ug/L							
Surrogate: 1-Chlorooctadecane	*25.5*		ug/L	*50.00*		*51*	*40-140*			
Blank										
2-Methylnaphthalene	ND	5.0	ug/L							

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 20G0197

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch DG00832 - 3510C										
Acenaphthene	ND	5.0	ug/L							
Acenaphthylene	ND	5.0	ug/L							
Anthracene	ND	5.0	ug/L							
Benzo(a)anthracene	ND	5.0	ug/L							
Benzo(a)pyrene	ND	10.0	ug/L							
Benzo(b)fluoranthene	ND	5.0	ug/L							
Benzo(g,h,i)perylene	ND	10.0	ug/L							
Benzo(k)fluoranthene	ND	10.0	ug/L							
C11-C22 Unadjusted Aromatics1	ND	100	ug/L							
Chrysene	ND	10.0	ug/L							
Dibenzo(a,h)Anthracene	ND	5.0	ug/L							
Fluoranthene	ND	10.0	ug/L							
Fluorene	ND	5.0	ug/L							
Indeno(1,2,3-cd)Pyrene	ND	5.0	ug/L							
Naphthalene	ND	10.0	ug/L							
Phenanthrene	ND	5.0	ug/L							
Pyrene	ND	5.0	ug/L							
Surrogate: 2-Bromonaphthalene	*55.1*		mg/L	*50.00*		*110*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*51.5*		mg/L	*50.00*		*103*	*40-140*			
Surrogate: O-Terphenyl	*47.4*		ug/L	*50.00*		*95*	*40-140*			
LCS										
C19-C36 Aliphatics1	354	100	ug/L	400.0		89	40-140			
C9-C18 Aliphatics1	203	100	ug/L	300.0		68	40-140			
Decane (C10)	25	5	ug/L	50.00		50	40-140			
Docosane (C22)	41	5	ug/L	50.00		81	40-140			
Dodecane (C12)	30	5	ug/L	50.00		59	40-140			
Eicosane (C20)	41	5	ug/L	50.00		81	40-140			
Hexacosane (C26)	40	5	ug/L	50.00		81	40-140			
Hexadecane (C16)	39	5	ug/L	50.00		78	40-140			
Hexatriacontane (C36)	45	5	ug/L	50.00		89	40-140			
Nonadecane (C19)	40	5	ug/L	50.00		80	40-140			
Nonane (C9)	19	5	ug/L	50.00		39	30-140			
Octacosane (C28)	42	5	ug/L	50.00		83	40-140			
Octadecane (C18)	40	5	ug/L	50.00		79	40-140			
Tetracosane (C24)	41	5	ug/L	50.00		82	40-140			
Tetradecane (C14)	35	5	ug/L	50.00		70	40-140			
Triacontane (C30)	41	5	ug/L	50.00		82	40-140			
Surrogate: 1-Chlorooctadecane	*30.4*		ug/L	*50.00*		*61*	*40-140*			
LCS										
2-Methylnaphthalene	43.4	5.0	ug/L	50.00		87	40-140			
Acenaphthene	47.4	5.0	ug/L	50.00		95	40-140			
Acenaphthylene	46.2	5.0	ug/L	50.00		92	40-140			
Anthracene	56.0	5.0	ug/L	50.00		112	40-140			
Benzo(a)anthracene	54.4	5.0	ug/L	50.00		109	40-140			

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 20G0197

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch DG00832 - 3510C										
Benzo(a)pyrene	55.1	10.0	ug/L	50.00		110	40-140			
Benzo(b)fluoranthene	52.7	5.0	ug/L	50.00		105	40-140			
Benzo(g,h,i)perylene	52.3	10.0	ug/L	50.00		105	40-140			
Benzo(k)fluoranthene	66.5	10.0	ug/L	50.00		133	40-140			
C11-C22 Unadjusted Aromatics1	847	100	ug/L	850.0		100	40-140			
Chrysene	62.6	10.0	ug/L	50.00		125	40-140			
Dibenzo(a,h)Anthracene	51.7	5.0	ug/L	50.00		103	40-140			
Fluoranthene	62.7	10.0	ug/L	50.00		125	40-140			
Fluorene	52.6	5.0	ug/L	50.00		105	40-140			
Indeno(1,2,3-cd)Pyrene	55.5	5.0	ug/L	50.00		111	40-140			
Naphthalene	36.7	10.0	ug/L	50.00		73	40-140			
Phenanthrene	57.2	5.0	ug/L	50.00		114	40-140			
Pyrene	61.2	5.0	ug/L	50.00		122	40-140			
Surrogate: 2-Bromonaphthalene	*53.0*		mg/L	*50.00*		*106*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*52.0*		mg/L	*50.00*		*104*	*40-140*			
Surrogate: O-Terphenyl	*49.1*		ug/L	*50.00*		*98*	*40-140*			
LCS										
2-Methylnaphthalene Breakthrough	0.0		%				0-5			
Naphthalene Breakthrough	0.0		%				0-5			
LCS Dup										
C19-C36 Aliphatics1	360	100	ug/L	400.0		90	40-140	2	25	
C9-C18 Aliphatics1	197	100	ug/L	300.0		66	40-140	3	25	
Decane (C10)	25	5	ug/L	50.00		49	40-140	2	25	
Docosane (C22)	41	5	ug/L	50.00		81	40-140	0.2	25	
Dodecane (C12)	29	5	ug/L	50.00		58	40-140	3	25	
Eicosane (C20)	40	5	ug/L	50.00		80	40-140	1	25	
Hexacosane (C26)	41	5	ug/L	50.00		82	40-140	1	25	
Hexadecane (C16)	38	5	ug/L	50.00		76	40-140	3	25	
Hexatriacontane (C36)	48	5	ug/L	50.00		95	40-140	6	25	
Nonadecane (C19)	39	5	ug/L	50.00		79	40-140	2	25	
Nonane (C9)	19	5	ug/L	50.00		38	30-140	3	25	
Octacosane (C28)	42	5	ug/L	50.00		85	40-140	2	25	
Octadecane (C18)	39	5	ug/L	50.00		78	40-140	2	25	
Tetracosane (C24)	41	5	ug/L	50.00		82	40-140	0.4	25	
Tetradecane (C14)	34	5	ug/L	50.00		67	40-140	3	25	
Triacontane (C30)	42	5	ug/L	50.00		84	40-140	3	25	
Surrogate: 1-Chlorooctadecane	*29.5*		ug/L	*50.00*		*59*	*40-140*			
LCS Dup										
2-Methylnaphthalene	43.4	5.0	ug/L	50.00		87	40-140	0.1	20	
Acenaphthene	48.3	5.0	ug/L	50.00		97	40-140	2	20	
Acenaphthylene	48.2	5.0	ug/L	50.00		96	40-140	4	20	
Anthracene	56.6	5.0	ug/L	50.00		113	40-140	0.9	20	
Benzo(a)anthracene	53.0	5.0	ug/L	50.00		106	40-140	3	20	
Benzo(a)pyrene	55.0	10.0	ug/L	50.00		110	40-140	0.2	20	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 20G0197

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
MADEP-EPH Extractable Petroleum Hydrocarbons										
Batch DG00832 - 3510C										
Benzo(b)fluoranthene	54.0	5.0	ug/L	50.00		108	40-140	2	20	
Benzo(g,h,i)perylene	49.7	10.0	ug/L	50.00		99	40-140	5	20	
Benzo(k)fluoranthene	68.7	10.0	ug/L	50.00		137	40-140	3	20	
C11-C22 Unadjusted Aromatics1	863	100	ug/L	850.0		102	40-140	2	25	
Chrysene	62.3	10.0	ug/L	50.00		125	40-140	0.5	20	
Dibenzo(a,h)Anthracene	50.3	5.0	ug/L	50.00		101	40-140	3	20	
Fluoranthene	61.9	10.0	ug/L	50.00		124	40-140	1	20	
Fluorene	52.7	5.0	ug/L	50.00		105	40-140	0.2	20	
Indeno(1,2,3-cd)Pyrene	53.3	5.0	ug/L	50.00		107	40-140	4	20	
Naphthalene	37.9	10.0	ug/L	50.00		76	40-140	3	20	
Phenanthrene	58.4	5.0	ug/L	50.00		117	40-140	2	20	
Pyrene	59.1	5.0	ug/L	50.00		118	40-140	3	20	
Surrogate: 2-Bromonaphthalene	*55.1*		mg/L	*50.00*		*110*	*40-140*			
Surrogate: 2-Fluorobiphenyl	*56.0*		mg/L	*50.00*		*112*	*40-140*			
Surrogate: O-Terphenyl	*48.7*		ug/L	*50.00*		*97*	*40-140*			
LCS Dup										
2-Methylnaphthalene Breakthrough	0.0		%				0-5		200	
Naphthalene Breakthrough	0.0		%				0-5		200	

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP ESS Laboratory Work Order: 20G0197

Notes and Definitions

Z-06	pH <= 2
U	Analyte included in the analysis, but not detected
SI	Surrogate recovery(ies) outside of criteria. Insufficient sample volume for re-extraction (SI).
S+	Surrogate recovery(ies) above upper control limit (S+).
PT	Pentachlorophenol tailing factor > 2.
BT	Benzidine tailing factor >2.
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probably Number
TNTC	Too numerous to Count
CFU	Colony Forming Units

CERTIFICATE OF ANALYSIS

Client Name: GEI Consultants, Inc.
Client Project ID: Amesbury Former MGP

ESS Laboratory Work Order: 20G0197

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

Massachusetts Potable and Non Potable Water: M-RI002
http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

Shipped/Delivered Via: ESS Courier

ESS Project ID: 20G0197
Date Received: 7/8/2020
Project Due Date: 7/15/2020
Days for Project: 5 Day

1. Air bill manifest present? No
   Air No.: NA
2. Were custody seals present? No
3. Is radiation count <100 CPM? Yes
4. Is a Cooler Present? Yes
   Temp: 1.9 Iced with: Ice
5. Was COC signed and dated by client? Yes
6. Does COC match bottles? Yes
7. Is COC complete and correct? Yes
8. Were samples received intact? Yes
9. **Were labs informed about short holds & rushes?** Yes / No / (NA)
10. Were any analyses received outside of hold time? Yes / (No)

11. Any Subcontracting needed? Yes / (No)
    ESS Sample IDs:
    Analysis:
    TAT:
12. Were VOAs received? Yes / (No)
    a. Air bubbles in aqueous VOAs? Yes / No
    b. Does methanol cover soil completely? Yes / No / NA

13. Are the samples properly preserved? Yes / No
    a. If metals preserved upon receipt: Date: Time: By:
    b. Low Level VOA vials frozen: Date: Time: By:

Sample Receiving Notes:

did not receive NP amber for PAH analysis

14. Was there a need to contact Project Manager? (Yes) / No
    a. Was there a need to contact the client? Yes / No
    Who was contacted: Date: Time: By:

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
1	62430	Yes	N/A	Yes	1L Amber	HCl	
1	62436	Yes	N/A	Yes	1L Amber	HCl	
2	62431	Yes	N/A	Yes	1L Amber	HCl	
2	62437	Yes	N/A	Yes	1L Amber	HCl	
3	62432	Yes	N/A	Yes	1L Amber	HCl	
3	62438	Yes	N/A	Yes	1L Amber	HCl	
4	62433	Yes	N/A	Yes	1L Amber	HCl	
4	62439	Yes	N/A	Yes	1L Amber	HCl	
5	62434	Yes	N/A	Yes	1L Amber	HCl	
5	62440	Yes	N/A	Yes	1L Amber	HCl	

2nd Review
Were all containers scanned into storage/lab? Initials: Yes / No
Are barcode labels on correct containers? Yes / No / NA
Are all Flashpoint stickers attached/container ID # circled? Yes / No / NA
Are all Hex Chrome stickers attached? Yes / No / NA
Are all QC stickers attached? Yes / No / NA
Are VOA stickers attached if bubbles noted? Yes / No / NA

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GEI Consultants, Inc. - TB

ESS Project ID: 20G0197

Date Received: 7/8/2020

Completed By: [signature] Date & Time: 7/8/20 1628

Reviewed By: Date & Time: 7/8/20 1644

Delivered By: 7/8/20 1644

Chain-of-Custody Record

Laboratory: _____ Laboratory Job #: _____

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP
Project Number: 1804576
Project Location: Amesbury, MA
Project Manager: Ryan Hoffman

Send Report to: Rhoffman@geiconsultants.com
Send EDD to: labdata@geiconsultants.com, Efarrington@geiconsultants.com

MCP PRESUMPTIVE CERTAINTY REQUIRED: YES / NO

If Yes, Are MCP Analytical Methods Required?	**YES**	NO	NA
Are Drinking Water Samples Submitted?	YES	**NO**	NA
If Yes, Have Drinking Water Sampling Requirements Been Met?	YES	NO	**NA**

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	Preservative	Preservative	Analysis: PAH17 8270D SIM	Analysis: EPH fractions only							Sample Specific Remarks
							HCl	HCl									
1	1804576-SW605	7/7/2020	9:25	Aqueous	2	BFM			X	X							
2	1804576-SW604	7/7/2020	9:35	Aqueous	2	BFM			X	X							
3	1804576-SW603	7/7/2020	9:45	Aqueous	2	BFM			X	X							
4	1804576-SW602	7/7/2020	9:55	Aqueous	2	BFM			X	X							
5	1804576-SW601	7/7/2020	10:05	Aqueous	2	BFM			X	X							

Sample Handling

Samples Field Filtered: YES / NO / NA

Sampled Shipped With Ice: YES / NO

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes wherever possible.

	Date	Time	
Relinquished by sampler: (signature) 1.	7/7/20	2145	Received by: (signature) 1. GEI Sample Fridge
Relinquished by: (signature) 2. GEI Sample Fridge	7/8/20	1110	Received by: (signature) 2. Chad Foglia
Relinquished by: (signature) 3. Chad Foglia	7/8/20	1115	Received by: (signature) 3.
Relinquished by: (signature) 4.	7/8/20	15:32	Received by: (signature) 4.

Turnaround Time (Business days):

Normal __X__ Other ____
10-Day ____ 7-Day ____
5-Day __X__ 3-Day ____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

Appendix L Porewater Bioavailability and Mobility Evaluation

Porewater Bioavailability and Mobility Evaluation

Introduction and Methods

GEI Consultants, Inc. (GEI) prepared this Technical Memorandum to summarize the results of an evaluation of freely dissolved polycyclic aromatic hydrocarbons (PAHs) in sediment from the Powwow River associated with the former Amesbury Manufactured Gas Plant (MGP) located on Water Street in Amesbury, Massachusetts. The purpose of the investigation was to evaluate the potential for migration to the surface of PAHs present in impacted subsurface sediment in the river. This evaluation is a line of evidence in the evaluation of the 1) continued isolation of deeper, impacted sediment; and 2) extent of potential migration of PAHs. This Technical Memorandum should be considered in conjunction with results of the non-aqueous phase liquid (NAPL) migration study in the Powwow River.

The approach to the evaluation is based on measuring the freely dissolved PAHs in paired subsurface and surface sediment samples. Freely dissolved PAHs are the fraction of all PAHs present as dissolved PAHs in interstitial water (i.e., porewater). Freely dissolved PAHs represent those PAHs which are 1) potentially bioavailable to benthic organisms; and 2) available to migrate vertically in the presence of an upward vertical hydraulic gradient. This represents a potential migration pathway even in the absence of any physical disturbance causing remobilization of sediment.

Freely dissolved PAHs can be measured using Solid Phase Micro Extraction (SPME) [ASTM (2013), USEPA (2017)] using passive SP3TM samplers (SiREM Labs, Guelph, Ontario, Canada). This method has been demonstrated to be an effective way to measure freely dissolved organics, including PAHs (Burgess et al. 2021). The freely dissolved PAH concentrations represent the bioavailable component of the total PAHs and are a function of multiple factors such as organic carbon content, lithology of the sediment matrix, and nature of the PAHs. The freely dissolved PAH concentrations are also an indicator for those PAHs which are mobile and could migrate through the undisturbed sediment column in the presence of an upward vertical hydraulic gradient or ebullition conditions.

Seven sediment cores were collected at locations in the Powwow River (Figure 1). The locations were selected to represent a range of surface and subsurface contaminant conditions observed in previously collected sediment samples in the river. For each of the seven sediment cores, a sediment sample was collected from the interval with the highest indicators of hydrocarbon impact (NAPL, sheening, discoloration, or odor). A paired sample was collected from the 0 to 0.5 ft interval to represent overlying surficial exposures.

The bulk sediment samples were submitted to SiREM for ex-situ extraction using SP3TM fibers. Equilibration exposure period for fibers inserted into the bulk sediment samples was 30 days. The fibers were then submitted to an analytical laboratory (Eurofins TestAmerica of Knoxville, Tennessee) for extraction and quantification of the NOAA34 suite of PAHs (i.e., parent and alkylated PAHs). SiREM back-calculated the freely dissolved (porewater) PAH concentrations from reported concentrations in the extracts. The laboratory report is in Attachment A.

Bulk sediment samples were also submitted to an analytical laboratory (ESS Laboratory of Cranston, Rhode Island) for concurrent analysis of total organic carbon and an extended suite of VOCs and SVOCs including bulk PAH34 analysis.

Results

Seven paired samples were collected as shown in Figure 1. Table 1 shows the selected sample locations, sediment lithological characteristics, and visual observations made during sample collection. Cfree values were derived for all samples except sample 851 (3.5-4 ft). This sample had elevated PAHs and could not be successfully extracted due to saturation of the SP3TM fiber. The Cfree in this sample could not be calculated.

Table 2 shows the resulting freely dissolved PAHs (Cfree) and the corresponding PAH17 bulk concentration and organic carbon content. To place the results in the context of potential risk, a Hazard Quotient for the Cfree was calculated by applying the methodology and Final Chronic Values (FCVs) for PAHs from USEPA (2003). The FCVs are based on narcosis effects on benthic biota. A HQ greater than one suggests adverse effects cannot be excluded. Increasing HQs indicate increasing probability of adverse effects. It is important to note that based on site-specific toxicity testing, we have previously demonstrated that for this site an HQ greater than 5 suggests adverse effects and HQs greater than one but less than 5 do not suggest adverse effects.

Table 2 shows that in no case did the surface (0-1 foot) sediment Cfree contain elevated concentrations of freely dissolved PAHs that could result in adverse effects. Free dissolved PAH concentrations were uniformly low in the 0.6 to 5.7 ug/L range and the HQs ranged from 0.1 to 0.5. The Cfree remained low even in one sample where the bulk PAH17 was relatively elevated (353 mg/kg), but the Cfree was 5.7 ug/L, yielding a HQ of only 0.3. This illustrates that the mobile fraction of PAHs is highly dependent of sediment conditions.

In no case was there an HQ in surface sediment porewater that may indicate current risk. There was also no apparent relationship between the surface and subsurface conditions, even when elevated concentrations in the 1-2 feet range were found close to the surface. Based on the results of the paired freely dissolved PAH concentrations, there is no evidence of vertical migration of PAHs from the subsurface sediment porewater towards the surface sediment.

In the subsurface porewater samples, the freely dissolved PAH concentrations ranged from non-detect to greater than 340 ug/L. In sample 851 (3.5-4 ft), there was saturation in the fiber such that extraction and analysis could not be performed. This sample had highly elevated bulk PAH17 concentration at 3,650 mg/kg. Six of the samples had HQs>1 (including the saturated sample).

Conclusions

The pairwise comparison of subsurface and surface sediment under a range of subsurface conditions ranging from non-detect to very high concentrations of freely dissolved PAHs do not indicate that vertical migration of mobile subsurface contamination to the surface is occurring at the Site. This absence of evidence of vertical migration suggests that the existing surface sediment deposits constitute an effective natural cap preventing exposure to the PAH contamination that remains in deeper sediment.

Reference

ASTM, 2013. Standard Test method for the Determination of Parent and Alkyl Polycyclic Aromatics in Sediment Pore Water Using Solid-Phase Microextraction and Gas Chromatography/Mass Spectrometry in Selected Ion-Monitoring Mode. ASTM Standard D7363-13a.

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Enclosures

- Tables
- Figure
- Attachment A Laboratory Data Report

Tables

Table 1. Samples selected for SPME analysis

Boring	Interval (ft)	Lithology	Visible Impacts
843	0-0.5	Silty sand	Plant debris. No sheen or staining. PID 0 ppm
	1-2	Sand with silt	Clinkers, sheen, staining, impacts increasing with depth. PID 1.2 increasing to 4.7 ppm
844	0-0.5	Silty sand	Plant debris. No sheen or staining. PID 4.5 ppm
	3-3.5	Silty sand	Clinkers, debris. Sheen from 3 to 3.5. PID 68.4 ppm
846	0-0.5	Silty sand	Wood debris. No sheen or staining. PID 0.6 ppm
	3.5-4.75	Silt with sand	Wood fragments, clinkers. PID 77.2 ppm.
851	0-0.5	Sand with silt	Clinkers, brick fragments, wood debris, plant fibers. PID 3.1 ppm
	3.5-4	Sand with silt	Coal tar blebs, saturated at 39" (3.25'), sheen throughout. PID 75.1 to 259.1 ppm
852	0-0.5	Silty sand	Wood and brick fragments. PID 0.2 ppm
	3.5-4	Silty sand	Coal-like fragments, clinkers, wood debris. Strong odor. PID 36.6 ppm
853	0-0.5	Sandy silt	Black staining, sheening, wood fragments. PID 117.7 ppm
	5.5-6	Silty sand	Wood fragments and plant fibers. PID 0.8 ppm
854	0-0.5	Sand with silt	Slight sheening, clinkers, brick fragments. PID 0.2 ppm
	1.5-2	Sand with silt	Slight sheening, clinkers, brick fragments. PID 0.2 ppm

PID = photoionization detector

ppm = parts per million

Table 2. Summary of SPME Evaluation

	Surface					Subsurface				
Sample	**interval (ft)**	**TPAH17 (mg/kg)**	**TPAH34 C_{free} (µg/L)**	**TOC (%)**	**HQ**	**interval (ft)**	**TPAH17 (mg/kg)**	**TPAH34 C_{free} (µg/L)**	**TOC (%)**	**HQ**
843	0-0.5	101	1.3	8.6	0.1	1-2	98.5	203	7.3	7.8
844	0-0.5	41.1	2.6	2.7	0.2	3-3.5	32.1	70	3.2	4.3
846	0-0.5	29.3	0.6	3.0	0.1	3.5-4.75	21.0	15	3.2	1
851	0-0.5	14.9	2.4	1.8	0.2	3.5-4	3,650	**	4.6	**
852	0-0.5	353	5.7	1.8	0.3	3.5-4	159	339	10	10.2
853	0-0.5	3.8	4.2	2.5	0.5	5.5-6	ND	0.01	0.9	0
854	0-0.5	32.5	3.0	2.6	0.4	1.5-2	13.1	27	0.9	2.4

ND = Not detected

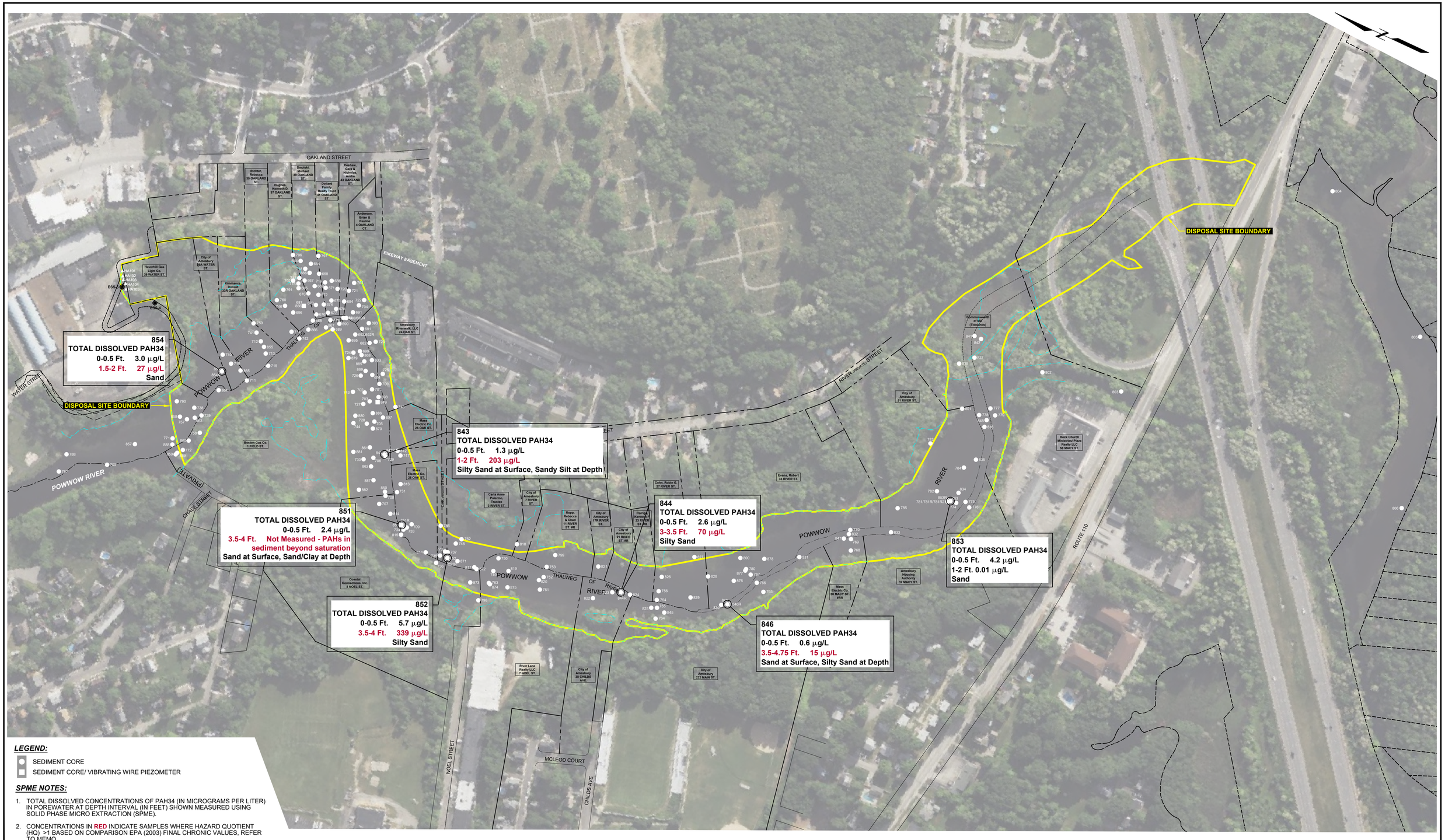
Total PAH_{34} = sum of NOAA 34 parent and alkylated freely dissolved PAHs (C_{free}) in interstitial water

HQ= hazard quotient expressed as HQ=Σ ({$C_{free\ -\ i}$ / FCV_i, for each of the 34 PAHs

FCV_i = Final Chronic Value for each PAH (i), per USEPA (2003) narcosis effect

** = Fiber saturated. Could not be extracted or analyzed for C_{free}

Figure



LEGEND:

- SEDIMENT CORE
- SEDIMENT CORE/ VIBRATING WIRE PIEZOMETER

SPME NOTES:

1. TOTAL DISSOLVED CONCENTRATIONS OF PAH34 (IN MICROGRAMS PER LITER) IN POREWATER AT DEPTH INTERVAL (IN FEET) SHOWN MEASURED USING SOLID PHASE MICRO EXTRACTION (SPME).
2. CONCENTRATIONS IN **RED** INDICATE SAMPLES WHERE HAZARD QUOTIENT (HQ) >1 BASED ON COMPARISON EPA (2003) FINAL CHRONIC VALUES, REFER TO MEMO.

NOTES:

1. MICROSOFT BING IMAGE 2021.
2. PARCEL BOUNDARIES, THALWEG OF RIVER, AND MEAN HIGH WATER PROVIDED BY HAYNER/SWANSON, 2025.
3. SEDIMENT SAMPLE LOCATIONS ARE APPROXIMATE.

0 150 300
Approximate Scale, Feet

Porewater Bioavailability and Mobility Evaluation Amesbury Former MGP Site Amesbury, Massachusetts	GEI Consultants	SPME SAMPLE LOCATIONS AND RESULTS
Boston Gas Company d|b|a National Grid Waltham, Massachusetts	Project 1804576	October 2025 Fig. A1

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Attachment A Laboratory Data Report

SiREM
Leading Science · Lasting Solutions

130 Stone Rd. W
Guelph, ON N1G 3Z2
(519) 822-2265

Certificate of Analysis
Concentrations of Freely Dissolved Analytes Measured via SP3™ Passive Samplers

Customer: GEI Consultants

SiREM Reference: Si-06718-051523

Ex Situ Tumbling Period:
September 27, 2023 to October 26, 2023

Revised Report Issued:
December 14, 2023

Introduction

This report represents the results from *ex situ* deployment of SP3™ passive samplers in sediment samples from the MGP site in Massachusetts (the Site). The data from 17 passive samplers (14 deployed, 3 PRC control blanks) were analyzed to determine the freely dissolved concentrations (C_{free}) of parent and alkylated polycyclic aromatic hydrocarbons (PAHs) in sediment porewater. Each sampler consisted of a polyethylene (PE) sheet spiked with PCB Performance Reference Compounds (PRCs), which are used in the determination of C_{free}. All passive sampling laboratory work for this study was performed at SiREM. *Ex situ* exposure of the samplers began on September 27, 2023 and ended on October 26, 2023. Details of the data analysis procedure are provided in Attachment A, the partitioning coefficients used in the data analysis are provided in Attachment B, and the Eurofins Environment Testing America analytical reports provided in Attachment C.

Sample Summary

Sample ID	Sampler Deployment Date	Sampler Retrieval Date	Analysis
1804576-843-S1	09/27/2023	10/26/2023	PAHs & PCB PRCs
1804576-843-S2	09/27/2023	10/26/2023	PAHs & PCB PRCs
1804576-844-S1	09/27/2023	10/26/2023	PAHs & PCB PRCs
1804576-844-S3	09/27/2023	10/26/2023	PAHs & PCB PRCs
1804576-846-S1	09/27/2023	10/26/2023	PAHs & PCB PRCs
1804576-846-S3	09/27/2023	10/26/2023	PAHs & PCB PRCs
1804576-851-S1	09/27/2023	10/26/2023	PAHs & PCB PRCs
1804576-851-S2	09/27/2023	10/26/2023	PAHs & PCB PRCs
1804576-852-S1	09/27/2023	10/26/2023	PAHs & PCB PRCs
1804576-852-S2	09/27/2023	10/26/2023	PAHs & PCB PRCs
1804576-853-S1	09/27/2023	10/26/2023	PAHs & PCB PRCs
1804576-853-S3	09/27/2023	10/26/2023	PAHs & PCB PRCs
1804576-854-S1	09/27/2023	10/26/2023	PAHs & PCB PRCs
1804576-854-S2	09/27/2023	10/26/2023	PAHs & PCB PRCs
GEI.PRC.BLK1	--	--	PAHs & PCB PRCs
GEI.PRC.BLK2	--	--	PAHs & PCB PRCs
GEI.PRC.BLK3	--	--	PAHs & PCB PRCs

Sampler Design, Deployment, and Chemical Analysis

The SP3™ sampler design for this project consisted of a 3-cm × 3-cm sheet of 13-micrometer thick low-density polyethylene (PE) housed in a stainless steel mesh envelope. For the SP3™

sampler and blank samplers, the PE was spiked with PRCs consisting of unlabeled PCB congeners that are assumed to: 1) not be present in the media sampled or 2) present at concentrations so low as to be inconsequential, not affect calculations involving PRCs, and insignificant compared to the concentration of other freely-dissolved PCBs in the media sampled. The PRCs used for this project were: PCB-14, PCB-36, PCB-78, PCB-104, PCB-121, PCB-142, PCB-155, PCB-184, PCB-192, and PCB-204[1]. Three PRC control blanks (labelled GEI.PRC.BLK1, GEI.PRC.BLK2, GEI.PRC.BLK3) were packaged and stored cold (approximately 4 °C) and shipped with the tumbled samplers to Eurofins Environment Testing America, Knoxville TN for analysis by a modified EPA 8270D to determine PRC loading efficiency and consistency[2] as well as potential analyte contamination.

On September 27, 2023, each of the samplers were deployed in a 250-mL wide-mouth, amber glass jar (Systems Plus, New Hamburg, ON) along with approximately 275 g (wet weight) of total sediment. 200 mL of a 125-milligram per liter (mg/L) sodium azide solution was added to each jar as a preservative and to ensure a mixable slurry sample was present in the jars. The jars were sealed with black vinyl tape. The jars were then loaded onto an end-over-end tumbler (Merq, Stoney Creek, ON) rotated end-over-end at approximately 15 rotations per minute (RPM) until the samplers were retrieved on October 26, 2023. The deployment time for each sampler was 29 days. Upon retrieval, samplers were removed from the jars and rinsed with ultrapure deionized water to remove excess sediment. Samplers were then wrapped in aluminum foil, placed in an opaque resealable bag, placed in an additional re-sealable plastic bag, and packaged in a cooler with ice or ice packs for overnight shipment to Eurofins Environment Testing America in Knoxville, TN. The PRC blanks remained in its original packaging under cold storage (approximately 4 °C) with the exception of a period in which the blanks were removed from the packaging by laboratory personnel, exposed to ambient laboratory conditions for approximately 5 minutes, and packaged for shipment in the same manner as the deployed samplers.

Processing of the samplers by Eurofins Environment Testing America included removal of the PE from the stainless-steel mesh envelope, wiping any visible sediment from the PE using a moist tissue, and determination of the concentrations of parent and alkylated PAHs (including the PCB PRCs) in PE by a modified EPA 8270D. The analytical report provided by Eurofins Environment Testing America is provided in Attachment C.

Results

C_{free} values for the parent and alkylated PAHs are reported in Table 1.

As detailed in Attachment A, concentrations of PRCs in the exposed samplers and trip blanks were used to estimate a compound-specific mass transport rate for each sampler. For example, if 100 nanograms per gram (ng/g) of a PRC is present in a trip blank and 50 ng/g of the same PRC is present in a sampler following retrieval, the data indicate that the PRC is at 50 percent (%) of its equilibrium concentration upon retrieval. With several different PRC depletion values, a predictive model can be constructed to estimate primary target compound fractional equilibrium, as described in greater detail in Attachment A. A full list of the K_{PE} values used for this analysis are tabulated in Attachment B.

[1] PCB shorthand nomenclature used in this report follows the Chemical Abstract Service (CAS) nomenclature used by USEPA (2003): United States Environmental Protection Agency (USEPA). 2003. Table of PCB Species by Congener Number.
[2] PRCs were monitored to have a co-variance of less than 25% across the three PRC blanks, which was achieved.

During calculation of C_{free}, a commonly used data quality indicator is the presence of PRC outliers in specific SP3™ samplers. The three PRC blanks had initial PRC concentrations at the targeted amount with coefficients of variations between 8% and 25% (identical results would yield a coefficient of variation of 0%). PRCs in SP3™ samples are classified as outliers when their analyzed concentration is equal to or greater than blank PRC concentrations. Outlier PRCs are not used in calculating C_{free}. PRC outliers were observed in 4 SP3™ samplers during this deployment. In these samplers, the average concentrations of some PRCs were much higher than the concentrations in the PRC blank samplers (which were not exposed to the environment). This is unlikely to be a result of PRC-spiking heterogeneity, as the samplers prepared in this study were treated the same manner and allowed to equilibrate in the same container. It is also unlikely that these samplers accumulated the PCBs used as PRCs from the environment from which they were exposed based on their rare occurrence. Although it is impossible to confirm, it is most likely that the anomalous results in this sample may be due extreme variation during the sample processing and quantification steps that results in a positive bias (potential overestimation) of the concentrations of PRCs in the PE. As a result, outlier PRCs are not used in calculating C_{free}. Even with the exclusion of the outlier PRCs from the calculations from those samples, C_{free} values for those samplers were calculable and are presented in Table 1.

Finally, extremely high abundance of PAHs were measured on the SP3™ sampler tumbled in sediment from sample 1804576-851-S2. The total PAHs from this sample (in ng/g; Table A1) were 2 orders of magnitude higher than the next highest sample which required extensive sample dilution prior to analysis. The dilutions resulted in the PRCs being non-detect (ND) in the samples, preventing the ability to determine C_{free}. A 5 times less diluted extract from the same sample (labelled 1804576-851-S2(2) in SiREM tables) still resulted in the majority of the PRCs being ND, with a large majority of the PAH values being out of calibration (“E” flagged). Overall, the extremely high abundance of PAHs did not allow for any “less diluted” extracts to be analyzed without the potential to damage the analytical equipment, therefore C_{free} from 1804576-851-S2 could not be performed. However given the extremely high abundance detected in comparison to the remainder of the samples (the highest of which exhibited total PAH concentration of 340 µg/L), this sample can be estimated to have a total PAH concentrations much higher based on the ng/g measured in SP3™.

TABLE 1

Table 1. Concentration of Freely-Dissolved (C_{free}) Analytes.

GEI Consultants, MGP Site, MA

Client ID	1804576-843-S1			1804576-843-S2			1804576-844-S1			1804576-844-S3			1804576-846-S1			1804576-846-S3		
Analyte	Result (pg/L)	Qualifier	MDL (pg/L)	Result (pg/L)	Qualifier	MDL (pg/L)	Result (pg/L)	Qualifier	MDL (pg/L)	Result (pg/L)	Qualifier	MDL (pg/L)	Result (pg/L)	Qualifier	MDL (pg/L)	Result (pg/L)	Qualifier	MDL (pg/L)
Acenaphthene	320000	J	140000	95000000		720000	880000		140000	32000000		180000	220000	J	140000	7200000		130000
Acenaphthylene	63000	J	27000	1500000	J	140000	41000	J	27000	520000		34000	ND		27000	120000	J	25000
Anthracene	68000		18000	3900000		92000	230000		18000	1400000		23000	22000	J	19000	320000		18000
Benzo[a]anthracene	8700		1000	140000		5300	14000		1900	210000		1800	5500		1400	30000		1400
Benzo[a]pyrene	1700		120	14000		550	2400		520	34000		390	920		210	3400		220
Benzo[b]fluoranthene	2900		210	21000		980	4500		750	42000		590	1700		340	6100		350
Benzo[e]pyrene	2200		110	12000		500	3000		370	28000		290	1400		170	4200		180
Benzo[g,h,i]perylene	270		14	1100		57	650	JL	110	4500		71	200	J	31	440		31
Benzo[k]fluoranthene	880		110	6200		500	1400	J	440	20000		330	640	J	180	2400		190
Chrysene	12000		370	160000		1800	18000		650	220000		640	7000		480	38000		500
Dibenz(a,h)anthracene	62	J	12	290	J	47	120	JL	89	1300		54	39	J	24	110	J	25
Fluoranthene	130000		14000	3300000		72000	190000		15000	2400000		18000	96000		15000	670000		15000
Fluorene	170000	J	88000	20000000		450000	330000		88000	4400000		110000	ND		88000	200000	J	81000
Indeno[1,2,3-cd]pyrene	200		11	870		44	530	JL	100	3900		61	120	J	25	360		25
1-Methylnaphthalene	ND		320000	17000000		1600000	ND		320000	600000	J	400000	ND		320000	ND		280000
2-Methylnaphthalene	ND		440000	ND		2200000	ND		440000	ND		560000	ND		440000	ND		410000
Naphthalene	ND		6800000	ND		35000000	ND		6800000	ND		8400000	ND		6800000	ND		6100000
Perylene	1300		650	8700		3200	2300	J	1600	14000		1500	1600	J	960	3200		970
Phenanthrene	300000		130000	25000000		690000	530000		130000	8600000		170000	ND		130000	1600000		130000
Pyrene	120000		3800	3300000		19000	190000		4300	2600000		5200	88000		4200	640000		4100
C1-Fluoranthenes/pyrene	31000		4900	540000		25000	42000		7100	680000		8000	25000		6000	150000		6000
C1-Fluorenes	ND		44000	1500000		230000	ND		45000	660000		55000	ND		47000	240000		45000
C2-Fluorenes	ND		19000	960000		96000	30000		20000	610000		26000	27000		20000	220000		20000
C3-Fluorenes	21000		8600	480000		43000	18000		11000	370000		13000	21000		9900	130000		9900
C2-Naphthalenes	ND		330000	22000000		1700000	ND		330000	7100000		410000	ND		330000	1500000		310000
C3-Naphthalenes	ND		82000	5000000		420000	ND		83000	3800000		100000	ND		85000	940000		81000
C4-Naphthalenes	ND		21000	650000		110000	ND		27000	610000		31000	ND		25000	180000		25000
C1-Phenanthrenes/Anthracenes	ND		75000	2200000		380000	ND		79000	1500000		99000	ND		81000	380000		79000
C2-Phenanthrenes/Anthracenes	38000		8400	1000000		42000	42000		10000	960000		13000	30000		9700	310000		9700
C3-Phenanthrenes/Anthracenes	8000		2400	200000		12000	13000		4600	240000		4700	9000		3200	94000		3300
C4-Phenanthrenes/Anthracenes	1600		670	32000	AP	3100	3200		2300	45000		1900	1700		1100	16000		1100
C1-Chrysenes/Benz(a)anthracenes	3000		850	27000		4000	4400		2600	63000		2200	2000		1300	10000		1400
C2-Chrysenes/Benz(a)anthracenes	500		280	3100		1200	ND		1500	12000		1100	ND		520	2100		540
C3-Chrysenes/Benz(a)anthracenes	81		74	350		280	ND	L	800	1800		470	ND		170	250		180
C4-Chrysenes/Benz(a)anthracenes	ND		21	ND		66	ND	L	450	210	L	210	ND		62	ND		61
Total PAHs	**1304393**			**203956610**			**2590500**			**69749710**			**560819**			**15010560**		

Notes:

AP: Compounds have an altered pattern compared to the reference pattern within the expected retention time window. This may be due to interferences from non-target compounds, and/or due to different relative concentrations of the compounds.

C_{free}: freely dissolved concentration

J: Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

L: Percent to steady state less than 10%.

MDL: method detection limit

ND: Non-detect

PAH: polycyclic aromatic hydrocarbons

pg/L: picograms per liter

Table 1. Concentration of Freely-Dissolved (C_{free}) Analytes.

GEI Consultants, MGP Site, MA

Client ID	1804576-851-S1			1804576-852-S1			1804576-852-S2			1804576-853-S1			1804576-853-S3			1804576-854-S1		
Analyte	Result (pg/L)	Qualifier	MDL (pg/L)	Result (pg/L)	Qualifier	MDL (pg/L)	Result (pg/L)	Qualifier	MDL (pg/L)	Result (pg/L)	Qualifier	MDL (pg/L)	Result (pg/L)	Qualifier	MDL (pg/L)	Result (pg/L)	Qualifier	MDL (pg/L)
Acenaphthene	1200000		100000	1500000		130000	200000000		720000	410000	J	130000	ND		140000	820000		180000
Acenaphthylene	34000	J	19000	230000	J	25000	1300000	J	140000	53000	J	25000	ND		27000	71000	J	34000
Anthracene	58000		13000	150000		16000	5300000		91000	33000	J	18000	ND		20000	90000		22000
Benzo[a]anthracene	7400		970	23000		890	130000		5300	9700		1400	ND		1700	17000		1700
Benzo[a]pyrene	990		150	4200		95	10000		560	1100		220	ND		310	3700		420
Benzo[b]fluoranthene	1900		250	5700		170	14000		990	2100		360	ND		490	6600		620
Benzo[e]pyrene	1300		120	4100		88	10000		500	1600		190	ND		250	4400		300
Benzo[g,h,i]perylene	150	J	22	540		12	730		60	130	J	32	ND		48	870		94
Benzo[k]fluoranthene	740		130	2800		84	6700		510	820	J	190	ND		260	3000		360
Chrysene	9300		350	26000		320	130000		1800	13000		510	ND		610	24000		580
Dibenz(a,h)anthracene	35	J	17	150		9	170	J	49	ND		25	ND		38	220	J	69
Fluoranthene	180000		11000	320000		13000	3500000		71000	140000		15000	ND		17000	260000		17000
Fluorene	280000		64000	470000		80000	24000000		440000	240000	J	81000	ND		89000	170000	J	110000
Indeno[1,2,3-cd]pyrene	140	J	18	470		9	520		46	110	J	26	ND		40	720	J	84
1-Methylnaphthalene	ND		230000	500000	J	280000	33000000		1600000	ND		290000	ND		320000	ND		400000
2-Methylnaphthalene	ND		320000	620000	J	400000	ND		2200000	ND		410000	ND		440000	ND		560000
Naphthalene	ND		4900000	ND		6100000	ND		35000000	ND		6100000	ND		6800000	ND		8400000
Perylene	1900		680	3500		530	6800		3200	3000		1000	7600		1300	4800		1400
Phenanthrene	210000		96000	850000		120000	28000000		680000	320000		130000	ND		140000	470000		170000
Pyrene	170000		3000	280000		3300	3900000		19000	150000		4200	ND		4800	220000		4800
C1-Fluoranthenes/pyrene	31000		4300	65000		4300	590000		24000	52000		6200	ND		7300	67000		7200
C1-Fluorenes	ND		34000	ND		41000	1800000		220000	62000	J	46000	ND		50000	58000	J	54000
C2-Fluorenes	25000		15000	35000		17000	740000		95000	160000		20000	ND		23000	87000		24000
C3-Fluorenes	20000		7100	18000		7600	340000		43000	110000		10000	ND		12000	71000		12000
C2-Naphthalenes	ND		230000	300000		300000	27000000		1700000	750000		310000	ND		340000	ND		410000
C3-Naphthalenes	69000		60000	100000		73000	5000000		410000	1100000		82000	ND		91000	230000		100000
C4-Naphthalenes	ND		18000	ND		19000	530000		110000	250000		25000	ND		30000	72000		28000
C1-Phenanthrenes/Anthracenes	ND		57000	110000		68000	2500000		380000	130000		80000	ND		89000	110000		95000
C2-Phenanthrenes/Anthracenes	34000		7000	72000		7400	840000		42000	150000		9900	ND		11000	96000		11000
C3-Phenanthrenes/Anthracenes	7800		2300	14000		2000	150000		12000	45000		3400	ND		4100	36000		4300
C4-Phenanthrenes/Anthracenes	1100		780	1900		540	18000		3200	6500		1100	ND		1500	8100		2000
C1-Chrysenes/Benz(a)anthracenes	2100		950	6900		690	23000		4000	4300		1400	ND		1800	8400		2200
C2-Chrysenes/Benz(a)anthracenes	400		370	1200		220	2700		1200	780		550	ND		780	2300		1200
C3-Chrysenes/Benz(a)anthracenes	ND		120	170		63	360		290	ND		180	ND		280	ND	L	670
C4-Chrysenes/Benz(a)anthracenes	ND		43	24		22	ND		72	ND		61	ND		110	ND	L	390
Total PAHs	**2346255**			**5714654**			**338842980**			**4198140**			**7600**			**3012110**		

Notes:

AP: Compounds have an altered pattern compared to the reference pattern within the expected retention time window. This may be due to interferences from non-target compounds, and/or due to different relative concentrations of the compounds.

C_{free}: freely dissolved concentration

J: Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

L: Percent to steady state less than 10%.

MDL: method detection limit

ND: Non-detect

PAH: polycyclic aromatic hydrocarbons

pg/L: picograms per liter

Table 1. Concentration of Freely-Dissolved (C_{free}) Analytes.

GEI Consultants, MGP Site, MA

Client ID	1804576-854-S2		
Analyte	Result (pg/L)	Qualifier	MDL (pg/L)
Acenaphthene	4900000		120000
Acenaphthylene	250000	J	23000
Anthracene	1200000		16000
Benzo[a]anthracene	98000		1400
Benzo[a]pyrene	13000		300
Benzo[b]fluoranthene	15000		460
Benzo[e]pyrene	11000		220
Benzo[g,h,i]perylene	1500		54
Benzo[k]fluoranthene	7100		250
Chrysene	100000		510
Dibenz(a,h)anthracene	400	J	42
Fluoranthene	1500000		13000
Fluorene	1900000		74000
Indeno[1,2,3-cd]pyrene	1400		46
1-Methylnaphthalene	ND		270000
2-Methylnaphthalene	ND		370000
Naphthalene	ND		5600000
Perylene	17000		1100
Phenanthrene	5600000		110000
Pyrene	1500000		3700
C1-Fluoranthenes/pyrene	370000		5900
C1-Fluorenes	650000		40000
C2-Fluorenes	640000		18000
C3-Fluorenes	280000		9100
C2-Naphthalenes	2300000		280000
C3-Naphthalenes	2800000		73000
C4-Naphthalenes	560000		23000
C1-Phenanthrenes/Anthracenes	1200000		68000
C2-Phenanthrenes/Anthracenes	690000		8900
C3-Phenanthrenes/Anthracenes	130000		3500
C4-Phenanthrenes/Anthracenes	19000		1400
C1-Chrysenes/Benz(a)anthracenes	30000		1700
C2-Chrysenes/Benz(a)anthracenes	4900		800
C3-Chrysenes/Benz(a)anthracenes	650		340
C4-Chrysenes/Benz(a)anthracenes	ND	L	150
Total PAHs	**26788950**		

Notes:

AP: Compounds have an altered pattern compared to the reference pattern within the expected retention time window. This may be due to interferences from non-target compounds, and/or due to different relative concentrations of the compounds.

C_{free}: freely dissolved concentration

J: Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

L: Percent to steady state less than 10%.

MDL: method detection limit

ND: Non-detect

PAH: polycyclic aromatic hydrocarbons

pg/L: picograms per liter

ATTACHMENT A:

DATA ANALYSIS METHODS

Attachment A:

Data Analysis Methods
Concentrations of Freely Dissolved Analytes
Measured via SP3™ Passive Samplers

The concentration of analytes (Table A1) in PE obtained from the information provided in the analytical report (Attachment C) are used in a multi-step data process to calculate C_{free} analytes as described below.

Step 1:

The concentrations of the PRCs in PE [PE_t] were used to calculate the elimination rate (k_e) values for the PRCs in each deployed sampler using the following equation (Lohmann, 2012):

$$PRC\ k_e = \ln\left(\frac{[PE_{t=0}]}{[PE_{t=final}]}\right) \div t_{final}$$

where:

$PE_{t=0}$	= the average concentration of the PRC present in the PE at the beginning of the deployment (obtained from an average measurement of the PRC control blanks)
$PE_{t=final}$	= the concentration of the PRC in the PE after the deployment (obtained from each deployed PE sampler)
t_{final}	= the deployment time (in days)
k_e	= the elimination rate (in days^{-1})

PRC k_e values for the PRCs in each sampler are shown in Table A2. The values are also expressed as a percentage of steady state (concentration at equilibrium). If PRC k_e values were not calculated, they were treated as outliers because $PE_{t=final}$ values were equal to or greater than $PE_{t=0}$ values.

Step 2:

The second step was to estimate k_e values for the non-PRC primary analytes (PAHs) in each of the deployed samplers. This was accomplished by developing a linear regression model using PRC k_e values (dependent variable, from Tables A2) and PE-water partition coefficients (K_{PE}) for each PRC PCB (independent variable). K_{PE} values used are provided in Attachment B. Note that regression models were specific to each sampler (i.e. not global to the whole deployment) as local geologic and hydrodynamic conditions can vary greatly within a site.

Values were $\log_{10}$-transformed per Tomaszewski and Luthy (2008). By entering the analyte-specific K_{PE} into the linear regression model developed for each sampler (Attachment B), k_e values for each of the primary analytes for each sampler were calculated.

Step 3:

Concentrations of some non-PRC analytes (Table A1) in PE were corrected for trace levels of non-PRCs present in the PRC control blanks (due to trace levels present in the PRC spiking solutions and/or laboratory/field contamination). Using the sample specific k_e values, the expected amount of these trace primary analyte (PCBs shown as an example) present in the sample at the end of deployment (*Trace PCB* $_{t = final}$) was calculated via the following equation:

$$[Trace\ PCB_{t=final}] = \frac{[Trace\ PCB_{t=0}]}{e^{k_e \times t_{final}}}$$

where:

Trace PCB$_{t = final}$	= the concentration of trace PCBs remaining in the sample at the end of the deployment
Trace PCB$_{t = 0}$	= the average concentration of the trace PCB in the PE at the beginning of the deployment (obtained from an average measurement of the trace PCBs in the PRC control blanks)
k_e	= the elimination rate value predicted by the sampler-specific regression model (in days^{-1})
t_{final}	= the deployment time (in days)

Concentrations of *Trace PCB* $_{t = final}$ values were then subtracted from the measured concentrations of PAHs in PE (Table A1).

Step 4:

This step describes the calculation of sampling rate correction factors (*CF*s) for each primary analyte in each sampler. The following equation is used, as adapted from Lohmann (2012):

$$CF = \frac{1}{1 - e^{-k_e \times t_{final}}}$$

where:

k_e = the elimination rate value predicted by the sampler-specific regression model (in days^{-1})

t_{final} = the deployment time (in days).

Step 5:

The concentration of primary analyte in the PE of each sampler (obtained from Table A1) were multiplied by the *CF* values to calculate the steady-state concentration of primary analytes.

Step 6:

In the final step, the steady-state concentrations are divided by K_{PE} values (Attachment B) to obtain the concentrations of C_{free} for the primary analytes. These are reported in Table 1. C_{free} Method Detection Limits (MDLs) were calculated in the approach described above using the estimated MDL concentration in PE, as reported the analytical laboratory and shown in Table A1.

References Cited

Lohmann, R. 2012. Critical review of low-density polyethylene's partitioning and diffusion coefficients for trace organic contaminants and implications for its use as a passive sampler. Environ. Sci. Technol.: 46:606-618.

Tomaszewski, J.E., and Luthy, R.G. 2008. Field deployment of polyethylene devices to measure PCB concentrations in pore water of contaminated sediment. Environ. Sci. Technol. 42:6086-6091.

United States Environmental Protection Agency (USEPA). 2003. Table of PCB Species by Congener Number.

TABLE A1

Table A1. Concentration of Analytes in Polyethylene.
GEI Consultants, MGP Site, MA

Client ID			1804576-843-S1			1804576-843-S2			1804576-844-S1			1804576-844-S3			1804576-846-S1			1804576-846-S3			1804576-851-S1		
Analyte	Homolog Group	PRC	Result (ng/g)	Qualifier	MDL (ng/g)	Result (ng/g)	Qualifier	MDL (ng/g)	Result (ng/g)	Qualifier	MDL (ng/g)	Result (ng/g)	Qualifier	MDL (ng/g)	Result (ng/g)	Qualifier	MDL (ng/g)	Result (ng/g)	Qualifier	MDL (ng/g)	Result (ng/g)	Qualifier	MDL (ng/g)
Acenaphthene			590	J	260	170000		1300	1600		260	59000		330	400	J	260	13000		240	2100		190
Acenaphthylene			170	J	73	4000	J	370	110	J	73	1400		91	ND		73	320	J	66	92	J	52
Anthracene			1200		320	67000		1600	4100		320	25000		400	380	J	320	5300		290	1000		230
Benzo[a]anthracene			3100		370	51000		1900	2700		370	53000		460	1500		370	7300		340	2000		260
Benzo[a]pyrene			3900		280	35000		1400	1300		280	31000		350	1200		280	3900		250	1300		200
Benzo[b]fluoranthene			4900		350	38000		1800	2100		350	31000		440	1700		350	5500		320	1900		250
Benzo[e]pyrene			3200		160	20000		800	1300		160	19000		200	1300		160	3400		150	1200		110
Benzo[g,h,i]perylene			2100		110	11000		550	620	J	110	8900		140	710	J	110	1400		100	530	J	79
Benzo[k]fluoranthene			1900		230	15000		1200	730	J	230	18000		290	810	J	230	2700		210	940		160
Chrysene			4300		130	57000		650	3500		130	55000		160	1900		130	9300		120	2500		93
Dibenz(a,h)anthracene			440	J	82	2500	J	410	110	J	82	2500		100	130	J	82	340	J	75	120	J	59
Fluoranthene			7800		810	190000		4100	10000		810	130000		1000	5100		810	33000		740	9700		580
Fluorene			610	J	320	70000		1600	1200		320	16000		400	ND		320	730	J	290	1000		230
Indeno[1,2,3-cd]pyrene			2000		110	11000		550	570	J	110	9000		140	530	J	110	1400		100	630	J	79
1-Methylnaphthalene			ND		500	26000		2500	ND		500	950	J	630	ND		500	ND		450	ND		360
2-Methylnaphthalene			ND		700	ND		3500	ND		700	ND		880	ND		700	ND		640	ND		500
Naphthalene			ND		2900	ND		15000	ND		2900	ND		3600	ND		2900	ND		2600	ND		2100
Perylene			1000		510	7100		2600	720	J	510	6300		640	880	J	510	1500		460	1000		360
Phenanthrene			3900		1700	310000		8700	6800		1700	110000		2200	ND		1700	19000		1600	2700		1200
Pyrene			9300		300	260000		1500	13000		300	190000		380	6300		300	42000		270	12000		210
C1-Fluoranthenes/pyrene			6300		1000	110000		5000	5900		1000	110000		1300	4100		1000	22000		910	5200		710
C1-Fluorenes			ND		1300	42000		6500	ND		1300	19000		1600	ND		1300	6300		1200	ND		930
C2-Fluorenes			ND		1000	50000		5000	1500		1000	31000		1300	1300		1000	9800		910	1200		710
C3-Fluorenes			2500		1000	55000		5000	1700		1000	38000		1300	2100		1000	12000		910	2000		710
C2-Naphthalenes			ND		2000	130000		10000	ND		2000	43000		2500	ND		2000	9100		1800	ND		1400
C3-Naphthalenes			ND		2000	120000		10000	ND		2000	93000		2500	ND		2000	21000		1800	1600		1400
C4-Naphthalenes			ND		2800	84000		14000	ND		2800	69000		3500	ND		2800	18000		2500	ND		2000
C1-Phenanthrenes/Anthracenes			ND		3400	98000		17000	ND		3400	65000		4300	ND		3400	15000		3100	ND		2400
C2-Phenanthrenes/Anthracenes			4500		1000	120000		5000	4000		1000	100000		1300	3100		1000	29000		910	3500		710
C3-Phenanthrenes/Anthracenes			3300		1000	86000		5000	2800		1000	67000		1300	2800		1000	26000		910	2400		710
C4-Phenanthrenes/Anthracenes			2400		1000	51000	AP	5000	1400		1000	31000		1300	1600		1000	13000		910	1000		710
C1-Chrysenes/Benz(a)anthracenes			3500		1000	34000		5000	1700		1000	37000		1300	1500		1000	6800		910	1600		710
C2-Chrysenes/Benz(a)anthracenes			1800		1000	13000		5000	ND		1000	14000		1300	ND		1000	3500		910	770		710
C3-Chrysenes/Benz(a)anthracenes			1100		1000	6300		5000	ND		1000	5000		1300	ND		1000	1300		910	ND		710
C4-Chrysenes/Benz(a)anthracenes			ND		1000	ND		5000	ND		1000	1300		1300	ND		1000	ND		910	ND		710
PCB-14	Di	PRC	ND		10.0	ND		50.0	360	J	10.0	380	J	13.0	240	J	10.0	380	J	9.1	280	J	7.1
PCB-36	Tri	PRC	ND		10.0	ND		50.0	430	J	10.0	460	J	13.0	290	J	10.0	340	J	9.1	270	J	7.1
PCB-78	Tetra	PRC	240	J	10.0	ND		50.0	1200		10.0	1100	J	13.0	890	J	10.0	1100		9.1	900		7.1
PCB-104	Penta	PRC	230	J	10.0	180	J	50.0	1700		10.0	1200	J	13.0	1200		10.0	1200		9.1	1100		7.1
PCB-121	Penta	PRC	190	J	10.0	ND		50.0	830	J	10.0	550	J	13.0	450	J	10.0	630	J	9.1	600	J	7.1
PCB-142	Hexa	PRC	180	J	10.0	ND		50.0	610	J	10.0	500	J	13.0	420	J	10.0	490	J	9.1	370	J	7.1
PCB-155	Hexa	PRC	180	J	10.0	78	J	50.0	720	J	10.0	510	J	13.0	500	J	10.0	430	J	9.1	460	J	7.1
PCB-184	Hepta	PRC	270	J	10.0	97	J	50.0	970	J	10.0	810	J	13.0	720	J	10.0	750	J	9.1	680	J	7.1
PCB-192	Hepta	PRC	790	J	10.0	310	J	50.0	2500		10.0	2100		13.0	1700		10.0	1900		9.1	1800		7.1
PCB-204	Octa	PRC	710	J	10.0	230	J	50.0	1700		10.0	1600		13.0	1300		10.0	1300		9.1	1300		7.1
Total PAHs			**75810**			**2343900**			**69460**			**1489350**			**39340**			**342890**			**59982**		

Notes:
J: Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
AP: Compounds have an altered pattern compared to the reference pattern within the expected retention time window. This may be due to interferences from non-target compounds, and/or due to different relative concentrations of the compounds.
E: Result exceeded calibration range.
MDL: method detection limit
ND: Non-detect
ng/g: nanograms per gram
PAH: Polycyclic aromatic hydrocarbons
PRC: performance reference compound

Table A1. Concentration of Analytes in Polyethylene.
GEI Consultants, MGP Site, MA

Client ID			1804576-851-S2			1804576-851-S2(2)			1804576-852-S1			1804576-852-S2			1804576-853-S1			1804576-853-S3			1804576-854-S1		
Analyte	Homolog Group	PRC	Result (ng/g)	Qualifier	MDL (ng/g)	Result (ng/g)	Qualifier	MDL (ng/g)	Result (ng/g)	Qualifier	MDL (ng/g)	Result (ng/g)	Qualifier	MDL (ng/g)	Result (ng/g)	Qualifier	MDL (ng/g)	Result (ng/g)	Qualifier	MDL (ng/g)	Result (ng/g)	Qualifier	MDL (ng/g)
Acenaphthene			8800000		87000	19000000	E	1100	2700		240	360000		1300	740	J	240	ND		260	1500		330
Acenaphthylene			300000	J	24000	330000		300	610	J	66	3500	J	370	140	J	66	ND		73	190	J	91
Anthracene			6800000		110000	11000000	E	1300	2600		290	93000		1600	530	J	290	ND		320	1600		400
Benzo[a]anthracene			2700000		120000	2800000	E	1500	8800		340	47000		1900	2300		340	ND		370	4600		460
Benzo[a]pyrene			2500000		93000	2900000	E	1200	11000		250	26000		1400	1300		250	ND		280	3100		350
Benzo[b]fluoranthene			1800000		120000	1800000	E	1500	11000		320	26000		1800	1900		320	ND		350	4700		440
Benzo[e]pyrene			1300000		53000	1400000	E	670	6900		150	16000		800	1300		150	ND		160	2900		200
Benzo[g,h,i]perylene			1300000		37000	1300000	E	460	4700		100	6700		550	410	J	100	ND		110	1300		140
Benzo[k]fluoranthene			990000		77000	1000000		960	7100		210	16000		1200	900	J	210	ND		230	2400		290
Chrysene			3000000		43000	2400000	E	540	10000		120	47000		650	3100		120	ND		130	6500		160
Dibenz(a,h)anthracene			200000	J	27000	230000		340	1200		75	1400	J	410	ND		75	ND		82	310	J	100
Fluoranthene			6800000		270000	9200000	E	3400	19000		740	200000		4100	6600		740	ND		810	15000		1000
Fluorene			3900000		110000	3900000	E	1300	1700		290	88000		1600	870	J	290	ND		320	600	J	400
Indeno[1,2,3-cd]pyrene			930000		37000	1000000		460	5100		100	6200		550	420	J	100	ND		110	1200	J	140
1-Methylnaphthalene			3100000		170000	5100000	E	2100	800	J	450	52000		2500	ND		450	ND		500	ND		630
2-Methylnaphthalene			3400000		230000	5900000	E	2900	990	J	640	ND		3500	ND		640	ND		700	ND		880
Naphthalene			2000000	J	970000	3400000	E	12000	ND		2600	ND		15000	ND		2600	ND		2900	ND		3600
Perylene			430000		170000	400000		2100	3000		460	5500		2600	1400		460	3000		510	2200		640
Phenanthrene			17000000		580000	17000000	E	7200	11000		1600	360000		8700	3900		1600	ND		1700	6100		2200
Pyrene			11000000		100000	14000000	E	1300	23000		270	310000		1500	9500		270	ND		300	17000		380
C1-Fluoranthenes/pyrene			4600000		330000	5600000		4200	14000		910	120000		5000	7600		910	ND		1000	12000		1300
C1-Fluorenes			1500000		430000	1700000		5400	ND		1200	51000		6500	1600	J	1200	ND		1300	1700	J	1600
C2-Fluorenes			800000		330000	730000		4200	1900		910	39000		5000	7100		910	ND		1000	4600		1300
C3-Fluorenes			ND		330000	280000		4200	2200		910	39000		5000	9700		910	ND		1000	8000		1300
C2-Naphthalenes			5200000		670000	8400000		8300	1800		1800	160000		10000	4400		1800	ND		2000	ND		2500
C3-Naphthalenes			2600000		670000	3800000		8300	2500		1800	120000		10000	25000		1800	ND		2000	5600		2500
C4-Naphthalenes			ND		930000	1100000		12000	ND		2500	69000		14000	25000		2500	ND		2800	8900		3500
C1-Phenanthrenes/Anthracenes			3900000		1100000	4400000		14000	5200		3100	110000		17000	4900		3100	ND		3400	5100		4300
C2-Phenanthrenes/Anthracenes			2500000		330000	2400000		4200	8900		910	100000		5000	14000		910	ND		1000	11000		1300
C3-Phenanthrenes/Anthracenes			710000		330000	650000		4200	6100		910	62000		5000	12000		910	ND		1000	11000		1300
C4-Phenanthrenes/Anthracenes			ND		330000	170000		4200	3200		910	28000		5000	5200		910	ND		1000	5400		1300
C1-Chrysenes/Benz(a)anthracenes			1200000		330000	1100000		4200	9200		910	29000		5000	2800		910	ND		1000	4900		1300
C2-Chrysenes/Benz(a)anthracenes			ND		330000	280000		4200	4800		910	11000		5000	1300		910	ND		1000	2400		1300
C3-Chrysenes/Benz(a)anthracenes			ND		330000	51000		4200	2400		910	6200		5000	ND		910	ND		1000	ND		1300
C4-Chrysenes/Benz(a)anthracenes			ND		330000	18000		4200	1000		910	ND		5000	ND		910	ND		1000	ND		1300
PCB-14	Di	PRC	ND		3300.0	ND		42.0	ND		9.1	58	J	50.0	420	J	9.1	400	J	10.0	170	J	13.0
PCB-36	Tri	PRC	ND		3300.0	ND		42.0	ND		9.1	ND		50.0	420	J	9.1	340	J	10.0	190	J	13.0
PCB-78	Tetra	PRC	ND		3300.0	ND		42.0	ND		9.1	210	J	50.0	1100		9.1	1100		10.0	800	J	13.0
PCB-104	Penta	PRC	ND		3300.0	110	J	42.0	10	J	9.1	260	J	50.0	1200		9.1	1700		10.0	990	J	13.0
PCB-121	Penta	PRC	ND		3300.0	ND		42.0	91	J	9.1	120	J	50.0	900	J	9.1	720	J	10.0	790	J	13.0
PCB-142	Hexa	PRC	ND		3300.0	ND		42.0	68	J	9.1	80	J	50.0	470	J	9.1	590	J	10.0	460	J	13.0
PCB-155	Hexa	PRC	ND		3300.0	ND		42.0	33	J	9.1	83	J	50.0	540	J	9.1	600	J	10.0	690	J	13.0
PCB-184	Hepta	PRC	ND		3300.0	ND		42.0	200	J	9.1	110	J	50.0	790	J	9.1	820	J	10.0	1100	J	13.0
PCB-192	Hepta	PRC	ND		3300.0	160	J	42.0	540	J	9.1	400	J	50.0	1800		9.1	1900		10.0	2900		13.0
PCB-204	Octa	PRC	ND		3300.0	110	J	42.0	860	J	9.1	340	J	50.0	1300		9.1	1400		10.0	2000		13.0
Total PAHs			**101260000**			**134739000**			**194400**			**2608500**			**155910**			**3000**			**151800**		

Notes:

J: Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
AP: Compounds have an altered pattern compared to the reference pattern within the expected retention time window. This may be due to interferences from non-target compounds, and/or due to different relative concentrations of the compounds.
E: Result exceeded calibration range.
MDL: method detection limit
ND: Non-detect
ng/g: nanograms per gram
PAH: Polycyclic aromatic hydrocarbons
PRC: performance reference compound

Table A1. Concentration of Analytes in Polyethylene.
GEI Consultants, MGP Site, MA

Client ID			1804576-854-S2			GEI.PRC.BLK1			GEI.PRC.BLK2			GEI.PRC.BLK3		
Analyte	Homolog Group	PRC	Result (ng/g)	Qualifier	MDL (ng/g)	Result (ng/g)	Qualifier	MDL (ng/g)	Result (ng/g)	Qualifier	MDL (ng/g)	Result (ng/g)	Qualifier	MDL (ng/g)
Acenaphthene			9000		220	ND		220	ND		240	ND		240
Acenaphthylene			680	J	61	ND		61	ND		66	ND		66
Anthracene			21000		270	ND		270	ND		290	ND		290
Benzo[a]anthracene			21000		310	ND		310	ND		340	ND		340
Benzo[a]pyrene			9800		230	ND		230	ND		250	ND		250
Benzo[b]fluoranthene			9700		290	ND		290	ND		320	ND		320
Benzo[e]pyrene			6200		130	ND		130	ND		150	ND		150
Benzo[g,h,i]perylene			2600		92	ND		92	ND		100	ND		100
Benzo[k]fluoranthene			5300		190	ND		190	ND		210	ND		210
Chrysene			22000		110	ND		110	ND		120	ND		120
Dibenz(a,h)anthracene			640	J	68	ND		68	ND		75	ND		75
Fluoranthene			78000		680	ND		680	ND		740	ND		740
Fluorene			6800		270	ND		270	ND		290	ND		290
Indeno[1,2,3-cd]pyrene			2700		92	ND		92	ND		100	ND		100
1-Methylnaphthalene			ND		420	ND		420	ND		450	ND		450
2-Methylnaphthalene			ND		580	640	J	580	ND		640	ND		640
Naphthalene			ND		2400	ND		2400	ND		2600	ND		2600
Perylene			6200		430	ND		430	ND		460	ND		460
Phenanthrene			71000		1400	ND		1400	ND		1600	ND		1600
Pyrene			98000		250	ND		250	ND		270	ND		270
C1-Fluoranthenes/pyrene			53000		830	ND		830	ND		910	ND		910
C1-Fluorenes			18000		1100	ND		1100	ND		1200	ND		1200
C2-Fluorenes			30000		830	ND		830	ND		910	ND		910
C3-Fluorenes			26000		830	ND		830	ND		910	ND		910
C2-Naphthalenes			14000		1700	ND		1700	ND		1800	ND		1800
C3-Naphthalenes			65000		1700	ND		1700	ND		1800	ND		1800
C4-Naphthalenes			56000		2300	ND		2300	ND		2500	ND		2500
C1-Phenanthrenes/Anthracenes			51000		2800	ND		2800	ND		3100	ND		3100
C2-Phenanthrenes/Anthracenes			64000		830	ND		830	ND		910	ND		910
C3-Phenanthrenes/Anthracenes			32000		830	ND		830	ND		910	ND		910
C4-Phenanthrenes/Anthracenes			11000		830	ND		830	ND		910	ND		910
C1-Chrysenes/Benz(a)anthracenes			15000		830	ND		830	ND		910	ND		910
C2-Chrysenes/Benz(a)anthracenes			5100		830	ND		830	ND		910	ND		910
C3-Chrysenes/Benz(a)anthracenes			1600		830	ND		830	ND		910	ND		910
C4-Chrysenes/Benz(a)anthracenes			ND		830	ND		830	ND		910	ND		910
PCB-14	Di	PRC	500	J	8.3	3300		8.3	2800		9.1	2900		9.1
PCB-36	Tri	PRC	400	J	8.3	1200		8.3	920		9.1	900	J	9.1
PCB-78	Tetra	PRC	1200		8.3	2800		8.3	2100		9.1	2200		9.1
PCB-104	Penta	PRC	1400		8.3	3200		8.3	2400		9.1	2500		9.1
PCB-121	Penta	PRC	990		8.3	1200		8.3	940		9.1	840	J	9.1
PCB-142	Hexa	PRC	540	J	8.3	880		8.3	600	J	9.1	580	J	9.1
PCB-155	Hexa	PRC	700	J	8.3	910		8.3	770	J	9.1	760	J	9.1
PCB-184	Hepta	PRC	900		8.3	1400		8.3	990		9.1	870	J	9.1
PCB-192	Hepta	PRC	2200		8.3	2700		8.3	2400		9.1	2300		9.1
PCB-204	Octa	PRC	1500		8.3	1900		8.3	1600		9.1	1500		9.1
Total PAHs			**812320**			**640**			**0**			**0**		

Notes:
J: Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
AP: Compounds have an altered pattern compared to the reference pattern within the expected retention time window. This may be due to interferences from non-target compounds, and/or due to different relative concentrations of the compounds.
E: Result exceeded calibration range.
MDL: method detection limit
ND: Non-detect
ng/g: nanograms per gram
PAH: Polycyclic aromatic hydrocarbons
PRC: performance reference compound

TABLE A2

Table A2. Elimination Rates (k_e) and Percentage to Steady State Reached by PRCs During Deployment.

GEI Consultants, MGP Site, MA

Client ID		1804576-843-S1		1804576-843-S2		1804576-844-S1		1804576-844-S3		1804576-846-S1		1804576-846-S3		1804576-851-S1		1804576-852-S1		1804576-852-S2	
PRC	Homolog Group	k_e	Steady State	k_e	Steady State	k_e	Steady State	k_e	Steady State	k_e	Steady State	k_e	Steady State	k_e	Steady State	k_e	Steady State	k_e	Steady State
		(d^{-1})	%	(d^{-1})	%	(d^{-1})	%	(d^{-1})	%	(d^{-1})	%	(d^{-1})	%	(d^{-1})	%	(d^{-1})	%	(d^{-1})	%
PCB-14	Di	> 0.2	100%	> 0.14	100%	0.0731	88%	0.0712	87%	0.0871	92%	0.0712	87%	0.0818	91%	> 0.2	100%	0.1361	98%
PCB-36	Tri	> 0.16	100%	> 0.1	100%	0.0293	57%	0.0270	54%	0.0429	71%	0.0374	66%	0.0454	73%	> 0.16	100%	> 0.1	100%
PCB-78	Tetra	0.0789	90%	> 0.13	100%	0.0234	49%	0.0264	54%	0.0337	62%	0.0264	54%	0.0333	62%	> 0.19	100%	0.0835	91%
PCB-104	Penta	0.0849	91%	0.0934	93%	0.0160	37%	0.0280	56%	0.0280	56%	0.0280	56%	0.0310	59%	0.1930	100%	0.0807	90%
PCB-121	Penta	0.0570	81%	> 0.1	100%	0.0062	16%	0.0204	45%	0.0273	55%	0.0157	37%	0.0174	40%	0.0824	91%	0.0729	88%
PCB-142	Hexa	0.0462	74%	> 0.09	100%	0.0041	11%	0.0109	27%	0.0170	39%	0.0116	29%	0.0213	46%	0.0797	90%	0.0741	88%
PCB-155	Hexa	0.0520	78%	0.0808	90%	0.0042	11%	0.0161	37%	0.0168	39%	0.0220	47%	0.0197	43%	0.1105	96%	0.0787	90%
PCB-184	Hepta	0.0480	75%	0.0833	91%	0.0039	11%	0.0101	25%	0.0142	34%	0.0128	31%	0.0162	37%	0.0584	82%	0.0790	90%
PCB-192	Hepta	0.0393	68%	0.0715	87%	OUTLIER	OUTLIER	0.0055	15%	0.0128	31%	0.0090	23%	0.0109	27%	0.0524	78%	0.0627	84%
PCB-204	Octa	0.0294	57%	0.0683	86%	OUTLIER	OUTLIER	0.0014	4%	0.0086	22%	0.0086	22%	0.0086	22%	0.0228	48%	0.0548	80%

Notes

%: percent
d: day
k_e: elimination rate
PCB: Polychlorinated biphenyl
PRC: Performance Reference Compound

Table A2. Elimination Rates (k_e) and Percentage to Steady State Reached by PRCs During Deployment.

GEI Consultants, MGP Site, MA

Client ID		1804576-853-S1		1804576-853-S3		1804576-854-S1		1804576-854-S2	
PRC	Homolog Group	k_e	Steady State	k_e	Steady State	k_e	Steady State	k_e	Steady State
		(d^{-1})	%	(d^{-1})	%	(d^{-1})	%	(d^{-1})	%
PCB-14	Di	0.0678	86%	0.0695	87%	0.0990	94%	0.0618	83%
PCB-36	Tri	0.0301	58%	0.0374	66%	0.0575	81%	0.0318	60%
PCB-78	Tetra	0.0264	54%	0.0264	54%	0.0374	66%	0.0234	49%
PCB-104	Penta	0.0280	56%	0.0160	37%	0.0346	63%	0.0226	48%
PCB-121	Penta	OUTLIER	OUTLIER	0.0111	28%	0.0079	20%	OUTLIER	OUTLIER
PCB-142	Hexa	0.0131	32%	0.0052	14%	0.0138	33%	0.0083	21%
PCB-155	Hexa	0.0141	34%	0.0105	26%	0.0057	15%	0.0052	14%
PCB-184	Hepta	0.0110	27%	0.0097	25%	OUTLIER	OUTLIER	0.0065	17%
PCB-192	Hepta	0.0109	27%	0.0090	23%	OUTLIER	OUTLIER	0.0039	11%
PCB-204	Octa	0.0086	22%	0.0060	16%	OUTLIER	OUTLIER	0.0036	10%

Notes

%: percent
d: day
k_e: elimination rate
PCB: Polychlorinated biphenyl
PRC: Performance Reference Compound

ATTACHMENT B:

POLYETHYLENE-WATER PARTITION COEFFICIENTS (K_{PE}) USED IN THIS ANALYSIS

Analyte	Log_{10} K_{PE}	Source of $Log_{10}K_{PE}$
PCB-14	4.99	Best empirical values, Table 2 from Jonker (2022)
PCB-36	5.28	Calculated from Jonker (2022) PCB model using Log_{10} K_{OW} obtained from Sabljic et al. (1993)
PCB-78	6.03	Best empirical values, Table 2 from Jonker (2022)
PCB-104	6.00	Best empirical values, Table 2 from Jonker (2022)
PCB-121	6.27	Calculated from Jonker (2022) PCB model using Log_{10} K_{OW} obtained from Sabljic et al. (1993)
PCB-142	6.57	Calculated from Jonker (2022) PCB model using Log_{10} K_{OW} obtained from Sabljic et al. (1993)
PCB-155	6.81	Best empirical values, Table 2 from Jonker (2022)
PCB-184	7.13	Calculated from Jonker (2022) PCB model using Log_{10} K_{OW} obtained from Sabljic et al. (1993)
PCB-192	7.07	Calculated from Jonker (2022) PCB model using Log_{10} K_{OW} obtained from Sabljic et al. (1993)
PCB-204	7.77	Best empirical values, Table 2 from Jonker (2022)
Acenaphthene	3.26	Calculated from Jonker (2022) PAH model using Log_{10} K_{OW} obtained from Neff et al. (2005)
Acenaphthylene	3.43	Calculated from Jonker (2022) PAH model using Log_{10} K_{OW} obtained from Neff et al. (2005)
Anthracene	4.25	Best empirical values, Table 2 from Jonker (2022)
Benzo[a]anthracene	5.58	Best empirical values, Table 2 from Jonker (2022)
Benzo[a]pyrene	6.44	Best empirical values, Table 2 from Jonker (2022)
Benzo[b]fluoranthene	6.3	Best empirical values, Table 2 from Jonker (2022)
Benzo[g,h,i]perylene	7.03	Best empirical values, Table 2 from Jonker (2022)
Benzo[k]fluoranthene	6.42	Best empirical values, Table 2 from Jonker (2022)
Chrysene	5.58	Best empirical values, Table 2 from Jonker (2022)
Dibenz[a,h]anthracene	6.99	Best empirical values, Table 2 from Jonker (2022)
Fluoranthene	4.77	Best empirical values, Table 2 from Jonker (2022)
Fluorene	3.56	Calculated from Jonker (2022) PAH model using Log_{10} K_{OW} obtained from Neff et al. (2005)
Indeno[1,2,3-cd]pyrene	7.15	Best empirical values, Table 2 from Jonker (2022)
Naphthalene	2.63	Calculated from Jonker (2022) PAH model using Log_{10} K_{OW} obtained from Neff et al. (2005)
Phenanthrene	4.11	Best empirical values, Table 2 from Jonker (2022)
Pyrene	4.91	Best empirical values, Table 2 from Jonker (2022)
Benzo[e]pyrene	6.24	Best empirical values, Table 2 from Jonker (2022)
Perylene	5.94	Calculated from Jonker (2022) PAH model using Log_{10} K_{OW} obtained from Neff et al. (2005)
1-Methylnaphthalene	3.2	Calculated from Jonker (2022) PAH model using Log_{10} K_{OW} obtained from Neff et al. (2005)
2-Methylnaphthalene	3.2	Calculated from Jonker (2022) PAH model using Log_{10} K_{OW} obtained from Neff et al. (2005)
C1-Chrysenes/Benz(a)anthracenes	6.13	Calculated from Jonker (2022) PAH model using Log_{10} K_{OW} obtained from Neff et al. (2005)
C2-Chrysenes/Benz(a)anthracenes	6.66	Calculated from Jonker (2022) PAH model using Log_{10} K_{OW} obtained from Neff et al. (2005)
C3-Chrysenes/Benz(a)anthracenes	7.31	Calculated from Jonker (2022) PAH model using Log_{10} K_{OW} obtained from Neff et al. (2005)
C4-Chrysenes/Benz(a)anthracenes	7.95	Calculated from Jonker (2022) PAH model using Log_{10} K_{OW} obtained from Neff et al. (2005)
C1-Fluoranthenes/pyrene	5.33	Calculated from Jonker (2022) PAH model using Log_{10} K_{OW} obtained from Neff et al. (2005)
C1-Fluorenes	4.47	Calculated from Jonker (2022) PAH model using Log_{10} K_{OW} obtained from Neff et al. (2005)
C2-Fluorenes	4.73	Calculated from Jonker (2022) PAH model using Log_{10} K_{OW} obtained from Neff et al. (2005)
C3-Fluorenes	5.08	Calculated from Jonker (2022) PAH model using Log_{10} K_{OW} obtained from Neff et al. (2005)
C2-Naphthalenes	3.78	Calculated from Jonker (2022) PAH model using Log_{10} K_{OW} obtained from Neff et al. (2005)
C3-Naphthalenes	4.39	Calculated from Jonker (2022) PAH model using Log_{10} K_{OW} obtained from Neff et al. (2005)
C4-Naphthalenes	5.13	Calculated from Jonker (2022) PAH model using Log_{10} K_{OW} obtained from Neff et al. (2005)
C1-Phenanthrenes/Anthracenes	4.66	Calculated from Jonker (2022) PAH model using Log_{10} K_{OW} obtained from Neff et al. (2005)
C2-Phenanthrenes/Anthracenes	5.09	Calculated from Jonker (2022) PAH model using Log_{10} K_{OW} obtained from Neff et al. (2005)
C3-Phenanthrenes/Anthracenes	5.65	Calculated from Jonker (2022) PAH model using Log_{10} K_{OW} obtained from Neff et al. (2005)
C4-Phenanthrenes/Anthracenes	6.24	Calculated from Jonker (2022) PAH model using Log_{10} K_{OW} obtained from Neff et al. (2005)

References Cited

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Sabljic, A., Guesten, H., Hermens, J., Opperhuizen, A. 1993. Modeling octanol/water partition coefficients by molecular topology: chlorinated benzenes and biphenyls. Environ. Sci. Technol. 27:1394-1402.

ATTACHMENT C:

EUROFINS ENVIRONMENT TESTING AMERICA
ANALYTICAL LABORATORY REPORT

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Brent Pautler
Sirem, div of Geosyntec Consultants
130 Stone Rd West
Guelph, Ontario N1G 3Z2

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JOB DESCRIPTION

GEI Ex-Situ MGP SP3

JOB NUMBER

140-34148-1

Eurofins Knoxville
5815 Middlebrook Pike
Knoxville TN 37921

See page two for job notes and contact information.

myEOL

Eurofins Knoxville

Job Notes

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Definitions/Glossary

Client: Sirem, div of Geosyntec Consultants
Job ID: 140-34148-1
Project/Site: GEI Ex-Situ MGP SP3

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
AP	Compounds have an altered pattern compared to the reference pattern within the expected retention time window. This may be due to interferences from non-target compounds, and/or due to different relative concentrations of the compounds.
E	Result exceeded calibration range.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job Narrative
140-34148-1

Revision
The report being provided is a revision of the original report sent on 11/27/2023. The report (revision 1) is being revised due to: The client requested a re-analysis of 1 sample at a lesser dilution..

Receipt
The samples were received on 10/27/2023 at 9:30am and arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.8º C.

Receipt Exceptions
The Field Sampler was not listed on the Chain of Custody.

GC/MS Semi VOA
Method ID-0016: The following sample was diluted to bring the concentration of target analytes within the calibration range: 1804576-852-S2. Elevated reporting limits (RLs) are provided.

Method ID-0016: The following sample was diluted to bring the concentration of target analytes within the calibration range: 1804576-843-S2. Elevated reporting limits (RLs) are provided.

Method ID-0016: The required dilution factor for the following sample was higher than could be achieved by "in vial" dilution, as it would dilute out the Isotope Dilution Analytes (IDA): 1804576-851-S2. As such, the dilution was achieved by taking a subsample of the undiluted extract, adding sufficient solvent, and re-spiking the extract with IDA.

Method ID-0016: The following sample was diluted due to the nature of the sample matrix: 1804576-851-S2. Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Sample Summary

Client: Sirem, div of Geosyntec Consultants
Job ID: 140-34148-1
Project/Site: GEI Ex-Situ MGP SP3

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
140-34148-1	GEI.PRC.BLK1	PE	10/26/23 14:00	10/27/23 09:30
140-34148-2	GEI.PRC.BLK2	PE	10/26/23 14:00	10/27/23 09:30
140-34148-3	GEI.PRC.BLK3	PE	10/26/23 14:00	10/27/23 09:30
140-34148-4	1804576-851-S1	PE	10/26/23 14:00	10/27/23 09:30
140-34148-5	1804576-851-S2	PE	10/26/23 14:00	10/27/23 09:30
140-34148-6	1804576-852-S1	PE	10/26/23 14:00	10/27/23 09:30
140-34148-7	1804576-852-S2	PE	10/26/23 14:00	10/27/23 09:30
140-34148-8	1804576-843-S1	PE	10/26/23 14:00	10/27/23 09:30
140-34148-9	1804576-843-S2	PE	10/26/23 14:00	10/27/23 09:30
140-34148-10	1804576-844-S1	PE	10/26/23 14:00	10/27/23 09:30
140-34148-11	1804576-844-S3	PE	10/26/23 14:00	10/27/23 09:30
140-34148-12	1804576-854-S1	PE	10/26/23 14:00	10/27/23 09:30
140-34148-13	1804576-854-S2	PE	10/26/23 14:00	10/27/23 09:30
140-34148-14	1804576-846-S1	PE	10/26/23 14:00	10/27/23 09:30
140-34148-15	1804576-846-S3	PE	10/26/23 14:00	10/27/23 09:30
140-34148-16	1804576-853-S1	PE	10/26/23 14:00	10/27/23 09:30
140-34148-17	1804576-853-S3	PE	10/26/23 14:00	10/27/23 09:30

Client Sample ID: GEI.PRC.BLK1
Lab Sample ID: 140-34148-1

Date Collected: 10/26/23 14:00
Matrix: PE

Date Received: 10/27/23 09:30

Method: ID-0016 - PAHs (GC/MS Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		830	220	ng/g		11/03/23 10:43	11/13/23 21:45	1
Acenaphthylene	ND		830	61	ng/g		11/03/23 10:43	11/13/23 21:45	1
Anthracene	ND		830	270	ng/g		11/03/23 10:43	11/13/23 21:45	1
Benzo[a]anthracene	ND		830	310	ng/g		11/03/23 10:43	11/13/23 21:45	1
Benzo[a]pyrene	ND		830	230	ng/g		11/03/23 10:43	11/13/23 21:45	1
Benzo[b]fluoranthene	ND		830	290	ng/g		11/03/23 10:43	11/13/23 21:45	1
Benzo[e]pyrene	ND		830	130	ng/g		11/03/23 10:43	11/13/23 21:45	1
Benzo[g,h,i]perylene	ND		830	92	ng/g		11/03/23 10:43	11/13/23 21:45	1
Benzo[k]fluoranthene	ND		830	190	ng/g		11/03/23 10:43	11/13/23 21:45	1
Chrysene	ND		830	110	ng/g		11/03/23 10:43	11/13/23 21:45	1
Dibenz(a,h)anthracene	ND		830	68	ng/g		11/03/23 10:43	11/13/23 21:45	1
Fluoranthene	ND		830	680	ng/g		11/03/23 10:43	11/13/23 21:45	1
Fluorene	ND		830	270	ng/g		11/03/23 10:43	11/13/23 21:45	1
Indeno[1,2,3-cd]pyrene	ND		830	92	ng/g		11/03/23 10:43	11/13/23 21:45	1
1-Methylnaphthalene	ND		4200	420	ng/g		11/03/23 10:43	11/13/23 21:45	1
2-Methylnaphthalene	**640**	**J**	4200	580	ng/g		11/03/23 10:43	11/13/23 21:45	1
Naphthalene	ND		17000	2400	ng/g		11/03/23 10:43	11/13/23 21:45	1
Perylene	ND		830	430	ng/g		11/03/23 10:43	11/13/23 21:45	1
Phenanthrene	ND		1700	1400	ng/g		11/03/23 10:43	11/13/23 21:45	1
Pyrene	ND		1700	250	ng/g		11/03/23 10:43	11/13/23 21:45	1
C1-Fluoranthenes/pyrene	ND		830	830	ng/g		11/03/23 10:43	11/13/23 21:45	1
C1-Fluorenes	ND		1700	1100	ng/g		11/03/23 10:43	11/13/23 21:45	1
C2-Fluorenes	ND		830	830	ng/g		11/03/23 10:43	11/13/23 21:45	1
C3-Fluorenes	ND		830	830	ng/g		11/03/23 10:43	11/13/23 21:45	1
C2-Naphthalenes	ND		1700	1700	ng/g		11/03/23 10:43	11/13/23 21:45	1
C3-Naphthalenes	ND		1700	1700	ng/g		11/03/23 10:43	11/13/23 21:45	1
C4-Naphthalenes	ND		2500	2300	ng/g		11/03/23 10:43	11/13/23 21:45	1
C1-Phenanthrenes/Anthracenes	ND		3300	2800	ng/g		11/03/23 10:43	11/13/23 21:45	1
C2-Phenanthrenes/Anthracenes	ND		830	830	ng/g		11/03/23 10:43	11/13/23 21:45	1
C3-Phenanthrenes/Anthracenes	ND		830	830	ng/g		11/03/23 10:43	11/13/23 21:45	1
C4-Phenanthrenes/Anthracenes	ND		830	830	ng/g		11/03/23 10:43	11/13/23 21:45	1
C1-Chrysenes/Benz(a)anthracenes	ND		830	830	ng/g		11/03/23 10:43	11/13/23 21:45	1
C2-Chrysenes/Benz(a)anthracenes	ND		830	830	ng/g		11/03/23 10:43	11/13/23 21:45	1
C3-Chrysenes/Benz(a)anthracenes	ND		830	830	ng/g		11/03/23 10:43	11/13/23 21:45	1
C4-Chrysenes/Benz(a)anthracenes	ND		830	830	ng/g		11/03/23 10:43	11/13/23 21:45	1
PCB-14	**3300**		830	8.3	ng/g		11/03/23 10:43	11/13/23 21:45	1
PCB-192	**2700**		830	8.3	ng/g		11/03/23 10:43	11/13/23 21:45	1
PCB-184	**1400**		830	8.3	ng/g		11/03/23 10:43	11/13/23 21:45	1
PCB-155	**910**		830	8.3	ng/g		11/03/23 10:43	11/13/23 21:45	1
PCB-142	**880**		830	8.3	ng/g		11/03/23 10:43	11/13/23 21:45	1
PCB-204	**1900**		830	8.3	ng/g		11/03/23 10:43	11/13/23 21:45	1
PCB-104	**3200**		830	8.3	ng/g		11/03/23 10:43	11/13/23 21:45	1
PCB-121	**1200**		830	8.3	ng/g		11/03/23 10:43	11/13/23 21:45	1
PCB-78	**2800**		830	8.3	ng/g		11/03/23 10:43	11/13/23 21:45	1
PCB-36	**1200**		830	8.3	ng/g		11/03/23 10:43	11/13/23 21:45	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Acenaphthylene-d8	*72*		*30 - 120*	*11/03/23 10:43*	*11/13/23 21:45*	*1*
Anthracene-d10	*66*		*30 - 120*	*11/03/23 10:43*	*11/13/23 21:45*	*1*
Benzo(a)pyrene-d12	*66*		*30 - 120*	*11/03/23 10:43*	*11/13/23 21:45*	*1*

Client Sample ID: GEI.PRC.BLK1
Lab Sample ID: 140-34148-1

Date Collected: 10/26/23 14:00
Matrix: PE
Date Received: 10/27/23 09:30

Method: ID-0016 - PAHs (GC/MS Isotope Dilution) (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Benzo(b)fluoranthene-d12	79		30 - 120	11/03/23 10:43	11/13/23 21:45	1
Benzo(ghi)perylene-d12	79		30 - 120	11/03/23 10:43	11/13/23 21:45	1
Benzo(k)fluoranthene-d12	77		30 - 120	11/03/23 10:43	11/13/23 21:45	1
Chrysene-d12	70		30 - 120	11/03/23 10:43	11/13/23 21:45	1
Dibenz(a,h)anthracene-d14	73		30 - 120	11/03/23 10:43	11/13/23 21:45	1
Fluoranthene-d10	80		30 - 120	11/03/23 10:43	11/13/23 21:45	1
Fluorene -d10	78		30 - 120	11/03/23 10:43	11/13/23 21:45	1
Indeno[1,2,3-cd]pyrene-d12	78		30 - 120	11/03/23 10:43	11/13/23 21:45	1
1-Methylnaphthalene-d10	79		30 - 120	11/03/23 10:43	11/13/23 21:45	1
2-Methylnaphthalene-d10	76		30 - 120	11/03/23 10:43	11/13/23 21:45	1
Naphthalene-d8	72		30 - 120	11/03/23 10:43	11/13/23 21:45	1
Perylene-d12	60		30 - 120	11/03/23 10:43	11/13/23 21:45	1
Phenanthrene-d10	68		30 - 120	11/03/23 10:43	11/13/23 21:45	1

Client Sample ID: GEI.PRC.BLK2
Lab Sample ID: 140-34148-2

Date Collected: 10/26/23 14:00
Matrix: PE

Date Received: 10/27/23 09:30

Method: ID-0016 - PAHs (GC/MS Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		910	240	ng/g		11/03/23 10:43	11/13/23 22:08	1
Acenaphthylene	ND		910	66	ng/g		11/03/23 10:43	11/13/23 22:08	1
Anthracene	ND		910	290	ng/g		11/03/23 10:43	11/13/23 22:08	1
Benzo[a]anthracene	ND		910	340	ng/g		11/03/23 10:43	11/13/23 22:08	1
Benzo[a]pyrene	ND		910	250	ng/g		11/03/23 10:43	11/13/23 22:08	1
Benzo[b]fluoranthene	ND		910	320	ng/g		11/03/23 10:43	11/13/23 22:08	1
Benzo[e]pyrene	ND		910	150	ng/g		11/03/23 10:43	11/13/23 22:08	1
Benzo[g,h,i]perylene	ND		910	100	ng/g		11/03/23 10:43	11/13/23 22:08	1
Benzo[k]fluoranthene	ND		910	210	ng/g		11/03/23 10:43	11/13/23 22:08	1
Chrysene	ND		910	120	ng/g		11/03/23 10:43	11/13/23 22:08	1
Dibenz(a,h)anthracene	ND		910	75	ng/g		11/03/23 10:43	11/13/23 22:08	1
Fluoranthene	ND		910	740	ng/g		11/03/23 10:43	11/13/23 22:08	1
Fluorene	ND		910	290	ng/g		11/03/23 10:43	11/13/23 22:08	1
Indeno[1,2,3-cd]pyrene	ND		910	100	ng/g		11/03/23 10:43	11/13/23 22:08	1
1-Methylnaphthalene	ND		4500	450	ng/g		11/03/23 10:43	11/13/23 22:08	1
2-Methylnaphthalene	ND		4500	640	ng/g		11/03/23 10:43	11/13/23 22:08	1
Naphthalene	ND		18000	2600	ng/g		11/03/23 10:43	11/13/23 22:08	1
Perylene	ND		910	460	ng/g		11/03/23 10:43	11/13/23 22:08	1
Phenanthrene	ND		1800	1600	ng/g		11/03/23 10:43	11/13/23 22:08	1
Pyrene	ND		1800	270	ng/g		11/03/23 10:43	11/13/23 22:08	1
C1-Fluoranthenes/pyrene	ND		910	910	ng/g		11/03/23 10:43	11/13/23 22:08	1
C1-Fluorenes	ND		1800	1200	ng/g		11/03/23 10:43	11/13/23 22:08	1
C2-Fluorenes	ND		910	910	ng/g		11/03/23 10:43	11/13/23 22:08	1
C3-Fluorenes	ND		910	910	ng/g		11/03/23 10:43	11/13/23 22:08	1
C2-Naphthalenes	ND		1800	1800	ng/g		11/03/23 10:43	11/13/23 22:08	1
C3-Naphthalenes	ND		1800	1800	ng/g		11/03/23 10:43	11/13/23 22:08	1
C4-Naphthalenes	ND		2700	2500	ng/g		11/03/23 10:43	11/13/23 22:08	1
C1-Phenanthrenes/Anthracenes	ND		3600	3100	ng/g		11/03/23 10:43	11/13/23 22:08	1
C2-Phenanthrenes/Anthracenes	ND		910	910	ng/g		11/03/23 10:43	11/13/23 22:08	1
C3-Phenanthrenes/Anthracenes	ND		910	910	ng/g		11/03/23 10:43	11/13/23 22:08	1
C4-Phenanthrenes/Anthracenes	ND		910	910	ng/g		11/03/23 10:43	11/13/23 22:08	1
C1-Chrysenes/Benz(a)anthracenes	ND		910	910	ng/g		11/03/23 10:43	11/13/23 22:08	1
C2-Chrysenes/Benz(a)anthracenes	ND		910	910	ng/g		11/03/23 10:43	11/13/23 22:08	1
C3-Chrysenes/Benz(a)anthracenes	ND		910	910	ng/g		11/03/23 10:43	11/13/23 22:08	1
C4-Chrysenes/Benz(a)anthracenes	ND		910	910	ng/g		11/03/23 10:43	11/13/23 22:08	1
PCB-14	**2800**		910	9.1	ng/g		11/03/23 10:43	11/13/23 22:08	1
PCB-192	**2400**		910	9.1	ng/g		11/03/23 10:43	11/13/23 22:08	1
PCB-184	**990**		910	9.1	ng/g		11/03/23 10:43	11/13/23 22:08	1
PCB-155	**770**	**J**	910	9.1	ng/g		11/03/23 10:43	11/13/23 22:08	1
PCB-142	**600**	**J**	910	9.1	ng/g		11/03/23 10:43	11/13/23 22:08	1
PCB-204	**1600**		910	9.1	ng/g		11/03/23 10:43	11/13/23 22:08	1
PCB-104	**2400**		910	9.1	ng/g		11/03/23 10:43	11/13/23 22:08	1
PCB-121	**940**		910	9.1	ng/g		11/03/23 10:43	11/13/23 22:08	1
PCB-78	**2100**		910	9.1	ng/g		11/03/23 10:43	11/13/23 22:08	1
PCB-36	**920**		910	9.1	ng/g		11/03/23 10:43	11/13/23 22:08	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Acenaphthylene-d8	*79*		*30 - 120*	*11/03/23 10:43*	*11/13/23 22:08*	*1*
Anthracene-d10	*69*		*30 - 120*	*11/03/23 10:43*	*11/13/23 22:08*	*1*
Benzo(a)pyrene-d12	*73*		*30 - 120*	*11/03/23 10:43*	*11/13/23 22:08*	*1*

Client Sample ID: GEI.PRC.BLK2
Lab Sample ID: 140-34148-2

Date Collected: 10/26/23 14:00
Matrix: PE

Date Received: 10/27/23 09:30

Method: ID-0016 - PAHs (GC/MS Isotope Dilution) (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Benzo(b)fluoranthene-d12	86		30 - 120	11/03/23 10:43	11/13/23 22:08	1
Benzo(ghi)perylene-d12	85		30 - 120	11/03/23 10:43	11/13/23 22:08	1
Benzo(k)fluoranthene-d12	82		30 - 120	11/03/23 10:43	11/13/23 22:08	1
Chrysene-d12	74		30 - 120	11/03/23 10:43	11/13/23 22:08	1
Dibenz(a,h)anthracene-d14	79		30 - 120	11/03/23 10:43	11/13/23 22:08	1
Fluoranthene-d10	83		30 - 120	11/03/23 10:43	11/13/23 22:08	1
Fluorene -d10	80		30 - 120	11/03/23 10:43	11/13/23 22:08	1
Indeno[1,2,3-cd]pyrene-d12	84		30 - 120	11/03/23 10:43	11/13/23 22:08	1
1-Methylnaphthalene-d10	82		30 - 120	11/03/23 10:43	11/13/23 22:08	1
2-Methylnaphthalene-d10	82		30 - 120	11/03/23 10:43	11/13/23 22:08	1
Naphthalene-d8	80		30 - 120	11/03/23 10:43	11/13/23 22:08	1
Perylene-d12	68		30 - 120	11/03/23 10:43	11/13/23 22:08	1
Phenanthrene-d10	75		30 - 120	11/03/23 10:43	11/13/23 22:08	1

Client Sample ID: GEI.PRC.BLK3
Date Collected: 10/26/23 14:00
Date Received: 10/27/23 09:30

Lab Sample ID: 140-34148-3
Matrix: PE

Method: ID-0016 - PAHs (GC/MS Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		910	240	ng/g		11/03/23 10:43	11/13/23 22:31	1
Acenaphthylene	ND		910	66	ng/g		11/03/23 10:43	11/13/23 22:31	1
Anthracene	ND		910	290	ng/g		11/03/23 10:43	11/13/23 22:31	1
Benzo[a]anthracene	ND		910	340	ng/g		11/03/23 10:43	11/13/23 22:31	1
Benzo[a]pyrene	ND		910	250	ng/g		11/03/23 10:43	11/13/23 22:31	1
Benzo[b]fluoranthene	ND		910	320	ng/g		11/03/23 10:43	11/13/23 22:31	1
Benzo[e]pyrene	ND		910	150	ng/g		11/03/23 10:43	11/13/23 22:31	1
Benzo[g,h,i]perylene	ND		910	100	ng/g		11/03/23 10:43	11/13/23 22:31	1
Benzo[k]fluoranthene	ND		910	210	ng/g		11/03/23 10:43	11/13/23 22:31	1
Chrysene	ND		910	120	ng/g		11/03/23 10:43	11/13/23 22:31	1
Dibenz(a,h)anthracene	ND		910	75	ng/g		11/03/23 10:43	11/13/23 22:31	1
Fluoranthene	ND		910	740	ng/g		11/03/23 10:43	11/13/23 22:31	1
Fluorene	ND		910	290	ng/g		11/03/23 10:43	11/13/23 22:31	1
Indeno[1,2,3-cd]pyrene	ND		910	100	ng/g		11/03/23 10:43	11/13/23 22:31	1
1-Methylnaphthalene	ND		4500	450	ng/g		11/03/23 10:43	11/13/23 22:31	1
2-Methylnaphthalene	ND		4500	640	ng/g		11/03/23 10:43	11/13/23 22:31	1
Naphthalene	ND		18000	2600	ng/g		11/03/23 10:43	11/13/23 22:31	1
Perylene	ND		910	460	ng/g		11/03/23 10:43	11/13/23 22:31	1
Phenanthrene	ND		1800	1600	ng/g		11/03/23 10:43	11/13/23 22:31	1
Pyrene	ND		1800	270	ng/g		11/03/23 10:43	11/13/23 22:31	1
C1-Fluoranthenes/pyrene	ND		910	910	ng/g		11/03/23 10:43	11/13/23 22:31	1
C1-Fluorenes	ND		1800	1200	ng/g		11/03/23 10:43	11/13/23 22:31	1
C2-Fluorenes	ND		910	910	ng/g		11/03/23 10:43	11/13/23 22:31	1
C3-Fluorenes	ND		910	910	ng/g		11/03/23 10:43	11/13/23 22:31	1
C2-Naphthalenes	ND		1800	1800	ng/g		11/03/23 10:43	11/13/23 22:31	1
C3-Naphthalenes	ND		1800	1800	ng/g		11/03/23 10:43	11/13/23 22:31	1
C4-Naphthalenes	ND		2700	2500	ng/g		11/03/23 10:43	11/13/23 22:31	1
C1-Phenanthrenes/Anthracenes	ND		3600	3100	ng/g		11/03/23 10:43	11/13/23 22:31	1
C2-Phenanthrenes/Anthracenes	ND		910	910	ng/g		11/03/23 10:43	11/13/23 22:31	1
C3-Phenanthrenes/Anthracenes	ND		910	910	ng/g		11/03/23 10:43	11/13/23 22:31	1
C4-Phenanthrenes/Anthracenes	ND		910	910	ng/g		11/03/23 10:43	11/13/23 22:31	1
C1-Chrysenes/Benz(a)anthracenes	ND		910	910	ng/g		11/03/23 10:43	11/13/23 22:31	1
C2-Chrysenes/Benz(a)anthracenes	ND		910	910	ng/g		11/03/23 10:43	11/13/23 22:31	1
C3-Chrysenes/Benz(a)anthracenes	ND		910	910	ng/g		11/03/23 10:43	11/13/23 22:31	1
C4-Chrysenes/Benz(a)anthracenes	ND		910	910	ng/g		11/03/23 10:43	11/13/23 22:31	1
PCB-14	**2900**		910	9.1	ng/g		11/03/23 10:43	11/13/23 22:31	1
PCB-192	**2300**		910	9.1	ng/g		11/03/23 10:43	11/13/23 22:31	1
PCB-184	**870**	**J**	910	9.1	ng/g		11/03/23 10:43	11/13/23 22:31	1
PCB-155	**760**	**J**	910	9.1	ng/g		11/03/23 10:43	11/13/23 22:31	1
PCB-142	**580**	**J**	910	9.1	ng/g		11/03/23 10:43	11/13/23 22:31	1
PCB-204	**1500**		910	9.1	ng/g		11/03/23 10:43	11/13/23 22:31	1
PCB-104	**2500**		910	9.1	ng/g		11/03/23 10:43	11/13/23 22:31	1
PCB-121	**840**	**J**	910	9.1	ng/g		11/03/23 10:43	11/13/23 22:31	1
PCB-78	**2200**		910	9.1	ng/g		11/03/23 10:43	11/13/23 22:31	1
PCB-36	**900**	**J**	910	9.1	ng/g		11/03/23 10:43	11/13/23 22:31	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Acenaphthylene-d8	*81*		*30 - 120*	*11/03/23 10:43*	*11/13/23 22:31*	*1*
Anthracene-d10	*73*		*30 - 120*	*11/03/23 10:43*	*11/13/23 22:31*	*1*
Benzo(a)pyrene-d12	*77*		*30 - 120*	*11/03/23 10:43*	*11/13/23 22:31*	*1*

Client Sample ID: GEI.PRC.BLK3
Lab Sample ID: 140-34148-3

Date Collected: 10/26/23 14:00
Matrix: PE

Date Received: 10/27/23 09:30

Method: ID-0016 - PAHs (GC/MS Isotope Dilution) (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Benzo(b)fluoranthene-d12	90		30 - 120	11/03/23 10:43	11/13/23 22:31	1
Benzo(ghi)perylene-d12	91		30 - 120	11/03/23 10:43	11/13/23 22:31	1
Benzo(k)fluoranthene-d12	89		30 - 120	11/03/23 10:43	11/13/23 22:31	1
Chrysene-d12	77		30 - 120	11/03/23 10:43	11/13/23 22:31	1
Dibenz(a,h)anthracene-d14	84		30 - 120	11/03/23 10:43	11/13/23 22:31	1
Fluoranthene-d10	87		30 - 120	11/03/23 10:43	11/13/23 22:31	1
Fluorene -d10	85		30 - 120	11/03/23 10:43	11/13/23 22:31	1
Indeno[1,2,3-cd]pyrene-d12	89		30 - 120	11/03/23 10:43	11/13/23 22:31	1
1-Methylnaphthalene-d10	84		30 - 120	11/03/23 10:43	11/13/23 22:31	1
2-Methylnaphthalene-d10	84		30 - 120	11/03/23 10:43	11/13/23 22:31	1
Naphthalene-d8	83		30 - 120	11/03/23 10:43	11/13/23 22:31	1
Perylene-d12	73		30 - 120	11/03/23 10:43	11/13/23 22:31	1
Phenanthrene-d10	77		30 - 120	11/03/23 10:43	11/13/23 22:31	1

Client Sample ID: 1804576-851-S1
Date Collected: 10/26/23 14:00
Date Received: 10/27/23 09:30

Lab Sample ID: 140-34148-4
Matrix: PE

Method: ID-0016 - PAHs (GC/MS Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	**2100**		710	190	ng/g		11/03/23 10:43	11/13/23 22:55	1
Acenaphthylene	**92**	**J**	710	52	ng/g		11/03/23 10:43	11/13/23 22:55	1
Anthracene	**1000**		710	230	ng/g		11/03/23 10:43	11/13/23 22:55	1
Benzo[a]anthracene	**2000**		710	260	ng/g		11/03/23 10:43	11/13/23 22:55	1
Benzo[a]pyrene	**1300**		710	200	ng/g		11/03/23 10:43	11/13/23 22:55	1
Benzo[b]fluoranthene	**1900**		710	250	ng/g		11/03/23 10:43	11/13/23 22:55	1
Benzo[e]pyrene	**1200**		710	110	ng/g		11/03/23 10:43	11/13/23 22:55	1
Benzo[g,h,i]perylene	**530**	**J**	710	79	ng/g		11/03/23 10:43	11/13/23 22:55	1
Benzo[k]fluoranthene	**940**		710	160	ng/g		11/03/23 10:43	11/13/23 22:55	1
Chrysene	**2500**		710	93	ng/g		11/03/23 10:43	11/13/23 22:55	1
Dibenz(a,h)anthracene	**120**	**J**	710	59	ng/g		11/03/23 10:43	11/13/23 22:55	1
Fluoranthene	**9700**		710	580	ng/g		11/03/23 10:43	11/13/23 22:55	1
Fluorene	**1000**		710	230	ng/g		11/03/23 10:43	11/13/23 22:55	1
Indeno[1,2,3-cd]pyrene	**630**	**J**	710	79	ng/g		11/03/23 10:43	11/13/23 22:55	1
1-Methylnaphthalene	ND		3600	360	ng/g		11/03/23 10:43	11/13/23 22:55	1
2-Methylnaphthalene	ND		3600	500	ng/g		11/03/23 10:43	11/13/23 22:55	1
Naphthalene	ND		14000	2100	ng/g		11/03/23 10:43	11/13/23 22:55	1
Perylene	**1000**		710	360	ng/g		11/03/23 10:43	11/13/23 22:55	1
Phenanthrene	**2700**		1400	1200	ng/g		11/03/23 10:43	11/13/23 22:55	1
Pyrene	**12000**		1400	210	ng/g		11/03/23 10:43	11/13/23 22:55	1
C1-Fluoranthenes/pyrene	**5200**		710	710	ng/g		11/03/23 10:43	11/13/23 22:55	1
C1-Fluorenes	ND		1400	930	ng/g		11/03/23 10:43	11/13/23 22:55	1
C2-Fluorenes	**1200**		710	710	ng/g		11/03/23 10:43	11/13/23 22:55	1
C3-Fluorenes	**2000**		710	710	ng/g		11/03/23 10:43	11/13/23 22:55	1
C2-Naphthalenes	ND		1400	1400	ng/g		11/03/23 10:43	11/13/23 22:55	1
C3-Naphthalenes	**1600**		1400	1400	ng/g		11/03/23 10:43	11/13/23 22:55	1
C4-Naphthalenes	ND		2100	2000	ng/g		11/03/23 10:43	11/13/23 22:55	1
C1-Phenanthrenes/Anthracenes	ND		2900	2400	ng/g		11/03/23 10:43	11/13/23 22:55	1
C2-Phenanthrenes/Anthracenes	**3500**		710	710	ng/g		11/03/23 10:43	11/13/23 22:55	1
C3-Phenanthrenes/Anthracenes	**2400**		710	710	ng/g		11/03/23 10:43	11/13/23 22:55	1
C4-Phenanthrenes/Anthracenes	**1000**		710	710	ng/g		11/03/23 10:43	11/13/23 22:55	1
C1-Chrysenes/Benz(a)anthracenes	**1600**		710	710	ng/g		11/03/23 10:43	11/13/23 22:55	1
C2-Chrysenes/Benz(a)anthracenes	**770**		710	710	ng/g		11/03/23 10:43	11/13/23 22:55	1
C3-Chrysenes/Benz(a)anthracenes	ND		710	710	ng/g		11/03/23 10:43	11/13/23 22:55	1
C4-Chrysenes/Benz(a)anthracenes	ND		710	710	ng/g		11/03/23 10:43	11/13/23 22:55	1
PCB-14	**280**	**J**	710	7.1	ng/g		11/03/23 10:43	11/13/23 22:55	1
PCB-192	**1800**		710	7.1	ng/g		11/03/23 10:43	11/13/23 22:55	1
PCB-184	**680**	**J**	710	7.1	ng/g		11/03/23 10:43	11/13/23 22:55	1
PCB-155	**460**	**J**	710	7.1	ng/g		11/03/23 10:43	11/13/23 22:55	1
PCB-142	**370**	**J**	710	7.1	ng/g		11/03/23 10:43	11/13/23 22:55	1
PCB-204	**1300**		710	7.1	ng/g		11/03/23 10:43	11/13/23 22:55	1
PCB-104	**1100**		710	7.1	ng/g		11/03/23 10:43	11/13/23 22:55	1
PCB-121	**600**	**J**	710	7.1	ng/g		11/03/23 10:43	11/13/23 22:55	1
PCB-78	**900**		710	7.1	ng/g		11/03/23 10:43	11/13/23 22:55	1
PCB-36	**270**	**J**	710	7.1	ng/g		11/03/23 10:43	11/13/23 22:55	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Acenaphthylene-d8	*79*		*30 - 120*	*11/03/23 10:43*	*11/13/23 22:55*	*1*
Anthracene-d10	*73*		*30 - 120*	*11/03/23 10:43*	*11/13/23 22:55*	*1*

Client Sample ID: 1804576-851-S1
Date Collected: 10/26/23 14:00
Date Received: 10/27/23 09:30

Lab Sample ID: 140-34148-4
Matrix: PE

Method: ID-0016 - PAHs (GC/MS Isotope Dilution) (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Benzo(a)pyrene-d12	78		30 - 120	11/03/23 10:43	11/13/23 22:55	1
Benzo(b)fluoranthene-d12	88		30 - 120	11/03/23 10:43	11/13/23 22:55	1
Benzo(ghi)perylene-d12	88		30 - 120	11/03/23 10:43	11/13/23 22:55	1
Benzo(k)fluoranthene-d12	81		30 - 120	11/03/23 10:43	11/13/23 22:55	1
Chrysene-d12	75		30 - 120	11/03/23 10:43	11/13/23 22:55	1
Dibenz(a,h)anthracene-d14	82		30 - 120	11/03/23 10:43	11/13/23 22:55	1
Fluoranthene-d10	84		30 - 120	11/03/23 10:43	11/13/23 22:55	1
Fluorene -d10	84		30 - 120	11/03/23 10:43	11/13/23 22:55	1
Indeno[1,2,3-cd]pyrene-d12	85		30 - 120	11/03/23 10:43	11/13/23 22:55	1
1-Methylnaphthalene-d10	80		30 - 120	11/03/23 10:43	11/13/23 22:55	1
2-Methylnaphthalene-d10	79		30 - 120	11/03/23 10:43	11/13/23 22:55	1
Naphthalene-d8	77		30 - 120	11/03/23 10:43	11/13/23 22:55	1
Perylene-d12	74		30 - 120	11/03/23 10:43	11/13/23 22:55	1
Phenanthrene-d10	75		30 - 120	11/03/23 10:43	11/13/23 22:55	1

Client Sample ID: 1804576-851-S2
Lab Sample ID: 140-34148-5

Date Collected: 10/26/23 14:00
Matrix: PE
Date Received: 10/27/23 09:30

Method: ID-0016 - PAHs (GC/MS Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	**8800000**		330000	87000	ng/g		11/03/23 10:43	11/17/23 17:19	1
Acenaphthylene	**300000**	**J**	330000	24000	ng/g		11/03/23 10:43	11/17/23 17:19	1
Anthracene	**6800000**		330000	110000	ng/g		11/03/23 10:43	11/17/23 17:19	1
Benzo[a]anthracene	**2700000**		330000	120000	ng/g		11/03/23 10:43	11/17/23 17:19	1
Benzo[a]pyrene	**2500000**		330000	93000	ng/g		11/03/23 10:43	11/17/23 17:19	1
Benzo[b]fluoranthene	**1800000**		330000	120000	ng/g		11/03/23 10:43	11/17/23 17:19	1
Benzo[e]pyrene	**1300000**		330000	53000	ng/g		11/03/23 10:43	11/17/23 17:19	1
Benzo[g,h,i]perylene	**1300000**		330000	37000	ng/g		11/03/23 10:43	11/17/23 17:19	1
Benzo[k]fluoranthene	**990000**		330000	77000	ng/g		11/03/23 10:43	11/17/23 17:19	1
Chrysene	**3000000**		330000	43000	ng/g		11/03/23 10:43	11/17/23 17:19	1
Dibenz(a,h)anthracene	**200000**	**J**	330000	27000	ng/g		11/03/23 10:43	11/17/23 17:19	1
Fluoranthene	**6800000**		330000	270000	ng/g		11/03/23 10:43	11/17/23 17:19	1
Fluorene	**3900000**		330000	110000	ng/g		11/03/23 10:43	11/17/23 17:19	1
Indeno[1,2,3-cd]pyrene	**930000**		330000	37000	ng/g		11/03/23 10:43	11/17/23 17:19	1
1-Methylnaphthalene	**3100000**		1700000	170000	ng/g		11/03/23 10:43	11/17/23 17:19	1
2-Methylnaphthalene	**3400000**		1700000	230000	ng/g		11/03/23 10:43	11/17/23 17:19	1
Naphthalene	**2000000**	**J**	6700000	970000	ng/g		11/03/23 10:43	11/17/23 17:19	1
Perylene	**430000**		330000	170000	ng/g		11/03/23 10:43	11/17/23 17:19	1
Phenanthrene	**17000000**		670000	580000	ng/g		11/03/23 10:43	11/17/23 17:19	1
Pyrene	**11000000**		670000	100000	ng/g		11/03/23 10:43	11/17/23 17:19	1
C1-Fluoranthenes/pyrene	**4600000**		330000	330000	ng/g		11/03/23 10:43	11/17/23 17:19	1
C1-Fluorenes	**1500000**		670000	430000	ng/g		11/03/23 10:43	11/17/23 17:19	1
C2-Fluorenes	**800000**		330000	330000	ng/g		11/03/23 10:43	11/17/23 17:19	1
C3-Fluorenes	ND		330000	330000	ng/g		11/03/23 10:43	11/17/23 17:19	1
C2-Naphthalenes	**5200000**		670000	670000	ng/g		11/03/23 10:43	11/17/23 17:19	1
C3-Naphthalenes	**2600000**		670000	670000	ng/g		11/03/23 10:43	11/17/23 17:19	1
C4-Naphthalenes	ND		1000000	930000	ng/g		11/03/23 10:43	11/17/23 17:19	1
C1-Phenanthrenes/Anthracenes	**3900000**		1300000	1100000	ng/g		11/03/23 10:43	11/17/23 17:19	1
C2-Phenanthrenes/Anthracenes	**2500000**		330000	330000	ng/g		11/03/23 10:43	11/17/23 17:19	1
C3-Phenanthrenes/Anthracenes	**710000**		330000	330000	ng/g		11/03/23 10:43	11/17/23 17:19	1
C4-Phenanthrenes/Anthracenes	ND		330000	330000	ng/g		11/03/23 10:43	11/17/23 17:19	1
C1-Chrysenes/Benz(a)anthracenes	**1200000**		330000	330000	ng/g		11/03/23 10:43	11/17/23 17:19	1
C2-Chrysenes/Benz(a)anthracenes	ND		330000	330000	ng/g		11/03/23 10:43	11/17/23 17:19	1
C3-Chrysenes/Benz(a)anthracenes	ND		330000	330000	ng/g		11/03/23 10:43	11/17/23 17:19	1
C4-Chrysenes/Benz(a)anthracenes	ND		330000	330000	ng/g		11/03/23 10:43	11/17/23 17:19	1
PCB-14	ND		330000	3300	ng/g		11/03/23 10:43	11/17/23 17:19	1
PCB-192	ND		330000	3300	ng/g		11/03/23 10:43	11/17/23 17:19	1
PCB-184	ND		330000	3300	ng/g		11/03/23 10:43	11/17/23 17:19	1
PCB-155	ND		330000	3300	ng/g		11/03/23 10:43	11/17/23 17:19	1
PCB-142	ND		330000	3300	ng/g		11/03/23 10:43	11/17/23 17:19	1
PCB-204	ND		330000	3300	ng/g		11/03/23 10:43	11/17/23 17:19	1
PCB-104	ND		330000	3300	ng/g		11/03/23 10:43	11/17/23 17:19	1
PCB-121	ND		330000	3300	ng/g		11/03/23 10:43	11/17/23 17:19	1
PCB-78	ND		330000	3300	ng/g		11/03/23 10:43	11/17/23 17:19	1
PCB-36	ND		330000	3300	ng/g		11/03/23 10:43	11/17/23 17:19	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Acenaphthylene-d8	*114*		*30 - 120*	*11/03/23 10:43*	*11/17/23 17:19*	*1*
Anthracene-d10	*106*		*30 - 120*	*11/03/23 10:43*	*11/17/23 17:19*	*1*

Client Sample ID: 1804576-851-S2
Lab Sample ID: 140-34148-5

Date Collected: 10/26/23 14:00
Matrix: PE

Date Received: 10/27/23 09:30

Method: ID-0016 - PAHs (GC/MS Isotope Dilution) (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Benzo(a)pyrene-d12	114		30 - 120	11/03/23 10:43	11/17/23 17:19	1
Benzo(b)fluoranthene-d12	110		30 - 120	11/03/23 10:43	11/17/23 17:19	1
Benzo(ghi)perylene-d12	110		30 - 120	11/03/23 10:43	11/17/23 17:19	1
Benzo(k)fluoranthene-d12	108		30 - 120	11/03/23 10:43	11/17/23 17:19	1
Chrysene-d12	104		30 - 120	11/03/23 10:43	11/17/23 17:19	1
Dibenz(a,h)anthracene-d14	107		30 - 120	11/03/23 10:43	11/17/23 17:19	1
Fluoranthene-d10	107		30 - 120	11/03/23 10:43	11/17/23 17:19	1
Fluorene -d10	108		30 - 120	11/03/23 10:43	11/17/23 17:19	1
Indeno[1,2,3-cd]pyrene-d12	110		30 - 120	11/03/23 10:43	11/17/23 17:19	1
1-Methylnaphthalene-d10	111		30 - 120	11/03/23 10:43	11/17/23 17:19	1
2-Methylnaphthalene-d10	112		30 - 120	11/03/23 10:43	11/17/23 17:19	1
Naphthalene-d8	112		30 - 120	11/03/23 10:43	11/17/23 17:19	1
Perylene-d12	112		30 - 120	11/03/23 10:43	11/17/23 17:19	1
Phenanthrene-d10	113		30 - 120	11/03/23 10:43	11/17/23 17:19	1

Method: ID-0016 - PAHs (GC/MS Isotope Dilution) - RA

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	19000000	E	4200	1100	ng/g		11/03/23 10:43	12/01/23 22:11	5
Acenaphthylene	330000		4200	300	ng/g		11/03/23 10:43	12/01/23 22:11	5
Anthracene	11000000	E	4200	1300	ng/g		11/03/23 10:43	12/01/23 22:11	5
Benzo[a]anthracene	2800000	E	4200	1500	ng/g		11/03/23 10:43	12/01/23 22:11	5
Benzo[a]pyrene	2900000	E	4200	1200	ng/g		11/03/23 10:43	12/01/23 22:11	5
Benzo[b]fluoranthene	1800000	E	4200	1500	ng/g		11/03/23 10:43	12/01/23 22:11	5
Benzo[e]pyrene	1400000	E	4200	670	ng/g		11/03/23 10:43	12/01/23 22:11	5
Benzo[g,h,i]perylene	1300000	E	4200	460	ng/g		11/03/23 10:43	12/01/23 22:11	5
Benzo[k]fluoranthene	1000000		4200	960	ng/g		11/03/23 10:43	12/01/23 22:11	5
Chrysene	2400000	E	4200	540	ng/g		11/03/23 10:43	12/01/23 22:11	5
Dibenz(a,h)anthracene	230000		4200	340	ng/g		11/03/23 10:43	12/01/23 22:11	5
Fluoranthene	9200000	E	4200	3400	ng/g		11/03/23 10:43	12/01/23 22:11	5
Fluorene	3900000	E	4200	1300	ng/g		11/03/23 10:43	12/01/23 22:11	5
Indeno[1,2,3-cd]pyrene	1000000		4200	460	ng/g		11/03/23 10:43	12/01/23 22:11	5
1-Methylnaphthalene	5100000	E	21000	2100	ng/g		11/03/23 10:43	12/01/23 22:11	5
2-Methylnaphthalene	5900000	E	21000	2900	ng/g		11/03/23 10:43	12/01/23 22:11	5
Naphthalene	3400000	E	83000	12000	ng/g		11/03/23 10:43	12/01/23 22:11	5
Perylene	400000		4200	2100	ng/g		11/03/23 10:43	12/01/23 22:11	5
Phenanthrene	17000000	E	8300	7200	ng/g		11/03/23 10:43	12/01/23 22:11	5
Pyrene	14000000	E	8300	1300	ng/g		11/03/23 10:43	12/01/23 22:11	5
C1-Fluoranthenes/pyrene	5600000		4200	4200	ng/g		11/03/23 10:43	12/01/23 22:11	5
C1-Fluorenes	1700000		8300	5400	ng/g		11/03/23 10:43	12/01/23 22:11	5
C2-Fluorenes	730000		4200	4200	ng/g		11/03/23 10:43	12/01/23 22:11	5
C3-Fluorenes	280000		4200	4200	ng/g		11/03/23 10:43	12/01/23 22:11	5
C2-Naphthalenes	8400000		8300	8300	ng/g		11/03/23 10:43	12/01/23 22:11	5
C3-Naphthalenes	3800000		8300	8300	ng/g		11/03/23 10:43	12/01/23 22:11	5
C4-Naphthalenes	1100000		13000	12000	ng/g		11/03/23 10:43	12/01/23 22:11	5
C1-Phenanthrenes/Anthracenes	4400000		17000	14000	ng/g		11/03/23 10:43	12/01/23 22:11	5
C2-Phenanthrenes/Anthracenes	2400000		4200	4200	ng/g		11/03/23 10:43	12/01/23 22:11	5
C3-Phenanthrenes/Anthracenes	650000		4200	4200	ng/g		11/03/23 10:43	12/01/23 22:11	5
C4-Phenanthrenes/Anthracenes	170000		4200	4200	ng/g		11/03/23 10:43	12/01/23 22:11	5
C1-Chrysenes/Benz(a)anthracenes	1100000		4200	4200	ng/g		11/03/23 10:43	12/01/23 22:11	5

Client Sample ID: 1804576-851-S2
Date Collected: 10/26/23 14:00
Date Received: 10/27/23 09:30

Lab Sample ID: 140-34148-5
Matrix: PE

Method: ID-0016 - PAHs (GC/MS Isotope Dilution) - RA (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C2-Chrysenes/Benz(a)anthracenes	**280000**		4200	4200	ng/g		11/03/23 10:43	12/01/23 22:11	5
C3-Chrysenes/Benz(a)anthracenes	**51000**		4200	4200	ng/g		11/03/23 10:43	12/01/23 22:11	5
C4-Chrysenes/Benz(a)anthracenes	**18000**		4200	4200	ng/g		11/03/23 10:43	12/01/23 22:11	5
PCB-14	ND		4200	42	ng/g		11/03/23 10:43	12/01/23 22:11	5
PCB-192	**160**	**J**	4200	42	ng/g		11/03/23 10:43	12/01/23 22:11	5
PCB-184	ND		4200	42	ng/g		11/03/23 10:43	12/01/23 22:11	5
PCB-155	ND		4200	42	ng/g		11/03/23 10:43	12/01/23 22:11	5
PCB-142	ND		4200	42	ng/g		11/03/23 10:43	12/01/23 22:11	5
PCB-204	**110**	**J**	4200	42	ng/g		11/03/23 10:43	12/01/23 22:11	5
PCB-104	**110**	**J**	4200	42	ng/g		11/03/23 10:43	12/01/23 22:11	5
PCB-121	ND		4200	42	ng/g		11/03/23 10:43	12/01/23 22:11	5
PCB-78	ND		4200	42	ng/g		11/03/23 10:43	12/01/23 22:11	5
PCB-36	ND		4200	42	ng/g		11/03/23 10:43	12/01/23 22:11	5

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Acenaphthylene-d8	*73*		*30 - 120*	*11/03/23 10:43*	*12/01/23 22:11*	*5*
Anthracene-d10	*58*		*30 - 120*	*11/03/23 10:43*	*12/01/23 22:11*	*5*
Benzo(a)pyrene-d12	*84*		*30 - 120*	*11/03/23 10:43*	*12/01/23 22:11*	*5*
Benzo(b)fluoranthene-d12	*87*		*30 - 120*	*11/03/23 10:43*	*12/01/23 22:11*	*5*
Benzo(ghi)perylene-d12	*86*		*30 - 120*	*11/03/23 10:43*	*12/01/23 22:11*	*5*
Benzo(k)fluoranthene-d12	*84*		*30 - 120*	*11/03/23 10:43*	*12/01/23 22:11*	*5*
Chrysene-d12	*82*		*30 - 120*	*11/03/23 10:43*	*12/01/23 22:11*	*5*
Dibenz(a,h)anthracene-d14	*98*		*30 - 120*	*11/03/23 10:43*	*12/01/23 22:11*	*5*
Fluoranthene-d10	*62*		*30 - 120*	*11/03/23 10:43*	*12/01/23 22:11*	*5*
Fluorene -d10	*110*		*30 - 120*	*11/03/23 10:43*	*12/01/23 22:11*	*5*
Indeno[1,2,3-cd]pyrene-d12	*90*		*30 - 120*	*11/03/23 10:43*	*12/01/23 22:11*	*5*
1-Methylnaphthalene-d10	*64*		*30 - 120*	*11/03/23 10:43*	*12/01/23 22:11*	*5*
2-Methylnaphthalene-d10	*65*		*30 - 120*	*11/03/23 10:43*	*12/01/23 22:11*	*5*
Naphthalene-d8	*60*		*30 - 120*	*11/03/23 10:43*	*12/01/23 22:11*	*5*
Perylene-d12	*85*		*30 - 120*	*11/03/23 10:43*	*12/01/23 22:11*	*5*
Phenanthrene-d10	*74*		*30 - 120*	*11/03/23 10:43*	*12/01/23 22:11*	*5*

Client Sample ID: 1804576-852-S1
Date Collected: 10/26/23 14:00
Date Received: 10/27/23 09:30

Lab Sample ID: 140-34148-6
Matrix: PE

Method: ID-0016 - PAHs (GC/MS Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	2700		910	240	ng/g		11/03/23 10:43	11/16/23 15:49	1
Acenaphthylene	610	J	910	66	ng/g		11/03/23 10:43	11/16/23 15:49	1
Anthracene	2600		910	290	ng/g		11/03/23 10:43	11/16/23 15:49	1
Benzo[a]anthracene	8800		910	340	ng/g		11/03/23 10:43	11/16/23 15:49	1
Benzo[a]pyrene	11000		910	250	ng/g		11/03/23 10:43	11/16/23 15:49	1
Benzo[b]fluoranthene	11000		910	320	ng/g		11/03/23 10:43	11/16/23 15:49	1
Benzo[e]pyrene	6900		910	150	ng/g		11/03/23 10:43	11/16/23 15:49	1
Benzo[g,h,i]perylene	4700		910	100	ng/g		11/03/23 10:43	11/16/23 15:49	1
Benzo[k]fluoranthene	7100		910	210	ng/g		11/03/23 10:43	11/16/23 15:49	1
Chrysene	10000		910	120	ng/g		11/03/23 10:43	11/16/23 15:49	1
Dibenz(a,h)anthracene	1200		910	75	ng/g		11/03/23 10:43	11/16/23 15:49	1
Fluoranthene	19000		910	740	ng/g		11/03/23 10:43	11/16/23 15:49	1
Fluorene	1700		910	290	ng/g		11/03/23 10:43	11/16/23 15:49	1
Indeno[1,2,3-cd]pyrene	5100		910	100	ng/g		11/03/23 10:43	11/16/23 15:49	1
1-Methylnaphthalene	800	J	4500	450	ng/g		11/03/23 10:43	11/16/23 15:49	1
2-Methylnaphthalene	990	J	4500	640	ng/g		11/03/23 10:43	11/16/23 15:49	1
Naphthalene	ND		18000	2600	ng/g		11/03/23 10:43	11/16/23 15:49	1
Perylene	3000		910	460	ng/g		11/03/23 10:43	11/16/23 15:49	1
Phenanthrene	11000		1800	1600	ng/g		11/03/23 10:43	11/16/23 15:49	1
Pyrene	23000		1800	270	ng/g		11/03/23 10:43	11/16/23 15:49	1
C1-Fluoranthenes/pyrene	14000		910	910	ng/g		11/03/23 10:43	11/16/23 15:49	1
C1-Fluorenes	ND		1800	1200	ng/g		11/03/23 10:43	11/16/23 15:49	1
C2-Fluorenes	1900		910	910	ng/g		11/03/23 10:43	11/16/23 15:49	1
C3-Fluorenes	2200		910	910	ng/g		11/03/23 10:43	11/16/23 15:49	1
C2-Naphthalenes	1800		1800	1800	ng/g		11/03/23 10:43	11/16/23 15:49	1
C3-Naphthalenes	2500		1800	1800	ng/g		11/03/23 10:43	11/16/23 15:49	1
C4-Naphthalenes	ND		2700	2500	ng/g		11/03/23 10:43	11/16/23 15:49	1
C1-Phenanthrenes/Anthracenes	5200		3600	3100	ng/g		11/03/23 10:43	11/16/23 15:49	1
C2-Phenanthrenes/Anthracenes	8900		910	910	ng/g		11/03/23 10:43	11/16/23 15:49	1
C3-Phenanthrenes/Anthracenes	6100		910	910	ng/g		11/03/23 10:43	11/16/23 15:49	1
C4-Phenanthrenes/Anthracenes	3200		910	910	ng/g		11/03/23 10:43	11/16/23 15:49	1
C1-Chrysenes/Benz(a)anthracenes	9200		910	910	ng/g		11/03/23 10:43	11/16/23 15:49	1
C2-Chrysenes/Benz(a)anthracenes	4800		910	910	ng/g		11/03/23 10:43	11/16/23 15:49	1
C3-Chrysenes/Benz(a)anthracenes	2400		910	910	ng/g		11/03/23 10:43	11/16/23 15:49	1
C4-Chrysenes/Benz(a)anthracenes	1000		910	910	ng/g		11/03/23 10:43	11/16/23 15:49	1
PCB-14	ND		910	9.1	ng/g		11/03/23 10:43	11/16/23 15:49	1
PCB-192	540	J	910	9.1	ng/g		11/03/23 10:43	11/16/23 15:49	1
PCB-184	200	J	910	9.1	ng/g		11/03/23 10:43	11/16/23 15:49	1
PCB-155	33	J	910	9.1	ng/g		11/03/23 10:43	11/16/23 15:49	1
PCB-142	68	J	910	9.1	ng/g		11/03/23 10:43	11/16/23 15:49	1
PCB-204	860	J	910	9.1	ng/g		11/03/23 10:43	11/16/23 15:49	1
PCB-104	10	J	910	9.1	ng/g		11/03/23 10:43	11/16/23 15:49	1
PCB-121	91	J	910	9.1	ng/g		11/03/23 10:43	11/16/23 15:49	1
PCB-78	ND		910	9.1	ng/g		11/03/23 10:43	11/16/23 15:49	1
PCB-36	ND		910	9.1	ng/g		11/03/23 10:43	11/16/23 15:49	1

Client Sample ID: 1804576-852-S1
Lab Sample ID: 140-34148-6

Date Collected: 10/26/23 14:00
Matrix: PE
Date Received: 10/27/23 09:30

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Acenaphthylene-d8	77		30 - 120	11/03/23 10:43	11/16/23 15:49	1
Anthracene-d10	75		30 - 120	11/03/23 10:43	11/16/23 15:49	1
Benzo(a)pyrene-d12	76		30 - 120	11/03/23 10:43	11/16/23 15:49	1
Benzo(b)fluoranthene-d12	85		30 - 120	11/03/23 10:43	11/16/23 15:49	1
Benzo(ghi)perylene-d12	85		30 - 120	11/03/23 10:43	11/16/23 15:49	1
Benzo(k)fluoranthene-d12	81		30 - 120	11/03/23 10:43	11/16/23 15:49	1
Chrysene-d12	74		30 - 120	11/03/23 10:43	11/16/23 15:49	1
Dibenz(a,h)anthracene-d14	83		30 - 120	11/03/23 10:43	11/16/23 15:49	1
Fluoranthene-d10	84		30 - 120	11/03/23 10:43	11/16/23 15:49	1
Fluorene -d10	79		30 - 120	11/03/23 10:43	11/16/23 15:49	1
Indeno[1,2,3-cd]pyrene-d12	87		30 - 120	11/03/23 10:43	11/16/23 15:49	1
1-Methylnaphthalene-d10	79		30 - 120	11/03/23 10:43	11/16/23 15:49	1
2-Methylnaphthalene-d10	77		30 - 120	11/03/23 10:43	11/16/23 15:49	1
Naphthalene-d8	74		30 - 120	11/03/23 10:43	11/16/23 15:49	1
Perylene-d12	71		30 - 120	11/03/23 10:43	11/16/23 15:49	1
Phenanthrene-d10	78		30 - 120	11/03/23 10:43	11/16/23 15:49	1

Client Sample ID: 1804576-852-S2
Date Collected: 10/26/23 14:00
Date Received: 10/27/23 09:30

Lab Sample ID: 140-34148-7
Matrix: PE

Method: ID-0016 - PAHs (GC/MS Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	**360000**		5000	1300	ng/g		11/03/23 10:43	11/16/23 22:05	5
Acenaphthylene	**3500**	**J**	5000	370	ng/g		11/03/23 10:43	11/16/23 22:05	5
Anthracene	**93000**		5000	1600	ng/g		11/03/23 10:43	11/16/23 22:05	5
Benzo[a]anthracene	**47000**		5000	1900	ng/g		11/03/23 10:43	11/16/23 22:05	5
Benzo[a]pyrene	**26000**		5000	1400	ng/g		11/03/23 10:43	11/16/23 22:05	5
Benzo[b]fluoranthene	**26000**		5000	1800	ng/g		11/03/23 10:43	11/16/23 22:05	5
Benzo[e]pyrene	**16000**		5000	800	ng/g		11/03/23 10:43	11/16/23 22:05	5
Benzo[g,h,i]perylene	**6700**		5000	550	ng/g		11/03/23 10:43	11/16/23 22:05	5
Benzo[k]fluoranthene	**16000**		5000	1200	ng/g		11/03/23 10:43	11/16/23 22:05	5
Chrysene	**47000**		5000	650	ng/g		11/03/23 10:43	11/16/23 22:05	5
Dibenz(a,h)anthracene	**1400**	**J**	5000	410	ng/g		11/03/23 10:43	11/16/23 22:05	5
Fluoranthene	**200000**		5000	4100	ng/g		11/03/23 10:43	11/16/23 22:05	5
Fluorene	**88000**		5000	1600	ng/g		11/03/23 10:43	11/16/23 22:05	5
Indeno[1,2,3-cd]pyrene	**6200**		5000	550	ng/g		11/03/23 10:43	11/16/23 22:05	5
1-Methylnaphthalene	**52000**		25000	2500	ng/g		11/03/23 10:43	11/16/23 22:05	5
2-Methylnaphthalene	ND		25000	3500	ng/g		11/03/23 10:43	11/16/23 22:05	5
Naphthalene	ND		100000	15000	ng/g		11/03/23 10:43	11/16/23 22:05	5
Perylene	**5500**		5000	2600	ng/g		11/03/23 10:43	11/16/23 22:05	5
Phenanthrene	**360000**		10000	8700	ng/g		11/03/23 10:43	11/16/23 22:05	5
Pyrene	**310000**		10000	1500	ng/g		11/03/23 10:43	11/16/23 22:05	5
C1-Fluoranthenes/pyrene	**120000**		5000	5000	ng/g		11/03/23 10:43	11/16/23 22:05	5
C1-Fluorenes	**51000**		10000	6500	ng/g		11/03/23 10:43	11/16/23 22:05	5
C2-Fluorenes	**39000**		5000	5000	ng/g		11/03/23 10:43	11/16/23 22:05	5
C3-Fluorenes	**39000**		5000	5000	ng/g		11/03/23 10:43	11/16/23 22:05	5
C2-Naphthalenes	**160000**		10000	10000	ng/g		11/03/23 10:43	11/16/23 22:05	5
C3-Naphthalenes	**120000**		10000	10000	ng/g		11/03/23 10:43	11/16/23 22:05	5
C4-Naphthalenes	**69000**		15000	14000	ng/g		11/03/23 10:43	11/16/23 22:05	5
C1-Phenanthrenes/Anthracenes	**110000**		20000	17000	ng/g		11/03/23 10:43	11/16/23 22:05	5
C2-Phenanthrenes/Anthracenes	**100000**		5000	5000	ng/g		11/03/23 10:43	11/16/23 22:05	5
C3-Phenanthrenes/Anthracenes	**62000**		5000	5000	ng/g		11/03/23 10:43	11/16/23 22:05	5
C4-Phenanthrenes/Anthracenes	**28000**		5000	5000	ng/g		11/03/23 10:43	11/16/23 22:05	5
C1-Chrysenes/Benz(a)anthracenes	**29000**		5000	5000	ng/g		11/03/23 10:43	11/16/23 22:05	5
C2-Chrysenes/Benz(a)anthracenes	**11000**		5000	5000	ng/g		11/03/23 10:43	11/16/23 22:05	5
C3-Chrysenes/Benz(a)anthracenes	**6200**		5000	5000	ng/g		11/03/23 10:43	11/16/23 22:05	5
C4-Chrysenes/Benz(a)anthracenes	ND		5000	5000	ng/g		11/03/23 10:43	11/16/23 22:05	5
PCB-14	**58**	**J**	5000	50	ng/g		11/03/23 10:43	11/16/23 22:05	5
PCB-192	**400**	**J**	5000	50	ng/g		11/03/23 10:43	11/16/23 22:05	5
PCB-184	**110**	**J**	5000	50	ng/g		11/03/23 10:43	11/16/23 22:05	5
PCB-155	**83**	**J**	5000	50	ng/g		11/03/23 10:43	11/16/23 22:05	5
PCB-142	**80**	**J**	5000	50	ng/g		11/03/23 10:43	11/16/23 22:05	5
PCB-204	**340**	**J**	5000	50	ng/g		11/03/23 10:43	11/16/23 22:05	5
PCB-104	**260**	**J**	5000	50	ng/g		11/03/23 10:43	11/16/23 22:05	5
PCB-121	**120**	**J**	5000	50	ng/g		11/03/23 10:43	11/16/23 22:05	5
PCB-78	**210**	**J**	5000	50	ng/g		11/03/23 10:43	11/16/23 22:05	5
PCB-36	ND		5000	50	ng/g		11/03/23 10:43	11/16/23 22:05	5

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Acenaphthylene-d8	*79*		*30 - 120*	*11/03/23 10:43*	*11/16/23 22:05*	*5*

Client Sample ID: 1804576-852-S2
Date Collected: 10/26/23 14:00
Date Received: 10/27/23 09:30

Lab Sample ID: 140-34148-7
Matrix: PE

Method: ID-0016 - PAHs (GC/MS Isotope Dilution) (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Anthracene-d10	80		30 - 120	11/03/23 10:43	11/16/23 22:05	5
Benzo(a)pyrene-d12	84		30 - 120	11/03/23 10:43	11/16/23 22:05	5
Benzo(b)fluoranthene-d12	84		30 - 120	11/03/23 10:43	11/16/23 22:05	5
Benzo(ghi)perylene-d12	91		30 - 120	11/03/23 10:43	11/16/23 22:05	5
Benzo(k)fluoranthene-d12	86		30 - 120	11/03/23 10:43	11/16/23 22:05	5
Chrysene-d12	77		30 - 120	11/03/23 10:43	11/16/23 22:05	5
Dibenz(a,h)anthracene-d14	79		30 - 120	11/03/23 10:43	11/16/23 22:05	5
Fluoranthene-d10	87		30 - 120	11/03/23 10:43	11/16/23 22:05	5
Fluorene -d10	78		30 - 120	11/03/23 10:43	11/16/23 22:05	5
Indeno[1,2,3-cd]pyrene-d12	89		30 - 120	11/03/23 10:43	11/16/23 22:05	5
1-Methylnaphthalene-d10	78		30 - 120	11/03/23 10:43	11/16/23 22:05	5
2-Methylnaphthalene-d10	76		30 - 120	11/03/23 10:43	11/16/23 22:05	5
Naphthalene-d8	74		30 - 120	11/03/23 10:43	11/16/23 22:05	5
Perylene-d12	82		30 - 120	11/03/23 10:43	11/16/23 22:05	5
Phenanthrene-d10	89		30 - 120	11/03/23 10:43	11/16/23 22:05	5

Client Sample ID: 1804576-843-S1
Date Collected: 10/26/23 14:00
Date Received: 10/27/23 09:30

Lab Sample ID: 140-34148-8
Matrix: PE

Method: ID-0016 - PAHs (GC/MS Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	**590**	**J**	1000	260	ng/g		11/03/23 10:43	11/16/23 16:37	1
Acenaphthylene	**170**	**J**	1000	73	ng/g		11/03/23 10:43	11/16/23 16:37	1
Anthracene	**1200**		1000	320	ng/g		11/03/23 10:43	11/16/23 16:37	1
Benzo[a]anthracene	**3100**		1000	370	ng/g		11/03/23 10:43	11/16/23 16:37	1
Benzo[a]pyrene	**3900**		1000	280	ng/g		11/03/23 10:43	11/16/23 16:37	1
Benzo[b]fluoranthene	**4900**		1000	350	ng/g		11/03/23 10:43	11/16/23 16:37	1
Benzo[e]pyrene	**3200**		1000	160	ng/g		11/03/23 10:43	11/16/23 16:37	1
Benzo[g,h,i]perylene	**2100**		1000	110	ng/g		11/03/23 10:43	11/16/23 16:37	1
Benzo[k]fluoranthene	**1900**		1000	230	ng/g		11/03/23 10:43	11/16/23 16:37	1
Chrysene	**4300**		1000	130	ng/g		11/03/23 10:43	11/16/23 16:37	1
Dibenz(a,h)anthracene	**440**	**J**	1000	82	ng/g		11/03/23 10:43	11/16/23 16:37	1
Fluoranthene	**7800**		1000	810	ng/g		11/03/23 10:43	11/16/23 16:37	1
Fluorene	**610**	**J**	1000	320	ng/g		11/03/23 10:43	11/16/23 16:37	1
Indeno[1,2,3-cd]pyrene	**2000**		1000	110	ng/g		11/03/23 10:43	11/16/23 16:37	1
1-Methylnaphthalene	ND		5000	500	ng/g		11/03/23 10:43	11/16/23 16:37	1
2-Methylnaphthalene	ND		5000	700	ng/g		11/03/23 10:43	11/16/23 16:37	1
Naphthalene	ND		20000	2900	ng/g		11/03/23 10:43	11/16/23 16:37	1
Perylene	**1000**		1000	510	ng/g		11/03/23 10:43	11/16/23 16:37	1
Phenanthrene	**3900**		2000	1700	ng/g		11/03/23 10:43	11/16/23 16:37	1
Pyrene	**9300**		2000	300	ng/g		11/03/23 10:43	11/16/23 16:37	1
C1-Fluoranthenes/pyrene	**6300**		1000	1000	ng/g		11/03/23 10:43	11/16/23 16:37	1
C1-Fluorenes	ND		2000	1300	ng/g		11/03/23 10:43	11/16/23 16:37	1
C2-Fluorenes	ND		1000	1000	ng/g		11/03/23 10:43	11/16/23 16:37	1
C3-Fluorenes	**2500**		1000	1000	ng/g		11/03/23 10:43	11/16/23 16:37	1
C2-Naphthalenes	ND		2000	2000	ng/g		11/03/23 10:43	11/16/23 16:37	1
C3-Naphthalenes	ND		2000	2000	ng/g		11/03/23 10:43	11/16/23 16:37	1
C4-Naphthalenes	ND		3000	2800	ng/g		11/03/23 10:43	11/16/23 16:37	1
C1-Phenanthrenes/Anthracenes	ND		4000	3400	ng/g		11/03/23 10:43	11/16/23 16:37	1
C2-Phenanthrenes/Anthracenes	**4500**		1000	1000	ng/g		11/03/23 10:43	11/16/23 16:37	1
C3-Phenanthrenes/Anthracenes	**3300**		1000	1000	ng/g		11/03/23 10:43	11/16/23 16:37	1
C4-Phenanthrenes/Anthracenes	**2400**		1000	1000	ng/g		11/03/23 10:43	11/16/23 16:37	1
C1-Chrysenes/Benz(a)anthracenes	**3500**		1000	1000	ng/g		11/03/23 10:43	11/16/23 16:37	1
C2-Chrysenes/Benz(a)anthracenes	**1800**		1000	1000	ng/g		11/03/23 10:43	11/16/23 16:37	1
C3-Chrysenes/Benz(a)anthracenes	**1100**		1000	1000	ng/g		11/03/23 10:43	11/16/23 16:37	1
C4-Chrysenes/Benz(a)anthracenes	ND		1000	1000	ng/g		11/03/23 10:43	11/16/23 16:37	1
PCB-14	ND		1000	10	ng/g		11/03/23 10:43	11/16/23 16:37	1
PCB-192	**790**	**J**	1000	10	ng/g		11/03/23 10:43	11/16/23 16:37	1
PCB-184	**270**	**J**	1000	10	ng/g		11/03/23 10:43	11/16/23 16:37	1
PCB-155	**180**	**J**	1000	10	ng/g		11/03/23 10:43	11/16/23 16:37	1
PCB-142	**180**	**J**	1000	10	ng/g		11/03/23 10:43	11/16/23 16:37	1
PCB-204	**710**	**J**	1000	10	ng/g		11/03/23 10:43	11/16/23 16:37	1
PCB-104	**230**	**J**	1000	10	ng/g		11/03/23 10:43	11/16/23 16:37	1
PCB-121	**190**	**J**	1000	10	ng/g		11/03/23 10:43	11/16/23 16:37	1
PCB-78	**240**	**J**	1000	10	ng/g		11/03/23 10:43	11/16/23 16:37	1
PCB-36	ND		1000	10	ng/g		11/03/23 10:43	11/16/23 16:37	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Acenaphthylene-d8	*73*		*30 - 120*	*11/03/23 10:43*	*11/16/23 16:37*	*1*

Client Sample ID: 1804576-843-S1
Date Collected: 10/26/23 14:00
Date Received: 10/27/23 09:30

Lab Sample ID: 140-34148-8
Matrix: PE

Method: ID-0016 - PAHs (GC/MS Isotope Dilution) (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Anthracene-d10	59		30 - 120	11/03/23 10:43	11/16/23 16:37	1
Benzo(a)pyrene-d12	69		30 - 120	11/03/23 10:43	11/16/23 16:37	1
Benzo(b)fluoranthene-d12	76		30 - 120	11/03/23 10:43	11/16/23 16:37	1
Benzo(ghi)perylene-d12	79		30 - 120	11/03/23 10:43	11/16/23 16:37	1
Benzo(k)fluoranthene-d12	77		30 - 120	11/03/23 10:43	11/16/23 16:37	1
Chrysene-d12	69		30 - 120	11/03/23 10:43	11/16/23 16:37	1
Dibenz(a,h)anthracene-d14	73		30 - 120	11/03/23 10:43	11/16/23 16:37	1
Fluoranthene-d10	74		30 - 120	11/03/23 10:43	11/16/23 16:37	1
Fluorene -d10	72		30 - 120	11/03/23 10:43	11/16/23 16:37	1
Indeno[1,2,3-cd]pyrene-d12	77		30 - 120	11/03/23 10:43	11/16/23 16:37	1
1-Methylnaphthalene-d10	73		30 - 120	11/03/23 10:43	11/16/23 16:37	1
2-Methylnaphthalene-d10	70		30 - 120	11/03/23 10:43	11/16/23 16:37	1
Naphthalene-d8	67		30 - 120	11/03/23 10:43	11/16/23 16:37	1
Perylene-d12	65		30 - 120	11/03/23 10:43	11/16/23 16:37	1
Phenanthrene-d10	64		30 - 120	11/03/23 10:43	11/16/23 16:37	1

Client Sample ID: 1804576-843-S2
Lab Sample ID: 140-34148-9

Date Collected: 10/26/23 14:00
Matrix: PE
Date Received: 10/27/23 09:30

Method: ID-0016 - PAHs (GC/MS Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	**170000**		5000	1300	ng/g		11/03/23 10:43	11/17/23 16:55	5
Acenaphthylene	**4000**	**J**	5000	370	ng/g		11/03/23 10:43	11/17/23 16:55	5
Anthracene	**67000**		5000	1600	ng/g		11/03/23 10:43	11/17/23 16:55	5
Benzo[a]anthracene	**51000**		5000	1900	ng/g		11/03/23 10:43	11/17/23 16:55	5
Benzo[a]pyrene	**35000**		5000	1400	ng/g		11/03/23 10:43	11/17/23 16:55	5
Benzo[b]fluoranthene	**38000**		5000	1800	ng/g		11/03/23 10:43	11/17/23 16:55	5
Benzo[e]pyrene	**20000**		5000	800	ng/g		11/03/23 10:43	11/17/23 16:55	5
Benzo[g,h,i]perylene	**11000**		5000	550	ng/g		11/03/23 10:43	11/17/23 16:55	5
Benzo[k]fluoranthene	**15000**		5000	1200	ng/g		11/03/23 10:43	11/17/23 16:55	5
Chrysene	**57000**		5000	650	ng/g		11/03/23 10:43	11/17/23 16:55	5
Dibenz(a,h)anthracene	**2500**	**J**	5000	410	ng/g		11/03/23 10:43	11/17/23 16:55	5
Fluoranthene	**190000**		5000	4100	ng/g		11/03/23 10:43	11/17/23 16:55	5
Fluorene	**70000**		5000	1600	ng/g		11/03/23 10:43	11/17/23 16:55	5
Indeno[1,2,3-cd]pyrene	**11000**		5000	550	ng/g		11/03/23 10:43	11/17/23 16:55	5
1-Methylnaphthalene	**26000**		25000	2500	ng/g		11/03/23 10:43	11/17/23 16:55	5
2-Methylnaphthalene	ND		25000	3500	ng/g		11/03/23 10:43	11/17/23 16:55	5
Naphthalene	ND		100000	15000	ng/g		11/03/23 10:43	11/17/23 16:55	5
Perylene	**7100**		5000	2600	ng/g		11/03/23 10:43	11/17/23 16:55	5
Phenanthrene	**310000**		10000	8700	ng/g		11/03/23 10:43	11/17/23 16:55	5
Pyrene	**260000**		10000	1500	ng/g		11/03/23 10:43	11/17/23 16:55	5
C1-Fluoranthenes/pyrene	**110000**		5000	5000	ng/g		11/03/23 10:43	11/17/23 16:55	5
C1-Fluorenes	**42000**		10000	6500	ng/g		11/03/23 10:43	11/17/23 16:55	5
C2-Fluorenes	**50000**		5000	5000	ng/g		11/03/23 10:43	11/17/23 16:55	5
C3-Fluorenes	**55000**		5000	5000	ng/g		11/03/23 10:43	11/17/23 16:55	5
C2-Naphthalenes	**130000**		10000	10000	ng/g		11/03/23 10:43	11/17/23 16:55	5
C3-Naphthalenes	**120000**		10000	10000	ng/g		11/03/23 10:43	11/17/23 16:55	5
C4-Naphthalenes	**84000**		15000	14000	ng/g		11/03/23 10:43	11/17/23 16:55	5
C1-Phenanthrenes/Anthracenes	**98000**		20000	17000	ng/g		11/03/23 10:43	11/17/23 16:55	5
C2-Phenanthrenes/Anthracenes	**120000**		5000	5000	ng/g		11/03/23 10:43	11/17/23 16:55	5
C3-Phenanthrenes/Anthracenes	**86000**		5000	5000	ng/g		11/03/23 10:43	11/17/23 16:55	5
C4-Phenanthrenes/Anthracenes	**51000**	**AP**	5000	5000	ng/g		11/03/23 10:43	11/17/23 16:55	5
C1-Chrysenes/Benz(a)anthracenes	**34000**		5000	5000	ng/g		11/03/23 10:43	11/17/23 16:55	5
C2-Chrysenes/Benz(a)anthracenes	**13000**		5000	5000	ng/g		11/03/23 10:43	11/17/23 16:55	5
C3-Chrysenes/Benz(a)anthracenes	**6300**		5000	5000	ng/g		11/03/23 10:43	11/17/23 16:55	5
C4-Chrysenes/Benz(a)anthracenes	ND		5000	5000	ng/g		11/03/23 10:43	11/17/23 16:55	5
PCB-14	ND		5000	50	ng/g		11/03/23 10:43	11/17/23 16:55	5
PCB-192	**310**	**J**	5000	50	ng/g		11/03/23 10:43	11/17/23 16:55	5
PCB-184	**97**	**J**	5000	50	ng/g		11/03/23 10:43	11/17/23 16:55	5
PCB-155	**78**	**J**	5000	50	ng/g		11/03/23 10:43	11/17/23 16:55	5
PCB-142	ND		5000	50	ng/g		11/03/23 10:43	11/17/23 16:55	5
PCB-204	**230**	**J**	5000	50	ng/g		11/03/23 10:43	11/17/23 16:55	5
PCB-104	**180**	**J**	5000	50	ng/g		11/03/23 10:43	11/17/23 16:55	5
PCB-121	ND		5000	50	ng/g		11/03/23 10:43	11/17/23 16:55	5
PCB-78	ND		5000	50	ng/g		11/03/23 10:43	11/17/23 16:55	5
PCB-36	ND		5000	50	ng/g		11/03/23 10:43	11/17/23 16:55	5

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Acenaphthylene-d8	*82*		*30 - 120*	*11/03/23 10:43*	*11/17/23 16:55*	*5*

Client Sample ID: 1804576-843-S2
Date Collected: 10/26/23 14:00
Date Received: 10/27/23 09:30

Lab Sample ID: 140-34148-9
Matrix: PE

Method: ID-0016 - PAHs (GC/MS Isotope Dilution) (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Anthracene-d10	81		30 - 120	11/03/23 10:43	11/17/23 16:55	5
Benzo(a)pyrene-d12	91		30 - 120	11/03/23 10:43	11/17/23 16:55	5
Benzo(b)fluoranthene-d12	86		30 - 120	11/03/23 10:43	11/17/23 16:55	5
Benzo(ghi)perylene-d12	92		30 - 120	11/03/23 10:43	11/17/23 16:55	5
Benzo(k)fluoranthene-d12	95		30 - 120	11/03/23 10:43	11/17/23 16:55	5
Chrysene-d12	85		30 - 120	11/03/23 10:43	11/17/23 16:55	5
Dibenz(a,h)anthracene-d14	90		30 - 120	11/03/23 10:43	11/17/23 16:55	5
Fluoranthene-d10	92		30 - 120	11/03/23 10:43	11/17/23 16:55	5
Fluorene -d10	79		30 - 120	11/03/23 10:43	11/17/23 16:55	5
Indeno[1,2,3-cd]pyrene-d12	93		30 - 120	11/03/23 10:43	11/17/23 16:55	5
1-Methylnaphthalene-d10	77		30 - 120	11/03/23 10:43	11/17/23 16:55	5
2-Methylnaphthalene-d10	73		30 - 120	11/03/23 10:43	11/17/23 16:55	5
Naphthalene-d8	69		30 - 120	11/03/23 10:43	11/17/23 16:55	5
Perylene-d12	89		30 - 120	11/03/23 10:43	11/17/23 16:55	5
Phenanthrene-d10	85		30 - 120	11/03/23 10:43	11/17/23 16:55	5

Client Sample ID: 1804576-844-S1
Lab Sample ID: 140-34148-10

Date Collected: 10/26/23 14:00
Matrix: PE
Date Received: 10/27/23 09:30

Method: ID-0016 - PAHs (GC/MS Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	**1600**		1000	260	ng/g		11/03/23 10:43	11/16/23 17:24	1
Acenaphthylene	**110**	**J**	1000	73	ng/g		11/03/23 10:43	11/16/23 17:24	1
Anthracene	**4100**		1000	320	ng/g		11/03/23 10:43	11/16/23 17:24	1
Benzo[a]anthracene	**2700**		1000	370	ng/g		11/03/23 10:43	11/16/23 17:24	1
Benzo[a]pyrene	**1300**		1000	280	ng/g		11/03/23 10:43	11/16/23 17:24	1
Benzo[b]fluoranthene	**2100**		1000	350	ng/g		11/03/23 10:43	11/16/23 17:24	1
Benzo[e]pyrene	**1300**		1000	160	ng/g		11/03/23 10:43	11/16/23 17:24	1
Benzo[g,h,i]perylene	**620**	**J**	1000	110	ng/g		11/03/23 10:43	11/16/23 17:24	1
Benzo[k]fluoranthene	**730**	**J**	1000	230	ng/g		11/03/23 10:43	11/16/23 17:24	1
Chrysene	**3500**		1000	130	ng/g		11/03/23 10:43	11/16/23 17:24	1
Dibenz(a,h)anthracene	**110**	**J**	1000	82	ng/g		11/03/23 10:43	11/16/23 17:24	1
Fluoranthene	**10000**		1000	810	ng/g		11/03/23 10:43	11/16/23 17:24	1
Fluorene	**1200**		1000	320	ng/g		11/03/23 10:43	11/16/23 17:24	1
Indeno[1,2,3-cd]pyrene	**570**	**J**	1000	110	ng/g		11/03/23 10:43	11/16/23 17:24	1
1-Methylnaphthalene	ND		5000	500	ng/g		11/03/23 10:43	11/16/23 17:24	1
2-Methylnaphthalene	ND		5000	700	ng/g		11/03/23 10:43	11/16/23 17:24	1
Naphthalene	ND		20000	2900	ng/g		11/03/23 10:43	11/16/23 17:24	1
Perylene	**720**	**J**	1000	510	ng/g		11/03/23 10:43	11/16/23 17:24	1
Phenanthrene	**6800**		2000	1700	ng/g		11/03/23 10:43	11/16/23 17:24	1
Pyrene	**13000**		2000	300	ng/g		11/03/23 10:43	11/16/23 17:24	1
C1-Fluoranthenes/pyrene	**5900**		1000	1000	ng/g		11/03/23 10:43	11/16/23 17:24	1
C1-Fluorenes	ND		2000	1300	ng/g		11/03/23 10:43	11/16/23 17:24	1
C2-Fluorenes	**1500**		1000	1000	ng/g		11/03/23 10:43	11/16/23 17:24	1
C3-Fluorenes	**1700**		1000	1000	ng/g		11/03/23 10:43	11/16/23 17:24	1
C2-Naphthalenes	ND		2000	2000	ng/g		11/03/23 10:43	11/16/23 17:24	1
C3-Naphthalenes	ND		2000	2000	ng/g		11/03/23 10:43	11/16/23 17:24	1
C4-Naphthalenes	ND		3000	2800	ng/g		11/03/23 10:43	11/16/23 17:24	1
C1-Phenanthrenes/Anthracenes	ND		4000	3400	ng/g		11/03/23 10:43	11/16/23 17:24	1
C2-Phenanthrenes/Anthracenes	**4000**		1000	1000	ng/g		11/03/23 10:43	11/16/23 17:24	1
C3-Phenanthrenes/Anthracenes	**2800**		1000	1000	ng/g		11/03/23 10:43	11/16/23 17:24	1
C4-Phenanthrenes/Anthracenes	**1400**		1000	1000	ng/g		11/03/23 10:43	11/16/23 17:24	1
C1-Chrysenes/Benz(a)anthracenes	**1700**		1000	1000	ng/g		11/03/23 10:43	11/16/23 17:24	1
C2-Chrysenes/Benz(a)anthracenes	ND		1000	1000	ng/g		11/03/23 10:43	11/16/23 17:24	1
C3-Chrysenes/Benz(a)anthracenes	ND		1000	1000	ng/g		11/03/23 10:43	11/16/23 17:24	1
C4-Chrysenes/Benz(a)anthracenes	ND		1000	1000	ng/g		11/03/23 10:43	11/16/23 17:24	1
PCB-14	**360**	**J**	1000	10	ng/g		11/03/23 10:43	11/16/23 17:24	1
PCB-192	**2500**		1000	10	ng/g		11/03/23 10:43	11/16/23 17:24	1
PCB-184	**970**	**J**	1000	10	ng/g		11/03/23 10:43	11/16/23 17:24	1
PCB-155	**720**	**J**	1000	10	ng/g		11/03/23 10:43	11/16/23 17:24	1
PCB-142	**610**	**J**	1000	10	ng/g		11/03/23 10:43	11/16/23 17:24	1
PCB-204	**1700**		1000	10	ng/g		11/03/23 10:43	11/16/23 17:24	1
PCB-104	**1700**		1000	10	ng/g		11/03/23 10:43	11/16/23 17:24	1
PCB-121	**830**	**J**	1000	10	ng/g		11/03/23 10:43	11/16/23 17:24	1
PCB-78	**1200**		1000	10	ng/g		11/03/23 10:43	11/16/23 17:24	1
PCB-36	**430**	**J**	1000	10	ng/g		11/03/23 10:43	11/16/23 17:24	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Acenaphthylene-d8	*83*		*30 - 120*	*11/03/23 10:43*	*11/16/23 17:24*	*1*
Anthracene-d10	*79*		*30 - 120*	*11/03/23 10:43*	*11/16/23 17:24*	*1*

Client Sample ID: 1804576-844-S1
Date Collected: 10/26/23 14:00
Date Received: 10/27/23 09:30

Lab Sample ID: 140-34148-10
Matrix: PE

Method: ID-0016 - PAHs (GC/MS Isotope Dilution) (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Benzo(a)pyrene-d12	82		30 - 120	11/03/23 10:43	11/16/23 17:24	1
Benzo(b)fluoranthene-d12	89		30 - 120	11/03/23 10:43	11/16/23 17:24	1
Benzo(ghi)perylene-d12	91		30 - 120	11/03/23 10:43	11/16/23 17:24	1
Benzo(k)fluoranthene-d12	88		30 - 120	11/03/23 10:43	11/16/23 17:24	1
Chrysene-d12	79		30 - 120	11/03/23 10:43	11/16/23 17:24	1
Dibenz(a,h)anthracene-d14	86		30 - 120	11/03/23 10:43	11/16/23 17:24	1
Fluoranthene-d10	87		30 - 120	11/03/23 10:43	11/16/23 17:24	1
Fluorene -d10	85		30 - 120	11/03/23 10:43	11/16/23 17:24	1
Indeno[1,2,3-cd]pyrene-d12	90		30 - 120	11/03/23 10:43	11/16/23 17:24	1
1-Methylnaphthalene-d10	82		30 - 120	11/03/23 10:43	11/16/23 17:24	1
2-Methylnaphthalene-d10	81		30 - 120	11/03/23 10:43	11/16/23 17:24	1
Naphthalene-d8	76		30 - 120	11/03/23 10:43	11/16/23 17:24	1
Perylene-d12	77		30 - 120	11/03/23 10:43	11/16/23 17:24	1
Phenanthrene-d10	79		30 - 120	11/03/23 10:43	11/16/23 17:24	1

Client Sample ID: 1804576-844-S3
Lab Sample ID: 140-34148-11

Date Collected: 10/26/23 14:00
Matrix: PE

Date Received: 10/27/23 09:30

Method: ID-0016 - PAHs (GC/MS Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	59000		1300	330	ng/g		11/03/23 10:43	11/16/23 17:48	1
Acenaphthylene	1400		1300	91	ng/g		11/03/23 10:43	11/16/23 17:48	1
Anthracene	25000		1300	400	ng/g		11/03/23 10:43	11/16/23 17:48	1
Benzo[a]anthracene	53000		1300	460	ng/g		11/03/23 10:43	11/16/23 17:48	1
Benzo[a]pyrene	31000		1300	350	ng/g		11/03/23 10:43	11/16/23 17:48	1
Benzo[b]fluoranthene	31000		1300	440	ng/g		11/03/23 10:43	11/16/23 17:48	1
Benzo[e]pyrene	19000		1300	200	ng/g		11/03/23 10:43	11/16/23 17:48	1
Benzo[g,h,i]perylene	8900		1300	140	ng/g		11/03/23 10:43	11/16/23 17:48	1
Benzo[k]fluoranthene	18000		1300	290	ng/g		11/03/23 10:43	11/16/23 17:48	1
Chrysene	55000		1300	160	ng/g		11/03/23 10:43	11/16/23 17:48	1
Dibenz(a,h)anthracene	2500		1300	100	ng/g		11/03/23 10:43	11/16/23 17:48	1
Fluoranthene	130000		1300	1000	ng/g		11/03/23 10:43	11/16/23 17:48	1
Fluorene	16000		1300	400	ng/g		11/03/23 10:43	11/16/23 17:48	1
Indeno[1,2,3-cd]pyrene	9000		1300	140	ng/g		11/03/23 10:43	11/16/23 17:48	1
1-Methylnaphthalene	950	J	6300	630	ng/g		11/03/23 10:43	11/16/23 17:48	1
2-Methylnaphthalene	ND		6300	880	ng/g		11/03/23 10:43	11/16/23 17:48	1
Naphthalene	ND		25000	3600	ng/g		11/03/23 10:43	11/16/23 17:48	1
Perylene	6300		1300	640	ng/g		11/03/23 10:43	11/16/23 17:48	1
Phenanthrene	110000		2500	2200	ng/g		11/03/23 10:43	11/16/23 17:48	1
Pyrene	190000		2500	380	ng/g		11/03/23 10:43	11/16/23 17:48	1
C1-Fluoranthenes/pyrene	110000		1300	1300	ng/g		11/03/23 10:43	11/16/23 17:48	1
C1-Fluorenes	19000		2500	1600	ng/g		11/03/23 10:43	11/16/23 17:48	1
C2-Fluorenes	31000		1300	1300	ng/g		11/03/23 10:43	11/16/23 17:48	1
C3-Fluorenes	38000		1300	1300	ng/g		11/03/23 10:43	11/16/23 17:48	1
C2-Naphthalenes	43000		2500	2500	ng/g		11/03/23 10:43	11/16/23 17:48	1
C3-Naphthalenes	93000		2500	2500	ng/g		11/03/23 10:43	11/16/23 17:48	1
C4-Naphthalenes	69000		3800	3500	ng/g		11/03/23 10:43	11/16/23 17:48	1
C1-Phenanthrenes/Anthracenes	65000		5000	4300	ng/g		11/03/23 10:43	11/16/23 17:48	1
C2-Phenanthrenes/Anthracenes	100000		1300	1300	ng/g		11/03/23 10:43	11/16/23 17:48	1
C3-Phenanthrenes/Anthracenes	67000		1300	1300	ng/g		11/03/23 10:43	11/16/23 17:48	1
C4-Phenanthrenes/Anthracenes	31000		1300	1300	ng/g		11/03/23 10:43	11/16/23 17:48	1
C1-Chrysenes/Benz(a)anthracenes	37000		1300	1300	ng/g		11/03/23 10:43	11/16/23 17:48	1
C2-Chrysenes/Benz(a)anthracenes	14000		1300	1300	ng/g		11/03/23 10:43	11/16/23 17:48	1
C3-Chrysenes/Benz(a)anthracenes	5000		1300	1300	ng/g		11/03/23 10:43	11/16/23 17:48	1
C4-Chrysenes/Benz(a)anthracenes	1300		1300	1300	ng/g		11/03/23 10:43	11/16/23 17:48	1
PCB-14	380	J	1300	13	ng/g		11/03/23 10:43	11/16/23 17:48	1
PCB-192	2100		1300	13	ng/g		11/03/23 10:43	11/16/23 17:48	1
PCB-184	810	J	1300	13	ng/g		11/03/23 10:43	11/16/23 17:48	1
PCB-155	510	J	1300	13	ng/g		11/03/23 10:43	11/16/23 17:48	1
PCB-142	500	J	1300	13	ng/g		11/03/23 10:43	11/16/23 17:48	1
PCB-204	1600		1300	13	ng/g		11/03/23 10:43	11/16/23 17:48	1
PCB-104	1200	J	1300	13	ng/g		11/03/23 10:43	11/16/23 17:48	1
PCB-121	550	J	1300	13	ng/g		11/03/23 10:43	11/16/23 17:48	1
PCB-78	1100	J	1300	13	ng/g		11/03/23 10:43	11/16/23 17:48	1
PCB-36	460	J	1300	13	ng/g		11/03/23 10:43	11/16/23 17:48	1

Client Sample ID: 1804576-844-S3
Lab Sample ID: 140-34148-11

Date Collected: 10/26/23 14:00
Matrix: PE
Date Received: 10/27/23 09:30

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Acenaphthylene-d8	76		30 - 120	11/03/23 10:43	11/16/23 17:48	1
Anthracene-d10	84		30 - 120	11/03/23 10:43	11/16/23 17:48	1
Benzo(a)pyrene-d12	86		30 - 120	11/03/23 10:43	11/16/23 17:48	1
Benzo(b)fluoranthene-d12	91		30 - 120	11/03/23 10:43	11/16/23 17:48	1
Benzo(ghi)perylene-d12	90		30 - 120	11/03/23 10:43	11/16/23 17:48	1
Benzo(k)fluoranthene-d12	87		30 - 120	11/03/23 10:43	11/16/23 17:48	1
Chrysene-d12	77		30 - 120	11/03/23 10:43	11/16/23 17:48	1
Dibenz(a,h)anthracene-d14	88		30 - 120	11/03/23 10:43	11/16/23 17:48	1
Fluoranthene-d10	88		30 - 120	11/03/23 10:43	11/16/23 17:48	1
Fluorene -d10	77		30 - 120	11/03/23 10:43	11/16/23 17:48	1
Indeno[1,2,3-cd]pyrene-d12	93		30 - 120	11/03/23 10:43	11/16/23 17:48	1
1-Methylnaphthalene-d10	72		30 - 120	11/03/23 10:43	11/16/23 17:48	1
2-Methylnaphthalene-d10	70		30 - 120	11/03/23 10:43	11/16/23 17:48	1
Naphthalene-d8	63		30 - 120	11/03/23 10:43	11/16/23 17:48	1
Perylene-d12	80		30 - 120	11/03/23 10:43	11/16/23 17:48	1
Phenanthrene-d10	83		30 - 120	11/03/23 10:43	11/16/23 17:48	1

Client Sample ID: 1804576-854-S1
Date Collected: 10/26/23 14:00
Date Received: 10/27/23 09:30

Lab Sample ID: 140-34148-12
Matrix: PE

Method: ID-0016 - PAHs (GC/MS Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	**1500**		1300	330	ng/g		11/03/23 10:43	11/16/23 18:11	1
Acenaphthylene	**190**	**J**	1300	91	ng/g		11/03/23 10:43	11/16/23 18:11	1
Anthracene	**1600**		1300	400	ng/g		11/03/23 10:43	11/16/23 18:11	1
Benzo[a]anthracene	**4600**		1300	460	ng/g		11/03/23 10:43	11/16/23 18:11	1
Benzo[a]pyrene	**3100**		1300	350	ng/g		11/03/23 10:43	11/16/23 18:11	1
Benzo[b]fluoranthene	**4700**		1300	440	ng/g		11/03/23 10:43	11/16/23 18:11	1
Benzo[e]pyrene	**2900**		1300	200	ng/g		11/03/23 10:43	11/16/23 18:11	1
Benzo[g,h,i]perylene	**1300**		1300	140	ng/g		11/03/23 10:43	11/16/23 18:11	1
Benzo[k]fluoranthene	**2400**		1300	290	ng/g		11/03/23 10:43	11/16/23 18:11	1
Chrysene	**6500**		1300	160	ng/g		11/03/23 10:43	11/16/23 18:11	1
Dibenz(a,h)anthracene	**310**	**J**	1300	100	ng/g		11/03/23 10:43	11/16/23 18:11	1
Fluoranthene	**15000**		1300	1000	ng/g		11/03/23 10:43	11/16/23 18:11	1
Fluorene	**600**	**J**	1300	400	ng/g		11/03/23 10:43	11/16/23 18:11	1
Indeno[1,2,3-cd]pyrene	**1200**	**J**	1300	140	ng/g		11/03/23 10:43	11/16/23 18:11	1
1-Methylnaphthalene	ND		6300	630	ng/g		11/03/23 10:43	11/16/23 18:11	1
2-Methylnaphthalene	ND		6300	880	ng/g		11/03/23 10:43	11/16/23 18:11	1
Naphthalene	ND		25000	3600	ng/g		11/03/23 10:43	11/16/23 18:11	1
Perylene	**2200**		1300	640	ng/g		11/03/23 10:43	11/16/23 18:11	1
Phenanthrene	**6100**		2500	2200	ng/g		11/03/23 10:43	11/16/23 18:11	1
Pyrene	**17000**		2500	380	ng/g		11/03/23 10:43	11/16/23 18:11	1
C1-Fluoranthenes/pyrene	**12000**		1300	1300	ng/g		11/03/23 10:43	11/16/23 18:11	1
C1-Fluorenes	**1700**	**J**	2500	1600	ng/g		11/03/23 10:43	11/16/23 18:11	1
C2-Fluorenes	**4600**		1300	1300	ng/g		11/03/23 10:43	11/16/23 18:11	1
C3-Fluorenes	**8000**		1300	1300	ng/g		11/03/23 10:43	11/16/23 18:11	1
C2-Naphthalenes	ND		2500	2500	ng/g		11/03/23 10:43	11/16/23 18:11	1
C3-Naphthalenes	**5600**		2500	2500	ng/g		11/03/23 10:43	11/16/23 18:11	1
C4-Naphthalenes	**8900**		3800	3500	ng/g		11/03/23 10:43	11/16/23 18:11	1
C1-Phenanthrenes/Anthracenes	**5100**		5000	4300	ng/g		11/03/23 10:43	11/16/23 18:11	1
C2-Phenanthrenes/Anthracenes	**11000**		1300	1300	ng/g		11/03/23 10:43	11/16/23 18:11	1
C3-Phenanthrenes/Anthracenes	**11000**		1300	1300	ng/g		11/03/23 10:43	11/16/23 18:11	1
C4-Phenanthrenes/Anthracenes	**5400**		1300	1300	ng/g		11/03/23 10:43	11/16/23 18:11	1
C1-Chrysenes/Benz(a)anthracenes	**4900**		1300	1300	ng/g		11/03/23 10:43	11/16/23 18:11	1
C2-Chrysenes/Benz(a)anthracenes	**2400**		1300	1300	ng/g		11/03/23 10:43	11/16/23 18:11	1
C3-Chrysenes/Benz(a)anthracenes	ND		1300	1300	ng/g		11/03/23 10:43	11/16/23 18:11	1
C4-Chrysenes/Benz(a)anthracenes	ND		1300	1300	ng/g		11/03/23 10:43	11/16/23 18:11	1
PCB-14	**170**	**J**	1300	13	ng/g		11/03/23 10:43	11/16/23 18:11	1
PCB-192	**2900**		1300	13	ng/g		11/03/23 10:43	11/16/23 18:11	1
PCB-184	**1100**	**J**	1300	13	ng/g		11/03/23 10:43	11/16/23 18:11	1
PCB-155	**690**	**J**	1300	13	ng/g		11/03/23 10:43	11/16/23 18:11	1
PCB-142	**460**	**J**	1300	13	ng/g		11/03/23 10:43	11/16/23 18:11	1
PCB-204	**2000**		1300	13	ng/g		11/03/23 10:43	11/16/23 18:11	1
PCB-104	**990**	**J**	1300	13	ng/g		11/03/23 10:43	11/16/23 18:11	1
PCB-121	**790**	**J**	1300	13	ng/g		11/03/23 10:43	11/16/23 18:11	1
PCB-78	**800**	**J**	1300	13	ng/g		11/03/23 10:43	11/16/23 18:11	1
PCB-36	**190**	**J**	1300	13	ng/g		11/03/23 10:43	11/16/23 18:11	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Acenaphthylene-d8	*86*		*30 - 120*	*11/03/23 10:43*	*11/16/23 18:11*	*1*
Anthracene-d10	*88*		*30 - 120*	*11/03/23 10:43*	*11/16/23 18:11*	*1*

Client Sample ID: 1804576-854-S1
Lab Sample ID: 140-34148-12

Date Collected: 10/26/23 14:00
Matrix: PE
Date Received: 10/27/23 09:30

Method: ID-0016 - PAHs (GC/MS Isotope Dilution) (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Benzo(a)pyrene-d12	91		30 - 120	11/03/23 10:43	11/16/23 18:11	1
Benzo(b)fluoranthene-d12	90		30 - 120	11/03/23 10:43	11/16/23 18:11	1
Benzo(ghi)perylene-d12	93		30 - 120	11/03/23 10:43	11/16/23 18:11	1
Benzo(k)fluoranthene-d12	88		30 - 120	11/03/23 10:43	11/16/23 18:11	1
Chrysene-d12	81		30 - 120	11/03/23 10:43	11/16/23 18:11	1
Dibenz(a,h)anthracene-d14	89		30 - 120	11/03/23 10:43	11/16/23 18:11	1
Fluoranthene-d10	87		30 - 120	11/03/23 10:43	11/16/23 18:11	1
Fluorene -d10	83		30 - 120	11/03/23 10:43	11/16/23 18:11	1
Indeno[1,2,3-cd]pyrene-d12	91		30 - 120	11/03/23 10:43	11/16/23 18:11	1
1-Methylnaphthalene-d10	83		30 - 120	11/03/23 10:43	11/16/23 18:11	1
2-Methylnaphthalene-d10	81		30 - 120	11/03/23 10:43	11/16/23 18:11	1
Naphthalene-d8	78		30 - 120	11/03/23 10:43	11/16/23 18:11	1
Perylene-d12	87		30 - 120	11/03/23 10:43	11/16/23 18:11	1
Phenanthrene-d10	85		30 - 120	11/03/23 10:43	11/16/23 18:11	1

Client Sample ID: 1804576-854-S2
Lab Sample ID: 140-34148-13

Date Collected: 10/26/23 14:00
Matrix: PE

Date Received: 10/27/23 09:30

Method: ID-0016 - PAHs (GC/MS Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	**9000**		830	220	ng/g		11/03/23 10:43	11/16/23 18:35	1
Acenaphthylene	**680**	**J**	830	61	ng/g		11/03/23 10:43	11/16/23 18:35	1
Anthracene	**21000**		830	270	ng/g		11/03/23 10:43	11/16/23 18:35	1
Benzo[a]anthracene	**21000**		830	310	ng/g		11/03/23 10:43	11/16/23 18:35	1
Benzo[a]pyrene	**9800**		830	230	ng/g		11/03/23 10:43	11/16/23 18:35	1
Benzo[b]fluoranthene	**9700**		830	290	ng/g		11/03/23 10:43	11/16/23 18:35	1
Benzo[e]pyrene	**6200**		830	130	ng/g		11/03/23 10:43	11/16/23 18:35	1
Benzo[g,h,i]perylene	**2600**		830	92	ng/g		11/03/23 10:43	11/16/23 18:35	1
Benzo[k]fluoranthene	**5300**		830	190	ng/g		11/03/23 10:43	11/16/23 18:35	1
Chrysene	**22000**		830	110	ng/g		11/03/23 10:43	11/16/23 18:35	1
Dibenz(a,h)anthracene	**640**	**J**	830	68	ng/g		11/03/23 10:43	11/16/23 18:35	1
Fluoranthene	**78000**		830	680	ng/g		11/03/23 10:43	11/16/23 18:35	1
Fluorene	**6800**		830	270	ng/g		11/03/23 10:43	11/16/23 18:35	1
Indeno[1,2,3-cd]pyrene	**2700**		830	92	ng/g		11/03/23 10:43	11/16/23 18:35	1
1-Methylnaphthalene	ND		4200	420	ng/g		11/03/23 10:43	11/16/23 18:35	1
2-Methylnaphthalene	ND		4200	580	ng/g		11/03/23 10:43	11/16/23 18:35	1
Naphthalene	ND		17000	2400	ng/g		11/03/23 10:43	11/16/23 18:35	1
Perylene	**6200**		830	430	ng/g		11/03/23 10:43	11/16/23 18:35	1
Phenanthrene	**71000**		1700	1400	ng/g		11/03/23 10:43	11/16/23 18:35	1
Pyrene	**98000**		1700	250	ng/g		11/03/23 10:43	11/16/23 18:35	1
C1-Fluoranthenes/pyrene	**53000**		830	830	ng/g		11/03/23 10:43	11/16/23 18:35	1
C1-Fluorenes	**18000**		1700	1100	ng/g		11/03/23 10:43	11/16/23 18:35	1
C2-Fluorenes	**30000**		830	830	ng/g		11/03/23 10:43	11/16/23 18:35	1
C3-Fluorenes	**26000**		830	830	ng/g		11/03/23 10:43	11/16/23 18:35	1
C2-Naphthalenes	**14000**		1700	1700	ng/g		11/03/23 10:43	11/16/23 18:35	1
C3-Naphthalenes	**65000**		1700	1700	ng/g		11/03/23 10:43	11/16/23 18:35	1
C4-Naphthalenes	**56000**		2500	2300	ng/g		11/03/23 10:43	11/16/23 18:35	1
C1-Phenanthrenes/Anthracenes	**51000**		3300	2800	ng/g		11/03/23 10:43	11/16/23 18:35	1
C2-Phenanthrenes/Anthracenes	**64000**		830	830	ng/g		11/03/23 10:43	11/16/23 18:35	1
C3-Phenanthrenes/Anthracenes	**32000**		830	830	ng/g		11/03/23 10:43	11/16/23 18:35	1
C4-Phenanthrenes/Anthracenes	**11000**		830	830	ng/g		11/03/23 10:43	11/16/23 18:35	1
C1-Chrysenes/Benz(a)anthracenes	**15000**		830	830	ng/g		11/03/23 10:43	11/16/23 18:35	1
C2-Chrysenes/Benz(a)anthracenes	**5100**		830	830	ng/g		11/03/23 10:43	11/16/23 18:35	1
C3-Chrysenes/Benz(a)anthracenes	**1600**		830	830	ng/g		11/03/23 10:43	11/16/23 18:35	1
C4-Chrysenes/Benz(a)anthracenes	ND		830	830	ng/g		11/03/23 10:43	11/16/23 18:35	1
PCB-14	**500**	**J**	830	8.3	ng/g		11/03/23 10:43	11/16/23 18:35	1
PCB-192	**2200**		830	8.3	ng/g		11/03/23 10:43	11/16/23 18:35	1
PCB-184	**900**		830	8.3	ng/g		11/03/23 10:43	11/16/23 18:35	1
PCB-155	**700**	**J**	830	8.3	ng/g		11/03/23 10:43	11/16/23 18:35	1
PCB-142	**540**	**J**	830	8.3	ng/g		11/03/23 10:43	11/16/23 18:35	1
PCB-204	**1500**		830	8.3	ng/g		11/03/23 10:43	11/16/23 18:35	1
PCB-104	**1400**		830	8.3	ng/g		11/03/23 10:43	11/16/23 18:35	1
PCB-121	**990**		830	8.3	ng/g		11/03/23 10:43	11/16/23 18:35	1
PCB-78	**1200**		830	8.3	ng/g		11/03/23 10:43	11/16/23 18:35	1
PCB-36	**400**	**J**	830	8.3	ng/g		11/03/23 10:43	11/16/23 18:35	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Acenaphthylene-d8	*82*		*30 - 120*	*11/03/23 10:43*	*11/16/23 18:35*	*1*

Client Sample ID: 1804576-854-S2
Lab Sample ID: 140-34148-13

Date Collected: 10/26/23 14:00
Matrix: PE
Date Received: 10/27/23 09:30

Method: ID-0016 - PAHs (GC/MS Isotope Dilution) (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Anthracene-d10	80		30 - 120	11/03/23 10:43	11/16/23 18:35	1
Benzo(a)pyrene-d12	86		30 - 120	11/03/23 10:43	11/16/23 18:35	1
Benzo(b)fluoranthene-d12	91		30 - 120	11/03/23 10:43	11/16/23 18:35	1
Benzo(ghi)perylene-d12	91		30 - 120	11/03/23 10:43	11/16/23 18:35	1
Benzo(k)fluoranthene-d12	85		30 - 120	11/03/23 10:43	11/16/23 18:35	1
Chrysene-d12	77		30 - 120	11/03/23 10:43	11/16/23 18:35	1
Dibenz(a,h)anthracene-d14	88		30 - 120	11/03/23 10:43	11/16/23 18:35	1
Fluoranthene-d10	88		30 - 120	11/03/23 10:43	11/16/23 18:35	1
Fluorene -d10	81		30 - 120	11/03/23 10:43	11/16/23 18:35	1
Indeno[1,2,3-cd]pyrene-d12	91		30 - 120	11/03/23 10:43	11/16/23 18:35	1
1-Methylnaphthalene-d10	75		30 - 120	11/03/23 10:43	11/16/23 18:35	1
2-Methylnaphthalene-d10	73		30 - 120	11/03/23 10:43	11/16/23 18:35	1
Naphthalene-d8	68		30 - 120	11/03/23 10:43	11/16/23 18:35	1
Perylene-d12	81		30 - 120	11/03/23 10:43	11/16/23 18:35	1
Phenanthrene-d10	84		30 - 120	11/03/23 10:43	11/16/23 18:35	1

Client Sample ID: 1804576-846-S1
Date Collected: 10/26/23 14:00
Date Received: 10/27/23 09:30

Lab Sample ID: 140-34148-14
Matrix: PE

Method: ID-0016 - PAHs (GC/MS Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	**400**	**J**	1000	260	ng/g		11/03/23 10:43	11/16/23 18:59	1
Acenaphthylene	ND		1000	73	ng/g		11/03/23 10:43	11/16/23 18:59	1
Anthracene	**380**	**J**	1000	320	ng/g		11/03/23 10:43	11/16/23 18:59	1
Benzo[a]anthracene	**1500**		1000	370	ng/g		11/03/23 10:43	11/16/23 18:59	1
Benzo[a]pyrene	**1200**		1000	280	ng/g		11/03/23 10:43	11/16/23 18:59	1
Benzo[b]fluoranthene	**1700**		1000	350	ng/g		11/03/23 10:43	11/16/23 18:59	1
Benzo[e]pyrene	**1300**		1000	160	ng/g		11/03/23 10:43	11/16/23 18:59	1
Benzo[g,h,i]perylene	**710**	**J**	1000	110	ng/g		11/03/23 10:43	11/16/23 18:59	1
Benzo[k]fluoranthene	**810**	**J**	1000	230	ng/g		11/03/23 10:43	11/16/23 18:59	1
Chrysene	**1900**		1000	130	ng/g		11/03/23 10:43	11/16/23 18:59	1
Dibenz(a,h)anthracene	**130**	**J**	1000	82	ng/g		11/03/23 10:43	11/16/23 18:59	1
Fluoranthene	**5100**		1000	810	ng/g		11/03/23 10:43	11/16/23 18:59	1
Fluorene	ND		1000	320	ng/g		11/03/23 10:43	11/16/23 18:59	1
Indeno[1,2,3-cd]pyrene	**530**	**J**	1000	110	ng/g		11/03/23 10:43	11/16/23 18:59	1
1-Methylnaphthalene	ND		5000	500	ng/g		11/03/23 10:43	11/16/23 18:59	1
2-Methylnaphthalene	ND		5000	700	ng/g		11/03/23 10:43	11/16/23 18:59	1
Naphthalene	ND		20000	2900	ng/g		11/03/23 10:43	11/16/23 18:59	1
Perylene	**880**	**J**	1000	510	ng/g		11/03/23 10:43	11/16/23 18:59	1
Phenanthrene	ND		2000	1700	ng/g		11/03/23 10:43	11/16/23 18:59	1
Pyrene	**6300**		2000	300	ng/g		11/03/23 10:43	11/16/23 18:59	1
C1-Fluoranthenes/pyrene	**4100**		1000	1000	ng/g		11/03/23 10:43	11/16/23 18:59	1
C1-Fluorenes	ND		2000	1300	ng/g		11/03/23 10:43	11/16/23 18:59	1
C2-Fluorenes	**1300**		1000	1000	ng/g		11/03/23 10:43	11/16/23 18:59	1
C3-Fluorenes	**2100**		1000	1000	ng/g		11/03/23 10:43	11/16/23 18:59	1
C2-Naphthalenes	ND		2000	2000	ng/g		11/03/23 10:43	11/16/23 18:59	1
C3-Naphthalenes	ND		2000	2000	ng/g		11/03/23 10:43	11/16/23 18:59	1
C4-Naphthalenes	ND		3000	2800	ng/g		11/03/23 10:43	11/16/23 18:59	1
C1-Phenanthrenes/Anthracenes	ND		4000	3400	ng/g		11/03/23 10:43	11/16/23 18:59	1
C2-Phenanthrenes/Anthracenes	**3100**		1000	1000	ng/g		11/03/23 10:43	11/16/23 18:59	1
C3-Phenanthrenes/Anthracenes	**2800**		1000	1000	ng/g		11/03/23 10:43	11/16/23 18:59	1
C4-Phenanthrenes/Anthracenes	**1600**		1000	1000	ng/g		11/03/23 10:43	11/16/23 18:59	1
C1-Chrysenes/Benz(a)anthracenes	**1500**		1000	1000	ng/g		11/03/23 10:43	11/16/23 18:59	1
C2-Chrysenes/Benz(a)anthracenes	ND		1000	1000	ng/g		11/03/23 10:43	11/16/23 18:59	1
C3-Chrysenes/Benz(a)anthracenes	ND		1000	1000	ng/g		11/03/23 10:43	11/16/23 18:59	1
C4-Chrysenes/Benz(a)anthracenes	ND		1000	1000	ng/g		11/03/23 10:43	11/16/23 18:59	1
PCB-14	**240**	**J**	1000	10	ng/g		11/03/23 10:43	11/16/23 18:59	1
PCB-192	**1700**		1000	10	ng/g		11/03/23 10:43	11/16/23 18:59	1
PCB-184	**720**	**J**	1000	10	ng/g		11/03/23 10:43	11/16/23 18:59	1
PCB-155	**500**	**J**	1000	10	ng/g		11/03/23 10:43	11/16/23 18:59	1
PCB-142	**420**	**J**	1000	10	ng/g		11/03/23 10:43	11/16/23 18:59	1
PCB-204	**1300**		1000	10	ng/g		11/03/23 10:43	11/16/23 18:59	1
PCB-104	**1200**		1000	10	ng/g		11/03/23 10:43	11/16/23 18:59	1
PCB-121	**450**	**J**	1000	10	ng/g		11/03/23 10:43	11/16/23 18:59	1
PCB-78	**890**	**J**	1000	10	ng/g		11/03/23 10:43	11/16/23 18:59	1
PCB-36	**290**	**J**	1000	10	ng/g		11/03/23 10:43	11/16/23 18:59	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Acenaphthylene-d8	*82*		*30 - 120*	*11/03/23 10:43*	*11/16/23 18:59*	*1*
Anthracene-d10	*77*		*30 - 120*	*11/03/23 10:43*	*11/16/23 18:59*	*1*

Client Sample ID: 1804576-846-S1
Lab Sample ID: 140-34148-14

Date Collected: 10/26/23 14:00
Matrix: PE
Date Received: 10/27/23 09:30

Method: ID-0016 - PAHs (GC/MS Isotope Dilution) (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Benzo(a)pyrene-d12	80		30 - 120	11/03/23 10:43	11/16/23 18:59	1
Benzo(b)fluoranthene-d12	88		30 - 120	11/03/23 10:43	11/16/23 18:59	1
Benzo(ghi)perylene-d12	89		30 - 120	11/03/23 10:43	11/16/23 18:59	1
Benzo(k)fluoranthene-d12	85		30 - 120	11/03/23 10:43	11/16/23 18:59	1
Chrysene-d12	80		30 - 120	11/03/23 10:43	11/16/23 18:59	1
Dibenz(a,h)anthracene-d14	85		30 - 120	11/03/23 10:43	11/16/23 18:59	1
Fluoranthene-d10	85		30 - 120	11/03/23 10:43	11/16/23 18:59	1
Fluorene -d10	85		30 - 120	11/03/23 10:43	11/16/23 18:59	1
Indeno[1,2,3-cd]pyrene-d12	88		30 - 120	11/03/23 10:43	11/16/23 18:59	1
1-Methylnaphthalene-d10	83		30 - 120	11/03/23 10:43	11/16/23 18:59	1
2-Methylnaphthalene-d10	82		30 - 120	11/03/23 10:43	11/16/23 18:59	1
Naphthalene-d8	77		30 - 120	11/03/23 10:43	11/16/23 18:59	1
Perylene-d12	75		30 - 120	11/03/23 10:43	11/16/23 18:59	1
Phenanthrene-d10	77		30 - 120	11/03/23 10:43	11/16/23 18:59	1

Client Sample ID: 1804576-846-S3
Lab Sample ID: 140-34148-15

Date Collected: 10/26/23 14:00
Matrix: PE

Date Received: 10/27/23 09:30

Method: ID-0016 - PAHs (GC/MS Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	**13000**		910	240	ng/g		11/03/23 10:43	11/16/23 19:22	1
Acenaphthylene	**320**	**J**	910	66	ng/g		11/03/23 10:43	11/16/23 19:22	1
Anthracene	**5300**		910	290	ng/g		11/03/23 10:43	11/16/23 19:22	1
Benzo[a]anthracene	**7300**		910	340	ng/g		11/03/23 10:43	11/16/23 19:22	1
Benzo[a]pyrene	**3900**		910	250	ng/g		11/03/23 10:43	11/16/23 19:22	1
Benzo[b]fluoranthene	**5500**		910	320	ng/g		11/03/23 10:43	11/16/23 19:22	1
Benzo[e]pyrene	**3400**		910	150	ng/g		11/03/23 10:43	11/16/23 19:22	1
Benzo[g,h,i]perylene	**1400**		910	100	ng/g		11/03/23 10:43	11/16/23 19:22	1
Benzo[k]fluoranthene	**2700**		910	210	ng/g		11/03/23 10:43	11/16/23 19:22	1
Chrysene	**9300**		910	120	ng/g		11/03/23 10:43	11/16/23 19:22	1
Dibenz(a,h)anthracene	**340**	**J**	910	75	ng/g		11/03/23 10:43	11/16/23 19:22	1
Fluoranthene	**33000**		910	740	ng/g		11/03/23 10:43	11/16/23 19:22	1
Fluorene	**730**	**J**	910	290	ng/g		11/03/23 10:43	11/16/23 19:22	1
Indeno[1,2,3-cd]pyrene	**1400**		910	100	ng/g		11/03/23 10:43	11/16/23 19:22	1
1-Methylnaphthalene	ND		4500	450	ng/g		11/03/23 10:43	11/16/23 19:22	1
2-Methylnaphthalene	ND		4500	640	ng/g		11/03/23 10:43	11/16/23 19:22	1
Naphthalene	ND		18000	2600	ng/g		11/03/23 10:43	11/16/23 19:22	1
Perylene	**1500**		910	460	ng/g		11/03/23 10:43	11/16/23 19:22	1
Phenanthrene	**19000**		1800	1600	ng/g		11/03/23 10:43	11/16/23 19:22	1
Pyrene	**42000**		1800	270	ng/g		11/03/23 10:43	11/16/23 19:22	1
C1-Fluoranthenes/pyrene	**22000**		910	910	ng/g		11/03/23 10:43	11/16/23 19:22	1
C1-Fluorenes	**6300**		1800	1200	ng/g		11/03/23 10:43	11/16/23 19:22	1
C2-Fluorenes	**9800**		910	910	ng/g		11/03/23 10:43	11/16/23 19:22	1
C3-Fluorenes	**12000**		910	910	ng/g		11/03/23 10:43	11/16/23 19:22	1
C2-Naphthalenes	**9100**		1800	1800	ng/g		11/03/23 10:43	11/16/23 19:22	1
C3-Naphthalenes	**21000**		1800	1800	ng/g		11/03/23 10:43	11/16/23 19:22	1
C4-Naphthalenes	**18000**		2700	2500	ng/g		11/03/23 10:43	11/16/23 19:22	1
C1-Phenanthrenes/Anthracenes	**15000**		3600	3100	ng/g		11/03/23 10:43	11/16/23 19:22	1
C2-Phenanthrenes/Anthracenes	**29000**		910	910	ng/g		11/03/23 10:43	11/16/23 19:22	1
C3-Phenanthrenes/Anthracenes	**26000**		910	910	ng/g		11/03/23 10:43	11/16/23 19:22	1
C4-Phenanthrenes/Anthracenes	**13000**		910	910	ng/g		11/03/23 10:43	11/16/23 19:22	1
C1-Chrysenes/Benz(a)anthracenes	**6800**		910	910	ng/g		11/03/23 10:43	11/16/23 19:22	1
C2-Chrysenes/Benz(a)anthracenes	**3500**		910	910	ng/g		11/03/23 10:43	11/16/23 19:22	1
C3-Chrysenes/Benz(a)anthracenes	**1300**		910	910	ng/g		11/03/23 10:43	11/16/23 19:22	1
C4-Chrysenes/Benz(a)anthracenes	ND		910	910	ng/g		11/03/23 10:43	11/16/23 19:22	1
PCB-14	**380**	**J**	910	9.1	ng/g		11/03/23 10:43	11/16/23 19:22	1
PCB-192	**1900**		910	9.1	ng/g		11/03/23 10:43	11/16/23 19:22	1
PCB-184	**750**	**J**	910	9.1	ng/g		11/03/23 10:43	11/16/23 19:22	1
PCB-155	**430**	**J**	910	9.1	ng/g		11/03/23 10:43	11/16/23 19:22	1
PCB-142	**490**	**J**	910	9.1	ng/g		11/03/23 10:43	11/16/23 19:22	1
PCB-204	**1300**		910	9.1	ng/g		11/03/23 10:43	11/16/23 19:22	1
PCB-104	**1200**		910	9.1	ng/g		11/03/23 10:43	11/16/23 19:22	1
PCB-121	**630**	**J**	910	9.1	ng/g		11/03/23 10:43	11/16/23 19:22	1
PCB-78	**1100**		910	9.1	ng/g		11/03/23 10:43	11/16/23 19:22	1
PCB-36	**340**	**J**	910	9.1	ng/g		11/03/23 10:43	11/16/23 19:22	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Acenaphthylene-d8	*86*		*30 - 120*	*11/03/23 10:43*	*11/16/23 19:22*	*1*

Client Sample ID: 1804576-846-S3
Lab Sample ID: 140-34148-15
Date Collected: 10/26/23 14:00
Matrix: PE
Date Received: 10/27/23 09:30

Method: ID-0016 - PAHs (GC/MS Isotope Dilution) (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Anthracene-d10	86		30 - 120	11/03/23 10:43	11/16/23 19:22	1
Benzo(a)pyrene-d12	87		30 - 120	11/03/23 10:43	11/16/23 19:22	1
Benzo(b)fluoranthene-d12	93		30 - 120	11/03/23 10:43	11/16/23 19:22	1
Benzo(ghi)perylene-d12	93		30 - 120	11/03/23 10:43	11/16/23 19:22	1
Benzo(k)fluoranthene-d12	86		30 - 120	11/03/23 10:43	11/16/23 19:22	1
Chrysene-d12	84		30 - 120	11/03/23 10:43	11/16/23 19:22	1
Dibenz(a,h)anthracene-d14	88		30 - 120	11/03/23 10:43	11/16/23 19:22	1
Fluoranthene-d10	90		30 - 120	11/03/23 10:43	11/16/23 19:22	1
Fluorene -d10	85		30 - 120	11/03/23 10:43	11/16/23 19:22	1
Indeno[1,2,3-cd]pyrene-d12	90		30 - 120	11/03/23 10:43	11/16/23 19:22	1
1-Methylnaphthalene-d10	86		30 - 120	11/03/23 10:43	11/16/23 19:22	1
2-Methylnaphthalene-d10	84		30 - 120	11/03/23 10:43	11/16/23 19:22	1
Naphthalene-d8	81		30 - 120	11/03/23 10:43	11/16/23 19:22	1
Perylene-d12	84		30 - 120	11/03/23 10:43	11/16/23 19:22	1
Phenanthrene-d10	85		30 - 120	11/03/23 10:43	11/16/23 19:22	1

Client Sample ID: 1804576-853-S1
Date Collected: 10/26/23 14:00
Date Received: 10/27/23 09:30

Lab Sample ID: 140-34148-16
Matrix: PE

Method: ID-0016 - PAHs (GC/MS Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	**740**	**J**	910	240	ng/g		11/03/23 10:43	11/16/23 19:45	1
Acenaphthylene	**140**	**J**	910	66	ng/g		11/03/23 10:43	11/16/23 19:45	1
Anthracene	**530**	**J**	910	290	ng/g		11/03/23 10:43	11/16/23 19:45	1
Benzo[a]anthracene	**2300**		910	340	ng/g		11/03/23 10:43	11/16/23 19:45	1
Benzo[a]pyrene	**1300**		910	250	ng/g		11/03/23 10:43	11/16/23 19:45	1
Benzo[b]fluoranthene	**1900**		910	320	ng/g		11/03/23 10:43	11/16/23 19:45	1
Benzo[e]pyrene	**1300**		910	150	ng/g		11/03/23 10:43	11/16/23 19:45	1
Benzo[g,h,i]perylene	**410**	**J**	910	100	ng/g		11/03/23 10:43	11/16/23 19:45	1
Benzo[k]fluoranthene	**900**	**J**	910	210	ng/g		11/03/23 10:43	11/16/23 19:45	1
Chrysene	**3100**		910	120	ng/g		11/03/23 10:43	11/16/23 19:45	1
Dibenz(a,h)anthracene	ND		910	75	ng/g		11/03/23 10:43	11/16/23 19:45	1
Fluoranthene	**6600**		910	740	ng/g		11/03/23 10:43	11/16/23 19:45	1
Fluorene	**870**	**J**	910	290	ng/g		11/03/23 10:43	11/16/23 19:45	1
Indeno[1,2,3-cd]pyrene	**420**	**J**	910	100	ng/g		11/03/23 10:43	11/16/23 19:45	1
1-Methylnaphthalene	ND		4500	450	ng/g		11/03/23 10:43	11/16/23 19:45	1
2-Methylnaphthalene	ND		4500	640	ng/g		11/03/23 10:43	11/16/23 19:45	1
Naphthalene	ND		18000	2600	ng/g		11/03/23 10:43	11/16/23 19:45	1
Perylene	**1400**		910	460	ng/g		11/03/23 10:43	11/16/23 19:45	1
Phenanthrene	**3900**		1800	1600	ng/g		11/03/23 10:43	11/16/23 19:45	1
Pyrene	**9500**		1800	270	ng/g		11/03/23 10:43	11/16/23 19:45	1
C1-Fluoranthenes/pyrene	**7600**		910	910	ng/g		11/03/23 10:43	11/16/23 19:45	1
C1-Fluorenes	**1600**	**J**	1800	1200	ng/g		11/03/23 10:43	11/16/23 19:45	1
C2-Fluorenes	**7100**		910	910	ng/g		11/03/23 10:43	11/16/23 19:45	1
C3-Fluorenes	**9700**		910	910	ng/g		11/03/23 10:43	11/16/23 19:45	1
C2-Naphthalenes	**4400**		1800	1800	ng/g		11/03/23 10:43	11/16/23 19:45	1
C3-Naphthalenes	**25000**		1800	1800	ng/g		11/03/23 10:43	11/16/23 19:45	1
C4-Naphthalenes	**25000**		2700	2500	ng/g		11/03/23 10:43	11/16/23 19:45	1
C1-Phenanthrenes/Anthracenes	**4900**		3600	3100	ng/g		11/03/23 10:43	11/16/23 19:45	1
C2-Phenanthrenes/Anthracenes	**14000**		910	910	ng/g		11/03/23 10:43	11/16/23 19:45	1
C3-Phenanthrenes/Anthracenes	**12000**		910	910	ng/g		11/03/23 10:43	11/16/23 19:45	1
C4-Phenanthrenes/Anthracenes	**5200**		910	910	ng/g		11/03/23 10:43	11/16/23 19:45	1
C1-Chrysenes/Benz(a)anthracenes	**2800**		910	910	ng/g		11/03/23 10:43	11/16/23 19:45	1
C2-Chrysenes/Benz(a)anthracenes	**1300**		910	910	ng/g		11/03/23 10:43	11/16/23 19:45	1
C3-Chrysenes/Benz(a)anthracenes	ND		910	910	ng/g		11/03/23 10:43	11/16/23 19:45	1
C4-Chrysenes/Benz(a)anthracenes	ND		910	910	ng/g		11/03/23 10:43	11/16/23 19:45	1
PCB-14	**420**	**J**	910	9.1	ng/g		11/03/23 10:43	11/16/23 19:45	1
PCB-192	**1800**		910	9.1	ng/g		11/03/23 10:43	11/16/23 19:45	1
PCB-184	**790**	**J**	910	9.1	ng/g		11/03/23 10:43	11/16/23 19:45	1
PCB-155	**540**	**J**	910	9.1	ng/g		11/03/23 10:43	11/16/23 19:45	1
PCB-142	**470**	**J**	910	9.1	ng/g		11/03/23 10:43	11/16/23 19:45	1
PCB-204	**1300**		910	9.1	ng/g		11/03/23 10:43	11/16/23 19:45	1
PCB-104	**1200**		910	9.1	ng/g		11/03/23 10:43	11/16/23 19:45	1
PCB-121	**900**	**J**	910	9.1	ng/g		11/03/23 10:43	11/16/23 19:45	1
PCB-78	**1100**		910	9.1	ng/g		11/03/23 10:43	11/16/23 19:45	1
PCB-36	**420**	**J**	910	9.1	ng/g		11/03/23 10:43	11/16/23 19:45	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Acenaphthylene-d8	*80*		*30 - 120*	*11/03/23 10:43*	*11/16/23 19:45*	*1*
Anthracene-d10	*75*		*30 - 120*	*11/03/23 10:43*	*11/16/23 19:45*	*1*

Client Sample ID: 1804576-853-S1
Lab Sample ID: 140-34148-16

Date Collected: 10/26/23 14:00
Matrix: PE
Date Received: 10/27/23 09:30

Method: ID-0016 - PAHs (GC/MS Isotope Dilution) (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Benzo(a)pyrene-d12	81		30 - 120	11/03/23 10:43	11/16/23 19:45	1
Benzo(b)fluoranthene-d12	86		30 - 120	11/03/23 10:43	11/16/23 19:45	1
Benzo(ghi)perylene-d12	88		30 - 120	11/03/23 10:43	11/16/23 19:45	1
Benzo(k)fluoranthene-d12	84		30 - 120	11/03/23 10:43	11/16/23 19:45	1
Chrysene-d12	74		30 - 120	11/03/23 10:43	11/16/23 19:45	1
Dibenz(a,h)anthracene-d14	82		30 - 120	11/03/23 10:43	11/16/23 19:45	1
Fluoranthene-d10	83		30 - 120	11/03/23 10:43	11/16/23 19:45	1
Fluorene -d10	79		30 - 120	11/03/23 10:43	11/16/23 19:45	1
Indeno[1,2,3-cd]pyrene-d12	88		30 - 120	11/03/23 10:43	11/16/23 19:45	1
1-Methylnaphthalene-d10	79		30 - 120	11/03/23 10:43	11/16/23 19:45	1
2-Methylnaphthalene-d10	77		30 - 120	11/03/23 10:43	11/16/23 19:45	1
Naphthalene-d8	73		30 - 120	11/03/23 10:43	11/16/23 19:45	1
Perylene-d12	76		30 - 120	11/03/23 10:43	11/16/23 19:45	1
Phenanthrene-d10	80		30 - 120	11/03/23 10:43	11/16/23 19:45	1

Client Sample ID: 1804576-853-S3
Lab Sample ID: 140-34148-17

Date Collected: 10/26/23 14:00
Matrix: PE

Date Received: 10/27/23 09:30

Method: ID-0016 - PAHs (GC/MS Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		1000	260	ng/g		11/03/23 10:43	11/16/23 20:09	1
Acenaphthylene	ND		1000	73	ng/g		11/03/23 10:43	11/16/23 20:09	1
Anthracene	ND		1000	320	ng/g		11/03/23 10:43	11/16/23 20:09	1
Benzo[a]anthracene	ND		1000	370	ng/g		11/03/23 10:43	11/16/23 20:09	1
Benzo[a]pyrene	ND		1000	280	ng/g		11/03/23 10:43	11/16/23 20:09	1
Benzo[b]fluoranthene	ND		1000	350	ng/g		11/03/23 10:43	11/16/23 20:09	1
Benzo[e]pyrene	ND		1000	160	ng/g		11/03/23 10:43	11/16/23 20:09	1
Benzo[g,h,i]perylene	ND		1000	110	ng/g		11/03/23 10:43	11/16/23 20:09	1
Benzo[k]fluoranthene	ND		1000	230	ng/g		11/03/23 10:43	11/16/23 20:09	1
Chrysene	ND		1000	130	ng/g		11/03/23 10:43	11/16/23 20:09	1
Dibenz(a,h)anthracene	ND		1000	82	ng/g		11/03/23 10:43	11/16/23 20:09	1
Fluoranthene	ND		1000	810	ng/g		11/03/23 10:43	11/16/23 20:09	1
Fluorene	ND		1000	320	ng/g		11/03/23 10:43	11/16/23 20:09	1
Indeno[1,2,3-cd]pyrene	ND		1000	110	ng/g		11/03/23 10:43	11/16/23 20:09	1
1-Methylnaphthalene	ND		5000	500	ng/g		11/03/23 10:43	11/16/23 20:09	1
2-Methylnaphthalene	ND		5000	700	ng/g		11/03/23 10:43	11/16/23 20:09	1
Naphthalene	ND		20000	2900	ng/g		11/03/23 10:43	11/16/23 20:09	1
Perylene	**3000**		1000	510	ng/g		11/03/23 10:43	11/16/23 20:09	1
Phenanthrene	ND		2000	1700	ng/g		11/03/23 10:43	11/16/23 20:09	1
Pyrene	ND		2000	300	ng/g		11/03/23 10:43	11/16/23 20:09	1
C1-Fluoranthenes/pyrene	ND		1000	1000	ng/g		11/03/23 10:43	11/16/23 20:09	1
C1-Fluorenes	ND		2000	1300	ng/g		11/03/23 10:43	11/16/23 20:09	1
C2-Fluorenes	ND		1000	1000	ng/g		11/03/23 10:43	11/16/23 20:09	1
C3-Fluorenes	ND		1000	1000	ng/g		11/03/23 10:43	11/16/23 20:09	1
C2-Naphthalenes	ND		2000	2000	ng/g		11/03/23 10:43	11/16/23 20:09	1
C3-Naphthalenes	ND		2000	2000	ng/g		11/03/23 10:43	11/16/23 20:09	1
C4-Naphthalenes	ND		3000	2800	ng/g		11/03/23 10:43	11/16/23 20:09	1
C1-Phenanthrenes/Anthracenes	ND		4000	3400	ng/g		11/03/23 10:43	11/16/23 20:09	1
C2-Phenanthrenes/Anthracenes	ND		1000	1000	ng/g		11/03/23 10:43	11/16/23 20:09	1
C3-Phenanthrenes/Anthracenes	ND		1000	1000	ng/g		11/03/23 10:43	11/16/23 20:09	1
C4-Phenanthrenes/Anthracenes	ND		1000	1000	ng/g		11/03/23 10:43	11/16/23 20:09	1
C1-Chrysenes/Benz(a)anthracenes	ND		1000	1000	ng/g		11/03/23 10:43	11/16/23 20:09	1
C2-Chrysenes/Benz(a)anthracenes	ND		1000	1000	ng/g		11/03/23 10:43	11/16/23 20:09	1
C3-Chrysenes/Benz(a)anthracenes	ND		1000	1000	ng/g		11/03/23 10:43	11/16/23 20:09	1
C4-Chrysenes/Benz(a)anthracenes	ND		1000	1000	ng/g		11/03/23 10:43	11/16/23 20:09	1
PCB-14	**400**	**J**	1000	10	ng/g		11/03/23 10:43	11/16/23 20:09	1
PCB-192	**1900**		1000	10	ng/g		11/03/23 10:43	11/16/23 20:09	1
PCB-184	**820**	**J**	1000	10	ng/g		11/03/23 10:43	11/16/23 20:09	1
PCB-155	**600**	**J**	1000	10	ng/g		11/03/23 10:43	11/16/23 20:09	1
PCB-142	**590**	**J**	1000	10	ng/g		11/03/23 10:43	11/16/23 20:09	1
PCB-204	**1400**		1000	10	ng/g		11/03/23 10:43	11/16/23 20:09	1
PCB-104	**1700**		1000	10	ng/g		11/03/23 10:43	11/16/23 20:09	1
PCB-121	**720**	**J**	1000	10	ng/g		11/03/23 10:43	11/16/23 20:09	1
PCB-78	**1100**		1000	10	ng/g		11/03/23 10:43	11/16/23 20:09	1
PCB-36	**340**	**J**	1000	10	ng/g		11/03/23 10:43	11/16/23 20:09	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Acenaphthylene-d8	*77*		*30 - 120*	*11/03/23 10:43*	*11/16/23 20:09*	*1*
Anthracene-d10	*73*		*30 - 120*	*11/03/23 10:43*	*11/16/23 20:09*	*1*
Benzo(a)pyrene-d12	*73*		*30 - 120*	*11/03/23 10:43*	*11/16/23 20:09*	*1*

Client Sample ID: 1804576-853-S3
Lab Sample ID: 140-34148-17
Date Collected: 10/26/23 14:00
Matrix: PE
Date Received: 10/27/23 09:30

Method: ID-0016 - PAHs (GC/MS Isotope Dilution) (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Benzo(b)fluoranthene-d12	81		30 - 120	11/03/23 10:43	11/16/23 20:09	1
Benzo(ghi)perylene-d12	84		30 - 120	11/03/23 10:43	11/16/23 20:09	1
Benzo(k)fluoranthene-d12	82		30 - 120	11/03/23 10:43	11/16/23 20:09	1
Chrysene-d12	71		30 - 120	11/03/23 10:43	11/16/23 20:09	1
Dibenz(a,h)anthracene-d14	76		30 - 120	11/03/23 10:43	11/16/23 20:09	1
Fluoranthene-d10	82		30 - 120	11/03/23 10:43	11/16/23 20:09	1
Fluorene -d10	77		30 - 120	11/03/23 10:43	11/16/23 20:09	1
Indeno[1,2,3-cd]pyrene-d12	80		30 - 120	11/03/23 10:43	11/16/23 20:09	1
1-Methylnaphthalene-d10	79		30 - 120	11/03/23 10:43	11/16/23 20:09	1
2-Methylnaphthalene-d10	78		30 - 120	11/03/23 10:43	11/16/23 20:09	1
Naphthalene-d8	74		30 - 120	11/03/23 10:43	11/16/23 20:09	1
Perylene-d12	70		30 - 120	11/03/23 10:43	11/16/23 20:09	1
Phenanthrene-d10	71		30 - 120	11/03/23 10:43	11/16/23 20:09	1

Default Detection Limits

Client: Sirem, div of Geosyntec Consultants
Job ID: 140-34148-1
Project/Site: GEI Ex-Situ MGP SP3

Method: ID-0016 - PAHs (GC/MS Isotope Dilution)

Prep: Passive Sampler

Analyte	RL	MDL	Units
1-Methylnaphthalene	5.0	0.50	ng/g
2-Methylnaphthalene	5.0	0.70	ng/g
Acenaphthene	1.0	0.26	ng/g
Acenaphthylene	1.0	0.073	ng/g
Anthracene	1.0	0.32	ng/g
Benzo[a]anthracene	1.0	0.37	ng/g
Benzo[a]pyrene	1.0	0.28	ng/g
Benzo[b]fluoranthene	1.0	0.35	ng/g
Benzo[e]pyrene	1.0	0.16	ng/g
Benzo[g,h,i]perylene	1.0	0.11	ng/g
Benzo[k]fluoranthene	1.0	0.23	ng/g
C1-Chrysenes/Benz(a)anthracenes	1.0	1.0	ng/g
C1-Fluoranthenes/pyrene	1.0	1.0	ng/g
C1-Fluorenes	2.0	1.3	ng/g
C1-Phenanthrenes/Anthracenes	4.0	3.4	ng/g
C2-Chrysenes/Benz(a)anthracenes	1.0	1.0	ng/g
C2-Fluorenes	1.0	1.0	ng/g
C2-Naphthalenes	2.0	2.0	ng/g
C2-Phenanthrenes/Anthracenes	1.0	1.0	ng/g
C3-Chrysenes/Benz(a)anthracenes	1.0	1.0	ng/g
C3-Fluorenes	1.0	1.0	ng/g
C3-Naphthalenes	2.0	2.0	ng/g
C3-Phenanthrenes/Anthracenes	1.0	1.0	ng/g
C4-Chrysenes/Benz(a)anthracenes	1.0	1.0	ng/g
C4-Naphthalenes	3.0	2.8	ng/g
C4-Phenanthrenes/Anthracenes	1.0	1.0	ng/g
Chrysene	1.0	0.13	ng/g
Dibenz(a,h)anthracene	1.0	0.082	ng/g
Fluoranthene	1.0	0.81	ng/g
Fluorene	1.0	0.32	ng/g
Indeno[1,2,3-cd]pyrene	1.0	0.11	ng/g
Naphthalene	20	2.9	ng/g
PCB-104	1.0	0.010	ng/g
PCB-121	1.0	0.010	ng/g
PCB-14	1.0	0.010	ng/g
PCB-142	1.0	0.010	ng/g
PCB-155	1.0	0.010	ng/g
PCB-184	1.0	0.010	ng/g
PCB-192	1.0	0.010	ng/g
PCB-204	1.0	0.010	ng/g
PCB-36	1.0	0.010	ng/g
PCB-78	1.0	0.010	ng/g
Perylene	1.0	0.51	ng/g
Phenanthrene	2.0	1.7	ng/g
Pyrene	2.0	0.30	ng/g

Isotope Dilution Summary

Client: Sirem, div of Geosyntec Consultants
Job ID: 140-34148-1
Project/Site: GEI Ex-Situ MGP SP3

Method: ID-0016 - PAHs (GC/MS Isotope Dilution)

Matrix: PE **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)							
		ACY	ANC	BNAPd12	BBFd12	BNGHI12	BKFd12	CRY	DBAd14
Lab Sample ID	Client Sample ID	(30-120)	(30-120)	(30-120)	(30-120)	(30-120)	(30-120)	(30-120)	(30-120)
140-34148-1	GEI.PRC.BLK1	72	66	66	79	79	77	70	73
140-34148-2	GEI.PRC.BLK2	79	69	73	86	85	82	74	79
140-34148-3	GEI.PRC.BLK3	81	73	77	90	91	89	77	84
140-34148-4	1804576-851-S1	79	73	78	88	88	81	75	82
140-34148-5	1804576-851-S2	114	106	114	110	110	108	104	107
140-34148-5 - RA	1804576-851-S2	73	58	84	87	86	84	82	98
140-34148-6	1804576-852-S1	77	75	76	85	85	81	74	83
140-34148-7	1804576-852-S2	79	80	84	84	91	86	77	79
140-34148-8	1804576-843-S1	73	59	69	76	79	77	69	73
140-34148-9	1804576-843-S2	82	81	91	86	92	95	85	90
140-34148-10	1804576-844-S1	83	79	82	89	91	88	79	86
140-34148-11	1804576-844-S3	76	84	86	91	90	87	77	88
140-34148-12	1804576-854-S1	86	88	91	90	93	88	81	89
140-34148-13	1804576-854-S2	82	80	86	91	91	85	77	88
140-34148-14	1804576-846-S1	82	77	80	88	89	85	80	85
140-34148-15	1804576-846-S3	86	86	87	93	93	86	84	88
140-34148-16	1804576-853-S1	80	75	81	86	88	84	74	82
140-34148-17	1804576-853-S3	77	73	73	81	84	82	71	76

		Percent Isotope Dilution Recovery (Acceptance Limits)							
		FLN	FLd10	IDPd12	MNPd10	2MN	NPT	PRY	PHN
Lab Sample ID	Client Sample ID	(30-120)	(30-120)	(30-120)	(30-120)	(30-120)	(30-120)	(30-120)	(30-120)
140-34148-1	GEI.PRC.BLK1	80	78	78	79	76	72	60	68
140-34148-2	GEI.PRC.BLK2	83	80	84	82	82	80	68	75
140-34148-3	GEI.PRC.BLK3	87	85	89	84	84	83	73	77
140-34148-4	1804576-851-S1	84	84	85	80	79	77	74	75
140-34148-5	1804576-851-S2	107	108	110	111	112	112	112	113
140-34148-5 - RA	1804576-851-S2	62	110	90	64	65	60	85	74
140-34148-6	1804576-852-S1	84	79	87	79	77	74	71	78
140-34148-7	1804576-852-S2	87	78	89	78	76	74	82	89
140-34148-8	1804576-843-S1	74	72	77	73	70	67	65	64
140-34148-9	1804576-843-S2	92	79	93	77	73	69	89	85
140-34148-10	1804576-844-S1	87	85	90	82	81	76	77	79
140-34148-11	1804576-844-S3	88	77	93	72	70	63	80	83
140-34148-12	1804576-854-S1	87	83	91	83	81	78	87	85
140-34148-13	1804576-854-S2	88	81	91	75	73	68	81	84
140-34148-14	1804576-846-S1	85	85	88	83	82	77	75	77
140-34148-15	1804576-846-S3	90	85	90	86	84	81	84	85
140-34148-16	1804576-853-S1	83	79	88	79	77	73	76	80
140-34148-17	1804576-853-S3	82	77	80	79	78	74	70	71

Surrogate Legend

ACY = Acenaphthylene-d8
ANC = Anthracene-d10
BNAPd12 = Benzo(a)pyrene-d12
BBFd12 = Benzo(b)fluoranthene-d12
BNGHI12 = Benzo(ghi)perylene-d12
BKFd12 = Benzo(k)fluoranthene-d12
CRY = Chrysene-d12
DBAd14 = Dibenz(a,h)anthracene-d14
FLN = Fluoranthene-d10

Isotope Dilution Summary

Client: Sirem, div of Geosyntec Consultants
Job ID: 140-34148-1
Project/Site: GEI Ex-Situ MGP SP3

FLd10 = Fluorene -d10
IDPd12 = Indeno[1,2,3-cd]pyrene-d12
MNPd10 = 1-Methylnaphthalene-d10
2MN = 2-Methylnaphthalene-d10
NPT = Naphthalene-d8
PRY = Perylene-d12
PHN = Phenanthrene-d10

Method: ID-0016 - PAHs (GC/MS Isotope Dilution)

Matrix: Sediment **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)							
		ACY	ANC	BNAPd12	BBFd12	BNGHI12	BKFd12	CRY	DBAd14
Lab Sample ID	Client Sample ID	(30-120)	(30-120)	(30-120)	(30-120)	(30-120)	(30-120)	(30-120)	(30-120)
LCS 140-79842/18-A	Lab Control Sample	83	78	77	95	93	84	80	91
MB 140-79842/19-A	Method Blank	65	61	70	83	89	79	72	81

		Percent Isotope Dilution Recovery (Acceptance Limits)							
		FLN	FLd10	IDPd12	MNPd10	2MN	NPT	PRY	PHN
Lab Sample ID	Client Sample ID	(30-120)	(30-120)	(30-120)	(30-120)	(30-120)	(30-120)	(30-120)	(30-120)
LCS 140-79842/18-A	Lab Control Sample	88	86	93	87	86	84	72	84
MB 140-79842/19-A	Method Blank	73	73	86	72	71	69	66	63

Surrogate Legend

ACY = Acenaphthylene-d8
ANC = Anthracene-d10
BNAPd12 = Benzo(a)pyrene-d12
BBFd12 = Benzo(b)fluoranthene-d12
BNGHI12 = Benzo(ghi)perylene-d12
BKFd12 = Benzo(k)fluoranthene-d12
CRY = Chrysene-d12
DBAd14 = Dibenz(a,h)anthracene-d14
FLN = Fluoranthene-d10
FLd10 = Fluorene -d10
IDPd12 = Indeno[1,2,3-cd]pyrene-d12
MNPd10 = 1-Methylnaphthalene-d10
2MN = 2-Methylnaphthalene-d10
NPT = Naphthalene-d8
PRY = Perylene-d12
PHN = Phenanthrene-d10

Method: ID-0016 - PAHs (GC/MS Isotope Dilution)

Lab Sample ID: MB 140-79842/19-A
Matrix: Sediment
Analysis Batch: 80177

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 79842

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		400	100	ng/g		11/03/23 10:43	11/13/23 20:58	1
Acenaphthylene	ND		400	29	ng/g		11/03/23 10:43	11/13/23 20:58	1
Anthracene	ND		400	130	ng/g		11/03/23 10:43	11/13/23 20:58	1
Benzo[a]anthracene	ND		400	150	ng/g		11/03/23 10:43	11/13/23 20:58	1
Benzo[a]pyrene	ND		400	110	ng/g		11/03/23 10:43	11/13/23 20:58	1
Benzo[b]fluoranthene	ND		400	140	ng/g		11/03/23 10:43	11/13/23 20:58	1
Benzo[e]pyrene	ND		400	64	ng/g		11/03/23 10:43	11/13/23 20:58	1
Benzo[g,h,i]perylene	ND		400	44	ng/g		11/03/23 10:43	11/13/23 20:58	1
Benzo[k]fluoranthene	ND		400	92	ng/g		11/03/23 10:43	11/13/23 20:58	1
Chrysene	ND		400	52	ng/g		11/03/23 10:43	11/13/23 20:58	1
Dibenz(a,h)anthracene	ND		400	33	ng/g		11/03/23 10:43	11/13/23 20:58	1
Fluoranthene	ND		400	320	ng/g		11/03/23 10:43	11/13/23 20:58	1
Fluorene	ND		400	130	ng/g		11/03/23 10:43	11/13/23 20:58	1
Indeno[1,2,3-cd]pyrene	ND		400	44	ng/g		11/03/23 10:43	11/13/23 20:58	1
1-Methylnaphthalene	ND		2000	200	ng/g		11/03/23 10:43	11/13/23 20:58	1
2-Methylnaphthalene	ND		2000	280	ng/g		11/03/23 10:43	11/13/23 20:58	1
Naphthalene	ND		8000	1200	ng/g		11/03/23 10:43	11/13/23 20:58	1
Perylene	ND		400	200	ng/g		11/03/23 10:43	11/13/23 20:58	1
Phenanthrene	ND		800	690	ng/g		11/03/23 10:43	11/13/23 20:58	1
Pyrene	ND		800	120	ng/g		11/03/23 10:43	11/13/23 20:58	1
C1-Fluoranthenes/pyrene	ND		400	400	ng/g		11/03/23 10:43	11/13/23 20:58	1
C1-Fluorenes	ND		800	520	ng/g		11/03/23 10:43	11/13/23 20:58	1
C2-Fluorenes	ND		400	400	ng/g		11/03/23 10:43	11/13/23 20:58	1
C3-Fluorenes	ND		400	400	ng/g		11/03/23 10:43	11/13/23 20:58	1
C2-Naphthalenes	ND		800	800	ng/g		11/03/23 10:43	11/13/23 20:58	1
C3-Naphthalenes	ND		800	800	ng/g		11/03/23 10:43	11/13/23 20:58	1
C4-Naphthalenes	ND		1200	1100	ng/g		11/03/23 10:43	11/13/23 20:58	1
C1-Phenanthrenes/Anthracenes	ND		1600	1400	ng/g		11/03/23 10:43	11/13/23 20:58	1
C2-Phenanthrenes/Anthracenes	ND		400	400	ng/g		11/03/23 10:43	11/13/23 20:58	1
C3-Phenanthrenes/Anthracenes	ND		400	400	ng/g		11/03/23 10:43	11/13/23 20:58	1
C4-Phenanthrenes/Anthracenes	ND		400	400	ng/g		11/03/23 10:43	11/13/23 20:58	1
C1-Chrysenes/Benz(a)anthracenes	ND		400	400	ng/g		11/03/23 10:43	11/13/23 20:58	1
C2-Chrysenes/Benz(a)anthracenes	ND		400	400	ng/g		11/03/23 10:43	11/13/23 20:58	1
C3-Chrysenes/Benz(a)anthracenes	ND		400	400	ng/g		11/03/23 10:43	11/13/23 20:58	1
C4-Chrysenes/Benz(a)anthracenes	ND		400	400	ng/g		11/03/23 10:43	11/13/23 20:58	1
PCB-14	ND		400	4.0	ng/g		11/03/23 10:43	11/13/23 20:58	1
PCB-192	ND		400	4.0	ng/g		11/03/23 10:43	11/13/23 20:58	1
PCB-184	ND		400	4.0	ng/g		11/03/23 10:43	11/13/23 20:58	1
PCB-155	ND		400	4.0	ng/g		11/03/23 10:43	11/13/23 20:58	1
PCB-142	ND		400	4.0	ng/g		11/03/23 10:43	11/13/23 20:58	1
PCB-204	ND		400	4.0	ng/g		11/03/23 10:43	11/13/23 20:58	1
PCB-104	ND		400	4.0	ng/g		11/03/23 10:43	11/13/23 20:58	1
PCB-121	ND		400	4.0	ng/g		11/03/23 10:43	11/13/23 20:58	1
PCB-78	ND		400	4.0	ng/g		11/03/23 10:43	11/13/23 20:58	1
PCB-36	ND		400	4.0	ng/g		11/03/23 10:43	11/13/23 20:58	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Acenaphthylene-d8	*65*		*30 - 120*	*11/03/23 10:43*	*11/13/23 20:58*	*1*

Method: ID-0016 - PAHs (GC/MS Isotope Dilution) (Continued)

Lab Sample ID: MB 140-79842/19-A
Client Sample ID: Method Blank
Matrix: Sediment
Prep Type: Total/NA
Analysis Batch: 80177
Prep Batch: 79842

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Anthracene-d10	61		30 - 120	11/03/23 10:43	11/13/23 20:58	1
Benzo(a)pyrene-d12	70		30 - 120	11/03/23 10:43	11/13/23 20:58	1
Benzo(b)fluoranthene-d12	83		30 - 120	11/03/23 10:43	11/13/23 20:58	1
Benzo(ghi)perylene-d12	89		30 - 120	11/03/23 10:43	11/13/23 20:58	1
Benzo(k)fluoranthene-d12	79		30 - 120	11/03/23 10:43	11/13/23 20:58	1
Chrysene-d12	72		30 - 120	11/03/23 10:43	11/13/23 20:58	1
Dibenz(a,h)anthracene-d14	81		30 - 120	11/03/23 10:43	11/13/23 20:58	1
Fluoranthene-d10	73		30 - 120	11/03/23 10:43	11/13/23 20:58	1
Fluorene -d10	73		30 - 120	11/03/23 10:43	11/13/23 20:58	1
Indeno[1,2,3-cd]pyrene-d12	86		30 - 120	11/03/23 10:43	11/13/23 20:58	1
1-Methylnaphthalene-d10	72		30 - 120	11/03/23 10:43	11/13/23 20:58	1
2-Methylnaphthalene-d10	71		30 - 120	11/03/23 10:43	11/13/23 20:58	1
Naphthalene-d8	69		30 - 120	11/03/23 10:43	11/13/23 20:58	1
Perylene-d12	66		30 - 120	11/03/23 10:43	11/13/23 20:58	1
Phenanthrene-d10	63		30 - 120	11/03/23 10:43	11/13/23 20:58	1

Lab Sample ID: LCS 140-79842/18-A
Client Sample ID: Lab Control Sample
Matrix: Sediment
Prep Type: Total/NA
Analysis Batch: 80177
Prep Batch: 79842

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Acenaphthene	7810	7810		ng/g		100	60 - 140
Acenaphthylene	7810	7590		ng/g		97	60 - 140
Anthracene	7810	7990		ng/g		102	60 - 140
Benzo[a]anthracene	7810	7910		ng/g		101	60 - 140
Benzo[a]pyrene	7810	8140		ng/g		104	60 - 140
Benzo[b]fluoranthene	7810	7330		ng/g		94	60 - 140
Benzo[e]pyrene	7810	8990		ng/g		115	60 - 140
Benzo[g,h,i]perylene	7810	7860		ng/g		101	60 - 140
Benzo[k]fluoranthene	7810	8340		ng/g		107	60 - 140
Chrysene	7810	8110		ng/g		104	60 - 140
Dibenz(a,h)anthracene	7810	7890		ng/g		101	60 - 140
Fluoranthene	7810	7870		ng/g		101	60 - 140
Fluorene	7810	7770		ng/g		99	60 - 140
Indeno[1,2,3-cd]pyrene	7810	7840		ng/g		100	60 - 140
1-Methylnaphthalene	7810	7590		ng/g		97	60 - 140
2-Methylnaphthalene	7810	7780		ng/g		100	60 - 140
Naphthalene	7810	7930		ng/g		101	60 - 140
Perylene	7810	8140		ng/g		104	60 - 140
Phenanthrene	7810	7740		ng/g		99	60 - 140
Pyrene	7810	7680		ng/g		98	60 - 140

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
Acenaphthylene-d8	83		30 - 120
Anthracene-d10	78		30 - 120
Benzo(a)pyrene-d12	77		30 - 120
Benzo(b)fluoranthene-d12	95		30 - 120
Benzo(ghi)perylene-d12	93		30 - 120
Benzo(k)fluoranthene-d12	84		30 - 120

Method: ID-0016 - PAHs (GC/MS Isotope Dilution) (Continued)

Lab Sample ID: LCS 140-79842/18-A
Matrix: Sediment
Analysis Batch: 80177

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 79842

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
Chrysene-d12	80		30 - 120
Dibenz(a,h)anthracene-d14	91		30 - 120
Fluoranthene-d10	88		30 - 120
Fluorene -d10	86		30 - 120
Indeno[1,2,3-cd]pyrene-d12	93		30 - 120
1-Methylnaphthalene-d10	87		30 - 120
2-Methylnaphthalene-d10	86		30 - 120
Naphthalene-d8	84		30 - 120
Perylene-d12	72		30 - 120
Phenanthrene-d10	84		30 - 120

QC Association Summary

Client: Sirem, div of Geosyntec Consultants
Job ID: 140-34148-1
Project/Site: GEI Ex-Situ MGP SP3

GC/MS Semi VOA

Prep Batch: 79842

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-34148-1	GEI.PRC.BLK1	Total/NA	PE	Passive Sampler	
140-34148-2	GEI.PRC.BLK2	Total/NA	PE	Passive Sampler	
140-34148-3	GEI.PRC.BLK3	Total/NA	PE	Passive Sampler	
140-34148-4	1804576-851-S1	Total/NA	PE	Passive Sampler	
140-34148-5	1804576-851-S2	Total/NA	PE	Passive Sampler	
140-34148-5 - RA	1804576-851-S2	Total/NA	PE	Passive Sampler	
140-34148-6	1804576-852-S1	Total/NA	PE	Passive Sampler	
140-34148-7	1804576-852-S2	Total/NA	PE	Passive Sampler	
140-34148-8	1804576-843-S1	Total/NA	PE	Passive Sampler	
140-34148-9	1804576-843-S2	Total/NA	PE	Passive Sampler	
140-34148-10	1804576-844-S1	Total/NA	PE	Passive Sampler	
140-34148-11	1804576-844-S3	Total/NA	PE	Passive Sampler	
140-34148-12	1804576-854-S1	Total/NA	PE	Passive Sampler	
140-34148-13	1804576-854-S2	Total/NA	PE	Passive Sampler	
140-34148-14	1804576-846-S1	Total/NA	PE	Passive Sampler	
140-34148-15	1804576-846-S3	Total/NA	PE	Passive Sampler	
140-34148-16	1804576-853-S1	Total/NA	PE	Passive Sampler	
140-34148-17	1804576-853-S3	Total/NA	PE	Passive Sampler	
MB 140-79842/19-A	Method Blank	Total/NA	Sediment	Passive Sampler	
LCS 140-79842/18-A	Lab Control Sample	Total/NA	Sediment	Passive Sampler	

Analysis Batch: 80177

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-34148-1	GEI.PRC.BLK1	Total/NA	PE	ID-0016	79842
140-34148-2	GEI.PRC.BLK2	Total/NA	PE	ID-0016	79842
140-34148-3	GEI.PRC.BLK3	Total/NA	PE	ID-0016	79842
140-34148-4	1804576-851-S1	Total/NA	PE	ID-0016	79842
MB 140-79842/19-A	Method Blank	Total/NA	Sediment	ID-0016	79842
LCS 140-79842/18-A	Lab Control Sample	Total/NA	Sediment	ID-0016	79842

Analysis Batch: 80349

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-34148-6	1804576-852-S1	Total/NA	PE	ID-0016	79842
140-34148-7	1804576-852-S2	Total/NA	PE	ID-0016	79842
140-34148-8	1804576-843-S1	Total/NA	PE	ID-0016	79842
140-34148-10	1804576-844-S1	Total/NA	PE	ID-0016	79842
140-34148-11	1804576-844-S3	Total/NA	PE	ID-0016	79842
140-34148-12	1804576-854-S1	Total/NA	PE	ID-0016	79842
140-34148-13	1804576-854-S2	Total/NA	PE	ID-0016	79842
140-34148-14	1804576-846-S1	Total/NA	PE	ID-0016	79842
140-34148-15	1804576-846-S3	Total/NA	PE	ID-0016	79842
140-34148-16	1804576-853-S1	Total/NA	PE	ID-0016	79842
140-34148-17	1804576-853-S3	Total/NA	PE	ID-0016	79842

Analysis Batch: 80412

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-34148-5	1804576-851-S2	Total/NA	PE	ID-0016	80414
140-34148-9	1804576-843-S2	Total/NA	PE	ID-0016	79842

QC Association Summary

Client: Sirem, div of Geosyntec Consultants
Job ID: 140-34148-1
Project/Site: GEI Ex-Situ MGP SP3

GC/MS Semi VOA

Cleanup Batch: 80414

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-34148-5	1804576-851-S2	Total/NA	PE	PAH Dilution	79842

Analysis Batch: 80832

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
140-34148-5 - RA	1804576-851-S2	Total/NA	PE	ID-0016	79842

Lab Chronicle

Client: Sirem, div of Geosyntec Consultants
Project/Site: GEI Ex-Situ MGP SP3

Job ID: 140-34148-1

Client Sample ID: GEI.PRC.BLK1
Date Collected: 10/26/23 14:00
Date Received: 10/27/23 09:30

Lab Sample ID: 140-34148-1
Matrix: PE

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Passive Sampler			0.012 g	500 uL	79842	11/03/23 10:43	CMS	EET KNX
Total/NA	Analysis	ID-0016		1	1 mL	1 mL	80177	11/13/23 21:45	GEM	EET KNX
	Instrument ID: GCMS1									

Client Sample ID: GEI.PRC.BLK2
Date Collected: 10/26/23 14:00
Date Received: 10/27/23 09:30

Lab Sample ID: 140-34148-2
Matrix: PE

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Passive Sampler			0.011 g	500 uL	79842	11/03/23 10:43	CMS	EET KNX
Total/NA	Analysis	ID-0016		1	1 mL	1 mL	80177	11/13/23 22:08	GEM	EET KNX
	Instrument ID: GCMS1									

Client Sample ID: GEI.PRC.BLK3
Date Collected: 10/26/23 14:00
Date Received: 10/27/23 09:30

Lab Sample ID: 140-34148-3
Matrix: PE

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Passive Sampler			0.011 g	500 uL	79842	11/03/23 10:43	CMS	EET KNX
Total/NA	Analysis	ID-0016		1	1 mL	1 mL	80177	11/13/23 22:31	GEM	EET KNX
	Instrument ID: GCMS1									

Client Sample ID: 1804576-851-S1
Date Collected: 10/26/23 14:00
Date Received: 10/27/23 09:30

Lab Sample ID: 140-34148-4
Matrix: PE

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Passive Sampler			0.014 g	500 uL	79842	11/03/23 10:43	CMS	EET KNX
Total/NA	Analysis	ID-0016		1	1 mL	1 mL	80177	11/13/23 22:55	GEM	EET KNX
	Instrument ID: GCMS1									

Client Sample ID: 1804576-851-S2
Date Collected: 10/26/23 14:00
Date Received: 10/27/23 09:30

Lab Sample ID: 140-34148-5
Matrix: PE

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Passive Sampler			0.012 g	500 uL	79842	11/03/23 10:43	CMS	EET KNX
Total/NA	Cleanup	PAH Dilution			2.5 uL	1000 uL	80414	11/17/23 13:25	GEM	EET KNX
Total/NA	Analysis	ID-0016		1	1 mL	1 mL	80412	11/17/23 17:19	GEM	EET KNX
	Instrument ID: GCMS1									
Total/NA	Prep	Passive Sampler	RA		0.012 g	500 uL	79842	11/03/23 10:43	CMS	EET KNX
Total/NA	Analysis	ID-0016	RA	5	1 mL	1 mL	80832	12/01/23 22:11	GEM	EET KNX
	Instrument ID: GCMS1									

Client Sample ID: 1804576-852-S1
Lab Sample ID: 140-34148-6
Date Collected: 10/26/23 14:00
Matrix: PE
Date Received: 10/27/23 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Passive Sampler			0.011 g	500 uL	79842	11/03/23 10:43	CMS	EET KNX
Total/NA	Analysis	ID-0016		1	1 mL	1 mL	80349	11/16/23 15:49	GEM	EET KNX
	Instrument ID: GCMS1									

Client Sample ID: 1804576-852-S2
Lab Sample ID: 140-34148-7
Date Collected: 10/26/23 14:00
Matrix: PE
Date Received: 10/27/23 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Passive Sampler			0.010 g	500 uL	79842	11/03/23 10:43	CMS	EET KNX
Total/NA	Analysis	ID-0016		5	1 mL	1 mL	80349	11/16/23 22:05	GEM	EET KNX
	Instrument ID: GCMS1									

Client Sample ID: 1804576-843-S1
Lab Sample ID: 140-34148-8
Date Collected: 10/26/23 14:00
Matrix: PE
Date Received: 10/27/23 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Passive Sampler			0.010 g	500 uL	79842	11/03/23 10:43	CMS	EET KNX
Total/NA	Analysis	ID-0016		1	1 mL	1 mL	80349	11/16/23 16:37	GEM	EET KNX
	Instrument ID: GCMS1									

Client Sample ID: 1804576-843-S2
Lab Sample ID: 140-34148-9
Date Collected: 10/26/23 14:00
Matrix: PE
Date Received: 10/27/23 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Passive Sampler			0.010 g	500 uL	79842	11/03/23 10:43	CMS	EET KNX
Total/NA	Analysis	ID-0016		5	1 mL	1 mL	80412	11/17/23 16:55	GEM	EET KNX
	Instrument ID: GCMS1									

Client Sample ID: 1804576-844-S1
Lab Sample ID: 140-34148-10
Date Collected: 10/26/23 14:00
Matrix: PE
Date Received: 10/27/23 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Passive Sampler			0.010 g	500 uL	79842	11/03/23 10:43	CMS	EET KNX
Total/NA	Analysis	ID-0016		1	1 mL	1 mL	80349	11/16/23 17:24	GEM	EET KNX
	Instrument ID: GCMS1									

Client Sample ID: 1804576-844-S3
Lab Sample ID: 140-34148-11
Date Collected: 10/26/23 14:00
Matrix: PE
Date Received: 10/27/23 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Passive Sampler			0.008 g	500 uL	79842	11/03/23 10:43	CMS	EET KNX
Total/NA	Analysis	ID-0016		1	1 mL	1 mL	80349	11/16/23 17:48	GEM	EET KNX
	Instrument ID: GCMS1									

Client Sample ID: 1804576-854-S1
Lab Sample ID: 140-34148-12
Date Collected: 10/26/23 14:00
Matrix: PE
Date Received: 10/27/23 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Passive Sampler			0.008 g	500 uL	79842	11/03/23 10:43	CMS	EET KNX
Total/NA	Analysis	ID-0016		1	1 mL	1 mL	80349	11/16/23 18:11	GEM	EET KNX
	Instrument ID: GCMS1									

Client Sample ID: 1804576-854-S2
Lab Sample ID: 140-34148-13
Date Collected: 10/26/23 14:00
Matrix: PE
Date Received: 10/27/23 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Passive Sampler			0.012 g	500 uL	79842	11/03/23 10:43	CMS	EET KNX
Total/NA	Analysis	ID-0016		1	1 mL	1 mL	80349	11/16/23 18:35	GEM	EET KNX
	Instrument ID: GCMS1									

Client Sample ID: 1804576-846-S1
Lab Sample ID: 140-34148-14
Date Collected: 10/26/23 14:00
Matrix: PE
Date Received: 10/27/23 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Passive Sampler			0.010 g	500 uL	79842	11/03/23 10:43	CMS	EET KNX
Total/NA	Analysis	ID-0016		1	1 mL	1 mL	80349	11/16/23 18:59	GEM	EET KNX
	Instrument ID: GCMS1									

Client Sample ID: 1804576-846-S3
Lab Sample ID: 140-34148-15
Date Collected: 10/26/23 14:00
Matrix: PE
Date Received: 10/27/23 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Passive Sampler			0.011 g	500 uL	79842	11/03/23 10:43	CMS	EET KNX
Total/NA	Analysis	ID-0016		1	1 mL	1 mL	80349	11/16/23 19:22	GEM	EET KNX
	Instrument ID: GCMS1									

Lab Chronicle

Client: Sirem, div of Geosyntec Consultants
Job ID: 140-34148-1
Project/Site: GEI Ex-Situ MGP SP3

Client Sample ID: 1804576-853-S1
Lab Sample ID: 140-34148-16
Date Collected: 10/26/23 14:00
Matrix: PE
Date Received: 10/27/23 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Passive Sampler			0.011 g	500 uL	79842	11/03/23 10:43	CMS	EET KNX
Total/NA	Analysis	ID-0016		1	1 mL	1 mL	80349	11/16/23 19:45	GEM	EET KNX
	Instrument ID: GCMS1									

Client Sample ID: 1804576-853-S3
Lab Sample ID: 140-34148-17
Date Collected: 10/26/23 14:00
Matrix: PE
Date Received: 10/27/23 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Passive Sampler			0.010 g	500 uL	79842	11/03/23 10:43	CMS	EET KNX
Total/NA	Analysis	ID-0016		1	1 mL	1 mL	80349	11/16/23 20:09	GEM	EET KNX
	Instrument ID: GCMS1									

Client Sample ID: Method Blank
Lab Sample ID: MB 140-79842/19-A
Date Collected: N/A
Matrix: Sediment
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Passive Sampler			0.025 g	500 uL	79842	11/03/23 10:43	CMS	EET KNX
Total/NA	Analysis	ID-0016		1	1 mL	1 mL	80177	11/13/23 20:58	GEM	EET KNX
	Instrument ID: GCMS1									

Client Sample ID: Lab Control Sample
Lab Sample ID: LCS 140-79842/18-A
Date Collected: N/A
Matrix: Sediment
Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Passive Sampler			0.032 g	500 uL	79842	11/03/23 10:43	CMS	EET KNX
Total/NA	Analysis	ID-0016		1	1 mL	1 mL	80177	11/13/23 21:22	GEM	EET KNX
	Instrument ID: GCMS1									

Laboratory References:
EET KNX = Eurofins Knoxville, 5815 Middlebrook Pike, Knoxville, TN 37921, TEL (865)291-3000

Accreditation/Certification Summary

Client: Sirem, div of Geosyntec Consultants
Job ID: 140-34148-1
Project/Site: GEI Ex-Situ MGP SP3

Laboratory: Eurofins Knoxville

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
	AFCEE	N/A	
ANAB	Dept. of Defense ELAP	L2311	02-13-25
ANAB	Dept. of Energy	L2311.01	02-13-25
ANAB	ISO/IEC 17025	L2311	02-13-25
Arkansas DEQ	State	88-0688	06-16-24
Colorado	State	TN00009	02-29-24
Connecticut	State	PH-0223	09-30-25
Florida	NELAP	E87177	06-30-24
Georgia (DW)	State	906	07-27-25
Hawaii	State	NA	07-27-24
Kansas	NELAP	E-10349	10-31-24
Kentucky (DW)	State	90101	12-31-23
Louisiana (All)	NELAP	83979	06-30-24
Louisiana (DW)	State	LA019	12-31-23
Maryland	State	277	03-31-24
Michigan	State	9933	07-27-25
Nevada	State	TN00009	07-31-24
New Hampshire	NELAP	2999	01-17-24
New Jersey	NELAP	TN001	07-01-24
New York	NELAP	10781	03-31-24
North Carolina (DW)	State	21705	07-31-24
North Carolina (WW/SW)	State	64	12-31-23
Oklahoma	State	9415	12-31-23
Oregon	NELAP	TNI0189	01-01-24
Pennsylvania	NELAP	68-00576	12-01-23
Tennessee	State	02014	07-27-25
Texas	NELAP	T104704380-23-18	08-31-24
US Fish & Wildlife	US Federal Programs	058448	07-31-24
USDA	US Federal Programs	525-22-279-18762	10-06-25
Utah	NELAP	TN00009	07-31-24
Virginia	NELAP	460176	09-14-24
Washington	State	C593	01-19-24
West Virginia (DW)	State	9955C	12-31-23
West Virginia DEP	State	345	04-30-24
Wisconsin	State	998044300	08-31-24

Method Summary

Client: Sirem, div of Geosyntec Consultants
Job ID: 140-34148-1
Project/Site: GEI Ex-Situ MGP SP3

Method	Method Description	Protocol	Laboratory
ID-0016	PAHs (GC/MS Isotope Dilution)	None	EET KNX
PAH Dilution	Dilution and Re-foritfication of Standards	None	EET KNX
Passive Sampler	Preparation, Passive Sample	None	EET KNX

Protocol References:

None = None

Laboratory References:

EET KNX = Eurofins Knoxville, 5815 Middlebrook Pike, Knoxville, TN 37921, TEL (865)291-3000

GC/MS SEMI VOA MANUAL INTEGRATION SUMMARY

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Instrument ID: GCMS1 Analysis Batch Number: 80177

Lab Sample ID: IC 140-80177/13 Client Sample ID:

Date Analyzed: 11/13/23 15:08 Lab File ID: IC PCB2.D GC Column: Rxi-5SilMS 2 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
PCB-14	7.54	Baseline	SK9U	11/13/23 15:54
PCB-36	8.26	Baseline	SK9U	11/13/23 16:03
PCB-78	9.11	Baseline	SK9U	11/13/23 15:59

Lab Sample ID: IC 140-80177/14 Client Sample ID:

Date Analyzed: 11/13/23 15:31 Lab File ID: IC PCB1.D GC Column: Rxi-5SilMS 2 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
PCB-14	7.50	Baseline	SK9U	11/13/23 15:51
PCB-78	9.09	Baseline	SK9U	11/13/23 15:58

Lab Sample ID: IC 140-80177/19 Client Sample ID:

Date Analyzed: 11/13/23 17:27 Lab File ID: IC PAH7.D GC Column: Rxi-5SilMS 2 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Benzo[k]fluoranthene	11.43	Baseline	SK9U	11/14/23 09:27
Perylene	11.87	Split Peak	SK9U	11/14/23 09:27
Indeno[1,2,3-cd]pyrene	13.22	Split Peak	SK9U	11/14/23 09:27

GC/MS SEMI VOA MANUAL INTEGRATION SUMMARY

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Instrument ID: GCMS1 Analysis Batch Number: 80177

Lab Sample ID: IC 140-80177/20 Client Sample ID:

Date Analyzed: 11/13/23 17:51 Lab File ID: IC PAH6.D GC Column: Rxi-5SilMS 2 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Anthracene	7.79	Split Peak	SK9U	11/14/23 09:33
Chrysene-d12	10.27	Baseline	SK9U	11/14/23 09:34
Chrysene	10.30	Split Peak	SK9U	11/14/23 09:34
Perylene	11.87	Split Peak	SK9U	11/14/23 09:52
Dibenz(a,h)anthracene	13.24	Split Peak	SK9U	11/14/23 09:35

Lab Sample ID: IC 140-80177/21 Client Sample ID:

Date Analyzed: 11/13/23 18:14 Lab File ID: IC PAH5.D GC Column: Rxi-5SilMS 2 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
1-Methylphenanthrene	8.29	Baseline	SK9U	11/14/23 09:37
13C6-Fluoranthene (PRC)	8.83	Split Peak	SK9U	11/14/23 10:09
Perylene	11.87	Split Peak	SK9U	11/14/23 09:36
Benzo[g,h,i]perylene	13.58	Split Peak	SK9U	11/14/23 09:35

Lab Sample ID: IC 140-80177/22 Client Sample ID:

Date Analyzed: 11/13/23 18:38 Lab File ID: IC PAH4.D GC Column: Rxi-5SilMS 2 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Anthracene	7.79	Baseline	SK9U	11/14/23 09:55
1-Methylphenanthrene	8.29	Split Peak	SK9U	11/14/23 09:55
13C6-Fluoranthene (PRC)	8.83	Split Peak	SK9U	11/14/23 10:09

GC/MS SEMI VOA MANUAL INTEGRATION SUMMARY

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Instrument ID: GCMS1 Analysis Batch Number: 80177

Lab Sample ID: IC 140-80177/24 Client Sample ID:

Date Analyzed: 11/13/23 19:25 Lab File ID: IC PAH2.D GC Column: Rxi-5SilMS 2 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Anthracene	7.80	Baseline	SK9U	11/14/23 09:41
1-Methylphenanthrene	8.29	Split Peak	SK9U	11/14/23 09:41
13C6-Fluoranthene (PRC)	8.83	Baseline	SK9U	11/14/23 09:41

Lab Sample ID: IC 140-80177/25 Client Sample ID:

Date Analyzed: 11/13/23 19:48 Lab File ID: IC PAH1.D GC Column: Rxi-5SilMS 2 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
2-Methylnaphthalene	5.64	Baseline	SK9U	11/14/23 09:45
13C6-Phenanthrene (PRC)	7.75	Baseline	SK9U	11/14/23 09:44
Phenanthrene	7.76	Baseline	SK9U	11/14/23 09:44
1-Methylphenanthrene	8.30	Split Peak	SK9U	11/14/23 09:43
13C6-Fluoranthene (PRC)	8.83	Split Peak	SK9U	11/14/23 10:08
Dibenz(a,h)anthracene	13.25	Baseline	SK9U	11/14/23 09:42

GC/MS SEMI VOA MANUAL INTEGRATION SUMMARY

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Instrument ID: GCMS1 Analysis Batch Number: 80177

Lab Sample ID: MB 140-79842/19-A Client Sample ID:

Date Analyzed: 11/13/23 20:58 Lab File ID: MB 140-7984219-A.D GC Column: Rxi-5SilMS 2 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Naphthalene	5.08	Split Peak	SK9U	11/16/23 09:33
2-Methylnaphthalene	5.64	Baseline	SK9U	11/16/23 09:33
1-Methylnaphthalene	5.72	Baseline	SK9U	11/16/23 09:33
Acenaphthylene	6.38	Baseline	SK9U	11/16/23 09:34
Acenaphthene	6.52	Baseline	SK9U	11/16/23 09:35
Fluorene	6.95	Split Peak	SK9U	11/16/23 09:35
Anthracene	7.80	Split Peak	SK9U	11/16/23 09:37
Fluoranthene	8.83	Baseline	SK9U	11/16/23 09:37
PCB-14		Invalid Compound ID	SK9U	11/16/23 15:50
Chrysene	10.30	Baseline	SK9U	11/16/23 09:38
Benzo(k)fluoranthene-d12	11.40	Split Peak	SK9U	11/16/23 09:38
Benzo[b]fluoranthene	11.40	Baseline	SK9U	11/16/23 09:38
Benzo[k]fluoranthene	11.43	Baseline	SK9U	11/16/23 09:39
Benzo[e]pyrene	11.71	Baseline	SK9U	11/16/23 09:39
Benzo[a]pyrene	11.78	Baseline	SK9U	11/16/23 09:39
Perylene	11.87	Baseline	SK9U	11/16/23 09:39
Indeno[1,2,3-cd]pyrene	13.21	Split Peak	SK9U	11/16/23 09:40
Benzo[g,h,i]perylene	13.56	Split Peak	SK9U	11/16/23 09:33

Lab Sample ID: LCS 140-79842/18-A Client Sample ID:

Date Analyzed: 11/13/23 21:22 Lab File ID: LCS 140-7984218-A.D GC Column: Rxi-5SilMS 2 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Anthracene-d10	7.78	Split Peak	SK9U	11/16/23 09:42
Anthracene	7.79	Split Peak	SK9U	11/16/23 09:42

GC/MS SEMI VOA MANUAL INTEGRATION SUMMARY

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Instrument ID: GCMS1 Analysis Batch Number: 80177

Lab Sample ID: 140-34148-1 Client Sample ID: GEI.PRC.BLK1

Date Analyzed: 11/13/23 21:45 Lab File ID: 140-34148-A-1-Ac.D GC Column: Rxi-5SilMS 2 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Naphthalene	5.08	Baseline	SK9U	11/16/23 09:50
1-Methylnaphthalene	5.72	Baseline	SK9U	11/16/23 09:50
Acenaphthylene-d8	6.37	Baseline	SK9U	11/16/23 09:50
Acenaphthylene	6.38	Split Peak	SK9U	11/16/23 09:51
Acenaphthene	6.52	Split Peak	SK9U	11/16/23 09:51
Fluorene	6.95	Split Peak	SK9U	11/16/23 09:51
Phenanthrene	7.75	Split Peak	SK9U	11/16/23 09:52
Anthracene-d10	7.78	Baseline	SK9U	11/16/23 09:52
Anthracene	7.80	Baseline	SK9U	11/16/23 09:52
Fluoranthene	8.83	Baseline	SK9U	11/16/23 09:52
Pyrene	9.04	Baseline	SK9U	11/16/23 09:52
Benzo[a]anthracene	10.25	Baseline	SK9U	11/16/23 09:52
Chrysene	10.30	Split Peak	SK9U	11/16/23 09:53
Benzo[b]fluoranthene	11.40	Baseline	SK9U	11/16/23 09:53
Indeno[1,2,3-cd]pyrene	13.21	Split Peak	SK9U	11/16/23 10:08
Dibenz(a,h)anthracene	13.23	Baseline	SK9U	11/16/23 10:09
Benzo[g,h,i]perylene	13.58	Split Peak	SK9U	11/16/23 10:09

GC/MS SEMI VOA MANUAL INTEGRATION SUMMARY

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Instrument ID: GCMS1 Analysis Batch Number: 80177

Lab Sample ID: 140-34148-2 Client Sample ID: GEI.PRC.BLK2

Date Analyzed: 11/13/23 22:08 Lab File ID: 140-34148-A-2-A.D GC Column: Rxi-5SilMS 2 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Naphthalene	5.08	Split Peak	SK9U	11/16/23 10:53
2-Methylnaphthalene	5.64	Baseline	SK9U	11/16/23 10:53
Acenaphthylene	6.38	Baseline	SK9U	11/16/23 10:54
Acenaphthene	6.52	Split Peak	SK9U	11/16/23 10:54
Fluorene	6.95	Baseline	SK9U	11/16/23 10:54
Phenanthrene	7.75	Split Peak	SK9U	11/16/23 10:54
Anthracene-d10	7.78	Split Peak	SK9U	11/16/23 10:55
Anthracene	7.79	Baseline	SK9U	11/16/23 10:55
Fluoranthene	8.83	Split Peak	SK9U	11/16/23 10:55
Pyrene	9.04	Split Peak	SK9U	11/16/23 10:55
Benzo[e]pyrene		Invalid Compound ID	SK9U	11/16/23 10:57
C3-Fluorenes		Invalid Compound ID	SK9U	11/22/23 16:14
Benzo[a]anthracene	10.26	Split Peak	SK9U	11/16/23 10:56
Chrysene	10.30	Baseline	SK9U	11/16/23 10:56
Benzo[b]fluoranthene	11.40	Baseline	SK9U	11/16/23 10:57
Benzo[k]fluoranthene	11.43	Split Peak	SK9U	11/16/23 10:57
Perylene	11.87	Split Peak	SK9U	11/16/23 10:58
Indeno[1,2,3-cd]pyrene	13.22	Baseline	SK9U	11/16/23 10:58
Dibenz(a,h)anthracene	13.24	Split Peak	SK9U	11/16/23 10:58
Benzo[g,h,i]perylene	13.57	Split Peak	SK9U	11/16/23 10:59

GC/MS SEMI VOA MANUAL INTEGRATION SUMMARY

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Instrument ID: GCMS1 Analysis Batch Number: 80177

Lab Sample ID: 140-34148-3 Client Sample ID: GEI.PRC.BLK3

Date Analyzed: 11/13/23 22:31 Lab File ID: 140-34148-A-3-A.D GC Column: Rxi-5SilMS 2 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Naphthalene	5.08	Split Peak	SK9U	11/16/23 11:00
2-Methylnaphthalene	5.64	Baseline	SK9U	11/16/23 11:00
Fluorene	6.95	Baseline	SK9U	11/16/23 11:00
Anthracene-d10	7.78	Split Peak	SK9U	11/16/23 11:01
Anthracene	7.79	Baseline	SK9U	11/16/23 11:02
Fluoranthene	8.82	Split Peak	SK9U	11/16/23 11:02
Pyrene	9.04	Split Peak	SK9U	11/16/23 11:02
Benzo[e]pyrene		Invalid Compound ID	SK9U	11/16/23 11:04
Benzo[k]fluoranthene		Invalid Compound ID	SK9U	11/16/23 11:04
Dibenz(a,h)anthracene		Invalid Compound ID	SK9U	11/16/23 11:05
Perylene		Invalid Compound ID	SK9U	11/16/23 11:04
Benzo[a]anthracene	10.27	Split Peak	SK9U	11/16/23 11:03
Chrysene	10.30	Baseline	SK9U	11/16/23 11:03
Benzo[b]fluoranthene	11.40	Split Peak	SK9U	11/16/23 11:04
Benzo[a]pyrene	11.78	Split Peak	SK9U	11/16/23 11:04
Indeno[1,2,3-cd]pyrene	13.20	Baseline	SK9U	11/16/23 11:05
Benzo[g,h,i]perylene	13.57	Split Peak	SK9U	11/16/23 11:05

GC/MS SEMI VOA MANUAL INTEGRATION SUMMARY

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Instrument ID: GCMS1 Analysis Batch Number: 80177

Lab Sample ID: 140-34148-4 Client Sample ID: 1804576-851-S1

Date Analyzed: 11/13/23 22:55 Lab File ID: 140-34148-A-4-A.D GC Column: Rxi-5SilMS 2 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Naphthalene	5.08	Split Peak	SK9U	11/16/23 11:09
2-Methylnaphthalene	5.64	Baseline	SK9U	11/16/23 11:09
Acenaphthylene	6.38	Baseline	SK9U	11/16/23 11:10
Fluorene	6.95	Baseline	SK9U	11/16/23 11:10
PCB-14	7.48	Baseline	SK9U	11/16/23 15:45
Benzo[a]anthracene	10.26	Baseline	SK9U	11/16/23 11:10
Chrysene	10.30	Split Peak	SK9U	11/16/23 11:11
Benzo[b]fluoranthene	11.40	Split Peak	SK9U	11/16/23 11:11
Benzo[k]fluoranthene	11.43	Split Peak	SK9U	11/16/23 11:11
Perylene	11.87	Baseline	SK9U	11/16/23 11:11
Dibenz(a,h)anthracene	13.24	Baseline	SK9U	11/16/23 11:12
Benzo[g,h,i]perylene	13.58	Split Peak	SK9U	11/16/23 11:12

GC/MS SEMI VOA MANUAL INTEGRATION SUMMARY

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Instrument ID: GCMS1 Analysis Batch Number: 80349

Lab Sample ID: 140-34148-6 Client Sample ID: 1804576-852-S1

Date Analyzed: 11/16/23 15:49 Lab File ID: 810-82790-A-1-A.D GC Column: Rxi-5SilMS 2 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Naphthalene	5.08	Split Peak	SK9U	11/16/23 16:46
Acenaphthylene	6.38	Baseline	SK9U	11/16/23 16:46
PCB-14		Invalid Compound ID	SK9U	11/16/23 16:44
PCB-36		Invalid Compound ID	SK9U	11/16/23 16:44
PCB-78		Invalid Compound ID	SK9U	11/16/23 16:44
Chrysene	10.30	Baseline	SK9U	11/16/23 16:45
Indeno[1,2,3-cd]pyrene	13.22	Baseline	SK9U	11/16/23 16:45
Dibenz(a,h)anthracene	13.24	Baseline	SK9U	11/16/23 16:44

GC/MS SEMI VOA MANUAL INTEGRATION SUMMARY

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Instrument ID: GCMS1 Analysis Batch Number: 80349

Lab Sample ID: 140-34148-8 Client Sample ID: 1804576-843-S1

Date Analyzed: 11/16/23 16:37 Lab File ID: 810-82790-A-3-A.D GC Column: Rxi-5SilMS 2 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Naphthalene	5.08	Split Peak	SK9U	11/17/23 09:18
2-Methylnaphthalene	5.64	Baseline	SK9U	11/17/23 09:18
Acenaphthylene	6.38	Split Peak	SK9U	11/17/23 09:19
Fluorene	6.95	Baseline	SK9U	11/17/23 09:19
Anthracene-d10	7.78	Baseline	SK9U	11/17/23 09:20
Anthracene	7.80	Split Peak	SK9U	11/17/23 09:20
PCB-155	8.85	Baseline	SK9U	11/17/23 09:23
PCB-78	9.08	Baseline	SK9U	11/17/23 09:23
PCB-184	9.58	Baseline	SK9U	11/22/23 11:20
PCB-14		Split Peak	SK9U	11/17/23 09:22
PCB-36		Invalid Compound ID	SK9U	11/17/23 09:22
Benzo[a]anthracene	10.26	Baseline	SK9U	11/17/23 09:20
Benzo[b]fluoranthene	11.40	Baseline	SK9U	11/17/23 09:21
Perylene	11.87	Baseline	SK9U	11/17/23 09:21
Indeno[1,2,3-cd]pyrene	13.22	Split Peak	SK9U	11/17/23 09:22
Dibenz(a,h)anthracene	13.24	Baseline	SK9U	11/17/23 09:22
Benzo[g,h,i]perylene	13.59	Baseline	SK9U	11/17/23 09:22

Lab Sample ID: 140-34148-10 Client Sample ID: 1804576-844-S1

Date Analyzed: 11/16/23 17:24 Lab File ID: 140-34148-A-7-A.D GC Column: Rxi-5SilMS 2 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Naphthalene	5.08	Split Peak	SK9U	11/17/23 09:35
Anthracene	7.80	Baseline	SK9U	11/17/23 09:36
Chrysene	10.30	Baseline	SK9U	11/17/23 09:36
Benzo[k]fluoranthene	11.43	Baseline	SK9U	11/17/23 09:37
Indeno[1,2,3-cd]pyrene	13.22	Baseline	SK9U	11/17/23 09:38
Dibenz(a,h)anthracene	13.24	Baseline	SK9U	11/17/23 09:38

GC/MS SEMI VOA MANUAL INTEGRATION SUMMARY

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Instrument ID: GCMS1 Analysis Batch Number: 80349

Lab Sample ID: 140-34148-11 Client Sample ID: 1804576-844-S3

Date Analyzed: 11/16/23 17:48 Lab File ID: 140-34148-A-8-A.D GC Column: Rxi-5SilMS 2 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Naphthalene	5.08	Split Peak	SK9U	11/17/23 09:46
PCB-14	7.47	Baseline	SK9U	11/17/23 09:43
Benzo[b]fluoranthene	11.40	Split Peak	SK9U	11/17/23 09:44
Benzo[k]fluoranthene	11.42	Baseline	SK9U	11/17/23 09:45

Lab Sample ID: 140-34148-12 Client Sample ID: 1804576-854-S1

Date Analyzed: 11/16/23 18:11 Lab File ID: 140-34148-A-9-A.D GC Column: Rxi-5SilMS 2 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Naphthalene	5.08	Split Peak	SK9U	11/17/23 09:52
Acenaphthylene	6.38	Baseline	SK9U	11/17/23 09:52
PCB-14	7.48	Split Peak	SK9U	11/17/23 09:49
Benzo[a]anthracene	10.26	Baseline	SK9U	11/17/23 09:51
Benzo[k]fluoranthene	11.43	Baseline	SK9U	11/17/23 09:51
Dibenz(a,h)anthracene	13.24	Baseline	SK9U	11/17/23 09:50
Benzo[g,h,i]perylene	13.58	Baseline	SK9U	11/17/23 09:50

GC/MS SEMI VOA MANUAL INTEGRATION SUMMARY

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Instrument ID: GCMS1 Analysis Batch Number: 80349

Lab Sample ID: 140-34148-13 Client Sample ID: 1804576-854-S2

Date Analyzed: 11/16/23 18:35 Lab File ID: 140-34148-A-10-A.D GC Column: Rxi-5SilMS 2 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Naphthalene	5.08	Baseline	SK9U	11/17/23 10:00
Acenaphthylene	6.38	Baseline	SK9U	11/17/23 10:01
PCB-14	7.47	Split Peak	SK9U	11/17/23 10:03
Anthracene-d10	7.78	Split Peak	SK9U	11/17/23 10:01
PCB-36	8.20	Split Peak	SK9U	11/17/23 10:03
PCB-78	9.08	Baseline	SK9U	11/17/23 10:04
Benzo[b]fluoranthene	11.40	Split Peak	SK9U	11/17/23 10:01
Benzo[k]fluoranthene	11.43	Baseline	SK9U	11/17/23 10:02
Dibenz(a,h)anthracene	13.23	Baseline	SK9U	11/17/23 10:03

Lab Sample ID: 140-34148-14 Client Sample ID: 1804576-846-S1

Date Analyzed: 11/16/23 18:59 Lab File ID: 140-34148-A-11-A.D GC Column: Rxi-5SilMS 2 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Naphthalene	5.08	Split Peak	SK9U	11/17/23 10:06
Acenaphthylene	6.38	Split Peak	SK9U	11/17/23 10:06
Fluorene	6.95	Baseline	SK9U	11/17/23 10:07
PCB-14	7.48	Split Peak	SK9U	11/17/23 10:11
Anthracene	7.80	Baseline	SK9U	11/17/23 10:07
PCB-121	8.75	Split Peak	SK9U	11/17/23 10:11
Benzo[a]anthracene	10.26	Baseline	SK9U	11/17/23 10:07
Chrysene	10.30	Split Peak	SK9U	11/17/23 10:08
Benzo[k]fluoranthene	11.43	Baseline	SK9U	11/17/23 10:10
Dibenz(a,h)anthracene	13.24	Baseline	SK9U	11/17/23 10:10

GC/MS SEMI VOA MANUAL INTEGRATION SUMMARY

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Instrument ID: GCMS1 Analysis Batch Number: 80349

Lab Sample ID: 140-34148-15 Client Sample ID: 1804576-846-S3

Date Analyzed: 11/16/23 19:22 Lab File ID: 140-34148-A-12-A.D GC Column: Rxi-5SilMS 2 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Naphthalene	5.08	Baseline	SK9U	11/17/23 10:18
2-Methylnaphthalene	5.64	Baseline	SK9U	11/17/23 10:27
Fluorene	6.95	Baseline	SK9U	11/17/23 10:27
PCB-14	7.48	Split Peak	SK9U	11/17/23 10:29
PCB-36	8.21	Split Peak	SK9U	11/17/23 10:30
Benzo[a]anthracene	10.26	Baseline	SK9U	11/17/23 10:27
Chrysene	10.30	Split Peak	SK9U	11/17/23 10:28
Benzo[b]fluoranthene	11.40	Baseline	SK9U	11/17/23 10:28
Benzo[k]fluoranthene	11.43	Split Peak	SK9U	11/17/23 10:28
Indeno[1,2,3-cd]pyrene	13.21	Split Peak	SK9U	11/17/23 10:29
Dibenz(a,h)anthracene	13.24	Baseline	SK9U	11/17/23 10:29

Lab Sample ID: 140-34148-16 Client Sample ID: 1804576-853-S1

Date Analyzed: 11/16/23 19:45 Lab File ID: 140-34148-A-13-A.D GC Column: Rxi-5SilMS 2 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Naphthalene	5.08	Split Peak	SK9U	11/17/23 10:37
Acenaphthylene	6.38	Baseline	SK9U	11/17/23 10:38
Fluorene	6.95	Baseline	SK9U	11/17/23 10:38
PCB-14	7.47	Split Peak	SK9U	11/17/23 10:40
Anthracene-d10	7.78	Baseline	SK9U	11/17/23 10:38
PCB-36	8.21	Split Peak	SK9U	11/17/23 10:40
Benzo[a]anthracene	10.26	Baseline	SK9U	11/17/23 10:39
Chrysene	10.30	Split Peak	SK9U	11/17/23 10:39
Benzo[k]fluoranthene	11.43	Baseline	SK9U	11/17/23 10:36
Dibenz(a,h)anthracene	13.22	Split Peak	SK9U	11/17/23 10:40

GC/MS SEMI VOA MANUAL INTEGRATION SUMMARY

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Instrument ID: GCMS1 Analysis Batch Number: 80349

Lab Sample ID: 140-34148-17 Client Sample ID: 1804576-853-S3

Date Analyzed: 11/16/23 20:09 Lab File ID: 140-34148-A-14-A.D GC Column: Rxi-5SilMS 2 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Naphthalene	5.08	Split Peak	SK9U	11/17/23 10:55
Acenaphthylene	6.38	Baseline	SK9U	11/17/23 10:56
PCB-14	7.48	Baseline	SK9U	11/17/23 11:00
Phenanthrene	7.75	Split Peak	SK9U	11/17/23 10:56
Fluoranthene	8.83	Baseline	SK9U	11/17/23 10:57
Pyrene	9.04	Baseline	SK9U	11/17/23 10:57
Anthracene		Invalid Compound ID	SK9U	11/17/23 10:57
C3-Fluorenes		Invalid Compound ID	SK9U	11/17/23 10:44
Benzo[a]anthracene	10.27	Baseline	SK9U	11/17/23 10:57
Chrysene	10.30	Baseline	SK9U	11/17/23 10:58
Benzo[b]fluoranthene	11.40	Split Peak	SK9U	11/17/23 10:58
Benzo[k]fluoranthene	11.43	Split Peak	SK9U	11/17/23 10:58
Benzo[e]pyrene	11.71	Split Peak	SK9U	11/17/23 10:59
Indeno[1,2,3-cd]pyrene	13.21	Split Peak	SK9U	11/17/23 11:00
Dibenz(a,h)anthracene	13.22	Split Peak	SK9U	11/17/23 10:59
Benzo[g,h,i]perylene	13.56	Split Peak	SK9U	11/17/23 11:00

GC/MS SEMI VOA MANUAL INTEGRATION SUMMARY

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Instrument ID: GCMS1 Analysis Batch Number: 80349

Lab Sample ID: 140-34148-7 Client Sample ID: 1804576-852-S2

Date Analyzed: 11/16/23 22:05 Lab File ID: 34148-7df5.D GC Column: Rxi-5SilMS 2 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Naphthalene	5.08	Split Peak	SK9U	11/17/23 11:20
1-Methylnaphthalene	5.72	Split Peak	SK9U	11/17/23 11:20
Fluorene -d10	6.92	Baseline	SK9U	11/17/23 11:21
PCB-14	7.48	Split Peak	SK9U	11/17/23 11:24
PCB-121	8.75	Split Peak	SK9U	11/17/23 11:24
Fluoranthene-d10	8.81	Baseline	SK9U	11/17/23 11:21
PCB-155	8.85	Split Peak	SK9U	11/17/23 11:24
PCB-184	9.57	Split Peak	SK9U	11/17/23 11:25
Benzo[a]anthracene	10.26	Baseline	SK9U	11/17/23 11:21
Chrysene-d12	10.27	Split Peak	SK9U	11/17/23 11:22
PCB-192	10.28	Split Peak	SK9U	11/17/23 11:25
Chrysene	10.30	Baseline	SK9U	11/17/23 11:22
Benzo(k)fluoranthene-d12	11.40	Split Peak	SK9U	11/17/23 11:22
Benzo[b]fluoranthene	11.40	Split Peak	SK9U	11/17/23 11:22
Benzo[k]fluoranthene	11.42	Split Peak	SK9U	11/17/23 11:23
Benzo(a)pyrene-d12	11.75	Split Peak	SK9U	11/17/23 11:23
Dibenz(a,h)anthracene-d14	13.21	Split Peak	SK9U	11/17/23 11:23
Indeno[1,2,3-cd]pyrene	13.22	Baseline	SK9U	11/17/23 11:23

GC/MS SEMI VOA MANUAL INTEGRATION SUMMARY

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Instrument ID: GCMS1 Analysis Batch Number: 80412

Lab Sample ID: 140-34148-9 Client Sample ID: 1804576-843-S2

Date Analyzed: 11/17/23 16:55 Lab File ID: 140-34148-A-9-A.D GC Column: Rxi-5SilMS 2 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Naphthalene	5.08	Split Peak	SK9U	11/20/23 09:21
1-Methylnaphthalene-d10	5.69	Baseline	SK9U	11/20/23 09:22
Fluorene -d10	6.93	Split Peak	SK9U	11/20/23 09:23
Anthracene-d10	7.78	Baseline	SK9U	11/20/23 09:23
PCB-121		Invalid Compound ID	SK9U	11/20/23 09:25
PCB-14		Invalid Compound ID	SK9U	11/20/23 09:25
PCB-142		Invalid Compound ID	SK9U	11/20/23 09:25
PCB-78		Invalid Compound ID	SK9U	11/20/23 09:25
Benzo[a]anthracene	10.26	Baseline	SK9U	11/20/23 09:23
Chrysene	10.30	Split Peak	SK9U	11/20/23 09:24
Benzo[b]fluoranthene	11.40	Split Peak	SK9U	11/20/23 09:24
Benzo[k]fluoranthene	11.43	Baseline	SK9U	11/20/23 09:24
Dibenz(a,h)anthracene	13.24	Baseline	SK9U	11/20/23 09:21

GC/MS SEMI VOA MANUAL INTEGRATION SUMMARY

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Instrument ID: GCMS1 Analysis Batch Number: 80412

Lab Sample ID: 140-34148-5 Client Sample ID: 1804576-851-S2

Date Analyzed: 11/17/23 17:19 Lab File ID: 140-34148-A-5-C.D GC Column: Rxi-5SilMS 2 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
C2-Naphthalenes	6.10	Invalid Compound ID	SK9U	11/20/23 09:31
Anthracene-d10	7.78	Split Peak	SK9U	11/20/23 09:27
PCB-121		Invalid Compound ID	SK9U	11/20/23 09:30
PCB-14		Invalid Compound ID	SK9U	11/20/23 09:30
PCB-155		Invalid Compound ID	SK9U	11/20/23 09:30
PCB-204		Invalid Compound ID	SK9U	11/20/23 09:31
PCB-36		Invalid Compound ID	SK9U	11/20/23 09:30
PCB-78		Invalid Compound ID	SK9U	11/20/23 09:30
Benzo[b]fluoranthene	11.40	Baseline	SK9U	11/20/23 09:28
Benzo(k)fluoranthene-d12	11.41	Baseline	SK9U	11/20/23 09:28
Benzo[k]fluoranthene	11.42	Baseline	SK9U	11/20/23 09:29
Perylene	11.87	Split Peak	SK9U	11/20/23 09:29
Dibenz(a,h)anthracene	13.24	Baseline	SK9U	11/20/23 09:30
Benzo(ghi)perylene-d12	13.55	Split Peak	SK9U	11/20/23 09:30

GC/MS SEMI VOA MANUAL INTEGRATION SUMMARY

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Instrument ID: GCMS1 Analysis Batch Number: 80832

Lab Sample ID: 140-34148-5 RA Client Sample ID: 1804576-851-S2 RA

Date Analyzed: 12/01/23 22:11 Lab File ID: 140-34148-A-5-A.D GC Column: Rxi-5SilMS 2 ID: 0.25(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
2-Methylnaphthalene-d10	5.61	Baseline	SK9U	12/05/23 11:57
1-Methylnaphthalene-d10	5.69	Baseline	SK9U	12/05/23 11:57
Acenaphthylene-d8	6.36	Baseline	SK9U	12/05/23 11:57
Anthracene-d10	7.78	Baseline	SK9U	12/05/23 11:58
PCB-14		Split Peak	SK9U	12/05/23 16:53
PCB-142		Invalid Compound ID	SK9U	12/05/23 17:06
PCB-184		Invalid Compound ID	SK9U	12/05/23 17:06
PCB-36		Invalid Compound ID	SK9U	12/05/23 17:06
PCB-78		Invalid Compound ID	SK9U	12/05/23 17:06
Chrysene-d12	10.27	Baseline	SK9U	12/05/23 11:59
Benzo[b]fluoranthene	11.40	Split Peak	SK9U	12/05/23 11:59
Benzo[k]fluoranthene	11.42	Baseline	SK9U	12/05/23 11:59
Dibenz(a,h)anthracene	13.23	Baseline	SK9U	12/05/23 12:00

Method PAH_IsotopeDil

PAHs (GC/MS Isotope Dilution) by Method PAH_IsotopeDil

FORM II
GC/MS SEMI VOA SURROGATE RECOVERY

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Matrix: Sediment Level: Low

GC Column (1): Rxi-5SilMS ID: 0.25(mm)

Client Sample ID	Lab Sample ID	NPT #	2MN #	MNPd10 #	ACY #	FLd10 #	PHN #	ANC #	FLN #
GEI.PRC.BLK1	140-34148-1	72	76	79	72	78	68	66	80
GEI.PRC.BLK2	140-34148-2	80	82	82	79	80	75	69	83
GEI.PRC.BLK3	140-34148-3	83	84	84	81	85	77	73	87
1804576-851-S1	140-34148-4	77	79	80	79	84	75	73	84
1804576-851-S2	140-34148-5	112	112	111	114	108	113	106	107
1804576-851-S2 RA	140-34148-5 RA	60	65	64	73	110	74	58	62
1804576-852-S1	140-34148-6	74	77	79	77	79	78	75	84
1804576-852-S2	140-34148-7	74	76	78	79	78	89	80	87
1804576-843-S1	140-34148-8	67	70	73	73	72	64	59	74
1804576-843-S2	140-34148-9	69	73	77	82	79	85	81	92
1804576-844-S1	140-34148-10	76	81	82	83	85	79	79	87
1804576-844-S3	140-34148-11	63	70	72	76	77	83	84	88
1804576-854-S1	140-34148-12	78	81	83	86	83	85	88	87
1804576-854-S2	140-34148-13	68	73	75	82	81	84	80	88
1804576-846-S1	140-34148-14	77	82	83	82	85	77	77	85
1804576-846-S3	140-34148-15	81	84	86	86	85	85	86	90
1804576-853-S1	140-34148-16	73	77	79	80	79	80	75	83
1804576-853-S3	140-34148-17	74	78	79	77	77	71	73	82
	MB 140-79842/19-A	69	71	72	65	73	63	61	73
	LCS 140-79842/18-A	84	86	87	83	86	84	78	88

	QC LIMITS
NPT = Naphthalene-d8	30-120
2MN = 2-Methylnaphthalene-d10	30-120
MNPd10 = 1-Methylnaphthalene-d10	30-120
ACY = Acenaphthylene-d8	30-120
FLd10 = Fluorene -d10	30-120
PHN = Phenanthrene-d10	30-120
ANC = Anthracene-d10	30-120
FLN = Fluoranthene-d10	30-120

Column to be used to flag recovery values

FORM II ID-0016

FORM II
GC/MS SEMI VOA SURROGATE RECOVERY

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Matrix: Sediment Level: Low

GC Column (1): Rxi-5SilMS ID: 0.25(mm)

Client Sample ID	Lab Sample ID	CRY #	BBFd12 #	BKFd12 #	BNAPd12 #	PRY #	IDPd12 #	DBAd14 #	BNGHI12 #
GEI.PRC.BLK1	140-34148-1	70	79	77	66	60	78	73	79
GEI.PRC.BLK2	140-34148-2	74	86	82	73	68	84	79	85
GEI.PRC.BLK3	140-34148-3	77	90	89	77	73	89	84	91
1804576-851-S1	140-34148-4	75	88	81	78	74	85	82	88
1804576-851-S2	140-34148-5	104	110	108	114	112	110	107	110
1804576-851-S2 RA	140-34148-5 RA	82	87	84	84	85	90	98	86
1804576-852-S1	140-34148-6	74	85	81	76	71	87	83	85
1804576-852-S2	140-34148-7	77	84	86	84	82	89	79	91
1804576-843-S1	140-34148-8	69	76	77	69	65	77	73	79
1804576-843-S2	140-34148-9	85	86	95	91	89	93	90	92
1804576-844-S1	140-34148-10	79	89	88	82	77	90	86	91
1804576-844-S3	140-34148-11	77	91	87	86	80	93	88	90
1804576-854-S1	140-34148-12	81	90	88	91	87	91	89	93
1804576-854-S2	140-34148-13	77	91	85	86	81	91	88	91
1804576-846-S1	140-34148-14	80	88	85	80	75	88	85	89
1804576-846-S3	140-34148-15	84	93	86	87	84	90	88	93
1804576-853-S1	140-34148-16	74	86	84	81	76	88	82	88
1804576-853-S3	140-34148-17	71	81	82	73	70	80	76	84
	MB 140-79842/19-A	72	83	79	70	66	86	81	89
	LCS 140-79842/18-A	80	95	84	77	72	93	91	93

	QC LIMITS
CRY = Chrysene-d12	30-120
BBFd12 = Benzo(b)fluoranthene-d12	30-120
BKFd12 = Benzo(k)fluoranthene-d12	30-120
BNAPd12 = Benzo(a)pyrene-d12	30-120
PRY = Perylene-d12	30-120
IDPd12 = Indeno[1,2,3-cd]pyrene-d12	30-120
DBAd14 = Dibenz(a,h)anthracene-d14	30-120
BNGHI12 = Benzo(ghi)perylene-d12	30-120

Column to be used to flag recovery values

FORM II ID-0016

FORM III
GC/MS SEMI VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Matrix: Sediment Level: Low Lab File ID: LCS 140-7984218-A.D

Lab ID: LCS 140-79842/18-A Client ID:

COMPOUND	SPIKE ADDED (ng/g)	LCS CONCENTRATION (ng/g)	LCS % REC	QC LIMITS REC	#
Acenaphthene	7810	7810	100	60-140	
Acenaphthylene	7810	7590	97	60-140	
Anthracene	7810	7990	102	60-140	
Benzo[a]anthracene	7810	7910	101	60-140	
Benzo[a]pyrene	7810	8140	104	60-140	
Benzo[b]fluoranthene	7810	7330	94	60-140	
Benzo[e]pyrene	7810	8990	115	60-140	
Benzo[g,h,i]perylene	7810	7860	101	60-140	
Benzo[k]fluoranthene	7810	8340	107	60-140	
Chrysene	7810	8110	104	60-140	
Dibenz(a,h)anthracene	7810	7890	101	60-140	
Fluoranthene	7810	7870	101	60-140	
Fluorene	7810	7770	99	60-140	
Indeno[1,2,3-cd]pyrene	7810	7840	100	60-140	
1-Methylnaphthalene	7810	7590	97	60-140	
2-Methylnaphthalene	7810	7780	100	60-140	
Naphthalene	7810	7930	101	60-140	
Perylene	7810	8140	104	60-140	
Phenanthrene	7810	7740	99	60-140	
Pyrene	7810	7680	98	60-140	
Acenaphthylene-d8	7810	6490	83	30-120	
Anthracene-d10	7810	6080	78	30-120	
Benzo(a)pyrene-d12	7810	6030	77	30-120	
Benzo(b)fluoranthene-d12	7810	7440	95	30-120	
Benzo(ghi)perylene-d12	7810	7270	93	30-120	
Benzo(k)fluoranthene-d12	7810	6540	84	30-120	
Chrysene-d12	7810	6260	80	30-120	
Dibenz(a,h)anthracene-d14	7810	7090	91	30-120	
Fluoranthene-d10	7810	6850	88	30-120	
Fluorene -d10	7810	6750	86	30-120	
Indeno[1,2,3-cd]pyrene-d12	7810	7280	93	30-120	
1-Methylnaphthalene-d10	7810	6760	87	30-120	
2-Methylnaphthalene-d10	7810	6730	86	30-120	
Naphthalene-d8	7810	6580	84	30-120	
Perylene-d12	7810	5610	72	30-120	
Phenanthrene-d10	7810	6560	84	30-120	

Column to be used to flag recovery and RPD values

FORM III ID-0016

FORM IV
GC/MS SEMI VOA METHOD BLANK SUMMARY

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Lab File ID: MB 140-7984219-A.D Lab Sample ID: MB 140-79842/19-A

Matrix: Sediment Date Extracted: 11/03/2023 10:43

Instrument ID: GCMS1 Date Analyzed: 11/13/2023 20:58

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 140-79842/18-A	LCS 140-7984218-A.D	11/13/2023 21:22
GEI.PRC.BLK1	140-34148-1	140-34148-A-1-Ac.D	11/13/2023 21:45
GEI.PRC.BLK2	140-34148-2	140-34148-A-2-A.D	11/13/2023 22:08
GEI.PRC.BLK3	140-34148-3	140-34148-A-3-A.D	11/13/2023 22:31
1804576-851-S1	140-34148-4	140-34148-A-4-A.D	11/13/2023 22:55
1804576-852-S1	140-34148-6	810-82790-A-1-A.D	11/16/2023 15:49
1804576-843-S1	140-34148-8	810-82790-A-3-A.D	11/16/2023 16:37
1804576-844-S1	140-34148-10	140-34148-A-7-A.D	11/16/2023 17:24
1804576-844-S3	140-34148-11	140-34148-A-8-A.D	11/16/2023 17:48
1804576-854-S1	140-34148-12	140-34148-A-9-A.D	11/16/2023 18:11
1804576-854-S2	140-34148-13	140-34148-A-10-A.D	11/16/2023 18:35
1804576-846-S1	140-34148-14	140-34148-A-11-A.D	11/16/2023 18:59
1804576-846-S3	140-34148-15	140-34148-A-12-A.D	11/16/2023 19:22
1804576-853-S1	140-34148-16	140-34148-A-13-A.D	11/16/2023 19:45
1804576-853-S3	140-34148-17	140-34148-A-14-A.D	11/16/2023 20:09
1804576-852-S2	140-34148-7	34148-7df5.D	11/16/2023 22:05
1804576-843-S2	140-34148-9	140-34148-A-9-A.D	11/17/2023 16:55
1804576-851-S2	140-34148-5	140-34148-A-5-C.D	11/17/2023 17:19
1804576-851-S2 RA	140-34148-5 RA	140-34148-A-5-A.D	12/01/2023 22:11

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: GEI.PRC.BLK1 | Lab Sample ID: 140-34148-1

Matrix: PE | Lab File ID: 140-34148-A-1-Ac.D

Analysis Method: ID-0016 | Date Collected: 10/26/2023 14:00

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.012(g) | Date Analyzed: 11/13/2023 21:45

Con. Extract Vol.: 500(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80177 | Units: ng/g

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
83-32-9	Acenaphthene	ND		830	220
208-96-8	Acenaphthylene	ND		830	61
120-12-7	Anthracene	ND		830	270
56-55-3	Benzo[a]anthracene	ND		830	310
50-32-8	Benzo[a]pyrene	ND		830	230
205-99-2	Benzo[b]fluoranthene	ND		830	290
192-97-2	Benzo[e]pyrene	ND		830	130
191-24-2	Benzo[g,h,i]perylene	ND		830	92
207-08-9	Benzo[k]fluoranthene	ND		830	190
218-01-9	Chrysene	ND		830	110
53-70-3	Dibenz(a,h)anthracene	ND		830	68
206-44-0	Fluoranthene	ND		830	680
86-73-7	Fluorene	ND		830	270
193-39-5	Indeno[1,2,3-cd]pyrene	ND		830	92
90-12-0	1-Methylnaphthalene	ND		4200	420
91-57-6	2-Methylnaphthalene	640	J	4200	580
91-20-3	Naphthalene	ND		17000	2400
198-55-0	Perylene	ND		830	430
85-01-8	Phenanthrene	ND		1700	1400
129-00-0	Pyrene	ND		1700	250
STL00912	C1-Fluoranthenes/pyrene	ND		830	830
STL00913	C1-Fluorenes	ND		1700	1100
STL00914	C2-Fluorenes	ND		830	830
STL00915	C3-Fluorenes	ND		830	830
STL00917	C2-Naphthalenes	ND		1700	1700
STL00918	C3-Naphthalenes	ND		1700	1700
STL00919	C4-Naphthalenes	ND		2500	2300
STL00901	C1-Phenanthrenes/Anthracenes	ND		3300	2800
STL00902	C2-Phenanthrenes/Anthracenes	ND		830	830
STL00903	C3-Phenanthrenes/Anthracenes	ND		830	830
STL00904	C4-Phenanthrenes/Anthracenes	ND		830	830
STL02218	C1-Chrysenes/Benz(a)anthracenes	ND		830	830

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: GEI.PRC.BLK1 | Lab Sample ID: 140-34148-1

Matrix: PE | Lab File ID: 140-34148-A-1-Ac.D

Analysis Method: ID-0016 | Date Collected: 10/26/2023 14:00

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.012(g) | Date Analyzed: 11/13/2023 21:45

Con. Extract Vol.: 500(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80177 | Units: ng/g

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
STL02219	C2-Chrysenes/Benz(a)anthracenes	ND		830	830
STL02220	C3-Chrysenes/Benz(a)anthracenes	ND		830	830
STL02221	C4-Chrysenes/Benz(a)anthracenes	ND		830	830
34883-41-5	PCB-14	3300		830	8.3
74472-51-8	PCB-192	2700		830	8.3
74472-48-3	PCB-184	1400		830	8.3
33979-03-2	PCB-155	910		830	8.3
41411-61-4	PCB-142	880		830	8.3
74472-52-9	PCB-204	1900		830	8.3
56558-16-8	PCB-104	3200		830	8.3
56558-18-0	PCB-121	1200		830	8.3
70362-49-1	PCB-78	2800		830	8.3
38444-87-0	PCB-36	1200		830	8.3

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
93951-97-4	Acenaphthylene-d8	72		30-120
1719-06-8	Anthracene-d10	66		30-120
63466-71-7	Benzo(a)pyrene-d12	66		30-120
93951-98-5	Benzo(b)fluoranthene-d12	79		30-120
93951-66-7	Benzo(ghi)perylene-d12	79		30-120
93952-01-3	Benzo(k)fluoranthene-d12	77		30-120
1719-03-5	Chrysene-d12	70		30-120
13250-98-1	Dibenz(a,h)anthracene-d14	73		30-120
93951-69-0	Fluoranthene-d10	80		30-120
81103-79-9	Fluorene -d10	78		30-120
203578-33-0	Indeno[1,2,3-cd]pyrene-d12	78		30-120
38072-94-5	1-Methylnaphthalene-d10	79		30-120
7297-45-2	2-Methylnaphthalene-d10	76		30-120
1146-65-2	Naphthalene-d8	72		30-120
1520-96-3	Perylene-d12	60		30-120
1517-22-2	Phenanthrene-d10	68		30-120

Report Date: 16-Nov-2023 15:46:40 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D
Lims ID: 140-34148-A-1-A
Client ID: GEI.PRC.BLK1
Sample Type: Client
Inject. Date: 13-Nov-2023 21:45:19 ALS Bottle#: 0 Worklist Smp#: 30
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030467-030
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 16-Nov-2023 15:46:08 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1650

First Level Reviewer: SK9U Date: 16-Nov-2023 10:53:05

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/ml	%Rec	Flags
D 10 Naphthalene-d8	136	5.059	5.068	-0.009	100	47917	0.3619	72.4	
12 Naphthalene	128	5.077	5.077	-0.001	41	5843	0.0518		M
D 15 2-methylnaphthalene-d10	152	5.612	5.612	0.000	92	32806	0.3810	76.2	
16 2-Methylnaphthalene	142	5.635	5.635	0.000	94	1253	0.0154		
D 17 1-Methylnaphthalene-d10	152	5.692	5.692	0.000	100	34084	0.3951	79.0	
18 1-Methylnaphthalene	142	5.720	5.720	0.000	92	641	0.007748		7M
D 23 Acenaphthylene-d8	160	6.366	6.366	0.000	90	52938	0.3622	72.4	M
24 Acenaphthylene	152	6.376	6.376	-0.001	1	90	0.000723		7M
* 26 Acenaphthene-d10	164	6.492	6.492	0.000	97	47498	0.5000		
27 Acenaphthene	154	6.522	6.517	0.005	61	230	0.002885		M
D 29 Fluorene -d10	176	6.925	6.925	0.000	100	44186	0.3904	78.1	
30 Fluorene	166	6.950	6.945	0.005	95	366	0.003188		7M
D 35 Phenanthrene-d10	188	7.735	7.728	0.007	99	83674	0.3399	68.0	
36 Phenanthrene	178	7.752	7.753	0.003	32	1993	0.009873		7M
D 38 Anthracin-d10	188	7.780	7.783	0.004	99	79221	0.3296	65.9	M
39 Anthracene	178	7.797	7.794	0.003	68	343	0.001758		7M
D 41 Fluoranthene-d10	212	8.808	8.808	0.000	100	127143	0.3981	79.6	
43 Fluoranthene	202	8.825	8.822	0.000	20	1383	0.004251		M
* 44 Pyrene-d10 (IS)	212	9.027	9.027	0.000	99	157856	0.5000		
45 Pyrene	202	9.044	9.044	0.000	18	1209	0.003641		7M
47 Benzo[a]anthracene	228	10.254	10.259	-0.006	13	290	0.001039		7M
D 48 Chrysene-d12	240	10.270	10.270	0.000	96	107494	0.3490	69.8	
50 Chrysene	228	10.300	10.295	0.005	1	311	0.000994		7M
D 52 Benzo(b)fluoranthene-d12	264	11.376	11.369	0.007	100	93804	0.3946	78.9	
53 Benzo[b]fluoranthene	252	11.397	11.397	0.000	1	692	0.002190		7M
D 54 Benzo(k)fluoranthene-d12	264	11.404	11.404	0.000	41	107471	0.3848	77.0	
* 56 Benzo(e)pyrene-d12	264	11.684	11.684	0.000	99	93857	0.5000		
D 58 Benzo(a)pyrene-d12	264	11.747	11.747	0.000	100	68794	0.3300	66.0	
D 60 Perylene-d12	264	11.845	11.845	0.000	100	69339	0.2997	59.9	
D 62 Indeno[1,2,3-cd]pyrene-d12	288	13.186	13.186	0.000	80	87838	0.3878	77.6	
D 63 Dibenz(a,h)anthracene-d14	292	13.195	13.196	-0.001	94	74356	0.3669	73.4	
65 Indeno[1,2,3-cd]pyrene	276	13.214	13.196	0.000	1	164	0.000558		7M

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/ml	%Rec	Flags
66 Dibenz(a,h)anthracene	278	13.233	13.242	-0.009	25	85	0.000358		7M
D 67 Benzo(ghi)perylene-d12	288	13.552	13.543	0.009	100	89156	0.3964	79.3	
68 Benzo[g,h,i]perylene	276	13.580	13.580	0.000	1	140	0.000536		7M
74 PCB-14	222	7.479	7.476	0.000	98	15058	0.0803		
75 PCB-36	258	8.210	8.210	0.000	99	2732	0.0277		
76 PCB-104	326	8.395	8.396	-0.001	95	5896	0.0770		
77 PCB-121	326	8.751	8.751	0.000	98	1756	0.0285		
78 PCB-155	360	8.848	8.849	-0.001	87	1255	0.0218		
79 PCB-78	290	9.081	9.084	-0.003	92	3320	0.0671		
80 PCB-142	360	9.525	9.522	0.003	93	882	0.0211		
81 PCB-184	394	9.575	9.572	0.003	95	1421	0.0339		
* 82 PCB-167L	372	10.023	10.027	-0.004	73	20446	0.4000		
83 PCB-204	428	10.249	10.250	-0.001	78	1256	0.0461		
84 PCB-192	394	10.275	10.275	0.000	7	2495	0.0650		

QC Flag Legend

Processing Flags

7 - Failed Limit of Detection

Review Flags

M - Manually Integrated

Reagents:

60ISPCB_00001 Amount Added: 5.00 Units: uL

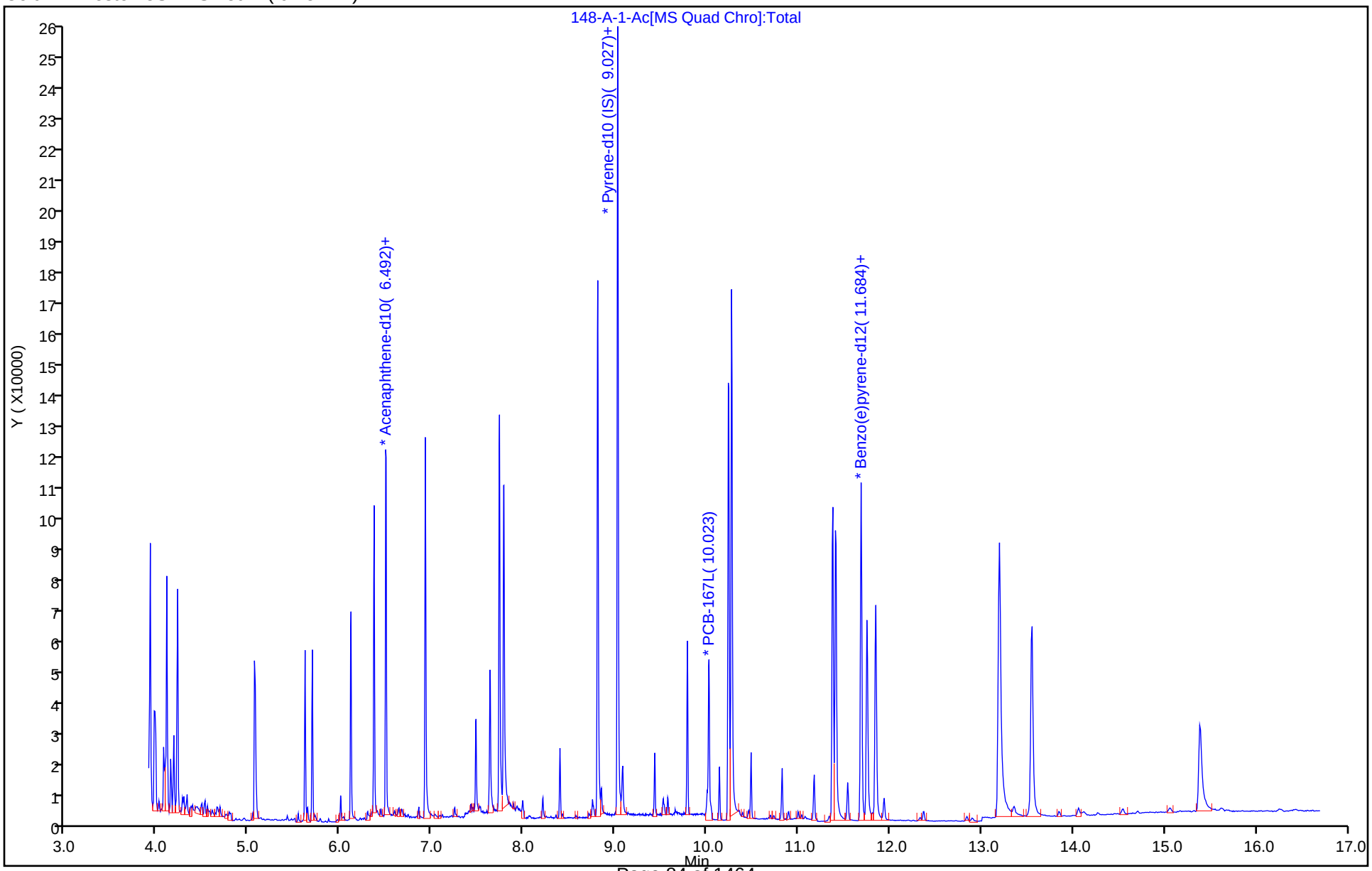
Report Date: 16-Nov-2023 15:46:40 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D

Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1	Worklist Smp#:	30
Client ID:	GEI.PRC.BLK1				
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)

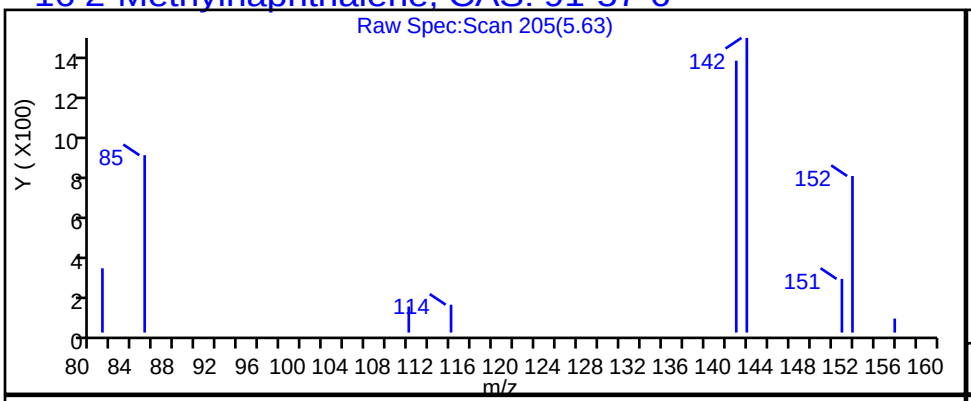


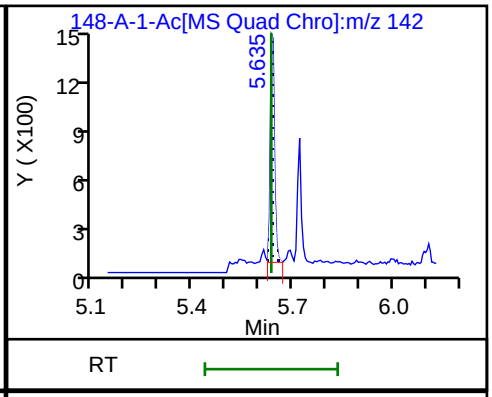
Report Date: 16-Nov-2023 15:46:40 Chrom Revision: 2.3 15-Nov-2023 20:54:34

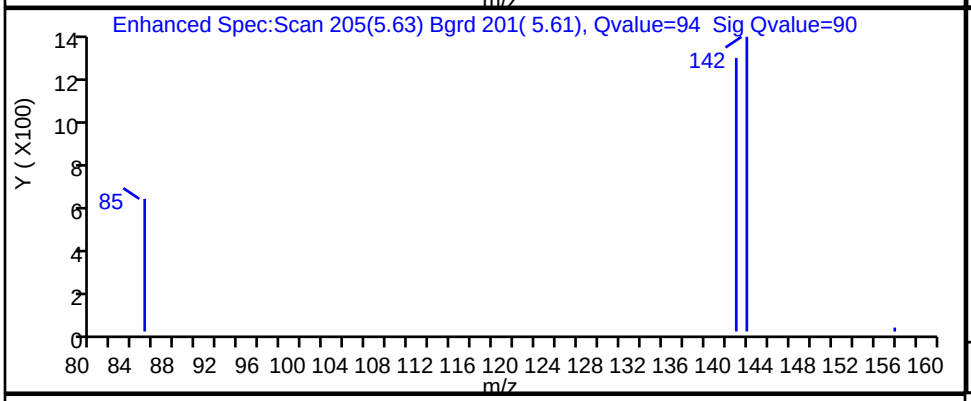
Eurofins Knoxville

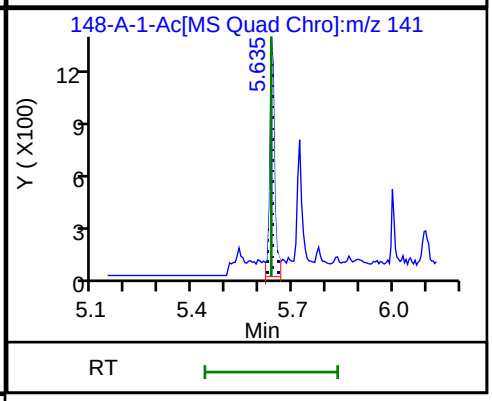
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D				
Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1		
Client ID:	GEI.PRC.BLK1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

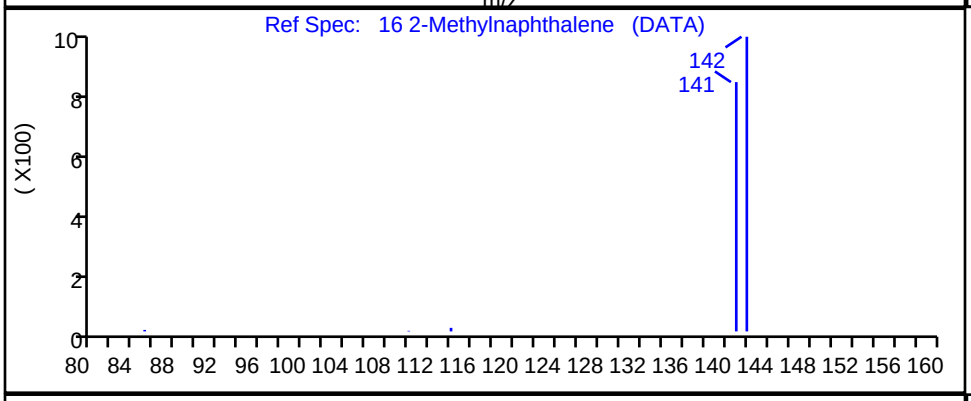
16 2-Methylnaphthalene, CAS: 91-57-6

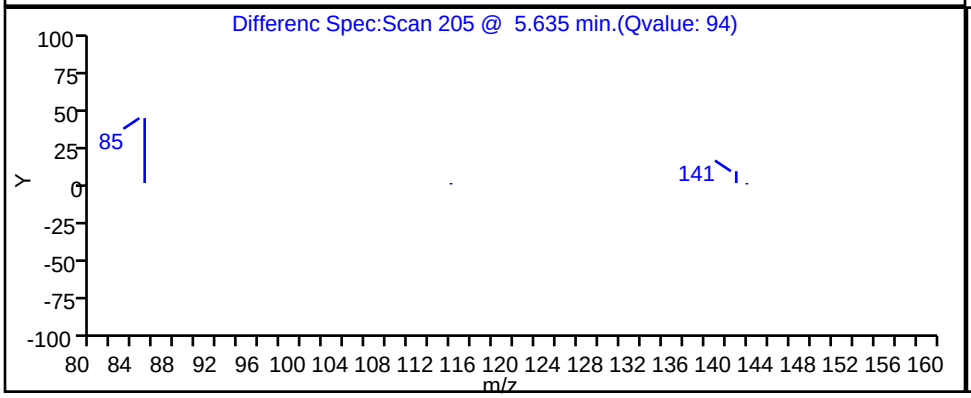


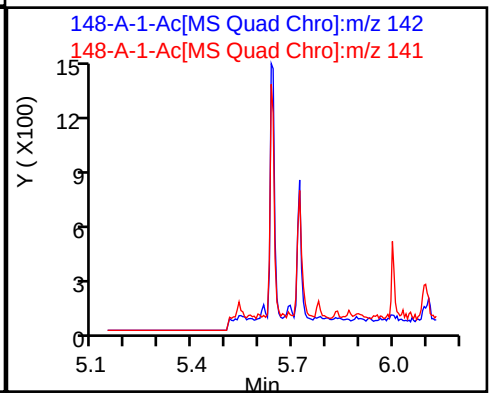










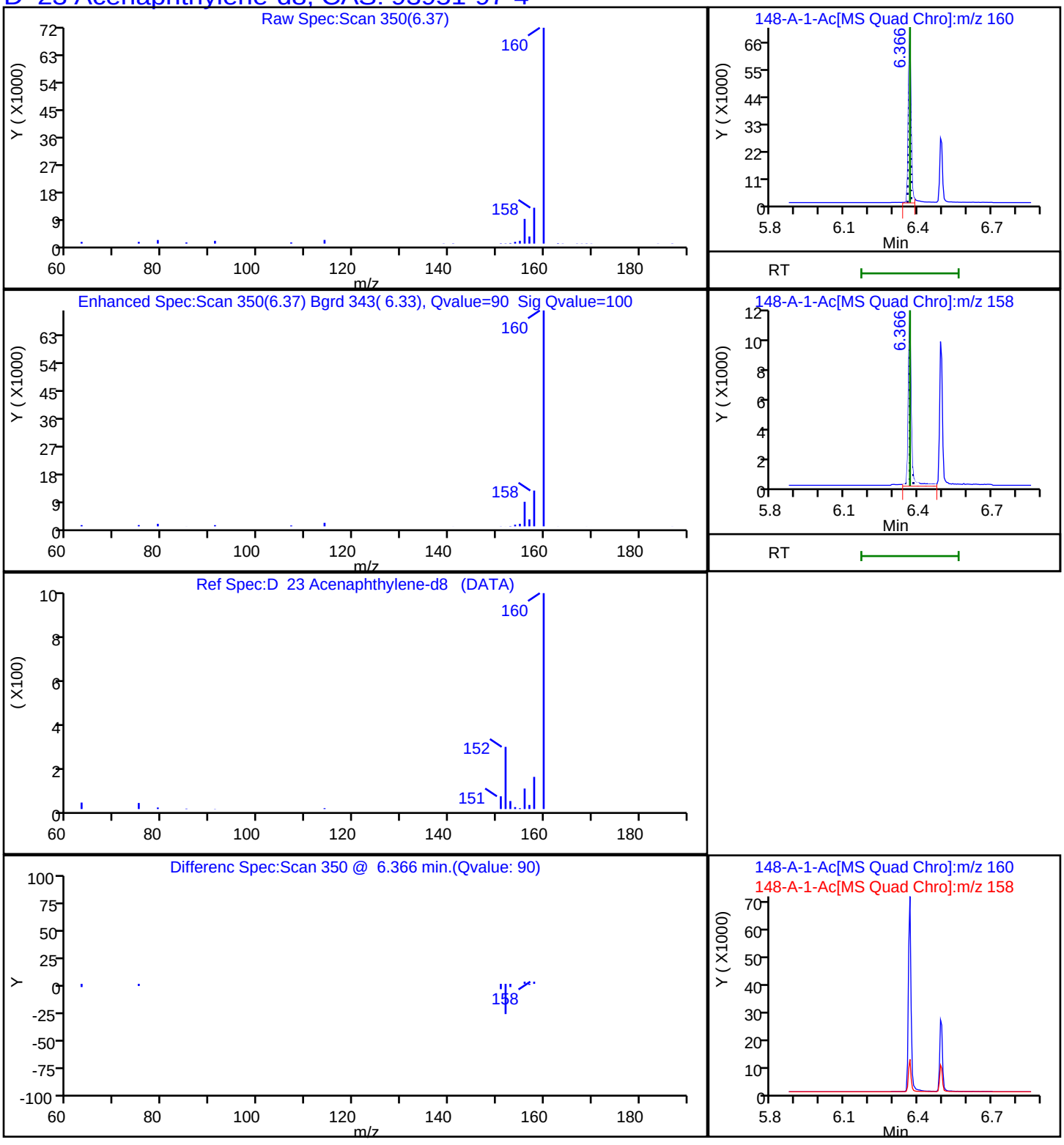


Report Date: 16-Nov-2023 15:46:41 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D				
Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1		
Client ID:	GEI.PRC.BLK1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 23 Acenaphthylene-d8, CAS: 93951-97-4

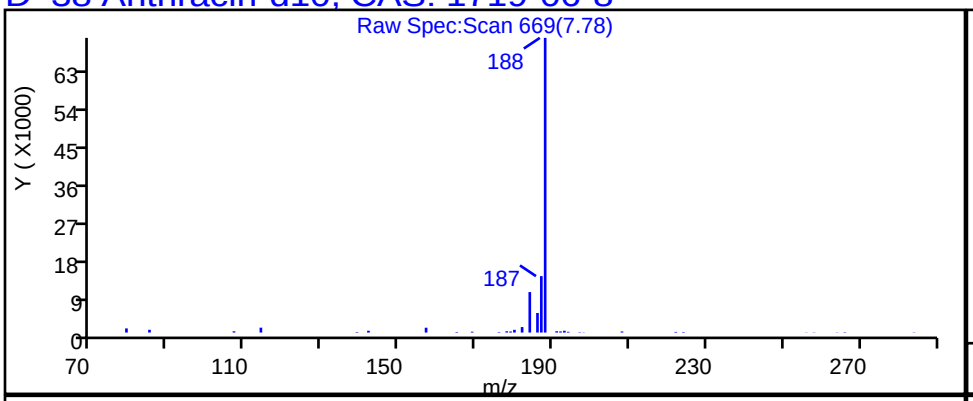


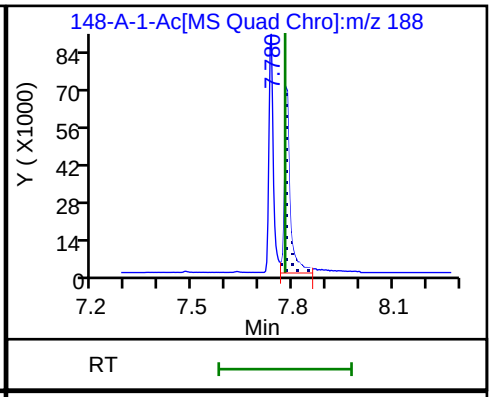
Report Date: 16-Nov-2023 15:46:41 Chrom Revision: 2.3 15-Nov-2023 20:54:34

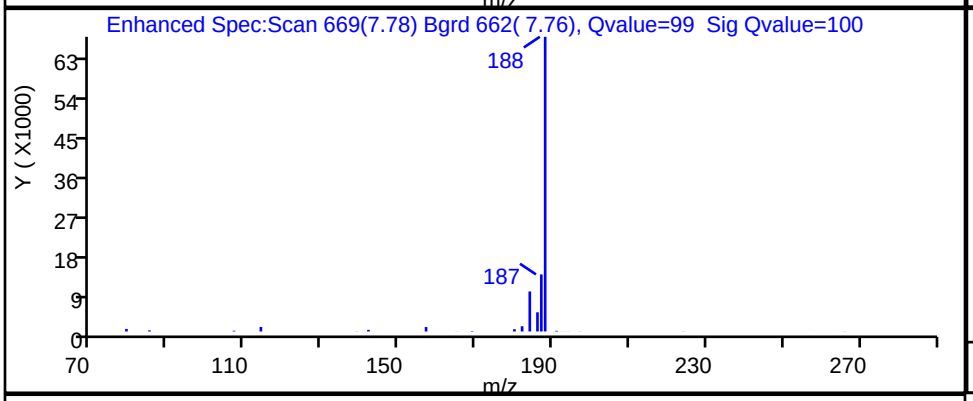
Eurofins Knoxville

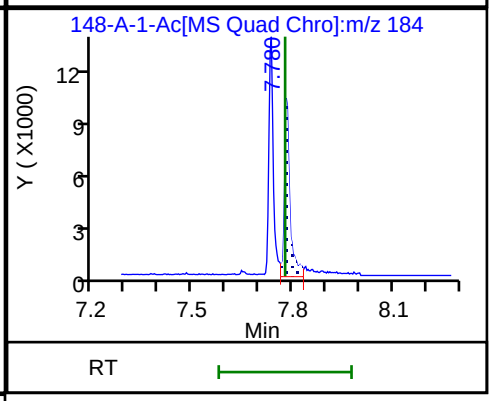
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D		
Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1
Client ID:	GEI.PRC.BLK1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

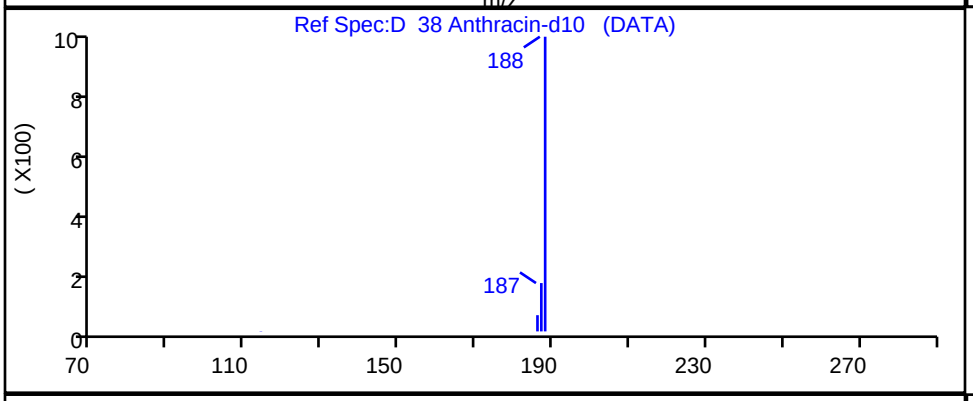
D 38 Anthracin-d10, CAS: 1719-06-8

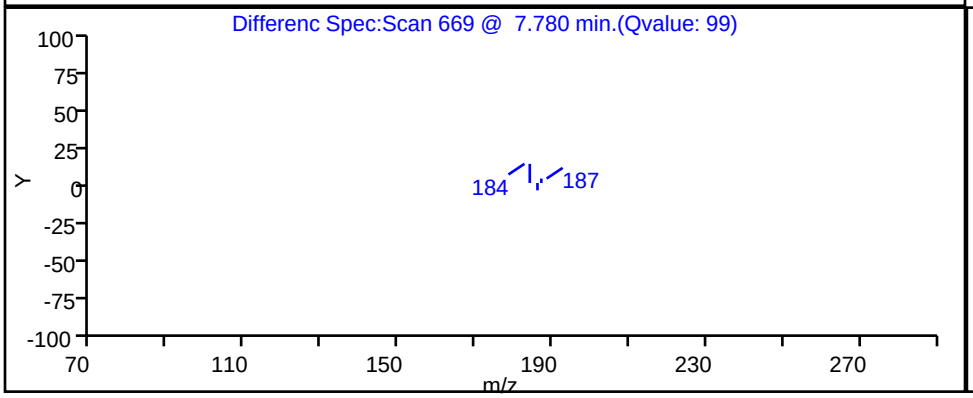


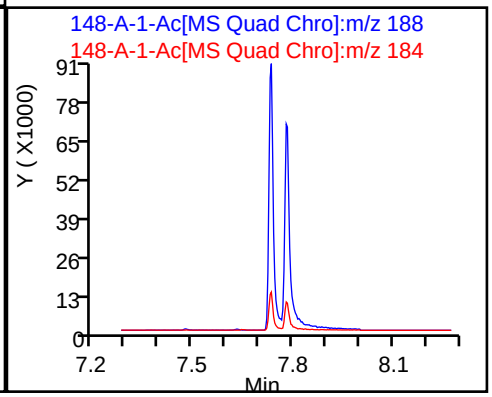










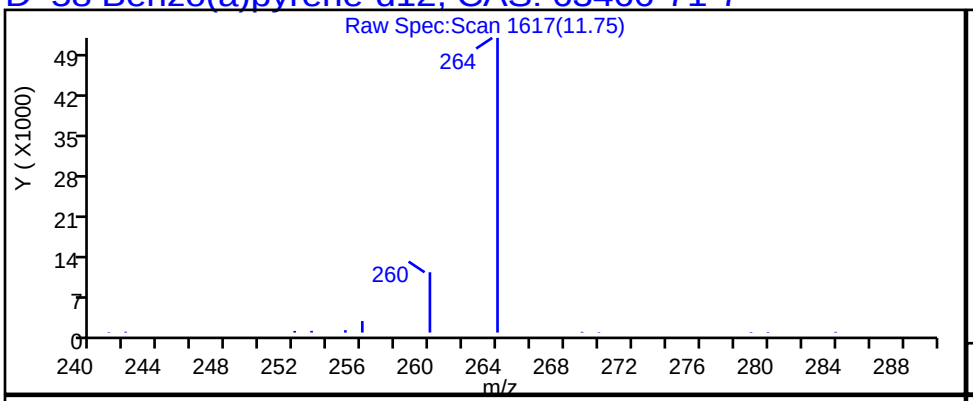


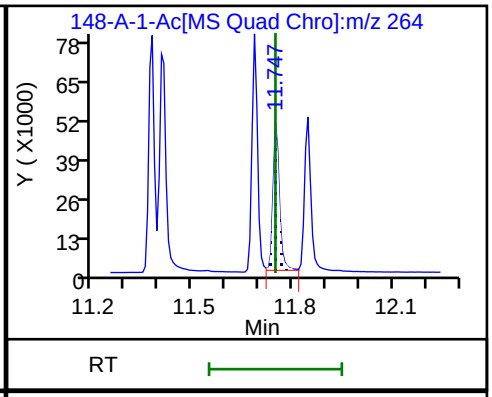
Report Date: 16-Nov-2023 15:46:41 Chrom Revision: 2.3 15-Nov-2023 20:54:34

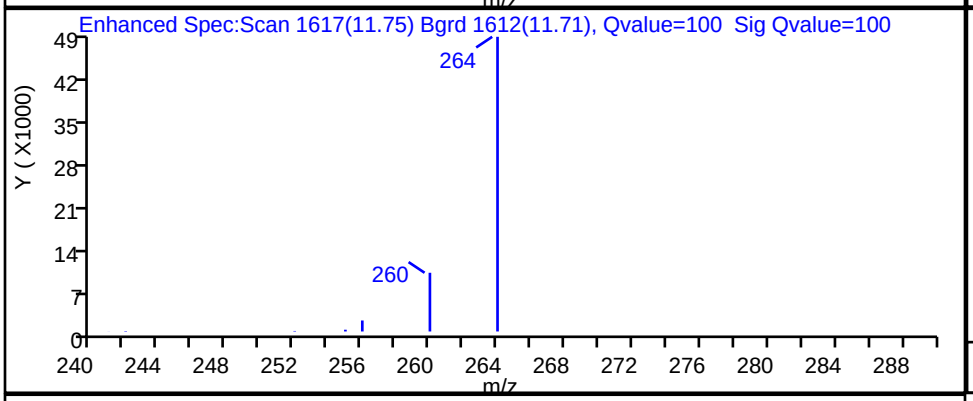
Eurofins Knoxville

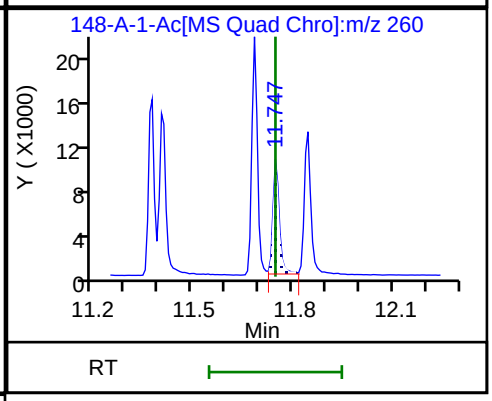
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D				
Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1		
Client ID:	GEI.PRC.BLK1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

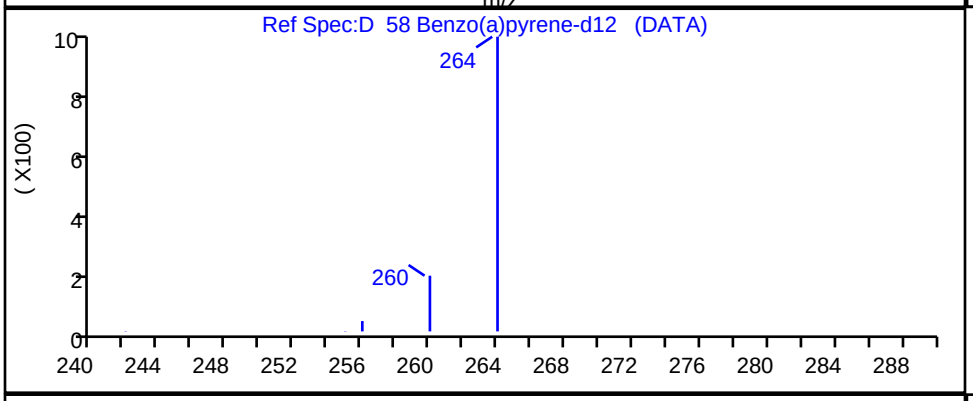
D 58 Benzo(a)pyrene-d12, CAS: 63466-71-7

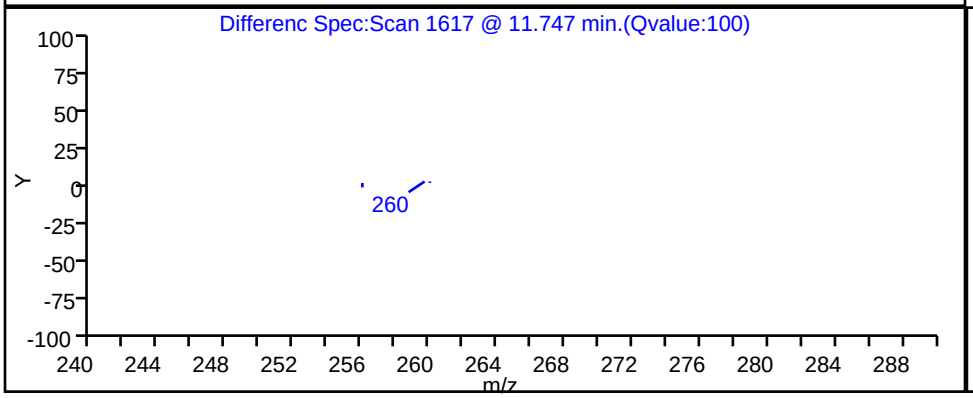


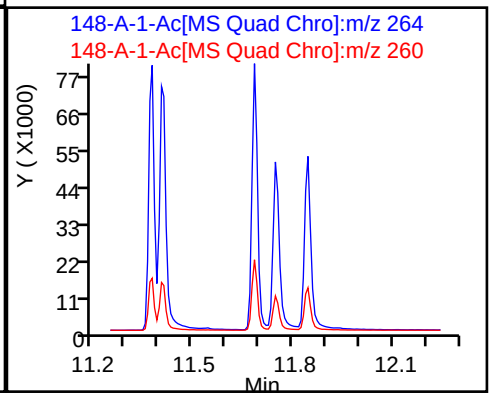










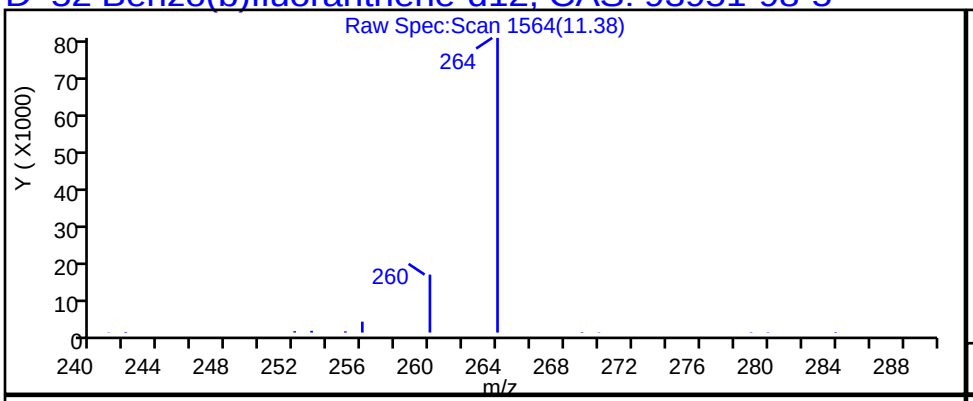


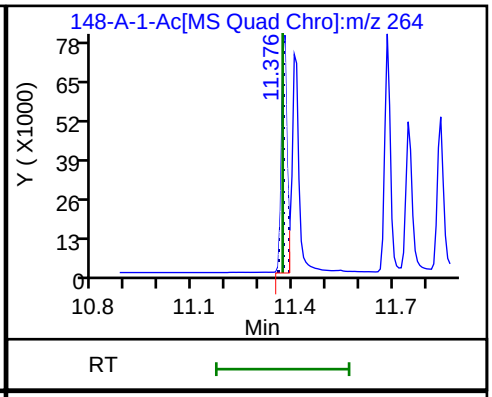
Report Date: 16-Nov-2023 15:46:41 Chrom Revision: 2.3 15-Nov-2023 20:54:34

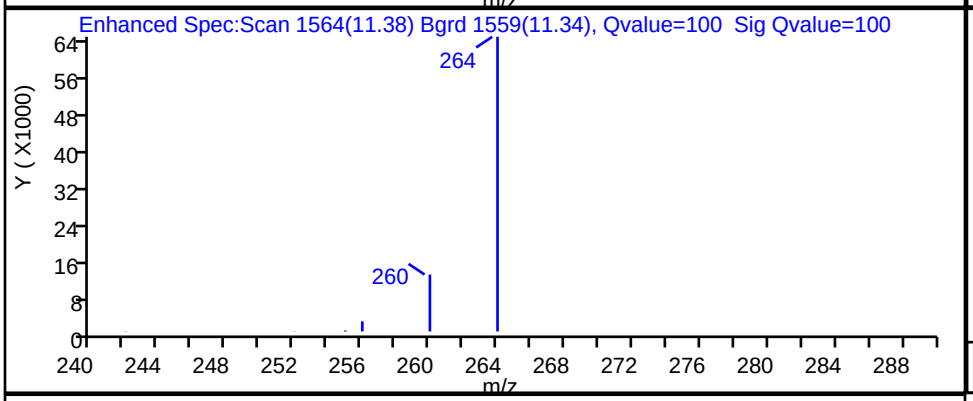
Eurofins Knoxville

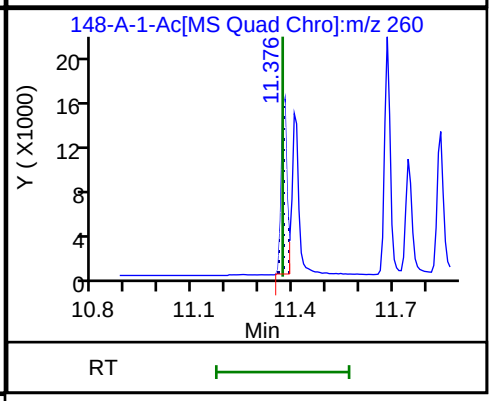
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D				
Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1		
Client ID:	GEI.PRC.BLK1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

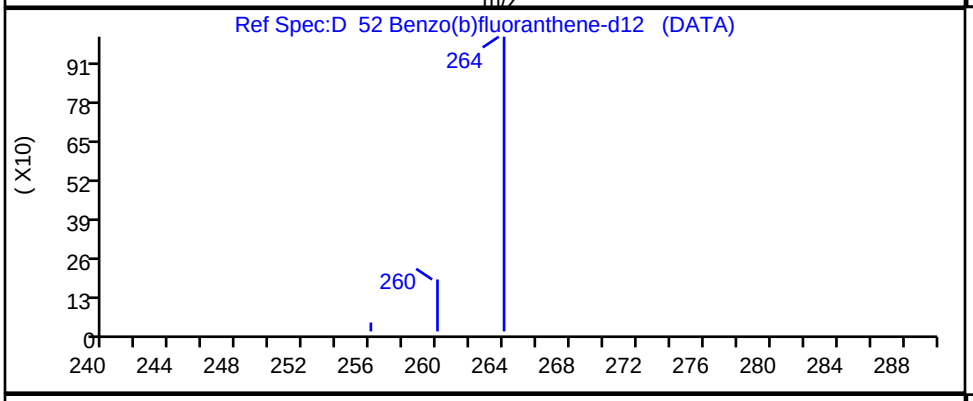
D 52 Benzo(b)fluoranthene-d12, CAS: 93951-98-5

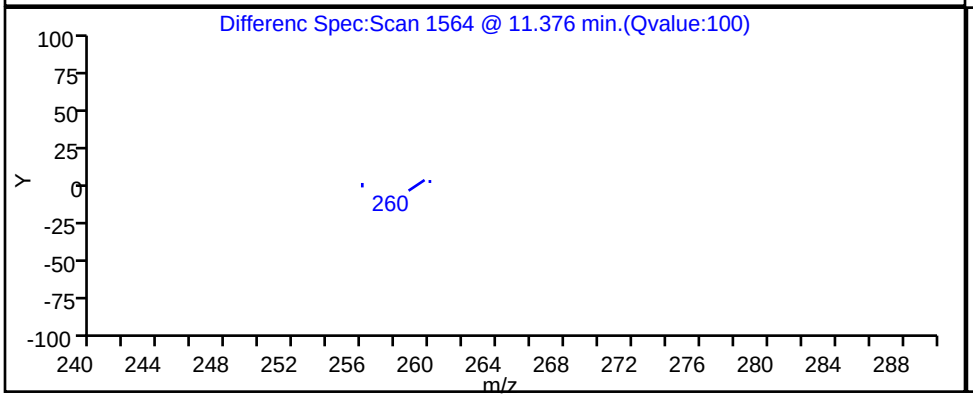


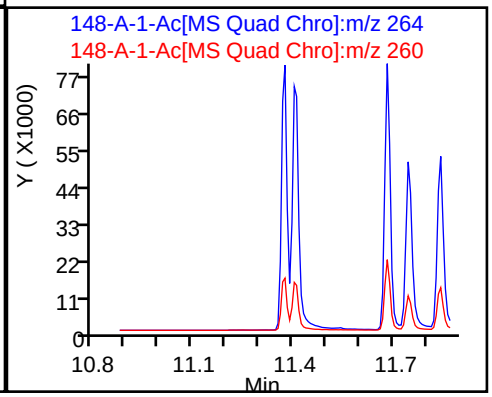












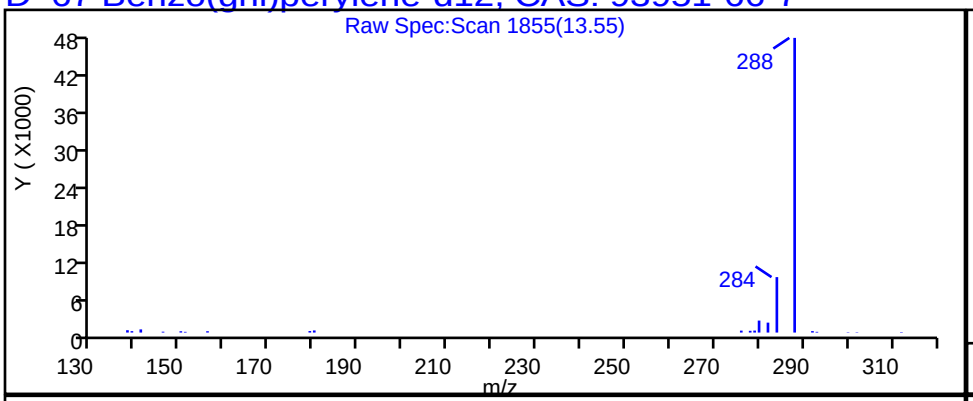
Report Date: 16-Nov-2023 15:46:42 Chrom Revision: 2.3 15-Nov-2023 20:54:34

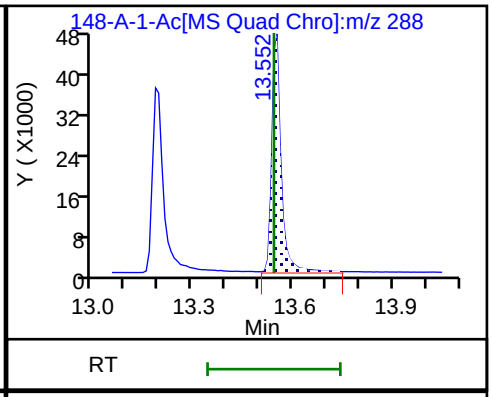
Eurofins Knoxville

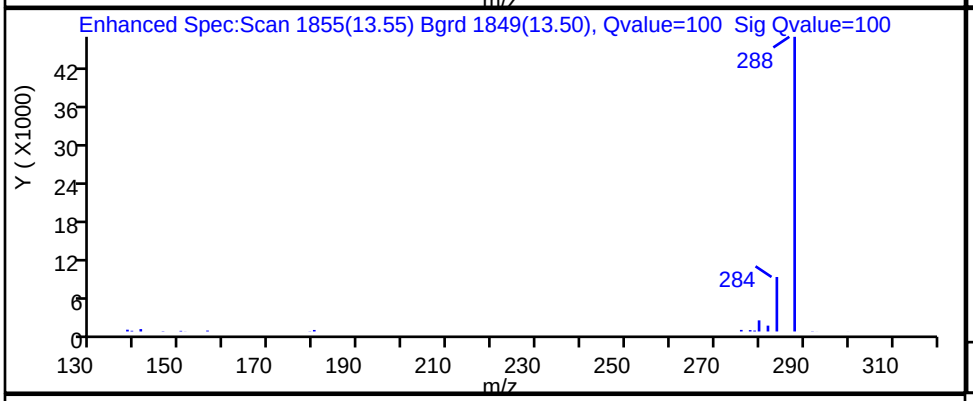
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D

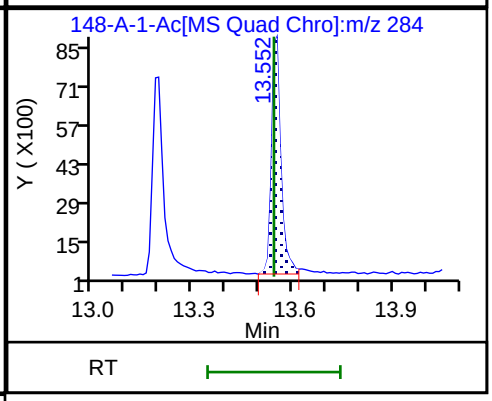
Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1		
Client ID:	GEI.PRC.BLK1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

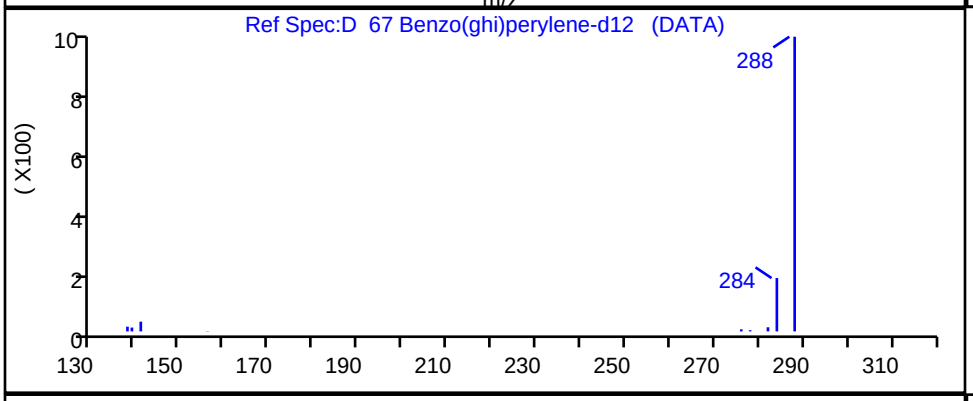
D_67 Benzo(ghi)perylene-d12, CAS: 93951-66-7

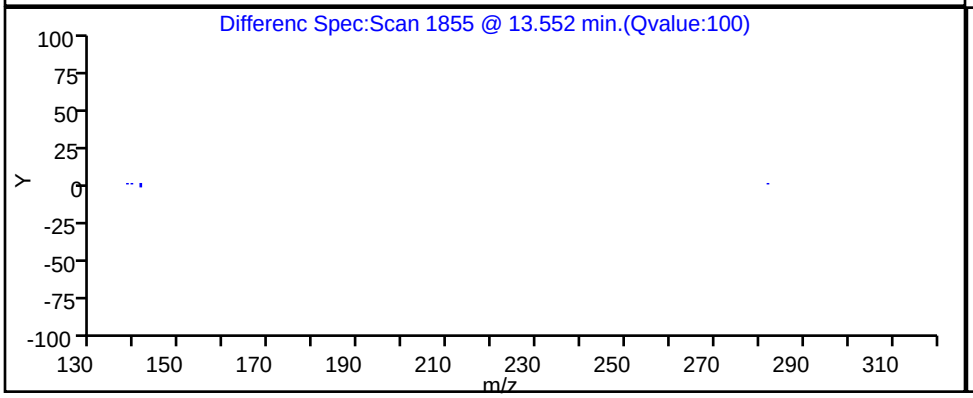


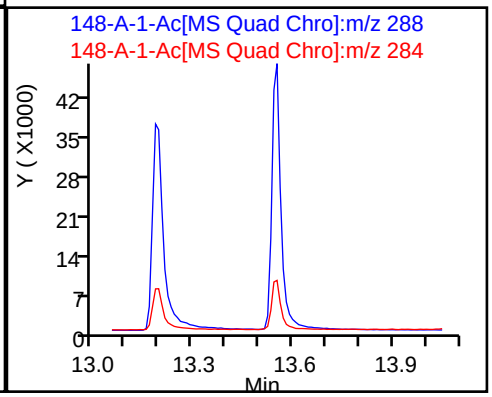










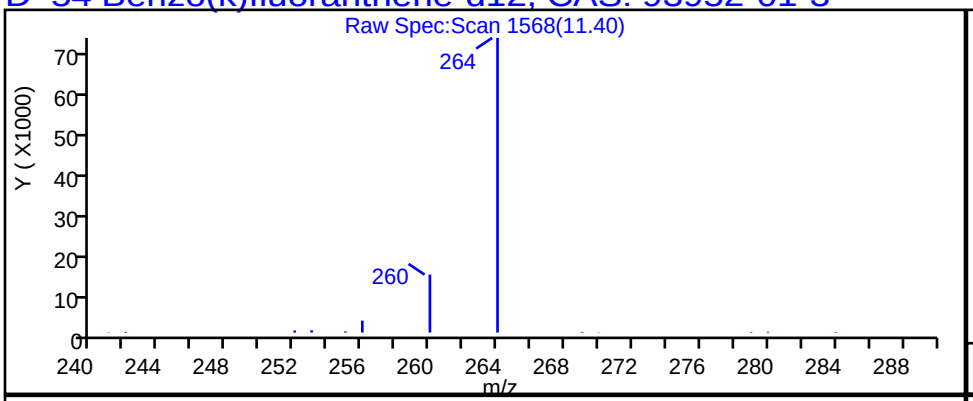


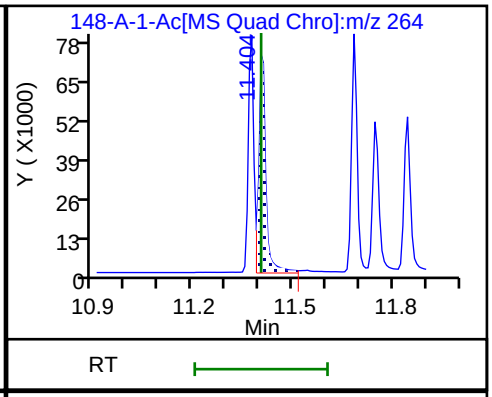
Report Date: 16-Nov-2023 15:46:41 Chrom Revision: 2.3 15-Nov-2023 20:54:34

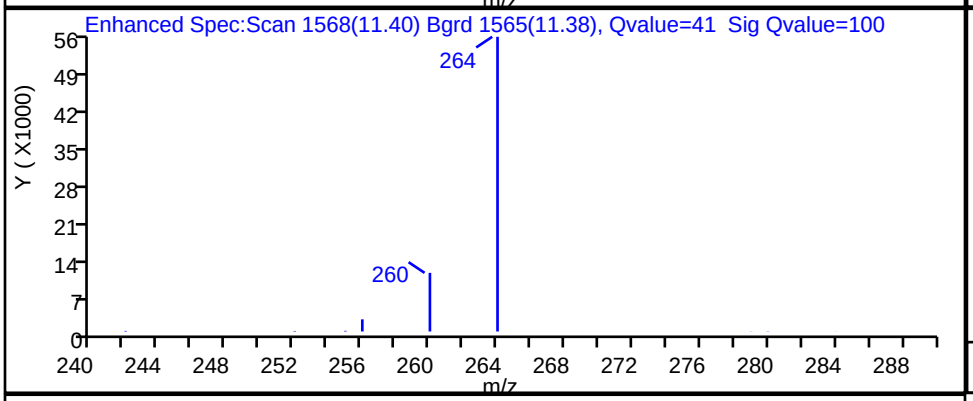
Eurofins Knoxville

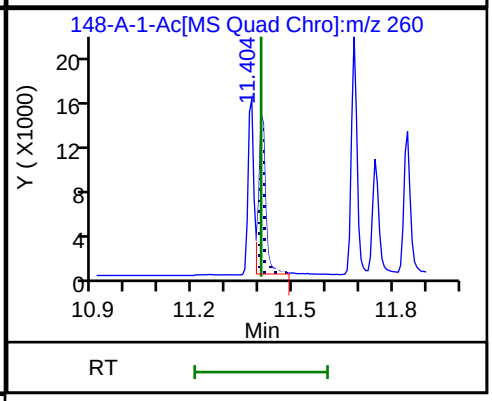
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D		
Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1
Client ID:	GEI.PRC.BLK1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

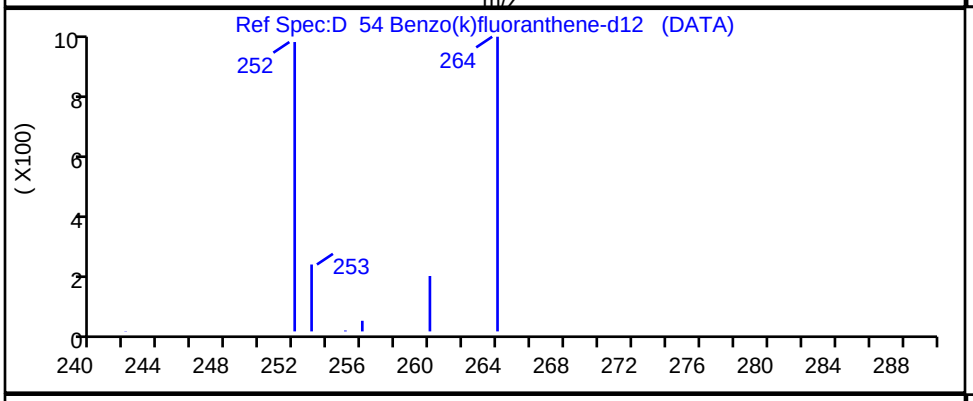
D_54 Benzo(k)fluoranthene-d12, CAS: 93952-01-3

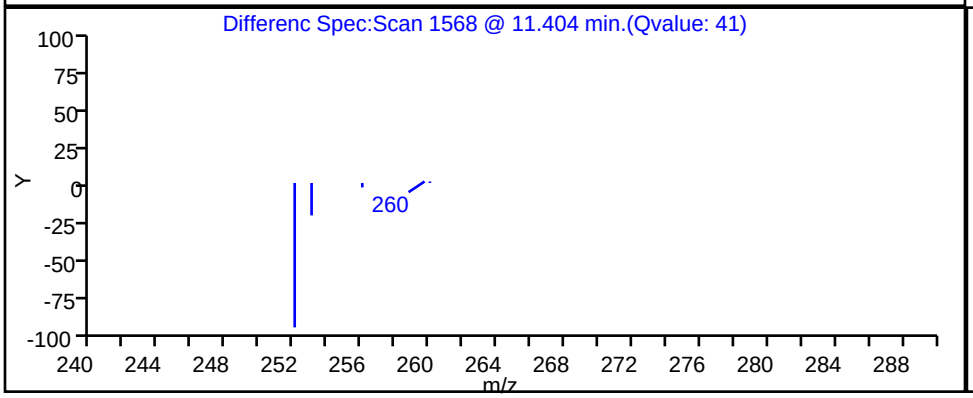


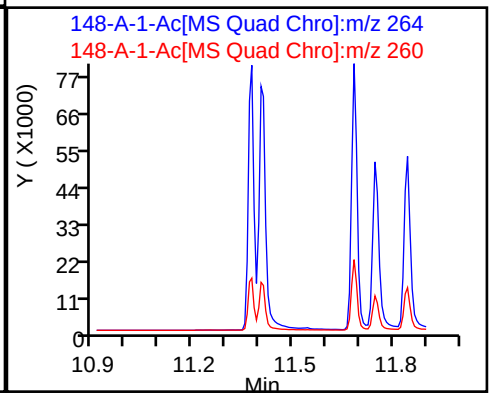










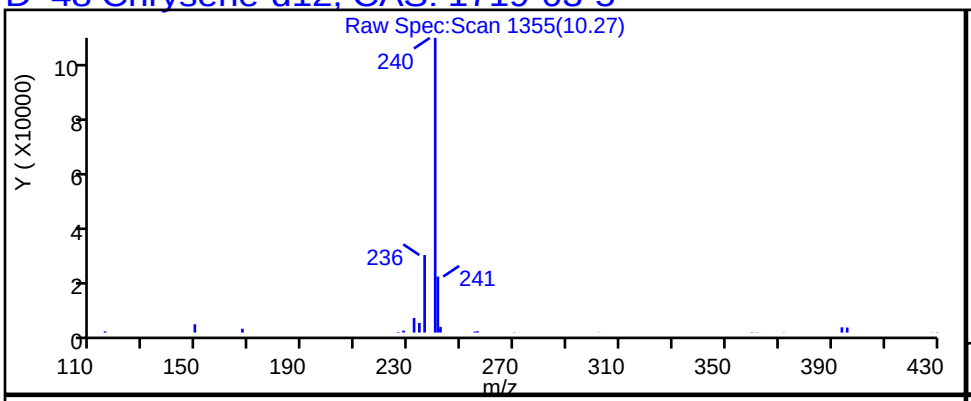


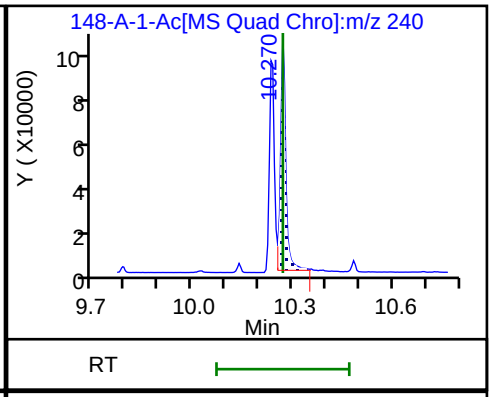
Report Date: 16-Nov-2023 15:46:41 Chrom Revision: 2.3 15-Nov-2023 20:54:34

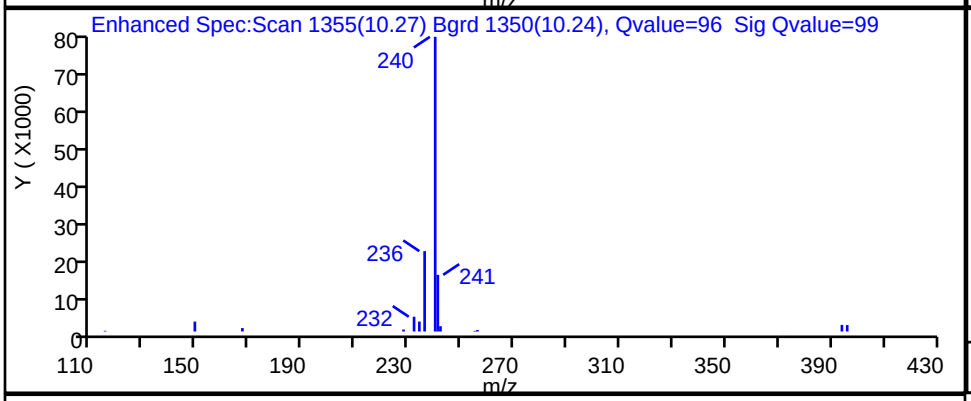
Eurofins Knoxville

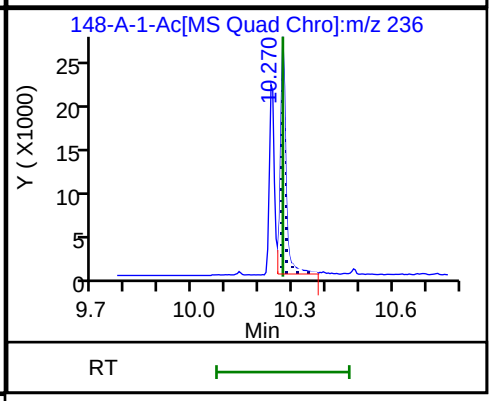
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D		
Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1
Client ID:	GEI.PRC.BLK1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

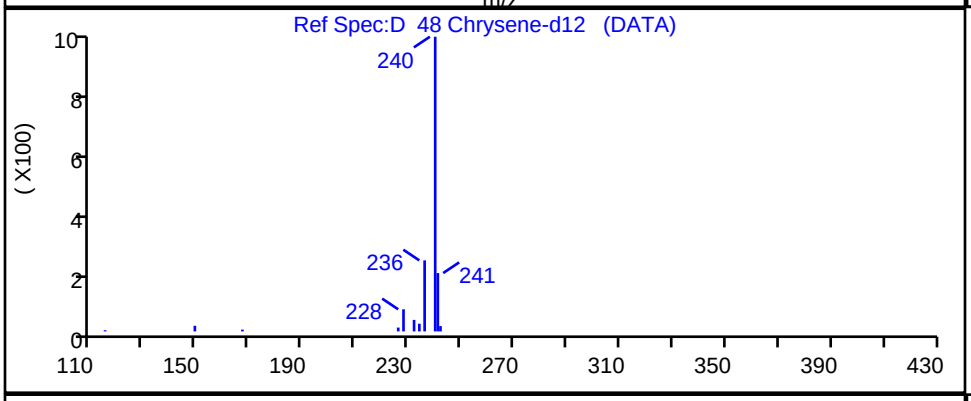
D 48 Chrysene-d12, CAS: 1719-03-5

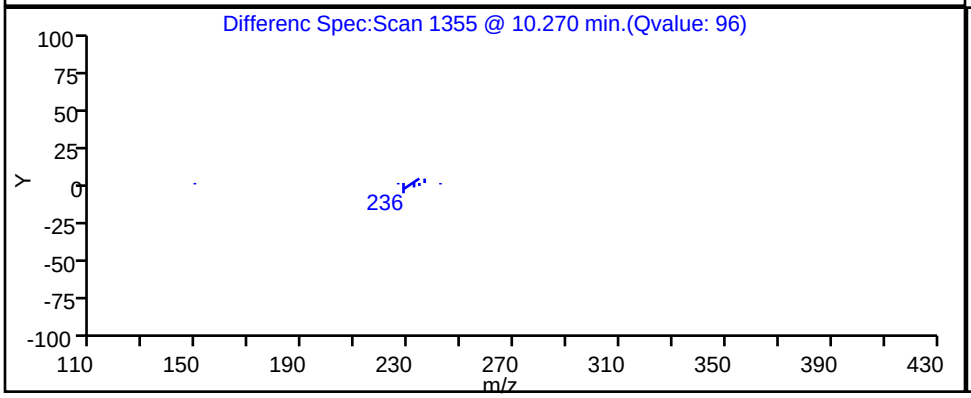


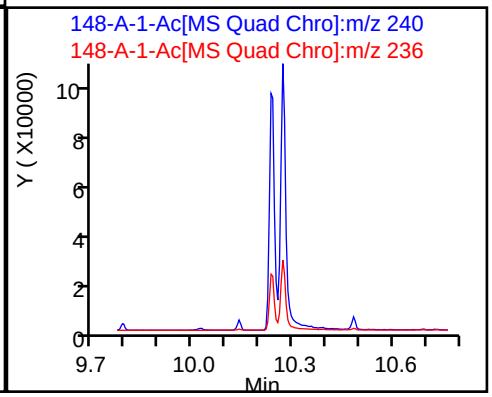












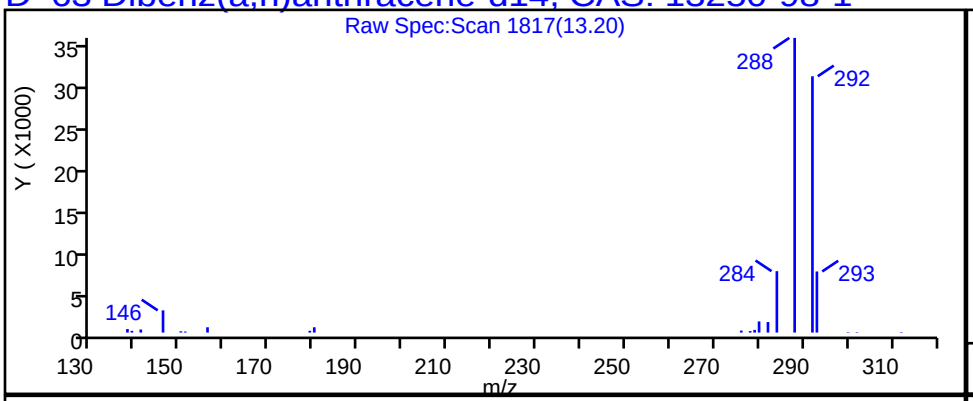
Report Date: 16-Nov-2023 15:46:41 Chrom Revision: 2.3 15-Nov-2023 20:54:34

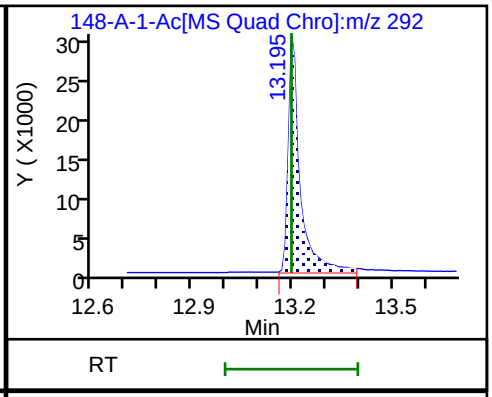
Eurofins Knoxville

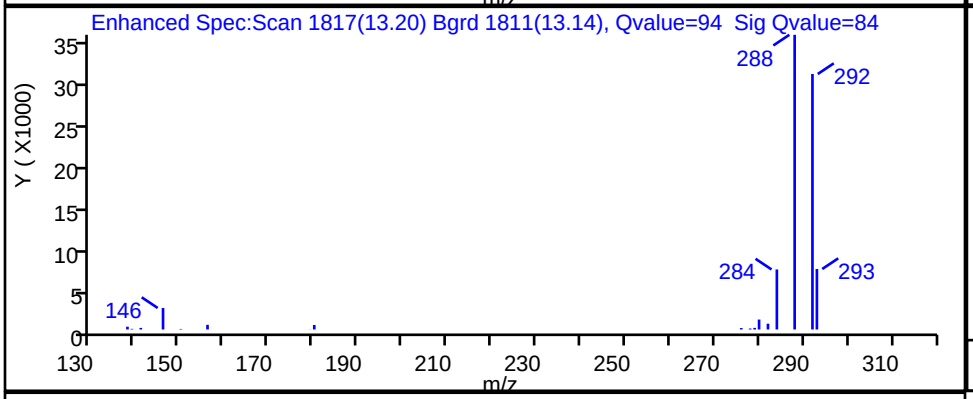
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D

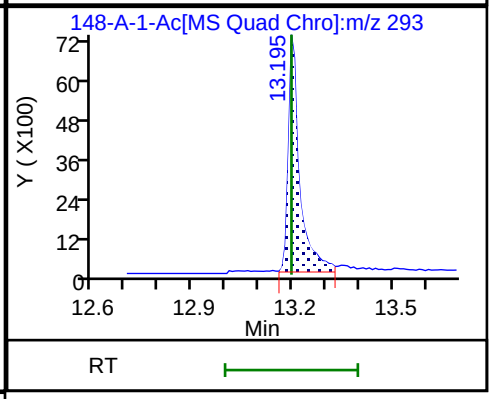
Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1		
Client ID:	GEI.PRC.BLK1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

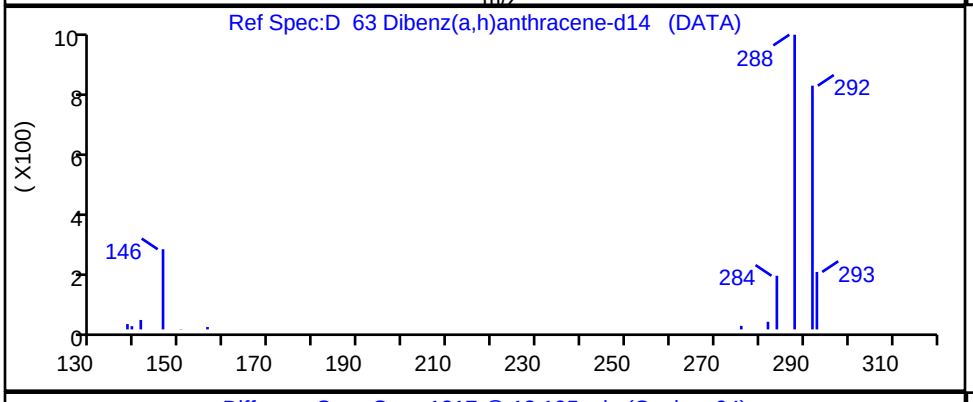
D 63 Dibenz(a,h)anthracene-d14, CAS: 13250-98-1

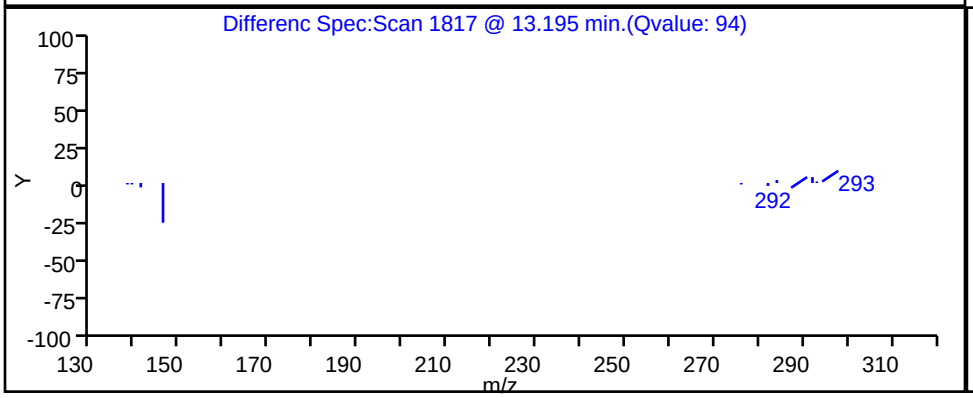


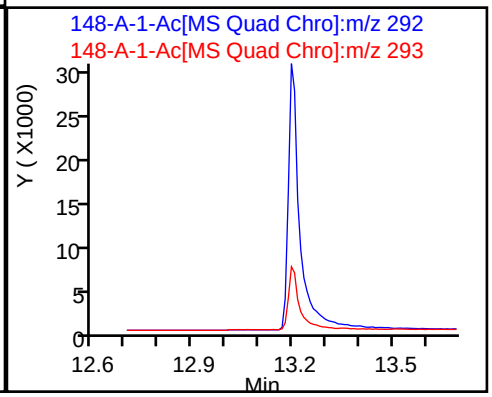












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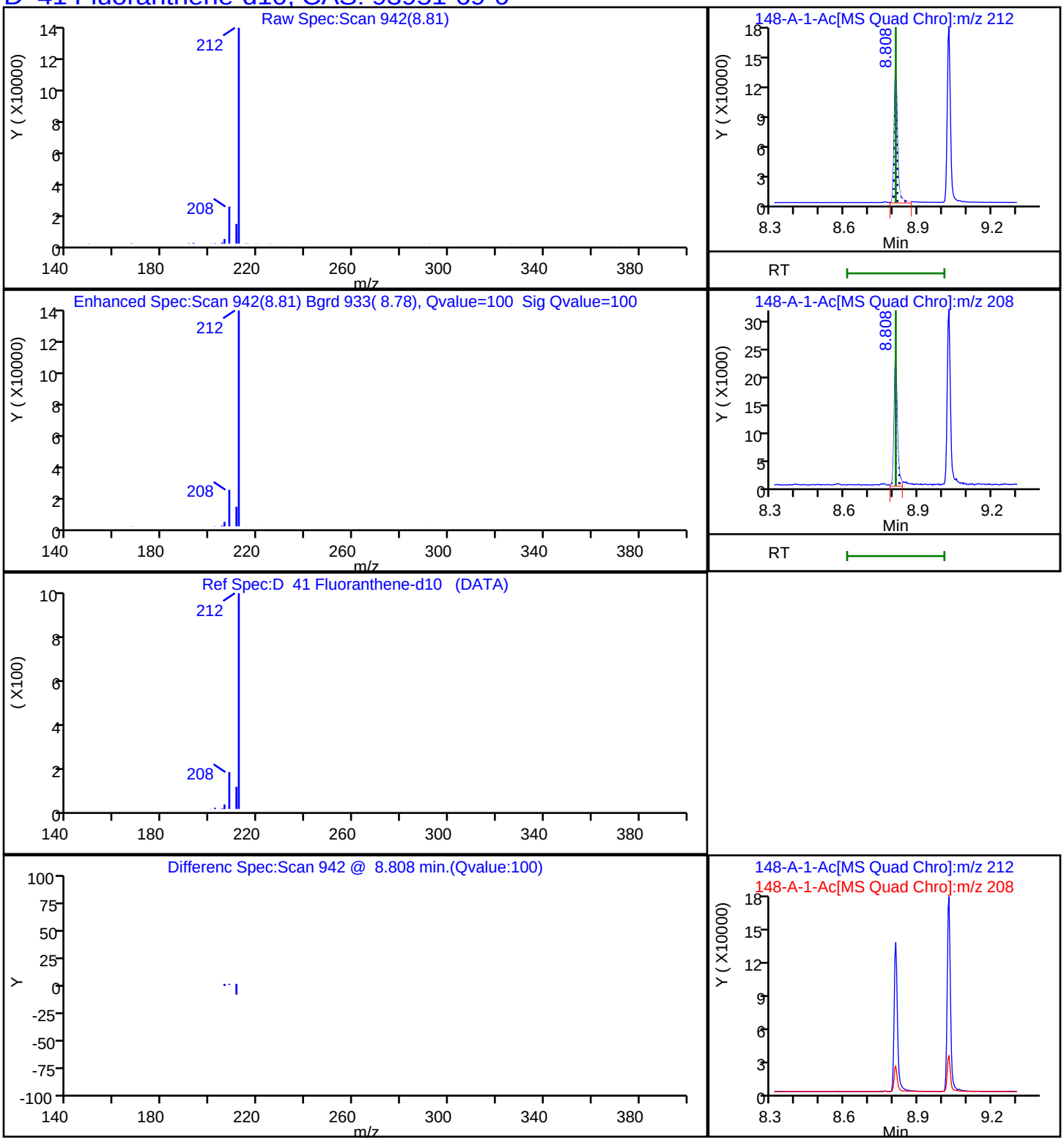
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D

Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1		
Client ID:	GEI.PRC.BLK1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 41 Fluoranthene-d10, CAS: 93951-69-0



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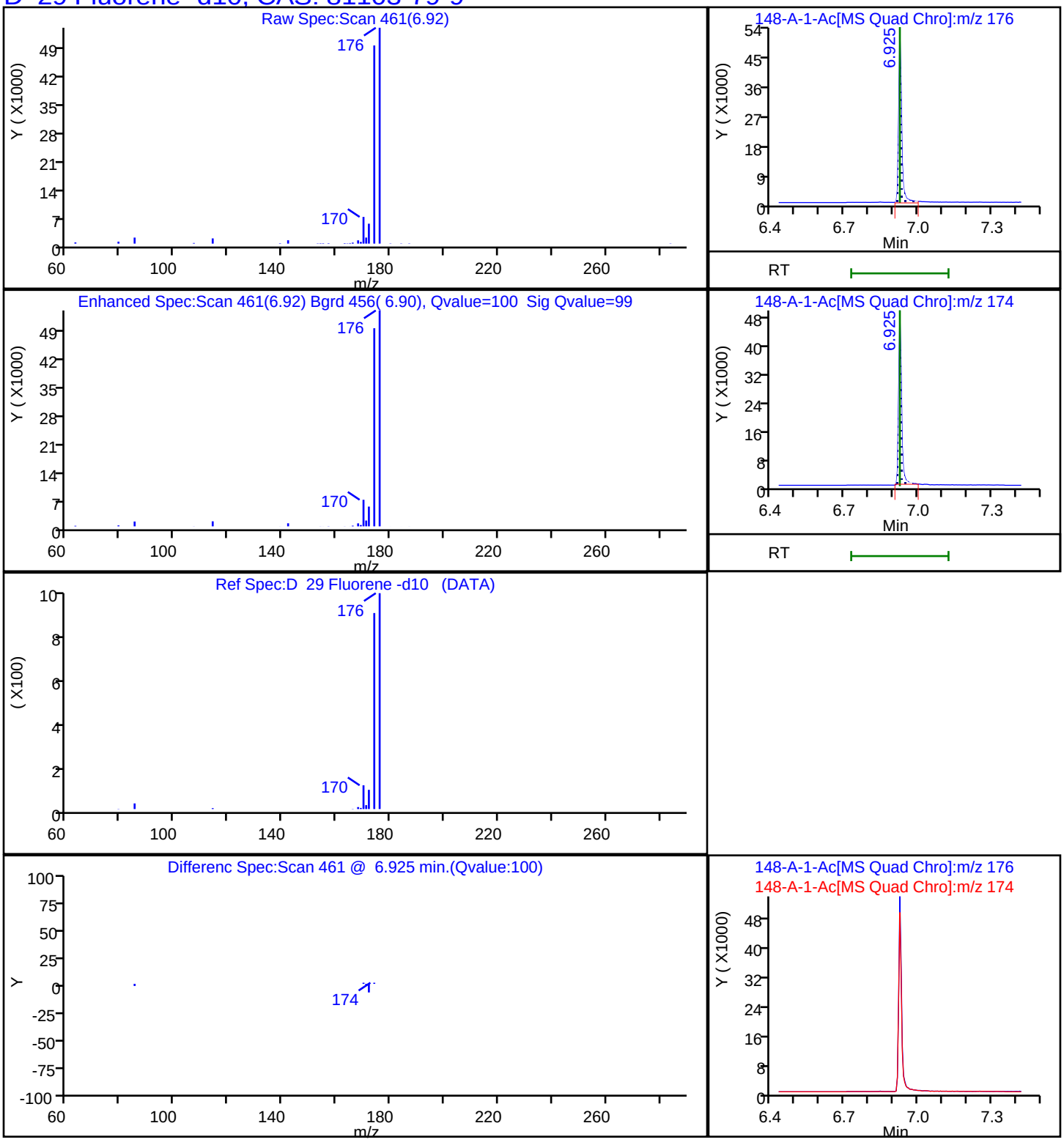
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D

Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1
Client ID:	GEI.PRC.BLK1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

D 29 Fluorene -d10, CAS: 81103-79-9

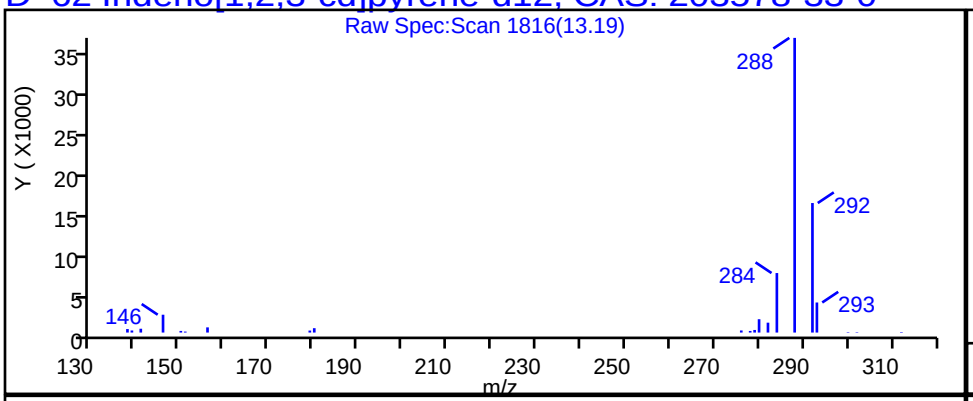


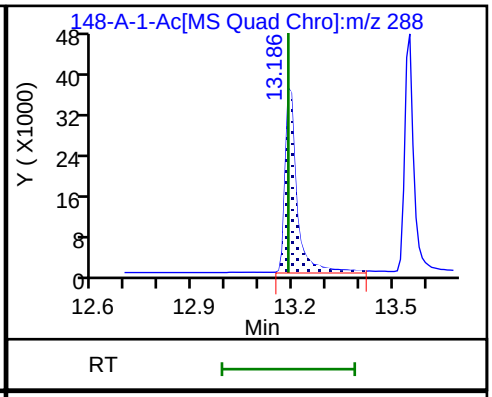
Report Date: 16-Nov-2023 15:46:41 Chrom Revision: 2.3 15-Nov-2023 20:54:34

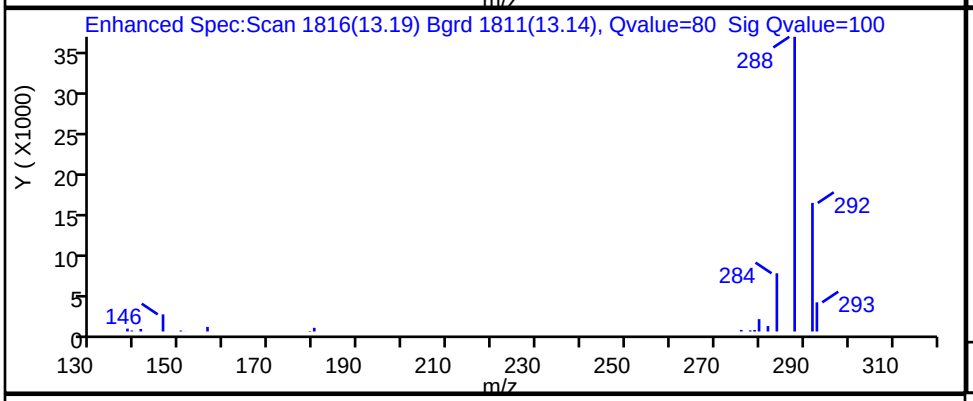
Eurofins Knoxville

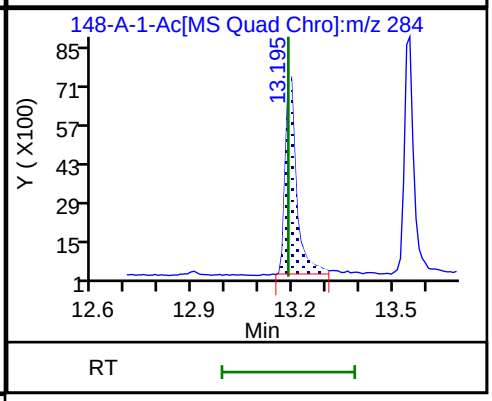
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D				
Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1		
Client ID:	GEI.PRC.BLK1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

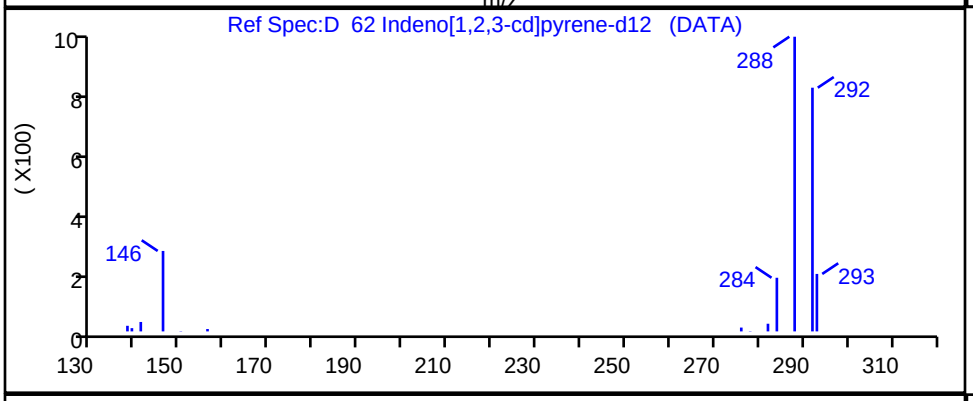
D 62 Indeno[1,2,3-cd]pyrene-d12, CAS: 203578-33-0

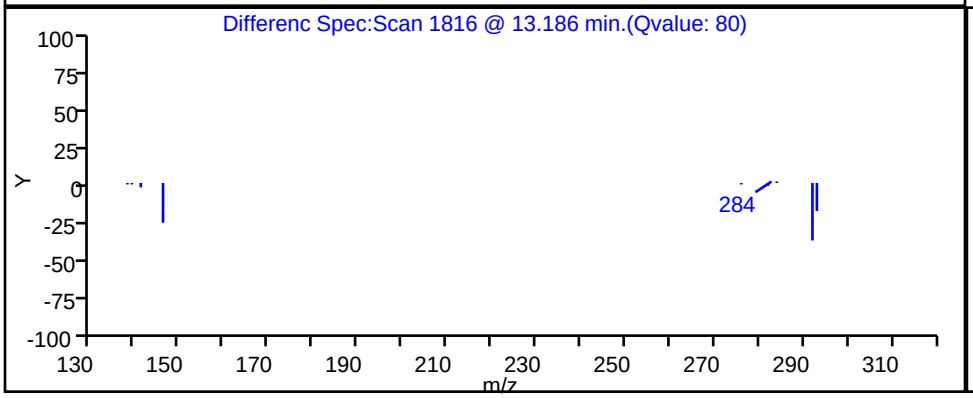


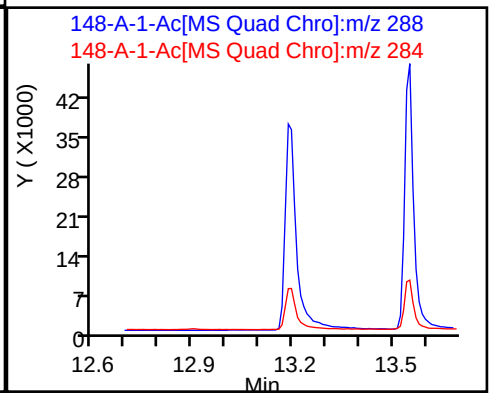












Report Date: 16-Nov-2023 15:46:41 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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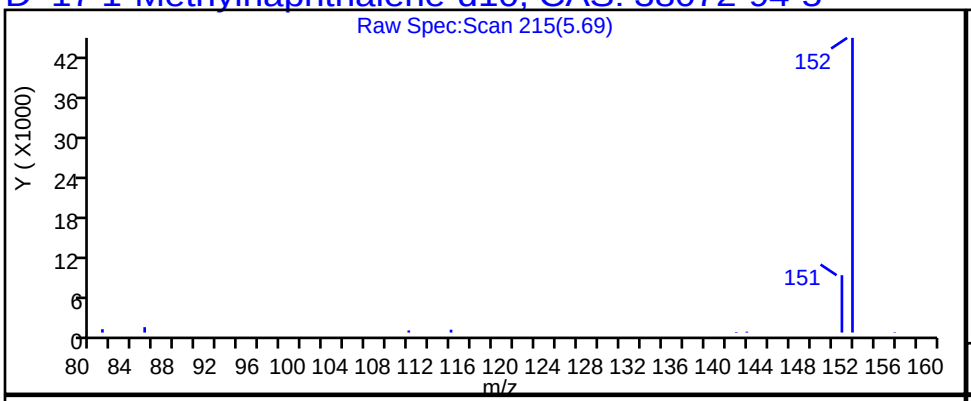
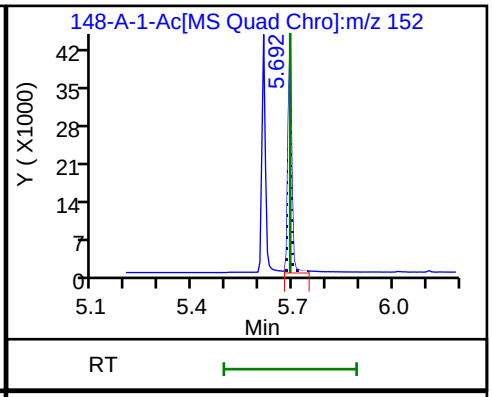
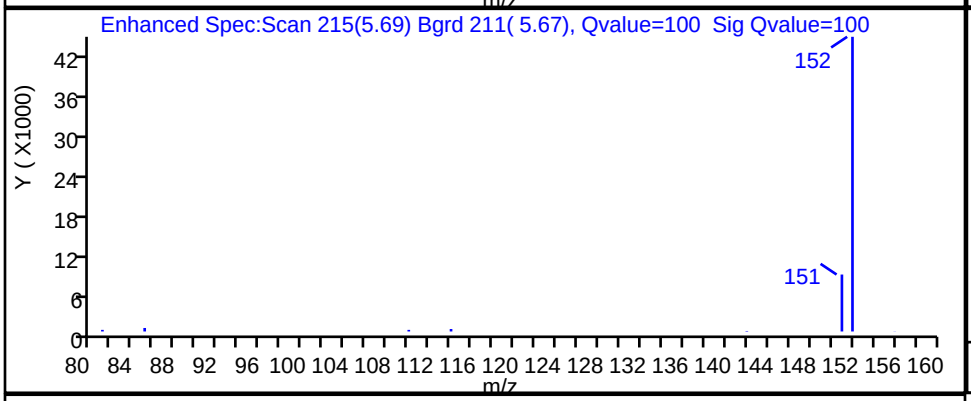
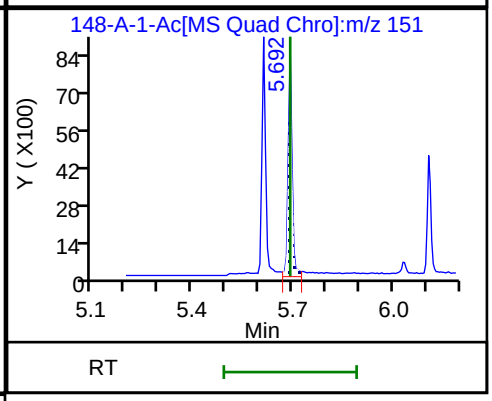
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1		
Client ID:	GEI.PRC.BLK1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

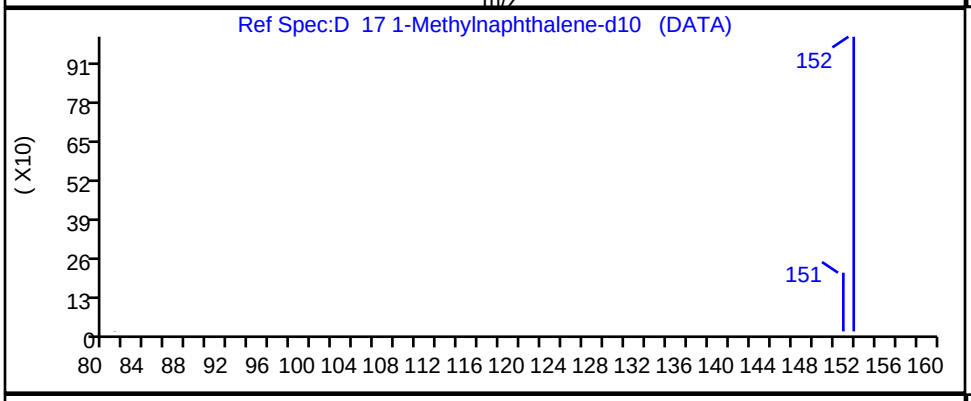
D 17 1-Methylnaphthalene-d10, CAS: 38072-94-5

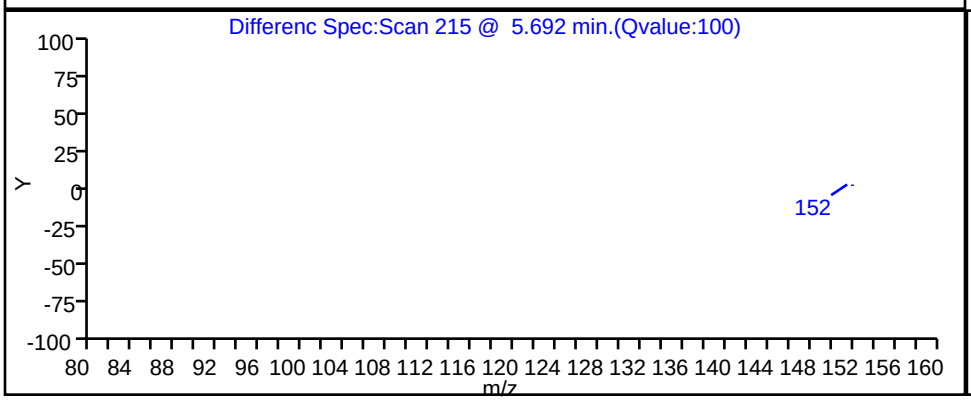


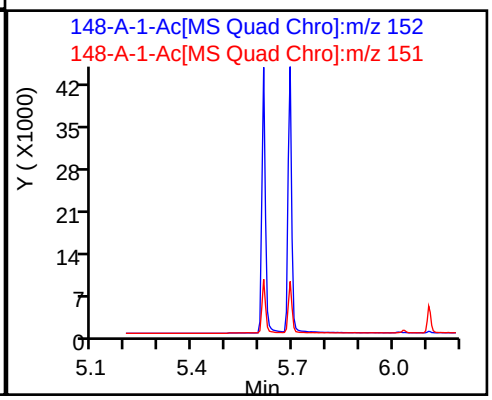












Report Date: 16-Nov-2023 15:46:40 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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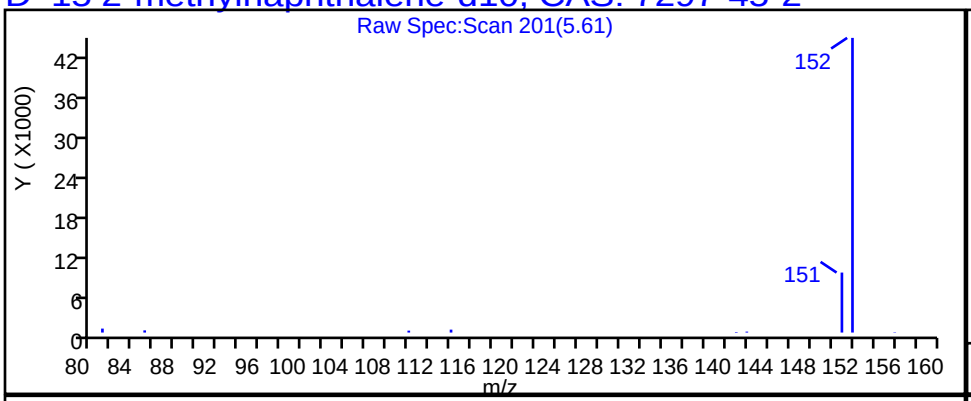
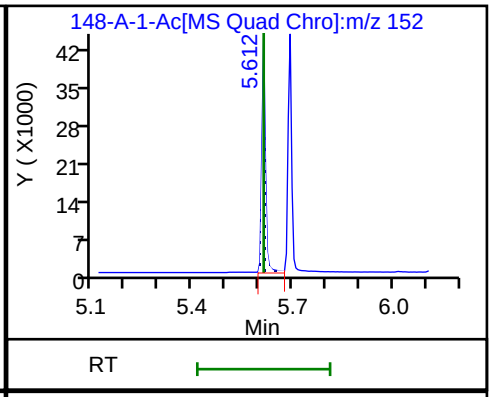
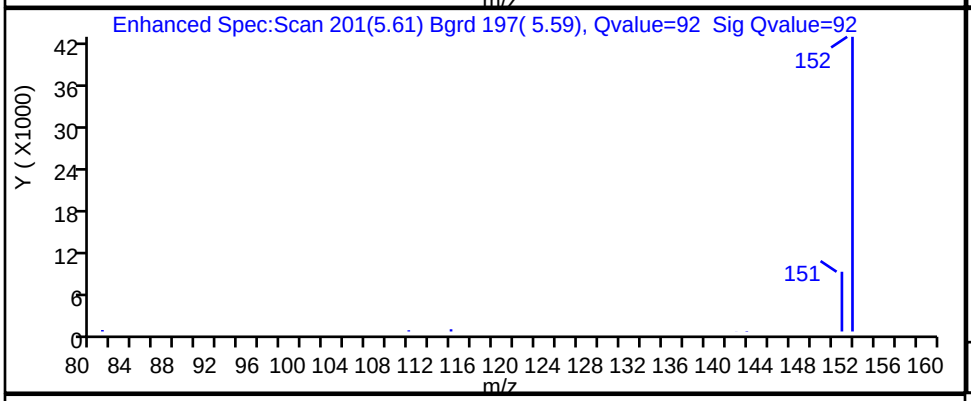
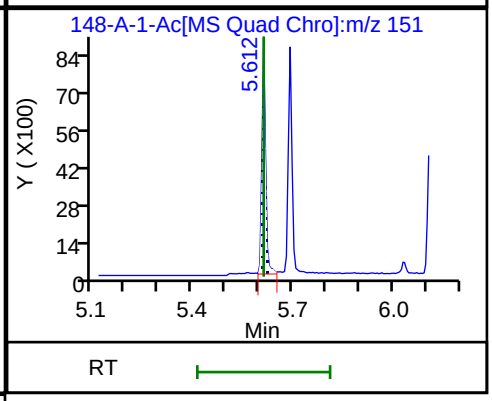
Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1		
Client ID:	GEI.PRC.BLK1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

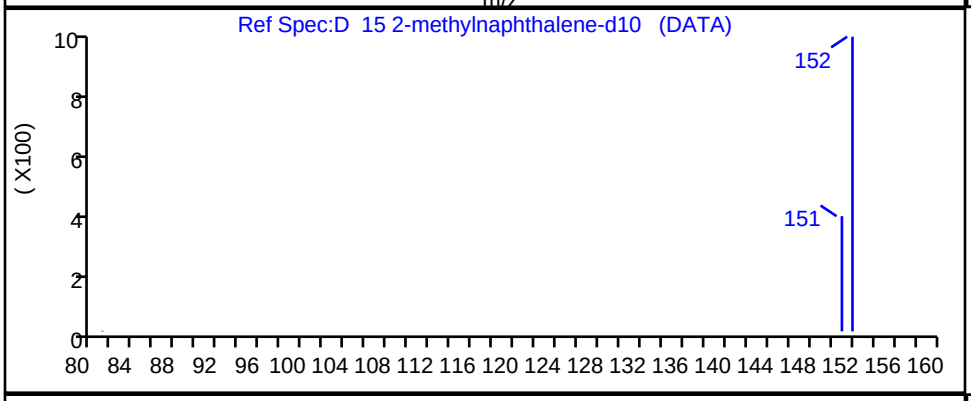
D 15 2-methylnaphthalene-d10, CAS: 7297-45-2

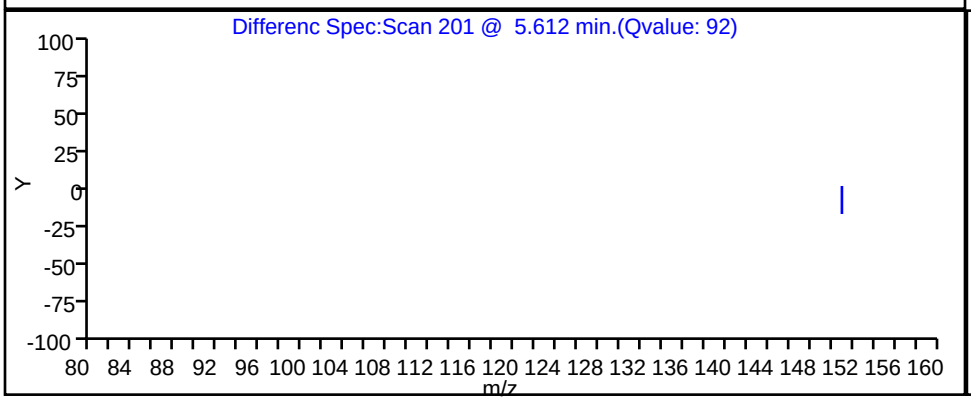


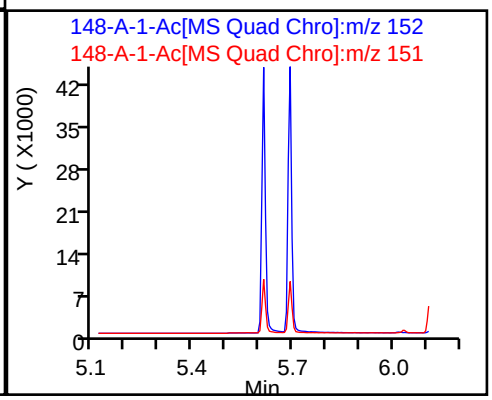












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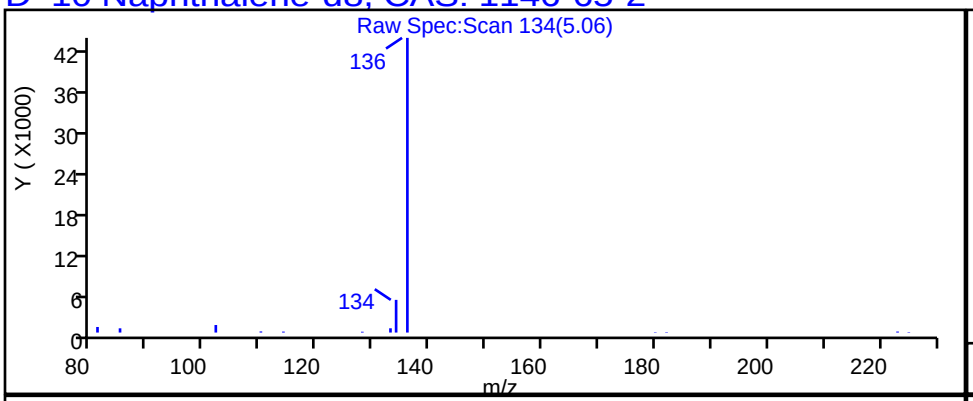
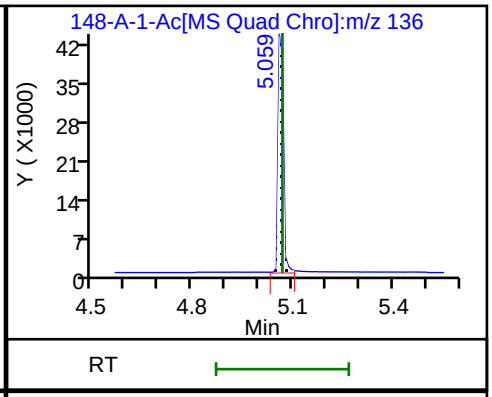
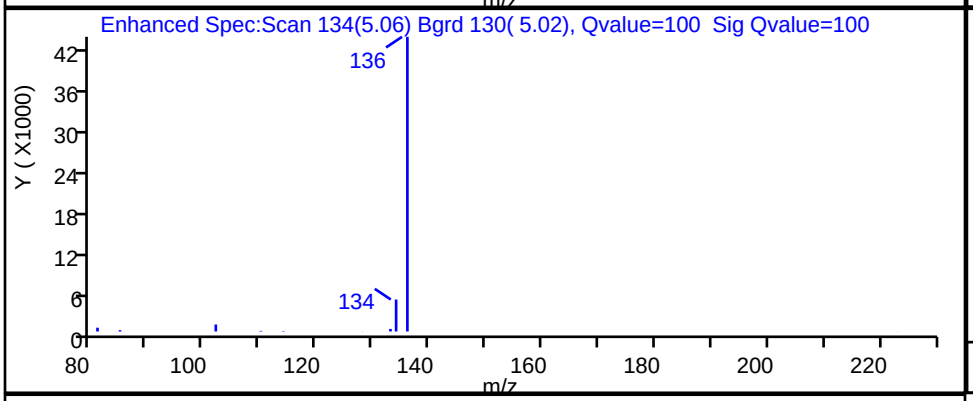
Eurofins Knoxville

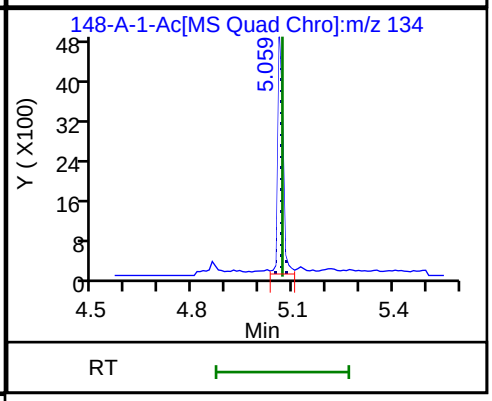
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D				
Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1		
Client ID:	GEI.PRC.BLK1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

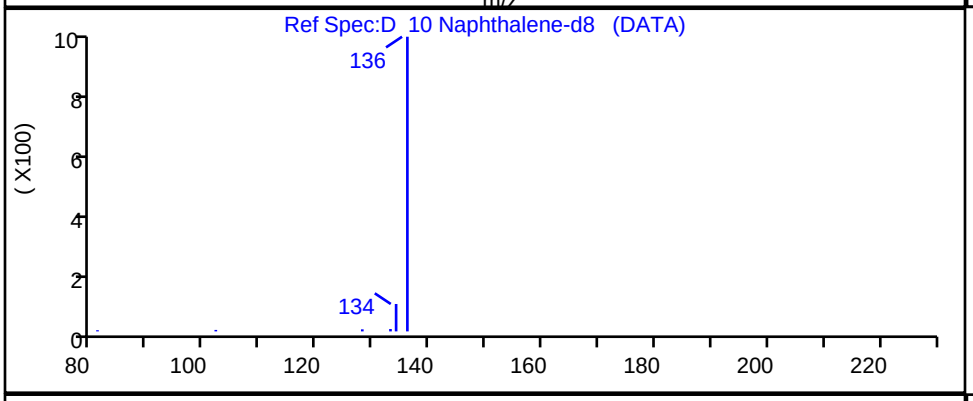
D_10 Naphthalene-d8, CAS: 1146-65-2

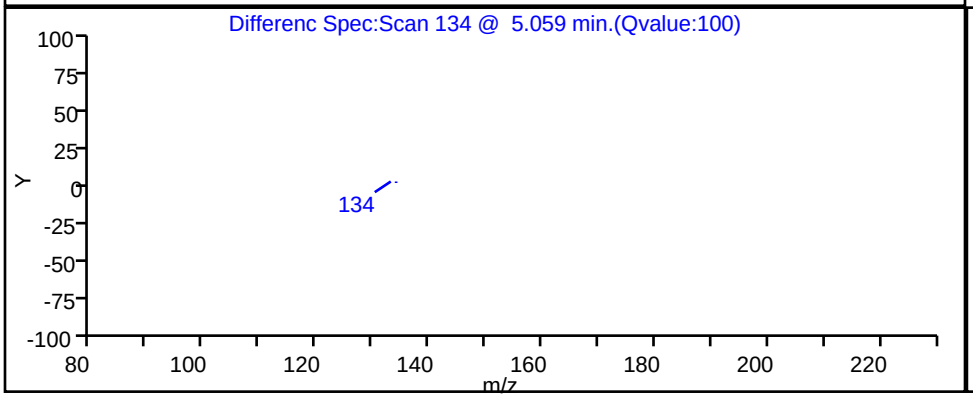


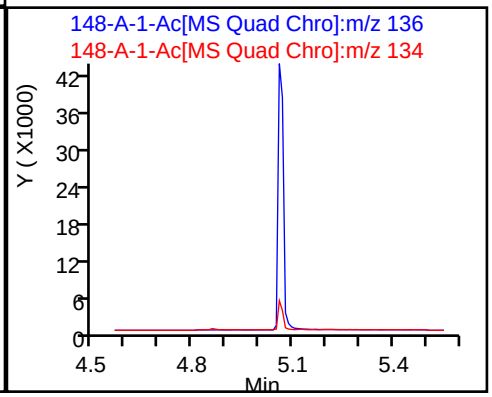












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Eurofins Knoxville

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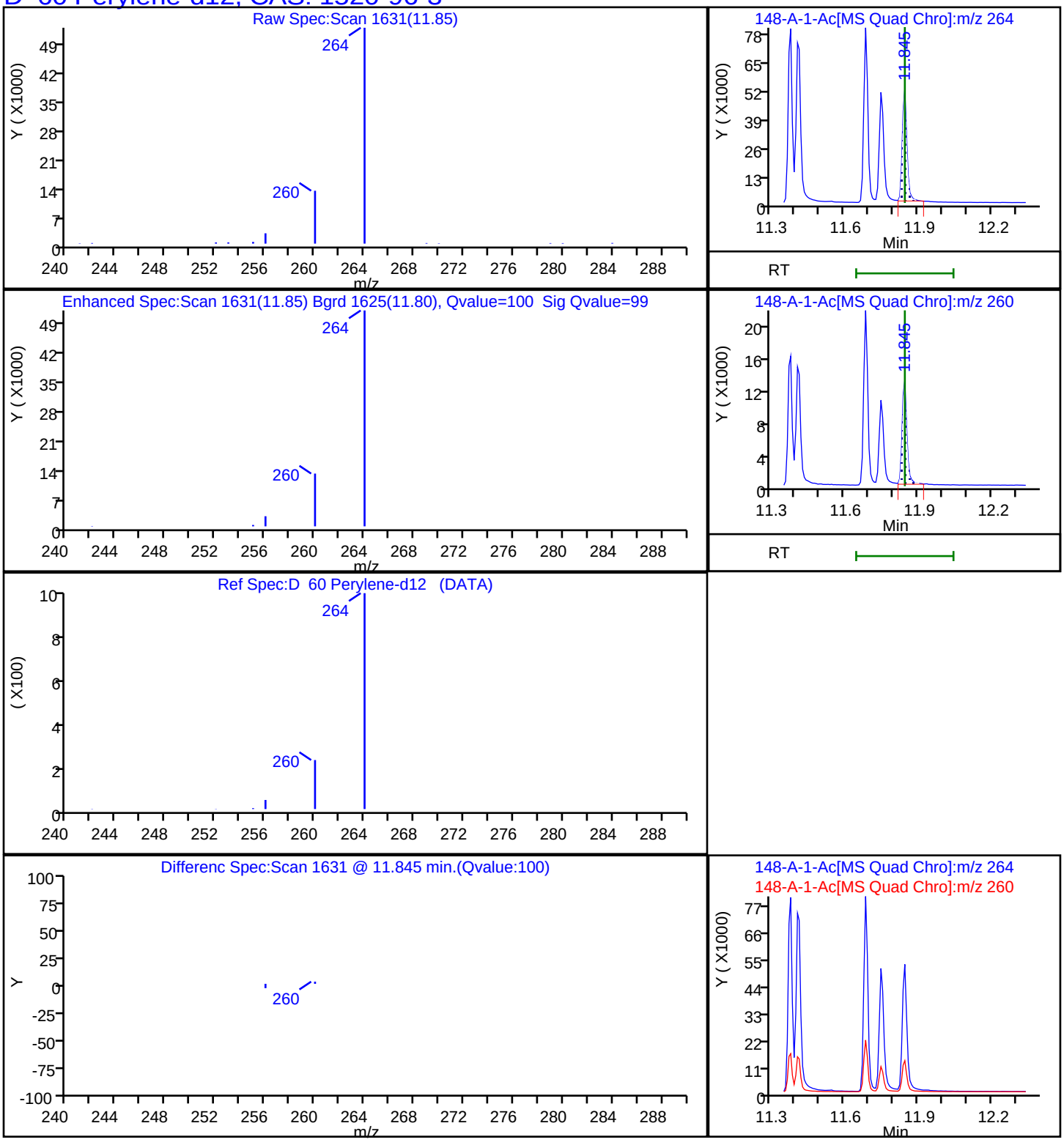
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1
Client ID:	GEI.PRC.BLK1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

D 60 Perylene-d12, CAS: 1520-96-3



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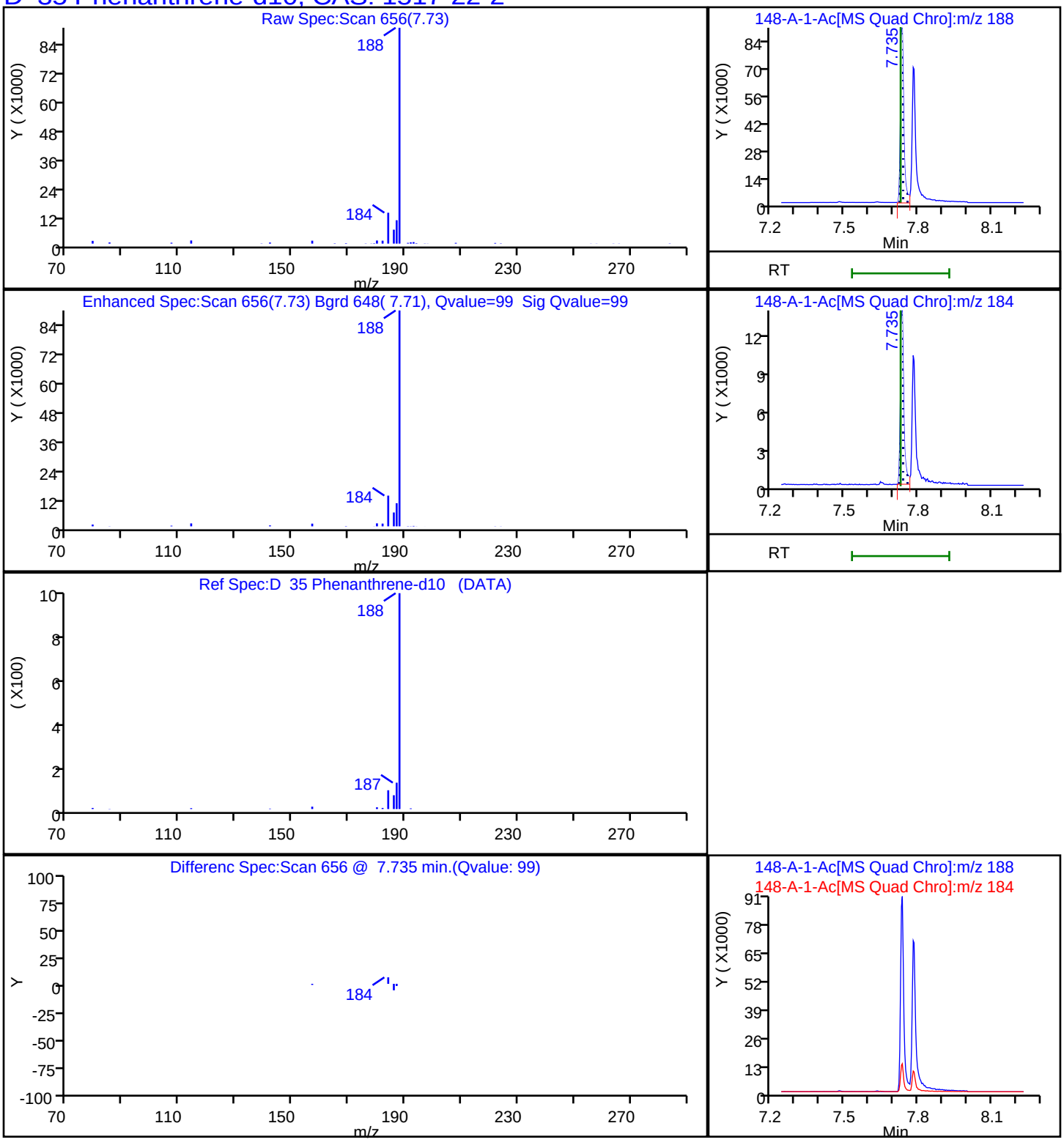
Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D				
Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1		
Client ID:	GEI.PRC.BLK1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D_35 Phenanthrene-d10, CAS: 1517-22-2



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Eurofins Knoxville

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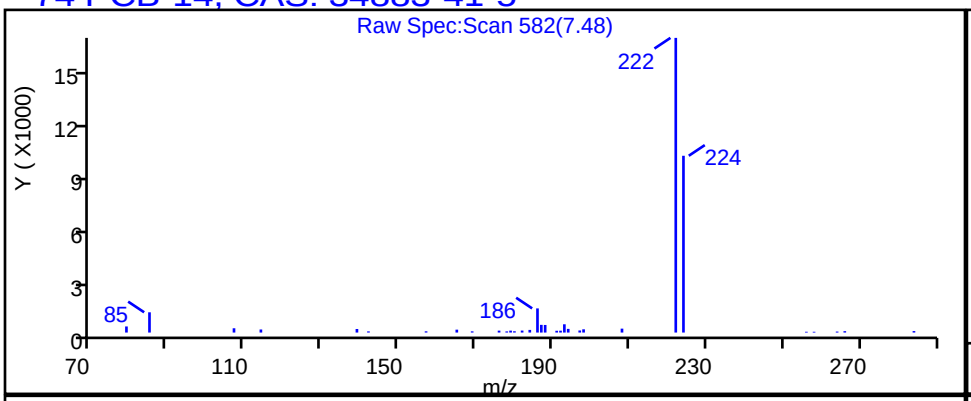
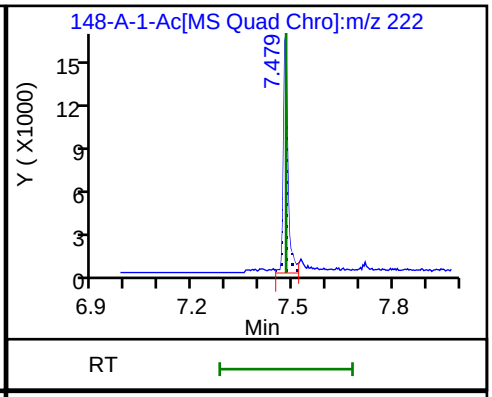
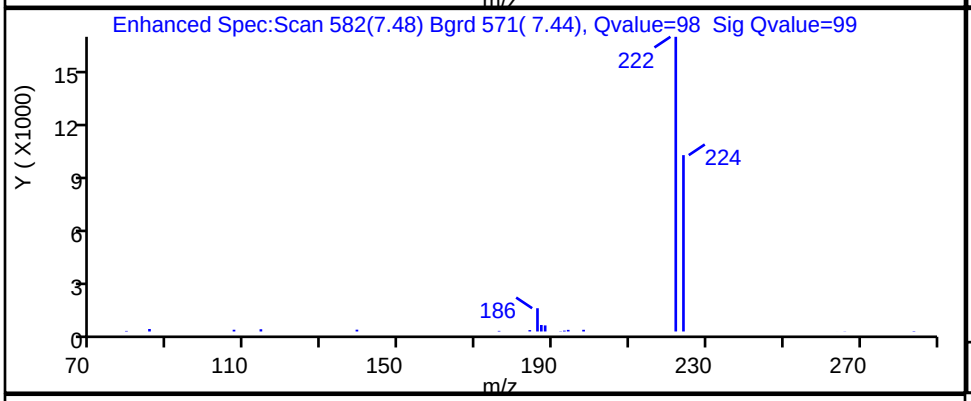
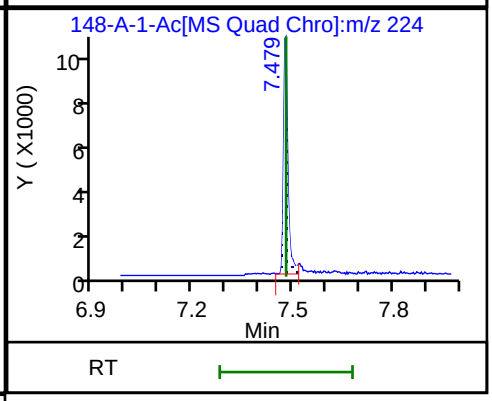
Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1		
Client ID:	GEI.PRC.BLK1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

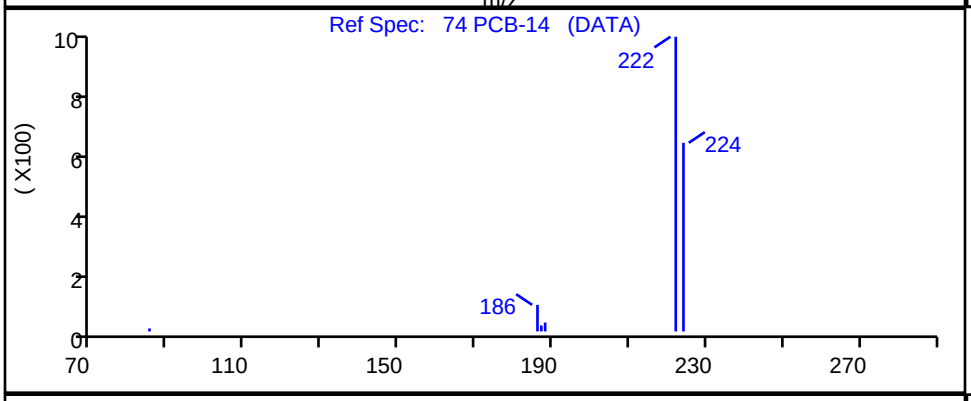
74 PCB-14, CAS: 34883-41-5

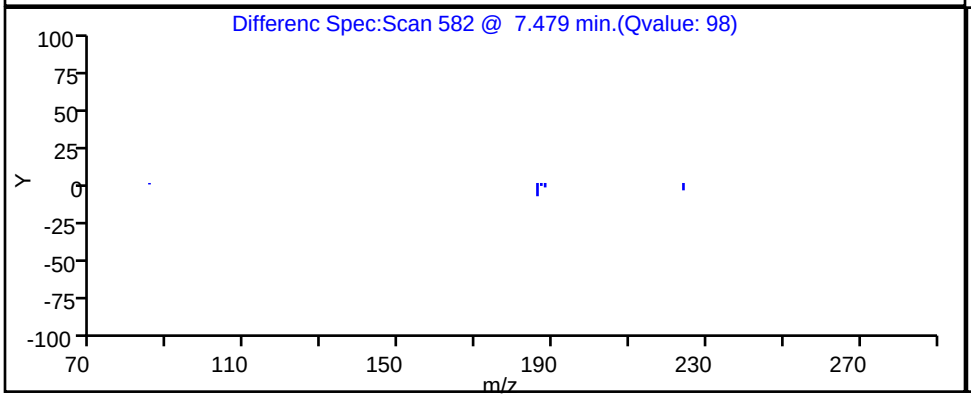


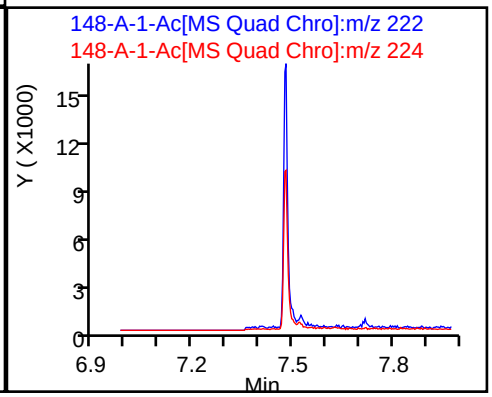












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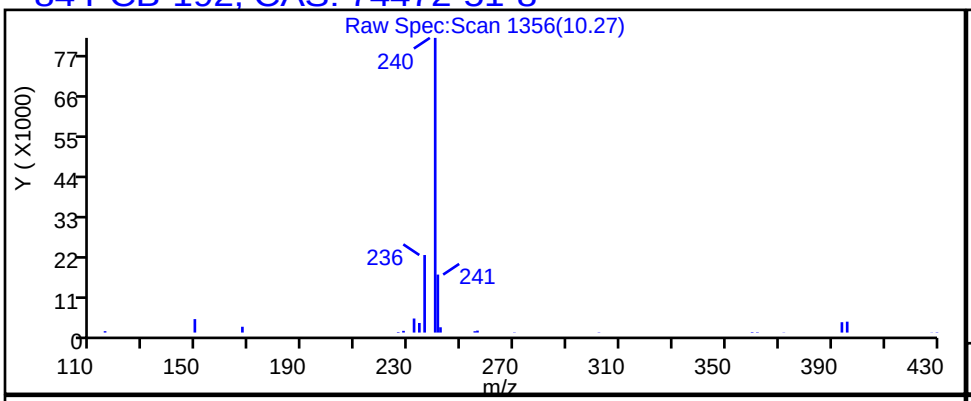
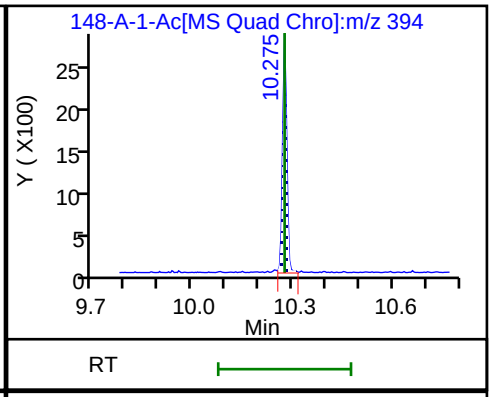
Eurofins Knoxville

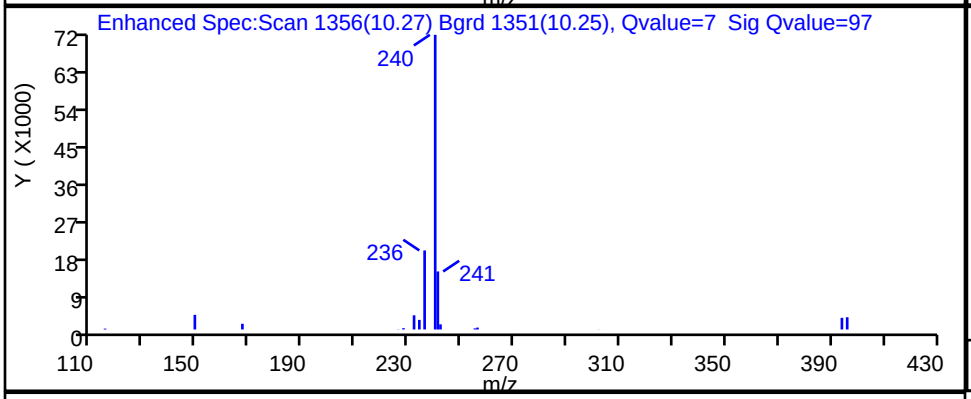
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D

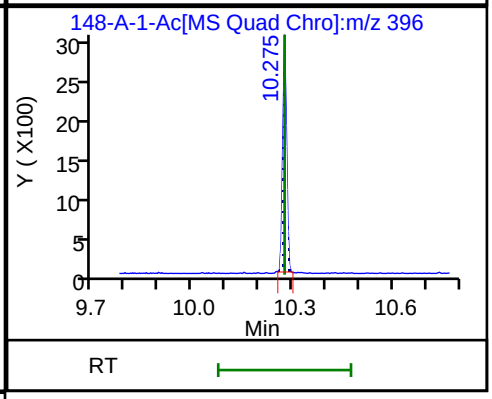
Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1
Client ID:	GEI.PRC.BLK1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

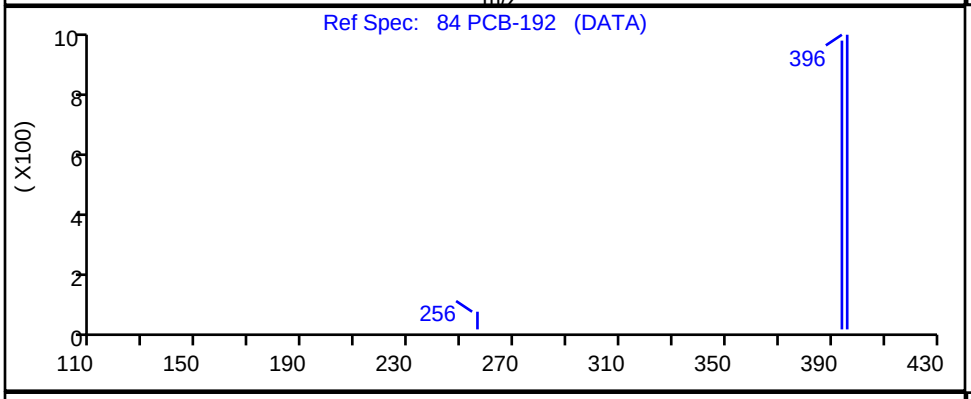
84 PCB-192, CAS: 74472-51-8

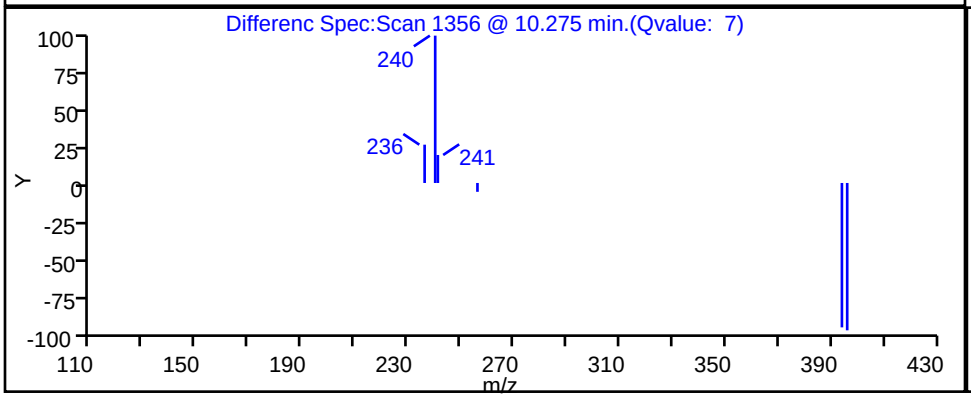


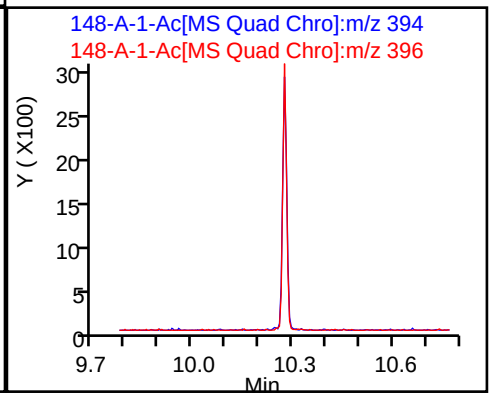












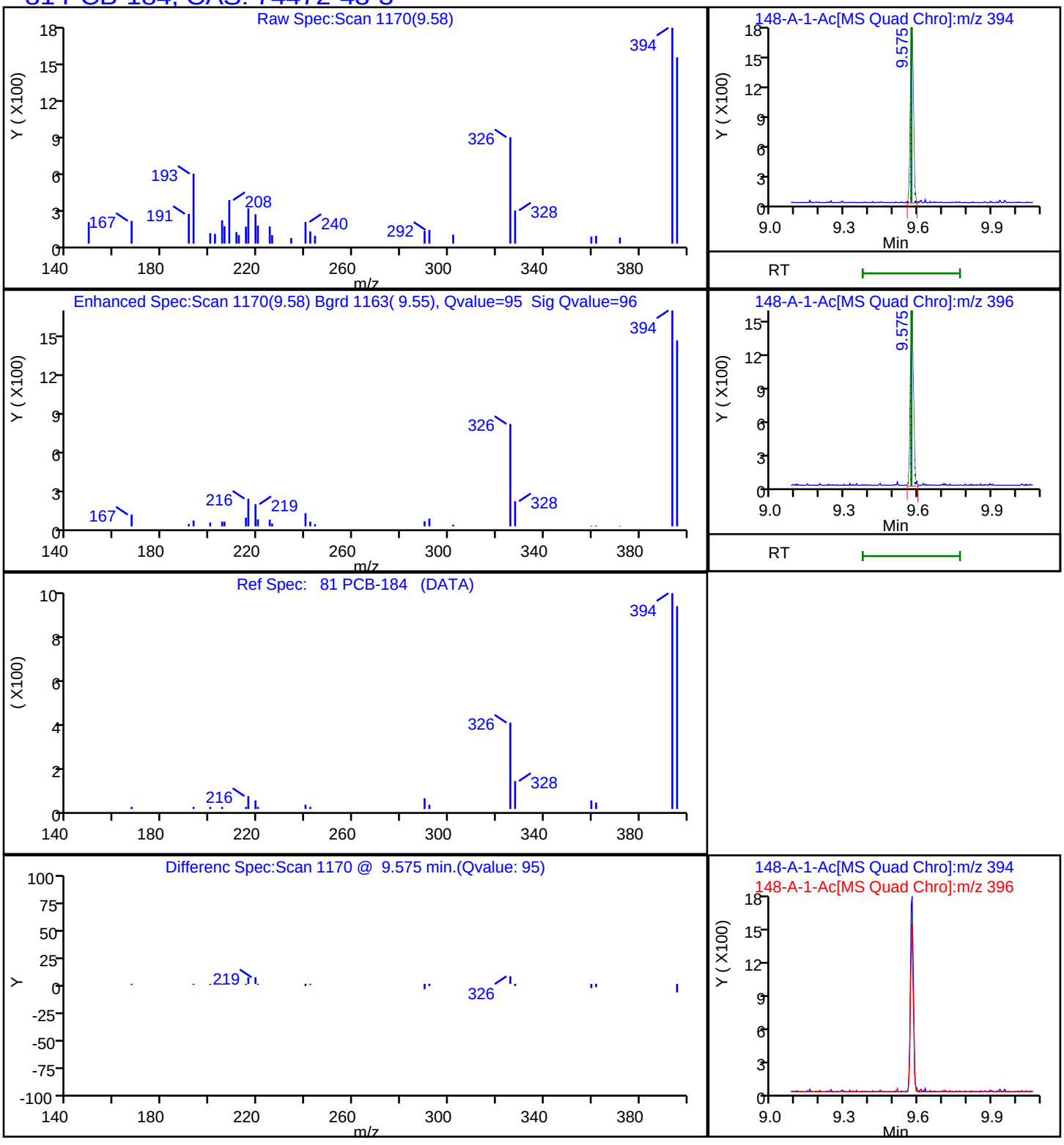
Report Date: 16-Nov-2023 15:46:42 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D

Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1		
Client ID:	GEI.PRC.BLK1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

81 PCB-184, CAS: 74472-48-3



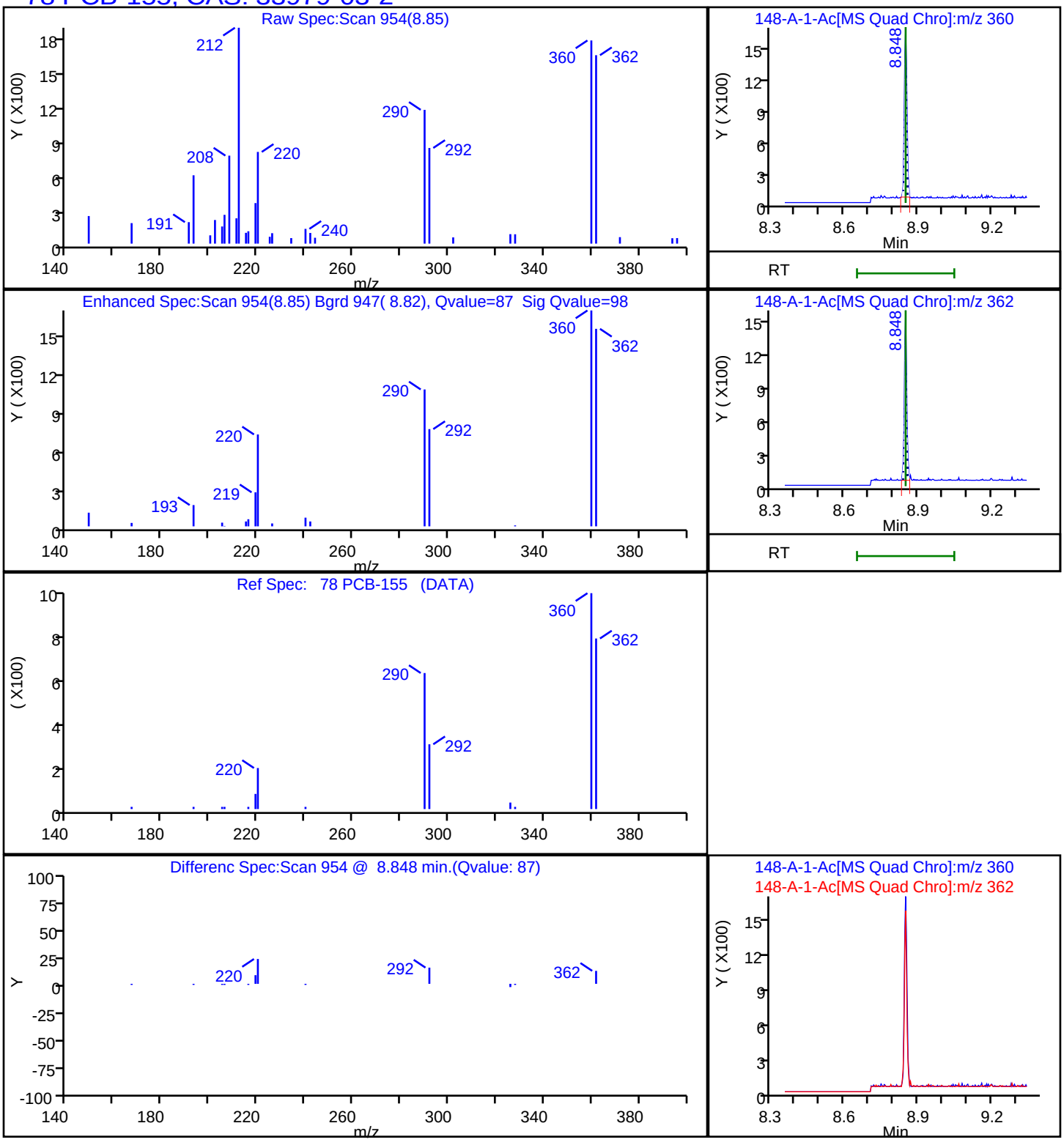
Report Date: 16-Nov-2023 15:46:42 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D

Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1
Client ID:	GEI.PRC.BLK1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

78 PCB-155, CAS: 33979-03-2



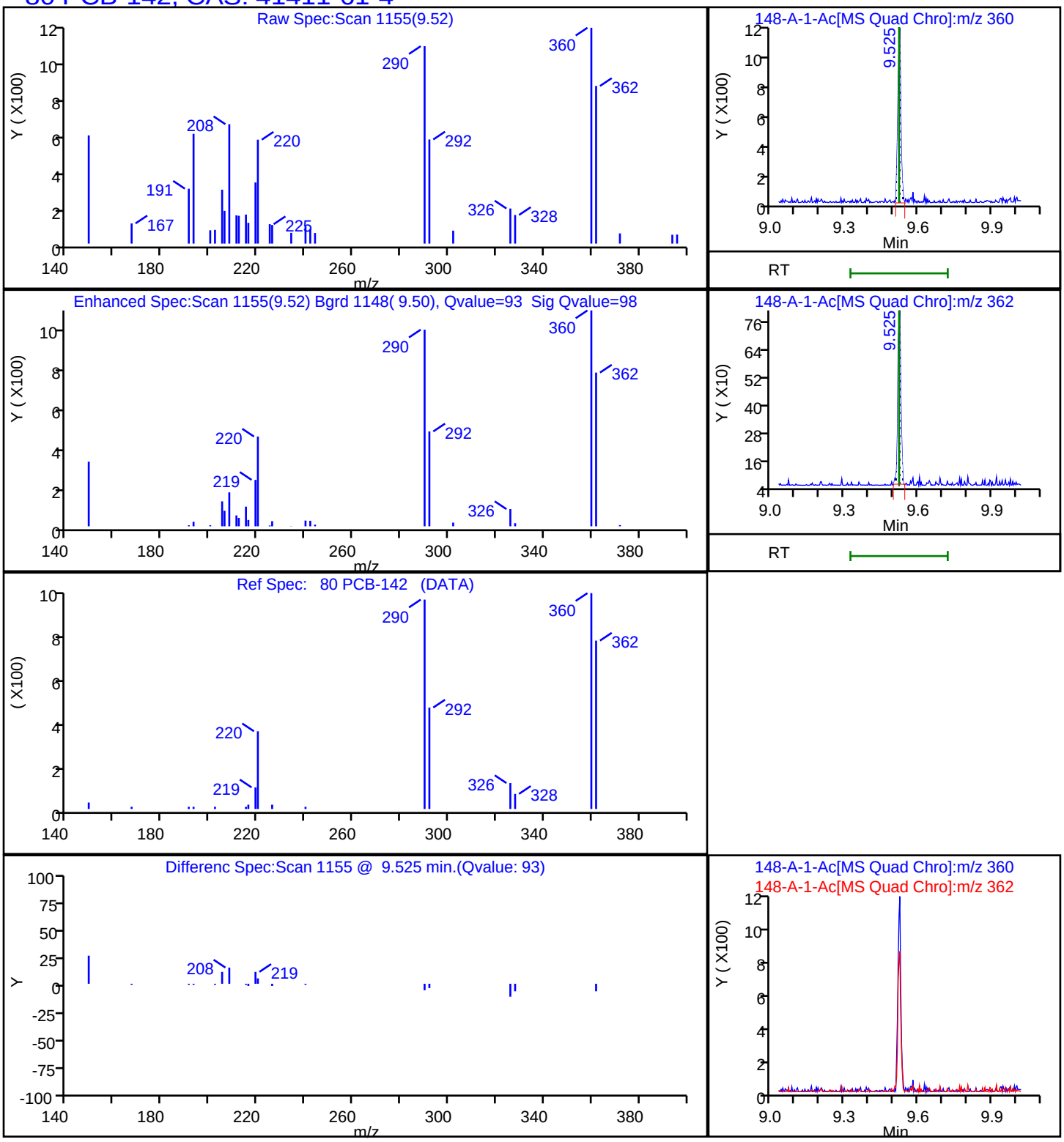
Report Date: 16-Nov-2023 15:46:42 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D

Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1
Client ID:	GEI.PRC.BLK1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

80 PCB-142, CAS: 41411-61-4



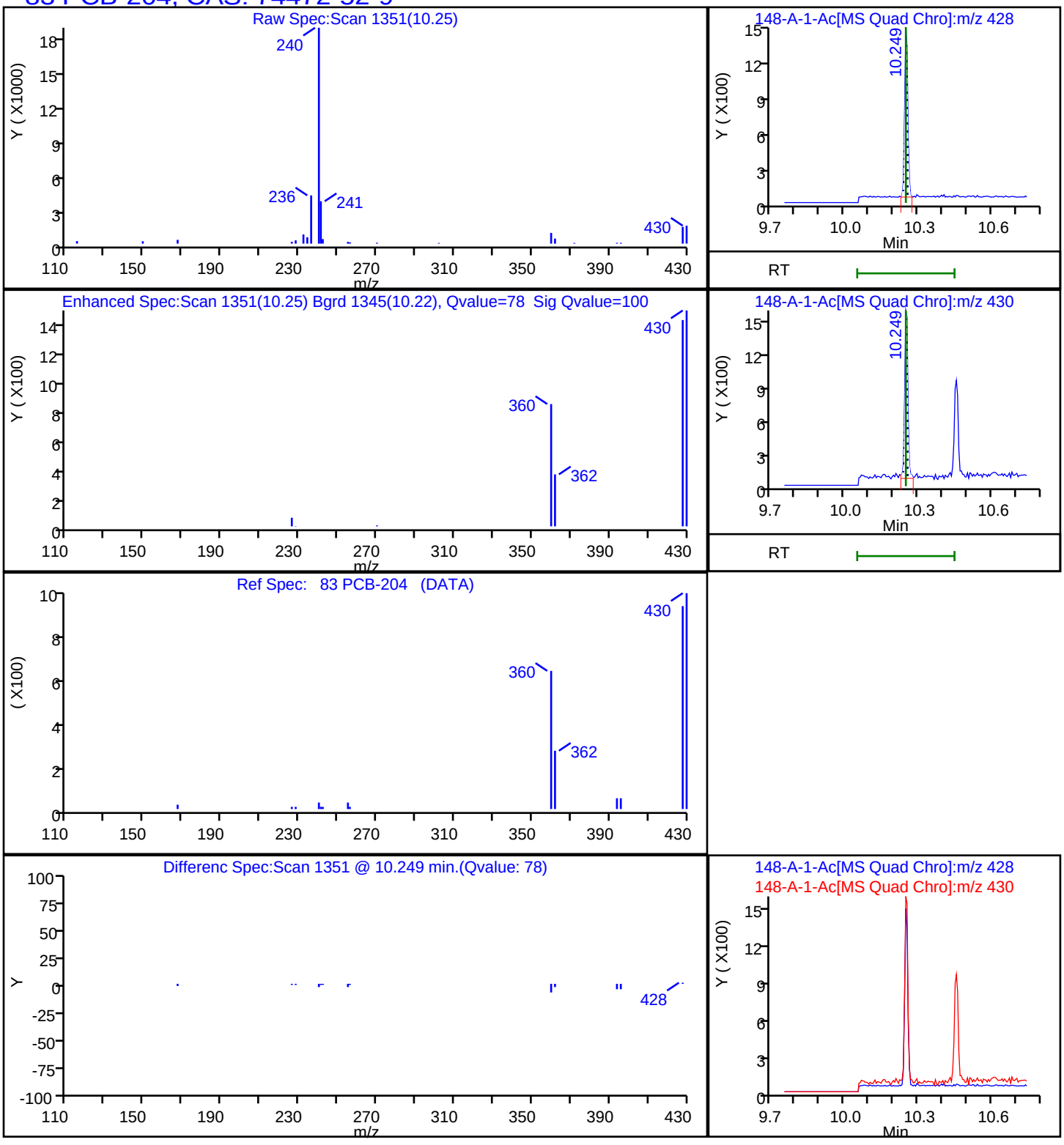
Report Date: 16-Nov-2023 15:46:42 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D

Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1		
Client ID:	GEI.PRC.BLK1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

83 PCB-204, CAS: 74472-52-9

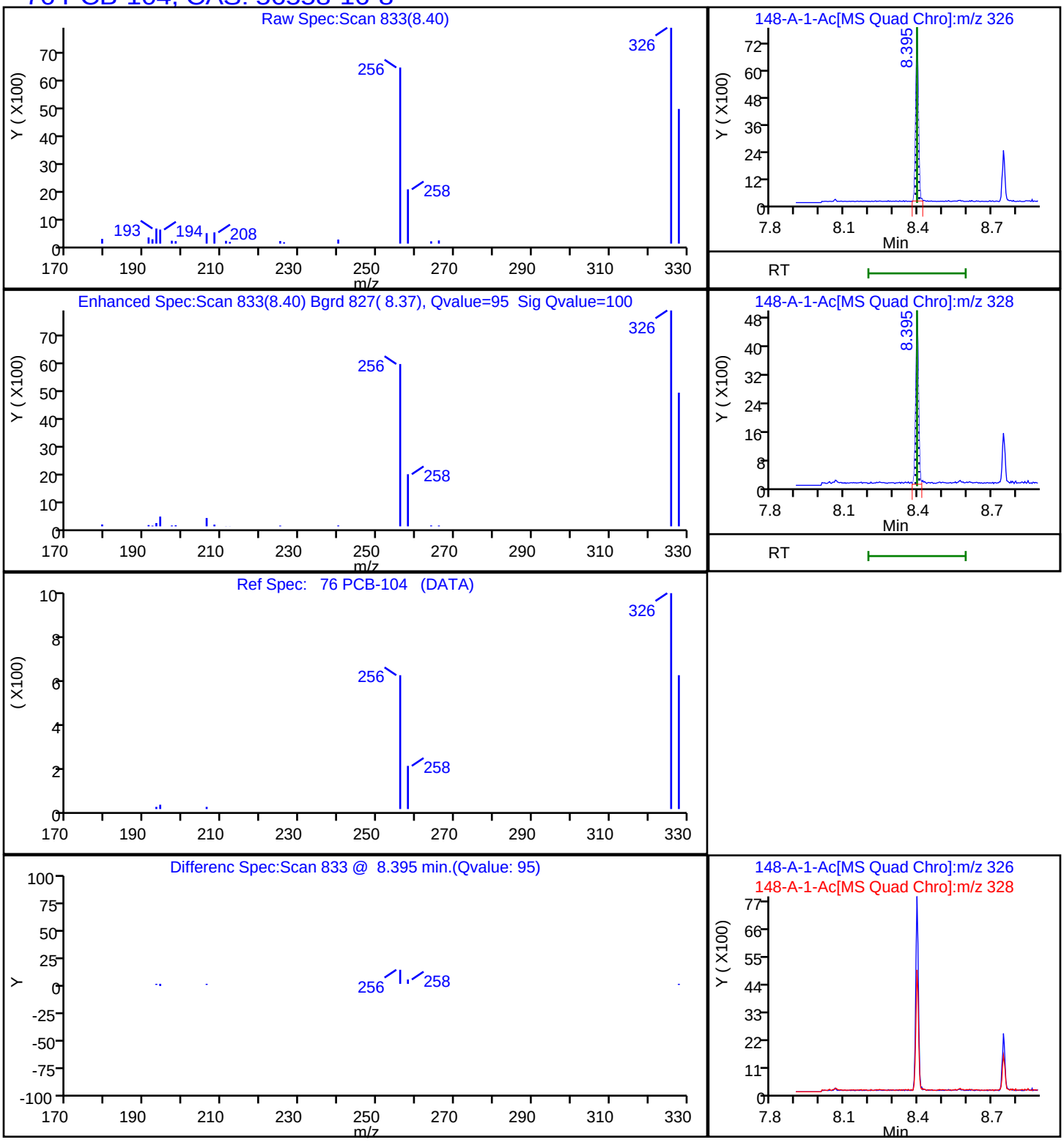


Report Date: 16-Nov-2023 15:46:42 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D		
Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1
Client ID:	GEI.PRC.BLK1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

76 PCB-104, CAS: 56558-16-8



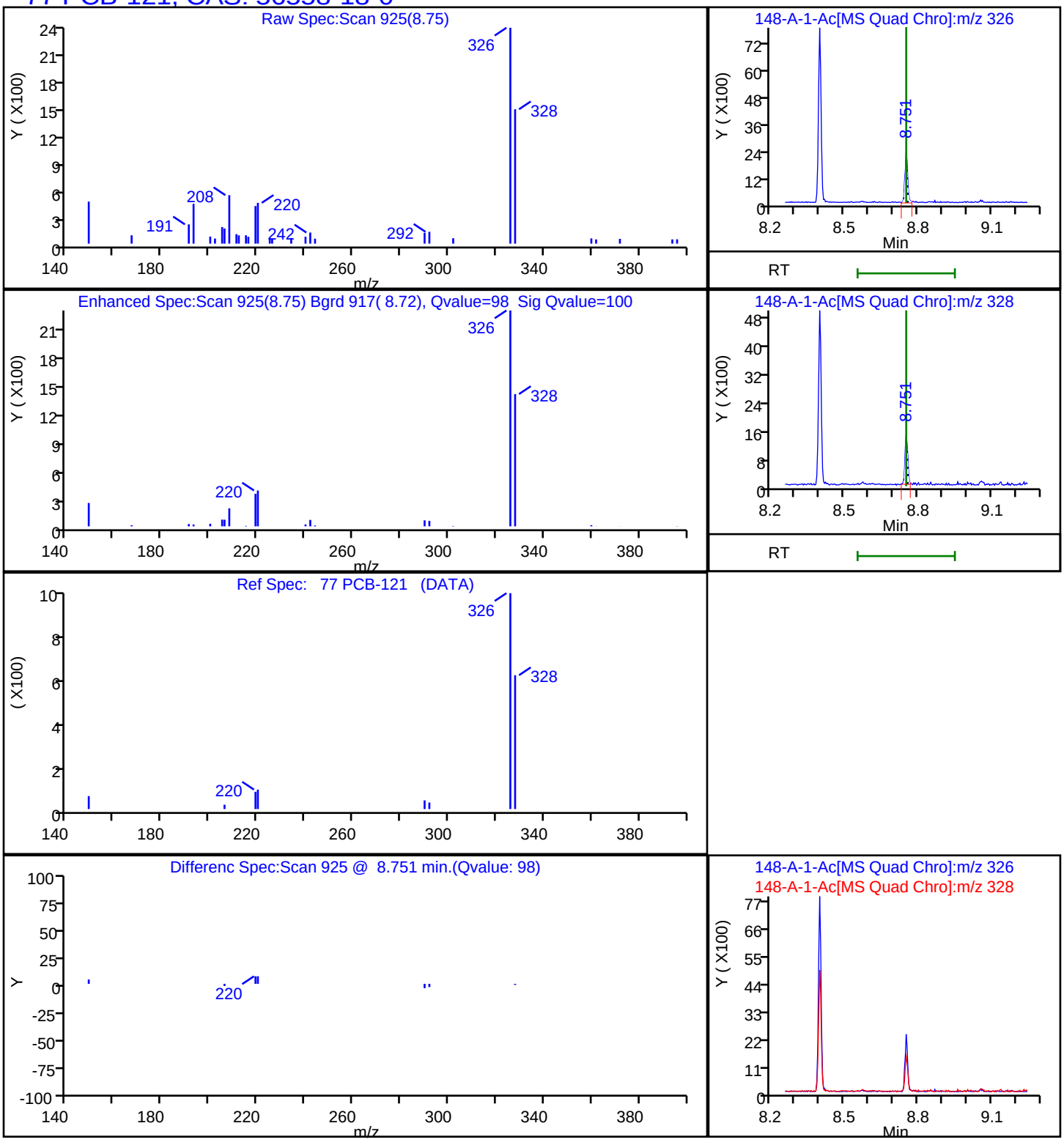
Report Date: 16-Nov-2023 15:46:42 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D

Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1
Client ID:	GEI.PRC.BLK1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

77 PCB-121, CAS: 56558-18-0



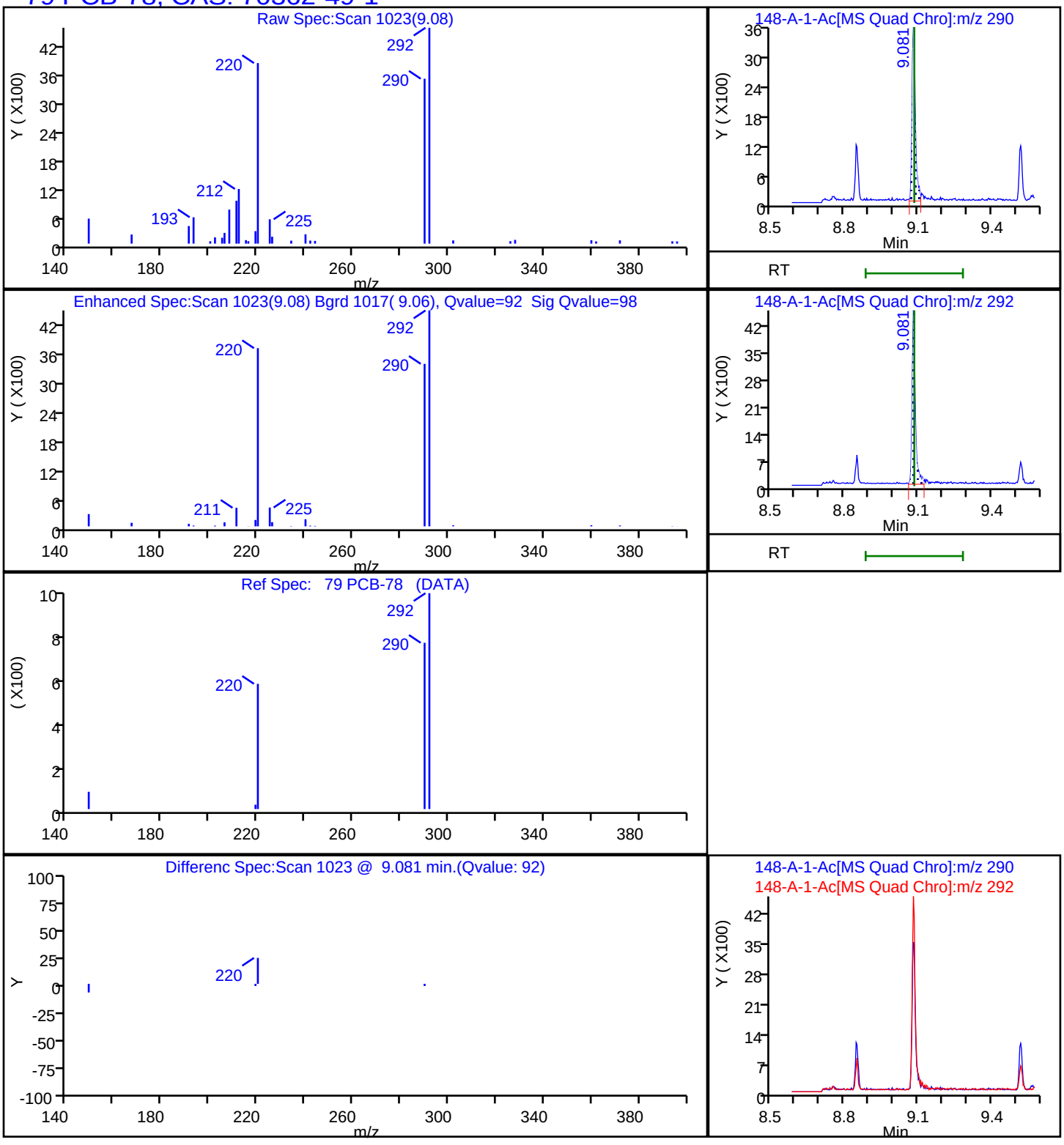
Report Date: 16-Nov-2023 15:46:42 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D

Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1		
Client ID:	GEI.PRC.BLK1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

79 PCB-78, CAS: 70362-49-1



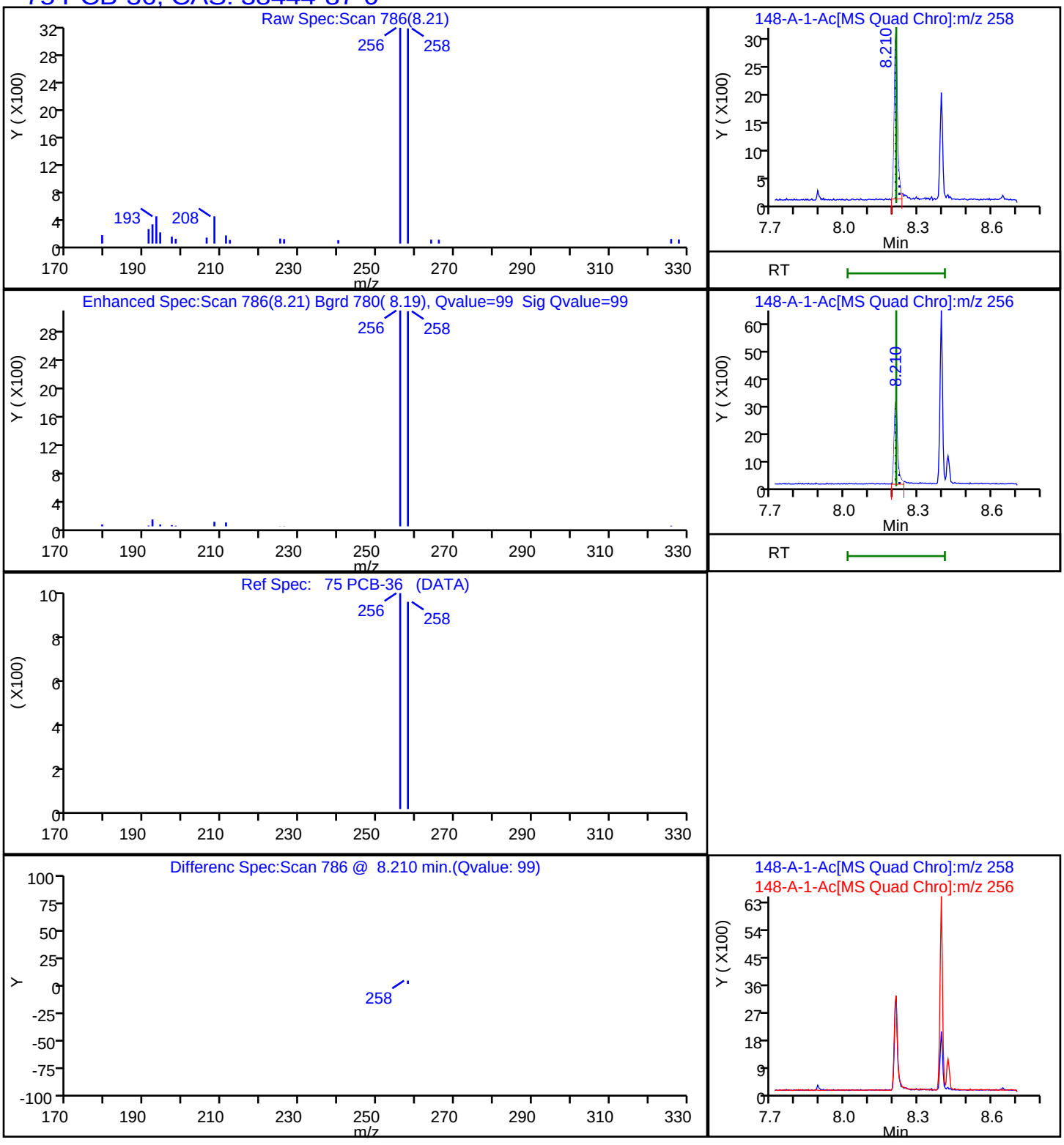
Report Date: 16-Nov-2023 15:46:42 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D

Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1		
Client ID:	GEI.PRC.BLK1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

75 PCB-36, CAS: 38444-87-0



Manual Integration/User Assign Peak Report

Eurofins Knoxville

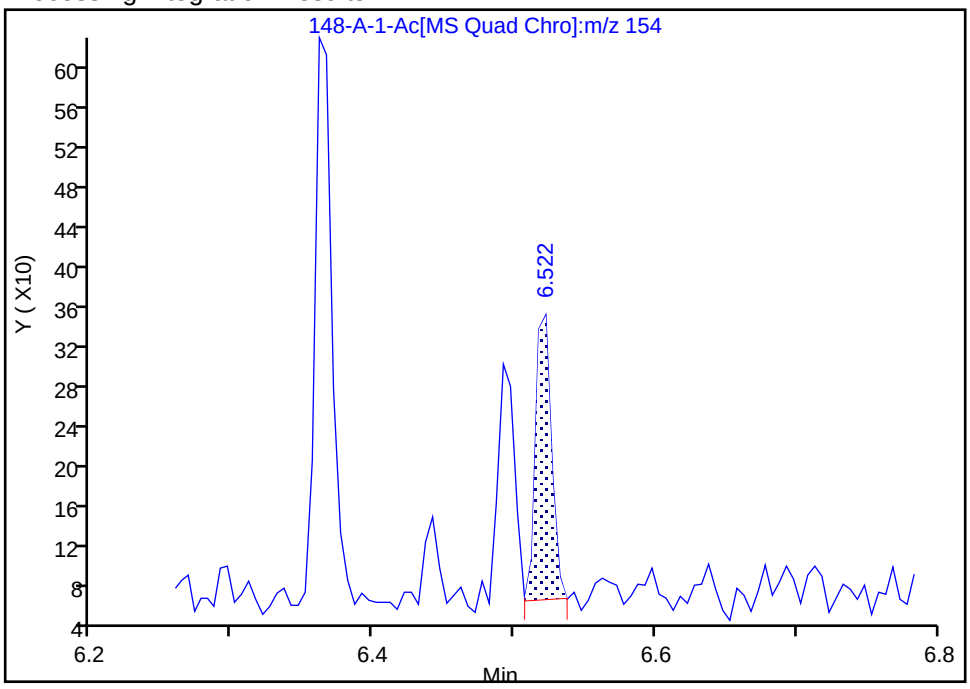
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D				
Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1		
Client ID:	GEI.PRC.BLK1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

27 Acenaphthene, CAS: 83-32-9

Signal: 1

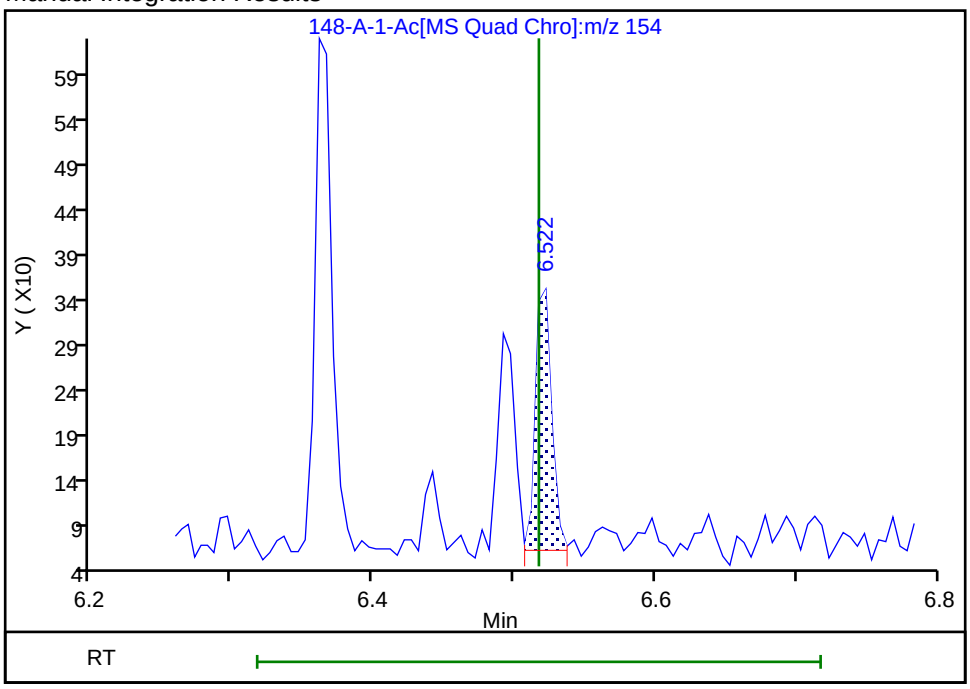
Processing Integration Results

RT: 6.52
Area: 224
Amount: 0.002810
Amount Units: ug/ml



Manual Integration Results

RT: 6.52
Area: 230
Amount: 0.002885
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 09:51:35 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

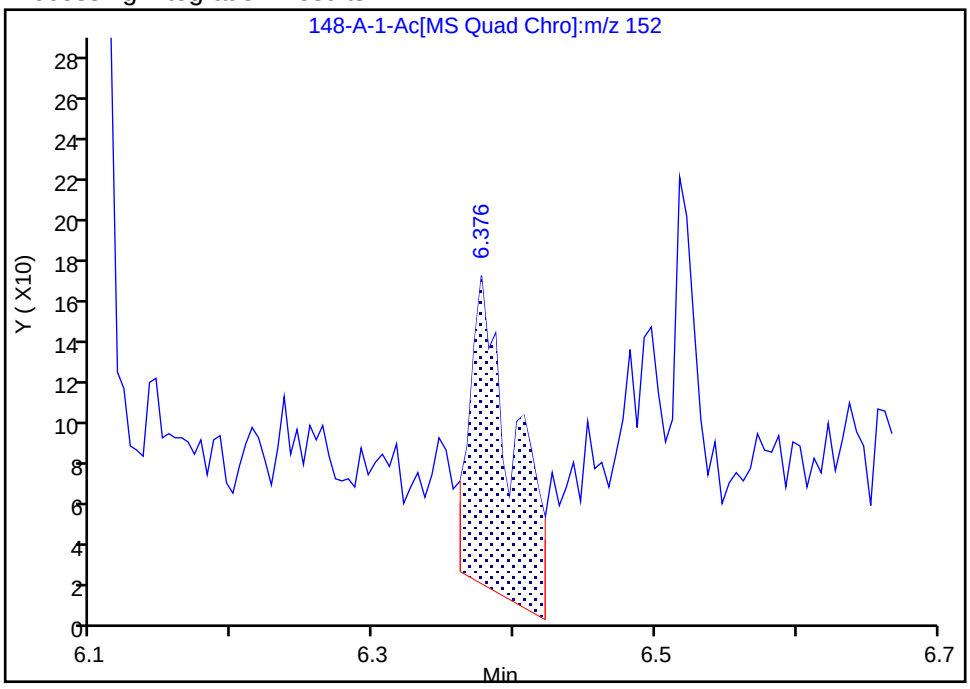
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D				
Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1		
Client ID:	GEI.PRC.BLK1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

24 Acenaphthylene, CAS: 208-96-8

Signal: 1

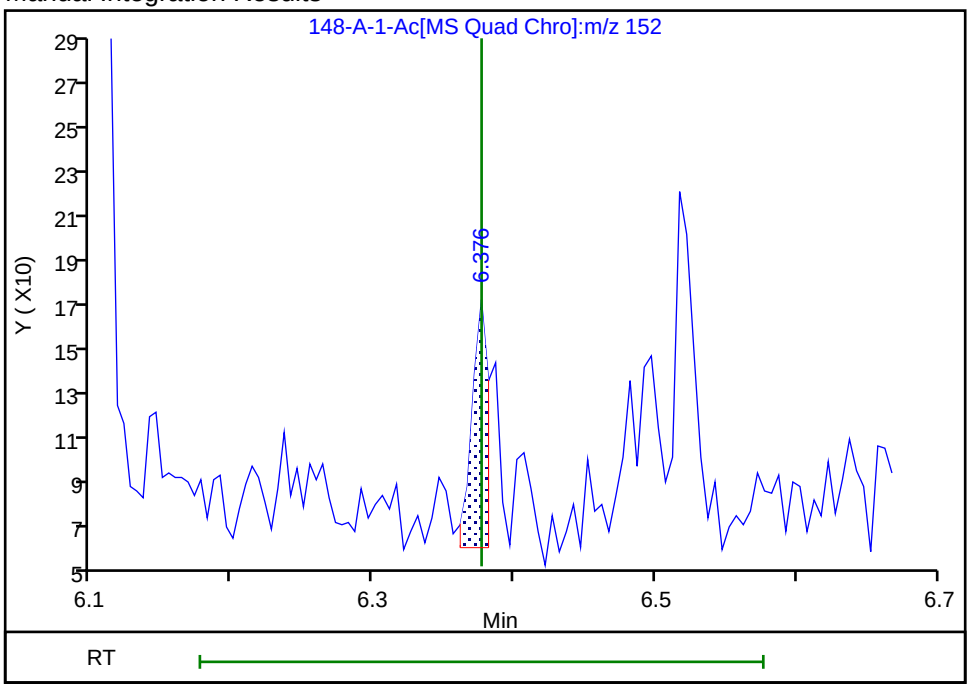
Processing Integration Results

RT: 6.38
Area: 333
Amount: 0.002676
Amount Units: ug/ml



Manual Integration Results

RT: 6.38
Area: 90
Amount: 0.000723
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 09:51:20 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Eurofins Knoxville

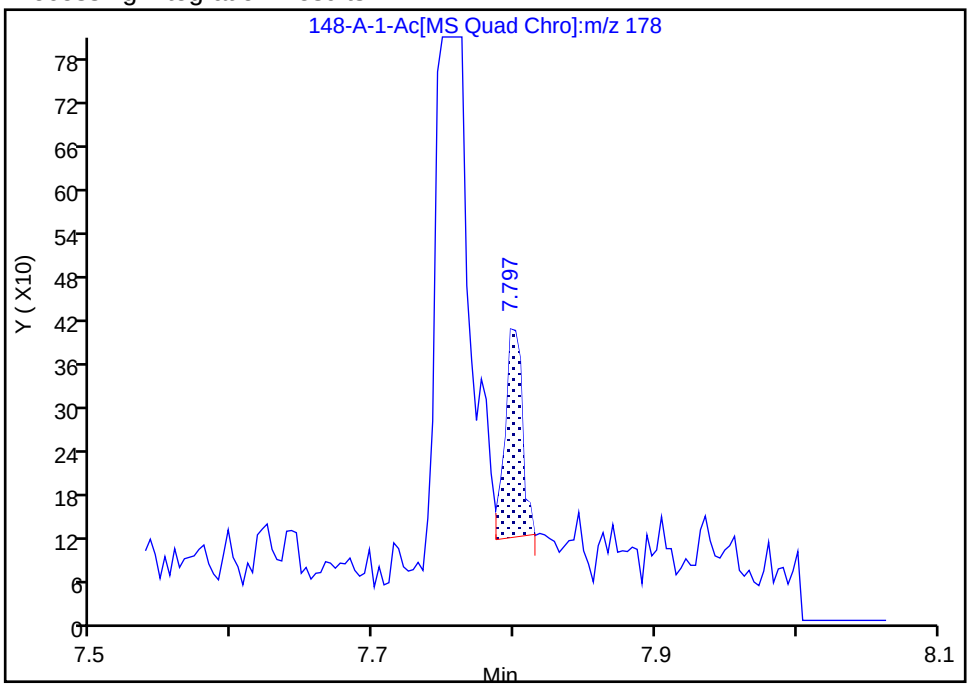
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D				
Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1		
Client ID:	GEI.PRC.BLK1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

39 Anthracene, CAS: 120-12-7

Signal: 1

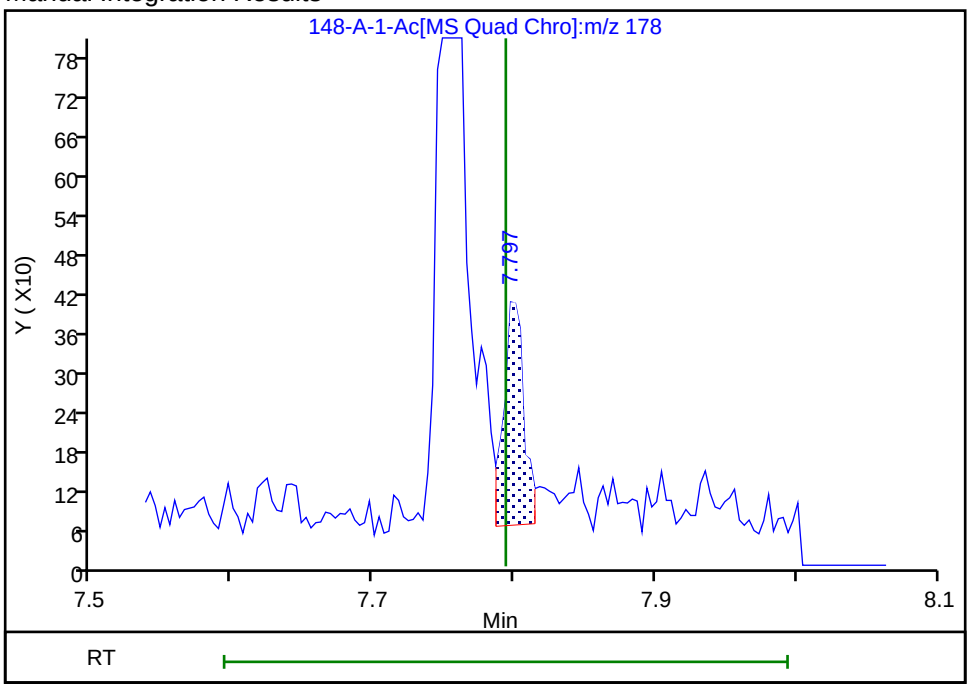
Processing Integration Results

RT: 7.80
Area: 245
Amount: 0.001256
Amount Units: ug/ml



Manual Integration Results

RT: 7.80
Area: 343
Amount: 0.001758
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 09:52:24 -05:00:00 (UTC)
Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

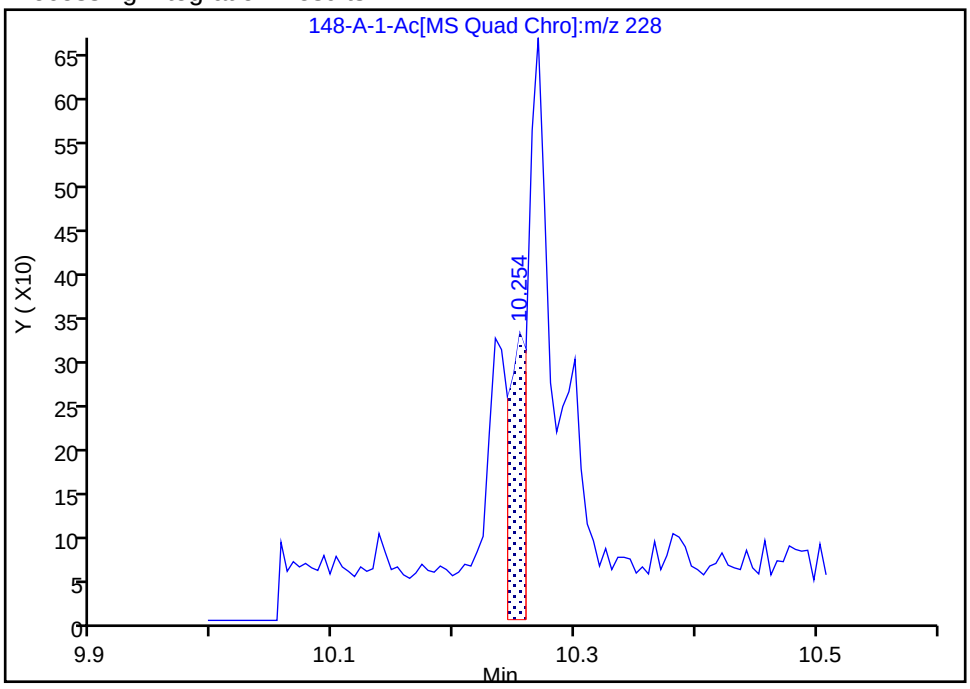
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D				
Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1		
Client ID:	GEI.PRC.BLK1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

47 Benzo[a]anthracene, CAS: 56-55-3

Signal: 1

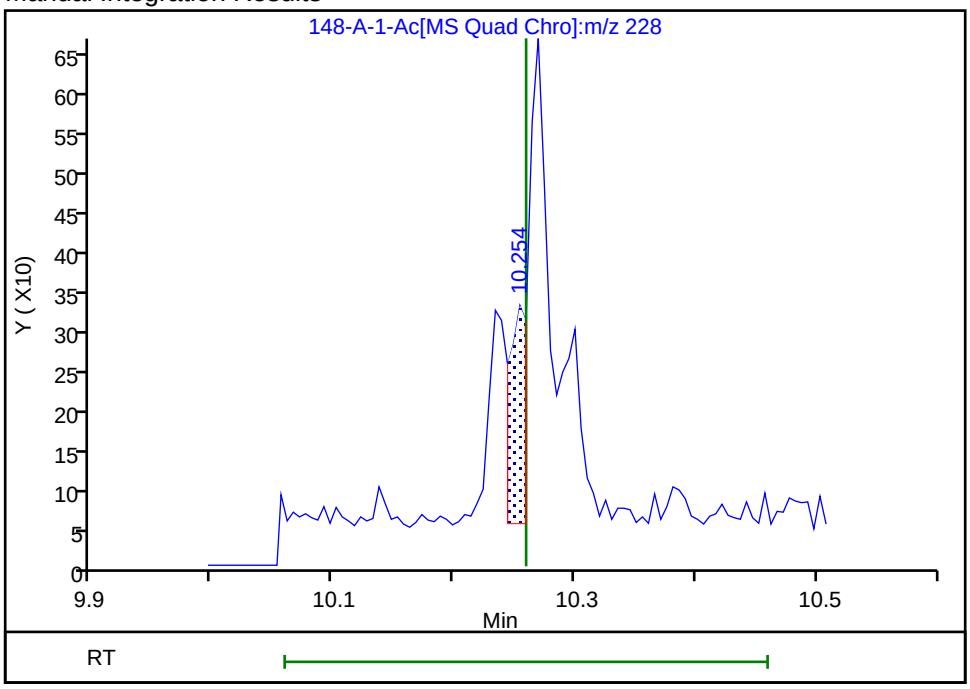
Processing Integration Results

RT: 10.25
Area: 356
Amount: 0.001275
Amount Units: ug/ml



Manual Integration Results

RT: 10.25
Area: 290
Amount: 0.001039
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 09:52:46 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

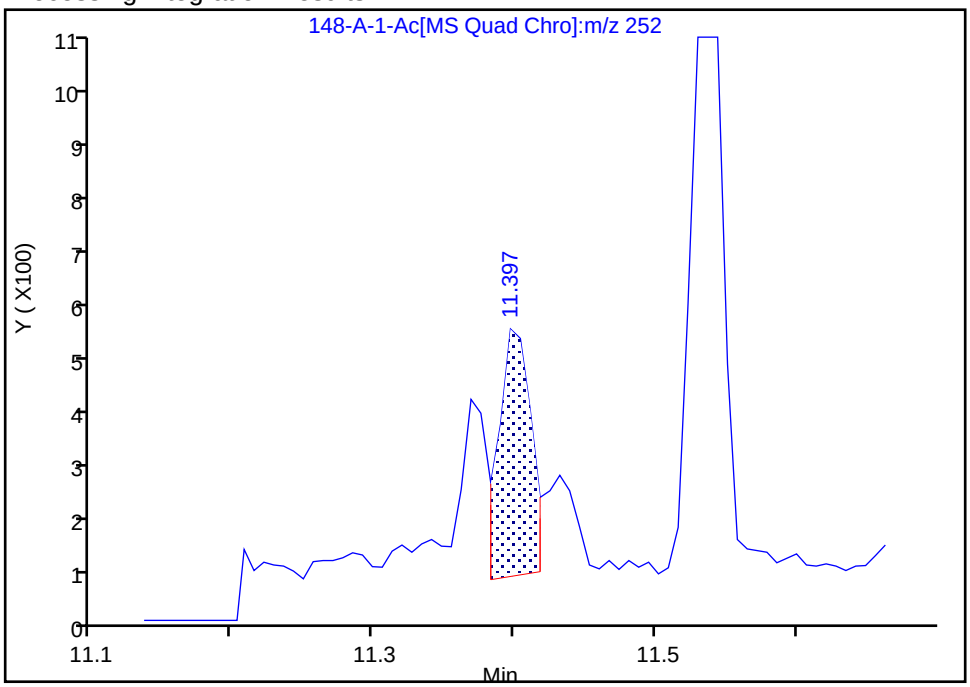
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D				
Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1		
Client ID:	GEI.PRC.BLK1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

53 Benzo[b]fluoranthene, CAS: 205-99-2

Signal: 1

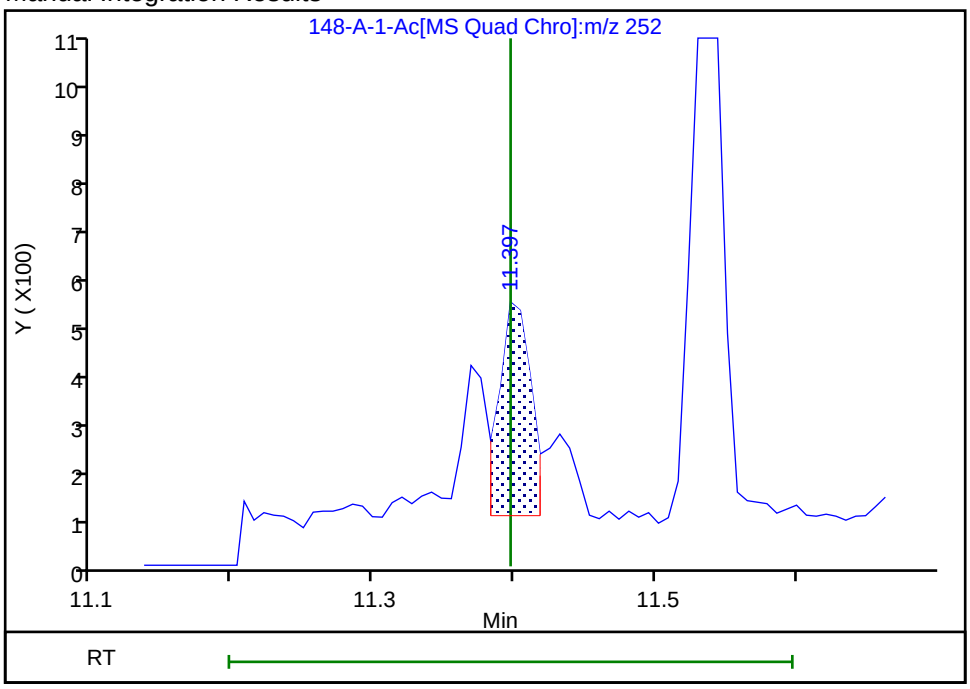
Processing Integration Results

RT: 11.40
Area: 741
Amount: 0.002345
Amount Units: ug/ml



Manual Integration Results

RT: 11.40
Area: 692
Amount: 0.002190
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 09:53:42 -05:00:00 (UTC)
Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

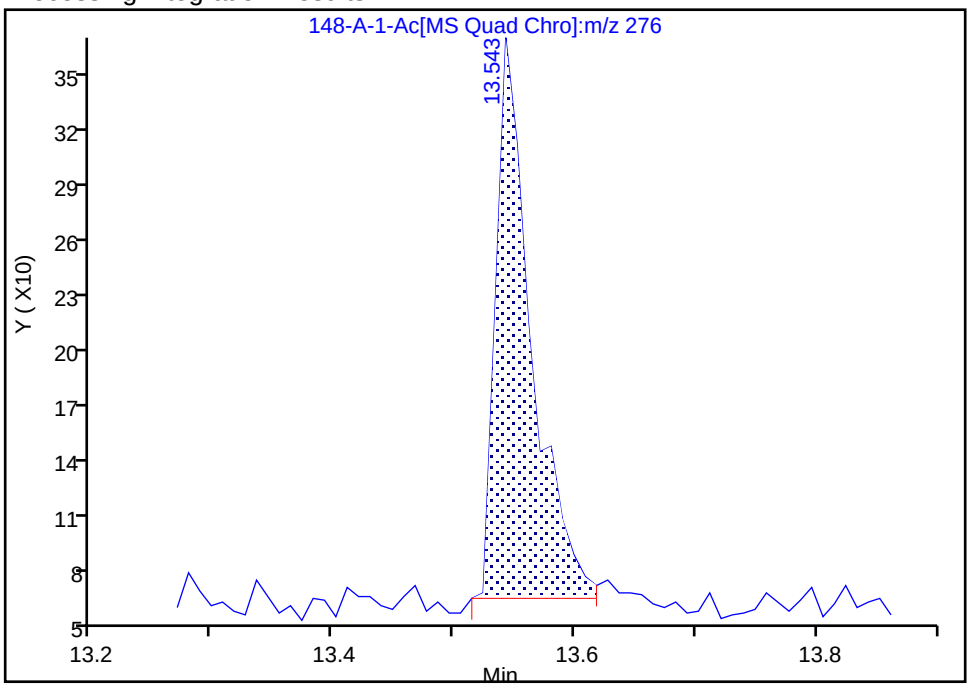
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D				
Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1		
Client ID:	GEI.PRC.BLK1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

68 Benzo[g,h,i]perylene, CAS: 191-24-2

Signal: 1

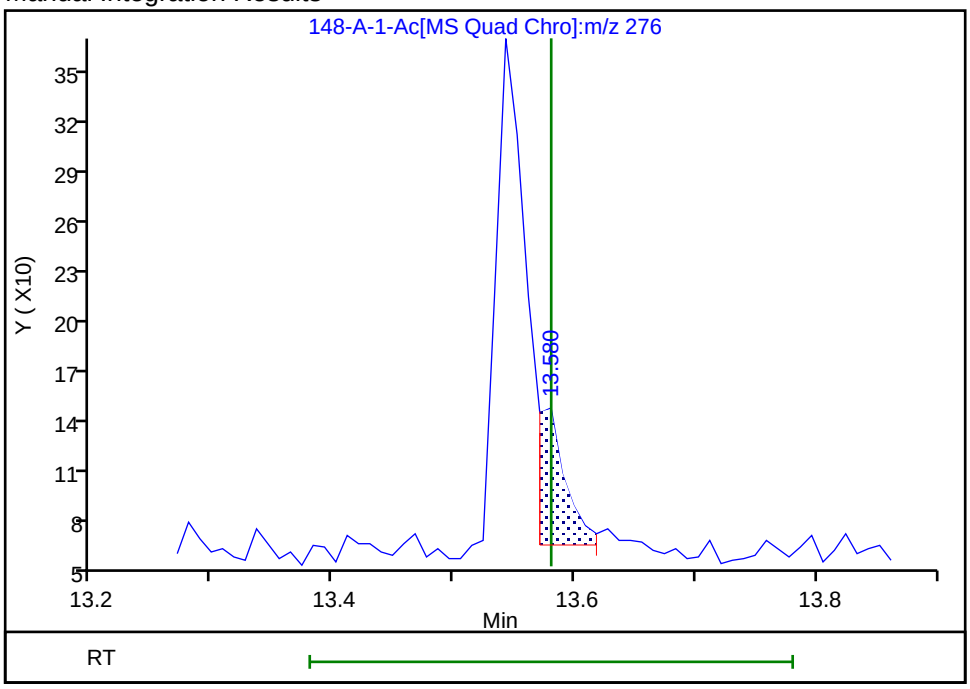
Processing Integration Results

RT: 13.54
Area: 623
Amount: 0.002386
Amount Units: ug/ml



Manual Integration Results

RT: 13.58
Area: 140
Amount: 0.000536
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 10:09:27 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

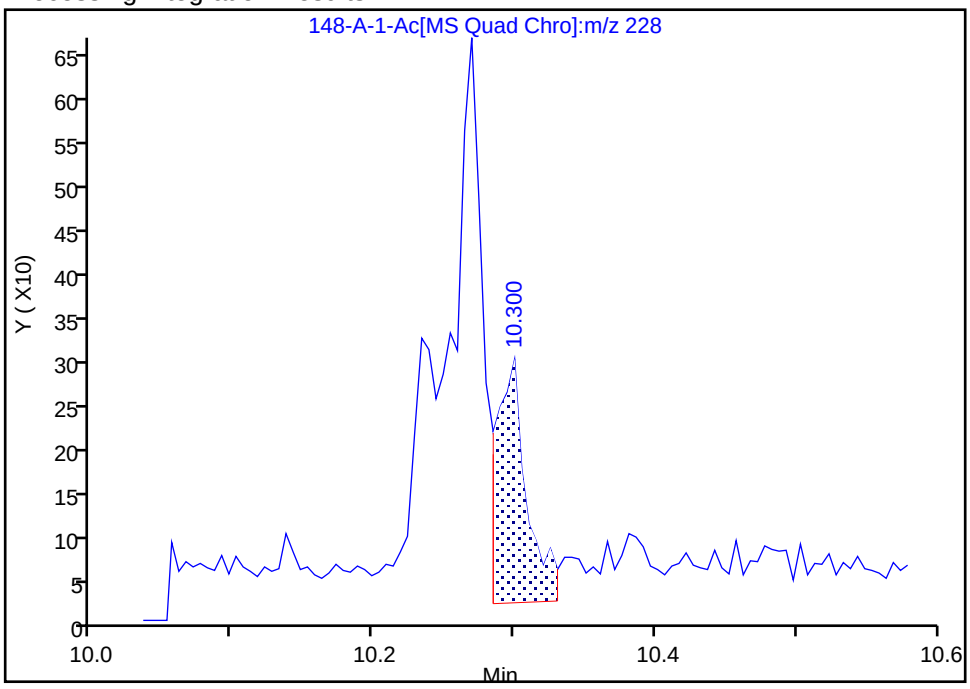
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D				
Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1		
Client ID:	GEI.PRC.BLK1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

50 Chrysene, CAS: 218-01-9

Signal: 1

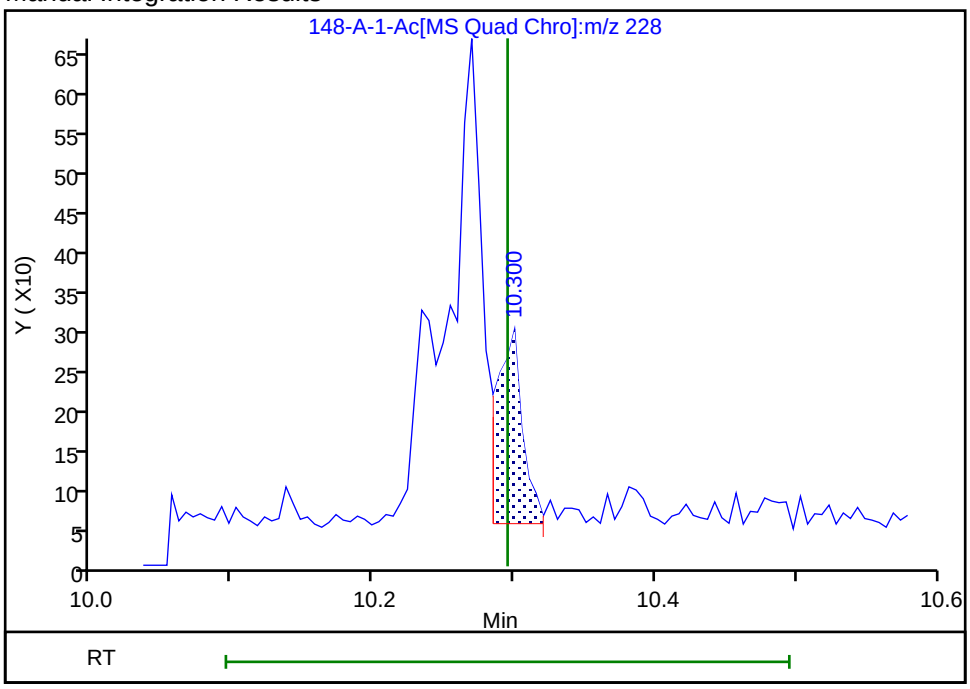
Processing Integration Results

RT: 10.30
Area: 426
Amount: 0.001361
Amount Units: ug/ml



Manual Integration Results

RT: 10.30
Area: 311
Amount: 0.000994
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 09:53:06 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

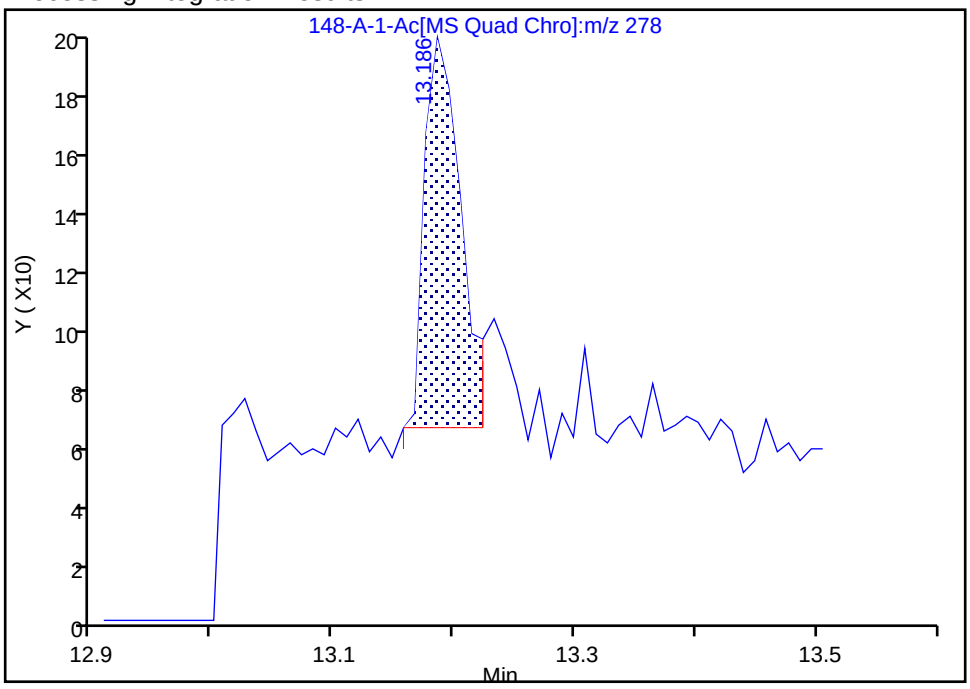
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D				
Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1		
Client ID:	GEI.PRC.BLK1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

66 Dibenz(a,h)anthracene, CAS: 53-70-3

Signal: 1

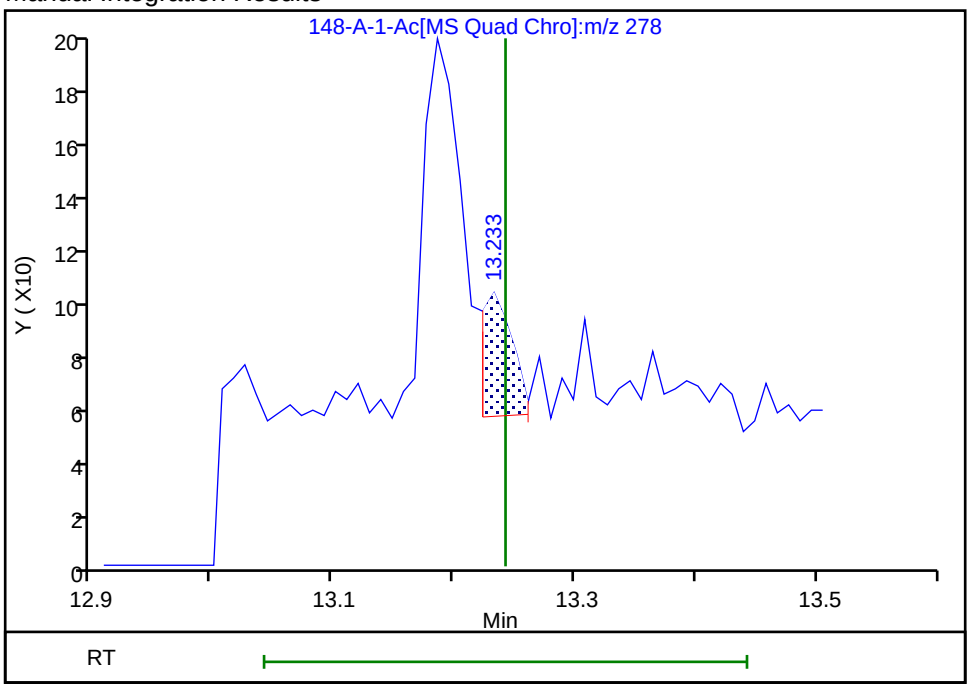
Processing Integration Results

RT: 13.19
Area: 278
Amount: 0.001171
Amount Units: ug/ml



Manual Integration Results

RT: 13.23
Area: 85
Amount: 0.000358
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 10:09:13 -05:00:00 (UTC)
Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

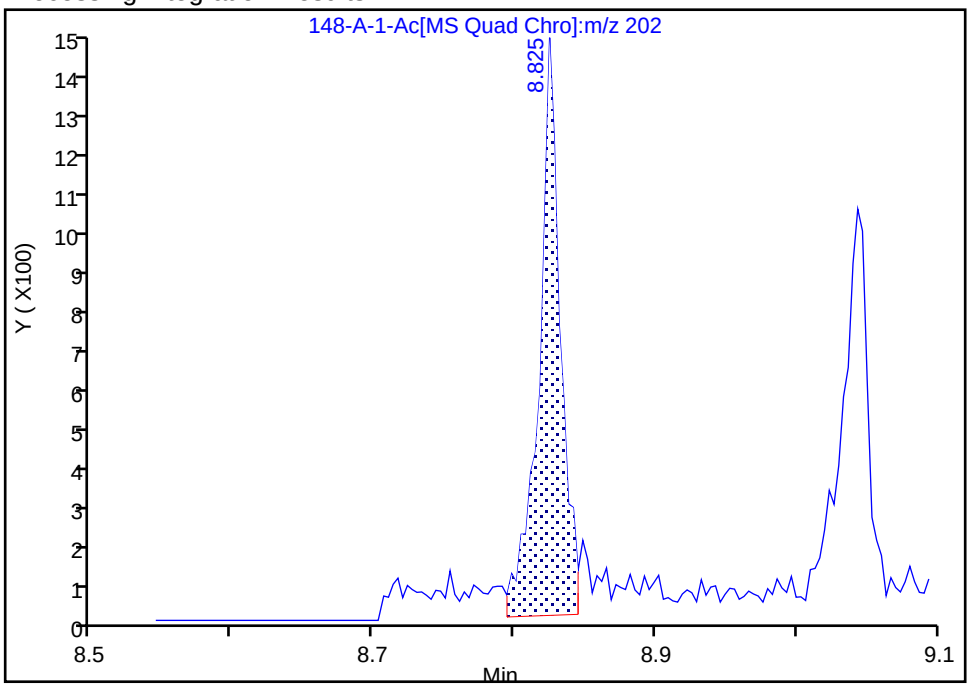
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D				
Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1		
Client ID:	GEI.PRC.BLK1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

43 Fluoranthene, CAS: 206-44-0

Signal: 1

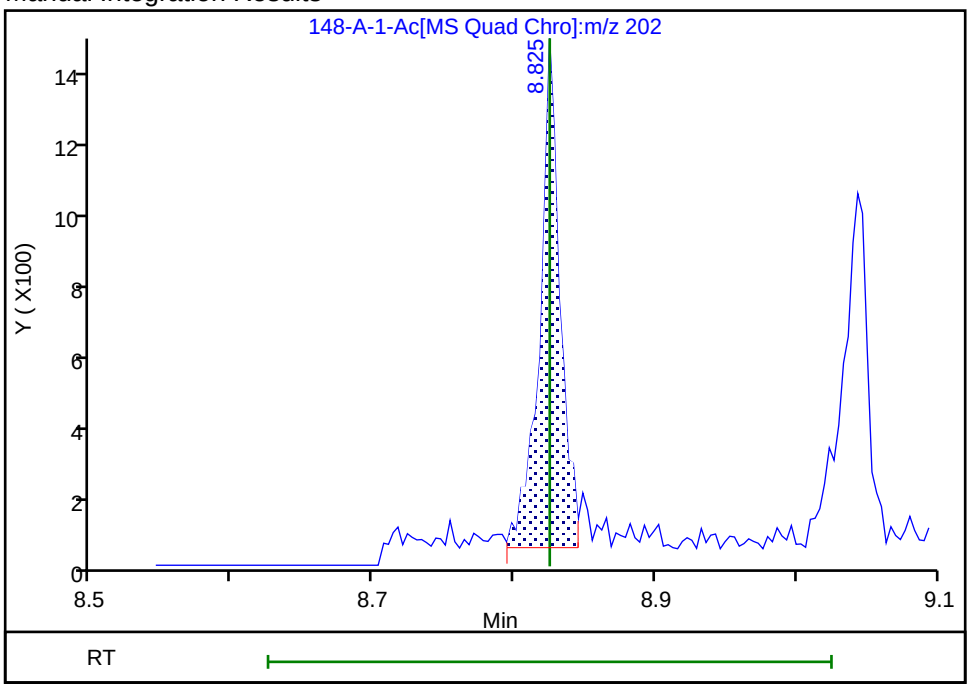
Processing Integration Results

RT: 8.82
Area: 1506
Amount: 0.004629
Amount Units: ug/ml



Manual Integration Results

RT: 8.82
Area: 1383
Amount: 0.004251
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 09:52:34 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

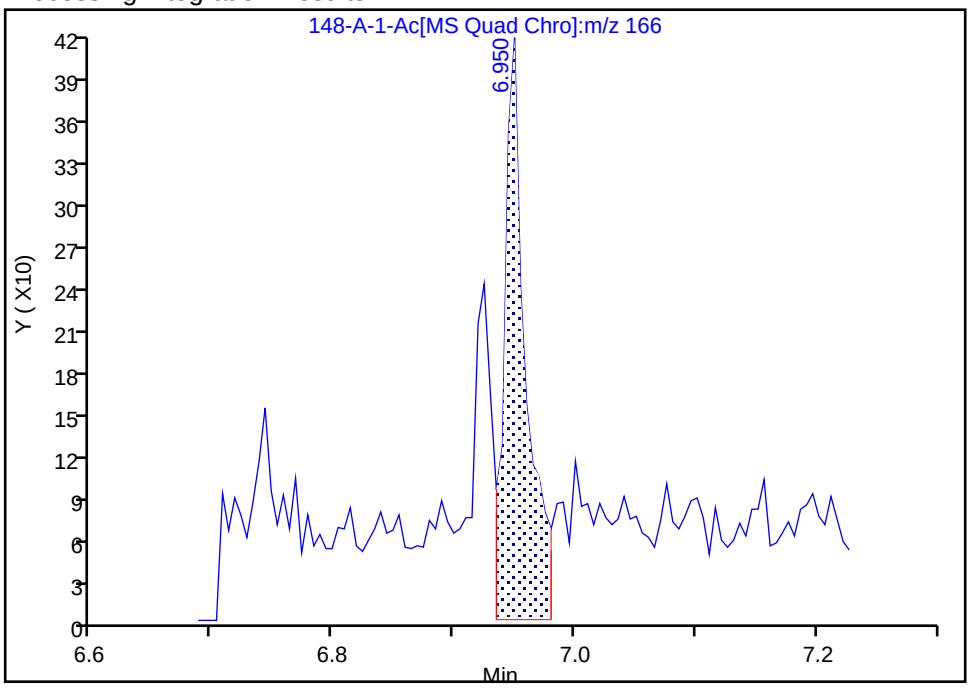
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D				
Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1		
Client ID:	GEI.PRC.BLK1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

30 Fluorene, CAS: 86-73-7

Signal: 1

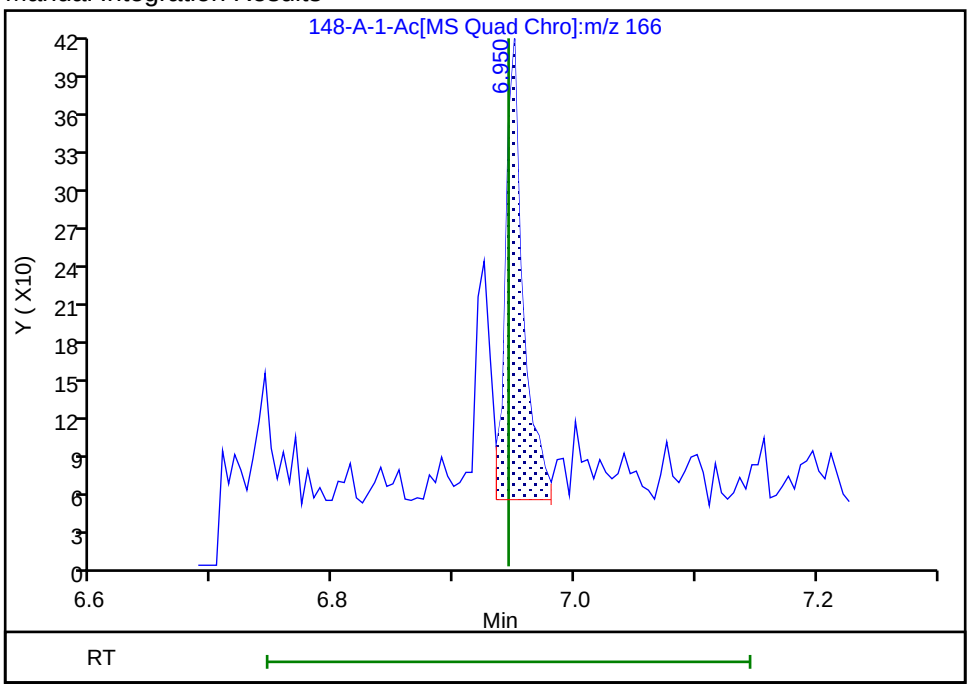
Processing Integration Results

RT: 6.95
Area: 521
Amount: 0.004539
Amount Units: ug/ml



Manual Integration Results

RT: 6.95
Area: 366
Amount: 0.003188
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 09:51:44 -05:00:00 (UTC)
Audit Action: Assigned New Baseline Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

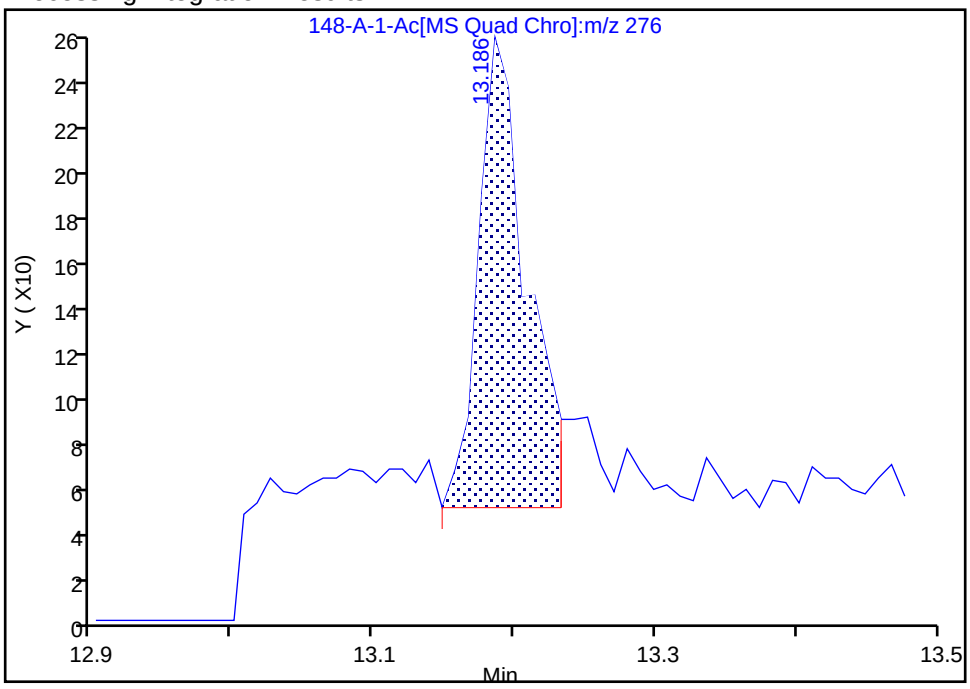
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D				
Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1		
Client ID:	GEI.PRC.BLK1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

65 Indeno[1,2,3-cd]pyrene, CAS: 193-39-5

Signal: 1

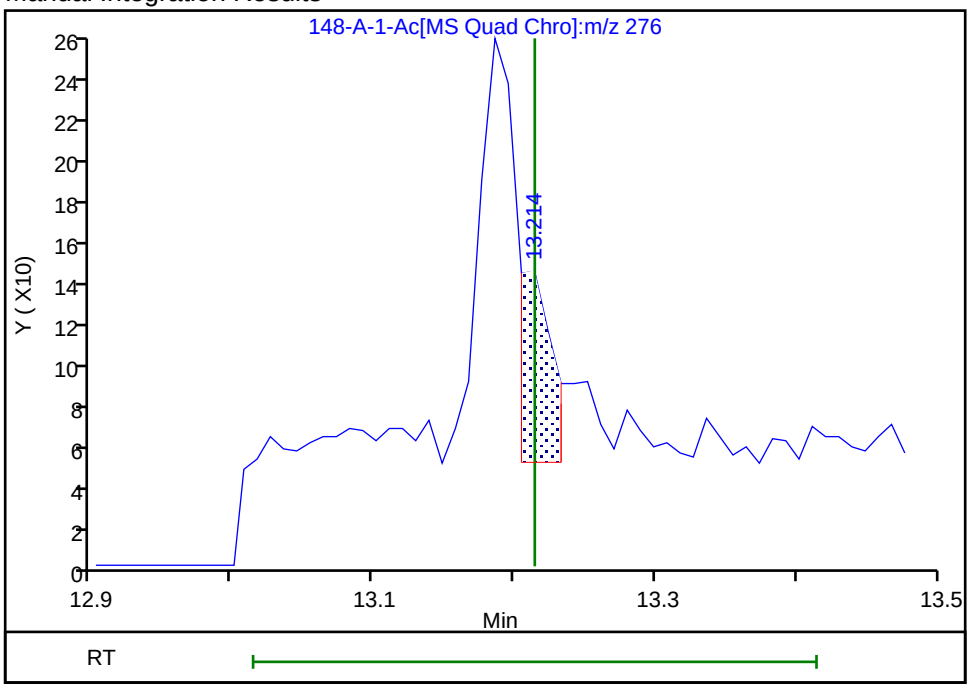
Processing Integration Results

RT: 13.19
Area: 496
Amount: 0.001687
Amount Units: ug/ml



Manual Integration Results

RT: 13.21
Area: 164
Amount: 0.000558
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 10:08:54 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

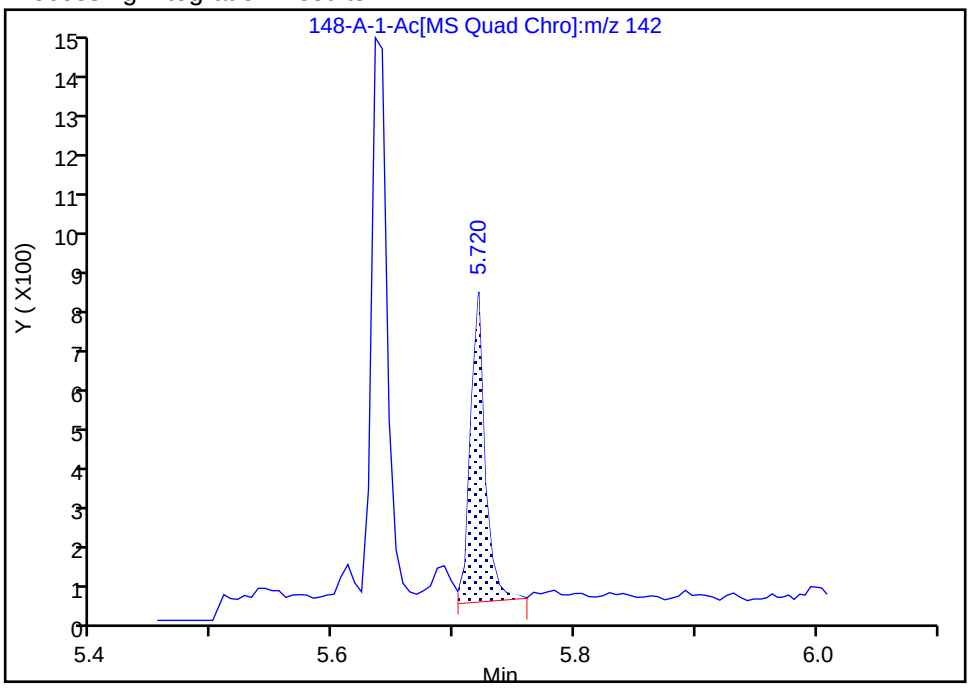
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D				
Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1		
Client ID:	GEI.PRC.BLK1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

18 1-Methylnaphthalene, CAS: 90-12-0

Signal: 1

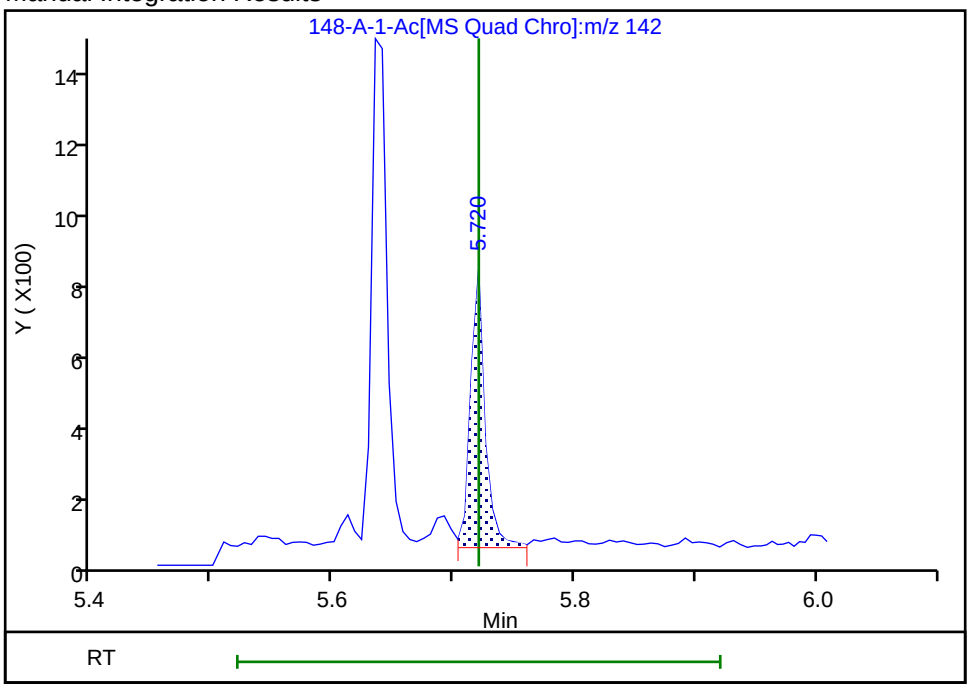
Processing Integration Results

RT: 5.72
Area: 651
Amount: 0.007869
Amount Units: ug/ml



Manual Integration Results

RT: 5.72
Area: 641
Amount: 0.007748
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 09:50:47 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

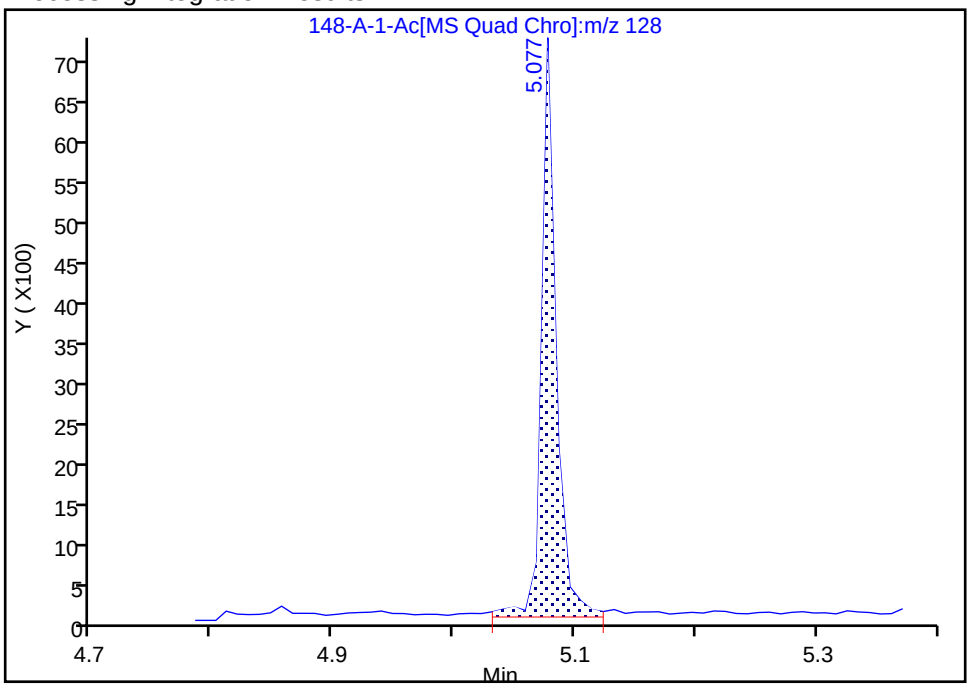
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D				
Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1		
Client ID:	GEI.PRC.BLK1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

12 Naphthalene, CAS: 91-20-3

Signal: 1

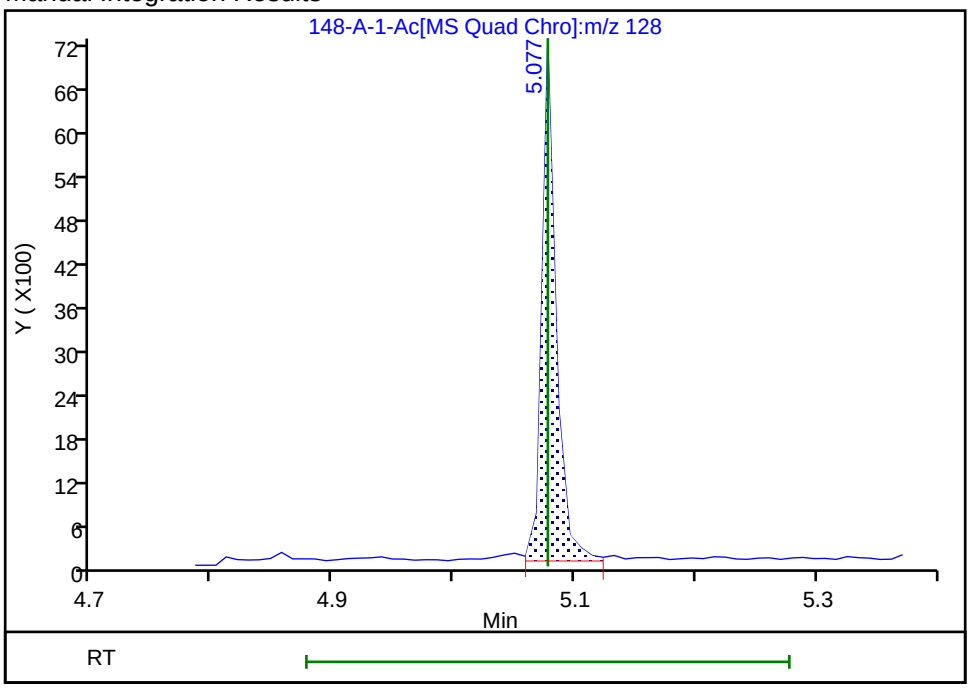
Processing Integration Results

RT: 5.08
Area: 6101
Amount: 0.054137
Amount Units: ug/ml



Manual Integration Results

RT: 5.08
Area: 5843
Amount: 0.051848
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 09:50:24 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

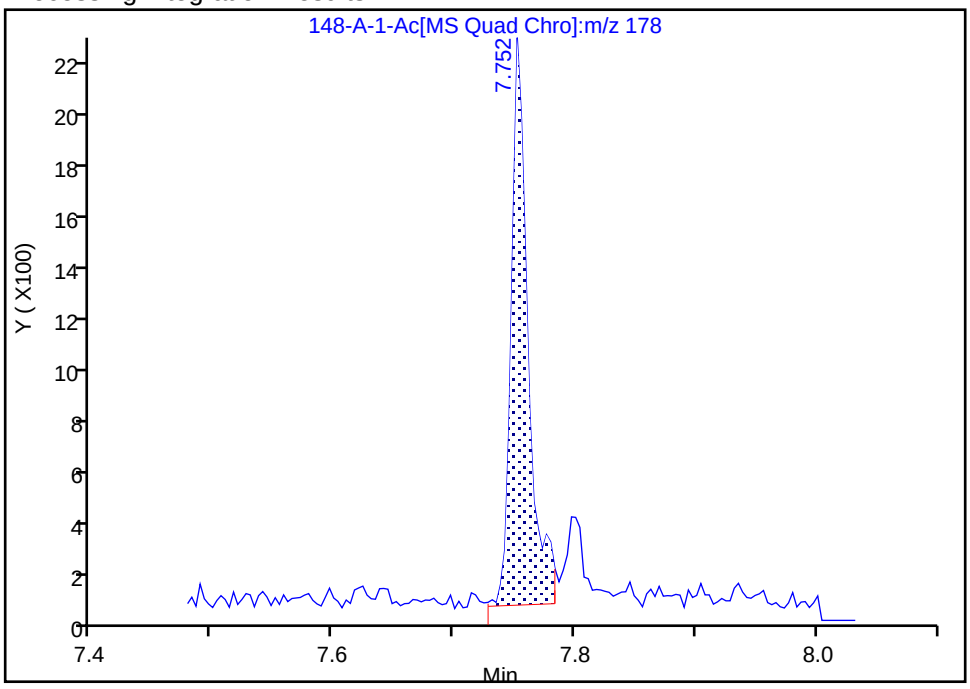
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D				
Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1		
Client ID:	GEI.PRC.BLK1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

36 Phenanthrene, CAS: 85-01-8

Signal: 1

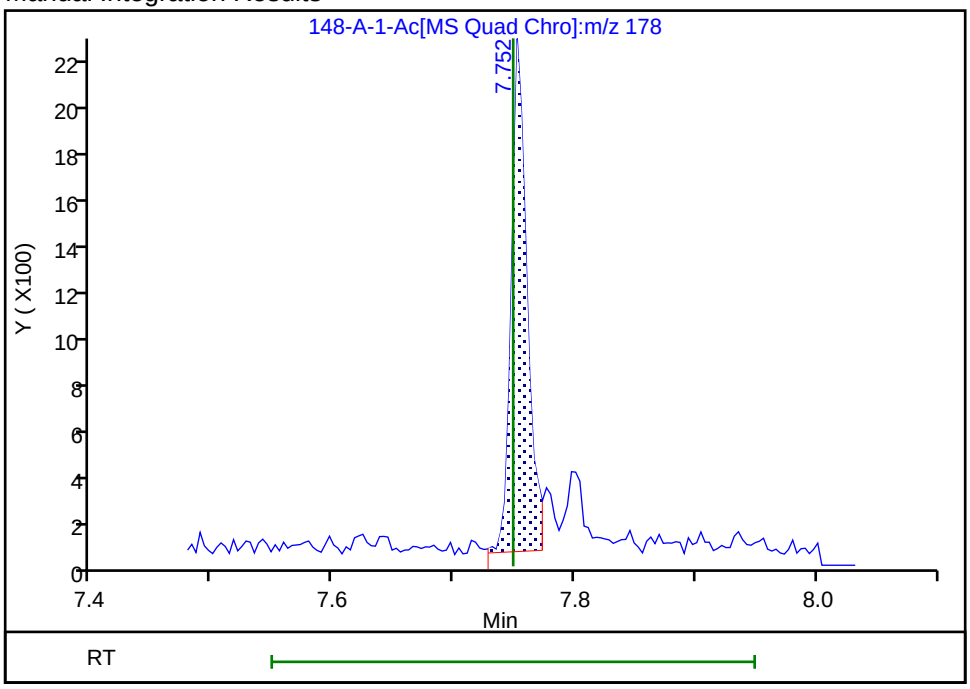
Processing Integration Results

RT: 7.75
Area: 2124
Amount: 0.010522
Amount Units: ug/ml



Manual Integration Results

RT: 7.75
Area: 1993
Amount: 0.009873
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 09:52:00 -05:00:00 (UTC)
Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

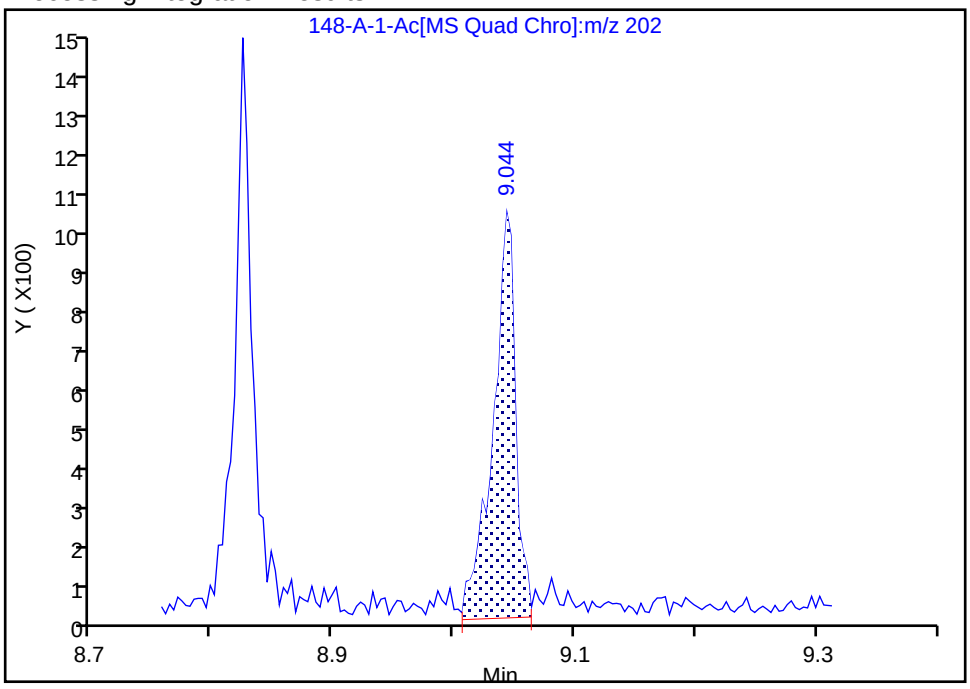
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D				
Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1		
Client ID:	GEI.PRC.BLK1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

45 Pyrene, CAS: 129-00-0

Signal: 1

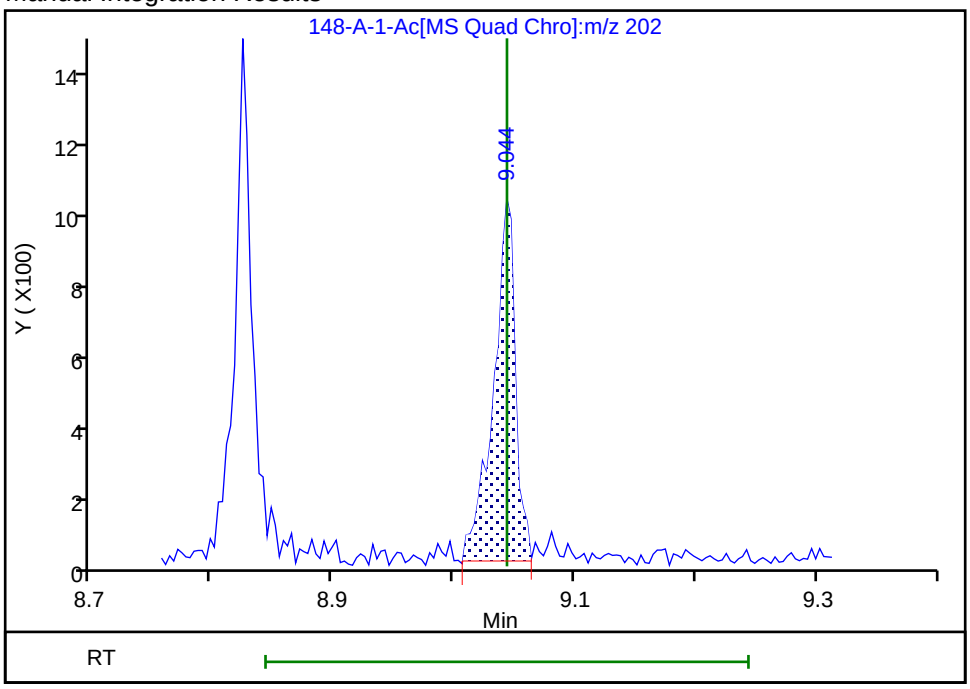
Processing Integration Results

RT: 9.04
Area: 1280
Amount: 0.003855
Amount Units: ug/ml



Manual Integration Results

RT: 9.04
Area: 1209
Amount: 0.003641
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 09:52:40 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

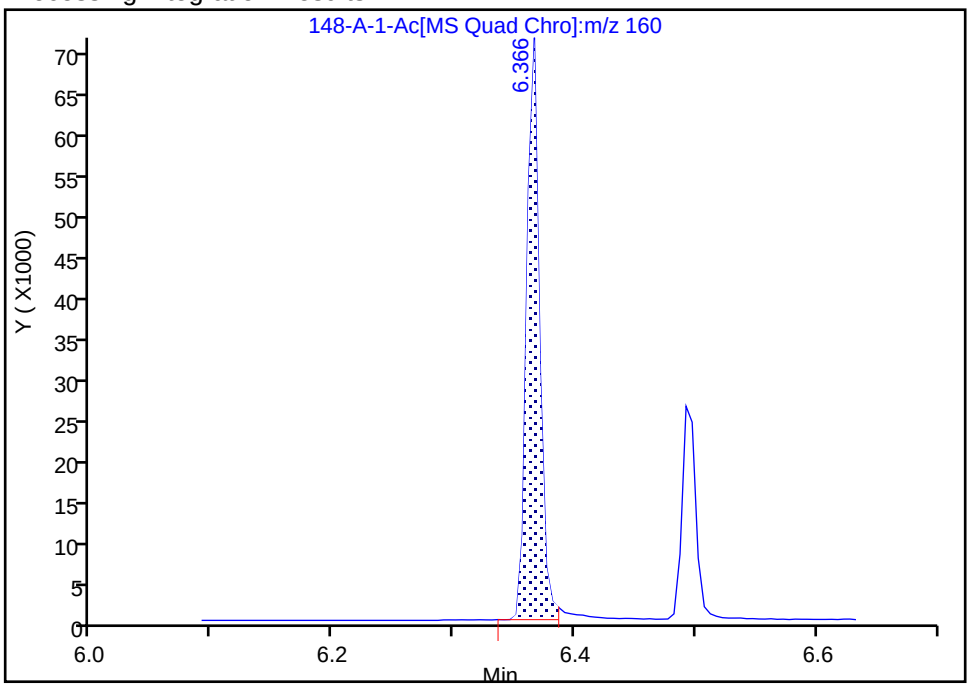
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D				
Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1		
Client ID:	GEI.PRC.BLK1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 23 Acenaphthylene-d8, CAS: 93951-97-4

Signal: 1

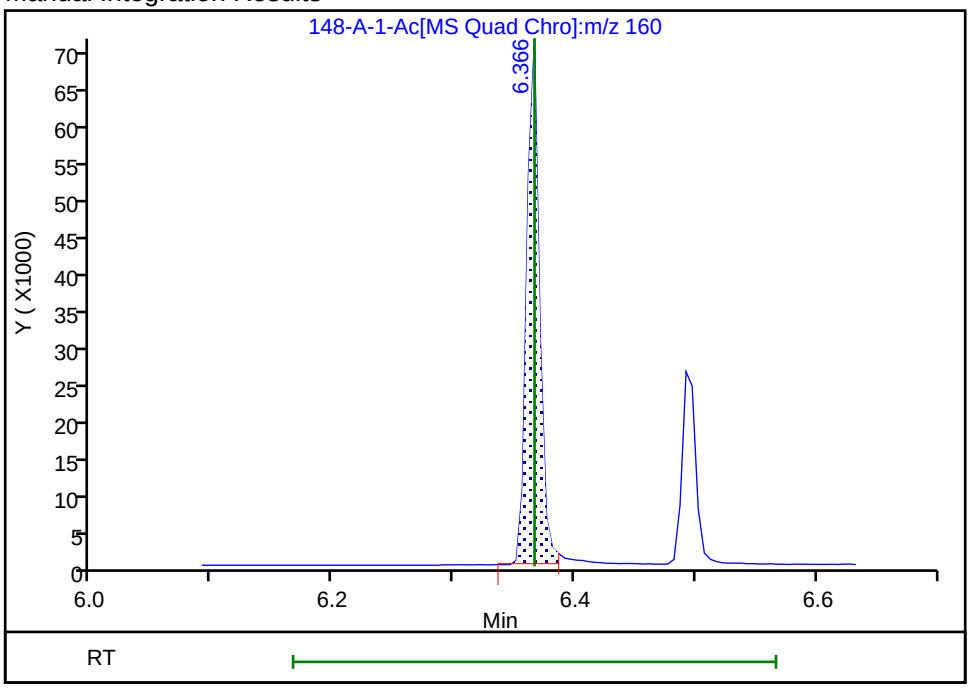
Processing Integration Results

RT: 6.37
Area: 52992
Amount: 0.362601
Amount Units: ug/ml



Manual Integration Results

RT: 6.37
Area: 52938
Amount: 0.362232
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 09:50:56 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Eurofins Knoxville

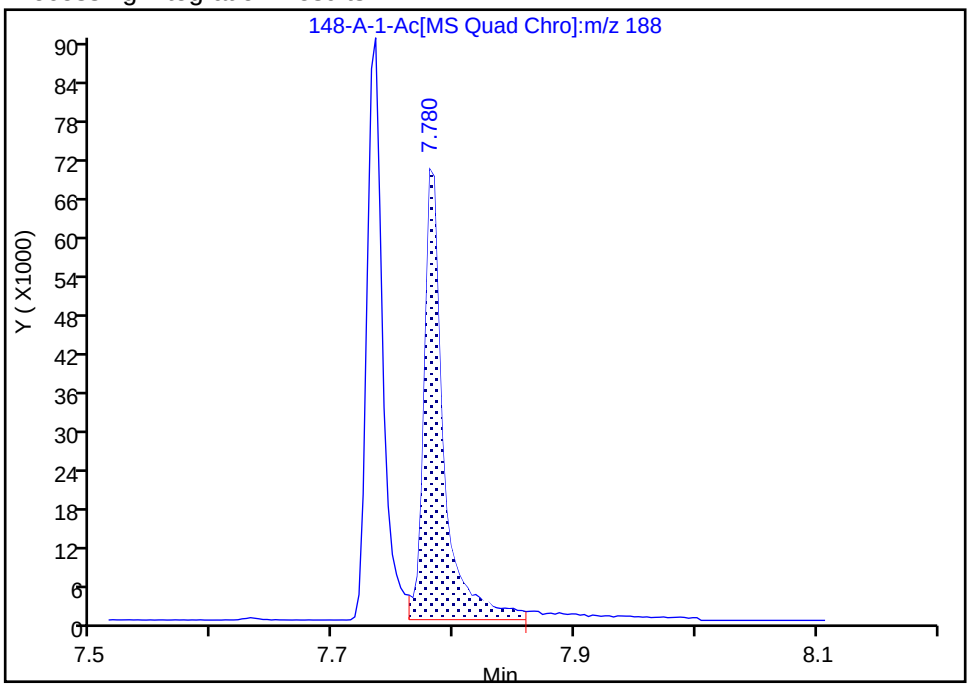
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-1-Ac.D				
Injection Date:	13-Nov-2023 21:45:19	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-1-A	Lab Sample ID:	140-34148-1		
Client ID:	GEI.PRC.BLK1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 38 Anthracin-d10, CAS: 1719-06-8

Signal: 1

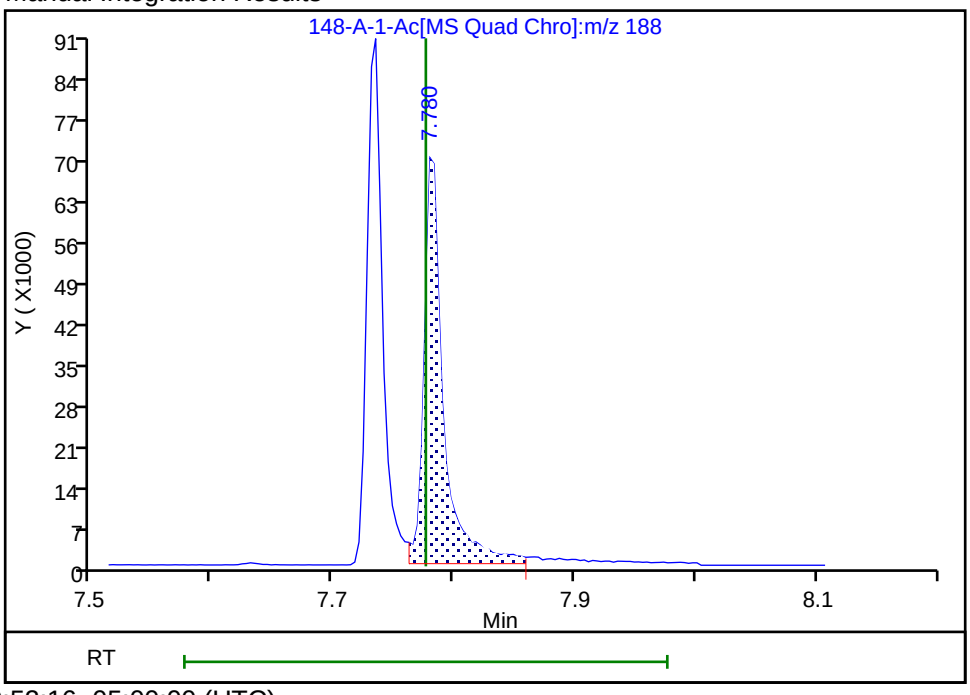
Processing Integration Results

RT: 7.78
Area: 80096
Amount: 0.333286
Amount Units: ug/ml



Manual Integration Results

RT: 7.78
Area: 79221
Amount: 0.329645
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 09:52:16 -05:00:00 (UTC)
Audit Action: Assigned New Baseline Audit Reason: Baseline

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: GEI.PRC.BLK2 | Lab Sample ID: 140-34148-2

Matrix: PE | Lab File ID: 140-34148-A-2-A.D

Analysis Method: ID-0016 | Date Collected: 10/26/2023 14:00

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.011(g) | Date Analyzed: 11/13/2023 22:08

Con. Extract Vol.: 500(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80177 | Units: ng/g

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
83-32-9	Acenaphthene	ND		910	240
208-96-8	Acenaphthylene	ND		910	66
120-12-7	Anthracene	ND		910	290
56-55-3	Benzo[a]anthracene	ND		910	340
50-32-8	Benzo[a]pyrene	ND		910	250
205-99-2	Benzo[b]fluoranthene	ND		910	320
192-97-2	Benzo[e]pyrene	ND		910	150
191-24-2	Benzo[g,h,i]perylene	ND		910	100
207-08-9	Benzo[k]fluoranthene	ND		910	210
218-01-9	Chrysene	ND		910	120
53-70-3	Dibenz(a,h)anthracene	ND		910	75
206-44-0	Fluoranthene	ND		910	740
86-73-7	Fluorene	ND		910	290
193-39-5	Indeno[1,2,3-cd]pyrene	ND		910	100
90-12-0	1-Methylnaphthalene	ND		4500	450
91-57-6	2-Methylnaphthalene	ND		4500	640
91-20-3	Naphthalene	ND		18000	2600
198-55-0	Perylene	ND		910	460
85-01-8	Phenanthrene	ND		1800	1600
129-00-0	Pyrene	ND		1800	270
STL00912	C1-Fluoranthenes/pyrene	ND		910	910
STL00913	C1-Fluorenes	ND		1800	1200
STL00914	C2-Fluorenes	ND		910	910
STL00915	C3-Fluorenes	ND		910	910
STL00917	C2-Naphthalenes	ND		1800	1800
STL00918	C3-Naphthalenes	ND		1800	1800
STL00919	C4-Naphthalenes	ND		2700	2500
STL00901	C1-Phenanthrenes/Anthracenes	ND		3600	3100
STL00902	C2-Phenanthrenes/Anthracenes	ND		910	910
STL00903	C3-Phenanthrenes/Anthracenes	ND		910	910
STL00904	C4-Phenanthrenes/Anthracenes	ND		910	910
STL02218	C1-Chrysenes/Benz(a)anthracenes	ND		910	910

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: GEI.PRC.BLK2 | Lab Sample ID: 140-34148-2

Matrix: PE | Lab File ID: 140-34148-A-2-A.D

Analysis Method: ID-0016 | Date Collected: 10/26/2023 14:00

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.011(g) | Date Analyzed: 11/13/2023 22:08

Con. Extract Vol.: 500(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80177 | Units: ng/g

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
STL02219	C2-Chrysenes/Benz(a)anthracenes	ND		910	910
STL02220	C3-Chrysenes/Benz(a)anthracenes	ND		910	910
STL02221	C4-Chrysenes/Benz(a)anthracenes	ND		910	910
34883-41-5	PCB-14	2800		910	9.1
74472-51-8	PCB-192	2400		910	9.1
74472-48-3	PCB-184	990		910	9.1
33979-03-2	PCB-155	770	J	910	9.1
41411-61-4	PCB-142	600	J	910	9.1
74472-52-9	PCB-204	1600		910	9.1
56558-16-8	PCB-104	2400		910	9.1
56558-18-0	PCB-121	940		910	9.1
70362-49-1	PCB-78	2100		910	9.1
38444-87-0	PCB-36	920		910	9.1

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
93951-97-4	Acenaphthylene-d8	79		30-120
1719-06-8	Anthracene-d10	69		30-120
63466-71-7	Benzo(a)pyrene-d12	73		30-120
93951-98-5	Benzo(b)fluoranthene-d12	86		30-120
93951-66-7	Benzo(ghi)perylene-d12	85		30-120
93952-01-3	Benzo(k)fluoranthene-d12	82		30-120
1719-03-5	Chrysene-d12	74		30-120
13250-98-1	Dibenz(a,h)anthracene-d14	79		30-120
93951-69-0	Fluoranthene-d10	83		30-120
81103-79-9	Fluorene -d10	80		30-120
203578-33-0	Indeno[1,2,3-cd]pyrene-d12	84		30-120
38072-94-5	1-Methylnaphthalene-d10	82		30-120
7297-45-2	2-Methylnaphthalene-d10	82		30-120
1146-65-2	Naphthalene-d8	80		30-120
1520-96-3	Perylene-d12	68		30-120
1517-22-2	Phenanthrene-d10	75		30-120

Report Date: 22-Nov-2023 16:14:12 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-2-A.D
Lims ID: 140-34148-A-2-A
Client ID: GEI.PRC.BLK2
Sample Type: Client
Inject. Date: 13-Nov-2023 22:08:38 ALS Bottle#: 0 Worklist Smp#: 31
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030467-031
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 22-Nov-2023 16:14:11 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1637

First Level Reviewer: SK9U Date: 22-Nov-2023 16:14:11

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/ml	%Rec	Flags
D 10 Naphthalene-d8	136	5.059	5.068	-0.009	99	58604	0.4008	80.2	
12 Naphthalene	128	5.078	5.077	0.000	45	1853	0.0134		7M
D 15 2-methylnaphthalene-d10	152	5.612	5.612	0.000	92	39185	0.4121	82.4	
16 2-Methylnaphthalene	142	5.635	5.635	0.000	95	548	0.005622		7M
D 17 1-Methylnaphthalene-d10	152	5.692	5.692	0.000	100	39205	0.4115	82.3	
D 23 Acenaphthylene-d8	160	6.367	6.366	0.001	80	63631	0.3943	78.9	
24 Acenaphthylene	152	6.377	6.376	0.000	42	81	0.000541		7M
* 26 Acenaphthene-d10	164	6.492	6.492	0.000	97	52452	0.5000		
27 Acenaphthene	154	6.517	6.517	0.000	87	152	0.001586		7M
D 29 Fluorene -d10	176	6.925	6.925	0.000	99	50169	0.4014	80.3	
30 Fluorene	166	6.950	6.945	0.005	84	272	0.002087		7M
D 35 Phenanthrene-d10	188	7.732	7.728	0.004	99	88068	0.3770	75.4	
36 Phenanthrene	178	7.753	7.753	0.003	29	1811	0.008524		7M
D 38 Anthracin-d10	188	7.784	7.783	0.008	99	79002	0.3465	69.3	M
39 Anthracene	178	7.794	7.794	0.000	42	198	0.001018		7M
D 41 Fluoranthene-d10	212	8.808	8.808	0.000	100	125494	0.4142	82.8	
43 Fluoranthene	202	8.825	8.822	0.000	34	725	0.002258		7M
* 44 Pyrene-d10 (IS)	212	9.027	9.027	0.000	99	149777	0.5000		
45 Pyrene	202	9.044	9.044	0.000	93	464	0.001416		7M
47 Benzo[a]anthracene	228	10.260	10.259	0.000	1	193	0.000689		7M
D 48 Chrysene-d12	240	10.270	10.270	0.000	96	107908	0.3692	73.8	
50 Chrysene	228	10.295	10.295	0.000	23	168	0.000535		7M
D 52 Benzo(b)fluoranthene-d12	264	11.369	11.369	0.000	100	94792	0.4303	86.1	
53 Benzo[b]fluoranthene	252	11.397	11.397	0.000	20	471	0.001475		7M
D 54 Benzo(k)fluoranthene-d12	264	11.404	11.404	0.000	40	106515	0.4116	82.3	
55 Benzo[k]fluoranthene	252	11.425	11.425	0.000	1	155	0.000497		7M
* 56 Benzo(e)pyrene-d12	264	11.684	11.684	0.000	99	86970	0.5000		
D 58 Benzo(a)pyrene-d12	264	11.748	11.747	0.001	100	70715	0.3661	73.2	
D 60 Perylene-d12	264	11.846	11.845	0.001	100	73346	0.3421	68.4	
61 Perylene	252	11.874	11.866	0.001	1	49	0.000234		7M
D 62 Indeno[1,2,3-cd]pyrene-d12	288	13.186	13.186	0.000	77	87704	0.4179	83.6	
D 63 Dibenz(a,h)anthracene-d14	292	13.205	13.196	0.009	83	74337	0.3959	79.2	

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/ml	%Rec	Flags
65 Indeno[1,2,3-cd]pyrene	276	13.215	13.196	0.001	19	155	0.000528		7M
66 Dibenz(a,h)anthracene	278	13.243	13.242	0.001	1	62	0.000261		7M
D 67 Benzo(ghi)perylene-d12	288	13.552	13.543	0.009	100	88813	0.4261	85.2	
68 Benzo[g,h,i]perylene	276	13.571	13.580	-0.009	1	112	0.000431		7M
74 PCB-14	222	7.476	7.476	-0.003	97	11323	0.0622		
75 PCB-36	258	8.210	8.210	0.000	100	1944	0.0203		
76 PCB-104	326	8.396	8.396	0.000	96	3948	0.0530		
77 PCB-121	326	8.751	8.751	0.000	97	1242	0.0207		
78 PCB-155	360	8.849	8.849	0.000	90	941	0.0168		
79 PCB-78	290	9.081	9.084	-0.003	90	2248	0.0470		
80 PCB-142	360	9.522	9.522	0.000	88	538	0.0132		
81 PCB-184	394	9.576	9.572	0.004	90	884	0.0217		
* 82 PCB-167L	372	10.023	10.027	-0.004	73	19872	0.4000		
83 PCB-204	428	10.250	10.250	0.000	74	948	0.0358		
84 PCB-192	394	10.275	10.275	0.000	7	1966	0.0527		

QC Flag Legend

Processing Flags

7 - Failed Limit of Detection

Review Flags

M - Manually Integrated

Reagents:

60ISPCB_00001 Amount Added: 5.00 Units: uL

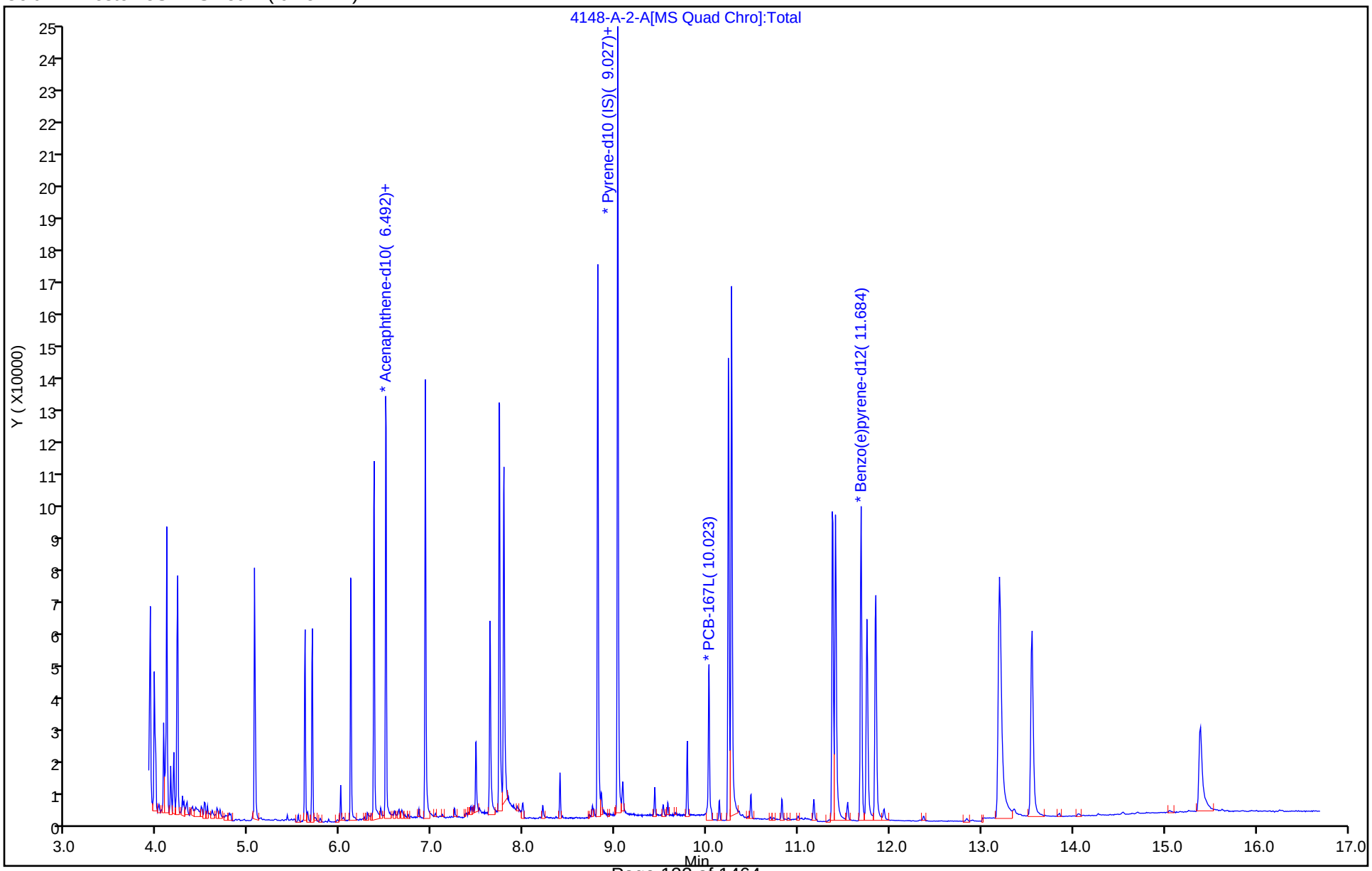
Report Date: 22-Nov-2023 16:14:12 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-2-A.D

Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2	Worklist Smp#:	31
Client ID:	GEI.PRC.BLK2				
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)

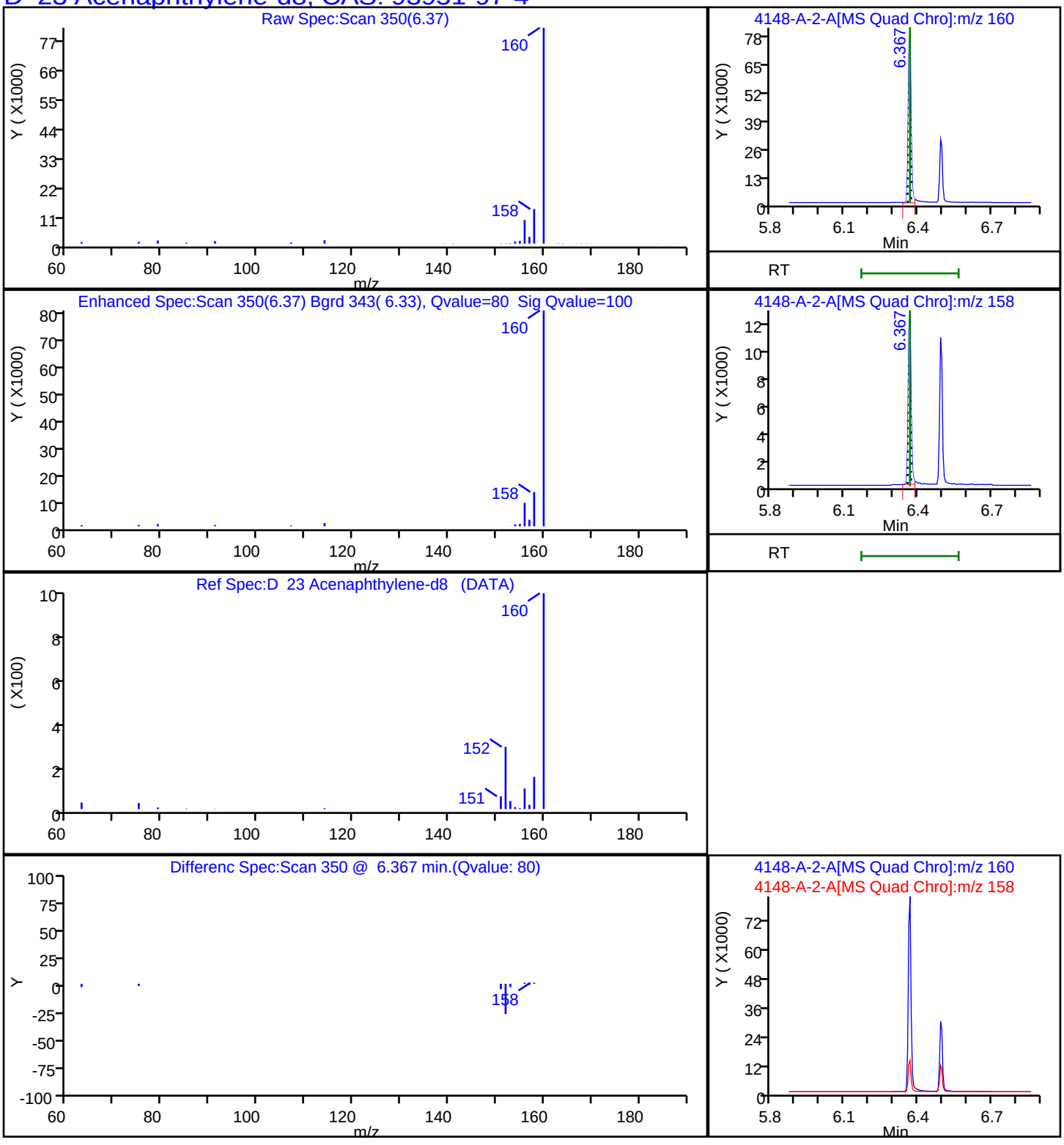


Report Date: 22-Nov-2023 16:14:12 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-2-A.D				
Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 23 Acenaphthylene-d8, CAS: 93951-97-4



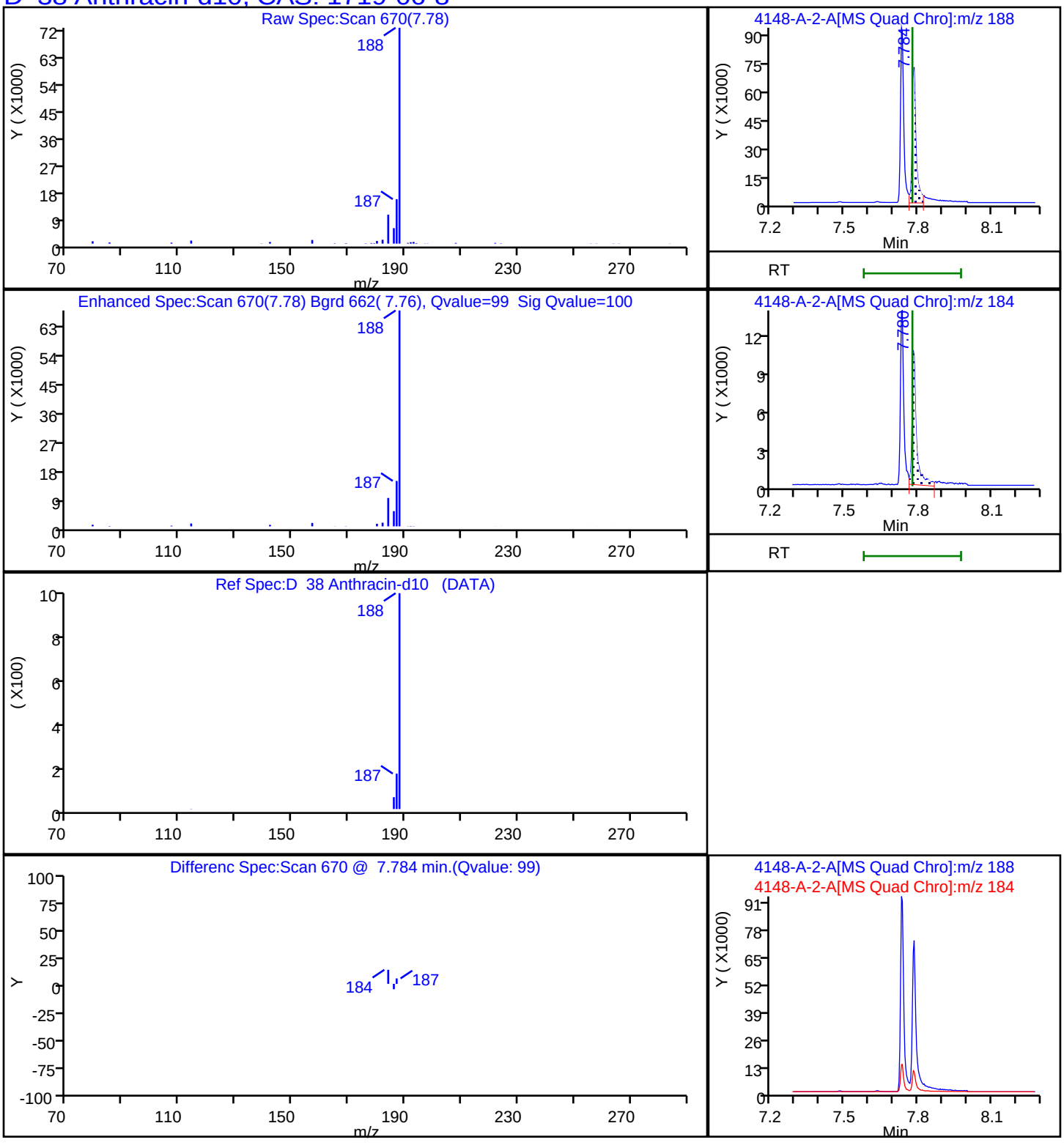
Report Date: 22-Nov-2023 16:14:12 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-2-A.D

Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 38 Anthracin-d10, CAS: 1719-06-8

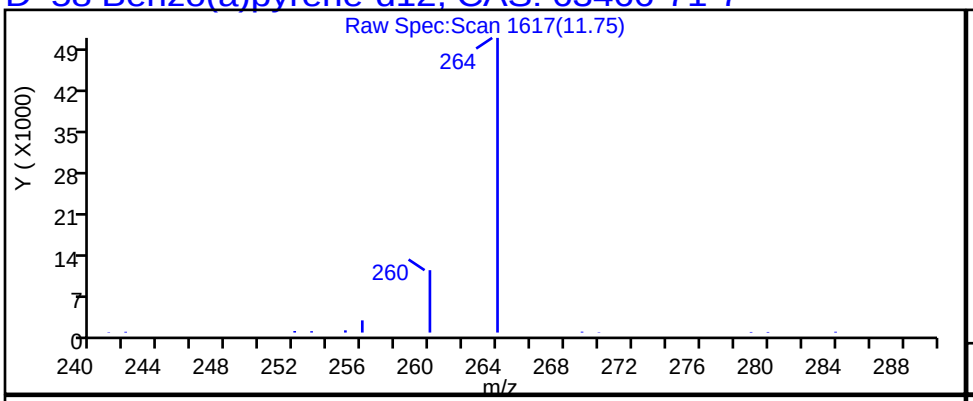


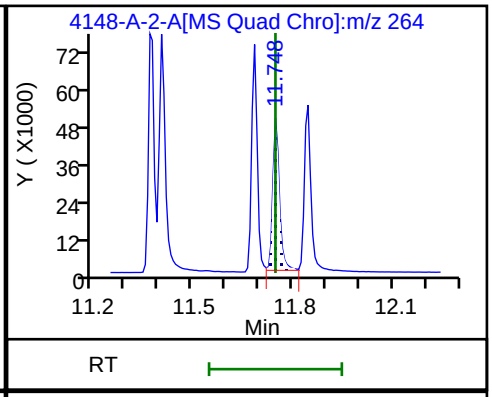
Report Date: 22-Nov-2023 16:14:12 Chrom Revision: 2.3 15-Nov-2023 20:54:34

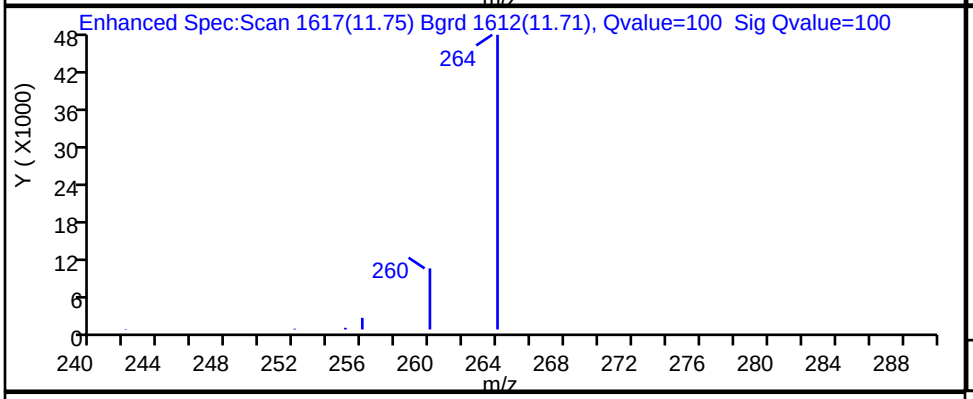
Eurofins Knoxville

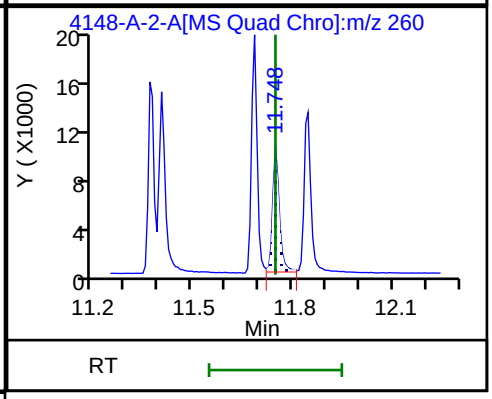
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-2-A.D				
Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

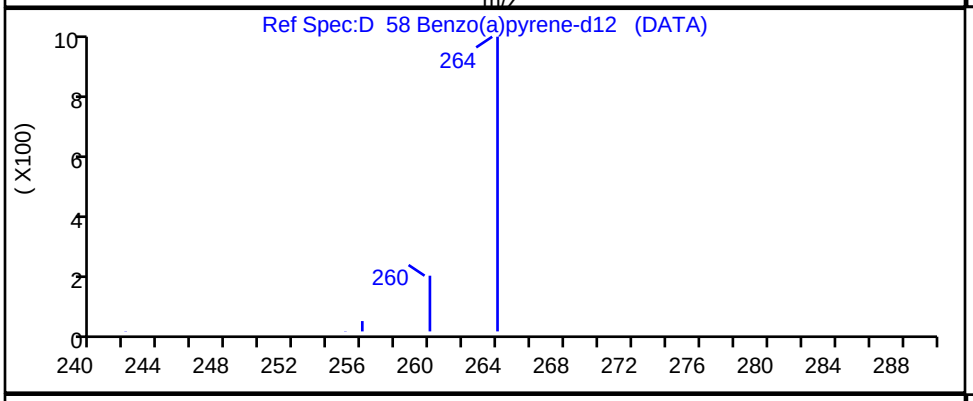
D 58 Benzo(a)pyrene-d12, CAS: 63466-71-7

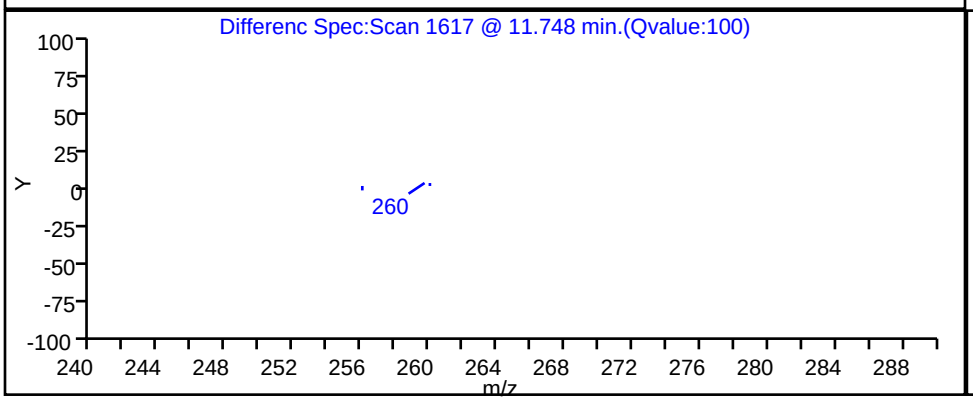


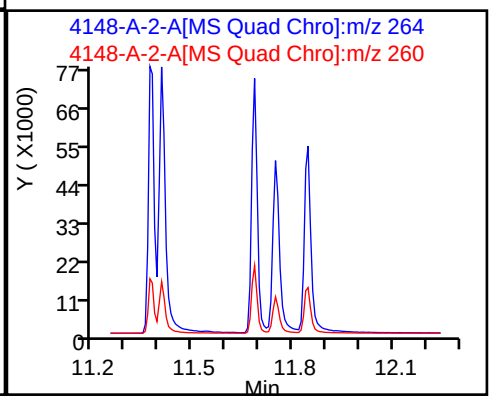










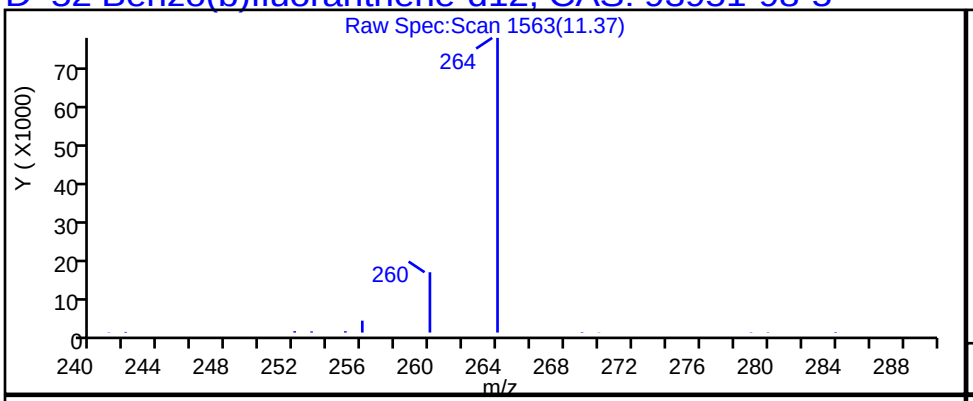


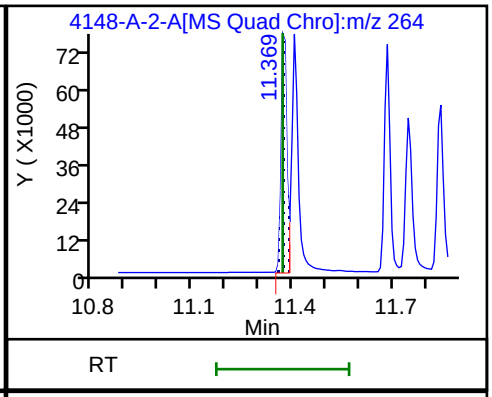
Report Date: 22-Nov-2023 16:14:12 Chrom Revision: 2.3 15-Nov-2023 20:54:34

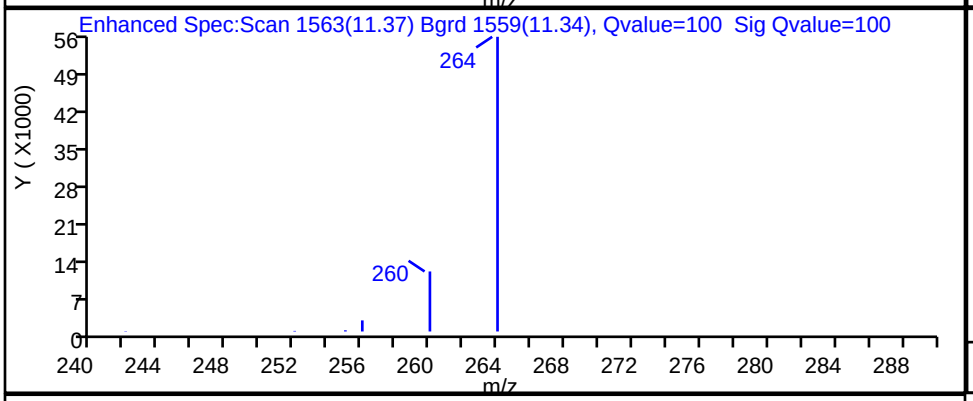
Eurofins Knoxville

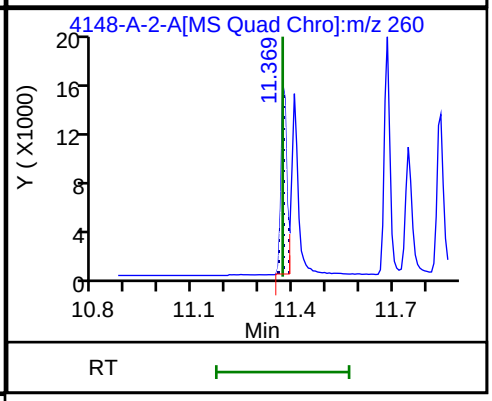
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-2-A.D				
Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

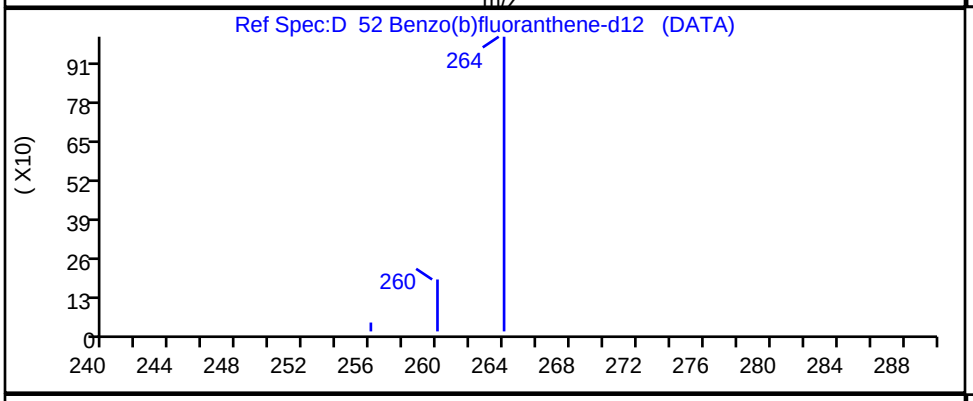
D 52 Benzo(b)fluoranthene-d12, CAS: 93951-98-5

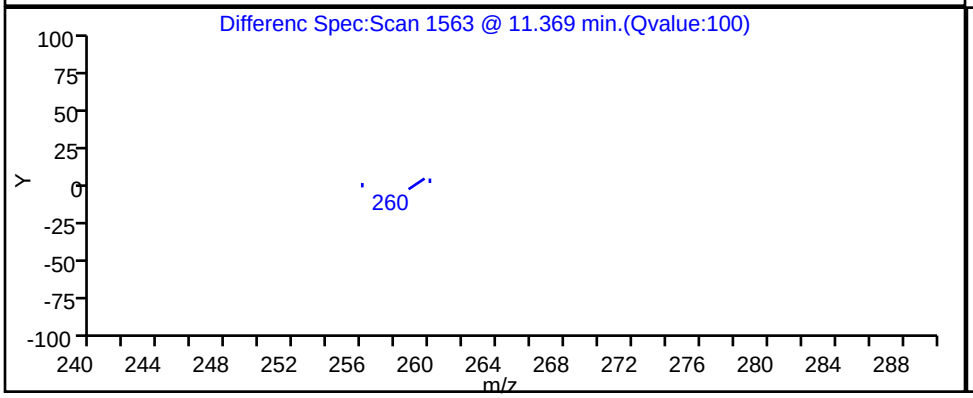


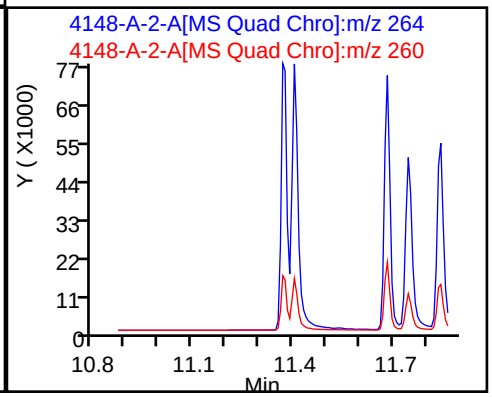










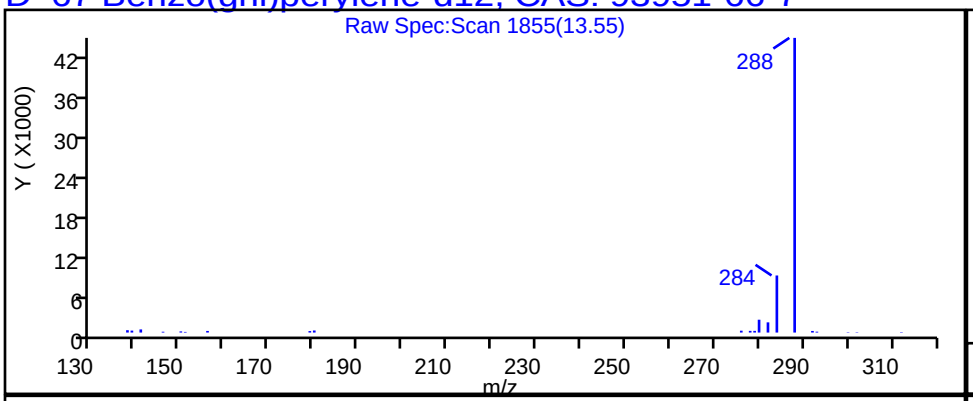


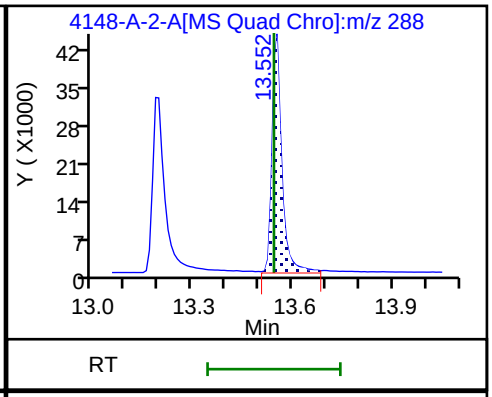
Report Date: 22-Nov-2023 16:14:12 Chrom Revision: 2.3 15-Nov-2023 20:54:34

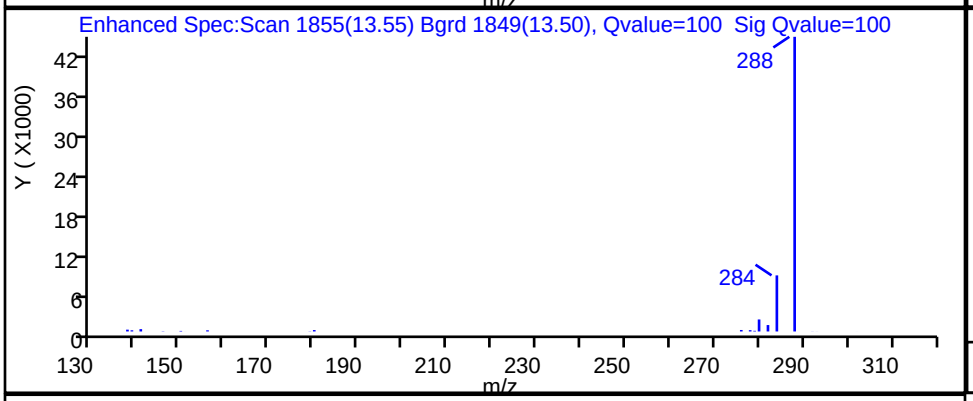
Eurofins Knoxville

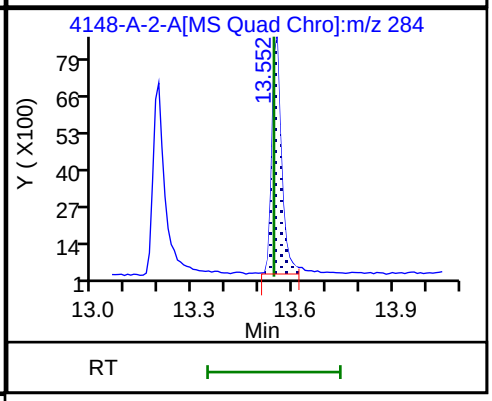
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-2-A.D				
Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

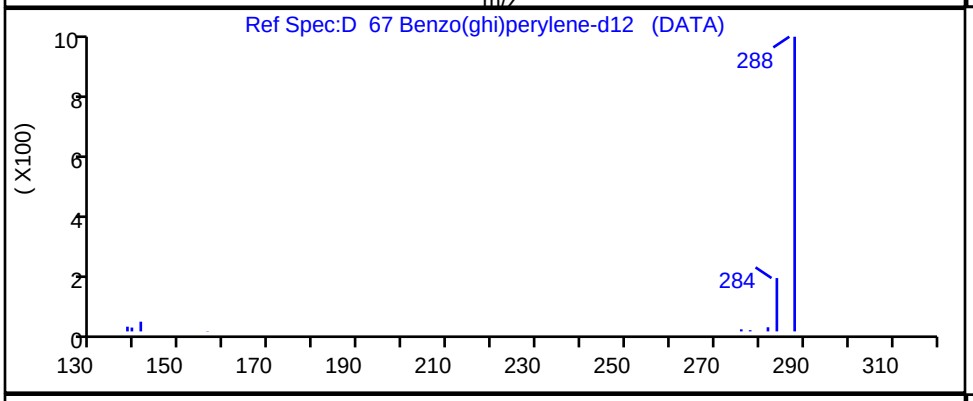
D 67 Benzo(ghi)perylene-d12, CAS: 93951-66-7

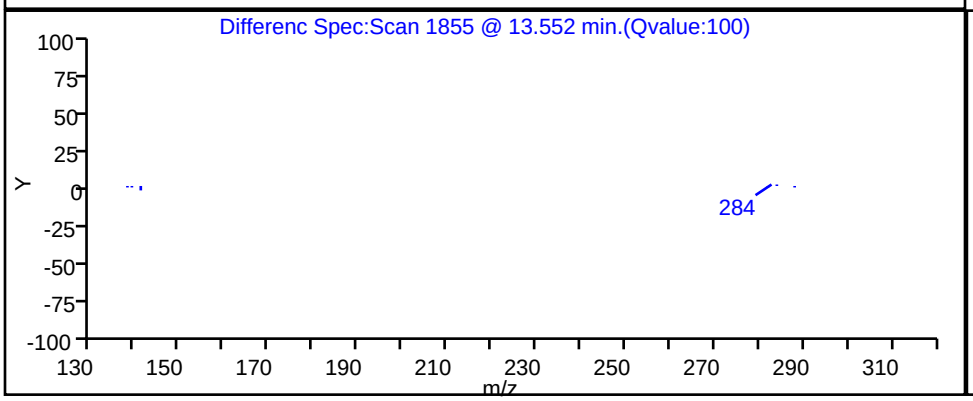


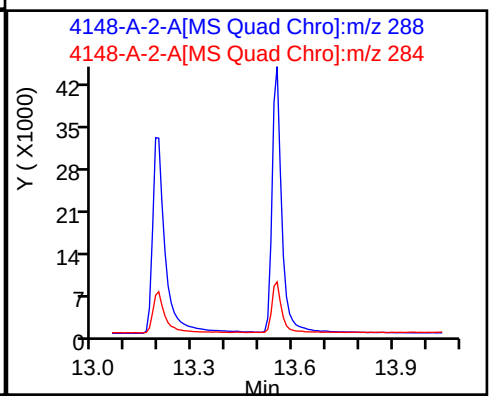












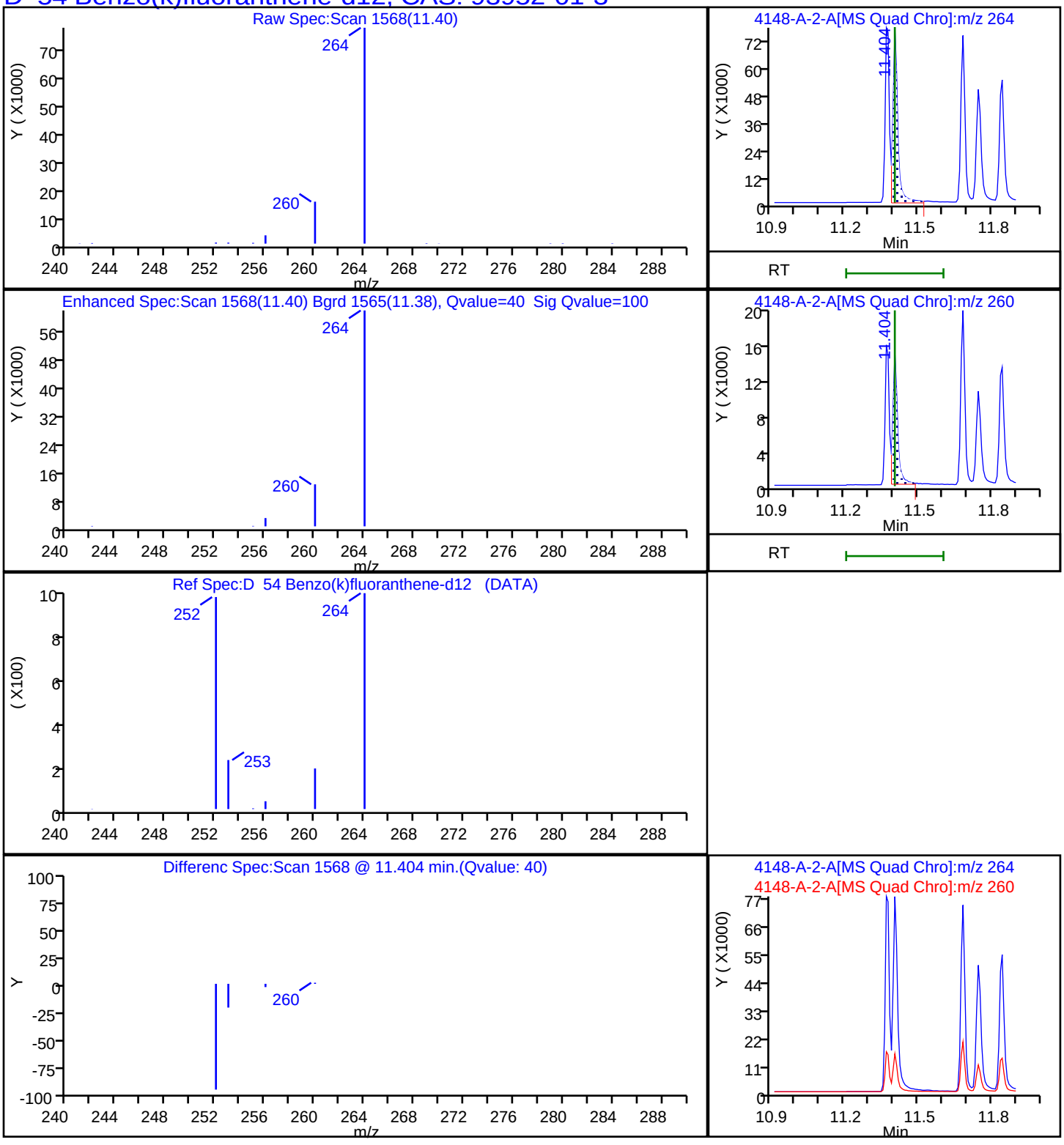
Report Date: 22-Nov-2023 16:14:12 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-2-A.D

Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 54 Benzo(k)fluoranthene-d12, CAS: 93952-01-3

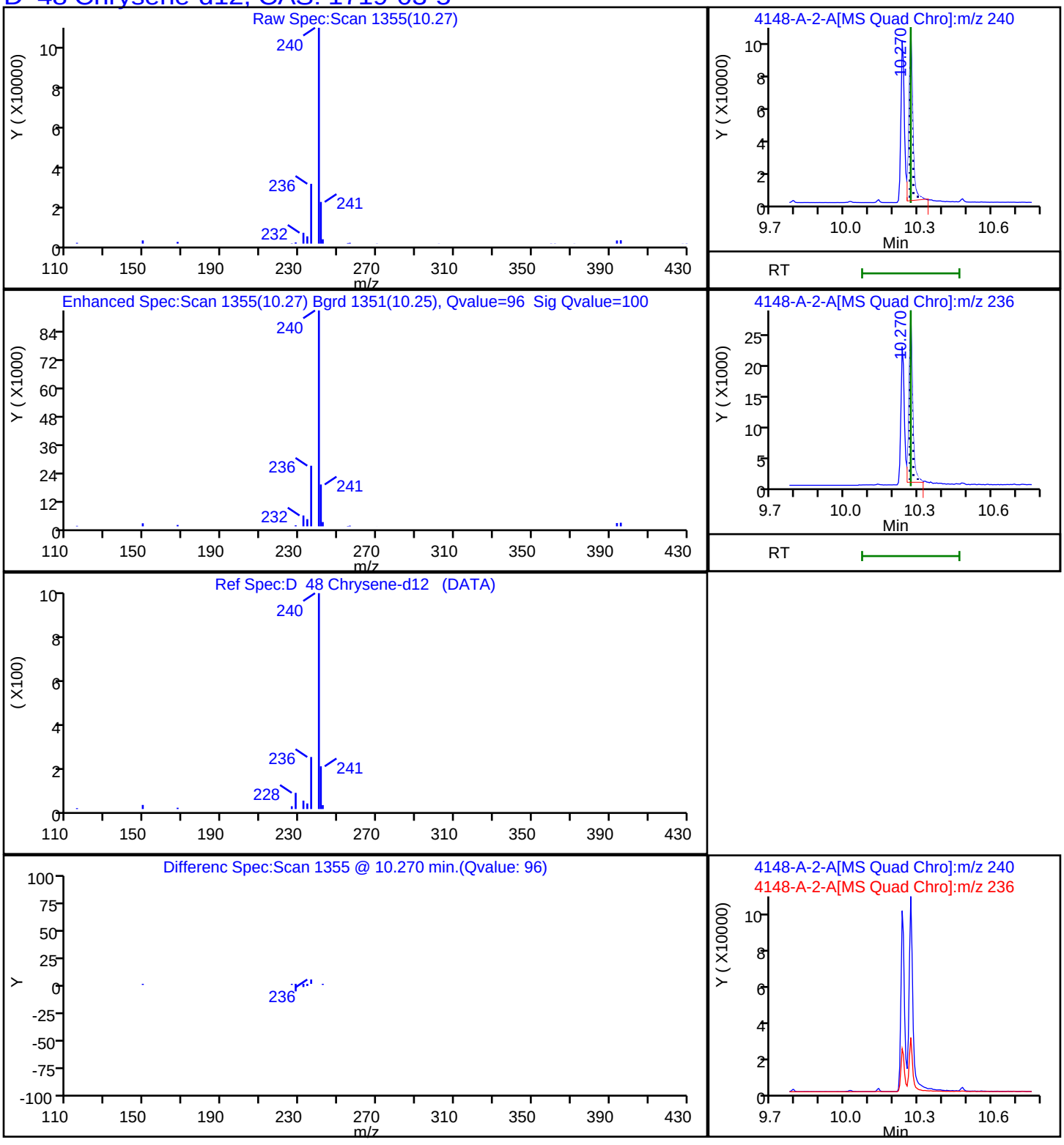


Report Date: 22-Nov-2023 16:14:12 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-2-A.D				
Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D_48 Chrysene-d12, CAS: 1719-03-5



Report Date: 22-Nov-2023 16:14:12 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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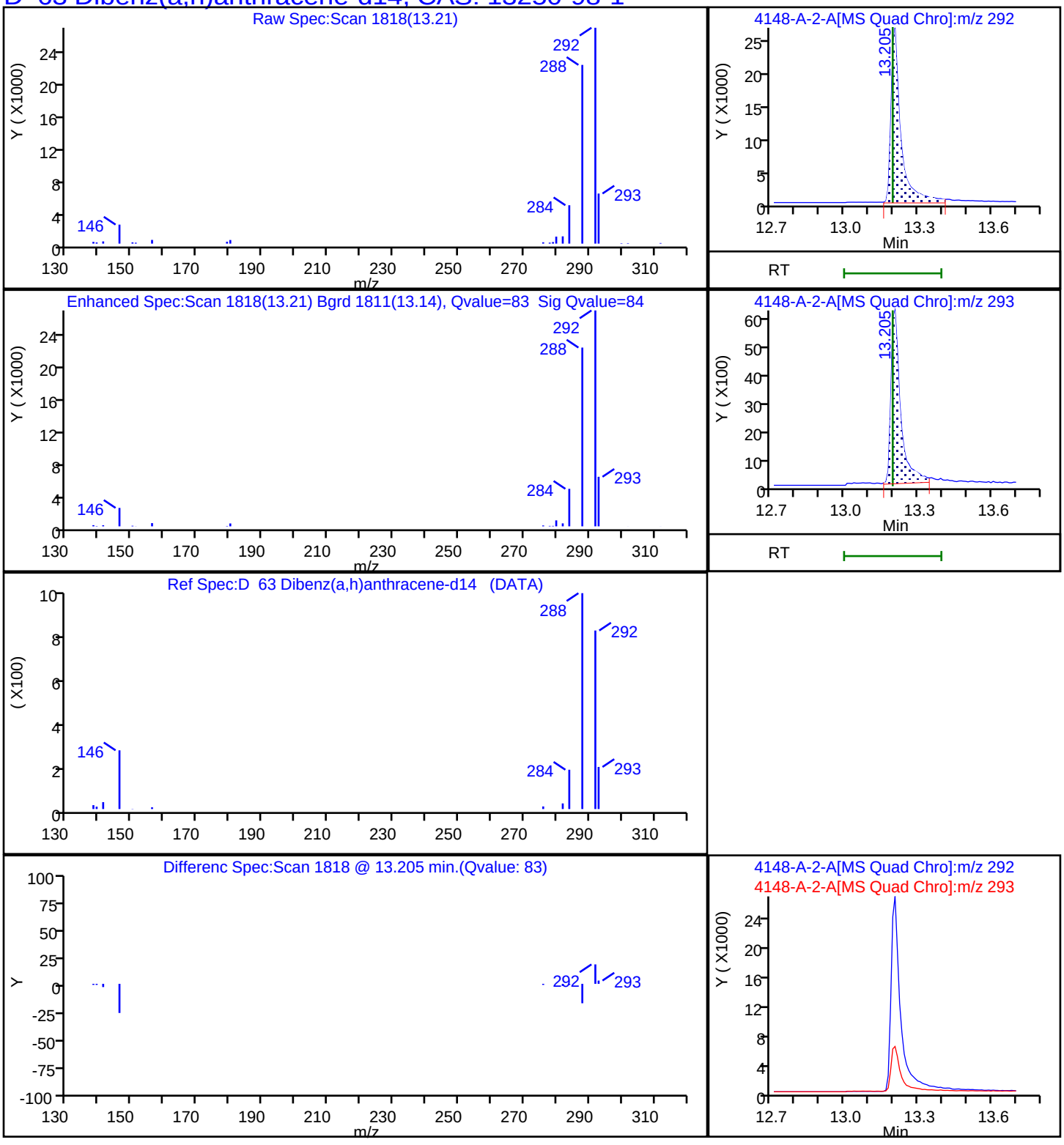
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D_63 Dibenz(a,h)anthracene-d14, CAS: 13250-98-1



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Eurofins Knoxville

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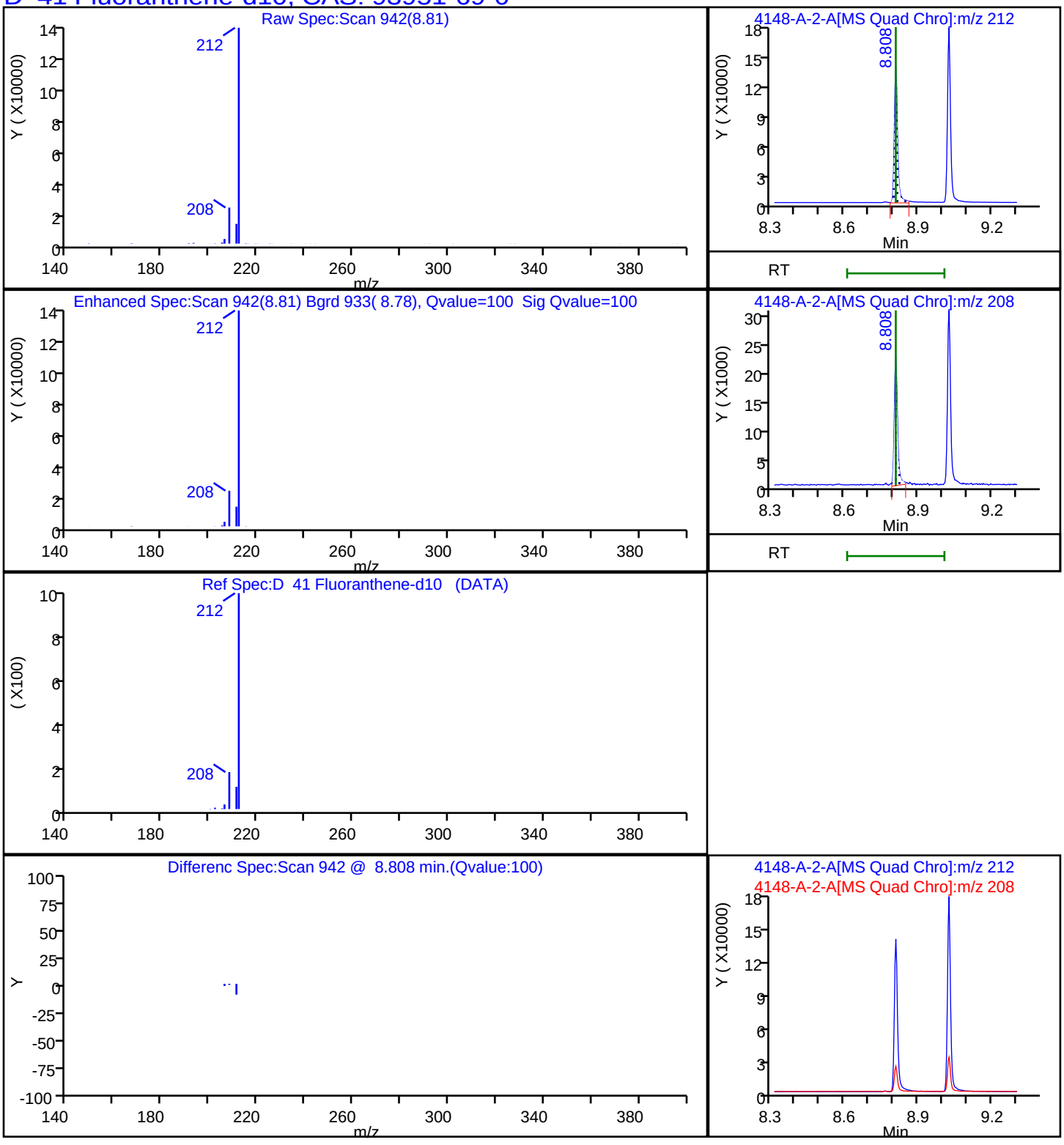
Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 41 Fluoranthene-d10, CAS: 93951-69-0



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Eurofins Knoxville

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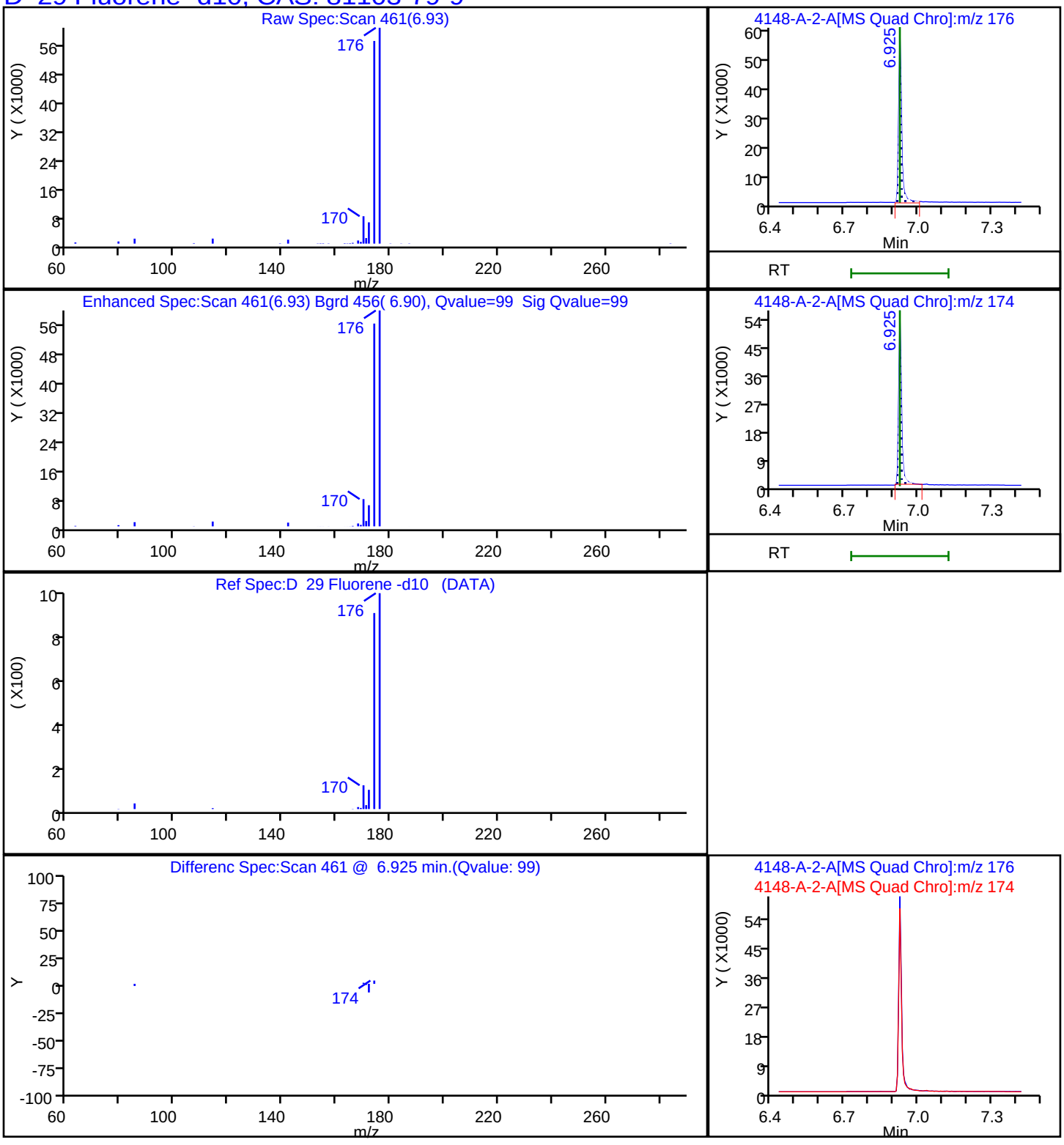
Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 29 Fluorene -d10, CAS: 81103-79-9



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Eurofins Knoxville

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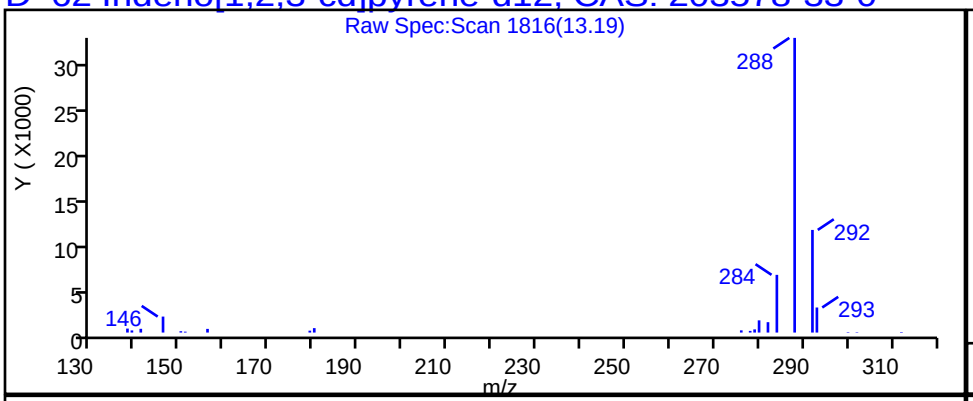
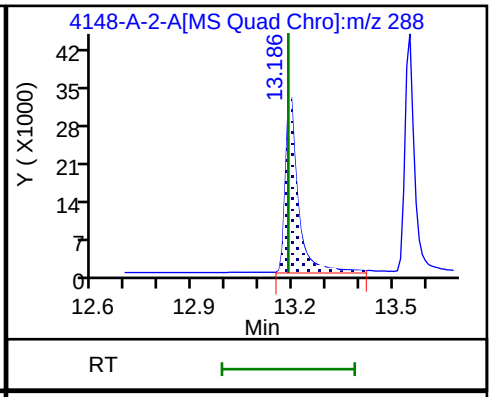
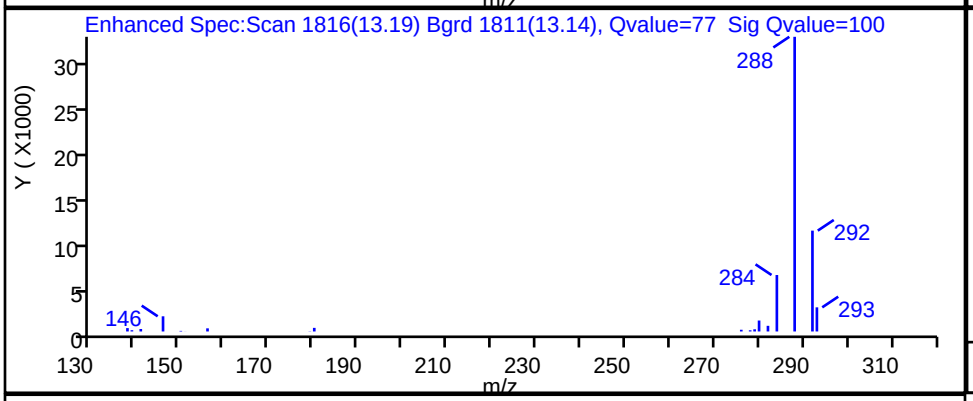
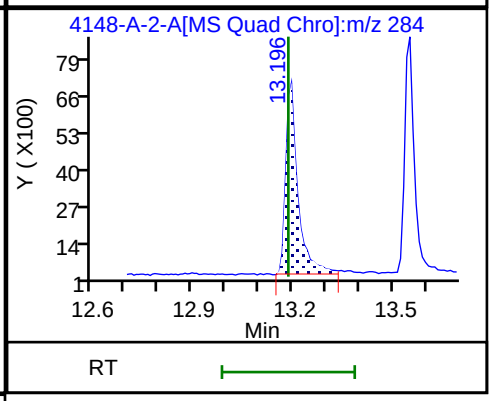
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

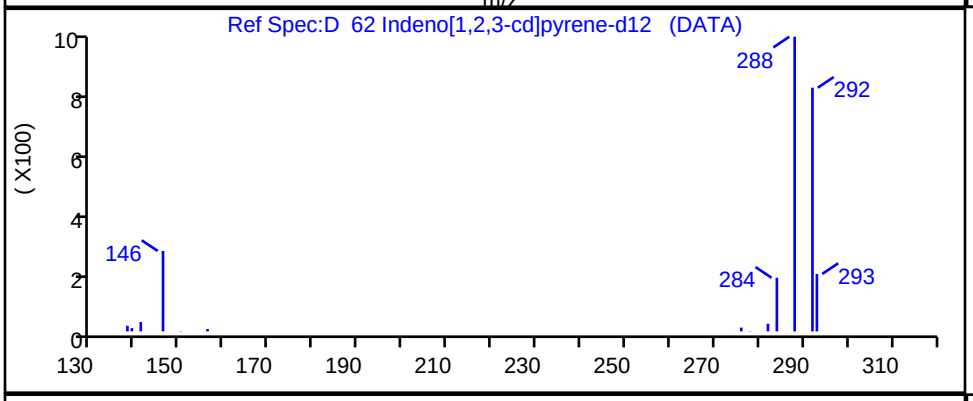
D 62 Indeno[1,2,3-cd]pyrene-d12, CAS: 203578-33-0

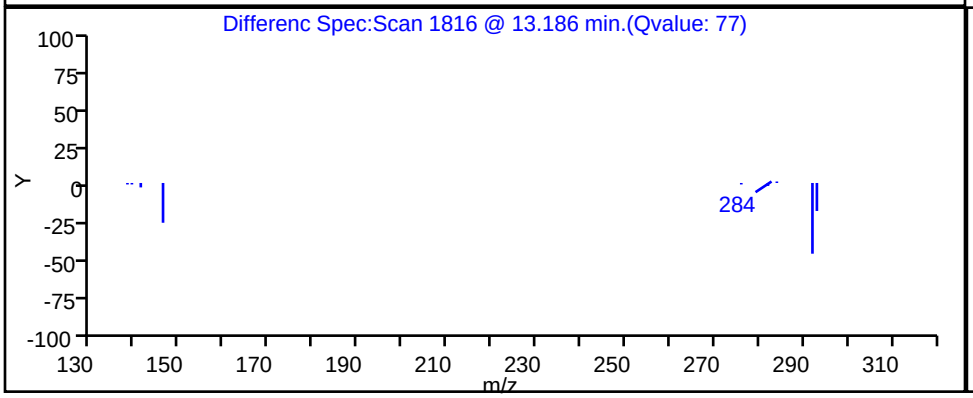


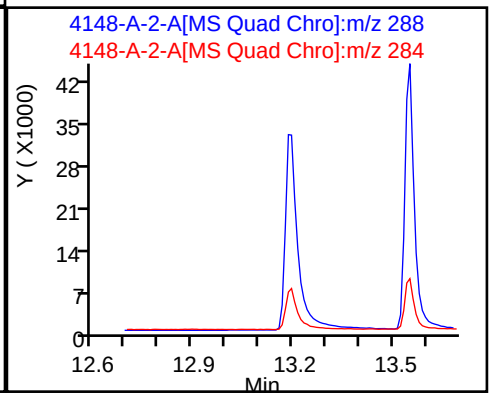












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Eurofins Knoxville

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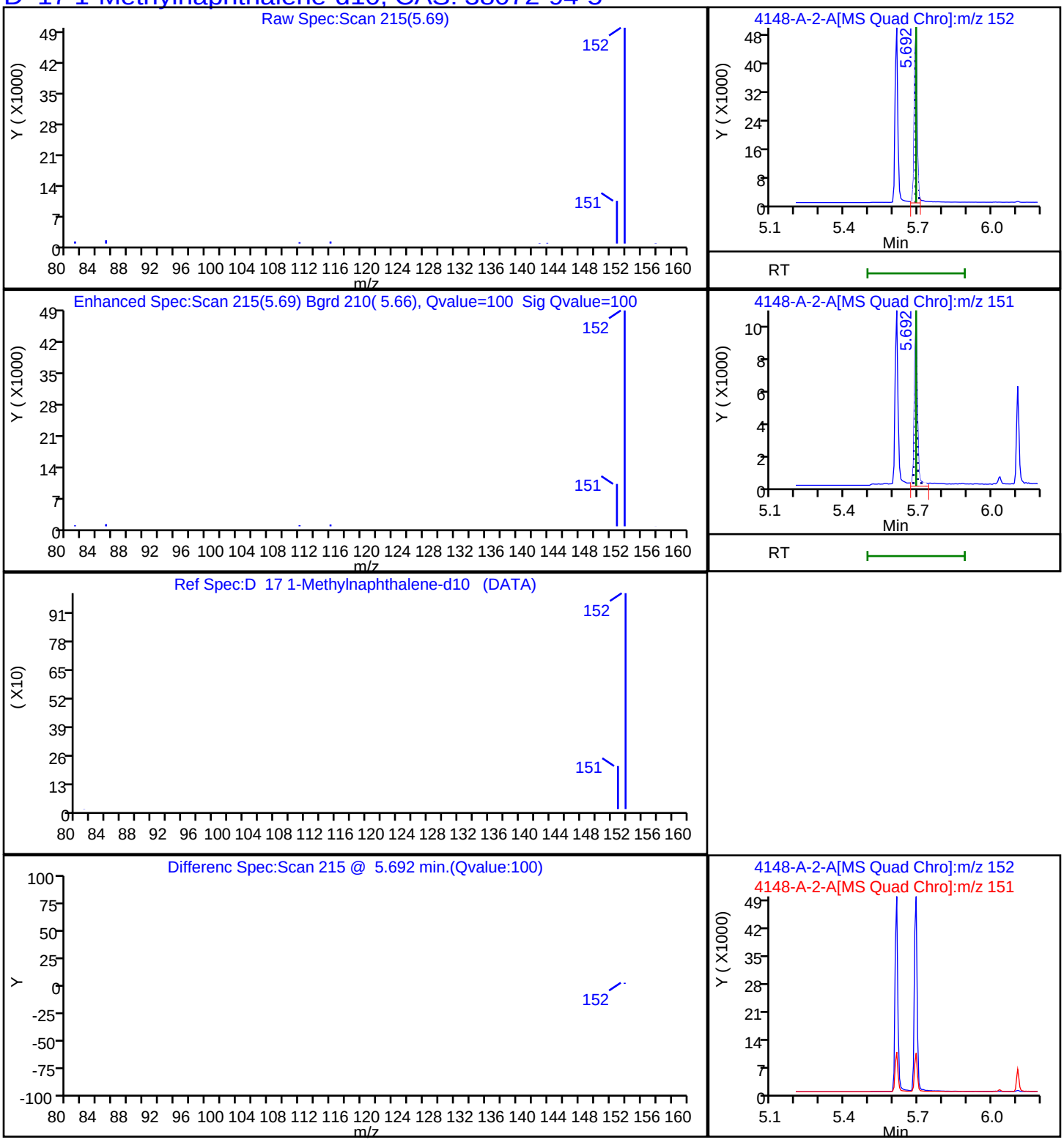
Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 17 1-Methylnaphthalene-d10, CAS: 38072-94-5



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Eurofins Knoxville

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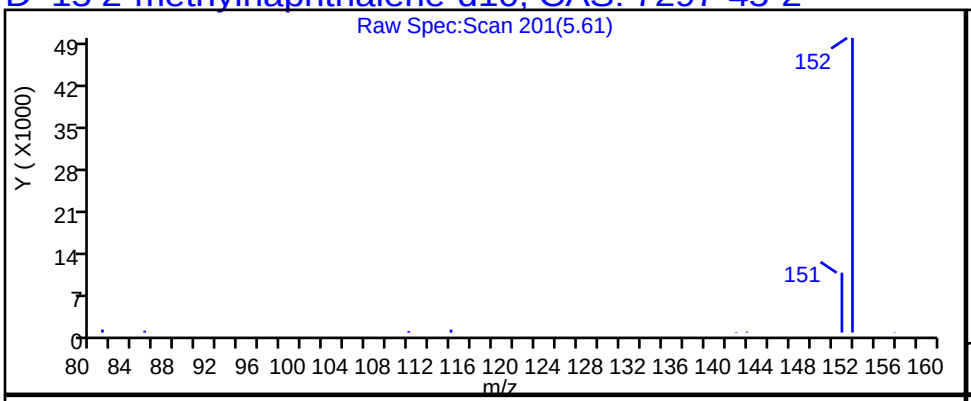
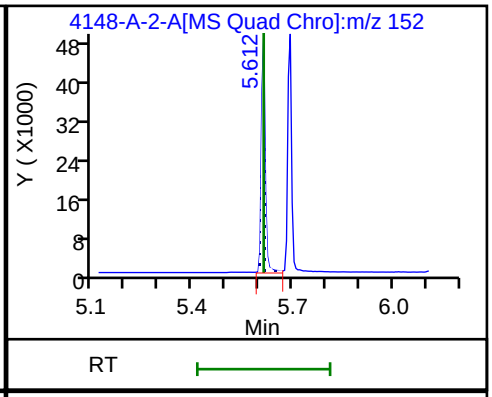
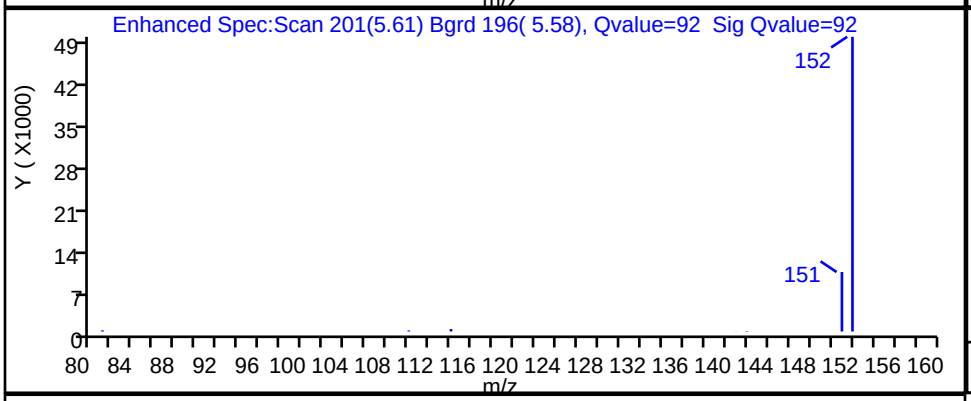
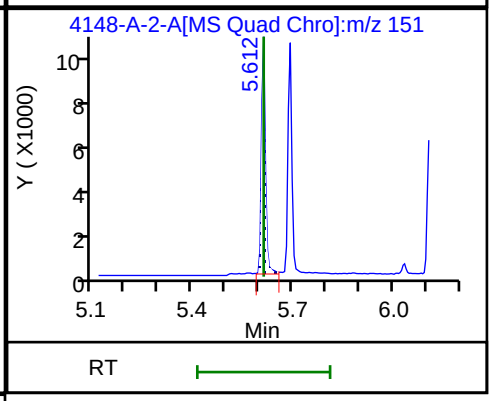
Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2
Client ID:	GEI.PRC.BLK2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

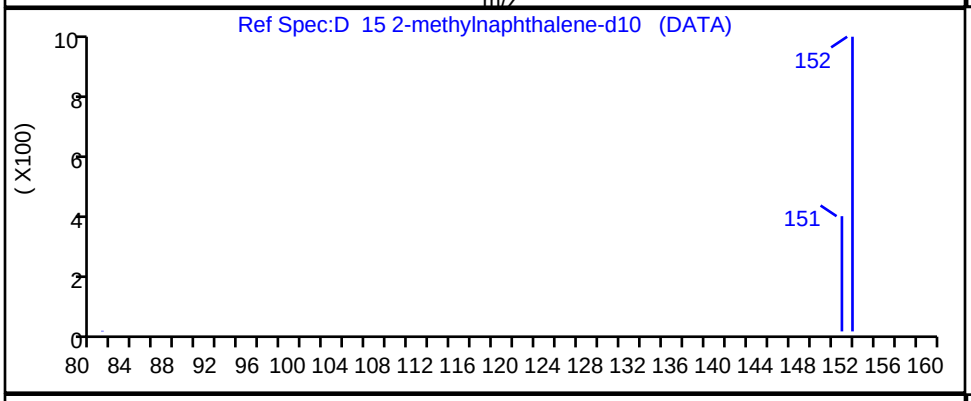
D 15 2-methylnaphthalene-d10, CAS: 7297-45-2

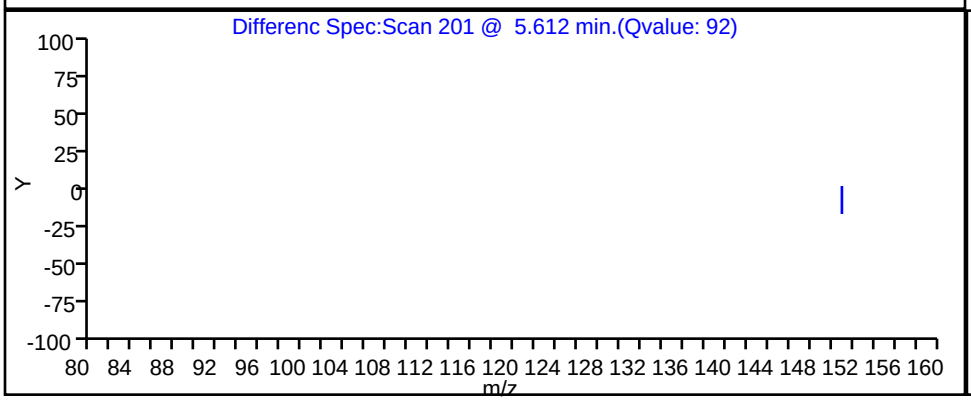


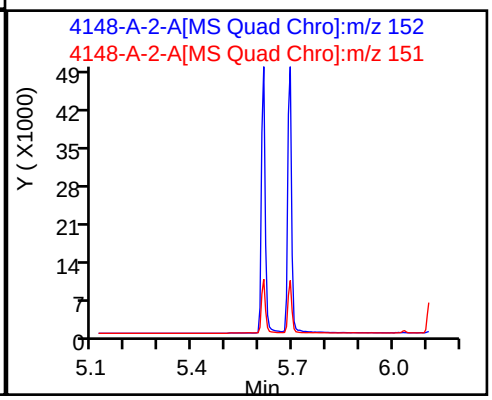












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Eurofins Knoxville

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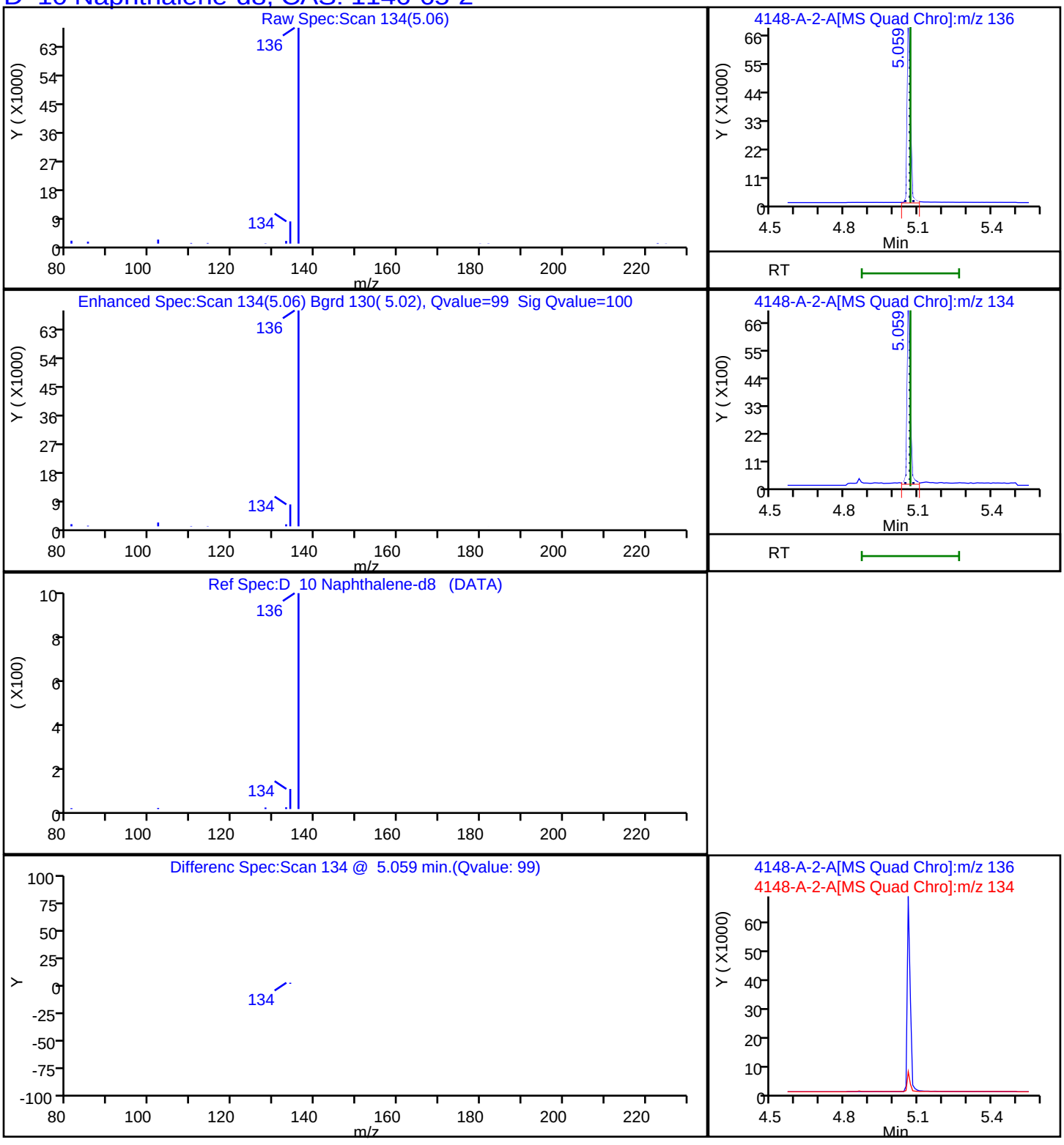
Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D_10 Naphthalene-d8, CAS: 1146-65-2



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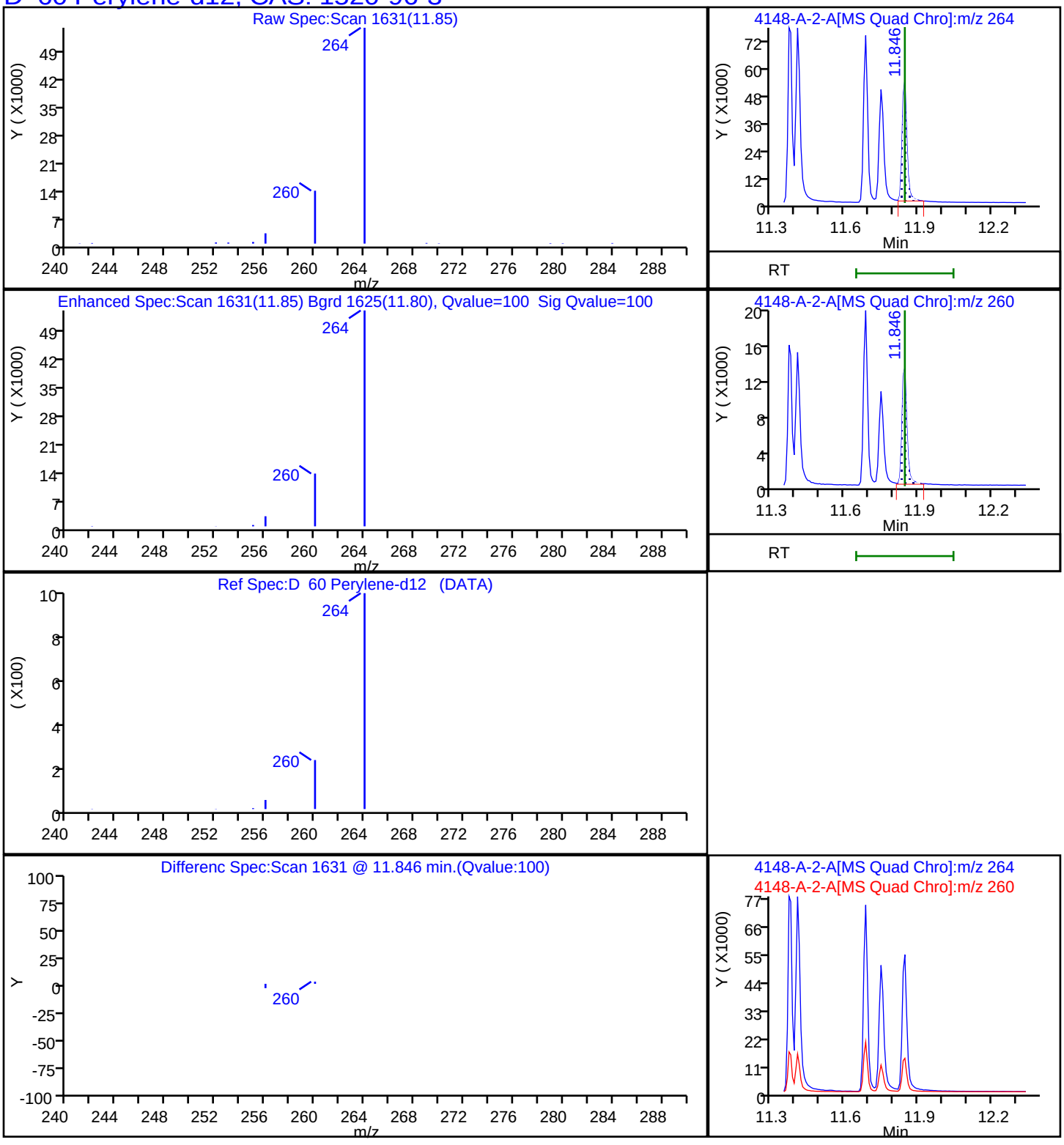
Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 60 Perylene-d12, CAS: 1520-96-3



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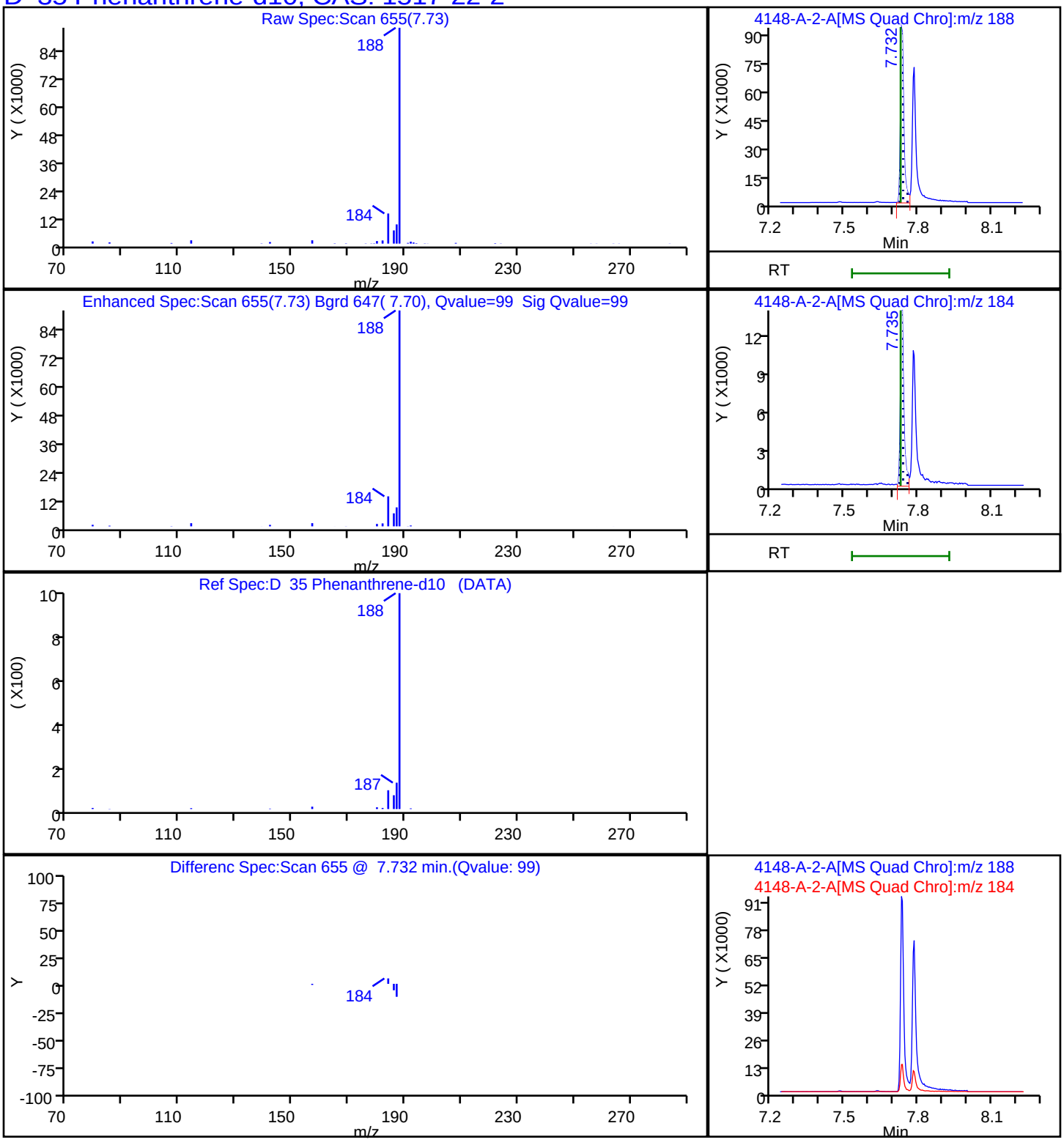
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D_35 Phenanthrene-d10, CAS: 1517-22-2



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Eurofins Knoxville

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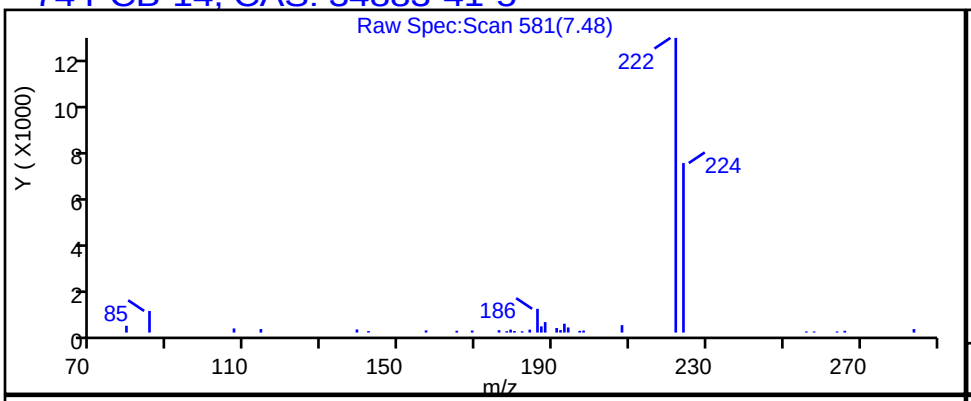
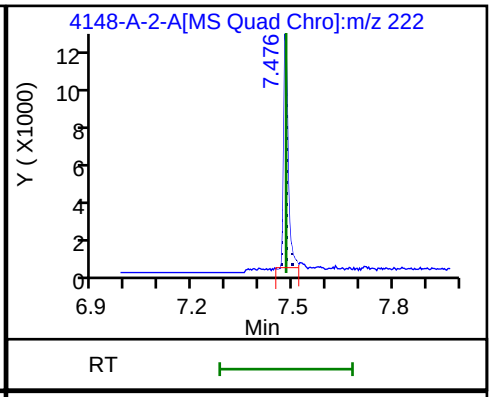
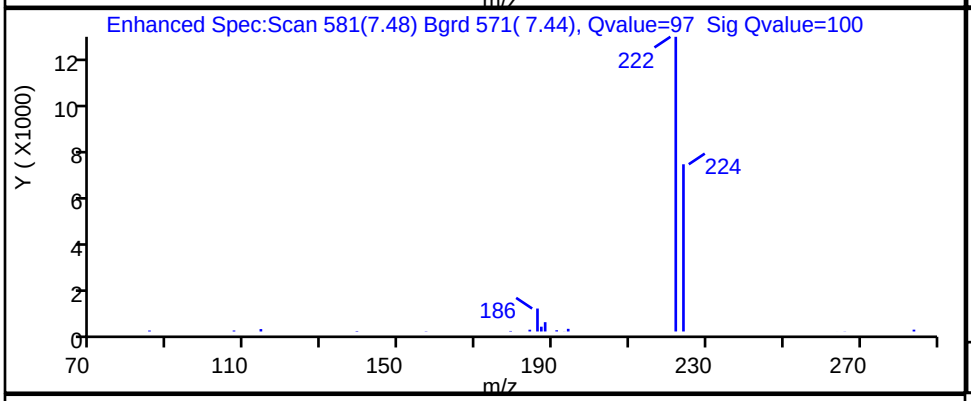
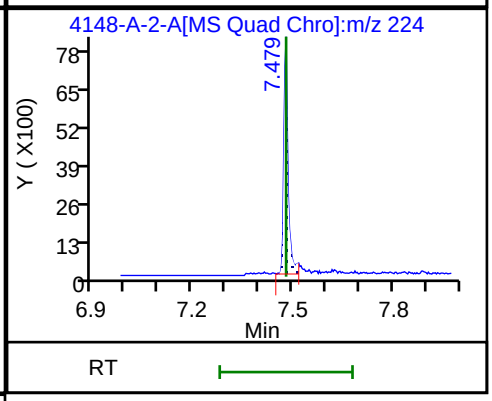
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2
Client ID:	GEI.PRC.BLK2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

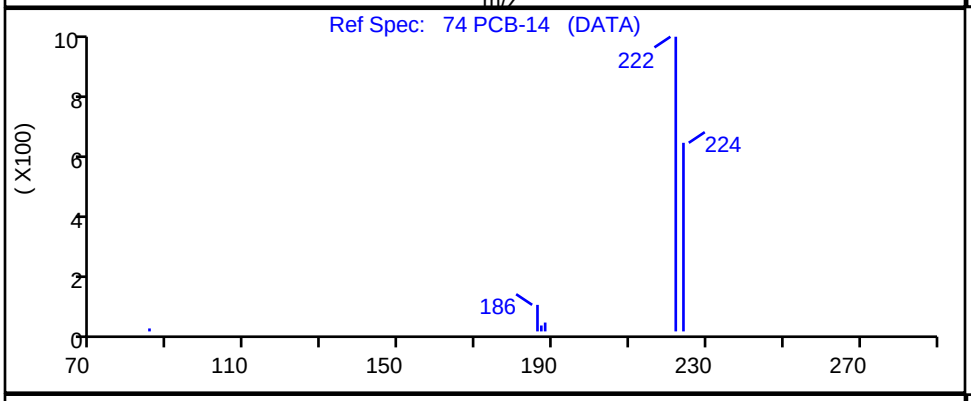
74 PCB-14, CAS: 34883-41-5

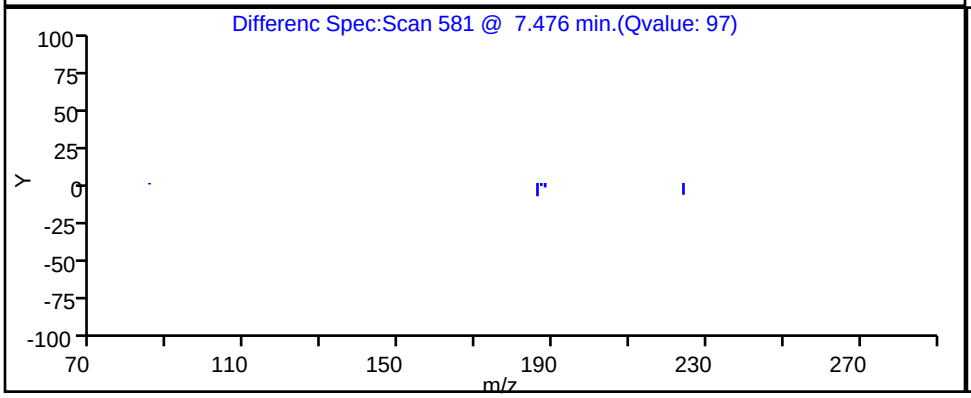


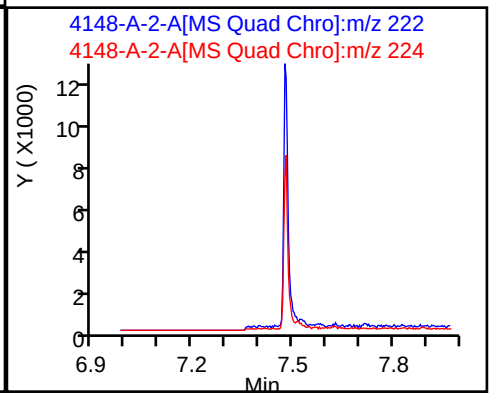












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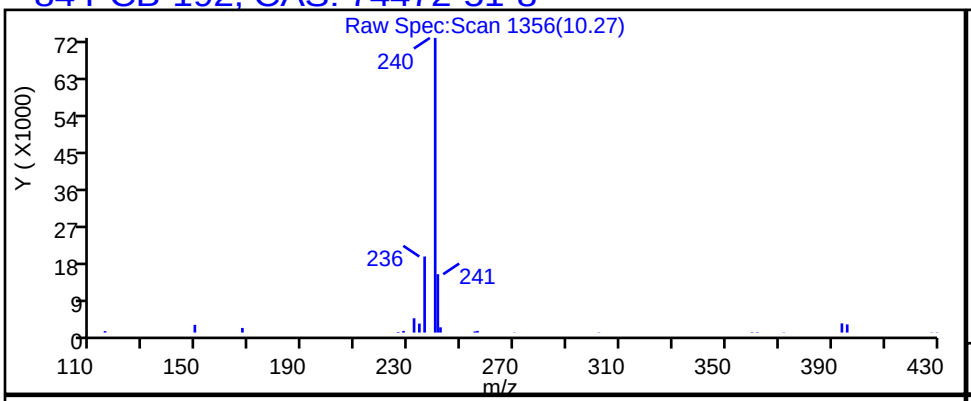
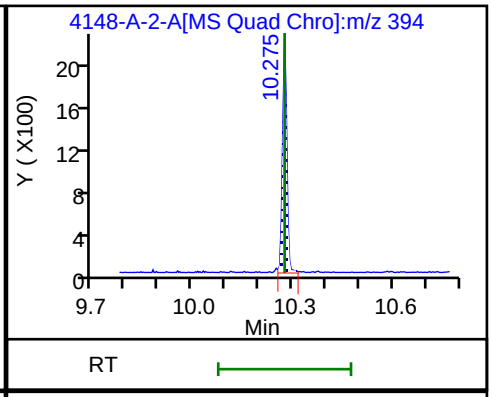
Eurofins Knoxville

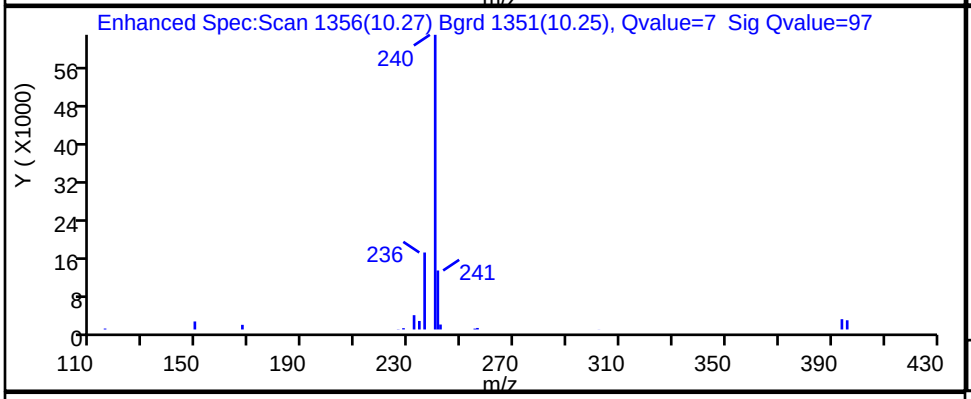
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-2-A.D

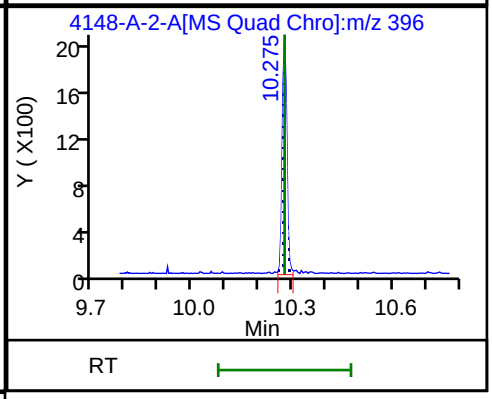
Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

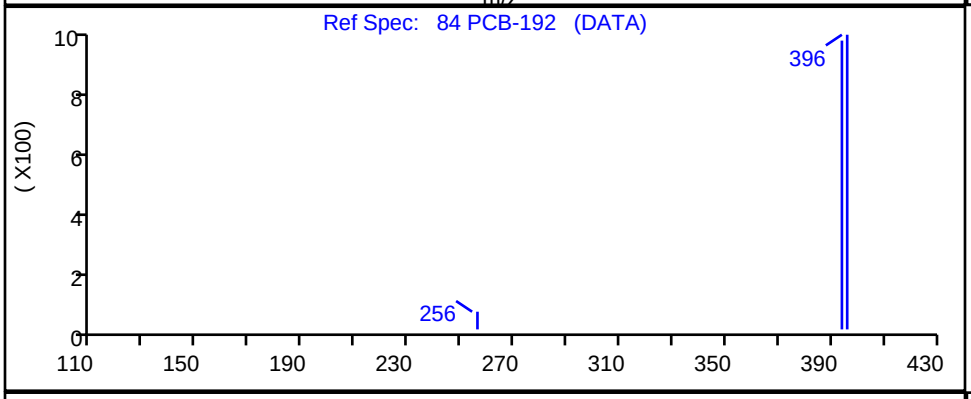
84 PCB-192, CAS: 74472-51-8

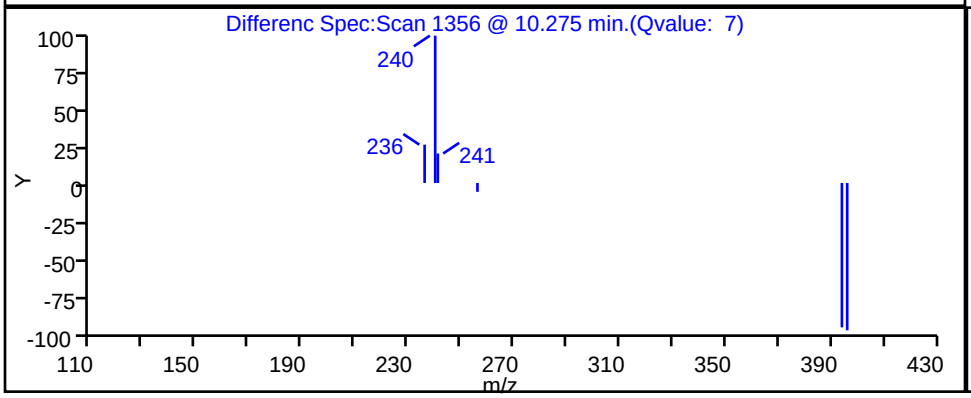


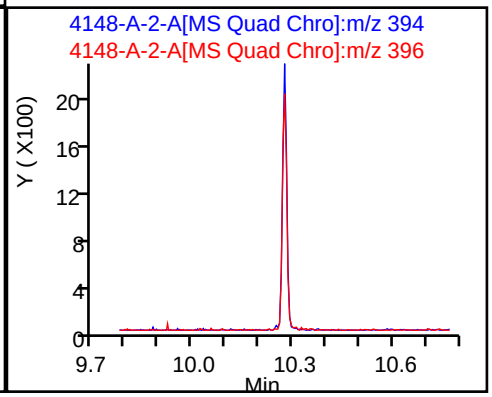












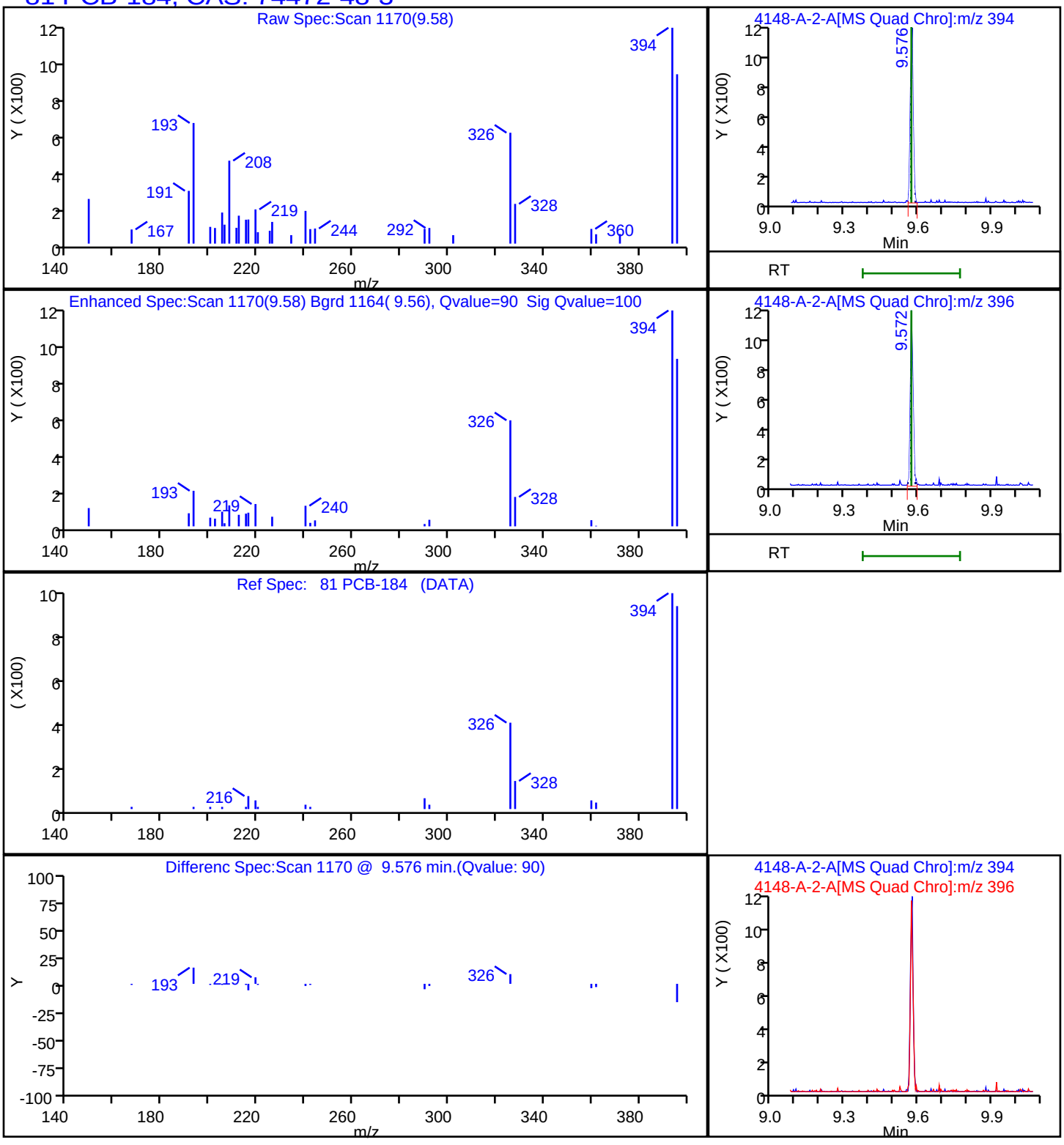
Report Date: 22-Nov-2023 16:14:13 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-2-A.D

Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

81 PCB-184, CAS: 74472-48-3



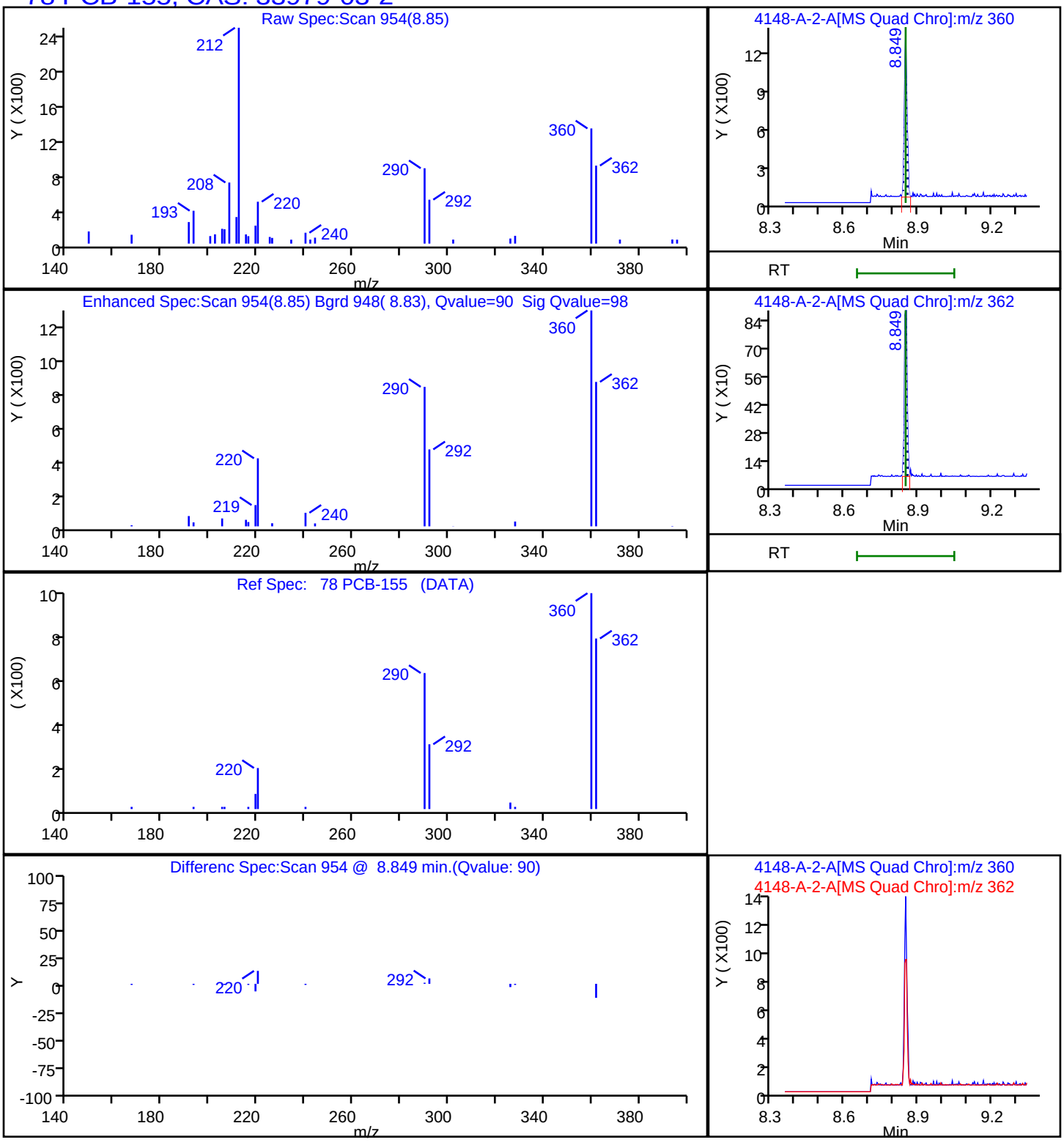
Report Date: 22-Nov-2023 16:14:13 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-2-A.D

Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

78 PCB-155, CAS: 33979-03-2



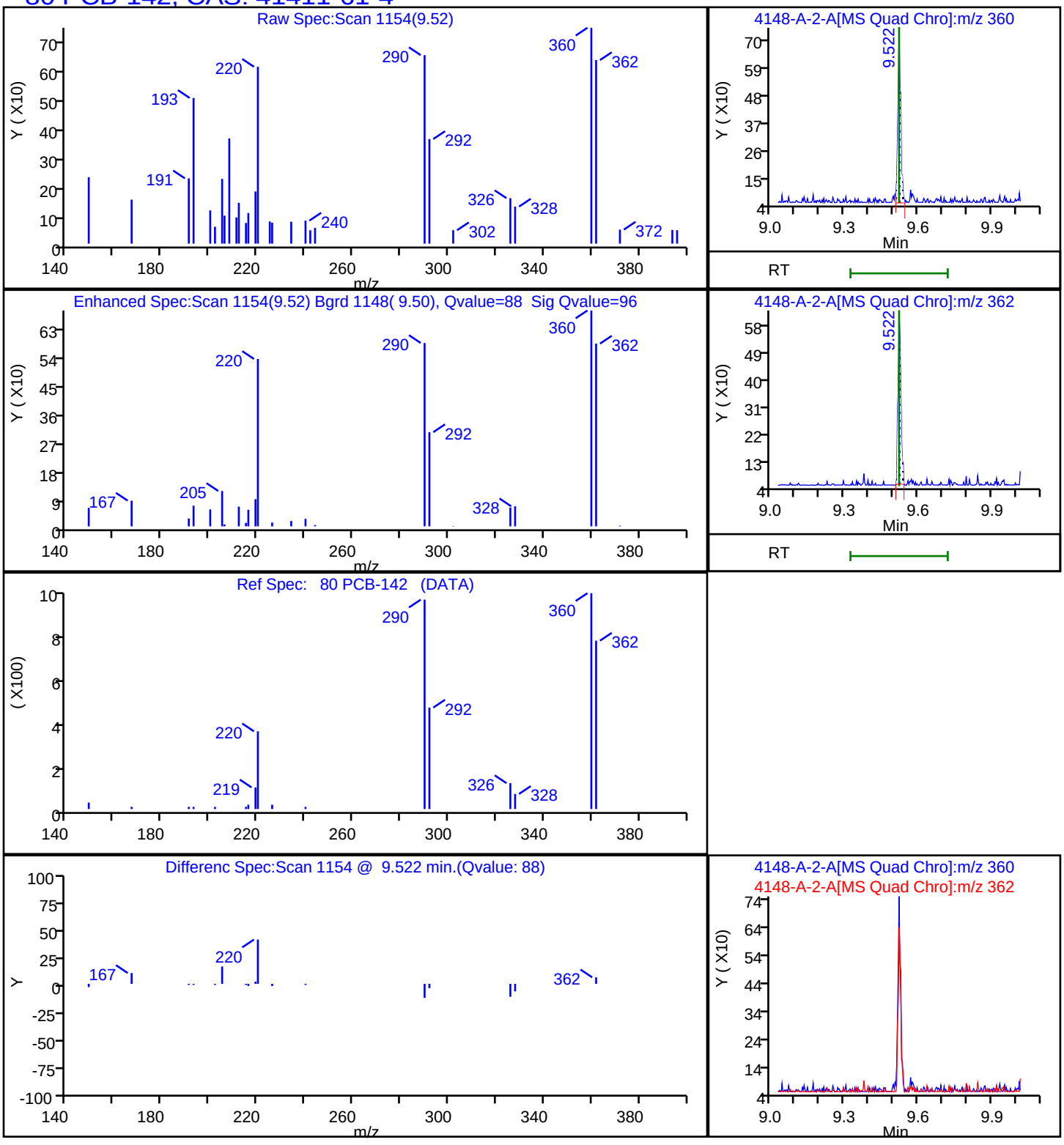
Report Date: 22-Nov-2023 16:14:13 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-2-A.D

Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

80 PCB-142, CAS: 41411-61-4



Report Date: 22-Nov-2023 16:14:13 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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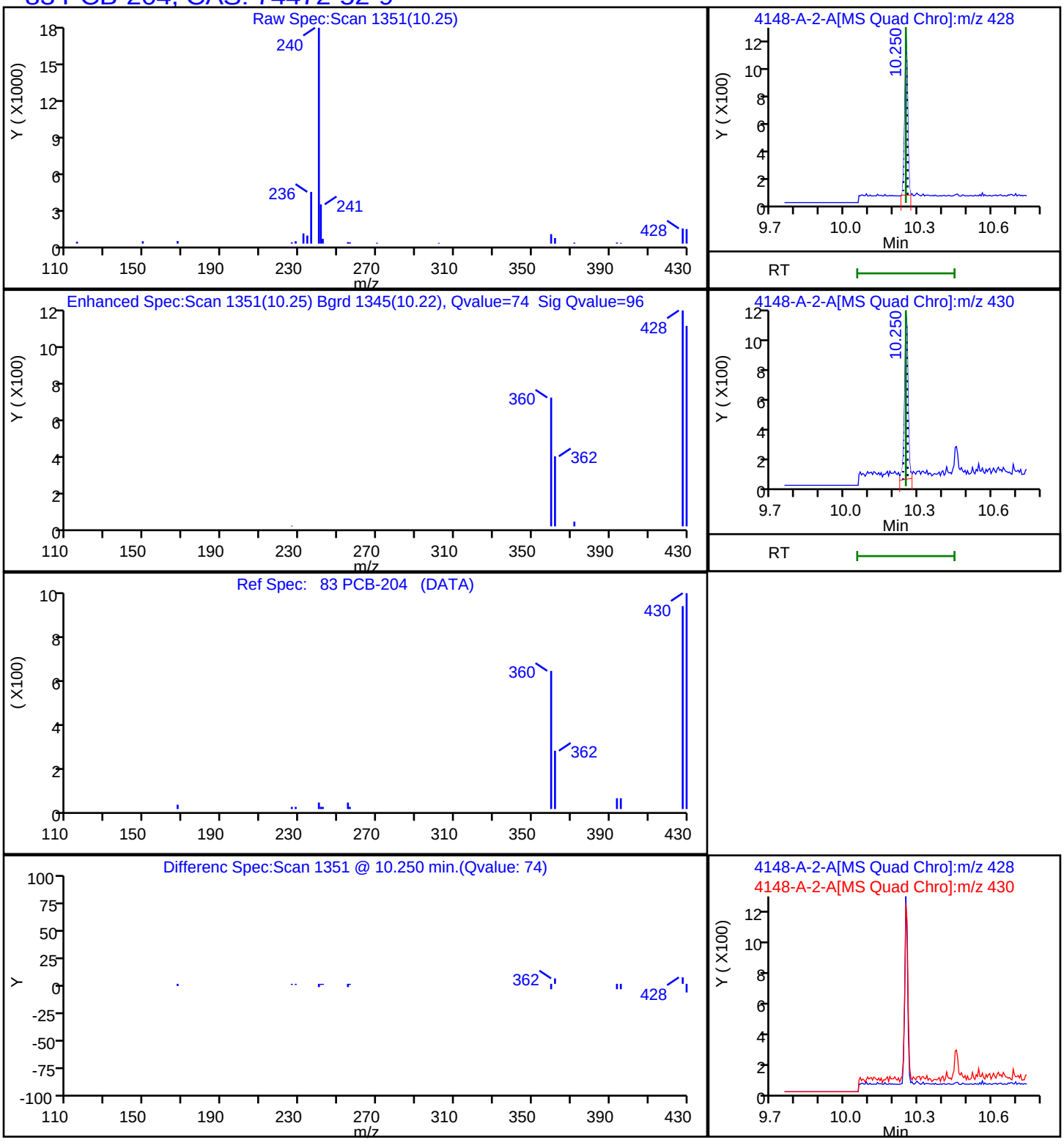
Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

83 PCB-204, CAS: 74472-52-9



Report Date: 22-Nov-2023 16:14:13 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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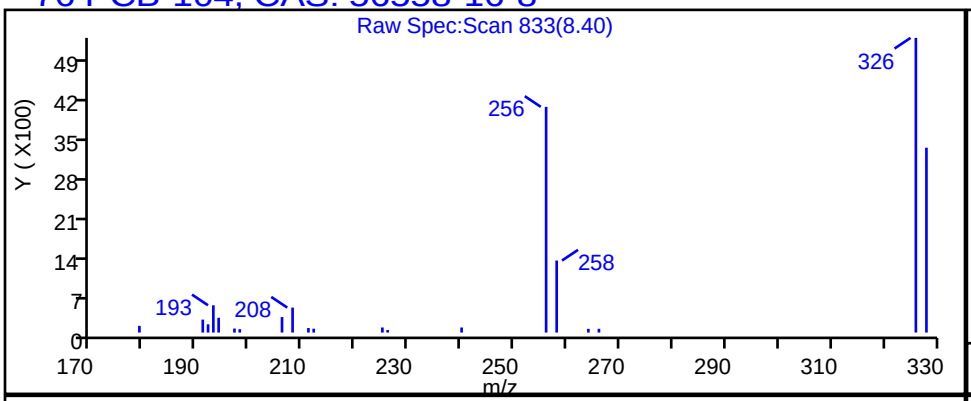
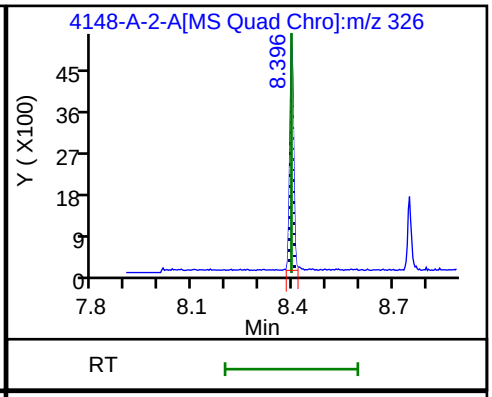
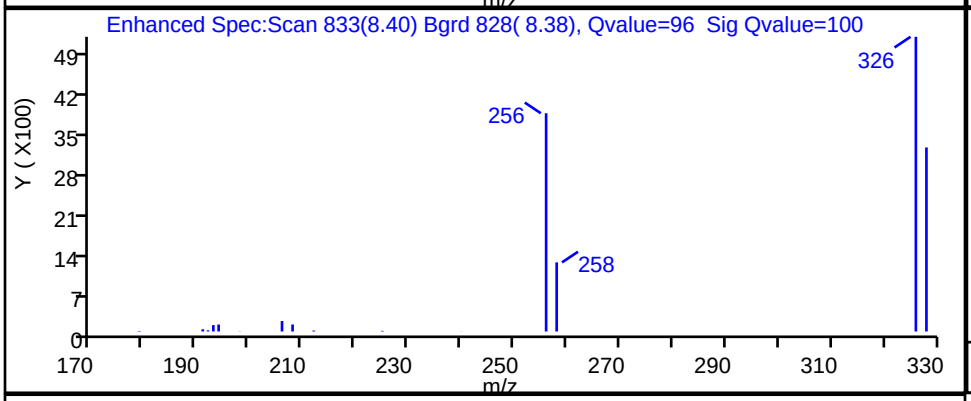
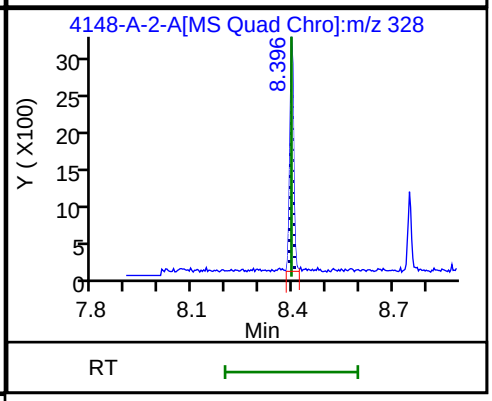
Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

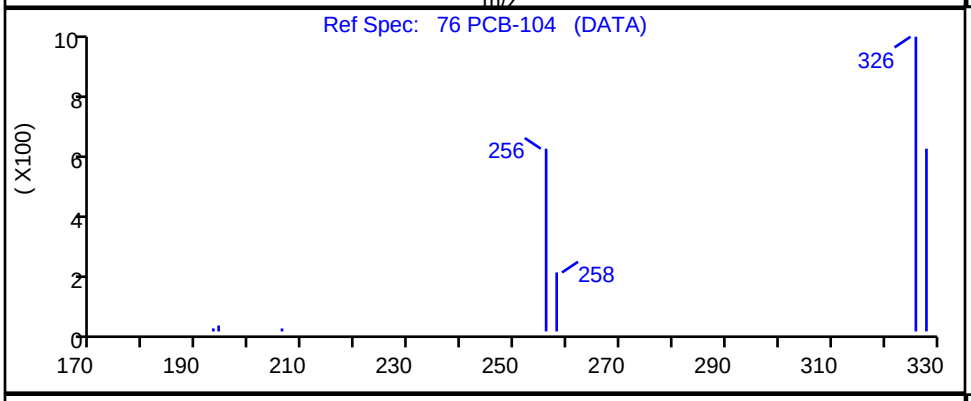
76 PCB-104, CAS: 56558-16-8

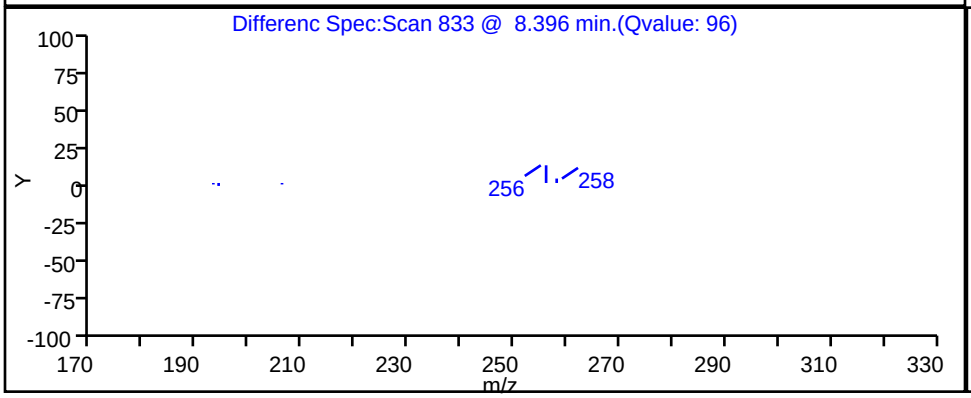


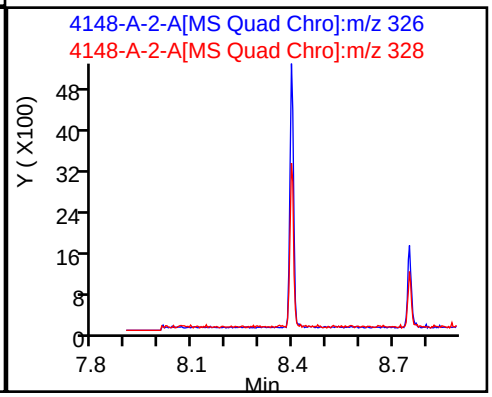












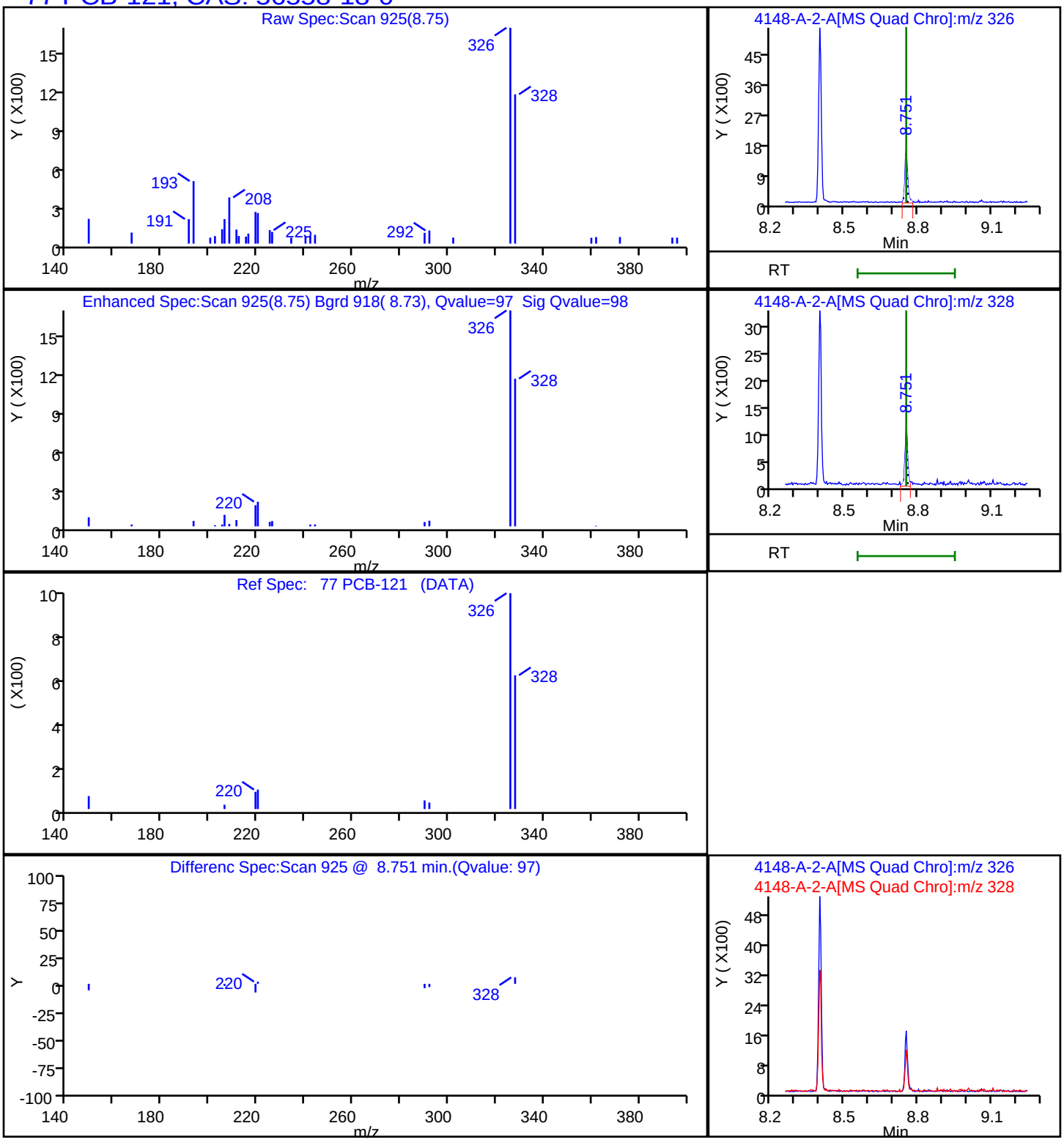
Report Date: 22-Nov-2023 16:14:13 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-2-A.D

Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

77 PCB-121, CAS: 56558-18-0



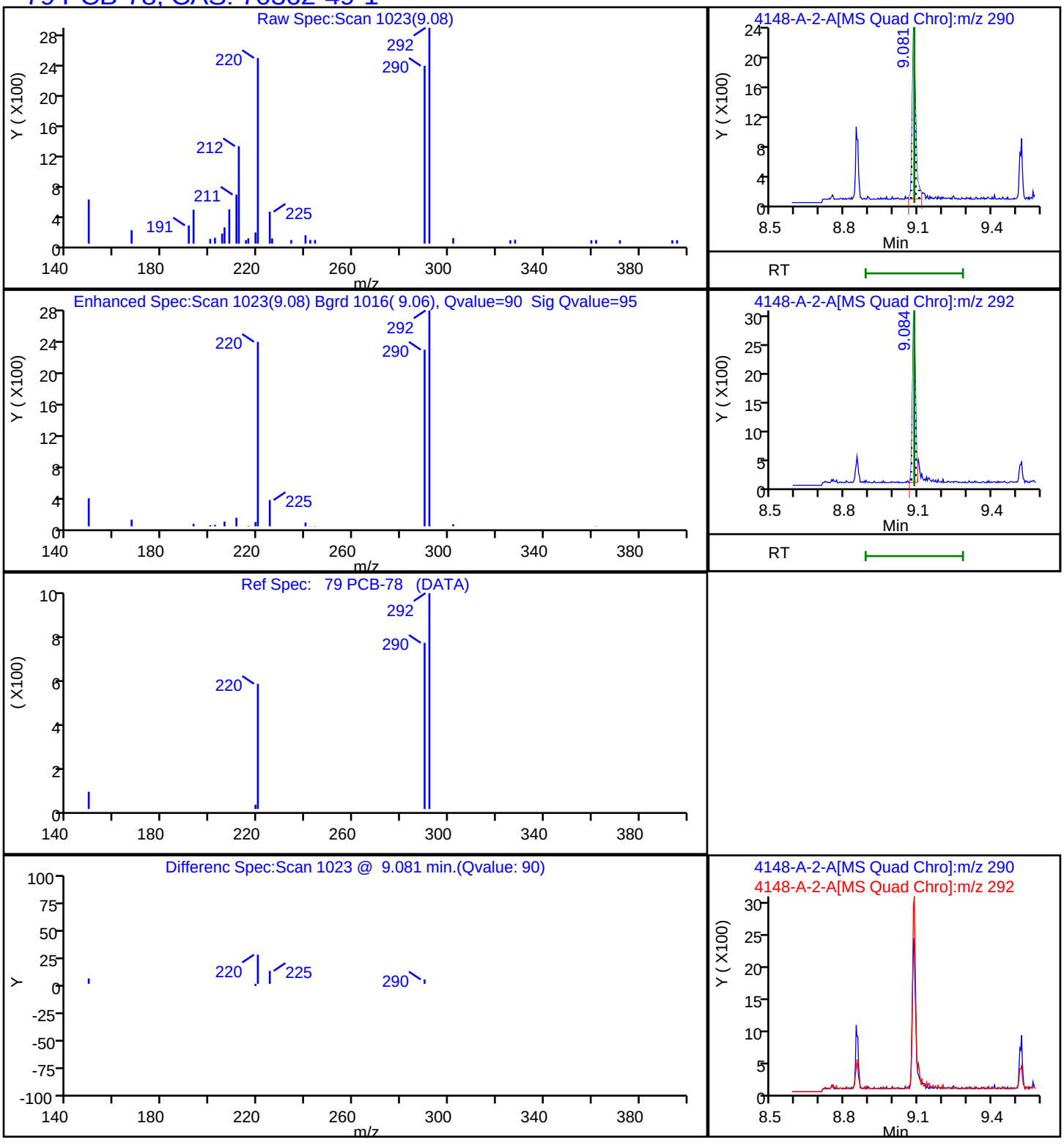
Report Date: 22-Nov-2023 16:14:13 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-2-A.D

Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

79 PCB-78, CAS: 70362-49-1



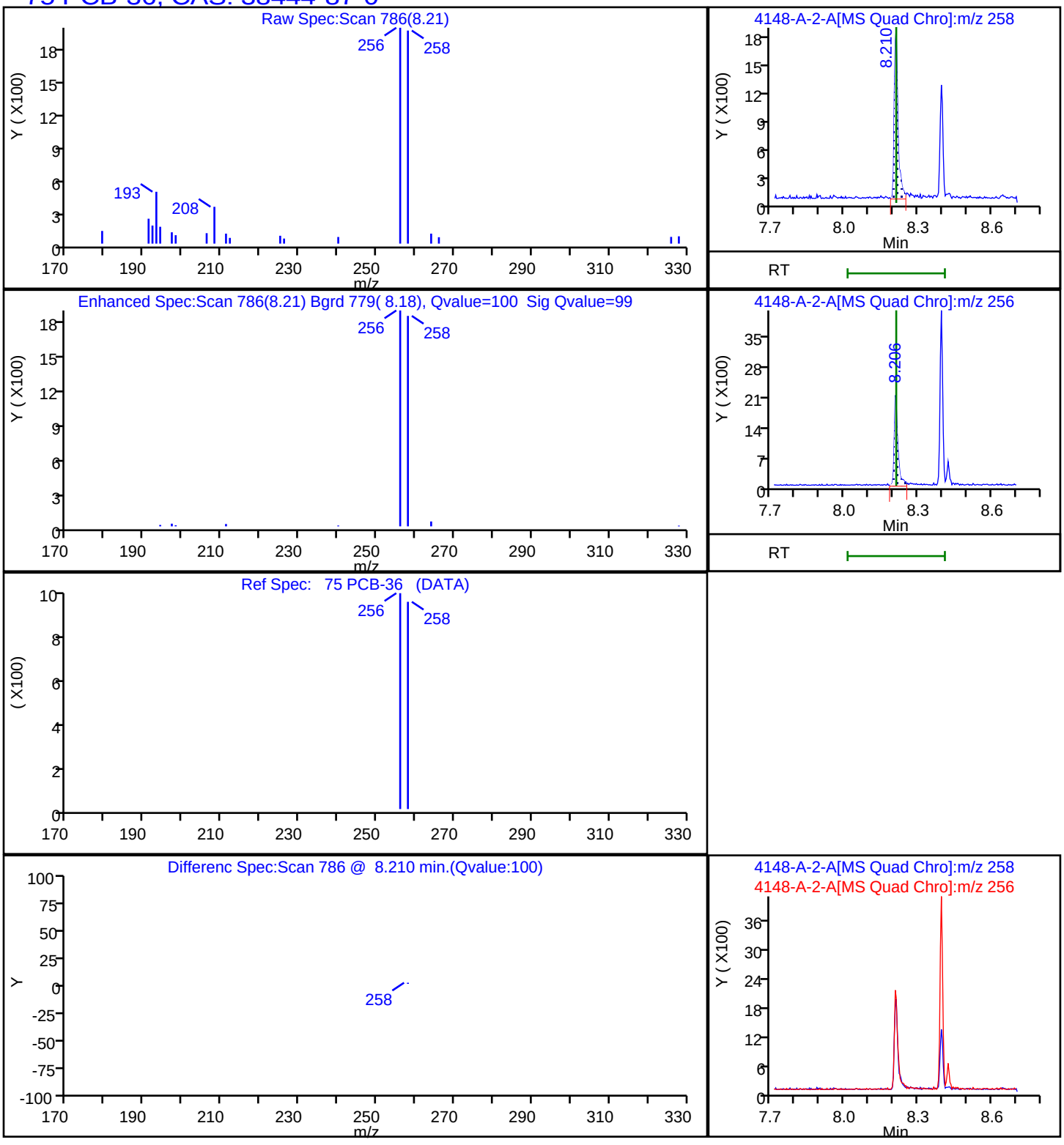
Report Date: 22-Nov-2023 16:14:13 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-2-A.D

Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2
Client ID:	GEI.PRC.BLK2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

75 PCB-36, CAS: 38444-87-0



Manual Integration/User Assign Peak Report

Eurofins Knoxville

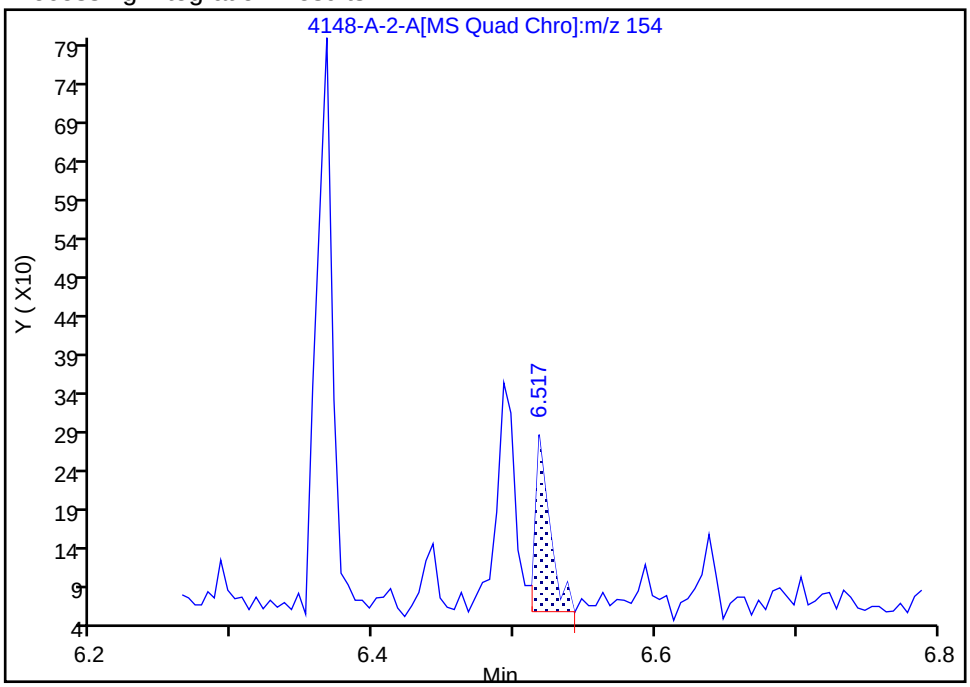
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-2-A.D				
Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

27 Acenaphthene, CAS: 83-32-9

Signal: 1

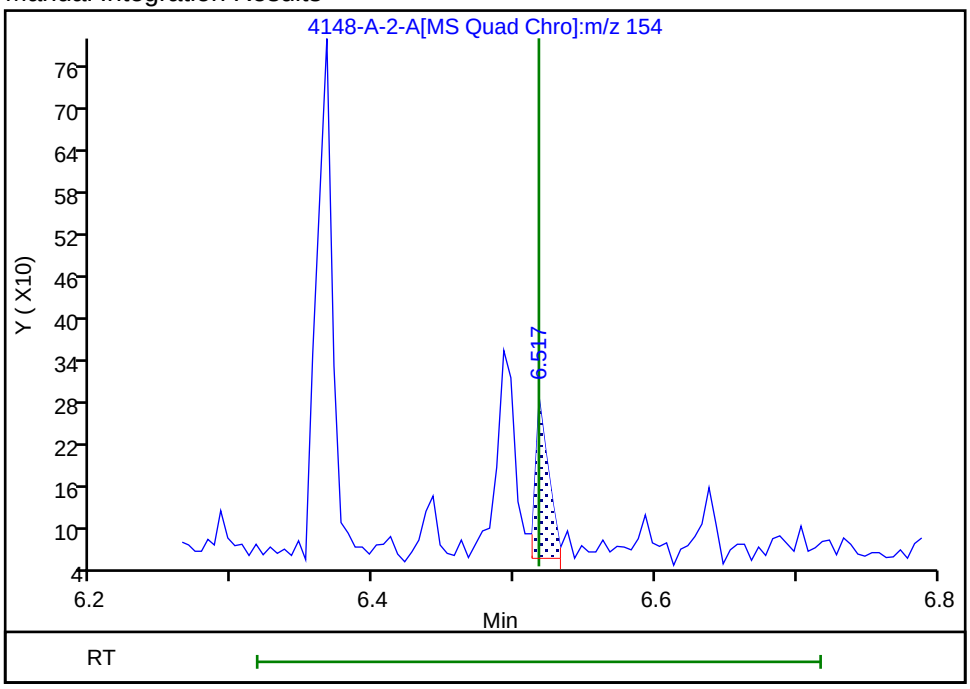
Processing Integration Results

RT: 6.52
Area: 164
Amount: 0.001712
Amount Units: ug/ml



Manual Integration Results

RT: 6.52
Area: 152
Amount: 0.001586
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 10:54:23 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Eurofins Knoxville

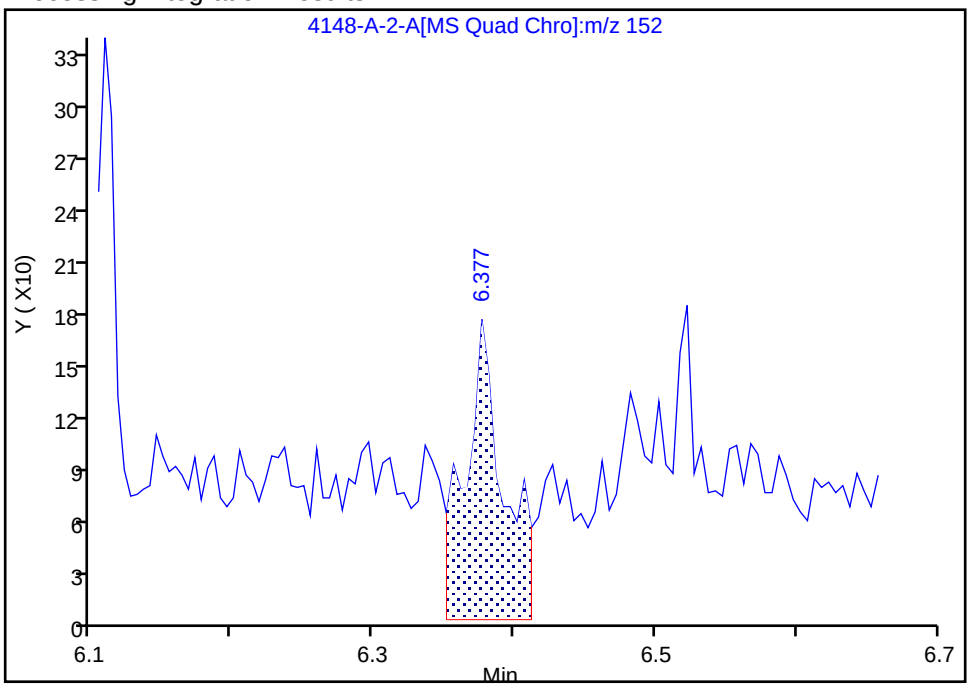
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-2-A.D				
Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

24 Acenaphthylene, CAS: 208-96-8

Signal: 1

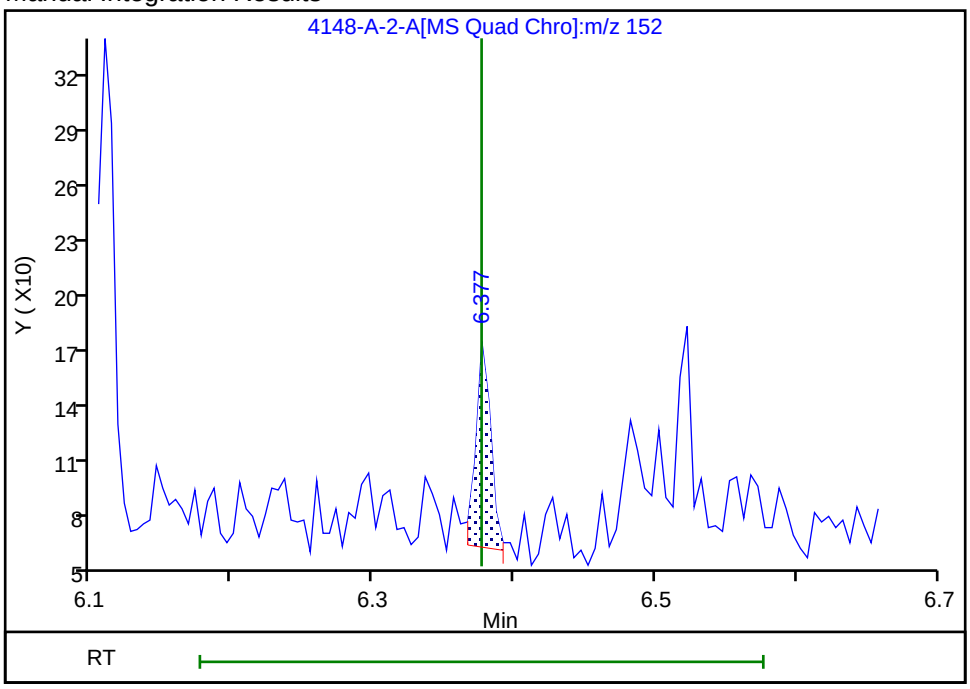
Processing Integration Results

RT: 6.38
Area: 338
Amount: 0.002259
Amount Units: ug/ml



Manual Integration Results

RT: 6.38
Area: 81
Amount: 0.000541
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 10:54:11 -05:00:00 (UTC)
Audit Action: Assigned New Baseline Audit Reason: Baseline

Eurofins Knoxville

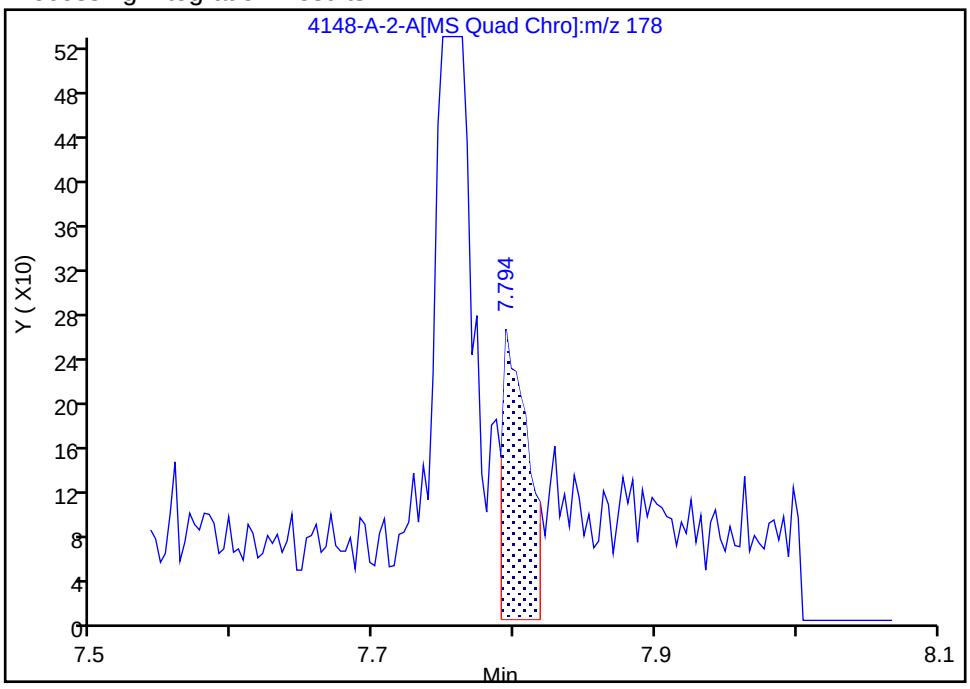
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-2-A.D				
Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

39 Anthracene, CAS: 120-12-7

Signal: 1

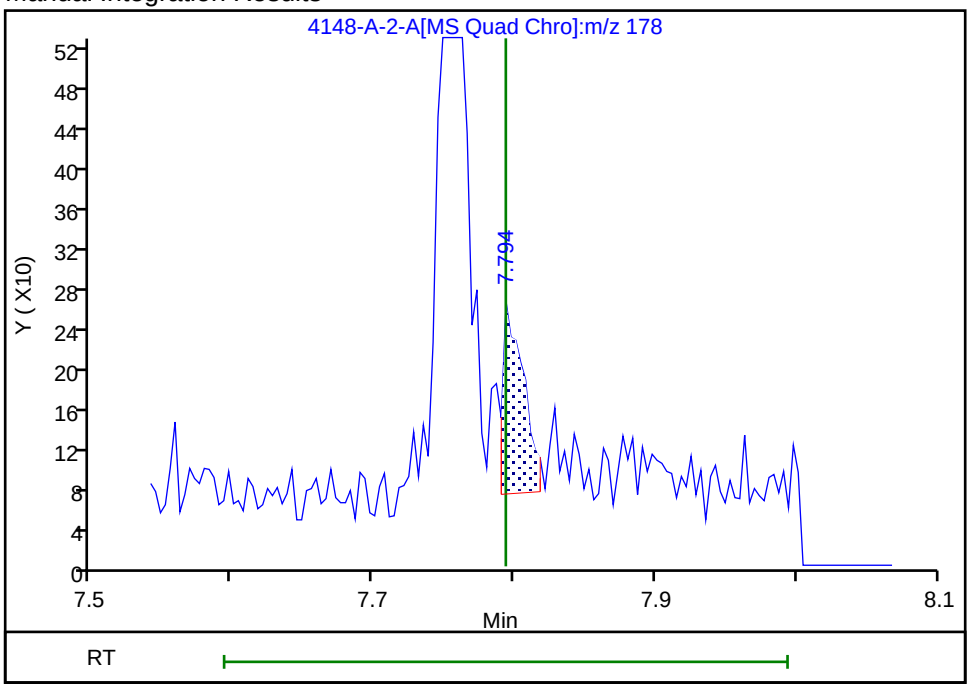
Processing Integration Results

RT: 7.79
Area: 330
Amount: 0.001696
Amount Units: ug/ml



Manual Integration Results

RT: 7.79
Area: 198
Amount: 0.001018
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 10:55:22 -05:00:00 (UTC)
Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

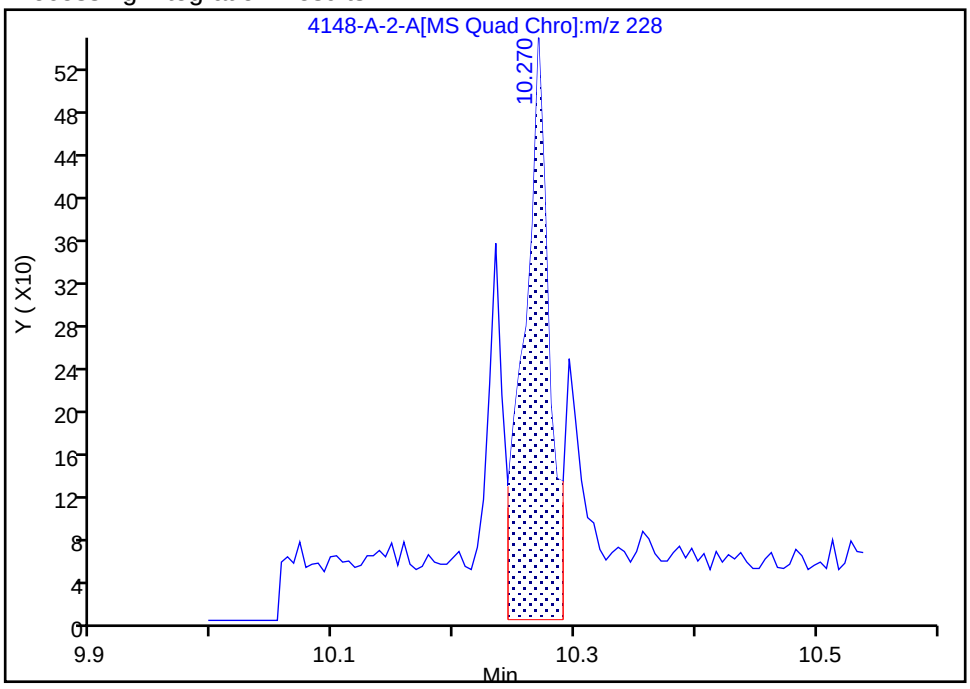
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-2-A.D				
Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

47 Benzo[a]anthracene, CAS: 56-55-3

Signal: 1

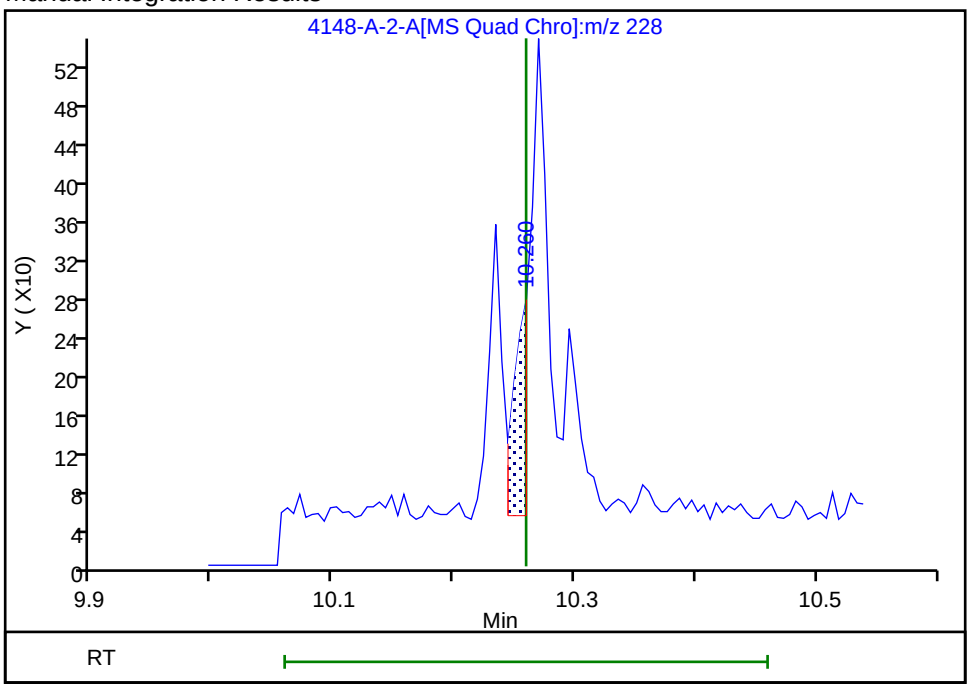
Processing Integration Results

RT: 10.27
Area: 804
Amount: 0.002869
Amount Units: ug/ml



Manual Integration Results

RT: 10.26
Area: 193
Amount: 0.000689
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 10:56:23 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

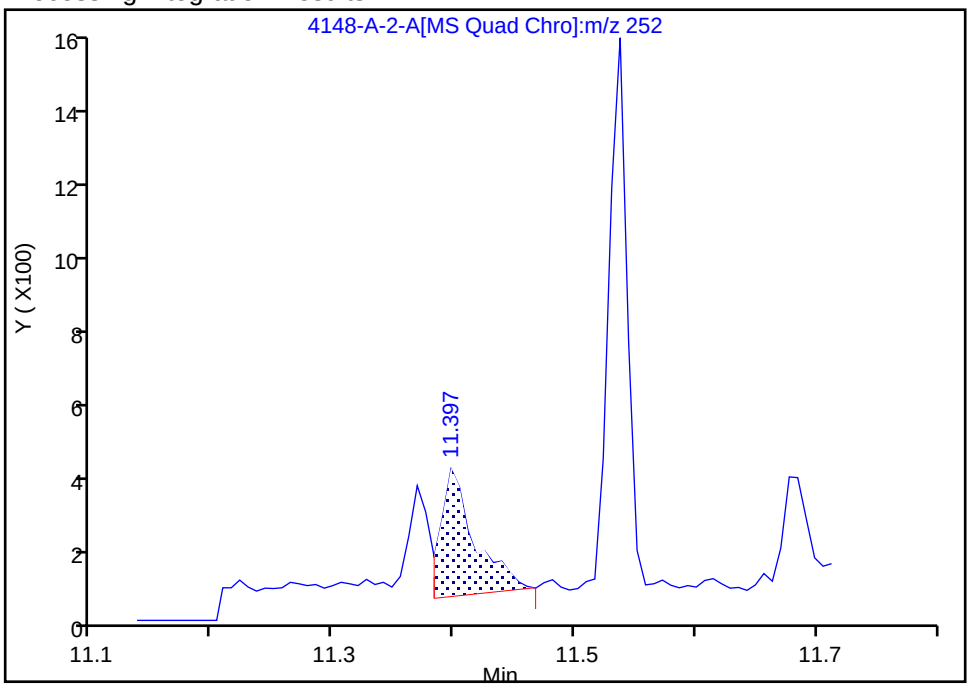
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-2-A.D				
Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

53 Benzo[b]fluoranthene, CAS: 205-99-2

Signal: 1

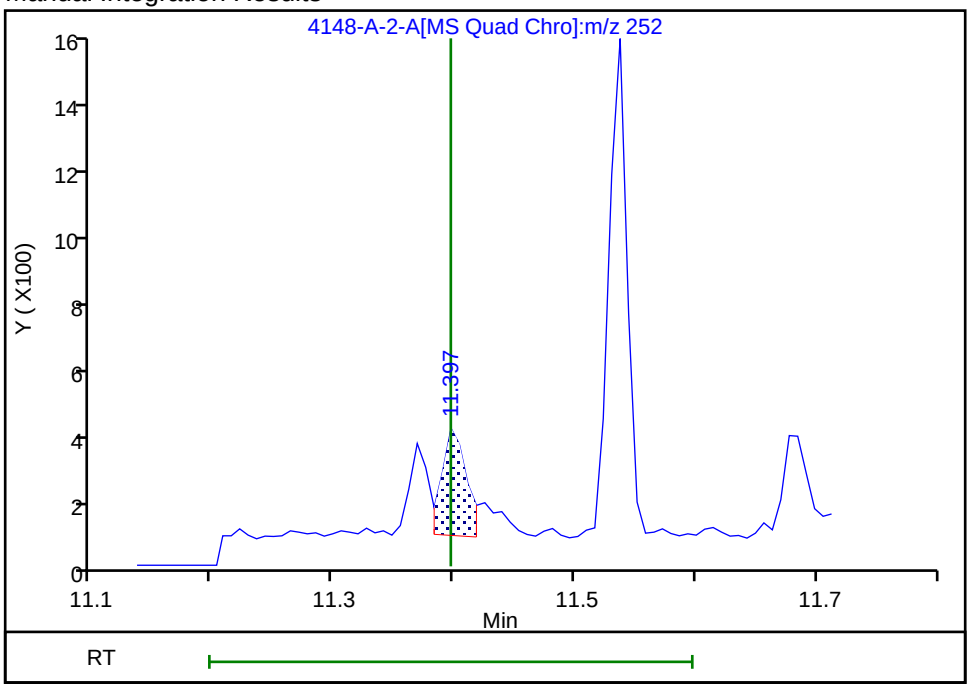
Processing Integration Results

RT: 11.40
Area: 682
Amount: 0.002135
Amount Units: ug/ml



Manual Integration Results

RT: 11.40
Area: 471
Amount: 0.001475
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 10:57:06 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

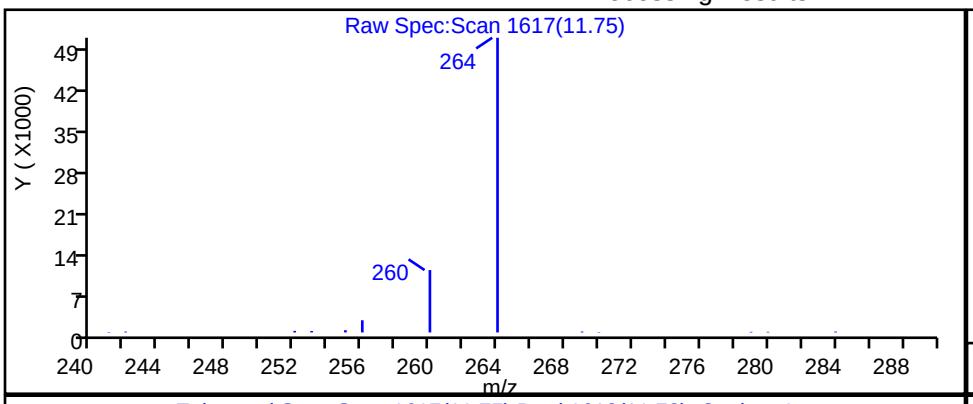
User Disabled Compound Report

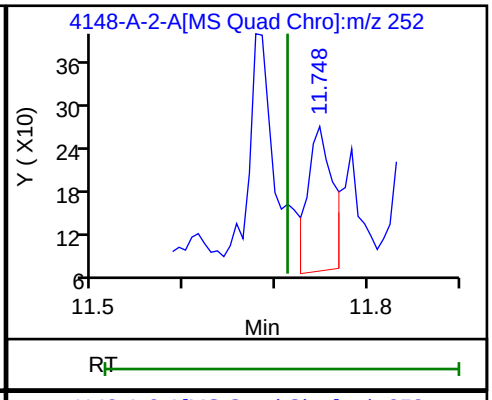
Eurofins Knoxville

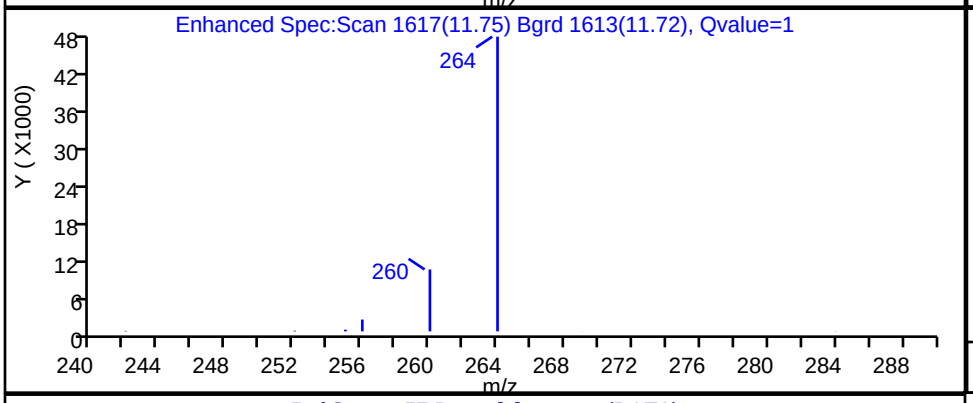
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-2-A.D				
Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

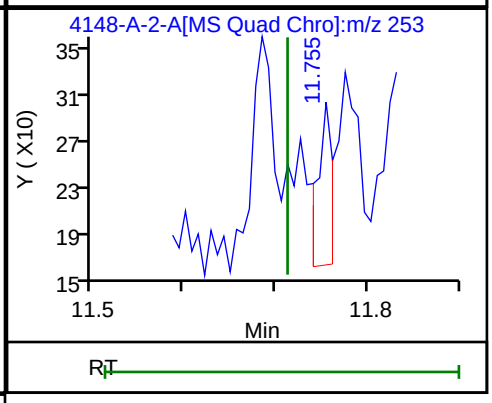
57 Benzo[e]pyrene, CAS: 192-97-2

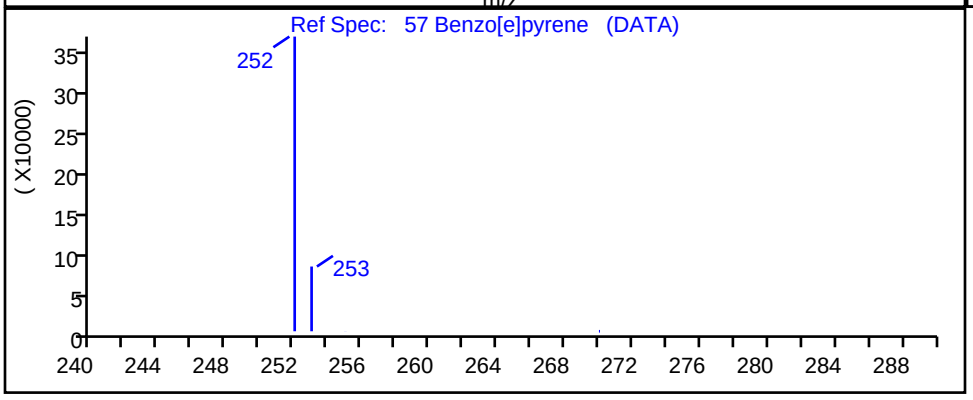
Processing Results











RT	Mass	Response	Amount
11.75	252.00	395	0.001657
11.75	253.00	160	

Reviewer: SK9U, 16-Nov-2023 10:57:39 -05:00:00 (UTC)

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

Manual Integration/User Assign Peak Report

Eurofins Knoxville

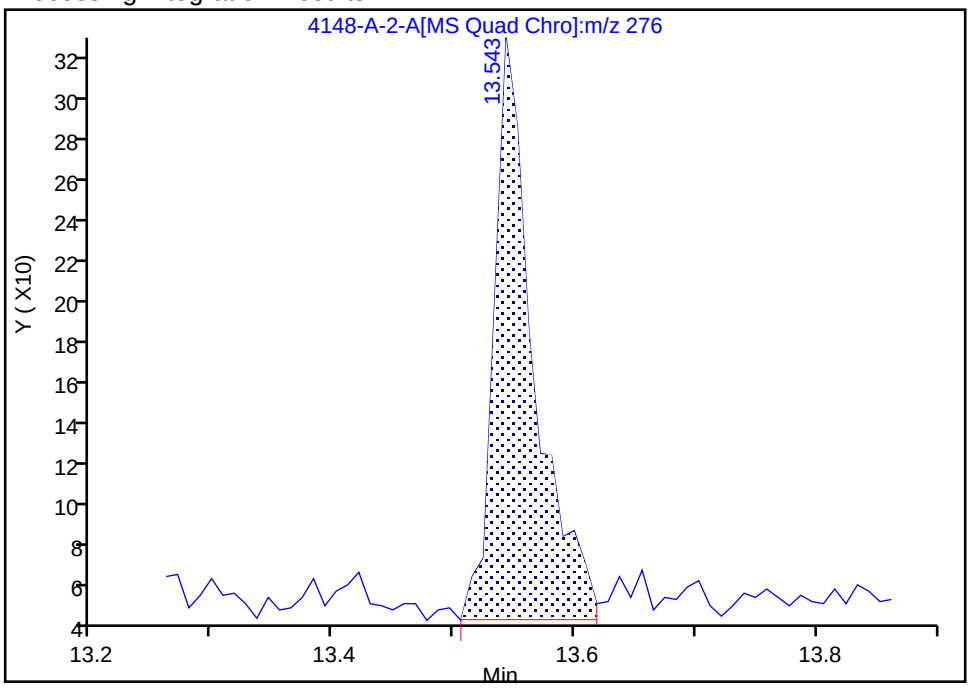
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-2-A.D				
Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

68 Benzo[g,h,i]perylene, CAS: 191-24-2

Signal: 1

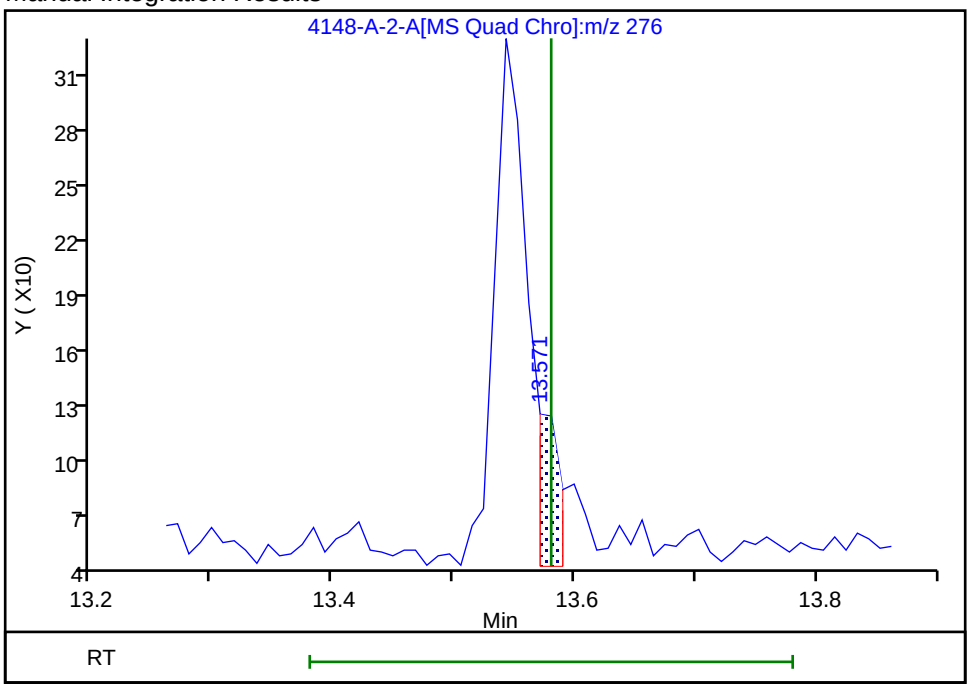
Processing Integration Results

RT: 13.54
Area: 640
Amount: 0.002461
Amount Units: ug/ml



Manual Integration Results

RT: 13.57
Area: 112
Amount: 0.000431
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 10:59:12 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

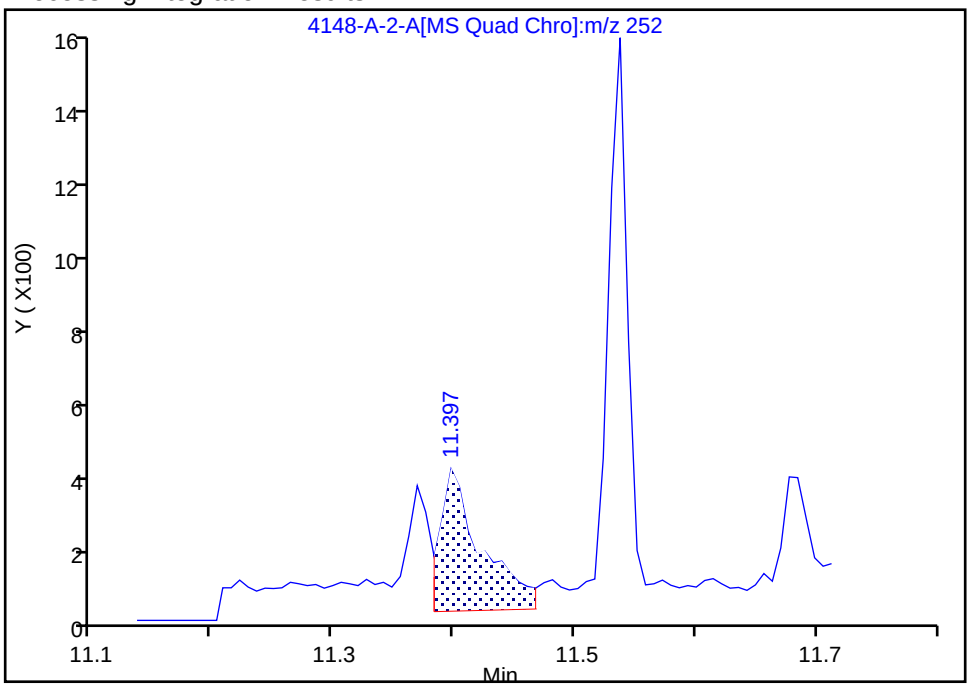
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-2-A.D				
Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

55 Benzo[k]fluoranthene, CAS: 207-08-9

Signal: 1

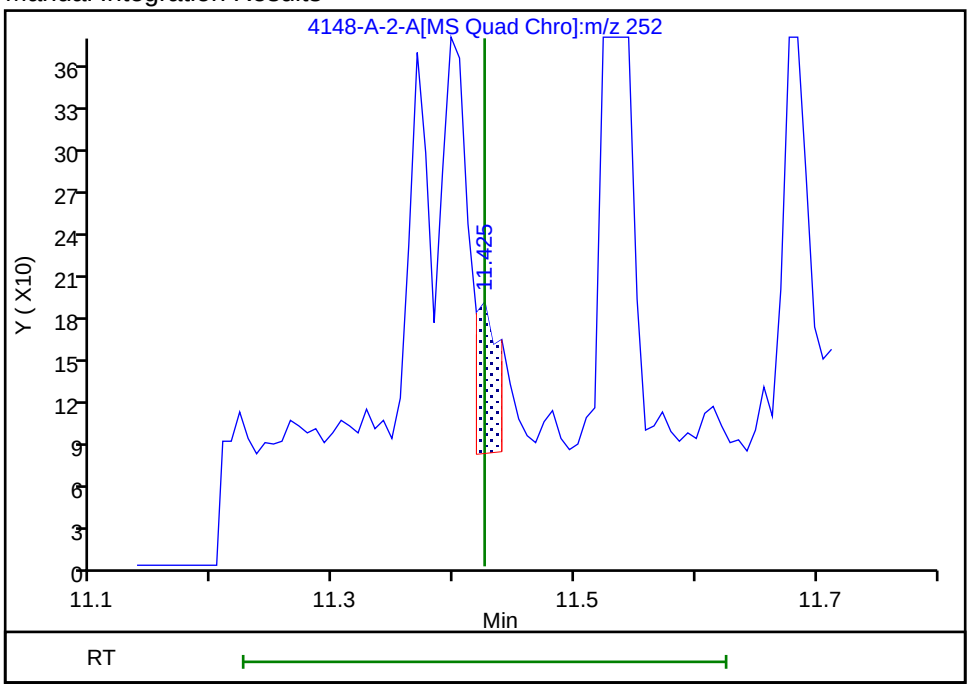
Processing Integration Results

RT: 11.40
Area: 947
Amount: 0.003035
Amount Units: ug/ml



Manual Integration Results

RT: 11.43
Area: 155
Amount: 0.000497
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 10:57:31 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

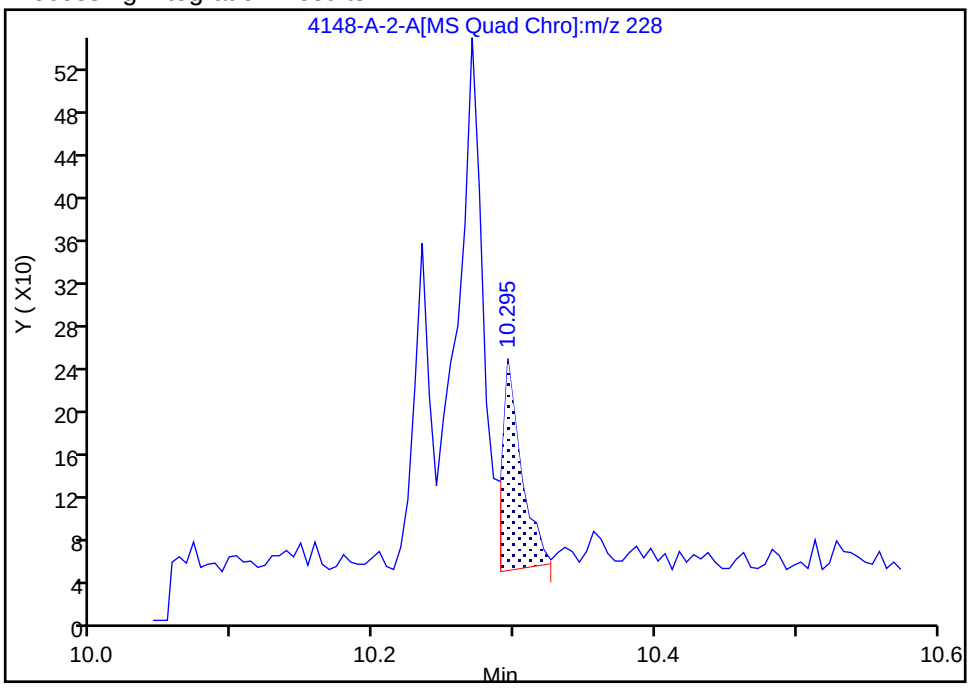
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-2-A.D				
Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

50 Chrysene, CAS: 218-01-9

Signal: 1

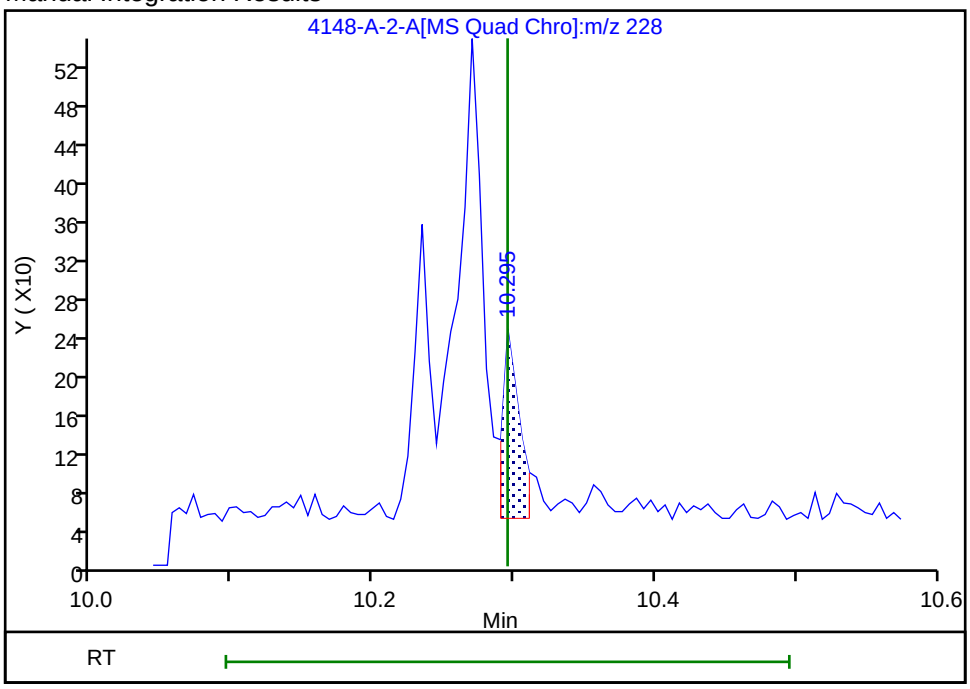
Processing Integration Results

RT: 10.30
Area: 186
Amount: 0.000592
Amount Units: ug/ml



Manual Integration Results

RT: 10.30
Area: 168
Amount: 0.000535
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 10:56:42 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

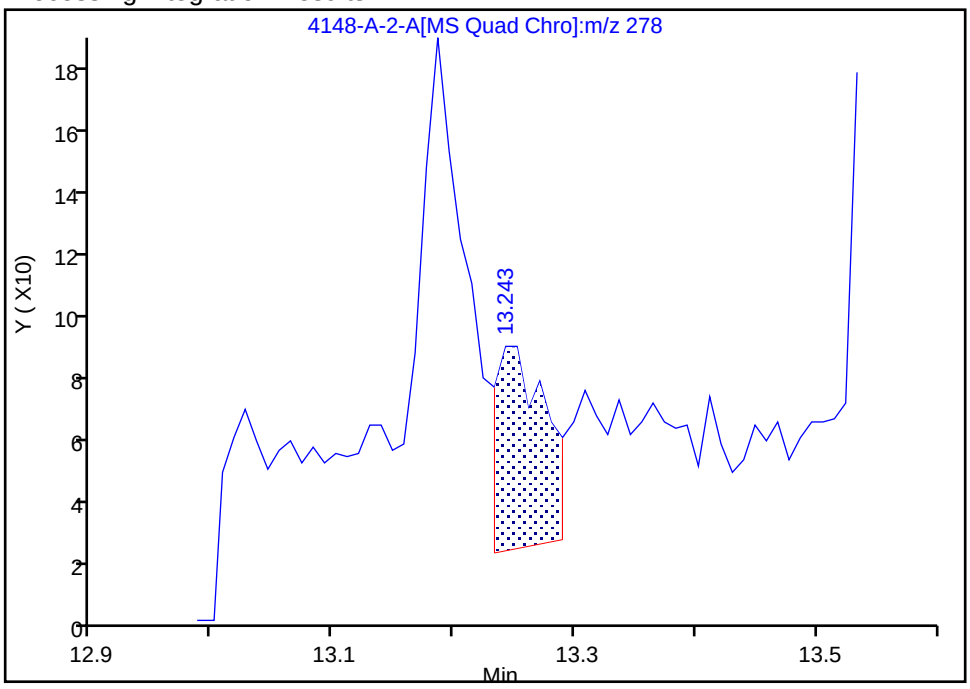
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-2-A.D				
Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

66 Dibenz(a,h)anthracene, CAS: 53-70-3

Signal: 1

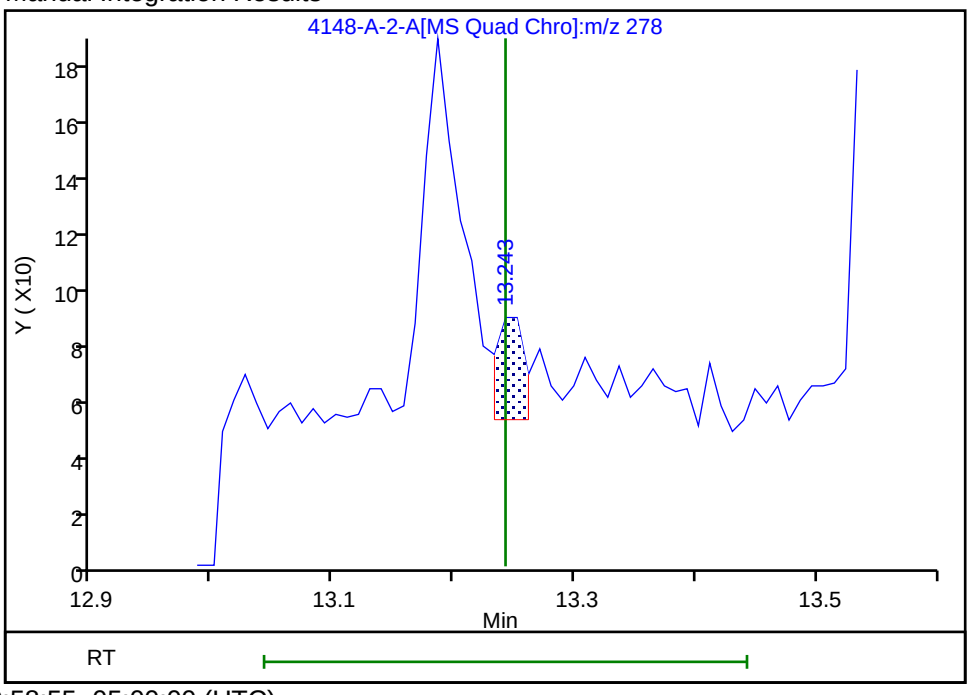
Processing Integration Results

RT: 13.24
Area: 196
Amount: 0.000826
Amount Units: ug/ml



Manual Integration Results

RT: 13.24
Area: 62
Amount: 0.000261
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 10:58:55 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

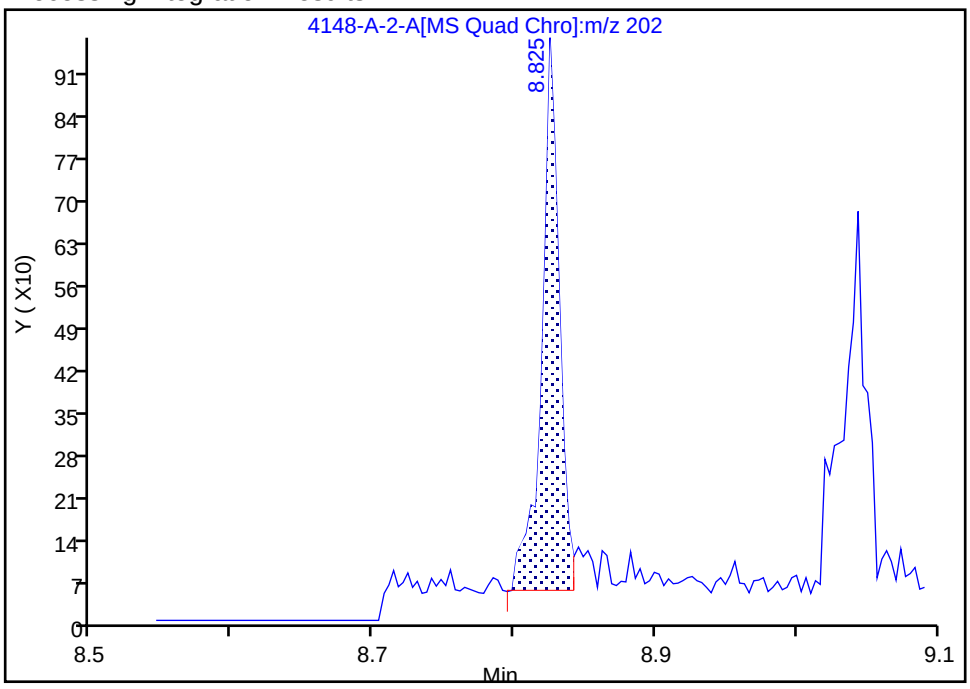
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-2-A.D				
Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

43 Fluoranthene, CAS: 206-44-0

Signal: 1

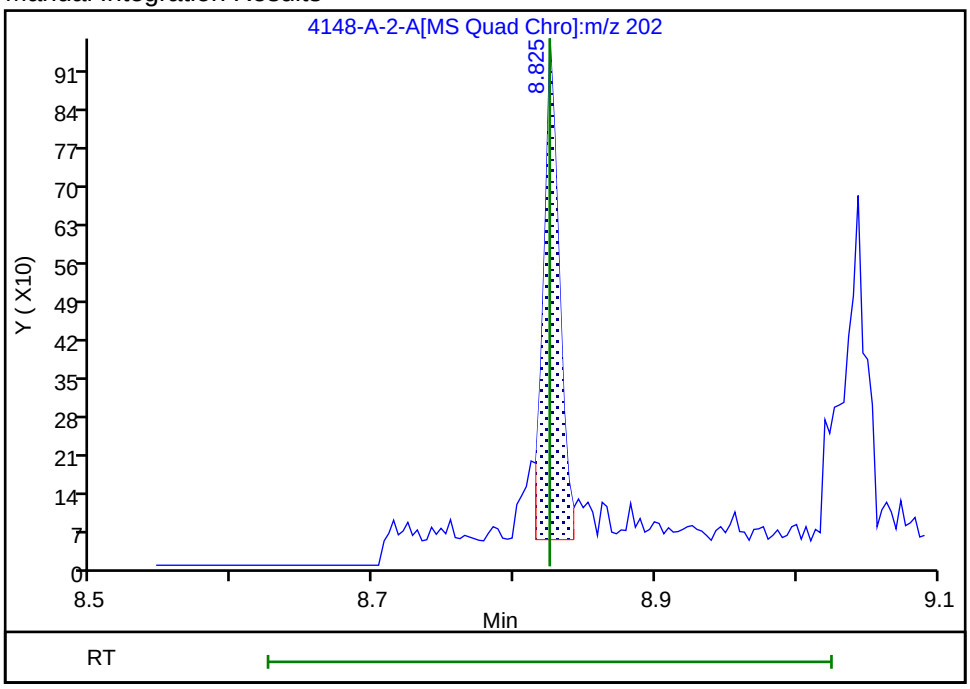
Processing Integration Results

RT: 8.83
Area: 803
Amount: 0.002501
Amount Units: ug/ml



Manual Integration Results

RT: 8.83
Area: 725
Amount: 0.002258
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 10:55:36 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

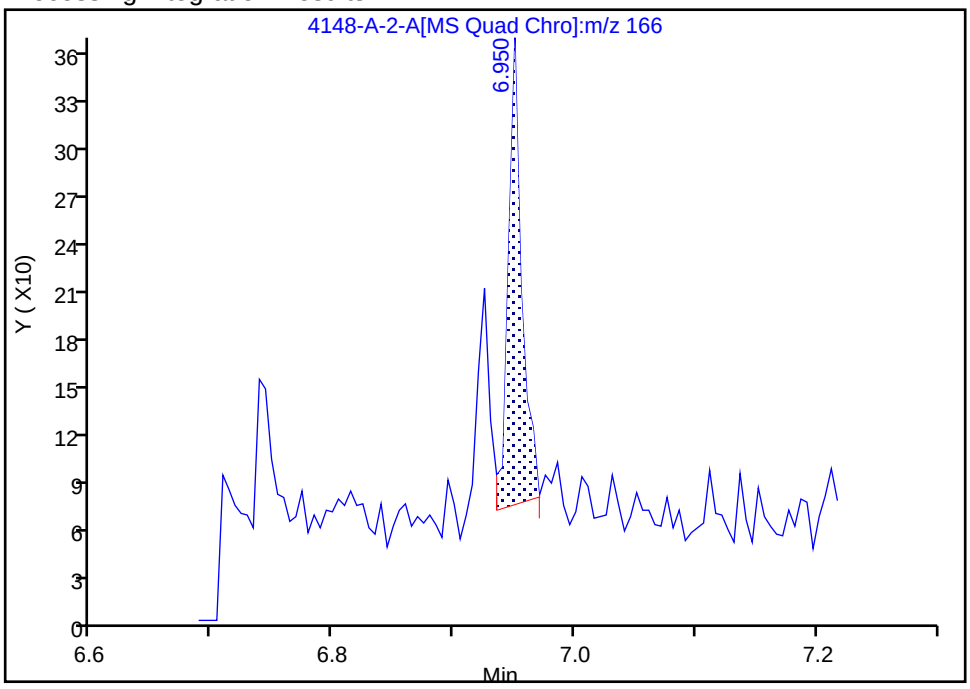
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-2-A.D				
Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

30 Fluorene, CAS: 86-73-7

Signal: 1

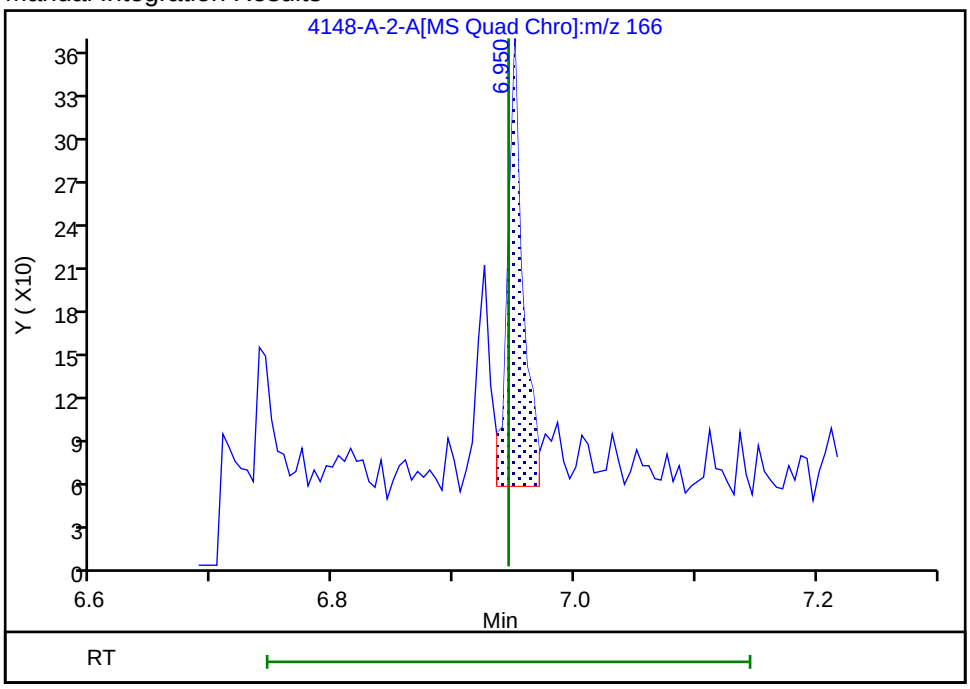
Processing Integration Results

RT: 6.95
Area: 226
Amount: 0.001734
Amount Units: ug/ml



Manual Integration Results

RT: 6.95
Area: 272
Amount: 0.002087
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 10:54:36 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

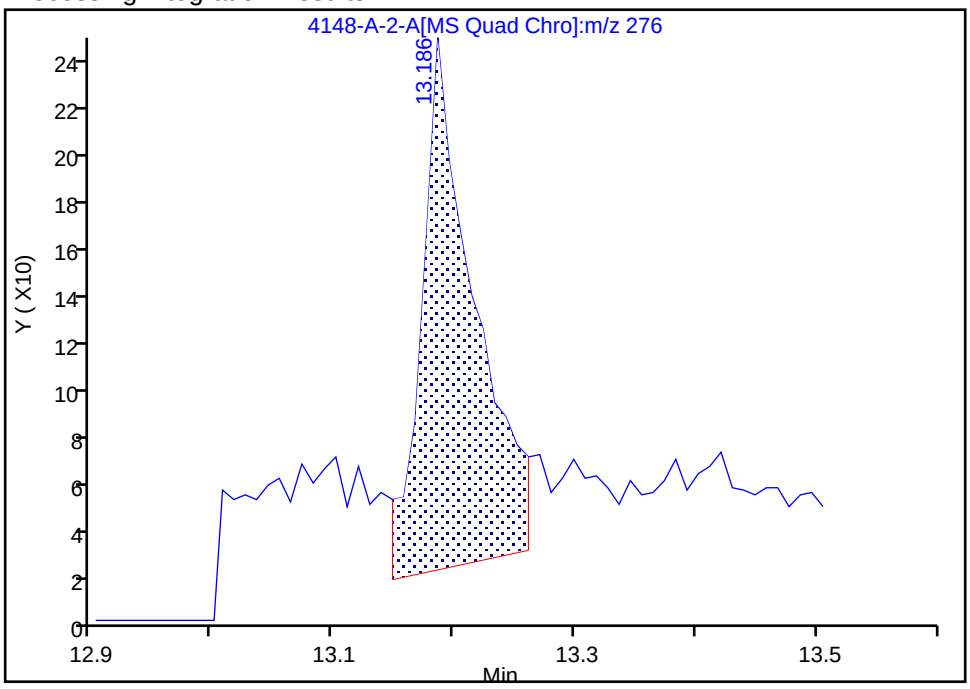
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-2-A.D				
Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

65 Indeno[1,2,3-cd]pyrene, CAS: 193-39-5

Signal: 1

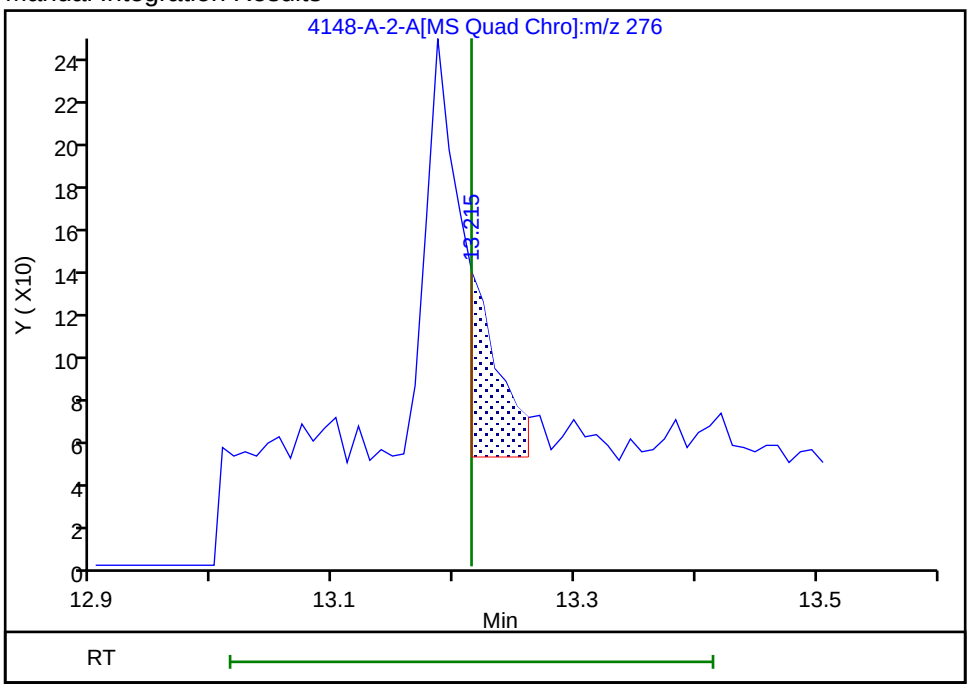
Processing Integration Results

RT: 13.19
Area: 692
Amount: 0.002357
Amount Units: ug/ml



Manual Integration Results

RT: 13.21
Area: 155
Amount: 0.000528
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 10:58:33 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Eurofins Knoxville

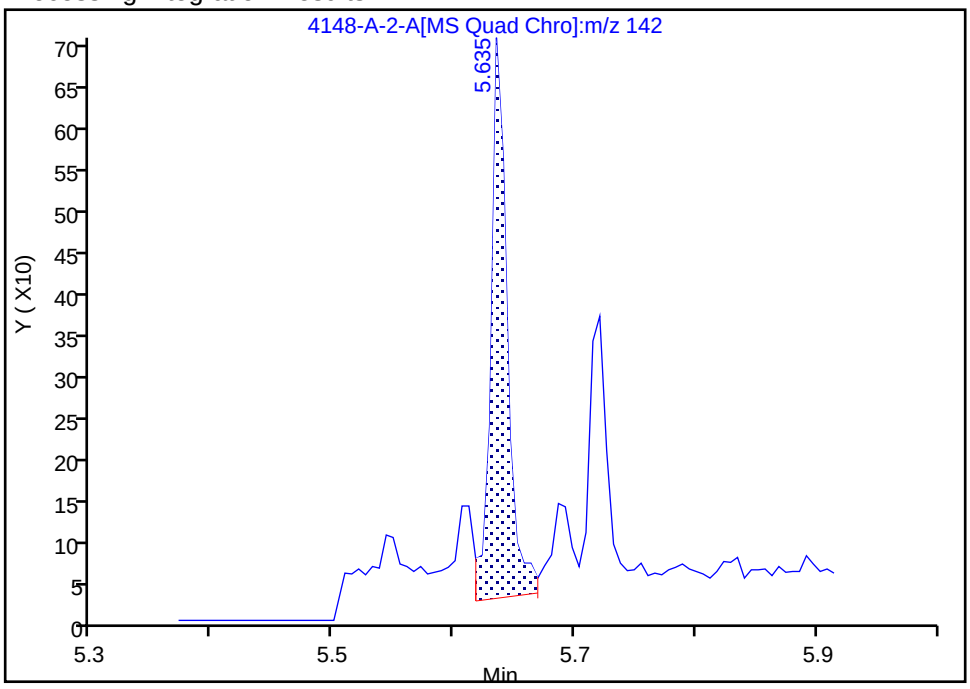
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-2-A.D				
Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

16 2-Methylnaphthalene, CAS: 91-57-6

Signal: 1

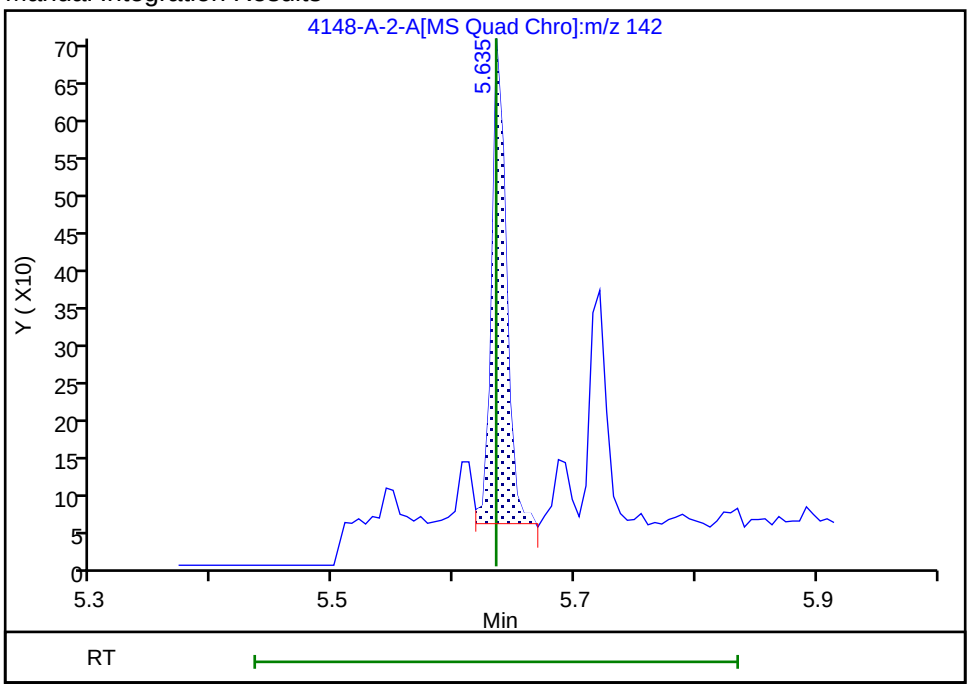
Processing Integration Results

RT: 5.63
Area: 637
Amount: 0.006535
Amount Units: ug/ml



Manual Integration Results

RT: 5.63
Area: 548
Amount: 0.005622
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 10:53:42 -05:00:00 (UTC)
Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

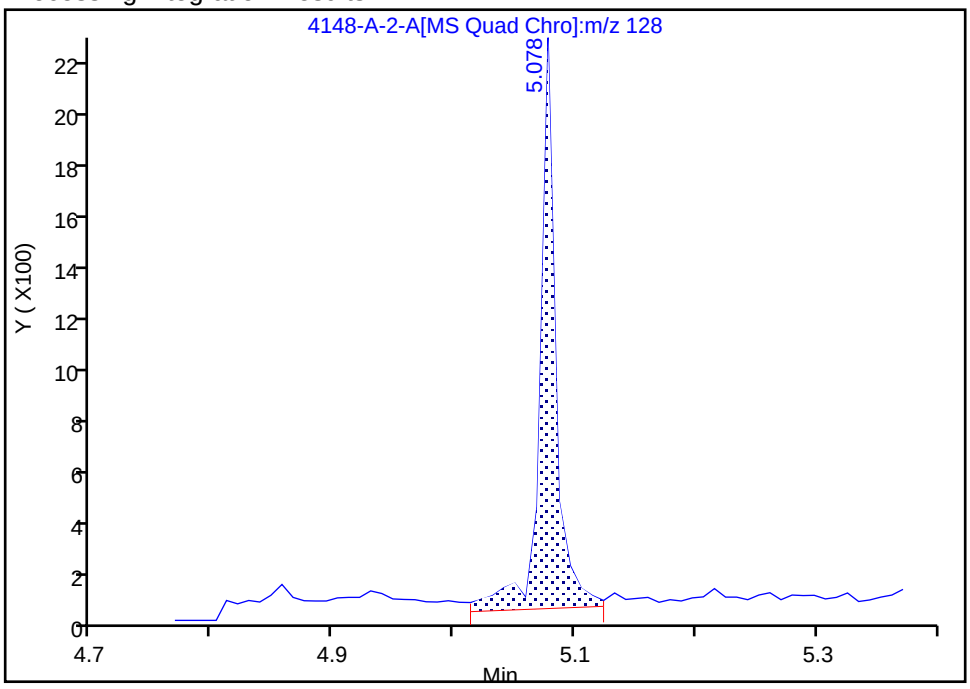
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-2-A.D				
Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

12 Naphthalene, CAS: 91-20-3

Signal: 1

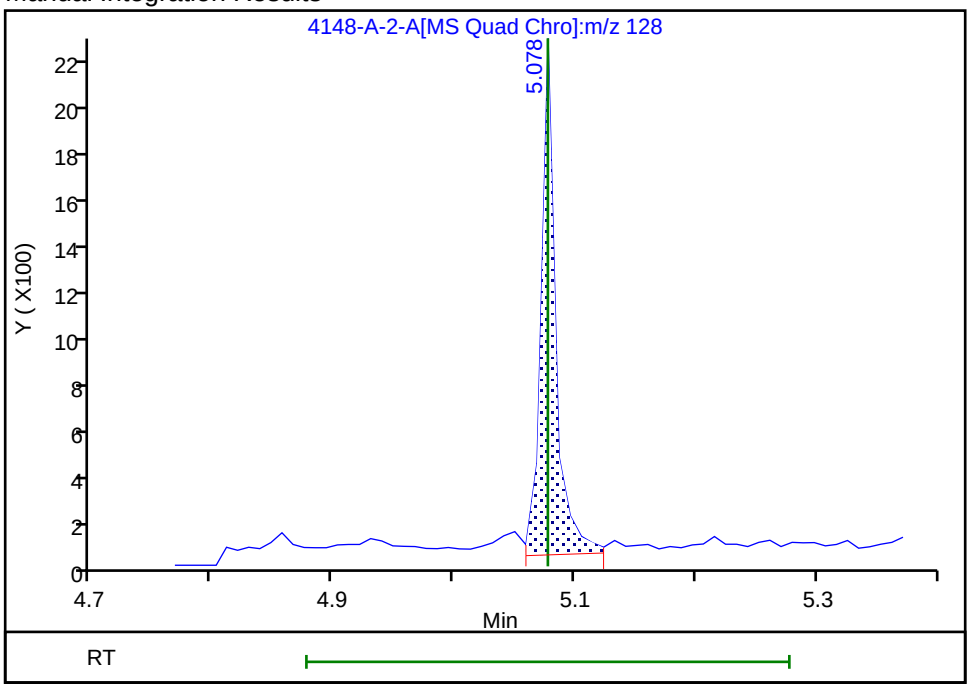
Processing Integration Results

RT: 5.08
Area: 2028
Amount: 0.014714
Amount Units: ug/ml



Manual Integration Results

RT: 5.08
Area: 1853
Amount: 0.013444
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 10:53:19 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

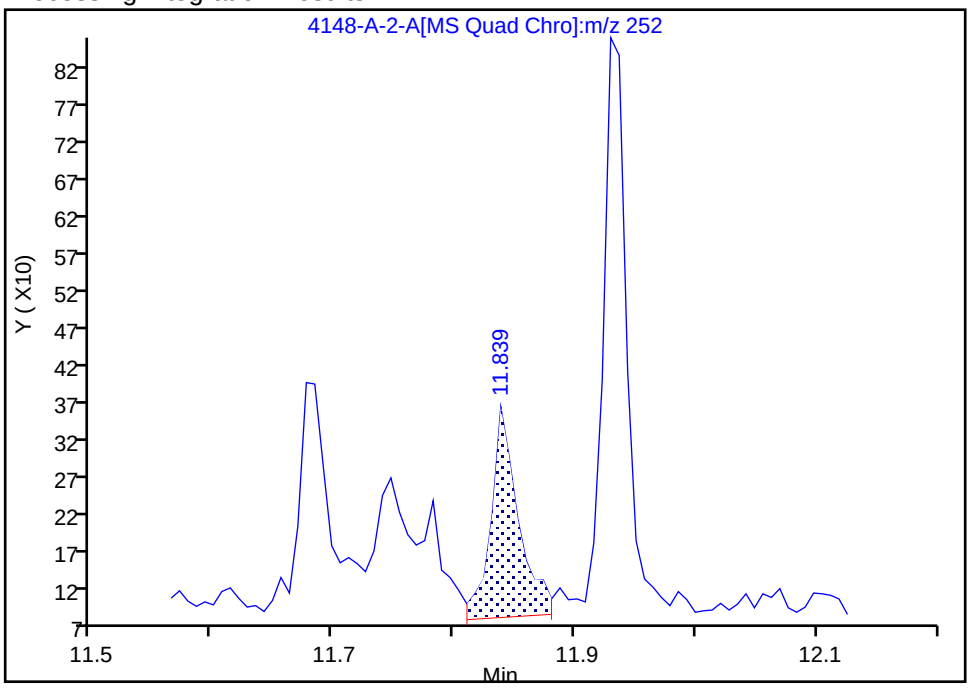
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-2-A.D				
Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

61 Perylene, CAS: 198-55-0

Signal: 1

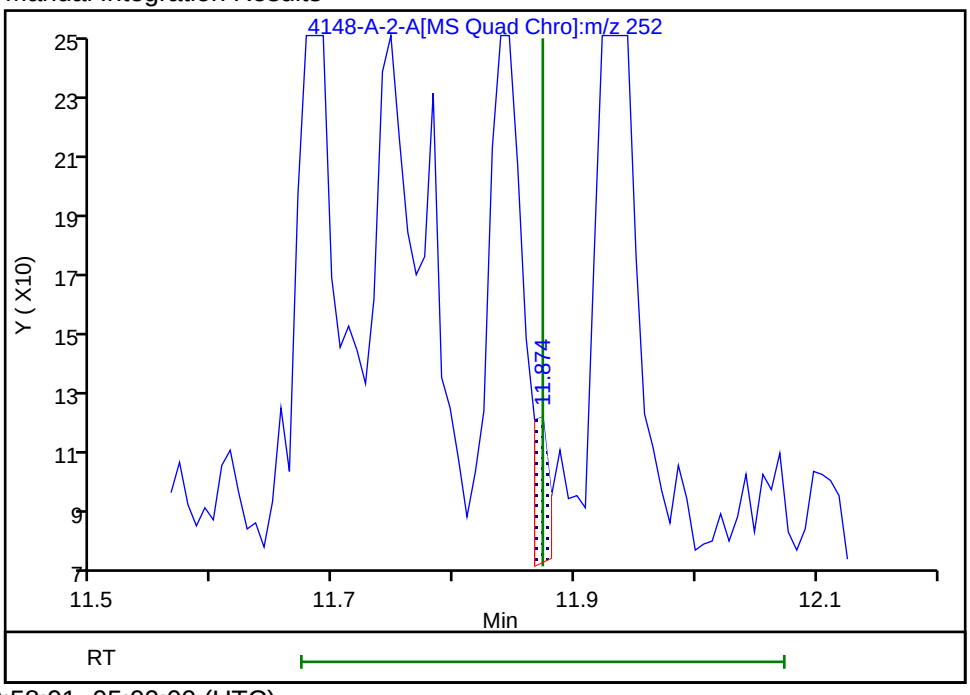
Processing Integration Results

RT: 11.84
Area: 455
Amount: 0.002171
Amount Units: ug/ml



Manual Integration Results

RT: 11.87
Area: 49
Amount: 0.000234
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 10:58:01 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

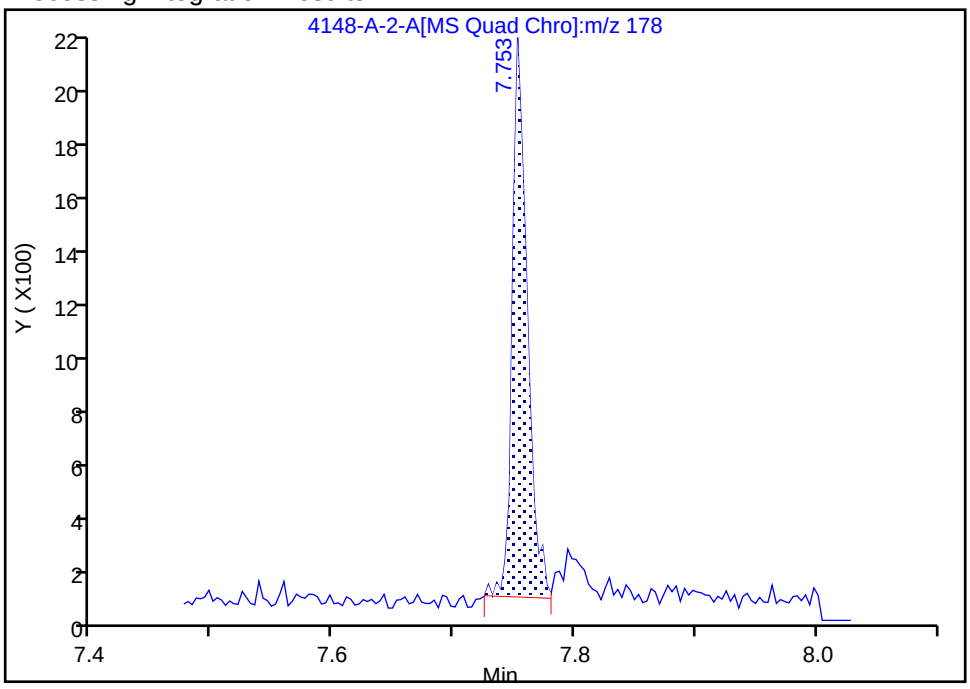
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-2-A.D				
Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

36 Phenanthrene, CAS: 85-01-8

Signal: 1

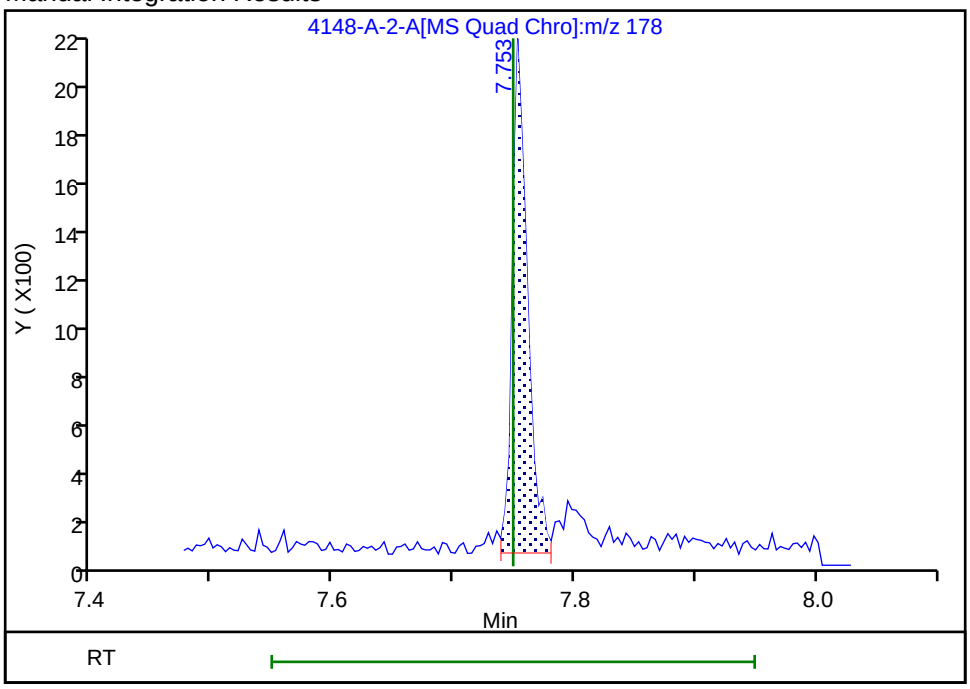
Processing Integration Results

RT: 7.75
Area: 1760
Amount: 0.008284
Amount Units: ug/ml



Manual Integration Results

RT: 7.75
Area: 1811
Amount: 0.008524
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 10:54:59 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

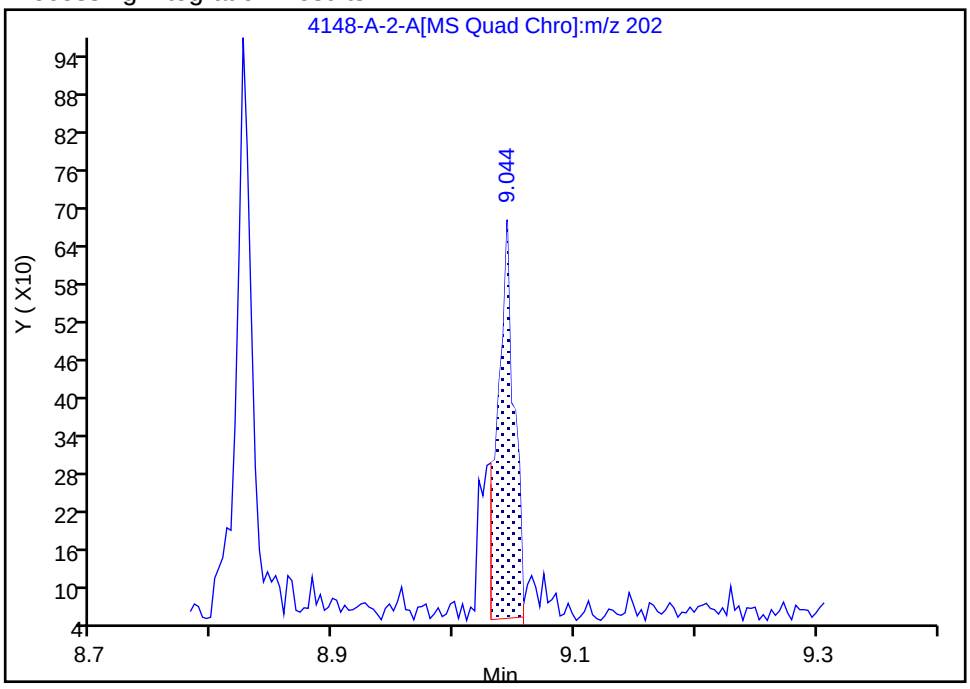
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-2-A.D				
Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

45 Pyrene, CAS: 129-00-0

Signal: 1

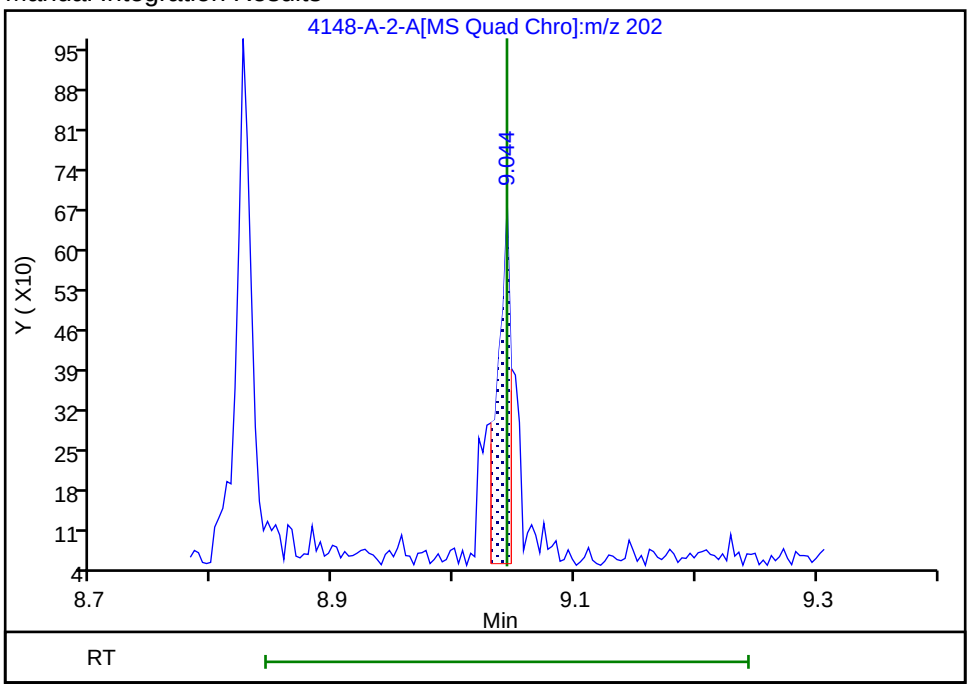
Processing Integration Results

RT: 9.04
Area: 585
Amount: 0.001785
Amount Units: ug/ml



Manual Integration Results

RT: 9.04
Area: 464
Amount: 0.001416
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 10:55:45 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

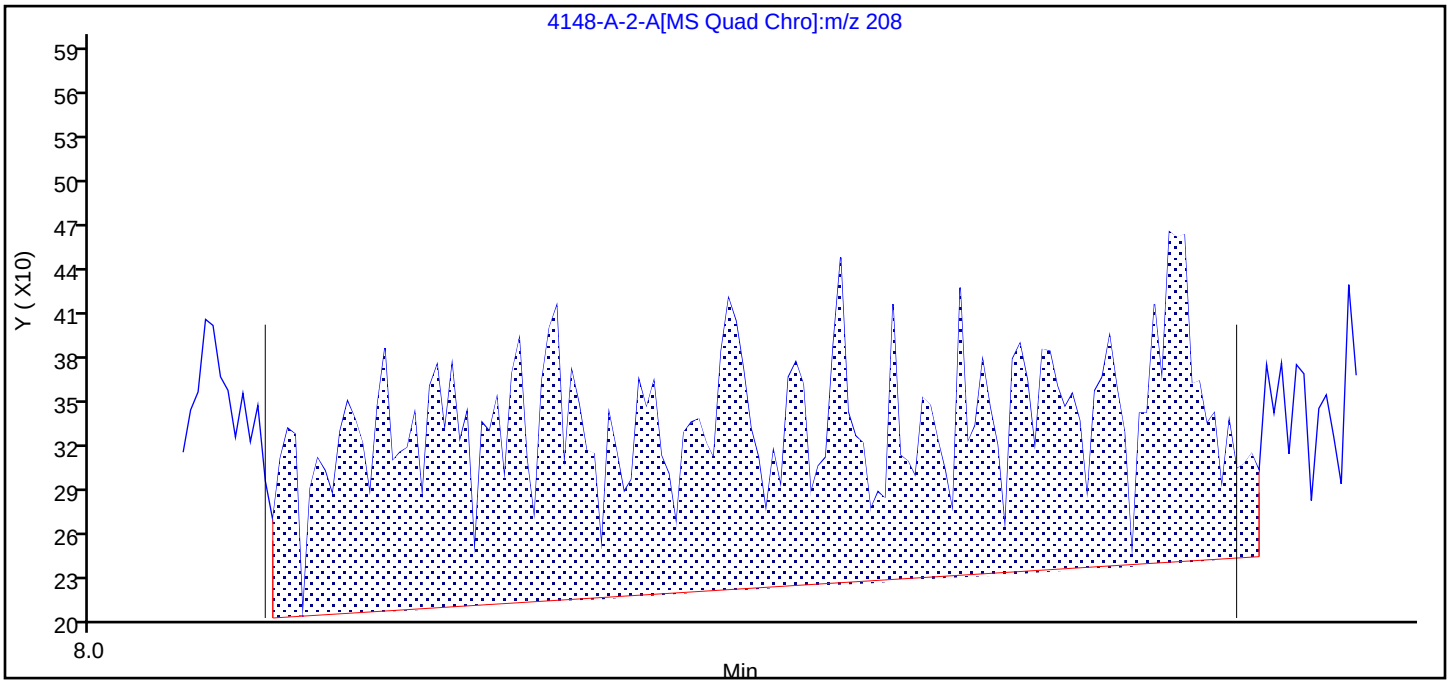
User Disabled Compound Report

Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-2-A.D				
Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 91 C3-Fluorenes, CAS: STL00915

Processing Results



Exp RT	RT	Response	Amount
8.35	8.36	3449	0.026463
8.35	8.34	3271	0

Reviewer: SK9U, 22-Nov-2023 16:14:07 -05:00:00 (UTC)

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

Eurofins Knoxville

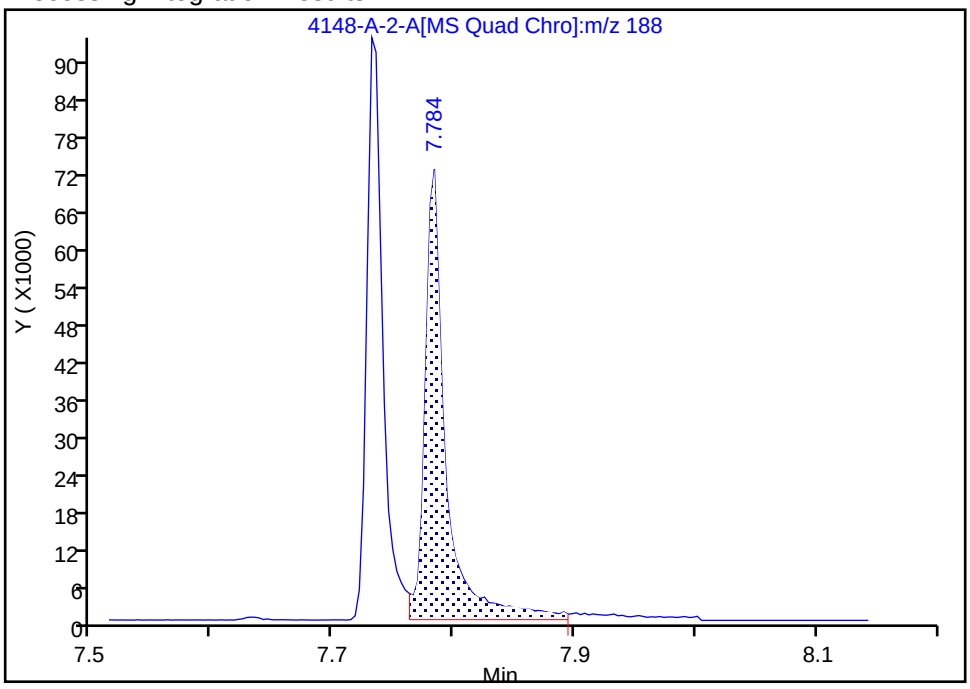
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-2-A.D				
Injection Date:	13-Nov-2023 22:08:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-2-A	Lab Sample ID:	140-34148-2		
Client ID:	GEI.PRC.BLK2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	31
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 38 Anthracin-d10, CAS: 1719-06-8

Signal: 1

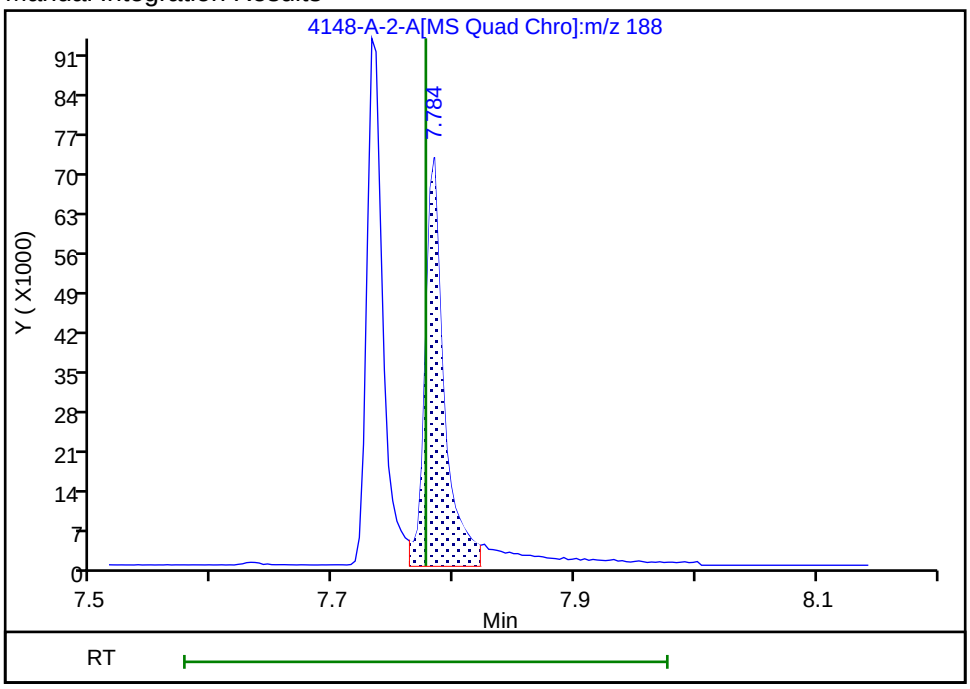
Processing Integration Results

RT: 7.78
Area: 87329
Amount: 0.382983
Amount Units: ug/ml



Manual Integration Results

RT: 7.78
Area: 79002
Amount: 0.346465
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 10:55:05 -05:00:00 (UTC)
Audit Action: Split an Integrated Peak Audit Reason: Split Peak

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: GEI.PRC.BLK3 | Lab Sample ID: 140-34148-3

Matrix: PE | Lab File ID: 140-34148-A-3-A.D

Analysis Method: ID-0016 | Date Collected: 10/26/2023 14:00

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.011(g) | Date Analyzed: 11/13/2023 22:31

Con. Extract Vol.: 500(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80177 | Units: ng/g

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
83-32-9	Acenaphthene	ND		910	240
208-96-8	Acenaphthylene	ND		910	66
120-12-7	Anthracene	ND		910	290
56-55-3	Benzo[a]anthracene	ND		910	340
50-32-8	Benzo[a]pyrene	ND		910	250
205-99-2	Benzo[b]fluoranthene	ND		910	320
192-97-2	Benzo[e]pyrene	ND		910	150
191-24-2	Benzo[g,h,i]perylene	ND		910	100
207-08-9	Benzo[k]fluoranthene	ND		910	210
218-01-9	Chrysene	ND		910	120
53-70-3	Dibenz(a,h)anthracene	ND		910	75
206-44-0	Fluoranthene	ND		910	740
86-73-7	Fluorene	ND		910	290
193-39-5	Indeno[1,2,3-cd]pyrene	ND		910	100
90-12-0	1-Methylnaphthalene	ND		4500	450
91-57-6	2-Methylnaphthalene	ND		4500	640
91-20-3	Naphthalene	ND		18000	2600
198-55-0	Perylene	ND		910	460
85-01-8	Phenanthrene	ND		1800	1600
129-00-0	Pyrene	ND		1800	270
STL00912	C1-Fluoranthenes/pyrene	ND		910	910
STL00913	C1-Fluorenes	ND		1800	1200
STL00914	C2-Fluorenes	ND		910	910
STL00915	C3-Fluorenes	ND		910	910
STL00917	C2-Naphthalenes	ND		1800	1800
STL00918	C3-Naphthalenes	ND		1800	1800
STL00919	C4-Naphthalenes	ND		2700	2500
STL00901	C1-Phenanthrenes/Anthracenes	ND		3600	3100
STL00902	C2-Phenanthrenes/Anthracenes	ND		910	910
STL00903	C3-Phenanthrenes/Anthracenes	ND		910	910
STL00904	C4-Phenanthrenes/Anthracenes	ND		910	910
STL02218	C1-Chrysenes/Benz(a)anthracenes	ND		910	910

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: GEI.PRC.BLK3 | Lab Sample ID: 140-34148-3

Matrix: PE | Lab File ID: 140-34148-A-3-A.D

Analysis Method: ID-0016 | Date Collected: 10/26/2023 14:00

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.011(g) | Date Analyzed: 11/13/2023 22:31

Con. Extract Vol.: 500(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80177 | Units: ng/g

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
STL02219	C2-Chrysenes/Benz(a)anthracenes	ND		910	910
STL02220	C3-Chrysenes/Benz(a)anthracenes	ND		910	910
STL02221	C4-Chrysenes/Benz(a)anthracenes	ND		910	910
34883-41-5	PCB-14	2900		910	9.1
74472-51-8	PCB-192	2300		910	9.1
74472-48-3	PCB-184	870	J	910	9.1
33979-03-2	PCB-155	760	J	910	9.1
41411-61-4	PCB-142	580	J	910	9.1
74472-52-9	PCB-204	1500		910	9.1
56558-16-8	PCB-104	2500		910	9.1
56558-18-0	PCB-121	840	J	910	9.1
70362-49-1	PCB-78	2200		910	9.1
38444-87-0	PCB-36	900	J	910	9.1

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
93951-97-4	Acenaphthylene-d8	81		30-120
1719-06-8	Anthracene-d10	73		30-120
63466-71-7	Benzo(a)pyrene-d12	77		30-120
93951-98-5	Benzo(b)fluoranthene-d12	90		30-120
93951-66-7	Benzo(ghi)perylene-d12	91		30-120
93952-01-3	Benzo(k)fluoranthene-d12	89		30-120
1719-03-5	Chrysene-d12	77		30-120
13250-98-1	Dibenz(a,h)anthracene-d14	84		30-120
93951-69-0	Fluoranthene-d10	87		30-120
81103-79-9	Fluorene -d10	85		30-120
203578-33-0	Indeno[1,2,3-cd]pyrene-d12	89		30-120
38072-94-5	1-Methylnaphthalene-d10	84		30-120
7297-45-2	2-Methylnaphthalene-d10	84		30-120
1146-65-2	Naphthalene-d8	83		30-120
1520-96-3	Perylene-d12	73		30-120
1517-22-2	Phenanthrene-d10	77		30-120

Report Date: 16-Nov-2023 15:46:53 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-3-A.D
Lims ID: 140-34148-A-3-A
Client ID: GEI.PRC.BLK3
Sample Type: Client
Inject. Date: 13-Nov-2023 22:31:55 ALS Bottle#: 0 Worklist Smp#: 32
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030467-032
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 16-Nov-2023 15:46:08 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1650

First Level Reviewer: SK9U Date: 16-Nov-2023 11:06:02

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/ml	%Rec	Flags
D 10 Naphthalene-d8	136	5.059	5.068	-0.009	100	56991	0.4144	82.9	
12 Naphthalene	128	5.077	5.077	-0.001	45	1900	0.0142		7M
D 15 2-methylnaphthalene-d10	152	5.612	5.612	0.000	92	37752	0.4222	84.4	
16 2-Methylnaphthalene	142	5.635	5.635	0.000	96	638	0.006794		7M
D 17 1-Methylnaphthalene-d10	152	5.692	5.692	0.000	100	37687	0.4207	84.1	
D 23 Acenaphthylene-d8	160	6.366	6.366	0.000	90	61324	0.4041	80.8	
* 26 Acenaphthene-d10	164	6.492	6.492	0.000	97	49324	0.5000		
D 29 Fluorene -d10	176	6.925	6.925	0.000	99	49934	0.4249	85.0	
30 Fluorene	166	6.950	6.945	0.005	79	282	0.002174		7M
D 35 Phenanthrene-d10	188	7.735	7.728	0.007	99	87999	0.3836	76.7	
D 38 Anthracin-d10	188	7.783	7.783	0.007	99	82082	0.3665	73.3	M
39 Anthracene	178	7.794	7.794	0.000	61	136	0.000673		7M
D 41 Fluoranthene-d10	212	8.808	8.808	0.000	100	128998	0.4335	86.7	
43 Fluoranthene	202	8.822	8.822	-0.003	32	374	0.001133		7M
* 44 Pyrene-d10 (IS)	212	9.027	9.027	0.000	99	147112	0.5000		
45 Pyrene	202	9.044	9.044	0.000	92	745	0.002212		7M
47 Benzo[a]anthracene	228	10.265	10.259	0.005	11	168	0.000588		7M
D 48 Chrysene-d12	240	10.270	10.270	0.000	98	110031	0.3833	76.7	
50 Chrysene	228	10.295	10.295	0.000	4	155	0.000484		7M
D 52 Benzo(b)fluoranthene-d12	264	11.376	11.369	0.007	100	95394	0.4506	90.1	
53 Benzo[b]fluoranthene	252	11.404	11.397	0.007	0	586	0.001823		7M
D 54 Benzo(k)fluoranthene-d12	264	11.404	11.404	0.000	41	110346	0.4437	88.7	
* 56 Benzo(e)pyrene-d12	264	11.684	11.684	0.000	99	83586	0.5000		
D 58 Benzo(a)pyrene-d12	264	11.747	11.747	0.000	100	71932	0.3874	77.5	
59 Benzo[a]pyrene	252	11.782	11.782	0.007	28	182	0.000765		7M
D 60 Perylene-d12	264	11.845	11.845	0.000	100	74709	0.3626	72.5	
D 62 Indeno[1,2,3-cd]pyrene-d12	288	13.186	13.186	0.000	80	89611	0.4443	88.9	
D 63 Dibenz(a,h)anthracene-d14	292	13.196	13.196	0.000	88	75886	0.4205	84.1	
65 Indeno[1,2,3-cd]pyrene	276	13.196	13.196	-0.018	17	271	0.000904		7M
D 67 Benzo(ghi)perylene-d12	288	13.552	13.543	0.009	100	91079	0.4547	90.9	
68 Benzo[g,h,i]perylene	276	13.571	13.580	-0.009	1	146	0.000547		7M
74 PCB-14	222	7.476	7.476	-0.003	99	13013	0.0628		

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/ml	%Rec	Flags
75 PCB-36	258	8.206	8.210	-0.004	99	2168	0.0199		
76 PCB-104	326	8.395	8.396	-0.001	96	4717	0.0557		
77 PCB-121	326	8.751	8.751	0.000	99	1255	0.0184		
78 PCB-155	360	8.848	8.849	-0.001	92	1063	0.0167		
79 PCB-78	290	9.081	9.084	-0.003	86	2655	0.0487		
80 PCB-142	360	9.521	9.522	-0.001	82	592	0.0128		
81 PCB-184	394	9.575	9.572	0.003	97	884	0.0191		
* 82 PCB-167L	372	10.023	10.027	-0.004	73	22621	0.4000		
83 PCB-204	428	10.249	10.250	-0.001	73	989	0.0328		
84 PCB-192	394	10.275	10.275	0.000	6	2161	0.0509		

QC Flag Legend

Processing Flags

7 - Failed Limit of Detection

Review Flags

M - Manually Integrated

Reagents:

60ISPCB_00001 Amount Added: 5.00 Units: uL

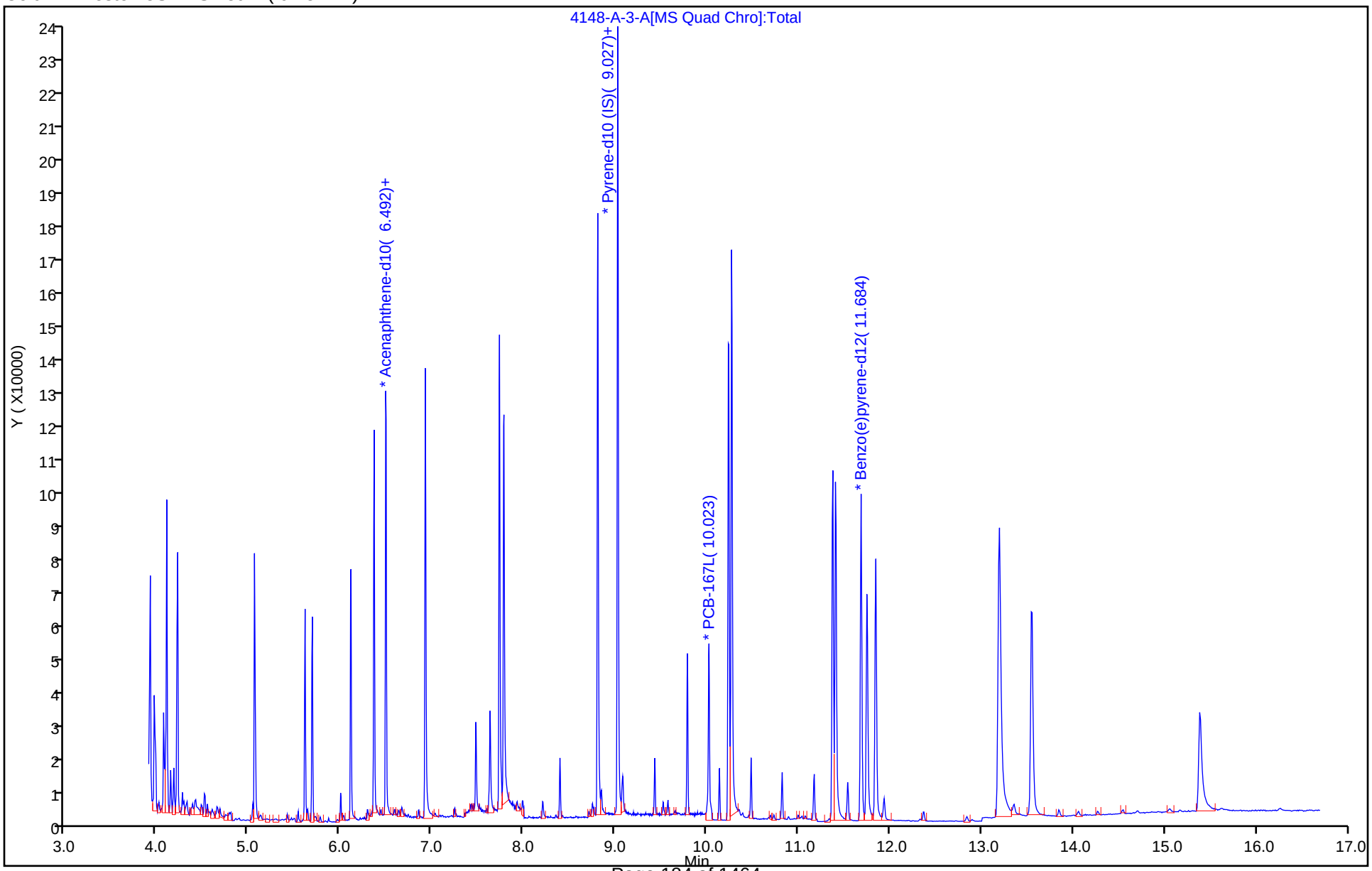
Report Date: 16-Nov-2023 15:46:53 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-3-A.D

Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3	Worklist Smp#:	32
Client ID:	GEI.PRC.BLK3				
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)

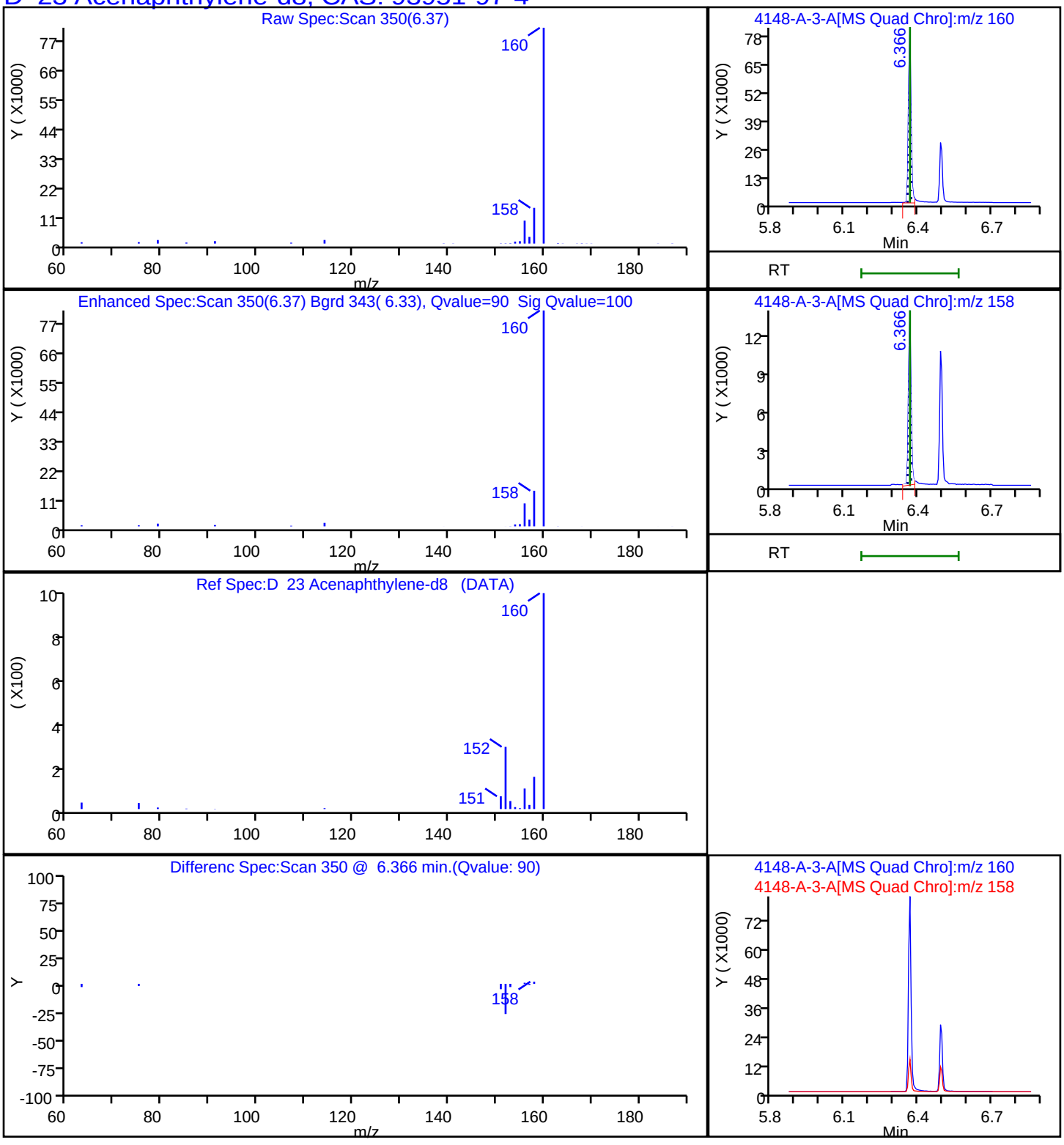


Report Date: 16-Nov-2023 15:46:53 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-3-A.D				
Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3		
Client ID:	GEI.PRC.BLK3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D_23 Acenaphthylene-d8, CAS: 93951-97-4



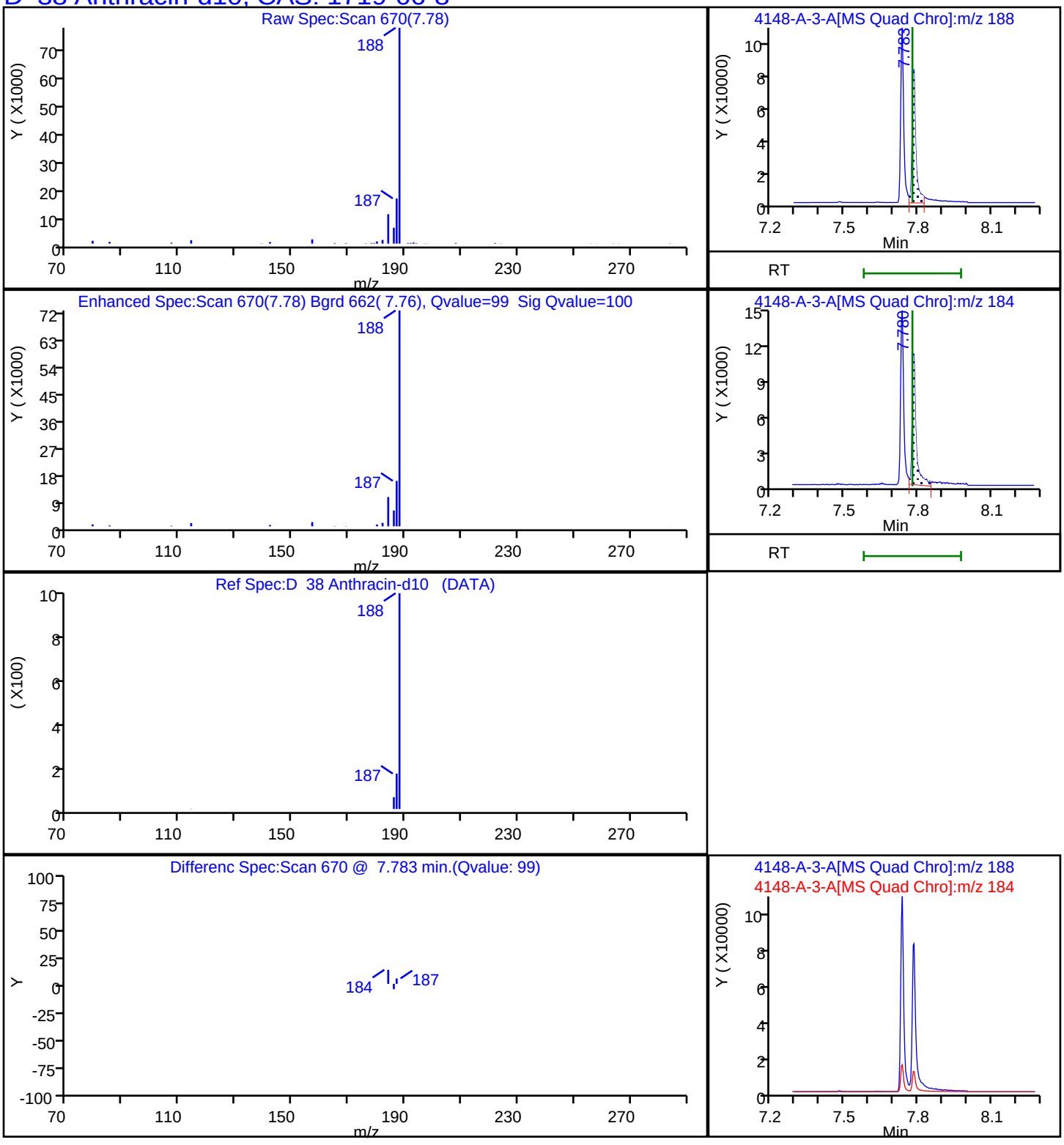
Report Date: 16-Nov-2023 15:46:53 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-3-A.D

Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3
Client ID:	GEI.PRC.BLK3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

D 38 Anthracin-d10, CAS: 1719-06-8

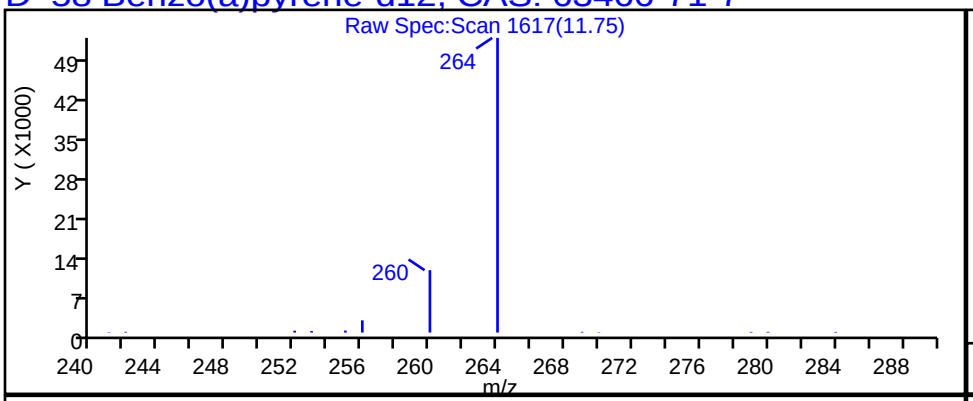


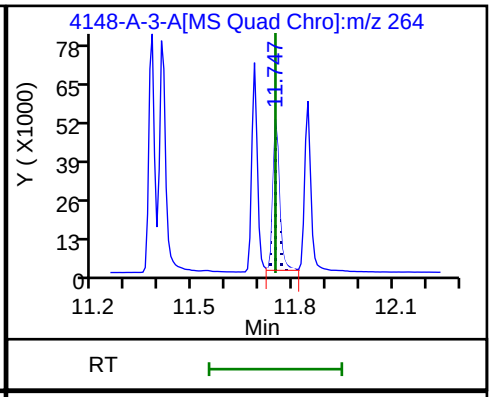
Report Date: 16-Nov-2023 15:46:54 Chrom Revision: 2.3 15-Nov-2023 20:54:34

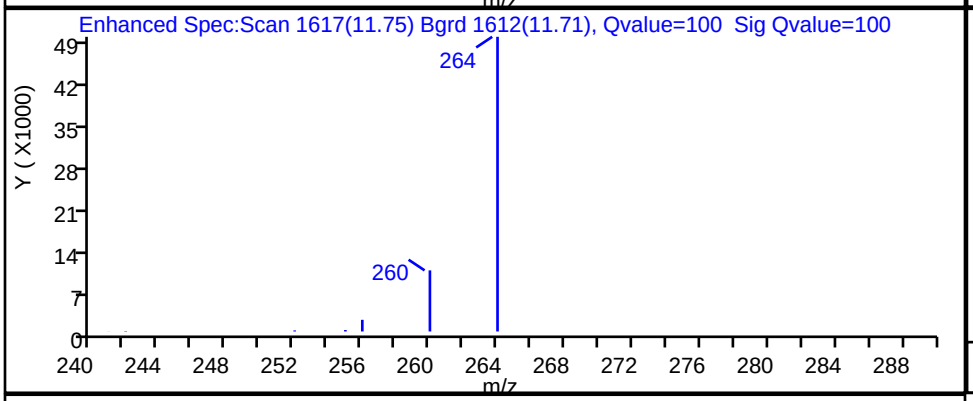
Eurofins Knoxville

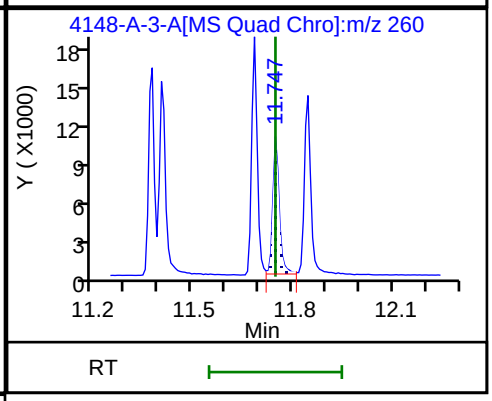
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-3-A.D		
Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3
Client ID:	GEI.PRC.BLK3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

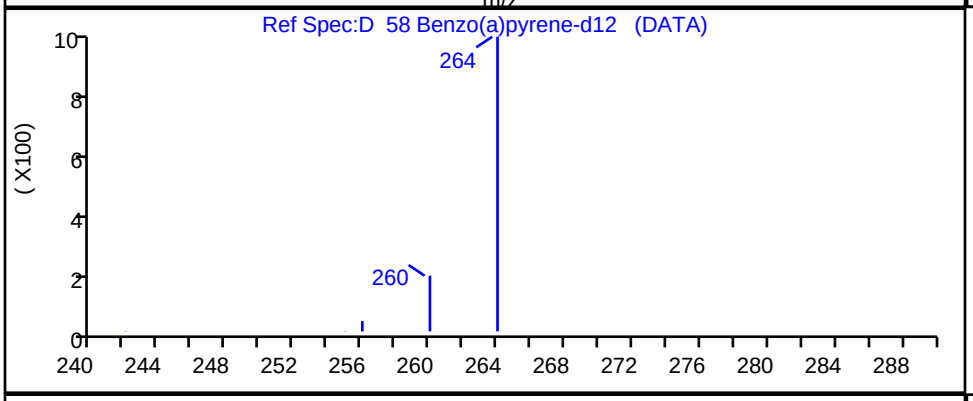
D 58 Benzo(a)pyrene-d12, CAS: 63466-71-7

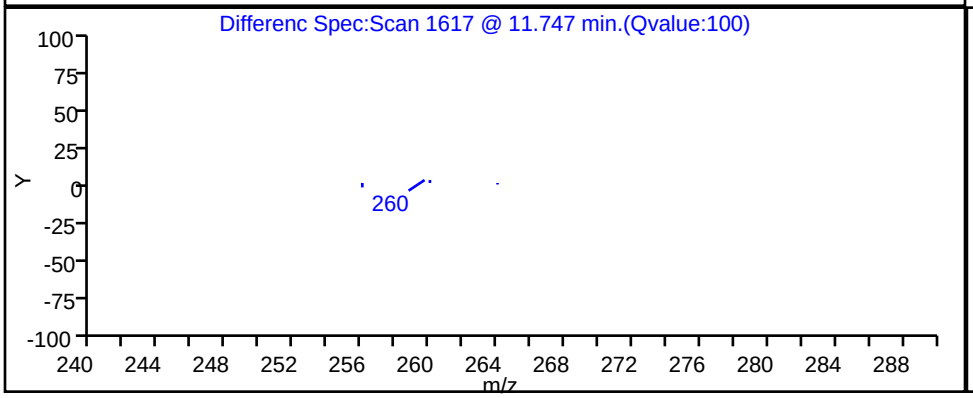


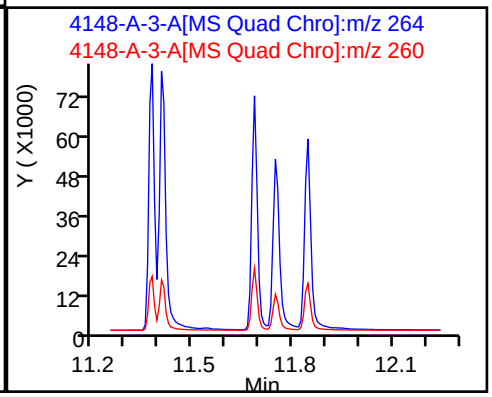












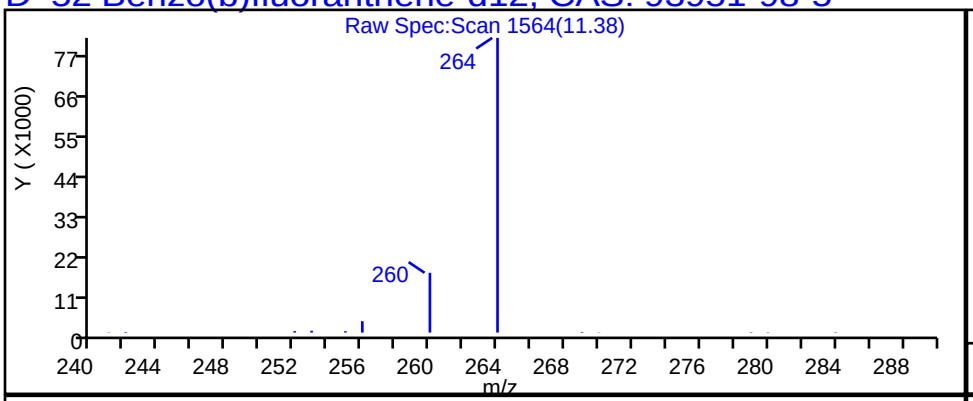
Report Date: 16-Nov-2023 15:46:53 Chrom Revision: 2.3 15-Nov-2023 20:54:34

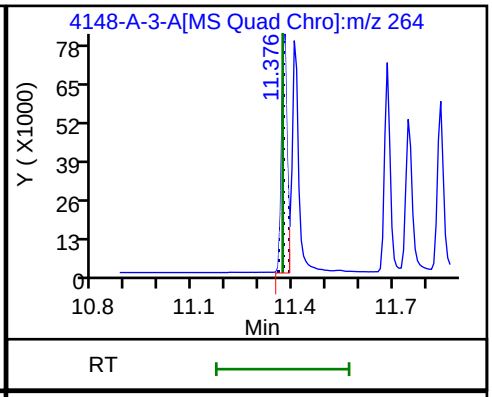
Eurofins Knoxville

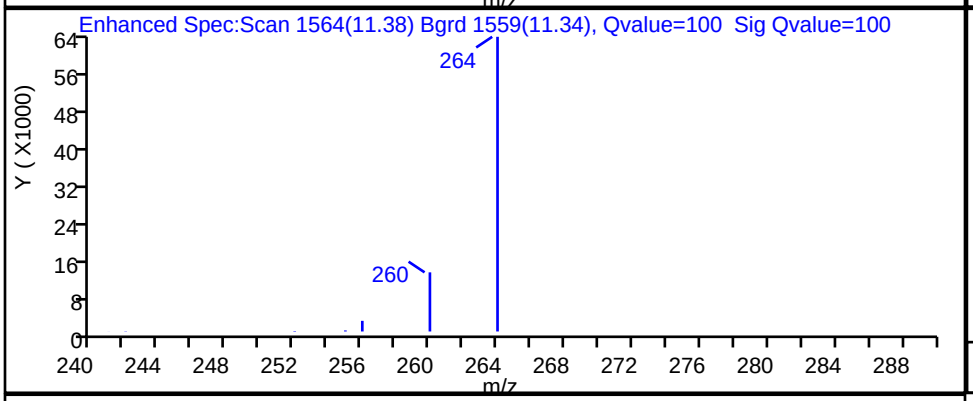
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-3-A.D

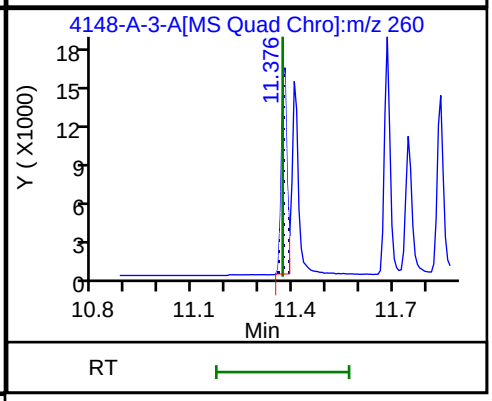
Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3
Client ID:	GEI.PRC.BLK3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

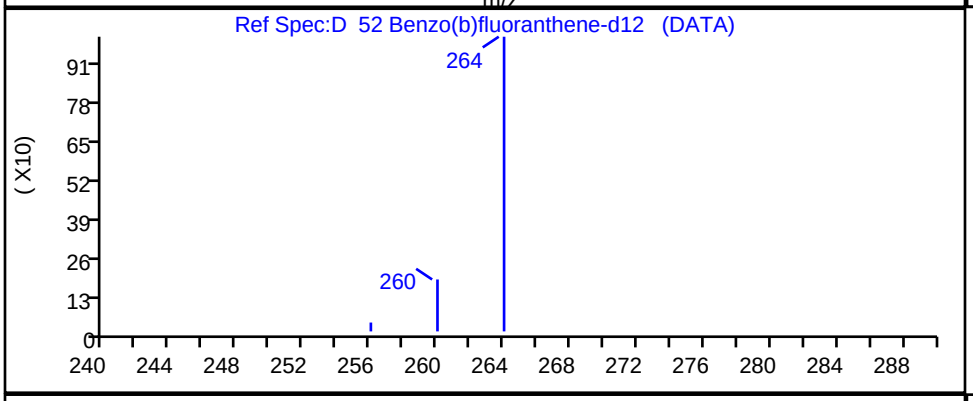
D 52 Benzo(b)fluoranthene-d12, CAS: 93951-98-5

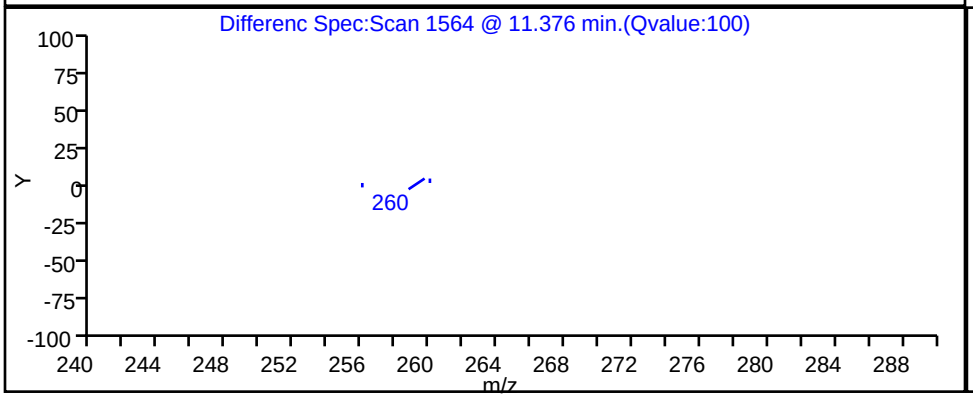


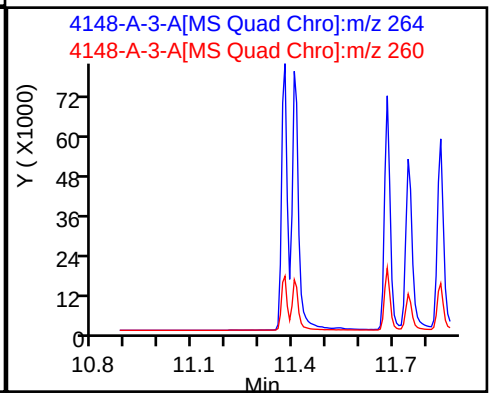










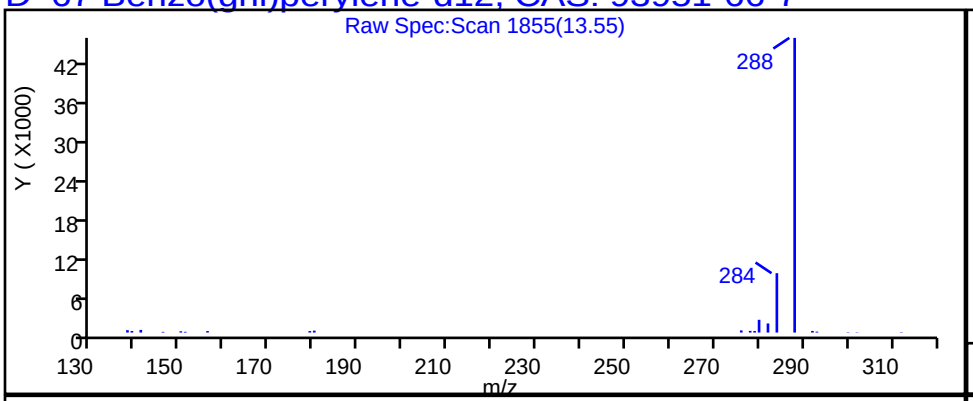


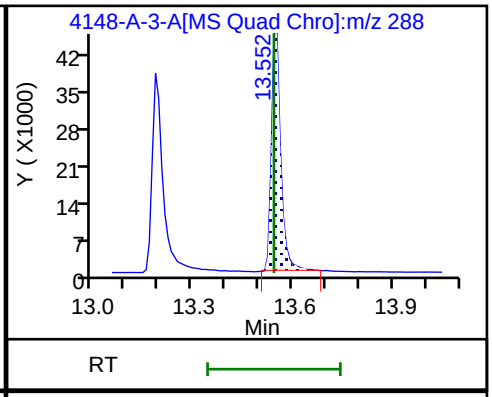
Report Date: 16-Nov-2023 15:46:54 Chrom Revision: 2.3 15-Nov-2023 20:54:34

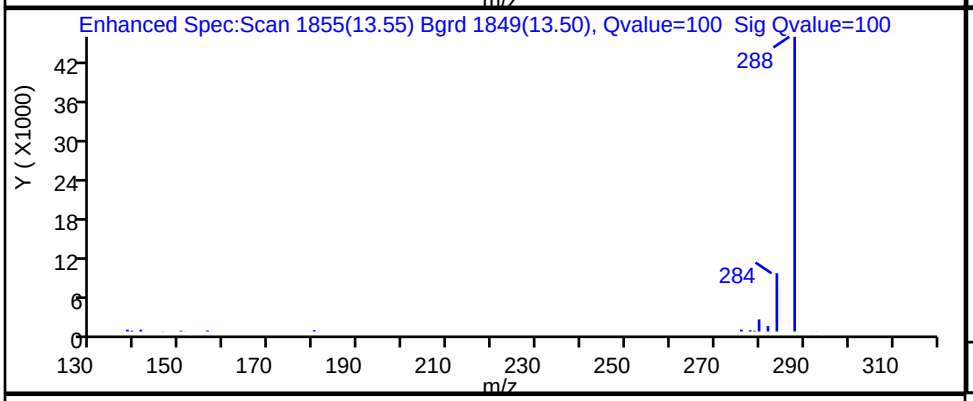
Eurofins Knoxville

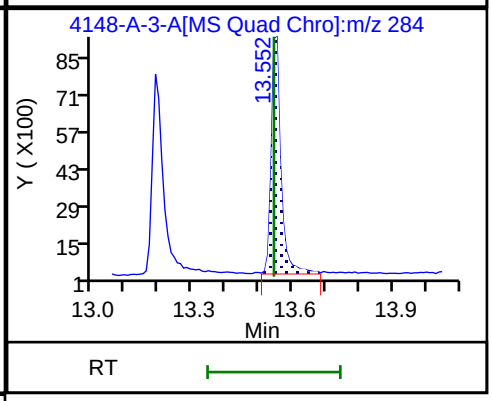
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-3-A.D				
Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3		
Client ID:	GEI.PRC.BLK3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

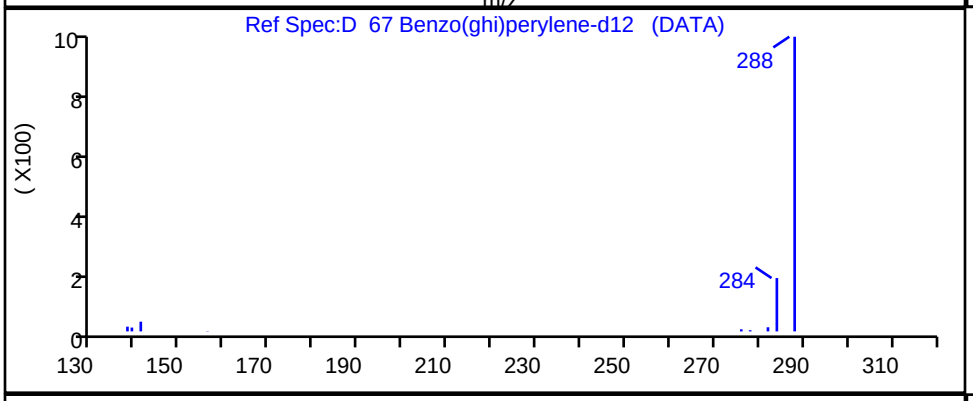
D 67 Benzo(ghi)perylene-d12, CAS: 93951-66-7

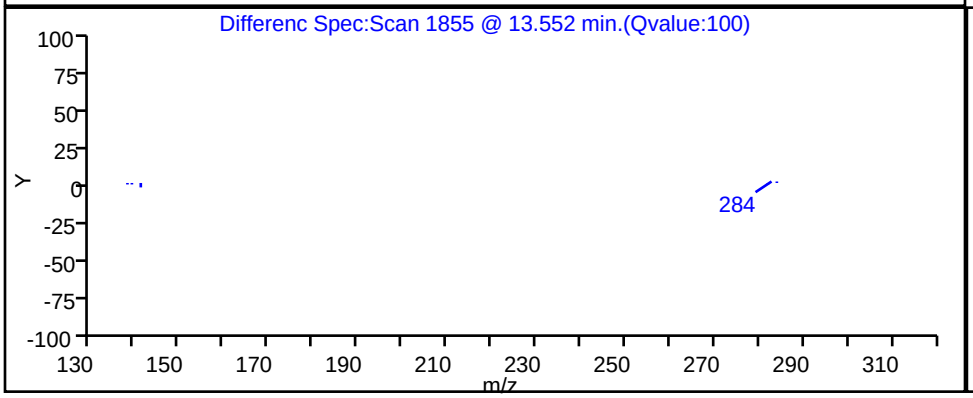


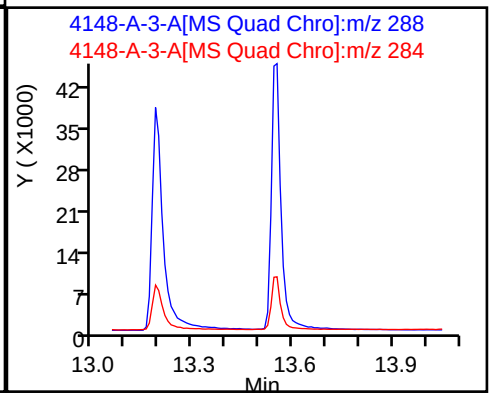












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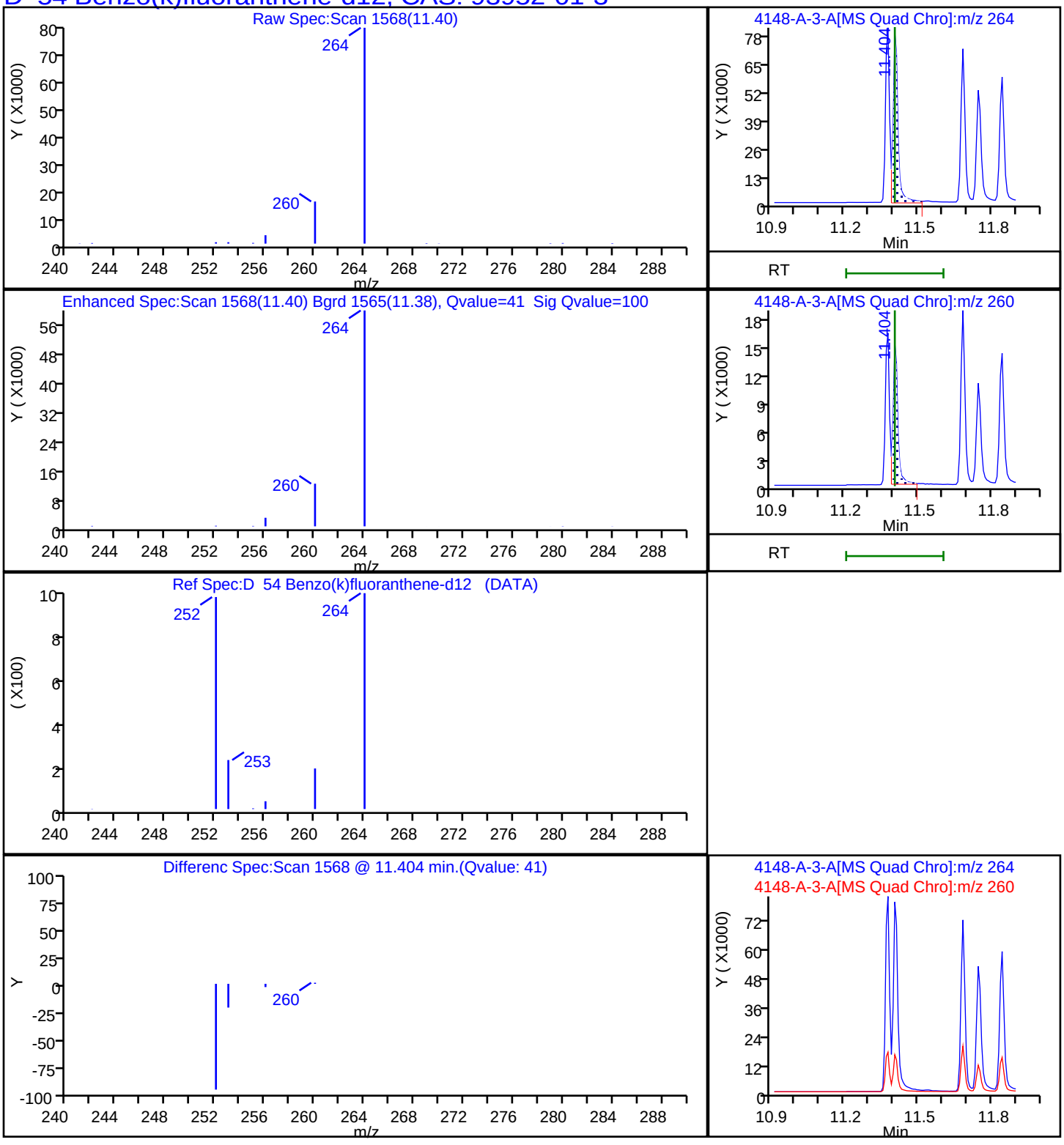
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-3-A.D

Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3		
Client ID:	GEI.PRC.BLK3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 54 Benzo(k)fluoranthene-d12, CAS: 93952-01-3



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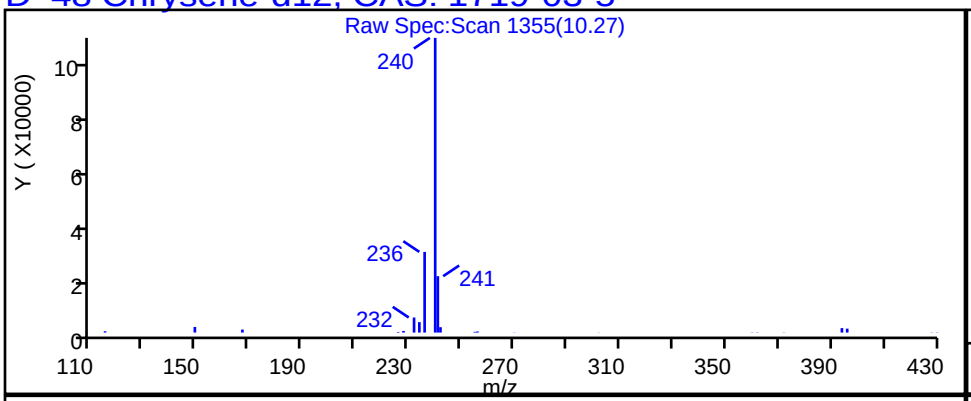
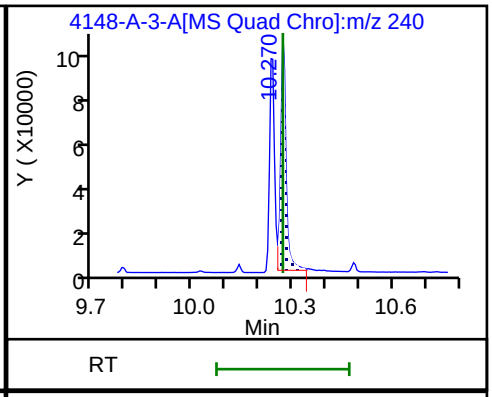
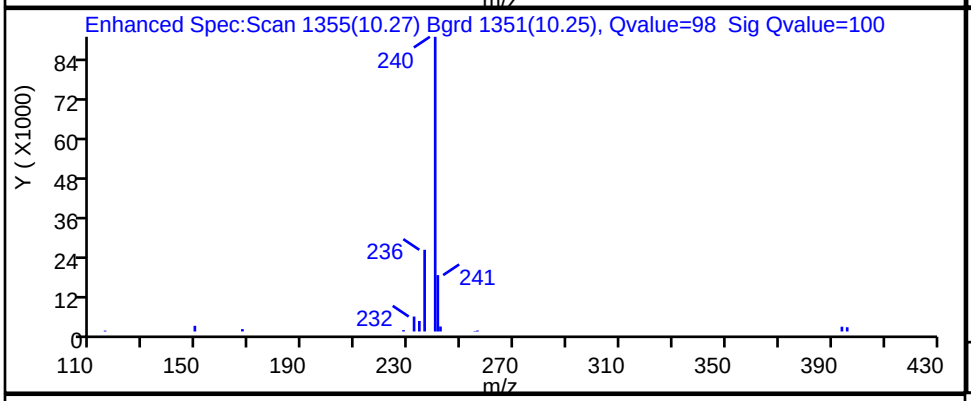
Eurofins Knoxville

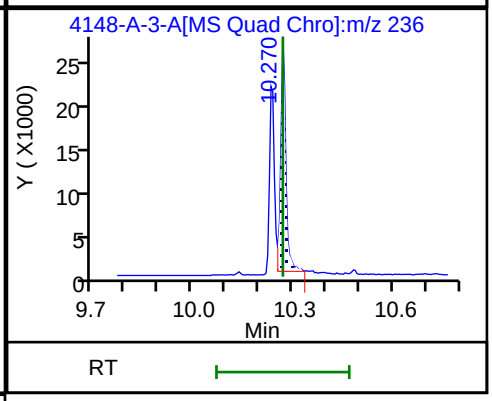
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-3-A.D		
Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3
Client ID:	GEI.PRC.BLK3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

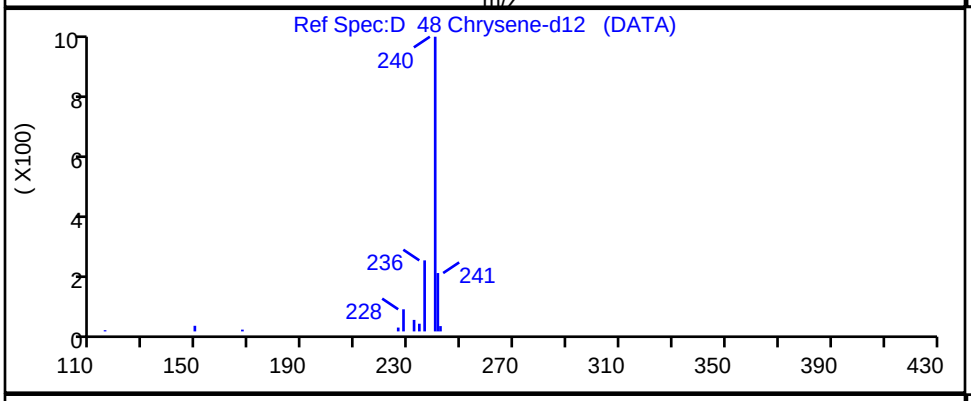
D_48 Chrysene-d12, CAS: 1719-03-5

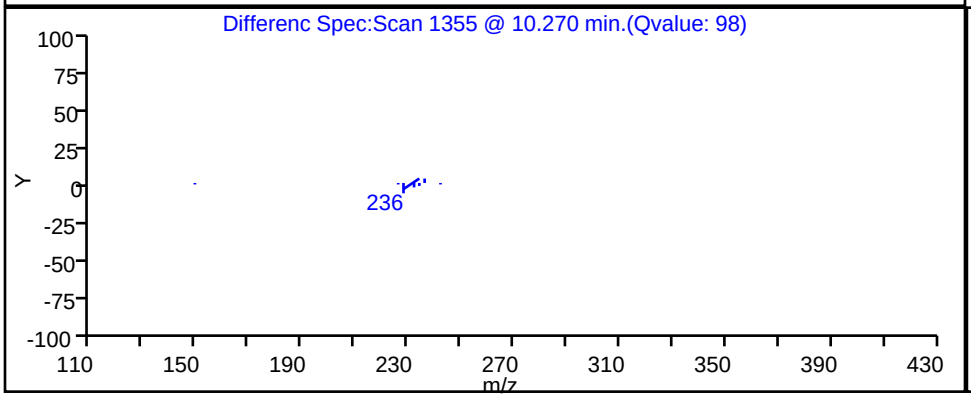


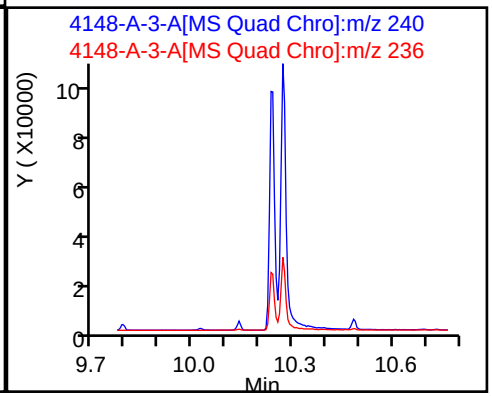












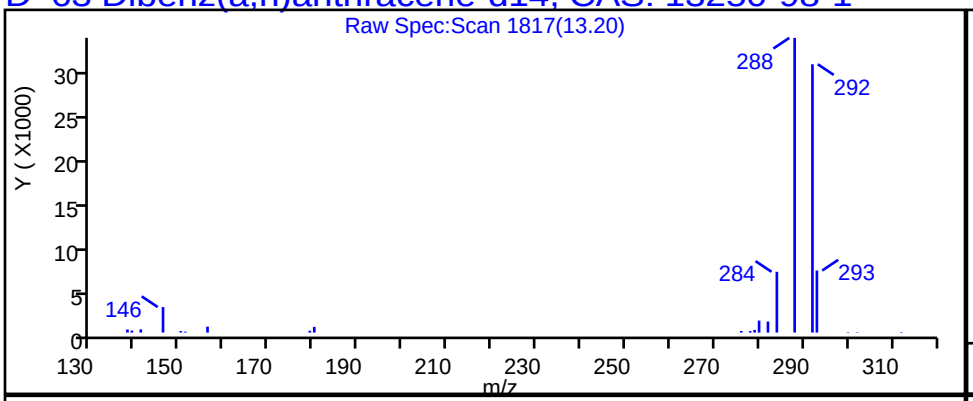
Report Date: 16-Nov-2023 15:46:54 Chrom Revision: 2.3 15-Nov-2023 20:54:34

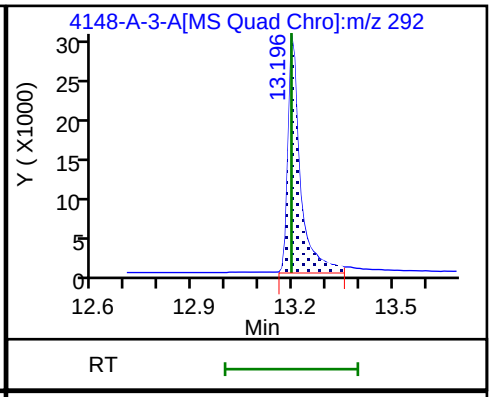
Eurofins Knoxville

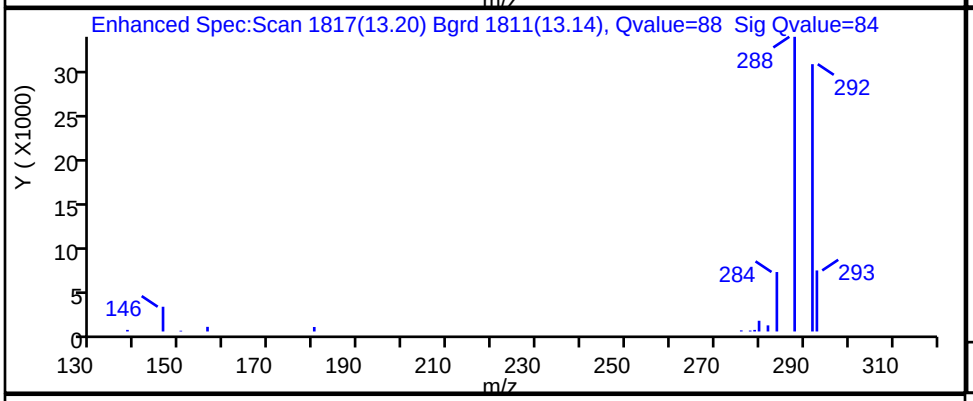
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-3-A.D

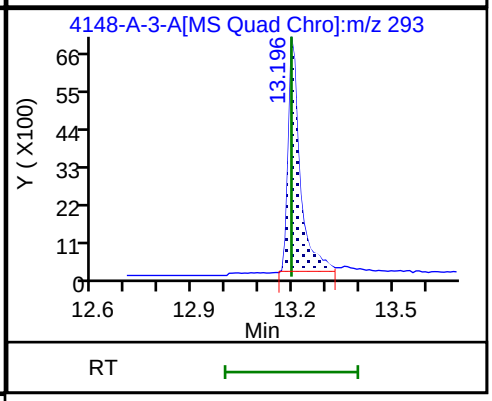
Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3		
Client ID:	GEI.PRC.BLK3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

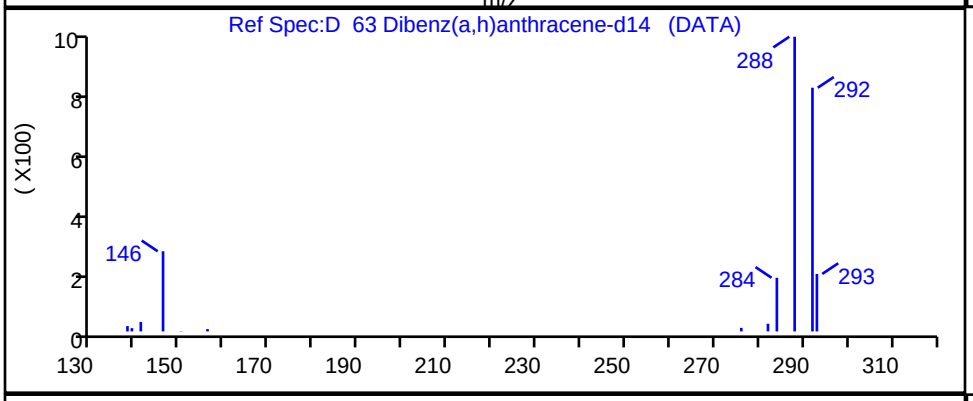
D_63 Dibenz(a,h)anthracene-d14, CAS: 13250-98-1

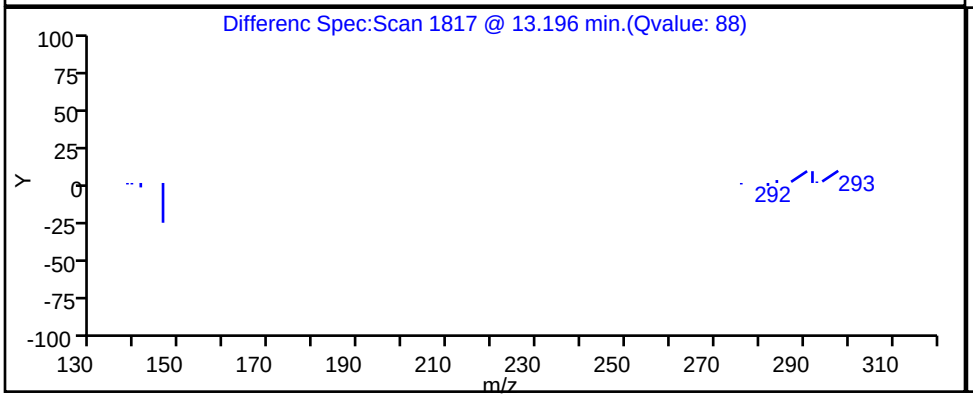


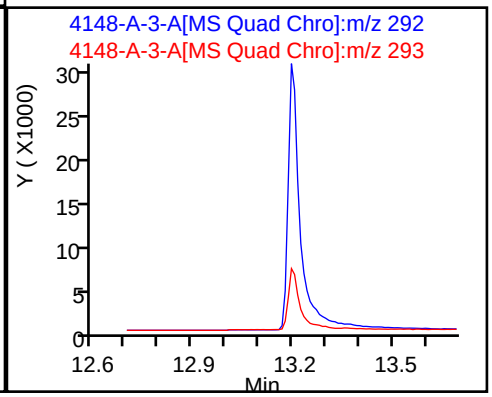












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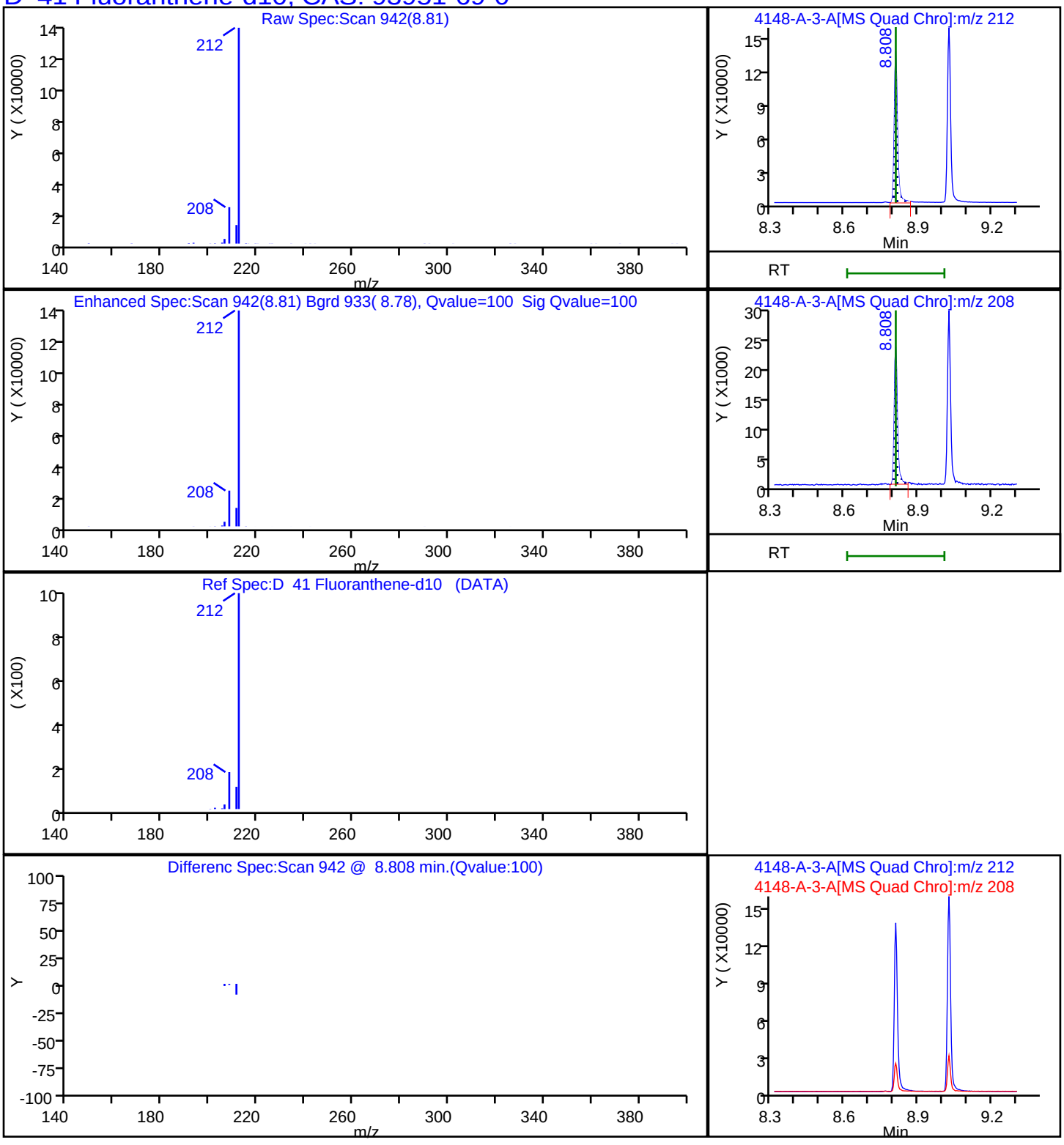
Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-3-A.D				
Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3		
Client ID:	GEI.PRC.BLK3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 41 Fluoranthene-d10, CAS: 93951-69-0



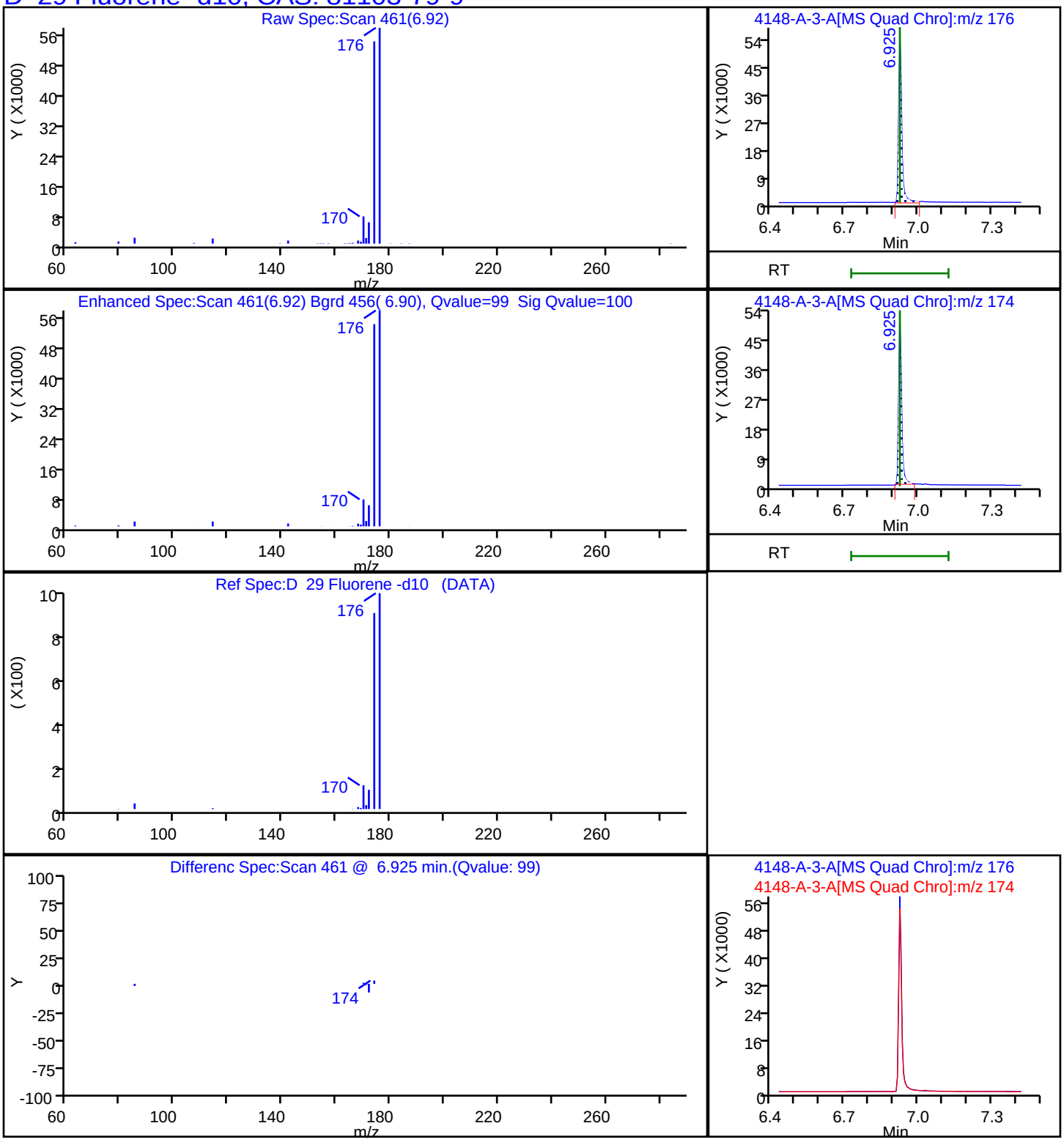
Report Date: 16-Nov-2023 15:46:53 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-3-A.D

Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3
Client ID:	GEI.PRC.BLK3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

D 29 Fluorene -d10, CAS: 81103-79-9



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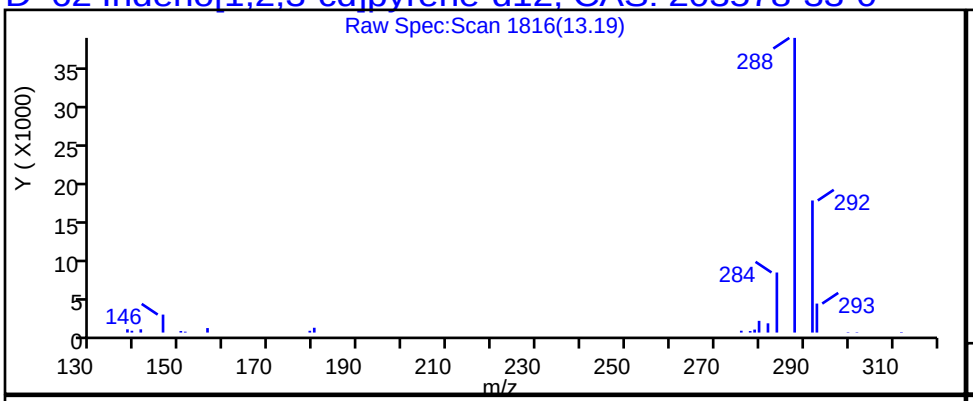
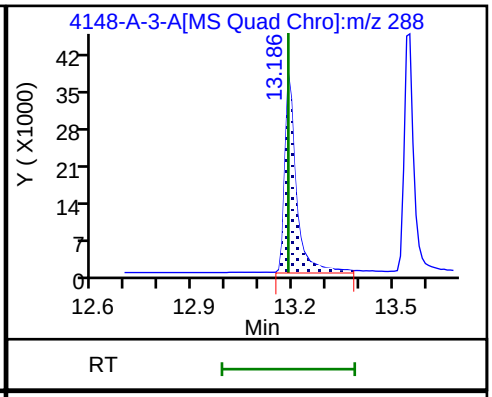
Eurofins Knoxville

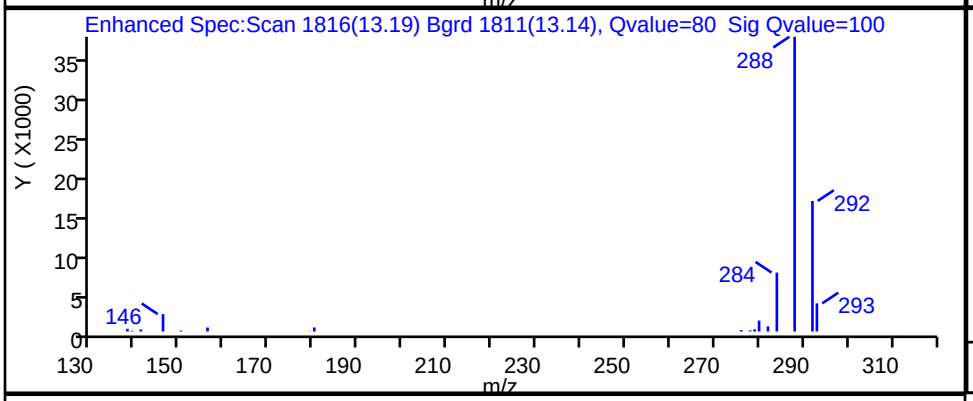
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-3-A.D

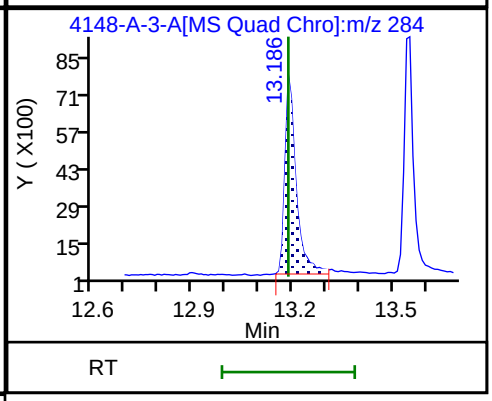
Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3
Client ID:	GEI.PRC.BLK3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

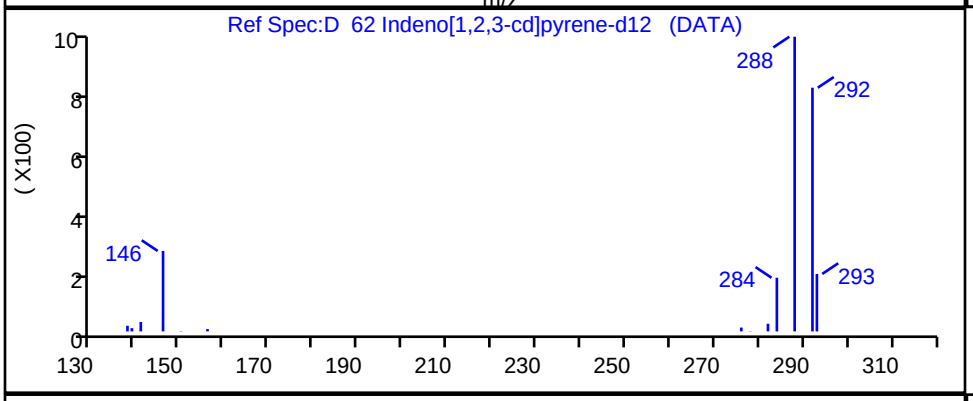
D 62 Indeno[1,2,3-cd]pyrene-d12, CAS: 203578-33-0

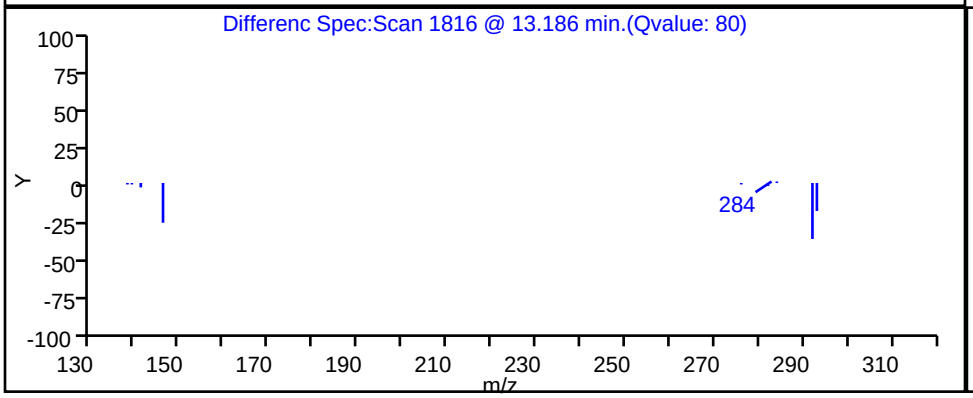


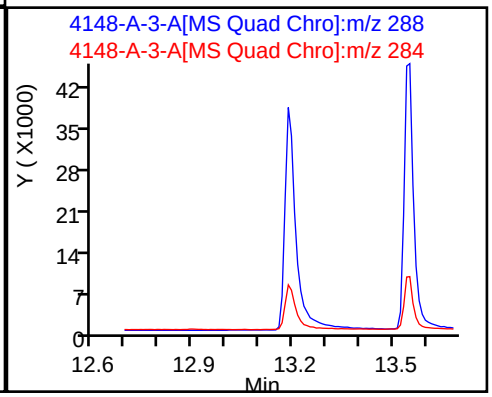












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Eurofins Knoxville

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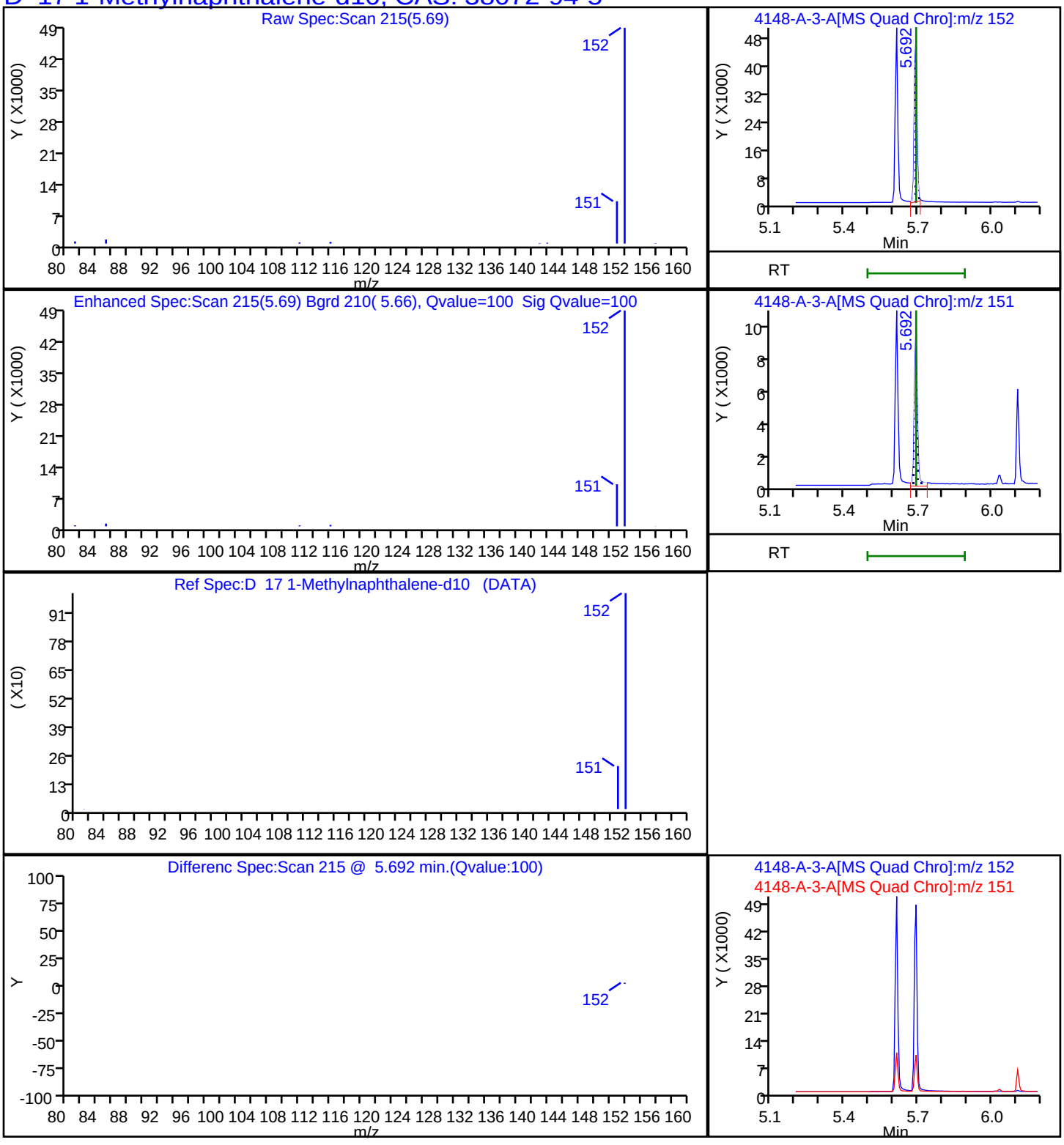
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3		
Client ID:	GEI.PRC.BLK3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 17 1-Methylnaphthalene-d10, CAS: 38072-94-5



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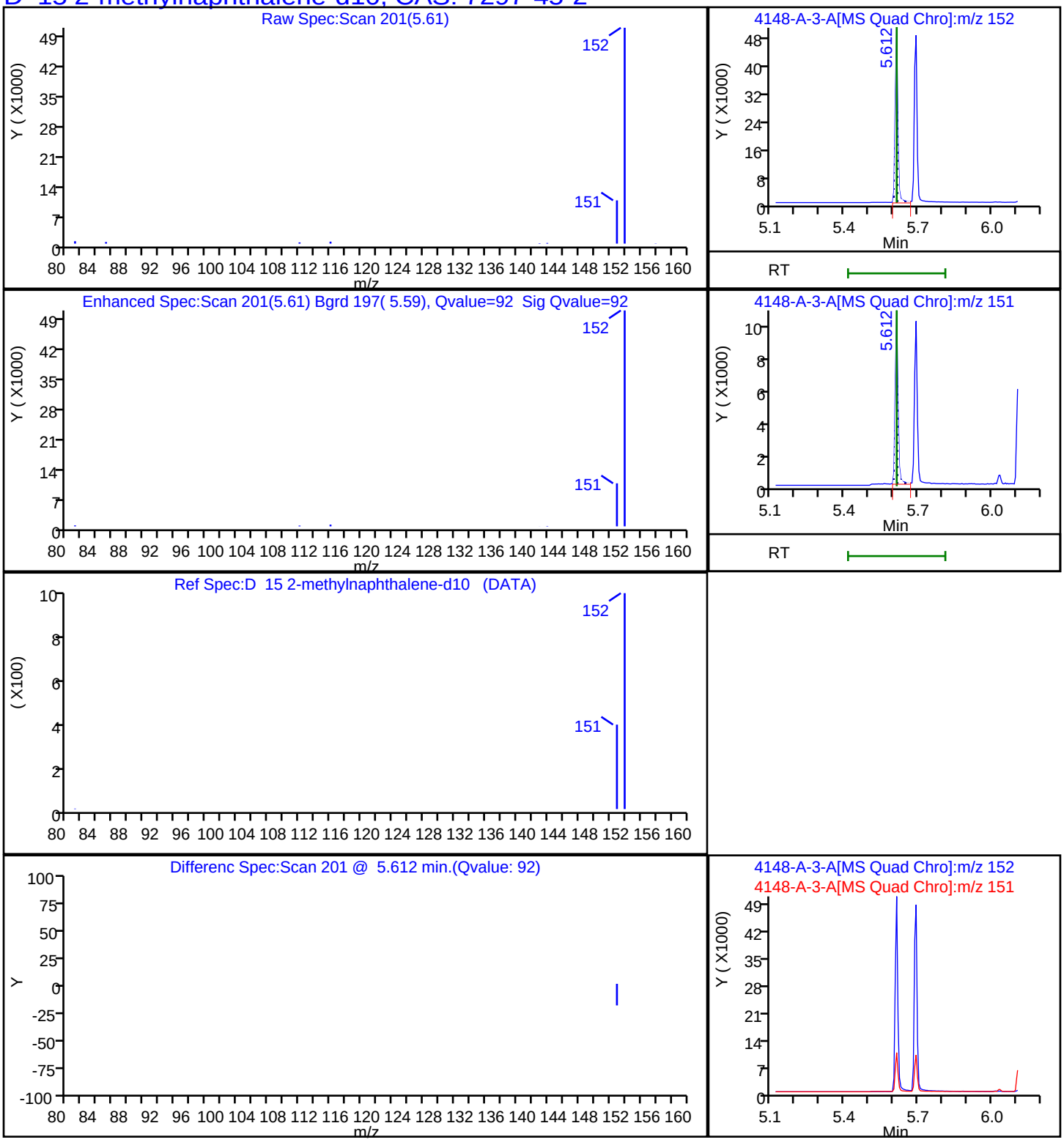
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3		
Client ID:	GEI.PRC.BLK3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 15 2-methylnaphthalene-d10, CAS: 7297-45-2



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Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1		
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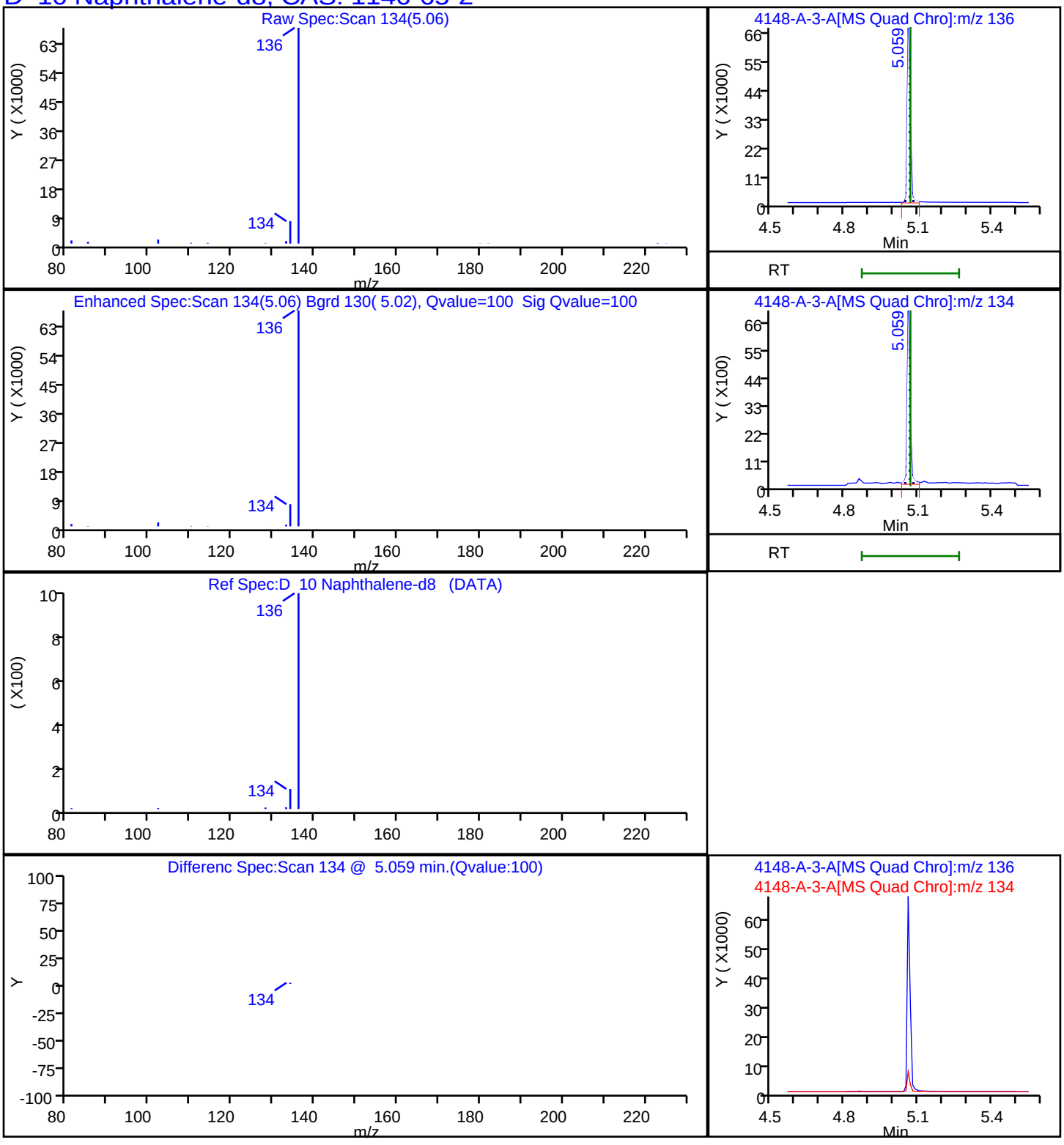
Client ID:	GEI.PRC.BLK3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D_10 Naphthalene-d8, CAS: 1146-65-2



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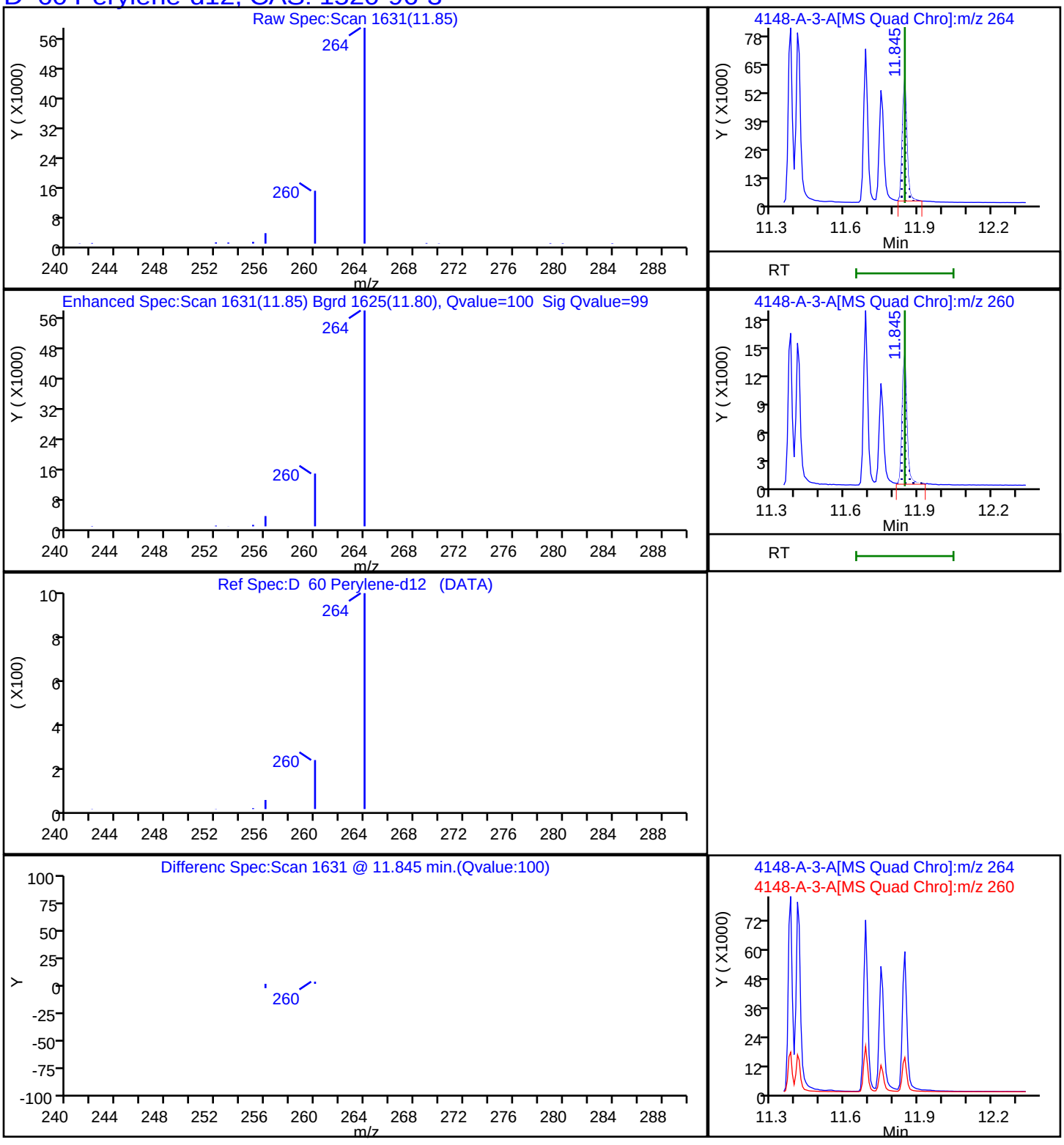
Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3
Client ID:	GEI.PRC.BLK3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

D 60 Perylene-d12, CAS: 1520-96-3



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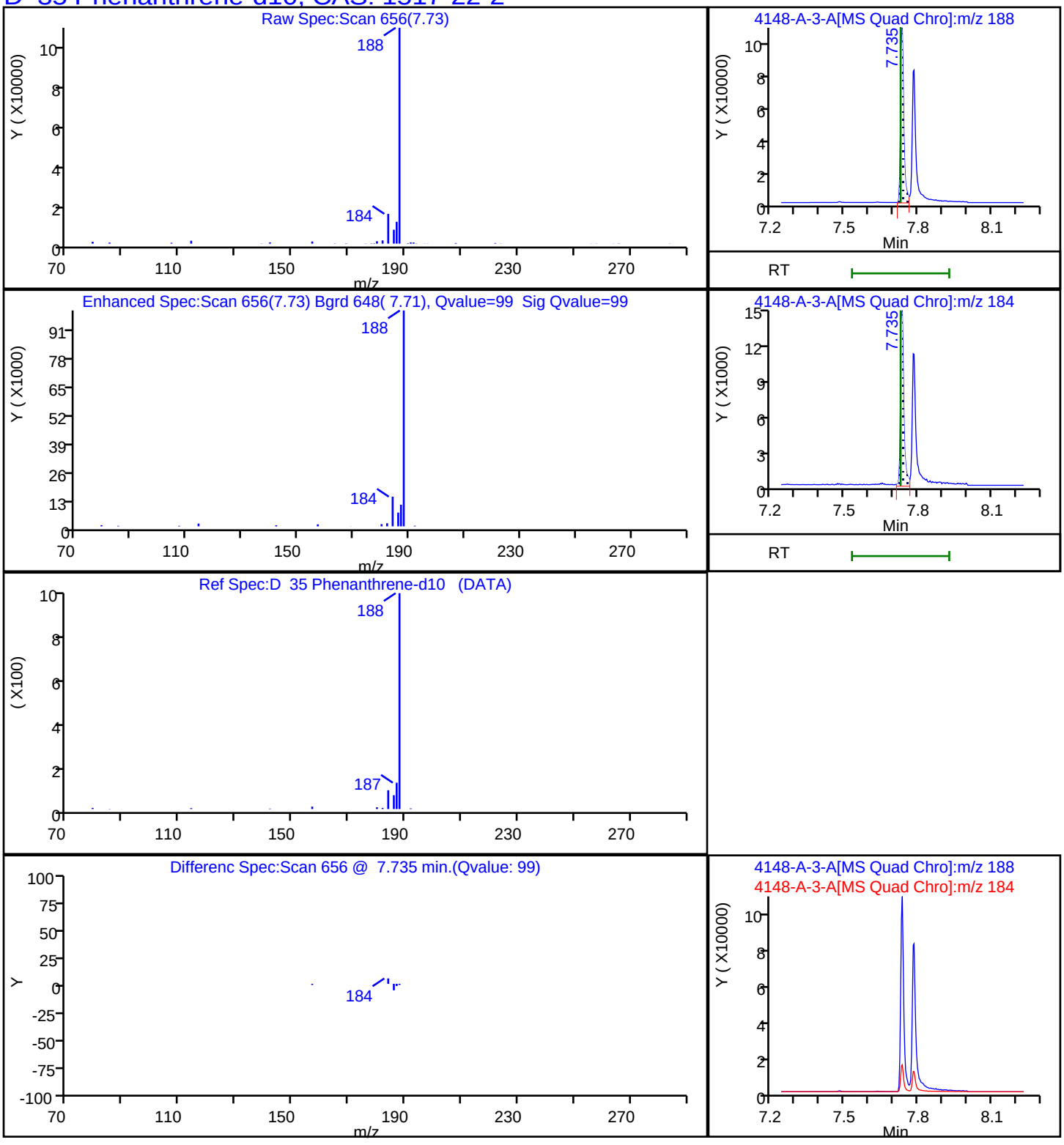
Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3		
Client ID:	GEI.PRC.BLK3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D_35 Phenanthrene-d10, CAS: 1517-22-2



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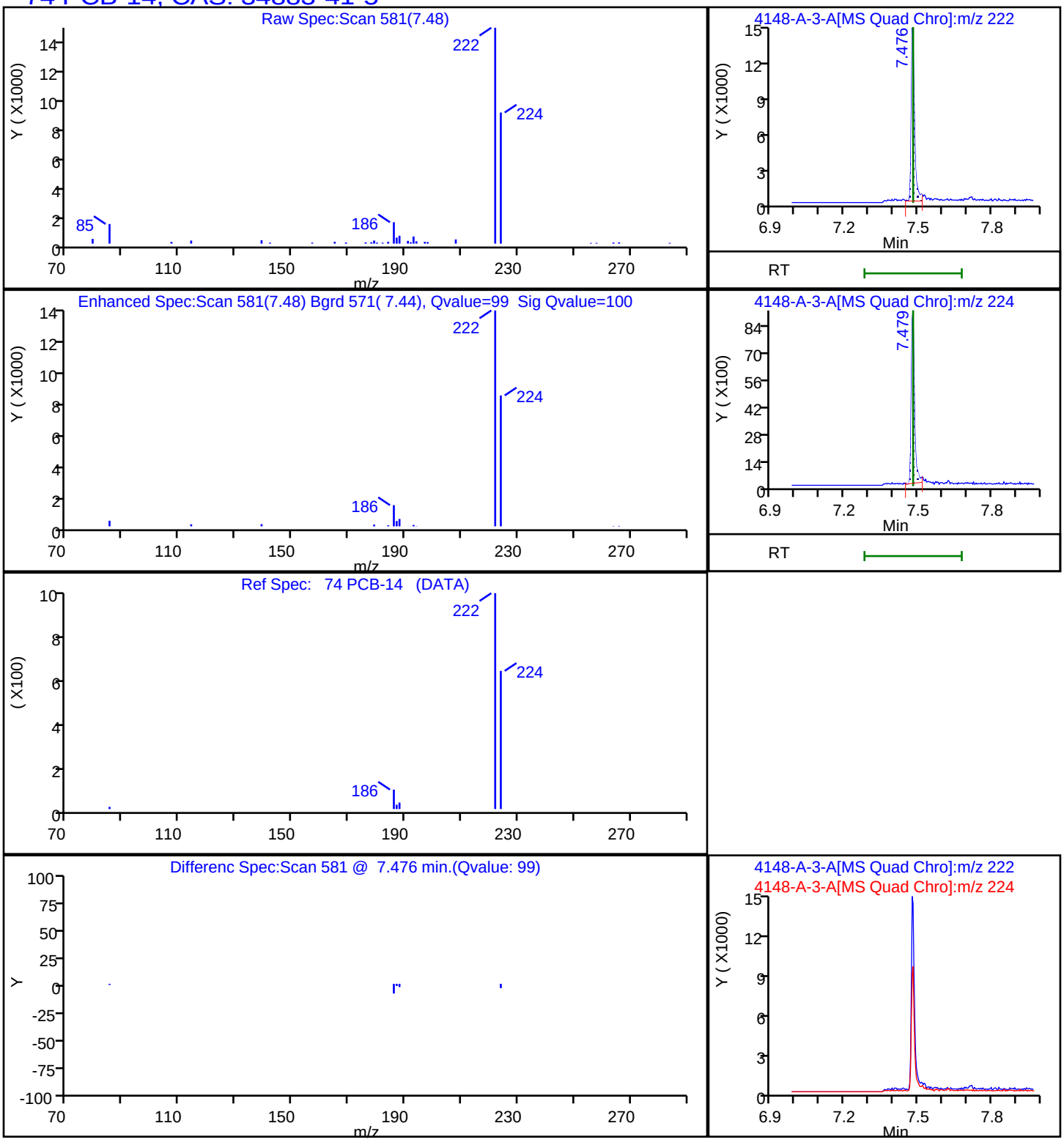
Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3
Client ID:	GEI.PRC.BLK3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

74 PCB-14, CAS: 34883-41-5



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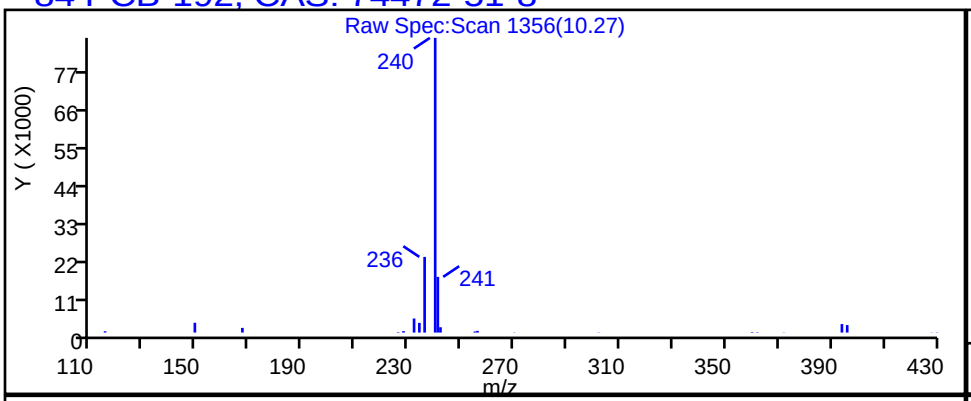
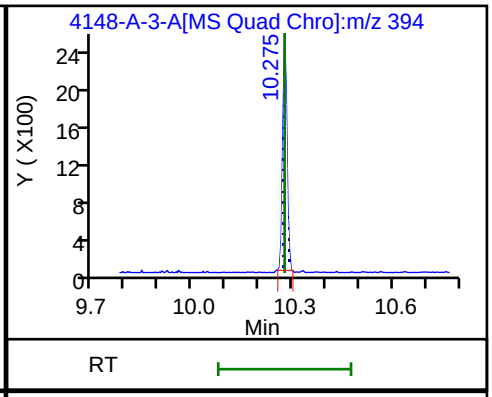
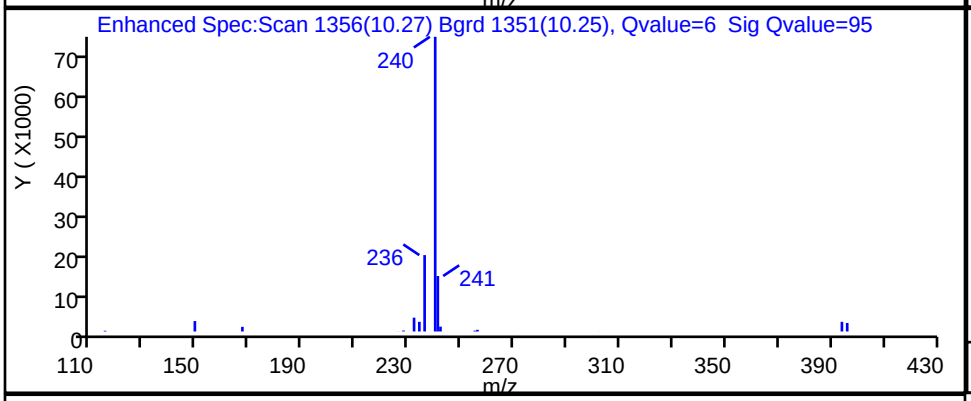
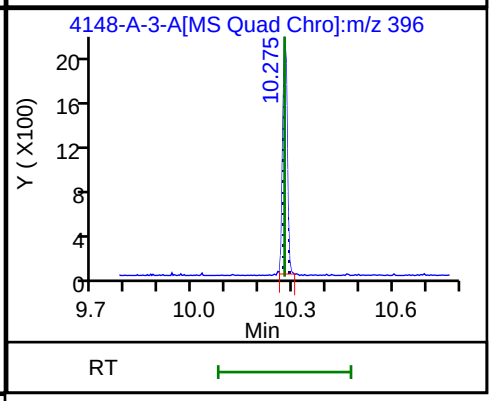
Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3
Client ID:	GEI.PRC.BLK3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

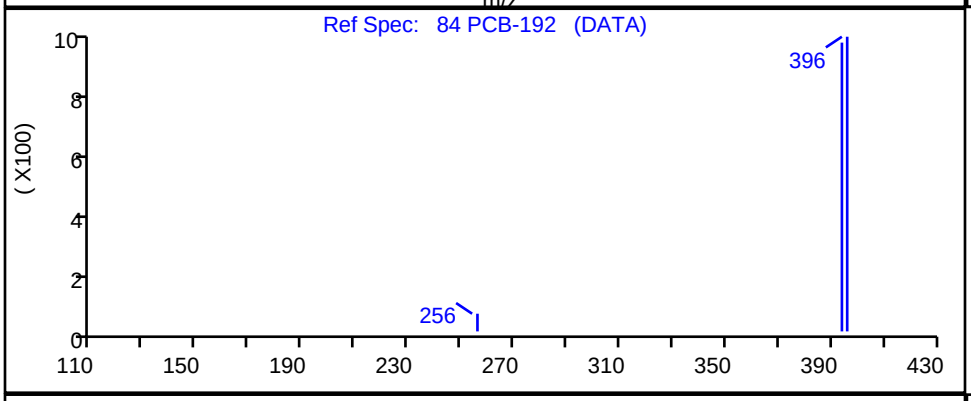
84 PCB-192, CAS: 74472-51-8

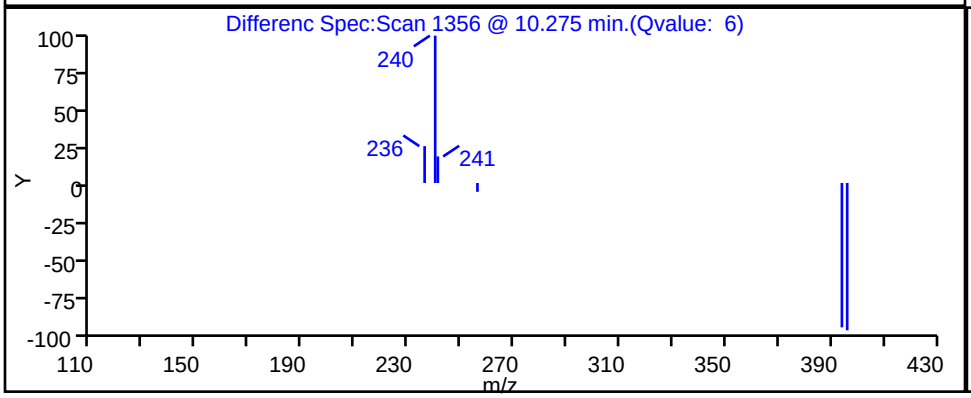


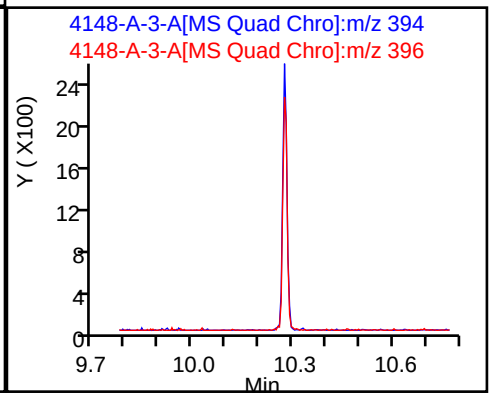












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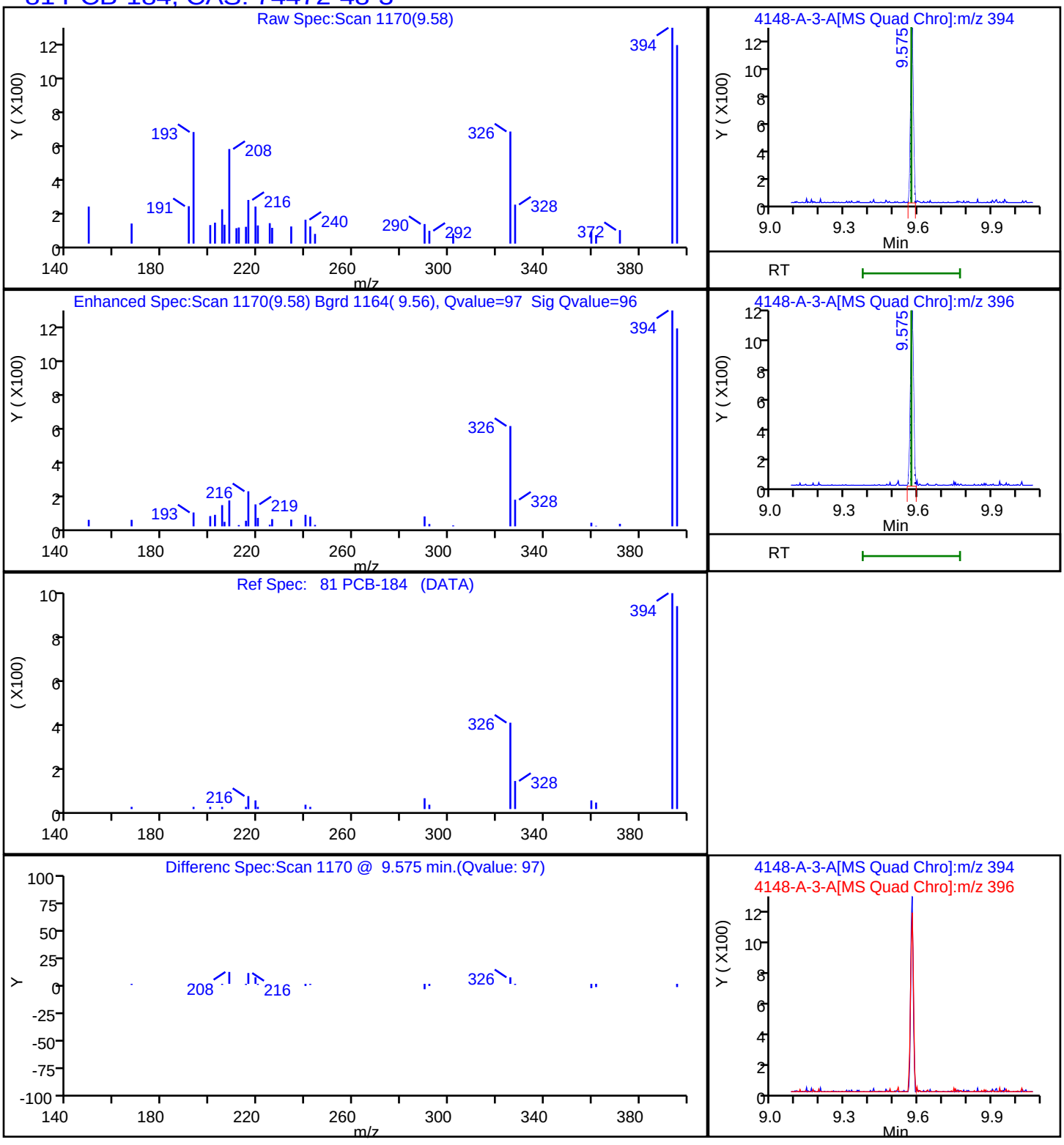
Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3
Client ID:	GEI.PRC.BLK3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

81 PCB-184, CAS: 74472-48-3



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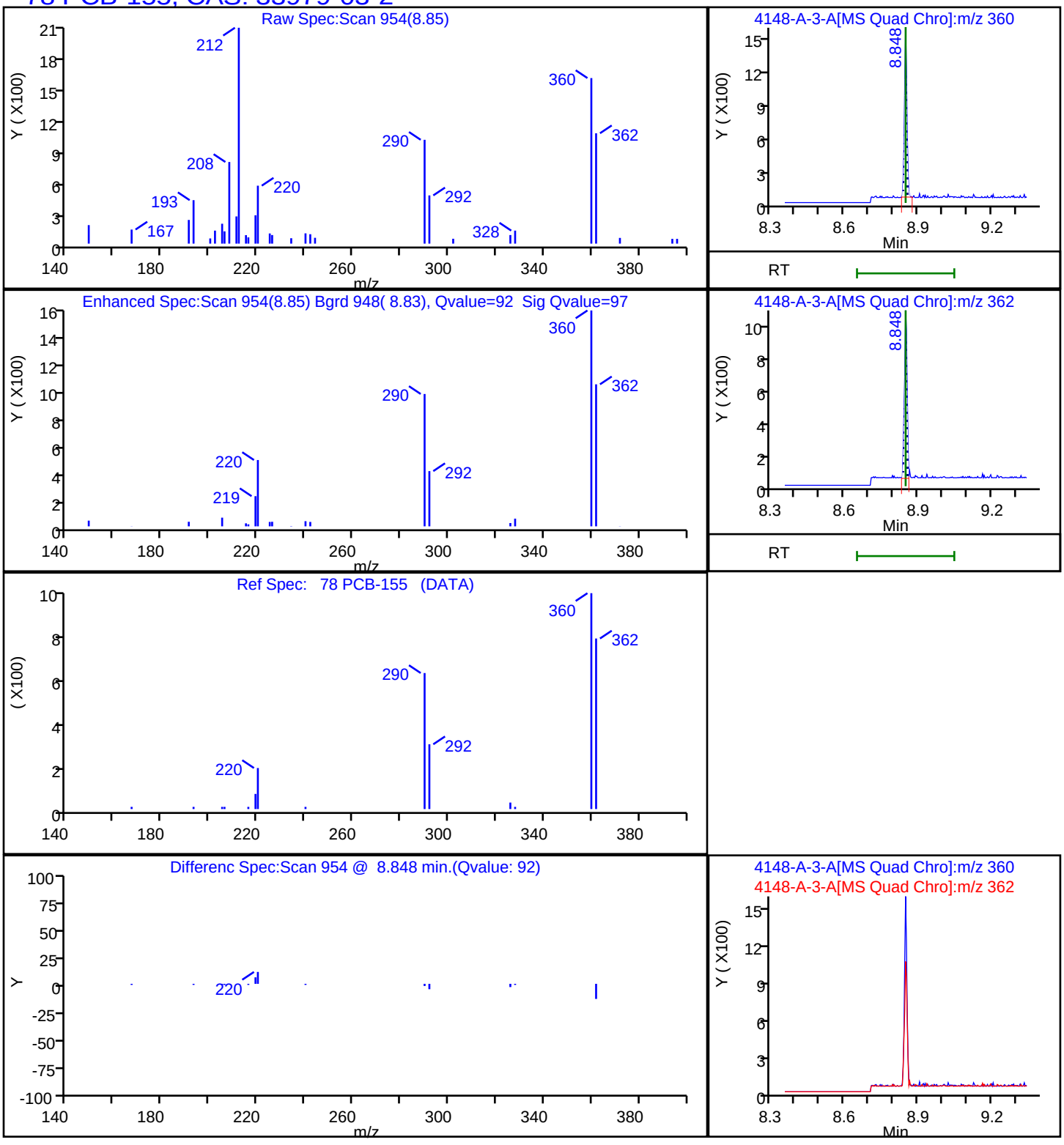
Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3
Client ID:	GEI.PRC.BLK3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

78 PCB-155, CAS: 33979-03-2



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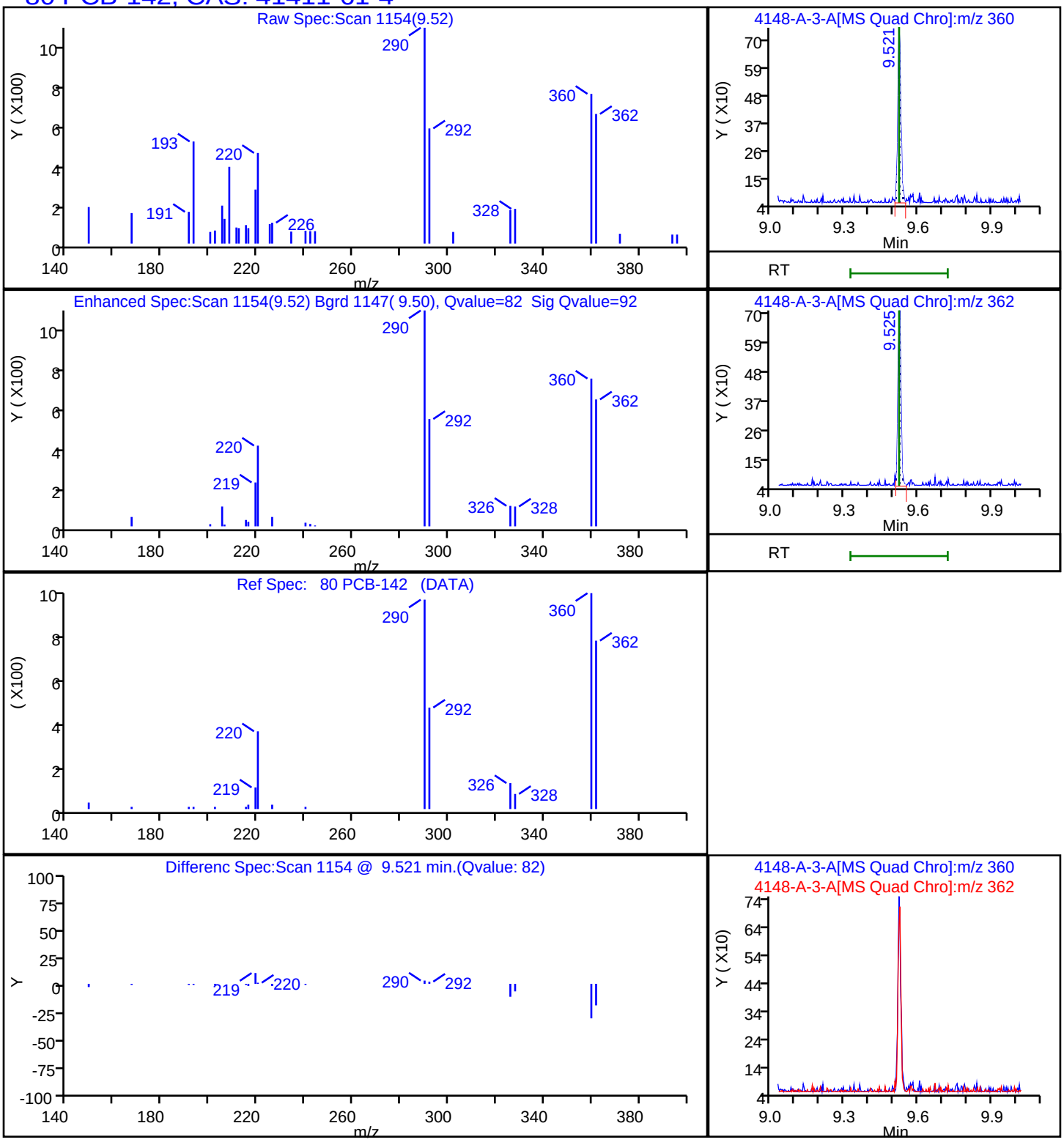
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3
Client ID:	GEI.PRC.BLK3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

80 PCB-142, CAS: 41411-61-4



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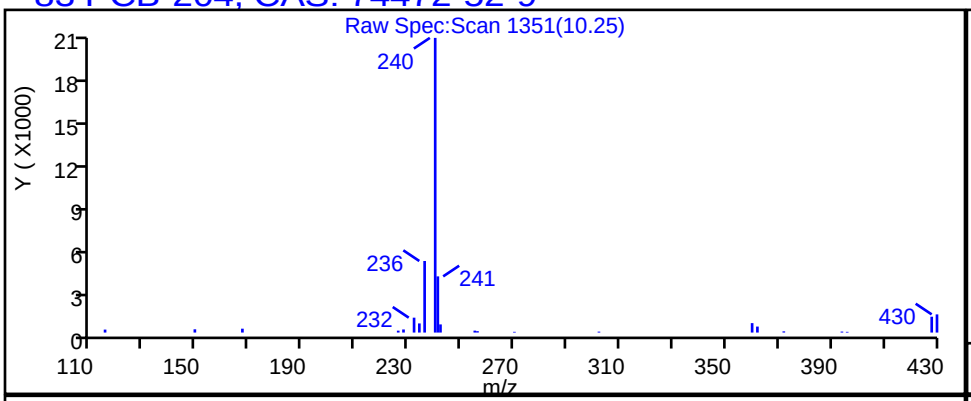
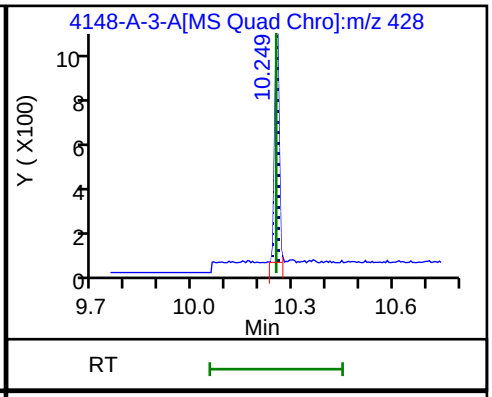
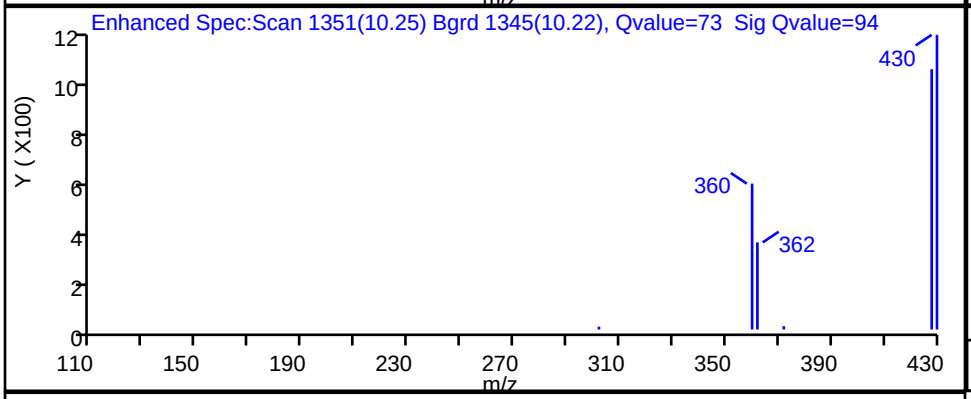
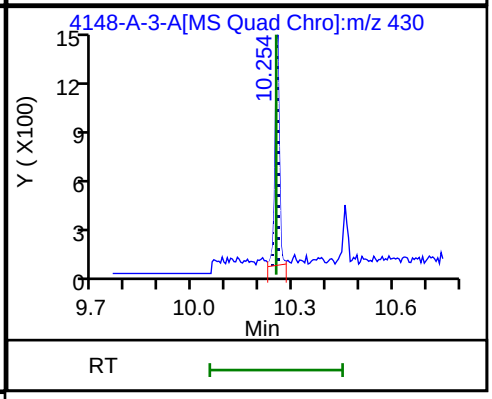
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3		
Client ID:	GEI.PRC.BLK3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

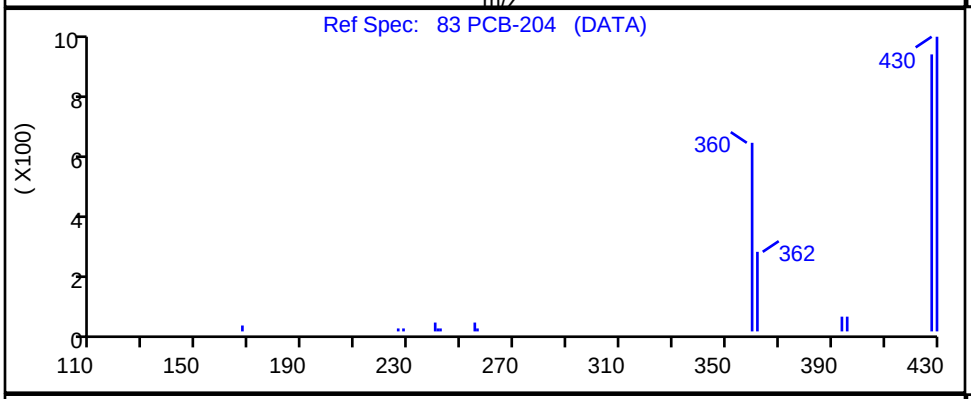
83 PCB-204, CAS: 74472-52-9

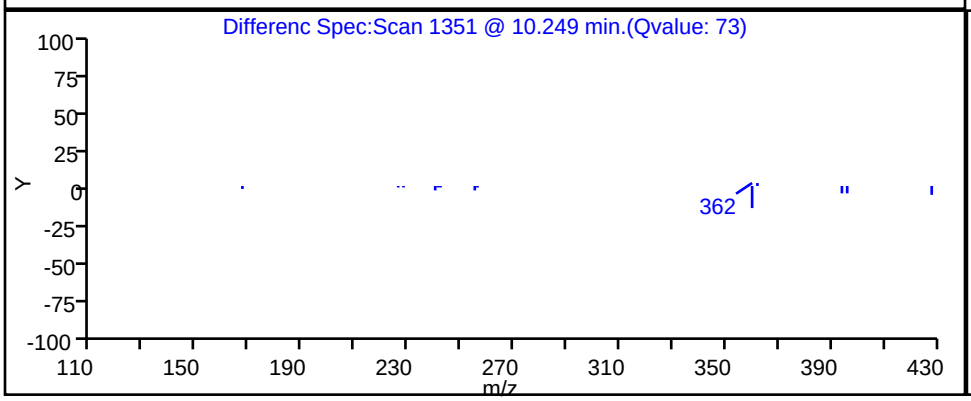


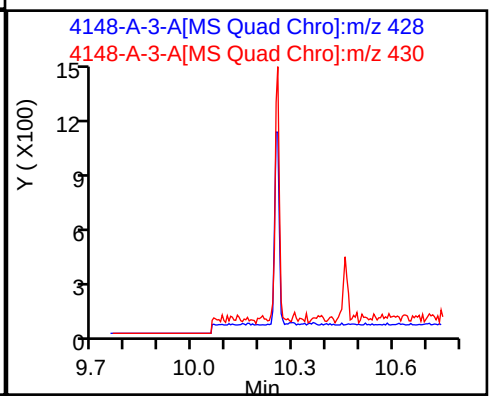












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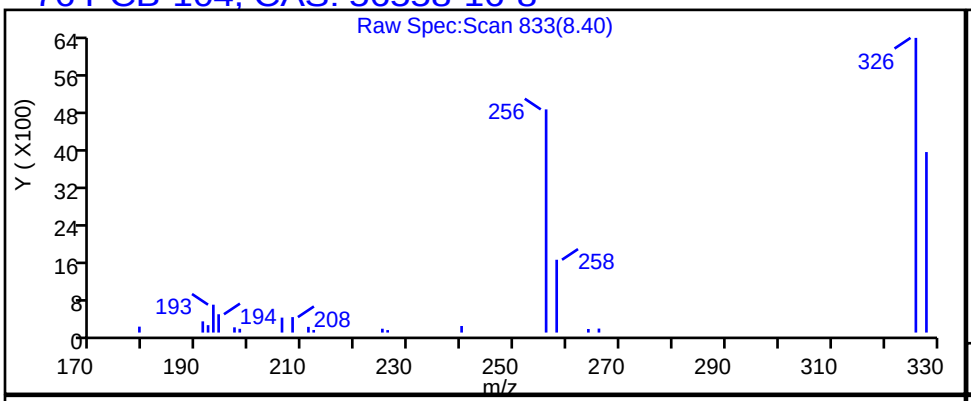
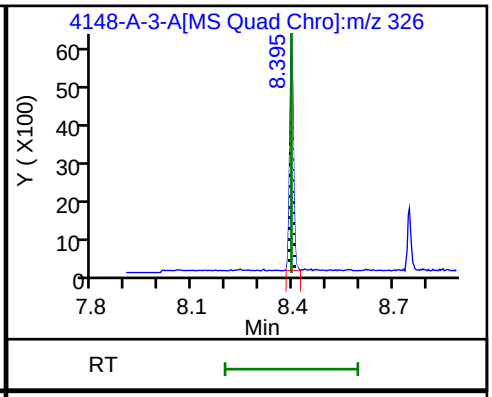
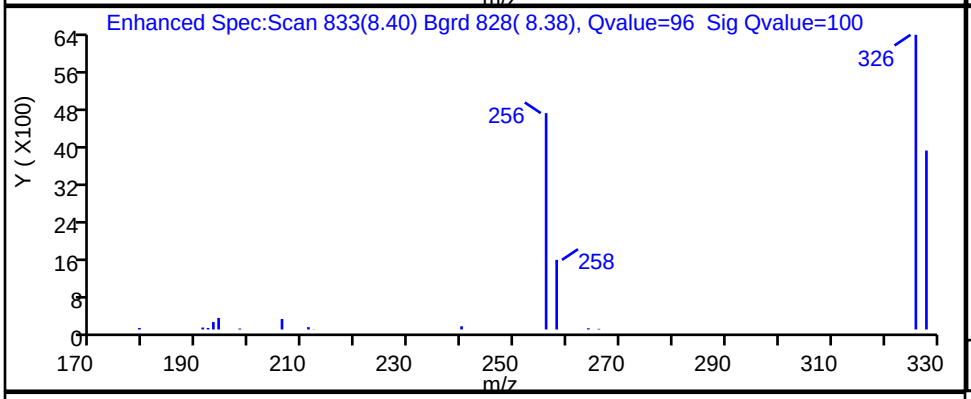
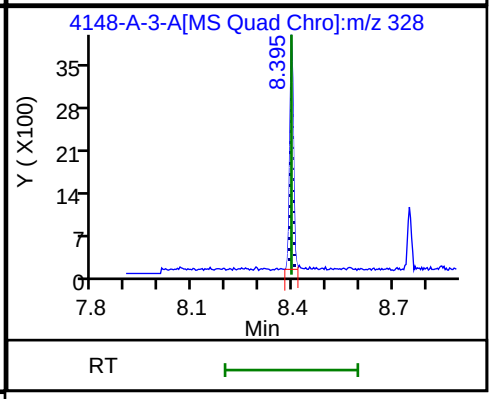
Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3
Client ID:	GEI.PRC.BLK3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

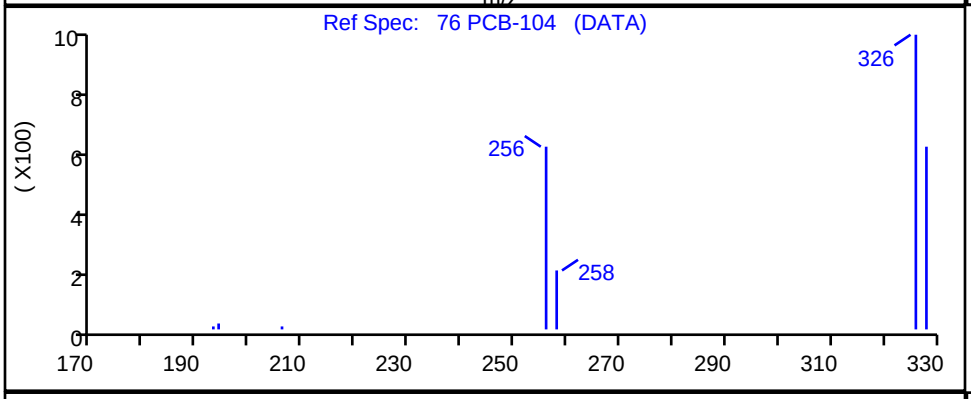
76 PCB-104, CAS: 56558-16-8

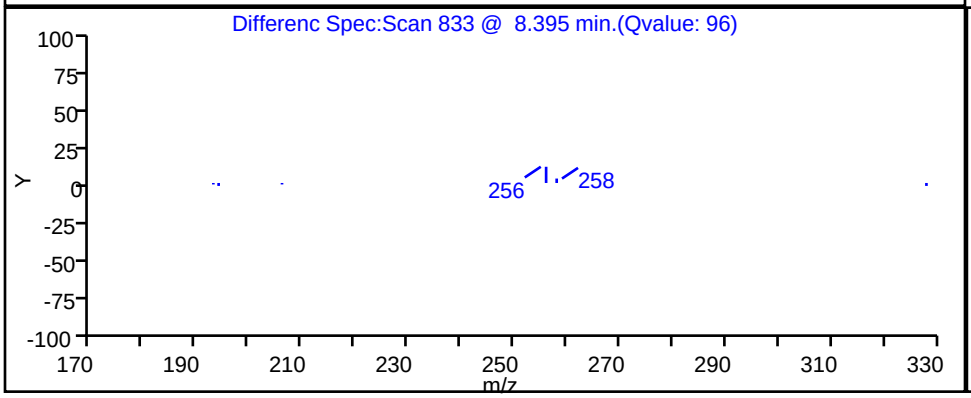


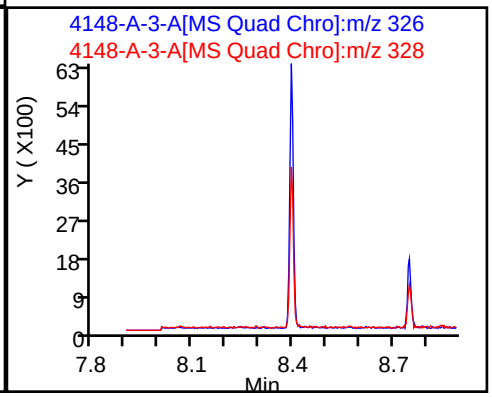












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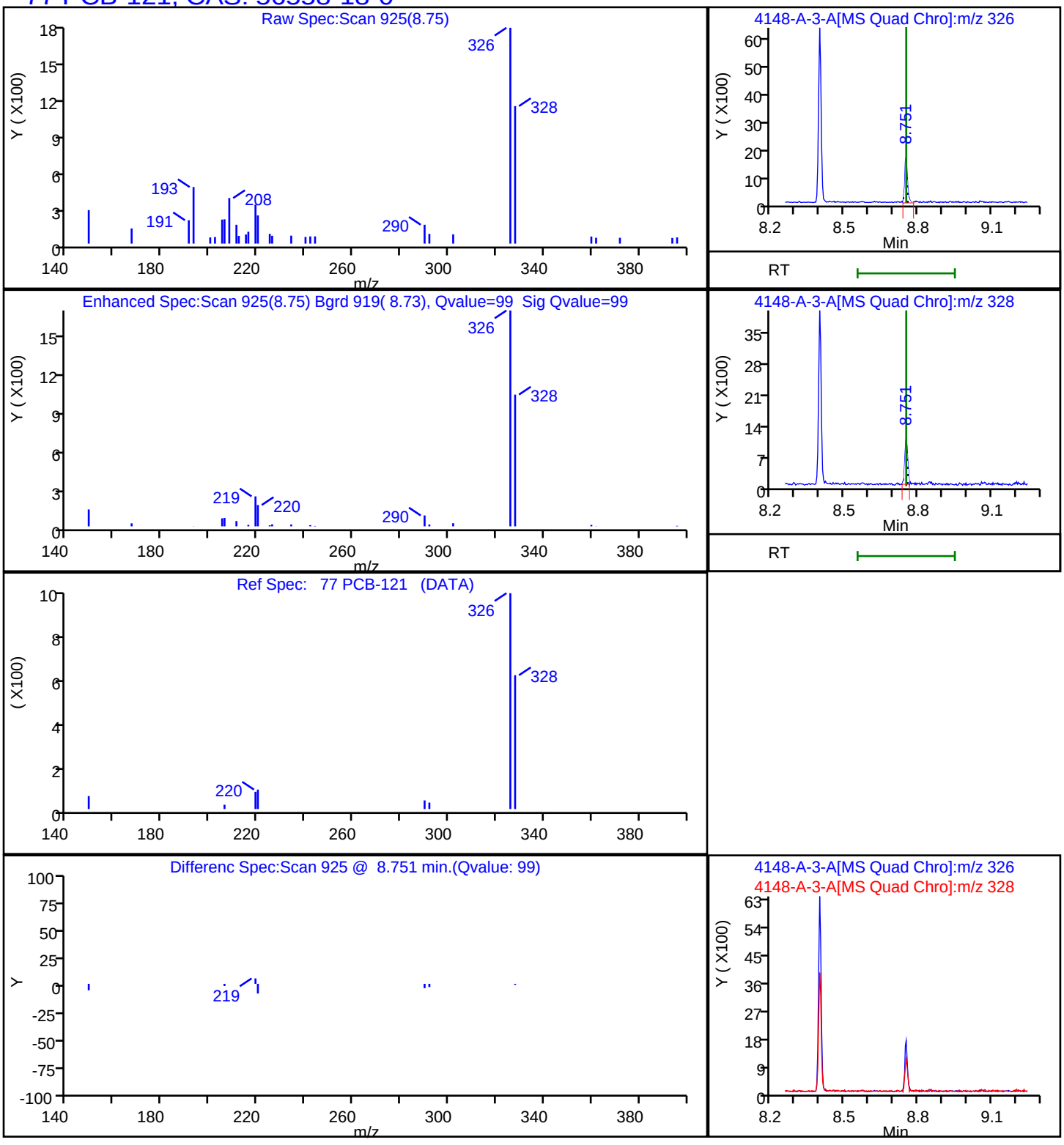
Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3
Client ID:	GEI.PRC.BLK3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

77 PCB-121, CAS: 56558-18-0



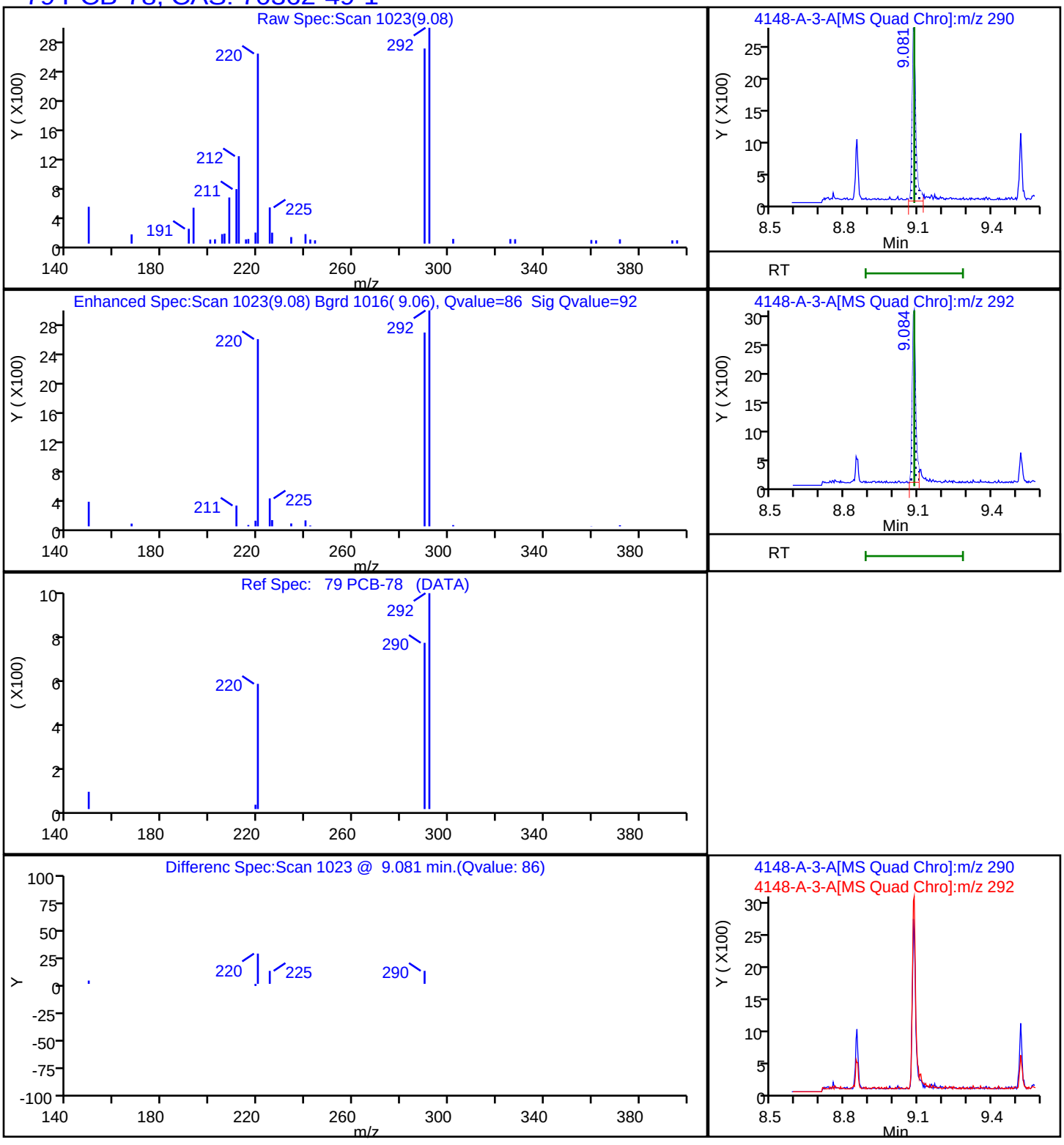
Report Date: 16-Nov-2023 15:46:54 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-3-A.D

Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3
Client ID:	GEI.PRC.BLK3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

79 PCB-78, CAS: 70362-49-1



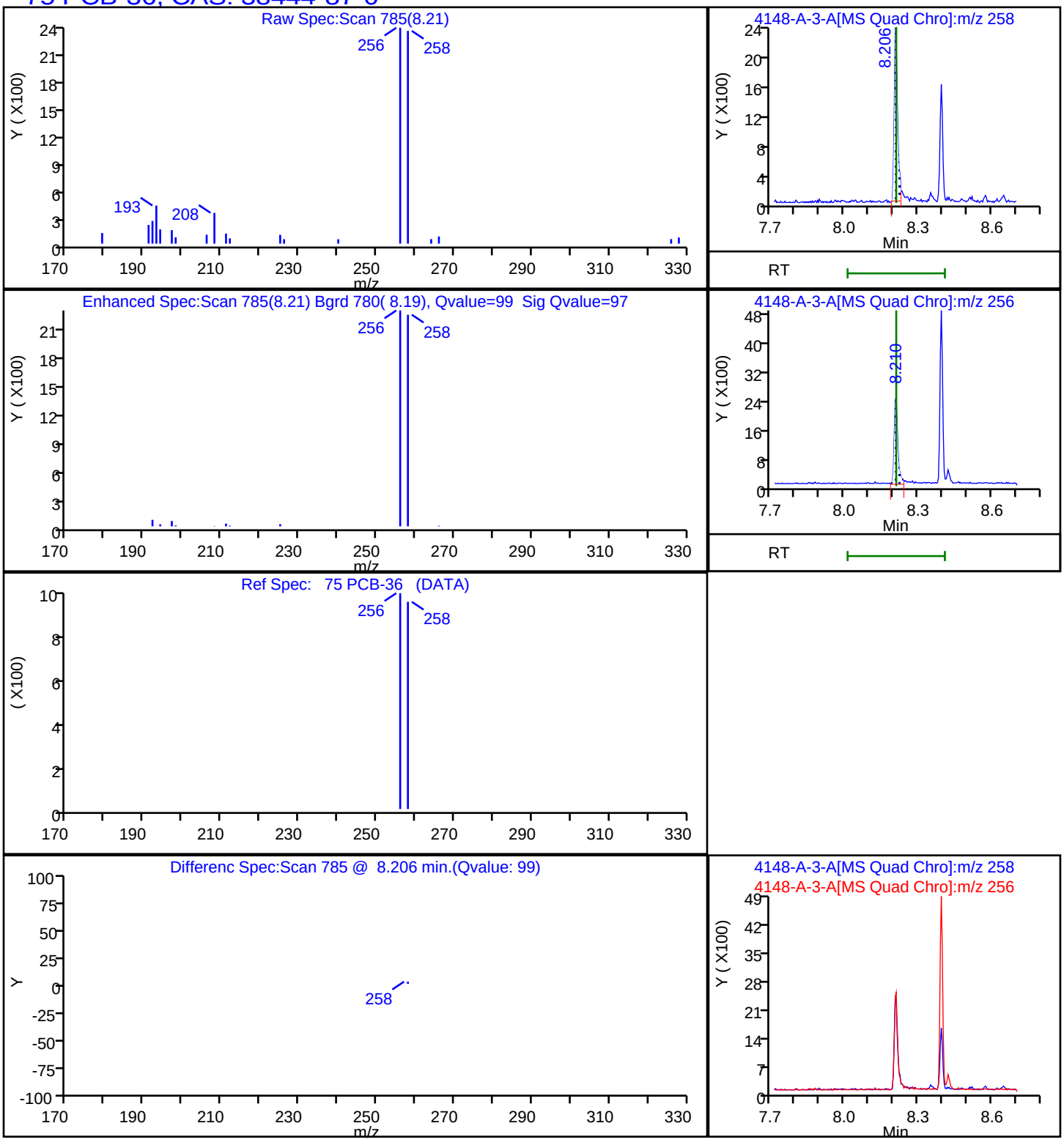
Report Date: 16-Nov-2023 15:46:54 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-3-A.D

Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3
Client ID:	GEI.PRC.BLK3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

75 PCB-36, CAS: 38444-87-0



Eurofins Knoxville

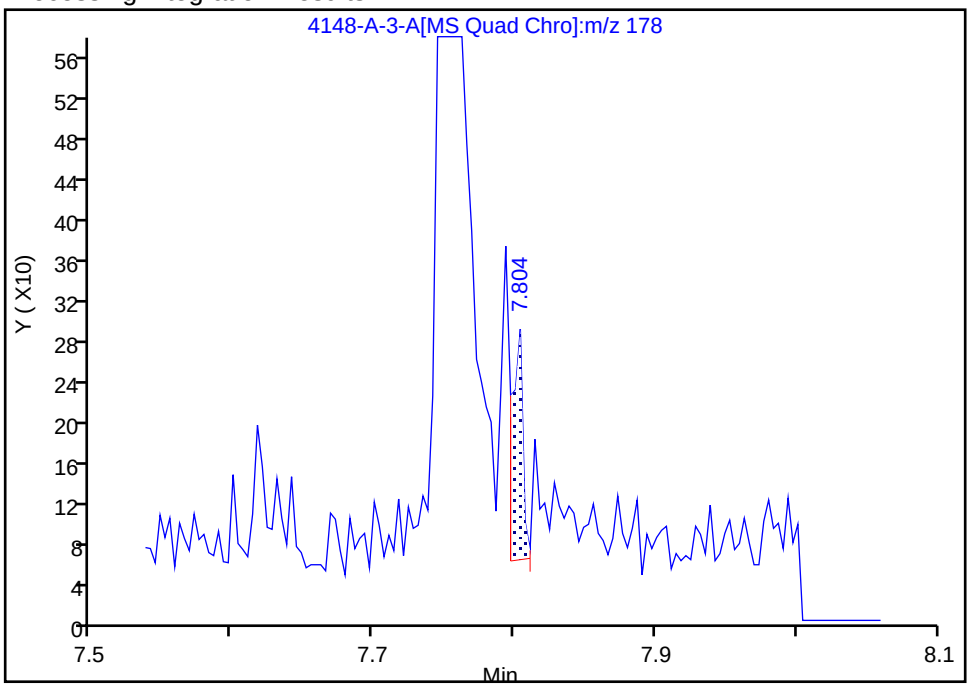
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-3-A.D				
Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3		
Client ID:	GEI.PRC.BLK3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

39 Anthracene, CAS: 120-12-7

Signal: 1

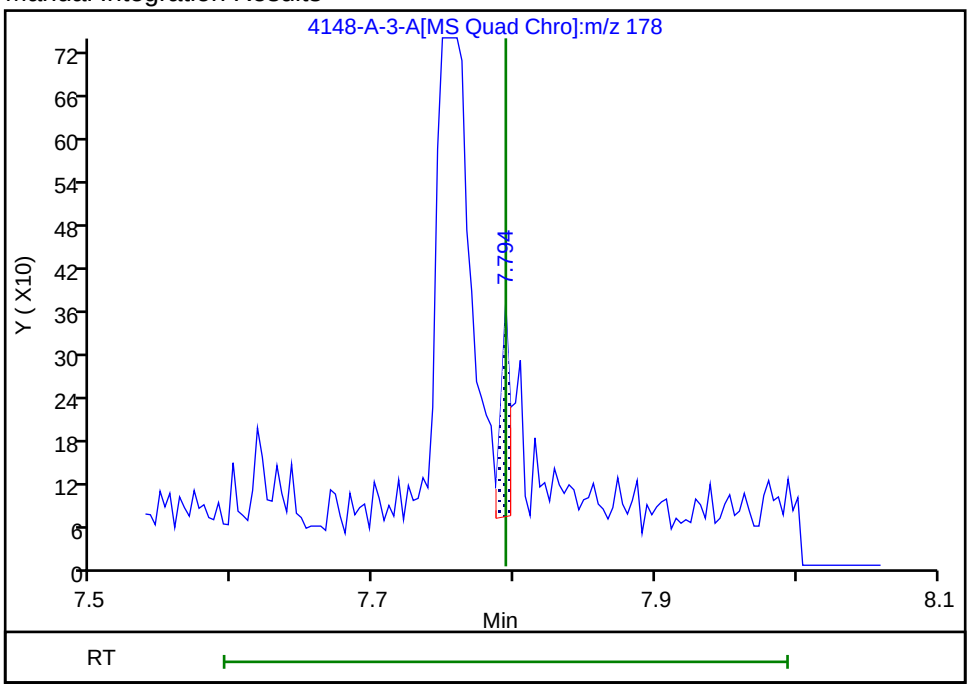
Processing Integration Results

RT: 7.80
Area: 124
Amount: 0.000614
Amount Units: ug/ml



Manual Integration Results

RT: 7.79
Area: 136
Amount: 0.000673
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 11:02:21 -05:00:00 (UTC)
Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

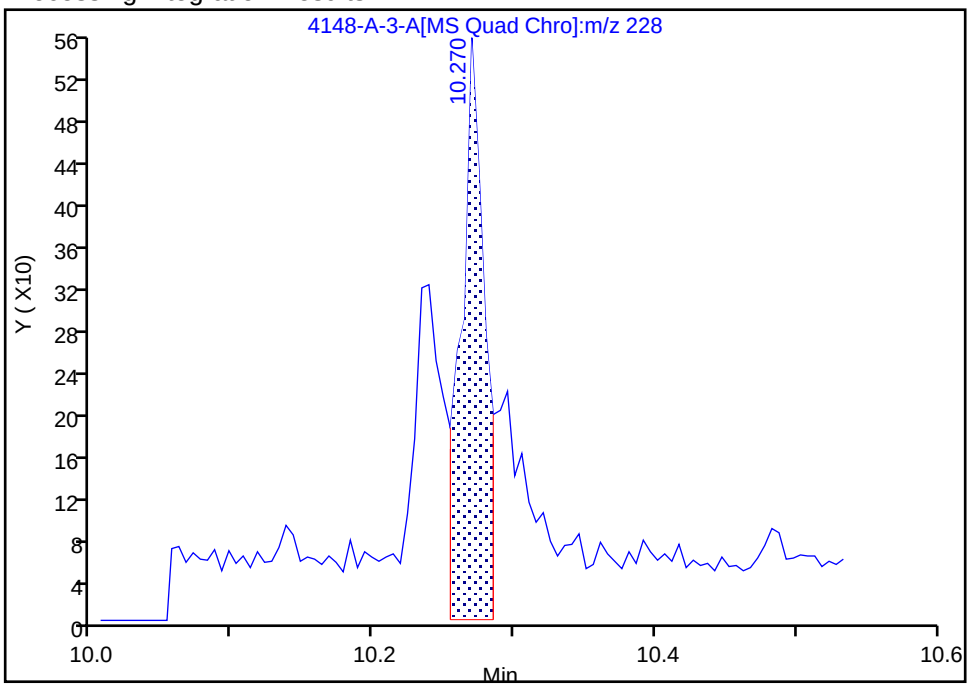
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-3-A.D				
Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3		
Client ID:	GEI.PRC.BLK3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

47 Benzo[a]anthracene, CAS: 56-55-3

Signal: 1

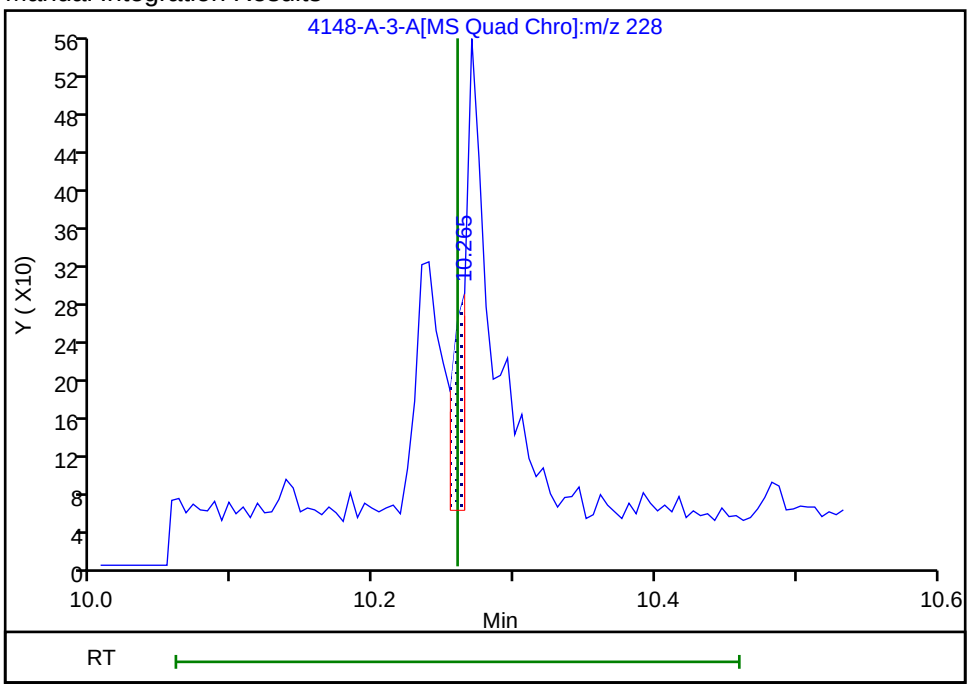
Processing Integration Results

RT: 10.27
Area: 660
Amount: 0.002310
Amount Units: ug/ml



Manual Integration Results

RT: 10.26
Area: 168
Amount: 0.000588
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 11:03:24 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

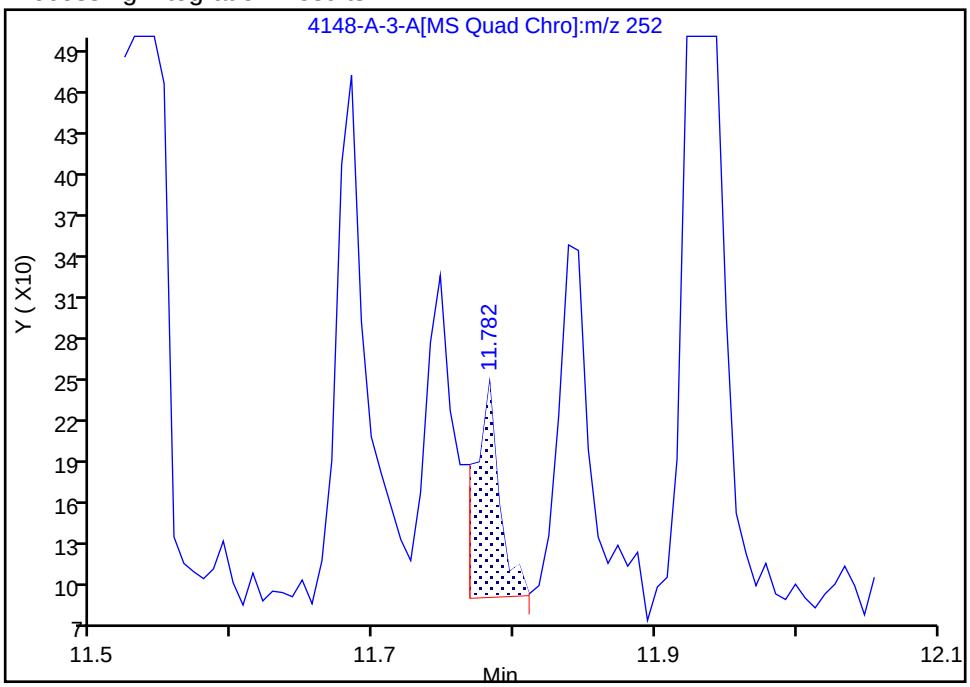
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-3-A.D				
Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3		
Client ID:	GEI.PRC.BLK3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

59 Benzo[a]pyrene, CAS: 50-32-8

Signal: 1

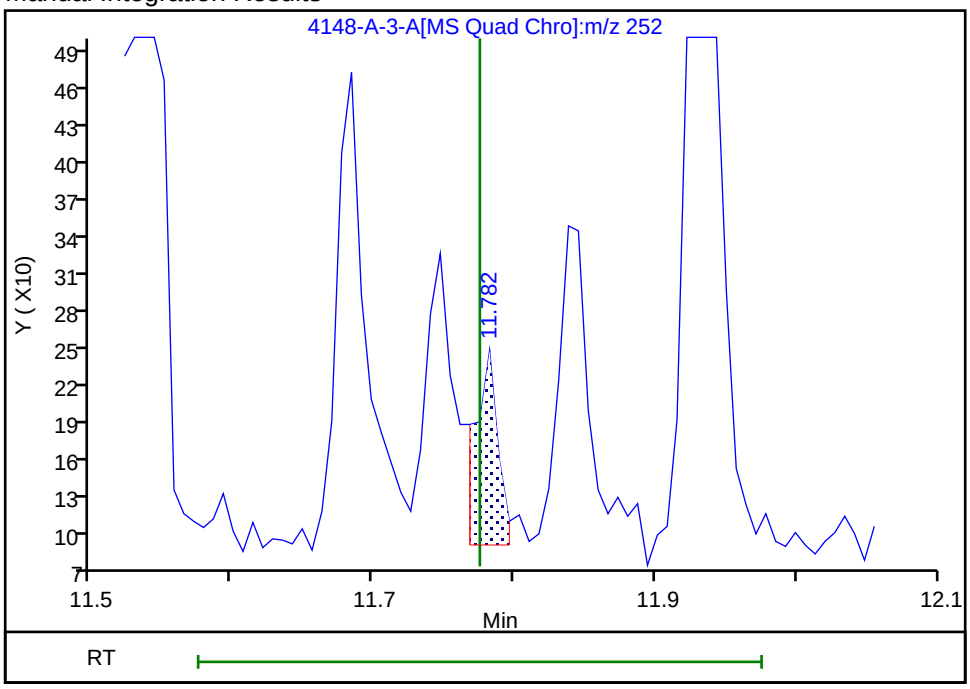
Processing Integration Results

RT: 11.78
Area: 191
Amount: 0.000803
Amount Units: ug/ml



Manual Integration Results

RT: 11.78
Area: 182
Amount: 0.000765
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 11:04:46 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

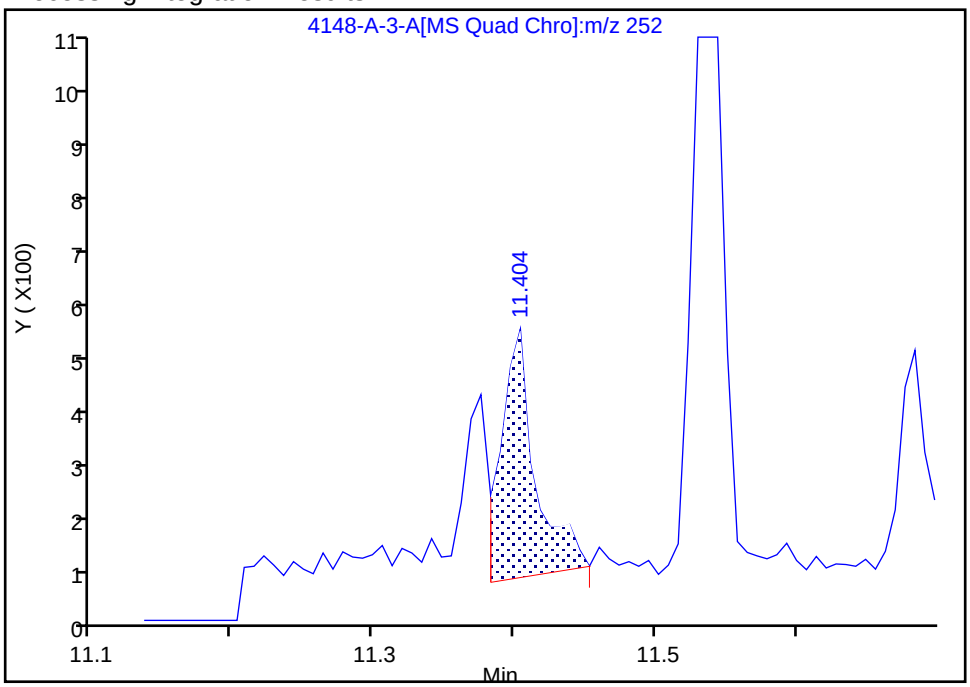
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-3-A.D				
Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3		
Client ID:	GEI.PRC.BLK3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

53 Benzo[b]fluoranthene, CAS: 205-99-2

Signal: 1

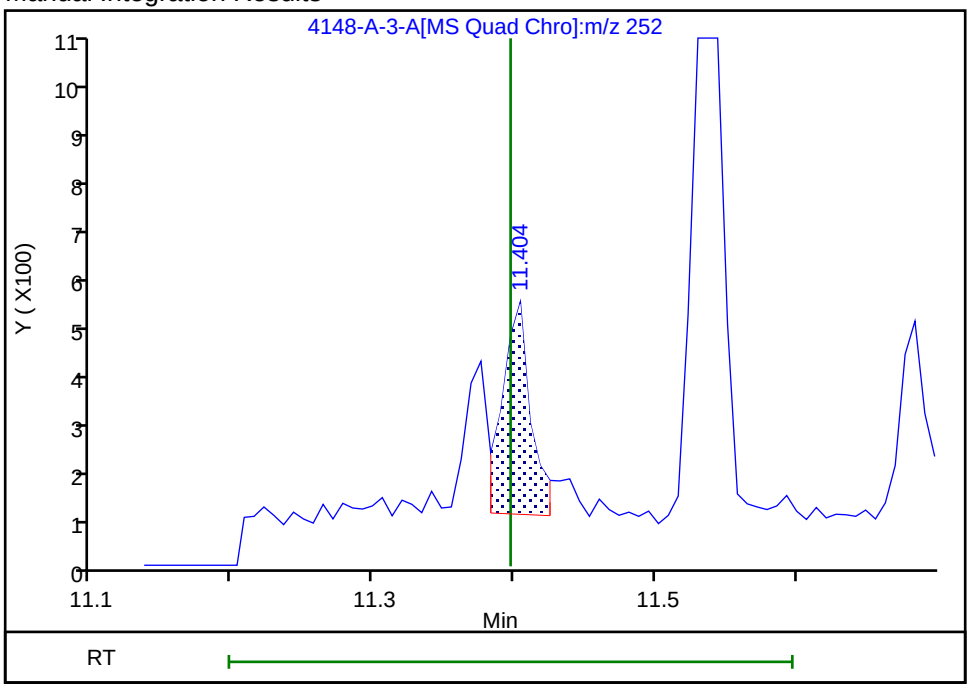
Processing Integration Results

RT: 11.40
Area: 733
Amount: 0.002281
Amount Units: ug/ml



Manual Integration Results

RT: 11.40
Area: 586
Amount: 0.001823
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 11:04:14 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

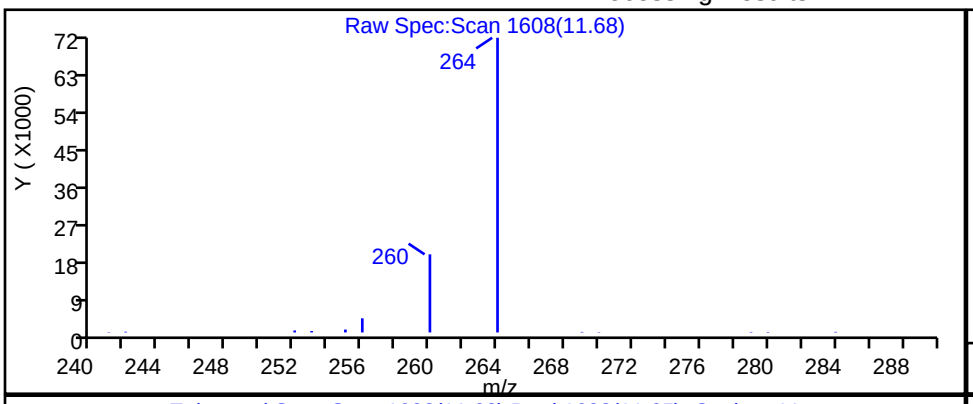
User Disabled Compound Report

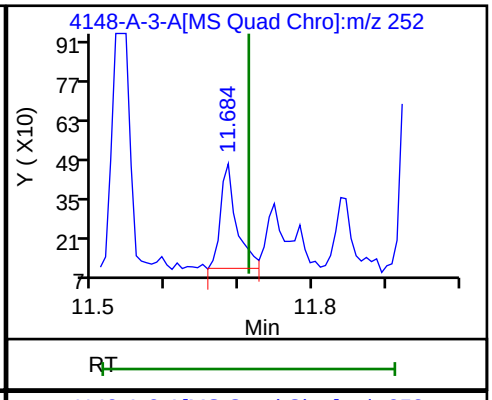
Eurofins Knoxville

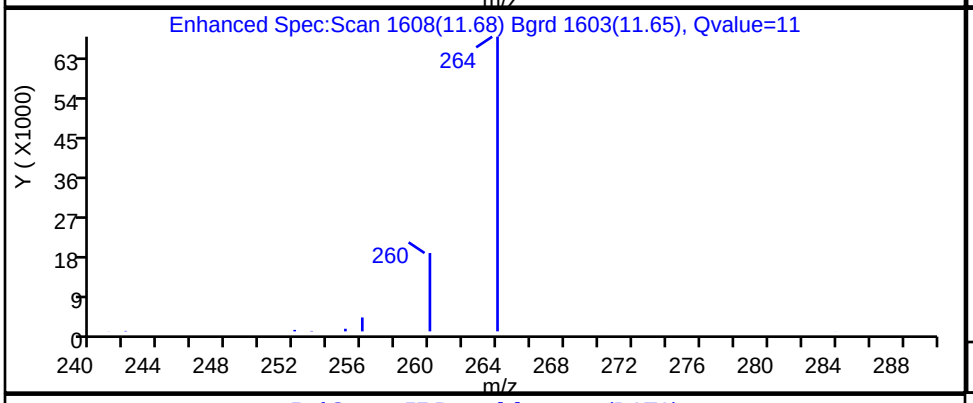
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-3-A.D				
Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3		
Client ID:	GEI.PRC.BLK3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

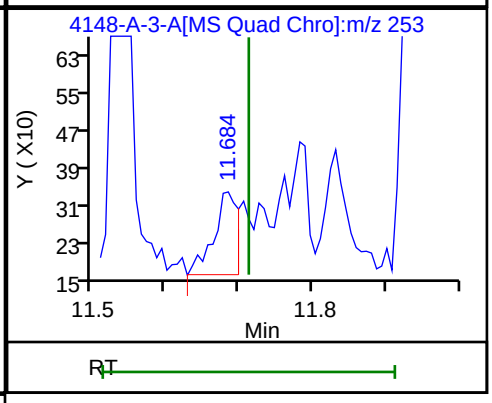
57 Benzo[e]pyrene, CAS: 192-97-2

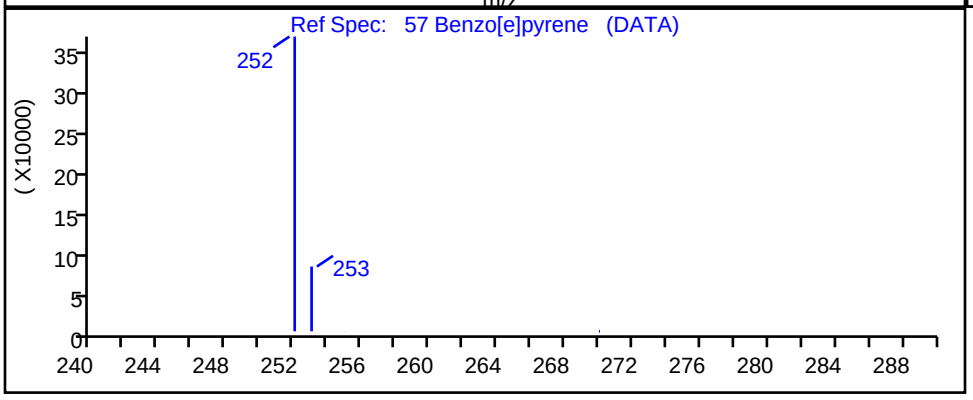
Processing Results











RT	Mass	Response	Amount
11.68	252.00	586	0.002417
11.68	253.00	413	

Reviewer: SK9U, 16-Nov-2023 11:04:34 -05:00:00 (UTC)

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

Manual Integration/User Assign Peak Report

Eurofins Knoxville

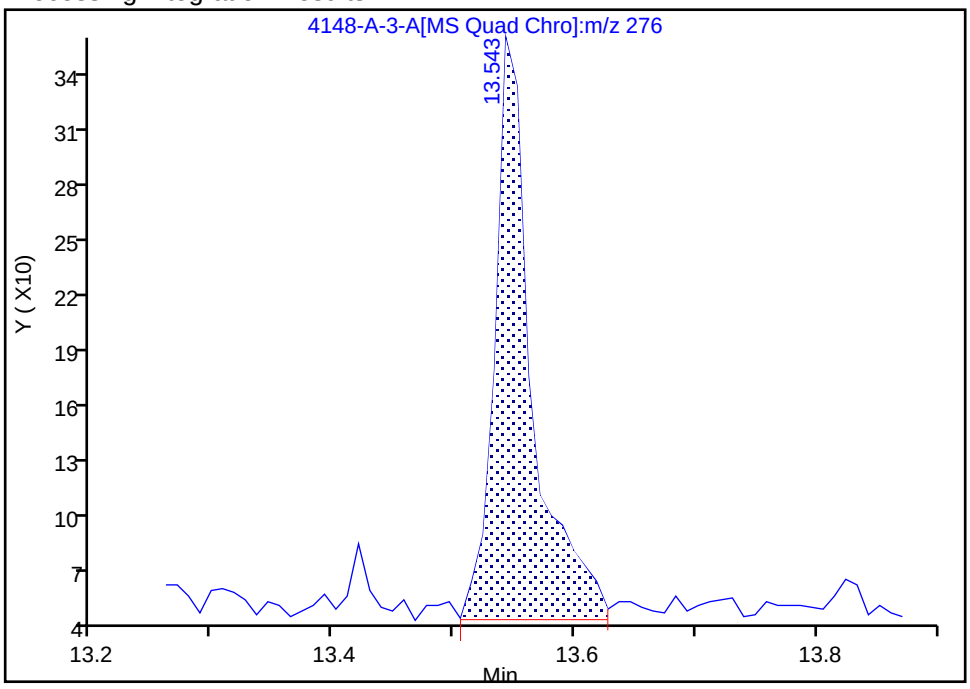
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-3-A.D				
Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3		
Client ID:	GEI.PRC.BLK3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

68 Benzo[g,h,i]perylene, CAS: 191-24-2

Signal: 1

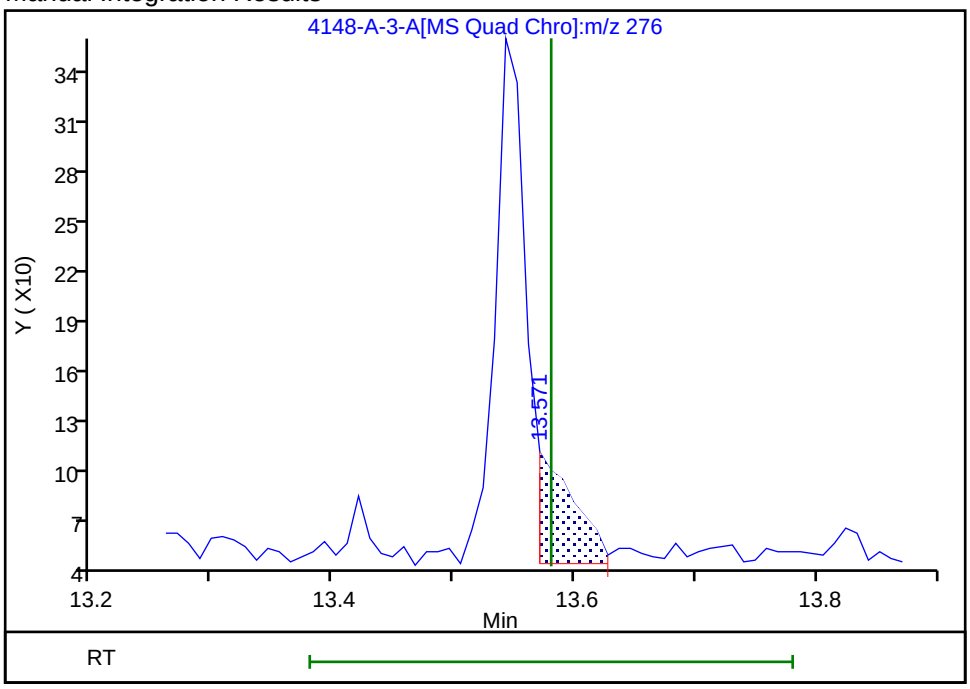
Processing Integration Results

RT: 13.54
Area: 667
Amount: 0.002501
Amount Units: ug/ml



Manual Integration Results

RT: 13.57
Area: 146
Amount: 0.000547
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 11:05:44 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

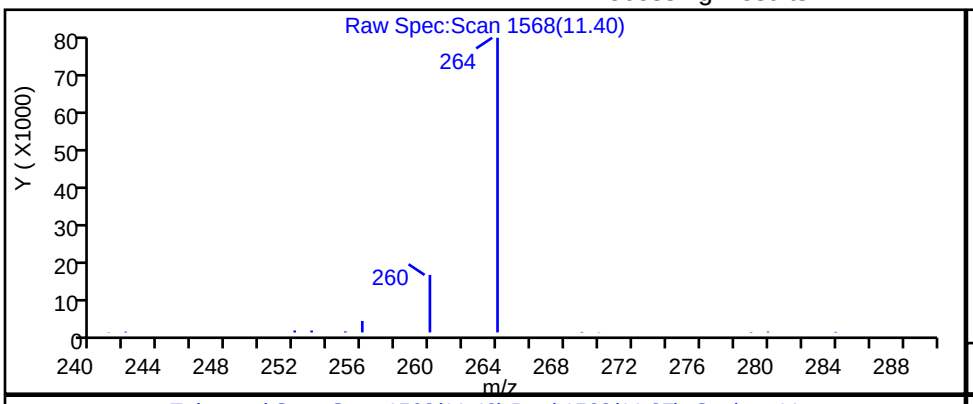
User Disabled Compound Report

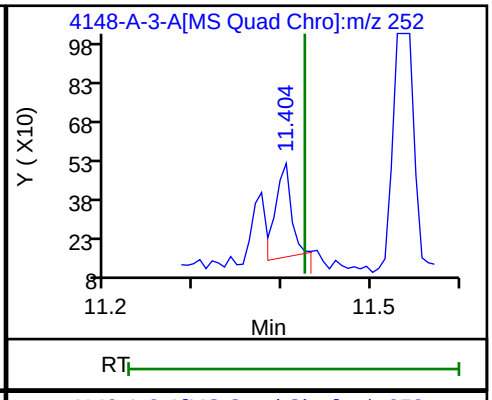
Eurofins Knoxville

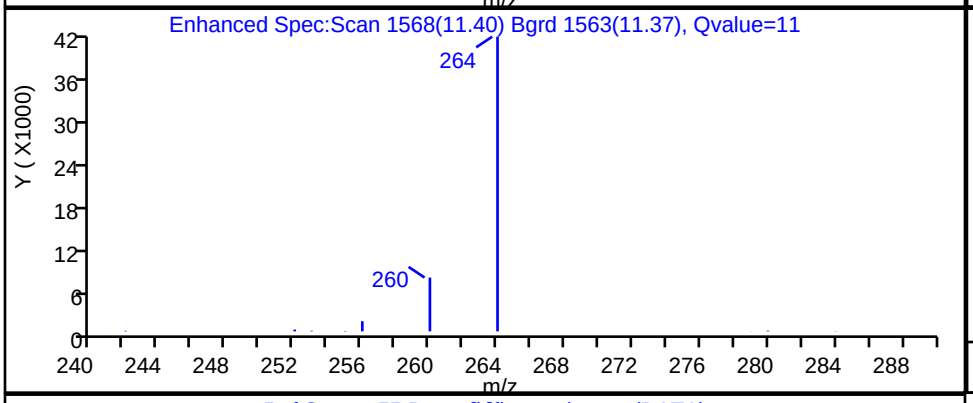
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-3-A.D				
Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3		
Client ID:	GEI.PRC.BLK3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

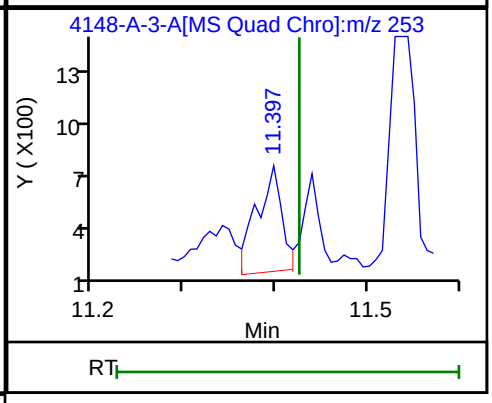
55 Benzo[k]fluoranthene, CAS: 207-08-9

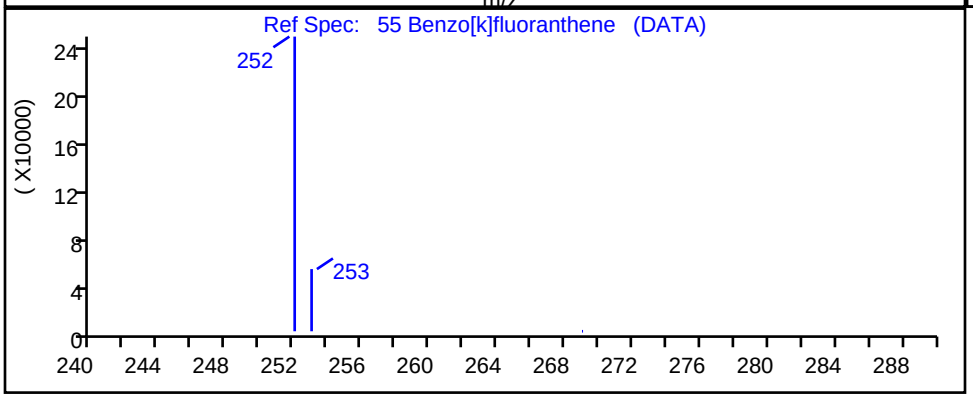
Processing Results











RT	Mass	Response	Amount
11.40	252.00	458	0.001417
11.40	253.00	1141	

Reviewer: SK9U, 16-Nov-2023 11:04:25 -05:00:00 (UTC)

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

Manual Integration/User Assign Peak Report

Eurofins Knoxville

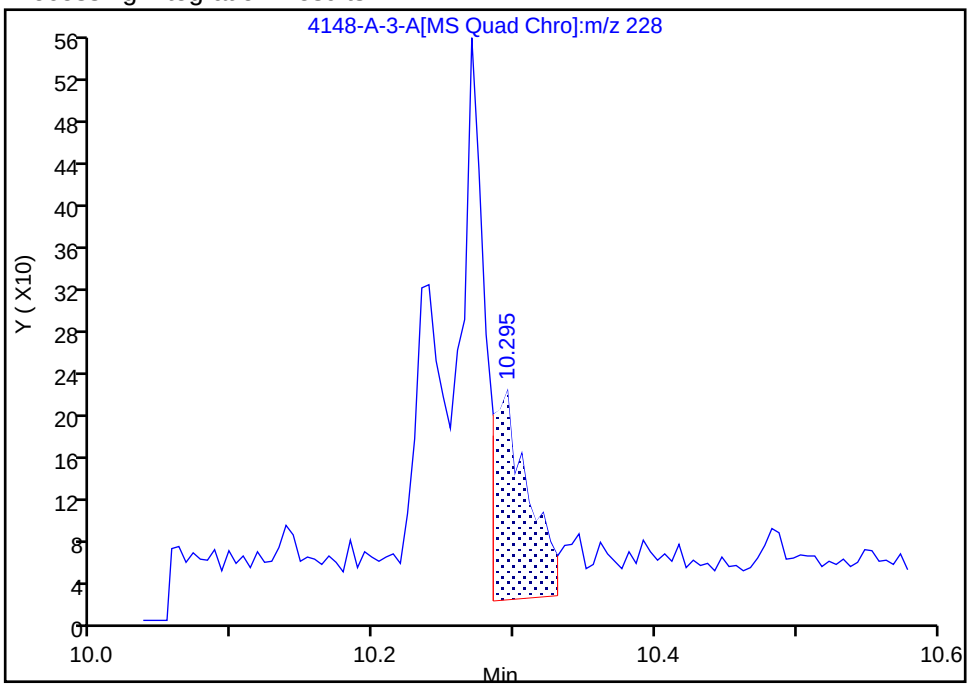
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-3-A.D				
Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3		
Client ID:	GEI.PRC.BLK3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

50 Chrysene, CAS: 218-01-9

Signal: 1

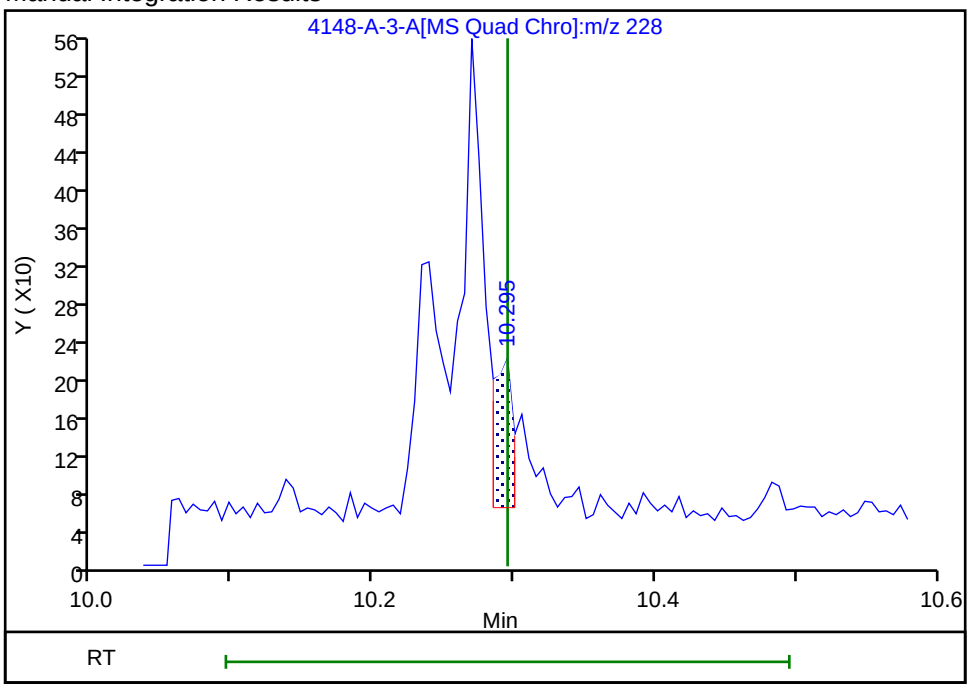
Processing Integration Results

RT: 10.29
Area: 347
Amount: 0.001083
Amount Units: ug/ml



Manual Integration Results

RT: 10.29
Area: 155
Amount: 0.000484
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 11:03:45 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

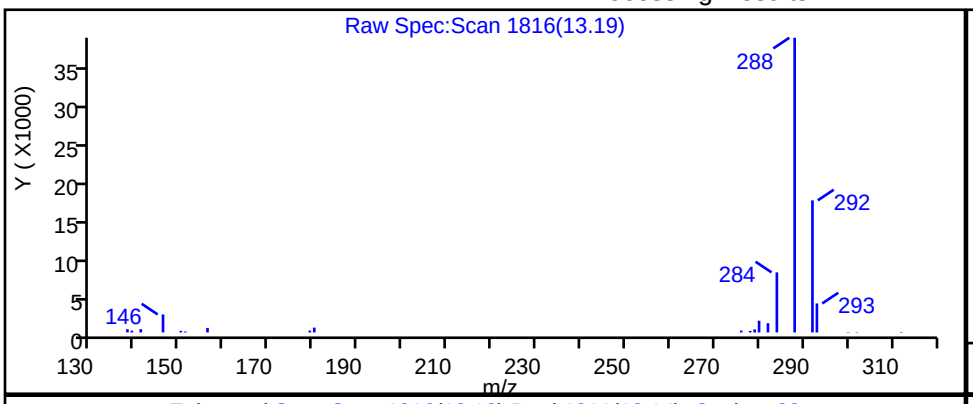
User Disabled Compound Report

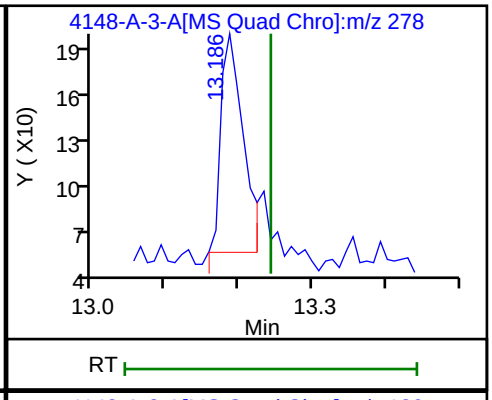
Eurofins Knoxville

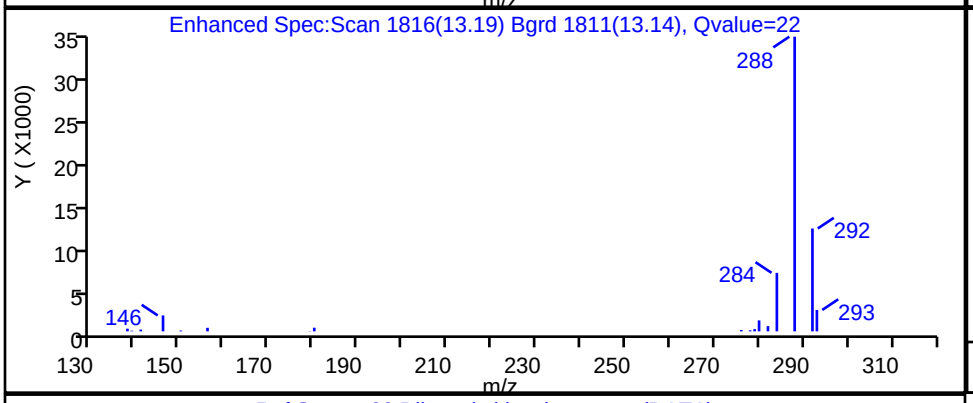
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-3-A.D				
Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3		
Client ID:	GEI.PRC.BLK3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

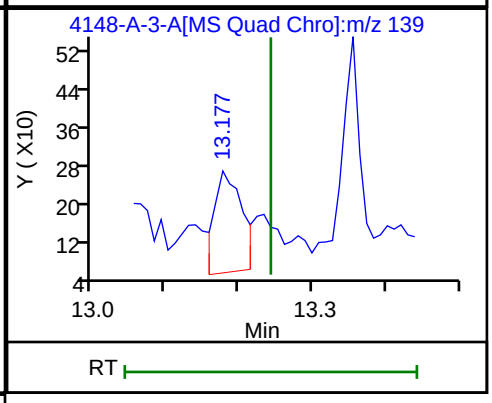
66 Dibenz(a,h)anthracene, CAS: 53-70-3

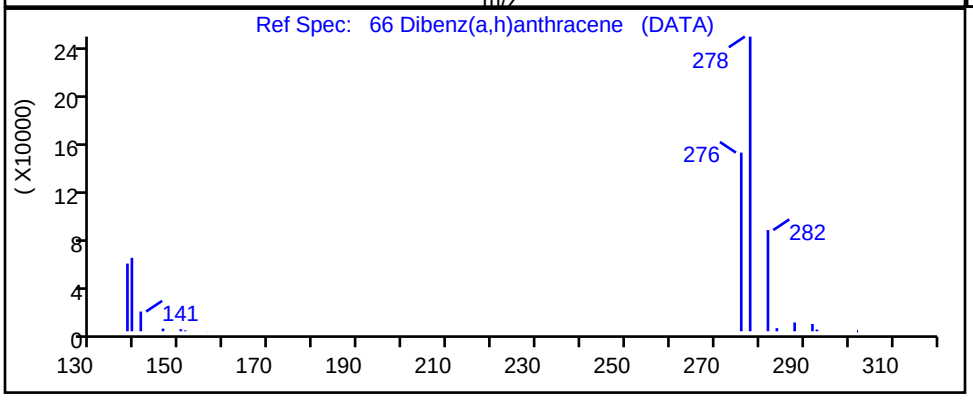
Processing Results











RT	Mass	Response	Amount
13.19	278.00	282	0.001164
13.18	139.00	576	

Reviewer: SK9U, 16-Nov-2023 11:05:28 -05:00:00 (UTC)

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

Manual Integration/User Assign Peak Report

Eurofins Knoxville

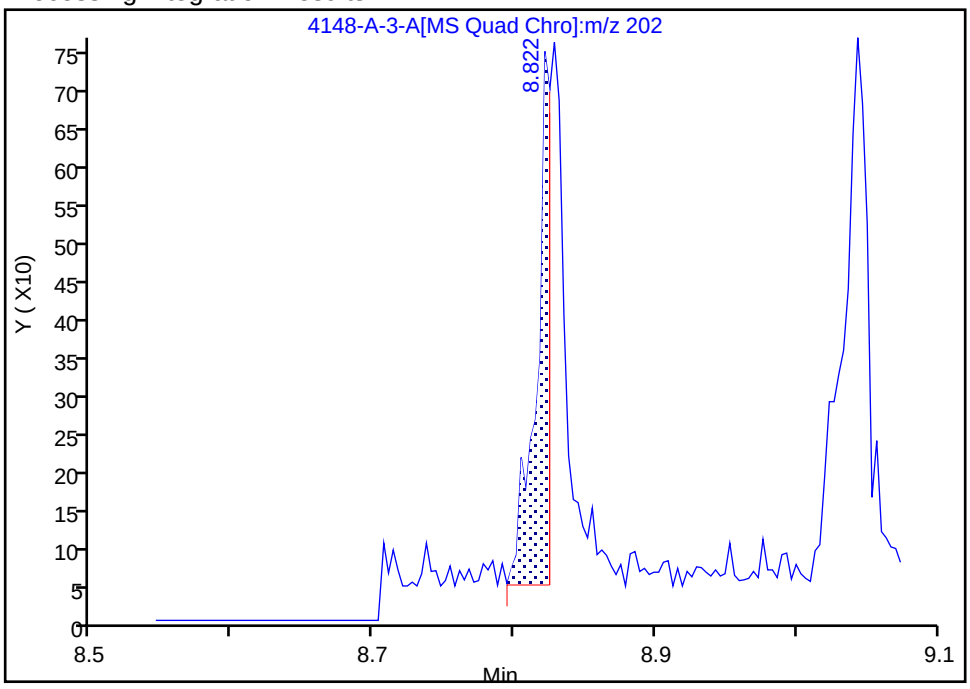
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-3-A.D				
Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3		
Client ID:	GEI.PRC.BLK3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

43 Fluoranthene, CAS: 206-44-0

Signal: 1

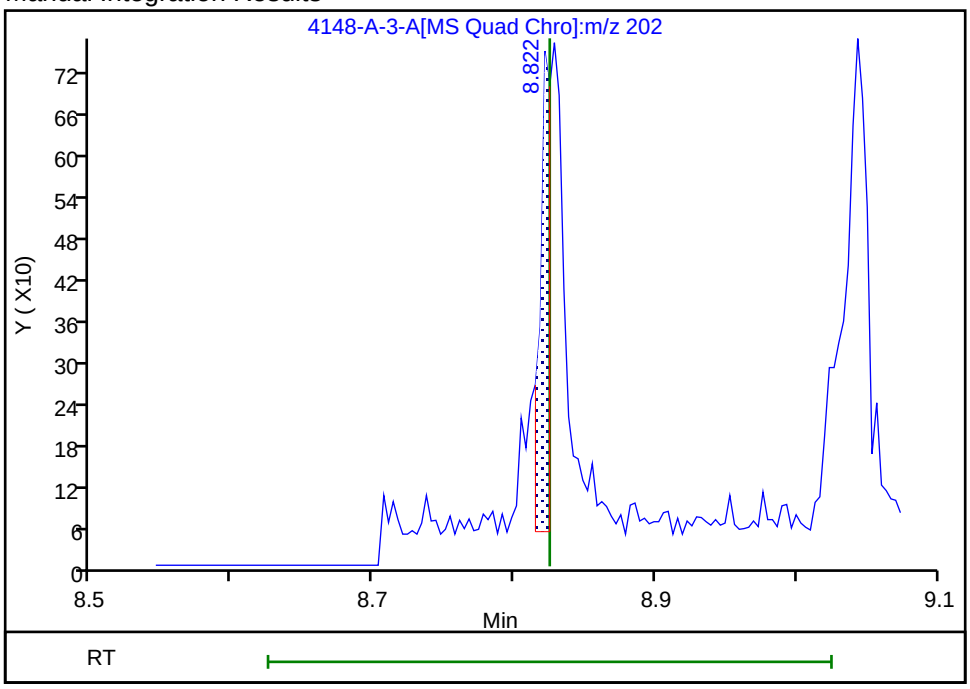
Processing Integration Results

RT: 8.82
Area: 482
Amount: 0.001460
Amount Units: ug/ml



Manual Integration Results

RT: 8.82
Area: 374
Amount: 0.001133
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 11:02:40 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

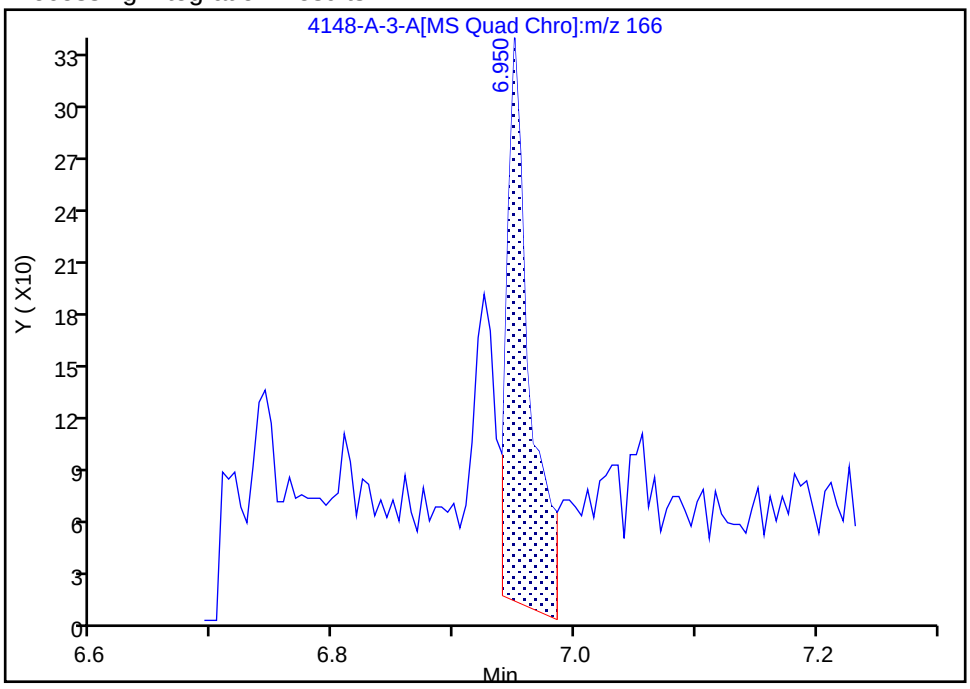
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-3-A.D				
Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3		
Client ID:	GEI.PRC.BLK3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

30 Fluorene, CAS: 86-73-7

Signal: 1

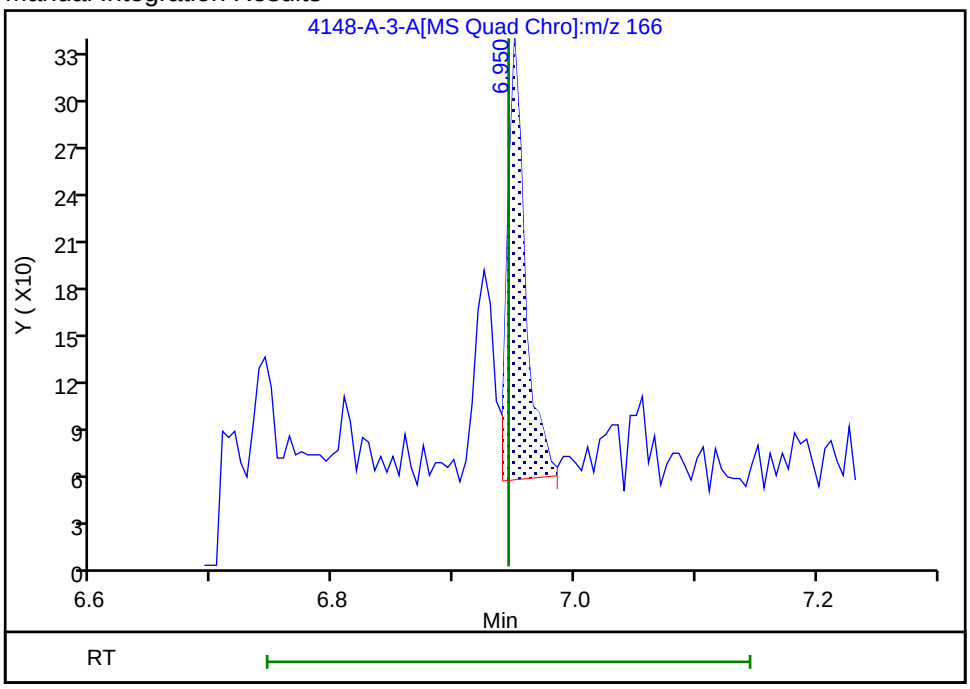
Processing Integration Results

RT: 6.95
Area: 429
Amount: 0.003307
Amount Units: ug/ml



Manual Integration Results

RT: 6.95
Area: 282
Amount: 0.002174
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 11:00:51 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

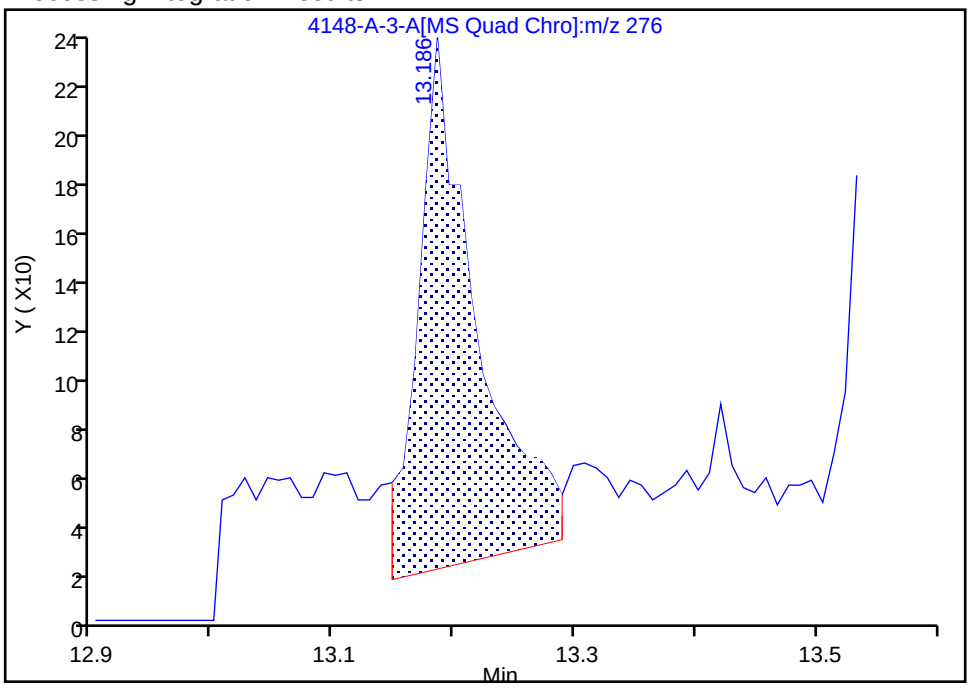
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-3-A.D				
Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3		
Client ID:	GEI.PRC.BLK3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

65 Indeno[1,2,3-cd]pyrene, CAS: 193-39-5

Signal: 1

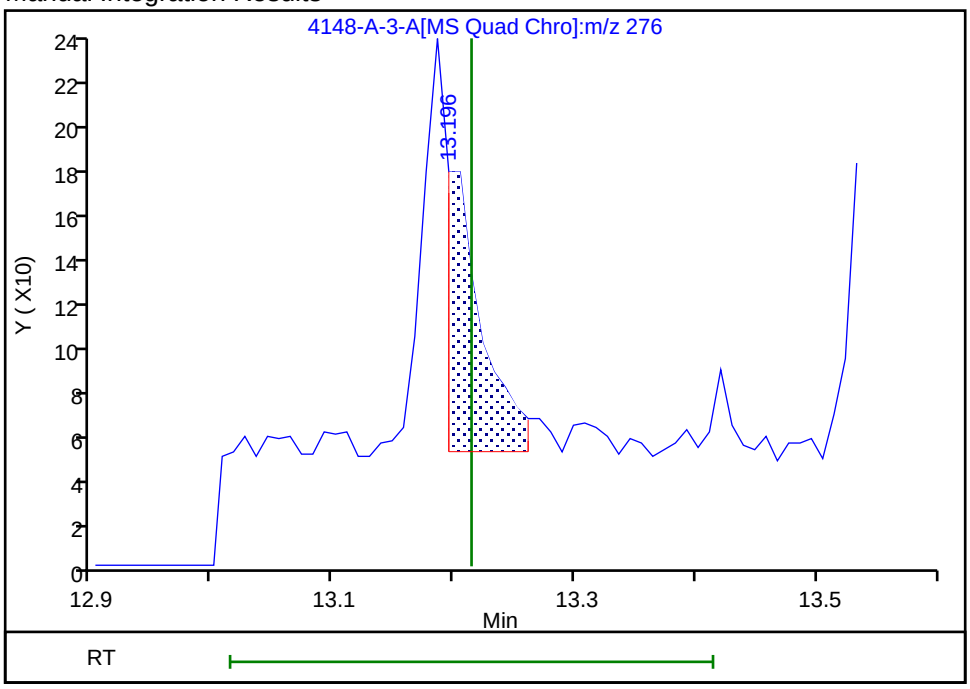
Processing Integration Results

RT: 13.19
Area: 733
Amount: 0.002444
Amount Units: ug/ml



Manual Integration Results

RT: 13.20
Area: 271
Amount: 0.000904
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 11:05:22 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Eurofins Knoxville

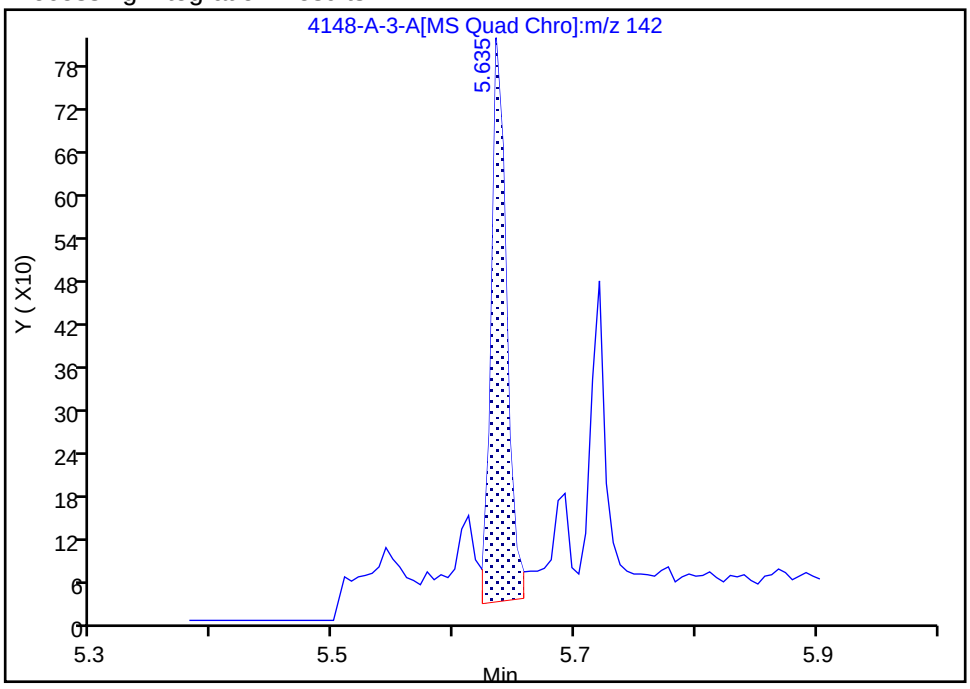
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-3-A.D				
Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3		
Client ID:	GEI.PRC.BLK3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

16 2-Methylnaphthalene, CAS: 91-57-6

Signal: 1

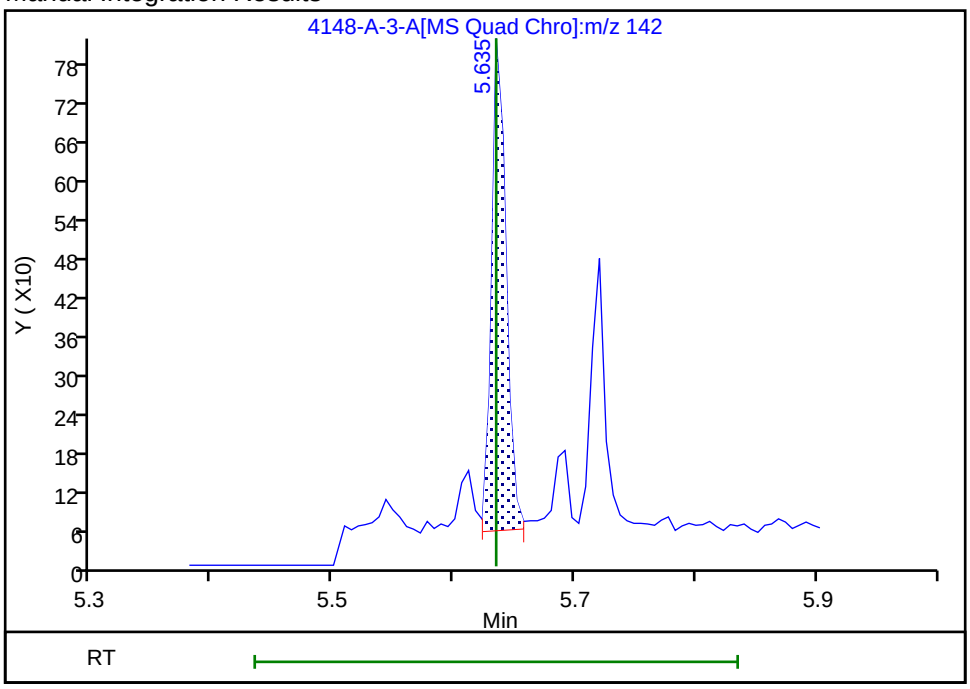
Processing Integration Results

RT: 5.63
Area: 700
Amount: 0.007454
Amount Units: ug/ml



Manual Integration Results

RT: 5.63
Area: 638
Amount: 0.006794
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 11:00:27 -05:00:00 (UTC)
Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

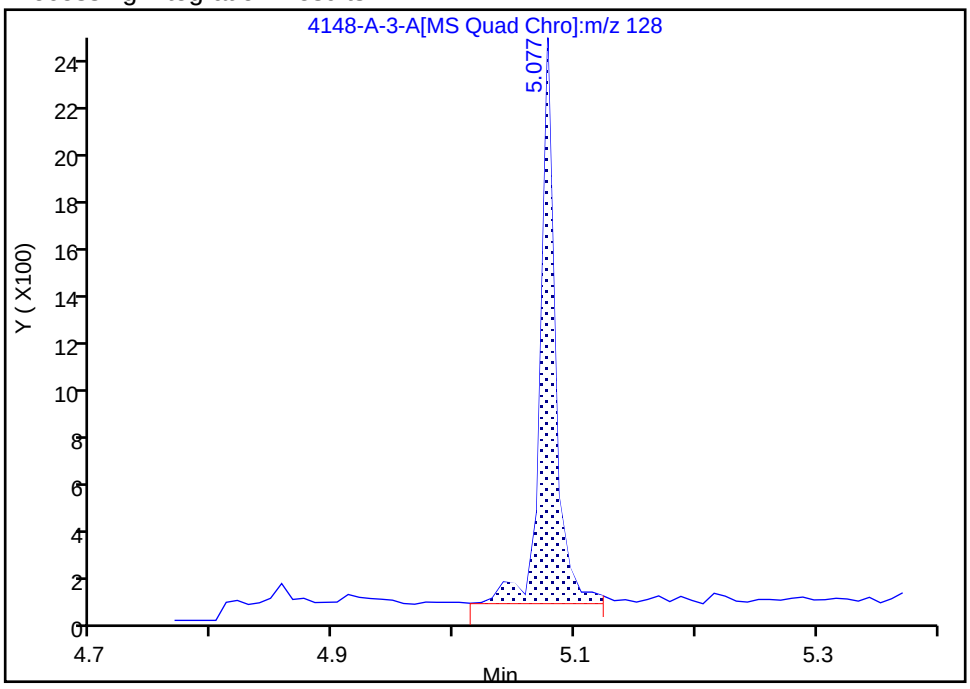
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-3-A.D				
Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3		
Client ID:	GEI.PRC.BLK3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

12 Naphthalene, CAS: 91-20-3

Signal: 1

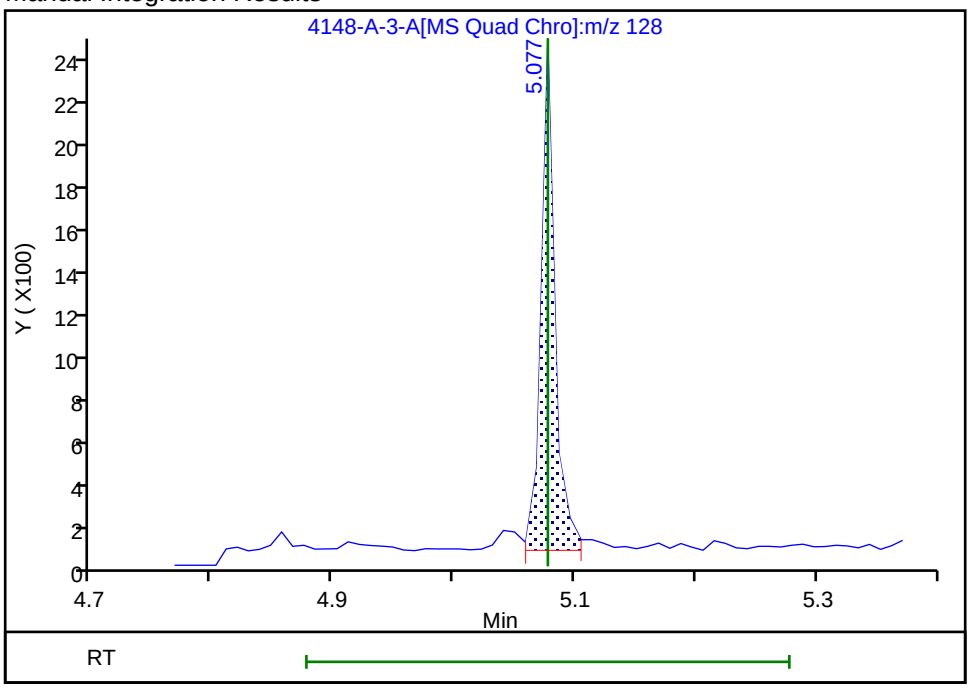
Processing Integration Results

RT: 5.08
Area: 2053
Amount: 0.015317
Amount Units: ug/ml



Manual Integration Results

RT: 5.08
Area: 1900
Amount: 0.014175
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 11:00:09 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

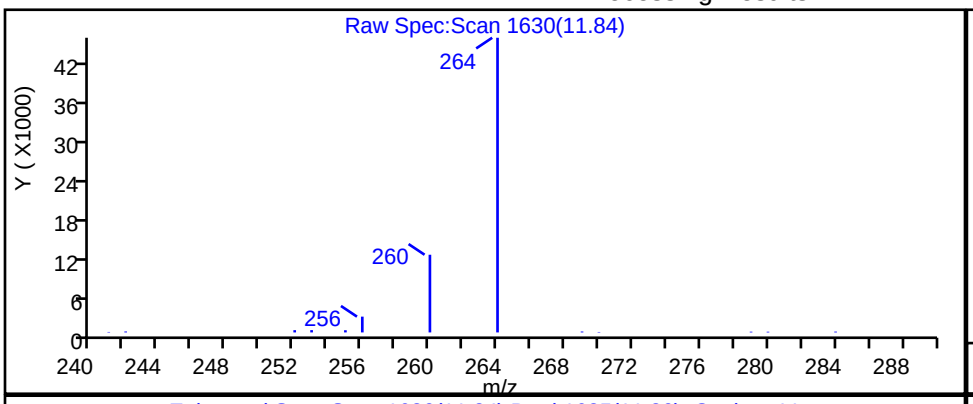
User Disabled Compound Report

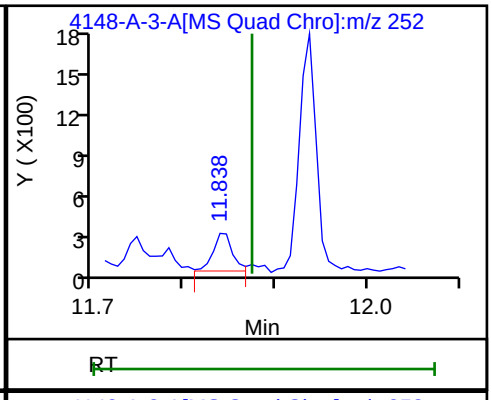
Eurofins Knoxville

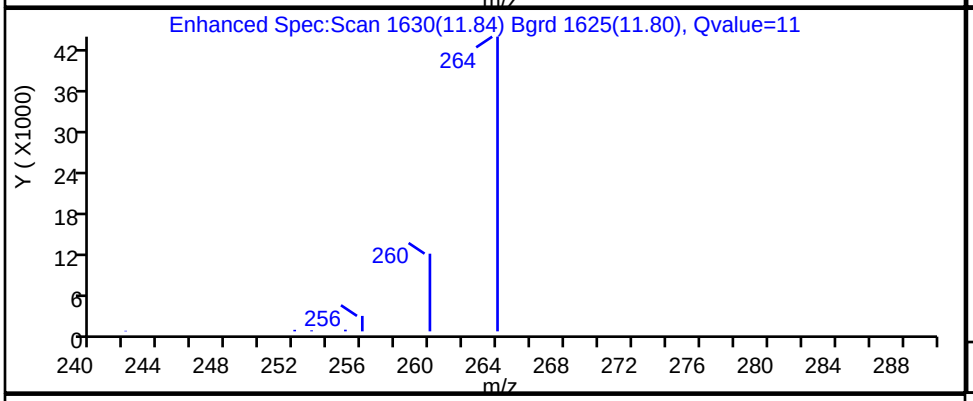
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-3-A.D				
Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3		
Client ID:	GEI.PRC.BLK3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

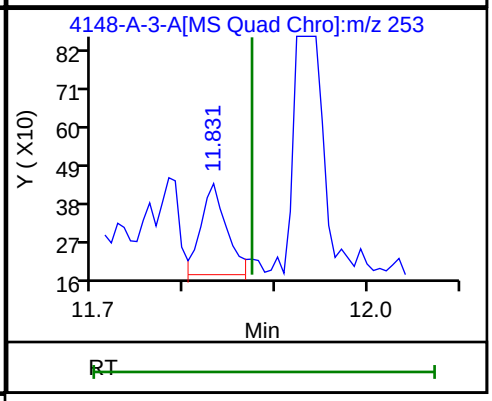
61 Perylene, CAS: 198-55-0

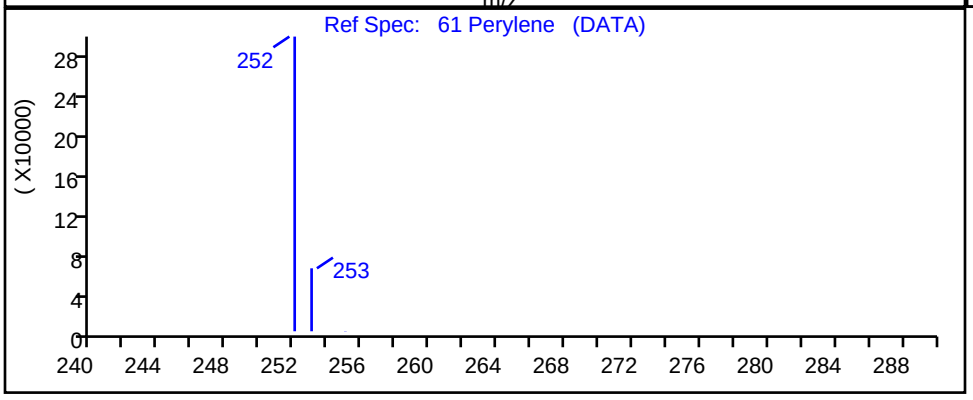
Processing Results











RT	Mass	Response	Amount
11.84	252.00	355	0.001663
11.83	253.00	531	

Reviewer: SK9U, 16-Nov-2023 11:04:55 -05:00:00 (UTC)

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

Manual Integration/User Assign Peak Report

Eurofins Knoxville

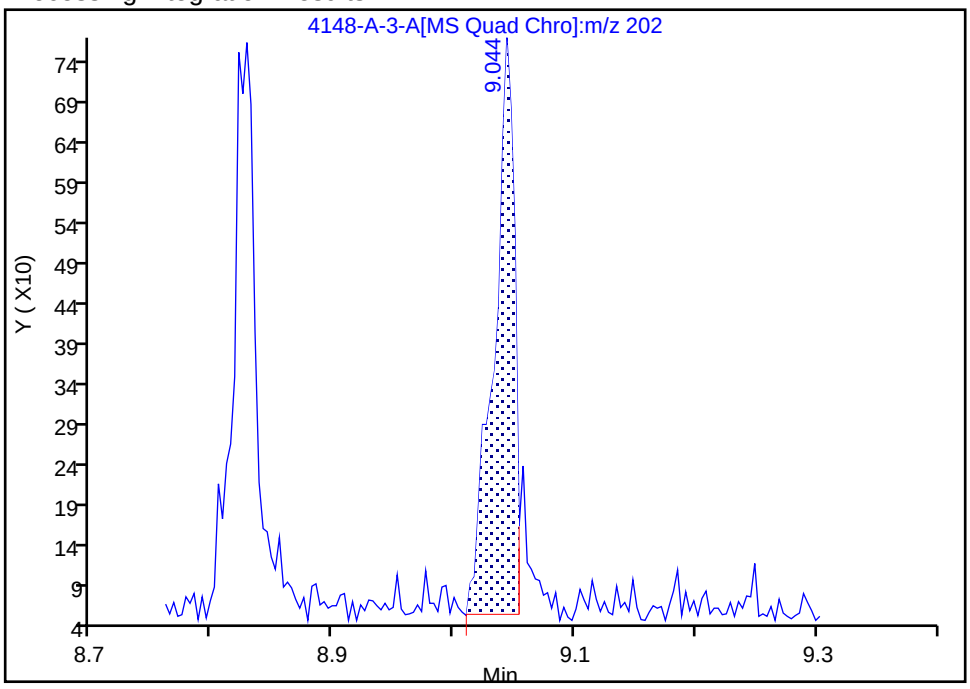
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-3-A.D				
Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3		
Client ID:	GEI.PRC.BLK3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

45 Pyrene, CAS: 129-00-0

Signal: 1

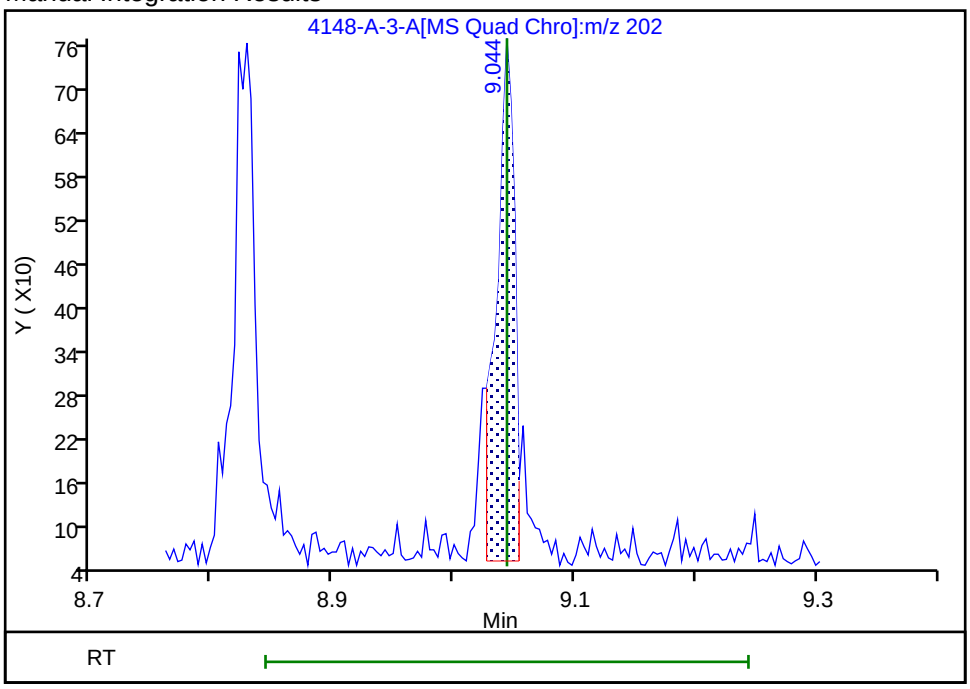
Processing Integration Results

RT: 9.04
Area: 838
Amount: 0.002488
Amount Units: ug/ml



Manual Integration Results

RT: 9.04
Area: 745
Amount: 0.002212
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 11:02:51 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

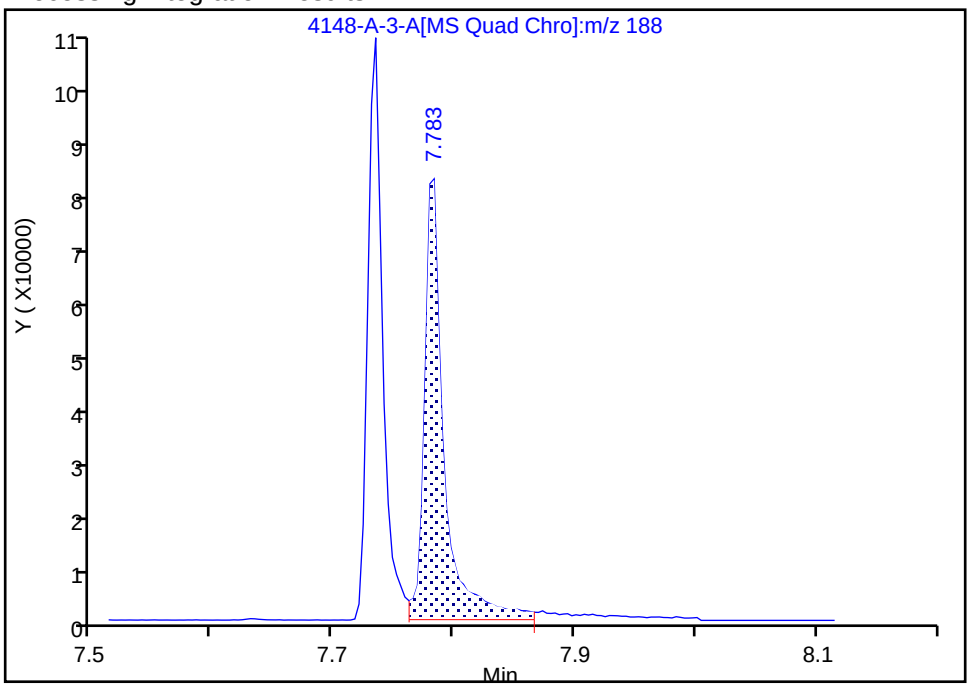
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-3-A.D				
Injection Date:	13-Nov-2023 22:31:55	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-3-A	Lab Sample ID:	140-34148-3		
Client ID:	GEI.PRC.BLK3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	32
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 38 Anthracin-d10, CAS: 1719-06-8

Signal: 1

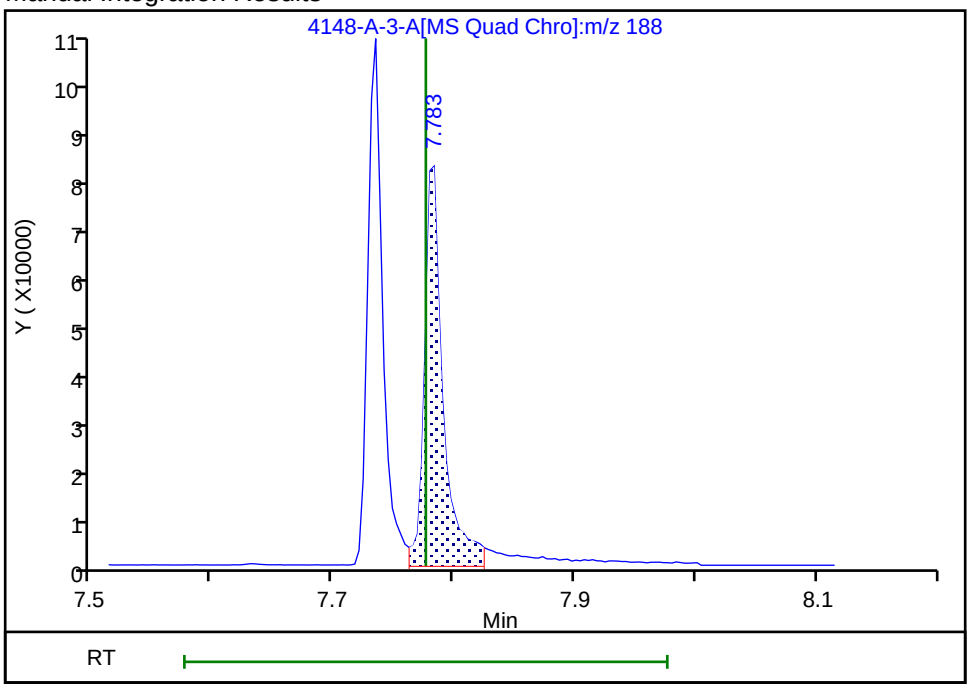
Processing Integration Results

RT: 7.78
Area: 87124
Amount: 0.389006
Amount Units: ug/ml



Manual Integration Results

RT: 7.78
Area: 82082
Amount: 0.366494
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 11:01:08 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: 1804576-851-S1 | Lab Sample ID: 140-34148-4

Matrix: PE | Lab File ID: 140-34148-A-4-A.D

Analysis Method: ID-0016 | Date Collected: 10/26/2023 14:00

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.014(g) | Date Analyzed: 11/13/2023 22:55

Con. Extract Vol.: 500(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80177 | Units: ng/g

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
83-32-9	Acenaphthene	2100		710	190
208-96-8	Acenaphthylene	92	J	710	52
120-12-7	Anthracene	1000		710	230
56-55-3	Benzo[a]anthracene	2000		710	260
50-32-8	Benzo[a]pyrene	1300		710	200
205-99-2	Benzo[b]fluoranthene	1900		710	250
192-97-2	Benzo[e]pyrene	1200		710	110
191-24-2	Benzo[g,h,i]perylene	530	J	710	79
207-08-9	Benzo[k]fluoranthene	940		710	160
218-01-9	Chrysene	2500		710	93
53-70-3	Dibenz(a,h)anthracene	120	J	710	59
206-44-0	Fluoranthene	9700		710	580
86-73-7	Fluorene	1000		710	230
193-39-5	Indeno[1,2,3-cd]pyrene	630	J	710	79
90-12-0	1-Methylnaphthalene	ND		3600	360
91-57-6	2-Methylnaphthalene	ND		3600	500
91-20-3	Naphthalene	ND		14000	2100
198-55-0	Perylene	1000		710	360
85-01-8	Phenanthrene	2700		1400	1200
129-00-0	Pyrene	12000		1400	210
STL00912	C1-Fluoranthenes/pyrene	5200		710	710
STL00913	C1-Fluorenes	ND		1400	930
STL00914	C2-Fluorenes	1200		710	710
STL00915	C3-Fluorenes	2000		710	710
STL00917	C2-Naphthalenes	ND		1400	1400
STL00918	C3-Naphthalenes	1600		1400	1400
STL00919	C4-Naphthalenes	ND		2100	2000
STL00901	C1-Phenanthrenes/Anthracenes	ND		2900	2400
STL00902	C2-Phenanthrenes/Anthracenes	3500		710	710
STL00903	C3-Phenanthrenes/Anthracenes	2400		710	710
STL00904	C4-Phenanthrenes/Anthracenes	1000		710	710
STL02218	C1-Chrysenes/Benz(a)anthracenes	1600		710	710

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: 1804576-851-S1 | Lab Sample ID: 140-34148-4

Matrix: PE | Lab File ID: 140-34148-A-4-A.D

Analysis Method: ID-0016 | Date Collected: 10/26/2023 14:00

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.014(g) | Date Analyzed: 11/13/2023 22:55

Con. Extract Vol.: 500(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80177 | Units: ng/g

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
STL02219	C2-Chrysenes/Benz(a)anthracenes	770		710	710
STL02220	C3-Chrysenes/Benz(a)anthracenes	ND		710	710
STL02221	C4-Chrysenes/Benz(a)anthracenes	ND		710	710
34883-41-5	PCB-14	280	J	710	7.1
74472-51-8	PCB-192	1800		710	7.1
74472-48-3	PCB-184	680	J	710	7.1
33979-03-2	PCB-155	460	J	710	7.1
41411-61-4	PCB-142	370	J	710	7.1
74472-52-9	PCB-204	1300		710	7.1
56558-16-8	PCB-104	1100		710	7.1
56558-18-0	PCB-121	600	J	710	7.1
70362-49-1	PCB-78	900		710	7.1
38444-87-0	PCB-36	270	J	710	7.1

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
93951-97-4	Acenaphthylene-d8	79		30-120
1719-06-8	Anthracene-d10	73		30-120
63466-71-7	Benzo(a)pyrene-d12	78		30-120
93951-98-5	Benzo(b)fluoranthene-d12	88		30-120
93951-66-7	Benzo(ghi)perylene-d12	88		30-120
93952-01-3	Benzo(k)fluoranthene-d12	81		30-120
1719-03-5	Chrysene-d12	75		30-120
13250-98-1	Dibenz(a,h)anthracene-d14	82		30-120
93951-69-0	Fluoranthene-d10	84		30-120
81103-79-9	Fluorene -d10	84		30-120
203578-33-0	Indeno[1,2,3-cd]pyrene-d12	85		30-120
38072-94-5	1-Methylnaphthalene-d10	80		30-120
7297-45-2	2-Methylnaphthalene-d10	79		30-120
1146-65-2	Naphthalene-d8	77		30-120
1520-96-3	Perylene-d12	74		30-120
1517-22-2	Phenanthrene-d10	75		30-120

Report Date: 16-Nov-2023 15:47:00 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-4-A.D
Lims ID: 140-34148-A-4-A
Client ID: 1804576-851-S1
Sample Type: Client
Inject. Date: 13-Nov-2023 22:55:07 ALS Bottle#: 0 Worklist Smp#: 33
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030467-033
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 16-Nov-2023 15:46:08 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1650

First Level Reviewer: SK9U Date: 16-Nov-2023 11:12:34

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/ml	%Rec	Flags
D 10 Naphthalene-d8	136	5.059	5.068	-0.009	100	50289	0.3835	76.7	
12 Naphthalene	128	5.077	5.077	-0.001	49	2260	0.0191		7M
D 15 2-methylnaphthalene-d10	152	5.612	5.612	0.000	92	33752	0.3958	79.2	
16 2-Methylnaphthalene	142	5.635	5.635	0.000	93	843	0.0100		7M
D 17 1-Methylnaphthalene-d10	152	5.692	5.692	0.000	100	34275	0.4012	80.2	
D 23 Acenaphthylene-d8	160	6.366	6.366	0.000	90	57057	0.3942	78.8	
24 Acenaphthylene	152	6.376	6.376	-0.001	21	346	0.002579		M
* 26 Acenaphthene-d10	164	6.492	6.492	0.000	97	47038	0.5000		
27 Acenaphthene	154	6.517	6.517	0.000	97	4968	0.0578		
D 29 Fluorene -d10	176	6.925	6.925	0.000	99	47355	0.4225	84.5	
30 Fluorene	166	6.945	6.945	0.000	96	3518	0.0286		M
D 35 Phenanthrene-d10	188	7.731	7.728	0.003	99	93533	0.3738	74.8	
36 Phenanthrene	178	7.749	7.753	0.000	32	17217	0.0763		
D 38 Anthracin-d10	188	7.780	7.783	0.004	99	88563	0.3626	72.5	
39 Anthracene	178	7.794	7.794	0.000	100	6410	0.0294		
D 41 Fluoranthene-d10	212	8.805	8.808	-0.003	99	136061	0.4192	83.8	
43 Fluoranthene	202	8.821	8.822	-0.004	41	94083	0.2702		
* 44 Pyrene-d10 (IS)	212	9.023	9.027	-0.004	98	160431	0.5000		
45 Pyrene	202	9.040	9.044	-0.004	96	115708	0.3257		
47 Benzo[a]anthracene	228	10.259	10.259	-0.001	99	17159	0.0559		M
D 48 Chrysene-d12	240	10.270	10.270	0.000	84	118120	0.3773	75.5	
50 Chrysene	228	10.295	10.295	0.000	14	23863	0.0694		M
D 52 Benzo(b)fluoranthene-d12	264	11.369	11.369	0.000	99	105358	0.4391	87.8	
53 Benzo[b]fluoranthene	252	11.397	11.397	0.000	28	19031	0.0536		M
D 54 Benzo(k)fluoranthene-d12	264	11.404	11.404	0.000	61	113530	0.4027	80.5	
55 Benzo[k]fluoranthene	252	11.425	11.425	0.000	100	8733	0.0263		M
* 56 Benzo(e)pyrene-d12	264	11.684	11.684	0.000	99	94741	0.5000		
57 Benzo[e]pyrene	252	11.712	11.712	0.000	100	9553	0.0343		
D 58 Benzo(a)pyrene-d12	264	11.747	11.747	0.000	100	82575	0.3924	78.5	
59 Benzo[a]pyrene	252	11.775	11.782	0.000	100	9597	0.0351		
D 60 Perylene-d12	264	11.838	11.845	-0.007	99	86014	0.3683	73.7	
61 Perylene	252	11.866	11.866	-0.007	100	7076	0.0288		M

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/ml	%Rec	Flags
D 62 Indeno[1,2,3-cd]pyrene-d12	288	13.186	13.186	0.000	84	96671	0.4229	84.6	
D 63 Dibenz(a,h)anthracene-d14	292	13.195	13.196	-0.001	88	83715	0.4093	81.9	
65 Indeno[1,2,3-cd]pyrene	276	13.214	13.196	0.000	22	5663	0.0175		
66 Dibenz(a,h)anthracene	278	13.242	13.242	0.000	1	933	0.003490		M
D 67 Benzo(ghi)perylene-d12	288	13.543	13.543	0.000	100	99404	0.4378	87.6	
68 Benzo[g,h,i]perylene	276	13.580	13.580	0.000	48	4347	0.0149		M
74 PCB-14	222	7.476	7.476	-0.003	96	1482	0.007803		M
75 PCB-36	258	8.202	8.210	-0.008	99	758	0.007582		
76 PCB-104	326	8.395	8.396	-0.001	92	2336	0.0301		
77 PCB-121	326	8.751	8.751	0.000	81	1041	0.0167		
78 PCB-155	360	8.845	8.849	-0.004	81	745	0.0128		
79 PCB-78	290	9.077	9.084	-0.007	82	1251	0.0252		
80 PCB-142	360	9.521	9.522	-0.001	84	434	0.0102		
81 PCB-184	394	9.572	9.572	0.000	30	809	0.0191		
* 82 PCB-167L	372	10.023	10.027	-0.004	75	20719	0.4000		
83 PCB-204	428	10.249	10.250	-0.001	17	972	0.0352		
84 PCB-192	394	10.275	10.275	0.000	8	1927	0.0495		
A 87 C3-Naphthalenes	170	6.814	(6.348-7.050)		0	5442	0.0460		
A 88 C4-Naphthalenes	184	7.116	(6.678-7.562)		0	5831	0.0493		
A 89 C1-Fluorenes	180	7.407	(7.364-7.505)		0	2883	0.0234		
A 90 C2-Fluorenes	194	7.893	(7.730-8.069)		0	4123	0.0335		
A 91 C3-Fluorenes	208	8.364	(8.092-8.605)		0	6728	0.0547		
A 96 C1-Phenanthrenes/Anthracenes	191	8.231	(8.155-8.332)		0	12588	0.0558		
A 97 C2-Phenanthrenes/Anthracenes	206	8.697	(8.490-8.926)		0	22193	0.0984		
A 98 C3-Phenanthrenes/Anthracenes	220	9.161	(8.851-9.456)		0	15050	0.0667		
A 99 C4-Phenanthrenes/Anthracenes	234	9.489	(9.106-9.824)		0	6380	0.0283		
A 100 C1-Fluoranthenes/pyrene	216	9.446	(9.246-9.640)		0	51605	0.1452		
A 101 C1-Chrysenes/Benz(a)anthracenes	242	10.680	(10.456-10.941)		0	15636	0.0455		
A 102 C2-Chrysenes/Benz(a)anthracenes	256	11.008	(10.667-11.381)		0	7401	0.0215		

QC Flag Legend

Processing Flags

7 - Failed Limit of Detection

Review Flags

M - Manually Integrated

Reagents:

60ISPCB_00001 Amount Added: 5.00 Units: uL

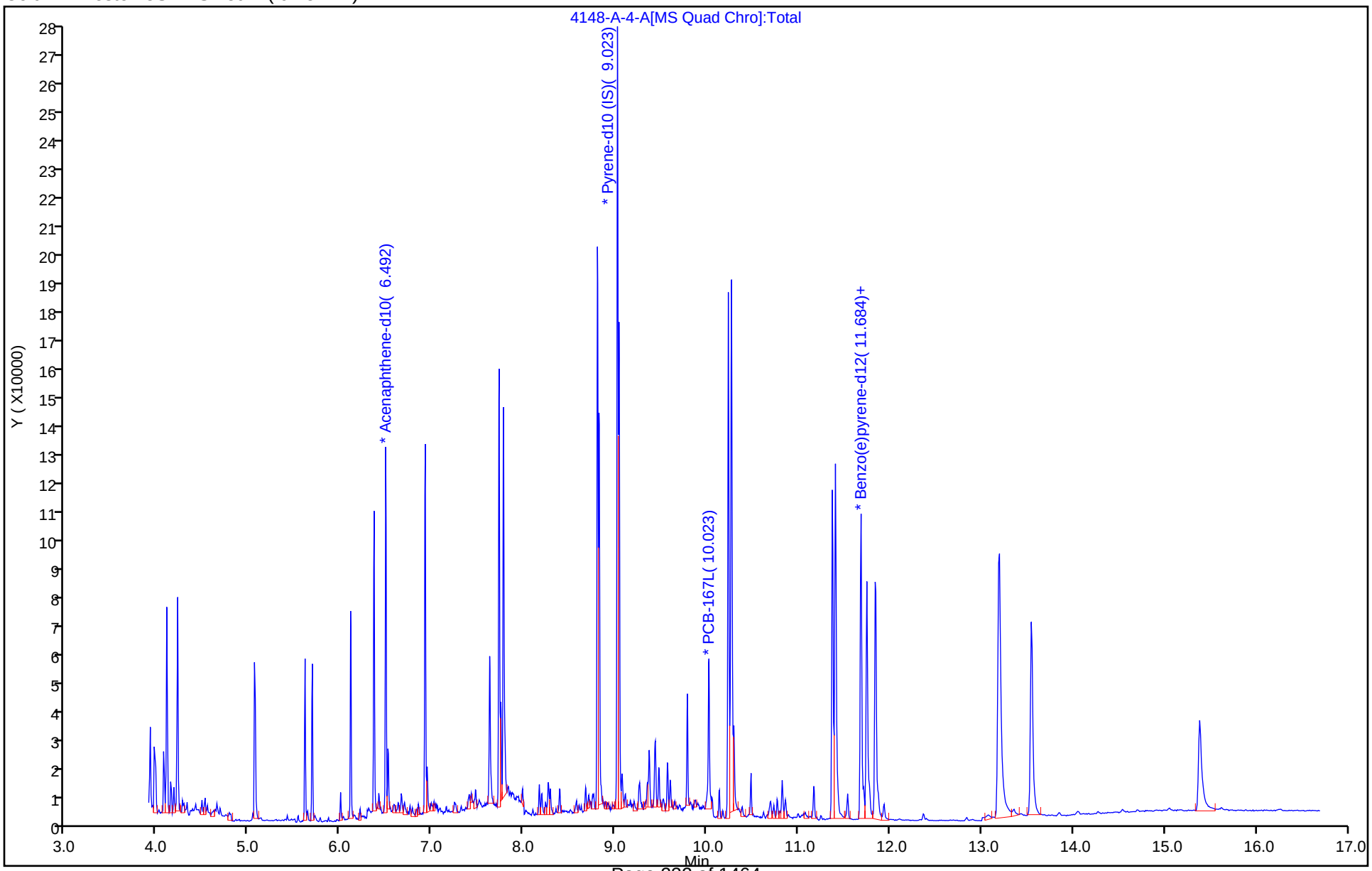
Report Date: 16-Nov-2023 15:47:00 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-4-A.D

Injection Date:	13-Nov-2023 22:55:07	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	140-34148-A-4-A	Lab Sample ID:	140-34148-4	Worklist Smp#:	33
Client ID:	1804576-851-S1				
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



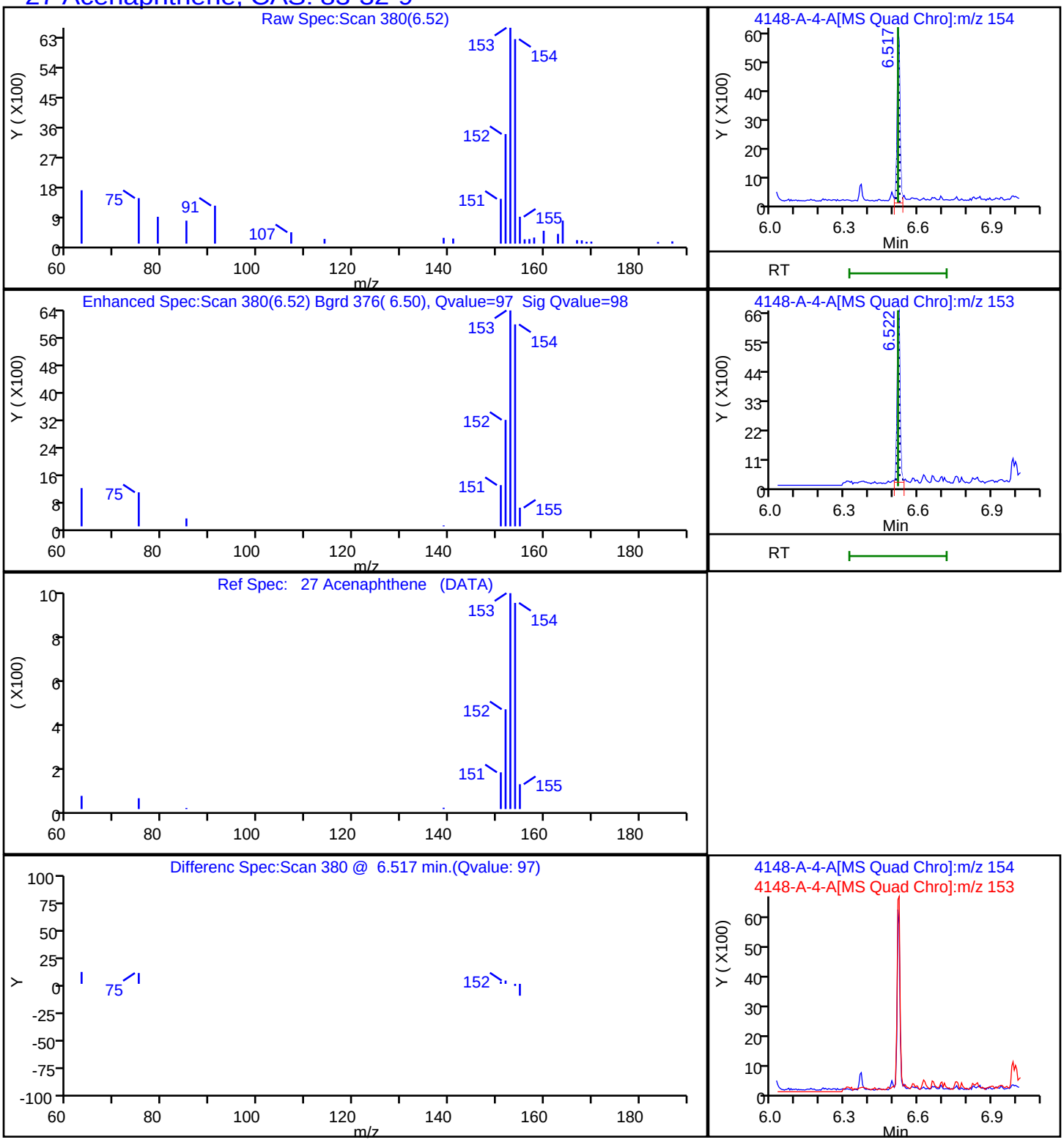
Report Date: 16-Nov-2023 15:47:00 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-4-A.D

Injection Date:	13-Nov-2023 22:55:07	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-4-A	Lab Sample ID:	140-34148-4		
Client ID:	1804576-851-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

27 Acenaphthene, CAS: 83-32-9



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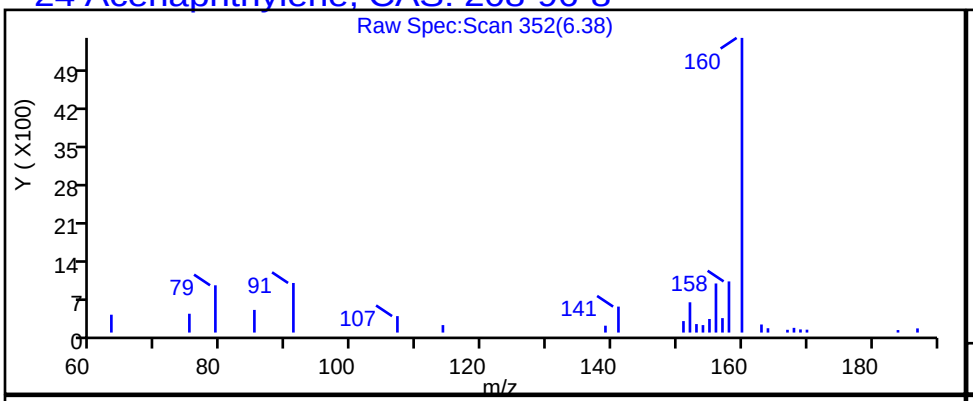
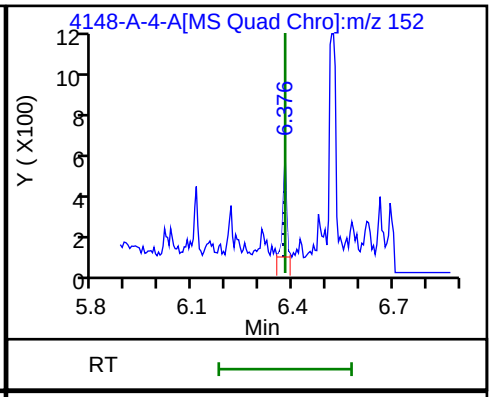
Eurofins Knoxville

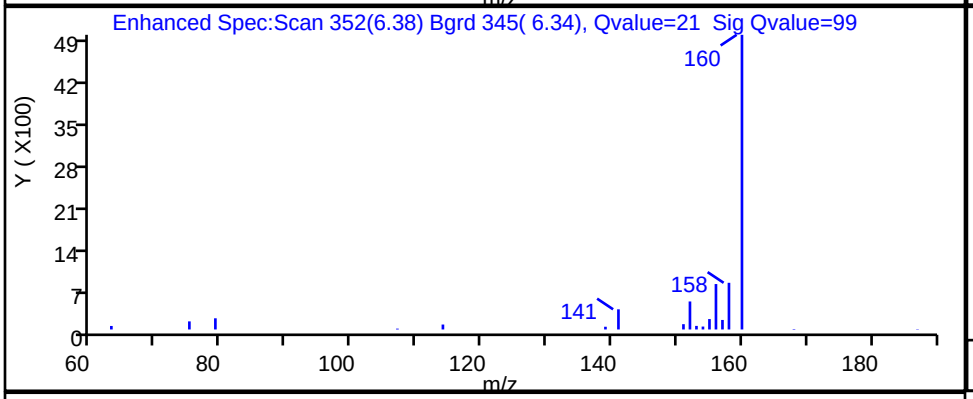
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-4-A.D

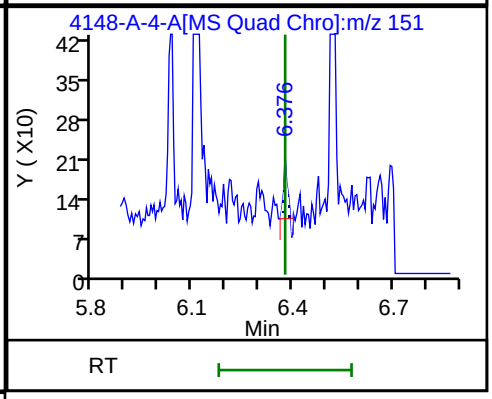
Injection Date:	13-Nov-2023 22:55:07	Instrument ID:	GCMS1
Lims ID:	140-34148-A-4-A	Lab Sample ID:	140-34148-4
Client ID:	1804576-851-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

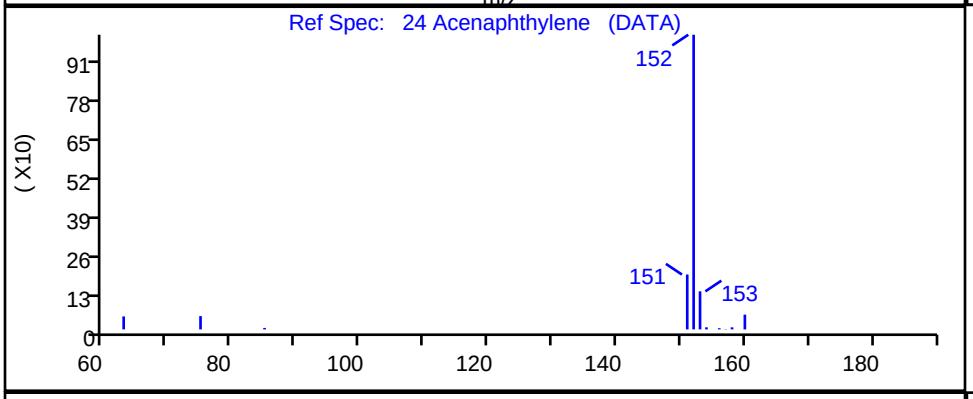
24 Acenaphthylene, CAS: 208-96-8

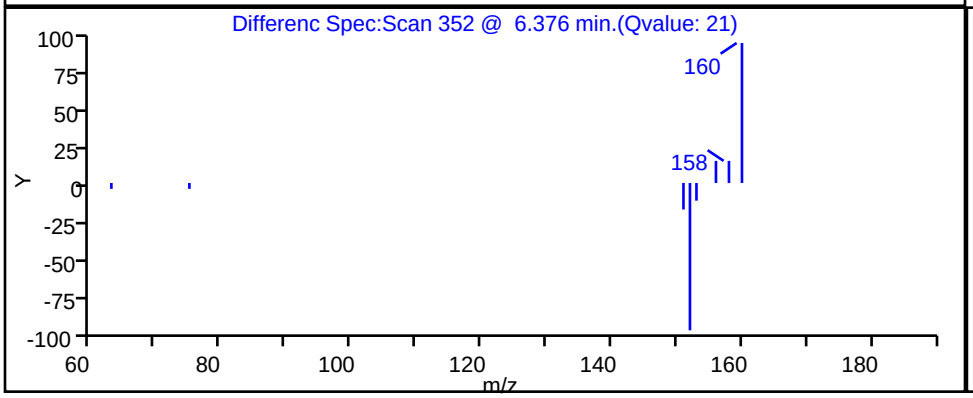


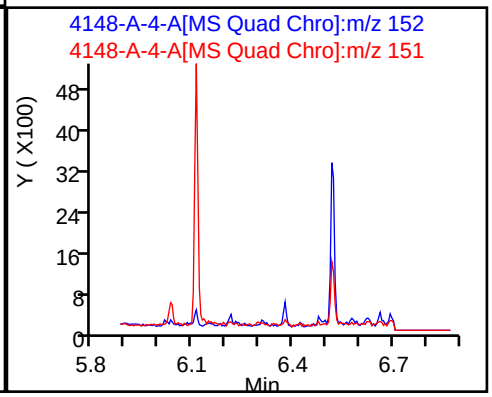












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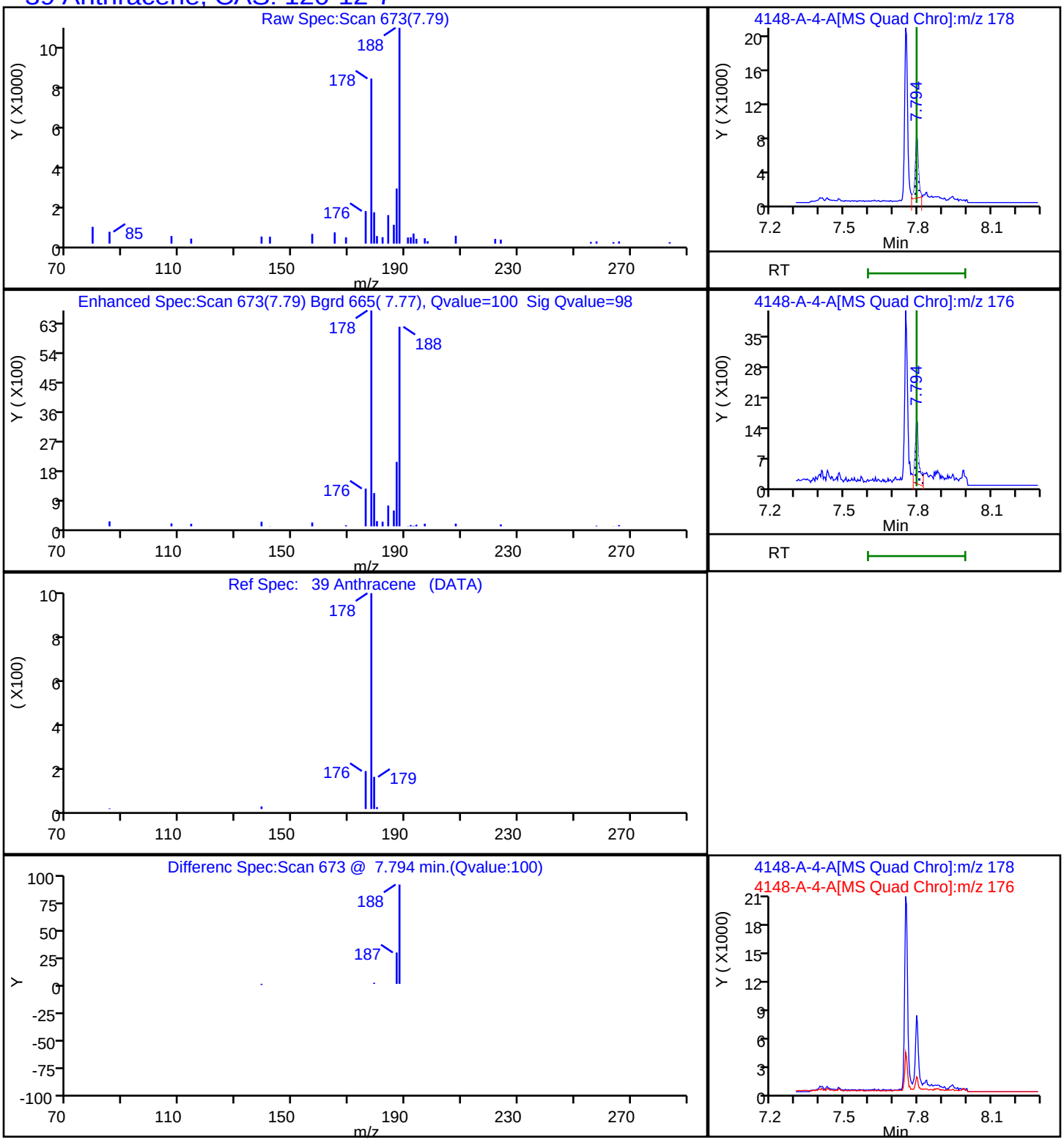
Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-4-A.D				
Injection Date:	13-Nov-2023 22:55:07	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-4-A	Lab Sample ID:	140-34148-4		
Client ID:	1804576-851-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

39 Anthracene, CAS: 120-12-7



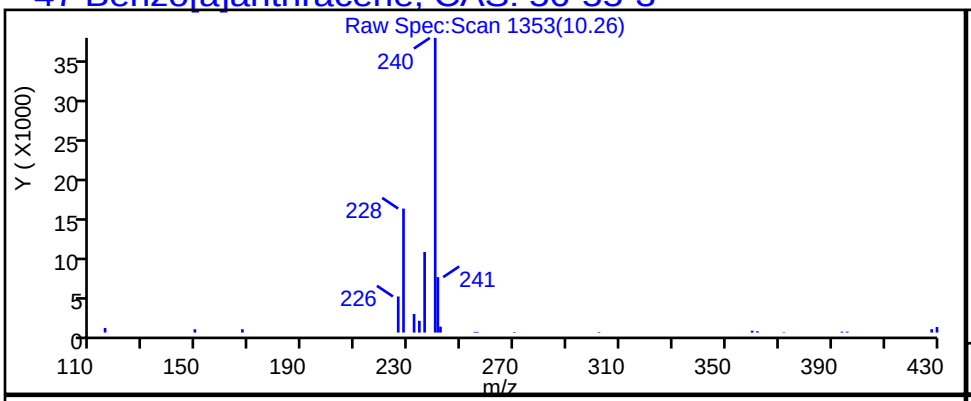
Report Date: 16-Nov-2023 15:47:01 Chrom Revision: 2.3 15-Nov-2023 20:54:34

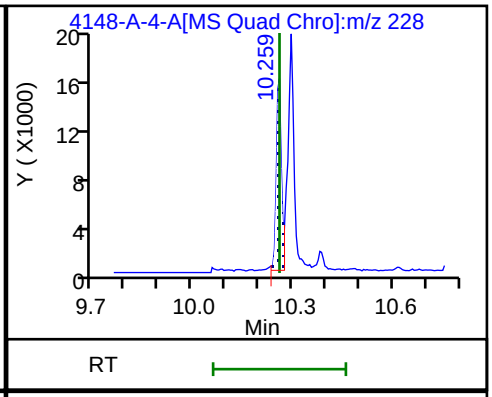
Eurofins Knoxville

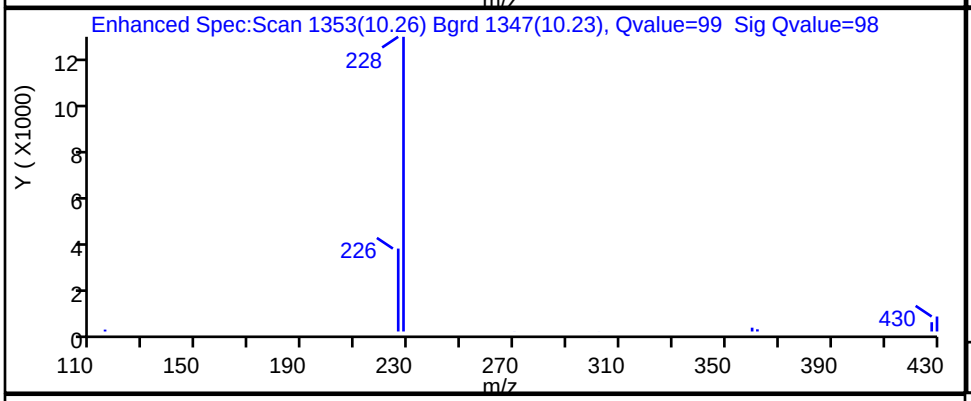
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-4-A.D

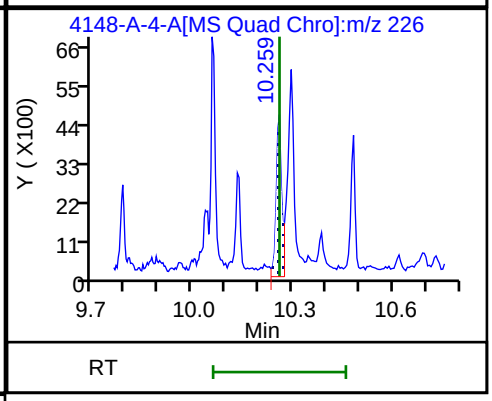
Injection Date:	13-Nov-2023 22:55:07	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-4-A	Lab Sample ID:	140-34148-4		
Client ID:	1804576-851-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

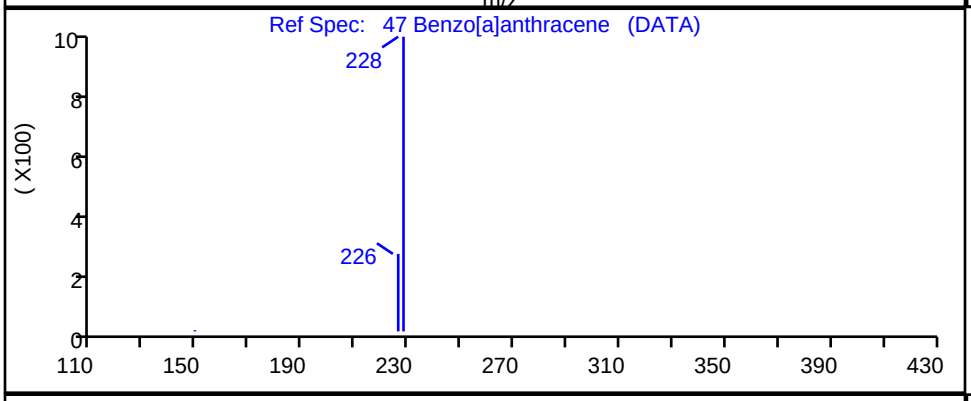
47 Benzo[a]anthracene, CAS: 56-55-3

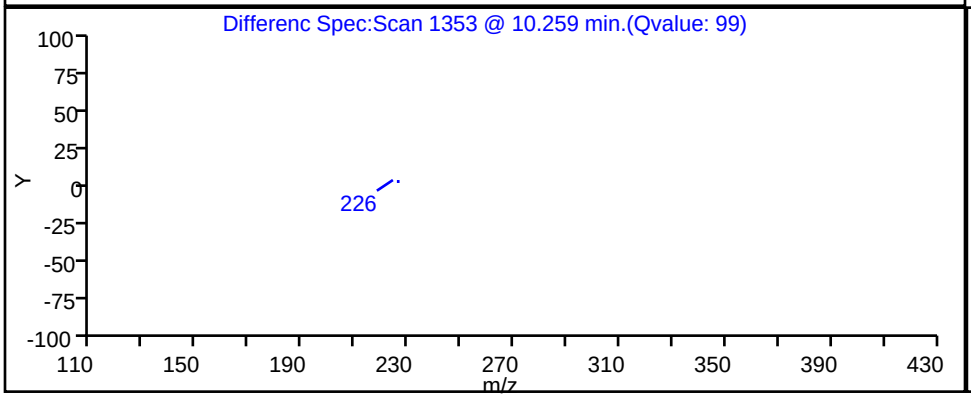


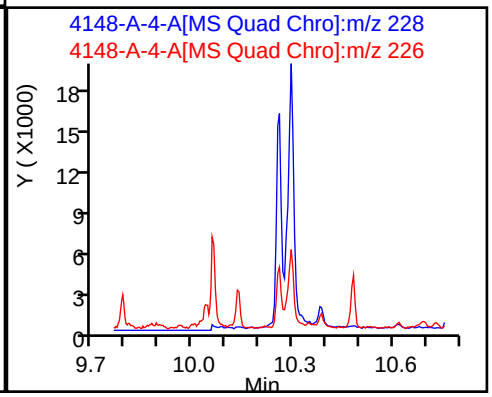












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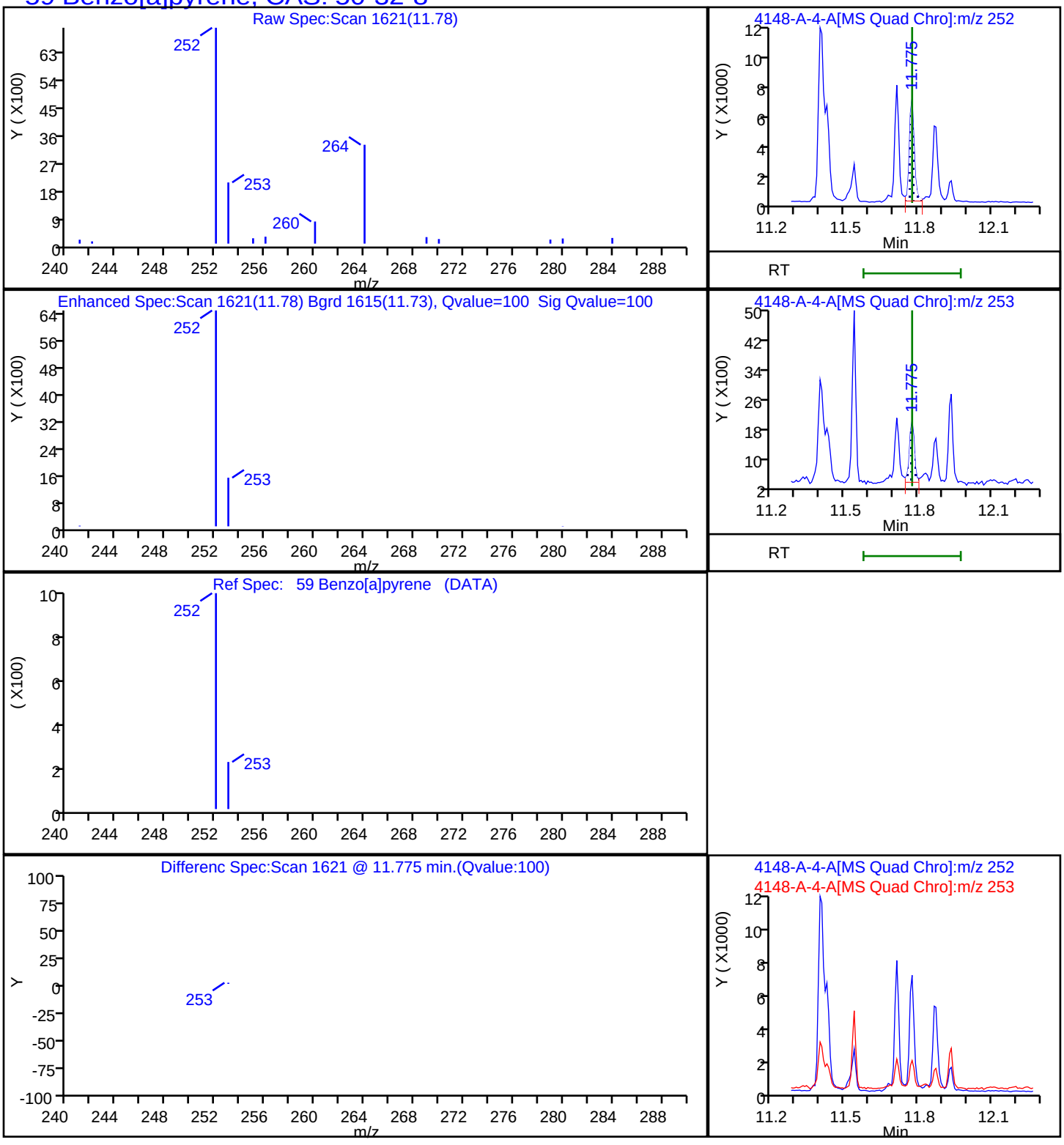
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-4-A.D

Injection Date:	13-Nov-2023 22:55:07	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-4-A	Lab Sample ID:	140-34148-4		
Client ID:	1804576-851-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

59 Benzo[a]pyrene, CAS: 50-32-8



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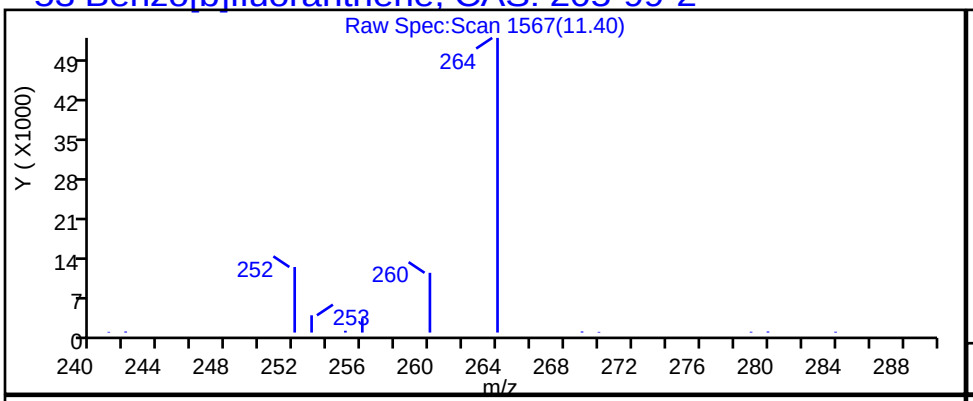
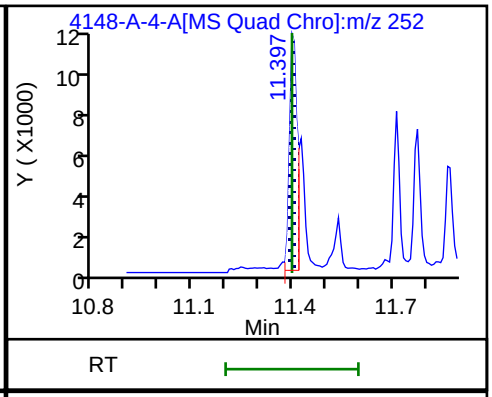
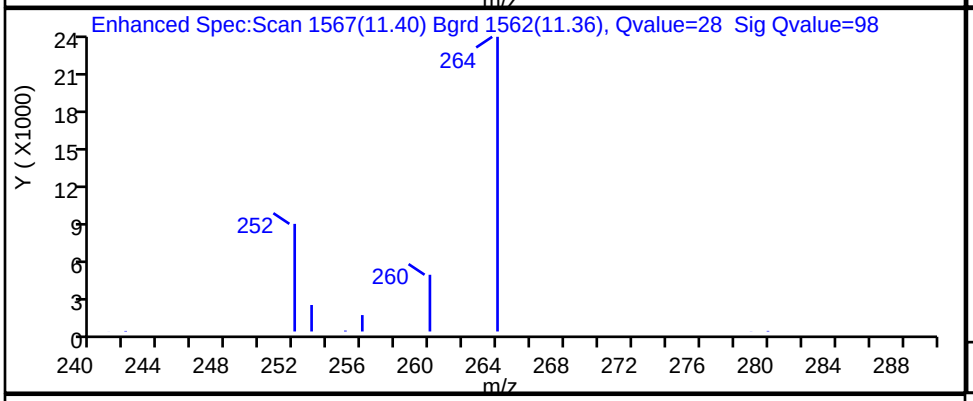
Eurofins Knoxville

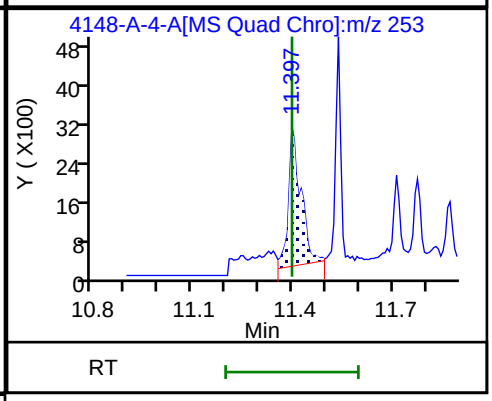
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-4-A.D				
Injection Date:	13-Nov-2023 22:55:07	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-4-A	Lab Sample ID:	140-34148-4		
Client ID:	1804576-851-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

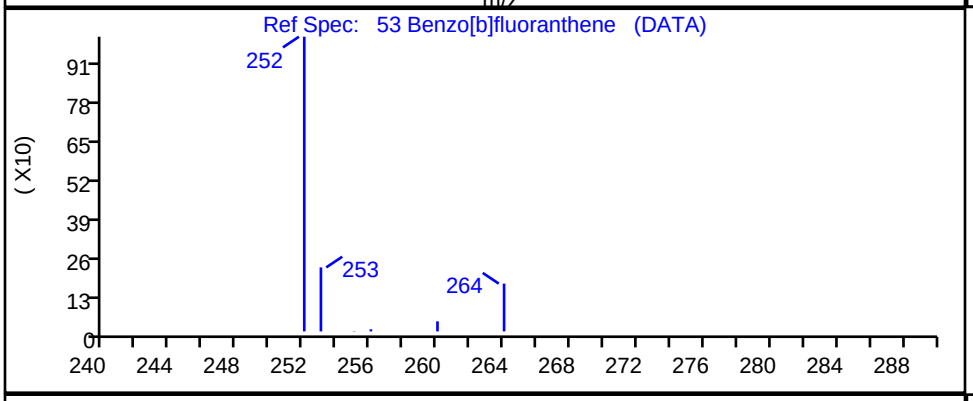
53 Benzo[b]fluoranthene, CAS: 205-99-2

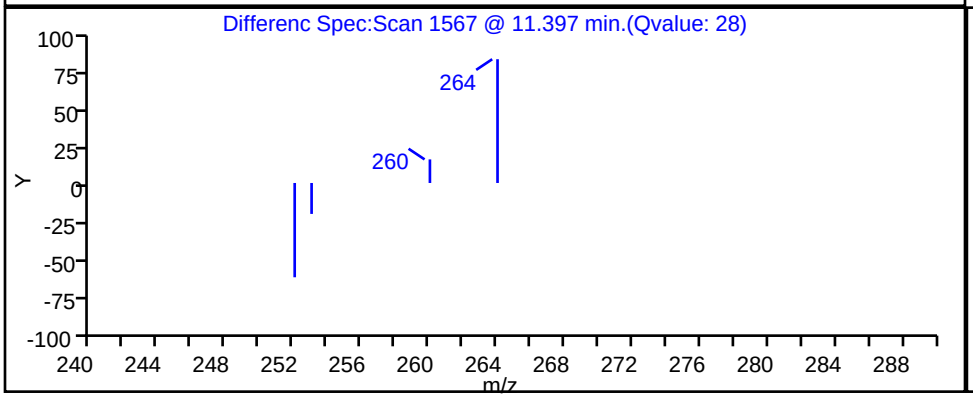


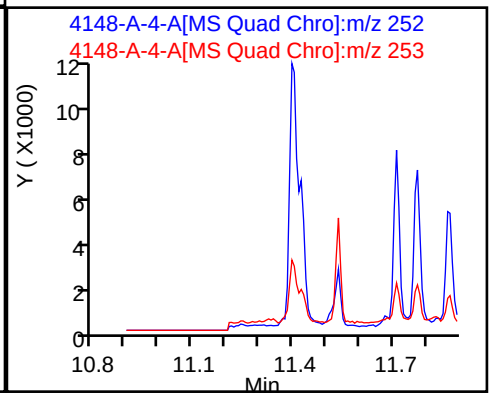










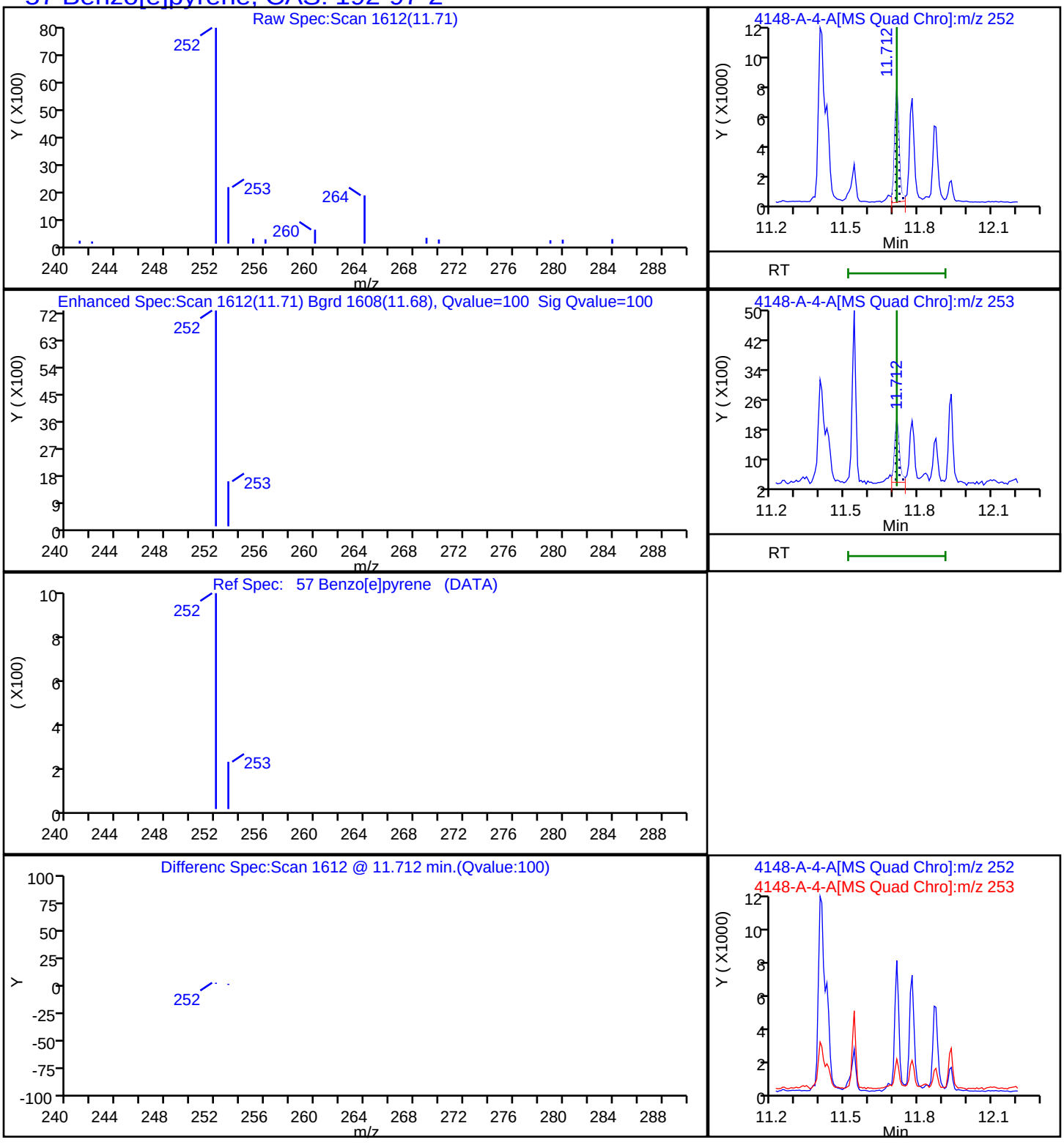


Report Date: 16-Nov-2023 15:47:01 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-4-A.D				
Injection Date:	13-Nov-2023 22:55:07	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-4-A	Lab Sample ID:	140-34148-4		
Client ID:	1804576-851-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

57 Benzo[e]pyrene, CAS: 192-97-2



Report Date: 16-Nov-2023 15:47:02 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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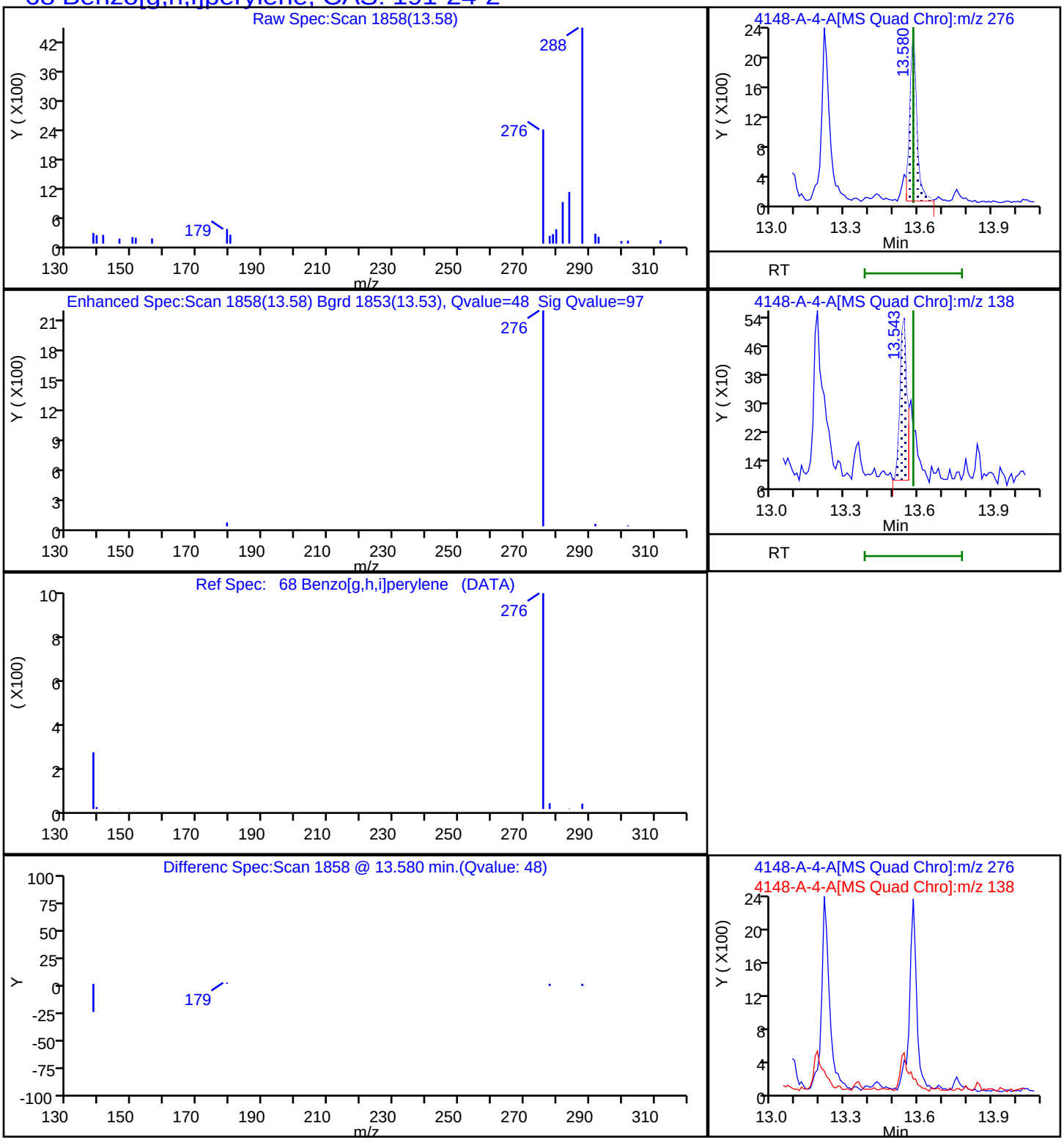
Client ID:	1804576-851-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

68 Benzo[g,h,i]perylene, CAS: 191-24-2



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Eurofins Knoxville

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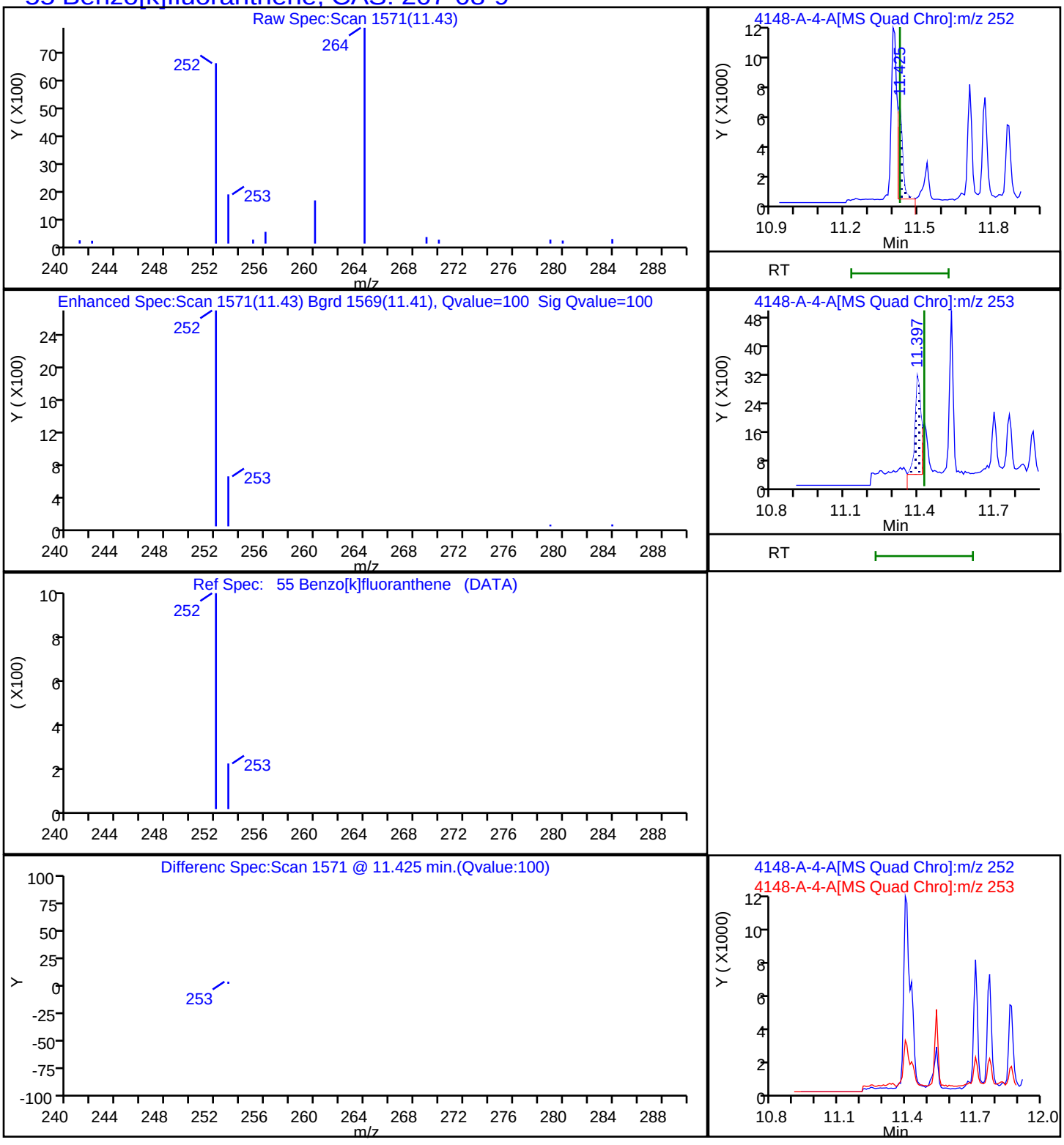
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

55 Benzo[k]fluoranthene, CAS: 207-08-9



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Eurofins Knoxville

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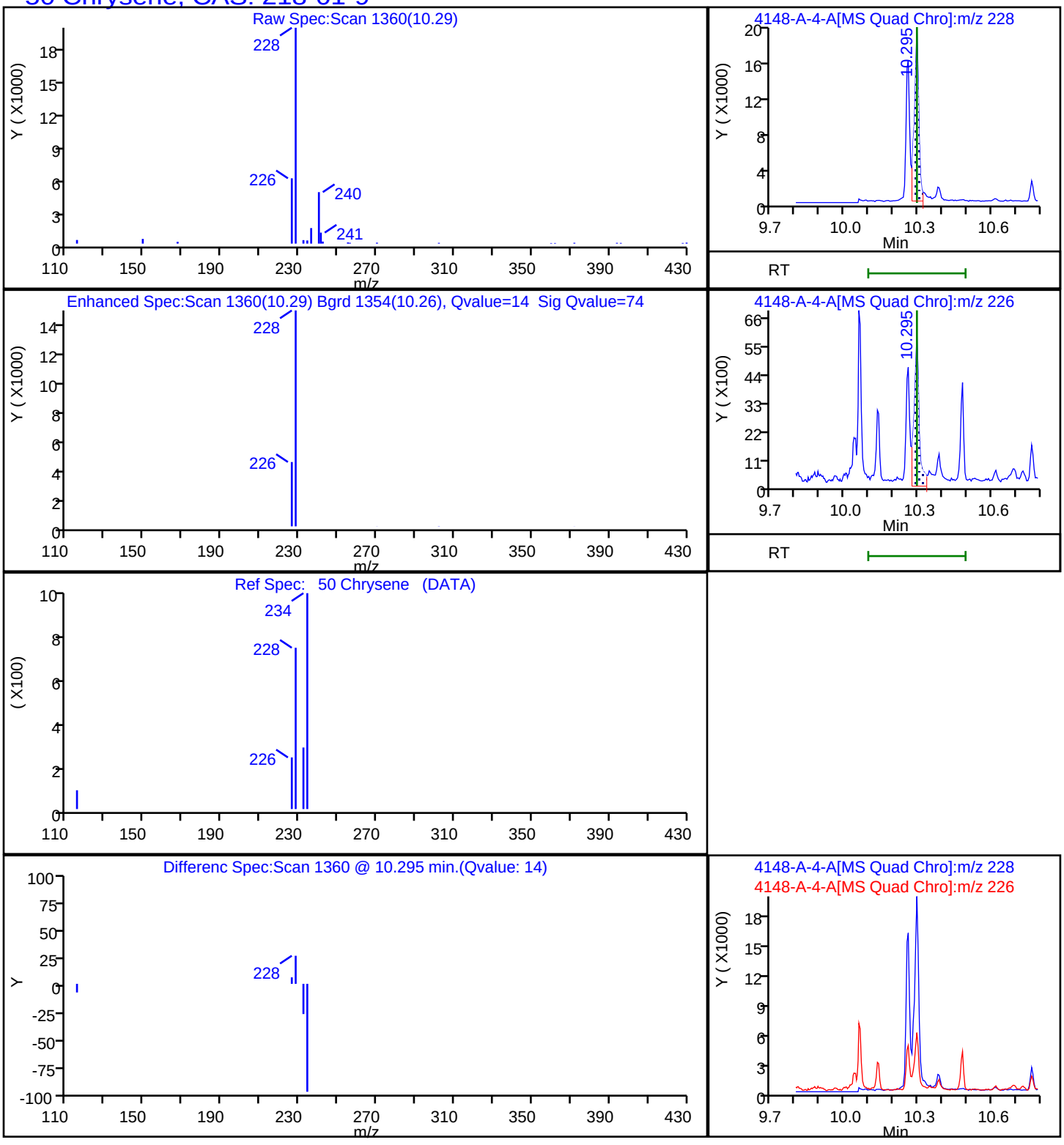
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

50 Chrysene, CAS: 218-01-9



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Eurofins Knoxville

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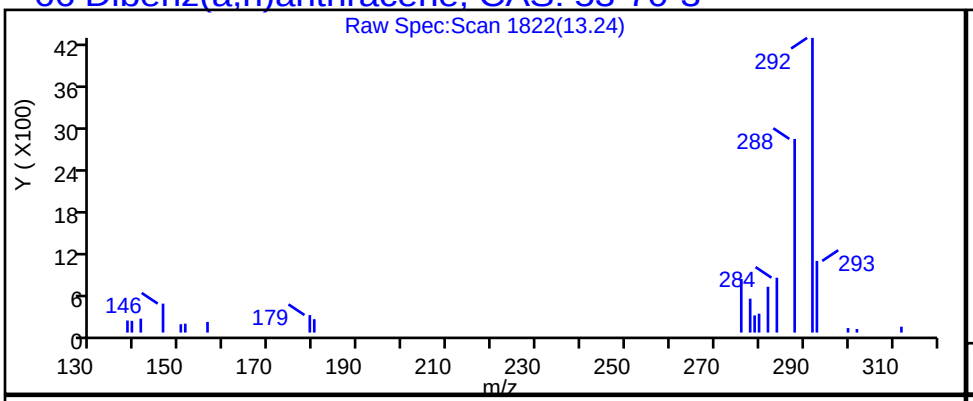
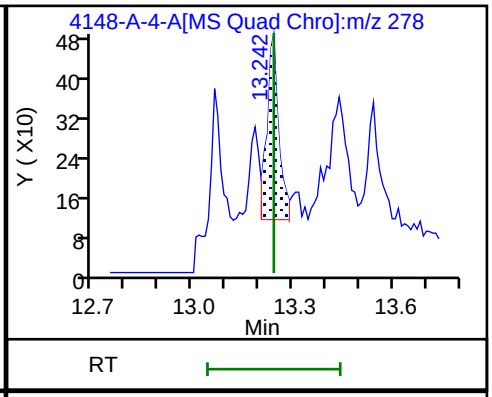
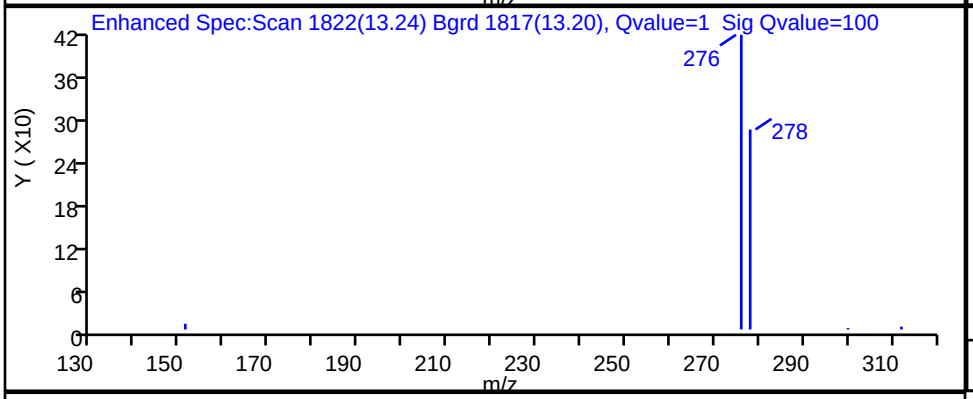
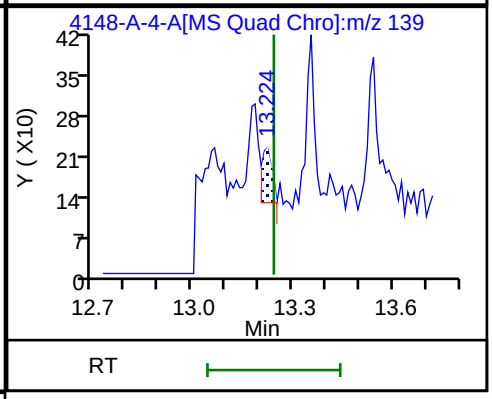
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

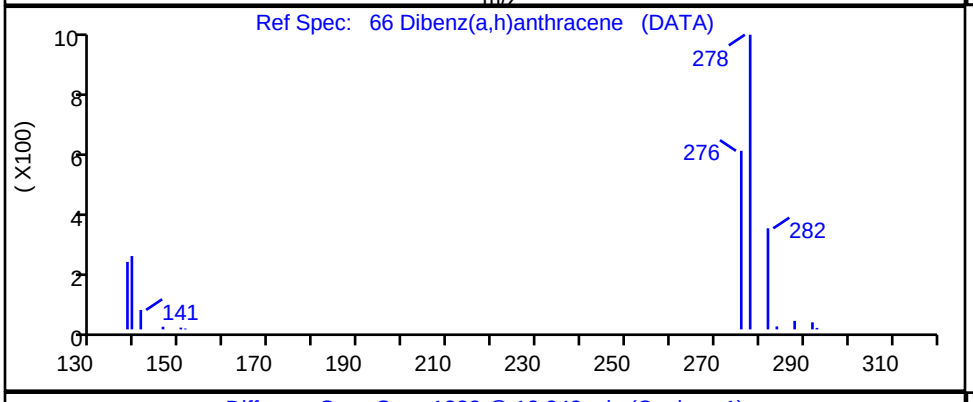
66 Dibenz(a,h)anthracene, CAS: 53-70-3

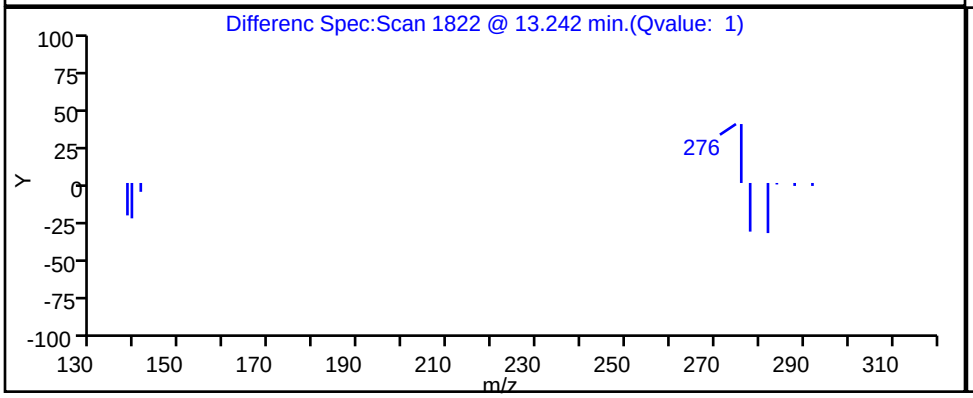


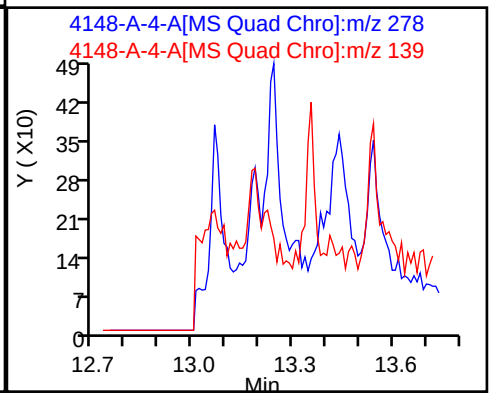












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Eurofins Knoxville

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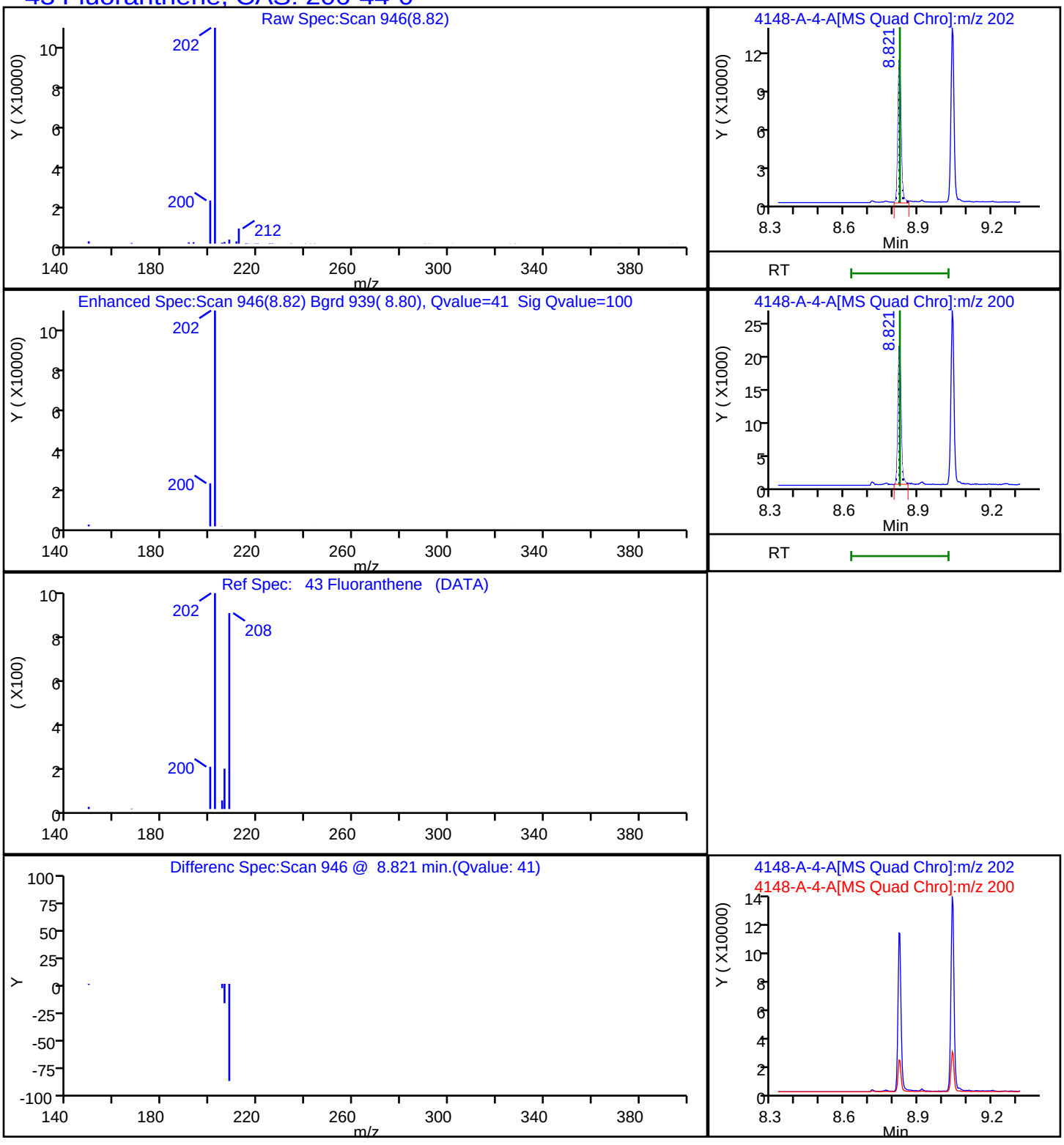
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

43 Fluoranthene, CAS: 206-44-0



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Eurofins Knoxville

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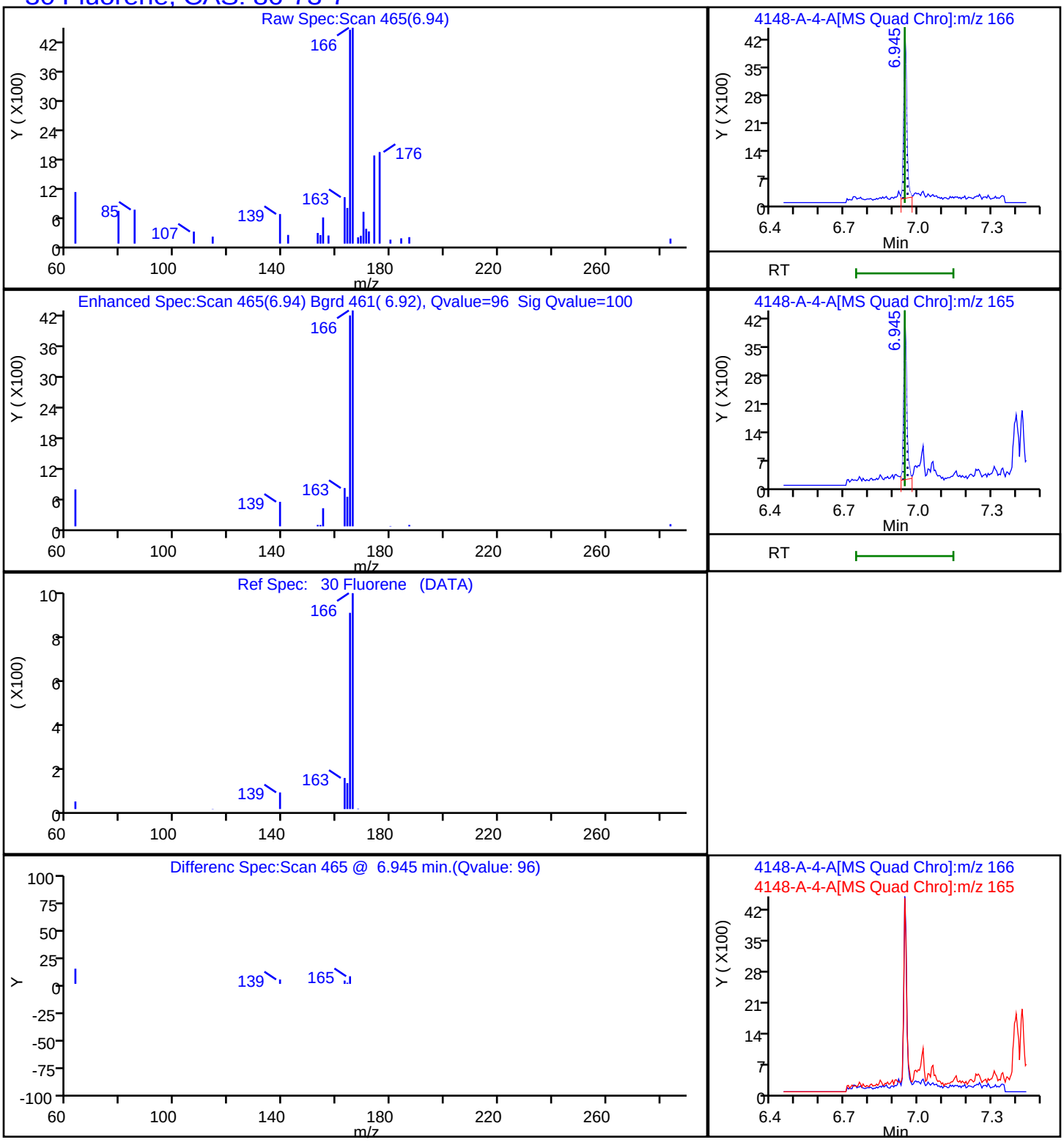
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

30 Fluorene, CAS: 86-73-7



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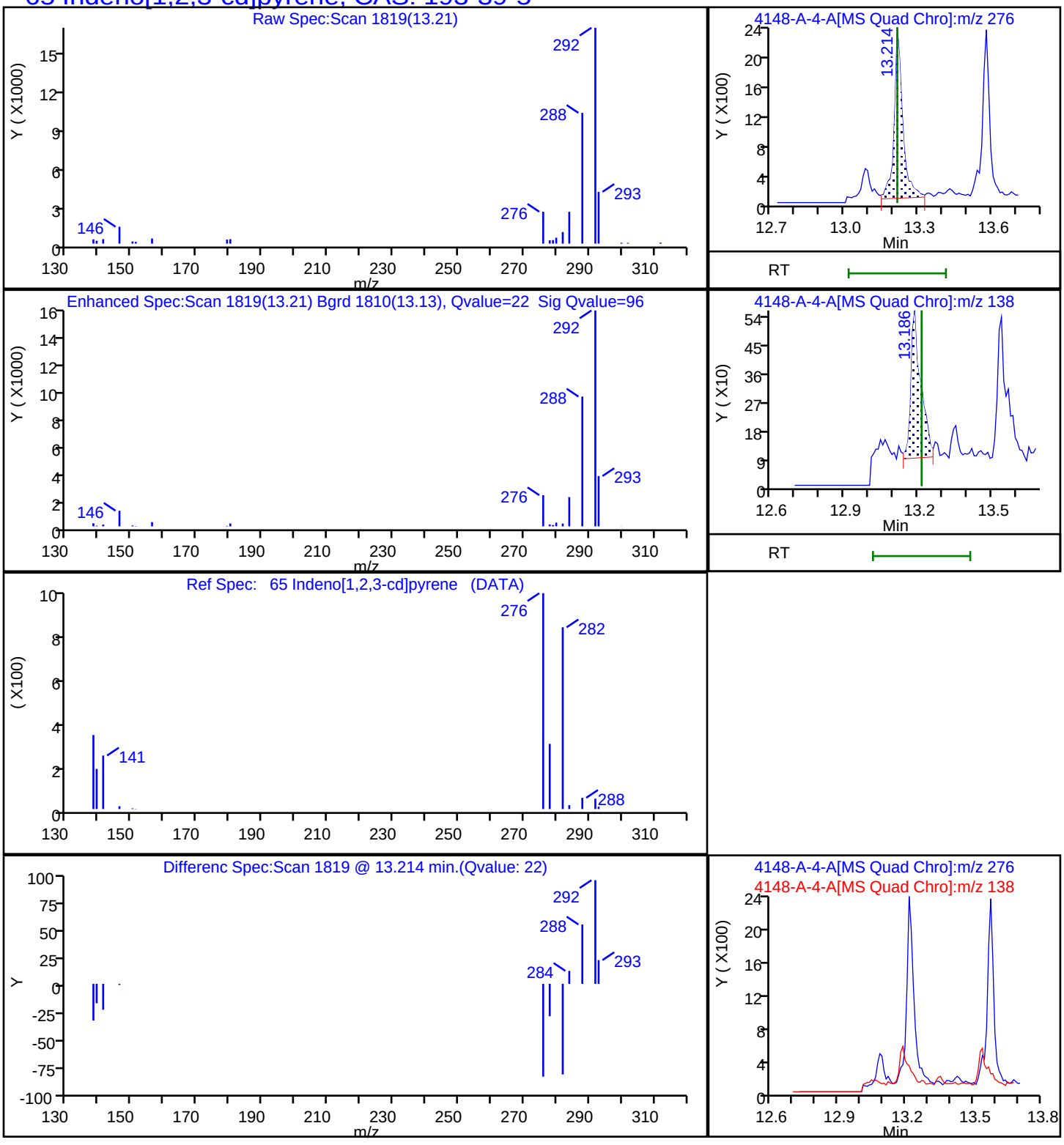
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

65 Indeno[1,2,3-cd]pyrene, CAS: 193-39-5



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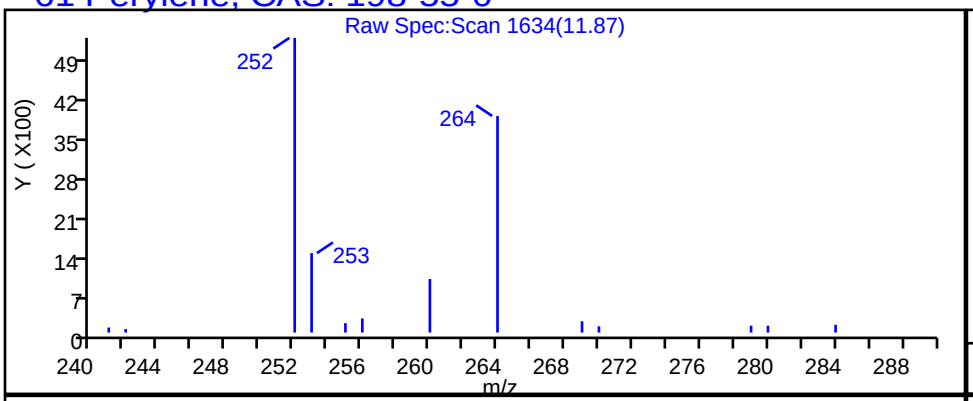
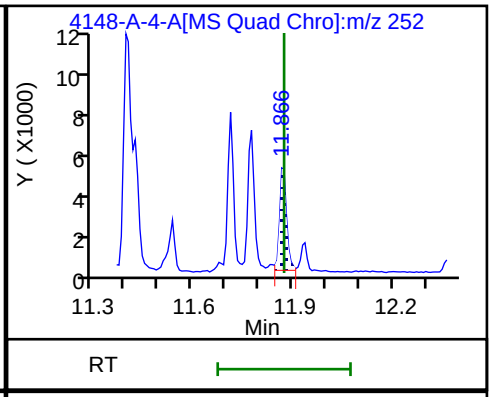
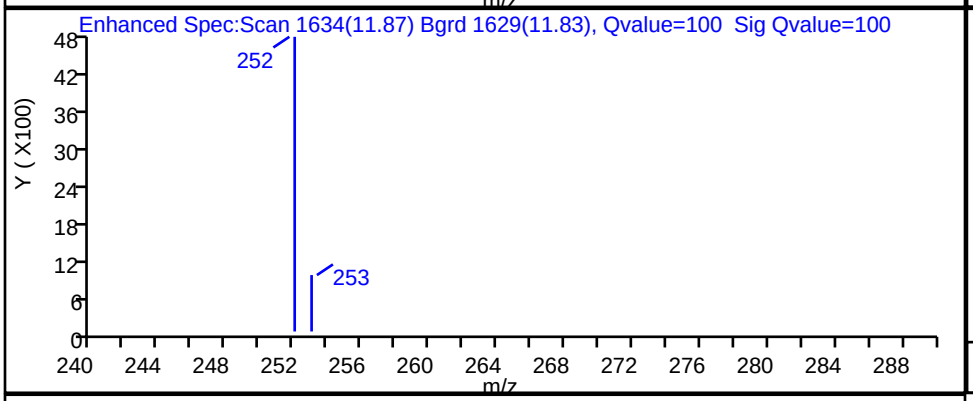
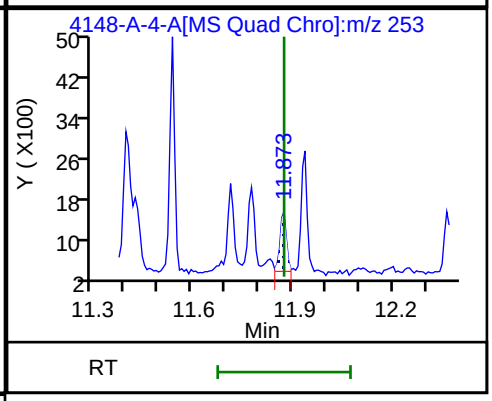
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

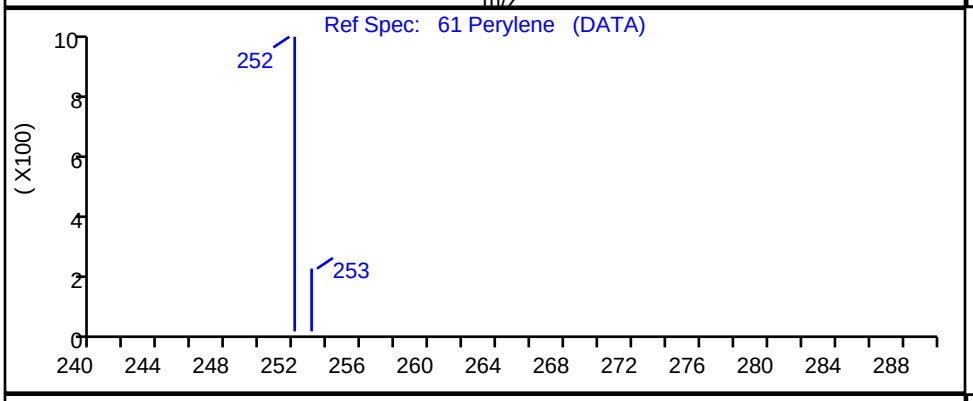
61 Perylene, CAS: 198-55-0

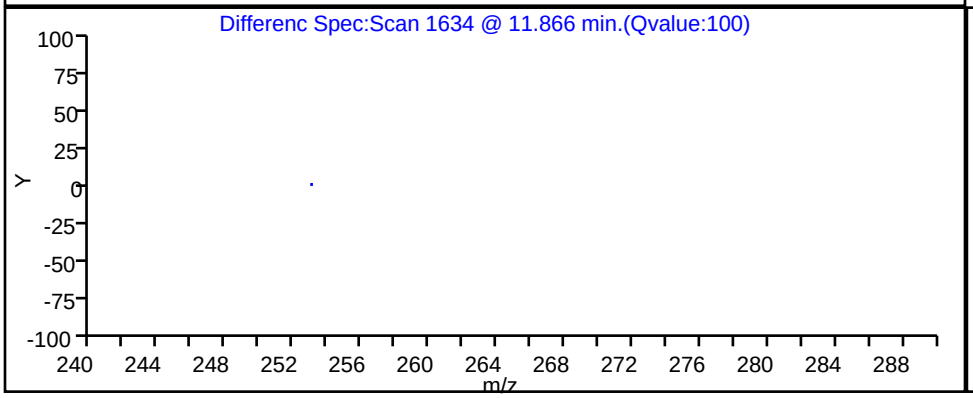


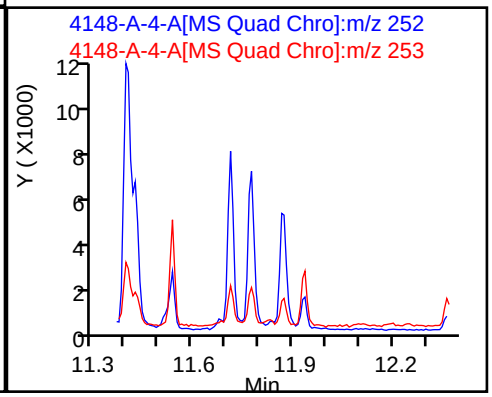












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Lims ID:	140-34148-A-4-A	Lab Sample ID:	140-34148-4		
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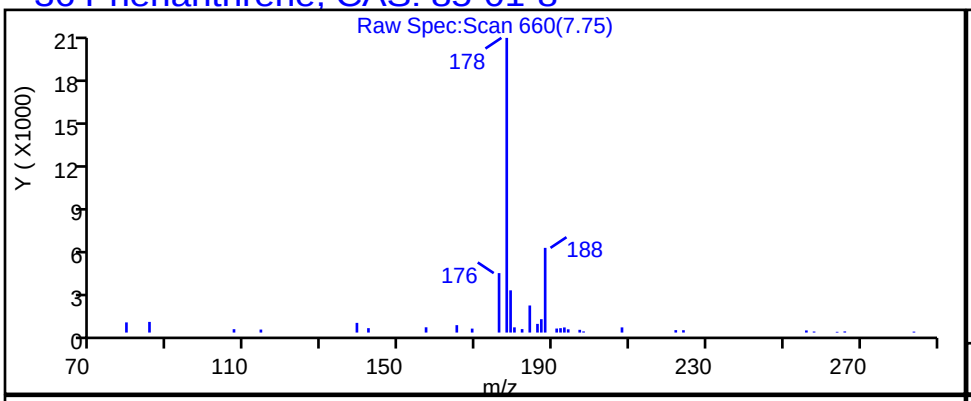
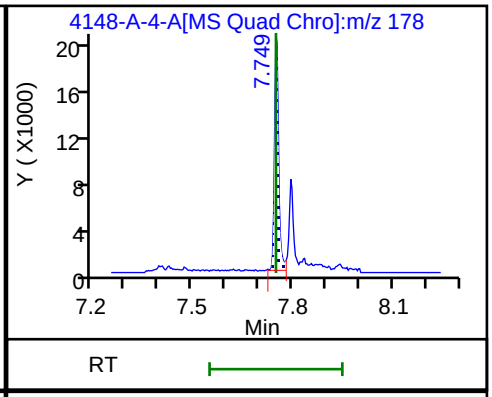
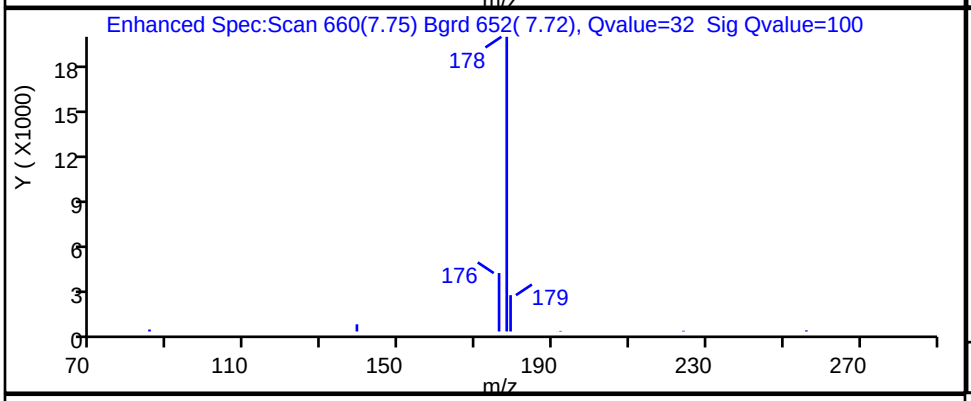
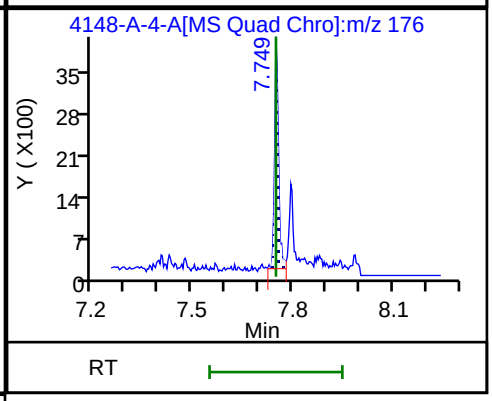
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

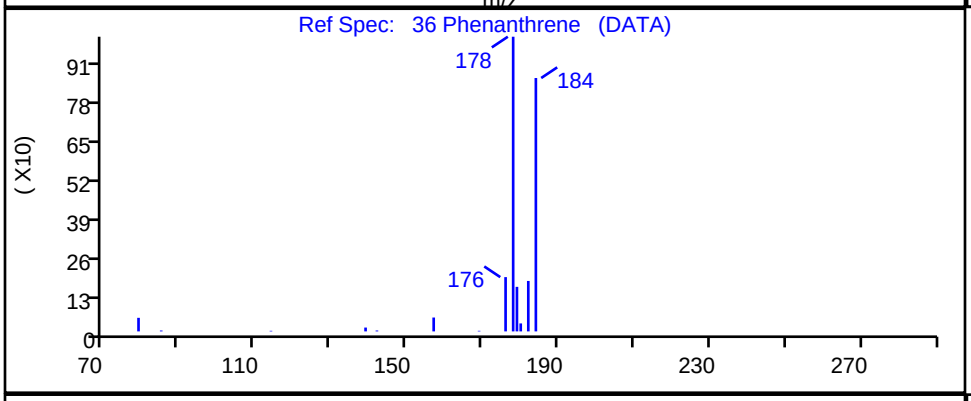
36 Phenanthrene, CAS: 85-01-8

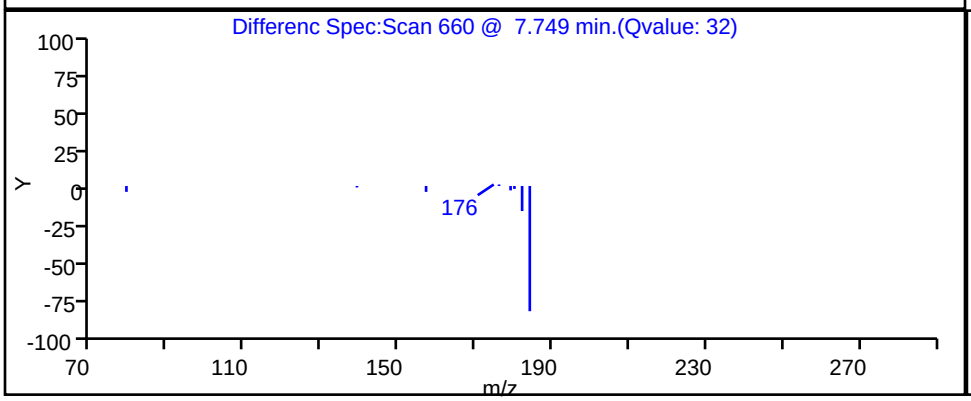


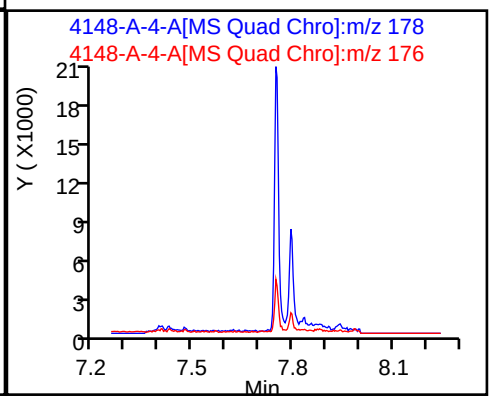












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Eurofins Knoxville

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Client ID:	1804576-851-S1		
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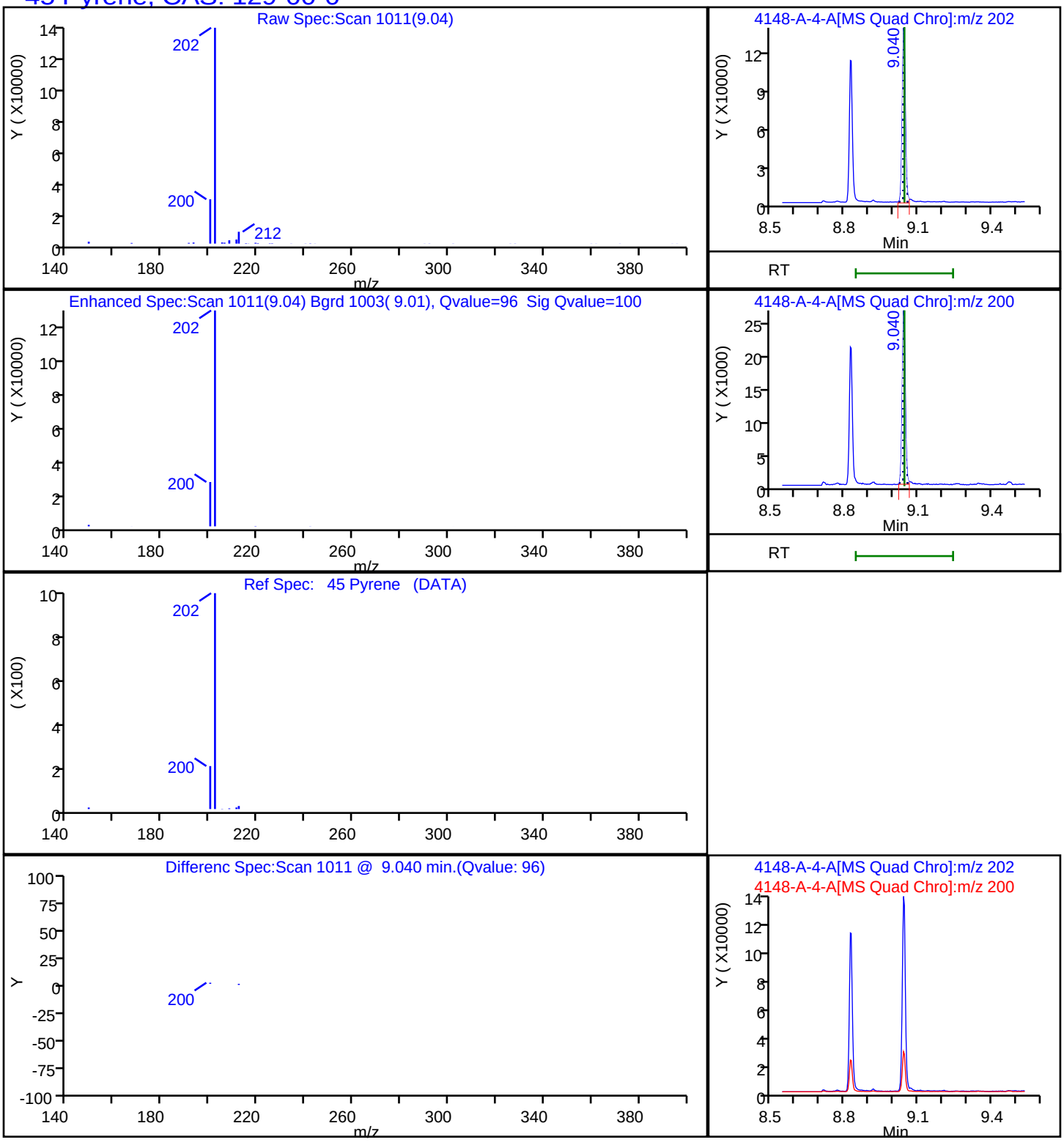
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

45 Pyrene, CAS: 129-00-0



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Eurofins Knoxville

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Injection Date:	13-Nov-2023 22:55:07	Instrument ID:	GCMS1		
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Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
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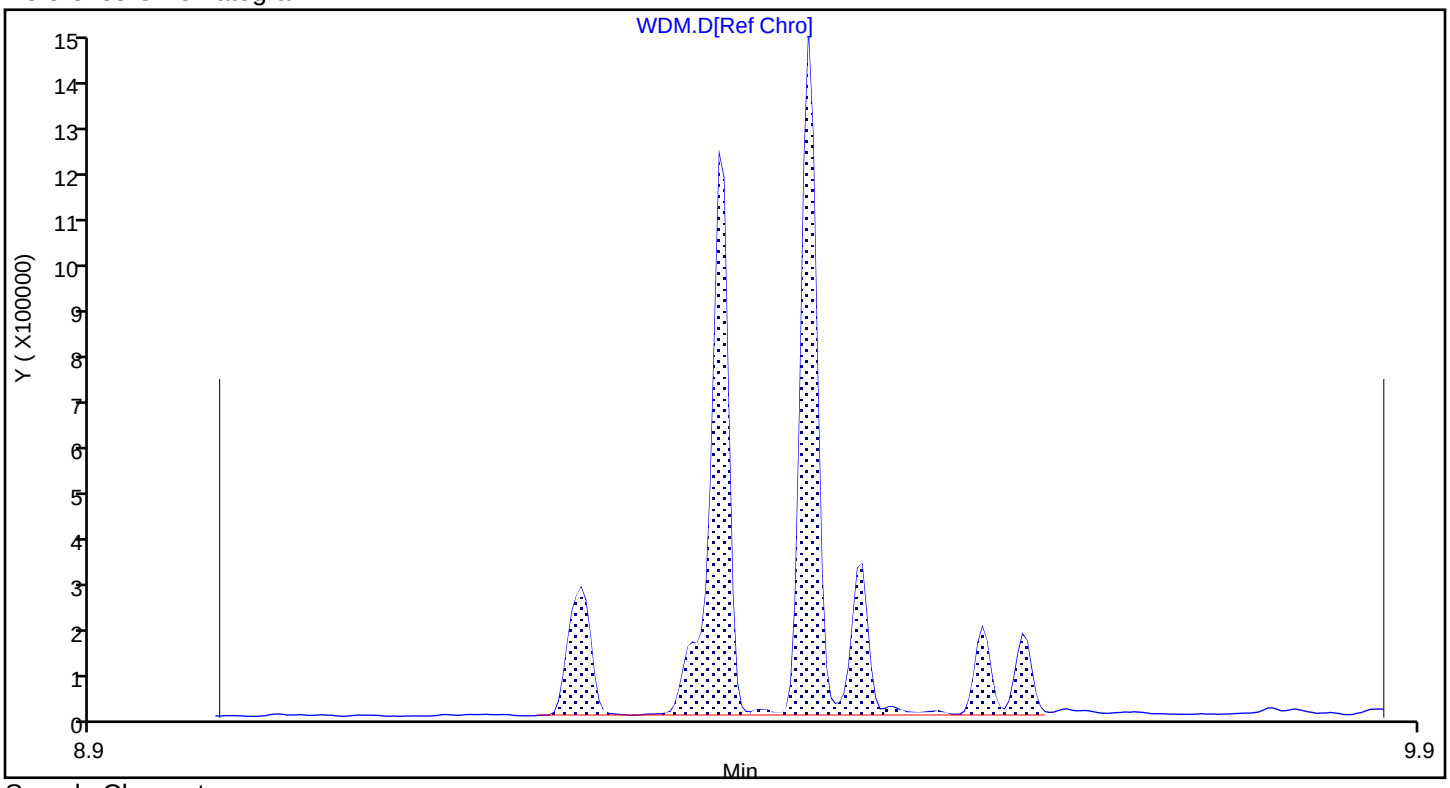
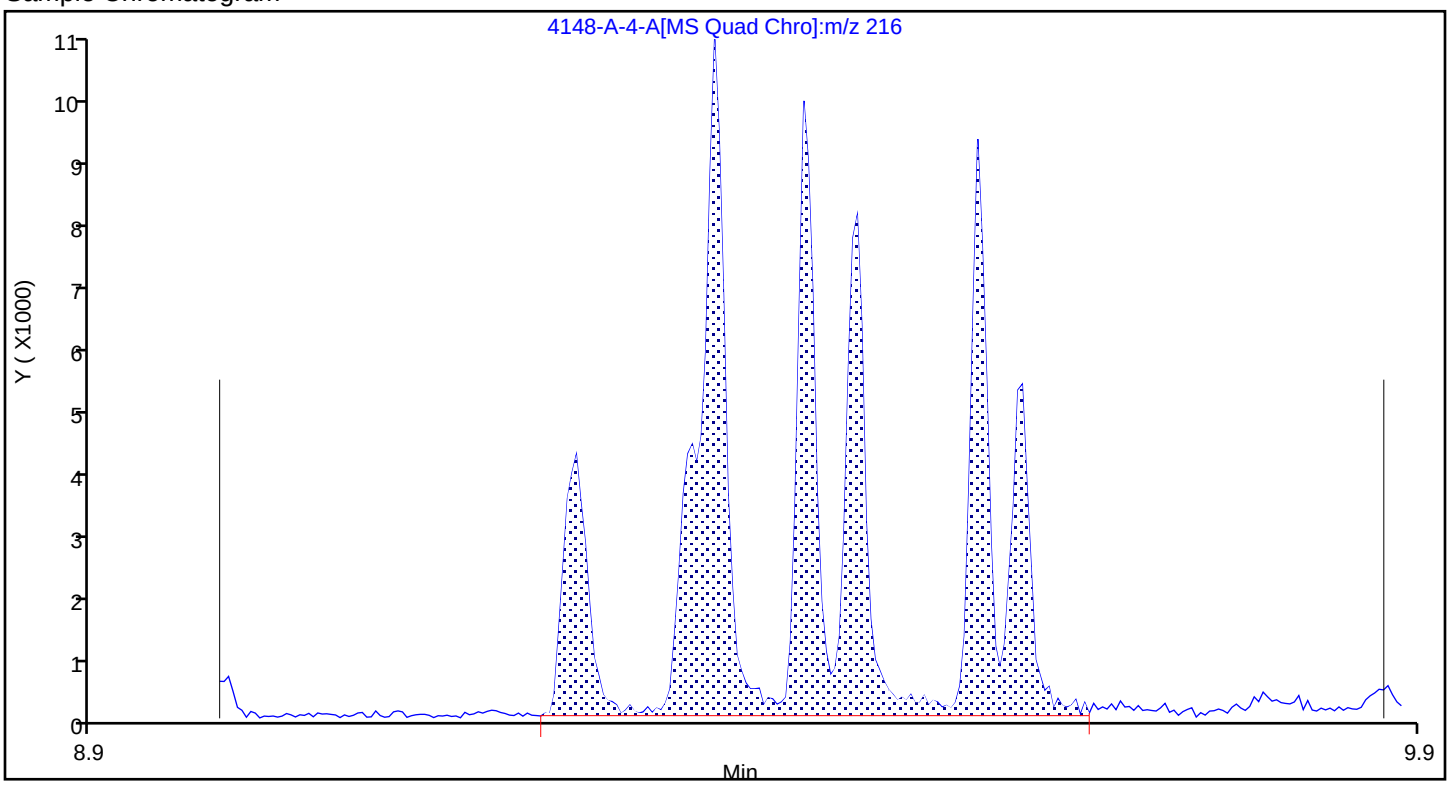
A 100 C1-Fluoranthenes/pyrene, CAS: STL00912

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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Injection Date:	13-Nov-2023 22:55:07	Instrument ID:	GCMS1		
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Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
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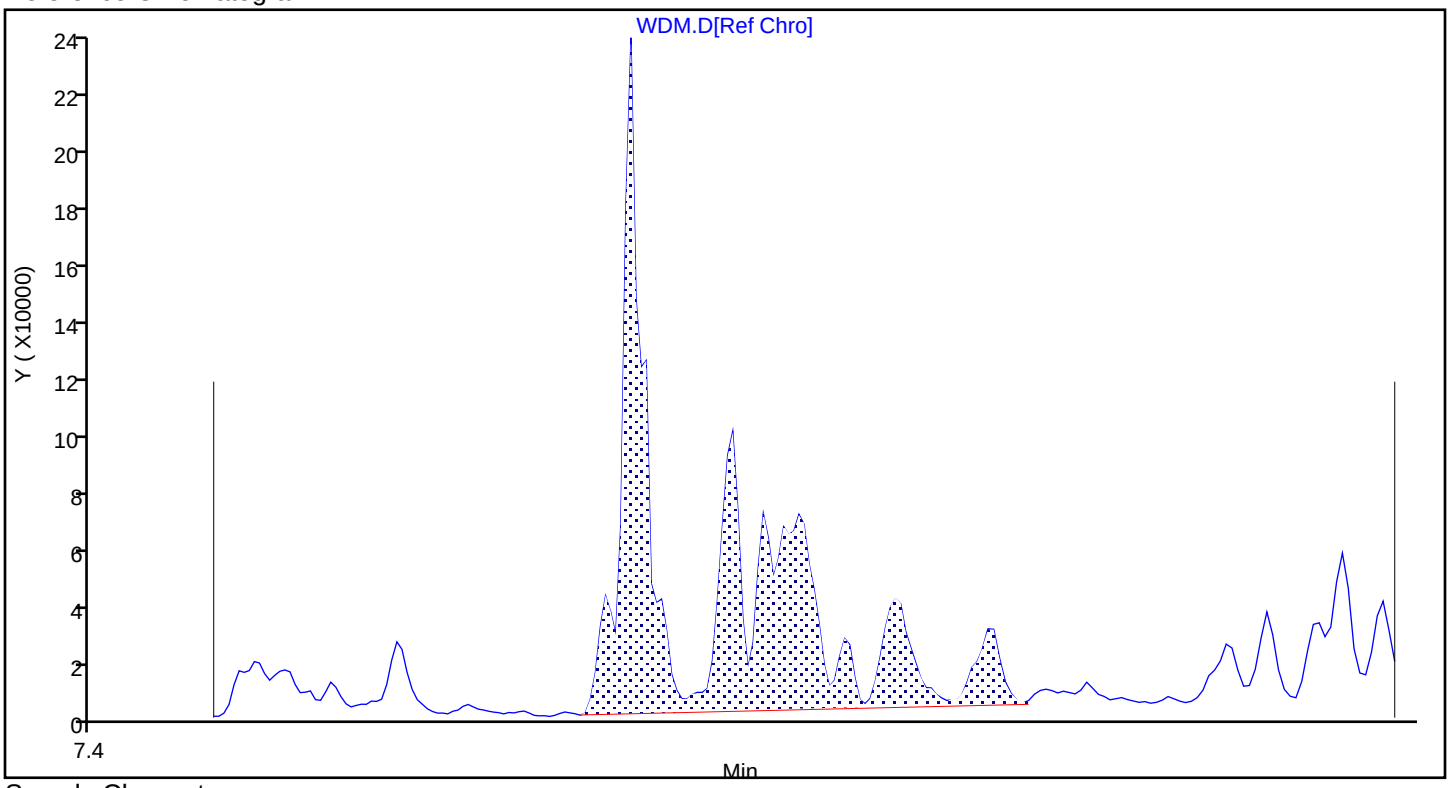
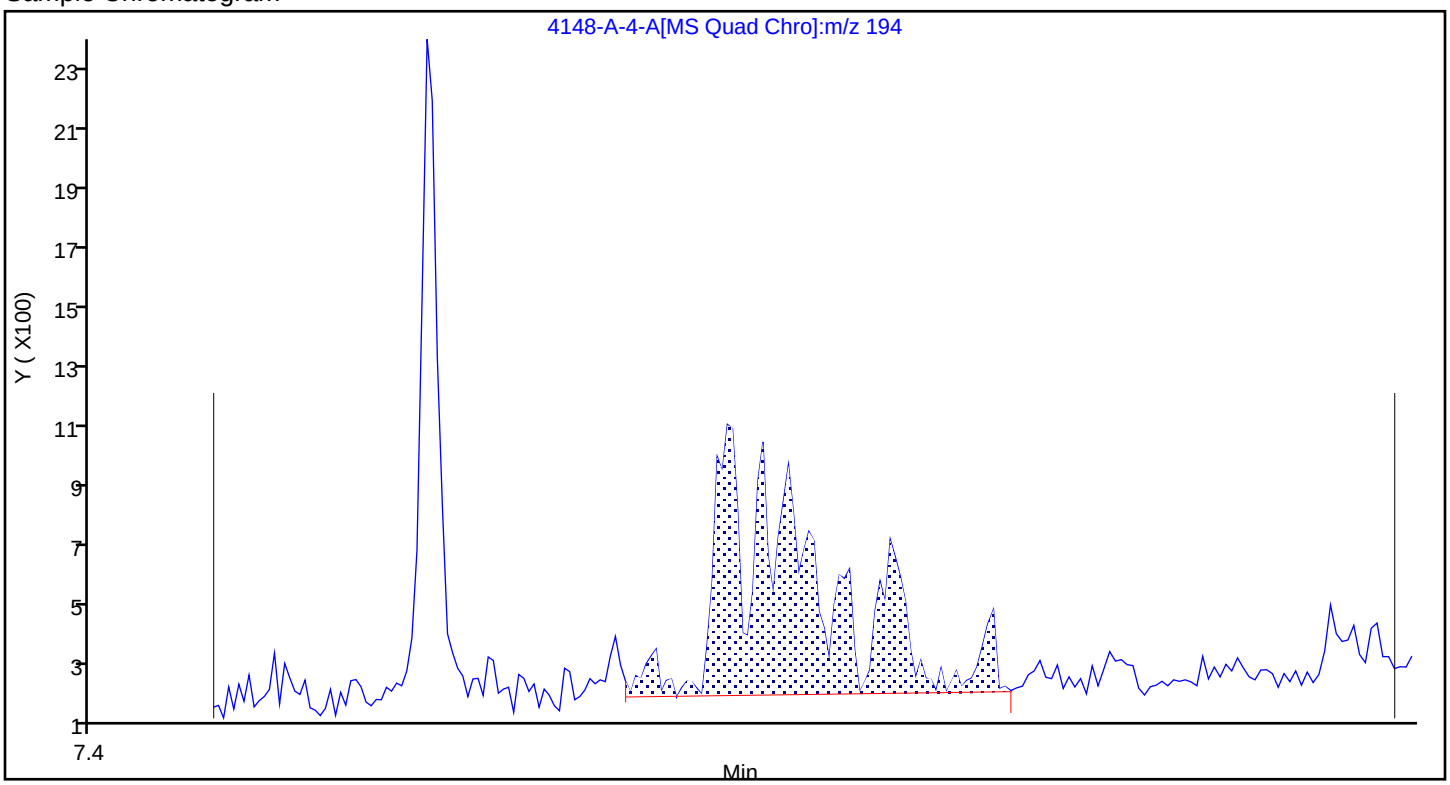
A 90 C2-Fluorenes, CAS: STL00914

Reference Chromatogram



Sample Chromatogram



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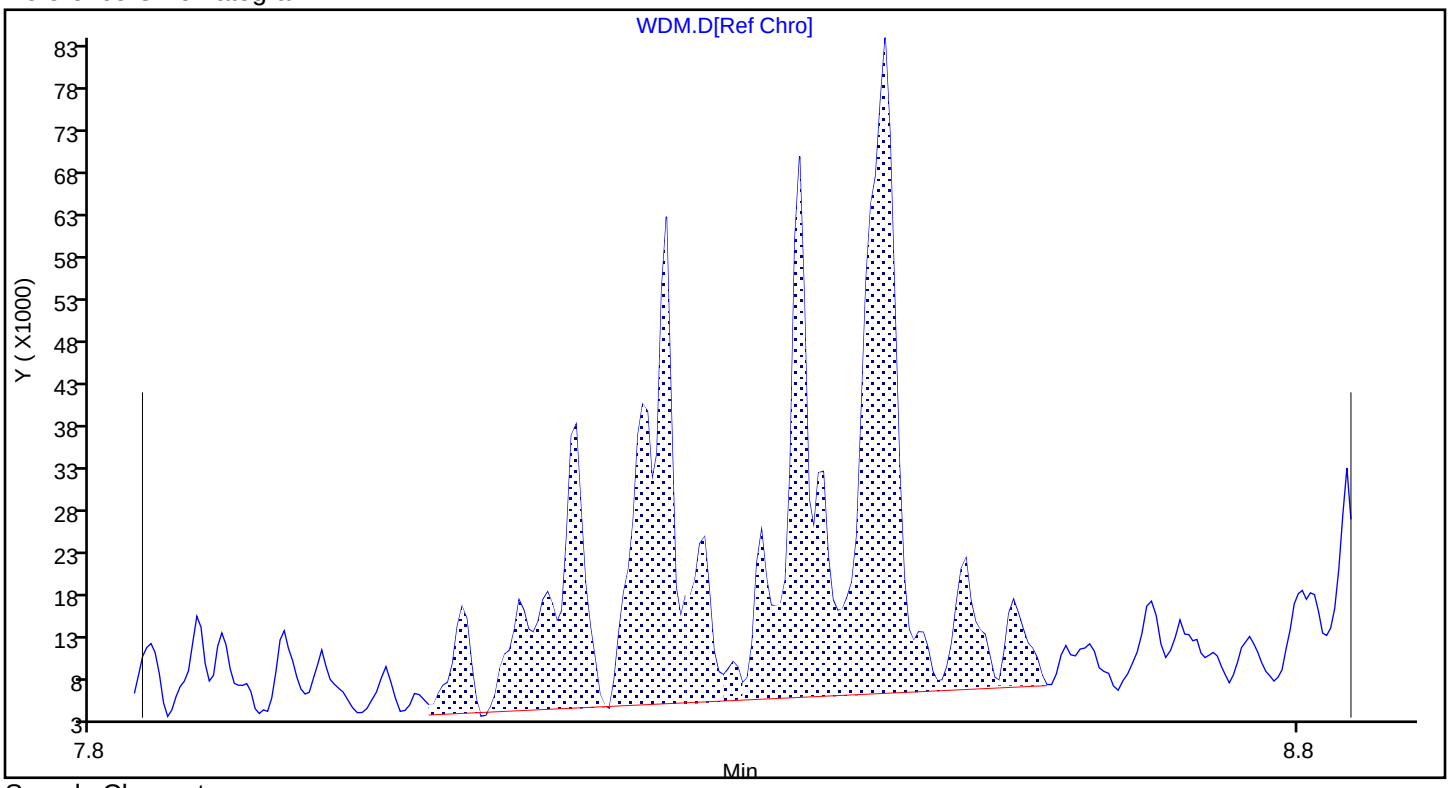
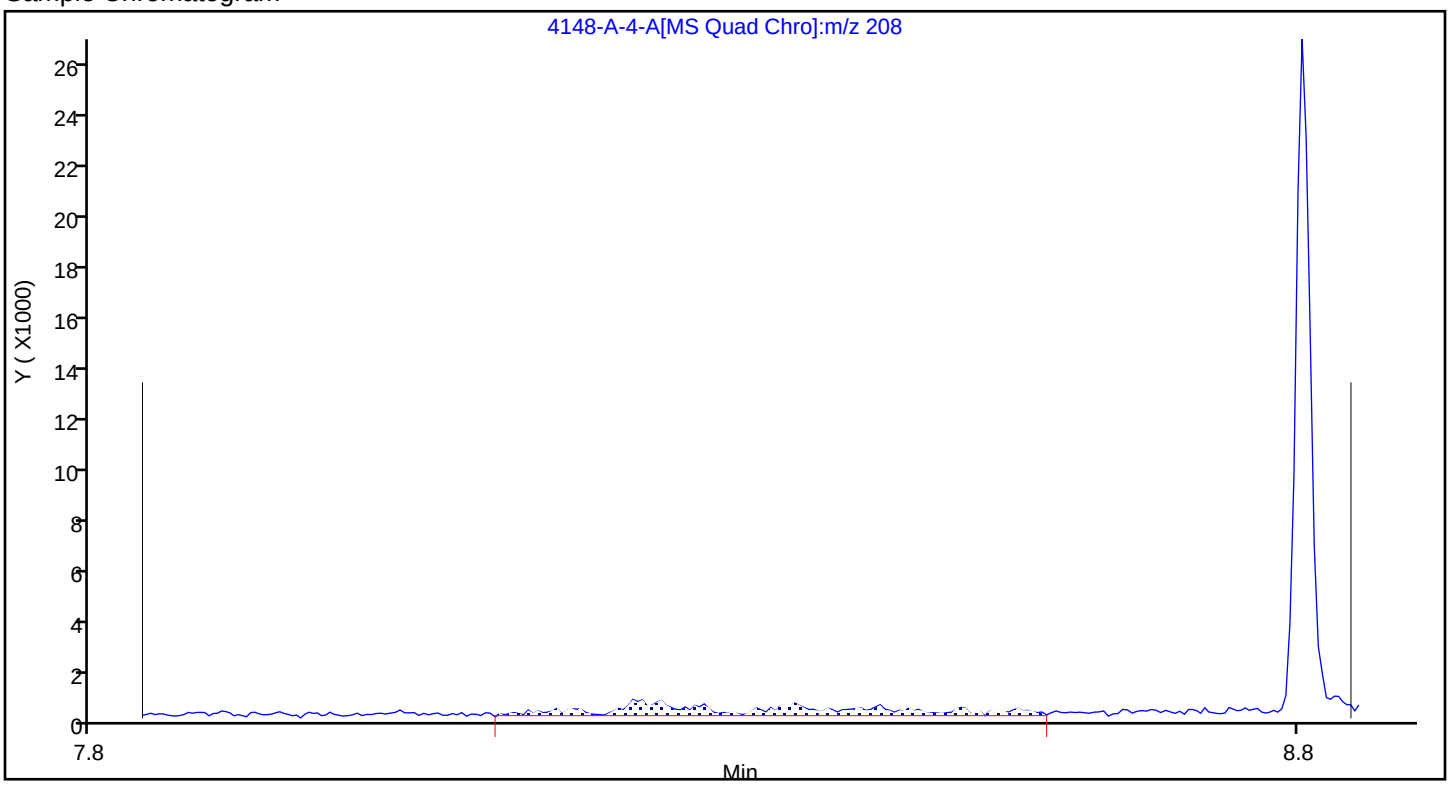
Lims ID:	140-34148-A-4-A	Lab Sample ID:	140-34148-4		
Client ID:	1804576-851-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 91 C3-Fluorenes, CAS: STL00915

Reference Chromatogram



Sample Chromatogram



Report Date: 16-Nov-2023 15:47:02 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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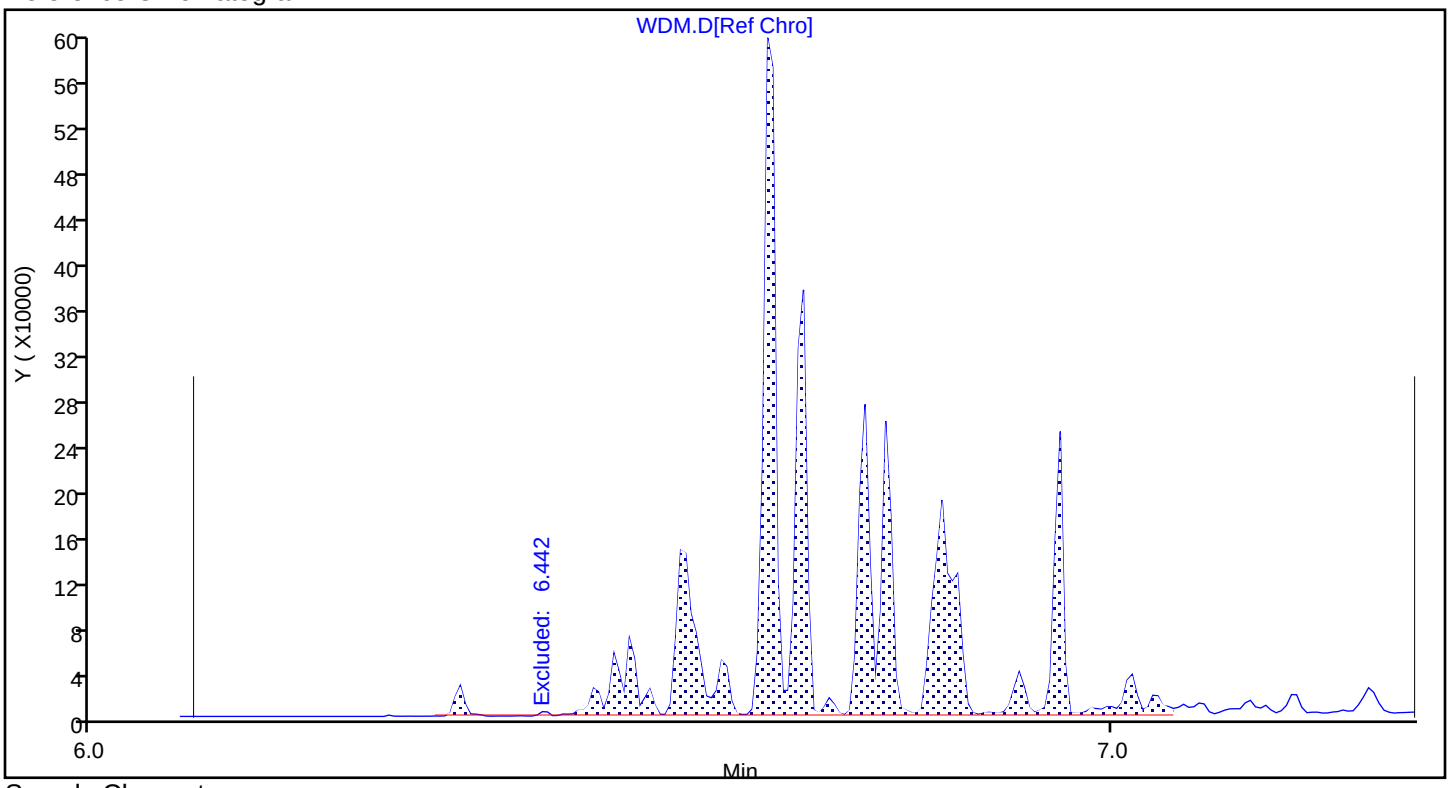
Lims ID:	140-34148-A-4-A	Lab Sample ID:	140-34148-4		
Client ID:	1804576-851-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 87 C3-Naphthalenes, CAS: STL00918

Reference Chromatogram



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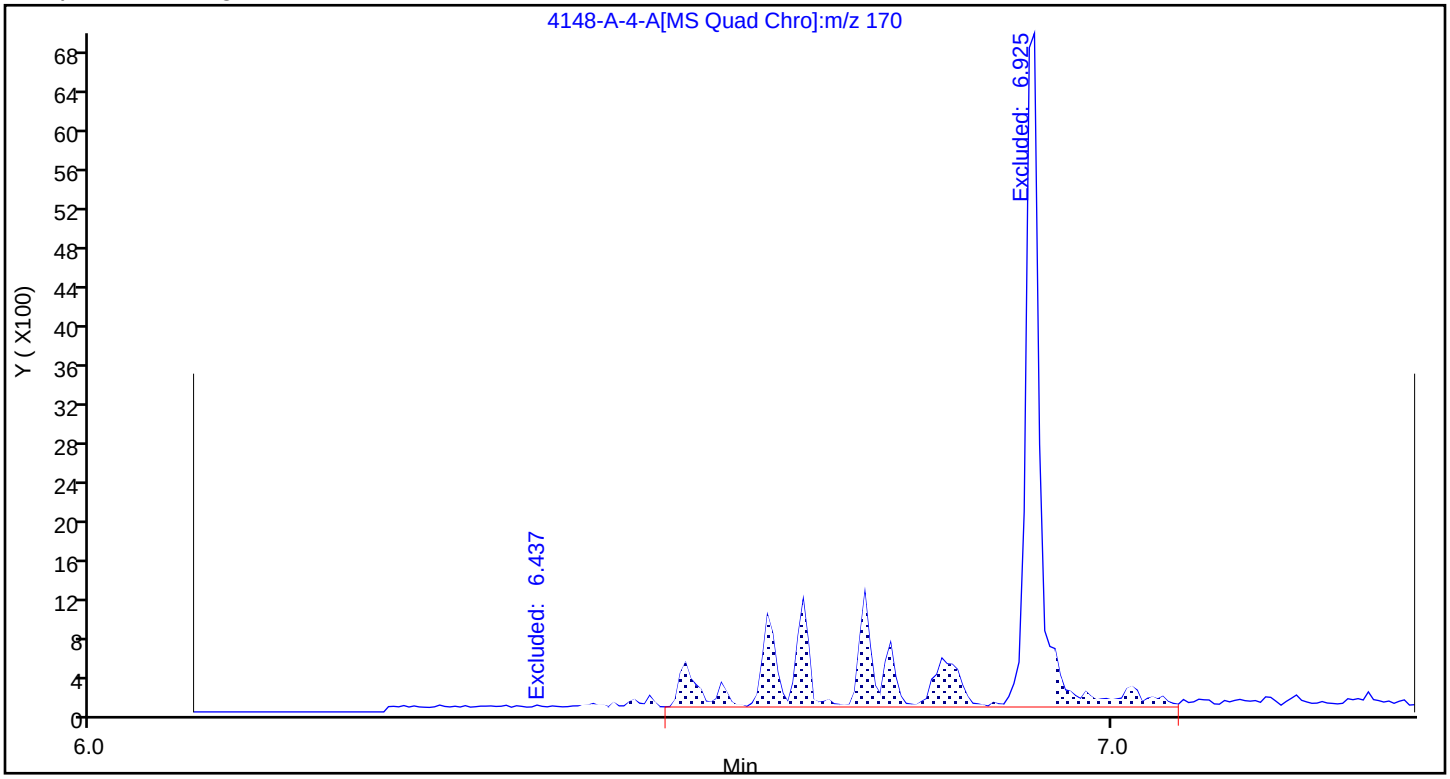

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Eurofins Knoxville

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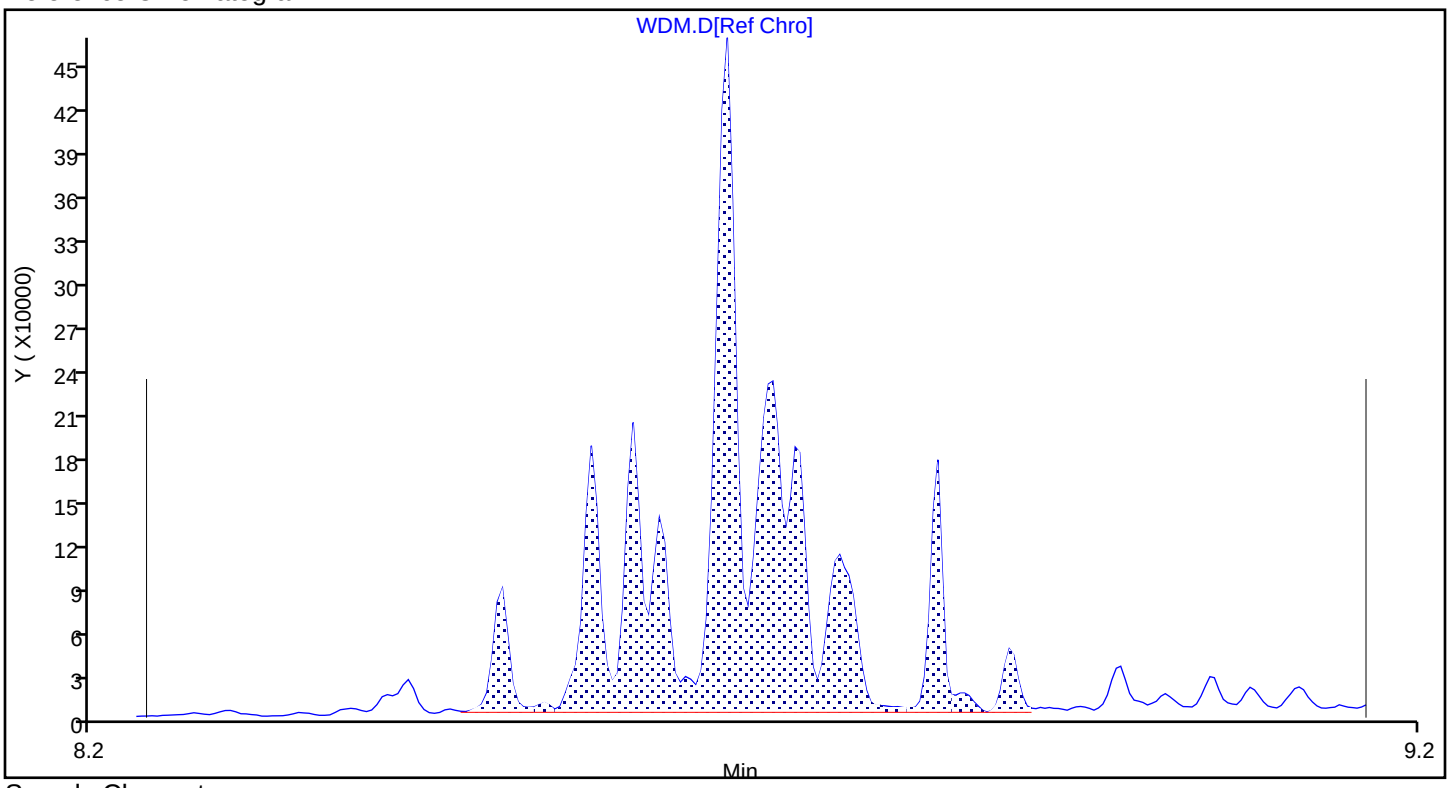
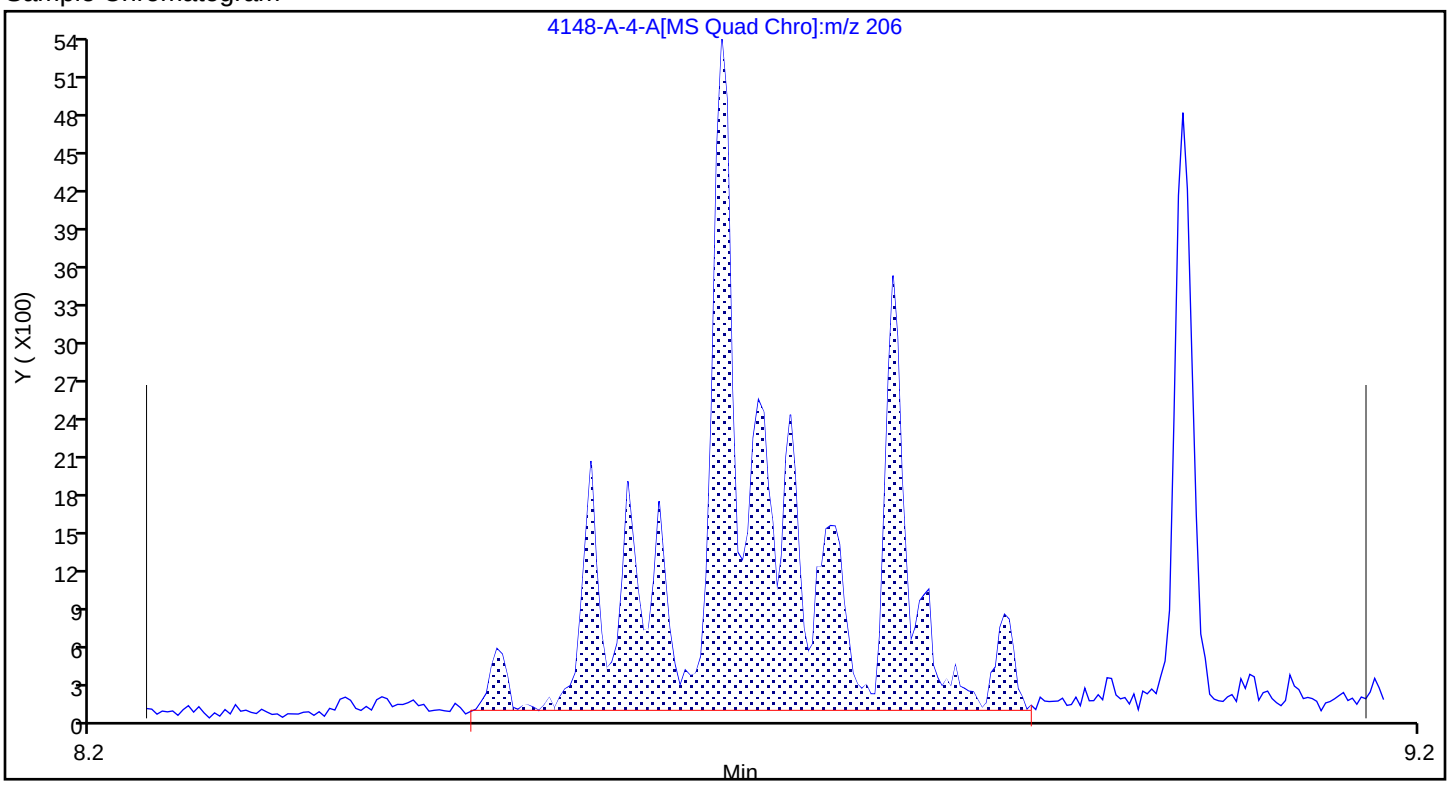
Lims ID:	140-34148-A-4-A	Lab Sample ID:	140-34148-4		
Client ID:	1804576-851-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 97 C2-Phenanthrenes/Anthracenes, CAS: STL00902

Reference Chromatogram



Sample Chromatogram



Report Date: 16-Nov-2023 15:47:02 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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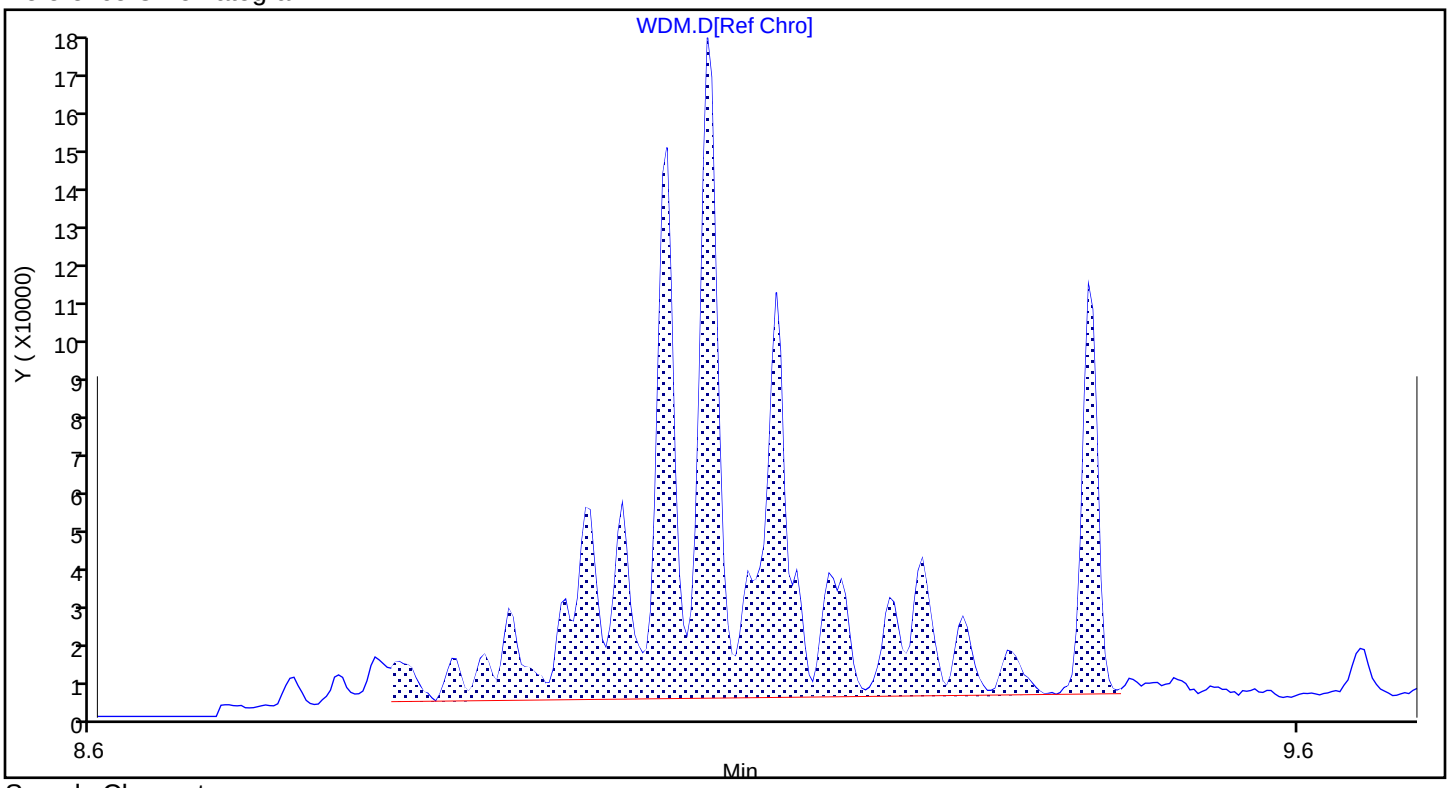
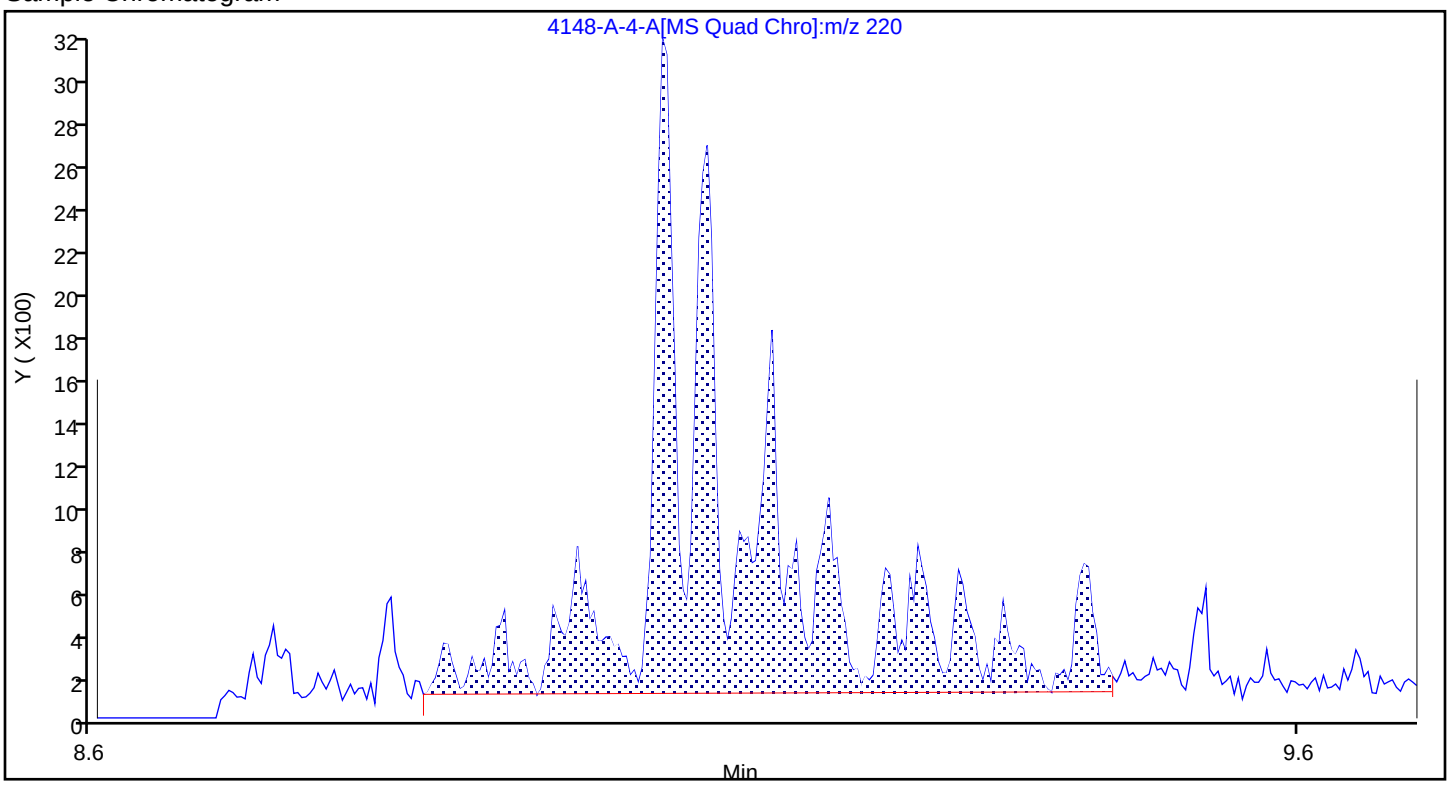
Injection Date:	13-Nov-2023 22:55:07	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-4-A	Lab Sample ID:	140-34148-4		
Client ID:	1804576-851-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 98 C3-Phenanthrenes/Anthracenes, CAS: STL00903

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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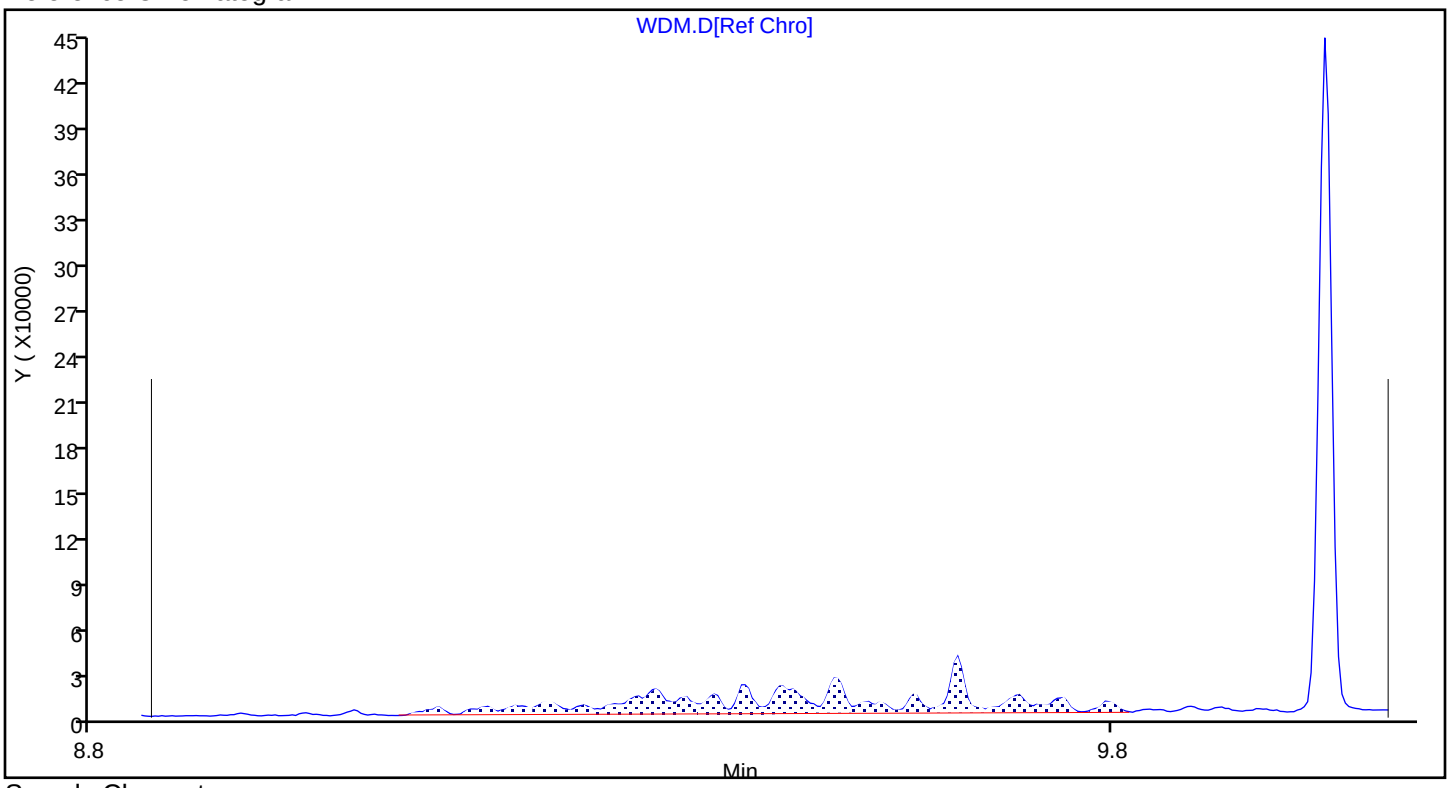
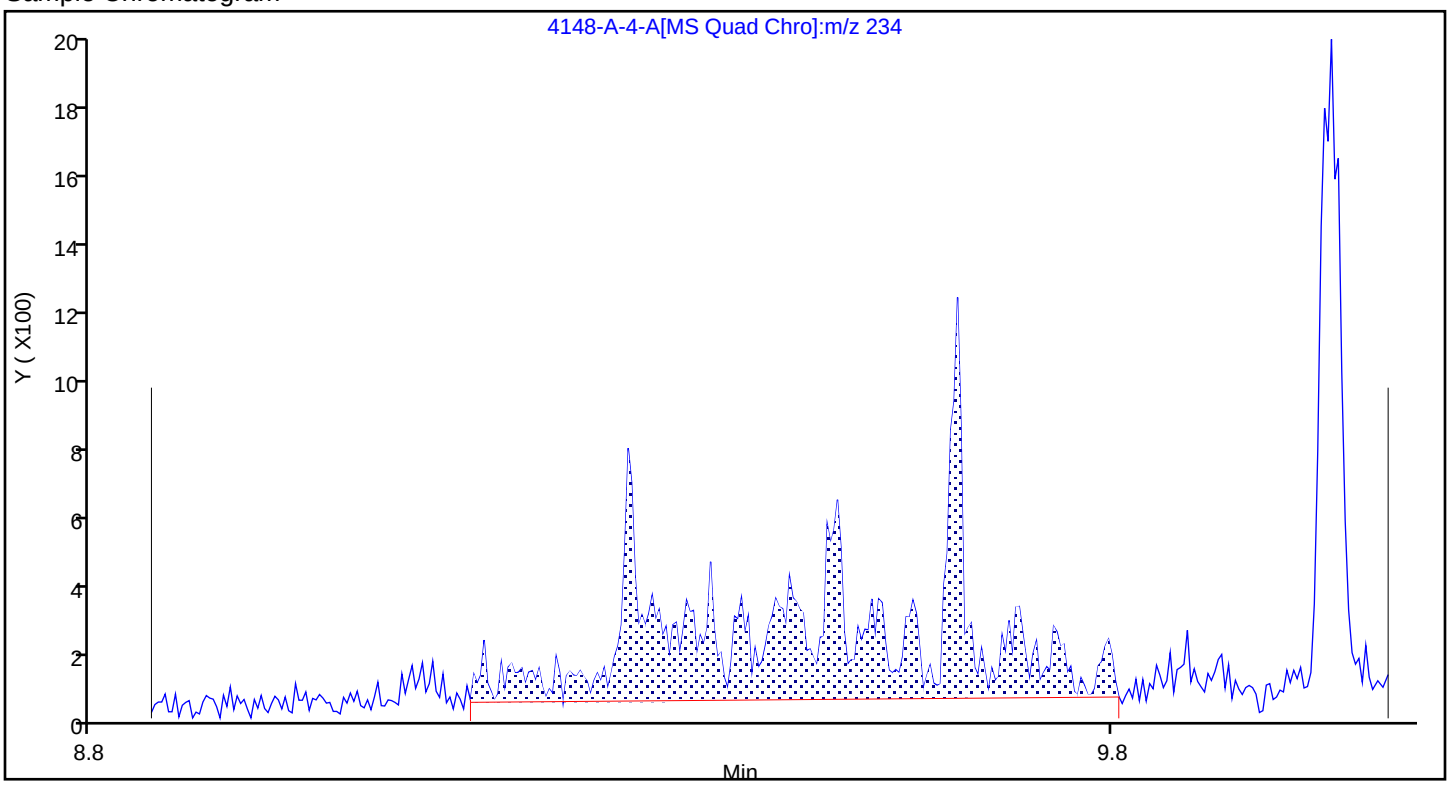
Injection Date:	13-Nov-2023 22:55:07	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-4-A	Lab Sample ID:	140-34148-4		
Client ID:	1804576-851-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 99 C4-Phenanthrenes/Anthracenes, CAS: STL00904

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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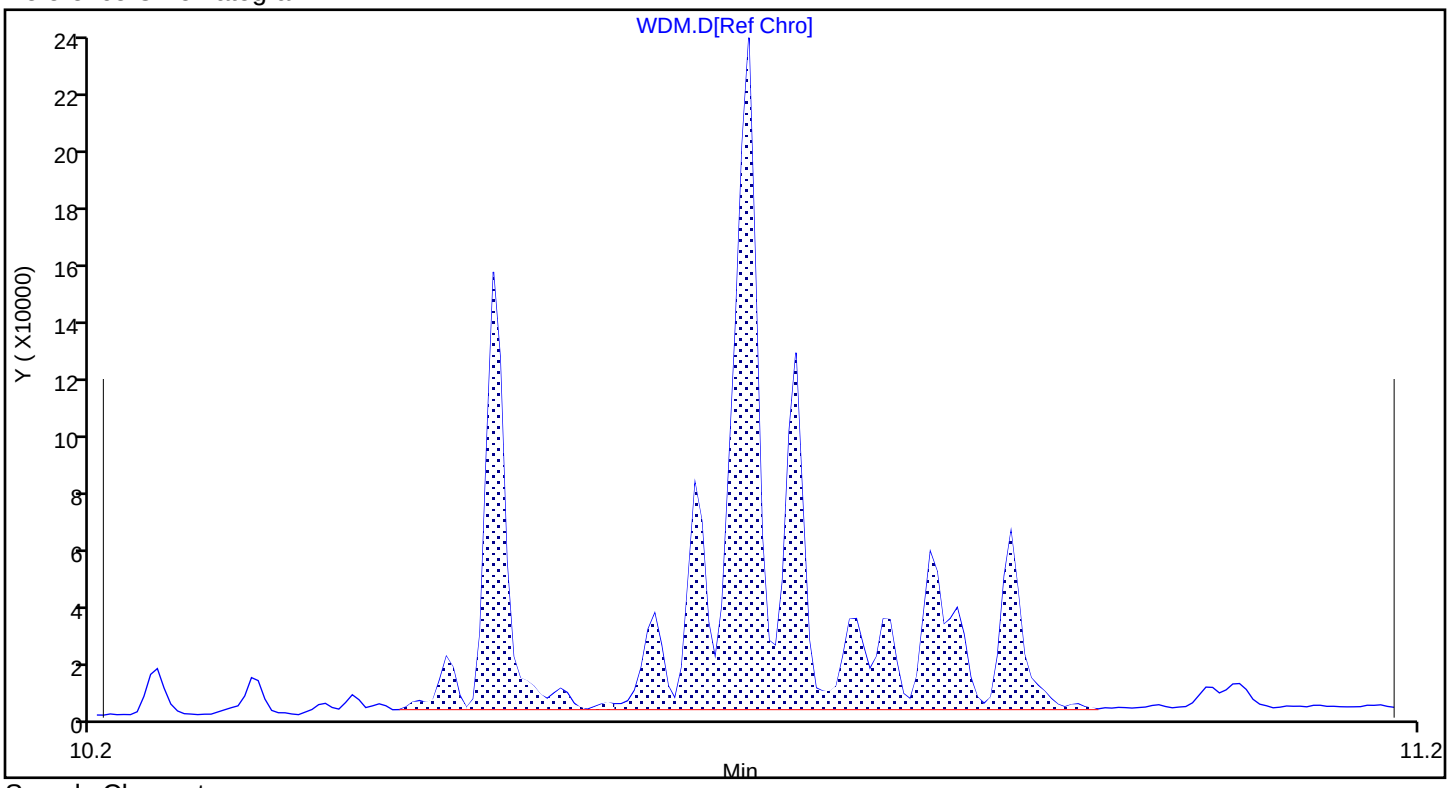
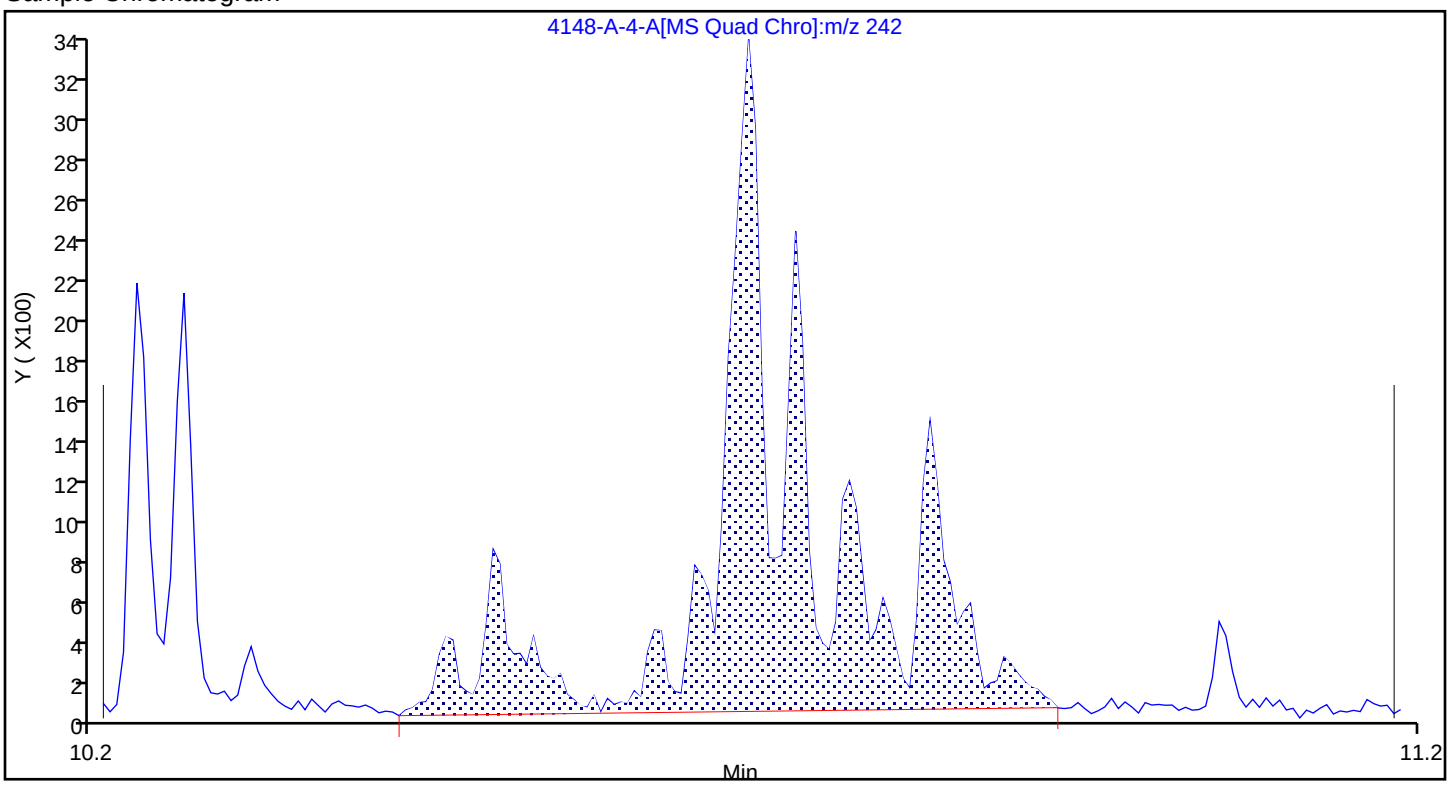
Lims ID:	140-34148-A-4-A	Lab Sample ID:	140-34148-4		
Client ID:	1804576-851-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 101 C1-Chrysenes/Benz(a)anthracenes, CAS: STL02218

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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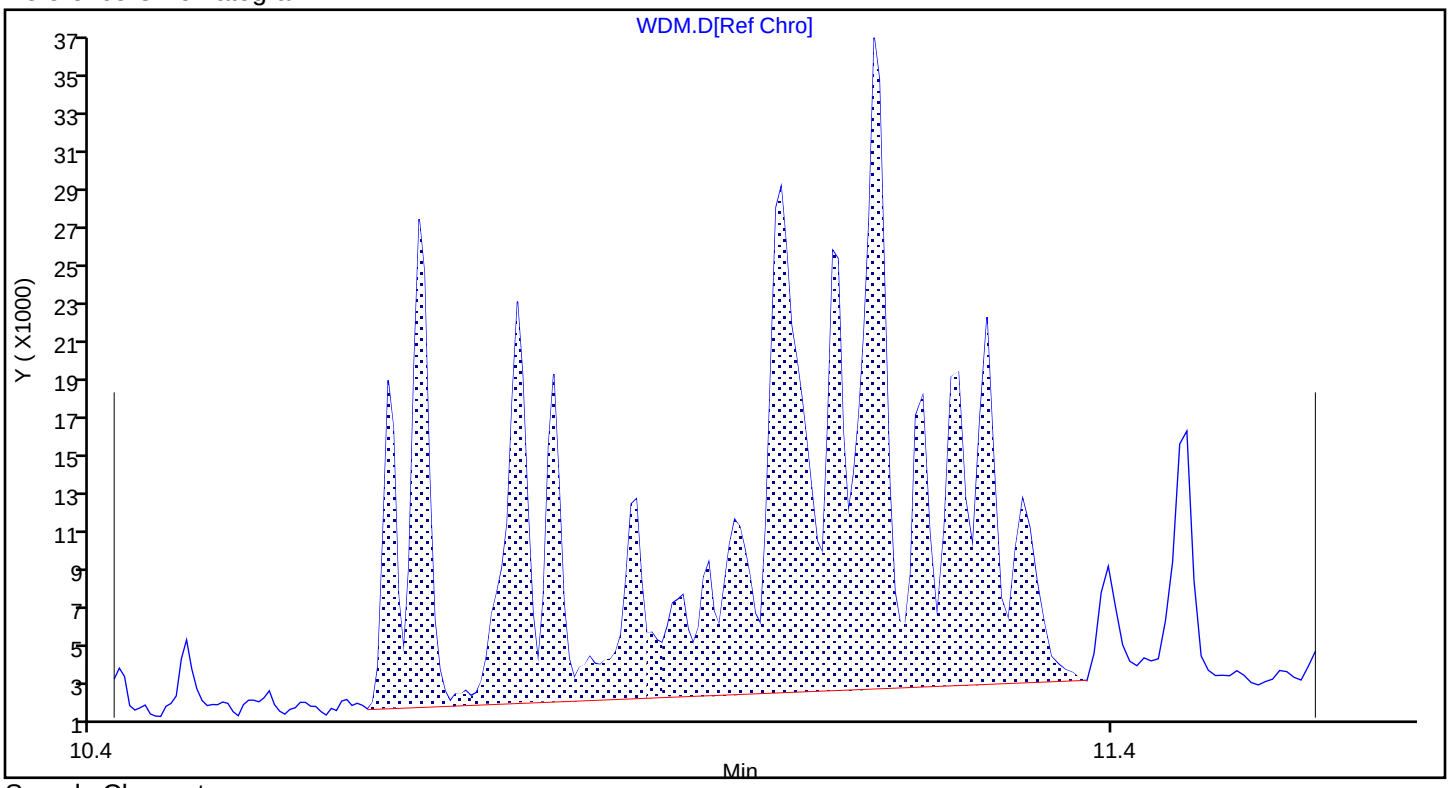
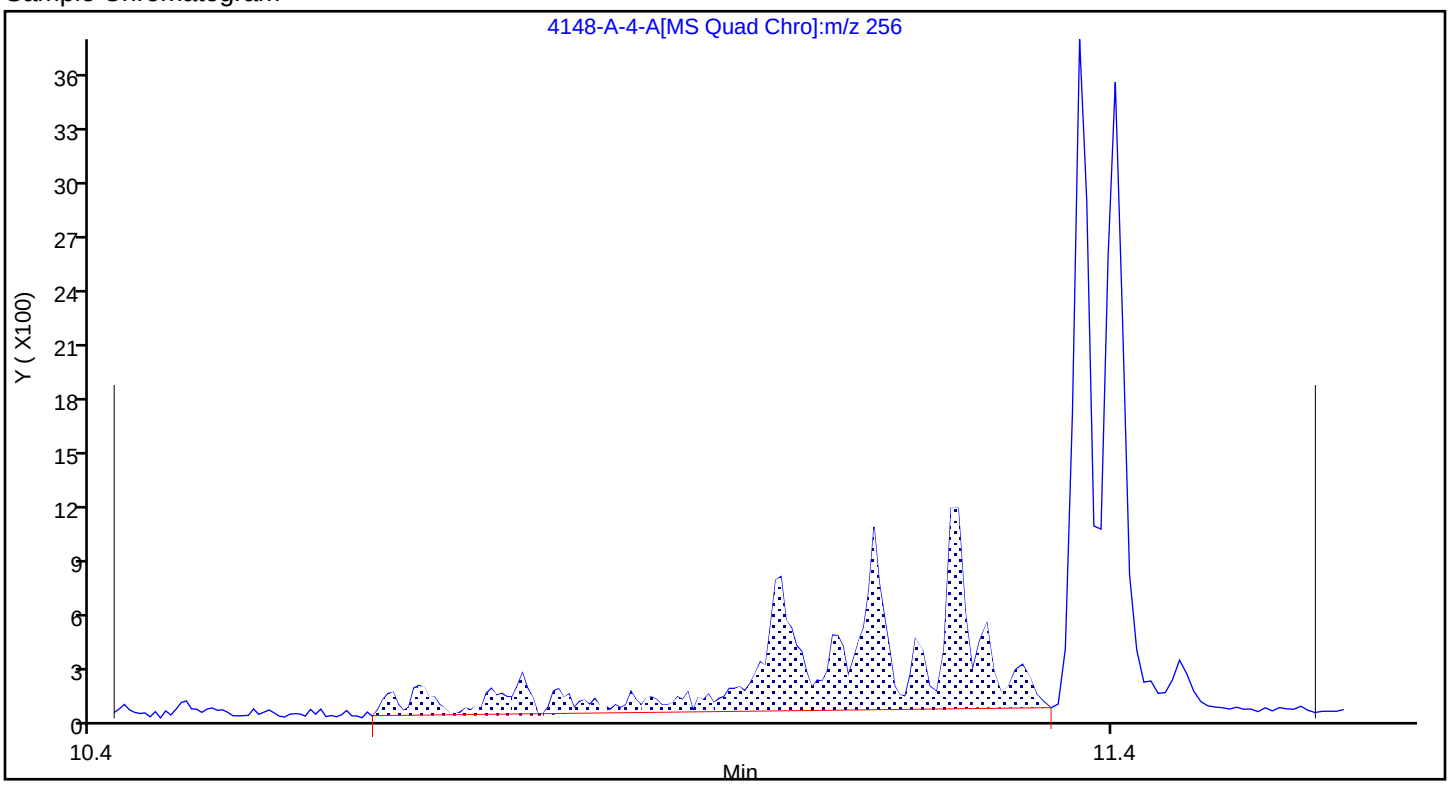
Lims ID:	140-34148-A-4-A	Lab Sample ID:	140-34148-4		
Client ID:	1804576-851-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 102 C2-Chrysenes/Benz(a)anthracenes, CAS: STL02219

Reference Chromatogram



Sample Chromatogram



Report Date: 16-Nov-2023 15:47:00 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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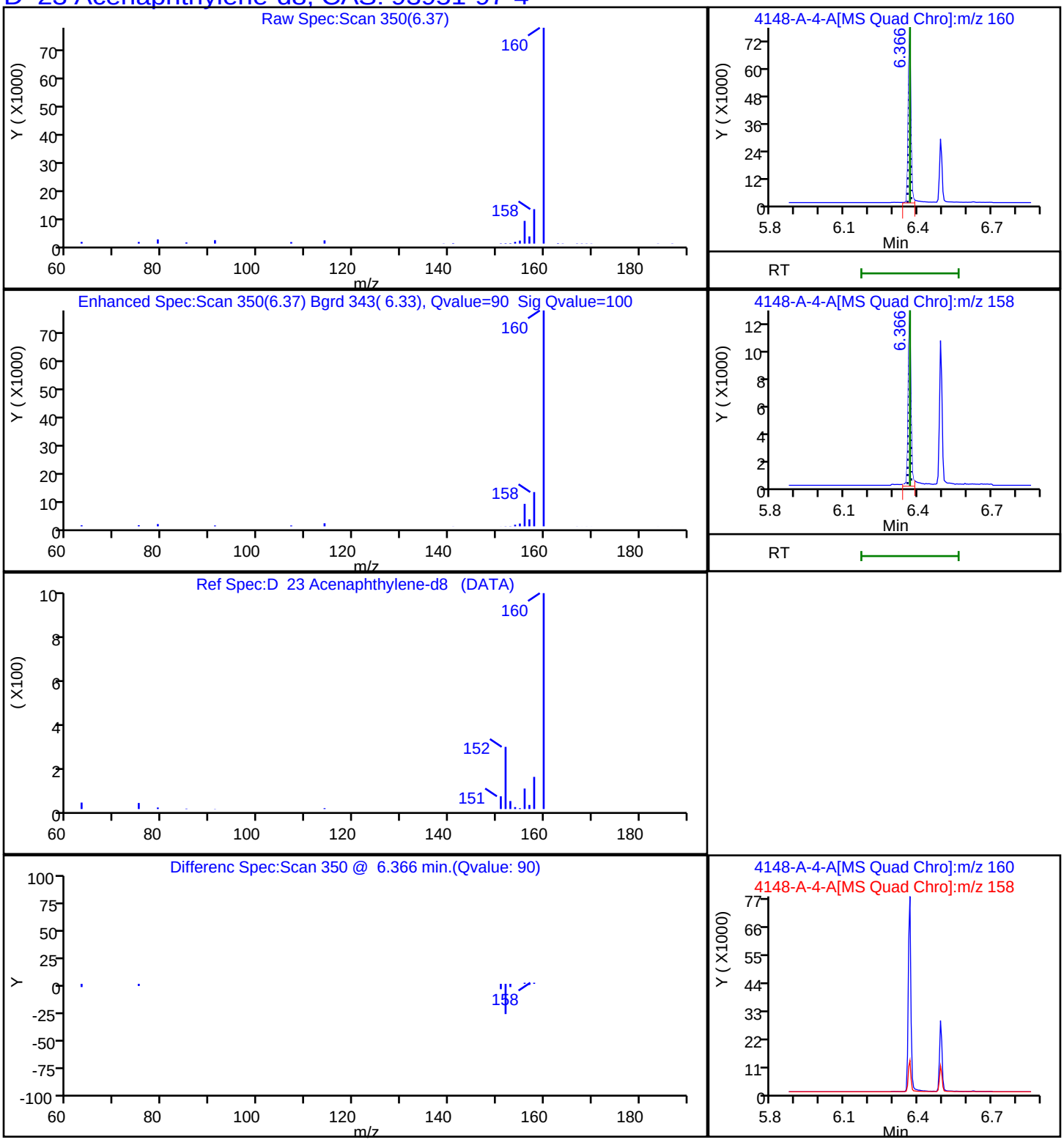
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D_23 Acenaphthylene-d8, CAS: 93951-97-4



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Eurofins Knoxville

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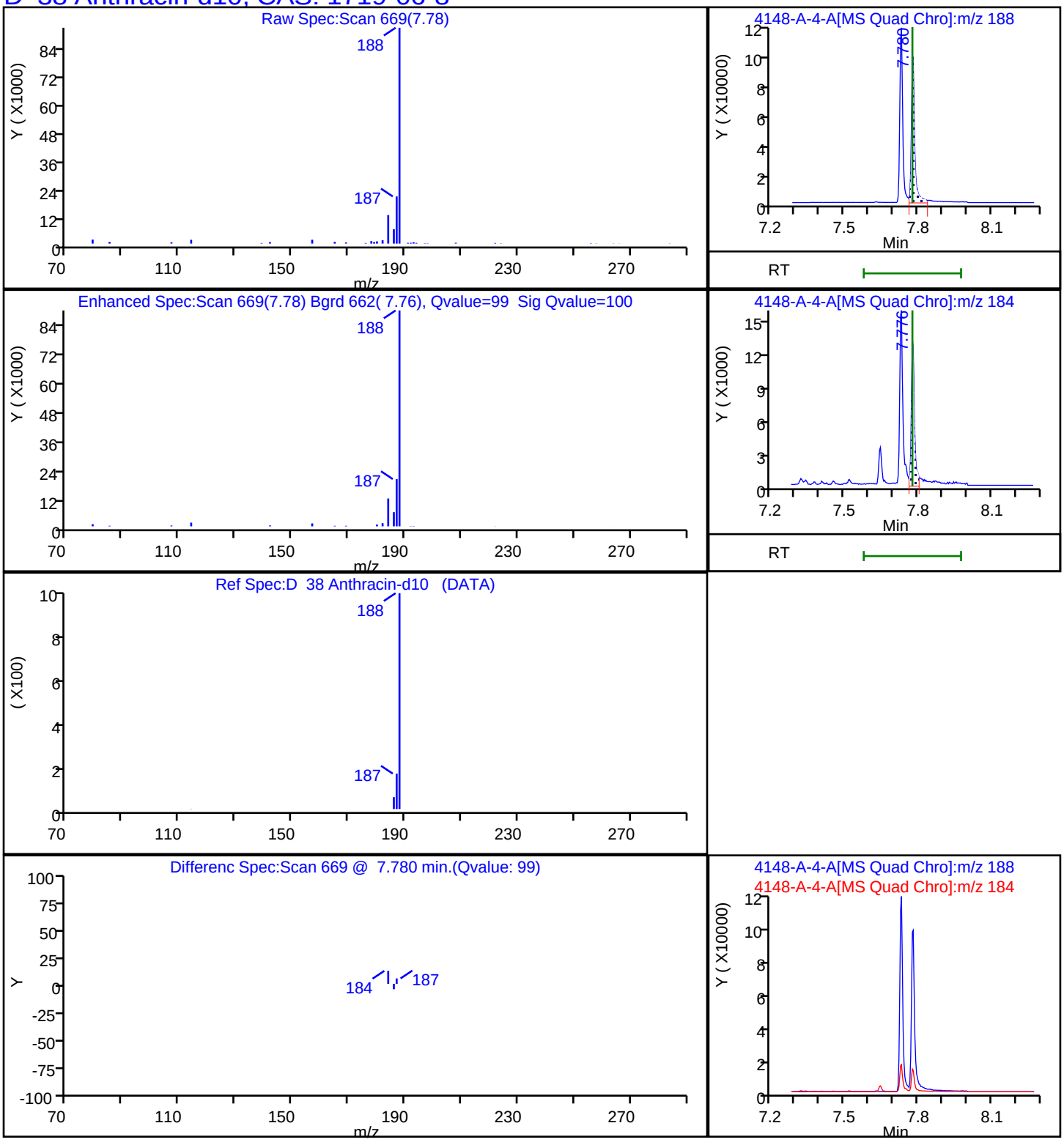
Lims ID:	140-34148-A-4-A	Lab Sample ID:	140-34148-4		
Client ID:	1804576-851-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 38 Anthracin-d10, CAS: 1719-06-8



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Eurofins Knoxville

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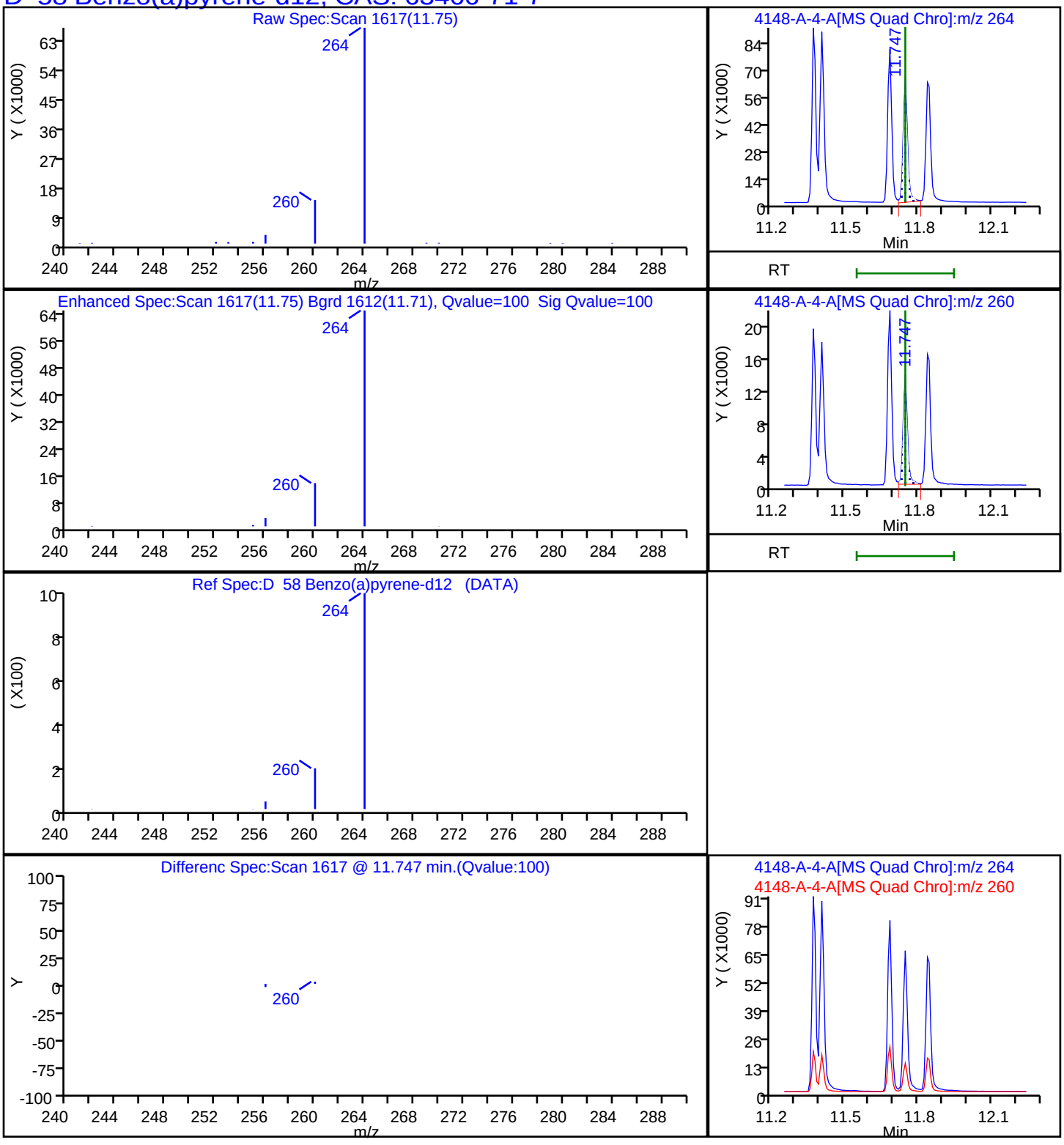
Lims ID:	140-34148-A-4-A	Lab Sample ID:	140-34148-4		
Client ID:	1804576-851-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 58 Benzo(a)pyrene-d12, CAS: 63466-71-7



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Eurofins Knoxville

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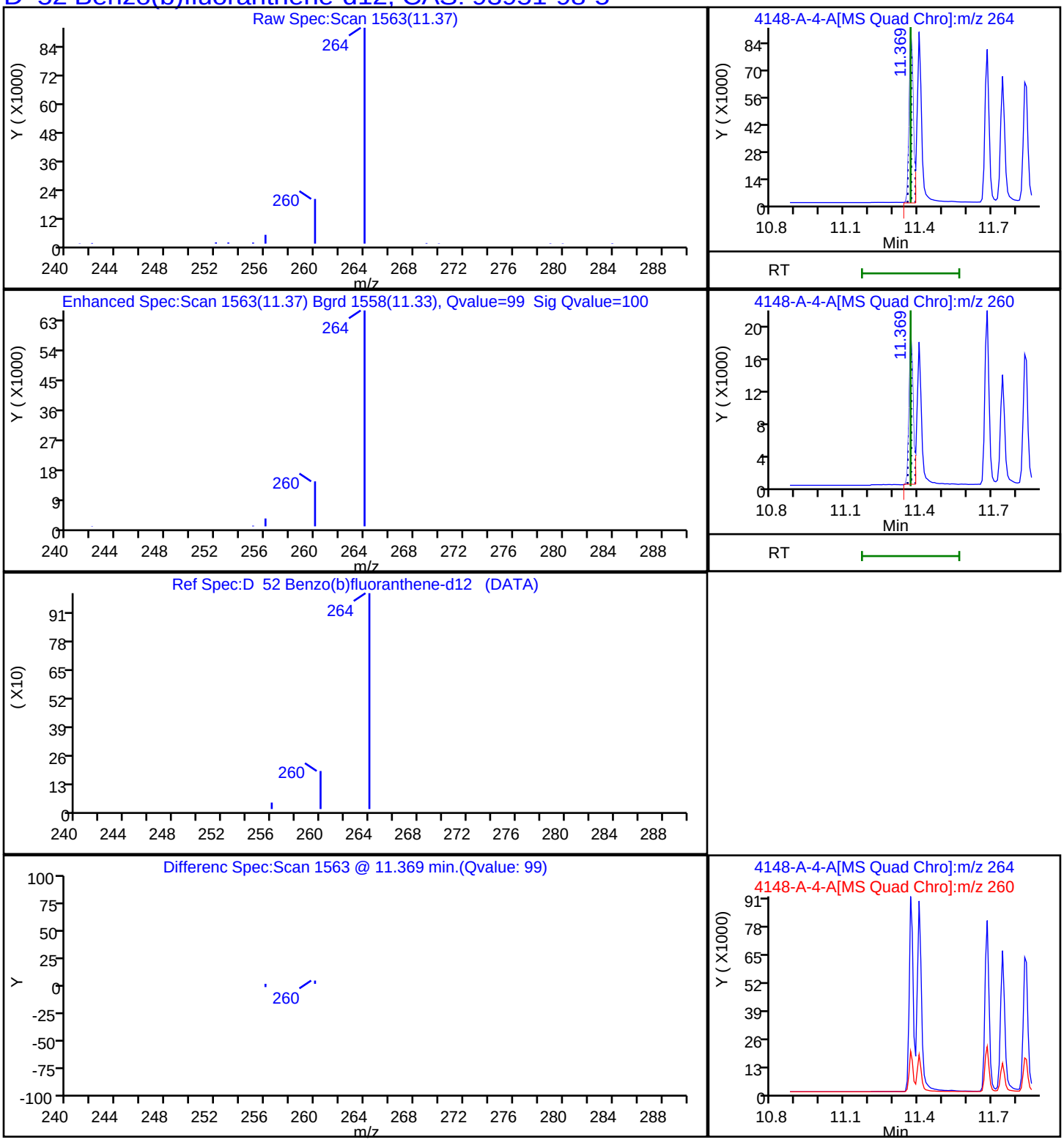
Client ID:	1804576-851-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 52 Benzo(b)fluoranthene-d12, CAS: 93951-98-5



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Eurofins Knoxville

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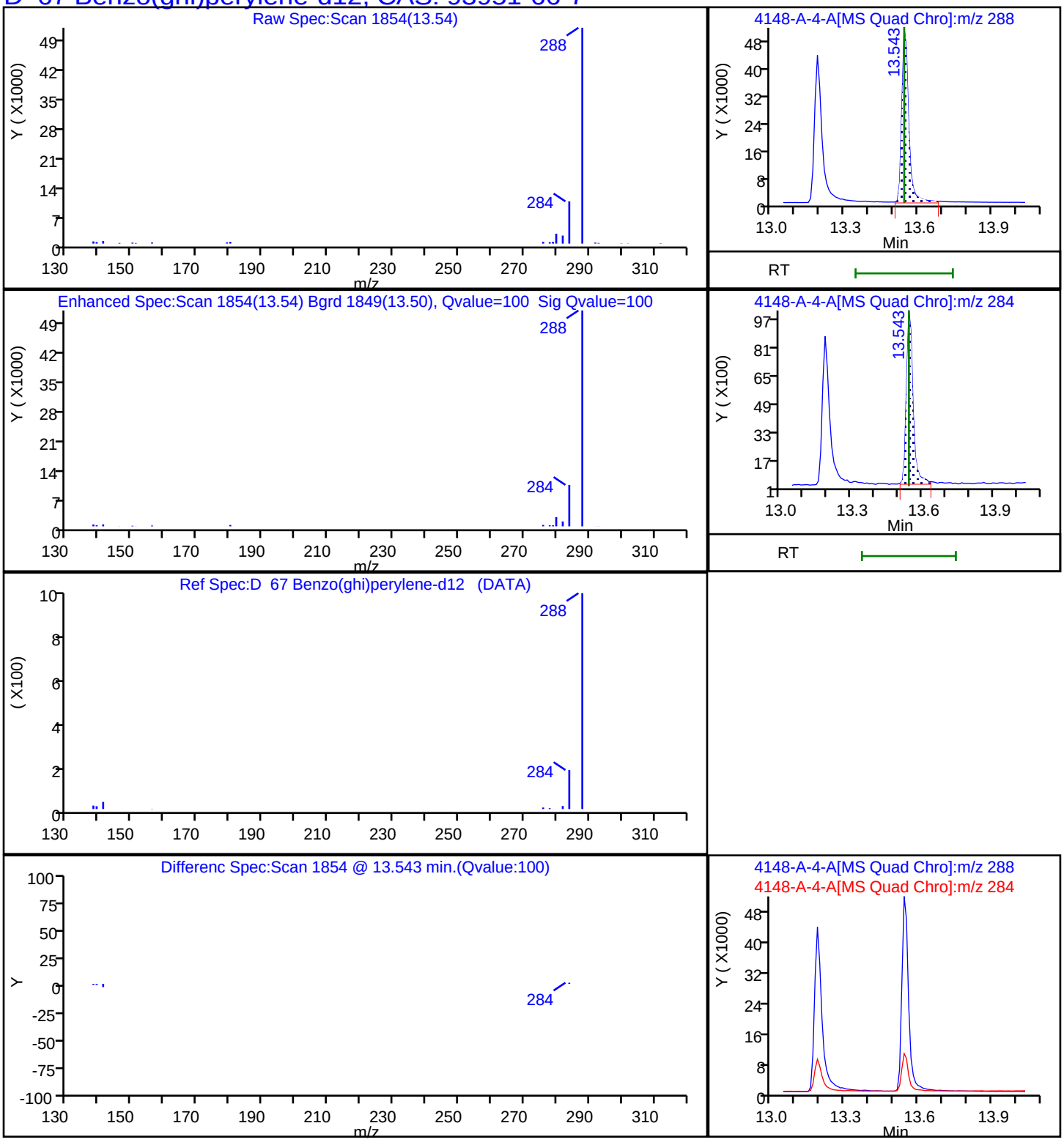
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 67 Benzo(ghi)perylene-d12, CAS: 93951-66-7



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Eurofins Knoxville

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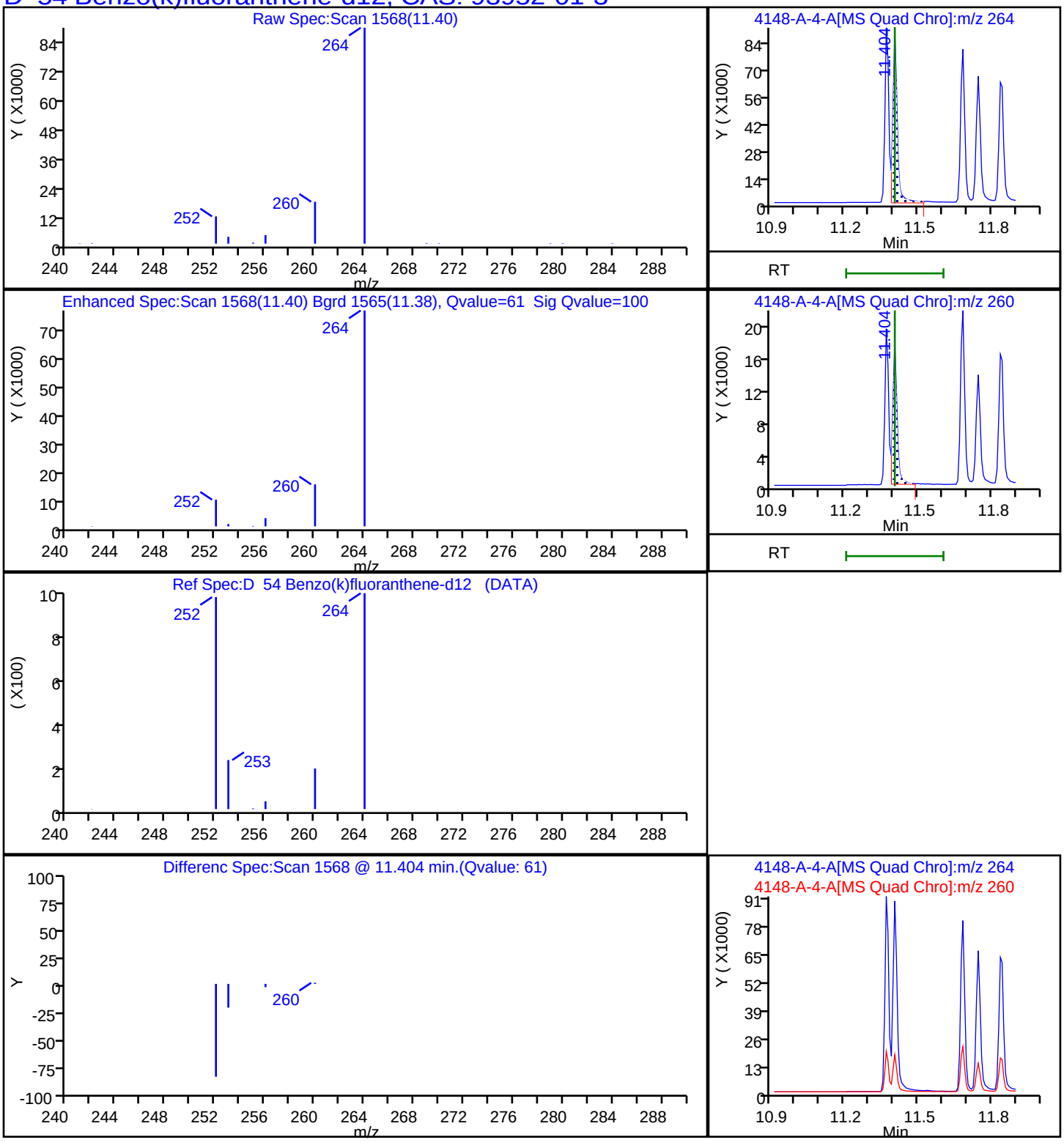
Client ID:	1804576-851-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 54 Benzo(k)fluoranthene-d12, CAS: 93952-01-3



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Eurofins Knoxville

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Injection Date:	13-Nov-2023 22:55:07	Instrument ID:	GCMS1		
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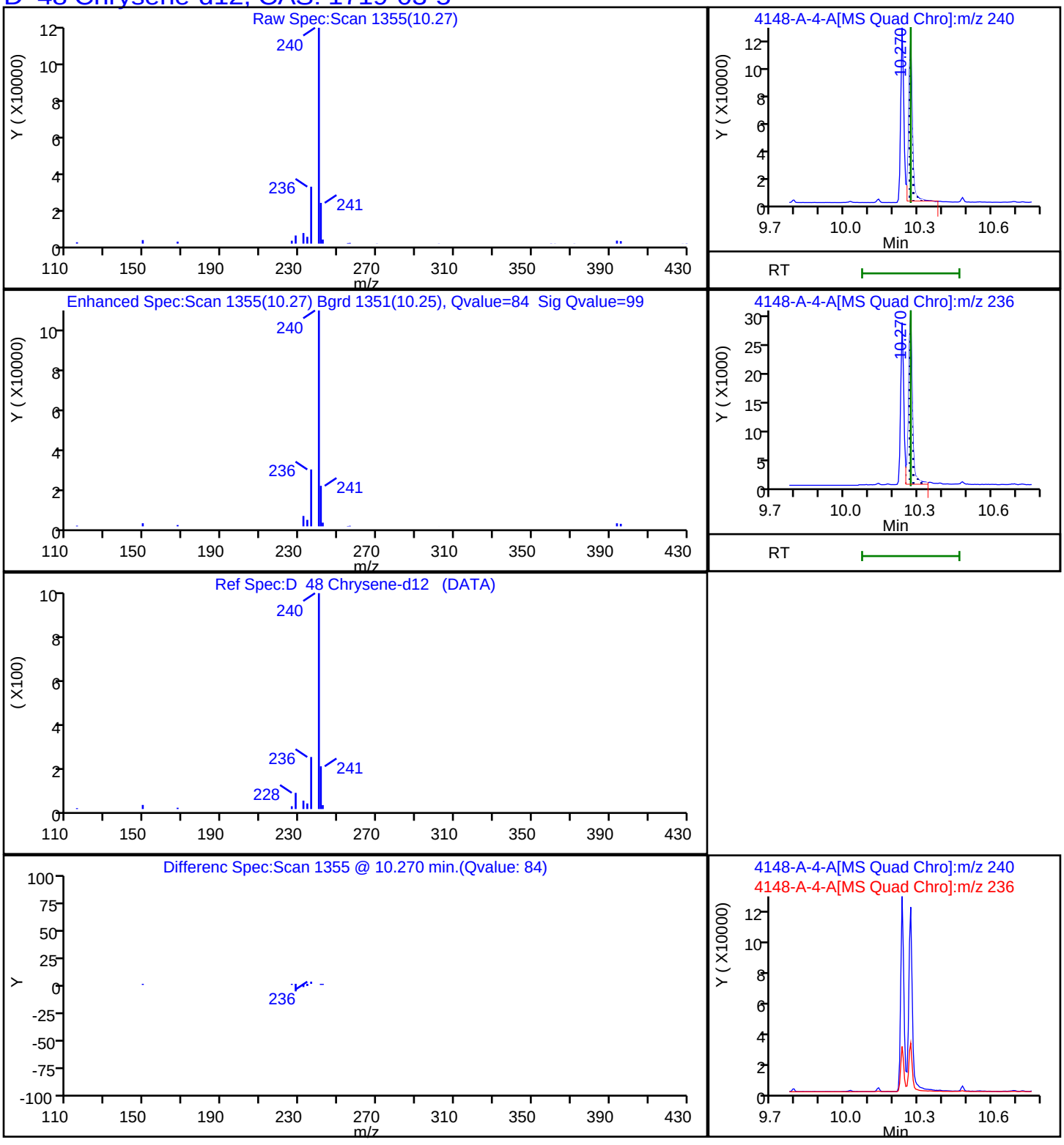
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 48 Chrysene-d12, CAS: 1719-03-5



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Eurofins Knoxville

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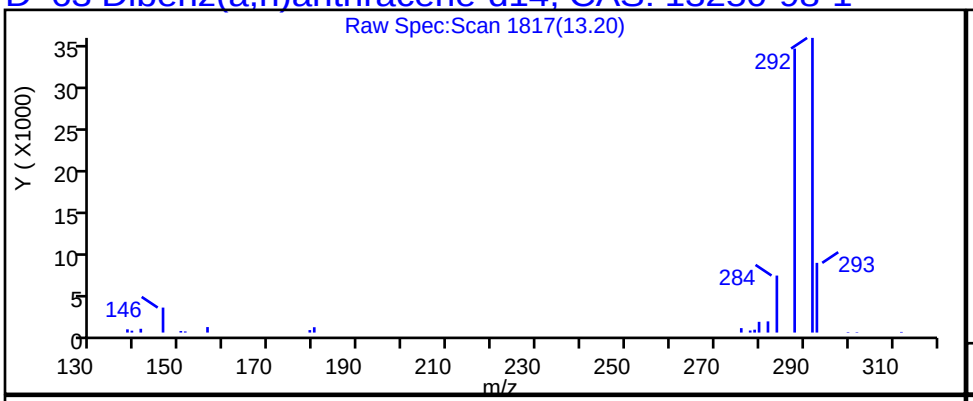
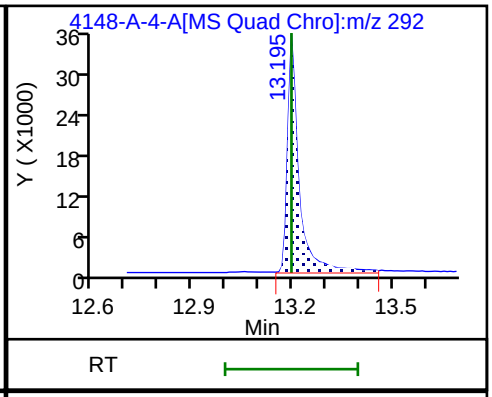
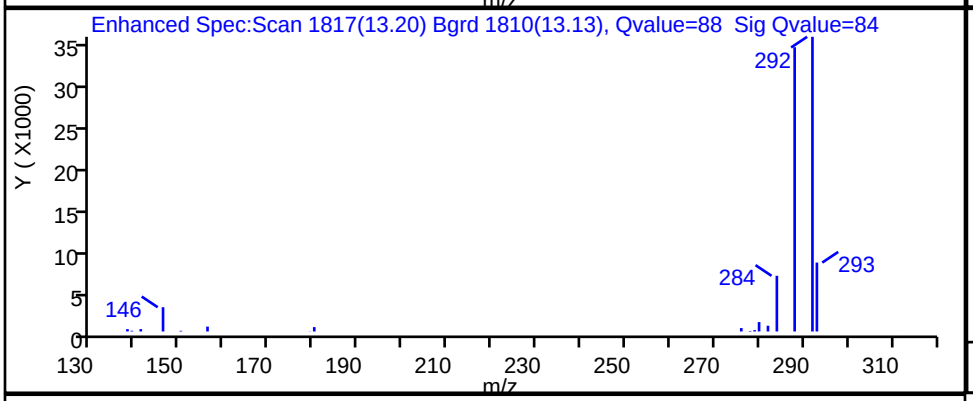
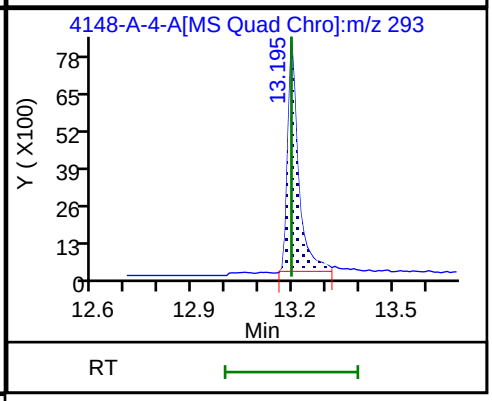
Client ID:	1804576-851-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

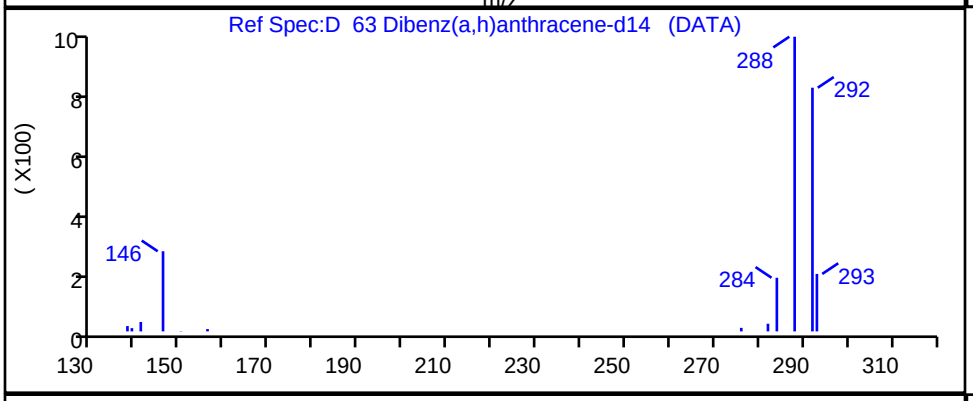
D 63 Dibenz(a,h)anthracene-d14, CAS: 13250-98-1

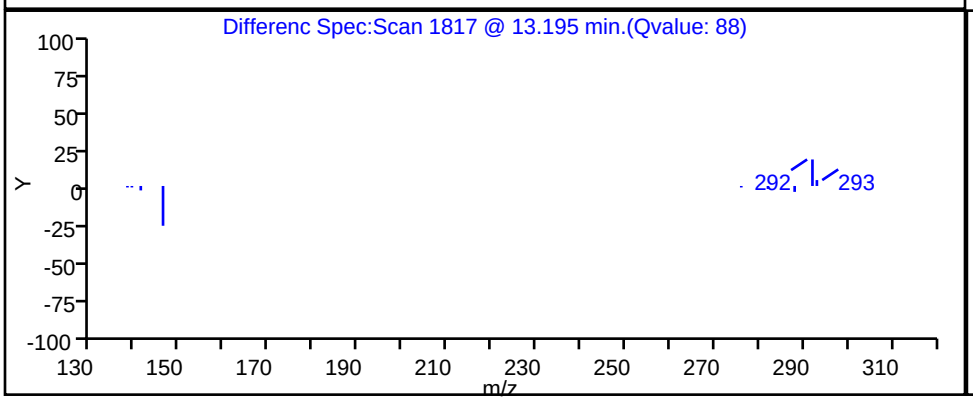


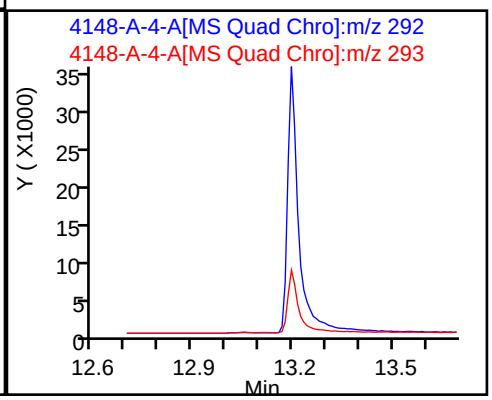












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Eurofins Knoxville

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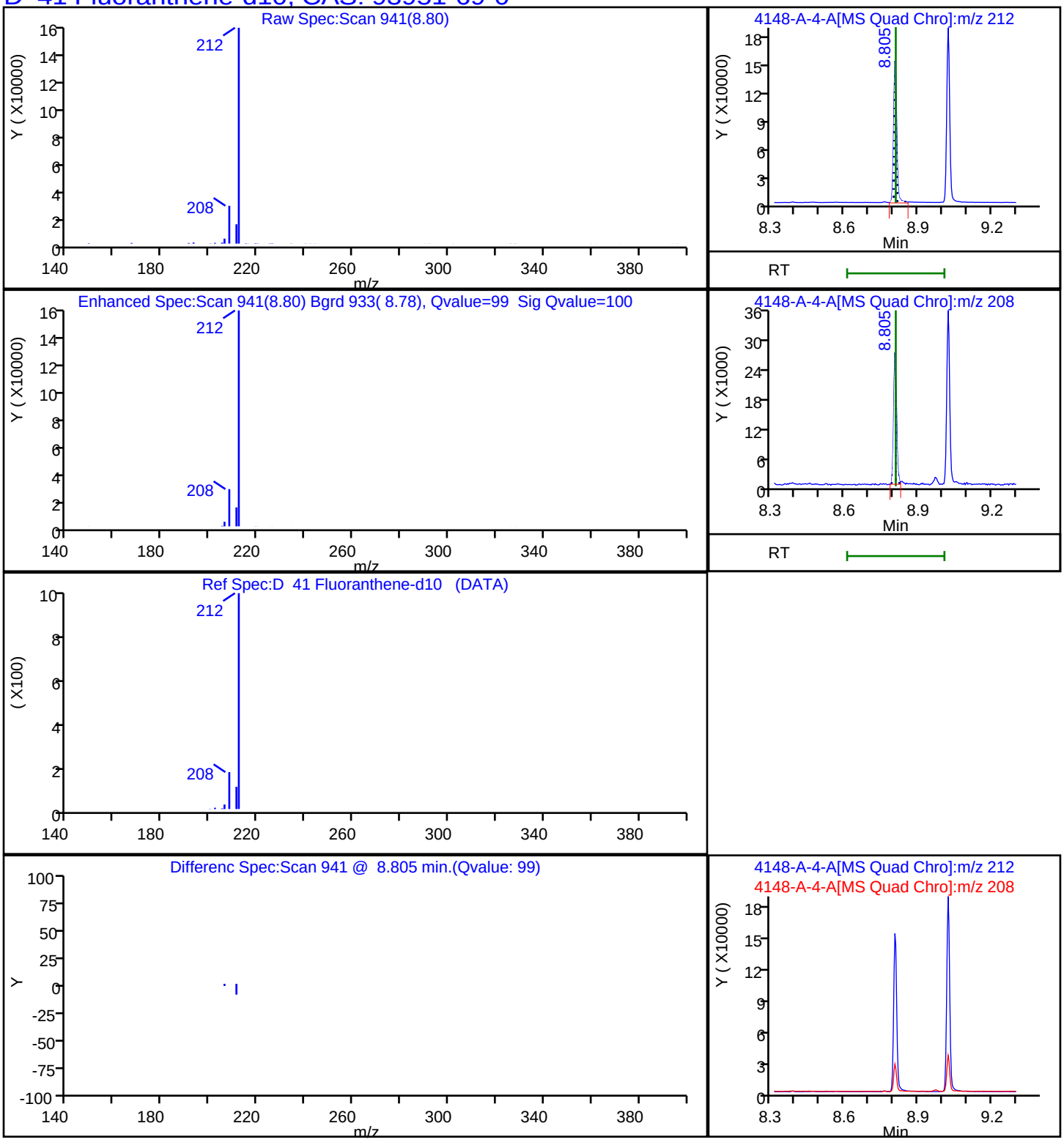
Lims ID:	140-34148-A-4-A	Lab Sample ID:	140-34148-4		
Client ID:	1804576-851-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 41 Fluoranthene-d10, CAS: 93951-69-0



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Eurofins Knoxville

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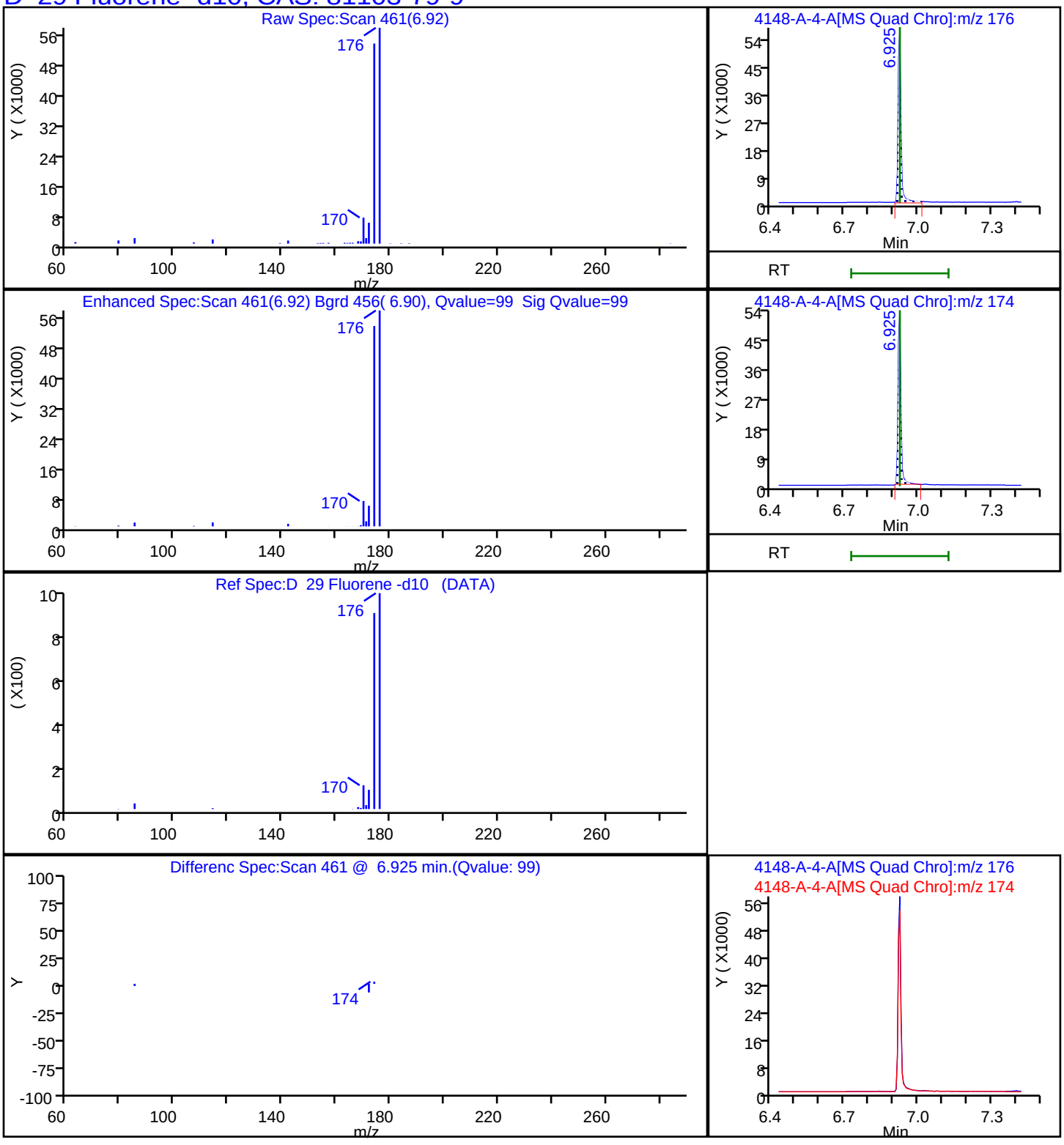
Injection Date:	13-Nov-2023 22:55:07	Instrument ID:	GCMS1
Lims ID:	140-34148-A-4-A	Lab Sample ID:	140-34148-4
Client ID:	1804576-851-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

D 29 Fluorene -d10, CAS: 81103-79-9



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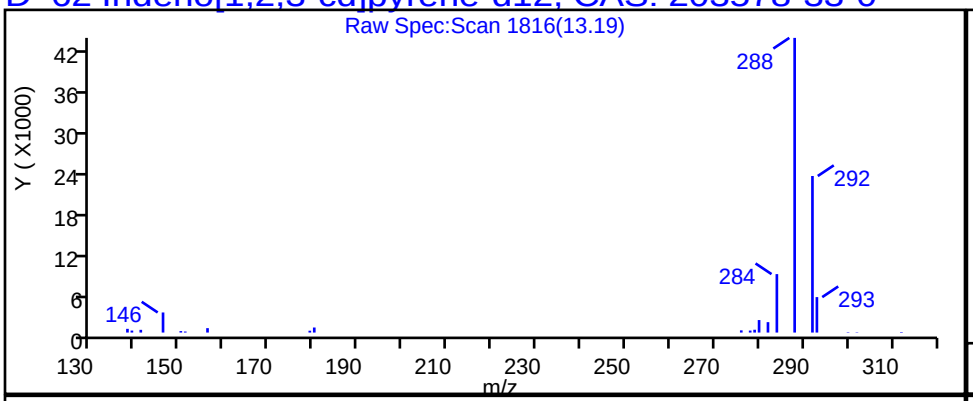
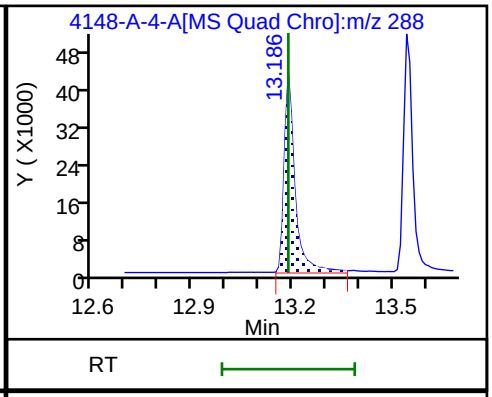
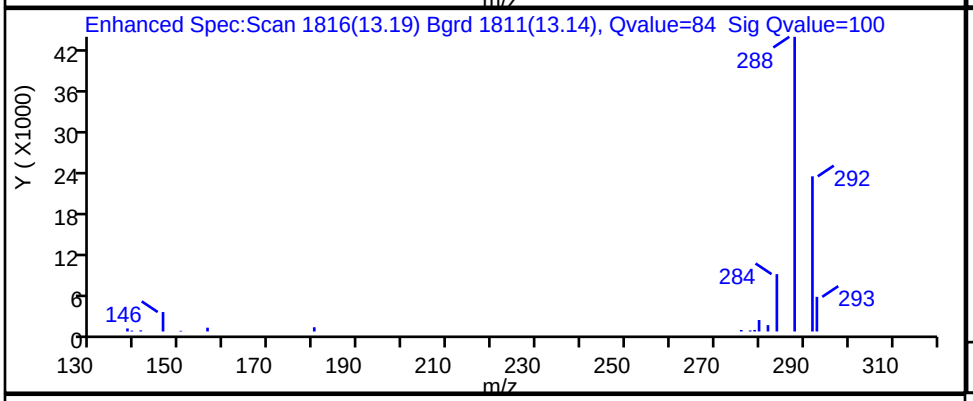
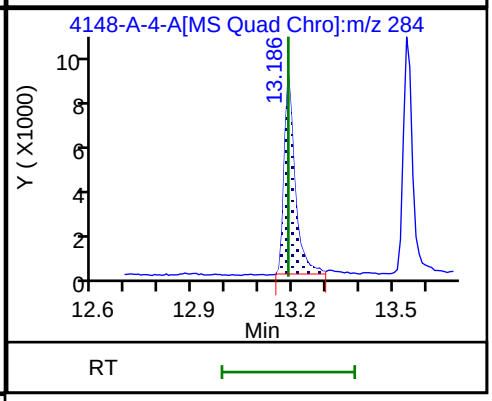
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

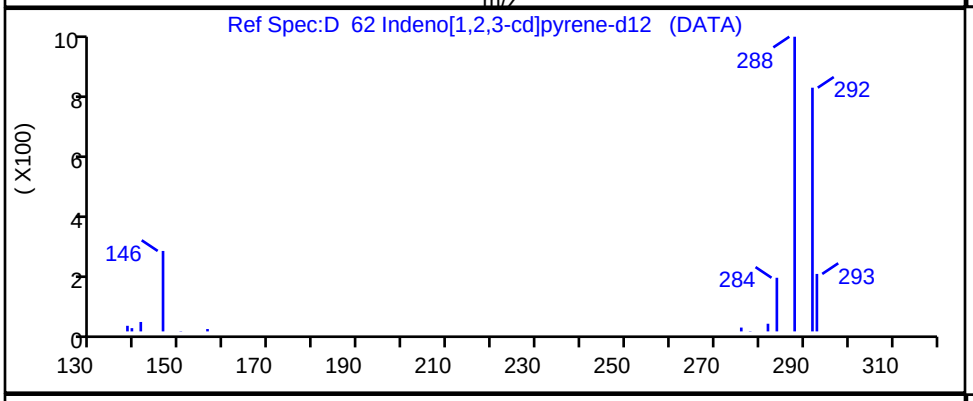
D 62 Indeno[1,2,3-cd]pyrene-d12, CAS: 203578-33-0

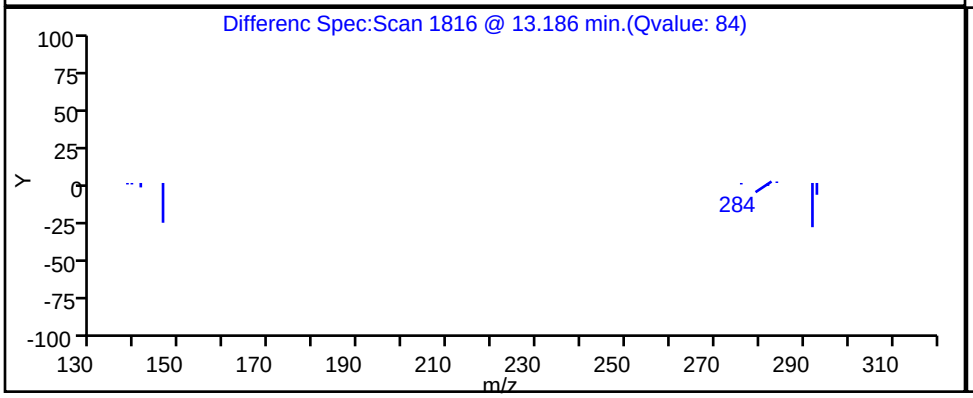


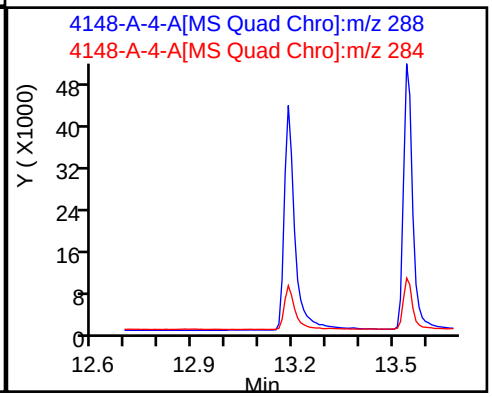












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Eurofins Knoxville

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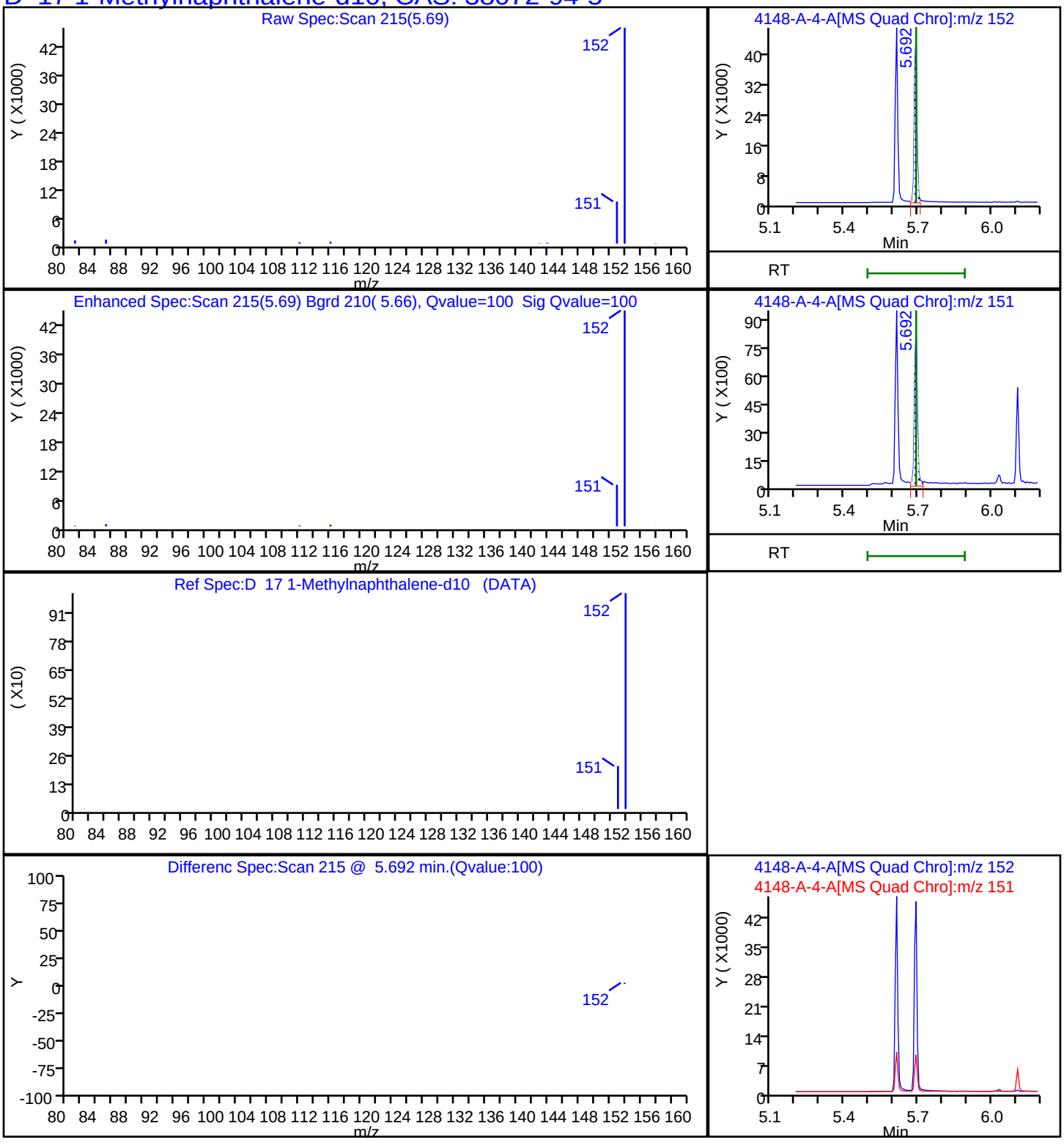
Client ID:	1804576-851-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 17 1-Methylnaphthalene-d10, CAS: 38072-94-5



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Eurofins Knoxville

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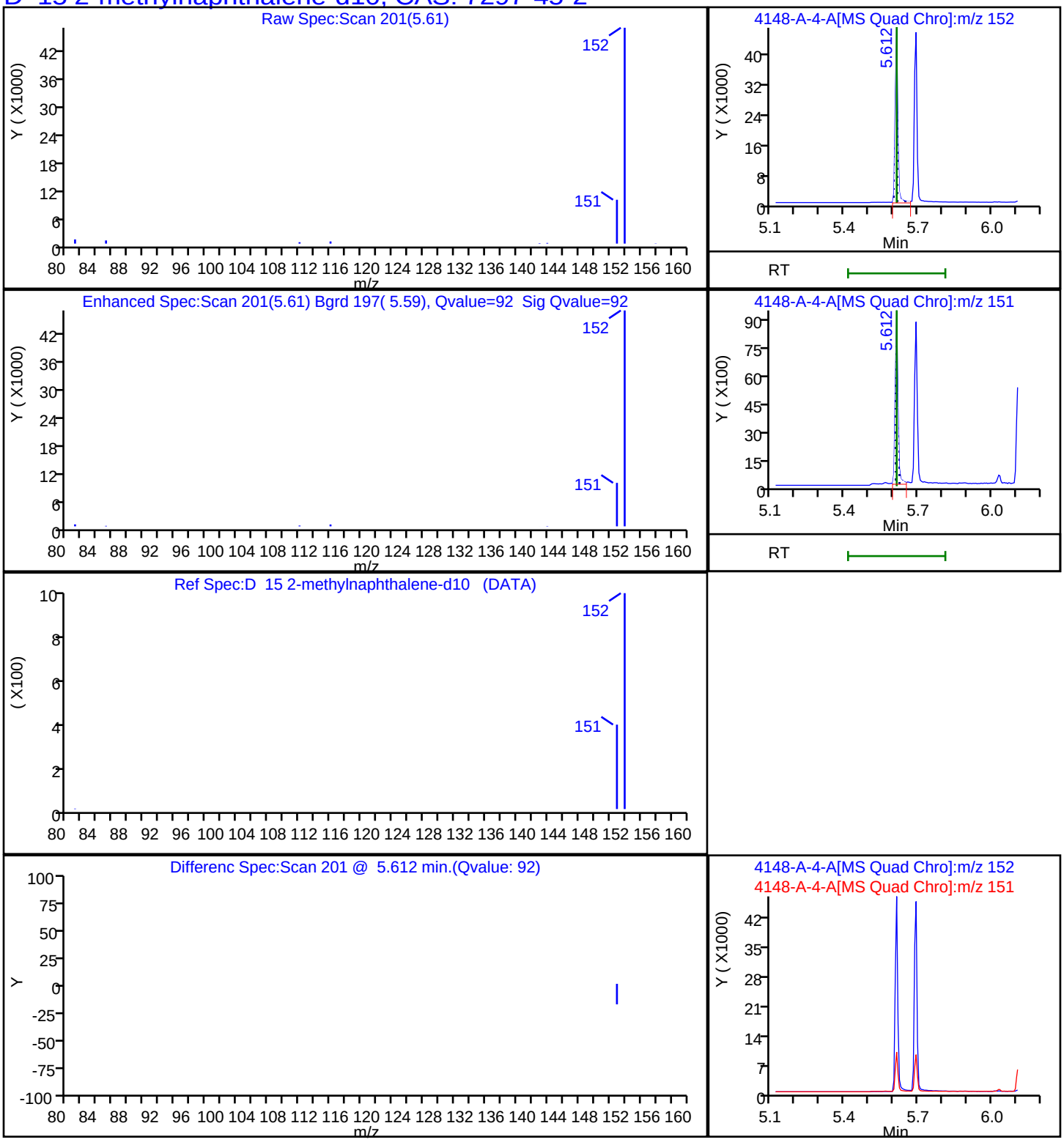
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

D 15 2-methylnaphthalene-d10, CAS: 7297-45-2



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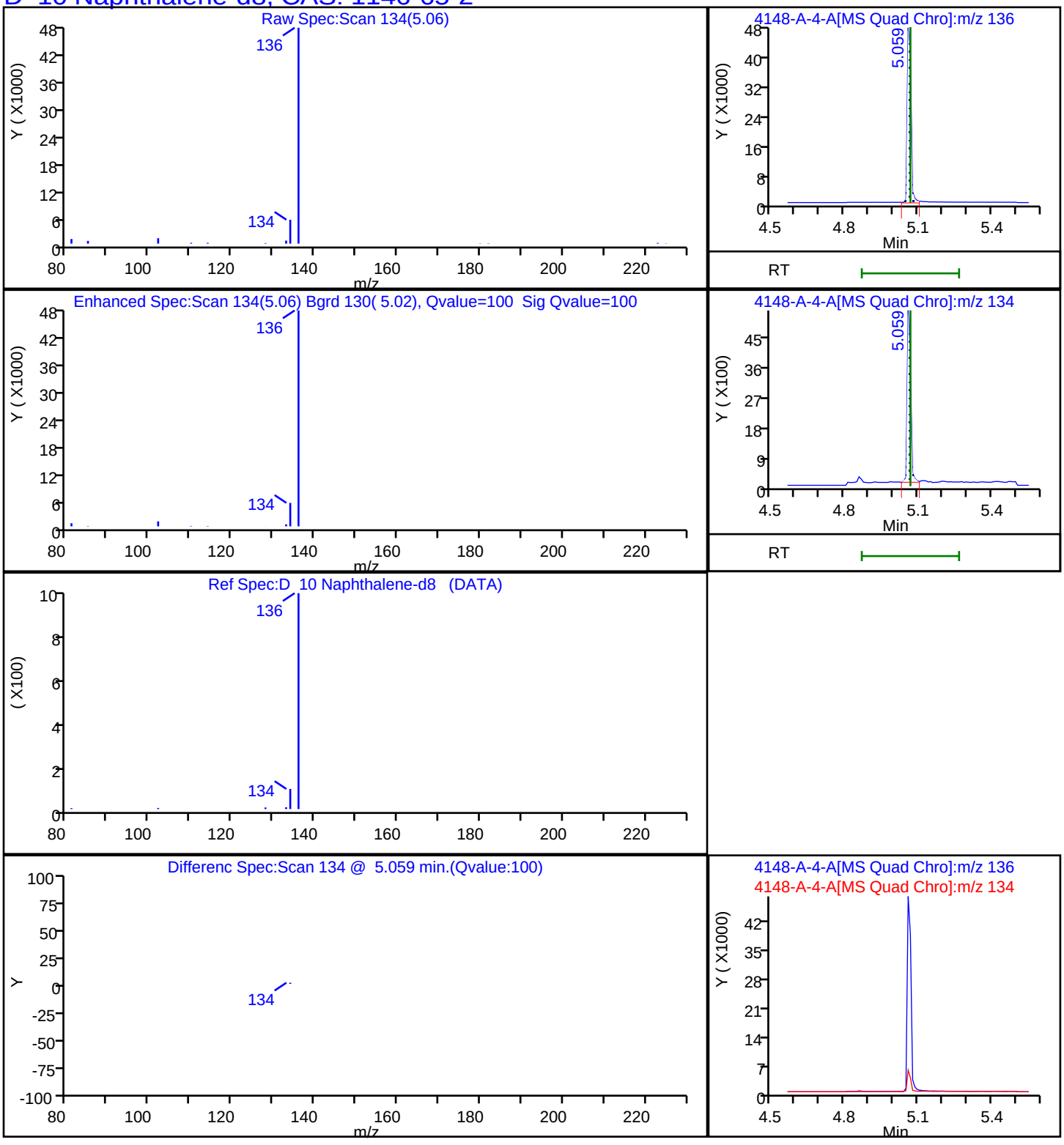
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D_10 Naphthalene-d8, CAS: 1146-65-2



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Lims ID:	140-34148-A-4-A	Lab Sample ID:	140-34148-4
Client ID:	1804576-851-S1		
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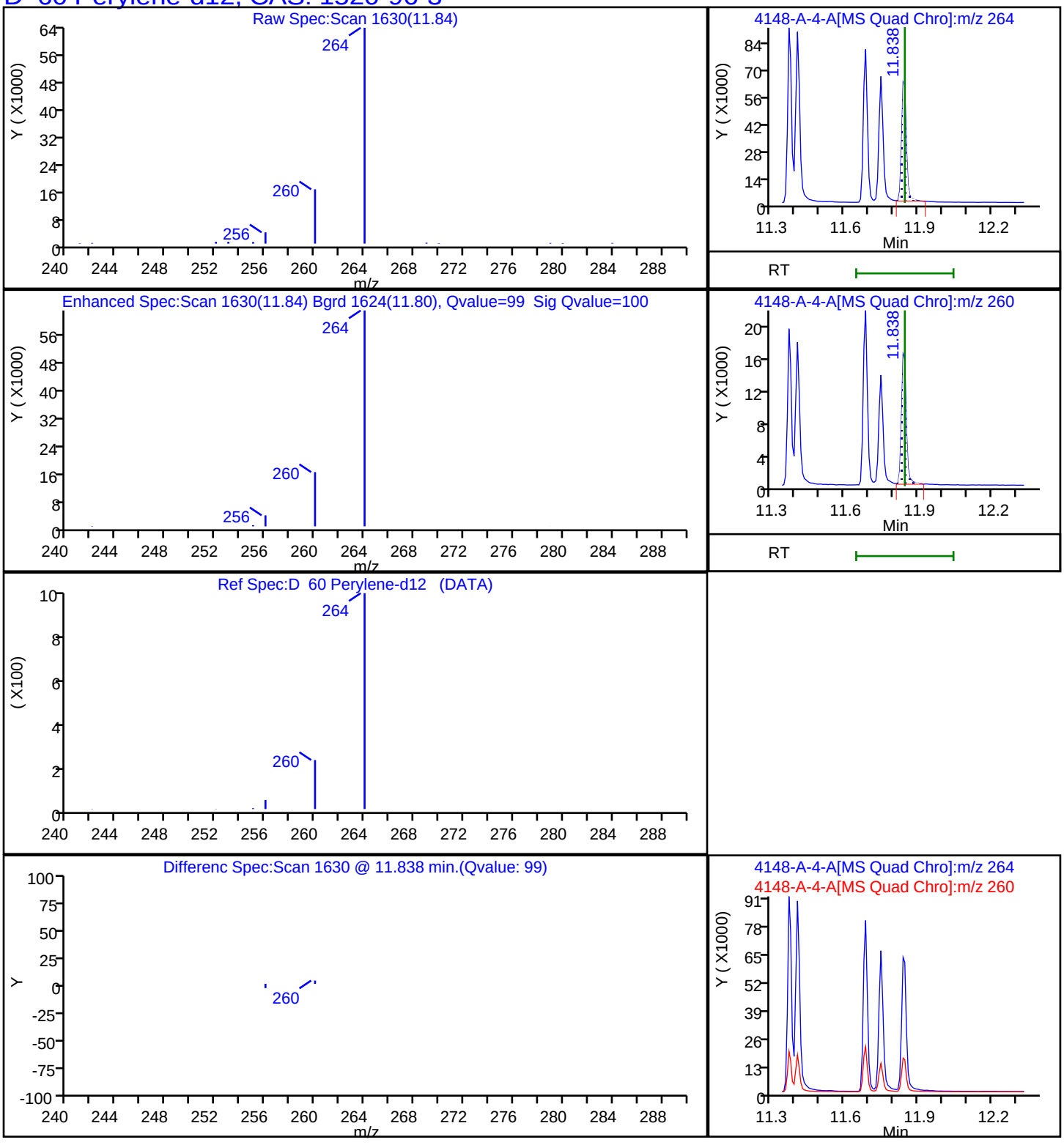
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

D 60 Perylene-d12, CAS: 1520-96-3



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Client ID:	1804576-851-S1		
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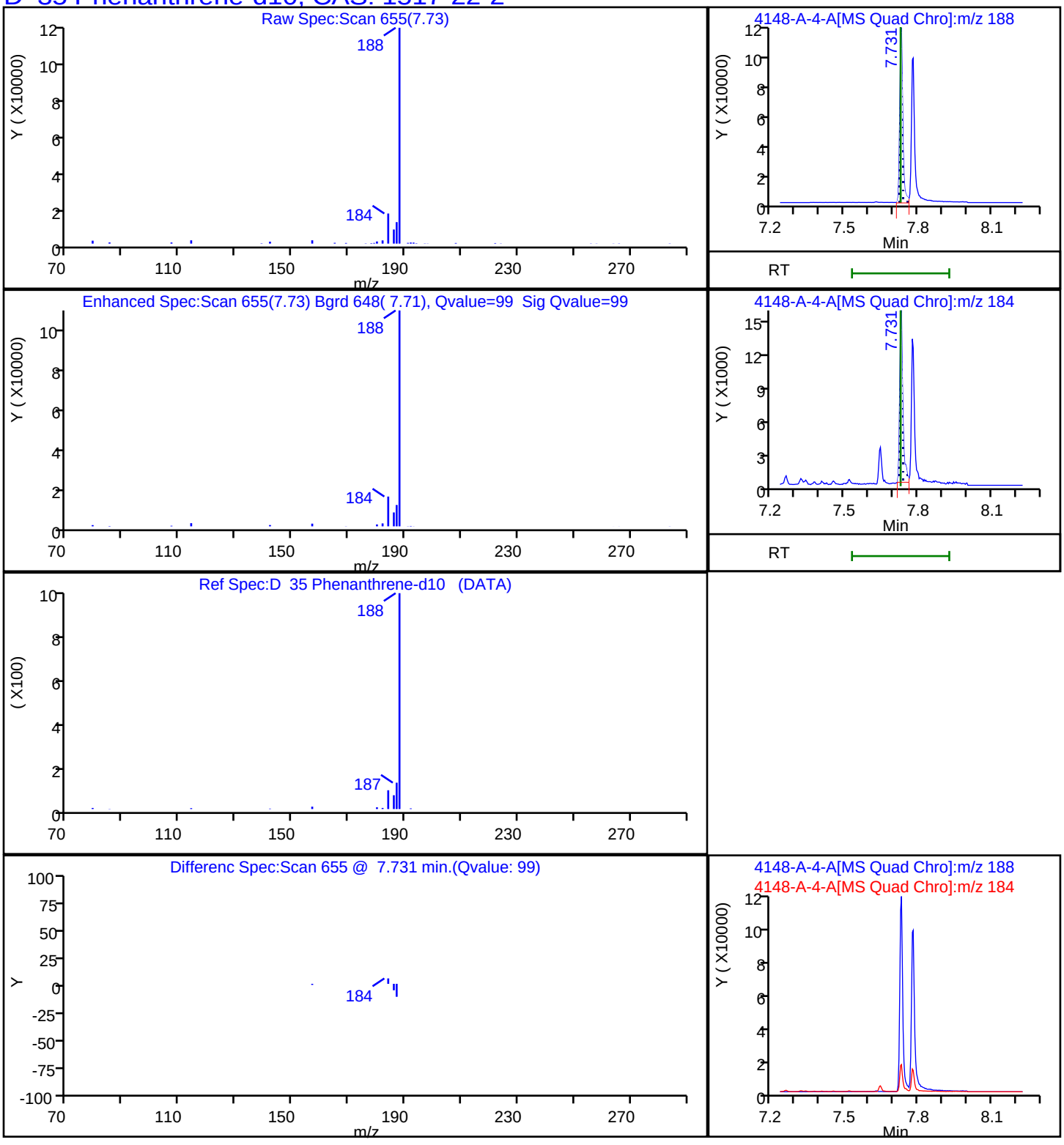
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

D_35 Phenanthrene-d10, CAS: 1517-22-2



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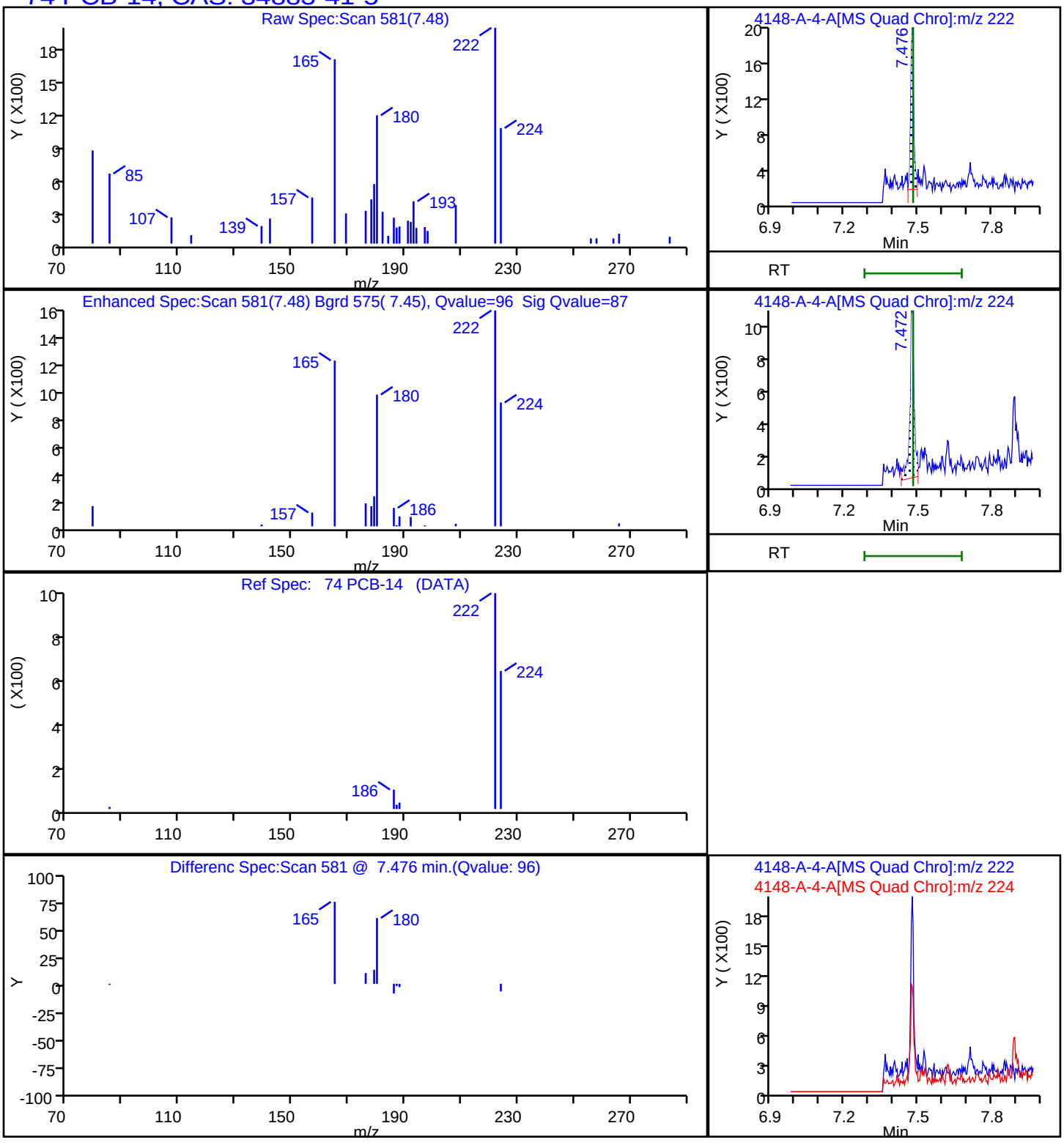
Client ID:	1804576-851-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

74 PCB-14, CAS: 34883-41-5



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Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
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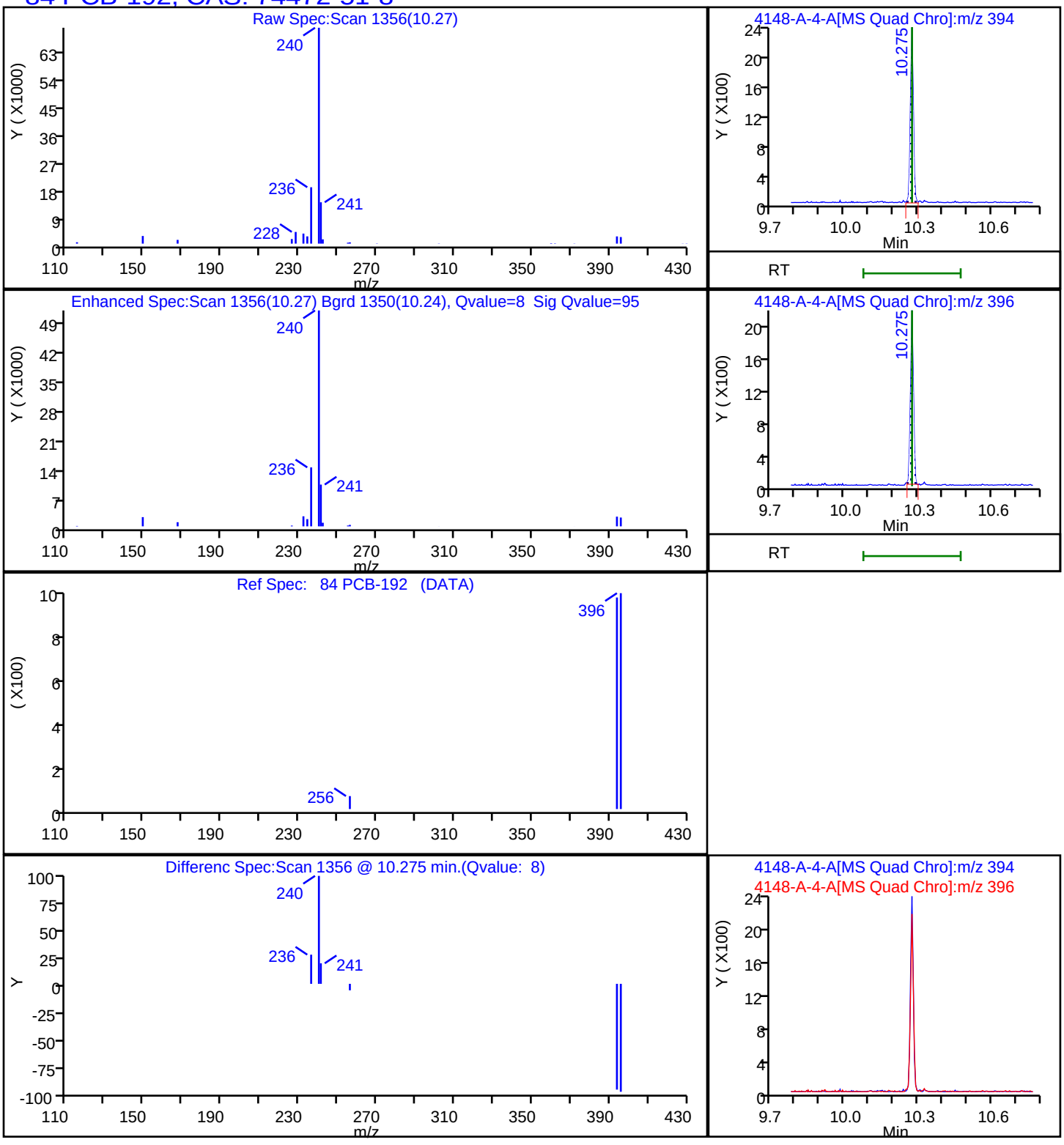
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

84 PCB-192, CAS: 74472-51-8



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Client ID:	1804576-851-S1		
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Injection Vol:	1.0 ul	Dil. Factor:	1.0000
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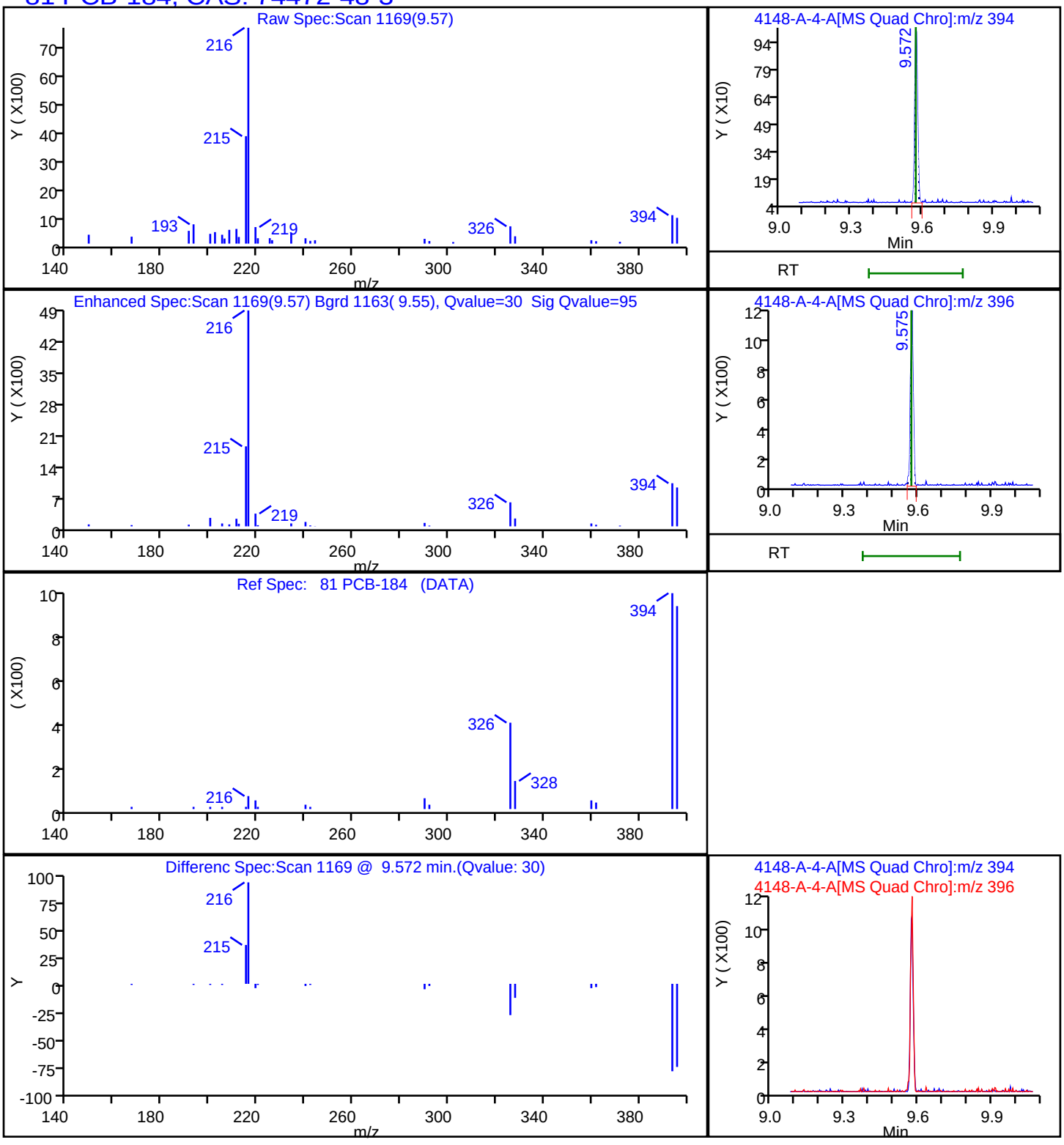
81 PCB-184, CAS: 74472-48-3



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Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
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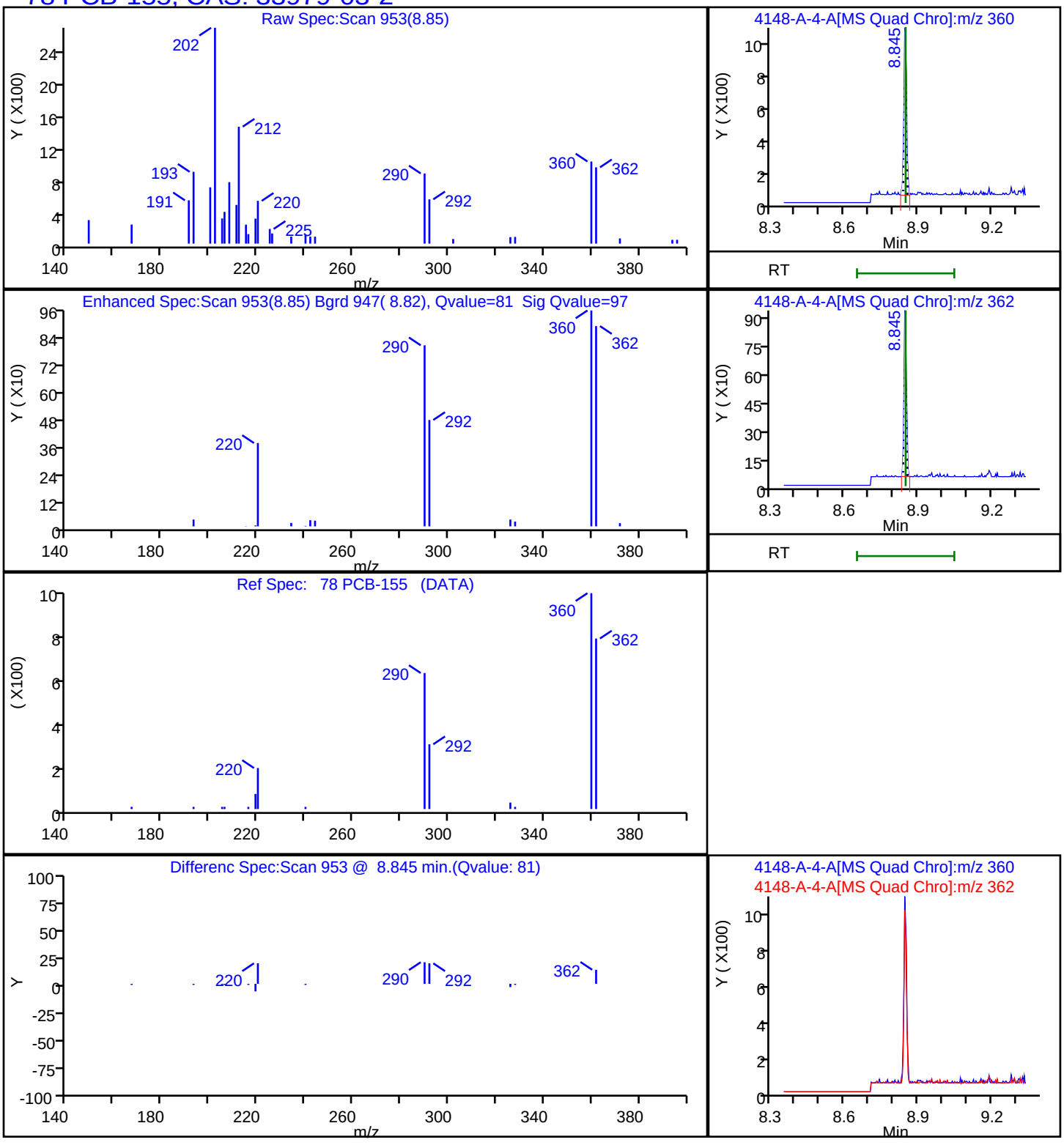
78 PCB-155, CAS: 33979-03-2



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Lims ID:	140-34148-A-4-A	Lab Sample ID:	140-34148-4
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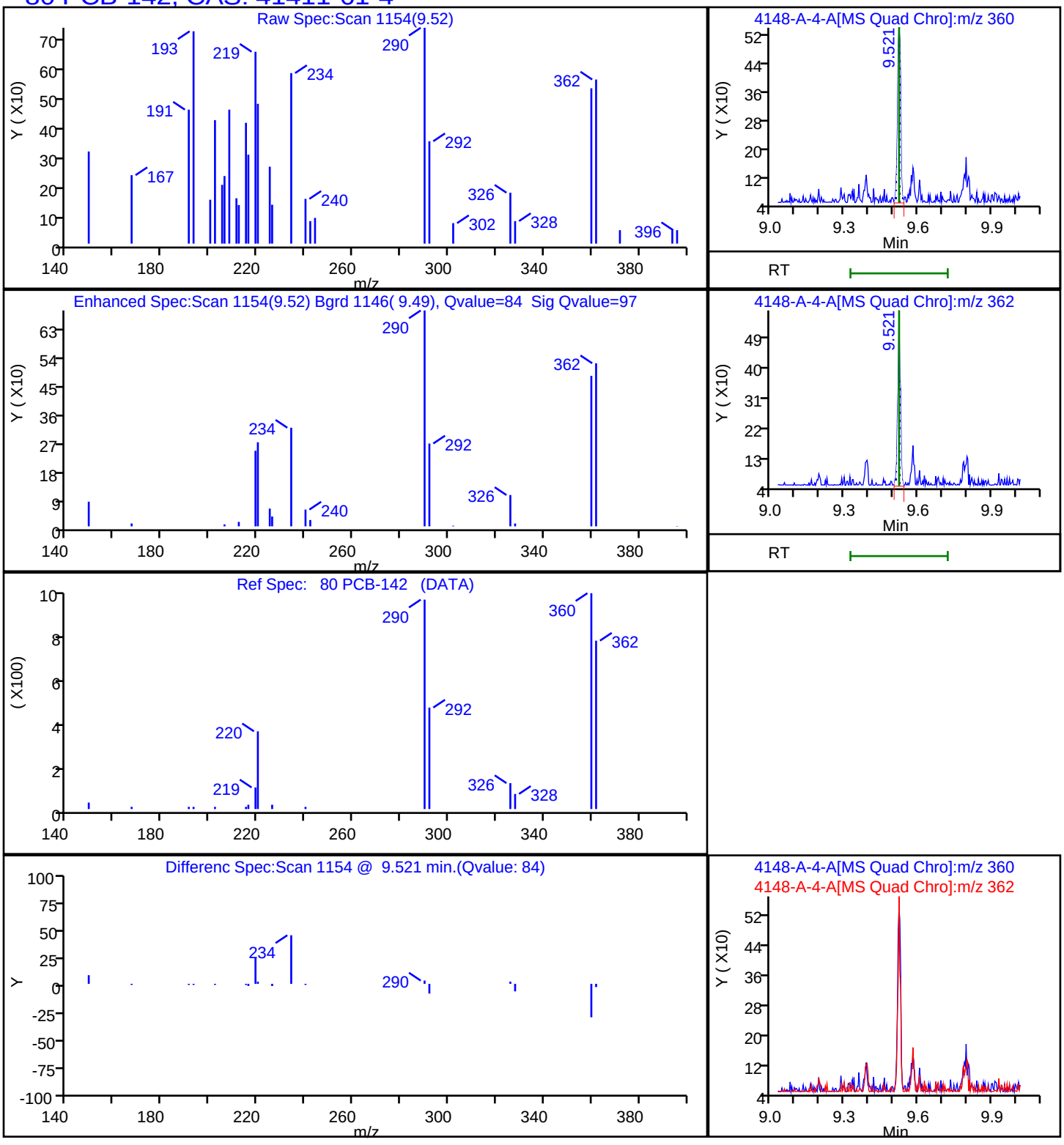
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

80 PCB-142, CAS: 41411-61-4



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Injection Date:	13-Nov-2023 22:55:07	Instrument ID:	GCMS1		
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Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
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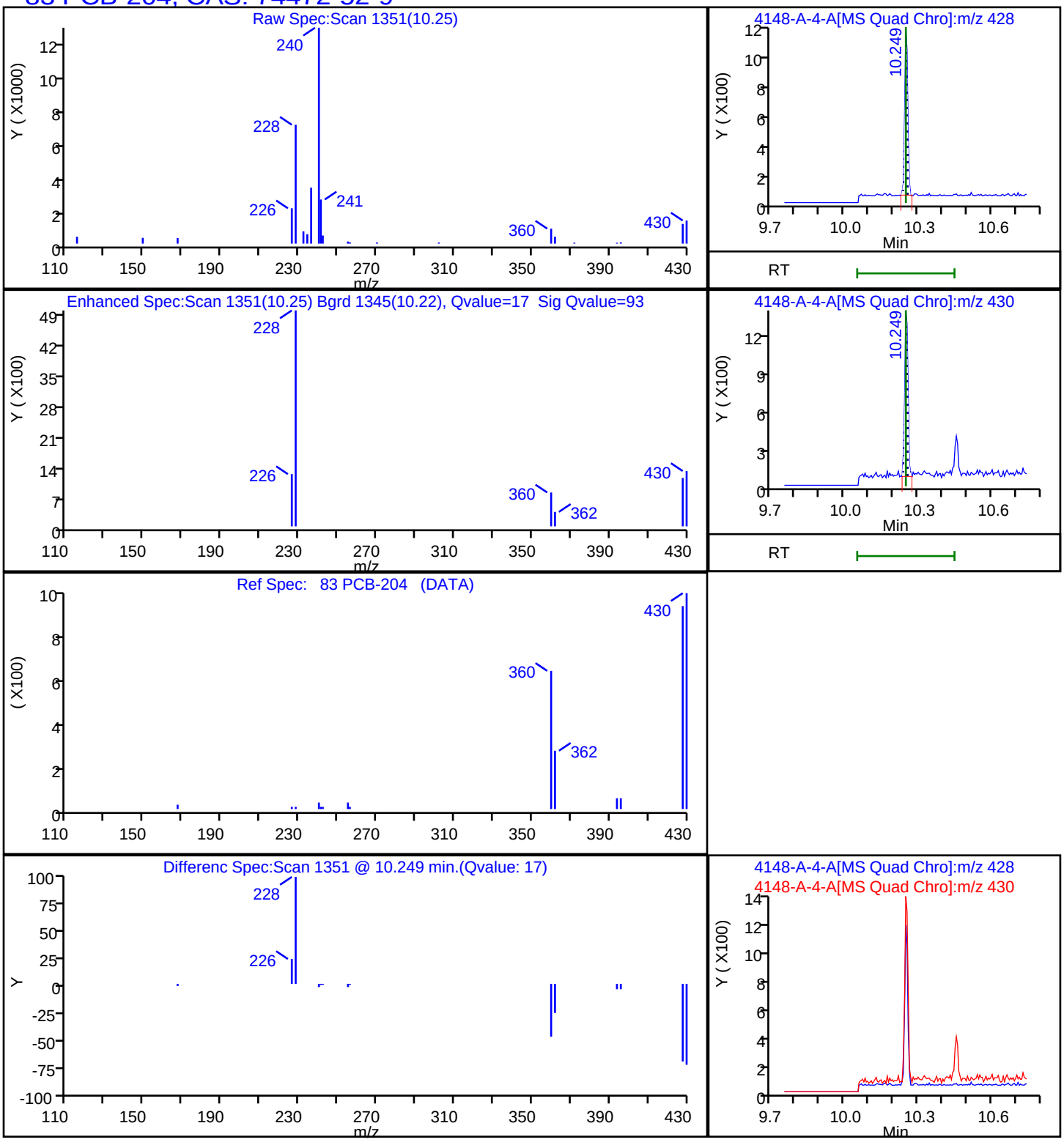
83 PCB-204, CAS: 74472-52-9



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Eurofins Knoxville

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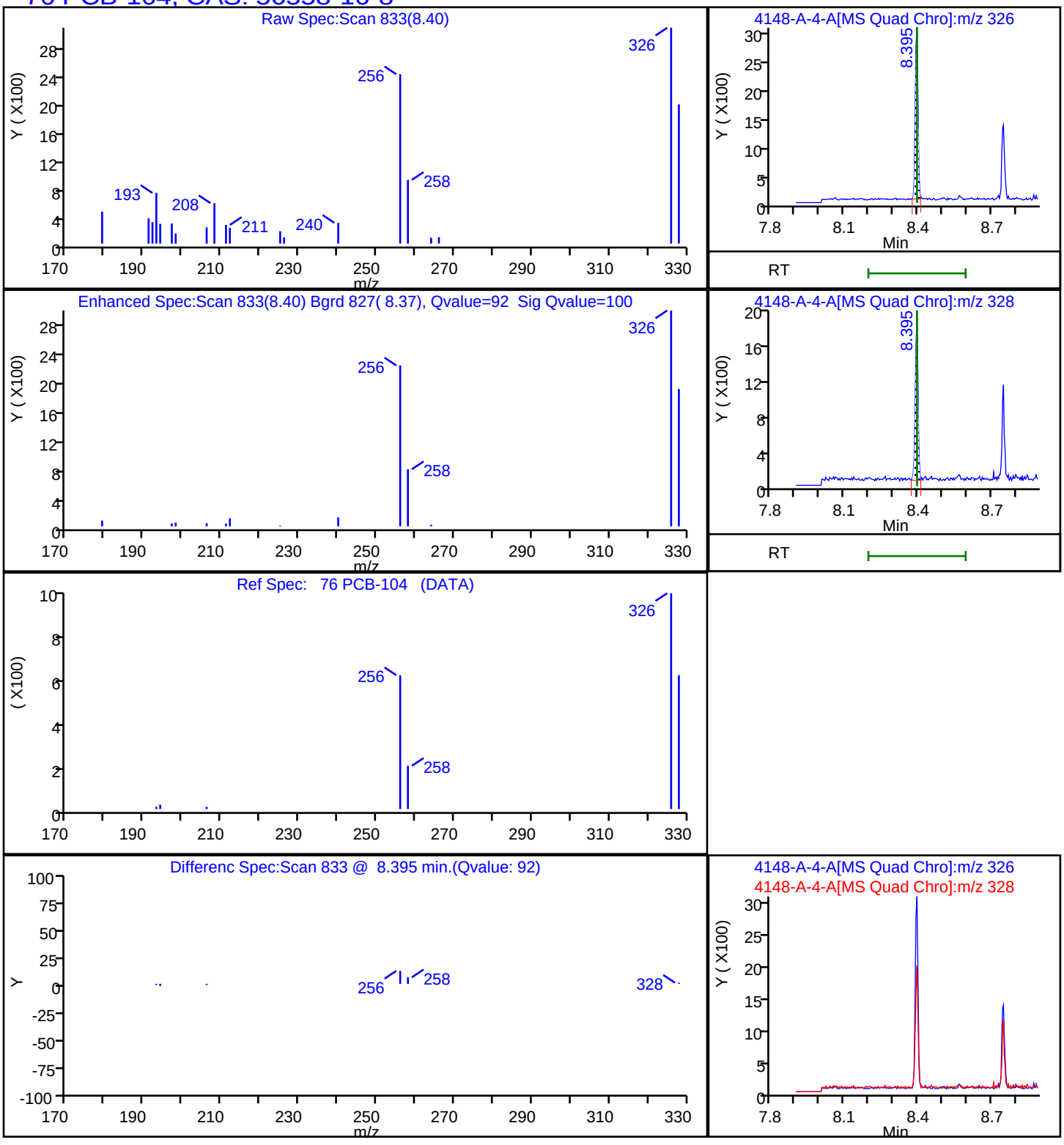
76 PCB-104, CAS: 56558-16-8



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Lims ID:	140-34148-A-4-A	Lab Sample ID:	140-34148-4
Client ID:	1804576-851-S1		
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Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
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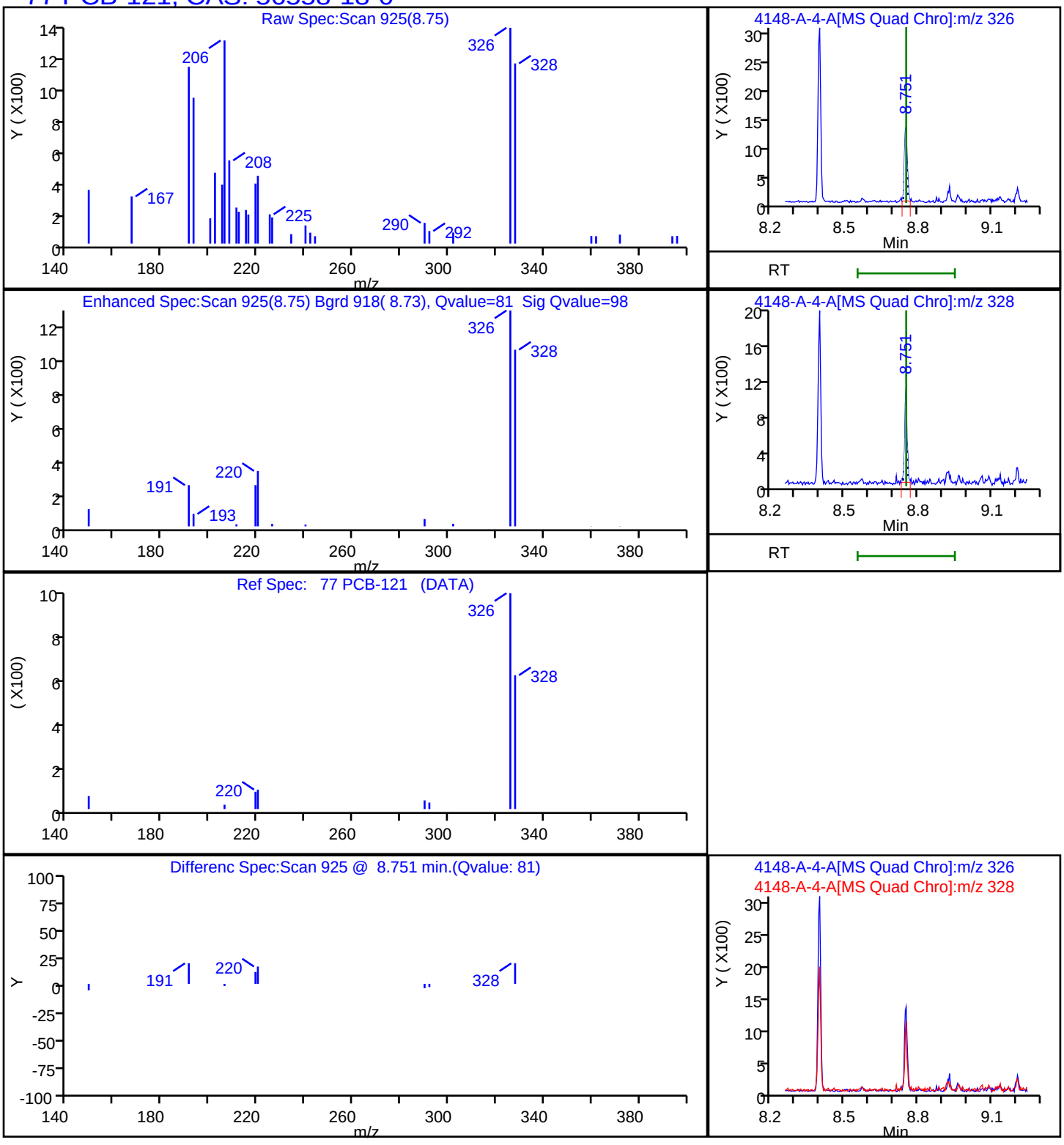
77 PCB-121, CAS: 56558-18-0



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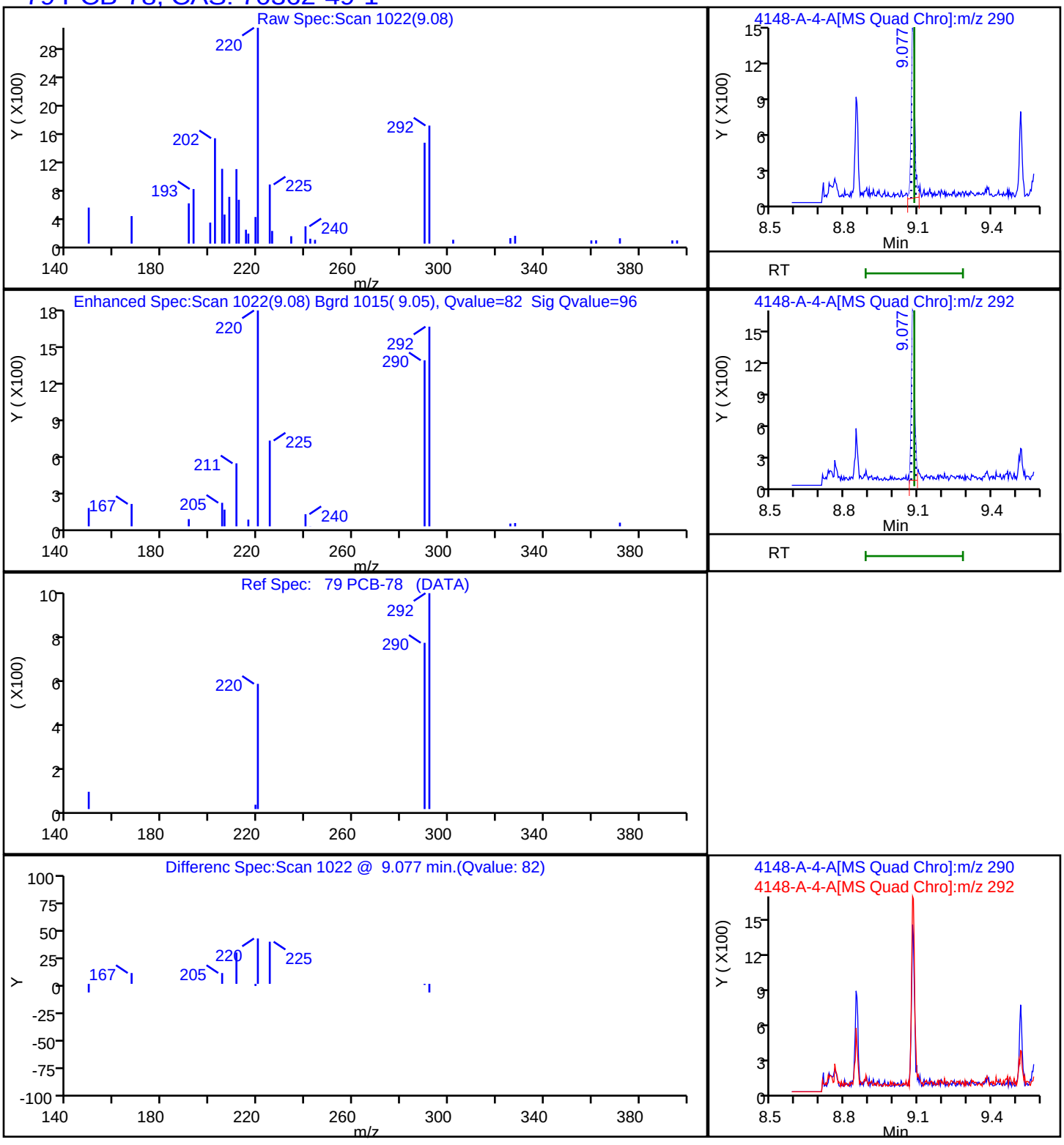
Lims ID:	140-34148-A-4-A	Lab Sample ID:	140-34148-4
Client ID:	1804576-851-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

79 PCB-78, CAS: 70362-49-1



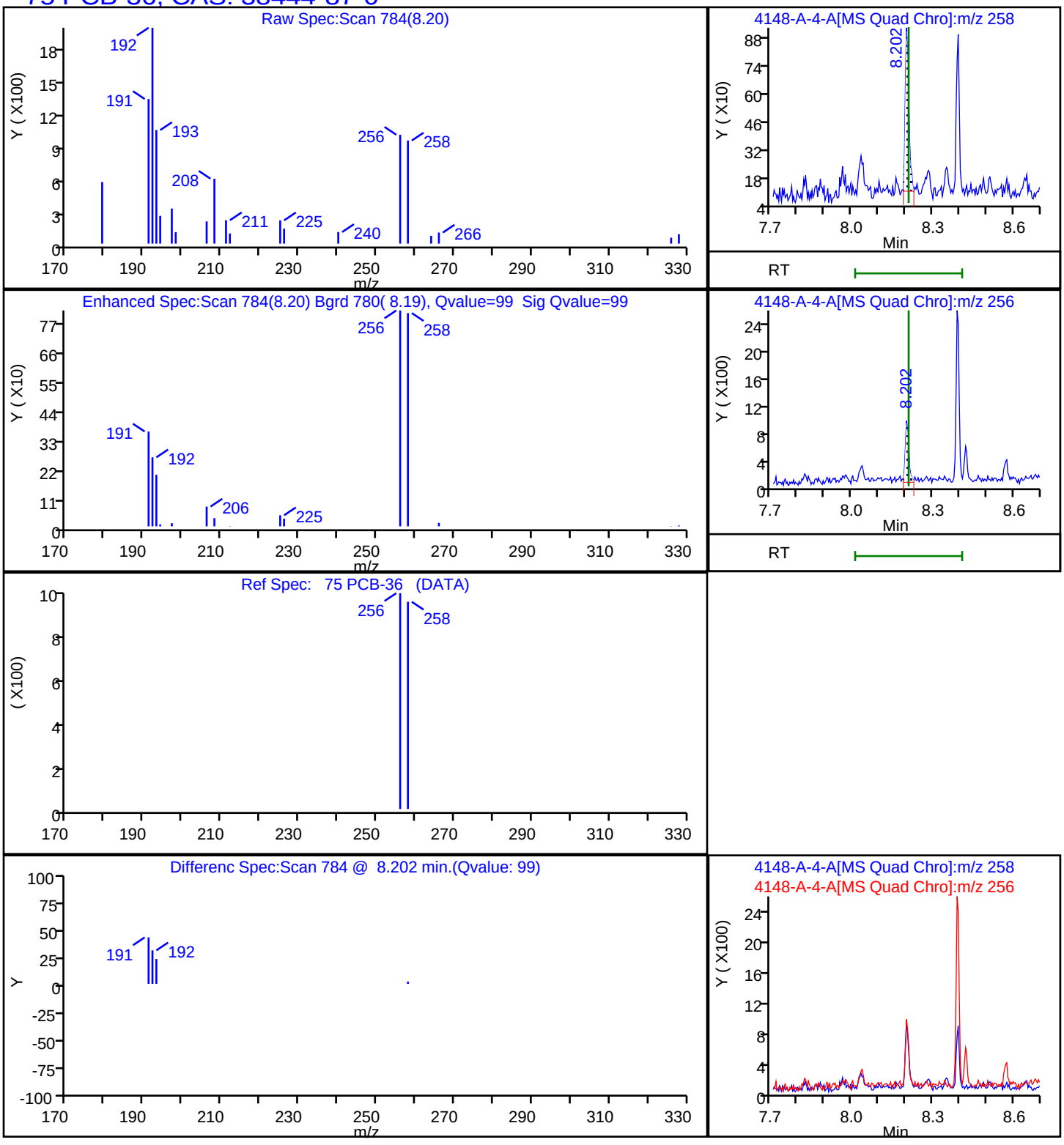
Report Date: 16-Nov-2023 15:47:02 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-4-A.D

Injection Date:	13-Nov-2023 22:55:07	Instrument ID:	GCMS1
Lims ID:	140-34148-A-4-A	Lab Sample ID:	140-34148-4
Client ID:	1804576-851-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

75 PCB-36, CAS: 38444-87-0



Manual Integration/User Assign Peak Report

Eurofins Knoxville

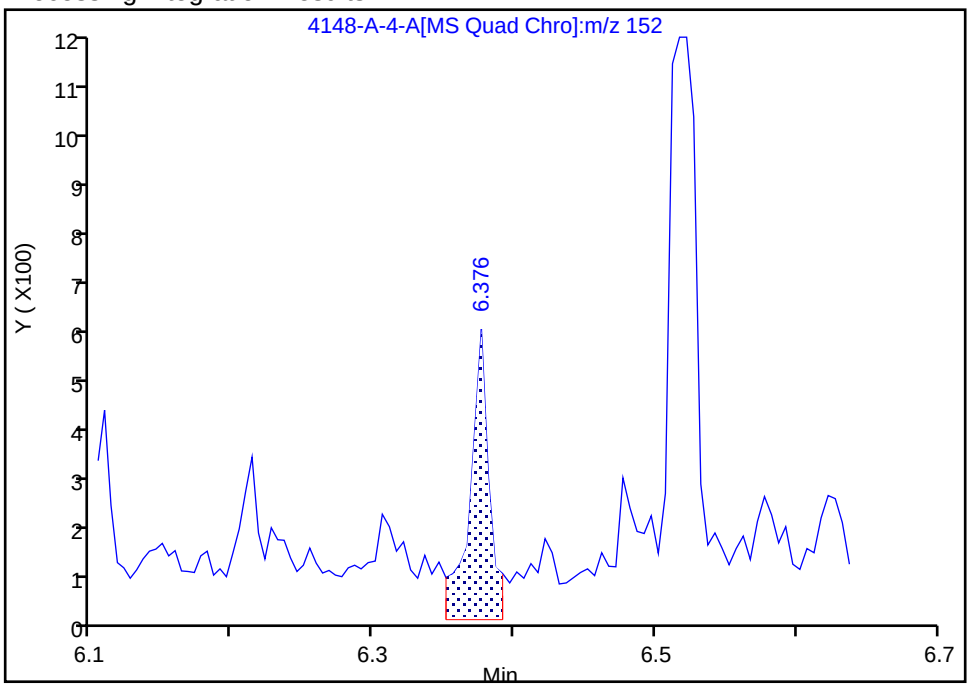
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-4-A.D				
Injection Date:	13-Nov-2023 22:55:07	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-4-A	Lab Sample ID:	140-34148-4		
Client ID:	1804576-851-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

24 Acenaphthylene, CAS: 208-96-8

Signal: 1

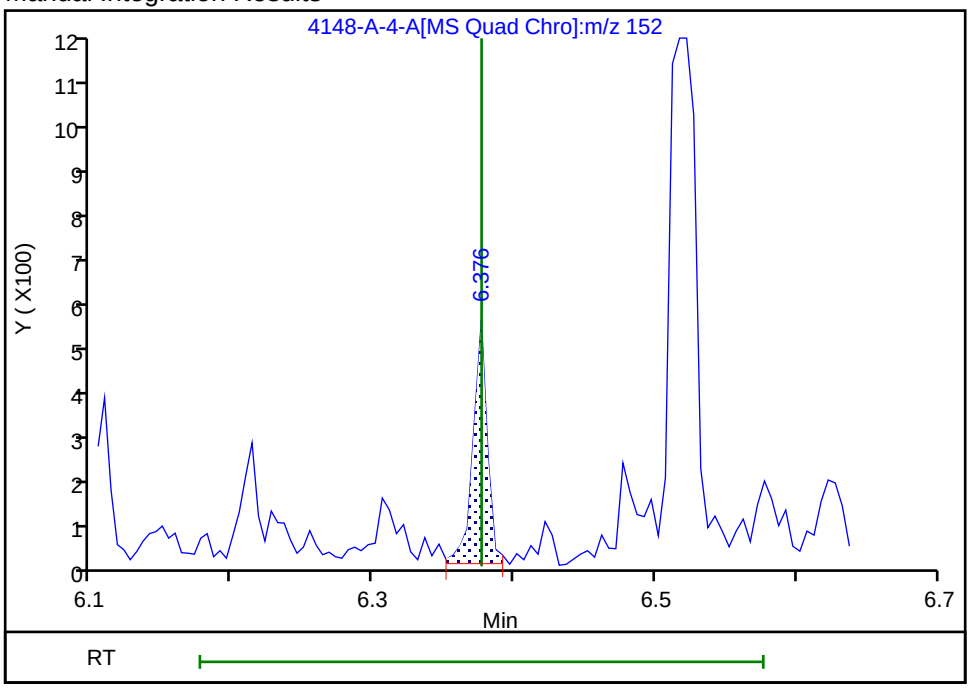
Processing Integration Results

RT: 6.38
Area: 544
Amount: 0.004055
Amount Units: ug/ml



Manual Integration Results

RT: 6.38
Area: 346
Amount: 0.002579
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 11:10:10 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

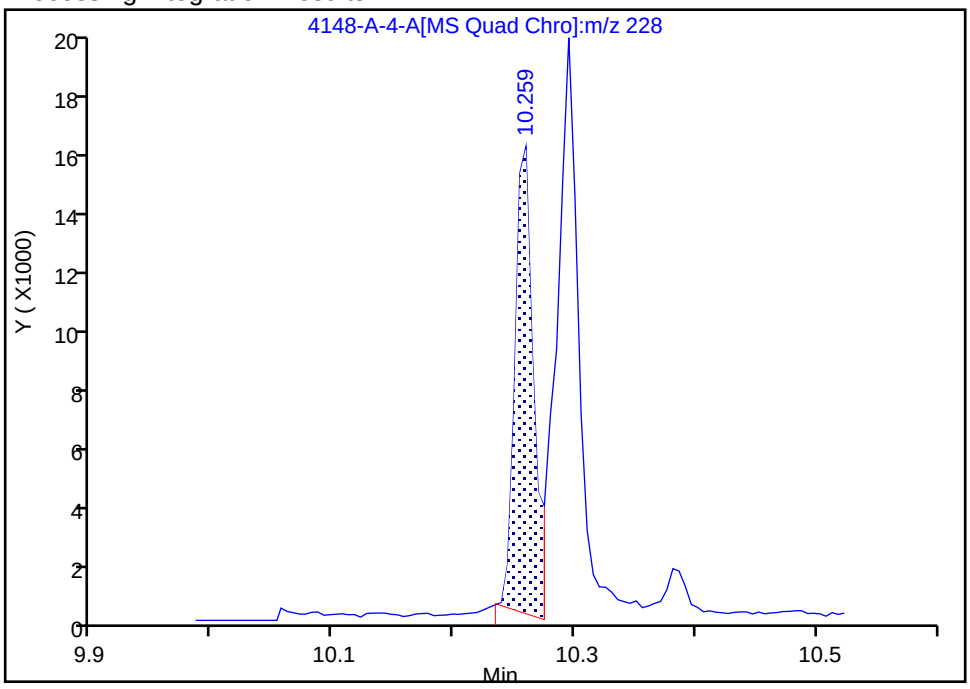
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-4-A.D				
Injection Date:	13-Nov-2023 22:55:07	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-4-A	Lab Sample ID:	140-34148-4		
Client ID:	1804576-851-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

47 Benzo[a]anthracene, CAS: 56-55-3

Signal: 1

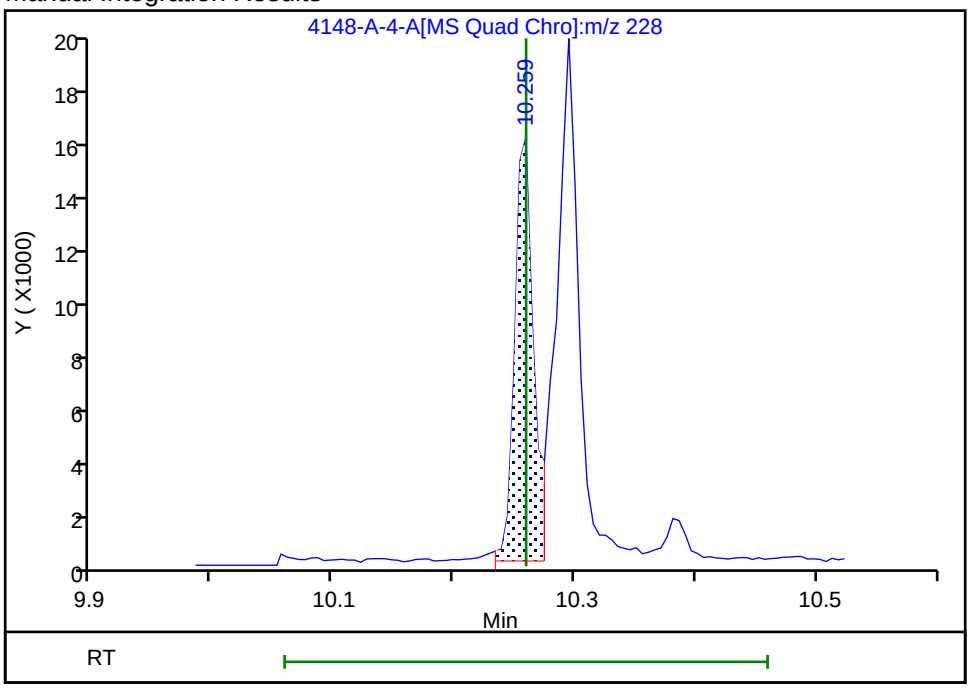
Processing Integration Results

RT: 10.26
Area: 16984
Amount: 0.055362
Amount Units: ug/ml



Manual Integration Results

RT: 10.26
Area: 17159
Amount: 0.055932
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 11:10:43 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

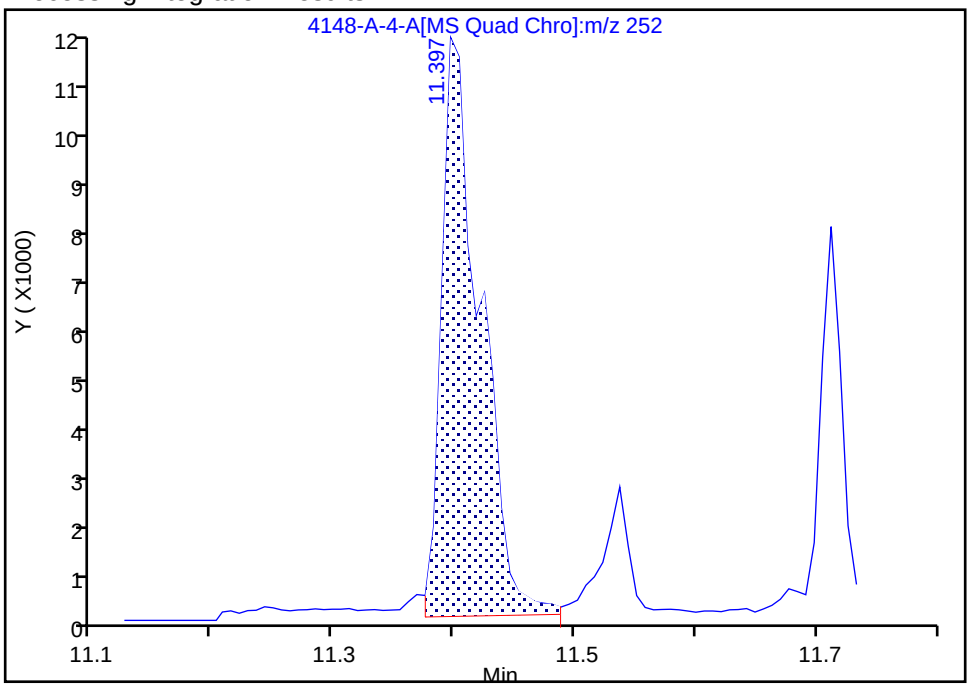
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-4-A.D				
Injection Date:	13-Nov-2023 22:55:07	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-4-A	Lab Sample ID:	140-34148-4		
Client ID:	1804576-851-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

53 Benzo[b]fluoranthene, CAS: 205-99-2

Signal: 1

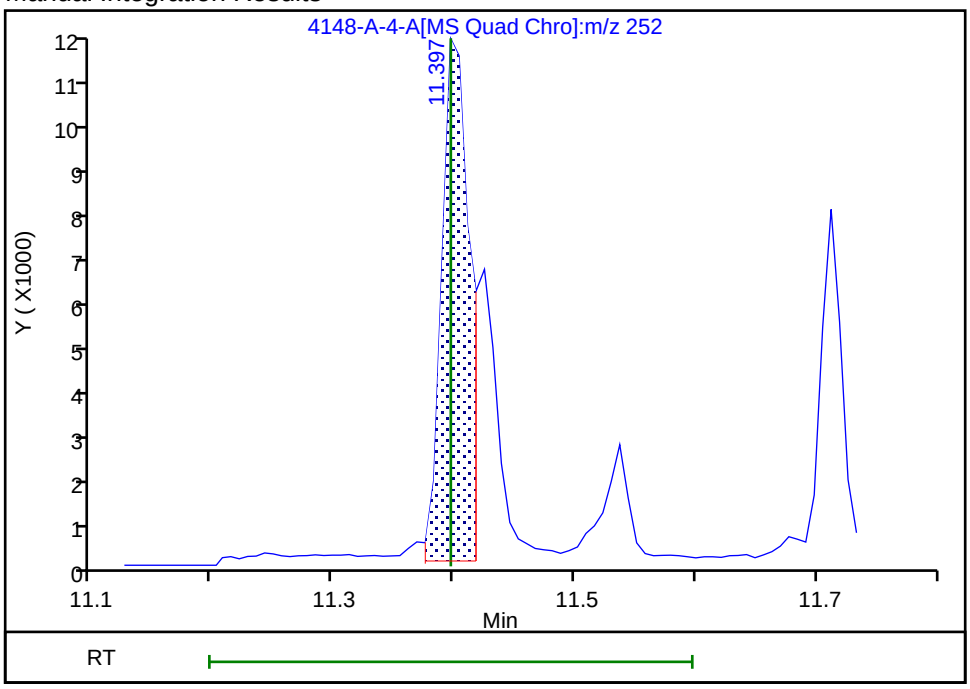
Processing Integration Results

RT: 11.40
Area: 25700
Amount: 0.072398
Amount Units: ug/ml



Manual Integration Results

RT: 11.40
Area: 19031
Amount: 0.053611
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 11:11:10 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

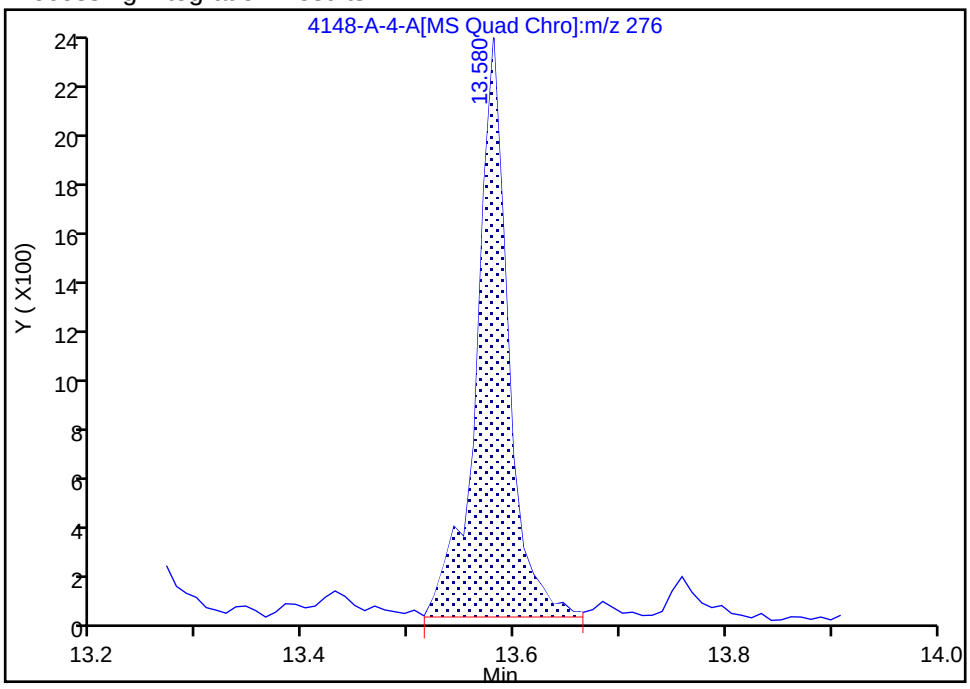
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-4-A.D				
Injection Date:	13-Nov-2023 22:55:07	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-4-A	Lab Sample ID:	140-34148-4		
Client ID:	1804576-851-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

68 Benzo[g,h,i]perylene, CAS: 191-24-2

Signal: 1

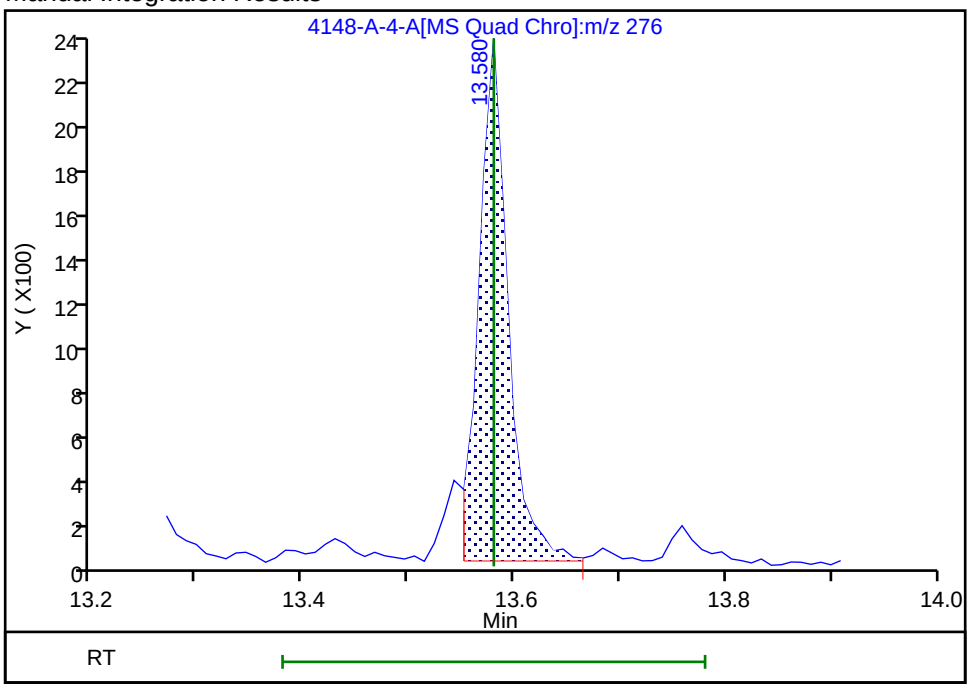
Processing Integration Results

RT: 13.58
Area: 4700
Amount: 0.016146
Amount Units: ug/ml



Manual Integration Results

RT: 13.58
Area: 4347
Amount: 0.014934
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 11:12:14 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

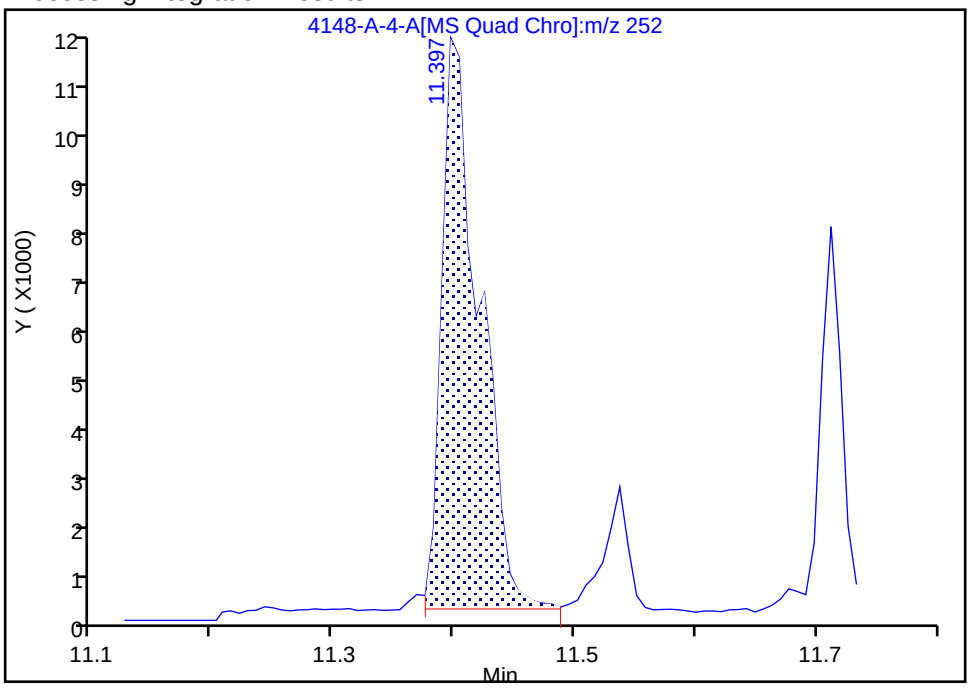
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-4-A.D				
Injection Date:	13-Nov-2023 22:55:07	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-4-A	Lab Sample ID:	140-34148-4		
Client ID:	1804576-851-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

55 Benzo[k]fluoranthene, CAS: 207-08-9

Signal: 1

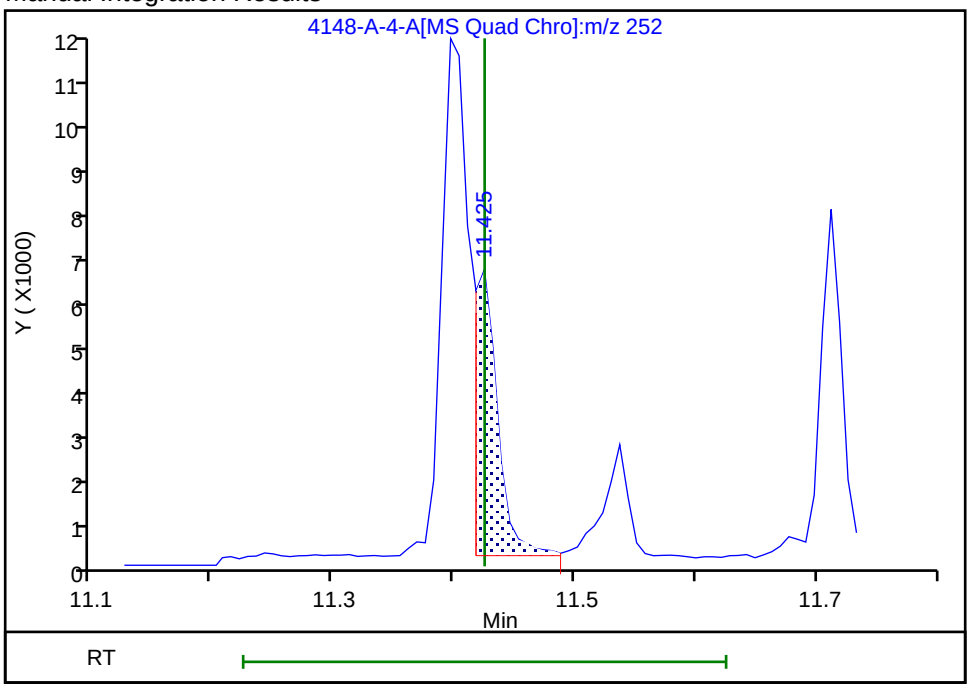
Processing Integration Results

RT: 11.40
Area: 24935
Amount: 0.074972
Amount Units: ug/ml



Manual Integration Results

RT: 11.43
Area: 8733
Amount: 0.026258
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 11:11:19 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

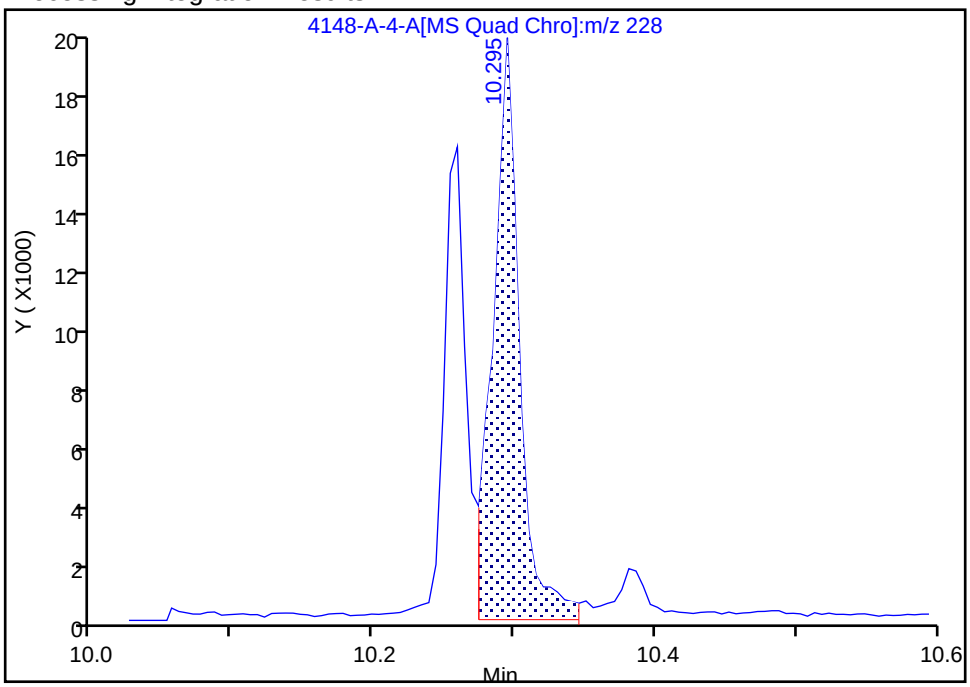
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-4-A.D				
Injection Date:	13-Nov-2023 22:55:07	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-4-A	Lab Sample ID:	140-34148-4		
Client ID:	1804576-851-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

50 Chrysene, CAS: 218-01-9

Signal: 1

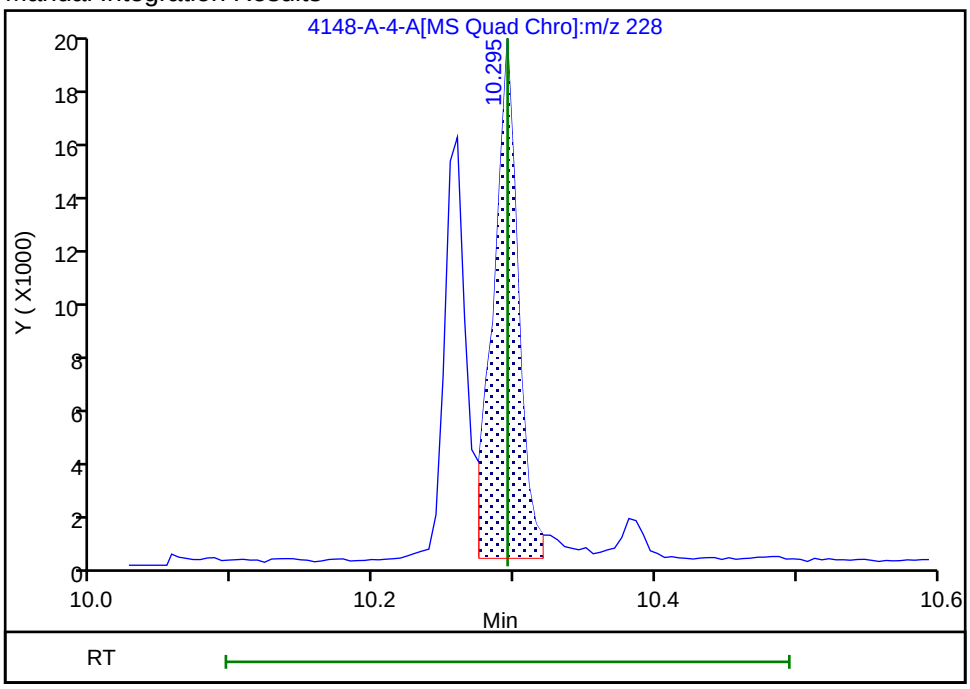
Processing Integration Results

RT: 10.29
Area: 25805
Amount: 0.075050
Amount Units: ug/ml



Manual Integration Results

RT: 10.29
Area: 23863
Amount: 0.069402
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 11:11:00 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

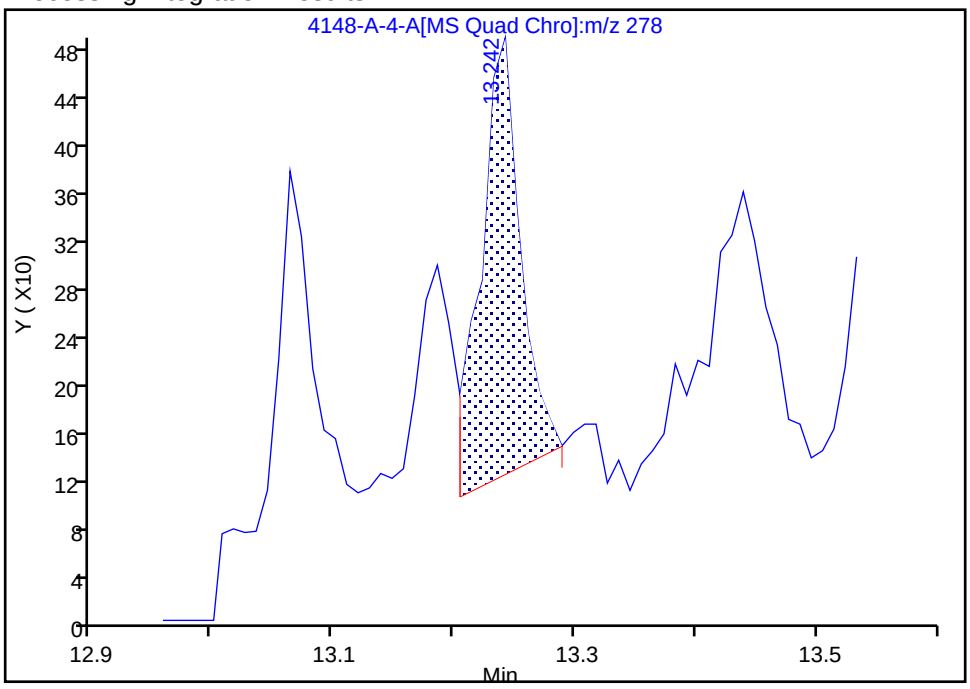
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-4-A.D				
Injection Date:	13-Nov-2023 22:55:07	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-4-A	Lab Sample ID:	140-34148-4		
Client ID:	1804576-851-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

66 Dibenz(a,h)anthracene, CAS: 53-70-3

Signal: 1

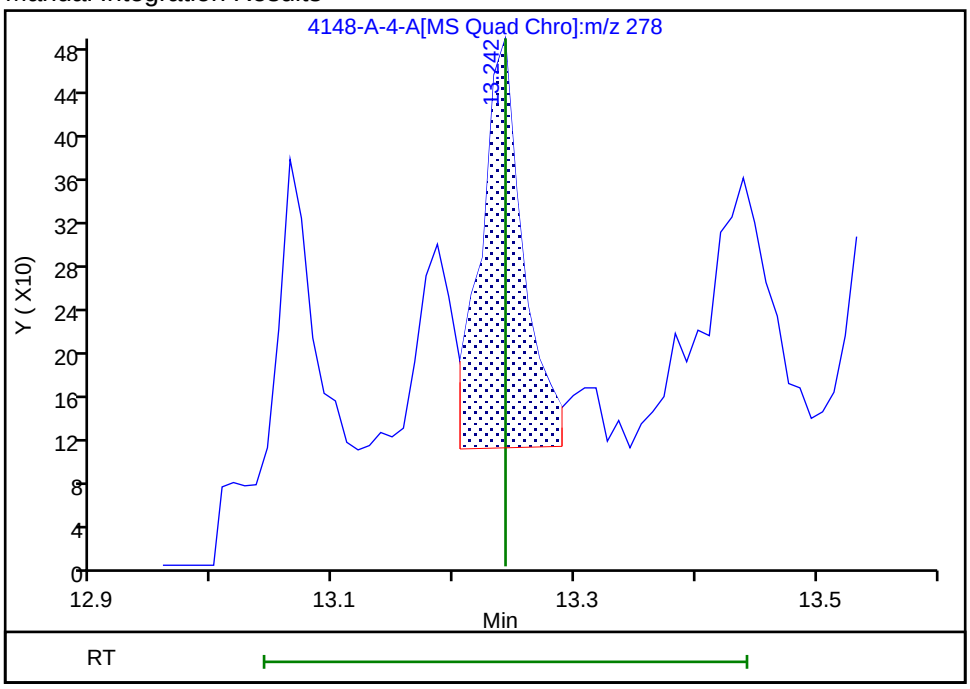
Processing Integration Results

RT: 13.24
Area: 846
Amount: 0.003165
Amount Units: ug/ml



Manual Integration Results

RT: 13.24
Area: 933
Amount: 0.003490
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 11:12:02 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Eurofins Knoxville

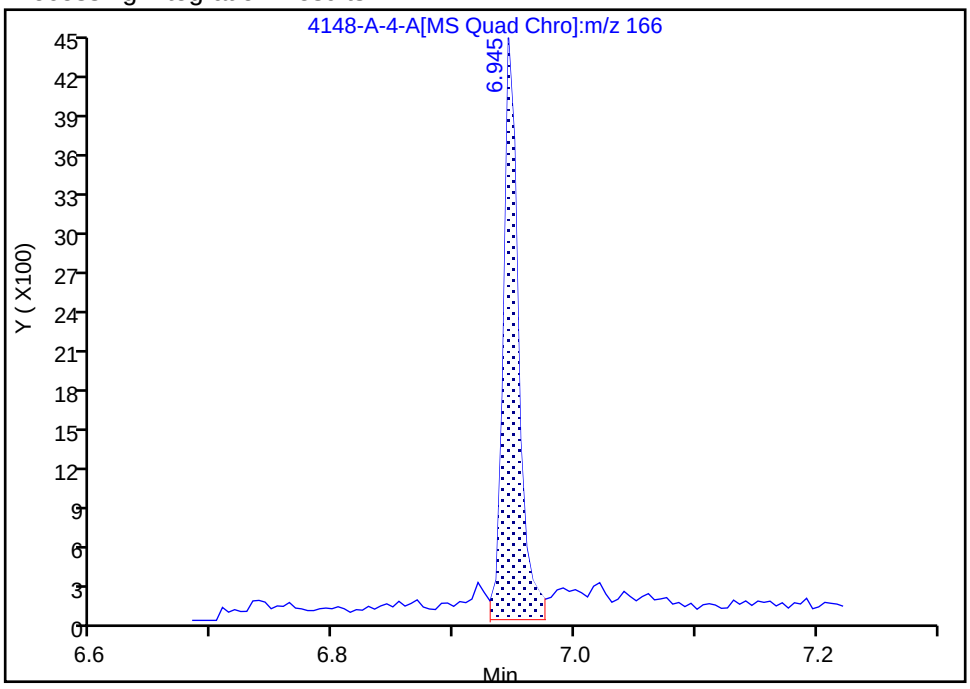
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-4-A.D				
Injection Date:	13-Nov-2023 22:55:07	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-4-A	Lab Sample ID:	140-34148-4		
Client ID:	1804576-851-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

30 Fluorene, CAS: 86-73-7

Signal: 1

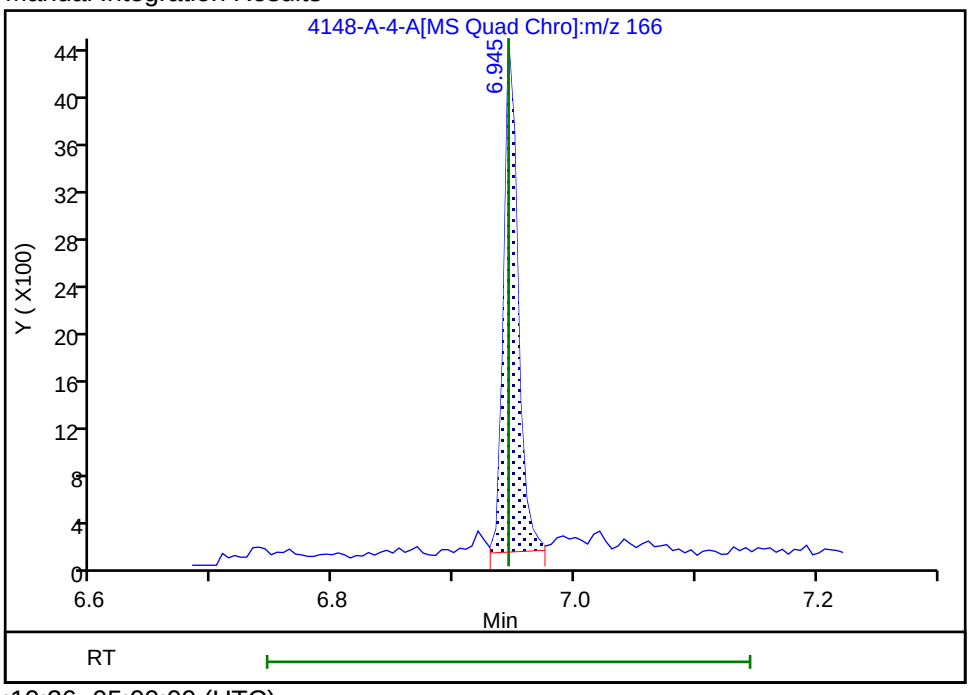
Processing Integration Results

RT: 6.94
Area: 3869
Amount: 0.031450
Amount Units: ug/ml



Manual Integration Results

RT: 6.94
Area: 3518
Amount: 0.028596
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 11:10:26 -05:00:00 (UTC)
Audit Action: Assigned New Baseline Audit Reason: Baseline

Eurofins Knoxville

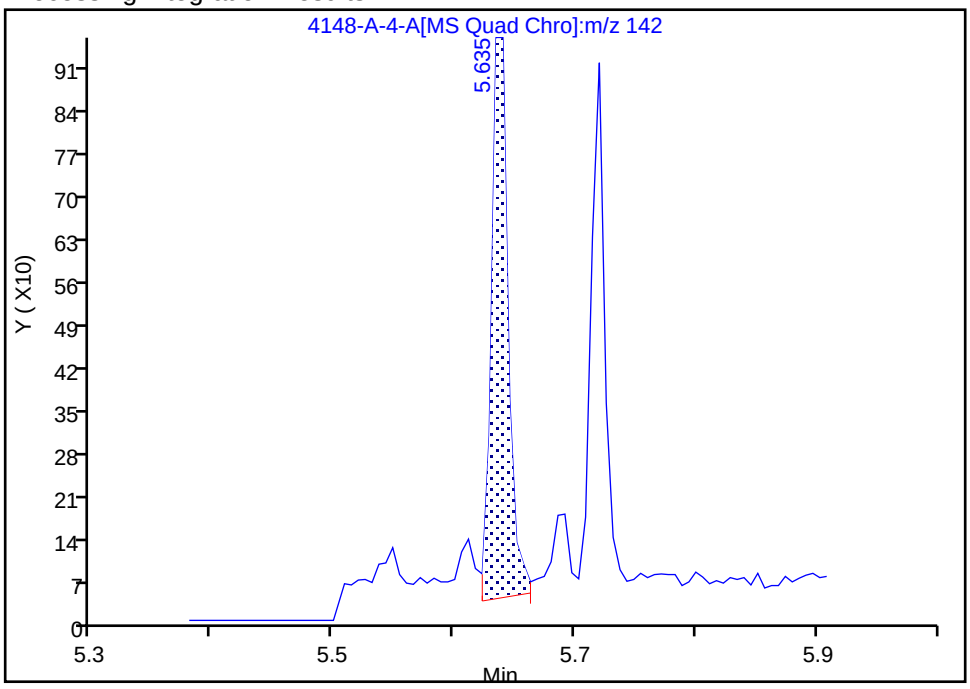
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-4-A.D				
Injection Date:	13-Nov-2023 22:55:07	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-4-A	Lab Sample ID:	140-34148-4		
Client ID:	1804576-851-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

16 2-Methylnaphthalene, CAS: 91-57-6

Signal: 1

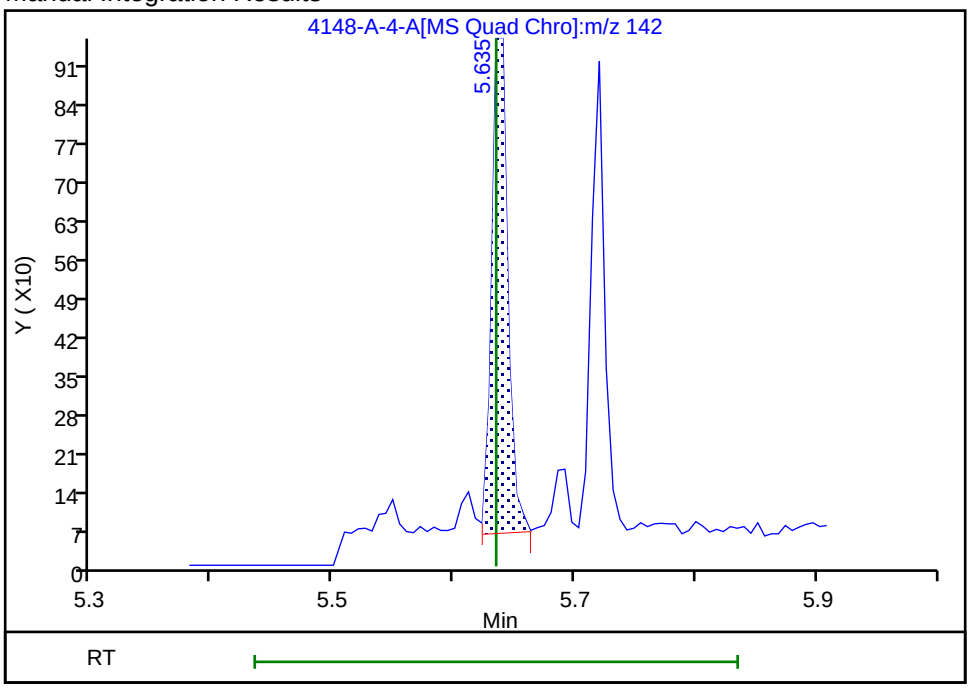
Processing Integration Results

RT: 5.63
Area: 900
Amount: 0.010720
Amount Units: ug/ml



Manual Integration Results

RT: 5.63
Area: 843
Amount: 0.010041
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 11:09:53 -05:00:00 (UTC)
Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

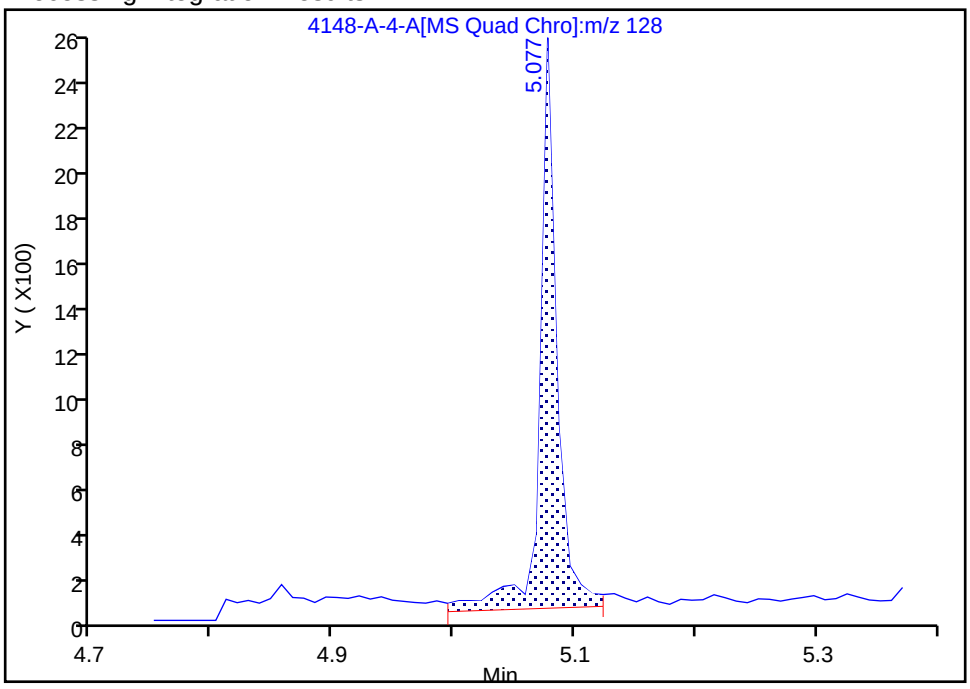
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-4-A.D				
Injection Date:	13-Nov-2023 22:55:07	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-4-A	Lab Sample ID:	140-34148-4		
Client ID:	1804576-851-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

12 Naphthalene, CAS: 91-20-3

Signal: 1

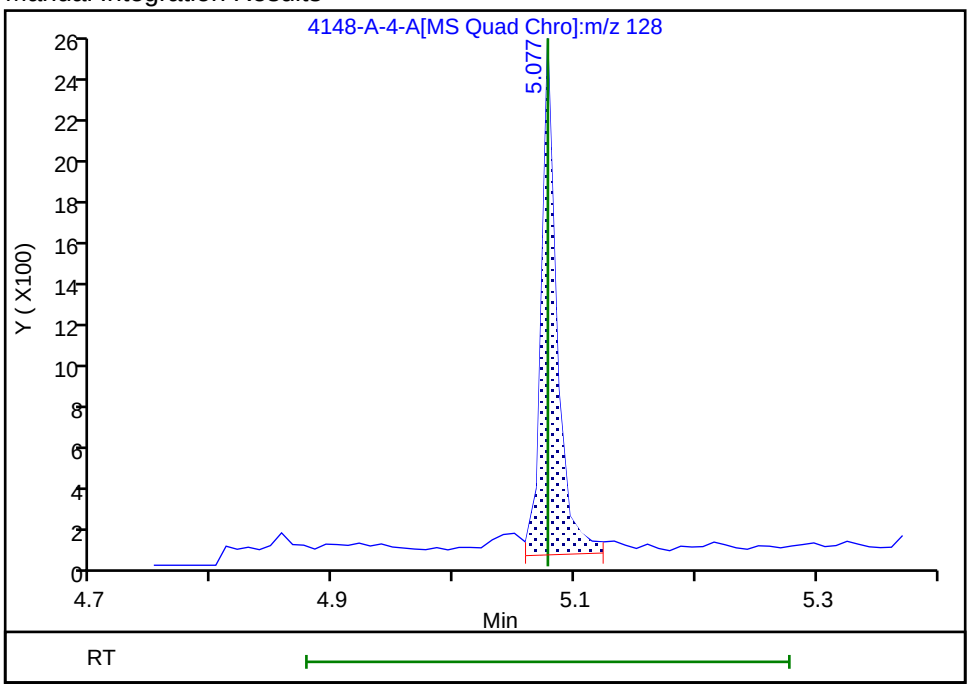
Processing Integration Results

RT: 5.08
Area: 2513
Amount: 0.021247
Amount Units: ug/ml



Manual Integration Results

RT: 5.08
Area: 2260
Amount: 0.019108
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 11:09:38 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

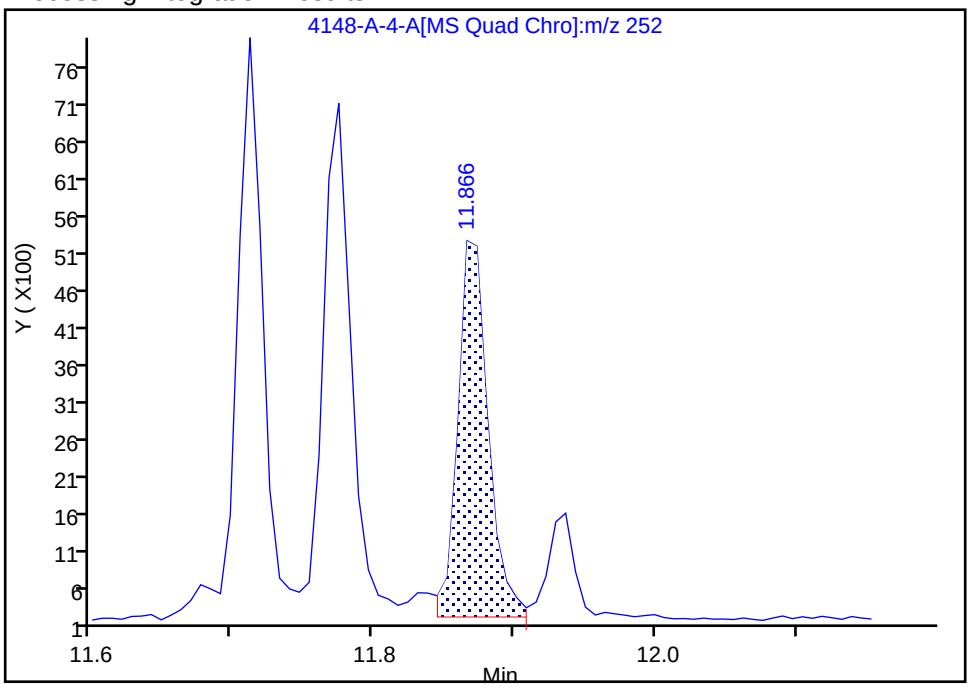
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-4-A.D				
Injection Date:	13-Nov-2023 22:55:07	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-4-A	Lab Sample ID:	140-34148-4		
Client ID:	1804576-851-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

61 Perylene, CAS: 198-55-0

Signal: 1

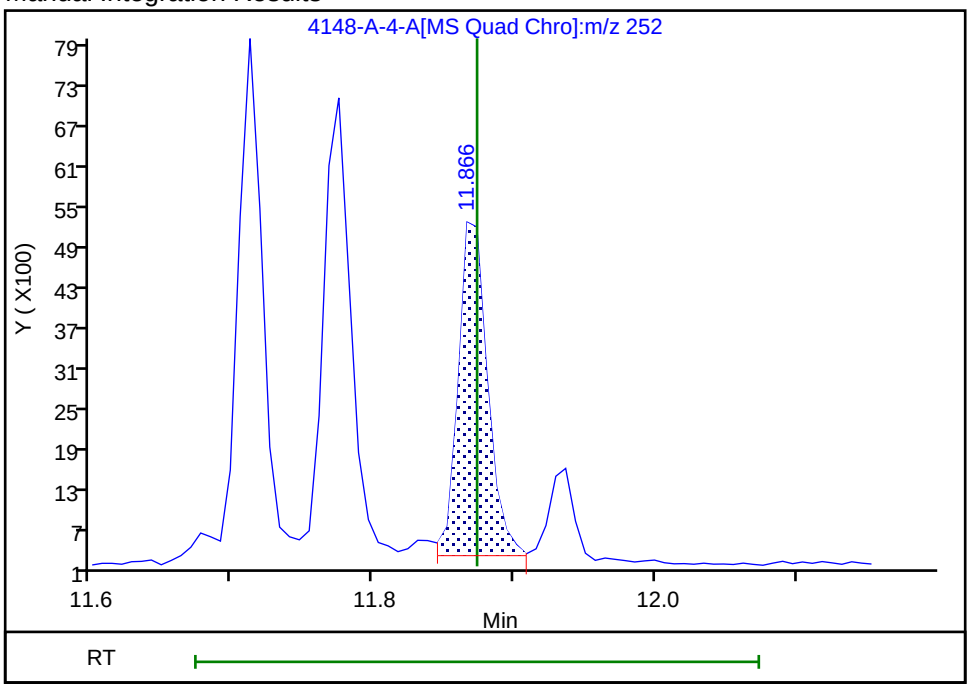
Processing Integration Results

RT: 11.87
Area: 7448
Amount: 0.030298
Amount Units: ug/ml



Manual Integration Results

RT: 11.87
Area: 7076
Amount: 0.028785
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 11:11:45 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

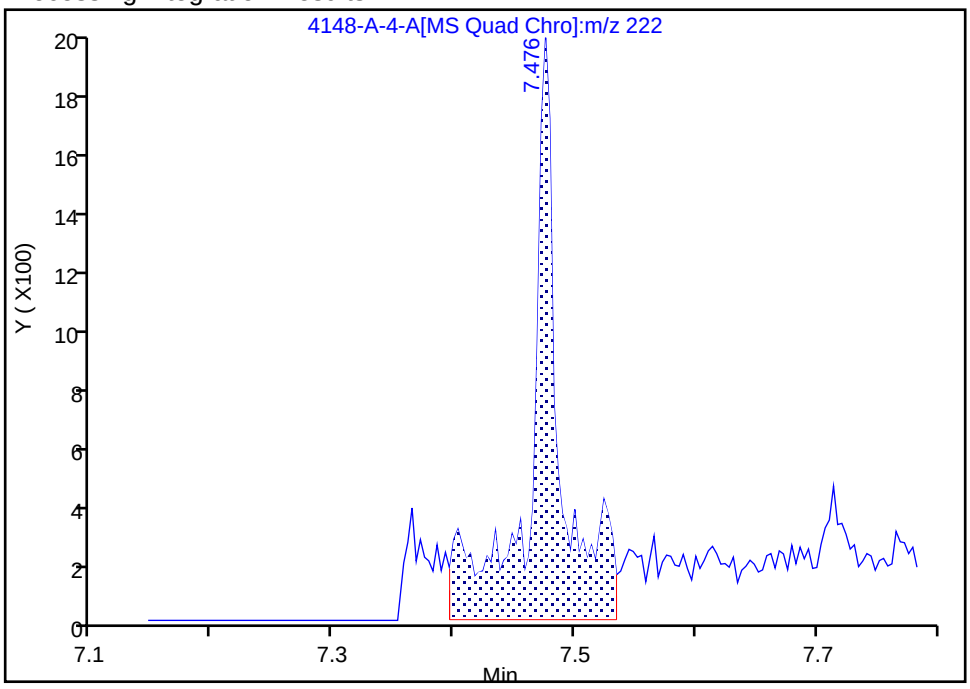
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\140-34148-A-4-A.D				
Injection Date:	13-Nov-2023 22:55:07	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-4-A	Lab Sample ID:	140-34148-4		
Client ID:	1804576-851-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

74 PCB-14, CAS: 34883-41-5

Signal: 1

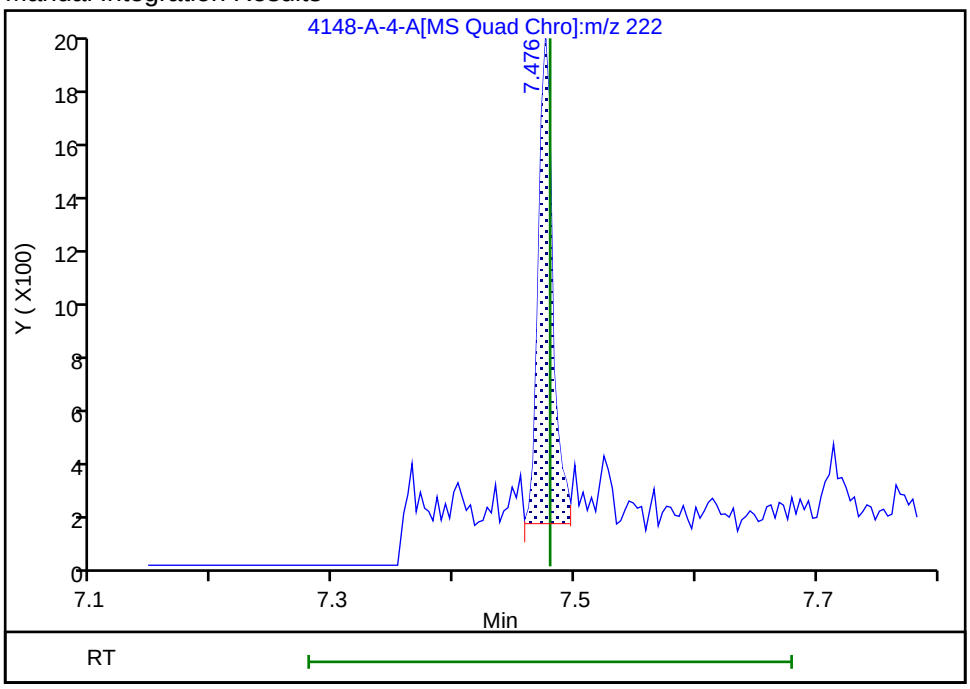
Processing Integration Results

RT: 7.48
Area: 3319
Amount: 0.017476
Amount Units: ug/ml



Manual Integration Results

RT: 7.48
Area: 1482
Amount: 0.007803
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 15:45:57 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: 1804576-851-S2 | Lab Sample ID: 140-34148-5

Matrix: PE | Lab File ID: 140-34148-A-5-C.D

Analysis Method: ID-0016 | Date Collected: 10/26/2023 14:00

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.012(g) | Date Analyzed: 11/17/2023 17:19

Con. Extract Vol.: 500(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80412 | Units: ng/g

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
83-32-9	Acenaphthene	8800000		330000	87000
208-96-8	Acenaphthylene	300000	J	330000	24000
120-12-7	Anthracene	6800000		330000	110000
56-55-3	Benzo[a]anthracene	2700000		330000	120000
50-32-8	Benzo[a]pyrene	2500000		330000	93000
205-99-2	Benzo[b]fluoranthene	1800000		330000	120000
192-97-2	Benzo[e]pyrene	1300000		330000	53000
191-24-2	Benzo[g,h,i]perylene	1300000		330000	37000
207-08-9	Benzo[k]fluoranthene	990000		330000	77000
218-01-9	Chrysene	3000000		330000	43000
53-70-3	Dibenz(a,h)anthracene	200000	J	330000	27000
206-44-0	Fluoranthene	6800000		330000	270000
86-73-7	Fluorene	3900000		330000	110000
193-39-5	Indeno[1,2,3-cd]pyrene	930000		330000	37000
90-12-0	1-Methylnaphthalene	3100000		1700000	170000
91-57-6	2-Methylnaphthalene	3400000		1700000	230000
91-20-3	Naphthalene	2000000	J	6700000	970000
198-55-0	Perylene	430000		330000	170000
85-01-8	Phenanthrene	17000000		670000	580000
129-00-0	Pyrene	11000000		670000	100000
STL00912	C1-Fluoranthenes/pyrene	4600000		330000	330000
STL00913	C1-Fluorenes	1500000		670000	430000
STL00914	C2-Fluorenes	800000		330000	330000
STL00915	C3-Fluorenes	ND		330000	330000
STL00917	C2-Naphthalenes	5200000		670000	670000
STL00918	C3-Naphthalenes	2600000		670000	670000
STL00919	C4-Naphthalenes	ND		1000000	930000
STL00901	C1-Phenanthrenes/Anthracenes	3900000		1300000	1100000
STL00902	C2-Phenanthrenes/Anthracenes	2500000		330000	330000
STL00903	C3-Phenanthrenes/Anthracenes	710000		330000	330000
STL00904	C4-Phenanthrenes/Anthracenes	ND		330000	330000
STL02218	C1-Chrysenes/Benz(a)anthracenes	1200000		330000	330000

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: 1804576-851-S2 | Lab Sample ID: 140-34148-5

Matrix: PE | Lab File ID: 140-34148-A-5-C.D

Analysis Method: ID-0016 | Date Collected: 10/26/2023 14:00

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.012(g) | Date Analyzed: 11/17/2023 17:19

Con. Extract Vol.: 500(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80412 | Units: ng/g

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
STL02219	C2-Chrysenes/Benz(a)anthracenes	ND		330000	330000
STL02220	C3-Chrysenes/Benz(a)anthracenes	ND		330000	330000
STL02221	C4-Chrysenes/Benz(a)anthracenes	ND		330000	330000
34883-41-5	PCB-14	ND		330000	3300
74472-51-8	PCB-192	ND		330000	3300
74472-48-3	PCB-184	ND		330000	3300
33979-03-2	PCB-155	ND		330000	3300
41411-61-4	PCB-142	ND		330000	3300
74472-52-9	PCB-204	ND		330000	3300
56558-16-8	PCB-104	ND		330000	3300
56558-18-0	PCB-121	ND		330000	3300
70362-49-1	PCB-78	ND		330000	3300
38444-87-0	PCB-36	ND		330000	3300

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
93951-97-4	Acenaphthylene-d8	114		30-120
1719-06-8	Anthracene-d10	106		30-120
63466-71-7	Benzo(a)pyrene-d12	114		30-120
93951-98-5	Benzo(b)fluoranthene-d12	110		30-120
93951-66-7	Benzo(ghi)perylene-d12	110		30-120
93952-01-3	Benzo(k)fluoranthene-d12	108		30-120
1719-03-5	Chrysene-d12	104		30-120
13250-98-1	Dibenz(a,h)anthracene-d14	107		30-120
93951-69-0	Fluoranthene-d10	107		30-120
81103-79-9	Fluorene -d10	108		30-120
203578-33-0	Indeno[1,2,3-cd]pyrene-d12	110		30-120
38072-94-5	1-Methylnaphthalene-d10	111		30-120
7297-45-2	2-Methylnaphthalene-d10	112		30-120
1146-65-2	Naphthalene-d8	112		30-120
1520-96-3	Perylene-d12	112		30-120
1517-22-2	Phenanthrene-d10	113		30-120

Report Date: 22-Nov-2023 14:37:44 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D
Lims ID: 140-34148-A-5-C
Client ID: 1804576-851-S2
Sample Type: Client
Inject. Date: 17-Nov-2023 17:19:36 ALS Bottle#: 0 Worklist Smp#: 11
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030536-011
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 22-Nov-2023 14:37:42 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1637

First Level Reviewer: SK9U Date: 20-Nov-2023 09:33:00

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/ml	%Rec	Flags
D 10 Naphthalene-d8	136	5.059	5.068	-0.009	99	48794	0.5608	112	
11 Naphthalene	128	5.078	5.077	0.001	24	13948	0.1218		
D 15 2-methylnaphthalene-d10	152	5.606	5.612	-0.006	91	31854	0.5630	112	
16 2-Methylnaphthalene	142	5.635	5.635	0.000	100	15938	0.2016		
D 17 1-Methylnaphthalene-d10	152	5.686	5.686	0.000	100	31620	0.5578	111	
18 1-Methylnaphthalene	142	5.715	5.715	0.000	95	14147	0.1848		
D 23 Acenaphthylene-d8	160	6.367	6.361	0.006	90	54878	0.5715	114	
24 Acenaphthylene	152	6.377	6.377	0.001	65	2348	0.0182		
* 26 Acenaphthene-d10	164	6.492	6.492	0.000	98	31288	0.5013		
27 Acenaphthene	154	6.517	6.517	0.000	97	43512	0.5279		
D 29 Fluorene -d10	176	6.925	6.925	0.000	98	40428	0.5436	108	
30 Fluorene	166	6.945	6.950	0.000	99	24589	0.2347		
D 35 Phenanthrene-d10	188	7.732	7.732	0.000	99	69147	0.5664	113	
36 Phenanthrene	178	7.752	7.749	0.003	36	168095	1.01		
D 38 Anthracin-d10	188	7.780	7.776	0.004	99	63589	0.5336	106	M
39 Anthracene	178	7.794	7.794	0.000	100	64083	0.4103		
D 41 Fluoranthene-d10	212	8.808	8.805	0.003	99	85231	0.5382	107	
43 Fluoranthene	202	8.825	8.825	0.000	37	89133	0.4097		
* 44 Pyrene-d10 (IS)	212	9.027	9.027	0.000	98	78476	0.5013		
45 Pyrene	202	9.044	9.044	0.000	100	142936	0.6438		
47 Benzo[a]anthracene	228	10.260	10.260	0.001	91	32805	0.1597		
D 48 Chrysene-d12	240	10.270	10.270	0.000	98	79306	0.5192	104	
50 Chrysene	228	10.300	10.295	0.005	24	41324	0.1795		
D 52 Benzo(b)fluoranthene-d12	264	11.376	11.376	0.000	100	64842	0.5490	110	
53 Benzo[b]fluoranthene	252	11.404	11.397	0.007	22	23201	0.1065		M
D 54 Benzo(k)fluoranthene-d12	264	11.411	11.404	0.007	73	75322	0.5428	108	M
55 Benzo[k]fluoranthene	252	11.418	11.425	-0.007	100	13046	0.0593		M
* 56 Benzo(e)pyrene-d12	264	11.684	11.684	0.000	99	46752	0.5013		
57 Benzo[e]pyrene	252	11.712	11.712	0.000	100	15328	0.0768		
D 58 Benzo(a)pyrene-d12	264	11.747	11.747	0.000	100	59384	0.5733	114	
59 Benzo[a]pyrene	252	11.775	11.775	0.000	100	29114	0.1486		
D 60 Perylene-d12	264	11.845	11.845	0.000	99	64449	0.5606	112	

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/ml	%Rec	Flags
61 Perylene	252	11.873	11.866	0.000	100	4710	0.0256		M
D 62 Indeno[1,2,3-cd]pyrene-d12	288	13.196	13.186	0.010	85	61987	0.5508	110	
D 63 Dibenz(a,h)anthracene-d14	292	13.205	13.196	0.009	86	54165	0.5380	107	
65 Indeno[1,2,3-cd]pyrene	276	13.224	13.224	0.000	34	11526	0.0557		
66 Dibenz(a,h)anthracene	278	13.243	13.233	0.009	0	2113	0.0122		M
D 67 Benzo(ghi)perylene-d12	288	13.552	13.552	0.000	100	61704	0.5521	110	M
68 Benzo[g,h,i]perylene	276	13.580	13.561	0.000	91	13937	0.0773		
* 82 PCB-167L	372	10.026	10.027	-0.001	70	12406	0.4000		
A 86 C2-Naphthalenes	156	6.095	(6.068-6.407)		0	35659	0.3115		
A 87 C3-Naphthalenes	170	6.709	(6.348-7.050)		0	17648	0.1542		
A 88 C4-Naphthalenes	184	7.110	(6.678-7.562)		0	5440	0.0475		
A 89 C1-Fluorenes	180	7.403	(7.364-7.505)		0	9562	0.0913		
A 90 C2-Fluorenes	194	7.832	(7.730-8.069)		0	5058	0.0483		
A 96 C1-Phenanthrenes/Anthracenes	191	8.237	(8.155-8.332)		0	38534	0.2316		
A 97 C2-Phenanthrenes/Anthracenes	206	8.712	(8.490-8.926)		0	25295	0.1520		
A 98 C3-Phenanthrenes/Anthracenes	220	9.148	(8.851-9.456)		0	7125	0.0428		
A 100 C1-Fluoranthenes/pyrene	216	9.461	(9.246-9.640)		0	61456	0.2768		
A 101 C1-Chrysenes/Benz(a)anthracenes	242	10.686	(10.456-10.941)		0	16872	0.0733		

QC Flag Legend

Processing Flags

Review Flags

M - Manually Integrated

Reagents:

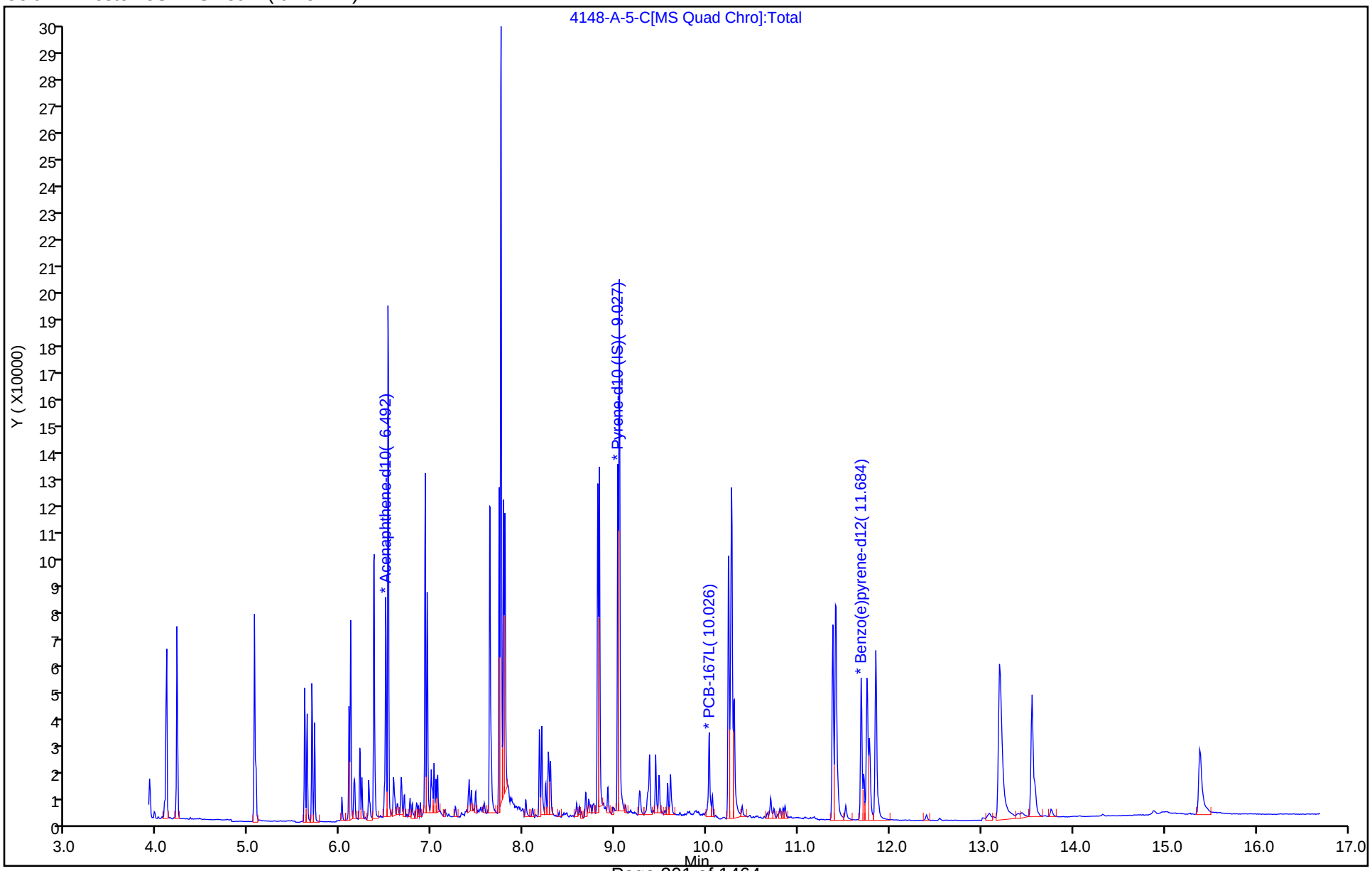
60ISPCB_00001 Amount Added: 50.00 Units: uL

Report Date: 22-Nov-2023 14:37:44 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D				
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5	Worklist Smp#:	11
Client ID:	1804576-851-S2				
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



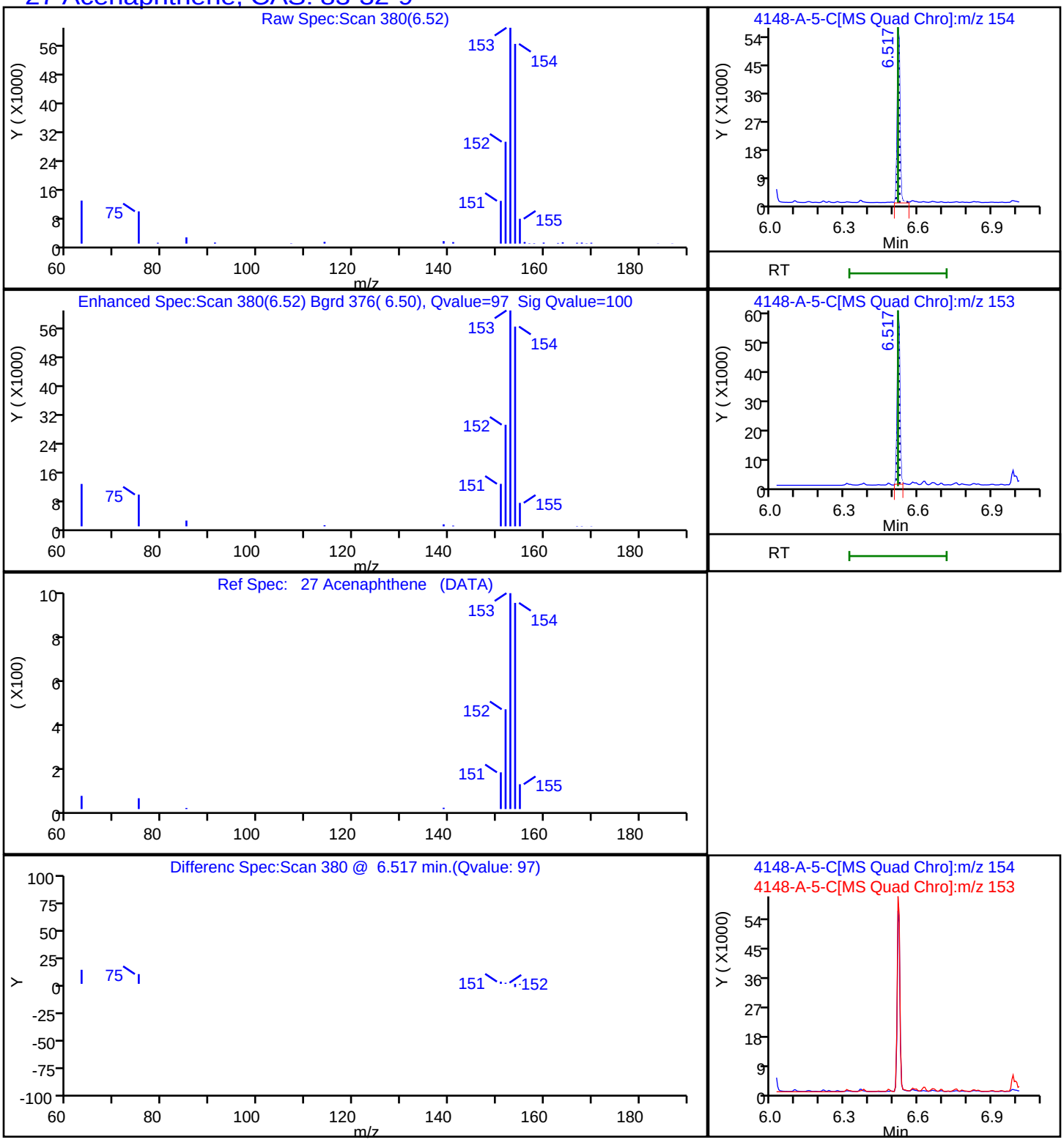
Report Date: 22-Nov-2023 14:37:44 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D

Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

27 Acenaphthene, CAS: 83-32-9



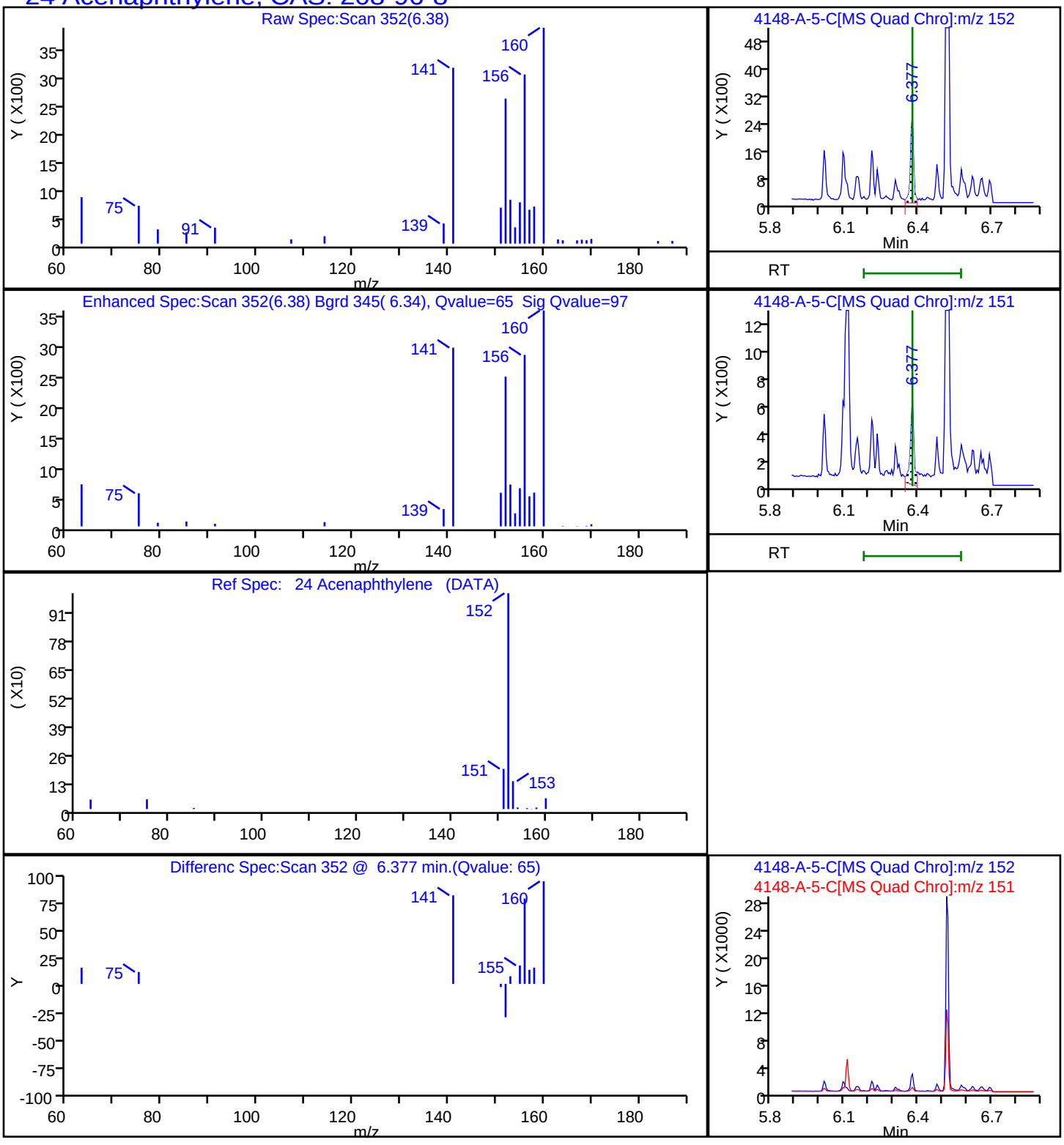
Report Date: 22-Nov-2023 14:37:44 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D

Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5
Client ID:	1804576-851-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

24 Acenaphthylene, CAS: 208-96-8



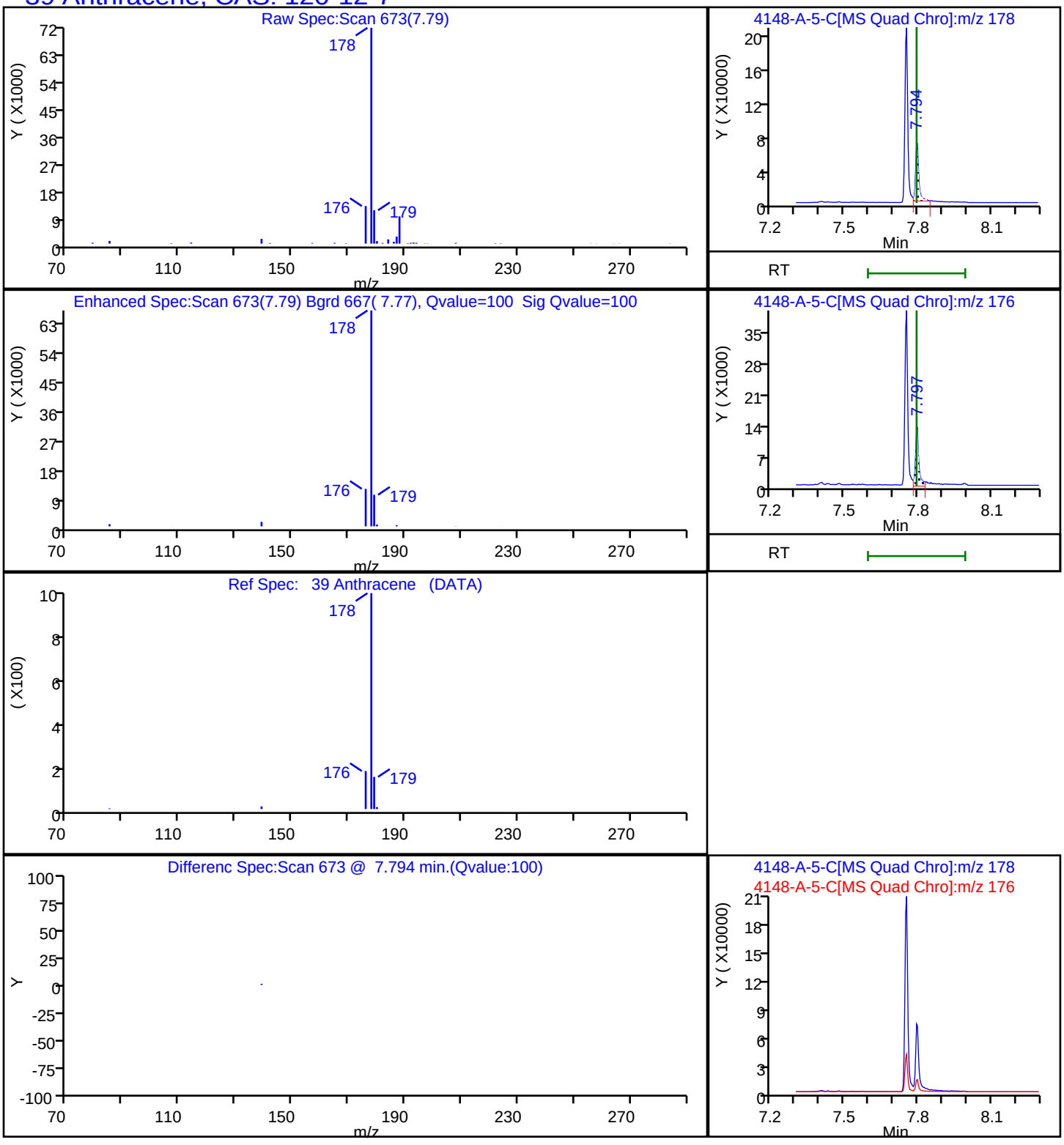
Report Date: 22-Nov-2023 14:37:44 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D

Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5
Client ID:	1804576-851-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

39 Anthracene, CAS: 120-12-7

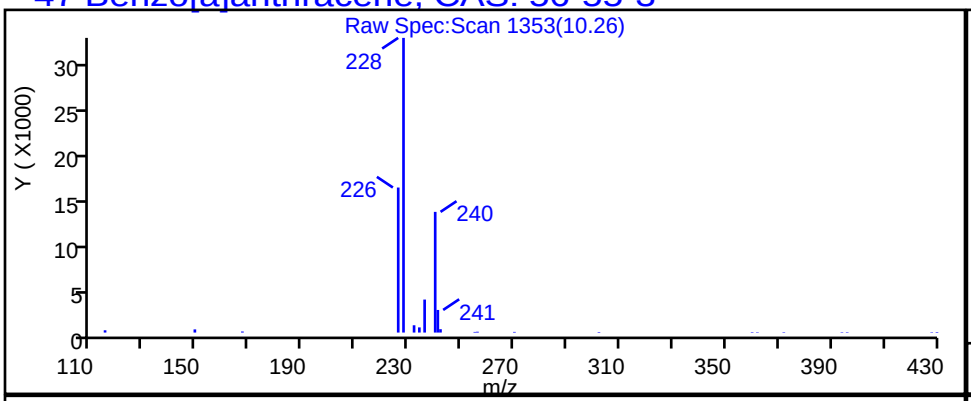


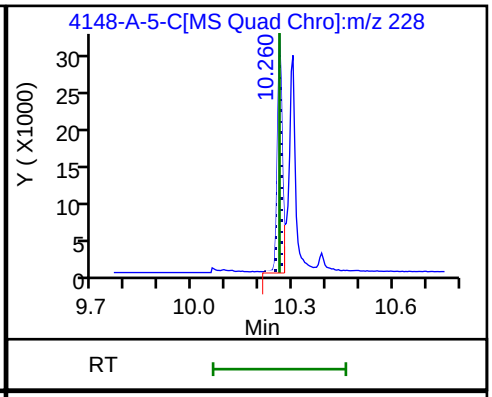
Report Date: 22-Nov-2023 14:37:44 Chrom Revision: 2.3 15-Nov-2023 20:54:34

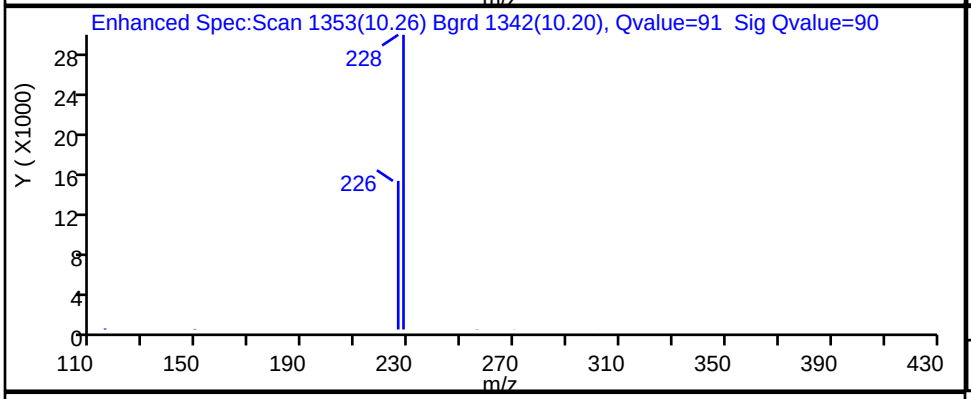
Eurofins Knoxville

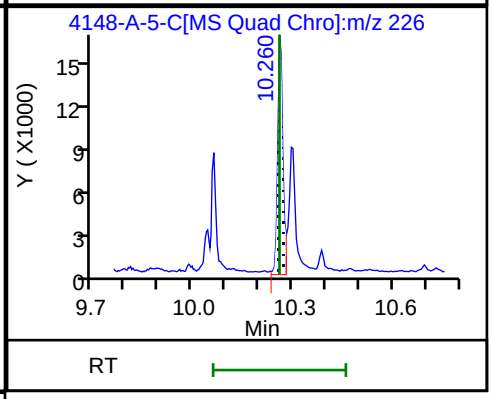
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D		
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5
Client ID:	1804576-851-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

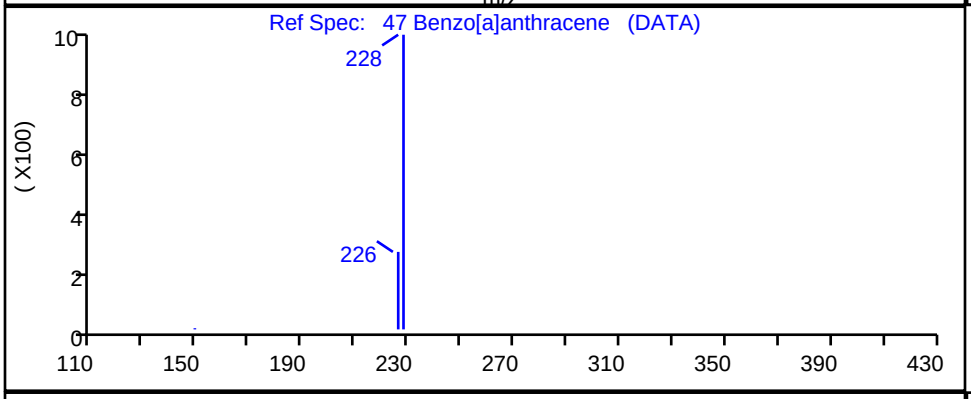
47 Benzo[a]anthracene, CAS: 56-55-3

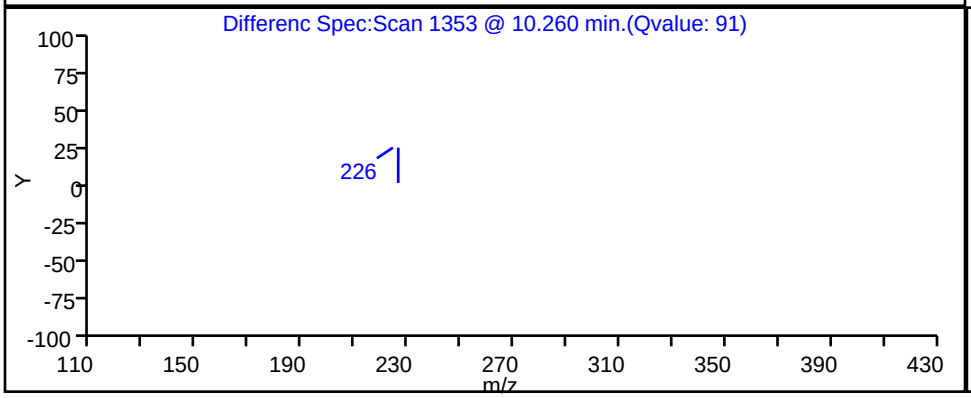


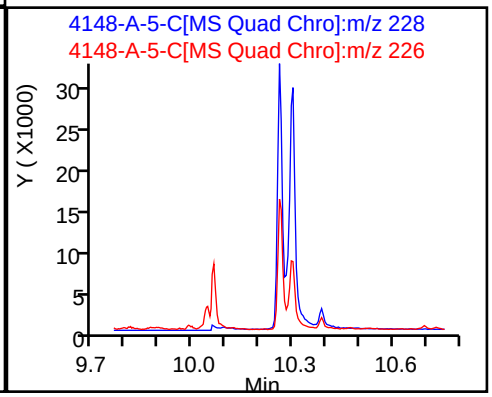












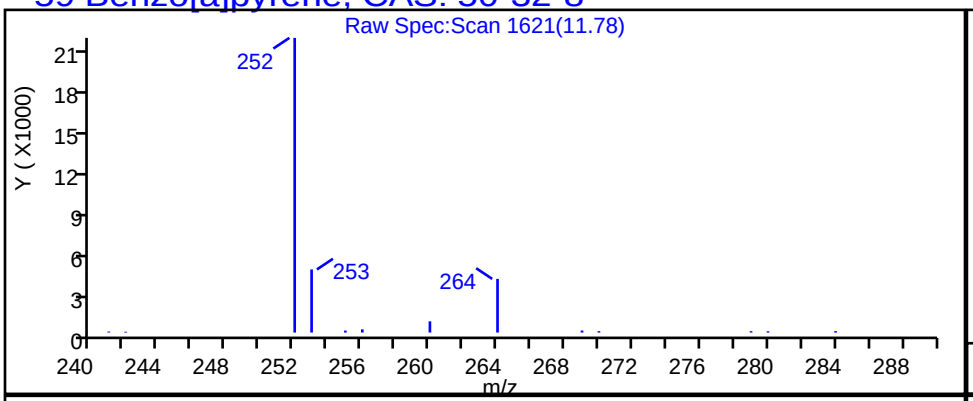
Report Date: 22-Nov-2023 14:37:45 Chrom Revision: 2.3 15-Nov-2023 20:54:34

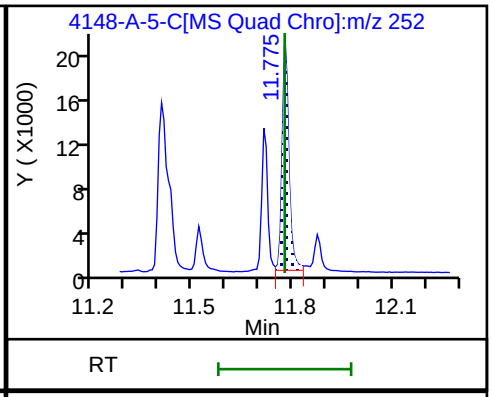
Eurofins Knoxville

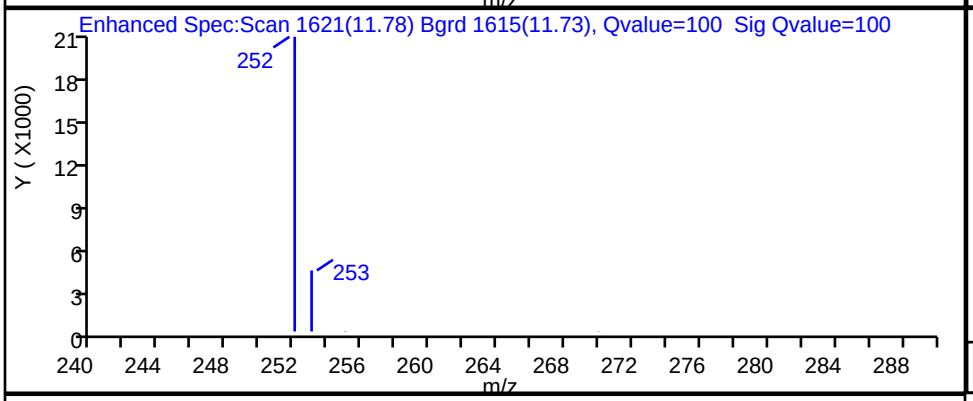
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D

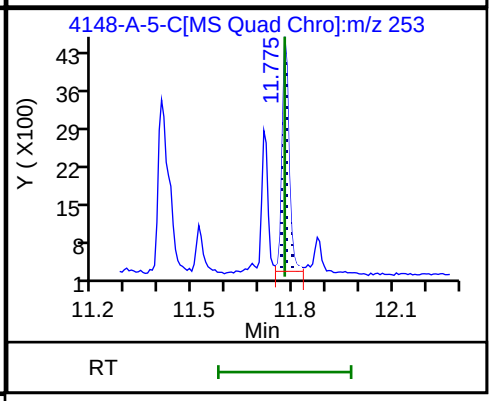
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5
Client ID:	1804576-851-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

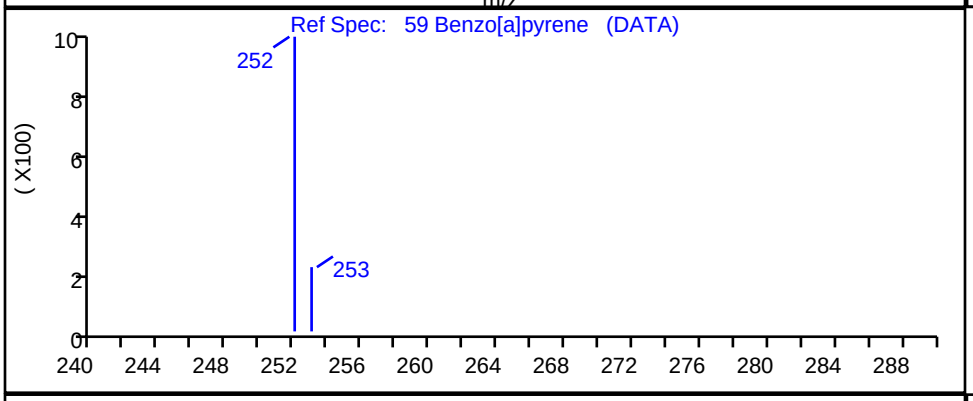
59 Benzo[a]pyrene, CAS: 50-32-8

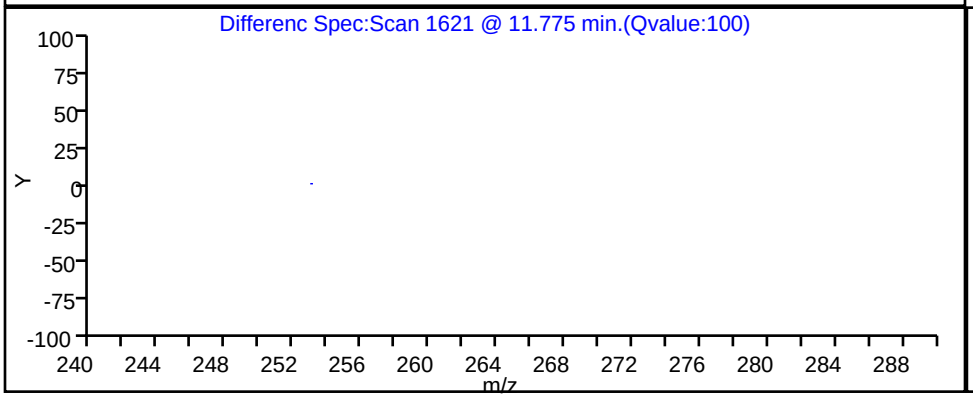


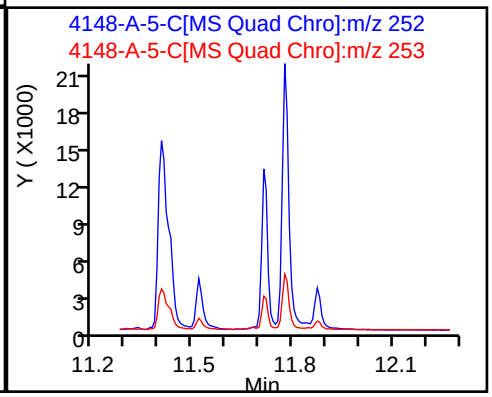










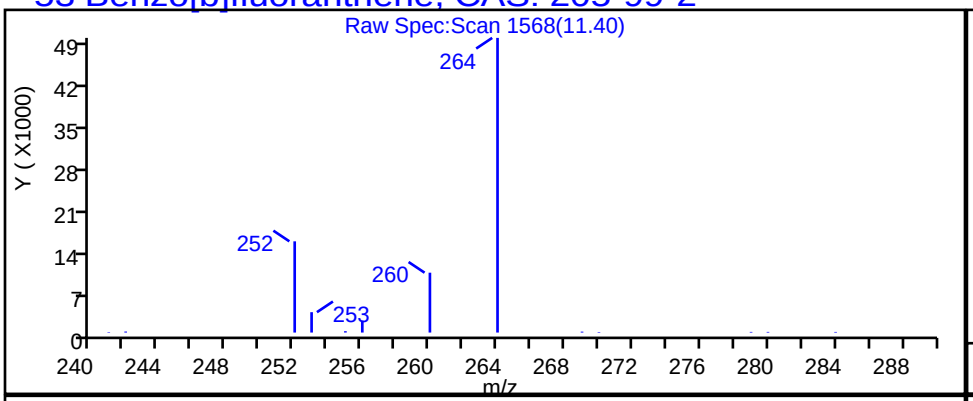


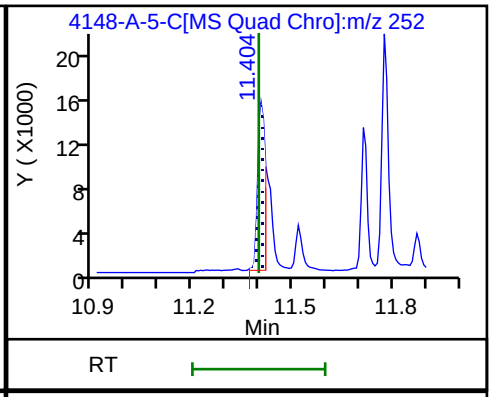
Report Date: 22-Nov-2023 14:37:44 Chrom Revision: 2.3 15-Nov-2023 20:54:34

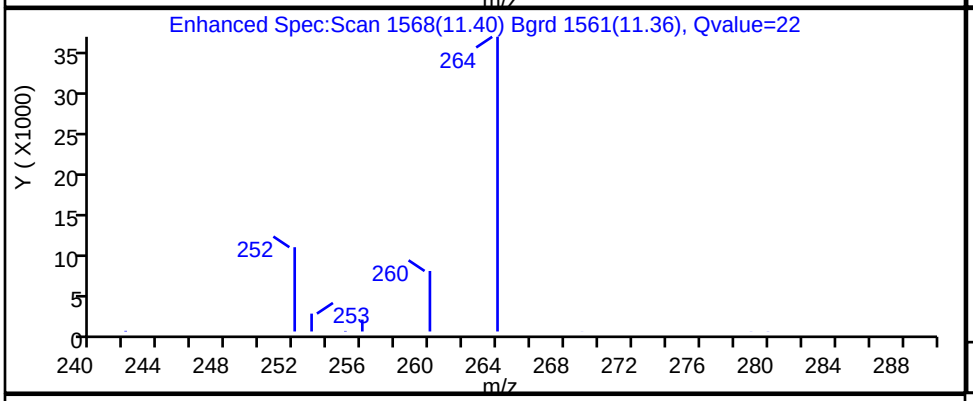
Eurofins Knoxville

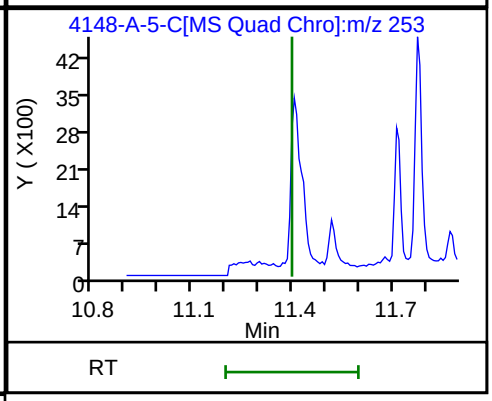
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D		
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5
Client ID:	1804576-851-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

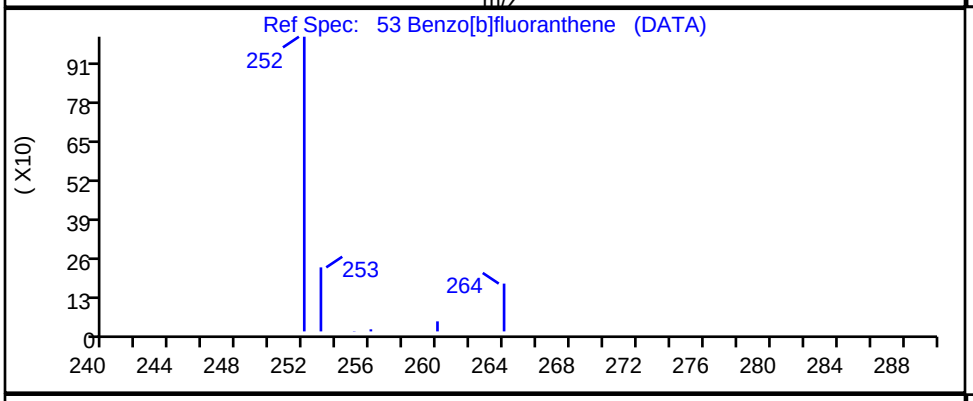
53 Benzo[b]fluoranthene, CAS: 205-99-2

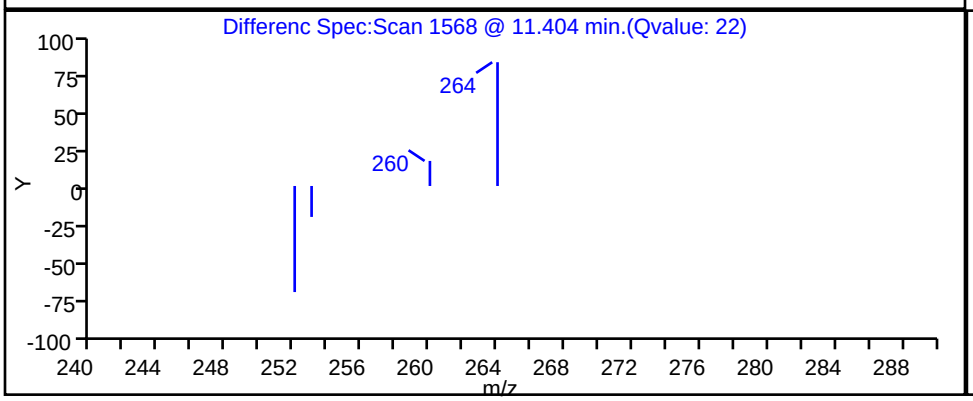


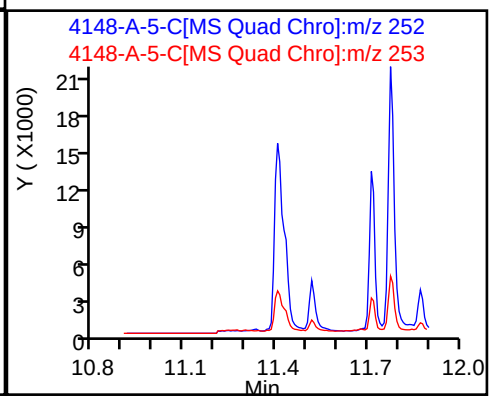












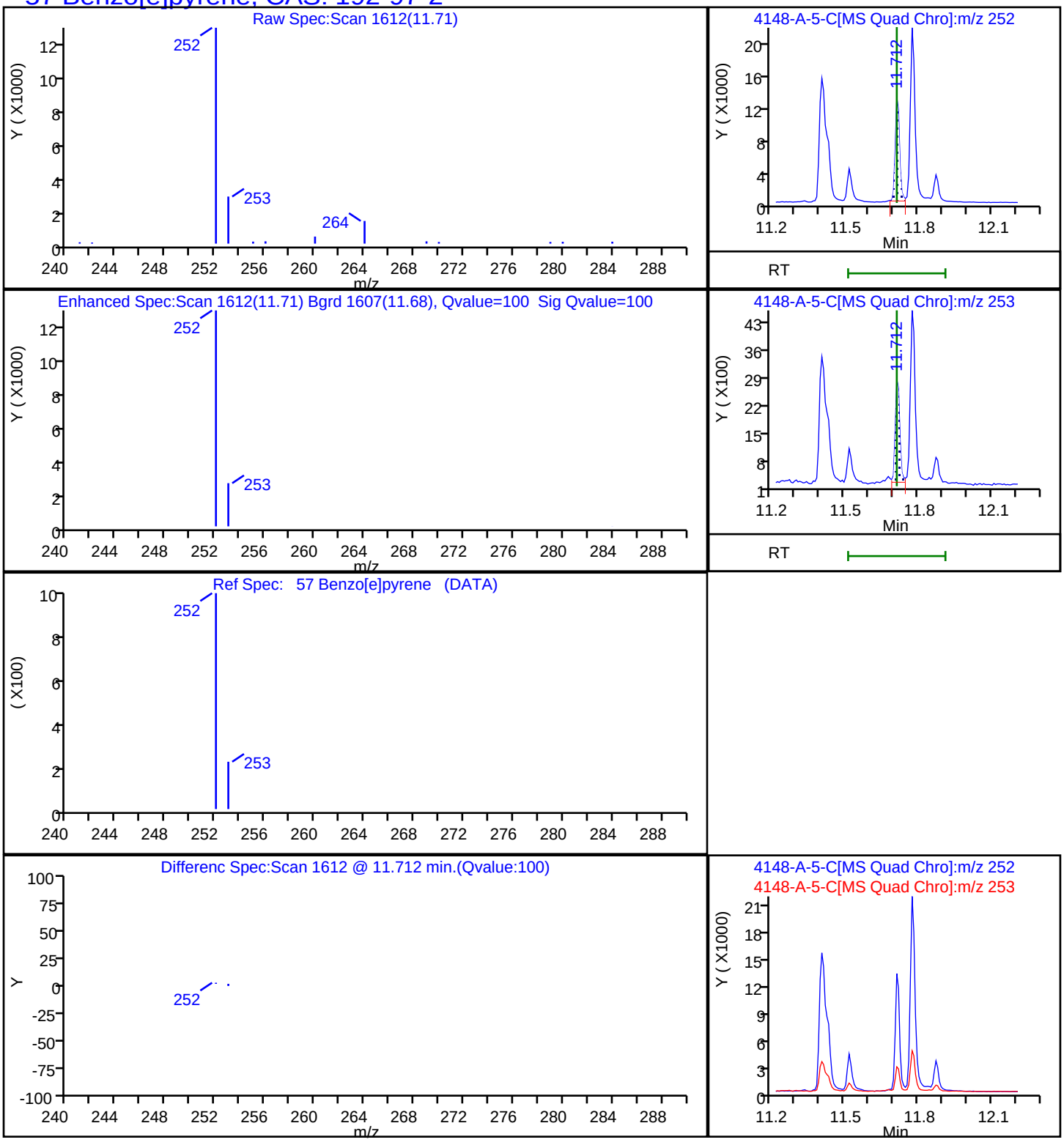
Report Date: 22-Nov-2023 14:37:44 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D

Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5
Client ID:	1804576-851-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

57 Benzo[e]pyrene, CAS: 192-97-2

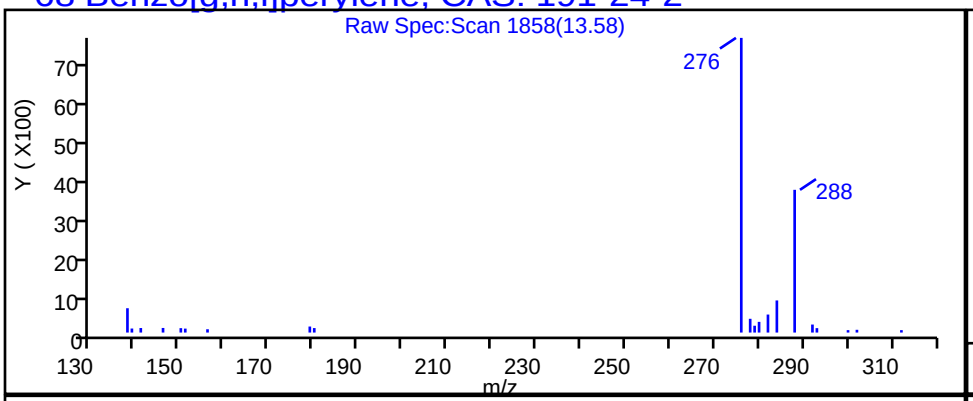


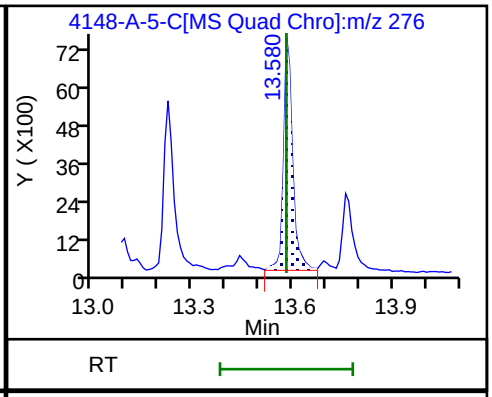
Report Date: 22-Nov-2023 14:37:45 Chrom Revision: 2.3 15-Nov-2023 20:54:34

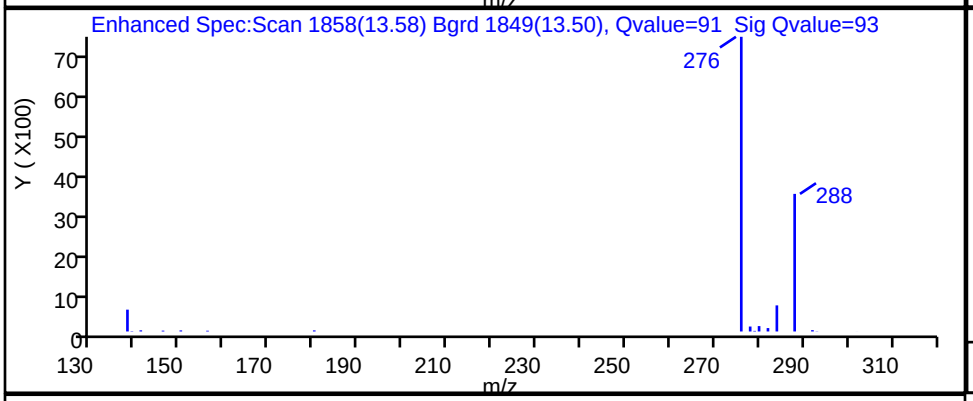
Eurofins Knoxville

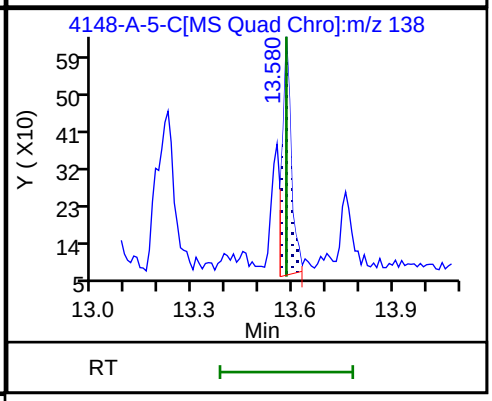
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D				
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

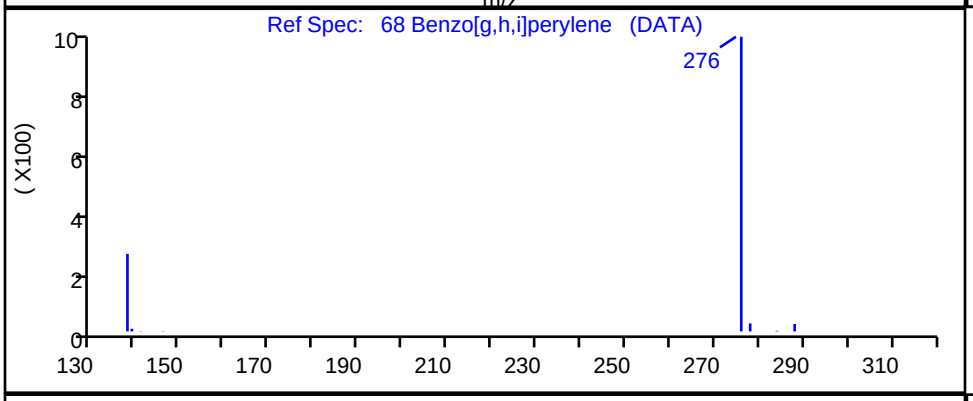
68 Benzo[g,h,i]perylene, CAS: 191-24-2

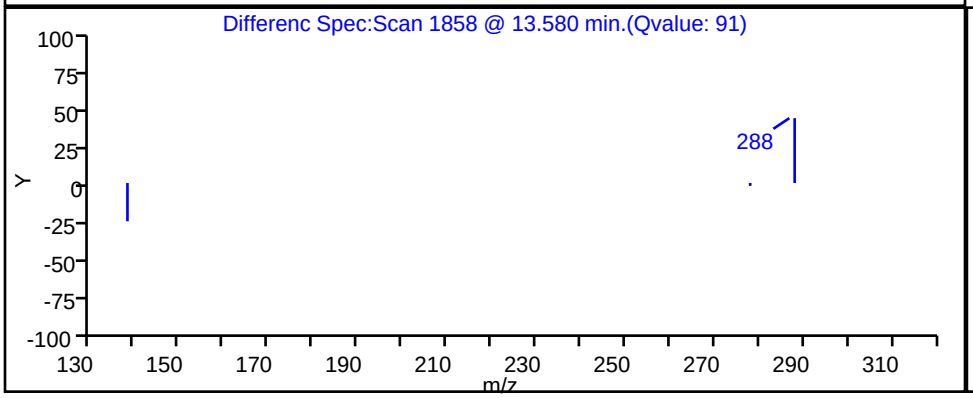


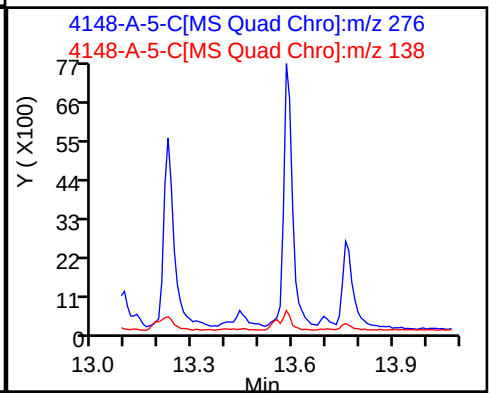










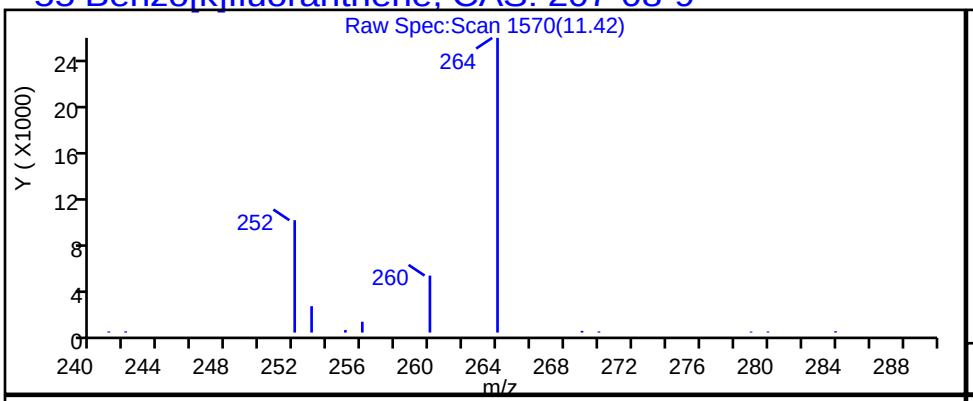


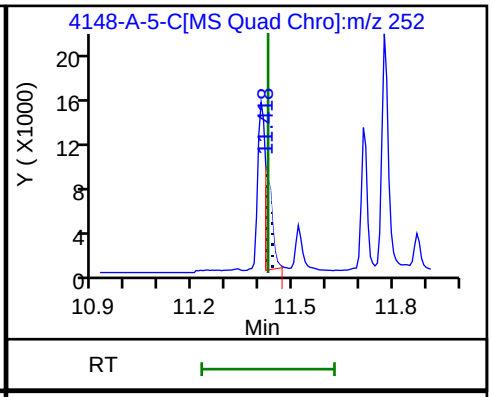
Report Date: 22-Nov-2023 14:37:44 Chrom Revision: 2.3 15-Nov-2023 20:54:34

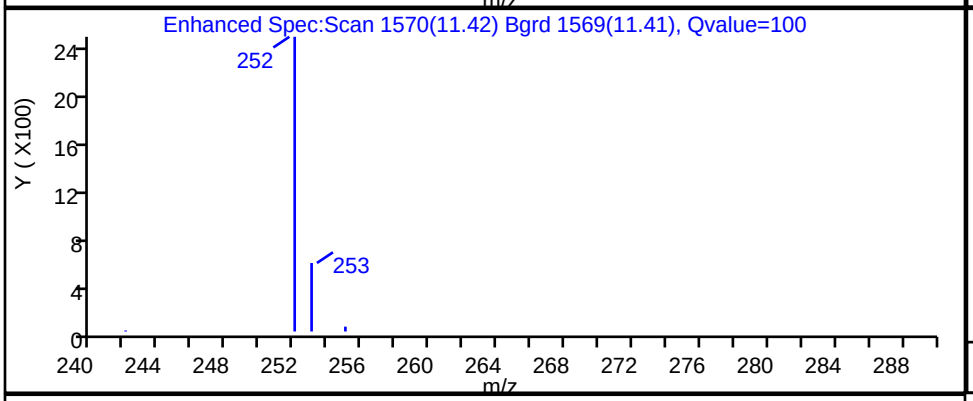
Eurofins Knoxville

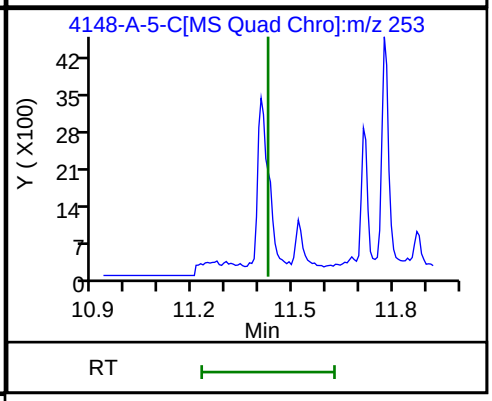
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D		
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5
Client ID:	1804576-851-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

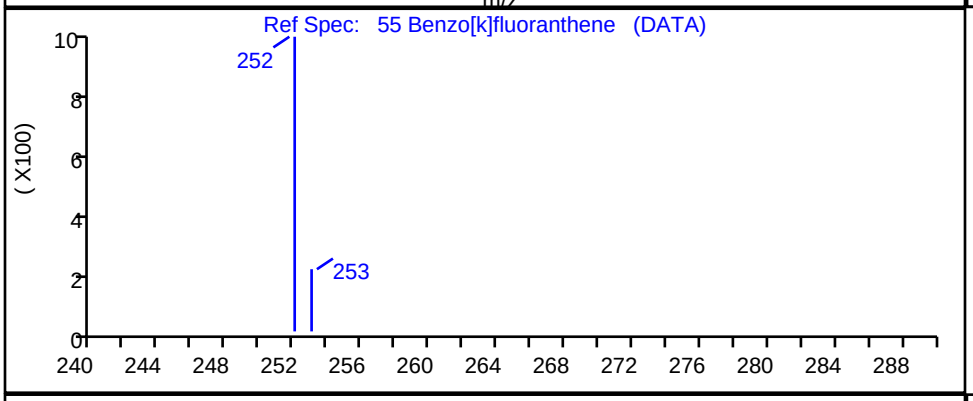
55 Benzo[k]fluoranthene, CAS: 207-08-9

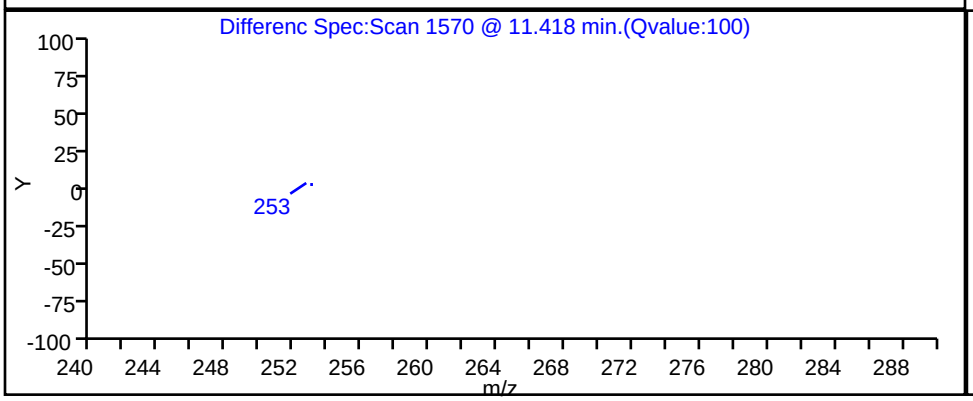


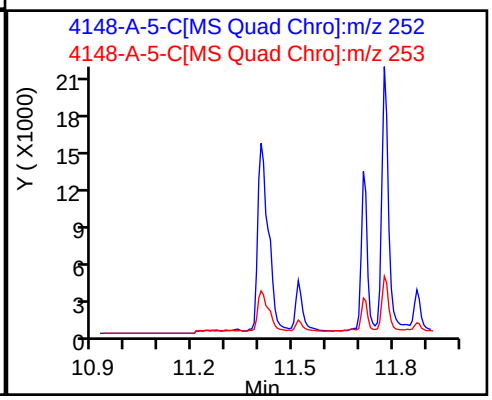












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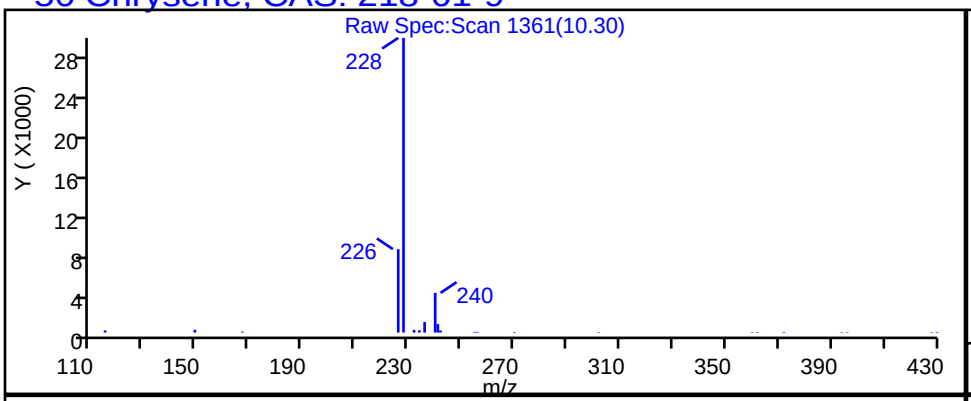
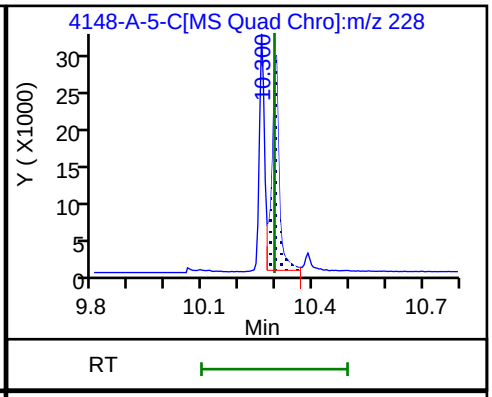
Eurofins Knoxville

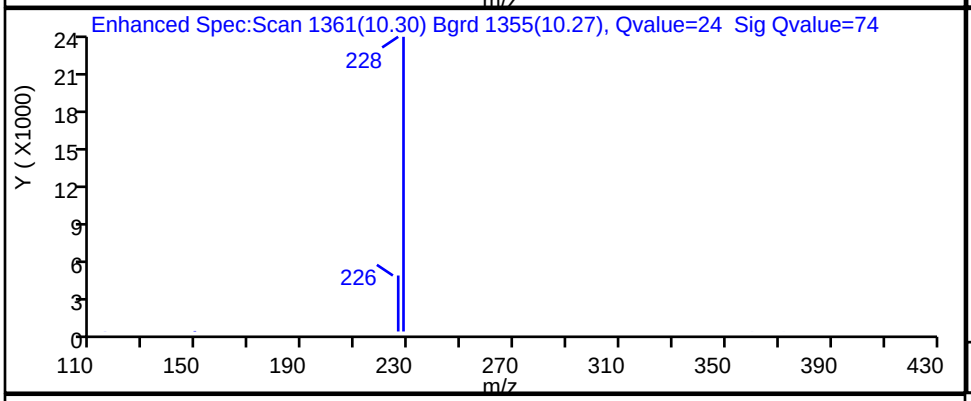
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D

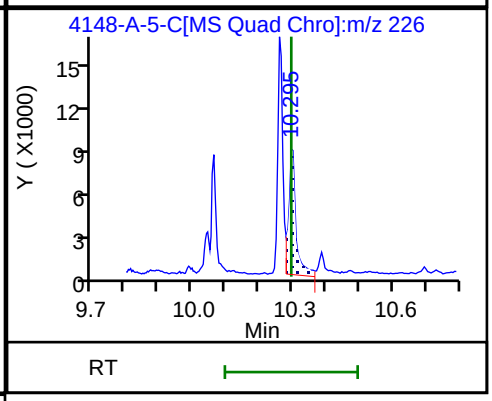
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

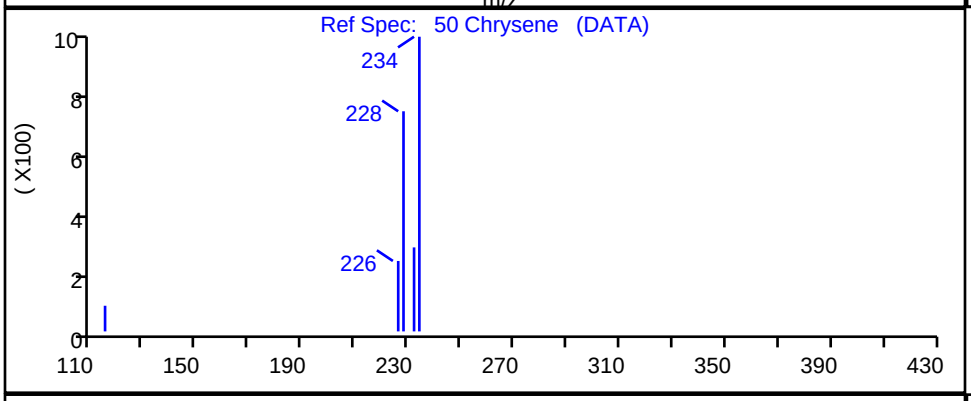
50 Chrysene, CAS: 218-01-9

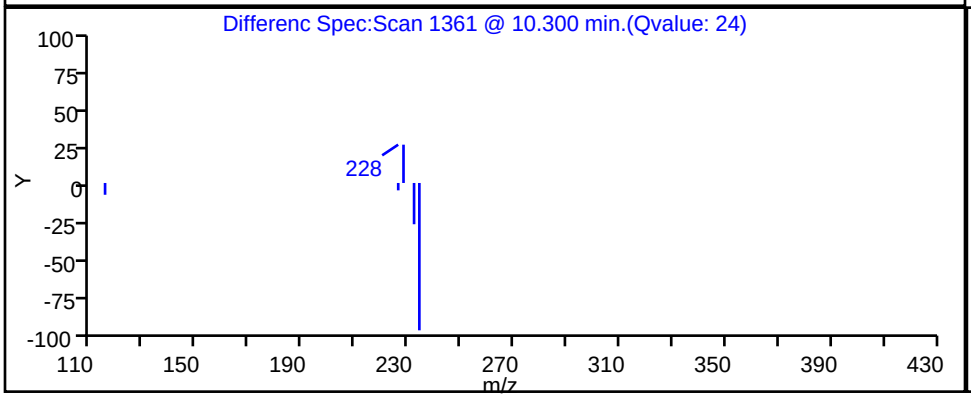


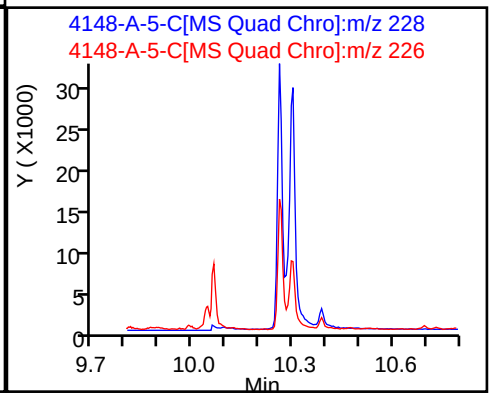












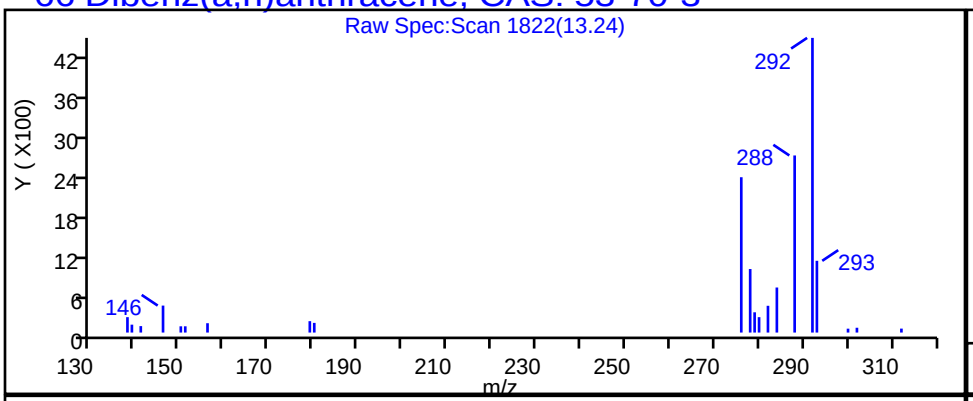
Report Date: 22-Nov-2023 14:37:45 Chrom Revision: 2.3 15-Nov-2023 20:54:34

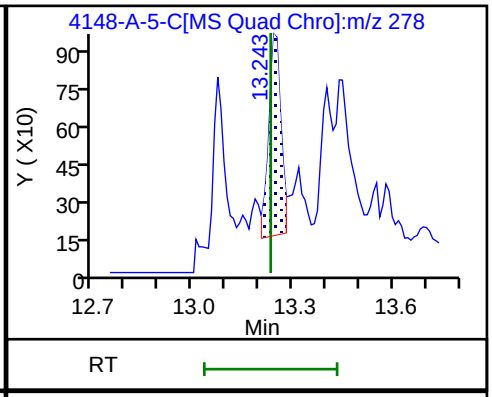
Eurofins Knoxville

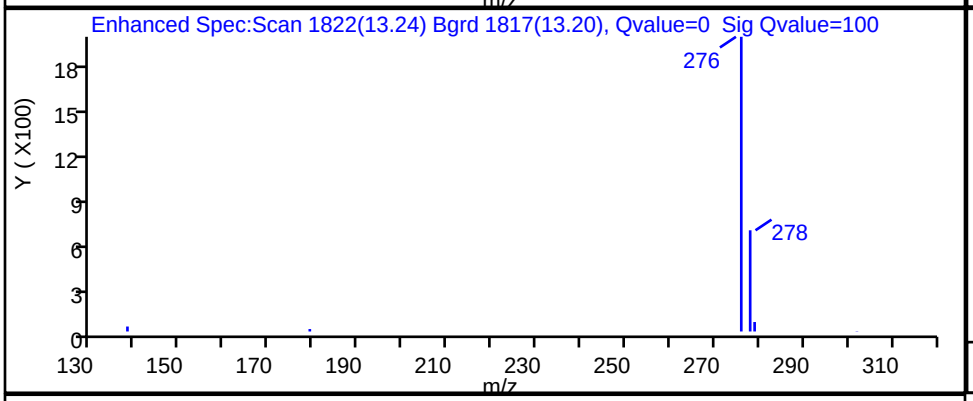
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D

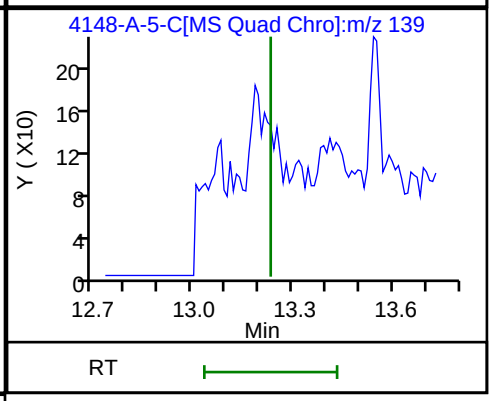
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5
Client ID:	1804576-851-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

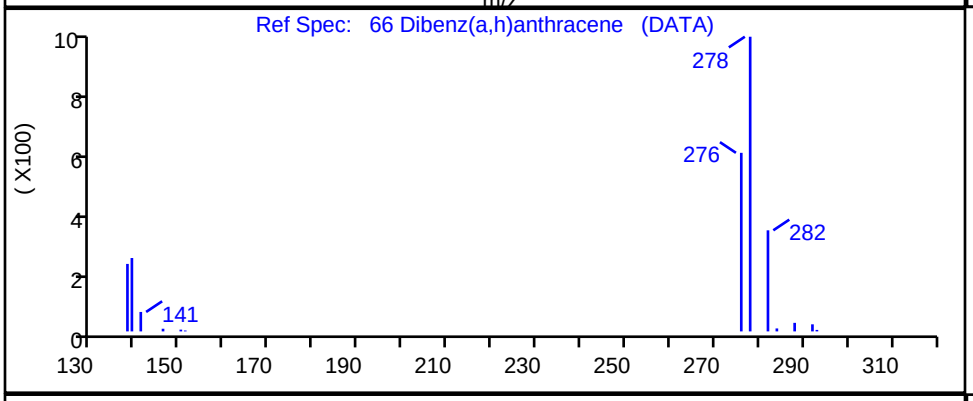
66 Dibenz(a,h)anthracene, CAS: 53-70-3

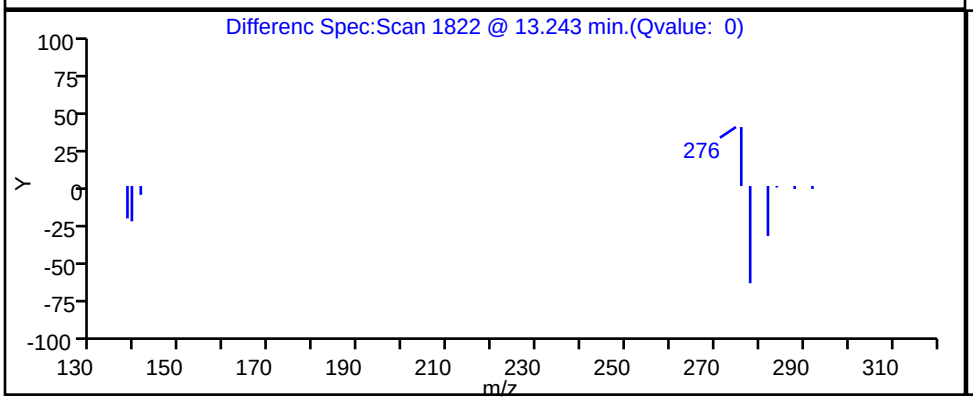


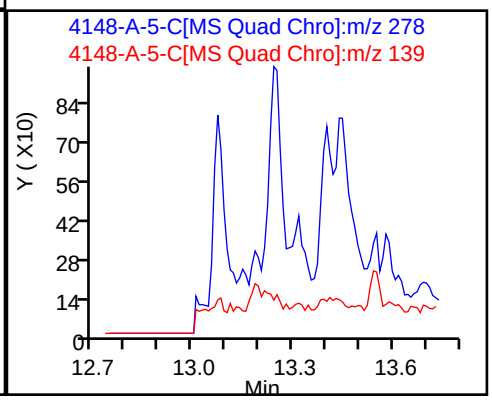












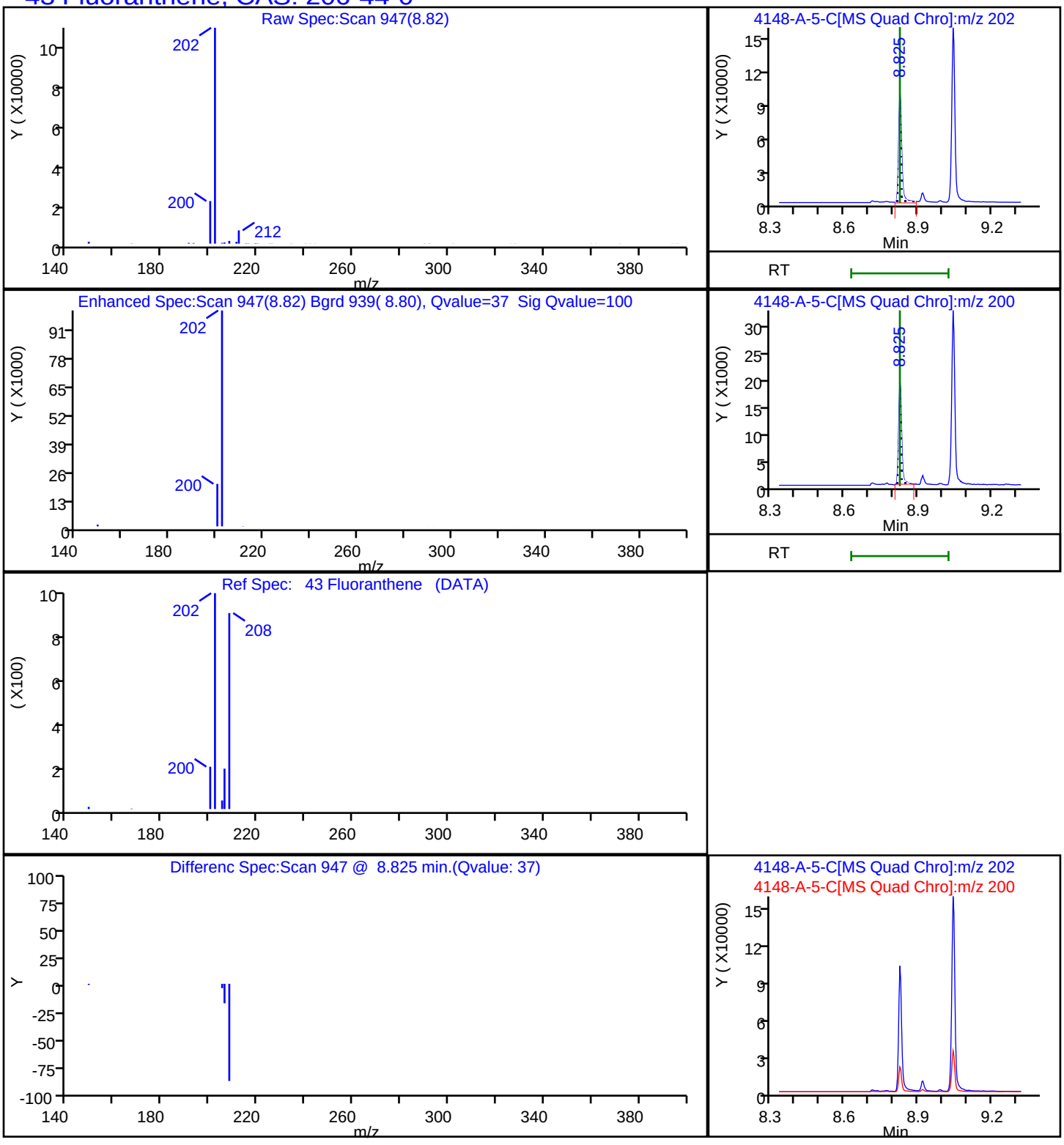
Report Date: 22-Nov-2023 14:37:44 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D

Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5
Client ID:	1804576-851-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

43 Fluoranthene, CAS: 206-44-0



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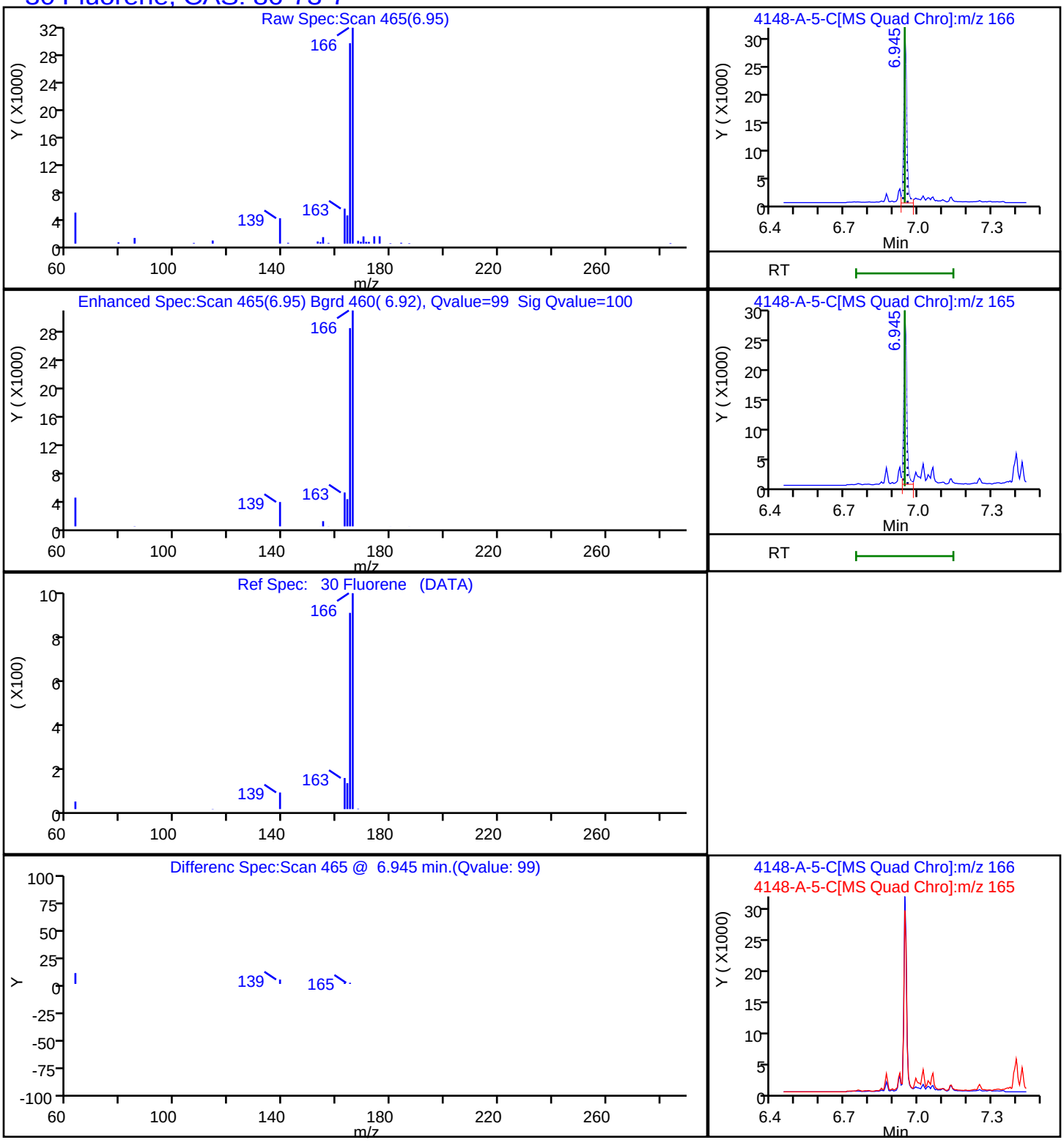
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D

Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5
Client ID:	1804576-851-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

30 Fluorene, CAS: 86-73-7



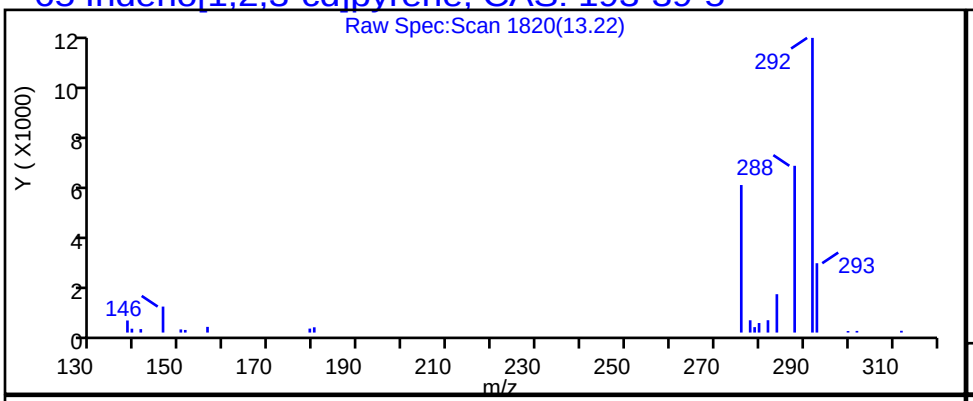
Report Date: 22-Nov-2023 14:37:45 Chrom Revision: 2.3 15-Nov-2023 20:54:34

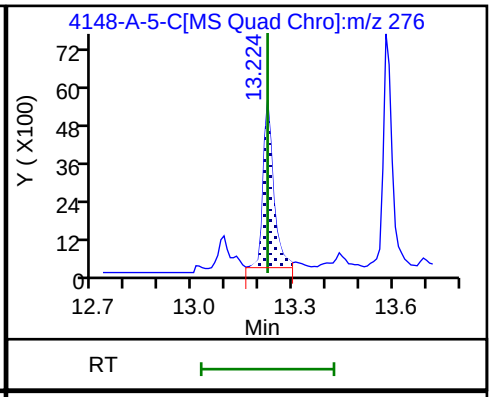
Eurofins Knoxville

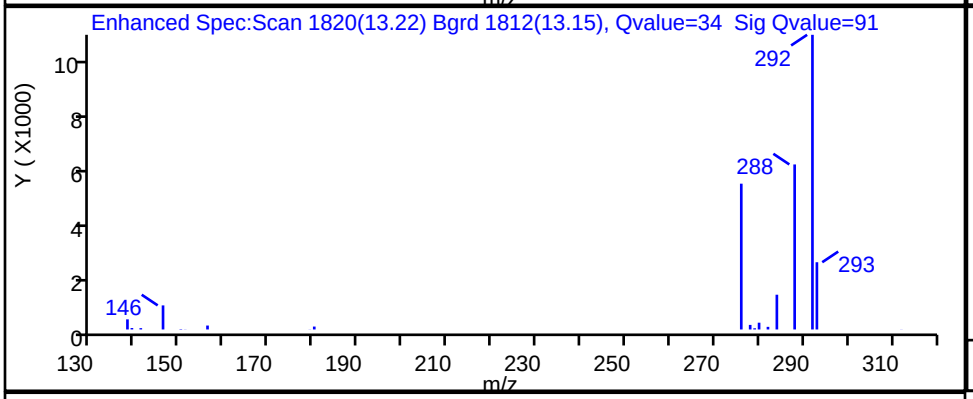
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D

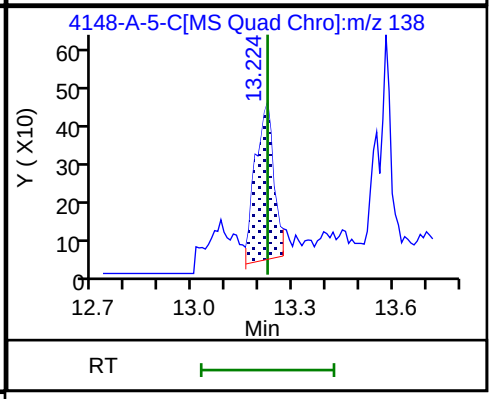
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

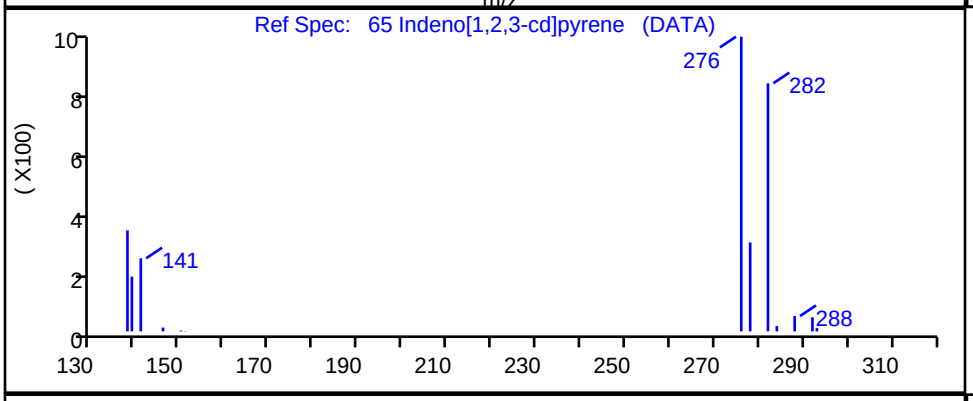
65 Indeno[1,2,3-cd]pyrene, CAS: 193-39-5

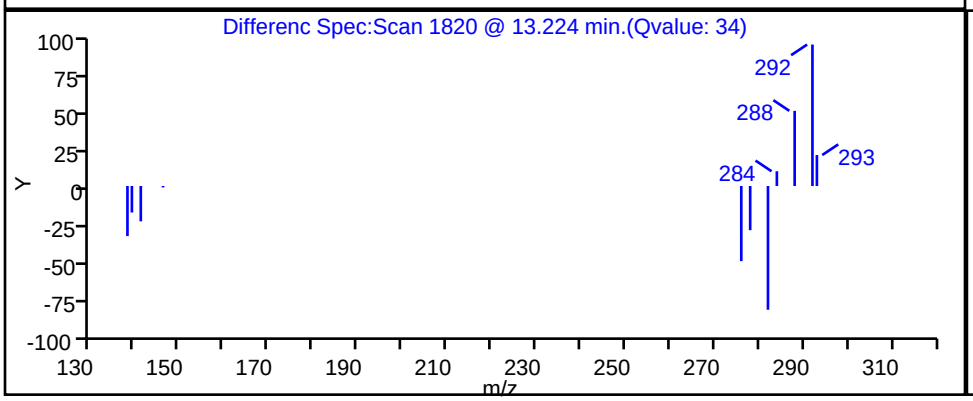


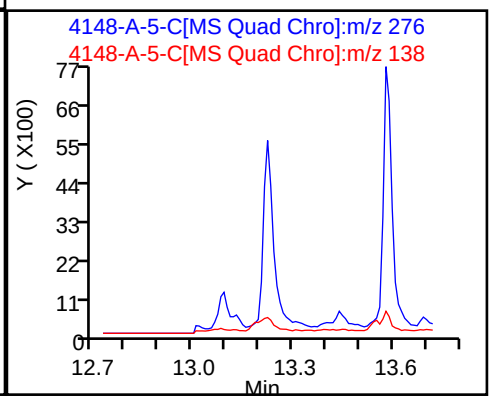












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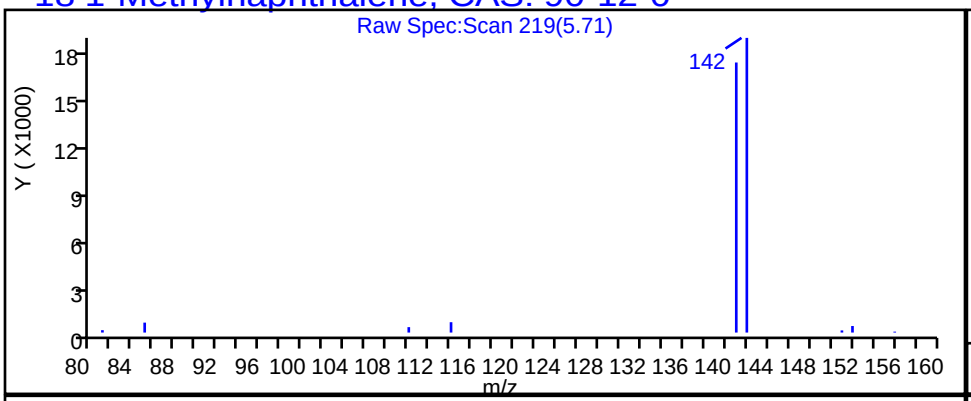
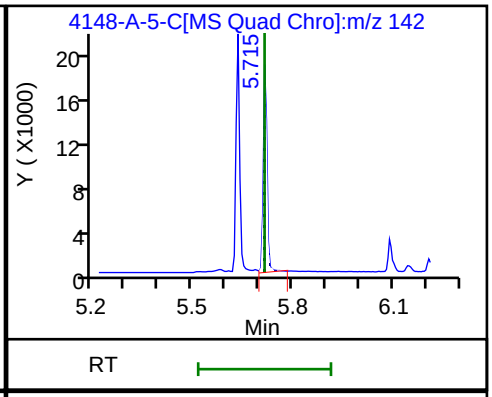
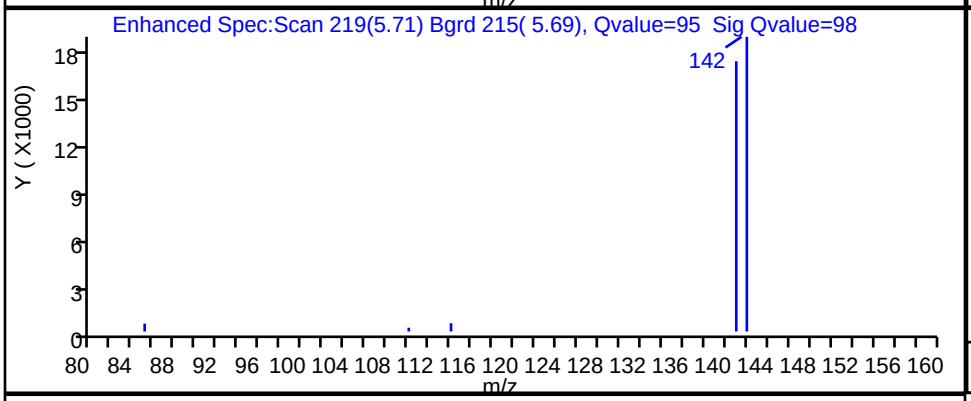
Eurofins Knoxville

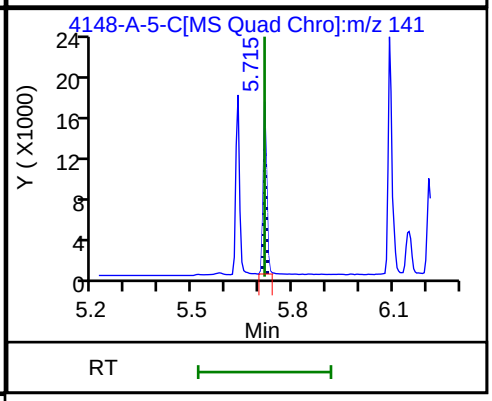
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D		
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5
Client ID:	1804576-851-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

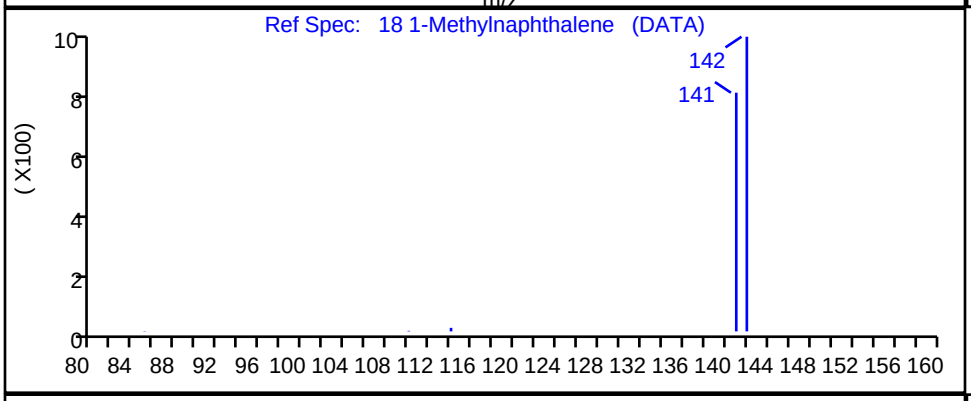
18 1-Methylnaphthalene, CAS: 90-12-0

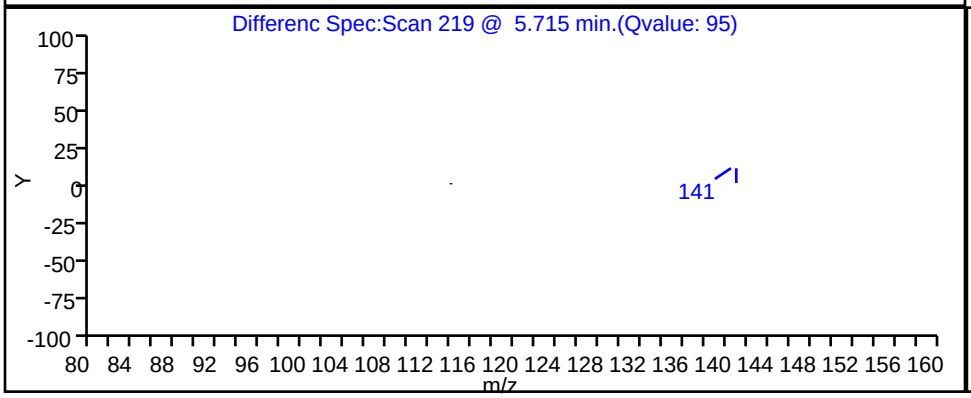


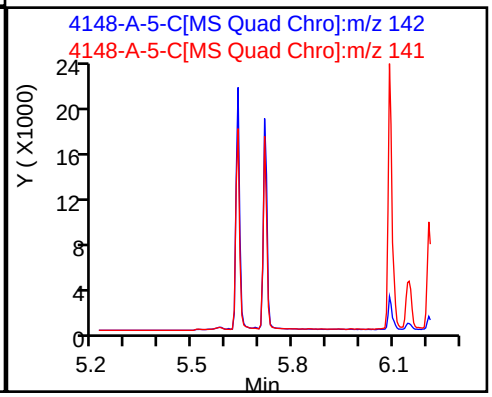












Report Date: 22-Nov-2023 14:37:44 Chrom Revision: 2.3 15-Nov-2023 20:54:34

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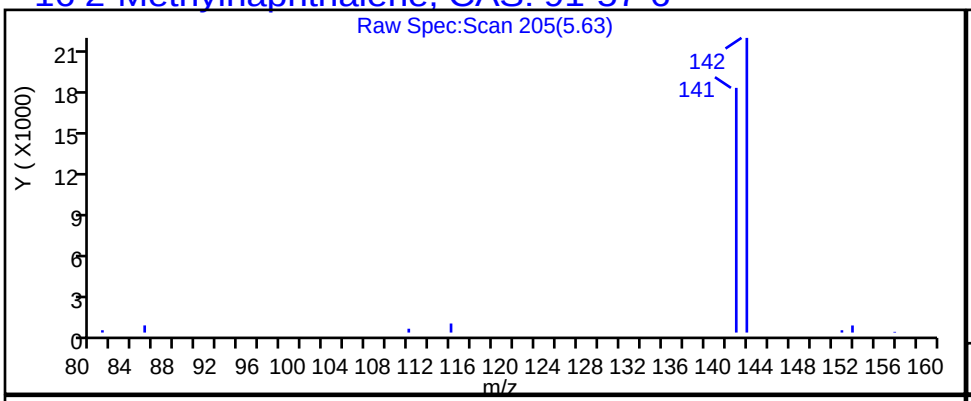
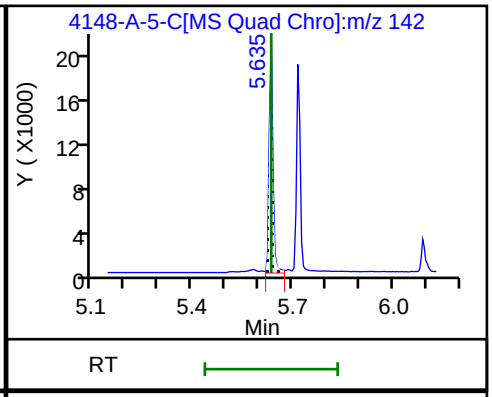
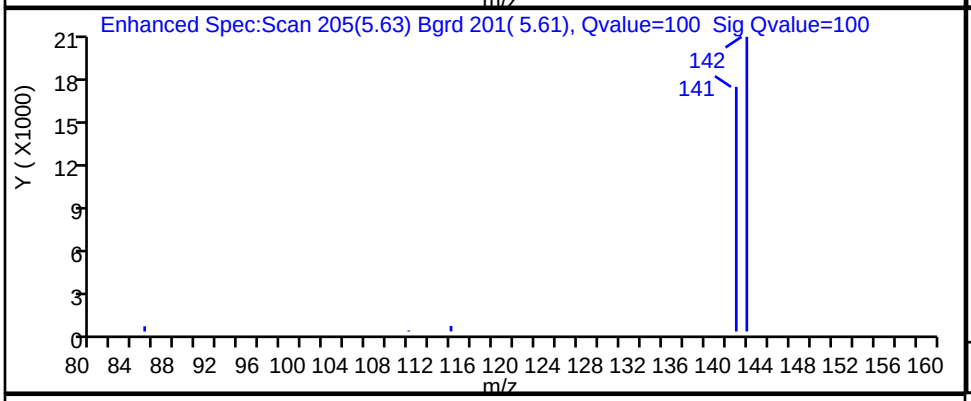
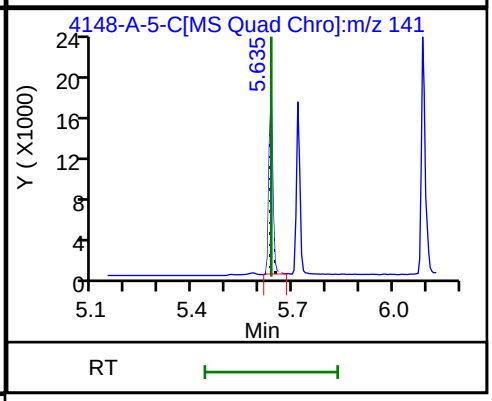
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D		
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5
Client ID:	1804576-851-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

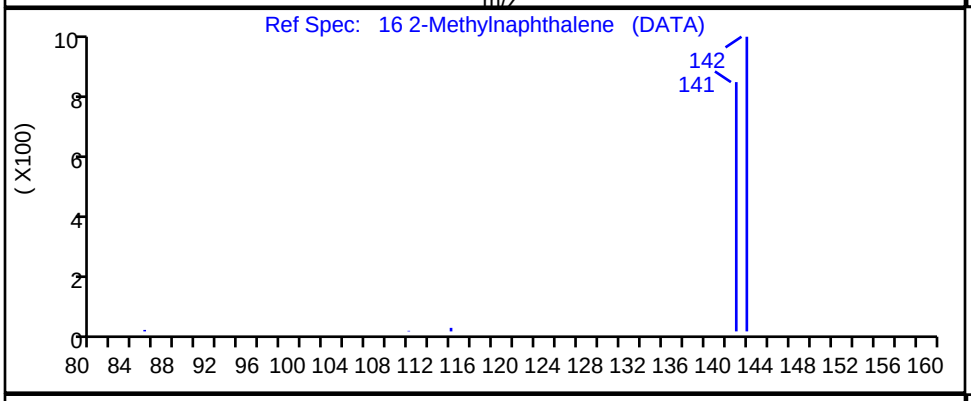
16 2-Methylnaphthalene, CAS: 91-57-6

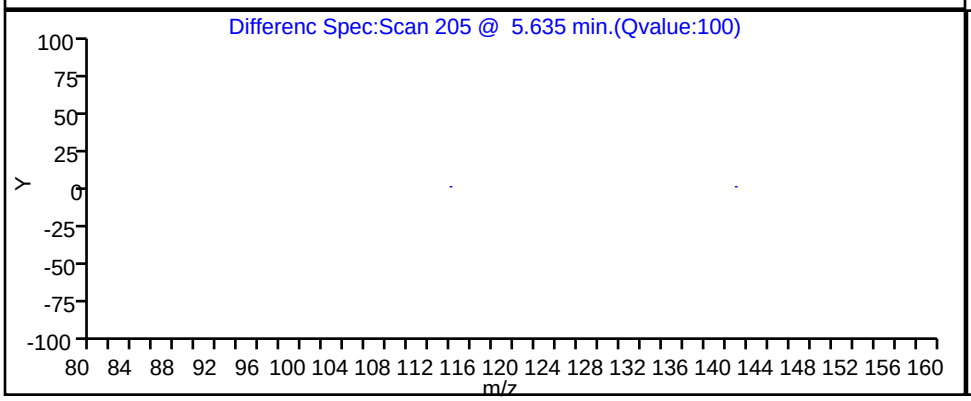


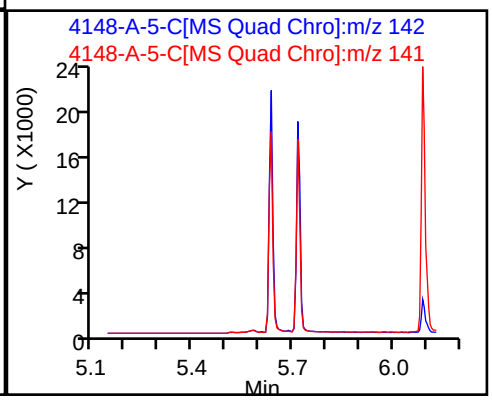












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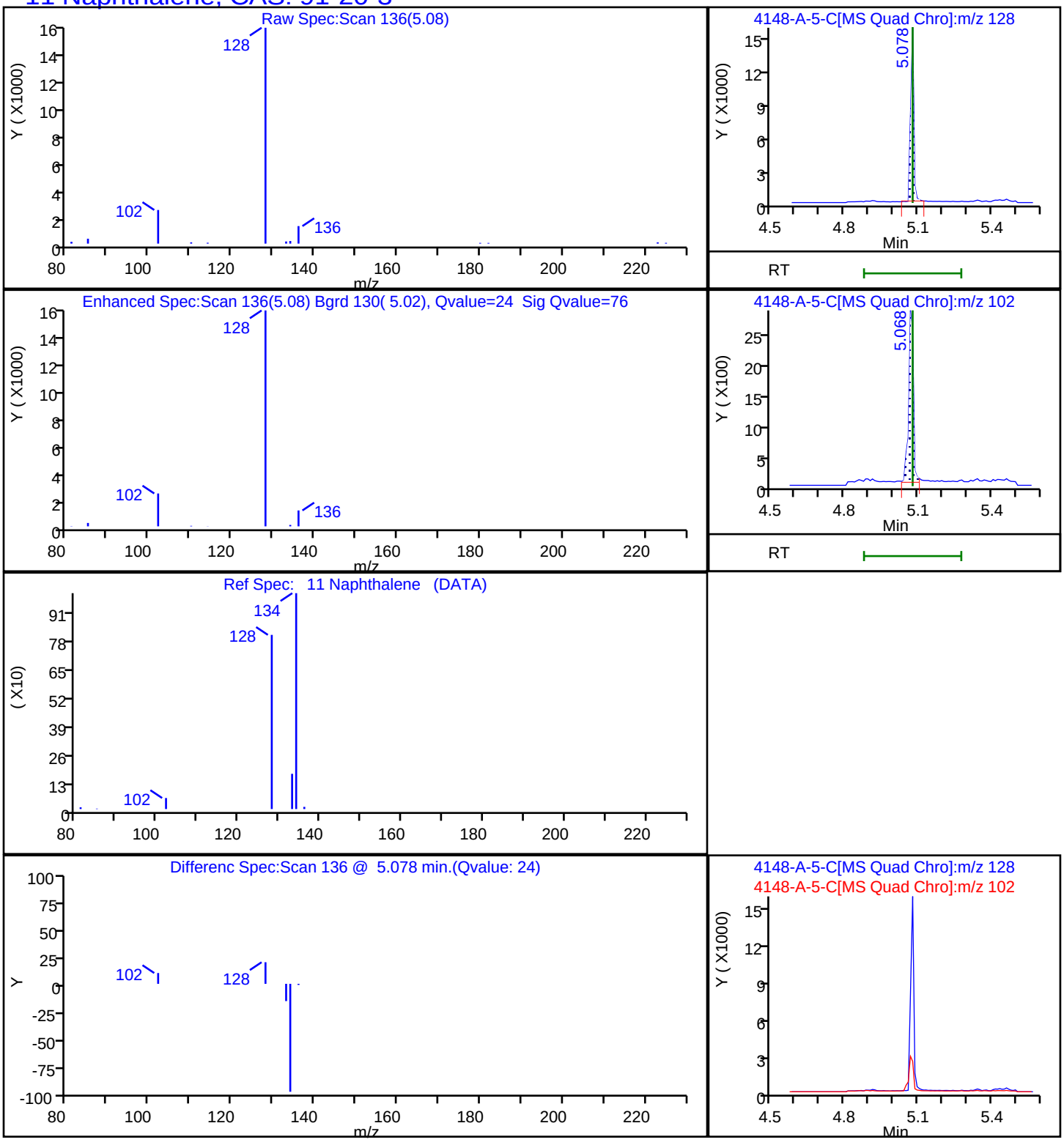
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5
Client ID:	1804576-851-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

11 Naphthalene, CAS: 91-20-3



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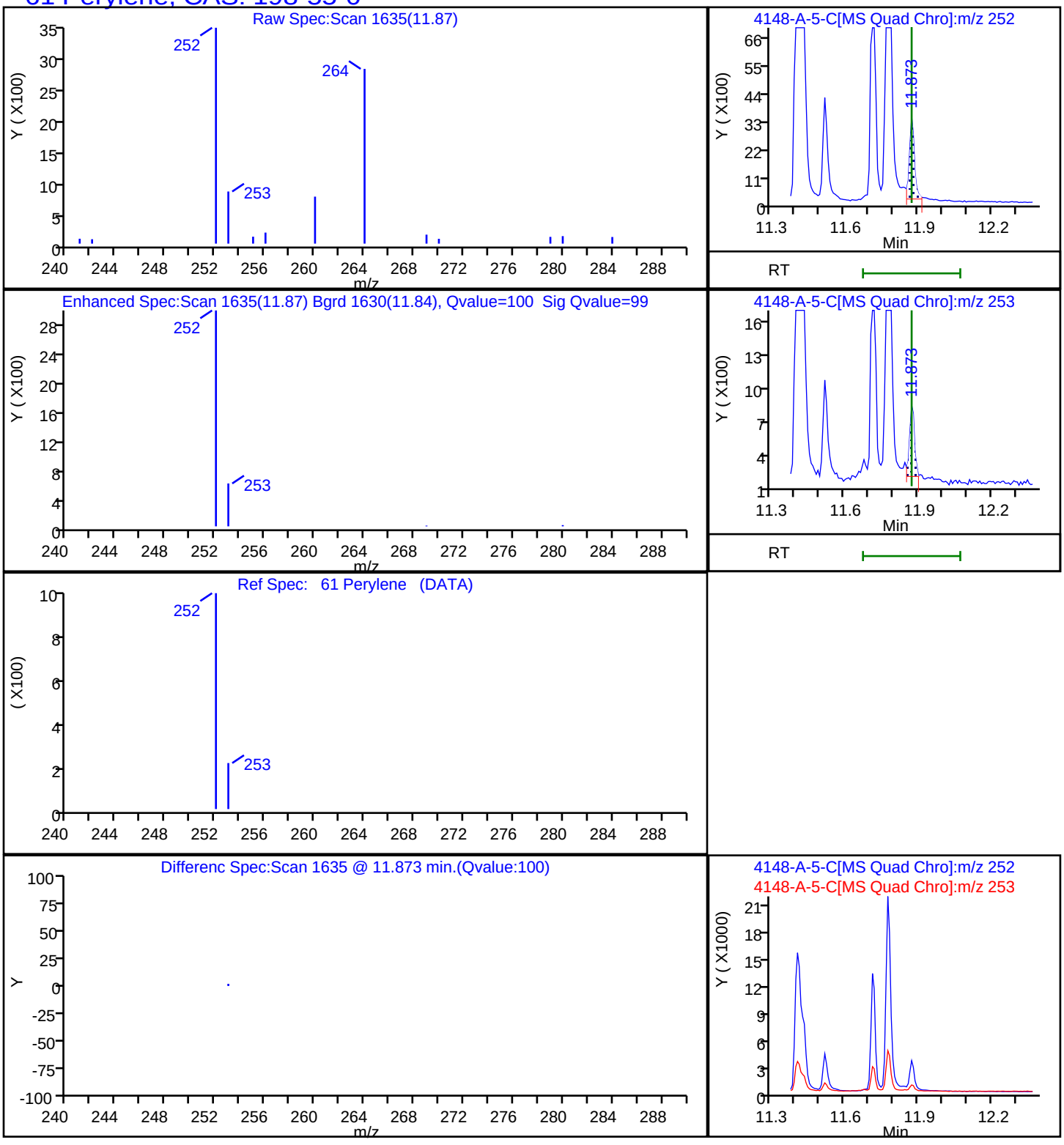
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D

Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5
Client ID:	1804576-851-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

61 Perylene, CAS: 198-55-0



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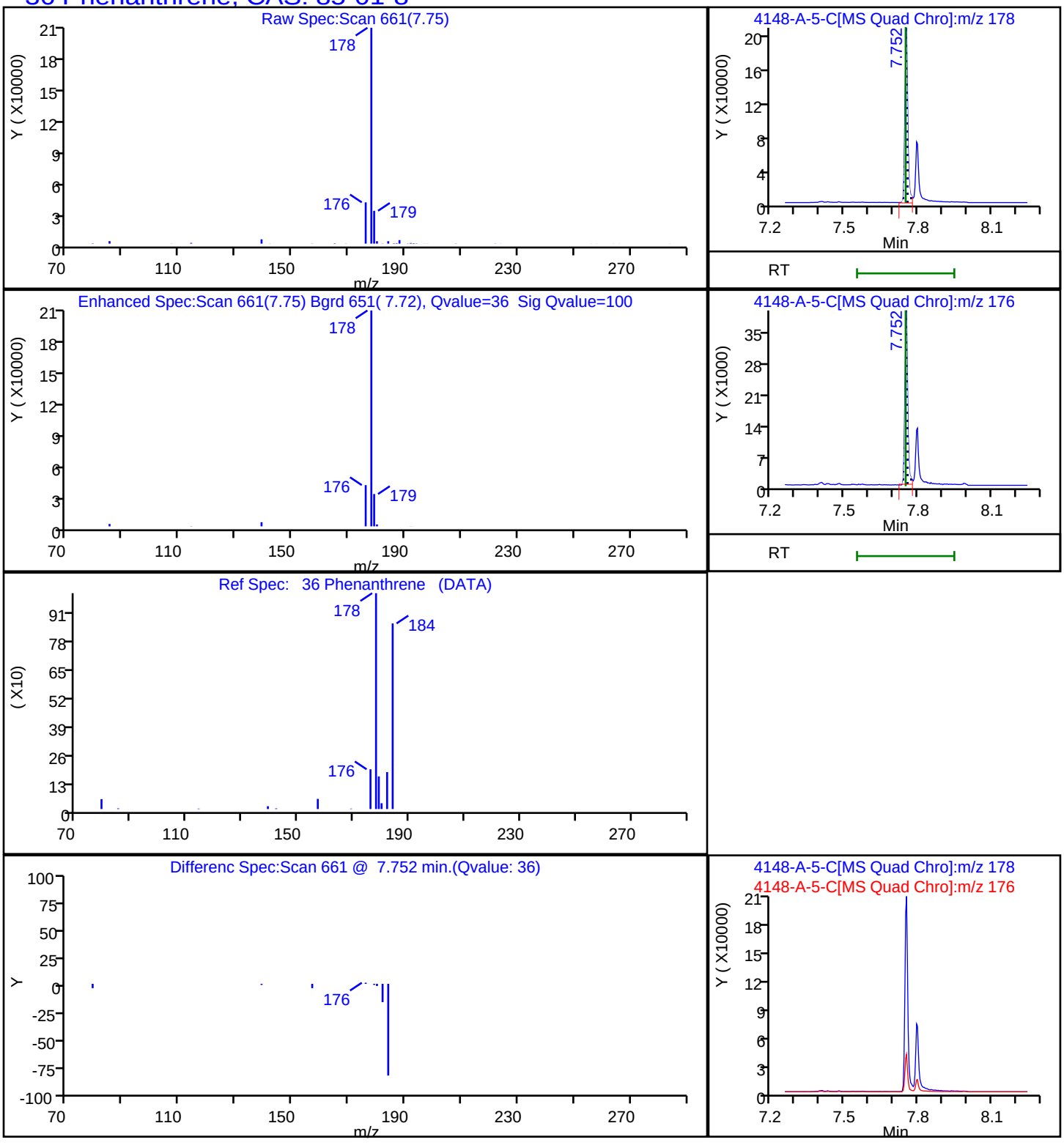
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D

Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5
Client ID:	1804576-851-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

36 Phenanthrene, CAS: 85-01-8



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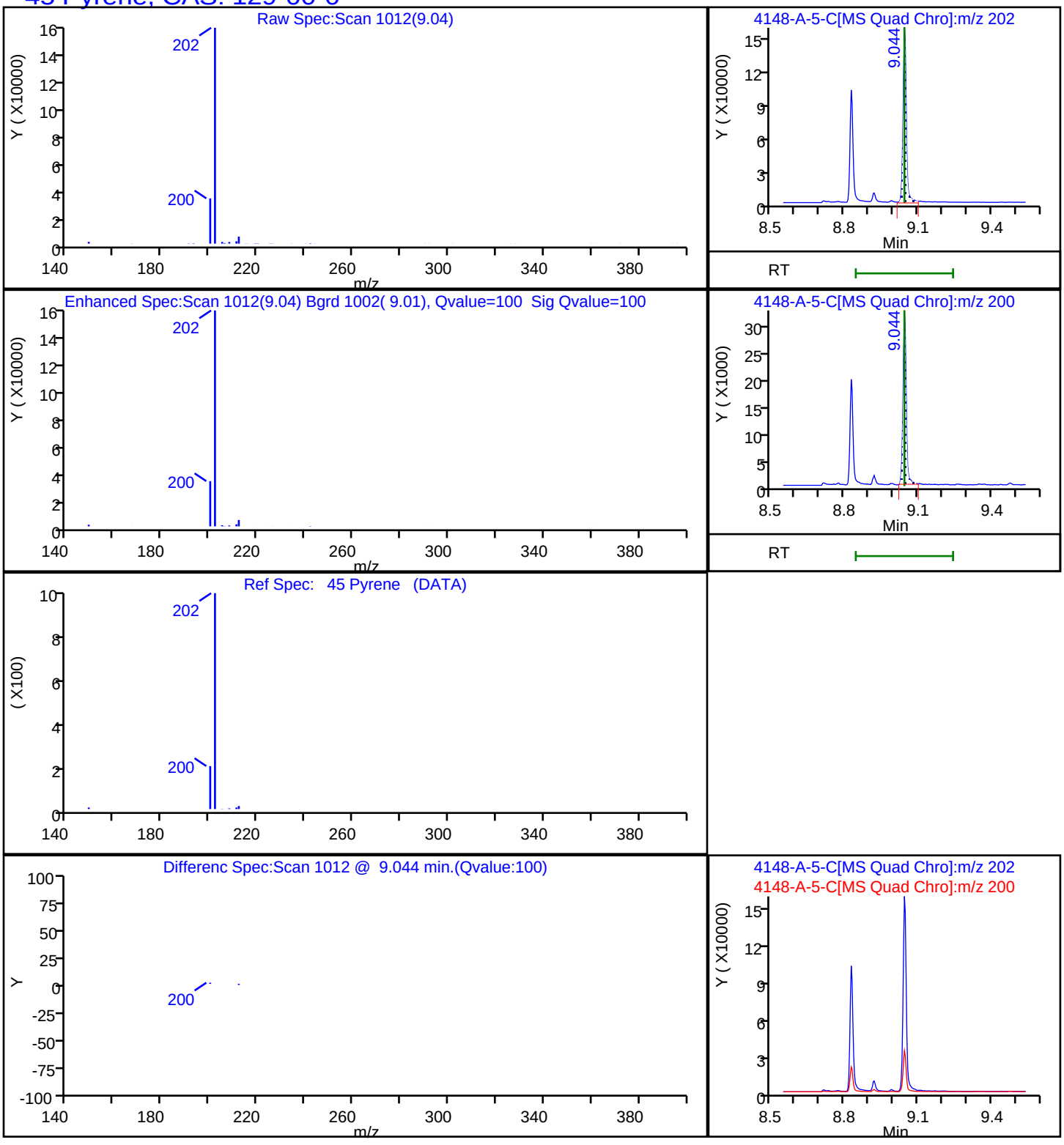
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D

Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5
Client ID:	1804576-851-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

45 Pyrene, CAS: 129-00-0



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Eurofins Knoxville

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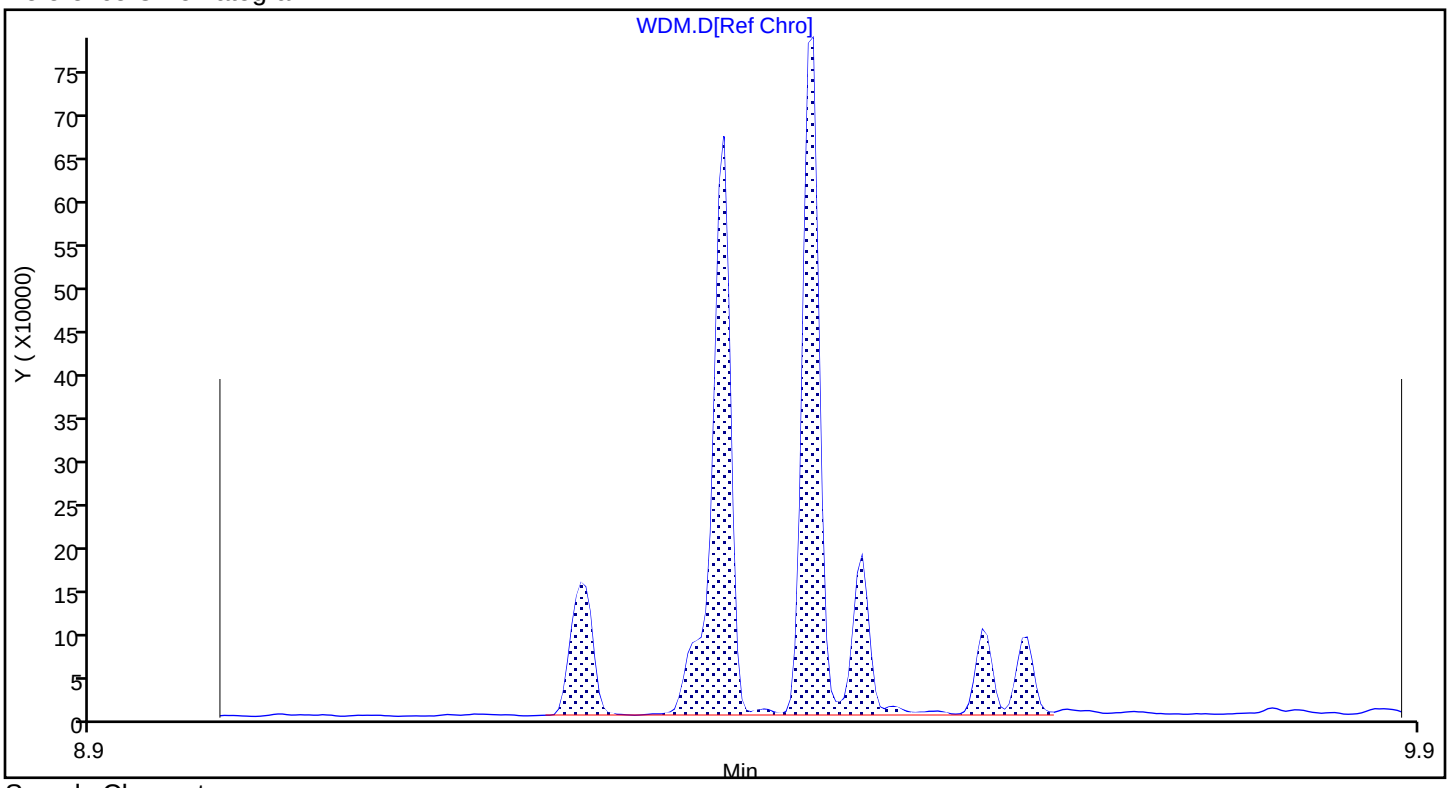
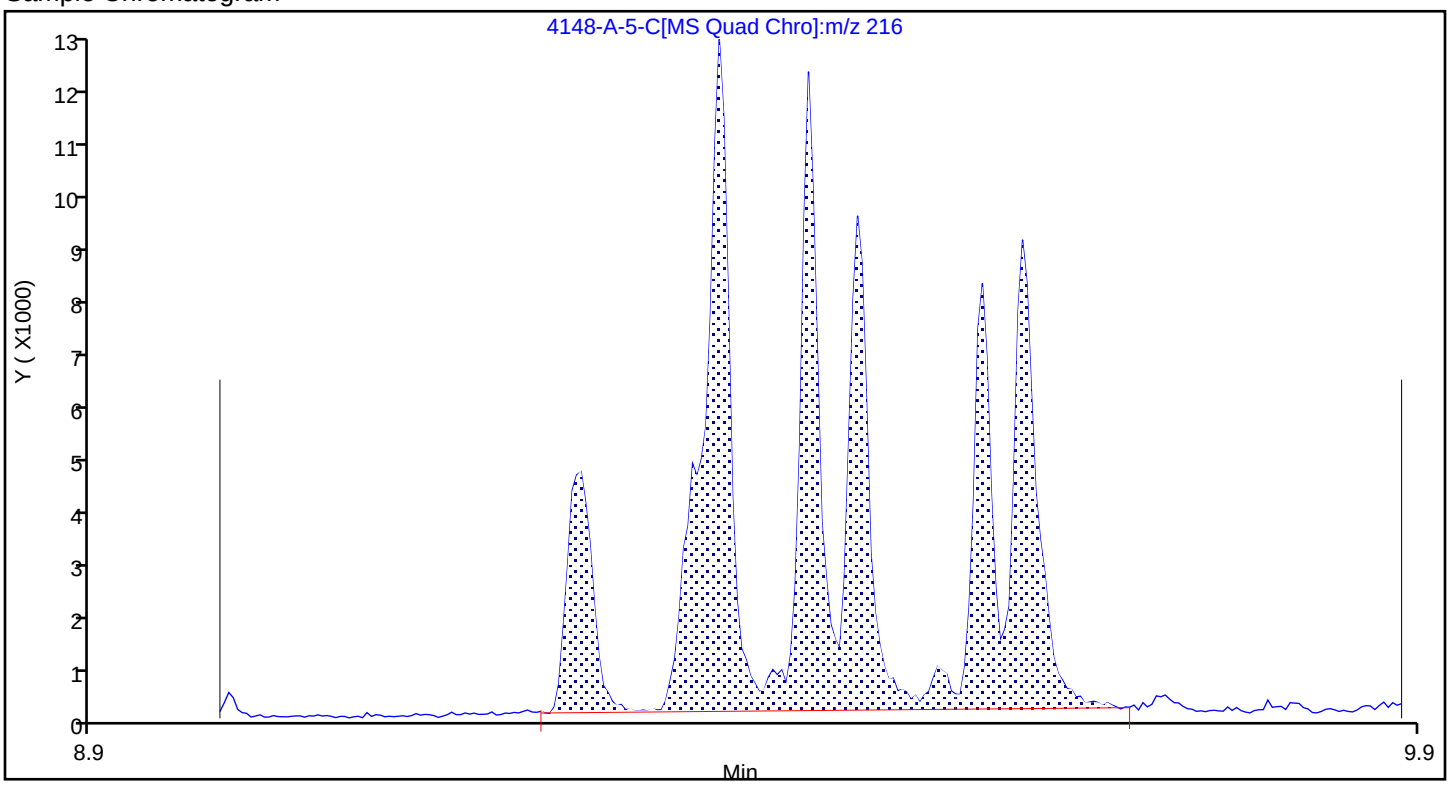
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 100 C1-Fluoranthenes/pyrene, CAS: STL00912

Reference Chromatogram



Sample Chromatogram



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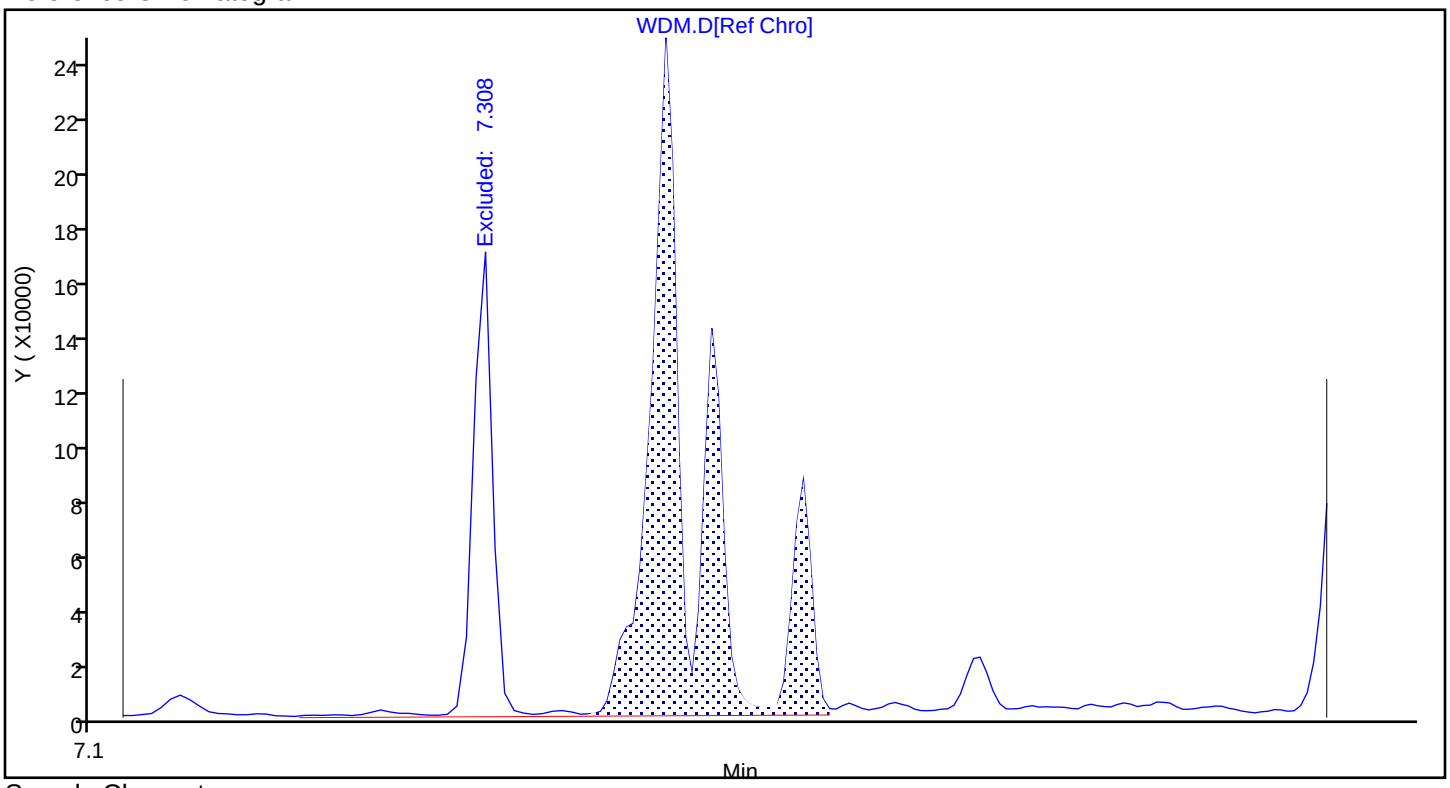
Eurofins Knoxville

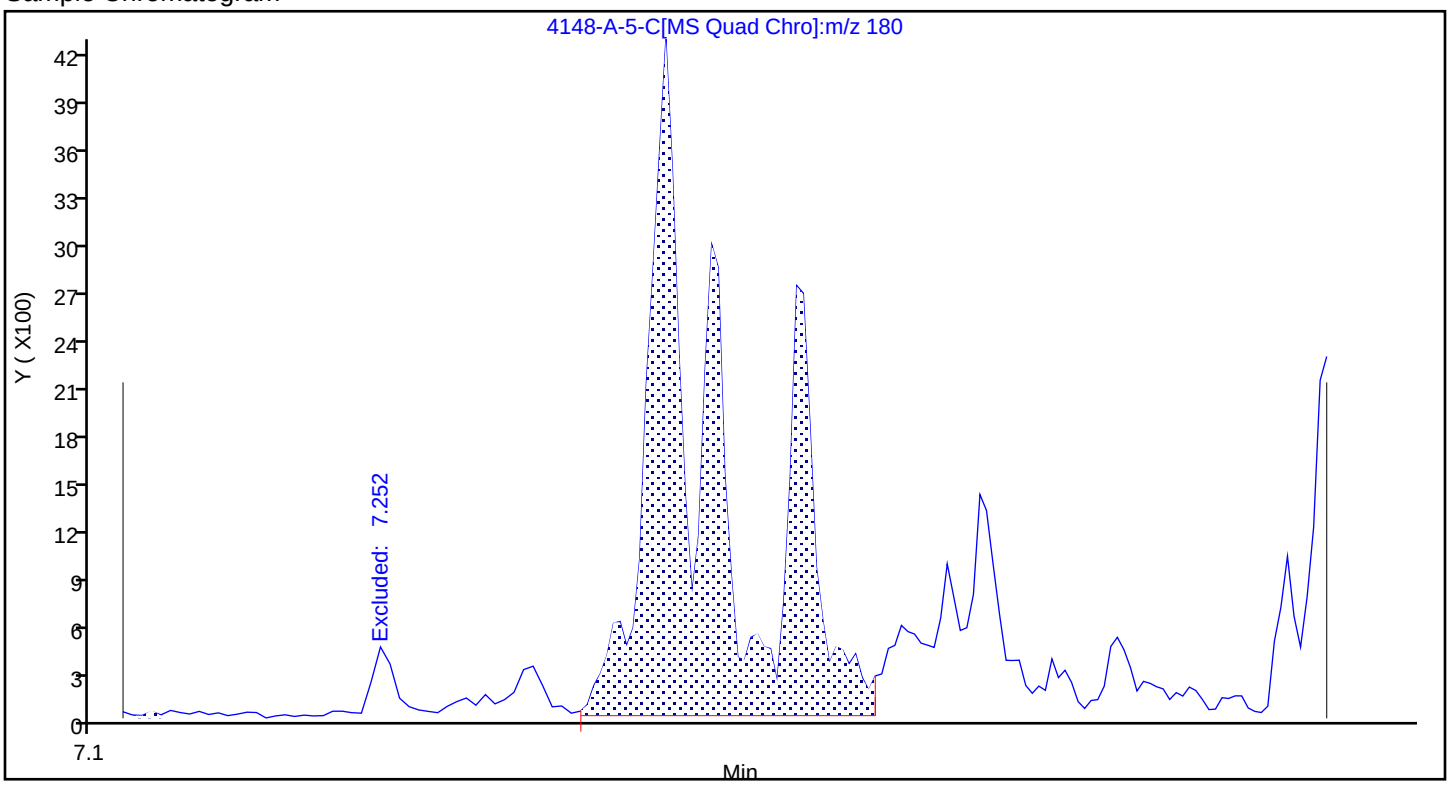
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D				
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 89 C1-Fluorenes, CAS: STL00913

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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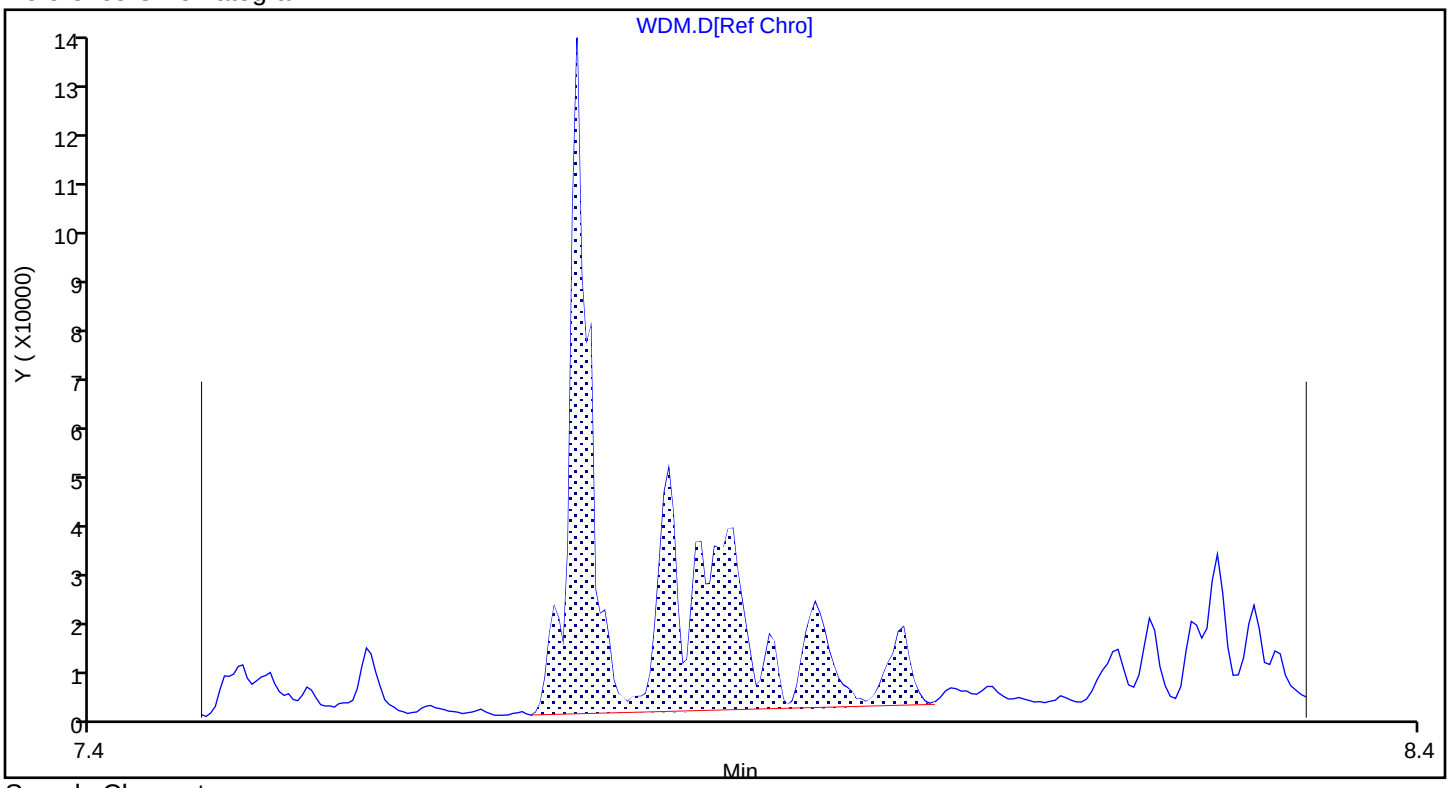
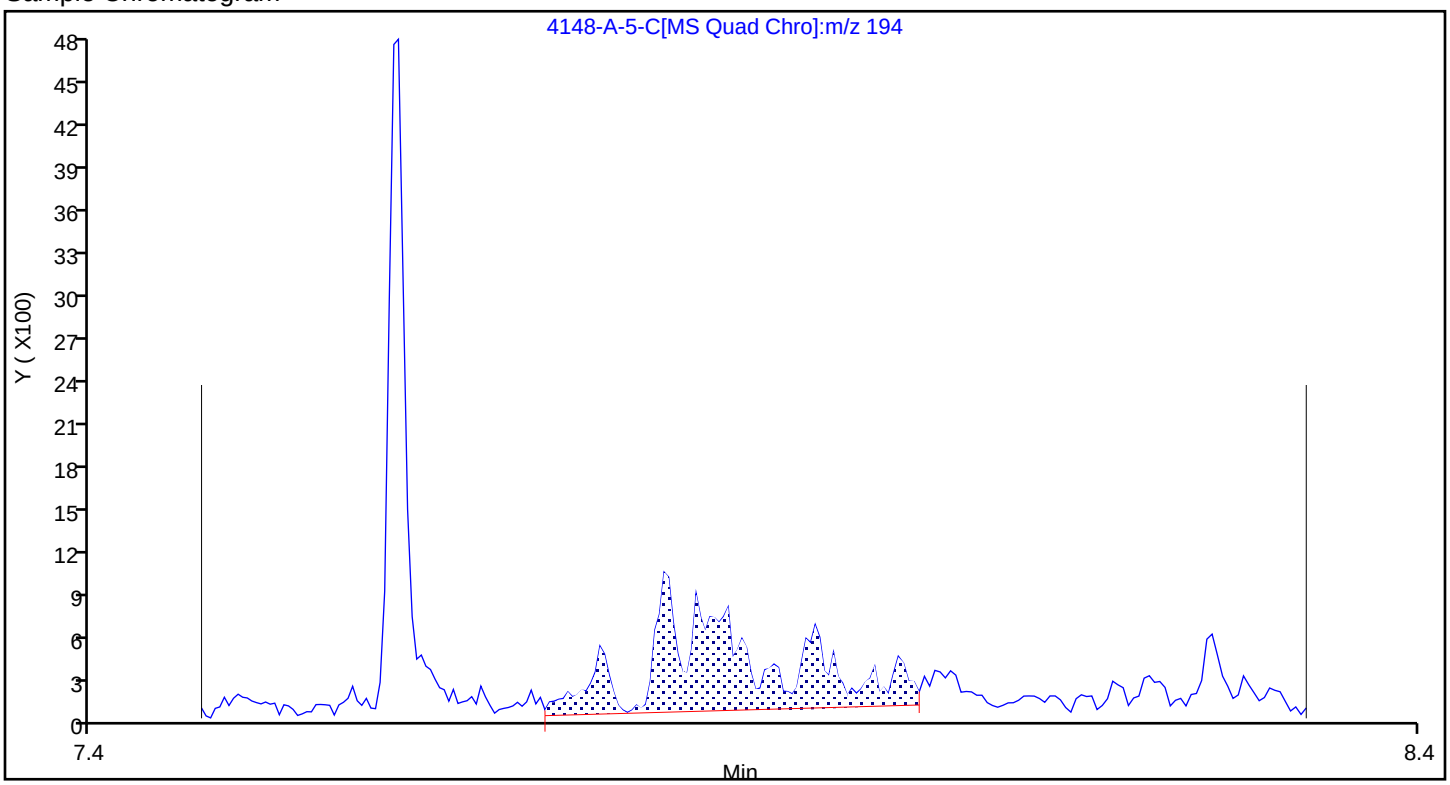
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 90 C2-Fluorenes, CAS: STL00914

Reference Chromatogram



Sample Chromatogram



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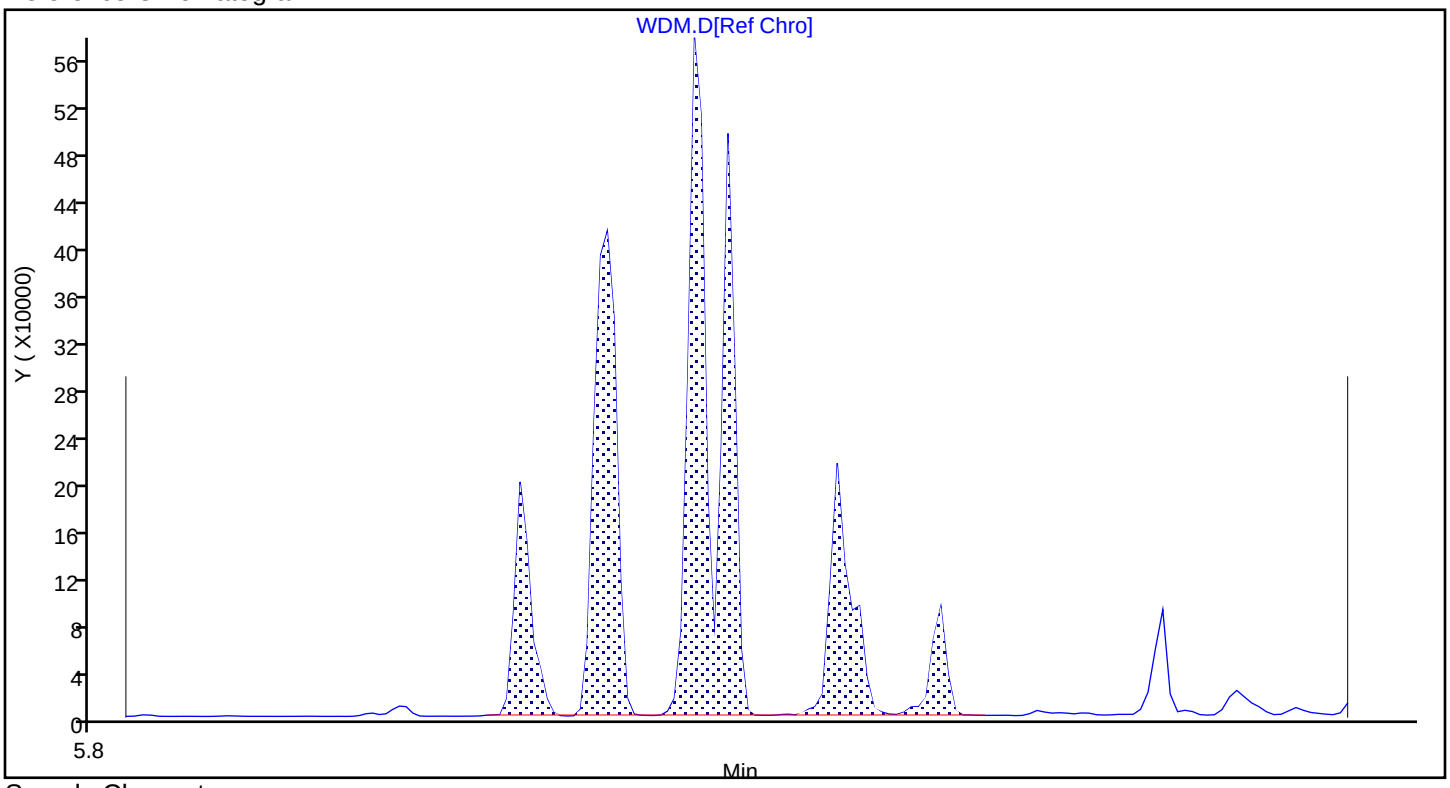
Eurofins Knoxville

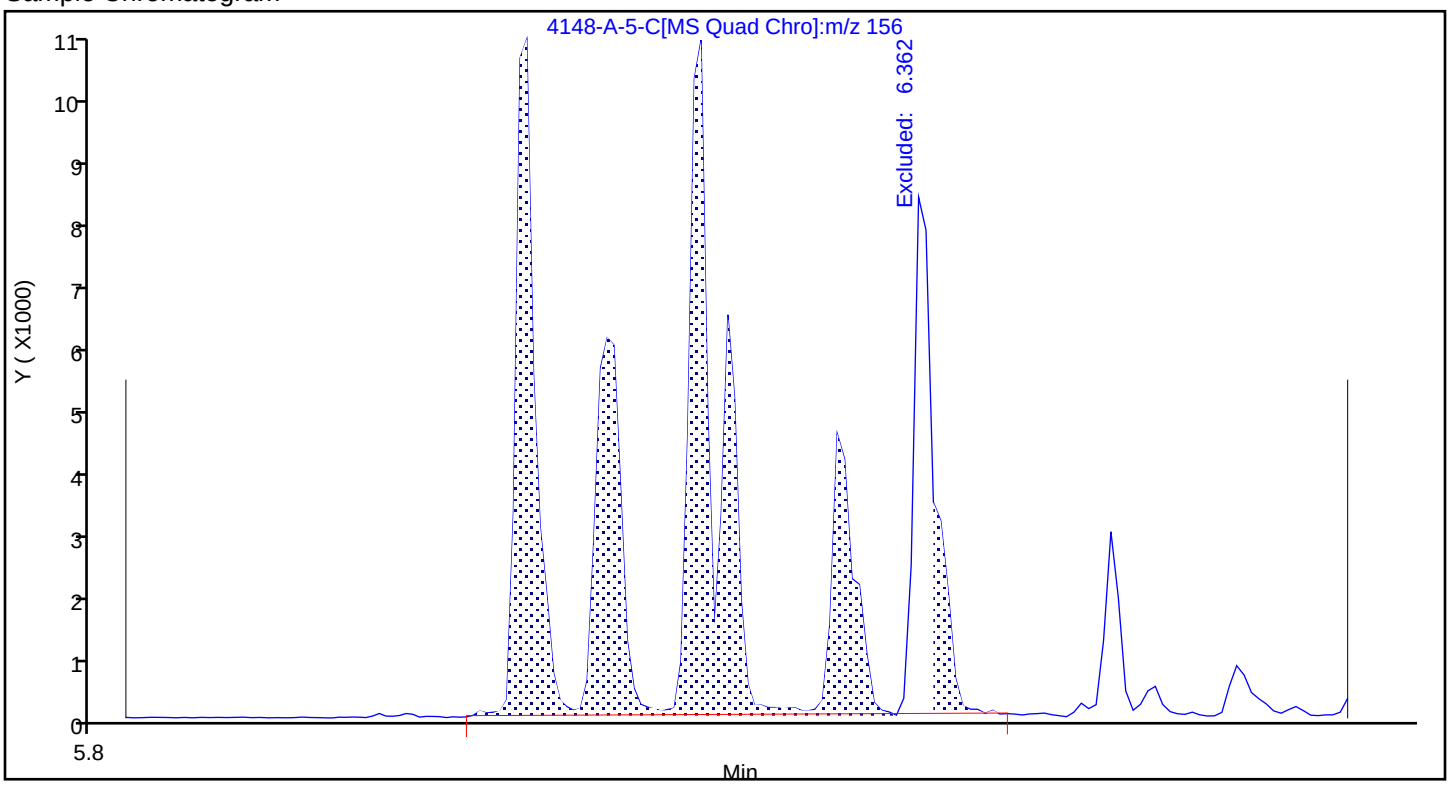
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D				
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 86 C2-Naphthalenes, CAS: STL00917

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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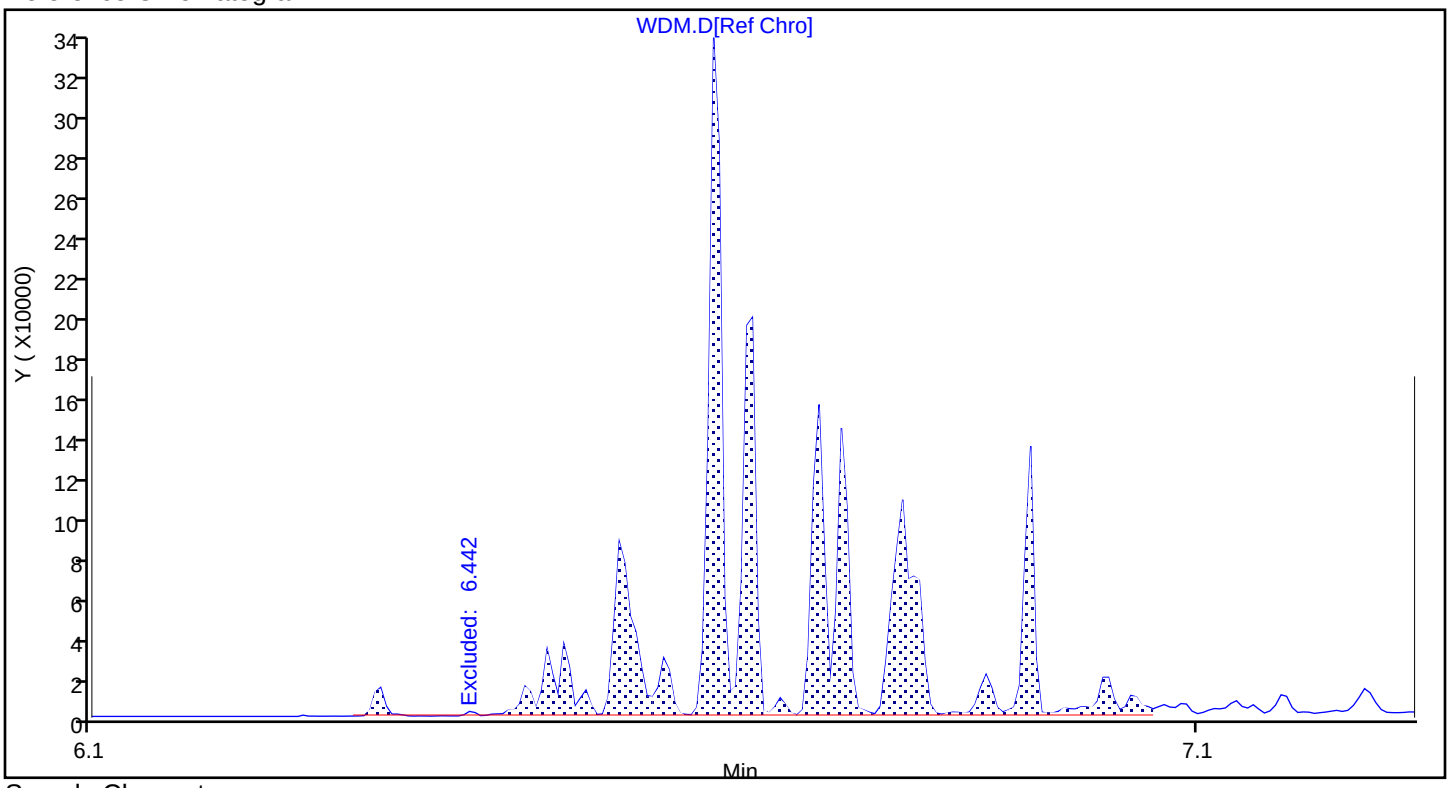
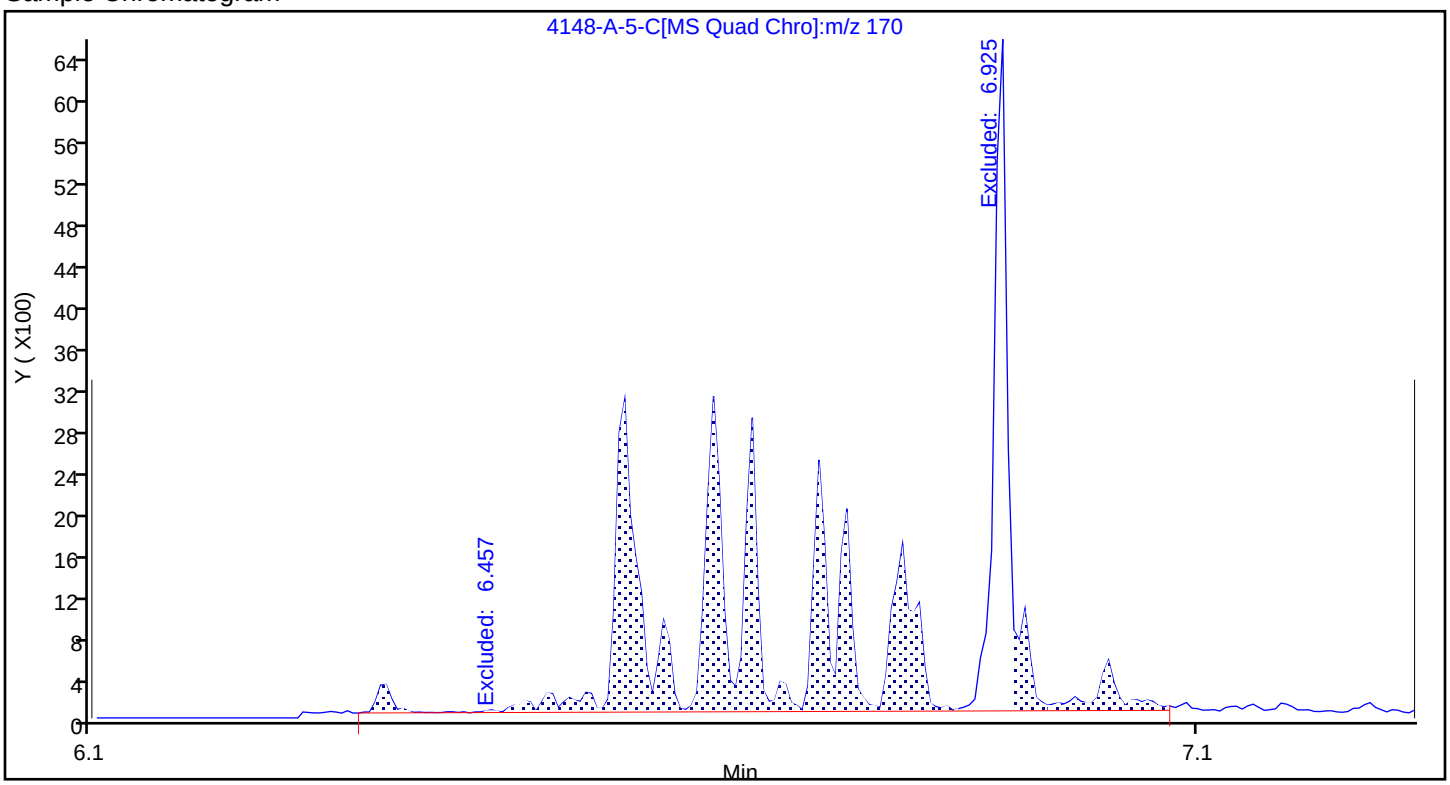
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 87 C3-Naphthalenes, CAS: STL00918

Reference Chromatogram



Sample Chromatogram



Report Date: 22-Nov-2023 14:37:45 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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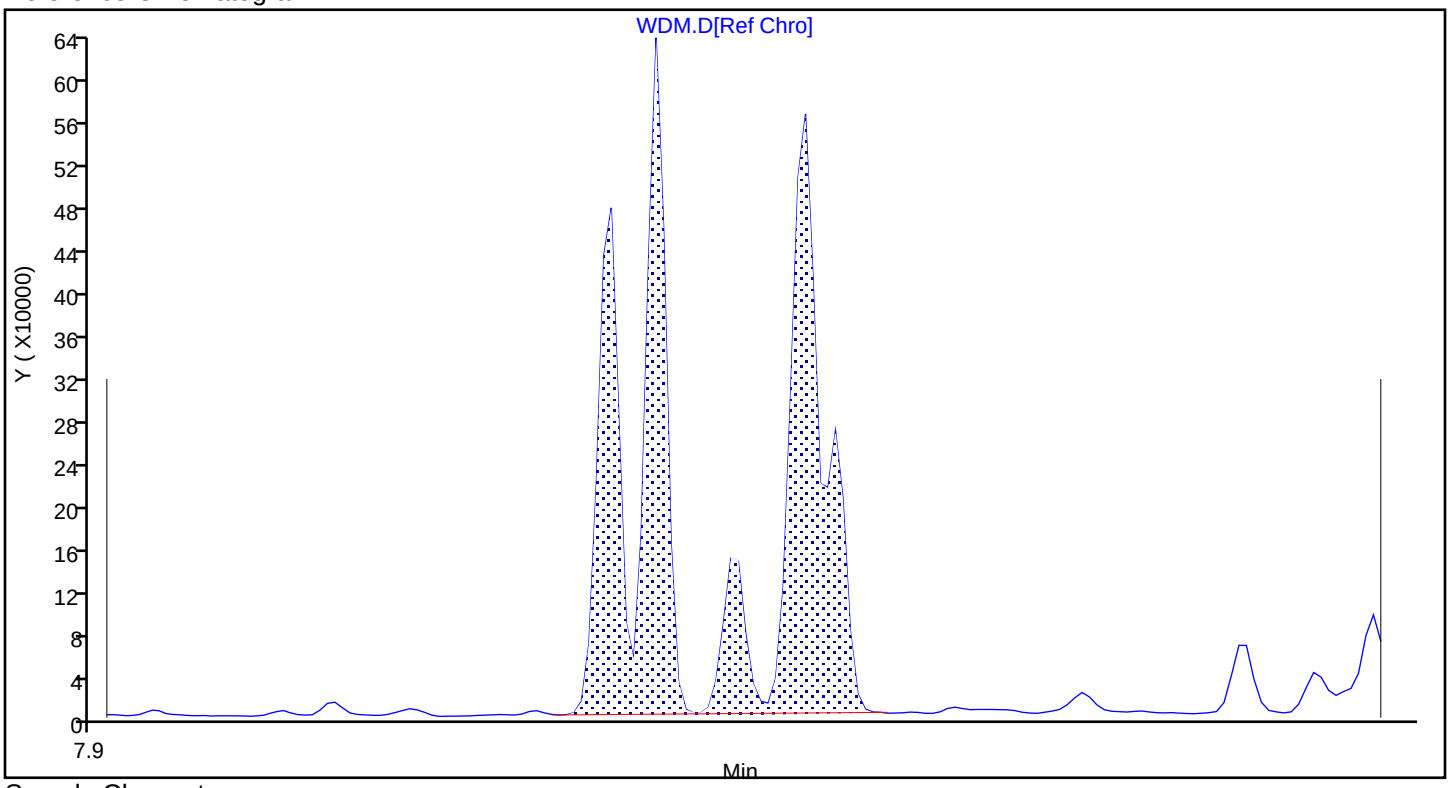
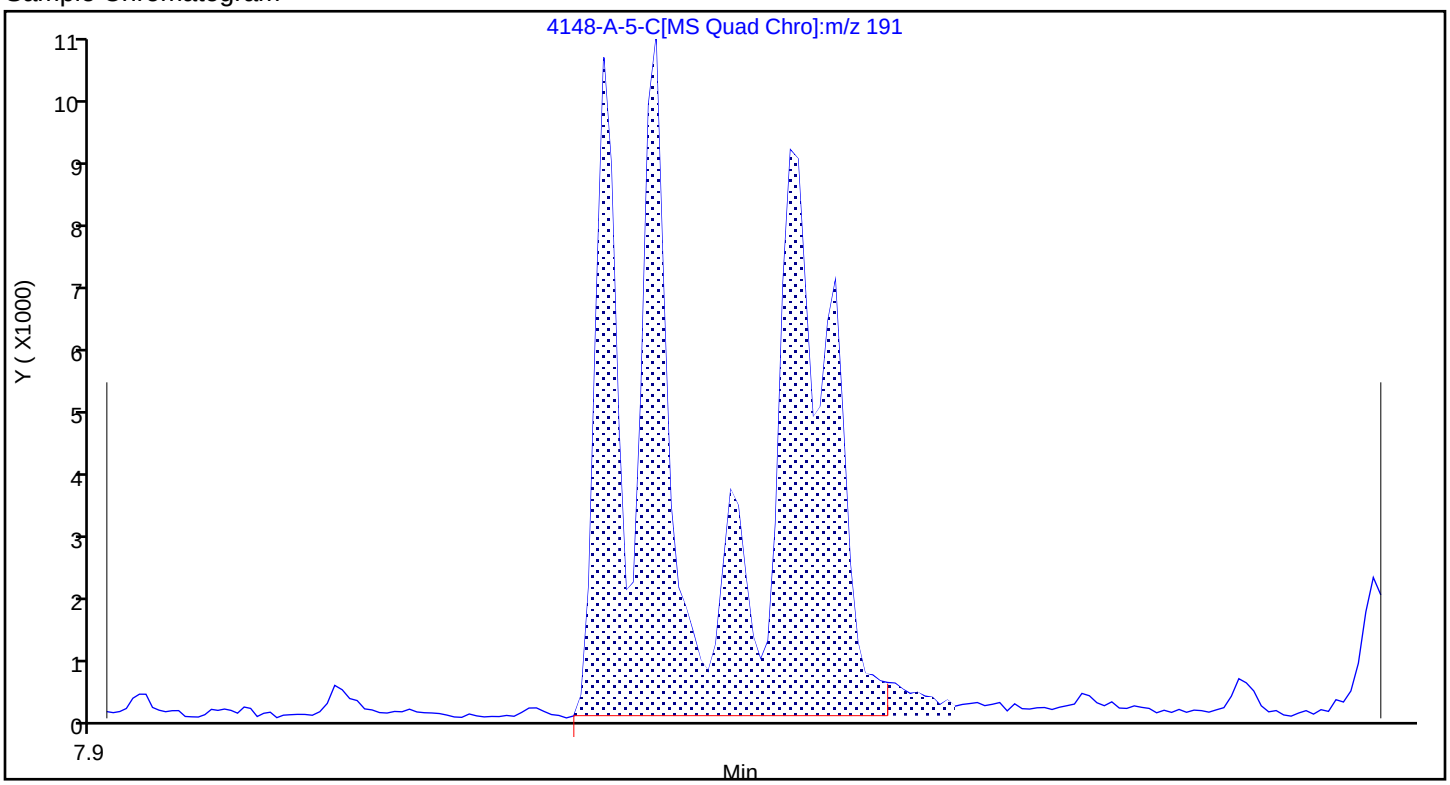
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 96 C1-Phenanthrenes/Anthracenes, CAS: STL00901

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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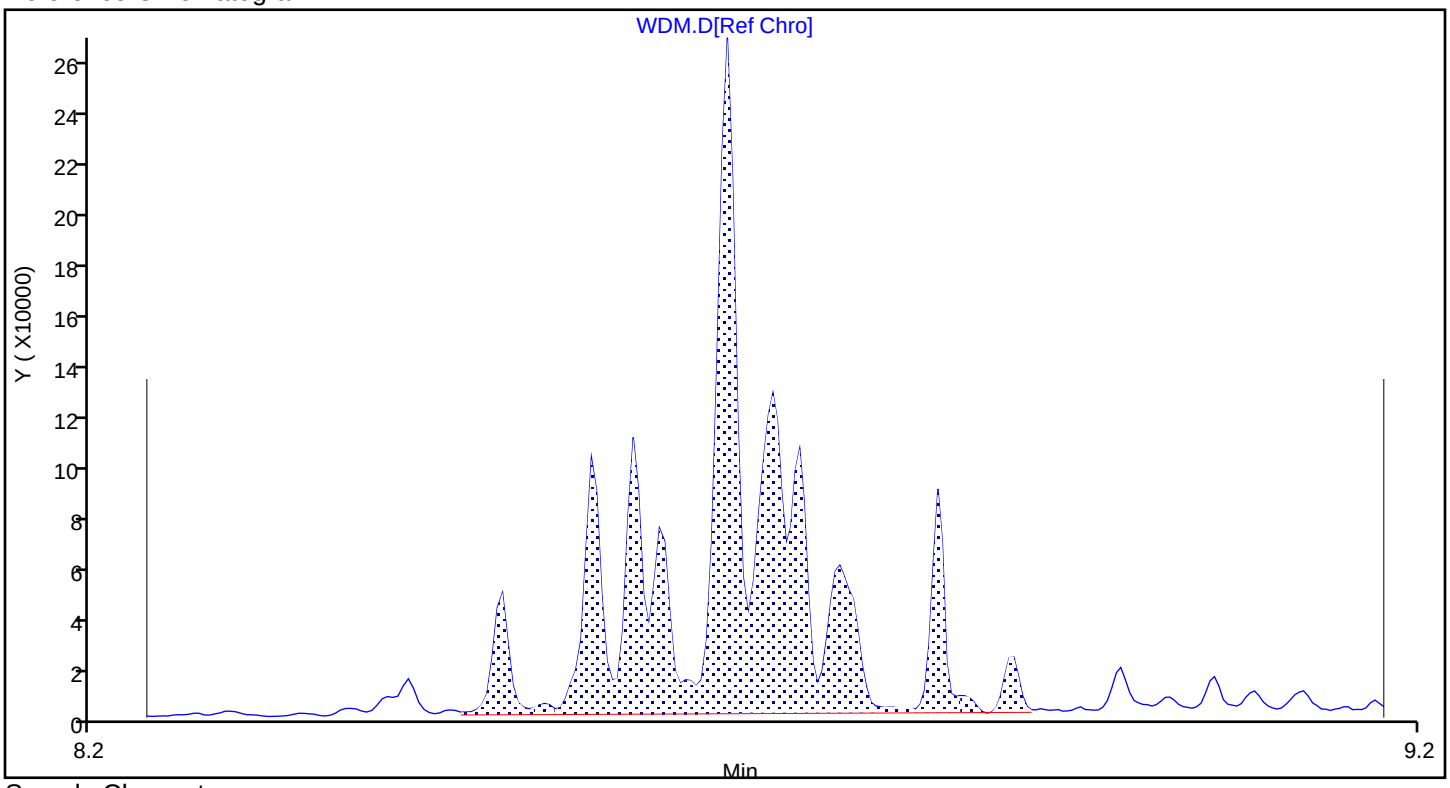
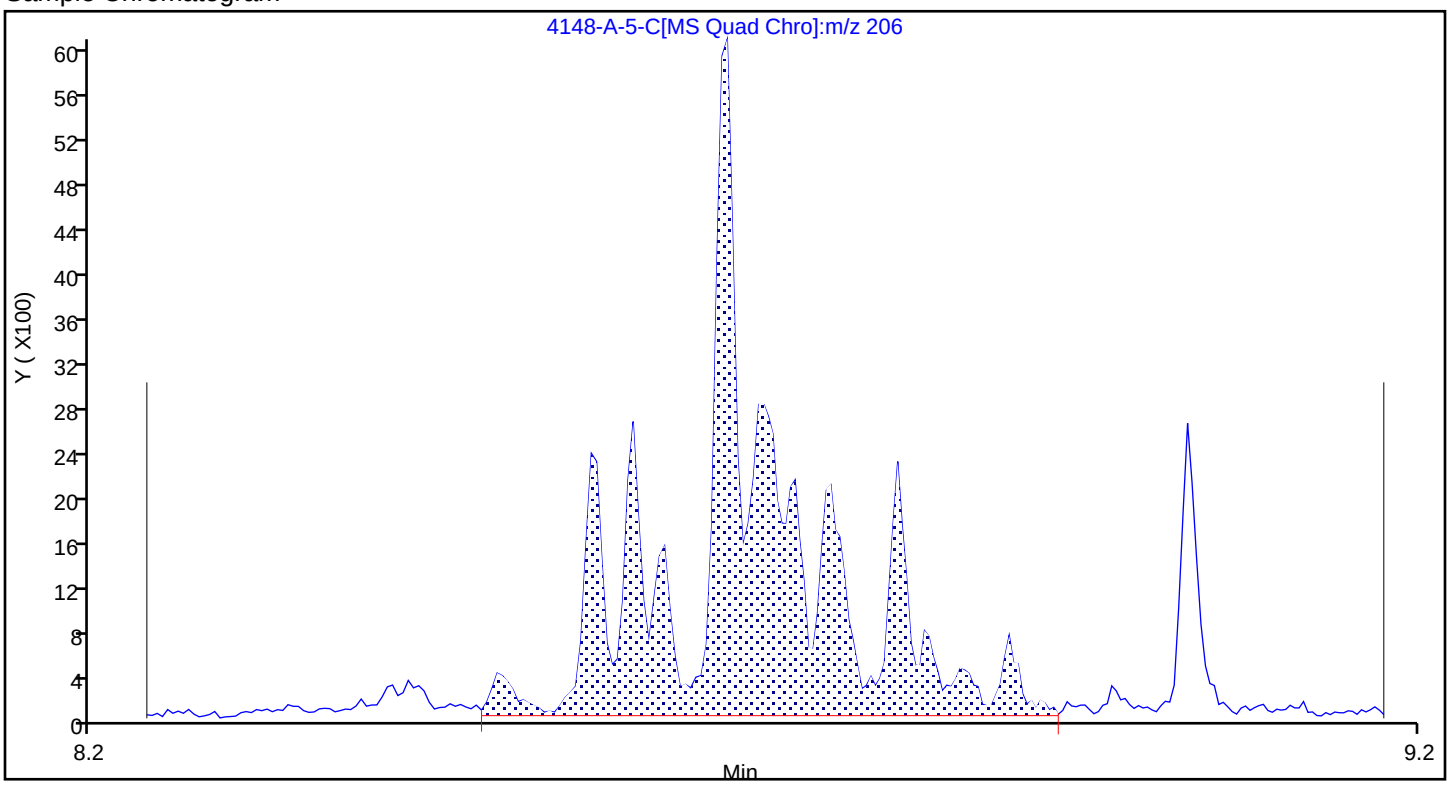
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 97 C2-Phenanthrenes/Anthracenes, CAS: STL00902

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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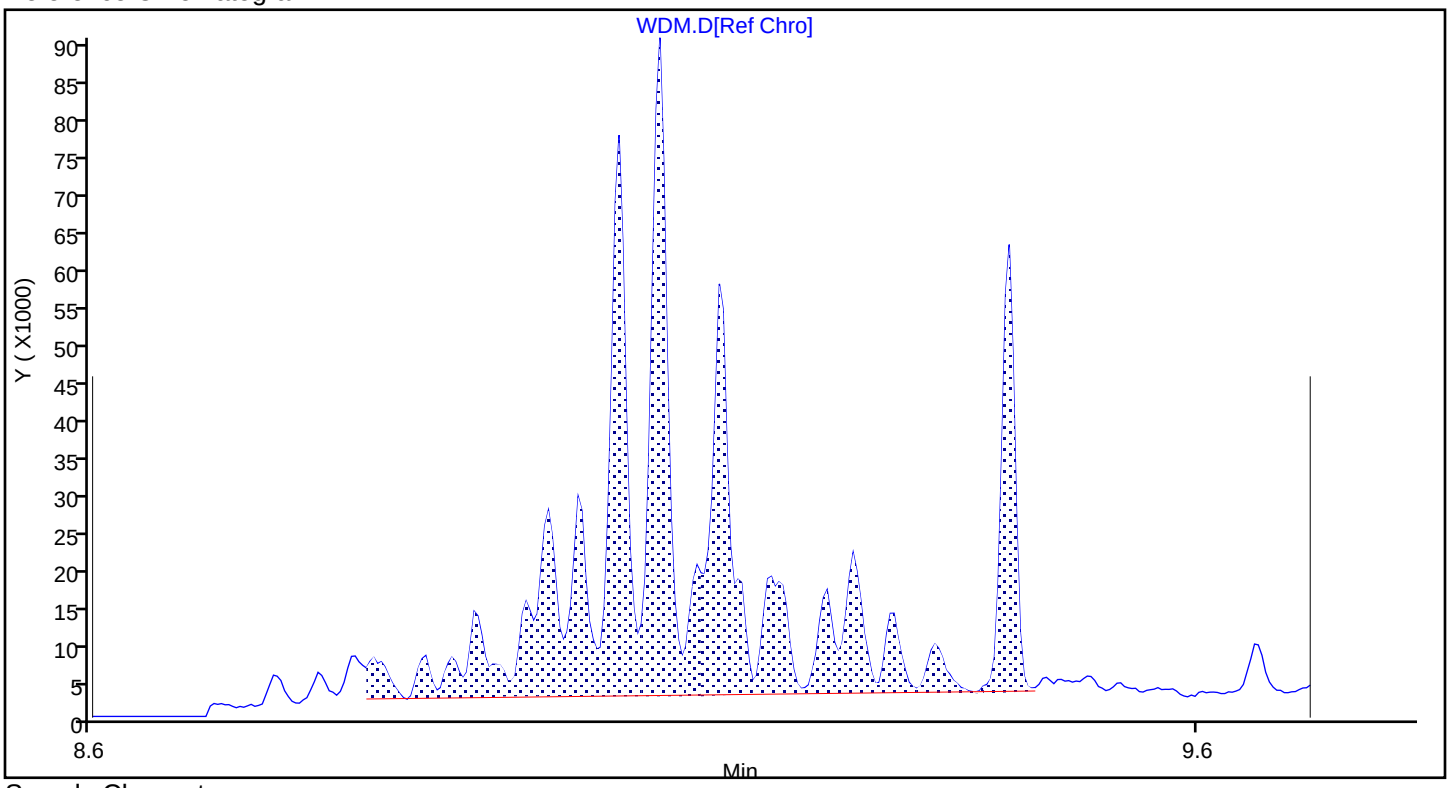
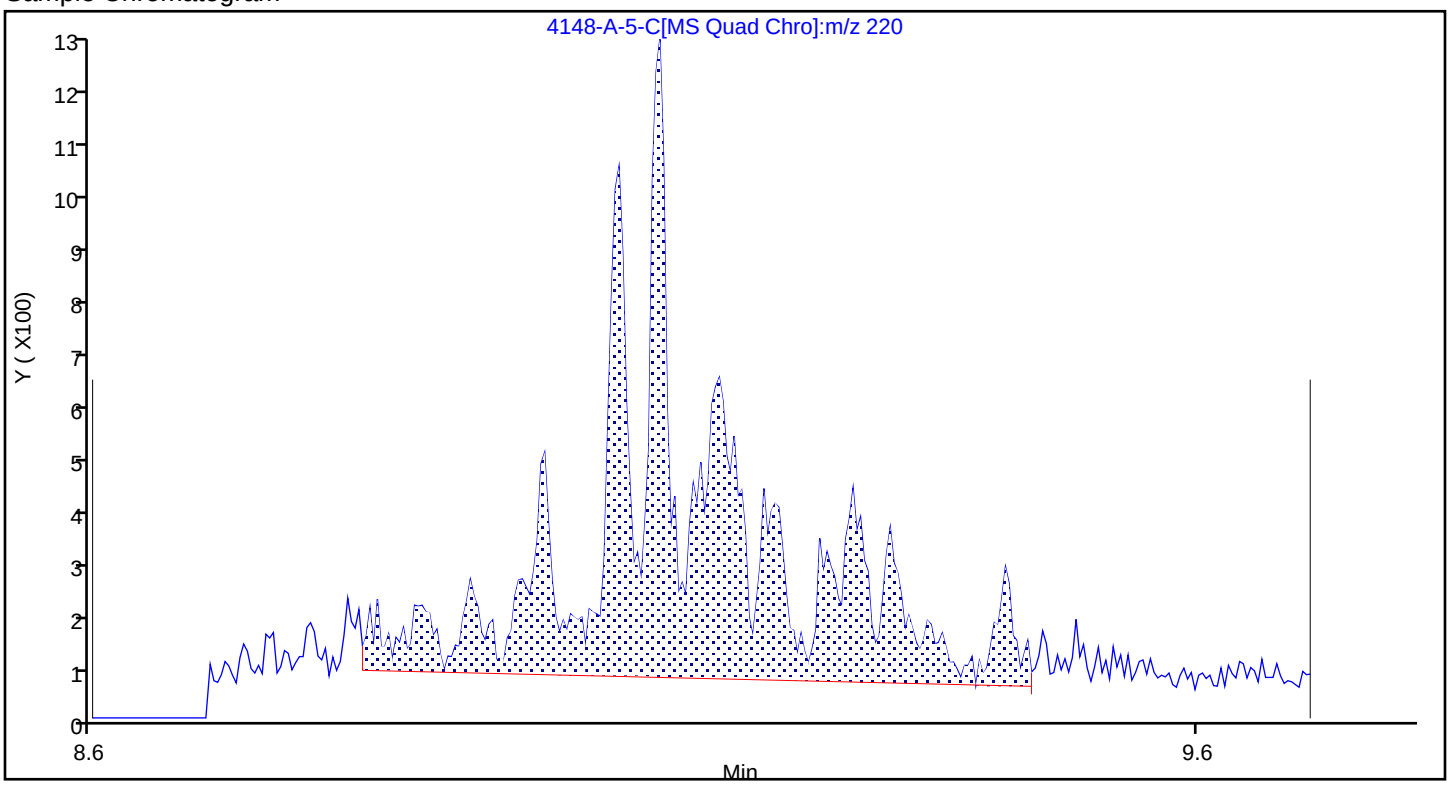
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 98 C3-Phenanthrenes/Anthracenes, CAS: STL00903

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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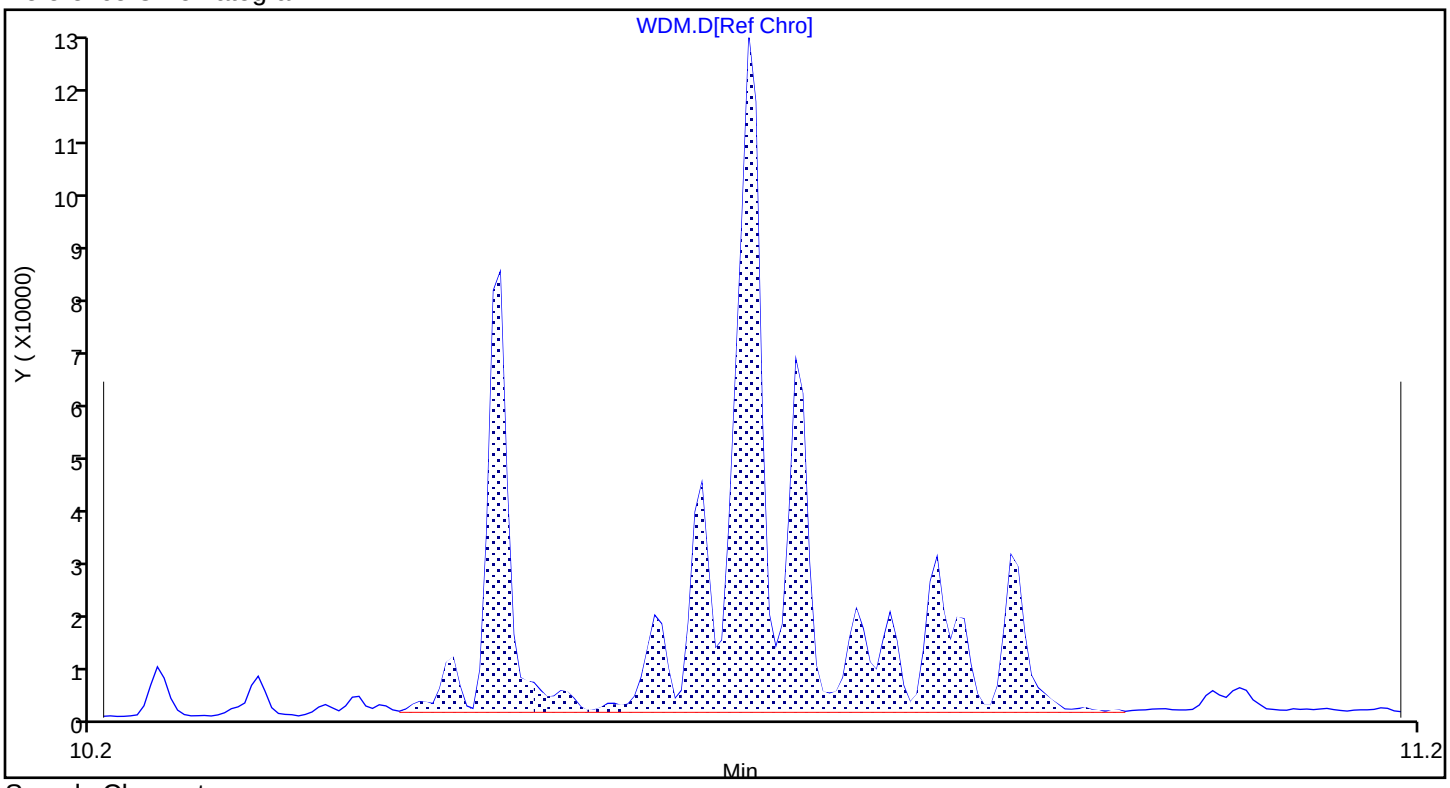
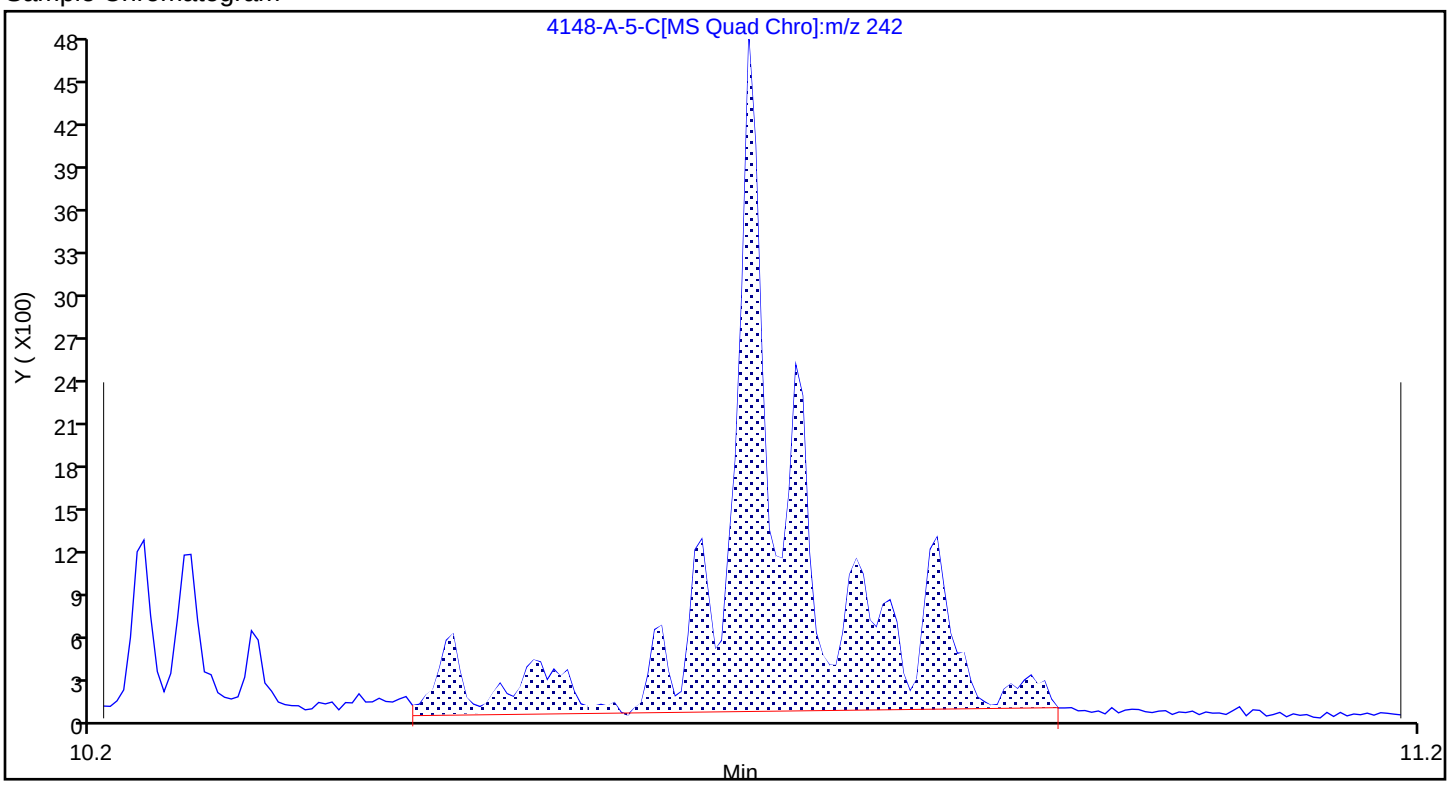
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 101 C1-Chrysenes/Benz(a)anthracenes, CAS: STL02218

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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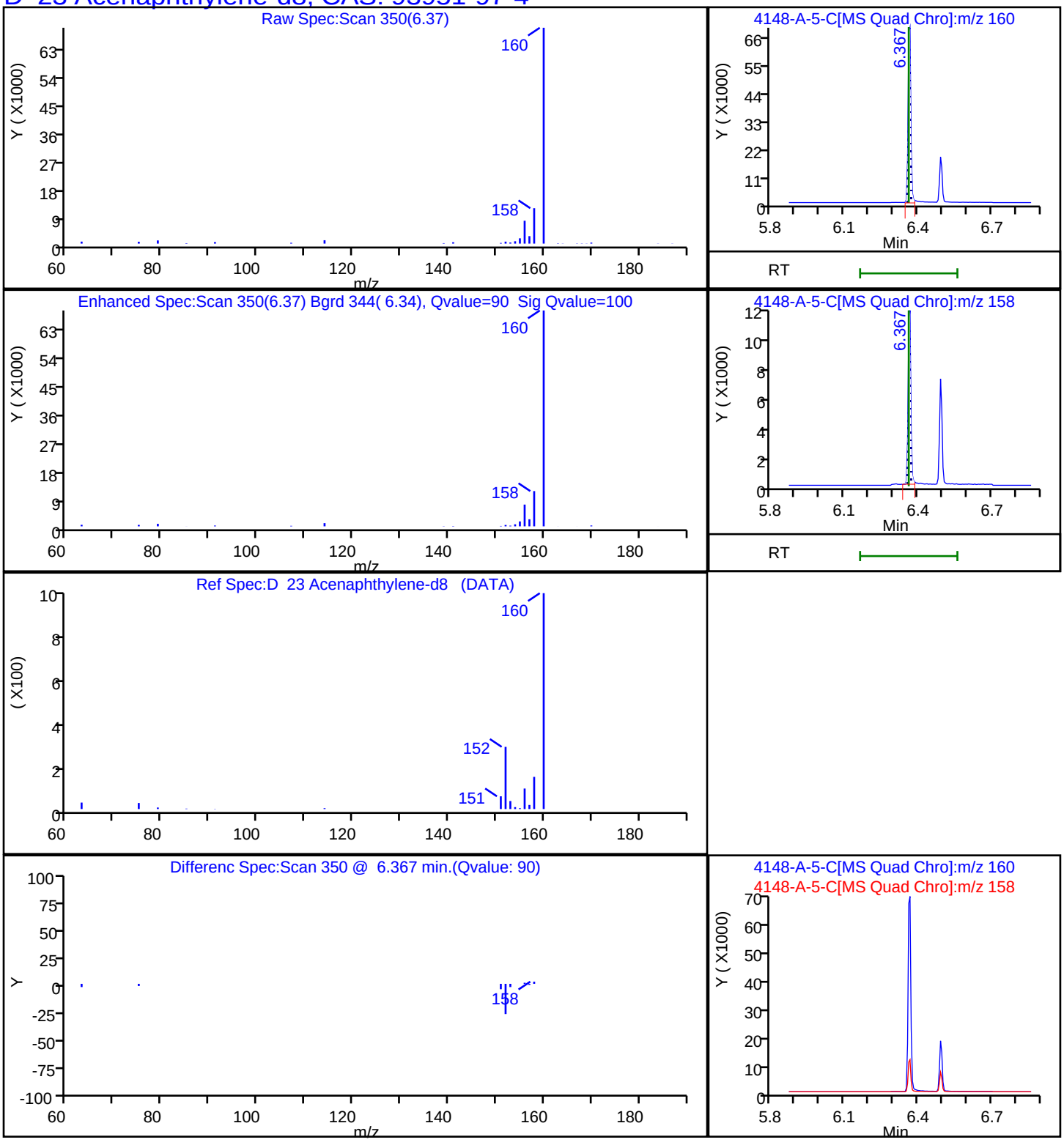
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 23 Acenaphthylene-d8, CAS: 93951-97-4



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Eurofins Knoxville

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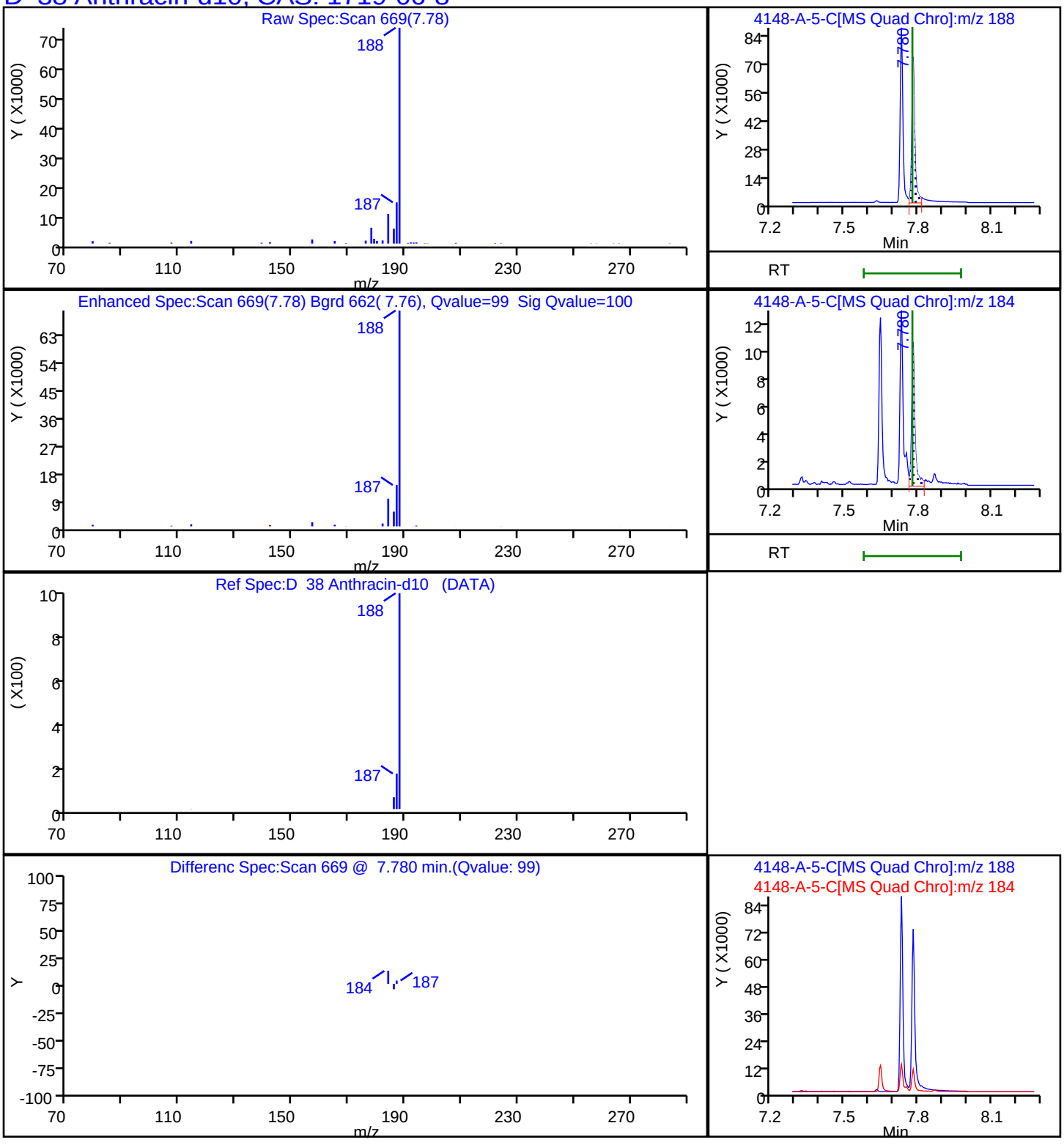
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 38 Anthracin-d10, CAS: 1719-06-8



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Eurofins Knoxville

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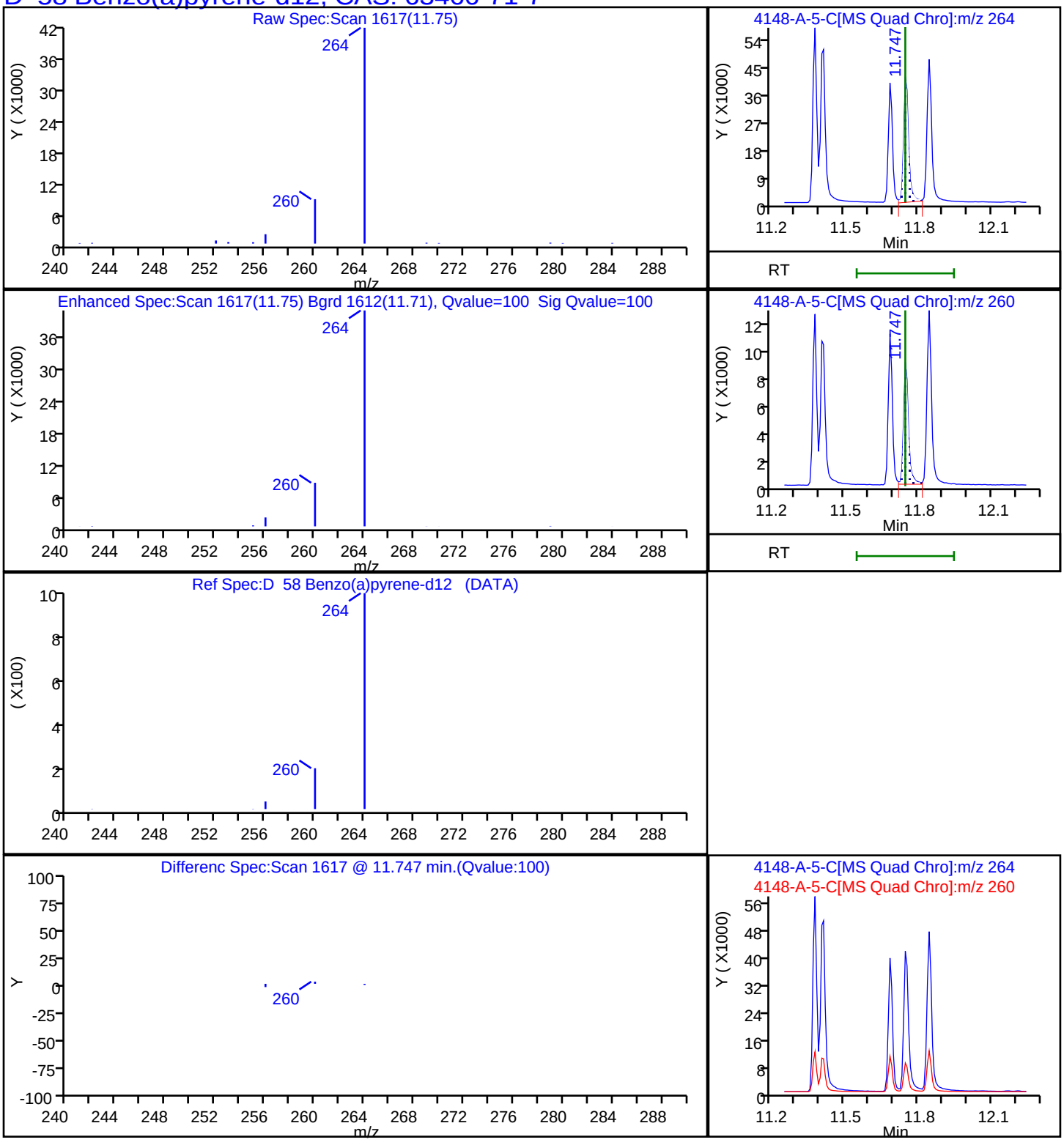
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 58 Benzo(a)pyrene-d12, CAS: 63466-71-7



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Eurofins Knoxville

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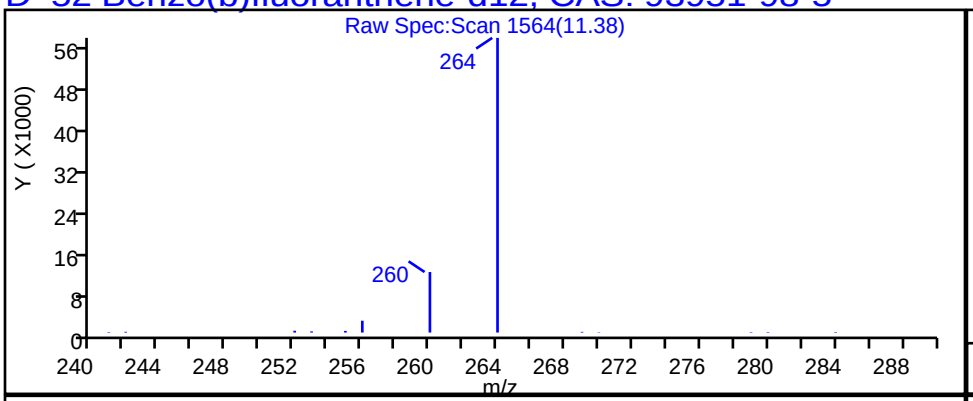
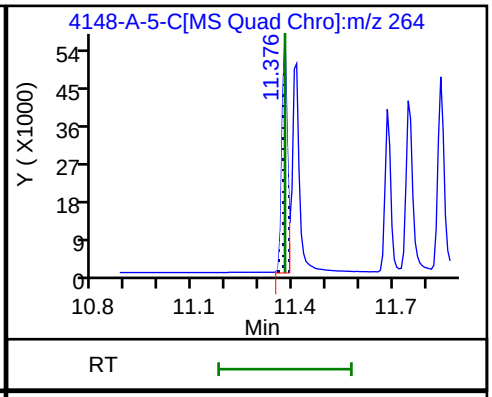
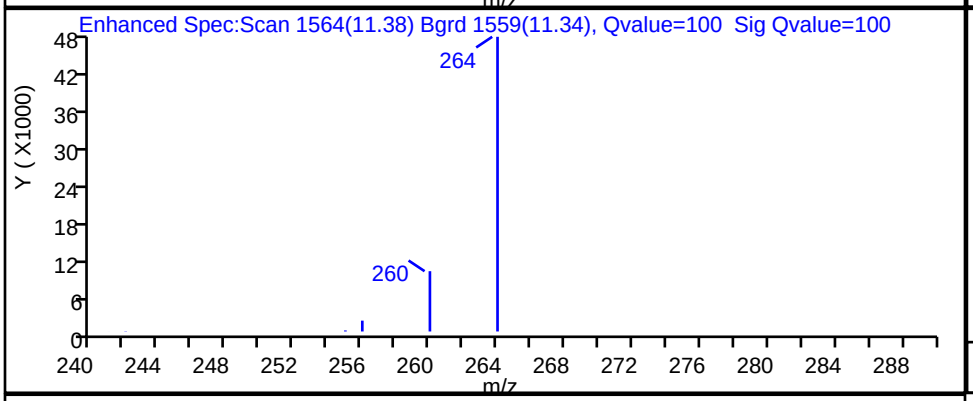
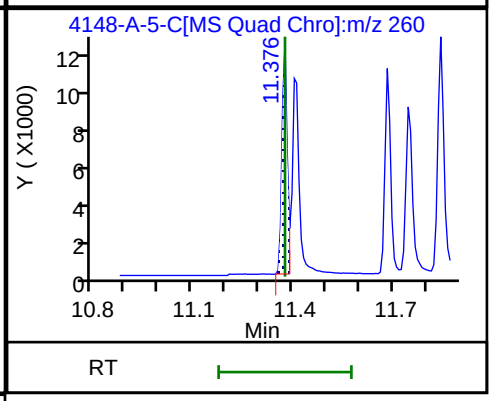
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

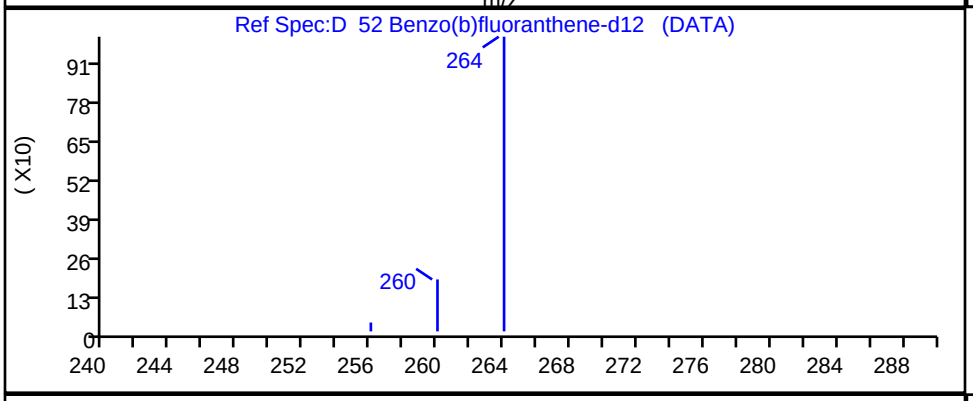
D 52 Benzo(b)fluoranthene-d12, CAS: 93951-98-5

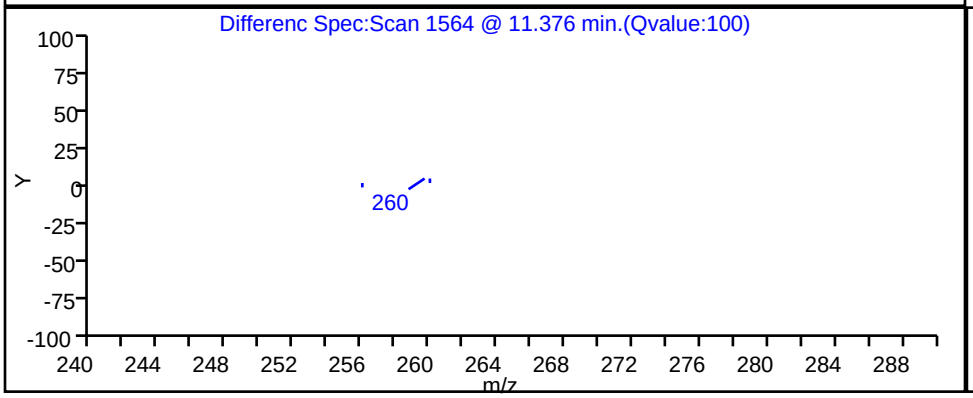


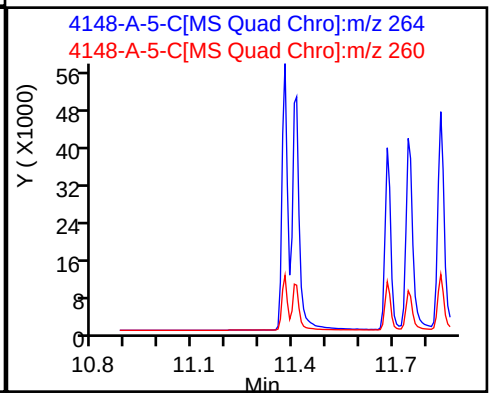












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Eurofins Knoxville

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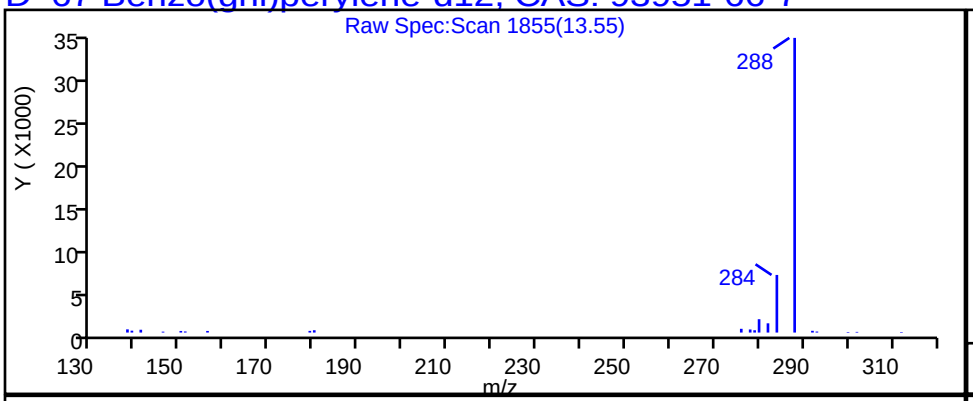
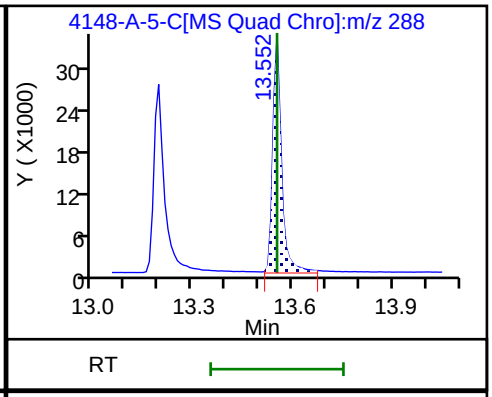
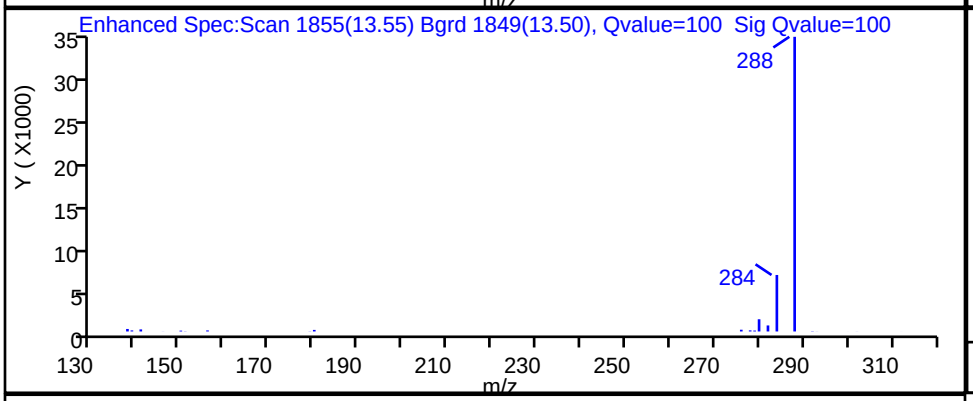
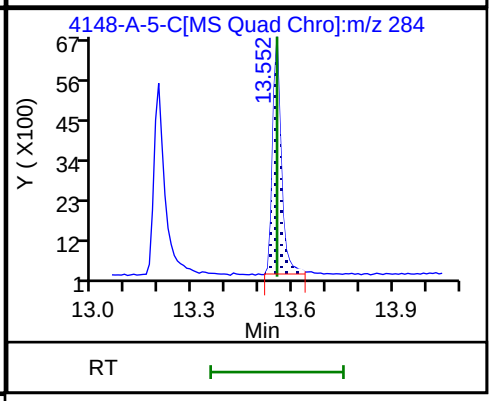
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

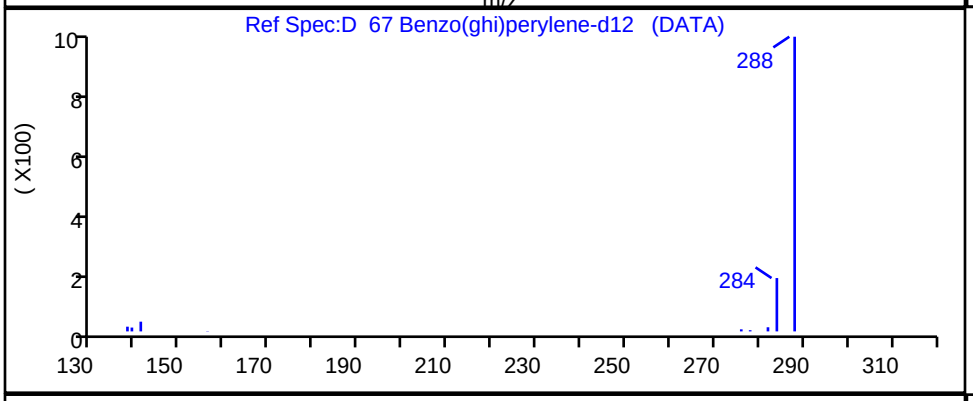
D 67 Benzo(ghi)perylene-d12, CAS: 93951-66-7

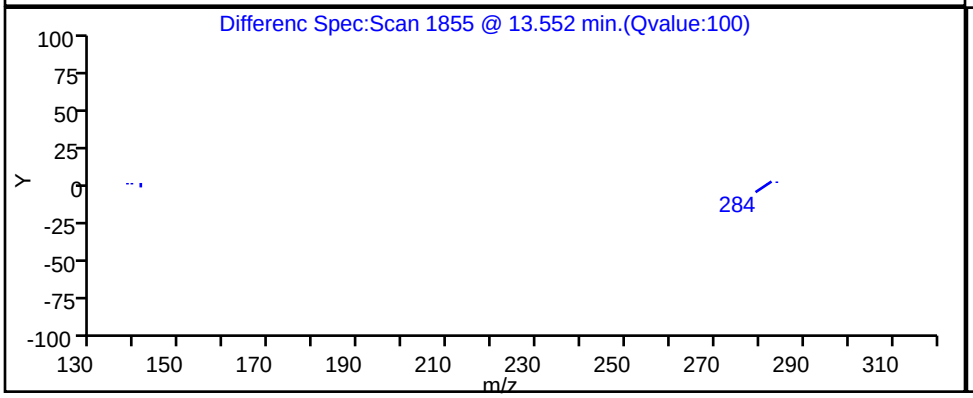


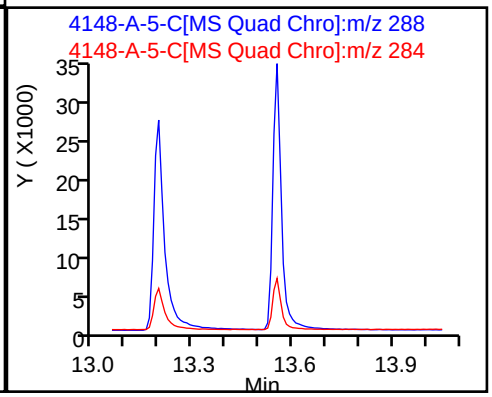












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Eurofins Knoxville

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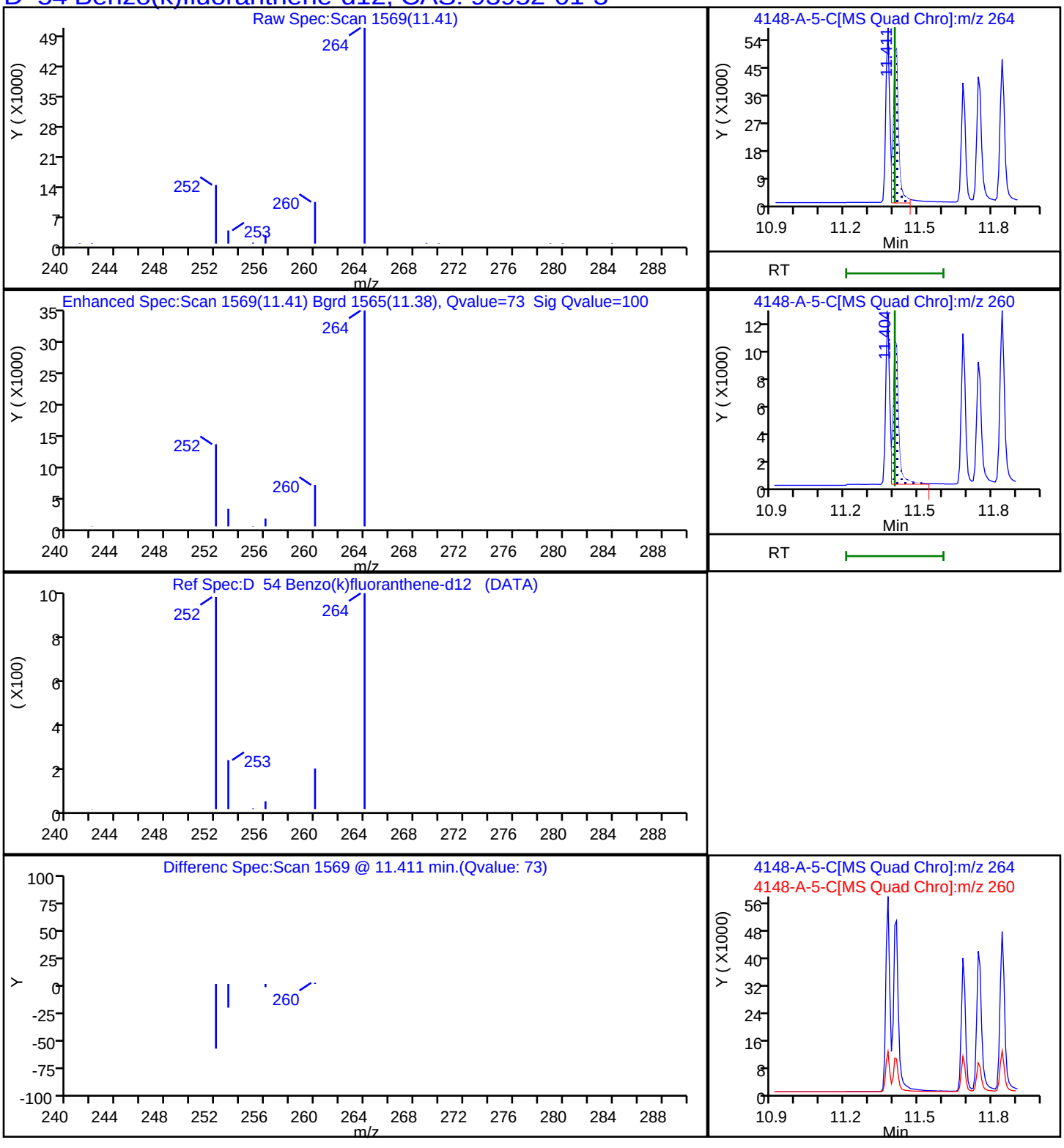
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5
Client ID:	1804576-851-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

D 54 Benzo(k)fluoranthene-d12, CAS: 93952-01-3



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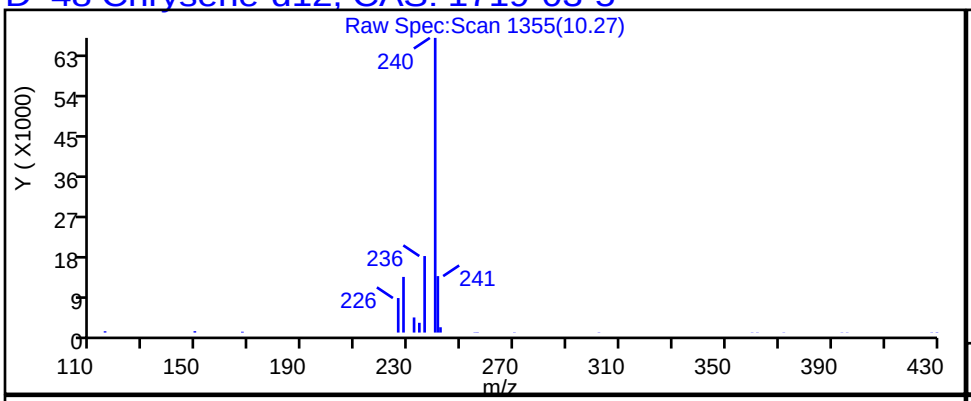
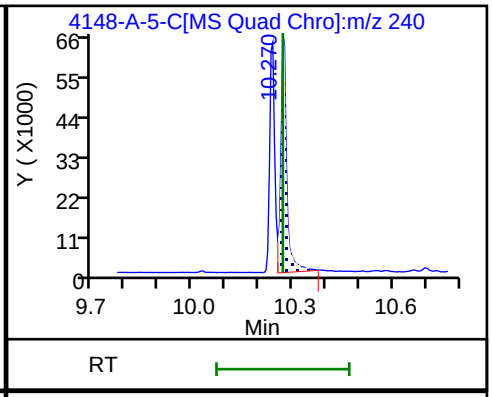
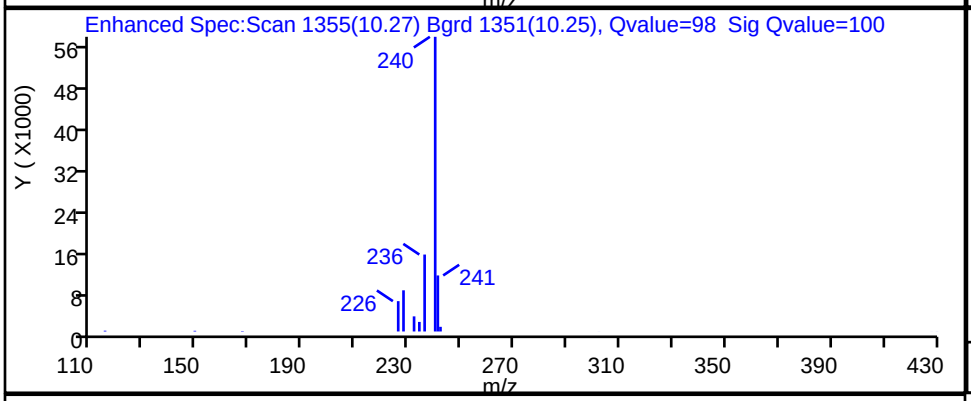
Eurofins Knoxville

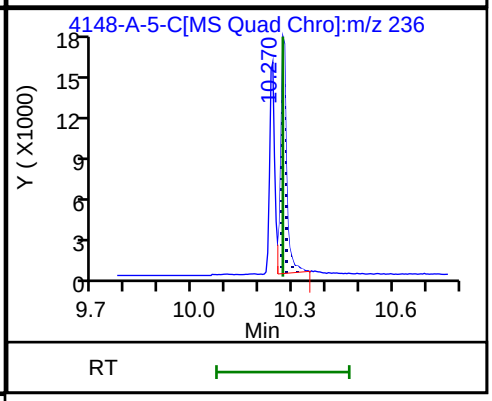
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D				
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

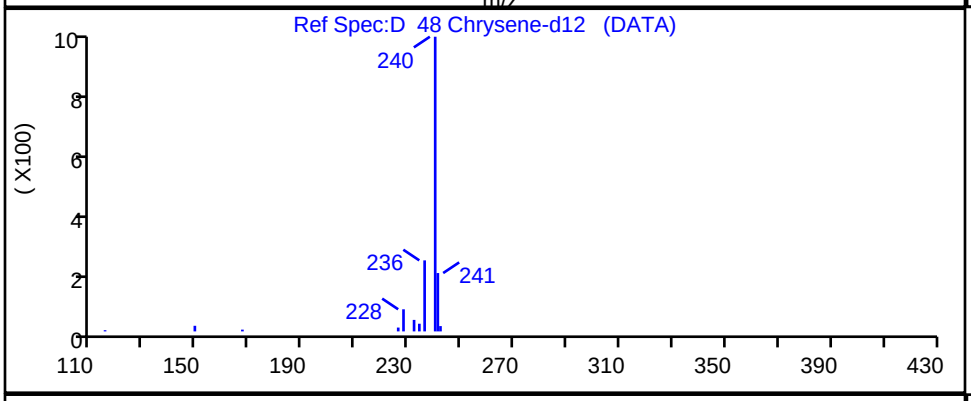
D 48 Chrysene-d12, CAS: 1719-03-5

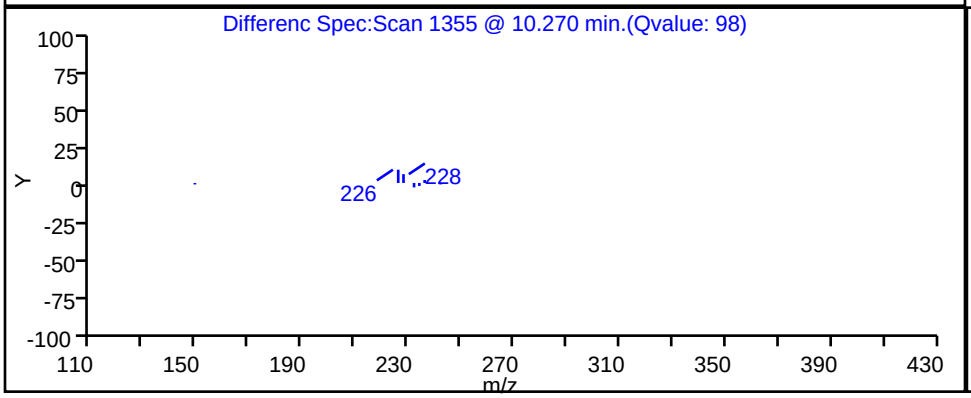


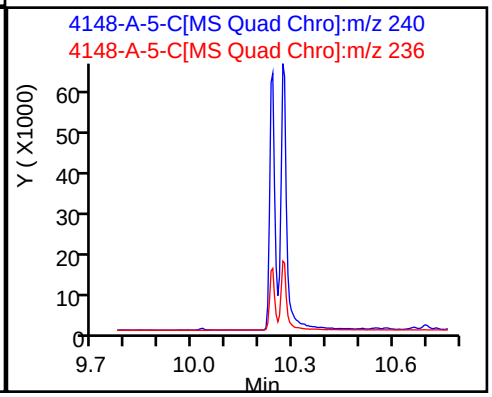












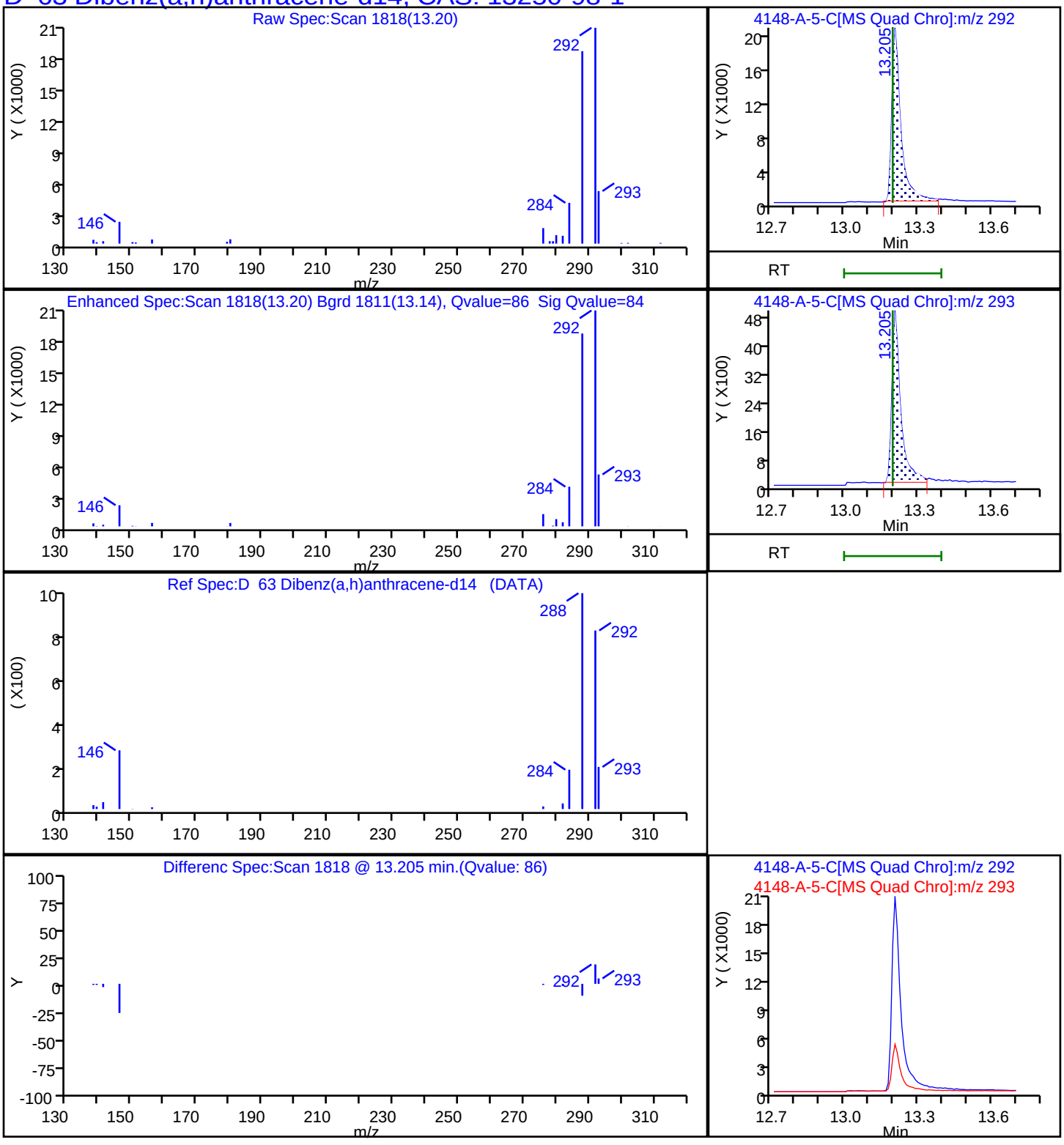
Report Date: 22-Nov-2023 14:37:45 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D

Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 63 Dibenz(a,h)anthracene-d14, CAS: 13250-98-1

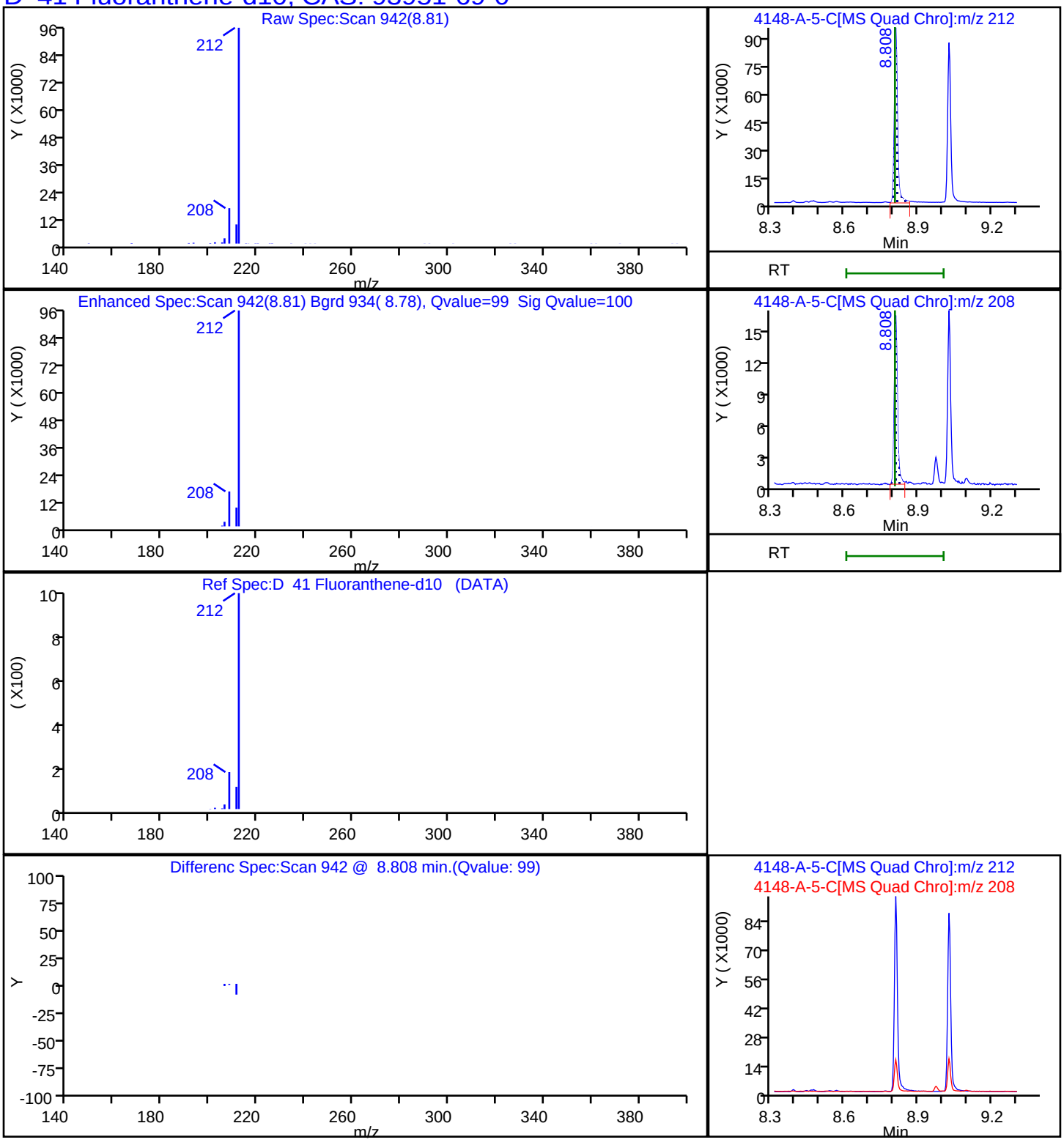


Report Date: 22-Nov-2023 14:37:44 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D		
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5
Client ID:	1804576-851-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

D 41 Fluoranthene-d10, CAS: 93951-69-0



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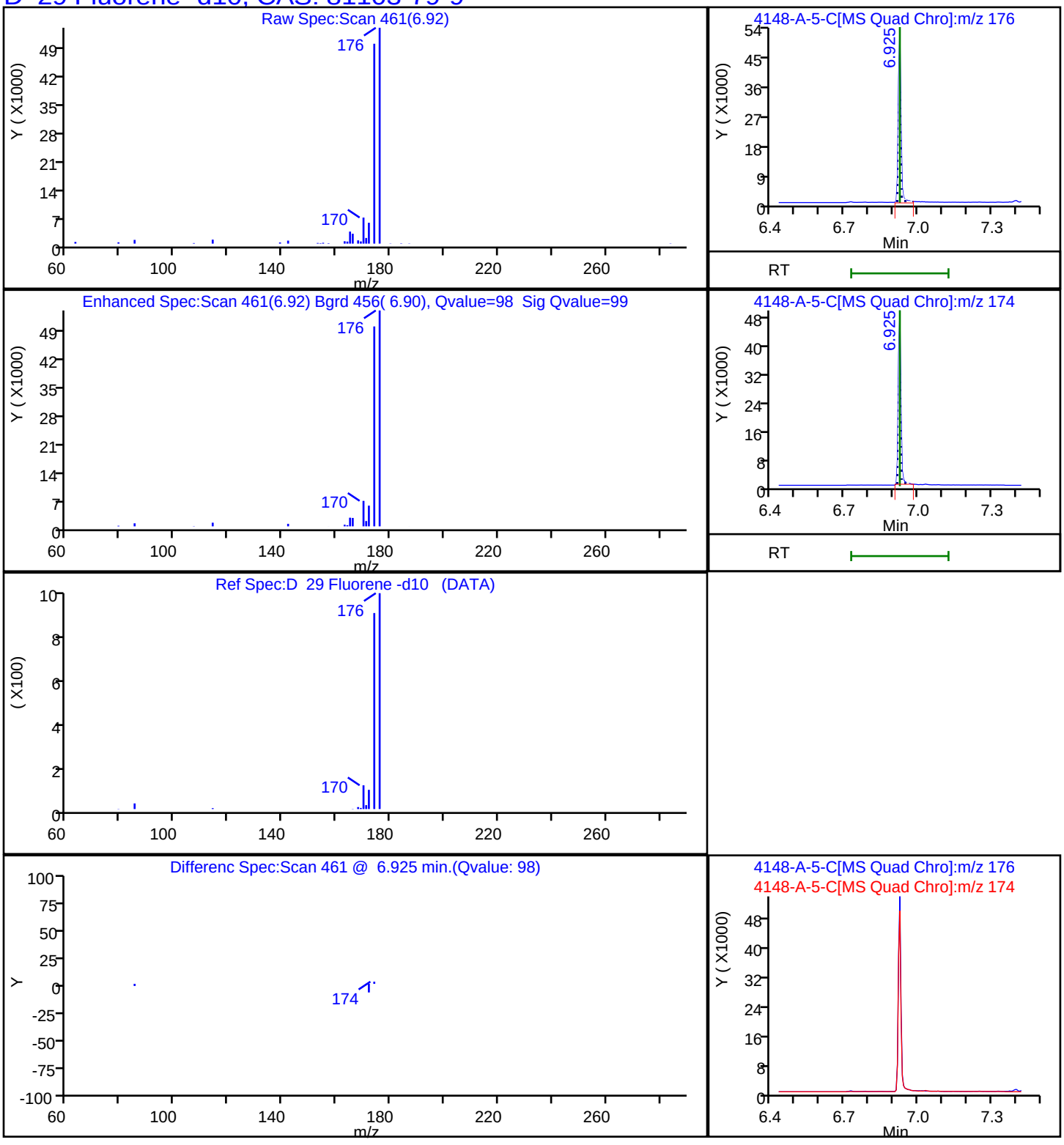
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D

Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5
Client ID:	1804576-851-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

D 29 Fluorene -d10, CAS: 81103-79-9



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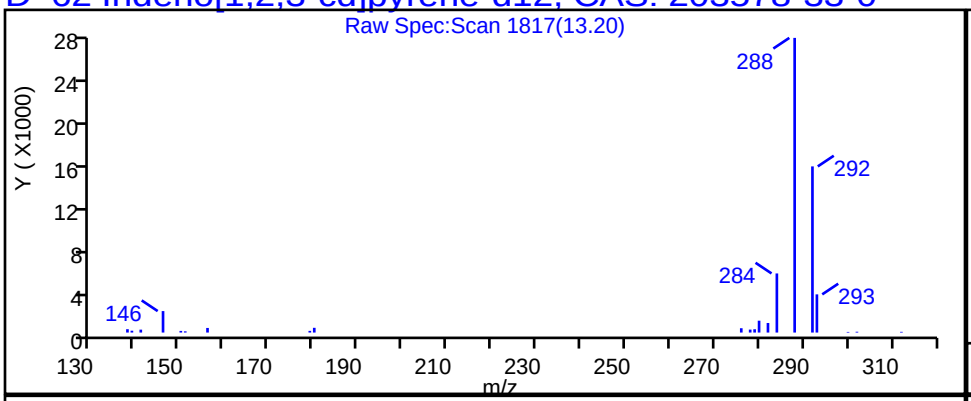
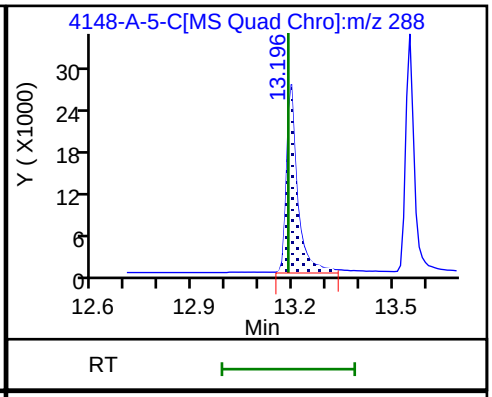
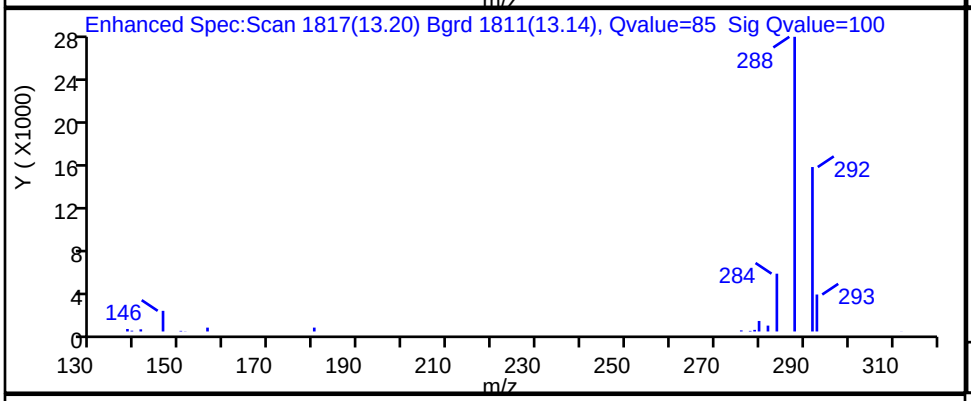
Eurofins Knoxville

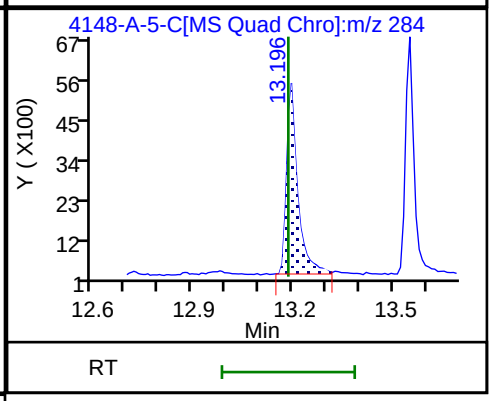
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D				
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

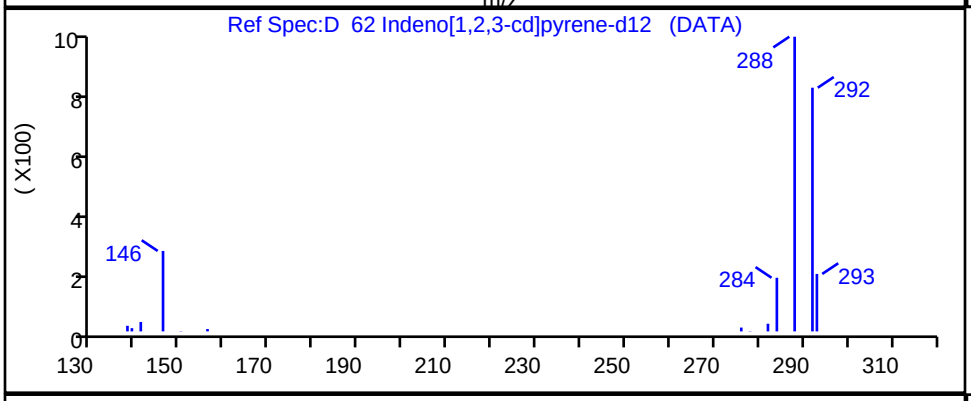
D 62 Indeno[1,2,3-cd]pyrene-d12, CAS: 203578-33-0

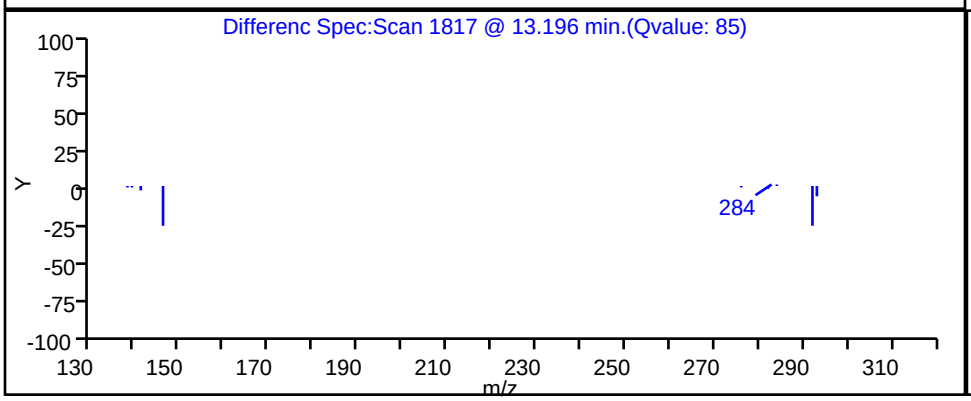


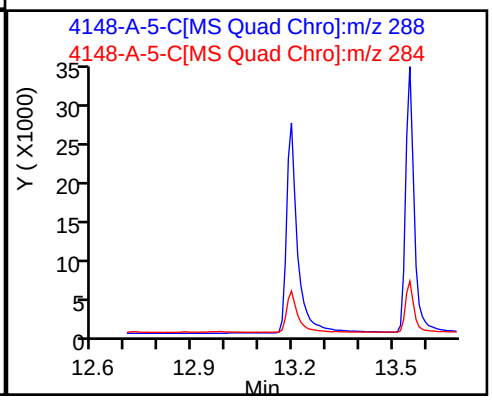










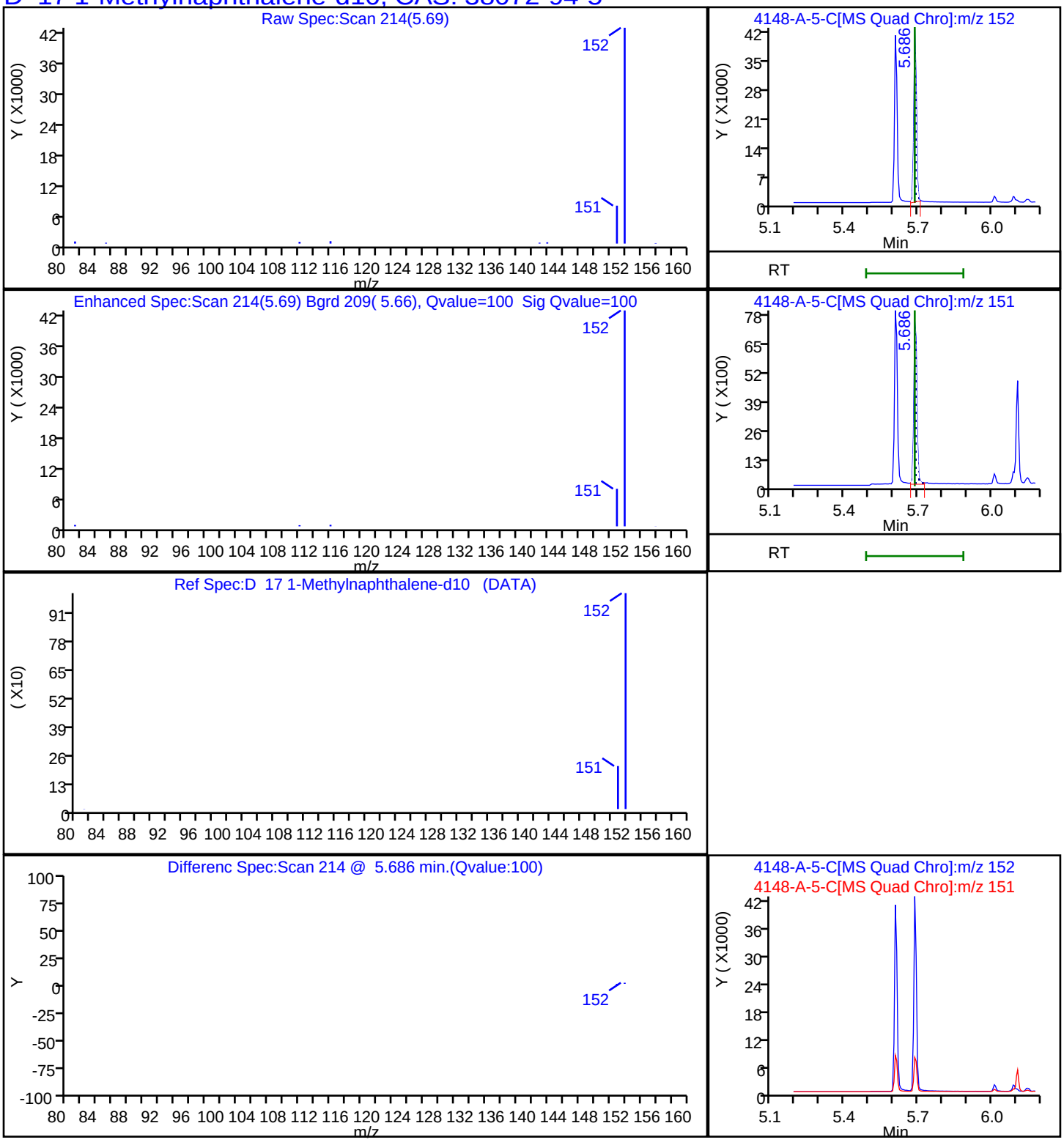


Report Date: 22-Nov-2023 14:37:44 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D				
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 17 1-Methylnaphthalene-d10, CAS: 38072-94-5



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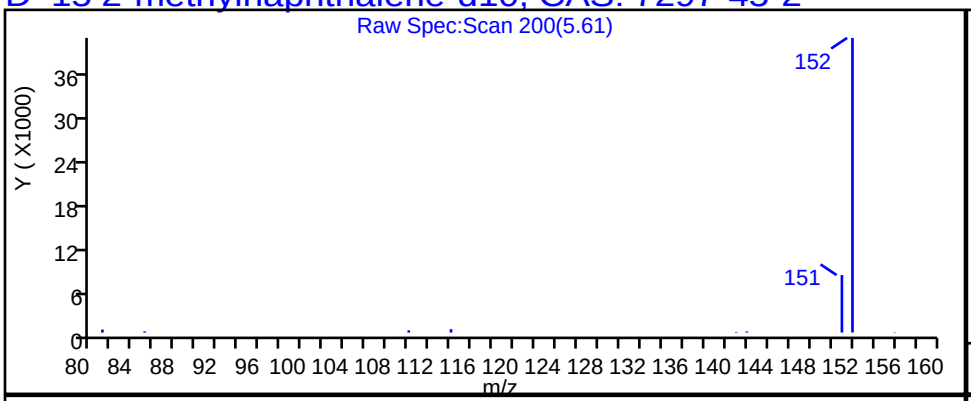
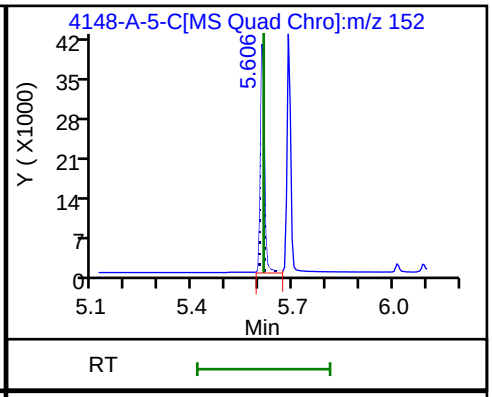
Eurofins Knoxville

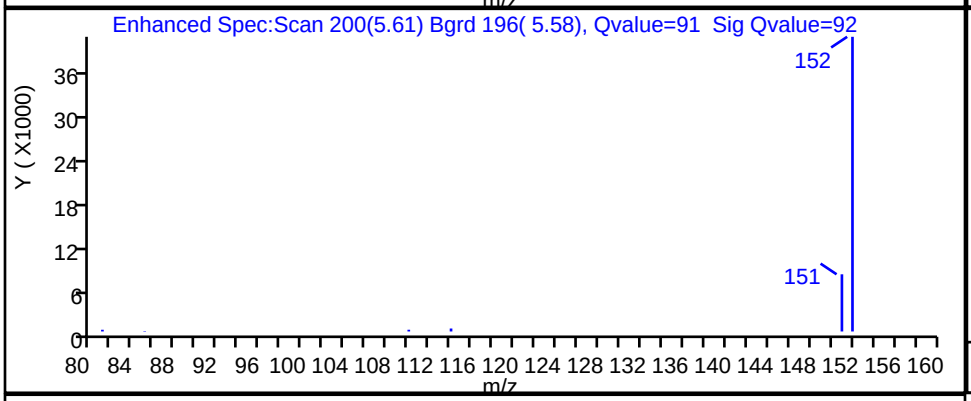
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D

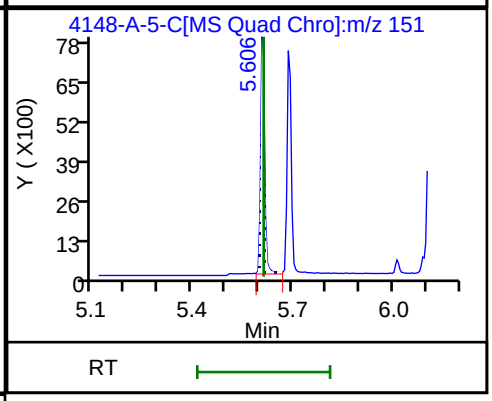
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

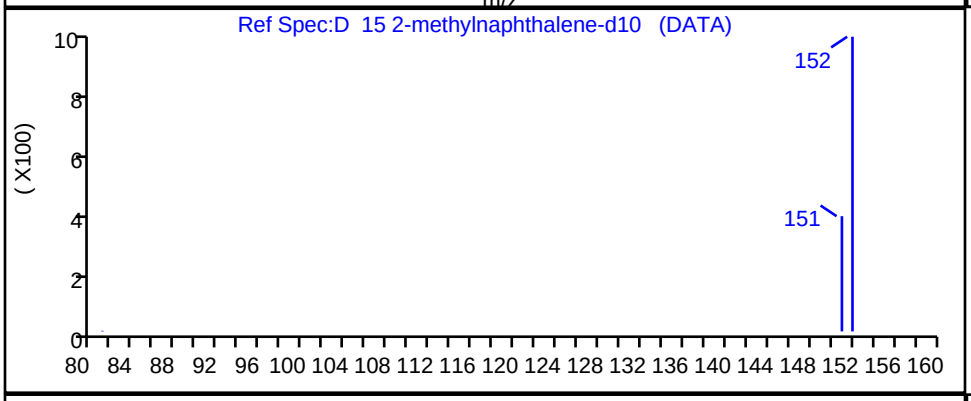
D 15 2-methylnaphthalene-d10, CAS: 7297-45-2

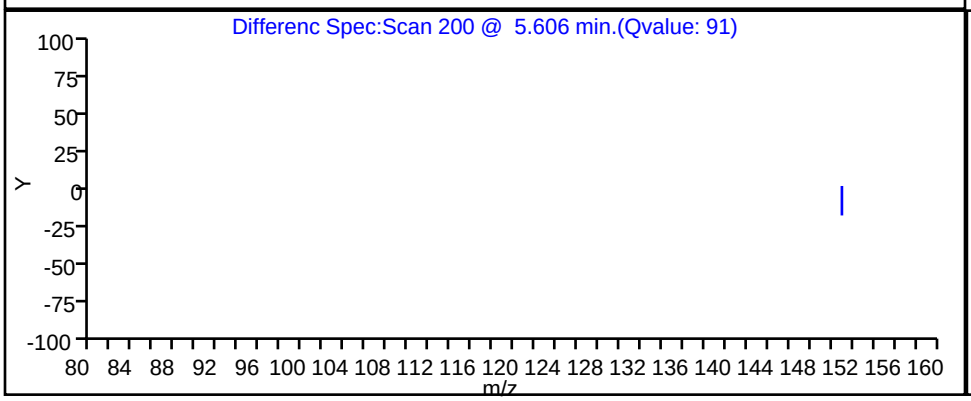


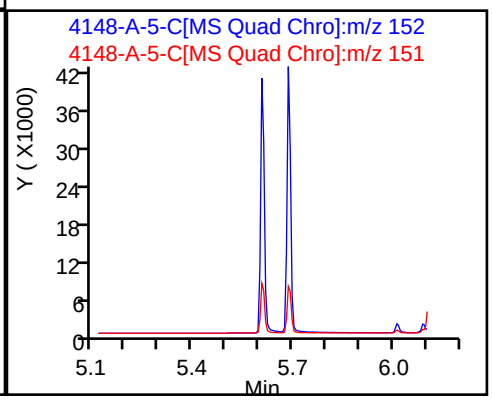












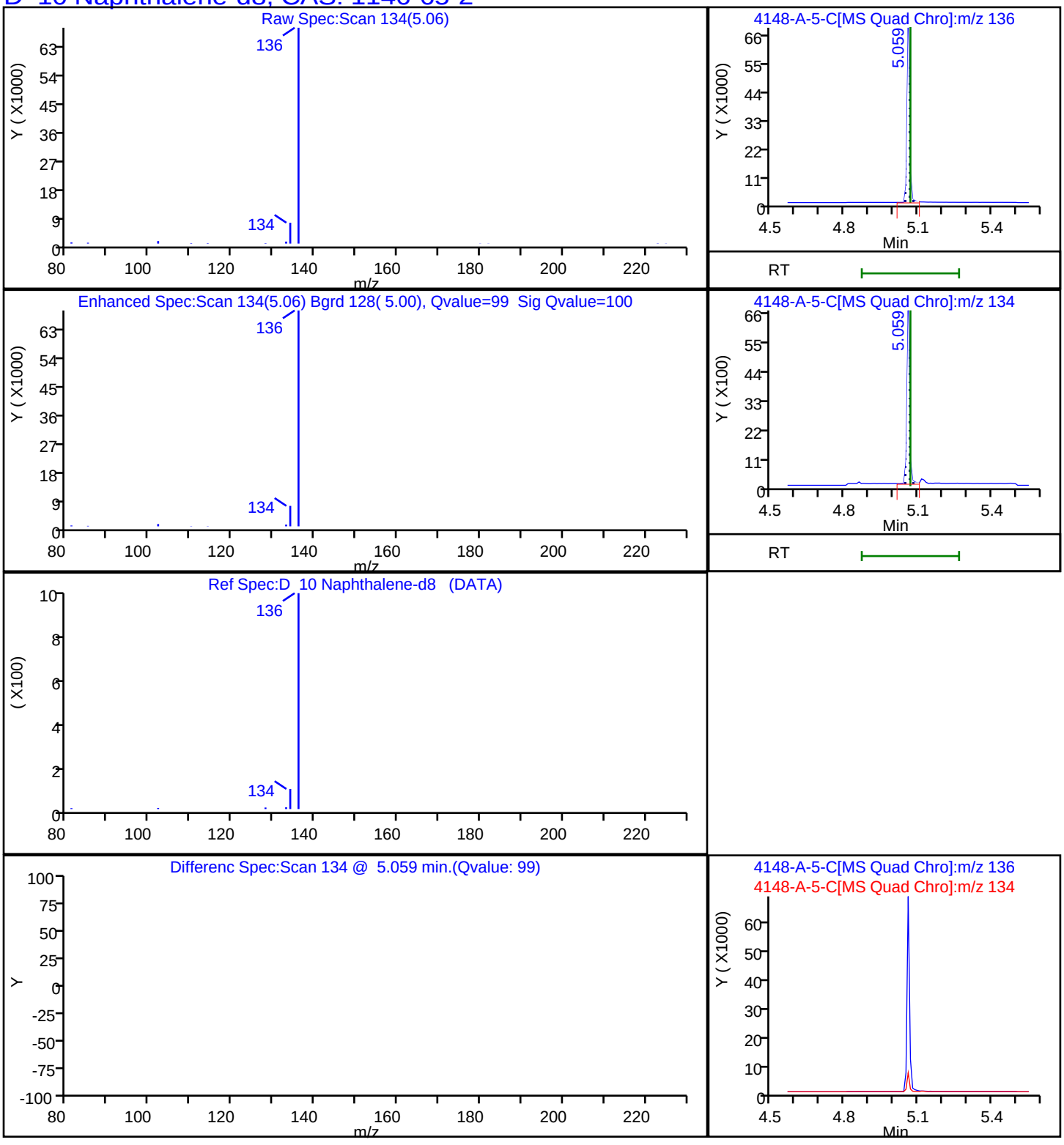
Report Date: 22-Nov-2023 14:37:44 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D

Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5
Client ID:	1804576-851-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

D_10 Naphthalene-d8, CAS: 1146-65-2



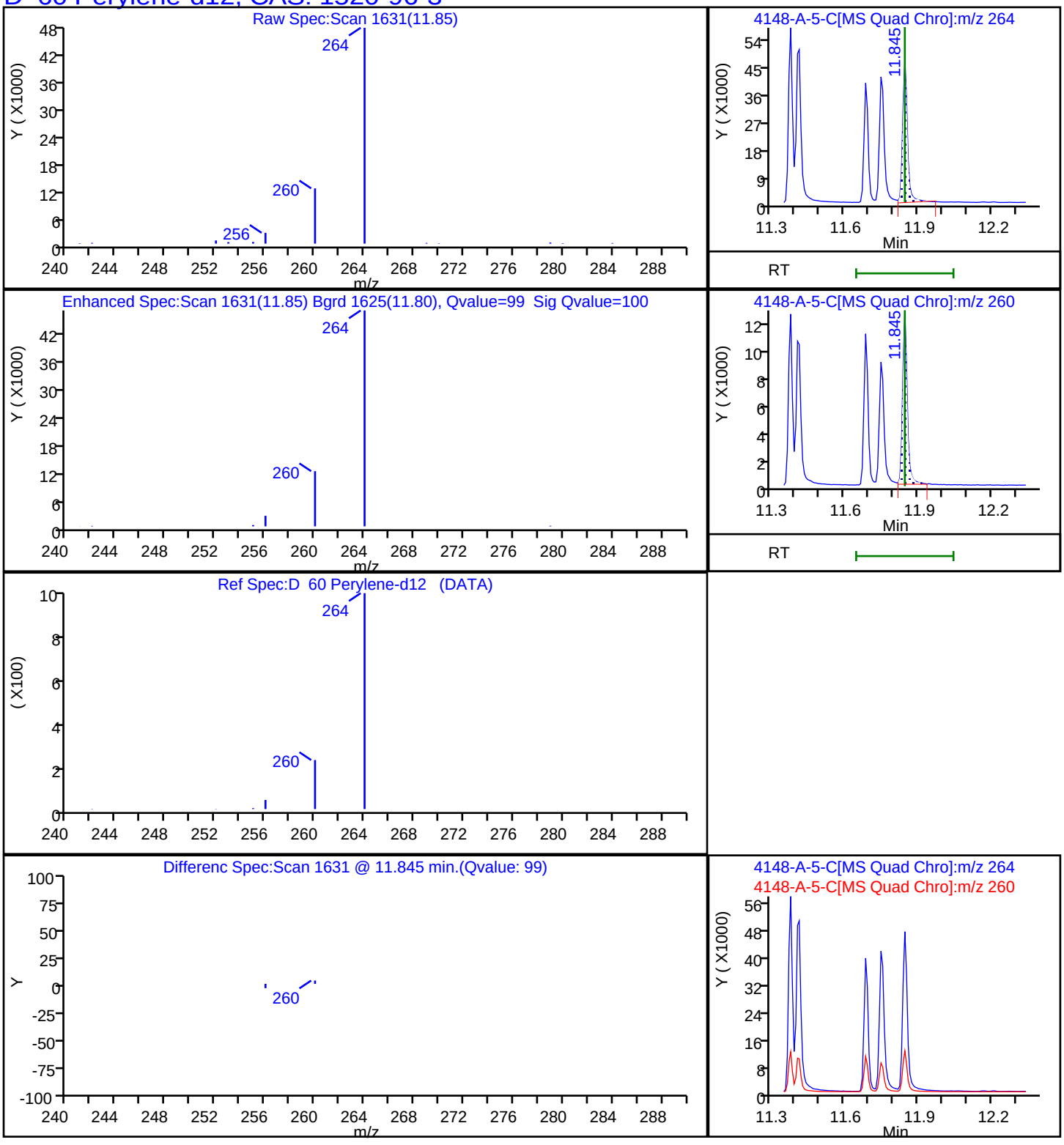
Report Date: 22-Nov-2023 14:37:45 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D

Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5
Client ID:	1804576-851-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

D 60 Perylene-d12, CAS: 1520-96-3



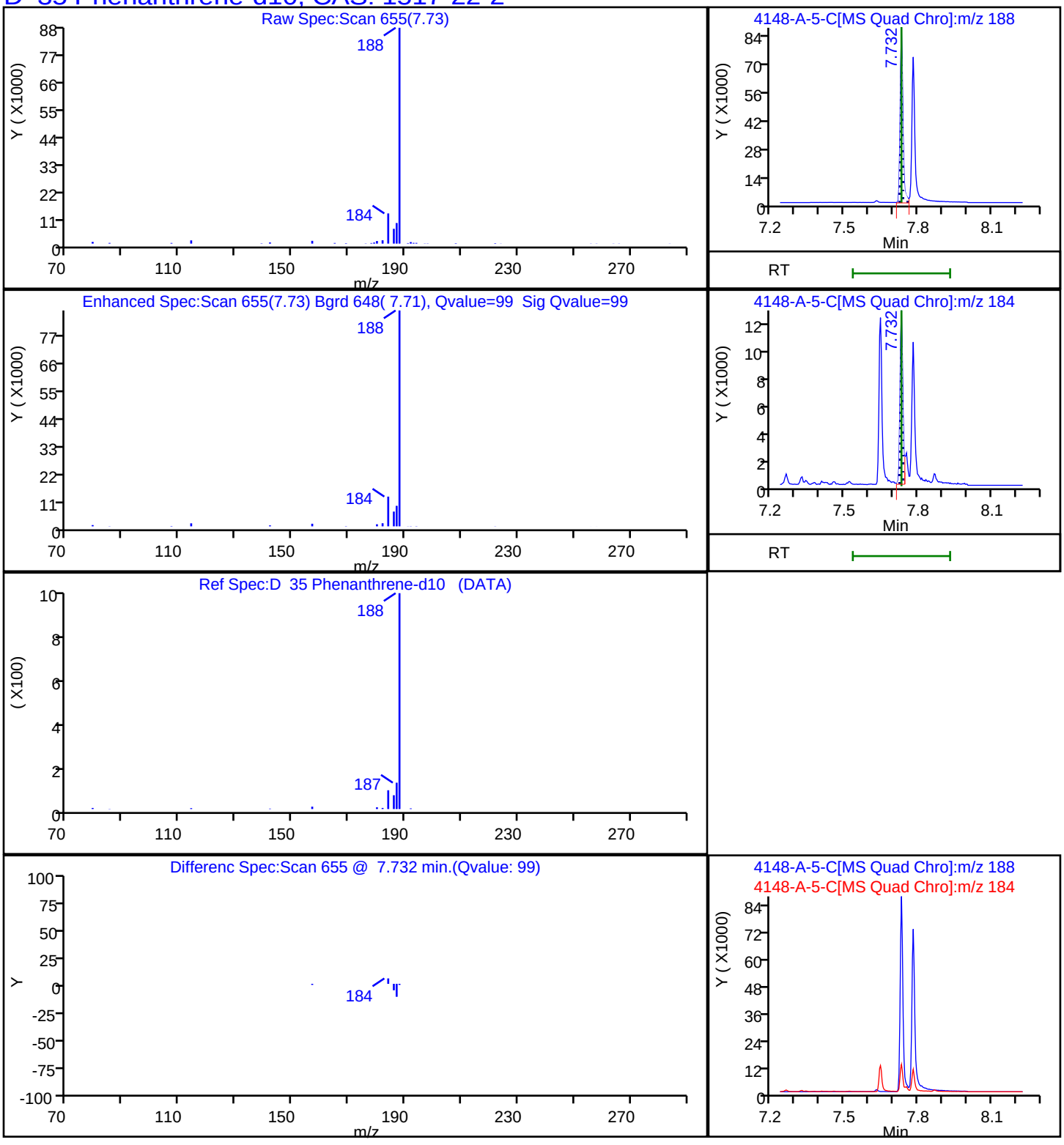
Report Date: 22-Nov-2023 14:37:44 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D

Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5
Client ID:	1804576-851-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

D_35 Phenanthrene-d10, CAS: 1517-22-2



Manual Integration/User Assign Peak Report

Eurofins Knoxville

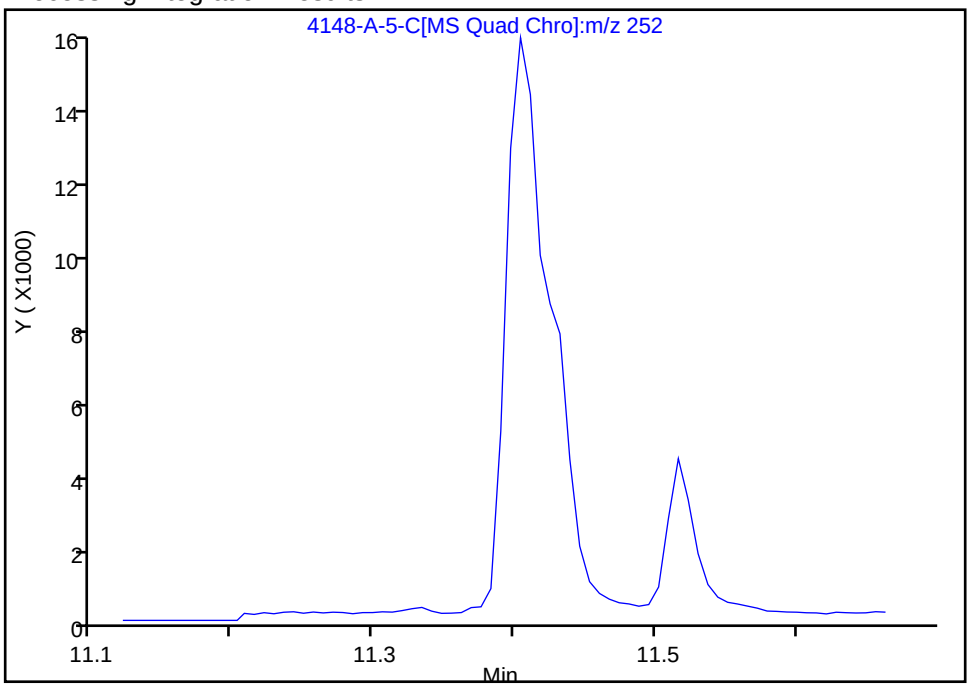
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D				
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

53 Benzo[b]fluoranthene, CAS: 205-99-2

Signal: 1

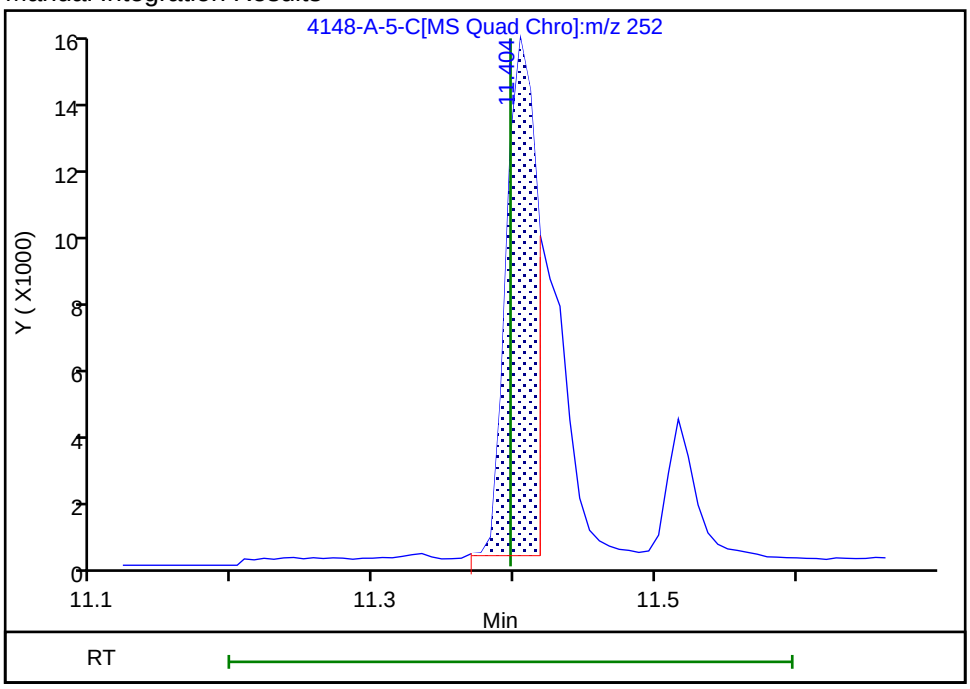
Not Detected
Expected RT: 11.40

Processing Integration Results



Manual Integration Results

RT: 11.40
Area: 23201
Amount: 0.106462
Amount Units: ug/ml



Reviewer: SK9U, 20-Nov-2023 09:28:27 -05:00:00 (UTC)
Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

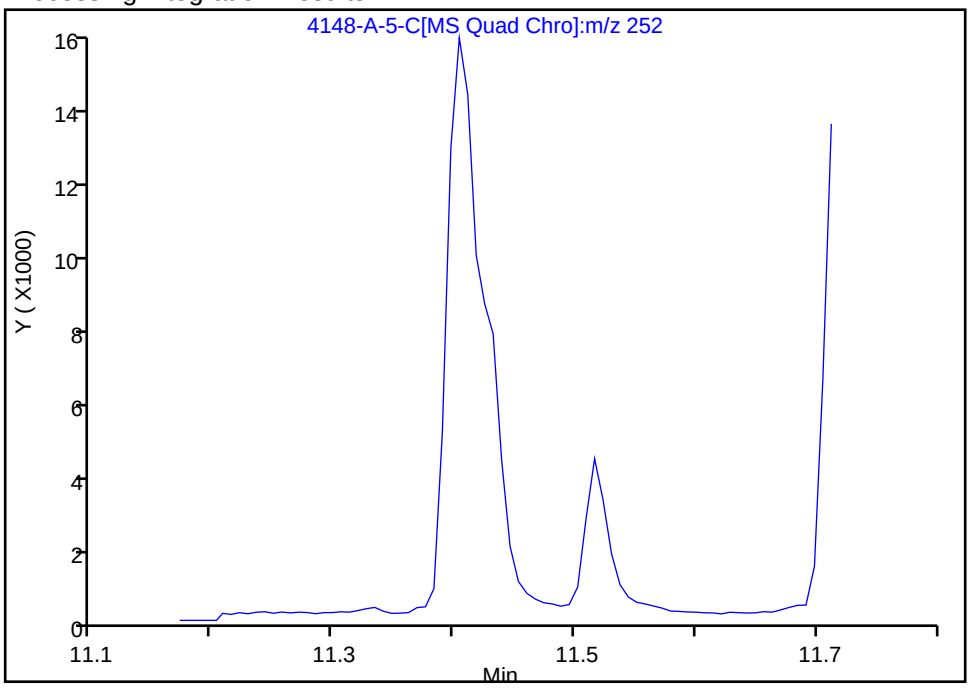
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D				
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

55 Benzo[k]fluoranthene, CAS: 207-08-9

Signal: 1

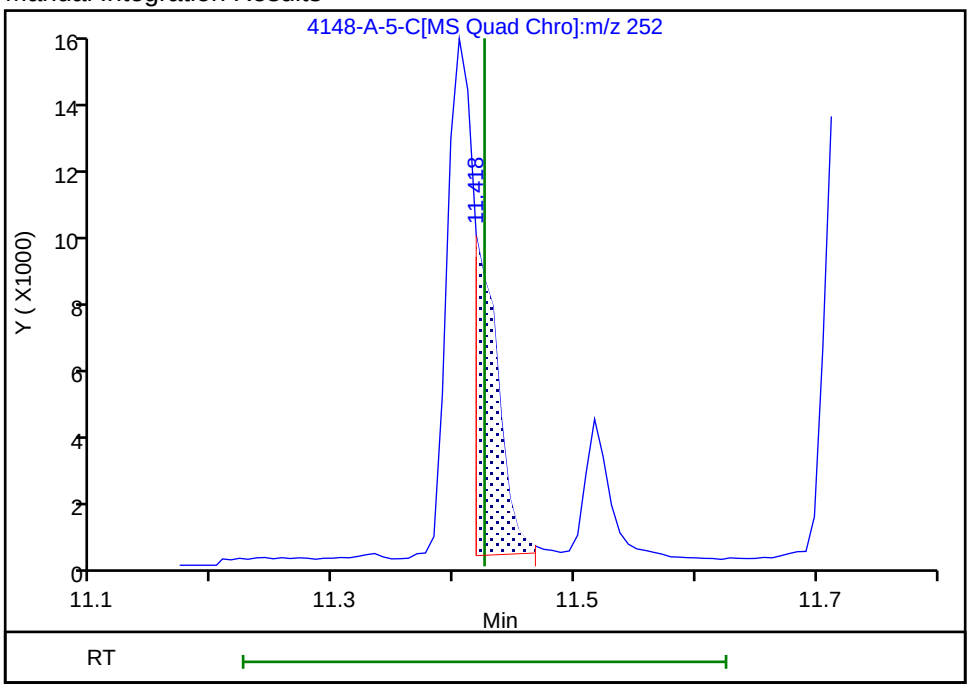
Not Detected
Expected RT: 11.43

Processing Integration Results



Manual Integration Results

RT: 11.42
Area: 13046
Amount: 0.059271
Amount Units: ug/ml



Reviewer: SK9U, 20-Nov-2023 09:29:12 -05:00:00 (UTC)
Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

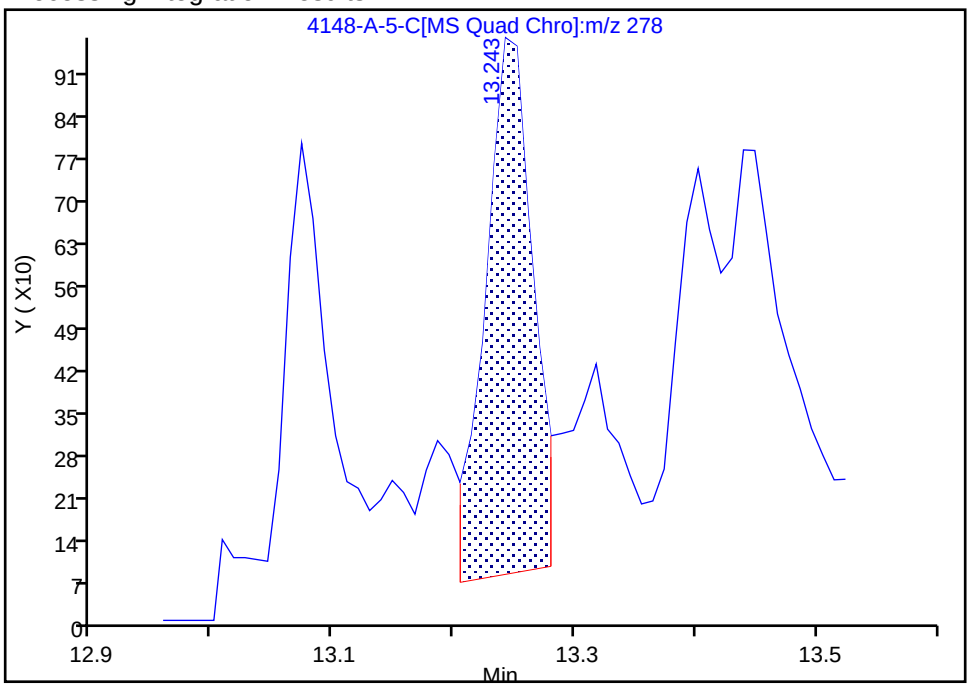
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D				
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

66 Dibenz(a,h)anthracene, CAS: 53-70-3

Signal: 1

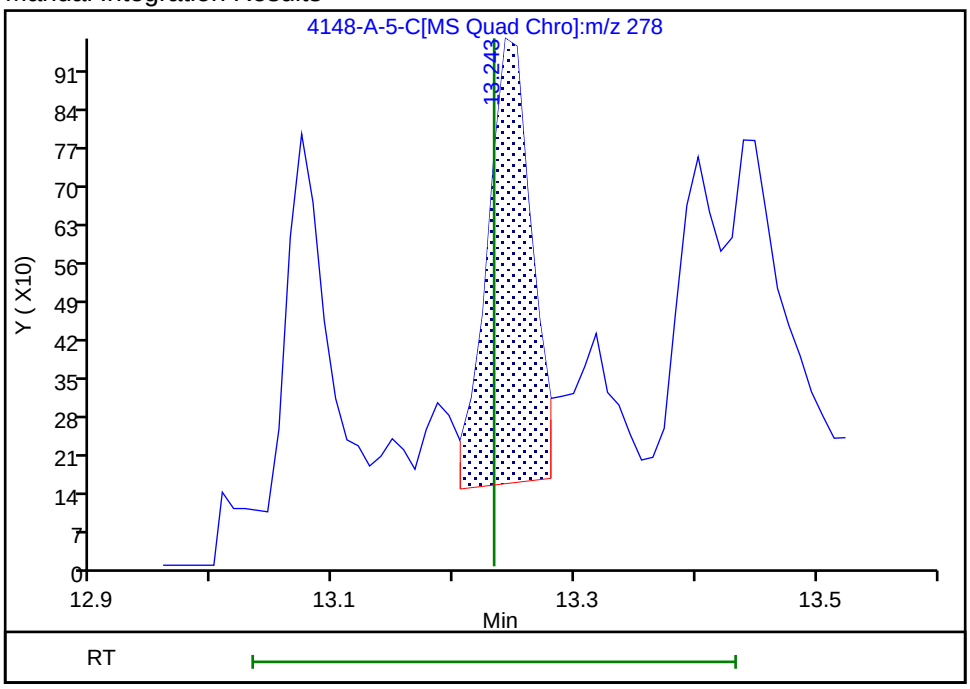
Processing Integration Results

RT: 13.24
Area: 2485
Amount: 0.014403
Amount Units: ug/ml



Manual Integration Results

RT: 13.24
Area: 2113
Amount: 0.012247
Amount Units: ug/ml



Reviewer: SK9U, 20-Nov-2023 09:30:17 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

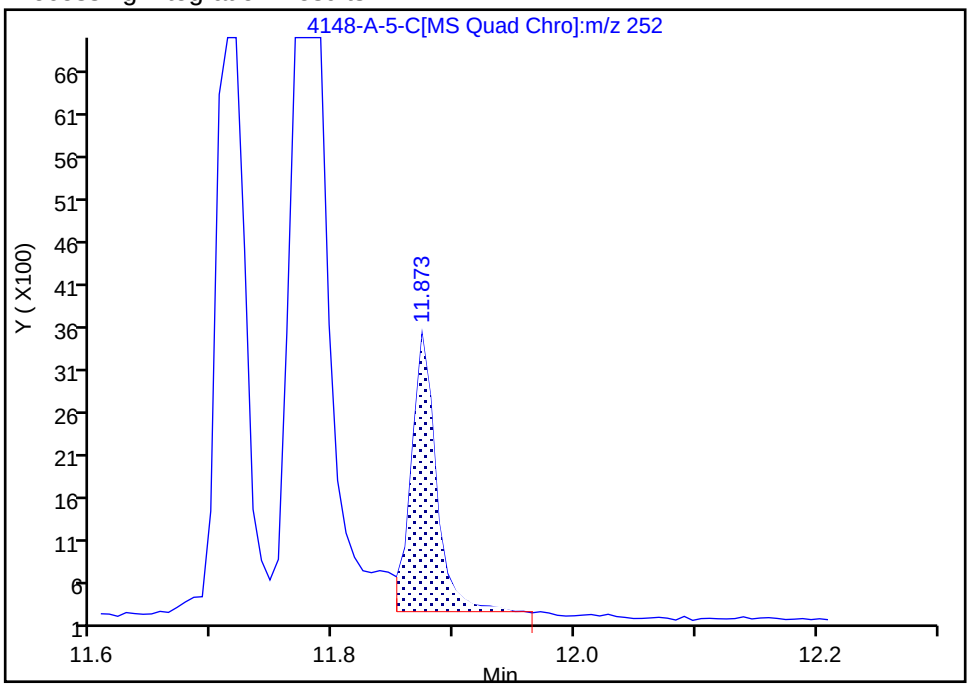
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D				
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

61 Perylene, CAS: 198-55-0

Signal: 1

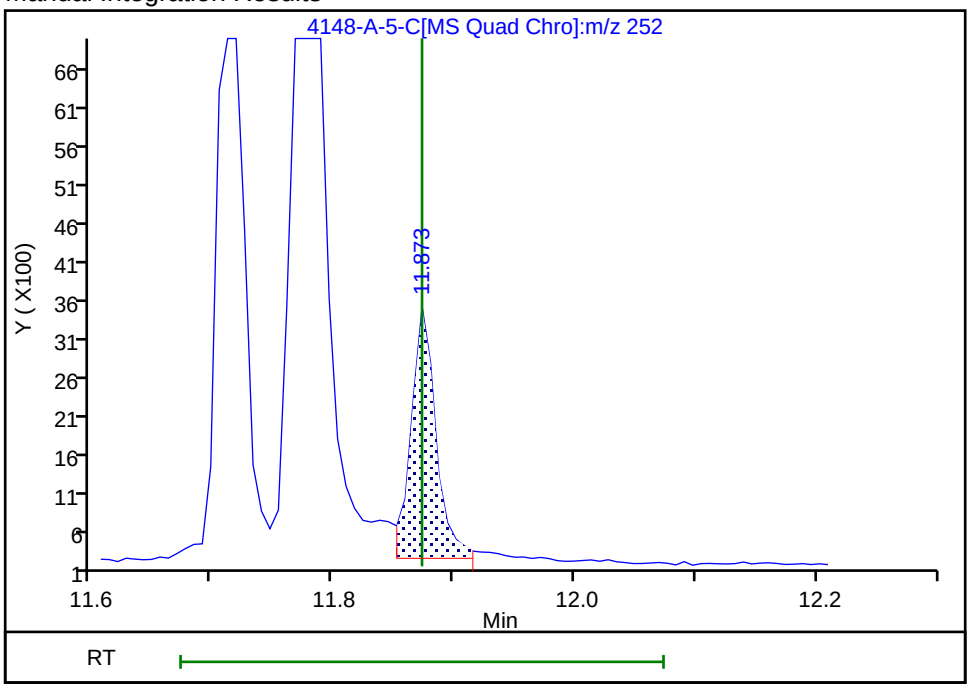
Processing Integration Results

RT: 11.87
Area: 4833
Amount: 0.026304
Amount Units: ug/ml



Manual Integration Results

RT: 11.87
Area: 4710
Amount: 0.025635
Amount Units: ug/ml



Reviewer: SK9U, 20-Nov-2023 09:29:55 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

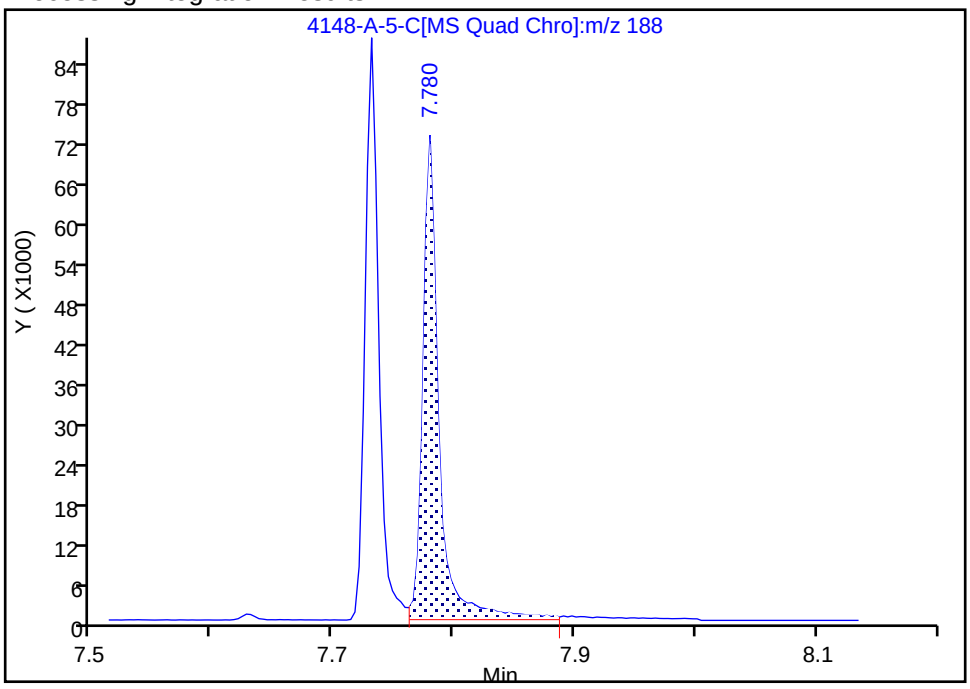
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D				
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 38 Anthracin-d10, CAS: 1719-06-8

Signal: 1

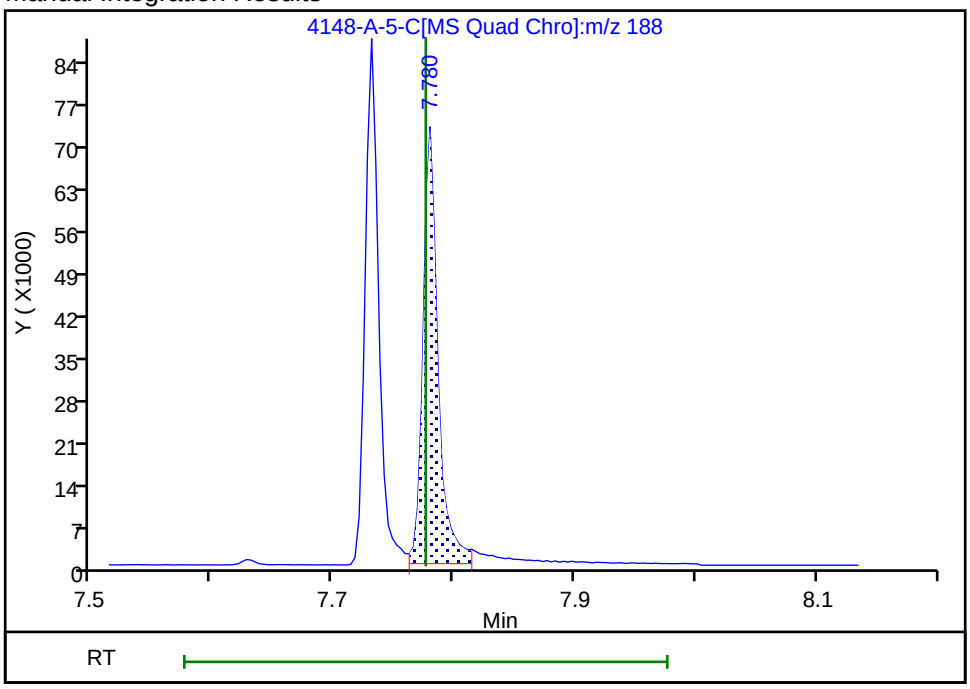
Processing Integration Results

RT: 7.78
Area: 68320
Amount: 0.573274
Amount Units: ug/ml



Manual Integration Results

RT: 7.78
Area: 63589
Amount: 0.533576
Amount Units: ug/ml



Reviewer: SK9U, 20-Nov-2023 09:27:47 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

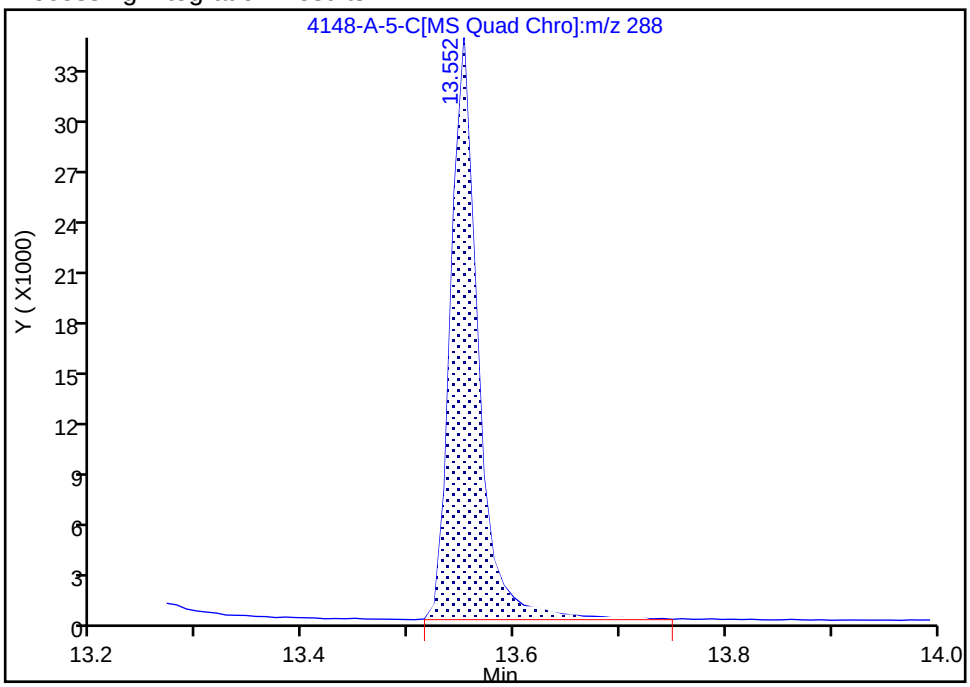
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D				
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 67 Benzo(ghi)perylene-d12, CAS: 93951-66-7

Signal: 1

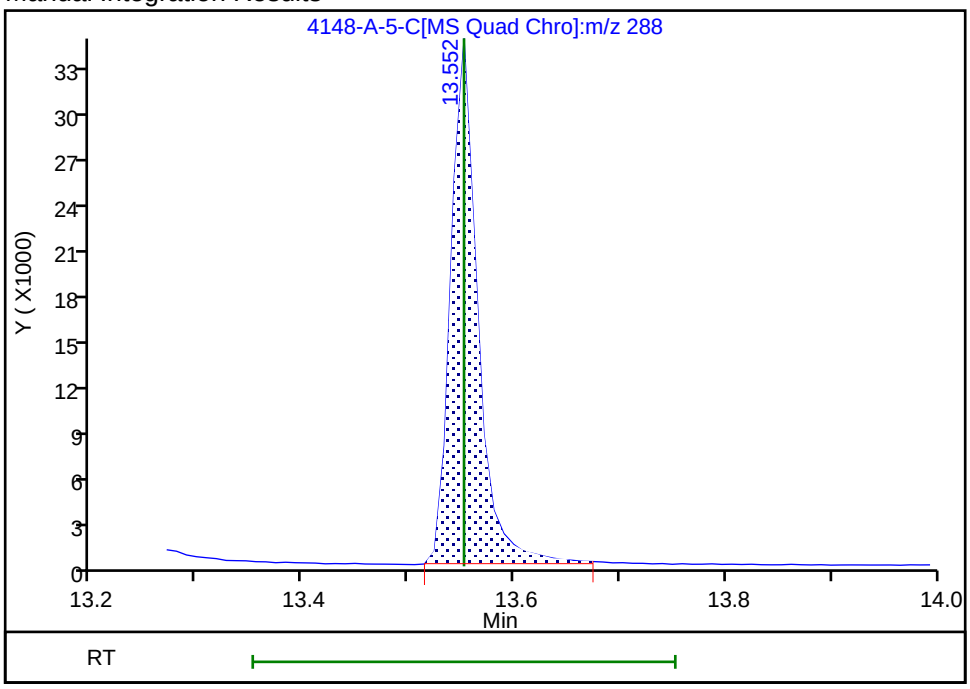
Processing Integration Results

RT: 13.55
Area: 62103
Amount: 0.555696
Amount Units: ug/ml



Manual Integration Results

RT: 13.55
Area: 61704
Amount: 0.552126
Amount Units: ug/ml



Reviewer: SK9U, 20-Nov-2023 09:30:31 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

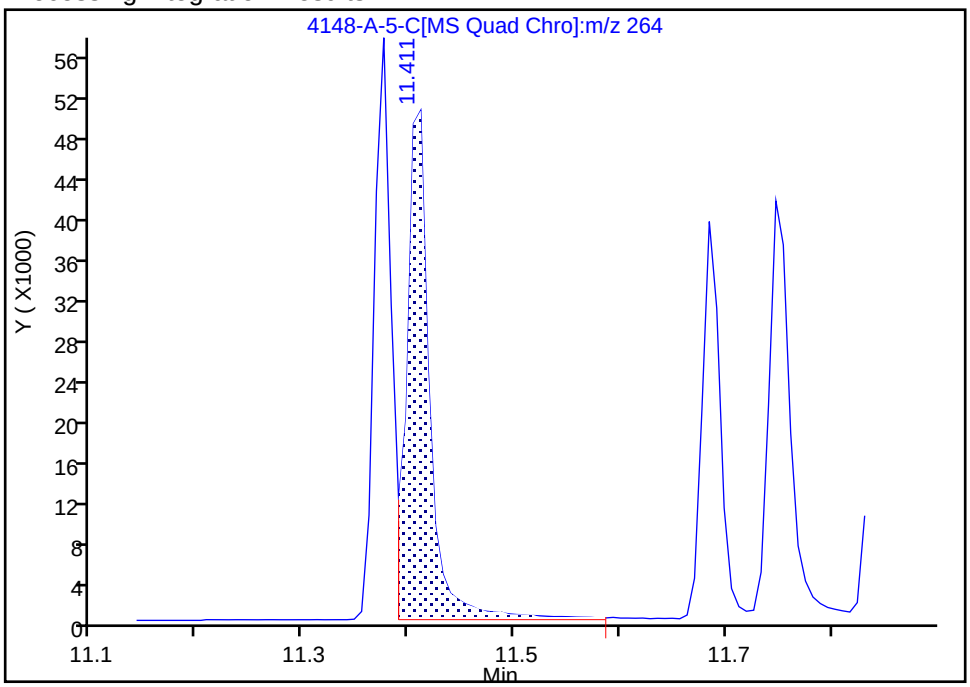
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D				
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 54 Benzo(k)fluoranthene-d12, CAS: 93952-01-3

Signal: 1

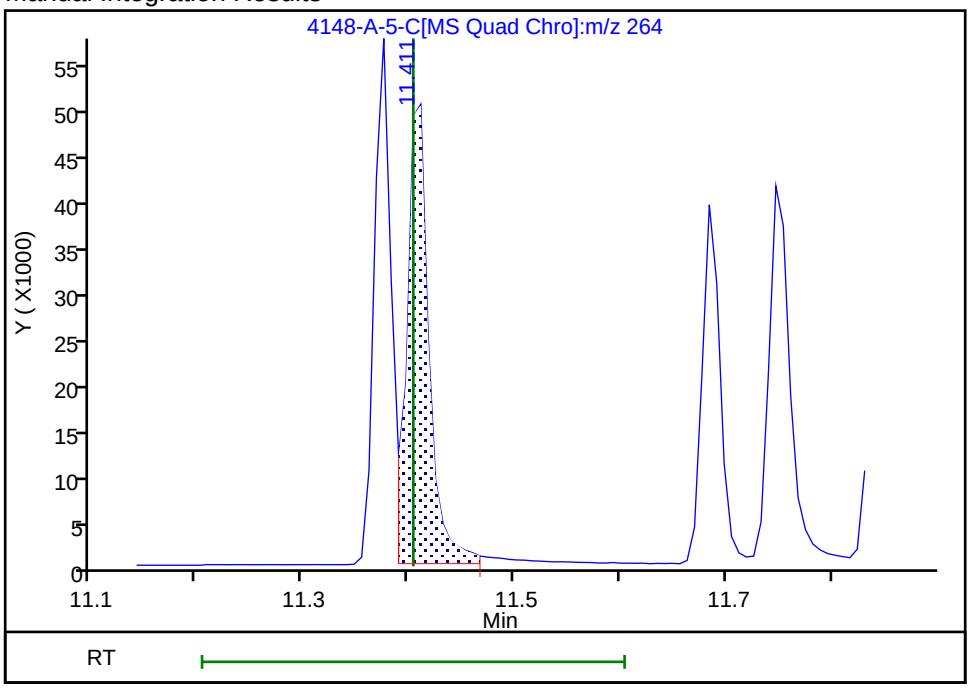
Processing Integration Results

RT: 11.41
Area: 78225
Amount: 0.563754
Amount Units: ug/ml



Manual Integration Results

RT: 11.41
Area: 75322
Amount: 0.542833
Amount Units: ug/ml



Reviewer: SK9U, 20-Nov-2023 09:28:37 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Baseline

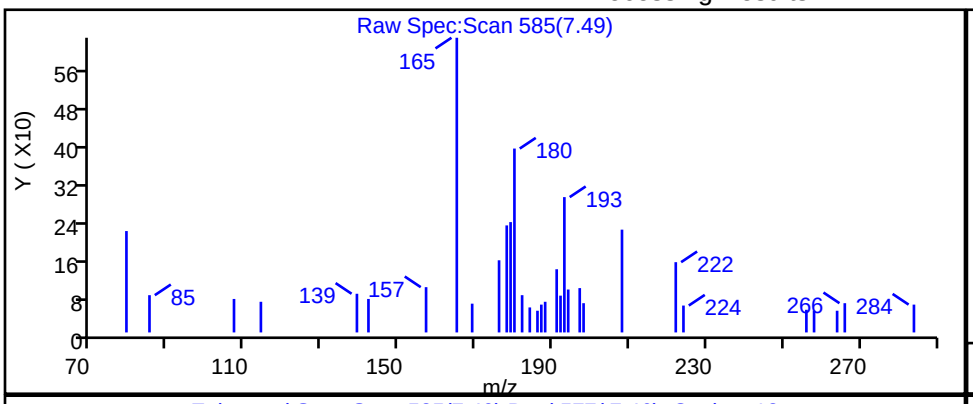
User Disabled Compound Report

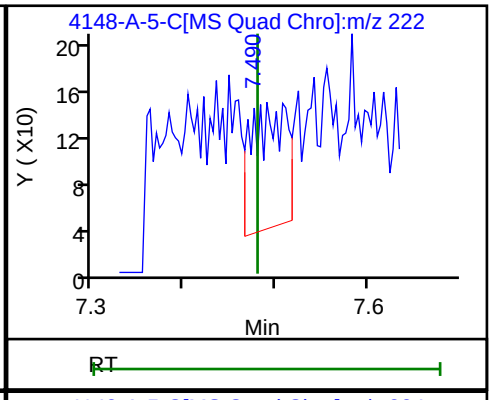
Eurofins Knoxville

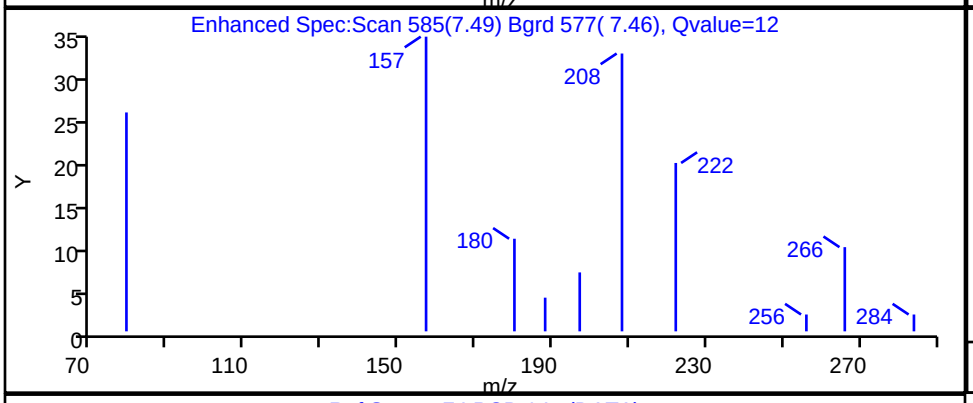
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D				
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

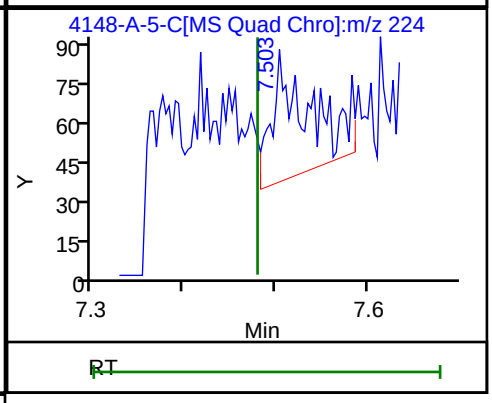
74 PCB-14, CAS: 34883-41-5

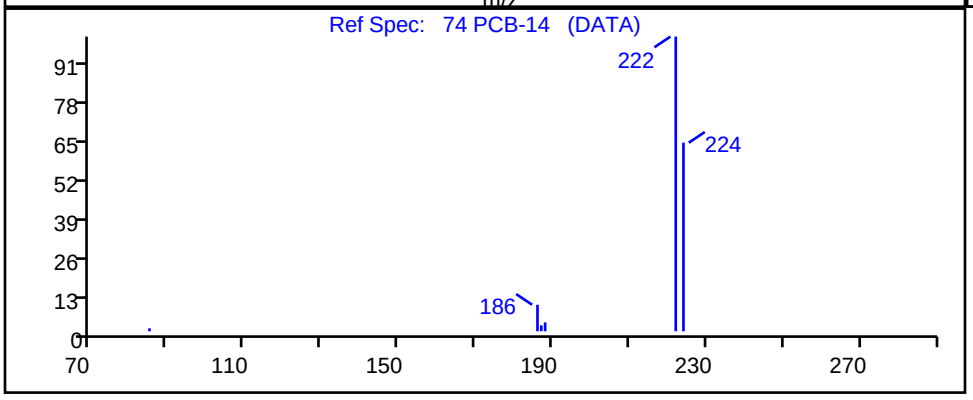
Processing Results











RT	Mass	Response	Amount
7.49	222.00	290	0.002550
7.50	224.00	140	

Reviewer: SK9U, 20-Nov-2023 09:30:39 -05:00:00 (UTC)

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

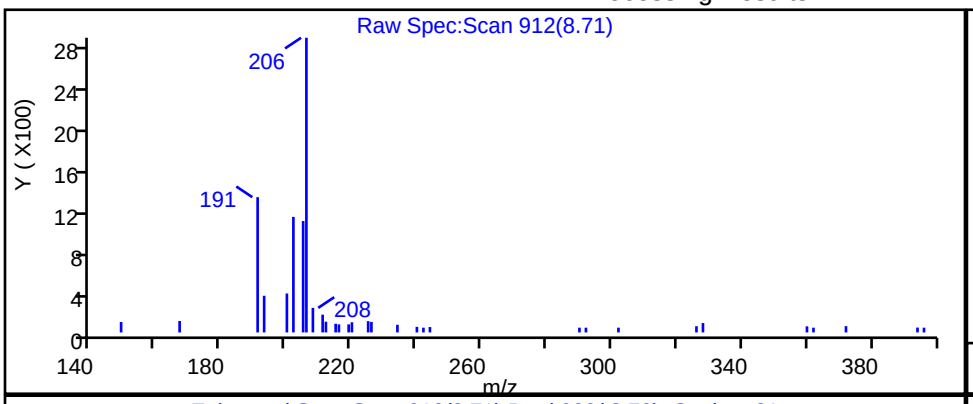
User Disabled Compound Report

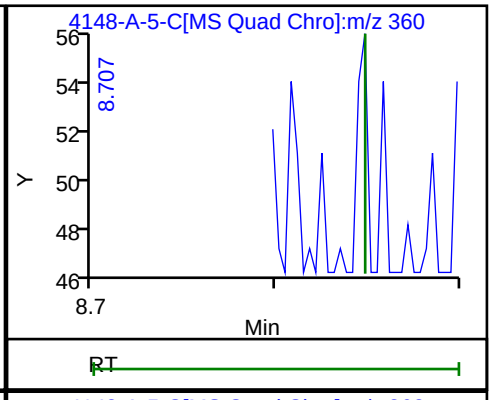
Eurofins Knoxville

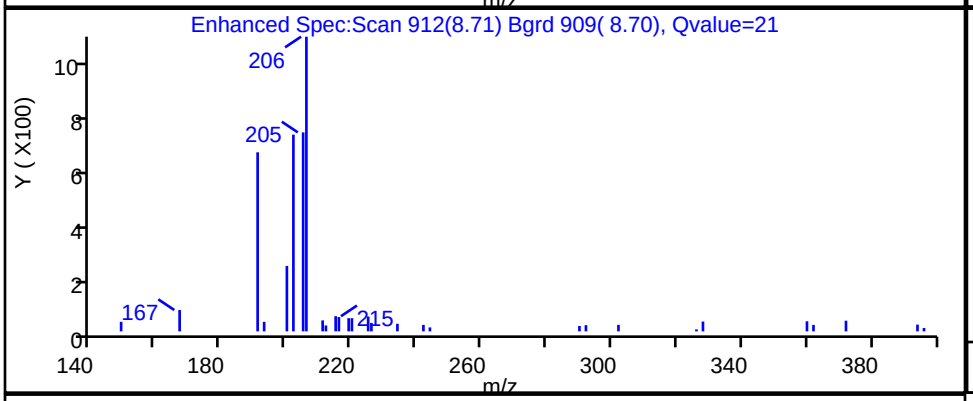
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D				
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

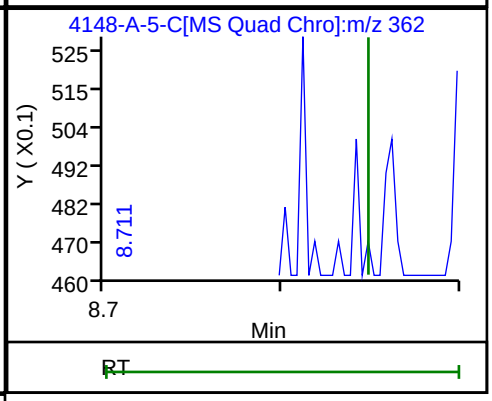
78 PCB-155, CAS: 33979-03-2

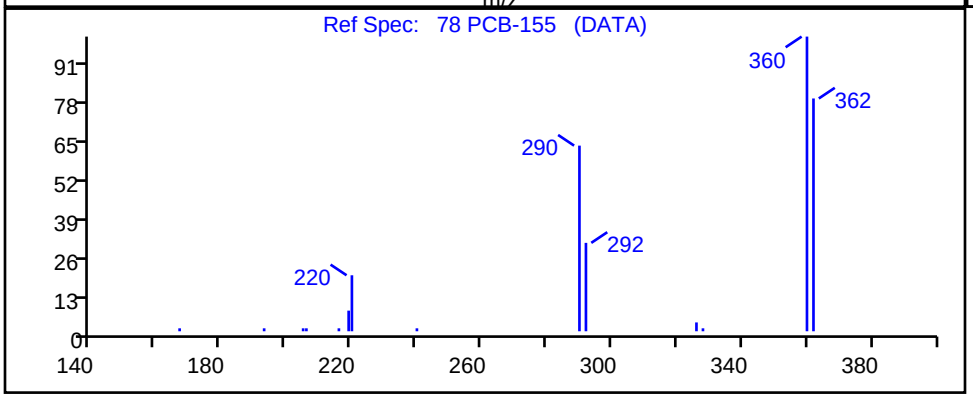
Processing Results











RT	Mass	Response	Amount
8.71	360.00	52	0.001491
8.71	362.00	30	

Reviewer: SK9U, 20-Nov-2023 09:30:53 -05:00:00 (UTC)

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

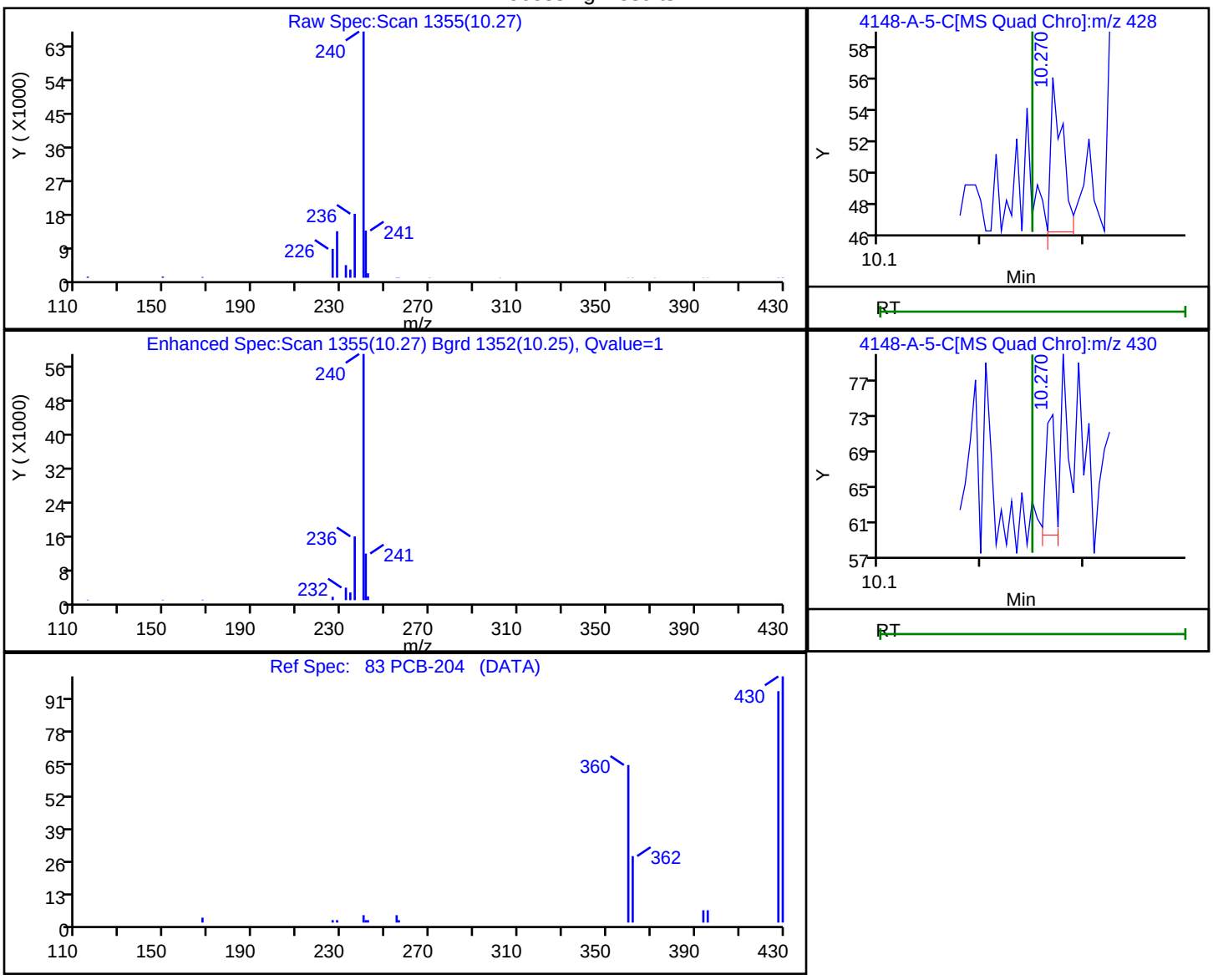
User Disabled Compound Report

Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D				
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

83 PCB-204, CAS: 74472-52-9

Processing Results



RT	Mass	Response	Amount
10.27	428.00	8	0.000484
10.27	430.00	9	

Reviewer: SK9U, 20-Nov-2023 09:31:01 -05:00:00 (UTC)

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

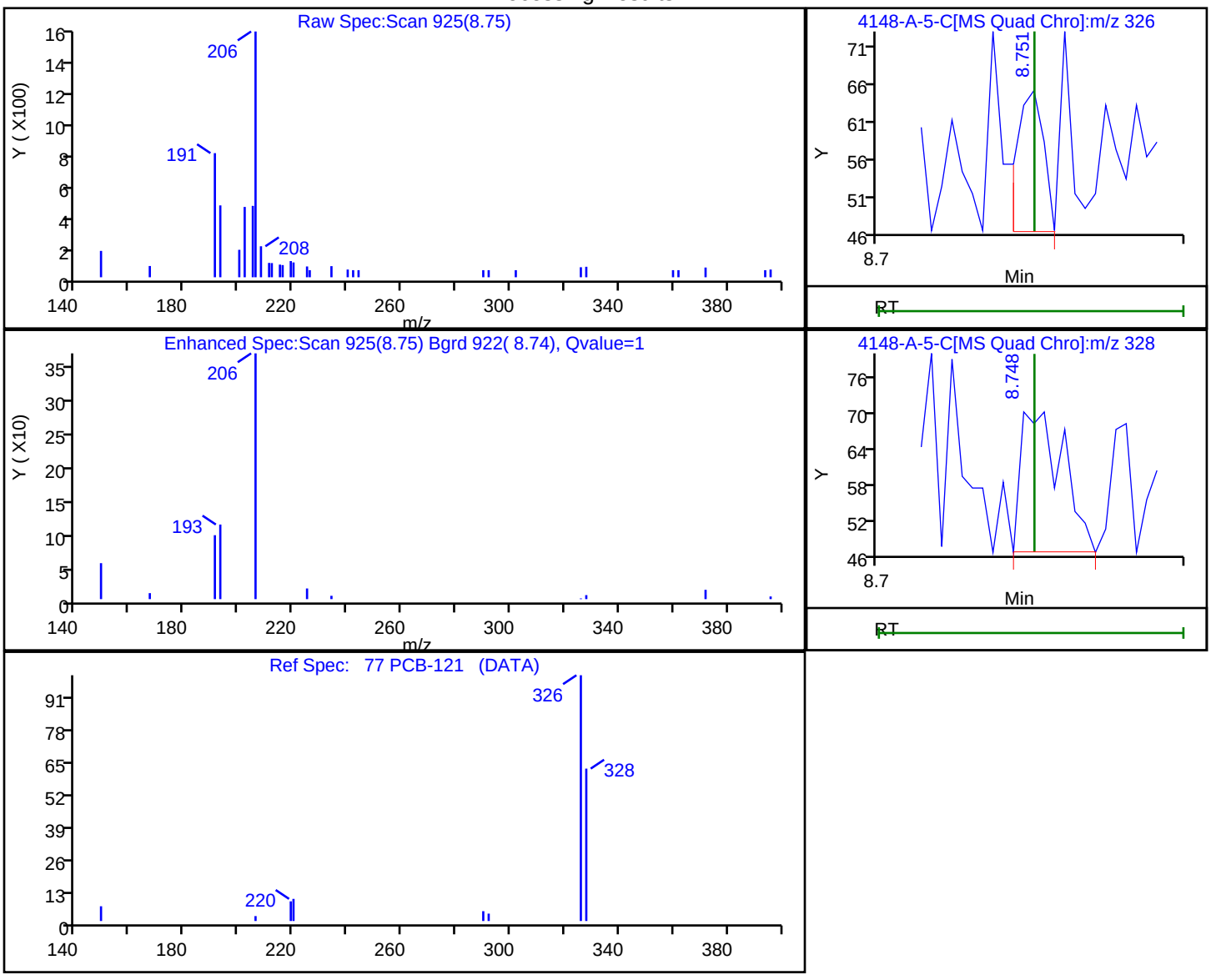
User Disabled Compound Report

Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D				
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

77 PCB-121, CAS: 56558-18-0

Processing Results



RT	Mass	Response	Amount
8.75	326.00	12	0.000322
8.75	328.00	23	

Reviewer: SK9U, 20-Nov-2023 09:30:47 -05:00:00 (UTC)

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

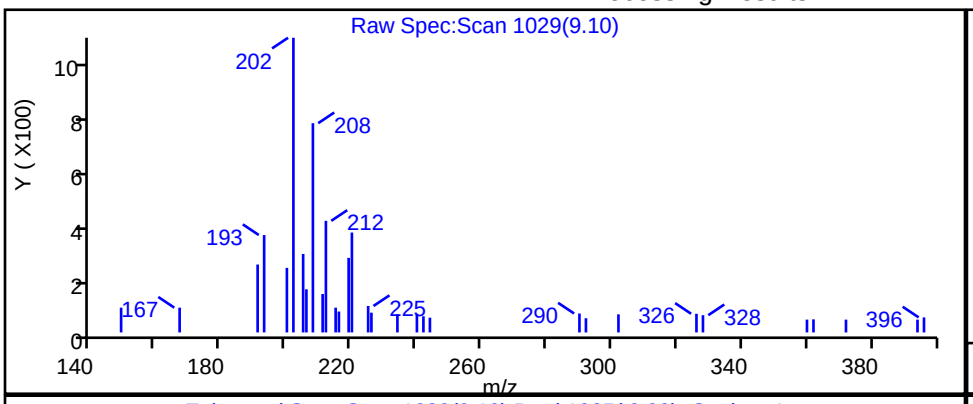
User Disabled Compound Report

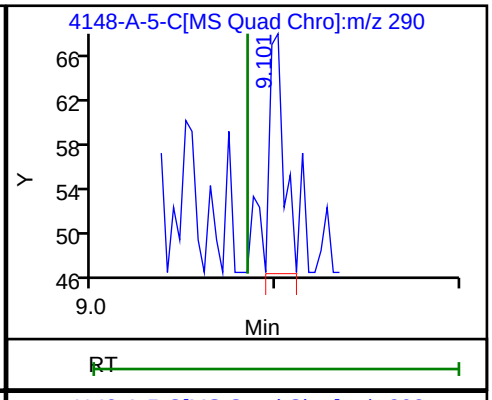
Eurofins Knoxville

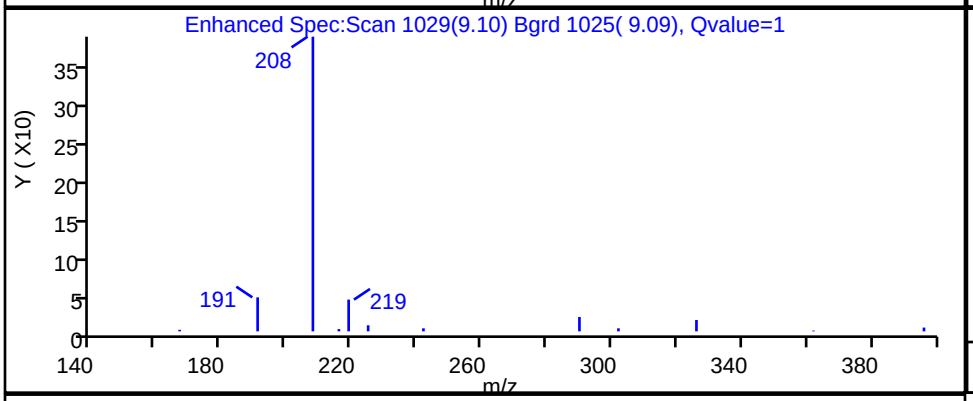
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D				
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

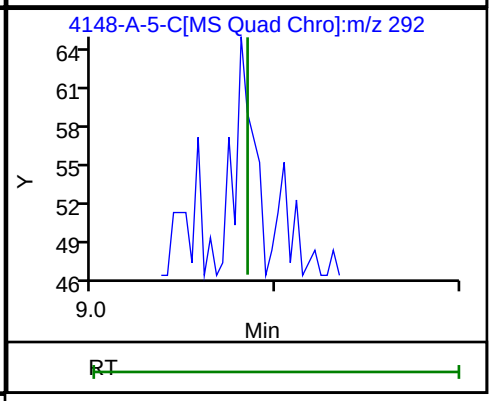
79 PCB-78, CAS: 70362-49-1

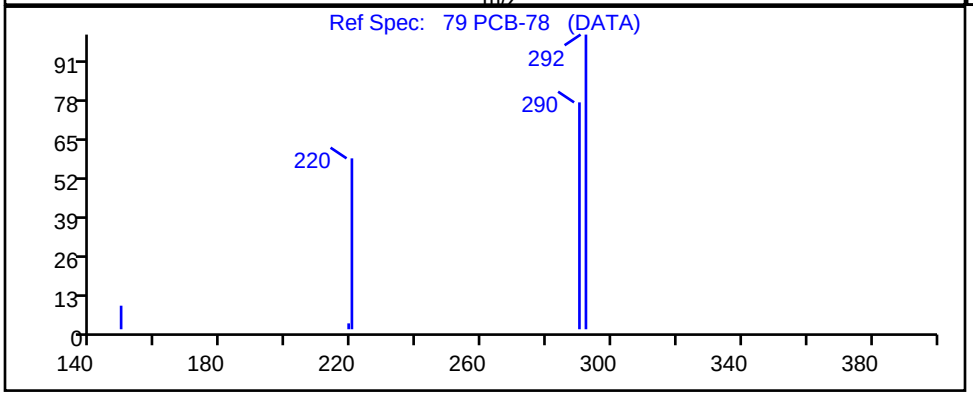
Processing Results











RT	Mass	Response	Amount
9.10	290.00	12	0.000407
9.08	292.00	0	

Reviewer: SK9U, 20-Nov-2023 09:30:55 -05:00:00 (UTC)

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

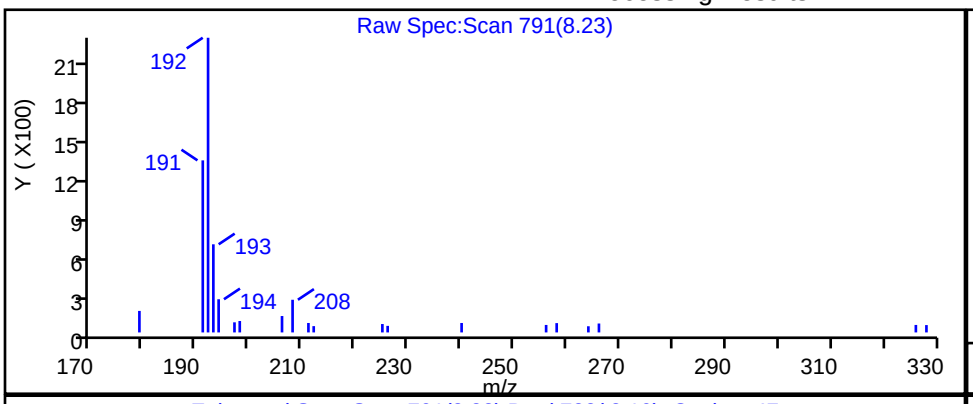
User Disabled Compound Report

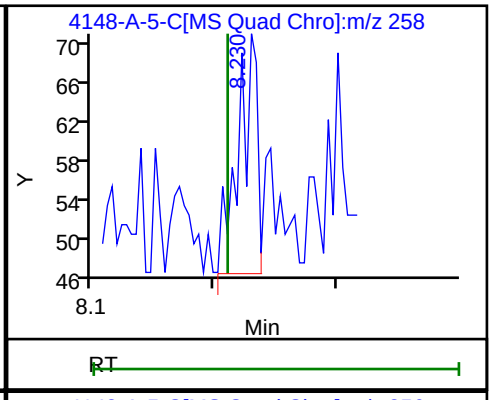
Eurofins Knoxville

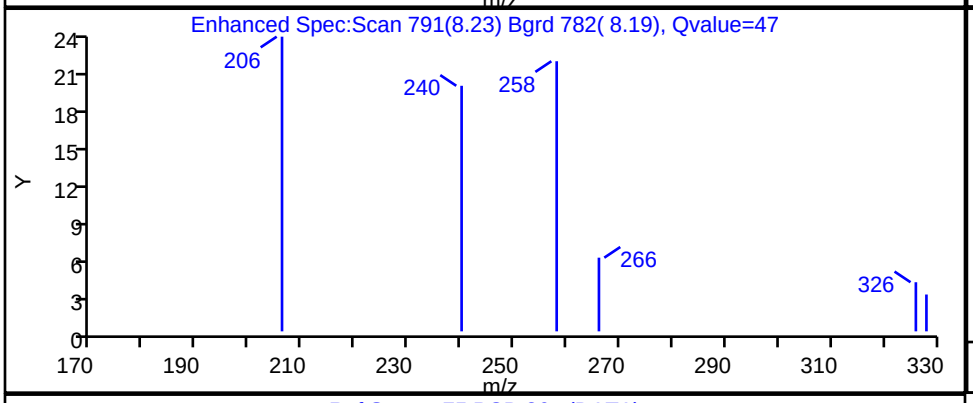
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-5-C.D				
Injection Date:	17-Nov-2023 17:19:36	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-C	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	11
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

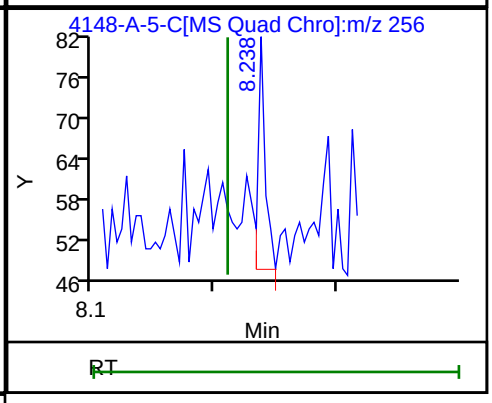
75 PCB-36, CAS: 38444-87-0

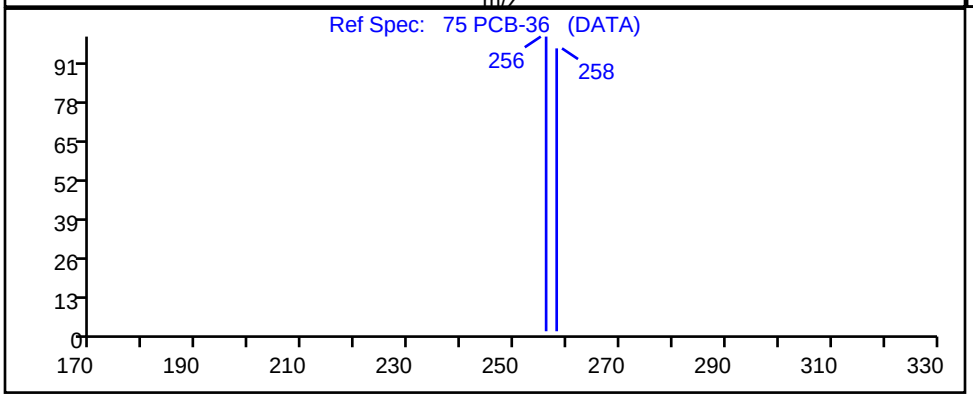
Processing Results











RT	Mass	Response	Amount
8.23	258.00	27	0.000451
8.24	256.00	14	

Reviewer: SK9U, 20-Nov-2023 09:30:42 -05:00:00 (UTC)

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: 1804576-851-S2 RA | Lab Sample ID: 140-34148-5 RA

Matrix: PE | Lab File ID: 140-34148-A-5-A.D

Analysis Method: ID-0016 | Date Collected: 10/26/2023 14:00

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.012(g) | Date Analyzed: 12/01/2023 22:11

Con. Extract Vol.: 500(uL) | Dilution Factor: 5

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80832 | Units: ng/g

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
83-32-9	Acenaphthene	19000000	E	4200	1100
208-96-8	Acenaphthylene	330000		4200	300
120-12-7	Anthracene	11000000	E	4200	1300
56-55-3	Benzo[a]anthracene	2800000	E	4200	1500
50-32-8	Benzo[a]pyrene	2900000	E	4200	1200
205-99-2	Benzo[b]fluoranthene	1800000	E	4200	1500
192-97-2	Benzo[e]pyrene	1400000	E	4200	670
191-24-2	Benzo[g,h,i]perylene	1300000	E	4200	460
207-08-9	Benzo[k]fluoranthene	1000000		4200	960
218-01-9	Chrysene	2400000	E	4200	540
53-70-3	Dibenz(a,h)anthracene	230000		4200	340
206-44-0	Fluoranthene	9200000	E	4200	3400
86-73-7	Fluorene	3900000	E	4200	1300
193-39-5	Indeno[1,2,3-cd]pyrene	1000000		4200	460
90-12-0	1-Methylnaphthalene	5100000	E	21000	2100
91-57-6	2-Methylnaphthalene	5900000	E	21000	2900
91-20-3	Naphthalene	3400000	E	83000	12000
198-55-0	Perylene	400000		4200	2100
85-01-8	Phenanthrene	17000000	E	8300	7200
129-00-0	Pyrene	14000000	E	8300	1300
STL00912	C1-Fluoranthenes/pyrene	5600000		4200	4200
STL00913	C1-Fluorenes	1700000		8300	5400
STL00914	C2-Fluorenes	730000		4200	4200
STL00915	C3-Fluorenes	280000		4200	4200
STL00917	C2-Naphthalenes	8400000		8300	8300
STL00918	C3-Naphthalenes	3800000		8300	8300
STL00919	C4-Naphthalenes	1100000		13000	12000
STL00901	C1-Phenanthrenes/Anthracenes	4400000		17000	14000
STL00902	C2-Phenanthrenes/Anthracenes	2400000		4200	4200
STL00903	C3-Phenanthrenes/Anthracenes	650000		4200	4200
STL00904	C4-Phenanthrenes/Anthracenes	170000		4200	4200
STL02218	C1-Chrysenes/Benz(a)anthracenes	1100000		4200	4200

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: 1804576-851-S2 RA | Lab Sample ID: 140-34148-5 RA

Matrix: PE | Lab File ID: 140-34148-A-5-A.D

Analysis Method: ID-0016 | Date Collected: 10/26/2023 14:00

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.012(g) | Date Analyzed: 12/01/2023 22:11

Con. Extract Vol.: 500(uL) | Dilution Factor: 5

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80832 | Units: ng/g

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
STL02219	C2-Chrysenes/Benz(a)anthracenes	280000		4200	4200
STL02220	C3-Chrysenes/Benz(a)anthracenes	51000		4200	4200
STL02221	C4-Chrysenes/Benz(a)anthracenes	18000		4200	4200
34883-41-5	PCB-14	ND		4200	42
74472-51-8	PCB-192	160	J	4200	42
74472-48-3	PCB-184	ND		4200	42
33979-03-2	PCB-155	ND		4200	42
41411-61-4	PCB-142	ND		4200	42
74472-52-9	PCB-204	110	J	4200	42
56558-16-8	PCB-104	110	J	4200	42
56558-18-0	PCB-121	ND		4200	42
70362-49-1	PCB-78	ND		4200	42
38444-87-0	PCB-36	ND		4200	42

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
93951-97-4	Acenaphthylene-d8	73		30-120
1719-06-8	Anthracene-d10	58		30-120
63466-71-7	Benzo(a)pyrene-d12	84		30-120
93951-98-5	Benzo(b)fluoranthene-d12	87		30-120
93951-66-7	Benzo(ghi)perylene-d12	86		30-120
93952-01-3	Benzo(k)fluoranthene-d12	84		30-120
1719-03-5	Chrysene-d12	82		30-120
13250-98-1	Dibenz(a,h)anthracene-d14	98		30-120
93951-69-0	Fluoranthene-d10	62		30-120
81103-79-9	Fluorene -d10	110		30-120
203578-33-0	Indeno[1,2,3-cd]pyrene-d12	90		30-120
38072-94-5	1-Methylnaphthalene-d10	64		30-120
7297-45-2	2-Methylnaphthalene-d10	65		30-120
1146-65-2	Naphthalene-d8	60		30-120
1520-96-3	Perylene-d12	85		30-120
1517-22-2	Phenanthrene-d10	74		30-120

Report Date: 06-Dec-2023 16:35:44 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D
Lims ID: 140-34148-A-5-J
Client ID: 1804576-851-S2
Sample Type: Client
Inject. Date: 01-Dec-2023 22:11:41 ALS Bottle#: 0 Worklist Smp#: 33
Injection Vol: 1.0 ul Dil. Factor: 5.0000
Sample Info: 140-0030677-033
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 06-Dec-2023 16:35:18 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1639

First Level Reviewer: SK9U Date: 06-Dec-2023 16:35:42

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/ml	%Rec	Flags
D 10 Naphthalene-d8	136	5.059	5.047	0.000	26	5726	0.0596	59.6	
12 Naphthalene	128	5.068	5.078	-0.010	36	1110028	16.5		E
D 15 2-methylnaphthalene-d10	152	5.606	5.606	0.000	92	4049	0.0648	64.8	M
16 2-Methylnaphthalene	142	5.629	5.635	-0.006	97	1433311	28.5		E
D 17 1-Methylnaphthalene-d10	152	5.686	5.686	0.000	100	3987	0.0637	63.7	M
18 1-Methylnaphthalene	142	5.715	5.715	0.000	100	1188818	24.6		E
D 23 Acenaphthylene-d8	160	6.361	6.361	-0.001	29	7693	0.0725	72.5	M
24 Acenaphthylene	152	6.372	6.372	0.000	82	141668	1.57		
* 26 Acenaphthene-d10	164	6.487	6.492	-0.005	17	6895	0.1000		M
27 Acenaphthene	154	6.522	6.502	0.005	96	5191593	89.6		E
D 29 Fluorene -d10	176	6.920	6.904	0.000	55	9057	0.1103	110	
30 Fluorene	166	6.945	6.945	0.000	98	2226999	18.9		E
D 35 Phenanthrene-d10	188	7.732	7.734	0.004	38	12222	0.0736	73.6	
36 Phenanthrene	178	7.756	7.752	0.011	61	12309028	83.5		Ee
D 38 Anthracin-d10	188	7.783	7.780	0.010	63	9330	0.0576	57.6	M
39 Anthracene	178	7.804	7.787	0.014	97	5964204	51.9		E
D 41 Fluoranthene-d10	212	8.808	8.811	0.003	83	13357	0.0620	62.0	
43 Fluoranthene	202	8.835	8.825	0.013	55	7579300	44.4		E
* 44 Pyrene-d10 (IS)	212	9.030	9.024	0.006	22	21289	0.1000		
45 Pyrene	202	9.054	9.044	0.014	97	11869648	68.1		Ee
47 Benzo[a]anthracene	228	10.265	10.260	0.010	91	2992081	13.6		E
D 48 Chrysene-d12	240	10.270	10.270	0.005	25	16958	0.0816	81.6	M
50 Chrysene	228	10.300	10.300	0.005	22	2882799	11.7		E
D 52 Benzo(b)fluoranthene-d12	264	11.369	11.369	0.000	90	12396	0.0867	86.7	
53 Benzo[b]fluoranthene	252	11.404	11.397	0.007	96	1816545	8.70		EM
D 54 Benzo(k)fluoranthene-d12	264	11.411	11.404	0.007	51	14126	0.0841	84.1	
55 Benzo[k]fluoranthene	252	11.418	11.418	-0.007	100	1015750	4.91		M
* 56 Benzo(e)pyrene-d12	264	11.684	11.684	0.000	98	11290	0.1000		
57 Benzo[e]pyrene	252	11.719	11.712	0.007	100	1186207	6.65		E
D 58 Benzo(a)pyrene-d12	264	11.747	11.747	0.000	100	10582	0.0844	84.4	
59 Benzo[a]pyrene	252	11.782	11.768	0.014	100	2397619	13.7		E
D 60 Perylene-d12	264	11.845	11.838	0.007	98	11832	0.0850	85.0	

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/ml	%Rec	Flags
61 Perylene	252	11.873	11.873	0.007	100	324856	1.92		
D 62 Indeno[1,2,3-cd]pyrene-d12	288	13.186	13.186	0.000	89	12217	0.0897	89.7	
D 63 Dibenz(a,h)anthracene-d14	292	13.196	13.186	0.010	55	11923	0.0978	97.8	
65 Indeno[1,2,3-cd]pyrene	276	13.224	13.224	0.010	61	993149	4.86		
66 Dibenz(a,h)anthracene	278	13.233	13.224	0.000	45	209690	1.10		M
D 67 Benzo(ghi)perylene-d12	288	13.543	13.543	0.000	89	11675	0.0863	86.3	
68 Benzo[g,h,i]perylene	276	13.590	13.571	0.010	87	1083871	6.34		E
76 PCB-104	326	8.395	8.393	-0.001	76	98	0.000548		
* 82 PCB-167L	372	10.023	10.027	-0.004	68	9555	0.0800		
83 PCB-204	428	10.249	10.246	-0.001	1	33	0.000518		
84 PCB-192	394	10.275	10.271	0.000	1	71	0.000791		
A 85 C2-Naphthalenes	156	6.231	(6.068-6.407)		0	2719737	40.4		E
A 87 C3-Naphthalenes	170	6.684	(6.341-7.034)		0	1224974	18.2		
A 88 C4-Naphthalenes	184	7.127	(6.678-7.562)		0	346128	5.14		
A 89 C1-Fluorenes	180	7.400	(7.364-7.505)		0	971945	8.26		
A 90 C2-Fluorenes	194	7.828	(7.730-8.069)		0	411186	3.50		
A 91 C3-Fluorenes	208	8.356	(8.092-8.605)		0	159487	1.36		
A 96 C1-Phenanthrenes/Anthracenes	191	8.226	(8.155-8.332)		0	3134083	21.3		
A 97 C2-Phenanthrenes/Anthracenes	206	8.694	(8.490-8.926)		0	1667625	11.3		
A 98 C3-Phenanthrenes/Anthracenes	220	9.148	(8.851-9.456)		0	458528	3.11		
A 99 C4-Phenanthrenes/Anthracenes	234	9.459	(9.106-9.824)		0	121626	0.8250		
A 100 C1-Fluoranthenes/pyrene	216	9.436	(9.246-9.640)		0	4697073	26.9		
A 101 C1-Chrysenes/Benz(a)anthracenes	242	10.681	(10.456-10.941)		0	1285387	5.21		
A 102 C2-Chrysenes/Benz(a)anthracenes	256	11.004	(10.667-11.381)		0	332954	1.35		
A 103 C3-Chrysenes/Benz(a)anthracenes	270	11.456	(11.002-11.867)		0	60797	0.2463		
A 104 C4-Chrysenes/Benz(a)anthracenes	284	11.978	(11.475-12.553)		0	21696	0.0879		

QC Flag Legend

Processing Flags

E - Exceeded Maximum Amount

e - Potential Peak Saturated

Review Flags

M - Manually Integrated

Reagents:

60ISPCB_00001 Amount Added: 5.00 Units: uL

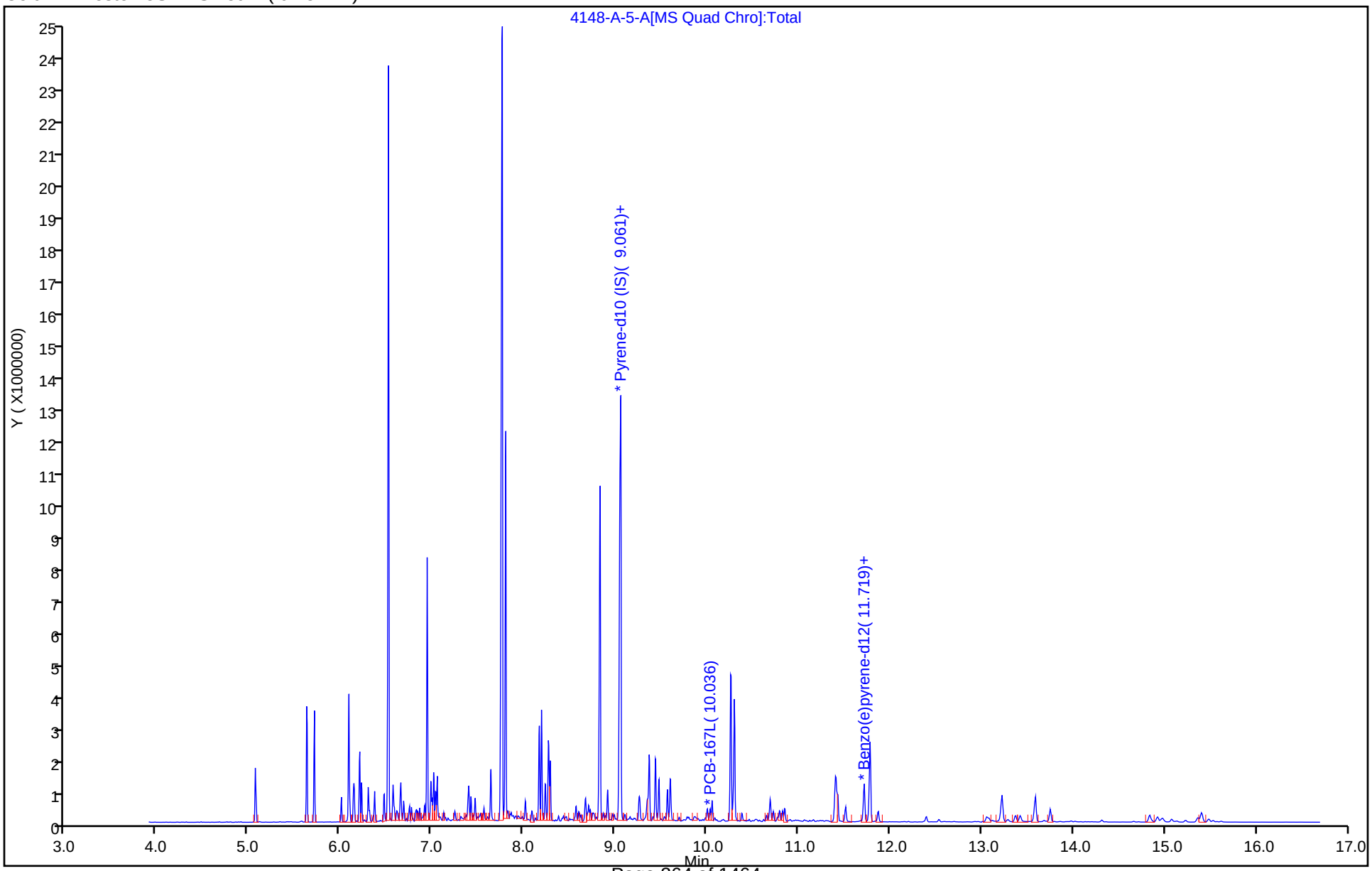
Report Date: 06-Dec-2023 16:35:44 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D

Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5	Worklist Smp#:	33
Client ID:	1804576-851-S2				
Injection Vol:	1.0 ul	Dil. Factor:	5.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



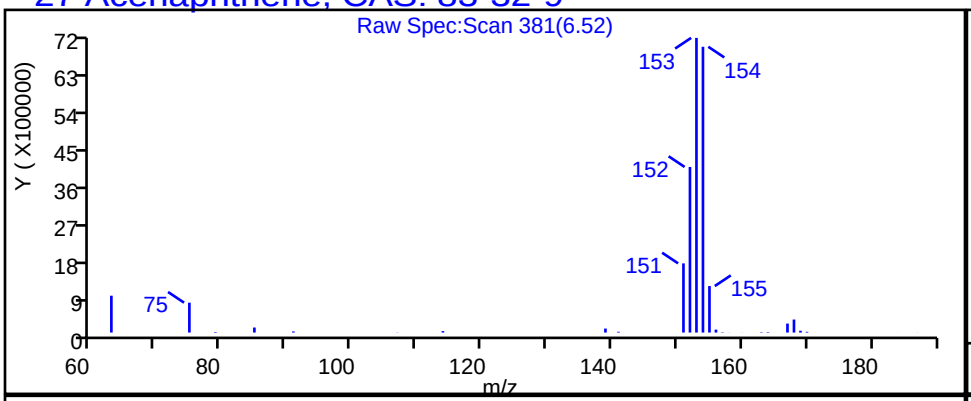
Report Date: 06-Dec-2023 16:35:44 Chrom Revision: 2.3 15-Nov-2023 20:54:34

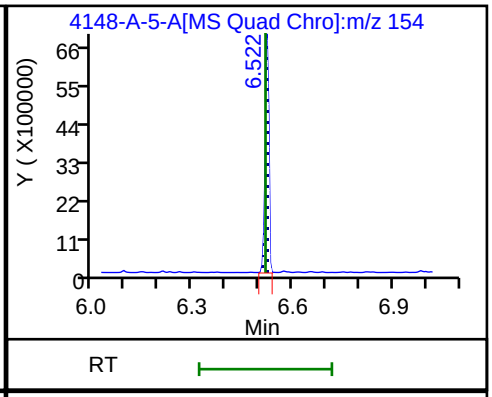
Eurofins Knoxville

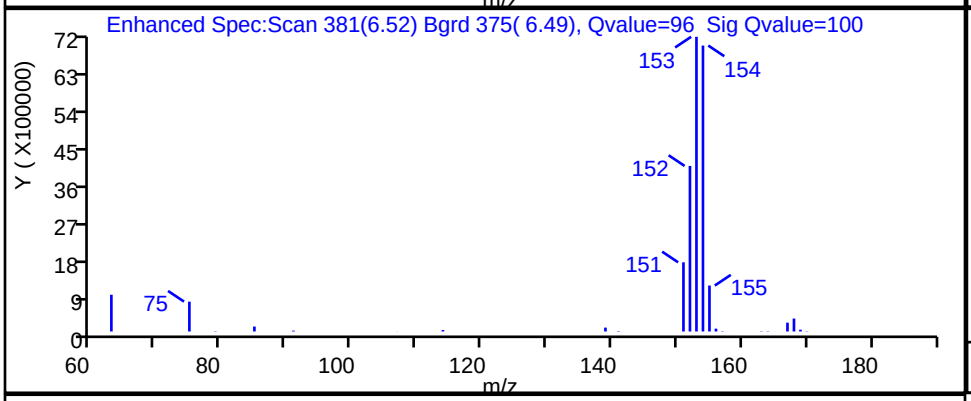
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D

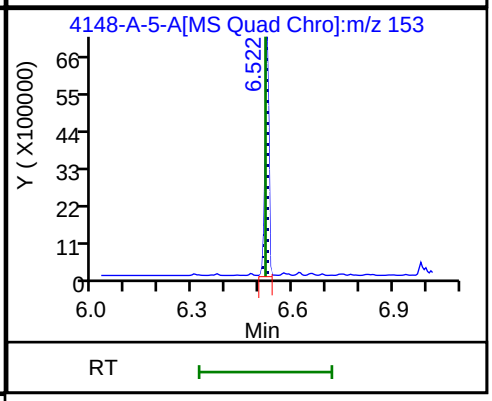
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

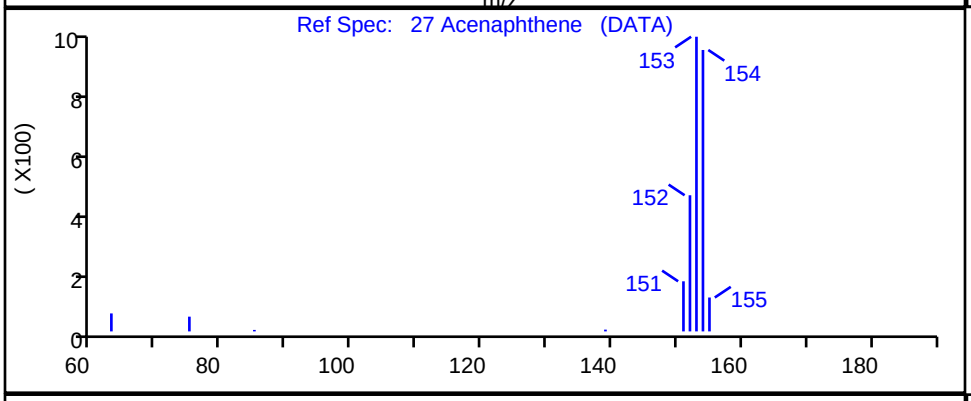
27 Acenaphthene, CAS: 83-32-9

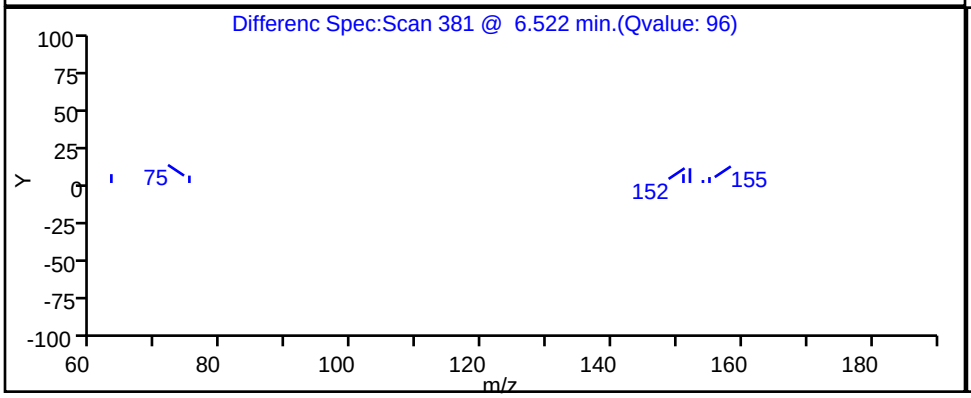


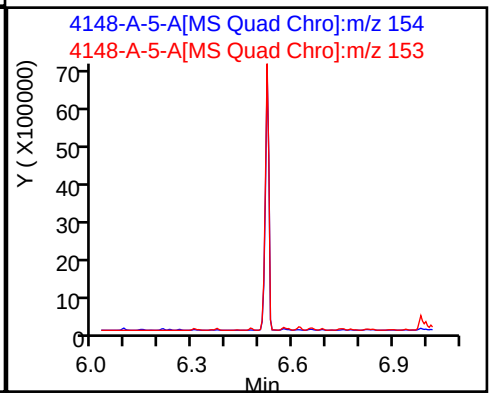












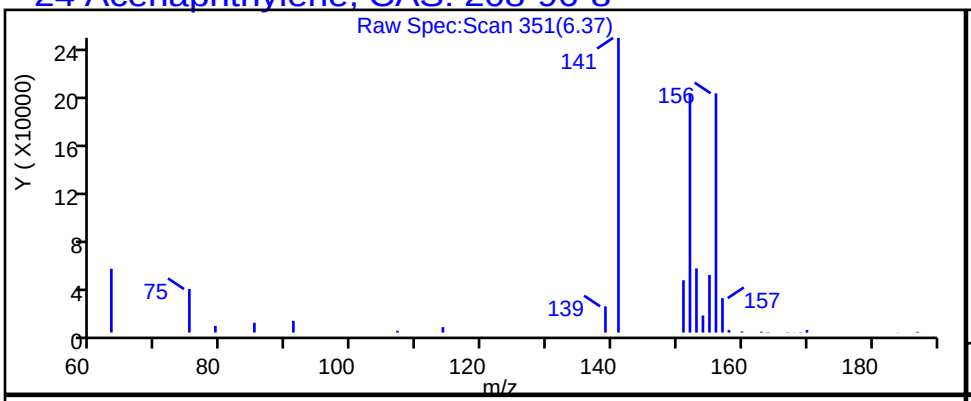
Report Date: 06-Dec-2023 16:35:44 Chrom Revision: 2.3 15-Nov-2023 20:54:34

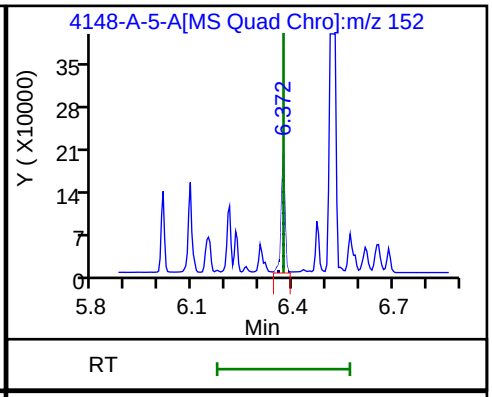
Eurofins Knoxville

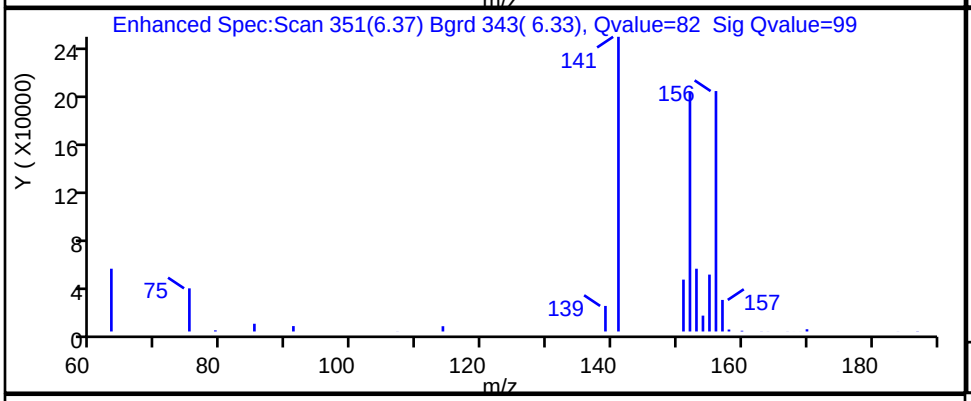
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D

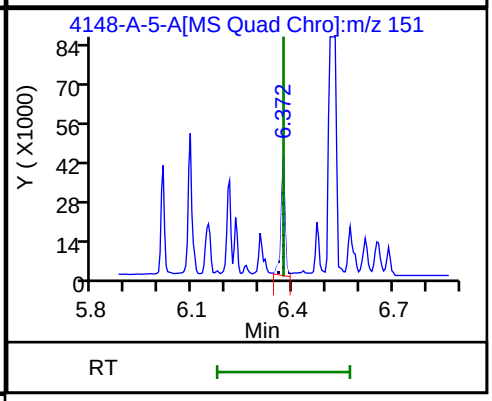
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

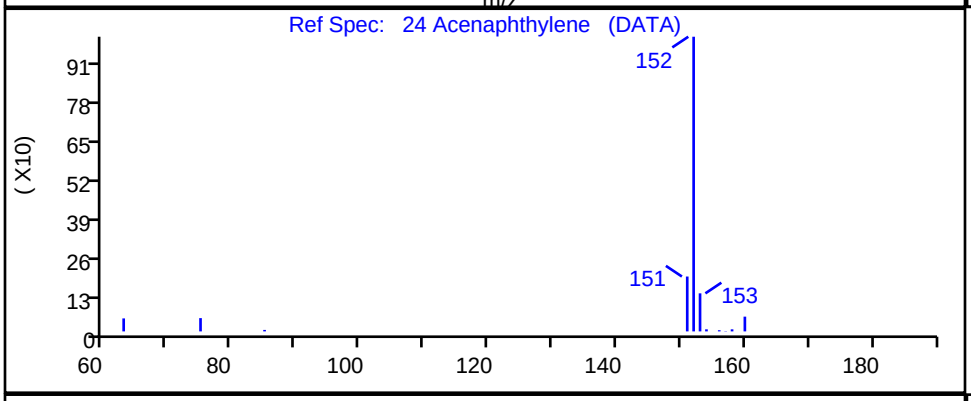
24 Acenaphthylene, CAS: 208-96-8

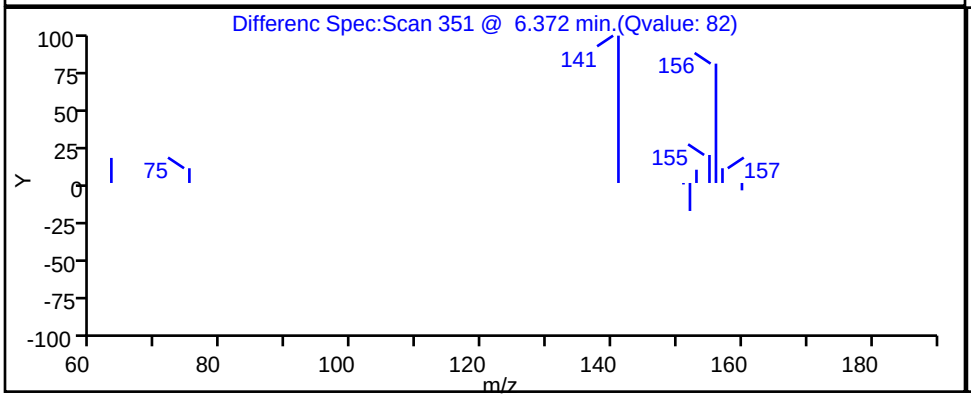


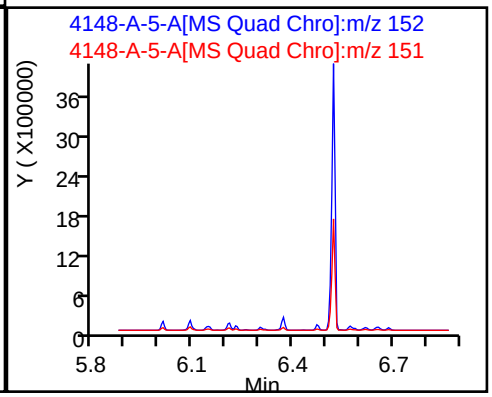












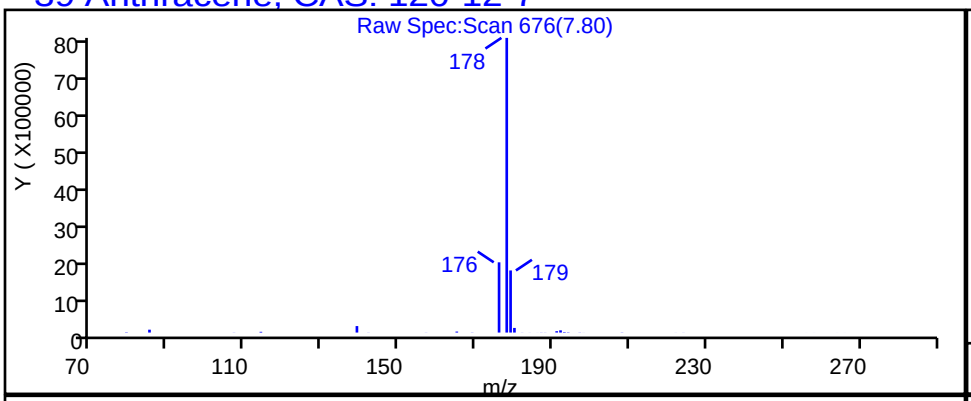
Report Date: 06-Dec-2023 16:35:44 Chrom Revision: 2.3 15-Nov-2023 20:54:34

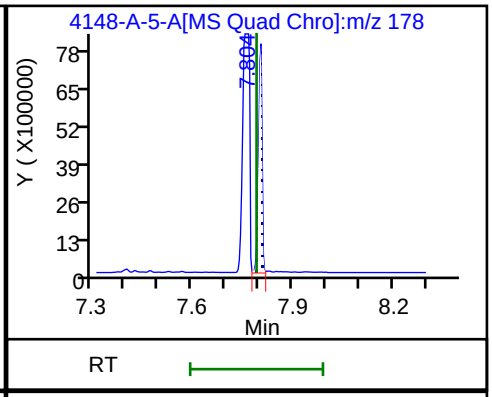
Eurofins Knoxville

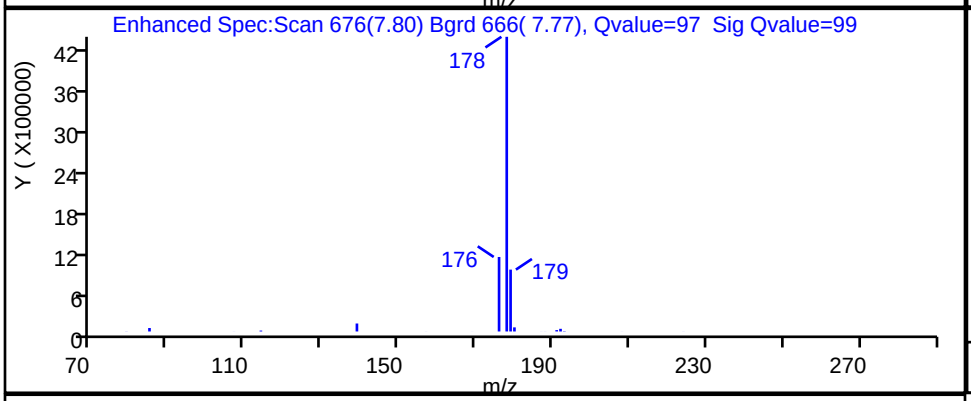
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D

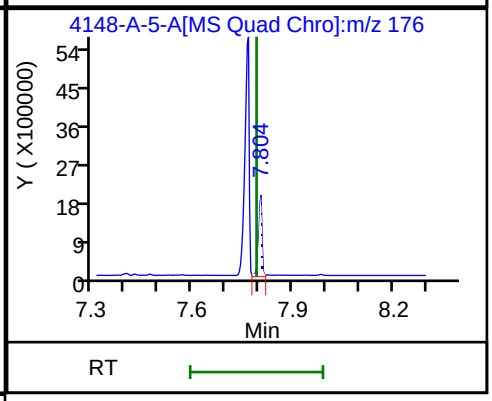
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

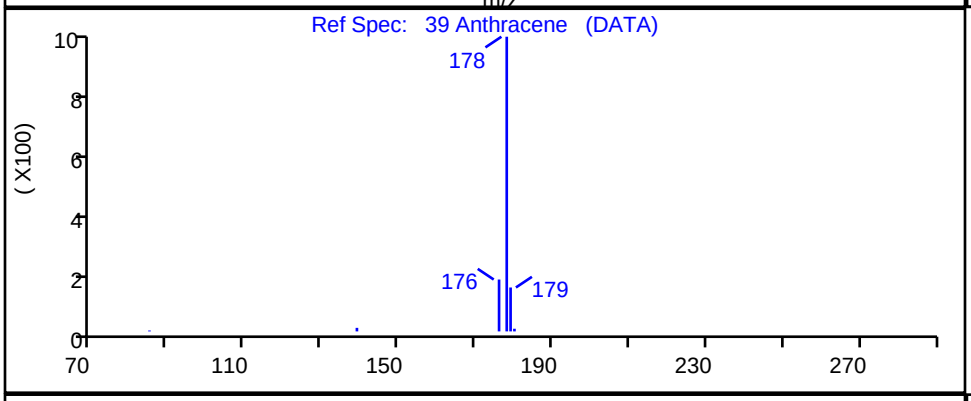
39 Anthracene, CAS: 120-12-7

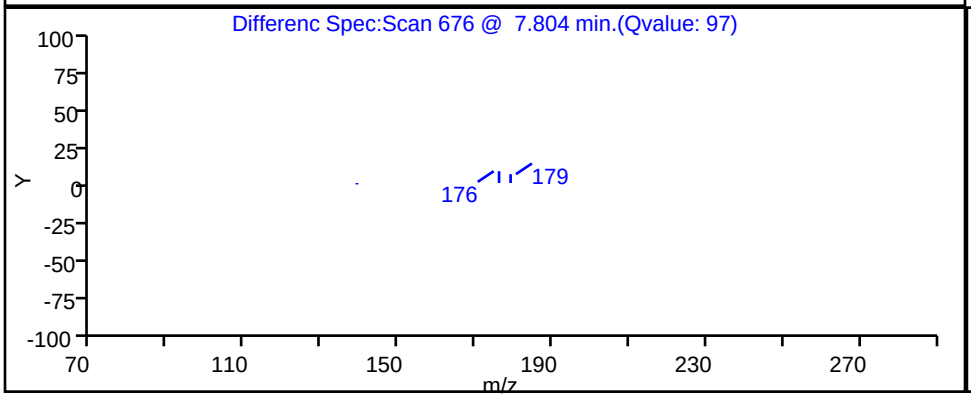


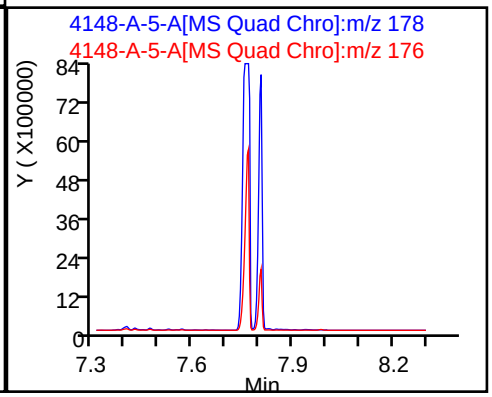












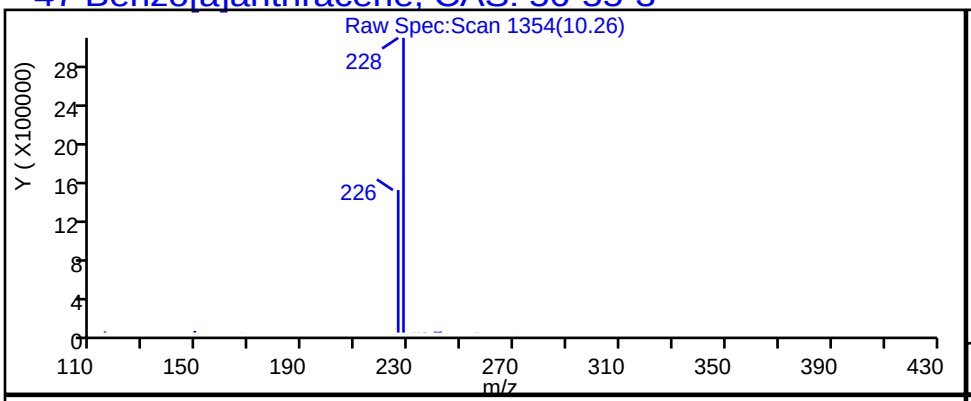
Report Date: 06-Dec-2023 16:35:44 Chrom Revision: 2.3 15-Nov-2023 20:54:34

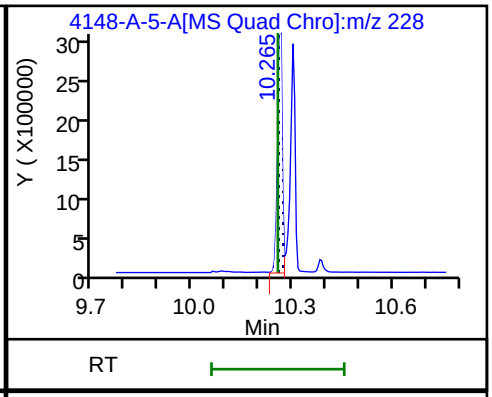
Eurofins Knoxville

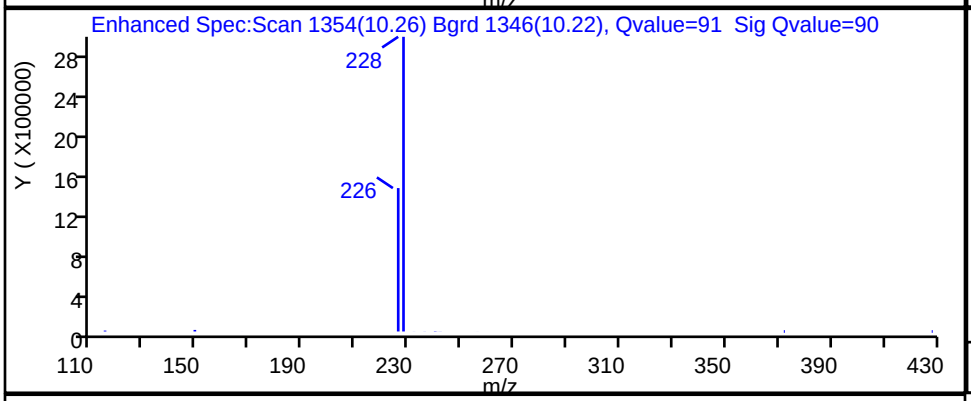
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D

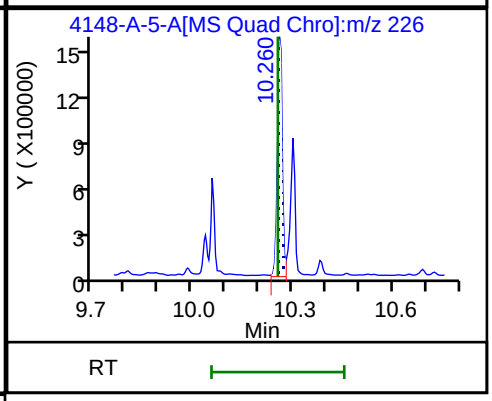
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

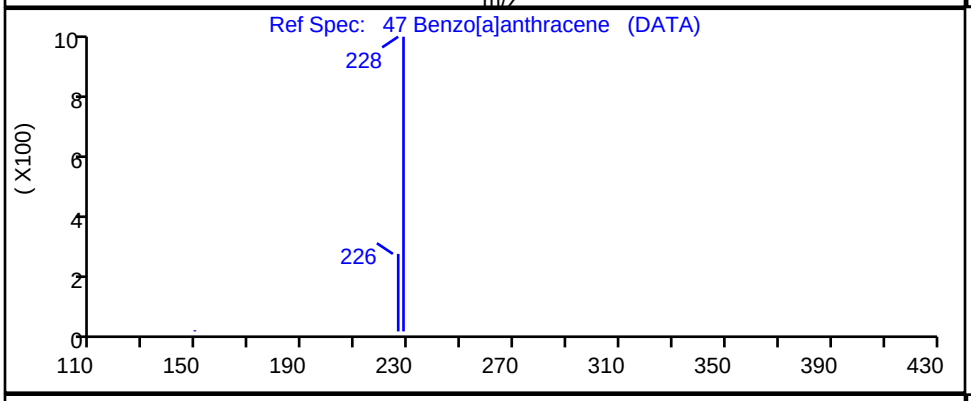
47 Benzo[a]anthracene, CAS: 56-55-3

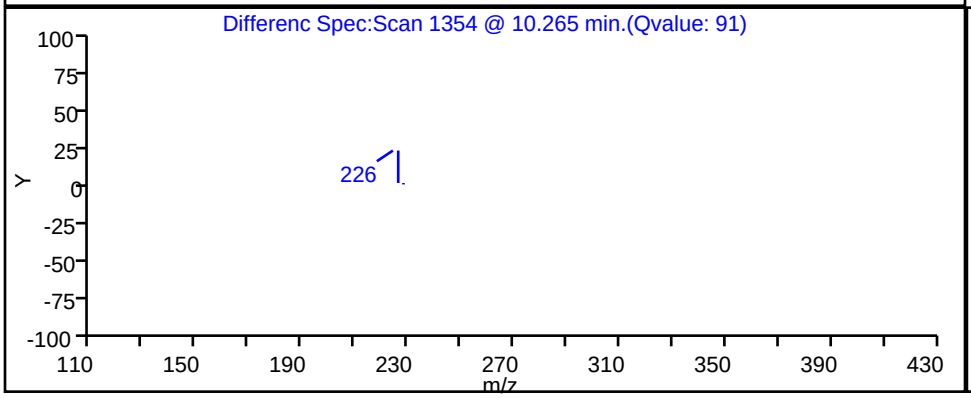


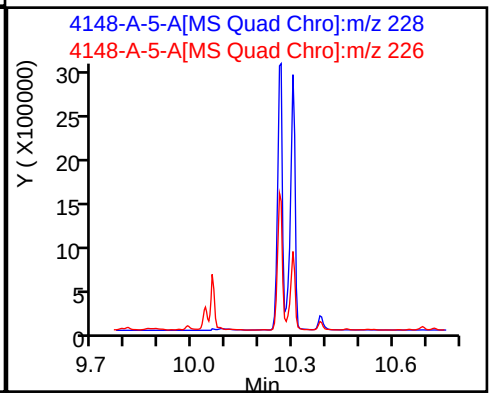












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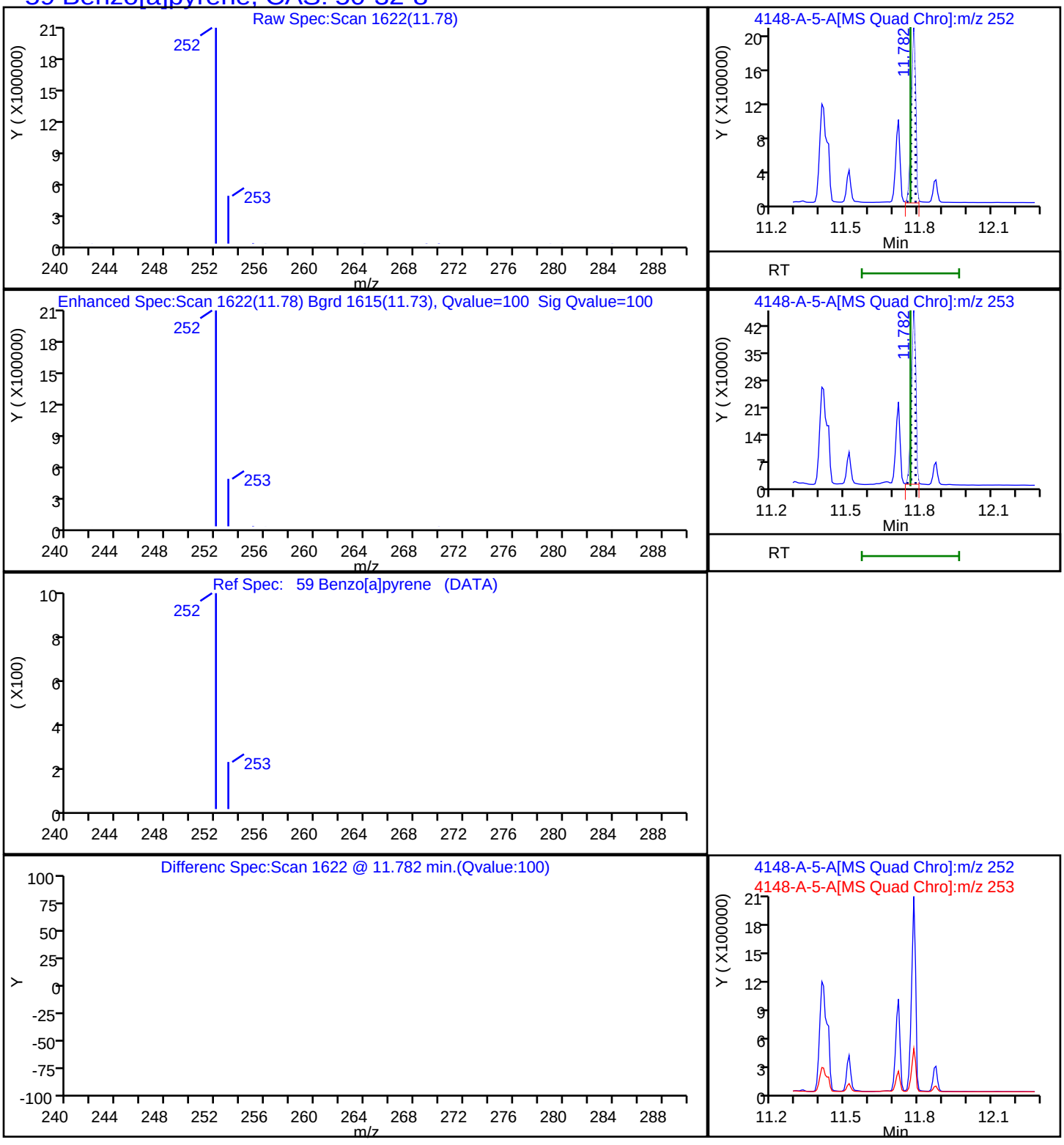
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D

Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

59 Benzo[a]pyrene, CAS: 50-32-8



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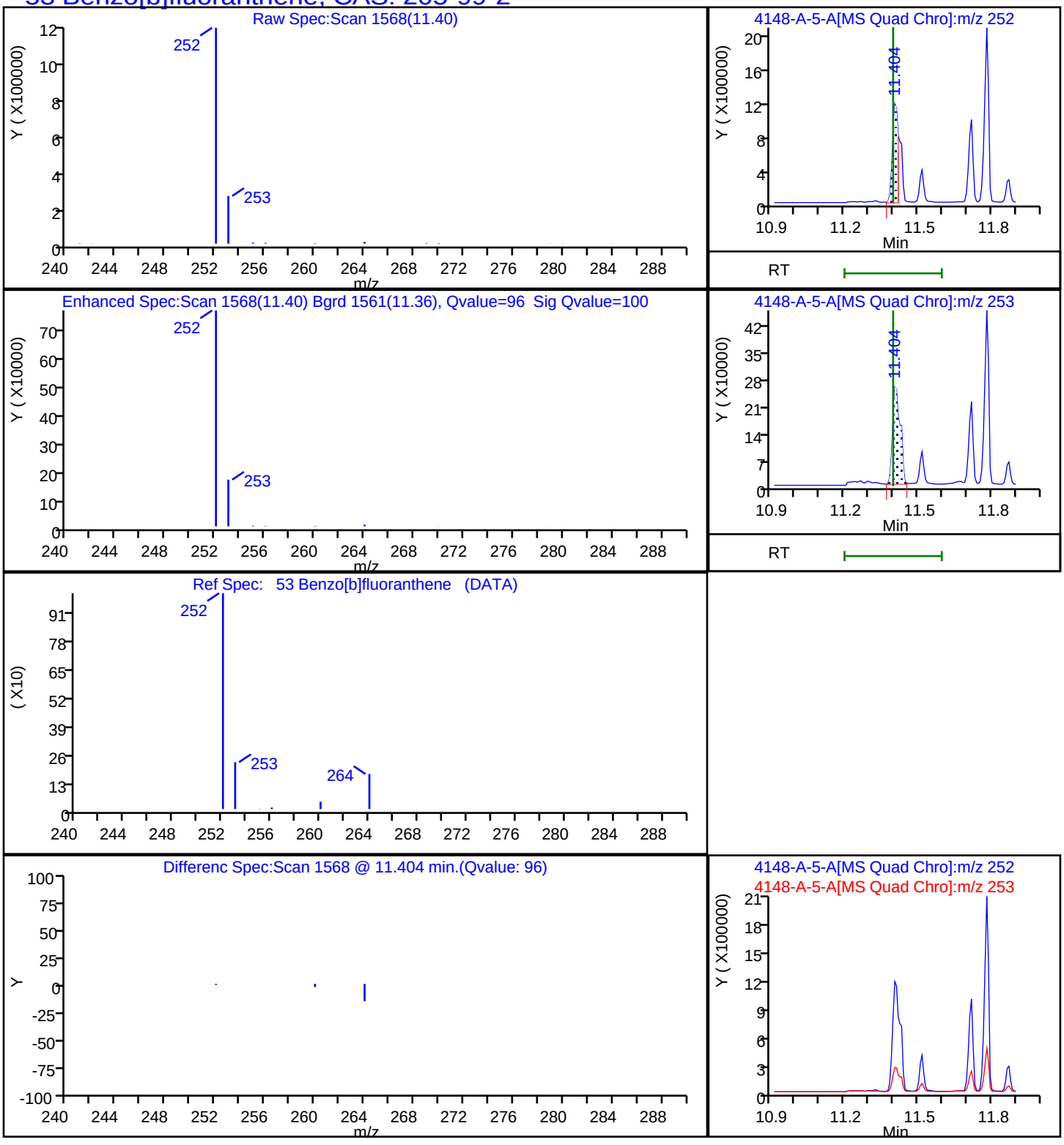
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D

Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

53 Benzo[b]fluoranthene, CAS: 205-99-2



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Eurofins Knoxville

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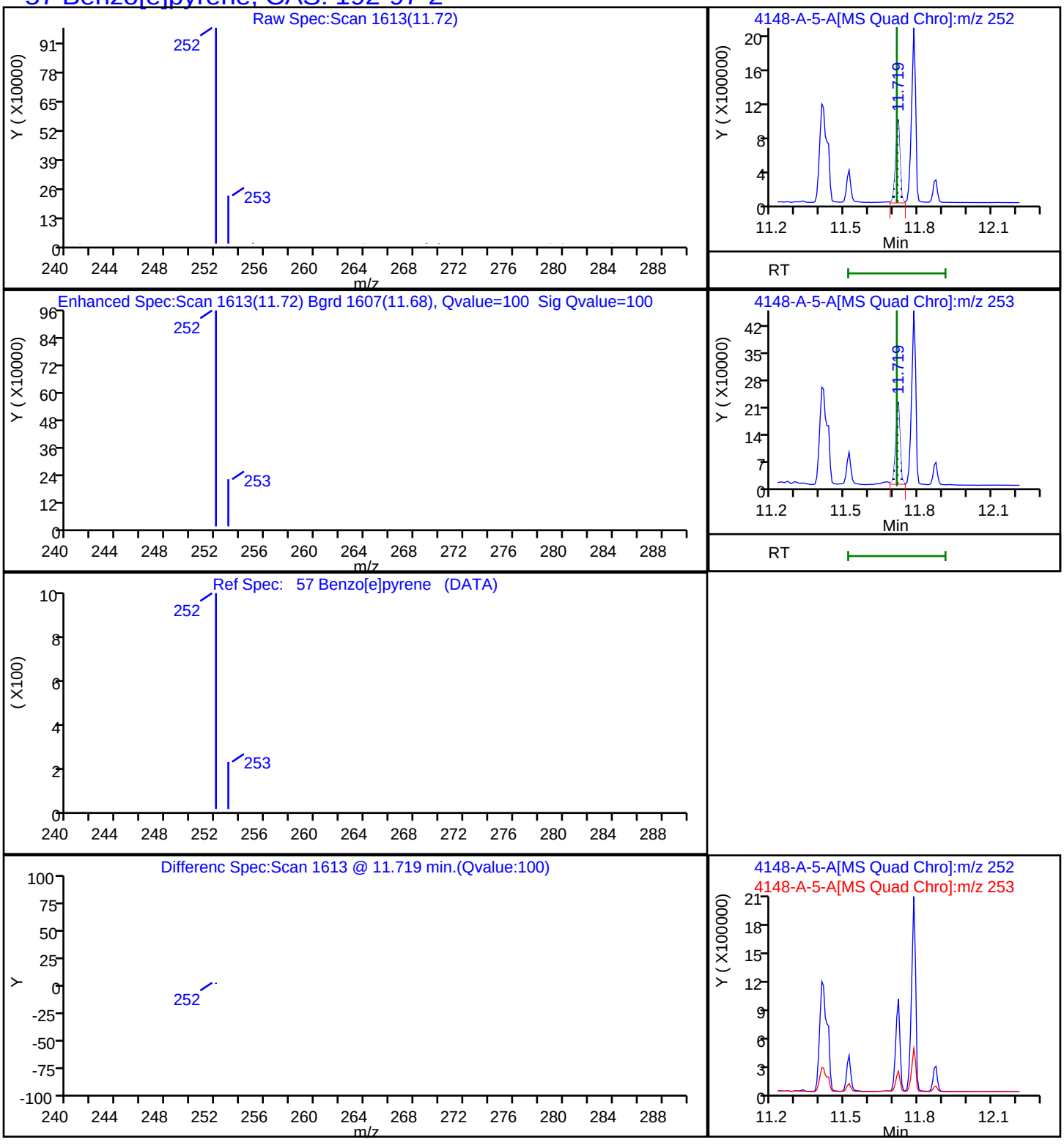
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

57 Benzo[e]pyrene, CAS: 192-97-2



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Eurofins Knoxville

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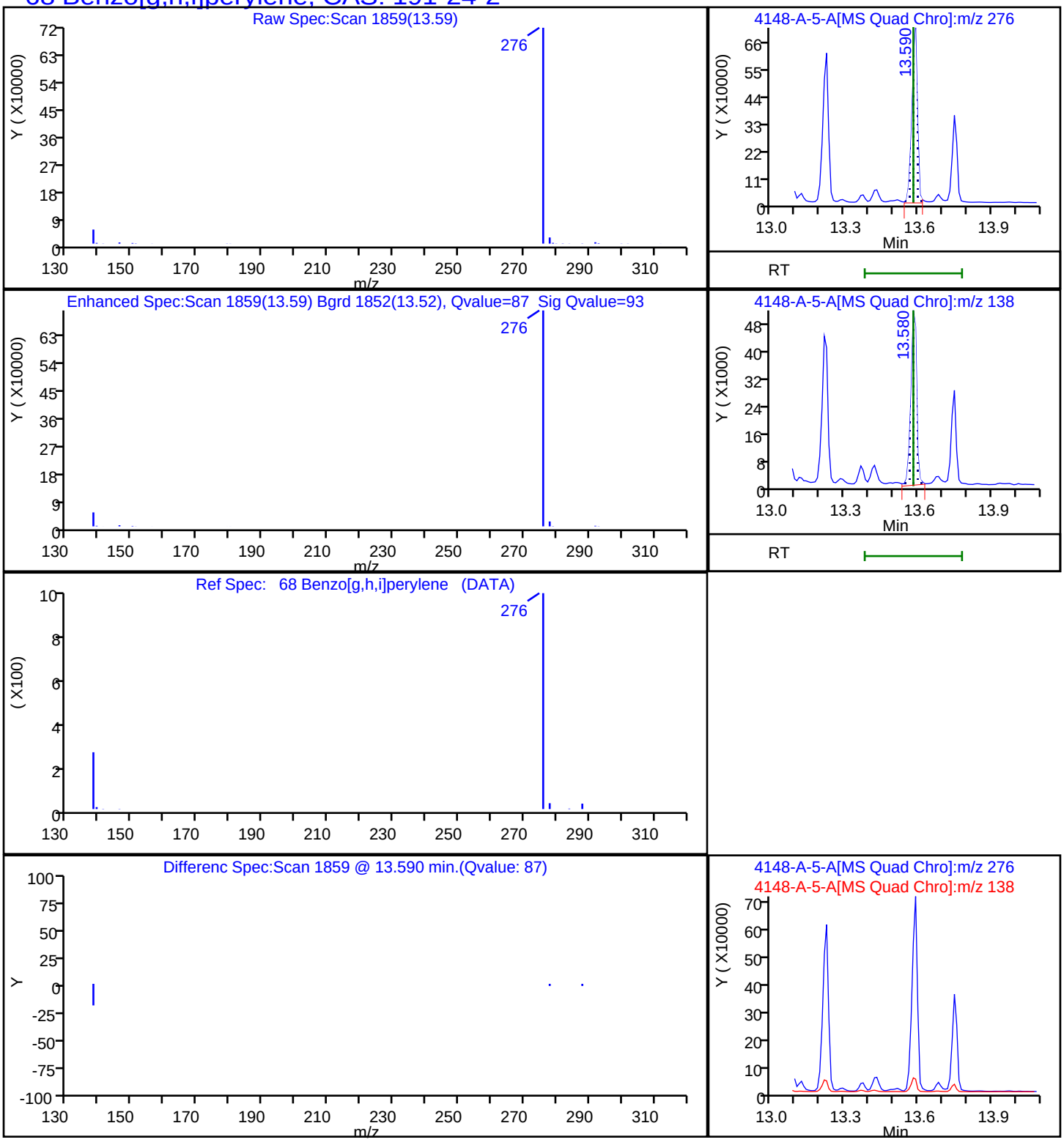
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

68 Benzo[g,h,i]perylene, CAS: 191-24-2



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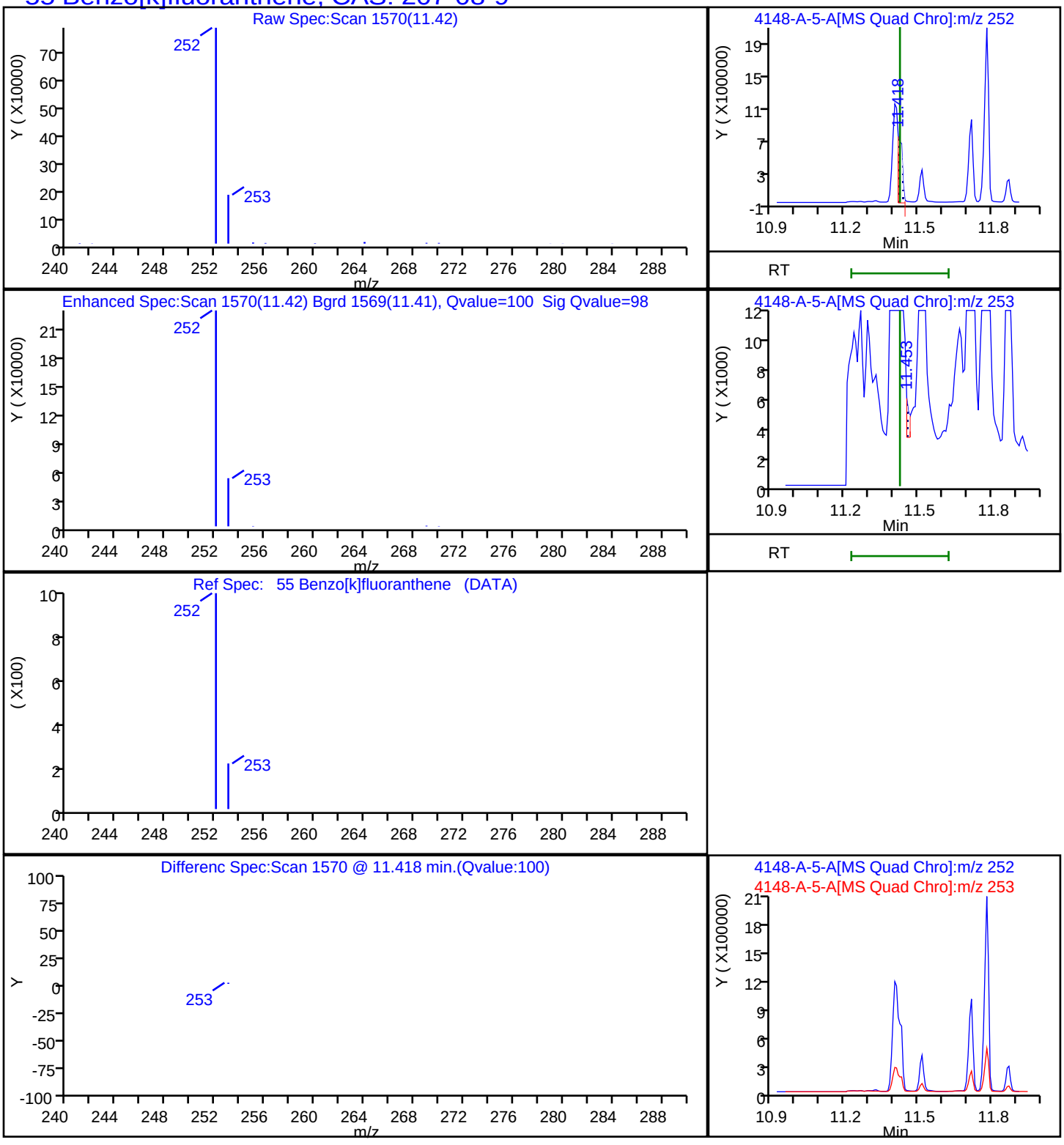
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

55 Benzo[k]fluoranthene, CAS: 207-08-9



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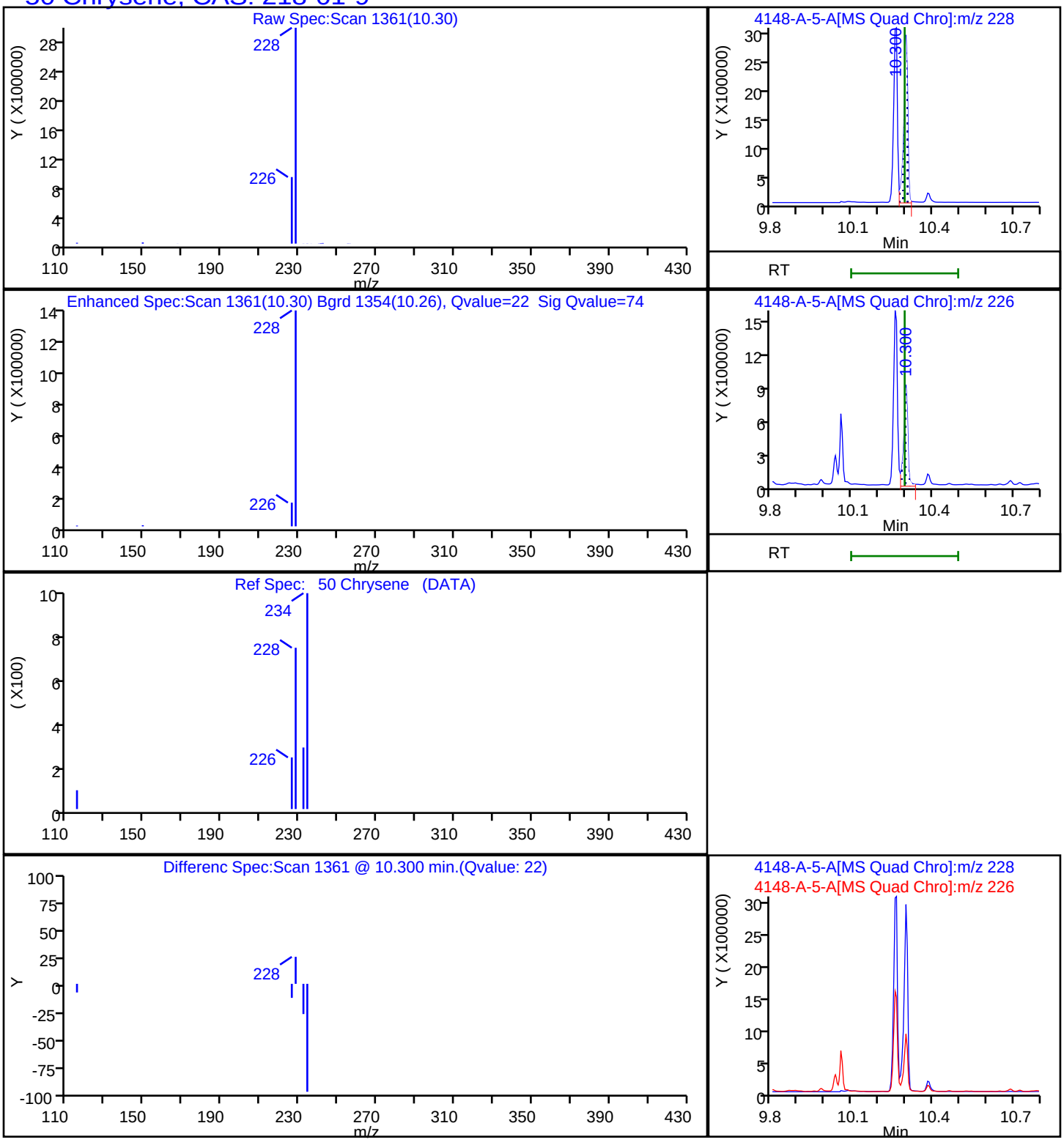
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D

Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

50 Chrysene, CAS: 218-01-9



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Eurofins Knoxville

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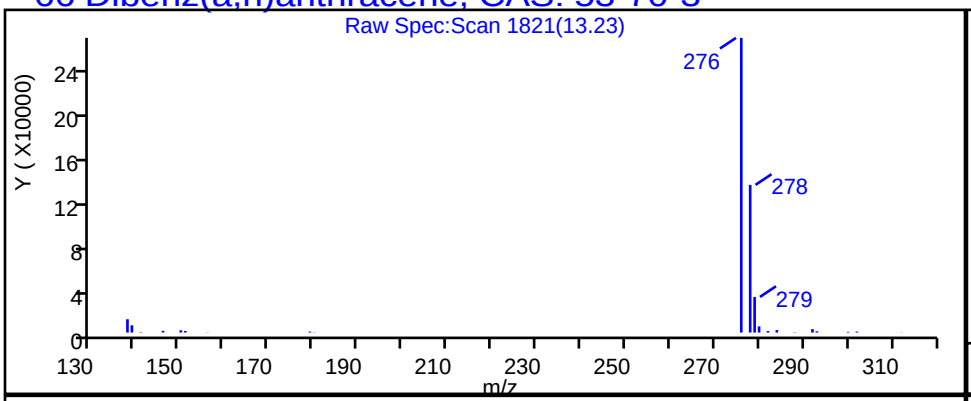
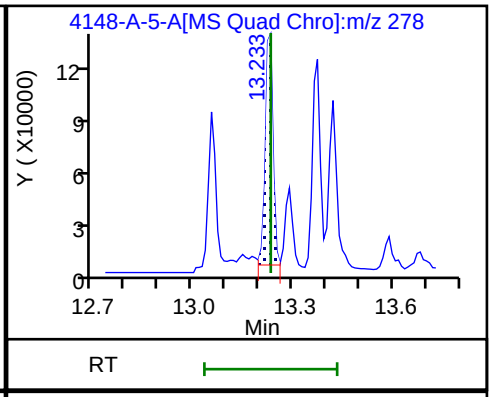
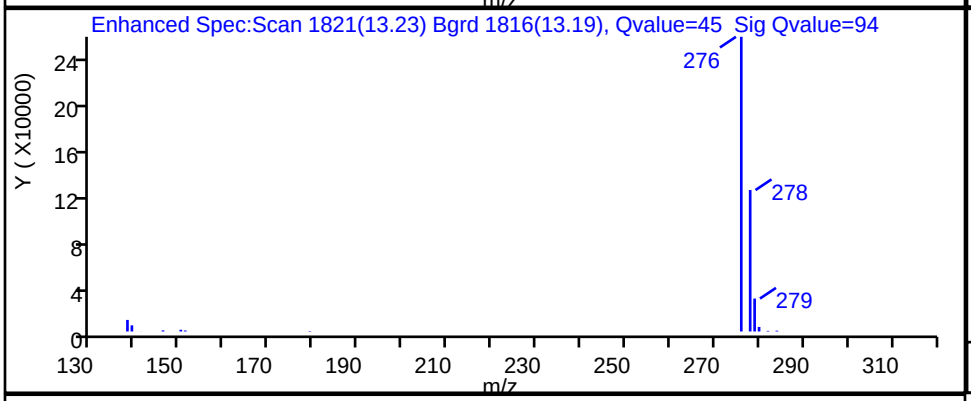
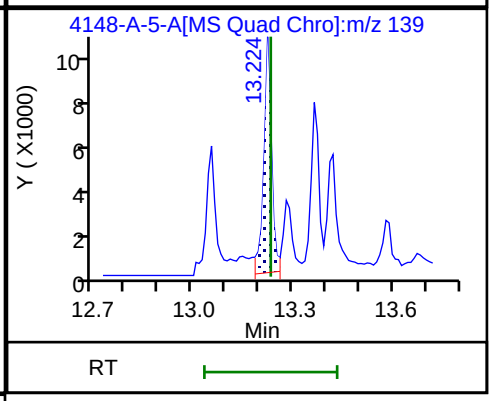
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

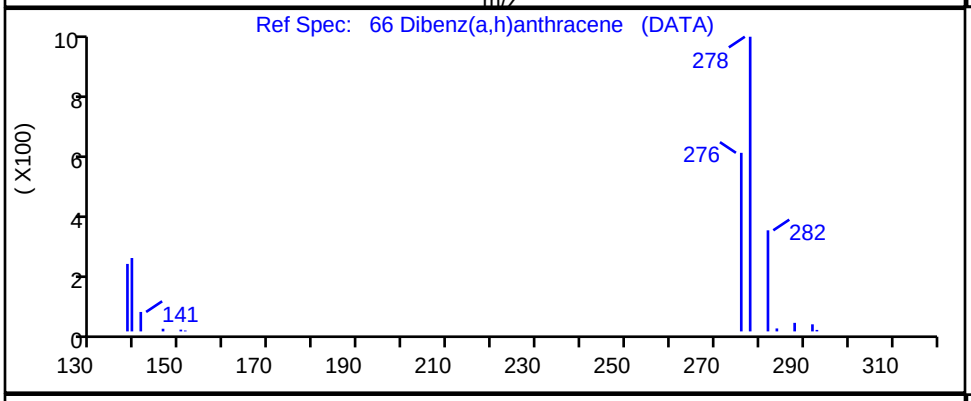
66 Dibenz(a,h)anthracene, CAS: 53-70-3

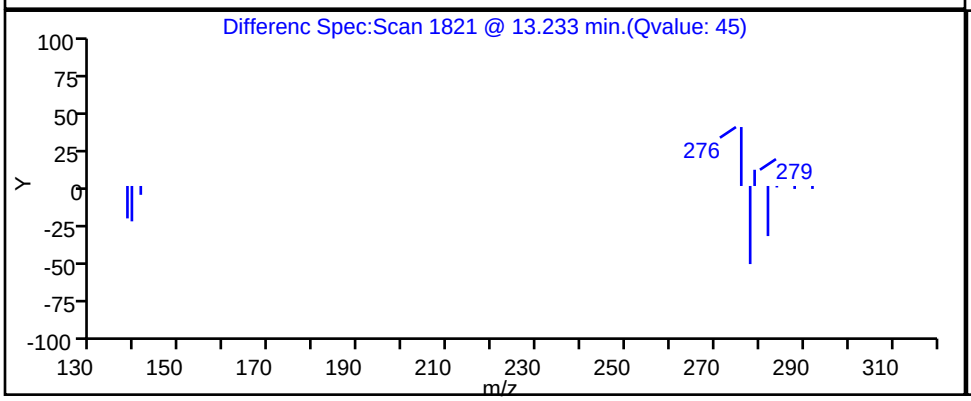


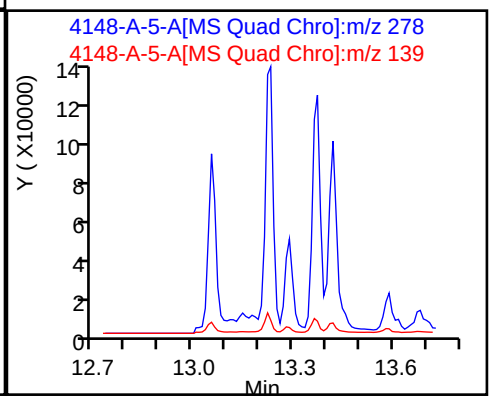












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Eurofins Knoxville

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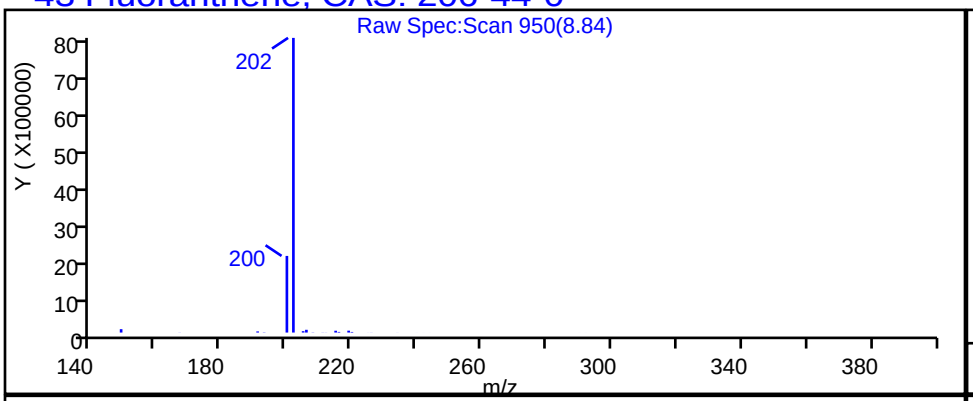
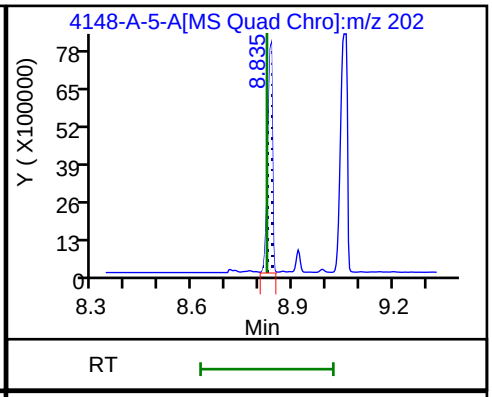
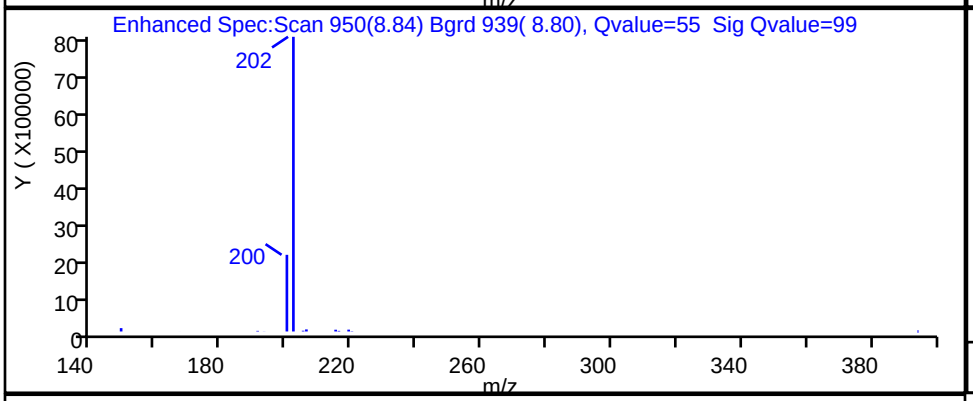
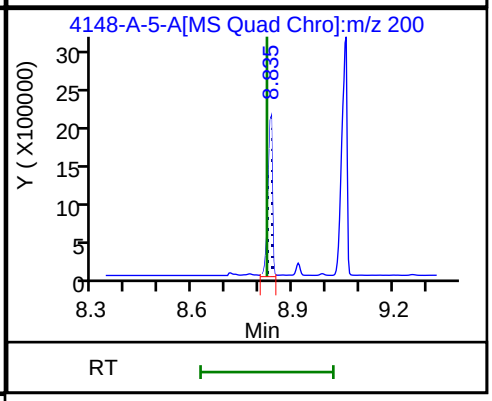
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

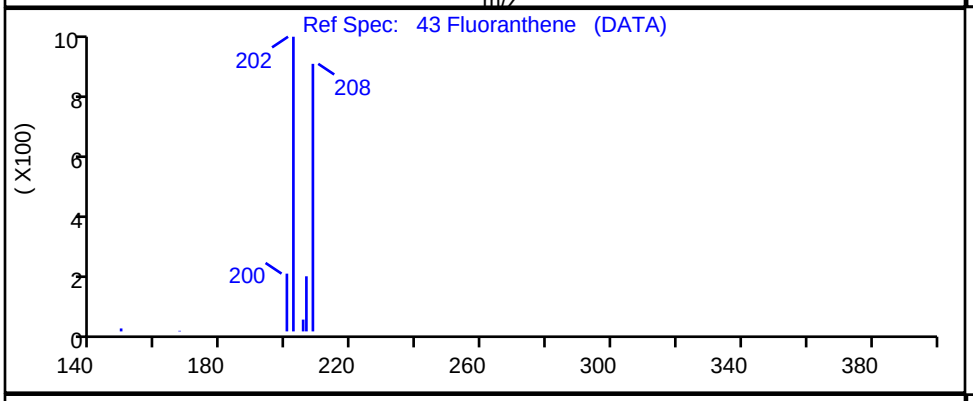
43 Fluoranthene, CAS: 206-44-0

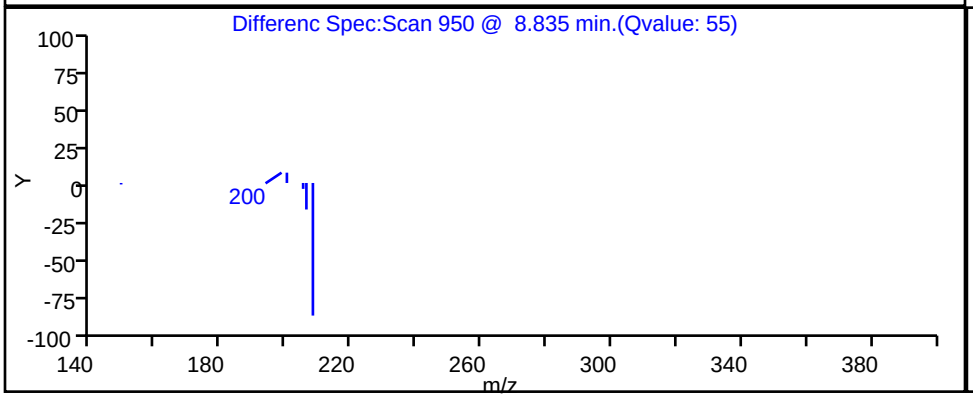


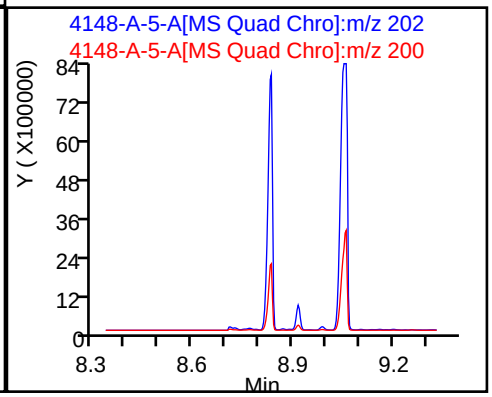












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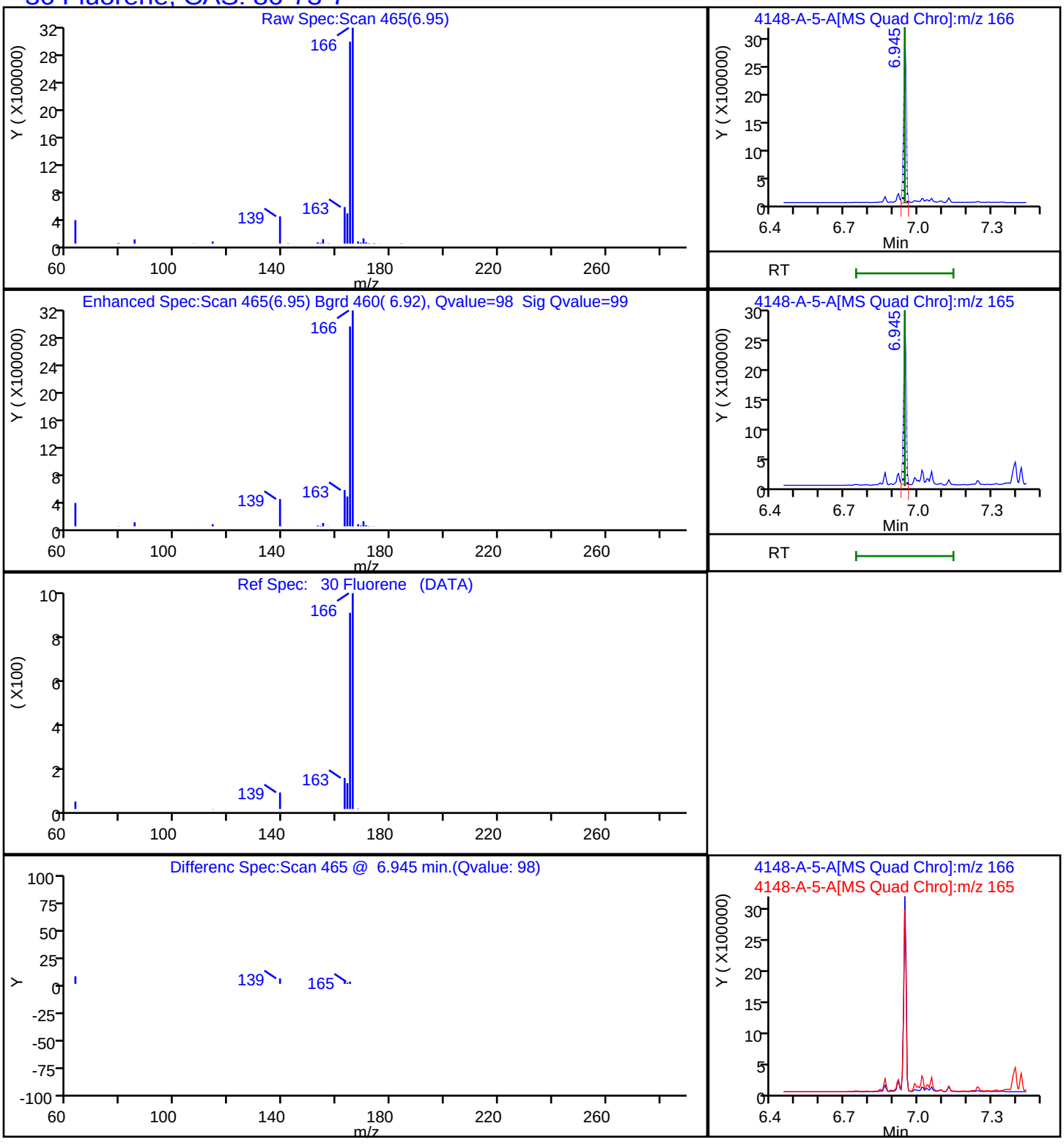
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D

Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

30 Fluorene, CAS: 86-73-7



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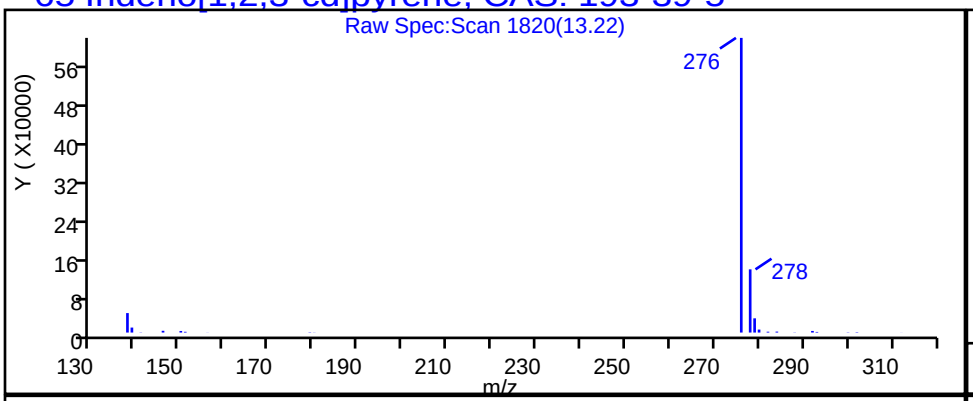
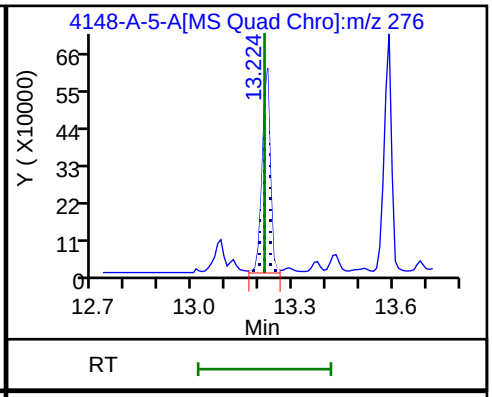
Eurofins Knoxville

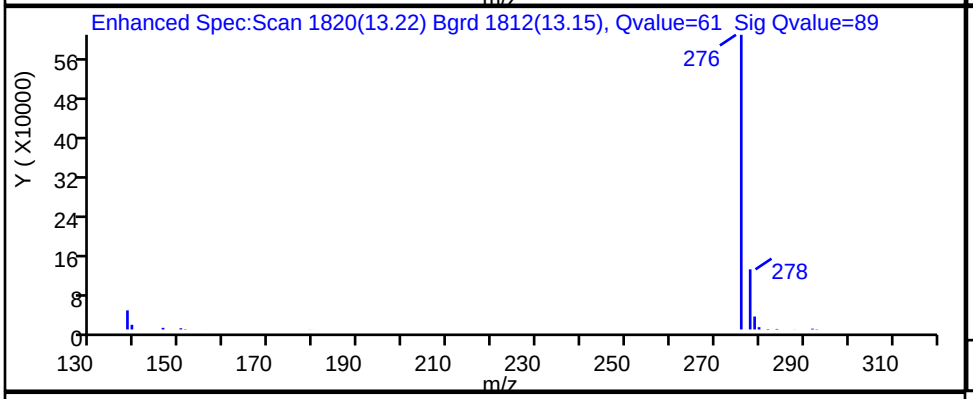
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D

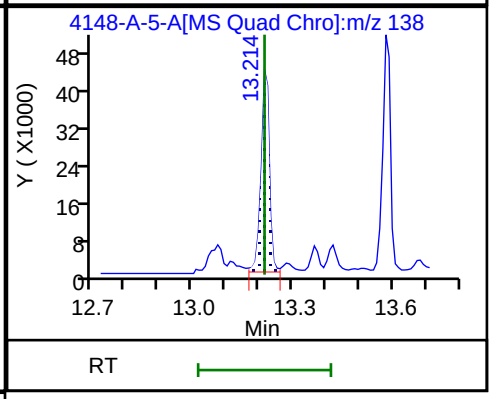
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

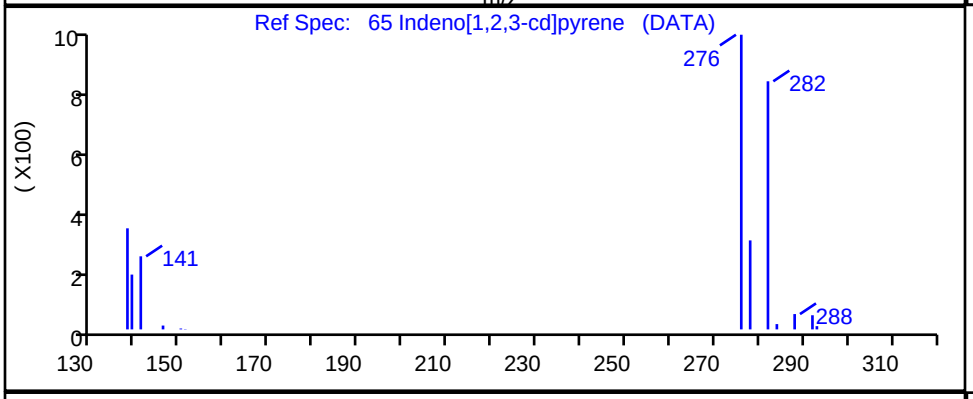
65 Indeno[1,2,3-cd]pyrene, CAS: 193-39-5

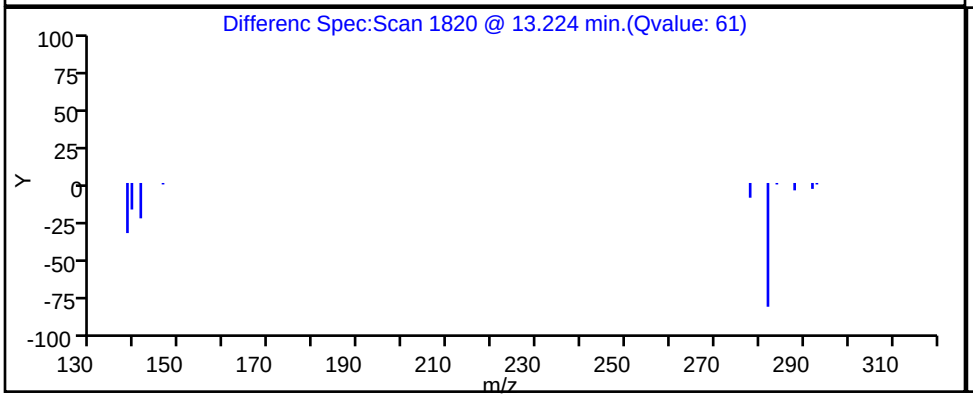


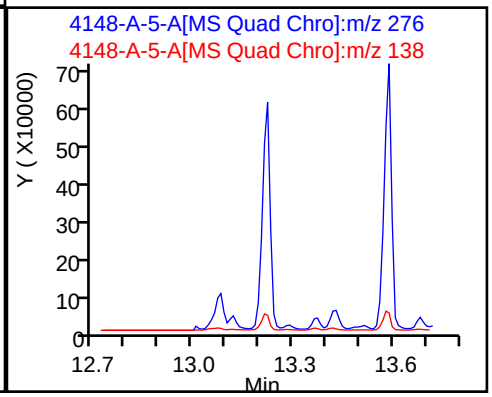












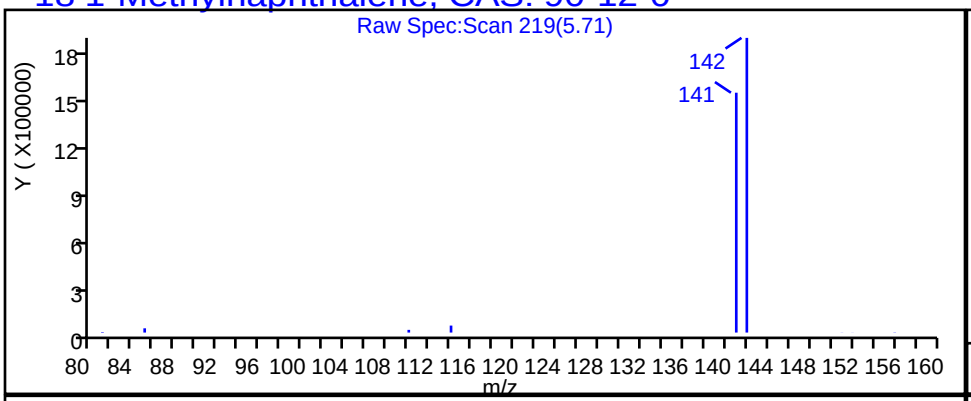
Report Date: 06-Dec-2023 16:35:44 Chrom Revision: 2.3 15-Nov-2023 20:54:34

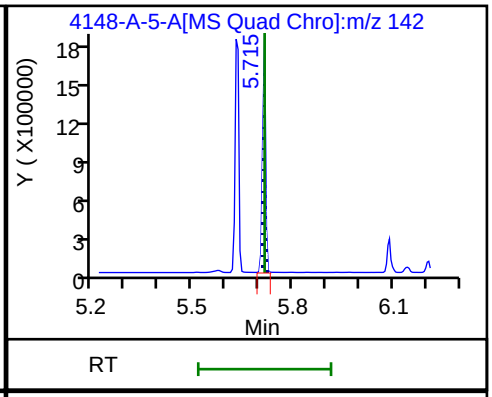
Eurofins Knoxville

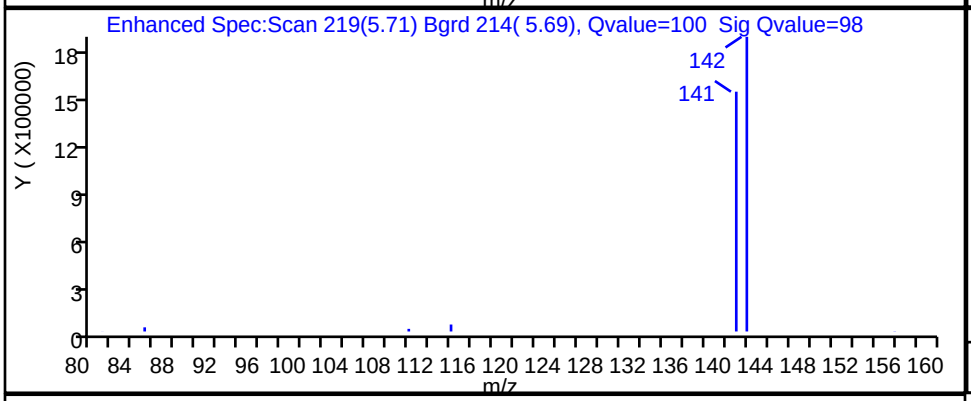
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D

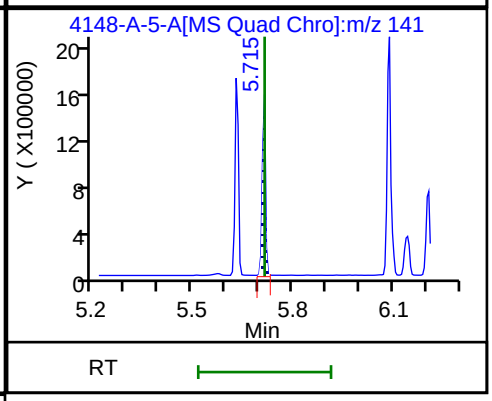
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

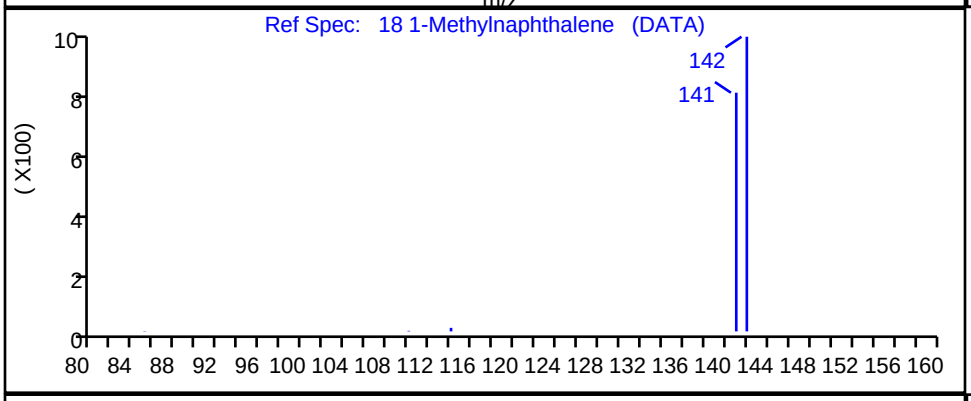
18 1-Methylnaphthalene, CAS: 90-12-0

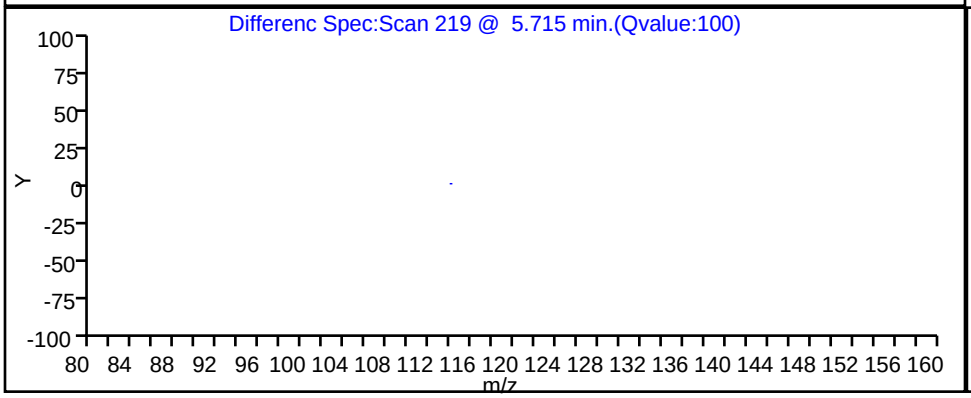


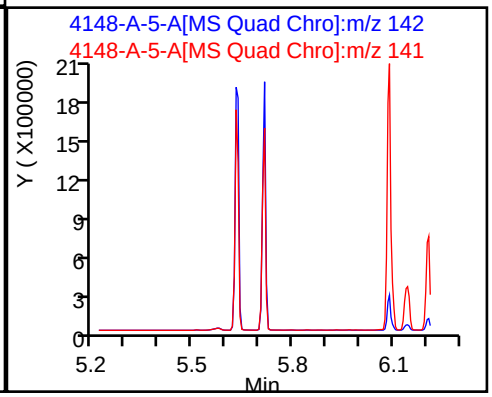












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Eurofins Knoxville

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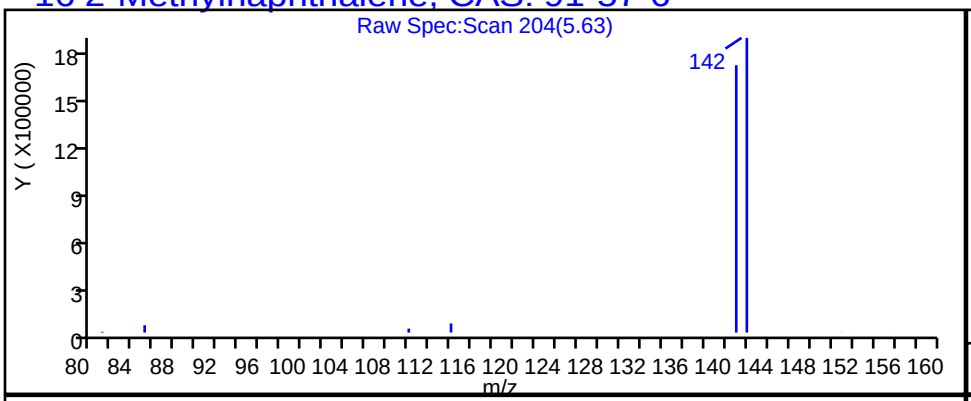
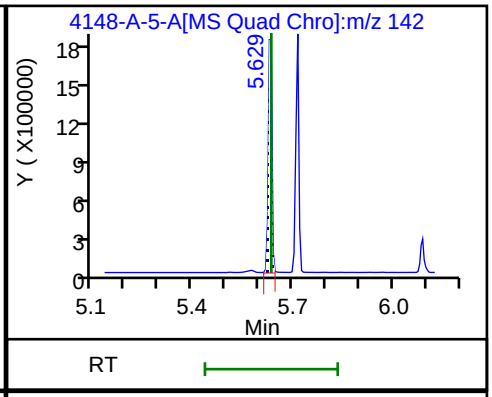
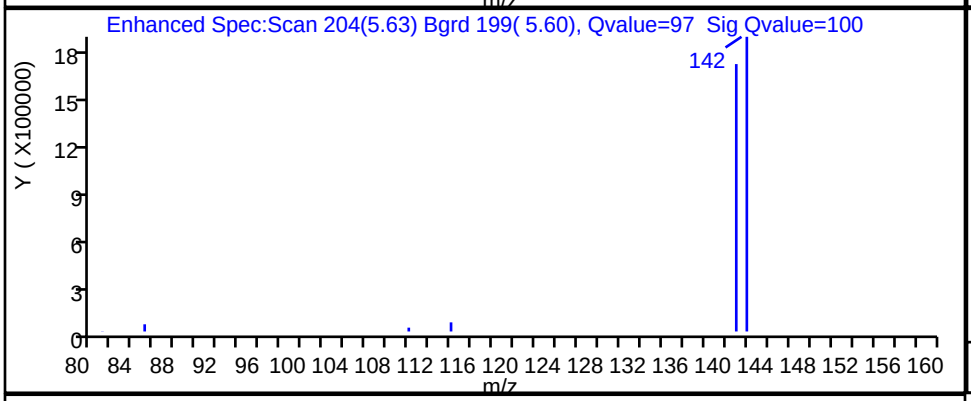
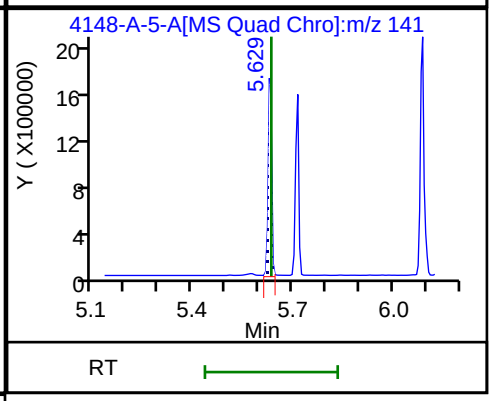
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

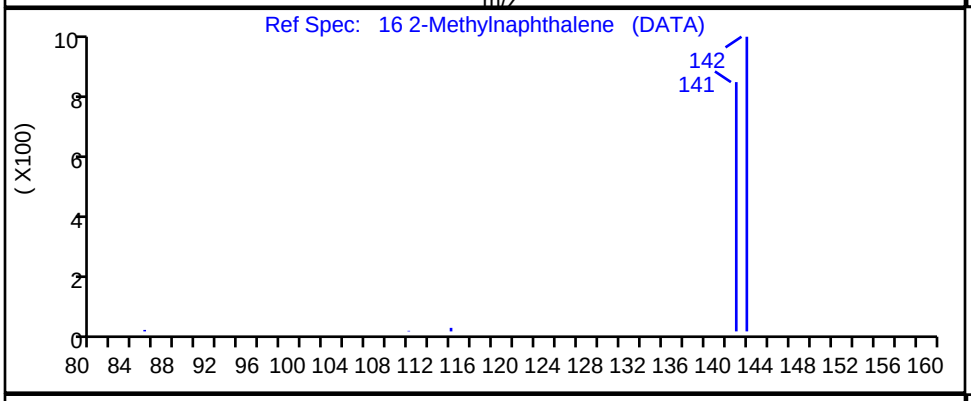
16 2-Methylnaphthalene, CAS: 91-57-6

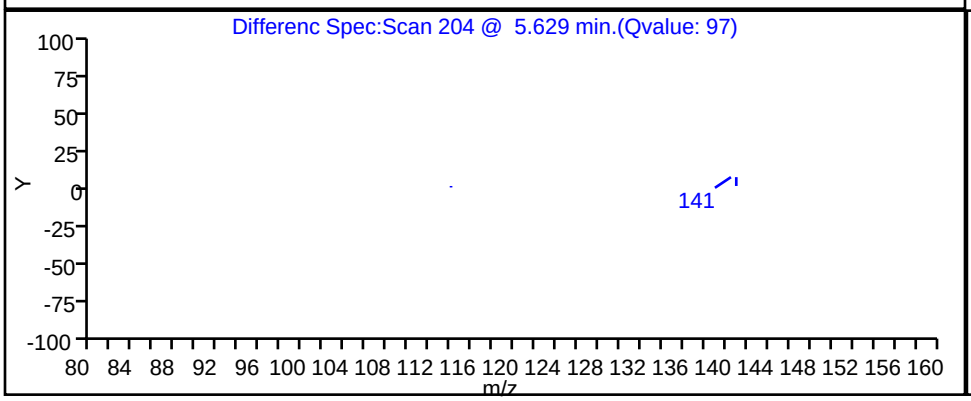


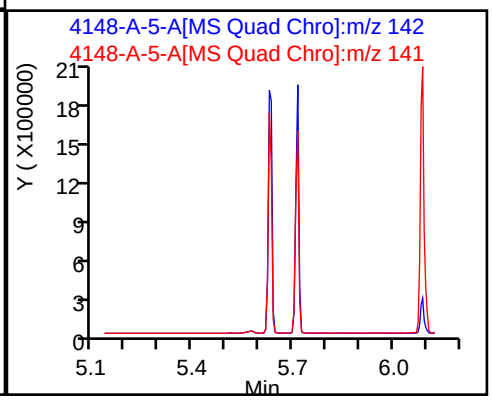












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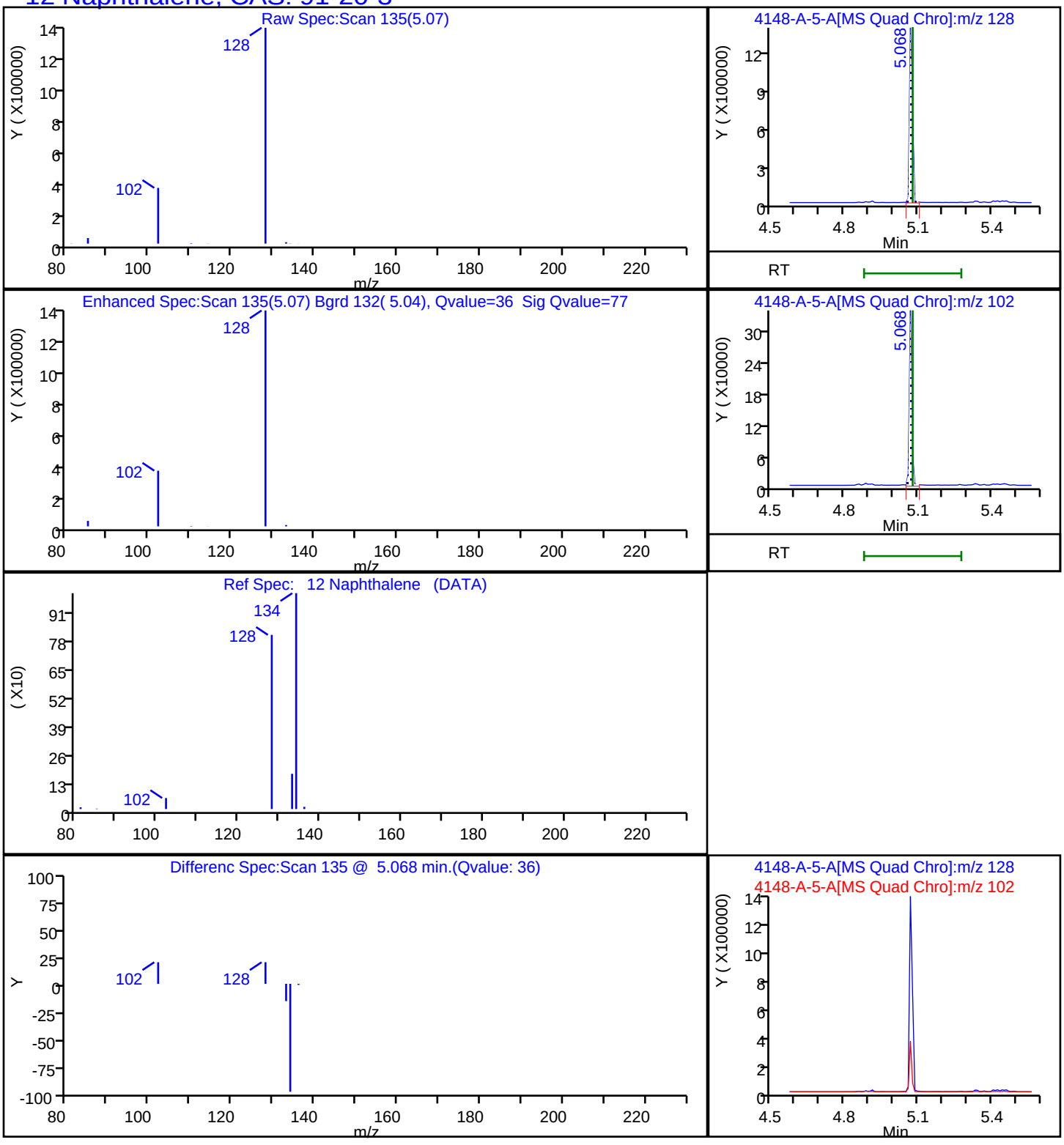
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D

Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

12 Naphthalene, CAS: 91-20-3



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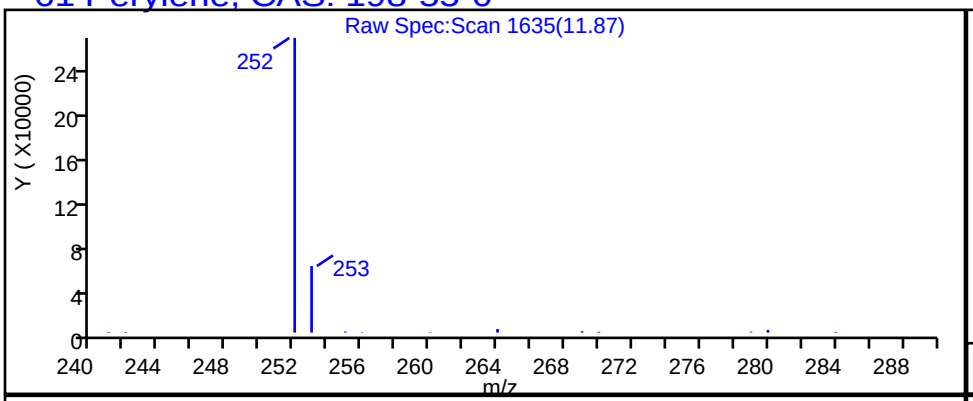
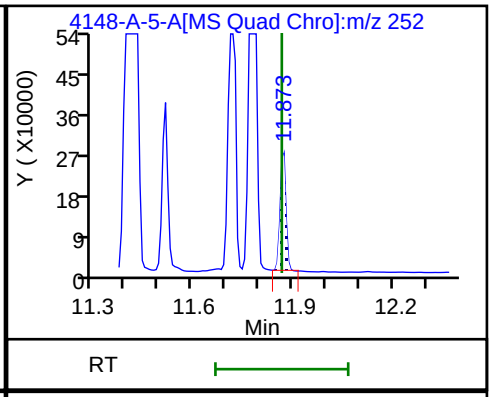
Eurofins Knoxville

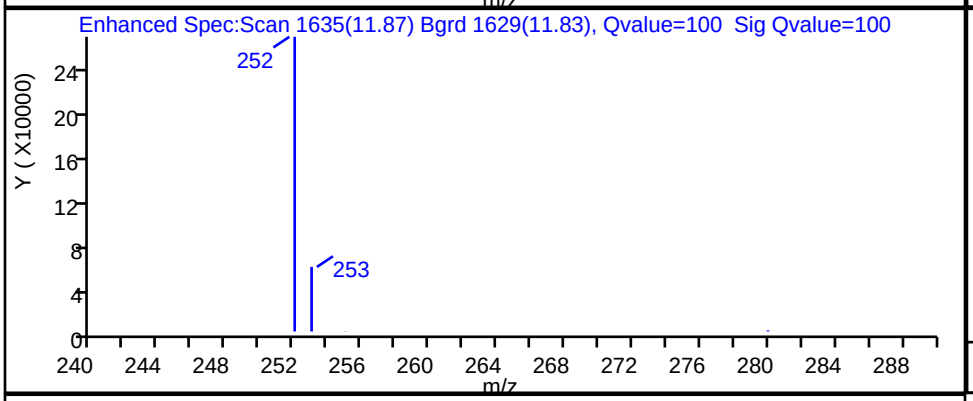
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D

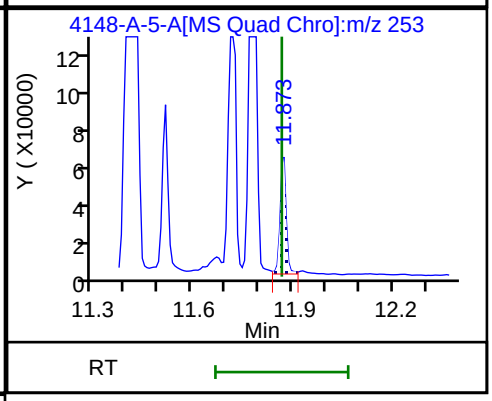
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

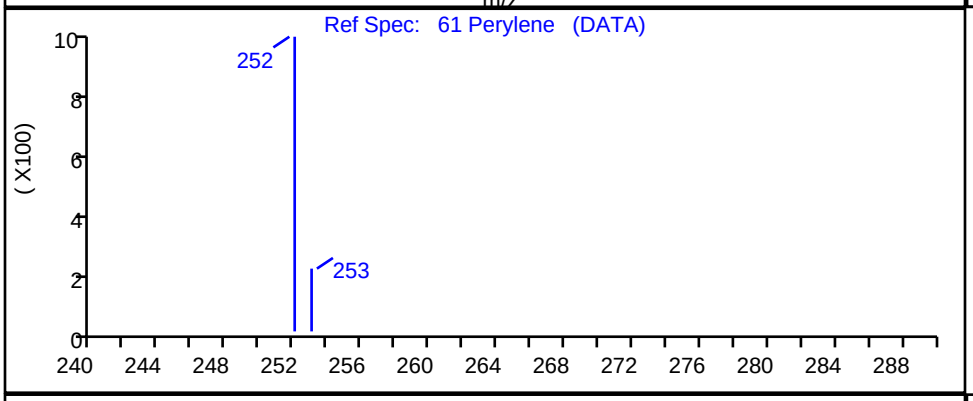
61 Perylene, CAS: 198-55-0

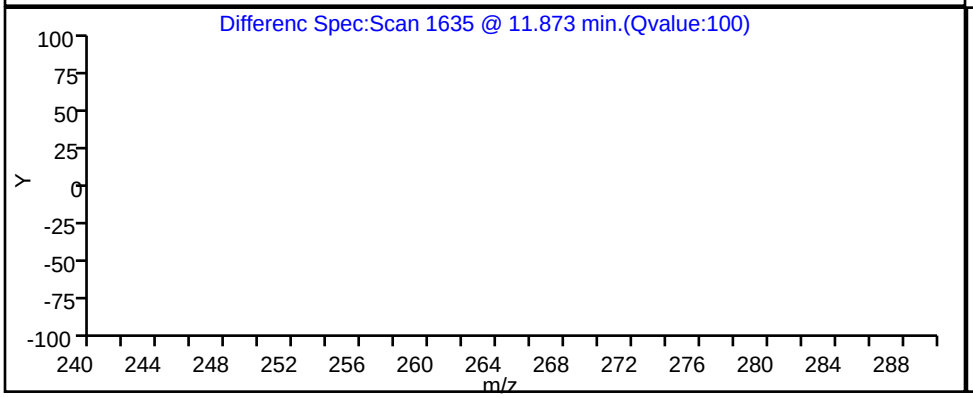


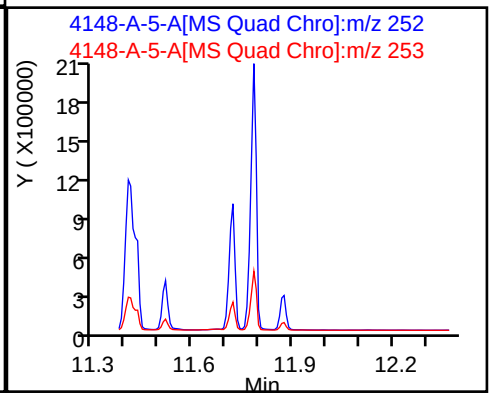












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Eurofins Knoxville

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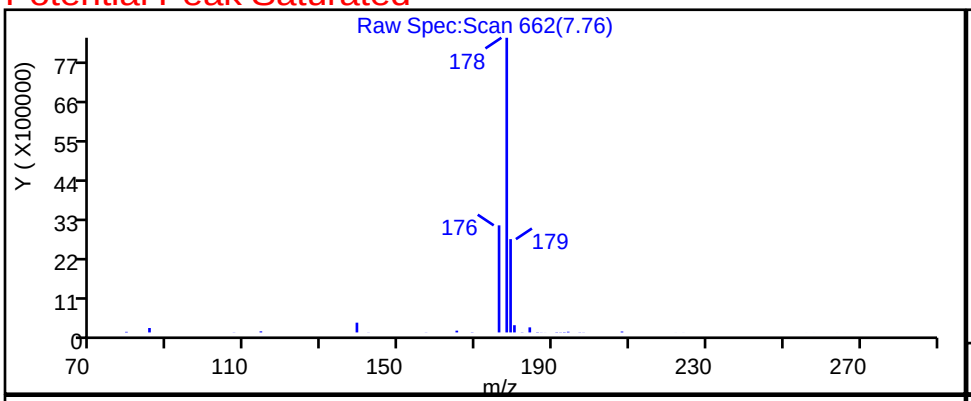
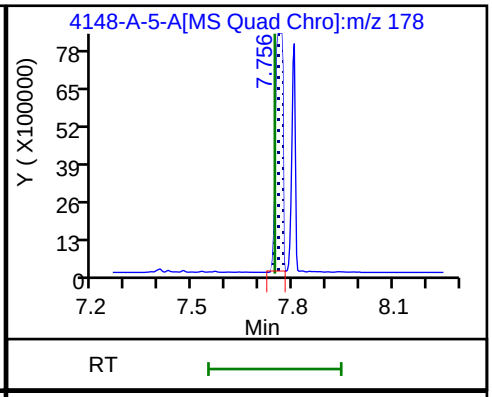
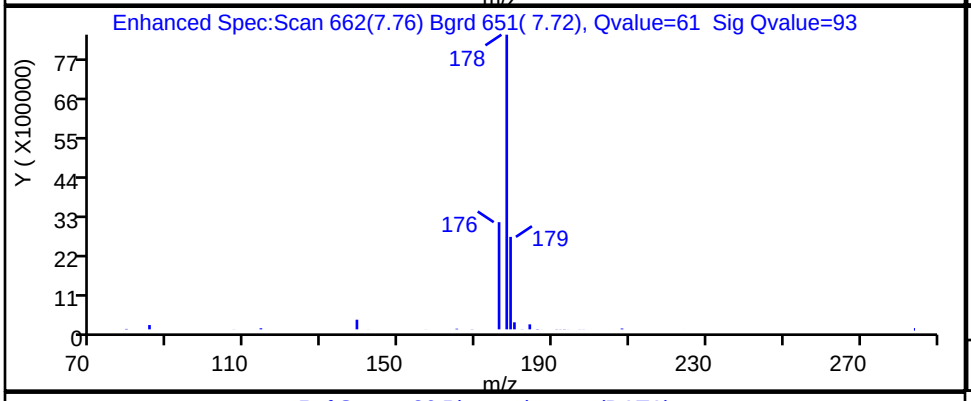
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

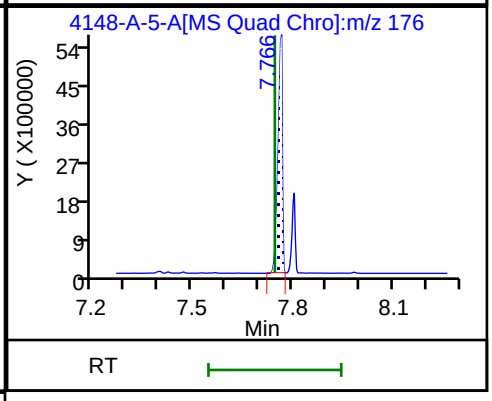
36 Phenanthrene, CAS: 85-01-8

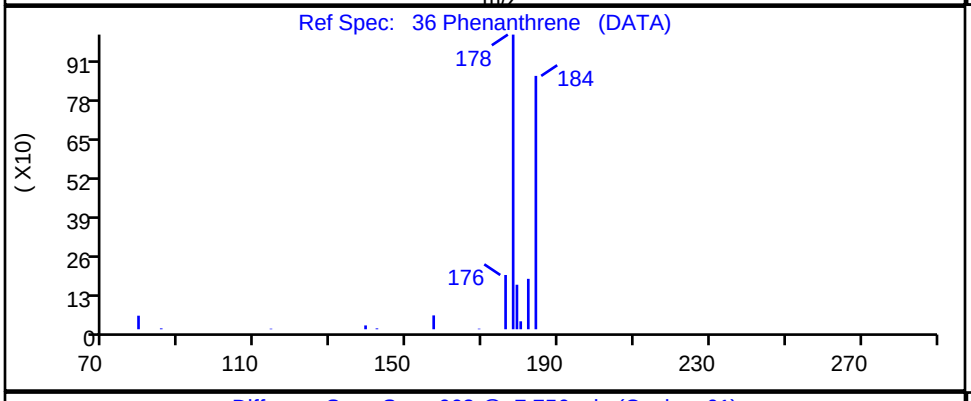
Potential Peak Saturated

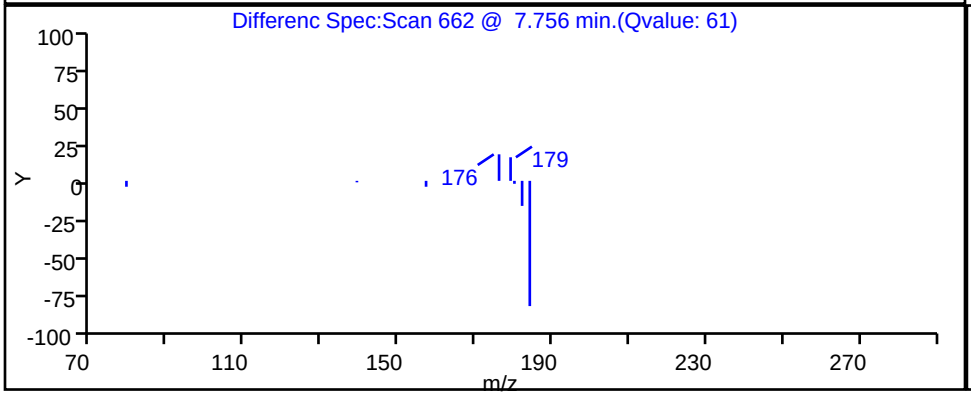


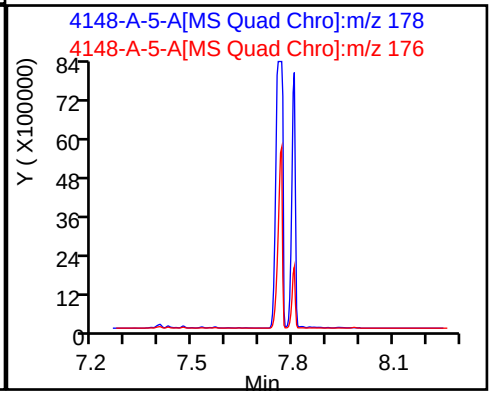












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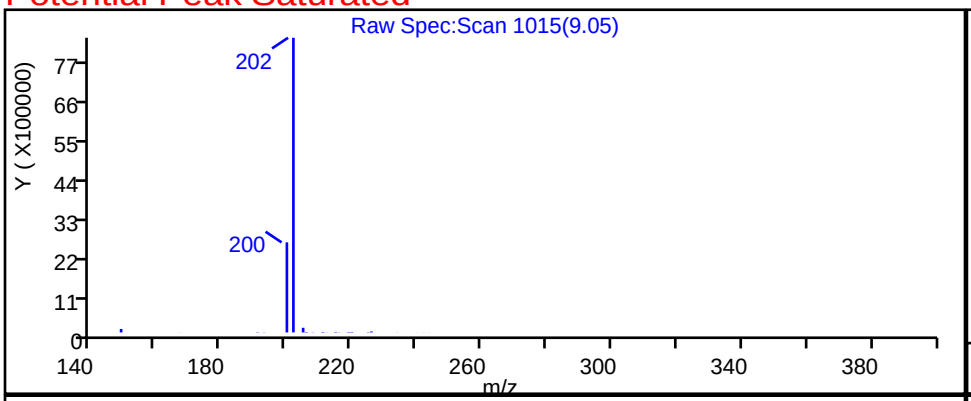
Eurofins Knoxville

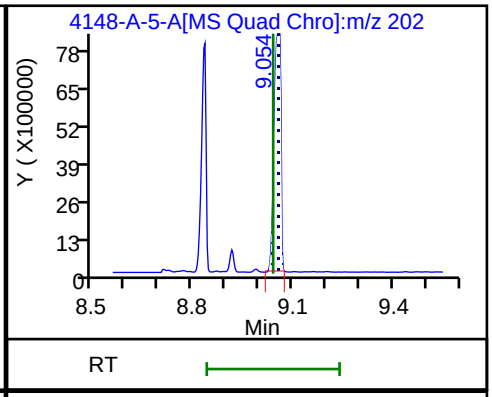
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D

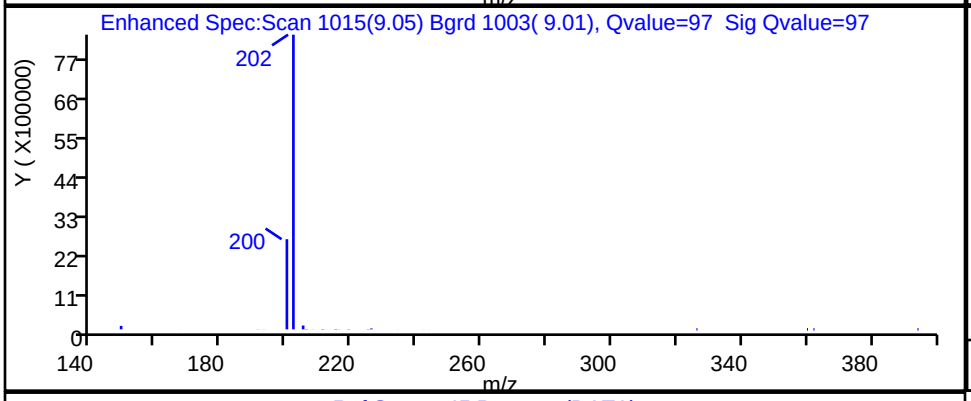
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

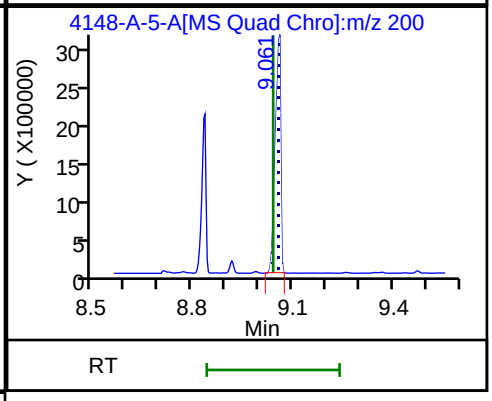
45 Pyrene, CAS: 129-00-0

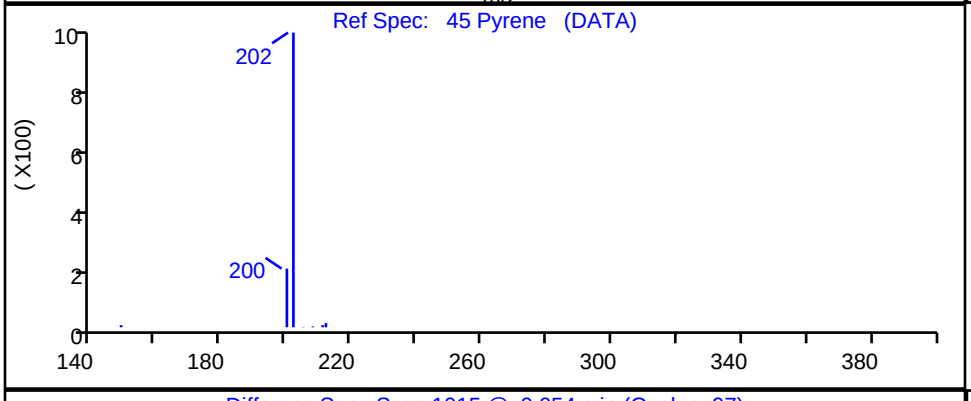
Potential Peak Saturated

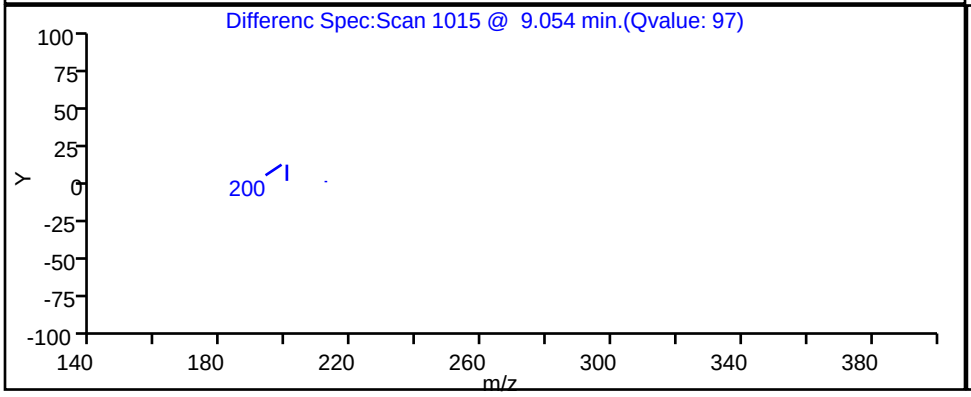


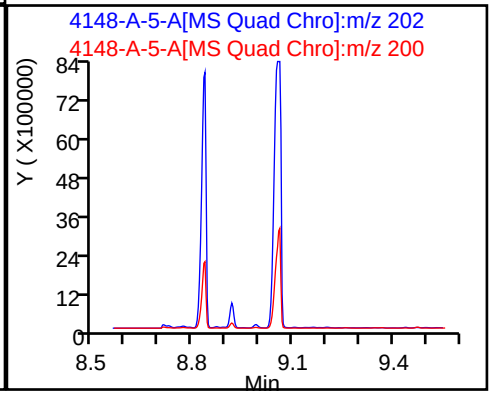












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Eurofins Knoxville

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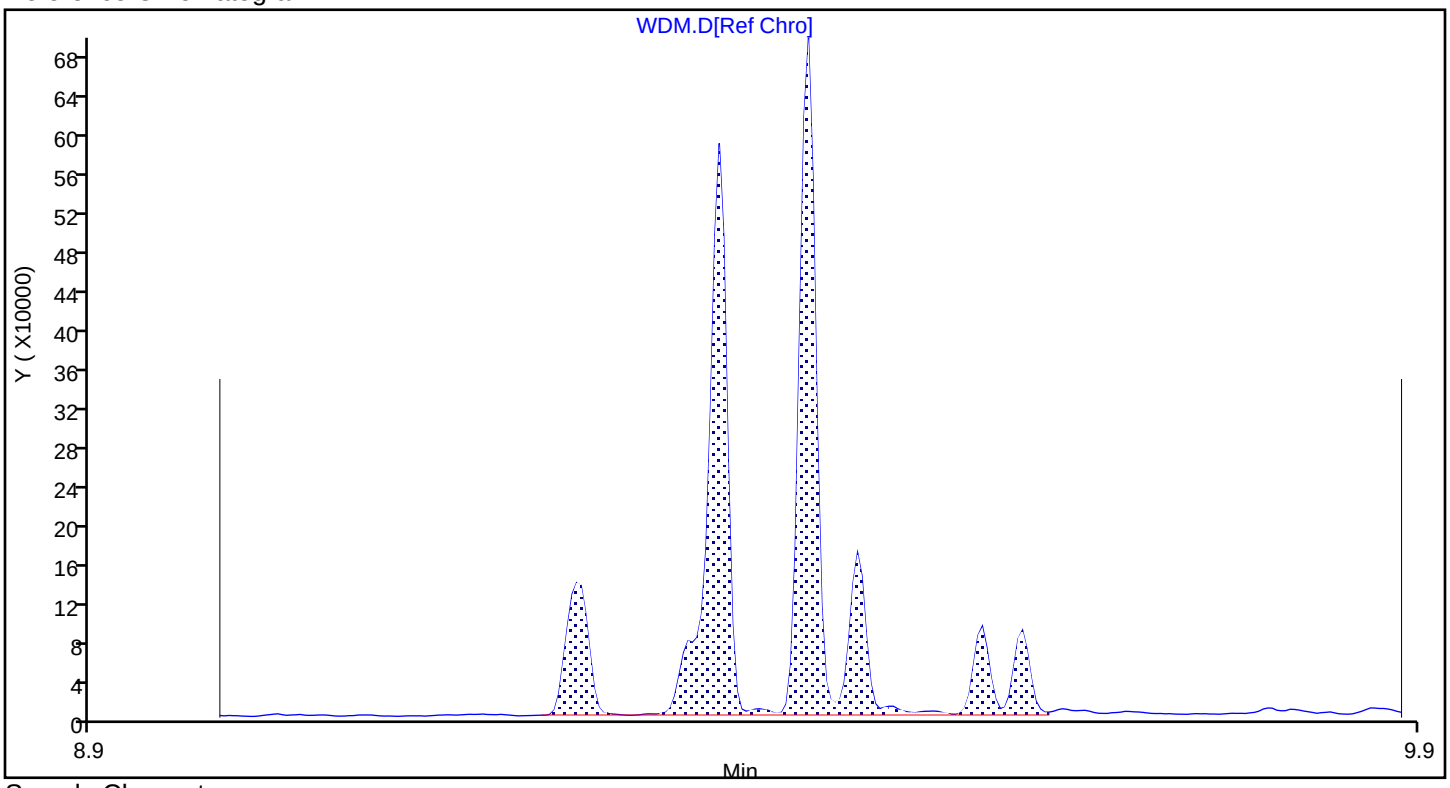
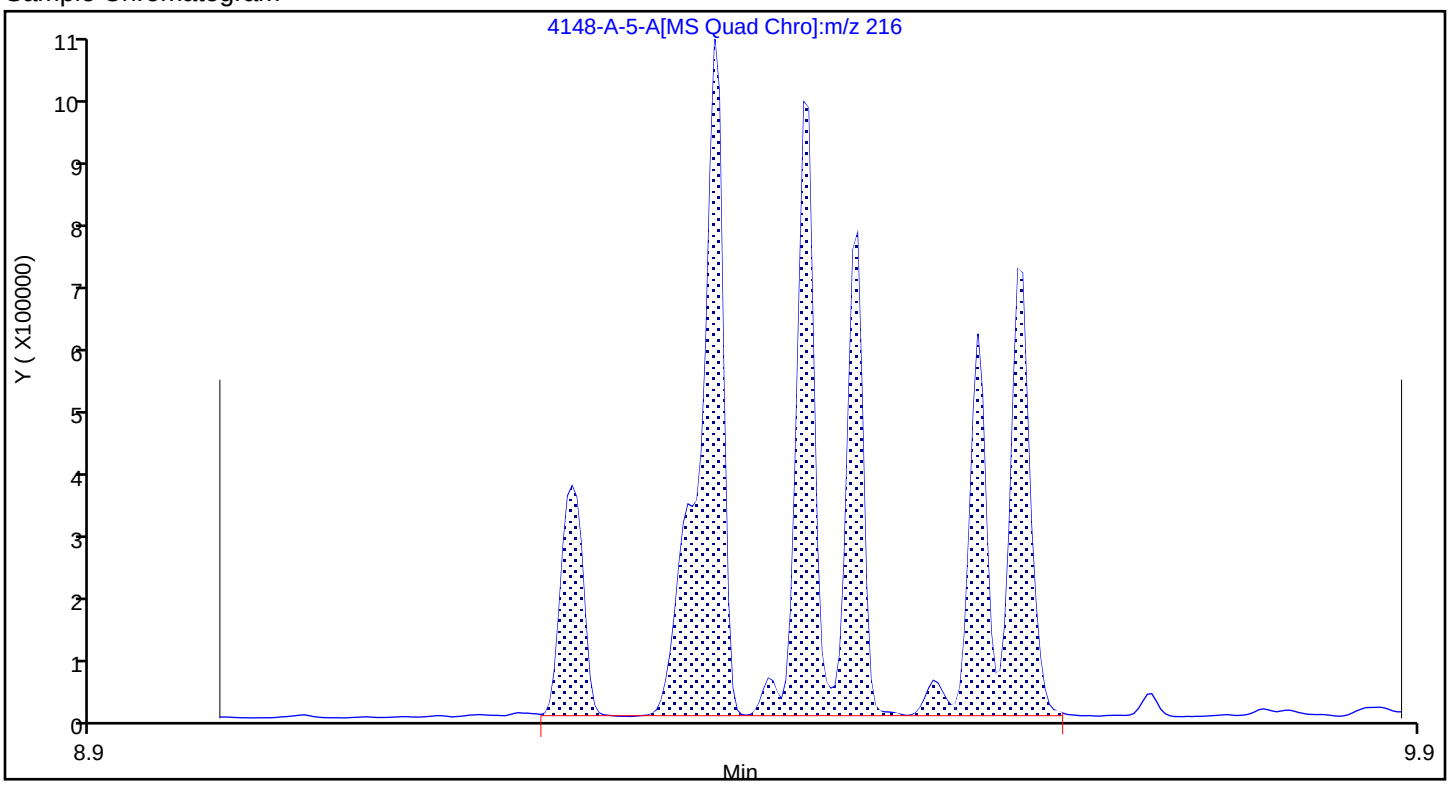
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 100 C1-Fluoranthenes/pyrene, CAS: STL00912

Reference Chromatogram



Sample Chromatogram



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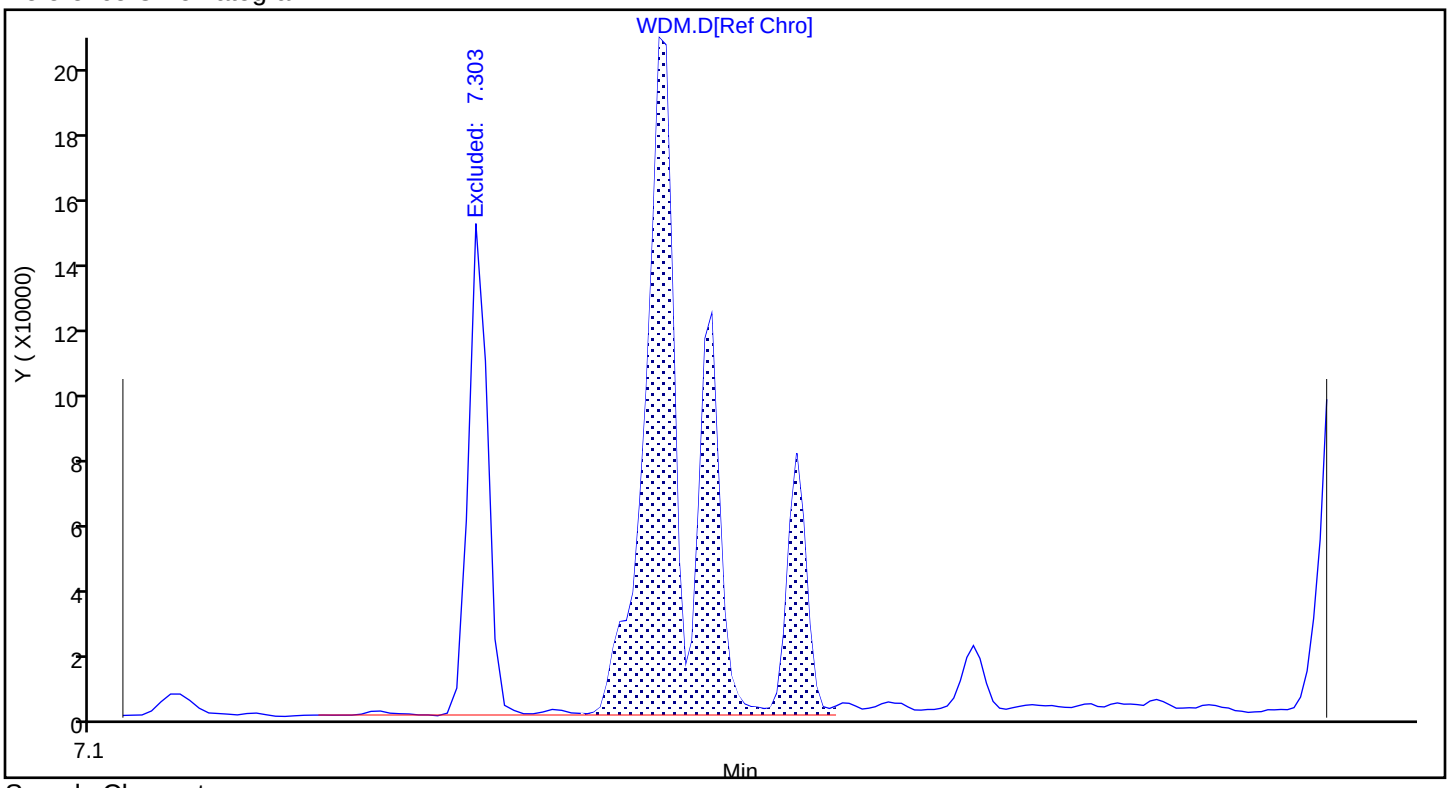
Eurofins Knoxville

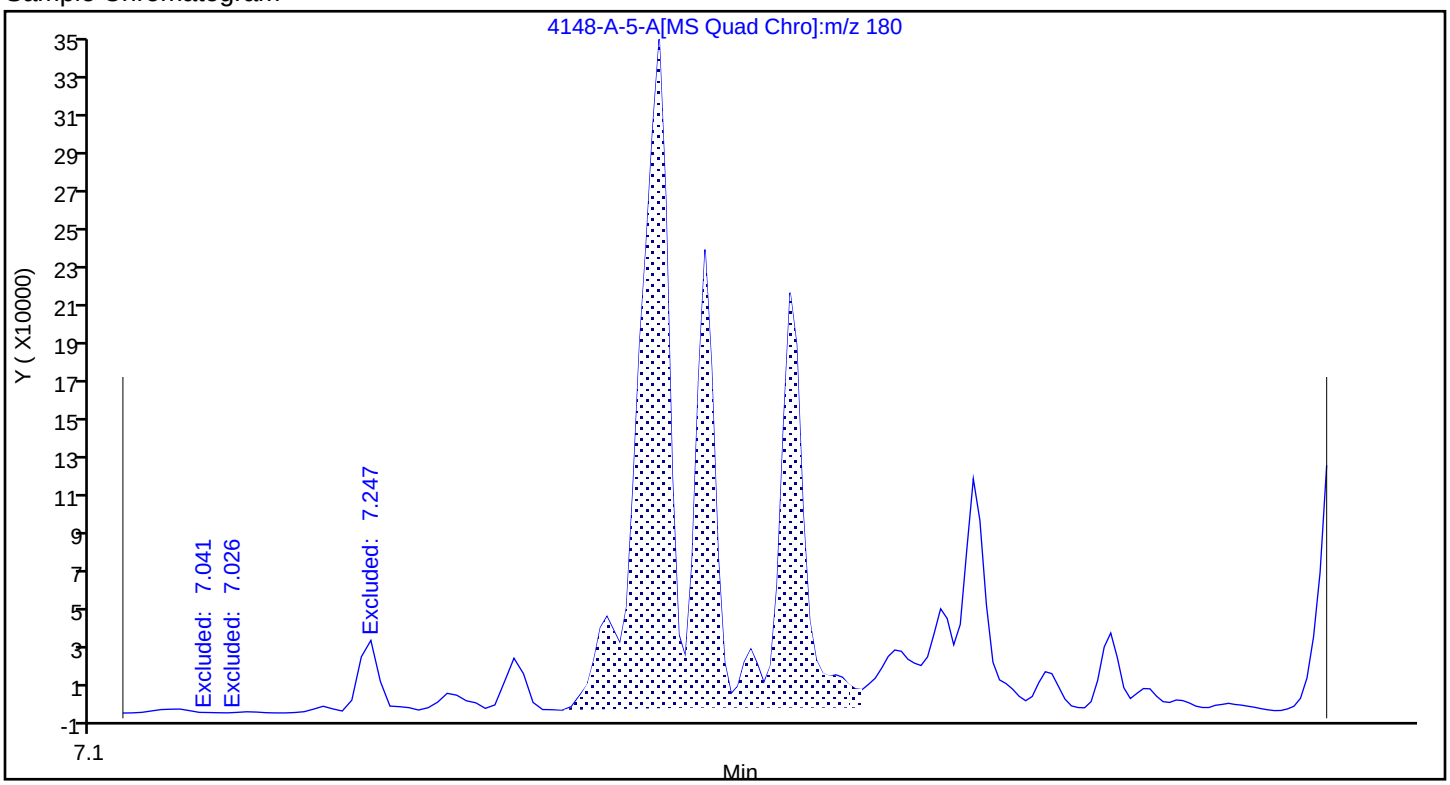
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D				
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 89 C1-Fluorenes, CAS: STL00913

Reference Chromatogram



Sample Chromatogram



Report Date: 06-Dec-2023 16:35:45 Chrom Revision: 2.3 15-Nov-2023 20:54:34

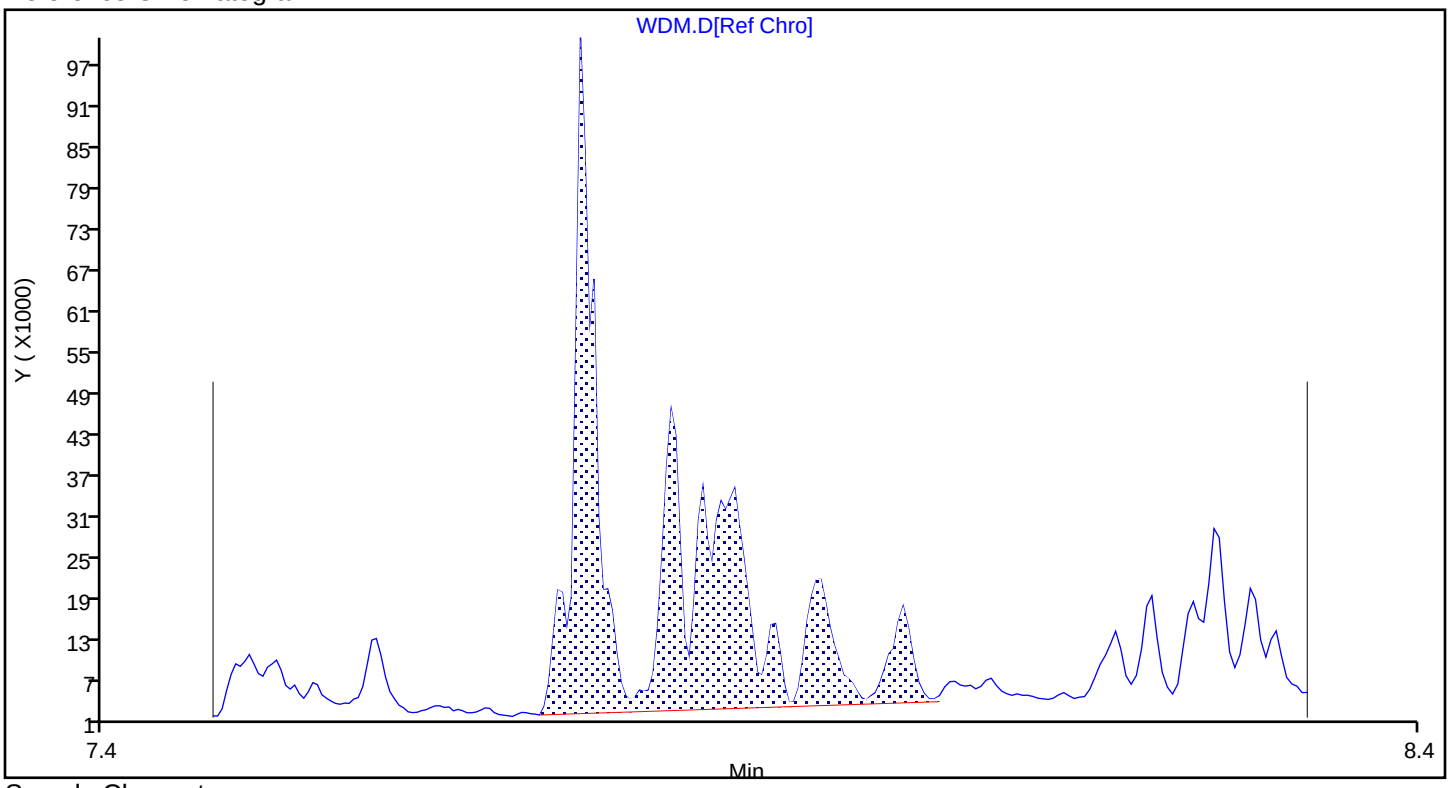
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D

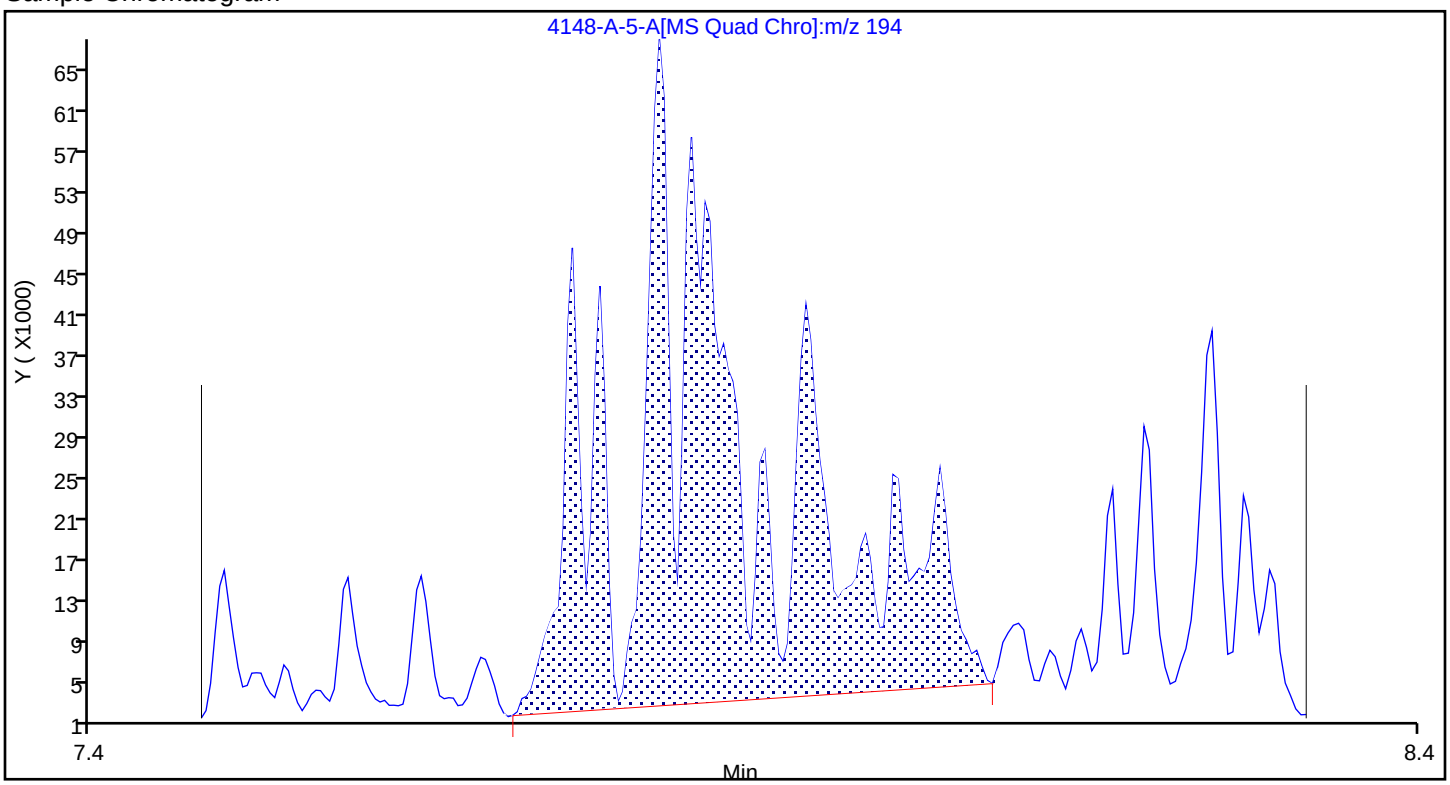
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 90 C2-Fluorenes, CAS: STL00914

Reference Chromatogram



Sample Chromatogram



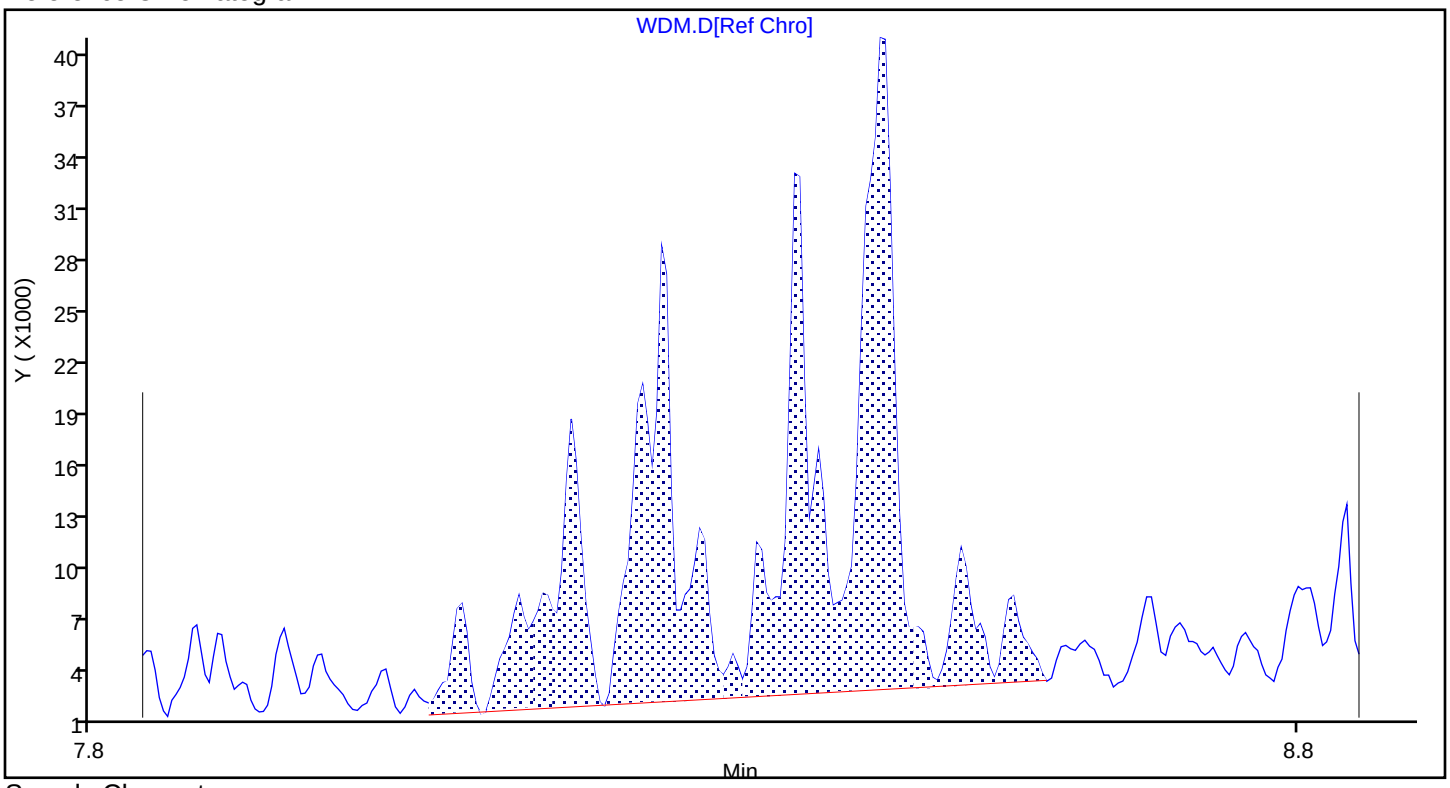
Report Date: 06-Dec-2023 16:35:45 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

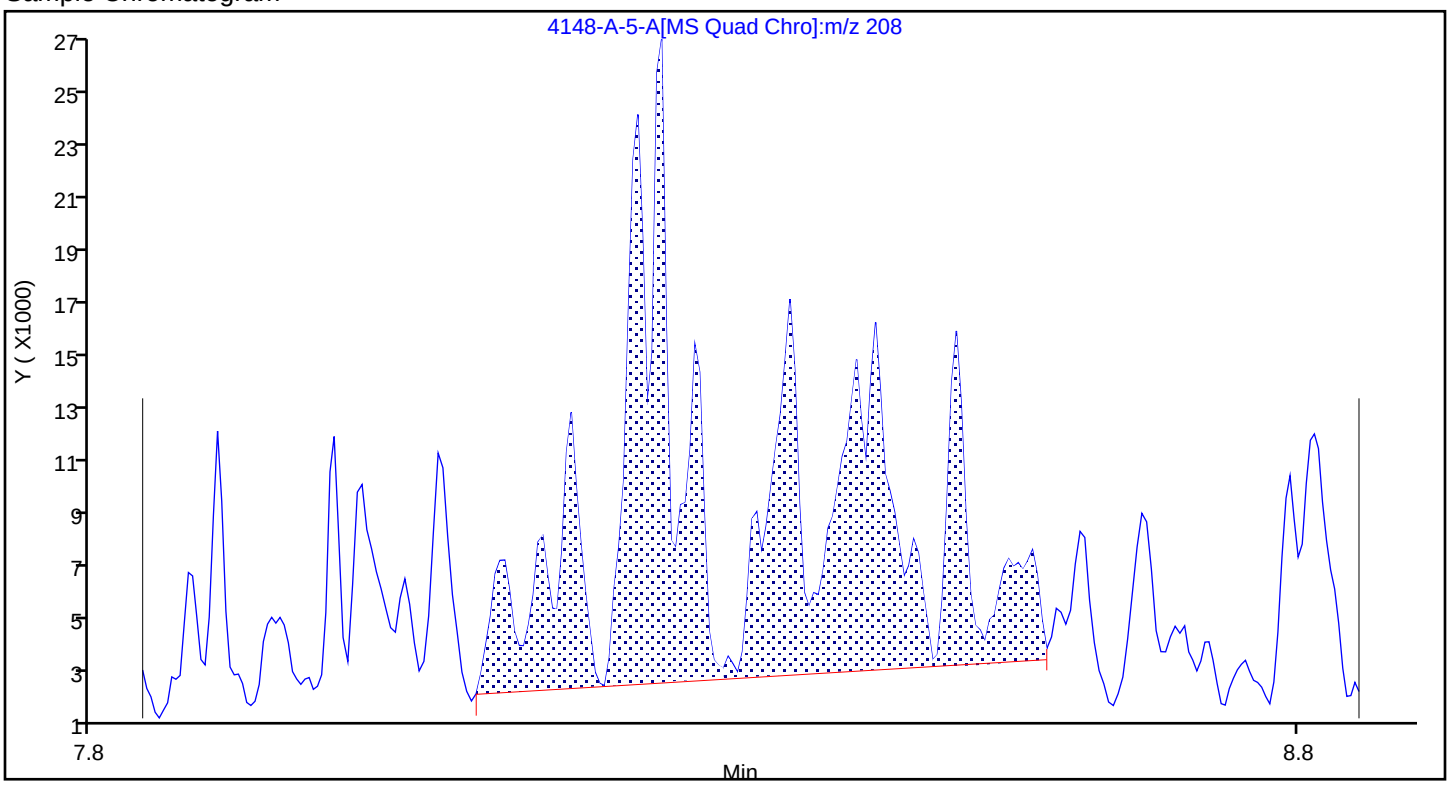
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D				
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 91 C3-Fluorenes, CAS: STL00915

Reference Chromatogram



Sample Chromatogram



Report Date: 06-Dec-2023 16:35:45 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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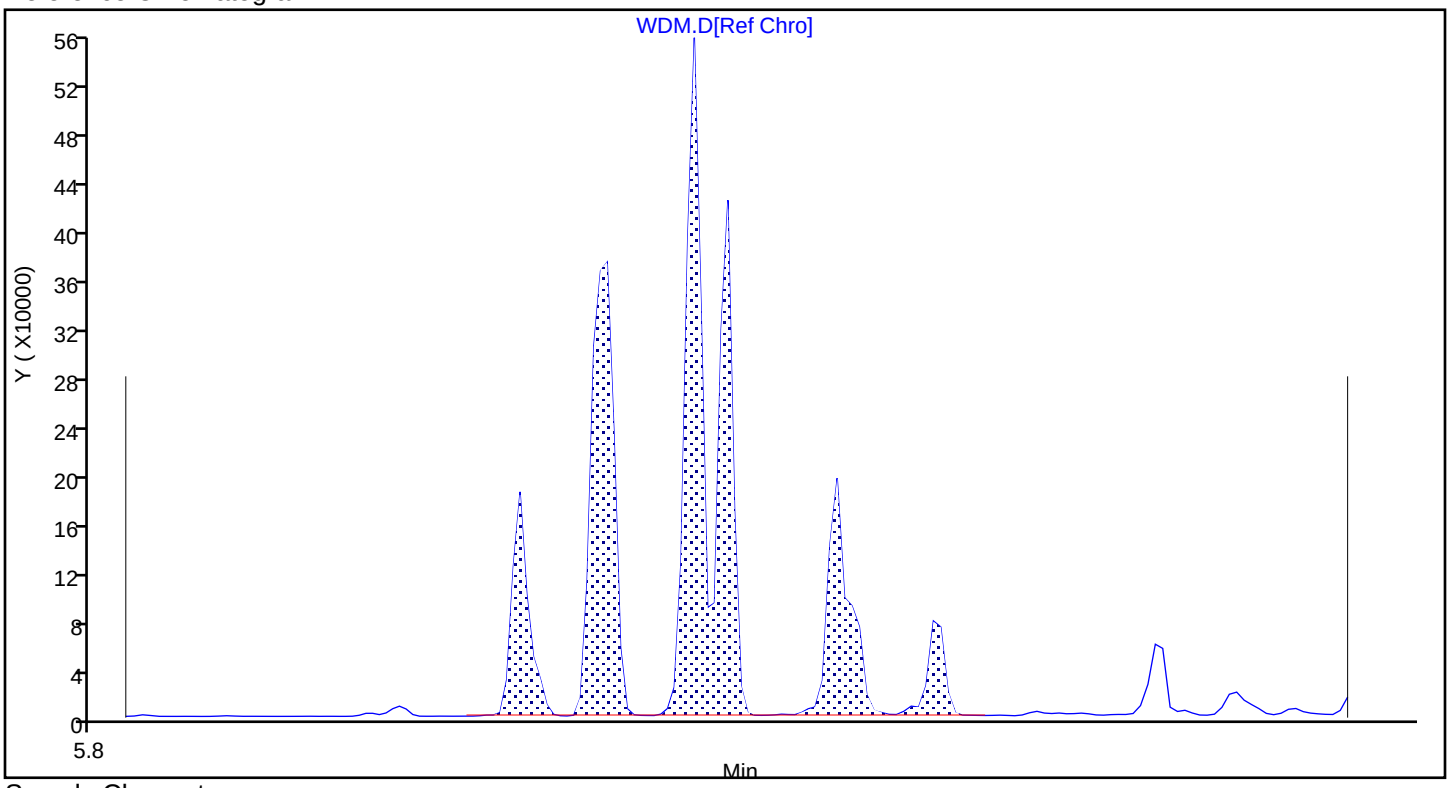
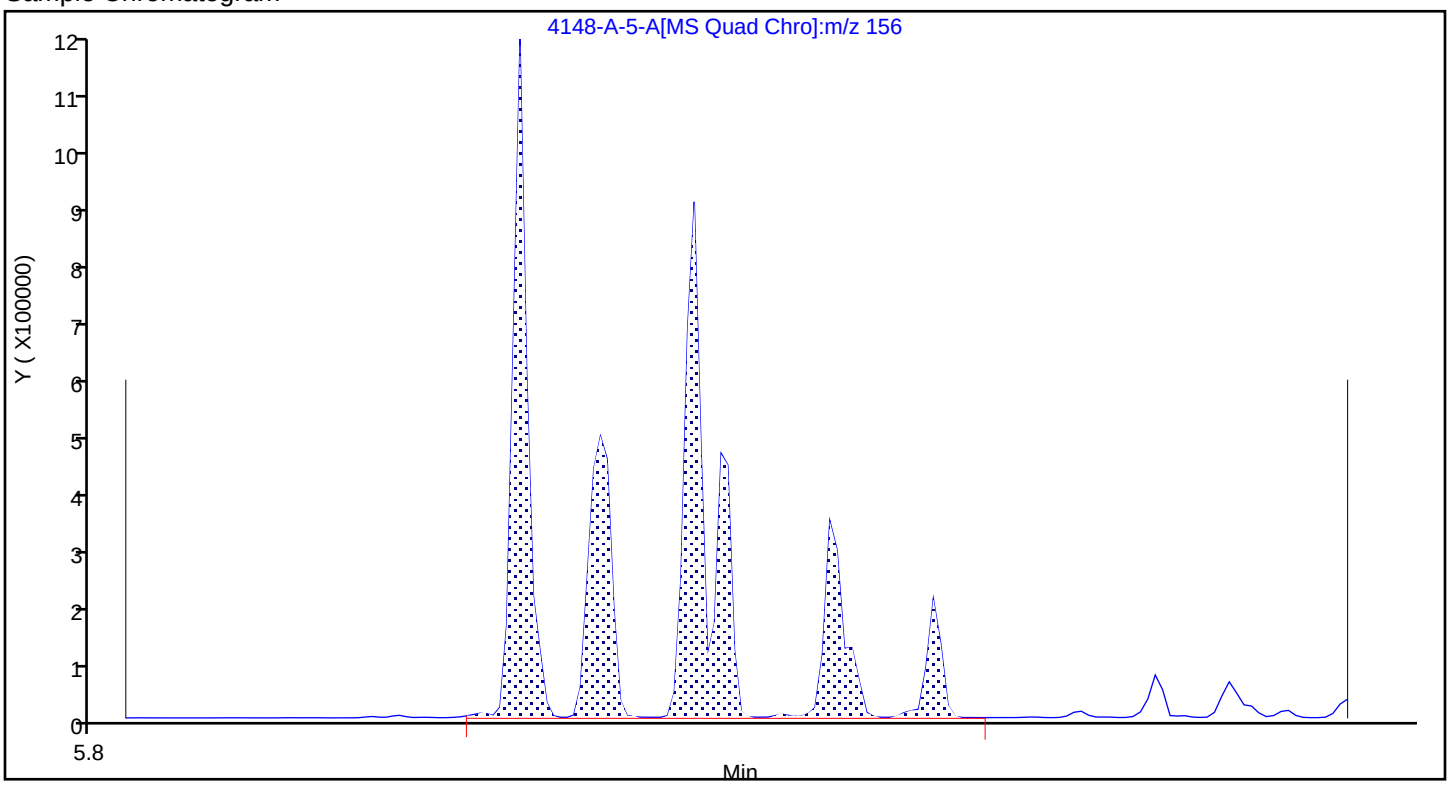
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 85 C2-Naphthalenes, CAS: STL00917

Reference Chromatogram



Sample Chromatogram



Report Date: 06-Dec-2023 16:35:45 Chrom Revision: 2.3 15-Nov-2023 20:54:34

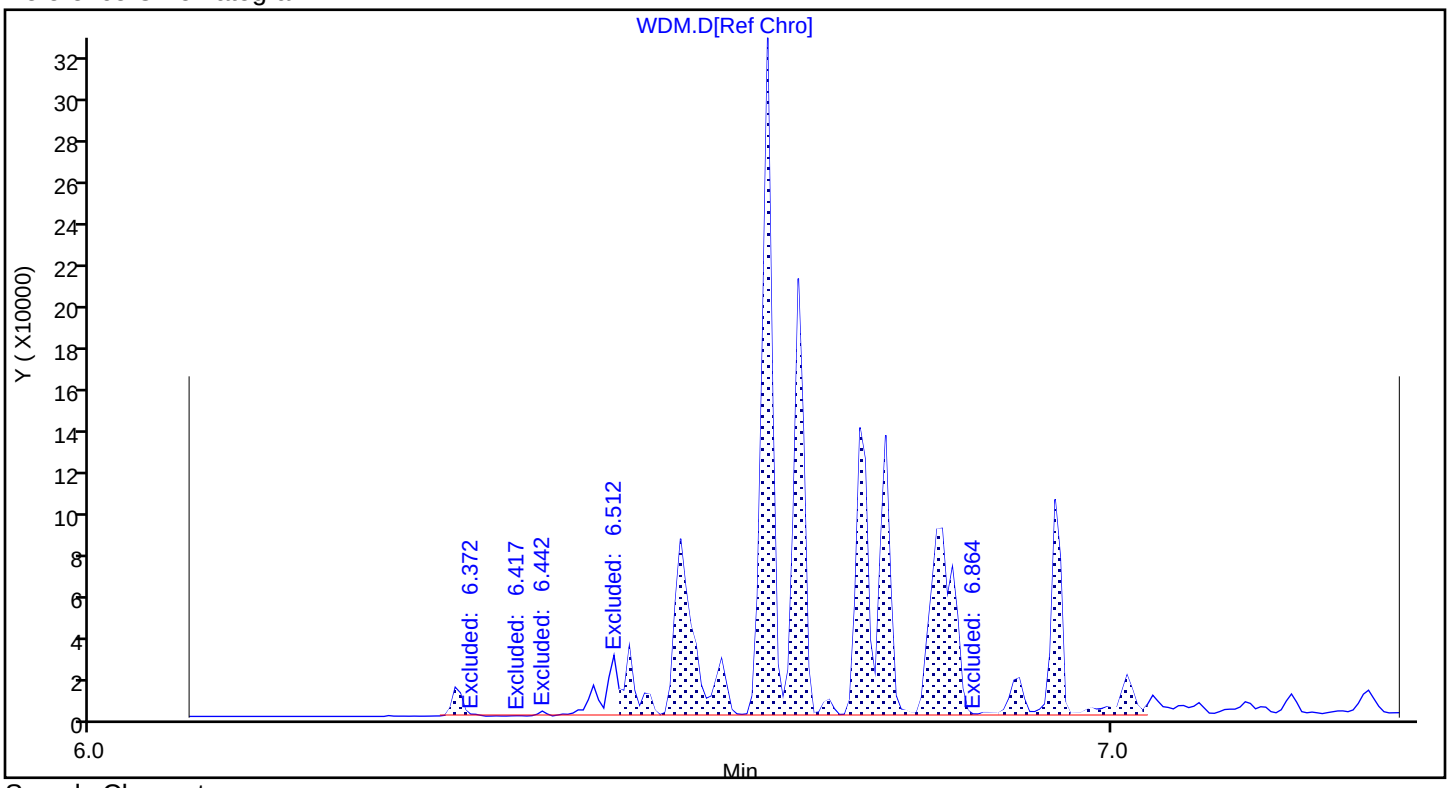
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D

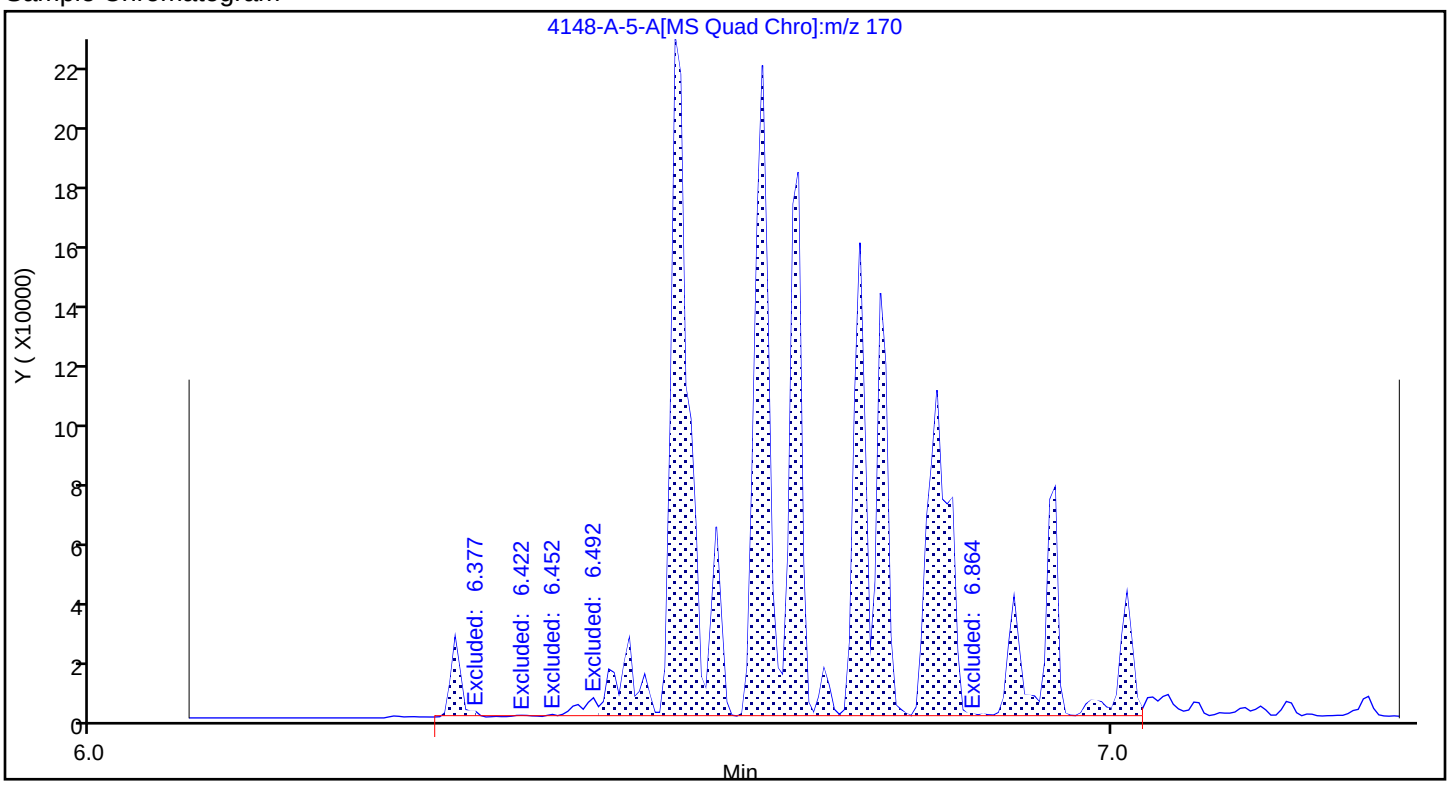
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 87 C3-Naphthalenes, CAS: STL00918

Reference Chromatogram



Sample Chromatogram



Report Date: 06-Dec-2023 16:35:45 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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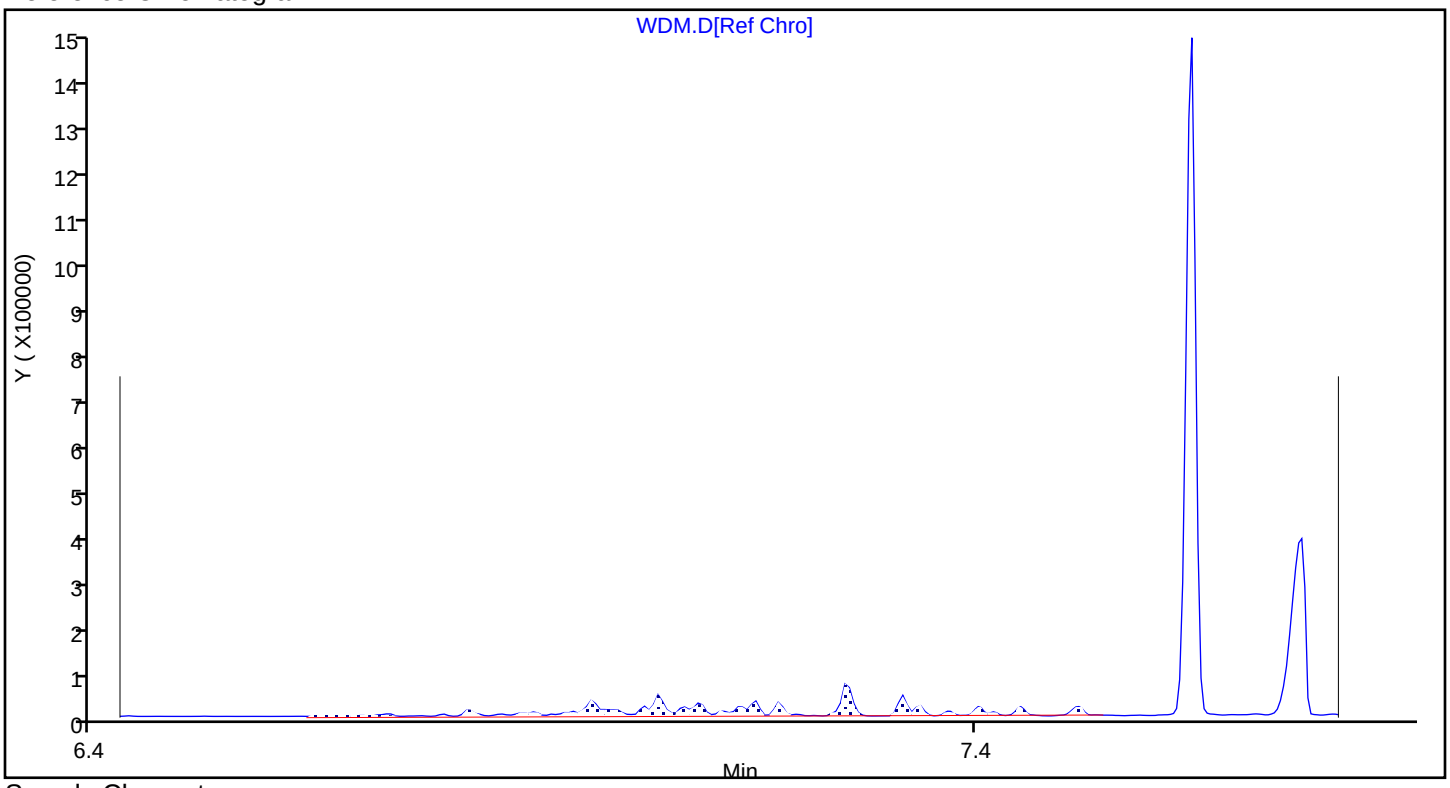
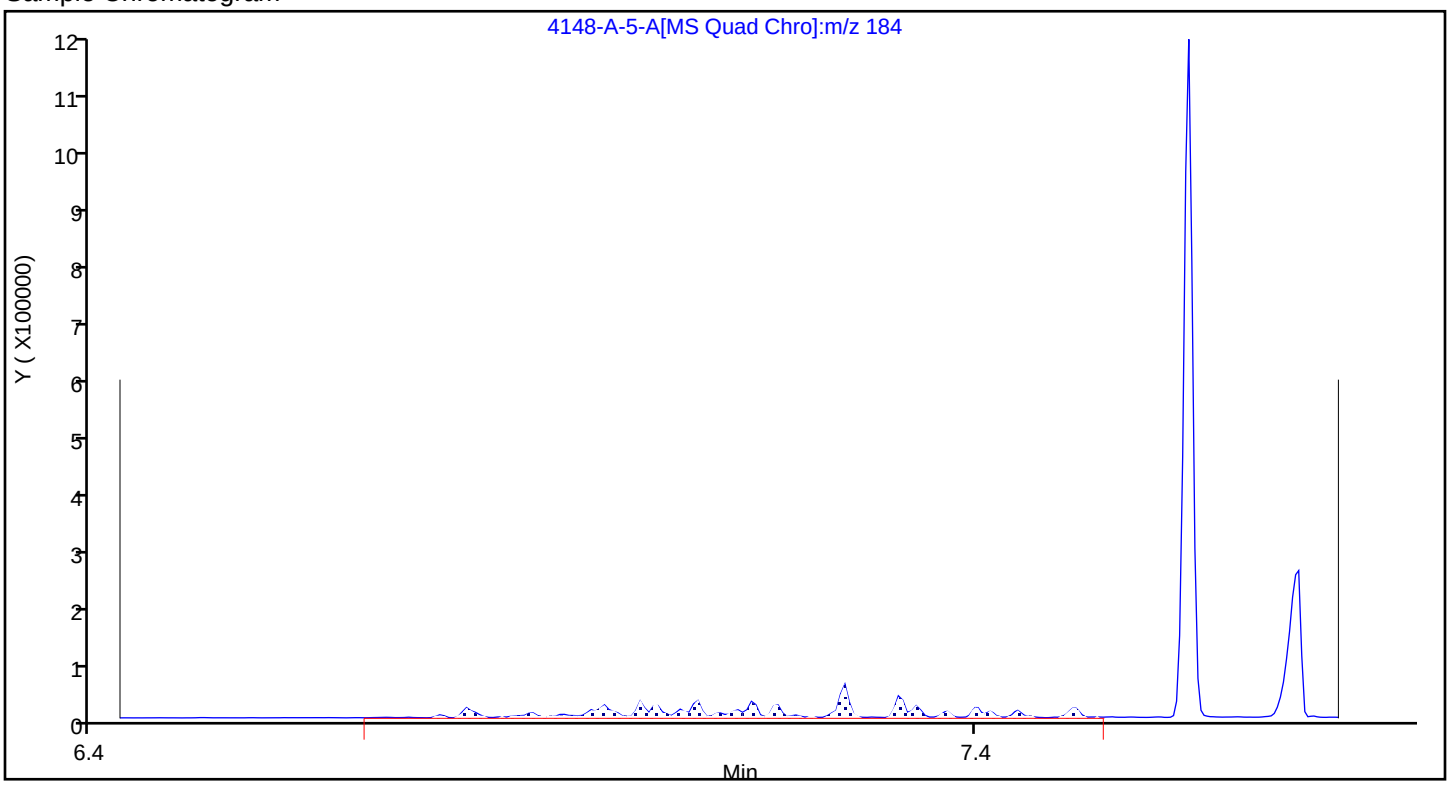
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 88 C4-Naphthalenes, CAS: STL00919

Reference Chromatogram



Sample Chromatogram



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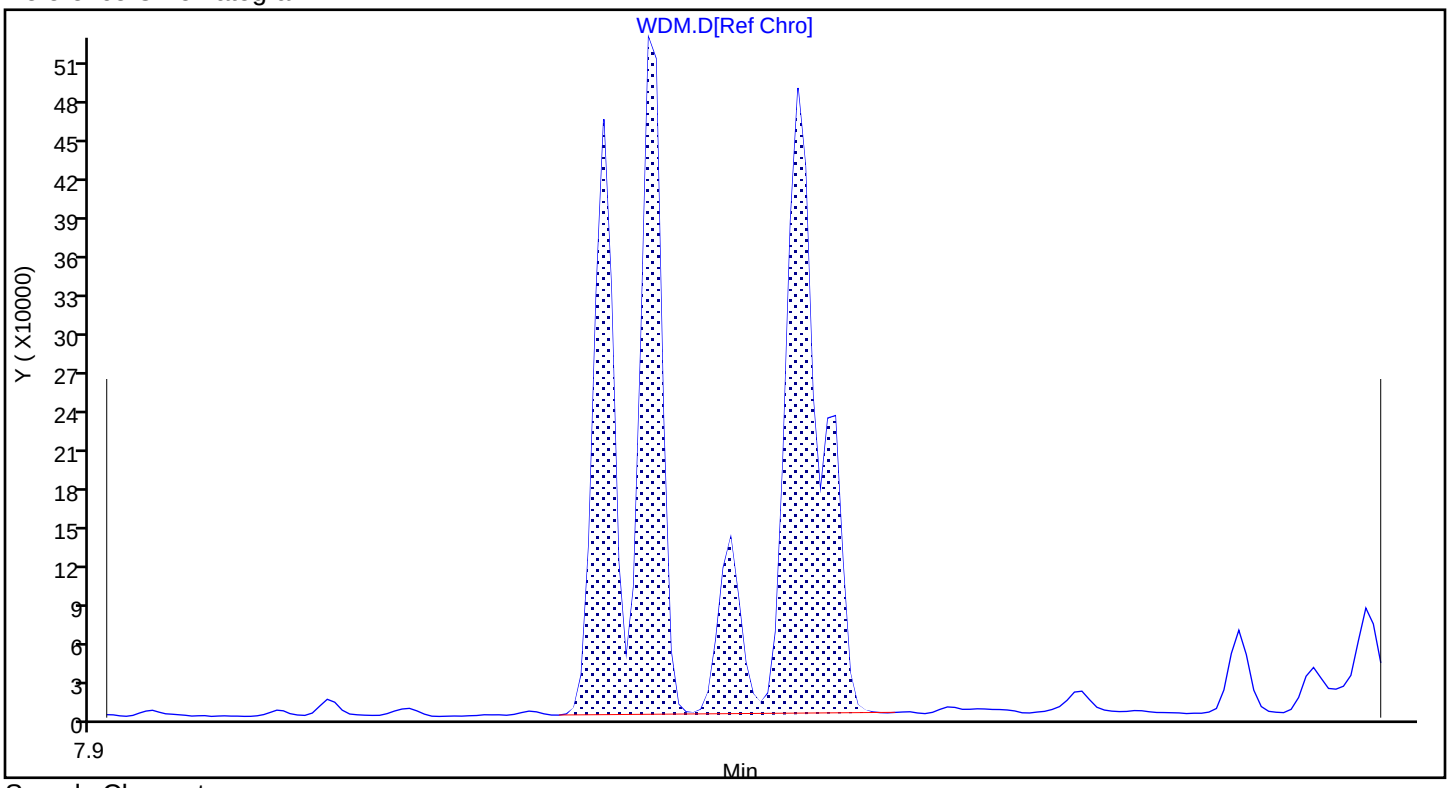
Eurofins Knoxville

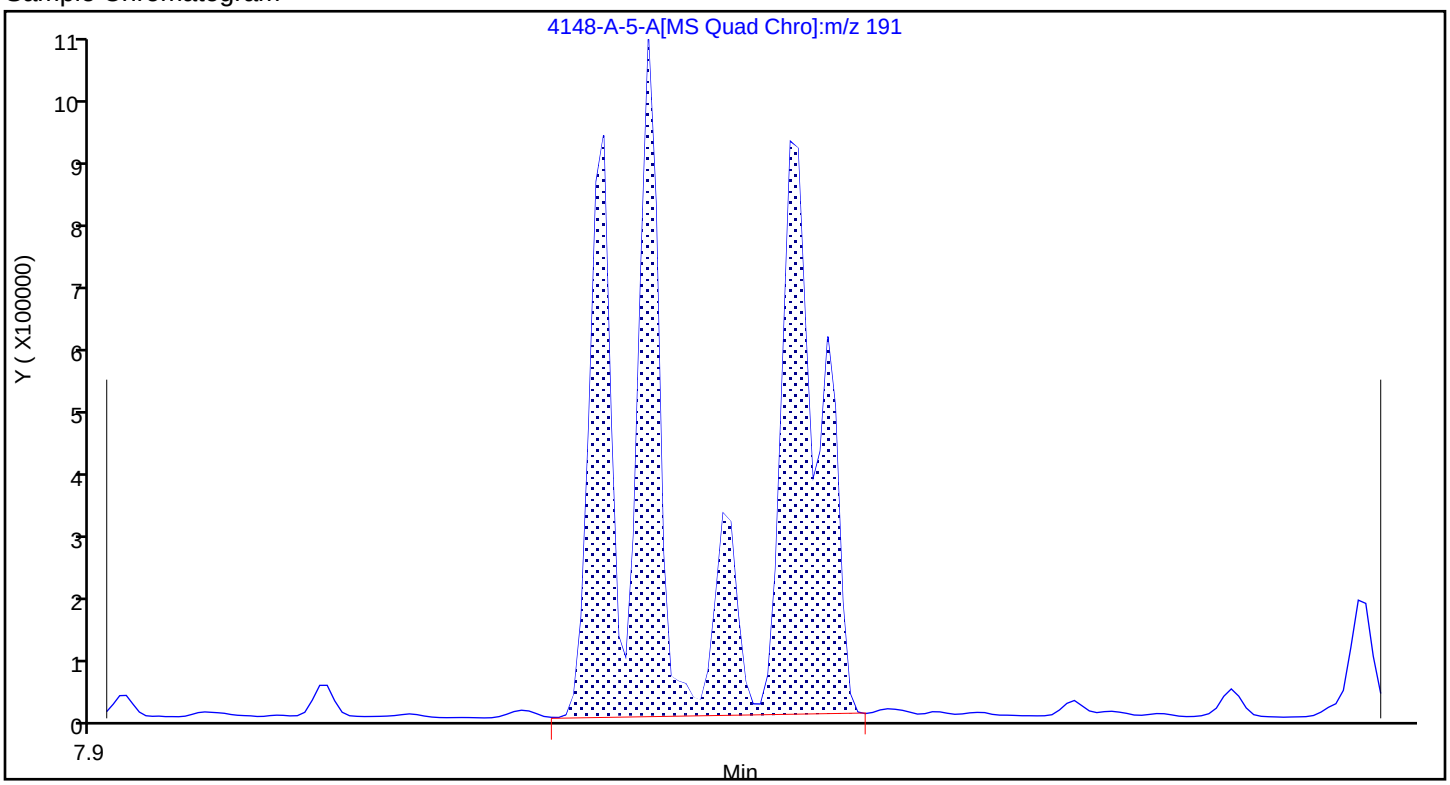
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D				
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 96 C1-Phenanthrenes/Anthracenes, CAS: STL00901

Reference Chromatogram



Sample Chromatogram



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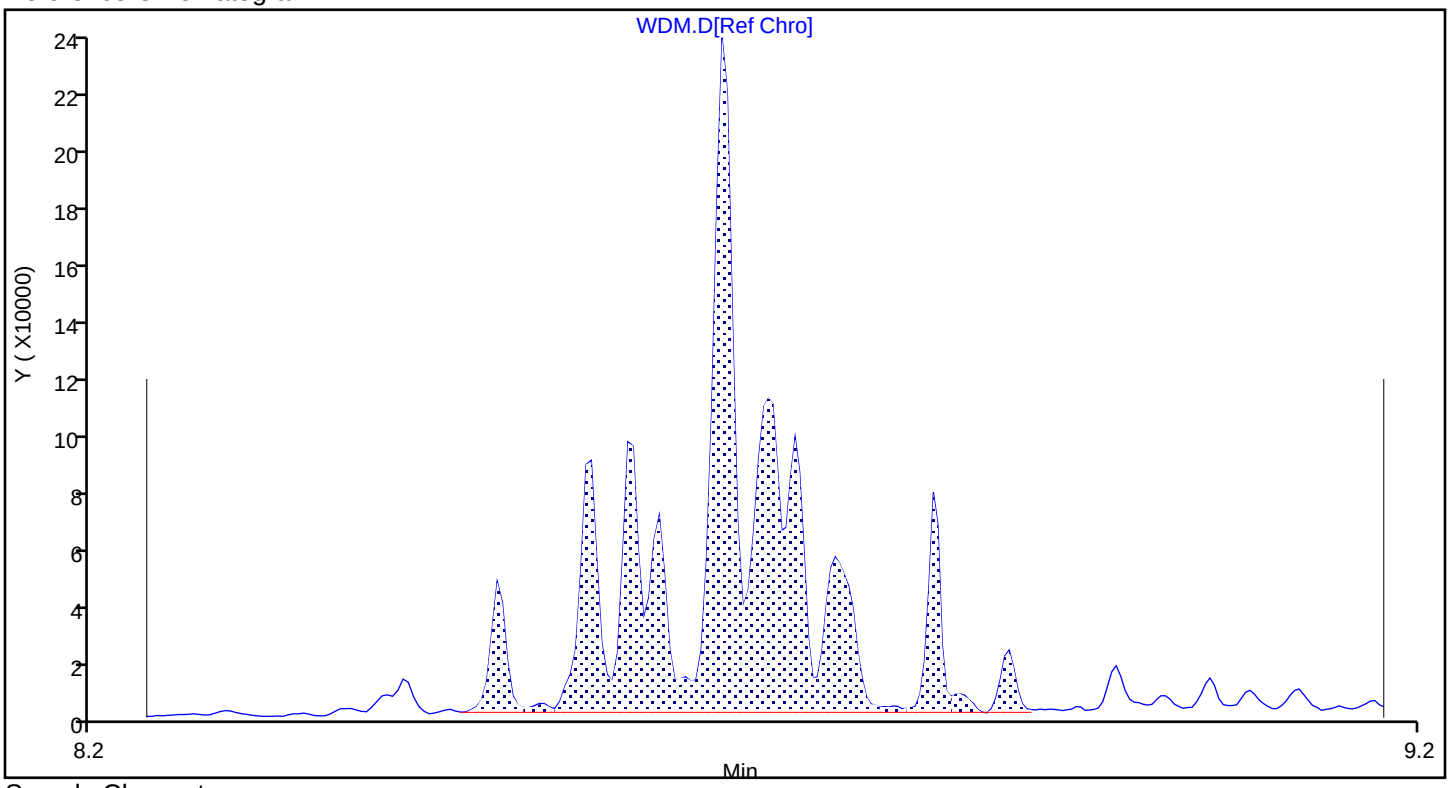
Eurofins Knoxville

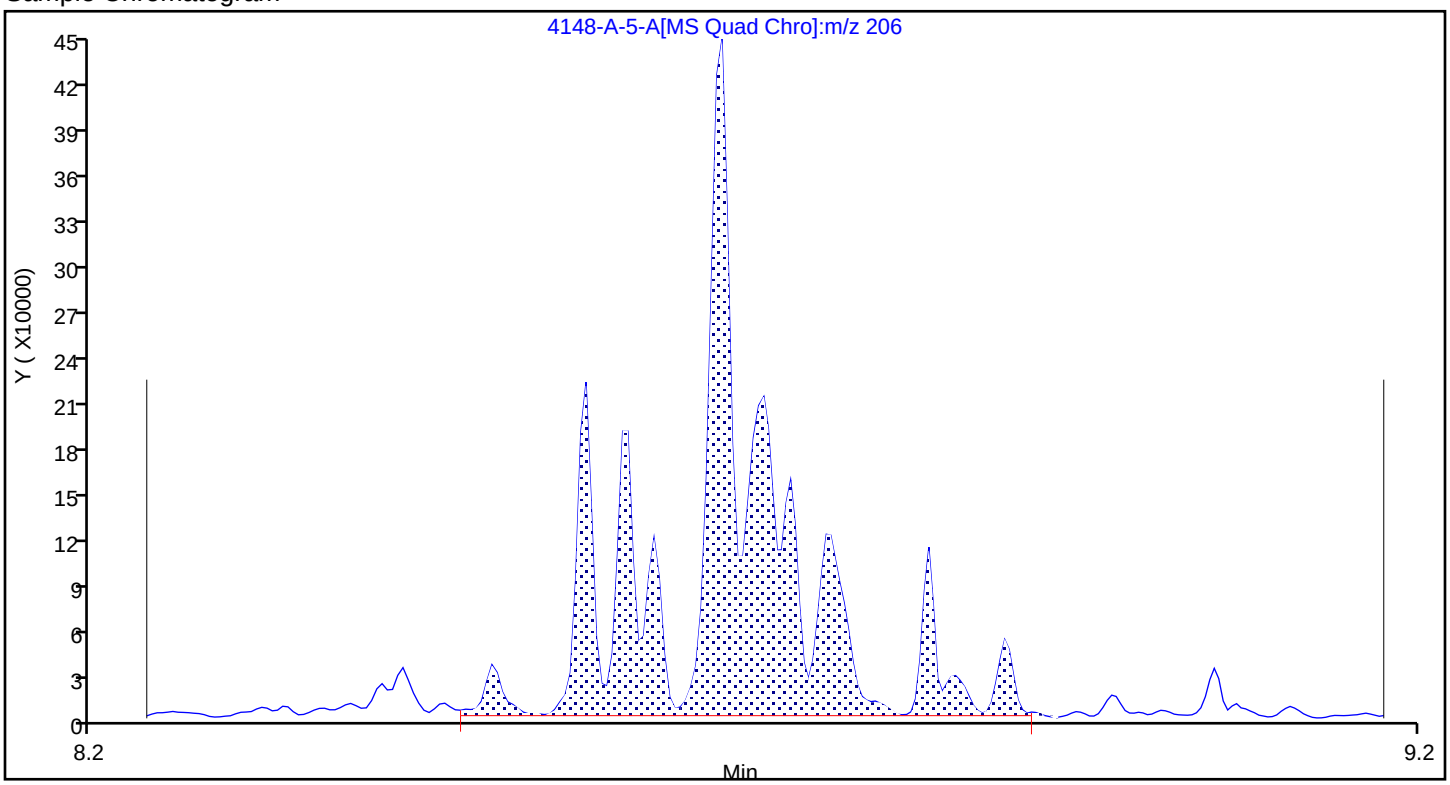
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D				
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 97 C2-Phenanthrenes/Anthracenes, CAS: STL00902

Reference Chromatogram



Sample Chromatogram



Report Date: 06-Dec-2023 16:35:45 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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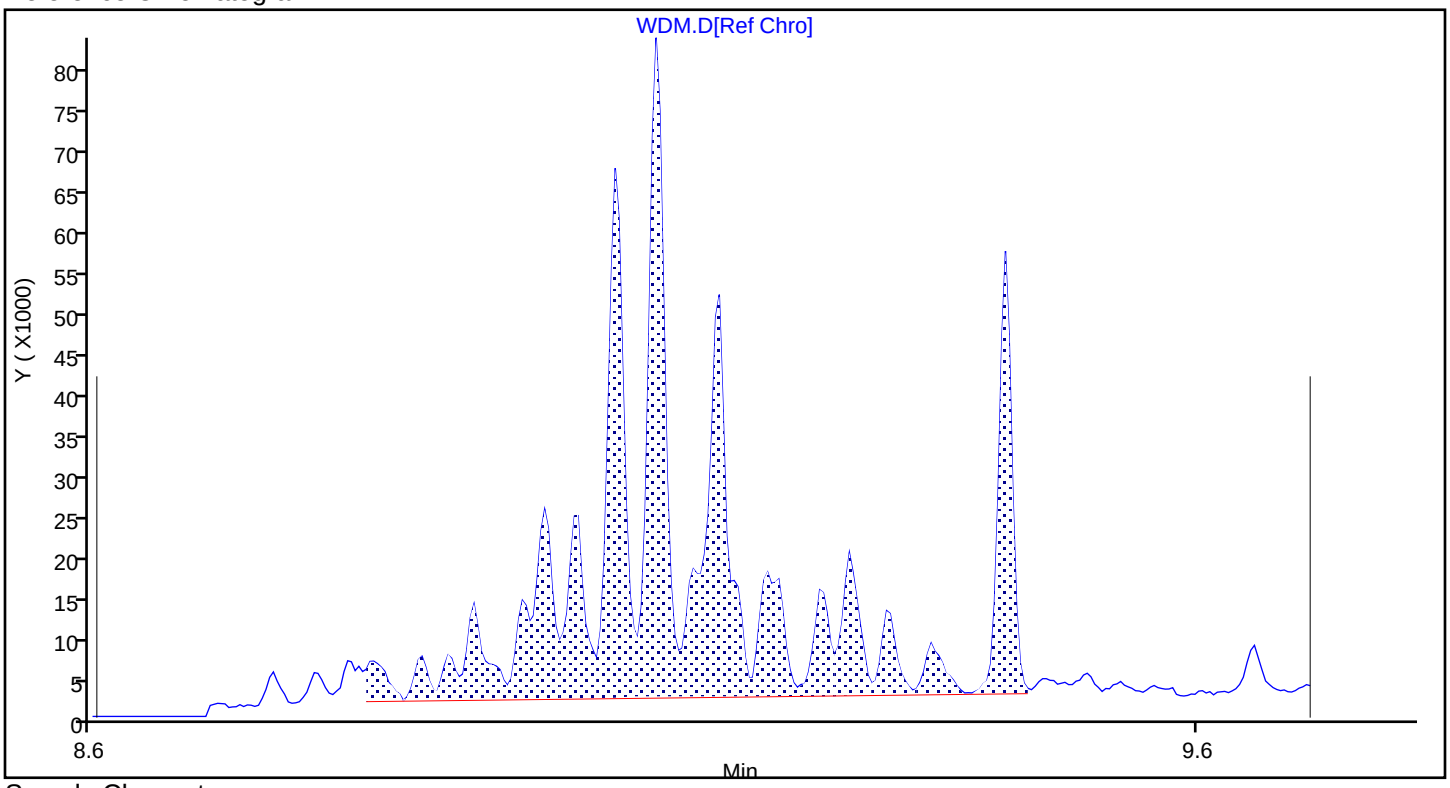
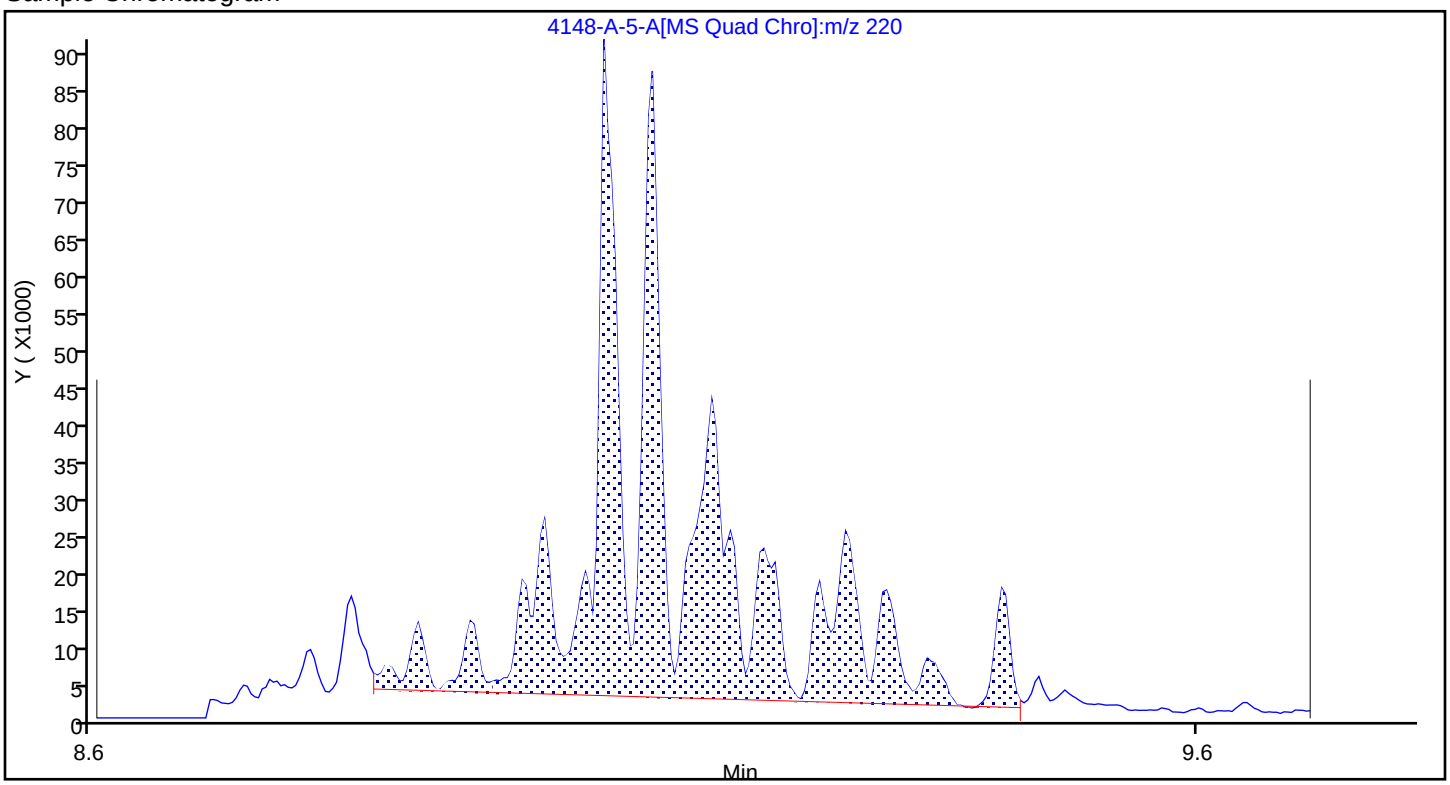
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 98 C3-Phenanthrenes/Anthracenes, CAS: STL00903

Reference Chromatogram



Sample Chromatogram



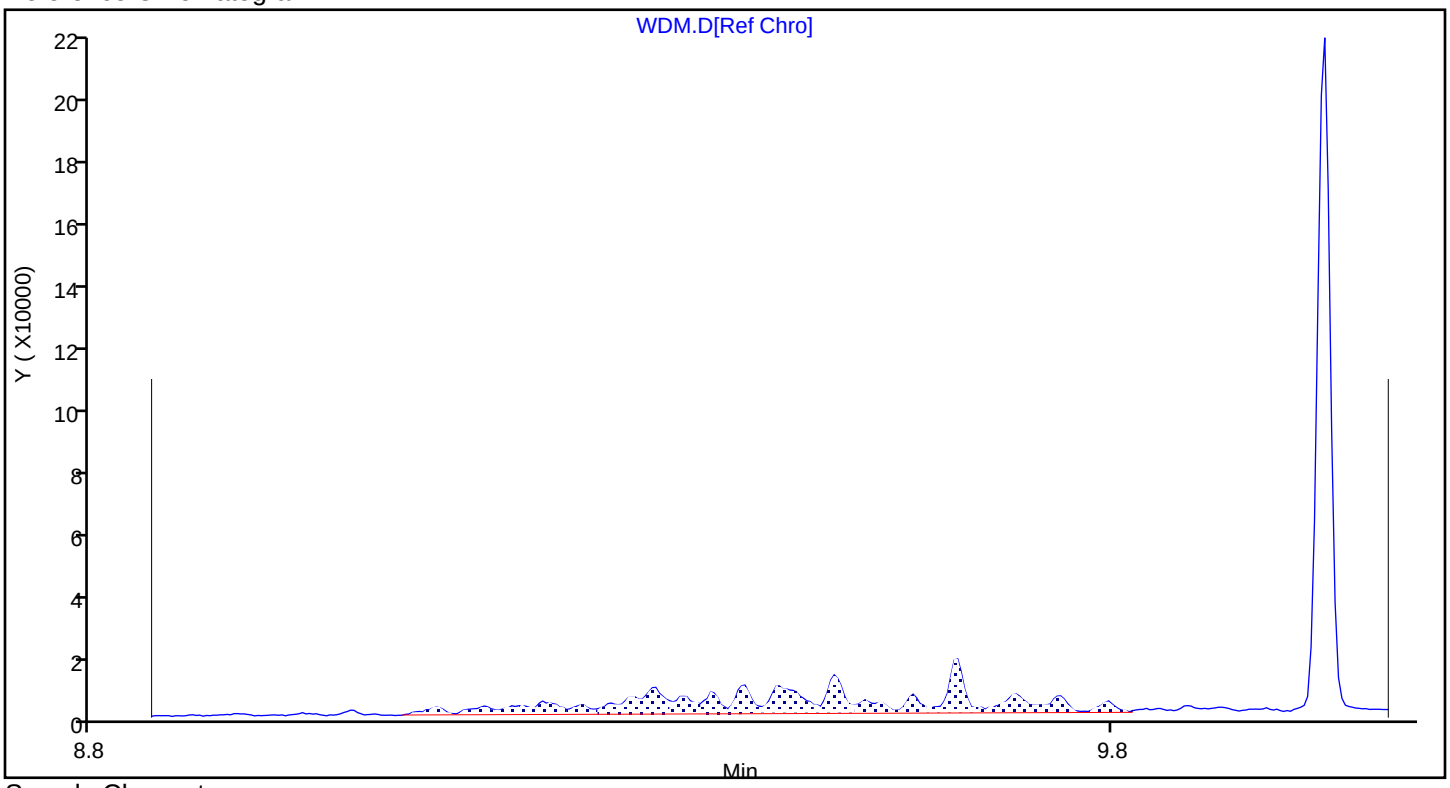
Report Date: 06-Dec-2023 16:35:45 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

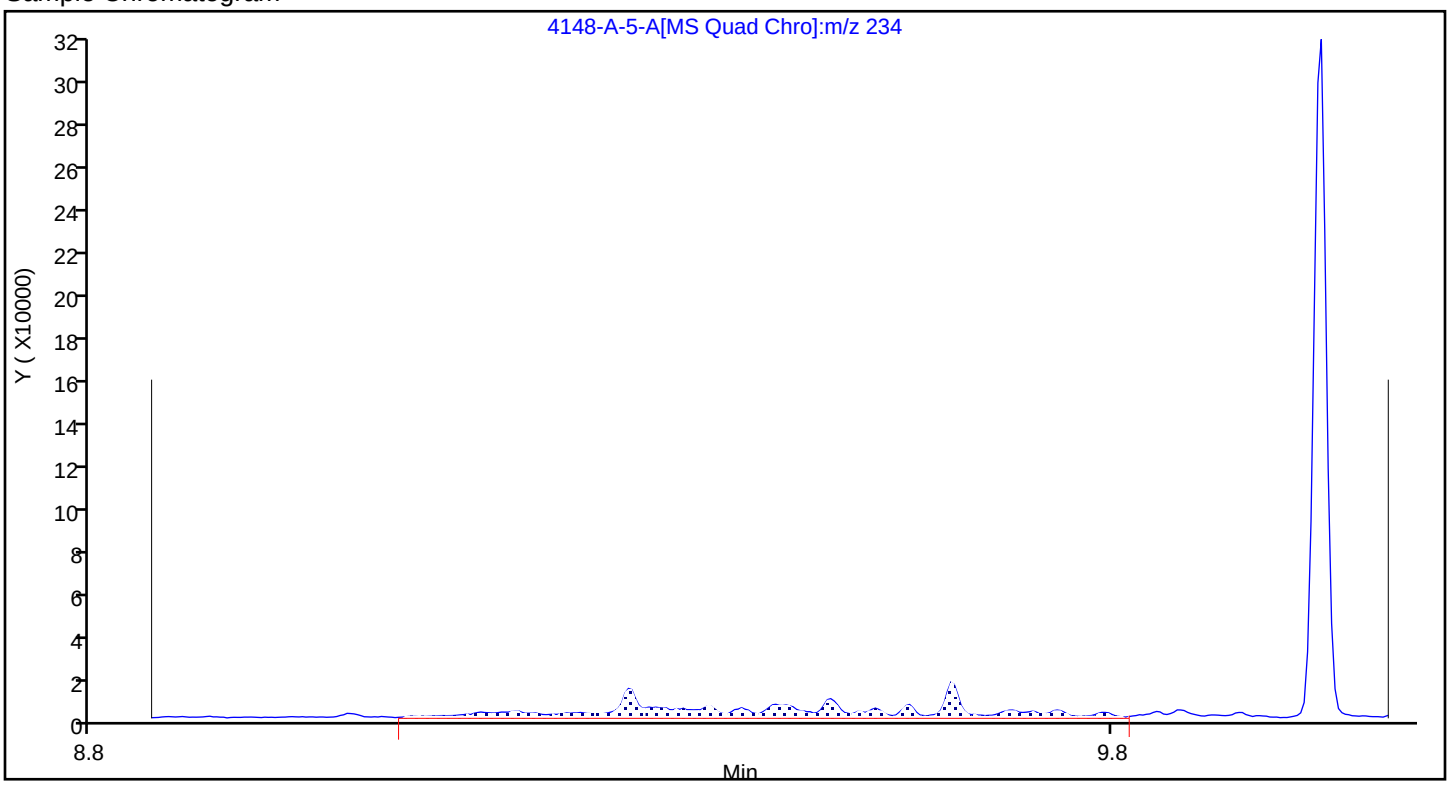
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D				
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 99 C4-Phenanthrenes/Anthracenes, CAS: STL00904

Reference Chromatogram



Sample Chromatogram



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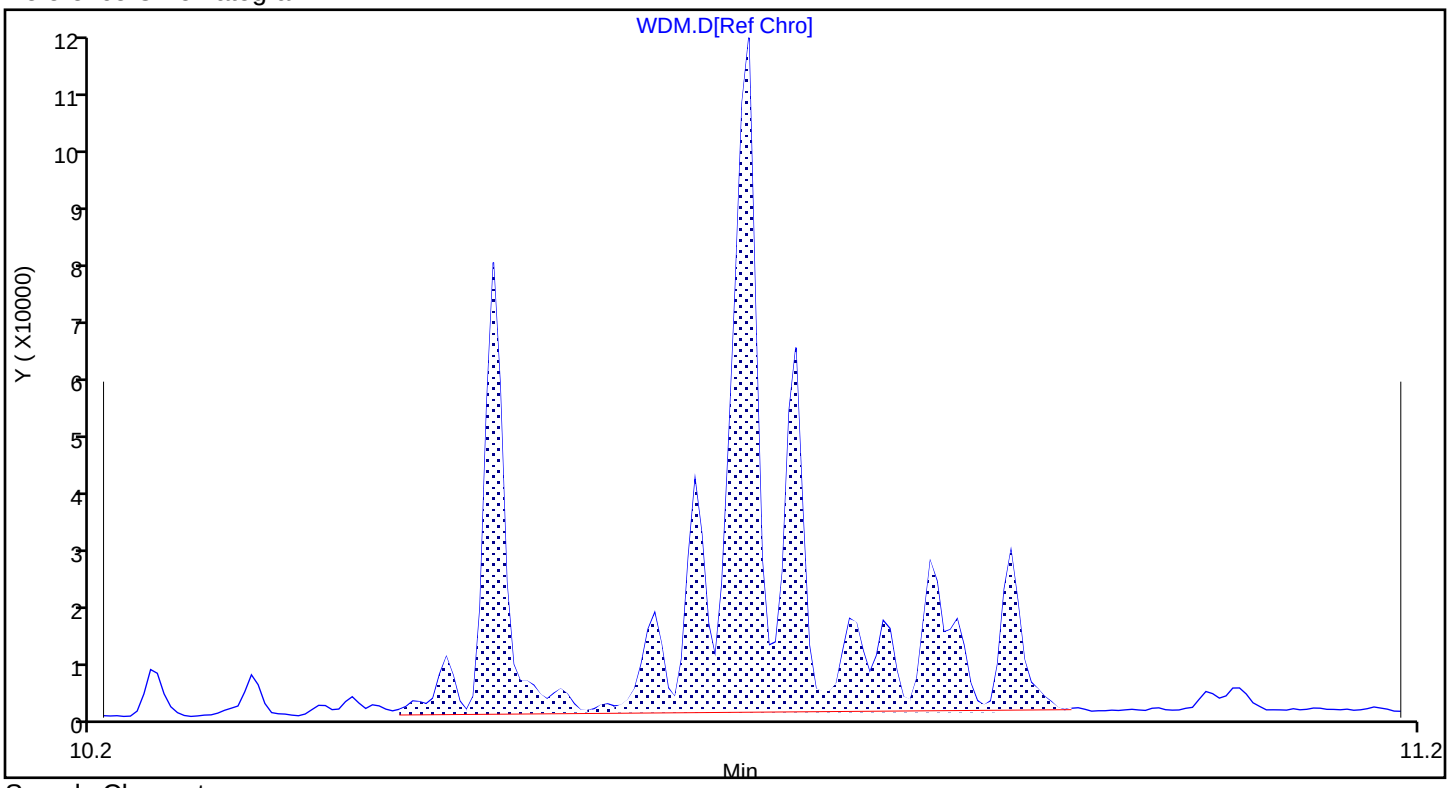
Eurofins Knoxville

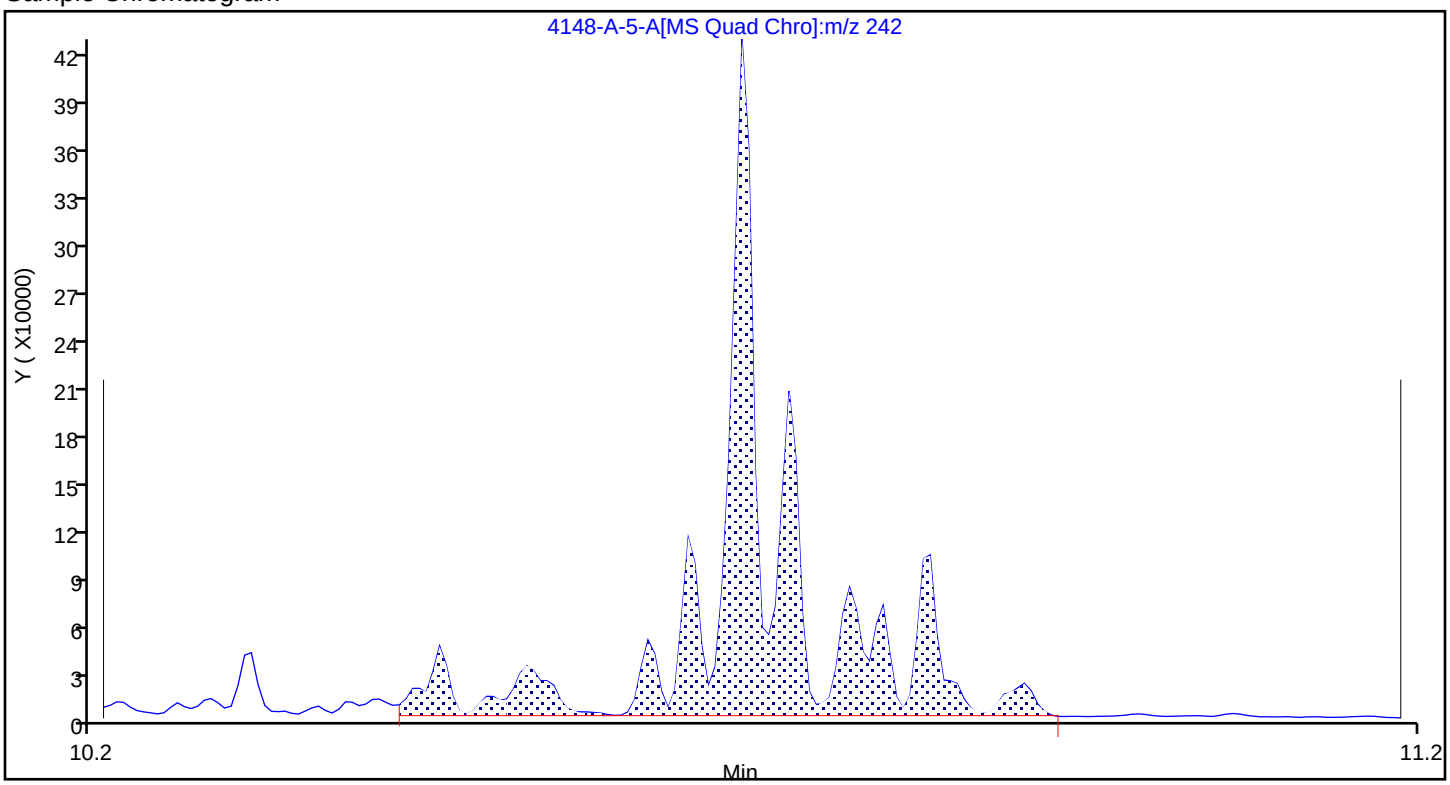
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D				
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 101 C1-Chrysenes/Benz(a)anthracenes, CAS: STL02218

Reference Chromatogram



Sample Chromatogram



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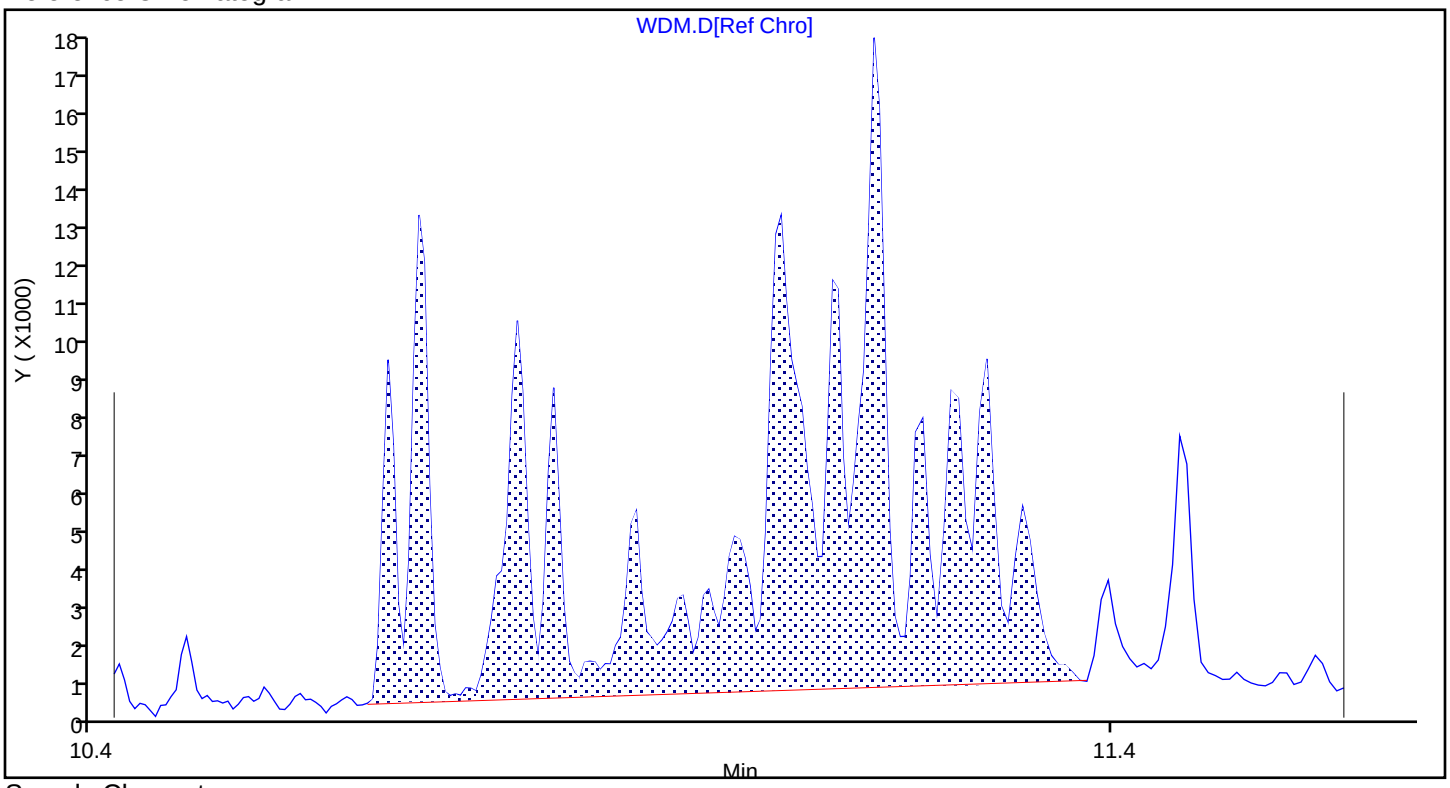
Eurofins Knoxville

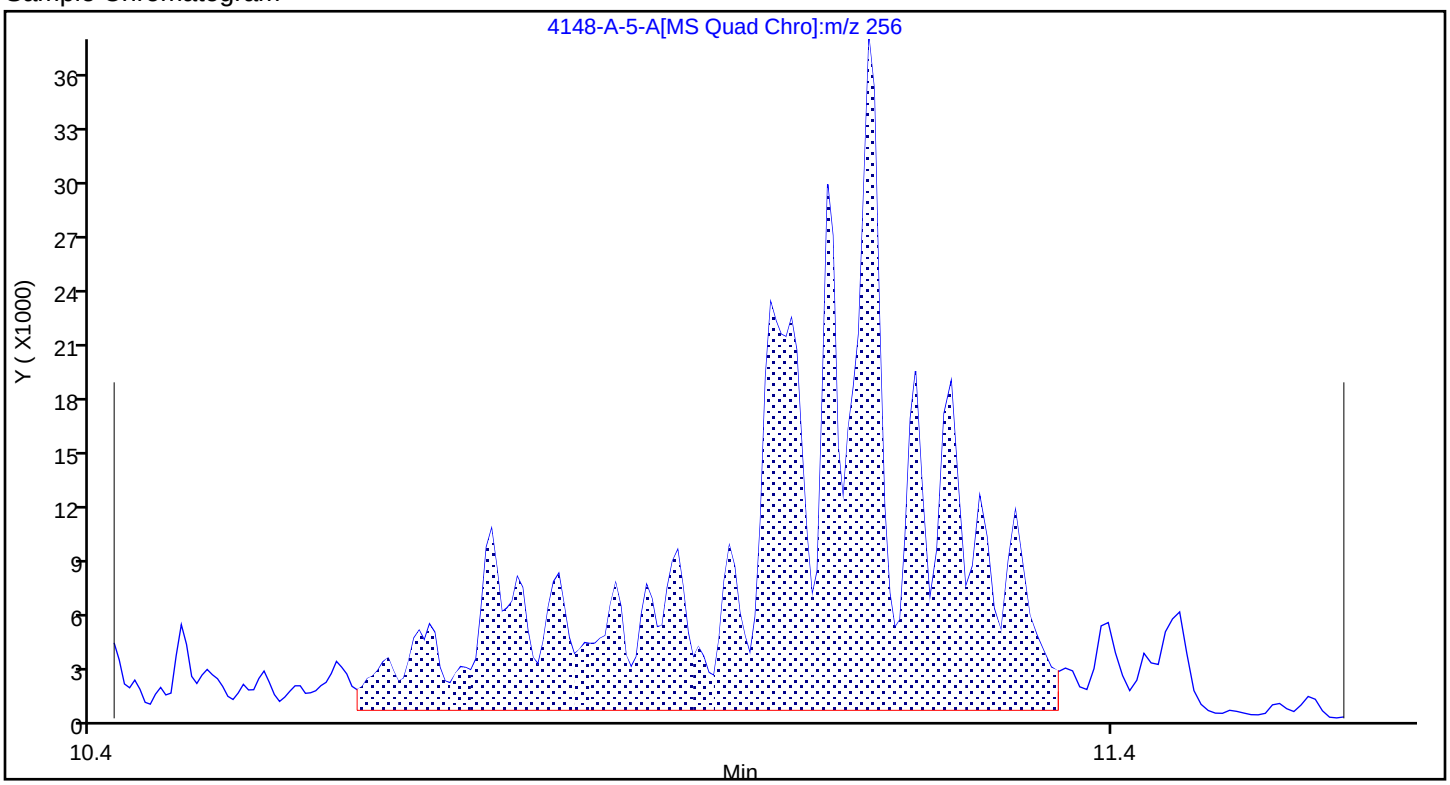
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D				
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 102 C2-Chrysenes/Benz(a)anthracenes, CAS: STL02219

Reference Chromatogram



Sample Chromatogram



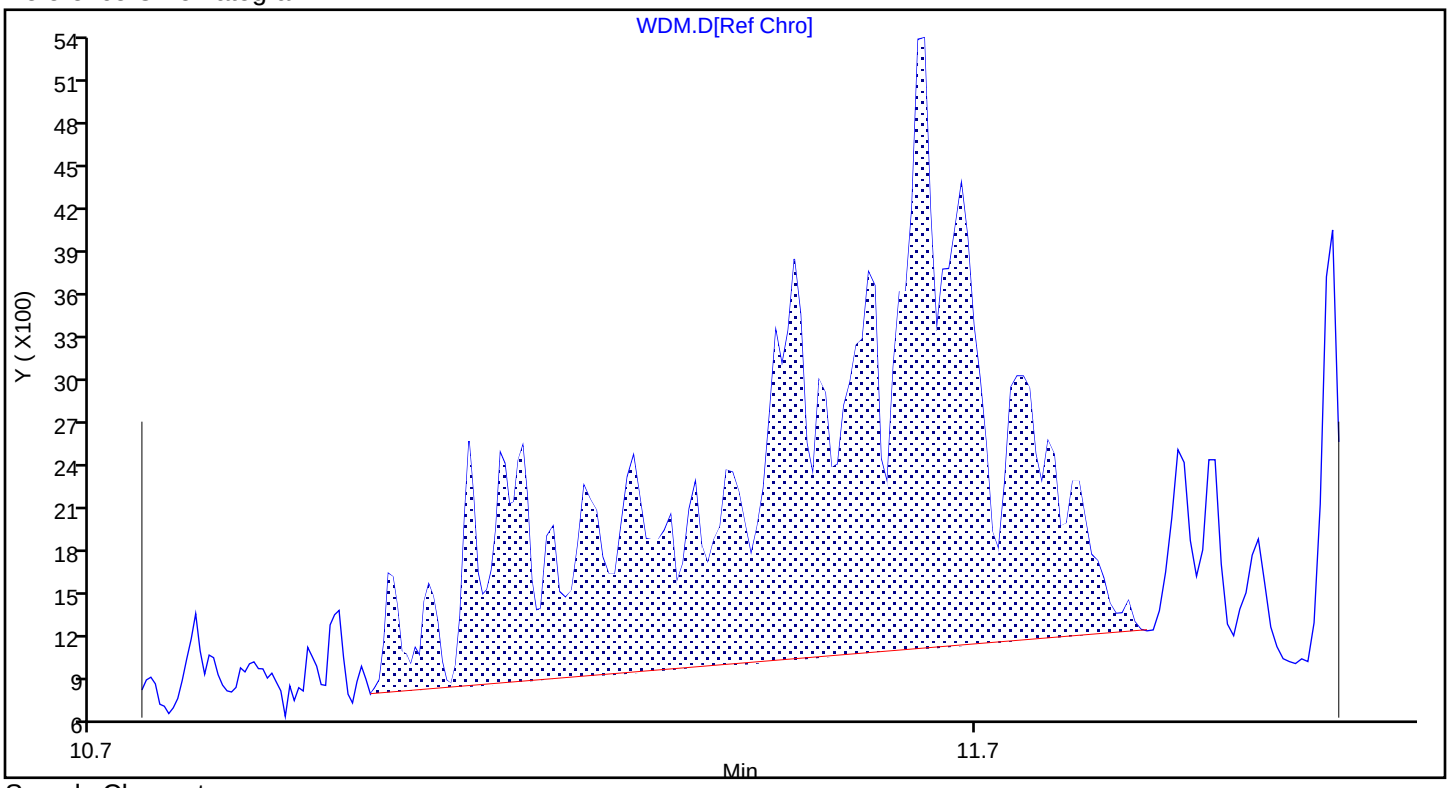
Report Date: 06-Dec-2023 16:35:45 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

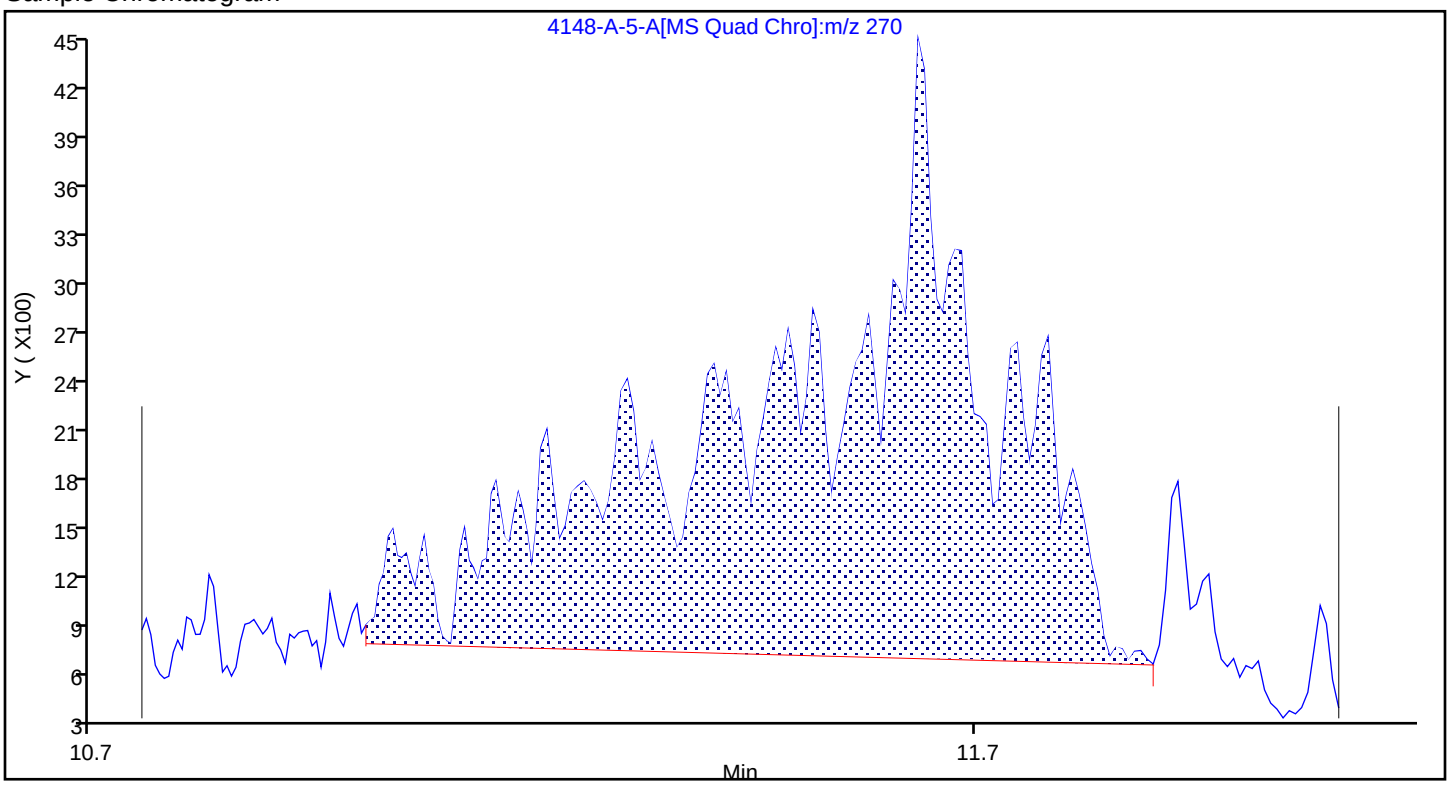
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D				
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 103 C3-Chrysenes/Benz(a)anthracenes, CAS: STL02220

Reference Chromatogram



Sample Chromatogram



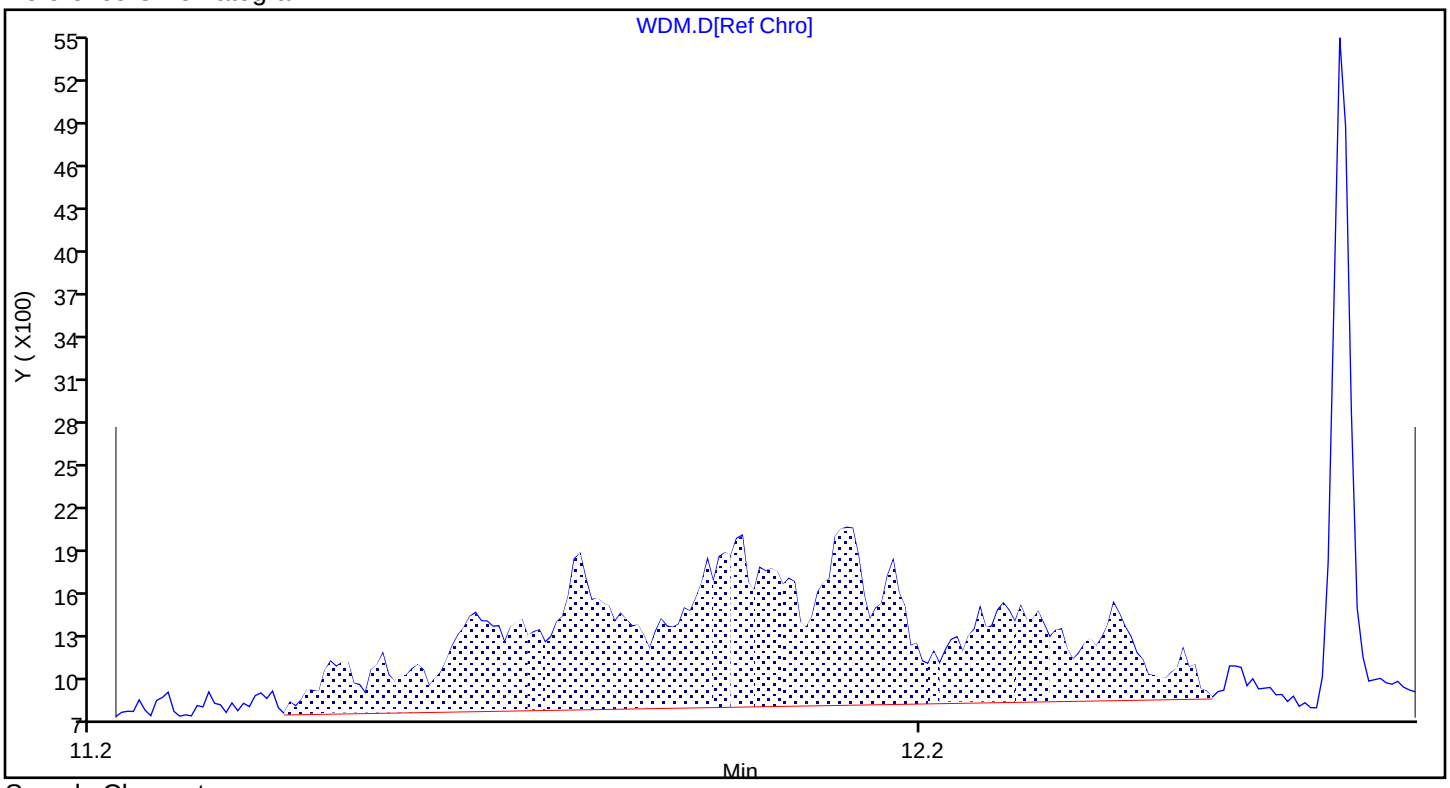
Report Date: 06-Dec-2023 16:35:45 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

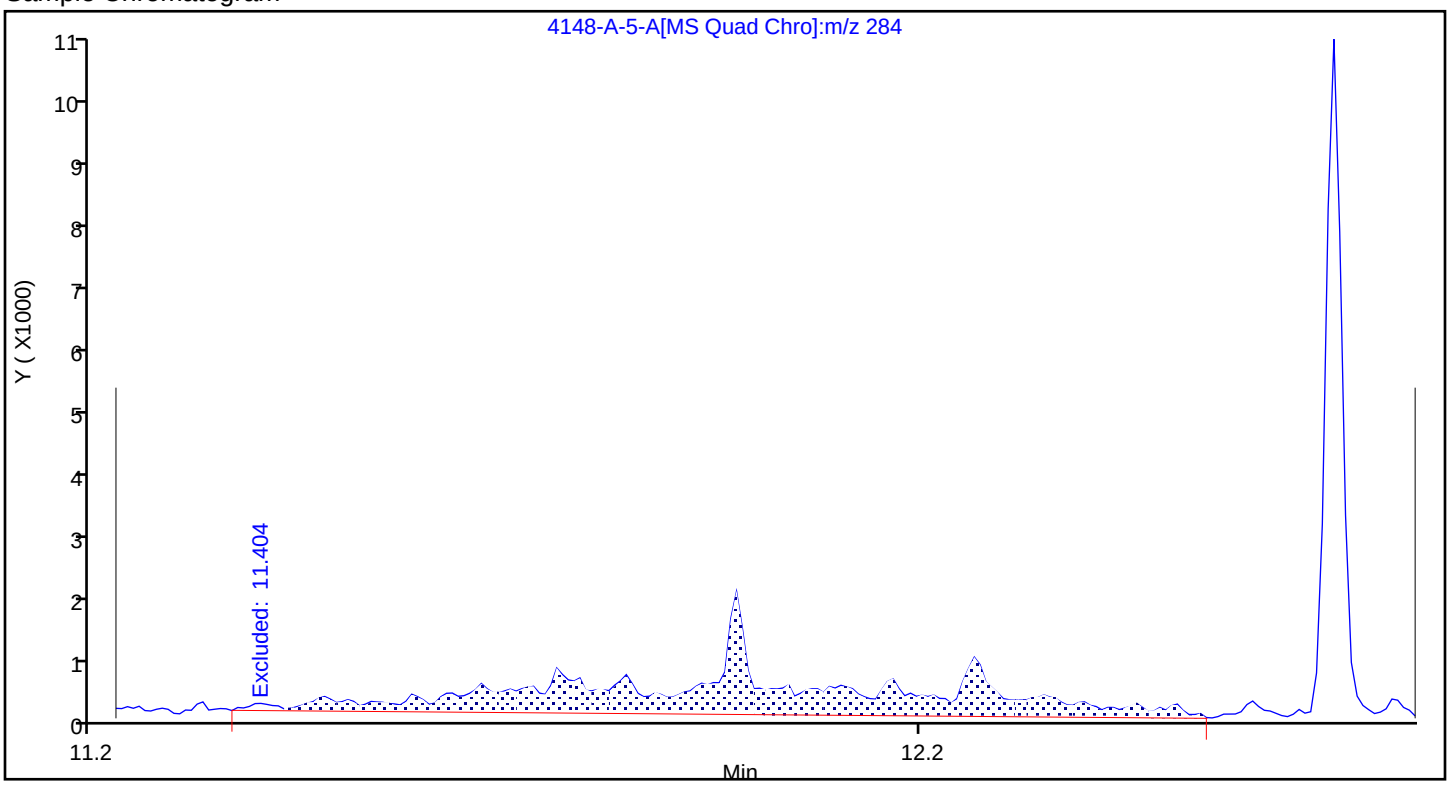
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D				
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 104 C4-Chrysenes/Benz(a)anthracenes, CAS: STL02221

Reference Chromatogram



Sample Chromatogram



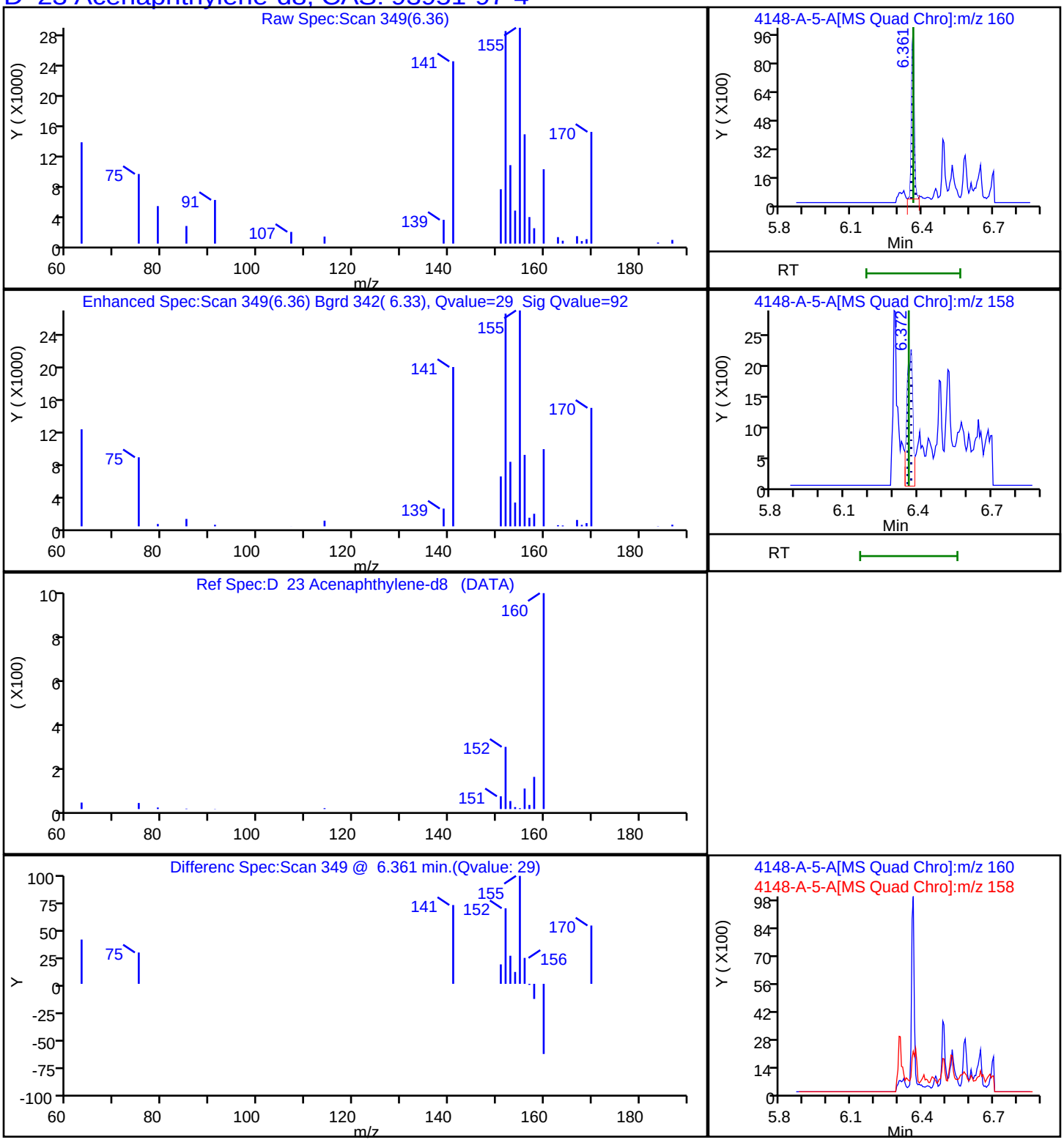
Report Date: 06-Dec-2023 16:35:44 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D

Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D_23 Acenaphthylene-d8, CAS: 93951-97-4



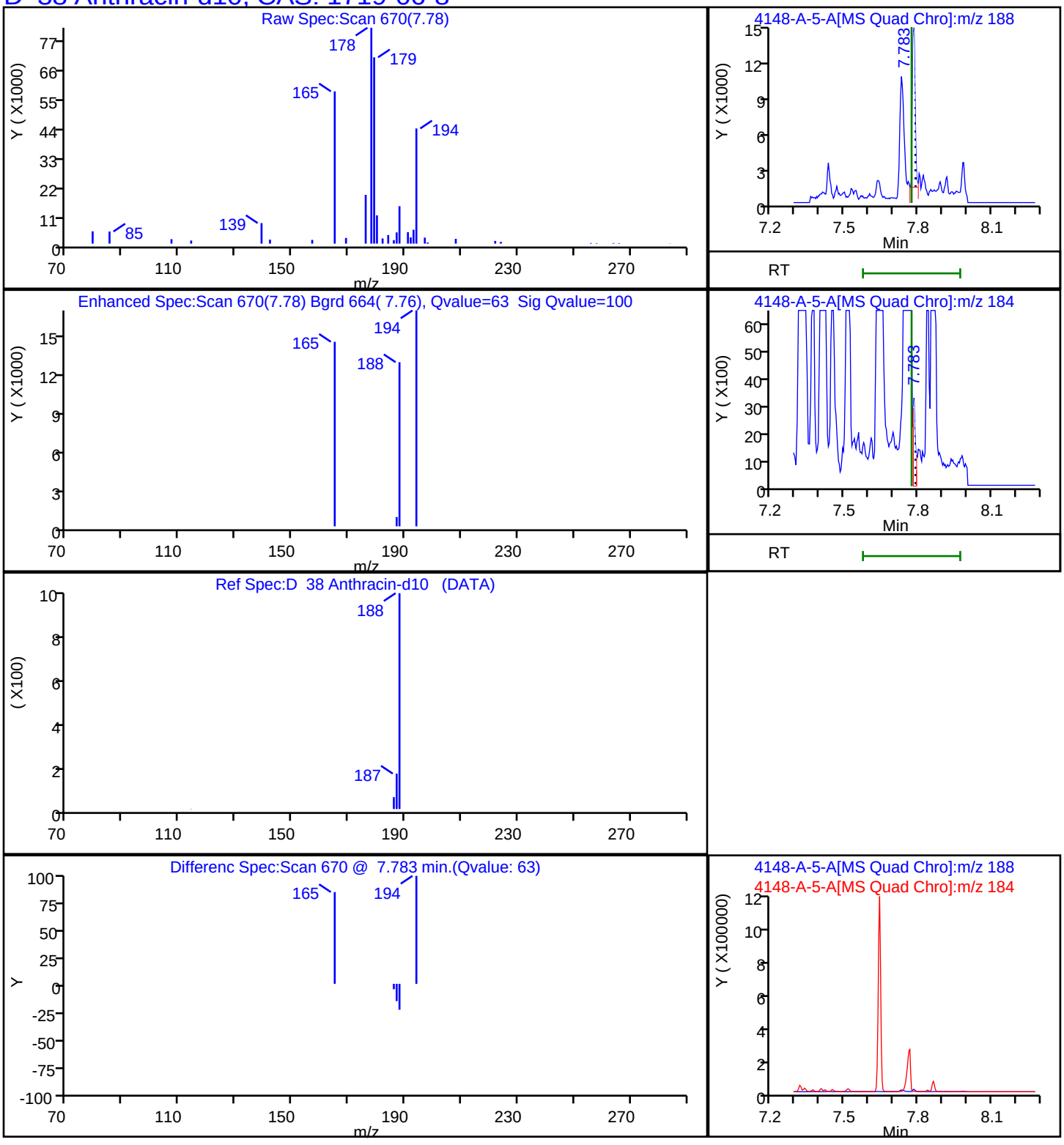
Report Date: 06-Dec-2023 16:35:44 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D

Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 38 Anthracin-d10, CAS: 1719-06-8



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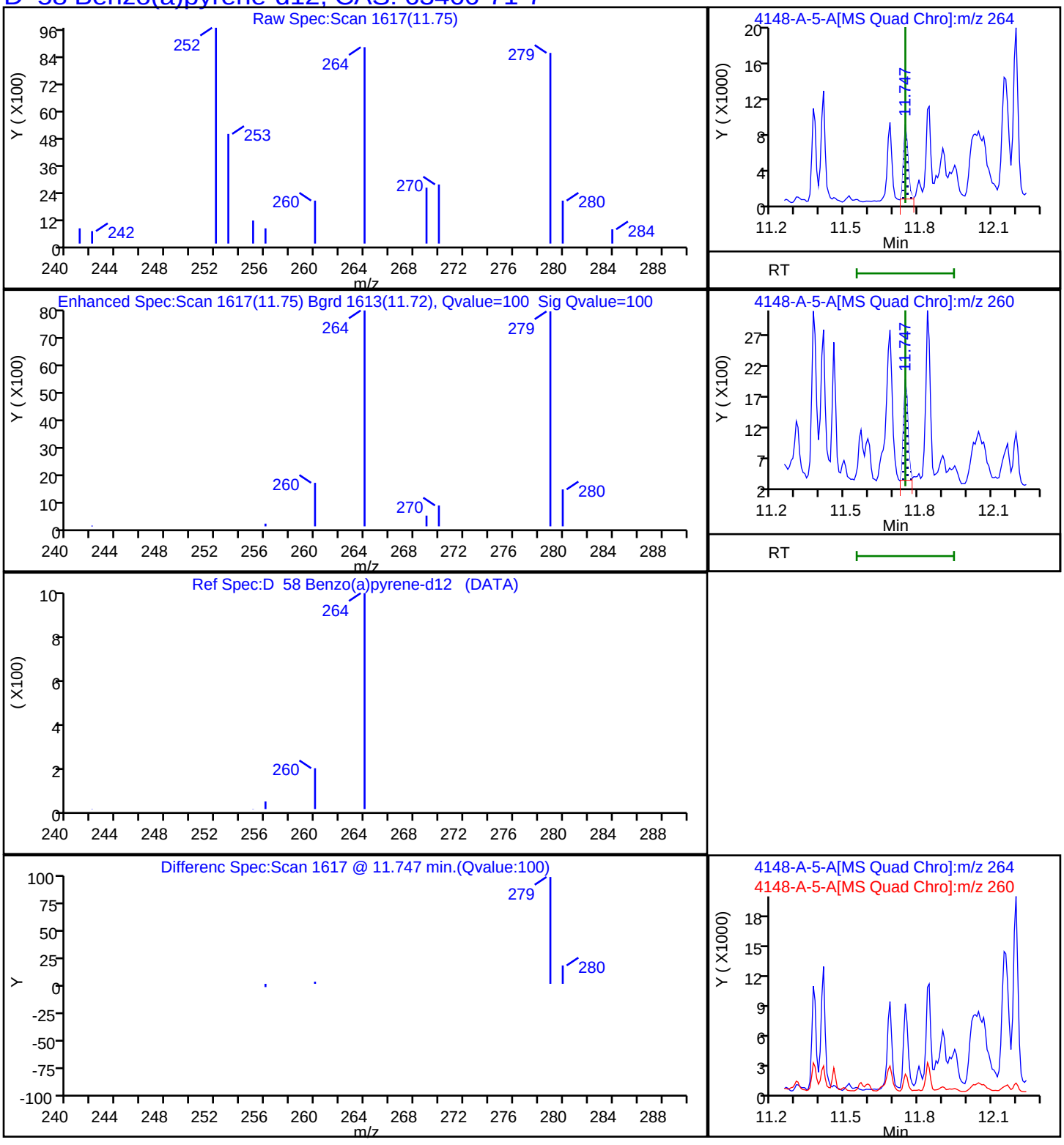
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D

Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 58 Benzo(a)pyrene-d12, CAS: 63466-71-7



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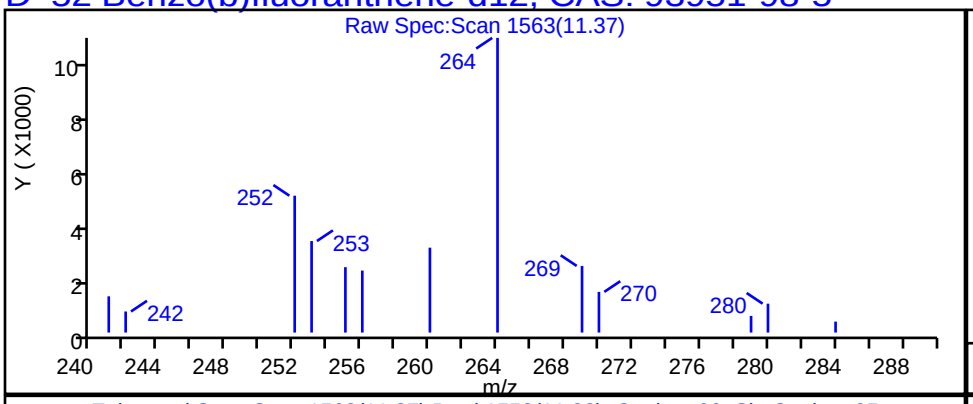
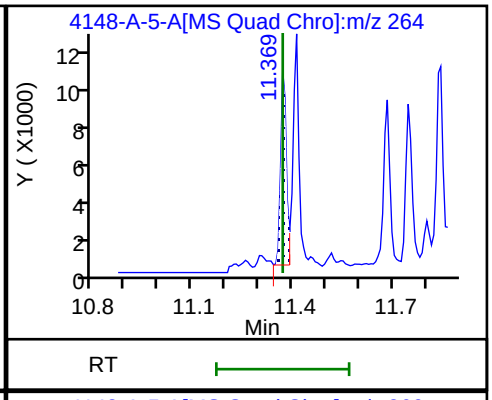
Eurofins Knoxville

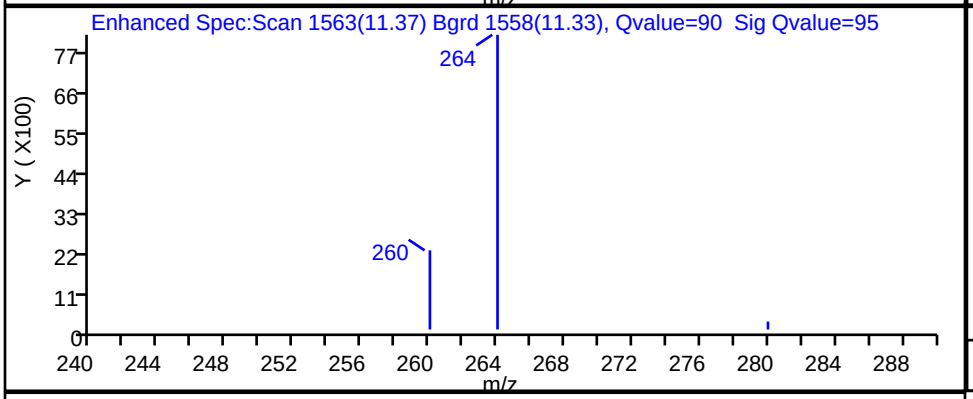
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D

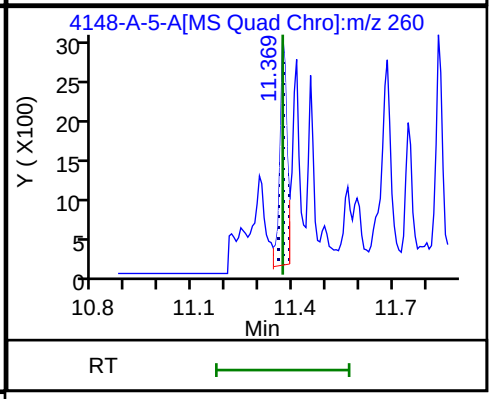
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

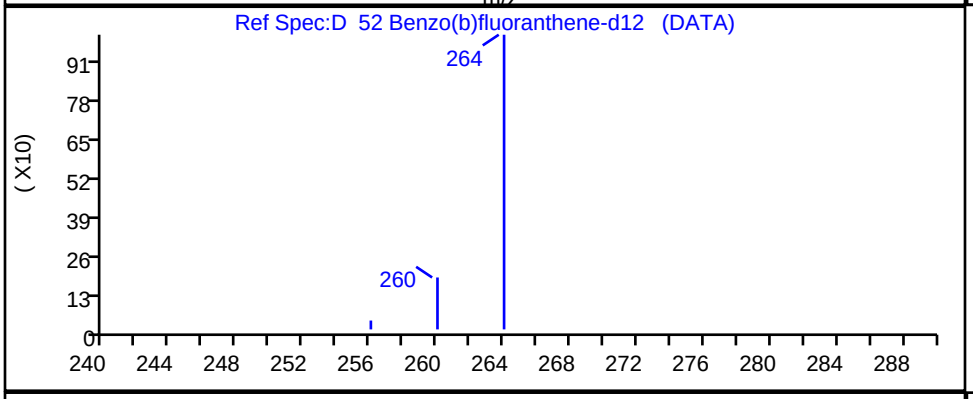
D 52 Benzo(b)fluoranthene-d12, CAS: 93951-98-5

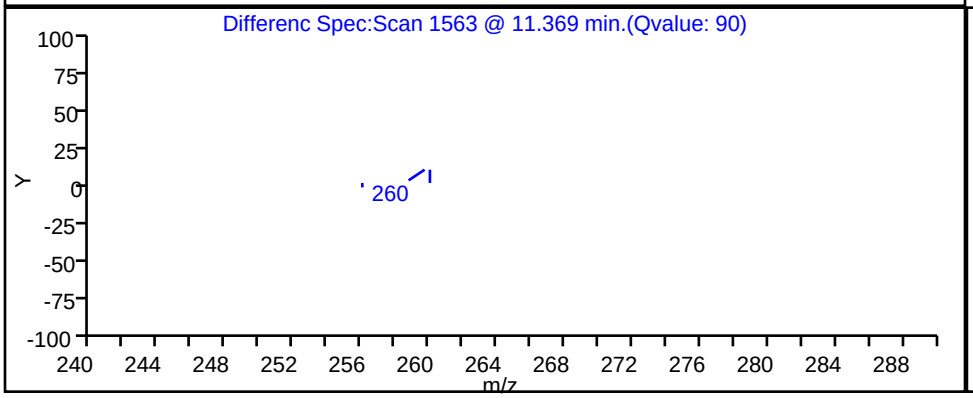


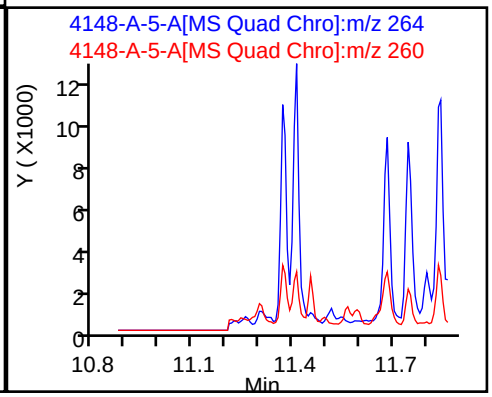












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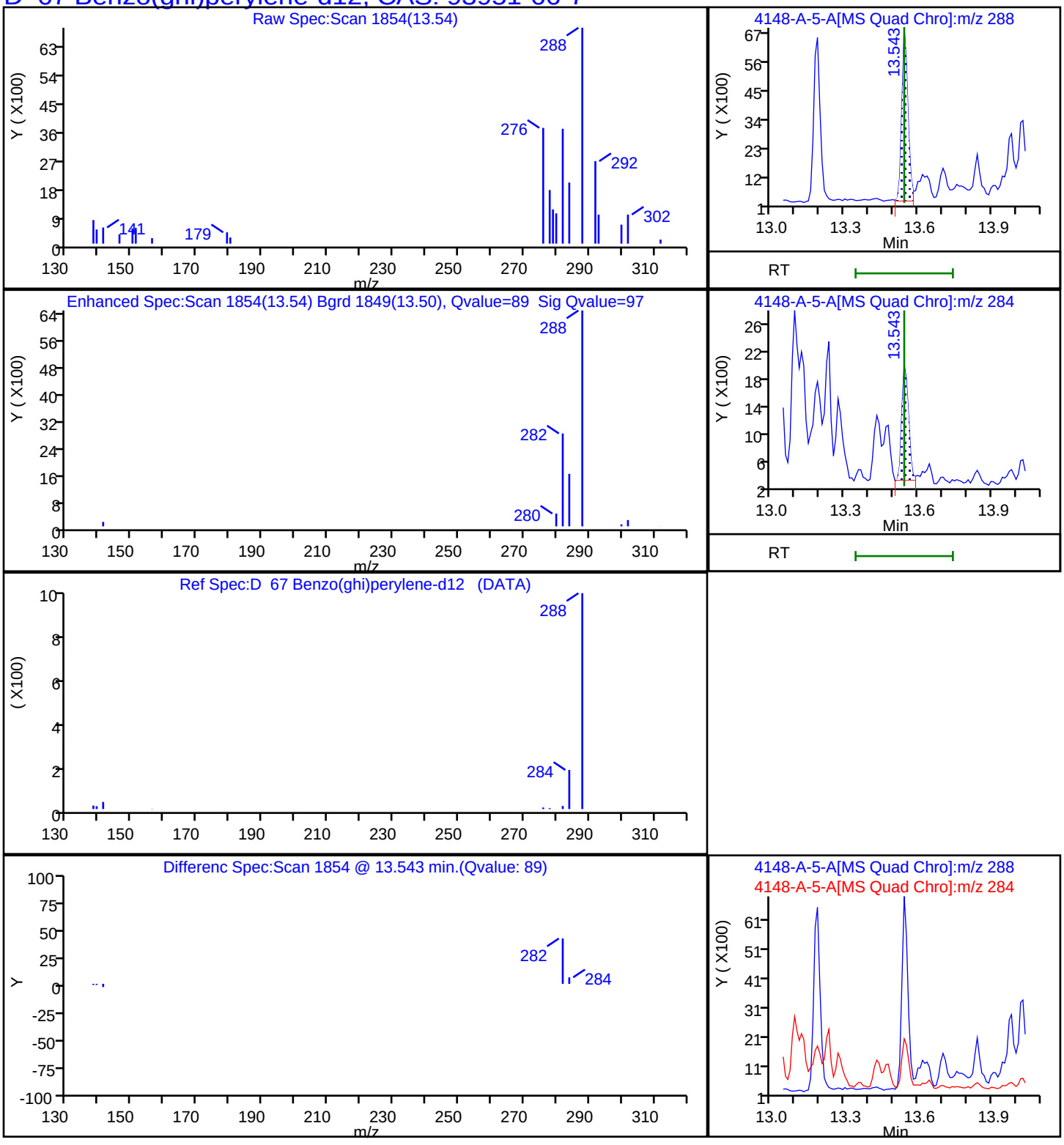
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D

Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 67 Benzo(ghi)perylene-d12, CAS: 93951-66-7



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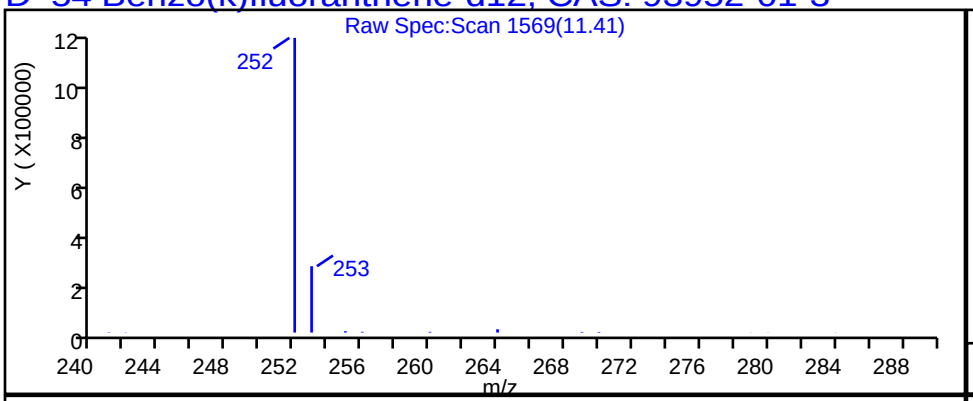
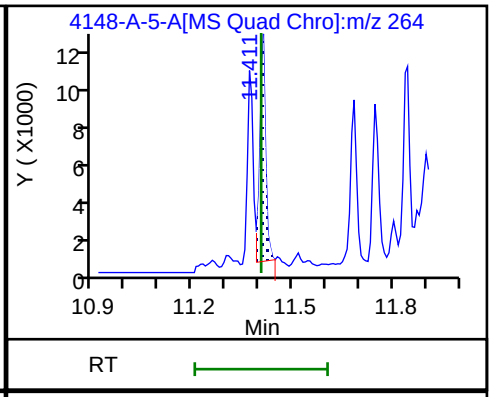
Eurofins Knoxville

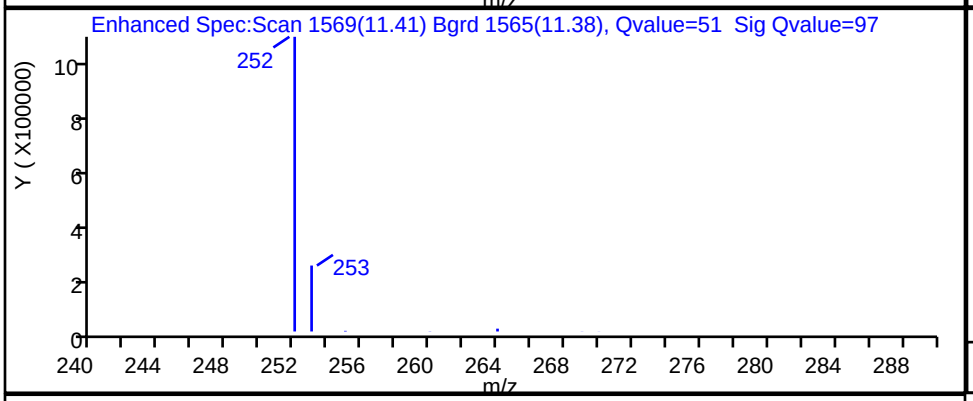
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D

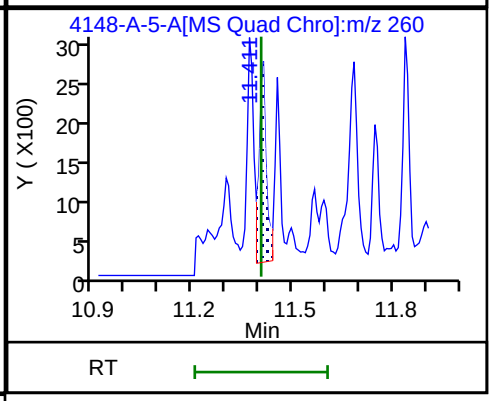
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

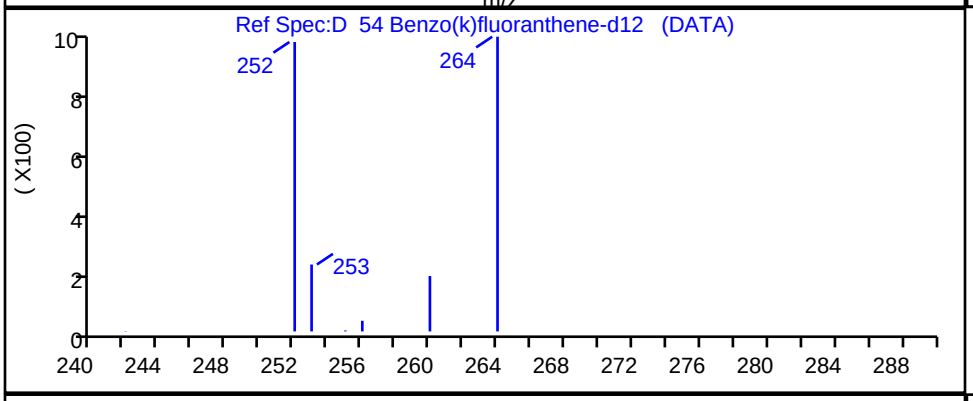
D 54 Benzo(k)fluoranthene-d12, CAS: 93952-01-3

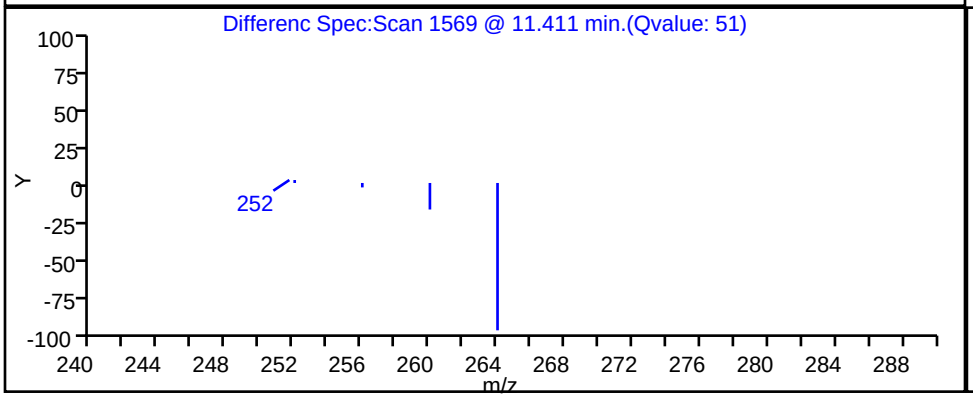


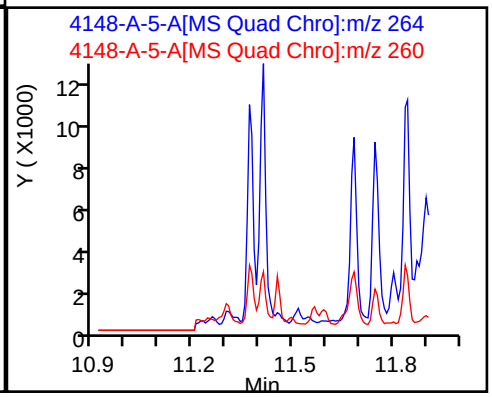












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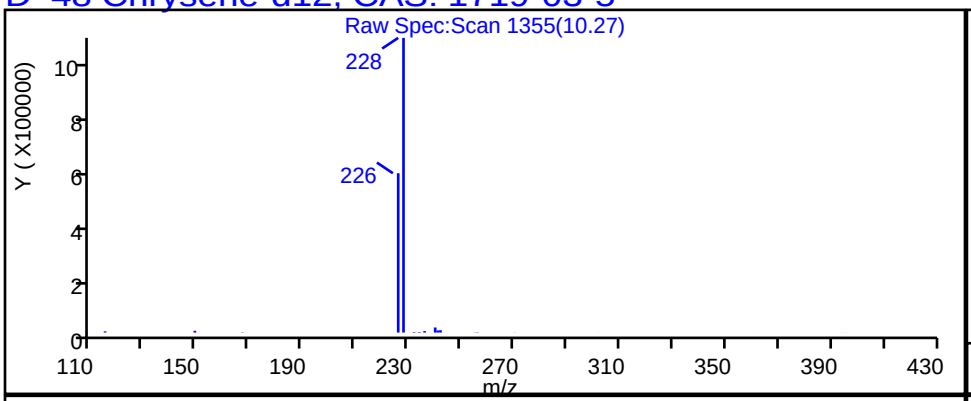
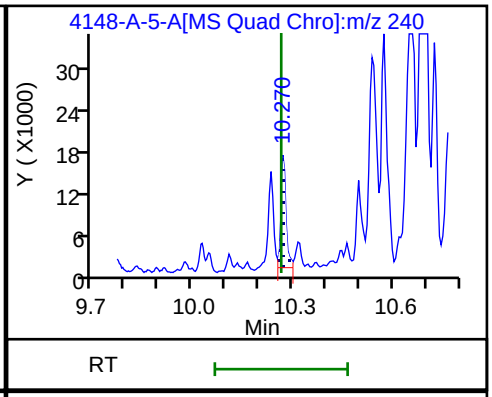
Eurofins Knoxville

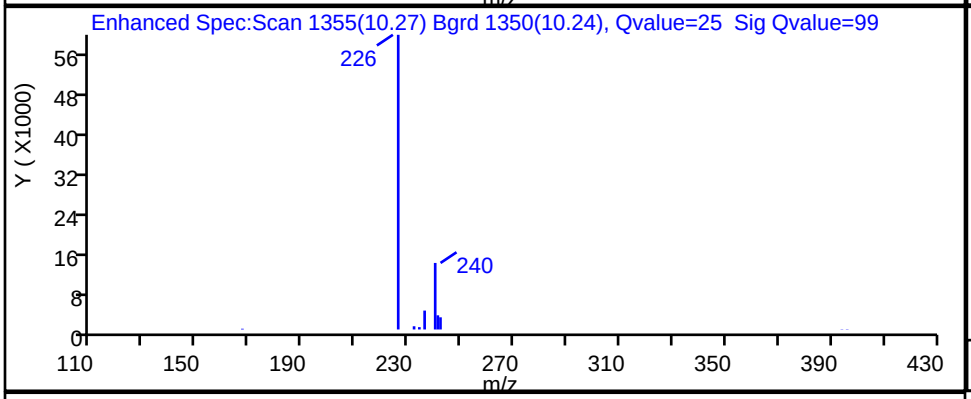
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D

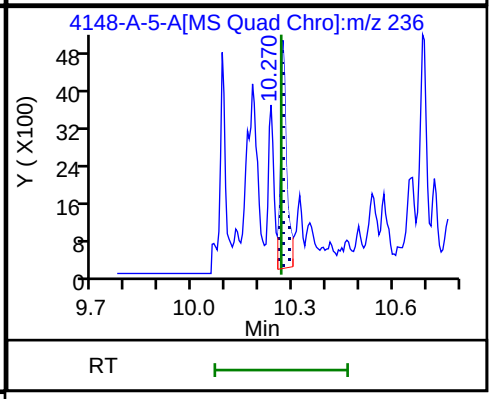
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

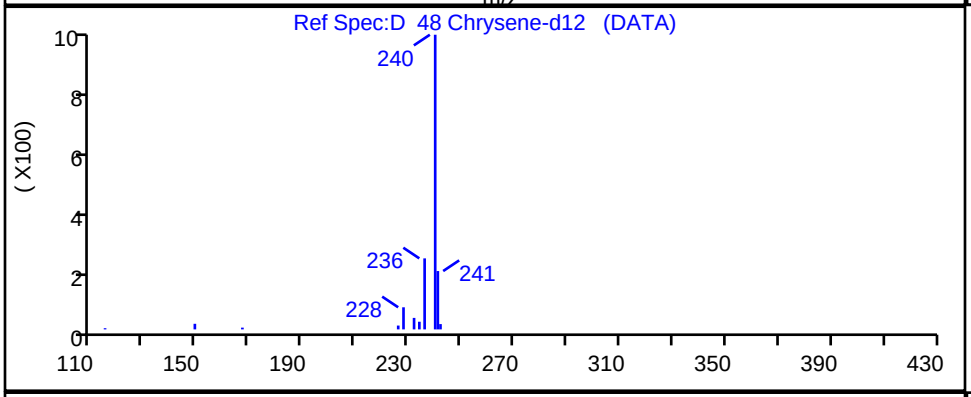
D 48 Chrysene-d12, CAS: 1719-03-5

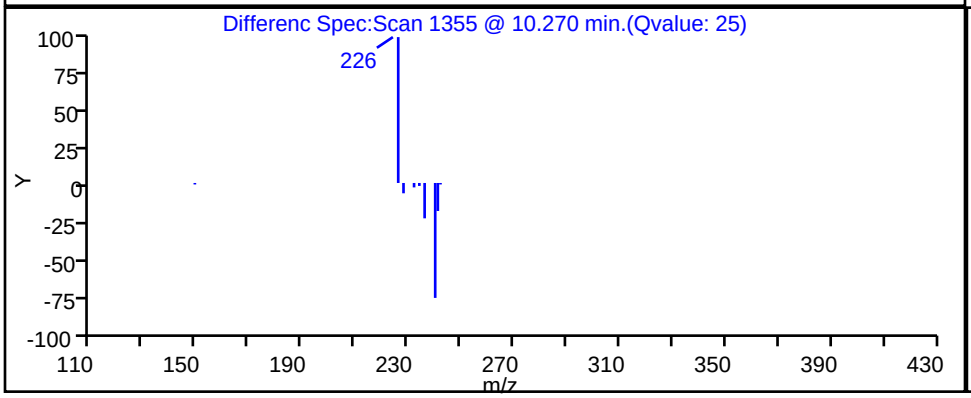


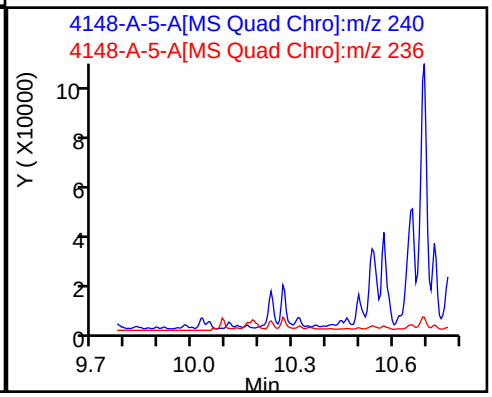












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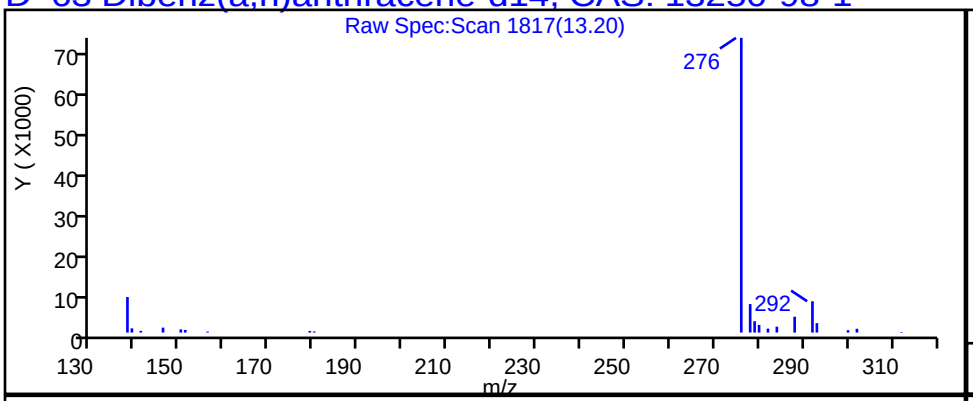
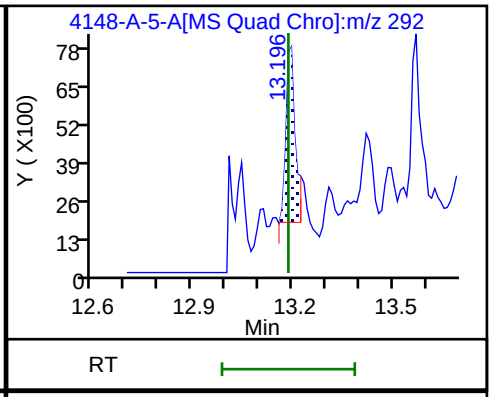
Eurofins Knoxville

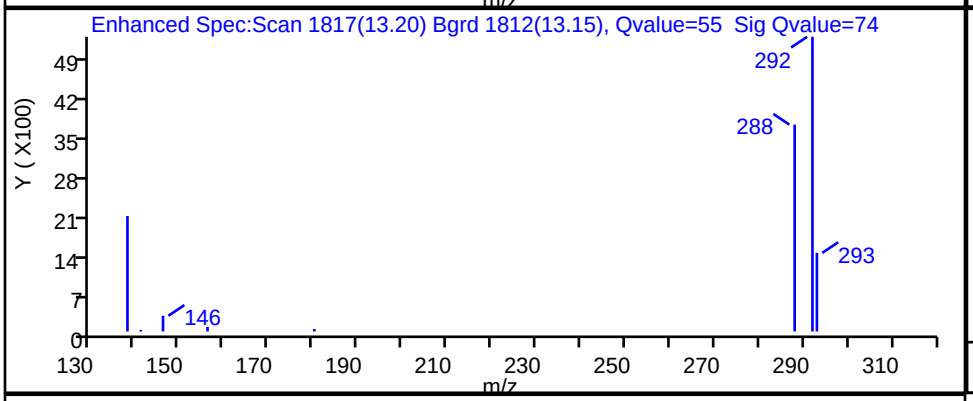
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D

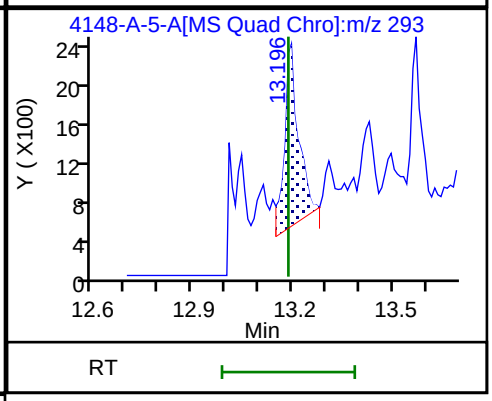
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

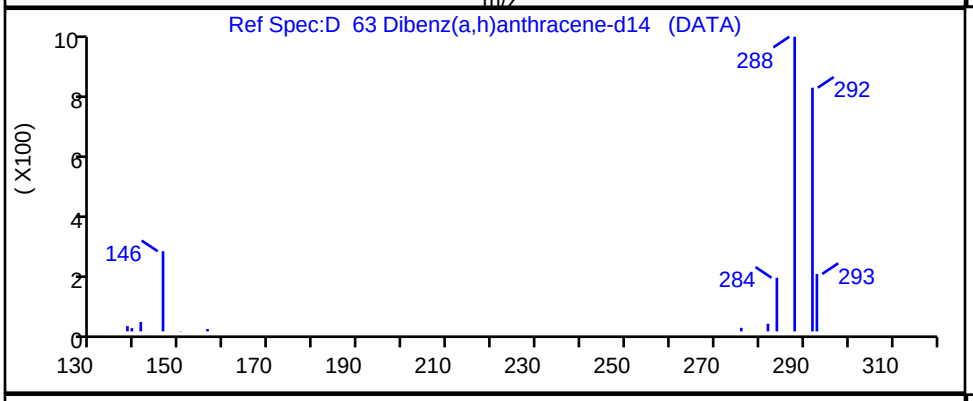
D 63 Dibenz(a,h)anthracene-d14, CAS: 13250-98-1

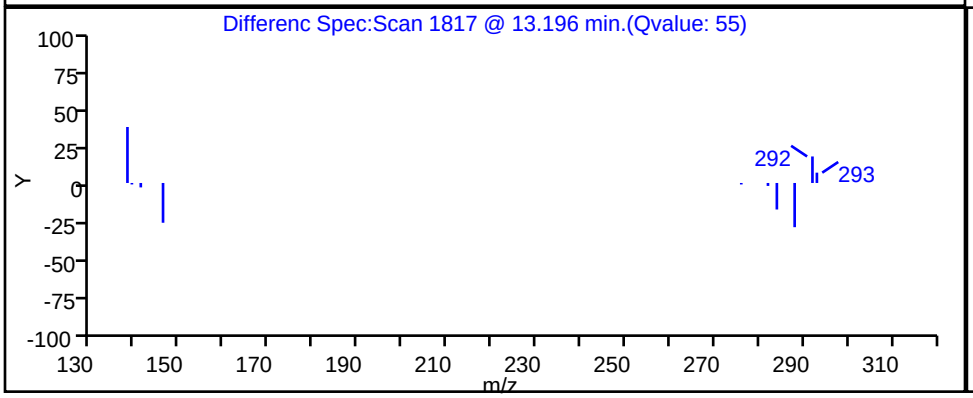


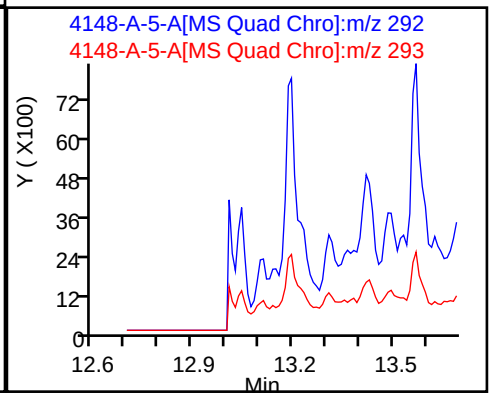












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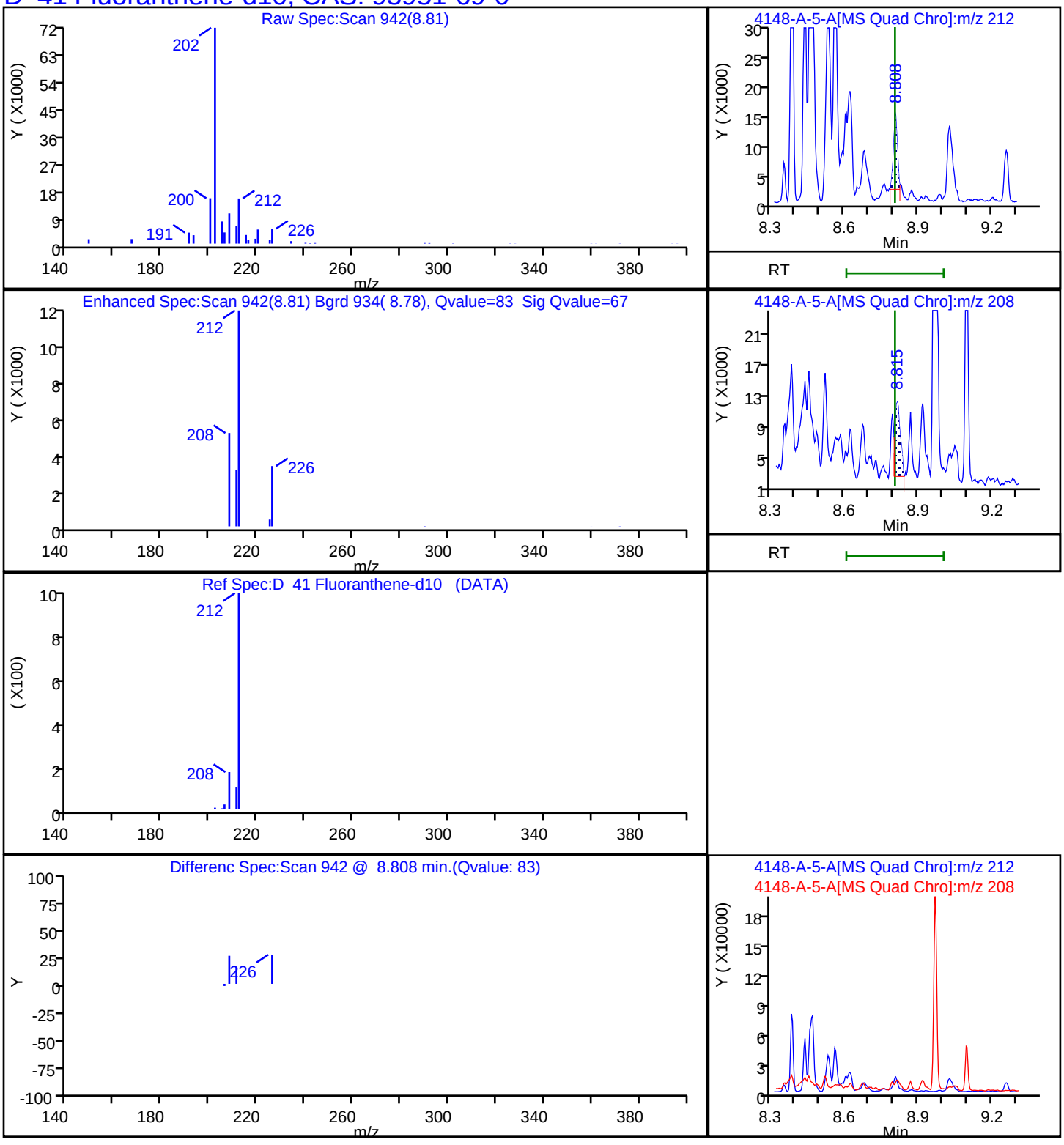
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D

Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 41 Fluoranthene-d10, CAS: 93951-69-0



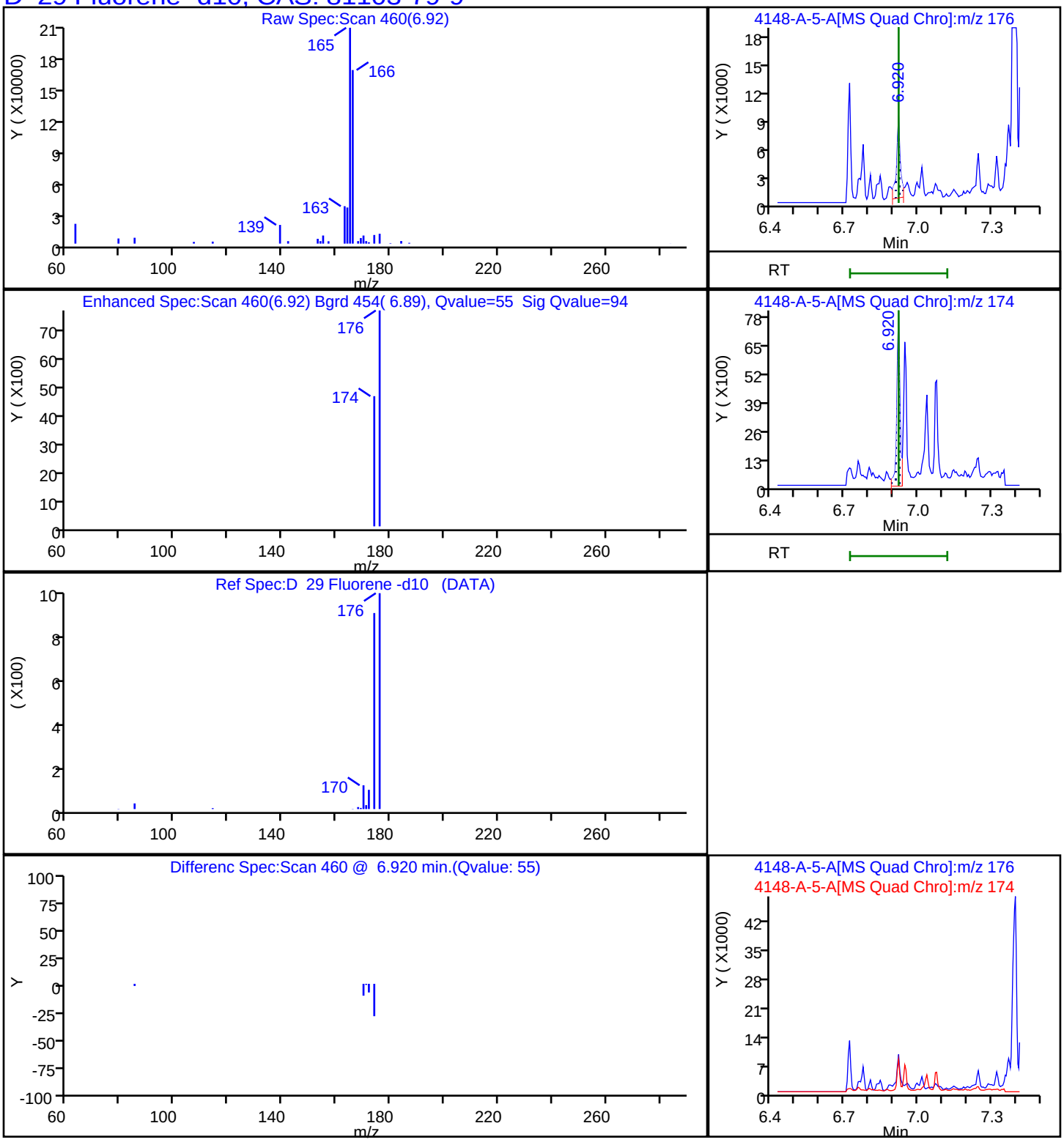
Report Date: 06-Dec-2023 16:35:44 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D

Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 29 Fluorene -d10, CAS: 81103-79-9



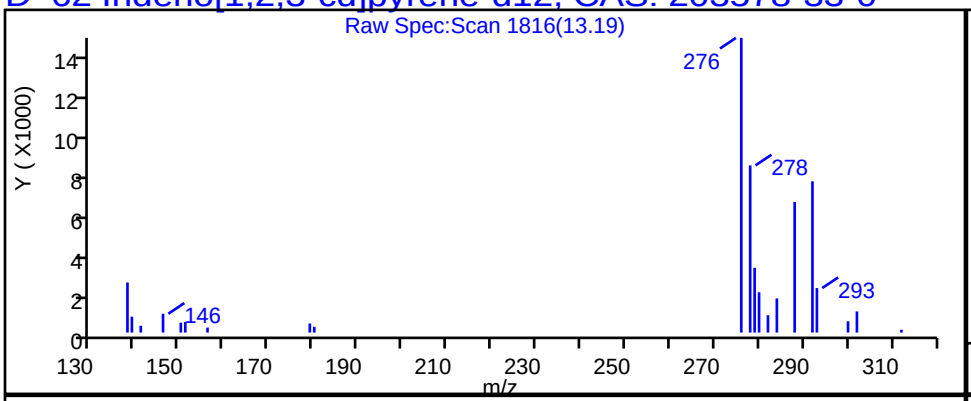
Report Date: 06-Dec-2023 16:35:45 Chrom Revision: 2.3 15-Nov-2023 20:54:34

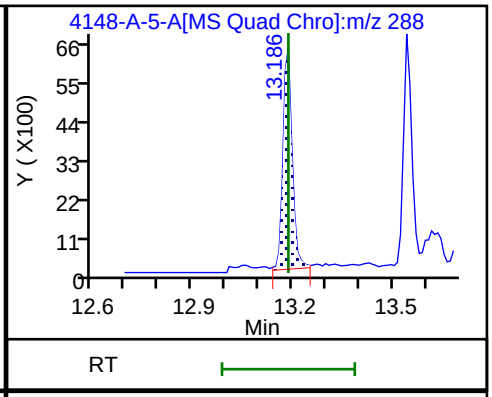
Eurofins Knoxville

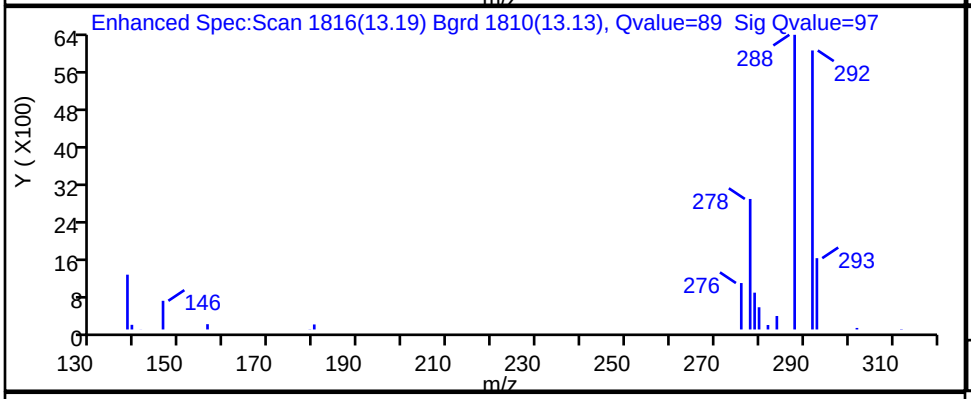
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D

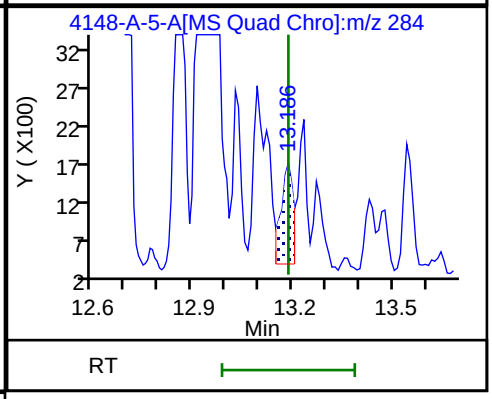
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

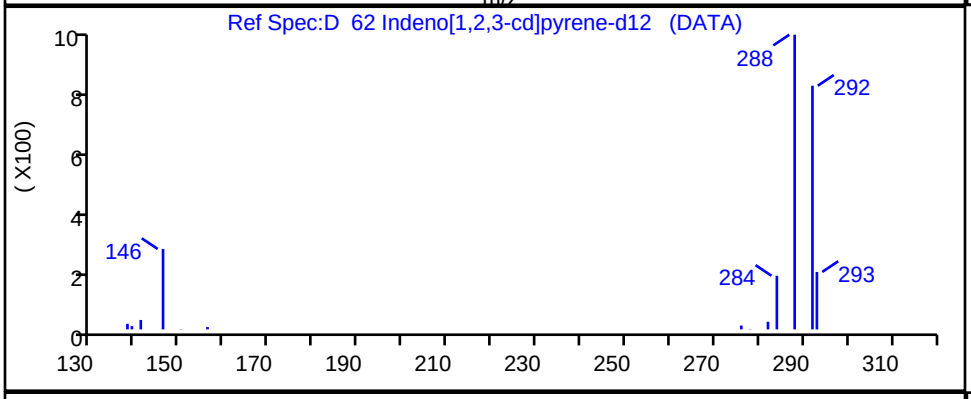
D 62 Indeno[1,2,3-cd]pyrene-d12, CAS: 203578-33-0

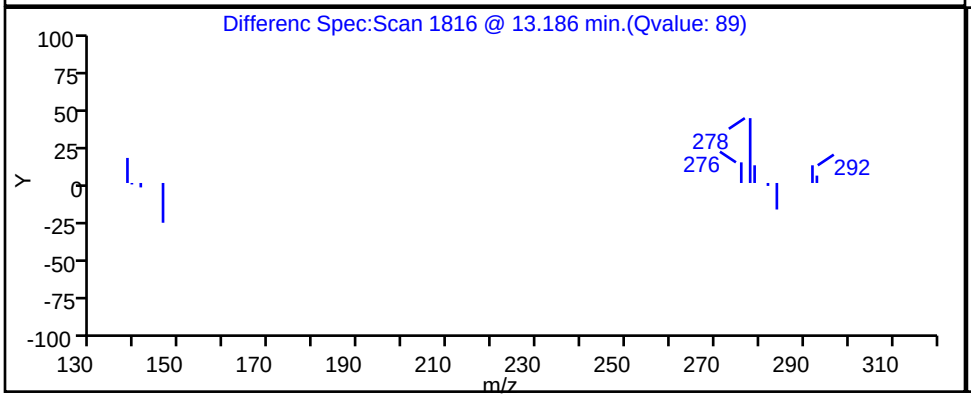


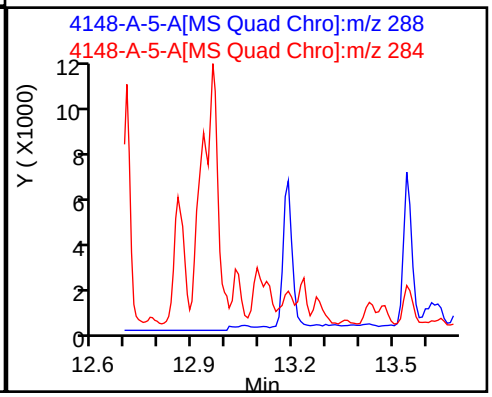












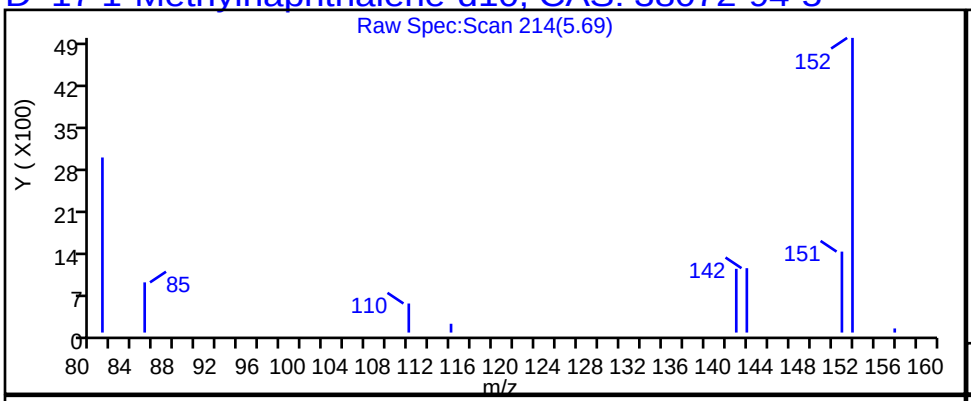
Report Date: 06-Dec-2023 16:35:44 Chrom Revision: 2.3 15-Nov-2023 20:54:34

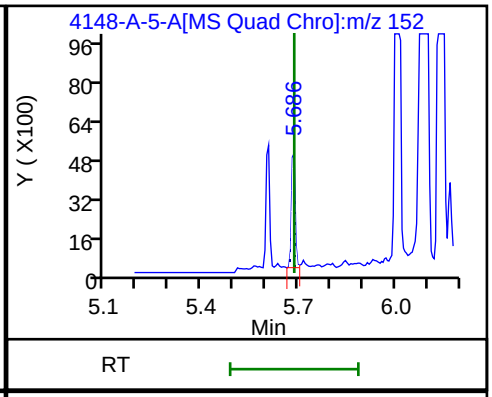
Eurofins Knoxville

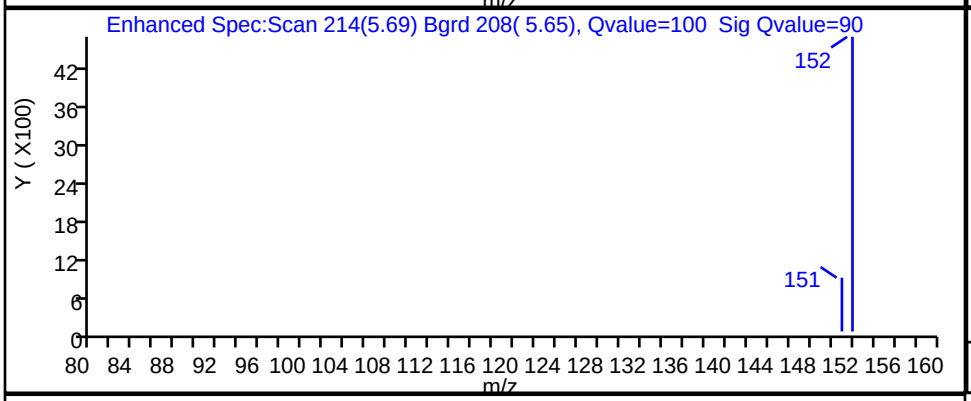
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D

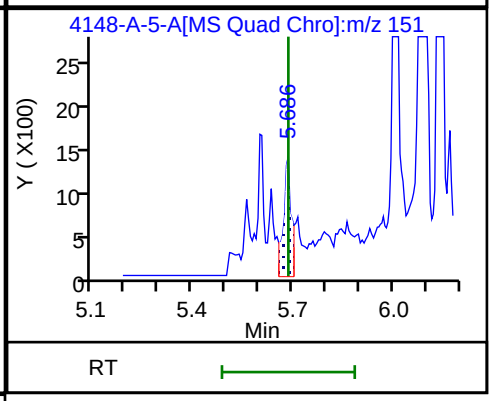
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

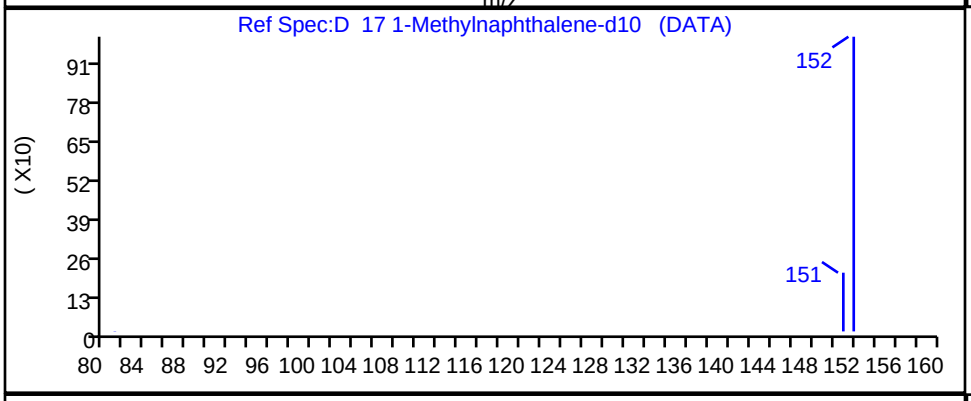
D 17 1-Methylnaphthalene-d10, CAS: 38072-94-5

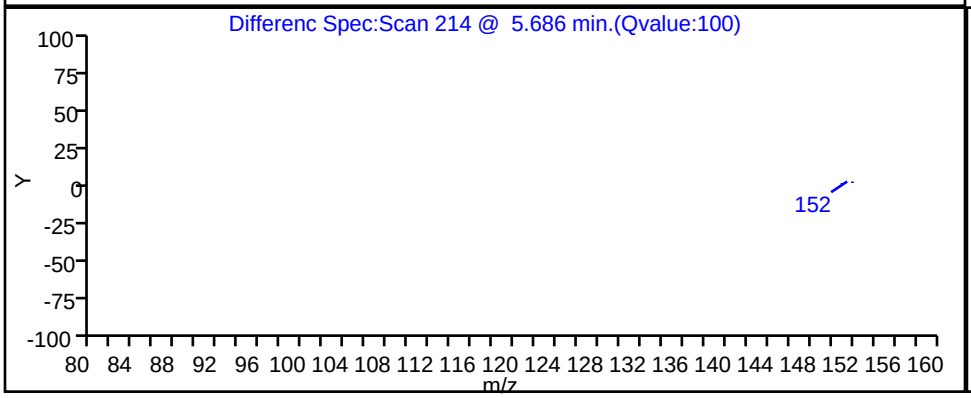


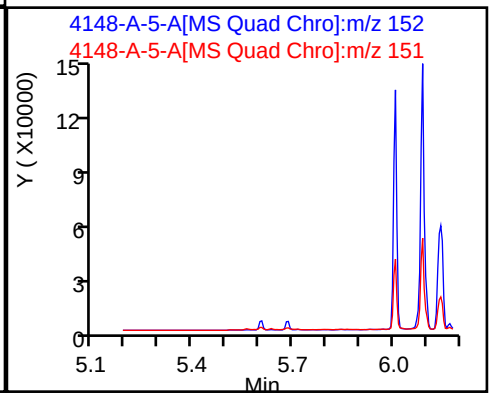












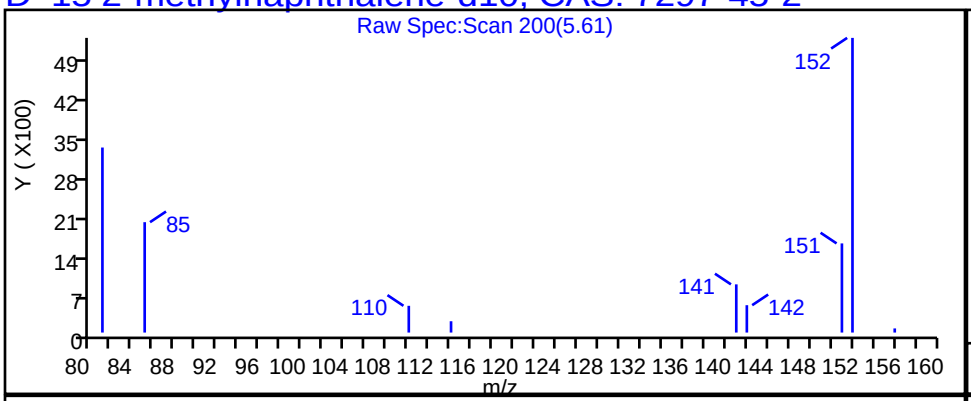
Report Date: 06-Dec-2023 16:35:44 Chrom Revision: 2.3 15-Nov-2023 20:54:34

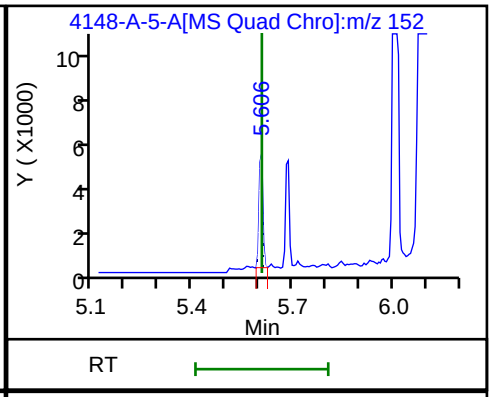
Eurofins Knoxville

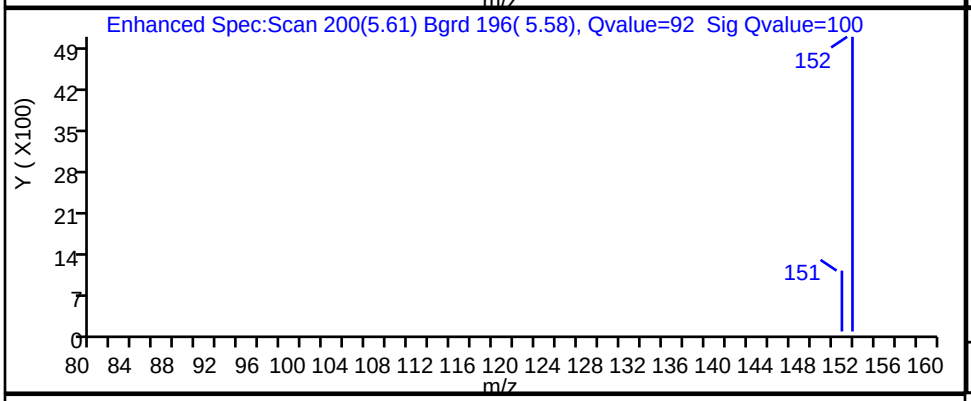
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D

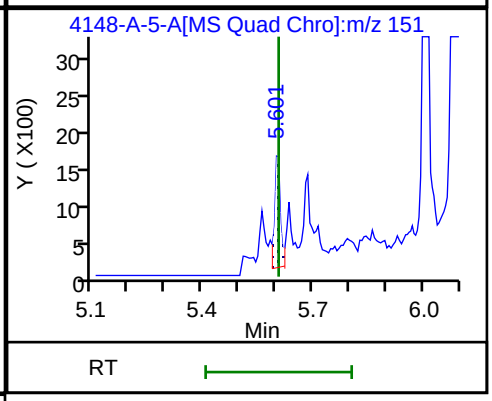
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

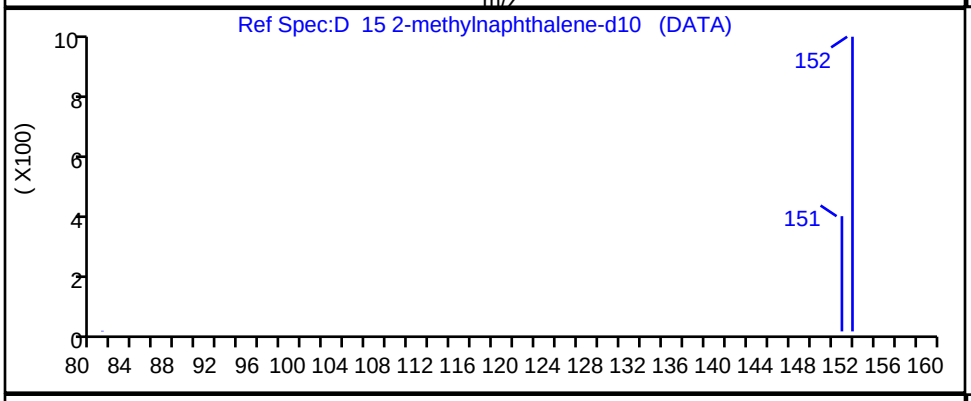
D 15 2-methylnaphthalene-d10, CAS: 7297-45-2

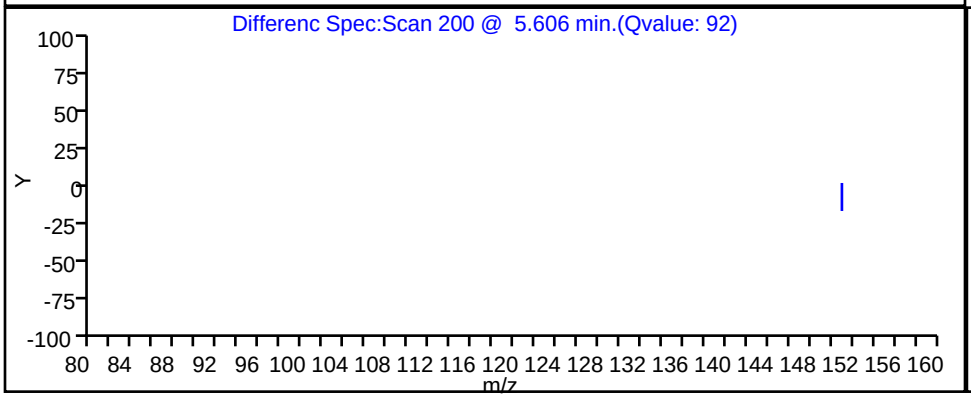


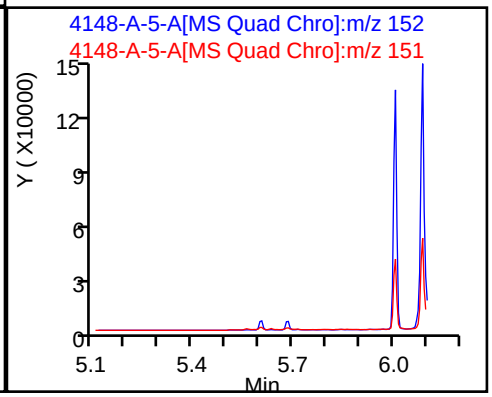












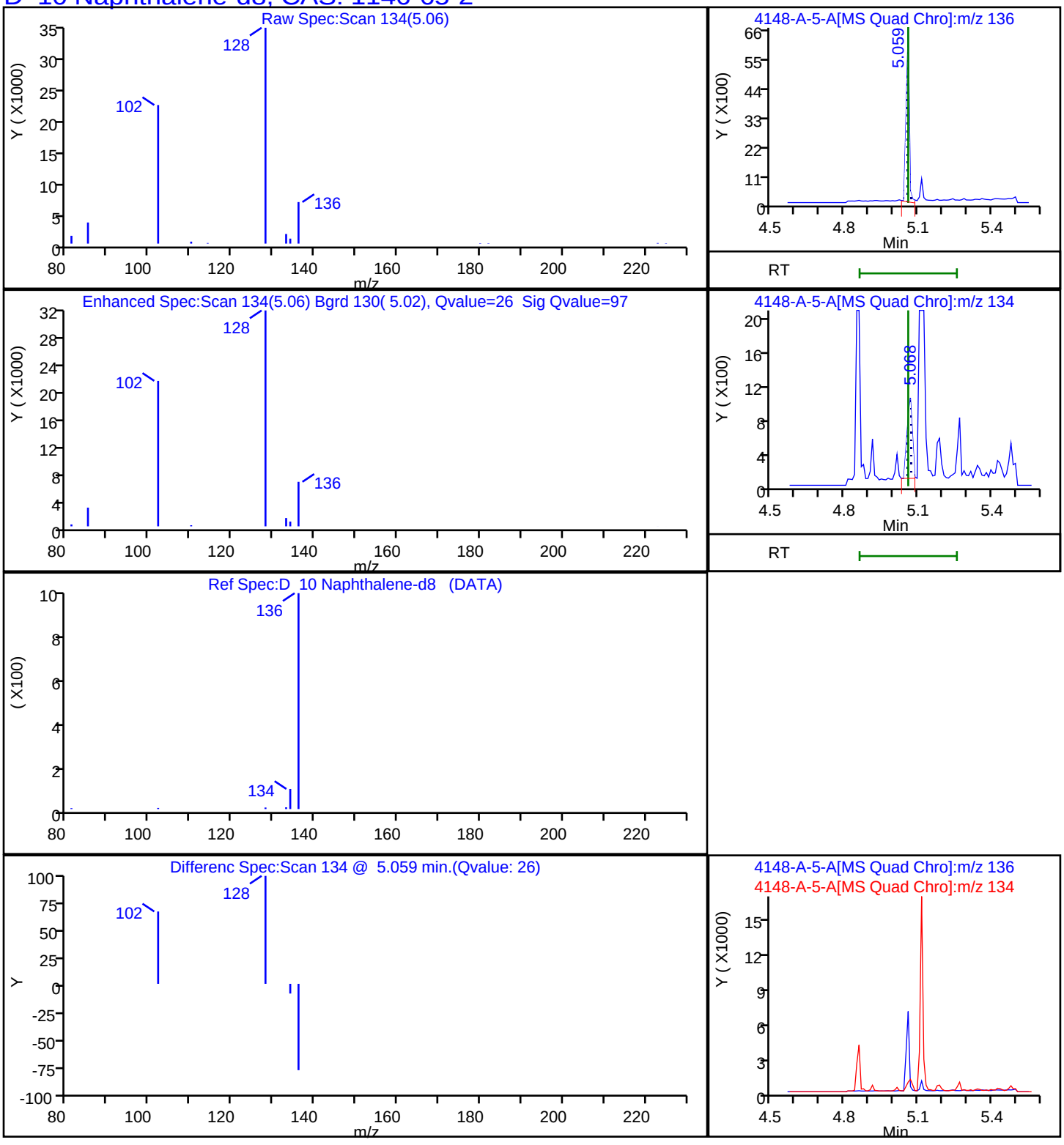
Report Date: 06-Dec-2023 16:35:44 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D

Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D_10 Naphthalene-d8, CAS: 1146-65-2



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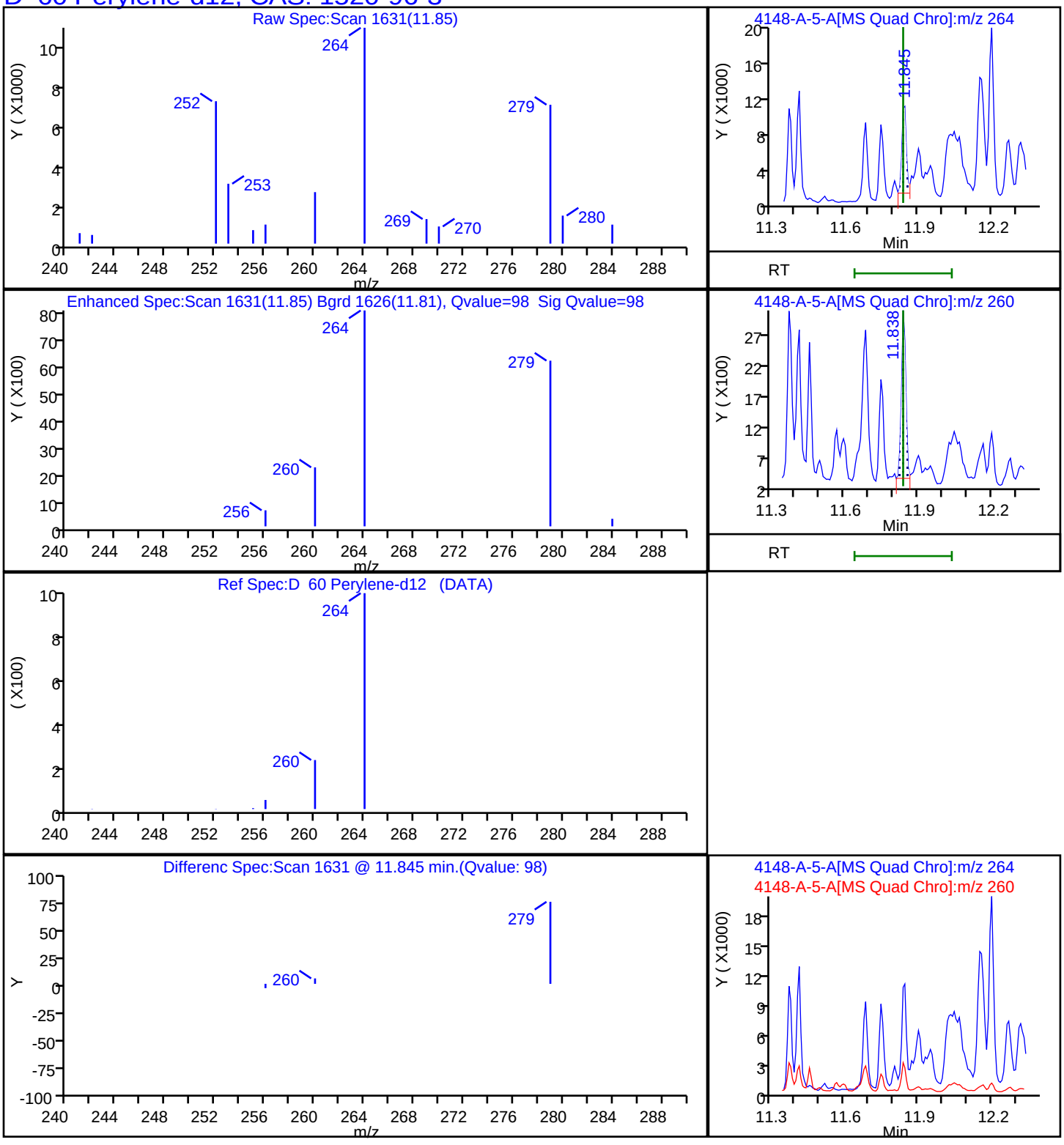
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D

Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 60 Perylene-d12, CAS: 1520-96-3



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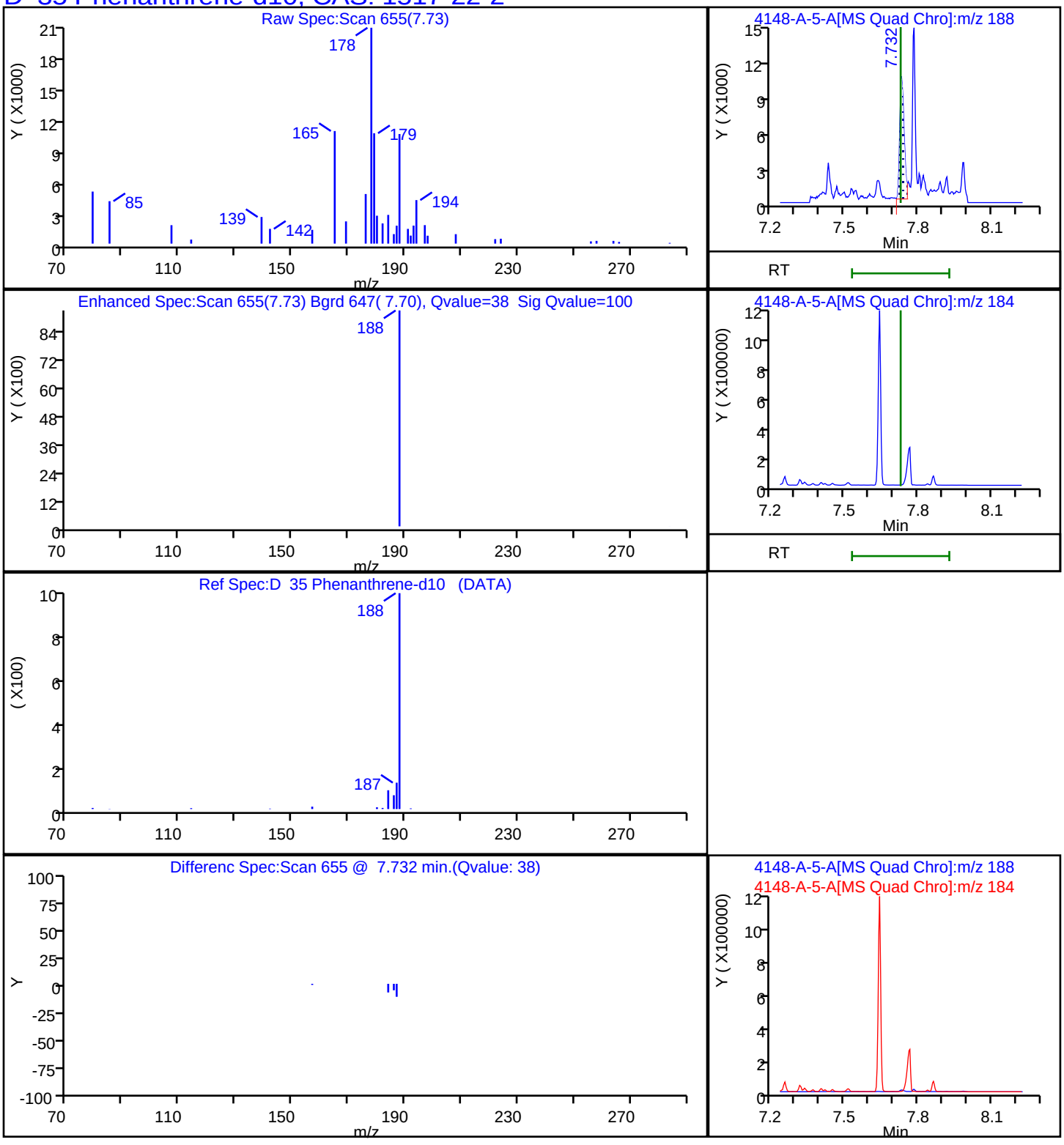
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D

Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D_35 Phenanthrene-d10, CAS: 1517-22-2



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Eurofins Knoxville

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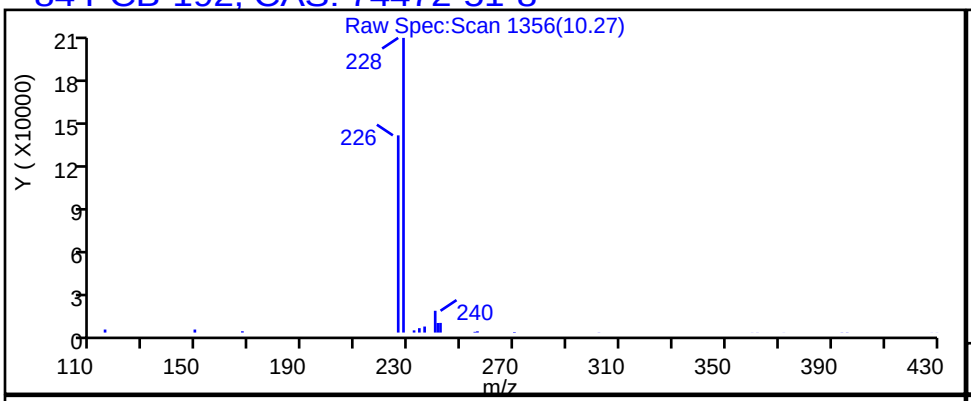
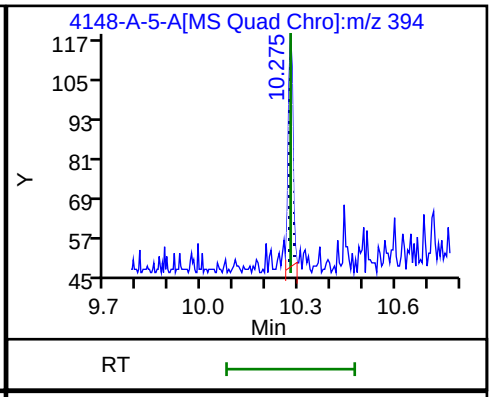
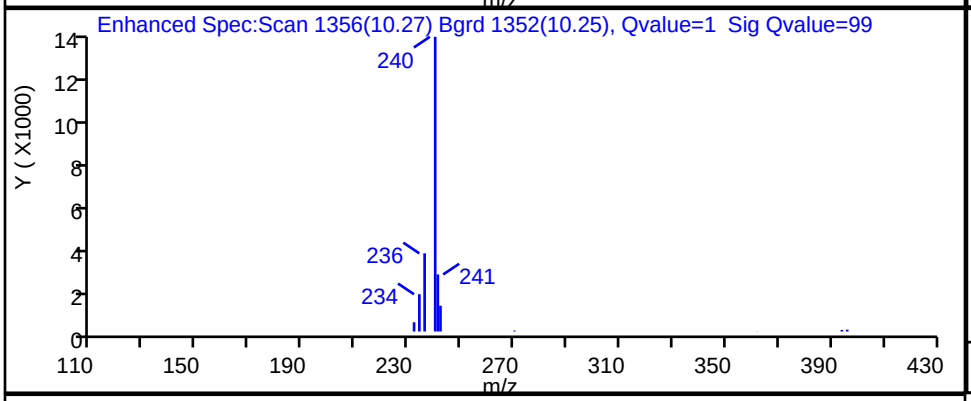
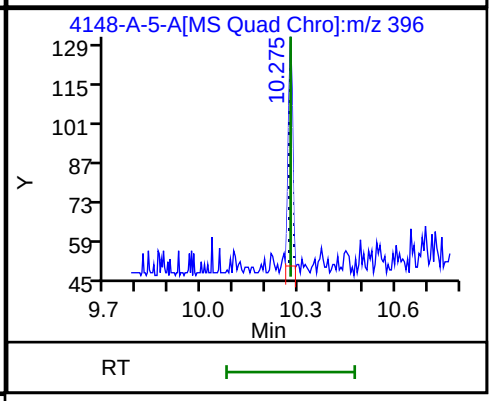
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

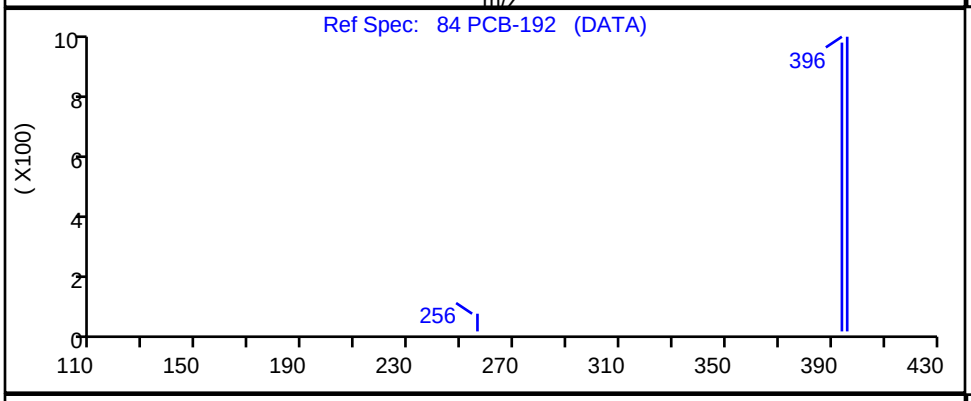
84 PCB-192, CAS: 74472-51-8

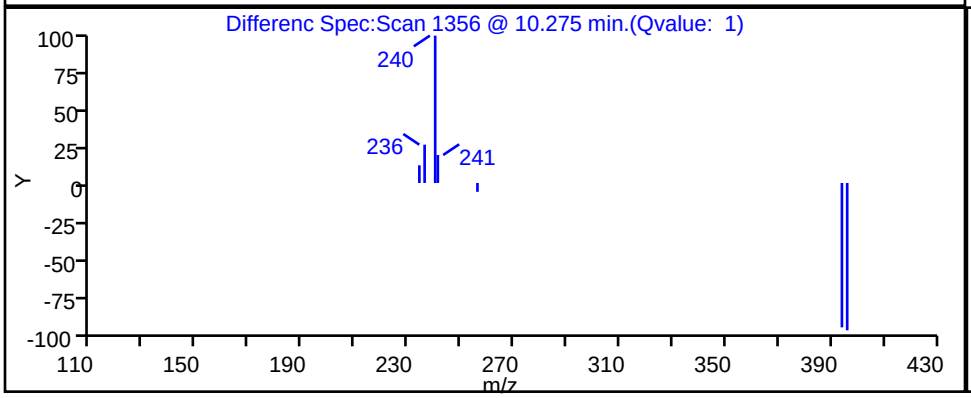


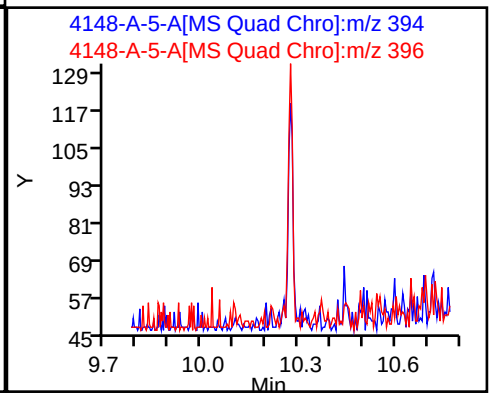












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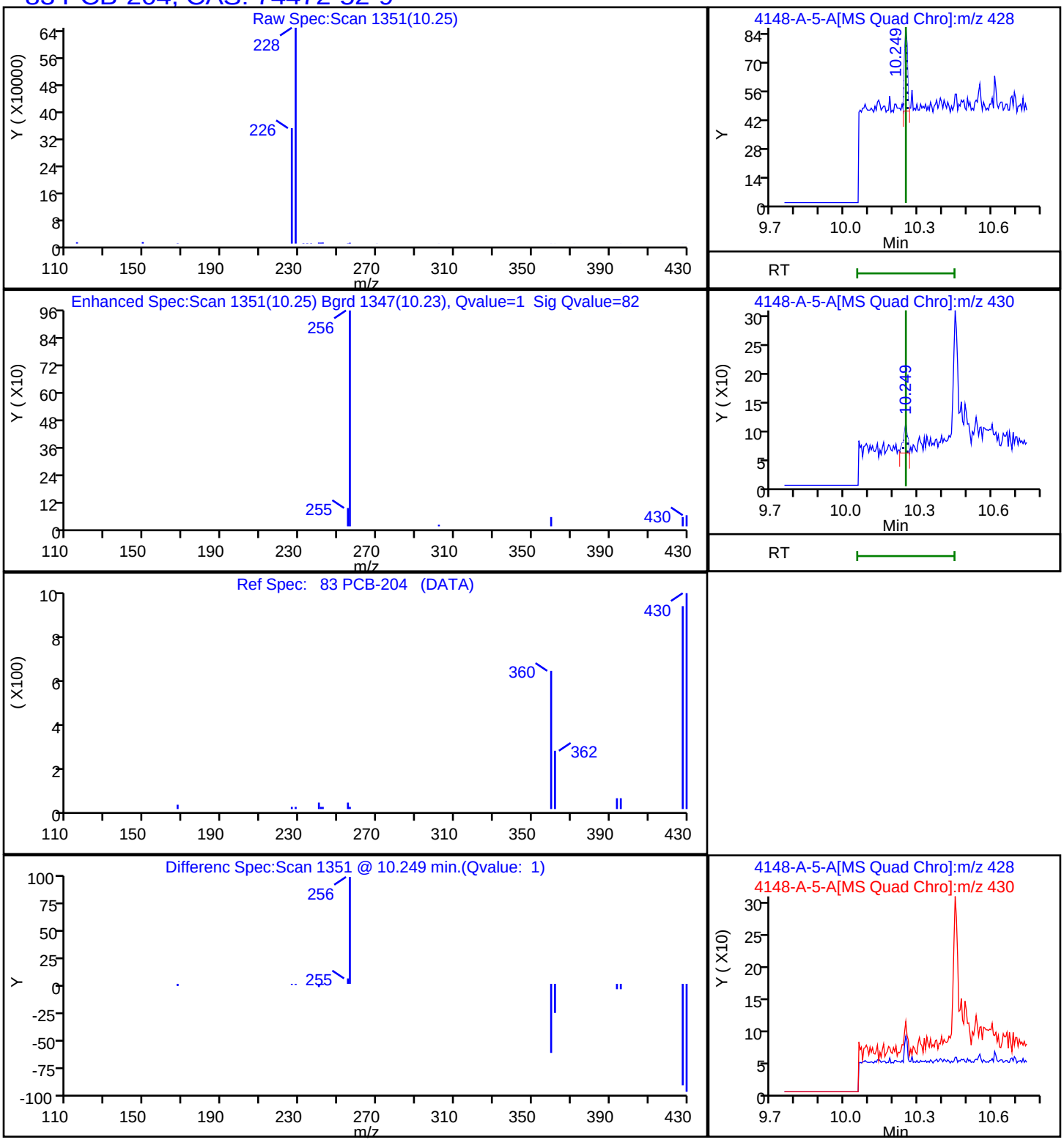
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D

Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

83 PCB-204, CAS: 74472-52-9



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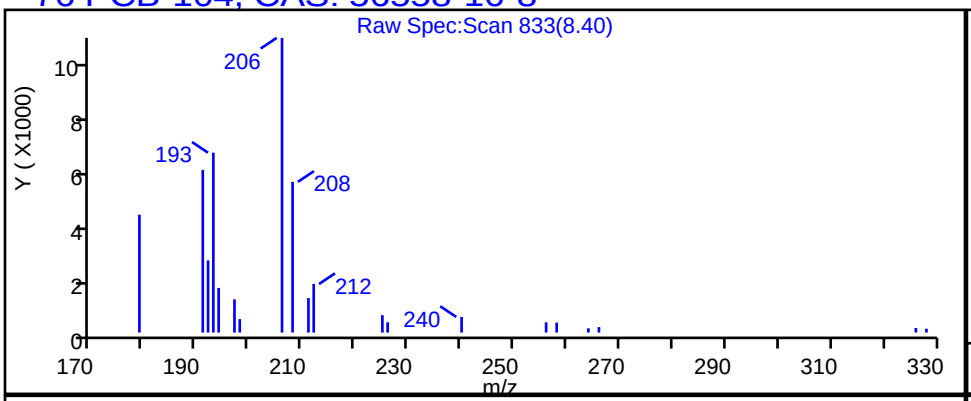
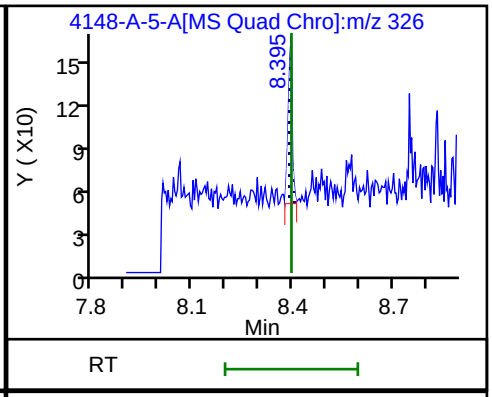
Eurofins Knoxville

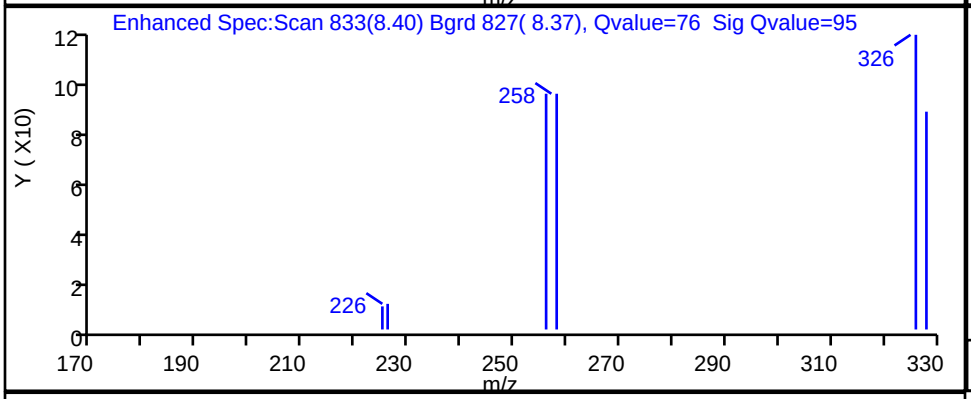
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D

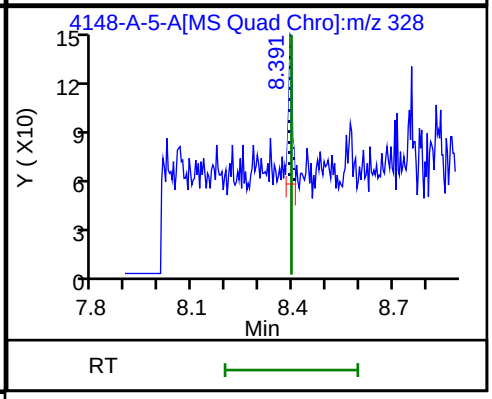
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

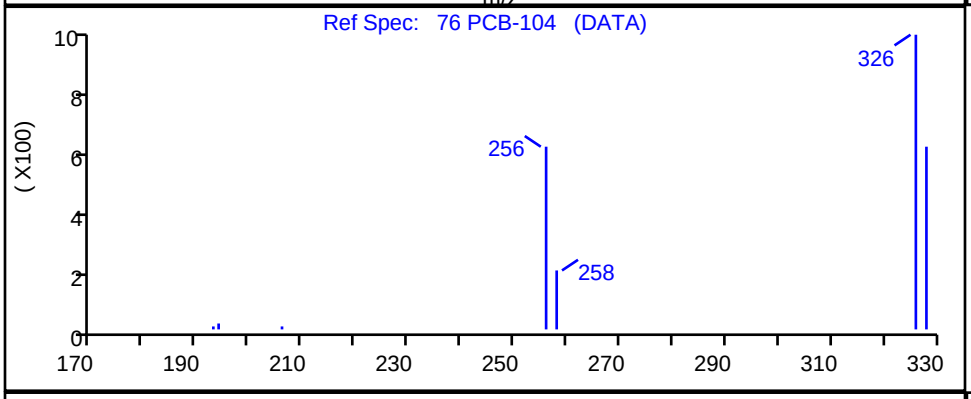
76 PCB-104, CAS: 56558-16-8

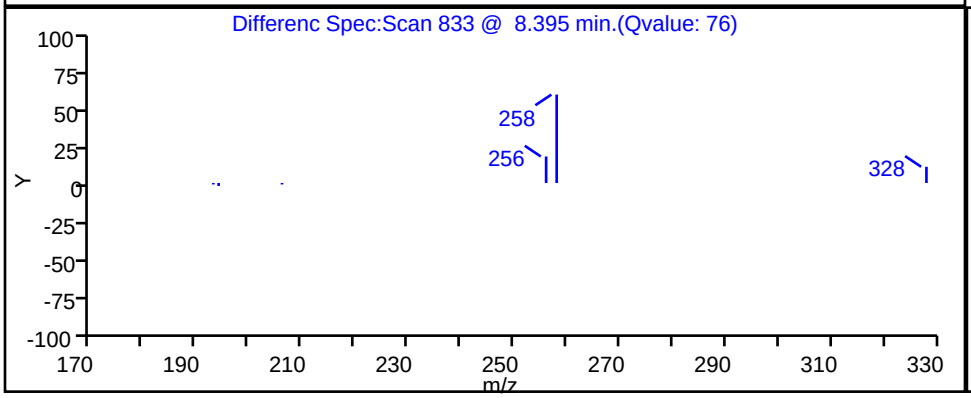


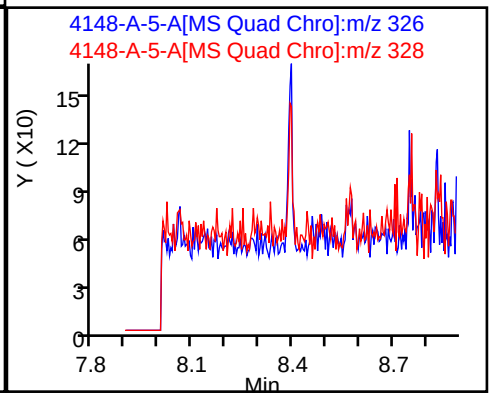












Manual Integration/User Assign Peak Report

Eurofins Knoxville

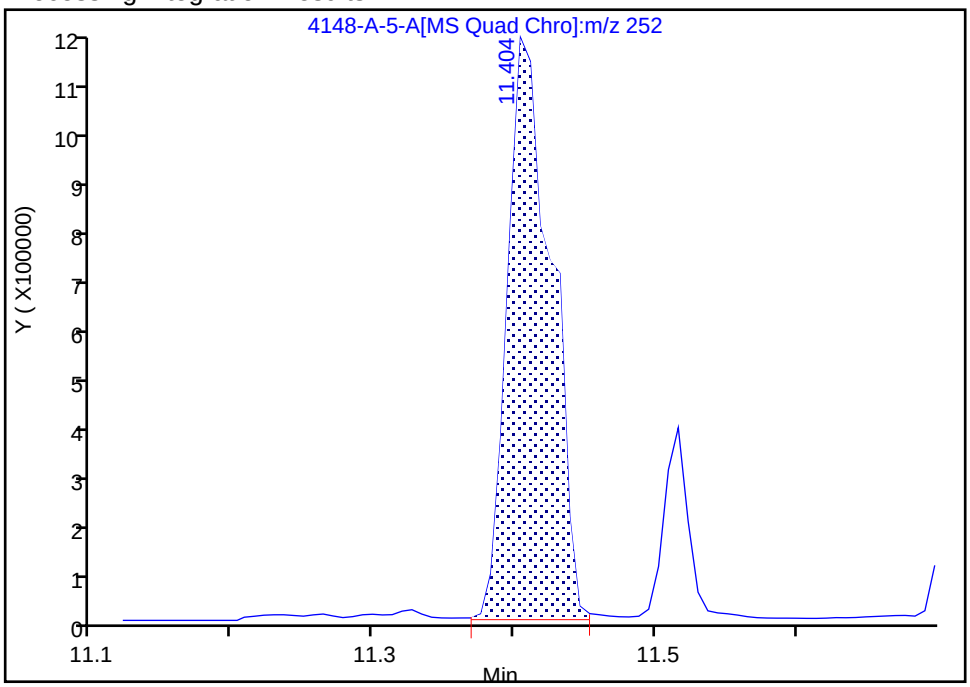
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D				
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

53 Benzo[b]fluoranthene, CAS: 205-99-2

Signal: 1

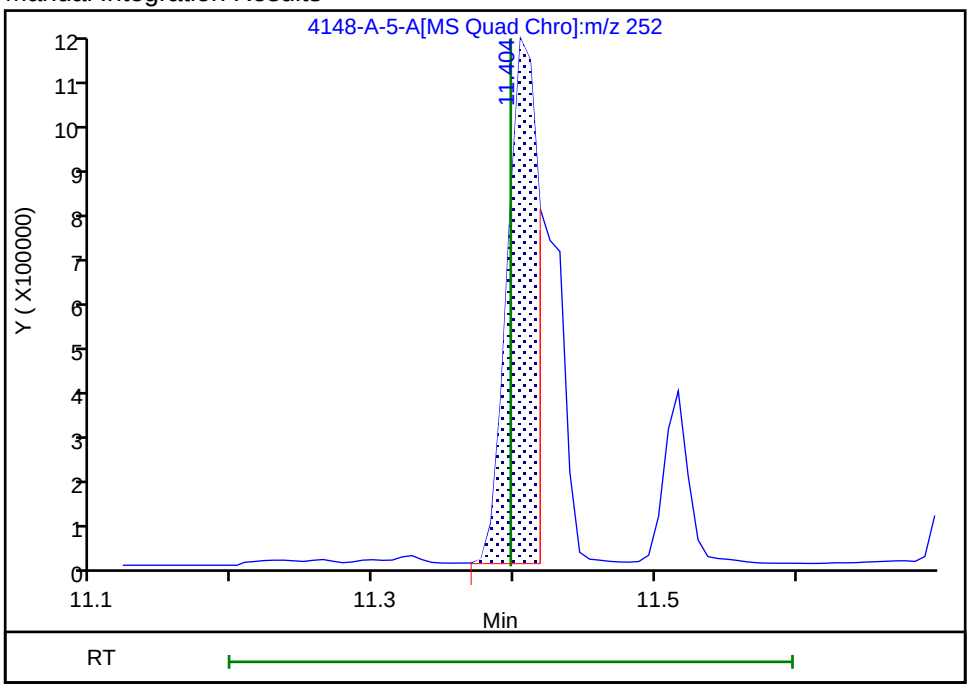
Processing Integration Results

RT: 11.40
Area: 2508490
Amount: 12.012165
Amount Units: ug/ml



Manual Integration Results

RT: 11.40
Area: 1816545
Amount: 8.698715
Amount Units: ug/ml



Reviewer: SK9U, 05-Dec-2023 11:59:30 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

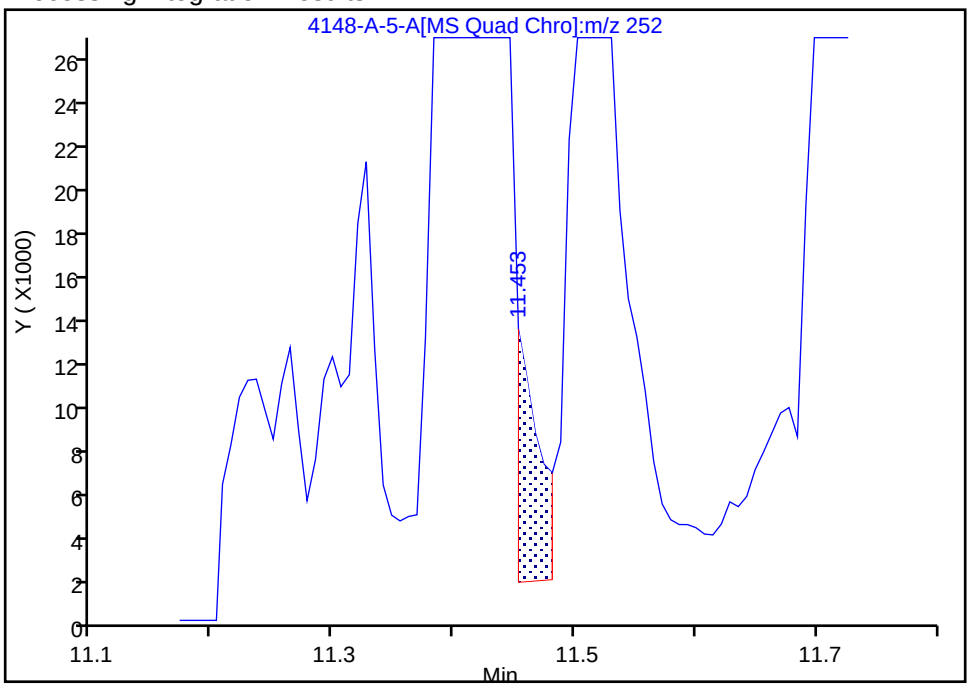
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D				
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

55 Benzo[k]fluoranthene, CAS: 207-08-9

Signal: 1

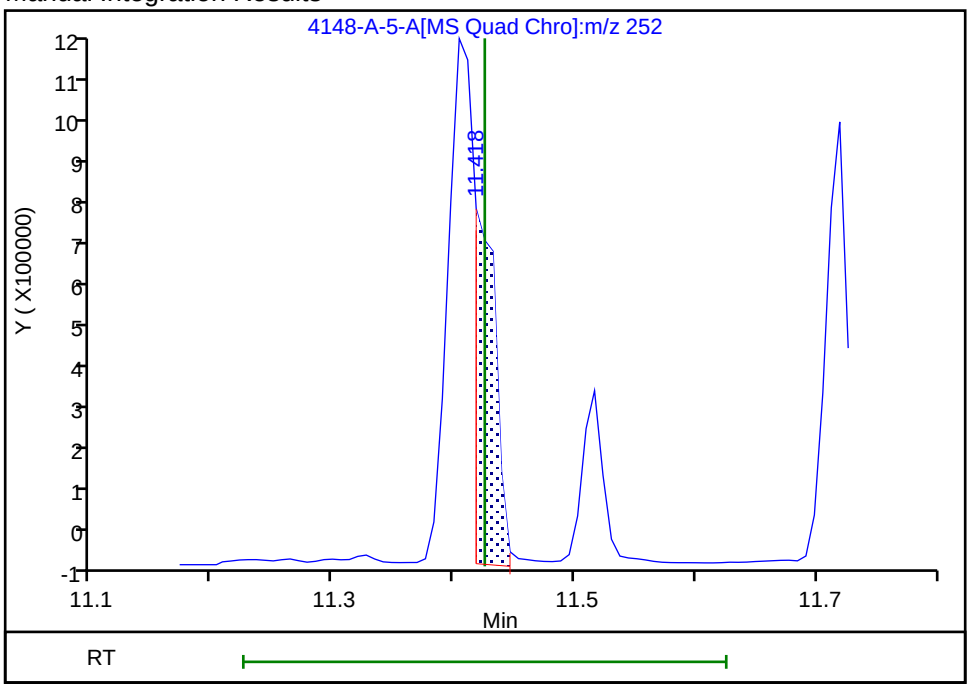
Processing Integration Results

RT: 11.45
Area: 16072
Amount: 0.077675
Amount Units: ug/ml



Manual Integration Results

RT: 11.42
Area: 1015750
Amount: 4.909059
Amount Units: ug/ml



Reviewer: SK9U, 05-Dec-2023 11:59:54 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

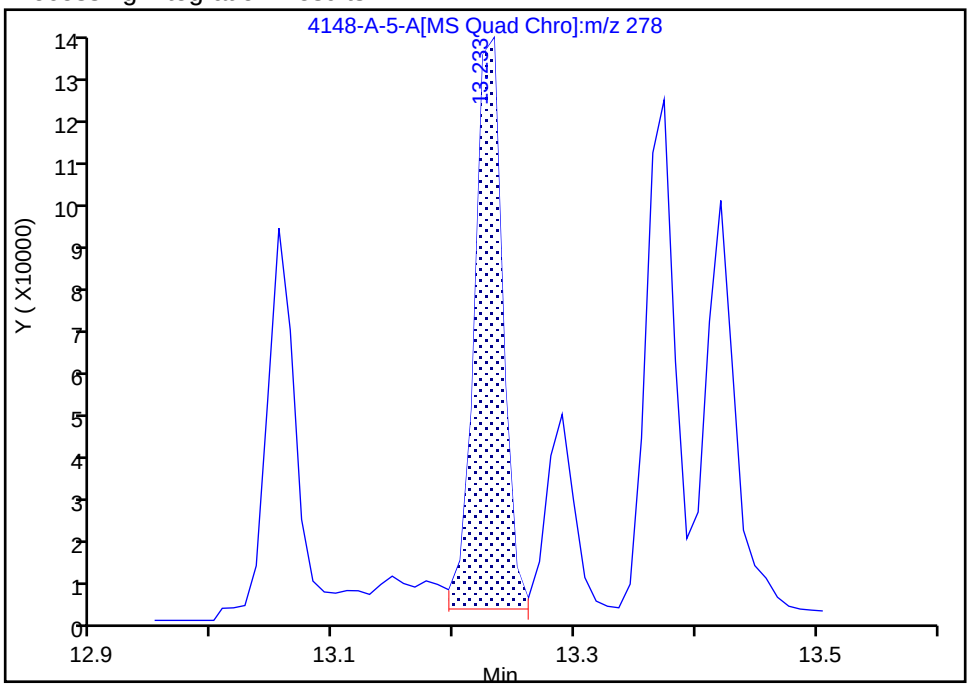
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D				
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

66 Dibenz(a,h)anthracene, CAS: 53-70-3

Signal: 1

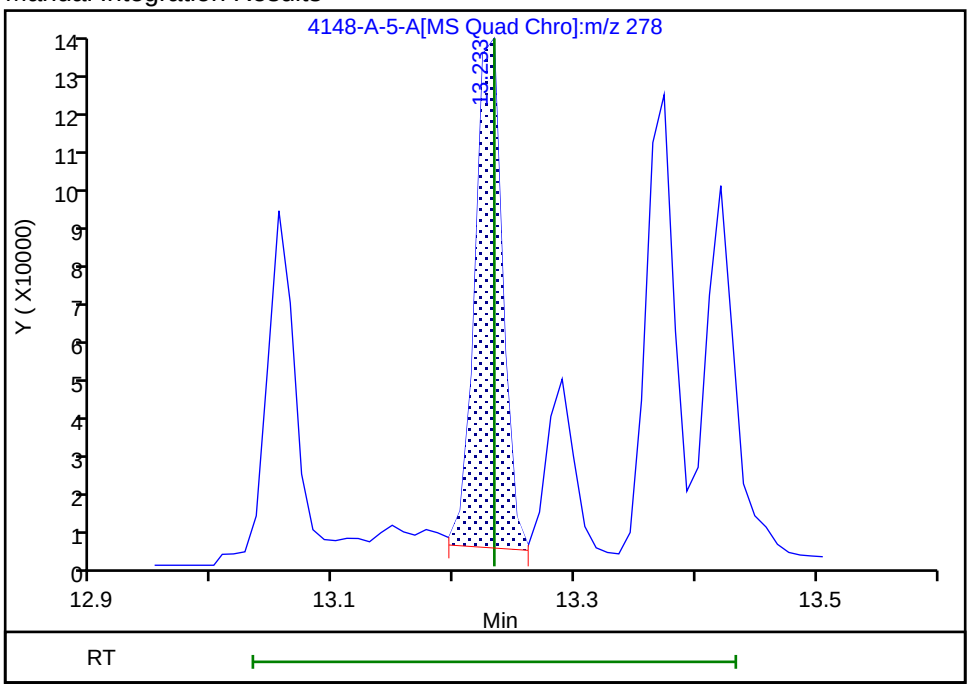
Processing Integration Results

RT: 13.23
Area: 218509
Amount: 1.147790
Amount Units: ug/ml



Manual Integration Results

RT: 13.23
Area: 209690
Amount: 1.101465
Amount Units: ug/ml



Reviewer: SK9U, 05-Dec-2023 12:00:23 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

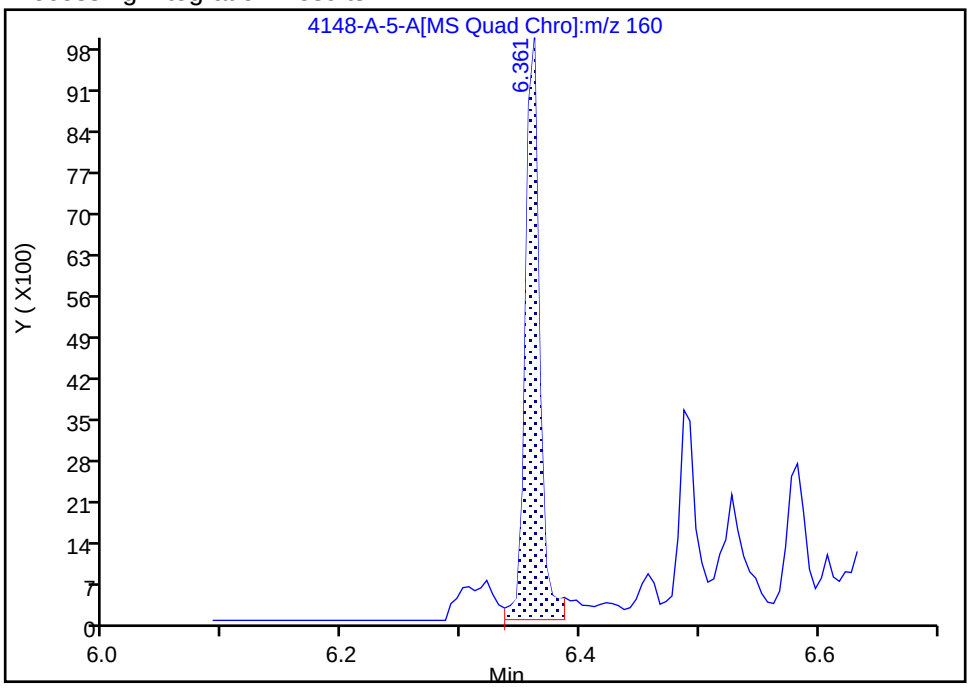
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D				
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 23 Acenaphthylene-d8, CAS: 93951-97-4

Signal: 1

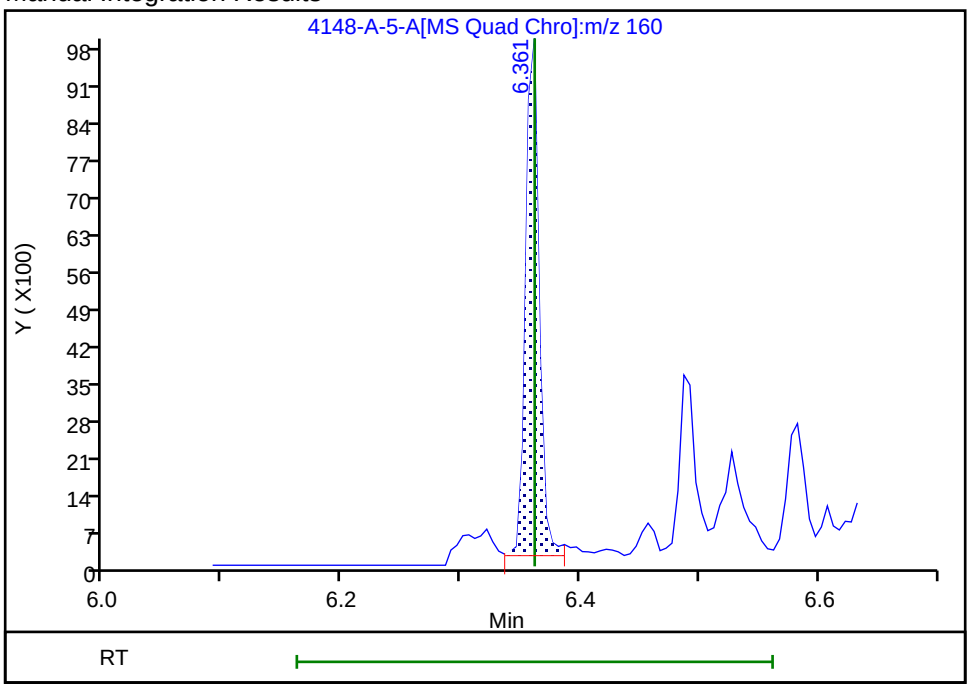
Processing Integration Results

RT: 6.36
Area: 8359
Amount: 0.039996
Amount Units: ug/ml



Manual Integration Results

RT: 6.36
Area: 7693
Amount: 0.072525
Amount Units: ug/ml



Reviewer: SK9U, 05-Dec-2023 11:57:56 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Eurofins Knoxville

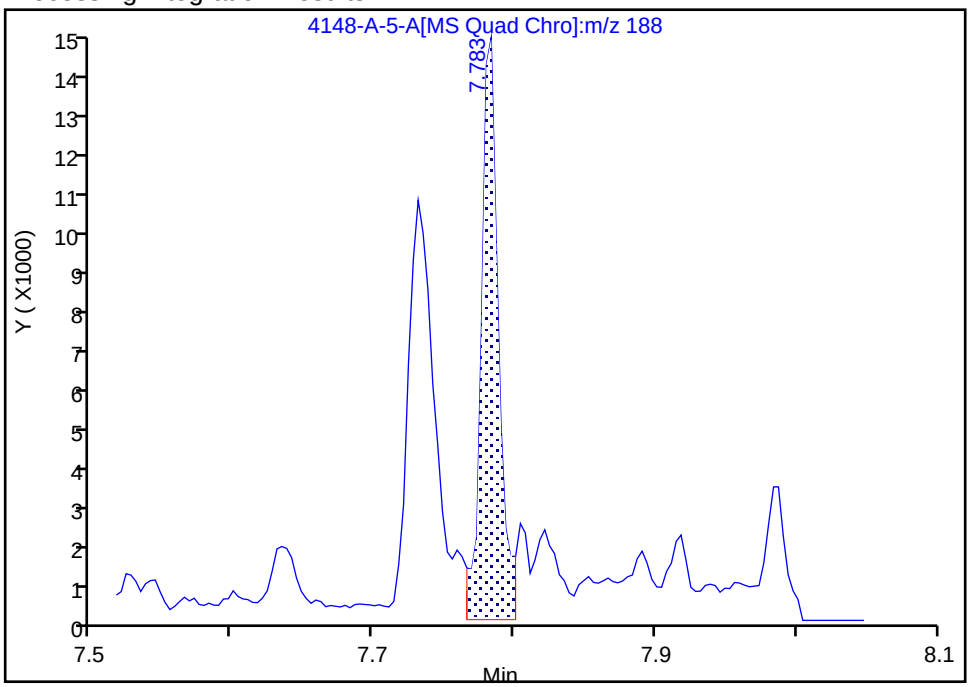
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D				
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 38 Anthracin-d10, CAS: 1719-06-8

Signal: 1

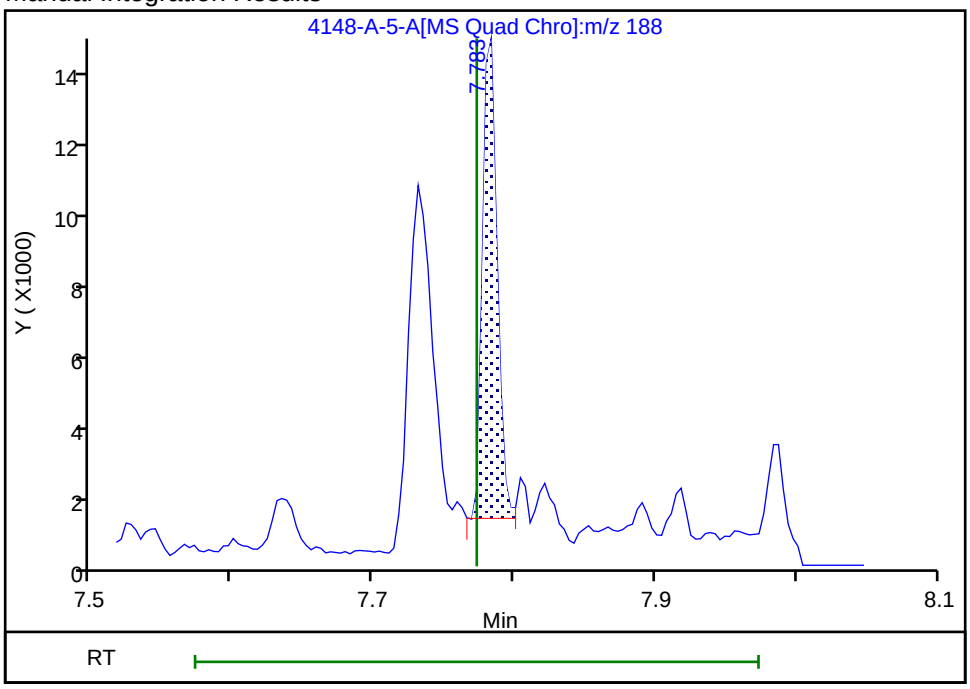
Processing Integration Results

RT: 7.78
Area: 12213
Amount: 0.075364
Amount Units: ug/ml



Manual Integration Results

RT: 7.78
Area: 9330
Amount: 0.057574
Amount Units: ug/ml



Reviewer: SK9U, 05-Dec-2023 11:58:51 -05:00:00 (UTC)
Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

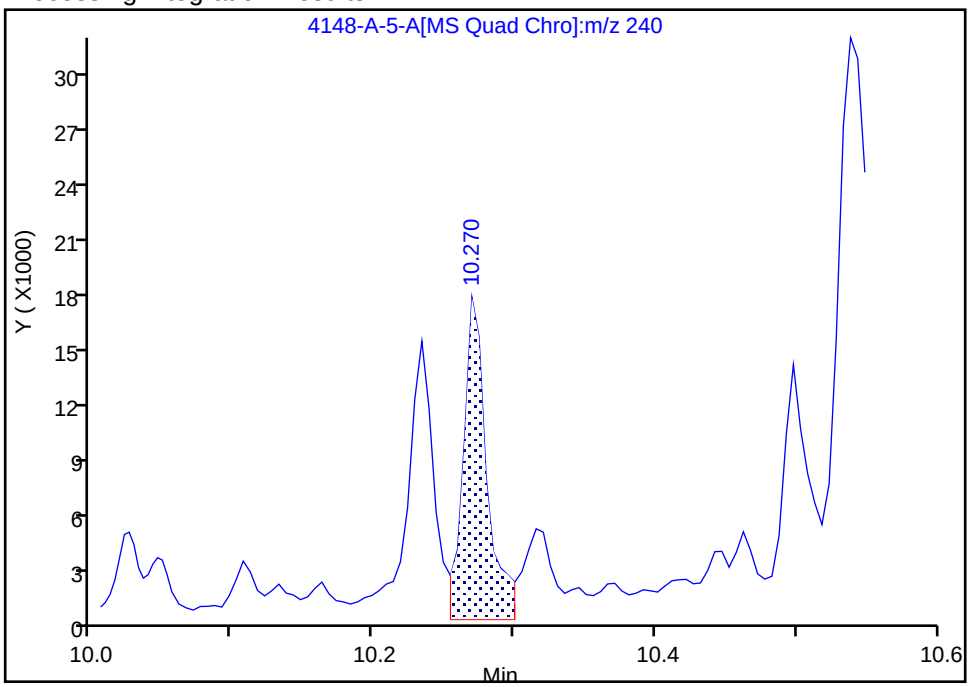
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D				
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 48 Chrysene-d12, CAS: 1719-03-5

Signal: 1

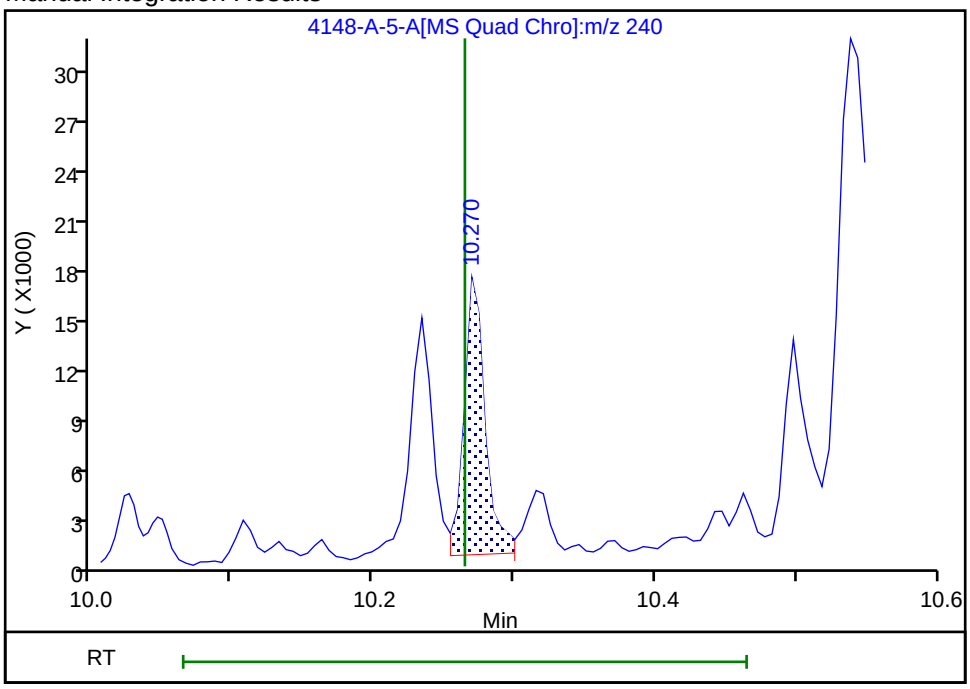
Processing Integration Results

RT: 10.27
Area: 20537
Amount: 0.098882
Amount Units: ug/ml



Manual Integration Results

RT: 10.27
Area: 16958
Amount: 0.081650
Amount Units: ug/ml



Reviewer: SK9U, 05-Dec-2023 11:59:09 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Eurofins Knoxville

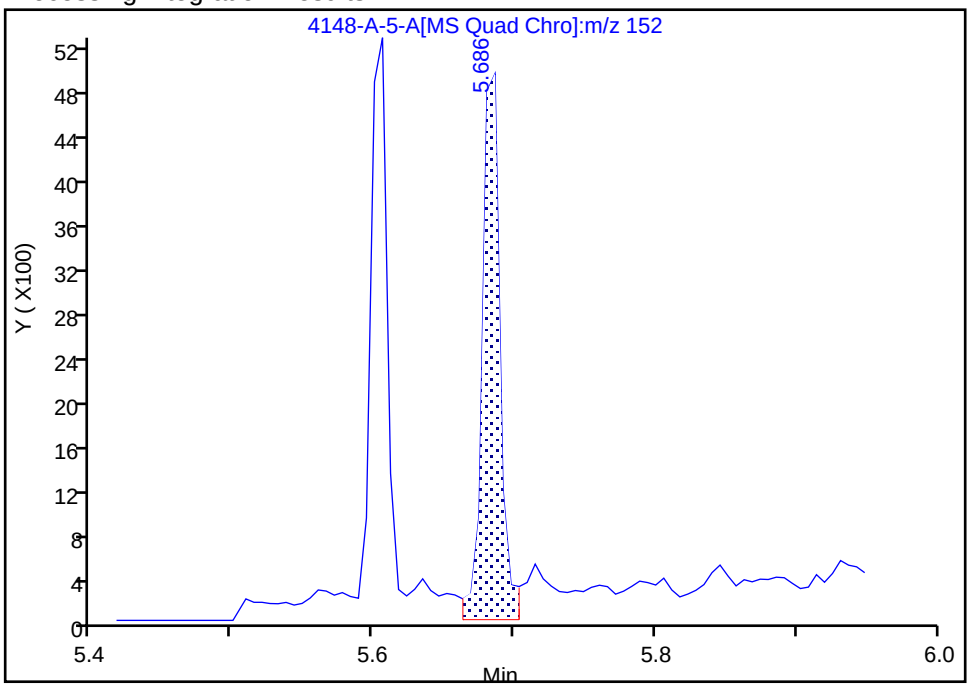
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D				
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 17 1-Methylnaphthalene-d10, CAS: 38072-94-5

Signal: 1

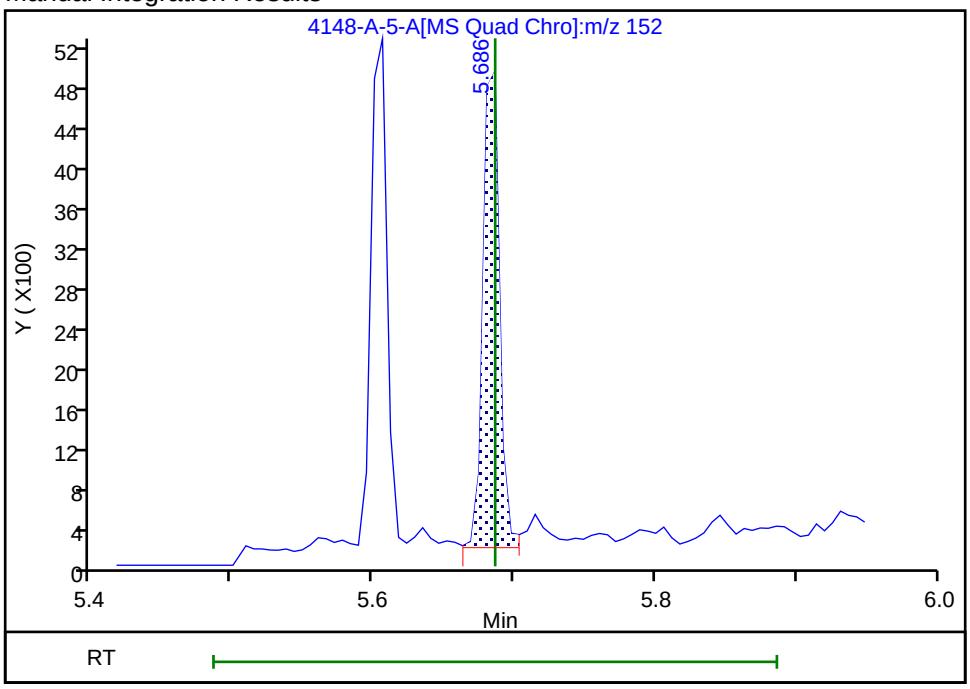
Processing Integration Results

RT: 5.69
Area: 4439
Amount: 0.035980
Amount Units: ug/ml



Manual Integration Results

RT: 5.69
Area: 3987
Amount: 0.063672
Amount Units: ug/ml



Reviewer: SK9U, 05-Dec-2023 11:57:48 -05:00:00 (UTC)
Audit Action: Assigned New Baseline Audit Reason: Baseline

Eurofins Knoxville

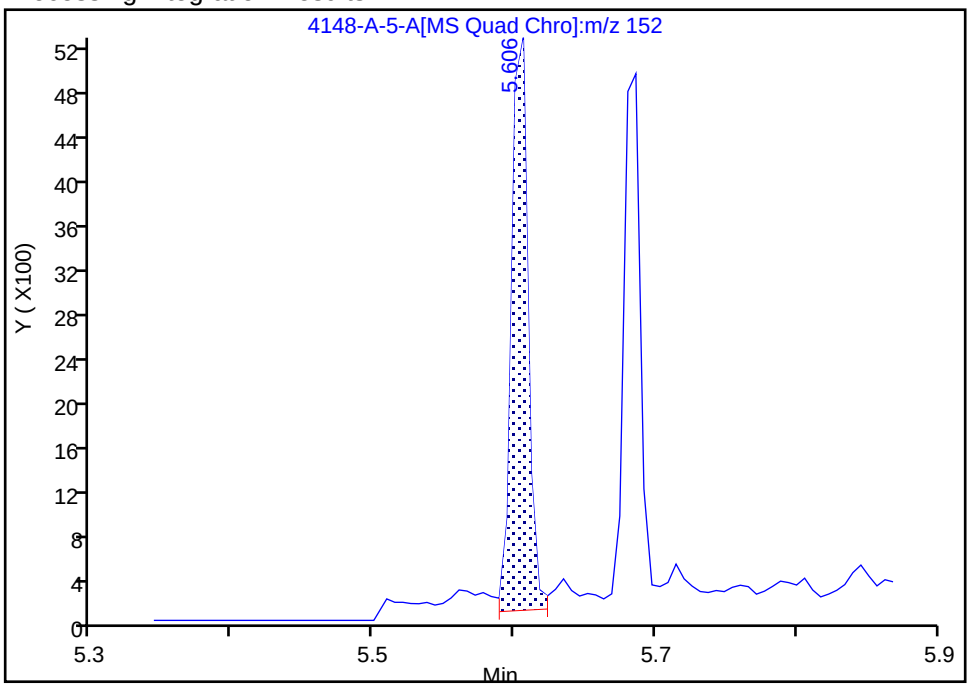
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D				
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 15 2-methylnaphthalene-d10, CAS: 7297-45-2

Signal: 1

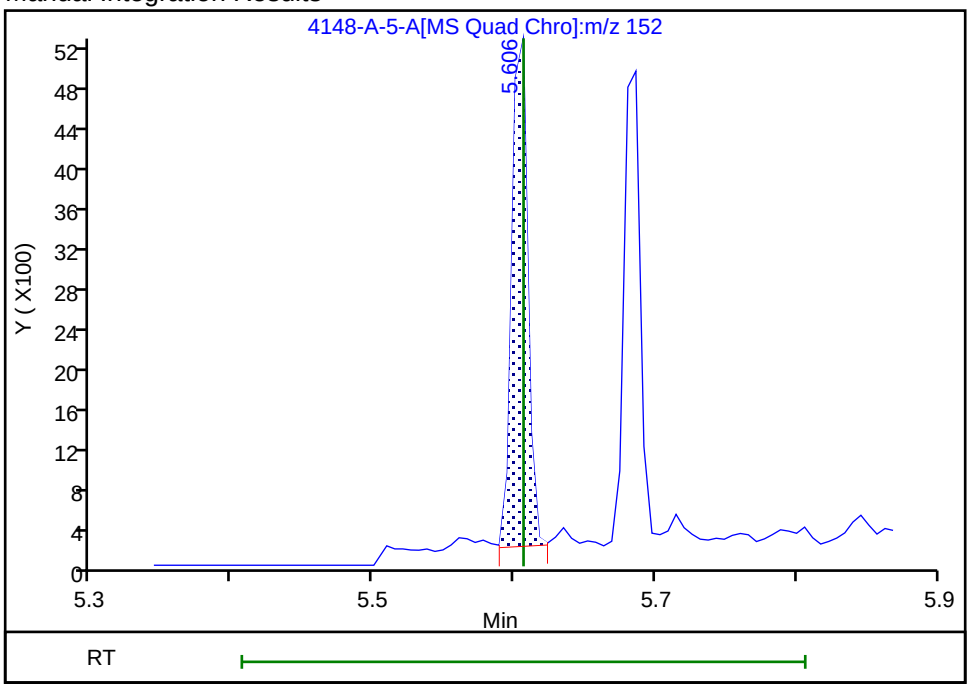
Processing Integration Results

RT: 5.61
Area: 4283
Amount: 0.034782
Amount Units: ug/ml



Manual Integration Results

RT: 5.61
Area: 4049
Amount: 0.064787
Amount Units: ug/ml



Reviewer: SK9U, 05-Dec-2023 11:57:36 -05:00:00 (UTC)
Audit Action: Assigned New Baseline Audit Reason: Baseline

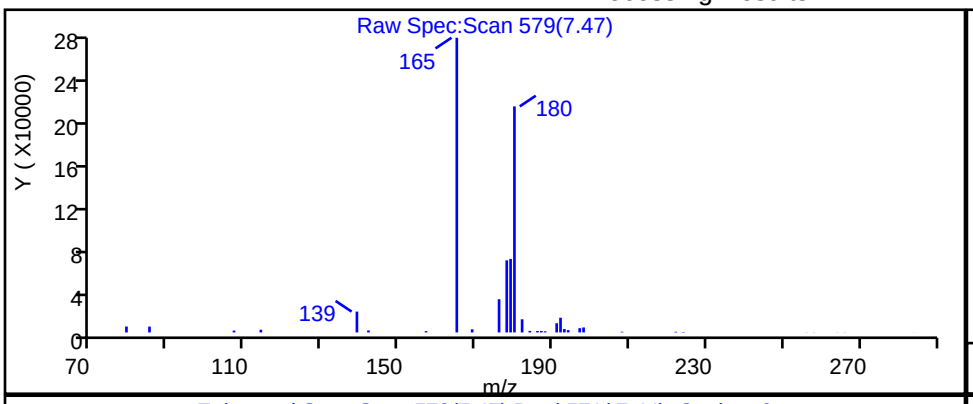
User Disabled Compound Report

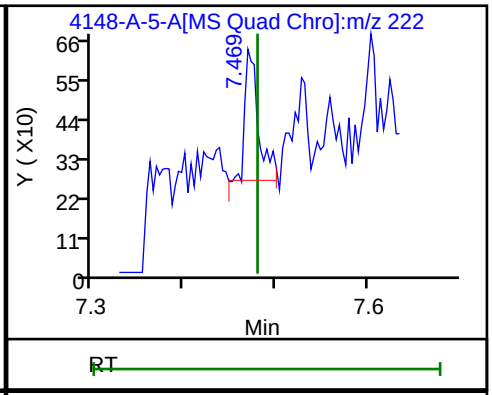
Eurofins Knoxville

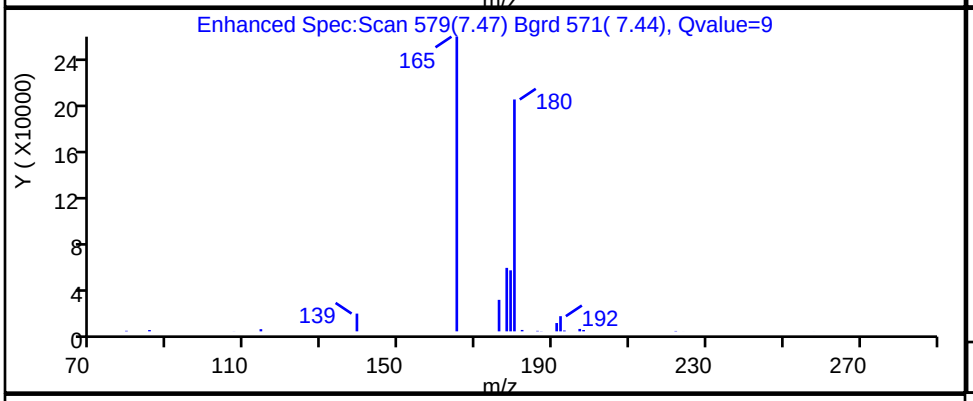
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D				
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

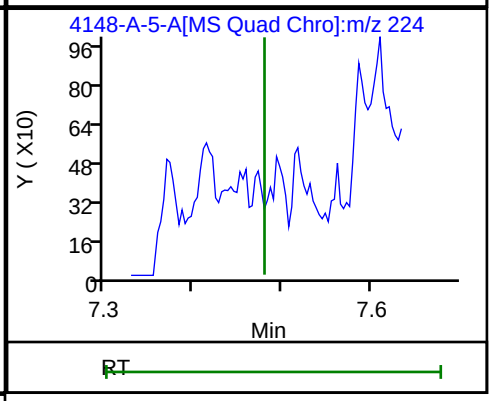
74 PCB-14, CAS: 34883-41-5

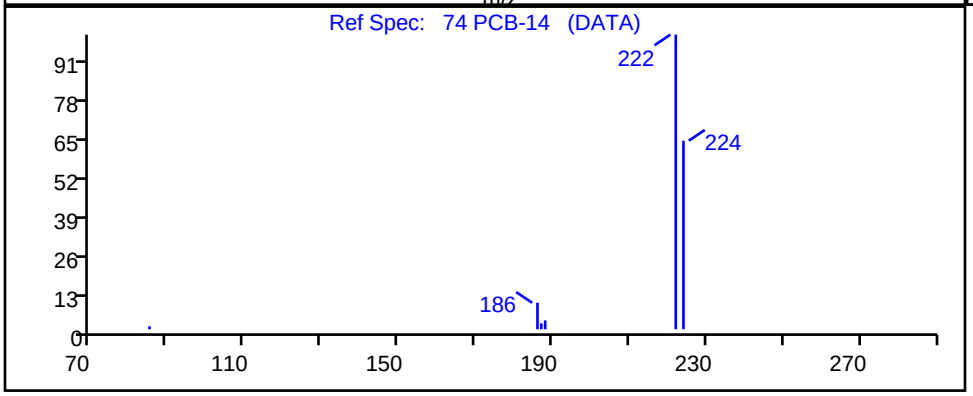
Processing Results











RT	Mass	Response	Amount
7.47	222.00	385	
7.48	224.00	0	

Reviewer: SK9U, 05-Dec-2023 17:06:33 -05:00:00 (UTC)

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

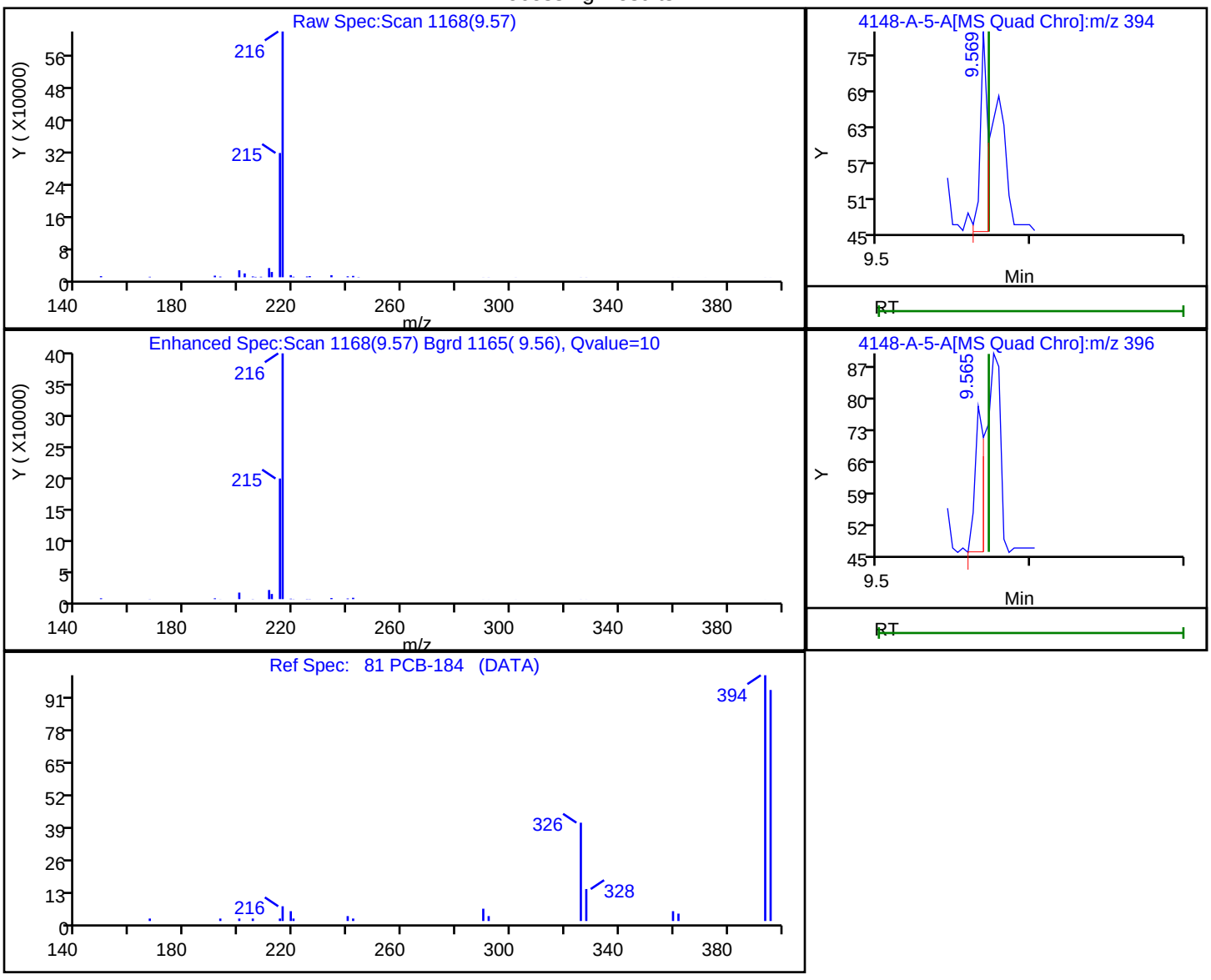
User Disabled Compound Report

Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D				
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

81 PCB-184, CAS: 74472-48-3

Processing Results



RT	Mass	Response	Amount
9.57	394.00	11	0.000112
9.57	396.00	14	

Reviewer: SK9U, 05-Dec-2023 17:06:50 -05:00:00 (UTC)

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

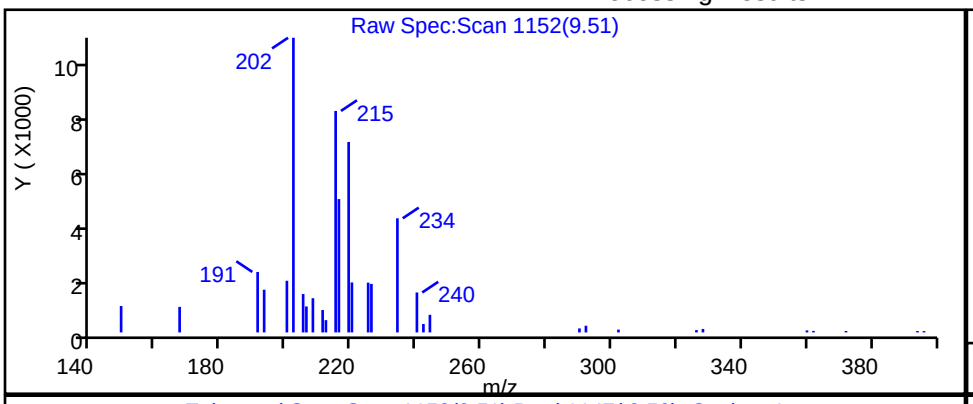
User Disabled Compound Report

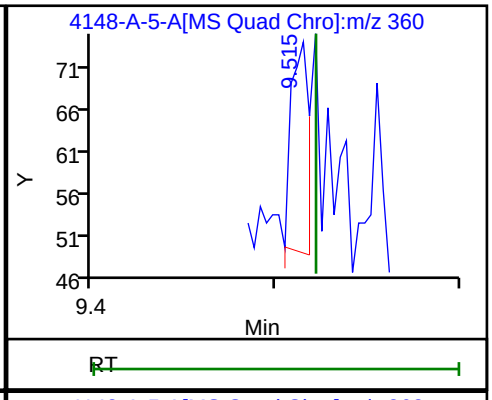
Eurofins Knoxville

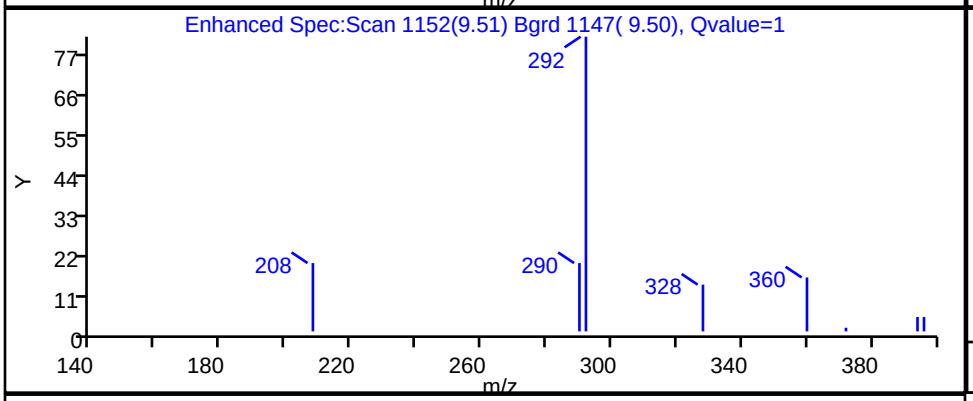
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D				
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

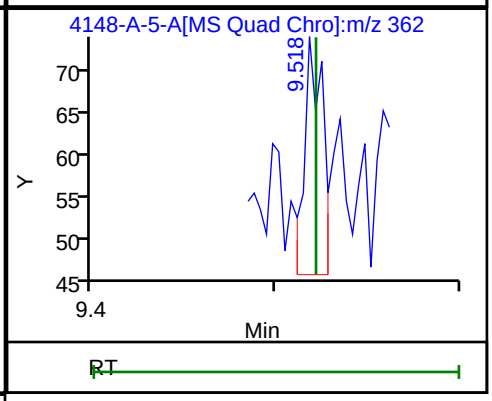
80 PCB-142, CAS: 41411-61-4

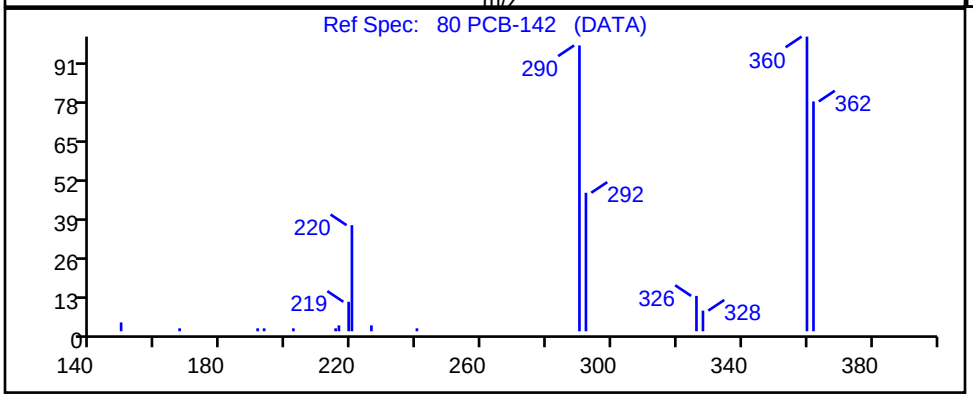
Processing Results











RT	Mass	Response	Amount
9.51	360.00	17	0.000174
9.52	362.00	21	

Reviewer: SK9U, 05-Dec-2023 17:06:51 -05:00:00 (UTC)

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

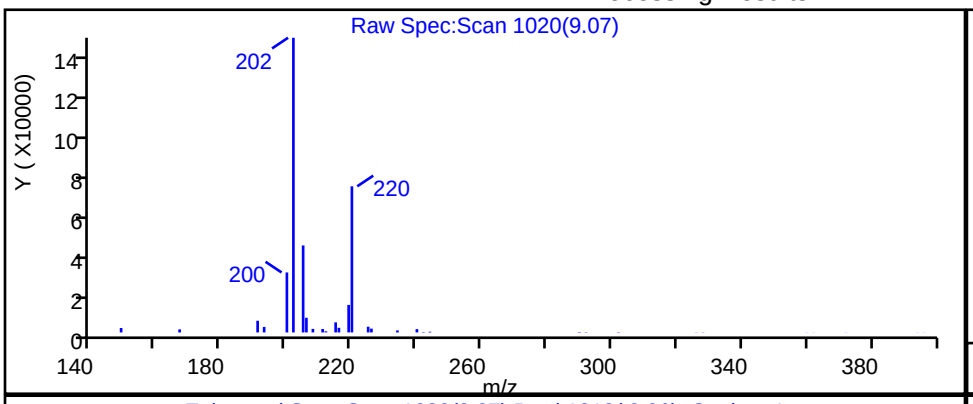
User Disabled Compound Report

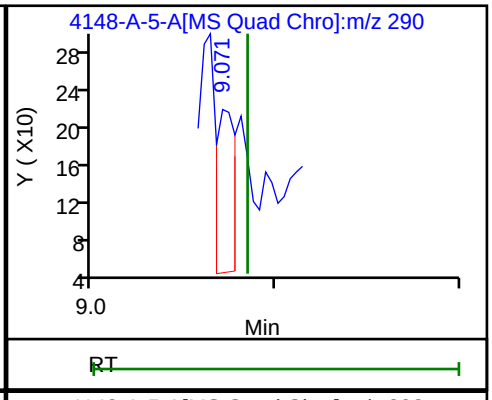
Eurofins Knoxville

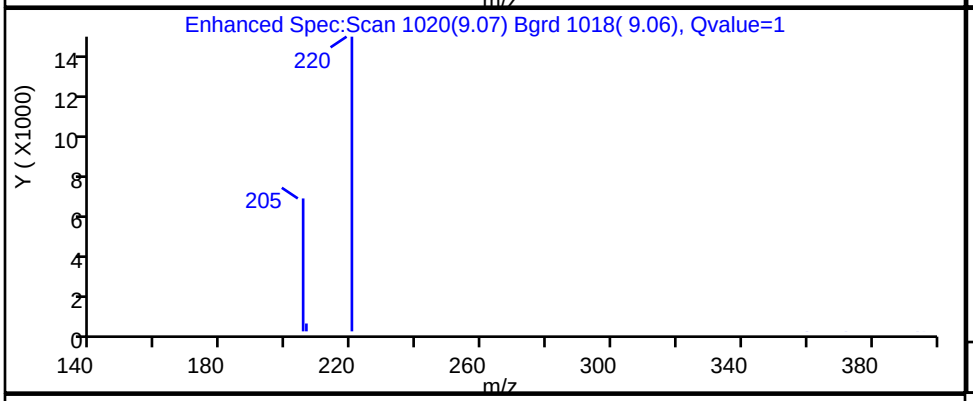
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D				
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

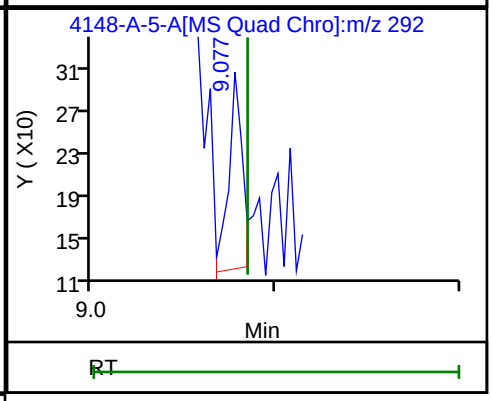
79 PCB-78, CAS: 70362-49-1

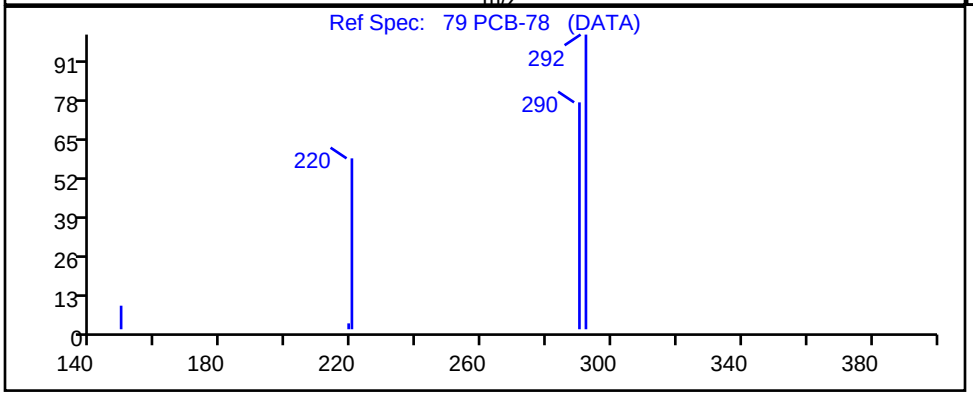
Processing Results











RT	Mass	Response	Amount
9.07	290.00	125	0.001100
9.08	292.00	94	

Reviewer: SK9U, 05-Dec-2023 17:06:44 -05:00:00 (UTC)

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

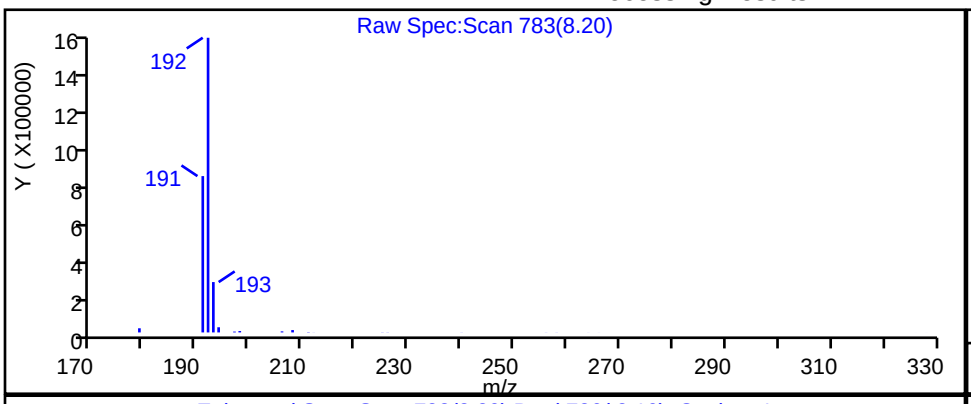
User Disabled Compound Report

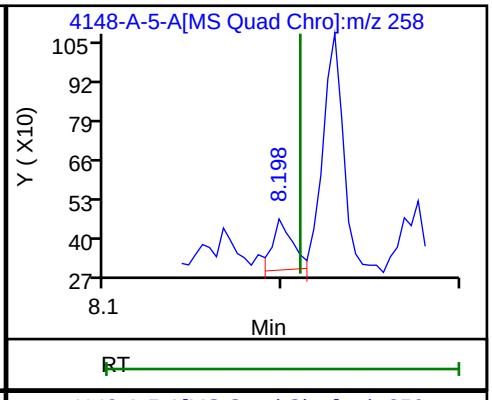
Eurofins Knoxville

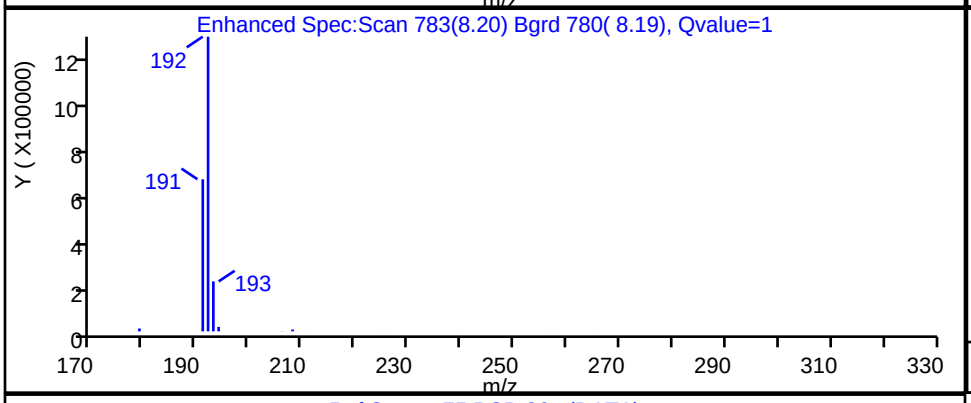
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\140-34148-A-5-A.D				
Injection Date:	01-Dec-2023 22:11:41	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-5-J	Lab Sample ID:	140-34148-5		
Client ID:	1804576-851-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	33
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

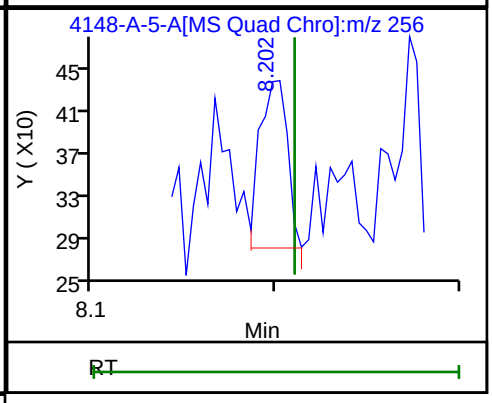
75 PCB-36, CAS: 38444-87-0

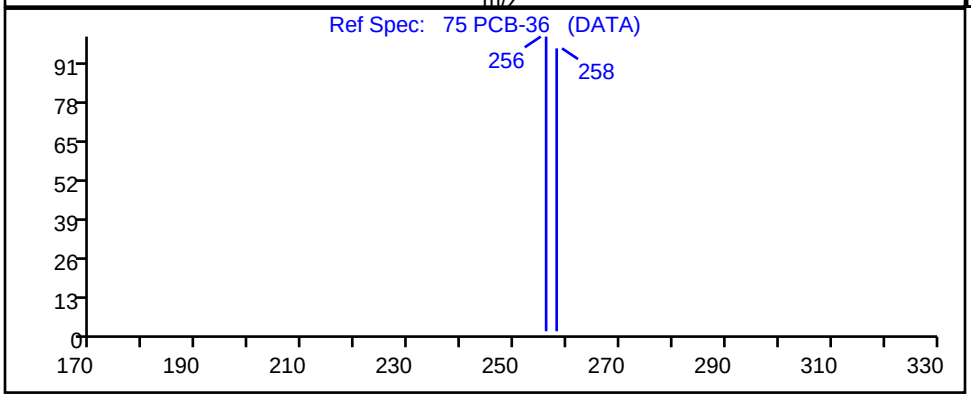
Processing Results











RT	Mass	Response	Amount
8.20	258.00	134	0.000581
8.20	256.00	166	

Reviewer: SK9U, 05-Dec-2023 17:06:36 -05:00:00 (UTC)

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: 1804576-852-S1 | Lab Sample ID: 140-34148-6

Matrix: PE | Lab File ID: 810-82790-A-1-A.D

Analysis Method: ID-0016 | Date Collected: 10/26/2023 14:00

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.011(g) | Date Analyzed: 11/16/2023 15:49

Con. Extract Vol.: 500(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80349 | Units: ng/g

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
83-32-9	Acenaphthene	2700		910	240
208-96-8	Acenaphthylene	610	J	910	66
120-12-7	Anthracene	2600		910	290
56-55-3	Benzo[a]anthracene	8800		910	340
50-32-8	Benzo[a]pyrene	11000		910	250
205-99-2	Benzo[b]fluoranthene	11000		910	320
192-97-2	Benzo[e]pyrene	6900		910	150
191-24-2	Benzo[g,h,i]perylene	4700		910	100
207-08-9	Benzo[k]fluoranthene	7100		910	210
218-01-9	Chrysene	10000		910	120
53-70-3	Dibenz(a,h)anthracene	1200		910	75
206-44-0	Fluoranthene	19000		910	740
86-73-7	Fluorene	1700		910	290
193-39-5	Indeno[1,2,3-cd]pyrene	5100		910	100
90-12-0	1-Methylnaphthalene	800	J	4500	450
91-57-6	2-Methylnaphthalene	990	J	4500	640
91-20-3	Naphthalene	ND		18000	2600
198-55-0	Perylene	3000		910	460
85-01-8	Phenanthrene	11000		1800	1600
129-00-0	Pyrene	23000		1800	270
STL00912	C1-Fluoranthenes/pyrene	14000		910	910
STL00913	C1-Fluorenes	ND		1800	1200
STL00914	C2-Fluorenes	1900		910	910
STL00915	C3-Fluorenes	2200		910	910
STL00917	C2-Naphthalenes	1800		1800	1800
STL00918	C3-Naphthalenes	2500		1800	1800
STL00919	C4-Naphthalenes	ND		2700	2500
STL00901	C1-Phenanthrenes/Anthracenes	5200		3600	3100
STL00902	C2-Phenanthrenes/Anthracenes	8900		910	910
STL00903	C3-Phenanthrenes/Anthracenes	6100		910	910
STL00904	C4-Phenanthrenes/Anthracenes	3200		910	910
STL02218	C1-Chrysenes/Benz(a)anthracenes	9200		910	910

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: 1804576-852-S1 | Lab Sample ID: 140-34148-6

Matrix: PE | Lab File ID: 810-82790-A-1-A.D

Analysis Method: ID-0016 | Date Collected: 10/26/2023 14:00

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.011(g) | Date Analyzed: 11/16/2023 15:49

Con. Extract Vol.: 500(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80349 | Units: ng/g

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
STL02219	C2-Chrysenes/Benz(a)anthracenes	4800		910	910
STL02220	C3-Chrysenes/Benz(a)anthracenes	2400		910	910
STL02221	C4-Chrysenes/Benz(a)anthracenes	1000		910	910
34883-41-5	PCB-14	ND		910	9.1
74472-51-8	PCB-192	540	J	910	9.1
74472-48-3	PCB-184	200	J	910	9.1
33979-03-2	PCB-155	33	J	910	9.1
41411-61-4	PCB-142	68	J	910	9.1
74472-52-9	PCB-204	860	J	910	9.1
56558-16-8	PCB-104	10	J	910	9.1
56558-18-0	PCB-121	91	J	910	9.1
70362-49-1	PCB-78	ND		910	9.1
38444-87-0	PCB-36	ND		910	9.1

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
93951-97-4	Acenaphthylene-d8	77		30-120
1719-06-8	Anthracene-d10	75		30-120
63466-71-7	Benzo(a)pyrene-d12	76		30-120
93951-98-5	Benzo(b)fluoranthene-d12	85		30-120
93951-66-7	Benzo(ghi)perylene-d12	85		30-120
93952-01-3	Benzo(k)fluoranthene-d12	81		30-120
1719-03-5	Chrysene-d12	74		30-120
13250-98-1	Dibenz(a,h)anthracene-d14	83		30-120
93951-69-0	Fluoranthene-d10	84		30-120
81103-79-9	Fluorene -d10	79		30-120
203578-33-0	Indeno[1,2,3-cd]pyrene-d12	87		30-120
38072-94-5	1-Methylnaphthalene-d10	79		30-120
7297-45-2	2-Methylnaphthalene-d10	77		30-120
1146-65-2	Naphthalene-d8	74		30-120
1520-96-3	Perylene-d12	71		30-120
1517-22-2	Phenanthrene-d10	78		30-120

Report Date: 22-Nov-2023 14:10:54 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D
Lims ID: 140-34148-A-6-A
Client ID: 1804576-852-S1
Sample Type: Client
Inject. Date: 16-Nov-2023 15:49:44 ALS Bottle#: 0 Worklist Smp#: 14
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030519-014
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 22-Nov-2023 14:10:53 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1637

First Level Reviewer: SK9U Date: 22-Nov-2023 14:10:53

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/ml	%Rec	Flags
D 10 Naphthalene-d8	136	5.059	5.068	-0.009	100	35826	0.3703	74.1	
11 Naphthalene	128	5.078	5.078	0.000	41	2218	0.0263		M
D 15 2-methylnaphthalene-d10	152	5.612	5.612	0.000	92	24356	0.3872	77.4	
16 2-Methylnaphthalene	142	5.635	5.635	0.000	95	1322	0.0218		
D 17 1-Methylnaphthalene-d10	152	5.692	5.686	0.006	100	24771	0.3930	78.6	
18 1-Methylnaphthalene	142	5.720	5.715	0.005	95	1055	0.0175		
D 23 Acenaphthylene-d8	160	6.367	6.362	0.005	90	41371	0.3875	77.5	
24 Acenaphthylene	152	6.377	6.372	0.005	51	1309	0.0135		M
* 26 Acenaphthene-d10	164	6.492	6.492	0.000	97	34701	0.5000		
27 Acenaphthene	154	6.522	6.517	0.005	99	3658	0.0587		
D 29 Fluorene -d10	176	6.925	6.920	0.005	100	32760	0.3962	79.2	
30 Fluorene	166	6.950	6.945	0.005	96	3133	0.0368		
D 35 Phenanthrene-d10	188	7.732	7.732	0.000	99	58582	0.3901	78.0	
36 Phenanthrene	178	7.752	7.749	0.003	36	33366	0.2361		
D 38 Anthracin-d10	188	7.780	7.777	0.003	99	54796	0.3738	74.8	
39 Anthracene	178	7.794	7.794	0.000	98	7741	0.0574		
D 41 Fluoranthene-d10	212	8.808	8.805	0.003	100	81366	0.4177	83.5	
43 Fluoranthene	202	8.825	8.825	0.000	60	87179	0.4187		
* 44 Pyrene-d10 (IS)	212	9.027	9.024	0.003	99	96296	0.5000		
45 Pyrene	202	9.044	9.044	0.000	96	106622	0.5018		
47 Benzo[a]anthracene	228	10.260	10.260	0.000	99	34647	0.1928		
D 48 Chrysene-d12	240	10.270	10.270	0.000	98	69202	0.3683	73.7	
50 Chrysene	228	10.295	10.295	0.000	15	46079	0.2287		M
D 52 Benzo(b)fluoranthene-d12	264	11.376	11.369	0.007	100	62093	0.4251	85.0	
53 Benzo[b]fluoranthene	252	11.404	11.397	0.007	68	48893	0.2337		
D 54 Benzo(k)fluoranthene-d12	264	11.411	11.404	0.007	84	69707	0.4062	81.2	
55 Benzo[k]fluoranthene	252	11.425	11.425	0.000	98	31909	0.1563		
* 56 Benzo(e)pyrene-d12	264	11.684	11.684	0.000	99	57670	0.5000		
57 Benzo[e]pyrene	252	11.712	11.712	0.000	100	25061	0.1521		
D 58 Benzo(a)pyrene-d12	264	11.747	11.747	0.000	100	48896	0.3817	76.3	
59 Benzo[a]pyrene	252	11.775	11.775	0.000	100	37581	0.2324		
D 60 Perylene-d12	264	11.845	11.838	0.007	100	50724	0.3568	71.4	

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/ml	%Rec	Flags
61 Perylene	252	11.873	11.873	0.000	100	9498	0.0655		
D 62 Indeno[1,2,3-cd]pyrene-d12	288	13.186	13.186	0.000	83	60300	0.4333	86.7	
D 63 Dibenz(a,h)anthracene-d14	292	13.196	13.186	0.000	89	51921	0.4170	83.4	
65 Indeno[1,2,3-cd]pyrene	276	13.224	13.214	0.010	56	22485	0.1114		M
66 Dibenz(a,h)anthracene	278	13.243	13.233	0.010	35	4255	0.0257		M
D 67 Benzo(ghi)perylene-d12	288	13.552	13.543	0.009	100	59018	0.4270	85.4	
68 Benzo[g,h,i]perylene	276	13.580	13.580	0.000	85	17895	0.1035		
76 PCB-104	326	8.399	8.393	0.003	54	12	0.000227		
77 PCB-121	326	8.751	8.748	0.000	11	85	0.002005		
78 PCB-155	360	8.849	8.852	0.000	27	29	0.000731		
80 PCB-142	360	9.528	9.519	0.006	3	43	0.001489		
81 PCB-184	394	9.576	9.579	0.004	17	125	0.004324		
* 82 PCB-167L	372	10.026	10.027	-0.001	74	14111	0.4000		
83 PCB-204	428	10.255	10.246	0.005	1	356	0.0189		
84 PCB-192	394	10.275	10.275	0.000	4	314	0.0118		
A 86 C2-Naphthalenes	156	6.237	(6.068-6.407)		0	3324	0.0394		
A 87 C3-Naphthalenes	170	6.709	(6.348-7.050)		0	4699	0.0558		
A 88 C4-Naphthalenes	184	7.129	(6.678-7.562)		0	4174	0.0495		
A 89 C1-Fluorenes	180	7.407	(7.364-7.505)		0	1906	0.0224		
A 90 C2-Fluorenes	194	7.874	(7.730-8.069)		0	3520	0.0414		
A 91 C3-Fluorenes	208	8.328	(8.092-8.605)		0	4178	0.0491		
A 96 C1-Phenanthrenes/Anthracenes	191	8.243	(8.155-8.332)		0	16202	0.1146		
A 97 C2-Phenanthrenes/Anthracenes	206	8.698	(8.490-8.926)		0	27642	0.1956		
A 98 C3-Phenanthrenes/Anthracenes	220	9.168	(8.851-9.456)		0	19097	0.1351		
A 99 C4-Phenanthrenes/Anthracenes	234	9.495	(9.106-9.824)		0	10085	0.0714		
A 100 C1-Fluoranthenes/pyrene	216	9.436	(9.246-9.640)		0	65760	0.3095		
A 101 C1-Chrysenes/Benz(a)anthracenes	242	10.686	(10.456-10.941)		0	40725	0.2022		
A 102 C2-Chrysenes/Benz(a)anthracenes	256	11.015	(10.667-11.381)		0	21156	0.1050		
A 103 C3-Chrysenes/Benz(a)anthracenes	270	11.642	(11.002-11.867)		0	10468	0.0520		
A 104 C4-Chrysenes/Benz(a)anthracenes	284	12.112	(11.475-12.553)		0	4449	0.0221		

QC Flag Legend

Processing Flags

Review Flags

M - Manually Integrated

Reagents:

60ISPCB_00001 Amount Added: 5.00 Units: uL

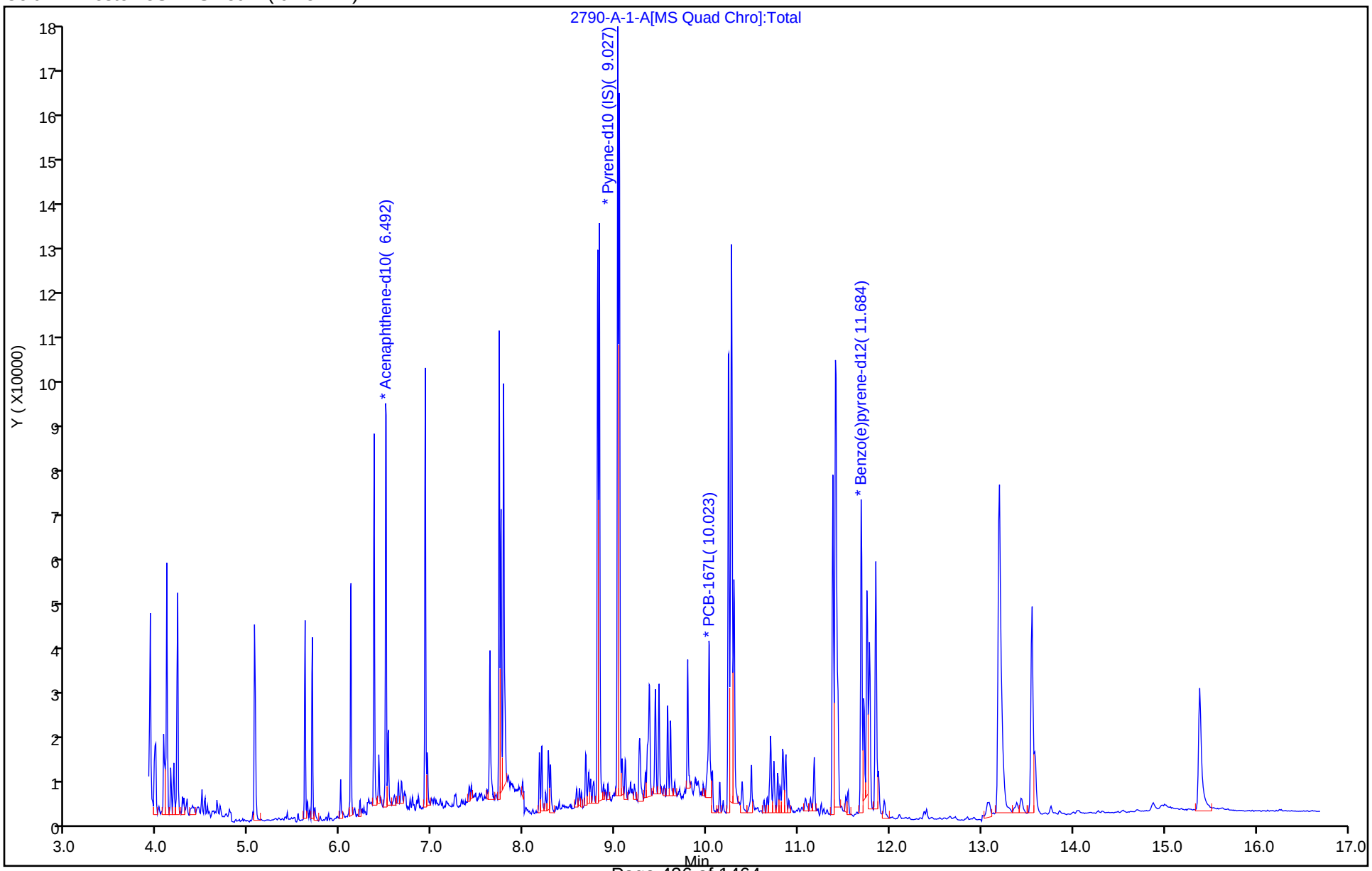
Report Date: 22-Nov-2023 14:10:54 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D

Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6	Worklist Smp#:	14
Client ID:	1804576-852-S1				
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



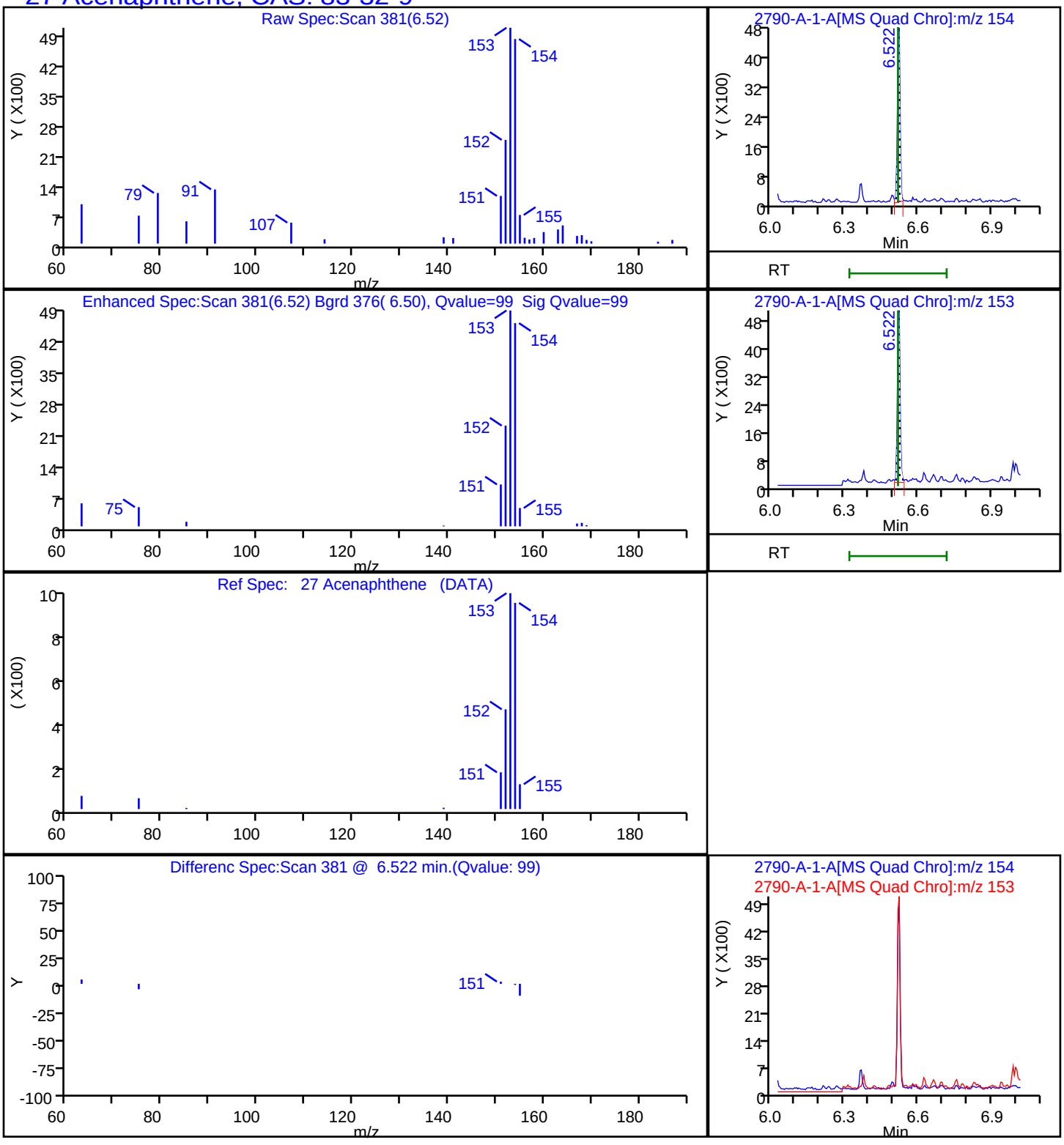
Report Date: 22-Nov-2023 14:10:55 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D

Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6
Client ID:	1804576-852-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

27 Acenaphthene, CAS: 83-32-9

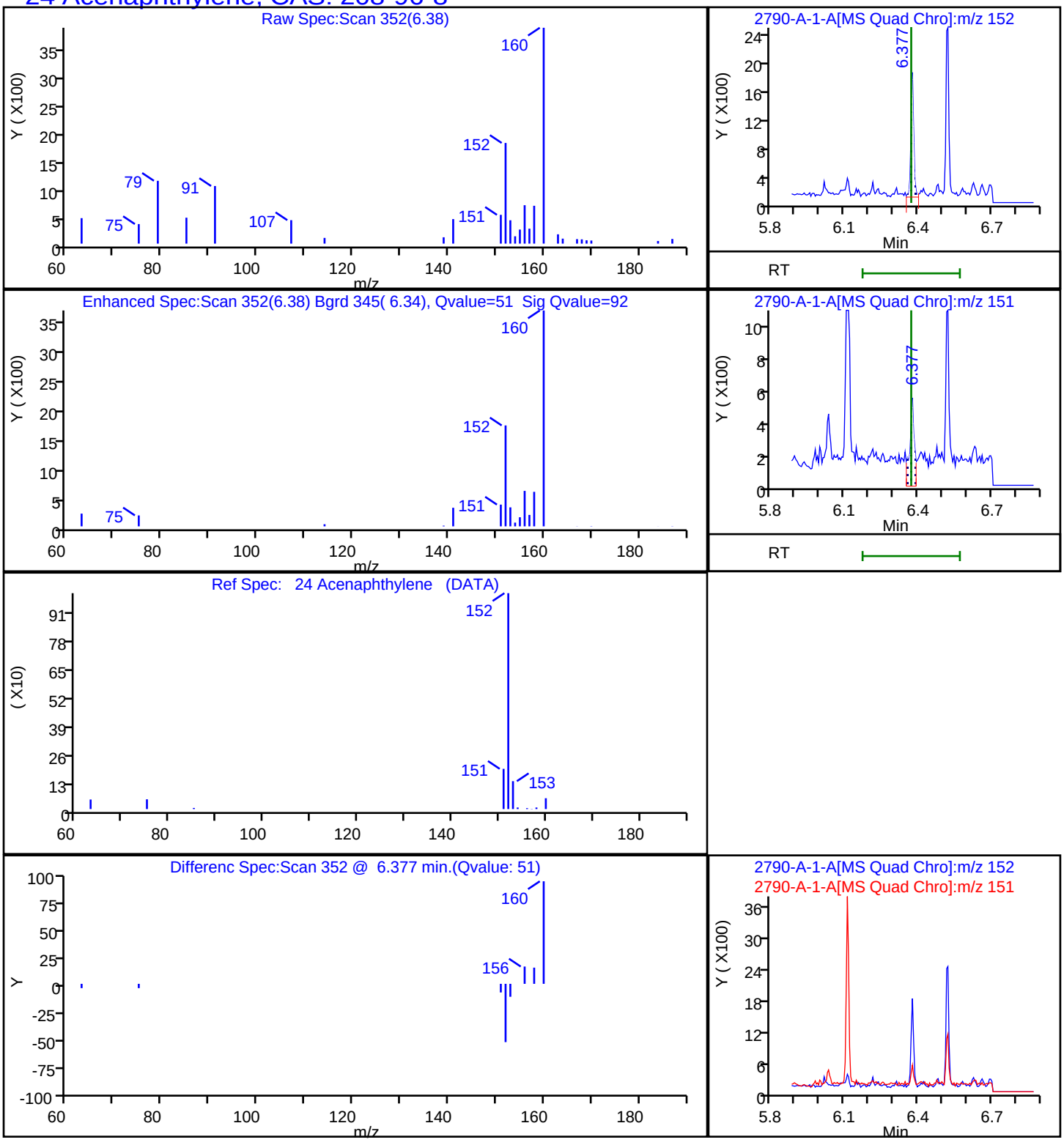


Report Date: 22-Nov-2023 14:10:55 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D				
Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

24 Acenaphthylene, CAS: 208-96-8



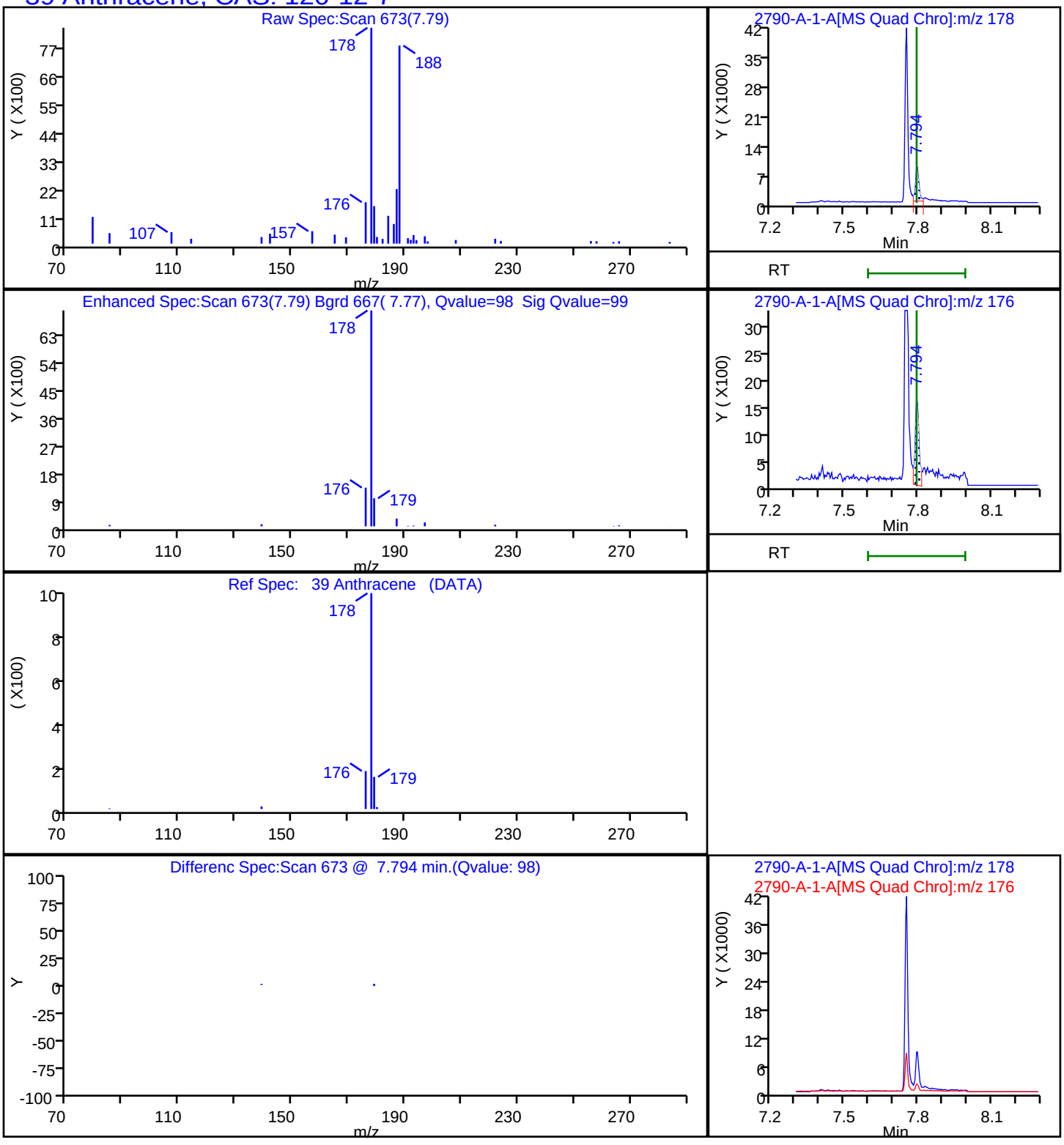
Report Date: 22-Nov-2023 14:10:55 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D

Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

39 Anthracene, CAS: 120-12-7



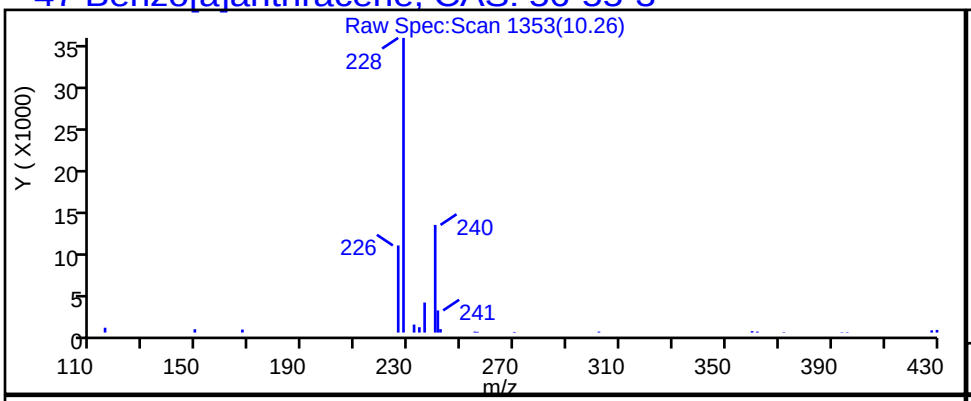
Report Date: 22-Nov-2023 14:10:55 Chrom Revision: 2.3 15-Nov-2023 20:54:34

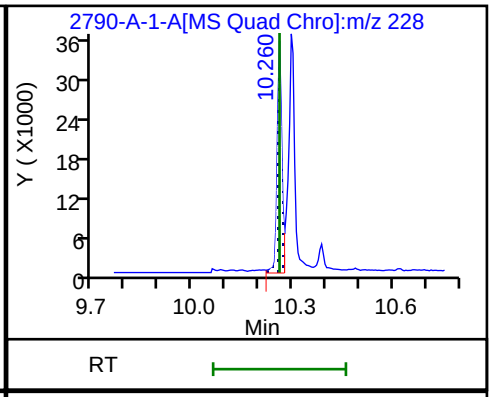
Eurofins Knoxville

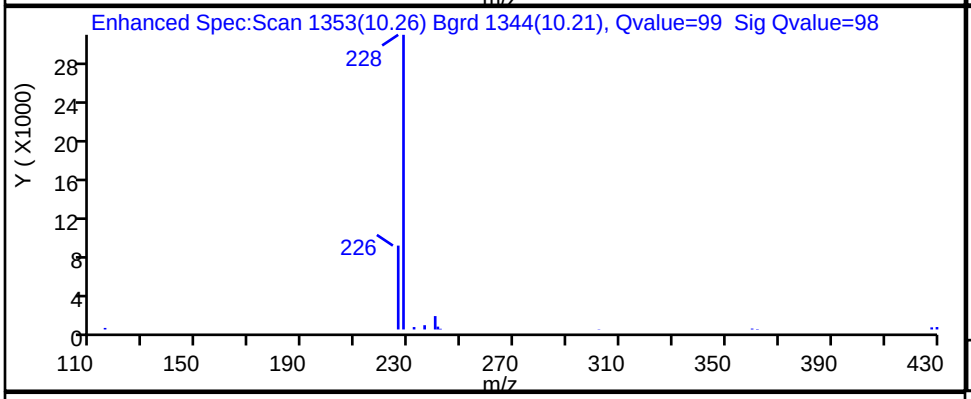
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D

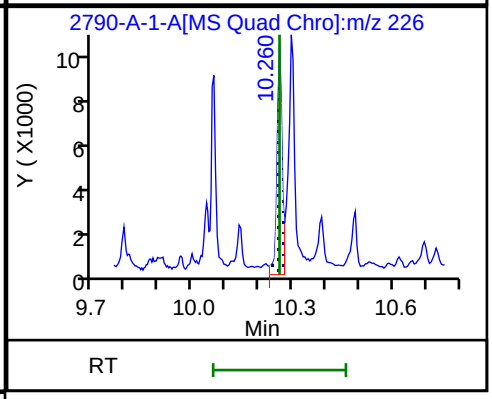
Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6
Client ID:	1804576-852-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

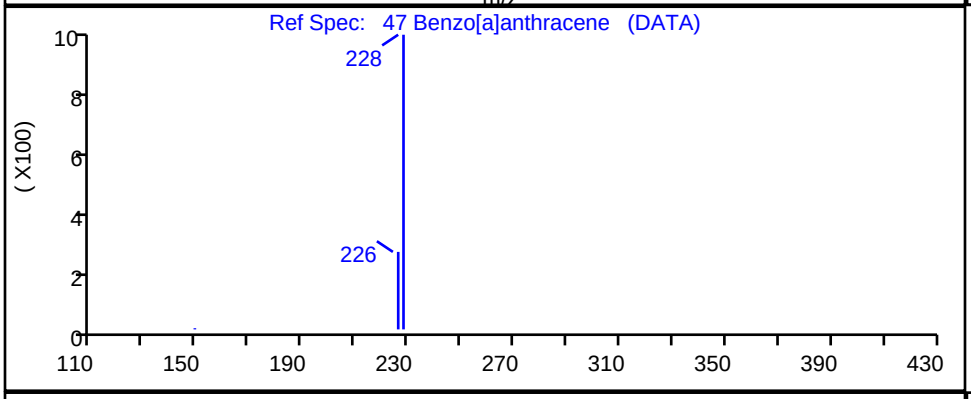
47 Benzo[a]anthracene, CAS: 56-55-3

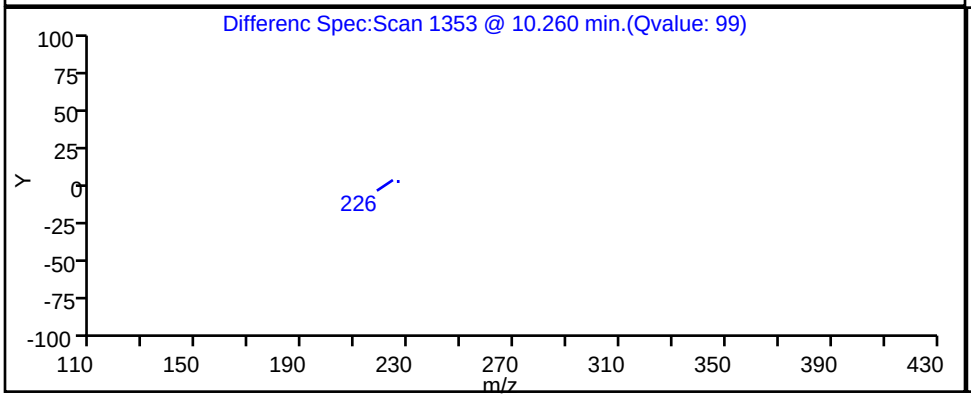


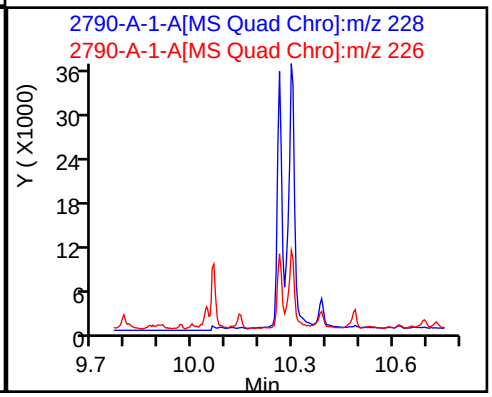










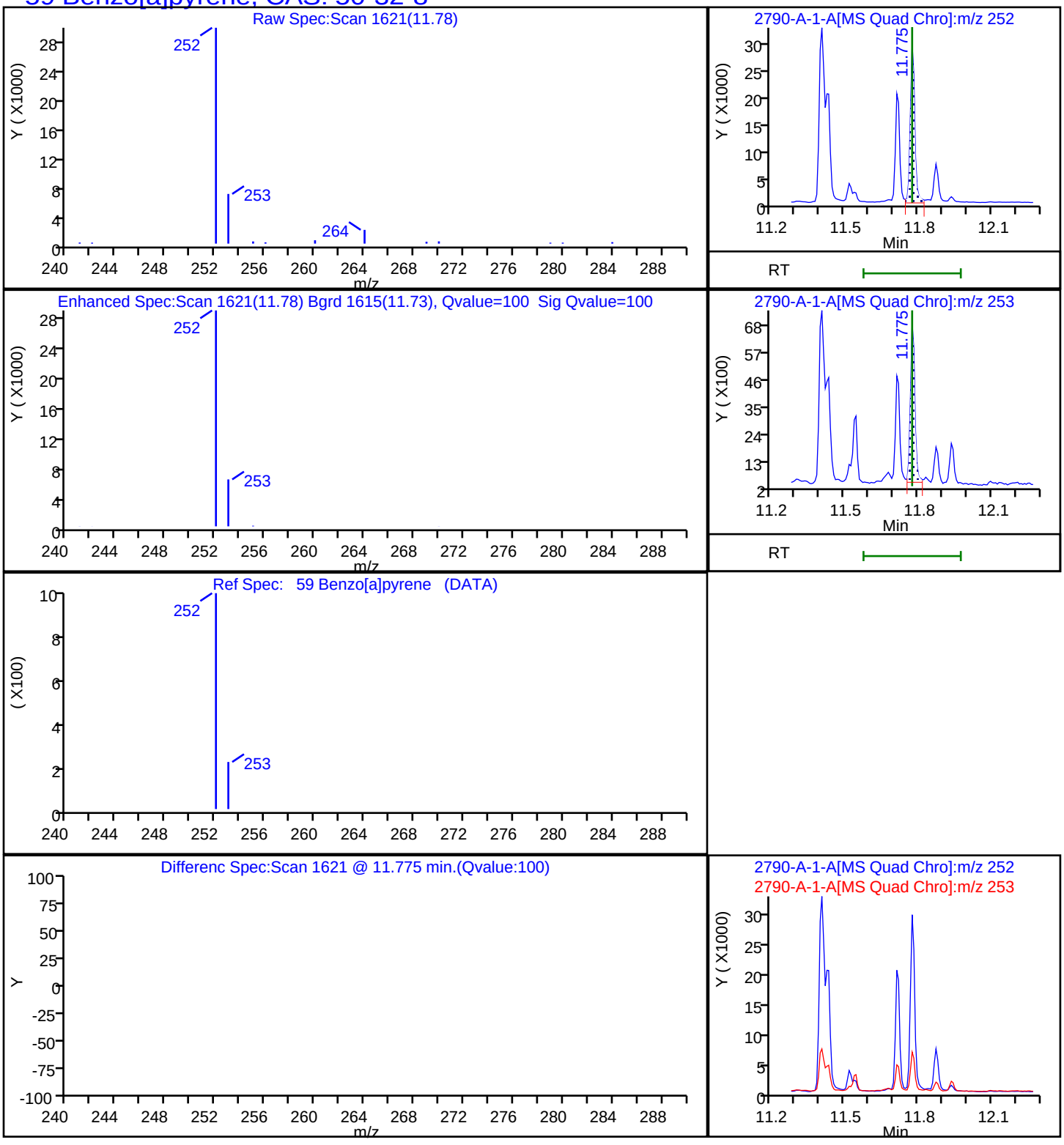


Report Date: 22-Nov-2023 14:10:55 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D				
Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

59 Benzo[a]pyrene, CAS: 50-32-8



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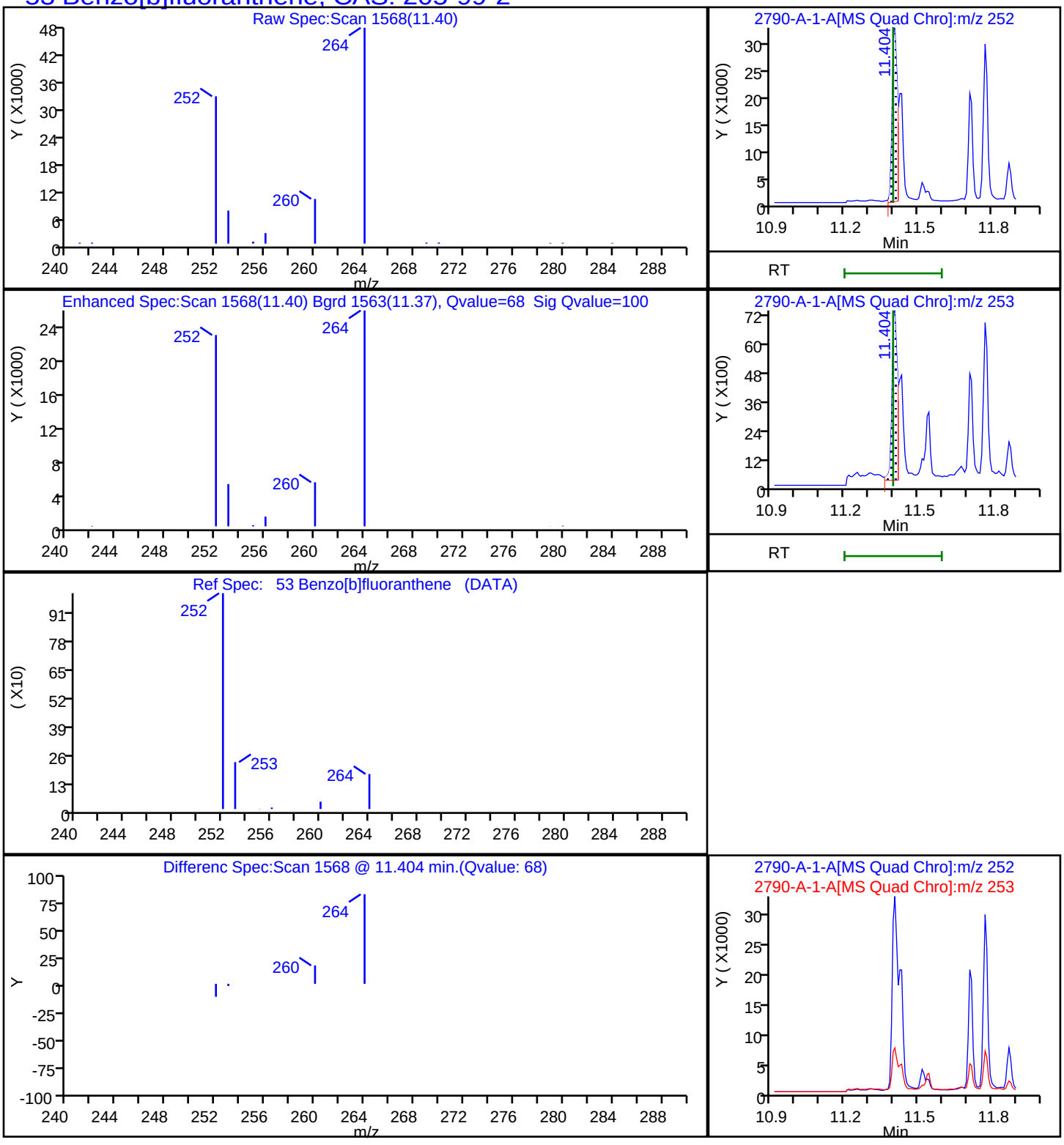
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D

Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

53 Benzo[b]fluoranthene, CAS: 205-99-2



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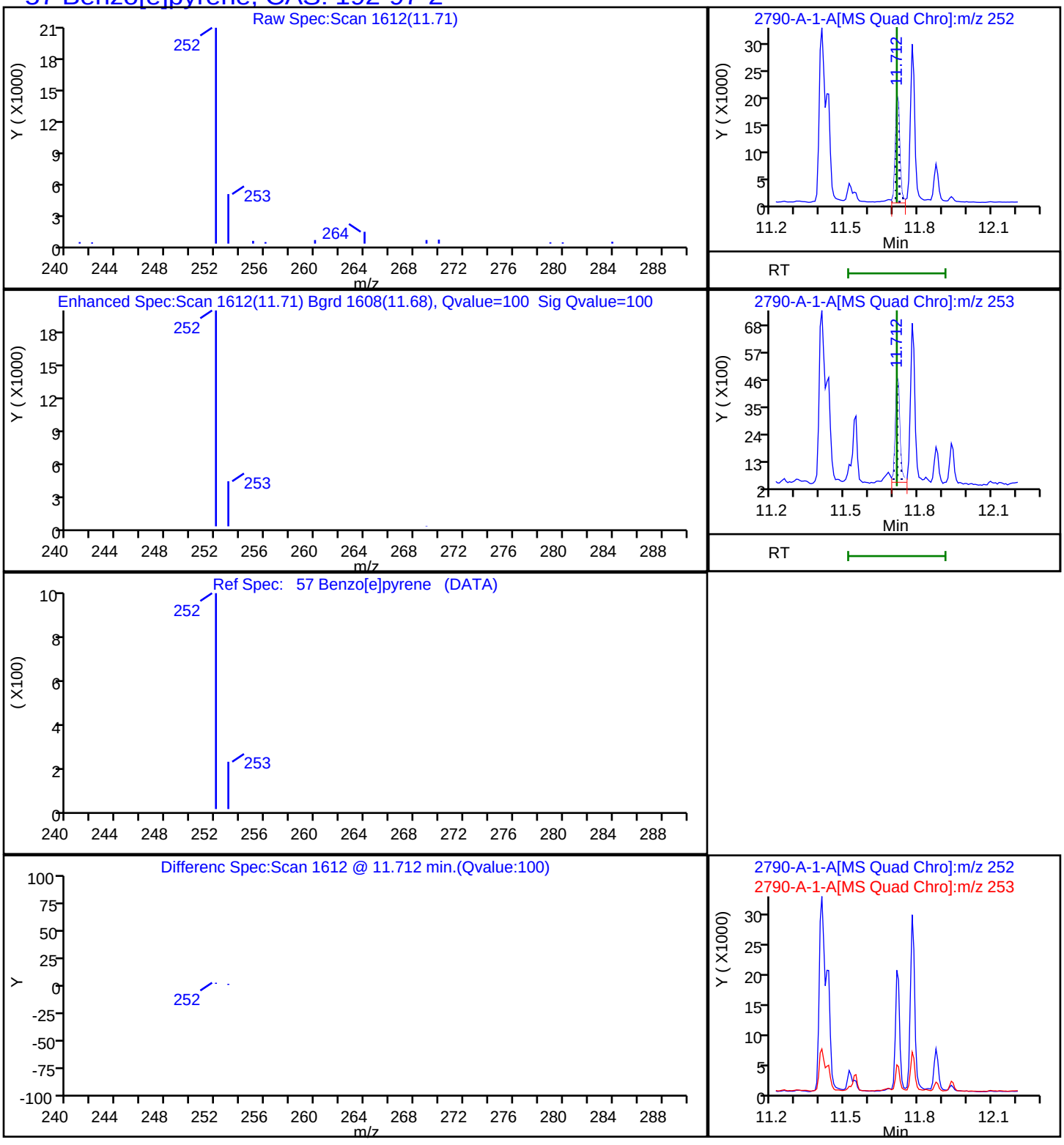
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D

Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6
Client ID:	1804576-852-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

57 Benzo[e]pyrene, CAS: 192-97-2



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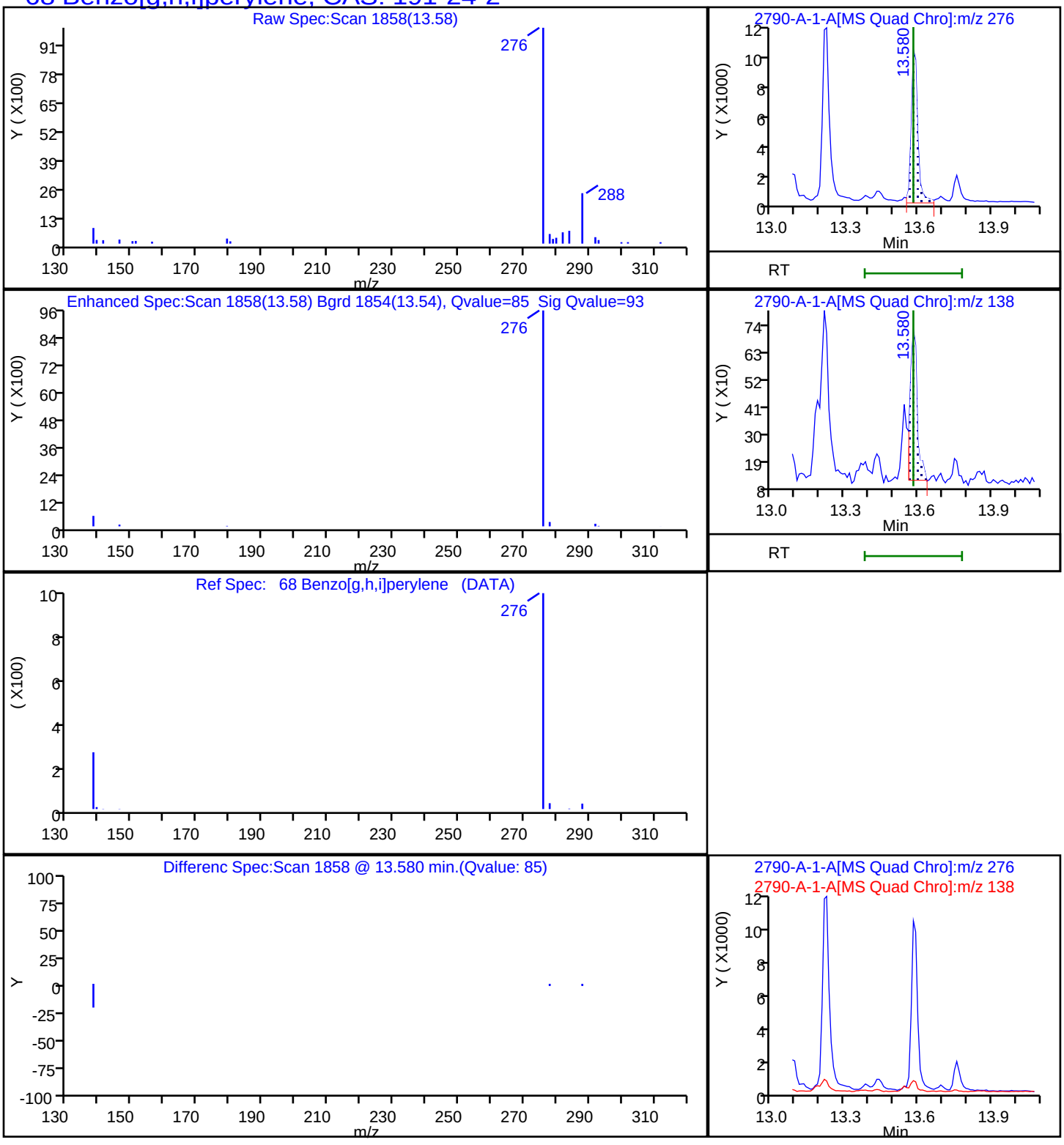
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D

Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

68 Benzo[g,h,i]perylene, CAS: 191-24-2



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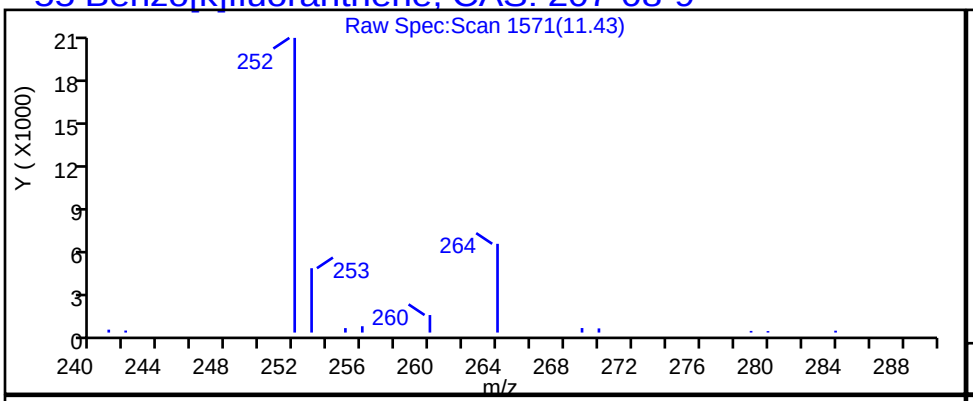
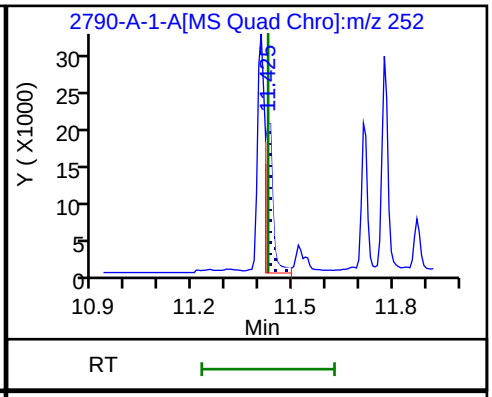
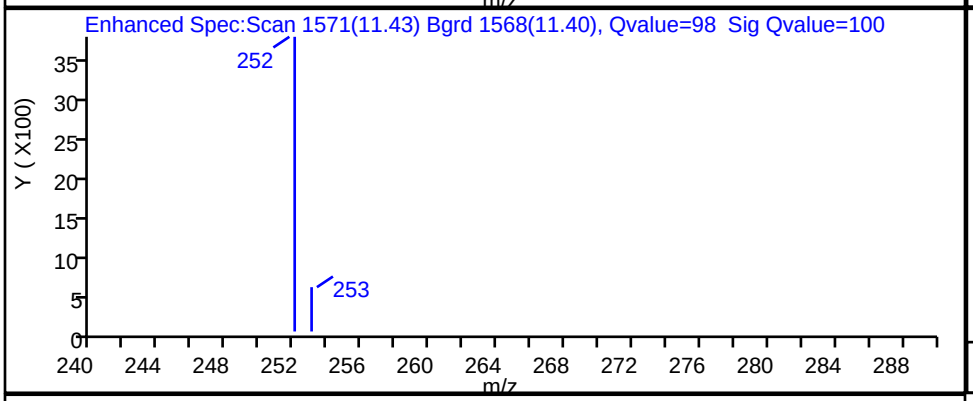
Eurofins Knoxville

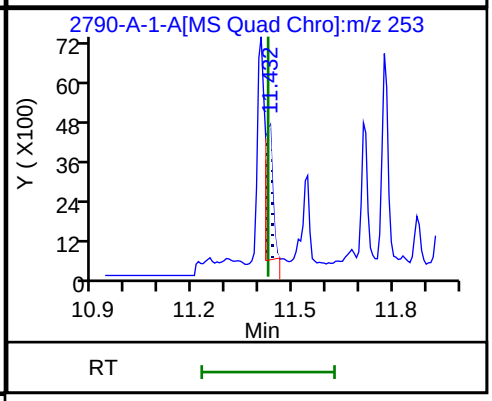
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D		
Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6
Client ID:	1804576-852-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

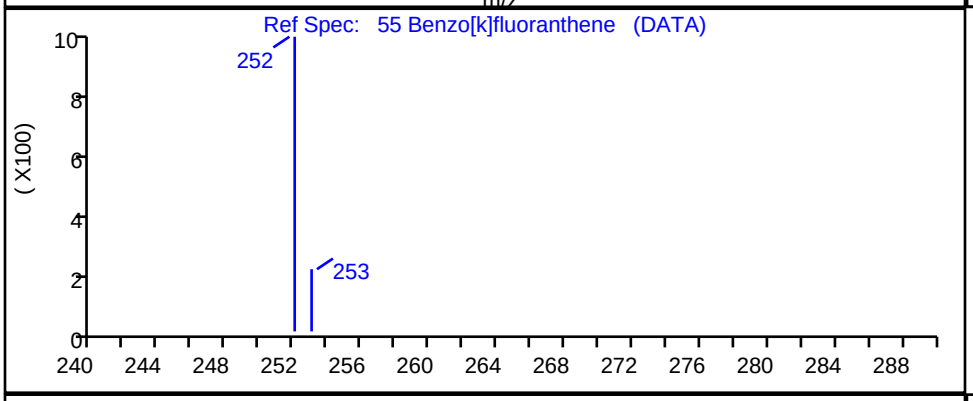
55 Benzo[k]fluoranthene, CAS: 207-08-9

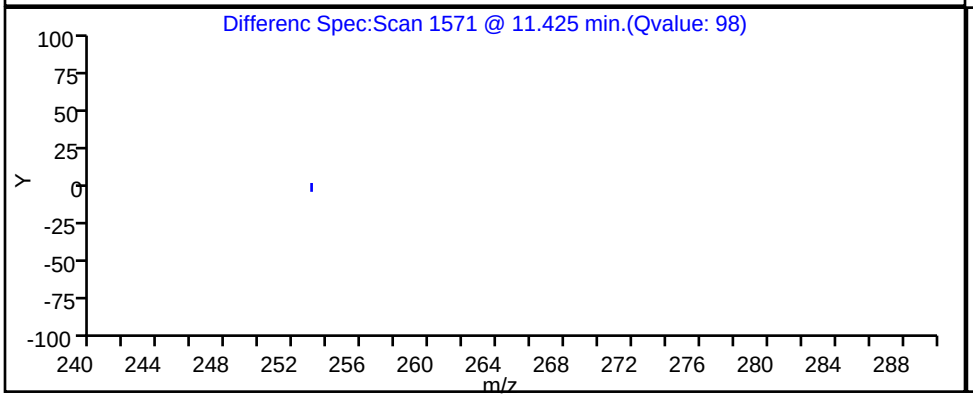


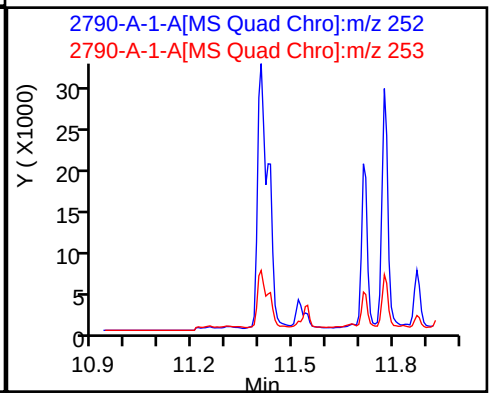












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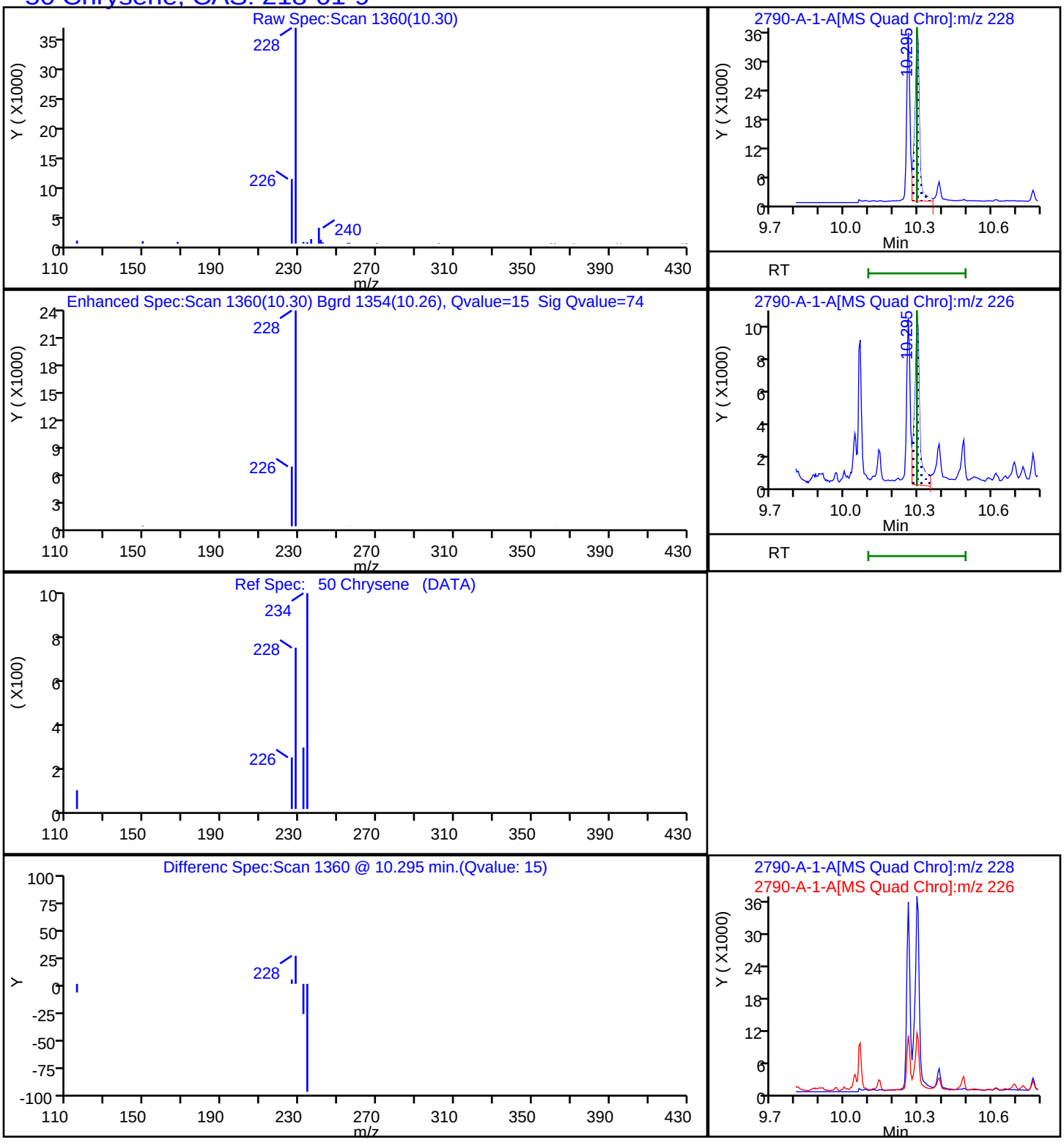
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D

Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

50 Chrysene, CAS: 218-01-9



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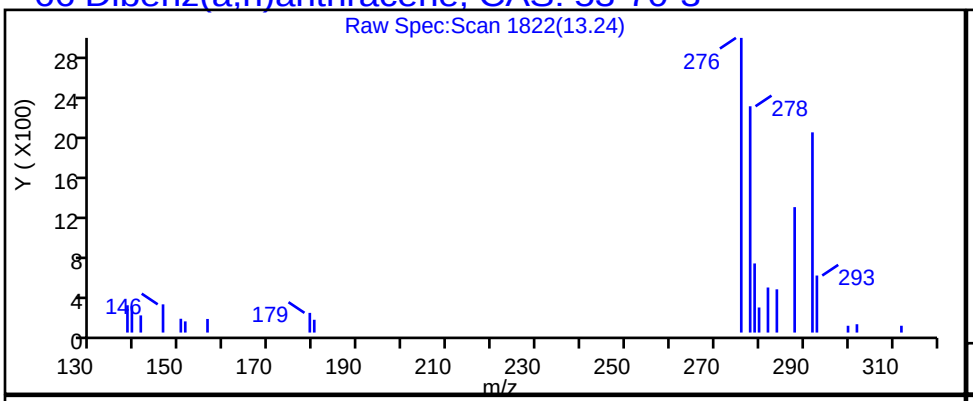
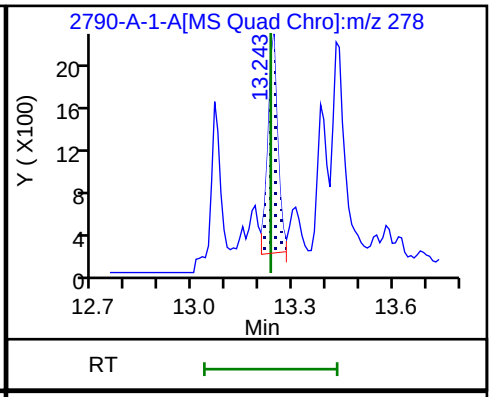
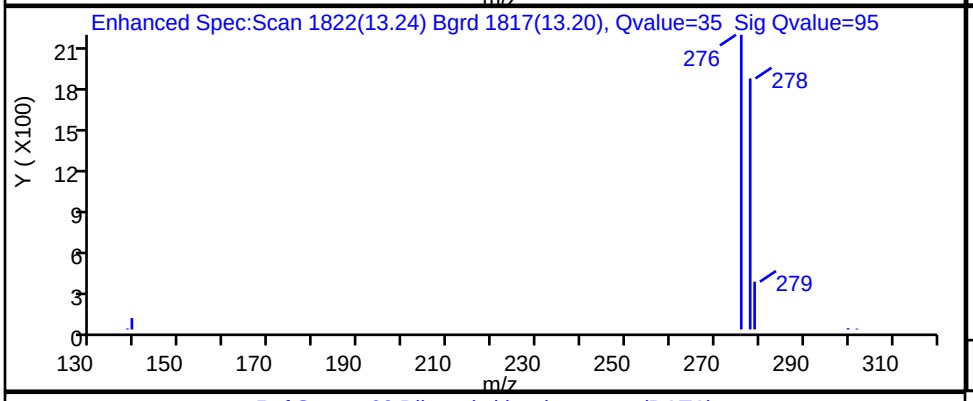
Eurofins Knoxville

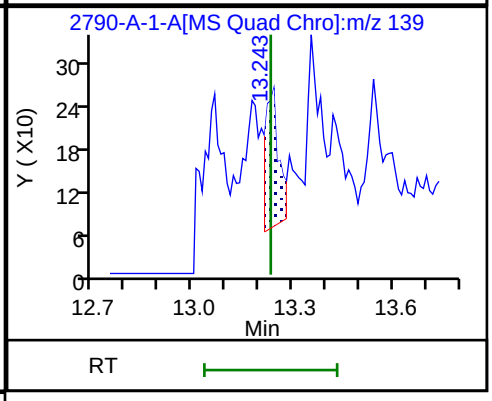
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D				
Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

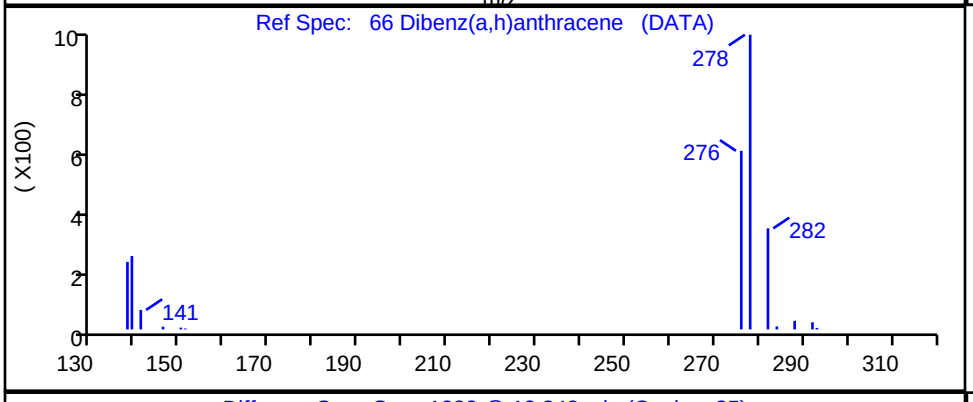
66 Dibenz(a,h)anthracene, CAS: 53-70-3

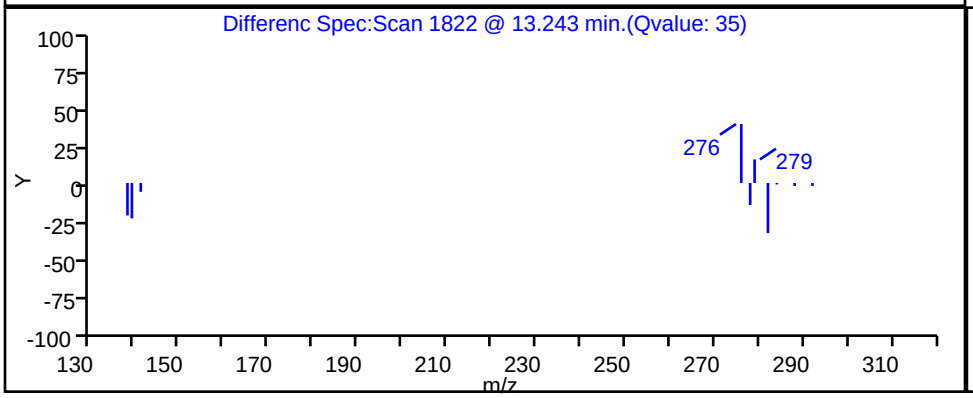


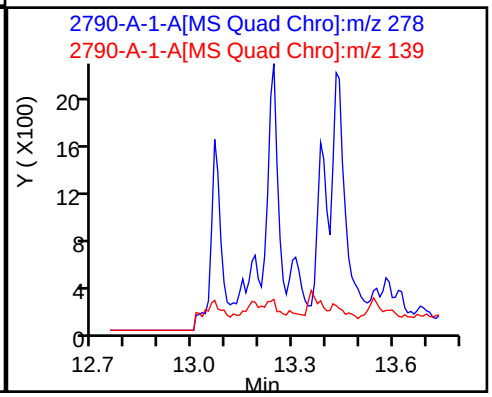












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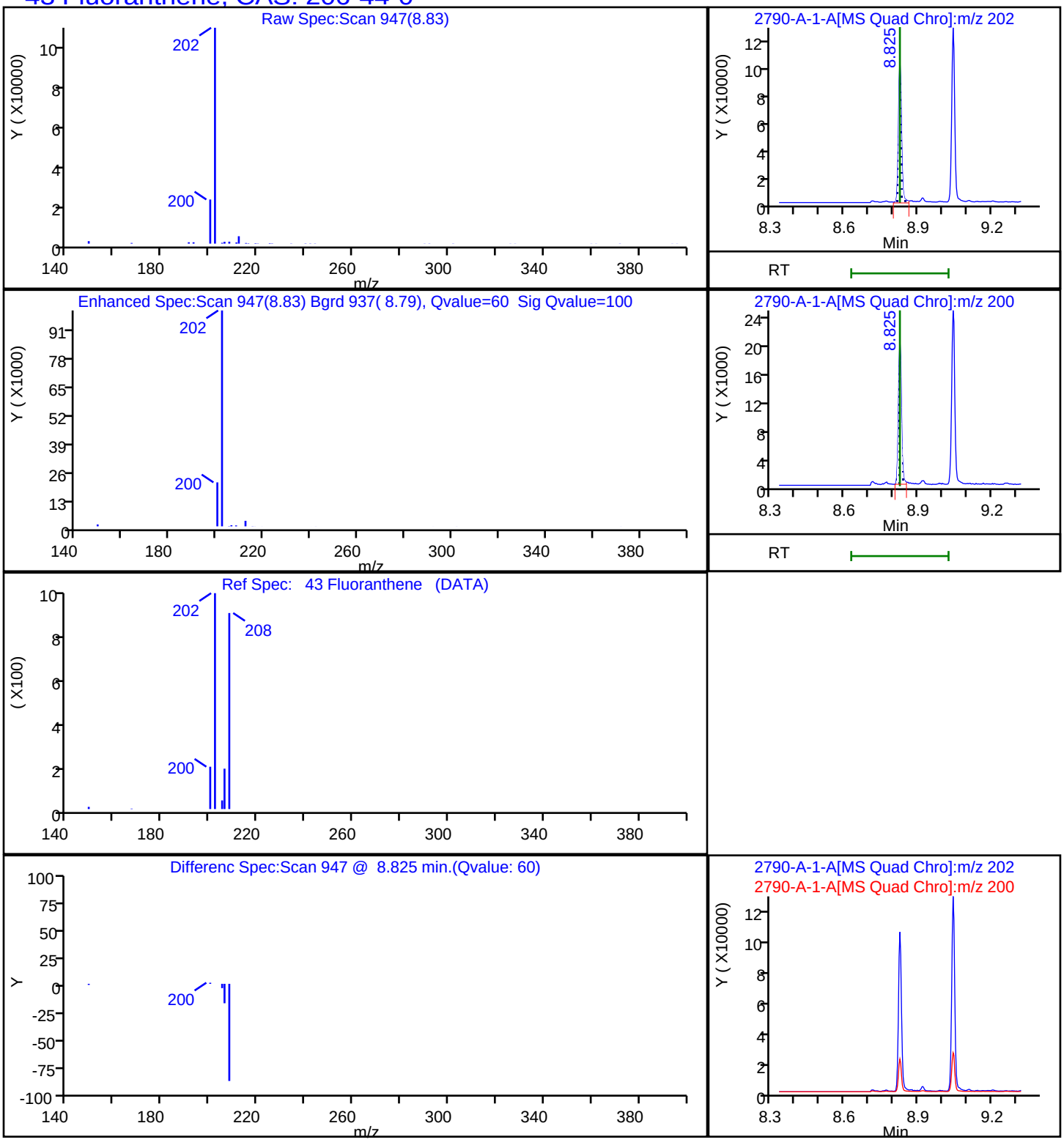
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D

Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6
Client ID:	1804576-852-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

43 Fluoranthene, CAS: 206-44-0



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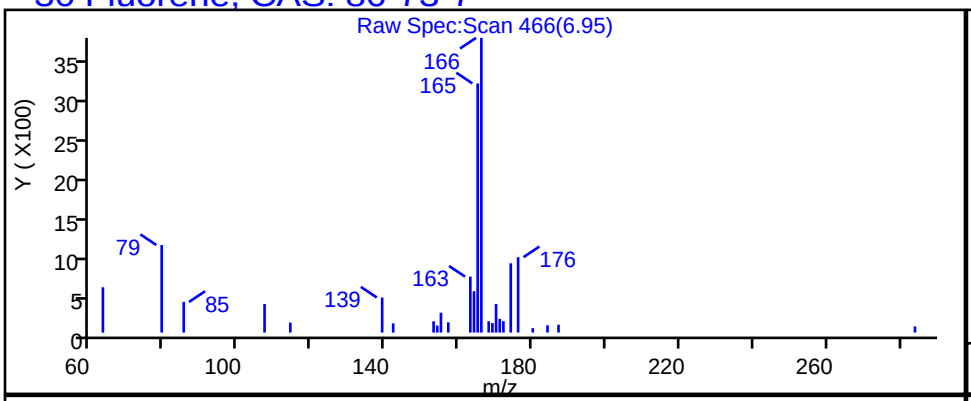
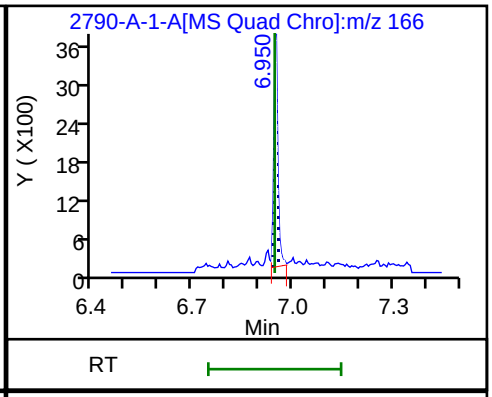
Eurofins Knoxville

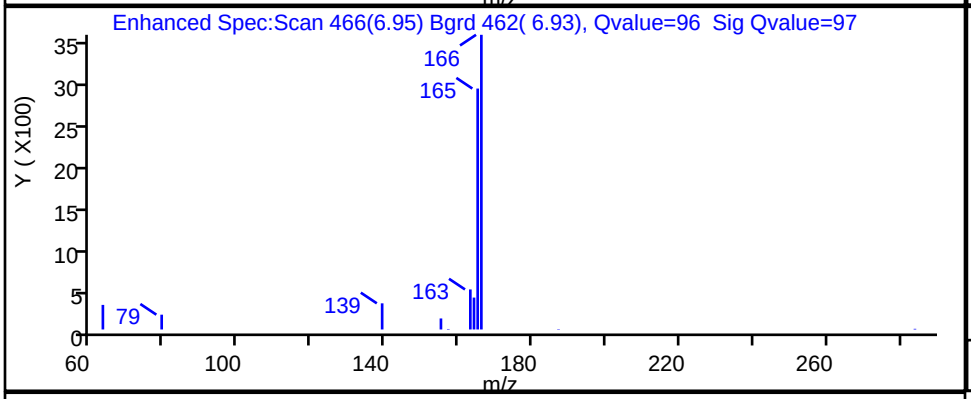
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D

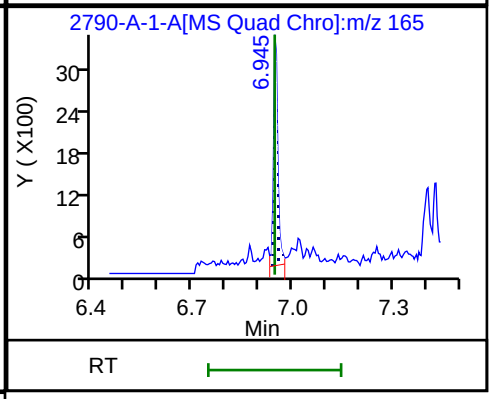
Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6
Client ID:	1804576-852-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

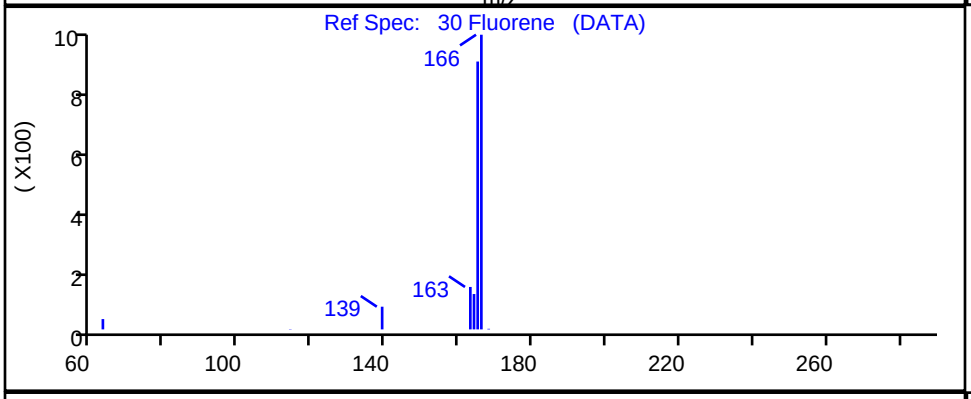
30 Fluorene, CAS: 86-73-7

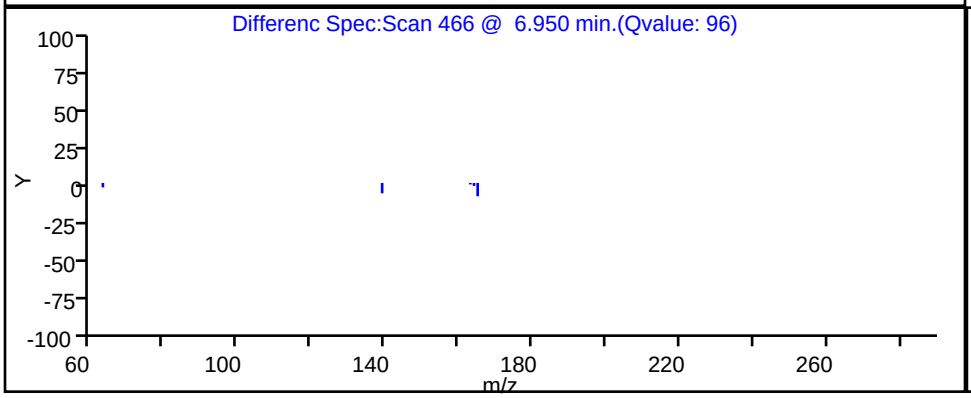


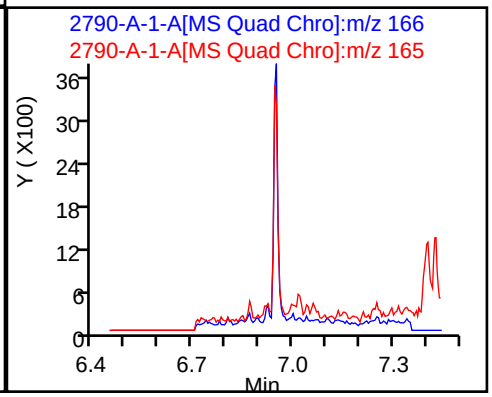












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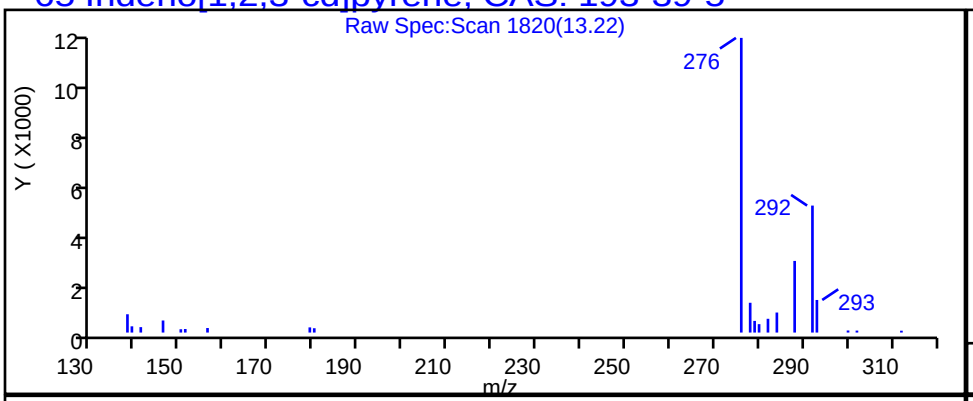
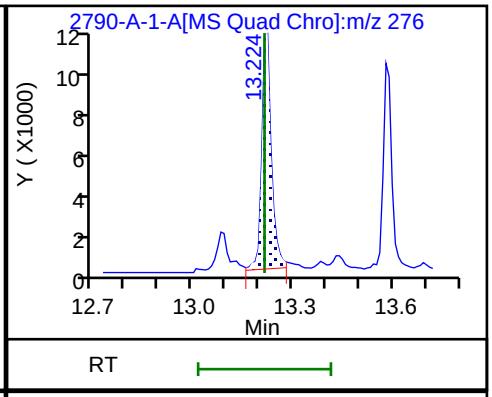
Eurofins Knoxville

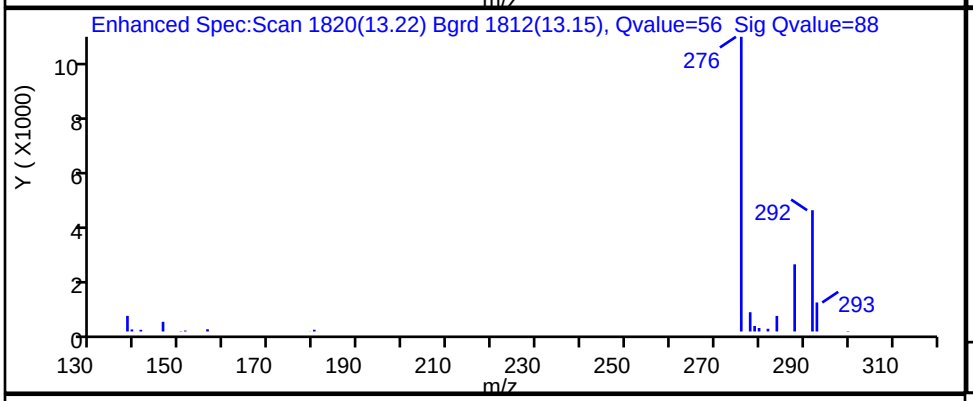
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D

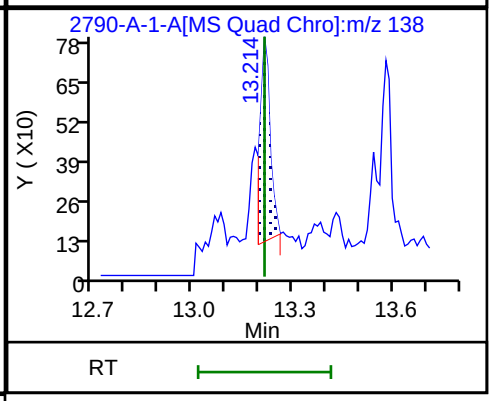
Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

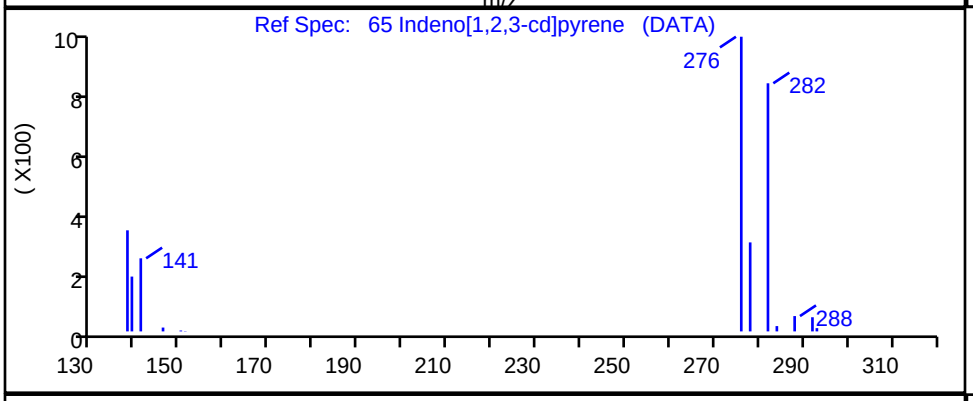
65 Indeno[1,2,3-cd]pyrene, CAS: 193-39-5

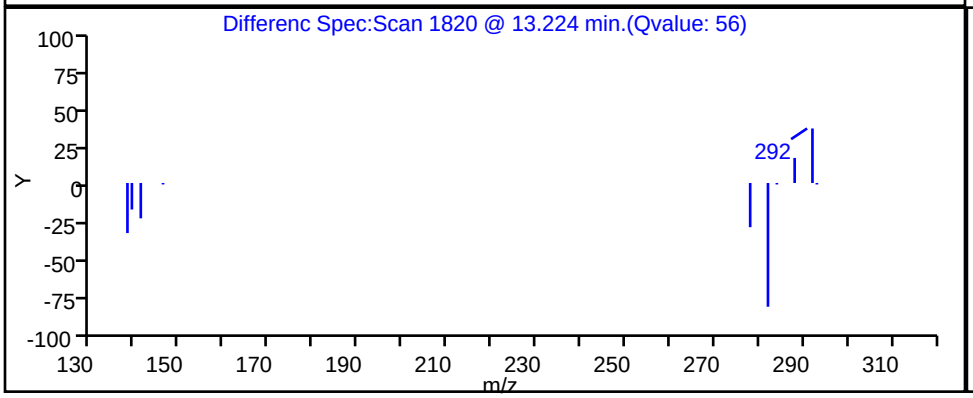


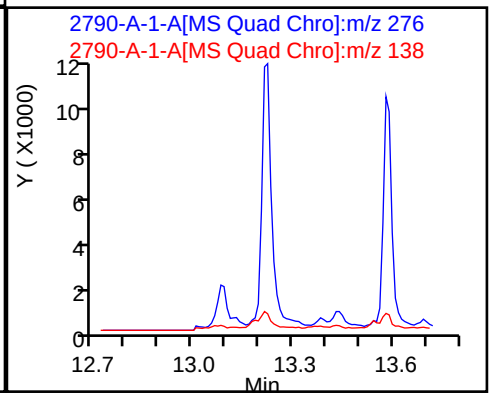










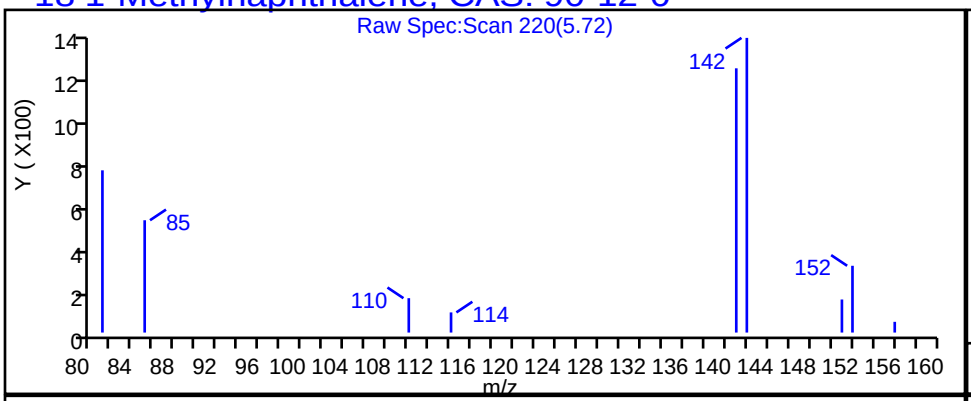


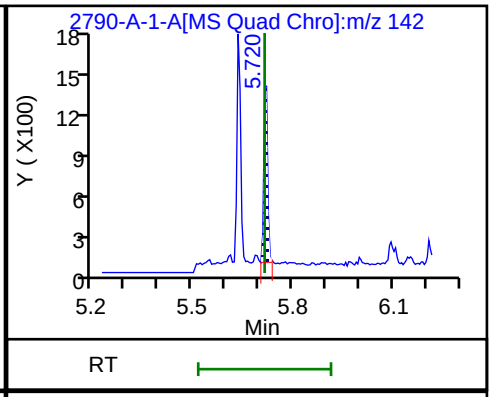
Report Date: 22-Nov-2023 14:10:55 Chrom Revision: 2.3 15-Nov-2023 20:54:34

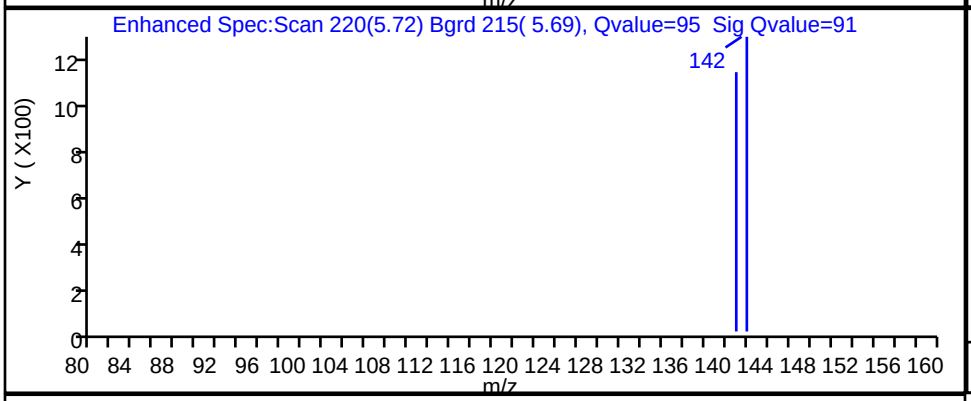
Eurofins Knoxville

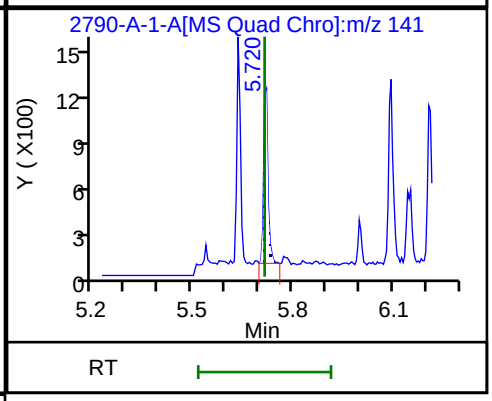
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D				
Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

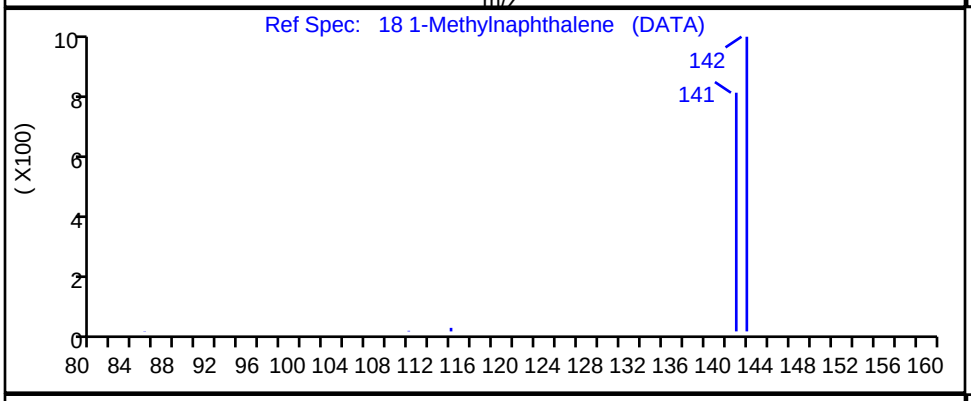
18 1-Methylnaphthalene, CAS: 90-12-0

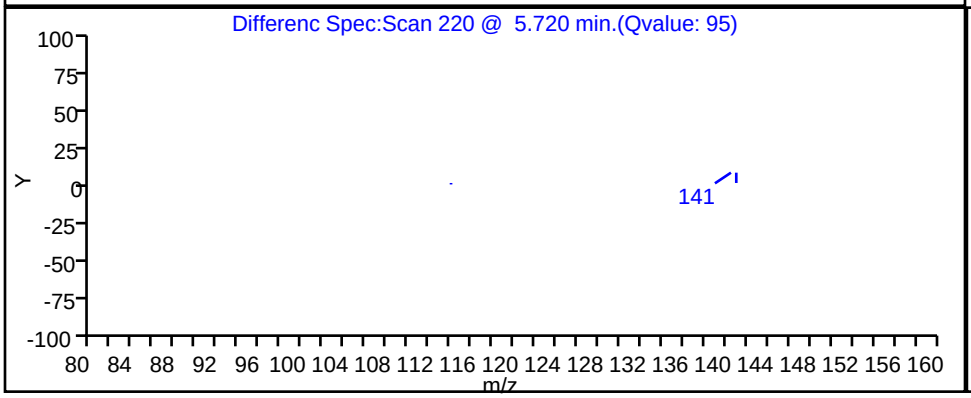


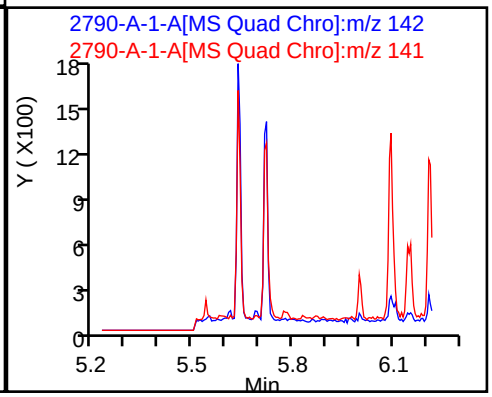










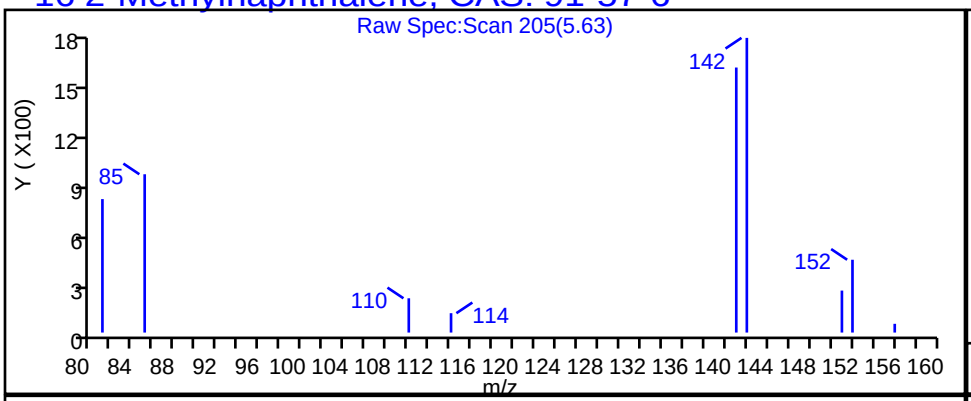


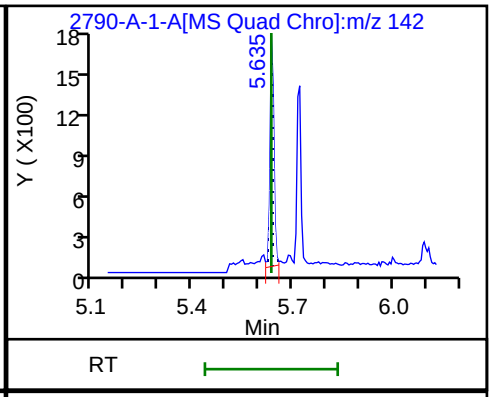
Report Date: 22-Nov-2023 14:10:54 Chrom Revision: 2.3 15-Nov-2023 20:54:34

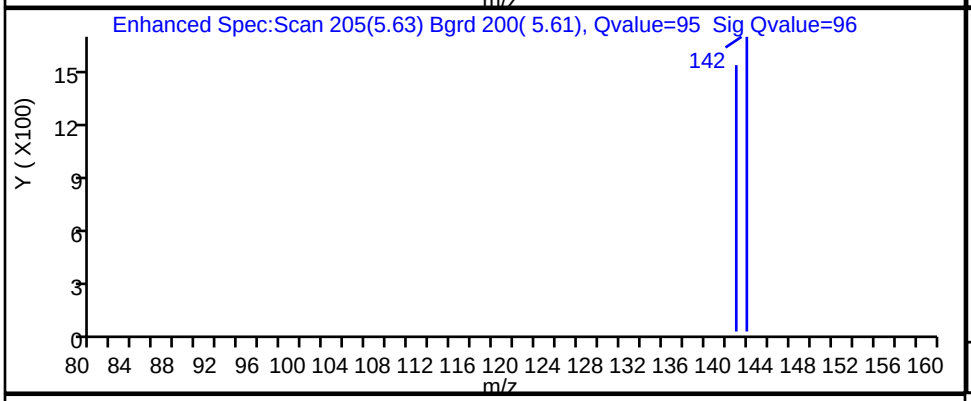
Eurofins Knoxville

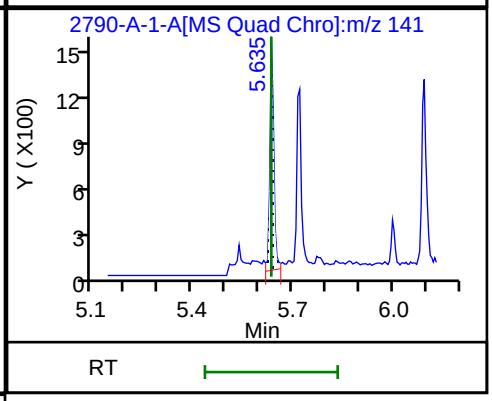
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D		
Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6
Client ID:	1804576-852-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

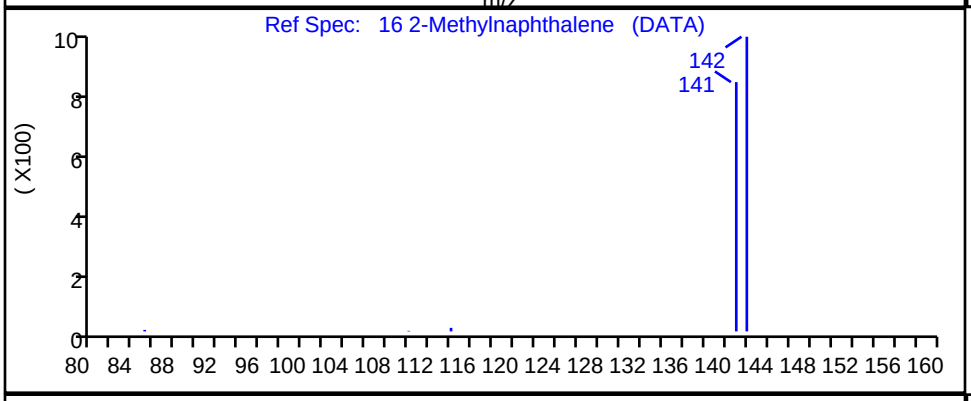
16 2-Methylnaphthalene, CAS: 91-57-6

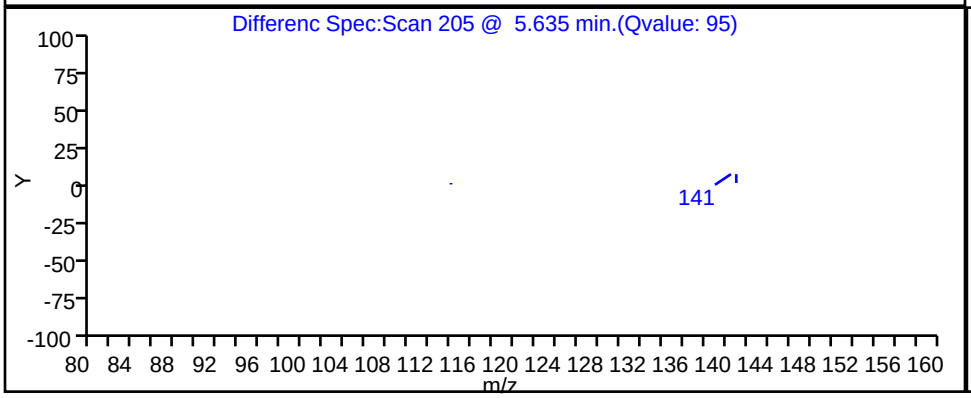


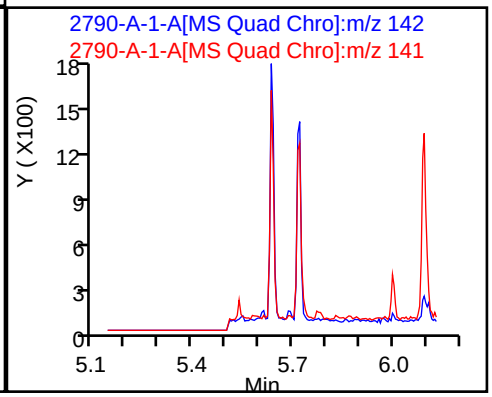












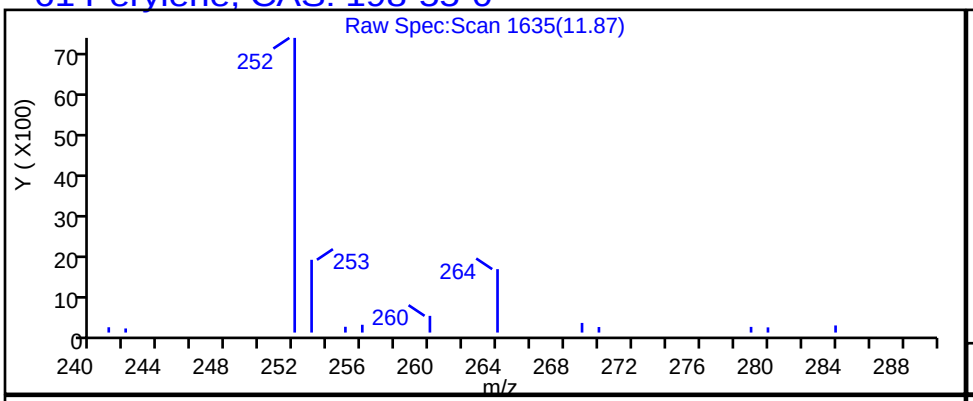
Report Date: 22-Nov-2023 14:10:55 Chrom Revision: 2.3 15-Nov-2023 20:54:34

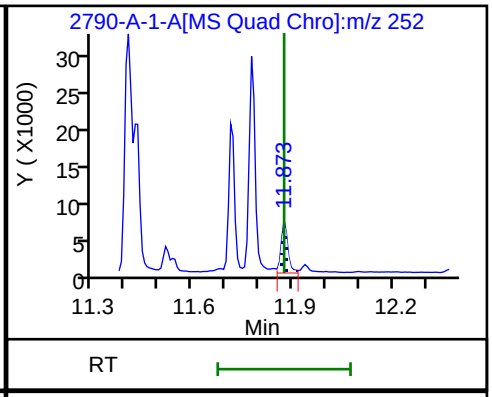
Eurofins Knoxville

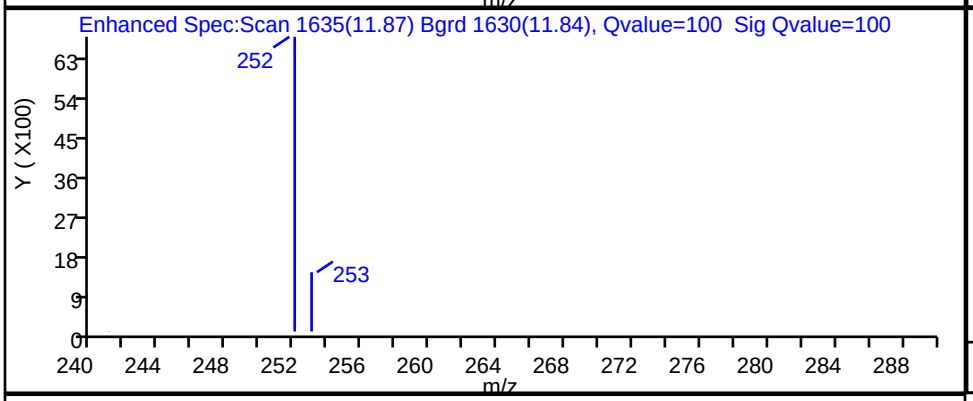
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D

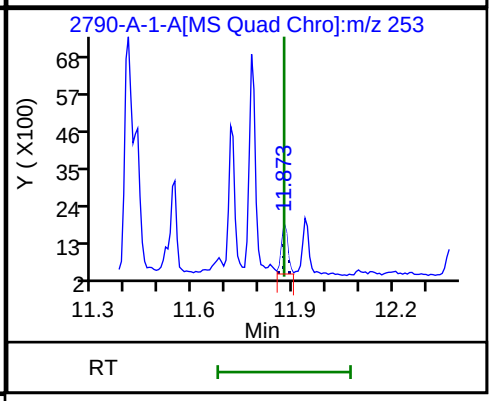
Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

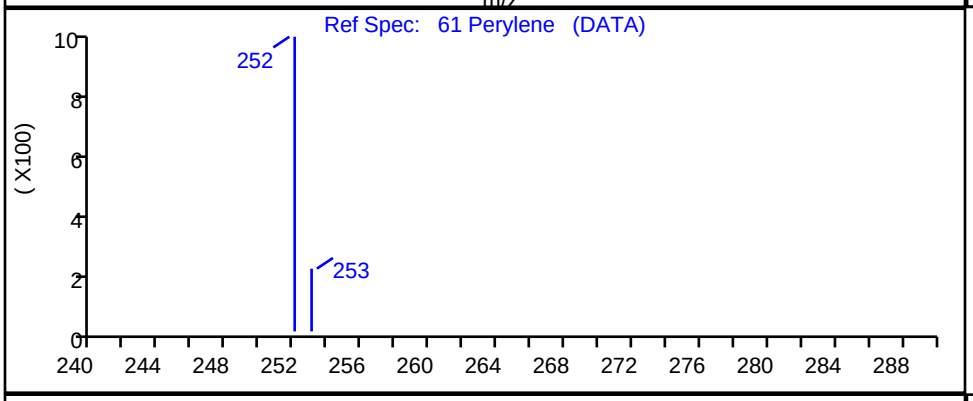
61 Perylene, CAS: 198-55-0

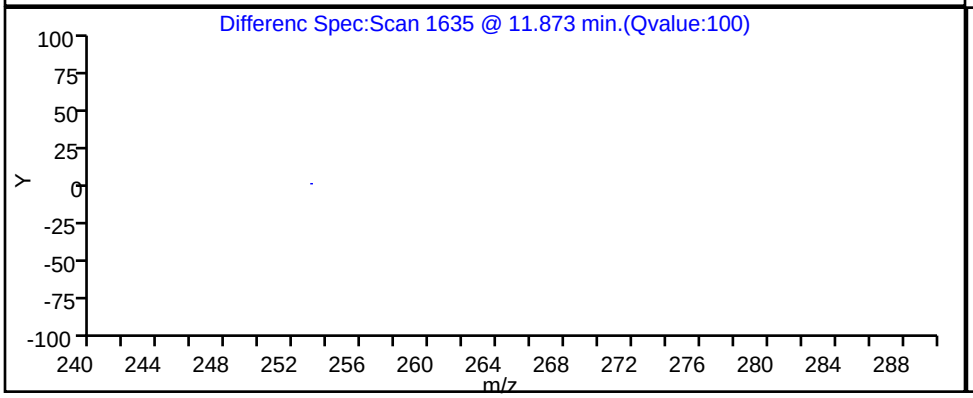


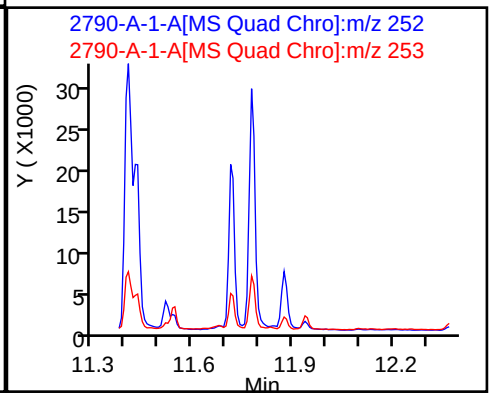












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Eurofins Knoxville

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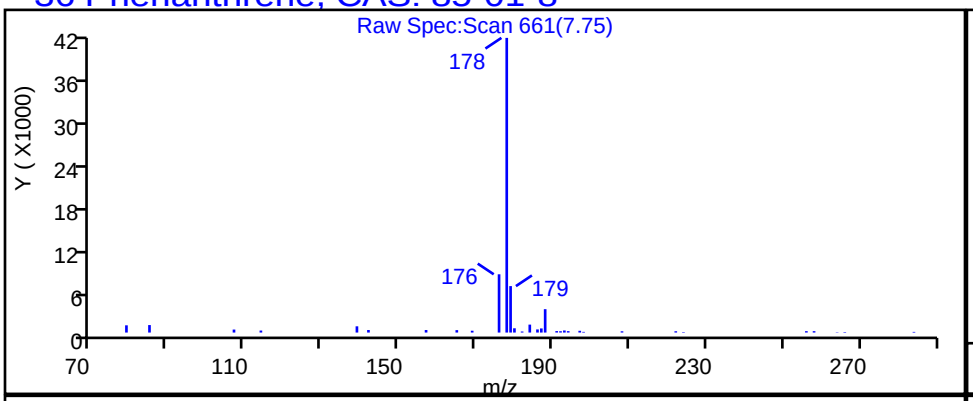
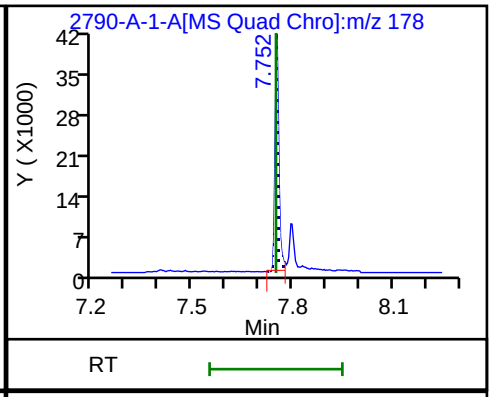
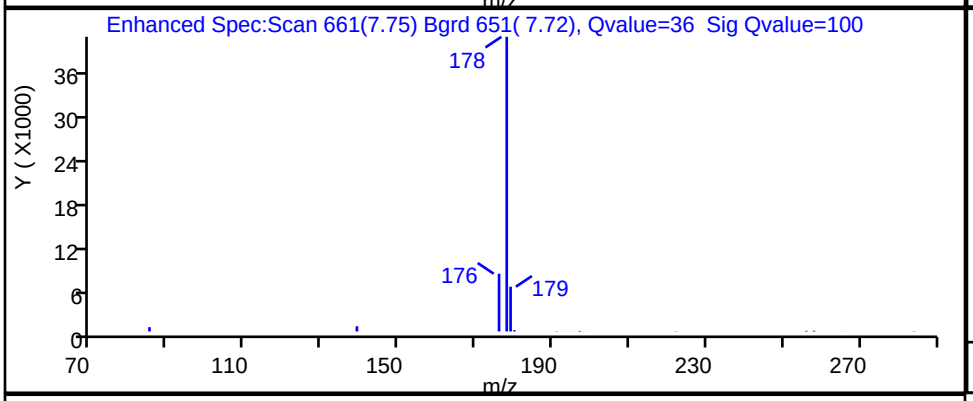
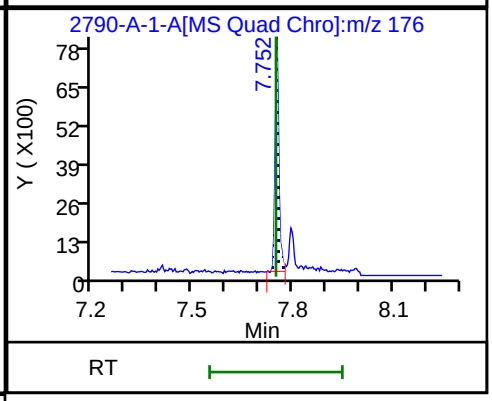
Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6
Client ID:	1804576-852-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

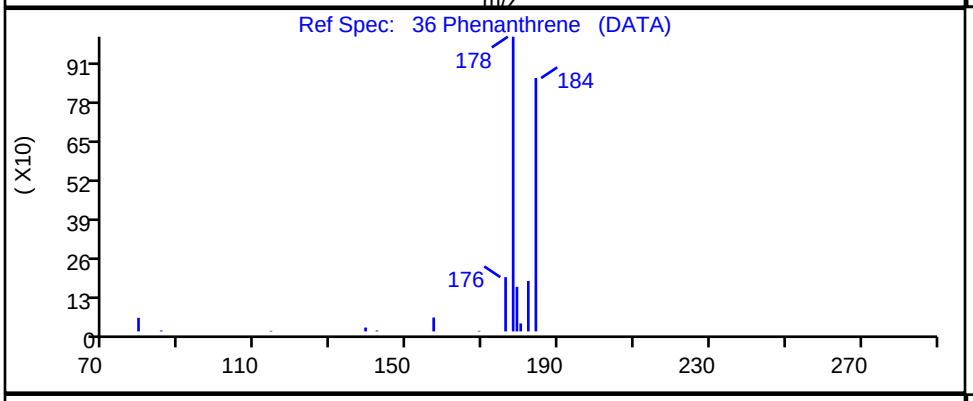
36 Phenanthrene, CAS: 85-01-8

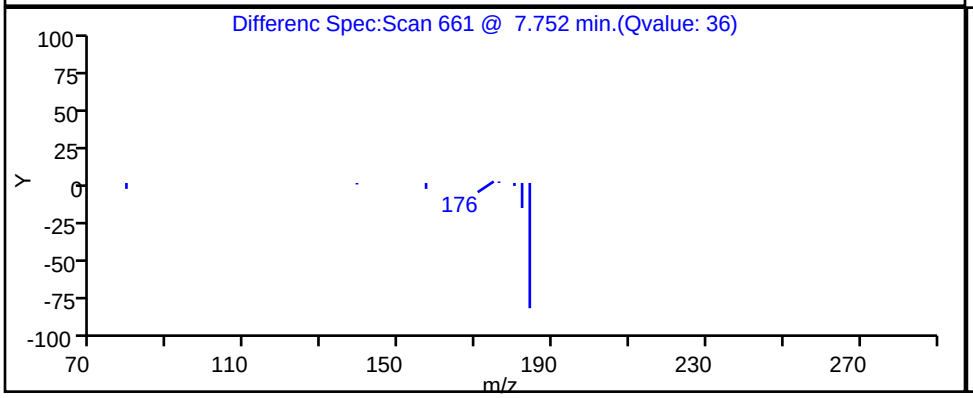


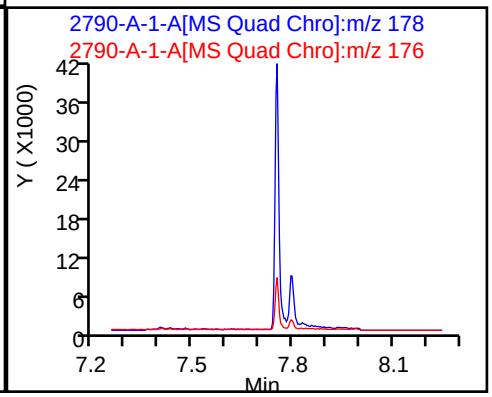












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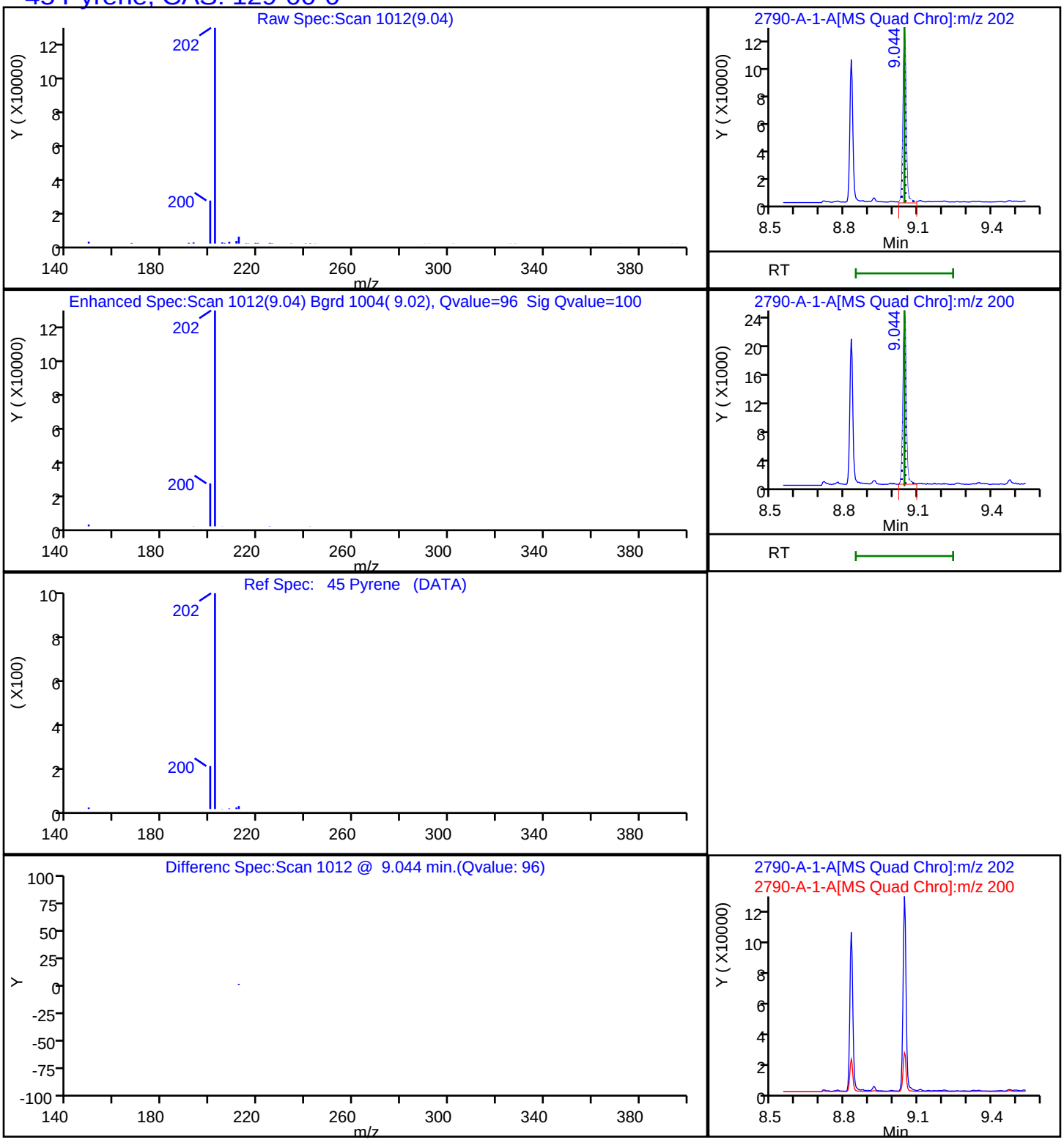
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D

Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6
Client ID:	1804576-852-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

45 Pyrene, CAS: 129-00-0



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Eurofins Knoxville

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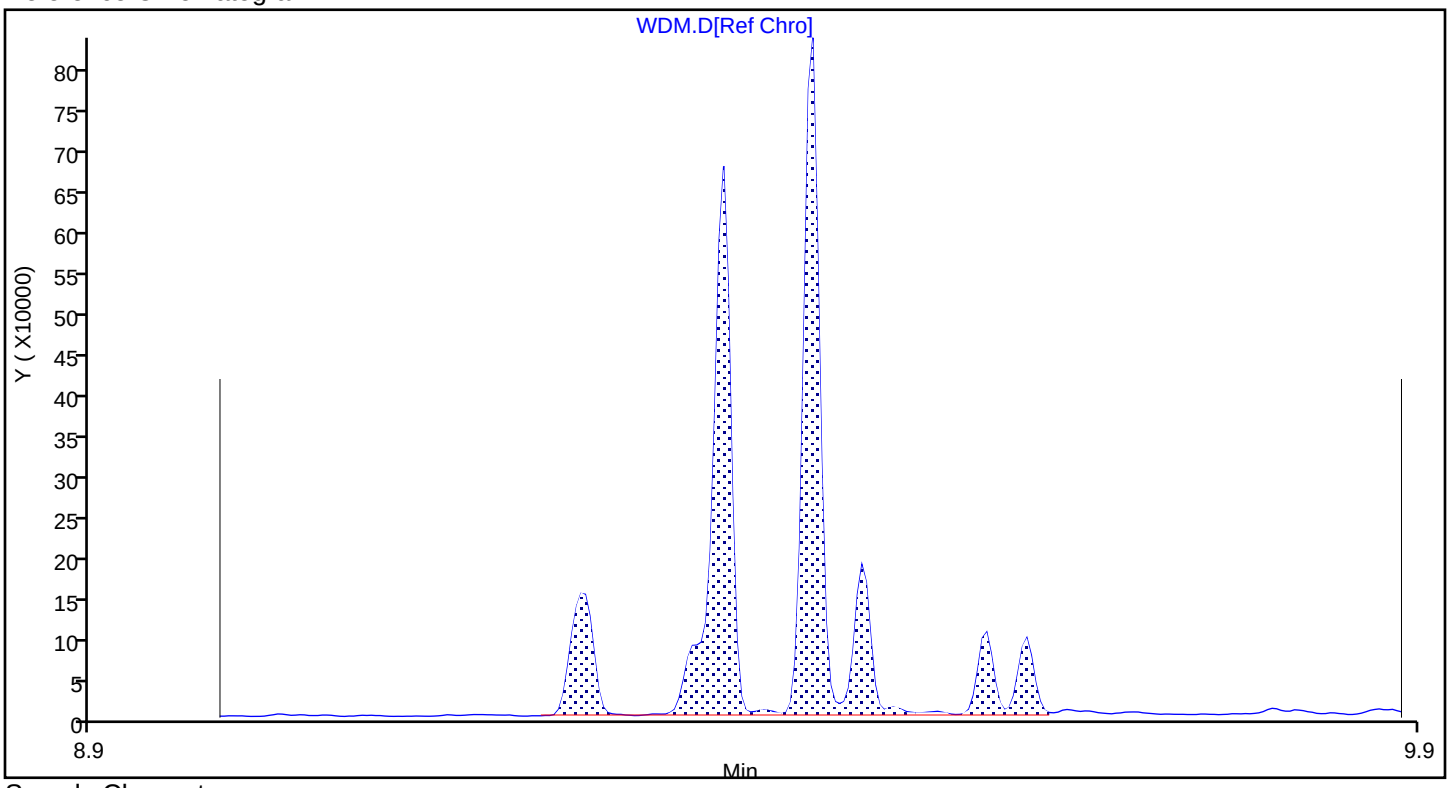
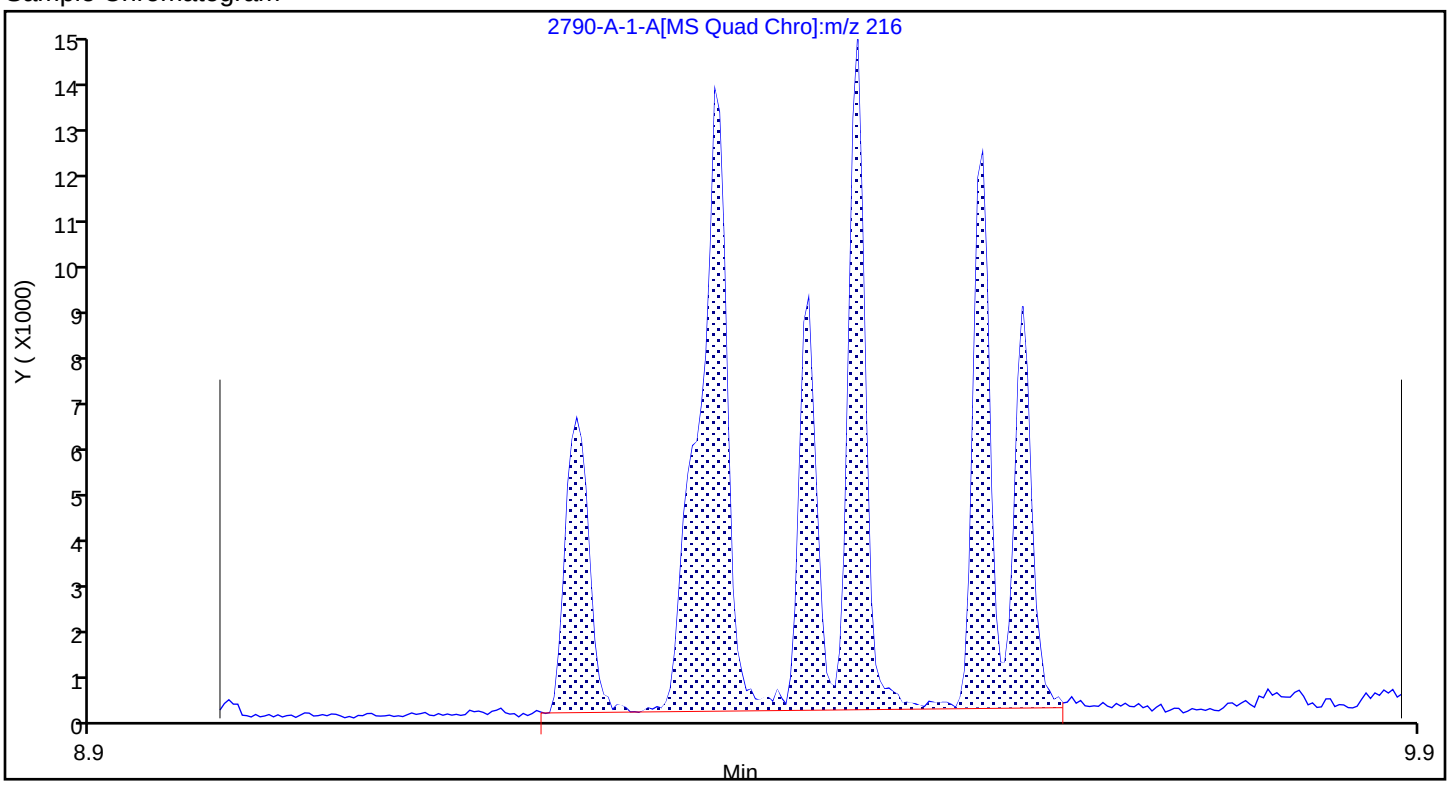
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 100 C1-Fluoranthenes/pyrene, CAS: STL00912

Reference Chromatogram



Sample Chromatogram



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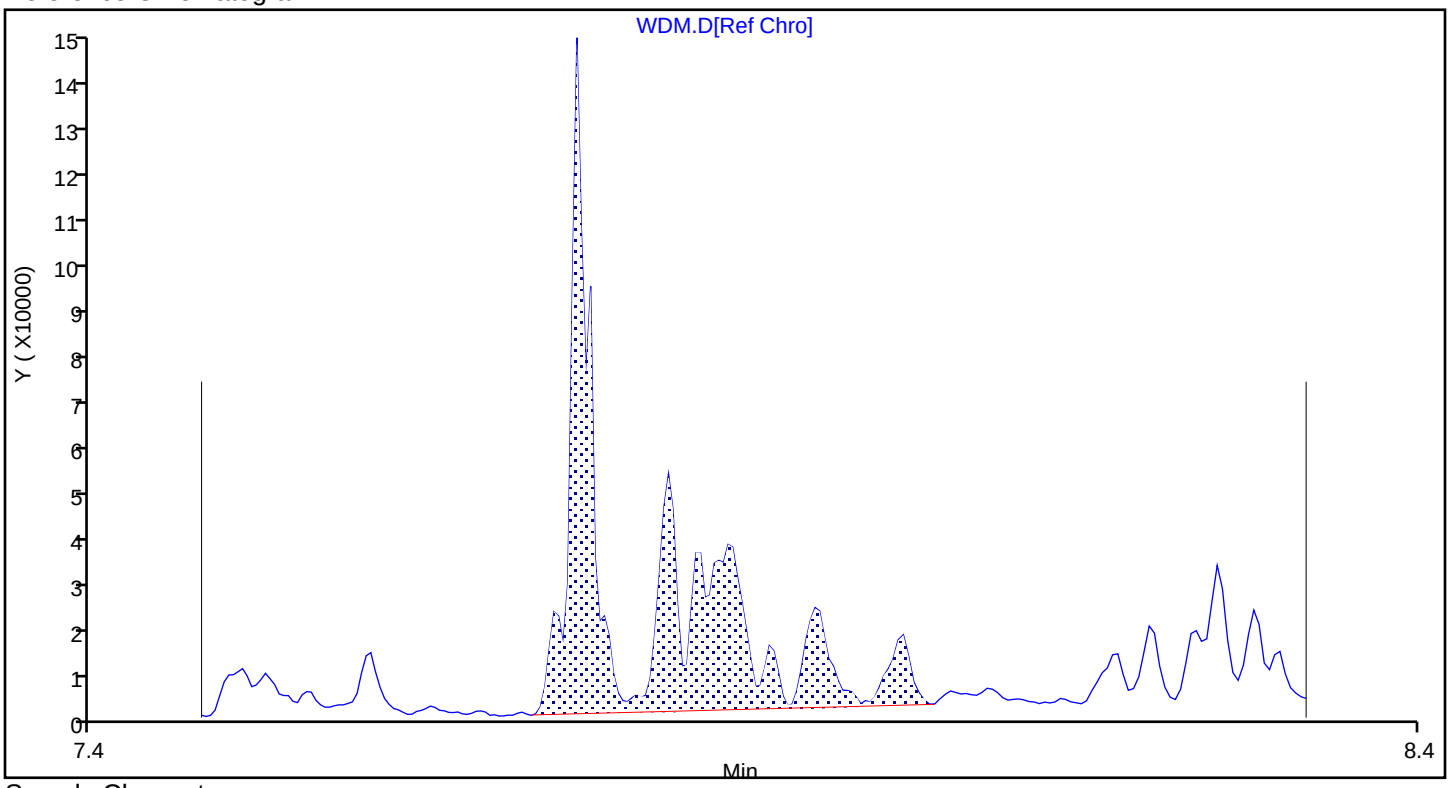
Eurofins Knoxville

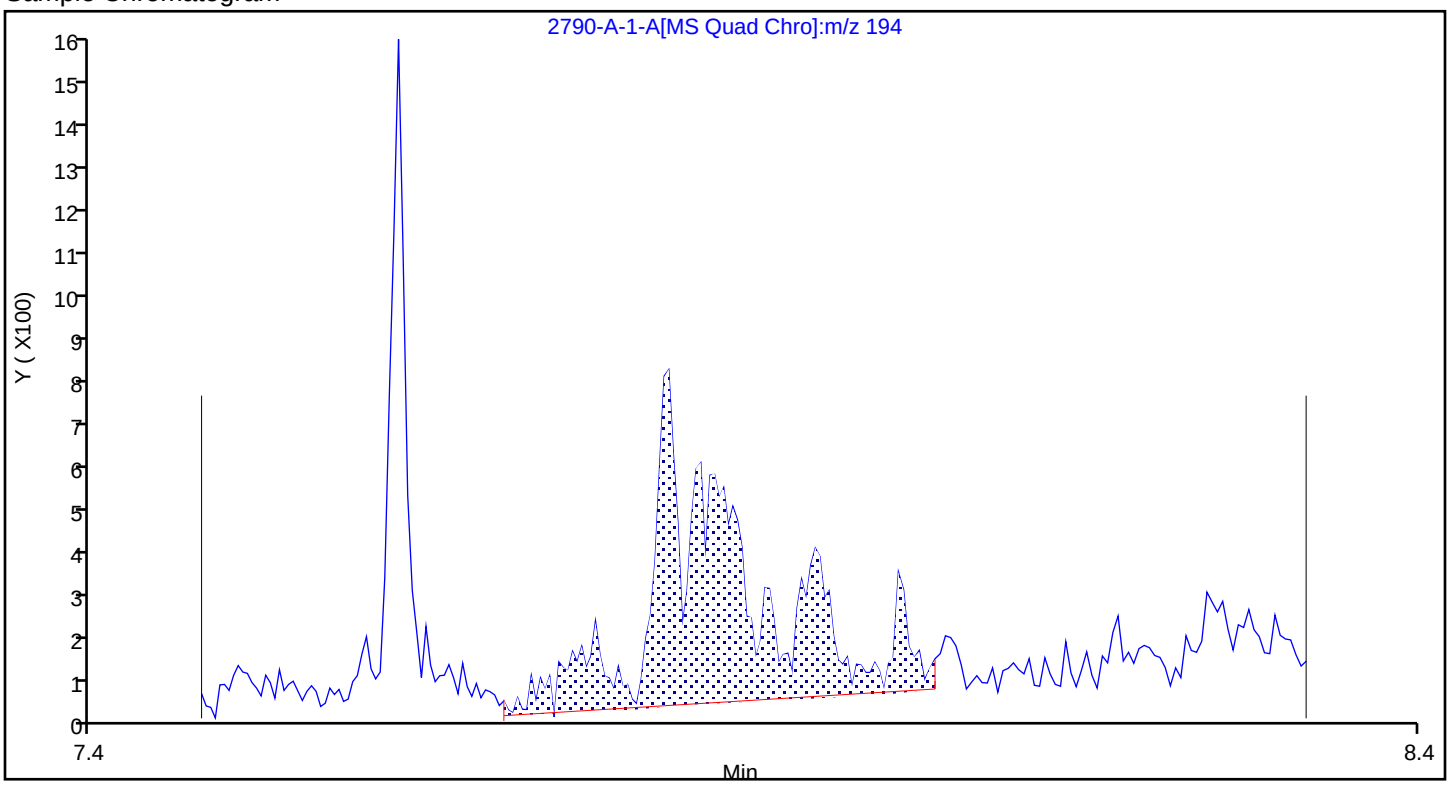
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D				
Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 90 C2-Fluorenes, CAS: STL00914

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D				
Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
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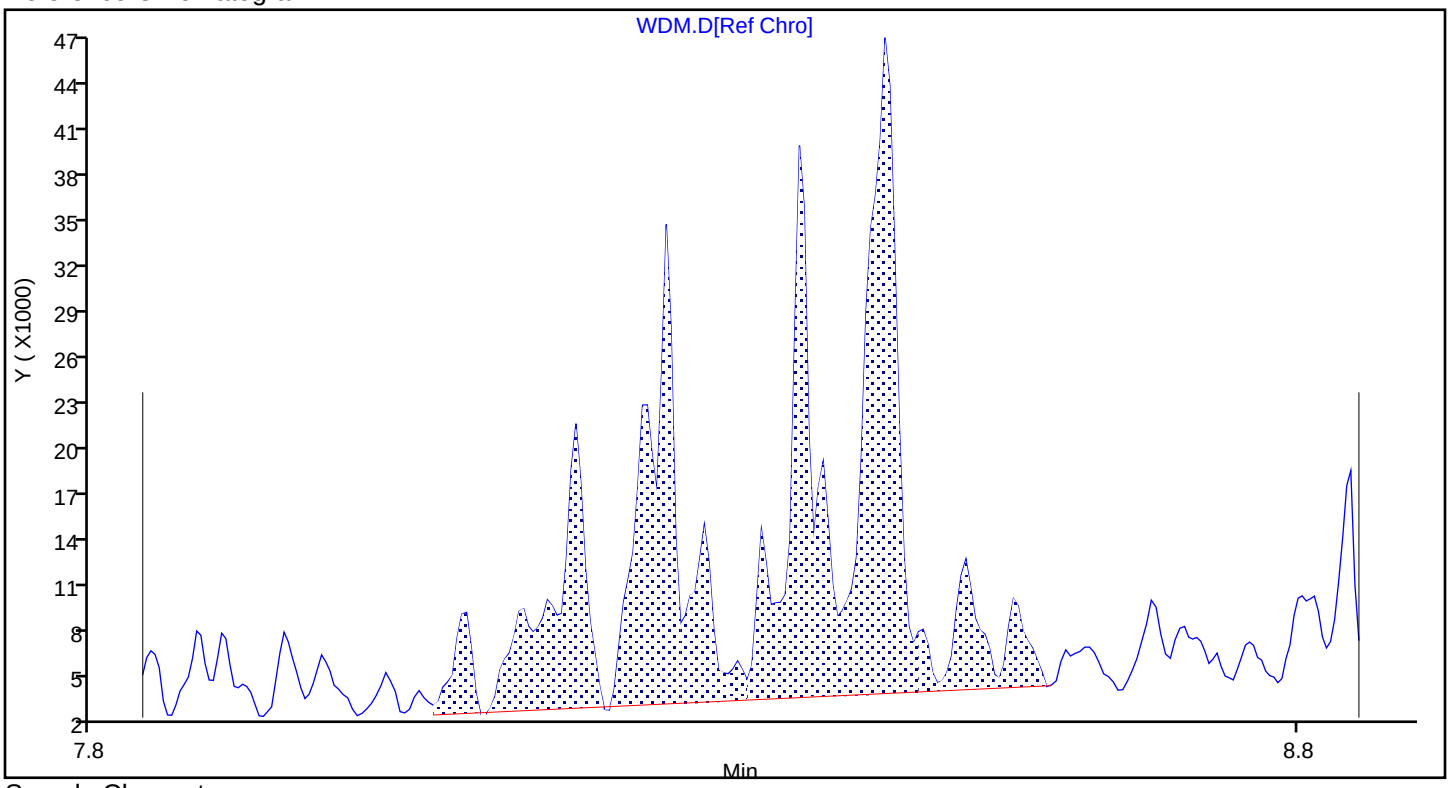
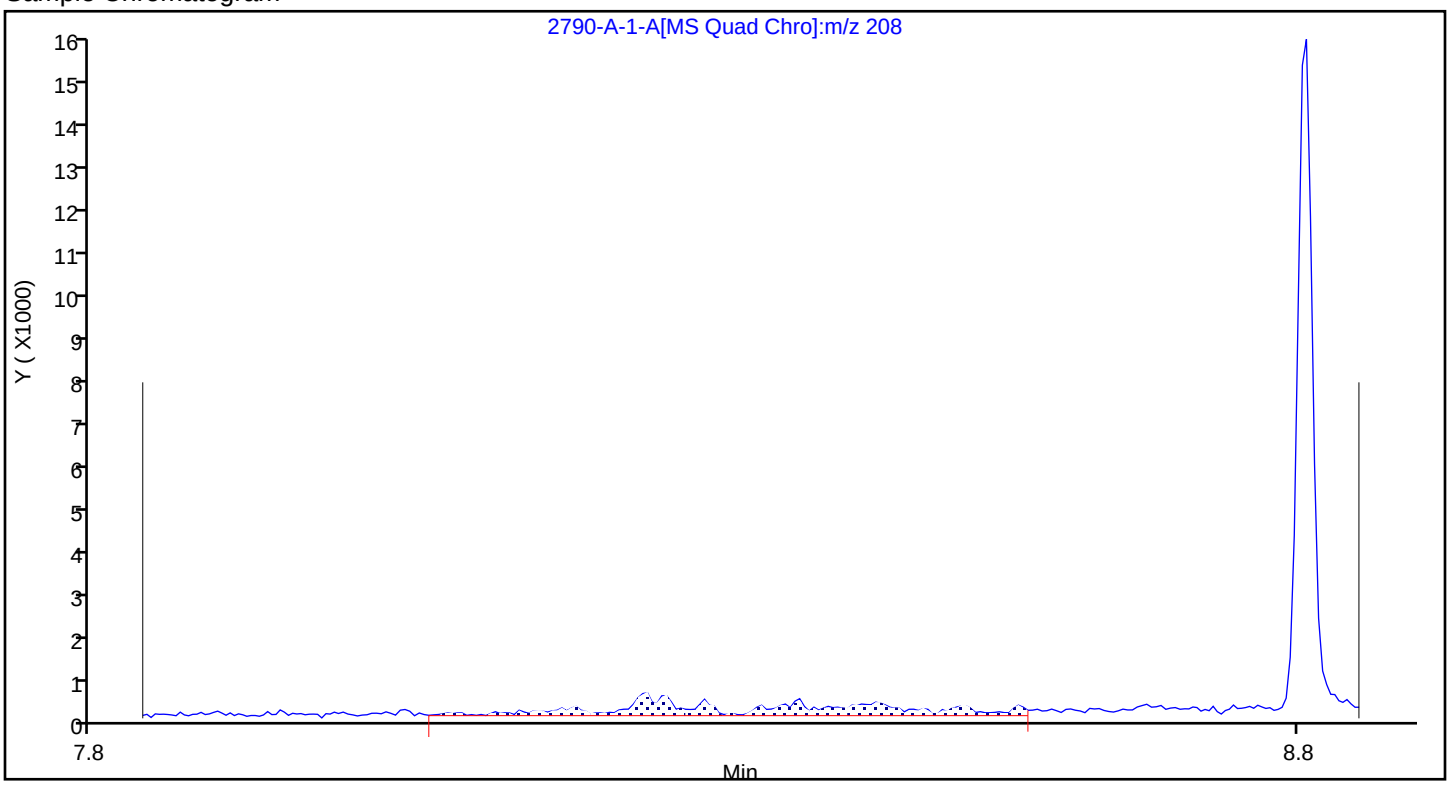
A 91 C3-Fluorenes, CAS: STL00915

Reference Chromatogram



Sample Chromatogram



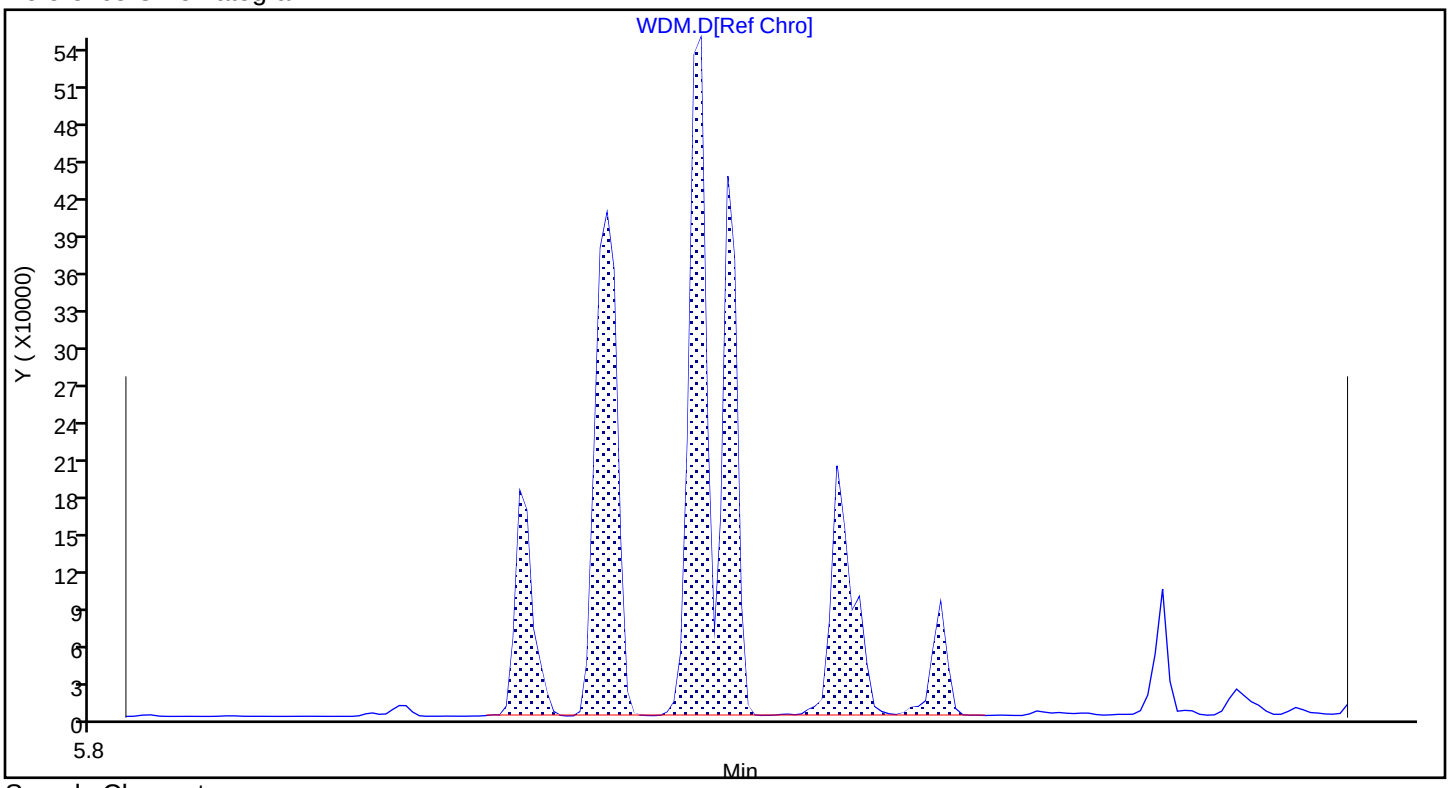
Report Date: 22-Nov-2023 14:10:55 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

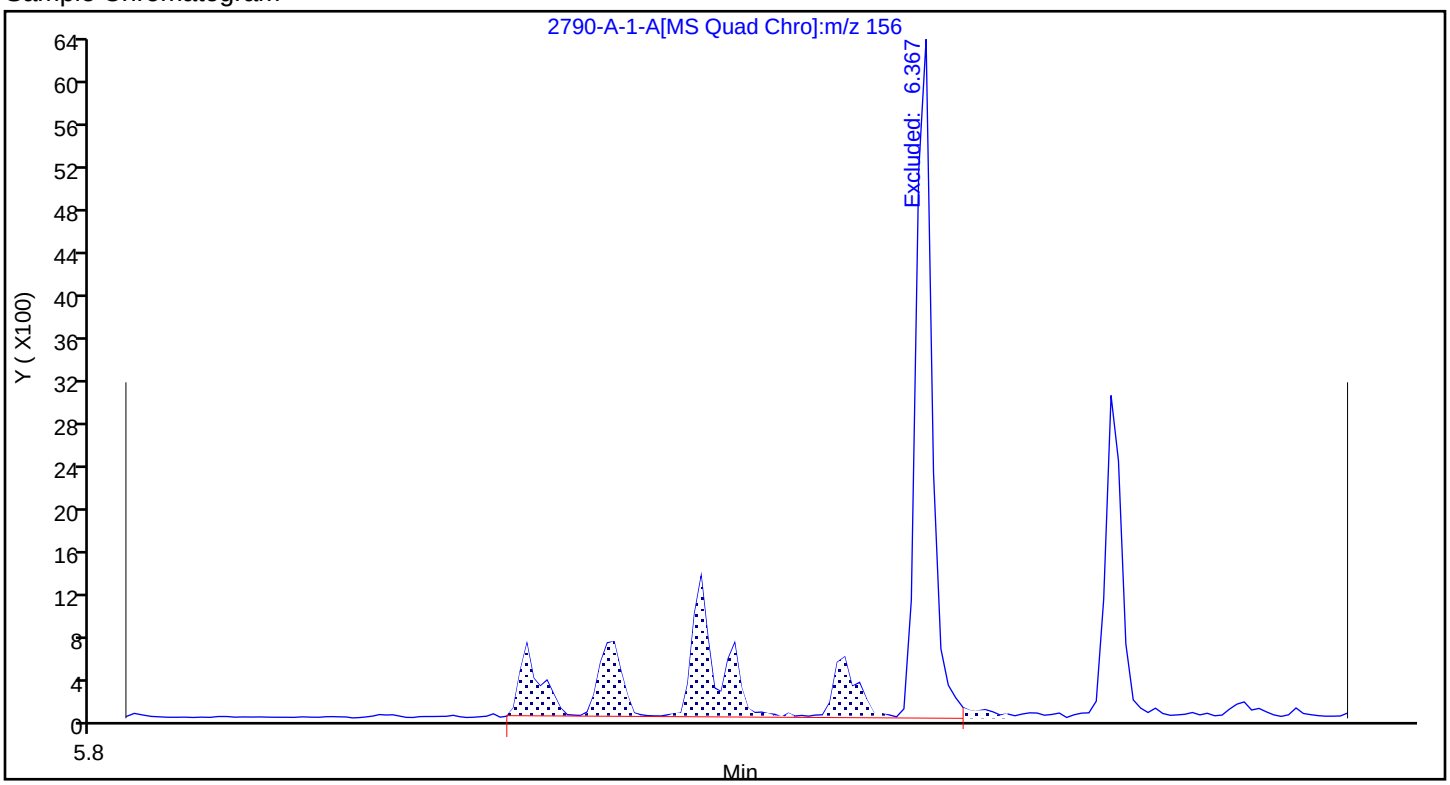
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D				
Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 86 C2-Naphthalenes, CAS: STL00917

Reference Chromatogram



Sample Chromatogram



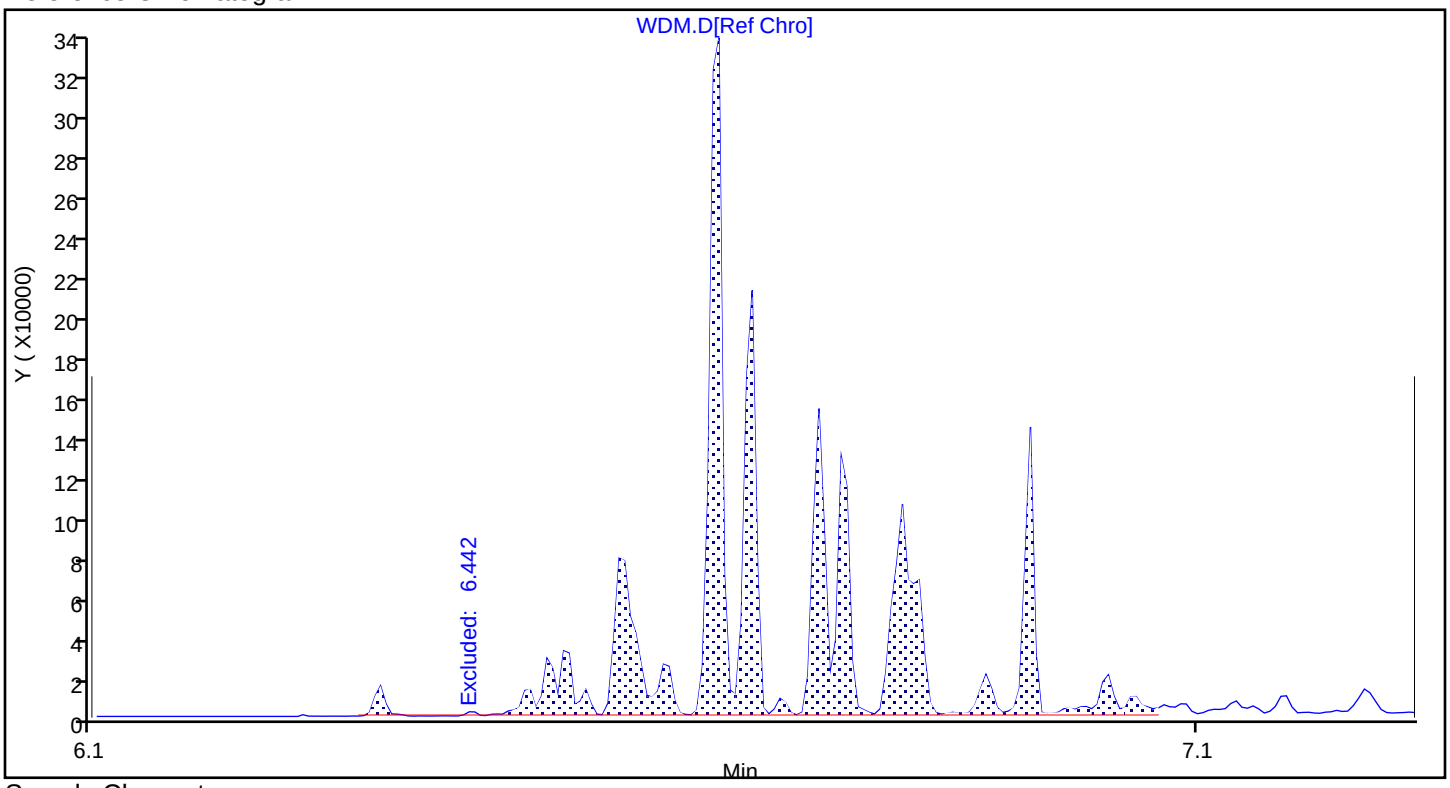
Report Date: 22-Nov-2023 14:10:56 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D				
Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 87 C3-Naphthalenes, CAS: STL00918

Reference Chromatogram



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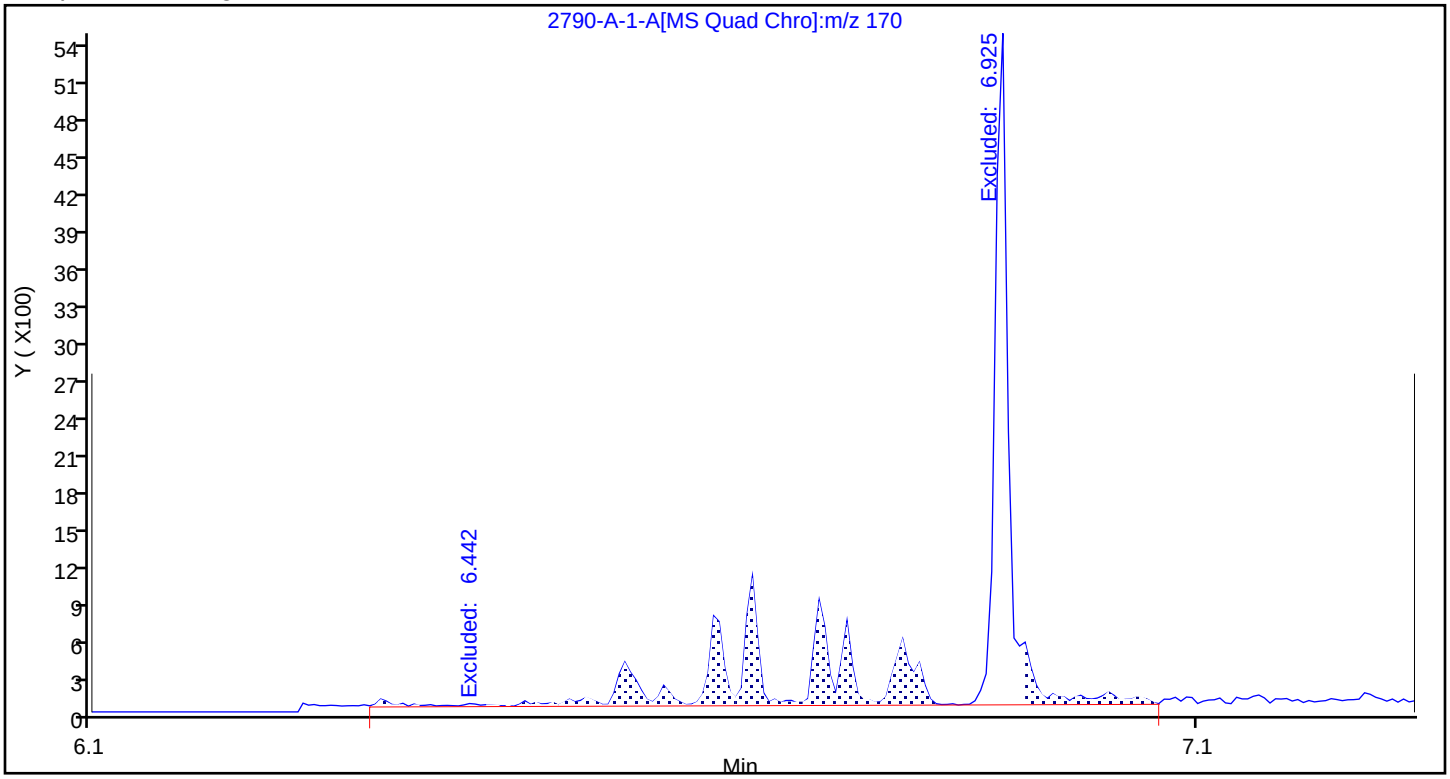


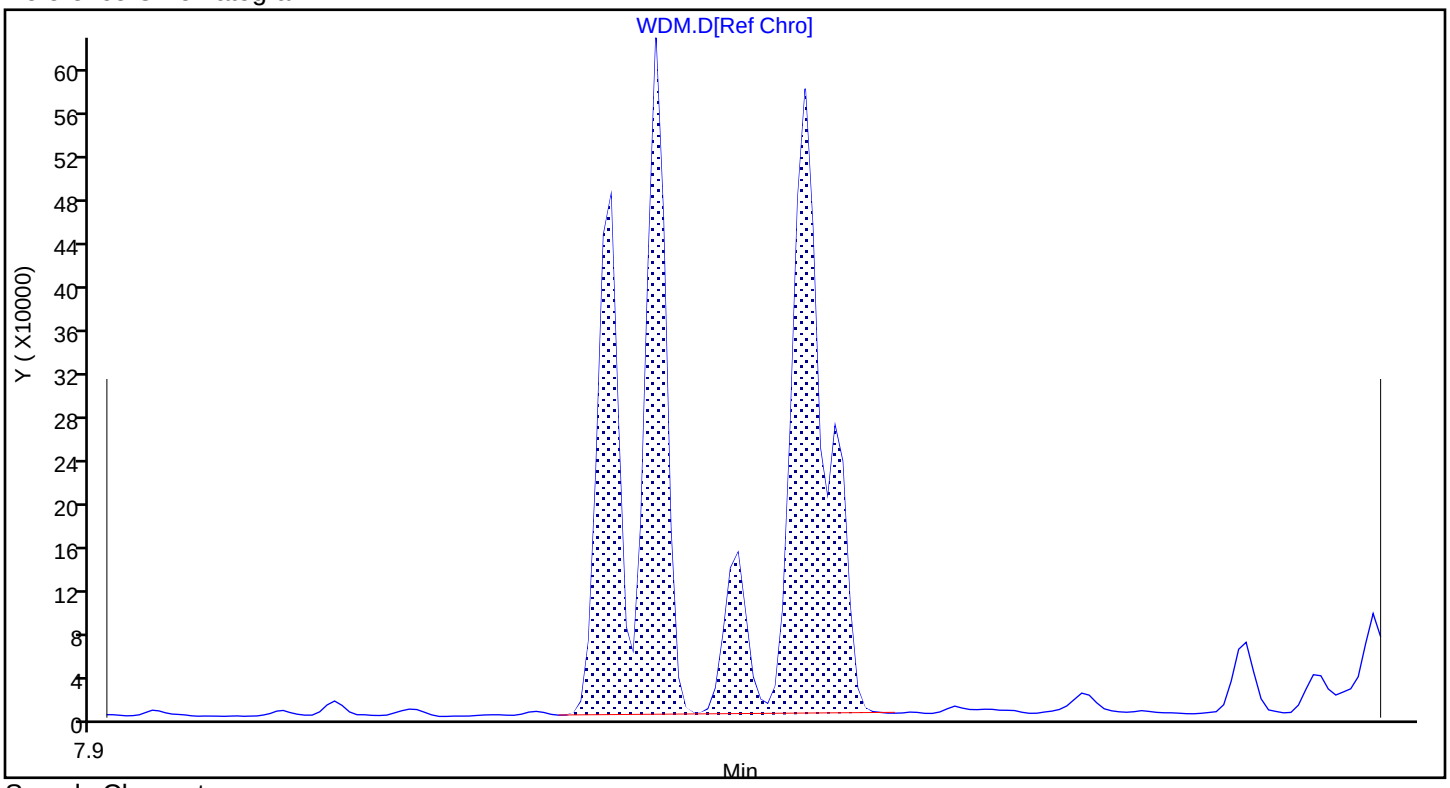
Report Date: 22-Nov-2023 14:10:56 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

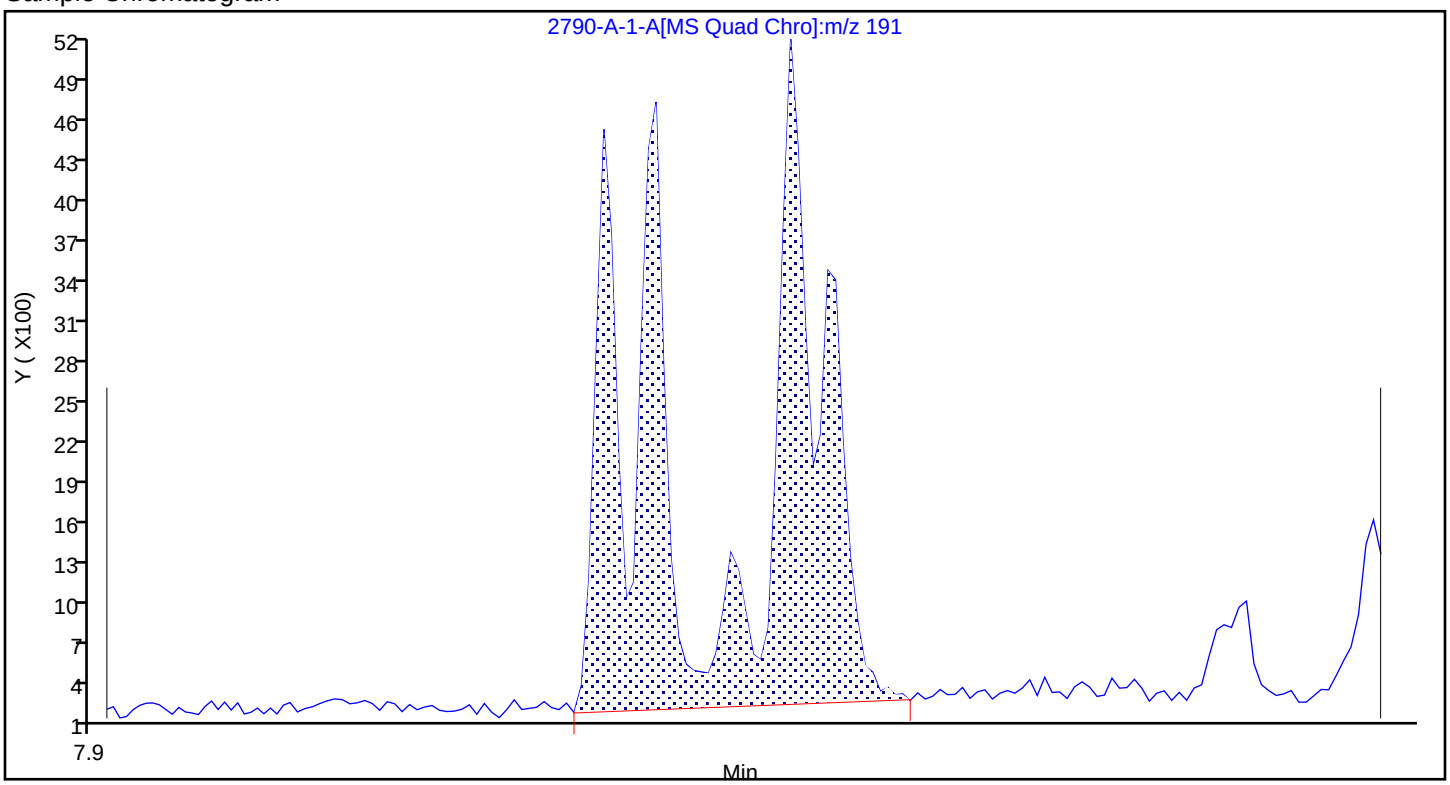
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D				
Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 96 C1-Phenanthrenes/Anthracenes, CAS: STL00901

Reference Chromatogram



Sample Chromatogram



Report Date: 22-Nov-2023 14:10:56 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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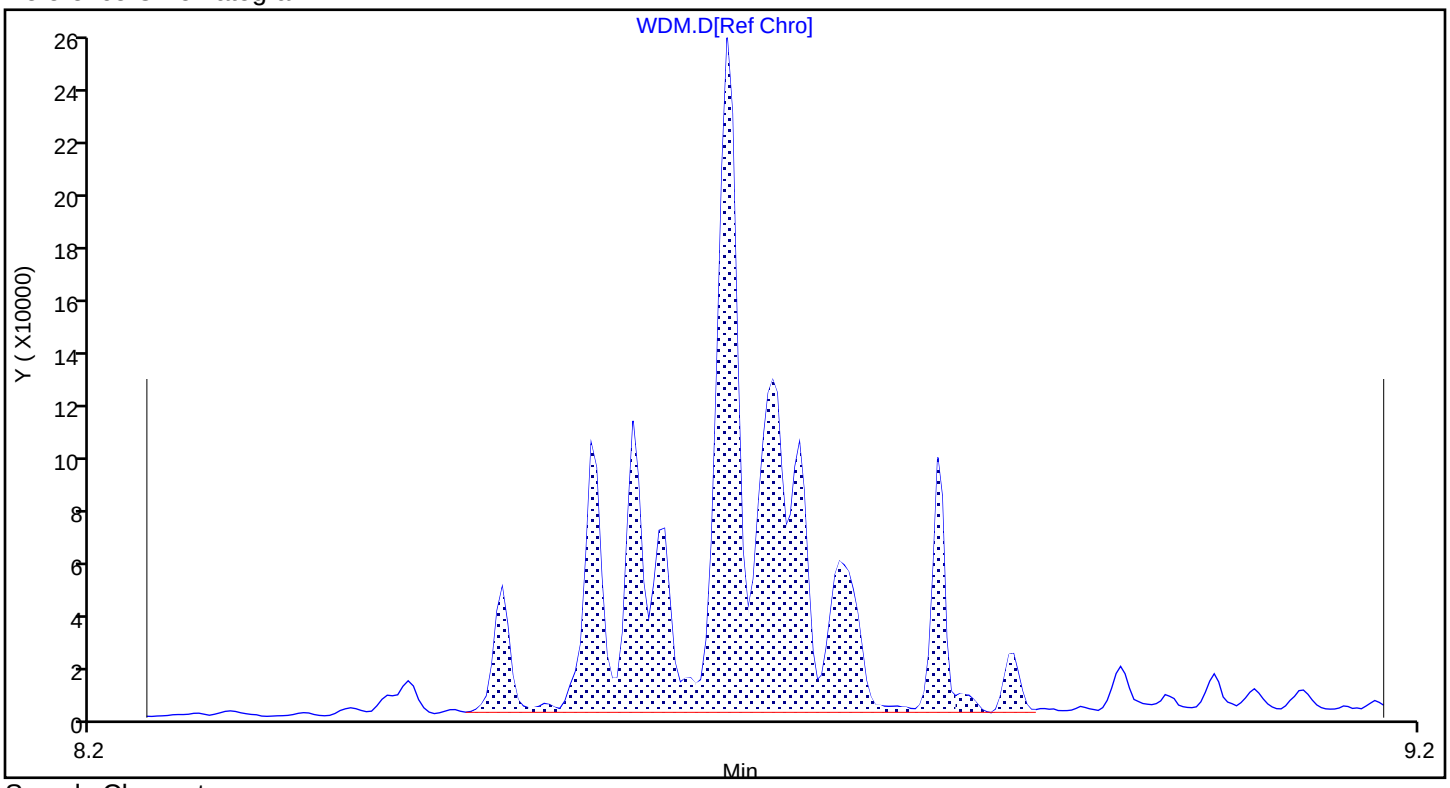
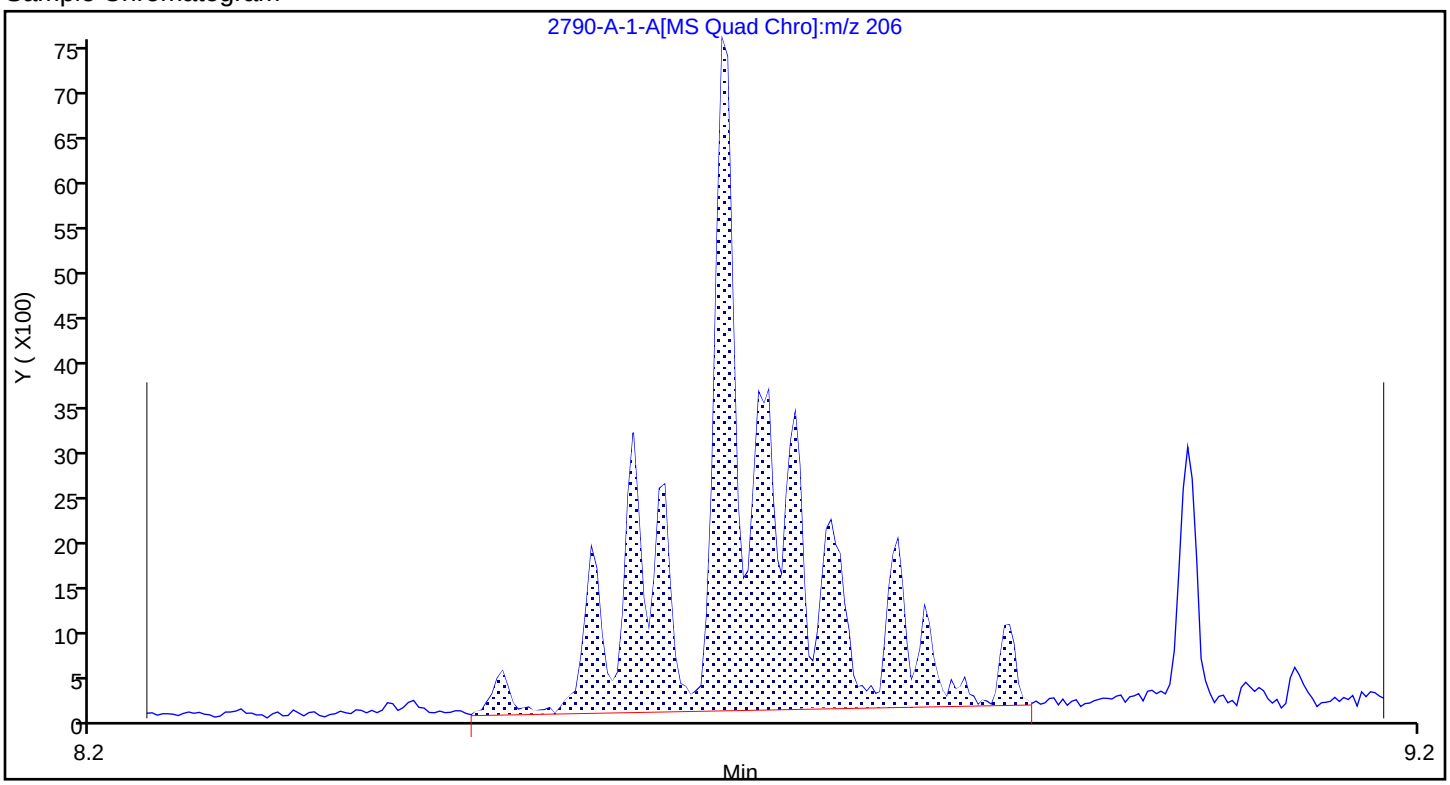
Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 97 C2-Phenanthrenes/Anthracenes, CAS: STL00902

Reference Chromatogram



Sample Chromatogram



Report Date: 22-Nov-2023 14:10:56 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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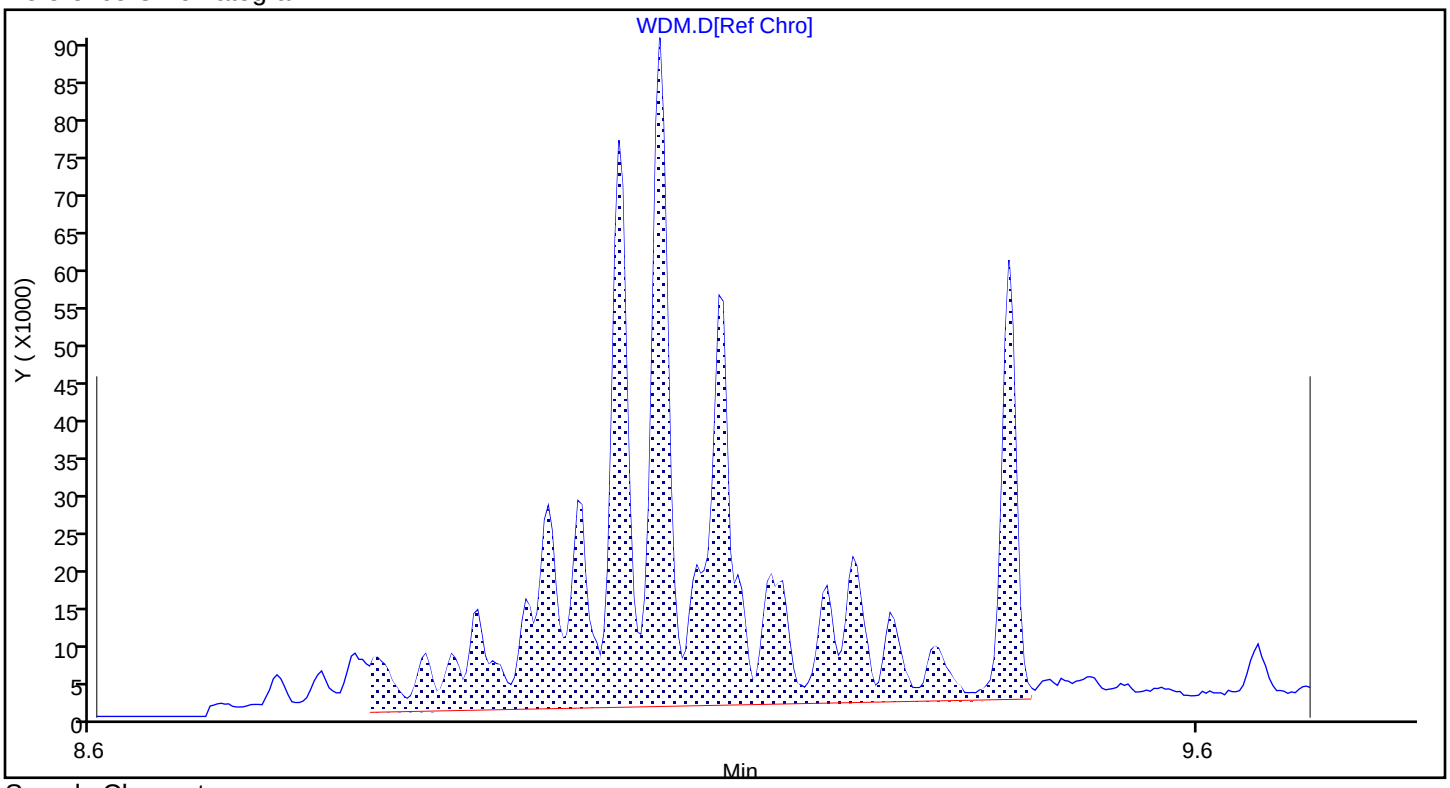
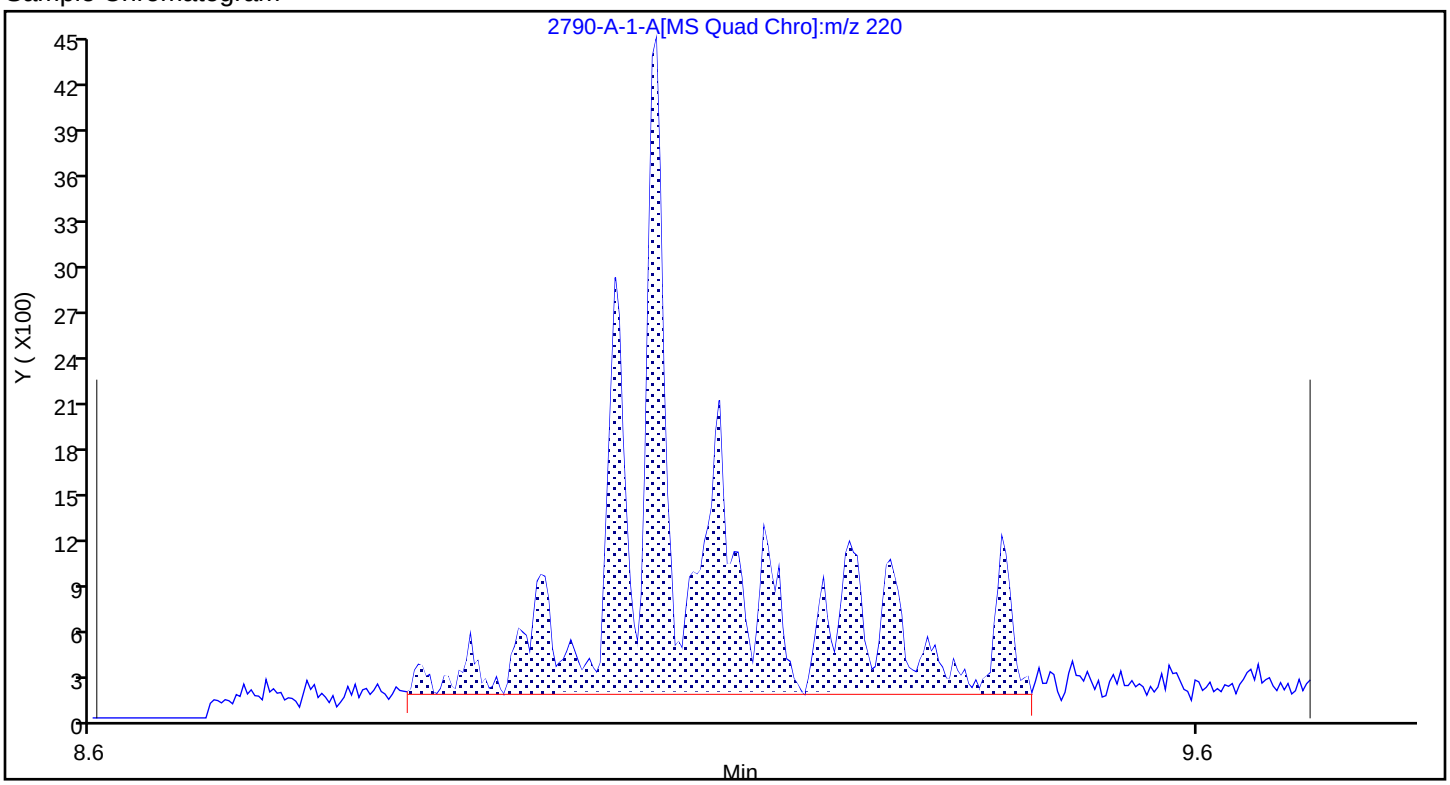
Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 98 C3-Phenanthrenes/Anthracenes, CAS: STL00903

Reference Chromatogram



Sample Chromatogram



Report Date: 22-Nov-2023 14:10:56 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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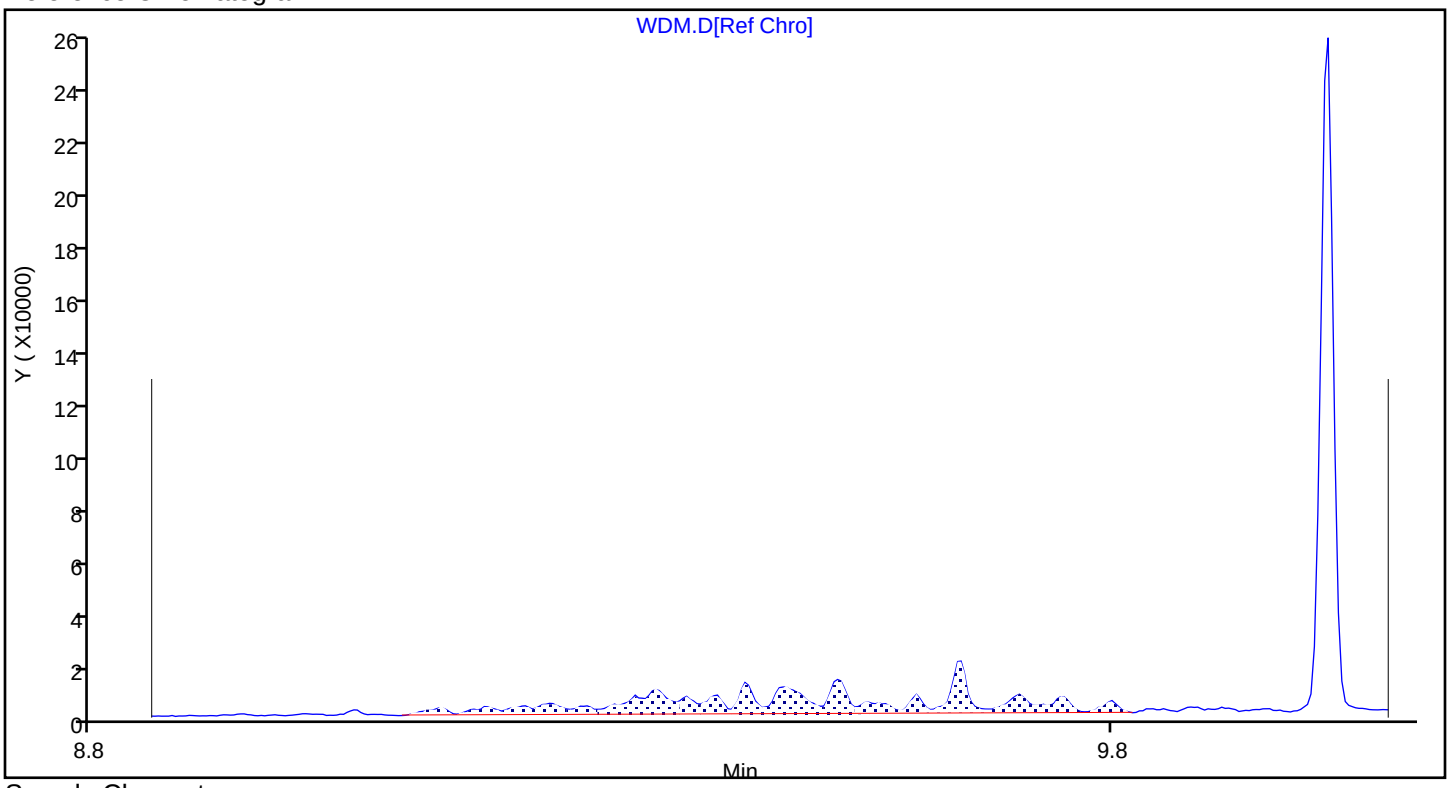
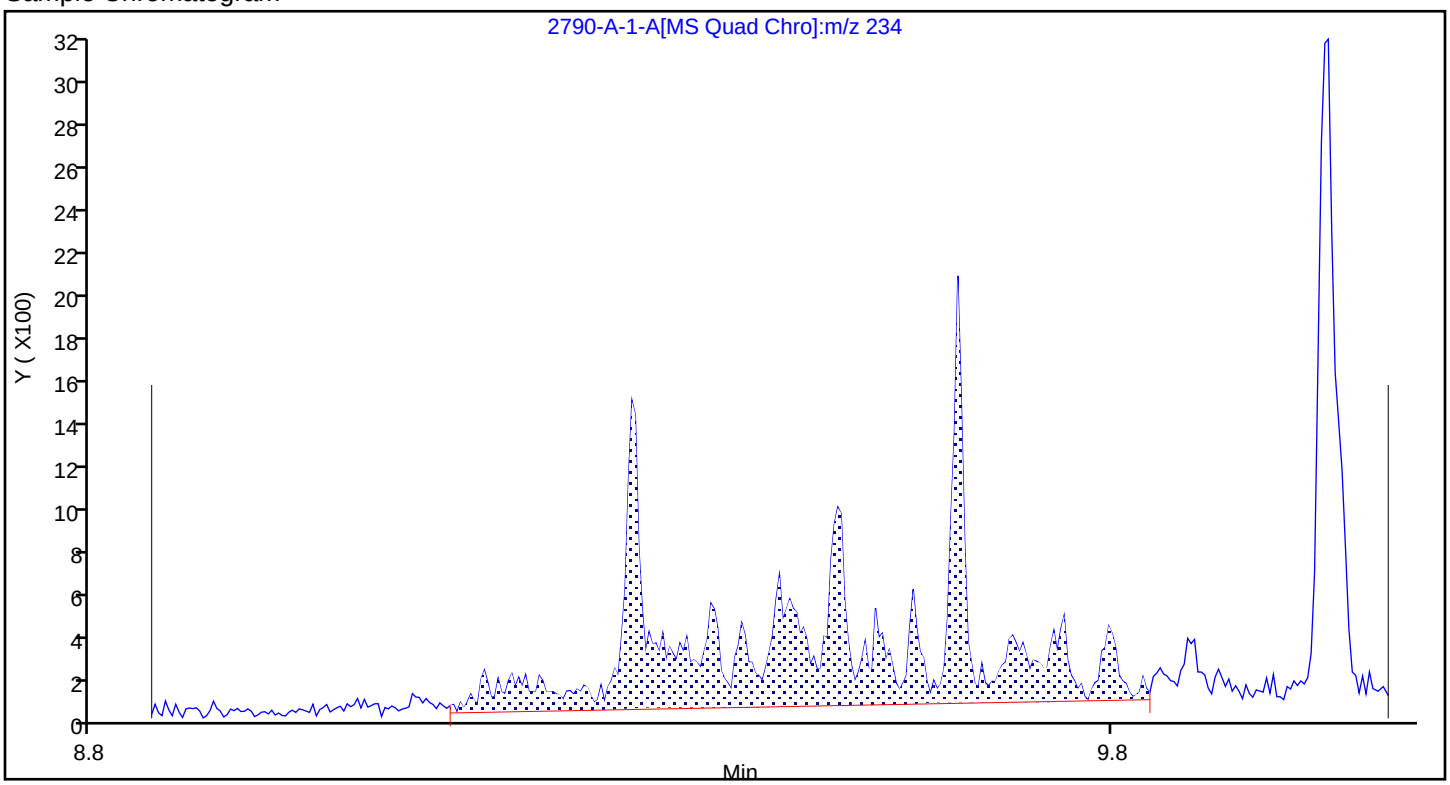
Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 99 C4-Phenanthrenes/Anthracenes, CAS: STL00904

Reference Chromatogram



Sample Chromatogram



Report Date: 22-Nov-2023 14:10:56 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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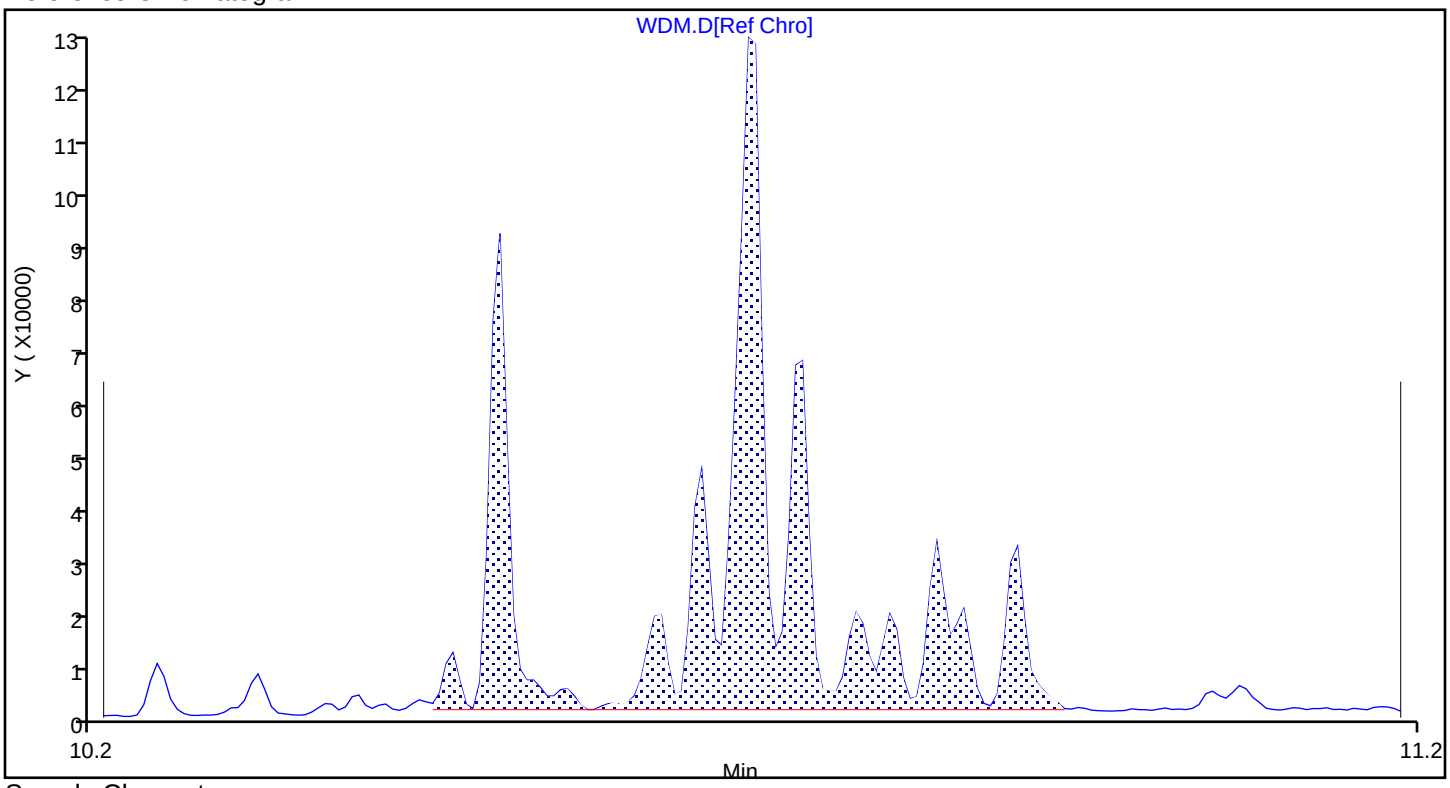
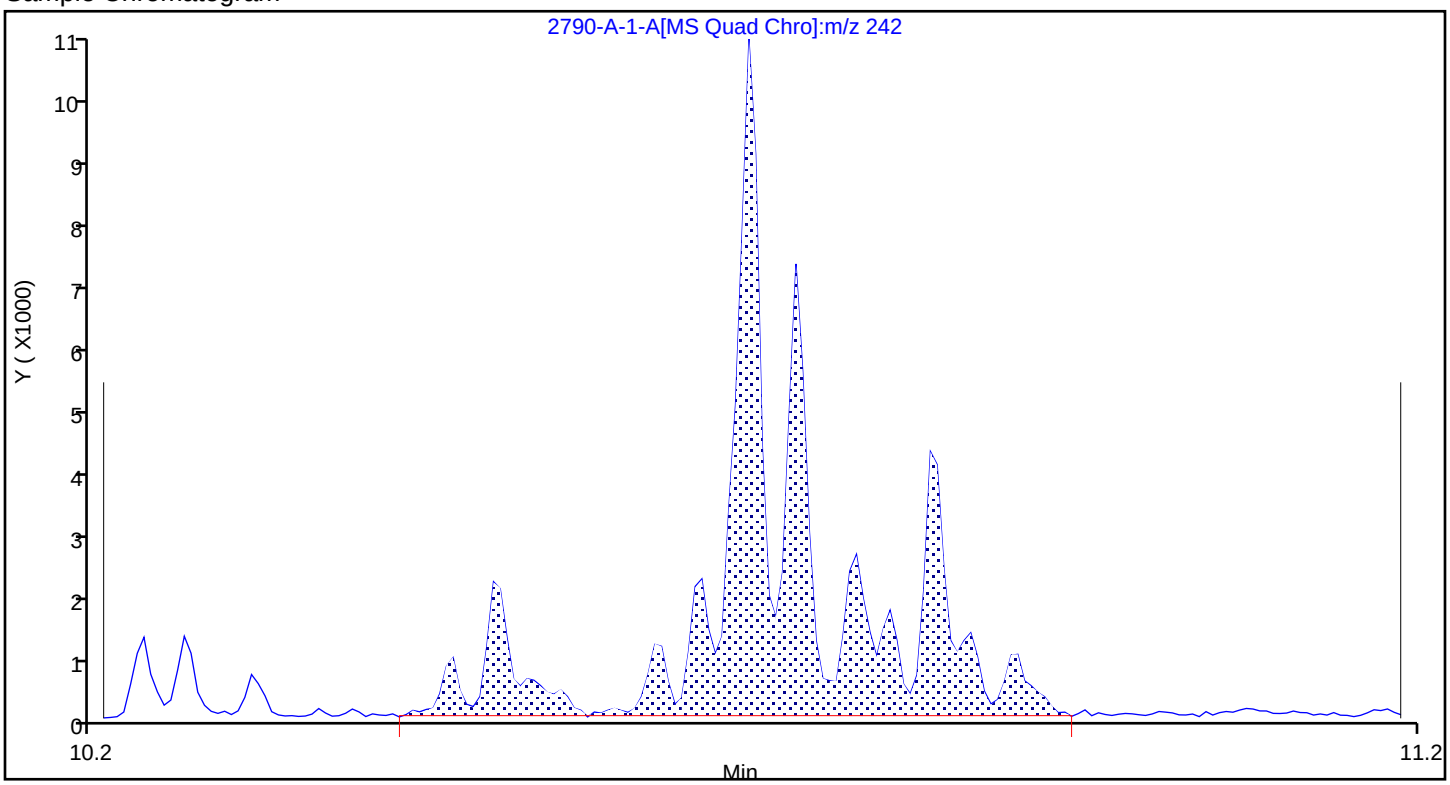
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 101 C1-Chrysenes/Benz(a)anthracenes, CAS: STL02218

Reference Chromatogram



Sample Chromatogram



Report Date: 22-Nov-2023 14:10:56 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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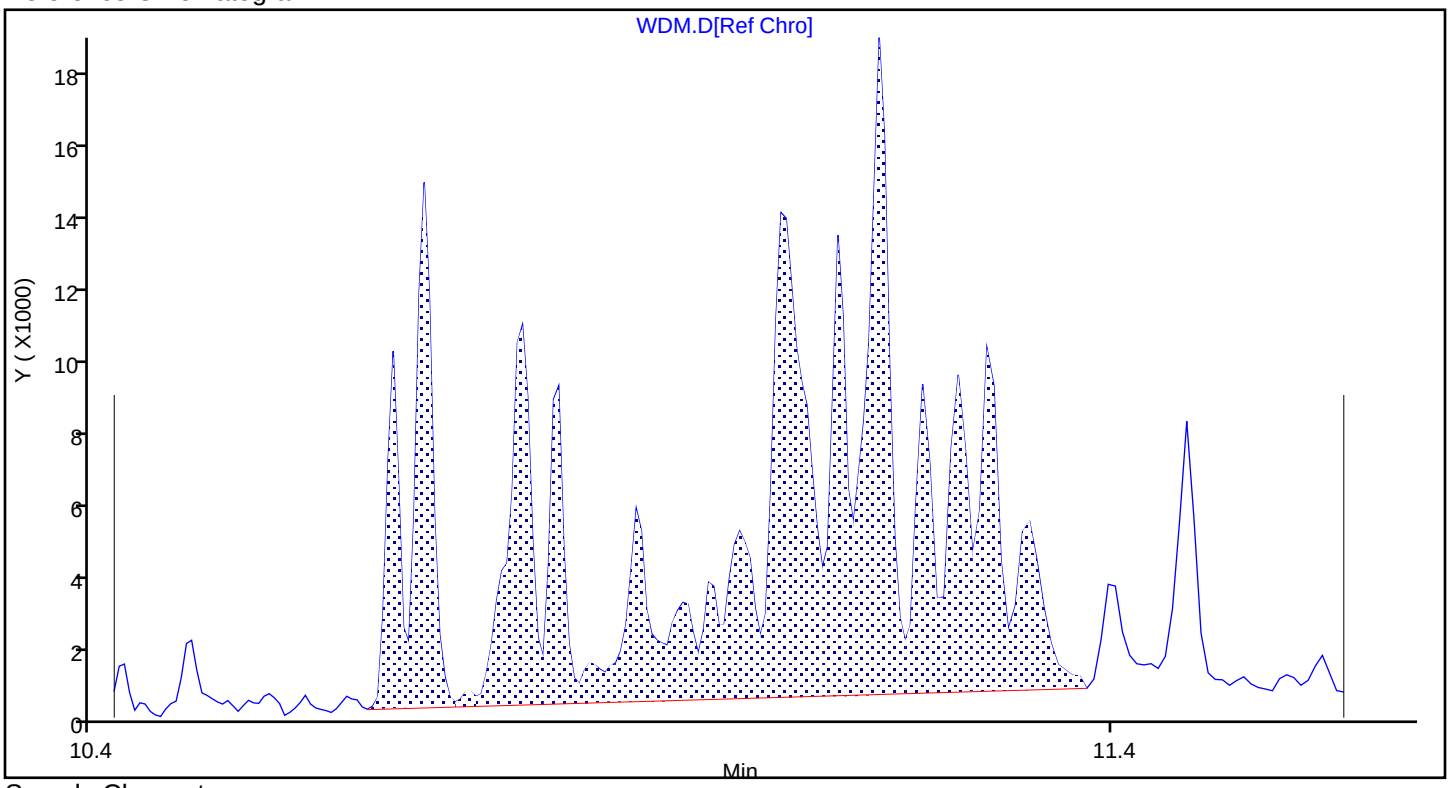
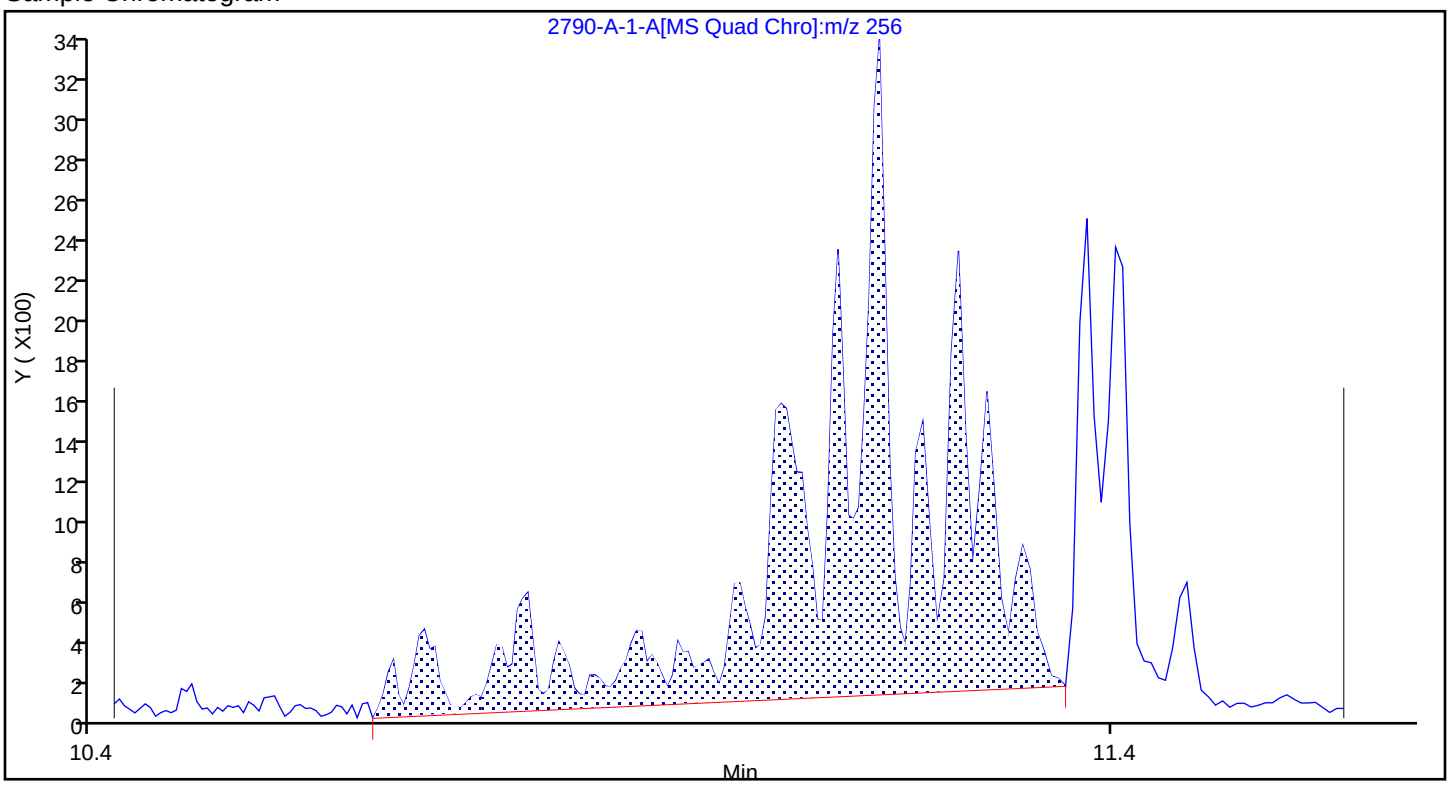
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 102 C2-Chrysenes/Benz(a)anthracenes, CAS: STL02219

Reference Chromatogram



Sample Chromatogram



Report Date: 22-Nov-2023 14:10:56 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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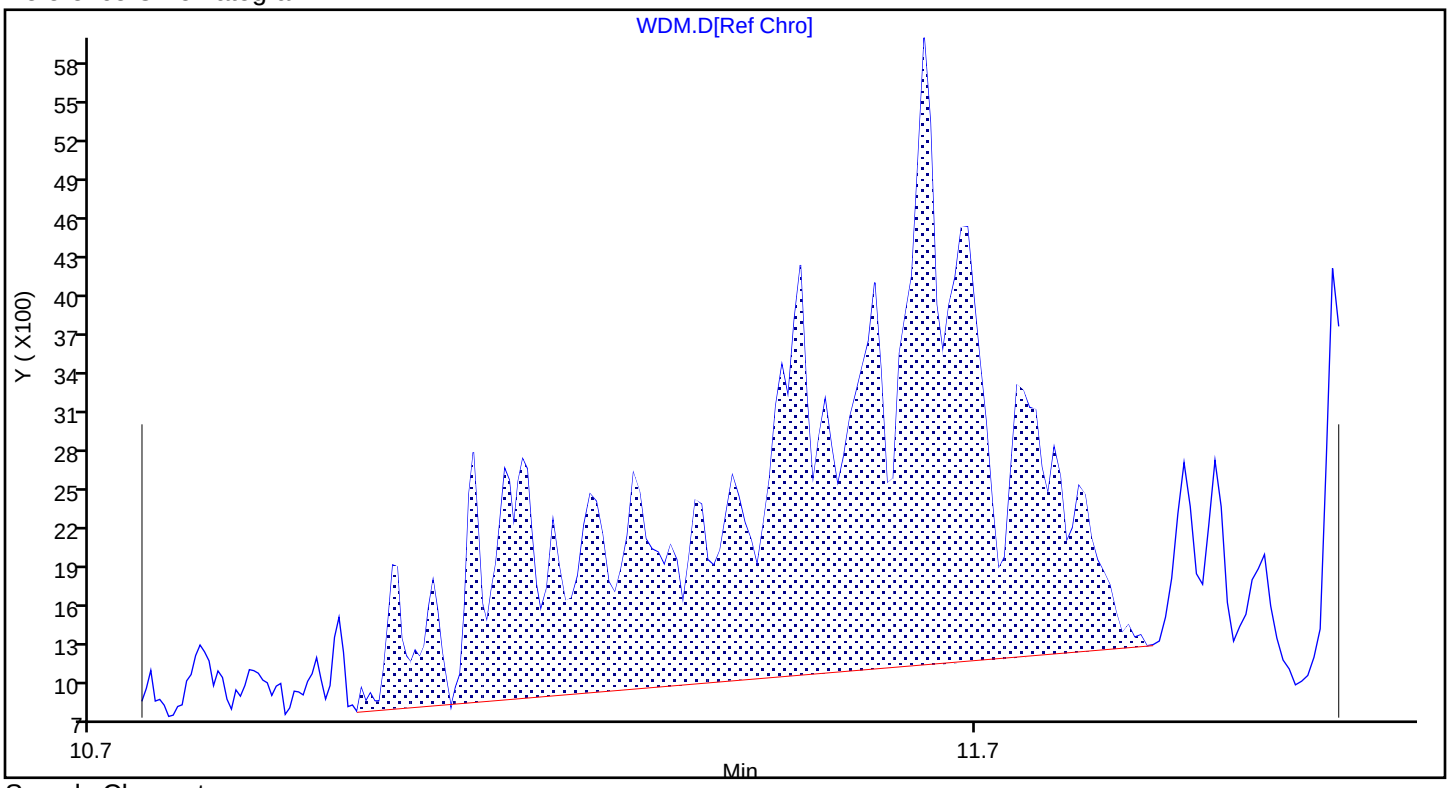
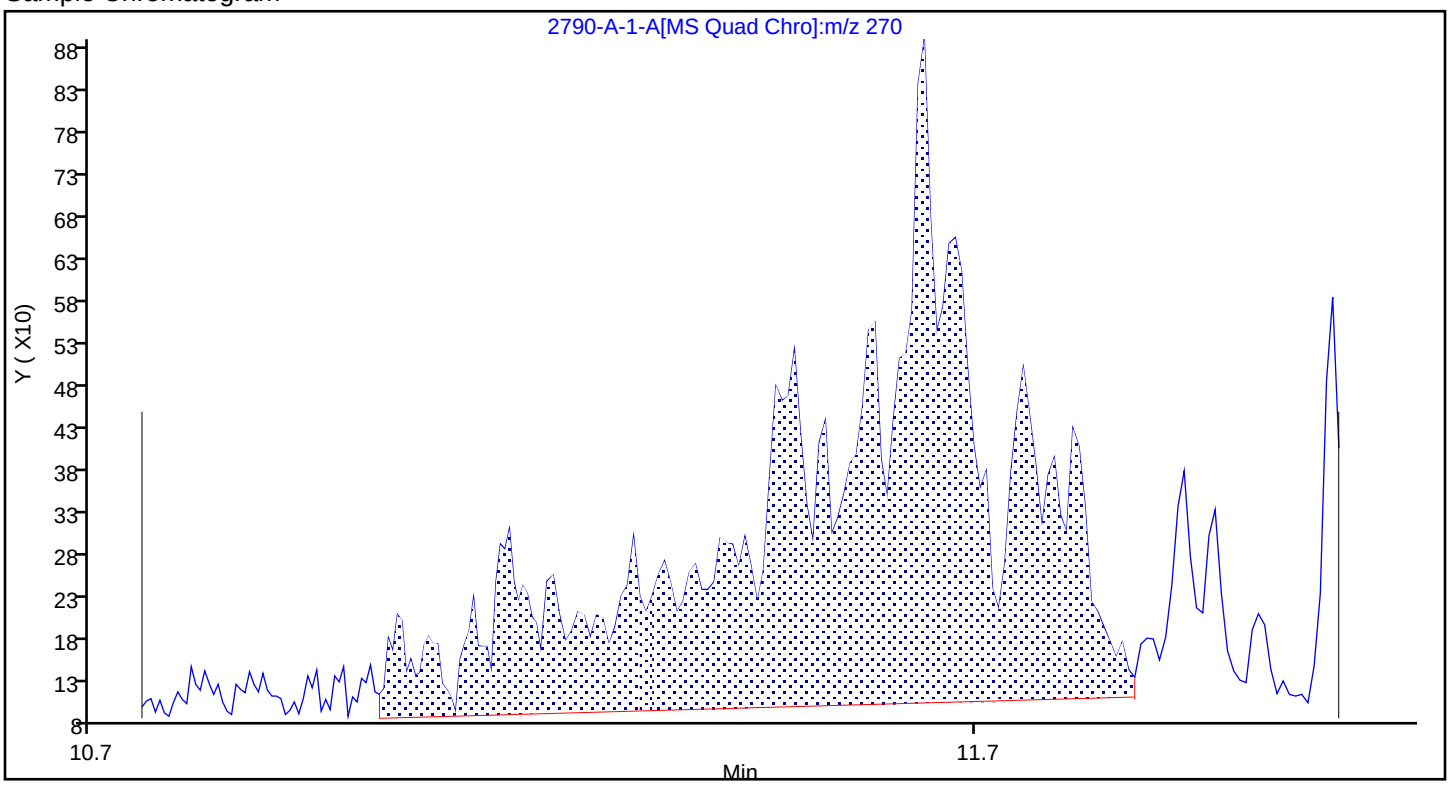
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 103 C3-Chrysenes/Benz(a)anthracenes, CAS: STL02220

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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Client ID:	1804576-852-S1				
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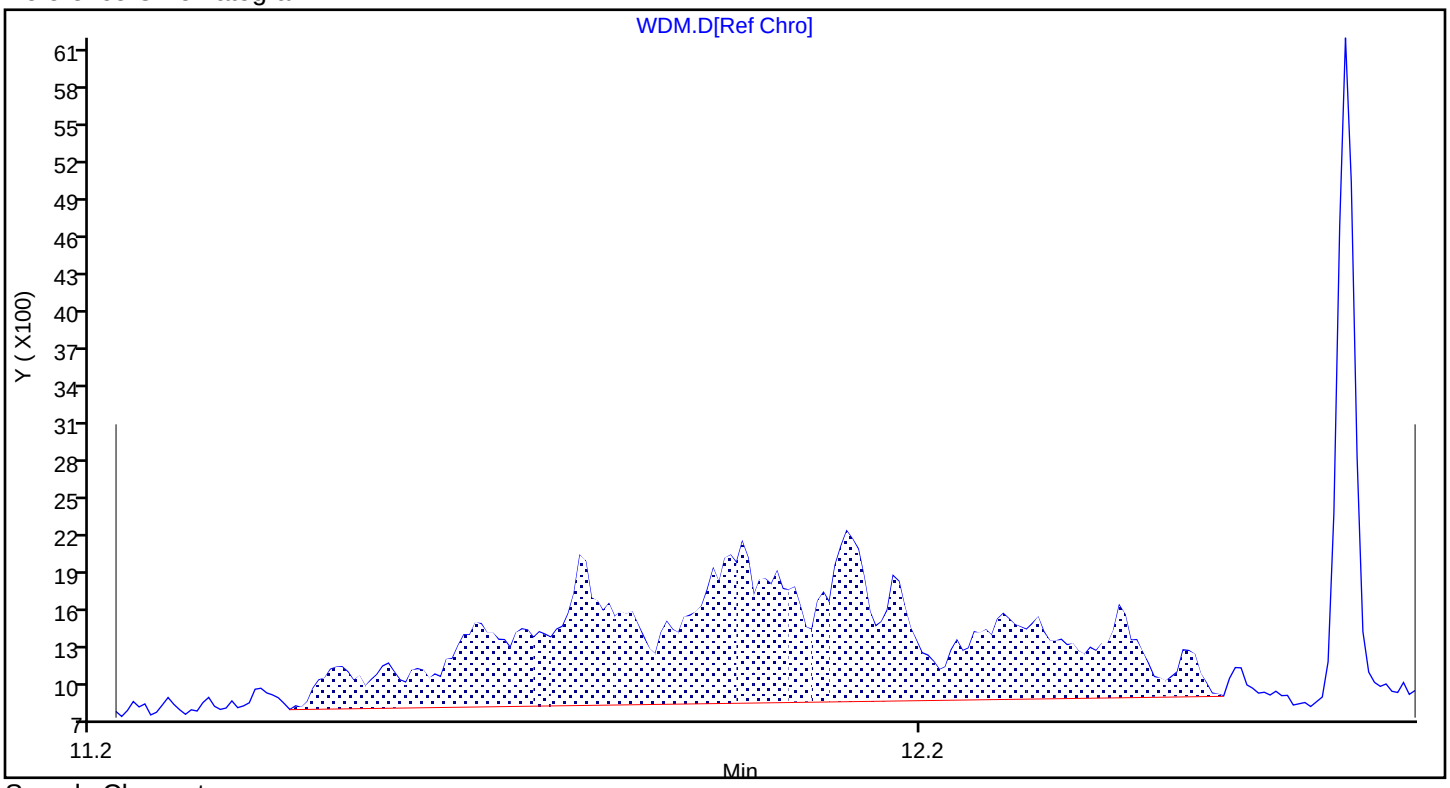
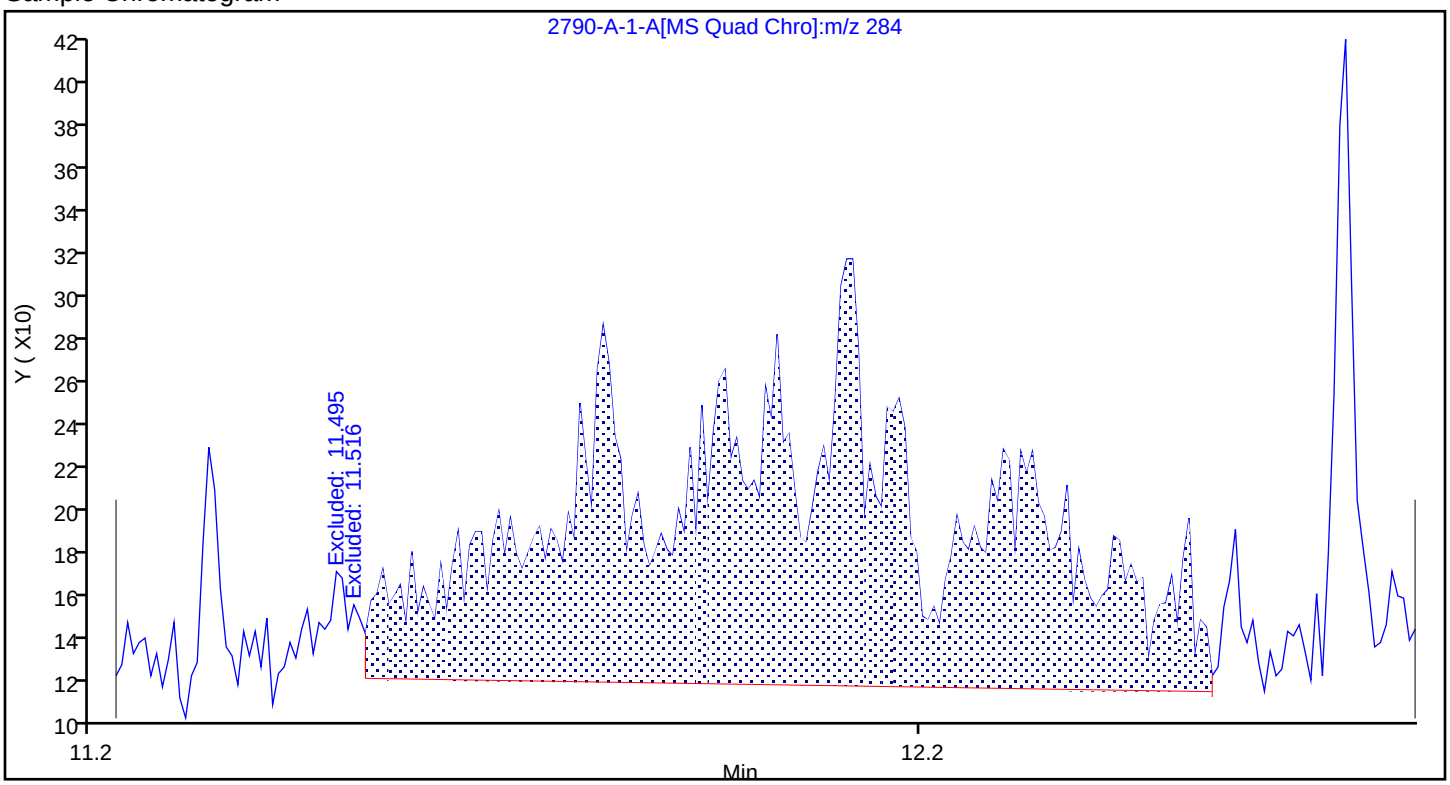
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 104 C4-Chrysenes/Benz(a)anthracenes, CAS: STL02221

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
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Client ID:	1804576-852-S1				
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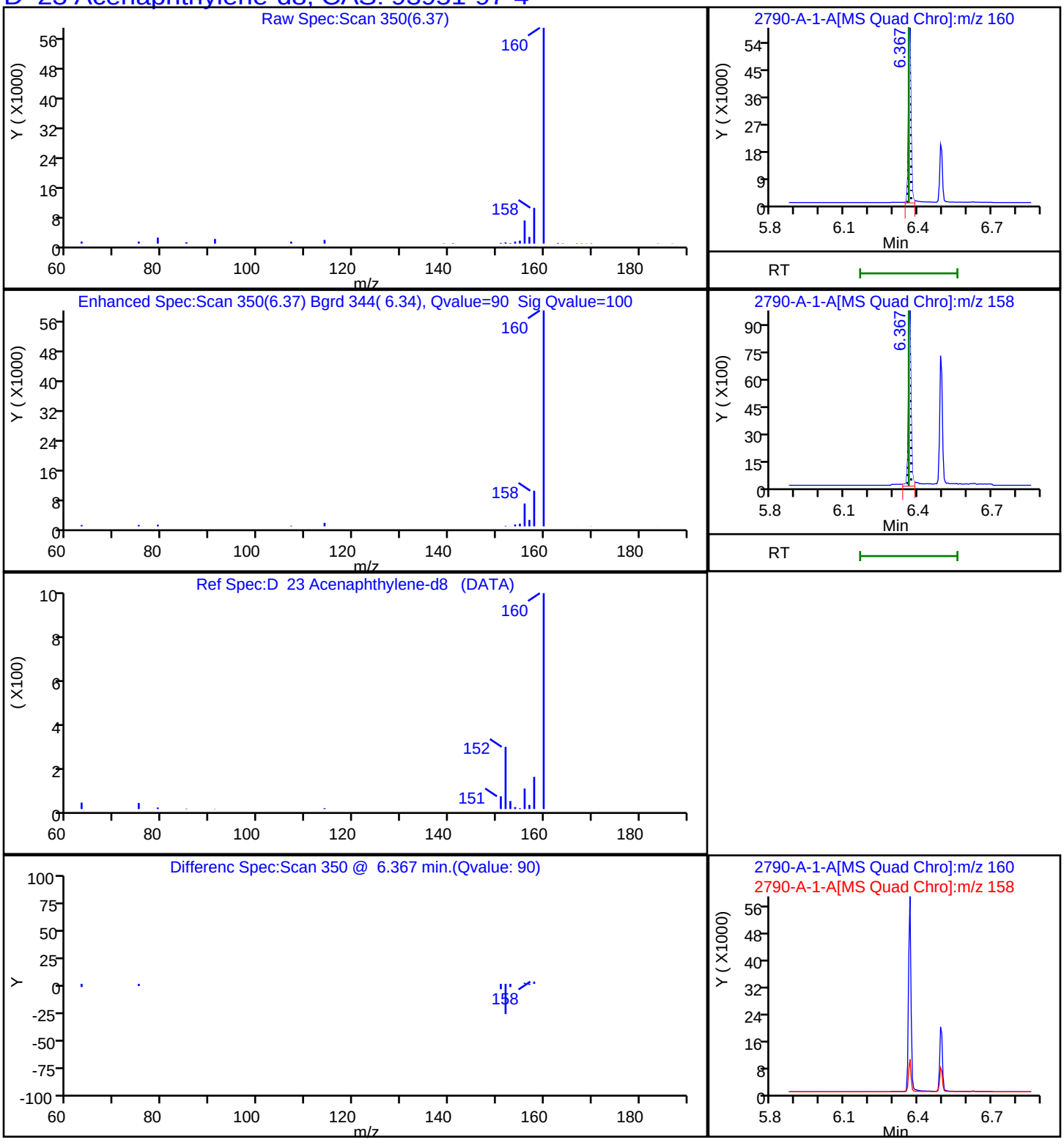
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 23 Acenaphthylene-d8, CAS: 93951-97-4



Report Date: 22-Nov-2023 14:10:55 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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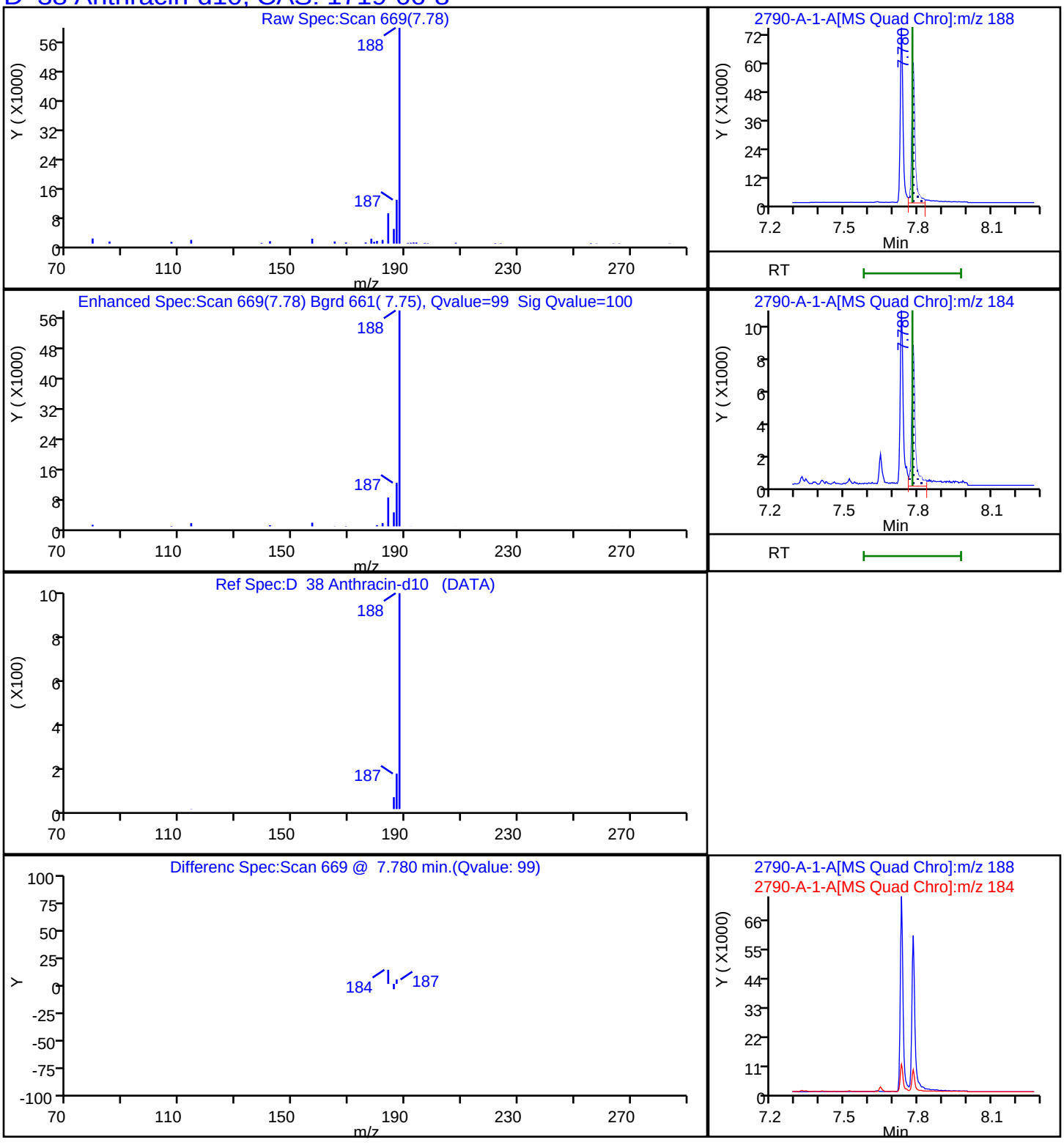
Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 38 Anthracin-d10, CAS: 1719-06-8



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Eurofins Knoxville

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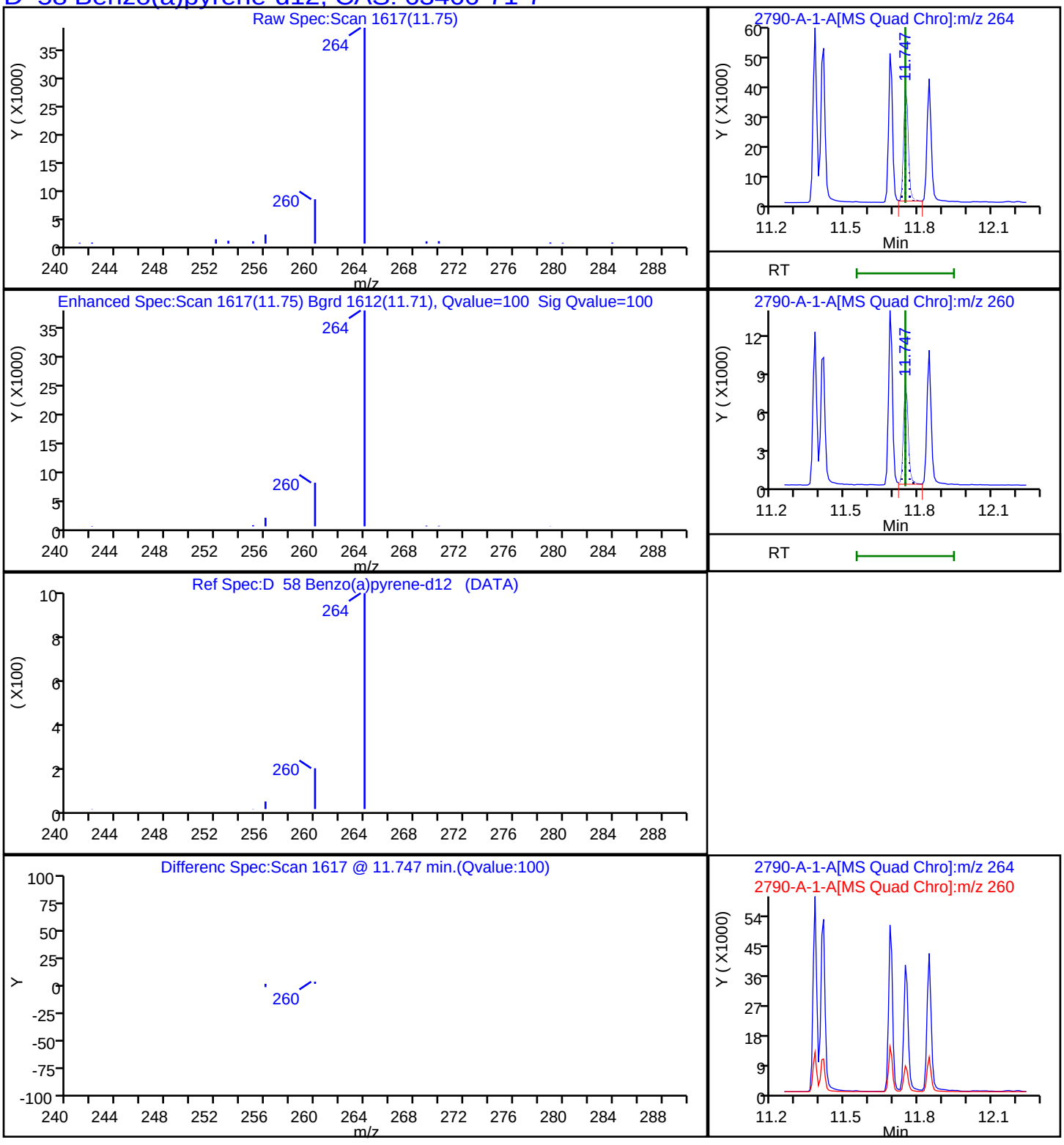
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 58 Benzo(a)pyrene-d12, CAS: 63466-71-7



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Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D

Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
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Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
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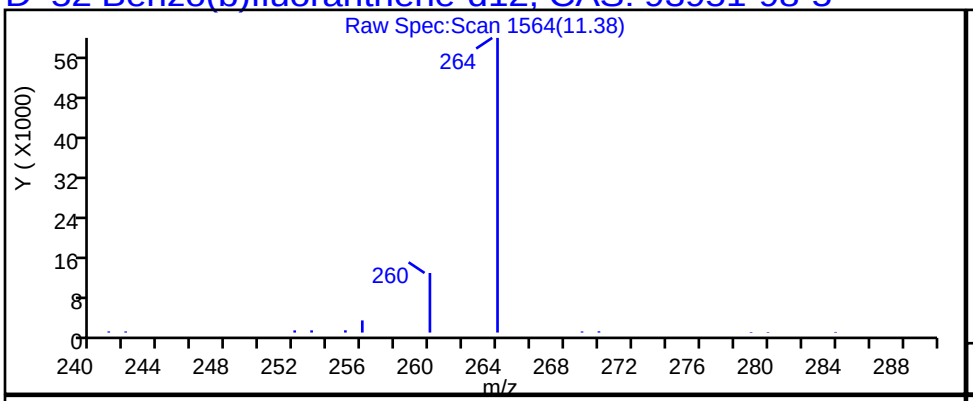
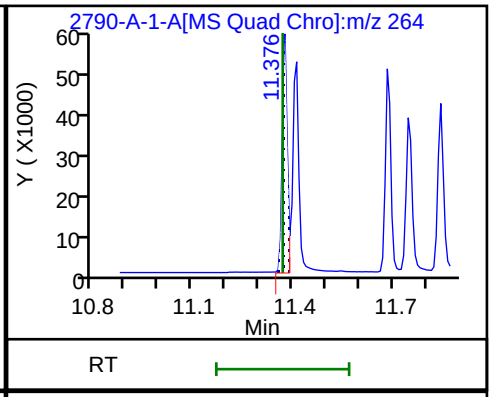
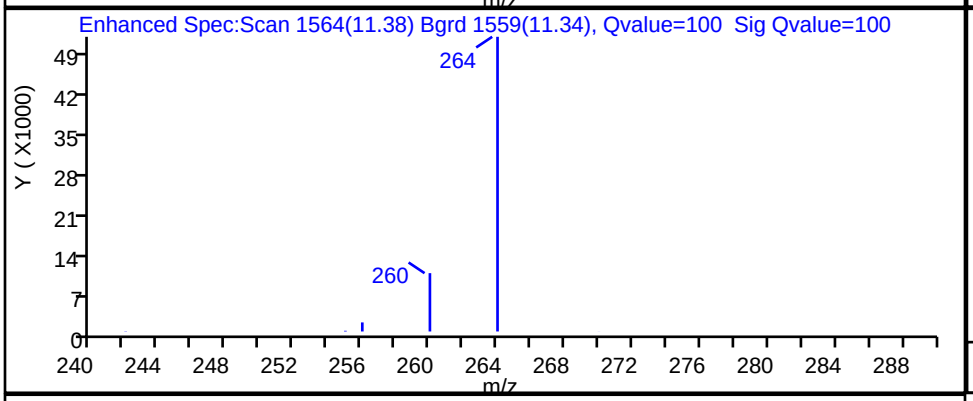
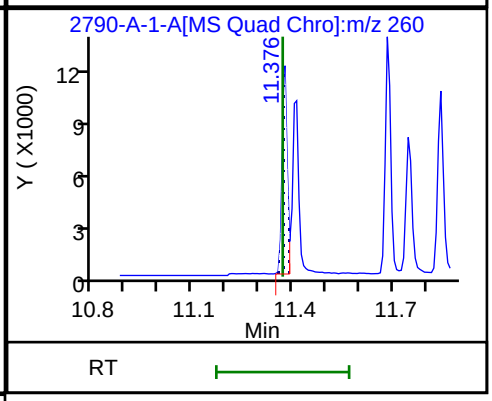
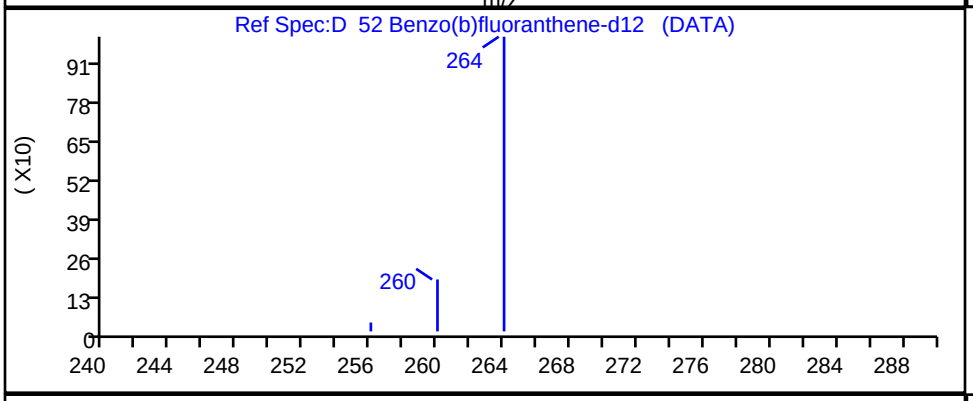
D 52 Benzo(b)fluoranthene-d12, CAS: 93951-98-5

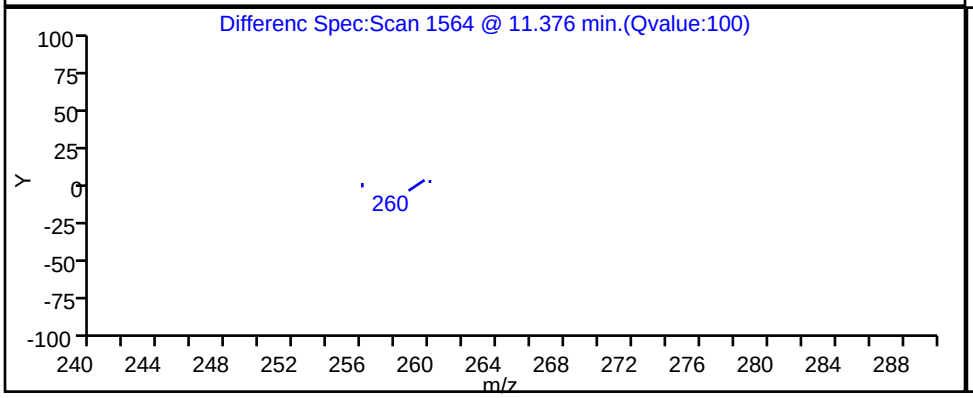


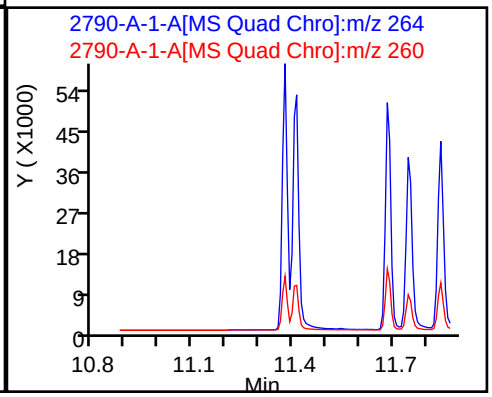












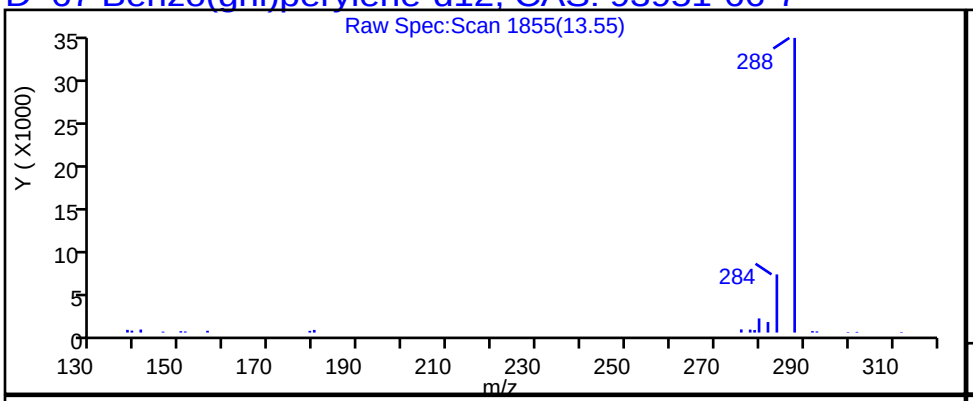
Report Date: 22-Nov-2023 14:10:55 Chrom Revision: 2.3 15-Nov-2023 20:54:34

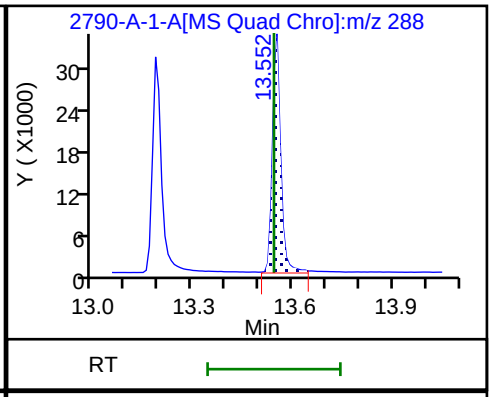
Eurofins Knoxville

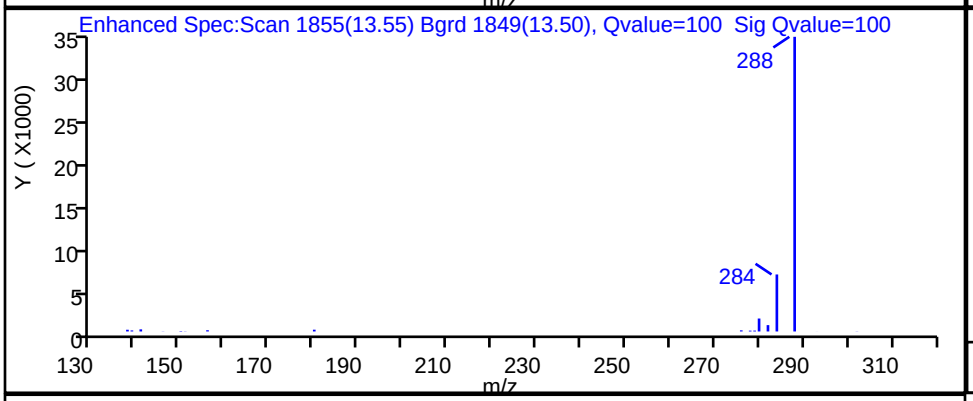
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D

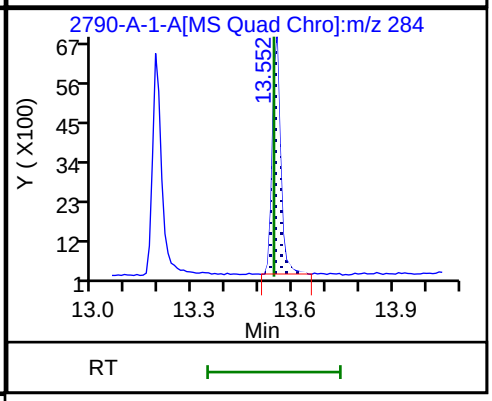
Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

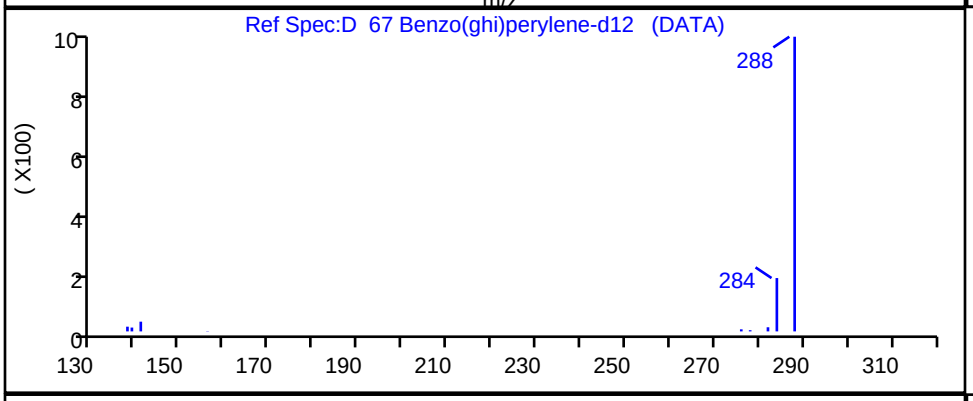
D 67 Benzo(ghi)perylene-d12, CAS: 93951-66-7

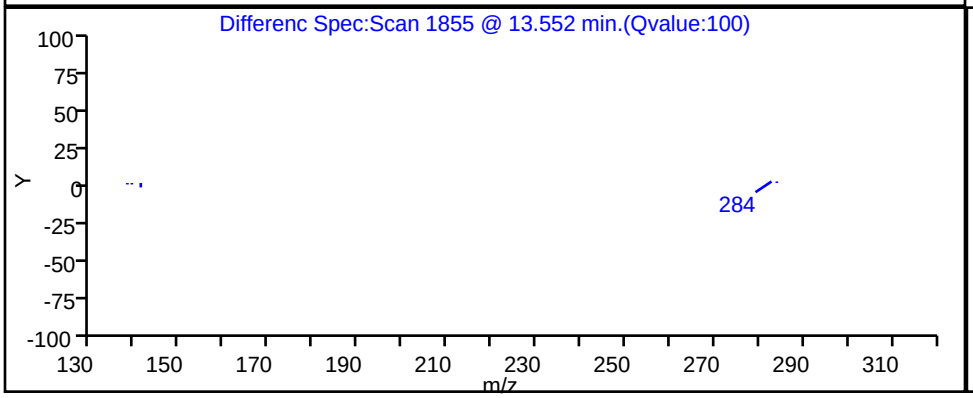


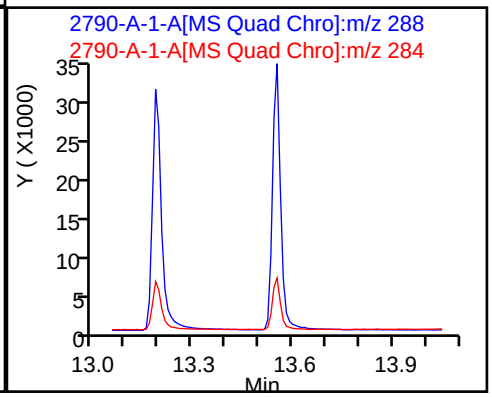












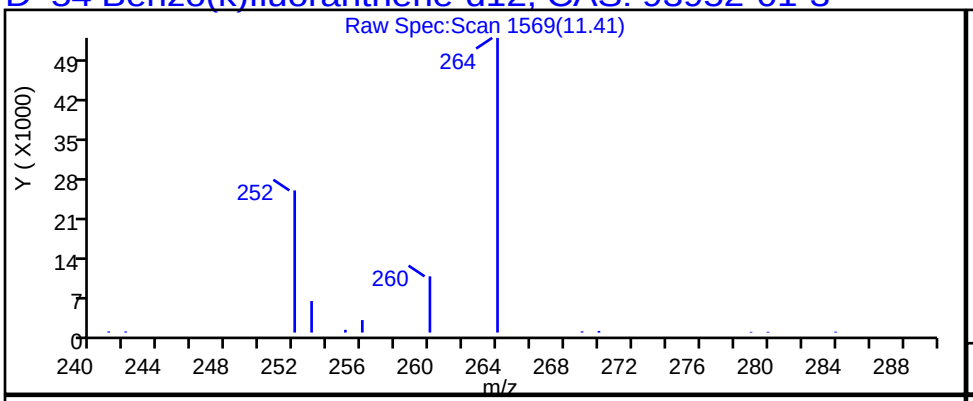
Report Date: 22-Nov-2023 14:10:55 Chrom Revision: 2.3 15-Nov-2023 20:54:34

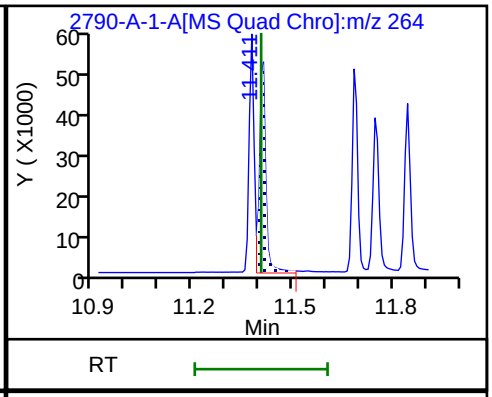
Eurofins Knoxville

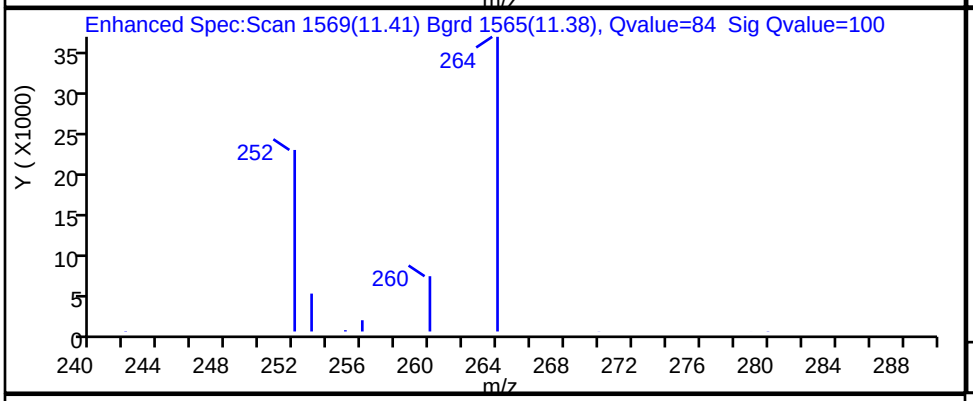
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D

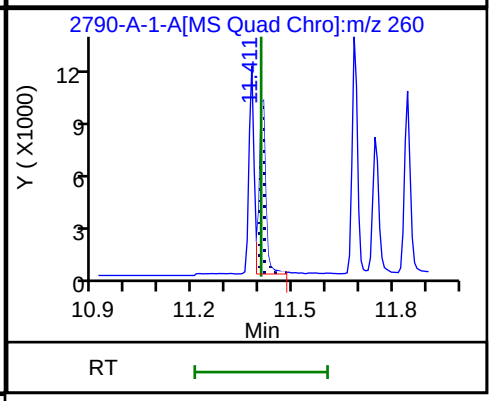
Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

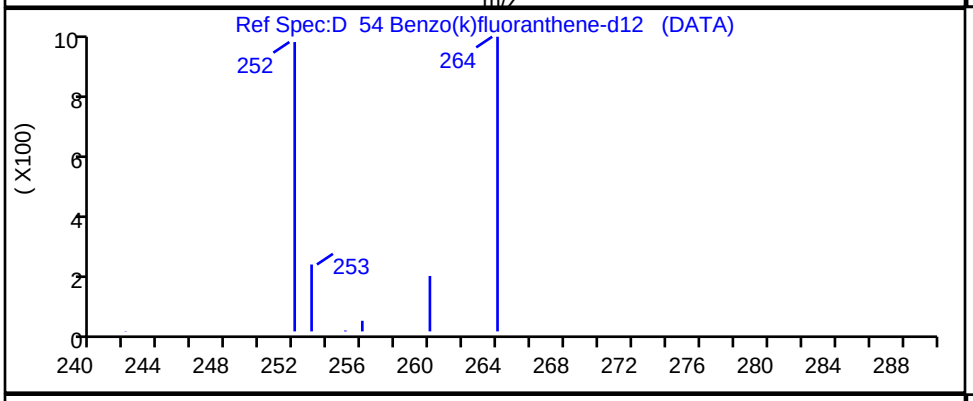
D 54 Benzo(k)fluoranthene-d12, CAS: 93952-01-3

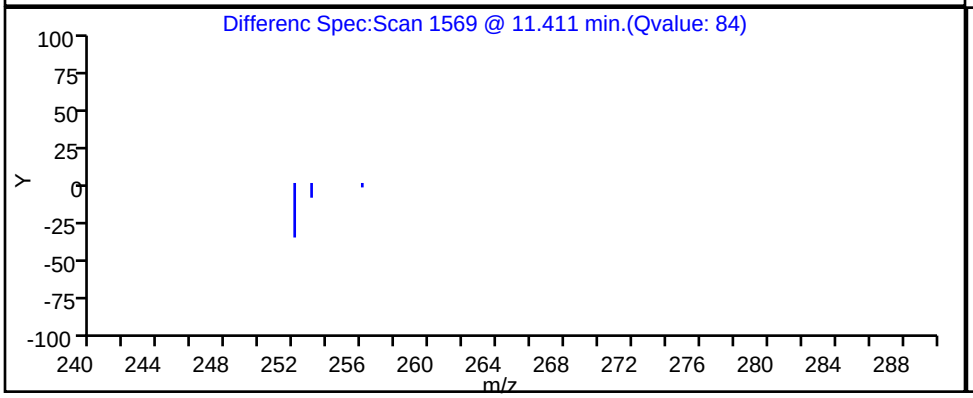


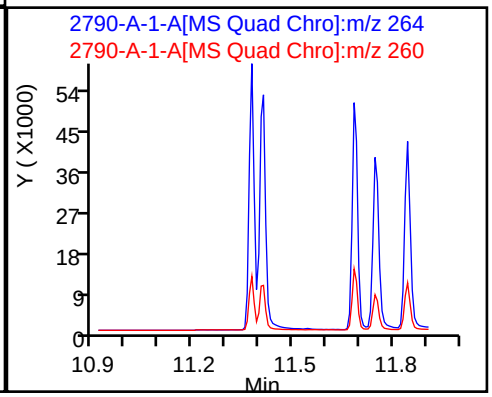










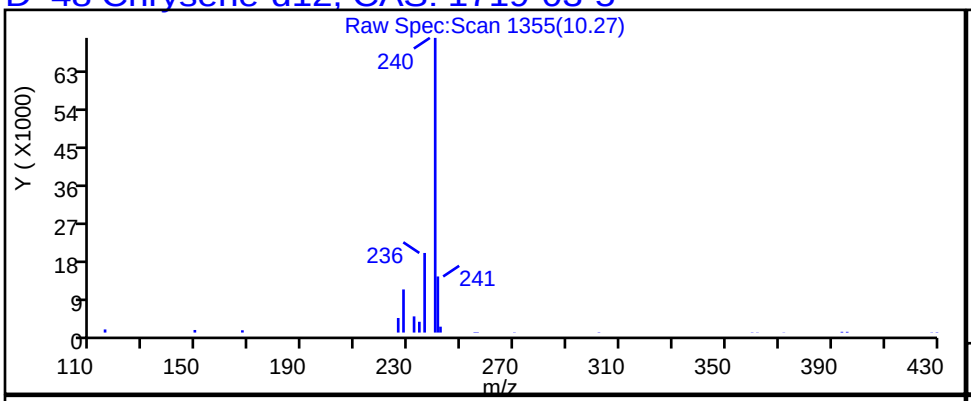


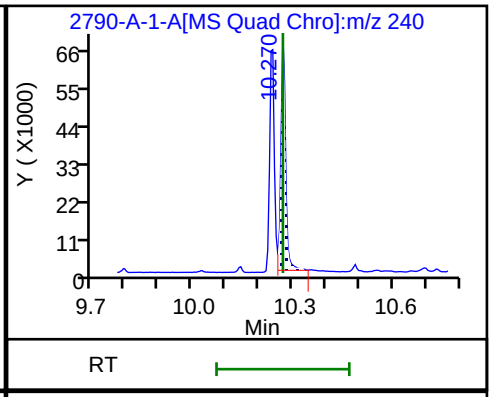
Report Date: 22-Nov-2023 14:10:55 Chrom Revision: 2.3 15-Nov-2023 20:54:34

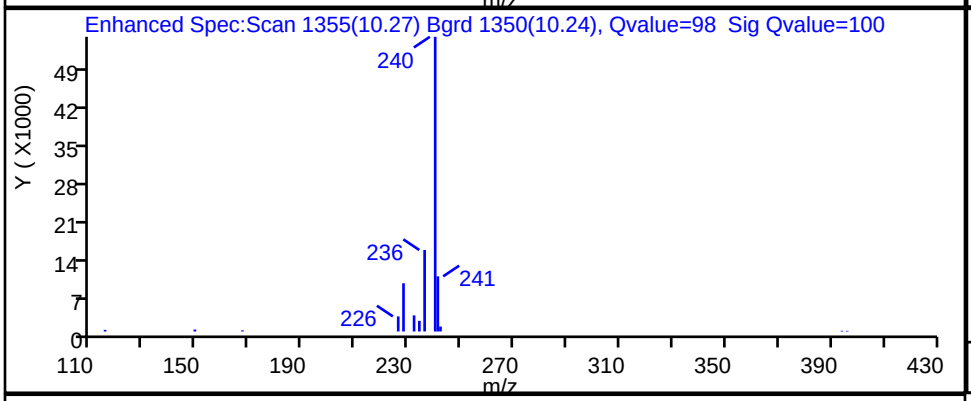
Eurofins Knoxville

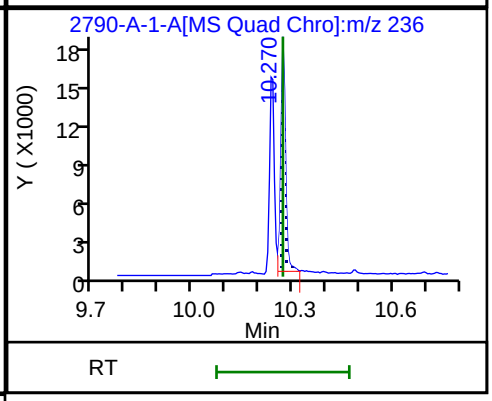
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D				
Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

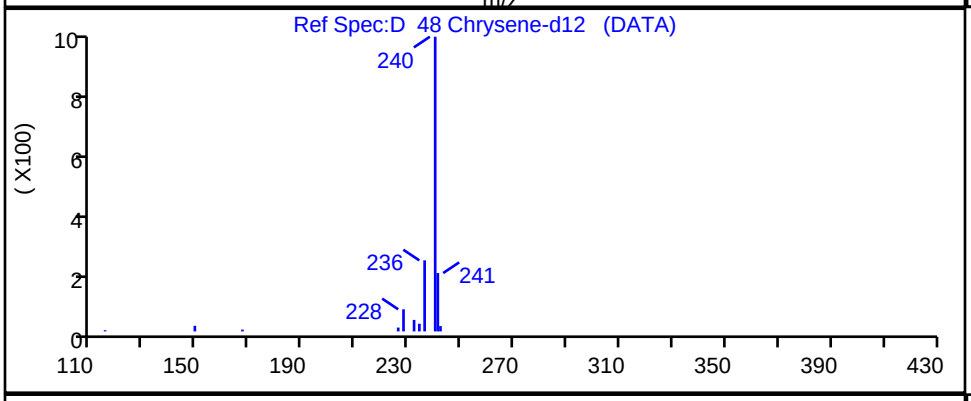
D 48 Chrysene-d12, CAS: 1719-03-5

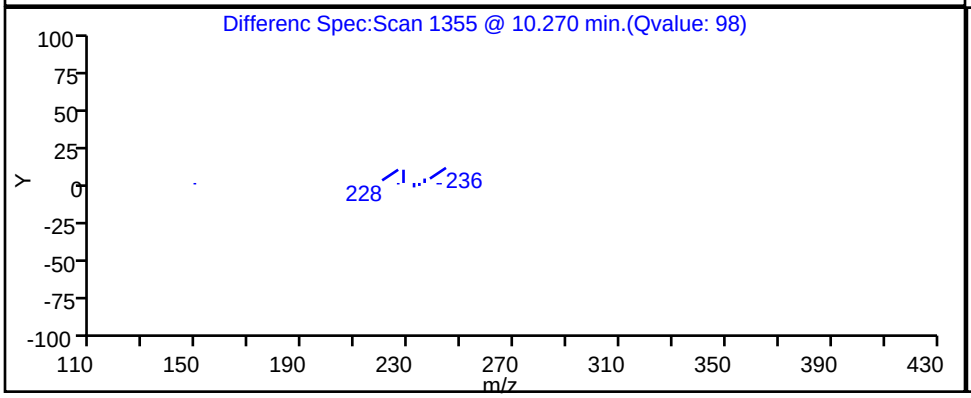


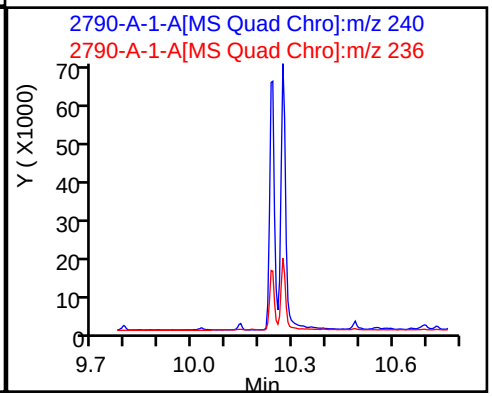












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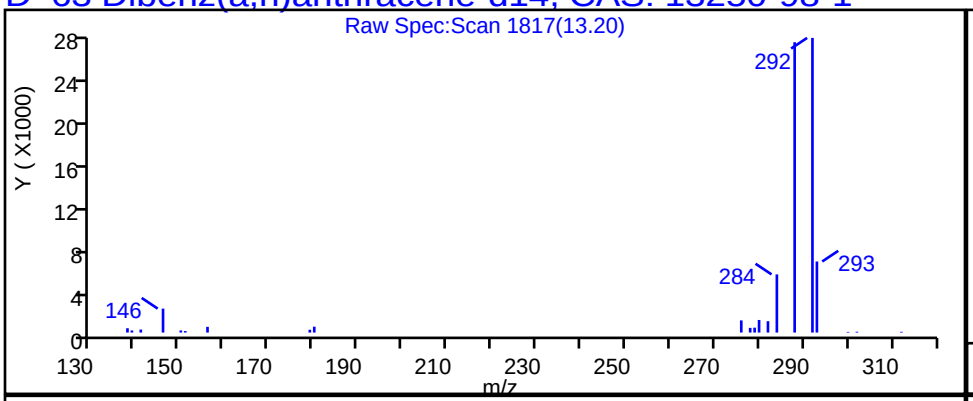
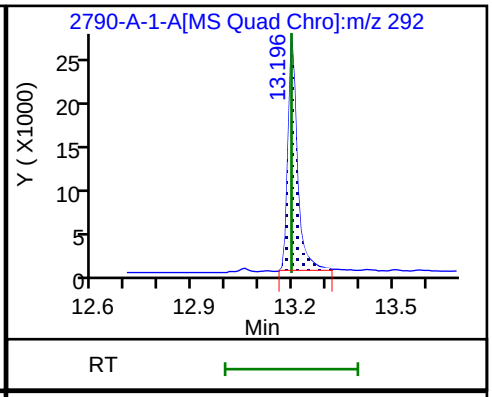
Eurofins Knoxville

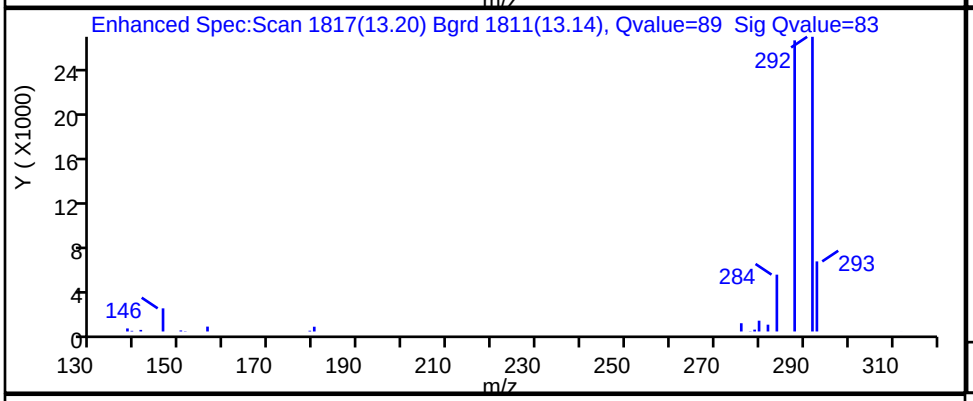
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D

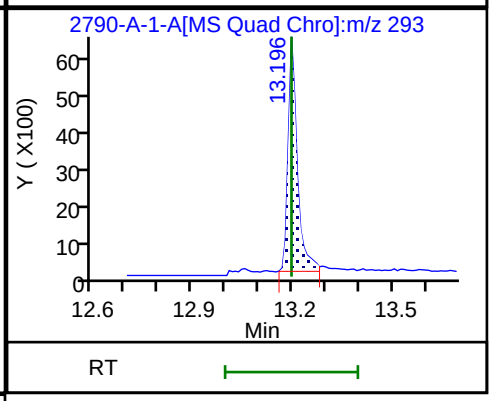
Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

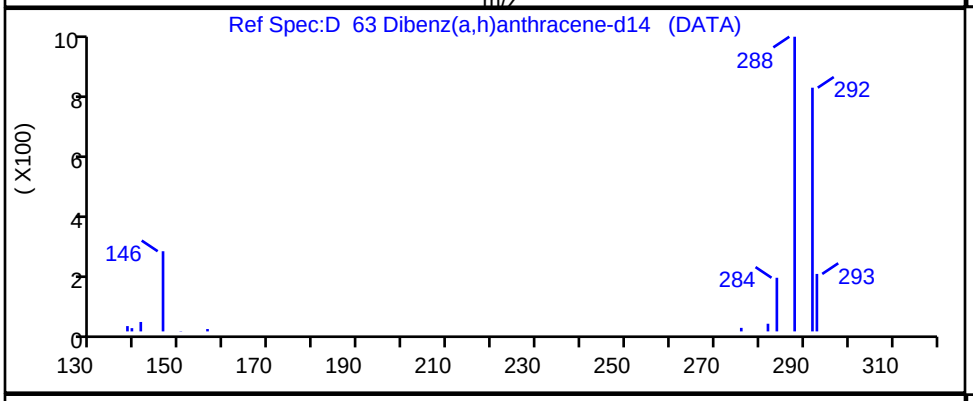
D 63 Dibenz(a,h)anthracene-d14, CAS: 13250-98-1

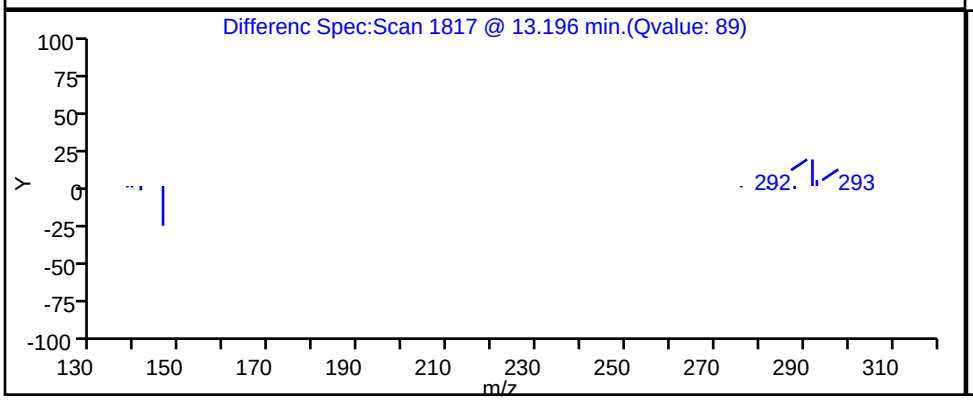


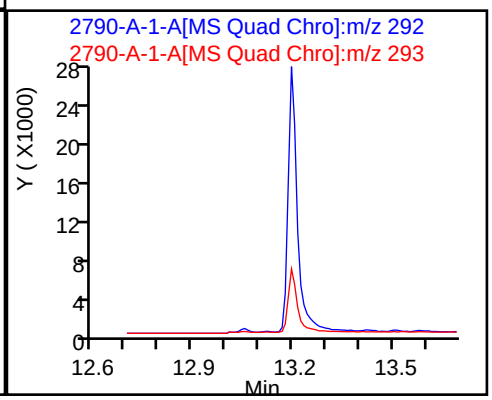












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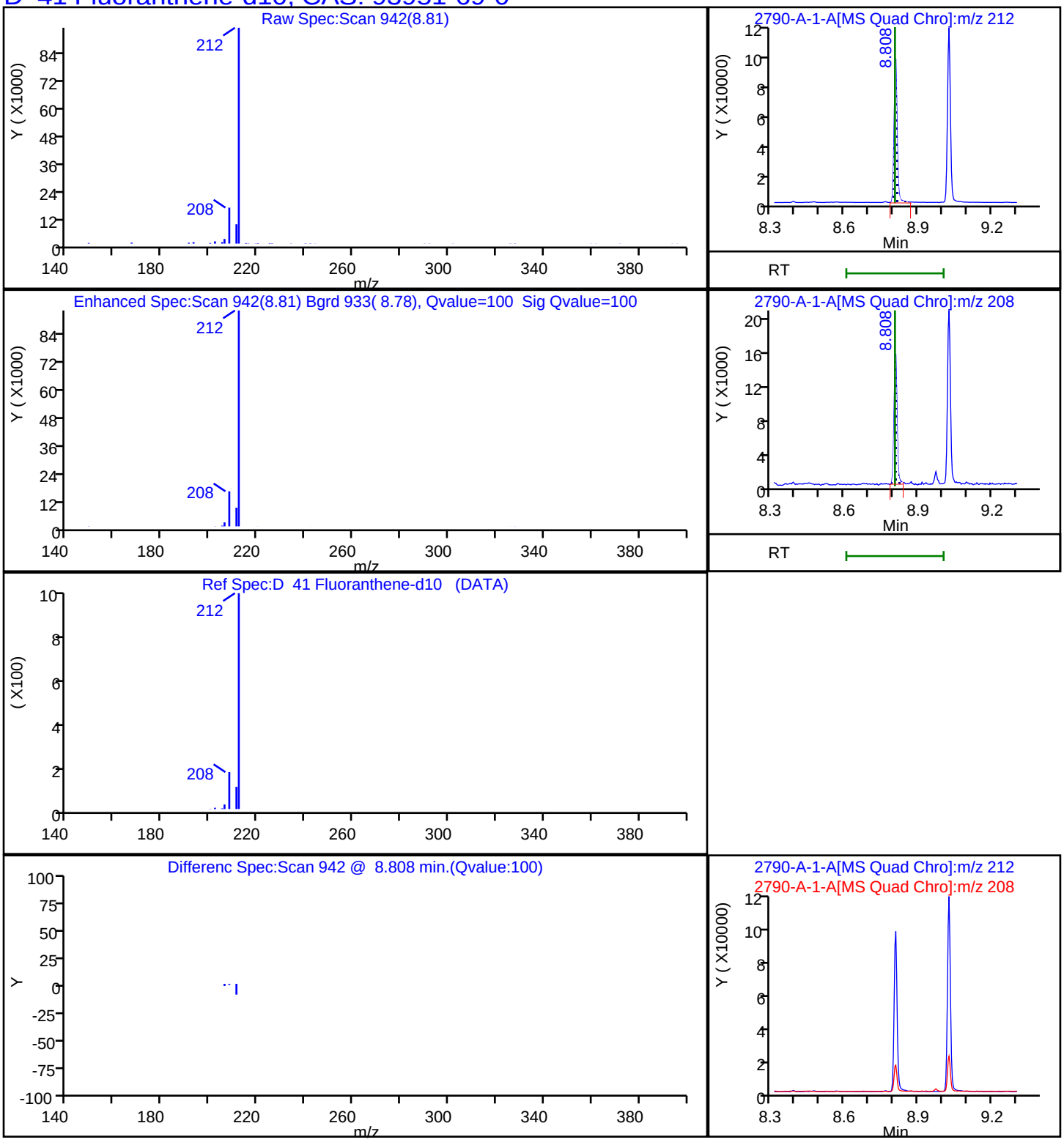
Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D				
Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 41 Fluoranthene-d10, CAS: 93951-69-0



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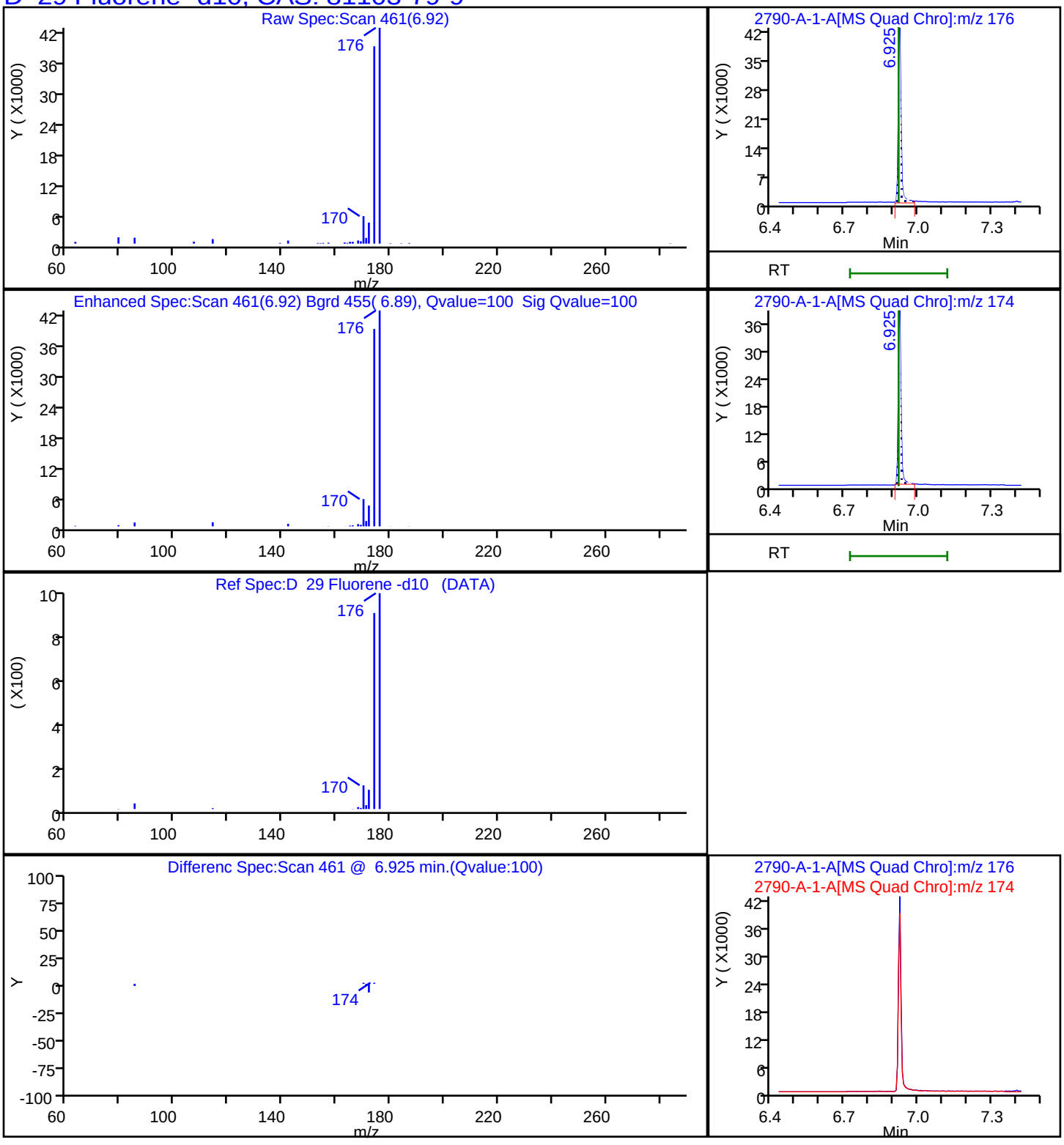
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D

Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6
Client ID:	1804576-852-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

D 29 Fluorene -d10, CAS: 81103-79-9



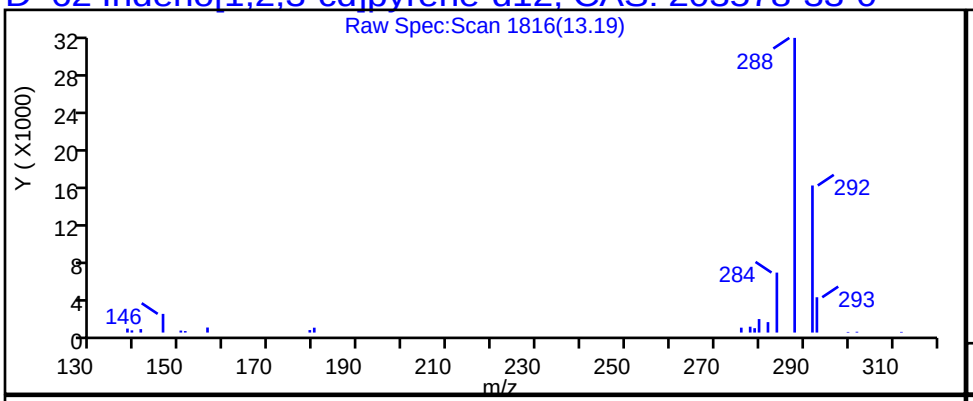
Report Date: 22-Nov-2023 14:10:55 Chrom Revision: 2.3 15-Nov-2023 20:54:34

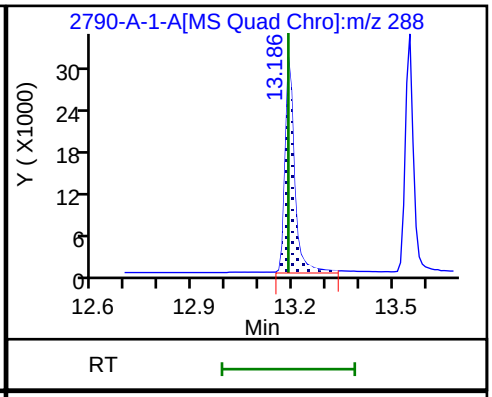
Eurofins Knoxville

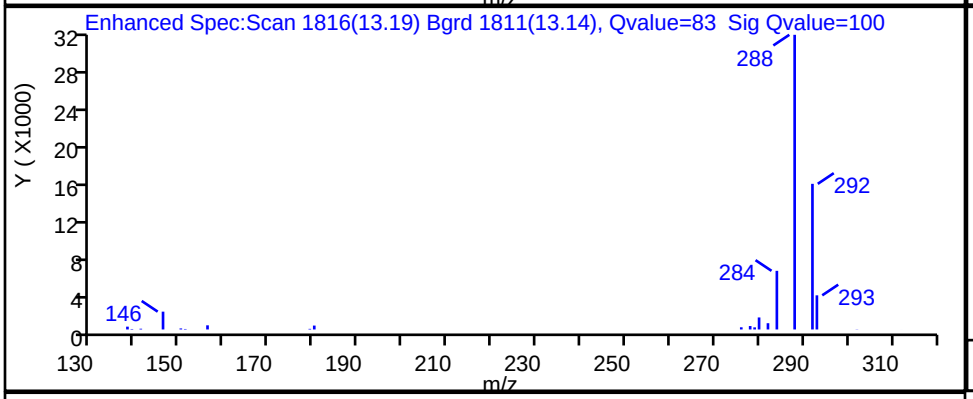
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D

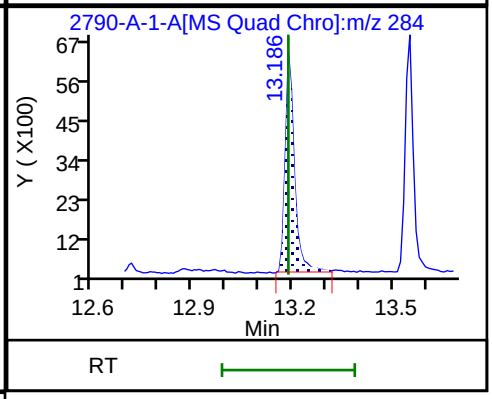
Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

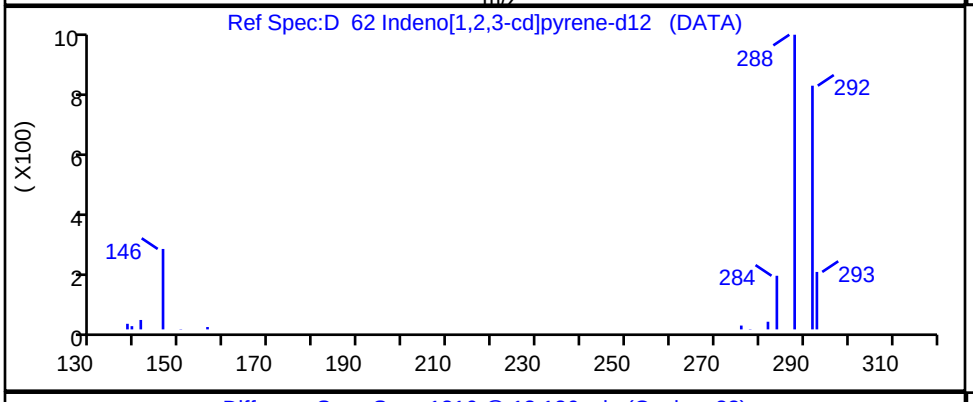
D 62 Indeno[1,2,3-cd]pyrene-d12, CAS: 203578-33-0

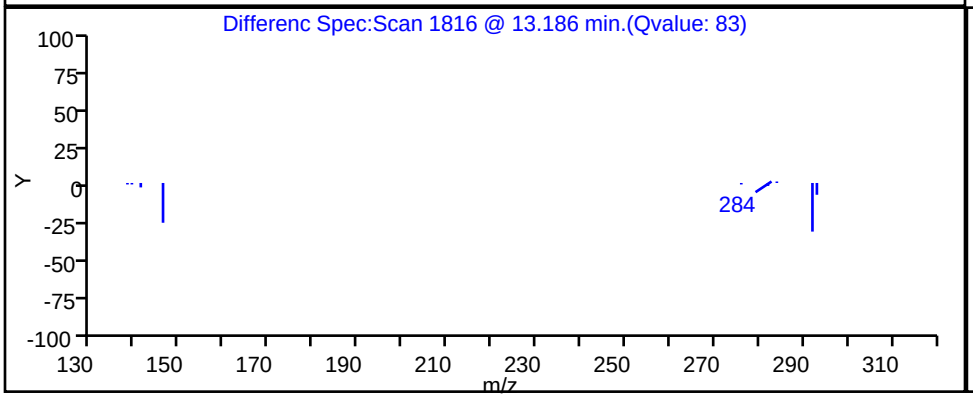


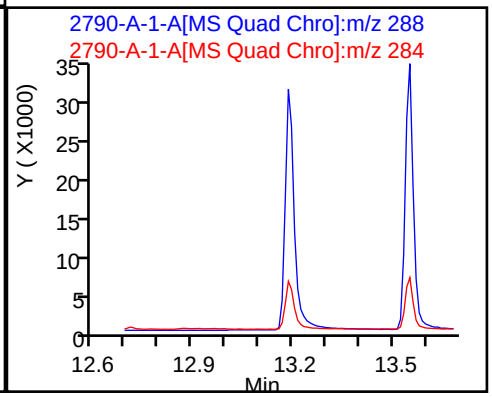










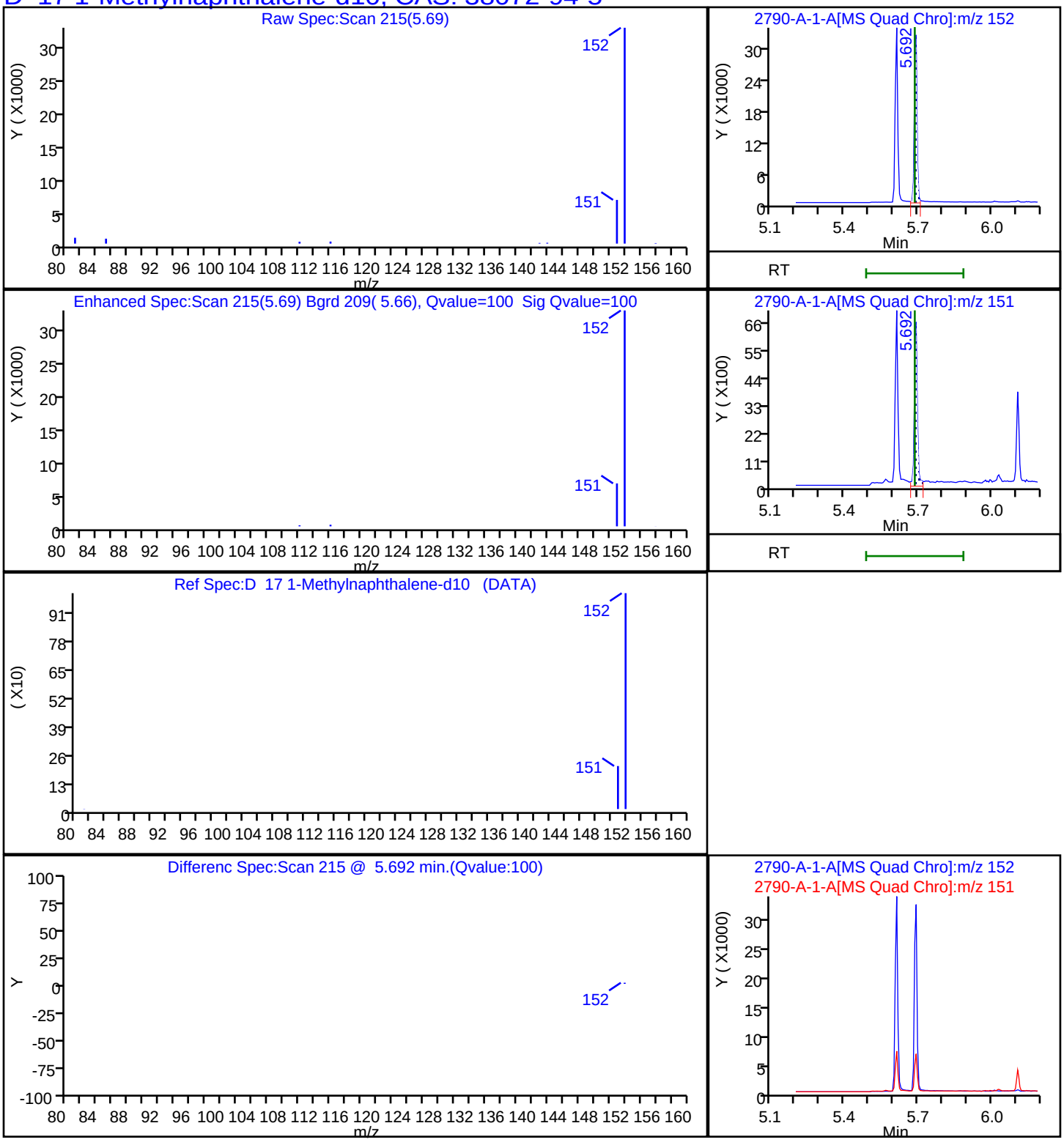


Report Date: 22-Nov-2023 14:10:54 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D				
Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 17 1-Methylnaphthalene-d10, CAS: 38072-94-5



Report Date: 22-Nov-2023 14:10:54 Chrom Revision: 2.3 15-Nov-2023 20:54:34

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Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D		
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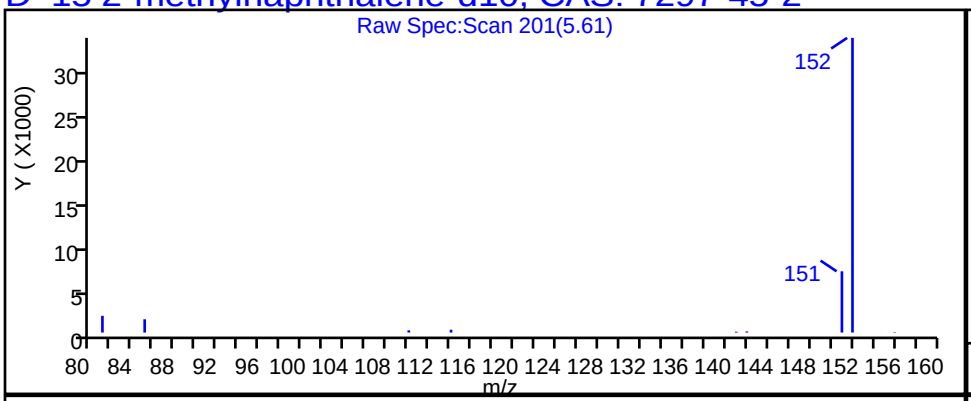
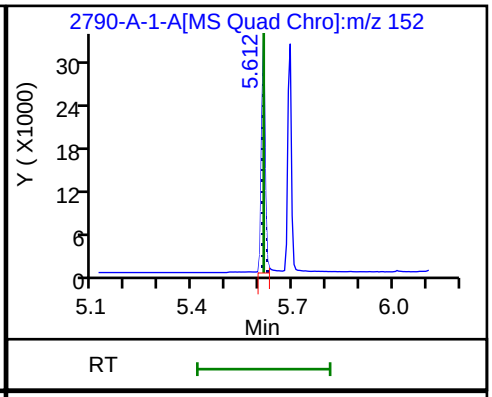
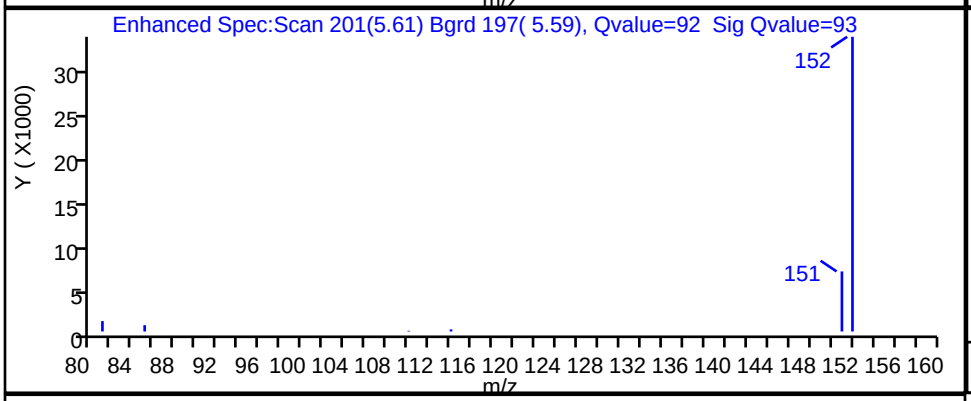
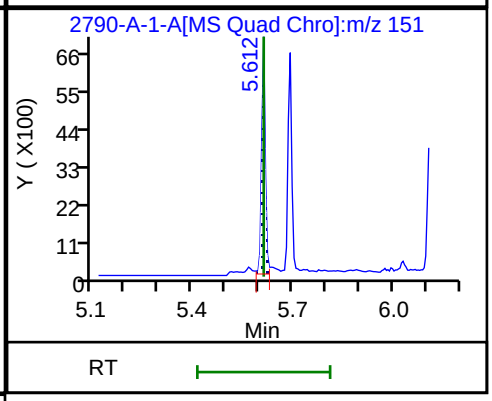
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6
Client ID:	1804576-852-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

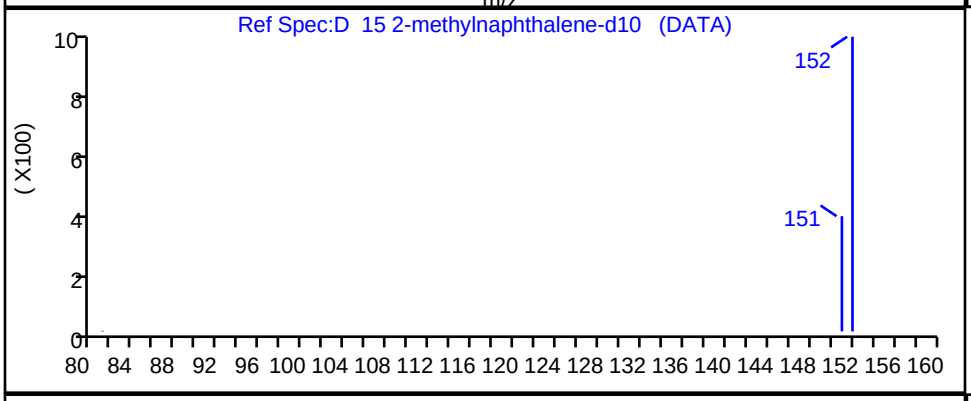
D 15 2-methylnaphthalene-d10, CAS: 7297-45-2

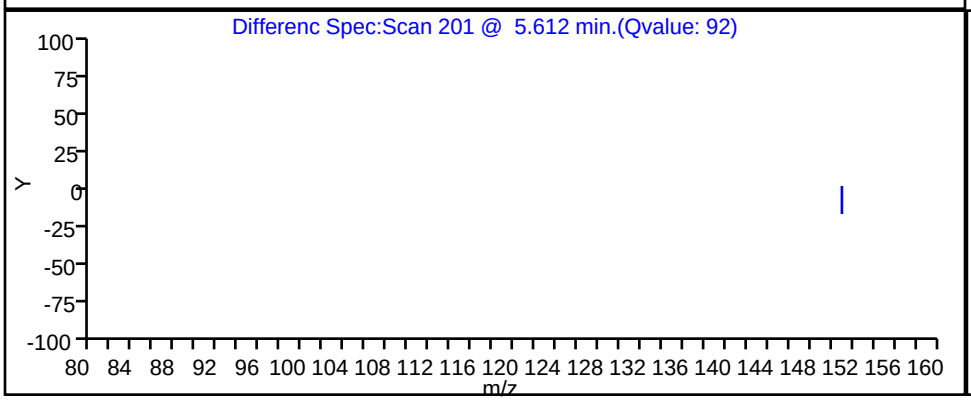


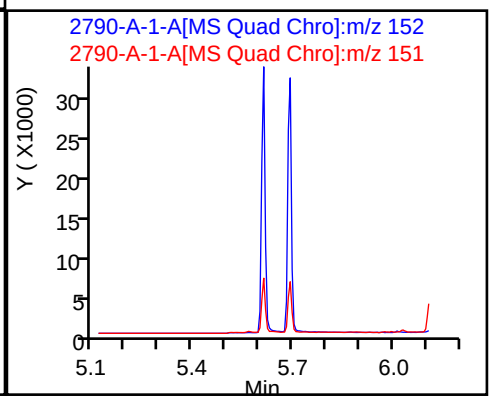












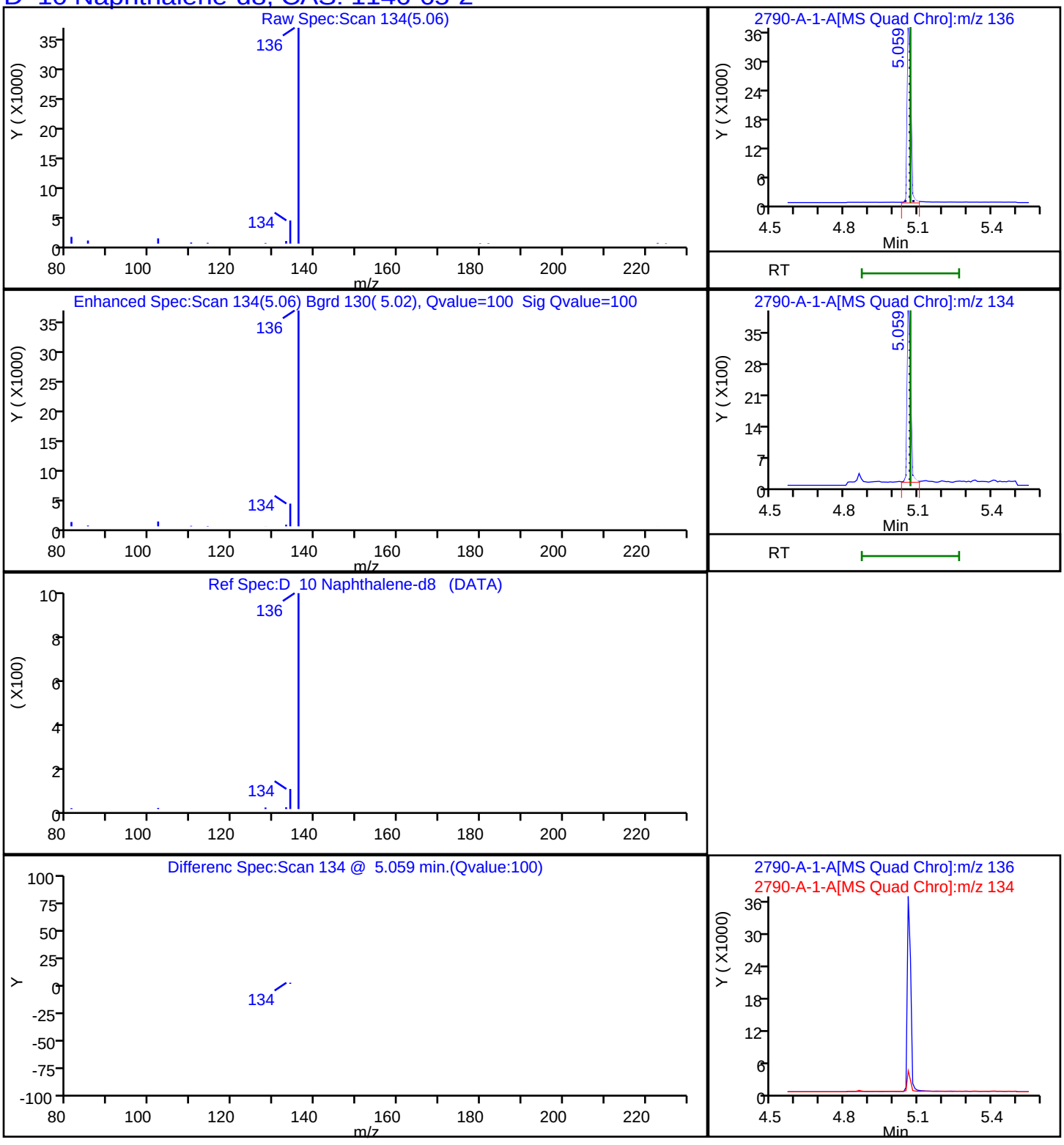
Report Date: 22-Nov-2023 14:10:54 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D

Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D_10 Naphthalene-d8, CAS: 1146-65-2



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Eurofins Knoxville

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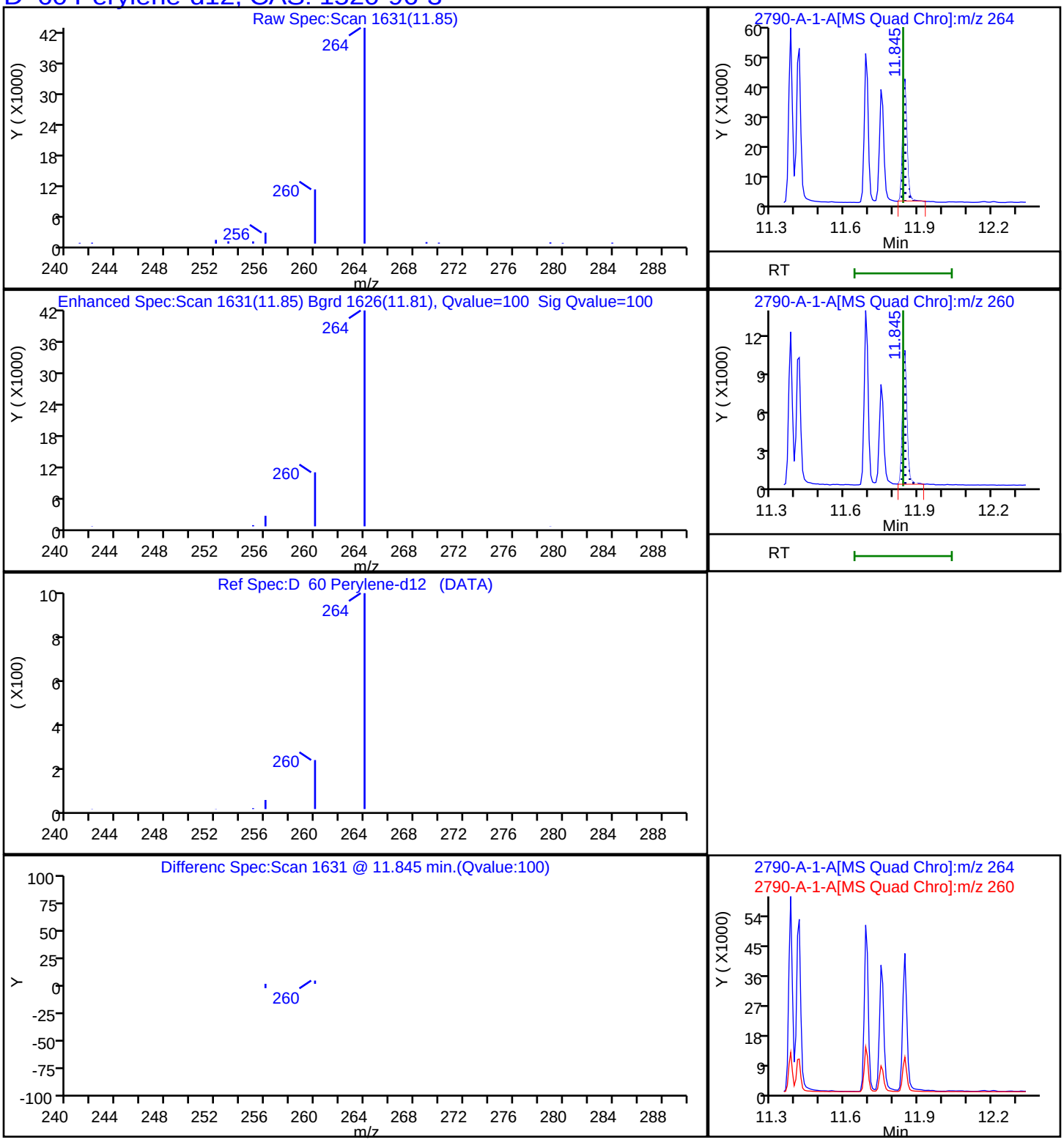
Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 60 Perylene-d12, CAS: 1520-96-3



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Eurofins Knoxville

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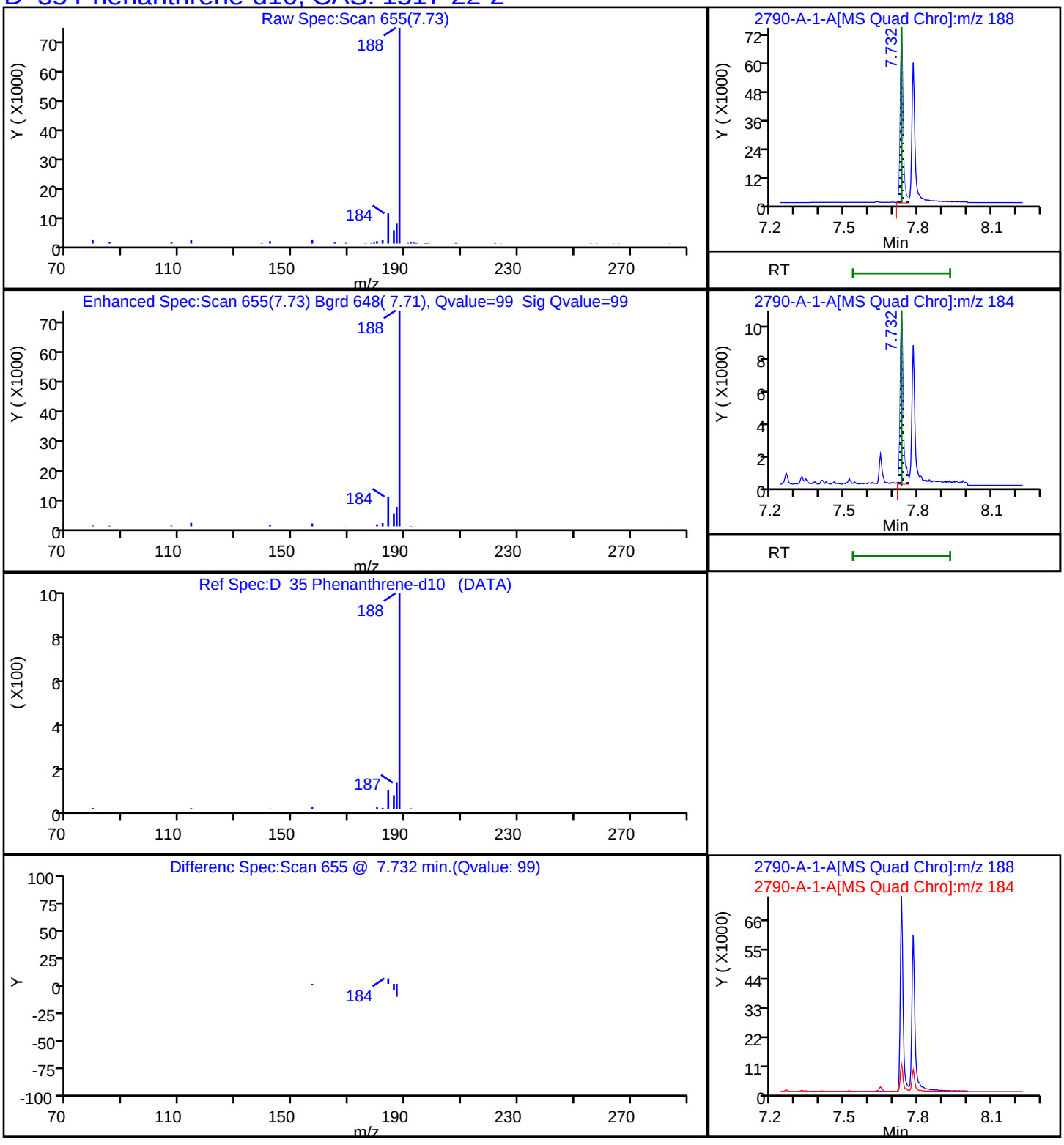
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D_35 Phenanthrene-d10, CAS: 1517-22-2



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Eurofins Knoxville

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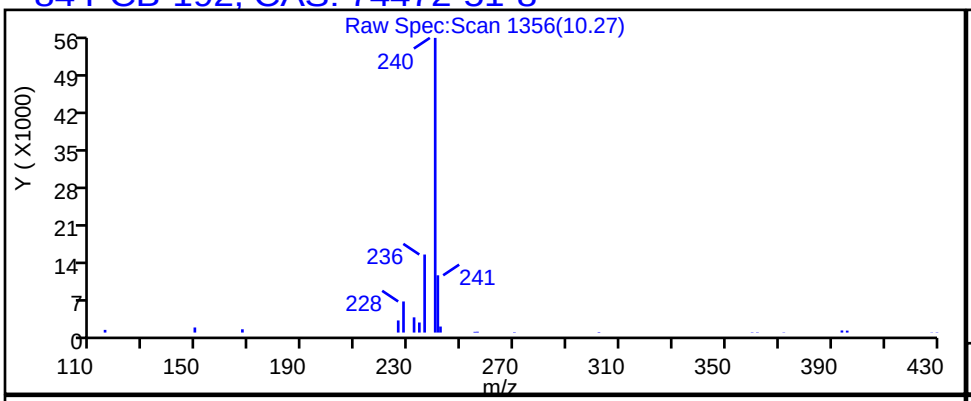
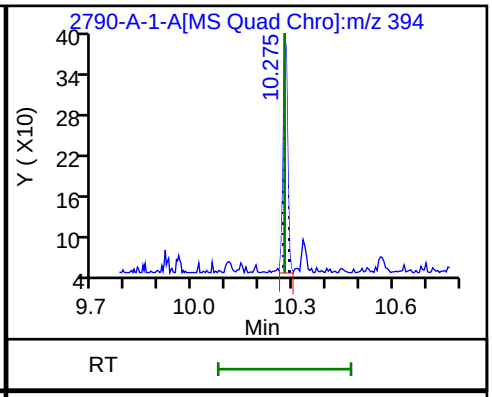
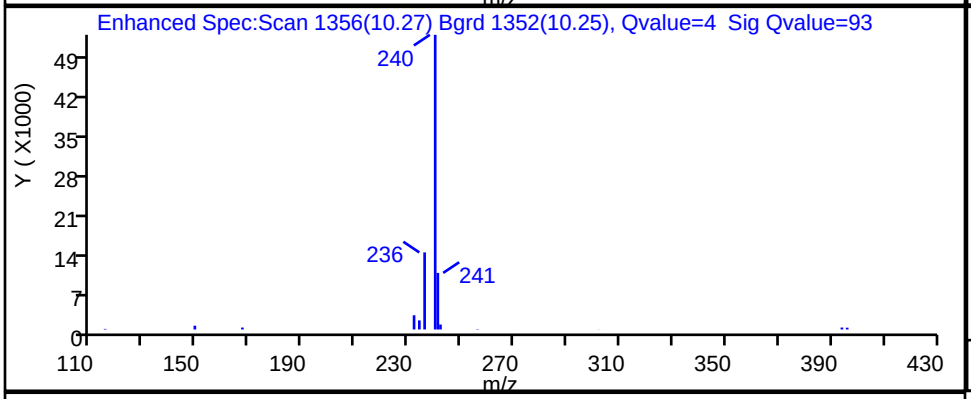
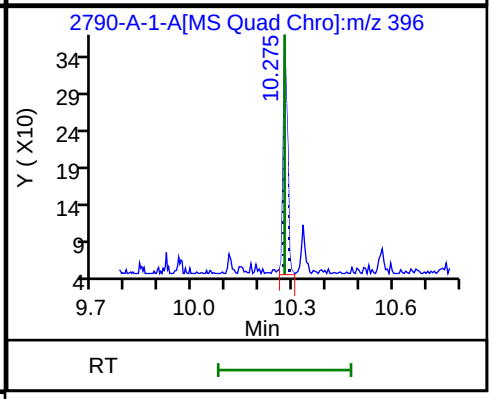
Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

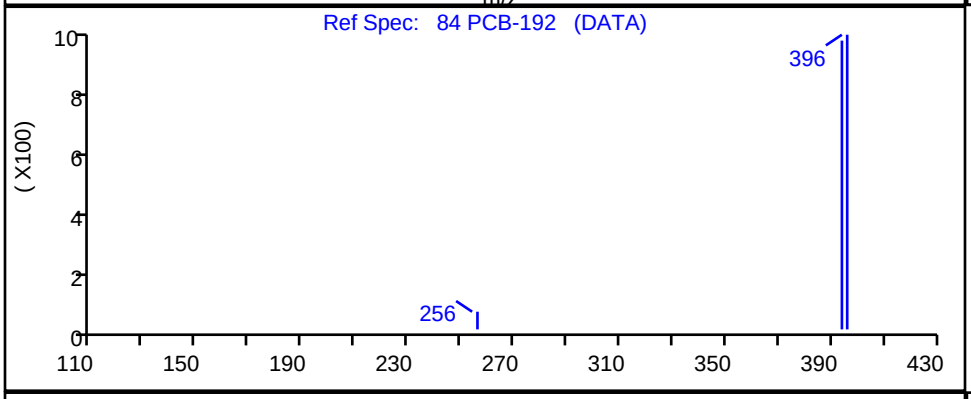
84 PCB-192, CAS: 74472-51-8

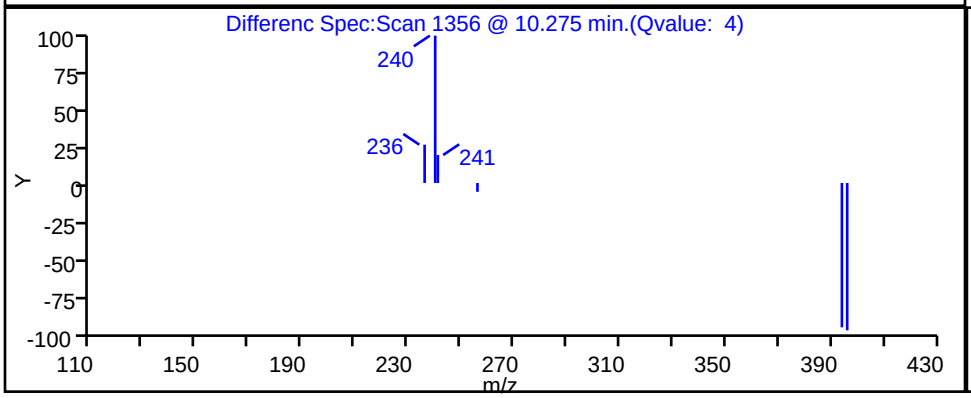


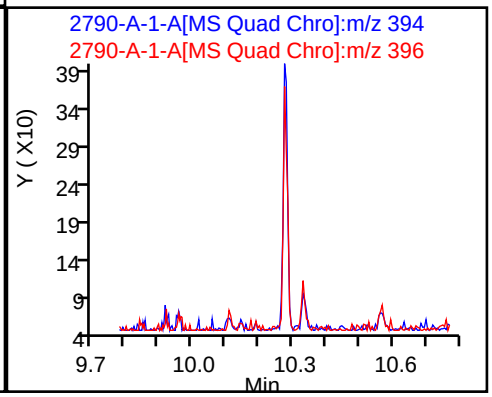












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Eurofins Knoxville

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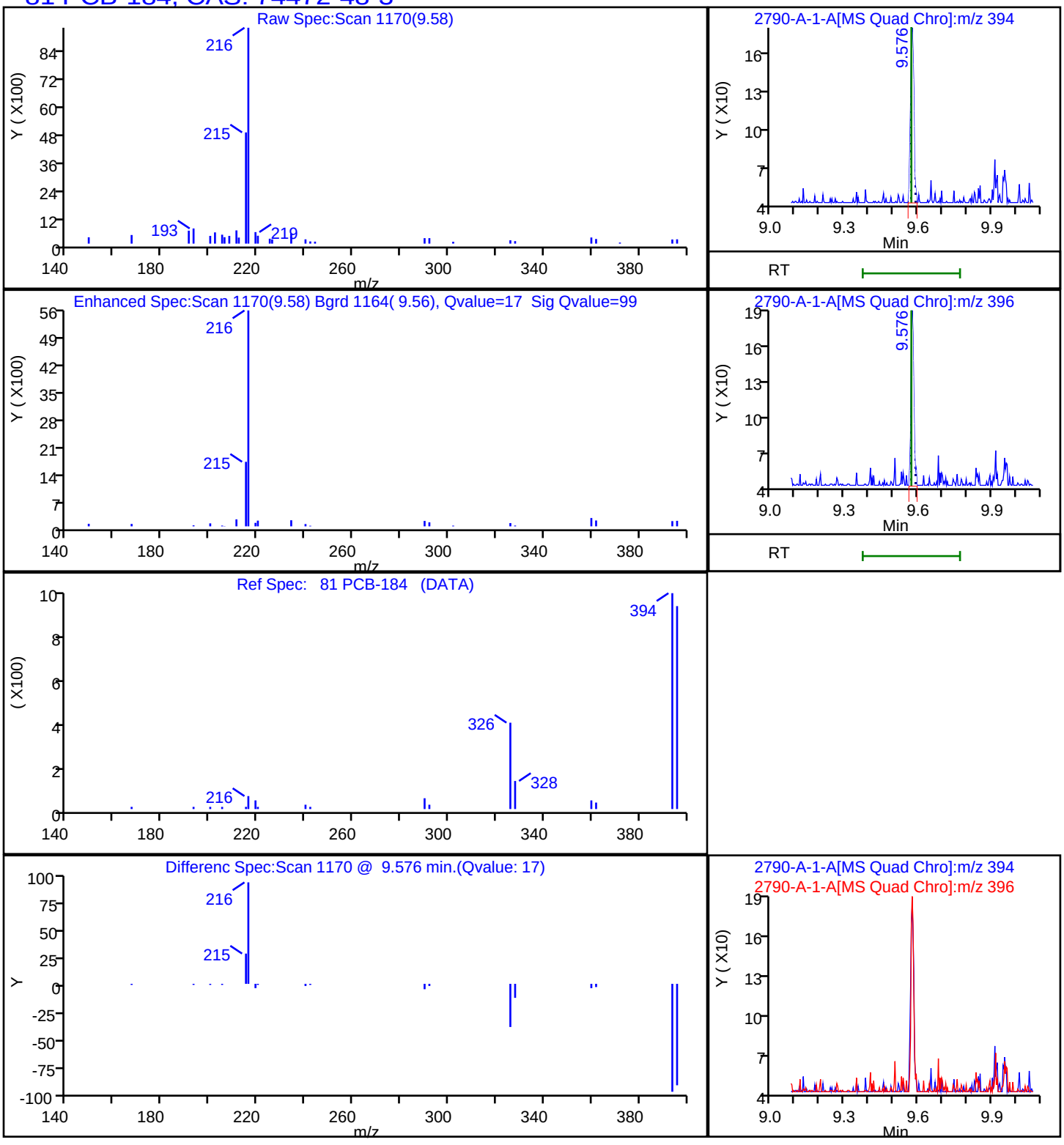
Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6
Client ID:	1804576-852-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

81 PCB-184, CAS: 74472-48-3



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Eurofins Knoxville

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Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
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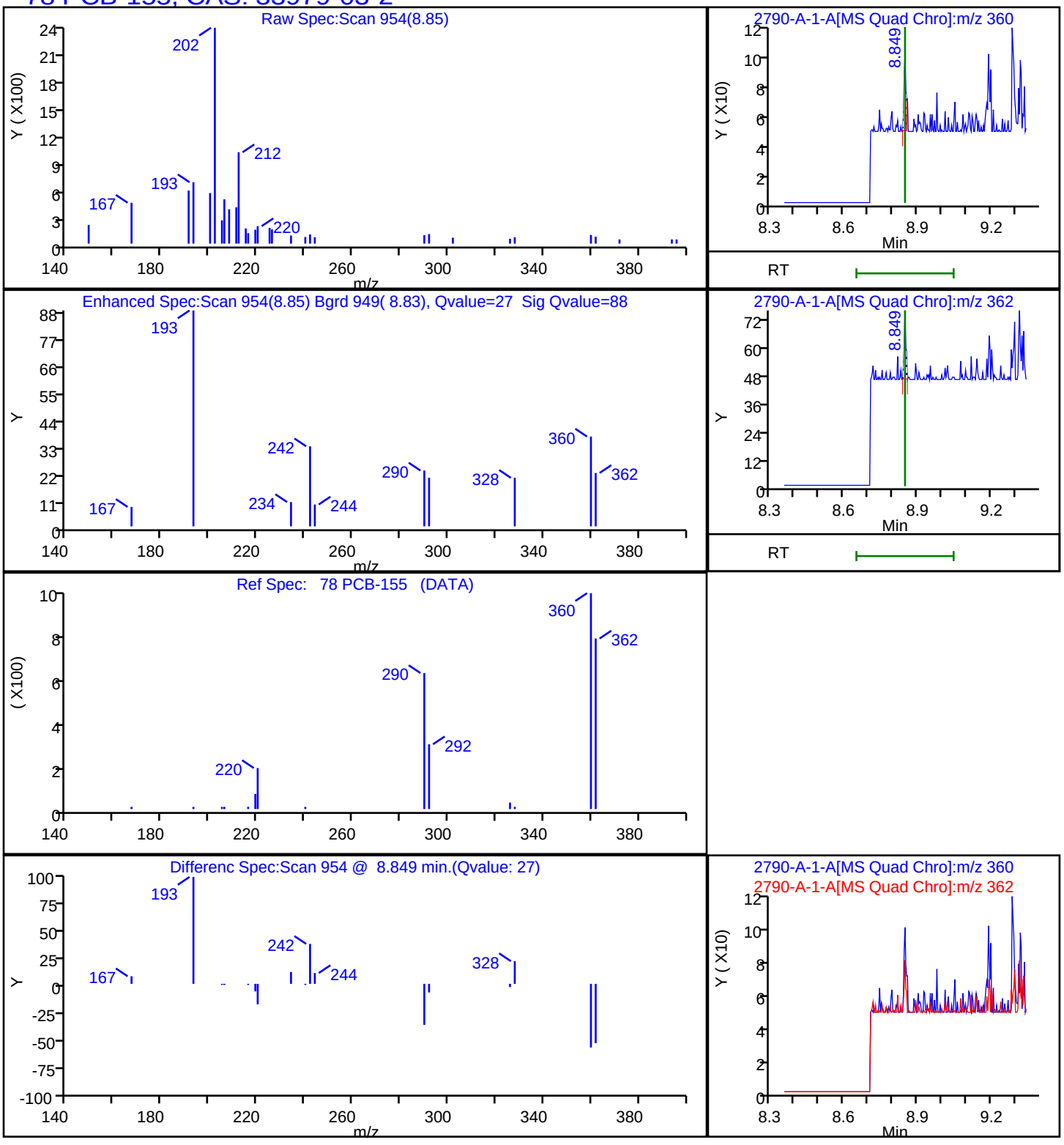
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

78 PCB-155, CAS: 33979-03-2



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Eurofins Knoxville

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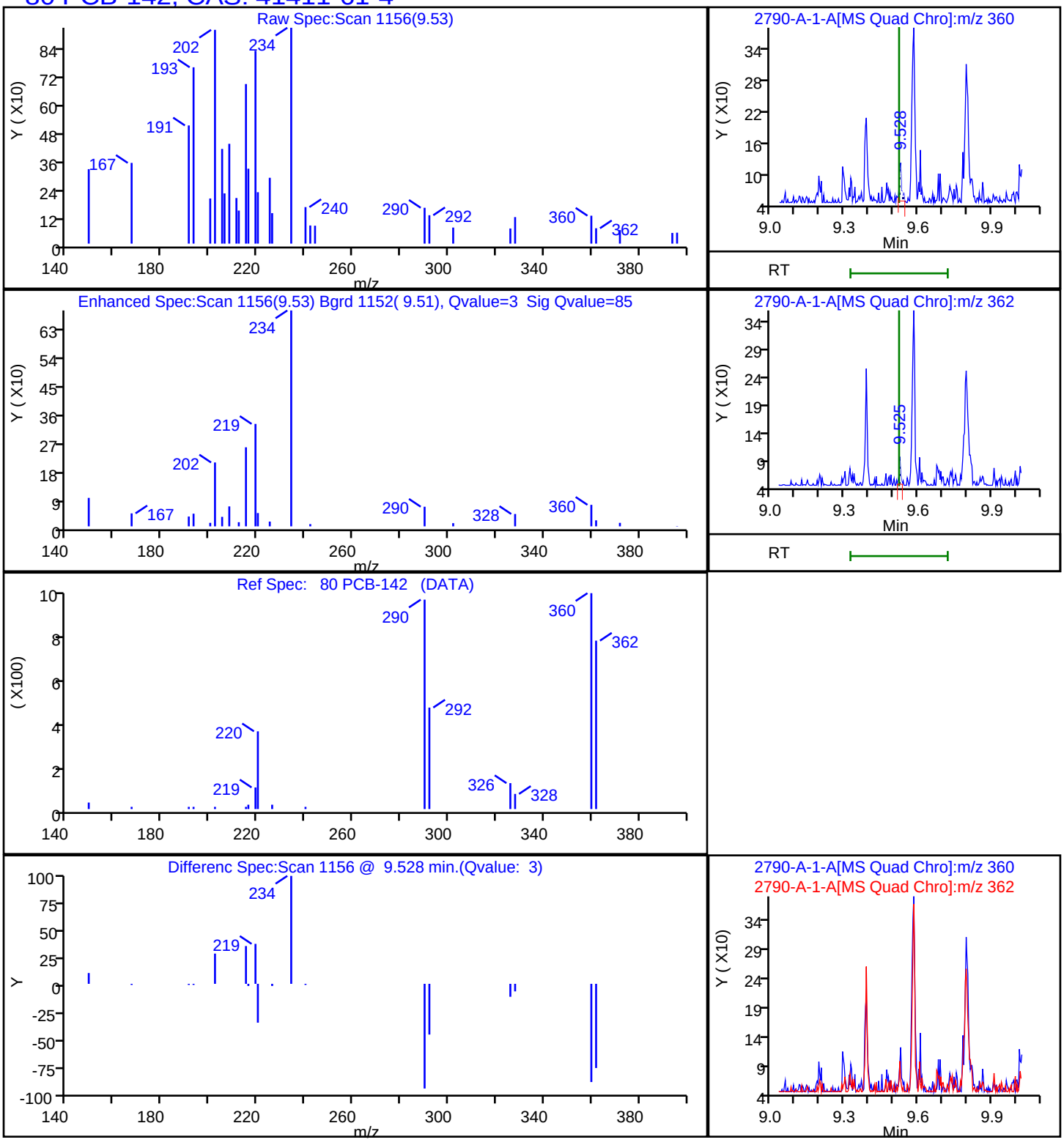
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6
Client ID:	1804576-852-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

80 PCB-142, CAS: 41411-61-4



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Eurofins Knoxville

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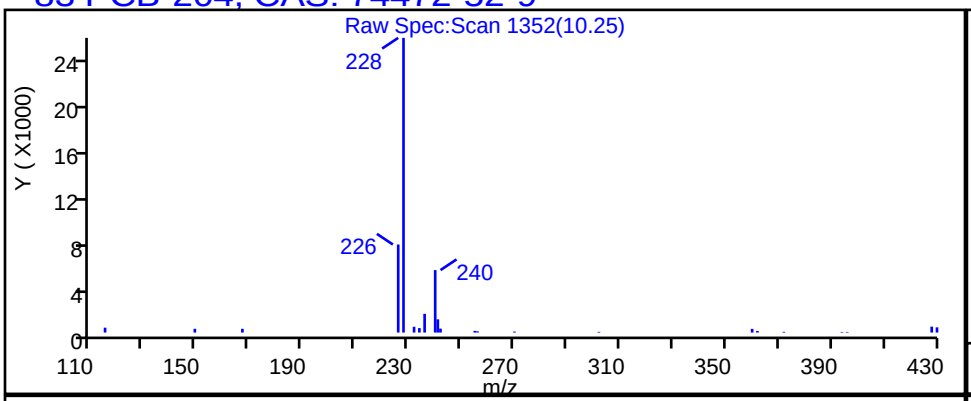
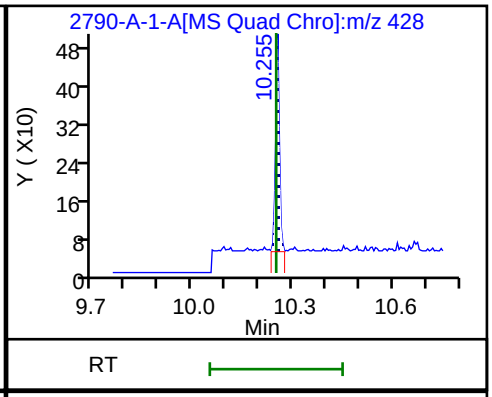
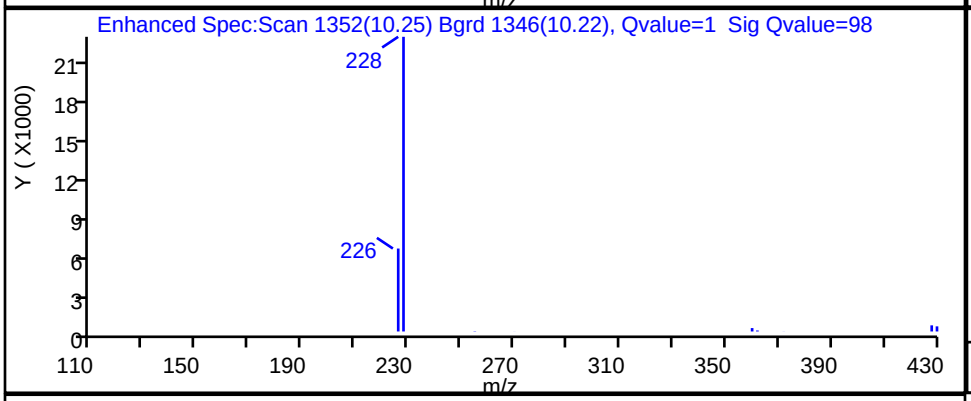
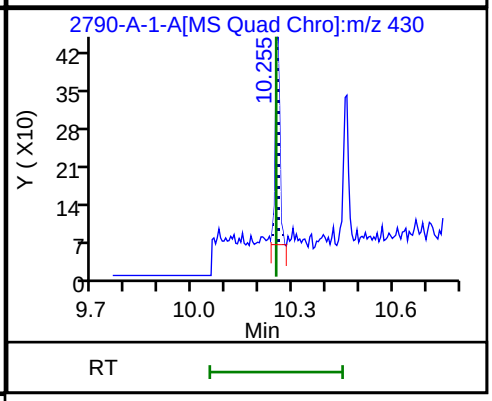
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

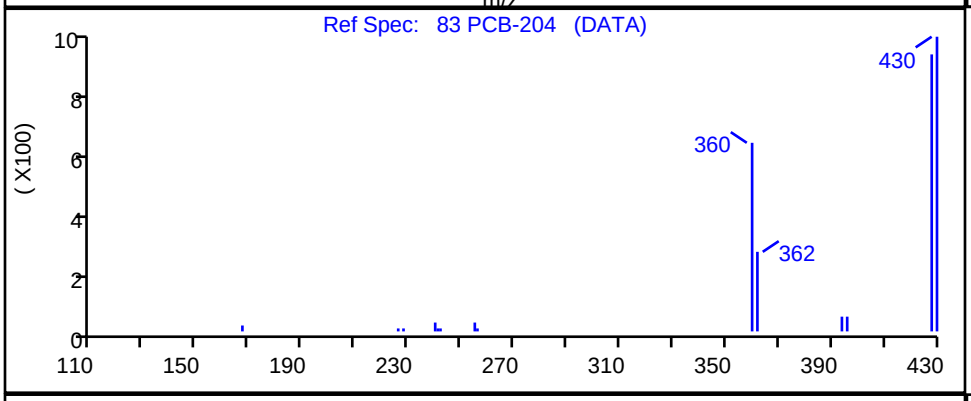
83 PCB-204, CAS: 74472-52-9

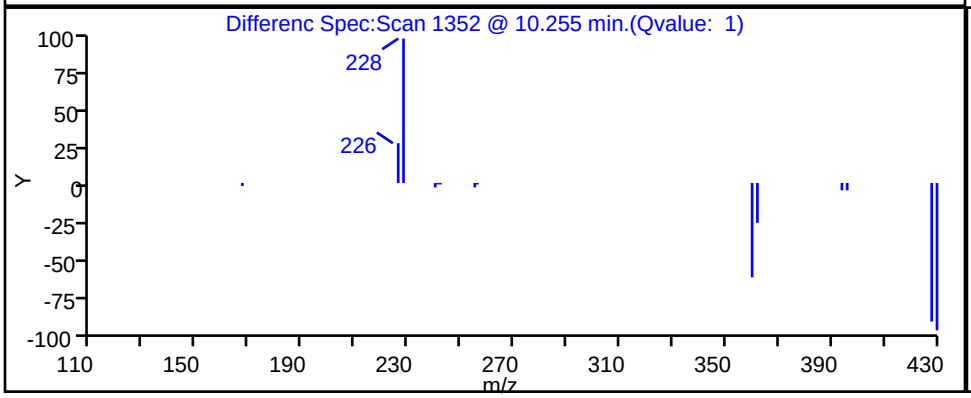


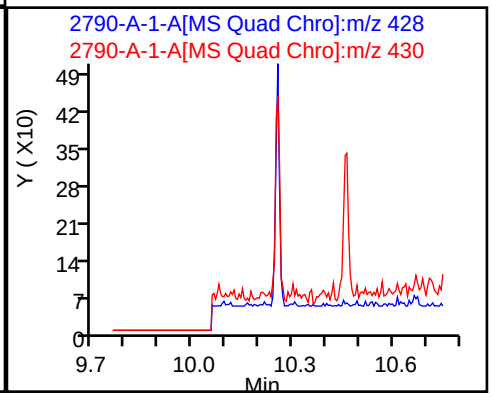












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Eurofins Knoxville

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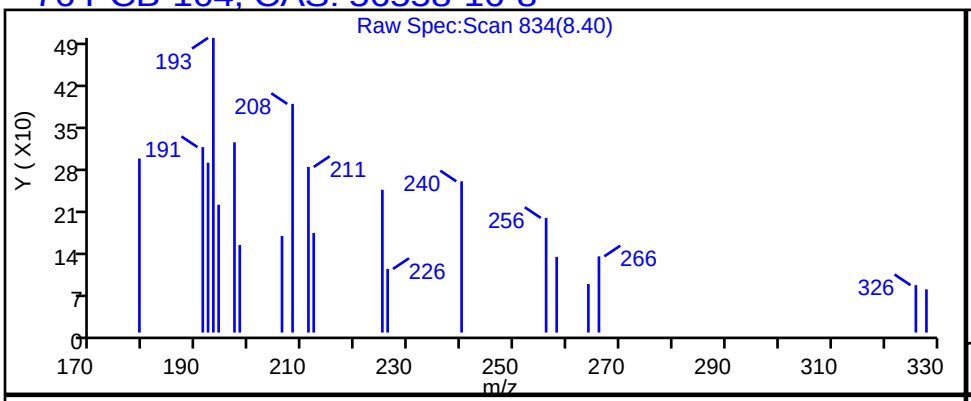
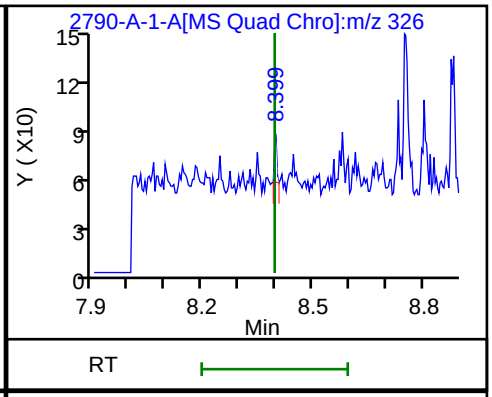
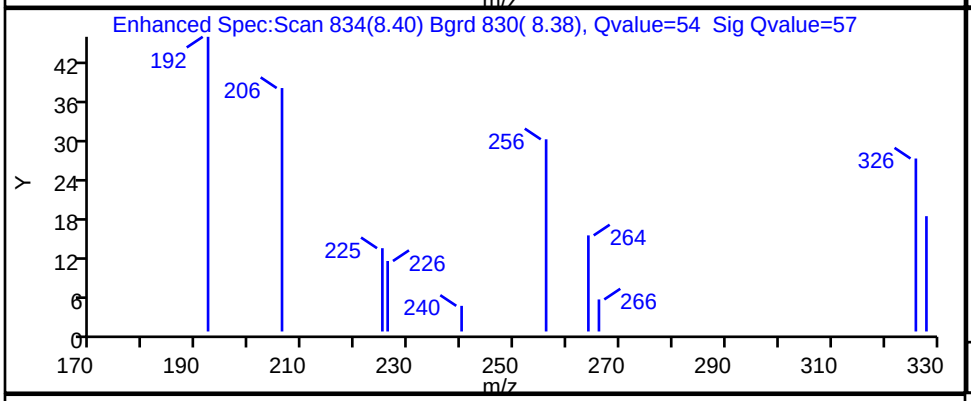
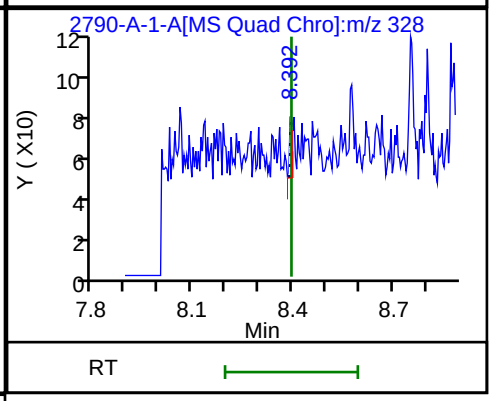
Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

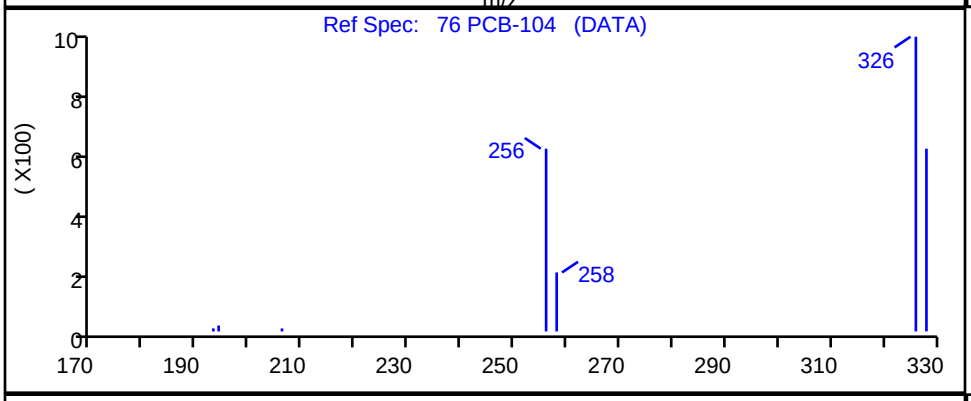
76 PCB-104, CAS: 56558-16-8

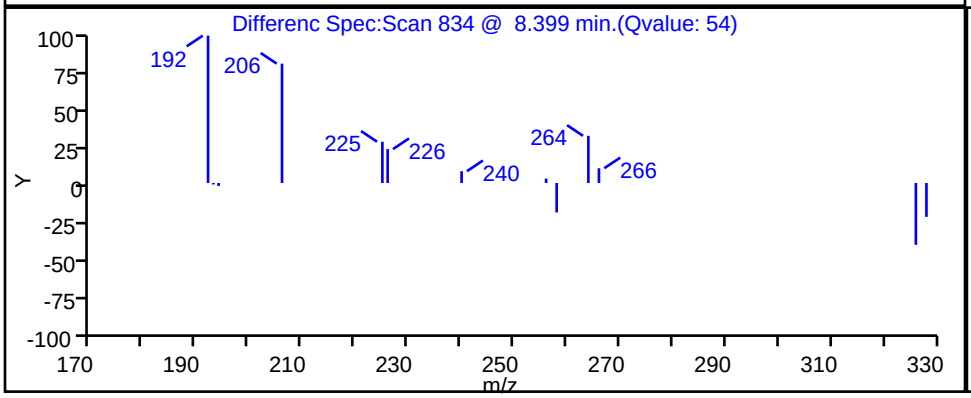


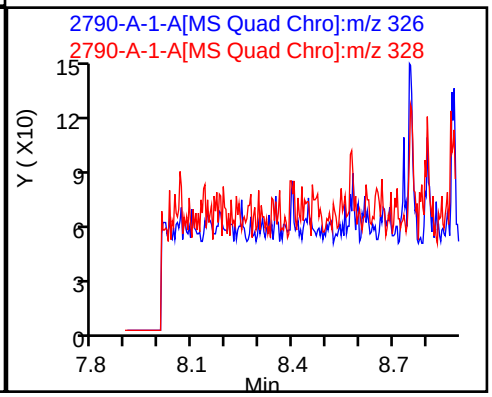












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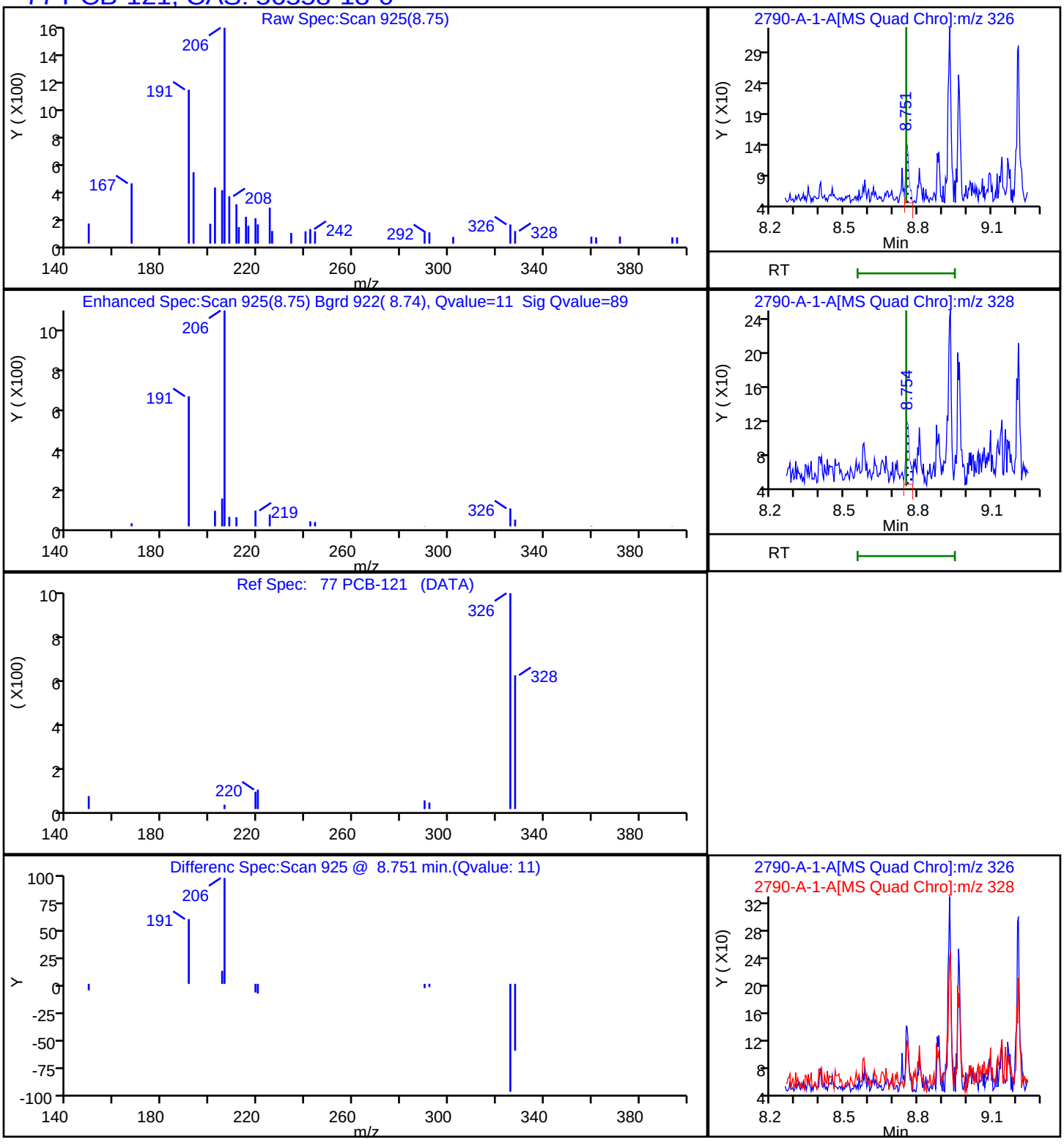
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D

Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6
Client ID:	1804576-852-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

77 PCB-121, CAS: 56558-18-0



Manual Integration/User Assign Peak Report

Eurofins Knoxville

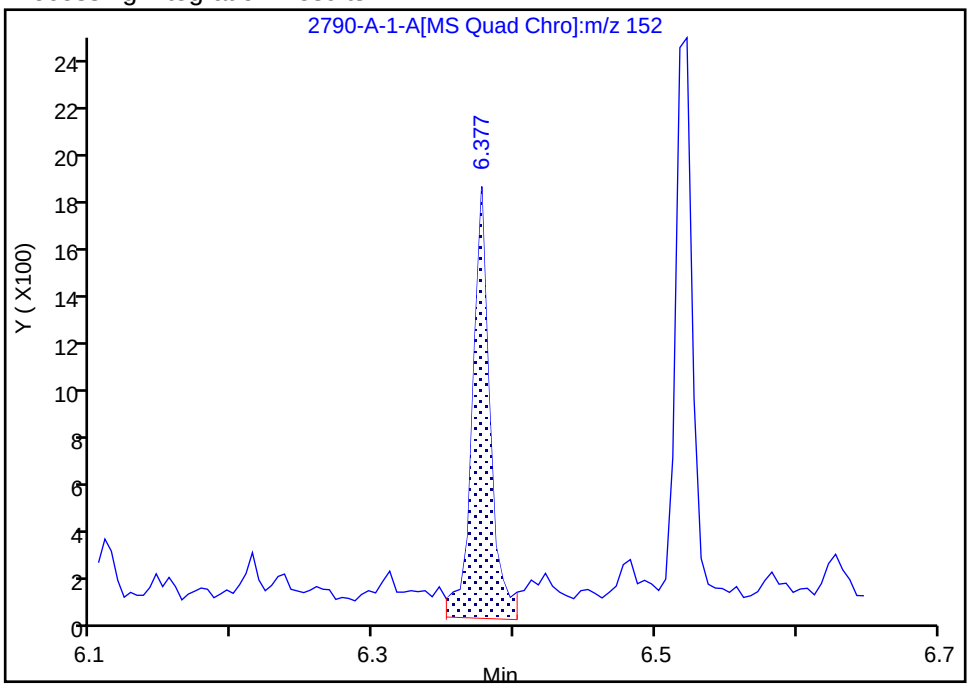
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D				
Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

24 Acenaphthylene, CAS: 208-96-8

Signal: 1

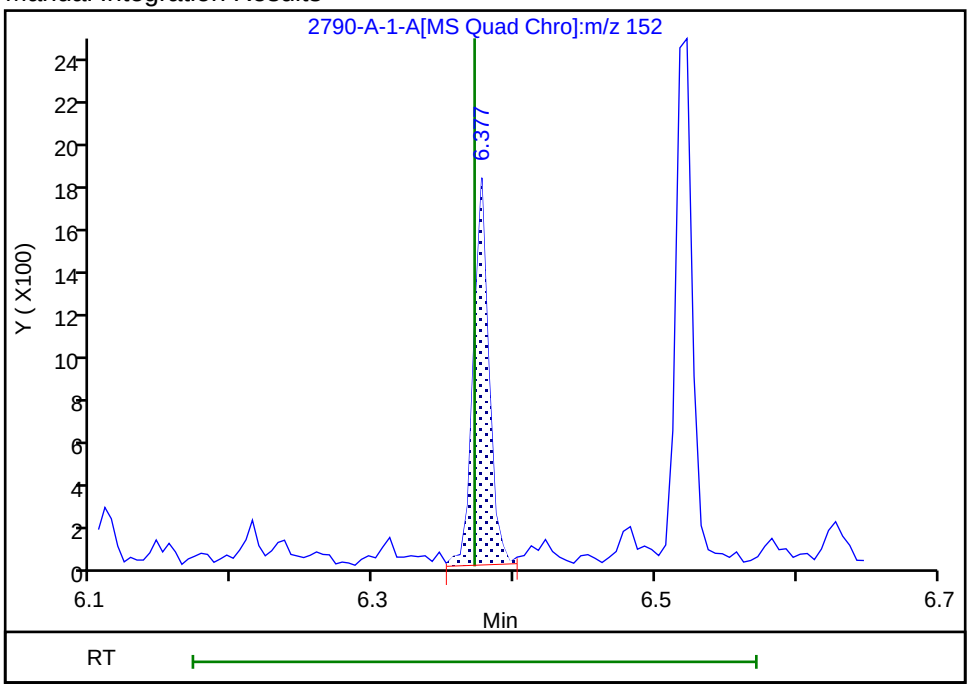
Processing Integration Results

RT: 6.38
Area: 1575
Amount: 0.016193
Amount Units: ug/ml



Manual Integration Results

RT: 6.38
Area: 1309
Amount: 0.013458
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 16:46:24 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

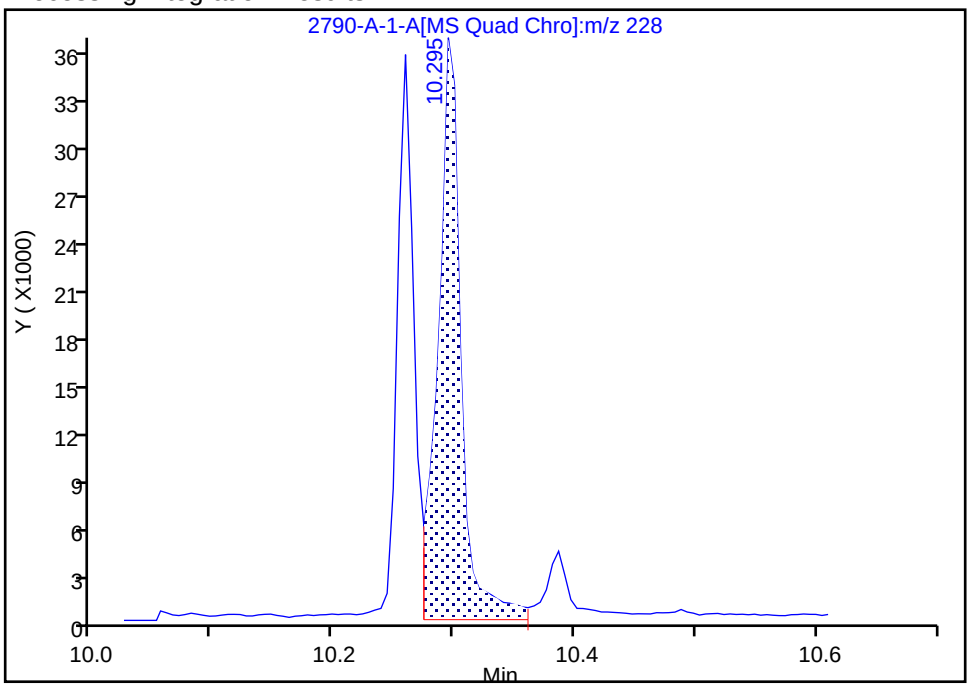
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D				
Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

50 Chrysene, CAS: 218-01-9

Signal: 1

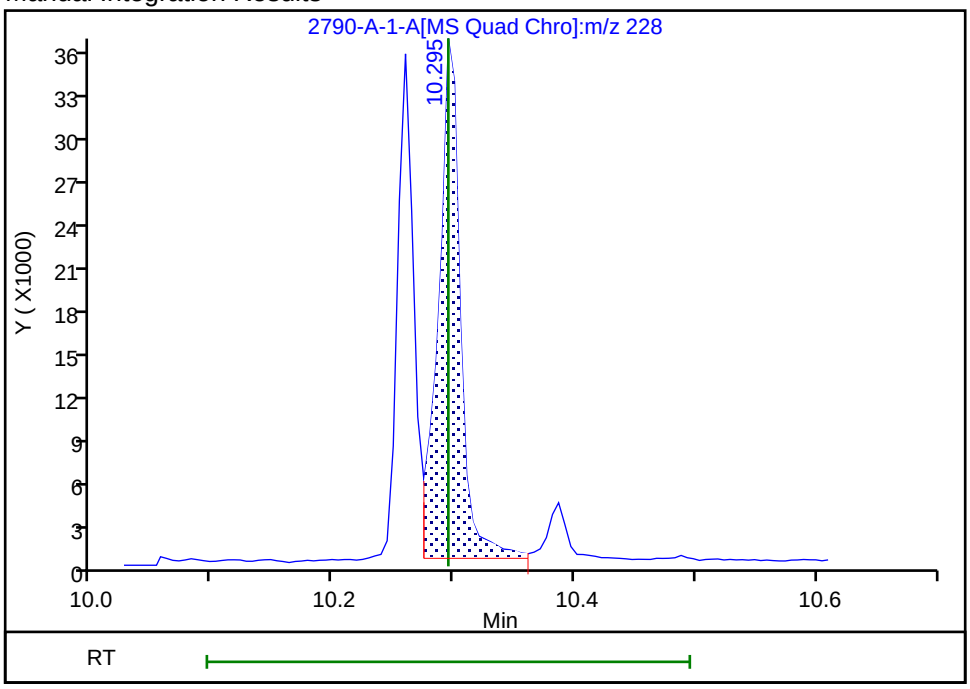
Processing Integration Results

RT: 10.30
Area: 48408
Amount: 0.240310
Amount Units: ug/ml



Manual Integration Results

RT: 10.30
Area: 46079
Amount: 0.228748
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 16:45:53 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

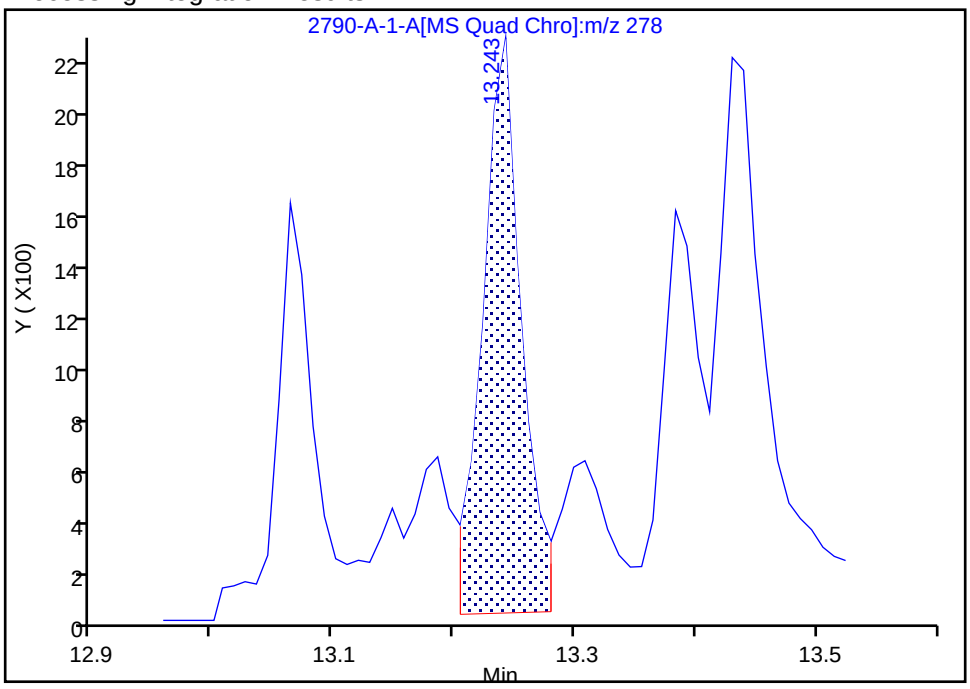
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D				
Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

66 Dibenz(a,h)anthracene, CAS: 53-70-3

Signal: 1

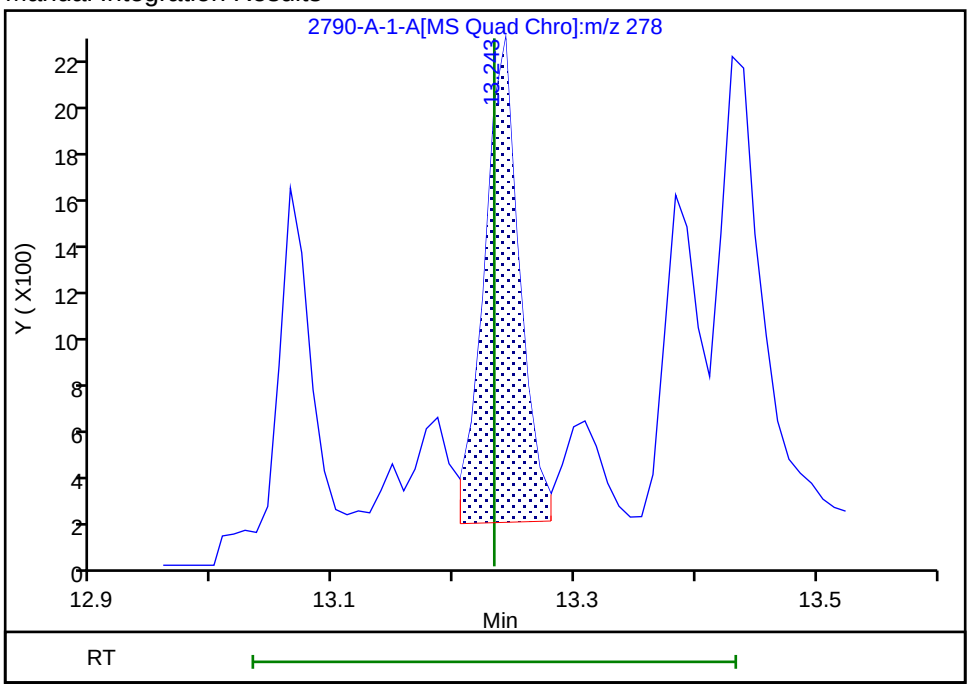
Processing Integration Results

RT: 13.24
Area: 5007
Amount: 0.030198
Amount Units: ug/ml



Manual Integration Results

RT: 13.24
Area: 4255
Amount: 0.025663
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 16:44:52 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

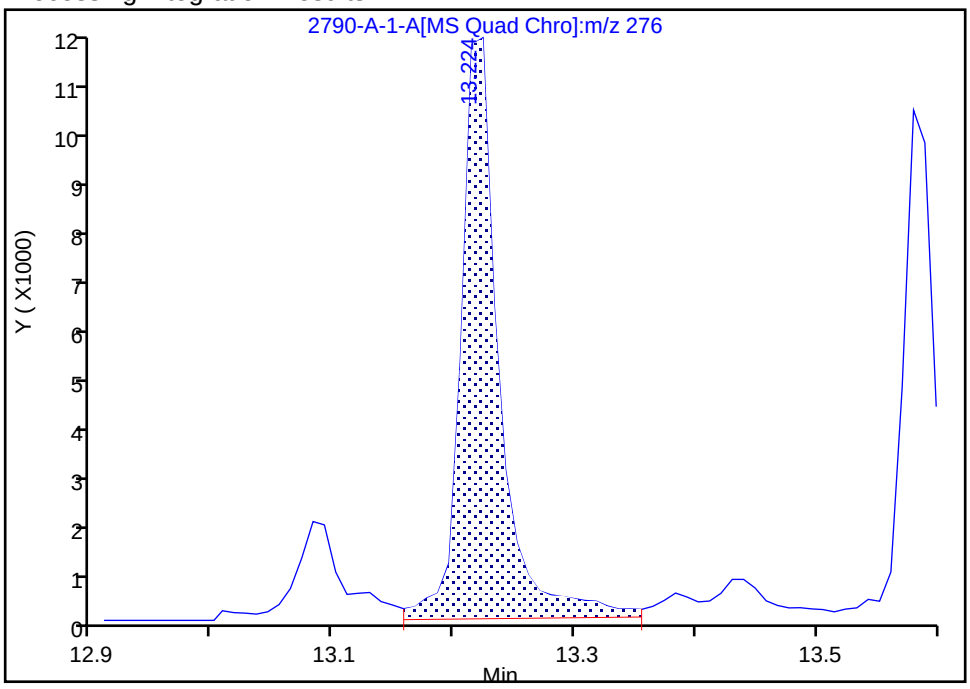
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D				
Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

65 Indeno[1,2,3-cd]pyrene, CAS: 193-39-5

Signal: 1

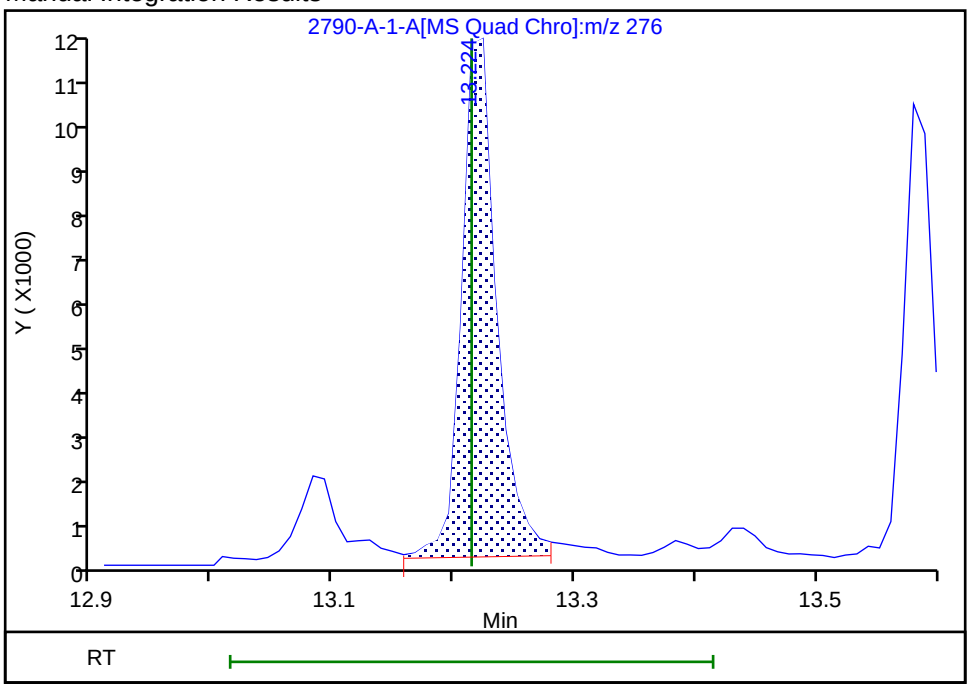
Processing Integration Results

RT: 13.22
Area: 24932
Amount: 0.123535
Amount Units: ug/ml



Manual Integration Results

RT: 13.22
Area: 22485
Amount: 0.111411
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 16:45:22 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

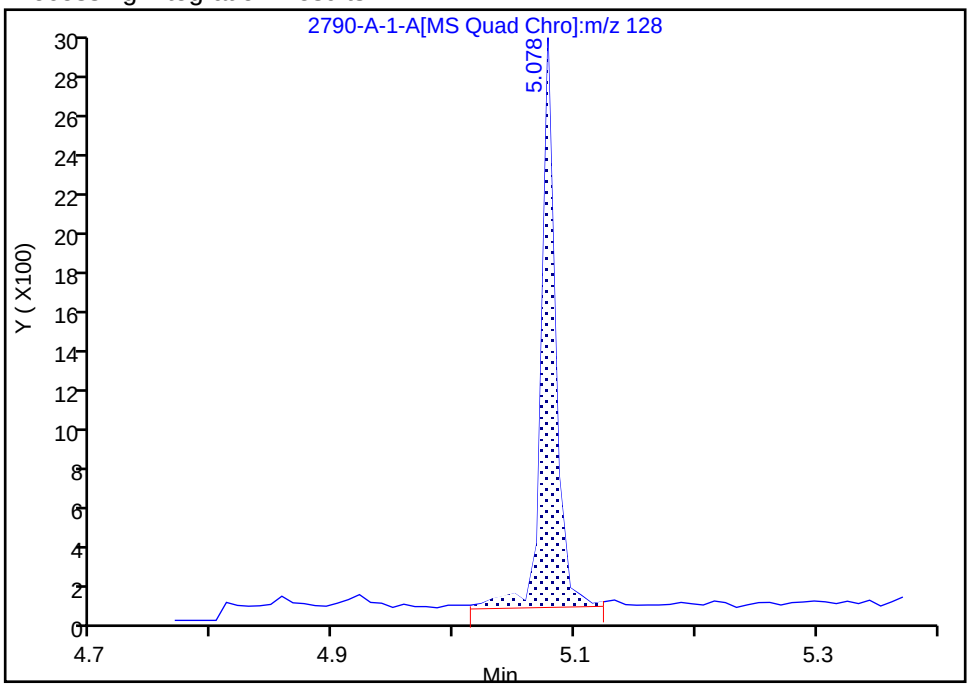
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D				
Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

11 Naphthalene, CAS: 91-20-3

Signal: 1

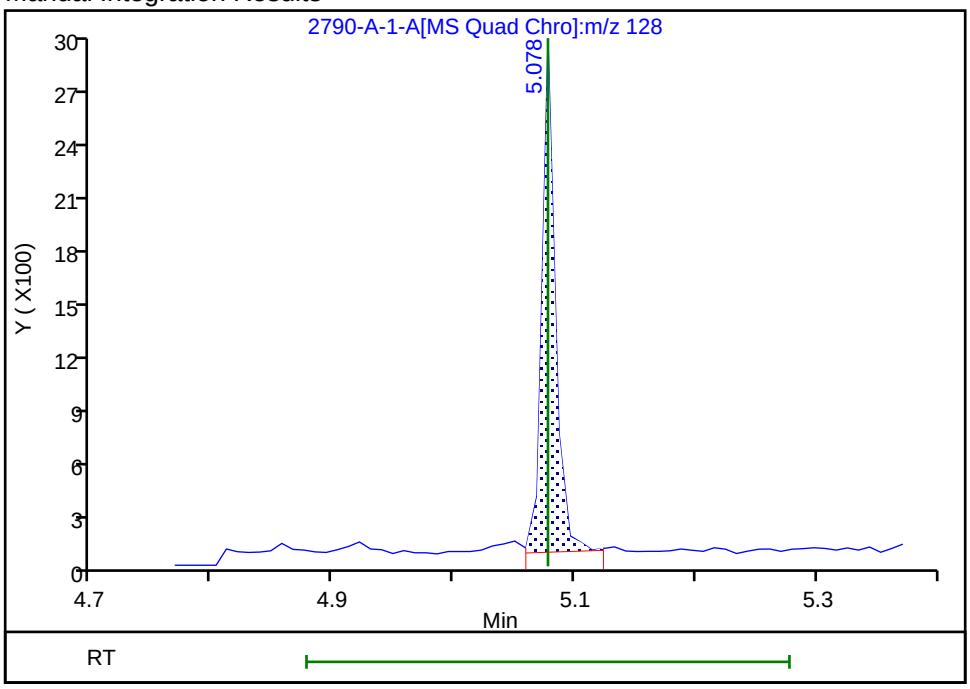
Processing Integration Results

RT: 5.08
Area: 2325
Amount: 0.027594
Amount Units: ug/ml



Manual Integration Results

RT: 5.08
Area: 2218
Amount: 0.026324
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 16:46:41 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

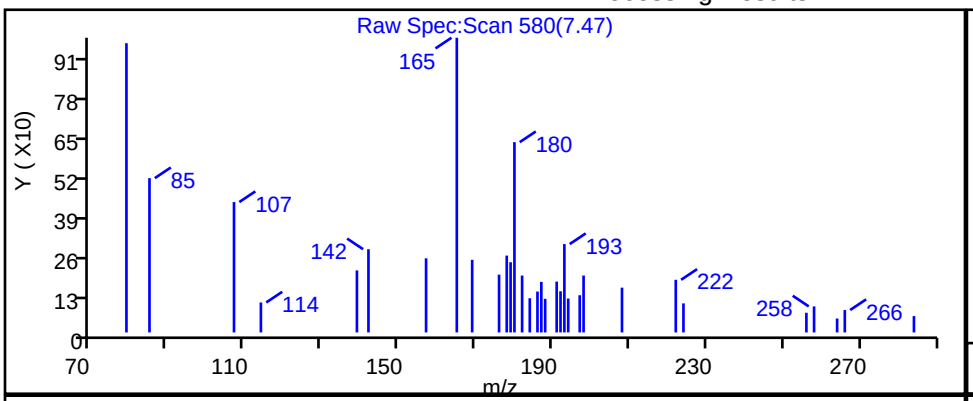
User Disabled Compound Report

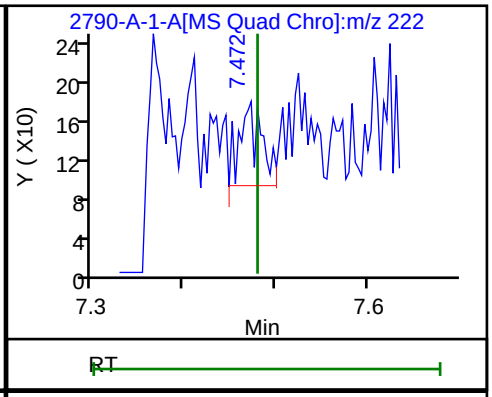
Eurofins Knoxville

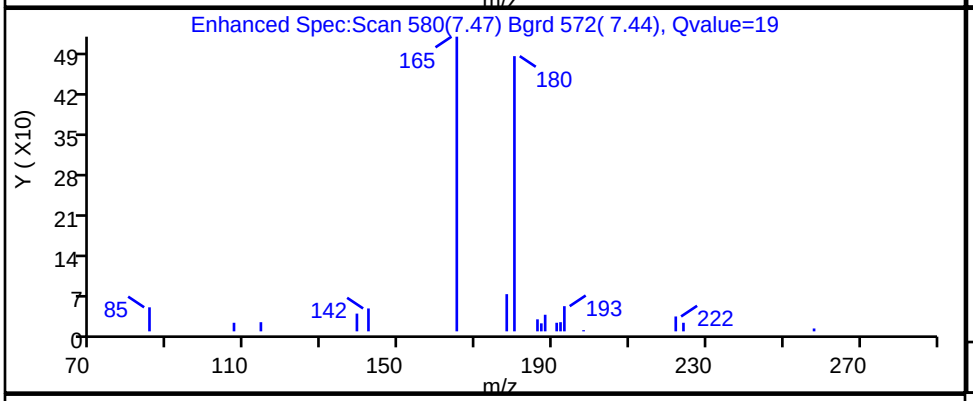
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D				
Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

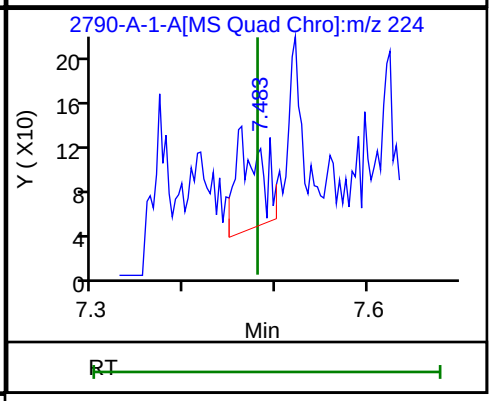
74 PCB-14, CAS: 34883-41-5

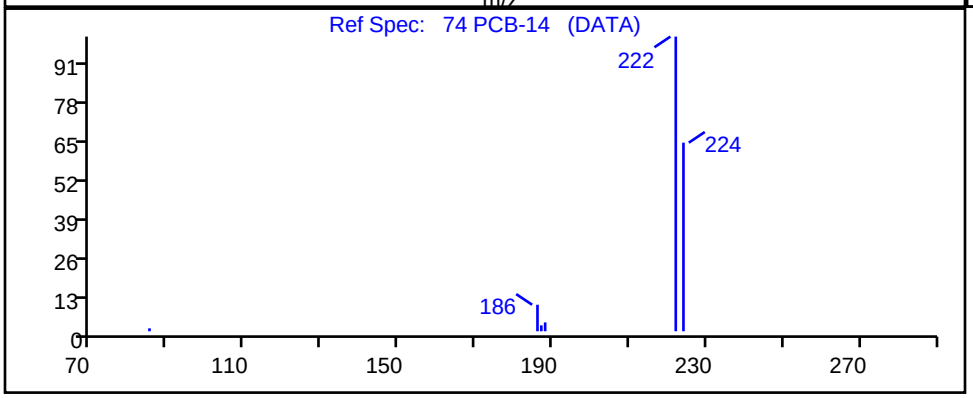
Processing Results











RT	Mass	Response	Amount
7.47	222.00	148	0.001144
7.48	224.00	169	

Reviewer: SK9U, 16-Nov-2023 16:44:38 -05:00:00 (UTC)

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

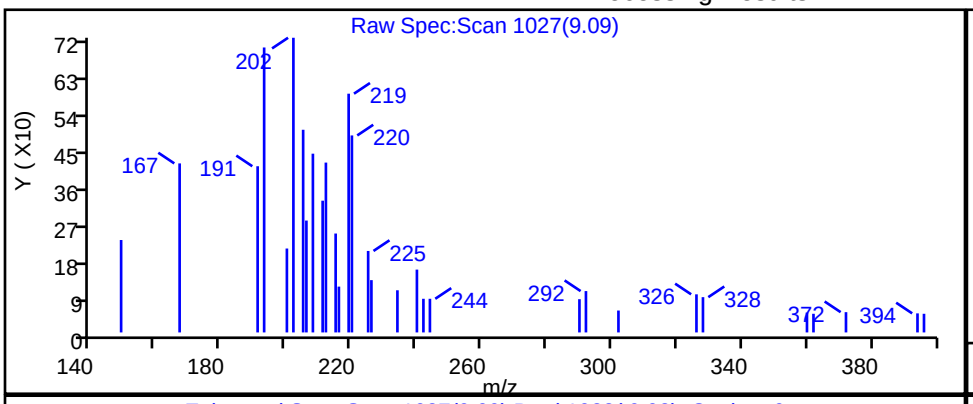
User Disabled Compound Report

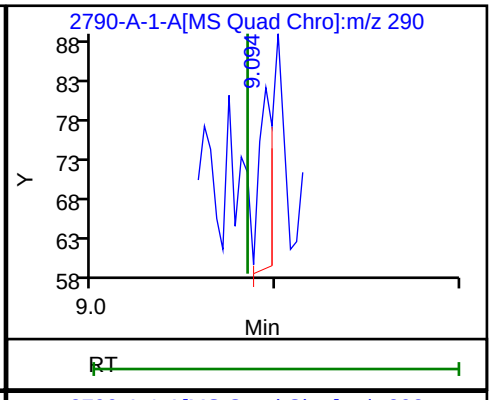
Eurofins Knoxville

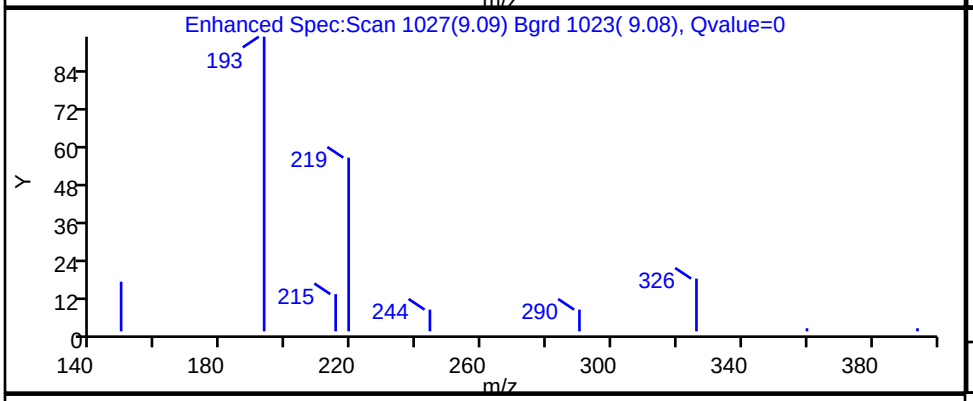
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D				
Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

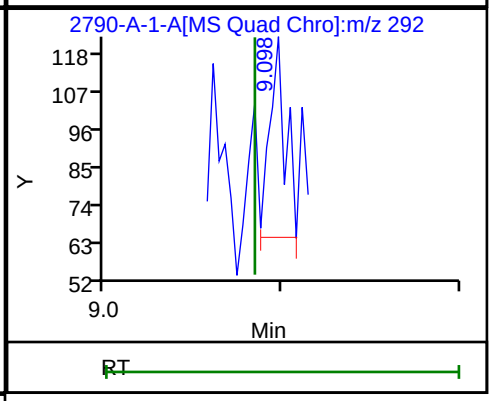
79 PCB-78, CAS: 70362-49-1

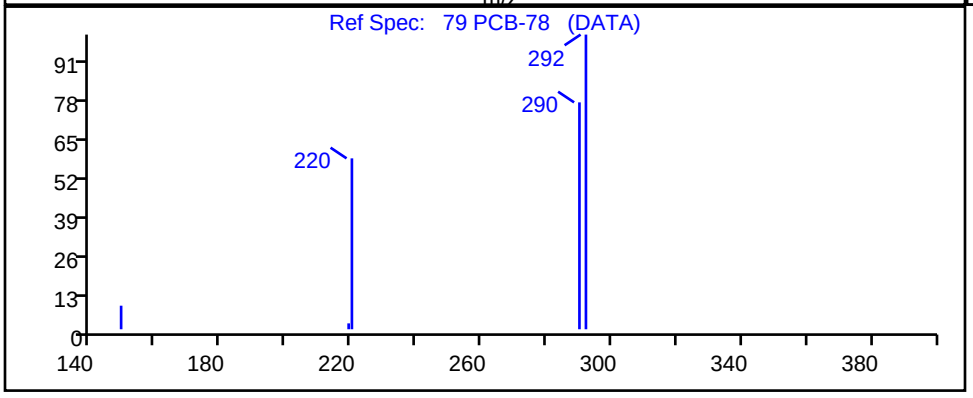
Processing Results











RT	Mass	Response	Amount
9.09	290.00	12	0.000358
9.10	292.00	37	

Reviewer: SK9U, 16-Nov-2023 16:44:29 -05:00:00 (UTC)

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

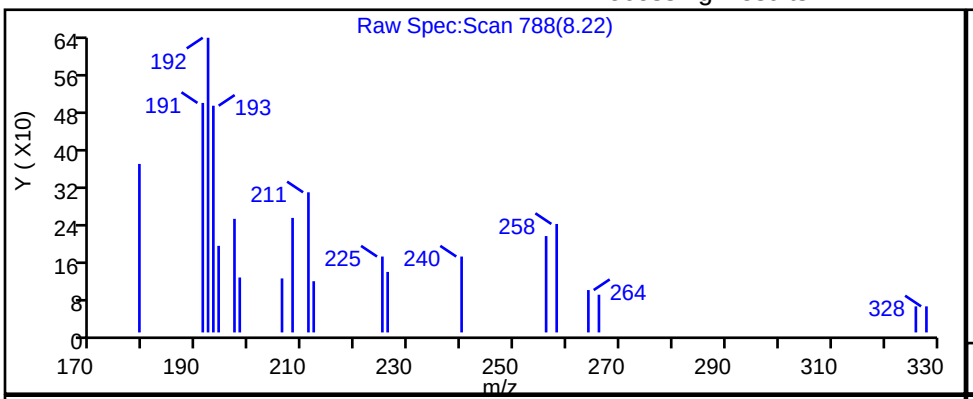
User Disabled Compound Report

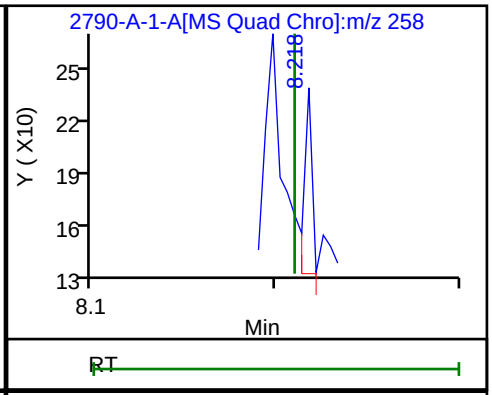
Eurofins Knoxville

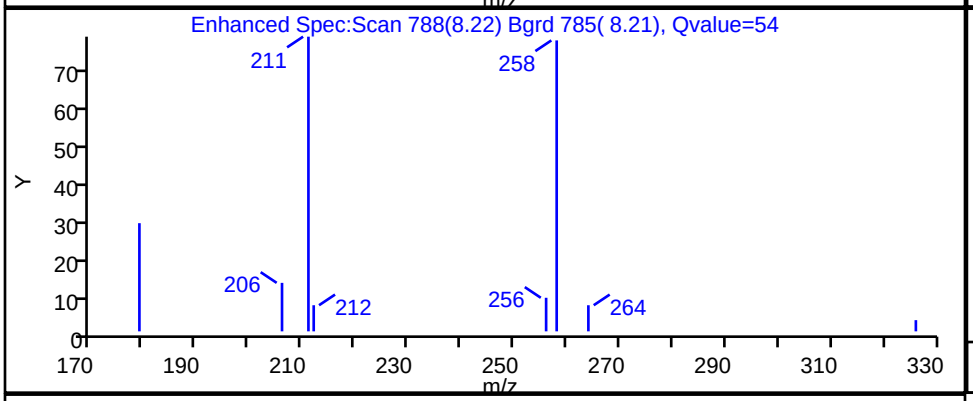
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-1-A.D				
Injection Date:	16-Nov-2023 15:49:44	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-6-A	Lab Sample ID:	140-34148-6		
Client ID:	1804576-852-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

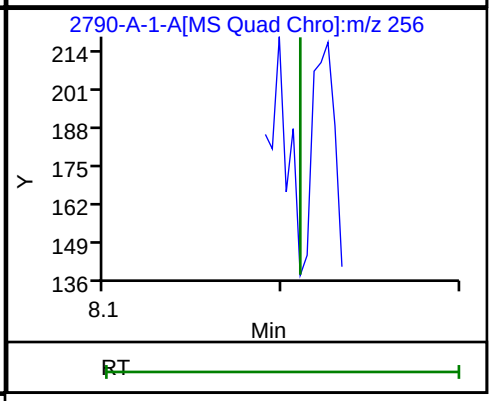
75 PCB-36, CAS: 38444-87-0

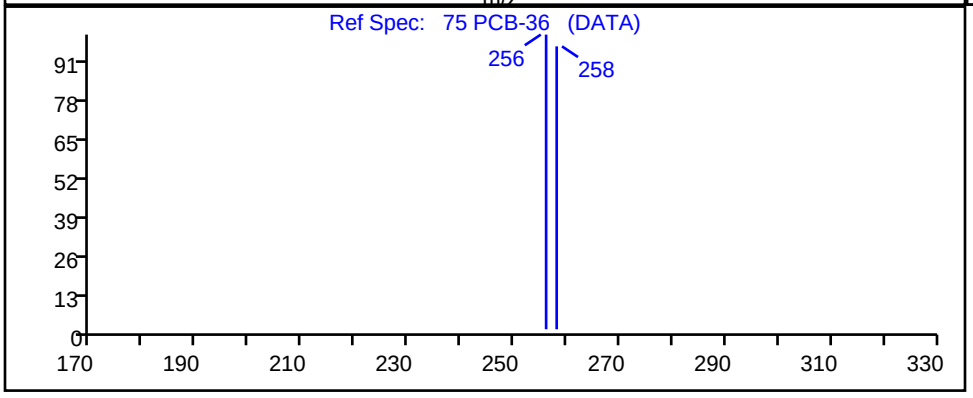
Processing Results











RT	Mass	Response	Amount
8.22	258.00	28	0.000411
8.21	256.00	0	

Reviewer: SK9U, 16-Nov-2023 16:44:36 -05:00:00 (UTC)

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: 1804576-852-S2 | Lab Sample ID: 140-34148-7

Matrix: PE | Lab File ID: 34148-7df5.D

Analysis Method: ID-0016 | Date Collected: 10/26/2023 14:00

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.010(g) | Date Analyzed: 11/16/2023 22:05

Con. Extract Vol.: 500(uL) | Dilution Factor: 5

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80349 | Units: ng/g

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
83-32-9	Acenaphthene	360000		5000	1300
208-96-8	Acenaphthylene	3500	J	5000	370
120-12-7	Anthracene	93000		5000	1600
56-55-3	Benzo[a]anthracene	47000		5000	1900
50-32-8	Benzo[a]pyrene	26000		5000	1400
205-99-2	Benzo[b]fluoranthene	26000		5000	1800
192-97-2	Benzo[e]pyrene	16000		5000	800
191-24-2	Benzo[g,h,i]perylene	6700		5000	550
207-08-9	Benzo[k]fluoranthene	16000		5000	1200
218-01-9	Chrysene	47000		5000	650
53-70-3	Dibenz(a,h)anthracene	1400	J	5000	410
206-44-0	Fluoranthene	200000		5000	4100
86-73-7	Fluorene	88000		5000	1600
193-39-5	Indeno[1,2,3-cd]pyrene	6200		5000	550
90-12-0	1-Methylnaphthalene	52000		25000	2500
91-57-6	2-Methylnaphthalene	ND		25000	3500
91-20-3	Naphthalene	ND		100000	15000
198-55-0	Perylene	5500		5000	2600
85-01-8	Phenanthrene	360000		10000	8700
129-00-0	Pyrene	310000		10000	1500
STL00912	C1-Fluoranthenes/pyrene	120000		5000	5000
STL00913	C1-Fluorenes	51000		10000	6500
STL00914	C2-Fluorenes	39000		5000	5000
STL00915	C3-Fluorenes	39000		5000	5000
STL00917	C2-Naphthalenes	160000		10000	10000
STL00918	C3-Naphthalenes	120000		10000	10000
STL00919	C4-Naphthalenes	69000		15000	14000
STL00901	C1-Phenanthrenes/Anthracenes	110000		20000	17000
STL00902	C2-Phenanthrenes/Anthracenes	100000		5000	5000
STL00903	C3-Phenanthrenes/Anthracenes	62000		5000	5000
STL00904	C4-Phenanthrenes/Anthracenes	28000		5000	5000
STL02218	C1-Chrysenes/Benz(a)anthracenes	29000		5000	5000

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: 1804576-852-S2 | Lab Sample ID: 140-34148-7

Matrix: PE | Lab File ID: 34148-7df5.D

Analysis Method: ID-0016 | Date Collected: 10/26/2023 14:00

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.010(g) | Date Analyzed: 11/16/2023 22:05

Con. Extract Vol.: 500(uL) | Dilution Factor: 5

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80349 | Units: ng/g

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
STL02219	C2-Chrysenes/Benz(a)anthracenes	11000		5000	5000
STL02220	C3-Chrysenes/Benz(a)anthracenes	6200		5000	5000
STL02221	C4-Chrysenes/Benz(a)anthracenes	ND		5000	5000
34883-41-5	PCB-14	58	J	5000	50
74472-51-8	PCB-192	400	J	5000	50
74472-48-3	PCB-184	110	J	5000	50
33979-03-2	PCB-155	83	J	5000	50
41411-61-4	PCB-142	80	J	5000	50
74472-52-9	PCB-204	340	J	5000	50
56558-16-8	PCB-104	260	J	5000	50
56558-18-0	PCB-121	120	J	5000	50
70362-49-1	PCB-78	210	J	5000	50
38444-87-0	PCB-36	ND		5000	50

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
93951-97-4	Acenaphthylene-d8	79		30-120
1719-06-8	Anthracene-d10	80		30-120
63466-71-7	Benzo(a)pyrene-d12	84		30-120
93951-98-5	Benzo(b)fluoranthene-d12	84		30-120
93951-66-7	Benzo(ghi)perylene-d12	91		30-120
93952-01-3	Benzo(k)fluoranthene-d12	86		30-120
1719-03-5	Chrysene-d12	77		30-120
13250-98-1	Dibenz(a,h)anthracene-d14	79		30-120
93951-69-0	Fluoranthene-d10	87		30-120
81103-79-9	Fluorene -d10	78		30-120
203578-33-0	Indeno[1,2,3-cd]pyrene-d12	89		30-120
38072-94-5	1-Methylnaphthalene-d10	78		30-120
7297-45-2	2-Methylnaphthalene-d10	76		30-120
1146-65-2	Naphthalene-d8	74		30-120
1520-96-3	Perylene-d12	82		30-120
1517-22-2	Phenanthrene-d10	89		30-120

Report Date: 22-Nov-2023 14:18:01 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D
Lims ID: 140-34148-A-7-A
Client ID: 1804576-852-S2
Sample Type: Client
Inject. Date: 16-Nov-2023 22:05:35 ALS Bottle#: 0 Worklist Smp#: 30
Injection Vol: 1.0 ul Dil. Factor: 5.0000
Sample Info: 140-0030519-030
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 22-Nov-2023 14:18:00 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1637

First Level Reviewer: SK9U Date: 17-Nov-2023 12:07:15

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/ml	%Rec	Flags
D 10 Naphthalene-d8	136	5.059	5.068	-0.009	99	7486	0.0744	74.4	
11 Naphthalene	128	5.078	5.078	0.000	33	457	0.005191		7M
D 15 2-methylnaphthalene-d10	152	5.612	5.612	0.000	92	4943	0.0756	75.6	
D 17 1-Methylnaphthalene-d10	152	5.686	5.686	0.000	100	5113	0.0780	78.0	
18 1-Methylnaphthalene	142	5.715	5.715	0.000	96	12835	0.2068		M
D 23 Acenaphthylene-d8	160	6.362	6.362	0.000	67	8791	0.0792	79.2	
24 Acenaphthylene	152	6.377	6.372	0.005	46	1446	0.0140		
* 26 Acenaphthene-d10	164	6.492	6.492	0.000	97	7218	0.1000		M
27 Acenaphthene	154	6.517	6.517	0.000	97	94365	1.43		
D 29 Fluorene -d10	176	6.920	6.920	0.000	97	6741	0.0784	78.4	M
30 Fluorene	166	6.945	6.945	0.000	98	30720	0.3508		
D 35 Phenanthrene-d10	188	7.732	7.732	0.000	99	11869	0.0887	88.7	
36 Phenanthrene	178	7.749	7.749	0.000	47	203819	1.42		
D 38 Anthracin-d10	188	7.777	7.777	0.000	100	10508	0.0804	80.4	
39 Anthracene	178	7.794	7.794	0.000	100	48038	0.3713		
D 41 Fluoranthene-d10	212	8.805	8.805	0.000	94	15065	0.0868	86.8	M
43 Fluoranthene	202	8.822	8.825	-0.003	56	157864	0.8190		
* 44 Pyrene-d10 (IS)	212	9.024	9.024	0.000	98	17167	0.1000		
45 Pyrene	202	9.040	9.044	-0.004	100	241354	1.23		
47 Benzo[a]anthracene	228	10.260	10.260	0.000	97	31387	0.1880		M
D 48 Chrysene-d12	240	10.270	10.270	0.000	84	12859	0.0768	76.8	M
50 Chrysene	228	10.295	10.295	0.000	25	35469	0.1895		M
D 52 Benzo(b)fluoranthene-d12	264	11.376	11.369	0.007	100	11245	0.0843	84.3	
53 Benzo[b]fluoranthene	252	11.404	11.397	0.007	84	19343	0.1021		M
D 54 Benzo(k)fluoranthene-d12	264	11.404	11.404	0.000	77	13532	0.0864	86.4	M
55 Benzo[k]fluoranthene	252	11.418	11.425	-0.007	99	12402	0.0626		M
* 56 Benzo(e)pyrene-d12	264	11.684	11.684	0.000	98	10529	0.1000		
57 Benzo[e]pyrene	252	11.712	11.712	0.000	100	10414	0.0627		
D 58 Benzo(a)pyrene-d12	264	11.747	11.747	0.000	100	9849	0.0842	84.2	M
59 Benzo[a]pyrene	252	11.775	11.775	0.000	100	17262	0.1060		
D 60 Perylene-d12	264	11.845	11.838	0.007	100	10635	0.0820	82.0	
61 Perylene	252	11.873	11.873	0.000	99	3320	0.0218		

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/ml	%Rec	Flags
D 62 Indeno[1,2,3-cd]pyrene-d12	288	13.196	13.186	0.010	77	11299	0.0889	88.9	
D 63 Dibenz(a,h)anthracene-d14	292	13.205	13.186	0.009	93	9028	0.0794	79.4	M
65 Indeno[1,2,3-cd]pyrene	276	13.224	13.214	0.010	52	4675	0.0247		M
66 Dibenz(a,h)anthracene	278	13.243	13.233	0.010	14	818	0.005675		
D 67 Benzo(ghi)perylene-d12	288	13.552	13.543	0.009	98	11528	0.0914	91.4	
68 Benzo[g,h,i]perylene	276	13.590	13.580	0.010	91	4516	0.0268		
74 PCB-14	222	7.479	7.479	0.000	41	129	0.000231		M
76 PCB-104	326	8.395	8.393	-0.001	91	233	0.001022		
77 PCB-121	326	8.748	8.748	-0.003	18	85	0.000465		M
78 PCB-155	360	8.852	8.852	0.003	22	57	0.000333		a
79 PCB-78	290	9.077	9.077	-0.007	32	123	0.000849		
80 PCB-142	360	9.518	9.519	-0.004	23	40	0.000321		
81 PCB-184	394	9.572	9.579	0.000	0	56	0.000449		M
* 82 PCB-167L	372	10.020	10.027	-0.007	71	12176	0.0800		
83 PCB-204	428	10.249	10.246	-0.001	0	110	0.001356		
84 PCB-192	394	10.275	10.275	0.000	6	185	0.001618		M
A 86 C2-Naphthalenes	156	6.237	(6.068-6.407)		0	55359	0.6289		
A 87 C3-Naphthalenes	170	6.709	(6.348-7.050)		0	43600	0.4953		
A 88 C4-Naphthalenes	184	7.116	(6.678-7.562)		0	24299	0.2760		
A 89 C1-Fluorenes	180	7.403	(7.364-7.505)		0	17736	0.2026		
A 90 C2-Fluorenes	194	7.894	(7.730-8.069)		0	13754	0.1571		
A 91 C3-Fluorenes	208	8.336	(8.092-8.605)		0	13787	0.1575		
A 96 C1-Phenanthrenes/Anthracenes	191	8.238	(8.155-8.332)		0	62583	0.4371		
A 97 C2-Phenanthrenes/Anthracenes	206	8.697	(8.490-8.926)		0	59390	0.4148		
A 98 C3-Phenanthrenes/Anthracenes	220	9.128	(8.851-9.456)		0	35345	0.2469		
A 99 C4-Phenanthrenes/Anthracenes	234	9.449	(9.106-9.824)		0	15875	0.1109		
A 100 C1-Fluoranthenes/pyrene	216	9.446	(9.246-9.640)		0	93222	0.4739		
A 101 C1-Chrysenes/Benz(a)anthracenes	242	10.681	(10.456-10.941)		0	21963	0.1174		
A 102 C2-Chrysenes/Benz(a)anthracenes	256	11.006	(10.667-11.381)		0	8038	0.0429		
A 103 C3-Chrysenes/Benz(a)anthracenes	270	11.635	(11.002-11.867)		0	4668	0.0249		

QC Flag Legend

Processing Flags

7 - Failed Limit of Detection

Review Flags

M - Manually Integrated

a - User Assigned ID

Reagents:

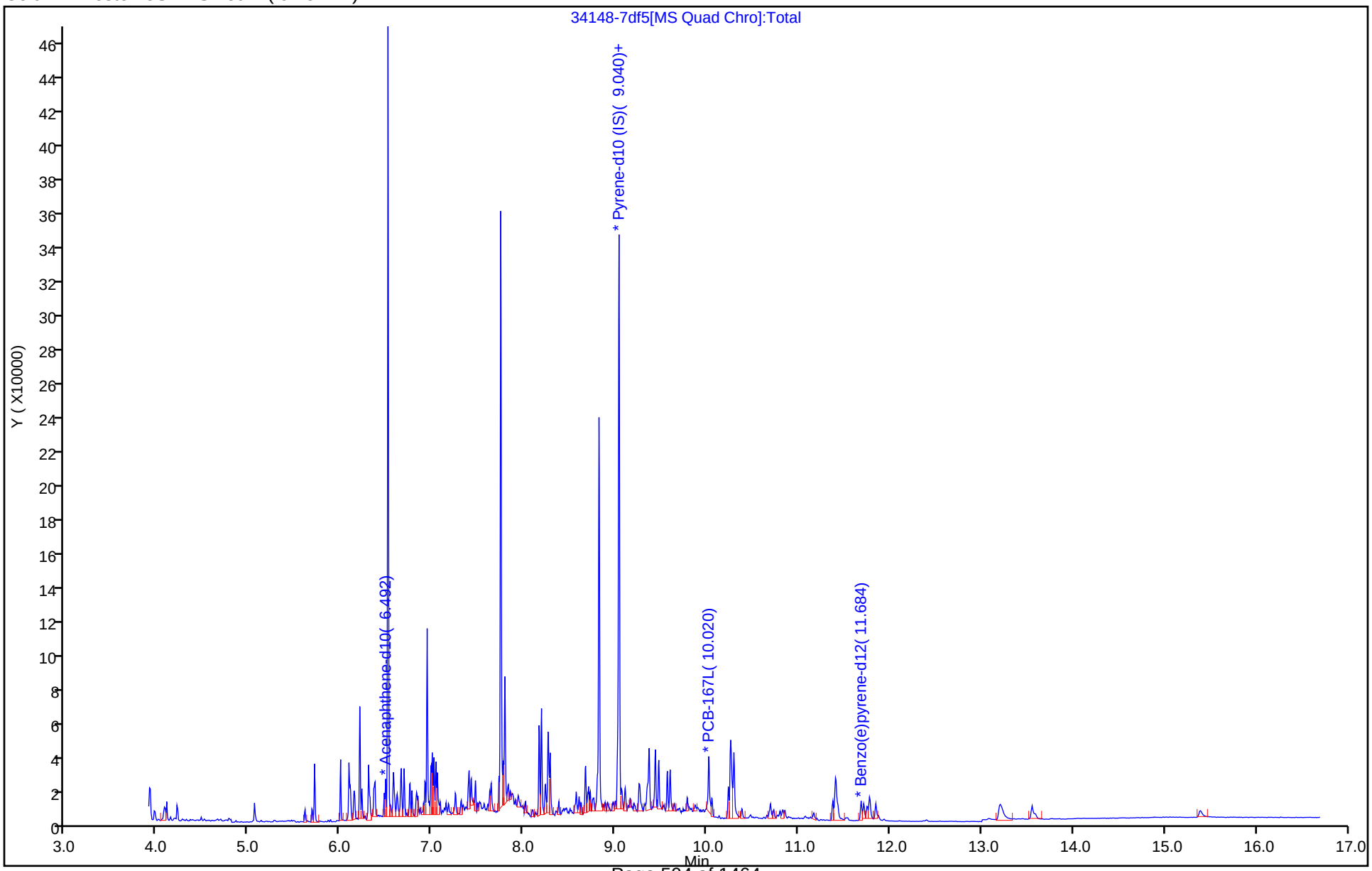
60ISPCB_00001 Amount Added: 5.00 Units: uL

Report Date: 22-Nov-2023 14:18:01 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D				
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7	Worklist Smp#:	30
Client ID:	1804576-852-S2				
Injection Vol:	1.0 ul	Dil. Factor:	5.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



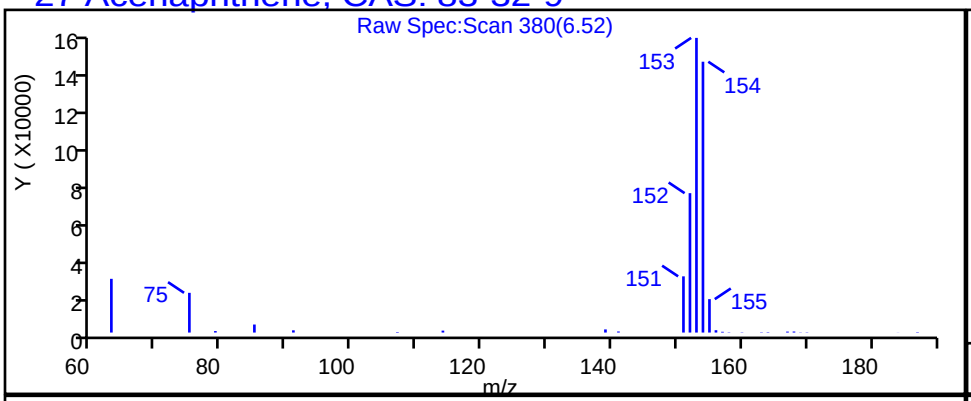
Report Date: 22-Nov-2023 14:18:01 Chrom Revision: 2.3 15-Nov-2023 20:54:34

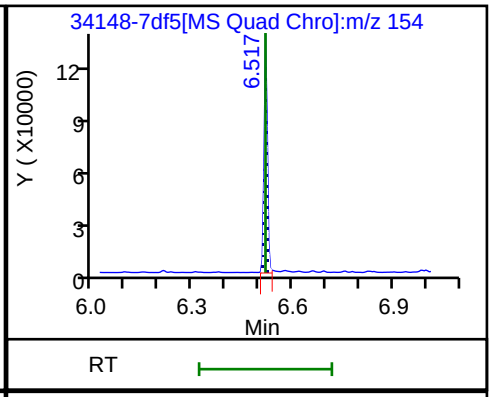
Eurofins Knoxville

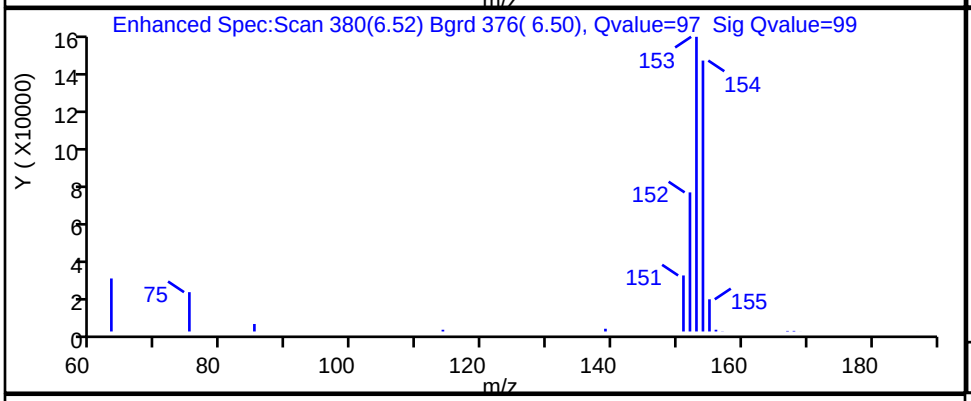
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D

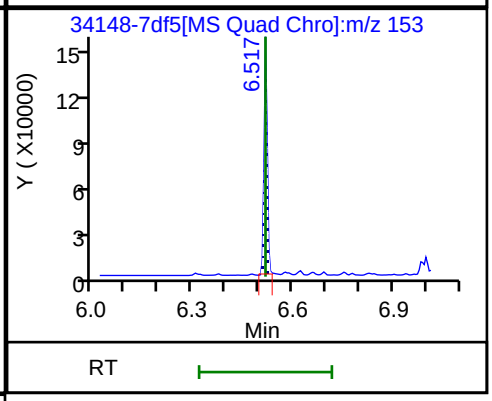
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7
Client ID:	1804576-852-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

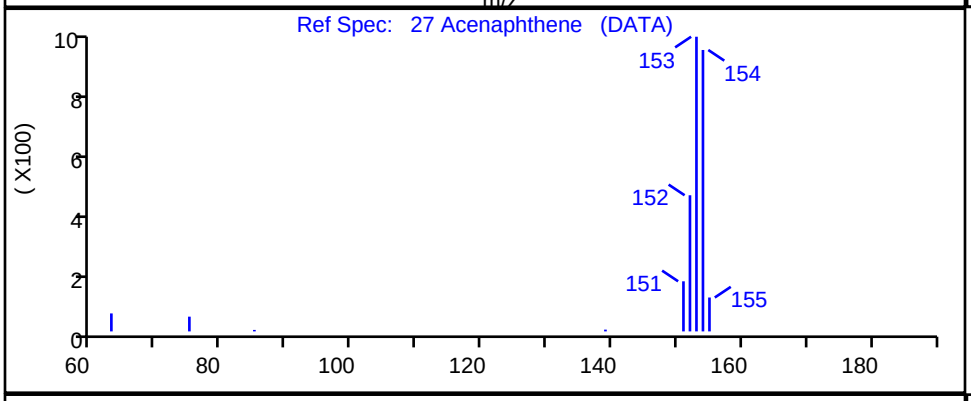
27 Acenaphthene, CAS: 83-32-9

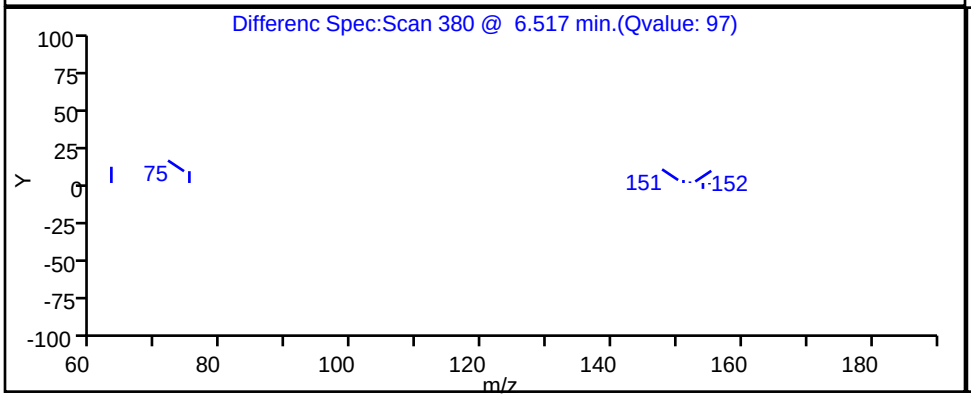


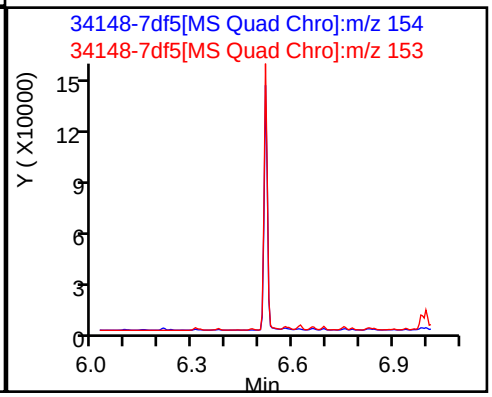












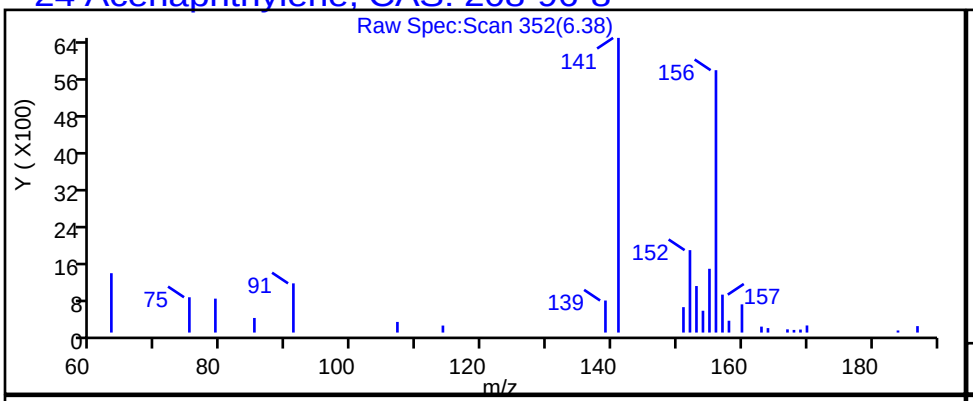
Report Date: 22-Nov-2023 14:18:01 Chrom Revision: 2.3 15-Nov-2023 20:54:34

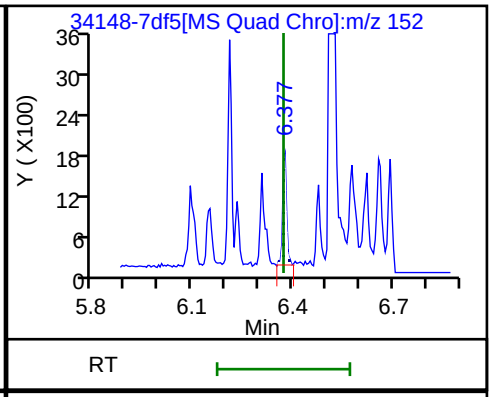
Eurofins Knoxville

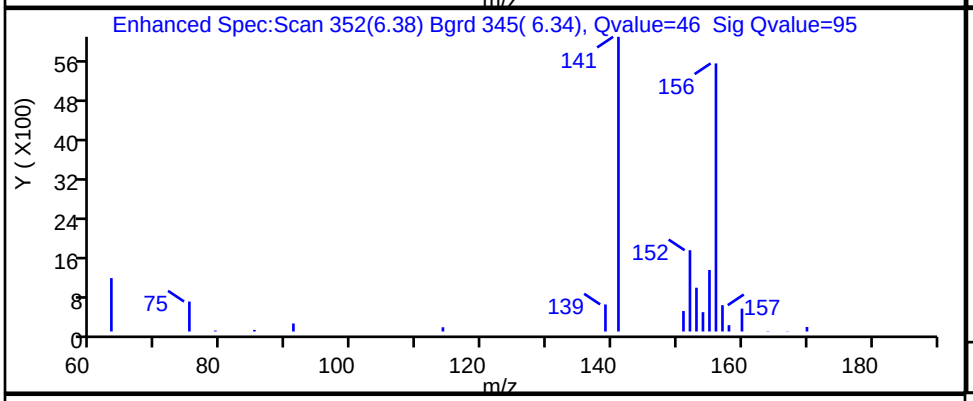
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D

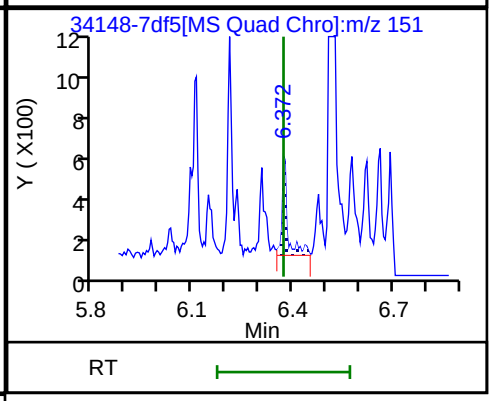
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7
Client ID:	1804576-852-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

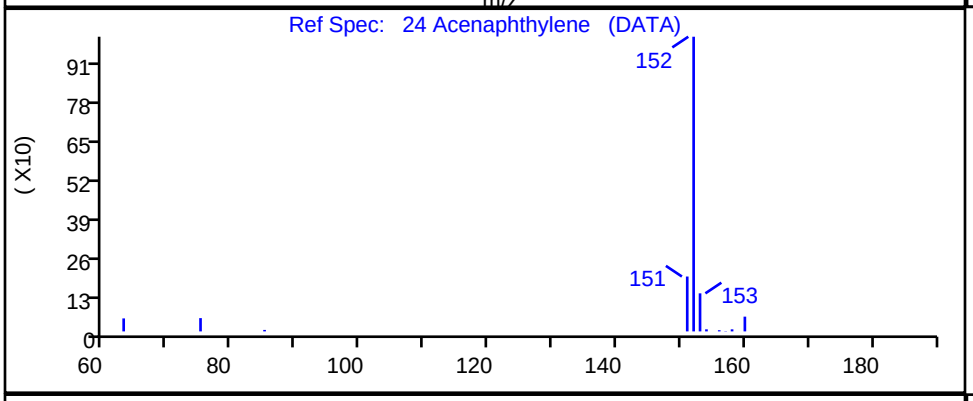
24 Acenaphthylene, CAS: 208-96-8

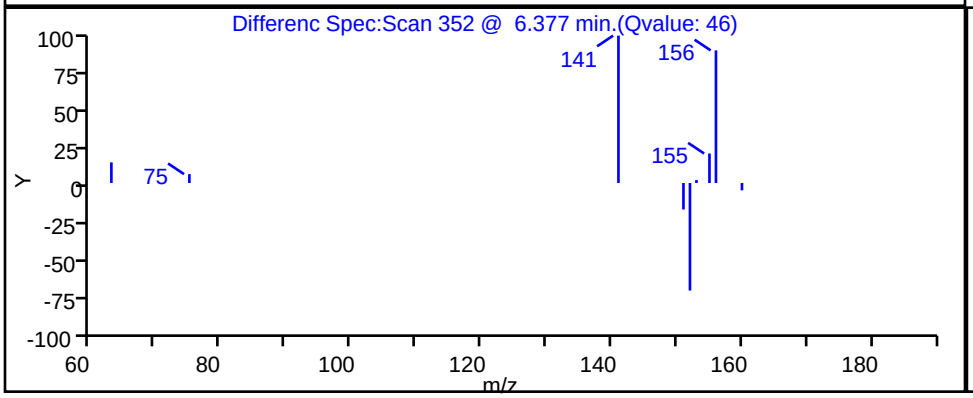


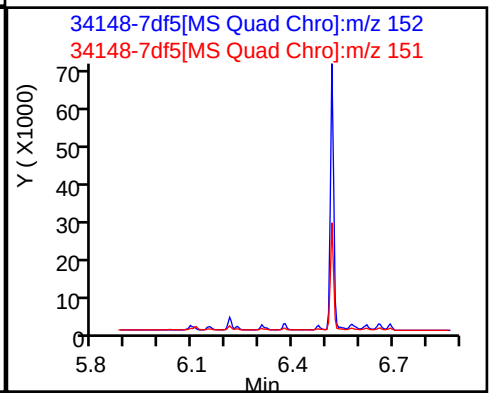












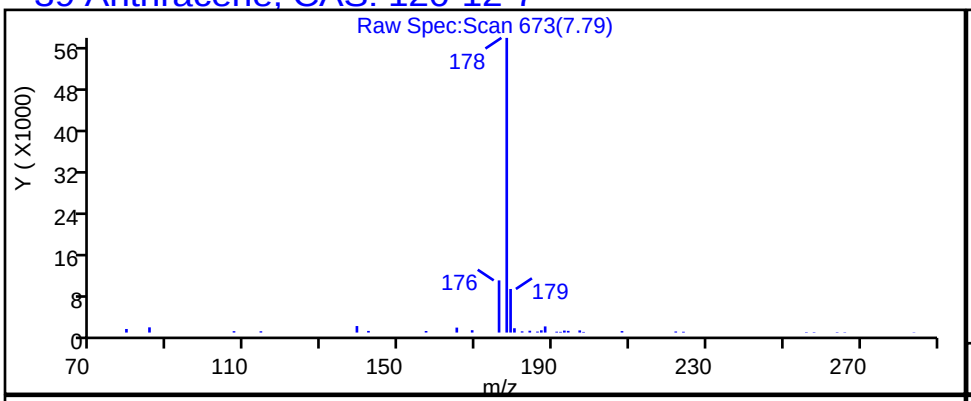
Report Date: 22-Nov-2023 14:18:01 Chrom Revision: 2.3 15-Nov-2023 20:54:34

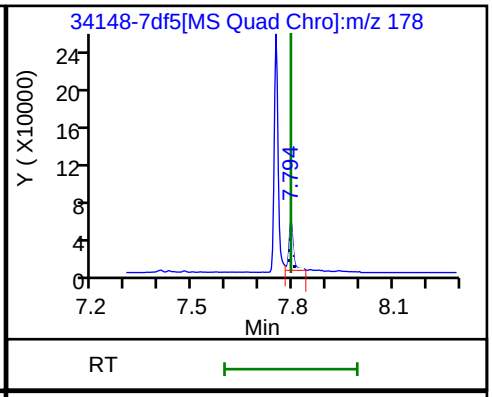
Eurofins Knoxville

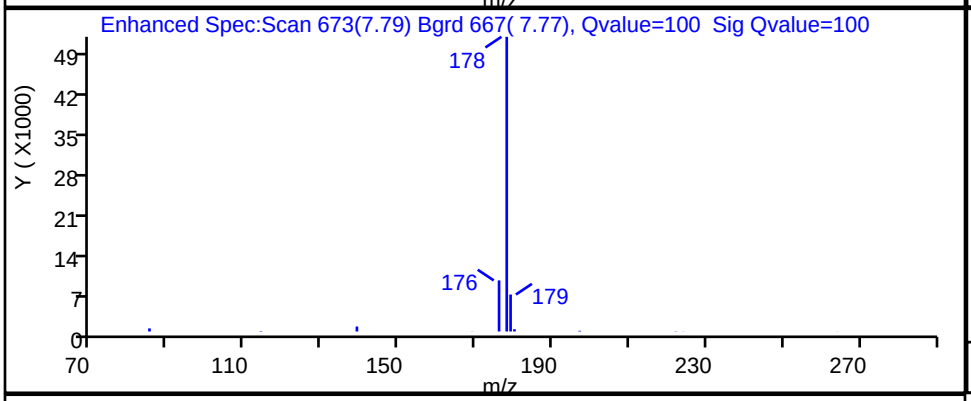
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D

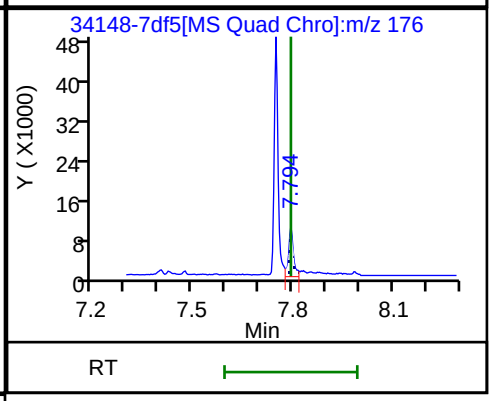
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

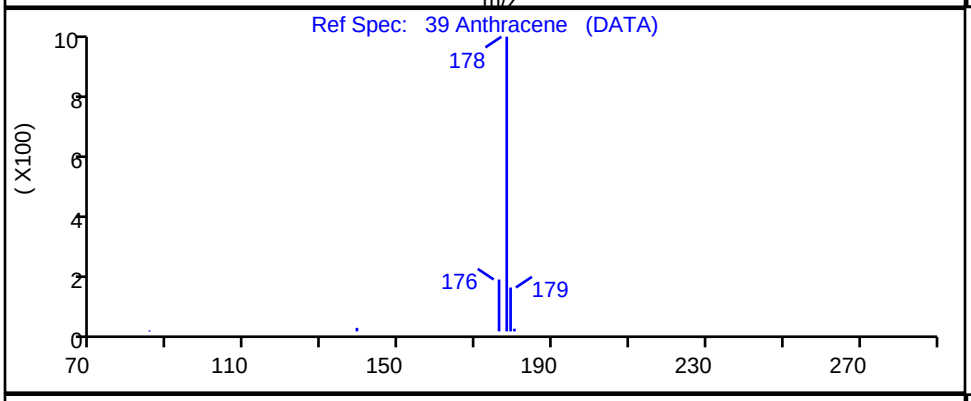
39 Anthracene, CAS: 120-12-7

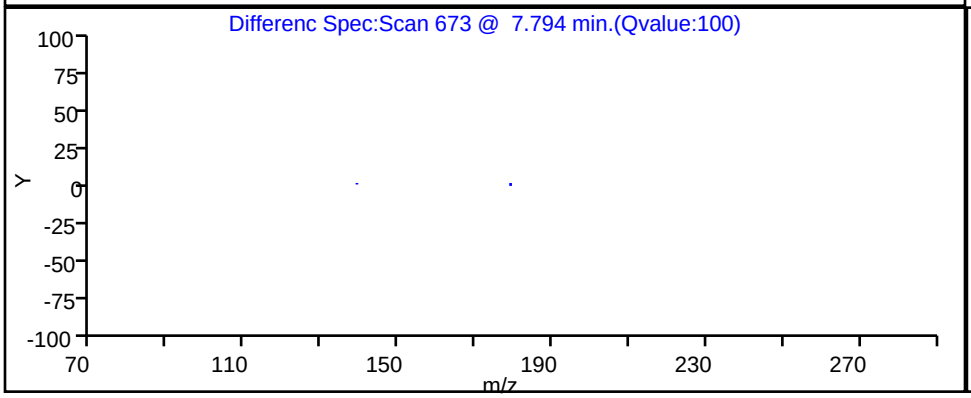


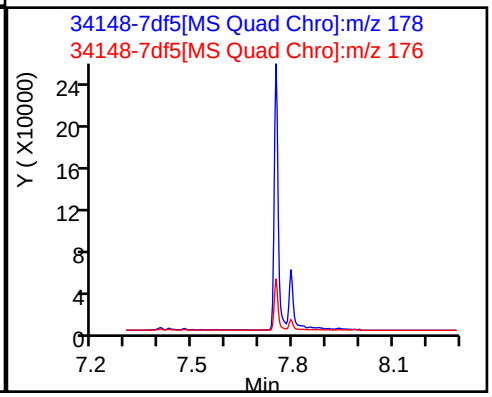












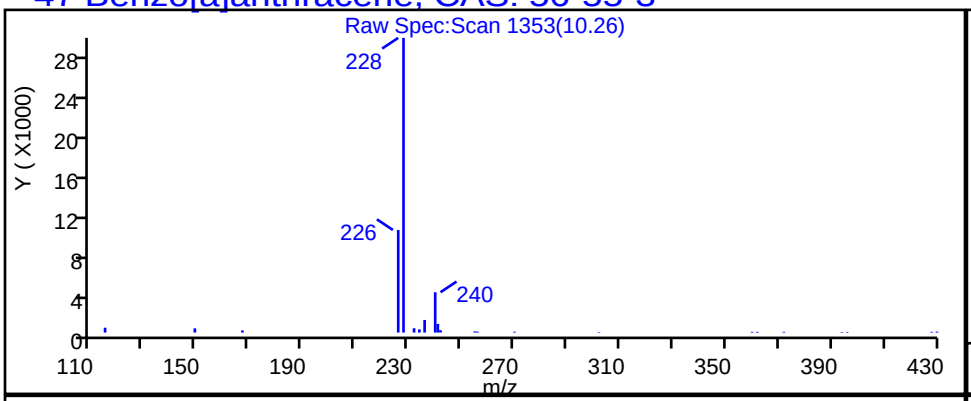
Report Date: 22-Nov-2023 14:18:02 Chrom Revision: 2.3 15-Nov-2023 20:54:34

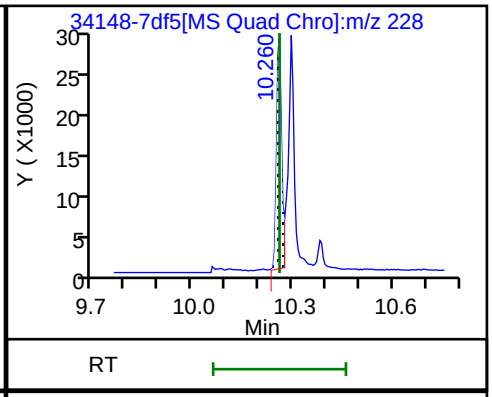
Eurofins Knoxville

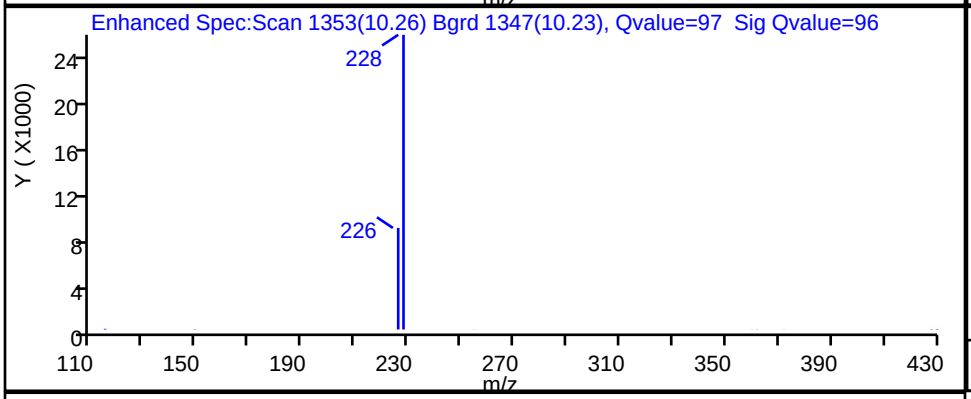
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D

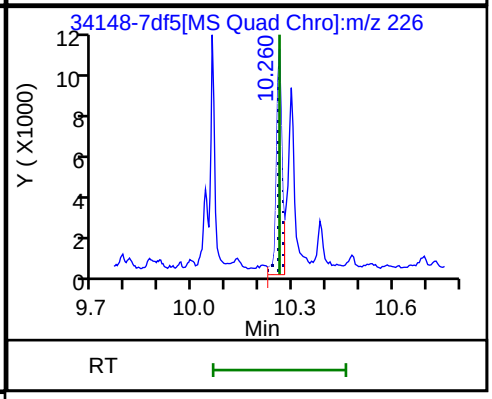
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

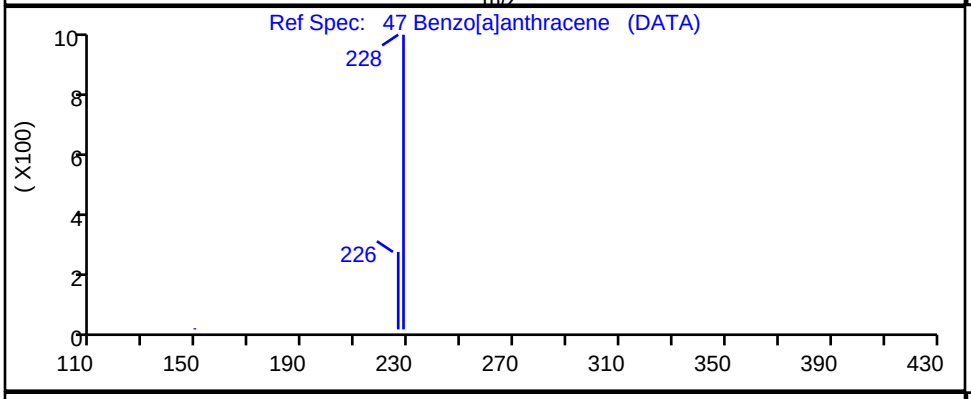
47 Benzo[a]anthracene, CAS: 56-55-3

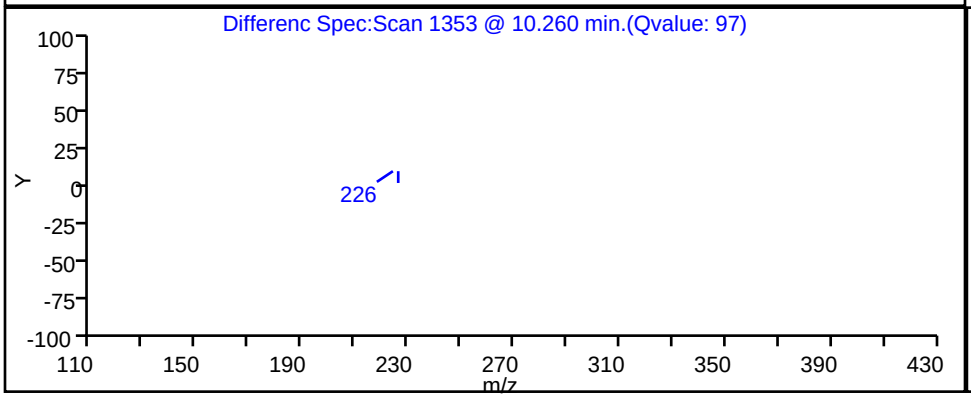


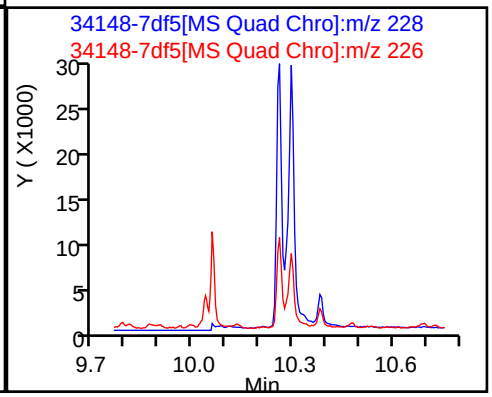










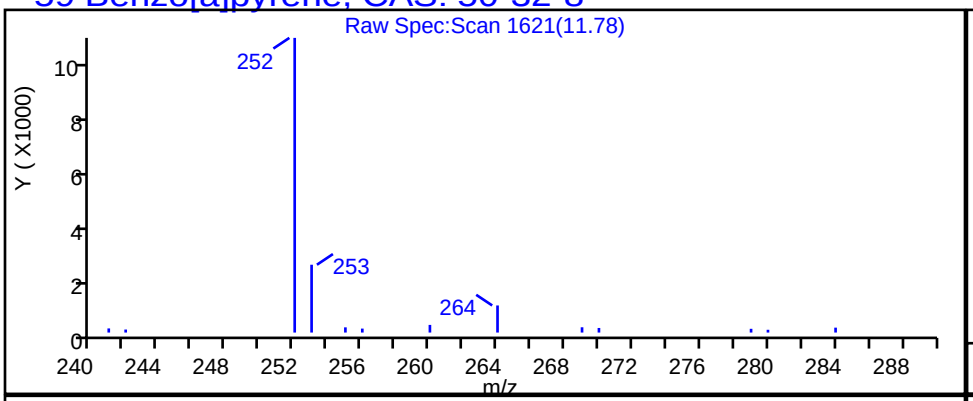


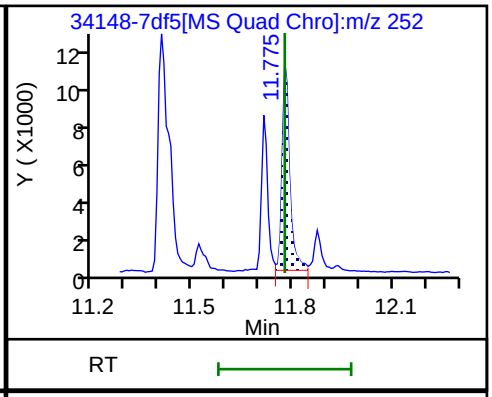
Report Date: 22-Nov-2023 14:18:02 Chrom Revision: 2.3 15-Nov-2023 20:54:34

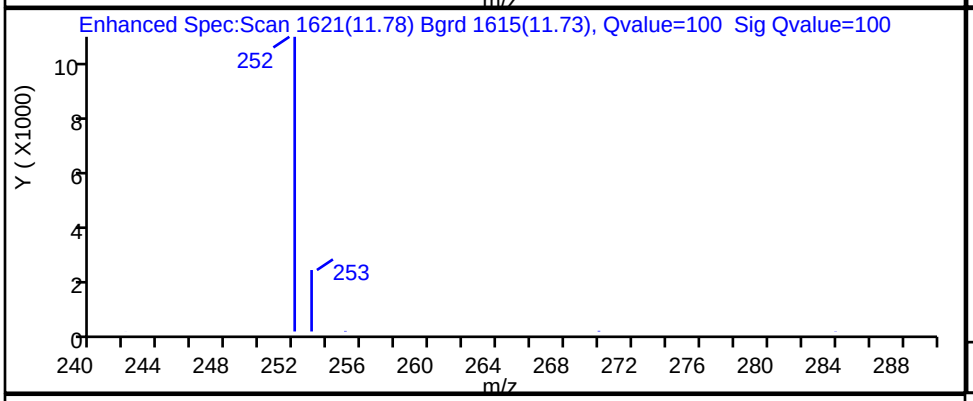
Eurofins Knoxville

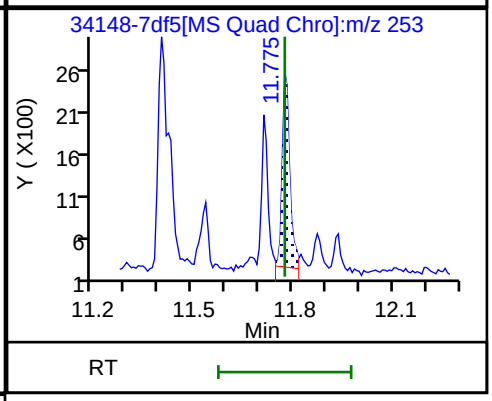
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D		
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7
Client ID:	1804576-852-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

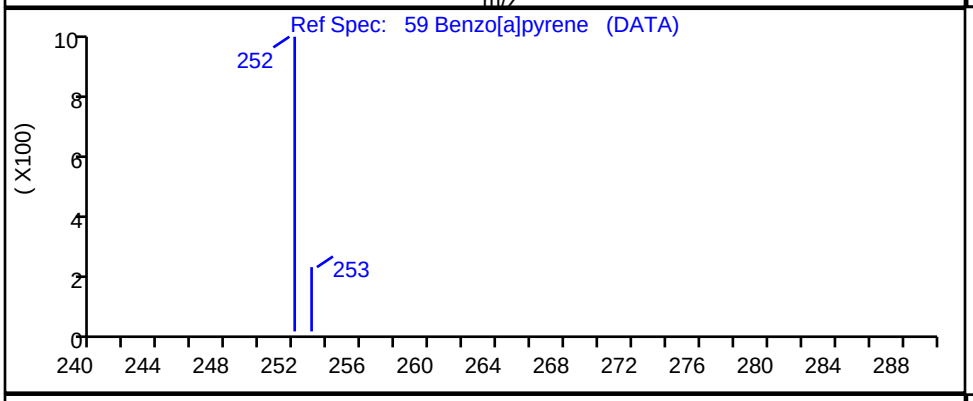
59 Benzo[a]pyrene, CAS: 50-32-8

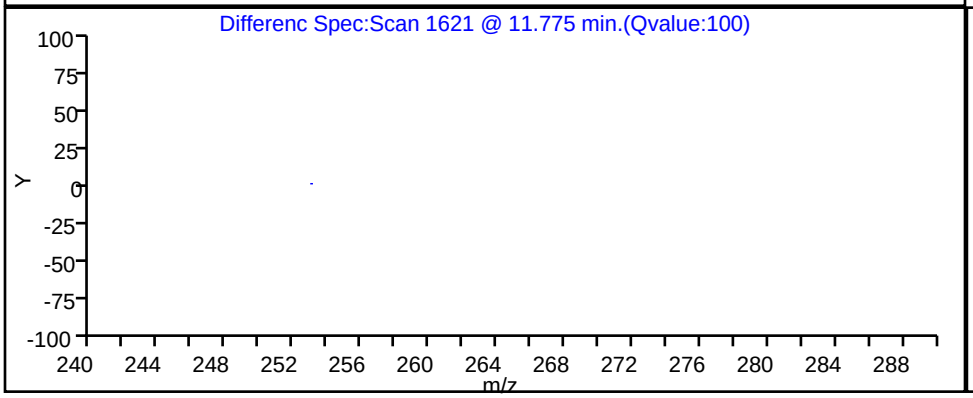


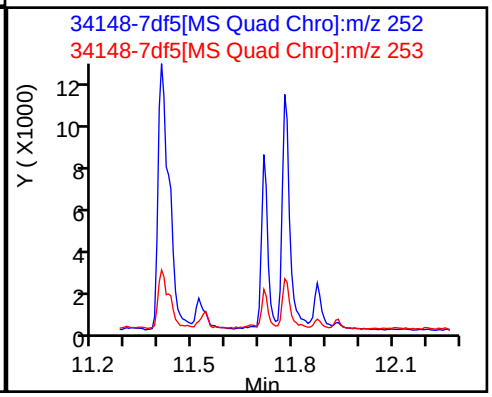










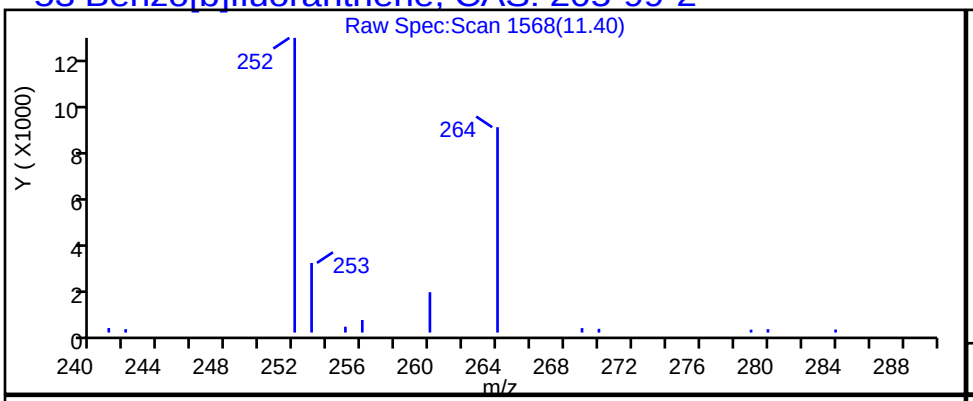


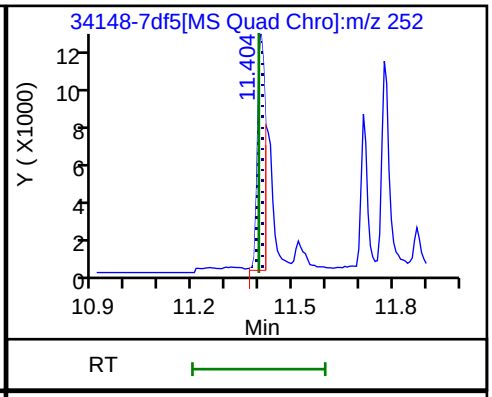
Report Date: 22-Nov-2023 14:18:02 Chrom Revision: 2.3 15-Nov-2023 20:54:34

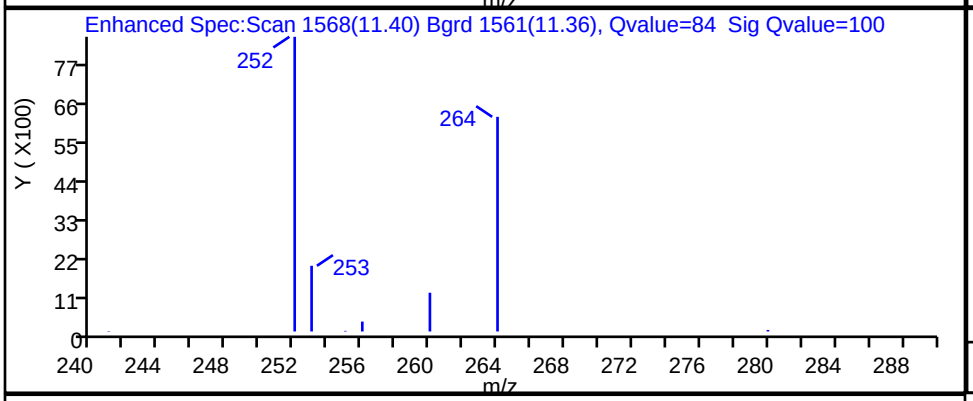
Eurofins Knoxville

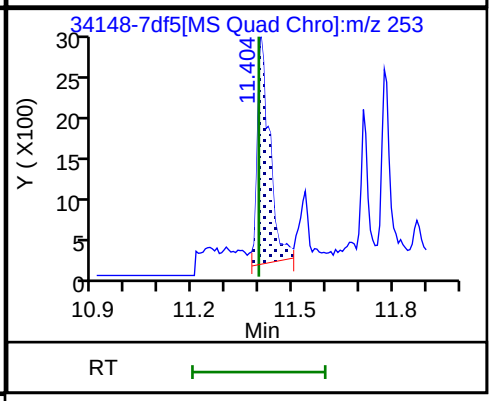
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D				
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

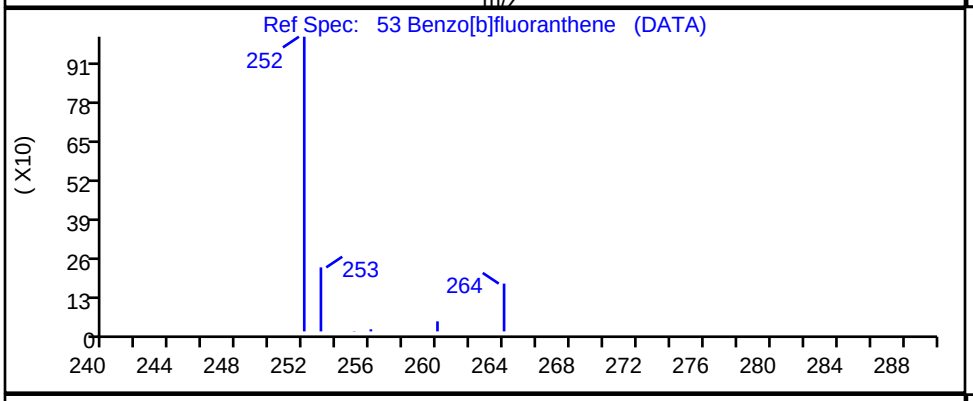
53 Benzo[b]fluoranthene, CAS: 205-99-2

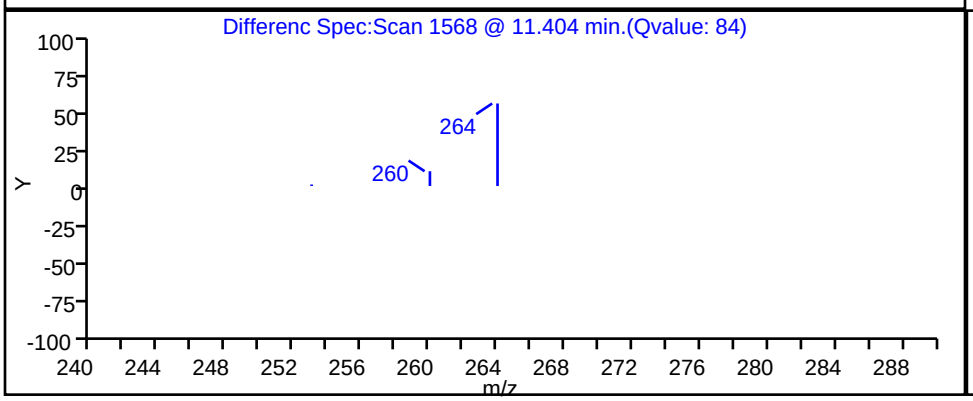


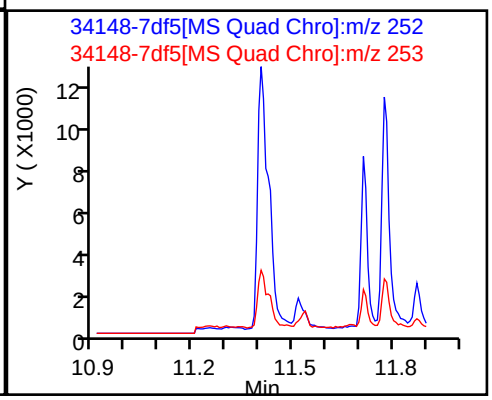












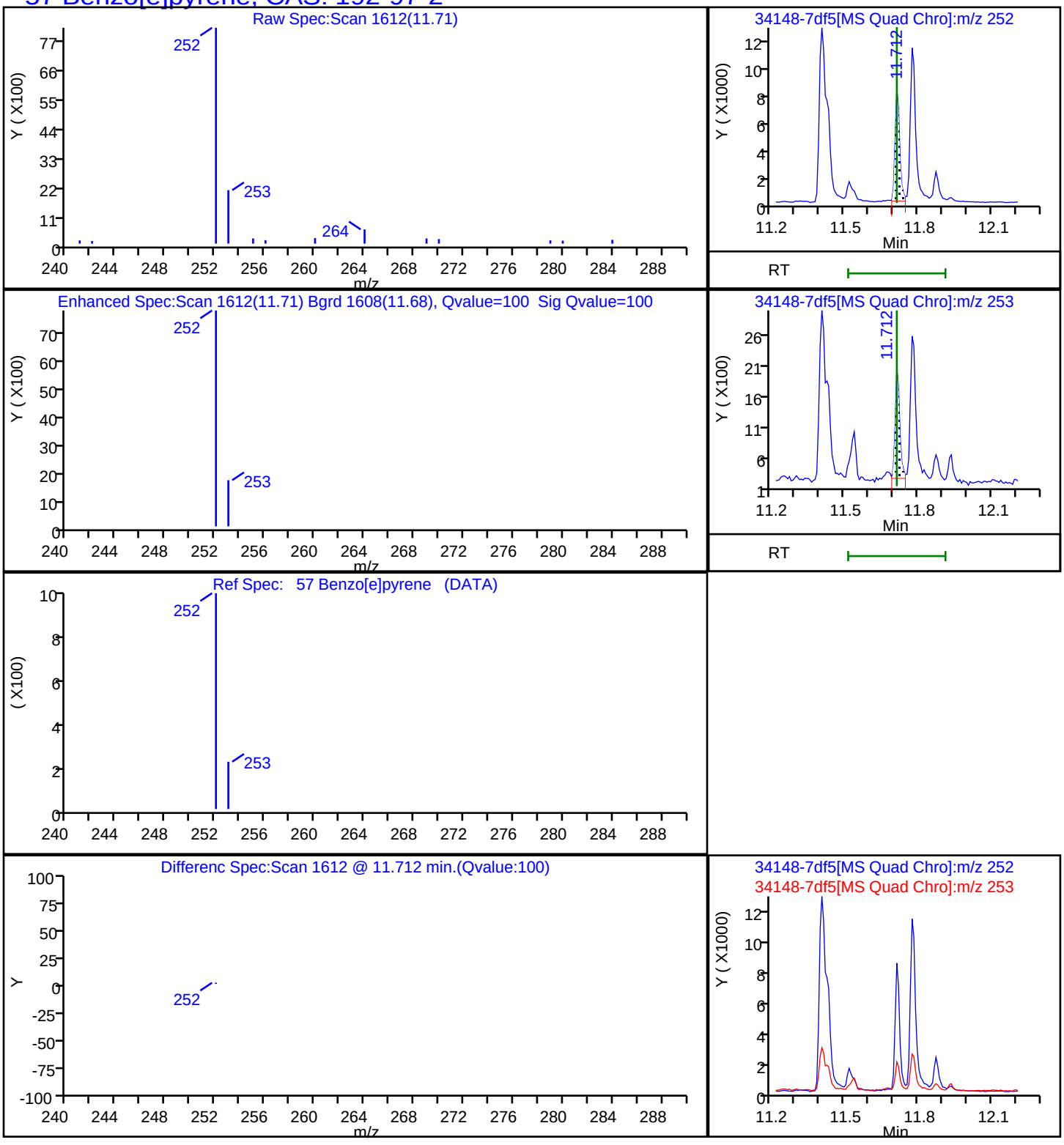
Report Date: 22-Nov-2023 14:18:02 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D

Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7
Client ID:	1804576-852-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

57 Benzo[e]pyrene, CAS: 192-97-2



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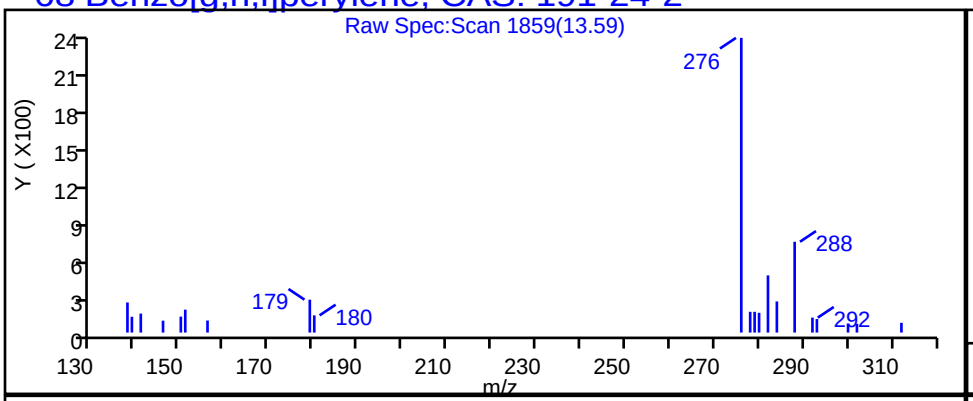
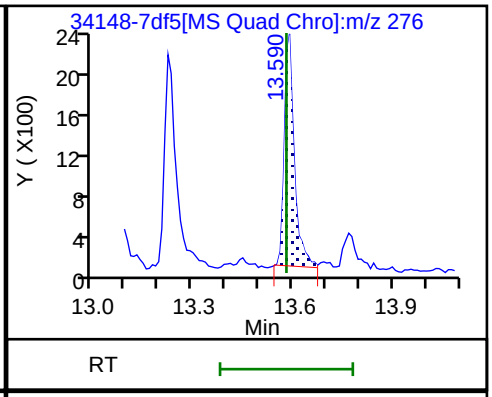
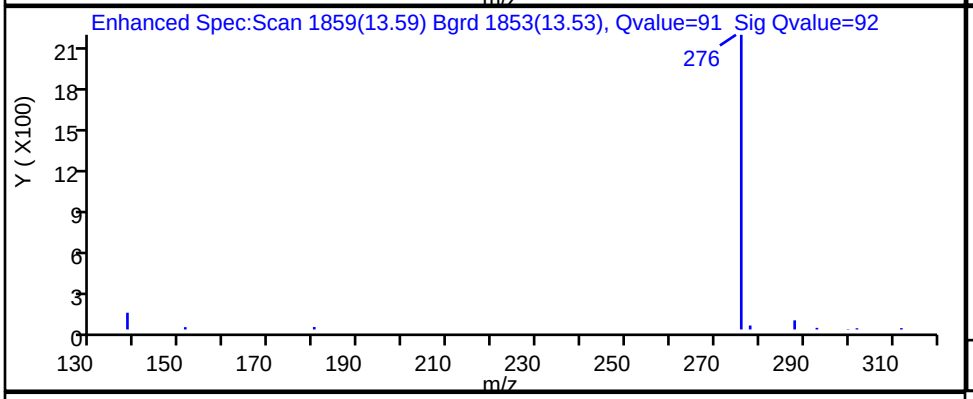
Eurofins Knoxville

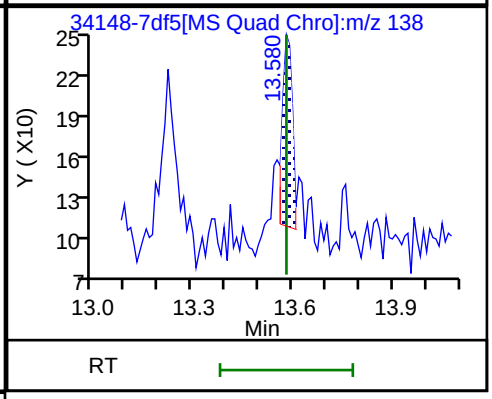
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D				
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

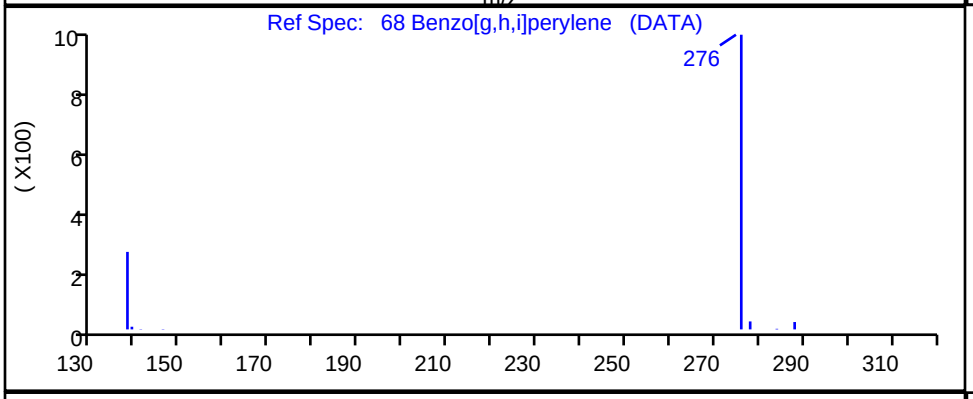
68 Benzo[g,h,i]perylene, CAS: 191-24-2

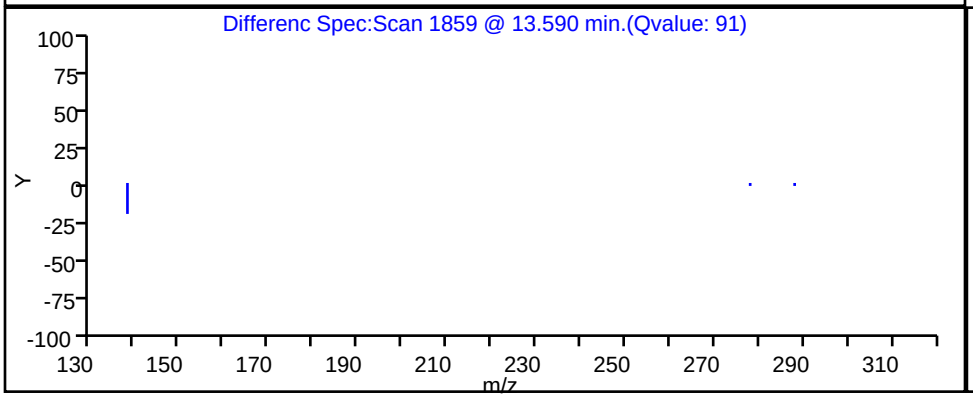


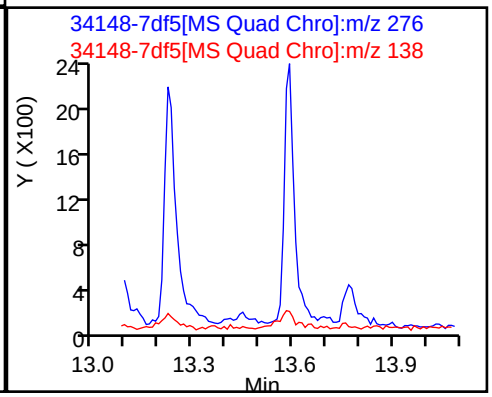












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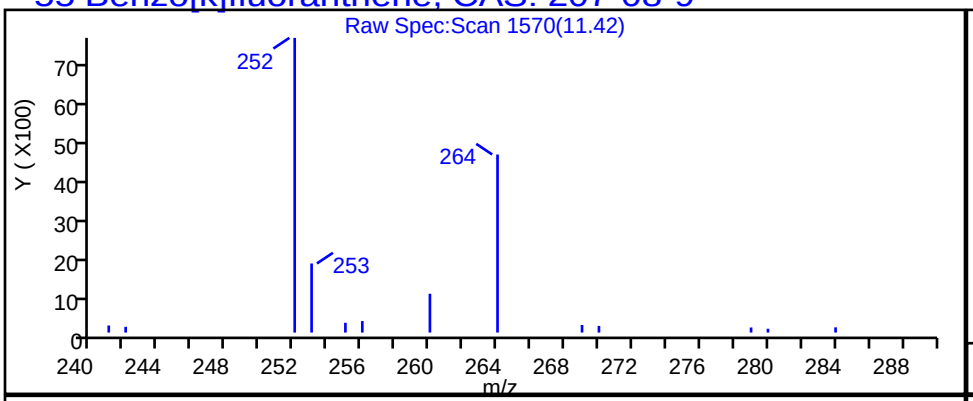
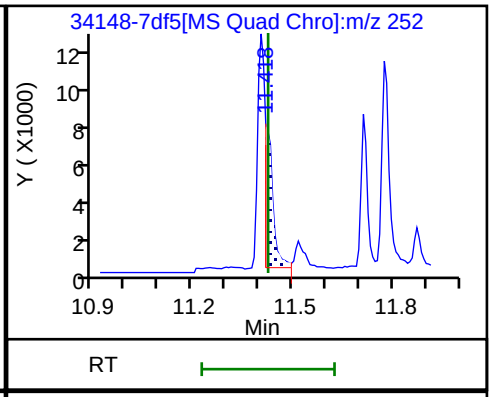
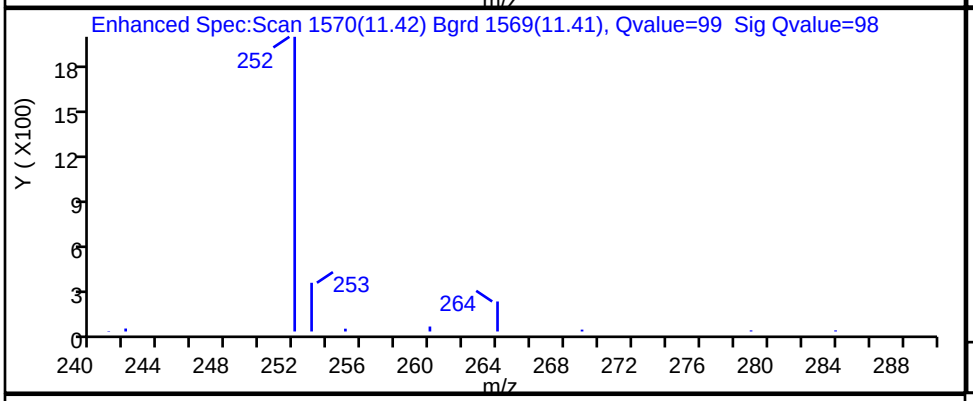
Eurofins Knoxville

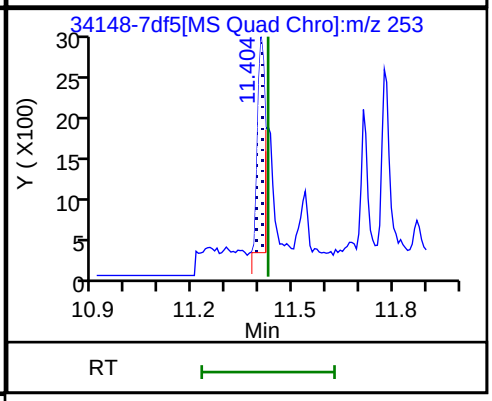
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D		
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7
Client ID:	1804576-852-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

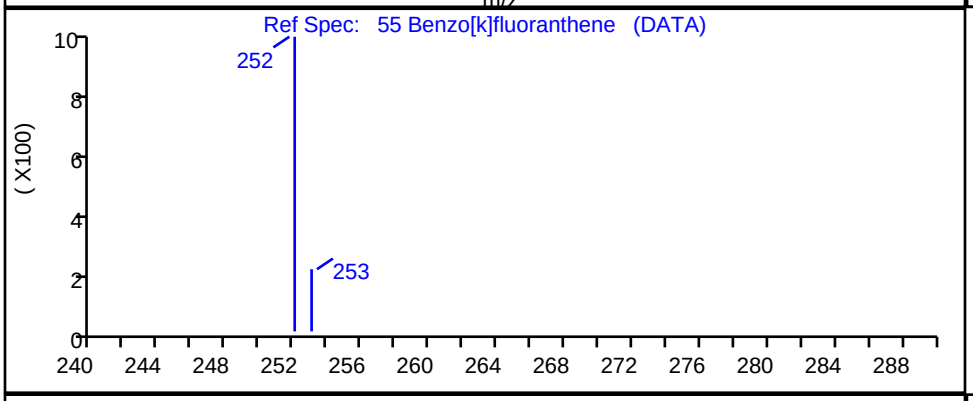
55 Benzo[k]fluoranthene, CAS: 207-08-9

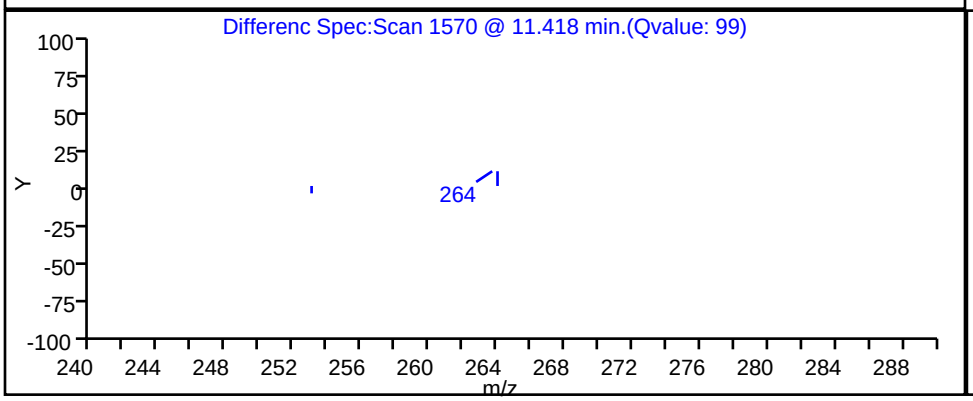


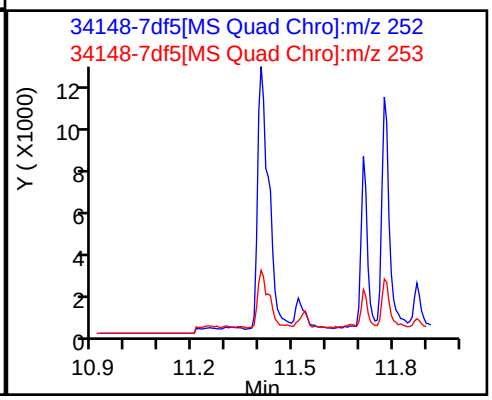












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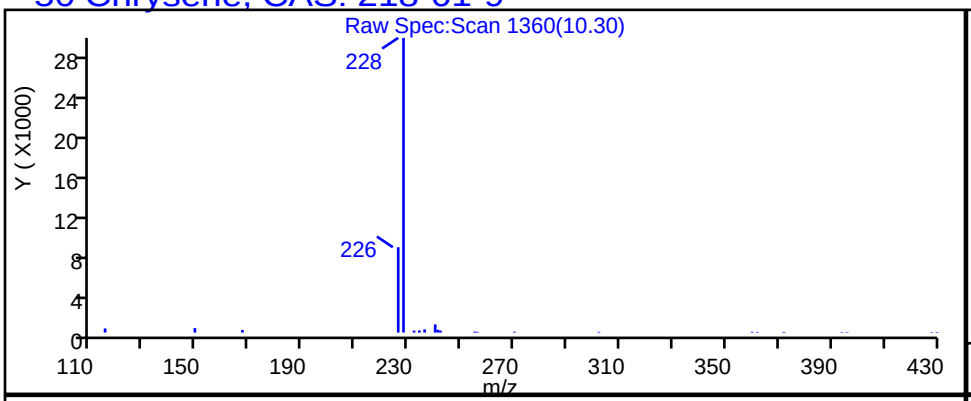
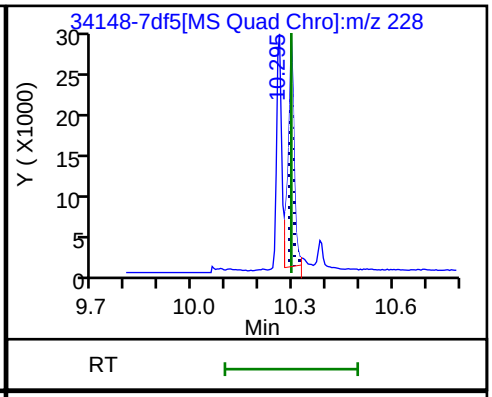
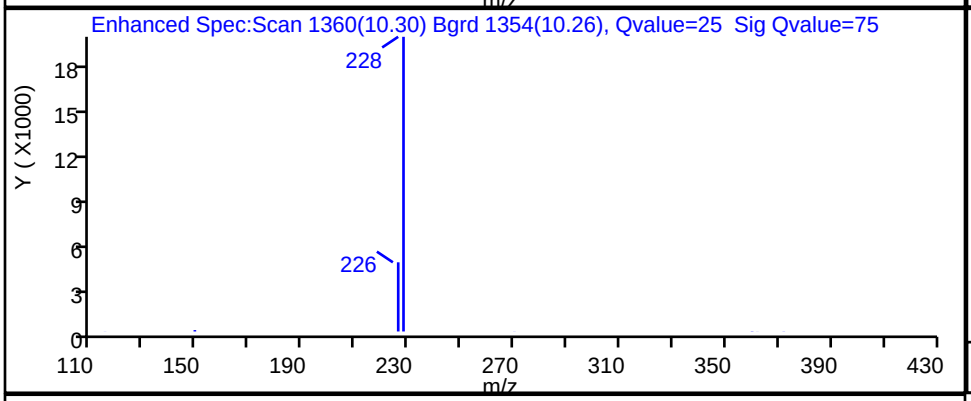
Eurofins Knoxville

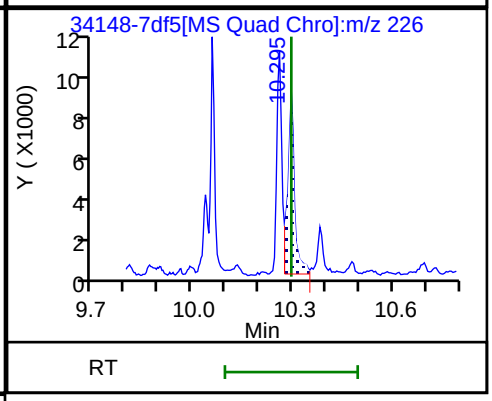
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D		
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7
Client ID:	1804576-852-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

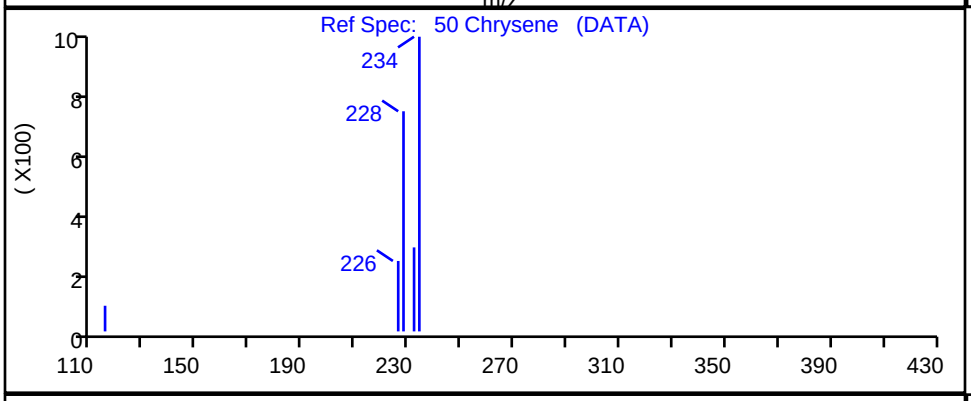
50 Chrysene, CAS: 218-01-9

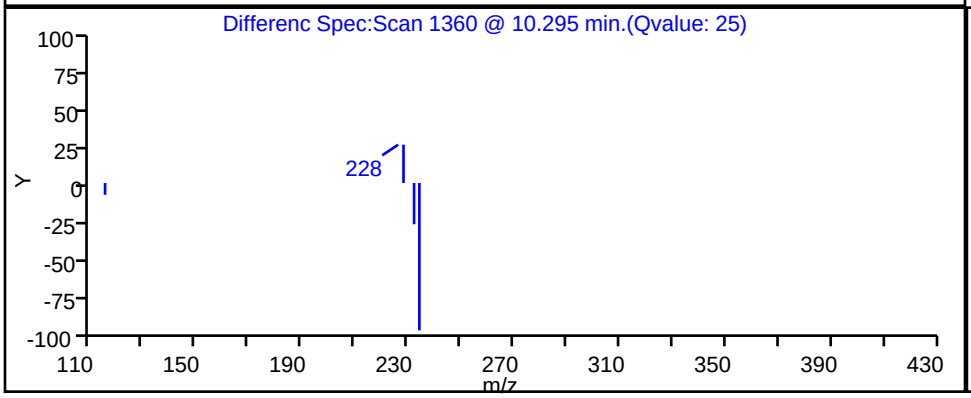


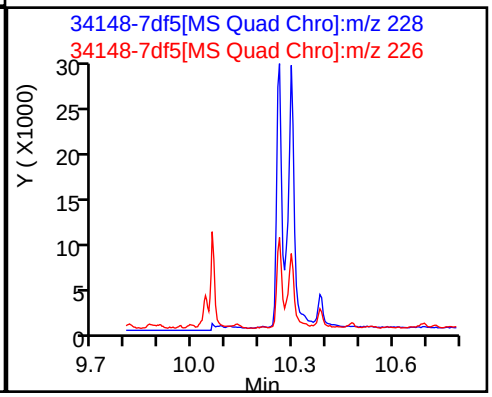












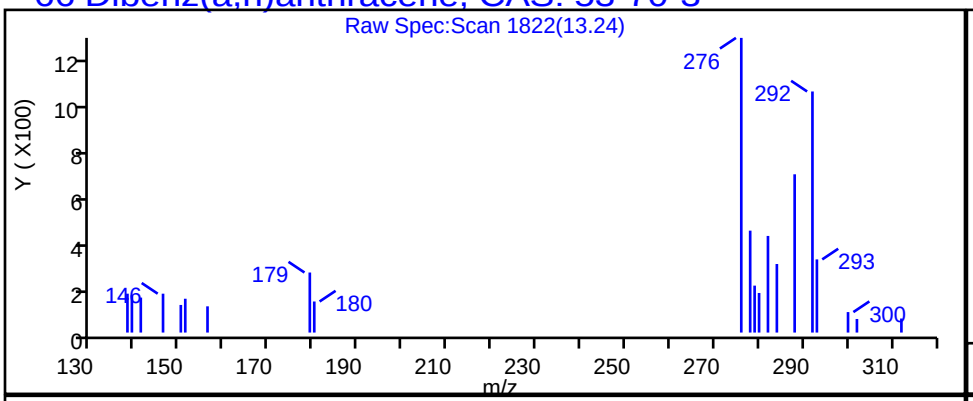
Report Date: 22-Nov-2023 14:18:02 Chrom Revision: 2.3 15-Nov-2023 20:54:34

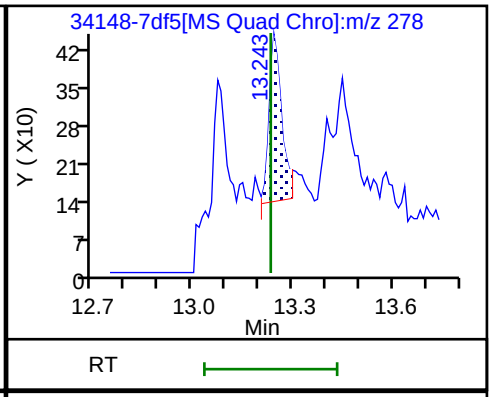
Eurofins Knoxville

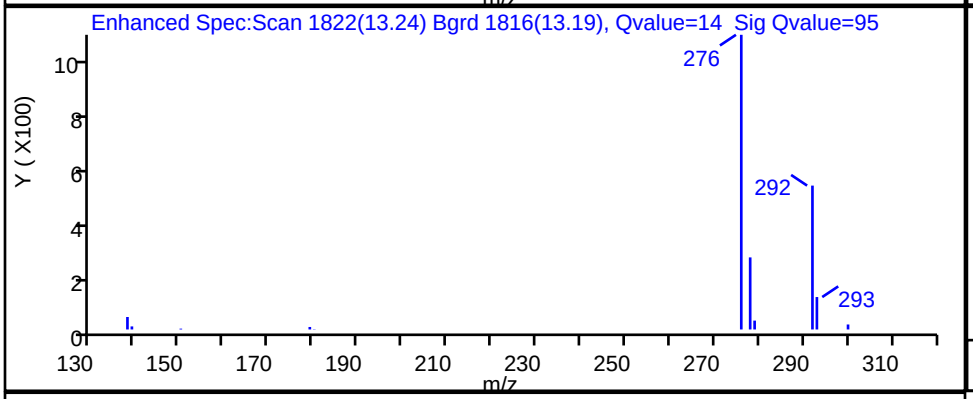
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D

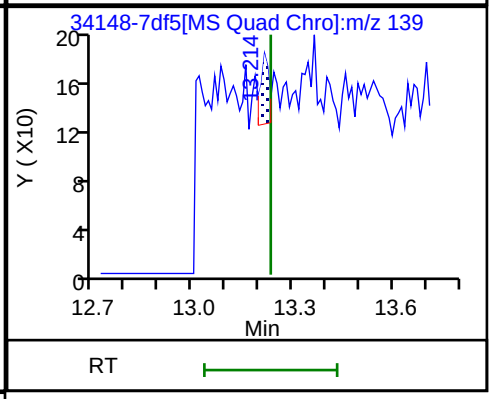
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

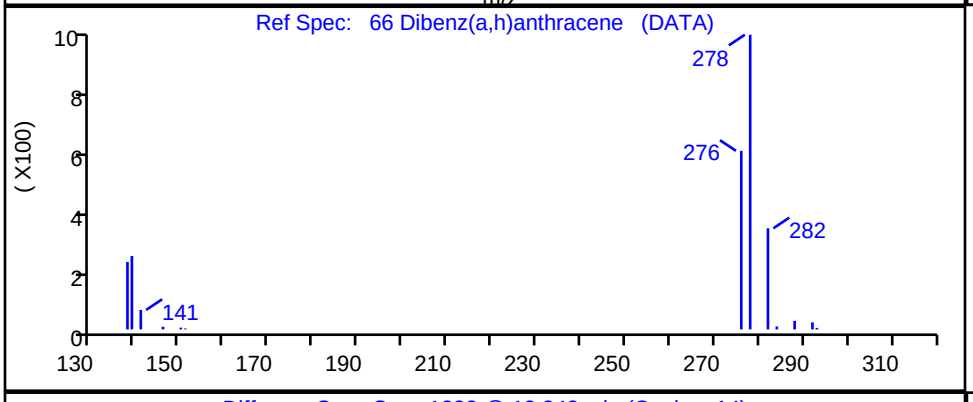
66 Dibenz(a,h)anthracene, CAS: 53-70-3

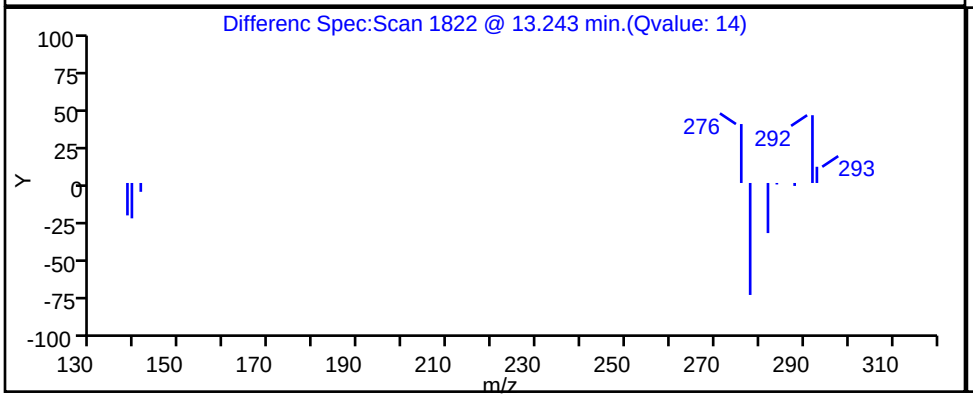


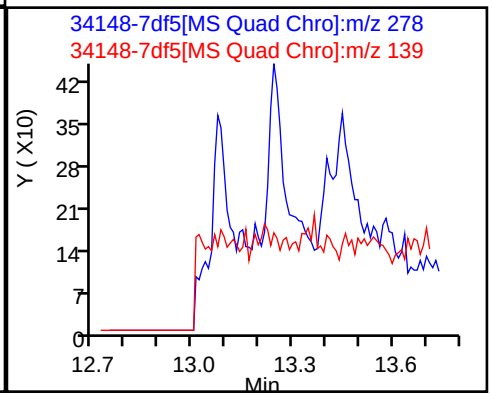












Report Date: 22-Nov-2023 14:18:01 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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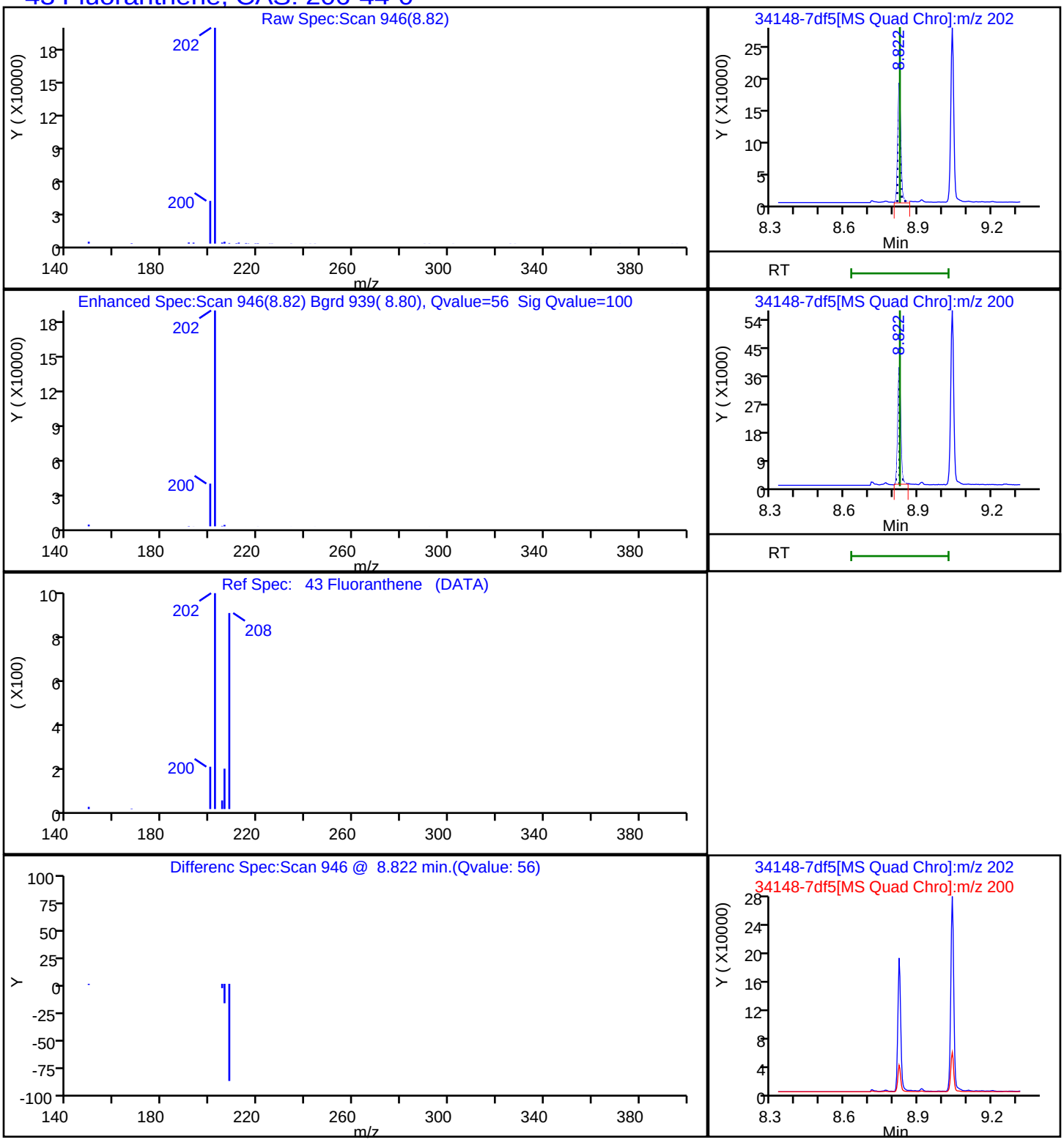
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

43 Fluoranthene, CAS: 206-44-0



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Eurofins Knoxville

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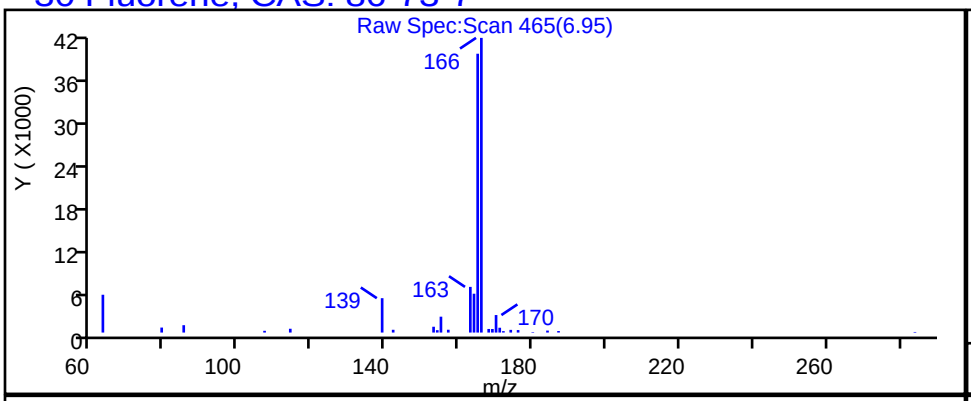
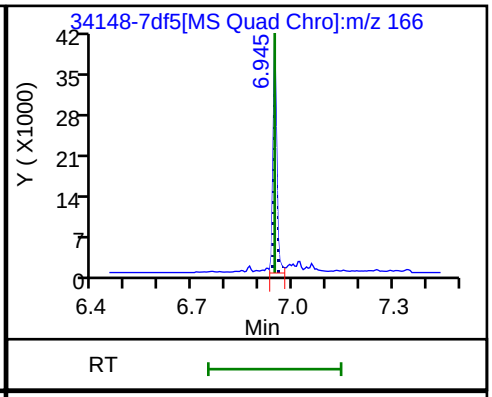
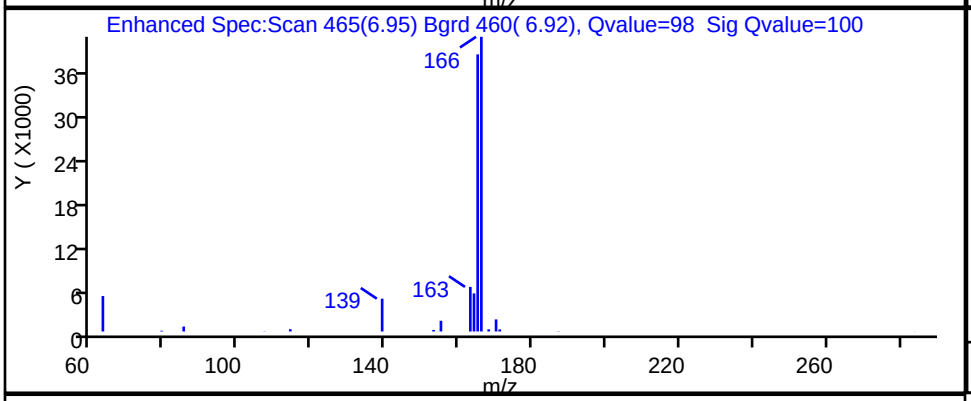
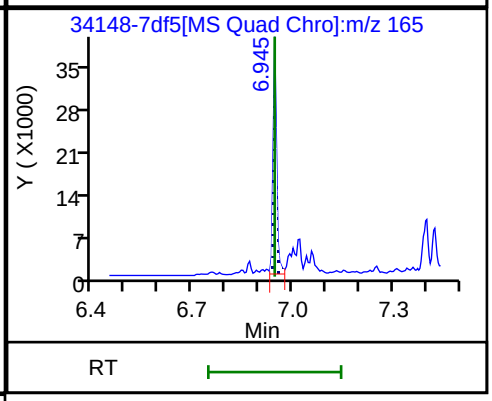
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7
Client ID:	1804576-852-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

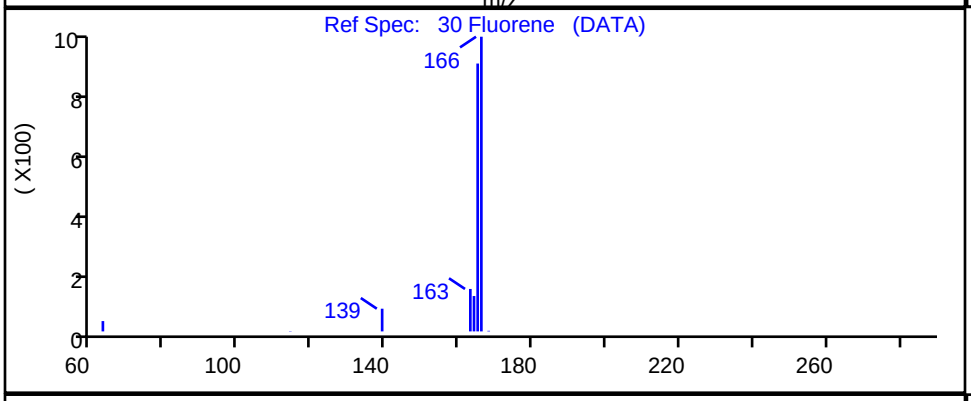
30 Fluorene, CAS: 86-73-7

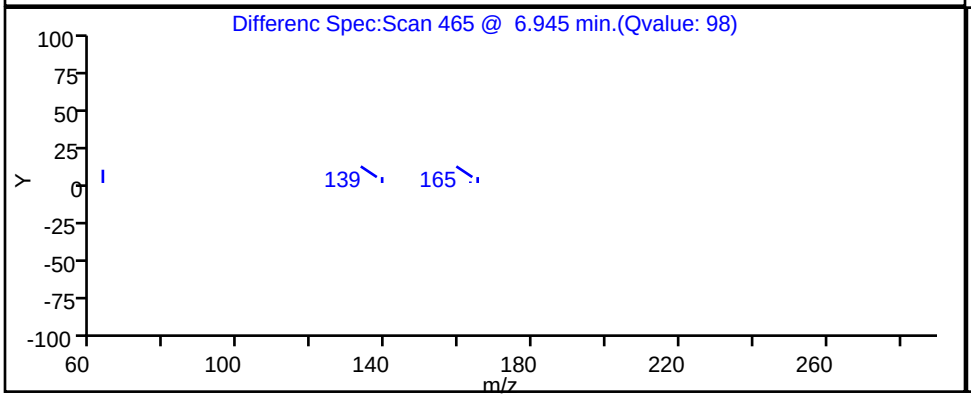


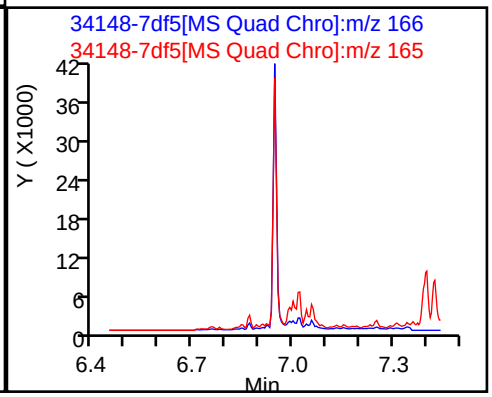












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Eurofins Knoxville

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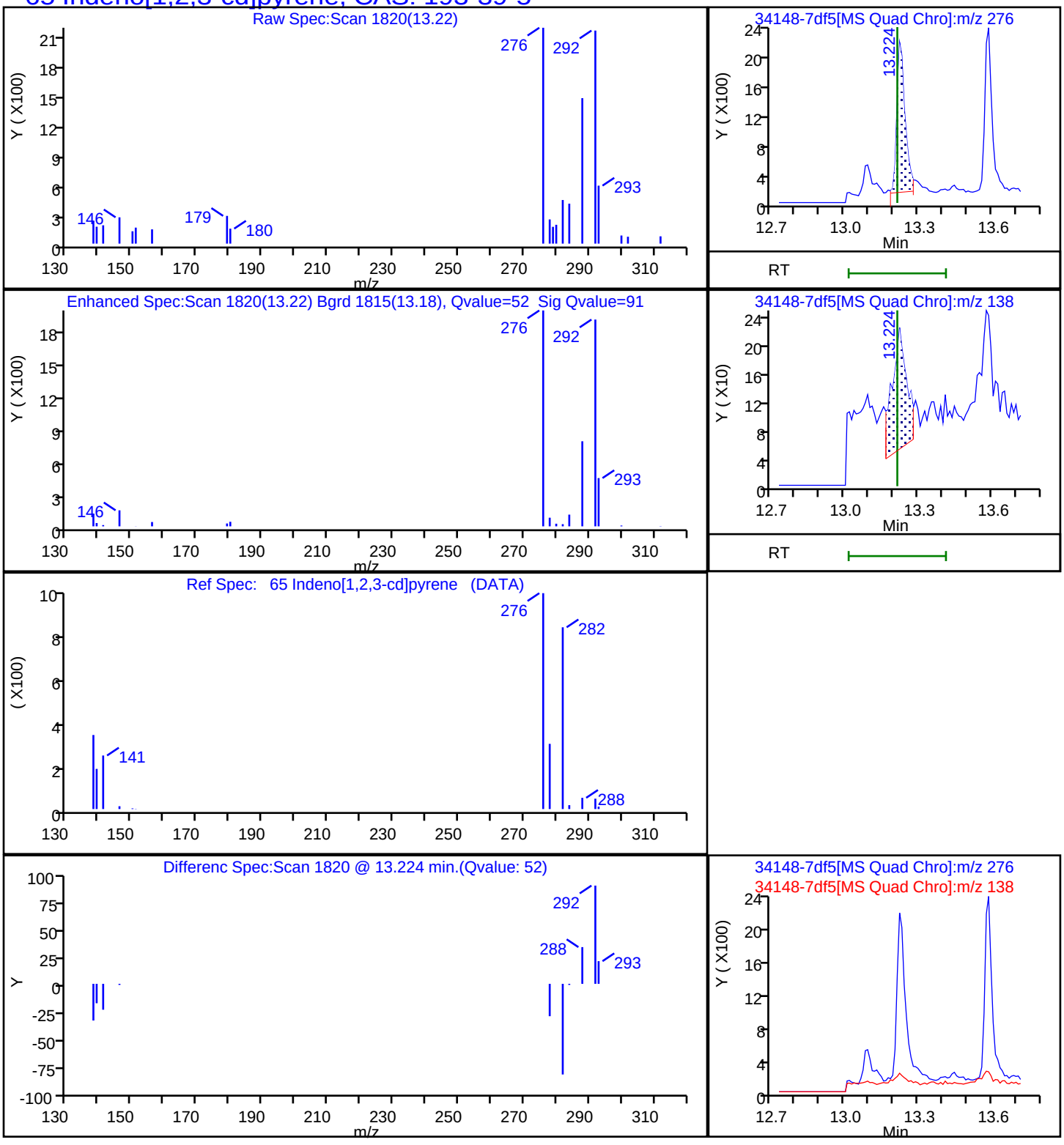
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

65 Indeno[1,2,3-cd]pyrene, CAS: 193-39-5



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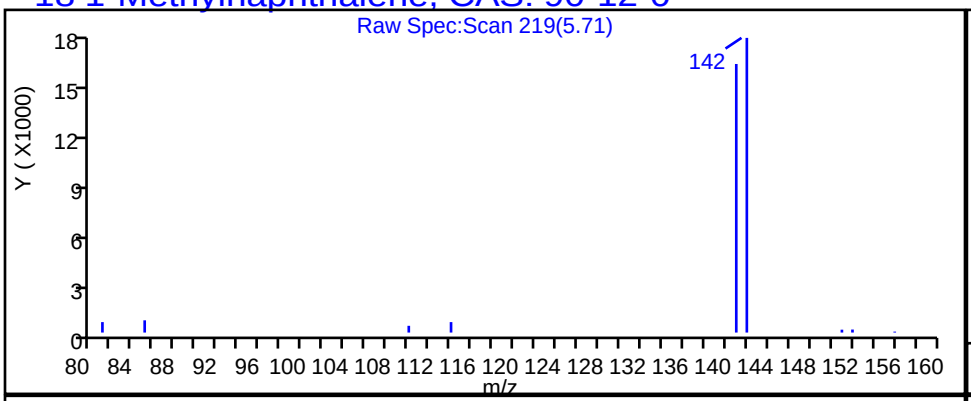
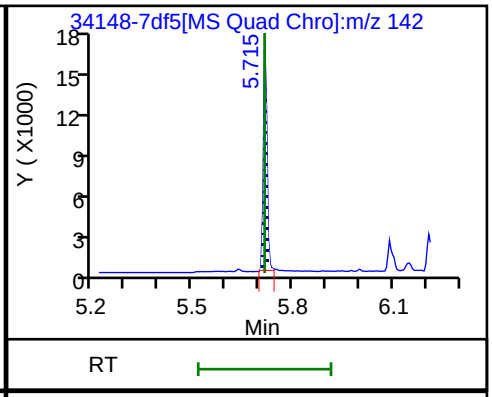
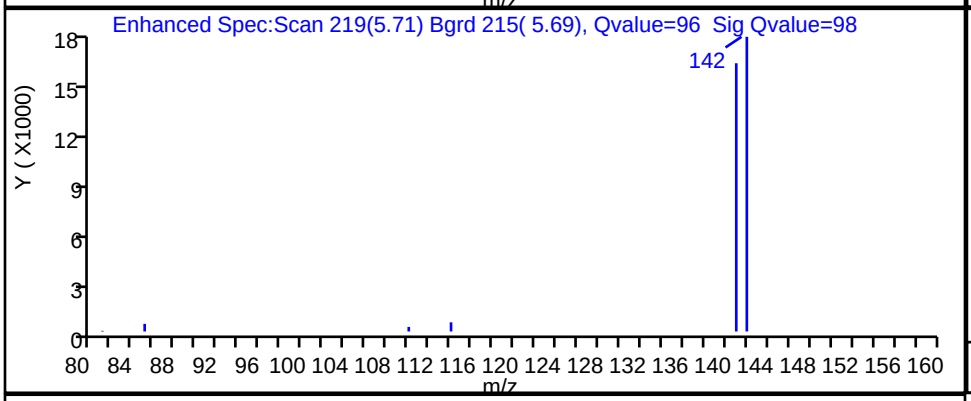
Eurofins Knoxville

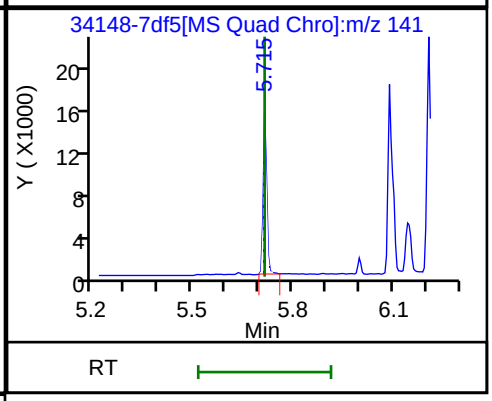
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D		
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7
Client ID:	1804576-852-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

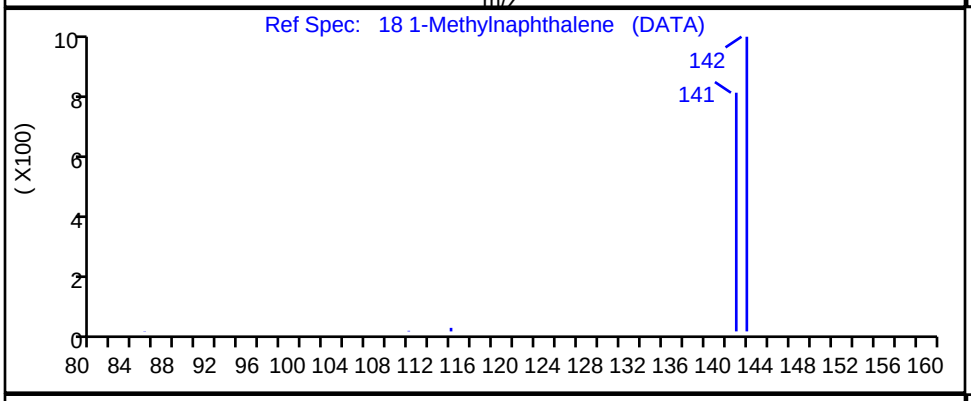
18 1-Methylnaphthalene, CAS: 90-12-0

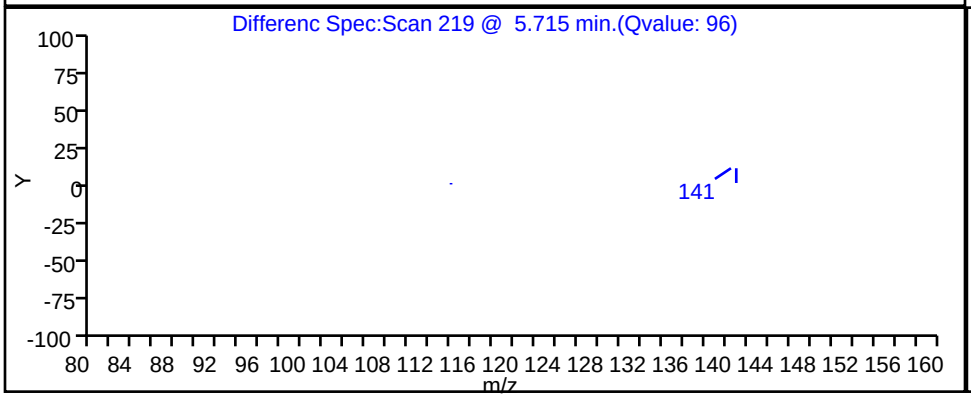


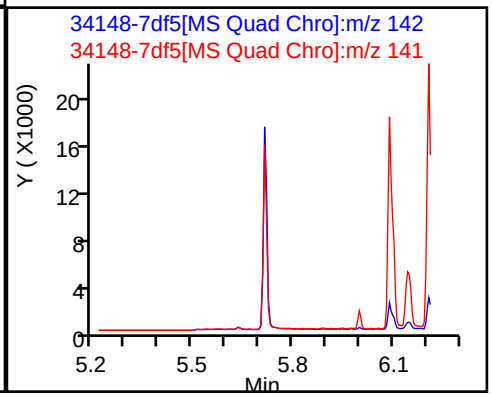












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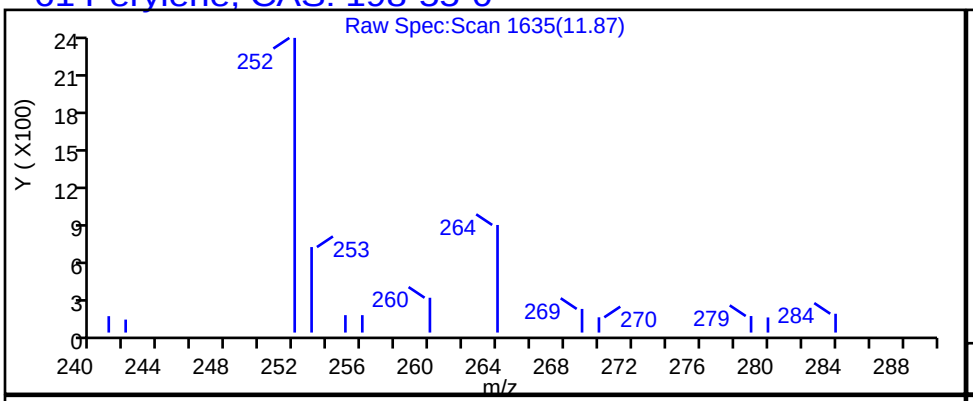
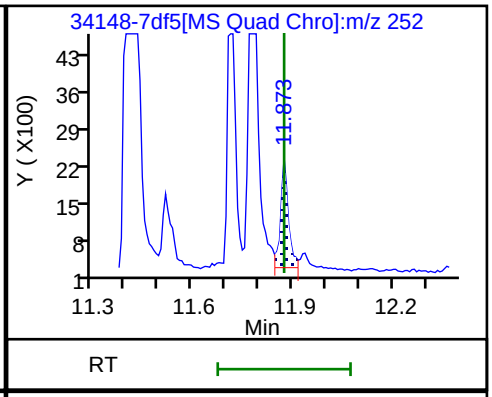
Eurofins Knoxville

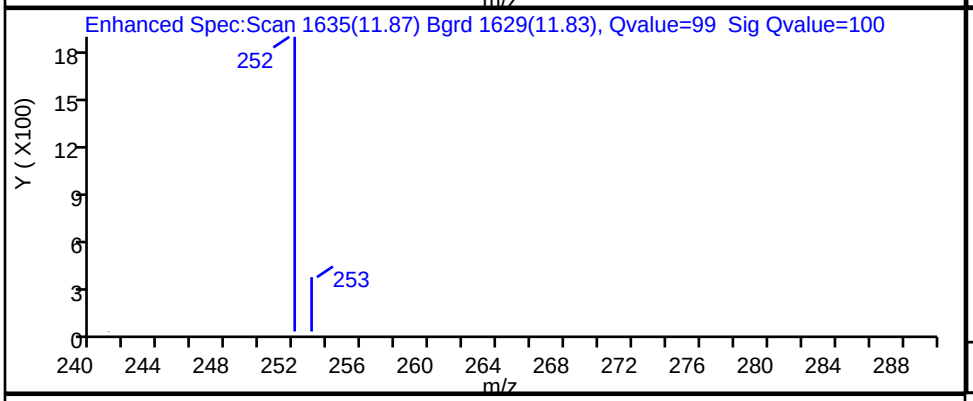
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D

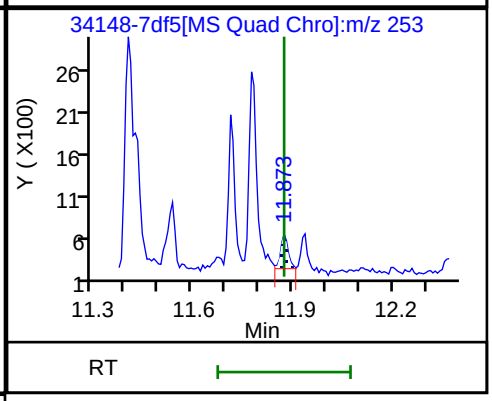
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7
Client ID:	1804576-852-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

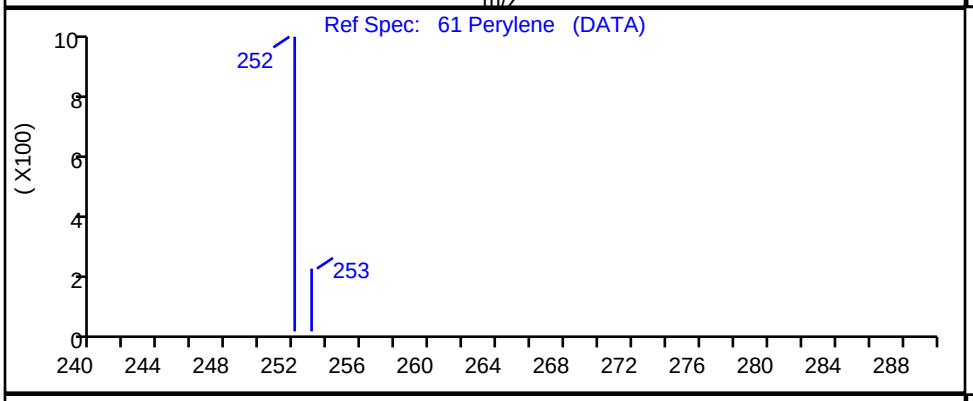
61 Perylene, CAS: 198-55-0

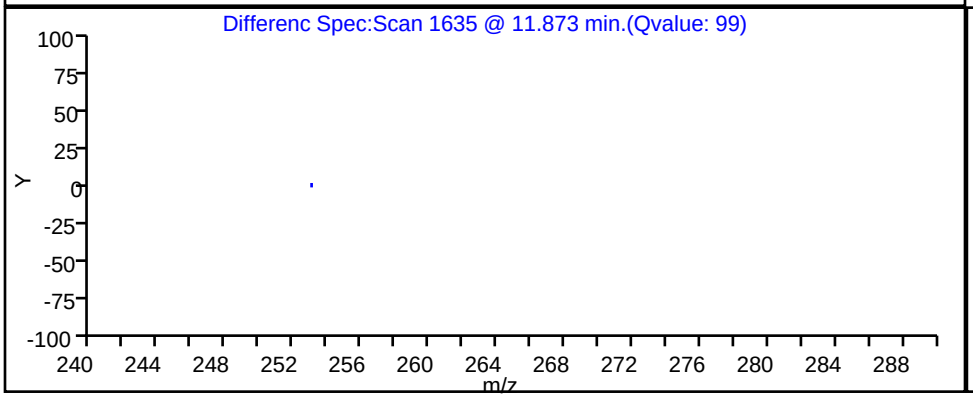


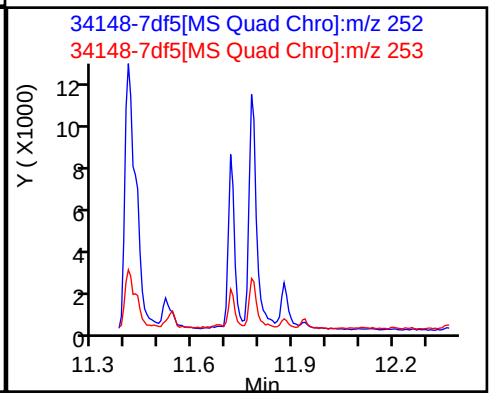












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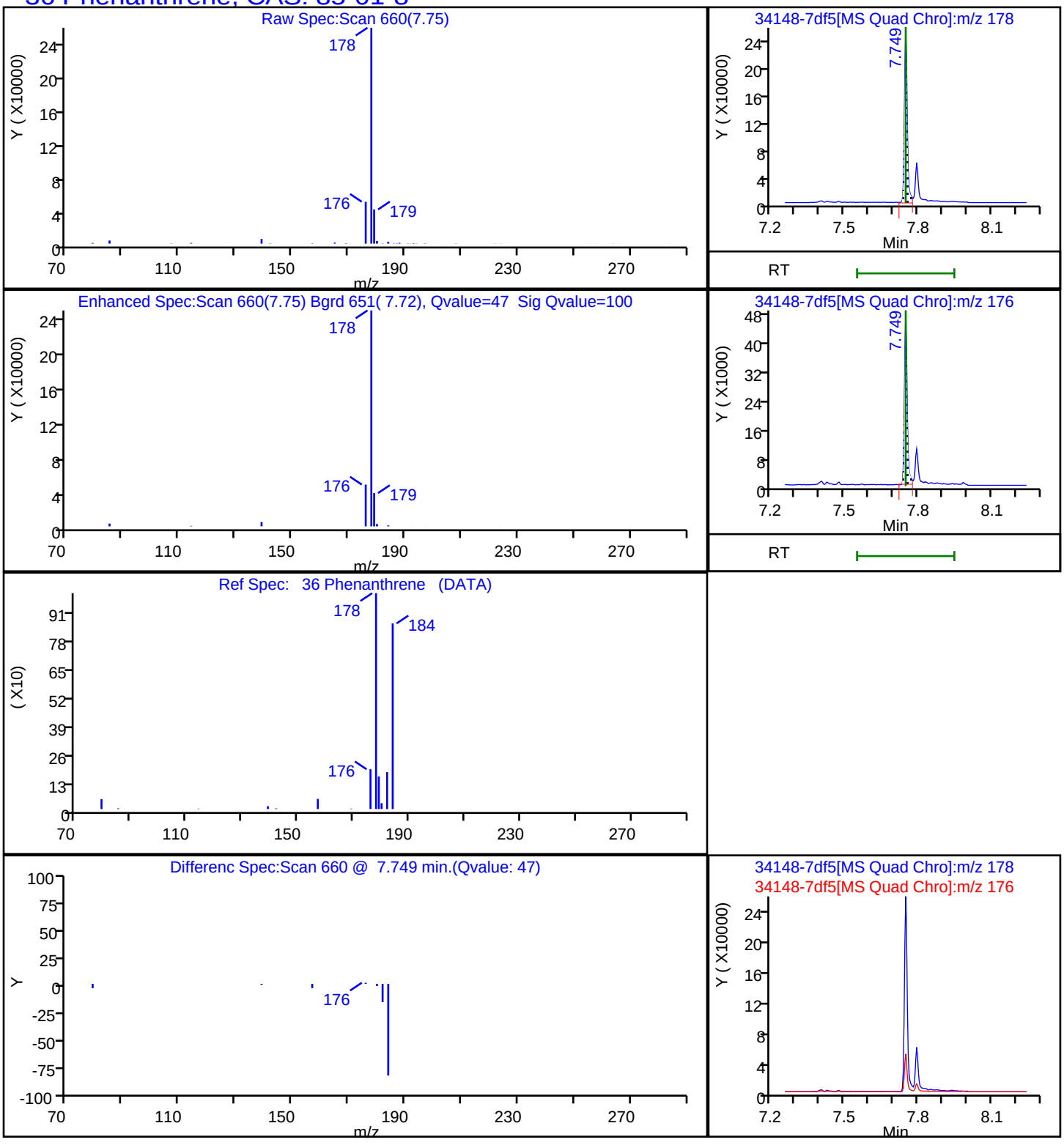
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D

Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7
Client ID:	1804576-852-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

36 Phenanthrene, CAS: 85-01-8



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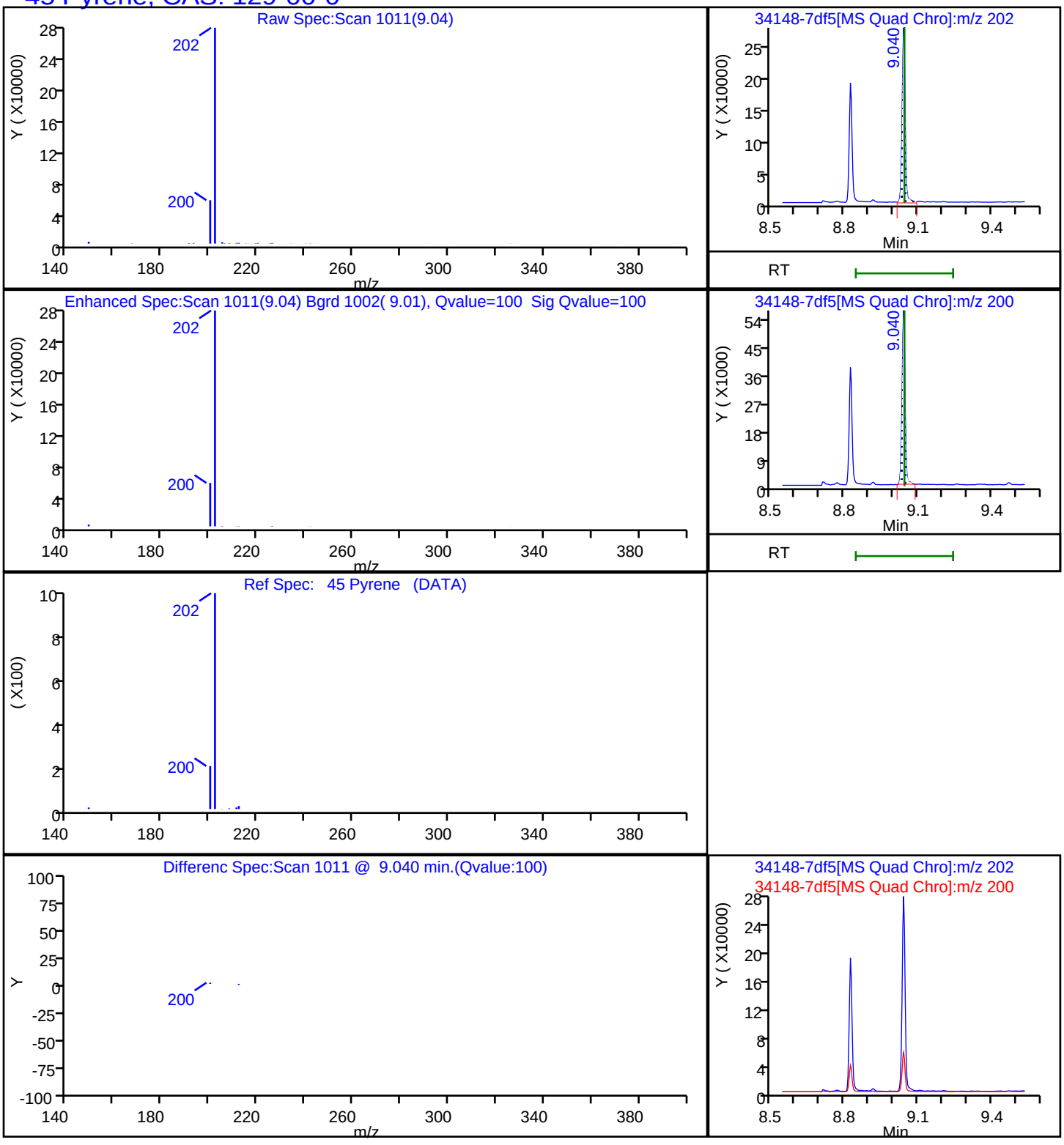
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D

Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7
Client ID:	1804576-852-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

45 Pyrene, CAS: 129-00-0



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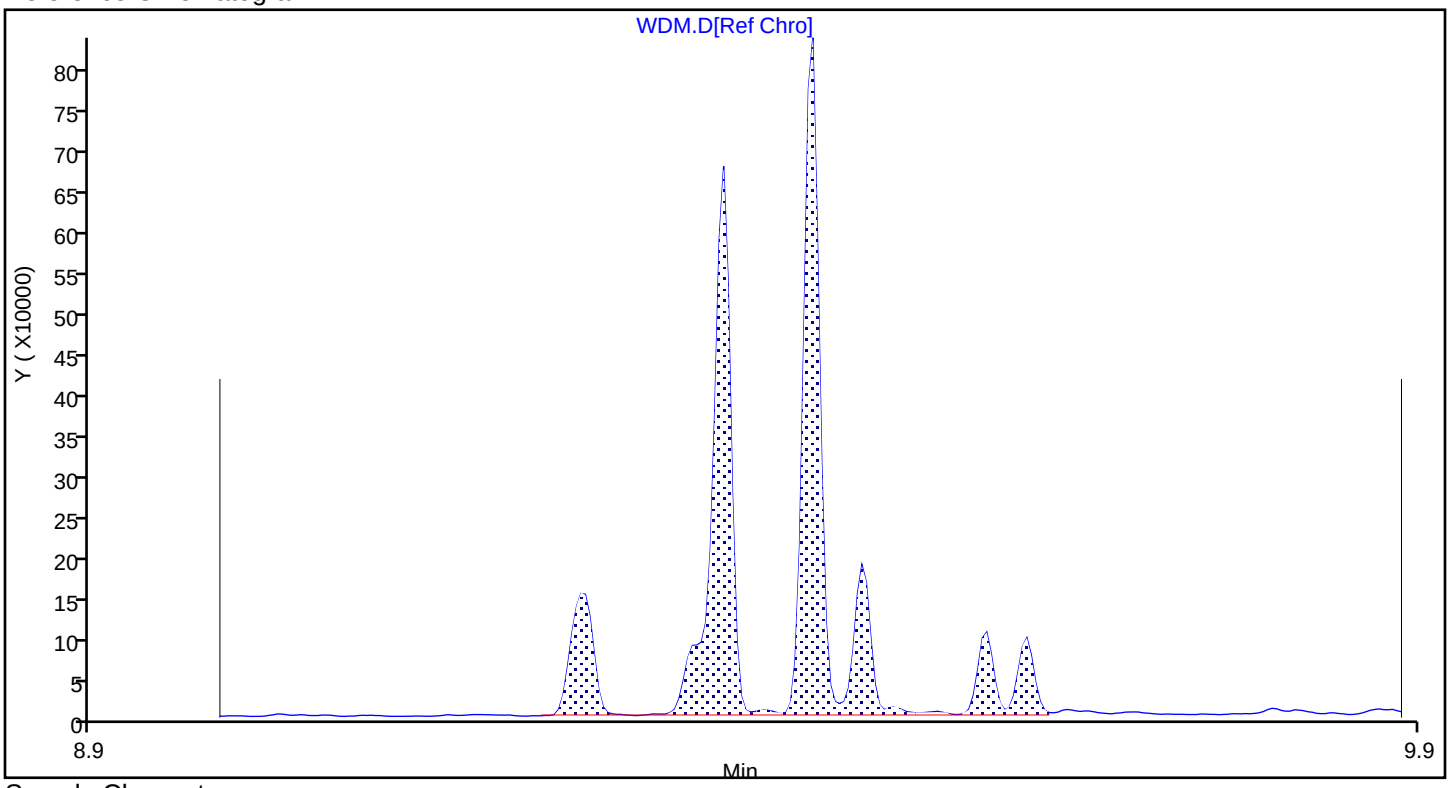
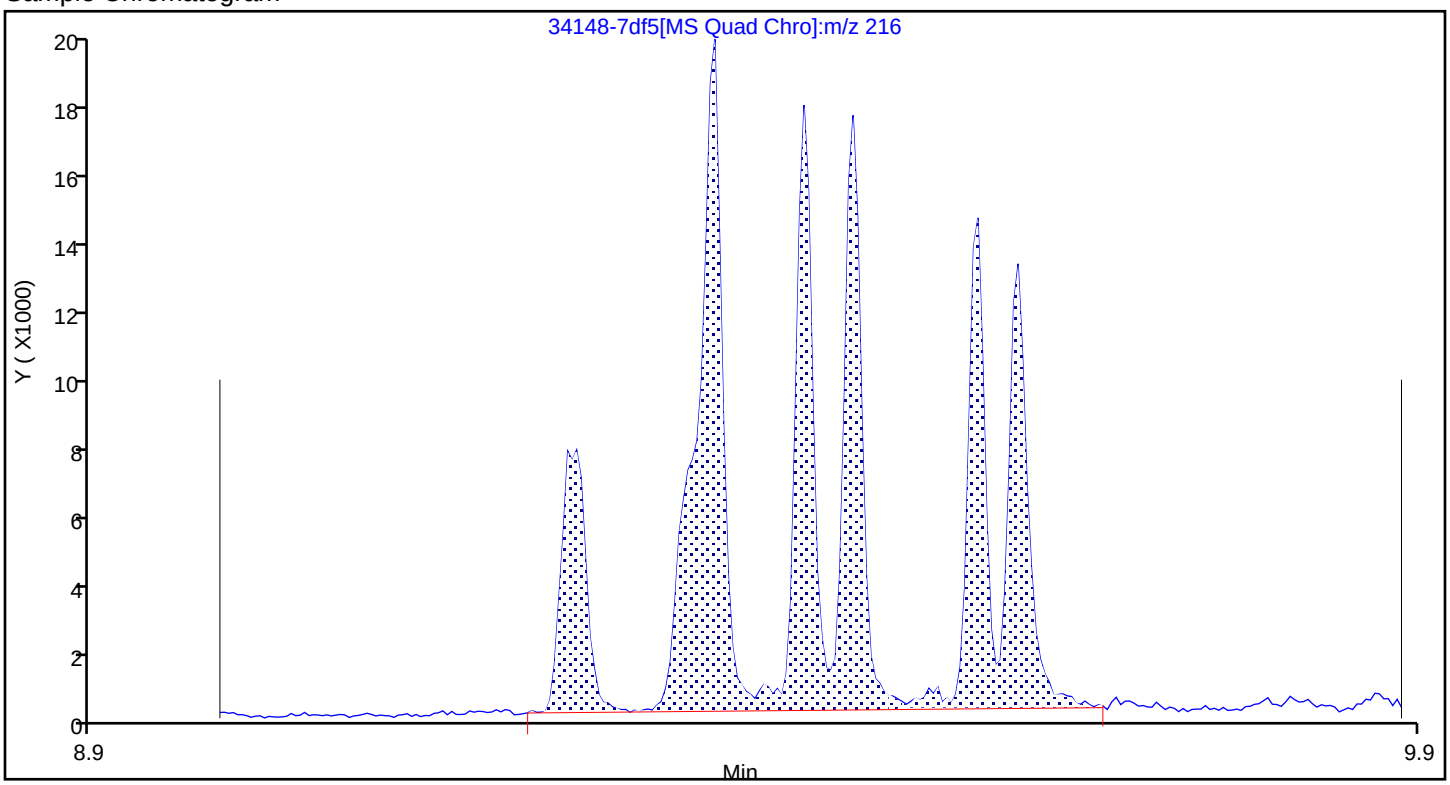
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 100 C1-Fluoranthenes/pyrene, CAS: STL00912

Reference Chromatogram



Sample Chromatogram



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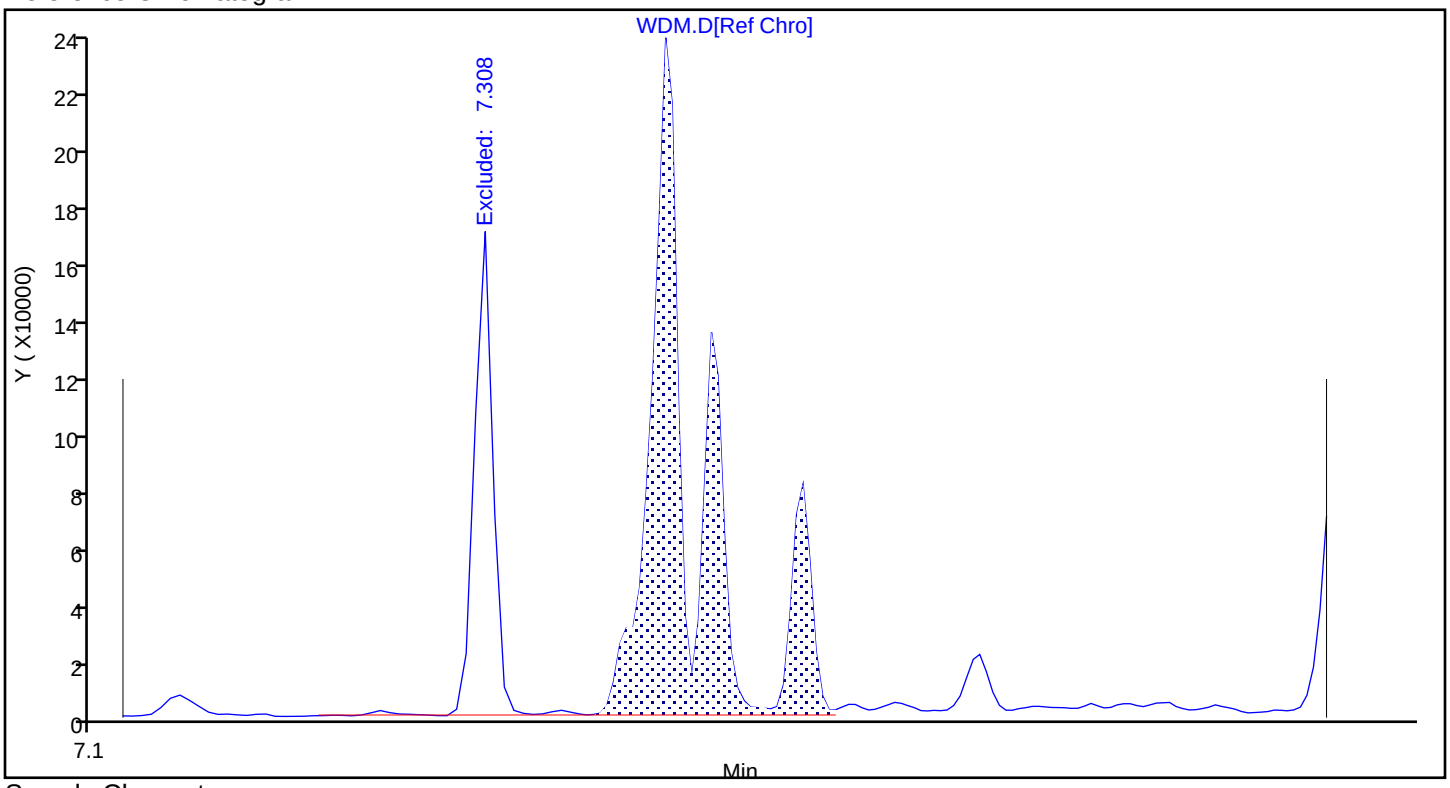
Eurofins Knoxville

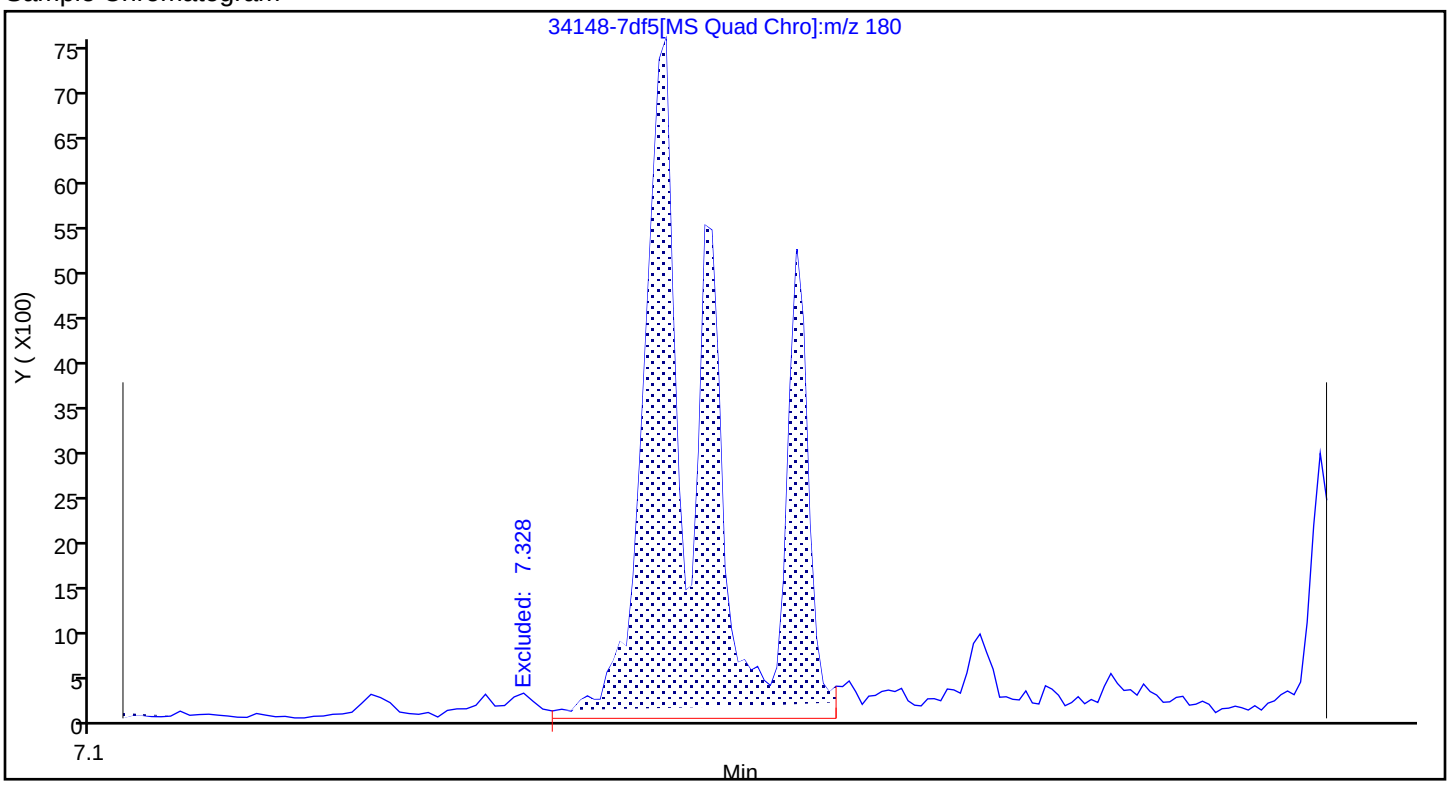
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D				
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 89 C1-Fluorenes, CAS: STL00913

Reference Chromatogram



Sample Chromatogram



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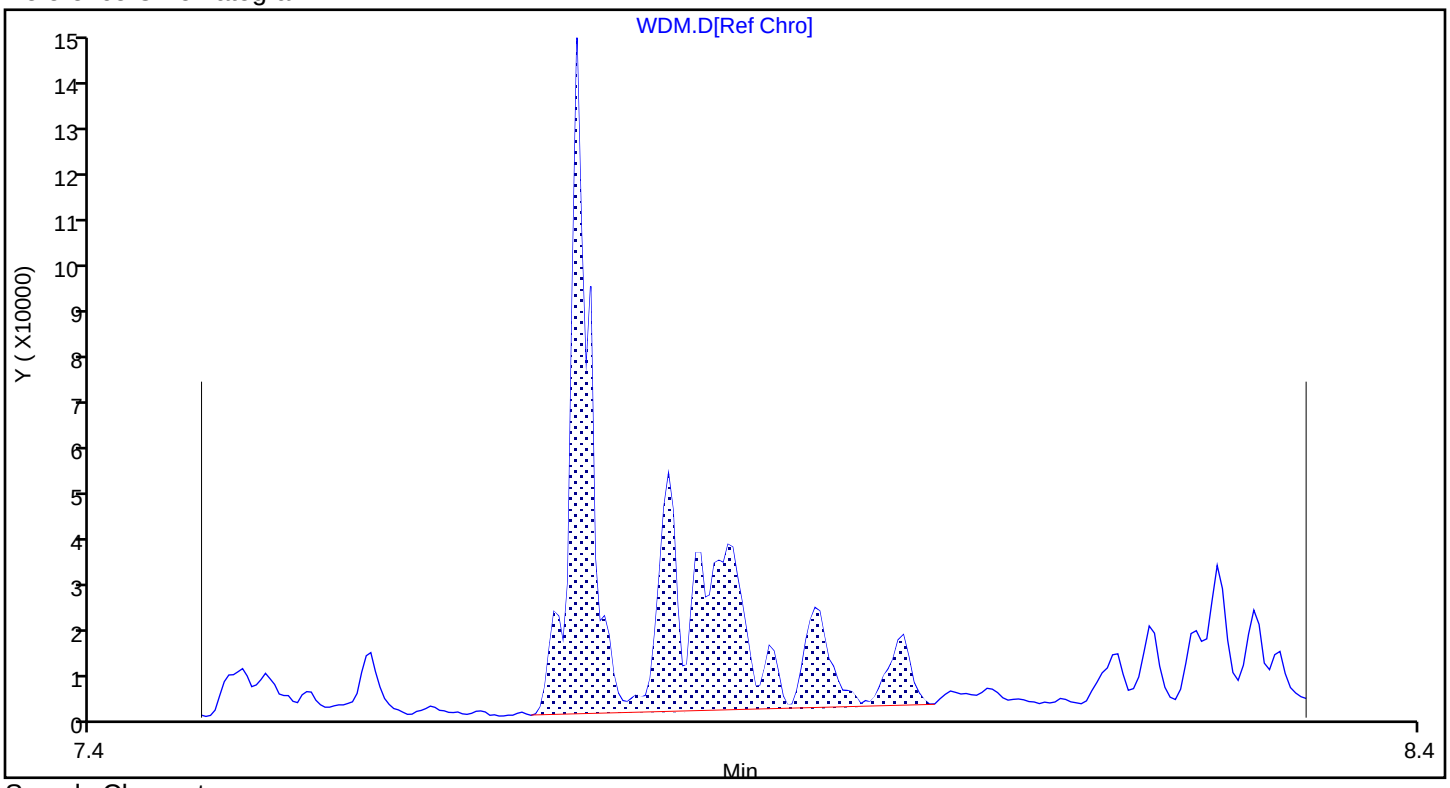
Eurofins Knoxville

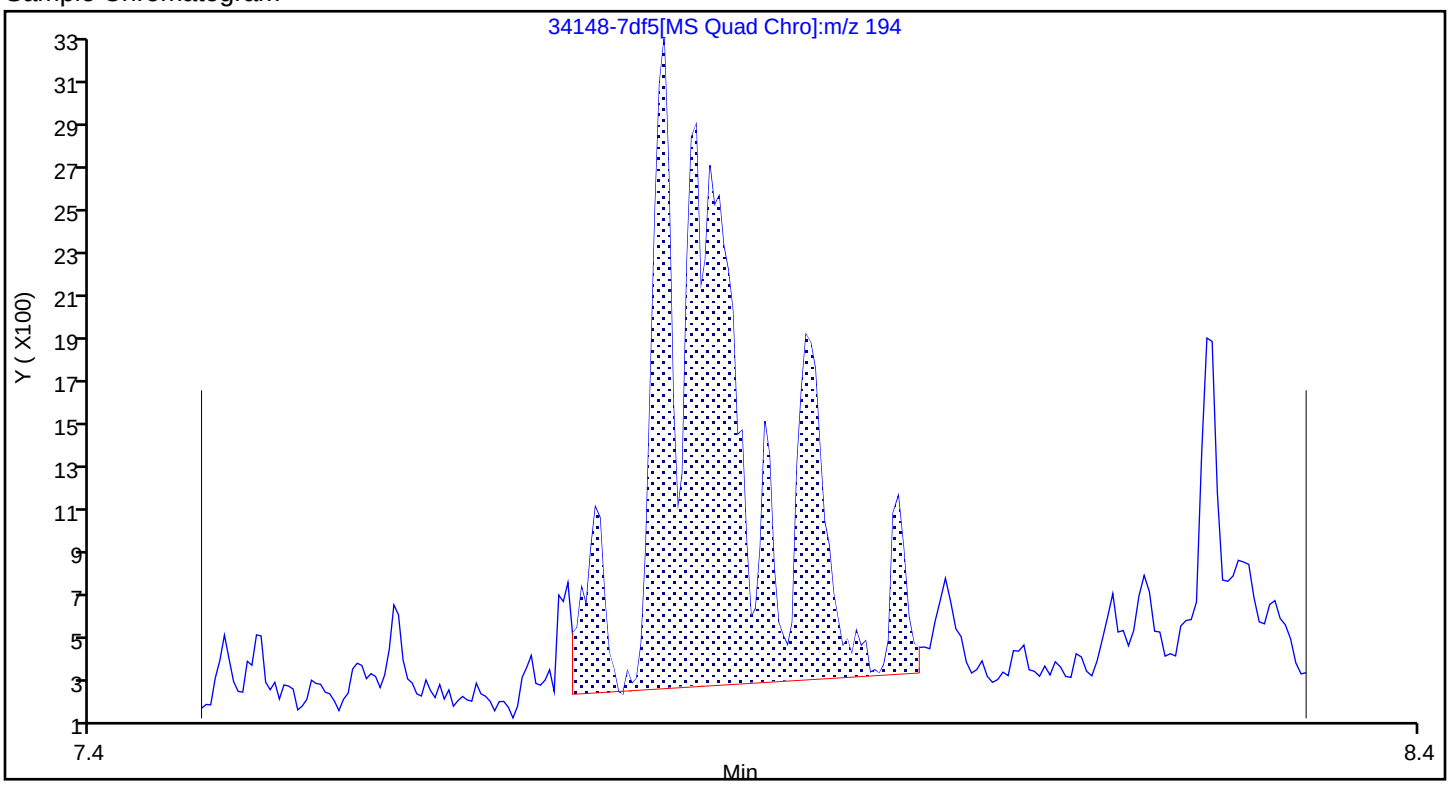
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D				
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 90 C2-Fluorenes, CAS: STL00914

Reference Chromatogram



Sample Chromatogram



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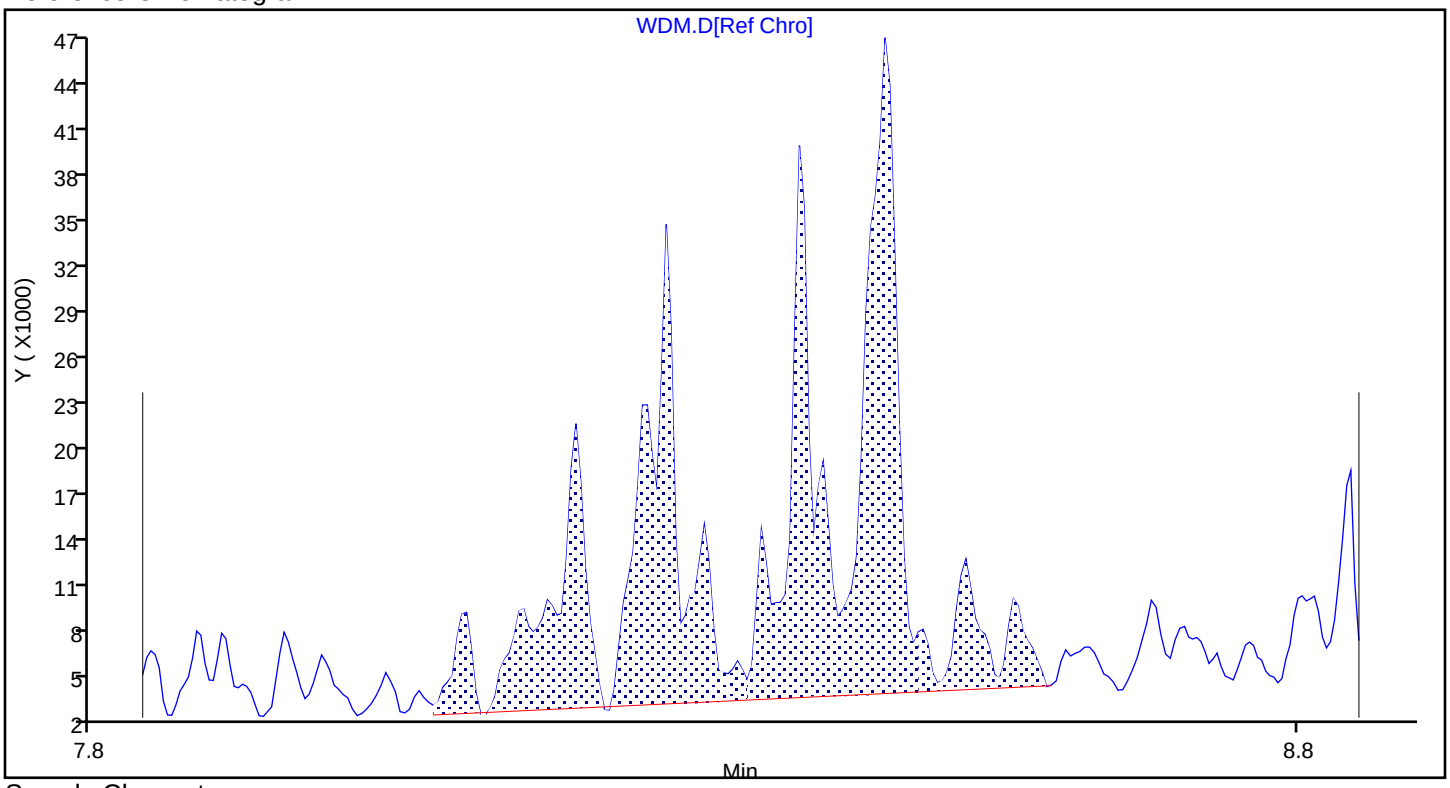
Eurofins Knoxville

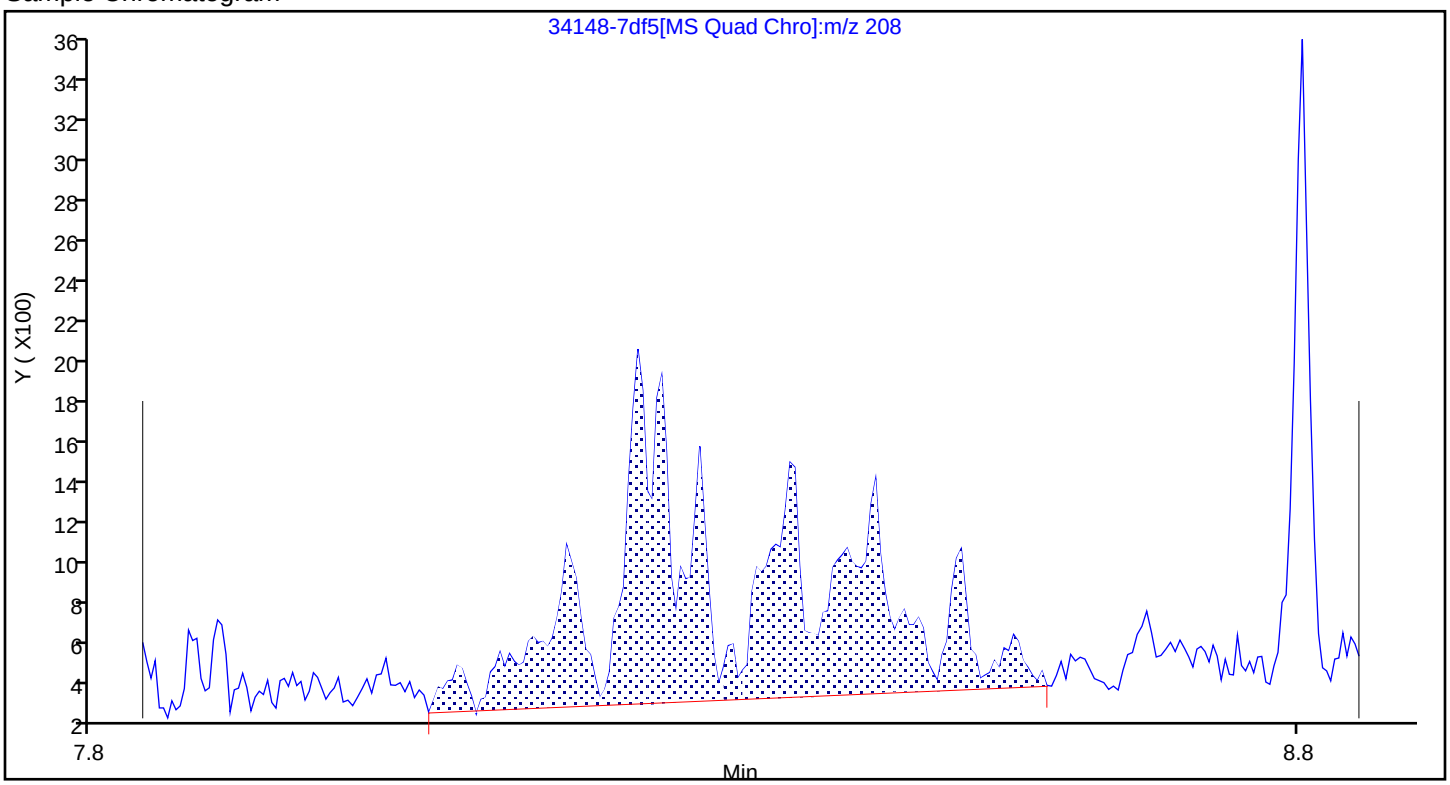
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D				
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 91 C3-Fluorenes, CAS: STL00915

Reference Chromatogram



Sample Chromatogram



Report Date: 22-Nov-2023 14:18:03 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D				
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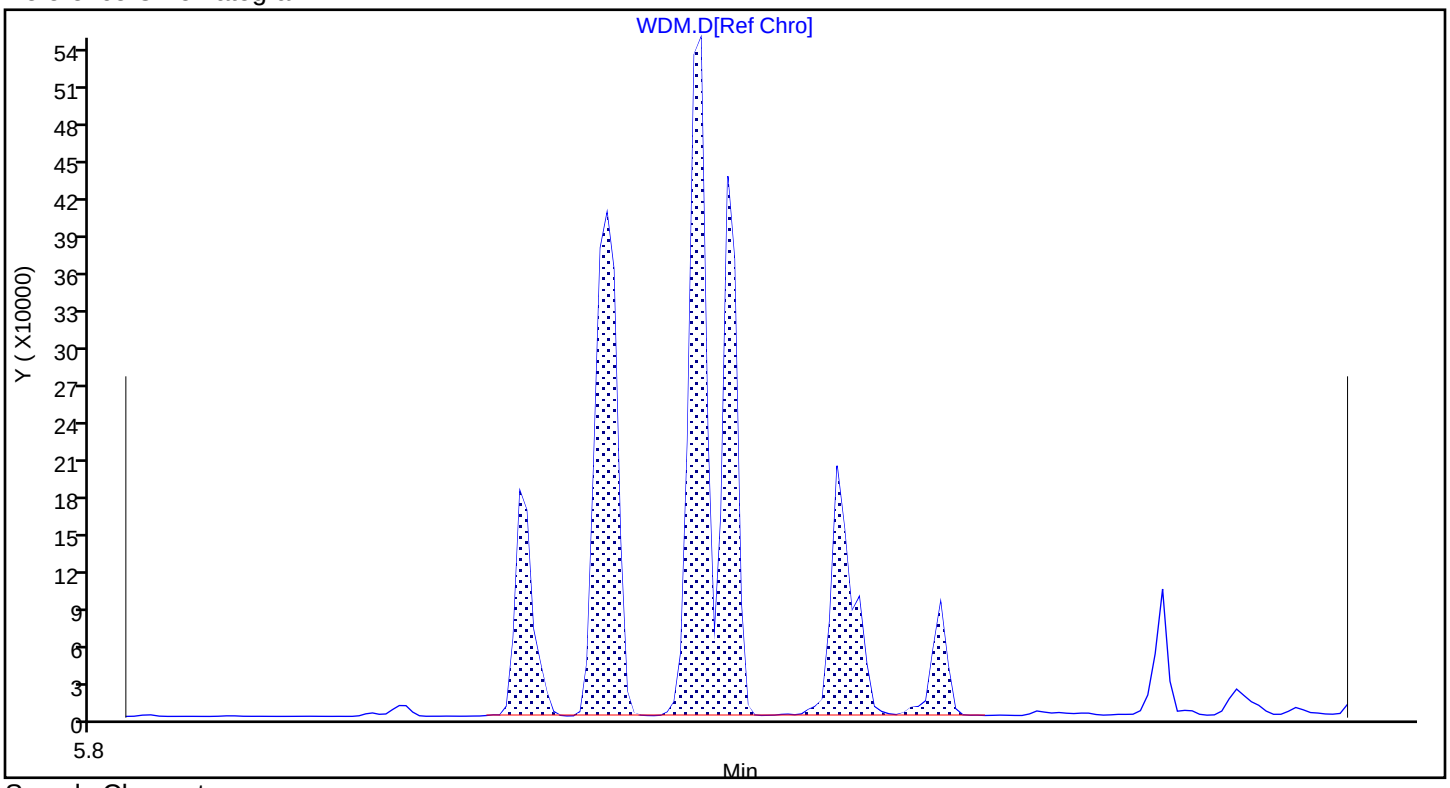
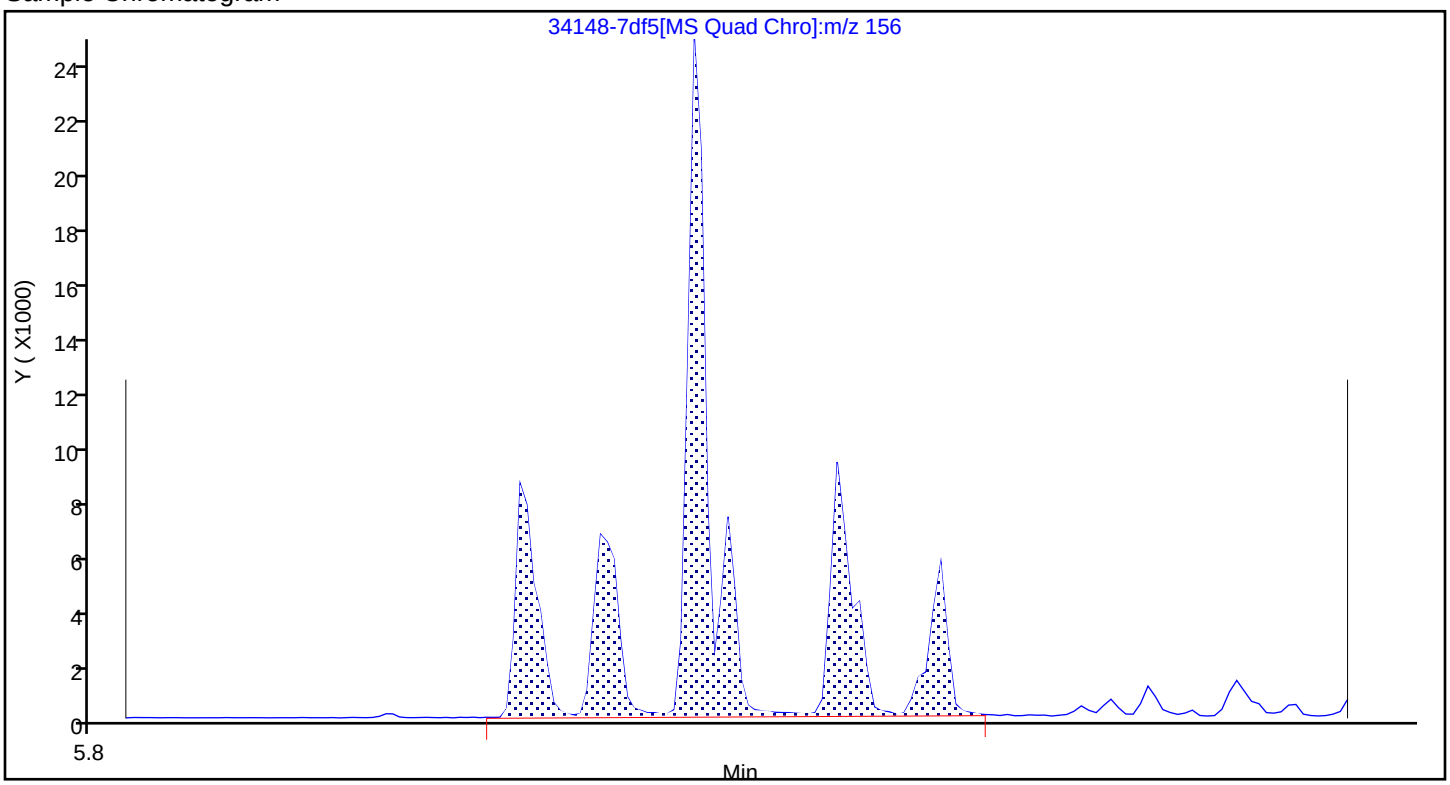
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 86 C2-Naphthalenes, CAS: STL00917

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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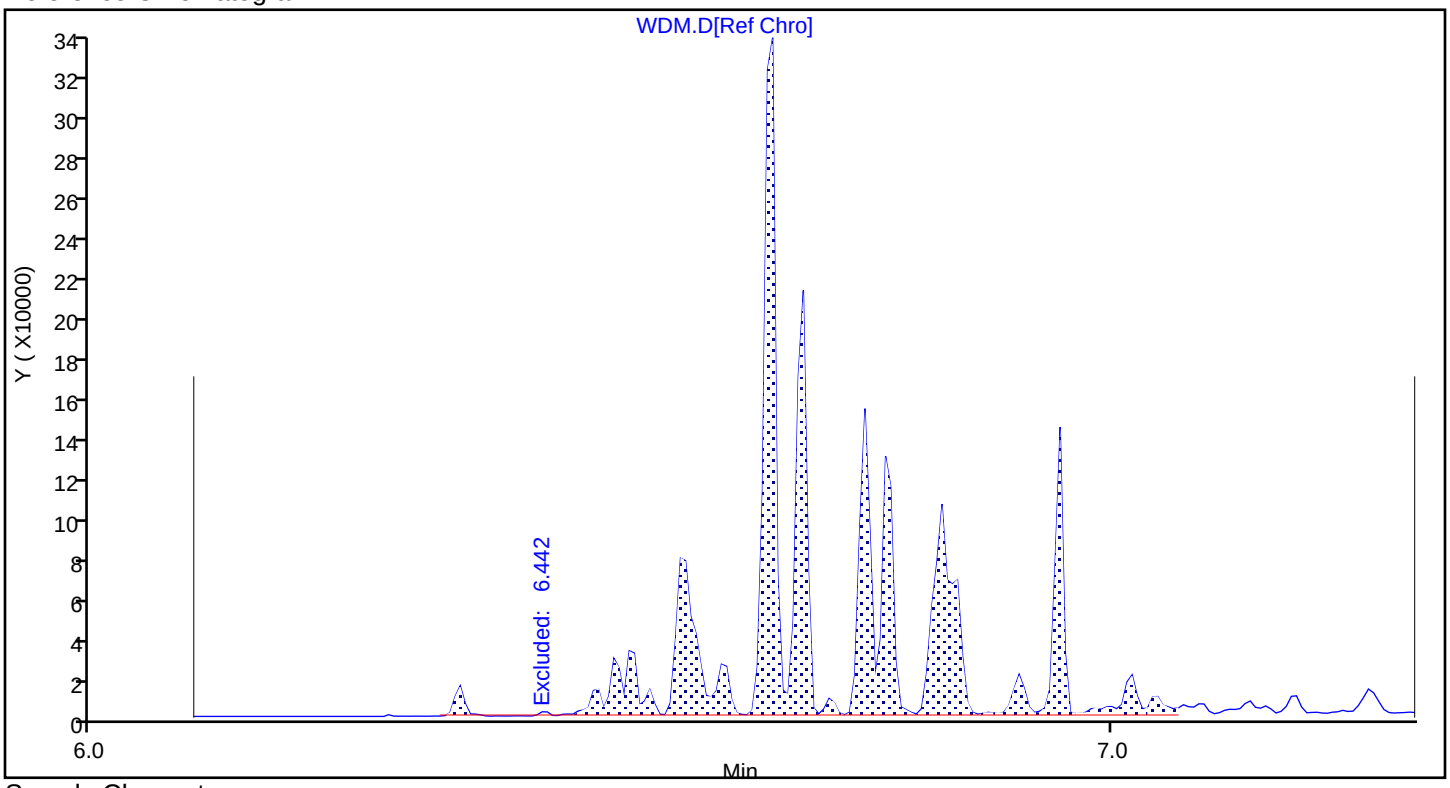
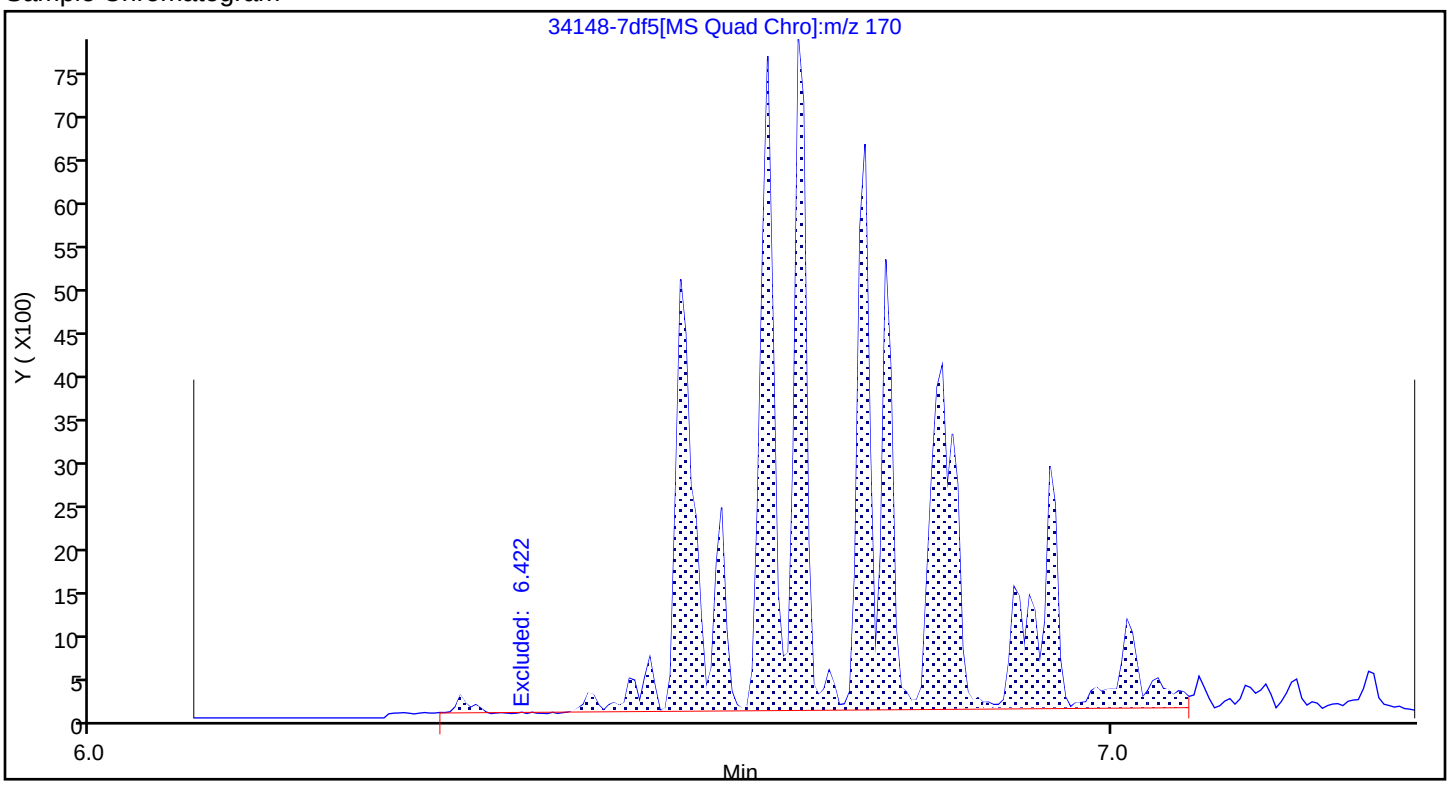
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 87 C3-Naphthalenes, CAS: STL00918

Reference Chromatogram



Sample Chromatogram



Report Date: 22-Nov-2023 14:18:03 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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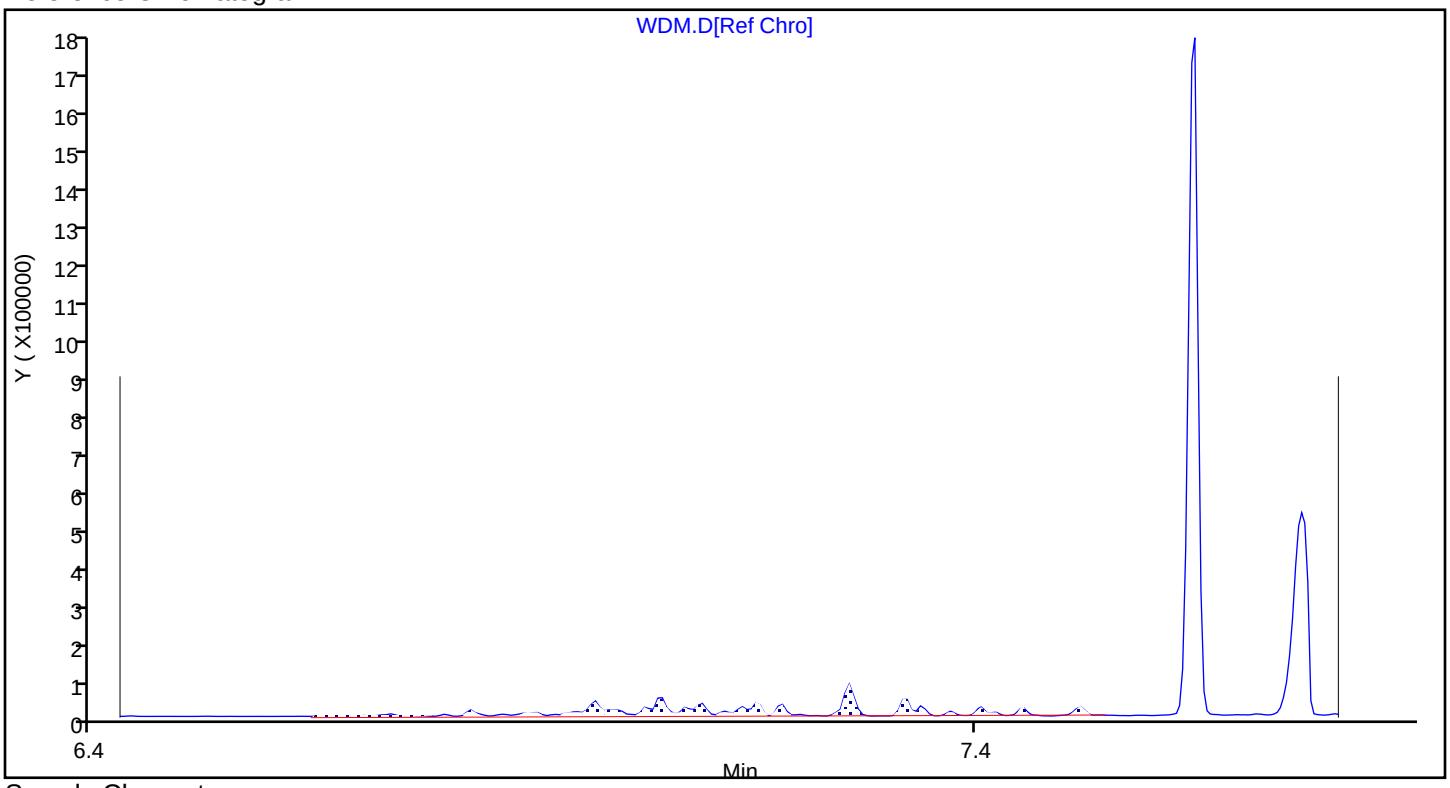
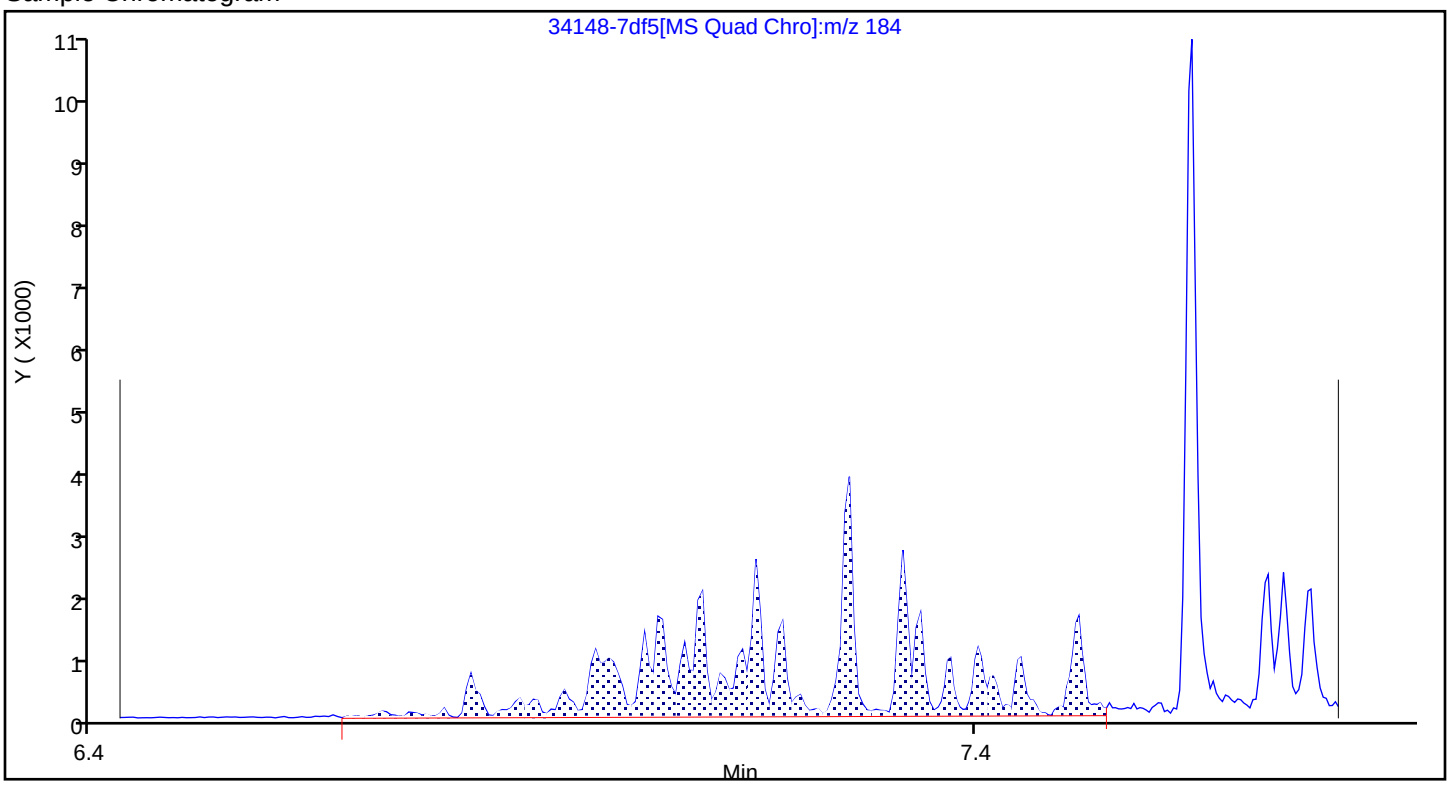
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 88 C4-Naphthalenes, CAS: STL00919

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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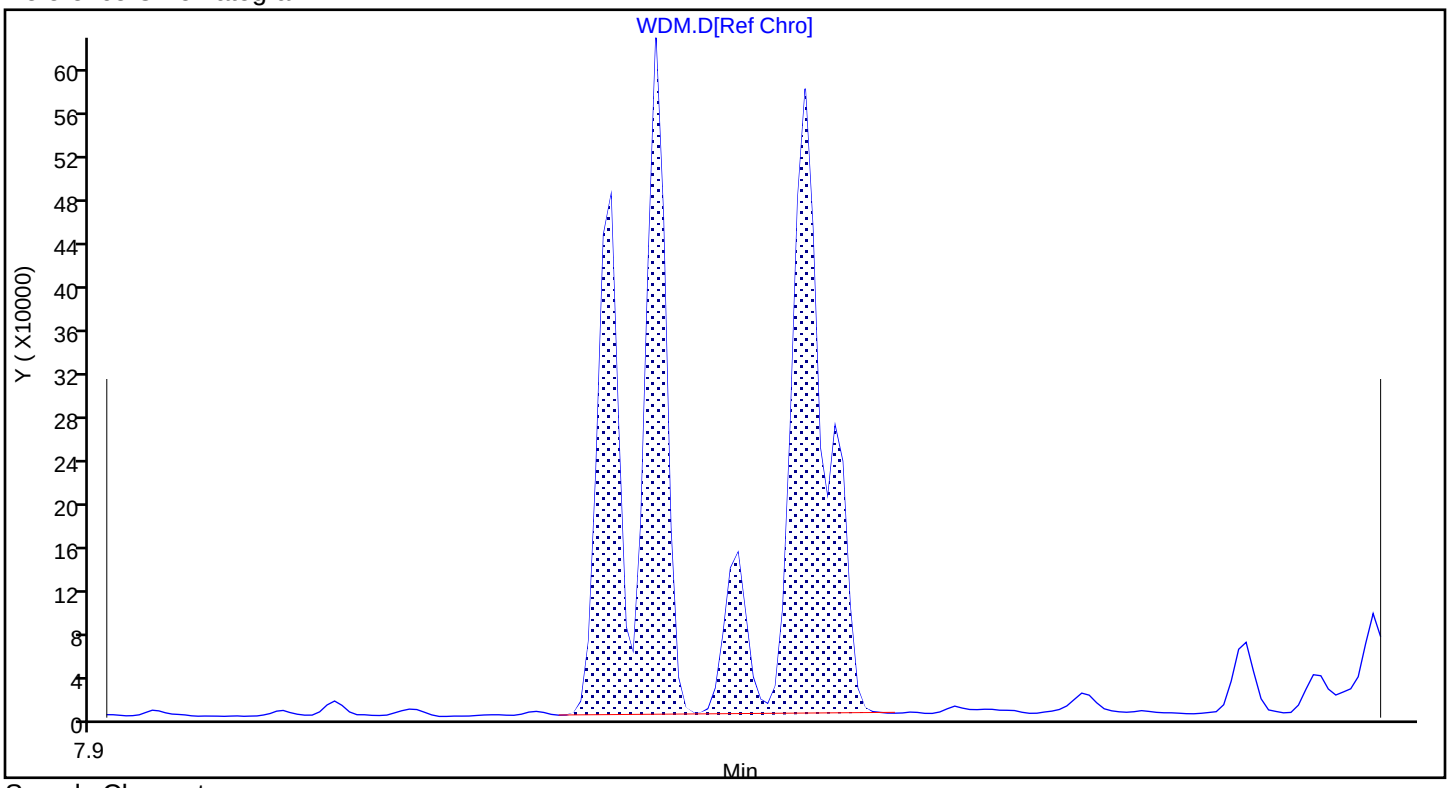
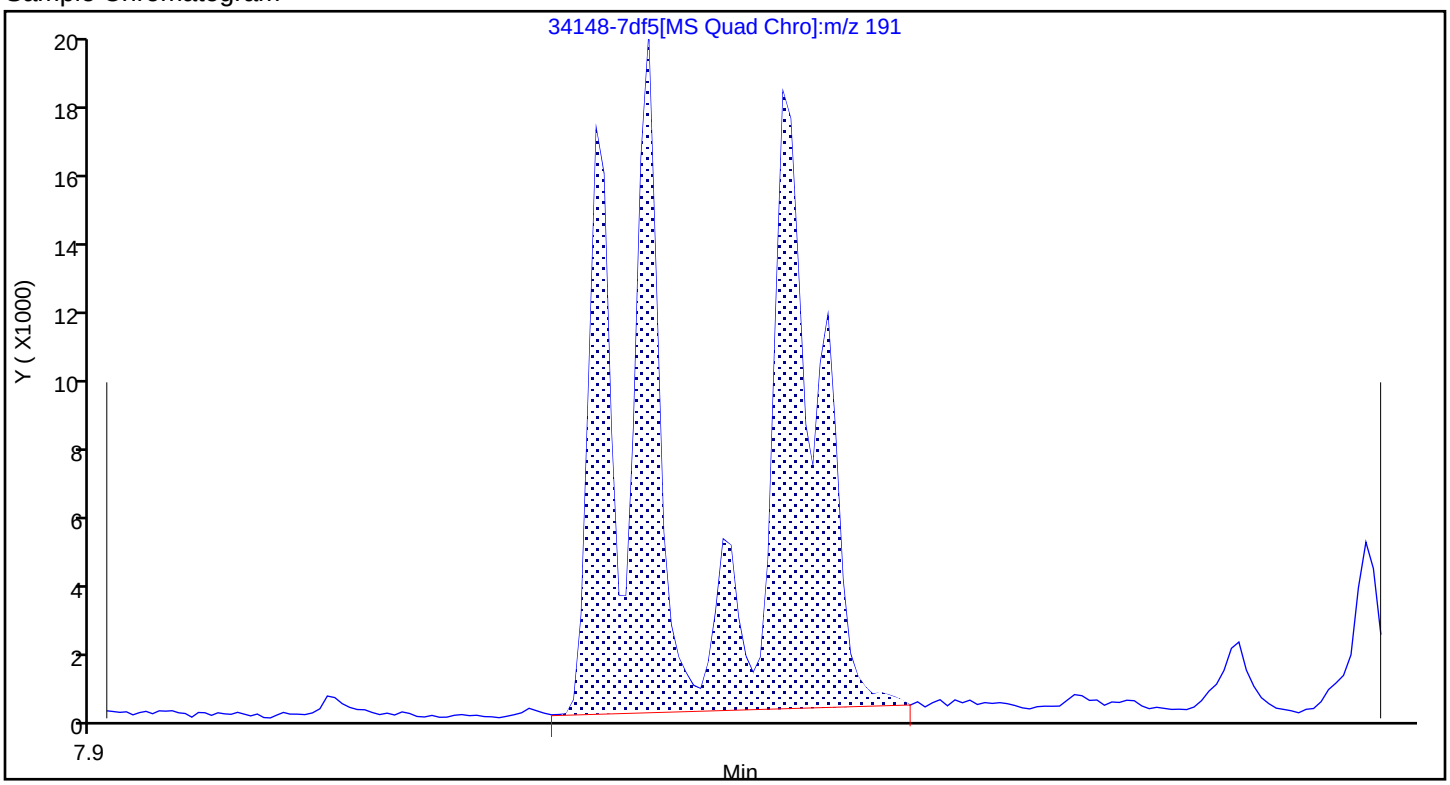
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 96 C1-Phenanthrenes/Anthracenes, CAS: STL00901

Reference Chromatogram



Sample Chromatogram



Report Date: 22-Nov-2023 14:18:03 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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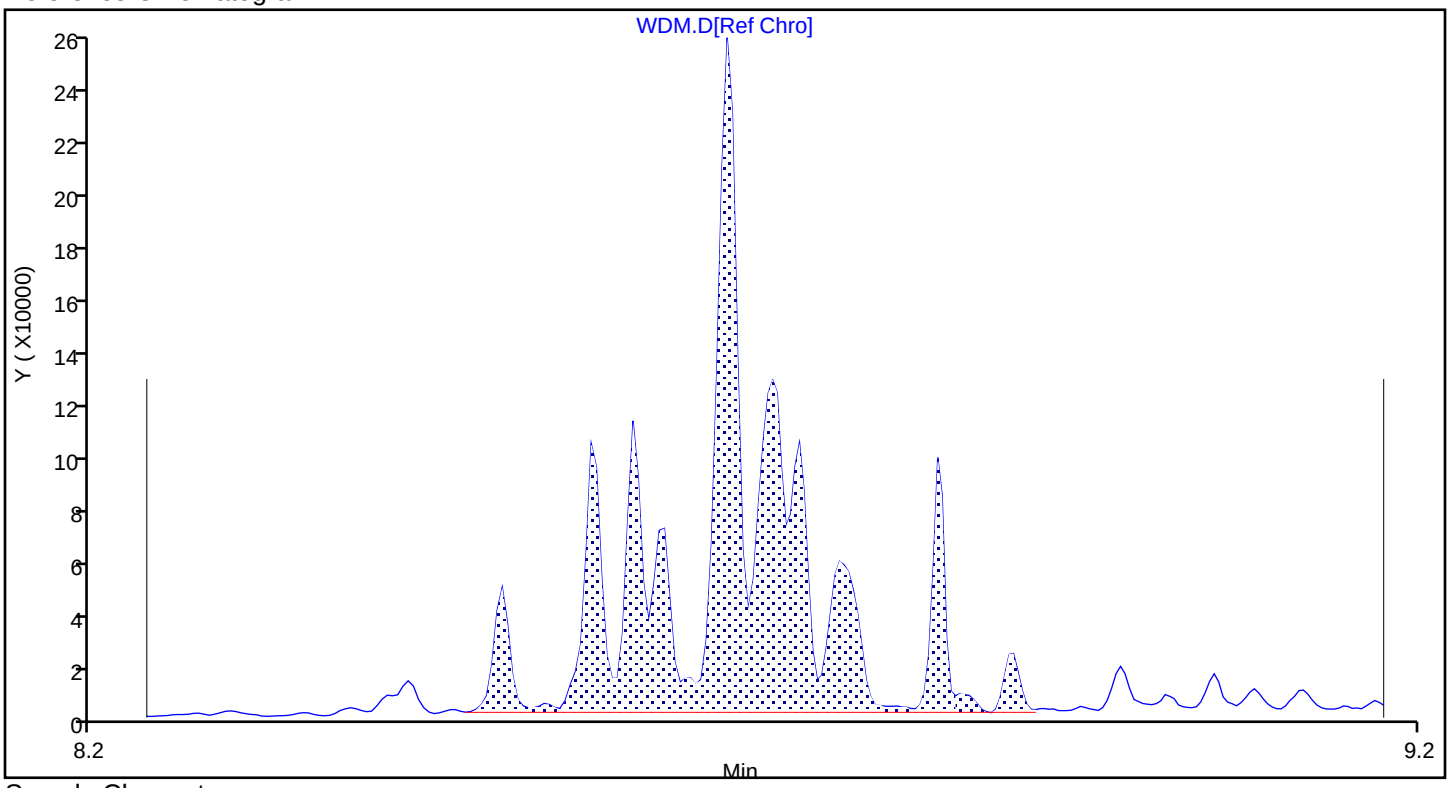
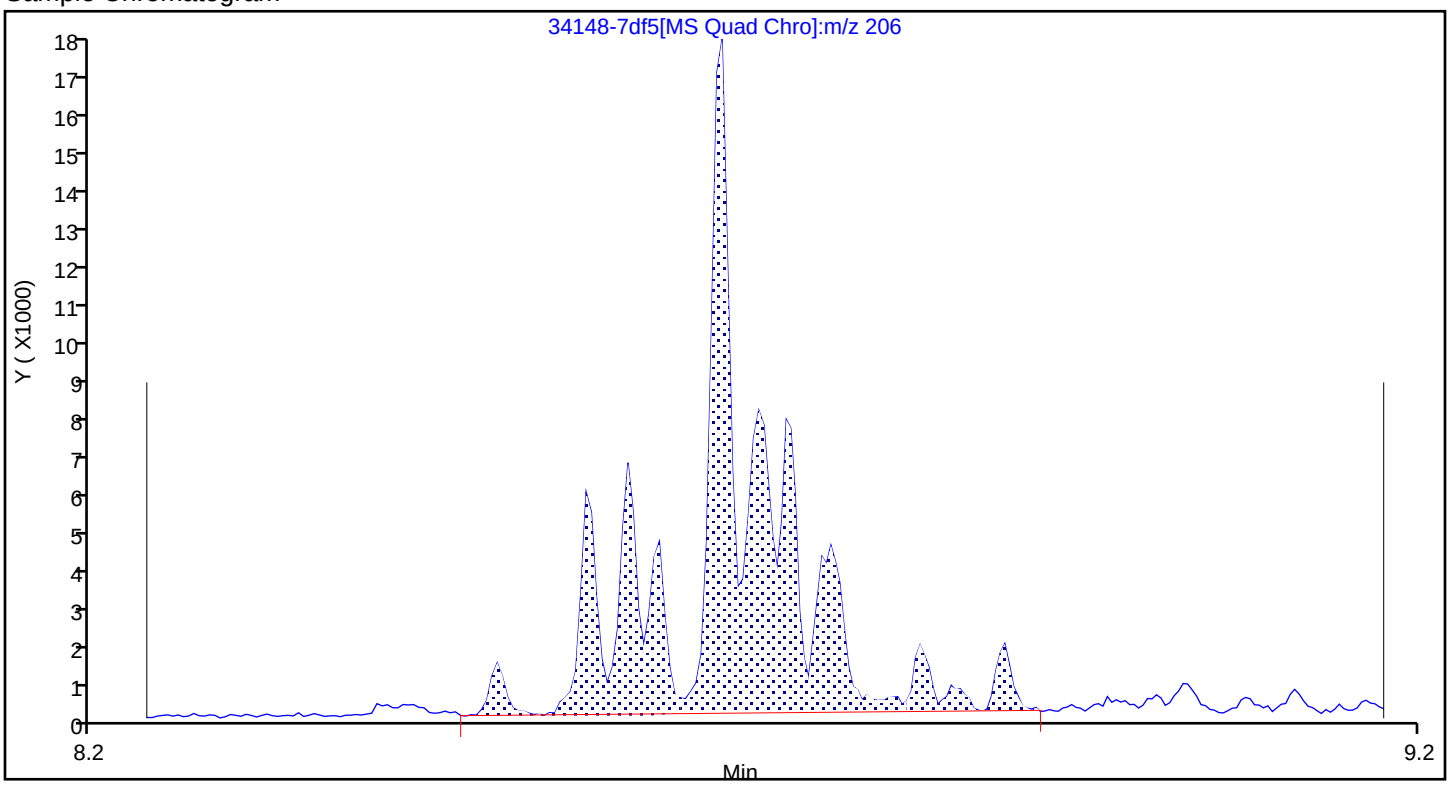
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 97 C2-Phenanthrenes/Anthracenes, CAS: STL00902

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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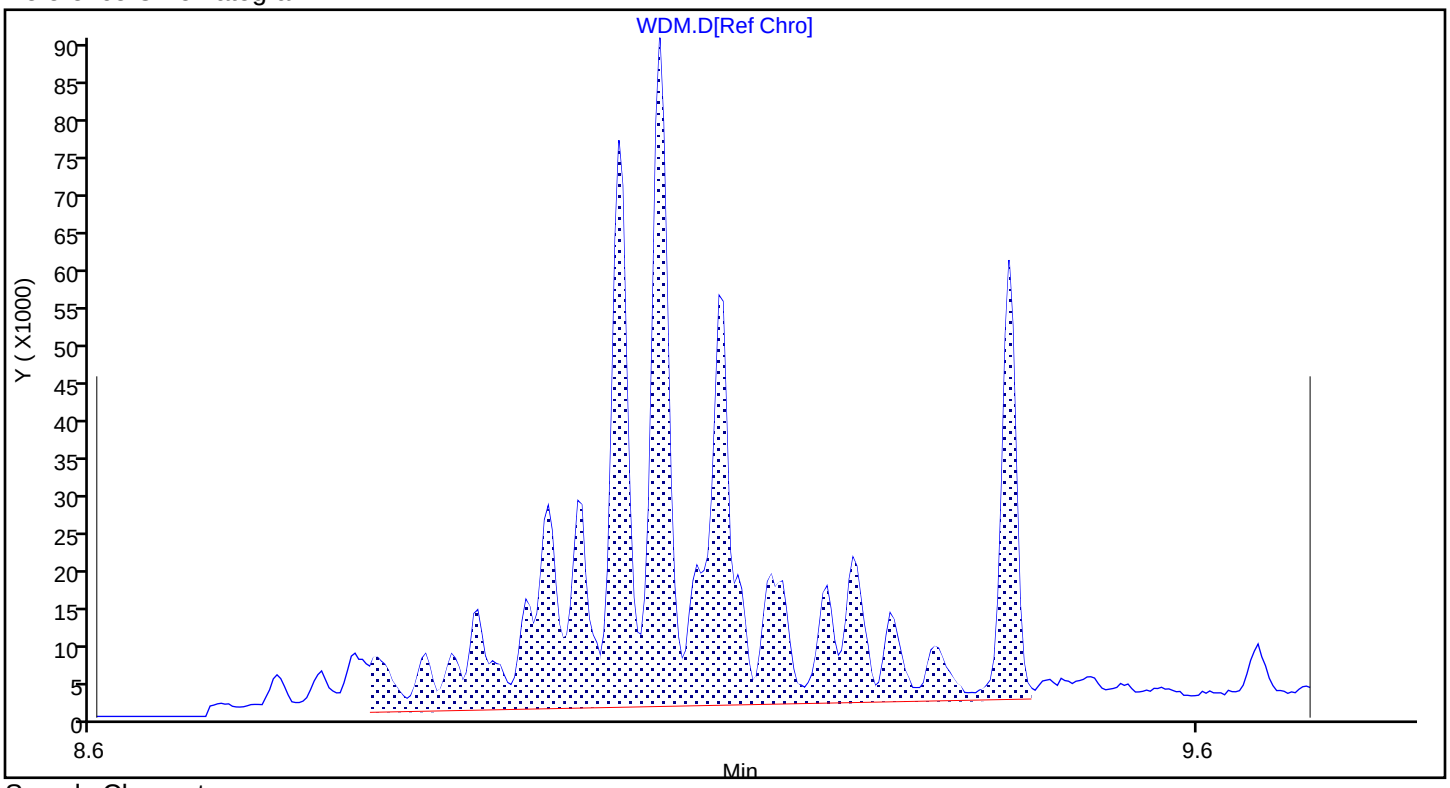
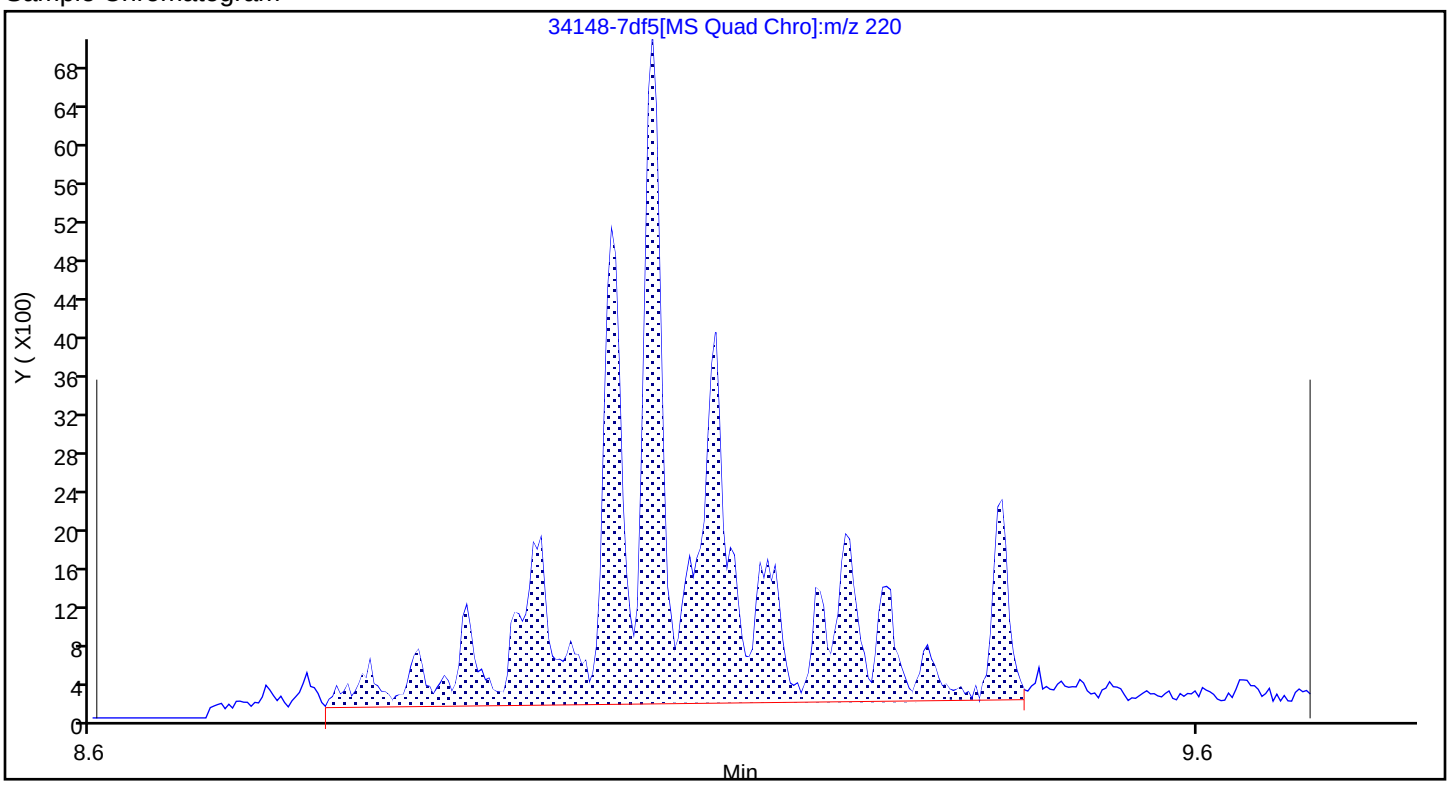
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 98 C3-Phenanthrenes/Anthracenes, CAS: STL00903

Reference Chromatogram



Sample Chromatogram



Report Date: 22-Nov-2023 14:18:03 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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Client ID:	1804576-852-S2				
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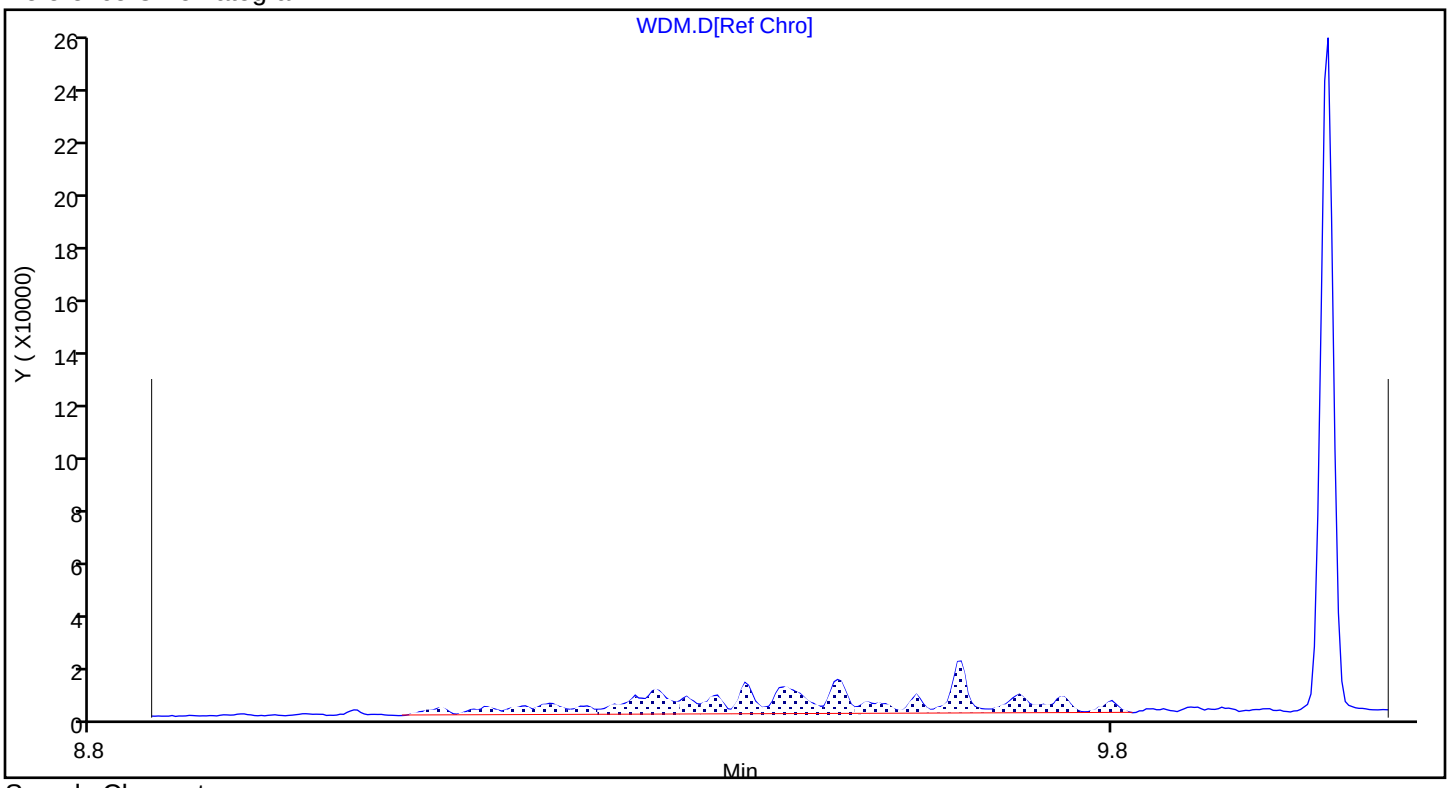
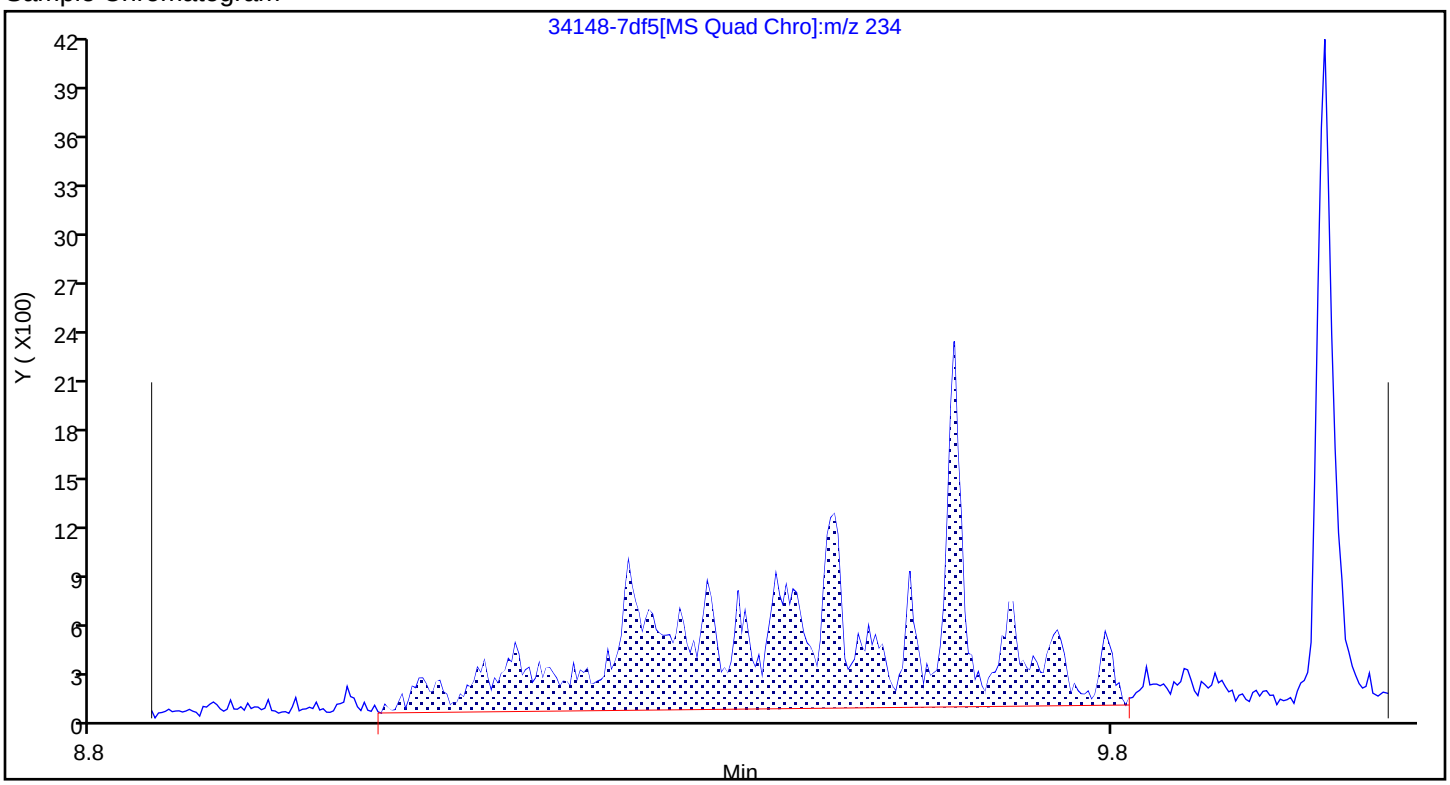
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 99 C4-Phenanthrenes/Anthracenes, CAS: STL00904

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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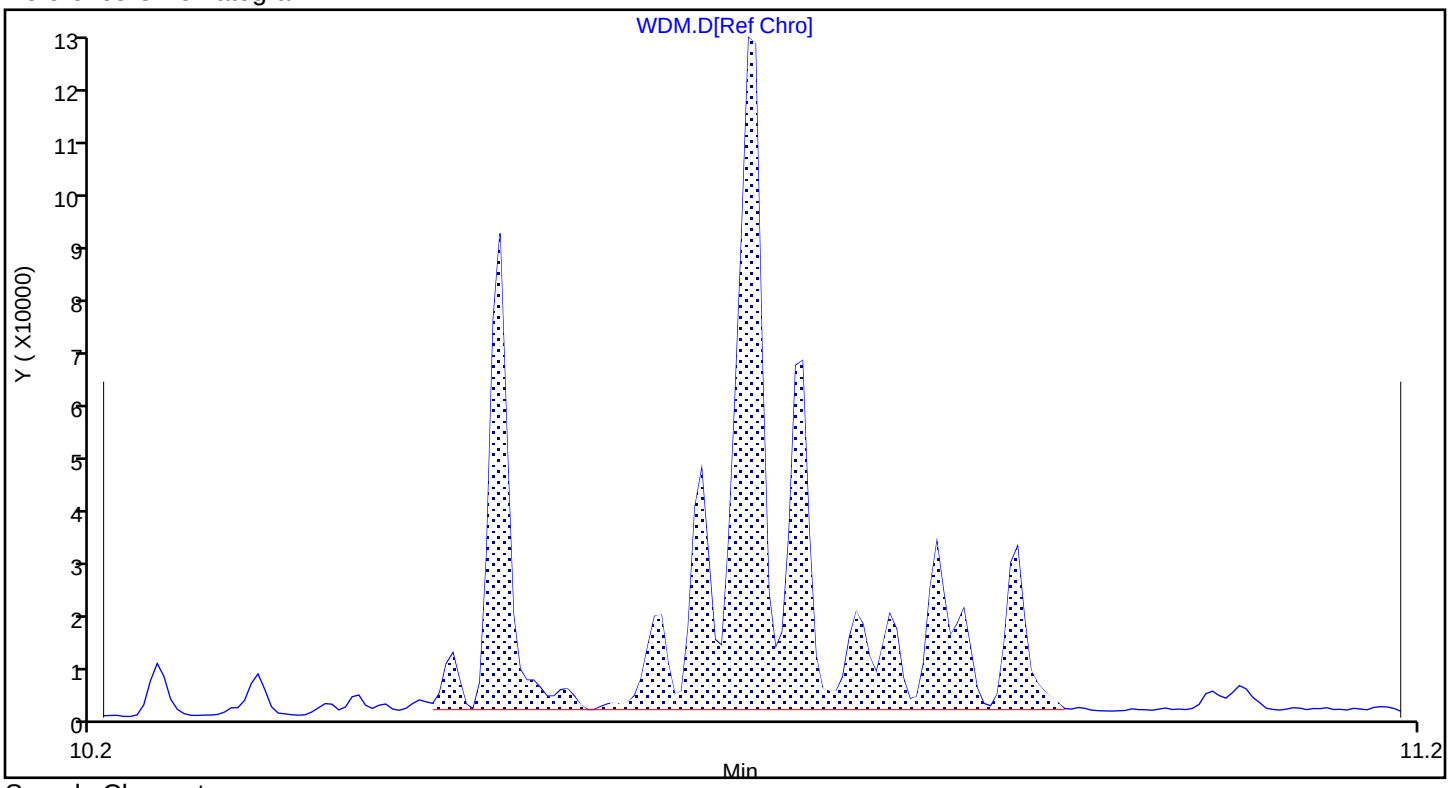
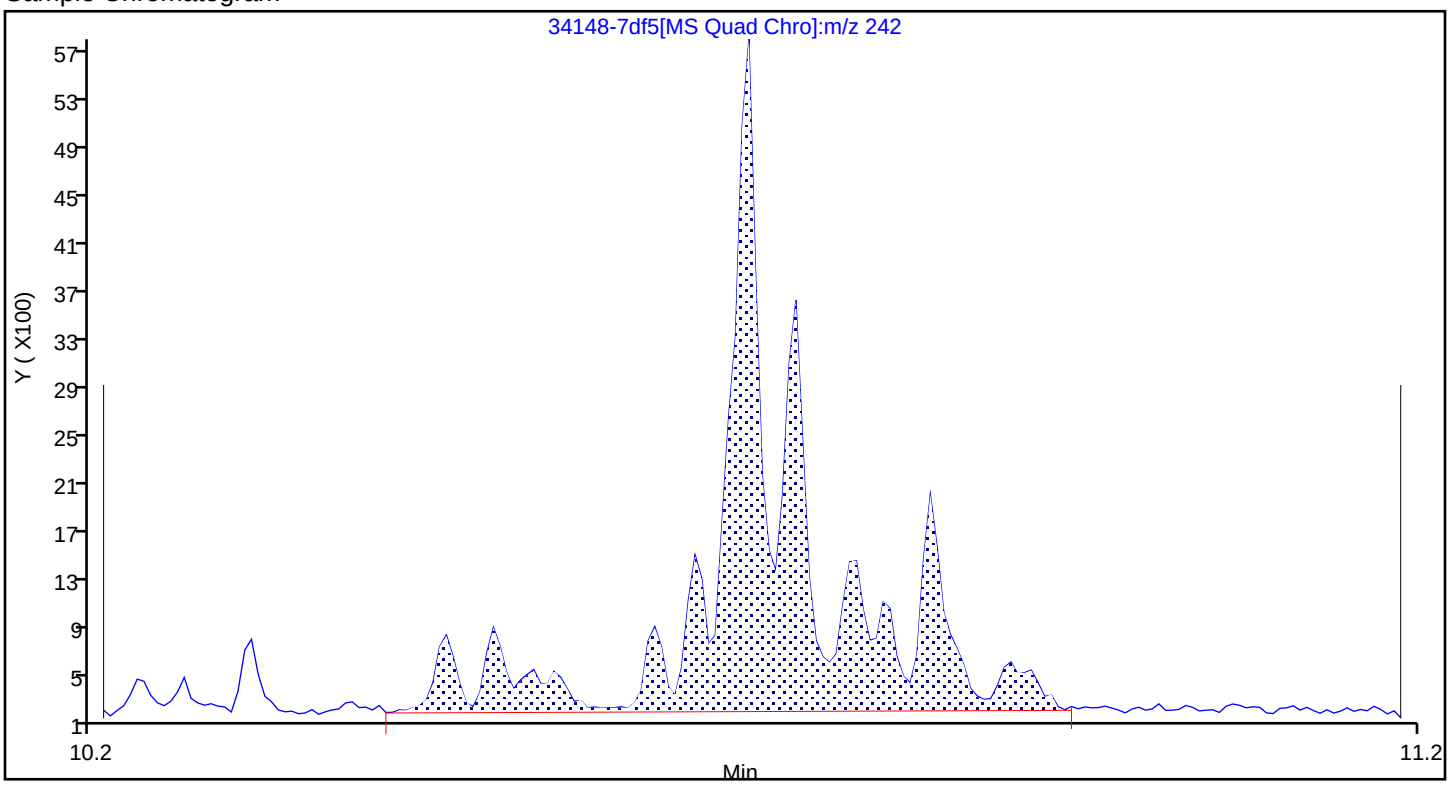
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 101 C1-Chrysenes/Benz(a)anthracenes, CAS: STL02218

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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Client ID:	1804576-852-S2				
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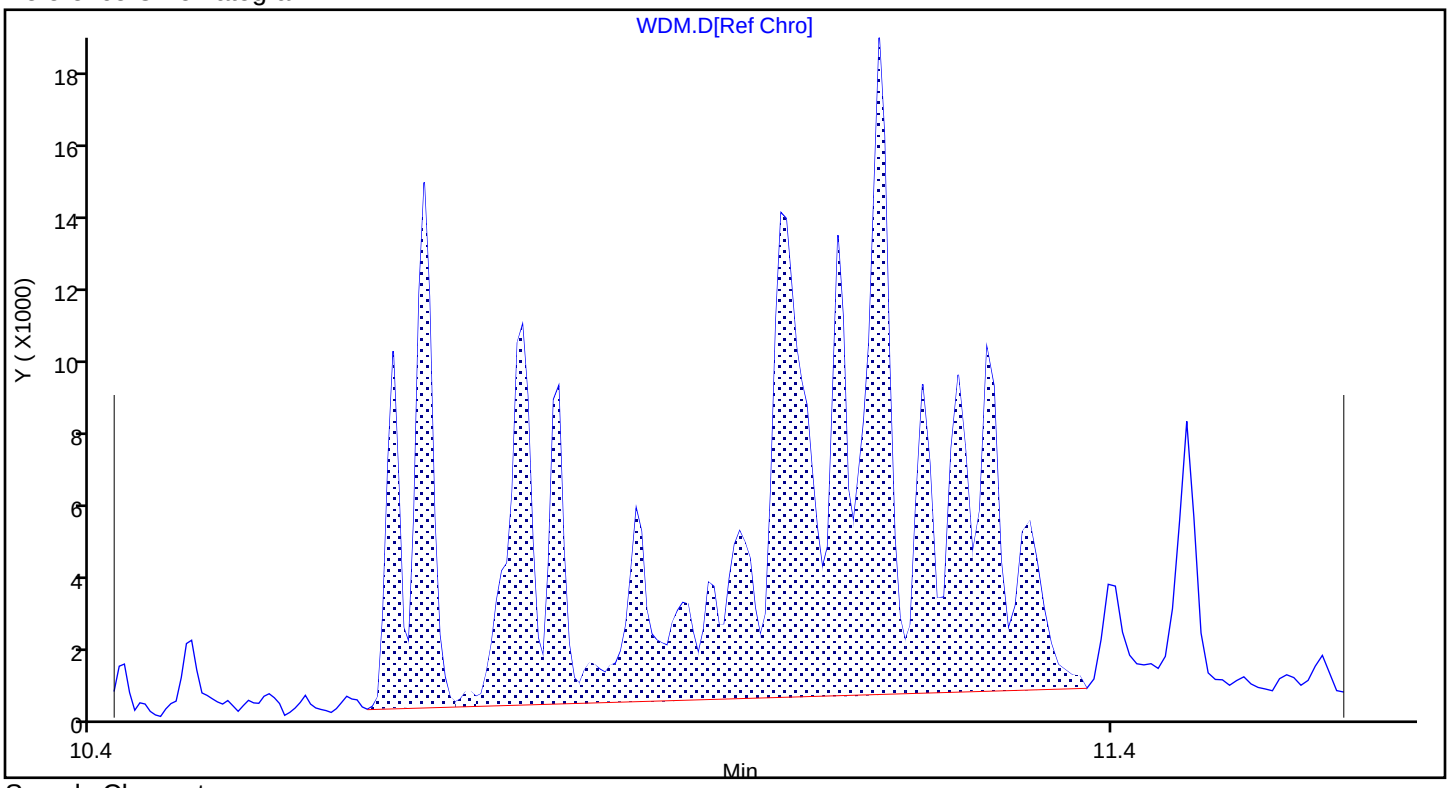
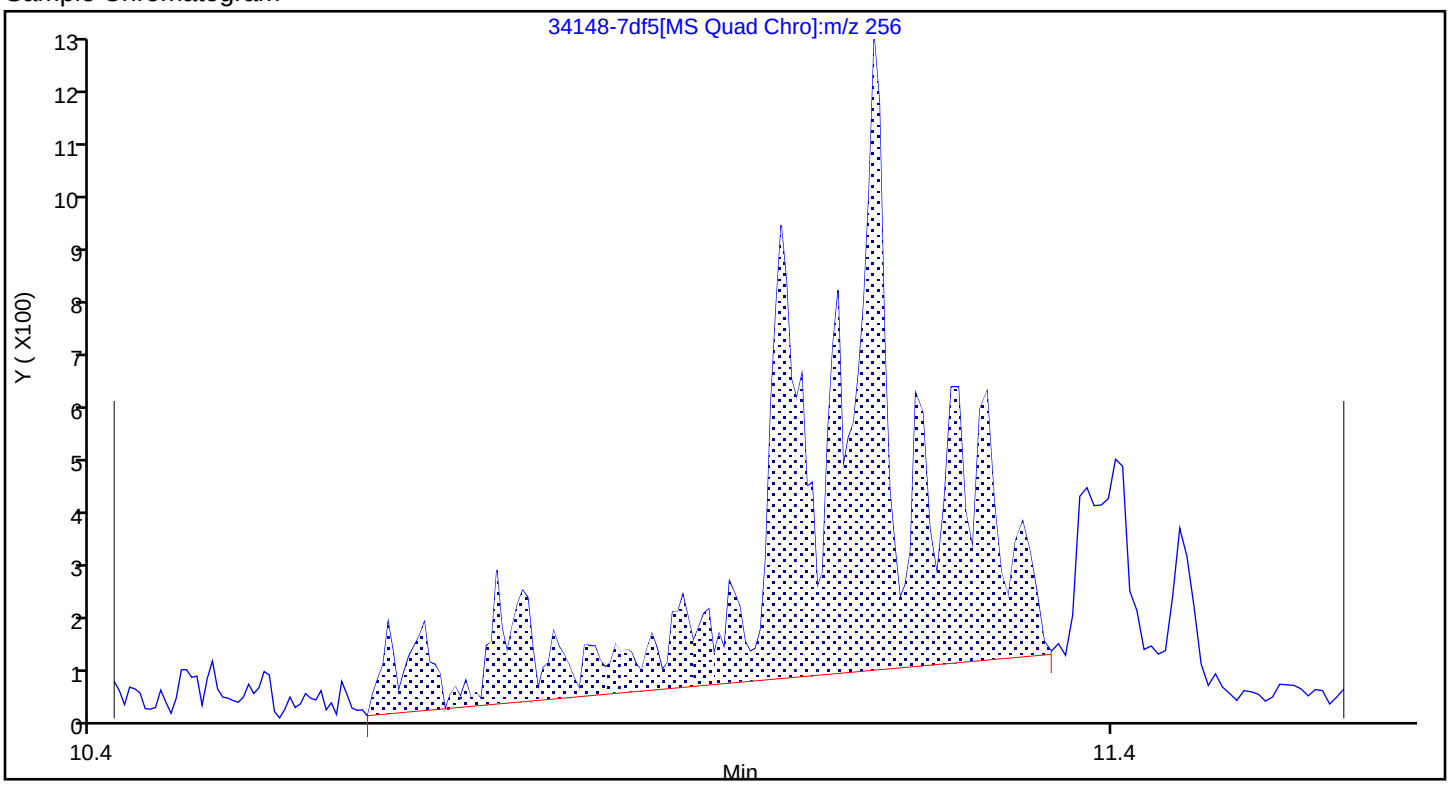
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 102 C2-Chrysenes/Benz(a)anthracenes, CAS: STL02219

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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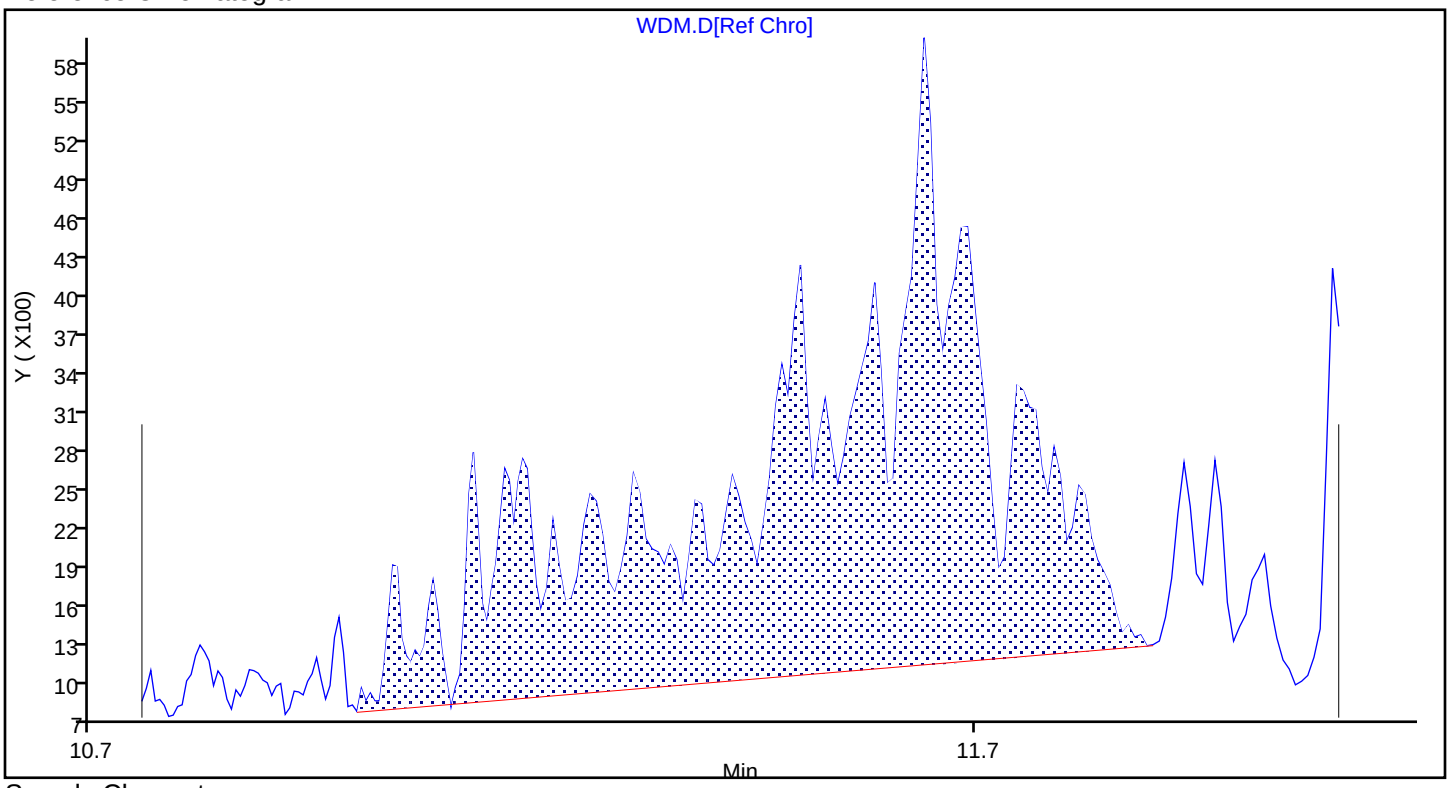
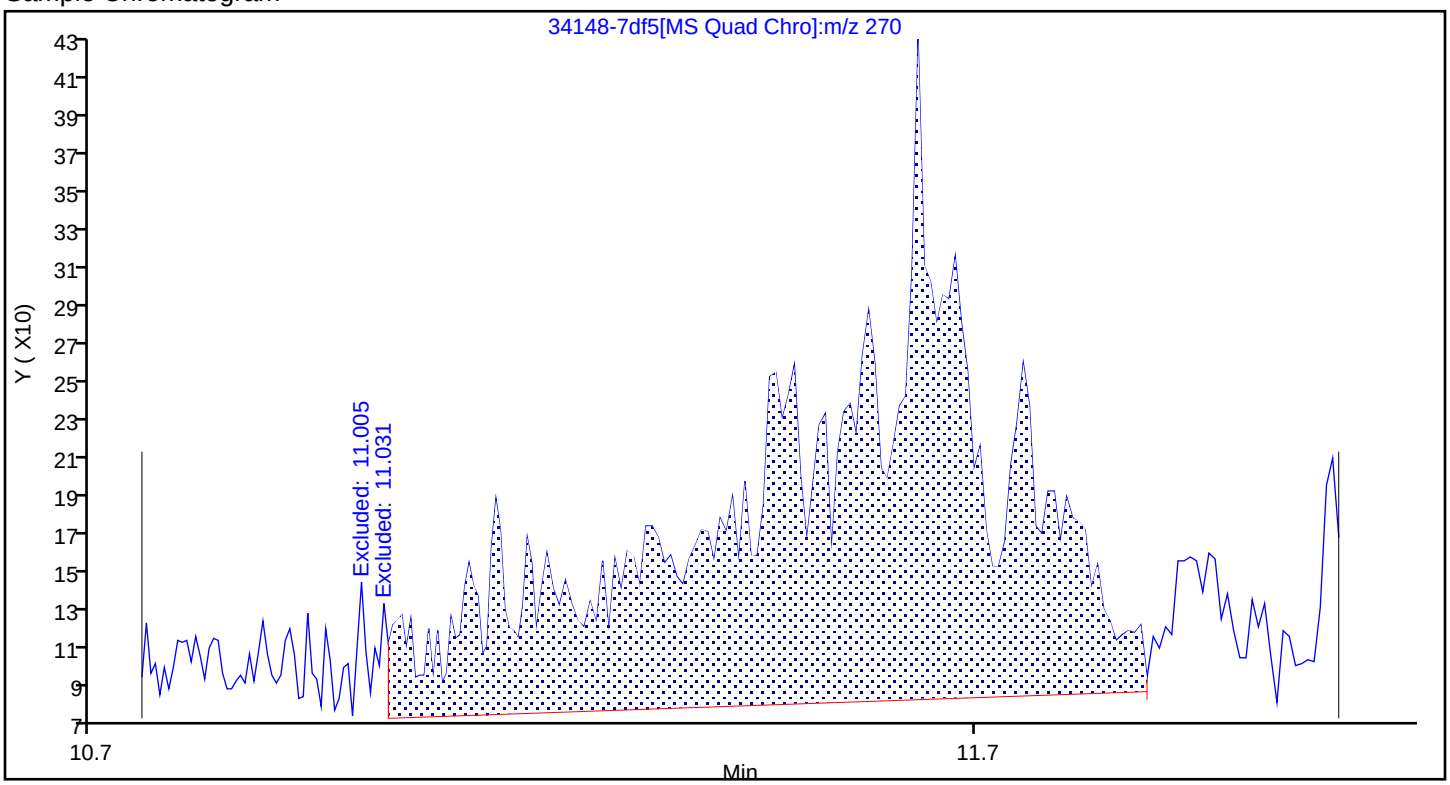
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 103 C3-Chrysenes/Benz(a)anthracenes, CAS: STL02220

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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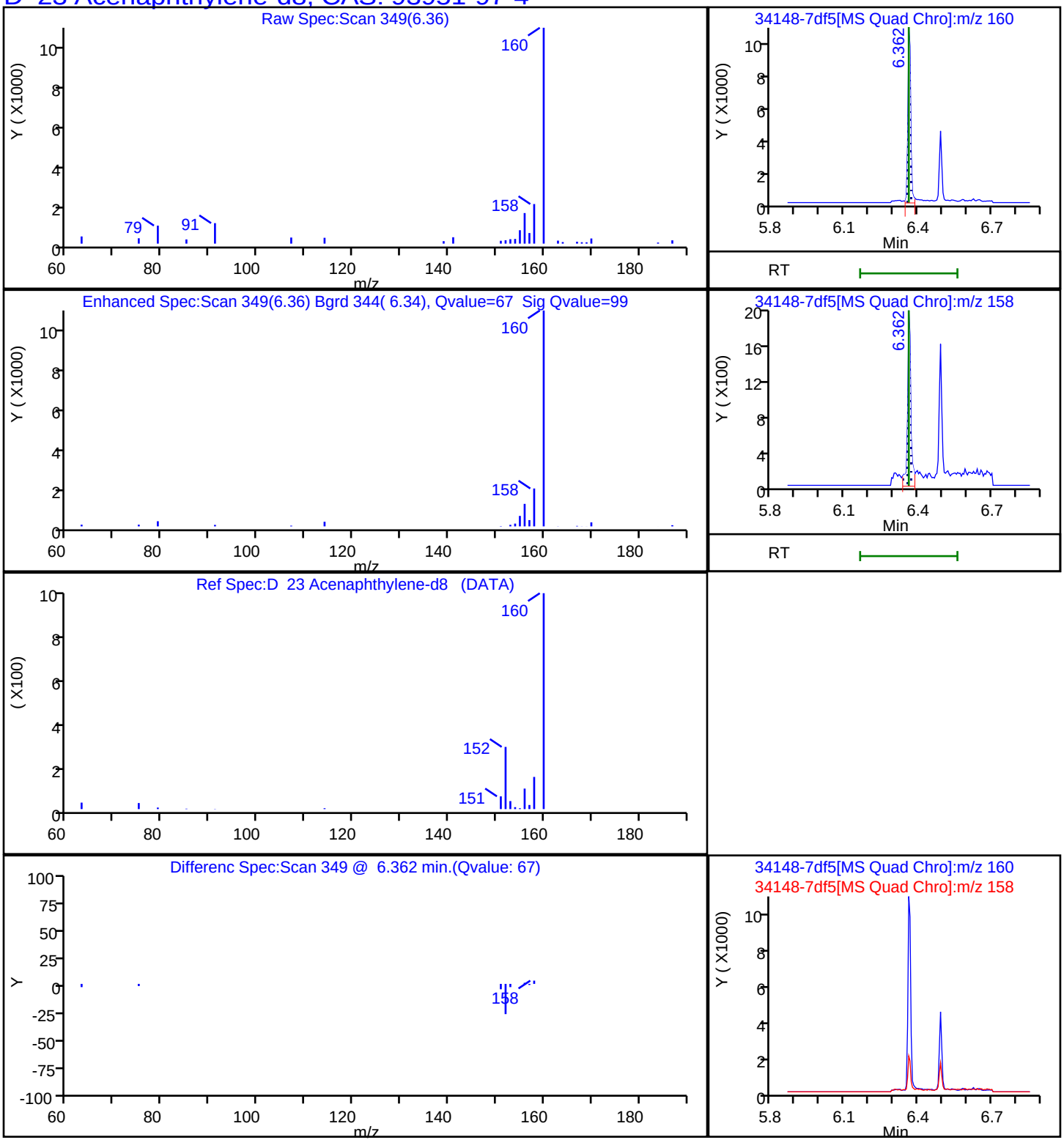
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 23 Acenaphthylene-d8, CAS: 93951-97-4



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Eurofins Knoxville

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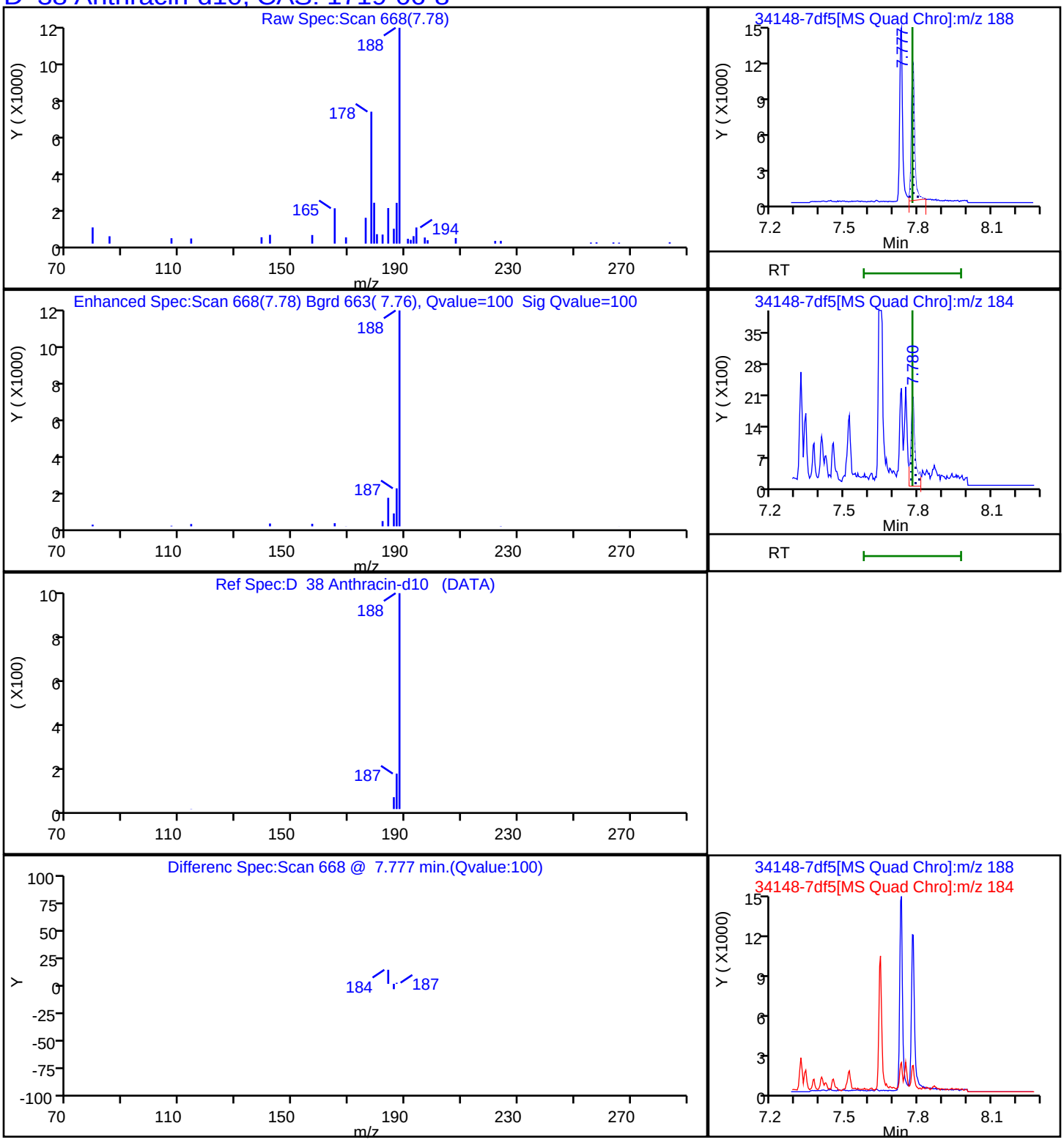
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 38 Anthracin-d10, CAS: 1719-06-8



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Eurofins Knoxville

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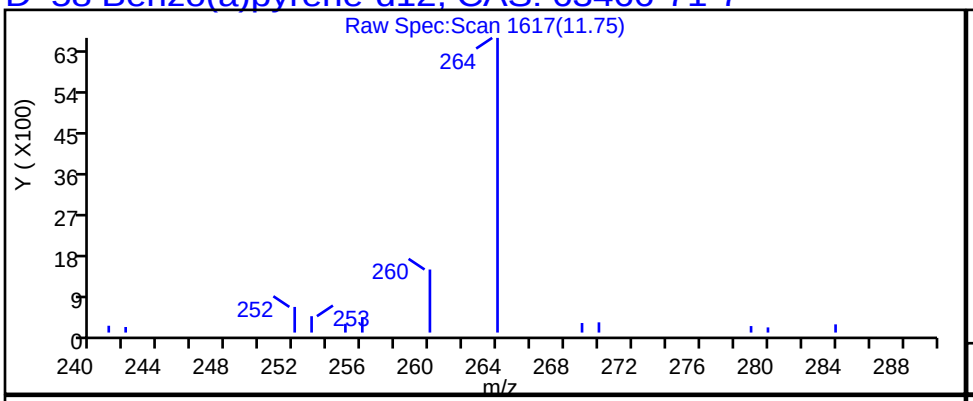
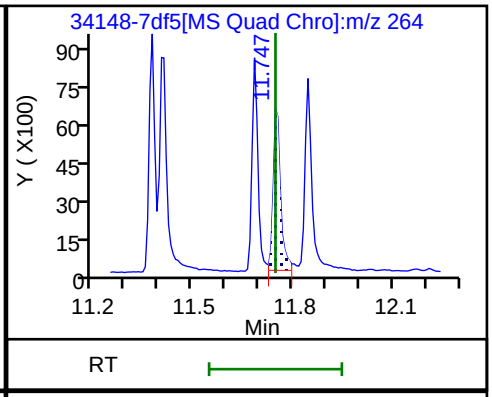
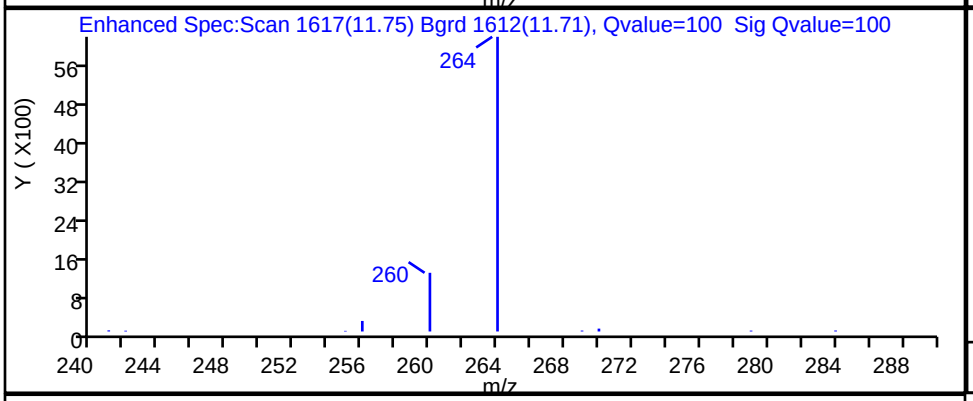
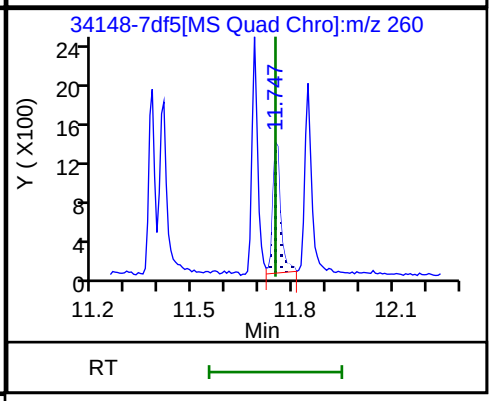
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

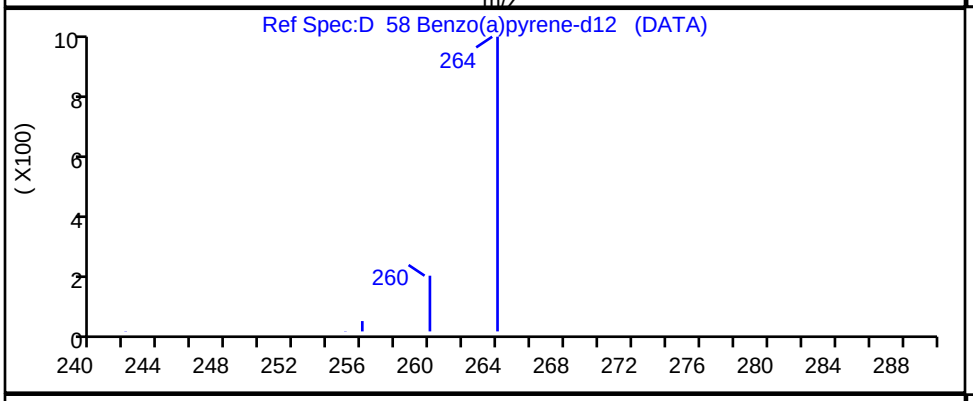
D 58 Benzo(a)pyrene-d12, CAS: 63466-71-7

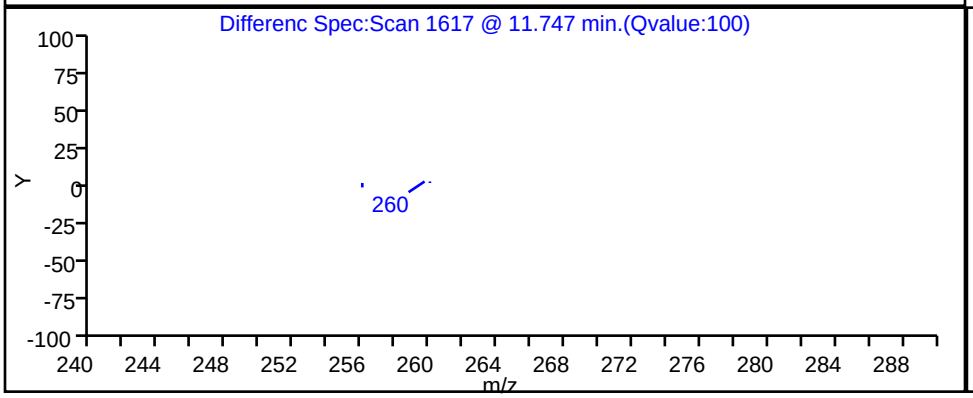


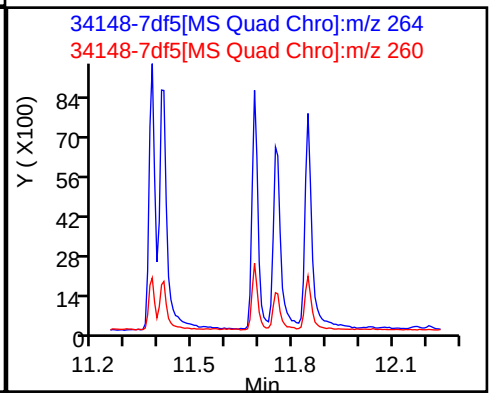












Report Date: 22-Nov-2023 14:18:02 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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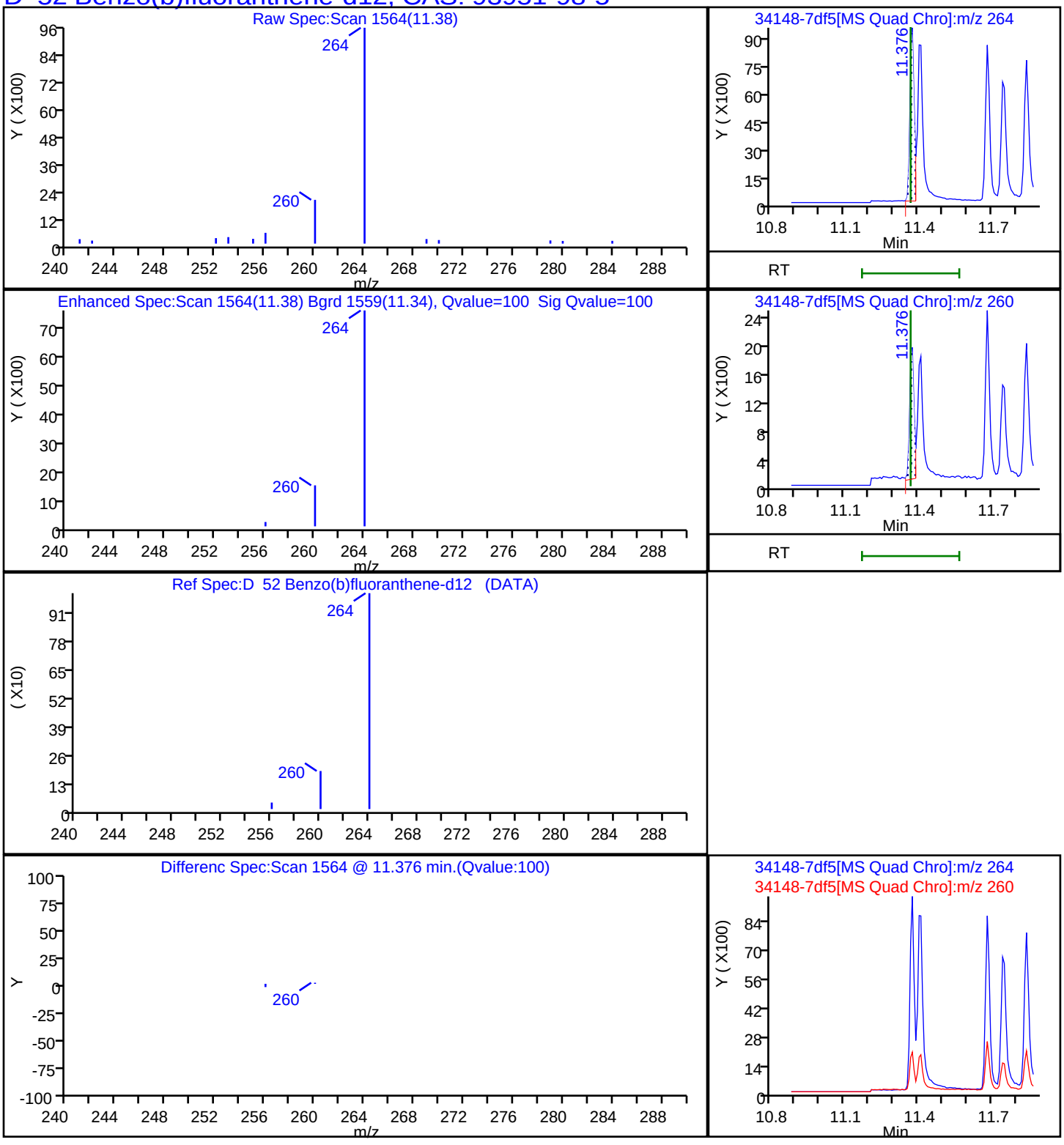
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 52 Benzo(b)fluoranthene-d12, CAS: 93951-98-5



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Eurofins Knoxville

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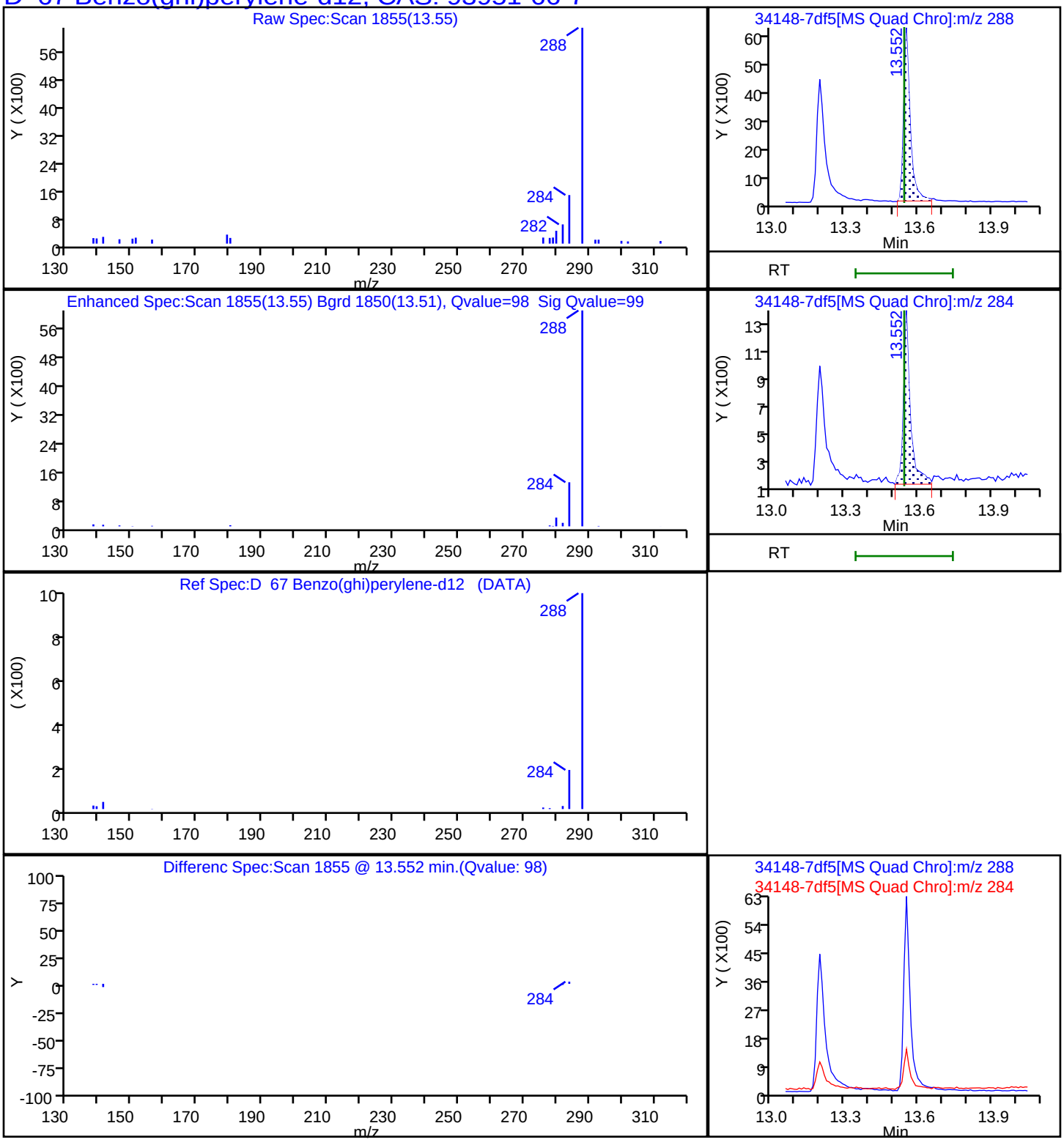
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D_67 Benzo(ghi)perylene-d12, CAS: 93951-66-7



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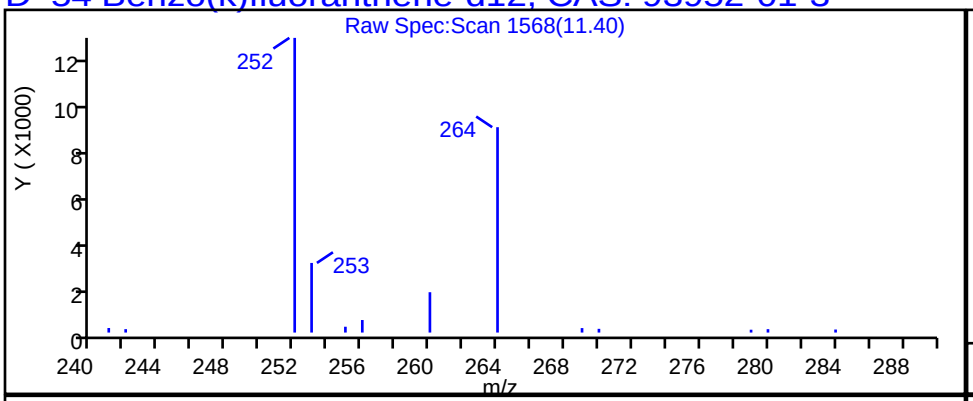
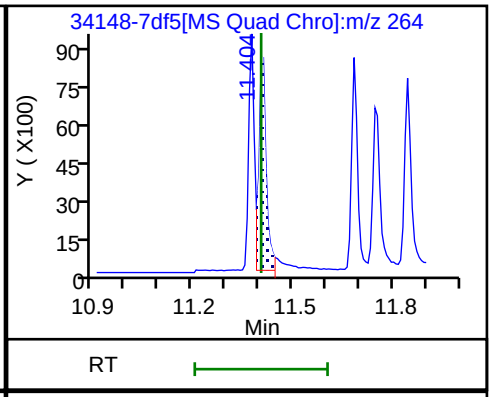
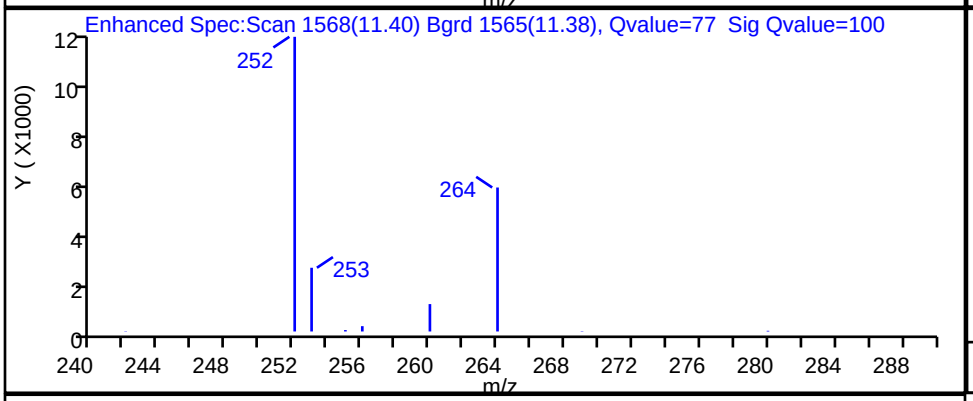
Eurofins Knoxville

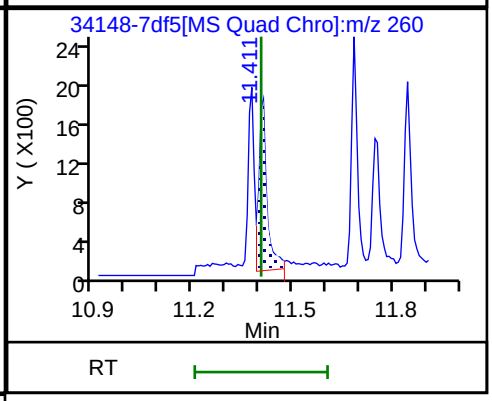
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D		
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7
Client ID:	1804576-852-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

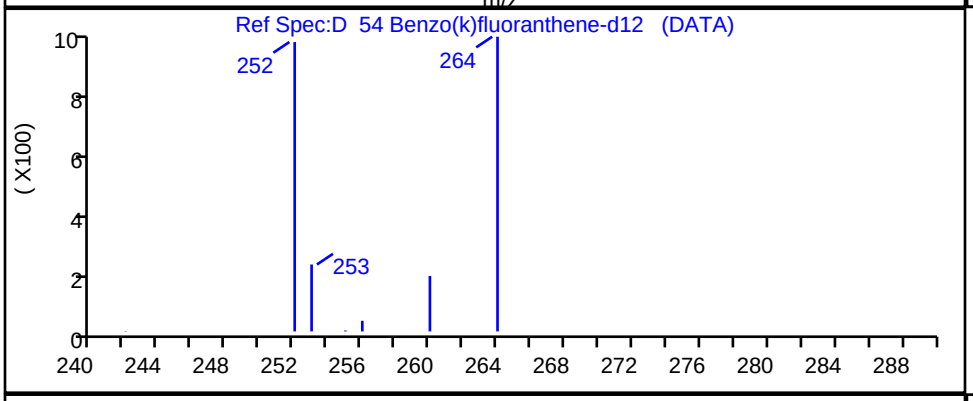
D 54 Benzo(k)fluoranthene-d12, CAS: 93952-01-3

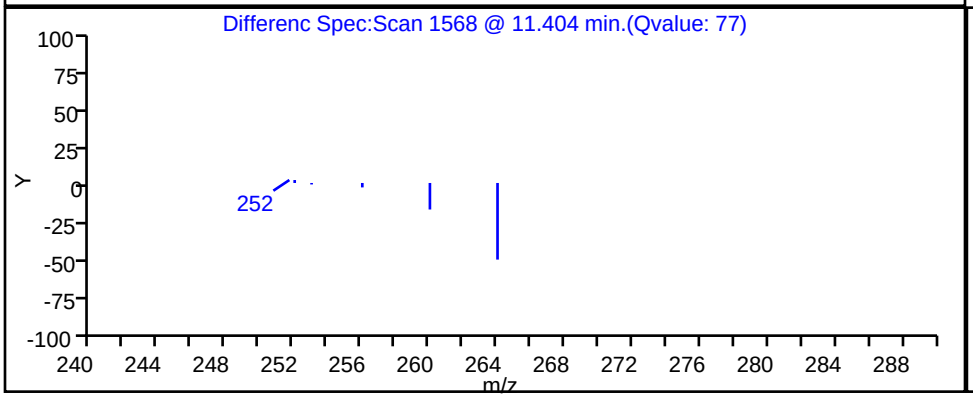


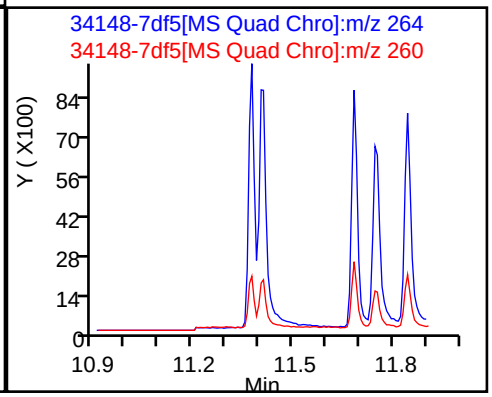












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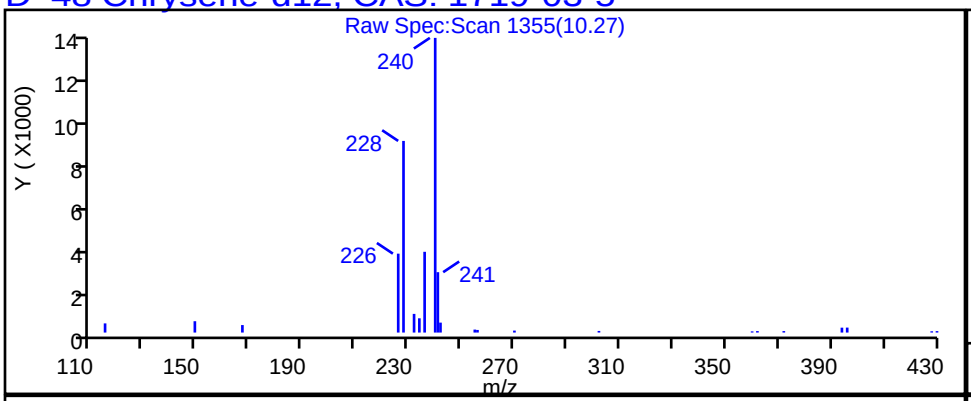
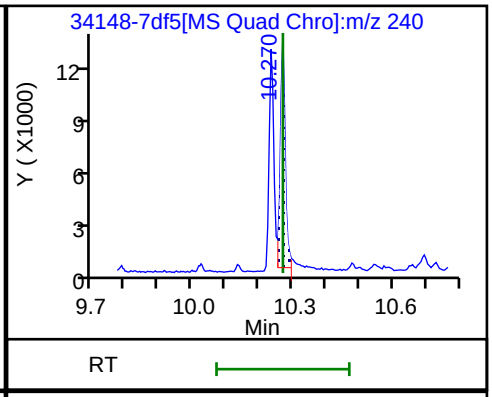
Eurofins Knoxville

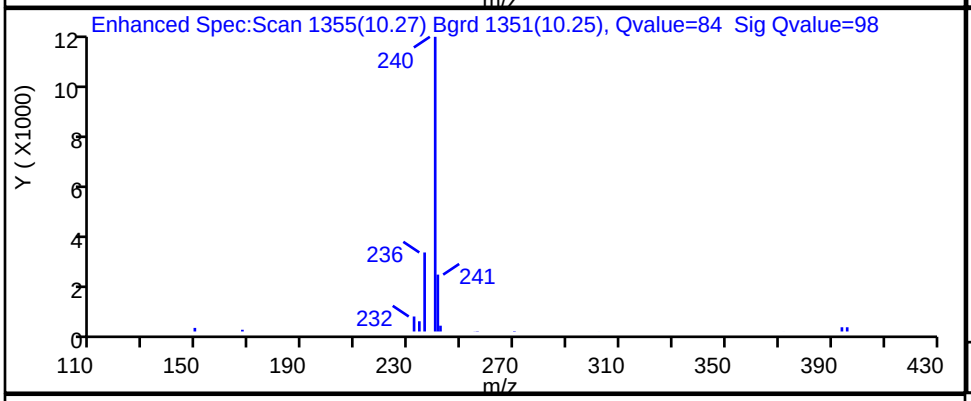
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D

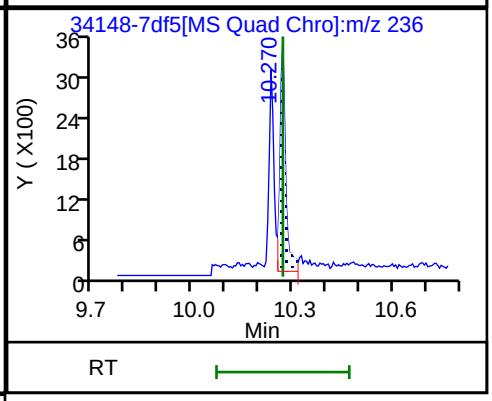
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

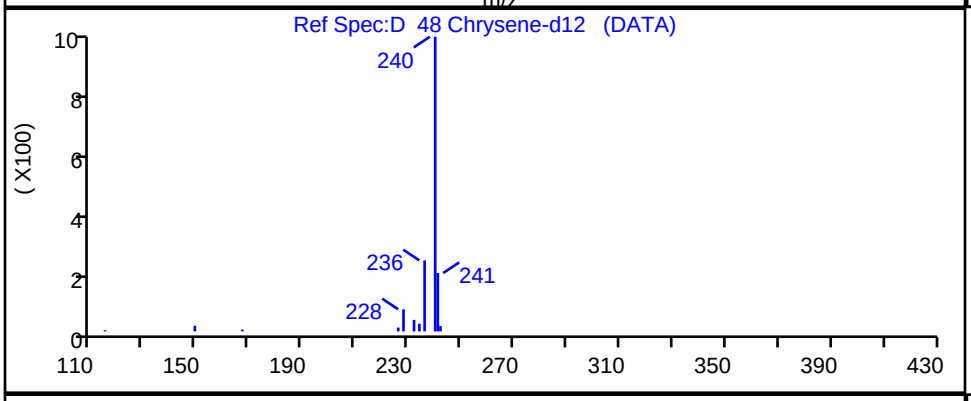
D 48 Chrysene-d12, CAS: 1719-03-5

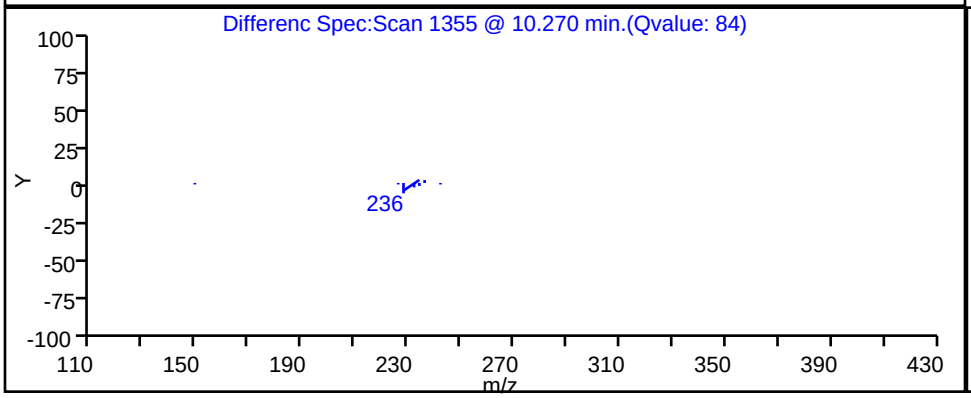


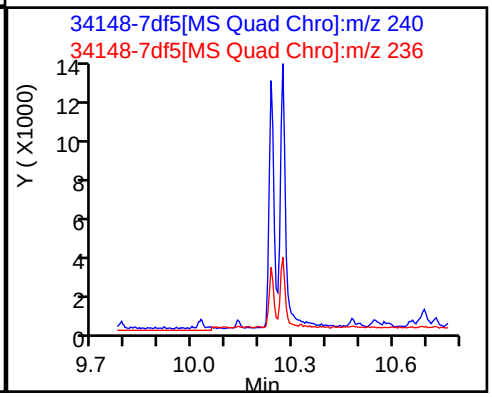












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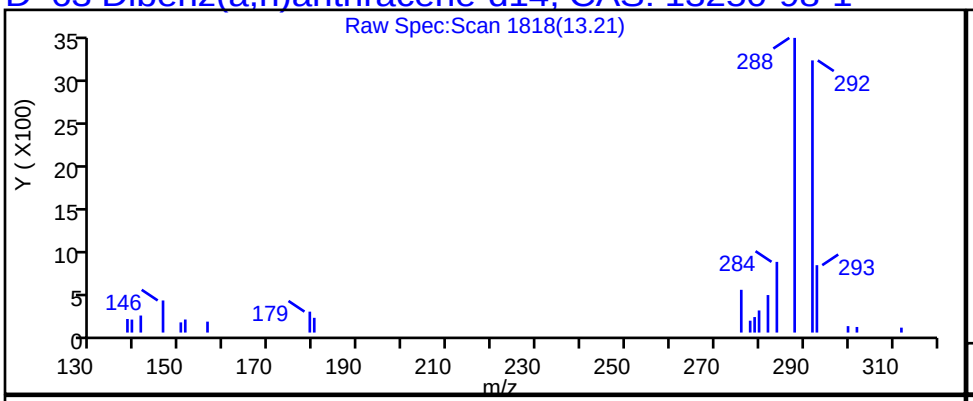
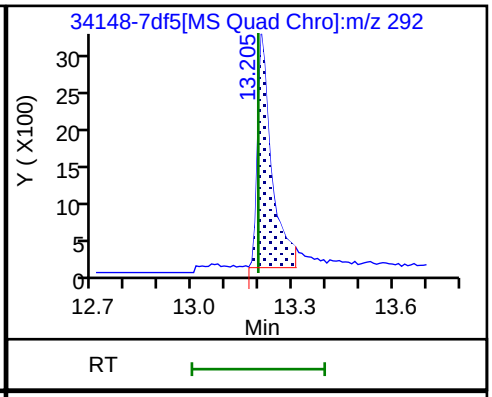
Eurofins Knoxville

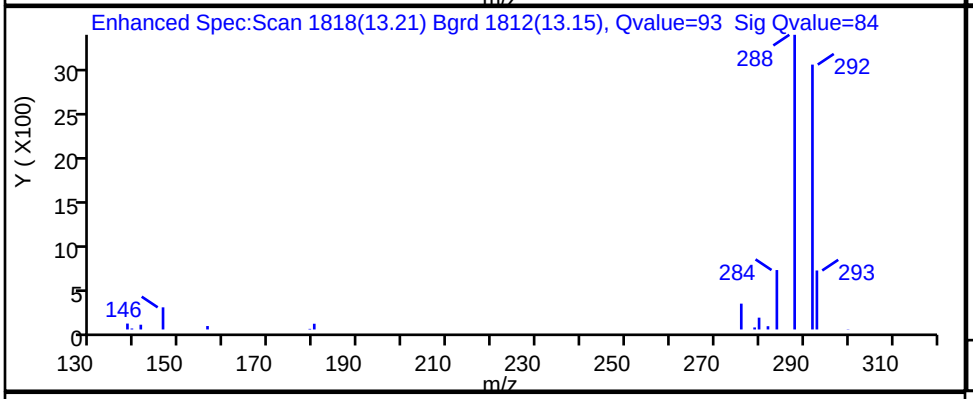
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D

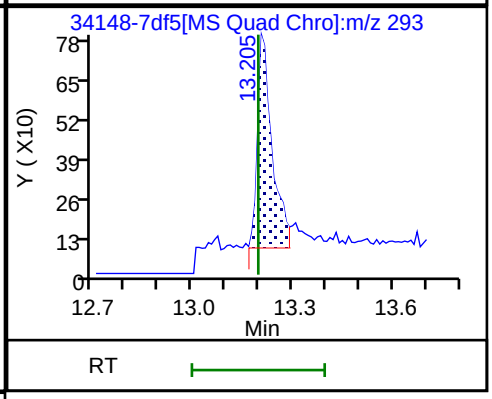
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

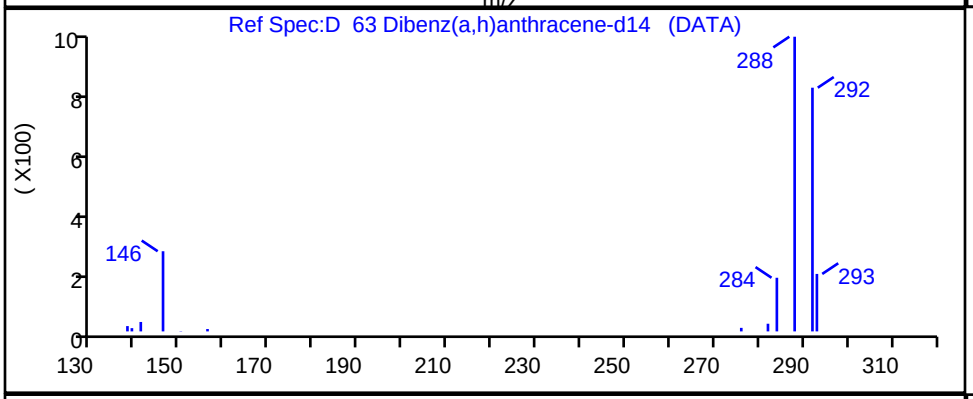
D 63 Dibenz(a,h)anthracene-d14, CAS: 13250-98-1

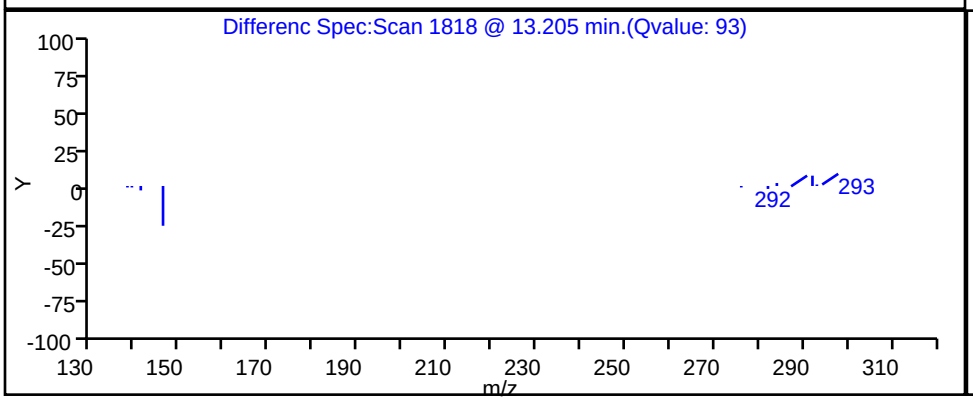


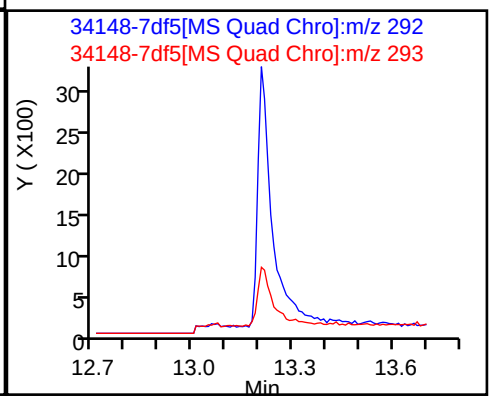












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Eurofins Knoxville

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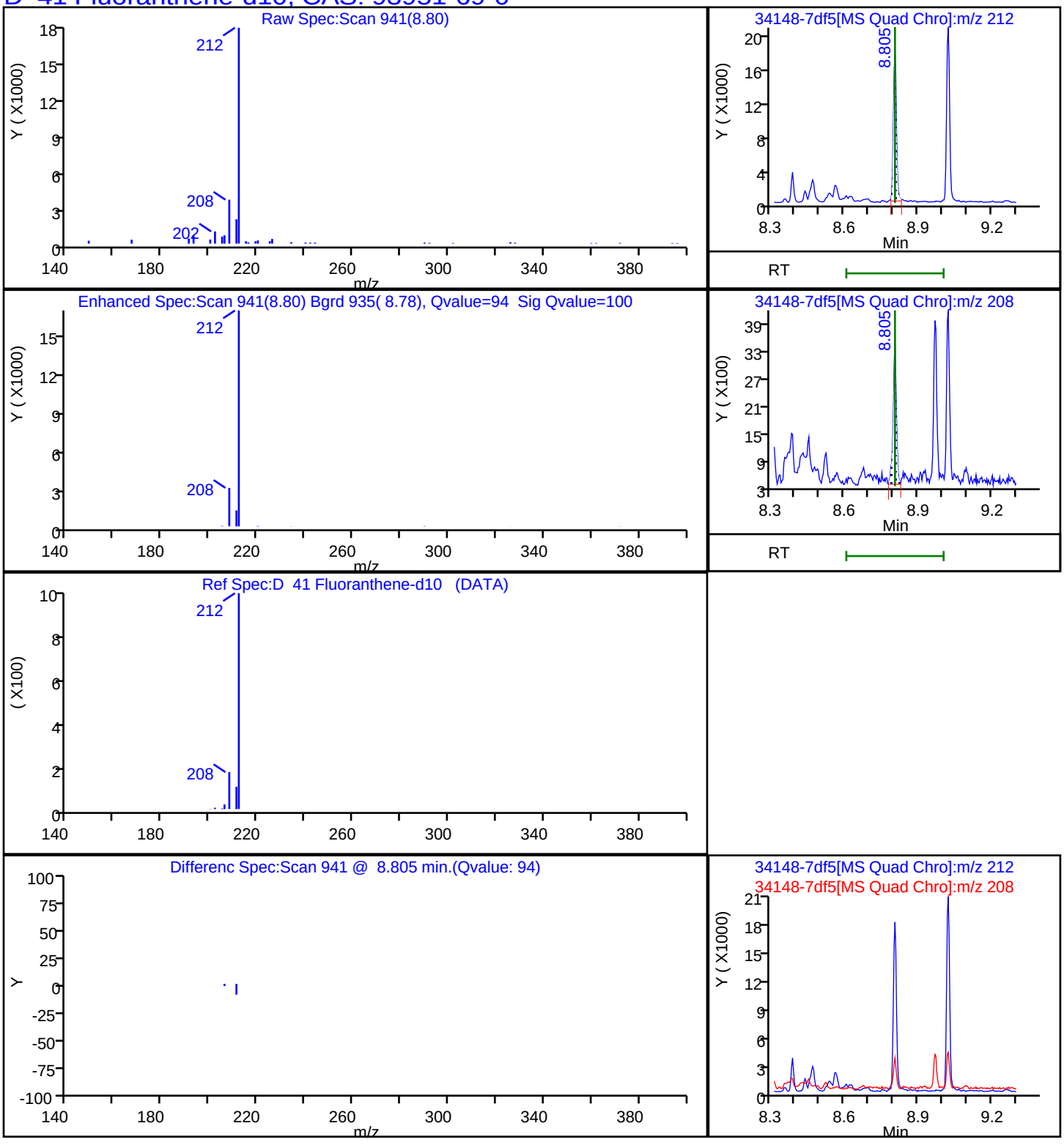
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7
Client ID:	1804576-852-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

D 41 Fluoranthene-d10, CAS: 93951-69-0



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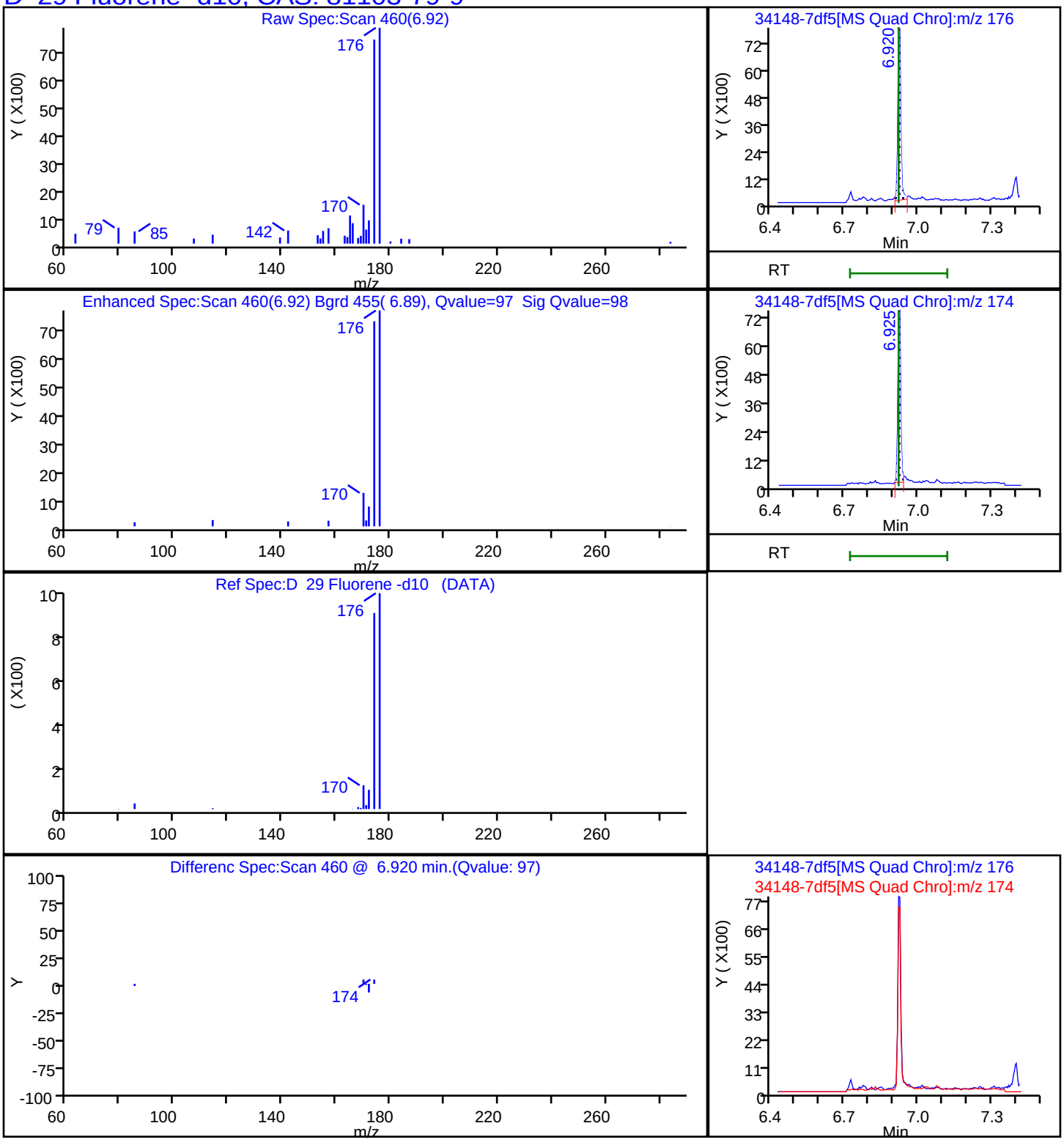
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D

Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 29 Fluorene -d10, CAS: 81103-79-9



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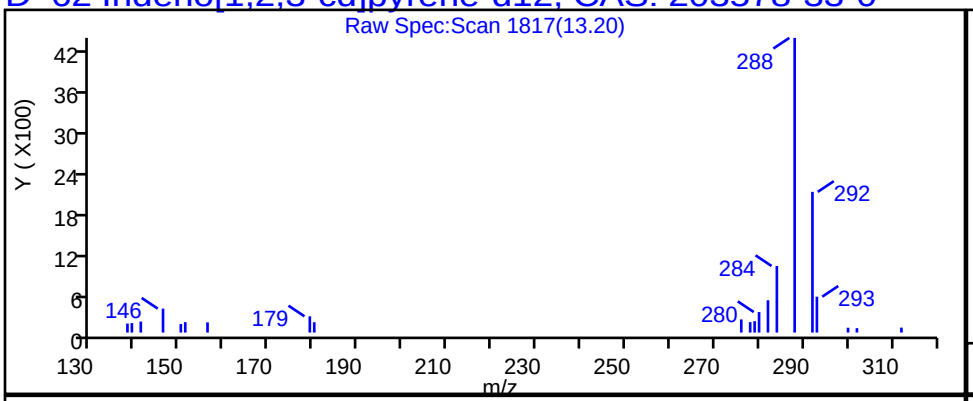
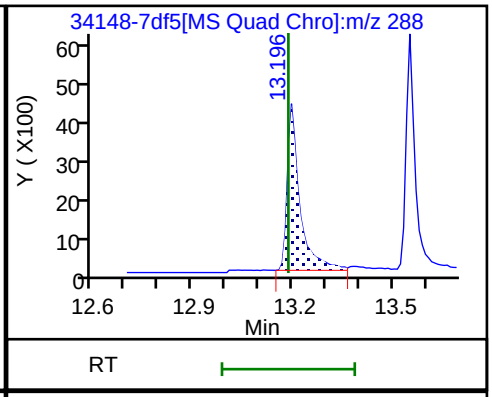
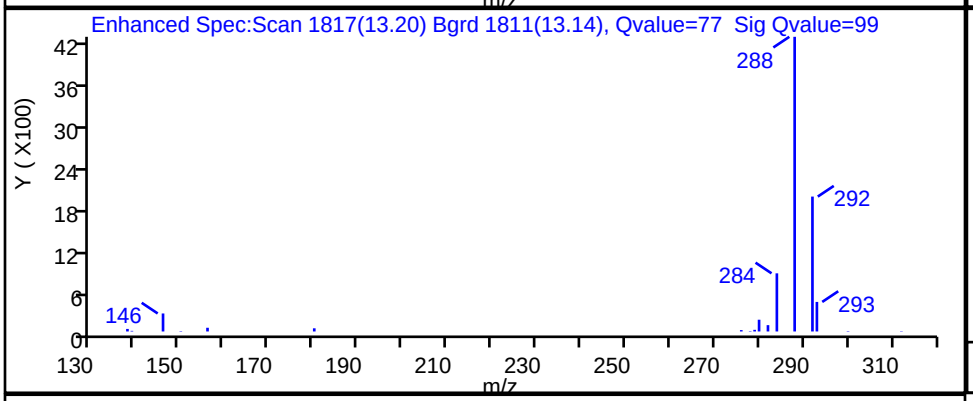
Eurofins Knoxville

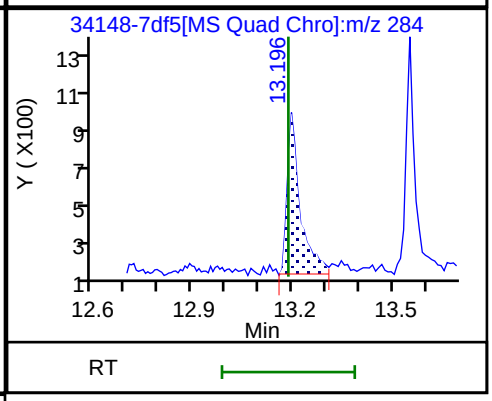
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D				
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

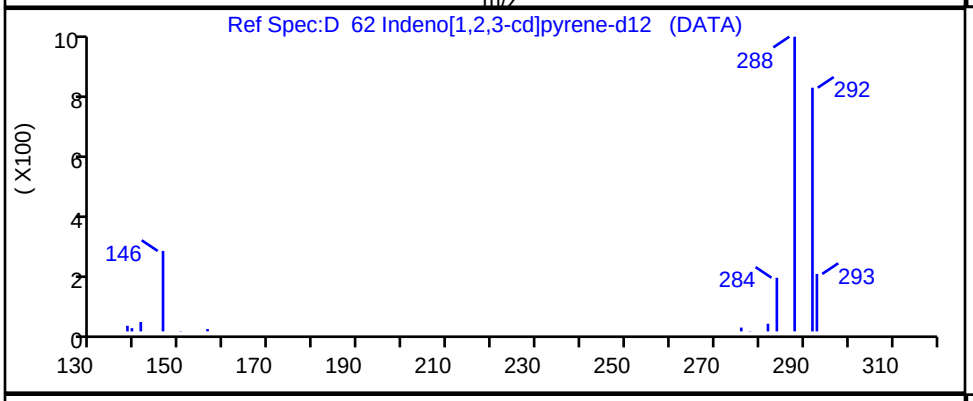
D 62 Indeno[1,2,3-cd]pyrene-d12, CAS: 203578-33-0

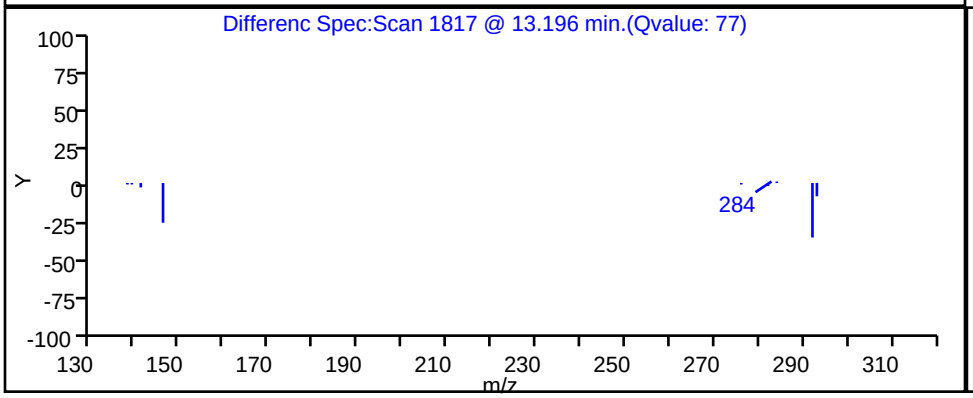


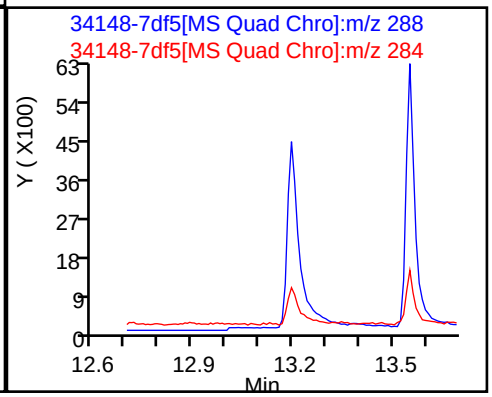










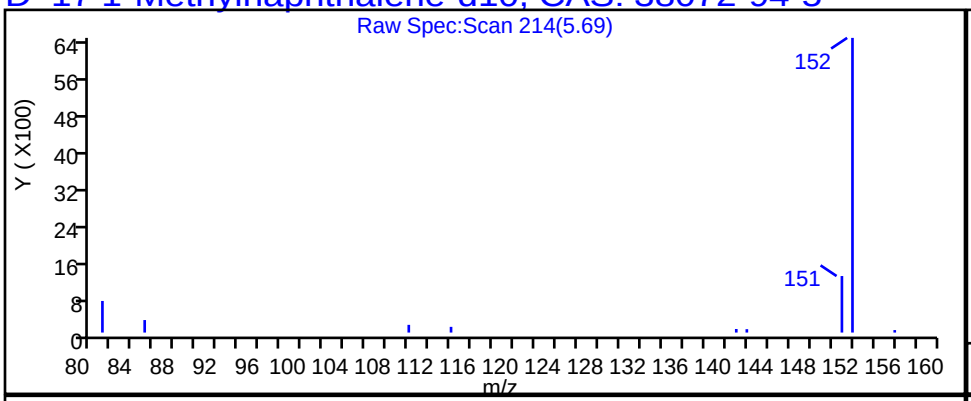


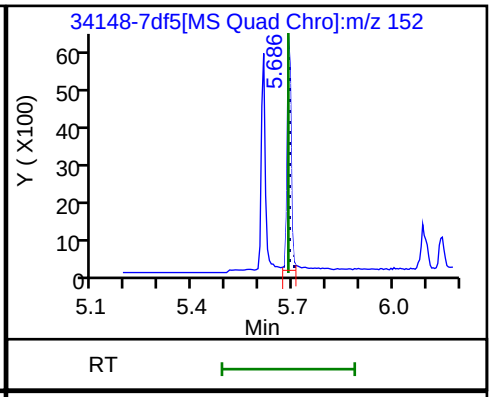
Report Date: 22-Nov-2023 14:18:01 Chrom Revision: 2.3 15-Nov-2023 20:54:34

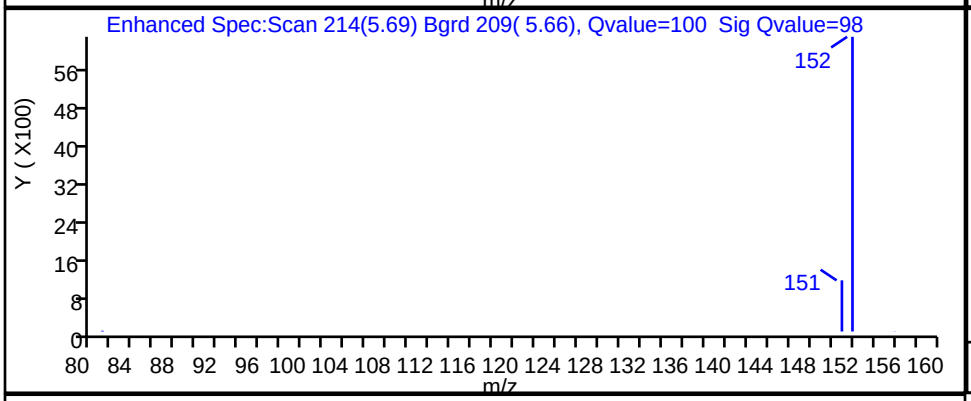
Eurofins Knoxville

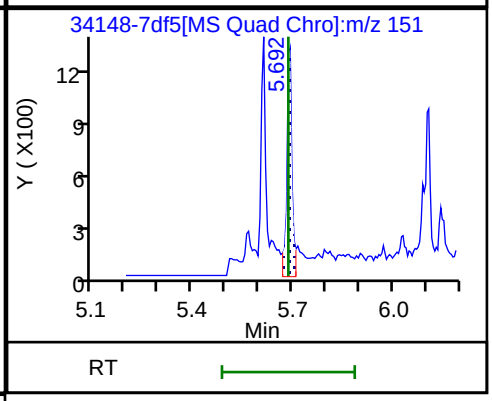
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D		
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7
Client ID:	1804576-852-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

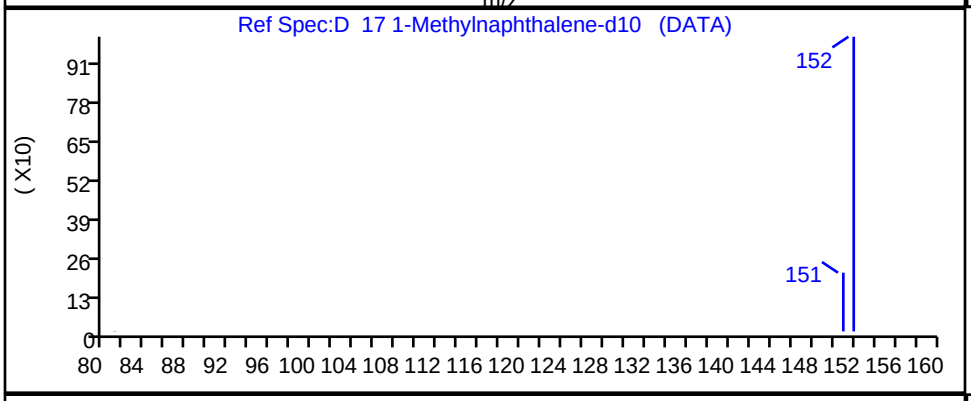
D 17 1-Methylnaphthalene-d10, CAS: 38072-94-5

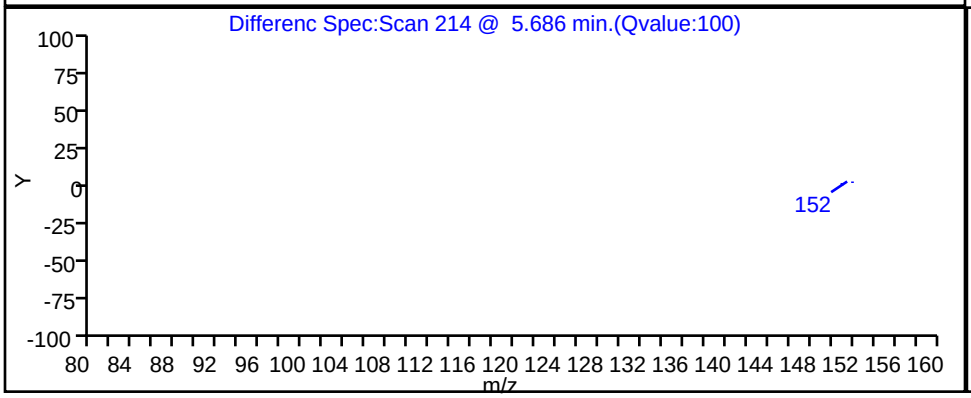


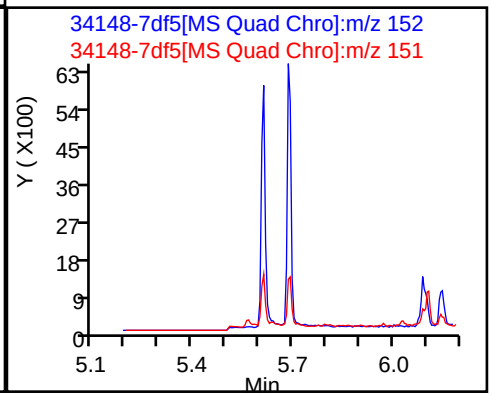












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Eurofins Knoxville

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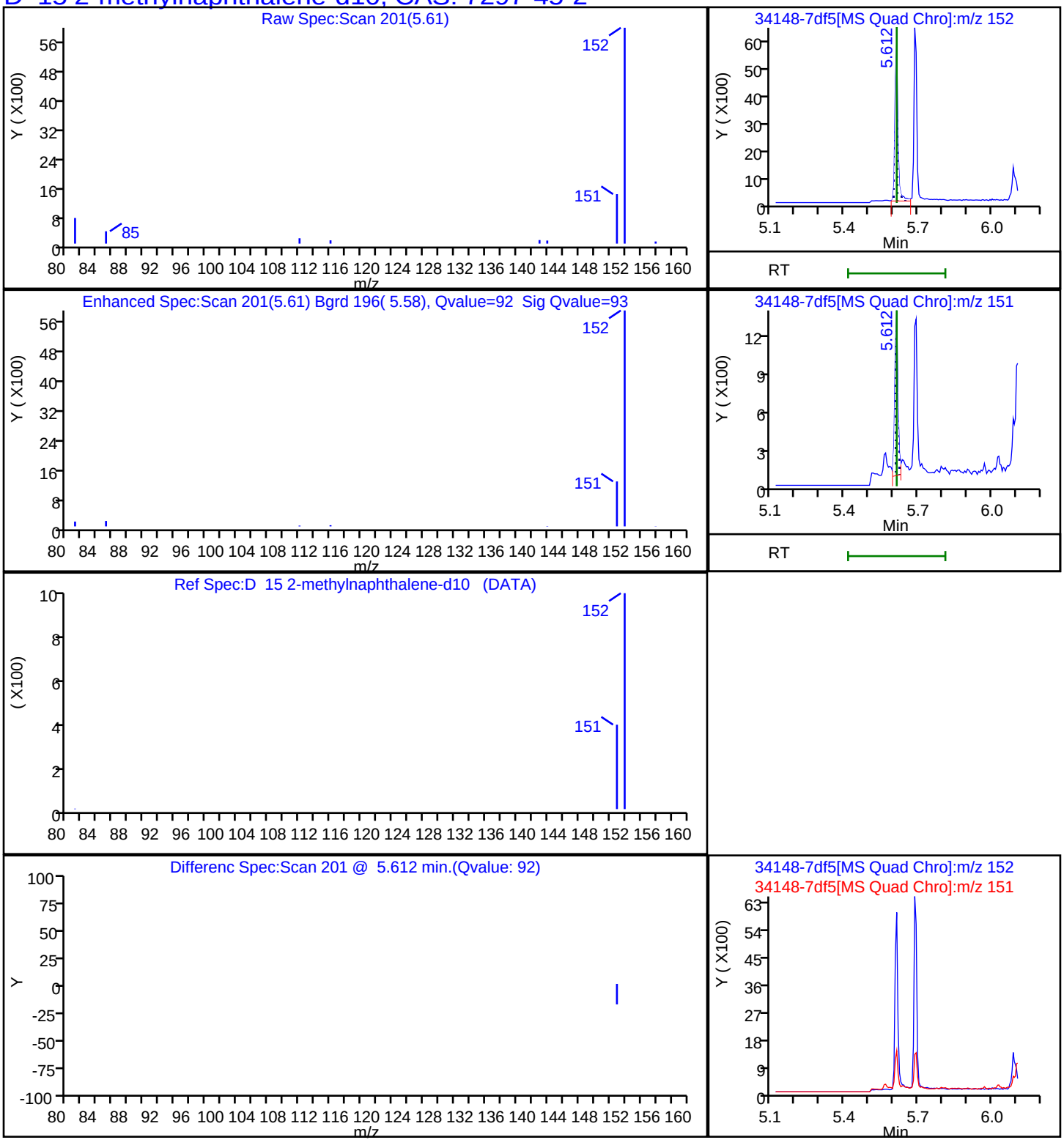
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 15 2-methylnaphthalene-d10, CAS: 7297-45-2



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Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
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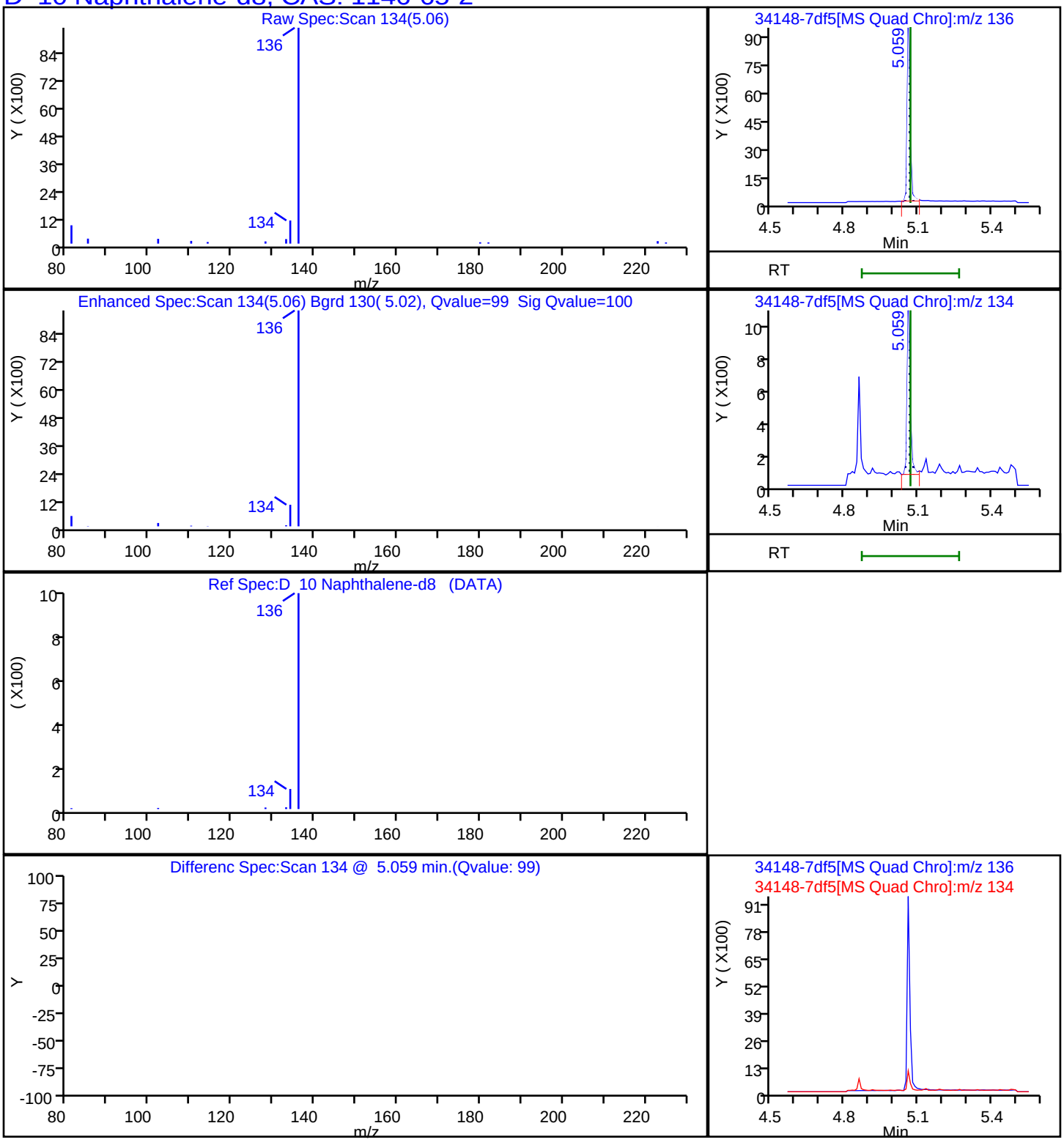
D_10 Naphthalene-d8, CAS: 1146-65-2



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Eurofins Knoxville

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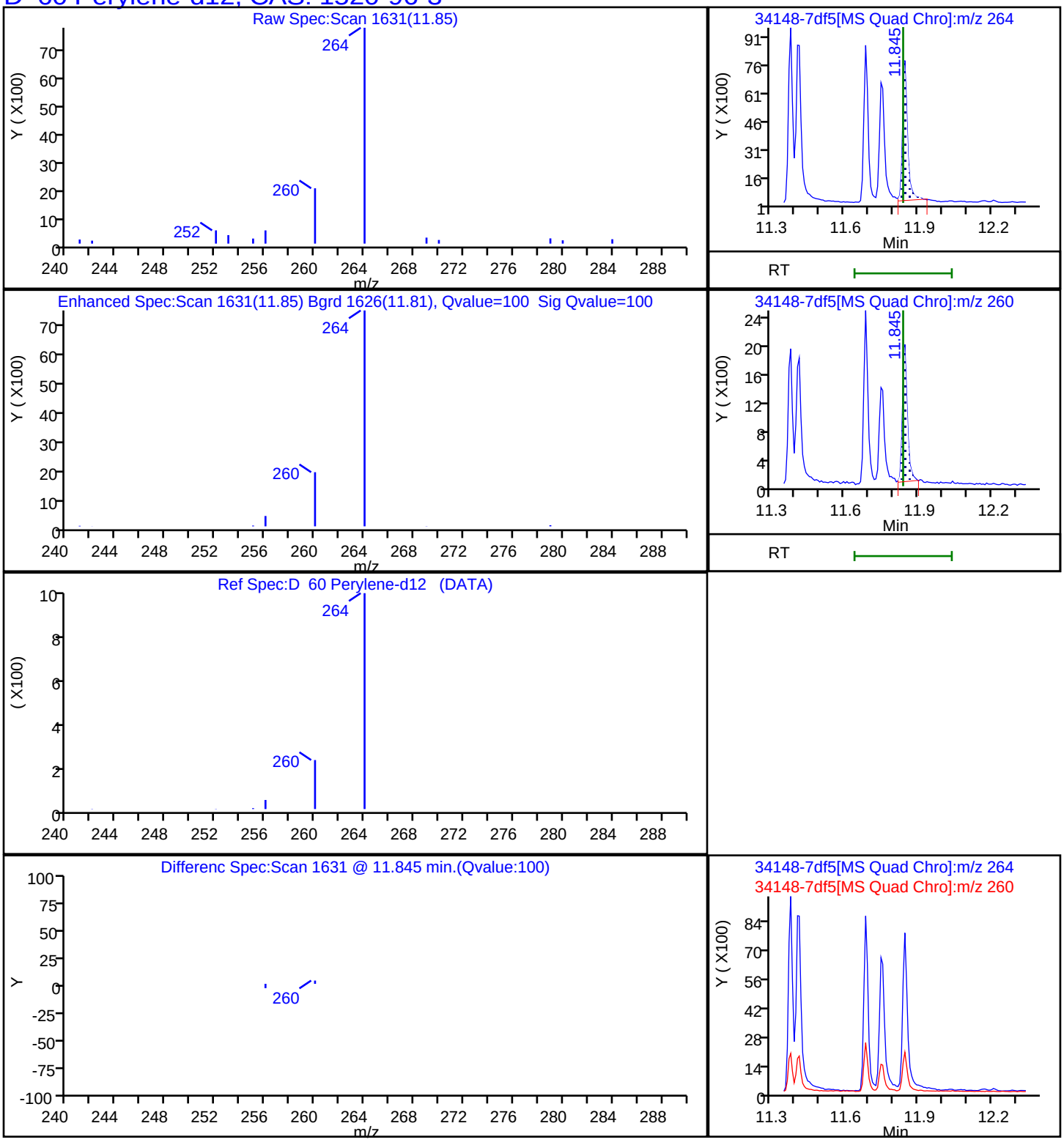
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 60 Perylene-d12, CAS: 1520-96-3



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Eurofins Knoxville

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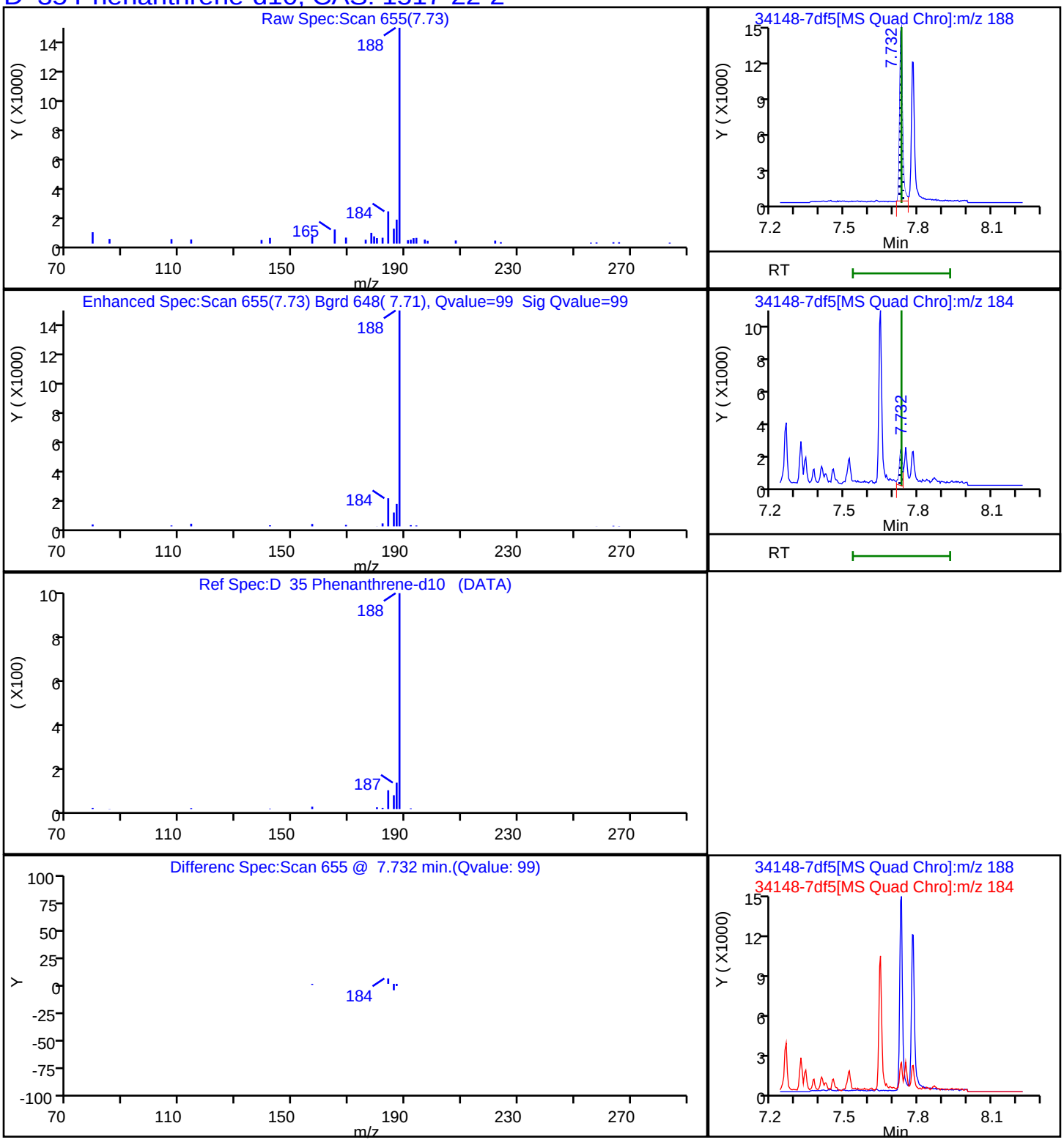
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D_35 Phenanthrene-d10, CAS: 1517-22-2



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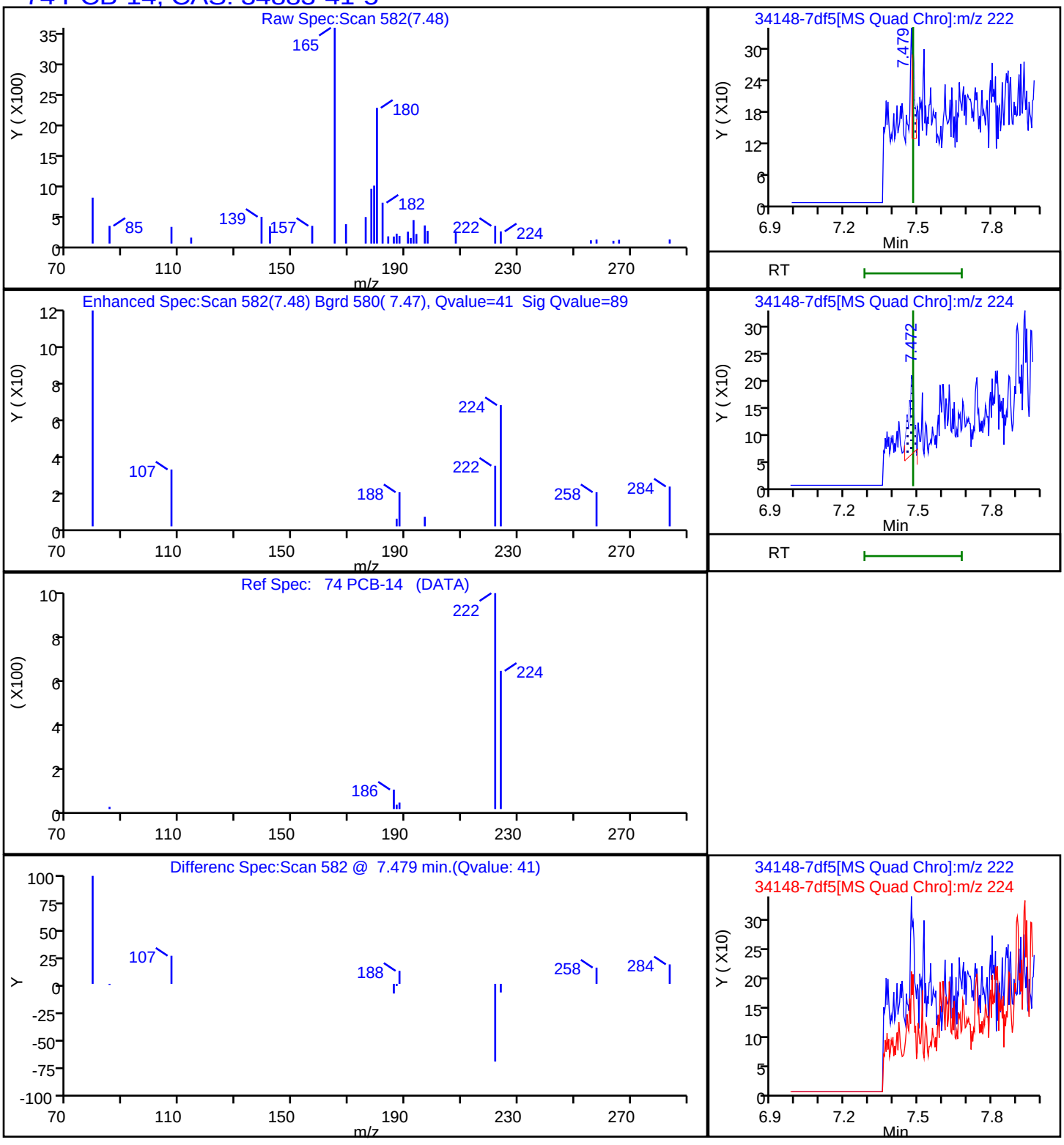
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7
Client ID:	1804576-852-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

74 PCB-14, CAS: 34883-41-5



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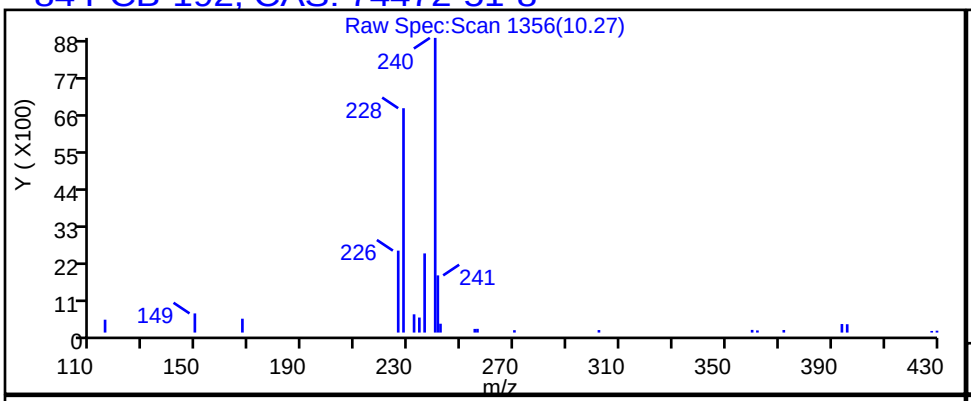
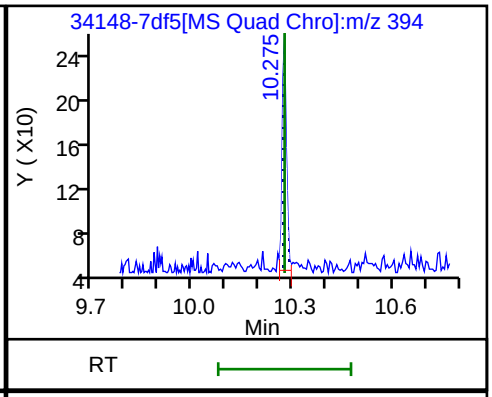
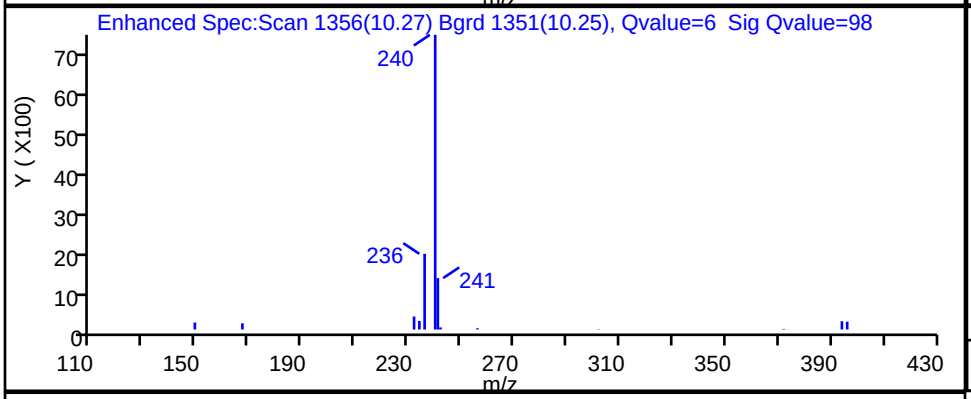
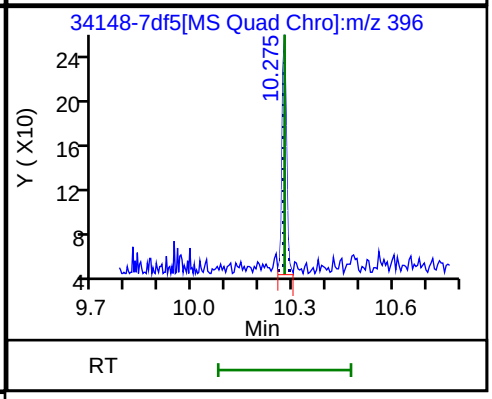
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7
Client ID:	1804576-852-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

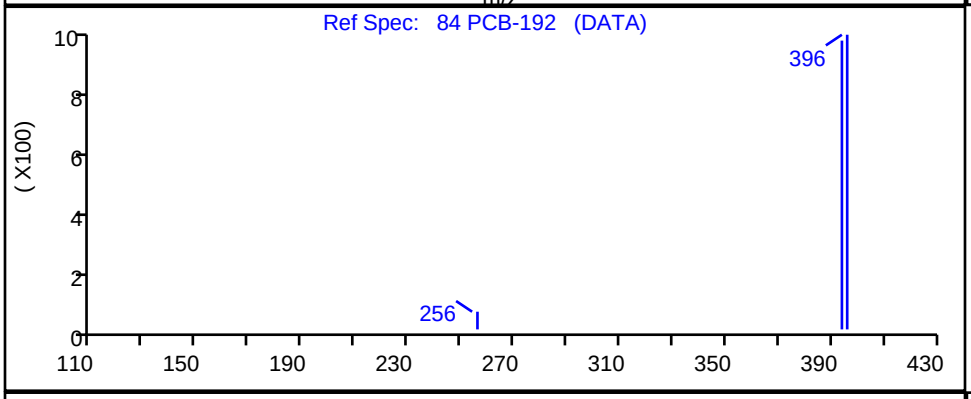
84 PCB-192, CAS: 74472-51-8

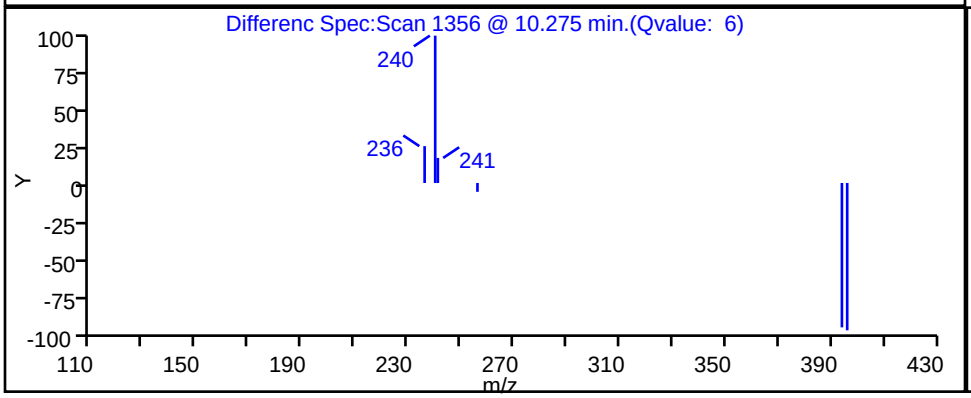


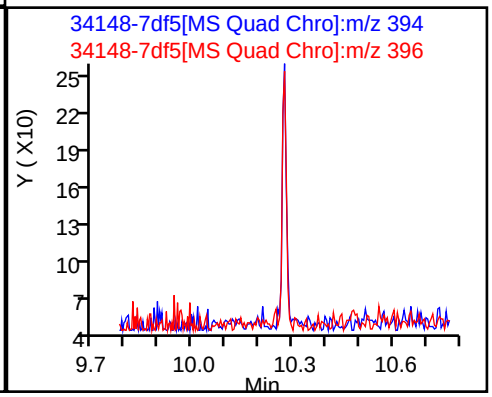












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Eurofins Knoxville

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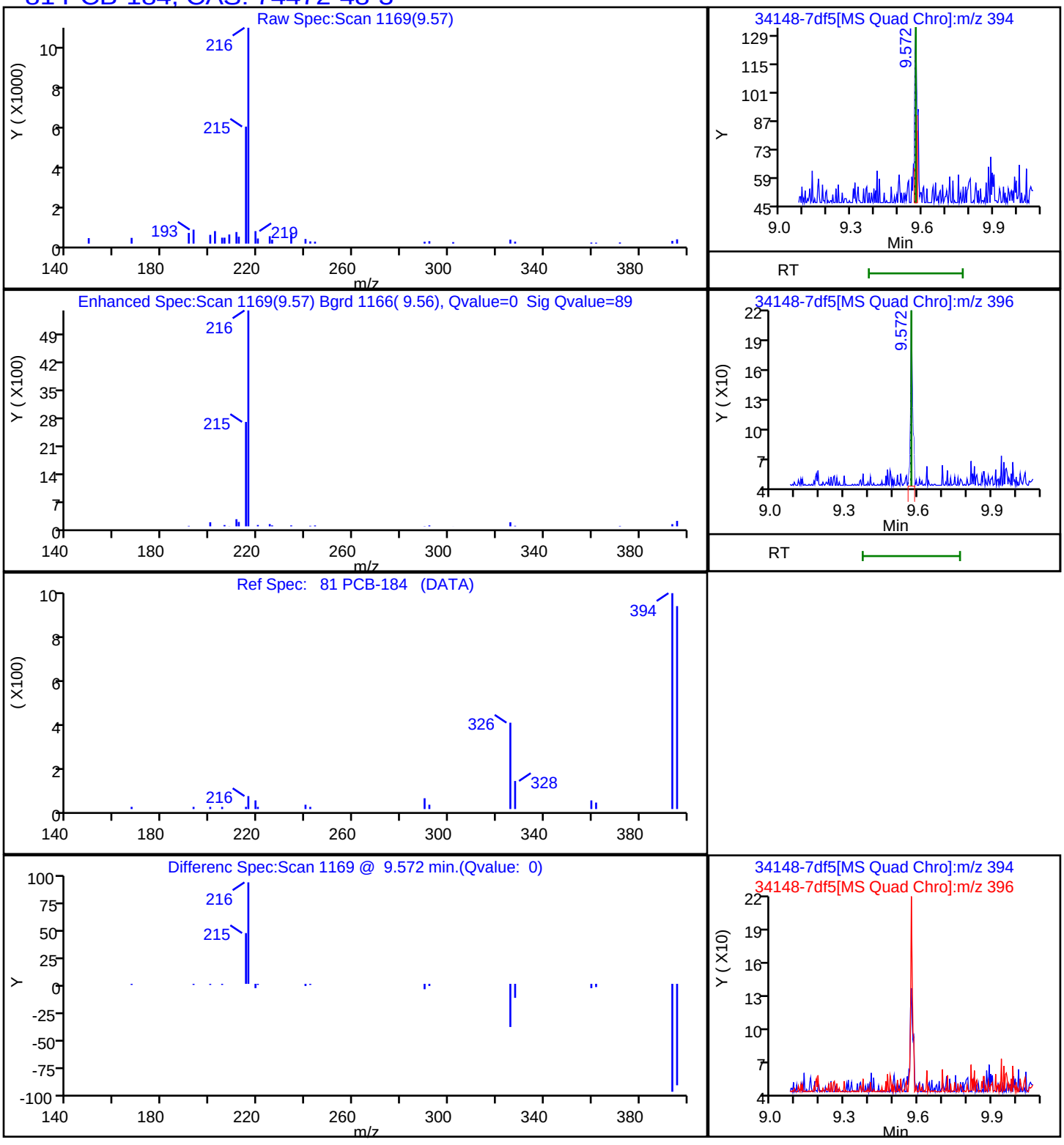
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7
Client ID:	1804576-852-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

81 PCB-184, CAS: 74472-48-3



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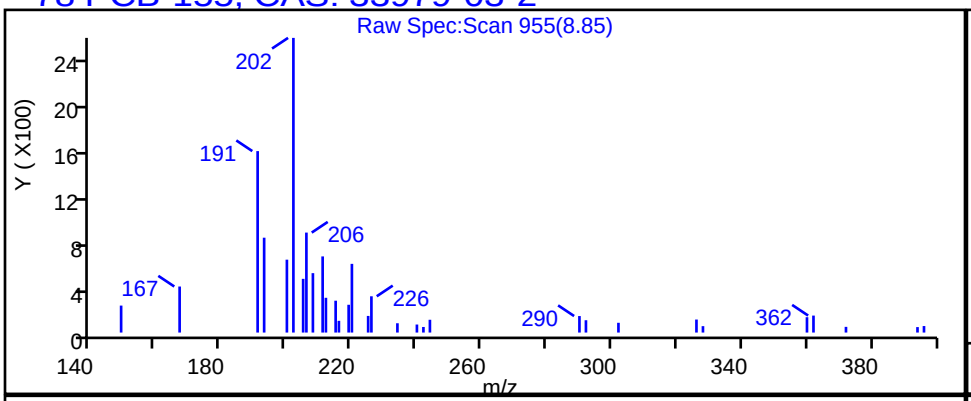
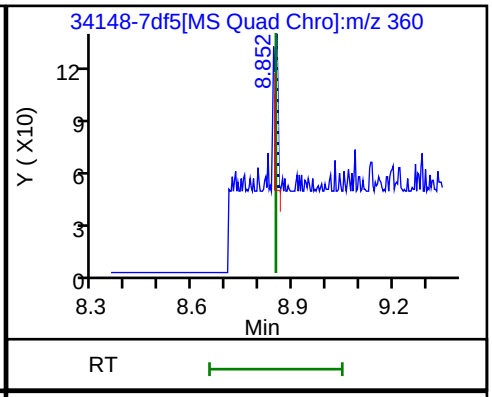
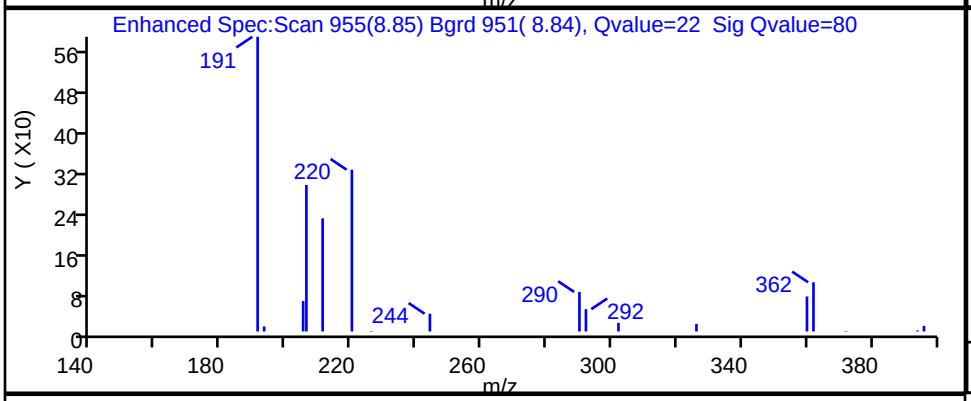
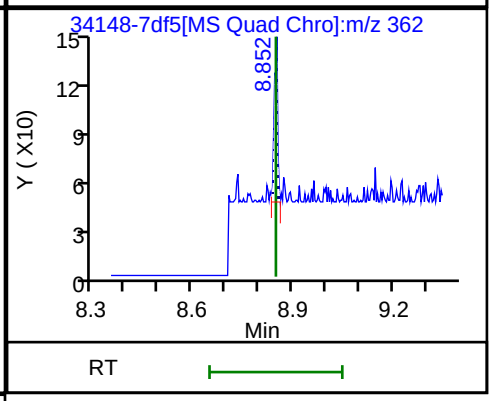
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7
Client ID:	1804576-852-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

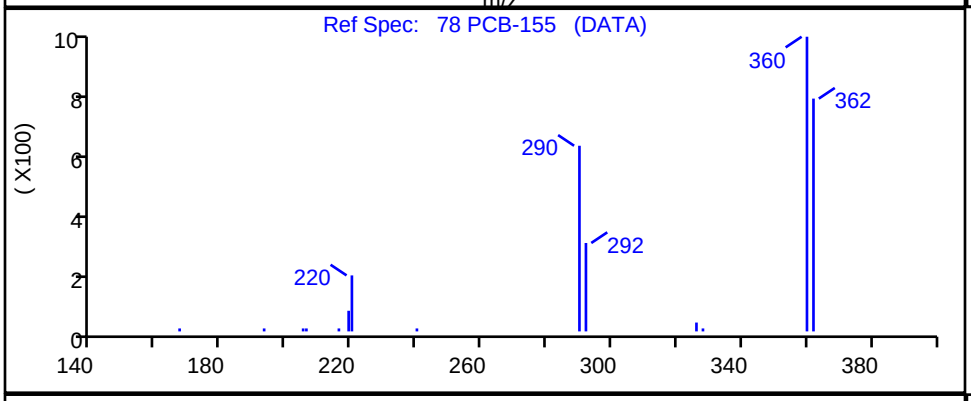
78 PCB-155, CAS: 33979-03-2

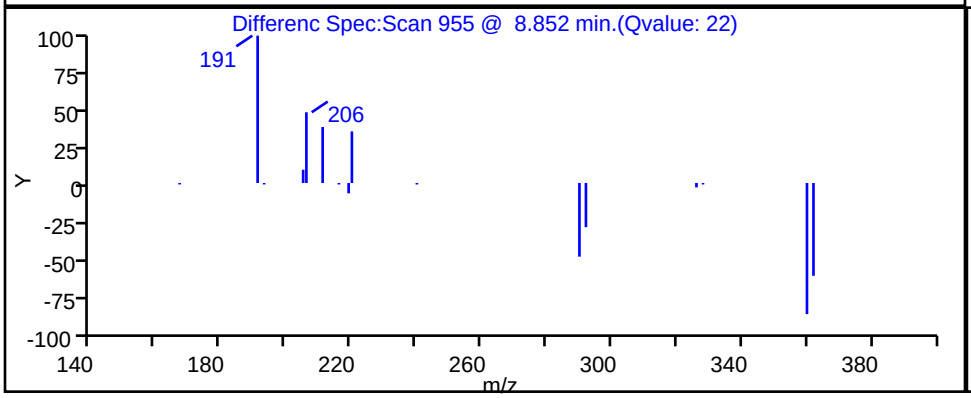


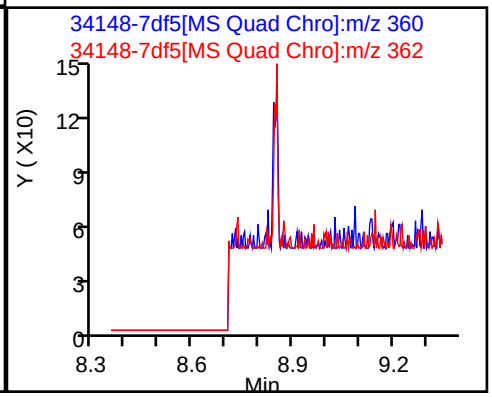












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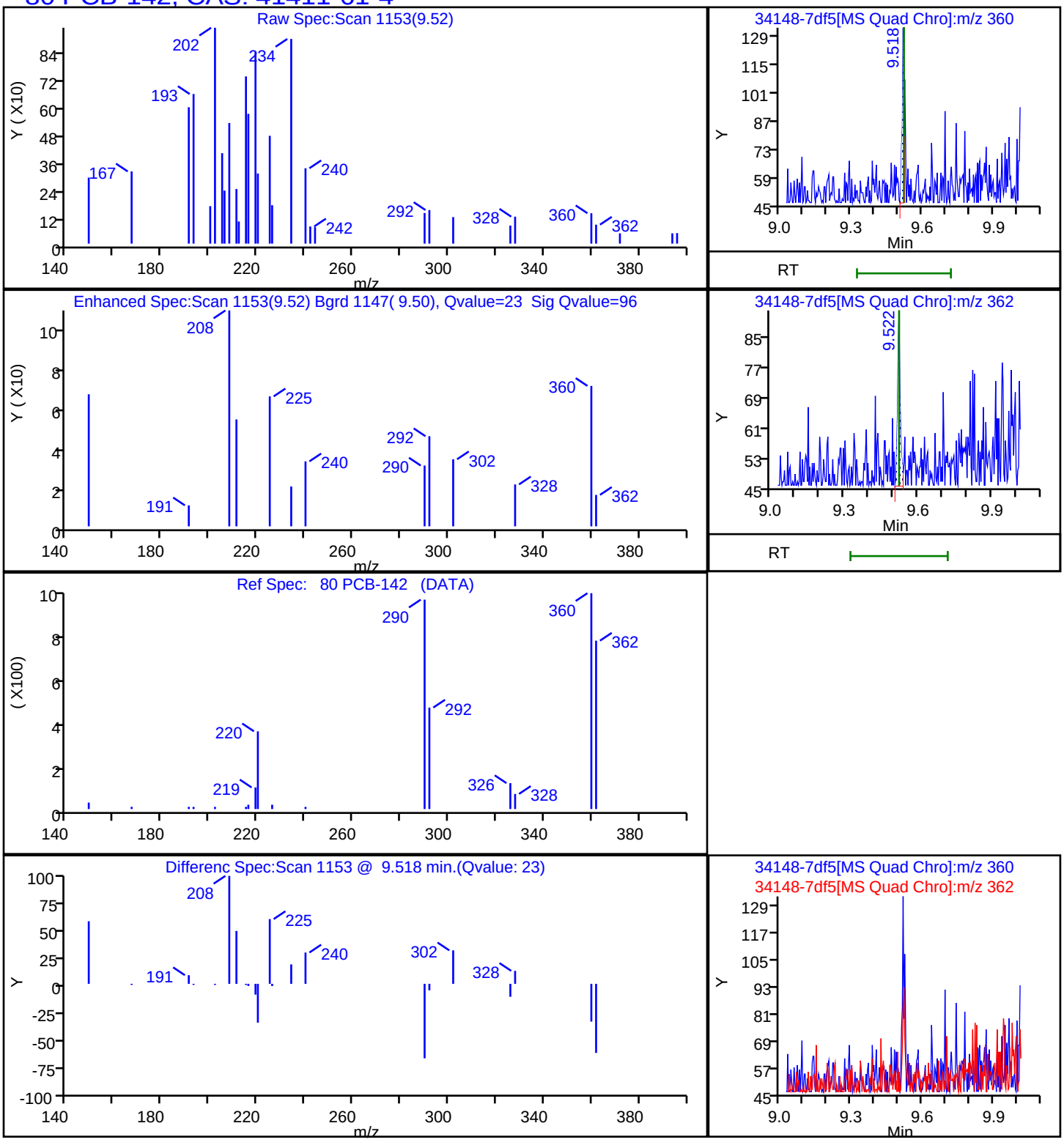
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

80 PCB-142, CAS: 41411-61-4



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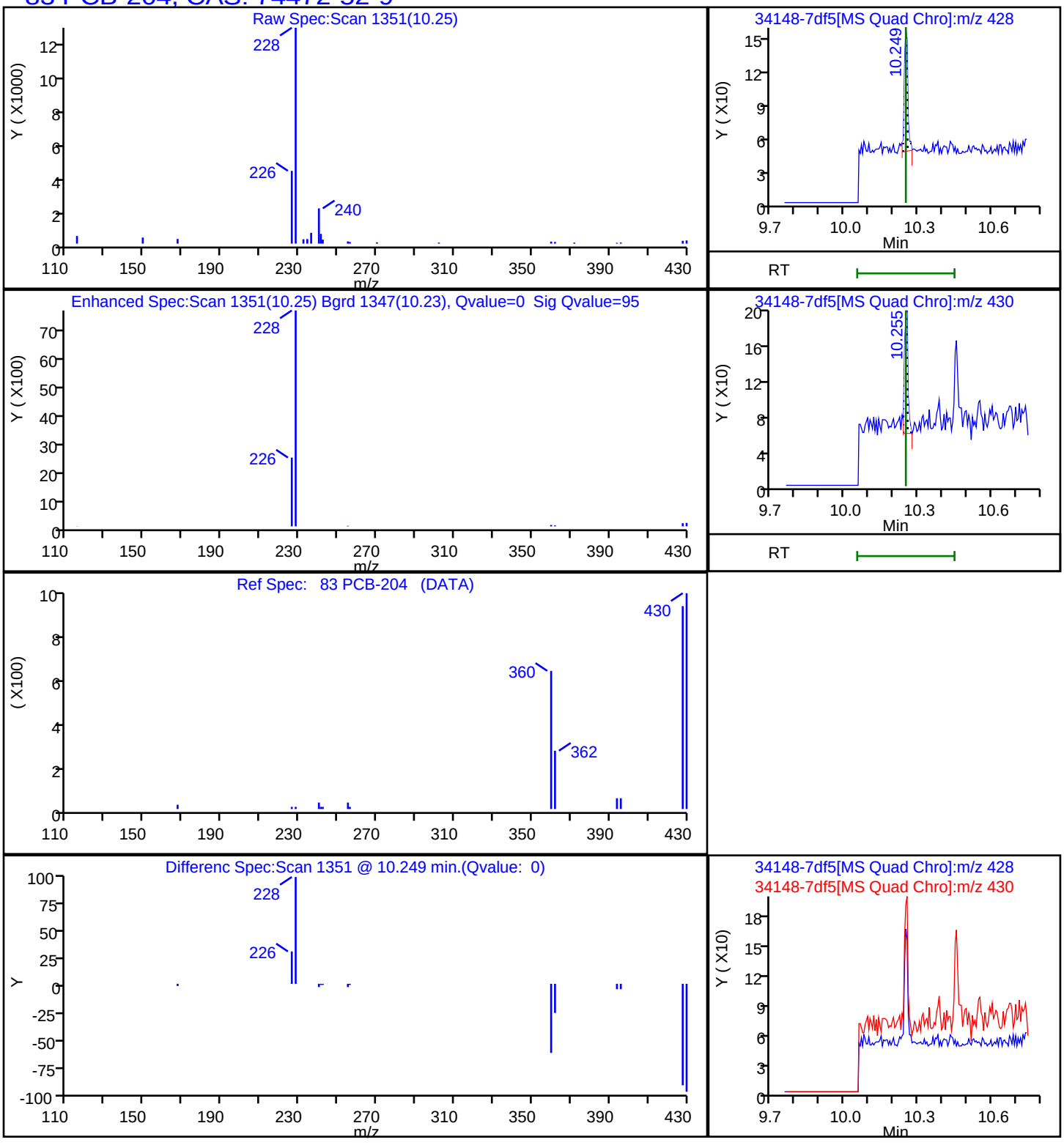
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

83 PCB-204, CAS: 74472-52-9



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Eurofins Knoxville

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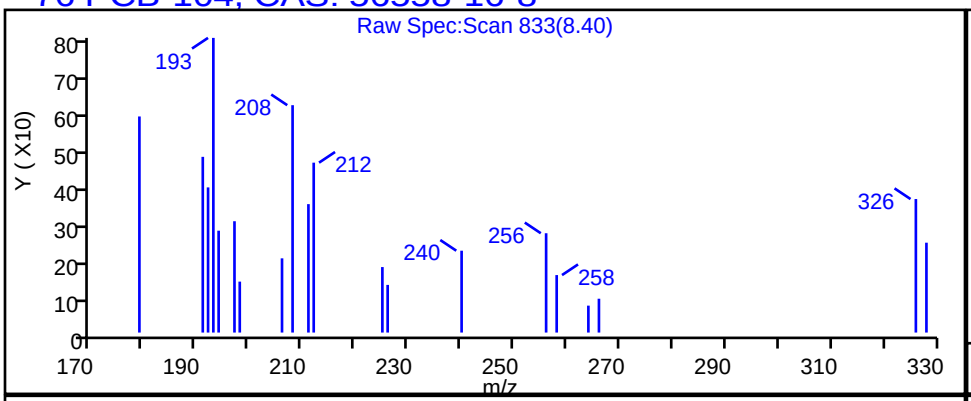
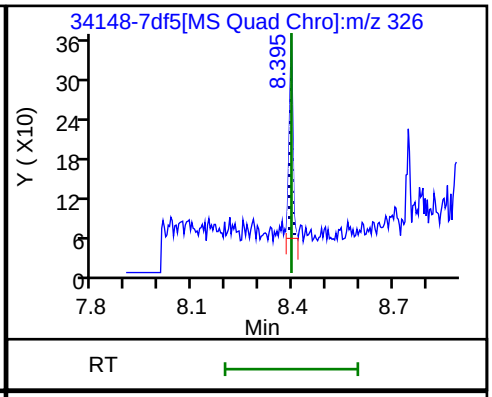
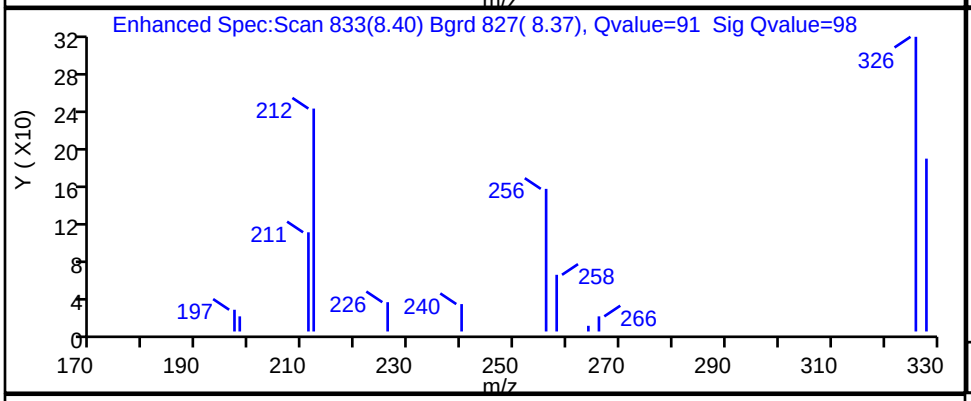
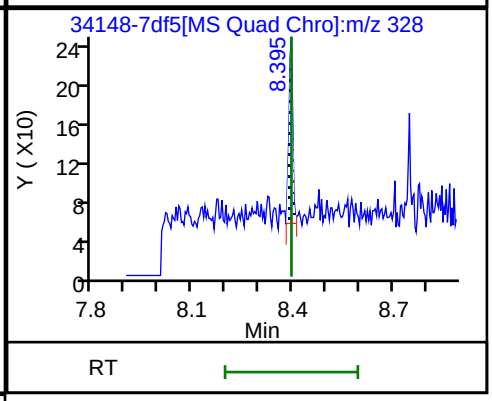
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

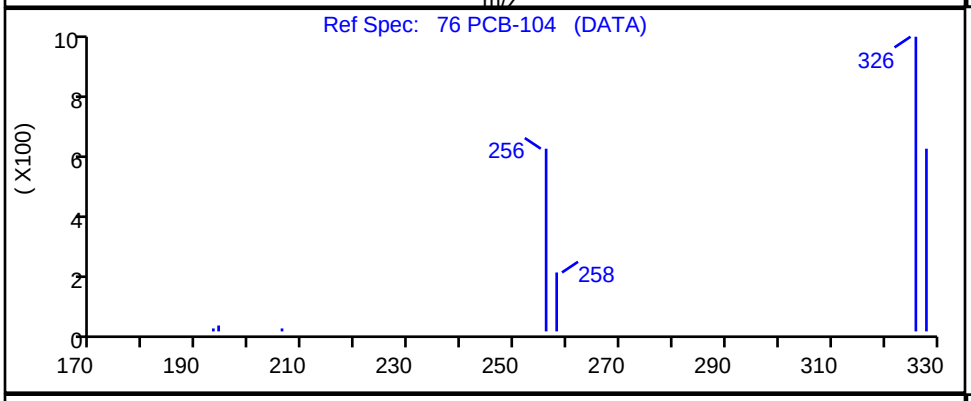
76 PCB-104, CAS: 56558-16-8

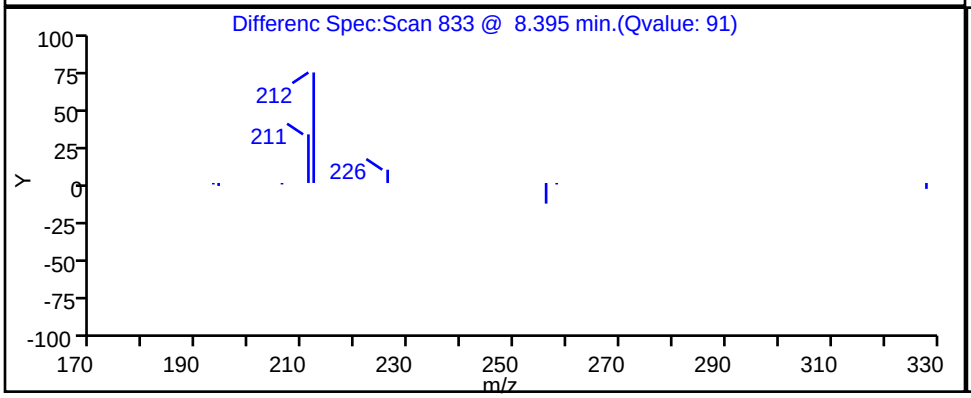


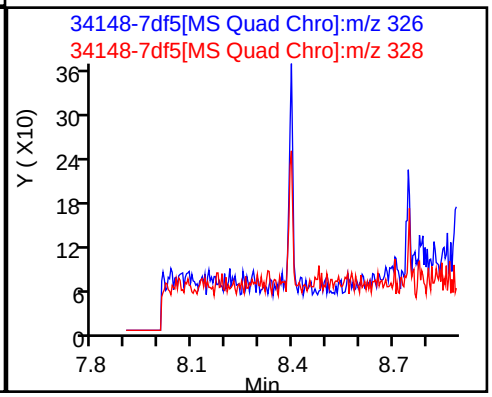












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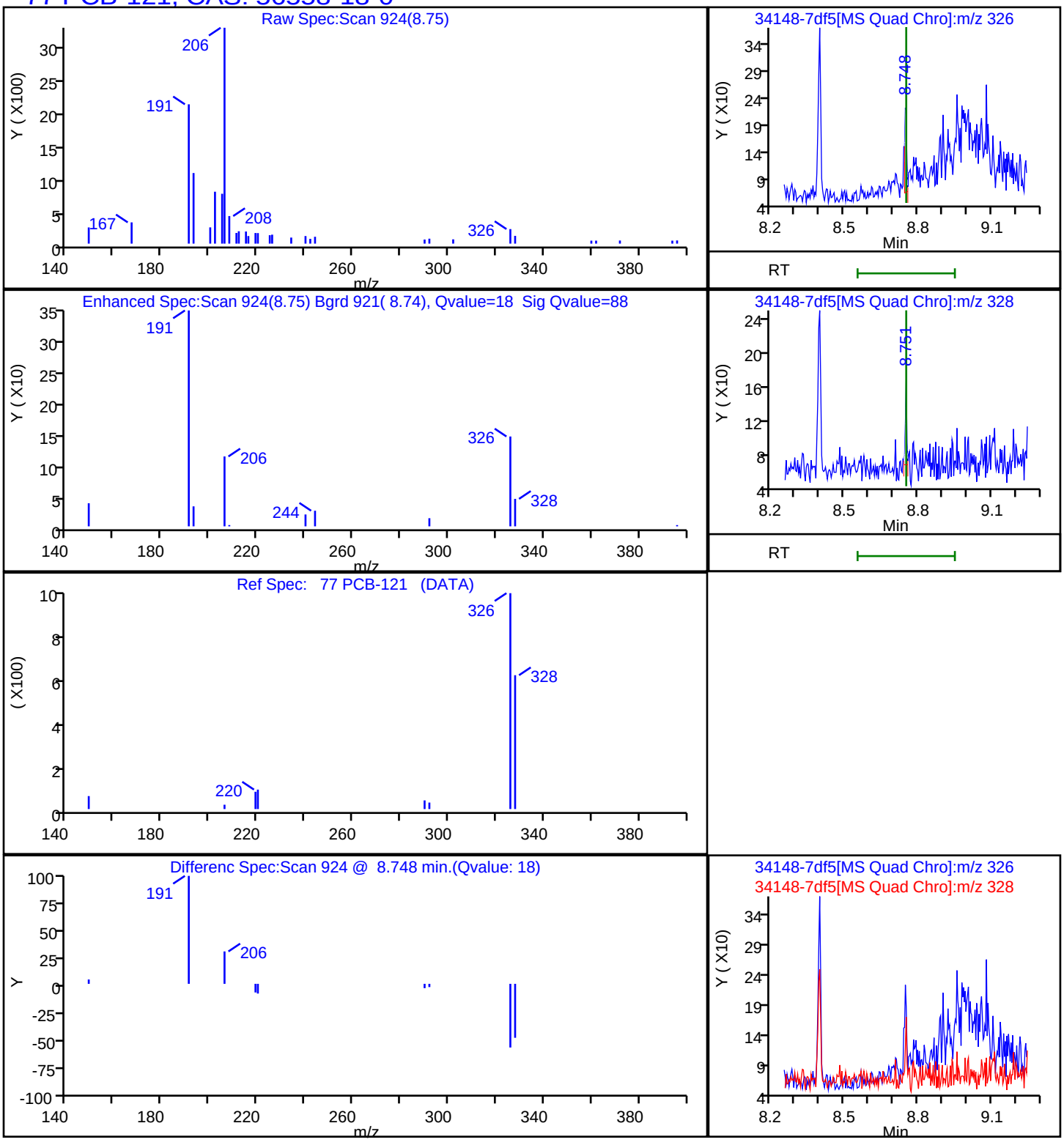
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

77 PCB-121, CAS: 56558-18-0



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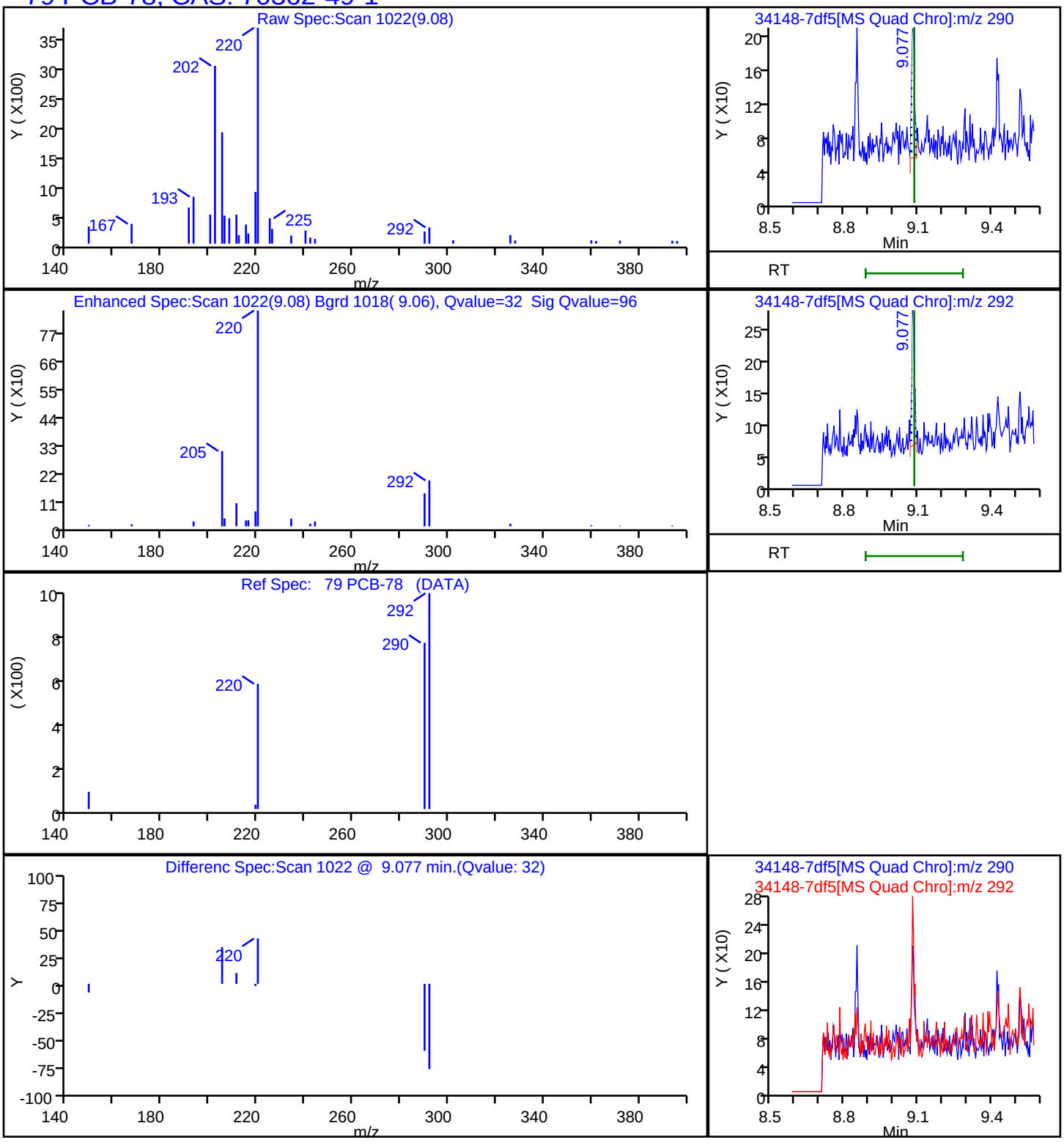
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D

Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7
Client ID:	1804576-852-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

79 PCB-78, CAS: 70362-49-1



Manual Integration/User Assign Peak Report

Eurofins Knoxville

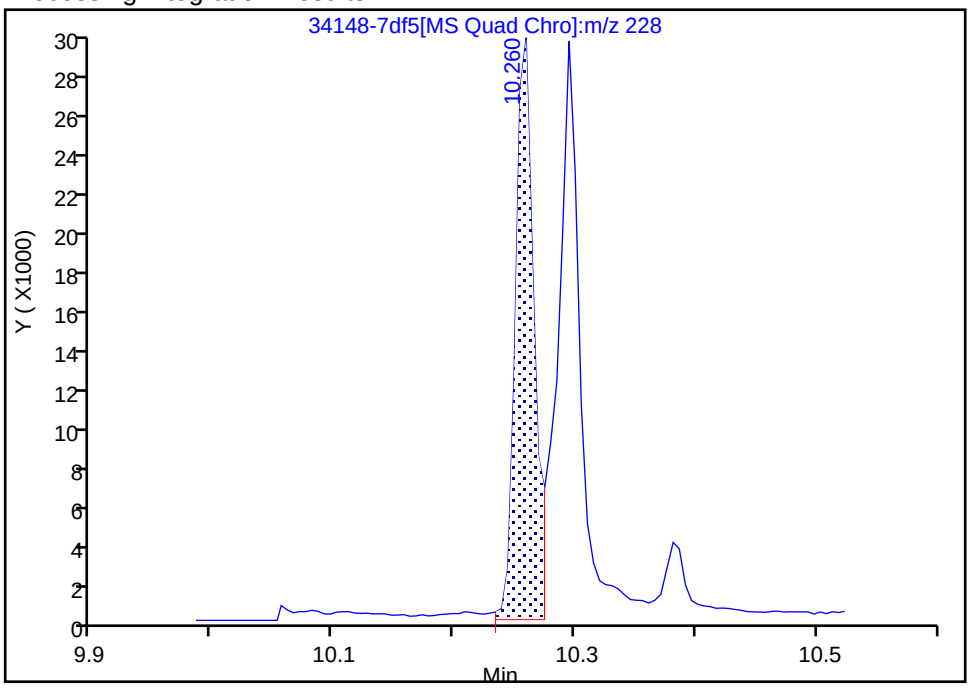
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D				
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

47 Benzo[a]anthracene, CAS: 56-55-3

Signal: 1

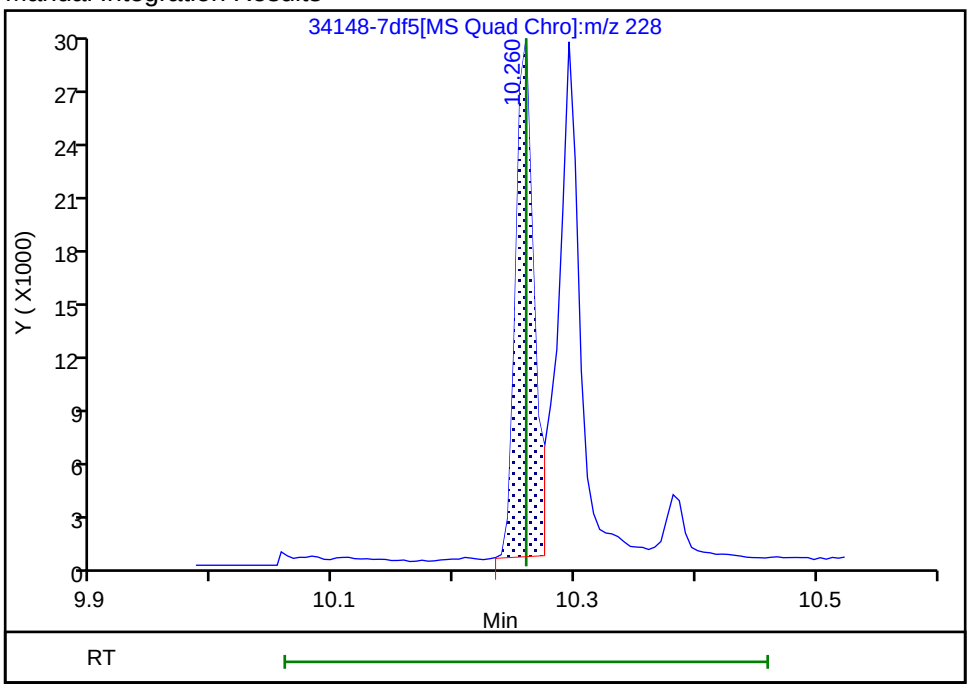
Processing Integration Results

RT: 10.26
Area: 32692
Amount: 0.189440
Amount Units: ug/ml



Manual Integration Results

RT: 10.26
Area: 31387
Amount: 0.187959
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 11:21:59 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

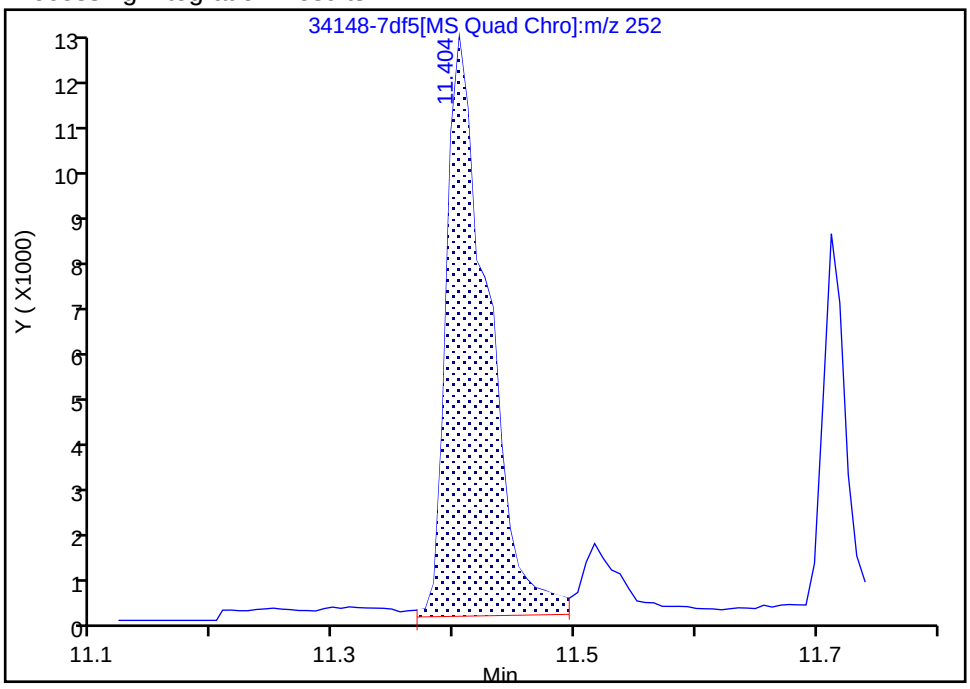
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D				
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

53 Benzo[b]fluoranthene, CAS: 205-99-2

Signal: 1

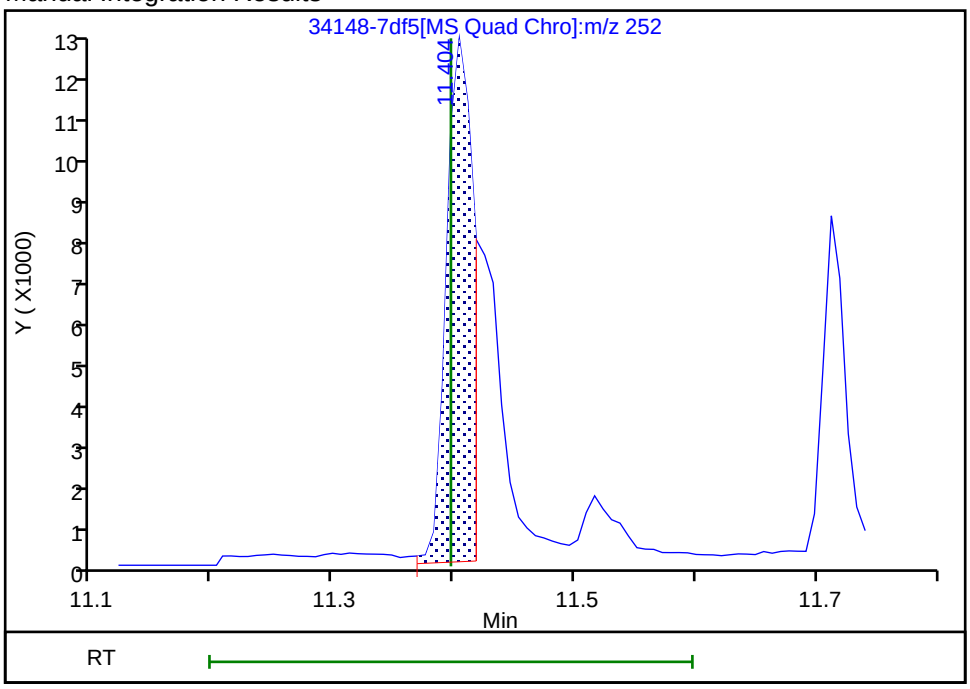
Processing Integration Results

RT: 11.40
Area: 29159
Amount: 0.153923
Amount Units: ug/ml



Manual Integration Results

RT: 11.40
Area: 19343
Amount: 0.102107
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 11:22:45 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

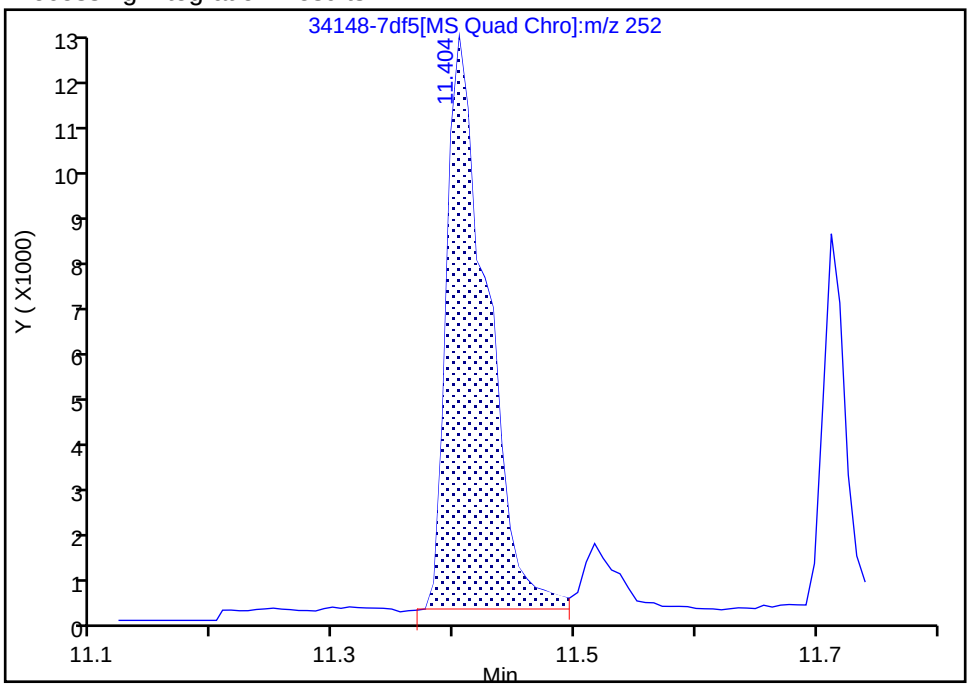
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D				
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

55 Benzo[k]fluoranthene, CAS: 207-08-9

Signal: 1

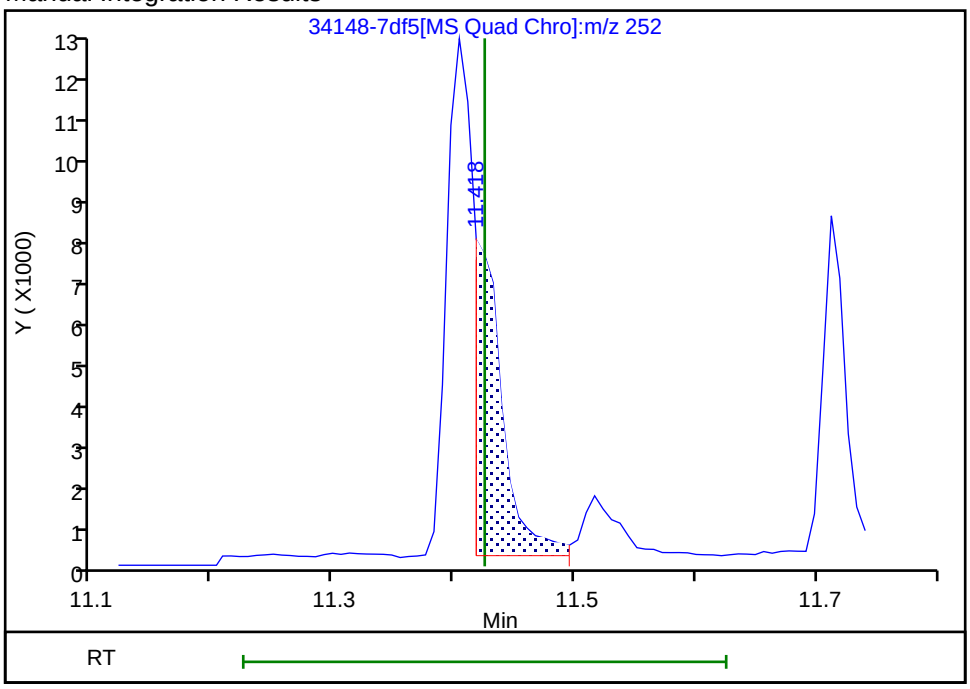
Processing Integration Results

RT: 11.40
Area: 28153
Amount: 0.142034
Amount Units: ug/ml



Manual Integration Results

RT: 11.42
Area: 12402
Amount: 0.062569
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 11:23:01 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

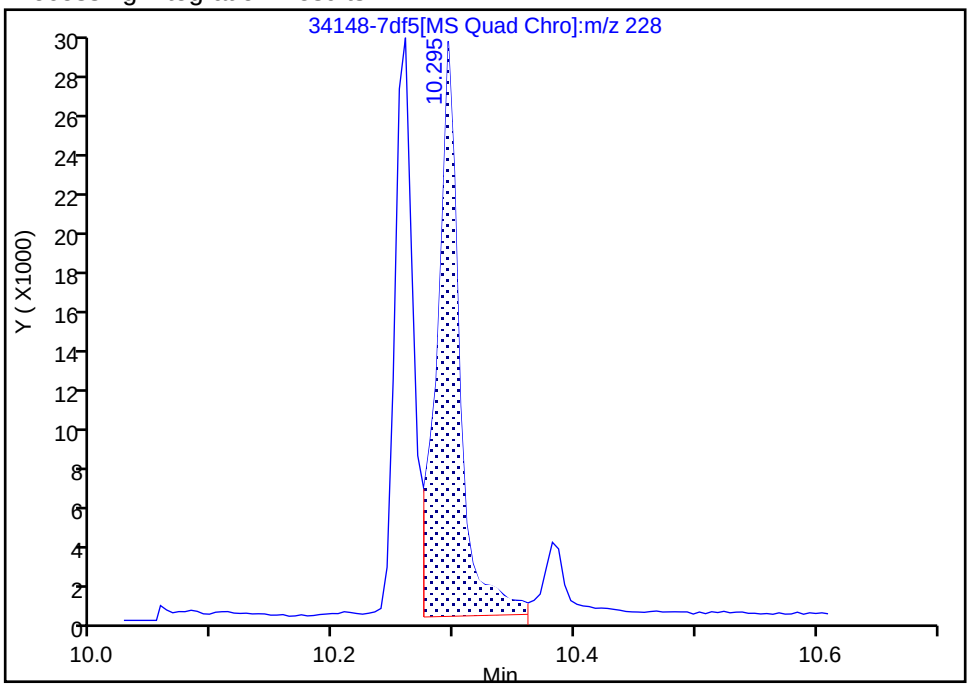
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D				
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

50 Chrysene, CAS: 218-01-9

Signal: 1

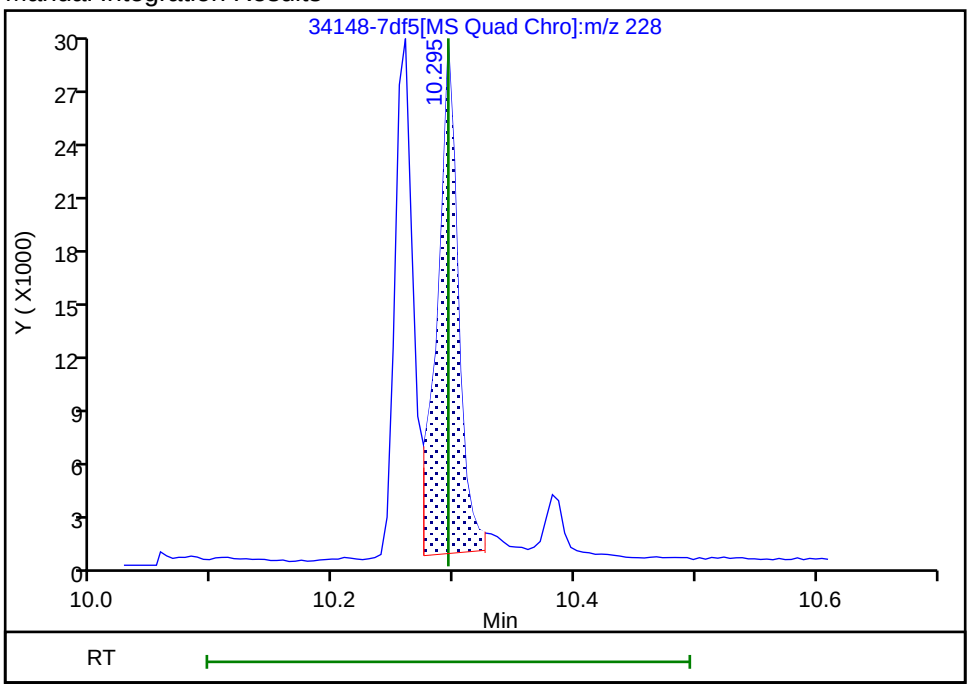
Processing Integration Results

RT: 10.30
Area: 38972
Amount: 0.208233
Amount Units: ug/ml



Manual Integration Results

RT: 10.30
Area: 35469
Amount: 0.189516
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 11:22:29 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

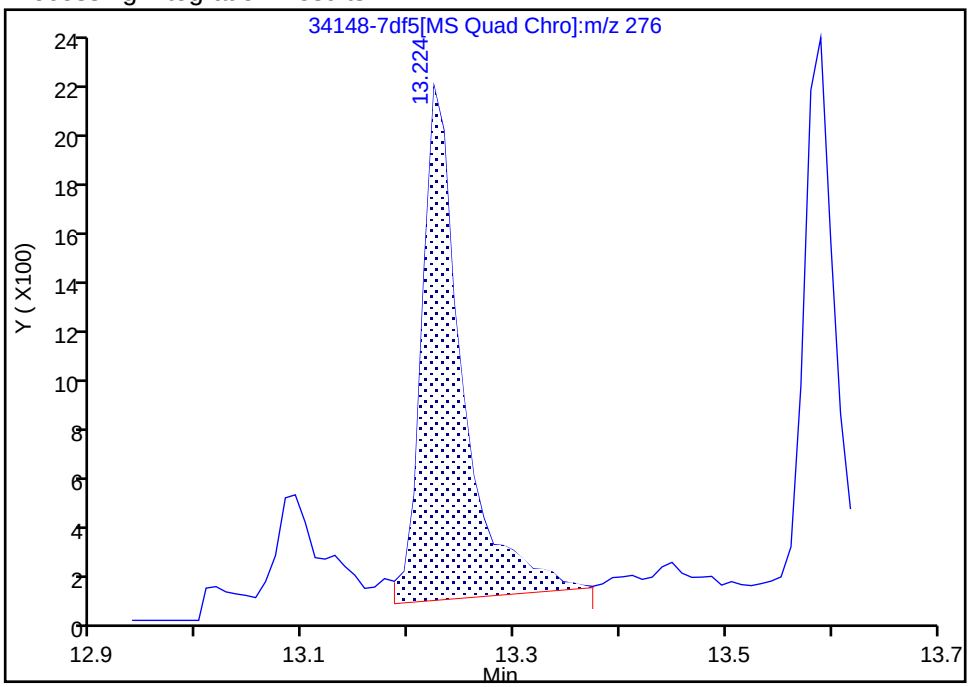
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D				
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

65 Indeno[1,2,3-cd]pyrene, CAS: 193-39-5

Signal: 1

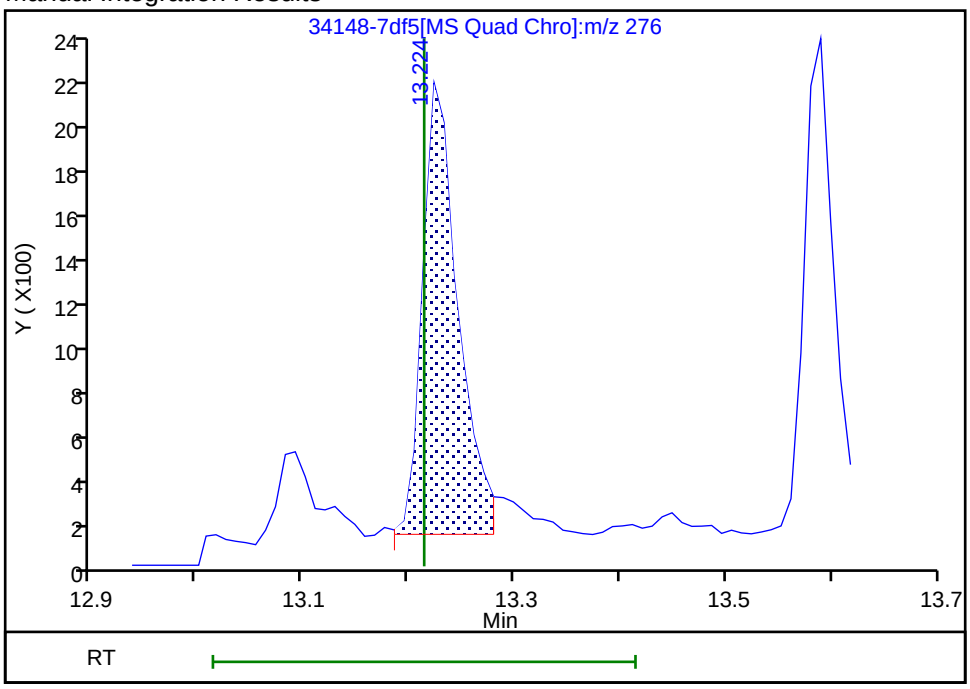
Processing Integration Results

RT: 13.22
Area: 5450
Amount: 0.028823
Amount Units: ug/ml



Manual Integration Results

RT: 13.22
Area: 4675
Amount: 0.024724
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 11:23:45 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

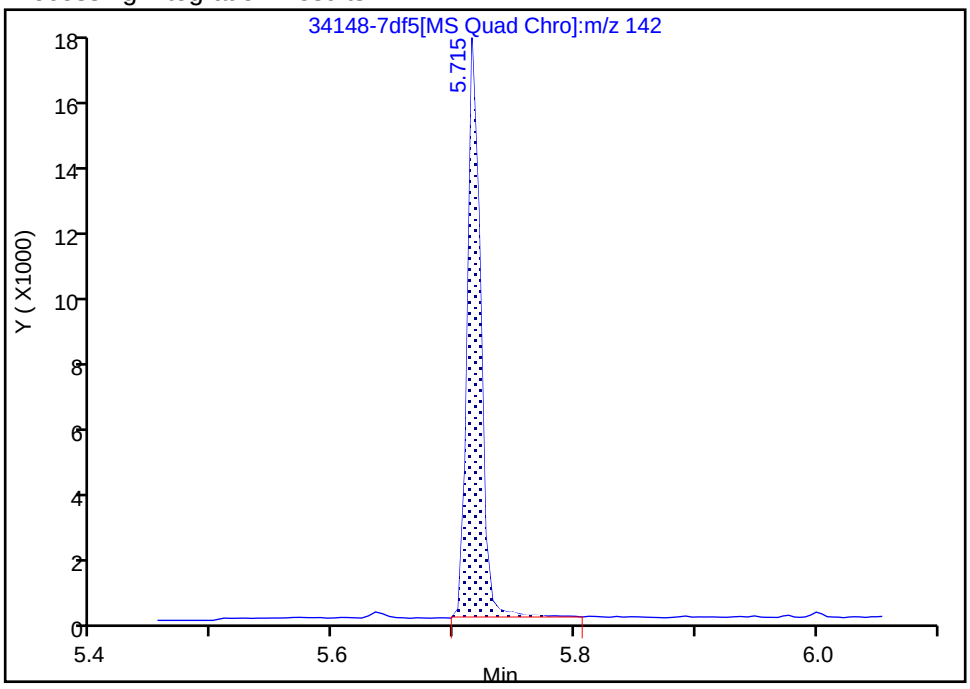
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D				
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

18 1-Methylnaphthalene, CAS: 90-12-0

Signal: 1

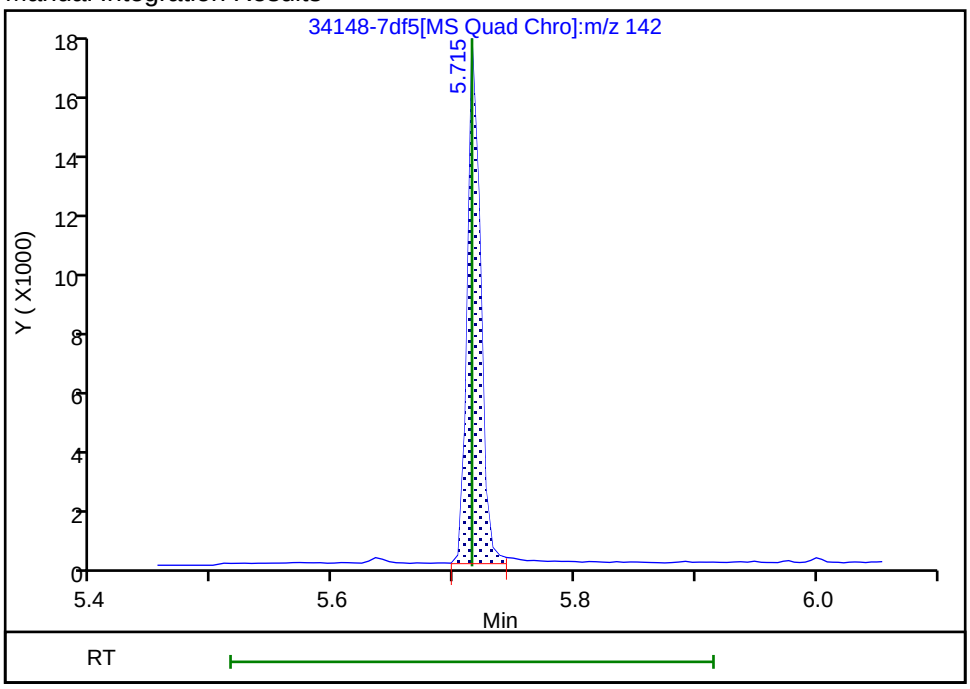
Processing Integration Results

RT: 5.71
Area: 13127
Amount: 0.211535
Amount Units: ug/ml



Manual Integration Results

RT: 5.71
Area: 12835
Amount: 0.206830
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 11:20:47 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

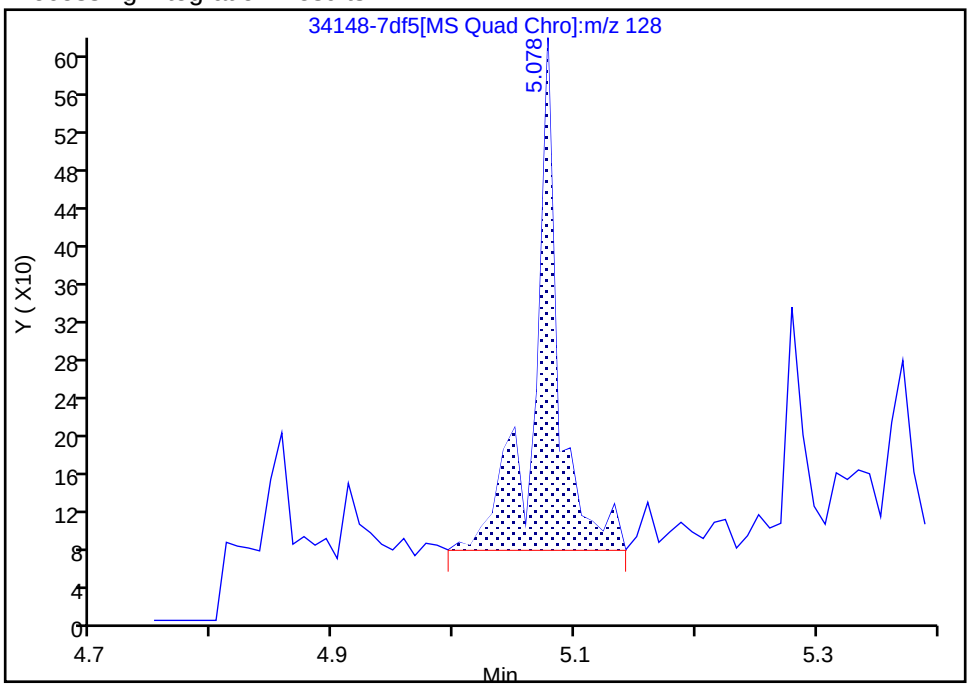
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D				
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

11 Naphthalene, CAS: 91-20-3

Signal: 1

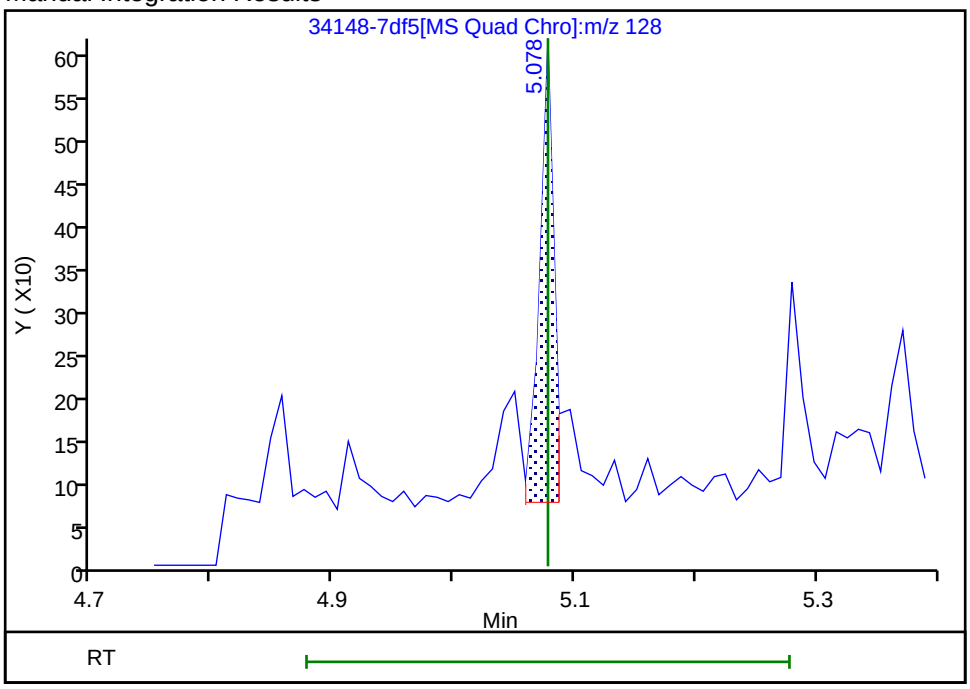
Processing Integration Results

RT: 5.08
Area: 758
Amount: 0.008611
Amount Units: ug/ml



Manual Integration Results

RT: 5.08
Area: 457
Amount: 0.005191
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 11:20:21 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

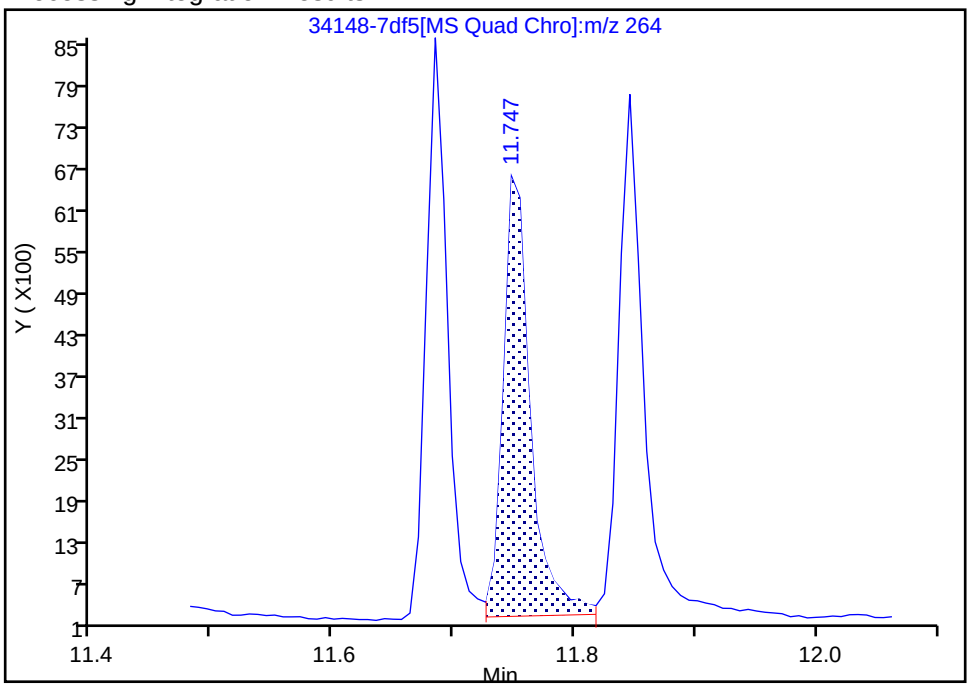
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D				
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 58 Benzo(a)pyrene-d12, CAS: 63466-71-7

Signal: 1

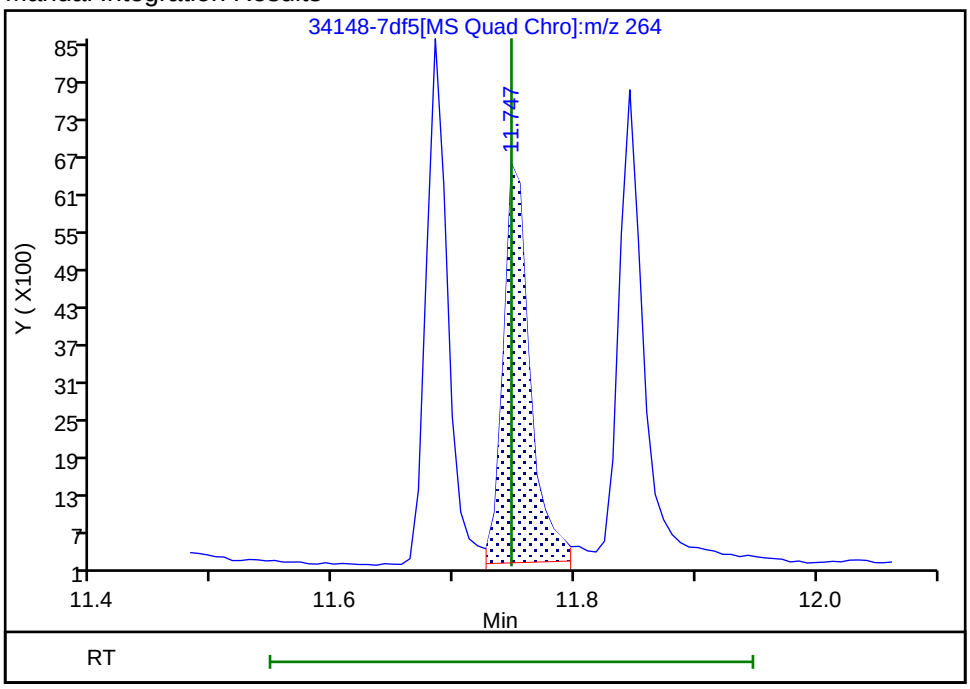
Processing Integration Results

RT: 11.75
Area: 10062
Amount: 0.086049
Amount Units: ug/ml



Manual Integration Results

RT: 11.75
Area: 9849
Amount: 0.084227
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 11:23:14 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

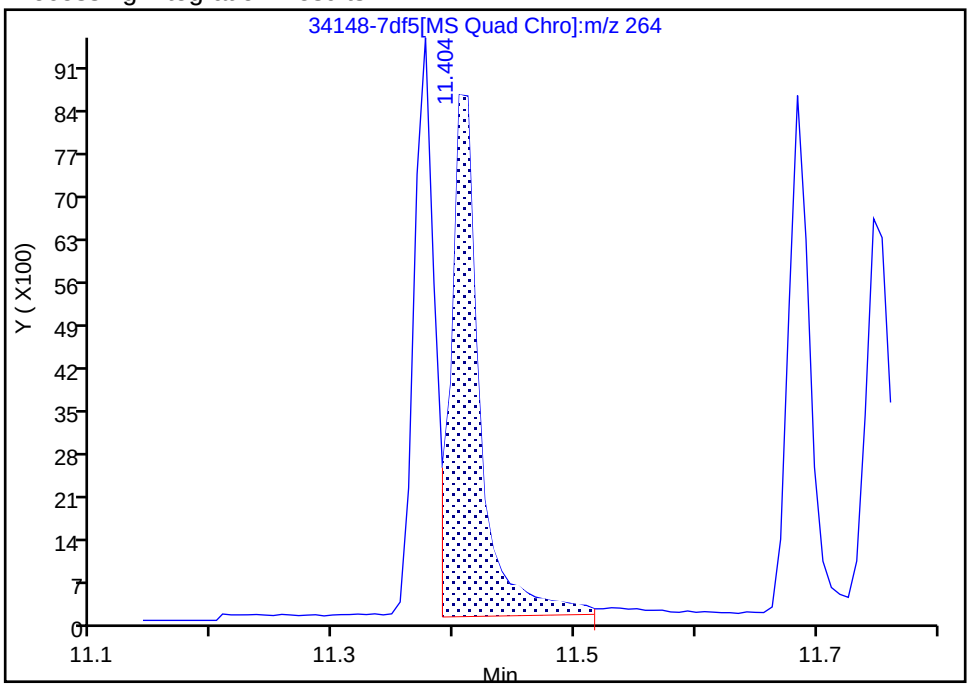
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D				
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 54 Benzo(k)fluoranthene-d12, CAS: 93952-01-3

Signal: 1

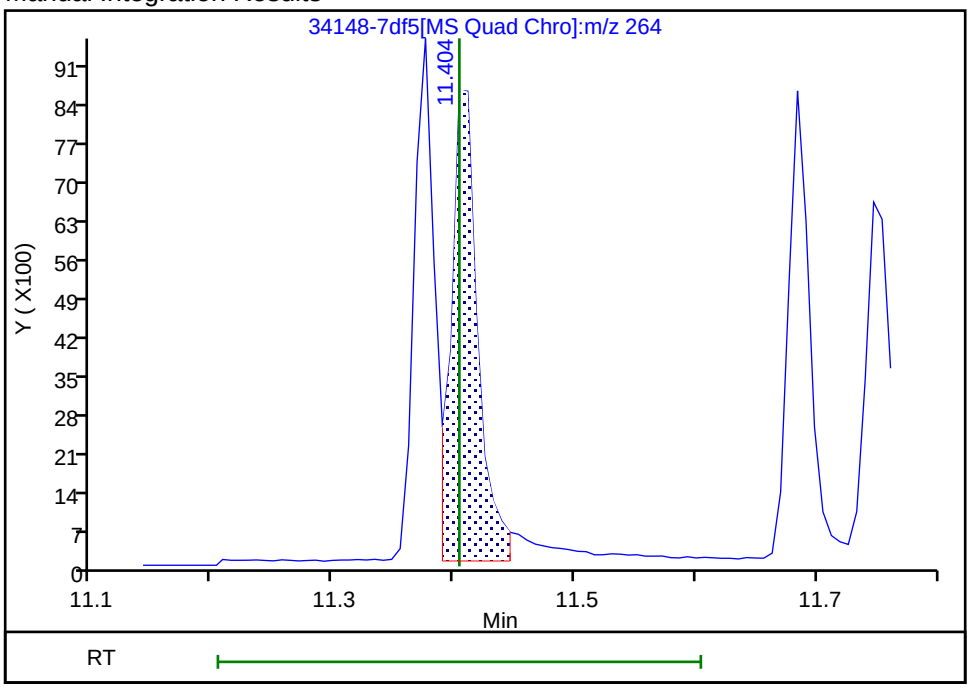
Processing Integration Results

RT: 11.40
Area: 14595
Amount: 0.093177
Amount Units: ug/ml



Manual Integration Results

RT: 11.40
Area: 13532
Amount: 0.086390
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 11:22:52 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Eurofins Knoxville

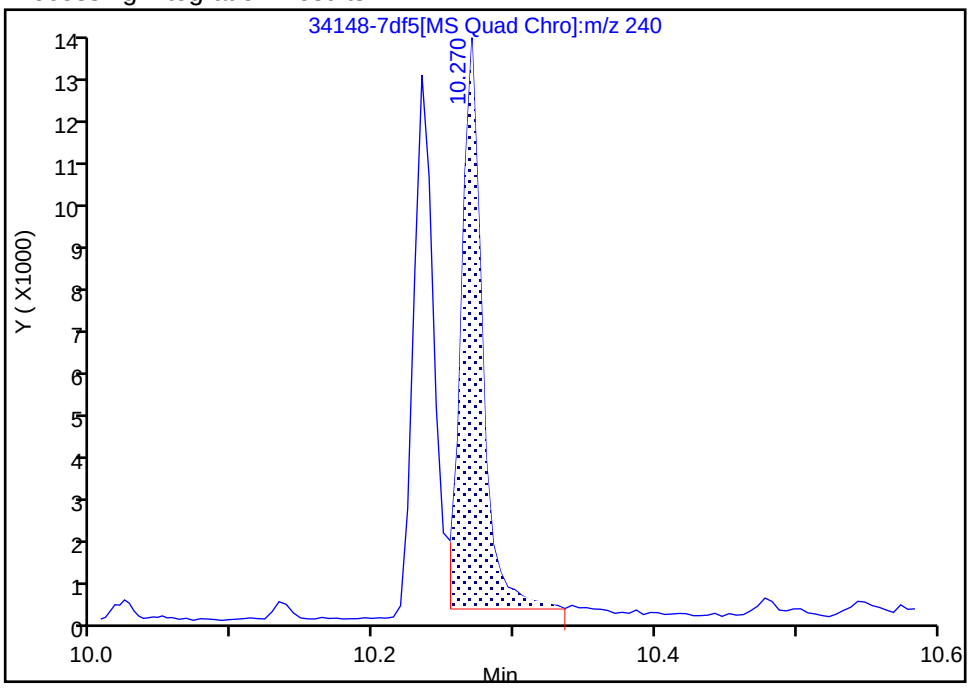
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D				
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 48 Chrysene-d12, CAS: 1719-03-5

Signal: 1

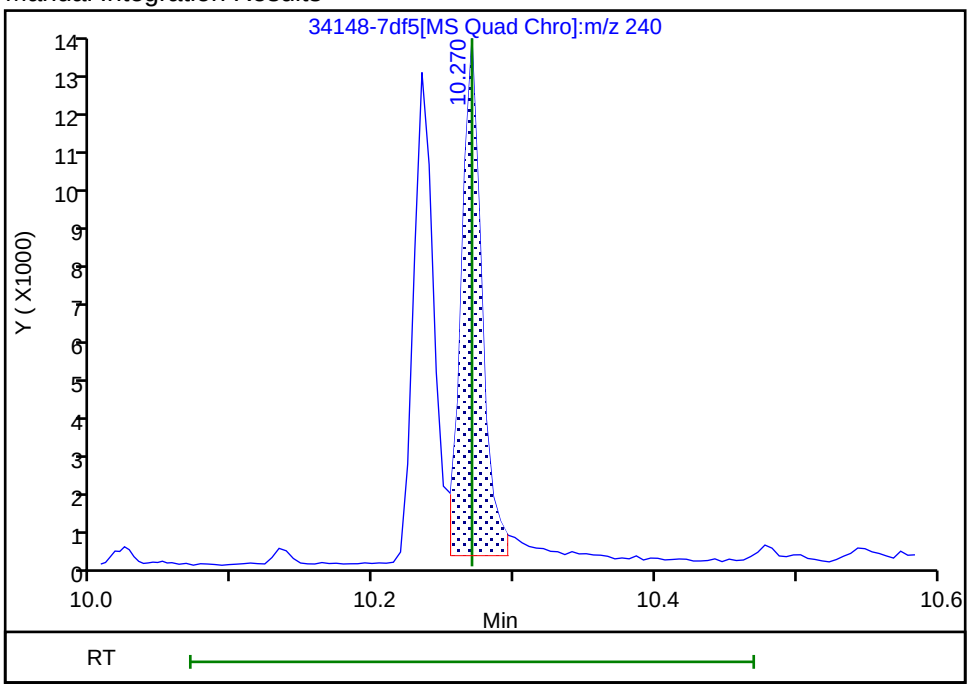
Processing Integration Results

RT: 10.27
Area: 13289
Amount: 0.079347
Amount Units: ug/ml



Manual Integration Results

RT: 10.27
Area: 12859
Amount: 0.076780
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 11:22:09 -05:00:00 (UTC)
Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

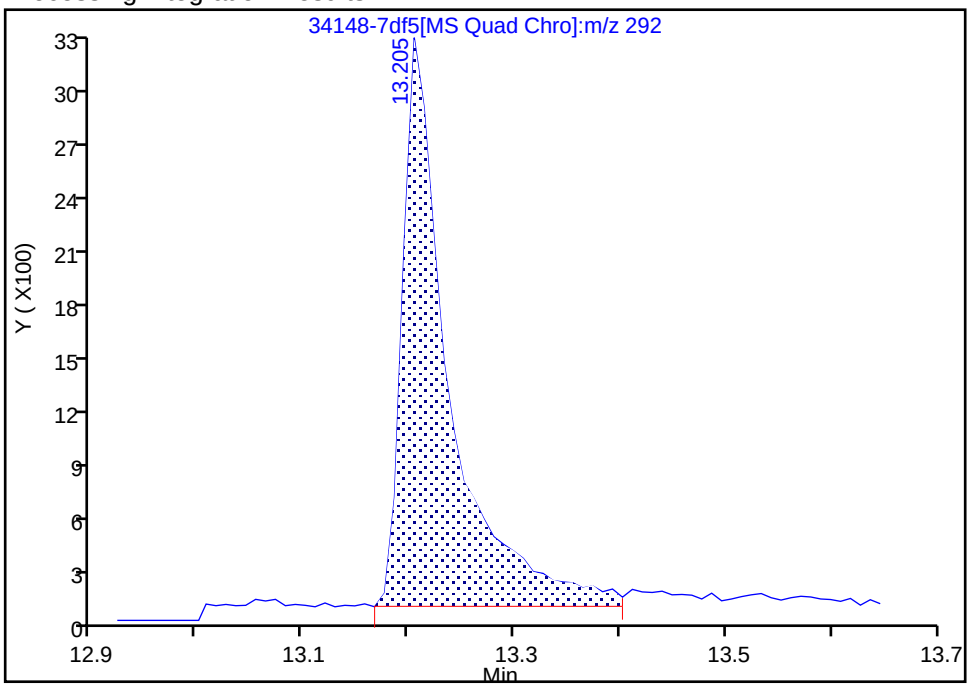
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D				
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 63 Dibenz(a,h)anthracene-d14, CAS: 13250-98-1

Signal: 1

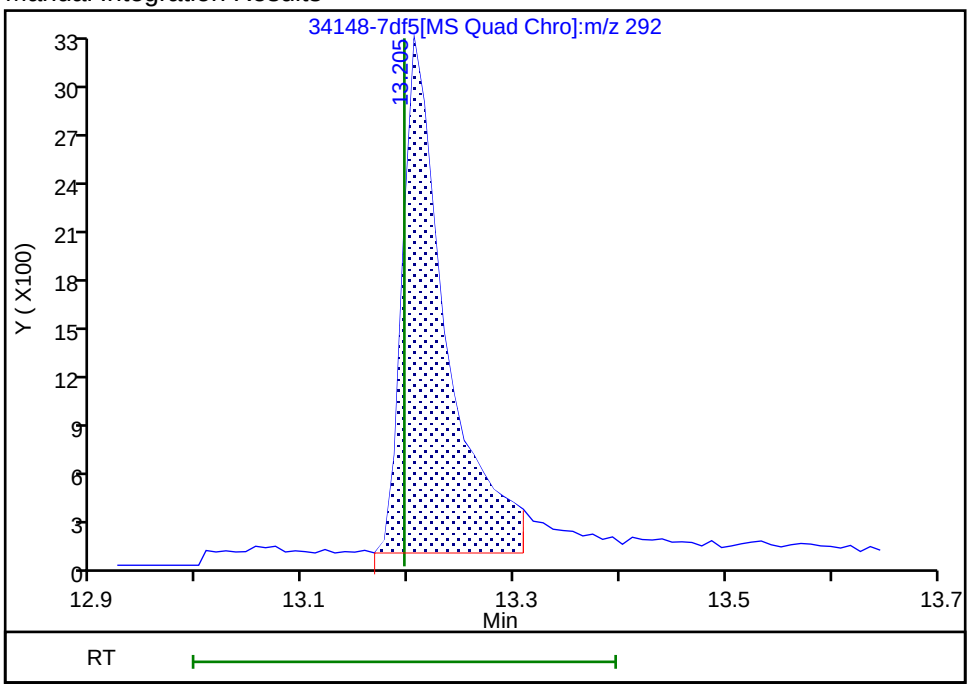
Processing Integration Results

RT: 13.21
Area: 9729
Amount: 0.085599
Amount Units: ug/ml



Manual Integration Results

RT: 13.21
Area: 9028
Amount: 0.079431
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 11:23:28 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

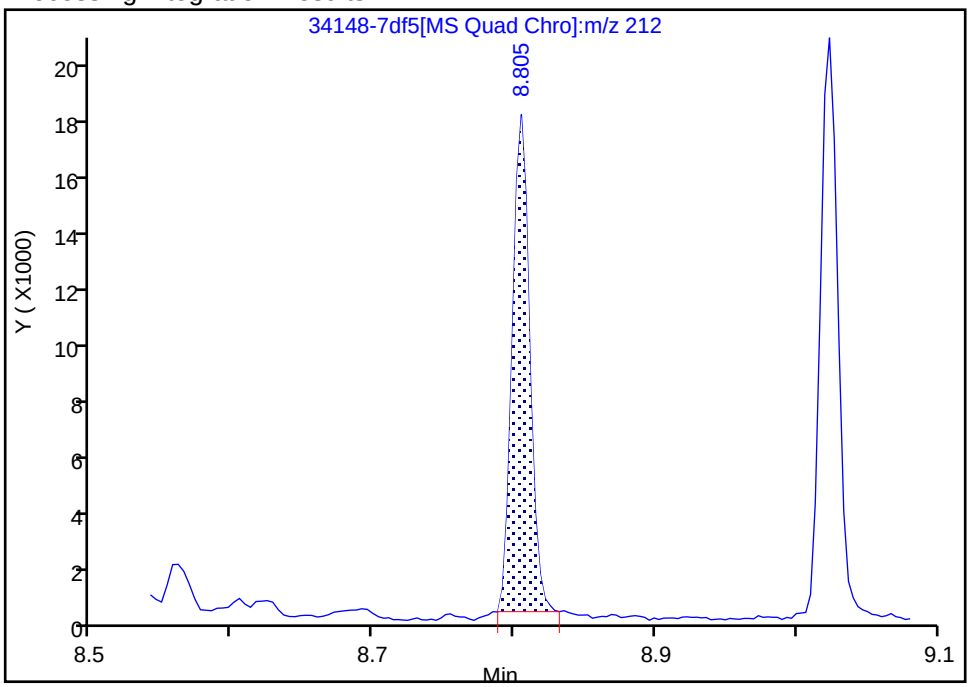
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D				
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 41 Fluoranthene-d10, CAS: 93951-69-0

Signal: 1

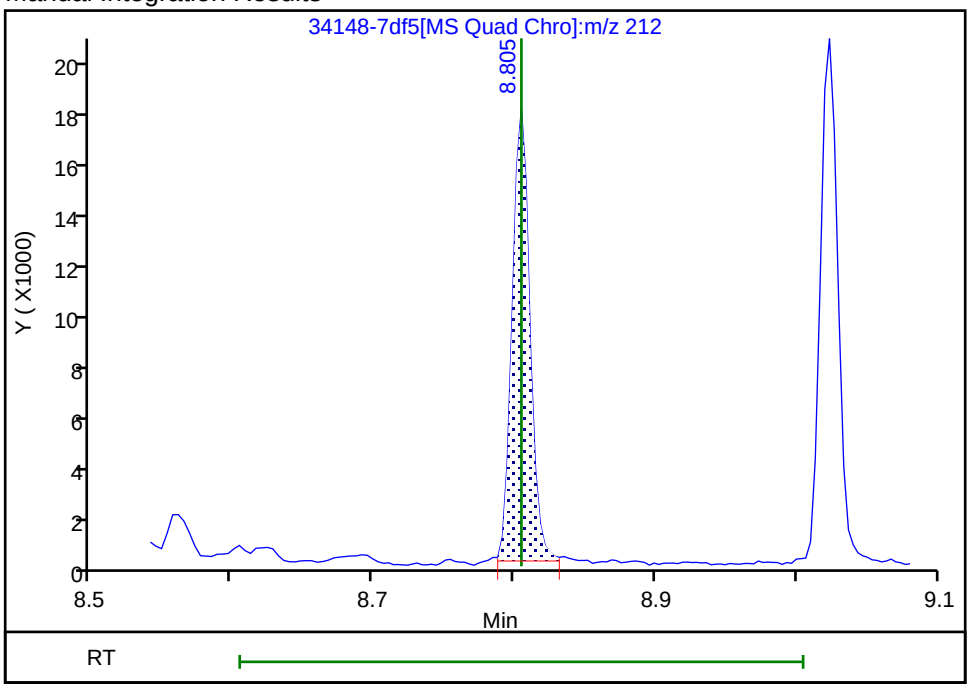
Processing Integration Results

RT: 8.80
Area: 14606
Amount: 0.084116
Amount Units: ug/ml



Manual Integration Results

RT: 8.80
Area: 15065
Amount: 0.086759
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 11:21:43 -05:00:00 (UTC)
Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

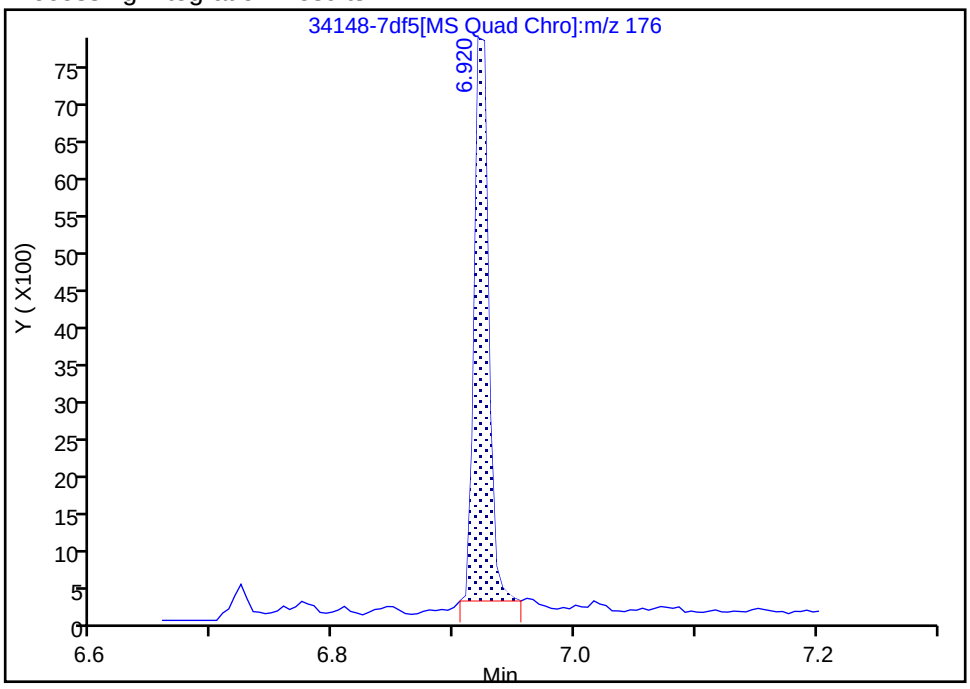
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D				
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 29 Fluorene -d10, CAS: 81103-79-9

Signal: 1

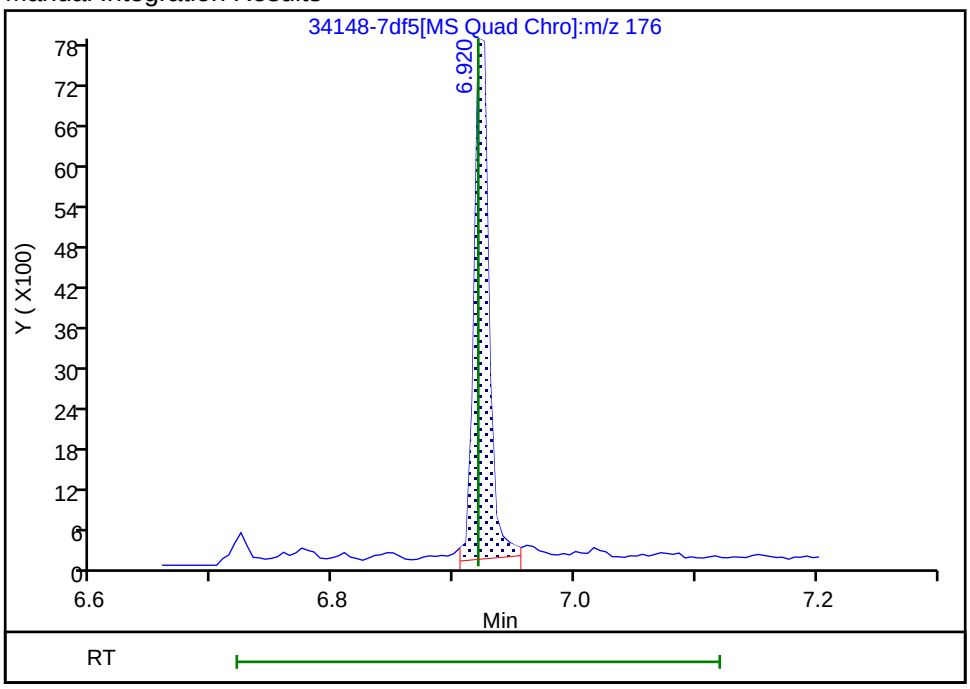
Processing Integration Results

RT: 6.92
Area: 6219
Amount: 0.072316
Amount Units: ug/ml



Manual Integration Results

RT: 6.92
Area: 6741
Amount: 0.078386
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 11:21:11 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

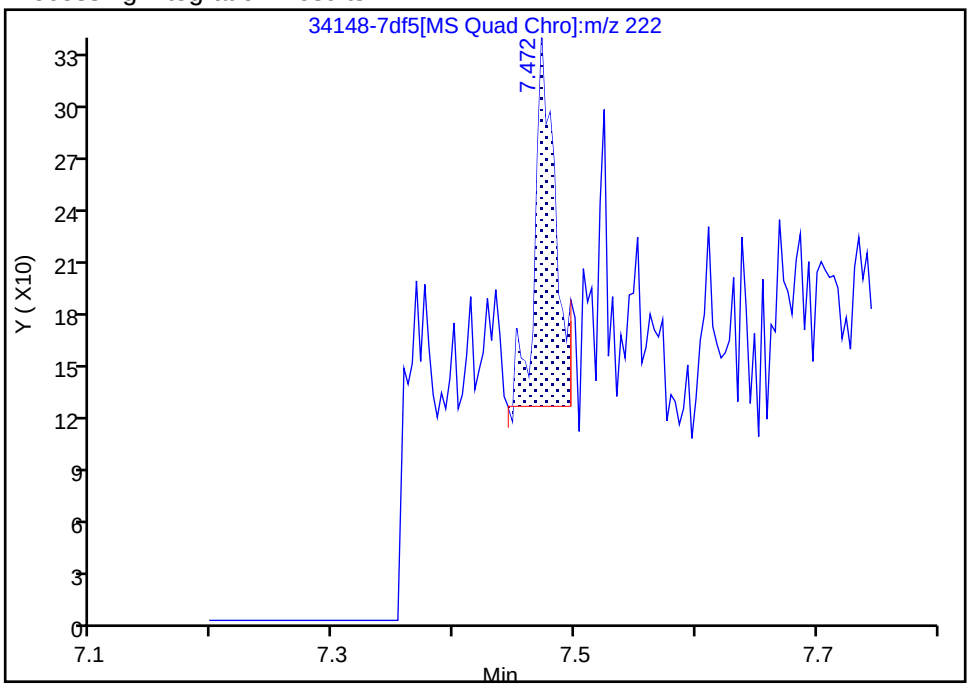
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D				
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

74 PCB-14, CAS: 34883-41-5

Signal: 1

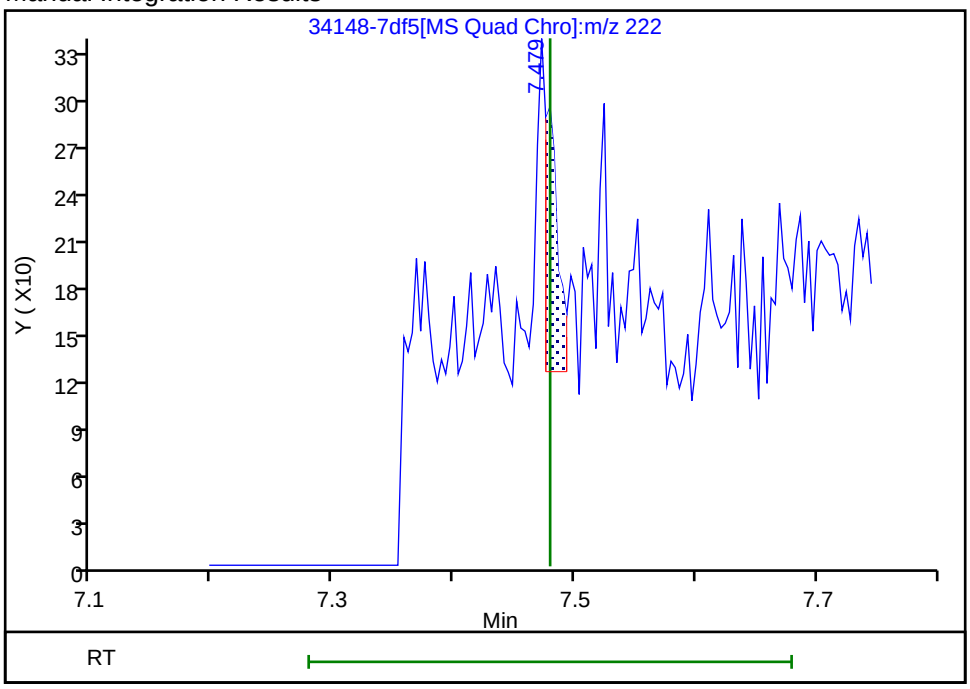
Processing Integration Results

RT: 7.47
Area: 246
Amount: 0.000441
Amount Units: ug/ml



Manual Integration Results

RT: 7.48
Area: 129
Amount: 0.000231
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 11:24:25 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

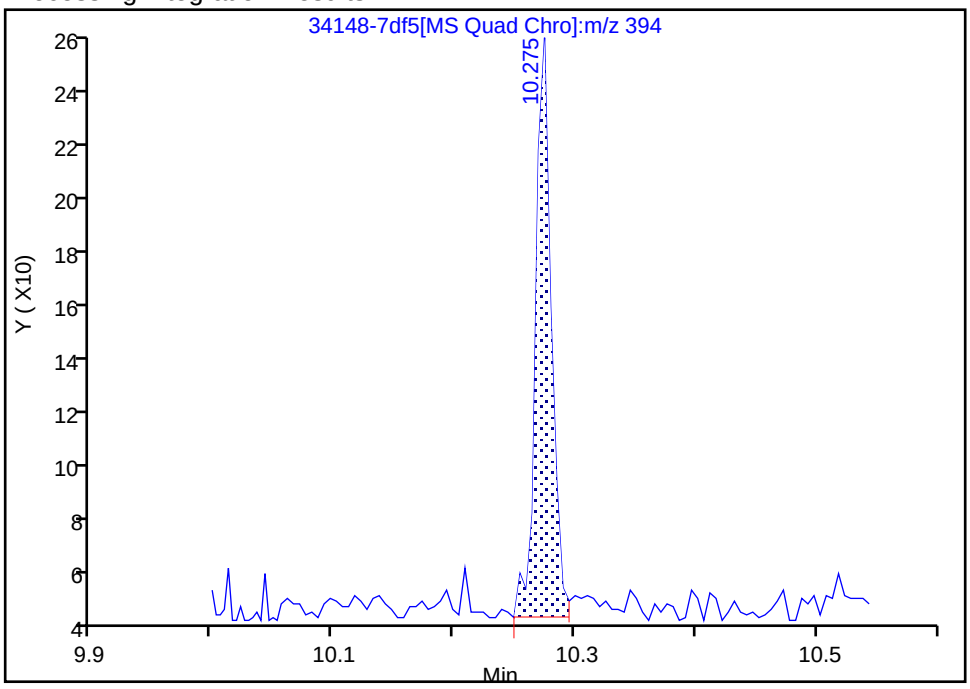
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D				
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

84 PCB-192, CAS: 74472-51-8

Signal: 1

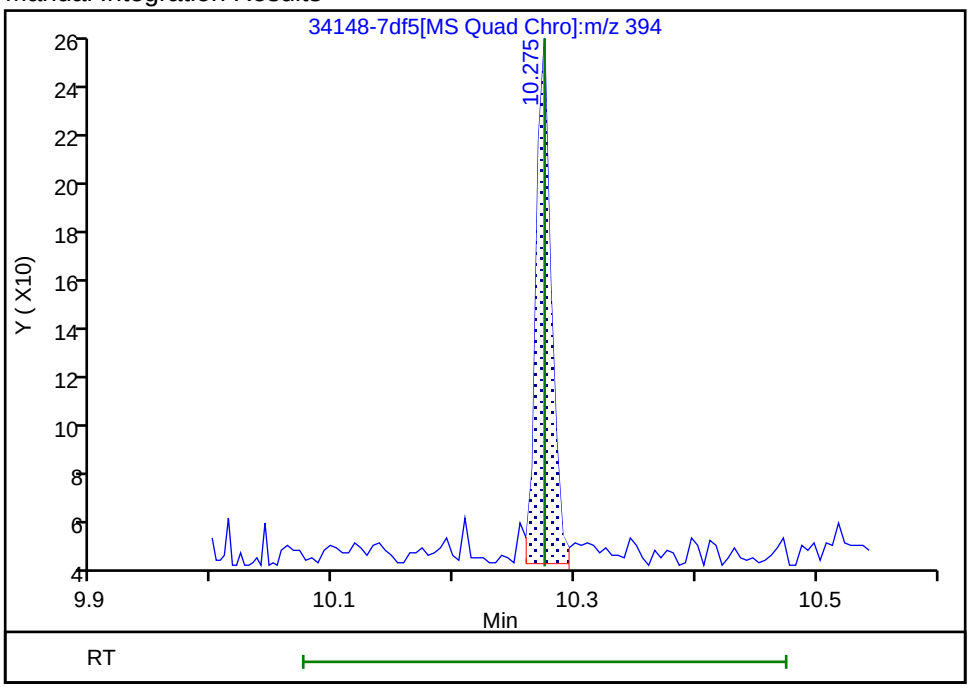
Processing Integration Results

RT: 10.27
Area: 190
Amount: 0.001662
Amount Units: ug/ml



Manual Integration Results

RT: 10.27
Area: 185
Amount: 0.001618
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 11:25:42 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

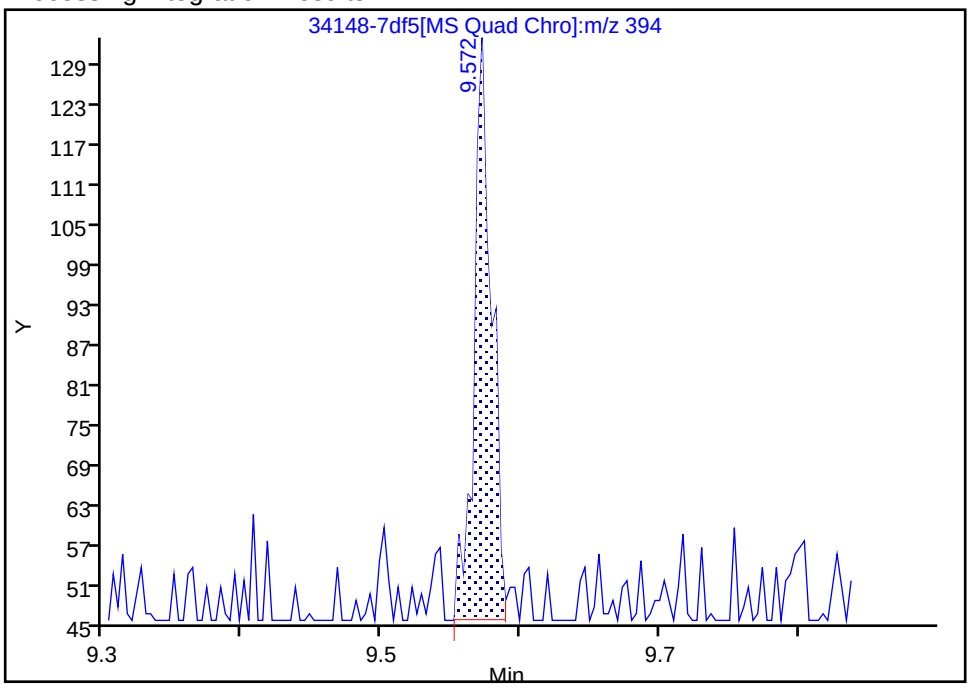
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D				
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

81 PCB-184, CAS: 74472-48-3

Signal: 1

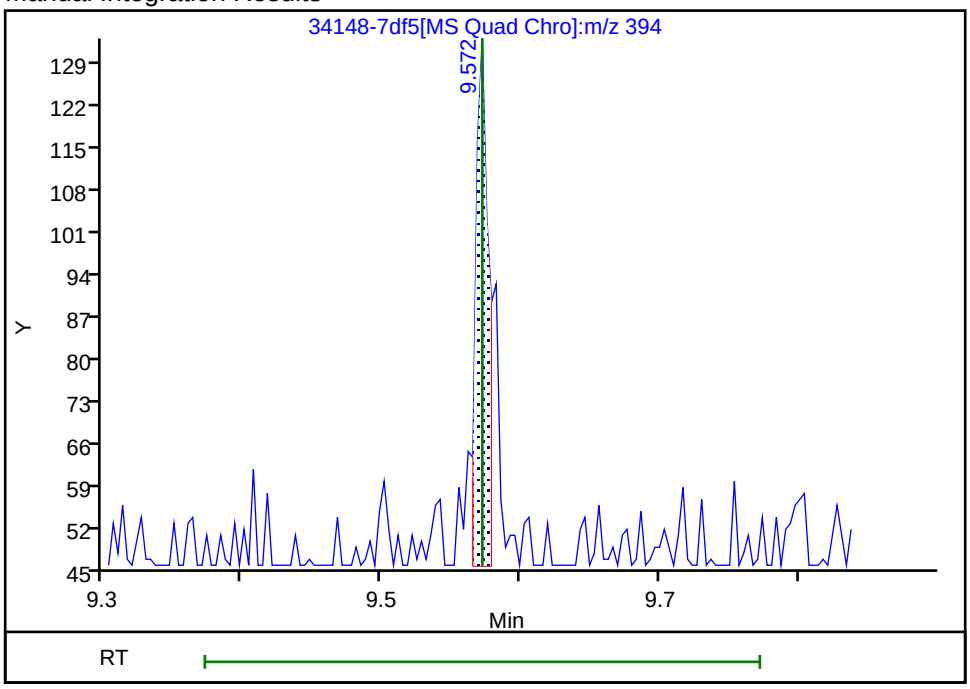
Processing Integration Results

RT: 9.57
Area: 76
Amount: 0.000609
Amount Units: ug/ml



Manual Integration Results

RT: 9.57
Area: 56
Amount: 0.000449
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 11:25:19 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

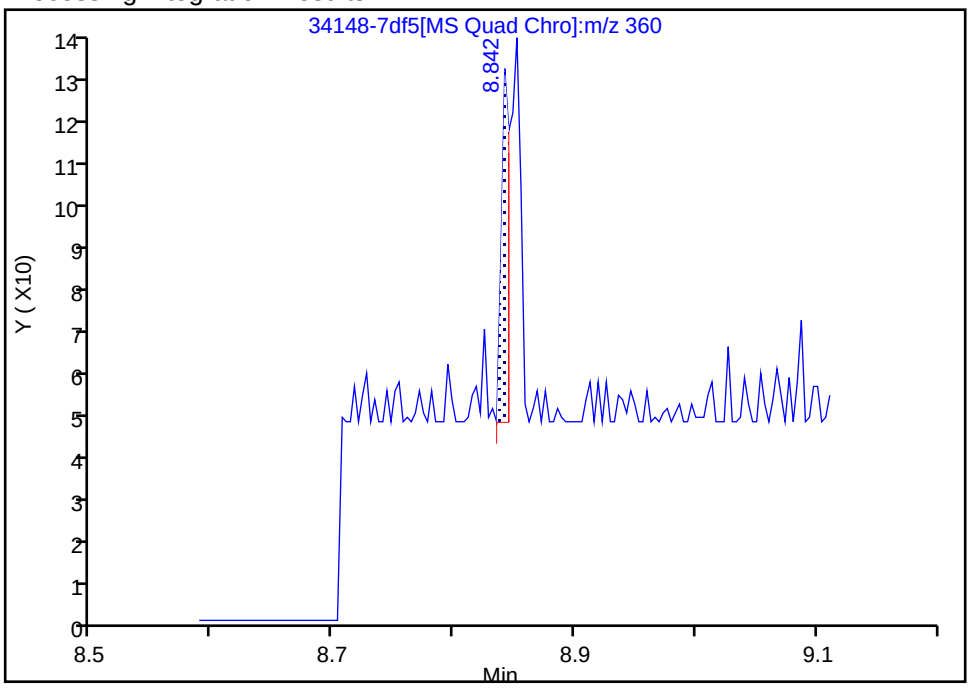
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D				
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

78 PCB-155, CAS: 33979-03-2

Signal: 1

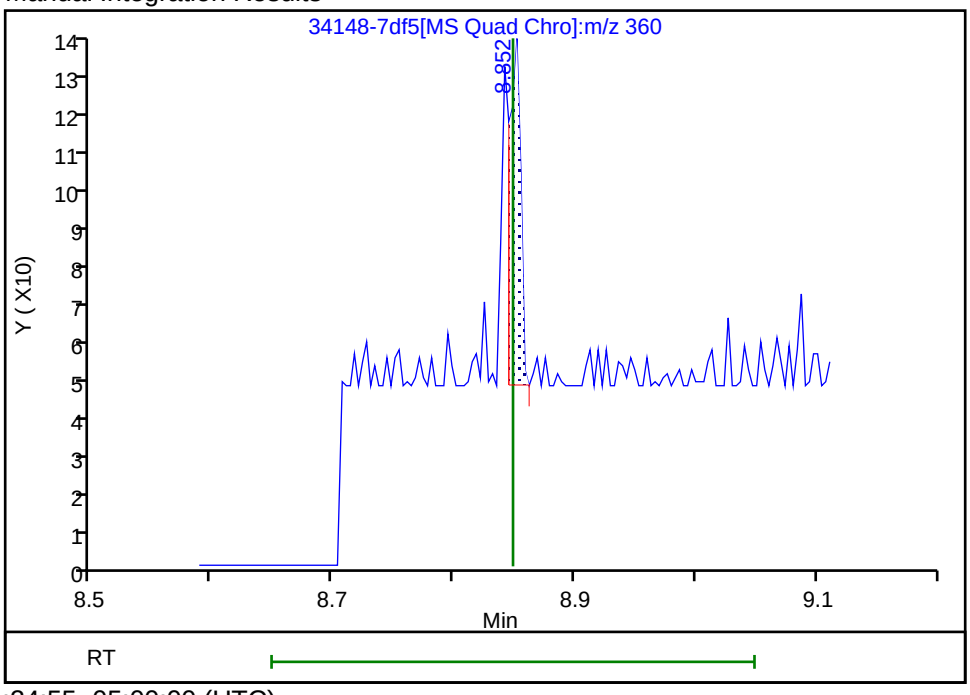
Processing Integration Results

RT: 8.84
Area: 37
Amount: 0.000216
Amount Units: ug/ml



Manual Integration Results

RT: 8.85
Area: 57
Amount: 0.000333
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 11:24:55 -05:00:00 (UTC)

Audit Action: Assigned Compound ID Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

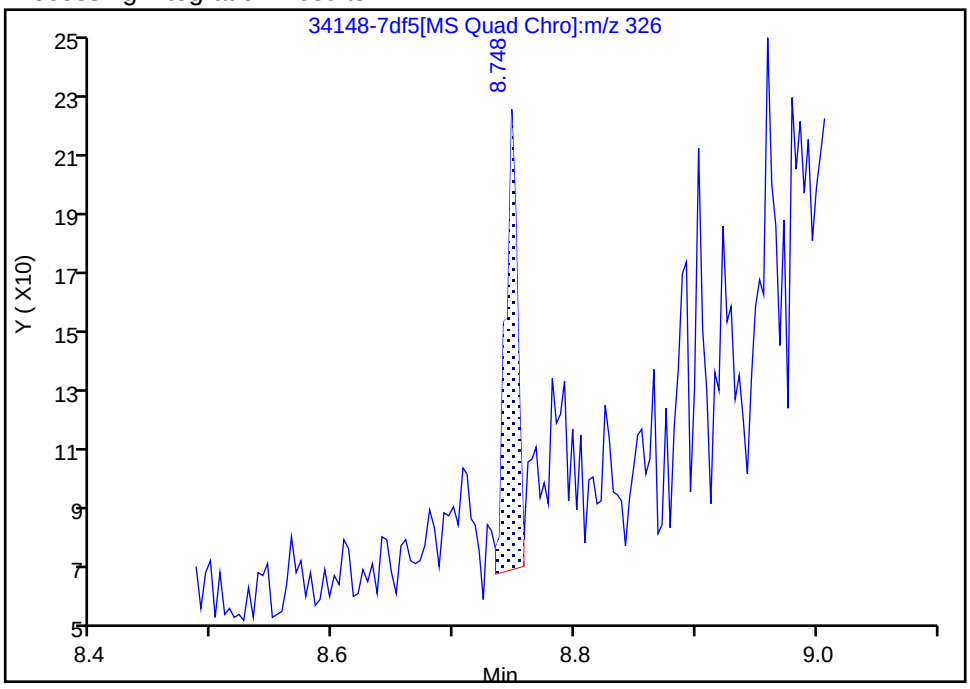
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\34148-7df5.D				
Injection Date:	16-Nov-2023 22:05:35	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-7-A	Lab Sample ID:	140-34148-7		
Client ID:	1804576-852-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	30
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

77 PCB-121, CAS: 56558-18-0

Signal: 1

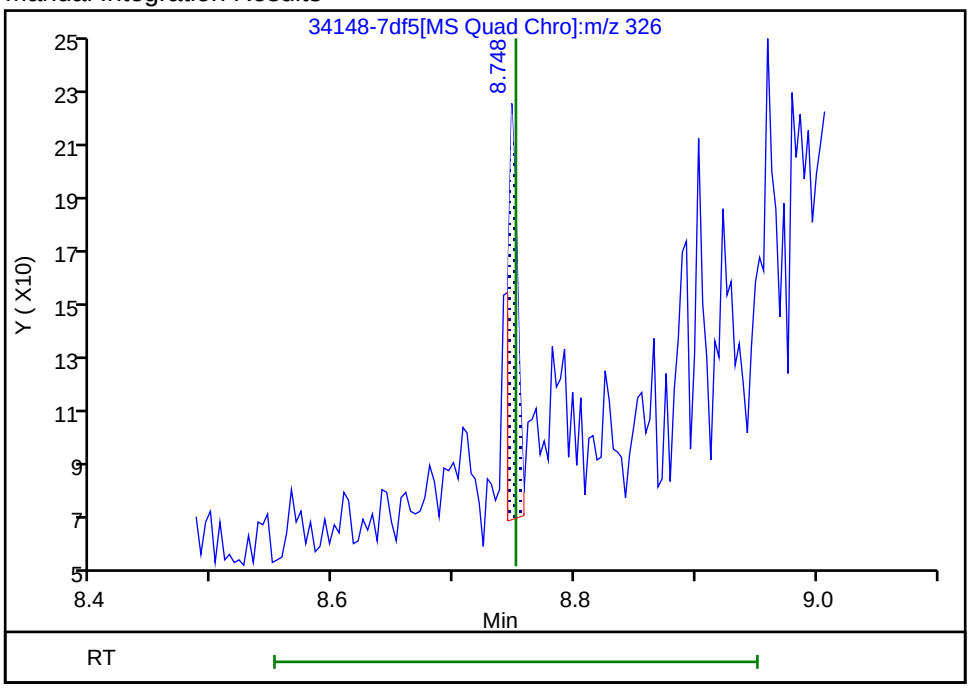
Processing Integration Results

RT: 8.75
Area: 106
Amount: 0.000580
Amount Units: ug/ml



Manual Integration Results

RT: 8.75
Area: 85
Amount: 0.000465
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 11:24:41 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: 1804576-843-S1 | Lab Sample ID: 140-34148-8

Matrix: PE | Lab File ID: 810-82790-A-3-A.D

Analysis Method: ID-0016 | Date Collected: 10/26/2023 14:00

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.010(g) | Date Analyzed: 11/16/2023 16:37

Con. Extract Vol.: 500(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80349 | Units: ng/g

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
83-32-9	Acenaphthene	590	J	1000	260
208-96-8	Acenaphthylene	170	J	1000	73
120-12-7	Anthracene	1200		1000	320
56-55-3	Benzo[a]anthracene	3100		1000	370
50-32-8	Benzo[a]pyrene	3900		1000	280
205-99-2	Benzo[b]fluoranthene	4900		1000	350
192-97-2	Benzo[e]pyrene	3200		1000	160
191-24-2	Benzo[g,h,i]perylene	2100		1000	110
207-08-9	Benzo[k]fluoranthene	1900		1000	230
218-01-9	Chrysene	4300		1000	130
53-70-3	Dibenz(a,h)anthracene	440	J	1000	82
206-44-0	Fluoranthene	7800		1000	810
86-73-7	Fluorene	610	J	1000	320
193-39-5	Indeno[1,2,3-cd]pyrene	2000		1000	110
90-12-0	1-Methylnaphthalene	ND		5000	500
91-57-6	2-Methylnaphthalene	ND		5000	700
91-20-3	Naphthalene	ND		20000	2900
198-55-0	Perylene	1000		1000	510
85-01-8	Phenanthrene	3900		2000	1700
129-00-0	Pyrene	9300		2000	300
STL00912	C1-Fluoranthenes/pyrene	6300		1000	1000
STL00913	C1-Fluorenes	ND		2000	1300
STL00914	C2-Fluorenes	ND		1000	1000
STL00915	C3-Fluorenes	2500		1000	1000
STL00917	C2-Naphthalenes	ND		2000	2000
STL00918	C3-Naphthalenes	ND		2000	2000
STL00919	C4-Naphthalenes	ND		3000	2800
STL00901	C1-Phenanthrenes/Anthracenes	ND		4000	3400
STL00902	C2-Phenanthrenes/Anthracenes	4500		1000	1000
STL00903	C3-Phenanthrenes/Anthracenes	3300		1000	1000
STL00904	C4-Phenanthrenes/Anthracenes	2400		1000	1000
STL02218	C1-Chrysenes/Benz(a)anthracenes	3500		1000	1000

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: 1804576-843-S1 | Lab Sample ID: 140-34148-8

Matrix: PE | Lab File ID: 810-82790-A-3-A.D

Analysis Method: ID-0016 | Date Collected: 10/26/2023 14:00

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.010(g) | Date Analyzed: 11/16/2023 16:37

Con. Extract Vol.: 500(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80349 | Units: ng/g

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
STL02219	C2-Chrysenes/Benz(a)anthracenes	1800		1000	1000
STL02220	C3-Chrysenes/Benz(a)anthracenes	1100		1000	1000
STL02221	C4-Chrysenes/Benz(a)anthracenes	ND		1000	1000
34883-41-5	PCB-14	ND		1000	10
74472-51-8	PCB-192	790	J	1000	10
74472-48-3	PCB-184	270	J	1000	10
33979-03-2	PCB-155	180	J	1000	10
41411-61-4	PCB-142	180	J	1000	10
74472-52-9	PCB-204	710	J	1000	10
56558-16-8	PCB-104	230	J	1000	10
56558-18-0	PCB-121	190	J	1000	10
70362-49-1	PCB-78	240	J	1000	10
38444-87-0	PCB-36	ND		1000	10

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
93951-97-4	Acenaphthylene-d8	73		30-120
1719-06-8	Anthracene-d10	59		30-120
63466-71-7	Benzo(a)pyrene-d12	69		30-120
93951-98-5	Benzo(b)fluoranthene-d12	76		30-120
93951-66-7	Benzo(ghi)perylene-d12	79		30-120
93952-01-3	Benzo(k)fluoranthene-d12	77		30-120
1719-03-5	Chrysene-d12	69		30-120
13250-98-1	Dibenz(a,h)anthracene-d14	73		30-120
93951-69-0	Fluoranthene-d10	74		30-120
81103-79-9	Fluorene -d10	72		30-120
203578-33-0	Indeno[1,2,3-cd]pyrene-d12	77		30-120
38072-94-5	1-Methylnaphthalene-d10	73		30-120
7297-45-2	2-Methylnaphthalene-d10	70		30-120
1146-65-2	Naphthalene-d8	67		30-120
1520-96-3	Perylene-d12	65		30-120
1517-22-2	Phenanthrene-d10	64		30-120

Report Date: 22-Nov-2023 14:12:21 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D
Lims ID: 140-34148-A-8-A
Client ID: 1804576-843-S1
Sample Type: Client
Inject. Date: 16-Nov-2023 16:37:15 ALS Bottle#: 0 Worklist Smp#: 16
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030519-016
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 22-Nov-2023 14:12:20 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1637

First Level Reviewer: SK9U Date: 22-Nov-2023 12:12:53

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/ml	%Rec	Flags
D 10 Naphthalene-d8	136	5.059	5.068	-0.009	100	24177	0.3354	67.1	
11 Naphthalene	128	5.078	5.078	0.000	49	930	0.0164		7M
D 15 2-methylnaphthalene-d10	152	5.612	5.612	0.000	92	16392	0.3497	69.9	
16 2-Methylnaphthalene	142	5.641	5.635	0.006	41	323	0.007921		7M
D 17 1-Methylnaphthalene-d10	152	5.692	5.686	0.006	100	17035	0.3627	72.5	
D 23 Acenaphthylene-d8	160	6.367	6.362	0.005	80	28878	0.3630	72.6	
24 Acenaphthylene	152	6.377	6.372	0.005	11	230	0.003388		M
* 26 Acenaphthene-d10	164	6.497	6.492	0.005	96	25857	0.5000		
27 Acenaphthene	154	6.522	6.517	0.005	89	513	0.0118		
D 29 Fluorene -d10	176	6.925	6.920	0.005	98	22332	0.3625	72.5	
30 Fluorene	166	6.950	6.945	0.005	96	708	0.0122		M
D 35 Phenanthrene-d10	188	7.735	7.732	0.003	99	42239	0.3179	63.6	
36 Phenanthrene	178	7.752	7.749	0.003	32	8048	0.0790		
D 38 Anthracin-d10	188	7.783	7.777	0.006	99	37983	0.2928	58.6	M
39 Anthracene	178	7.801	7.794	0.007	97	2267	0.0242		M
D 41 Fluoranthene-d10	212	8.808	8.805	0.003	99	64156	0.3722	74.4	
43 Fluoranthene	202	8.828	8.825	0.003	60	25725	0.1567		
* 44 Pyrene-d10 (IS)	212	9.027	9.024	0.003	98	85198	0.5000		
45 Pyrene	202	9.047	9.044	0.003	97	31260	0.1866		
47 Benzo[a]anthracene	228	10.260	10.260	0.000	99	9307	0.0623		M
D 48 Chrysene-d12	240	10.275	10.270	0.005	99	57546	0.3462	69.2	
50 Chrysene	228	10.300	10.295	0.005	15	14439	0.0862		
D 52 Benzo(b)fluoranthene-d12	264	11.376	11.369	0.007	100	48455	0.3788	75.8	
53 Benzo[b]fluoranthene	252	11.404	11.397	0.007	23	15951	0.0977		M
D 54 Benzo(k)fluoranthene-d12	264	11.411	11.404	0.007	67	58208	0.3874	77.5	
55 Benzo[k]fluoranthene	252	11.432	11.425	0.007	100	6435	0.0377		
* 56 Benzo(e)pyrene-d12	264	11.684	11.684	0.000	99	50499	0.5000		
57 Benzo[e]pyrene	252	11.719	11.712	0.007	100	8467	0.0646		
D 58 Benzo(a)pyrene-d12	264	11.754	11.747	0.007	100	38862	0.3465	69.3	
59 Benzo[a]pyrene	252	11.775	11.775	0.000	100	9978	0.0776		
D 60 Perylene-d12	264	11.845	11.838	0.007	100	40760	0.3274	65.5	
61 Perylene	252	11.873	11.873	0.000	98	2341	0.0201		M

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/ml	%Rec	Flags
D 62 Indeno[1,2,3-cd]pyrene-d12	288	13.196	13.186	0.010	92	46635	0.3827	76.5	
D 63 Dibenz(a,h)anthracene-d14	292	13.205	13.186	0.009	77	39720	0.3643	72.9	
65 Indeno[1,2,3-cd]pyrene	276	13.224	13.214	0.010	34	6235	0.0399		M
66 Dibenz(a,h)anthracene	278	13.243	13.233	0.010	2	1123	0.008854		M
D 67 Benzo(ghi)perylene-d12	288	13.552	13.543	0.009	100	47794	0.3949	79.0	
68 Benzo[g,h,i]perylene	276	13.590	13.580	0.010	90	5853	0.0418		M
76 PCB-104	326	8.399	8.393	0.003	86	242	0.004687		
77 PCB-121	326	8.751	8.748	0.000	69	160	0.003862		
78 PCB-155	360	8.852	8.852	0.003	75	142	0.003663		M
79 PCB-78	290	9.081	9.077	-0.003	45	156	0.004752		M
80 PCB-142	360	9.528	9.519	0.006	56	100	0.003545		
81 PCB-184	394	9.579	9.579	0.007	22	152	0.005382		M
* 82 PCB-167L	372	10.026	10.027	-0.001	73	13787	0.4000		
83 PCB-204	428	10.255	10.246	0.005	4	262	0.0143		
84 PCB-192	394	10.280	10.275	0.005	5	409	0.0158		
A 88 C4-Naphthalenes	184	7.117	(6.678-7.562)		0	1805	0.0317		
A 91 C3-Fluorenes	208	8.352	(8.092-8.605)		0	2924	0.0504		
A 96 C1-Phenanthrenes/Anthracenes	191	8.232	(8.155-8.332)		0	4463	0.0438		
A 97 C2-Phenanthrenes/Anthracenes	206	8.706	(8.490-8.926)		0	9122	0.0895		
A 98 C3-Phenanthrenes/Anthracenes	220	9.162	(8.851-9.456)		0	6735	0.0661		
A 99 C4-Phenanthrenes/Anthracenes	234	9.464	(9.106-9.824)		0	4844	0.0475		
A 100 C1-Fluoranthenes/pyrene	216	9.441	(9.246-9.640)		0	21202	0.1266		
A 101 C1-Chrysenes/Benz(a)anthracenes	242	10.706	(10.456-10.941)		0	11735	0.0701		
A 102 C2-Chrysenes/Benz(a)anthracenes	256	11.012	(10.667-11.381)		0	5954	0.0355		
A 103 C3-Chrysenes/Benz(a)anthracenes	270	11.642	(11.002-11.867)		0	3546	0.0212		

QC Flag Legend

Processing Flags

7 - Failed Limit of Detection

Review Flags

M - Manually Integrated

Reagents:

60ISPCB_00001 Amount Added: 5.00 Units: uL

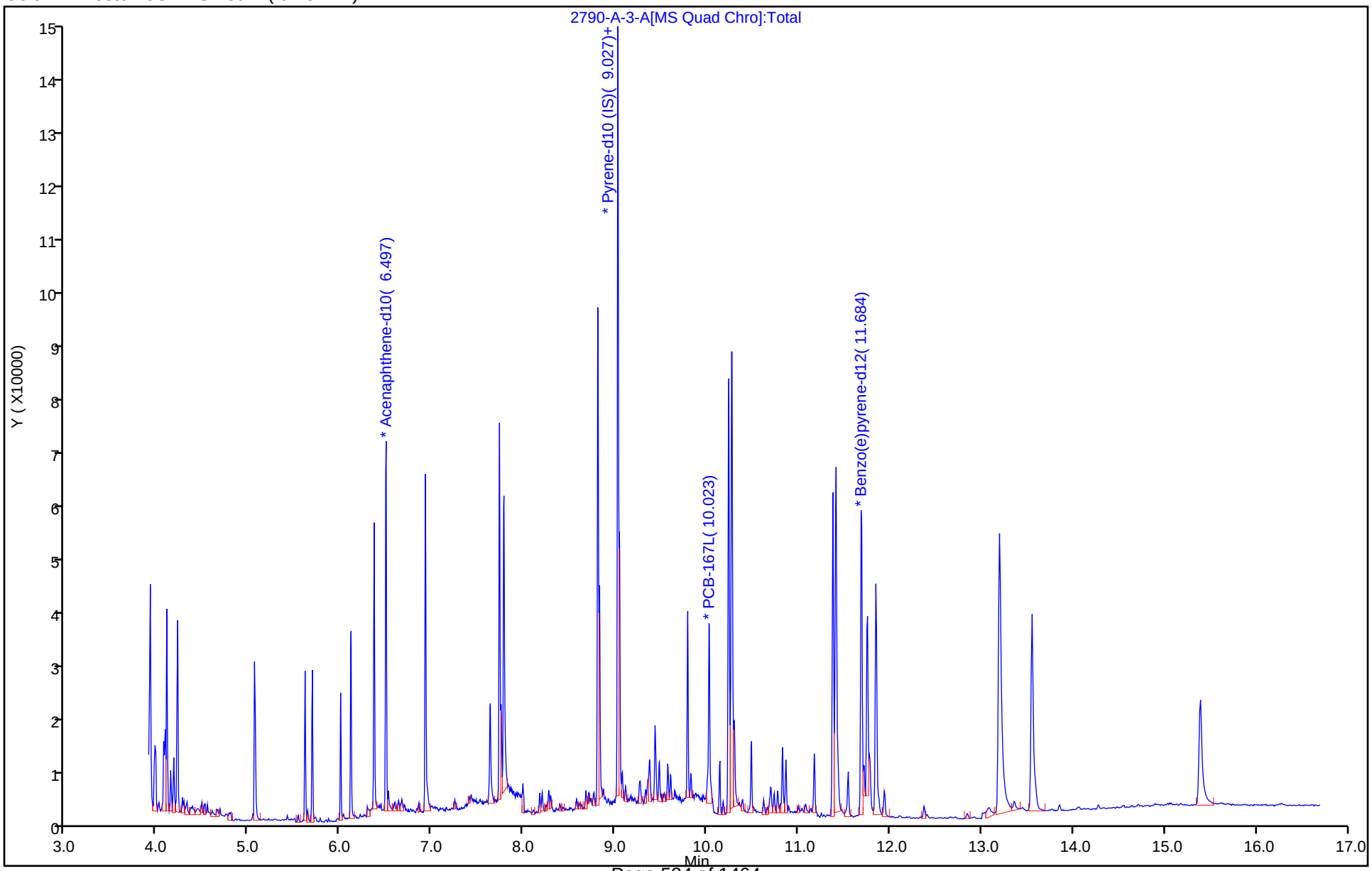
Report Date: 22-Nov-2023 14:12:21 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D

Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8	Worklist Smp#:	16
Client ID:	1804576-843-S1				
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



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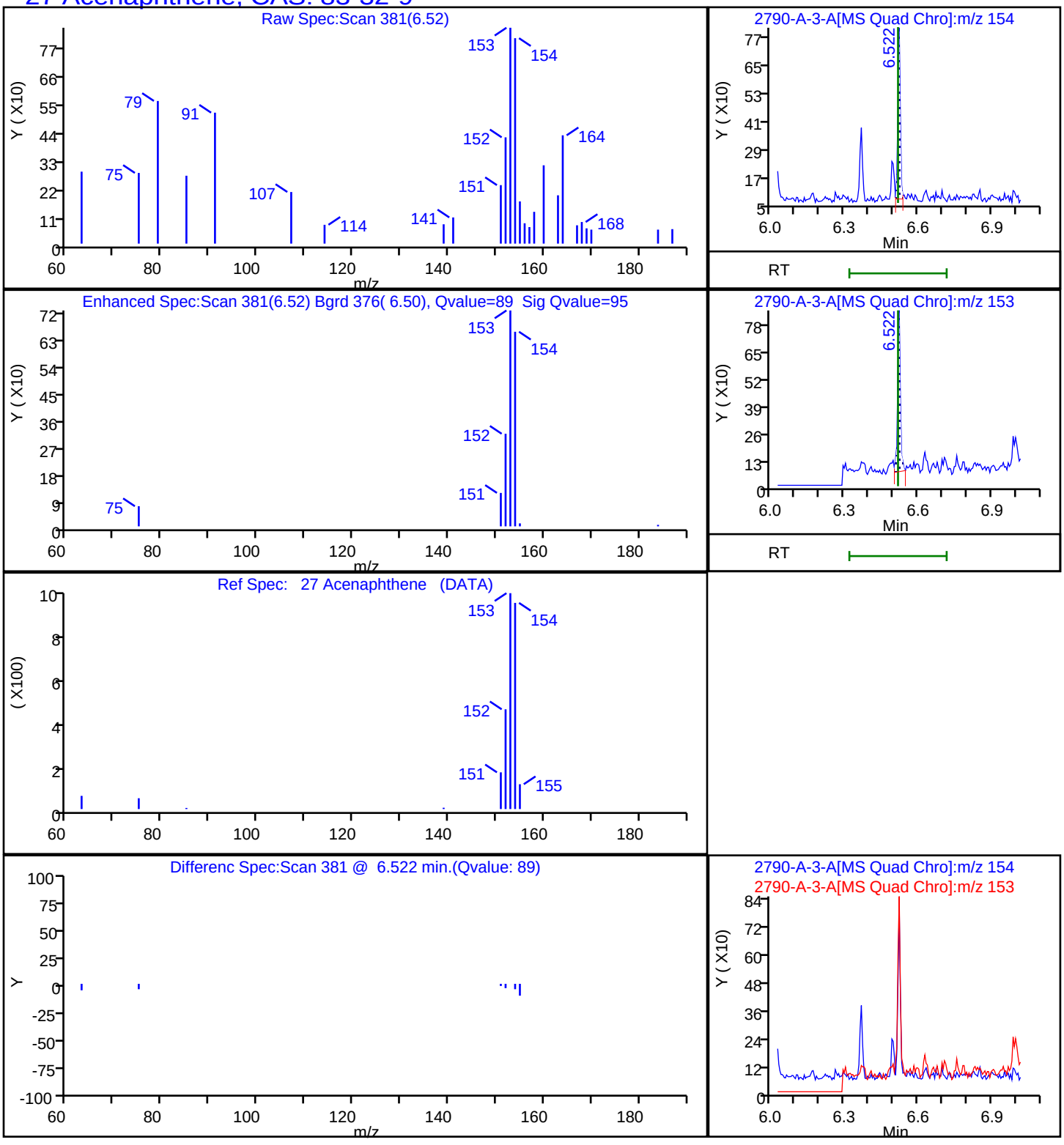
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D

Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8
Client ID:	1804576-843-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

27 Acenaphthene, CAS: 83-32-9



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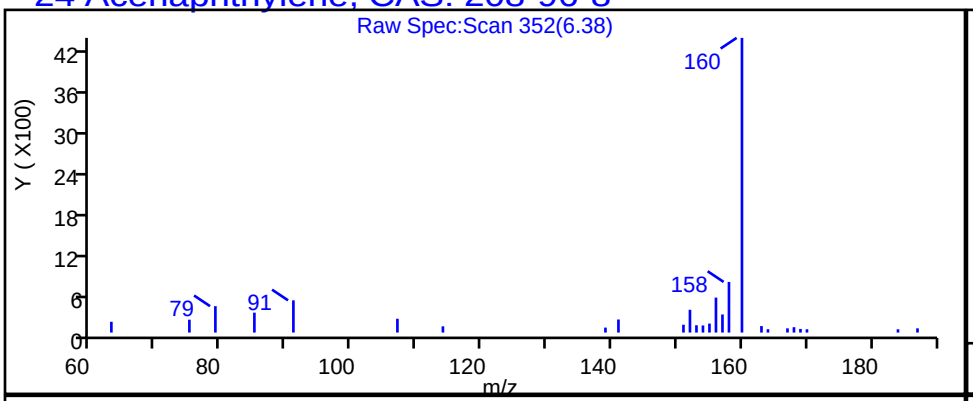
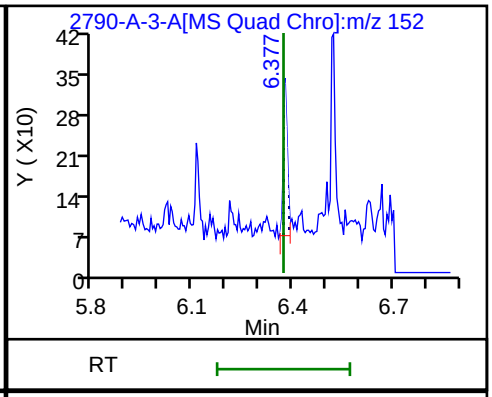
Eurofins Knoxville

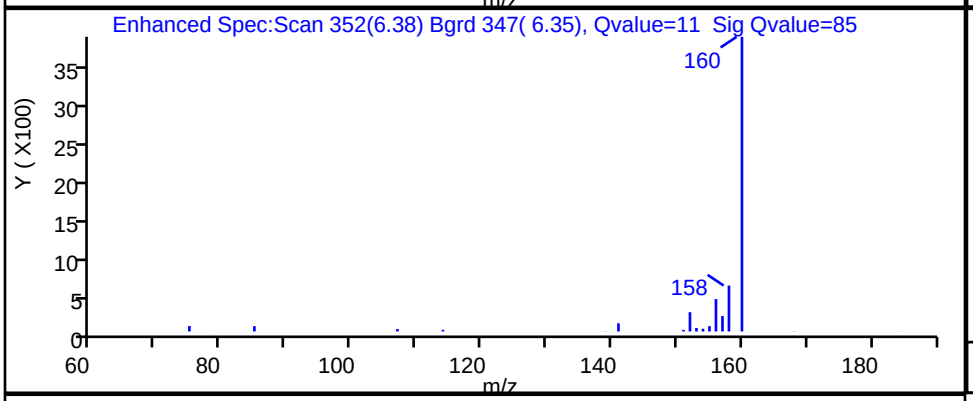
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D

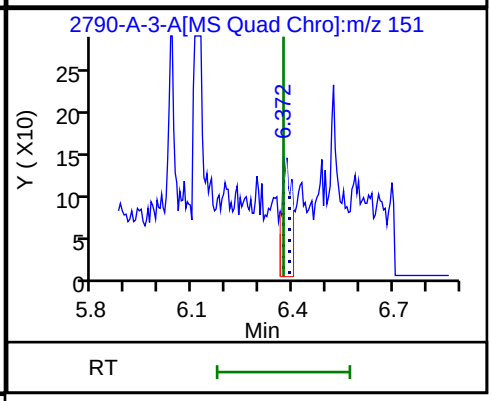
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8
Client ID:	1804576-843-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

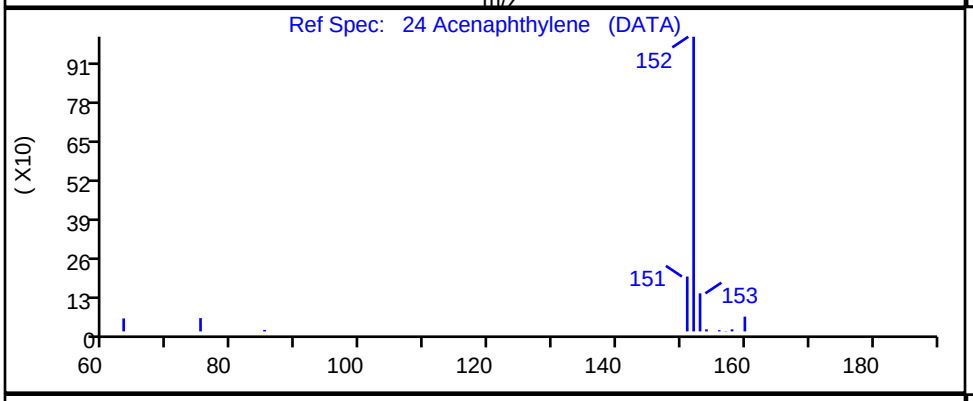
24 Acenaphthylene, CAS: 208-96-8

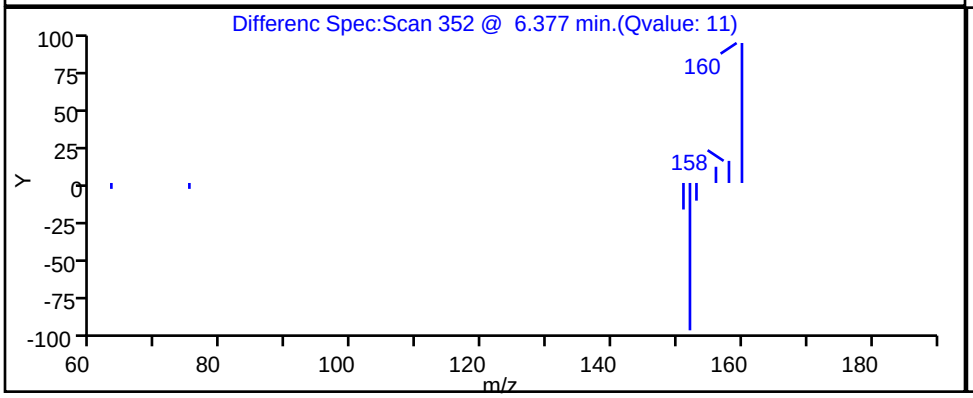


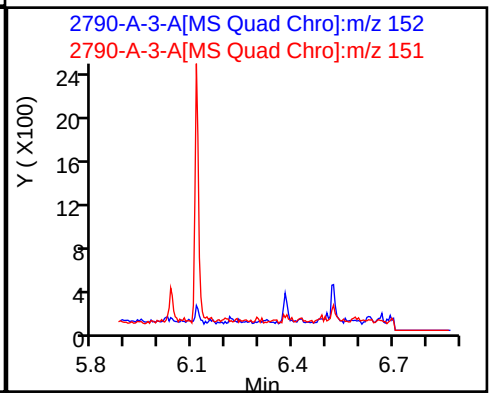












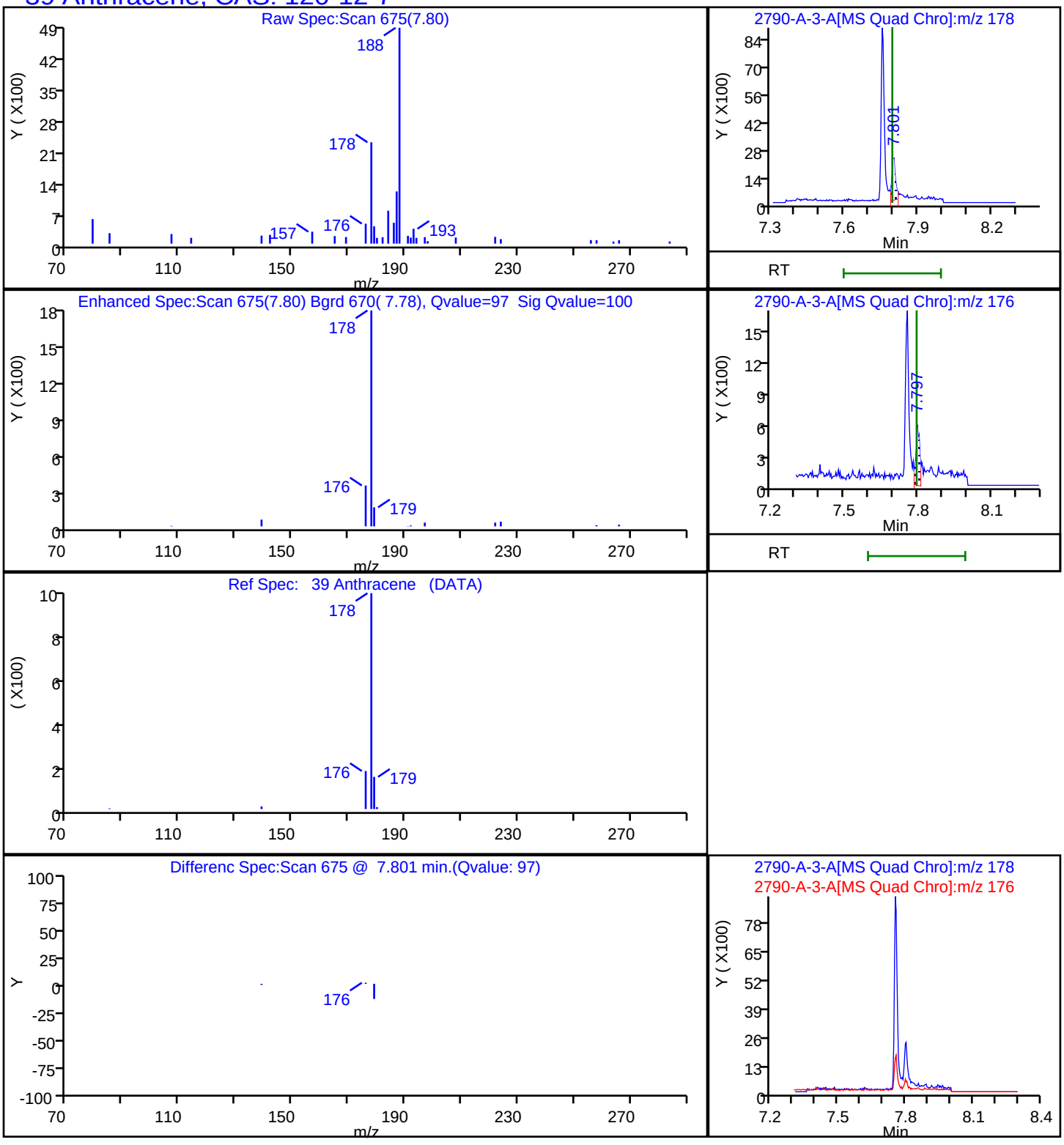
Report Date: 22-Nov-2023 14:12:22 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D

Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8
Client ID:	1804576-843-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

39 Anthracene, CAS: 120-12-7



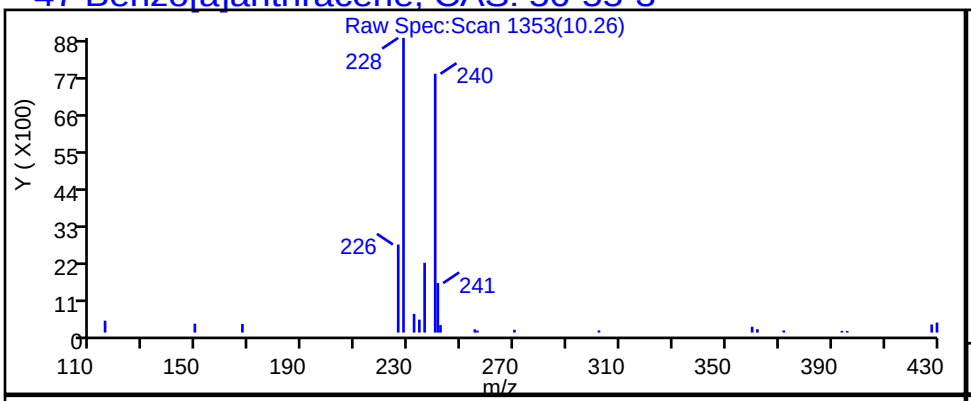
Report Date: 22-Nov-2023 14:12:22 Chrom Revision: 2.3 15-Nov-2023 20:54:34

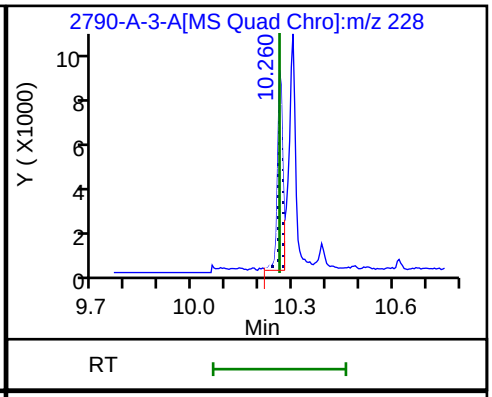
Eurofins Knoxville

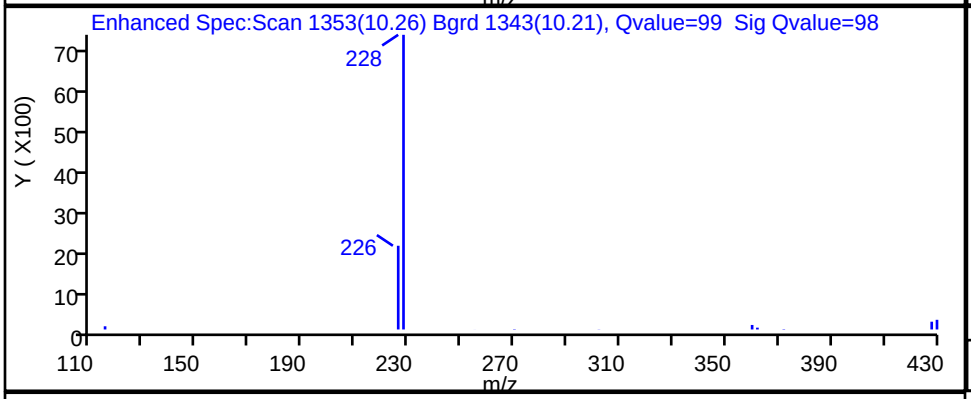
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D

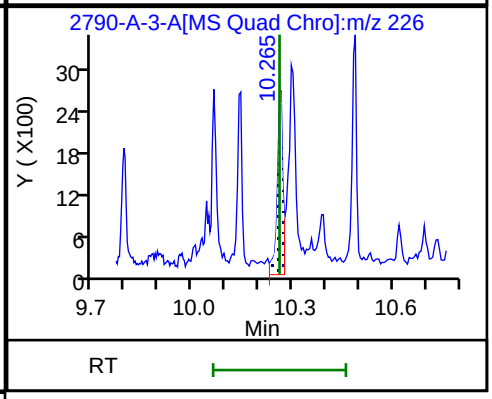
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8
Client ID:	1804576-843-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

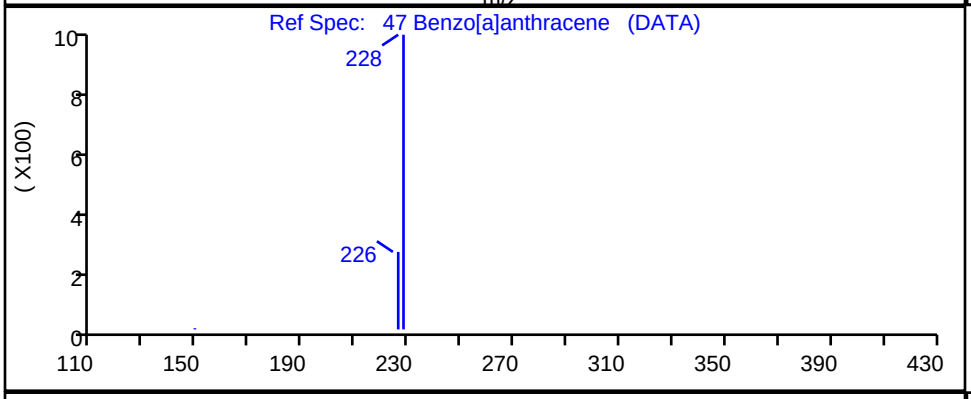
47 Benzo[a]anthracene, CAS: 56-55-3

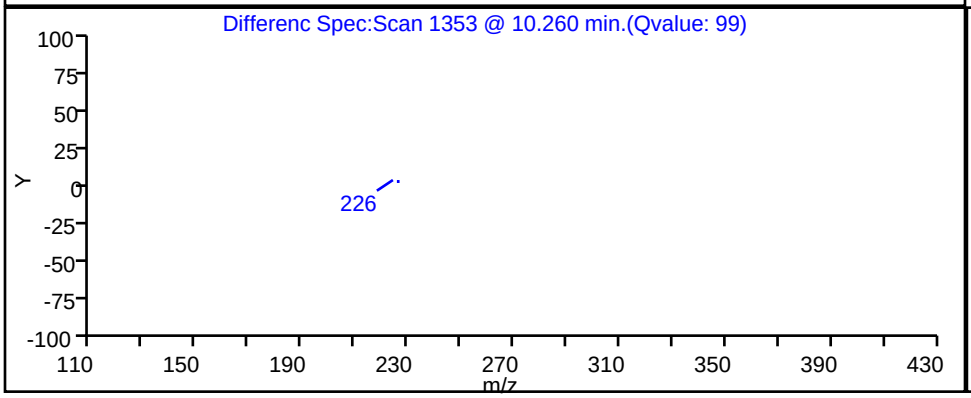


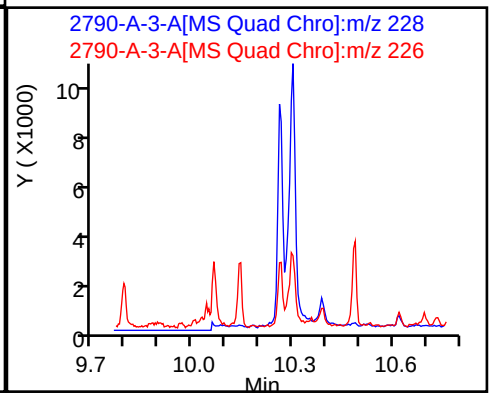












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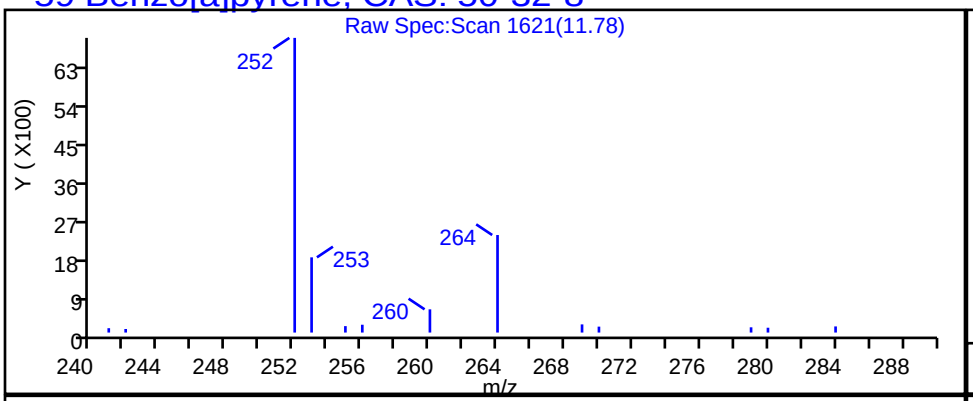
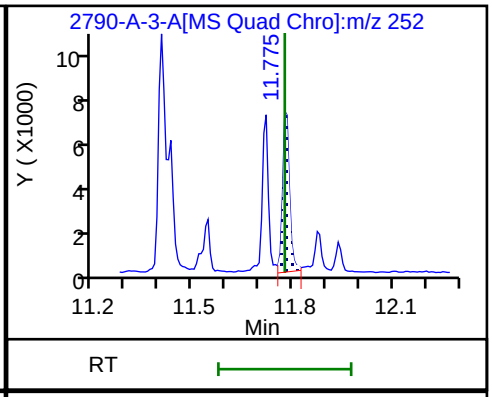
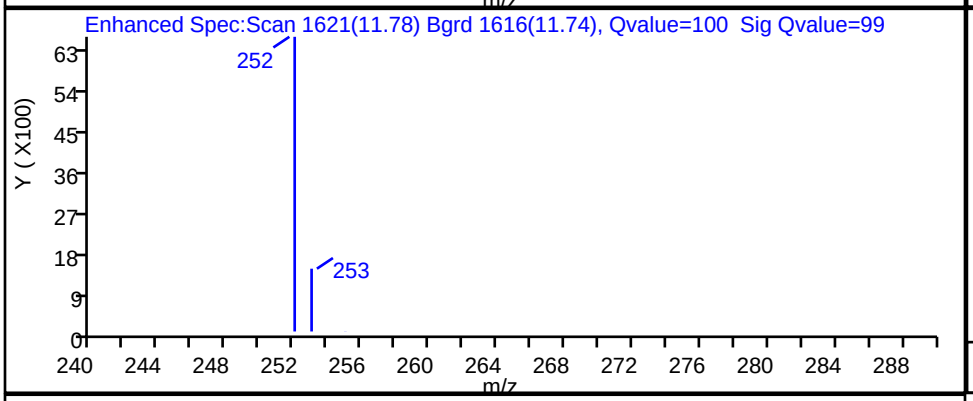
Eurofins Knoxville

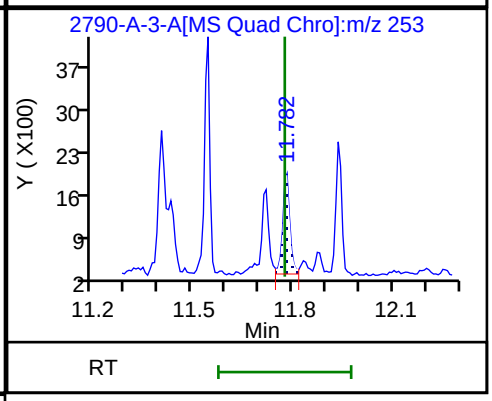
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D				
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

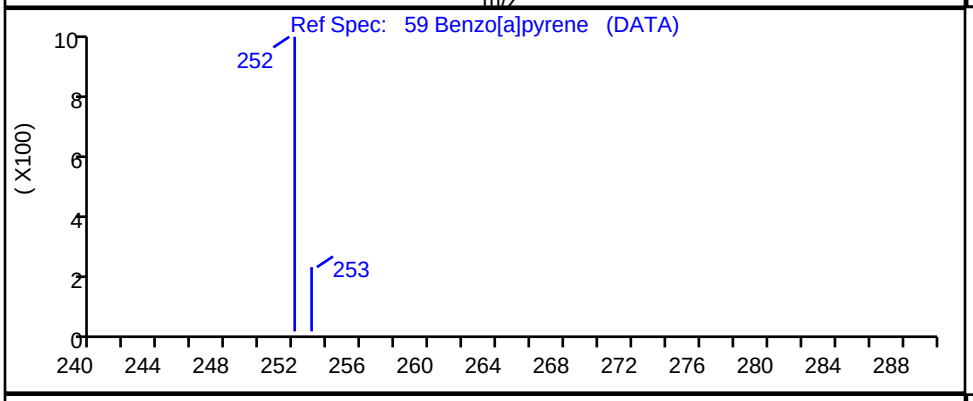
59 Benzo[a]pyrene, CAS: 50-32-8

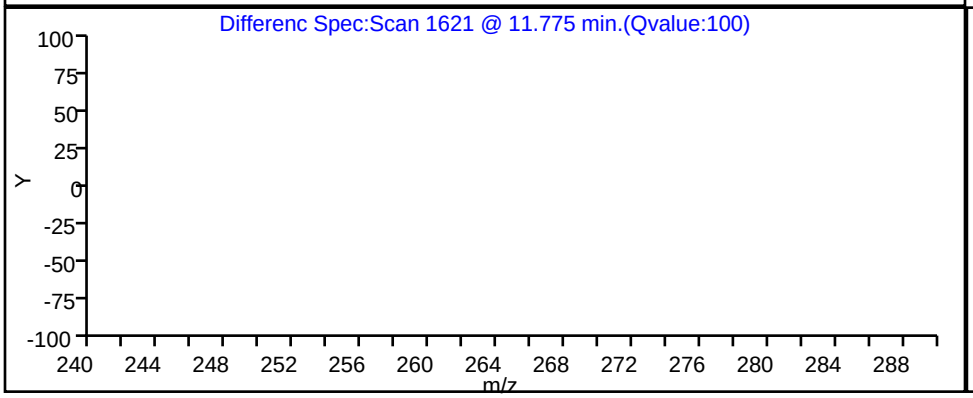


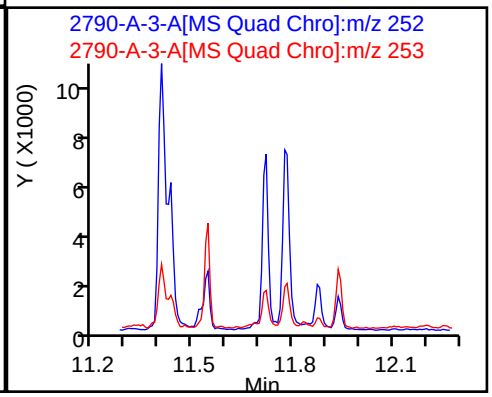












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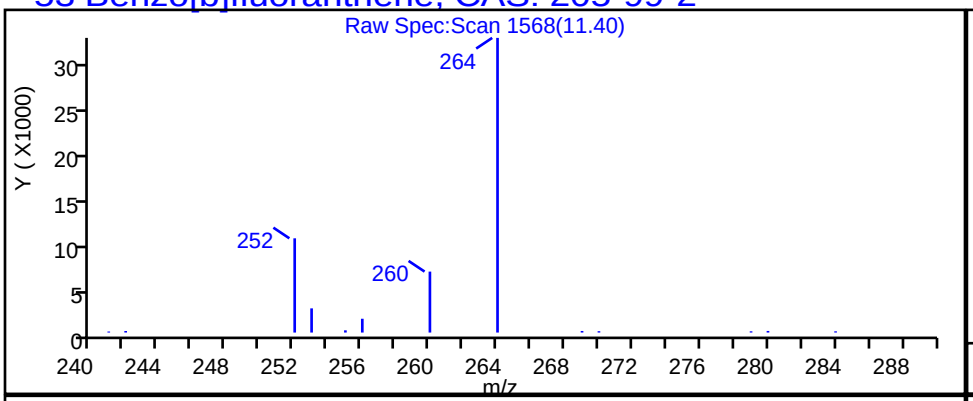
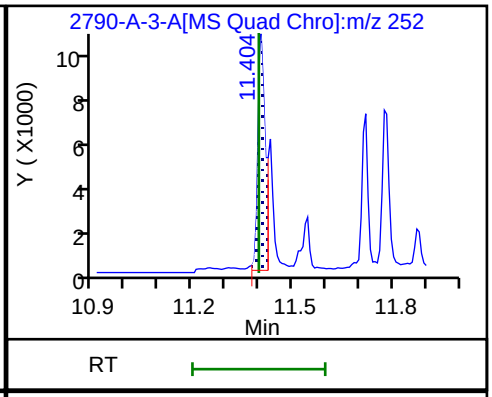
Eurofins Knoxville

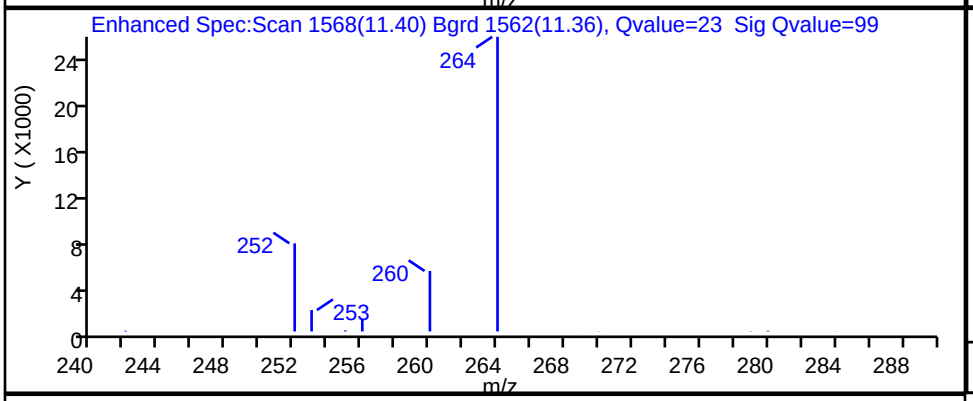
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D

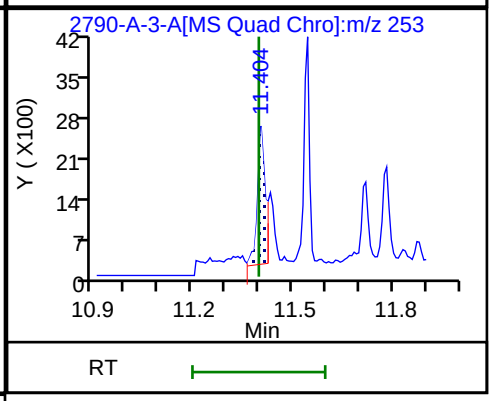
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8
Client ID:	1804576-843-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

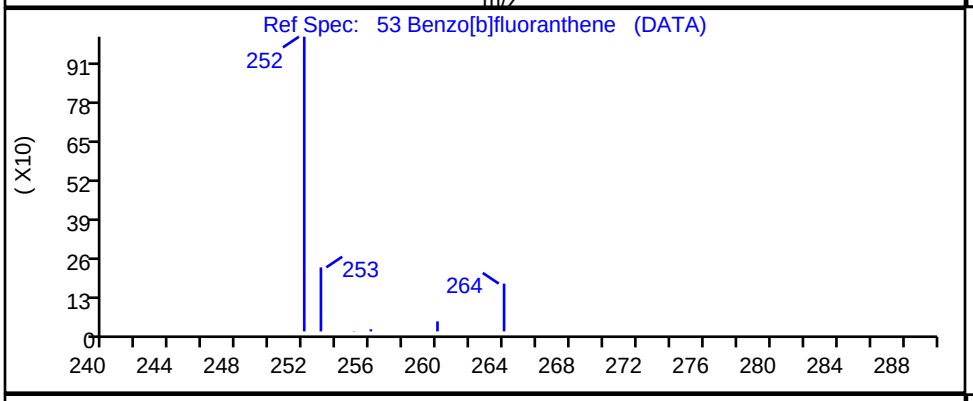
53 Benzo[b]fluoranthene, CAS: 205-99-2

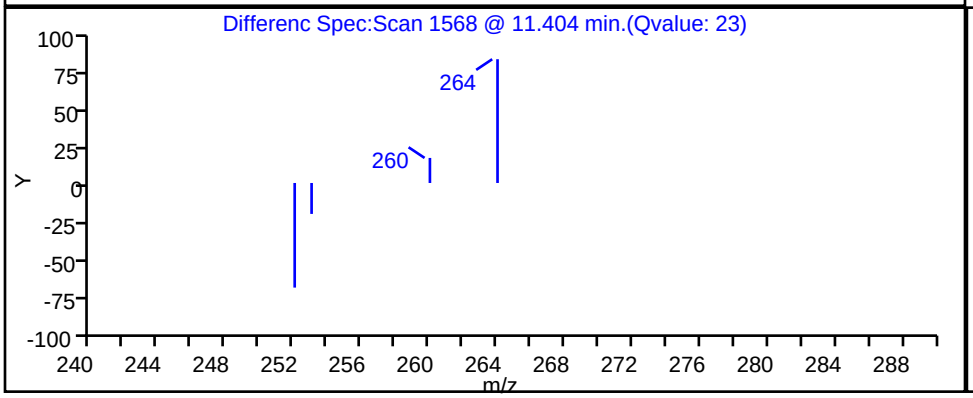


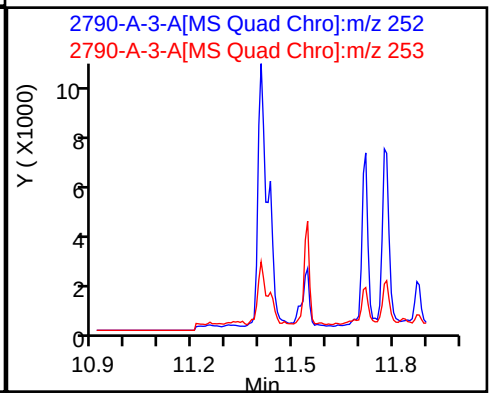










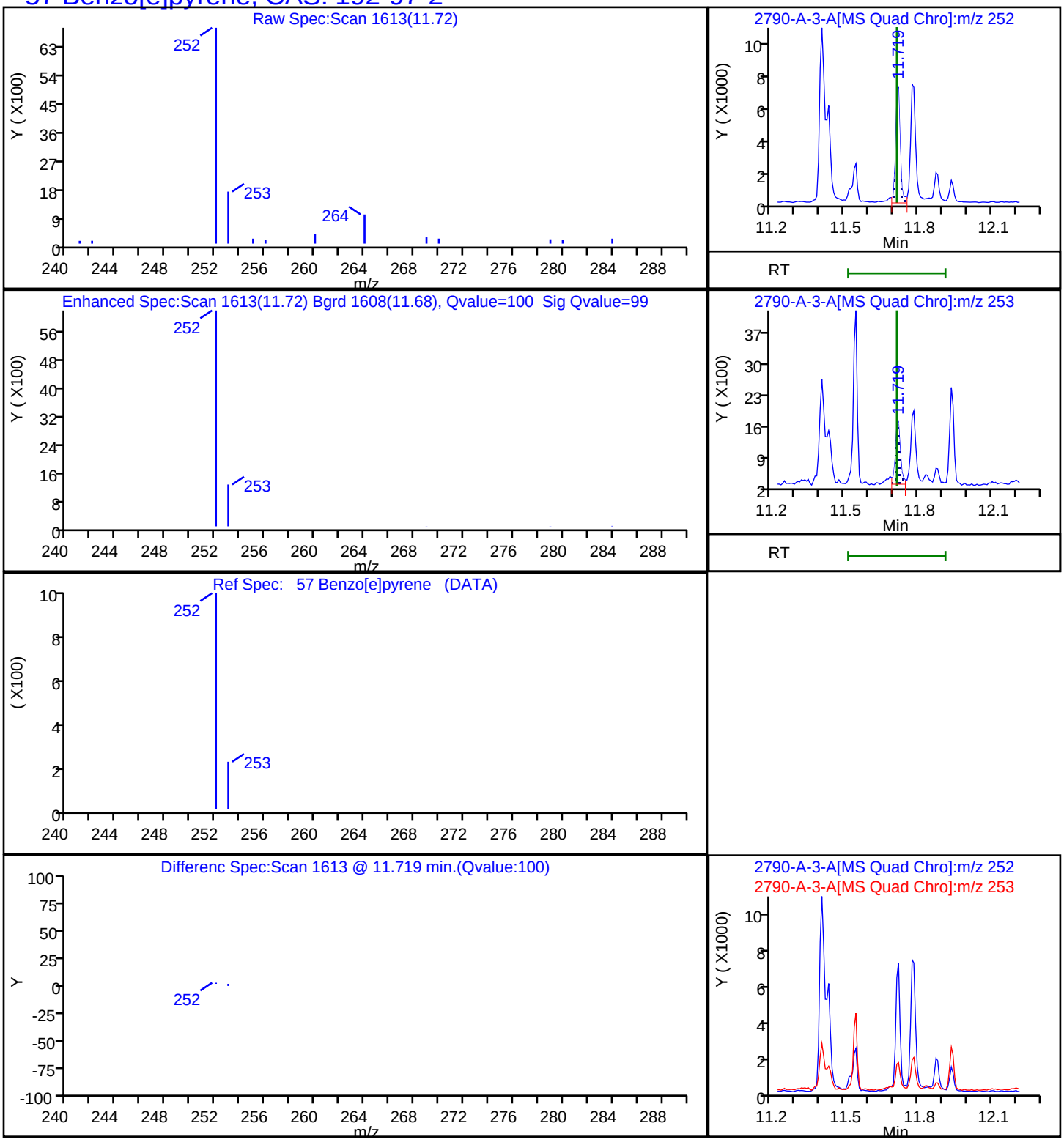


Report Date: 22-Nov-2023 14:12:22 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D		
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8
Client ID:	1804576-843-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

57 Benzo[e]pyrene, CAS: 192-97-2



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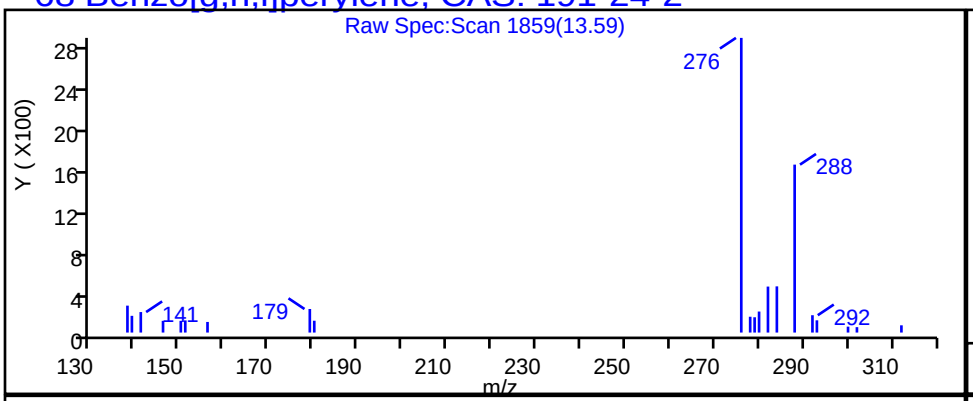
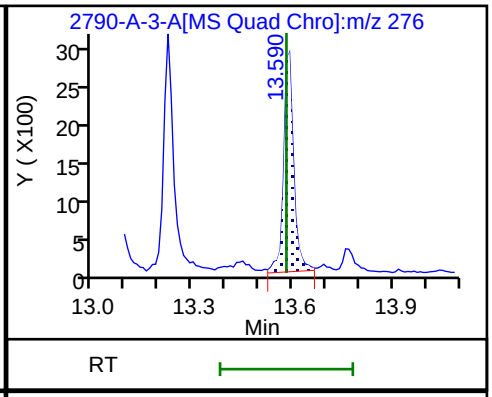
Eurofins Knoxville

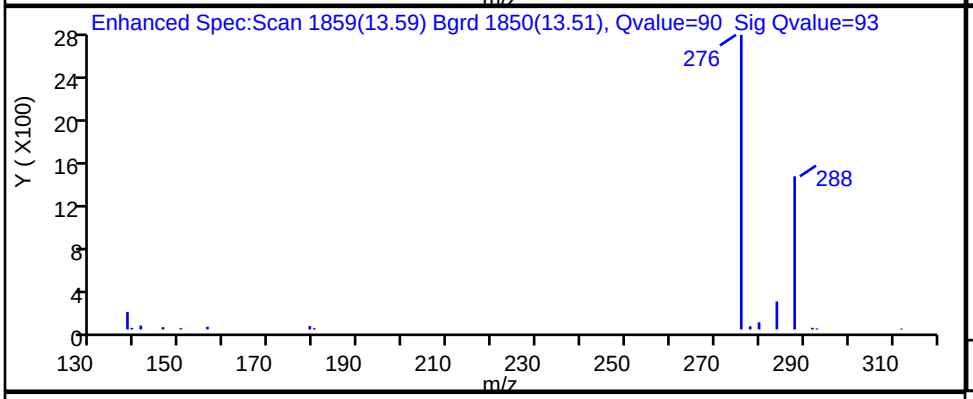
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D

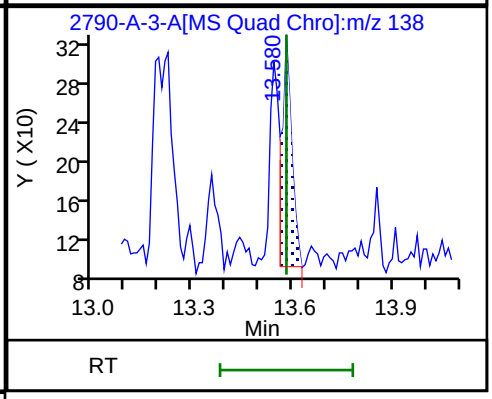
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

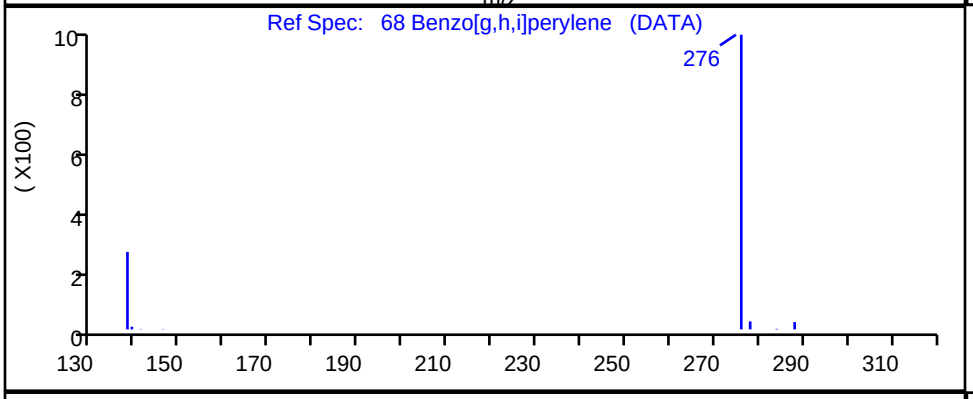
68 Benzo[g,h,i]perylene, CAS: 191-24-2

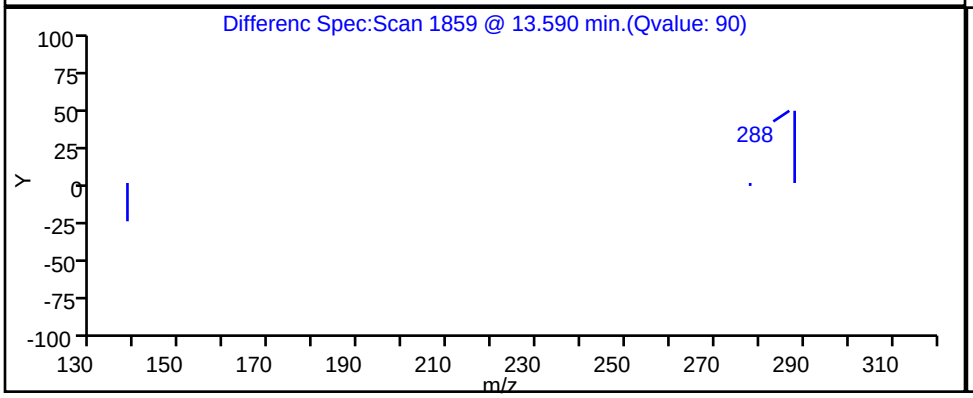


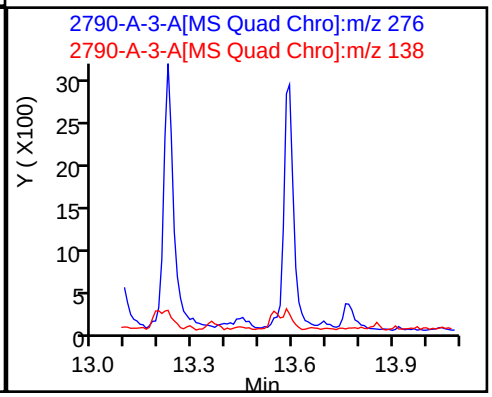












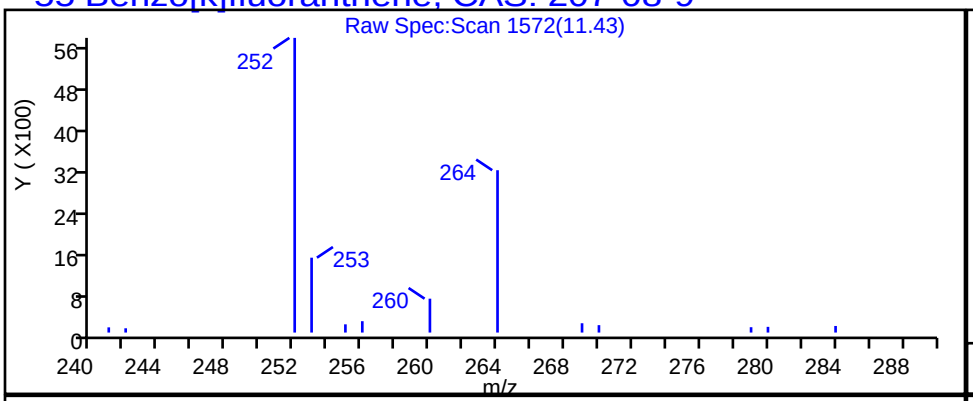
Report Date: 22-Nov-2023 14:12:22 Chrom Revision: 2.3 15-Nov-2023 20:54:34

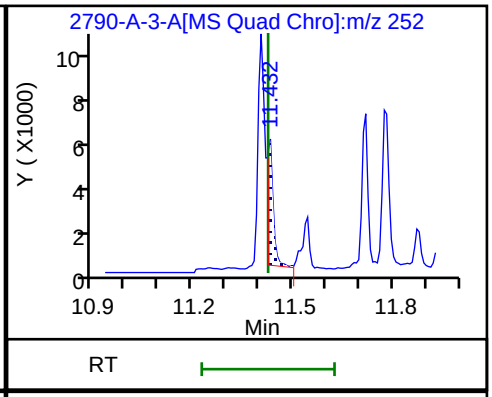
Eurofins Knoxville

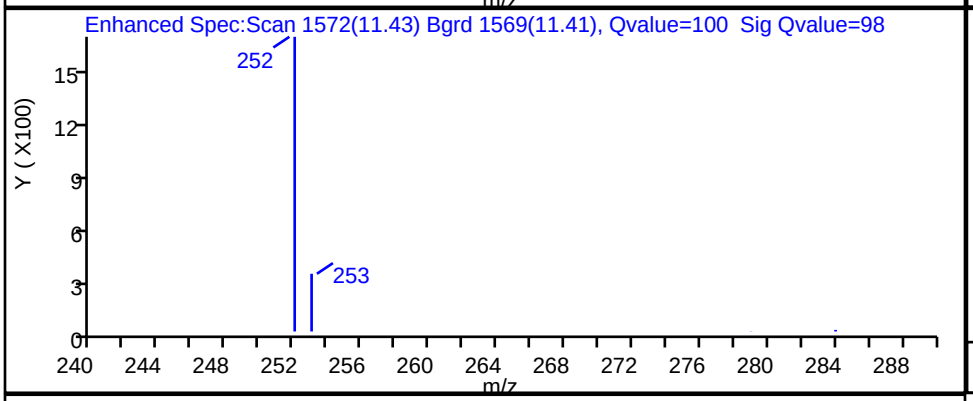
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D

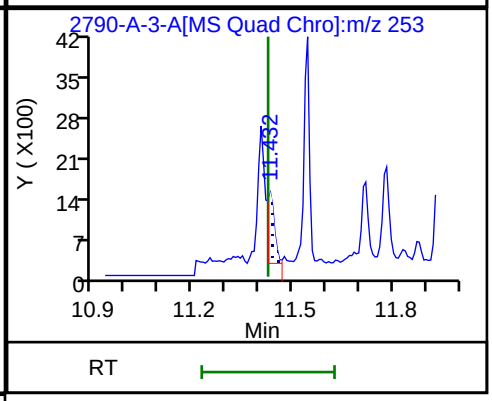
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8
Client ID:	1804576-843-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

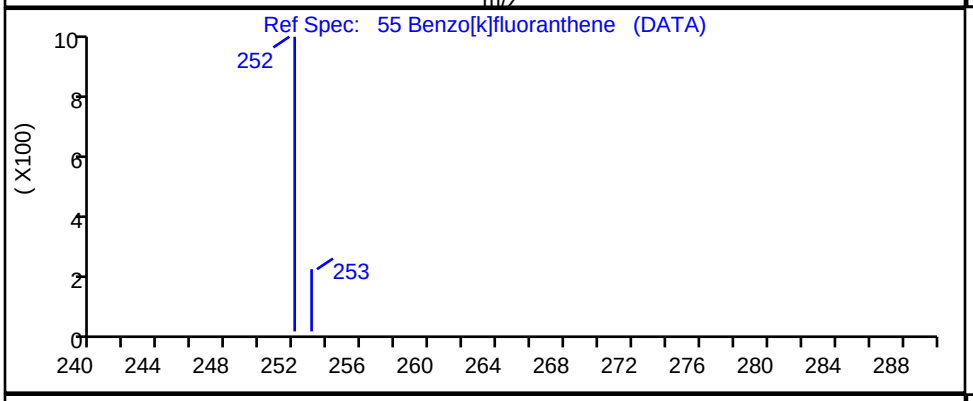
55 Benzo[k]fluoranthene, CAS: 207-08-9

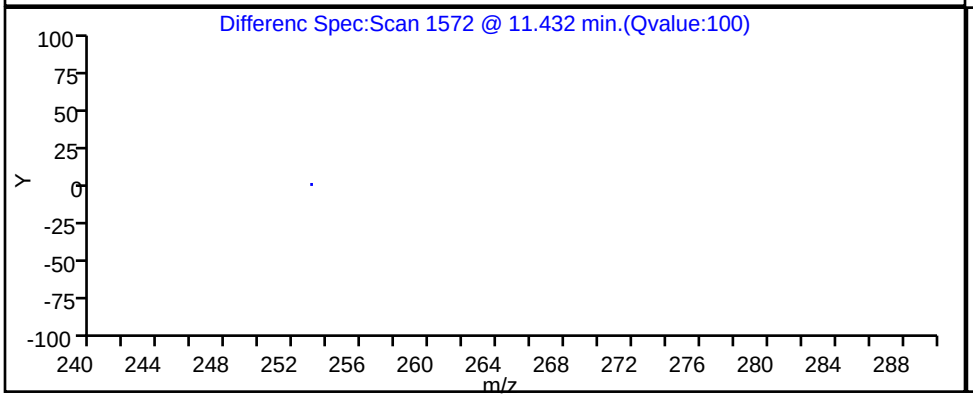


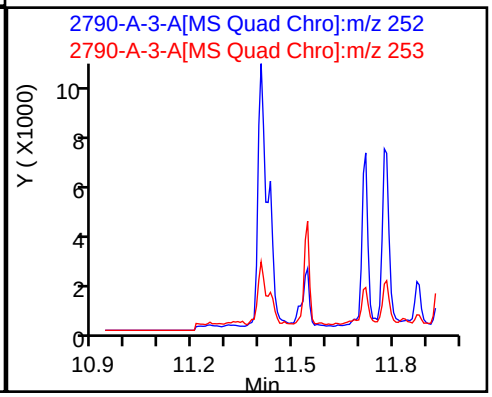












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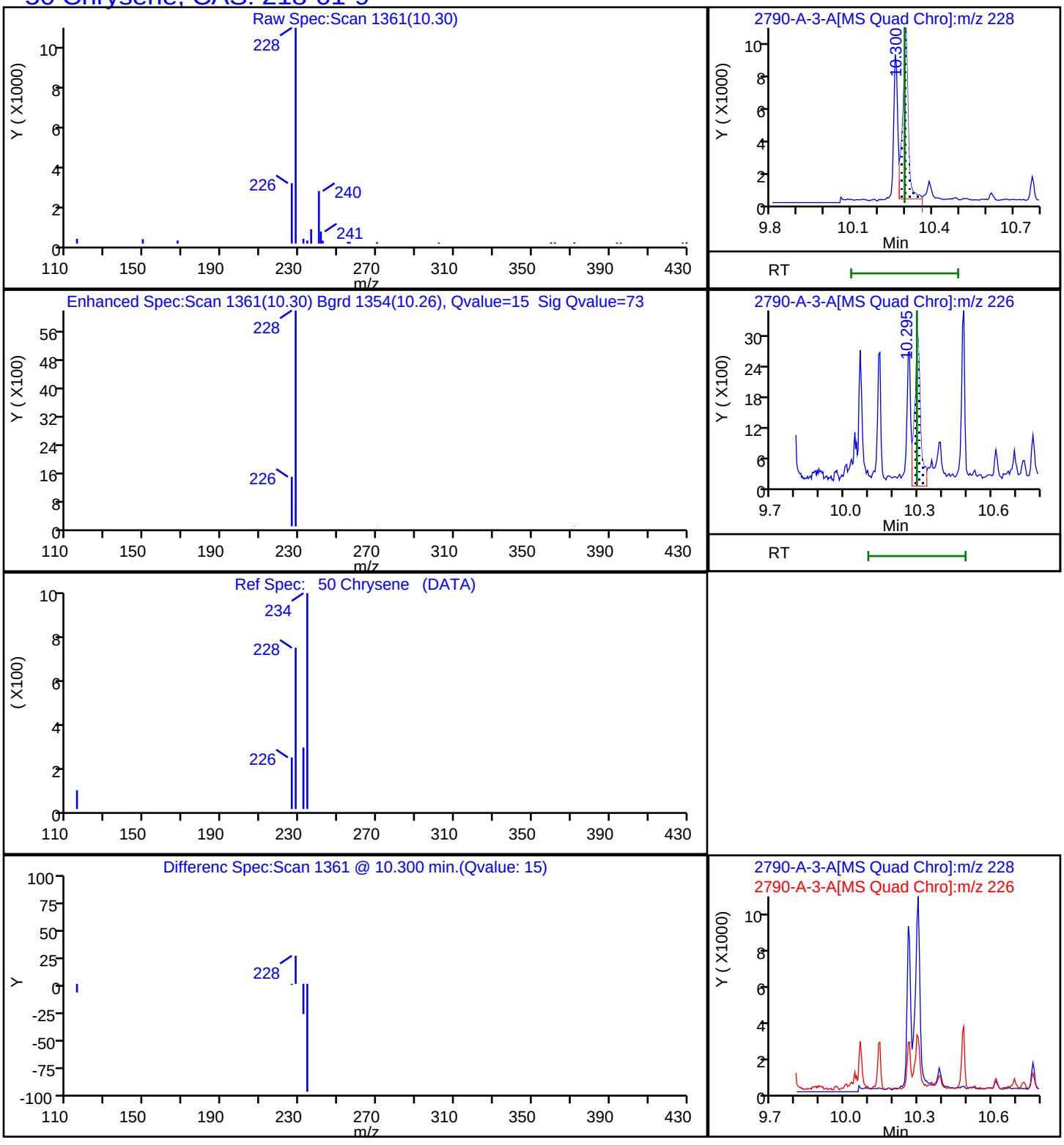
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D

Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

50 Chrysene, CAS: 218-01-9



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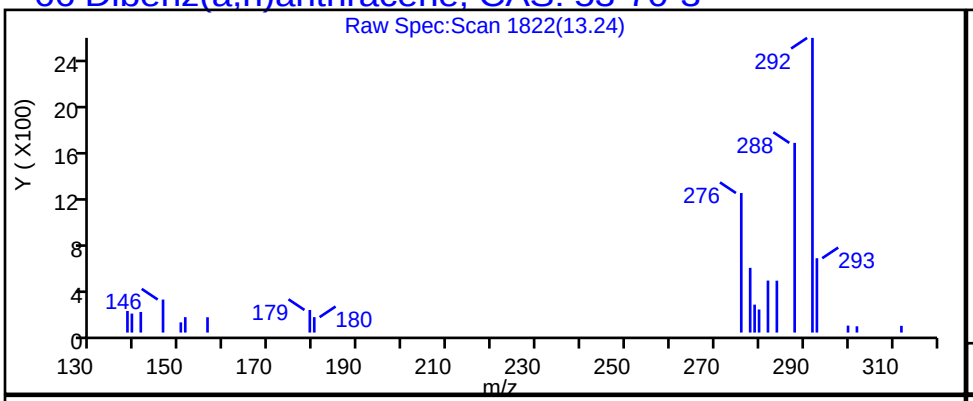
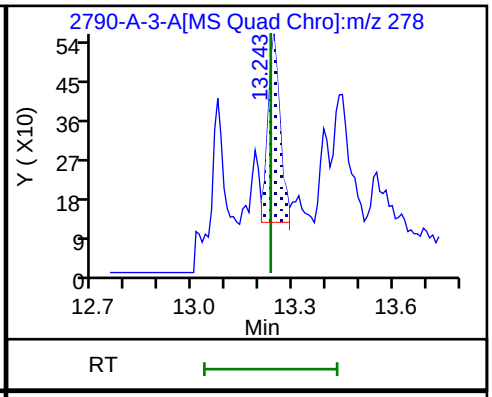
Eurofins Knoxville

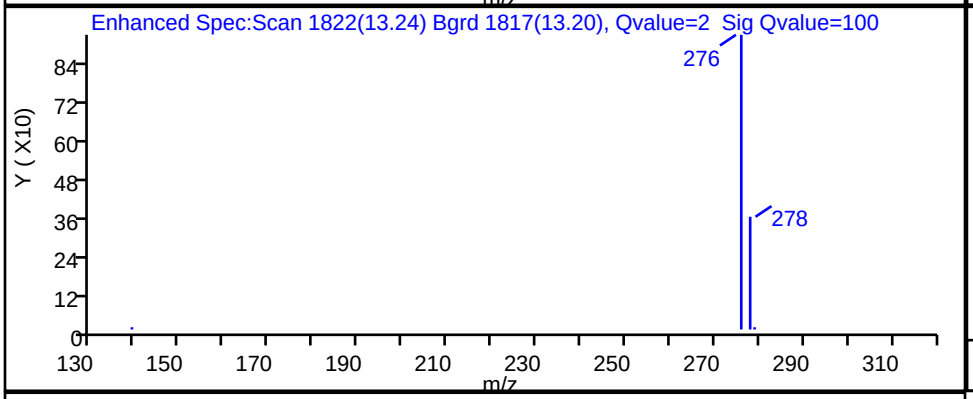
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D

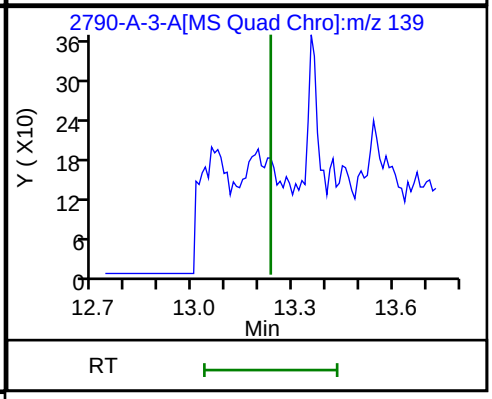
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8
Client ID:	1804576-843-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

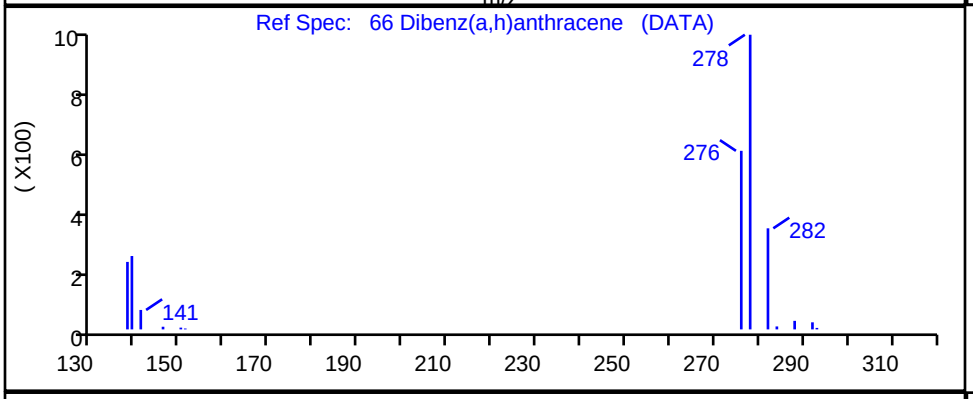
66 Dibenz(a,h)anthracene, CAS: 53-70-3

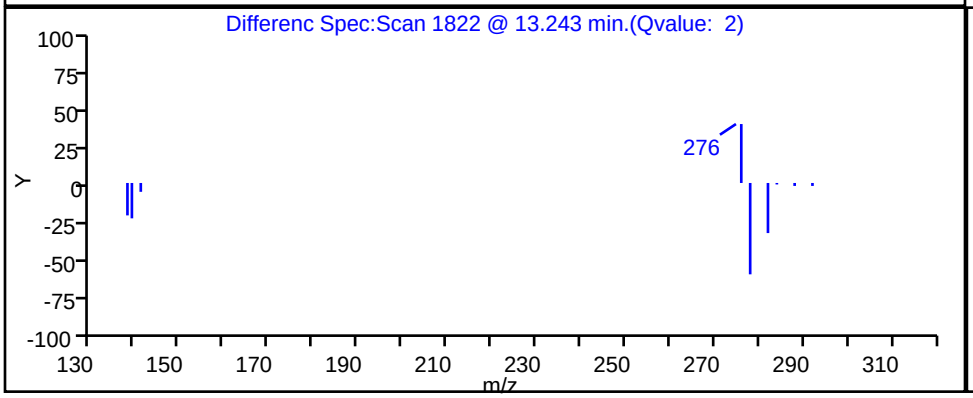


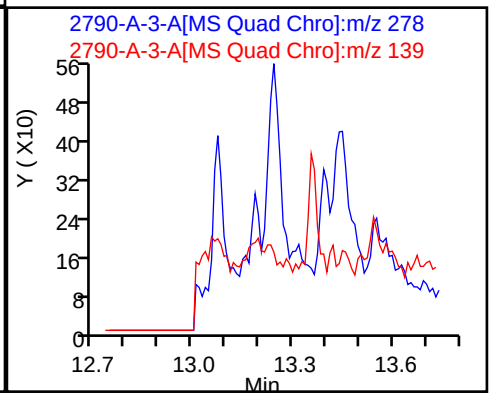












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Eurofins Knoxville

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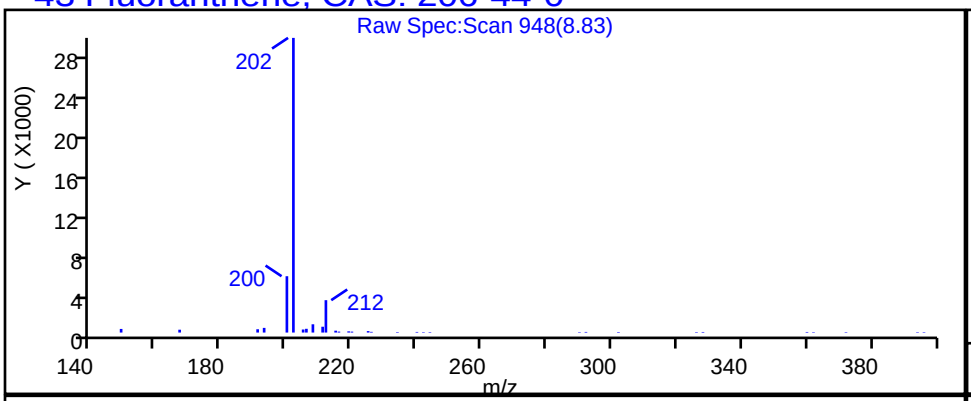
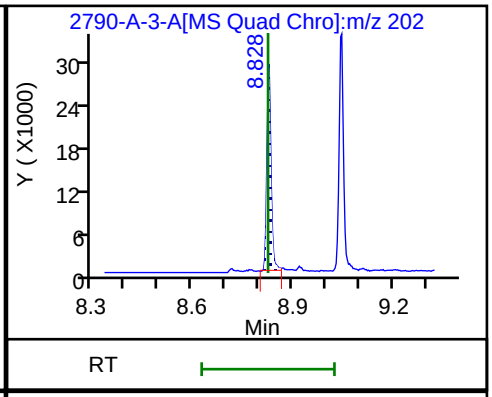
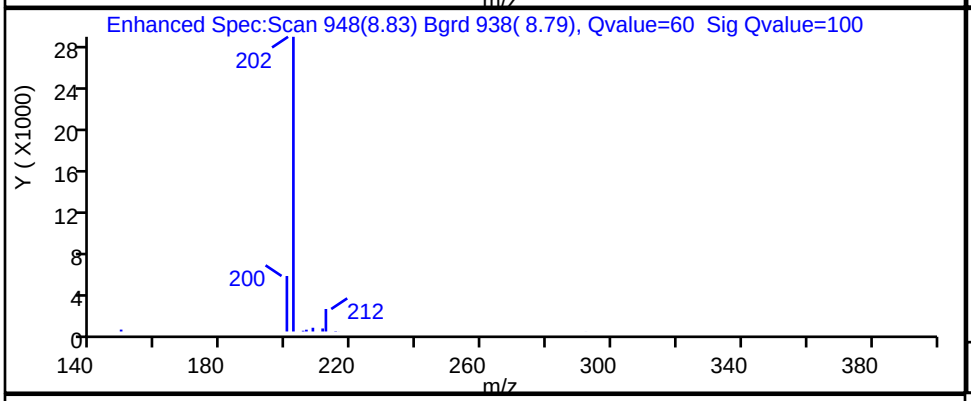
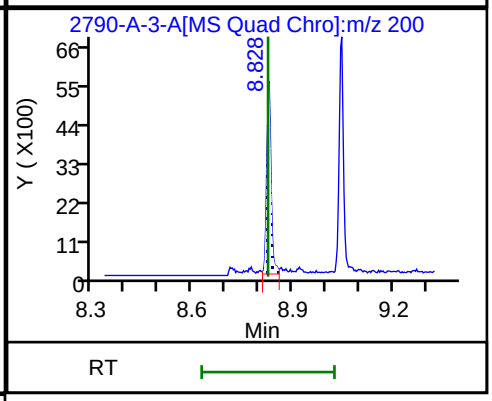
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8
Client ID:	1804576-843-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

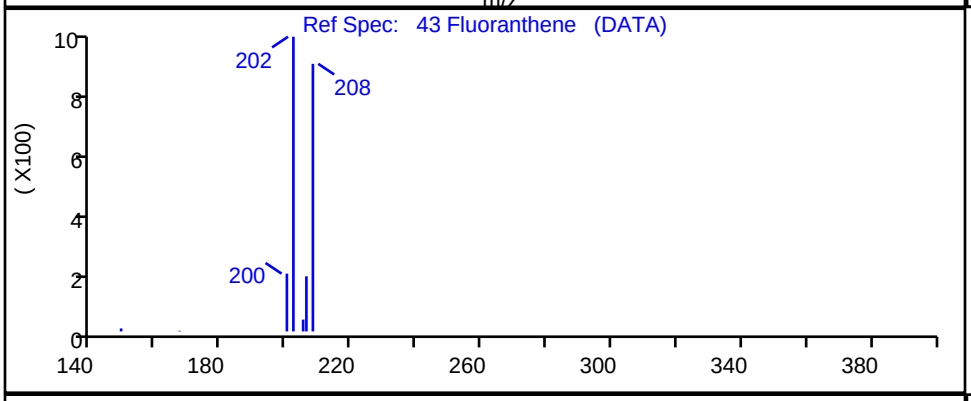
43 Fluoranthene, CAS: 206-44-0

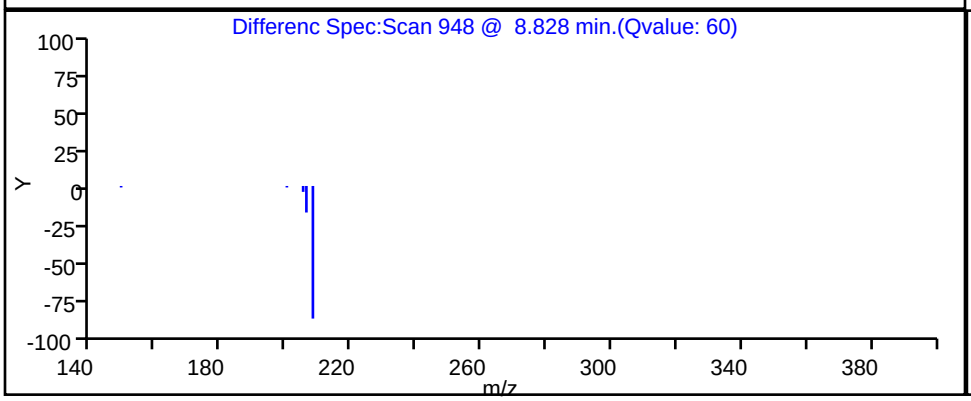


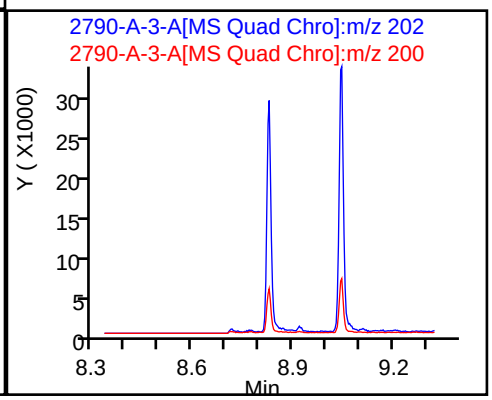












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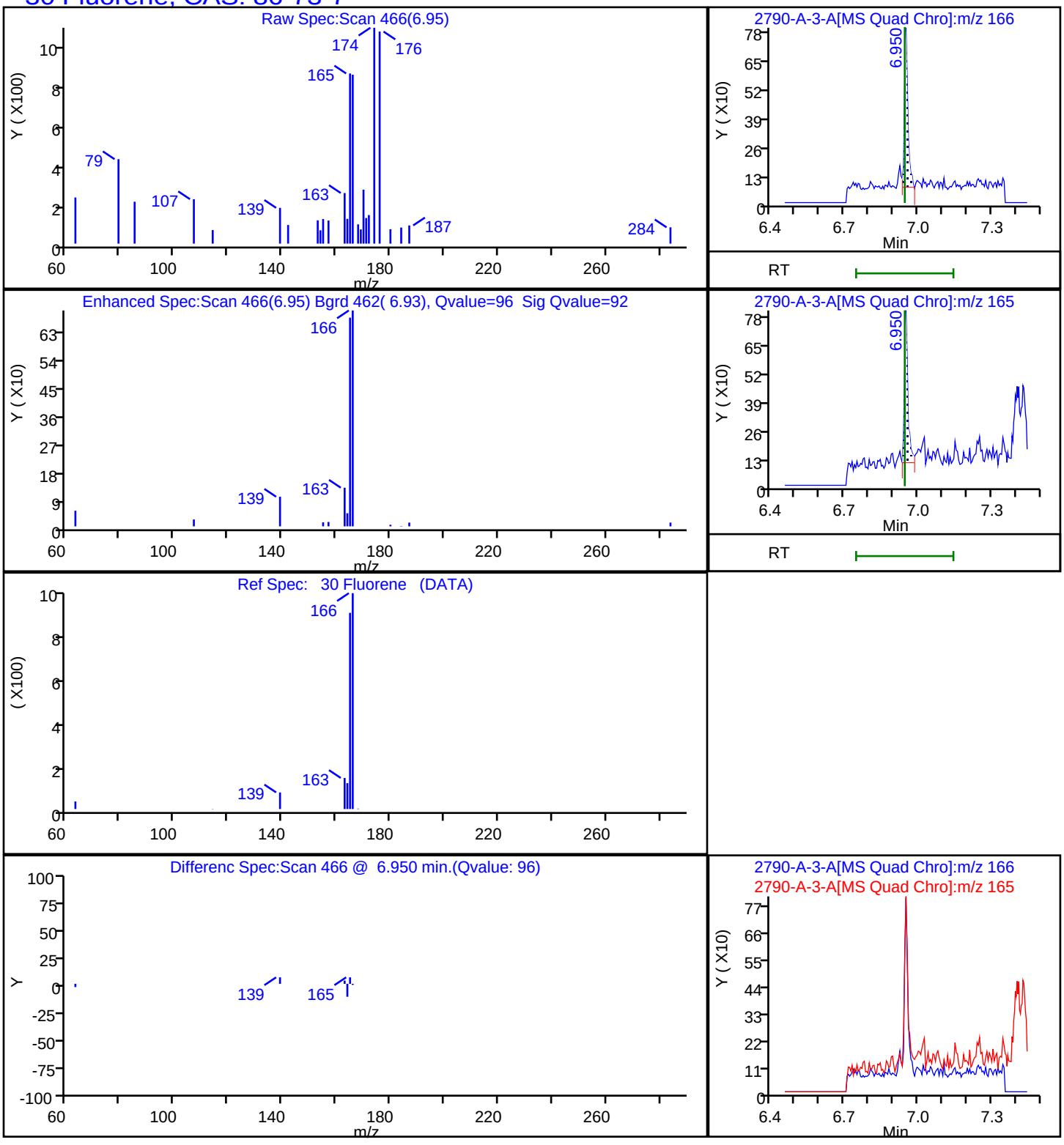
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D

Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8
Client ID:	1804576-843-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

30 Fluorene, CAS: 86-73-7



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Eurofins Knoxville

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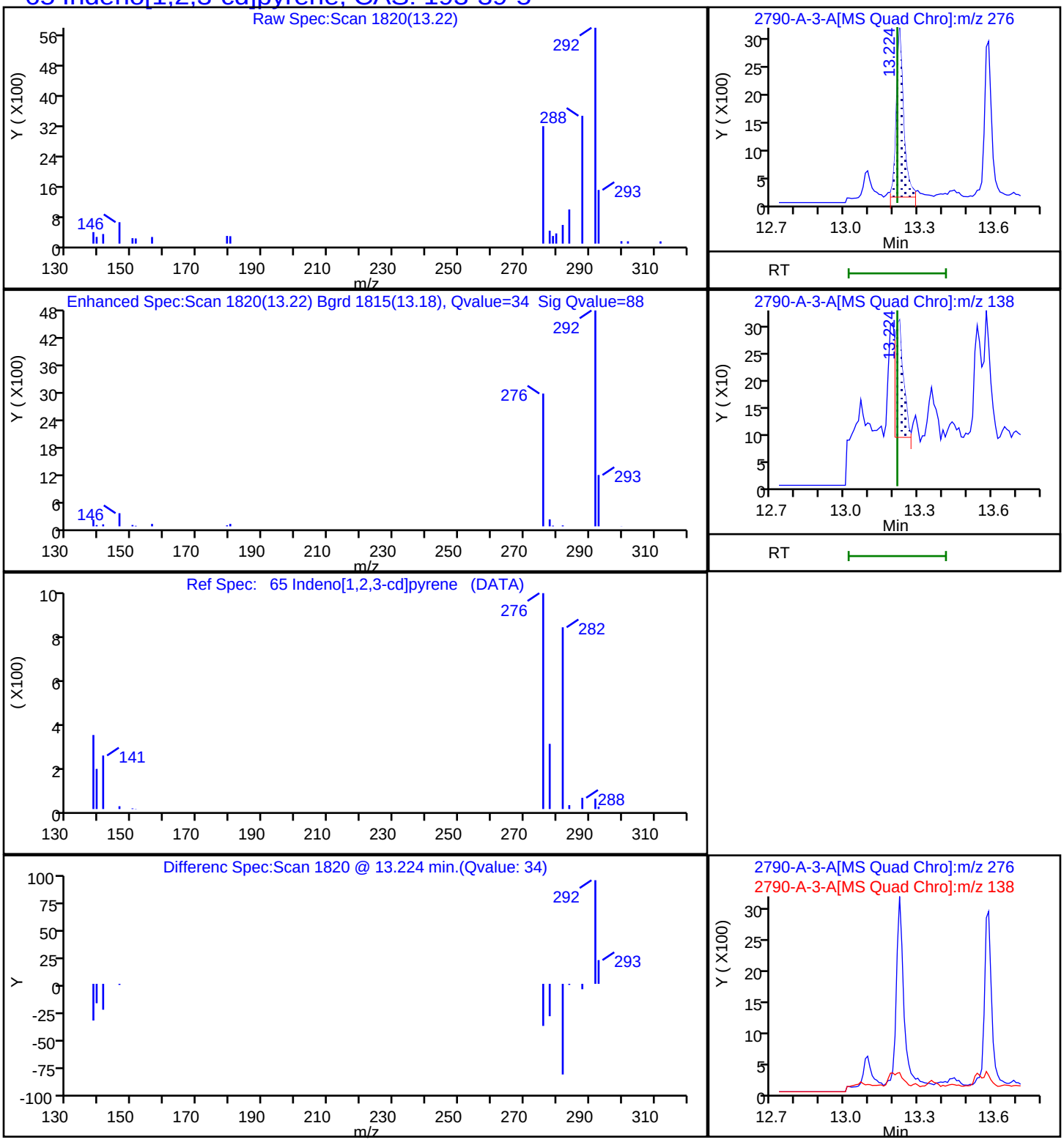
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

65 Indeno[1,2,3-cd]pyrene, CAS: 193-39-5



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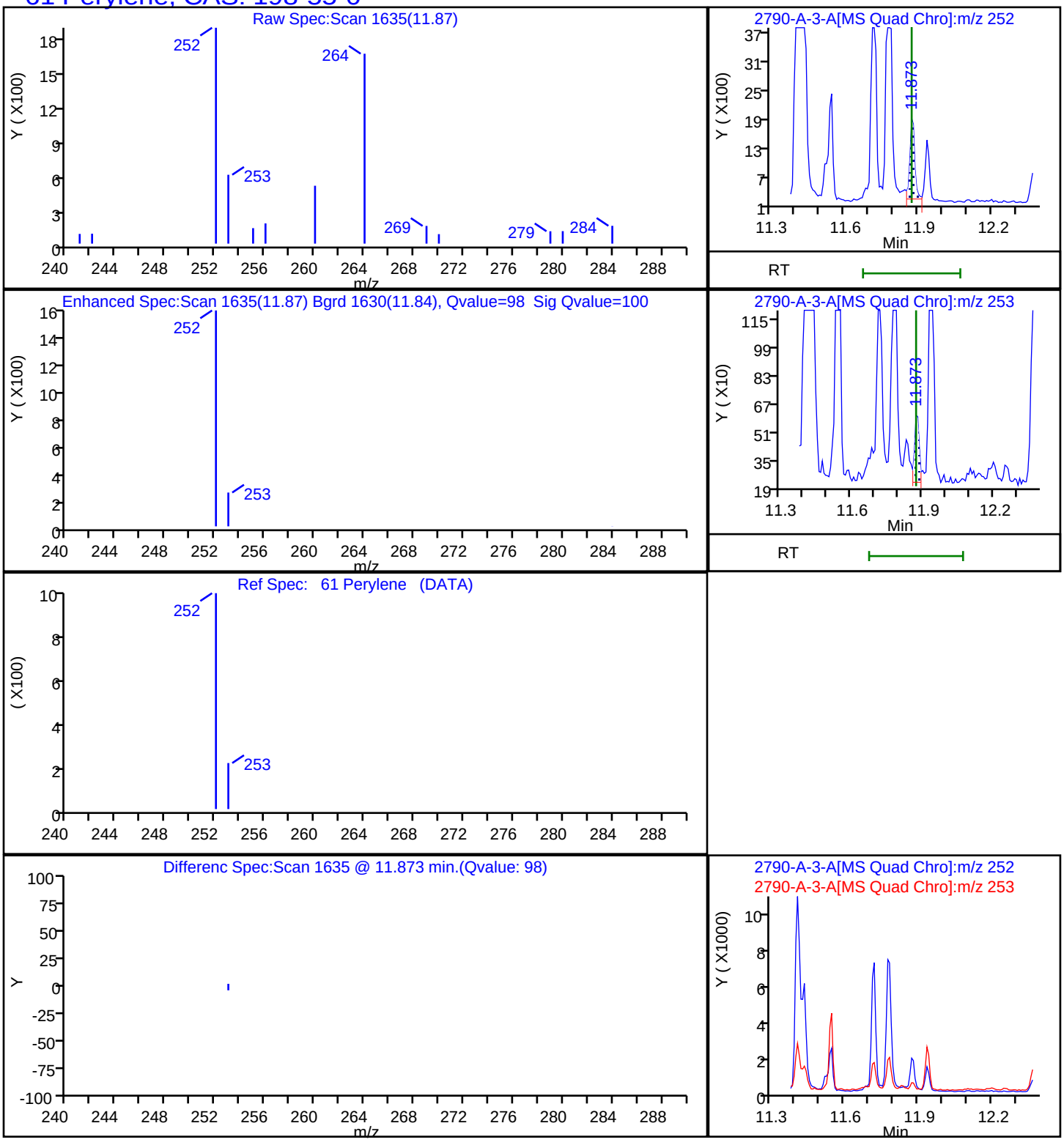
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8
Client ID:	1804576-843-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

61 Perylene, CAS: 198-55-0



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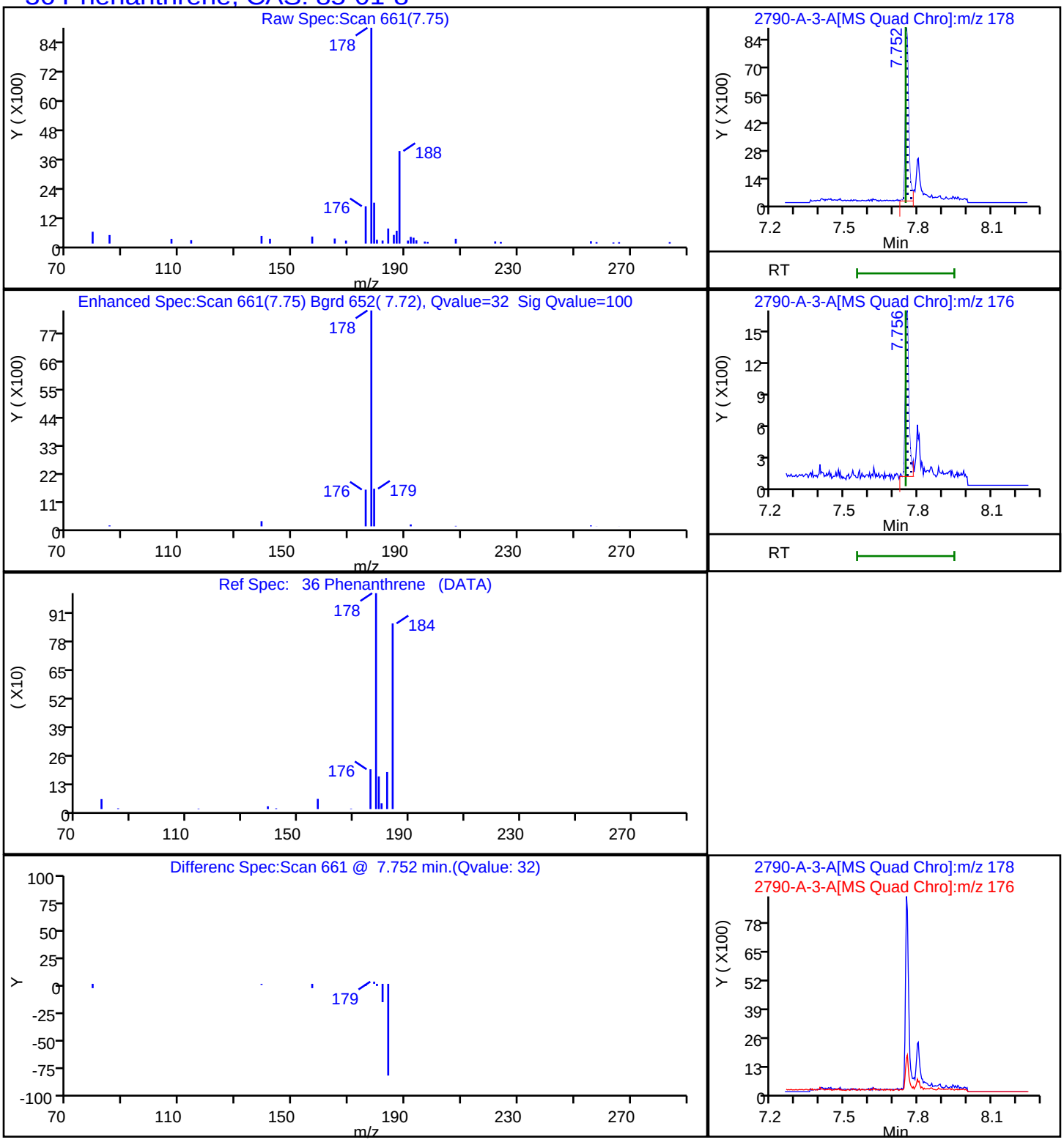
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8
Client ID:	1804576-843-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

36 Phenanthrene, CAS: 85-01-8



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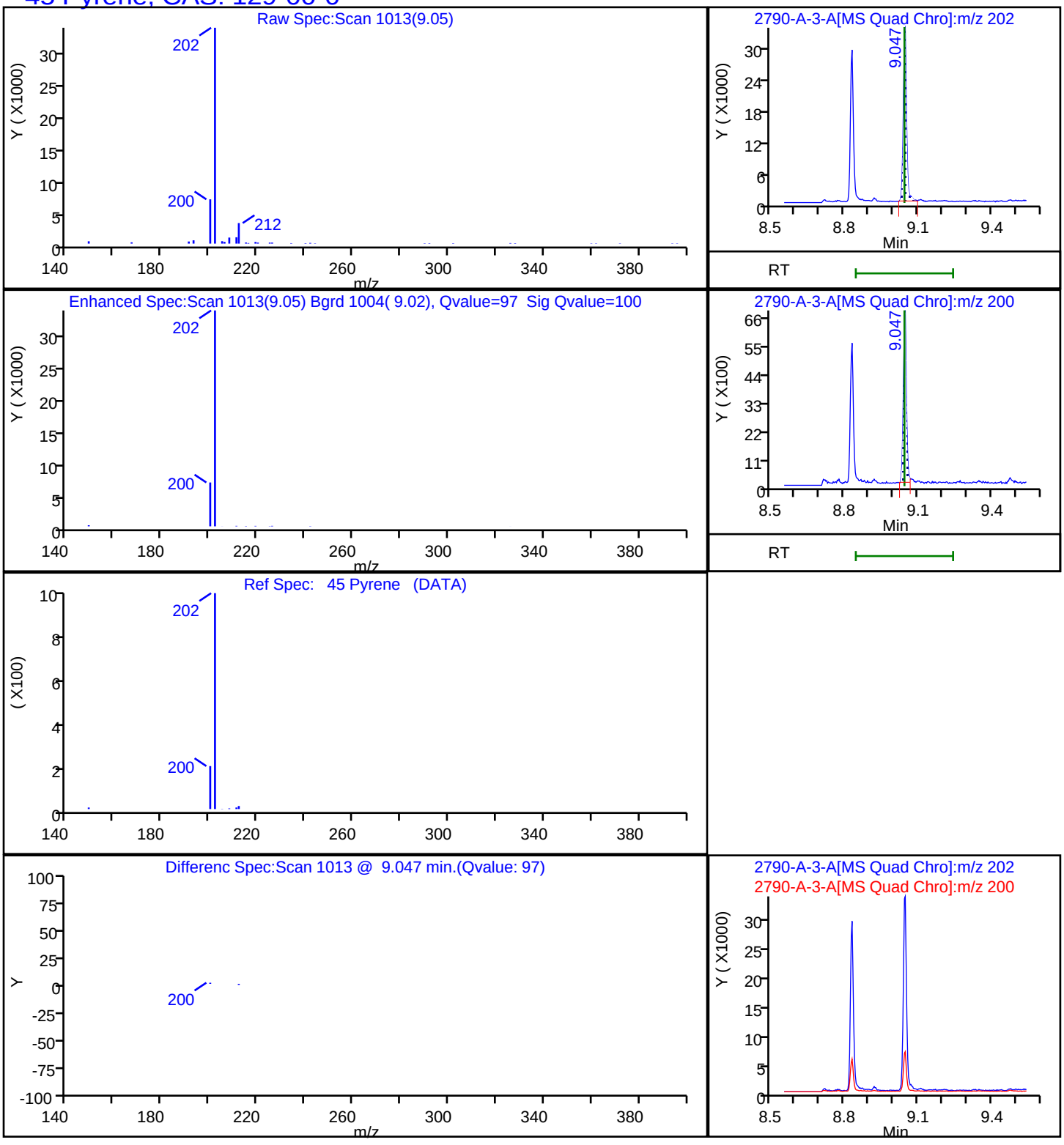
Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D		
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8
Client ID:	1804576-843-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

45 Pyrene, CAS: 129-00-0



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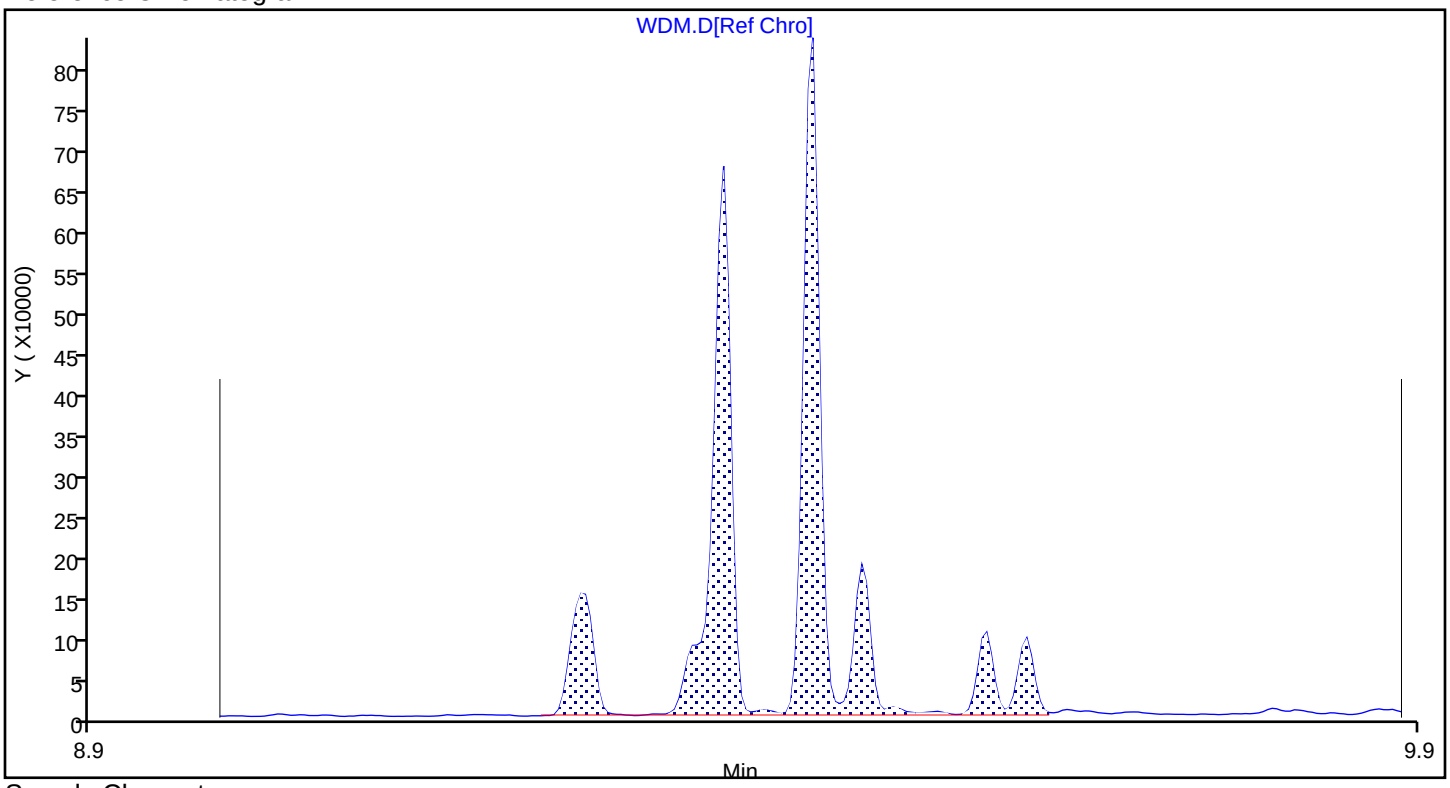
Eurofins Knoxville

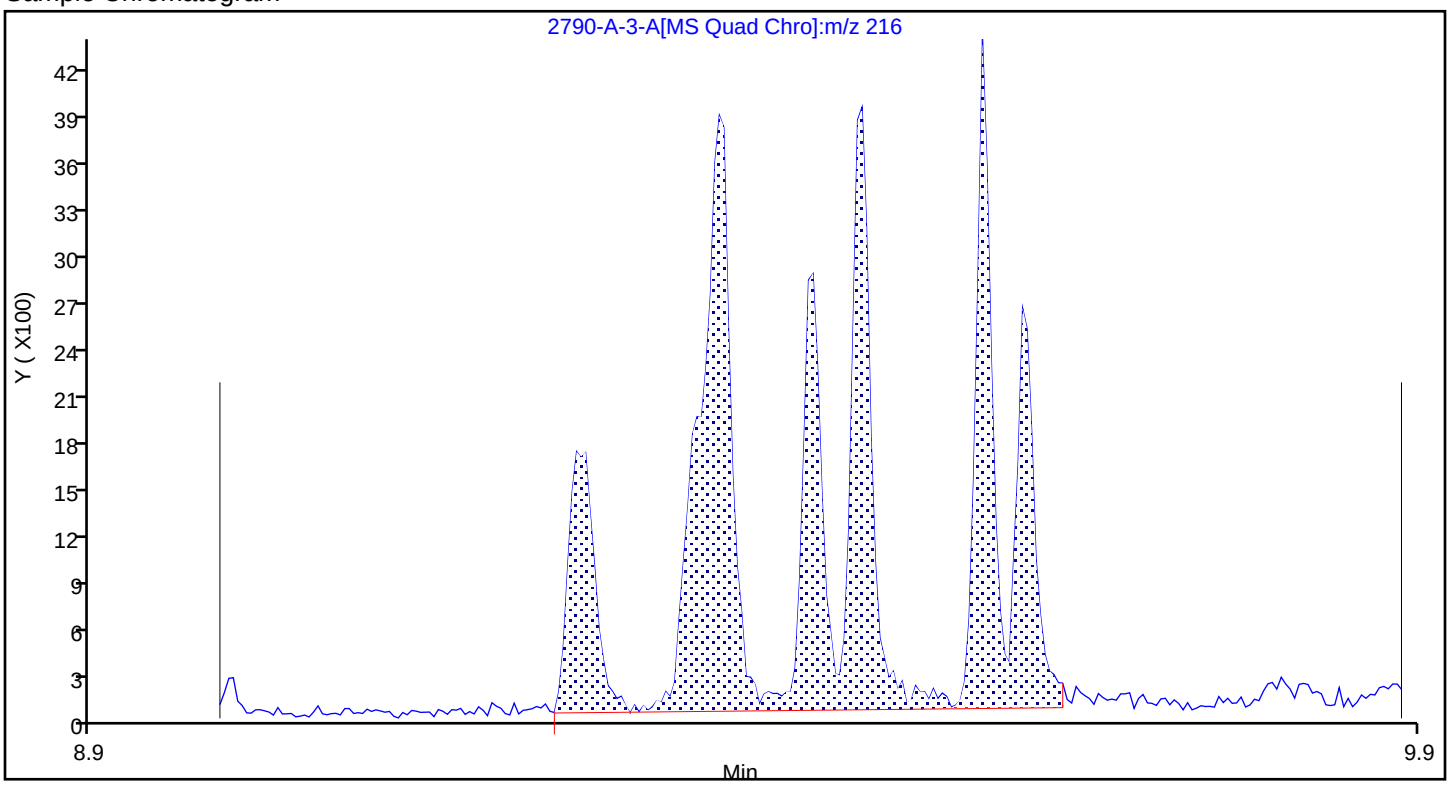
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D				
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 100 C1-Fluoranthenes/pyrene, CAS: STL00912

Reference Chromatogram



Sample Chromatogram



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Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D				
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
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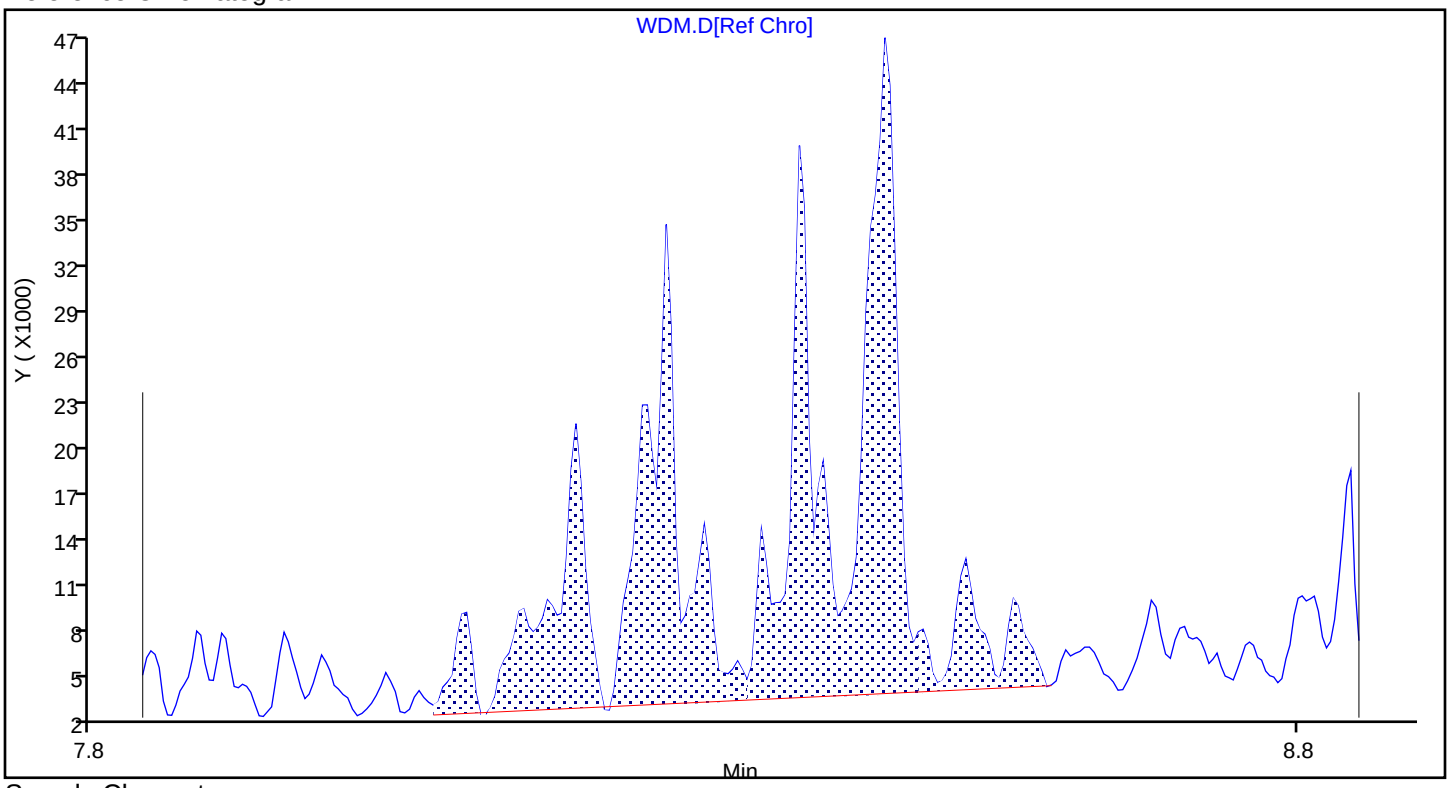
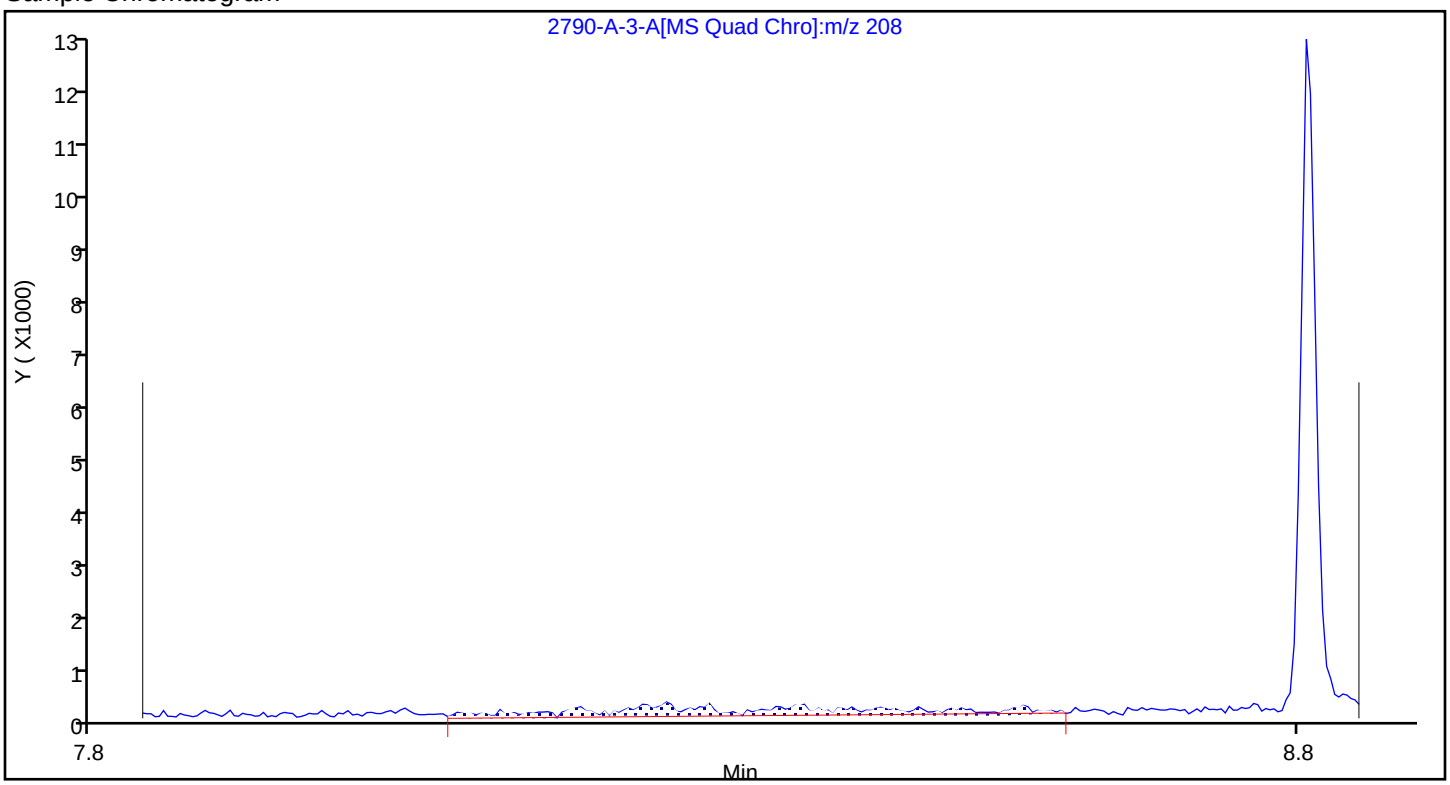
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 91 C3-Fluorenes, CAS: STL00915

Reference Chromatogram



Sample Chromatogram



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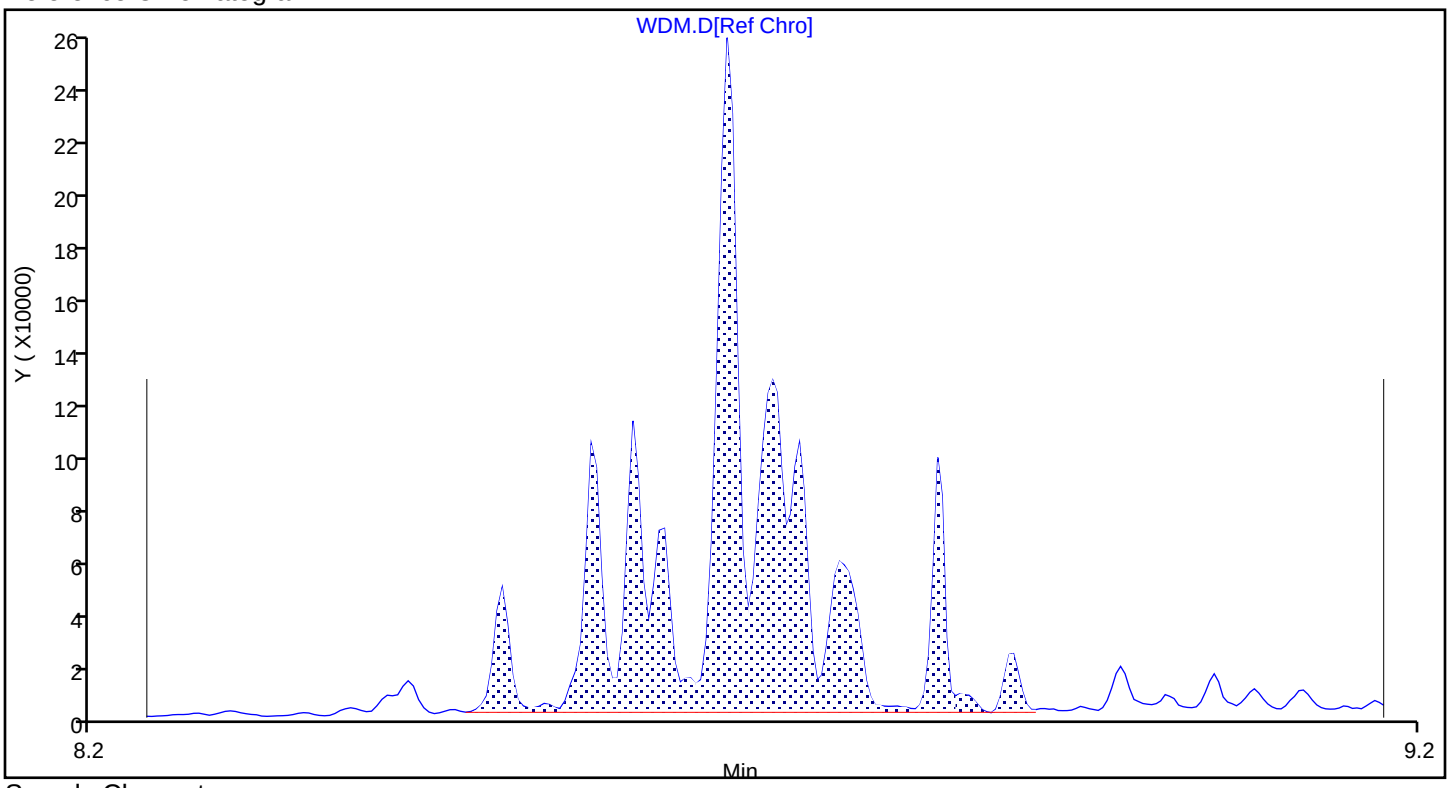
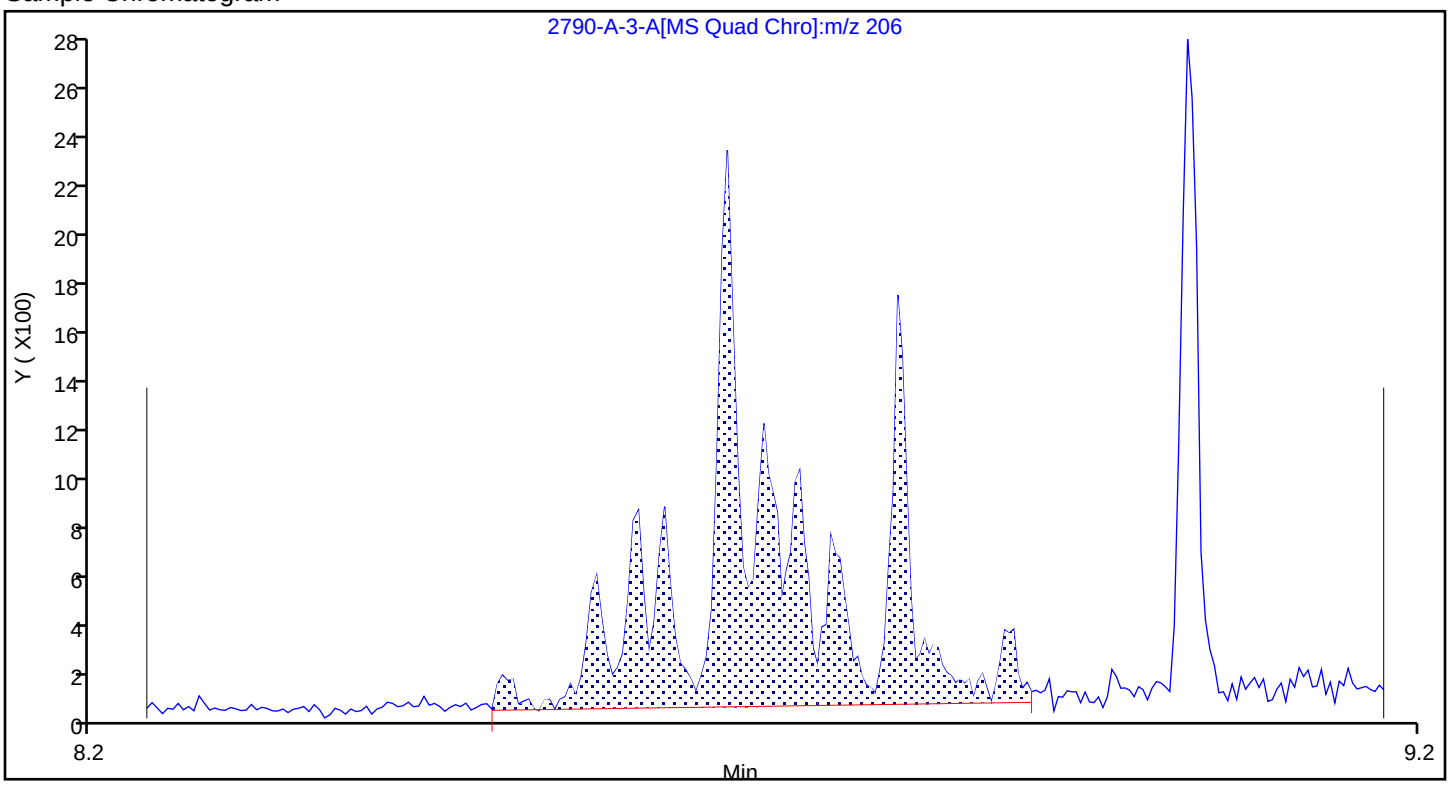
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D				
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 97 C2-Phenanthrenes/Anthracenes, CAS: STL00902

Reference Chromatogram



Sample Chromatogram



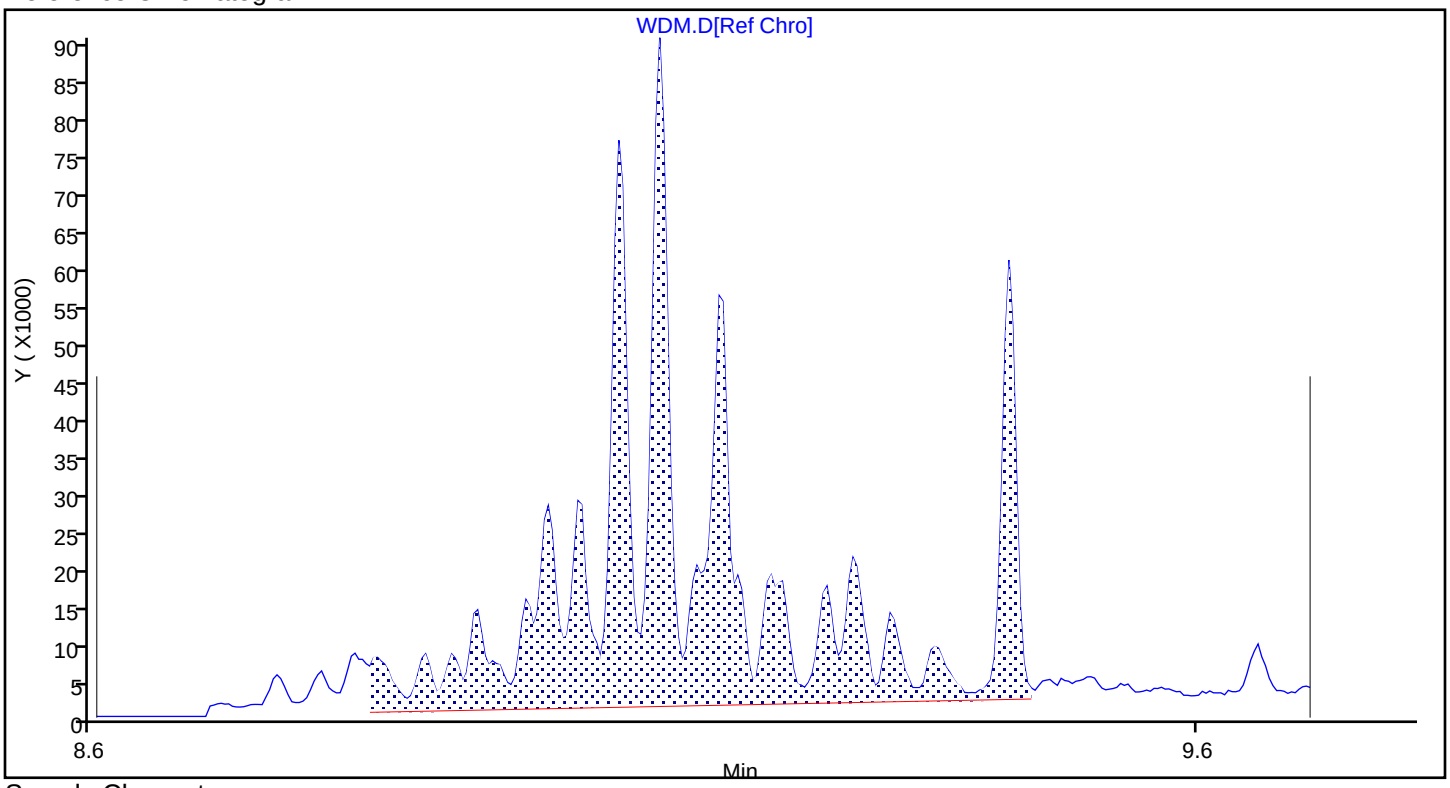
Report Date: 22-Nov-2023 14:12:22 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

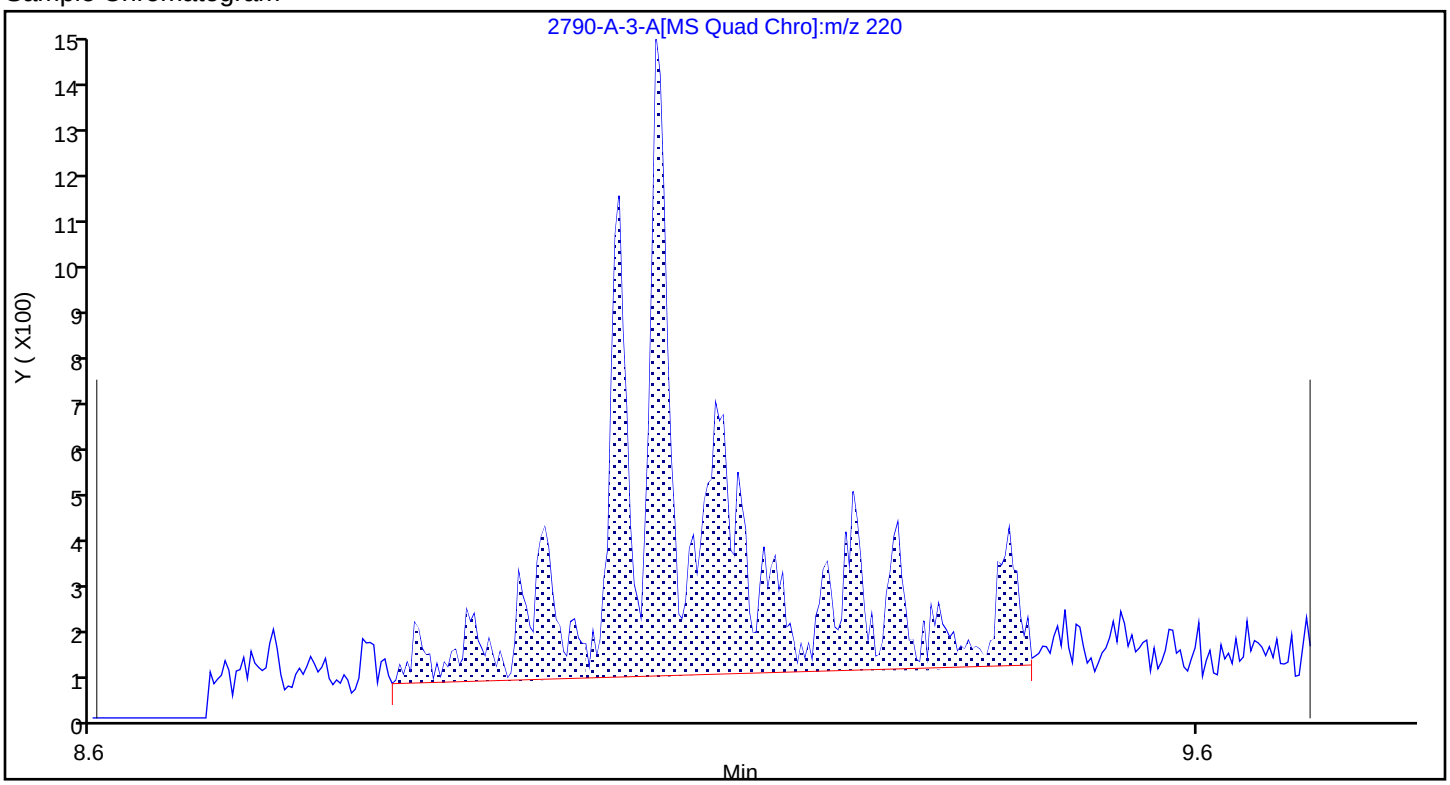
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D				
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 98 C3-Phenanthrenes/Anthracenes, CAS: STL00903

Reference Chromatogram



Sample Chromatogram



Report Date: 22-Nov-2023 14:12:22 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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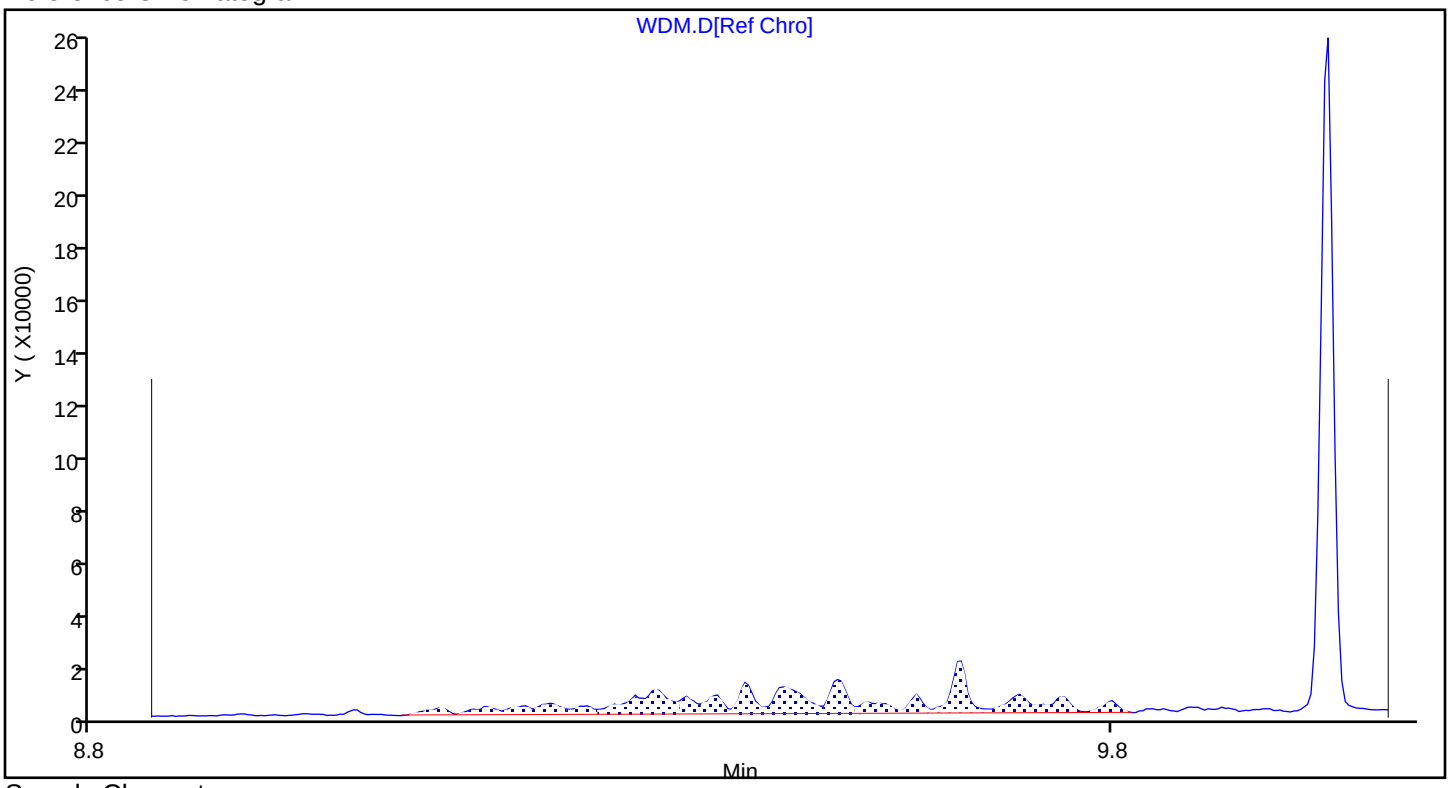
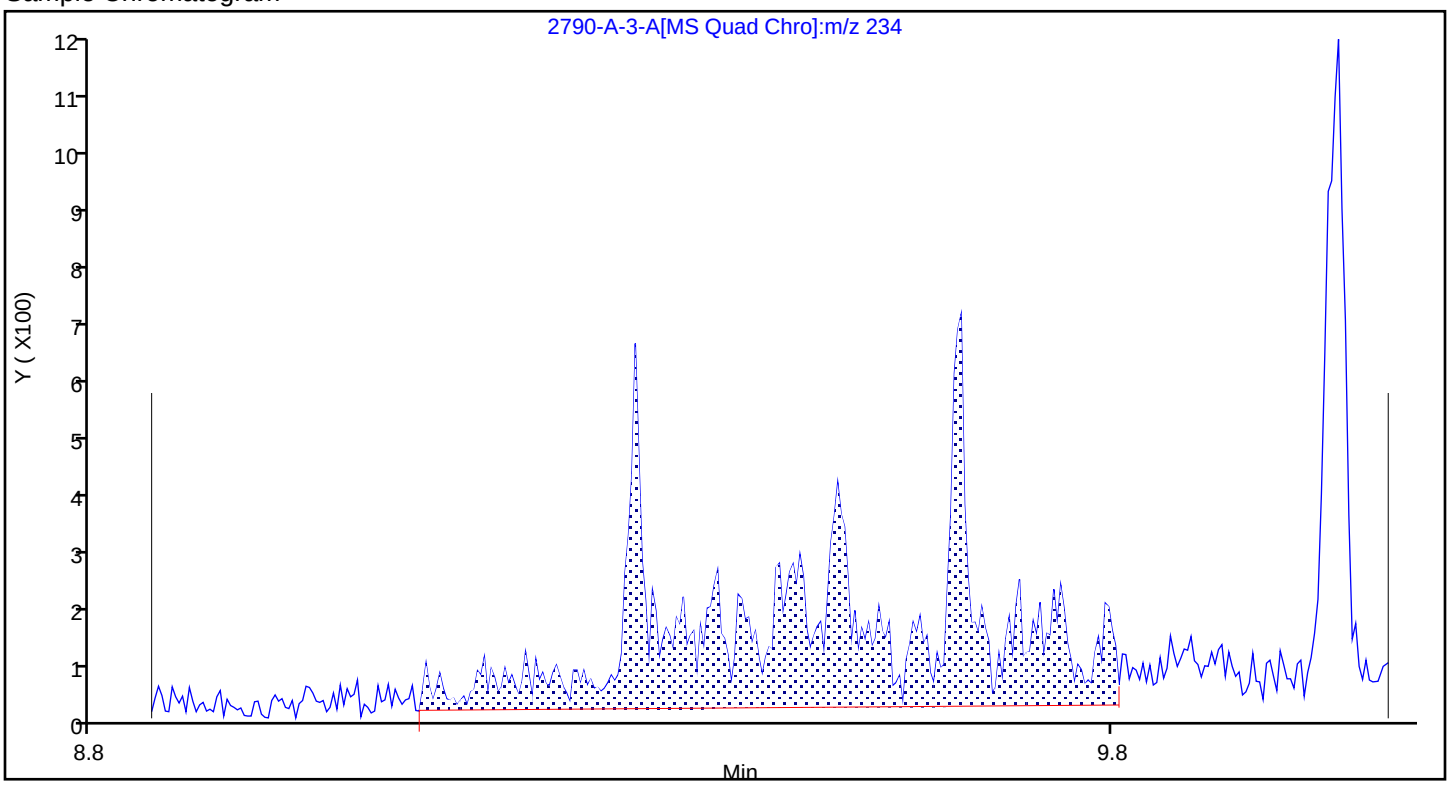
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 99 C4-Phenanthrenes/Anthracenes, CAS: STL00904

Reference Chromatogram



Sample Chromatogram



Report Date: 22-Nov-2023 14:12:22 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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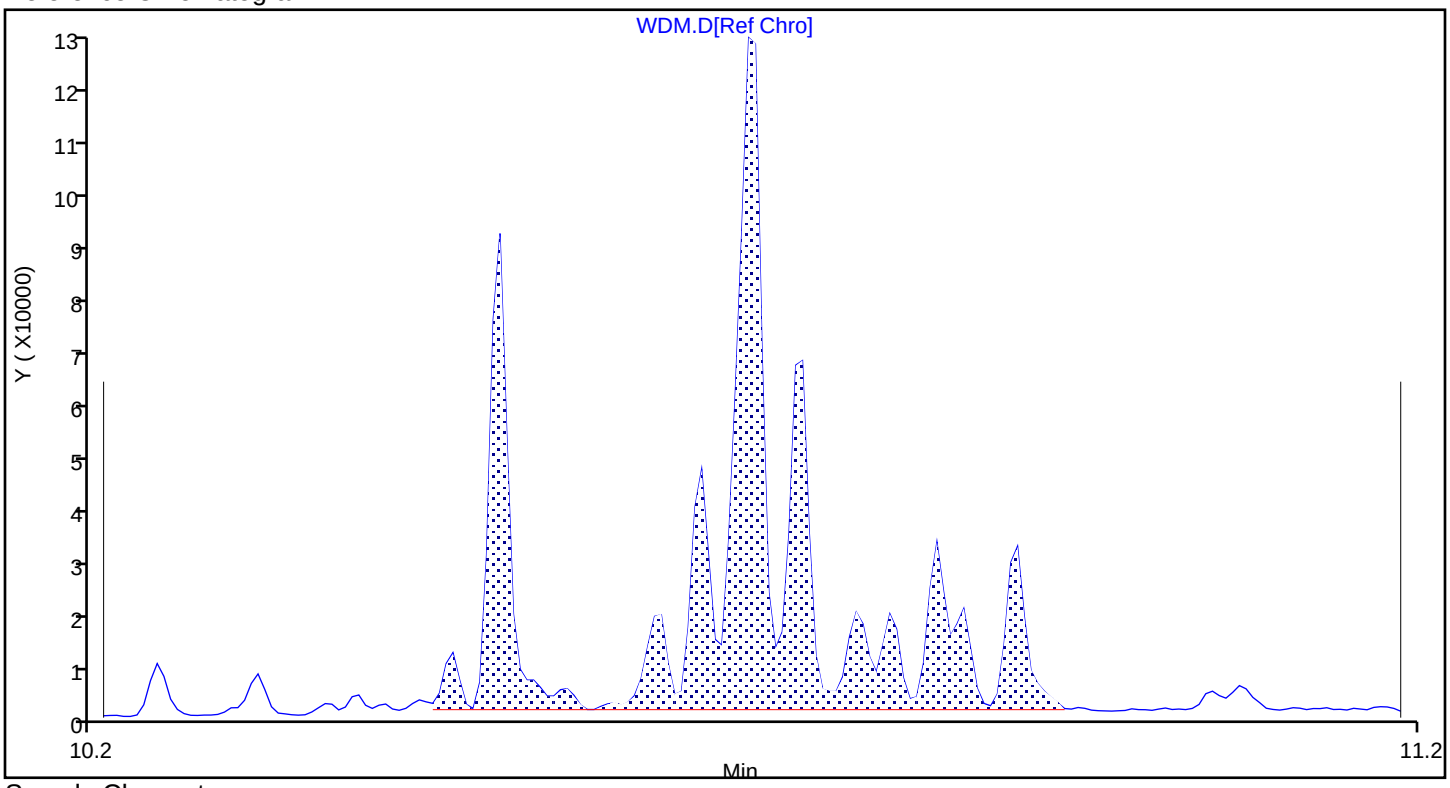
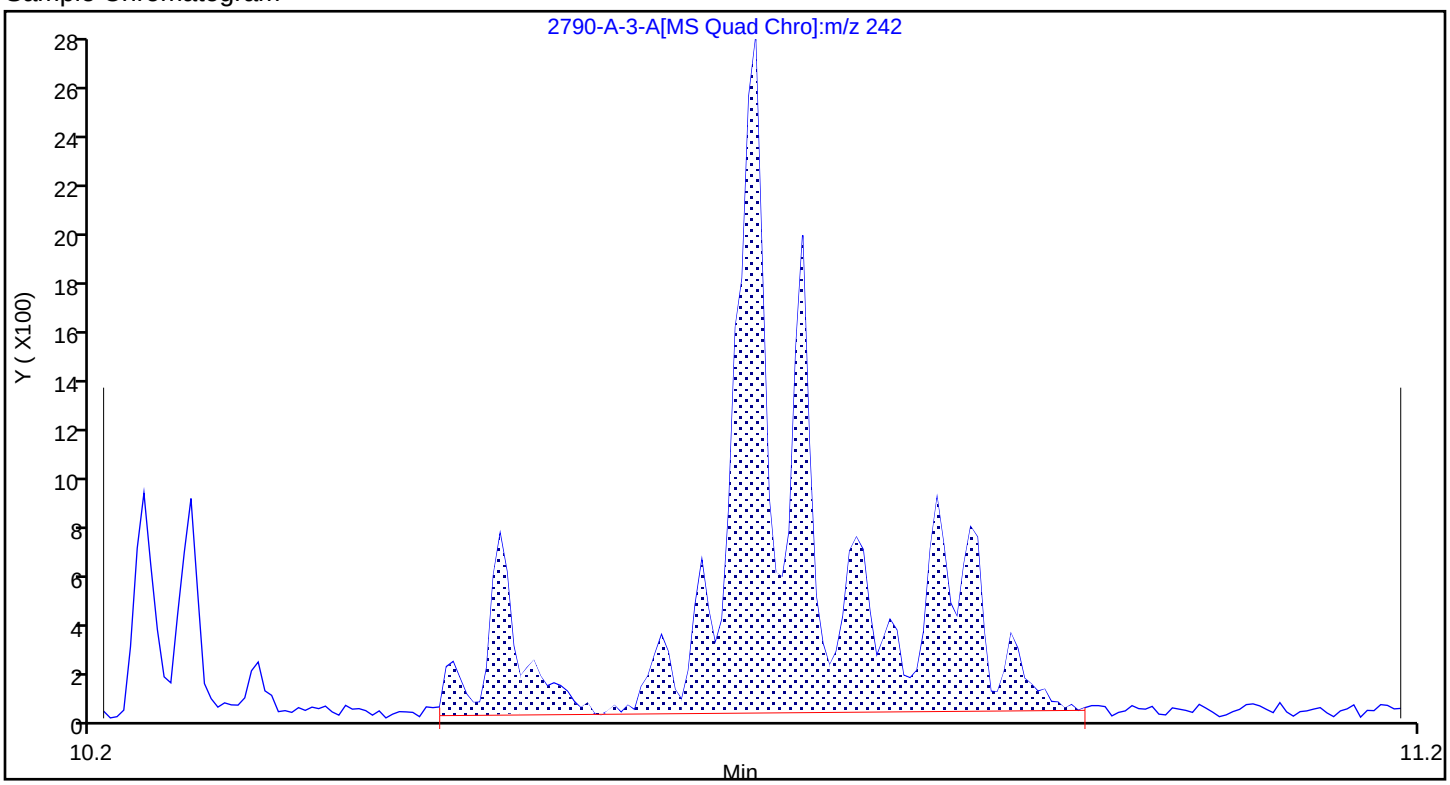
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 101 C1-Chrysenes/Benz(a)anthracenes, CAS: STL02218

Reference Chromatogram



Sample Chromatogram



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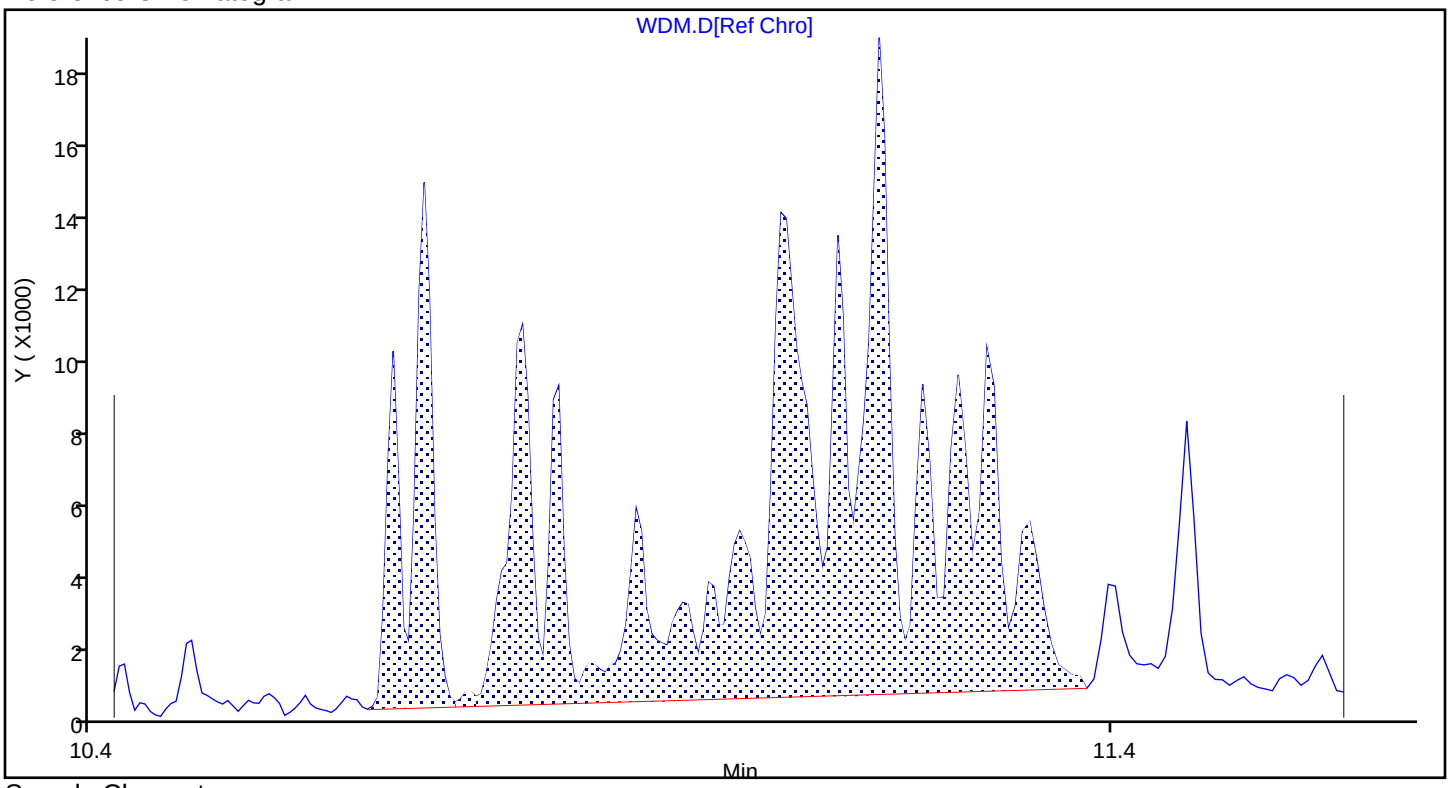
Eurofins Knoxville

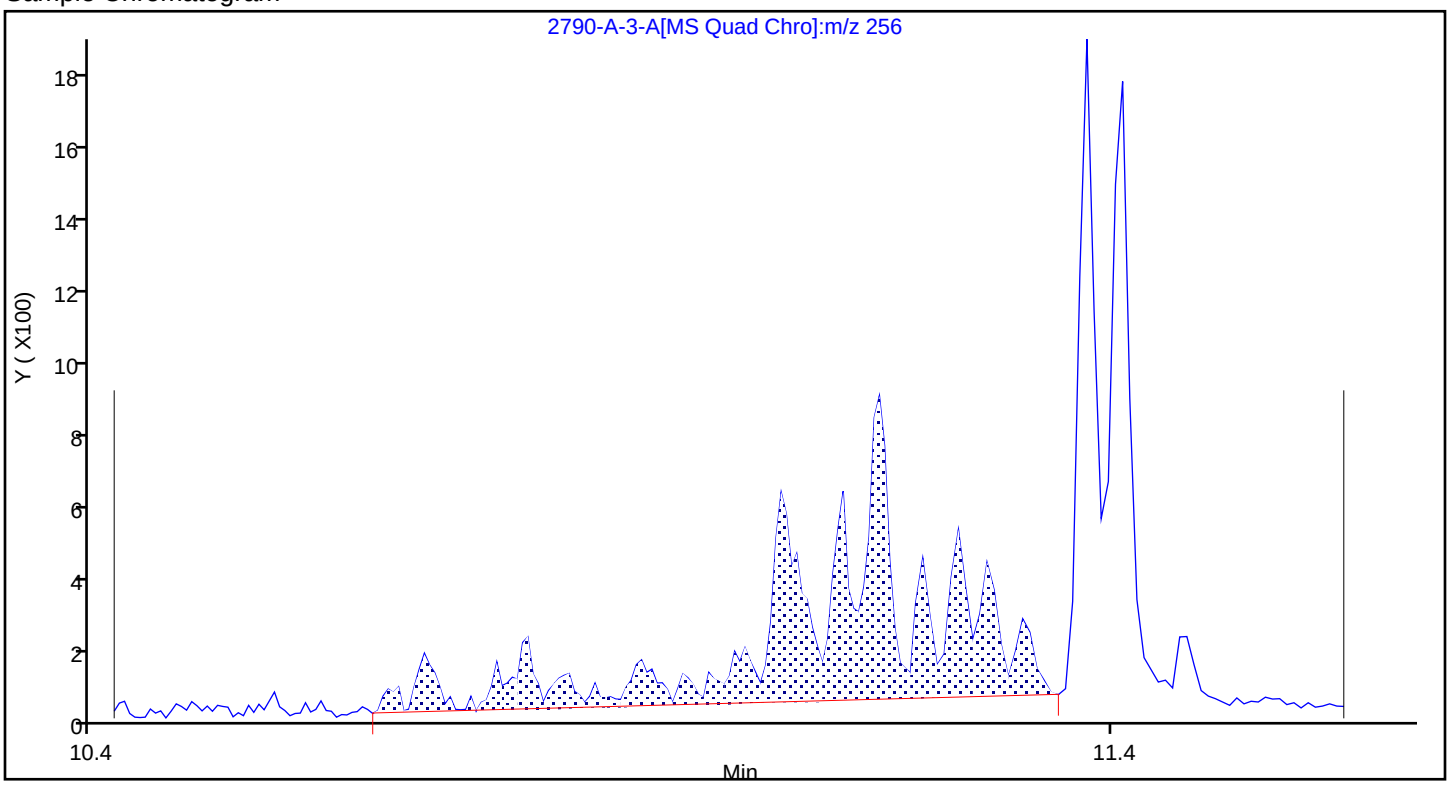
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D				
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 102 C2-Chrysenes/Benz(a)anthracenes, CAS: STL02219

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D				
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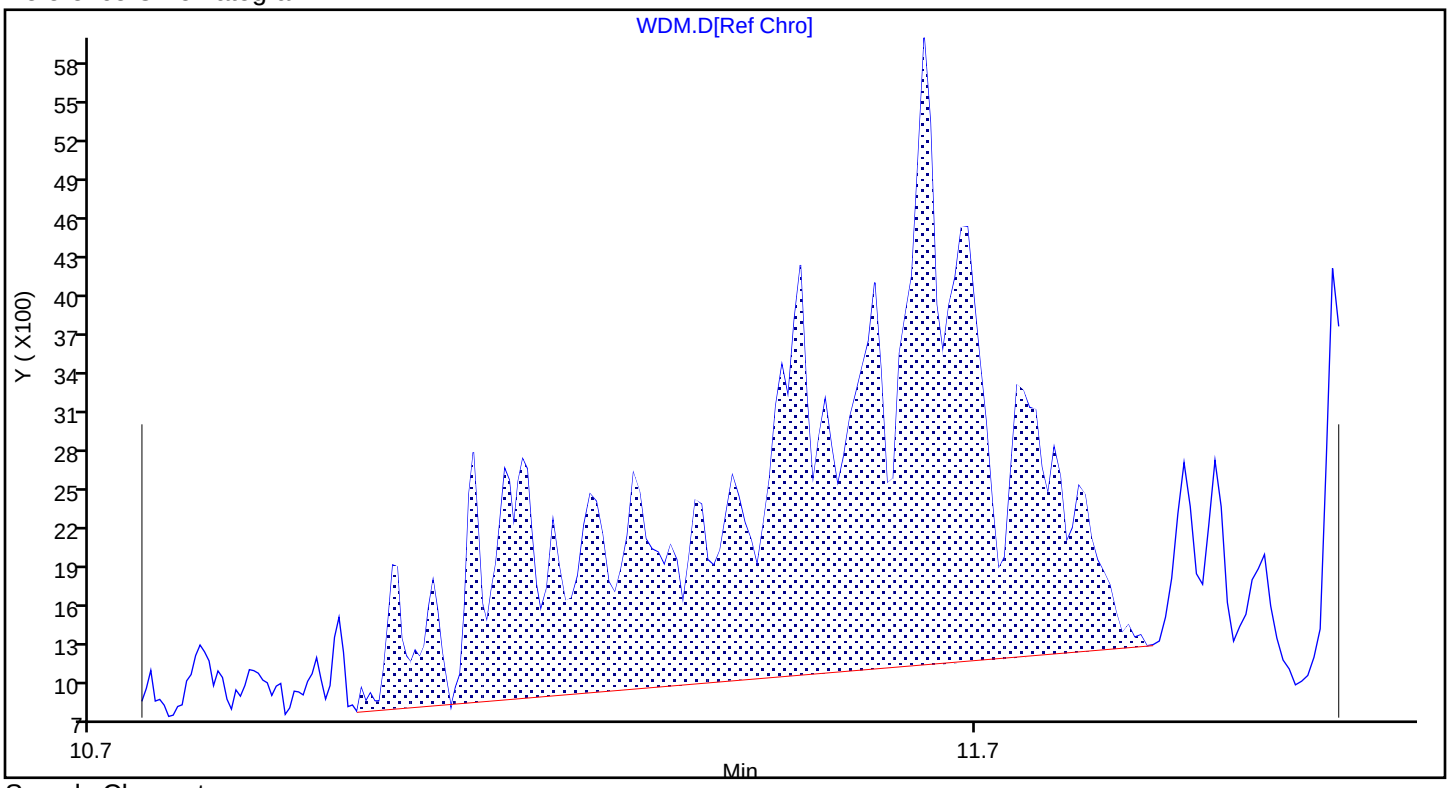
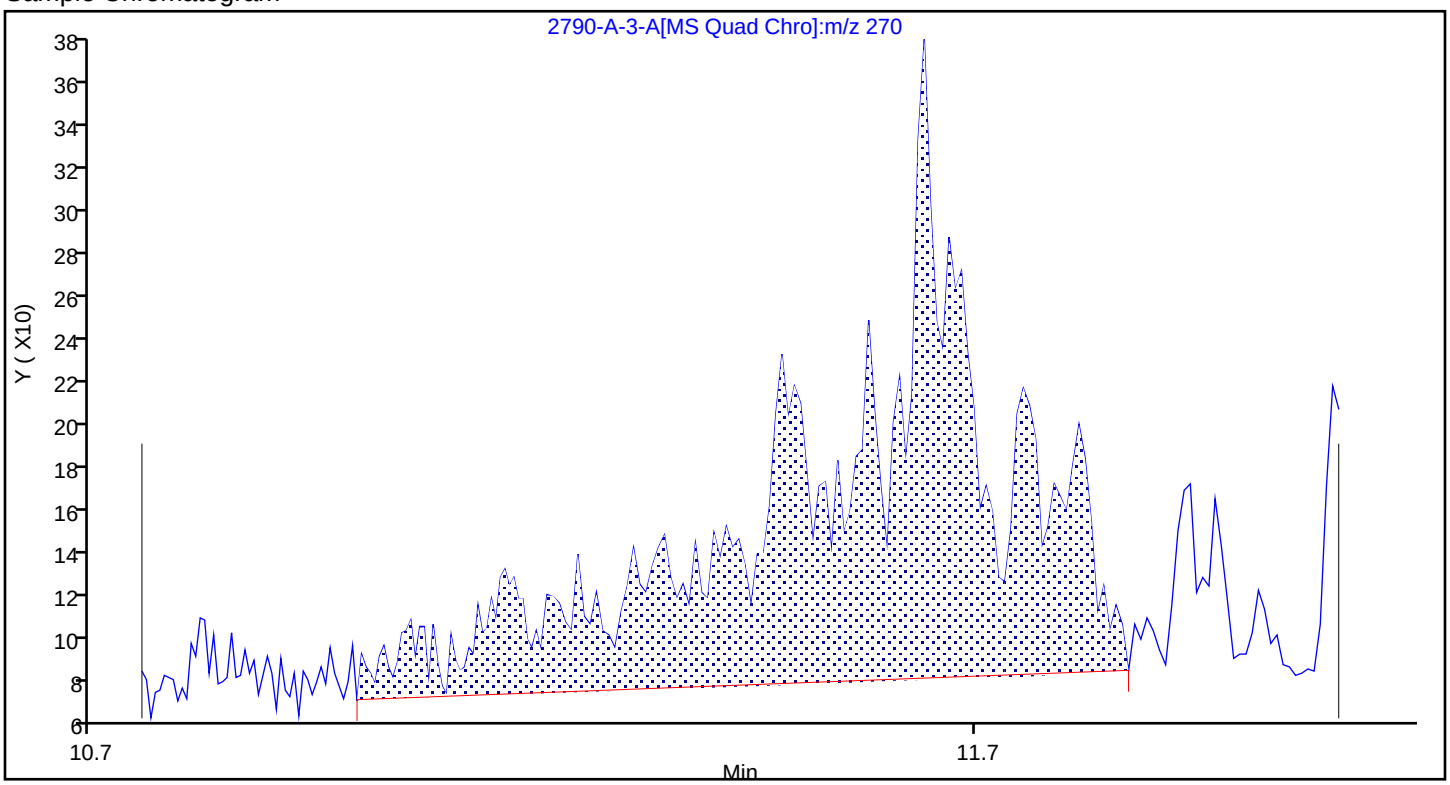
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 103 C3-Chrysenes/Benz(a)anthracenes, CAS: STL02220

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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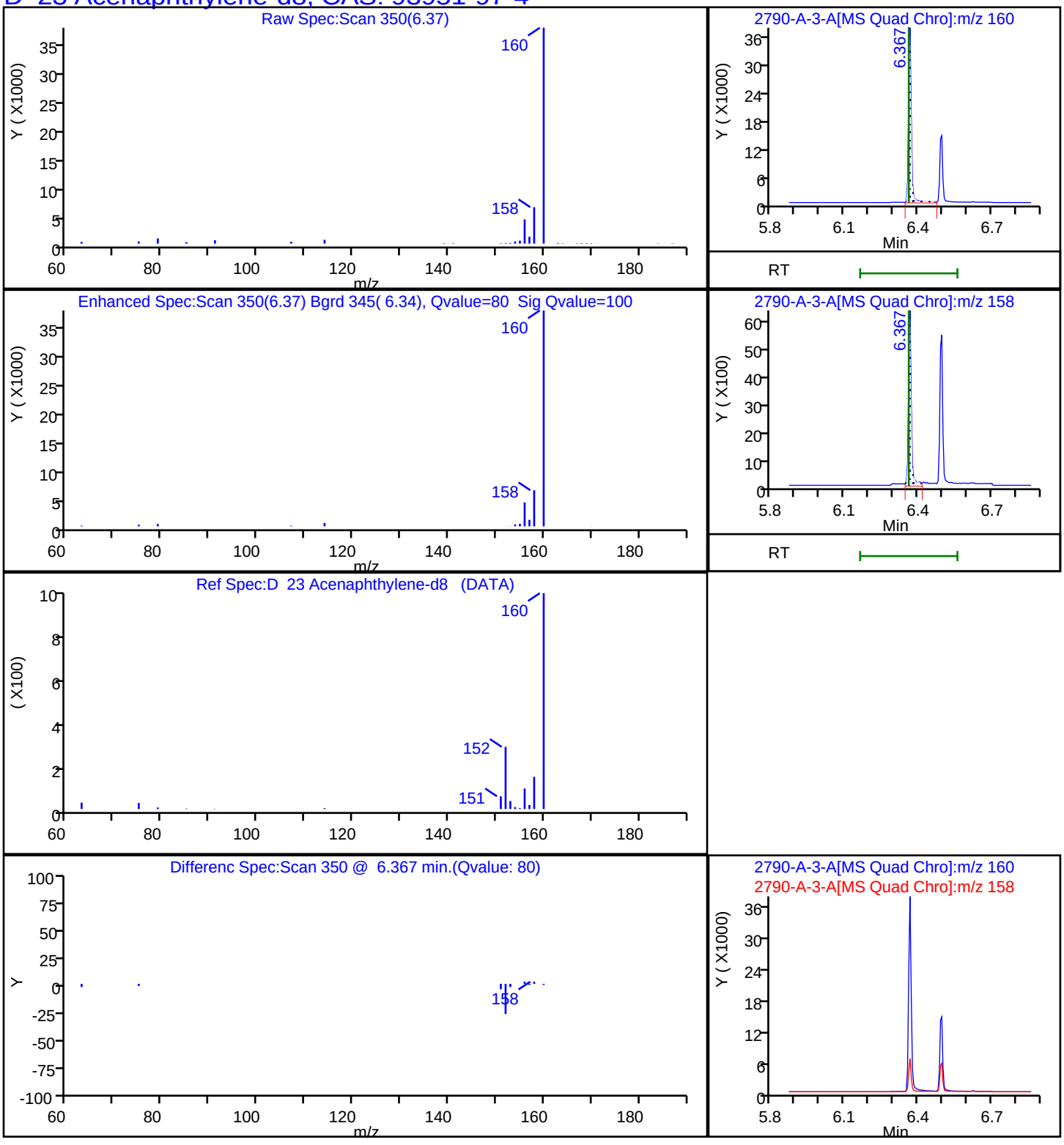
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 23 Acenaphthylene-d8, CAS: 93951-97-4



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Eurofins Knoxville

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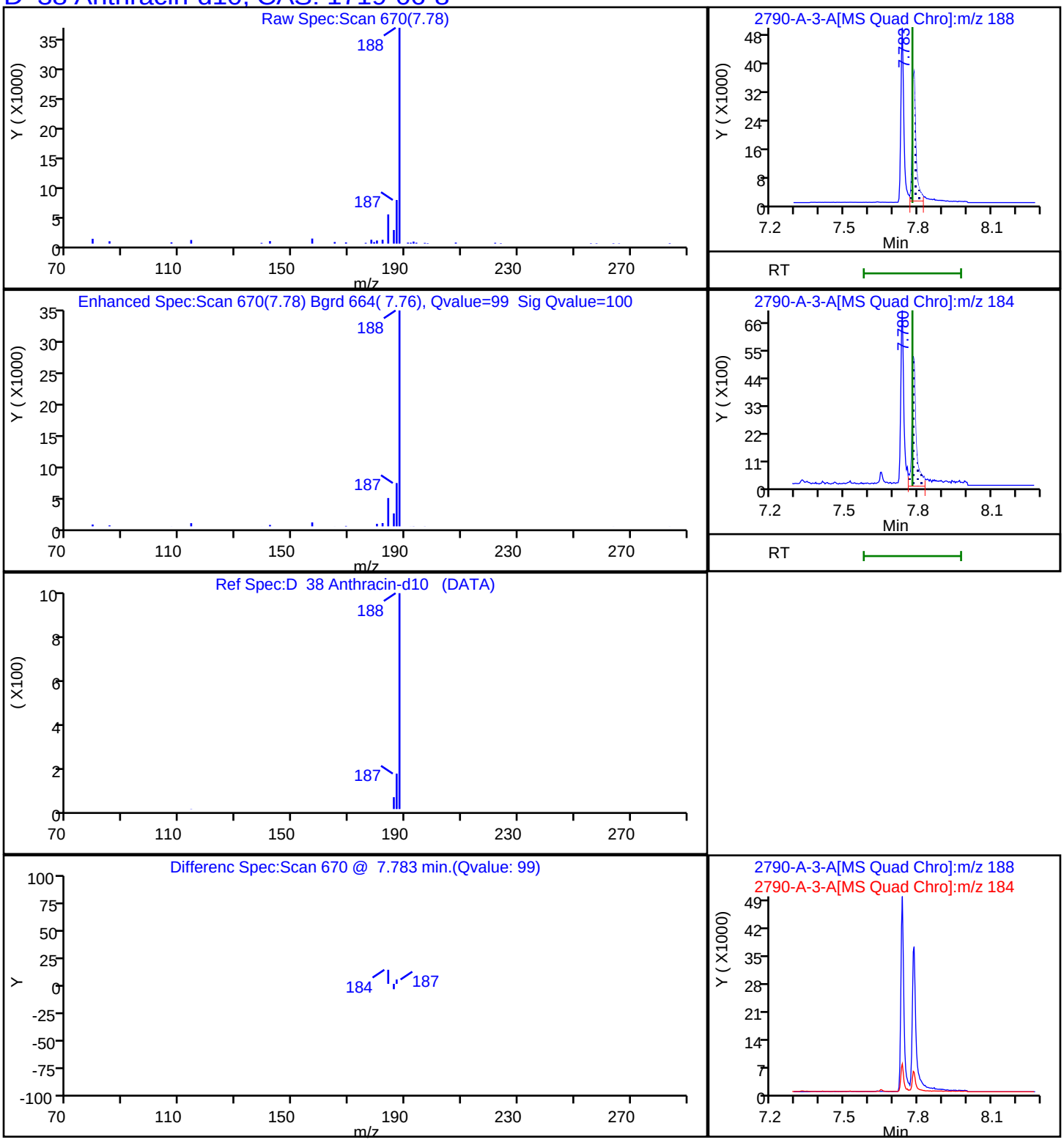
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8
Client ID:	1804576-843-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

D 38 Anthracin-d10, CAS: 1719-06-8



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Eurofins Knoxville

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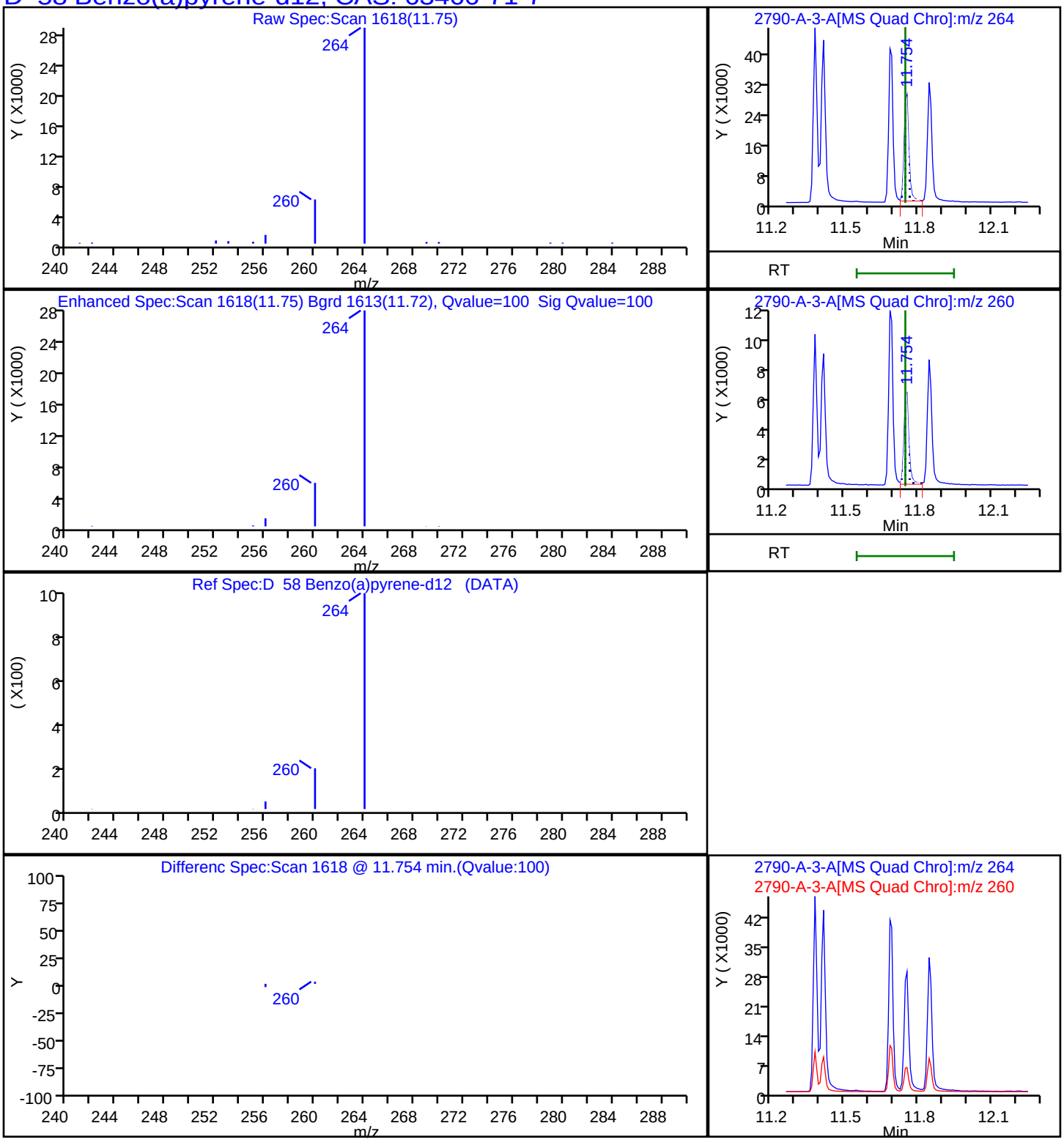
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8
Client ID:	1804576-843-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

D 58 Benzo(a)pyrene-d12, CAS: 63466-71-7



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Eurofins Knoxville

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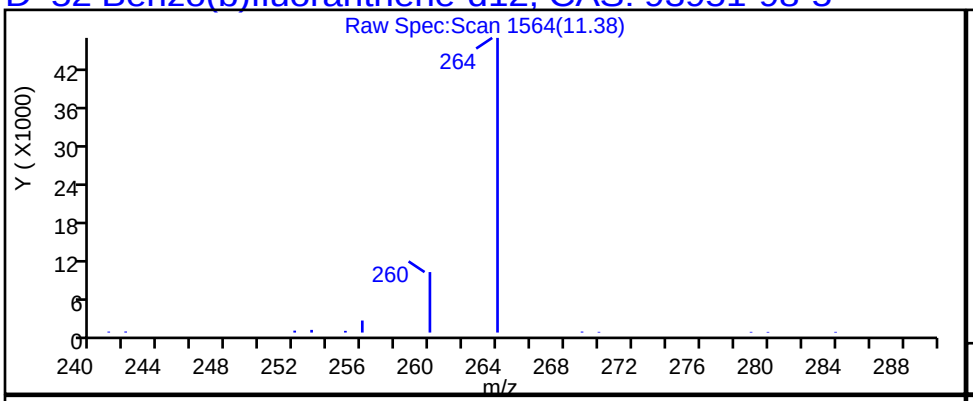
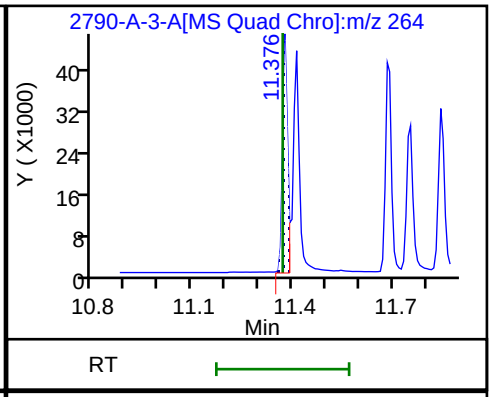
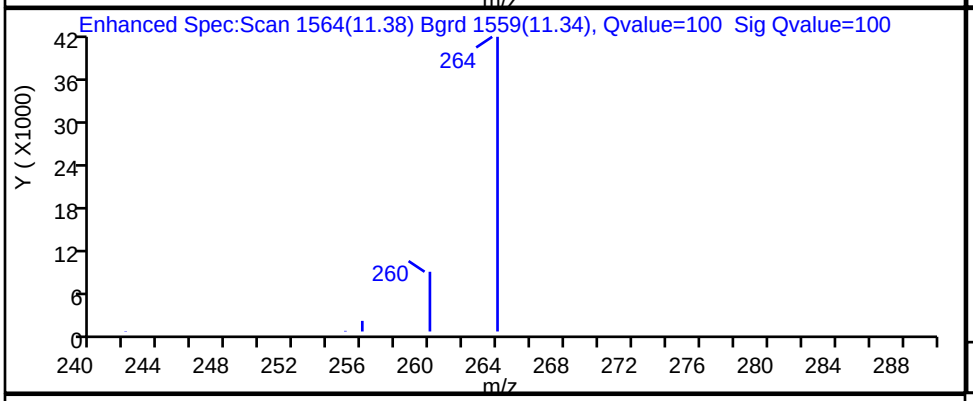
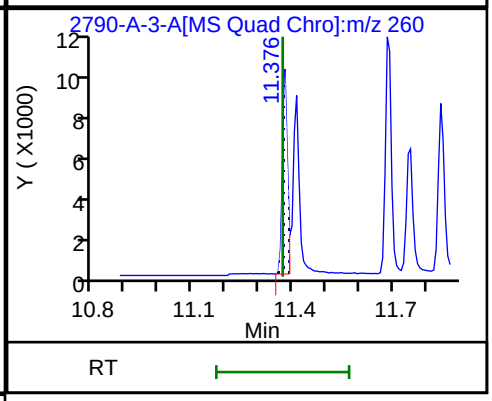
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

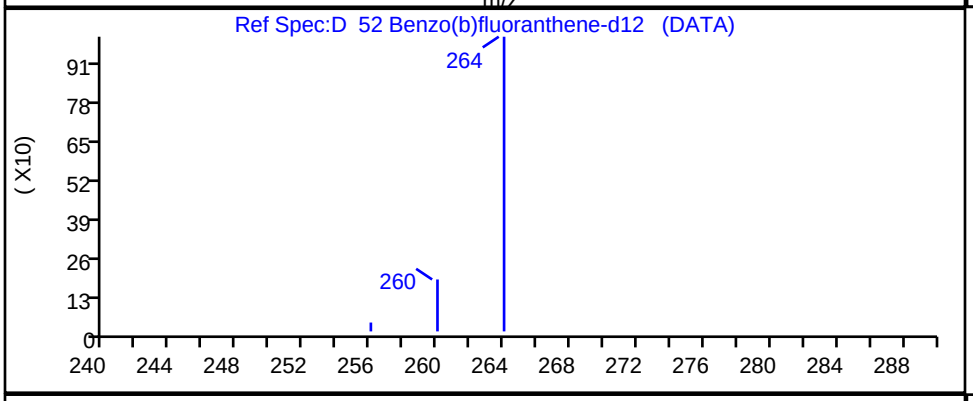
D 52 Benzo(b)fluoranthene-d12, CAS: 93951-98-5

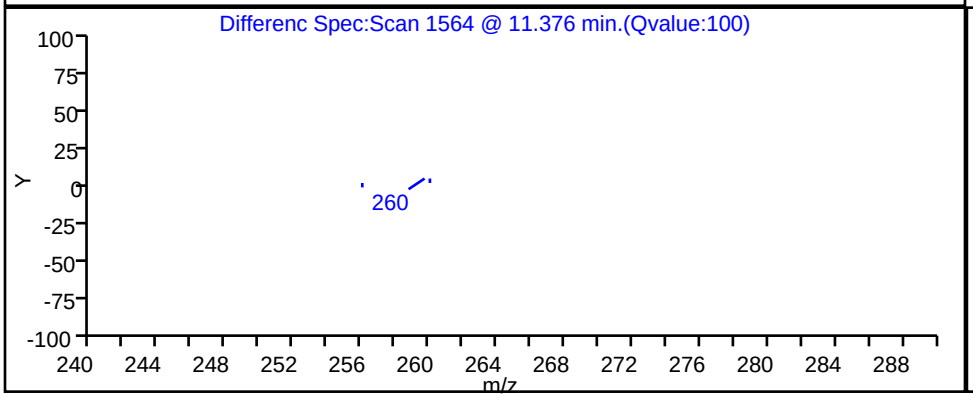


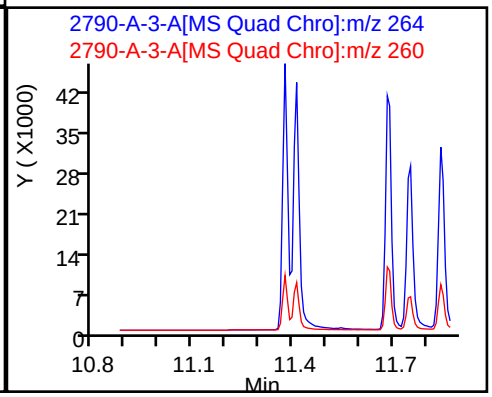












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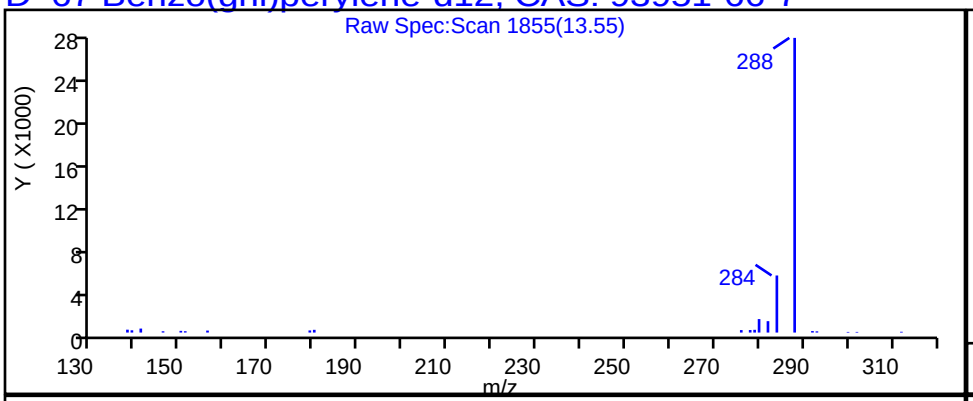
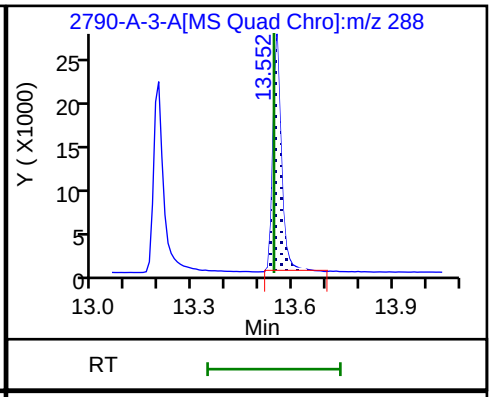
Eurofins Knoxville

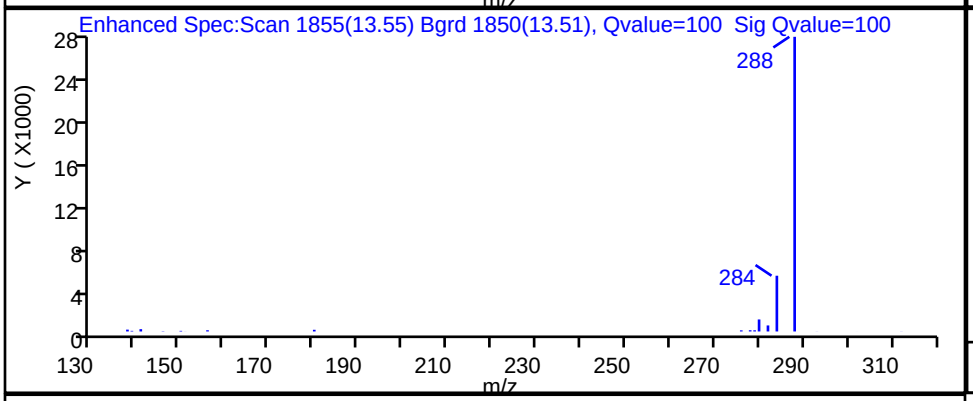
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D

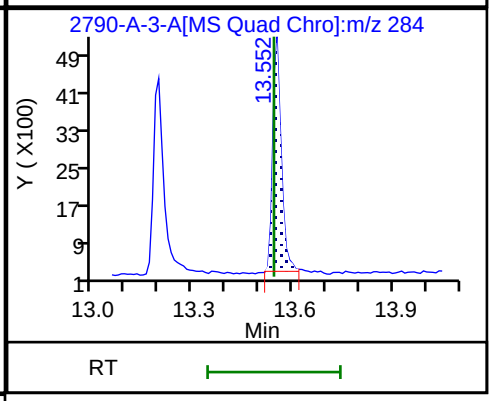
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

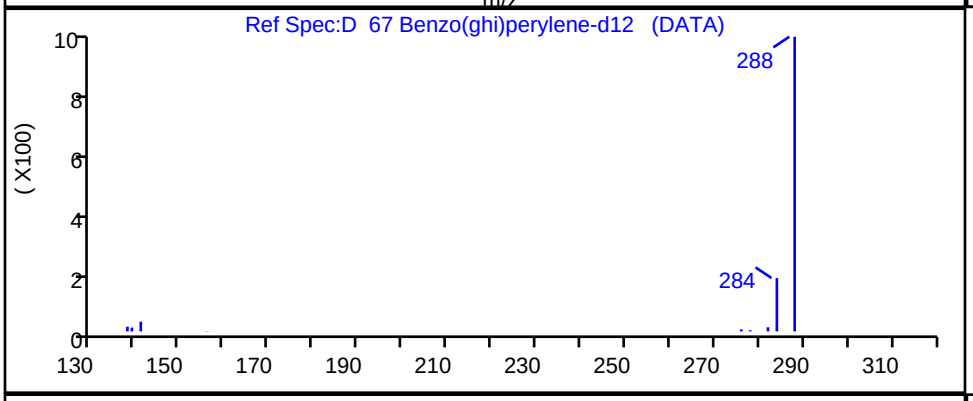
D 67 Benzo(ghi)perylene-d12, CAS: 93951-66-7

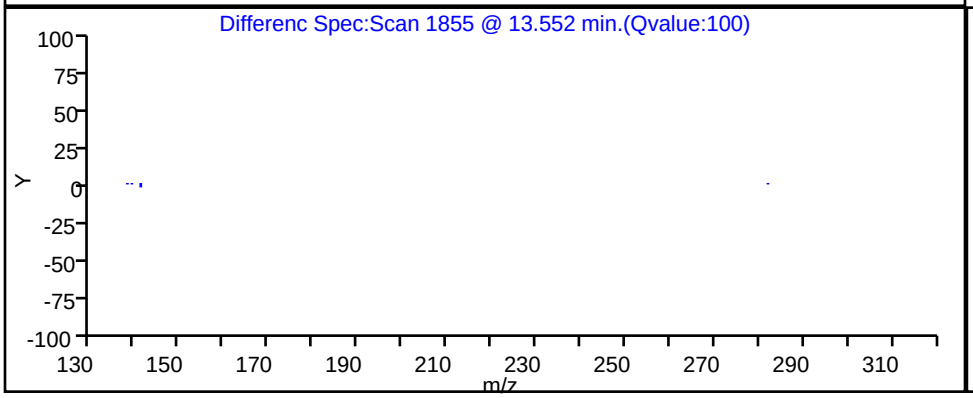


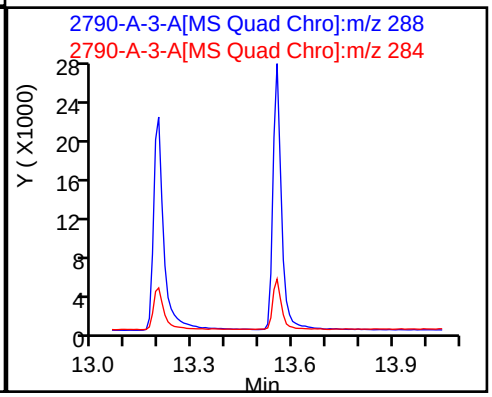












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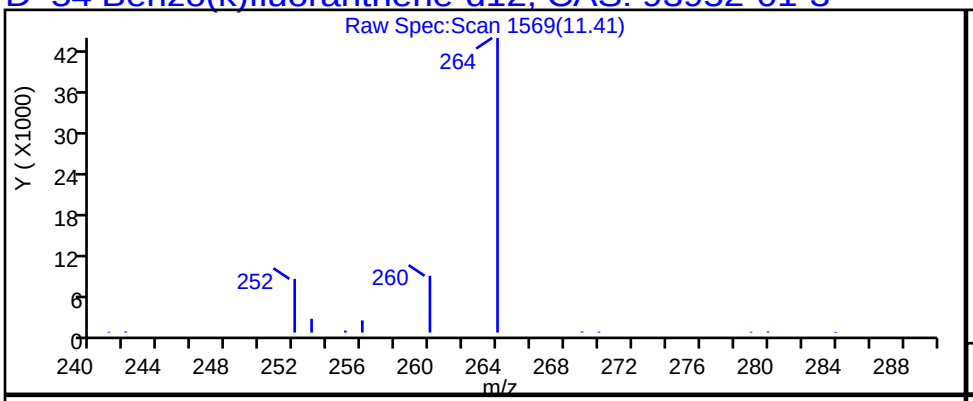
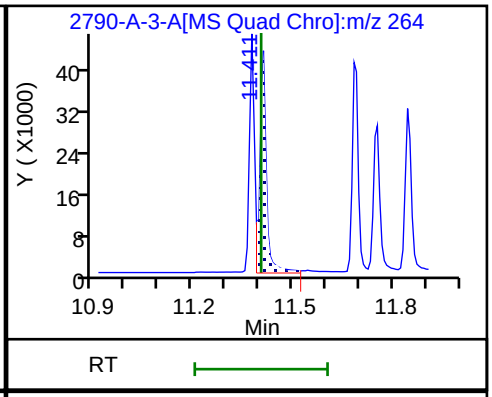
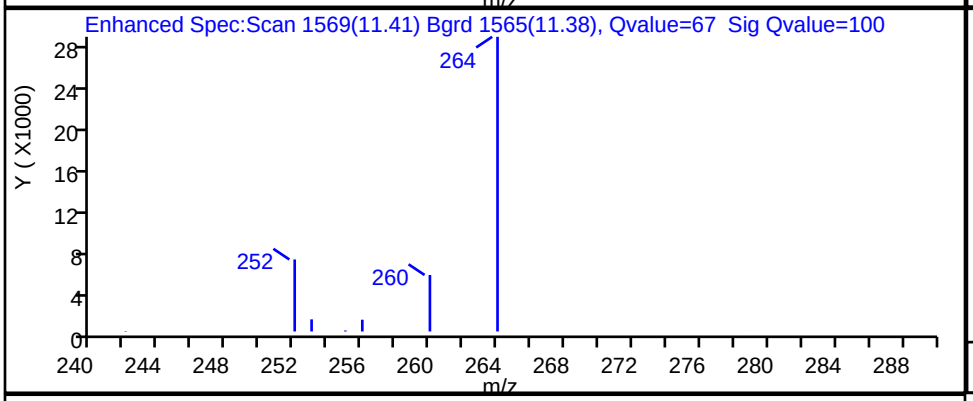
Eurofins Knoxville

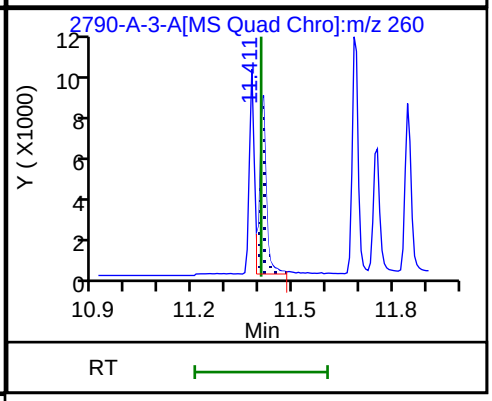
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D		
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8
Client ID:	1804576-843-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

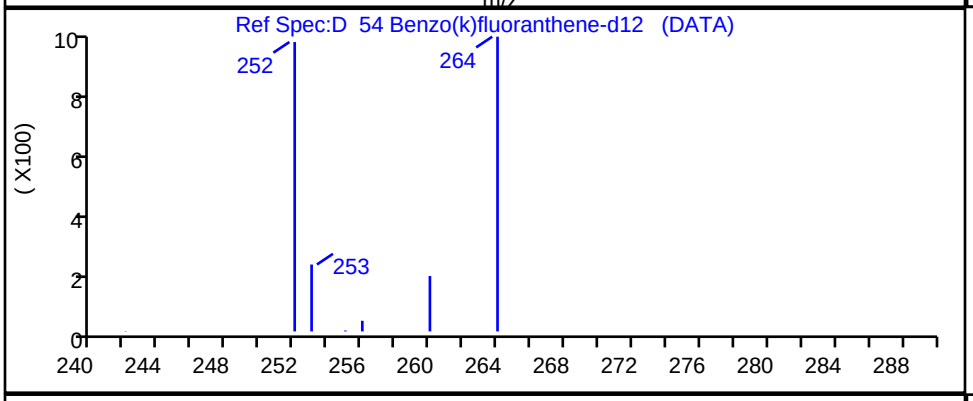
D 54 Benzo(k)fluoranthene-d12, CAS: 93952-01-3

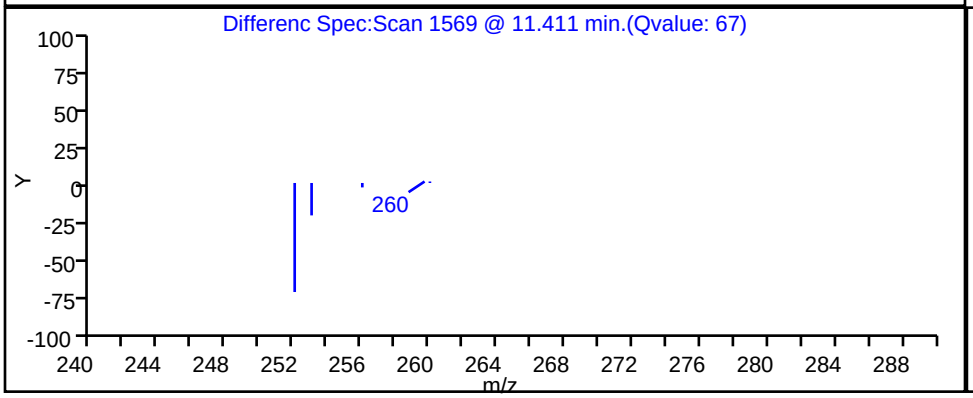


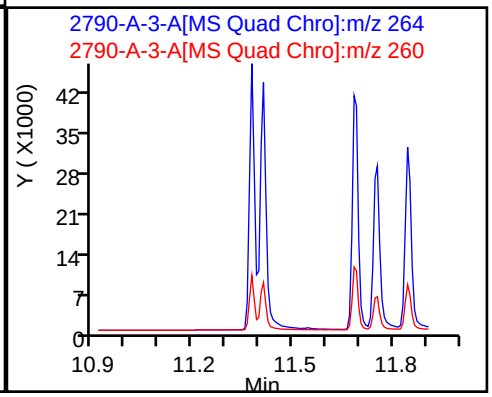












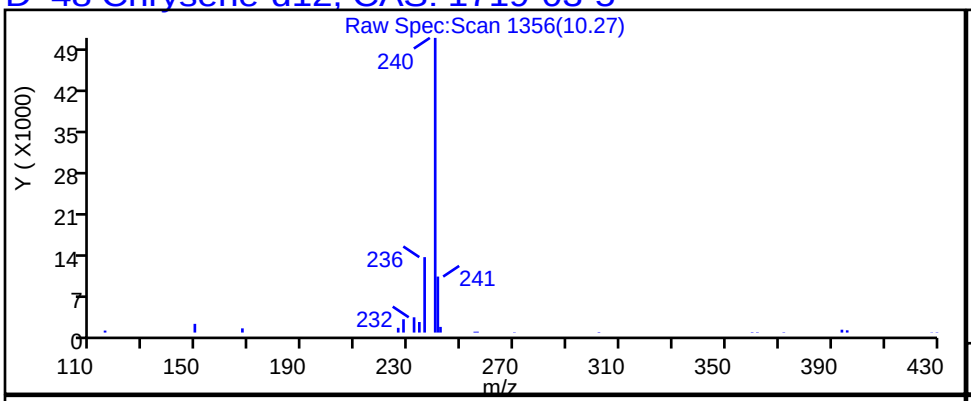
Report Date: 22-Nov-2023 14:12:22 Chrom Revision: 2.3 15-Nov-2023 20:54:34

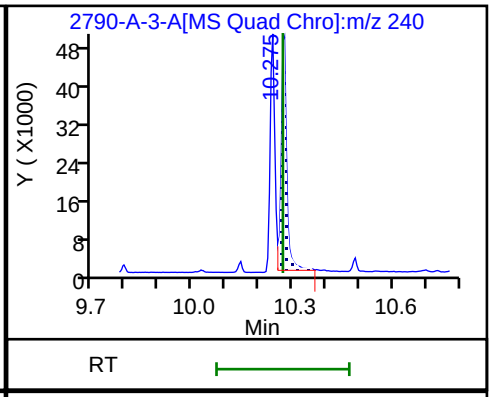
Eurofins Knoxville

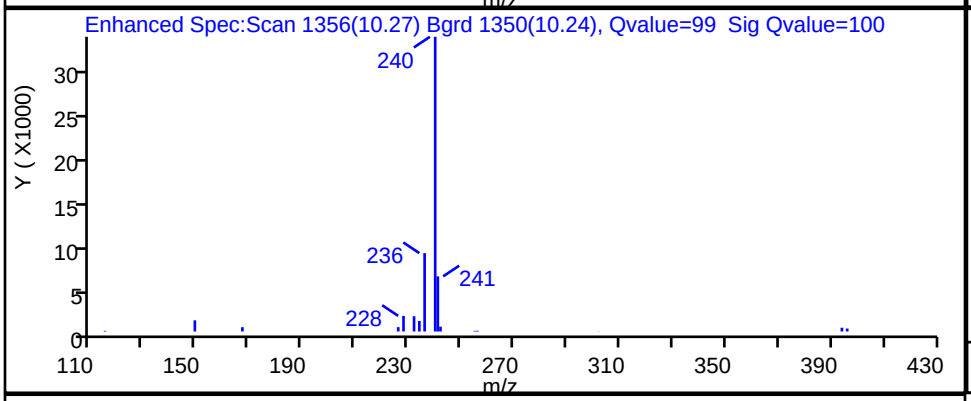
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D

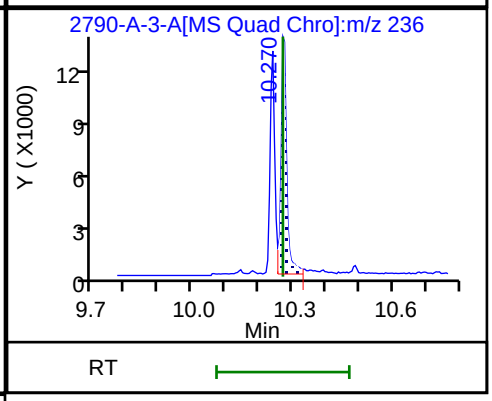
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

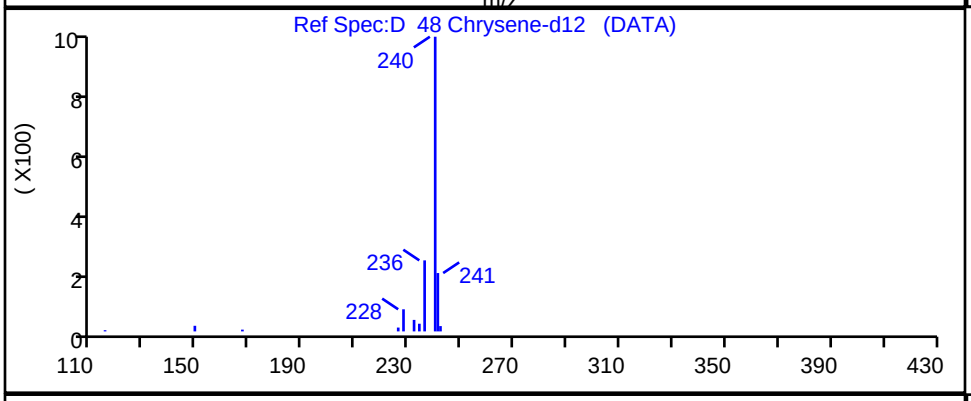
D 48 Chrysene-d12, CAS: 1719-03-5

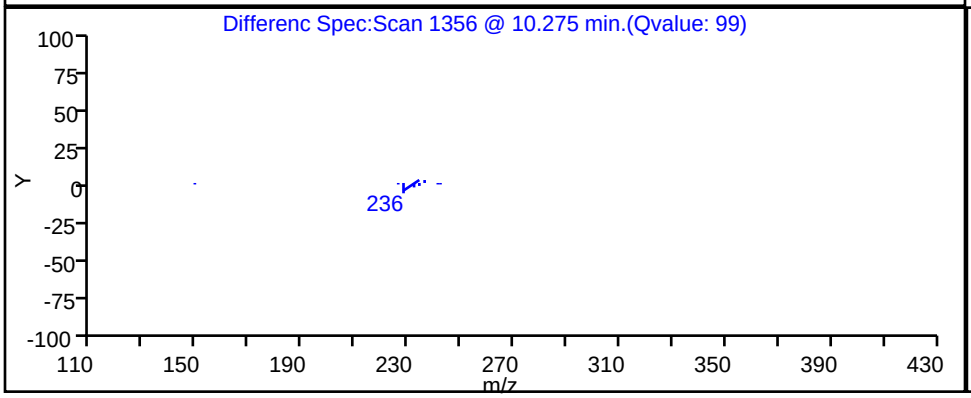


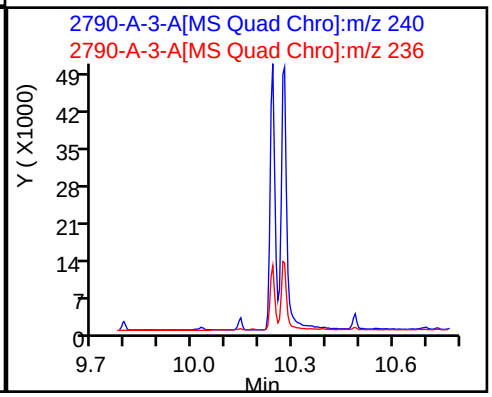












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Eurofins Knoxville

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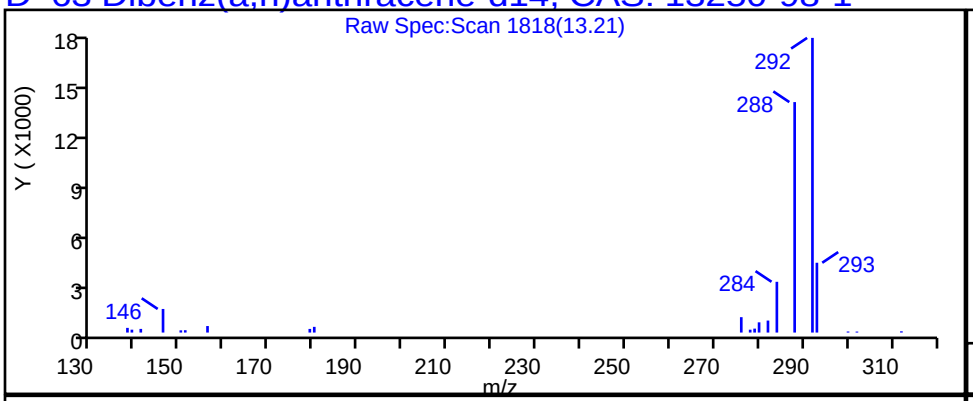
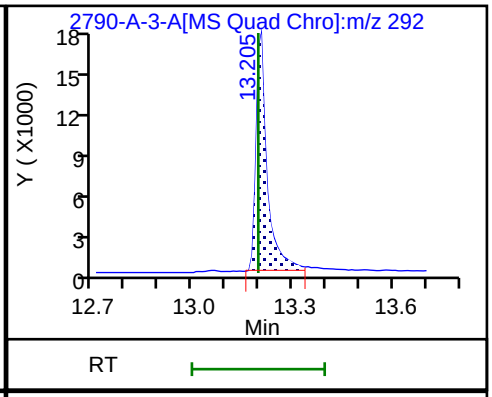
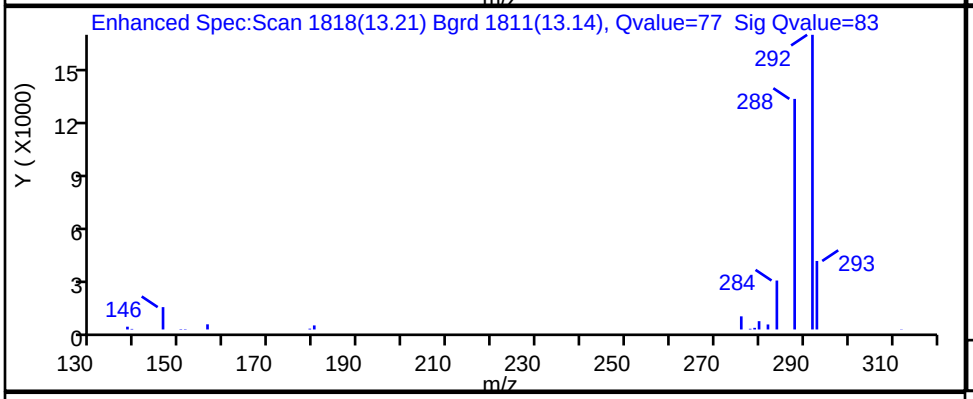
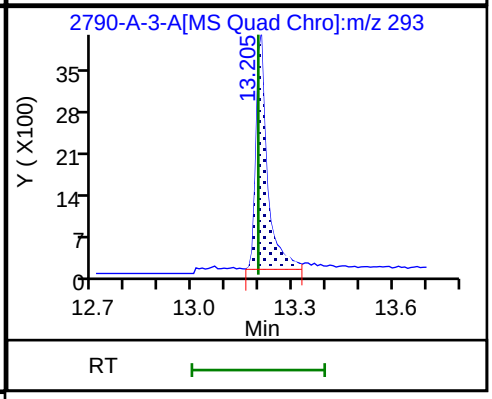
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

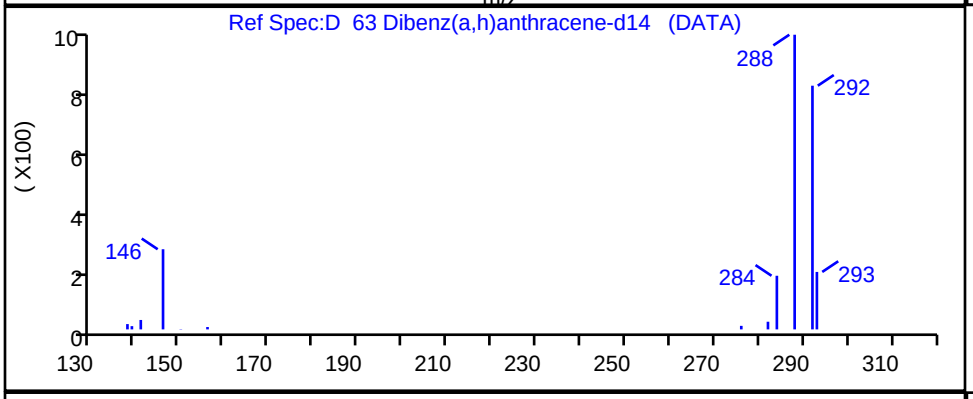
D_63 Dibenz(a,h)anthracene-d14, CAS: 13250-98-1

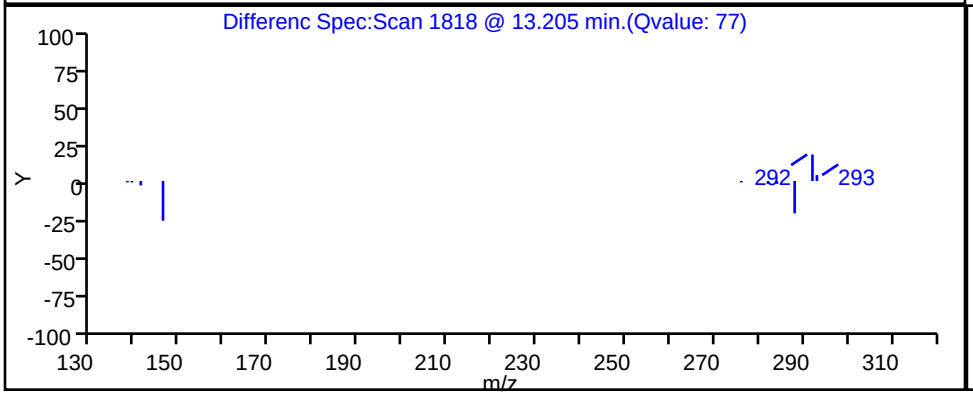


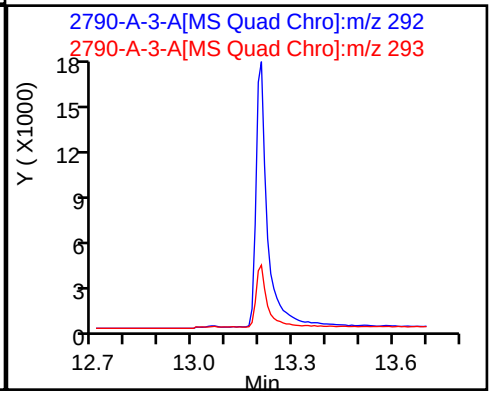












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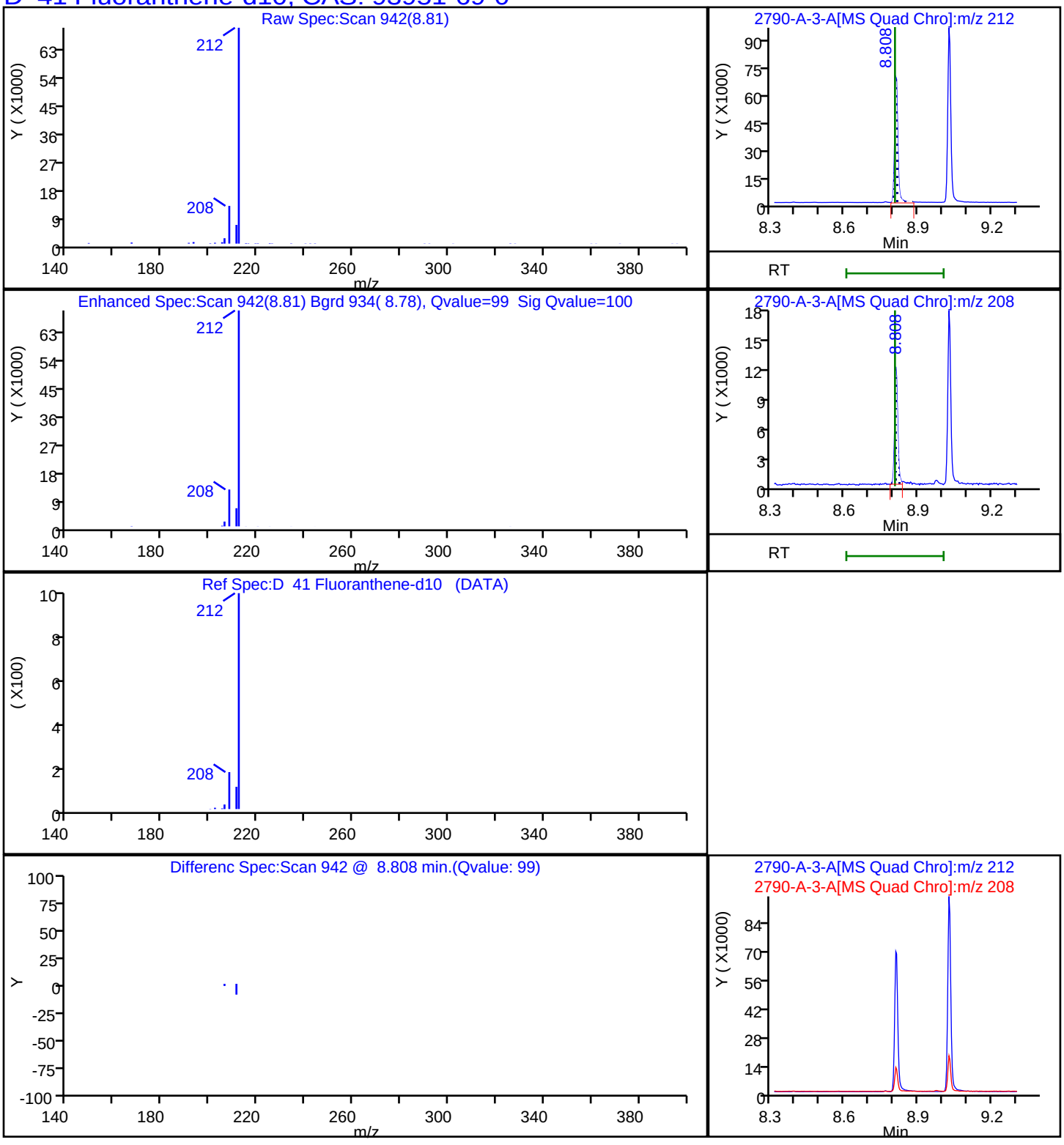
Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D				
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 41 Fluoranthene-d10, CAS: 93951-69-0



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Eurofins Knoxville

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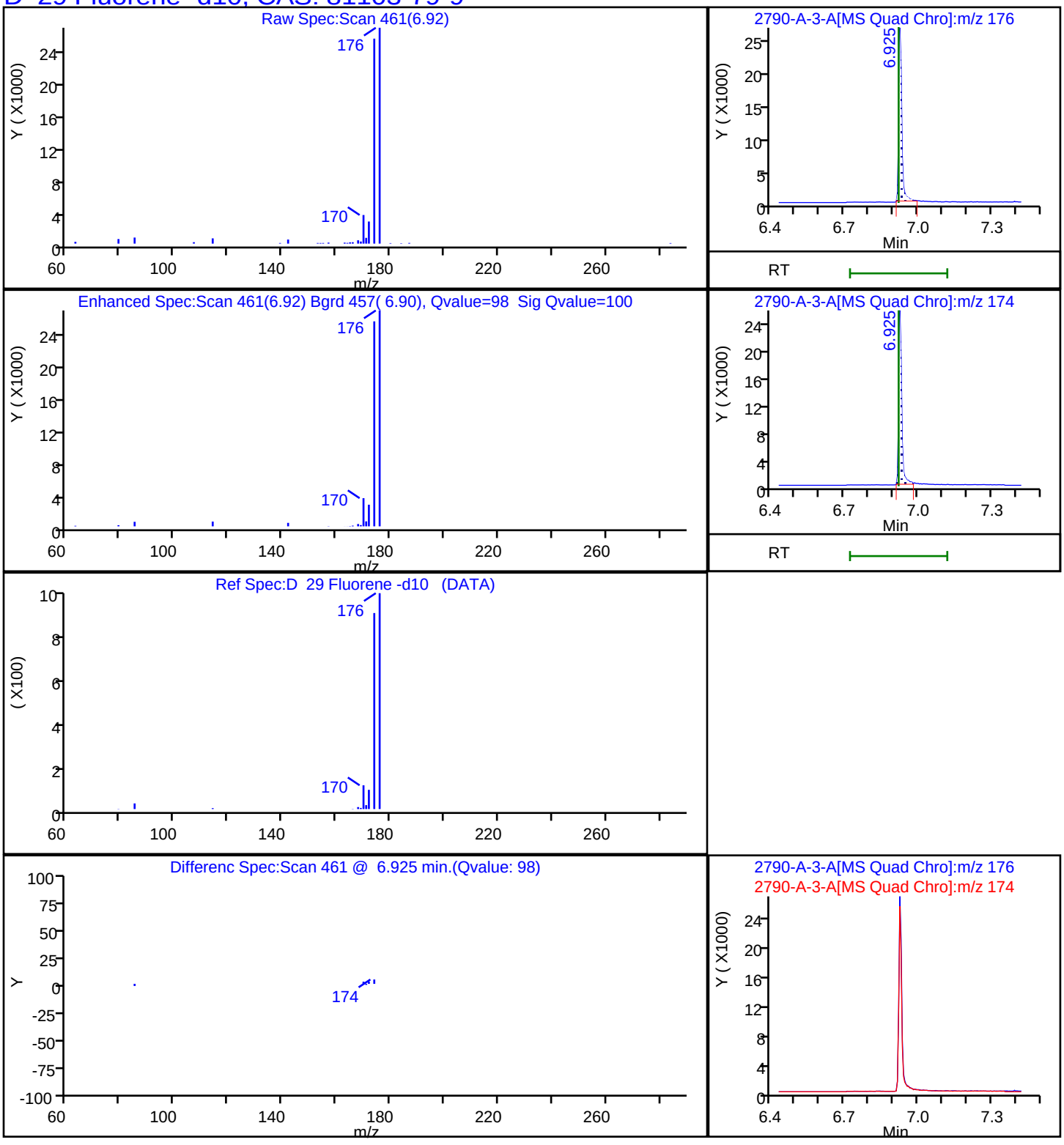
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8
Client ID:	1804576-843-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

D 29 Fluorene -d10, CAS: 81103-79-9



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Eurofins Knoxville

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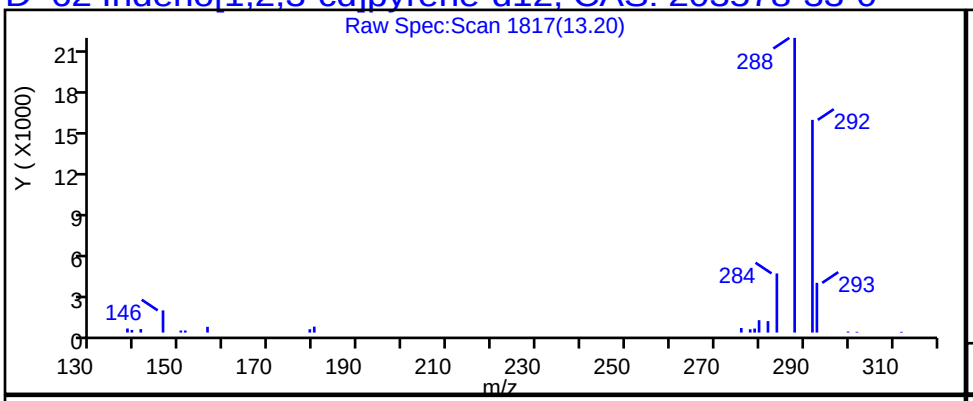
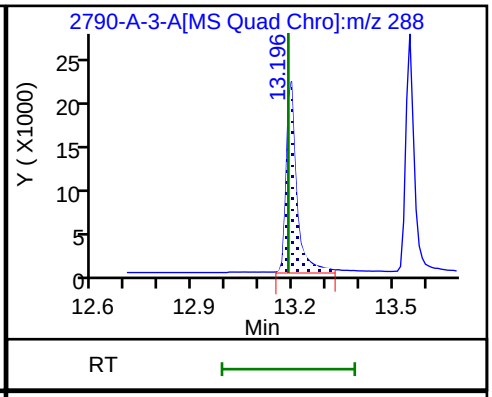
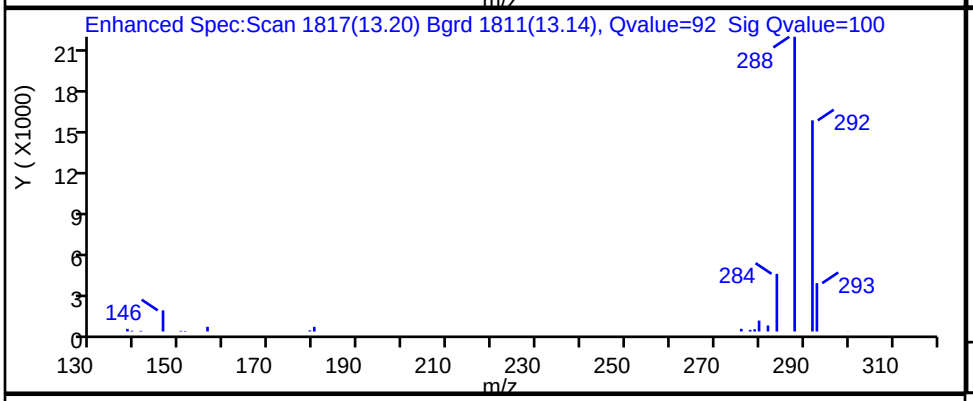
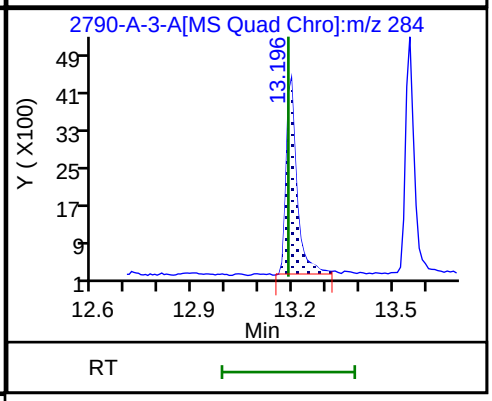
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

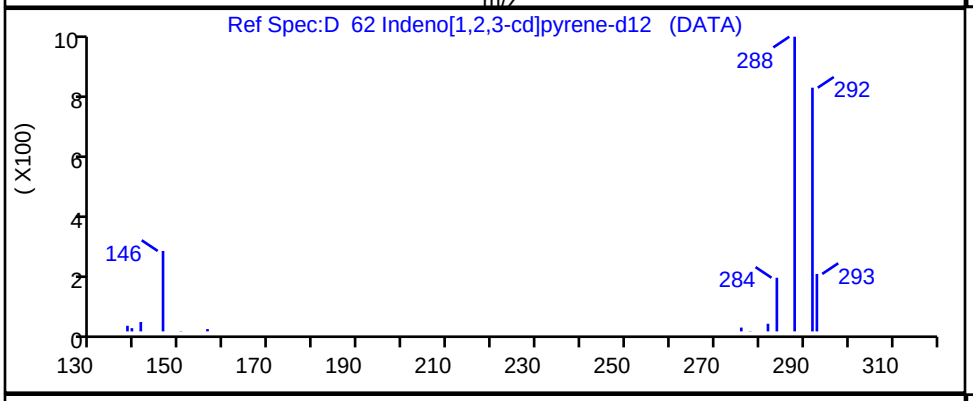
D 62 Indeno[1,2,3-cd]pyrene-d12, CAS: 203578-33-0

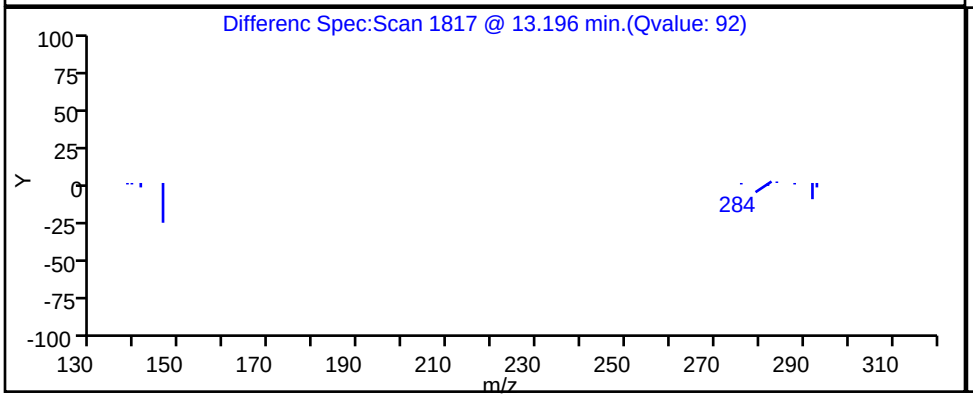


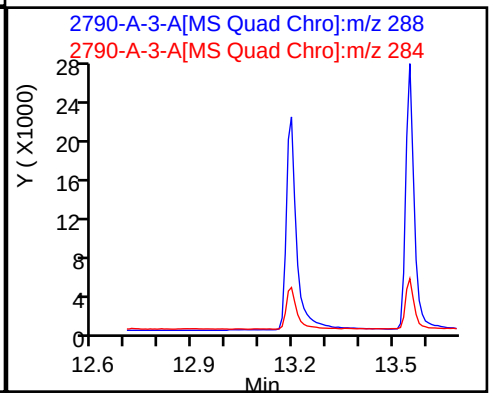












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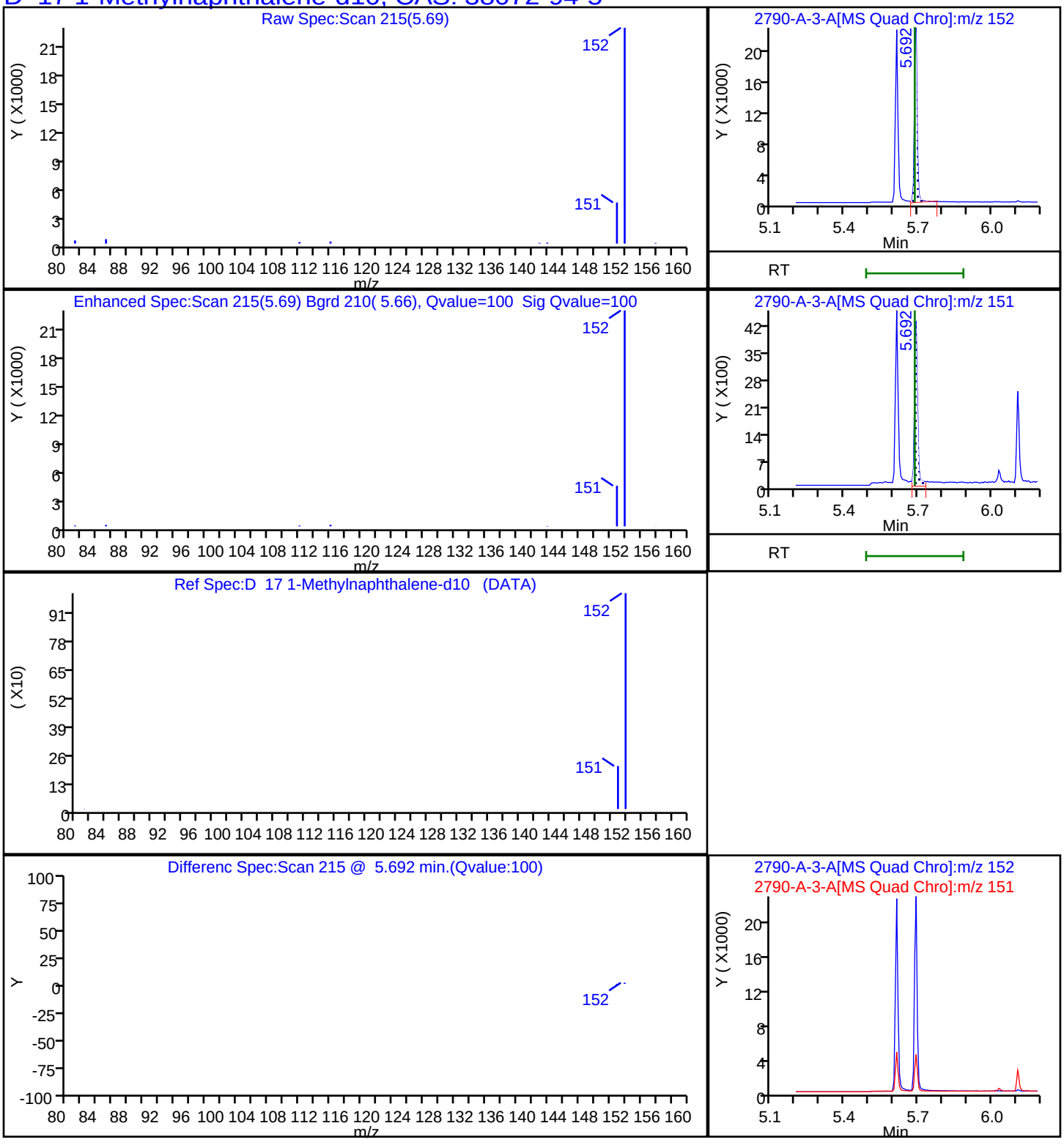
Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D				
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 17 1-Methylnaphthalene-d10, CAS: 38072-94-5



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Eurofins Knoxville

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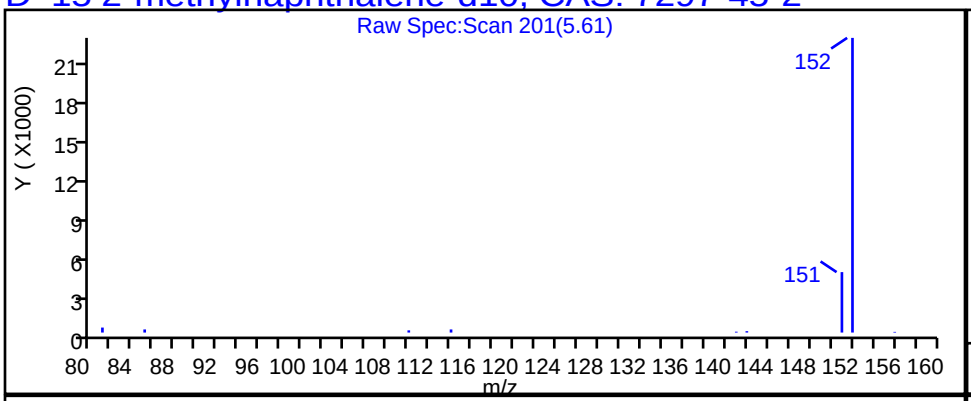
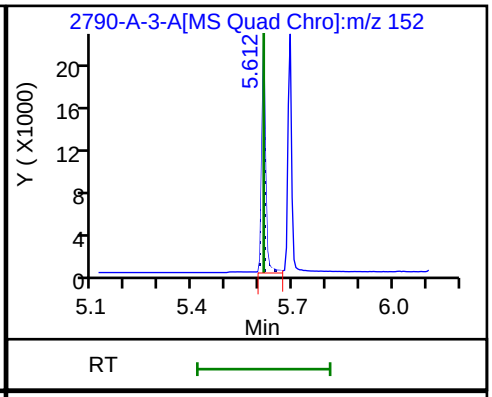
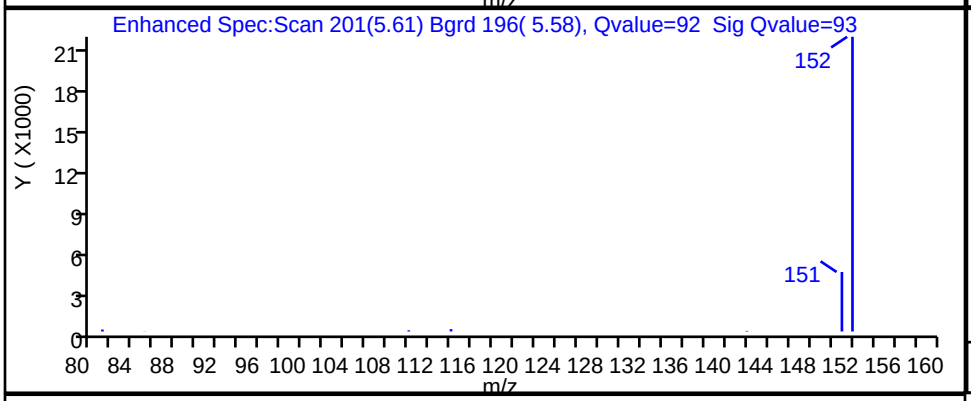
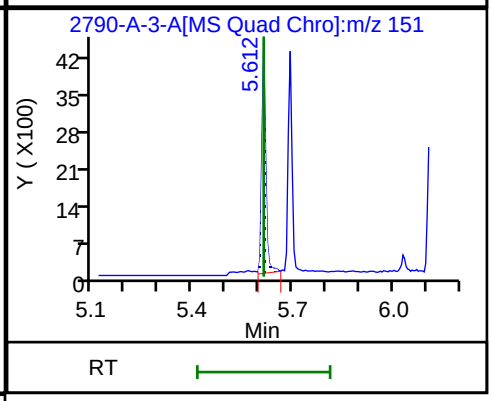
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

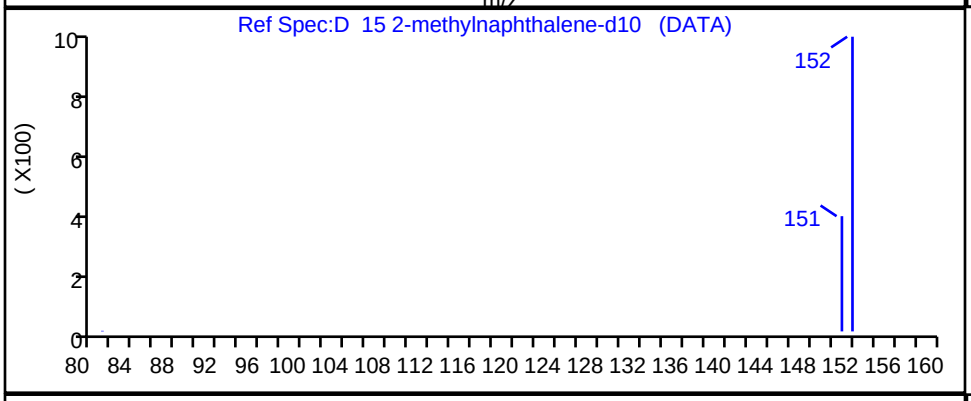
D 15 2-methylnaphthalene-d10, CAS: 7297-45-2

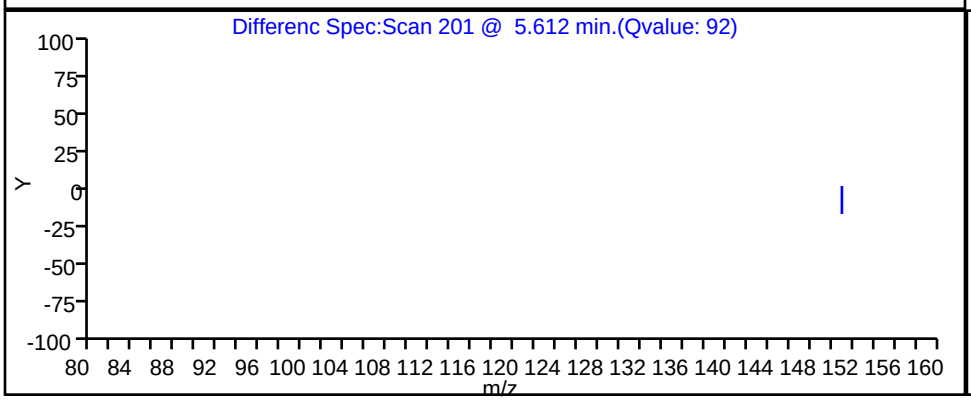


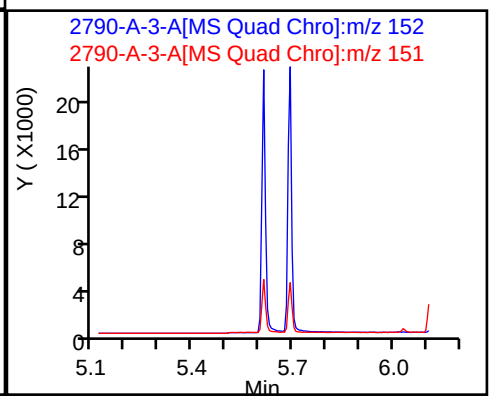












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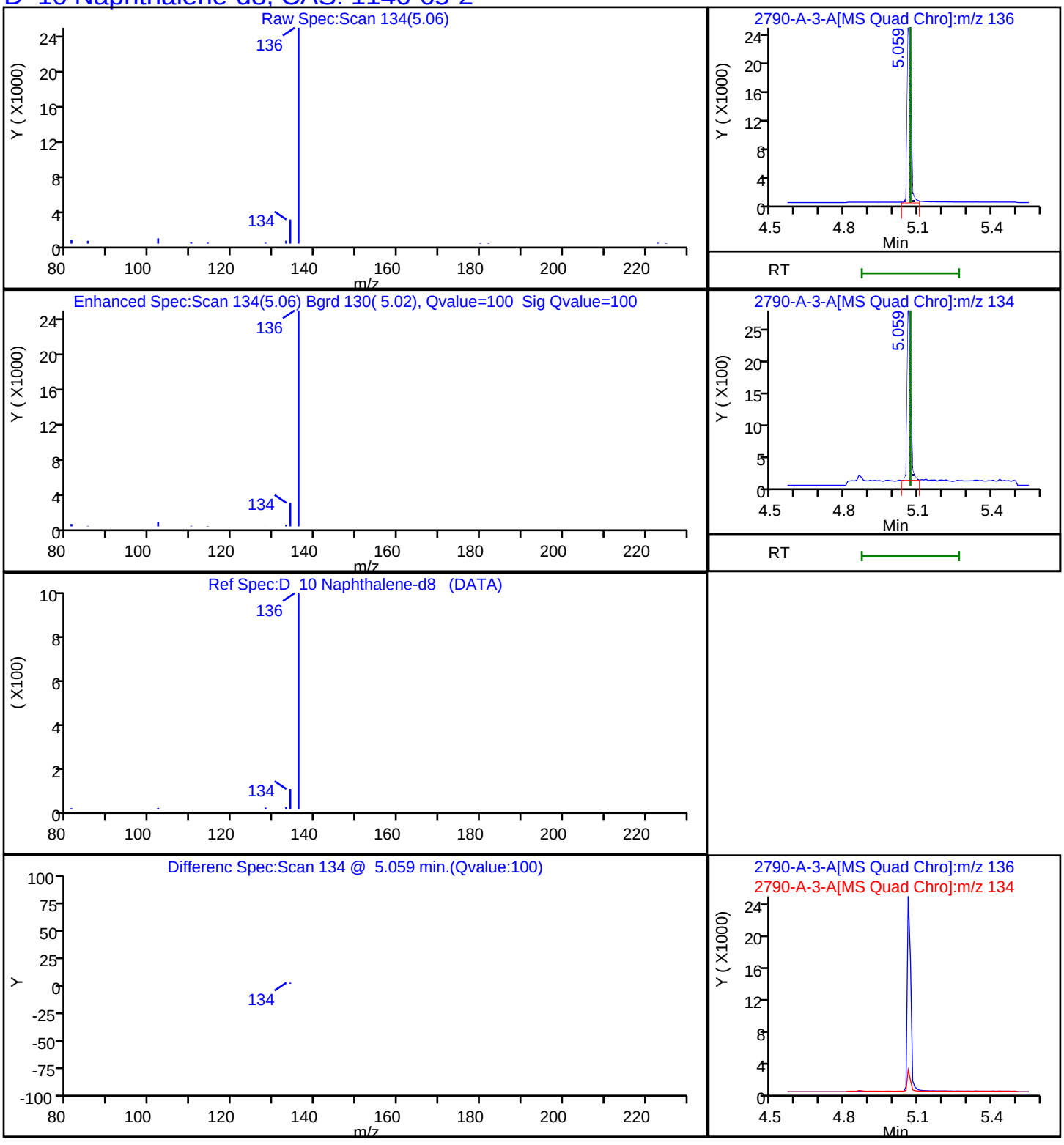
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D

Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8
Client ID:	1804576-843-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

D_10 Naphthalene-d8, CAS: 1146-65-2



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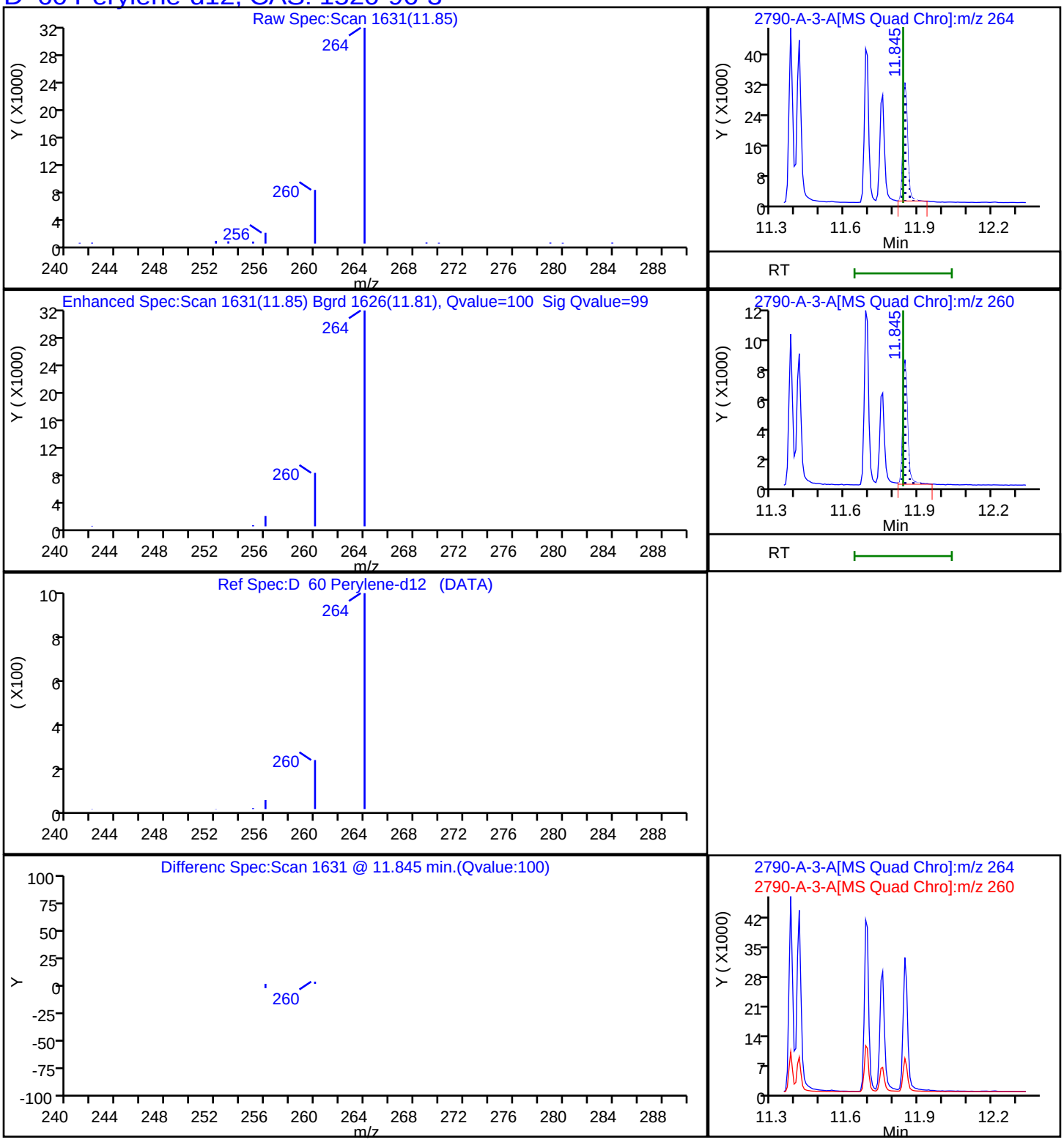
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D

Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 60 Perylene-d12, CAS: 1520-96-3



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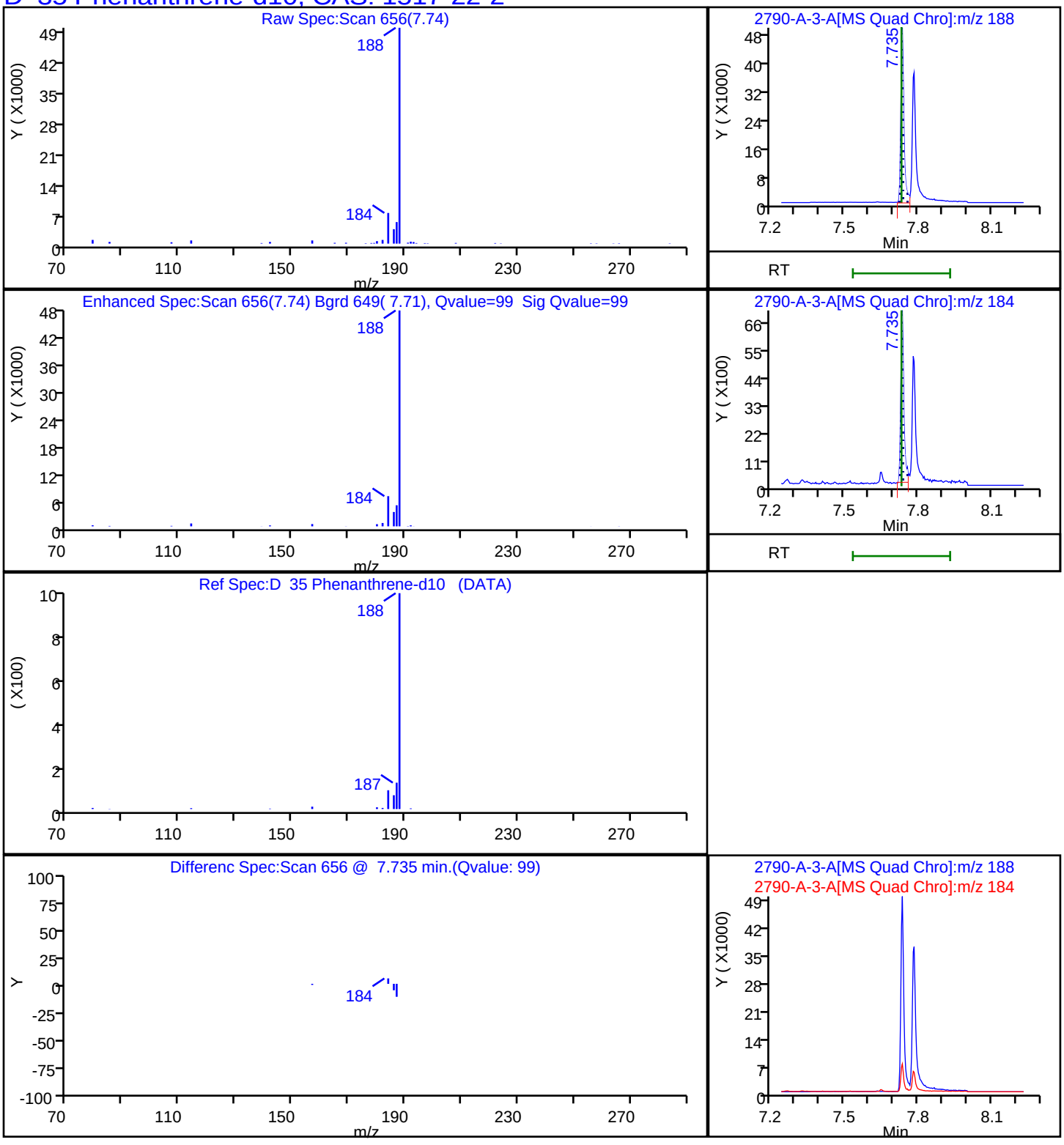
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D

Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8
Client ID:	1804576-843-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

D_35 Phenanthrene-d10, CAS: 1517-22-2



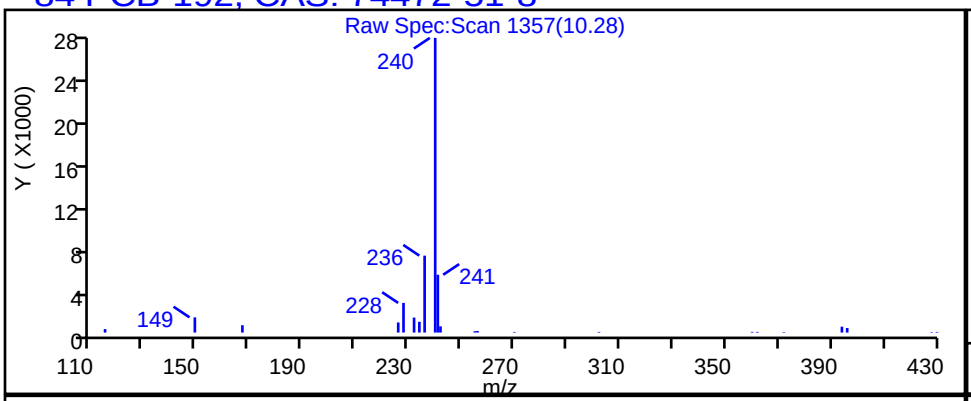
Report Date: 22-Nov-2023 14:12:22 Chrom Revision: 2.3 15-Nov-2023 20:54:34

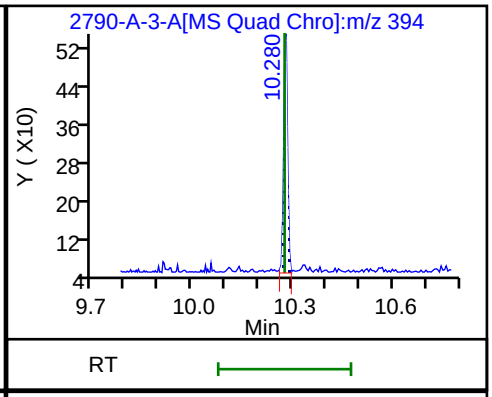
Eurofins Knoxville

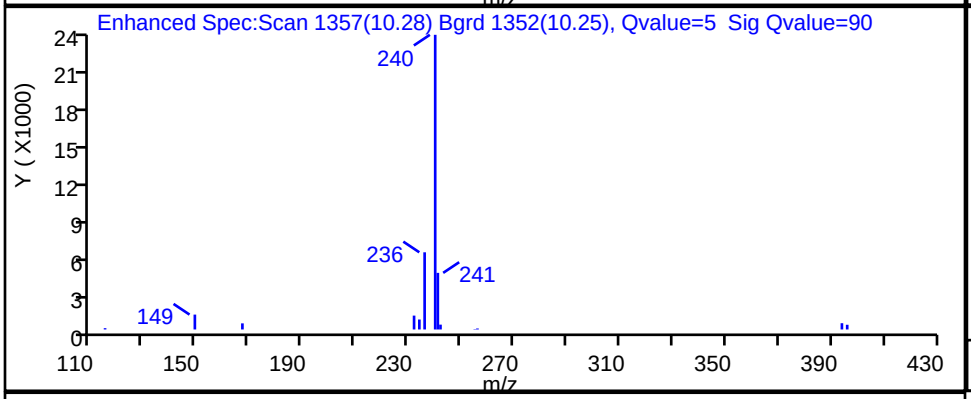
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D

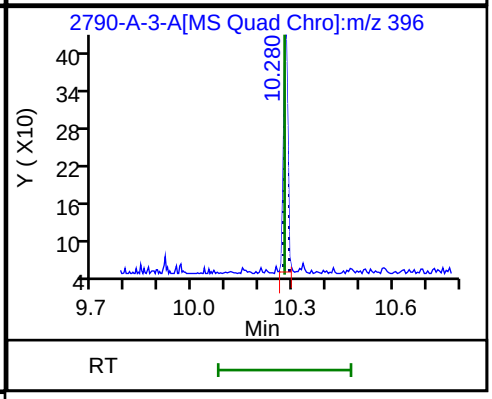
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8
Client ID:	1804576-843-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

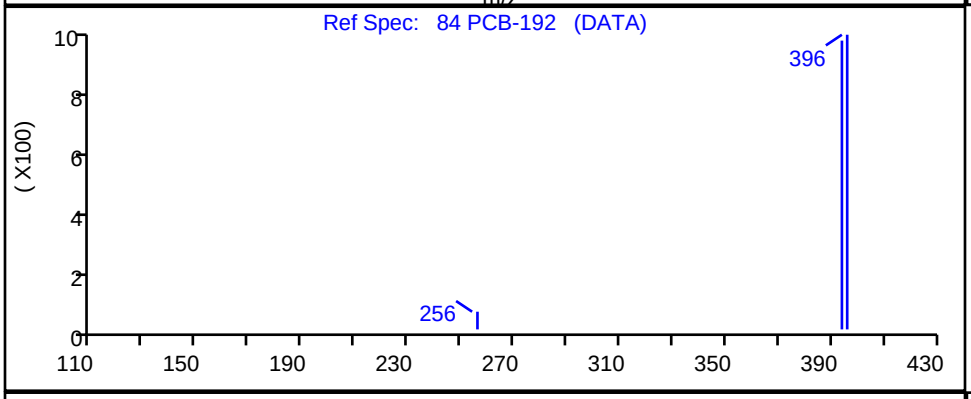
84 PCB-192, CAS: 74472-51-8

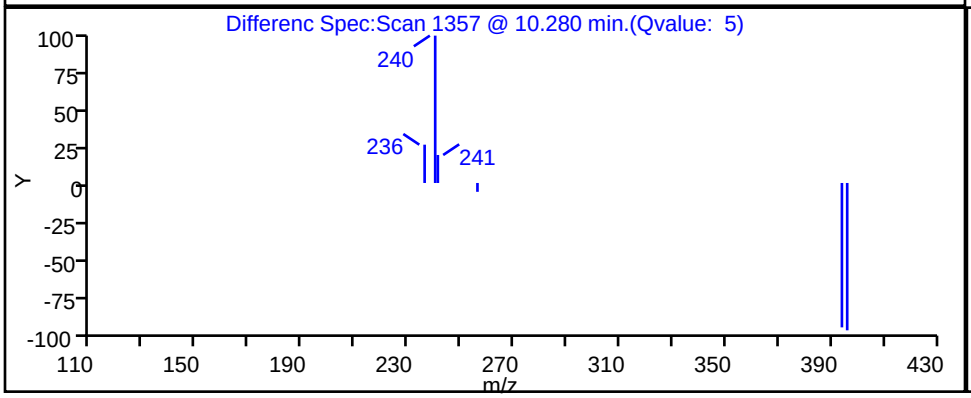


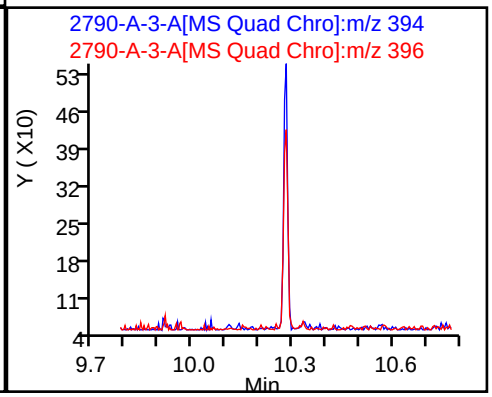












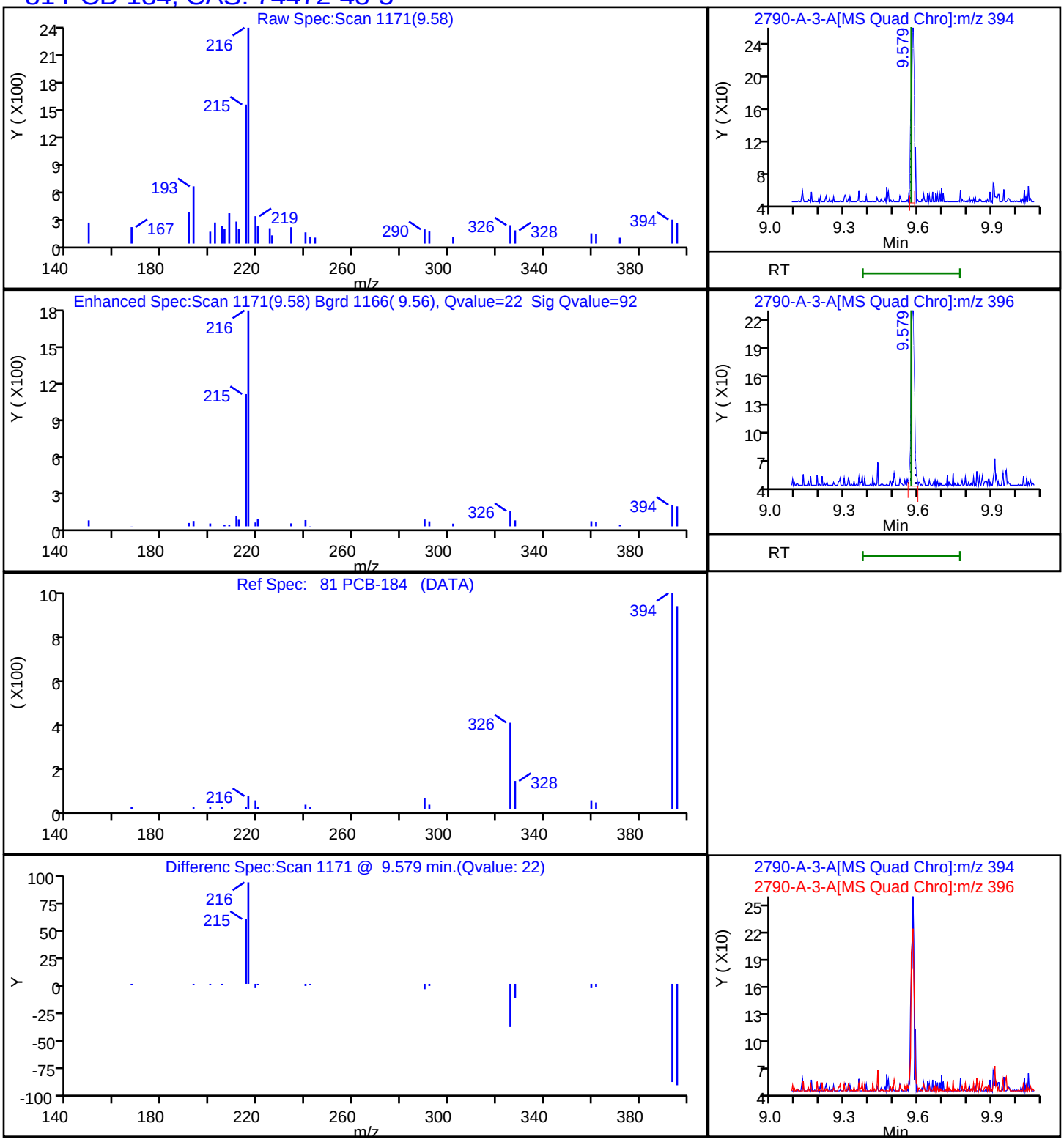
Report Date: 22-Nov-2023 14:12:22 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D

Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

81 PCB-184, CAS: 74472-48-3



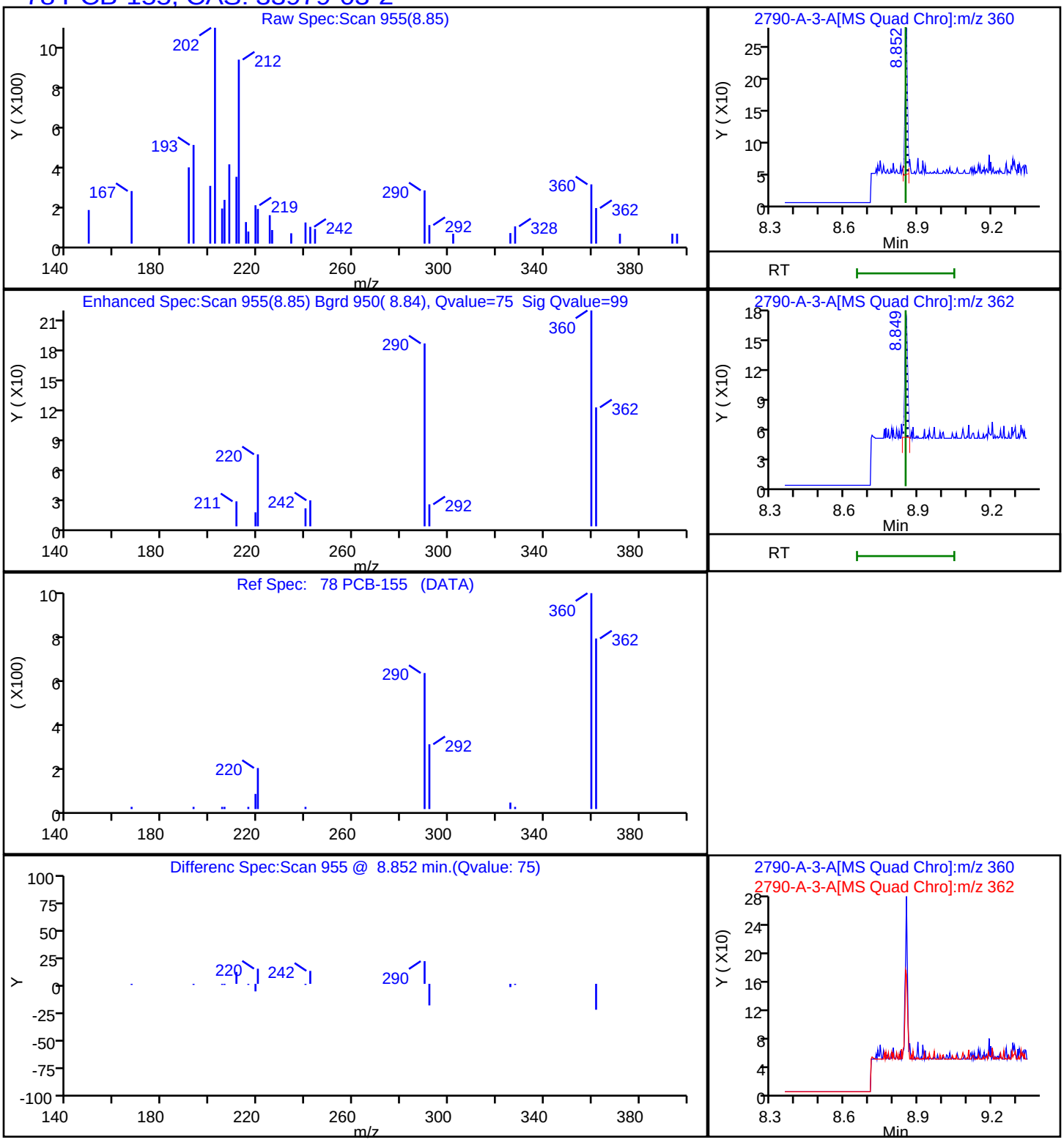
Report Date: 22-Nov-2023 14:12:22 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D

Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8
Client ID:	1804576-843-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

78 PCB-155, CAS: 33979-03-2



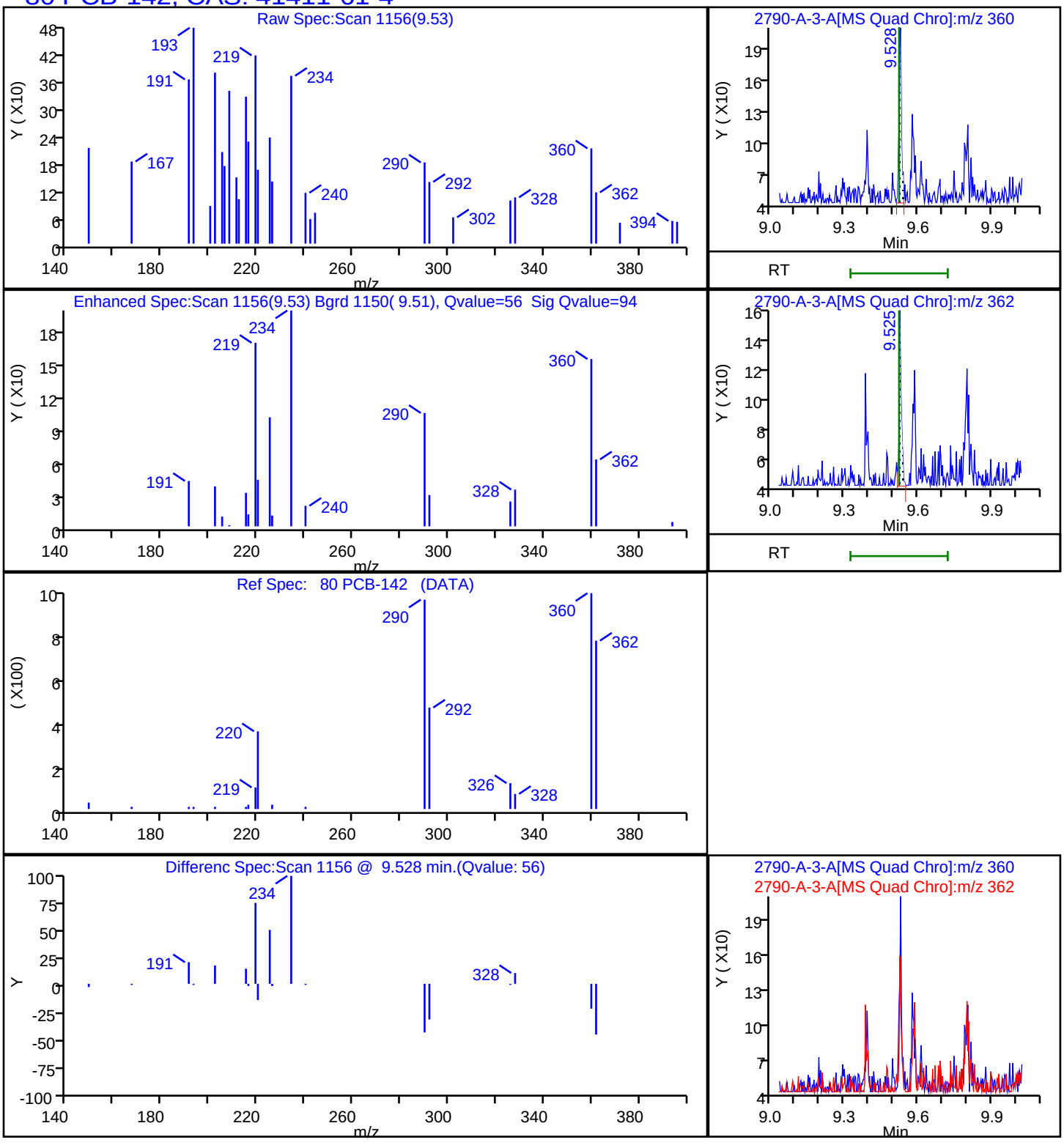
Report Date: 22-Nov-2023 14:12:22 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D

Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8
Client ID:	1804576-843-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

80 PCB-142, CAS: 41411-61-4

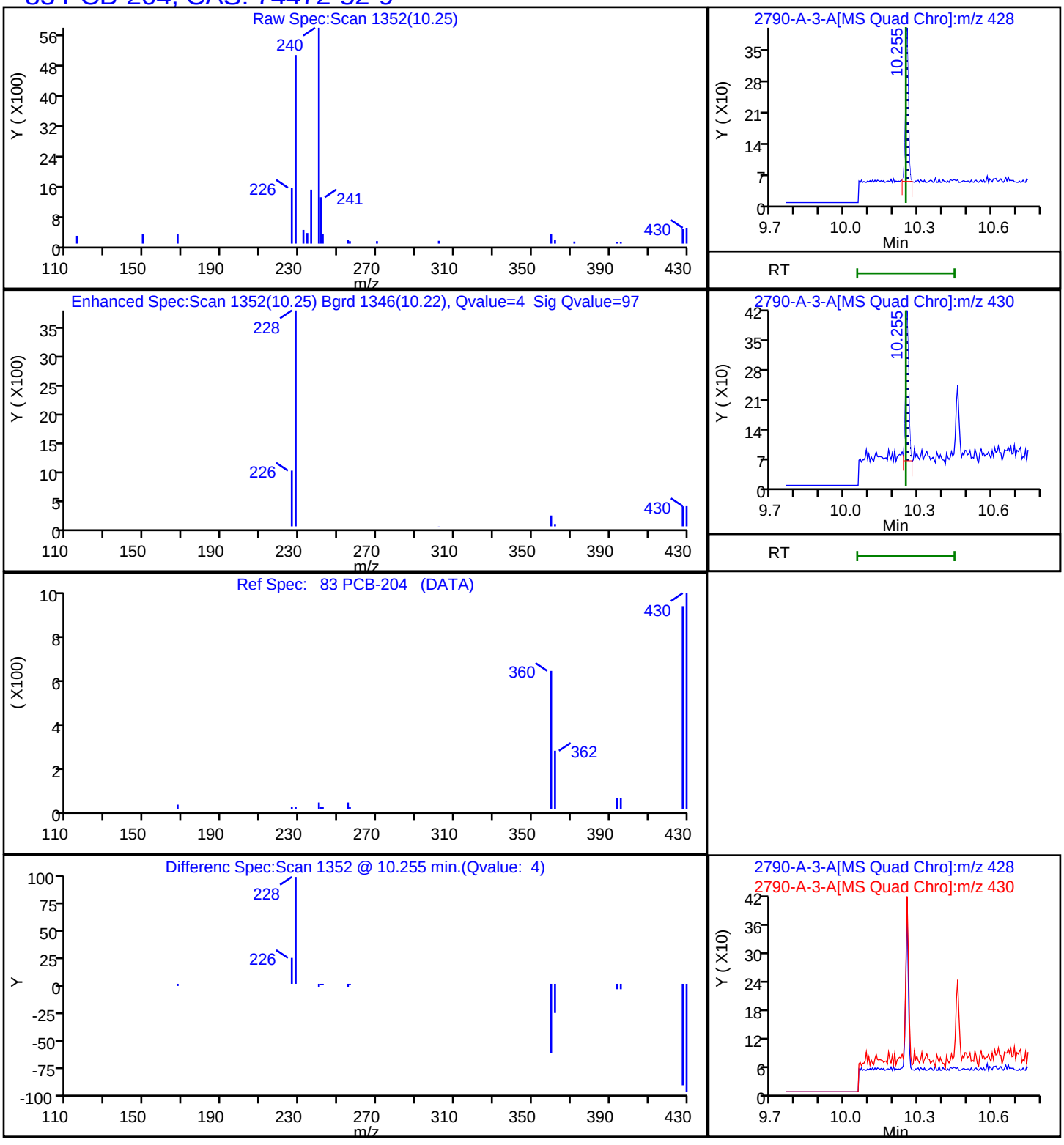


Report Date: 22-Nov-2023 14:12:22 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D				
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

83 PCB-204, CAS: 74472-52-9



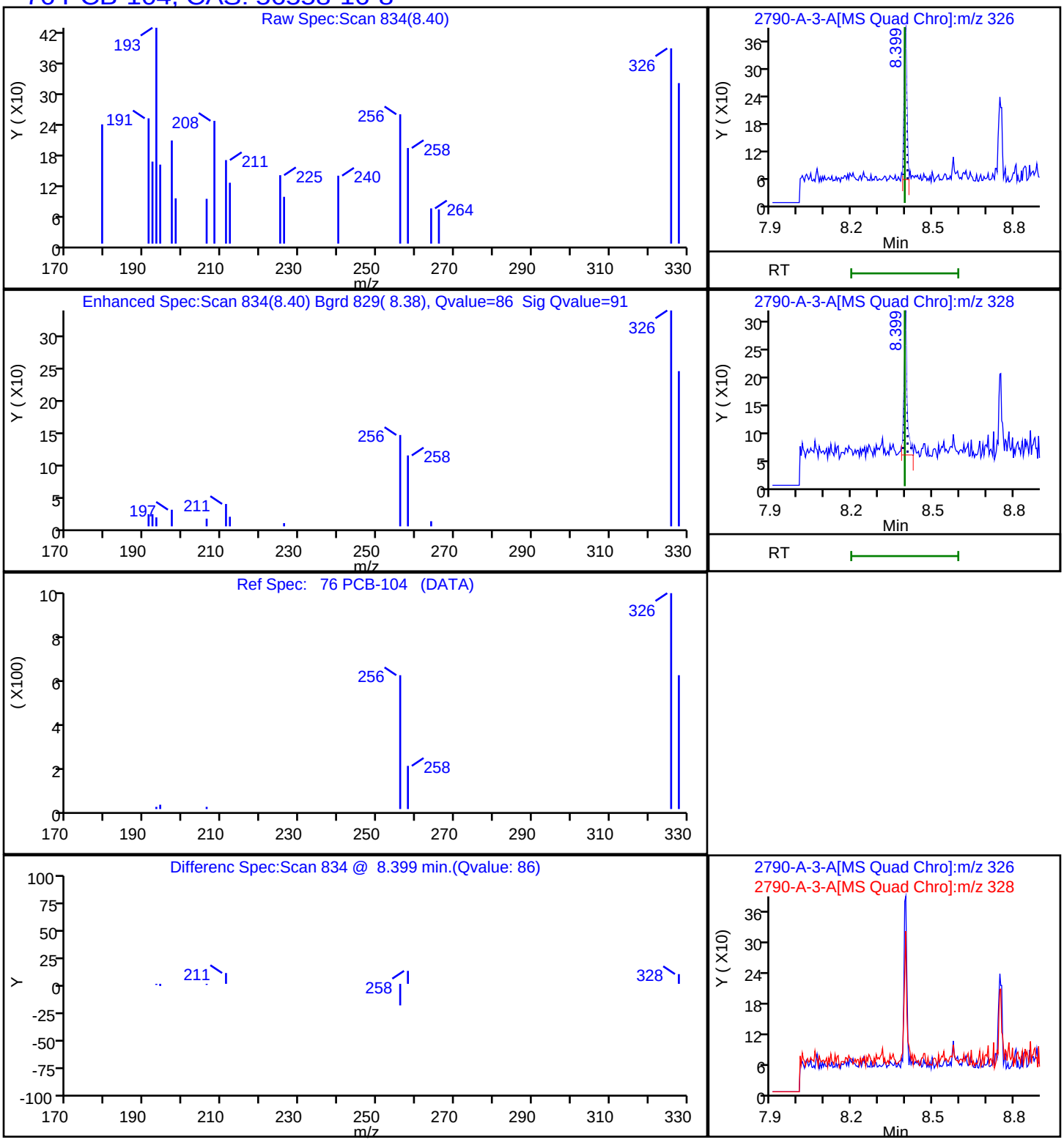
Report Date: 22-Nov-2023 14:12:22 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D

Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8
Client ID:	1804576-843-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

76 PCB-104, CAS: 56558-16-8



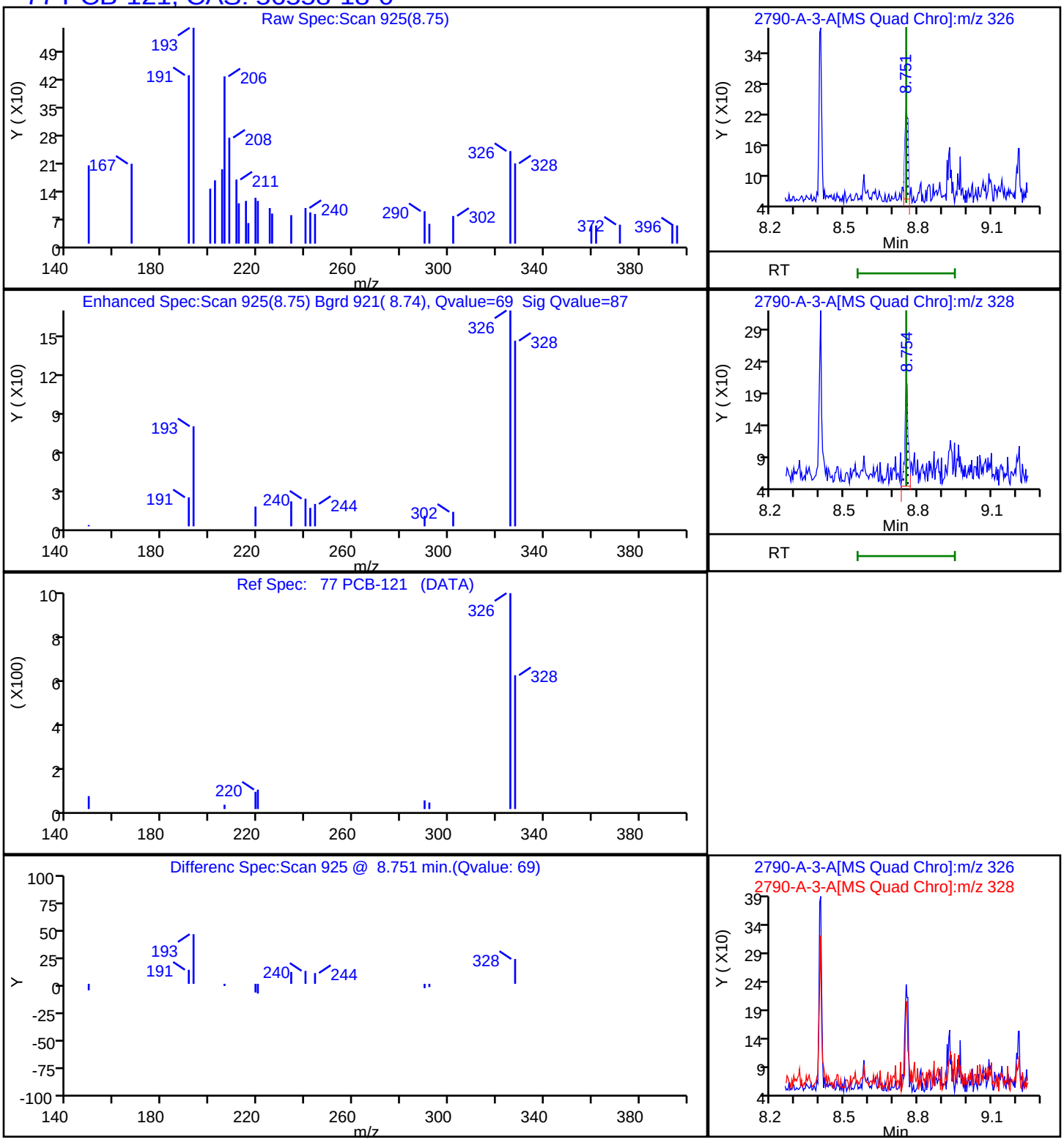
Report Date: 22-Nov-2023 14:12:22 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D

Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8
Client ID:	1804576-843-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

77 PCB-121, CAS: 56558-18-0



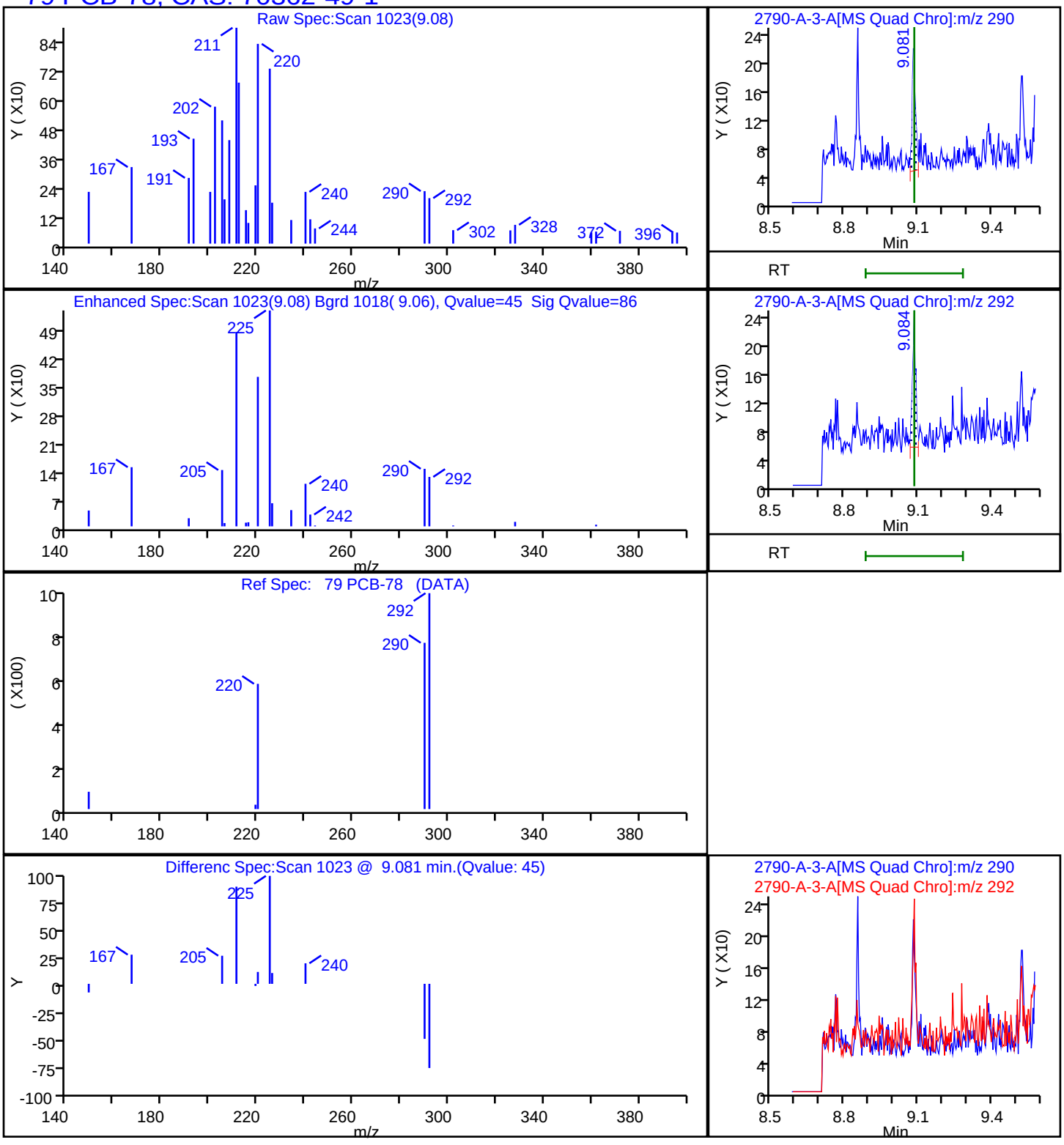
Report Date: 22-Nov-2023 14:12:22 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D

Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

79 PCB-78, CAS: 70362-49-1



Manual Integration/User Assign Peak Report

Eurofins Knoxville

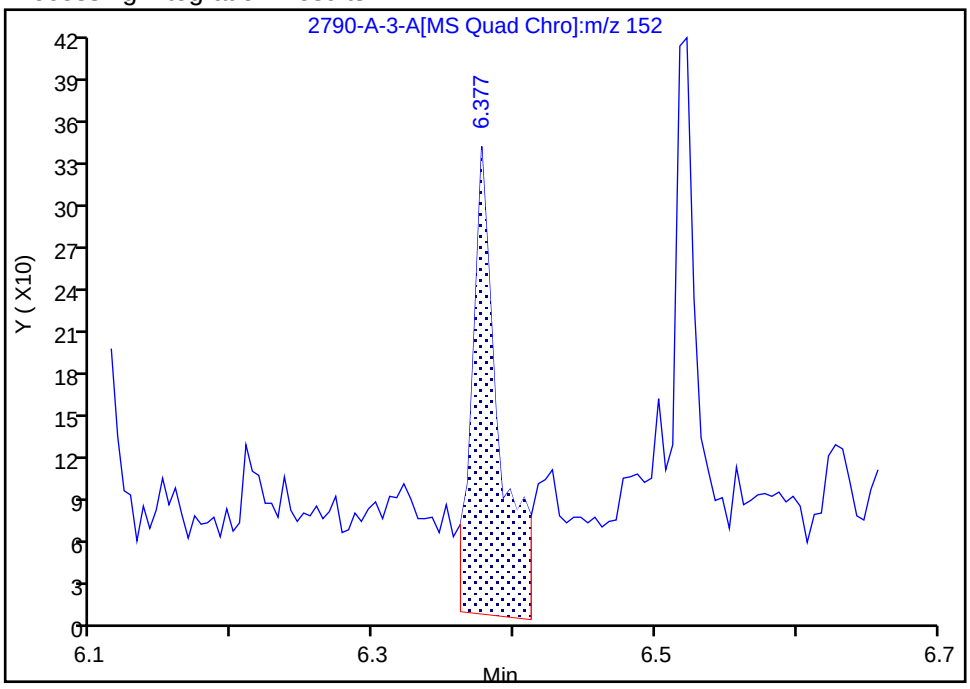
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D				
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

24 Acenaphthylene, CAS: 208-96-8

Signal: 1

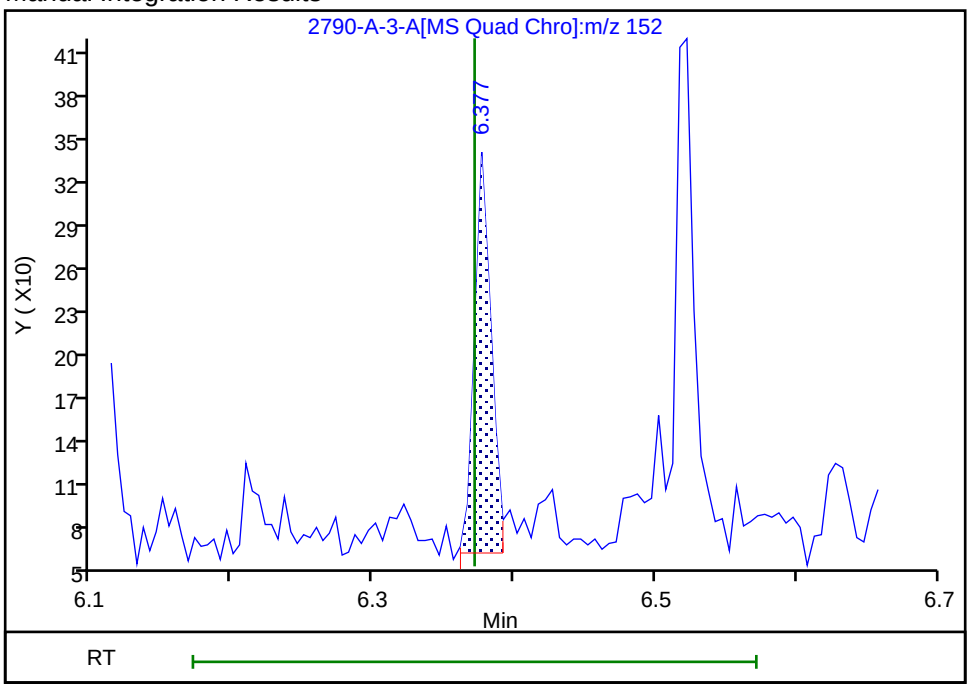
Processing Integration Results

RT: 6.38
Area: 455
Amount: 0.006702
Amount Units: ug/ml



Manual Integration Results

RT: 6.38
Area: 230
Amount: 0.003388
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 09:19:20 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Eurofins Knoxville

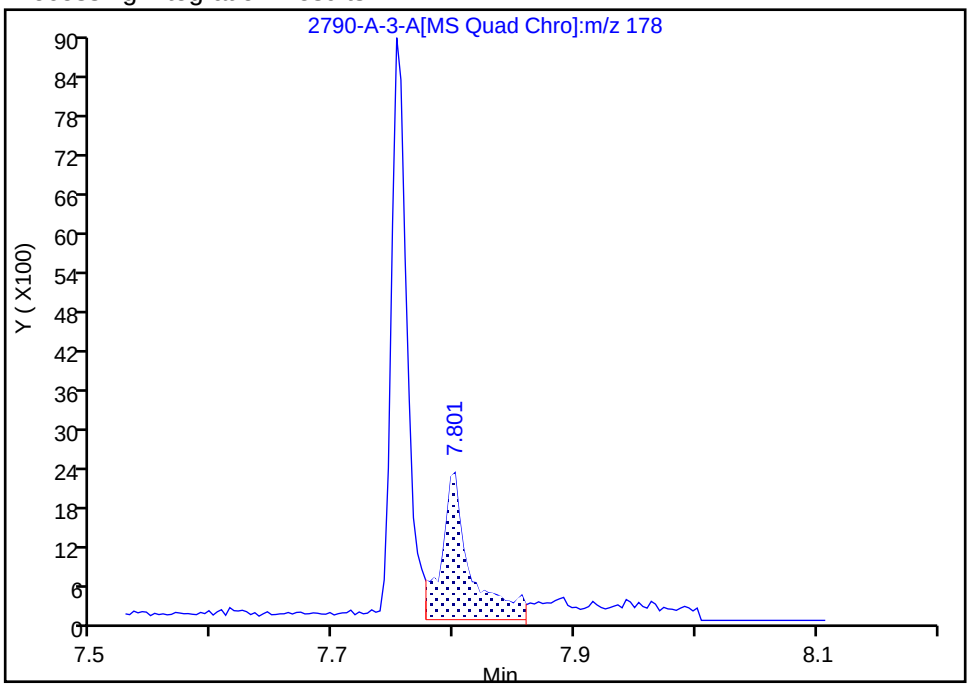
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D				
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

39 Anthracene, CAS: 120-12-7

Signal: 1

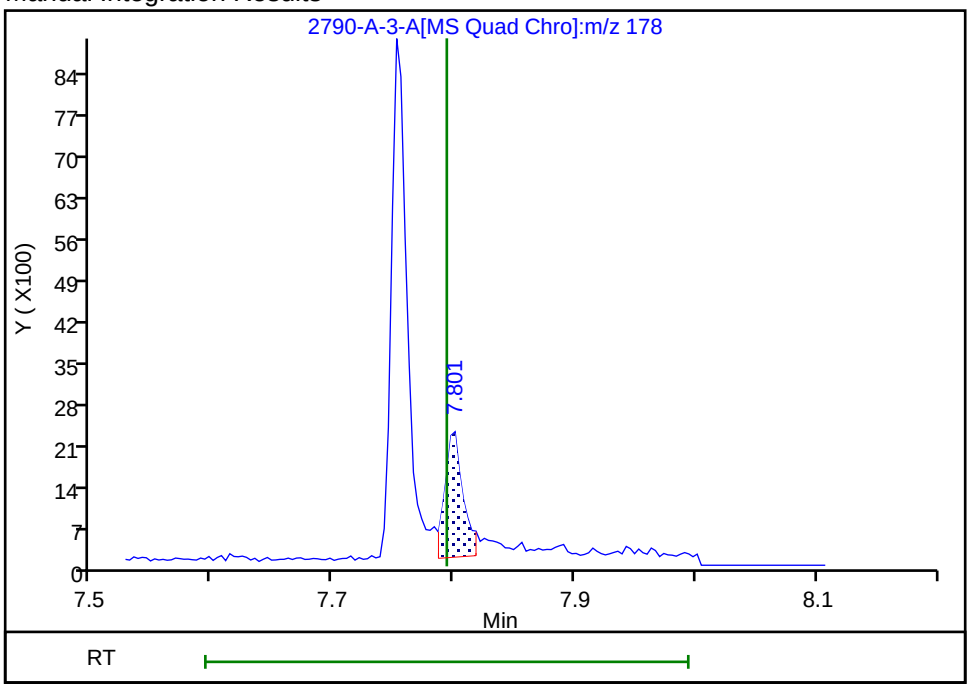
Processing Integration Results

RT: 7.80
Area: 3818
Amount: 0.040825
Amount Units: ug/ml



Manual Integration Results

RT: 7.80
Area: 2267
Amount: 0.024240
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 09:20:27 -05:00:00 (UTC)
Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

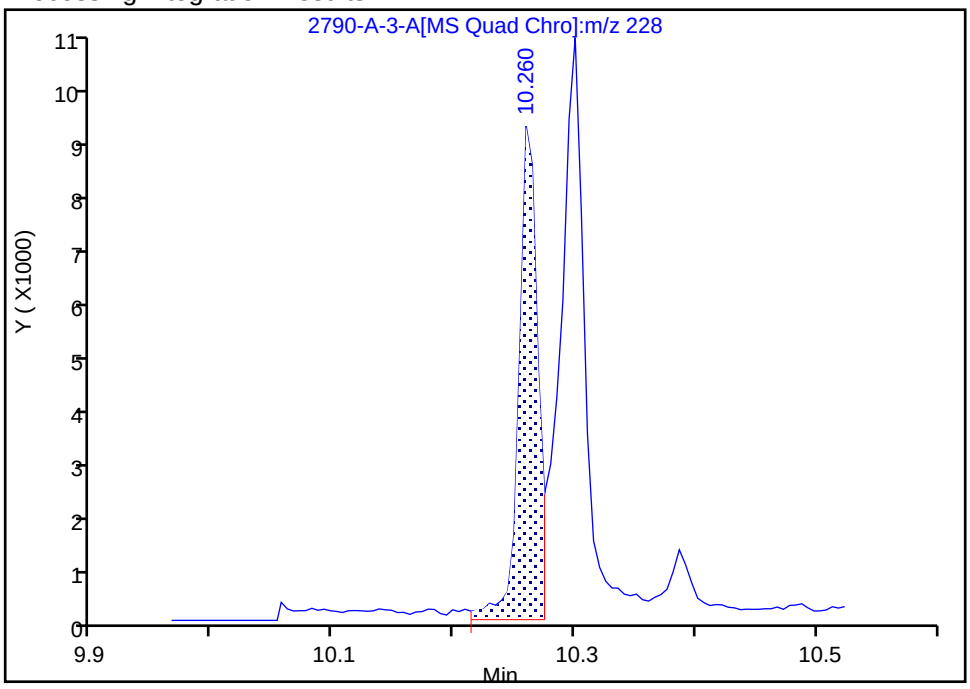
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D				
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

47 Benzo[a]anthracene, CAS: 56-55-3

Signal: 1

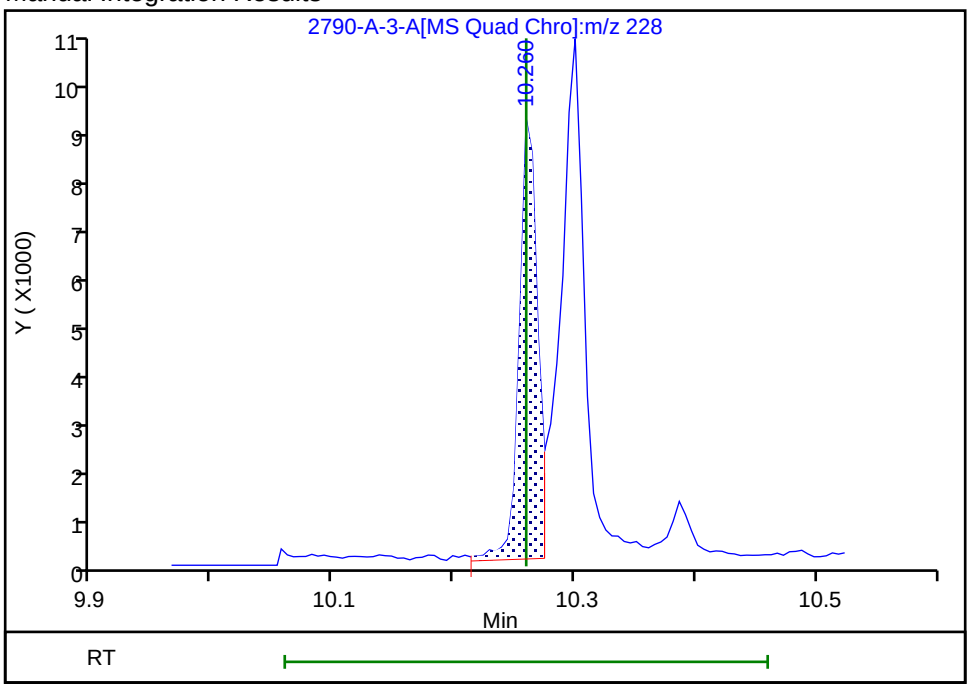
Processing Integration Results

RT: 10.26
Area: 9792
Amount: 0.065516
Amount Units: ug/ml



Manual Integration Results

RT: 10.26
Area: 9307
Amount: 0.062271
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 09:20:48 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

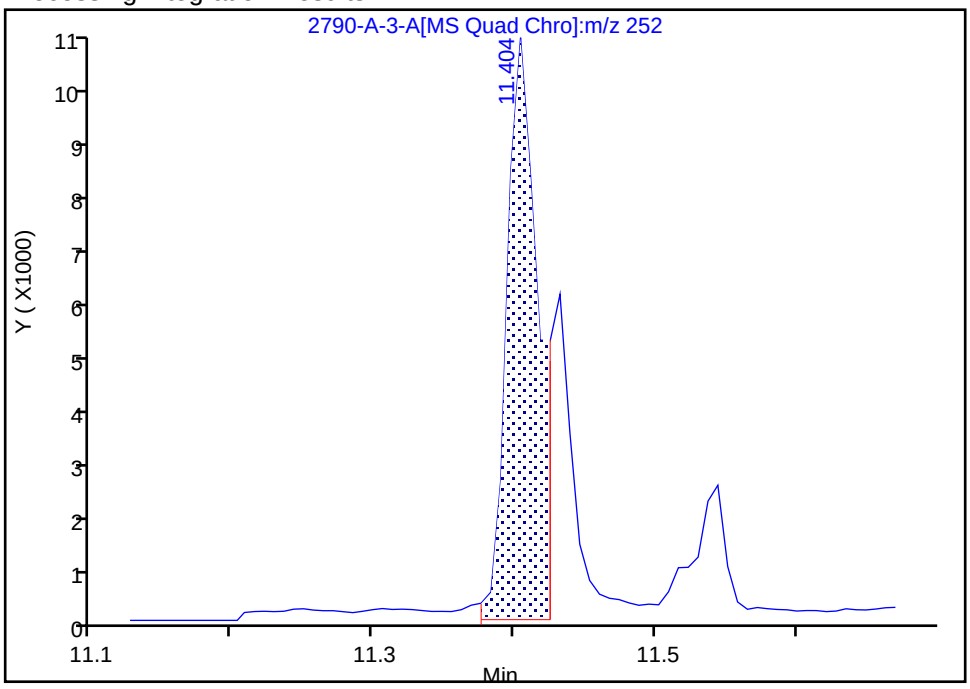
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D				
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

53 Benzo[b]fluoranthene, CAS: 205-99-2

Signal: 1

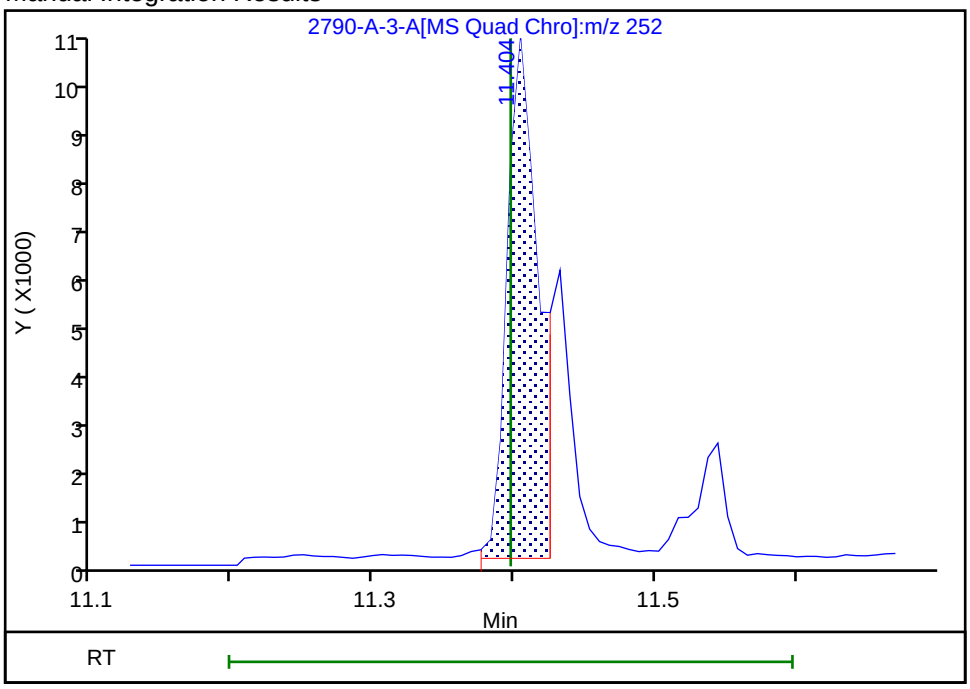
Processing Integration Results

RT: 11.40
Area: 16374
Amount: 0.100294
Amount Units: ug/ml



Manual Integration Results

RT: 11.40
Area: 15951
Amount: 0.097703
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 09:21:11 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

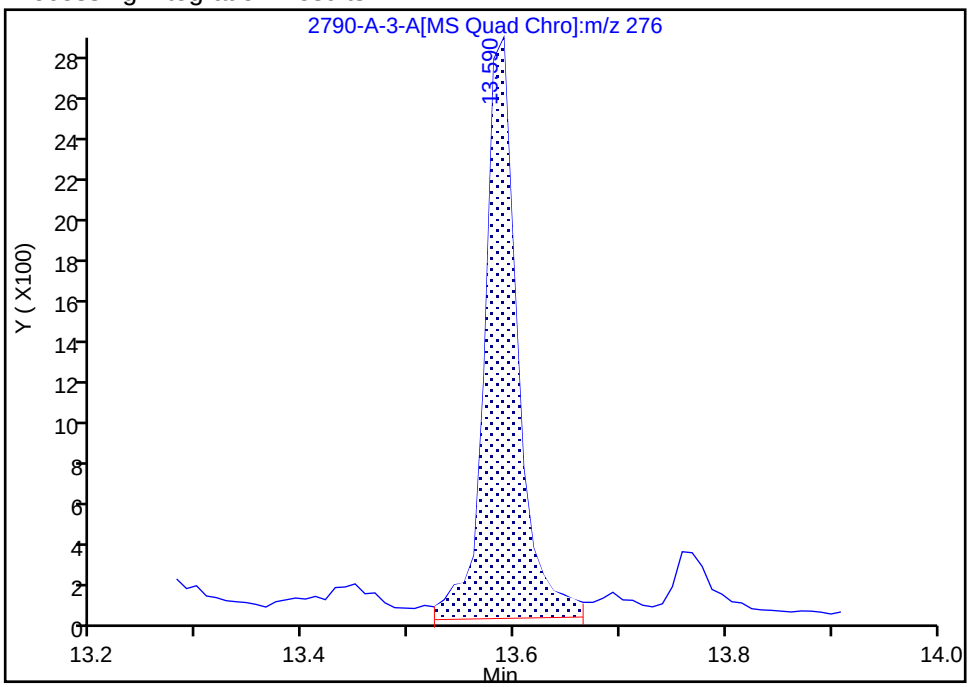
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D				
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

68 Benzo[g,h,i]perylene, CAS: 191-24-2

Signal: 1

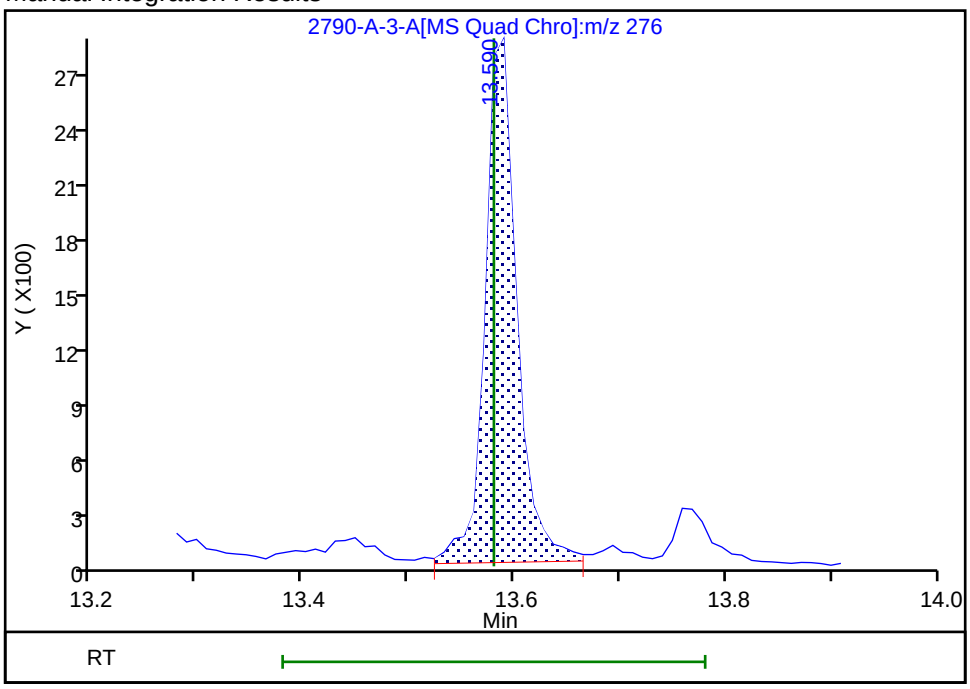
Processing Integration Results

RT: 13.59
Area: 6217
Amount: 0.044421
Amount Units: ug/ml



Manual Integration Results

RT: 13.59
Area: 5853
Amount: 0.041820
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 09:22:34 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

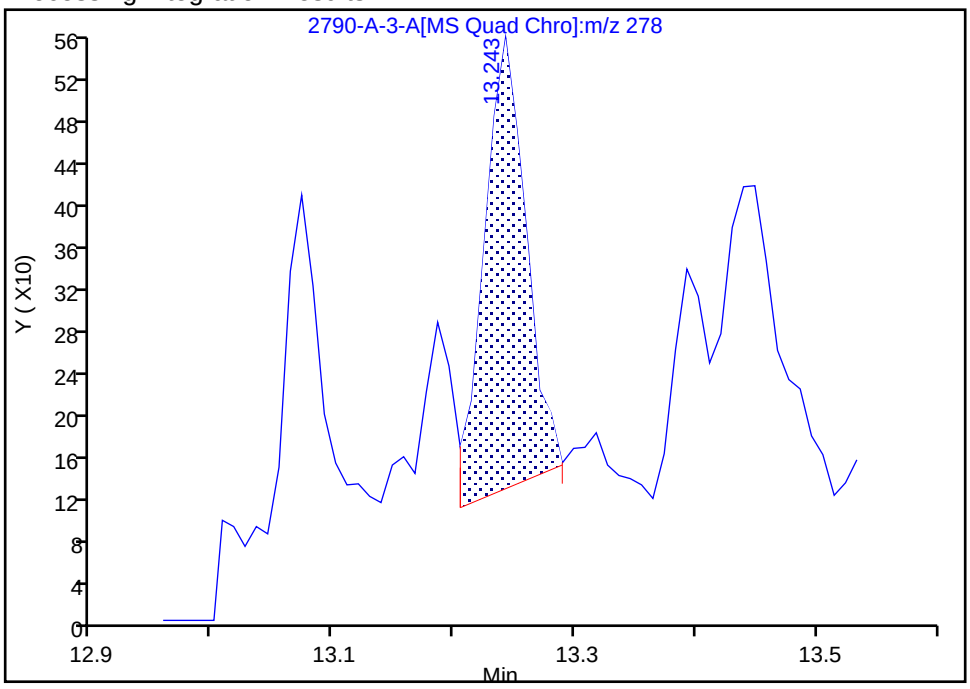
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D				
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

66 Dibenz(a,h)anthracene, CAS: 53-70-3

Signal: 1

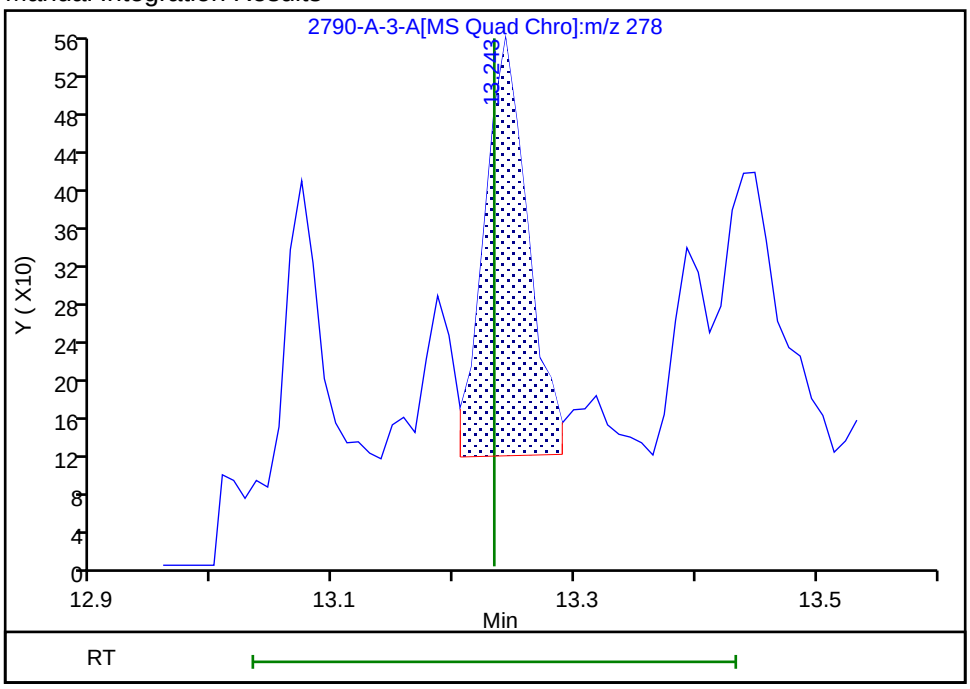
Processing Integration Results

RT: 13.24
Area: 1058
Amount: 0.008341
Amount Units: ug/ml



Manual Integration Results

RT: 13.24
Area: 1123
Amount: 0.008854
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 09:22:21 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

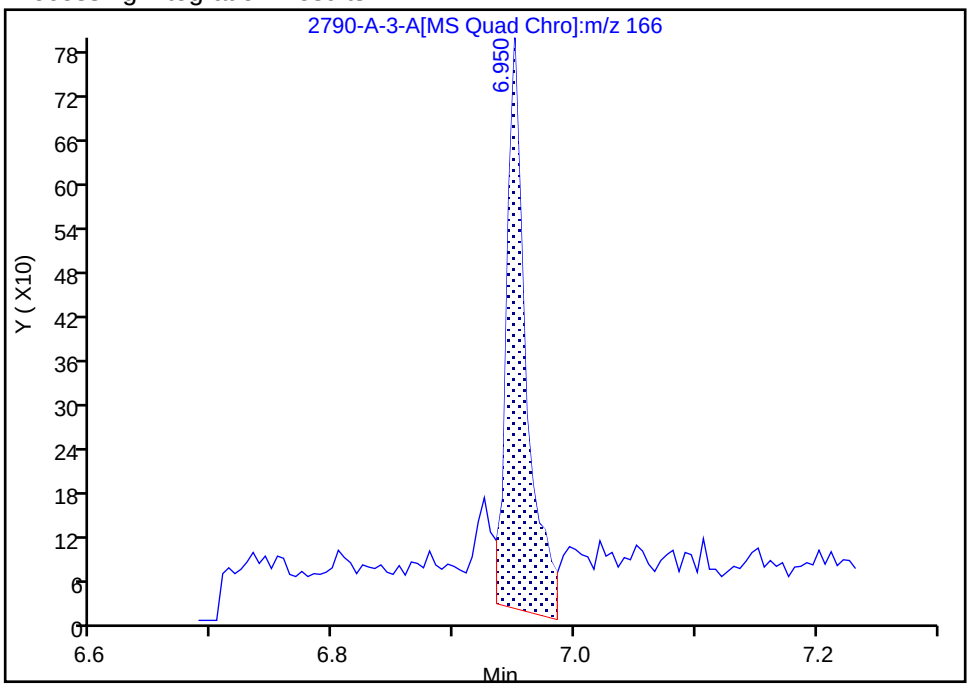
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D				
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

30 Fluorene, CAS: 86-73-7

Signal: 1

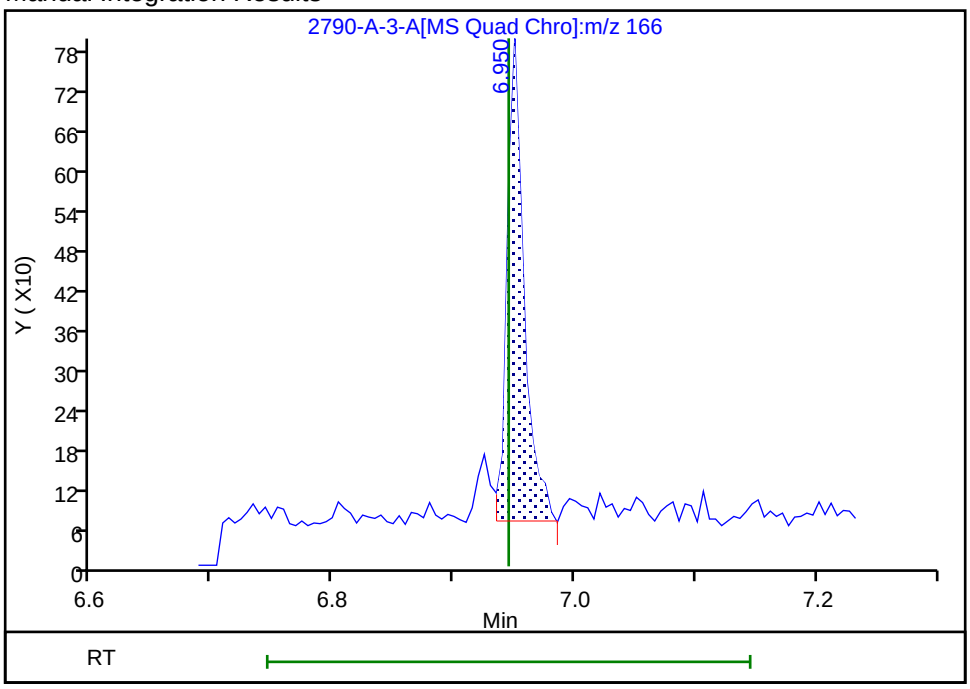
Processing Integration Results

RT: 6.95
Area: 896
Amount: 0.015444
Amount Units: ug/ml



Manual Integration Results

RT: 6.95
Area: 708
Amount: 0.012204
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 09:19:38 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

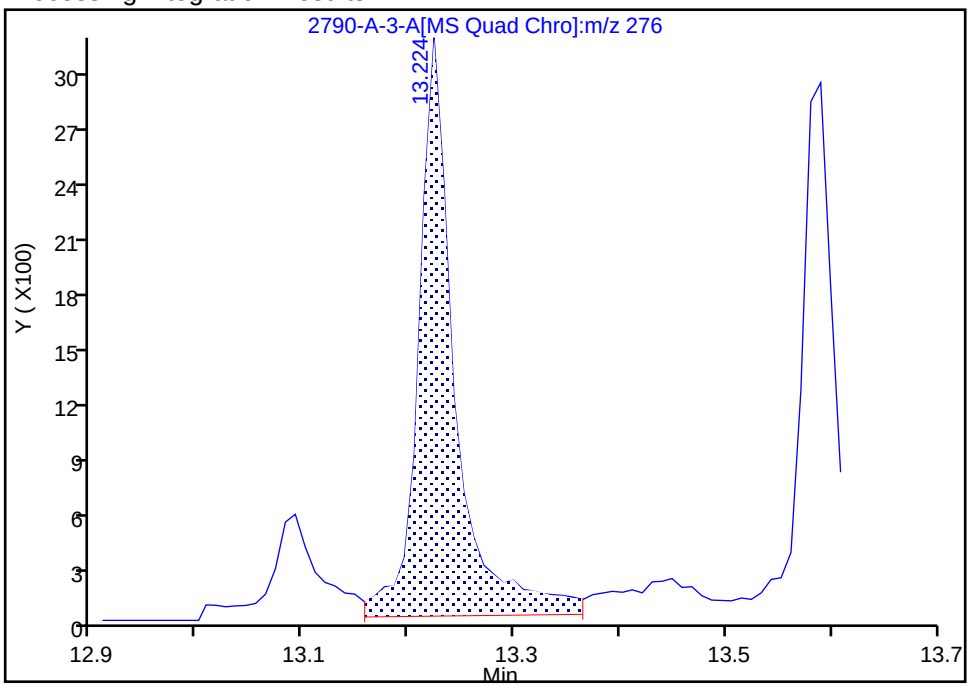
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D				
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

65 Indeno[1,2,3-cd]pyrene, CAS: 193-39-5

Signal: 1

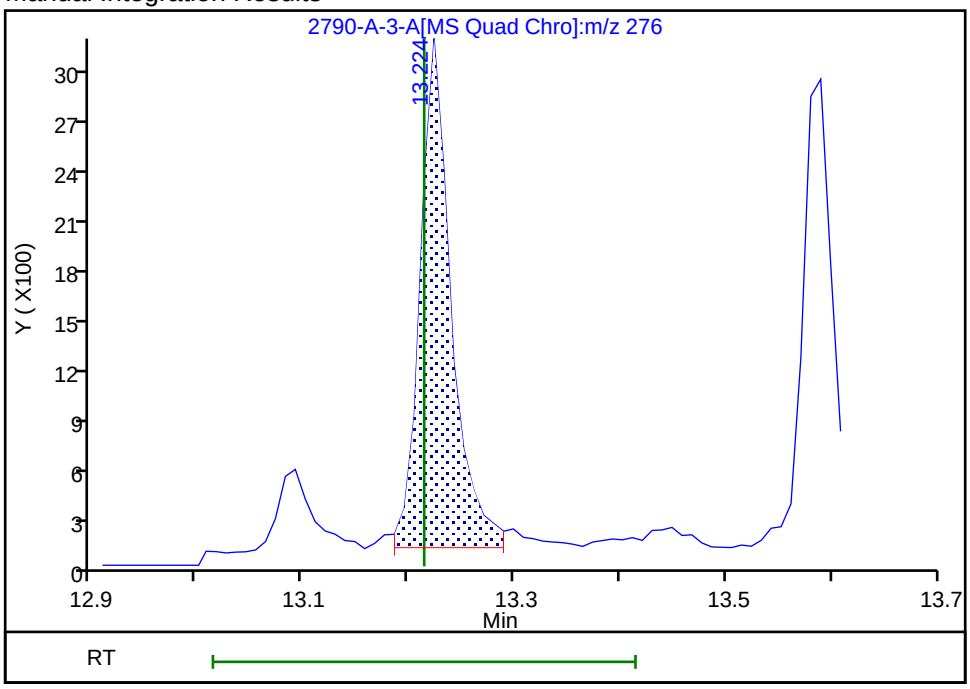
Processing Integration Results

RT: 13.22
Area: 7501
Amount: 0.048057
Amount Units: ug/ml



Manual Integration Results

RT: 13.22
Area: 6235
Amount: 0.039946
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 09:22:09 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Eurofins Knoxville

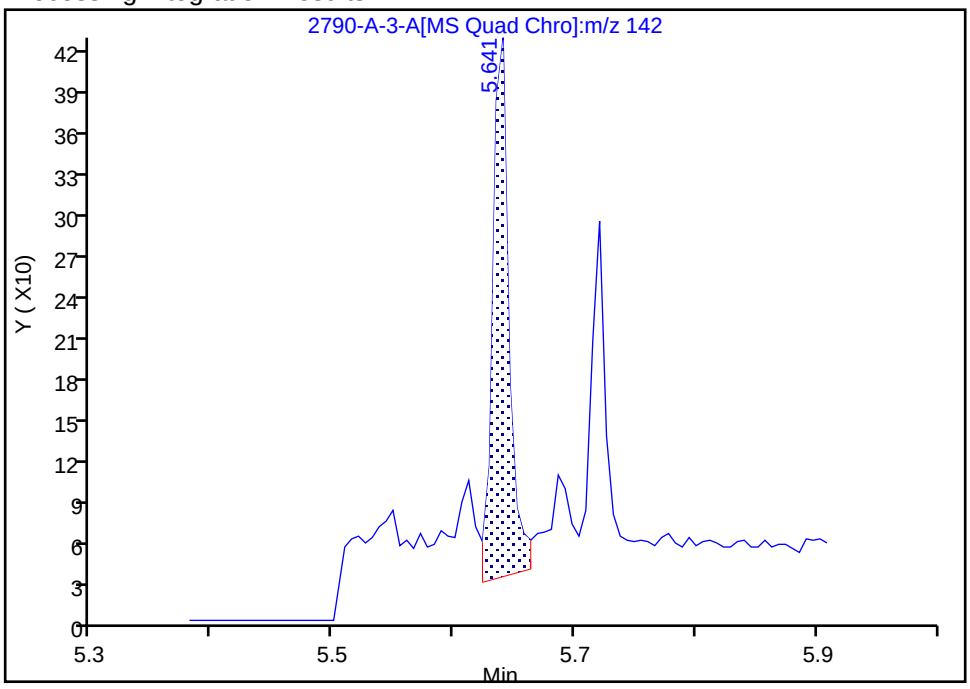
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D				
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

16 2-Methylnaphthalene, CAS: 91-57-6

Signal: 1

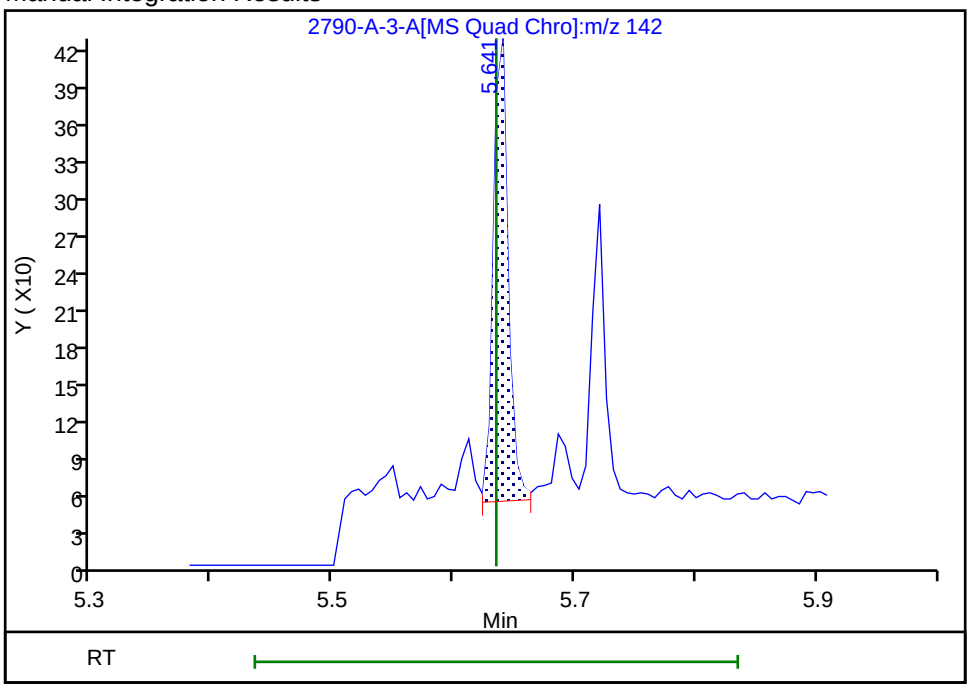
Processing Integration Results

RT: 5.64
Area: 378
Amount: 0.009270
Amount Units: ug/ml



Manual Integration Results

RT: 5.64
Area: 323
Amount: 0.007921
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 09:18:50 -05:00:00 (UTC)
Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

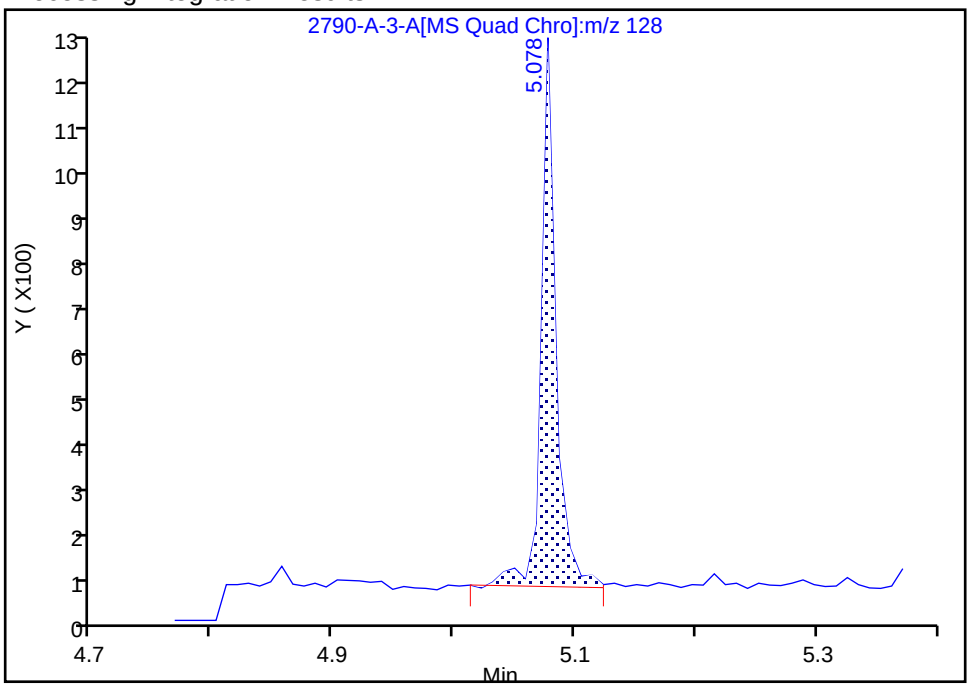
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D				
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

11 Naphthalene, CAS: 91-20-3

Signal: 1

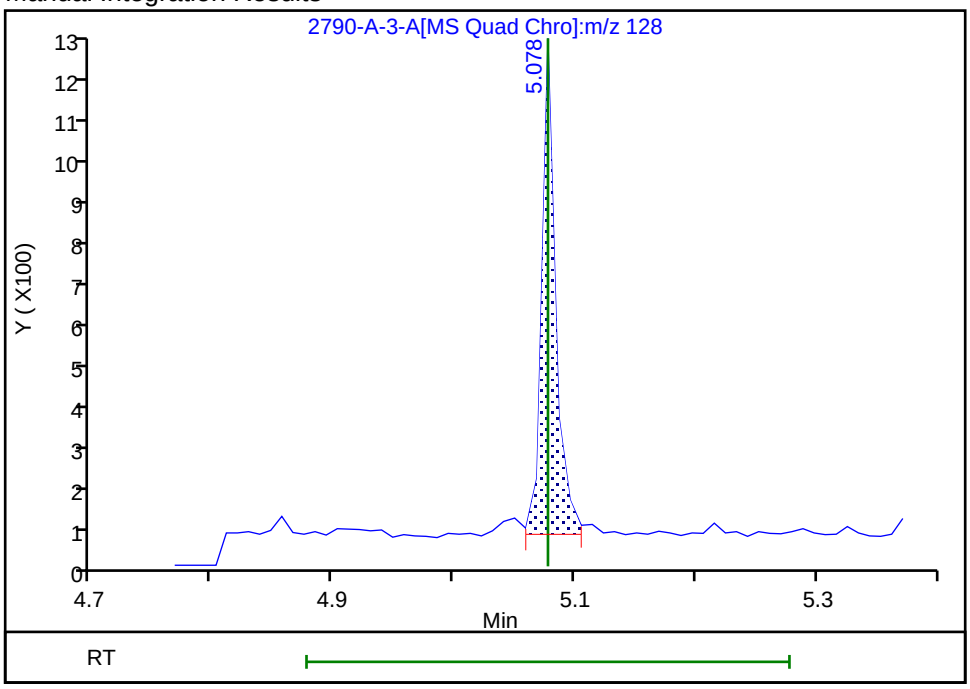
Processing Integration Results

RT: 5.08
Area: 983
Amount: 0.017288
Amount Units: ug/ml



Manual Integration Results

RT: 5.08
Area: 930
Amount: 0.016356
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 09:18:28 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Eurofins Knoxville

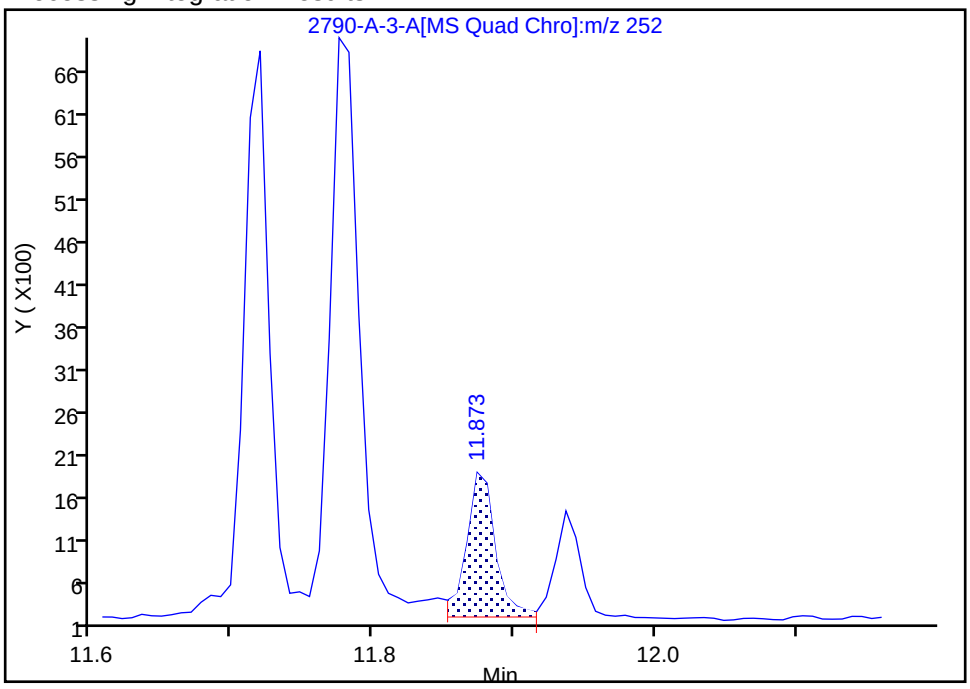
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D				
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

61 Perylene, CAS: 198-55-0

Signal: 1

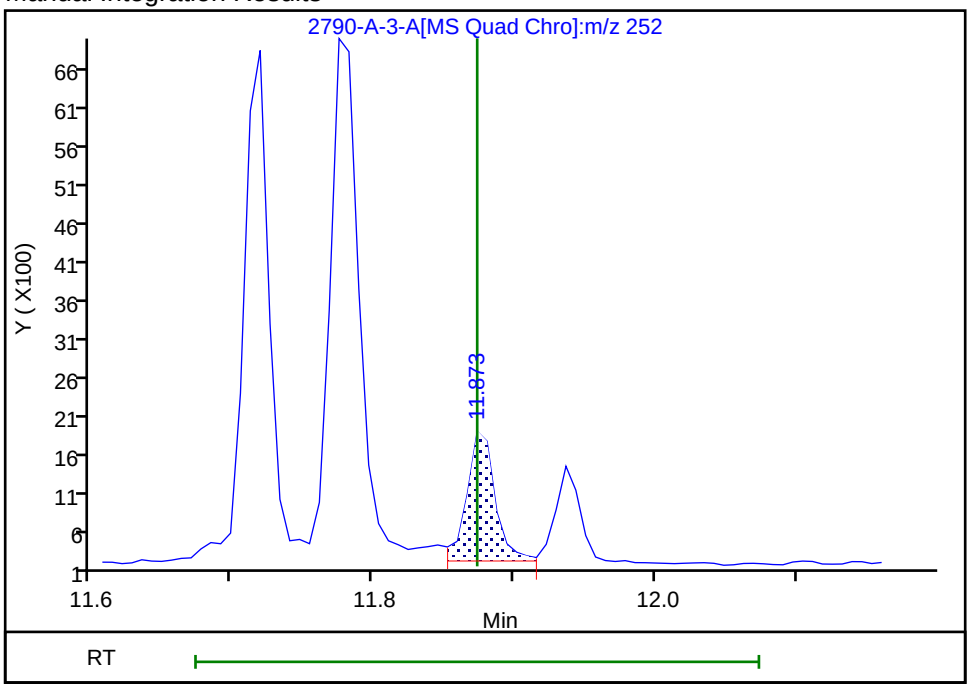
Processing Integration Results

RT: 11.87
Area: 2423
Amount: 0.020800
Amount Units: ug/ml



Manual Integration Results

RT: 11.87
Area: 2341
Amount: 0.020096
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 09:21:37 -05:00:00 (UTC)
Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

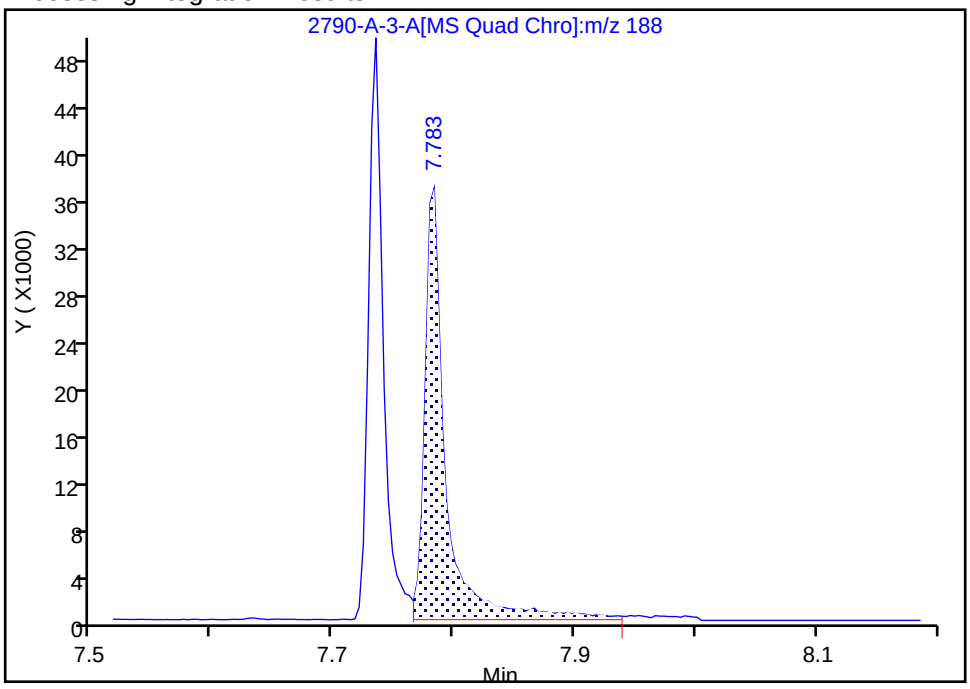
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D				
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 38 Anthracin-d10, CAS: 1719-06-8

Signal: 1

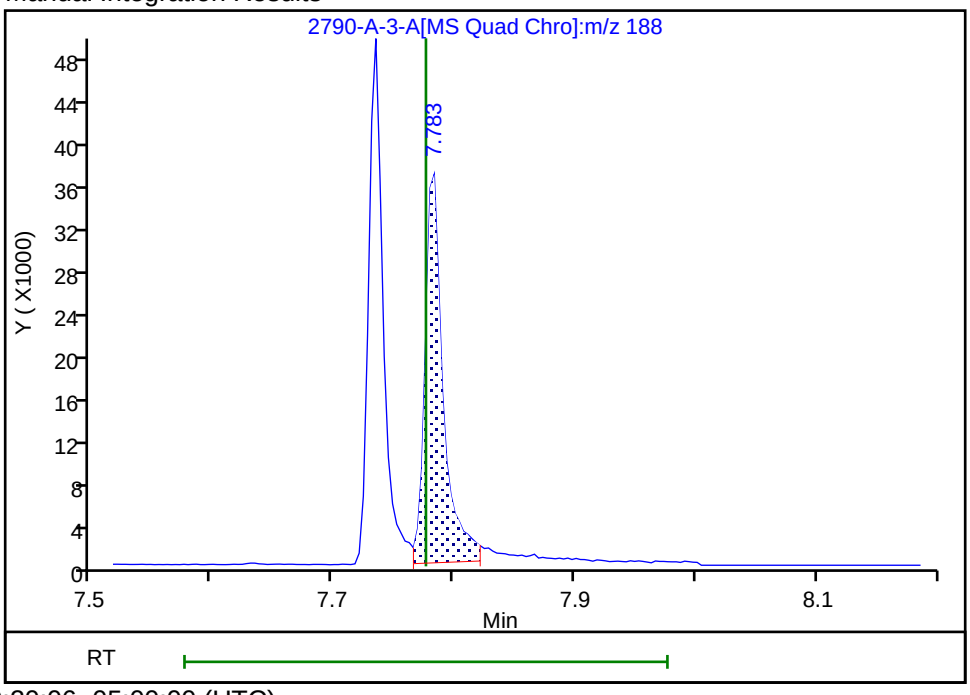
Processing Integration Results

RT: 7.78
Area: 44553
Amount: 0.343490
Amount Units: ug/ml



Manual Integration Results

RT: 7.78
Area: 37983
Amount: 0.292837
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 09:20:06 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

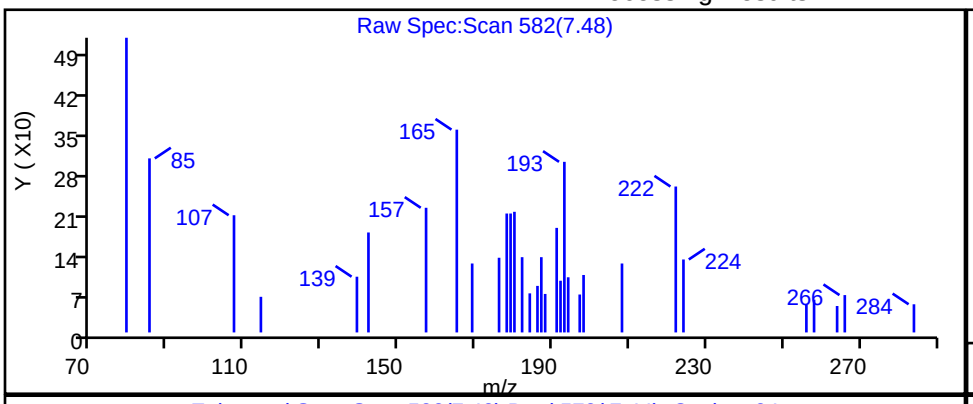
User Disabled Compound Report

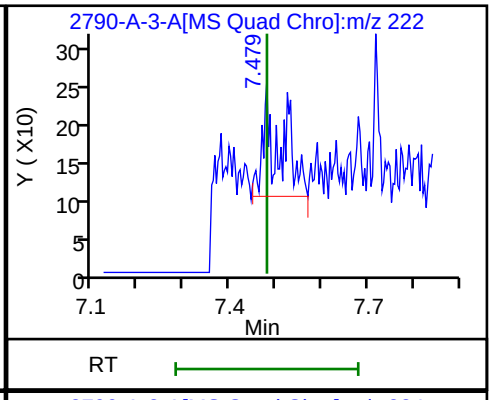
Eurofins Knoxville

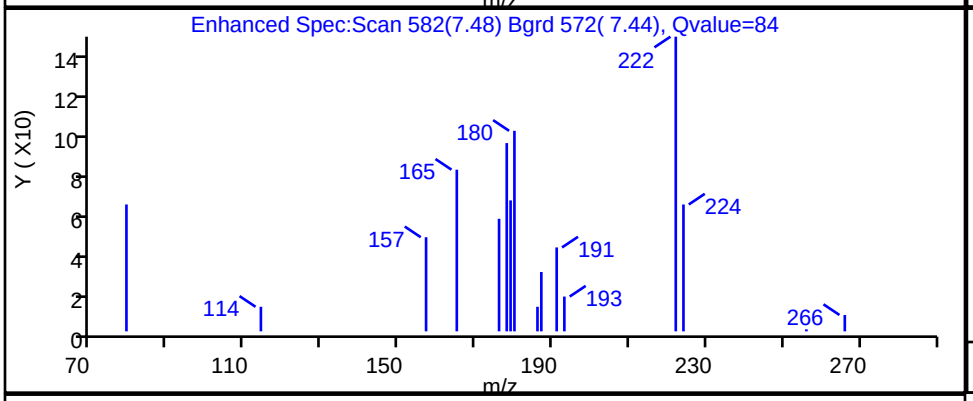
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D				
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

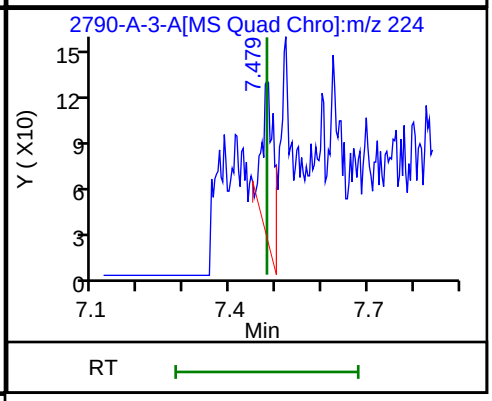
74 PCB-14, CAS: 34883-41-5

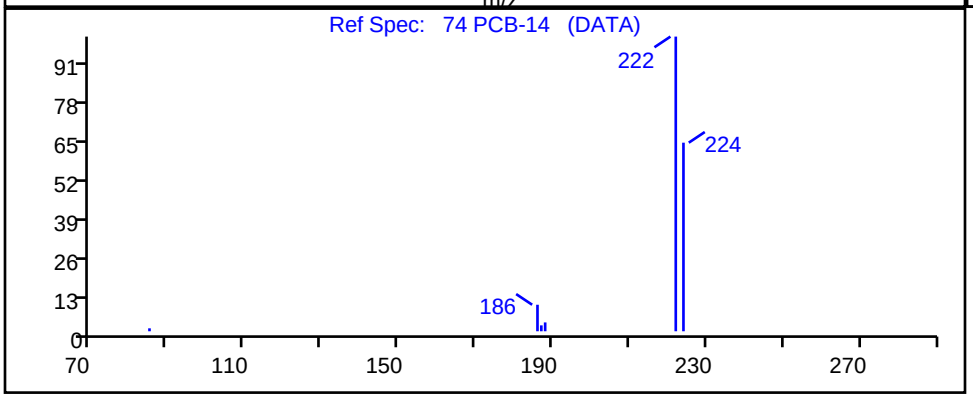
Processing Results











RT	Mass	Response	Amount
7.48	222.00	392	0.003102
7.48	224.00	179	

Reviewer: SK9U, 17-Nov-2023 09:22:54 -05:00:00 (UTC)

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

Manual Integration/User Assign Peak Report

Eurofins Knoxville

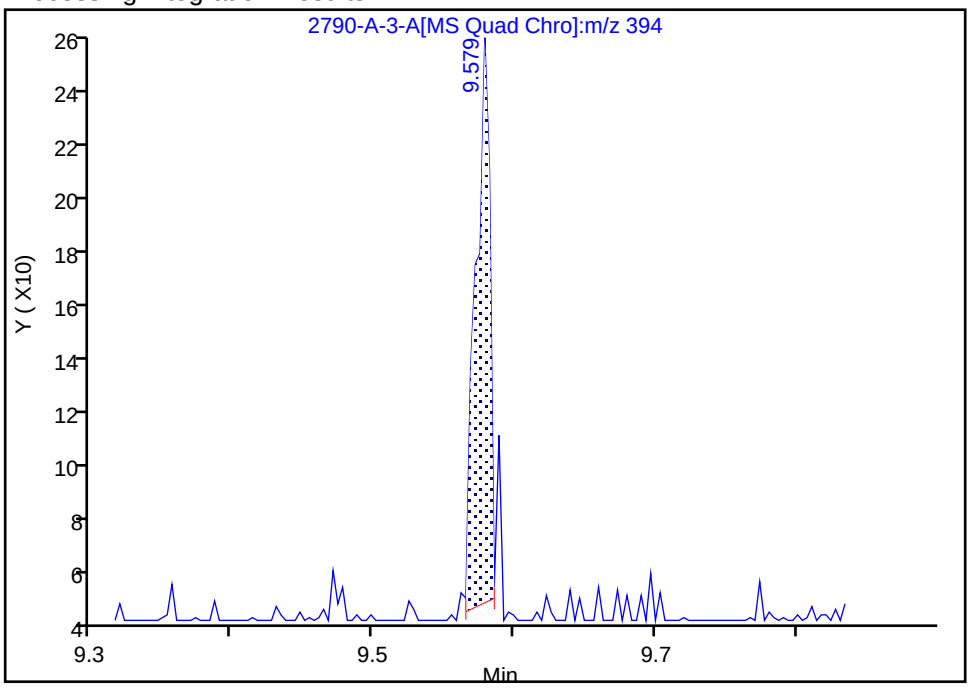
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D				
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

81 PCB-184, CAS: 74472-48-3

Signal: 1

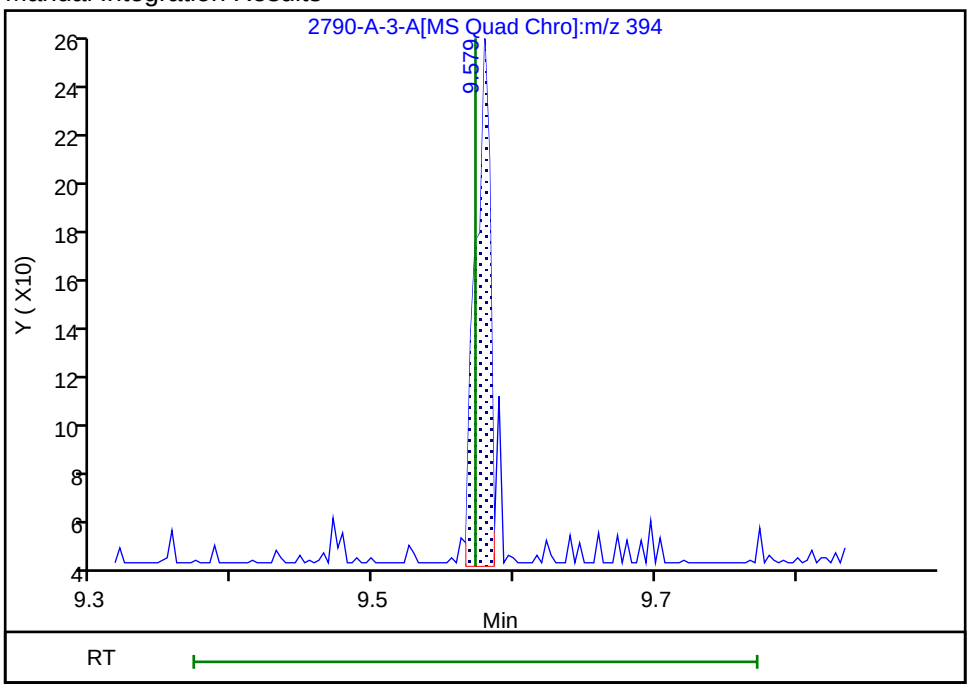
Processing Integration Results

RT: 9.58
Area: 143
Amount: 0.005063
Amount Units: ug/ml



Manual Integration Results

RT: 9.58
Area: 152
Amount: 0.005382
Amount Units: ug/ml



Reviewer: SK9U, 22-Nov-2023 11:20:37 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

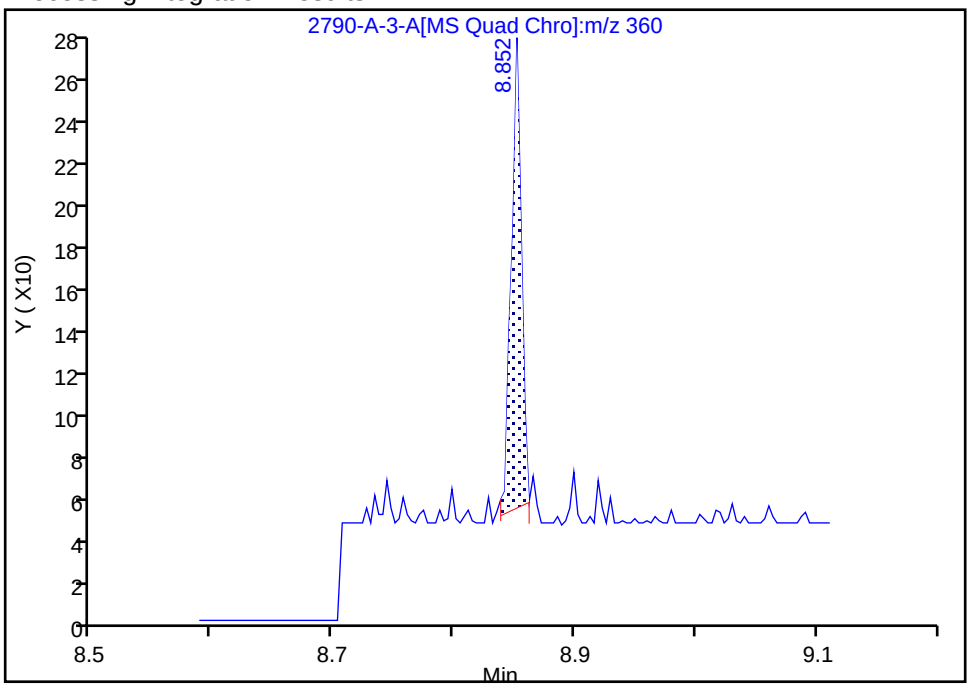
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D				
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

78 PCB-155, CAS: 33979-03-2

Signal: 1

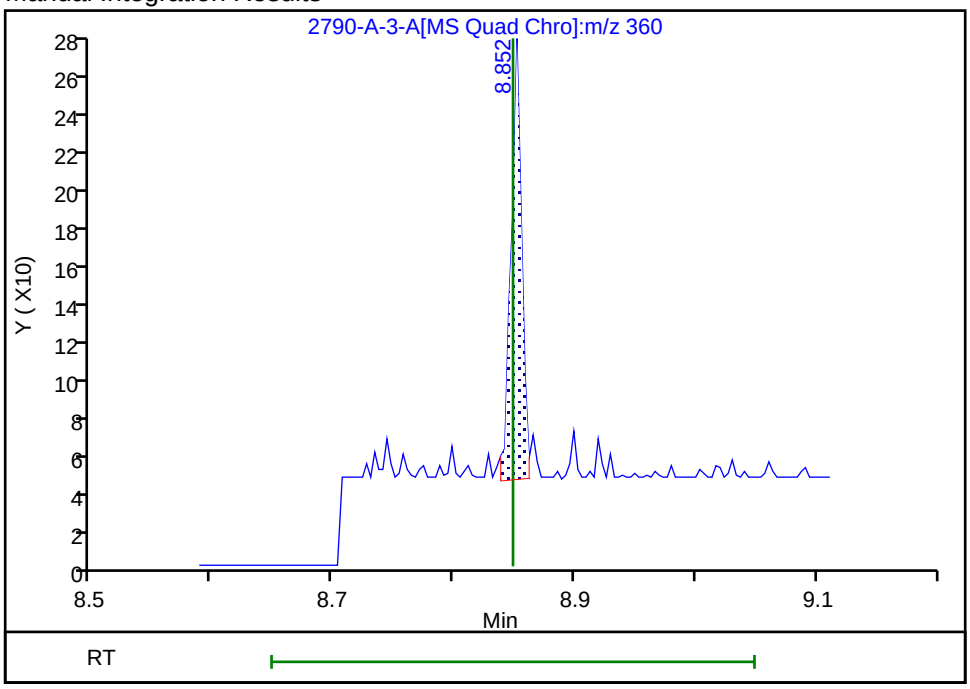
Processing Integration Results

RT: 8.85
Area: 129
Amount: 0.003328
Amount Units: ug/ml



Manual Integration Results

RT: 8.85
Area: 142
Amount: 0.003663
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 09:23:12 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

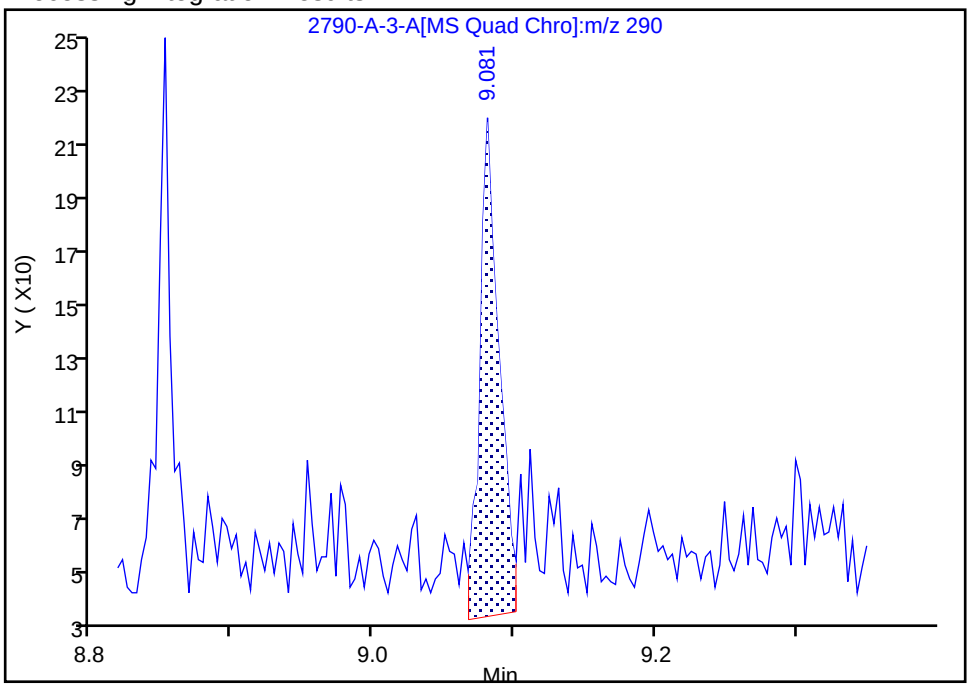
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D				
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

79 PCB-78, CAS: 70362-49-1

Signal: 1

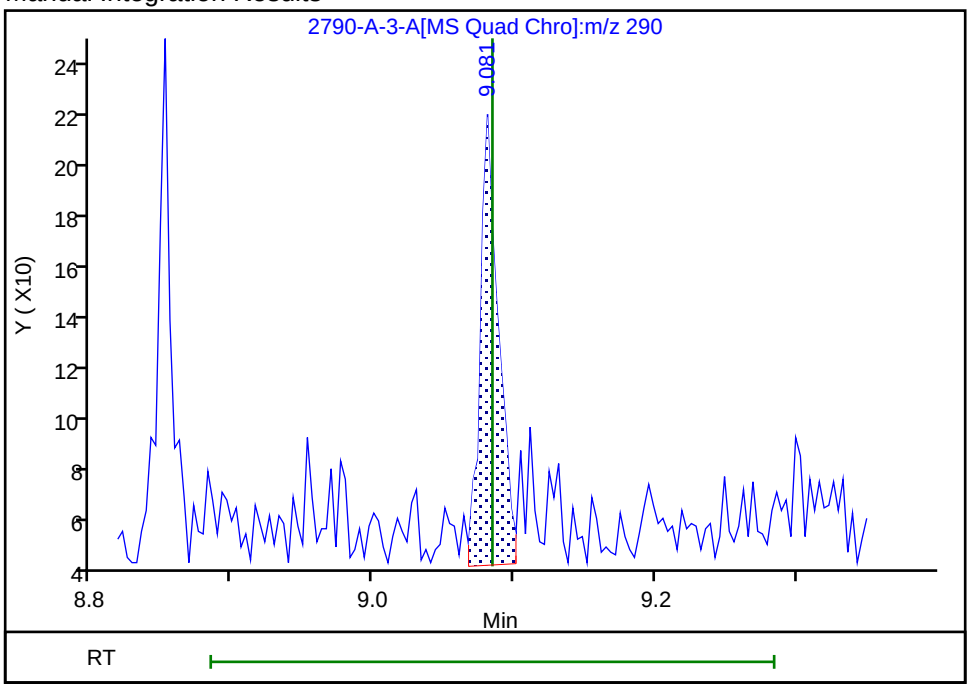
Processing Integration Results

RT: 9.08
Area: 173
Amount: 0.005269
Amount Units: ug/ml



Manual Integration Results

RT: 9.08
Area: 156
Amount: 0.004752
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 09:23:22 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

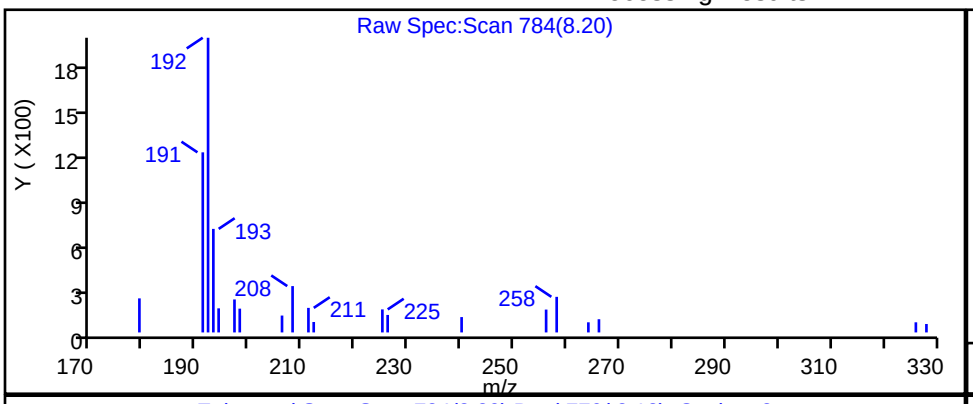
User Disabled Compound Report

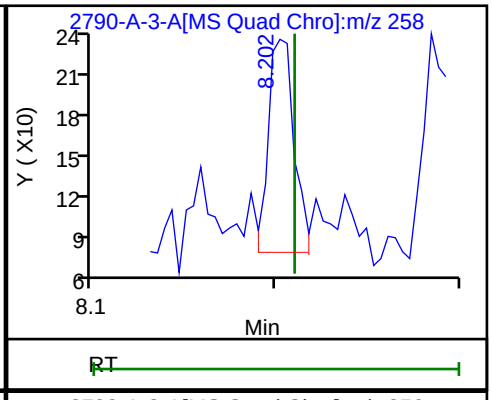
Eurofins Knoxville

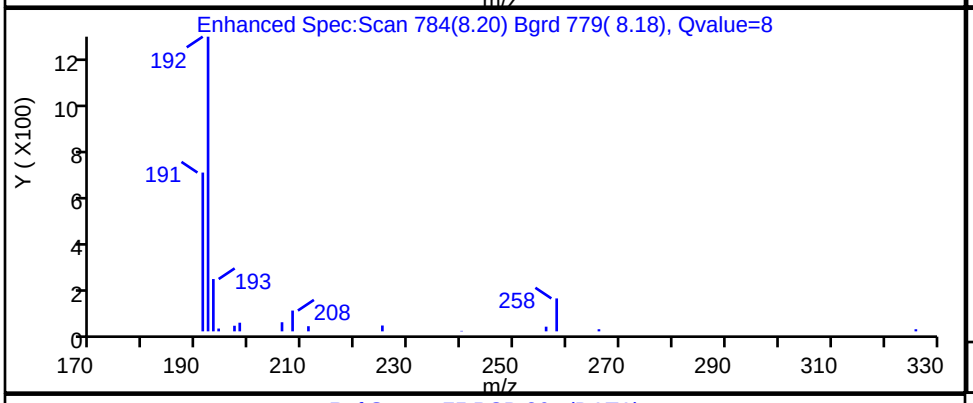
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\810-82790-A-3-A.D				
Injection Date:	16-Nov-2023 16:37:15	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-8-A	Lab Sample ID:	140-34148-8		
Client ID:	1804576-843-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	16
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

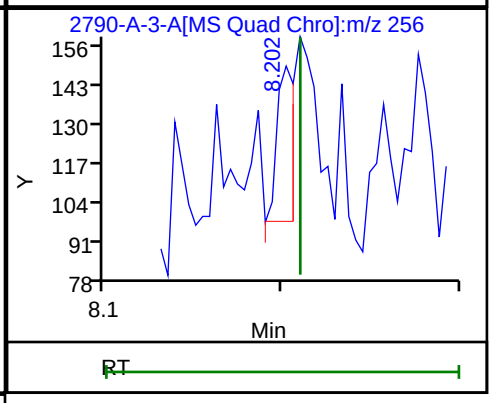
75 PCB-36, CAS: 38444-87-0

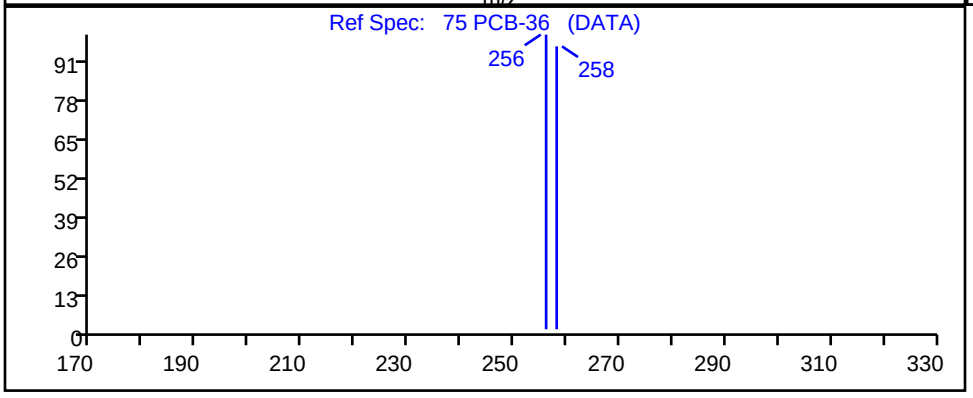
Processing Results











RT	Mass	Response	Amount
8.20	258.00	152	0.002285
8.20	256.00	36	

Reviewer: SK9U, 17-Nov-2023 09:22:58 -05:00:00 (UTC)

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: 1804576-843-S2 | Lab Sample ID: 140-34148-9

Matrix: PE | Lab File ID: 140-34148-A-9-A.D

Analysis Method: ID-0016 | Date Collected: 10/26/2023 14:00

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.010(g) | Date Analyzed: 11/17/2023 16:55

Con. Extract Vol.: 500(uL) | Dilution Factor: 5

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80412 | Units: ng/g

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
83-32-9	Acenaphthene	170000		5000	1300
208-96-8	Acenaphthylene	4000	J	5000	370
120-12-7	Anthracene	67000		5000	1600
56-55-3	Benzo[a]anthracene	51000		5000	1900
50-32-8	Benzo[a]pyrene	35000		5000	1400
205-99-2	Benzo[b]fluoranthene	38000		5000	1800
192-97-2	Benzo[e]pyrene	20000		5000	800
191-24-2	Benzo[g,h,i]perylene	11000		5000	550
207-08-9	Benzo[k]fluoranthene	15000		5000	1200
218-01-9	Chrysene	57000		5000	650
53-70-3	Dibenz(a,h)anthracene	2500	J	5000	410
206-44-0	Fluoranthene	190000		5000	4100
86-73-7	Fluorene	70000		5000	1600
193-39-5	Indeno[1,2,3-cd]pyrene	11000		5000	550
90-12-0	1-Methylnaphthalene	26000		25000	2500
91-57-6	2-Methylnaphthalene	ND		25000	3500
91-20-3	Naphthalene	ND		100000	15000
198-55-0	Perylene	7100		5000	2600
85-01-8	Phenanthrene	310000		10000	8700
129-00-0	Pyrene	260000		10000	1500
STL00912	C1-Fluoranthenes/pyrene	110000		5000	5000
STL00913	C1-Fluorenes	42000		10000	6500
STL00914	C2-Fluorenes	50000		5000	5000
STL00915	C3-Fluorenes	55000		5000	5000
STL00917	C2-Naphthalenes	130000		10000	10000
STL00918	C3-Naphthalenes	120000		10000	10000
STL00919	C4-Naphthalenes	84000		15000	14000
STL00901	C1-Phenanthrenes/Anthracenes	98000		20000	17000
STL00902	C2-Phenanthrenes/Anthracenes	120000		5000	5000
STL00903	C3-Phenanthrenes/Anthracenes	86000		5000	5000
STL00904	C4-Phenanthrenes/Anthracenes	51000	AP	5000	5000
STL02218	C1-Chrysenes/Benz(a)anthracenes	34000		5000	5000

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: 1804576-843-S2 | Lab Sample ID: 140-34148-9

Matrix: PE | Lab File ID: 140-34148-A-9-A.D

Analysis Method: ID-0016 | Date Collected: 10/26/2023 14:00

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.010(g) | Date Analyzed: 11/17/2023 16:55

Con. Extract Vol.: 500(uL) | Dilution Factor: 5

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80412 | Units: ng/g

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
STL02219	C2-Chrysenes/Benz(a)anthracenes	13000		5000	5000
STL02220	C3-Chrysenes/Benz(a)anthracenes	6300		5000	5000
STL02221	C4-Chrysenes/Benz(a)anthracenes	ND		5000	5000
34883-41-5	PCB-14	ND		5000	50
74472-51-8	PCB-192	310	J	5000	50
74472-48-3	PCB-184	97	J	5000	50
33979-03-2	PCB-155	78	J	5000	50
41411-61-4	PCB-142	ND		5000	50
74472-52-9	PCB-204	230	J	5000	50
56558-16-8	PCB-104	180	J	5000	50
56558-18-0	PCB-121	ND		5000	50
70362-49-1	PCB-78	ND		5000	50
38444-87-0	PCB-36	ND		5000	50

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
93951-97-4	Acenaphthylene-d8	82		30-120
1719-06-8	Anthracene-d10	81		30-120
63466-71-7	Benzo(a)pyrene-d12	91		30-120
93951-98-5	Benzo(b)fluoranthene-d12	86		30-120
93951-66-7	Benzo(ghi)perylene-d12	92		30-120
93952-01-3	Benzo(k)fluoranthene-d12	95		30-120
1719-03-5	Chrysene-d12	85		30-120
13250-98-1	Dibenz(a,h)anthracene-d14	90		30-120
93951-69-0	Fluoranthene-d10	92		30-120
81103-79-9	Fluorene -d10	79		30-120
203578-33-0	Indeno[1,2,3-cd]pyrene-d12	93		30-120
38072-94-5	1-Methylnaphthalene-d10	77		30-120
7297-45-2	2-Methylnaphthalene-d10	73		30-120
1146-65-2	Naphthalene-d8	69		30-120
1520-96-3	Perylene-d12	89		30-120
1517-22-2	Phenanthrene-d10	85		30-120

Report Date: 22-Nov-2023 13:56:27 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D
Lims ID: 140-34148-A-9-A
Client ID: 1804576-843-S2
Sample Type: Client
Inject. Date: 17-Nov-2023 16:55:54 ALS Bottle#: 0 Worklist Smp#: 10
Injection Vol: 1.0 ul Dil. Factor: 5.0000
Sample Info: 140-0030536-010
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 22-Nov-2023 13:56:26 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1637

First Level Reviewer: SK9U Date: 22-Nov-2023 13:56:26

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/ml	%Rec	Flags
D 10 Naphthalene-d8	136	5.059	5.068	-0.009	99	6435	0.0691	69.1	
11 Naphthalene	128	5.077	5.077	0.000	39	410	0.005418		7M
D 15 2-methylnaphthalene-d10	152	5.612	5.612	0.000	92	4435	0.0732	73.2	
D 17 1-Methylnaphthalene-d10	152	5.691	5.686	0.005	100	4654	0.0767	76.7	M
18 1-Methylnaphthalene	142	5.720	5.715	0.005	100	5874	0.1040		
D 23 Acenaphthylene-d8	160	6.366	6.361	0.005	90	8396	0.0817	81.7	
24 Acenaphthylene	152	6.376	6.377	0.000	50	1564	0.0158		
* 26 Acenaphthene-d10	164	6.492	6.492	0.000	97	6681	0.1000		M
27 Acenaphthene	154	6.517	6.517	0.000	97	43913	0.6947		
D 29 Fluorene -d10	176	6.925	6.925	-0.001	94	6320	0.0794	79.4	M
30 Fluorene	166	6.945	6.950	0.000	98	23026	0.2805		
D 35 Phenanthrene-d10	188	7.731	7.732	-0.001	99	11581	0.0846	84.6	
36 Phenanthrene	178	7.752	7.749	0.003	60	174135	1.25		
D 38 Anthracin-d10	188	7.780	7.776	0.004	99	10816	0.0809	80.9	M
39 Anthracene	178	7.797	7.794	0.003	99	35908	0.2697		
D 41 Fluoranthene-d10	212	8.808	8.805	0.003	94	16327	0.0919	91.9	
43 Fluoranthene	202	8.825	8.825	0.000	56	159138	0.7618		
* 44 Pyrene-d10 (IS)	212	9.027	9.027	-0.001	96	17565	0.1000		
45 Pyrene	202	9.043	9.044	-0.001	100	222525	1.04		
47 Benzo[a]anthracene	228	10.259	10.260	0.000	99	38186	0.2022		M
D 48 Chrysene-d12	240	10.269	10.270	-0.001	74	14545	0.0849	84.9	
50 Chrysene	228	10.300	10.295	0.005	24	48110	0.2273		M
D 52 Benzo(b)fluoranthene-d12	264	11.376	11.376	0.000	99	11887	0.0859	85.9	
53 Benzo[b]fluoranthene	252	11.404	11.397	0.007	90	30700	0.1533		M
D 54 Benzo(k)fluoranthene-d12	264	11.411	11.404	0.007	76	15433	0.0949	94.9	
55 Benzo[k]fluoranthene	252	11.432	11.425	0.007	100	13257	0.0586		M
* 56 Benzo(e)pyrene-d12	264	11.684	11.684	0.000	99	10926	0.1000		
57 Benzo[e]pyrene	252	11.719	11.712	0.007	100	14484	0.0780		
D 58 Benzo(a)pyrene-d12	264	11.754	11.747	0.007	100	11016	0.0908	90.8	
59 Benzo[a]pyrene	252	11.775	11.775	0.000	100	25845	0.1419		
D 60 Perylene-d12	264	11.845	11.845	0.000	99	11940	0.0887	88.7	
61 Perylene	252	11.873	11.866	0.000	100	4870	0.0285		

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/ml	%Rec	Flags
D 62 Indeno[1,2,3-cd]pyrene-d12	288	13.195	13.186	0.009	86	12218	0.0927	92.7	
D 63 Dibenz(a,h)anthracene-d14	292	13.205	13.196	0.009	85	10574	0.0897	89.7	
65 Indeno[1,2,3-cd]pyrene	276	13.223	13.224	-0.001	40	9211	0.0450		
66 Dibenz(a,h)anthracene	278	13.242	13.233	0.009	32	1698	0.0101		M
D 67 Benzo(ghi)perylene-d12	288	13.552	13.552	0.000	98	11979	0.0915	91.5	
68 Benzo[g,h,i]perylene	276	13.589	13.561	0.009	86	7982	0.0455		
76 PCB-104	326	8.395	8.396	-0.001	33	169	0.000735		
78 PCB-155	360	8.848	8.849	-0.001	14	54	0.000313		
81 PCB-184	394	9.578	9.572	0.006	1	49	0.000390		
* 82 PCB-167L	372	10.026	10.027	-0.001	74	12272	0.0800		
83 PCB-204	428	10.254	10.250	0.004	1	76	0.000929		
84 PCB-192	394	10.274	10.275	-0.001	5	145	0.001258		
A 86 C2-Naphthalenes	156	6.237	(6.068-6.407)		0	39759	0.5254		
A 87 C3-Naphthalenes	170	6.708	(6.348-7.050)		0	35231	0.4656		
A 88 C4-Naphthalenes	184	7.119	(6.678-7.562)		0	25392	0.3356		
A 89 C1-Fluorenes	180	7.427	(7.364-7.505)		0	13640	0.1662		
A 90 C2-Fluorenes	194	7.867	(7.730-8.069)		0	16471	0.2006		
A 91 C3-Fluorenes	208	8.344	(8.092-8.605)		0	17943	0.2186		
A 96 C1-Phenanthrenes/Anthracenes	191	8.231	(8.155-8.332)		0	54921	0.3931		
A 97 C2-Phenanthrenes/Anthracenes	206	8.697	(8.490-8.926)		0	65167	0.4665		
A 98 C3-Phenanthrenes/Anthracenes	220	9.164	(8.851-9.456)		0	47833	0.3424		
A 99 C4-Phenanthrenes/Anthracenes	234	9.454	(9.106-9.824)		0	28339	0.2029		
A 100 C1-Fluoranthenes/pyrene	216	9.445	(9.246-9.640)		0	97365	0.4567		
A 101 C1-Chrysenes/Benz(a)anthracenes	242	10.685	(10.456-10.941)		0	28375	0.1340		
A 102 C2-Chrysenes/Benz(a)anthracenes	256	11.011	(10.667-11.381)		0	10605	0.0501		
A 103 C3-Chrysenes/Benz(a)anthracenes	270	11.642	(11.002-11.867)		0	5327	0.0252		

QC Flag Legend

Processing Flags

7 - Failed Limit of Detection

Review Flags

M - Manually Integrated

Reagents:

60ISPCB_00001 Amount Added: 25.00 Units: uL

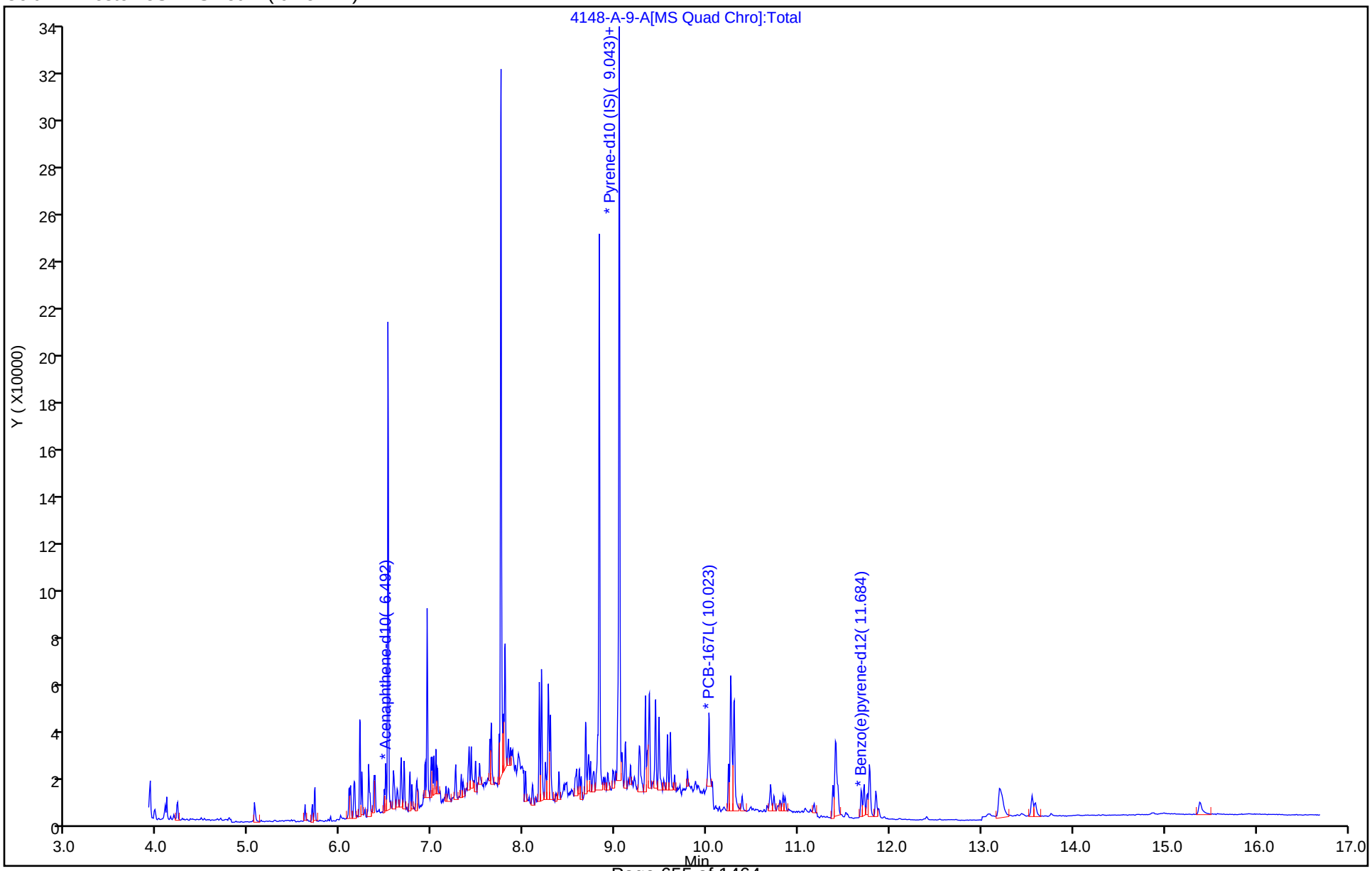
Report Date: 22-Nov-2023 13:56:27 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D

Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9	Worklist Smp#:	10
Client ID:	1804576-843-S2				
Injection Vol:	1.0 ul	Dil. Factor:	5.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



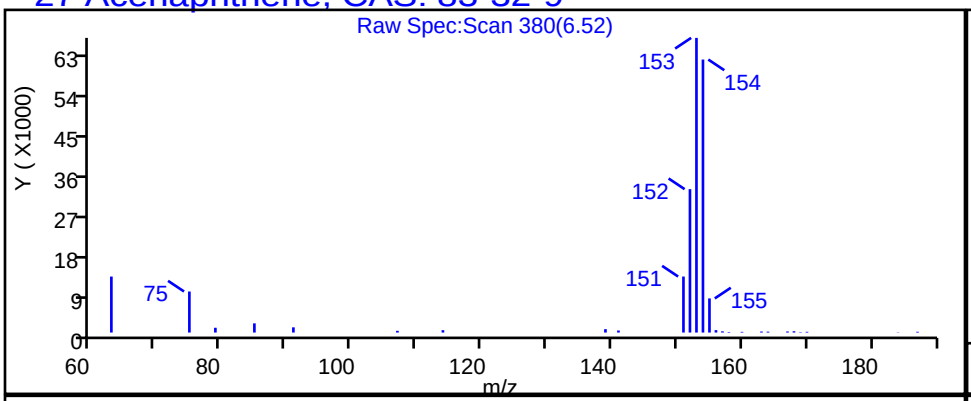
Report Date: 22-Nov-2023 13:56:27 Chrom Revision: 2.3 15-Nov-2023 20:54:34

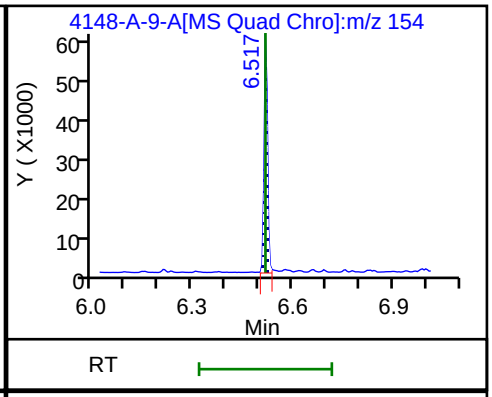
Eurofins Knoxville

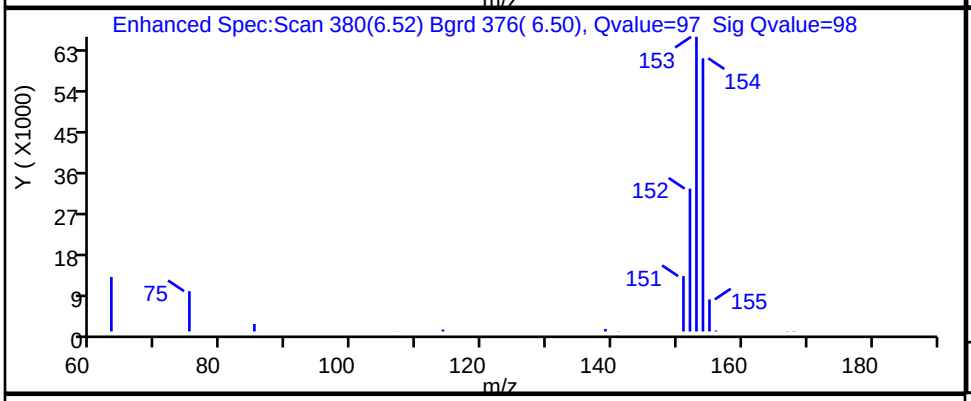
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D

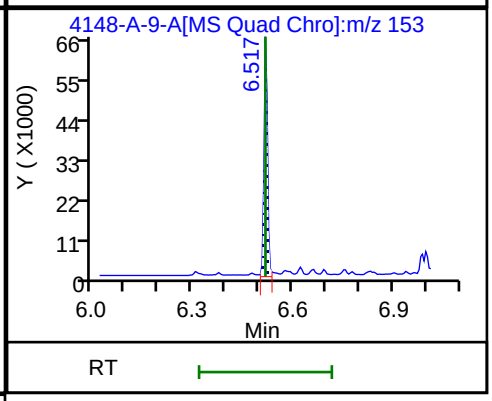
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

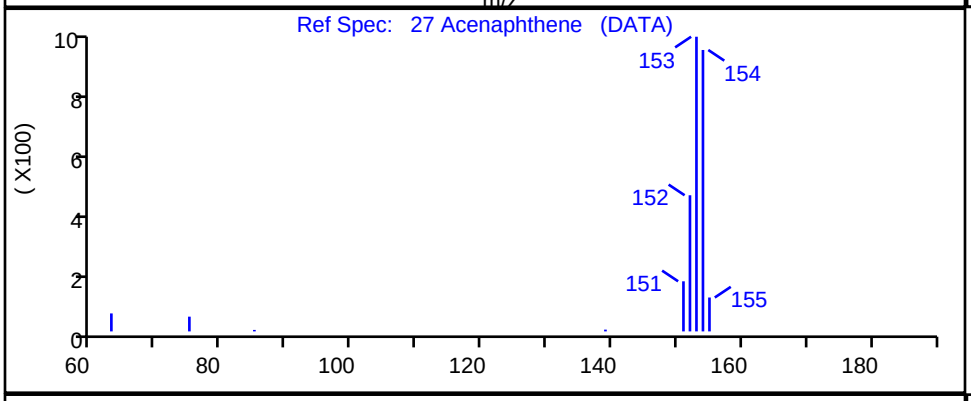
27 Acenaphthene, CAS: 83-32-9

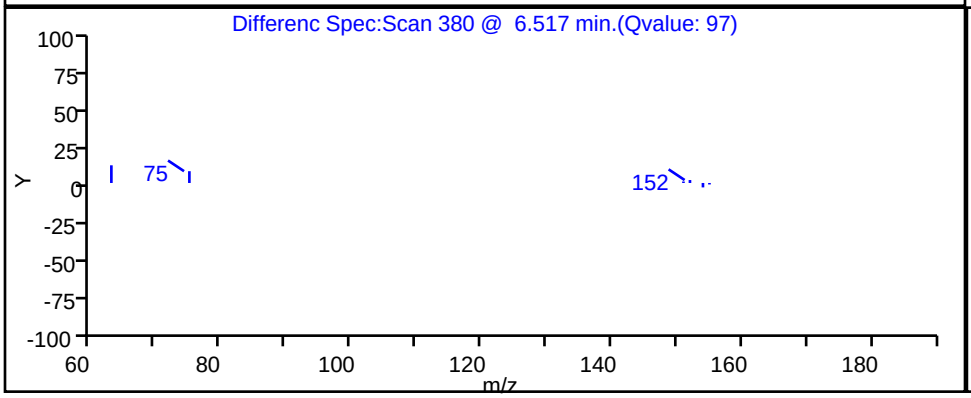


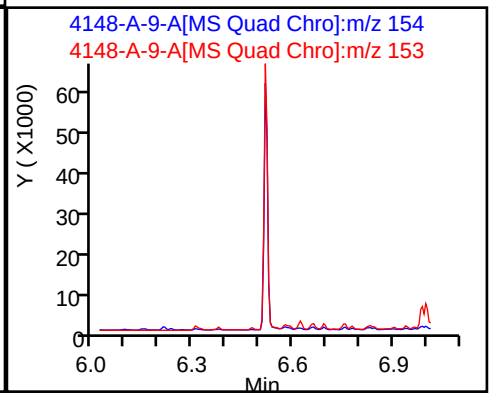












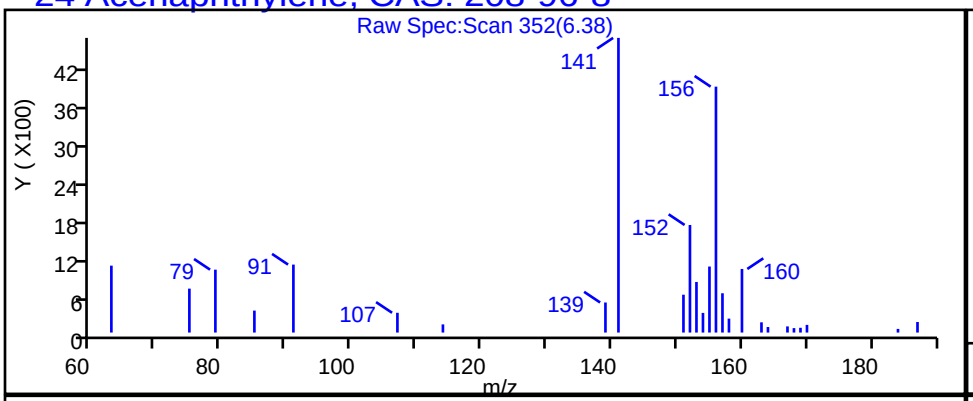
Report Date: 22-Nov-2023 13:56:27 Chrom Revision: 2.3 15-Nov-2023 20:54:34

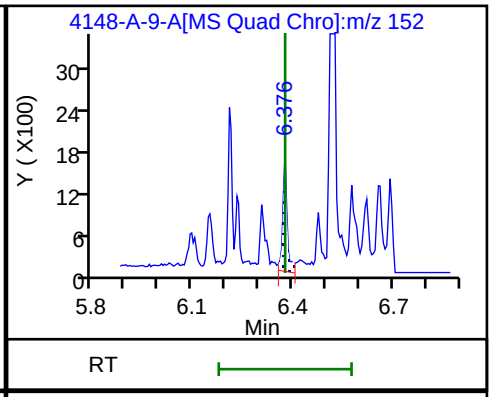
Eurofins Knoxville

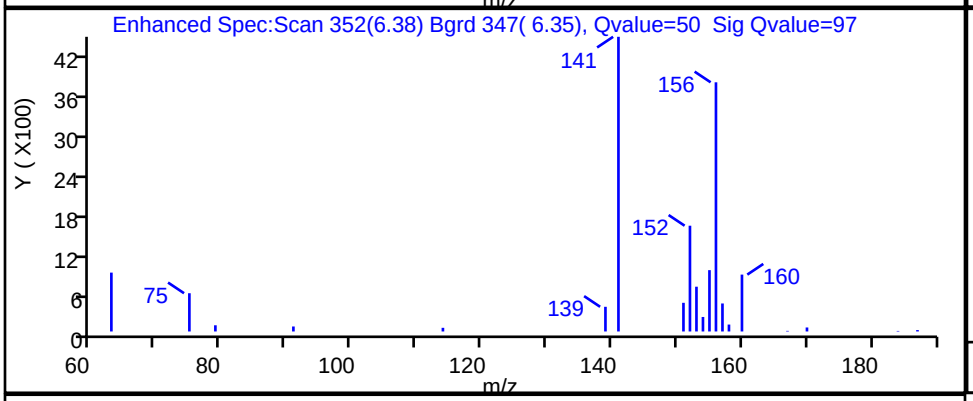
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D

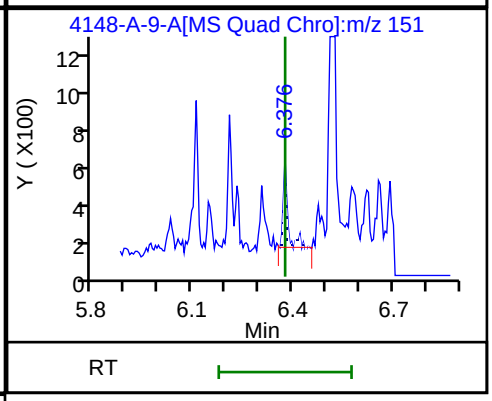
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9
Client ID:	1804576-843-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

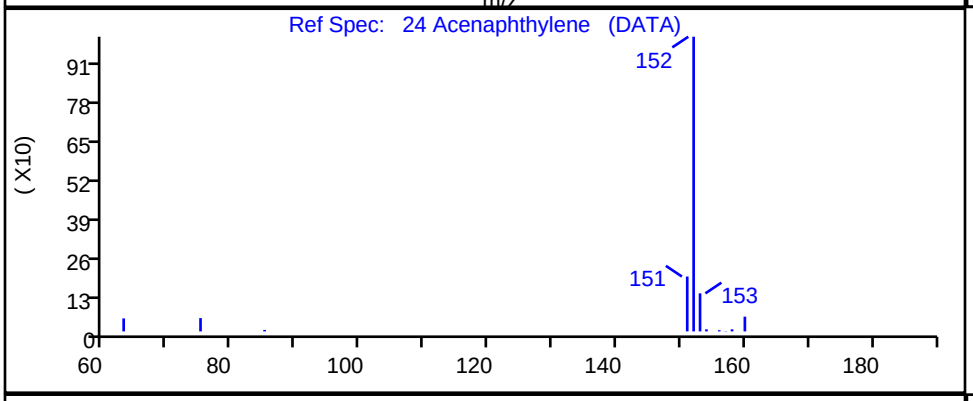
24 Acenaphthylene, CAS: 208-96-8

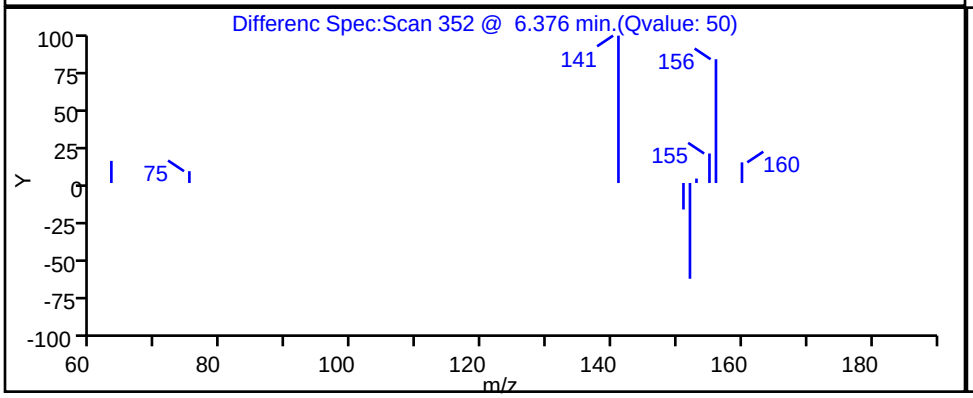


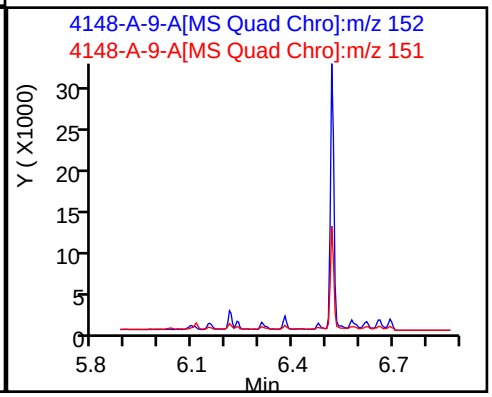












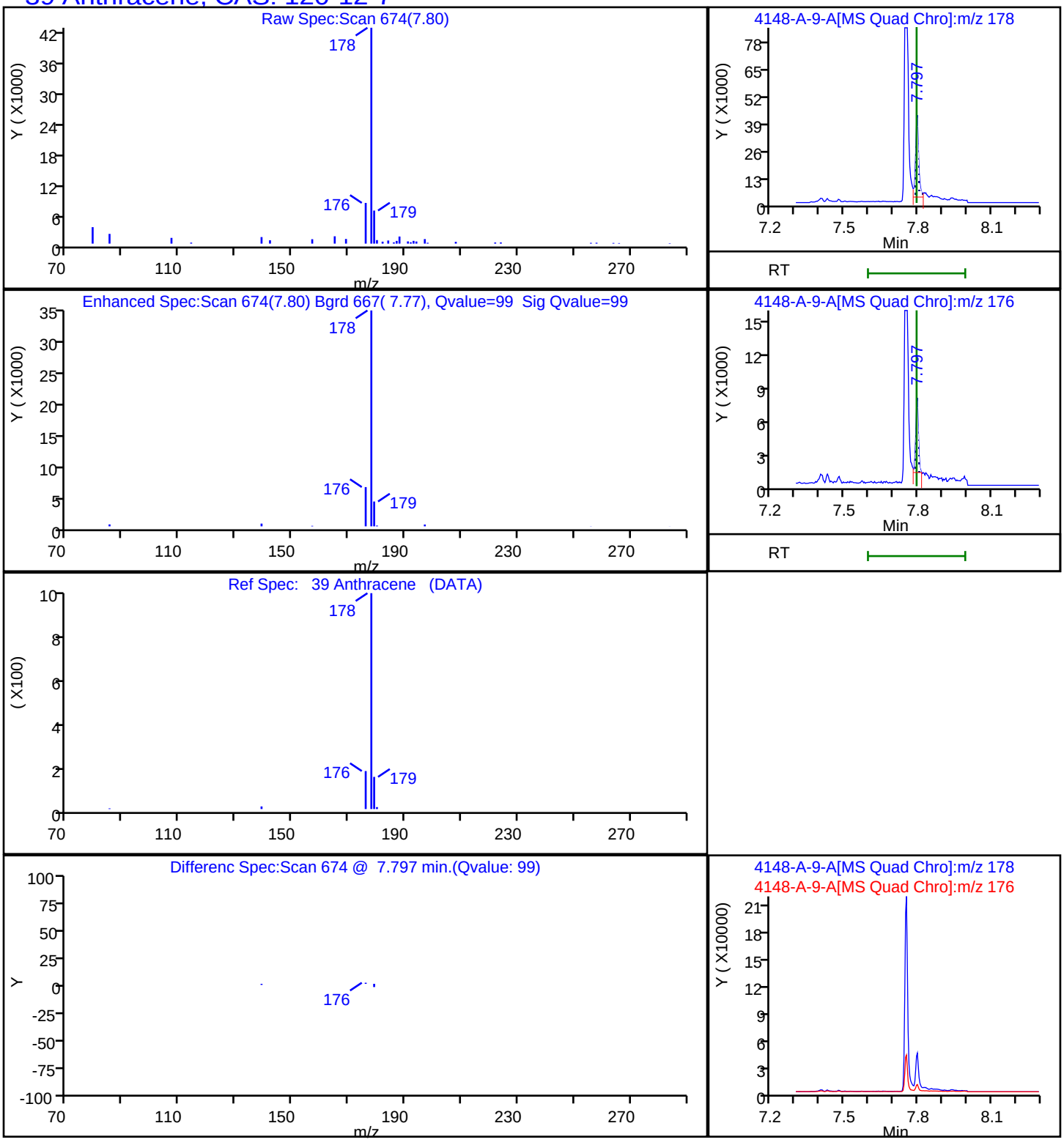
Report Date: 22-Nov-2023 13:56:27 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D

Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9
Client ID:	1804576-843-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

39 Anthracene, CAS: 120-12-7



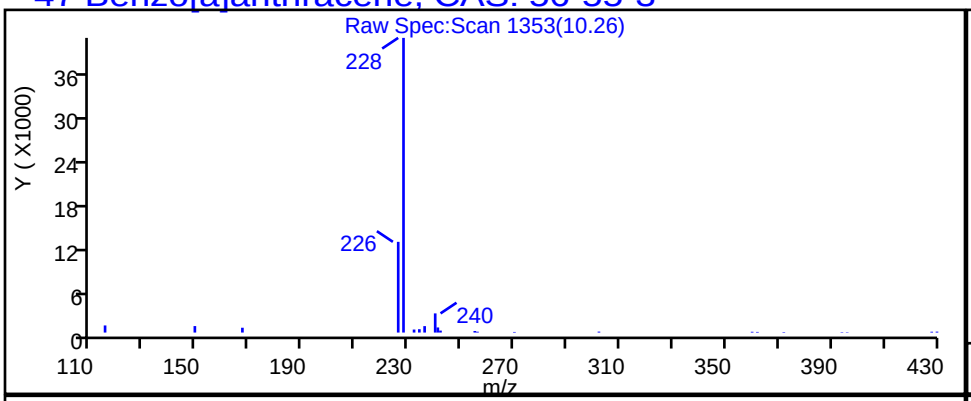
Report Date: 22-Nov-2023 13:56:28 Chrom Revision: 2.3 15-Nov-2023 20:54:34

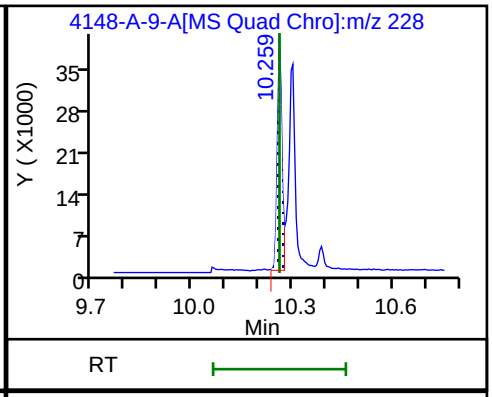
Eurofins Knoxville

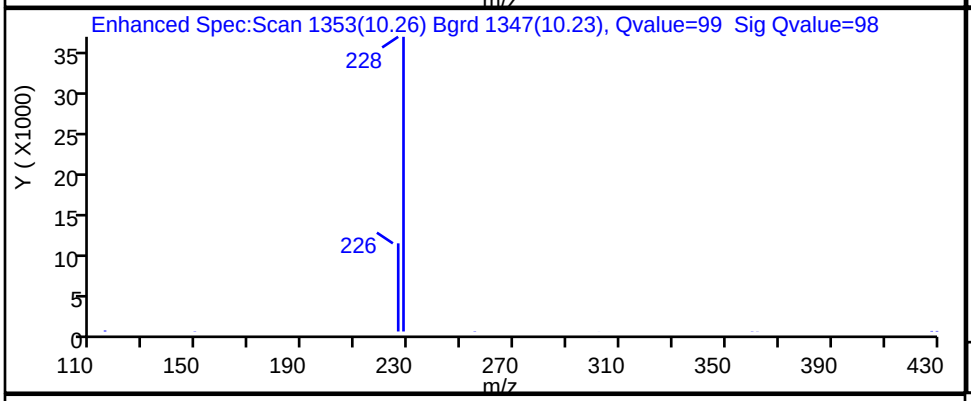
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D

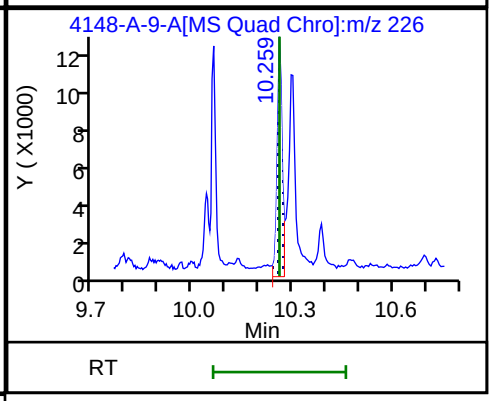
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

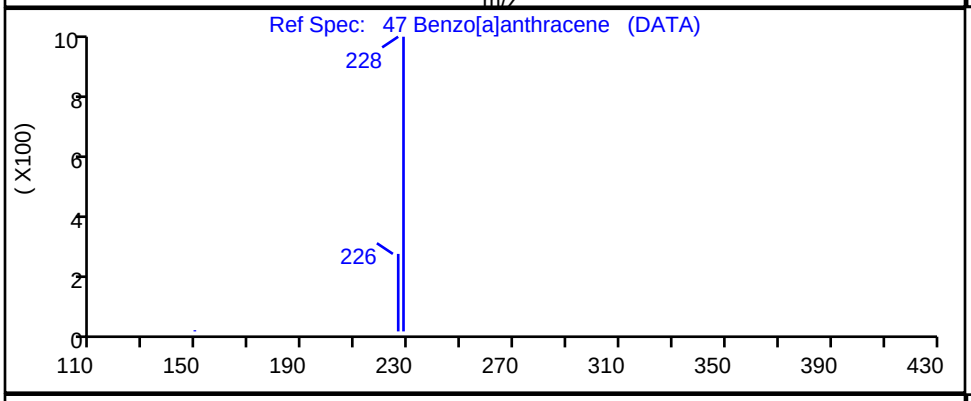
47 Benzo[a]anthracene, CAS: 56-55-3

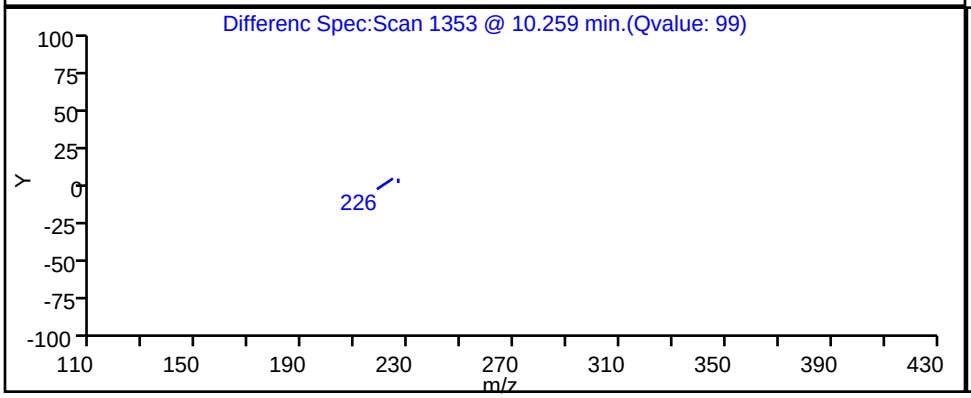


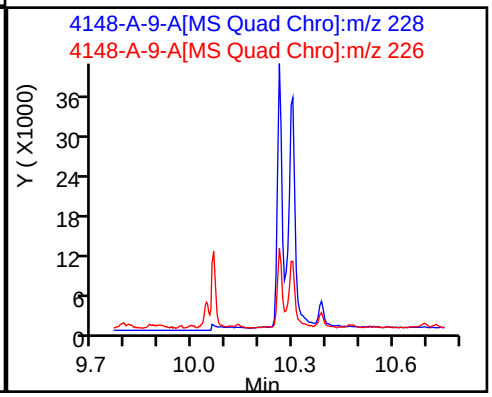












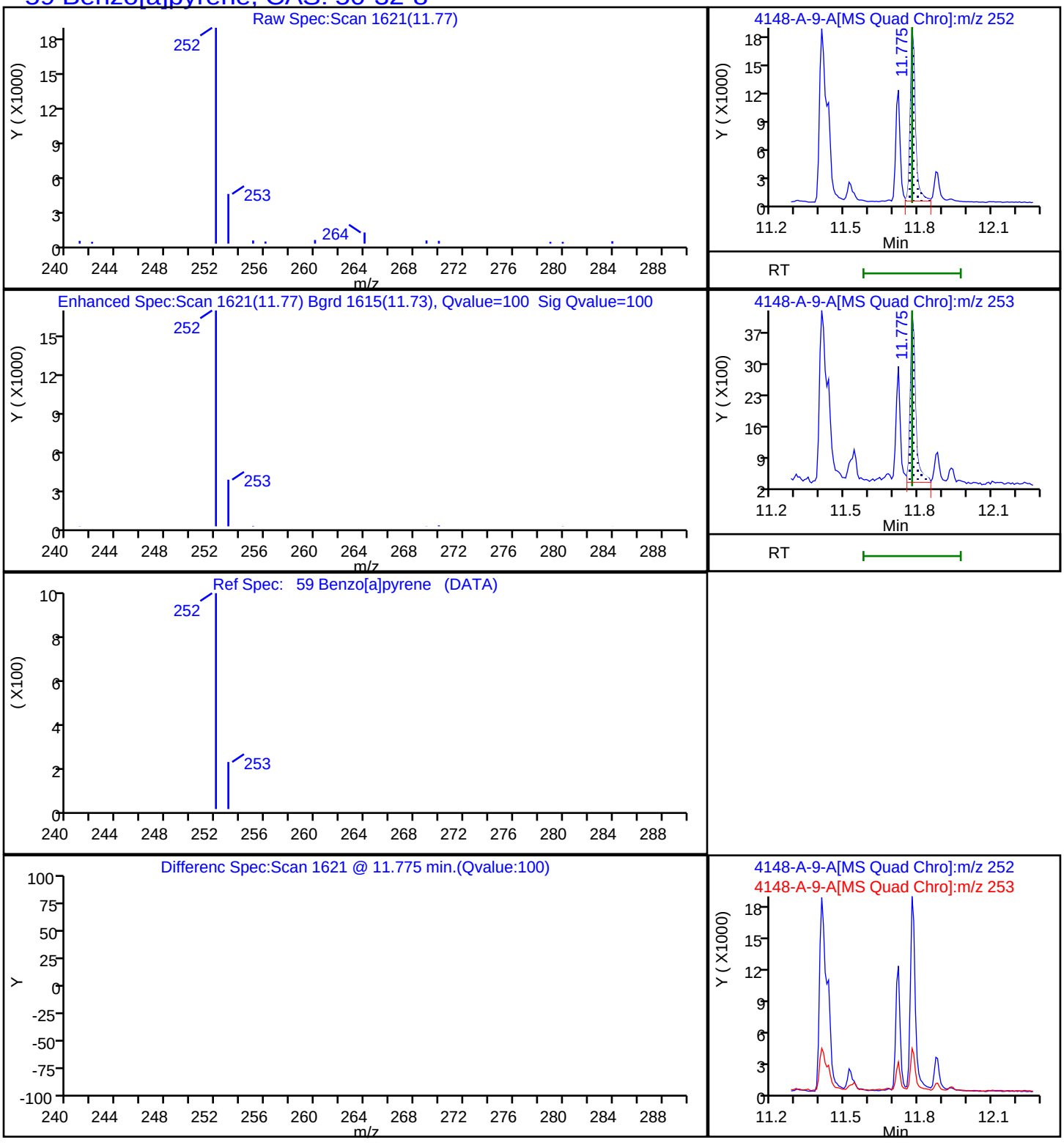
Report Date: 22-Nov-2023 13:56:28 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D

Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9
Client ID:	1804576-843-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

59 Benzo[a]pyrene, CAS: 50-32-8



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Eurofins Knoxville

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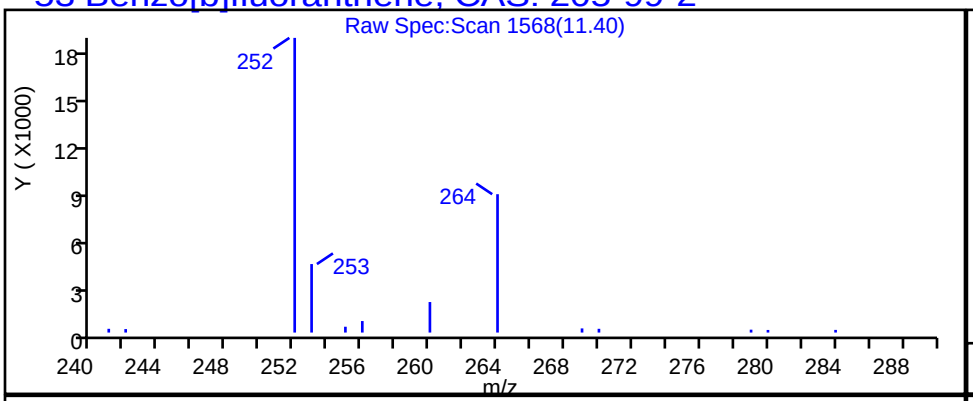
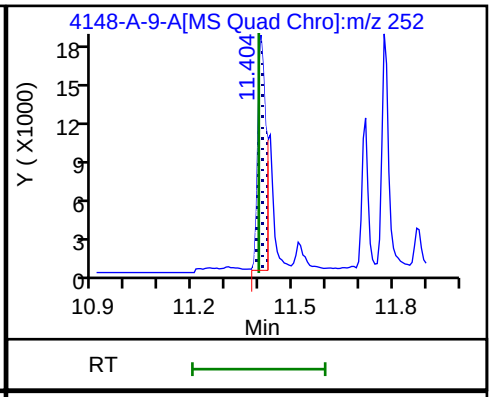
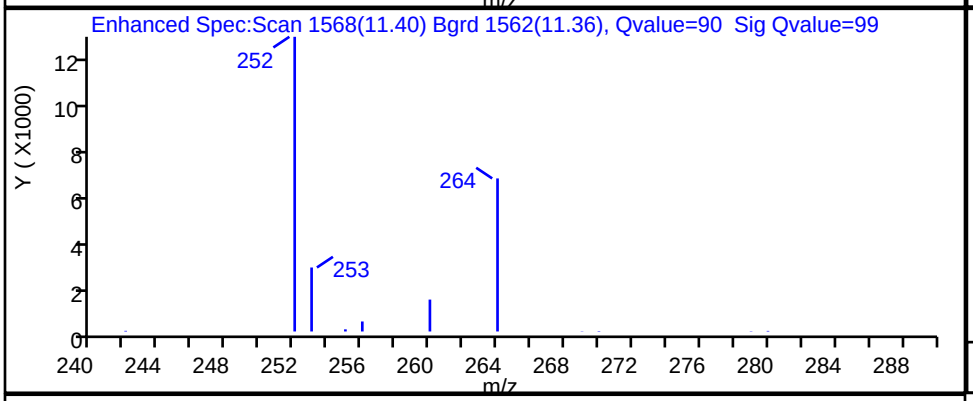
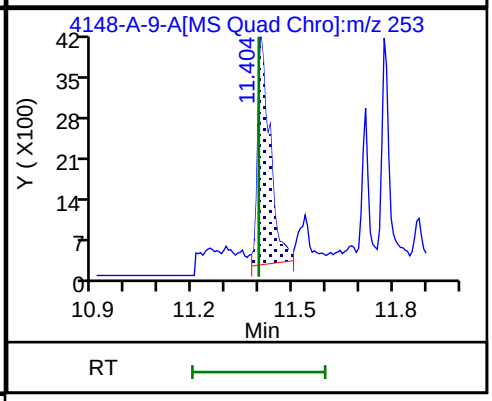
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

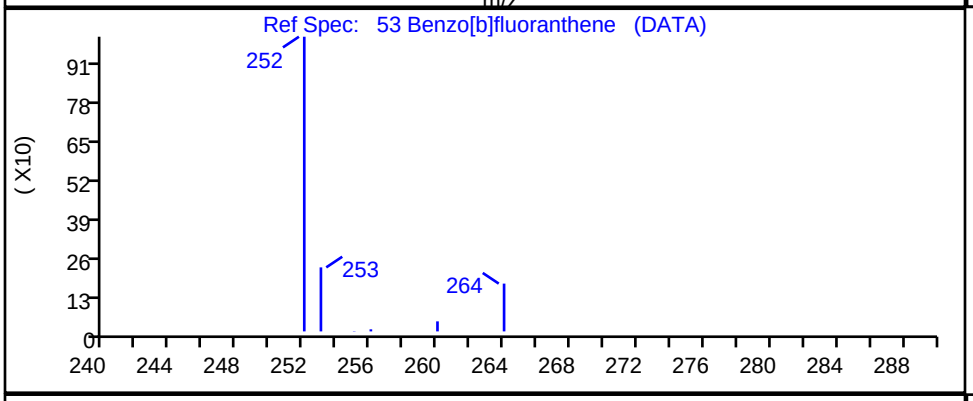
53 Benzo[b]fluoranthene, CAS: 205-99-2

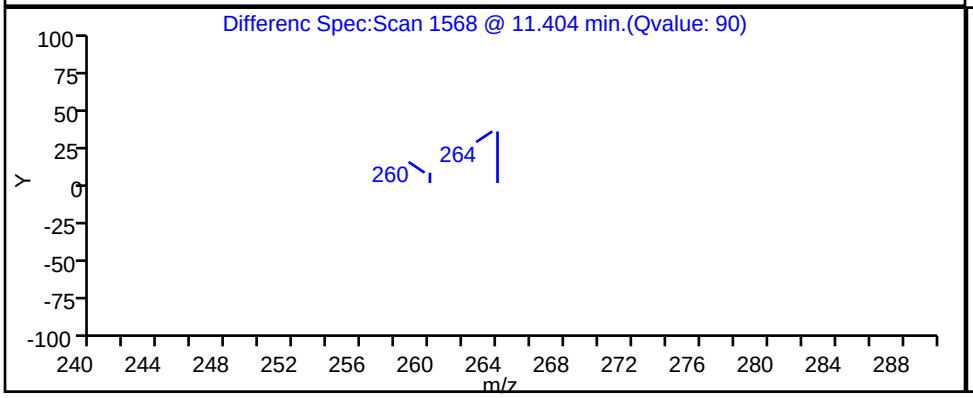


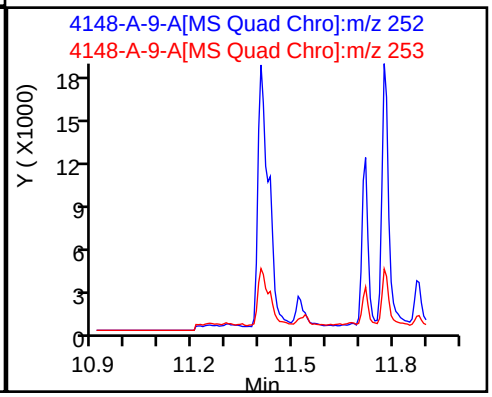












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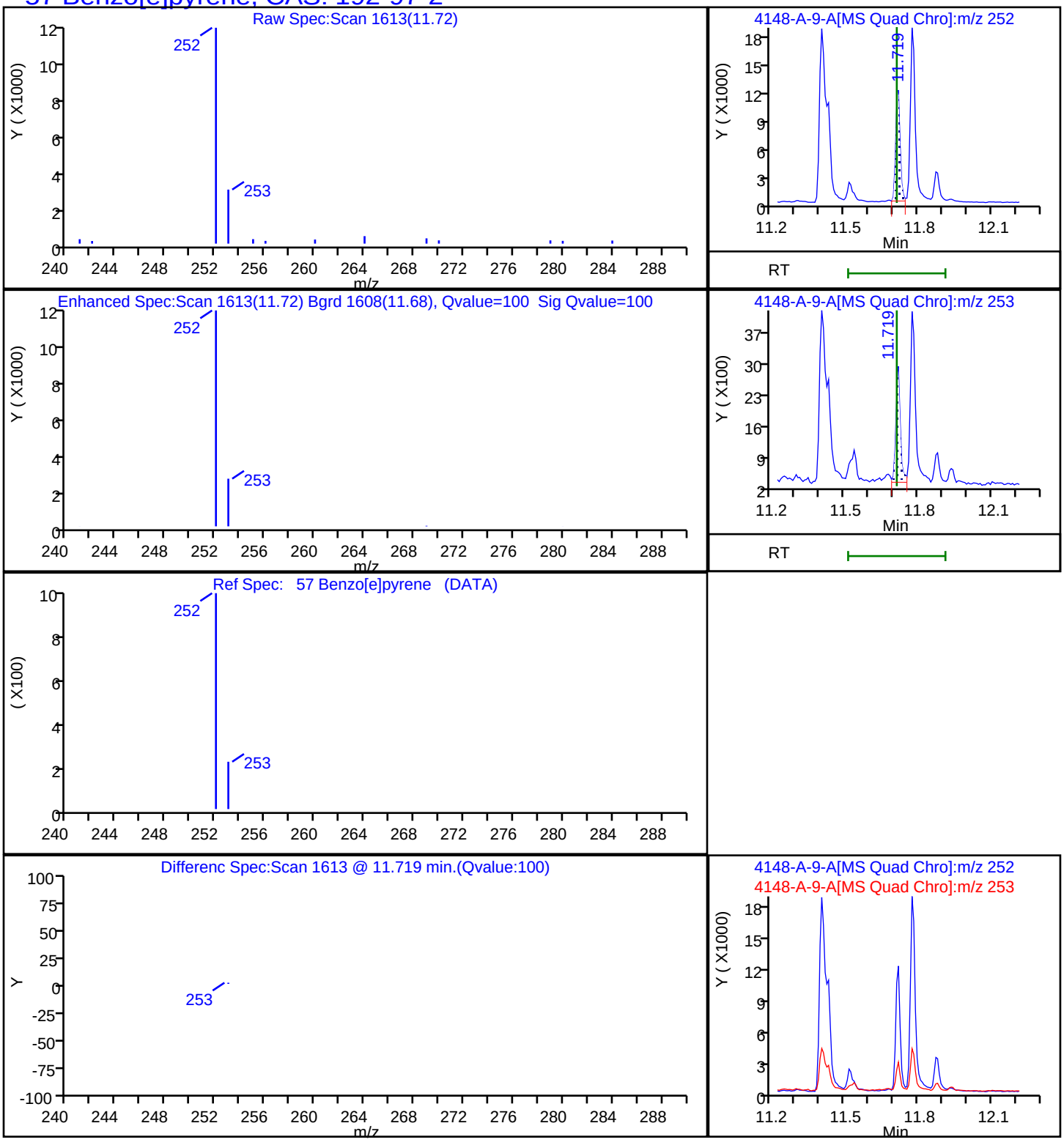
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D

Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

57 Benzo[e]pyrene, CAS: 192-97-2



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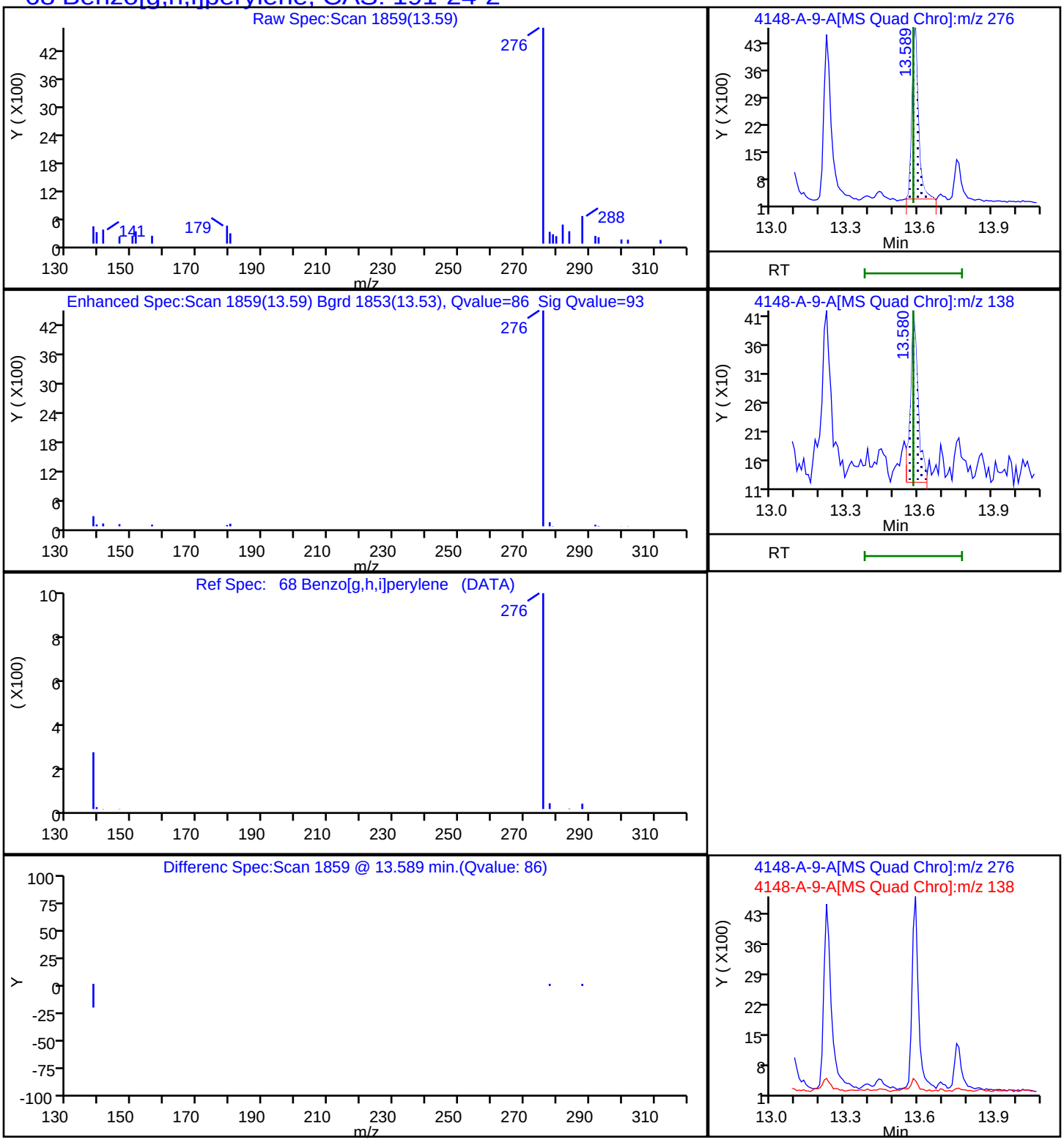
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D

Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

68 Benzo[g,h,i]perylene, CAS: 191-24-2



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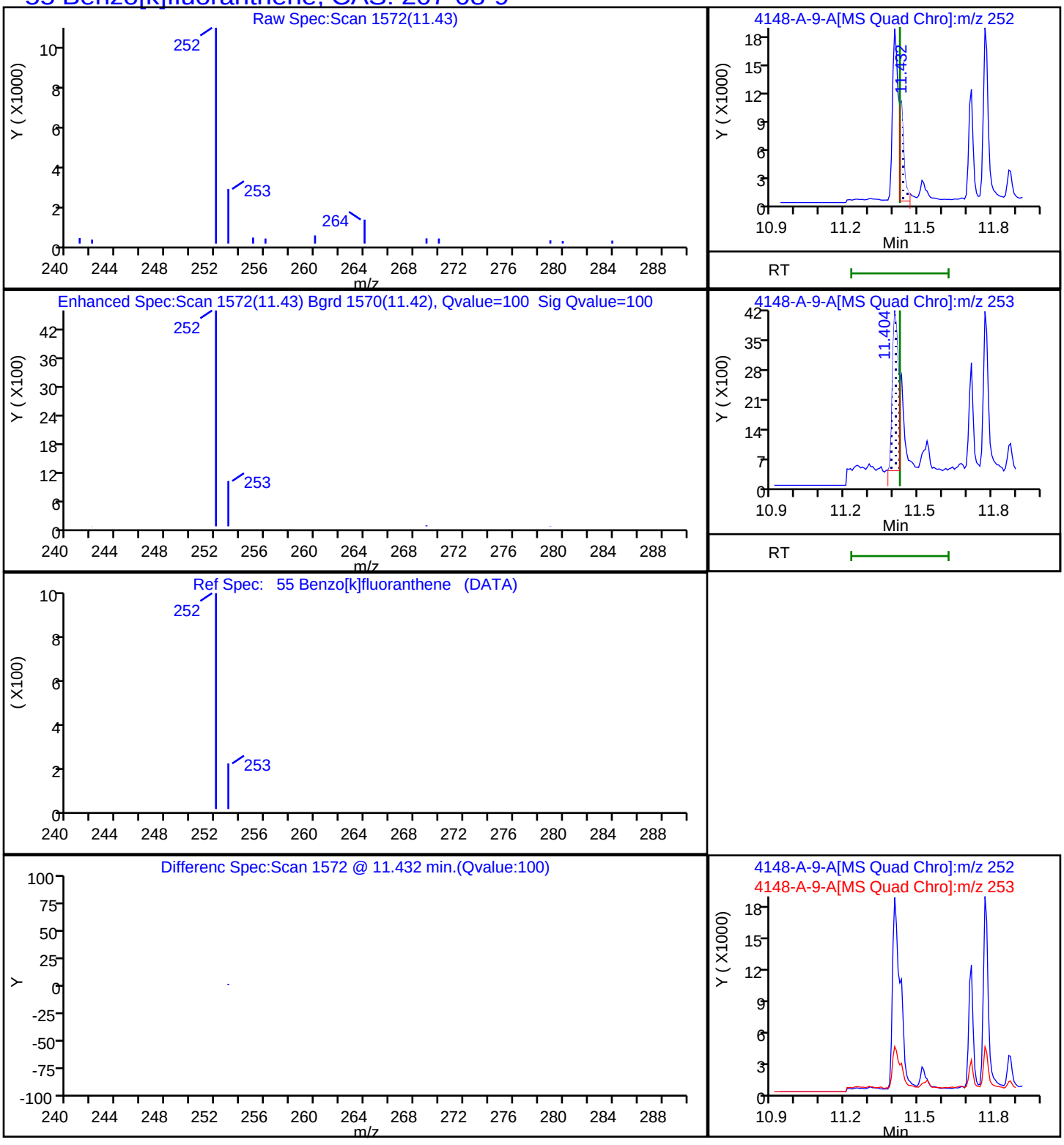
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D

Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9
Client ID:	1804576-843-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

55 Benzo[k]fluoranthene, CAS: 207-08-9



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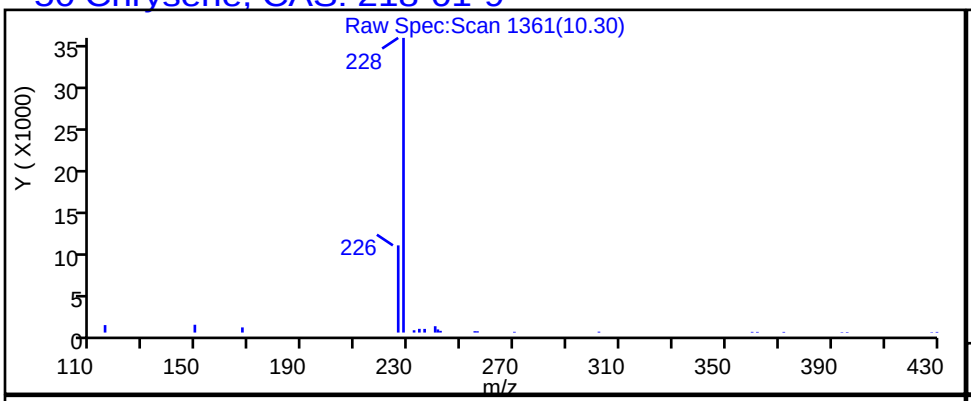
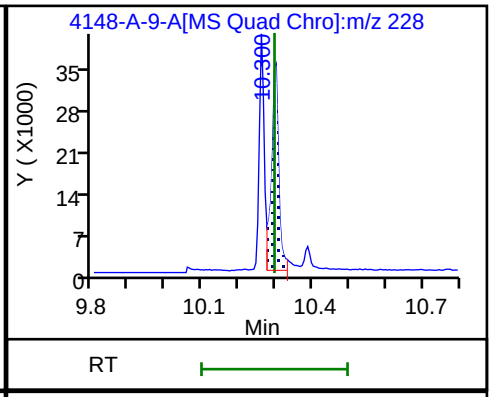
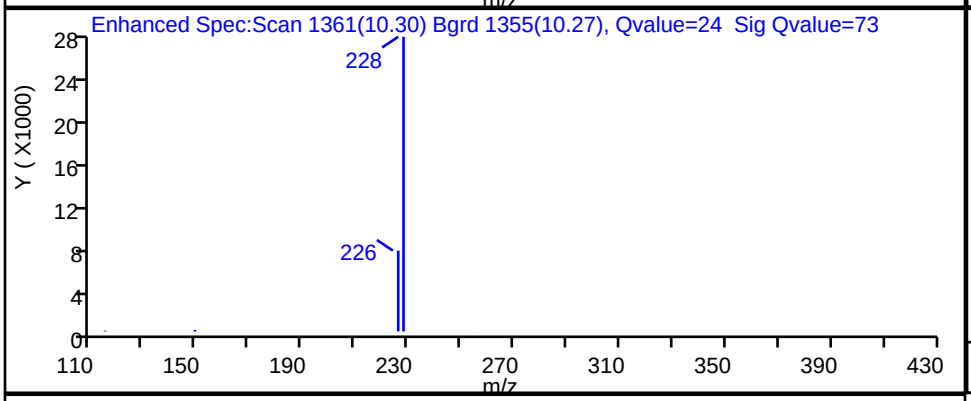
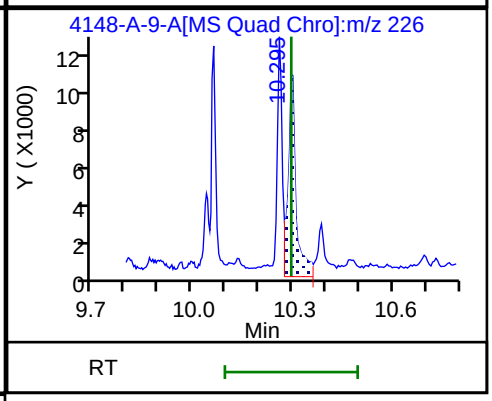
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

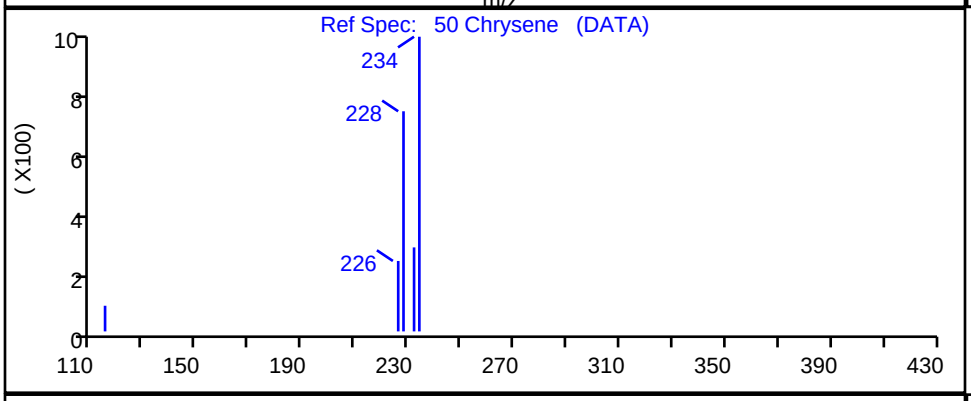
50 Chrysene, CAS: 218-01-9

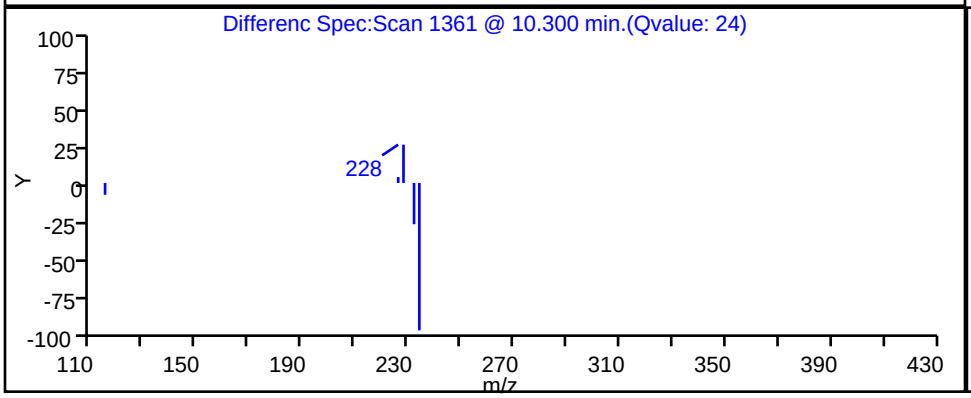


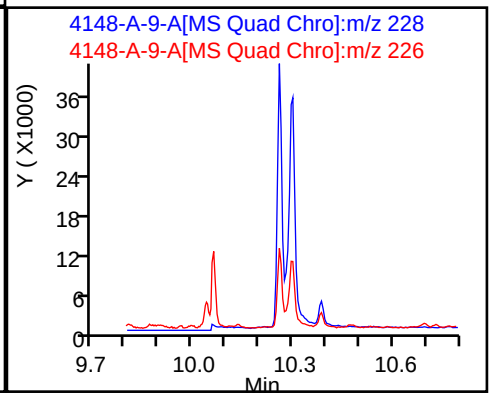












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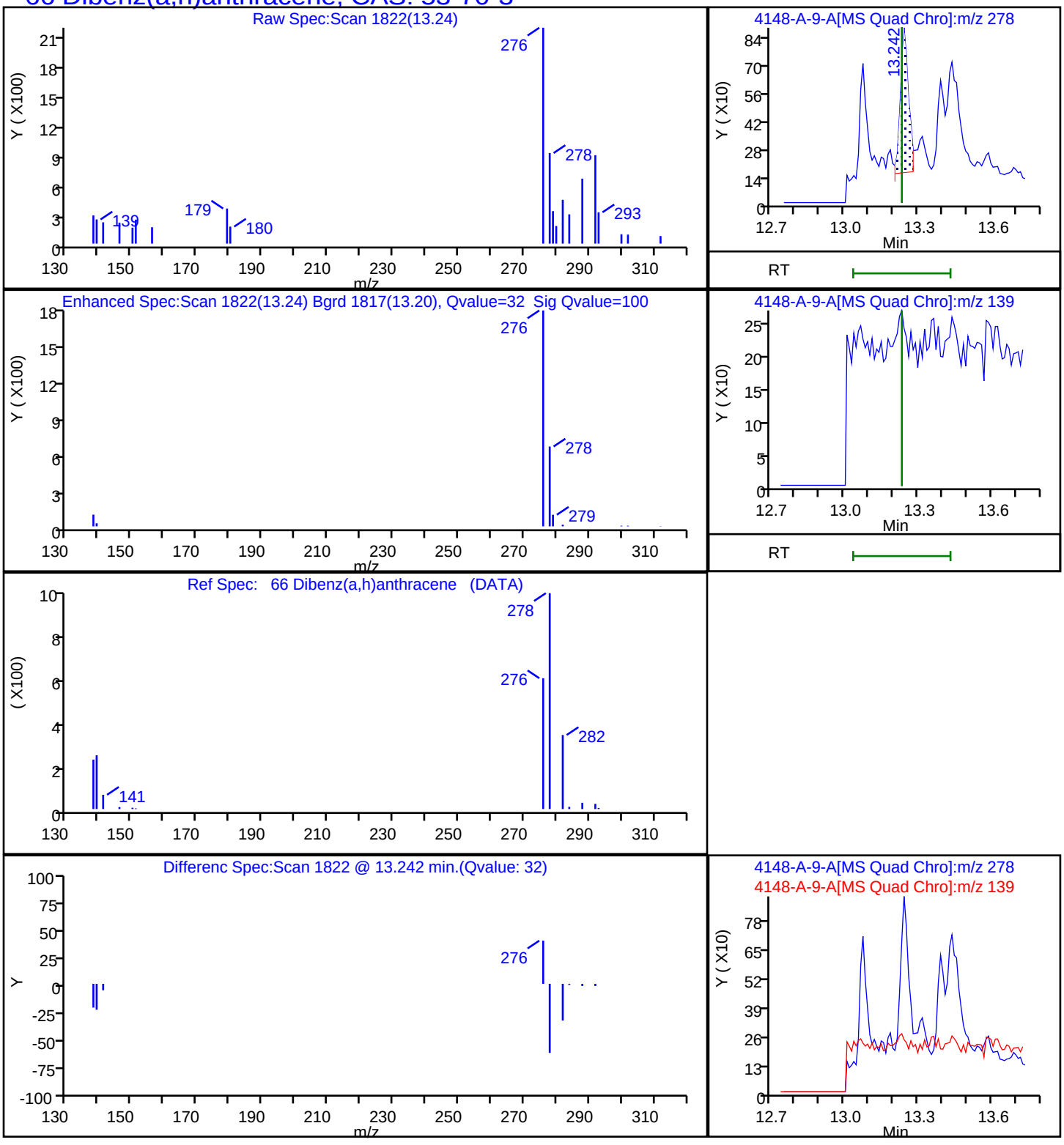
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D

Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

66 Dibenz(a,h)anthracene, CAS: 53-70-3



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Eurofins Knoxville

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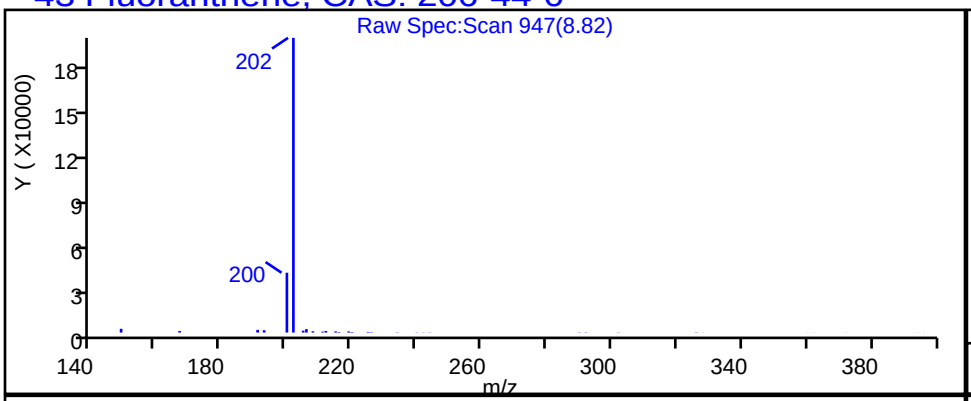
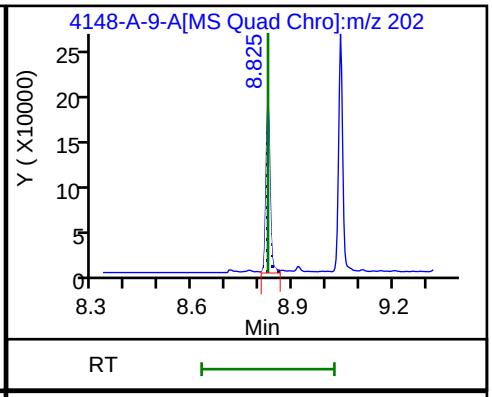
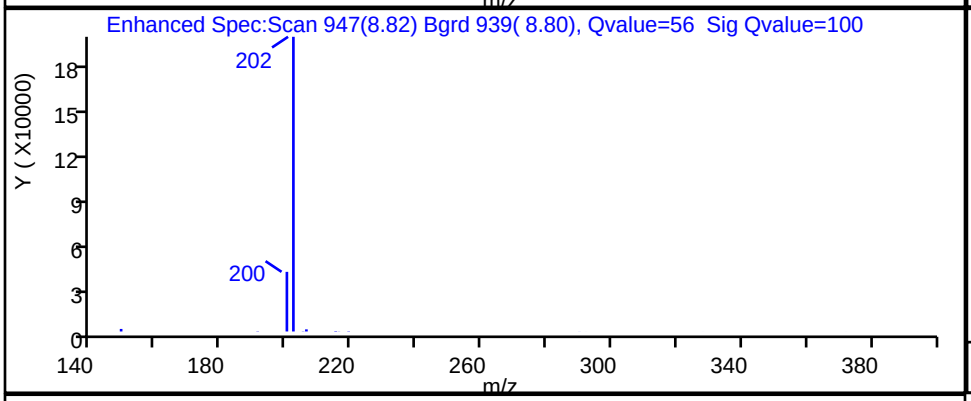
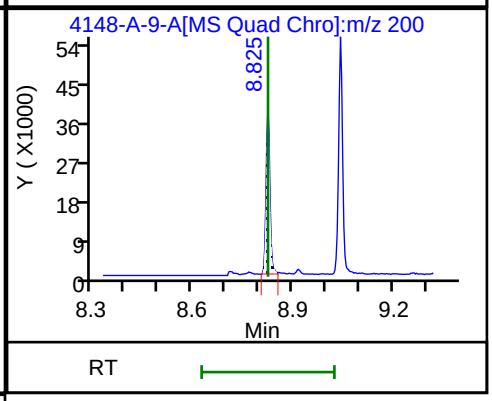
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9
Client ID:	1804576-843-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

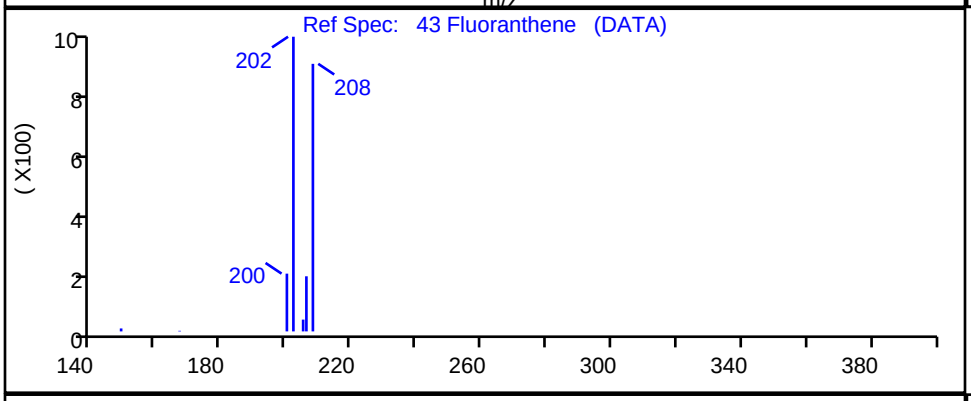
43 Fluoranthene, CAS: 206-44-0

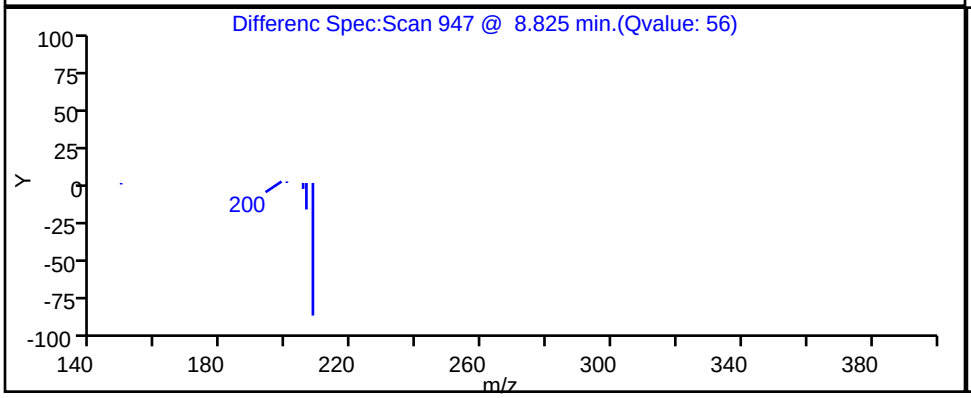


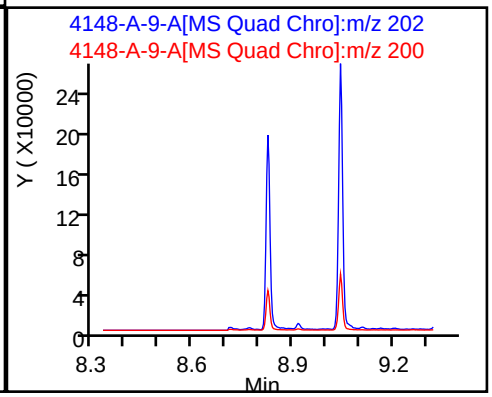










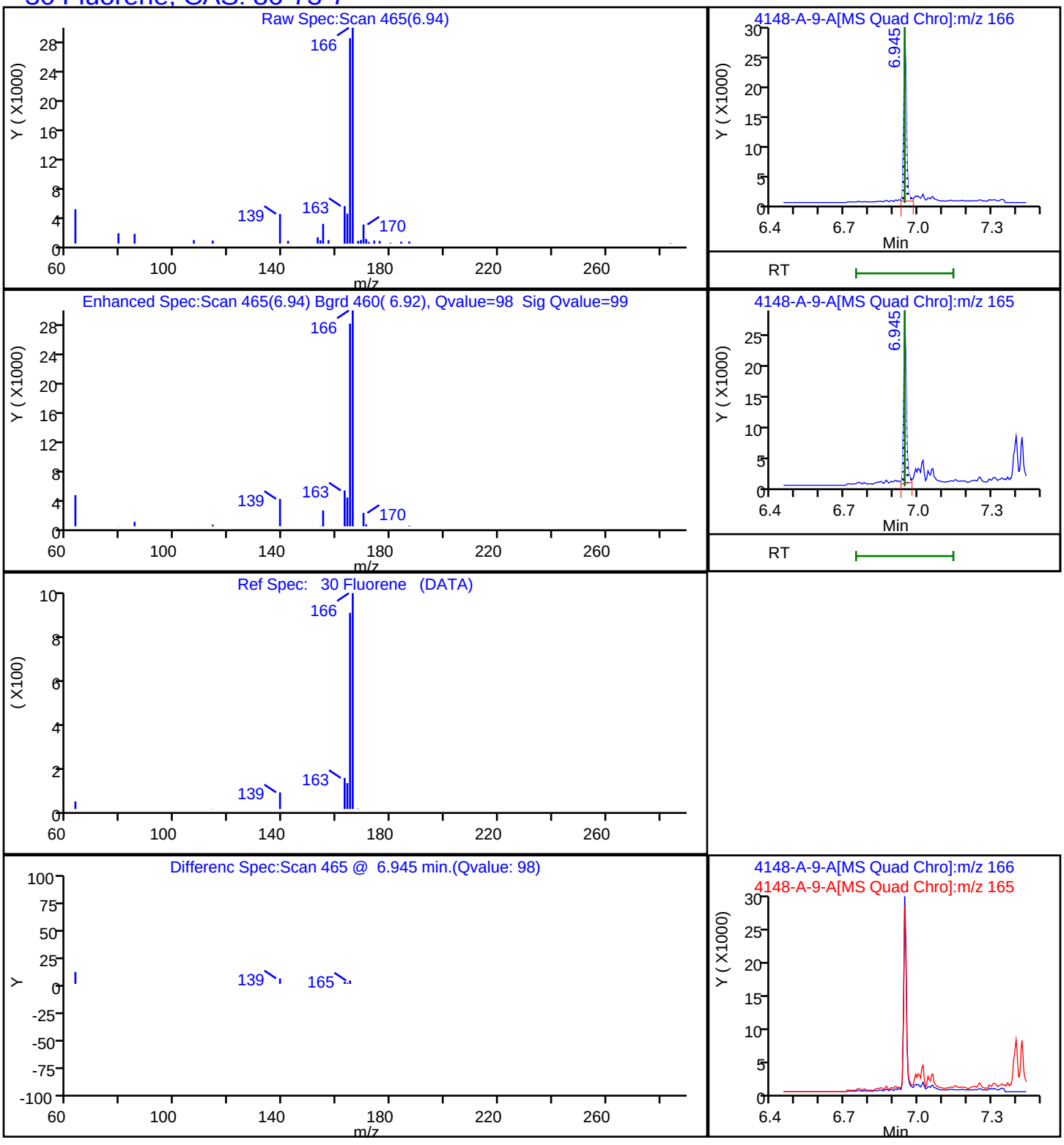


Report Date: 22-Nov-2023 13:56:27 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D				
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

30 Fluorene, CAS: 86-73-7



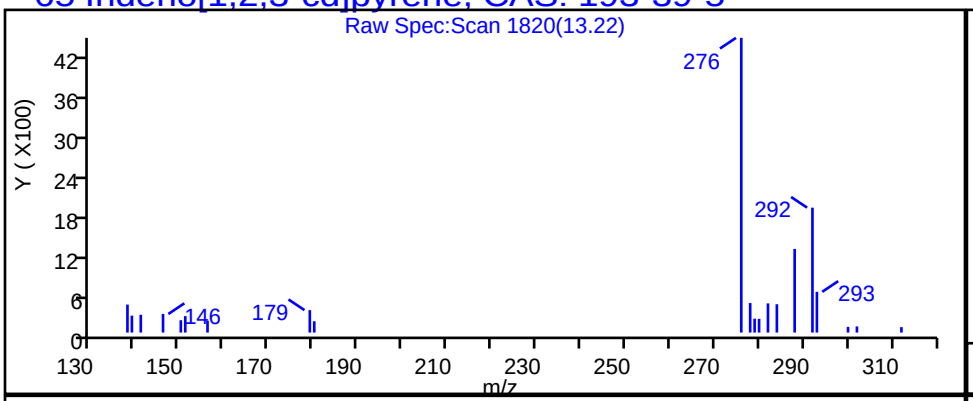
Report Date: 22-Nov-2023 13:56:28 Chrom Revision: 2.3 15-Nov-2023 20:54:34

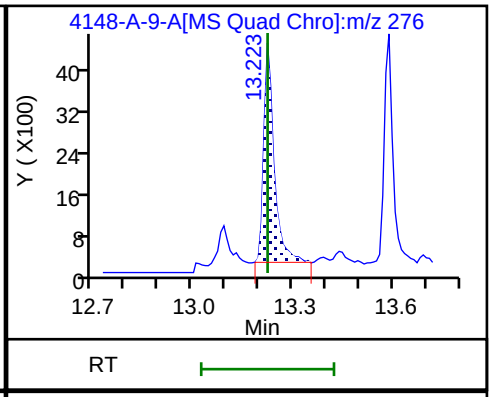
Eurofins Knoxville

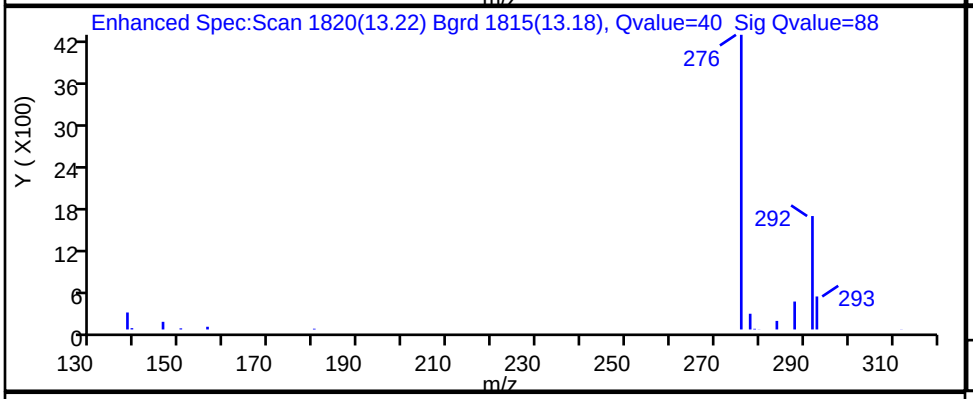
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D

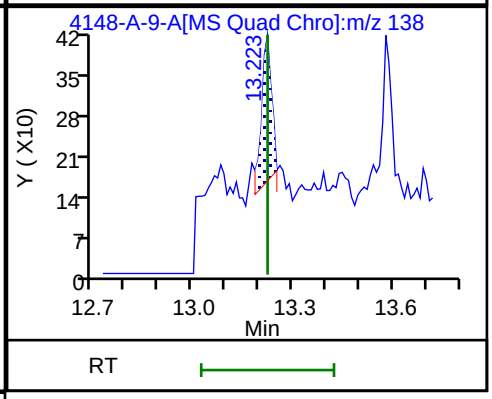
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

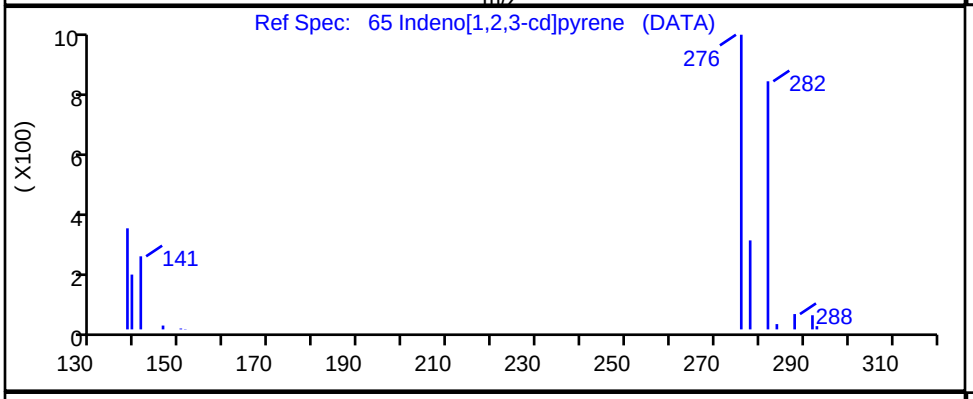
65 Indeno[1,2,3-cd]pyrene, CAS: 193-39-5

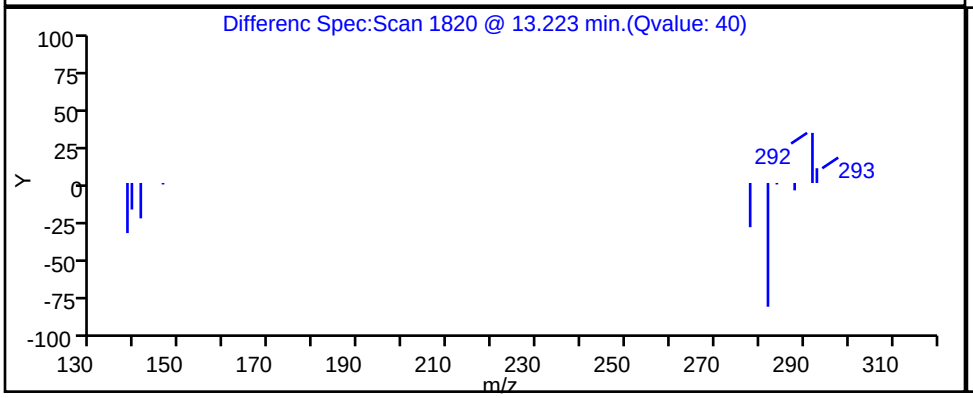


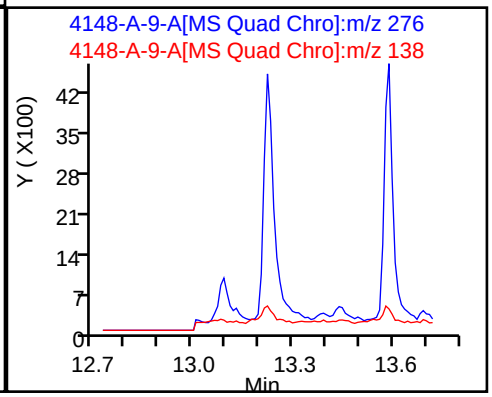












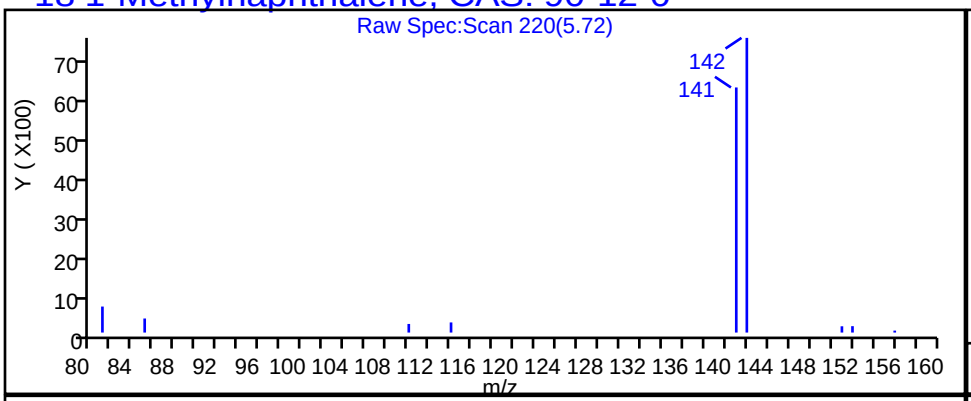
Report Date: 22-Nov-2023 13:56:27 Chrom Revision: 2.3 15-Nov-2023 20:54:34

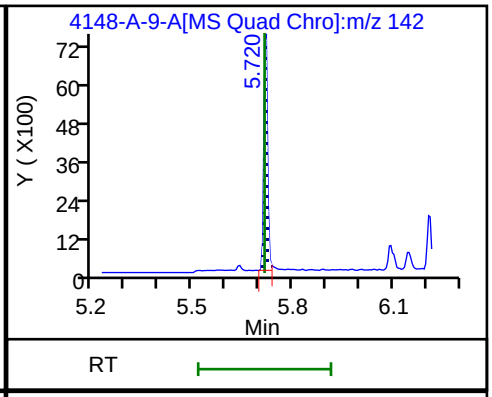
Eurofins Knoxville

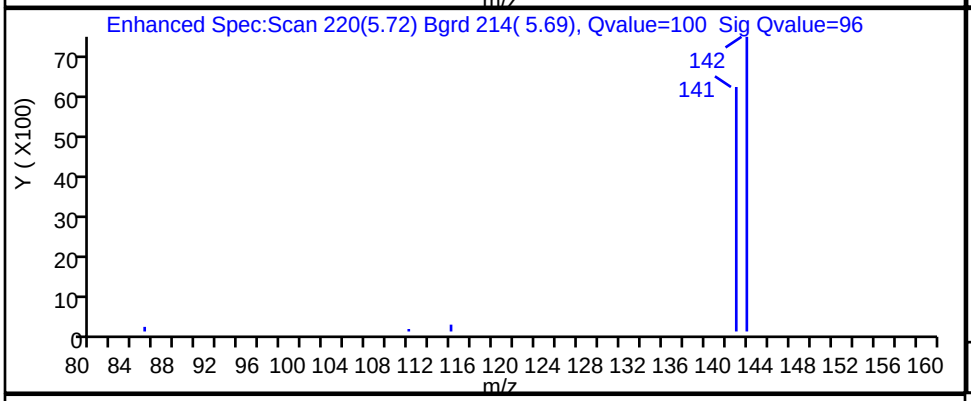
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D

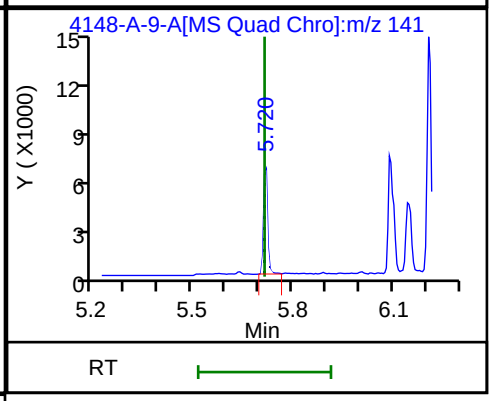
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9
Client ID:	1804576-843-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

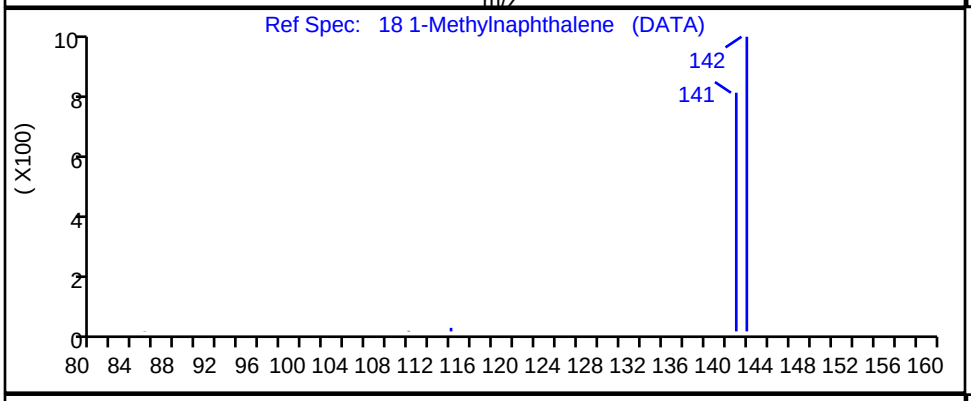
18 1-Methylnaphthalene, CAS: 90-12-0

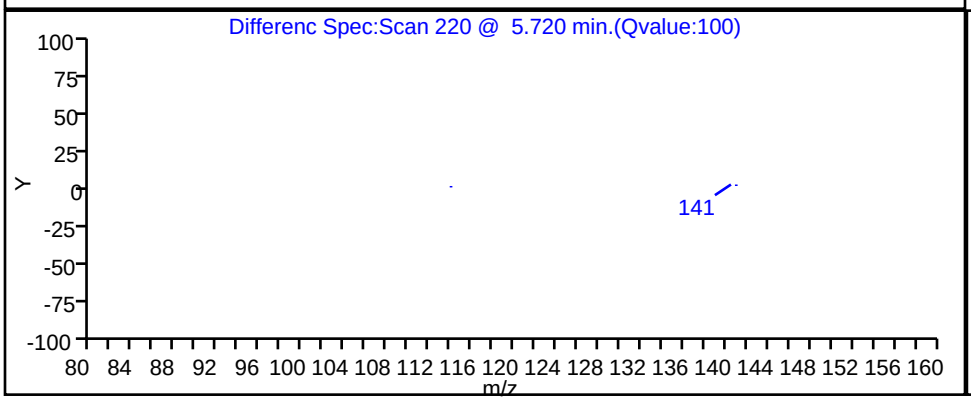


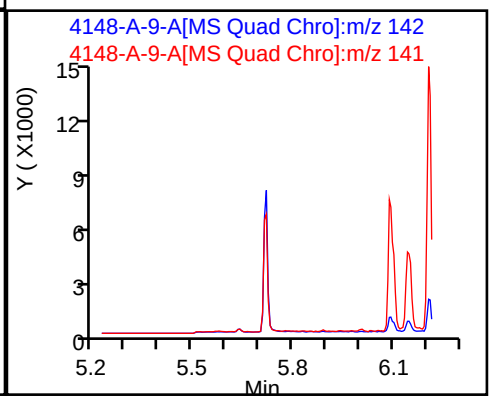












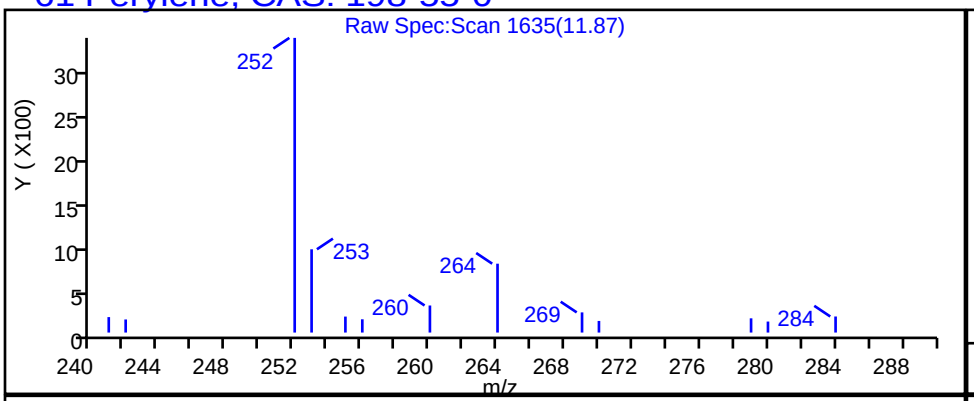
Report Date: 22-Nov-2023 13:56:28 Chrom Revision: 2.3 15-Nov-2023 20:54:34

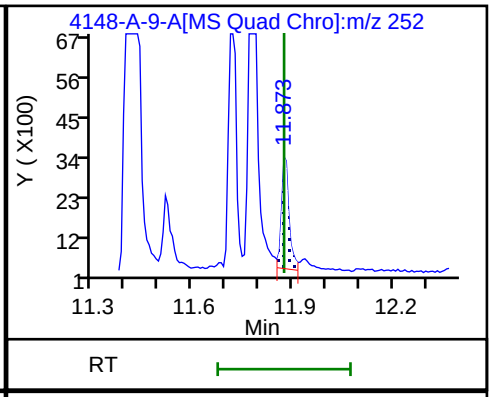
Eurofins Knoxville

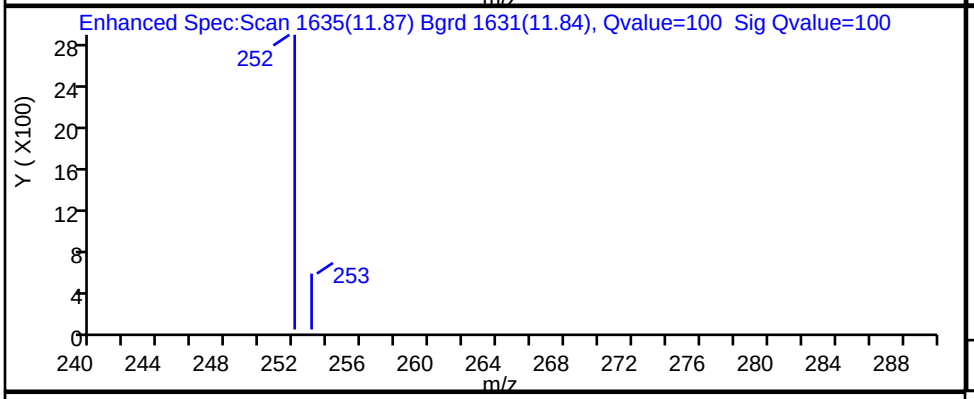
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D

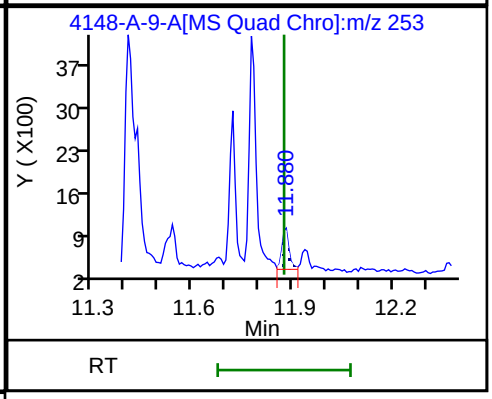
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9
Client ID:	1804576-843-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

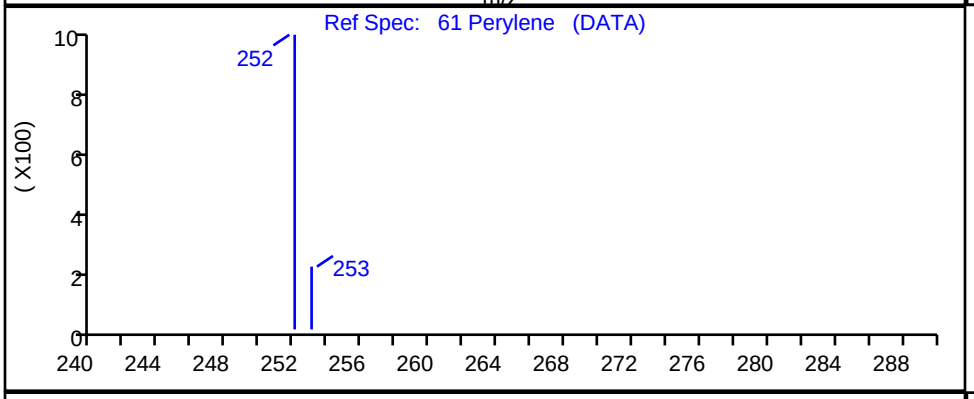
61 Perylene, CAS: 198-55-0

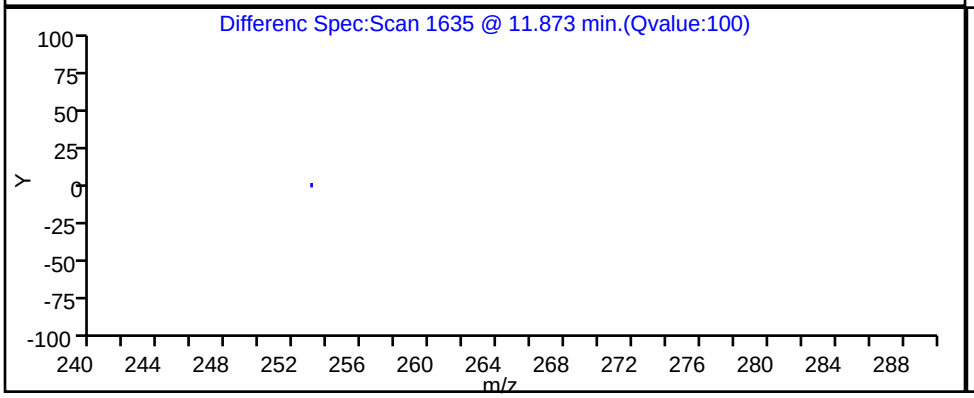


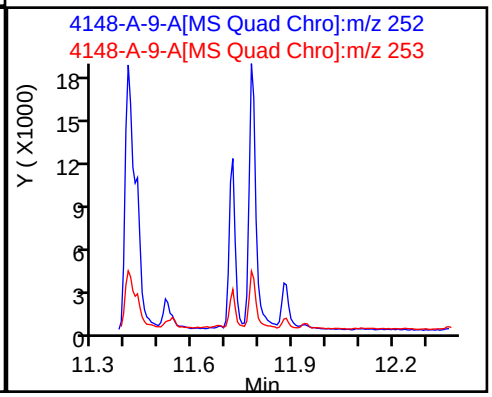












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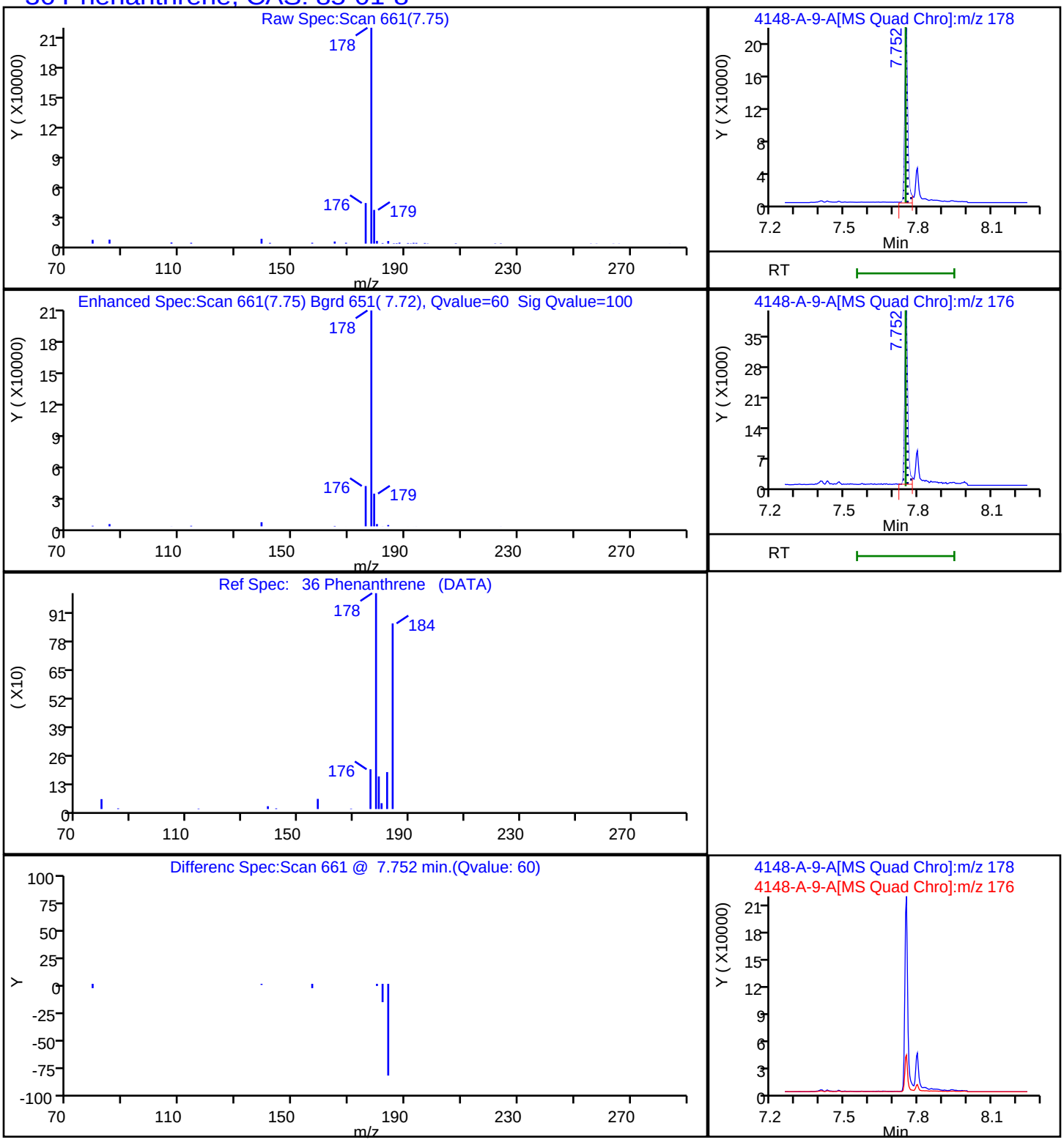
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D

Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

36 Phenanthrene, CAS: 85-01-8



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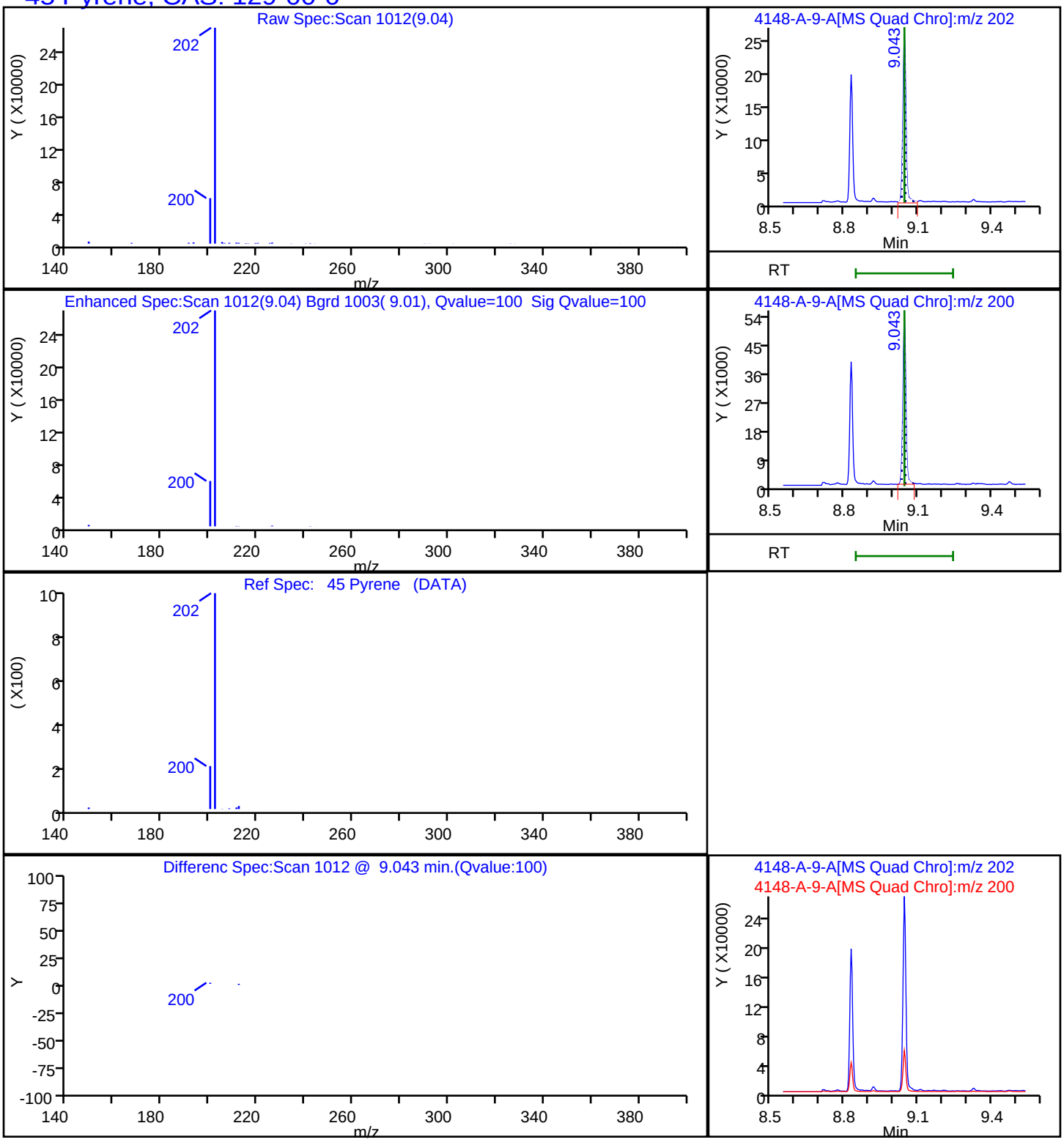
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D

Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9
Client ID:	1804576-843-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

45 Pyrene, CAS: 129-00-0



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Eurofins Knoxville

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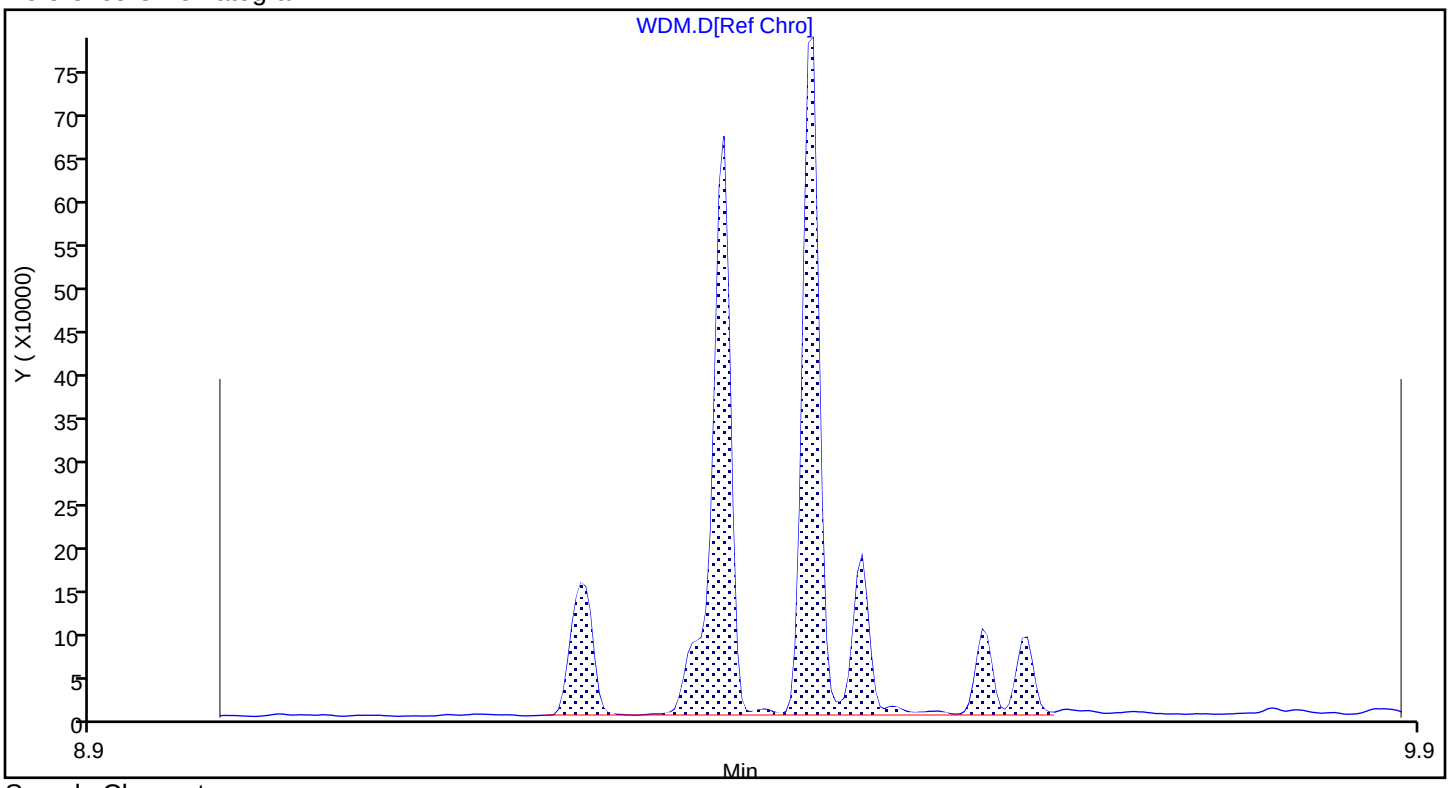
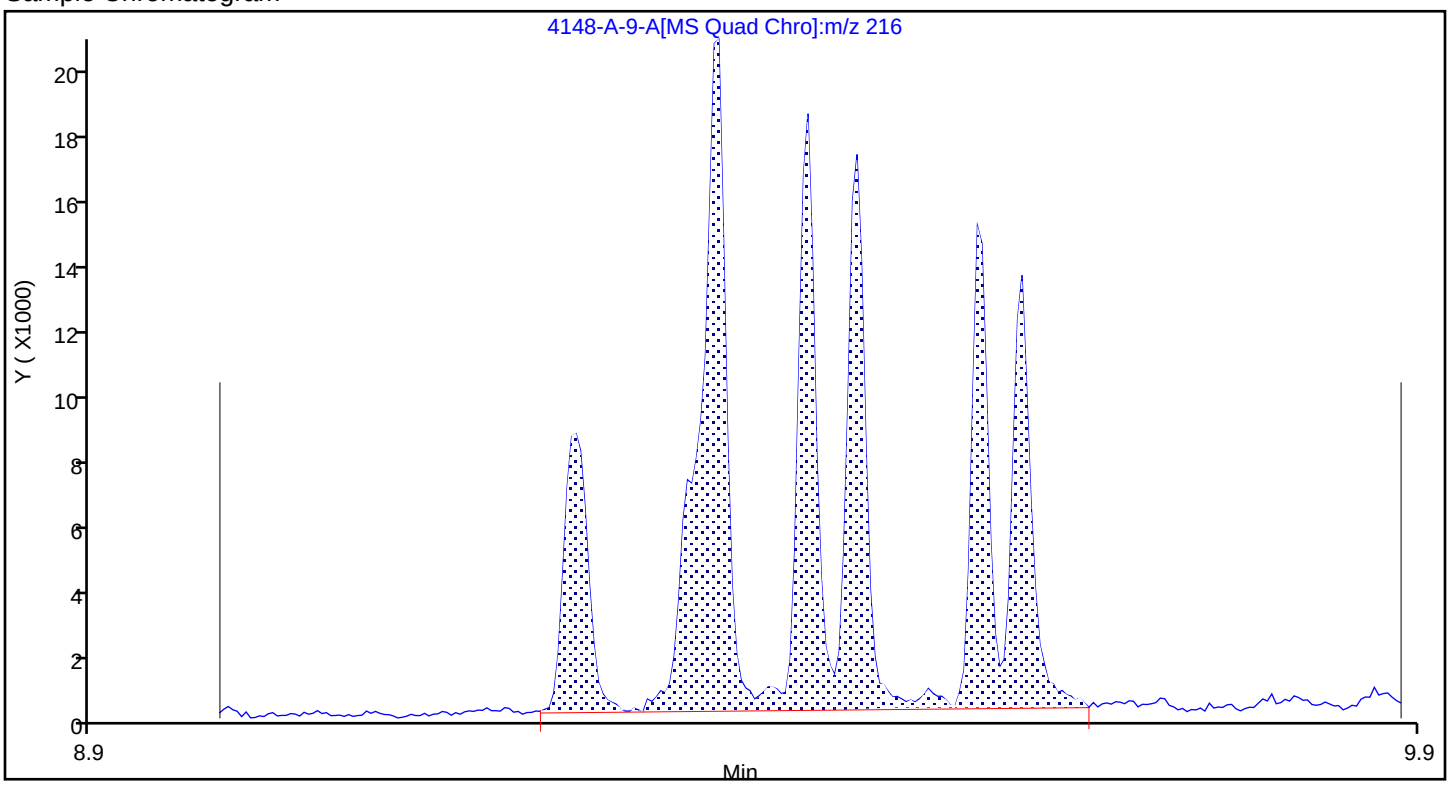
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 100 C1-Fluoranthenes/pyrene, CAS: STL00912

Reference Chromatogram



Sample Chromatogram



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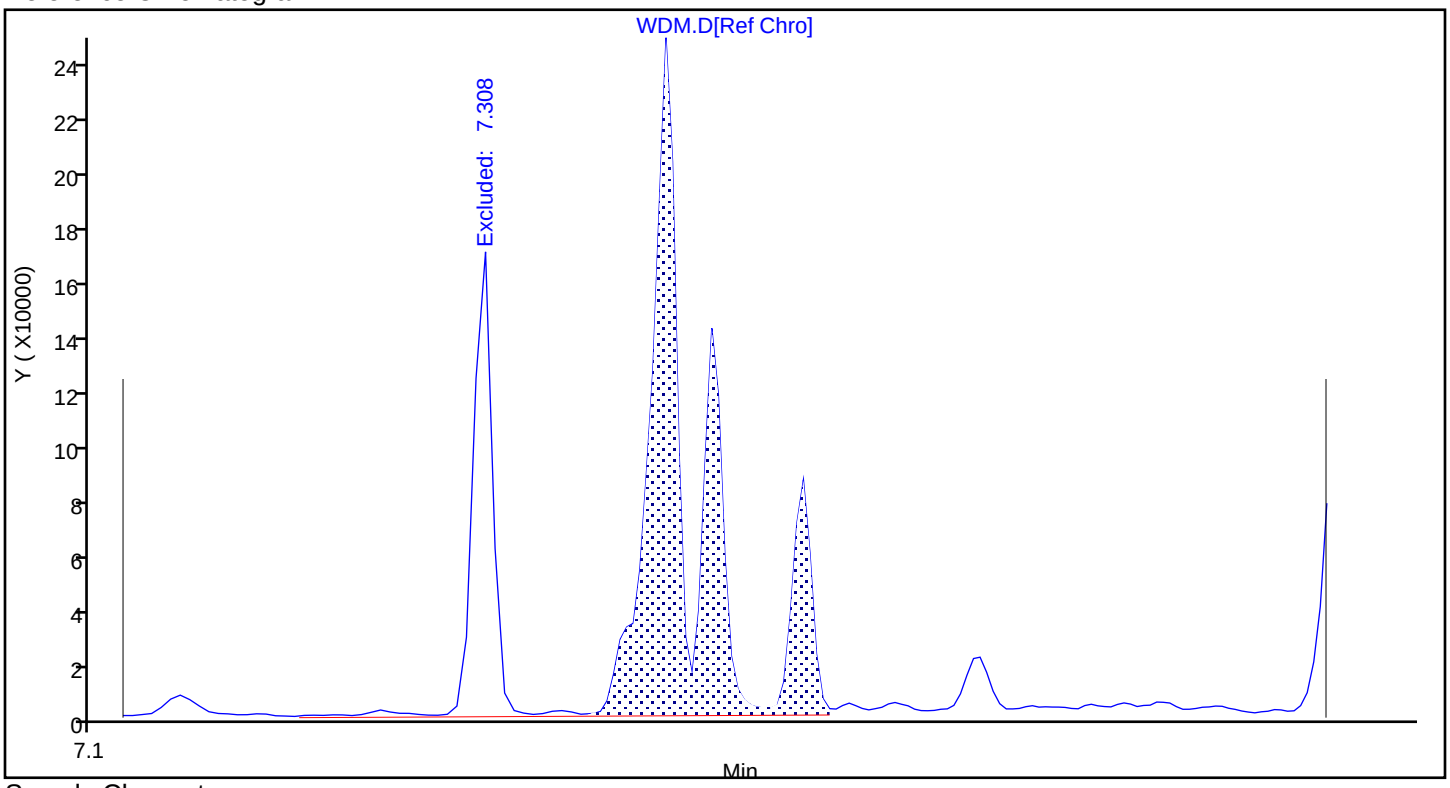
Eurofins Knoxville

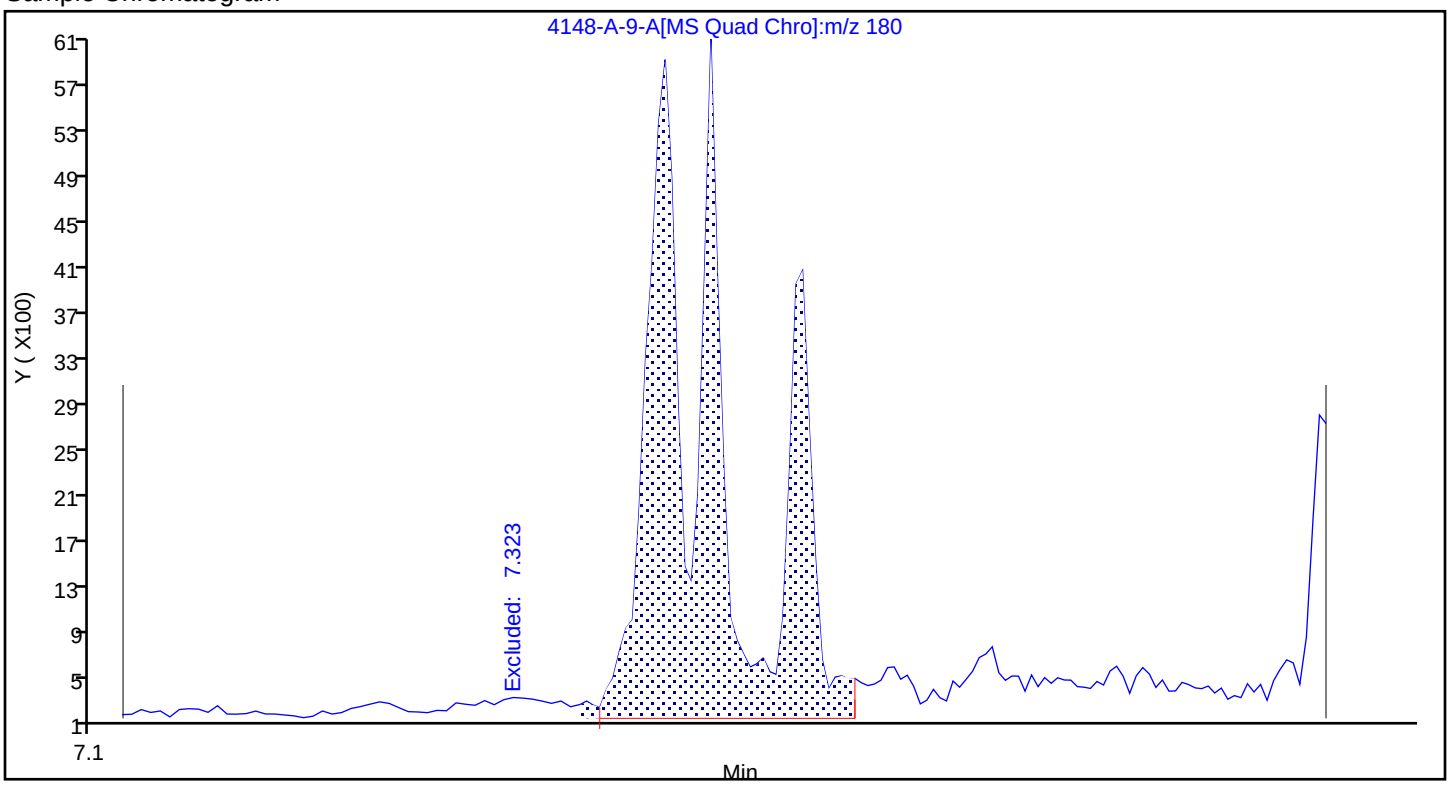
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D				
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 89 C1-Fluorenes, CAS: STL00913

Reference Chromatogram



Sample Chromatogram



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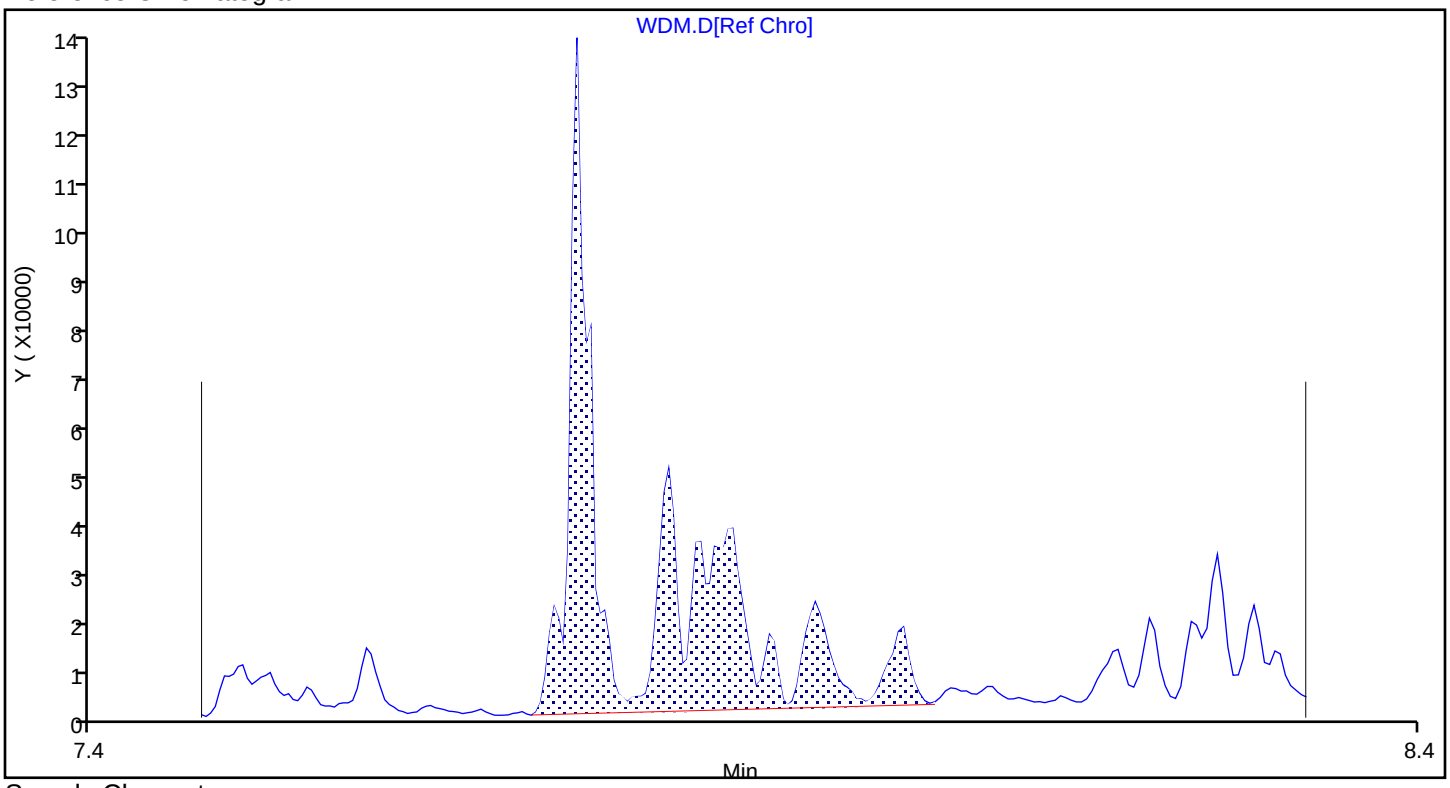
Eurofins Knoxville

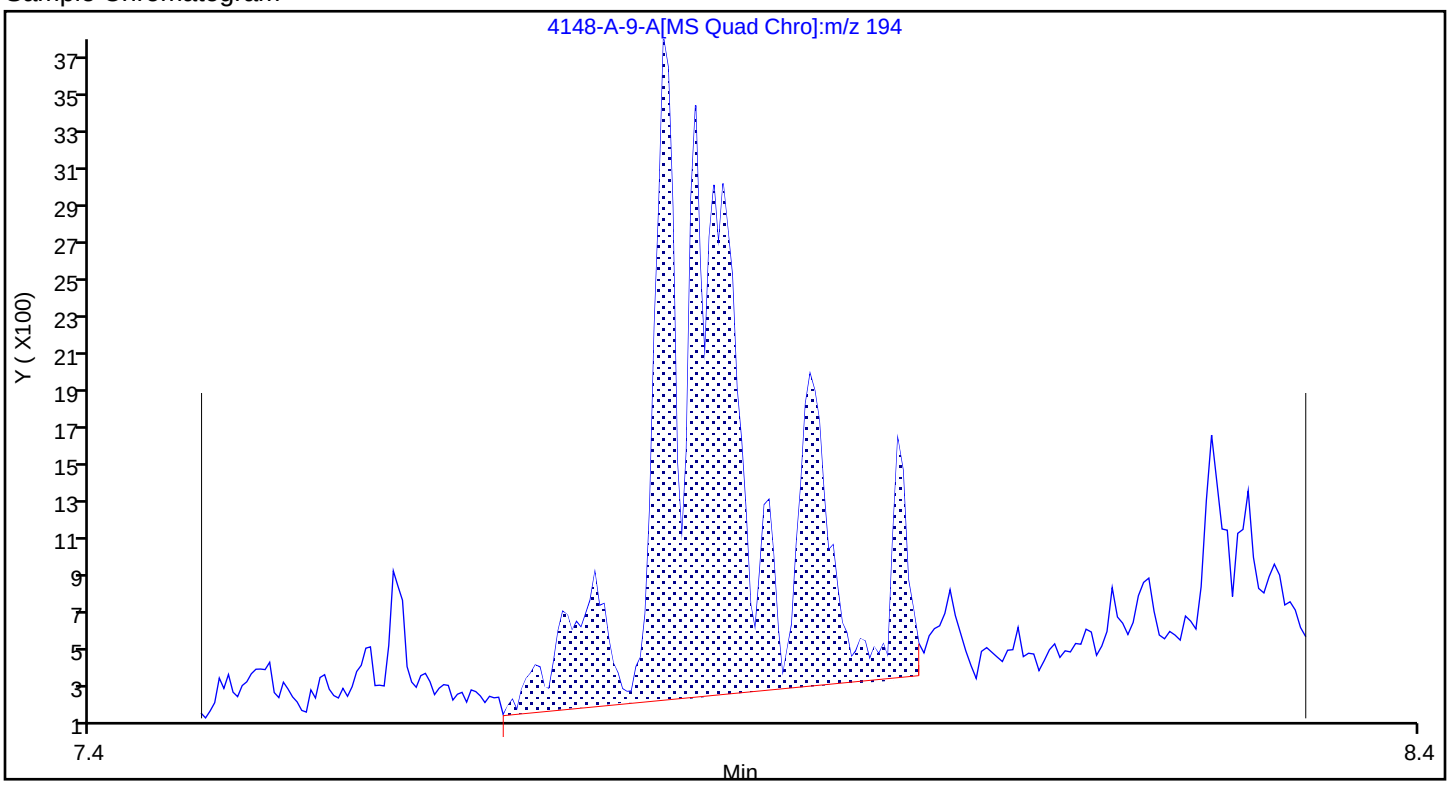
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D				
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 90 C2-Fluorenes, CAS: STL00914

Reference Chromatogram



Sample Chromatogram



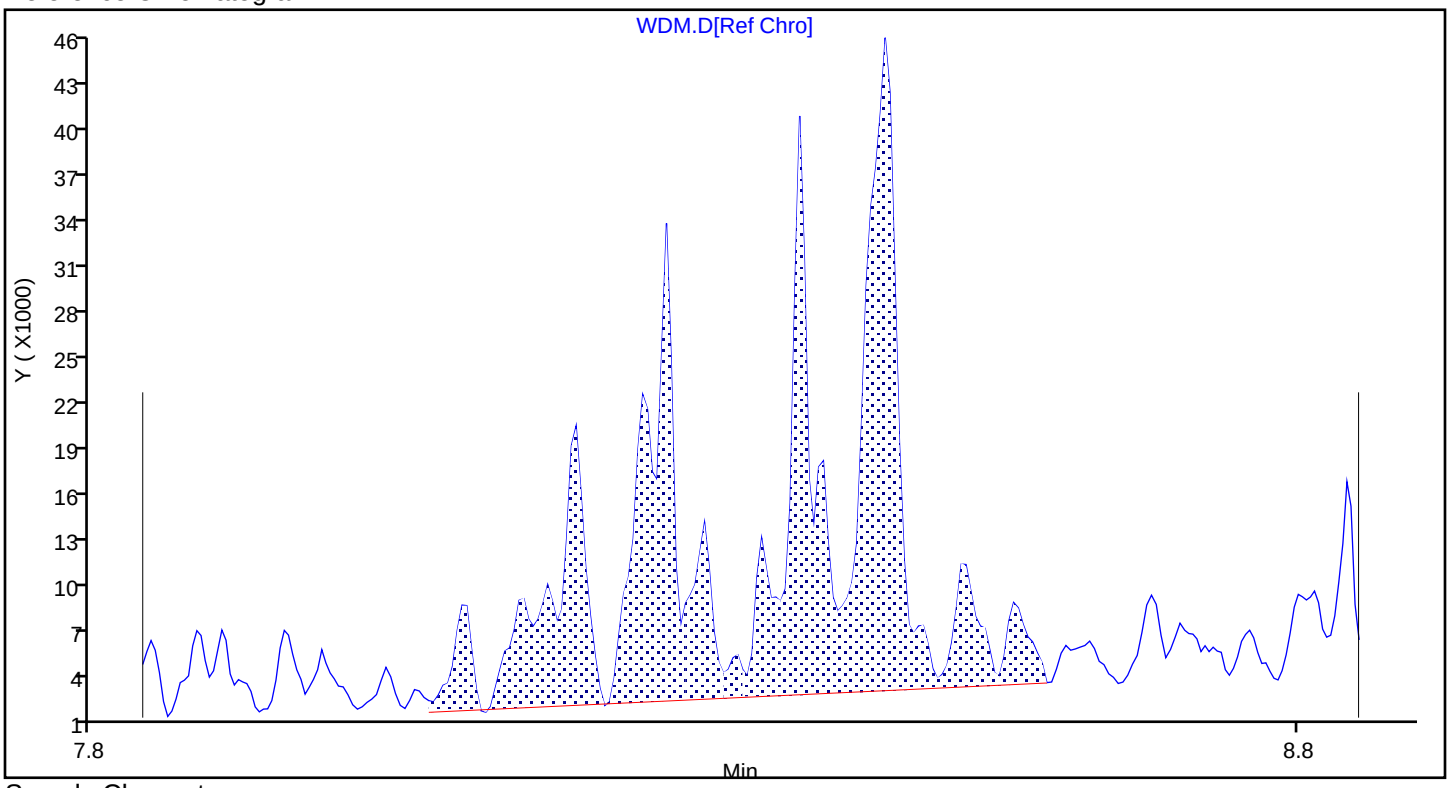
Report Date: 22-Nov-2023 13:56:29 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

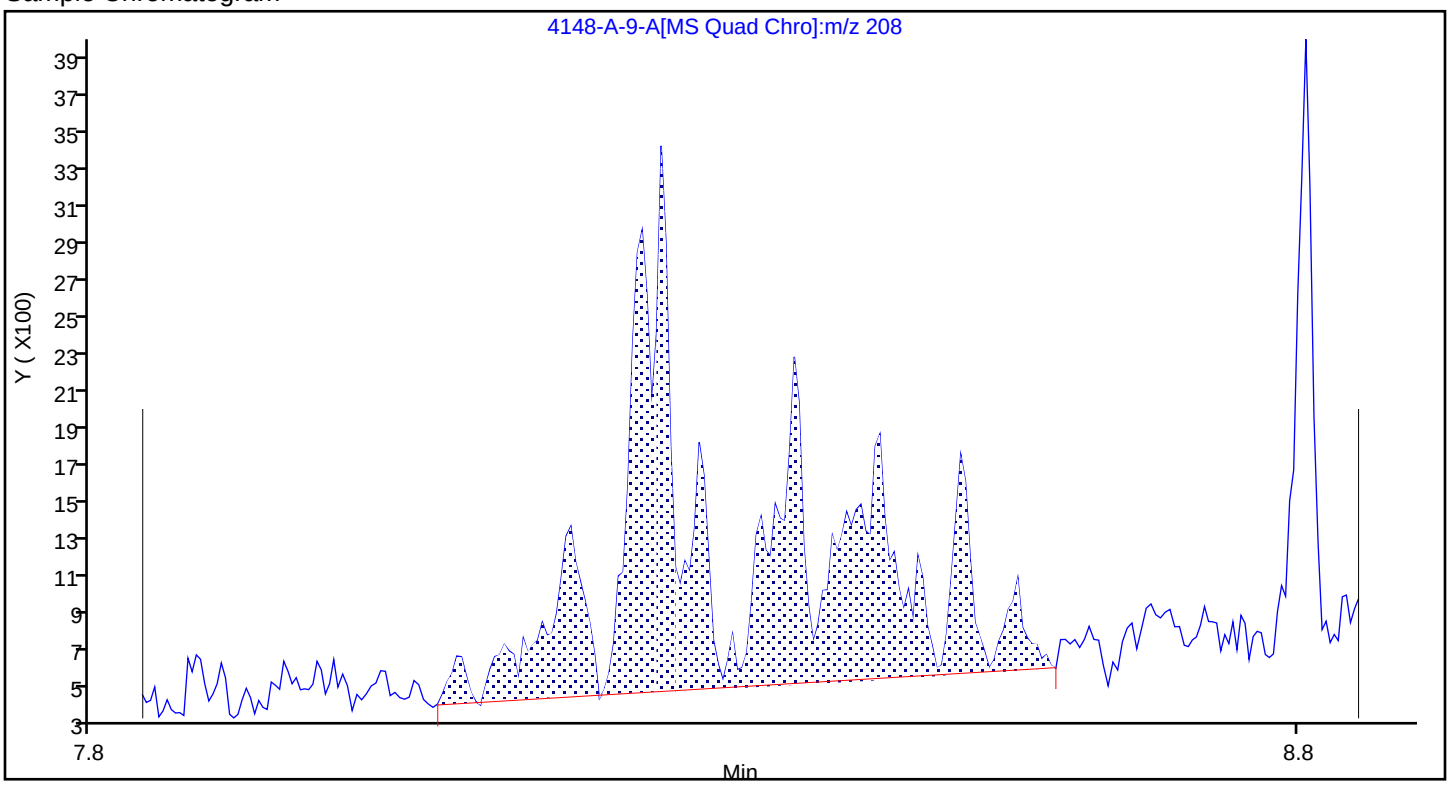
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D				
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 91 C3-Fluorenes, CAS: STL00915

Reference Chromatogram



Sample Chromatogram



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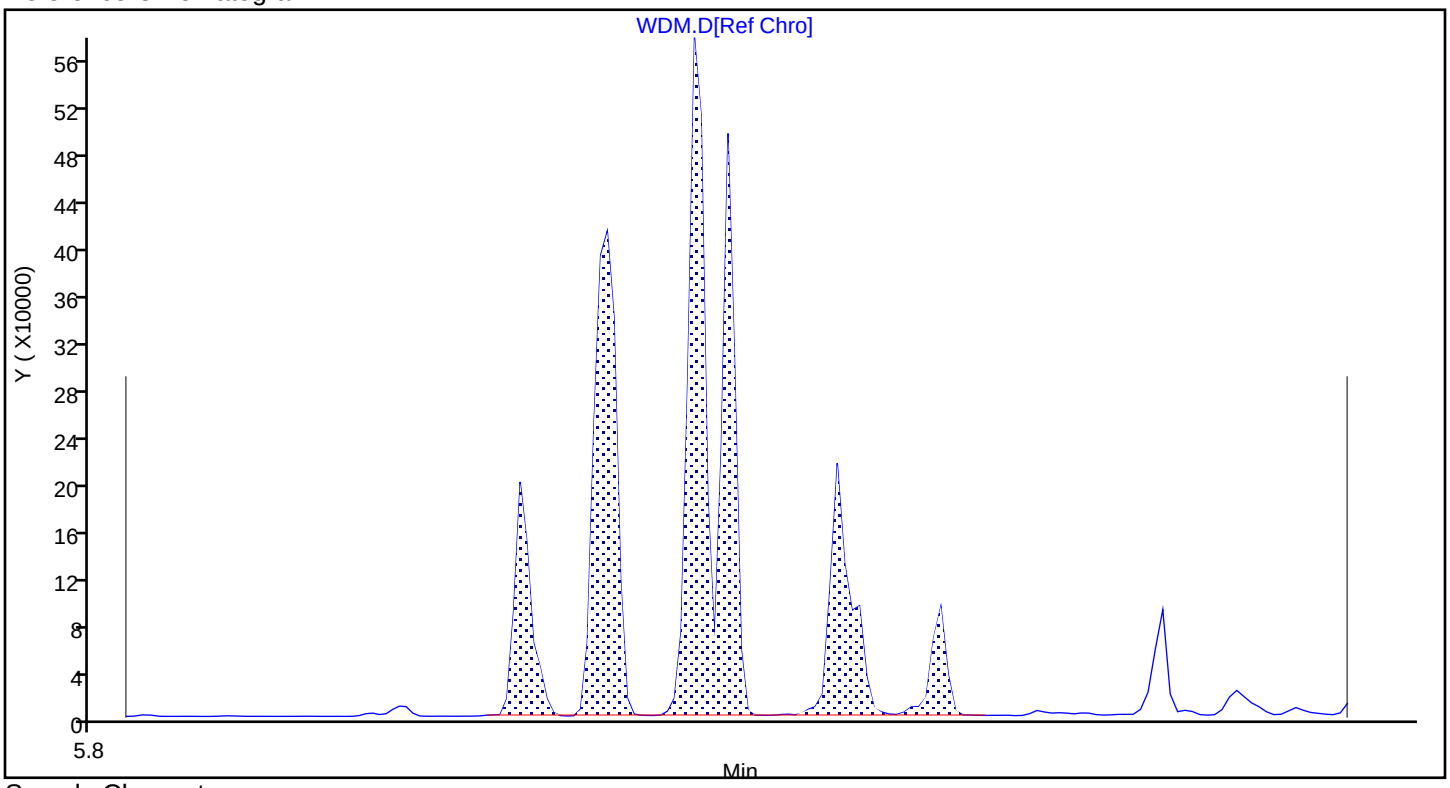
Eurofins Knoxville

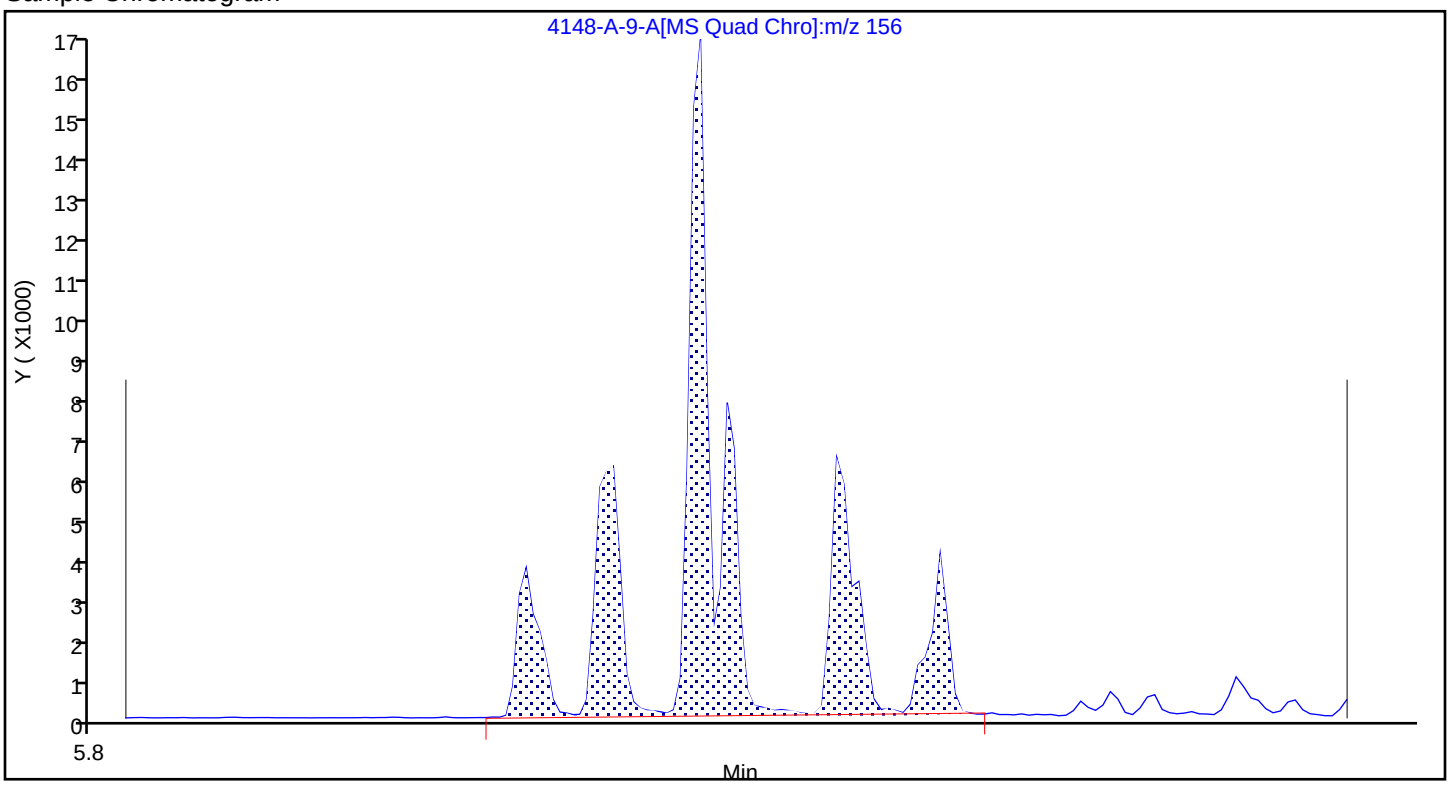
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D				
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 86 C2-Naphthalenes, CAS: STL00917

Reference Chromatogram



Sample Chromatogram



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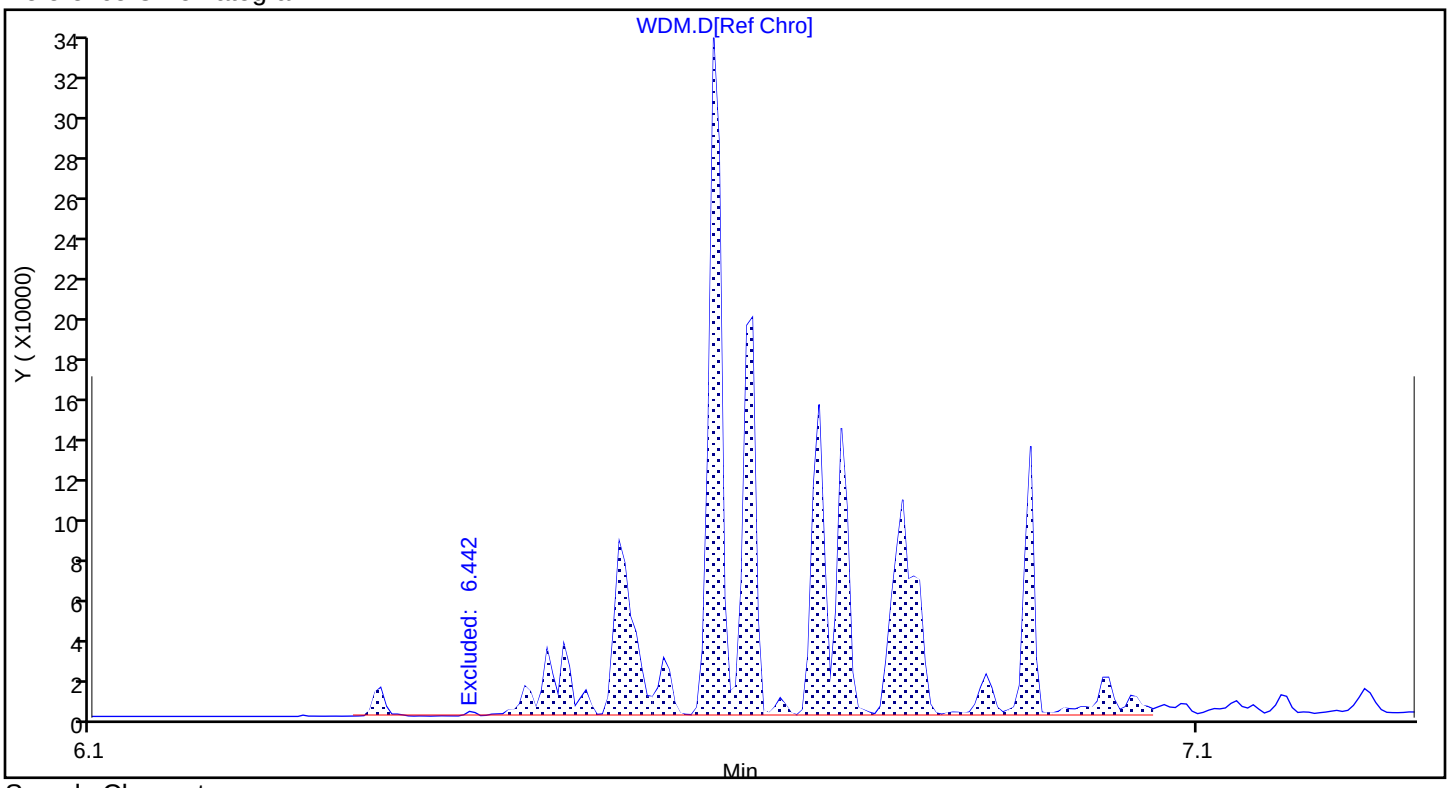
Eurofins Knoxville

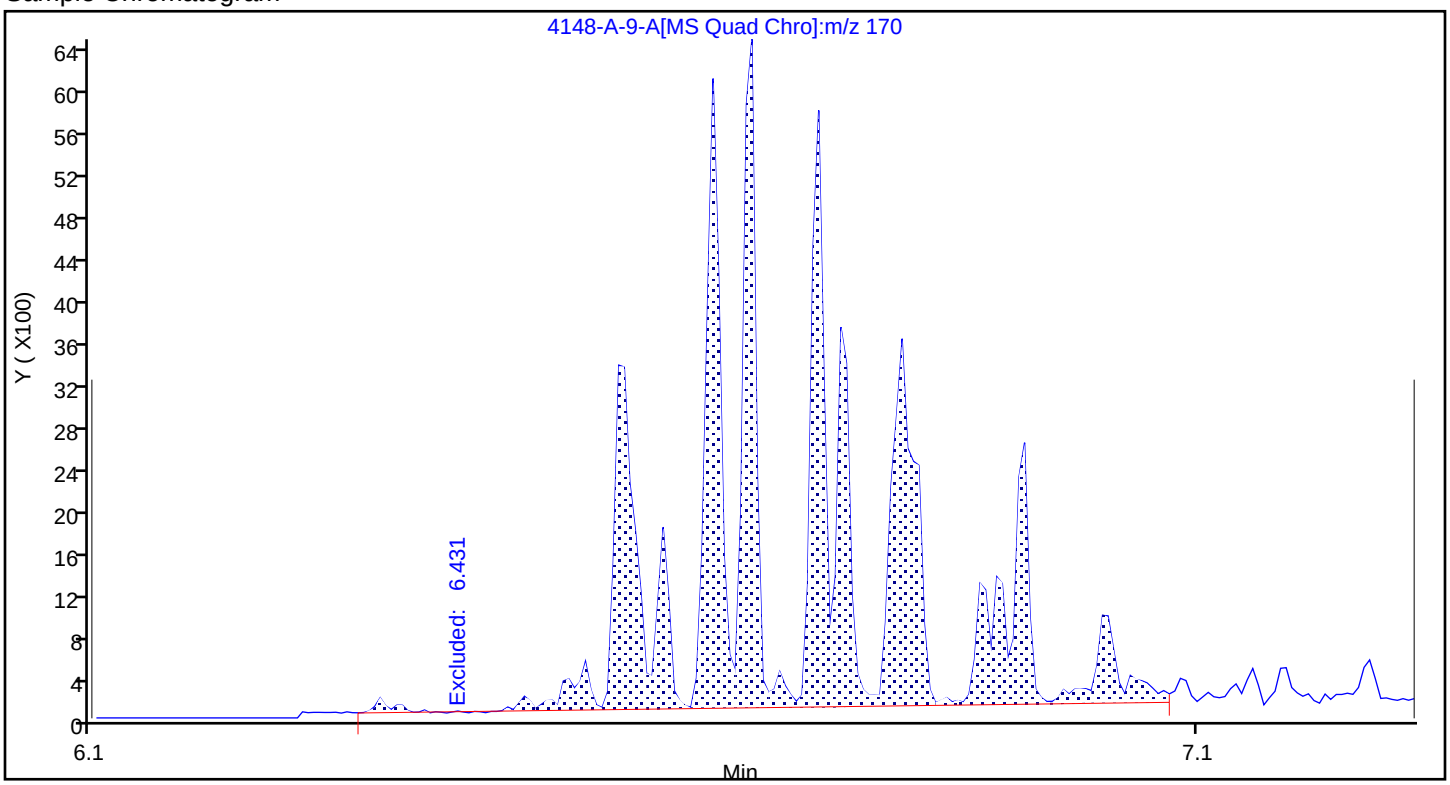
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D				
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 87 C3-Naphthalenes, CAS: STL00918

Reference Chromatogram



Sample Chromatogram



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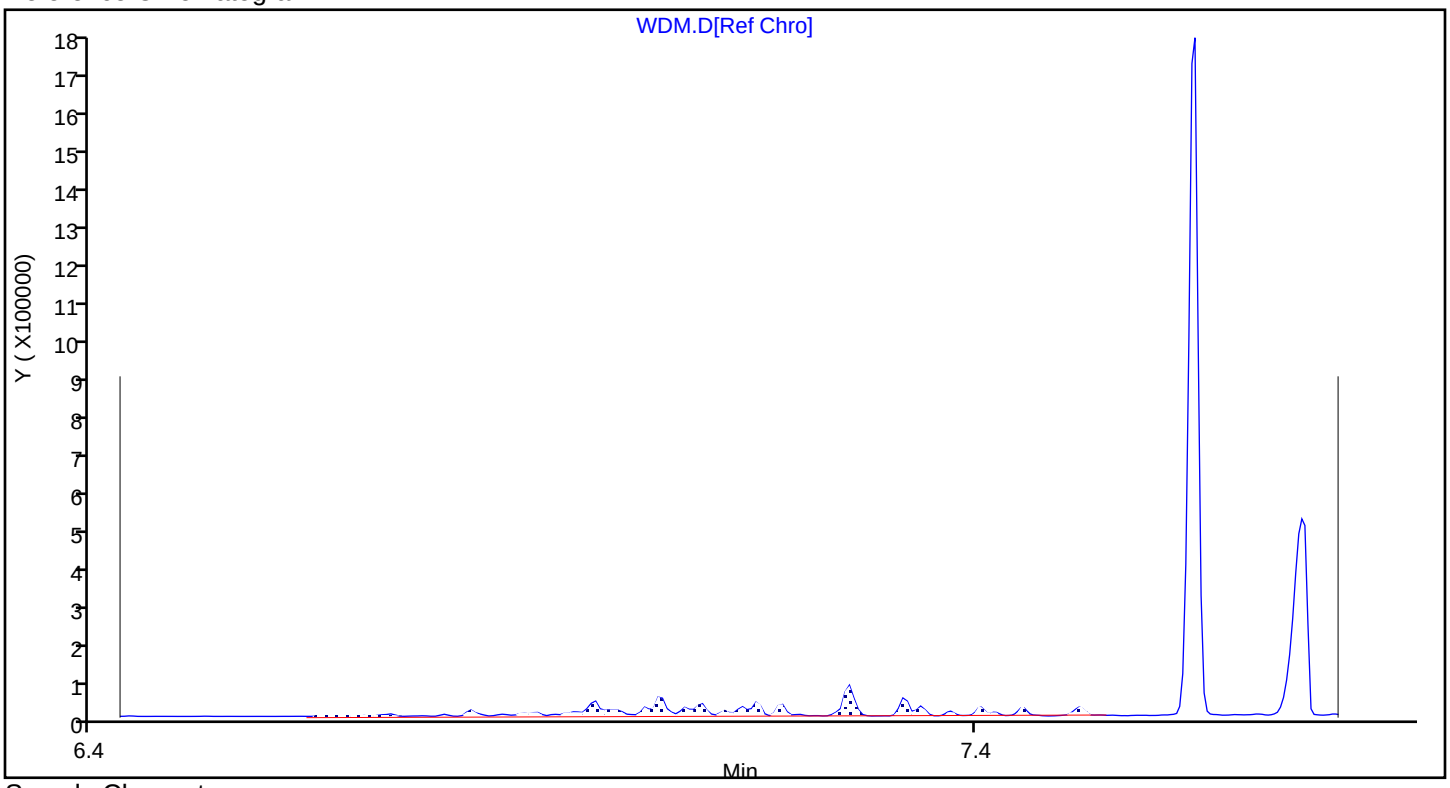
Eurofins Knoxville

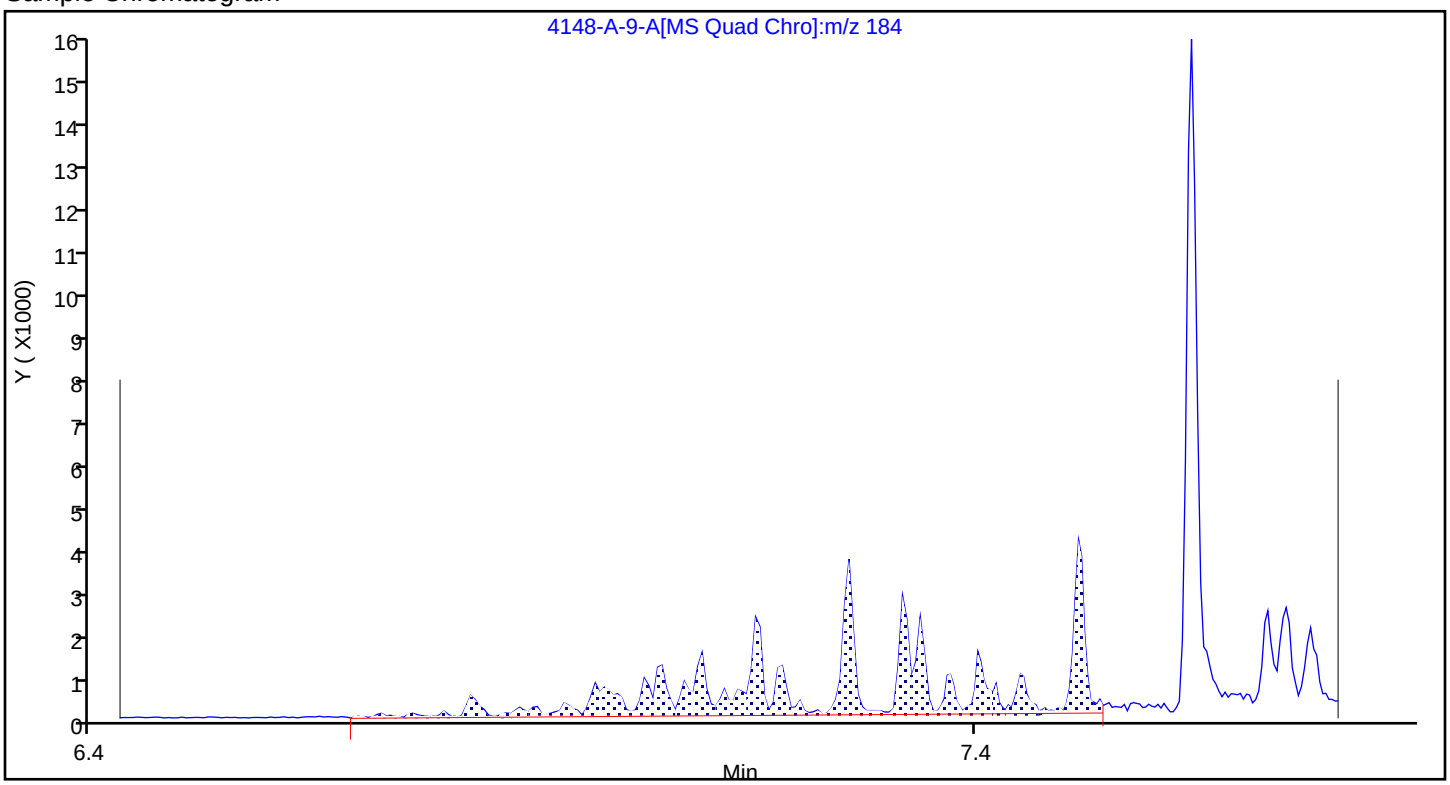
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D				
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 88 C4-Naphthalenes, CAS: STL00919

Reference Chromatogram



Sample Chromatogram



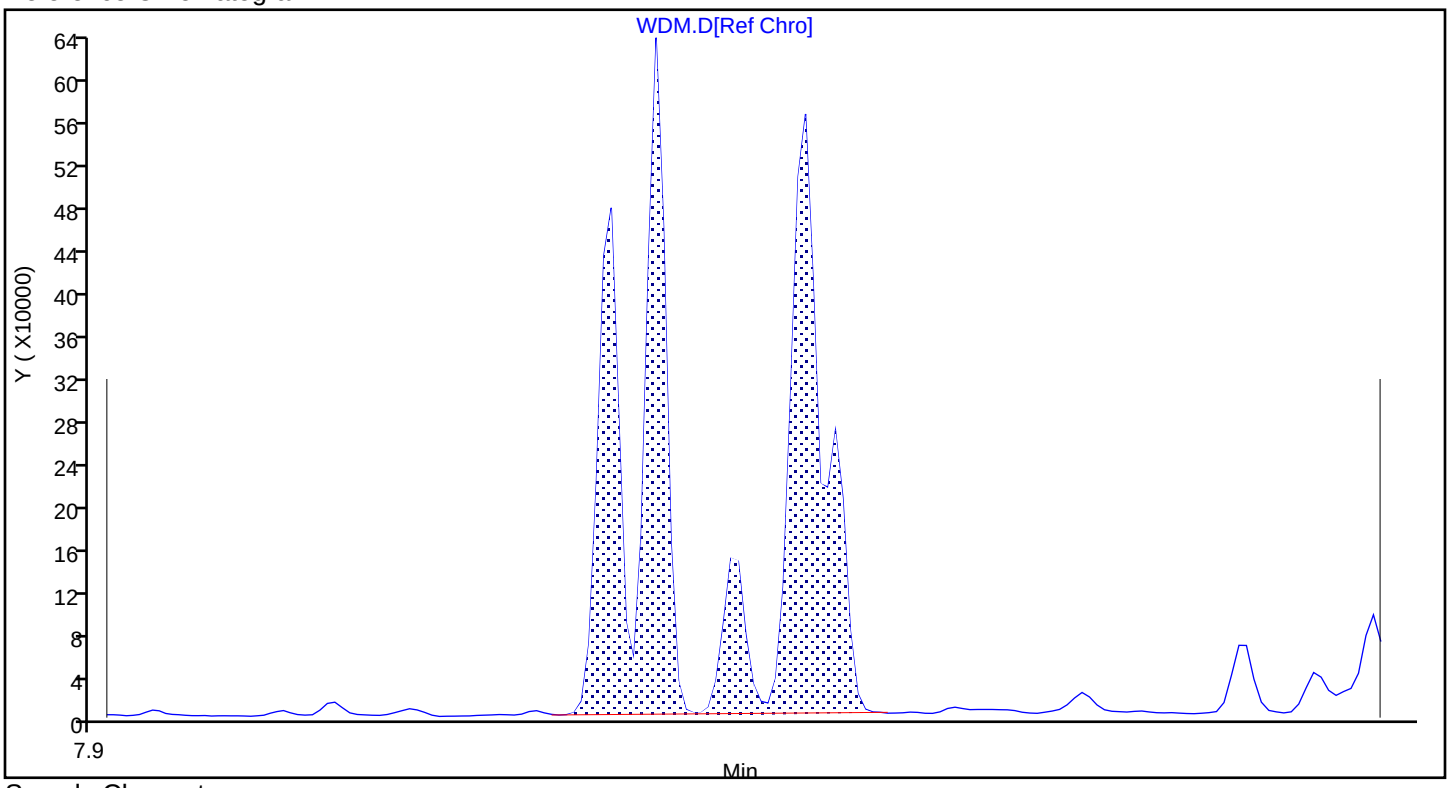
Report Date: 22-Nov-2023 13:56:29 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

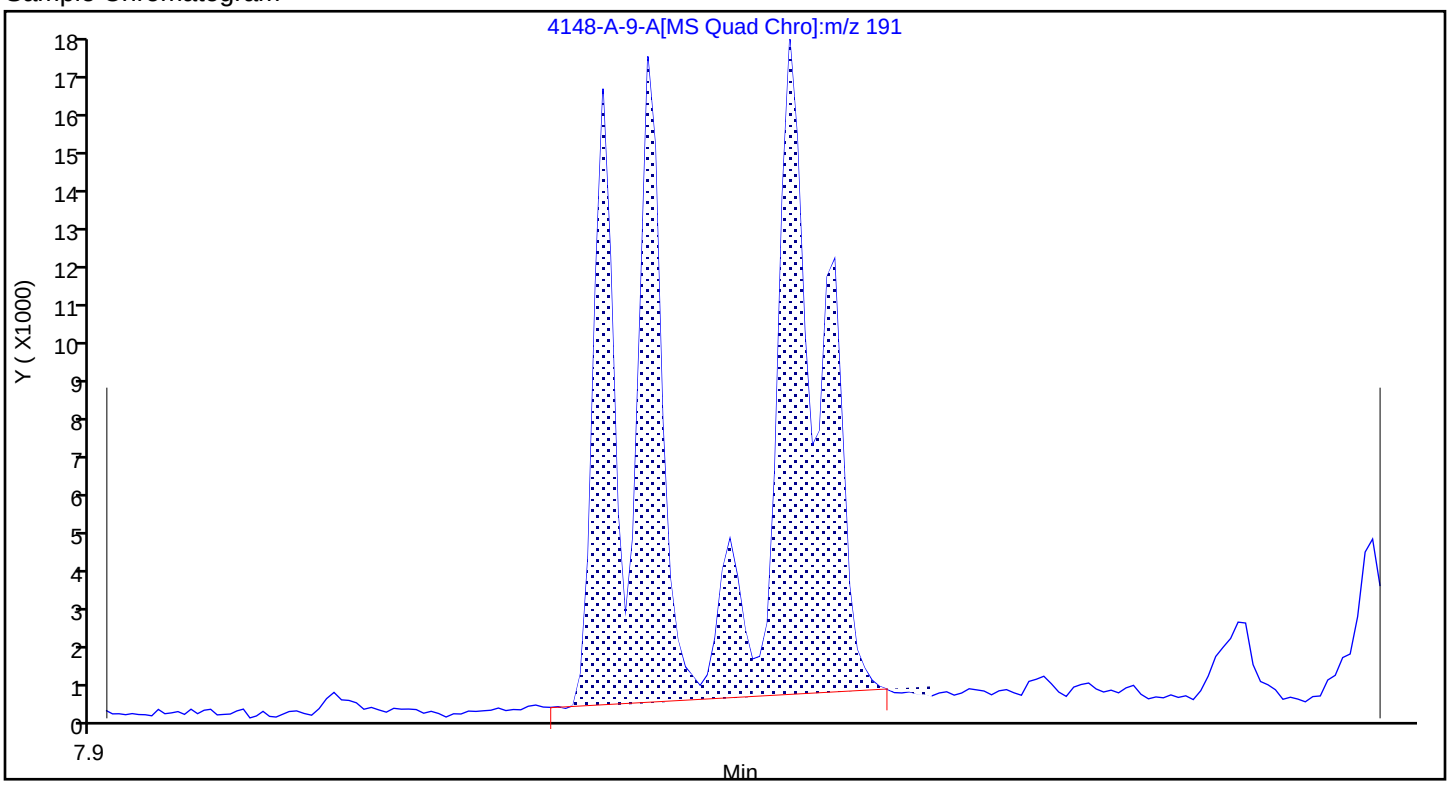
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D				
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 96 C1-Phenanthrenes/Anthracenes, CAS: STL00901

Reference Chromatogram



Sample Chromatogram



Report Date: 22-Nov-2023 13:56:29 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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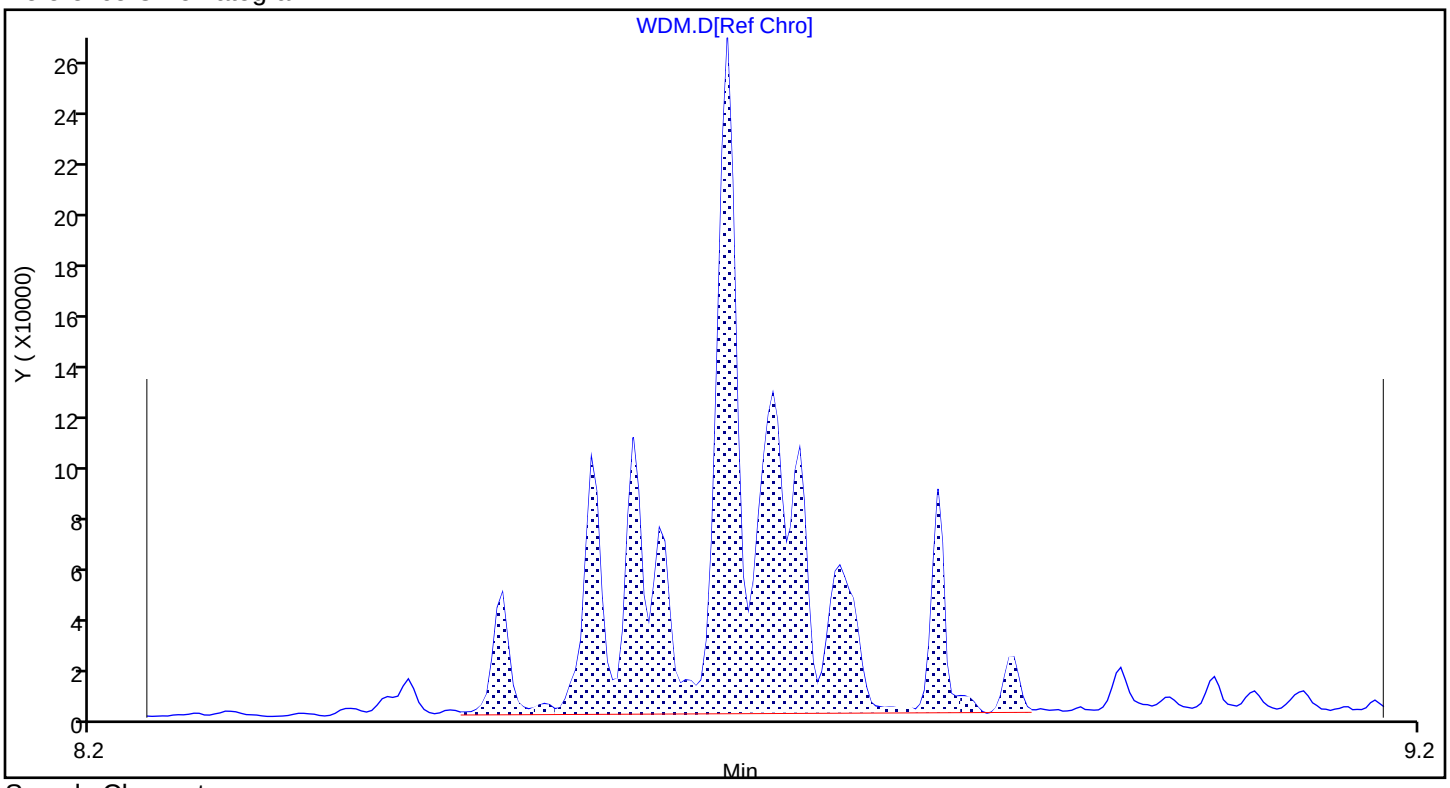
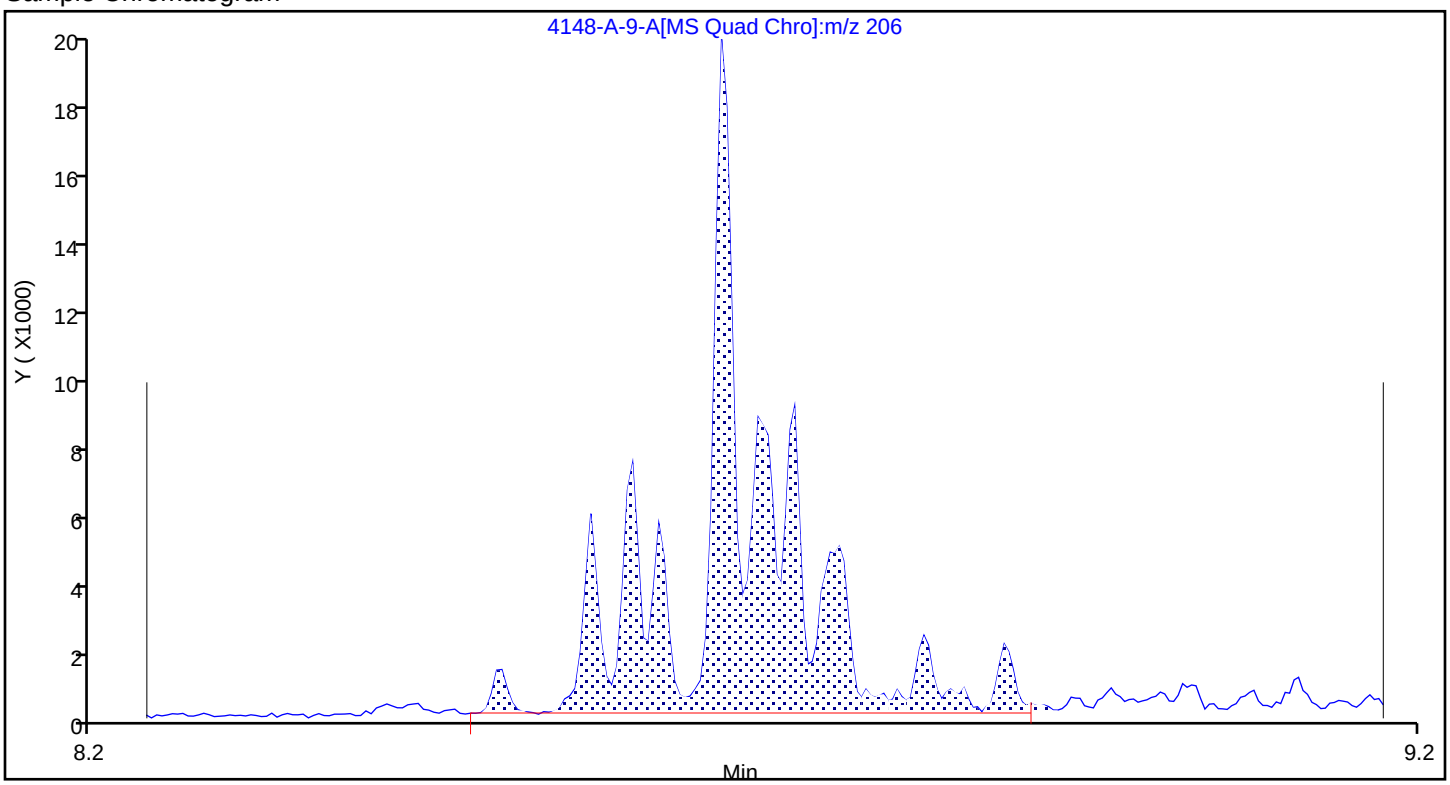
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 97 C2-Phenanthrenes/Anthracenes, CAS: STL00902

Reference Chromatogram



Sample Chromatogram



Report Date: 22-Nov-2023 13:56:29 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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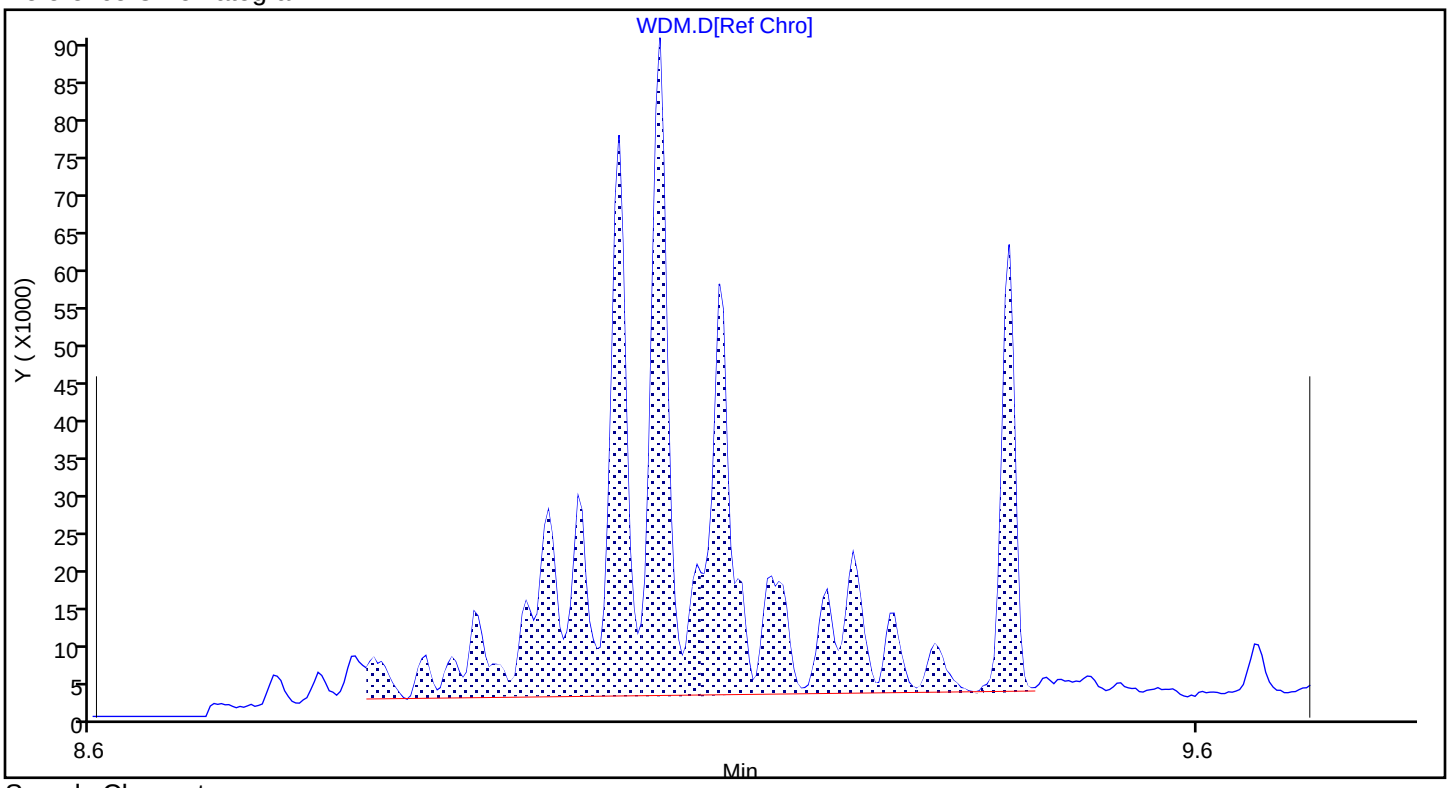
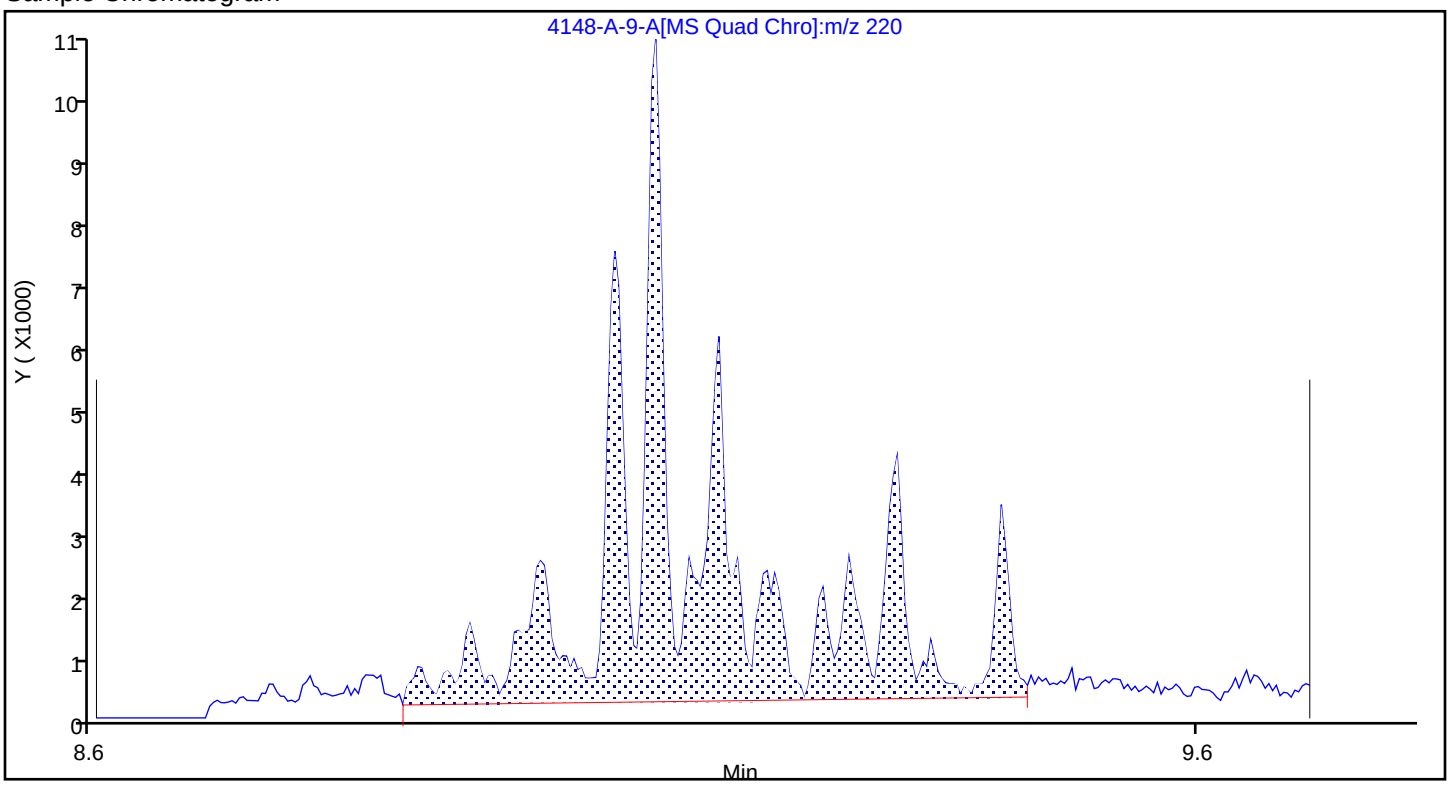
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 98 C3-Phenanthrenes/Anthracenes, CAS: STL00903

Reference Chromatogram



Sample Chromatogram



Report Date: 22-Nov-2023 13:56:29 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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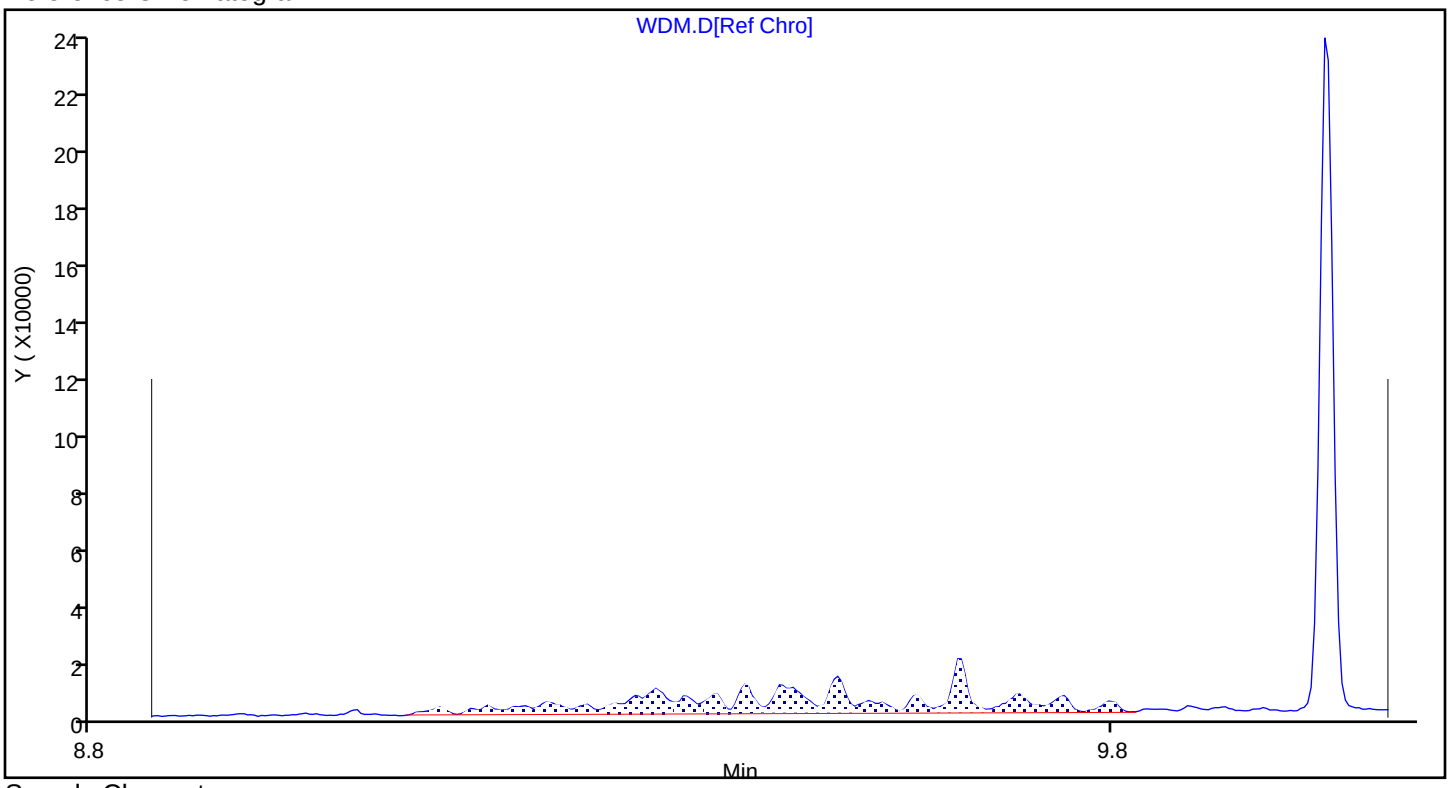
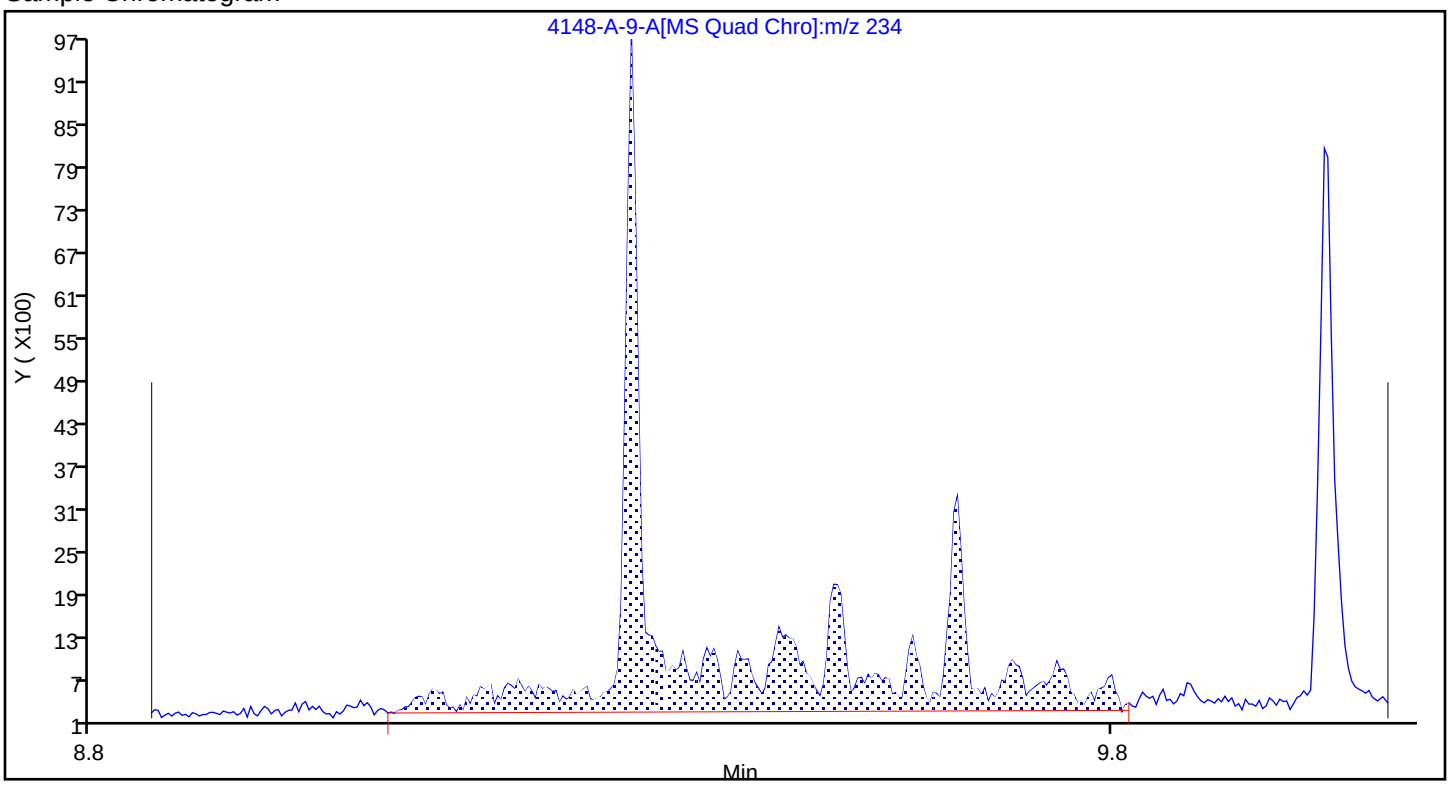
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 99 C4-Phenanthrenes/Anthracenes, CAS: STL00904

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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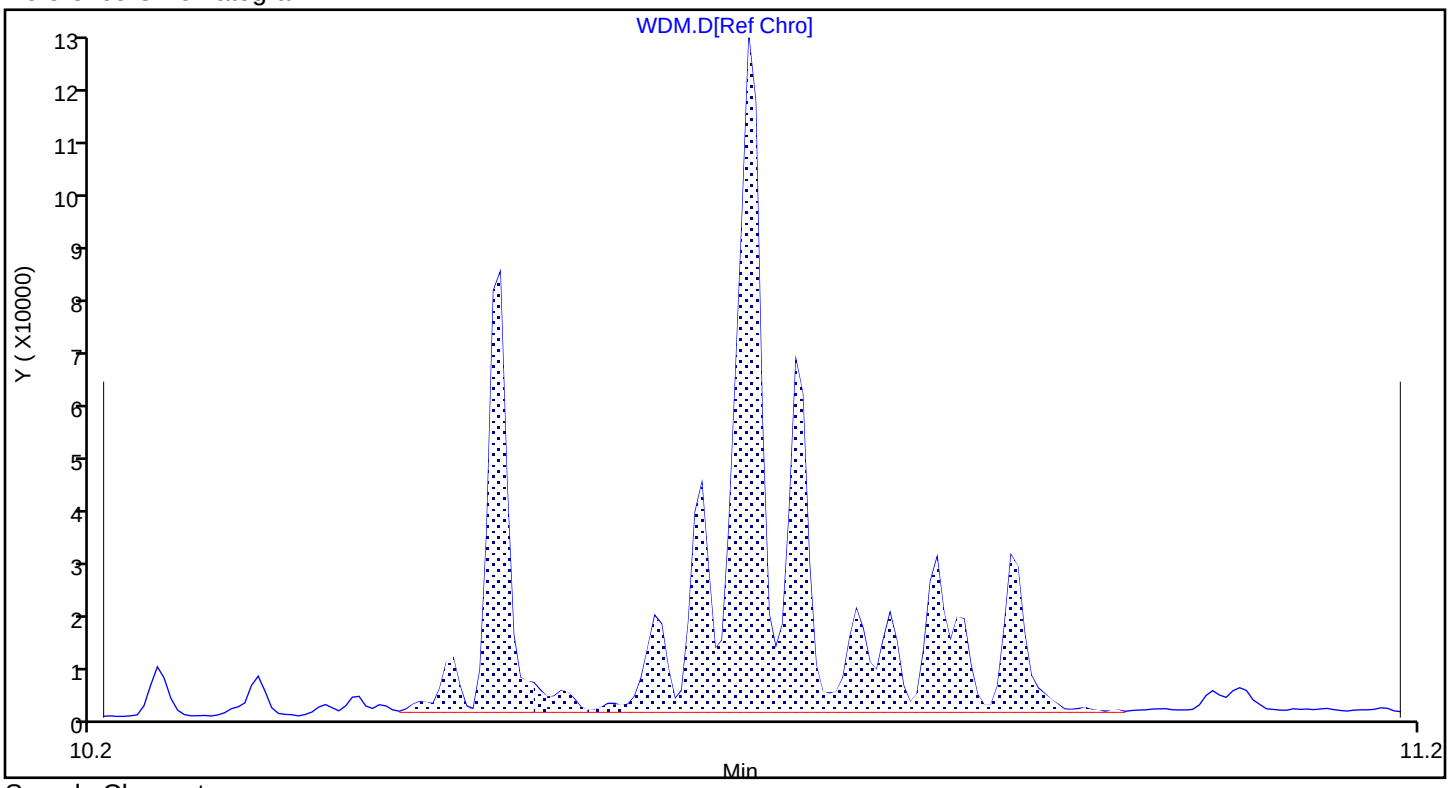
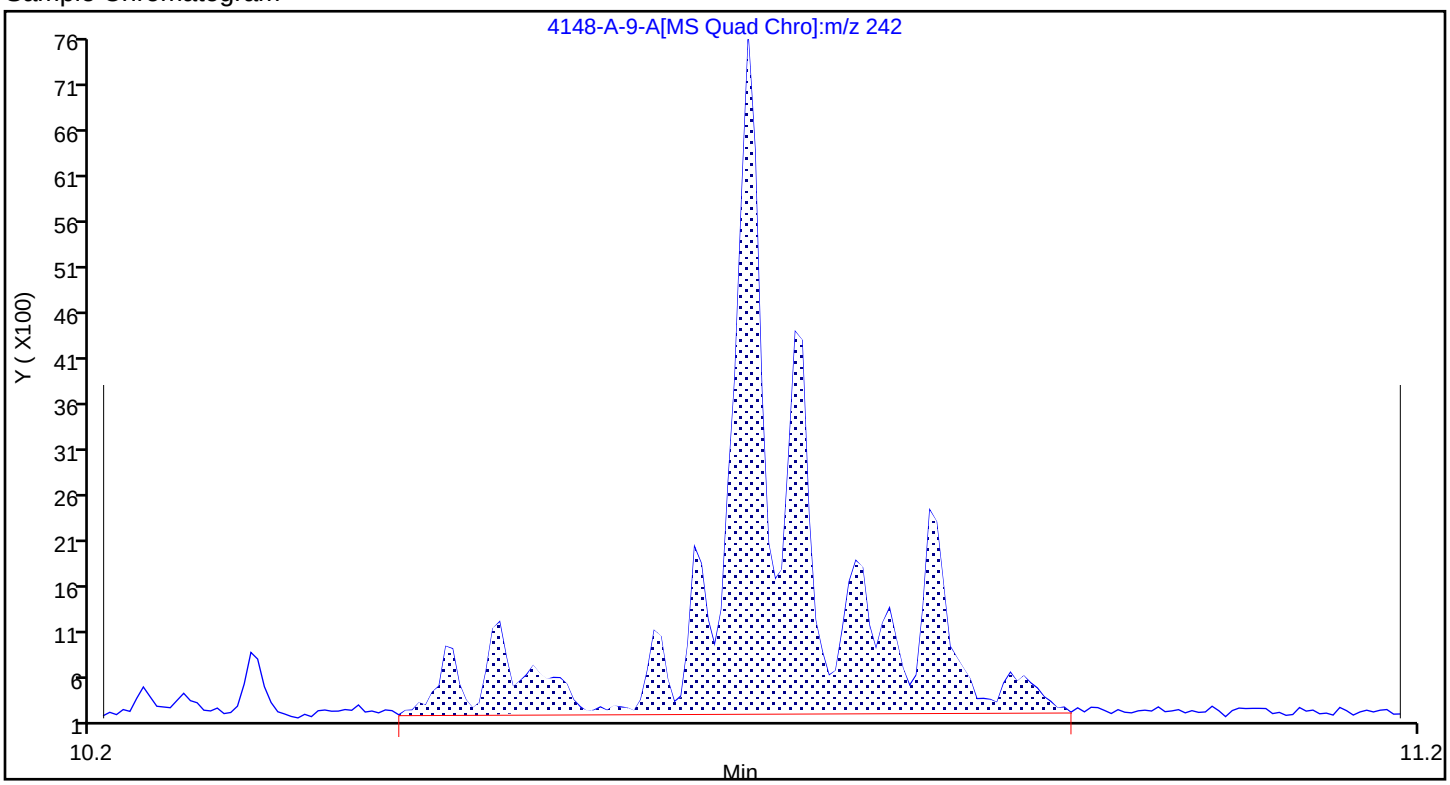
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 101 C1-Chrysenes/Benz(a)anthracenes, CAS: STL02218

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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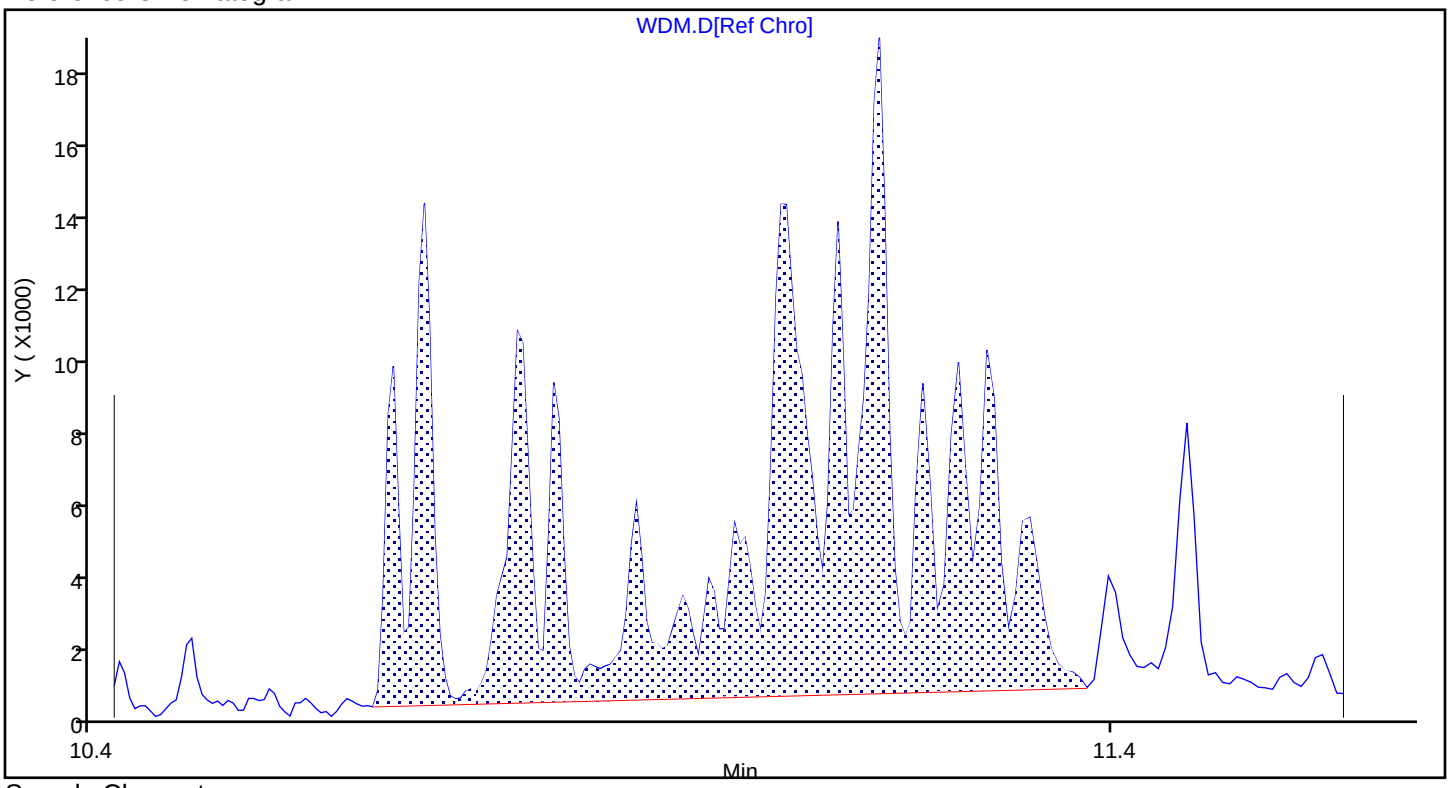
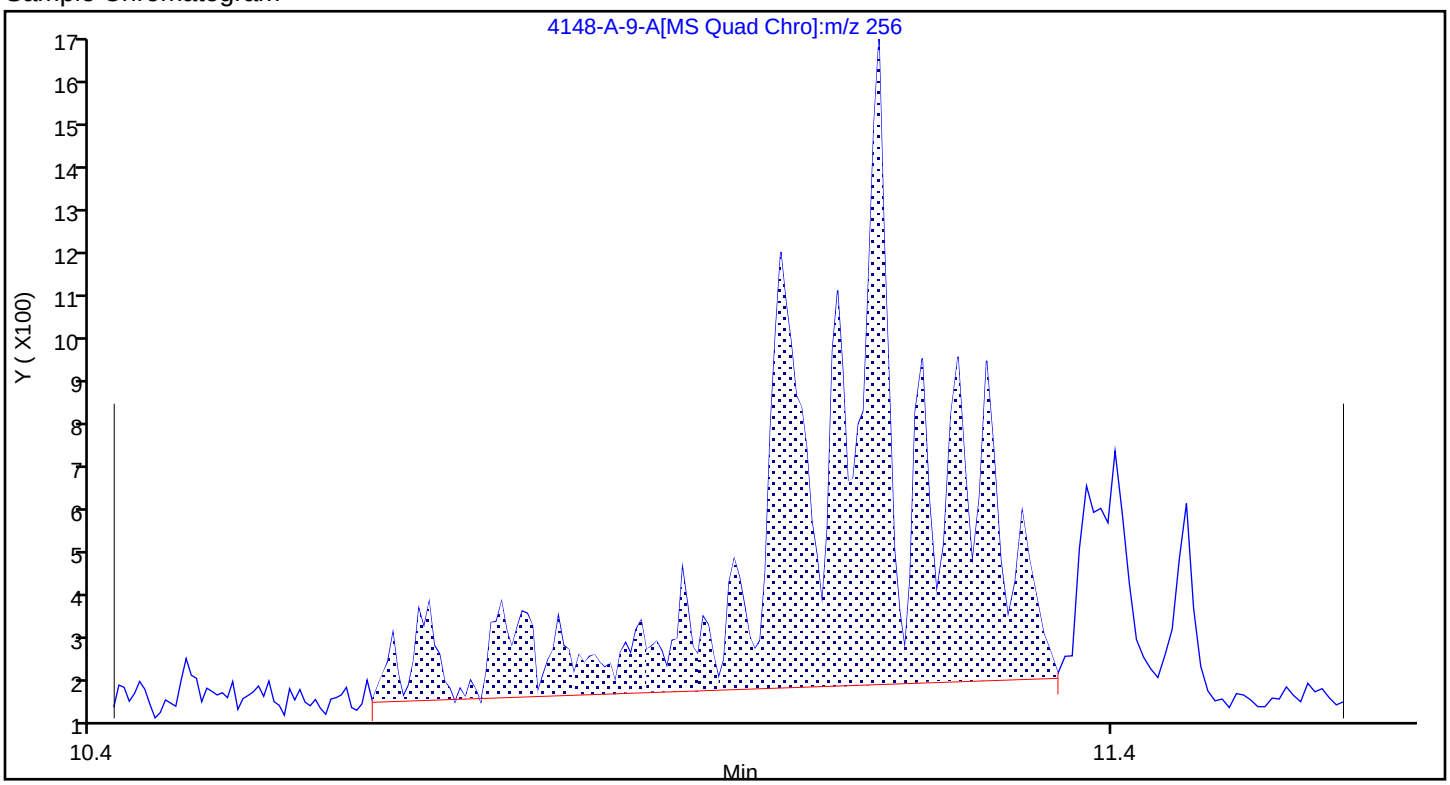
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 102 C2-Chrysenes/Benz(a)anthracenes, CAS: STL02219

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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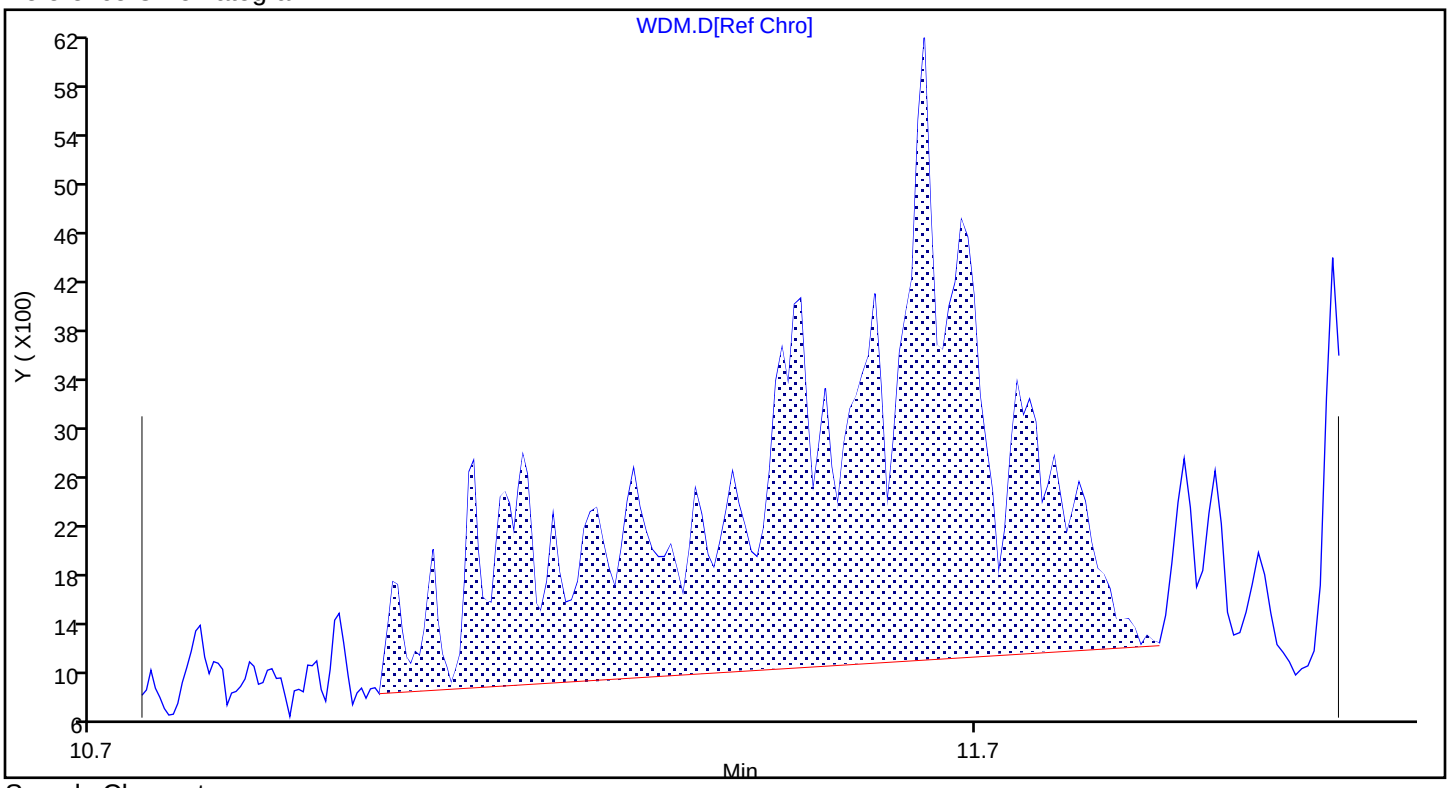
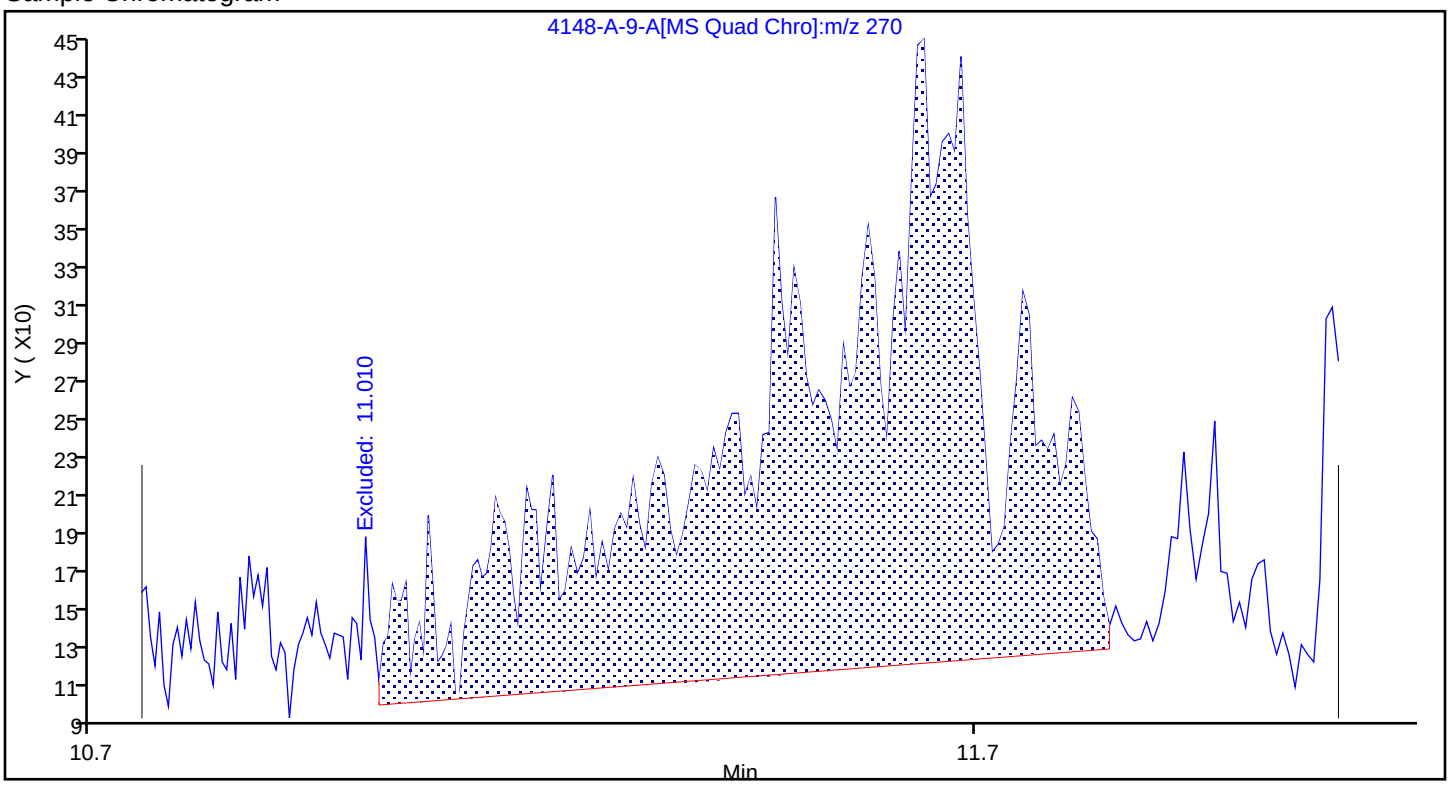
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 103 C3-Chrysenes/Benz(a)anthracenes, CAS: STL02220

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
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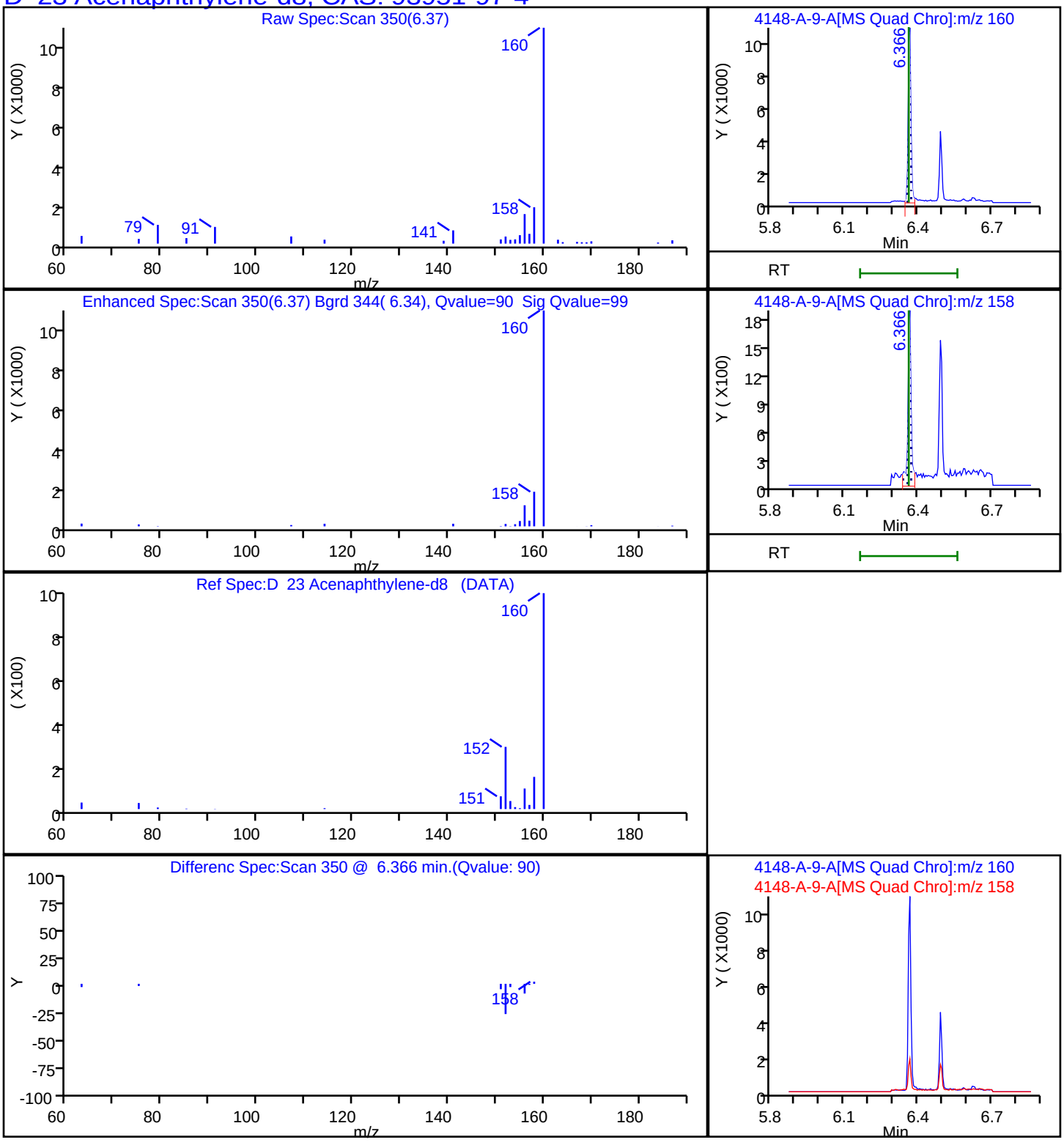
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 23 Acenaphthylene-d8, CAS: 93951-97-4



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Eurofins Knoxville

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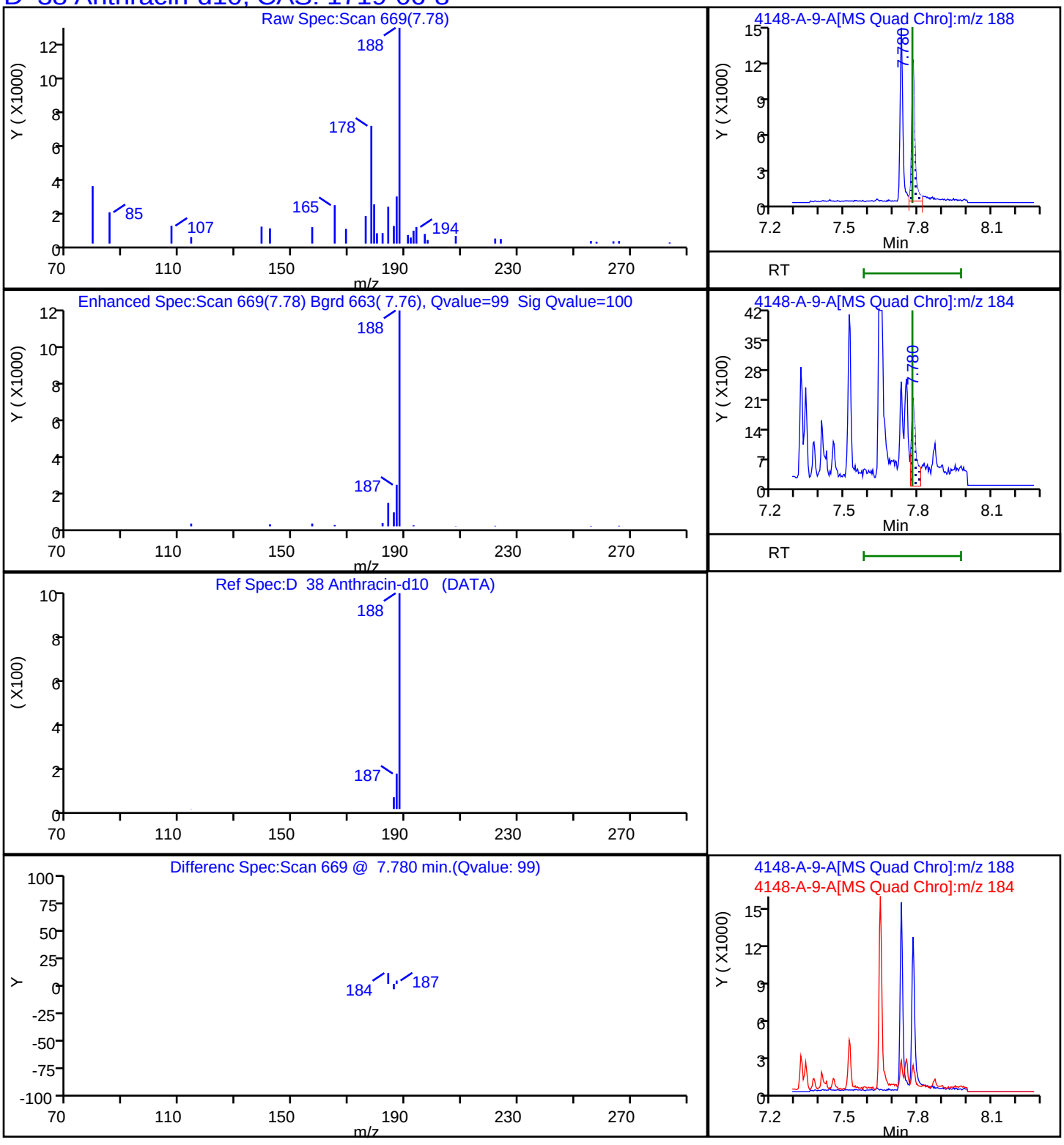
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9
Client ID:	1804576-843-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

D 38 Anthracin-d10, CAS: 1719-06-8



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Eurofins Knoxville

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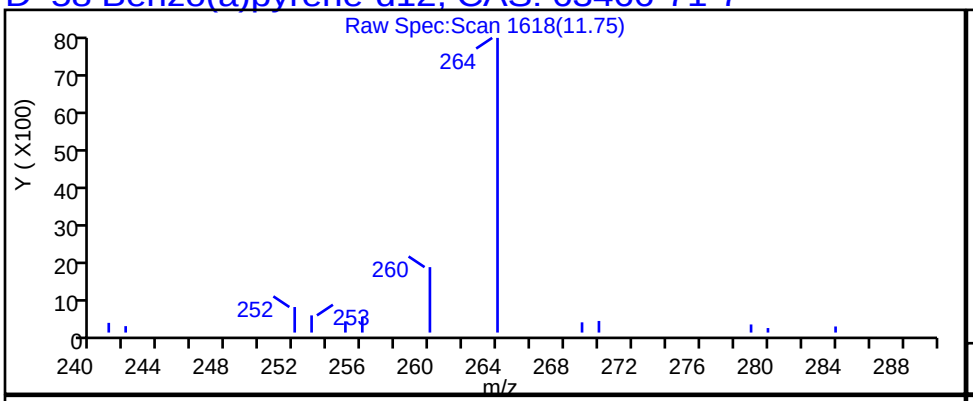
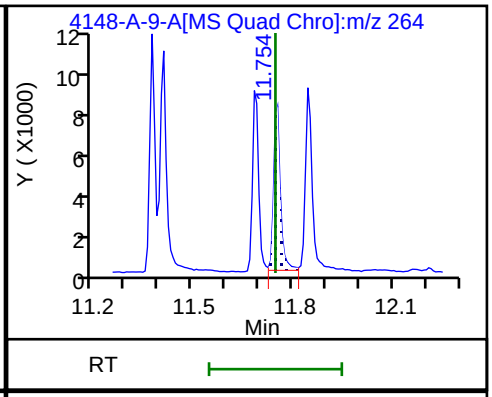
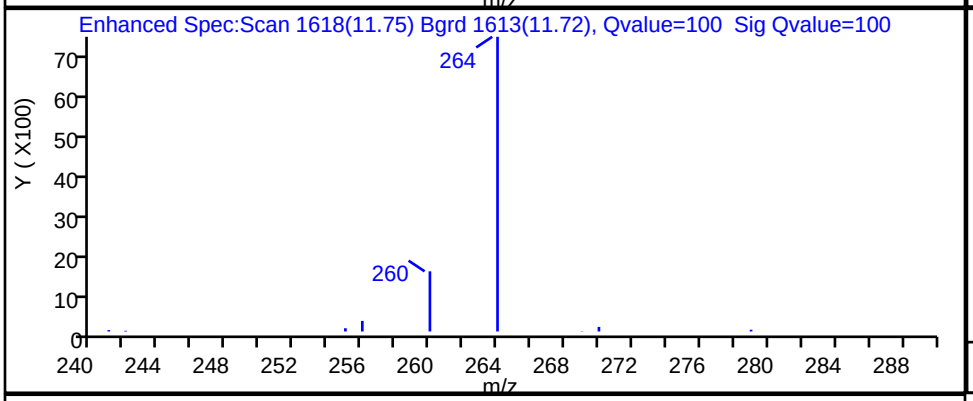
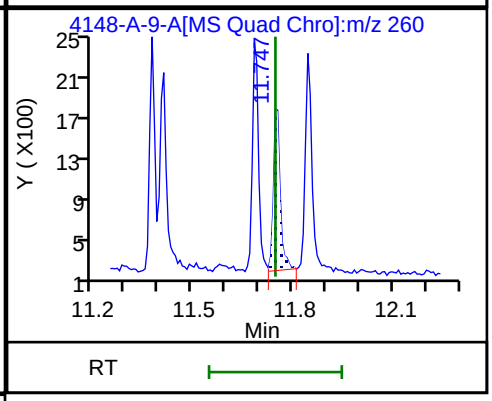
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

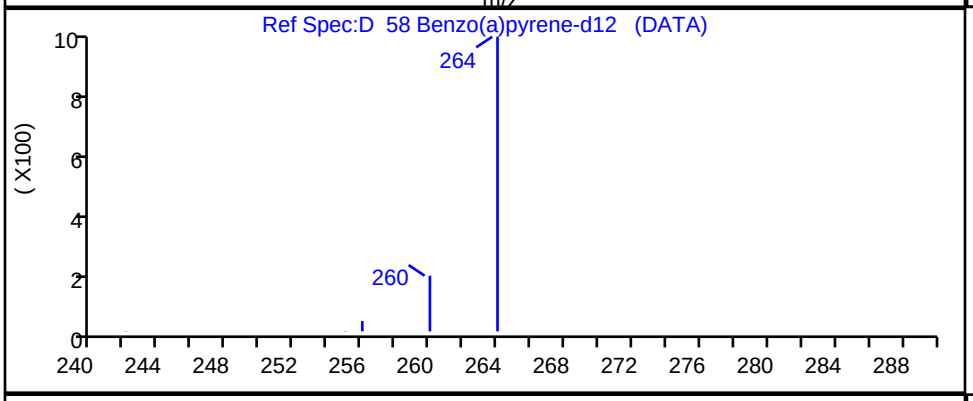
D 58 Benzo(a)pyrene-d12, CAS: 63466-71-7

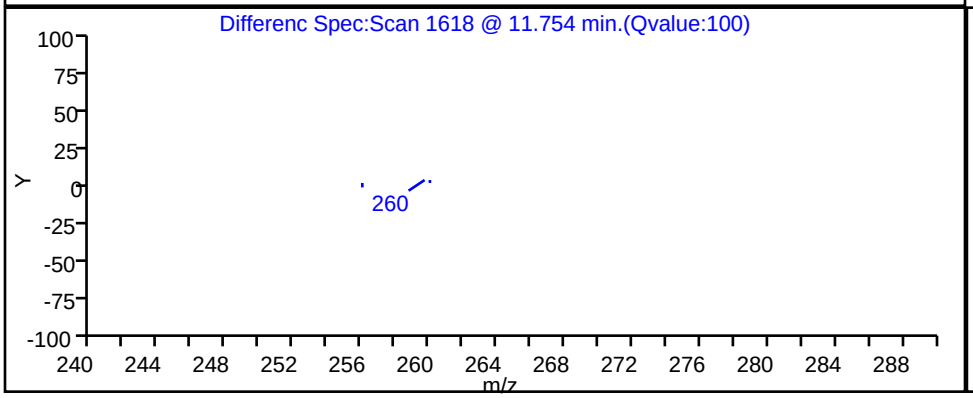


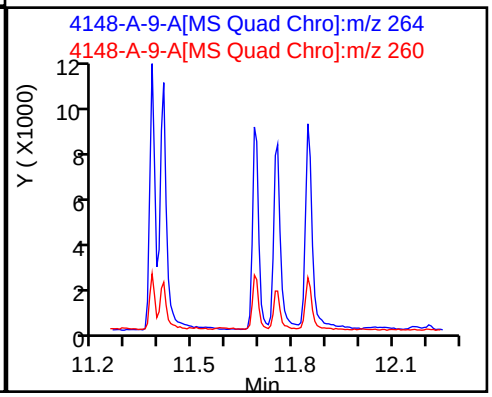












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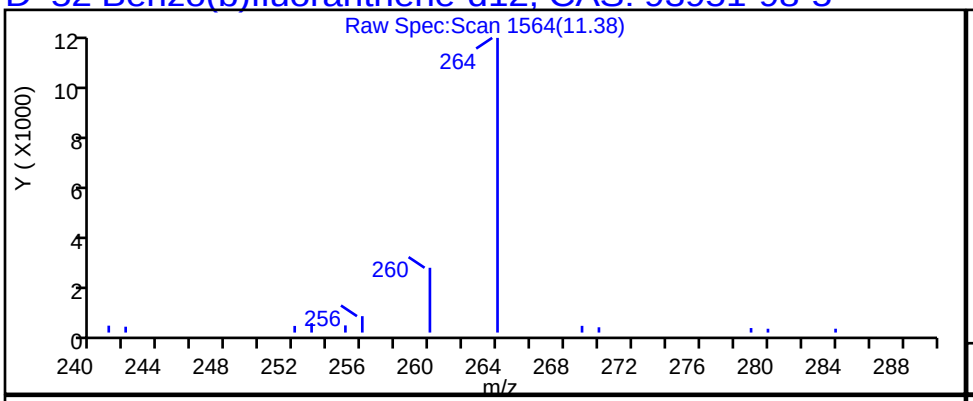
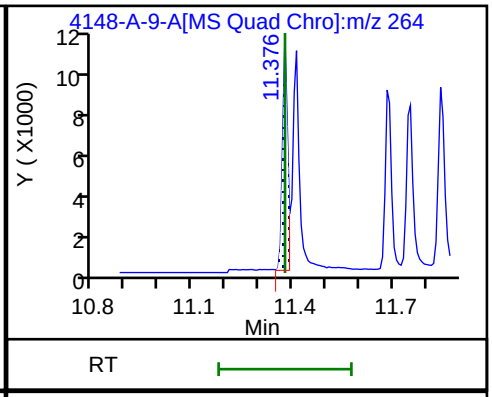
Eurofins Knoxville

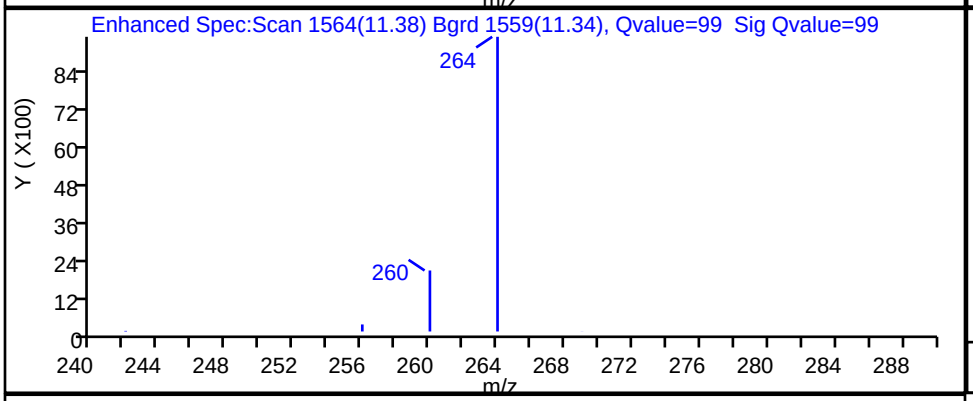
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D

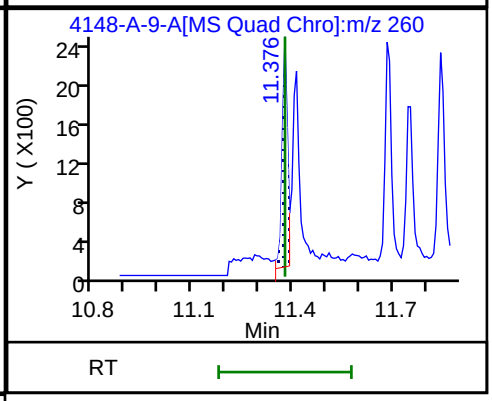
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

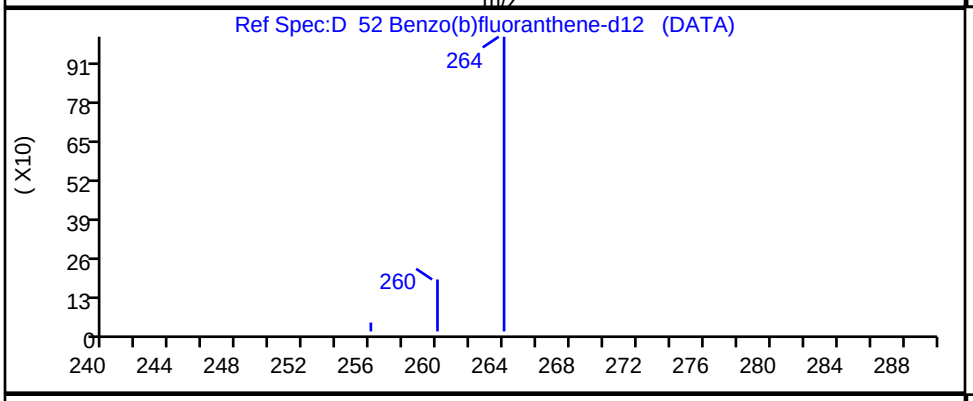
D 52 Benzo(b)fluoranthene-d12, CAS: 93951-98-5

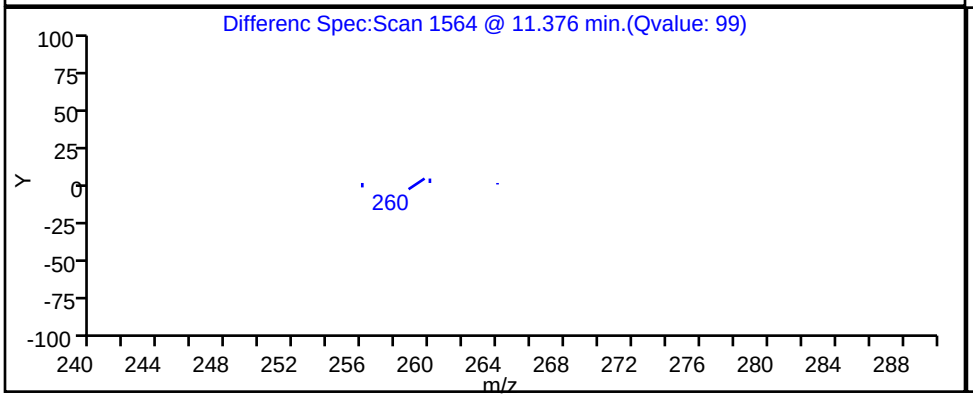


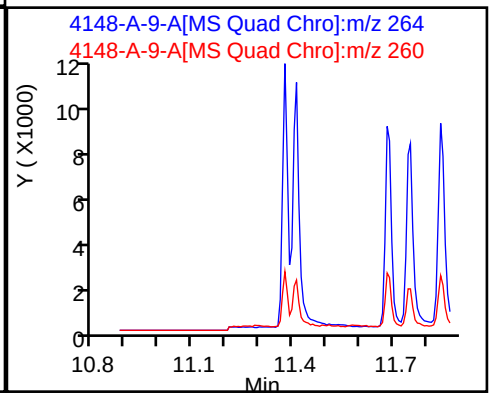










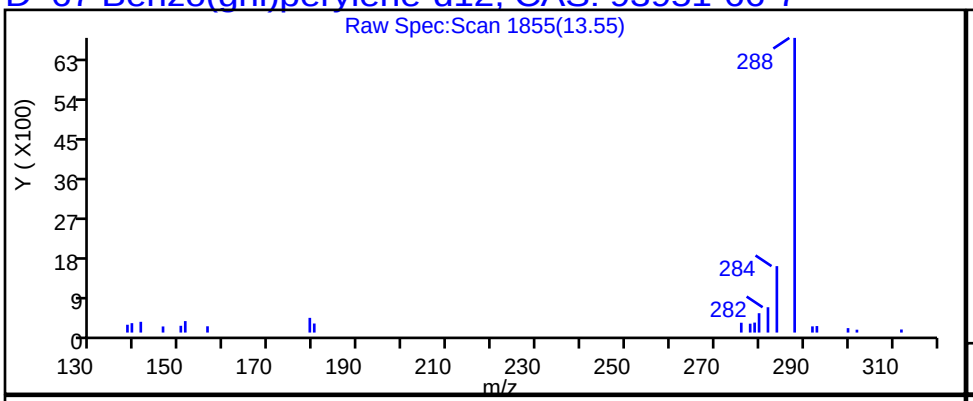


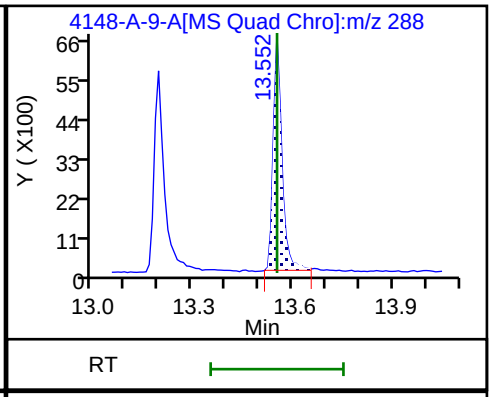
Report Date: 22-Nov-2023 13:56:28 Chrom Revision: 2.3 15-Nov-2023 20:54:34

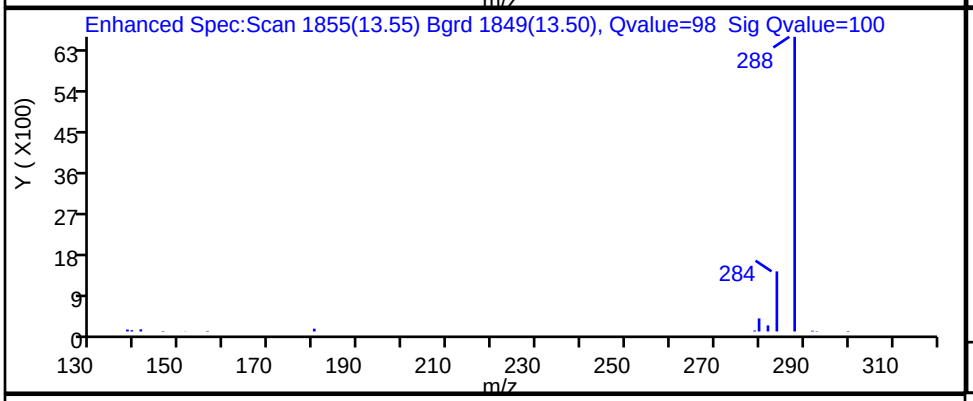
Eurofins Knoxville

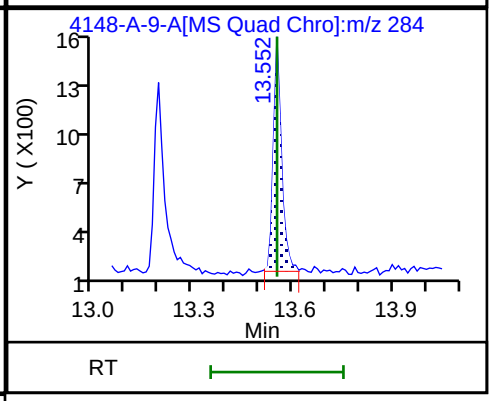
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D				
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

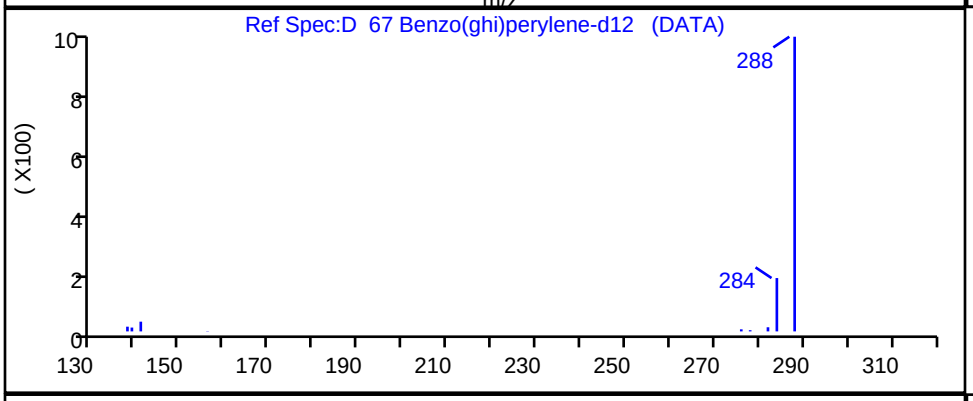
D 67 Benzo(ghi)perylene-d12, CAS: 93951-66-7

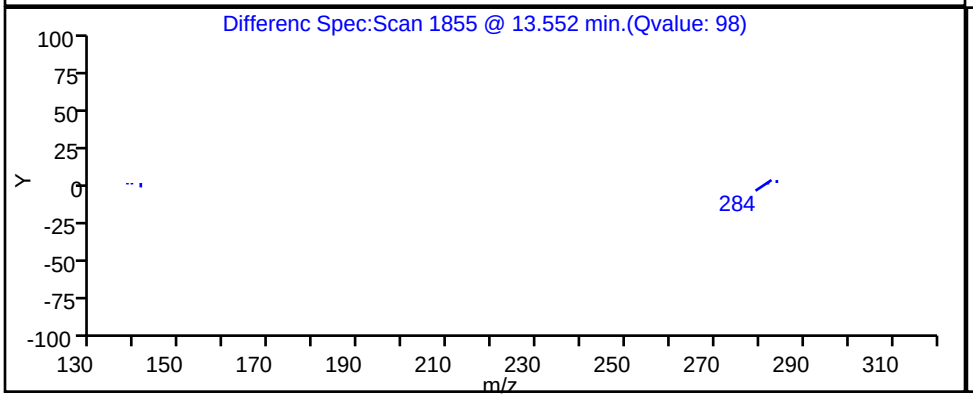


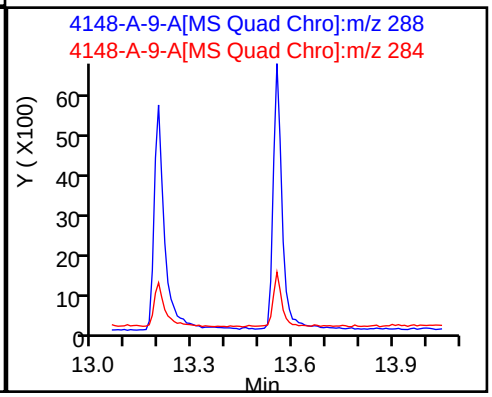










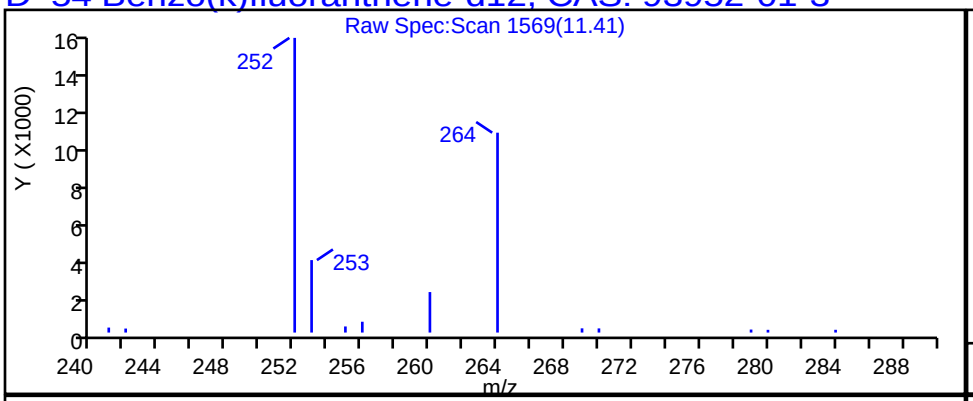


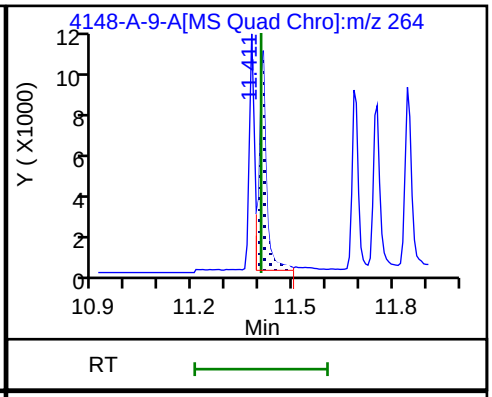
Report Date: 22-Nov-2023 13:56:28 Chrom Revision: 2.3 15-Nov-2023 20:54:34

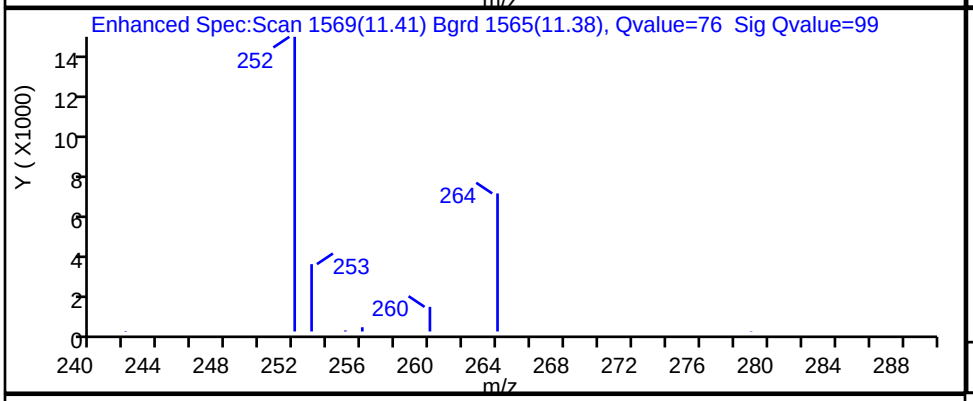
Eurofins Knoxville

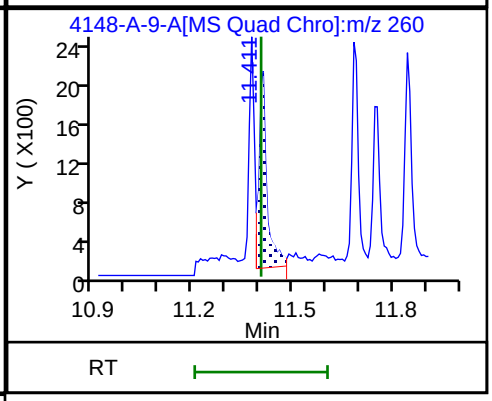
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D				
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

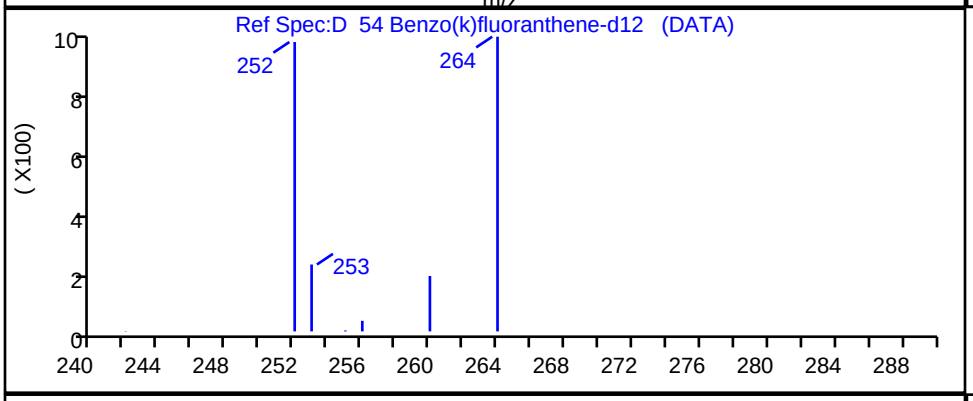
D 54 Benzo(k)fluoranthene-d12, CAS: 93952-01-3

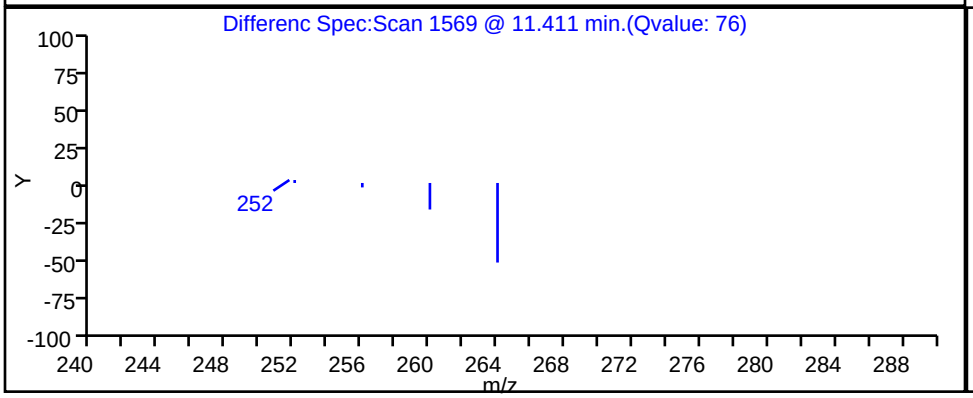


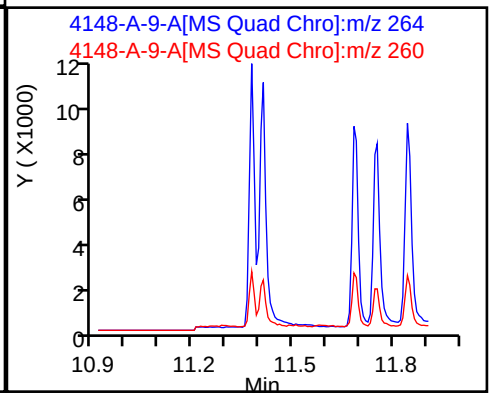












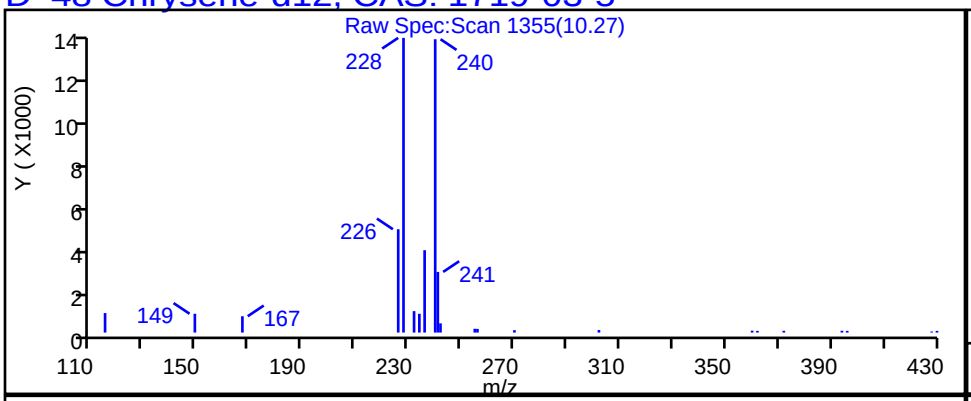
Report Date: 22-Nov-2023 13:56:28 Chrom Revision: 2.3 15-Nov-2023 20:54:34

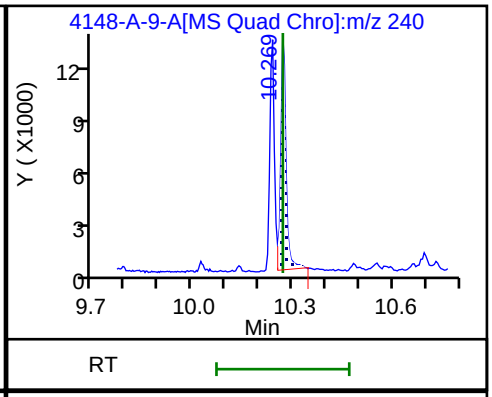
Eurofins Knoxville

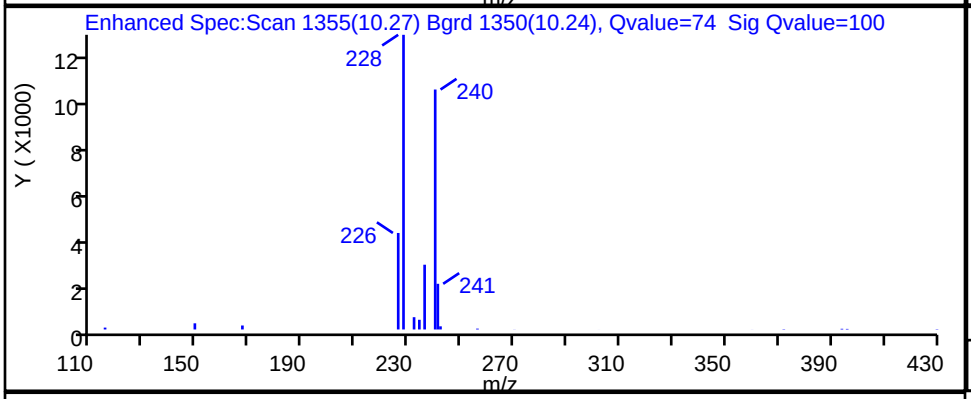
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D

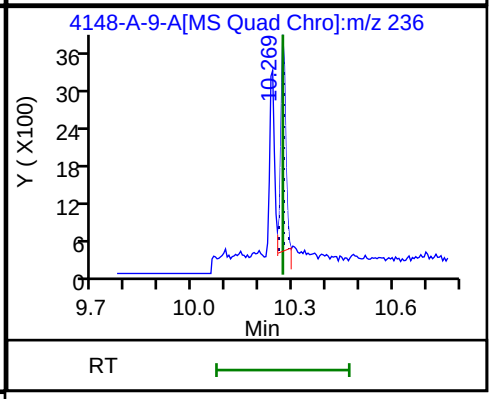
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9
Client ID:	1804576-843-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

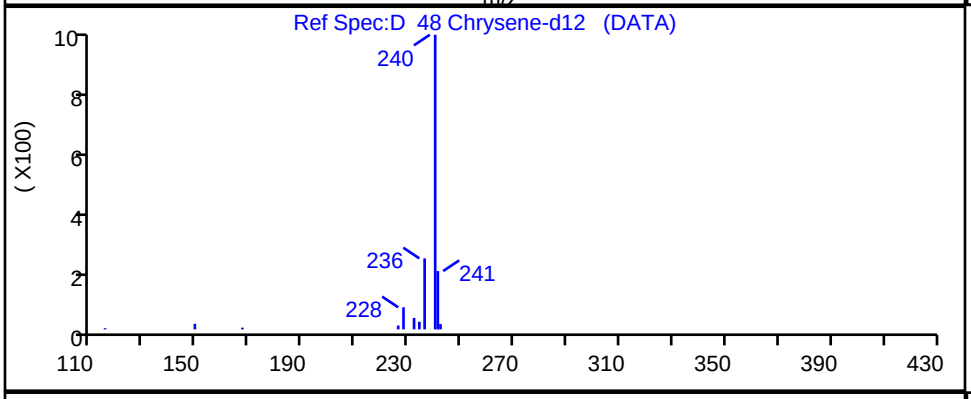
D 48 Chrysene-d12, CAS: 1719-03-5

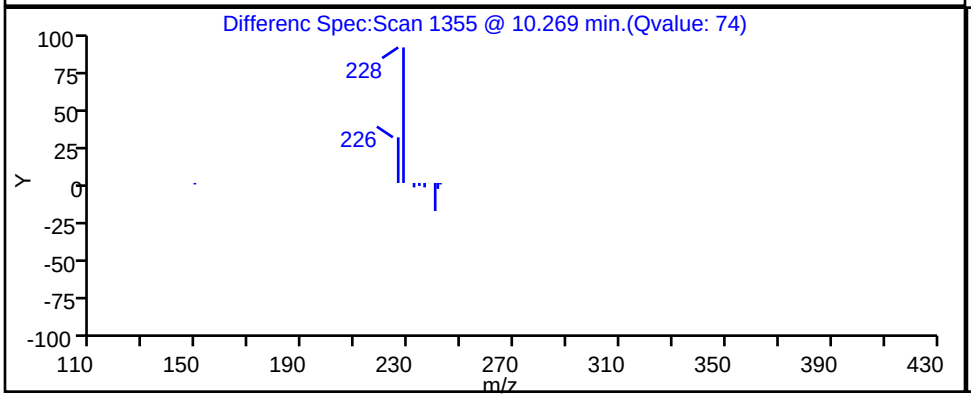


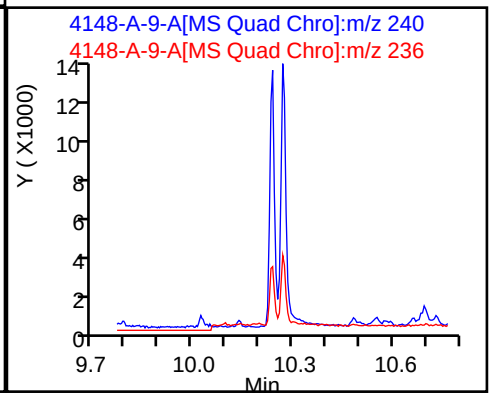












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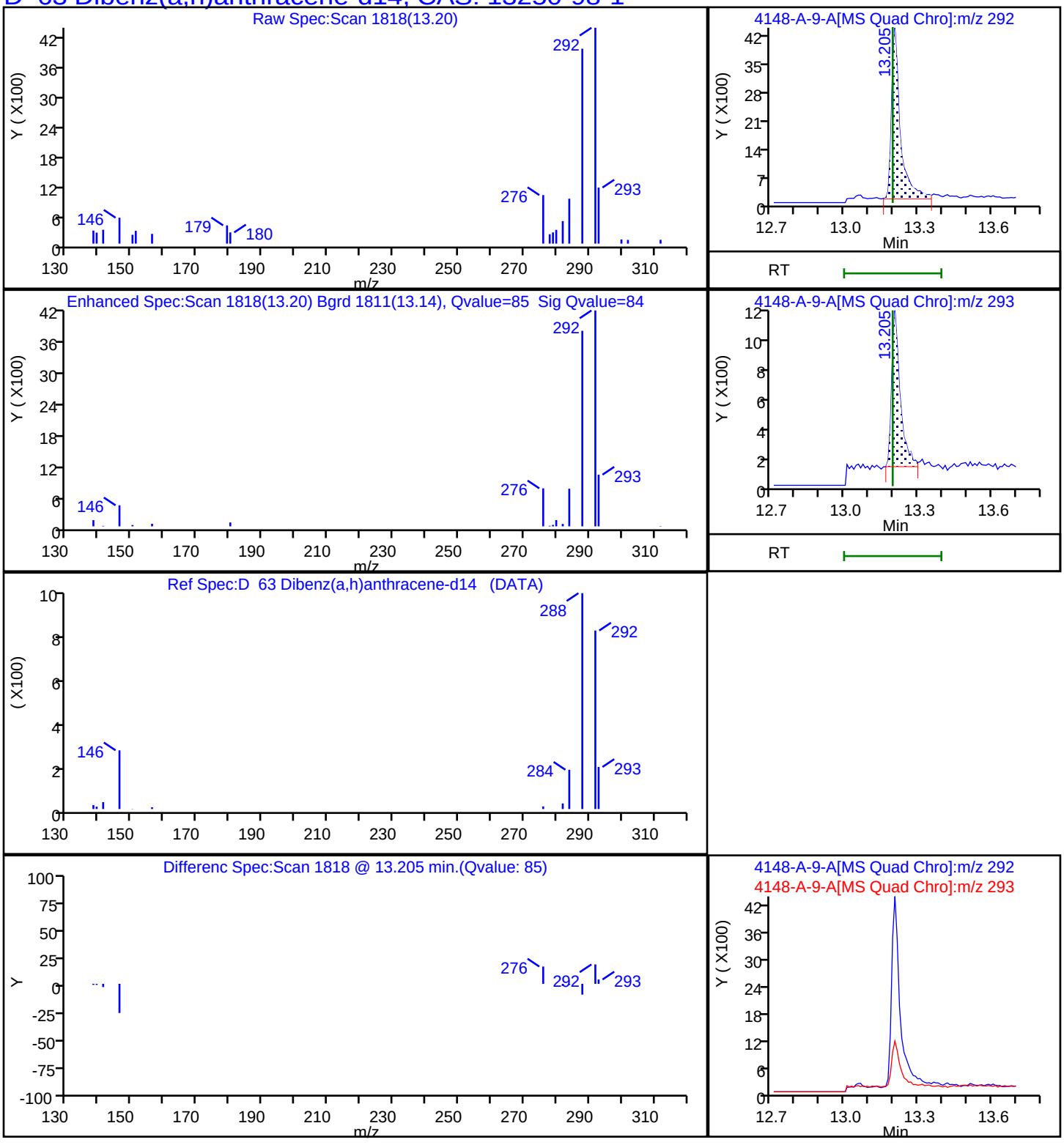
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D

Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 63 Dibenz(a,h)anthracene-d14, CAS: 13250-98-1



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Eurofins Knoxville

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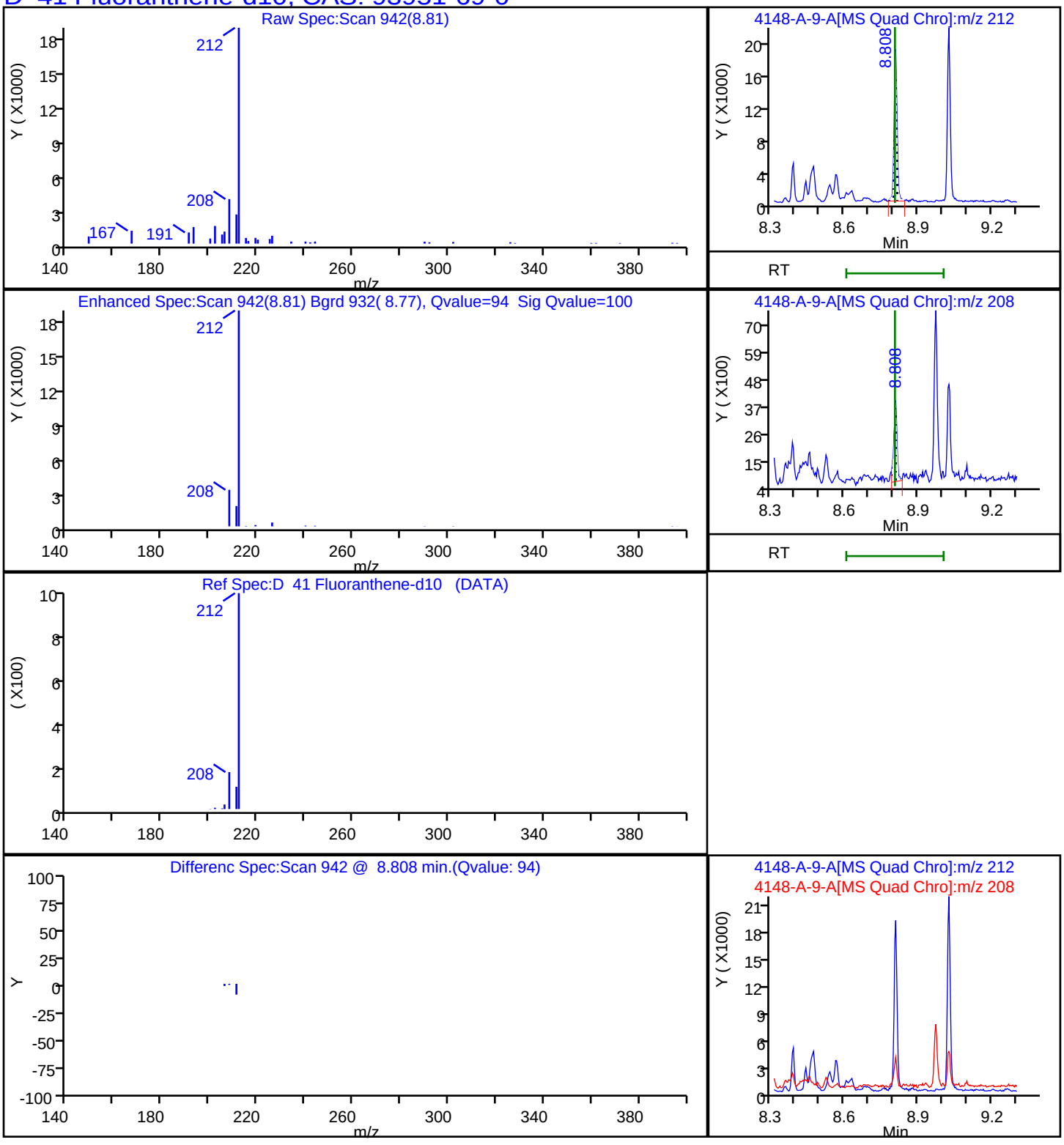
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 41 Fluoranthene-d10, CAS: 93951-69-0



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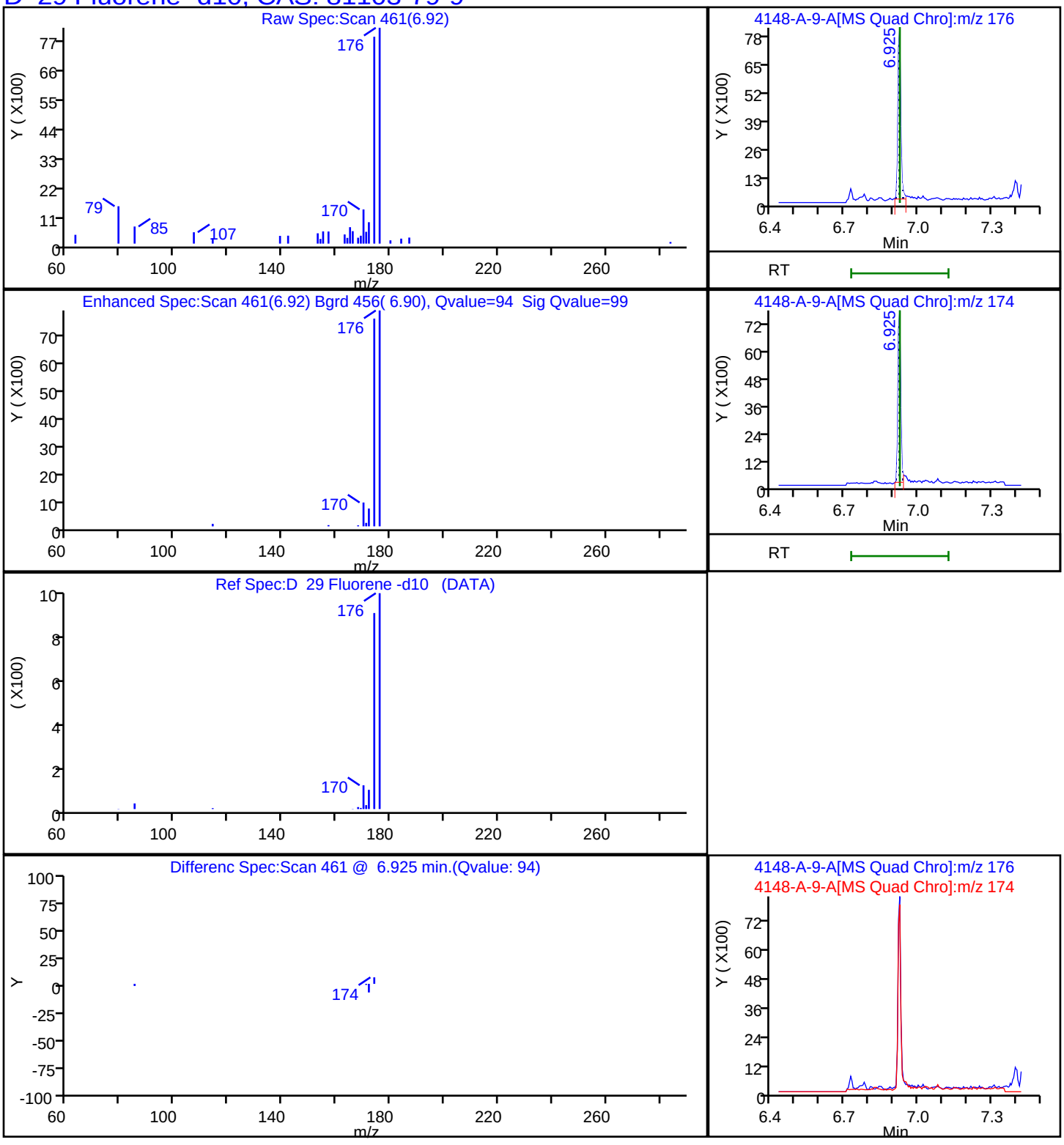
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D

Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 29 Fluorene -d10, CAS: 81103-79-9



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Eurofins Knoxville

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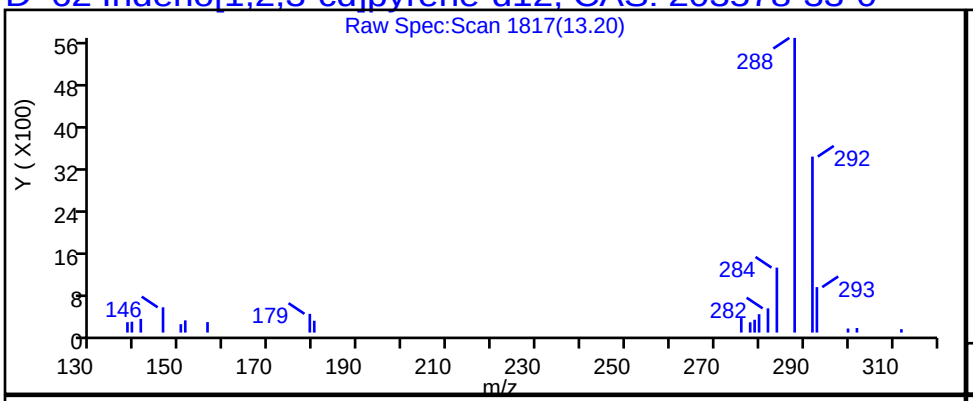
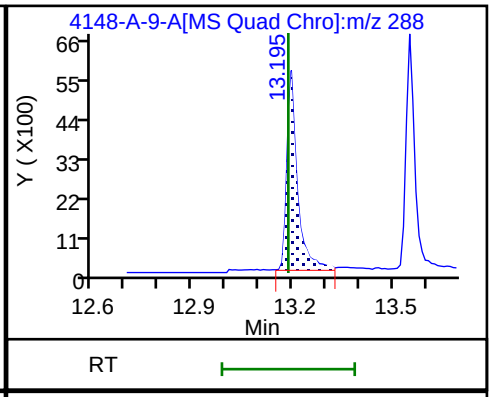
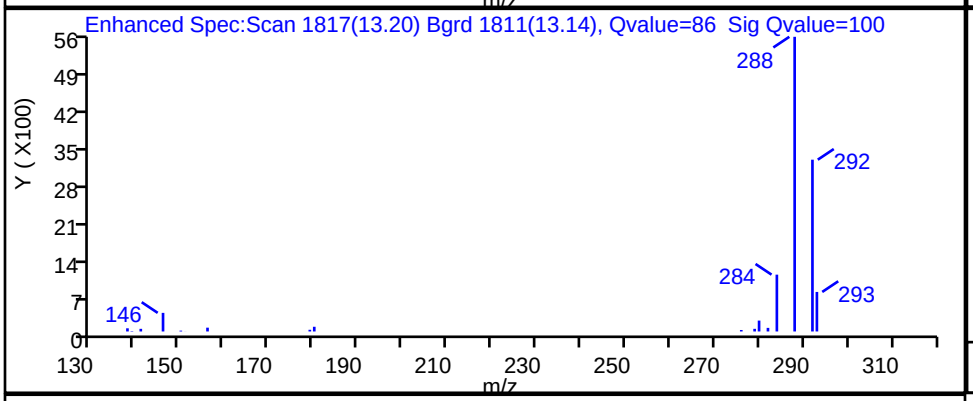
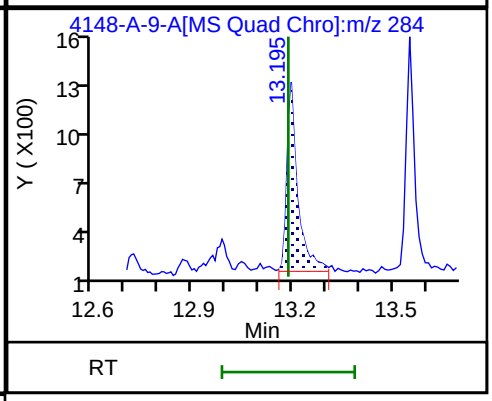
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

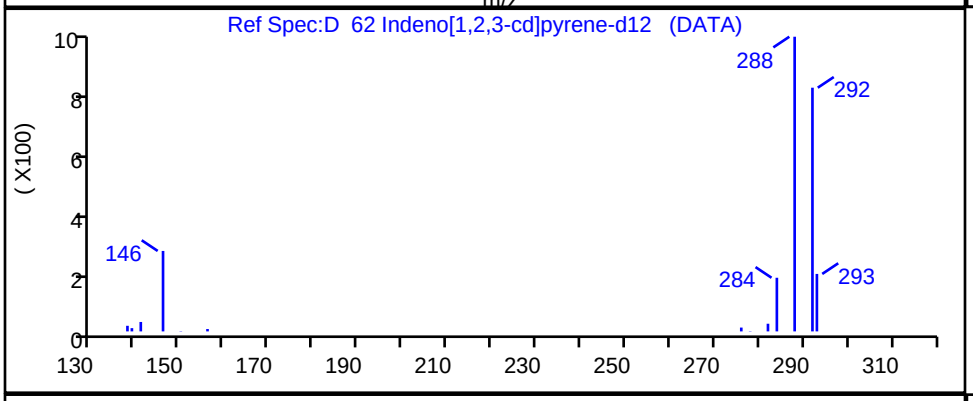
D 62 Indeno[1,2,3-cd]pyrene-d12, CAS: 203578-33-0

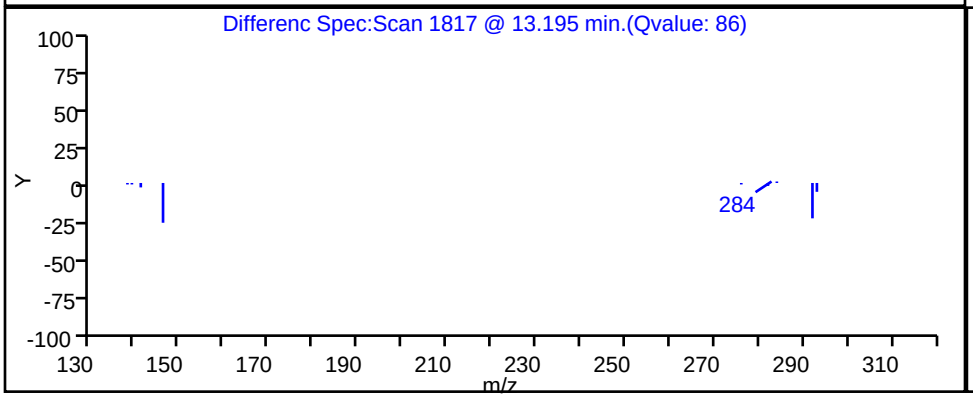


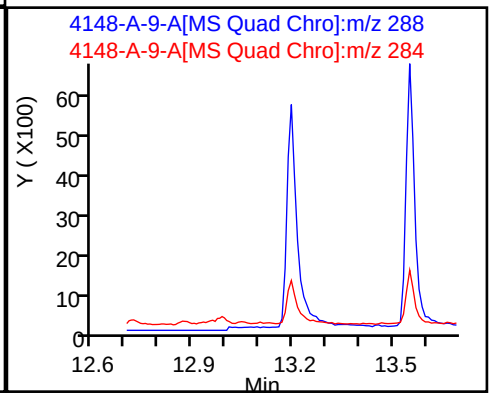












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Eurofins Knoxville

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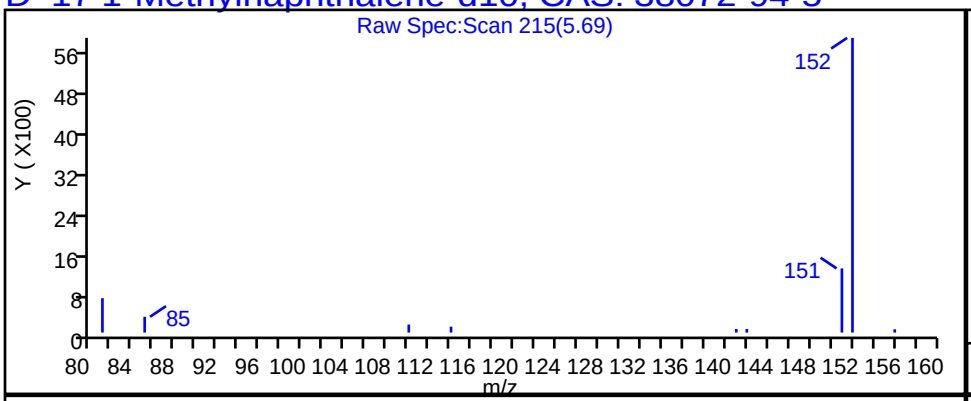
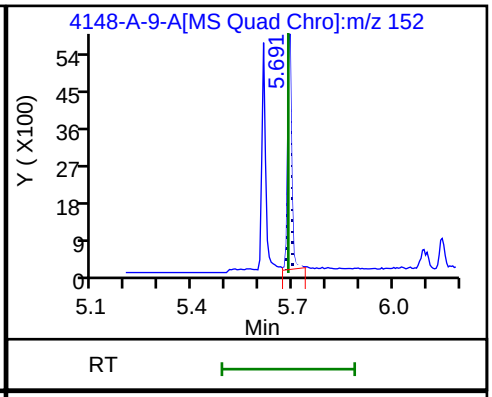
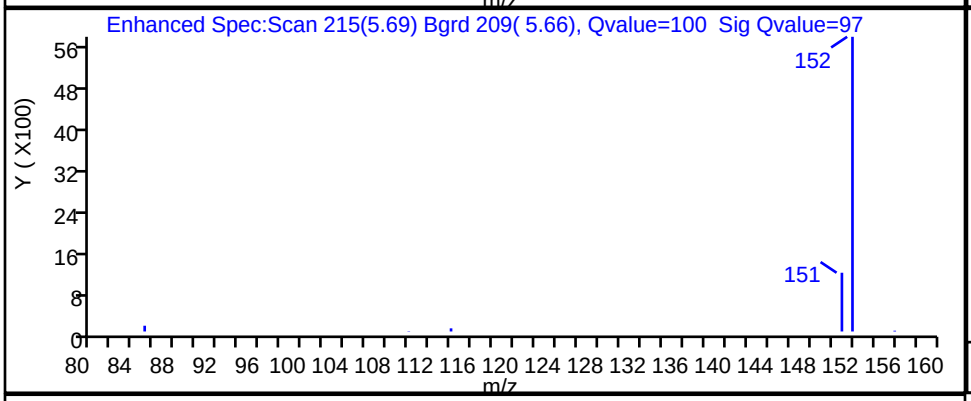
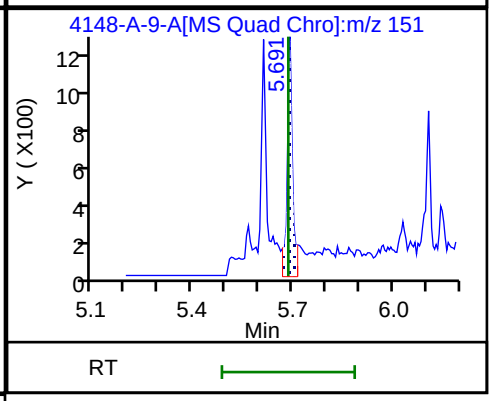
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

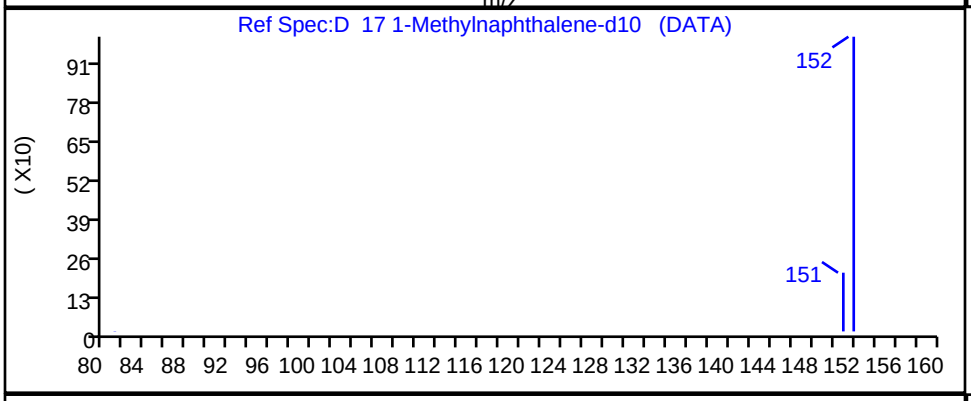
D 17 1-Methylnaphthalene-d10, CAS: 38072-94-5

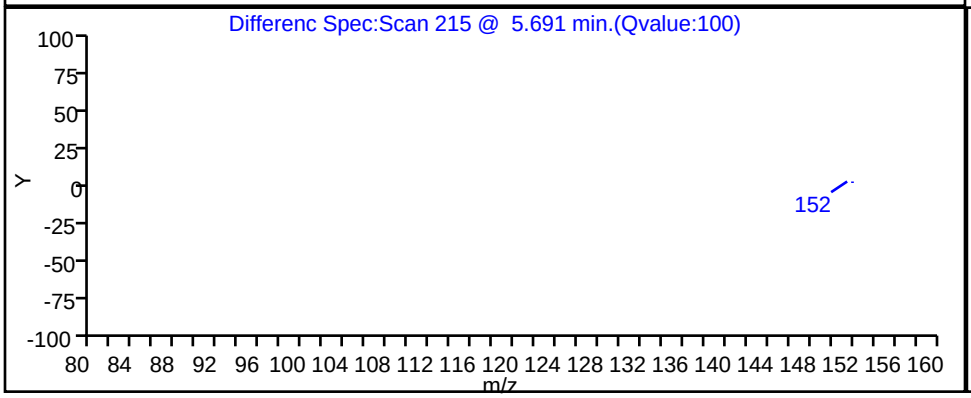


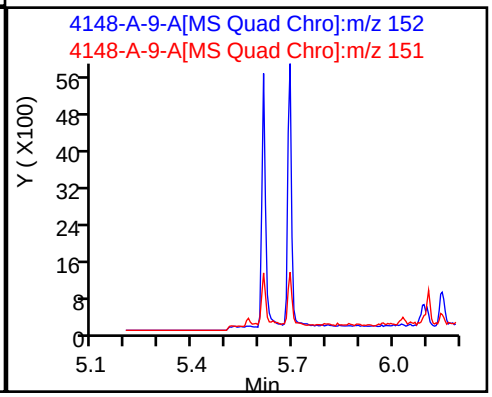












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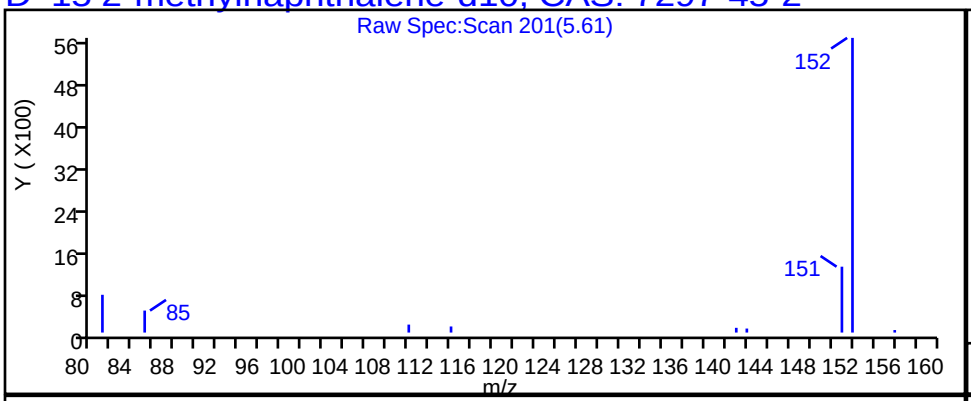
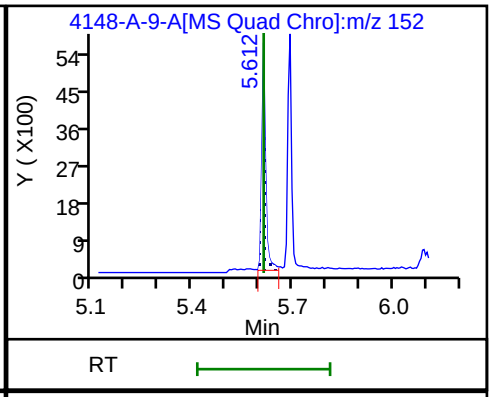
Eurofins Knoxville

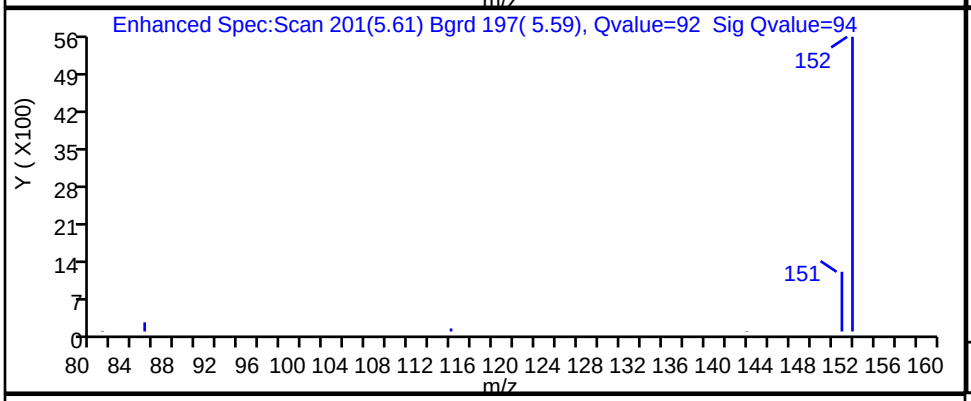
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D

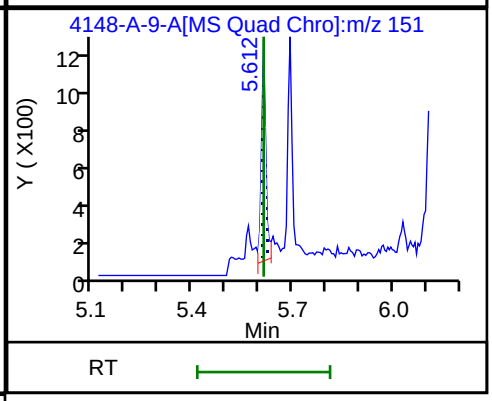
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9
Client ID:	1804576-843-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

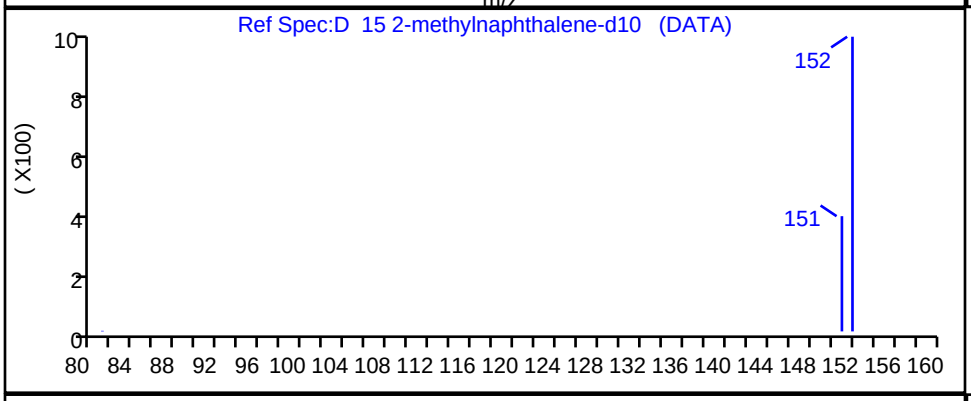
D 15 2-methylnaphthalene-d10, CAS: 7297-45-2

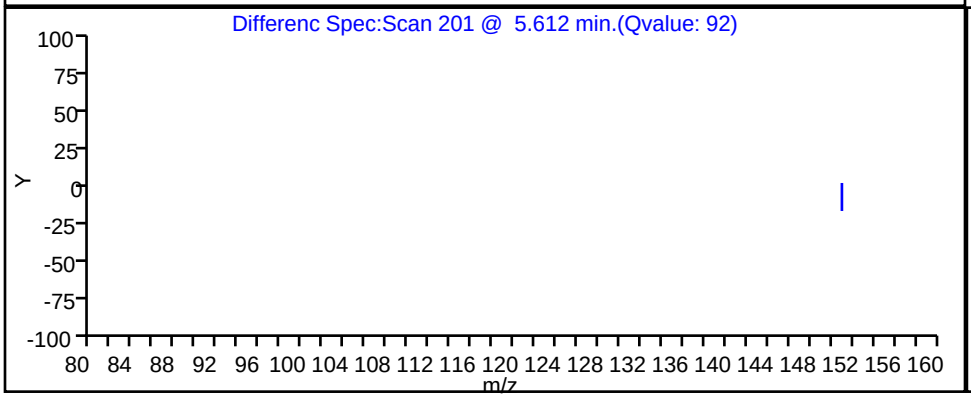


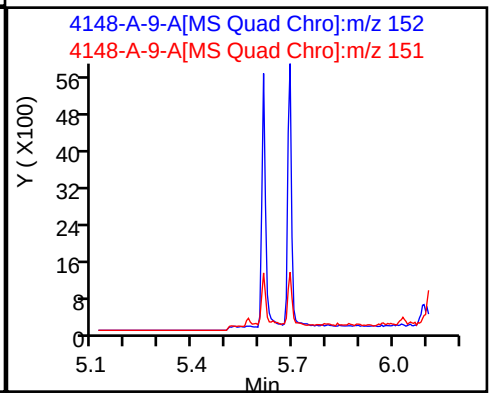












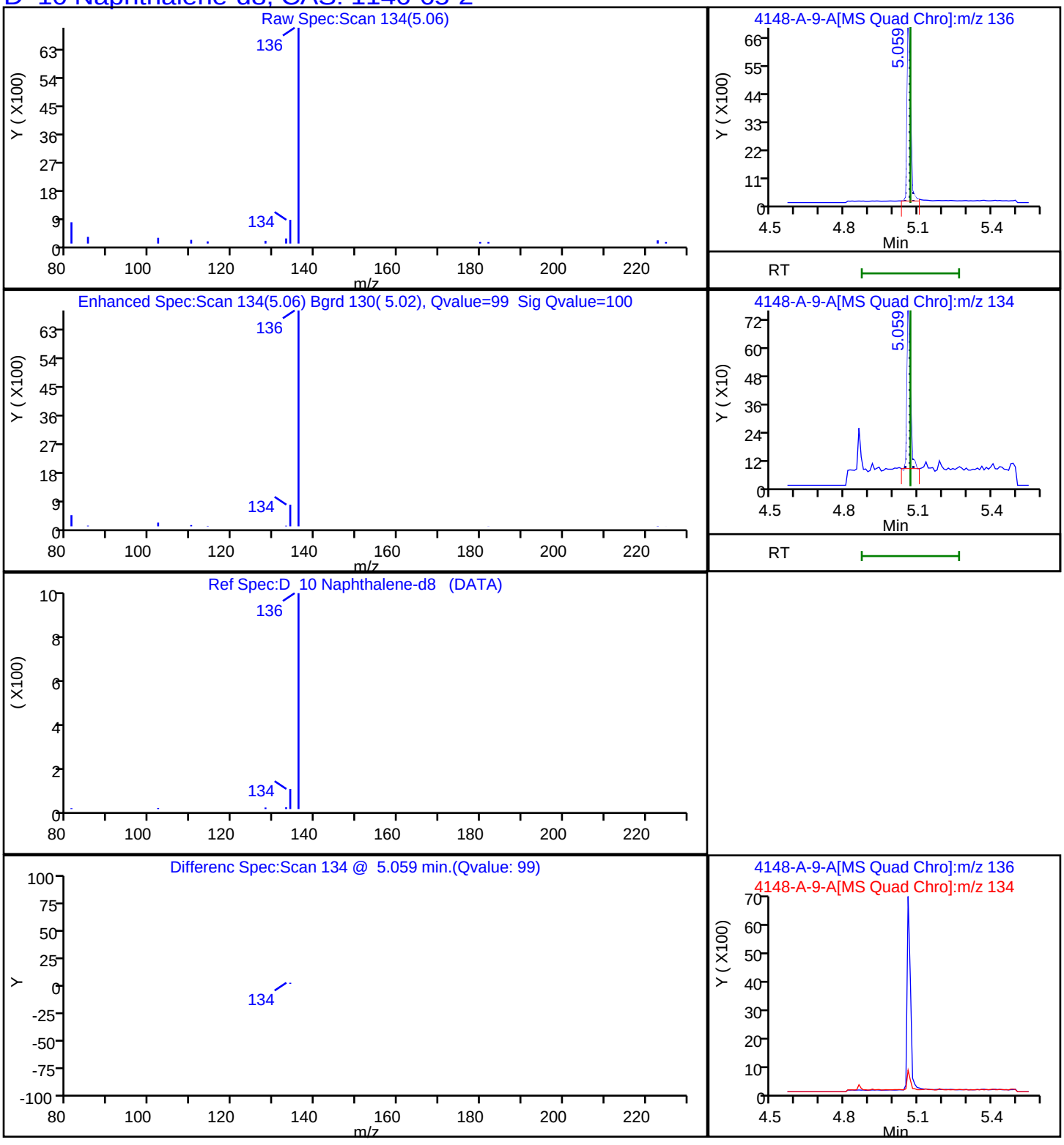
Report Date: 22-Nov-2023 13:56:27 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D

Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9
Client ID:	1804576-843-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

D_10 Naphthalene-d8, CAS: 1146-65-2



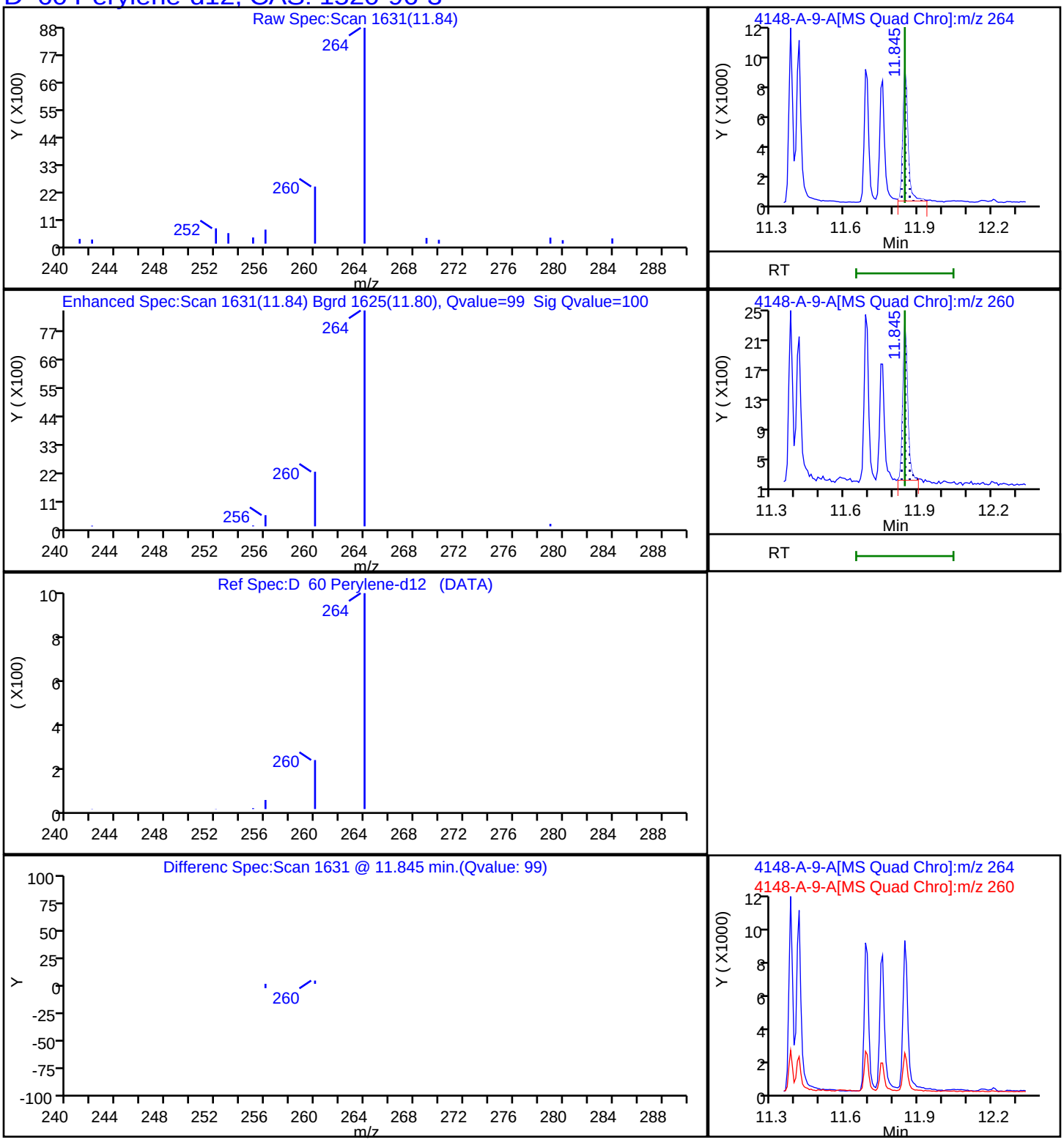
Report Date: 22-Nov-2023 13:56:28 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D

Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 60 Perylene-d12, CAS: 1520-96-3



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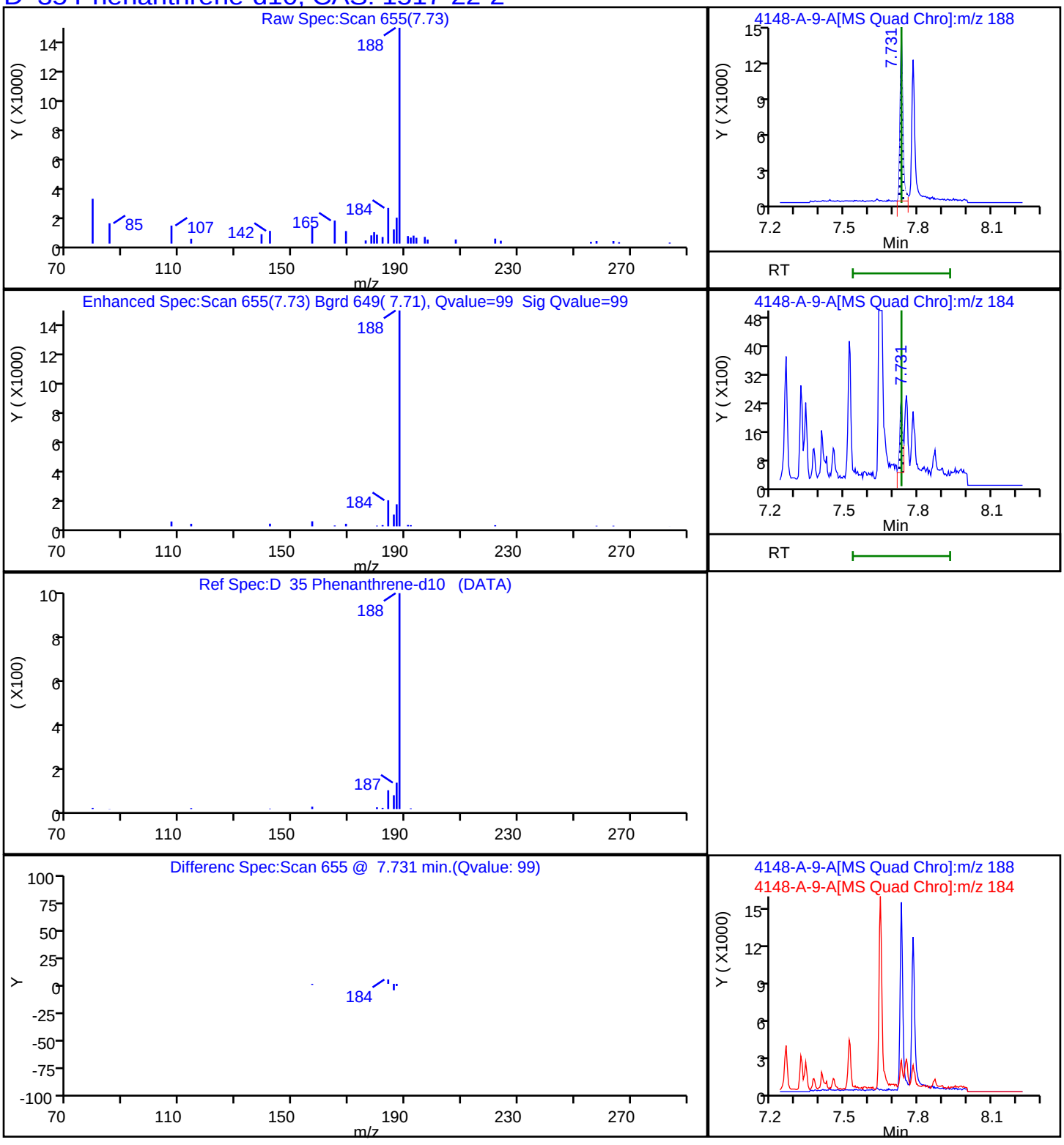
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D

Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9
Client ID:	1804576-843-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

D_35 Phenanthrene-d10, CAS: 1517-22-2



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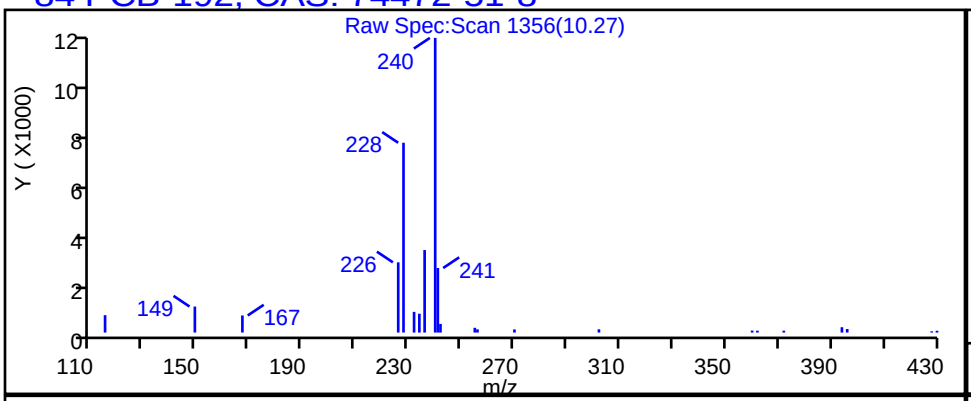
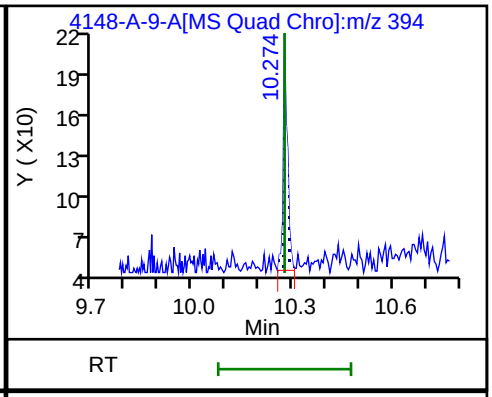
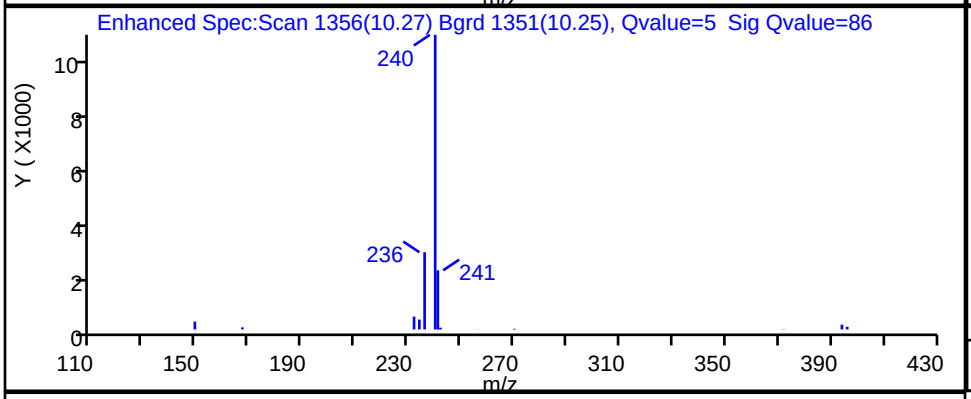
Eurofins Knoxville

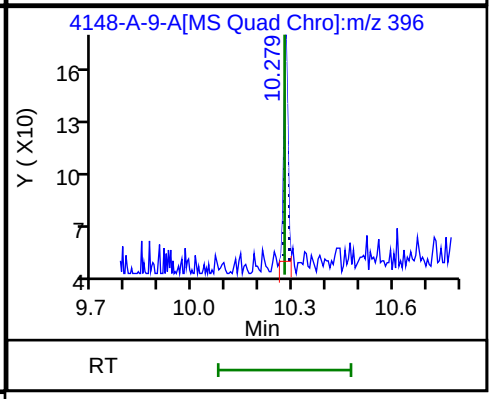
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D		
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9
Client ID:	1804576-843-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

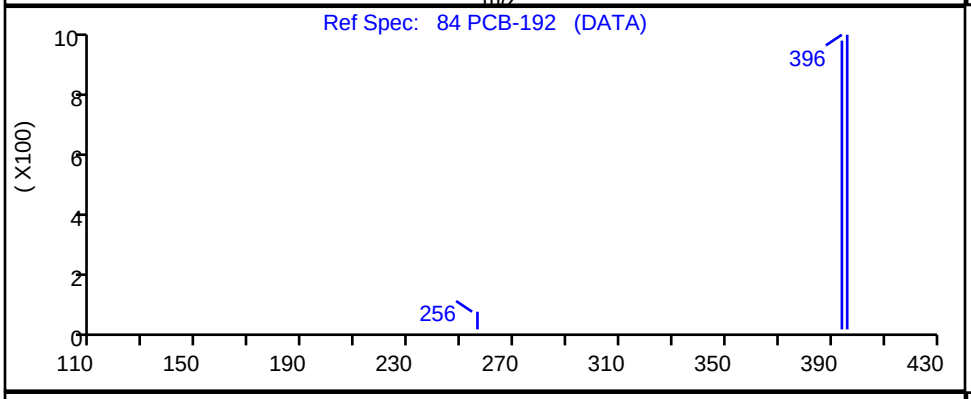
84 PCB-192, CAS: 74472-51-8

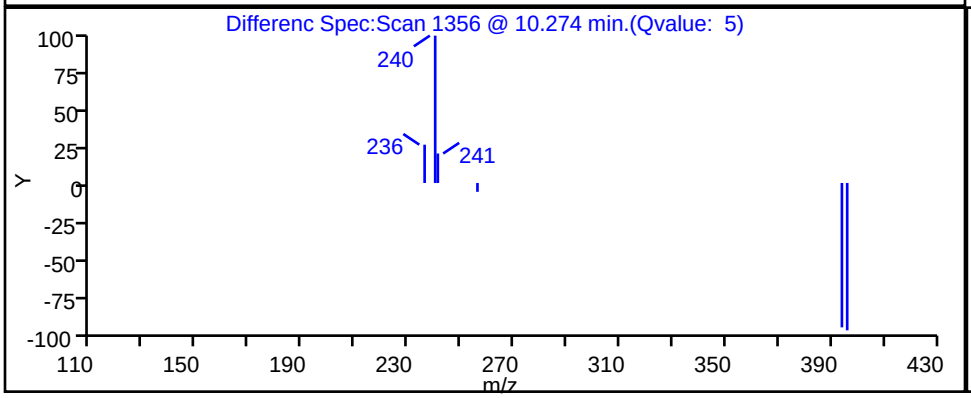


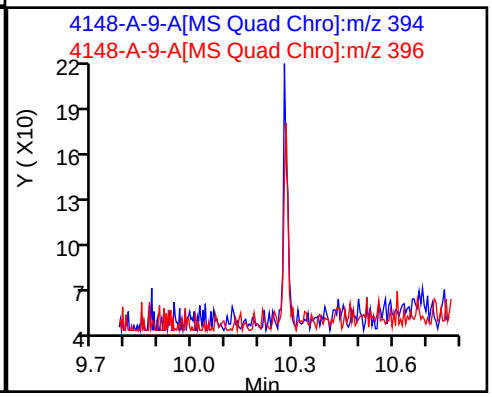












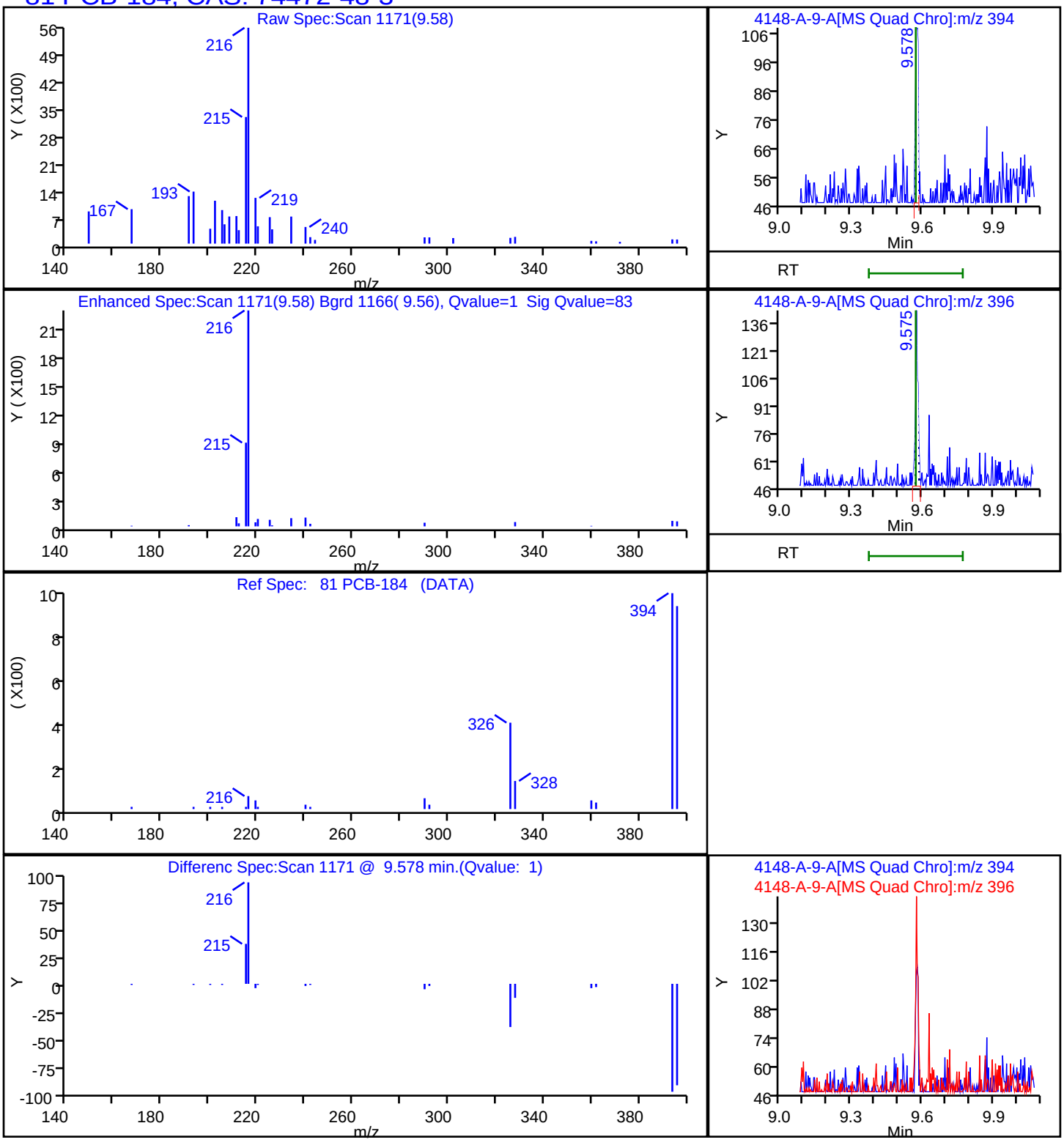
Report Date: 22-Nov-2023 13:56:28 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D

Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

81 PCB-184, CAS: 74472-48-3



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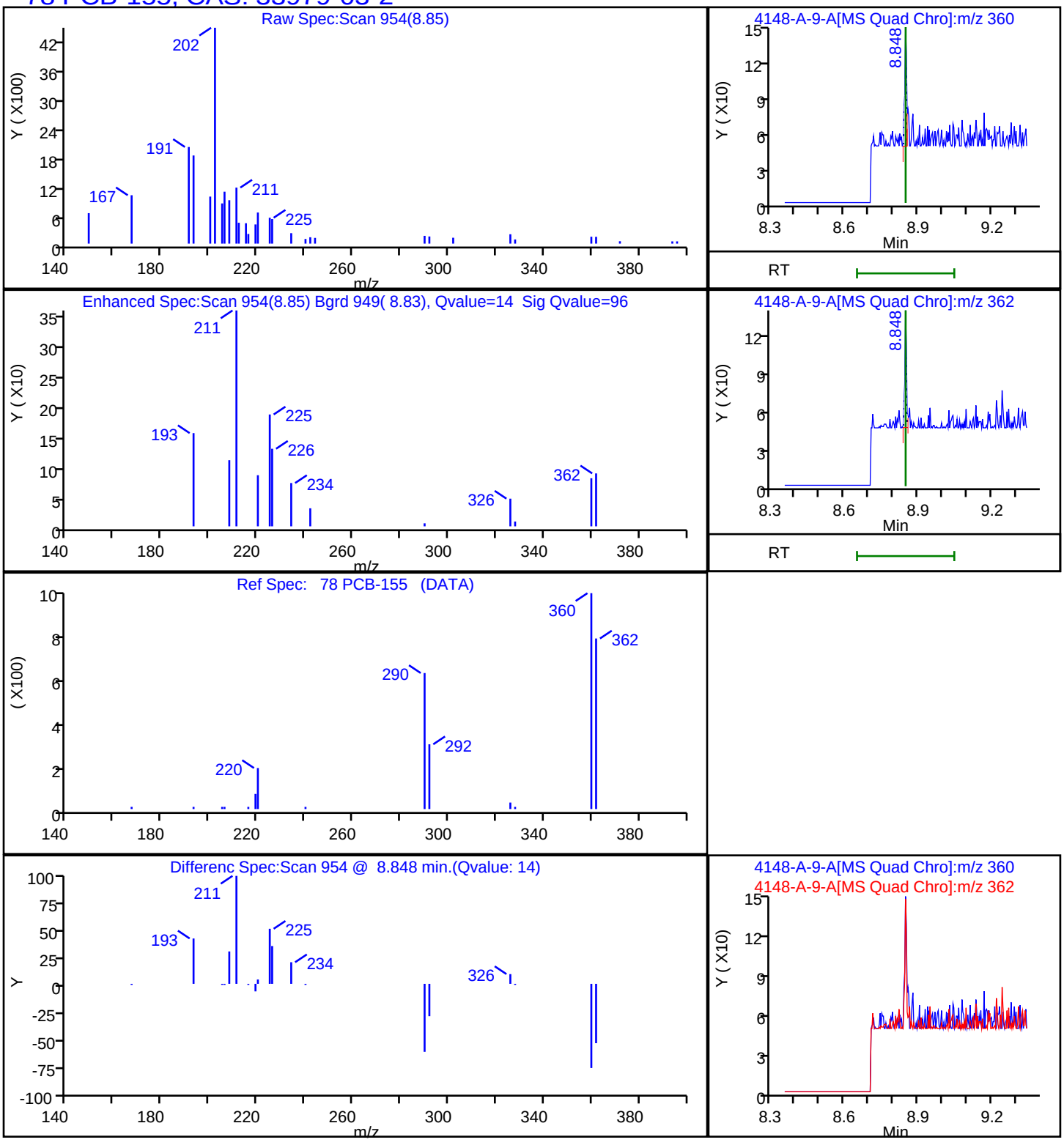
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D

Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9
Client ID:	1804576-843-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

78 PCB-155, CAS: 33979-03-2



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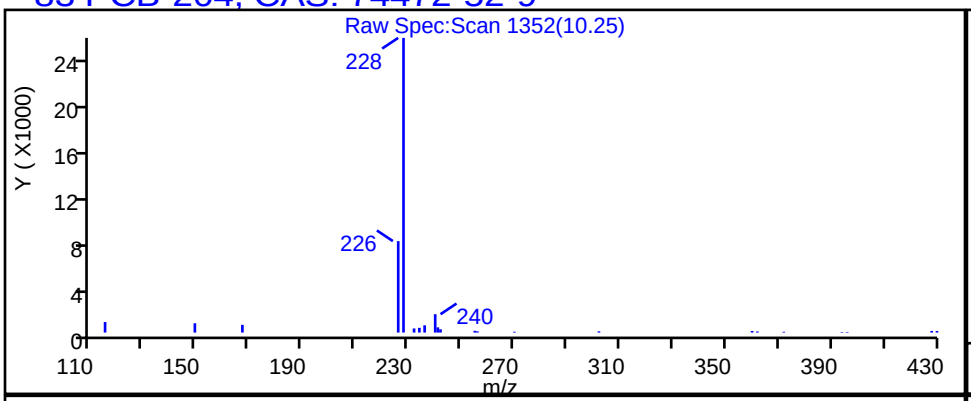
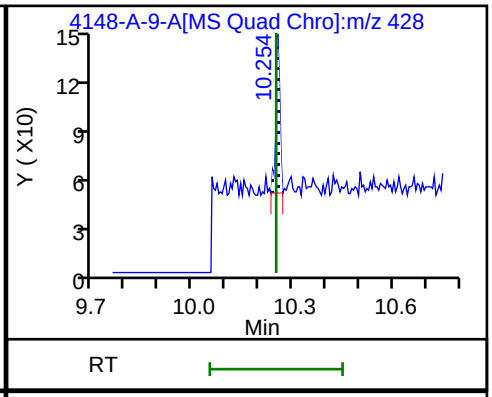
Eurofins Knoxville

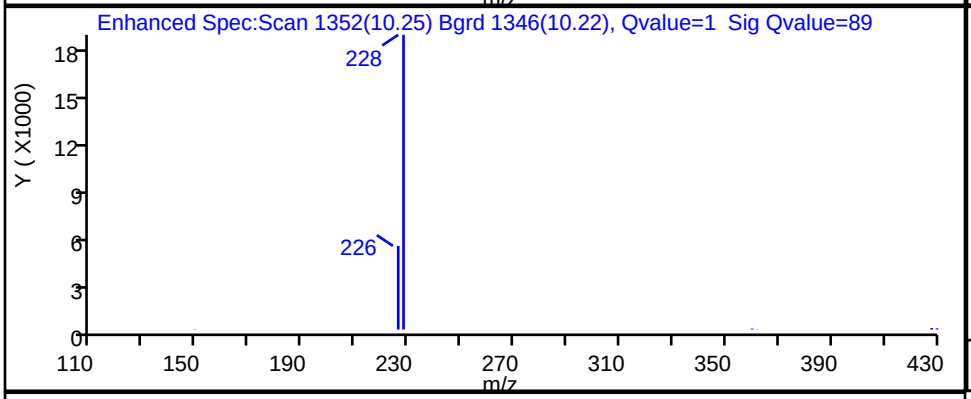
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D

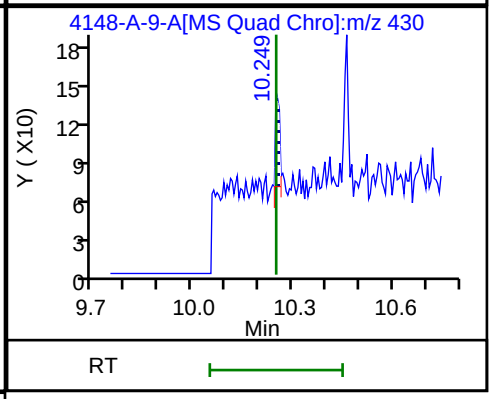
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9
Client ID:	1804576-843-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

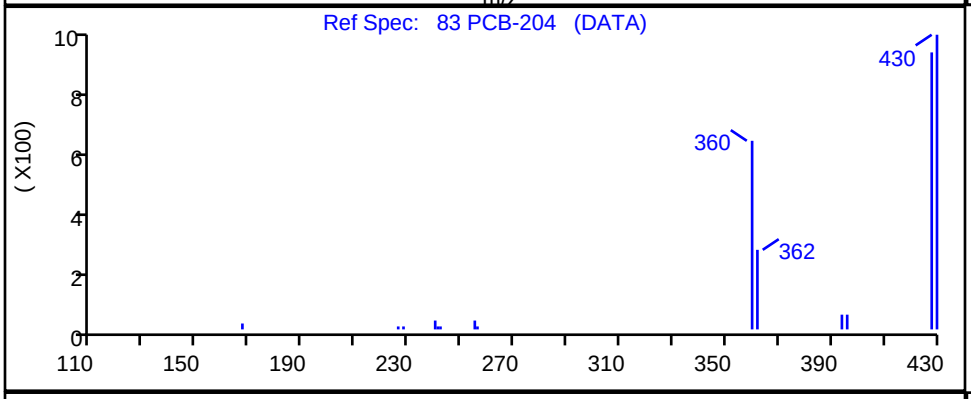
83 PCB-204, CAS: 74472-52-9

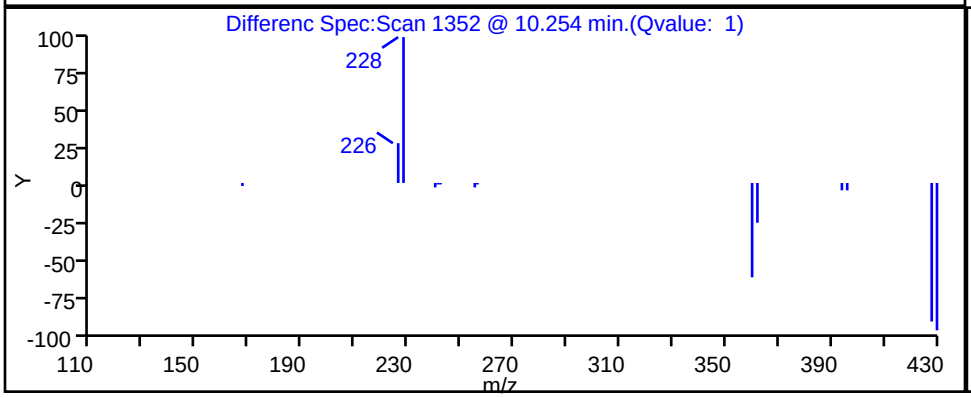


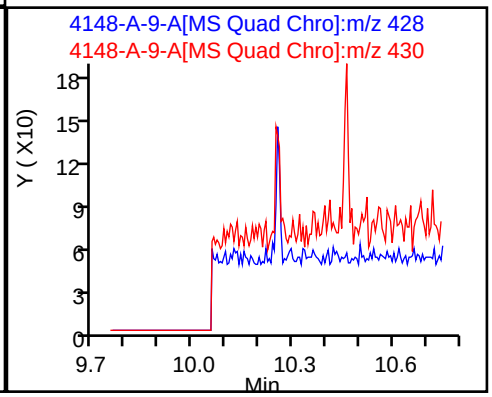












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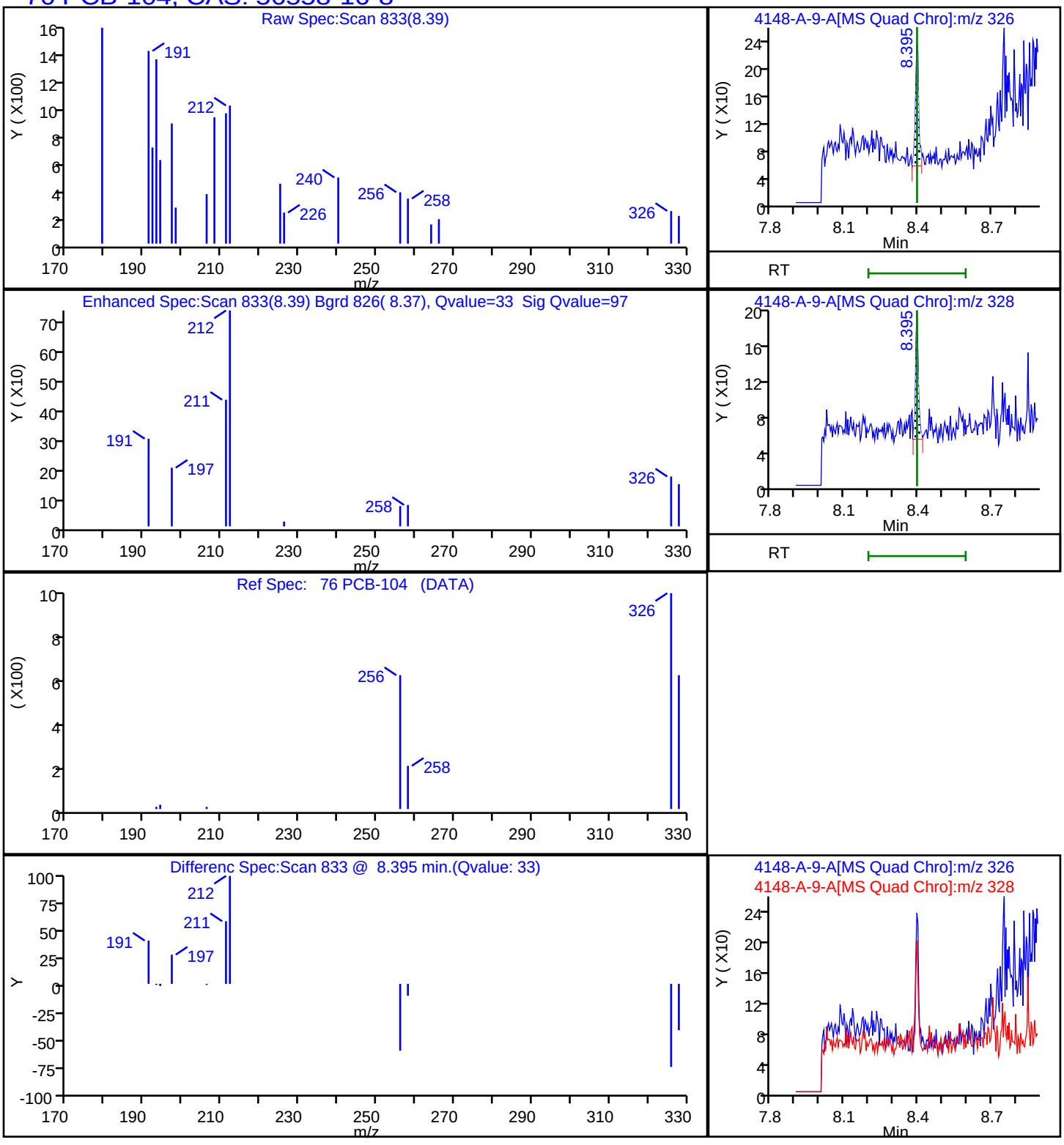
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D

Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

76 PCB-104, CAS: 56558-16-8



Manual Integration/User Assign Peak Report

Eurofins Knoxville

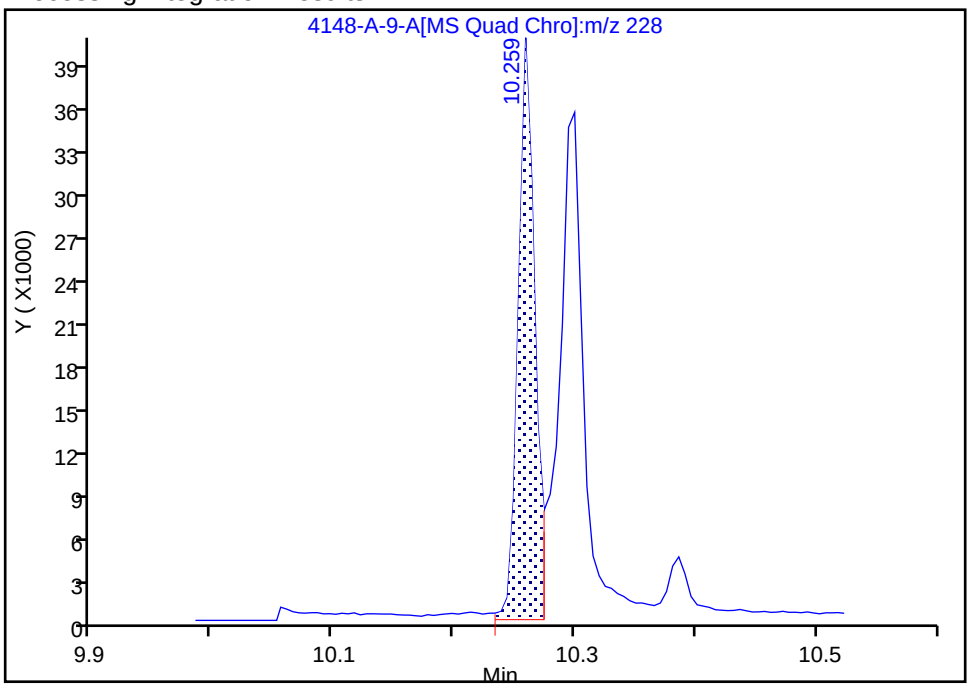
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D				
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

47 Benzo[a]anthracene, CAS: 56-55-3

Signal: 1

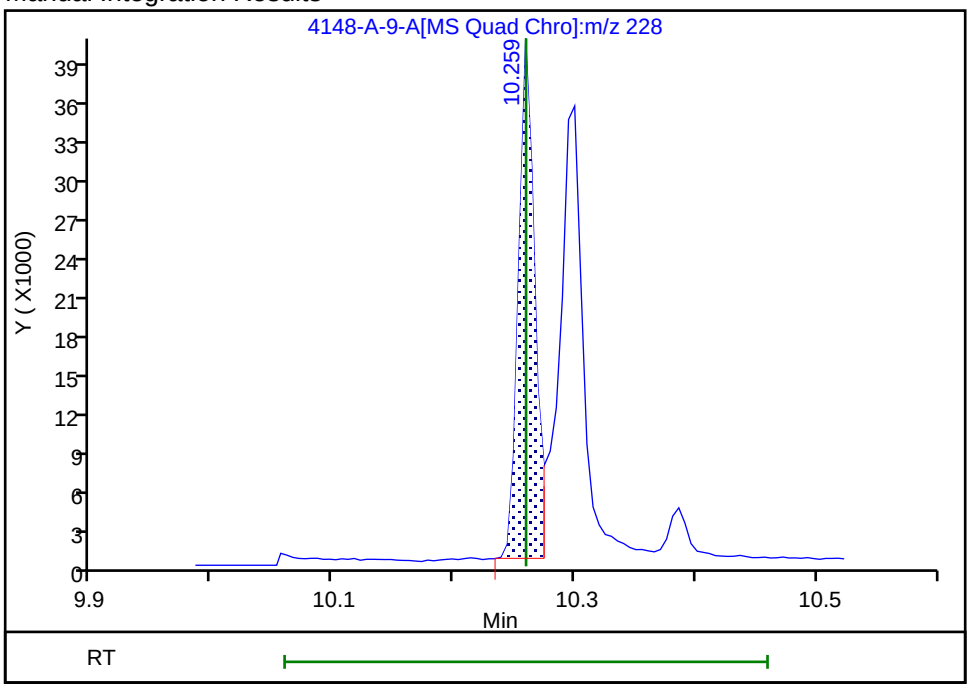
Processing Integration Results

RT: 10.26
Area: 39598
Amount: 0.209643
Amount Units: ug/ml



Manual Integration Results

RT: 10.26
Area: 38186
Amount: 0.202168
Amount Units: ug/ml



Reviewer: SK9U, 20-Nov-2023 09:23:44 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

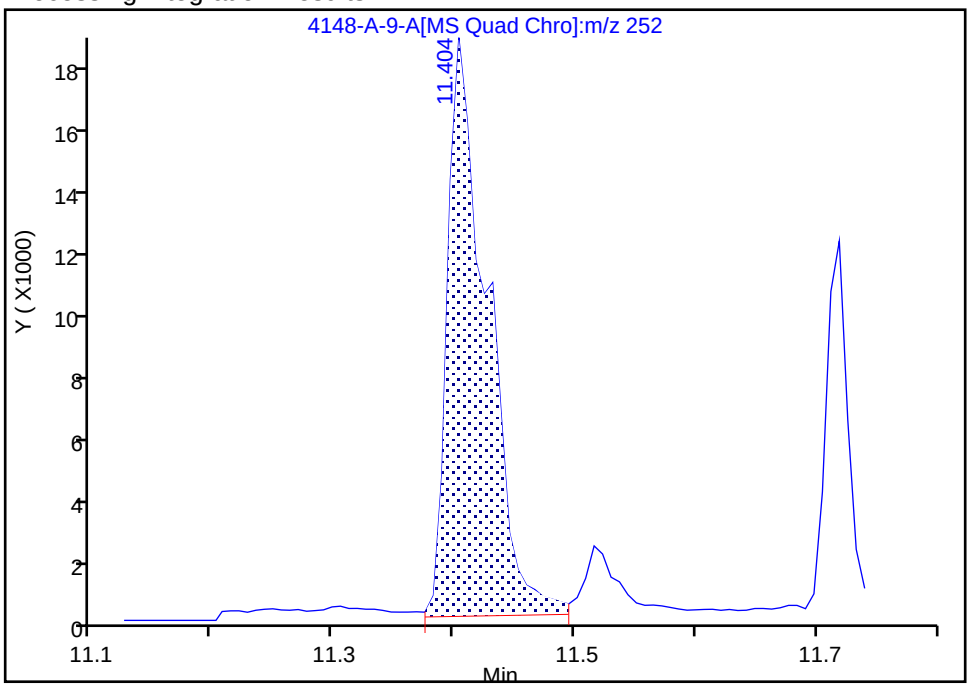
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D				
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

53 Benzo[b]fluoranthene, CAS: 205-99-2

Signal: 1

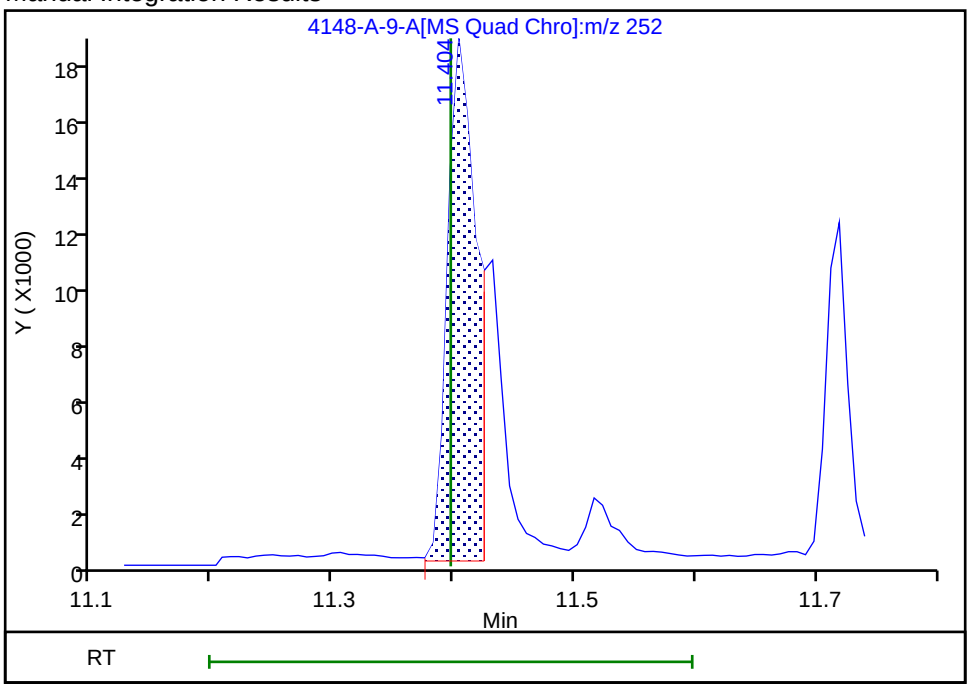
Processing Integration Results

RT: 11.40
Area: 40797
Amount: 0.203726
Amount Units: ug/ml



Manual Integration Results

RT: 11.40
Area: 30700
Amount: 0.153305
Amount Units: ug/ml



Reviewer: SK9U, 20-Nov-2023 09:24:15 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

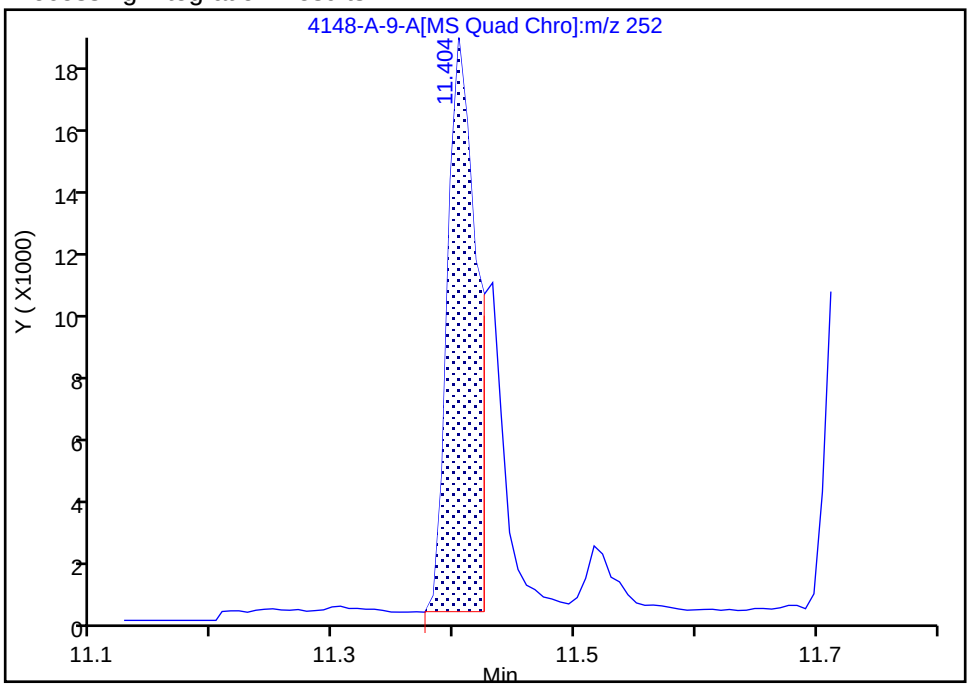
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D				
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

55 Benzo[k]fluoranthene, CAS: 207-08-9

Signal: 1

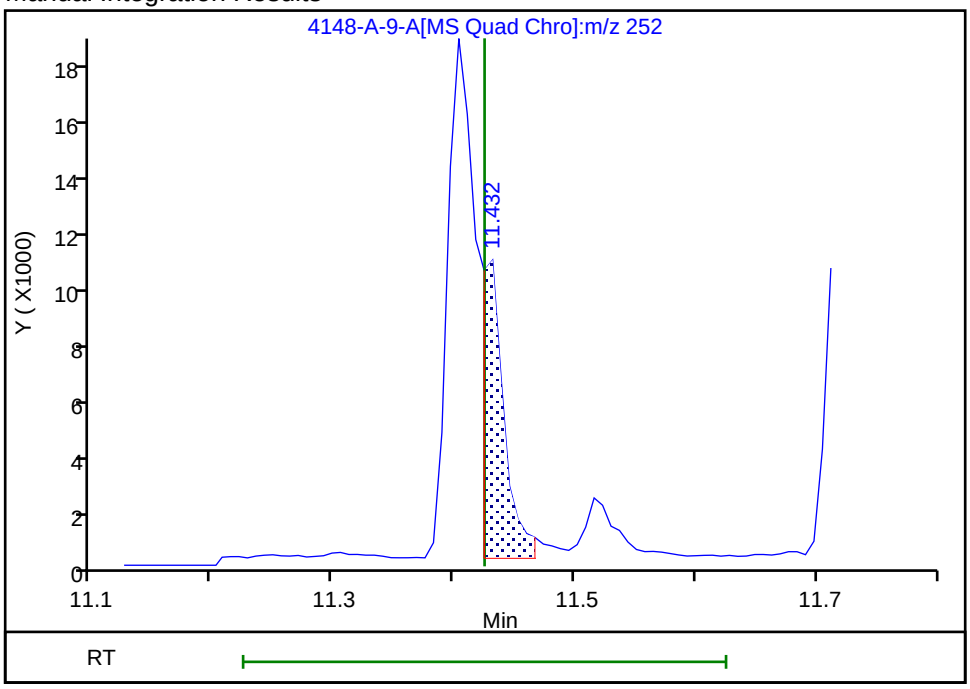
Processing Integration Results

RT: 11.40
Area: 30273
Amount: 0.133917
Amount Units: ug/ml



Manual Integration Results

RT: 11.43
Area: 13257
Amount: 0.058644
Amount Units: ug/ml



Reviewer: SK9U, 20-Nov-2023 09:24:36 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

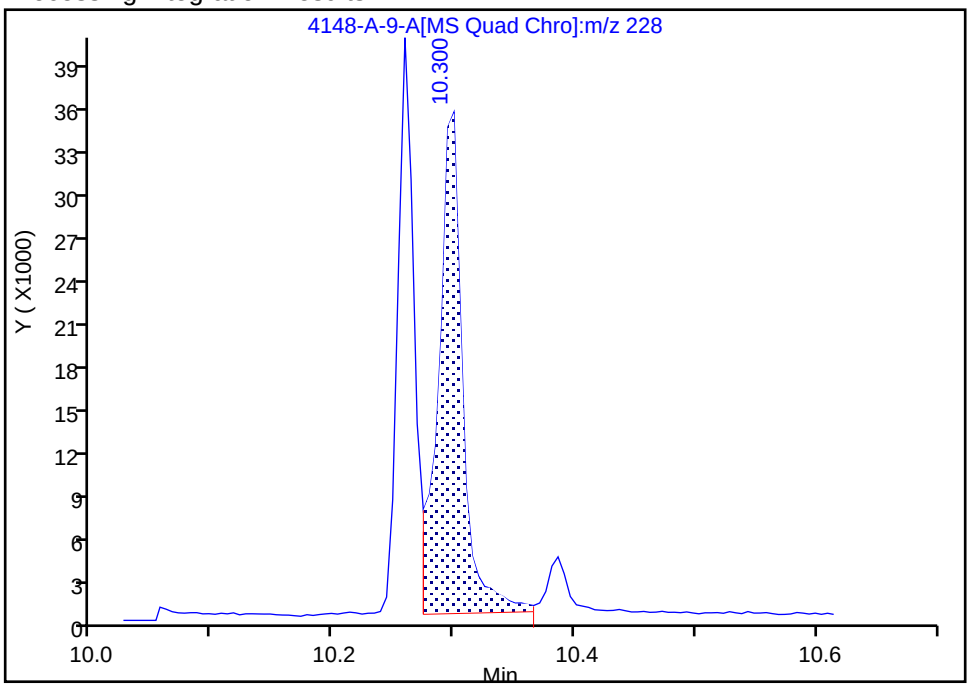
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D				
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

50 Chrysene, CAS: 218-01-9

Signal: 1

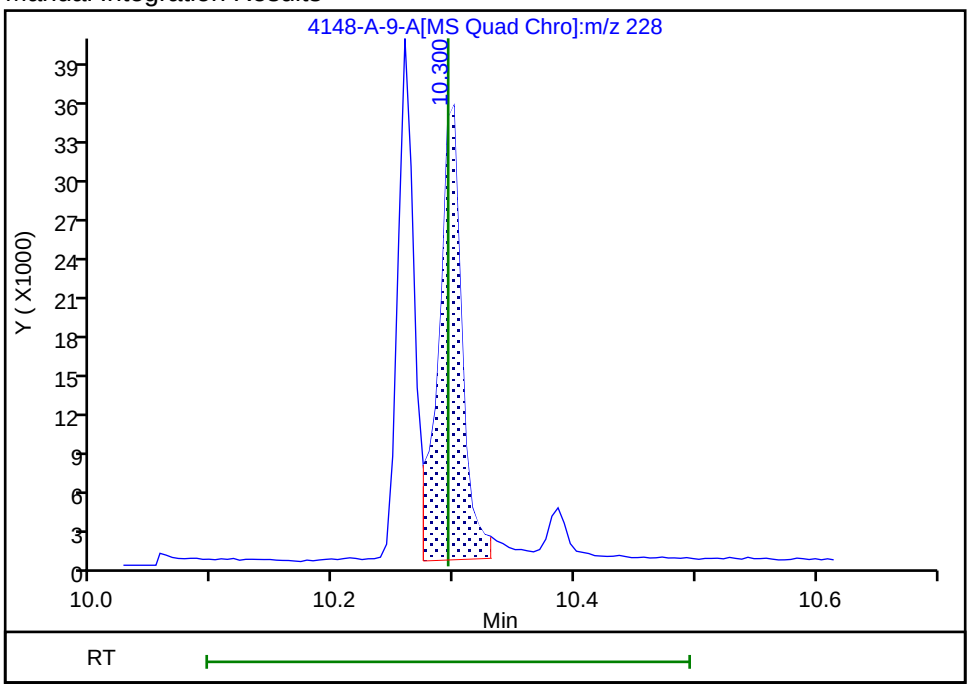
Processing Integration Results

RT: 10.30
Area: 49841
Amount: 0.235438
Amount Units: ug/ml



Manual Integration Results

RT: 10.30
Area: 48110
Amount: 0.227261
Amount Units: ug/ml



Reviewer: SK9U, 20-Nov-2023 09:24:03 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

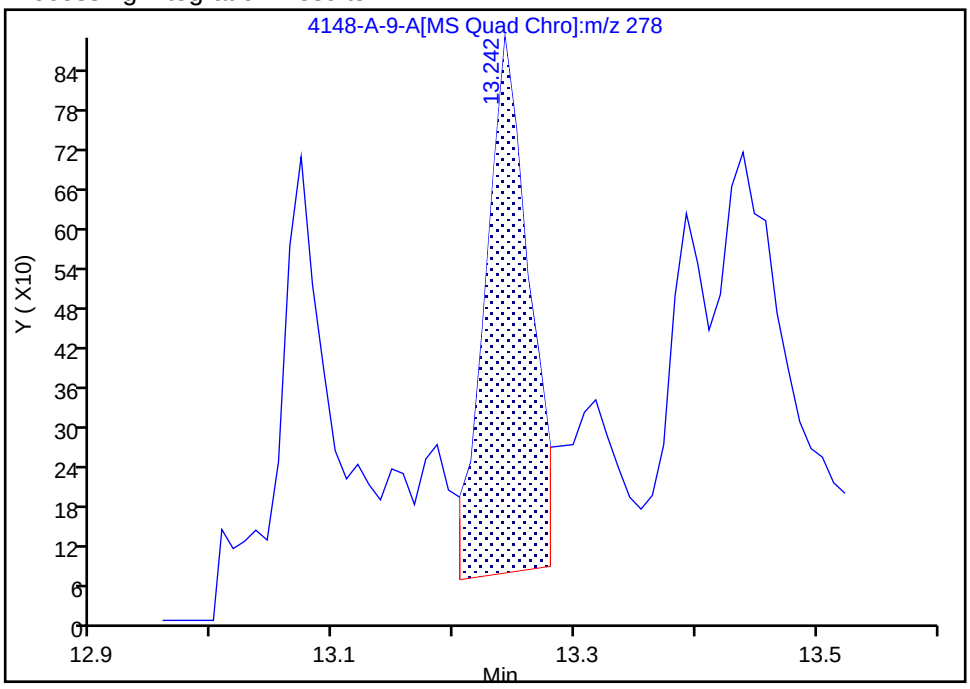
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D				
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

66 Dibenz(a,h)anthracene, CAS: 53-70-3

Signal: 1

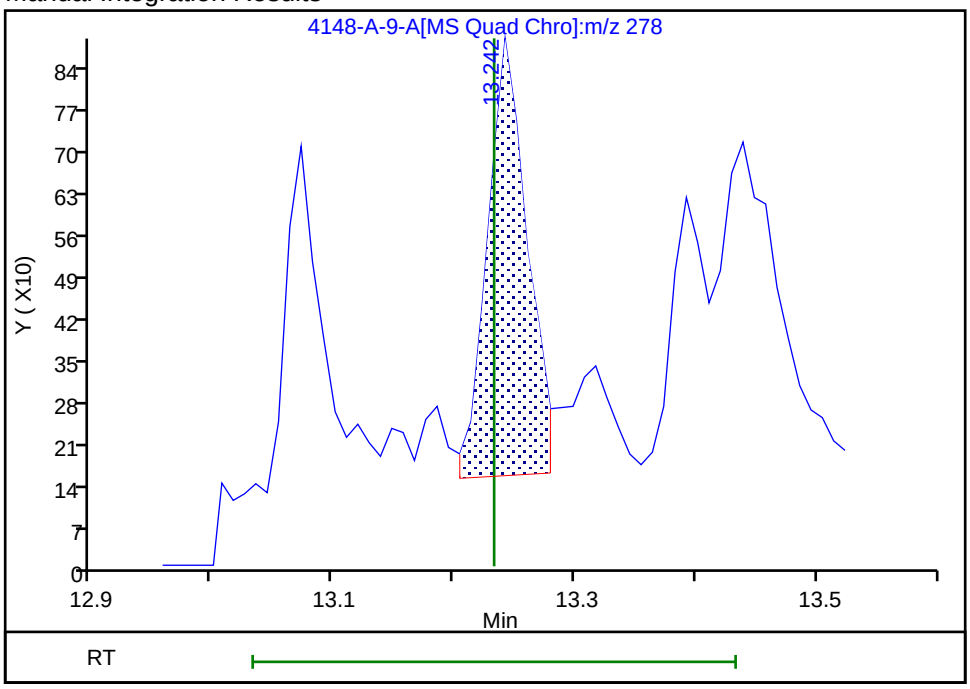
Processing Integration Results

RT: 13.24
Area: 2106
Amount: 0.012474
Amount Units: ug/ml



Manual Integration Results

RT: 13.24
Area: 1698
Amount: 0.010057
Amount Units: ug/ml



Reviewer: SK9U, 20-Nov-2023 09:21:18 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

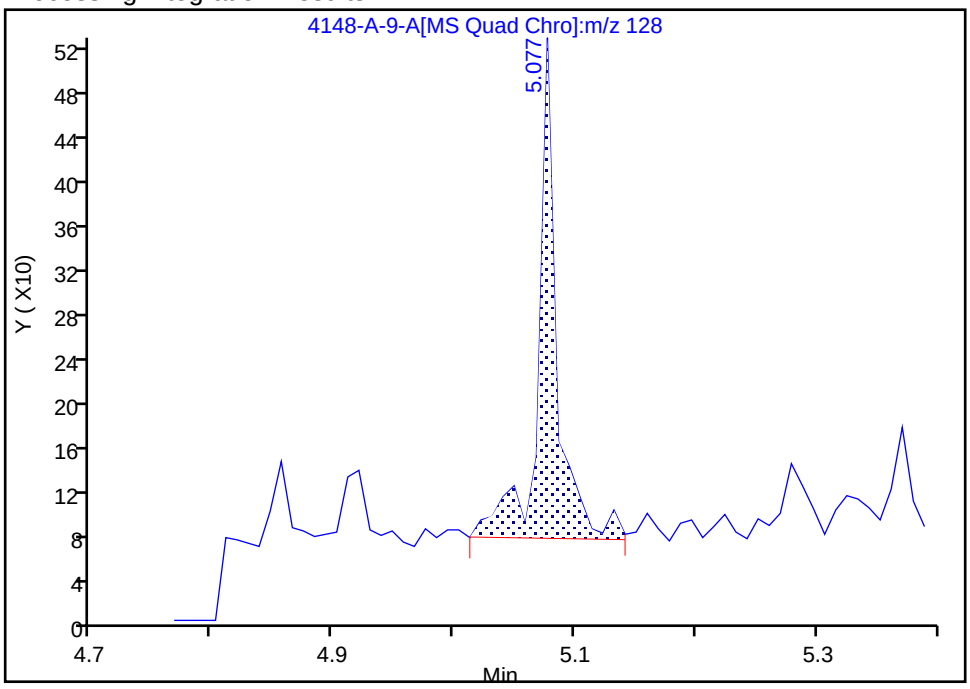
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D				
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

11 Naphthalene, CAS: 91-20-3

Signal: 1

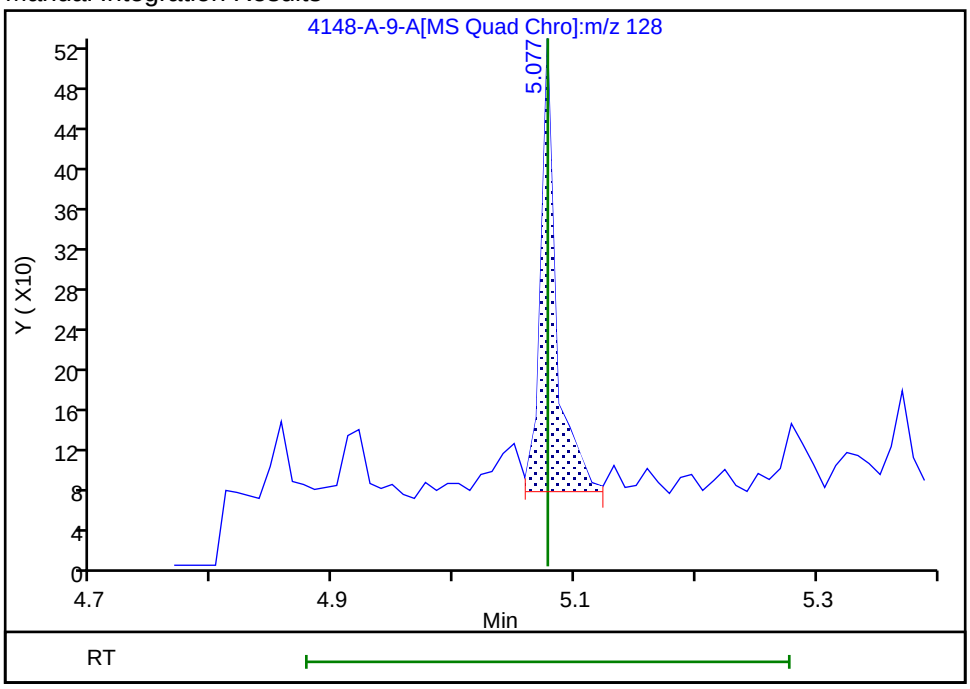
Processing Integration Results

RT: 5.08
Area: 499
Amount: 0.006594
Amount Units: ug/ml



Manual Integration Results

RT: 5.08
Area: 410
Amount: 0.005418
Amount Units: ug/ml



Reviewer: SK9U, 20-Nov-2023 09:21:54 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Eurofins Knoxville

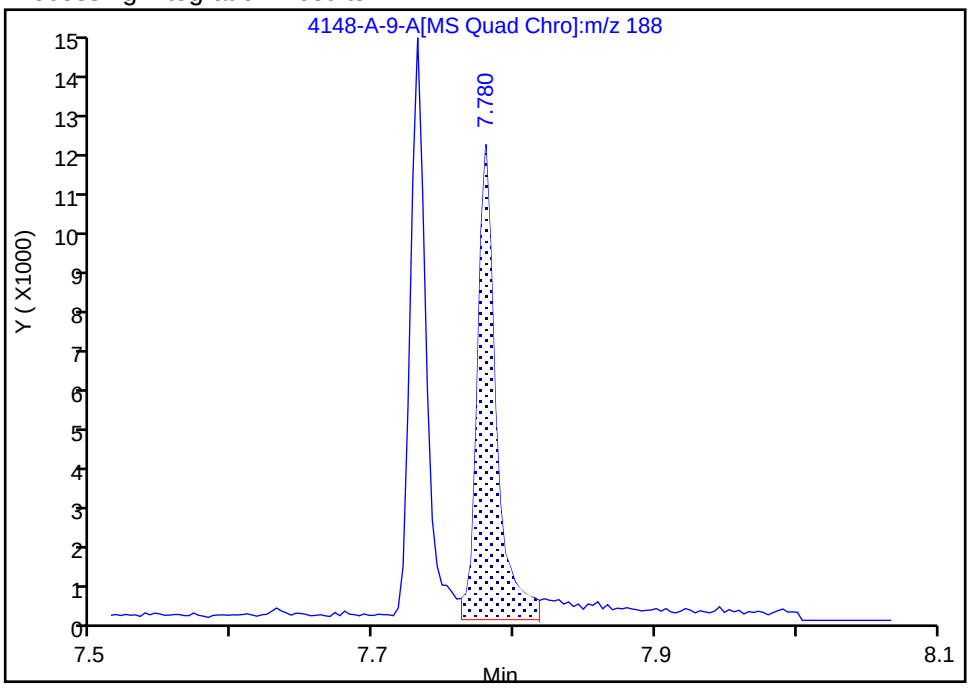
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D				
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 38 Anthracin-d10, CAS: 1719-06-8

Signal: 1

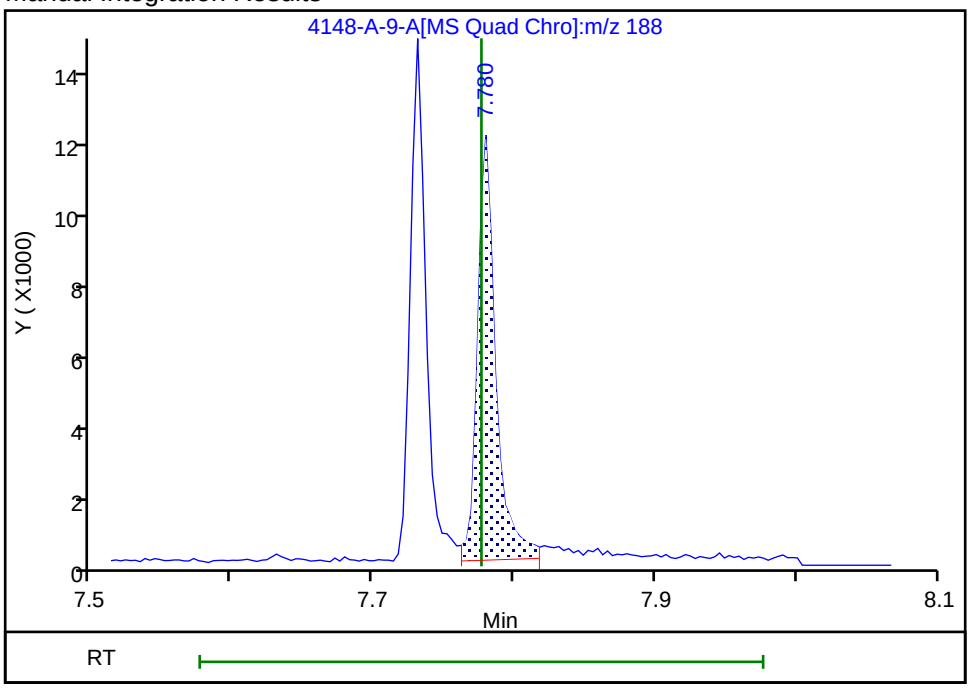
Processing Integration Results

RT: 7.78
Area: 11454
Amount: 0.085665
Amount Units: ug/ml



Manual Integration Results

RT: 7.78
Area: 10816
Amount: 0.080894
Amount Units: ug/ml



Reviewer: SK9U, 20-Nov-2023 09:23:24 -05:00:00 (UTC)
Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

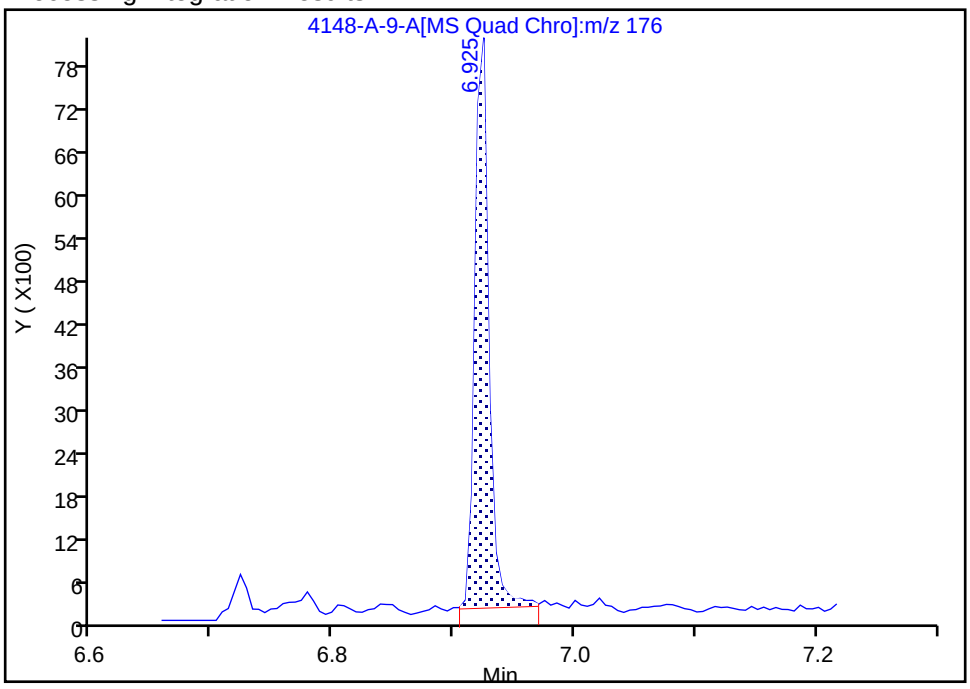
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D				
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 29 Fluorene -d10, CAS: 81103-79-9

Signal: 1

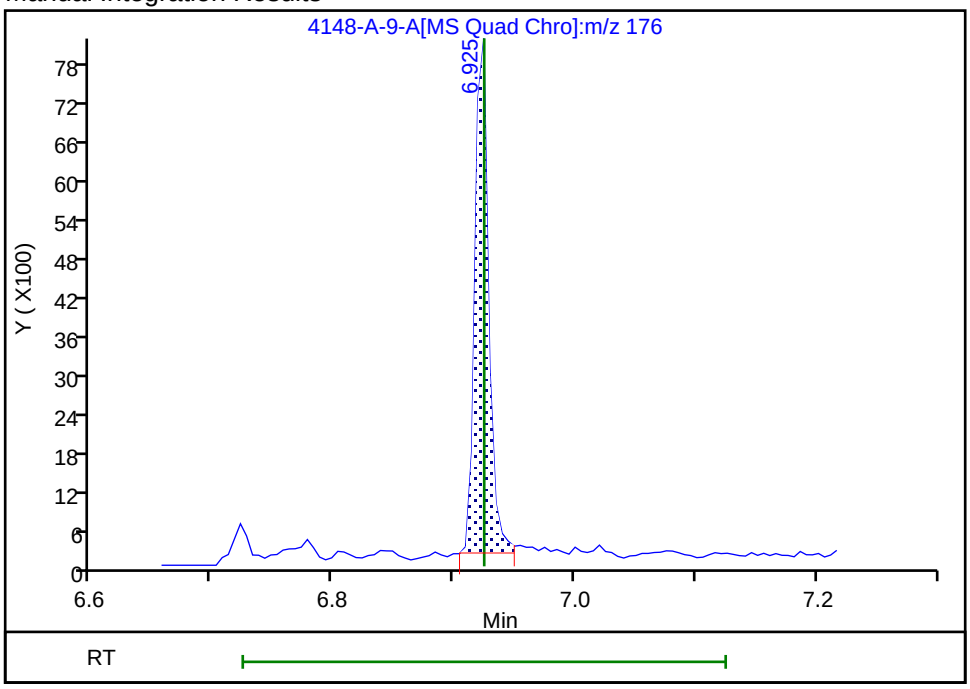
Processing Integration Results

RT: 6.92
Area: 6435
Amount: 0.080842
Amount Units: ug/ml



Manual Integration Results

RT: 6.92
Area: 6320
Amount: 0.079397
Amount Units: ug/ml



Reviewer: SK9U, 20-Nov-2023 09:23:01 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Eurofins Knoxville

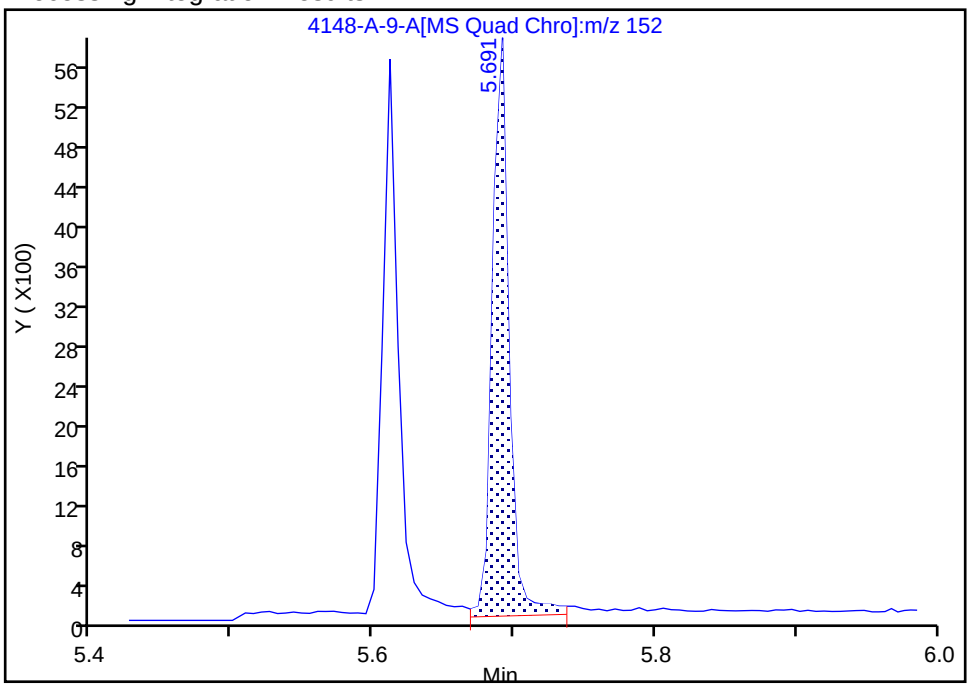
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D				
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 17 1-Methylnaphthalene-d10, CAS: 38072-94-5

Signal: 1

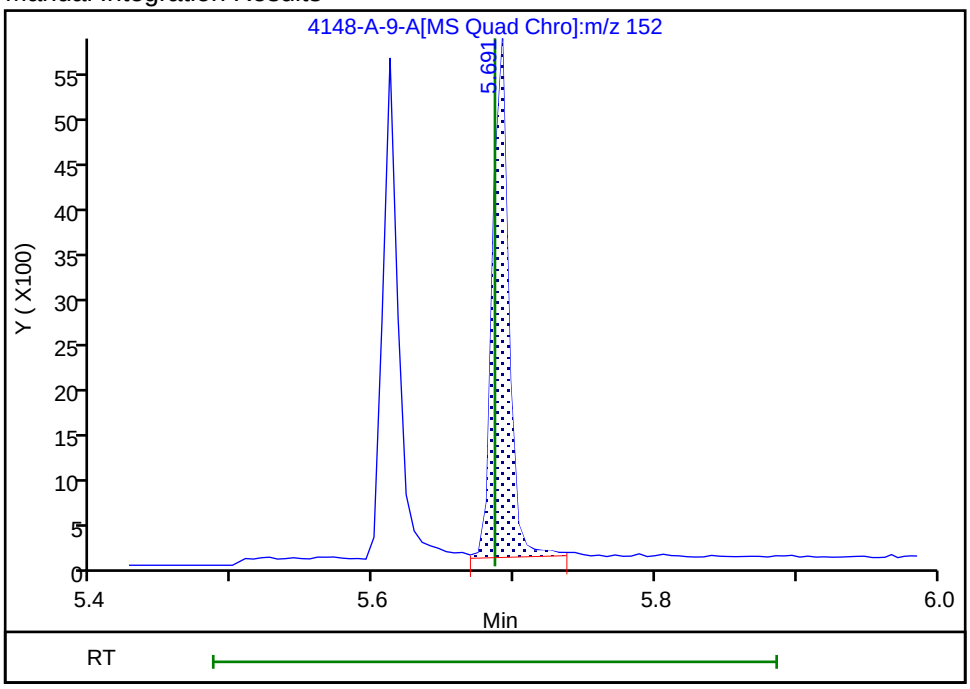
Processing Integration Results

RT: 5.69
Area: 4850
Amount: 0.077443
Amount Units: ug/ml



Manual Integration Results

RT: 5.69
Area: 4654
Amount: 0.076705
Amount Units: ug/ml



Reviewer: SK9U, 20-Nov-2023 09:22:17 -05:00:00 (UTC)
Audit Action: Assigned New Baseline Audit Reason: Baseline

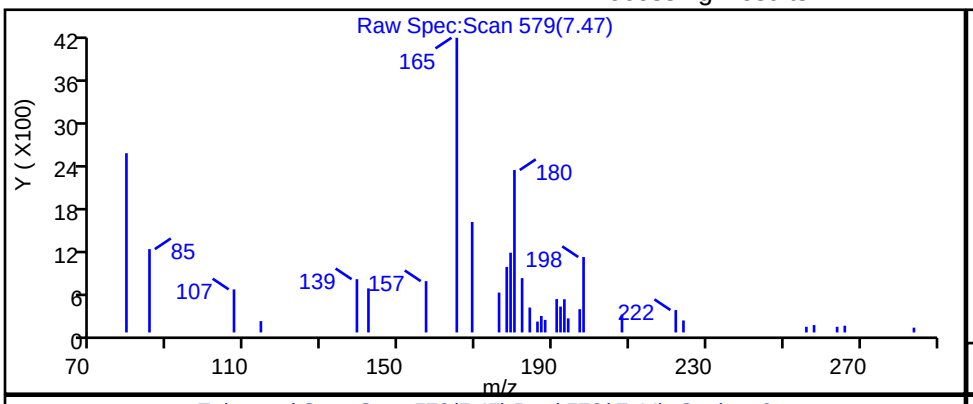
User Disabled Compound Report

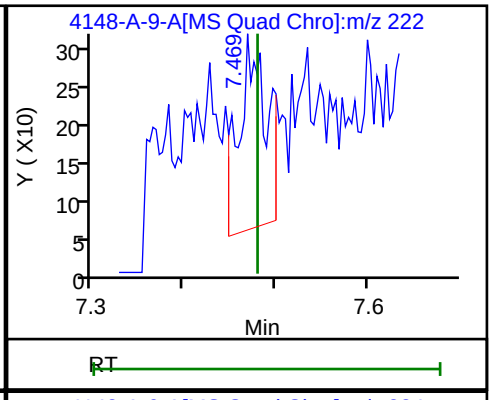
Eurofins Knoxville

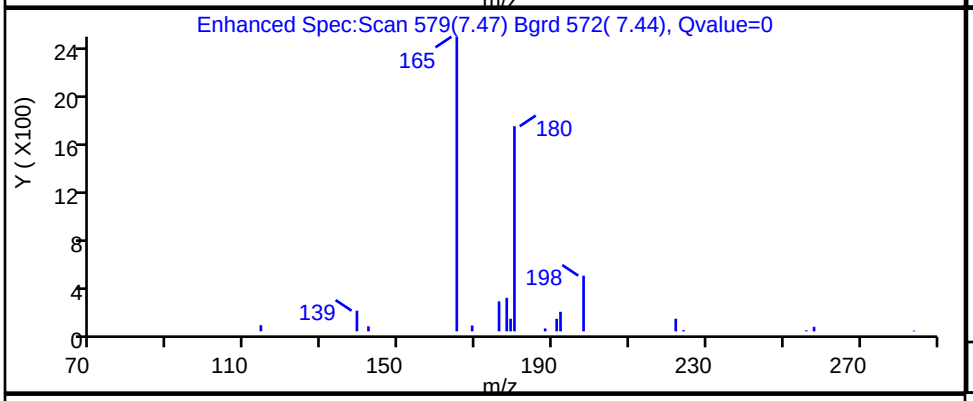
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D				
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

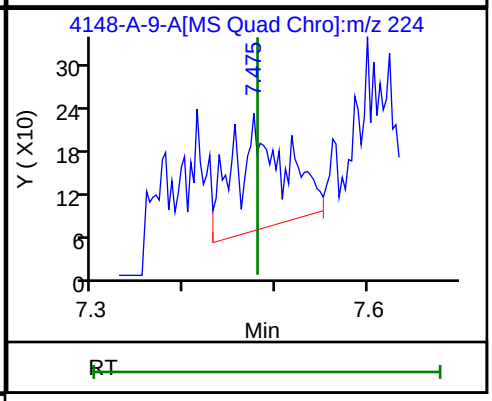
74 PCB-14, CAS: 34883-41-5

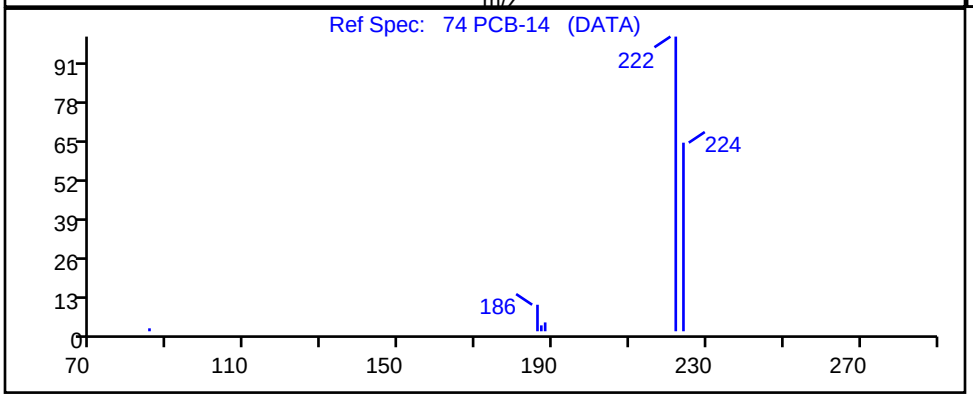
Processing Results











RT	Mass	Response	Amount
7.47	222.00	536	0.000953
7.48	224.00	617	

Reviewer: SK9U, 20-Nov-2023 09:25:08 -05:00:00 (UTC)

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

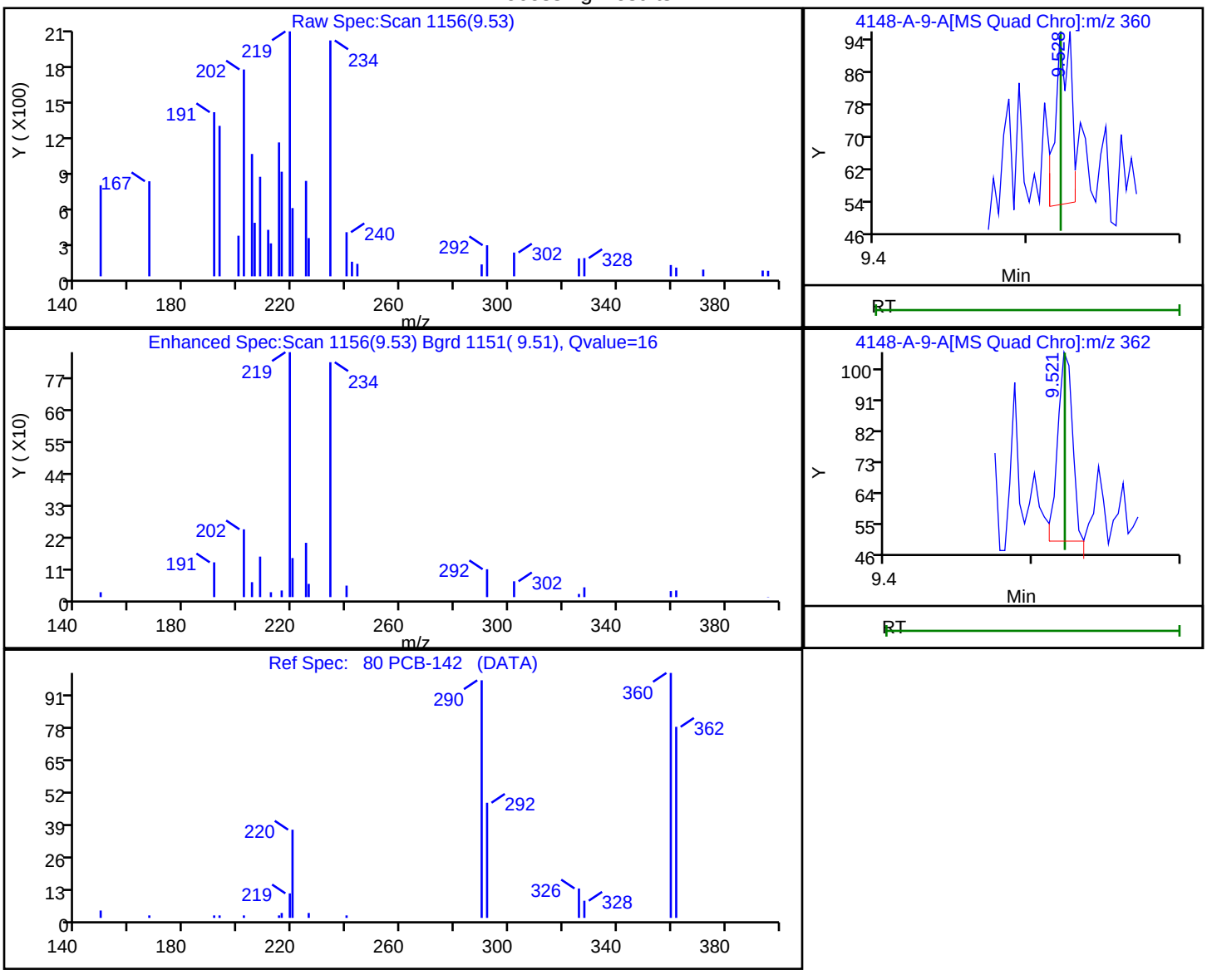
User Disabled Compound Report

Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D				
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

80 PCB-142, CAS: 41411-61-4

Processing Results



RT	Mass	Response	Amount
9.53	360.00	31	0.000247
9.52	362.00	39	

Reviewer: SK9U, 20-Nov-2023 09:25:32 -05:00:00 (UTC)

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

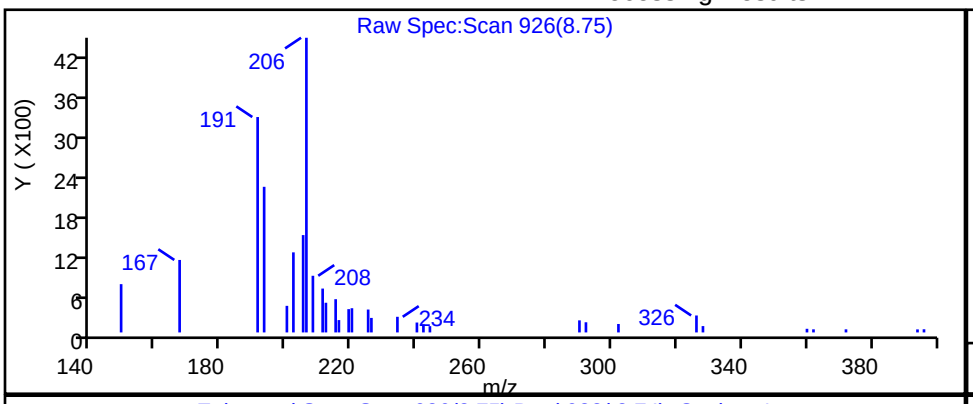
User Disabled Compound Report

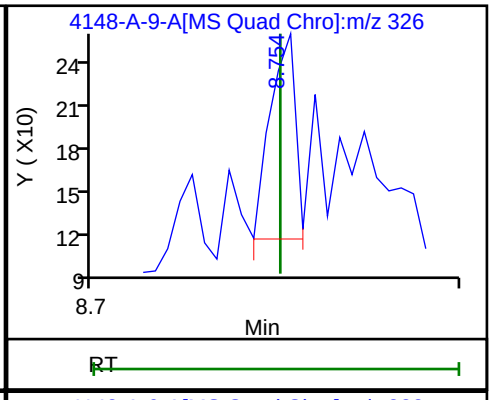
Eurofins Knoxville

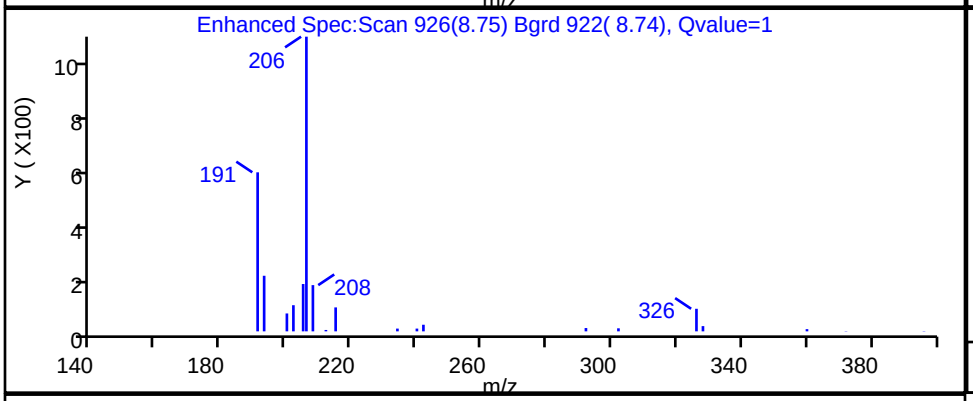
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D				
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

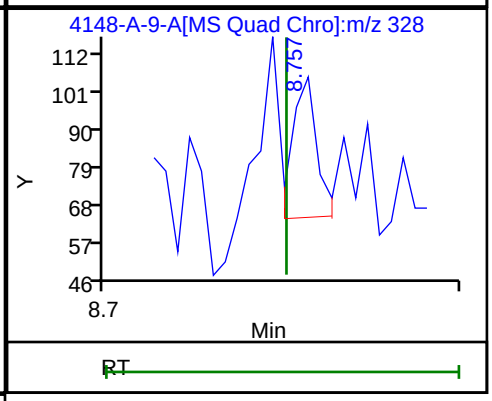
77 PCB-121, CAS: 56558-18-0

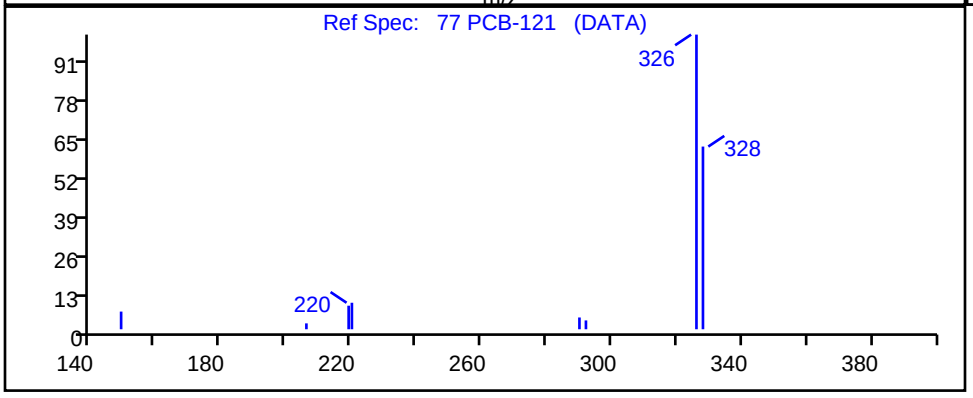
Processing Results











RT	Mass	Response	Amount
8.75	326.00	66	0.000358
8.76	328.00	20	

Reviewer: SK9U, 20-Nov-2023 09:25:15 -05:00:00 (UTC)

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

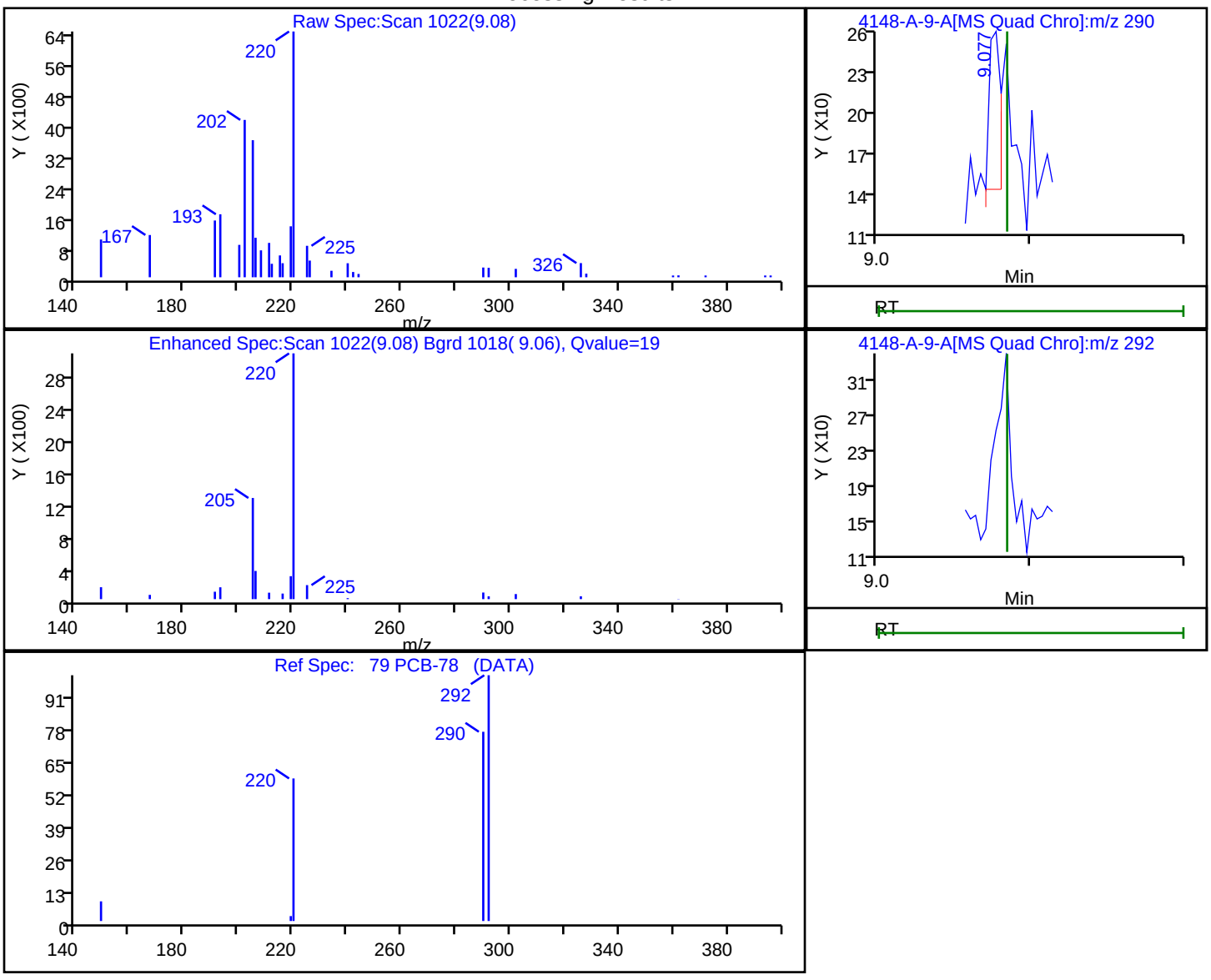
User Disabled Compound Report

Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\140-34148-A-9-A.D				
Injection Date:	17-Nov-2023 16:55:54	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-9-A	Lab Sample ID:	140-34148-9		
Client ID:	1804576-843-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	10
Injection Vol:	1.0 ul	Dil. Factor:	5.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

79 PCB-78, CAS: 70362-49-1

Processing Results



RT	Mass	Response	Amount
9.08	290.00	59	0.000404
9.08	292.00	0	

Reviewer: SK9U, 20-Nov-2023 09:25:22 -05:00:00 (UTC)

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: 1804576-844-S1 | Lab Sample ID: 140-34148-10

Matrix: PE | Lab File ID: 140-34148-A-7-A.D

Analysis Method: ID-0016 | Date Collected: 10/26/2023 14:00

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.010(g) | Date Analyzed: 11/16/2023 17:24

Con. Extract Vol.: 500(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80349 | Units: ng/g

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
83-32-9	Acenaphthene	1600		1000	260
208-96-8	Acenaphthylene	110	J	1000	73
120-12-7	Anthracene	4100		1000	320
56-55-3	Benzo[a]anthracene	2700		1000	370
50-32-8	Benzo[a]pyrene	1300		1000	280
205-99-2	Benzo[b]fluoranthene	2100		1000	350
192-97-2	Benzo[e]pyrene	1300		1000	160
191-24-2	Benzo[g,h,i]perylene	620	J	1000	110
207-08-9	Benzo[k]fluoranthene	730	J	1000	230
218-01-9	Chrysene	3500		1000	130
53-70-3	Dibenz(a,h)anthracene	110	J	1000	82
206-44-0	Fluoranthene	10000		1000	810
86-73-7	Fluorene	1200		1000	320
193-39-5	Indeno[1,2,3-cd]pyrene	570	J	1000	110
90-12-0	1-Methylnaphthalene	ND		5000	500
91-57-6	2-Methylnaphthalene	ND		5000	700
91-20-3	Naphthalene	ND		20000	2900
198-55-0	Perylene	720	J	1000	510
85-01-8	Phenanthrene	6800		2000	1700
129-00-0	Pyrene	13000		2000	300
STL00912	C1-Fluoranthenes/pyrene	5900		1000	1000
STL00913	C1-Fluorenes	ND		2000	1300
STL00914	C2-Fluorenes	1500		1000	1000
STL00915	C3-Fluorenes	1700		1000	1000
STL00917	C2-Naphthalenes	ND		2000	2000
STL00918	C3-Naphthalenes	ND		2000	2000
STL00919	C4-Naphthalenes	ND		3000	2800
STL00901	C1-Phenanthrenes/Anthracenes	ND		4000	3400
STL00902	C2-Phenanthrenes/Anthracenes	4000		1000	1000
STL00903	C3-Phenanthrenes/Anthracenes	2800		1000	1000
STL00904	C4-Phenanthrenes/Anthracenes	1400		1000	1000
STL02218	C1-Chrysenes/Benz(a)anthracenes	1700		1000	1000

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: 1804576-844-S1 | Lab Sample ID: 140-34148-10

Matrix: PE | Lab File ID: 140-34148-A-7-A.D

Analysis Method: ID-0016 | Date Collected: 10/26/2023 14:00

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.010(g) | Date Analyzed: 11/16/2023 17:24

Con. Extract Vol.: 500(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80349 | Units: ng/g

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
STL02219	C2-Chrysenes/Benz(a)anthracenes	ND		1000	1000
STL02220	C3-Chrysenes/Benz(a)anthracenes	ND		1000	1000
STL02221	C4-Chrysenes/Benz(a)anthracenes	ND		1000	1000
34883-41-5	PCB-14	360	J	1000	10
74472-51-8	PCB-192	2500		1000	10
74472-48-3	PCB-184	970	J	1000	10
33979-03-2	PCB-155	720	J	1000	10
41411-61-4	PCB-142	610	J	1000	10
74472-52-9	PCB-204	1700		1000	10
56558-16-8	PCB-104	1700		1000	10
56558-18-0	PCB-121	830	J	1000	10
70362-49-1	PCB-78	1200		1000	10
38444-87-0	PCB-36	430	J	1000	10

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
93951-97-4	Acenaphthylene-d8	83		30-120
1719-06-8	Anthracene-d10	79		30-120
63466-71-7	Benzo(a)pyrene-d12	82		30-120
93951-98-5	Benzo(b)fluoranthene-d12	89		30-120
93951-66-7	Benzo(ghi)perylene-d12	91		30-120
93952-01-3	Benzo(k)fluoranthene-d12	88		30-120
1719-03-5	Chrysene-d12	79		30-120
13250-98-1	Dibenz(a,h)anthracene-d14	86		30-120
93951-69-0	Fluoranthene-d10	87		30-120
81103-79-9	Fluorene -d10	85		30-120
203578-33-0	Indeno[1,2,3-cd]pyrene-d12	90		30-120
38072-94-5	1-Methylnaphthalene-d10	82		30-120
7297-45-2	2-Methylnaphthalene-d10	81		30-120
1146-65-2	Naphthalene-d8	76		30-120
1520-96-3	Perylene-d12	77		30-120
1517-22-2	Phenanthrene-d10	79		30-120

Report Date: 17-Nov-2023 12:15:40 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D
Lims ID: 140-34148-A-10-A
Client ID: 1804576-844-S1
Sample Type: Client
Inject. Date: 16-Nov-2023 17:24:38 ALS Bottle#: 0 Worklist Smp#: 18
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030519-018
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 17-Nov-2023 12:14:52 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1635

First Level Reviewer: SK9U Date: 17-Nov-2023 09:41:30

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/ml	%Rec	Flags
D 10 Naphthalene-d8	136	5.059	5.068	-0.009	100	38460	0.3808	76.2	
12 Naphthalene	128	5.077	5.078	-0.001	44	1351	0.0149		7M
D 15 2-methylnaphthalene-d10	152	5.612	5.612	0.000	92	26620	0.4054	81.1	
D 17 1-Methylnaphthalene-d10	152	5.692	5.686	0.006	100	27064	0.4113	82.3	
D 23 Acenaphthylene-d8	160	6.366	6.362	0.004	80	46065	0.4133	82.7	
24 Acenaphthylene	152	6.376	6.372	0.004	9	241	0.002225		
* 26 Acenaphthene-d10	164	6.497	6.492	0.005	97	36224	0.5000		
27 Acenaphthene	154	6.522	6.517	0.005	99	2156	0.0311		
D 29 Fluorene -d10	176	6.925	6.920	0.005	99	36479	0.4226	84.5	
30 Fluorene	166	6.950	6.945	0.005	94	2188	0.0231		
D 35 Phenanthrene-d10	188	7.731	7.732	-0.001	99	65750	0.3975	79.5	
36 Phenanthrene	178	7.752	7.749	0.003	33	21515	0.1356		
D 38 Anthracin-d10	188	7.780	7.777	0.003	100	63860	0.3955	79.1	
39 Anthracene	178	7.797	7.794	0.003	98	12928	0.0822		M
D 41 Fluoranthene-d10	212	8.808	8.805	0.003	99	93111	0.4340	86.8	
43 Fluoranthene	202	8.825	8.825	0.000	60	48084	0.2018		
* 44 Pyrene-d10 (IS)	212	9.027	9.024	0.003	98	106062	0.5000		
45 Pyrene	202	9.044	9.044	0.000	100	63048	0.2593		
47 Benzo[a]anthracene	228	10.259	10.260	-0.001	99	11317	0.0533		
D 48 Chrysene-d12	240	10.270	10.270	0.000	98	81690	0.3947	78.9	
50 Chrysene	228	10.300	10.295	0.005	15	16775	0.0705		M
D 52 Benzo(b)fluoranthene-d12	264	11.376	11.369	0.007	100	71514	0.4465	89.3	
53 Benzo[b]fluoranthene	252	11.404	11.397	0.007	12	10149	0.0421		
D 54 Benzo(k)fluoranthene-d12	264	11.411	11.404	0.007	60	83183	0.4421	88.4	
55 Benzo[k]fluoranthene	252	11.432	11.425	0.007	97	3573	0.0147		M
* 56 Benzo(e)pyrene-d12	264	11.684	11.684	0.000	99	63234	0.5000		
57 Benzo[e]pyrene	252	11.712	11.712	0.000	100	5192	0.0267		
D 58 Benzo(a)pyrene-d12	264	11.747	11.747	0.000	100	57700	0.4108	82.2	
59 Benzo[a]pyrene	252	11.775	11.775	0.000	100	5142	0.0269		
D 60 Perylene-d12	264	11.845	11.838	0.007	100	59652	0.3827	76.5	
61 Perylene	252	11.873	11.873	0.000	99	2452	0.0144		
D 62 Indeno[1,2,3-cd]pyrene-d12	288	13.195	13.186	0.009	96	68686	0.4502	90.0	

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/ml	%Rec	Flags
D 63 Dibenz(a,h)anthracene-d14	292	13.195	13.196	-0.001	91	58762	0.4304	86.1	
65 Indeno[1,2,3-cd]pyrene	276	13.224	13.214	0.010	23	2599	0.0113		M
66 Dibenz(a,h)anthracene	278	13.242	13.233	0.009	19	429	0.002286		M
D 67 Benzo(ghi)perylene-d12	288	13.552	13.543	0.009	100	68615	0.4528	90.6	
68 Benzo[g,h,i]perylene	276	13.580	13.580	0.000	48	2501	0.0124		
74 PCB-14	222	7.479	7.479	0.000	98	850	0.007179		
75 PCB-36	258	8.206	8.206	-0.004	95	534	0.008568		
76 PCB-104	326	8.395	8.393	-0.001	92	1620	0.0335		
77 PCB-121	326	8.754	8.748	0.003	77	642	0.0165		
78 PCB-155	360	8.848	8.852	-0.001	76	526	0.0145		
79 PCB-78	290	9.081	9.077	-0.003	80	773	0.0250		
80 PCB-142	360	9.525	9.519	0.003	81	320	0.0121		
81 PCB-184	394	9.575	9.572	0.003	34	511	0.0193		
* 82 PCB-167L	372	10.023	10.027	-0.004	71	12916	0.4000		
83 PCB-204	428	10.254	10.246	0.004	6	600	0.0349		
84 PCB-192	394	10.275	10.275	0.000	5	1197	0.0493		
A 87 C3-Naphthalenes	170	6.683	(6.348-7.050)		0	2670	0.0295		
A 88 C4-Naphthalenes	184	7.257	(6.678-7.562)		0	3456	0.0382		
A 90 C2-Fluorenes	194	7.889	(7.730-8.069)		0	2850	0.0301		
A 91 C3-Fluorenes	208	8.328	(8.092-8.605)		0	3295	0.0348		
A 96 C1-Phenanthrenes/Anthracenes	191	8.273	(8.155-8.332)		0	7450	0.0470		
A 97 C2-Phenanthrenes/Anthracenes	206	8.698	(8.490-8.926)		0	12612	0.0795		
A 98 C3-Phenanthrenes/Anthracenes	220	9.165	(8.851-9.456)		0	8795	0.0554		
A 99 C4-Phenanthrenes/Anthracenes	234	9.479	(9.106-9.824)		0	4400	0.0277		
A 100 C1-Fluoranthenes/pyrene	216	9.436	(9.246-9.640)		0	28927	0.1190		
A 101 C1-Chrysenes/Benz(a)anthracenes	242	10.665	(10.456-10.941)		0	7918	0.0333		

QC Flag Legend

Processing Flags

7 - Failed Limit of Detection

Review Flags

M - Manually Integrated

Reagents:

60ISPCB_00001 Amount Added: 5.00 Units: uL

Report Date: 17-Nov-2023 12:15:40 Chrom Revision: 2.3 15-Nov-2023 20:54:34

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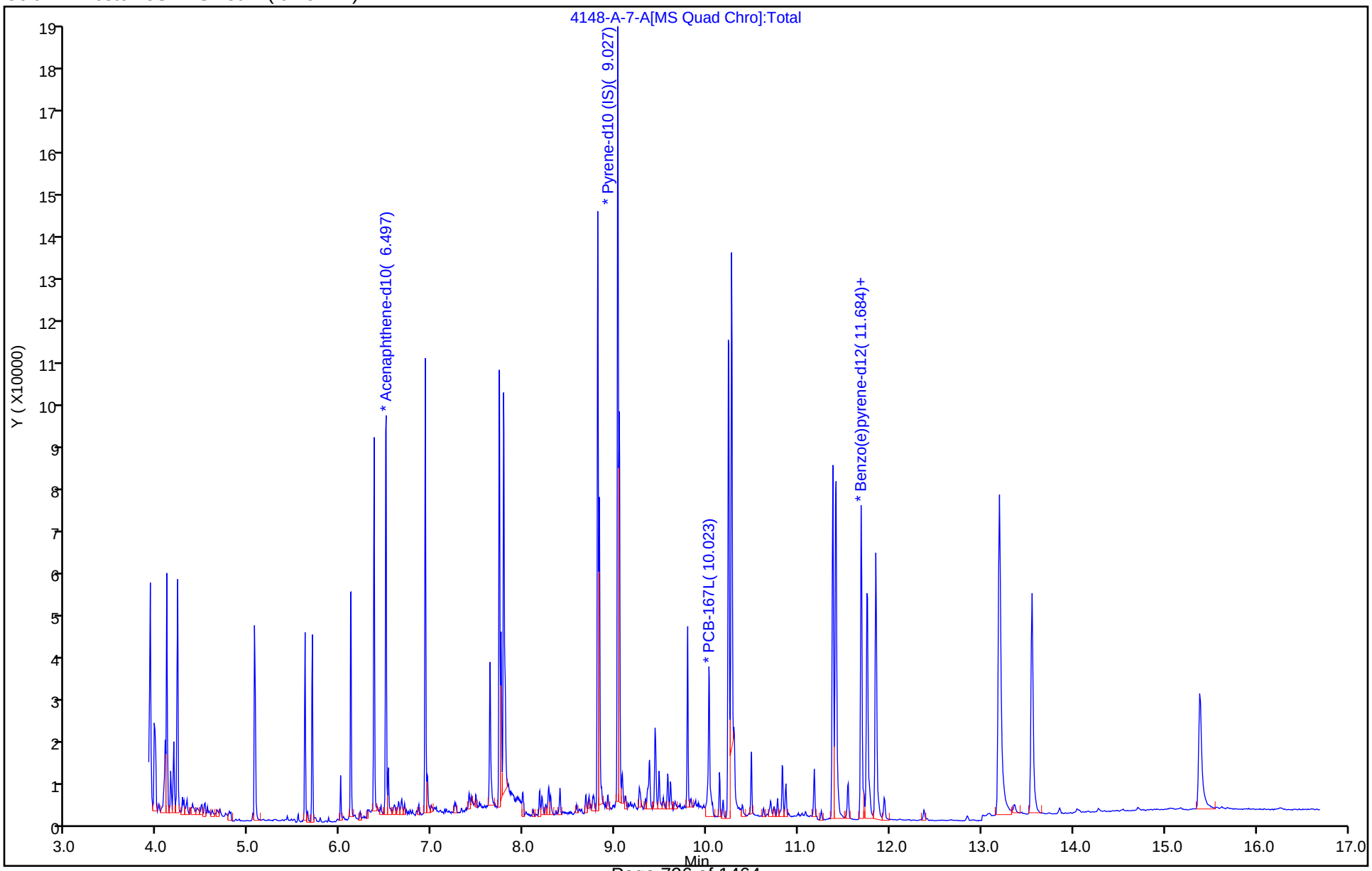
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D

Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10	Worklist Smp#:	18
Client ID:	1804576-844-S1				
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



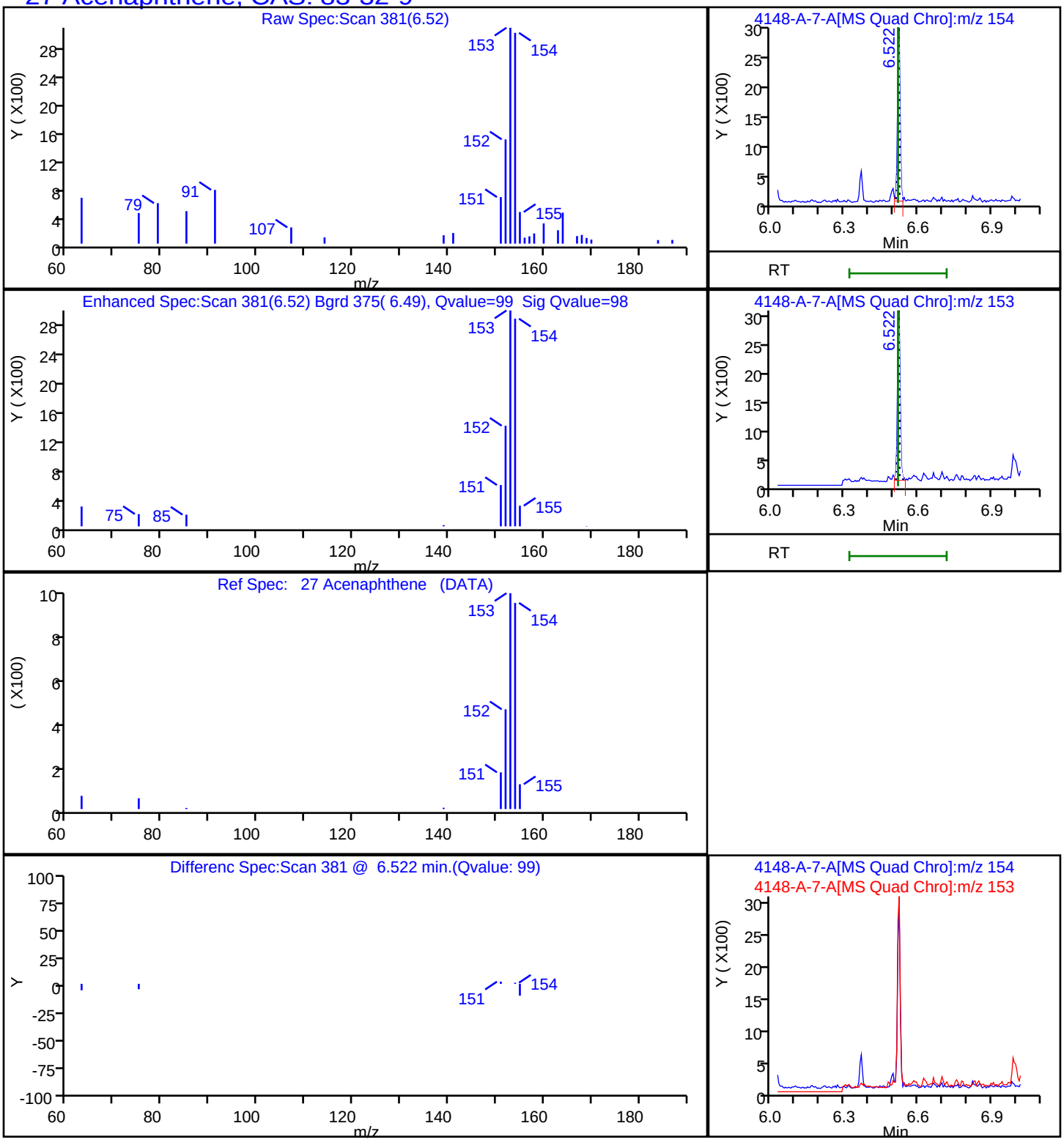
Report Date: 17-Nov-2023 12:15:40 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D

Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10
Client ID:	1804576-844-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

27 Acenaphthene, CAS: 83-32-9



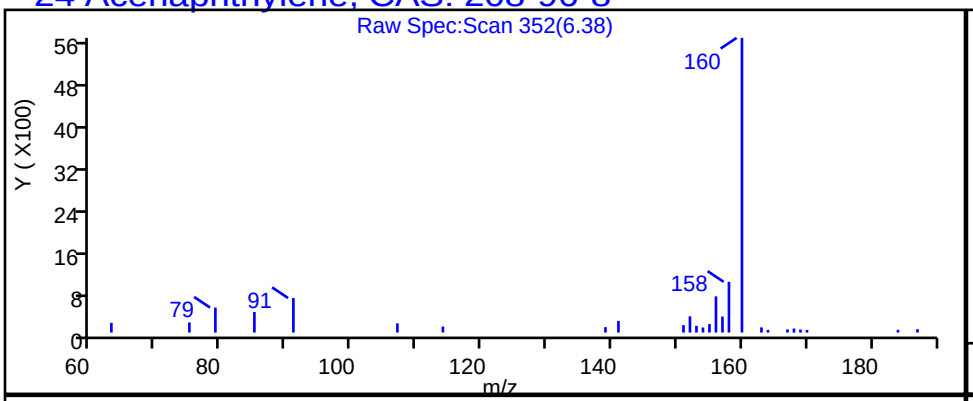
Report Date: 17-Nov-2023 12:15:40 Chrom Revision: 2.3 15-Nov-2023 20:54:34

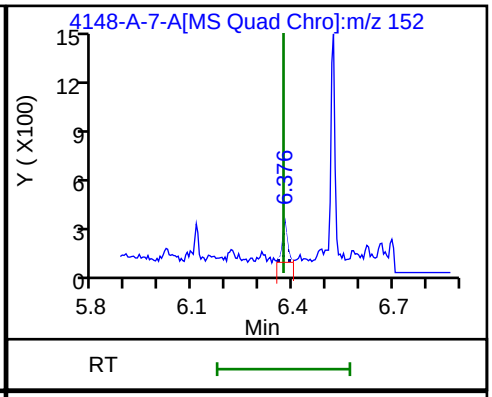
Eurofins Knoxville

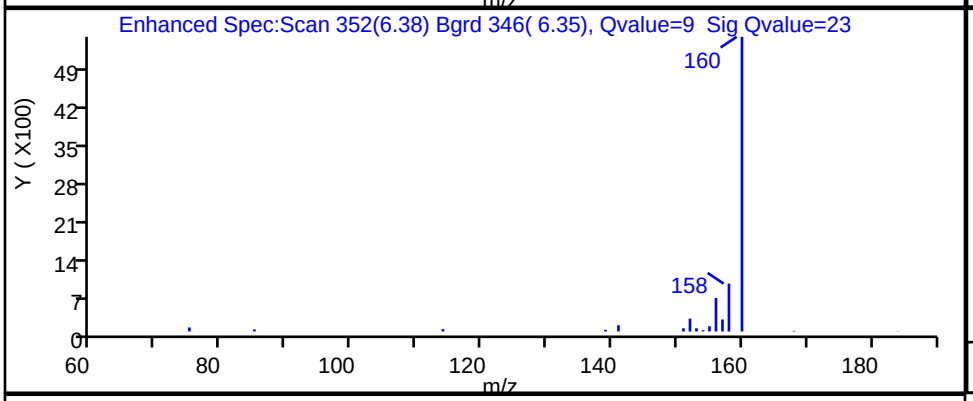
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D

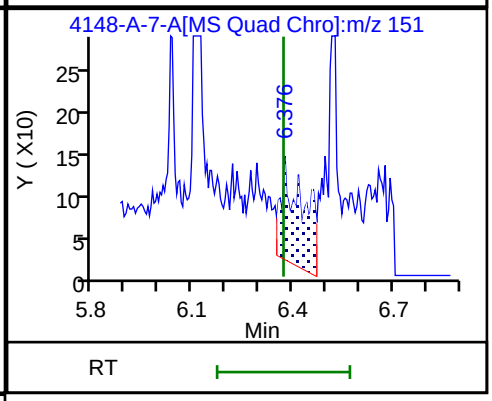
Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10
Client ID:	1804576-844-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

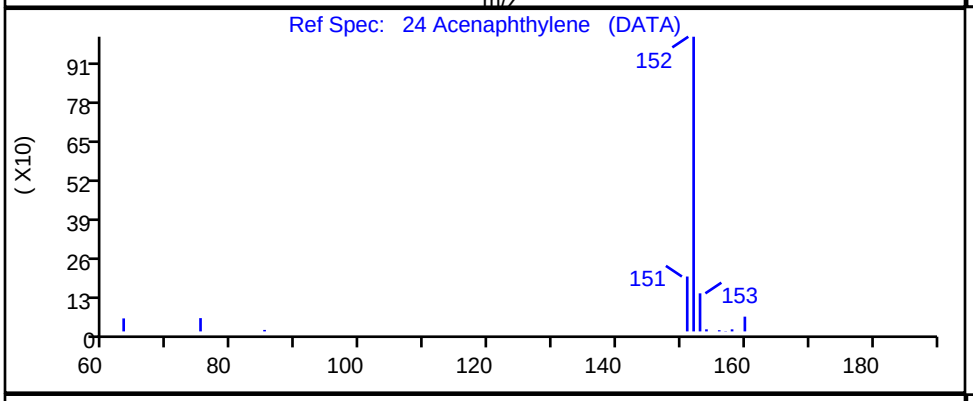
24 Acenaphthylene, CAS: 208-96-8

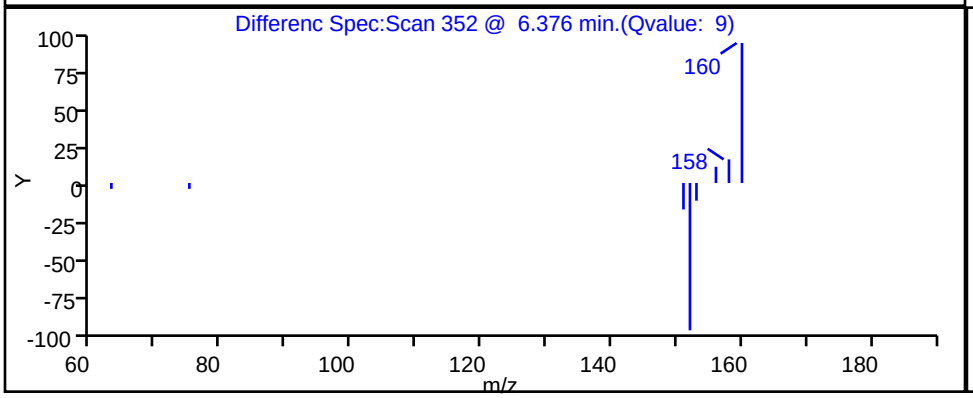


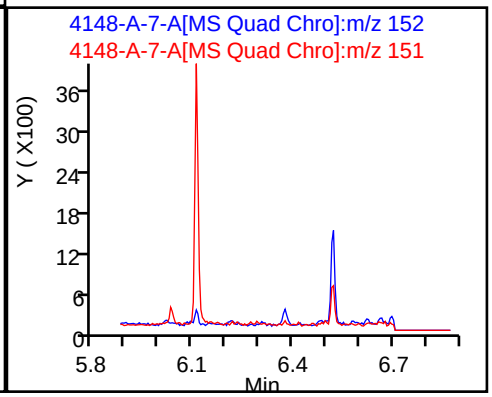










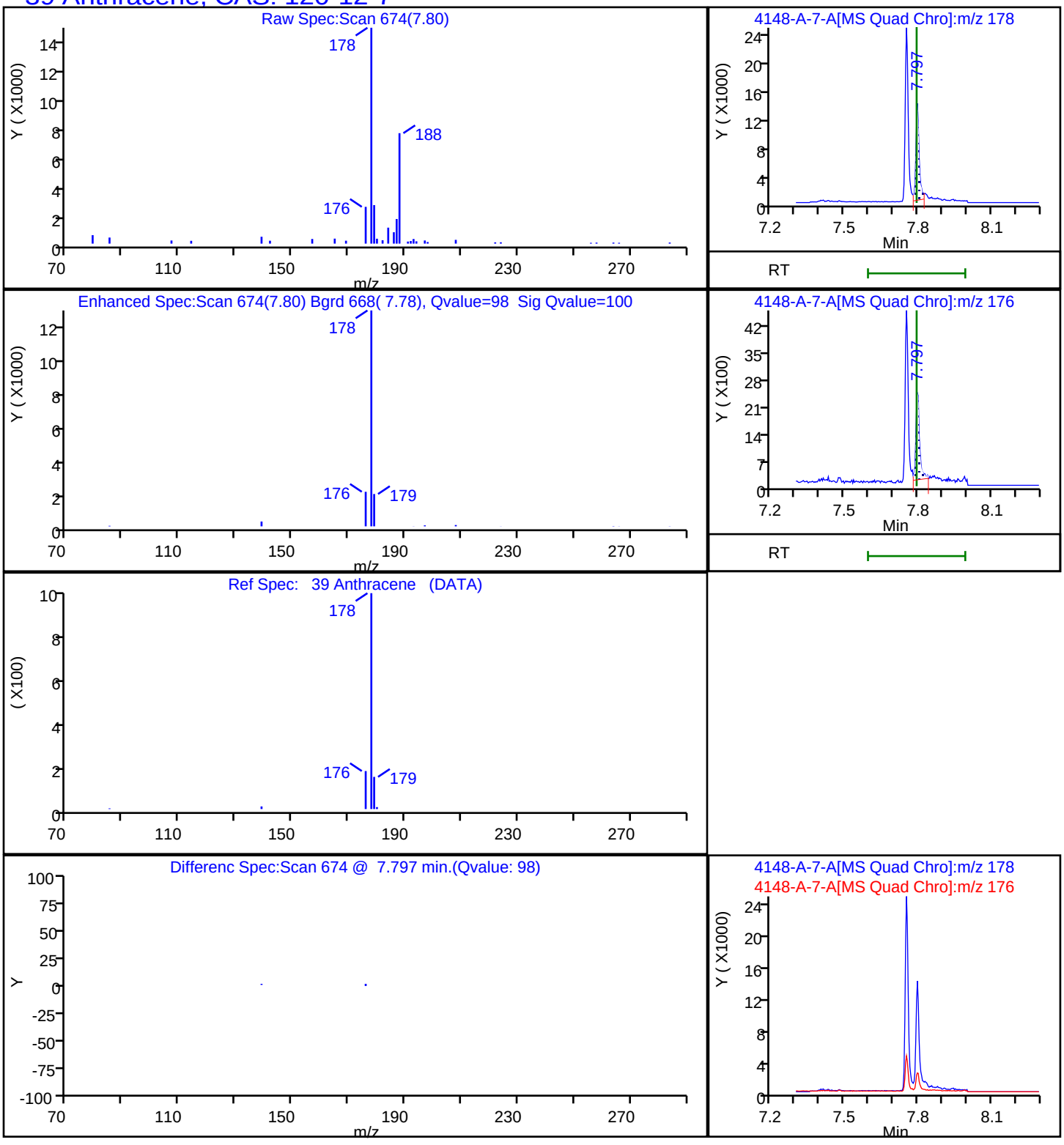


Report Date: 17-Nov-2023 12:15:40 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D		
Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10
Client ID:	1804576-844-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

39 Anthracene, CAS: 120-12-7



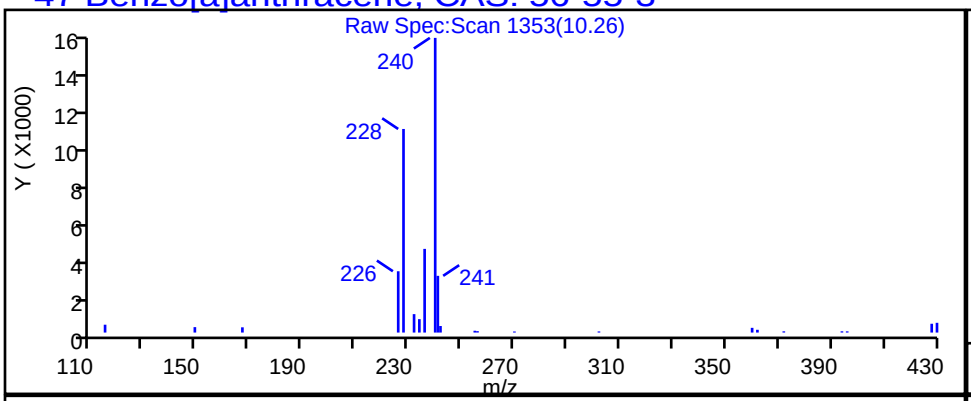
Report Date: 17-Nov-2023 12:15:40 Chrom Revision: 2.3 15-Nov-2023 20:54:34

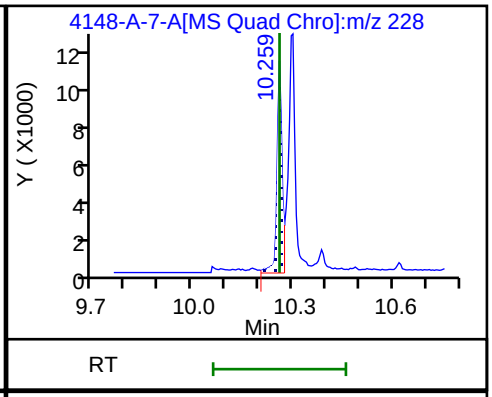
Eurofins Knoxville

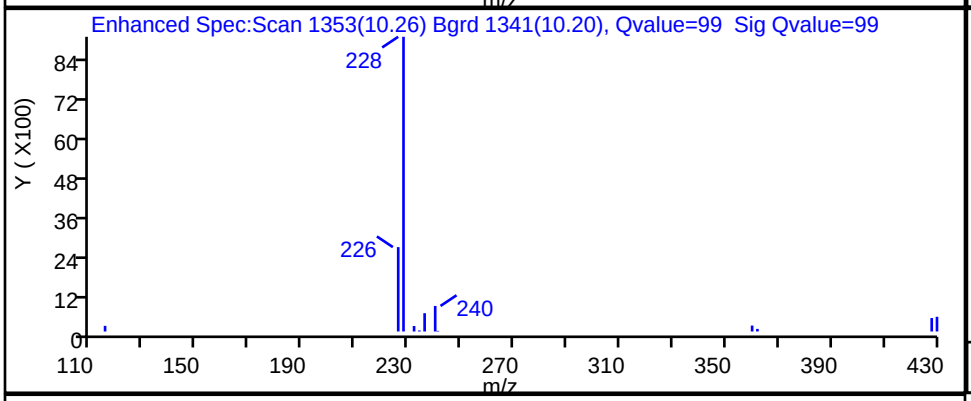
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D

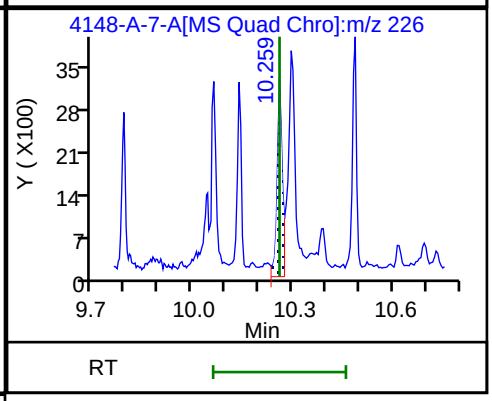
Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10		
Client ID:	1804576-844-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

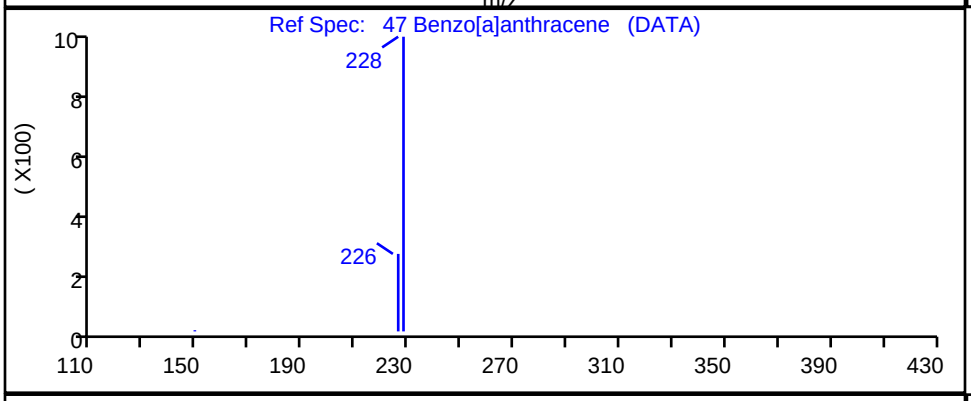
47 Benzo[a]anthracene, CAS: 56-55-3

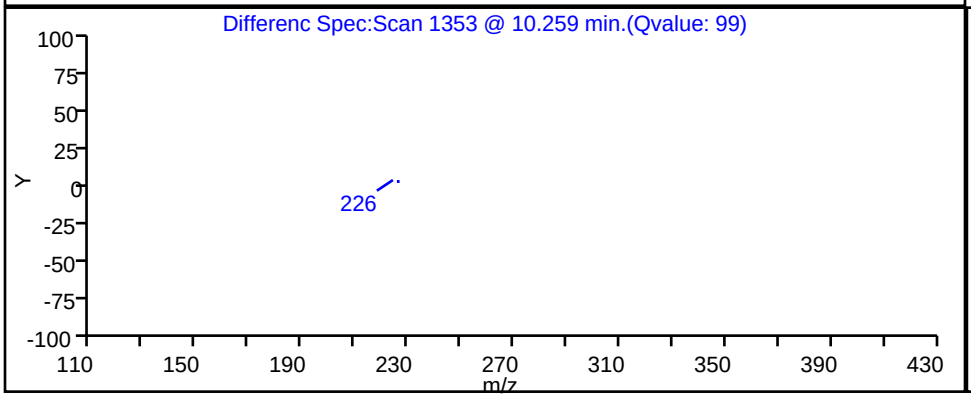


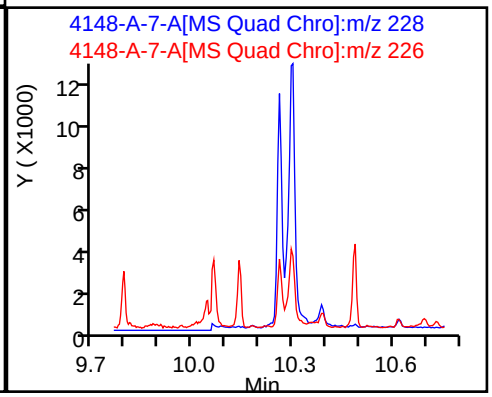












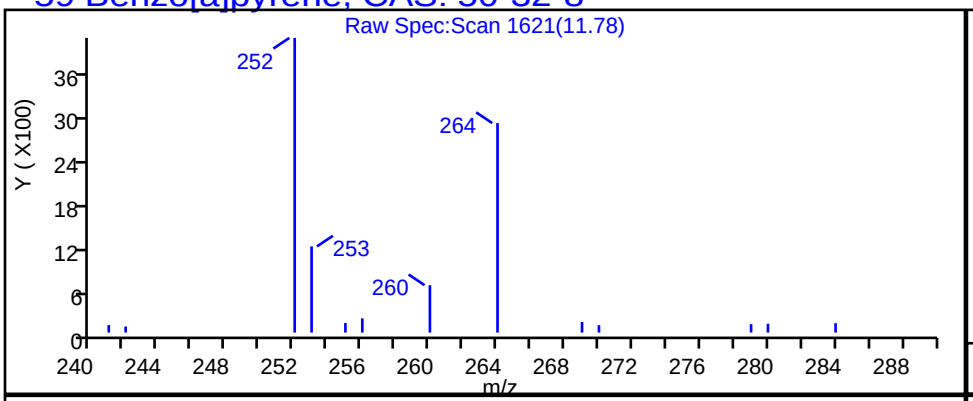
Report Date: 17-Nov-2023 12:15:40 Chrom Revision: 2.3 15-Nov-2023 20:54:34

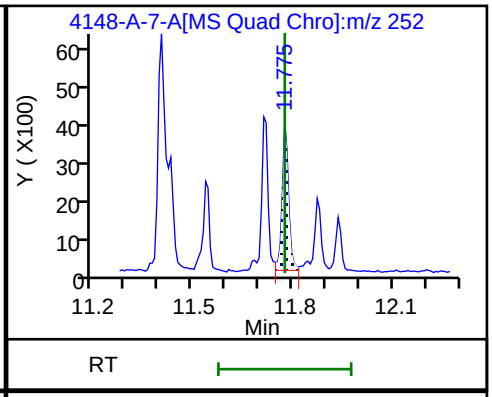
Eurofins Knoxville

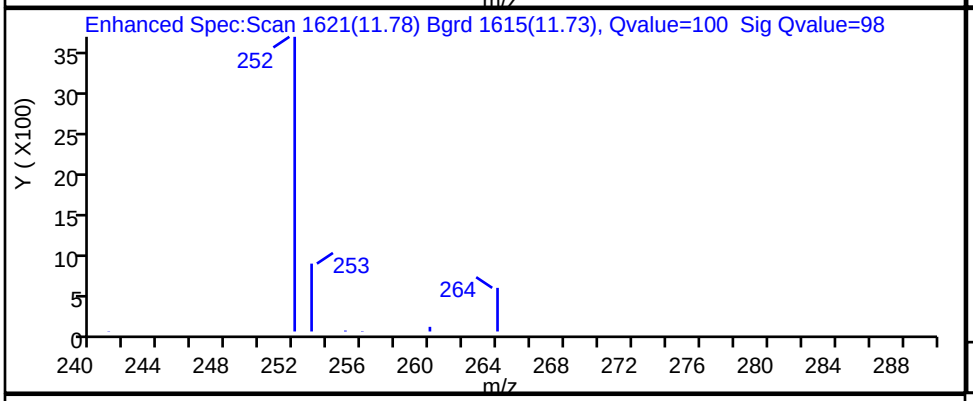
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D

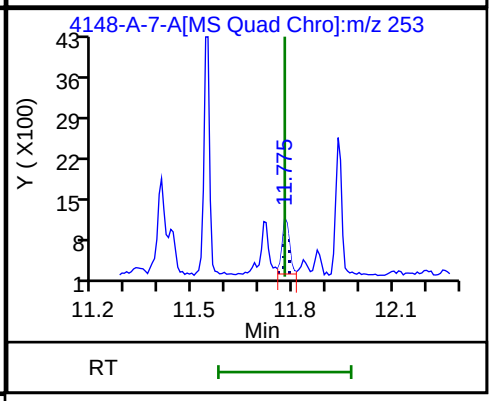
Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10
Client ID:	1804576-844-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

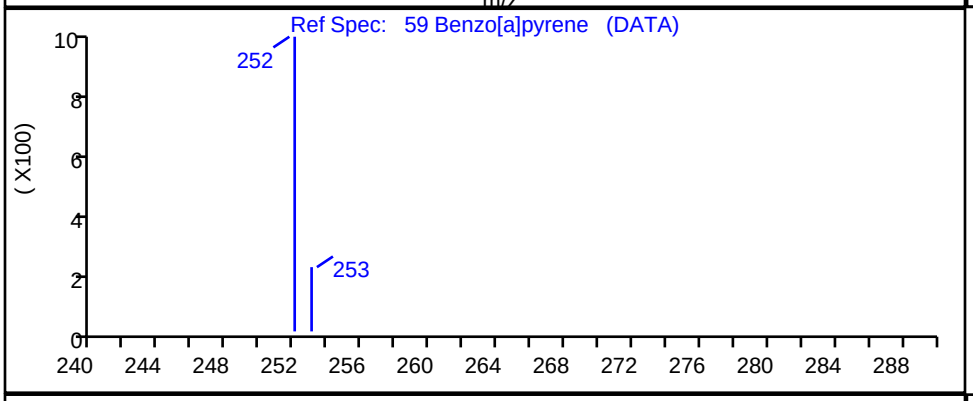
59 Benzo[a]pyrene, CAS: 50-32-8

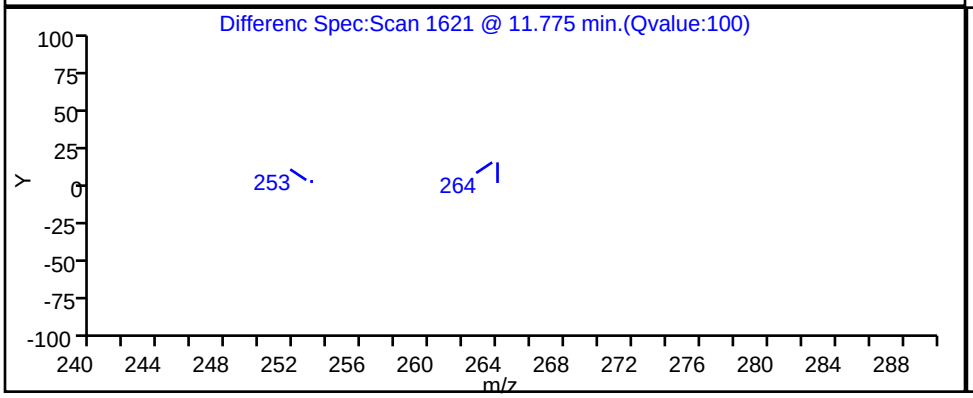


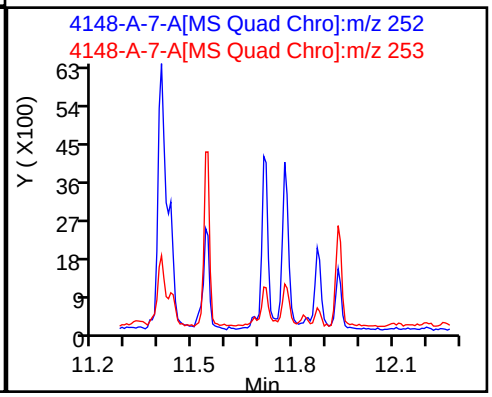












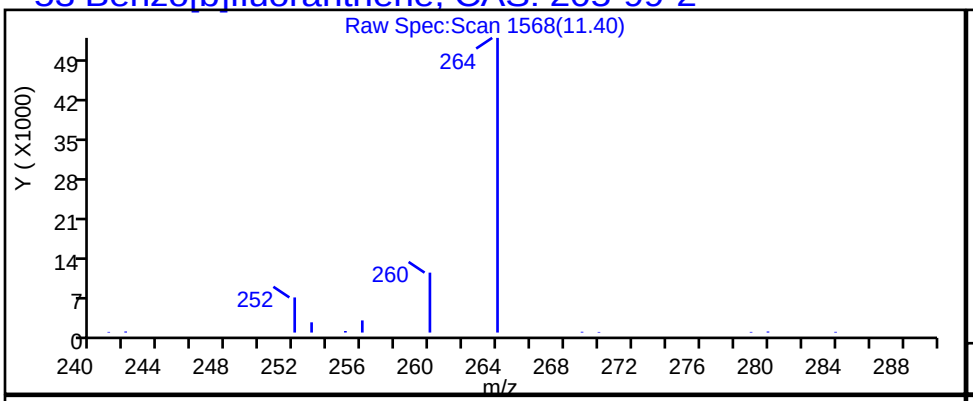
Report Date: 17-Nov-2023 12:15:40 Chrom Revision: 2.3 15-Nov-2023 20:54:34

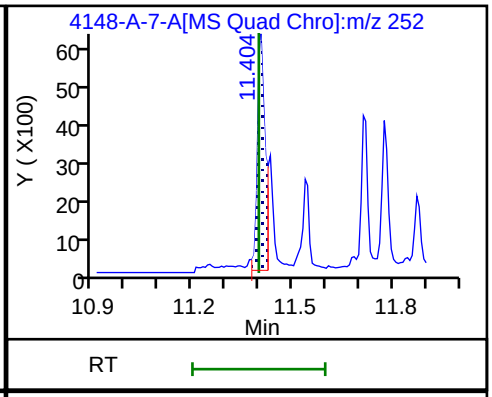
Eurofins Knoxville

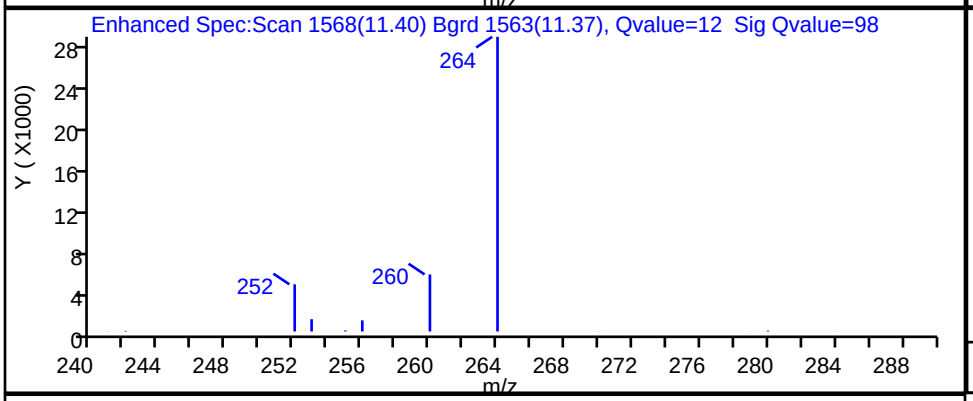
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D

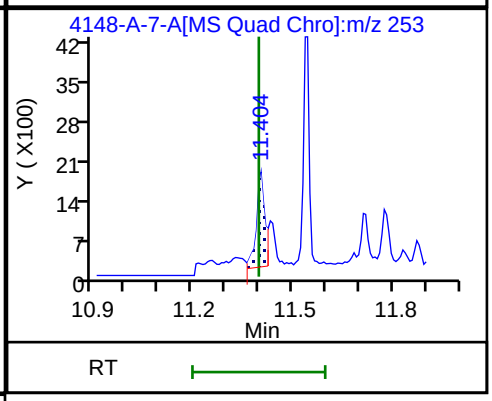
Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10
Client ID:	1804576-844-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

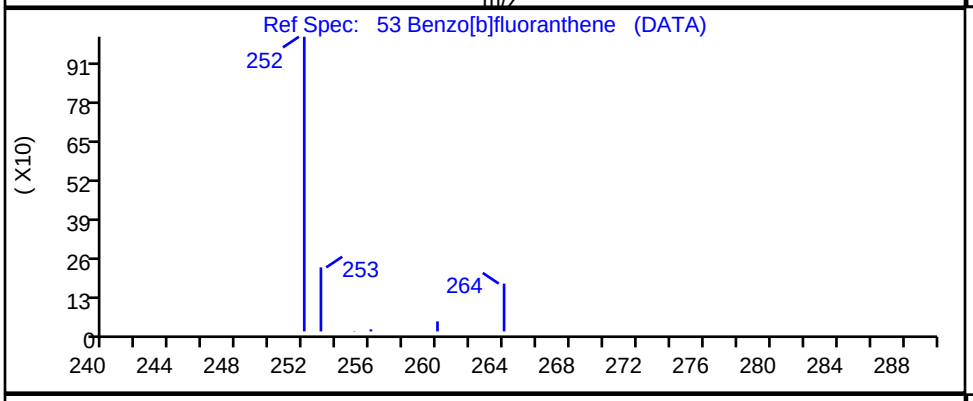
53 Benzo[b]fluoranthene, CAS: 205-99-2

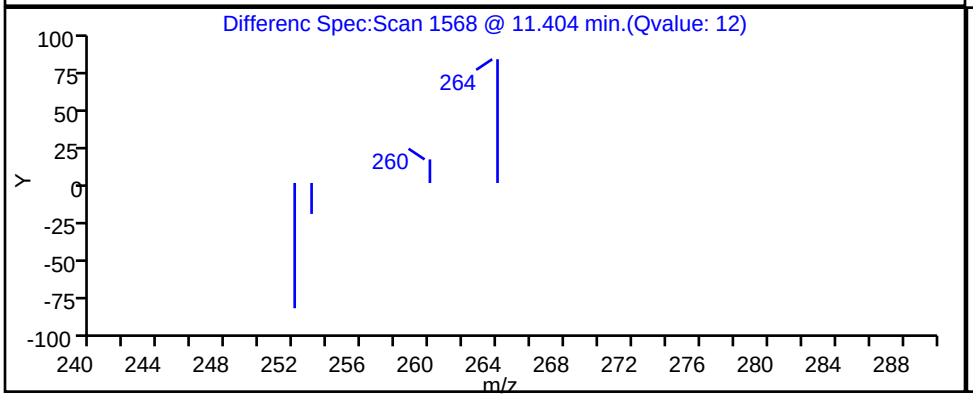


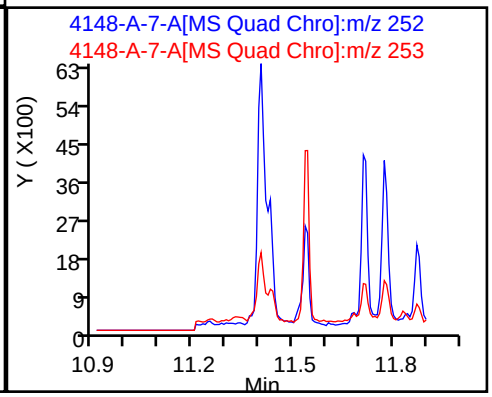












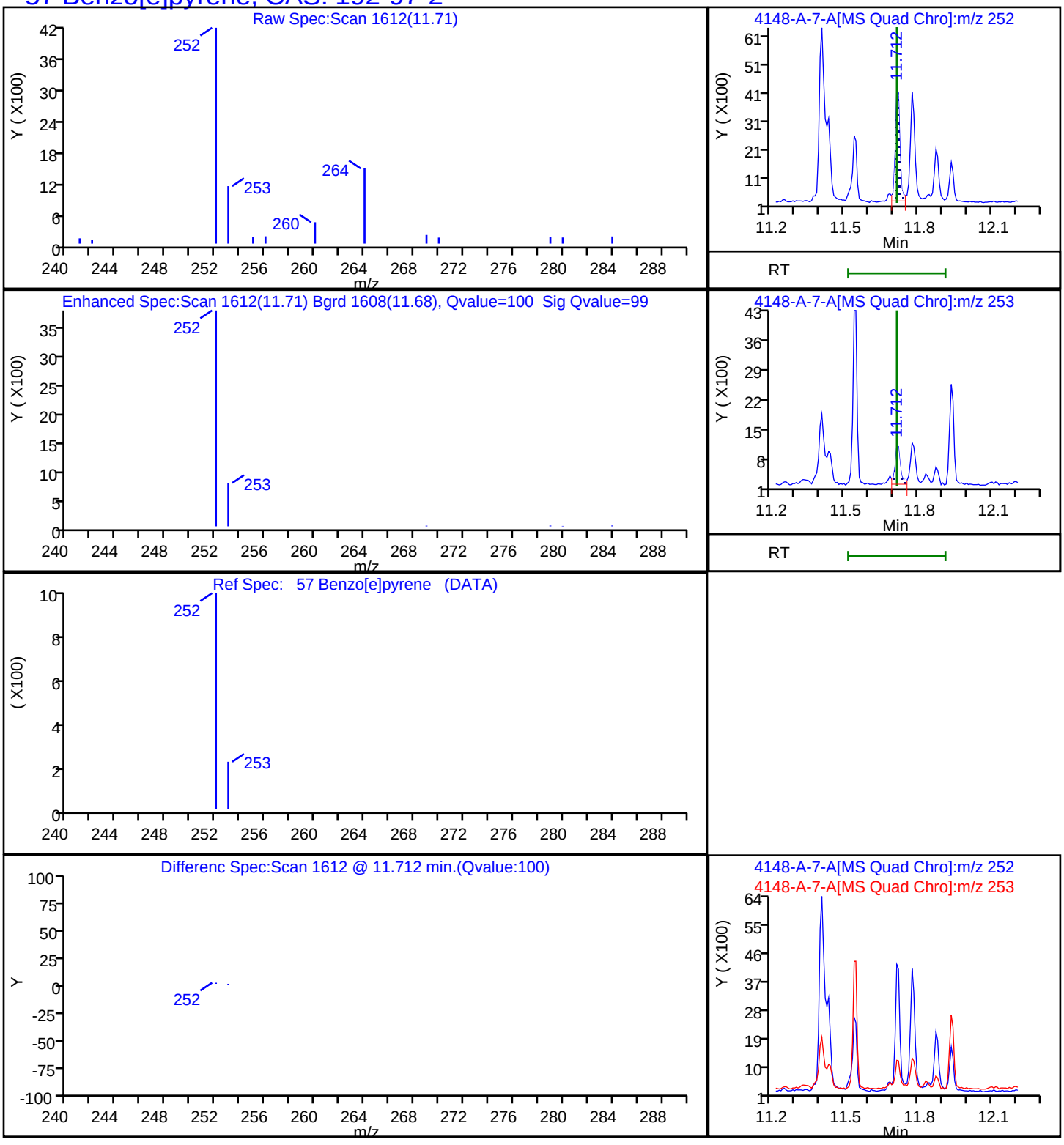
Report Date: 17-Nov-2023 12:15:40 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D

Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10
Client ID:	1804576-844-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

57 Benzo[e]pyrene, CAS: 192-97-2



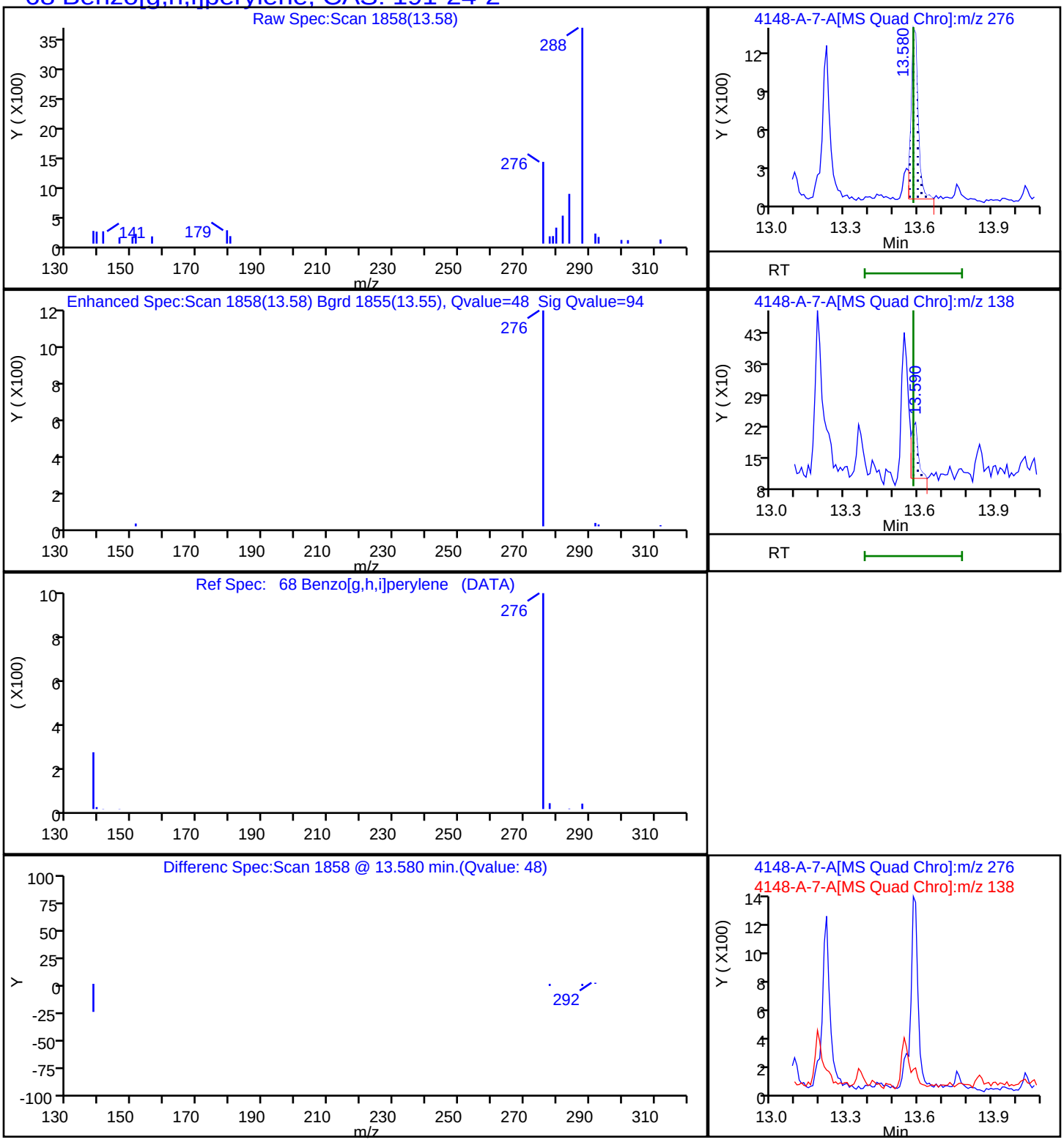
Report Date: 17-Nov-2023 12:15:41 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D

Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10		
Client ID:	1804576-844-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

68 Benzo[g,h,i]perylene, CAS: 191-24-2



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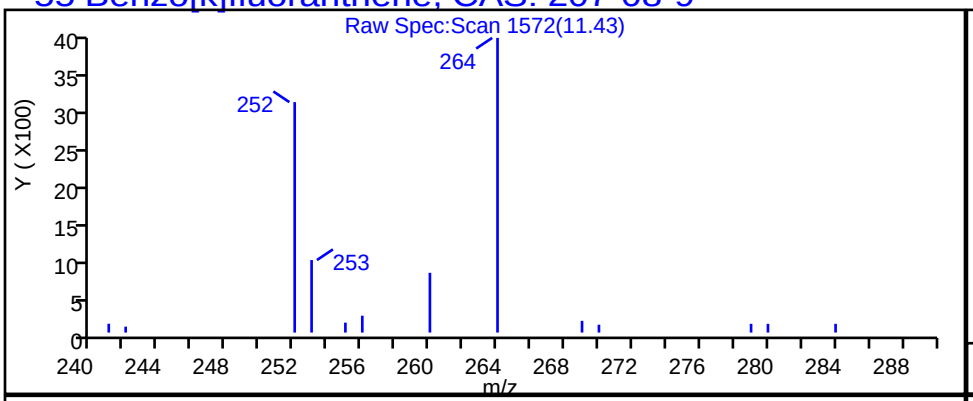
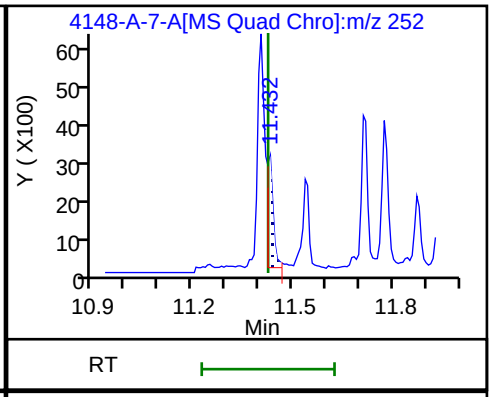
Eurofins Knoxville

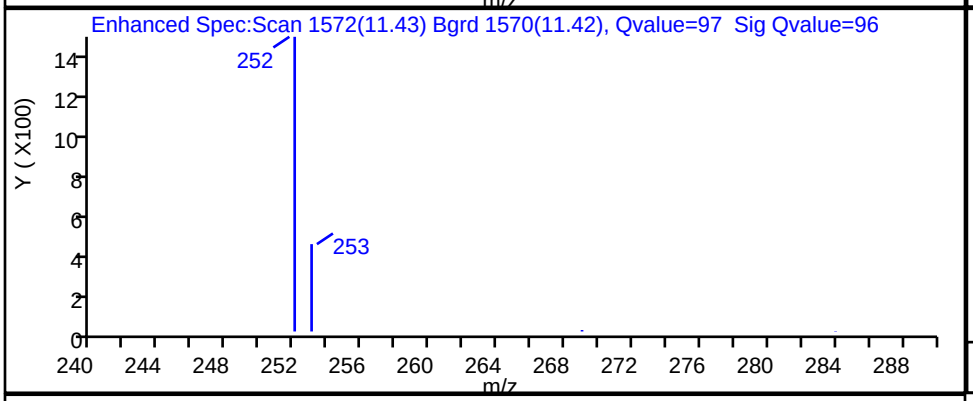
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D

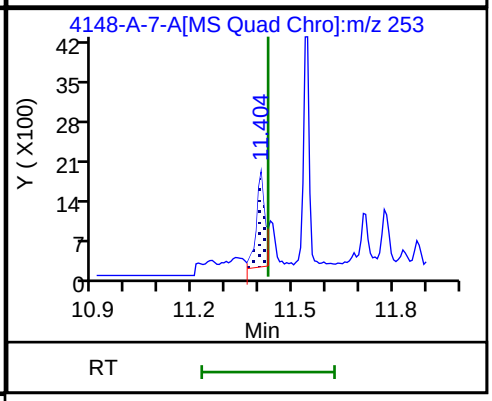
Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10		
Client ID:	1804576-844-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

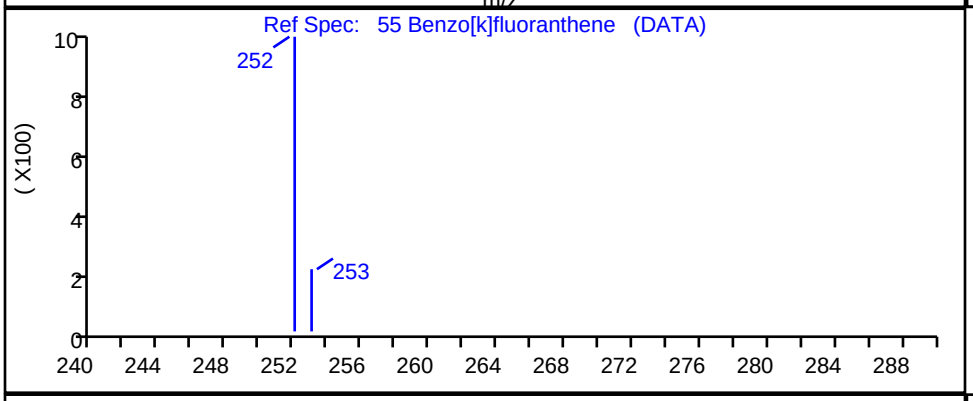
55 Benzo[k]fluoranthene, CAS: 207-08-9

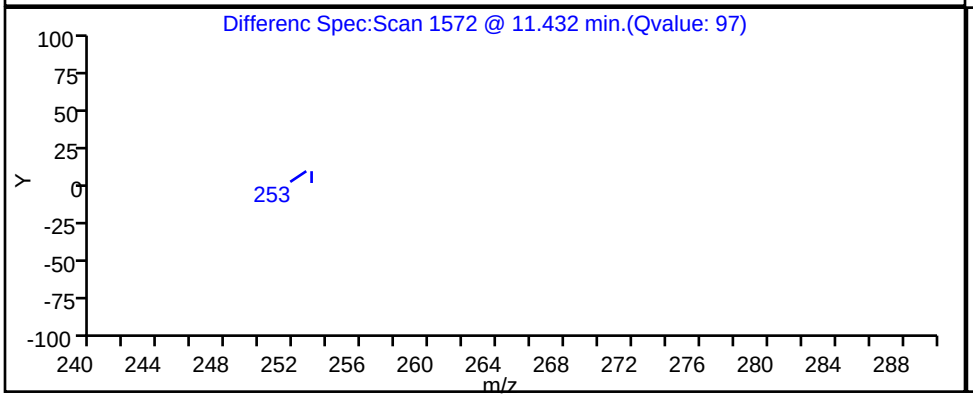


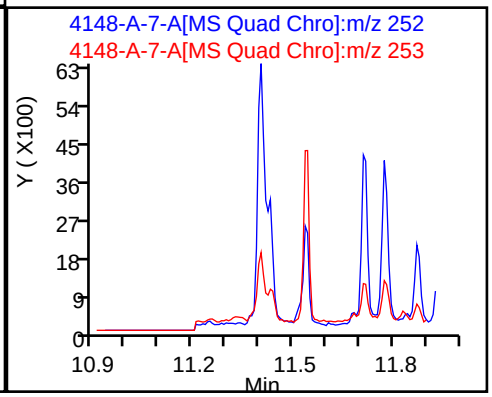












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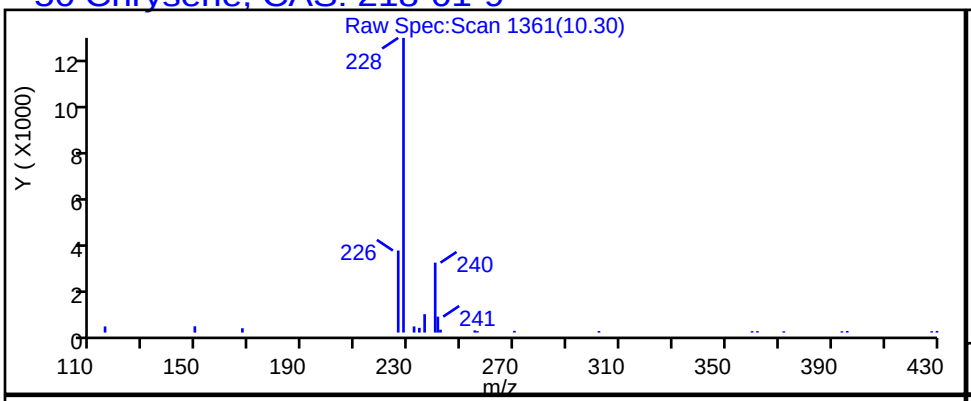
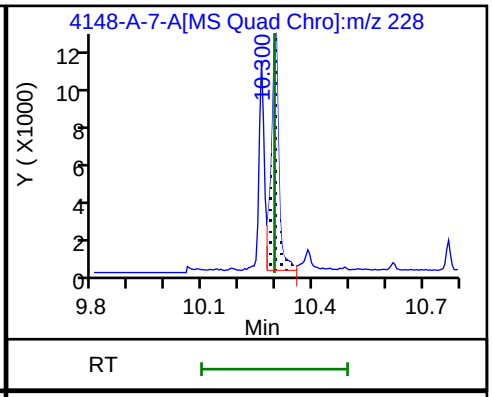
Eurofins Knoxville

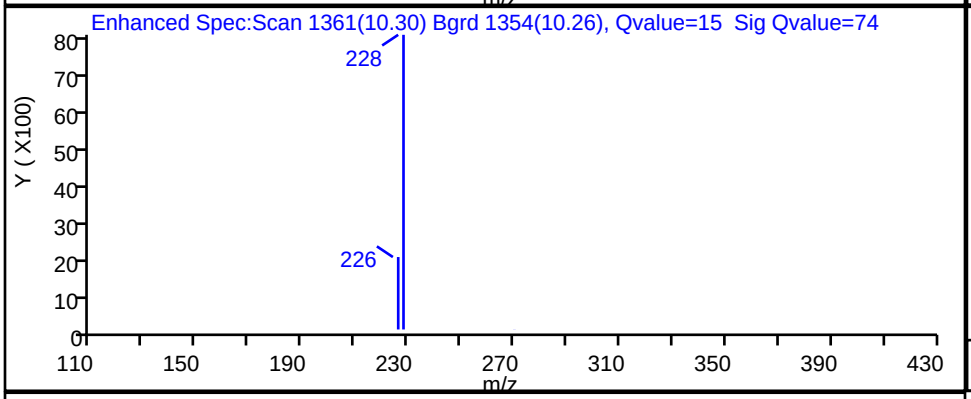
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D

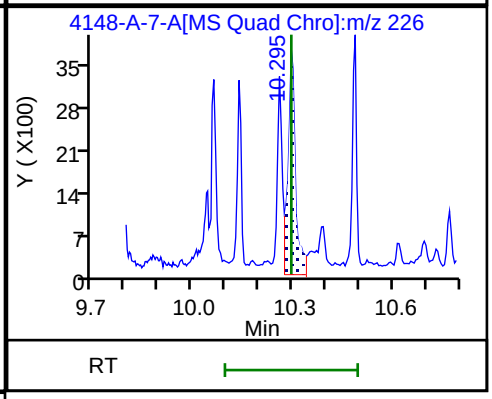
Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10
Client ID:	1804576-844-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

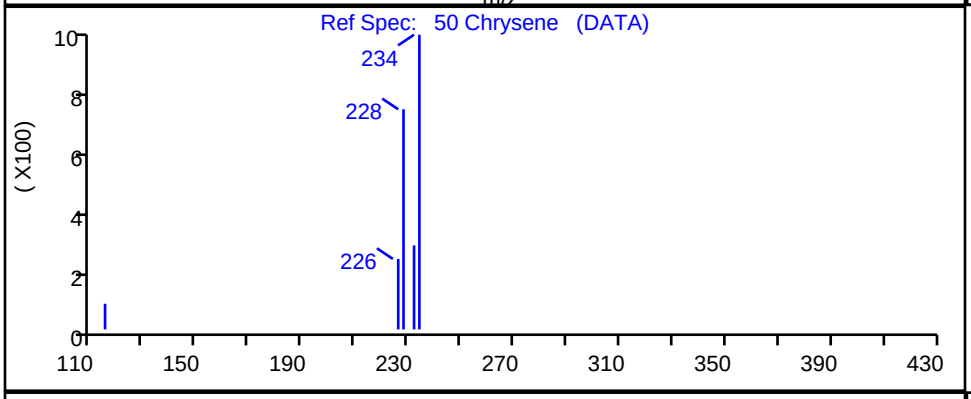
50 Chrysene, CAS: 218-01-9

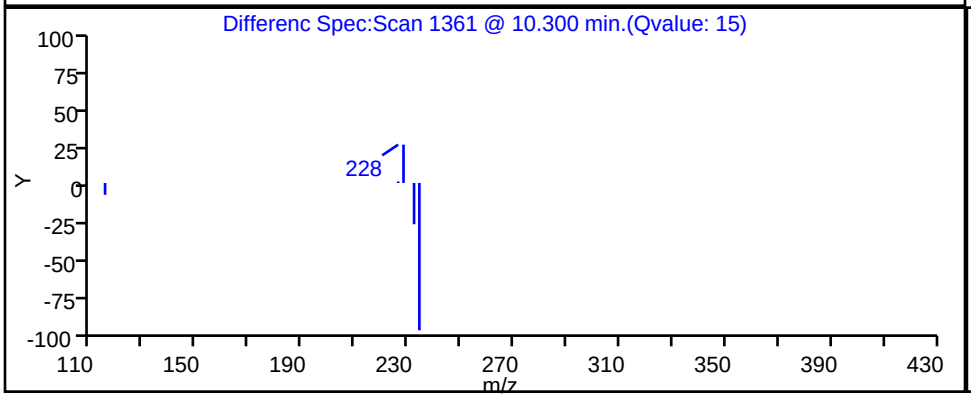


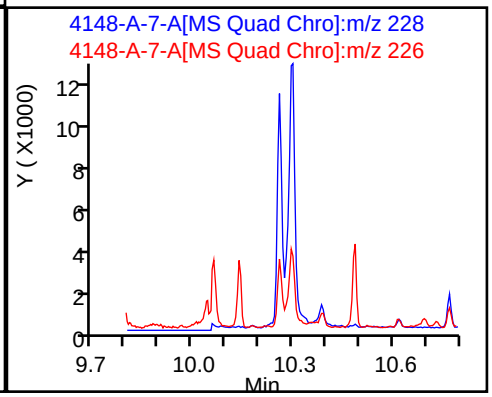












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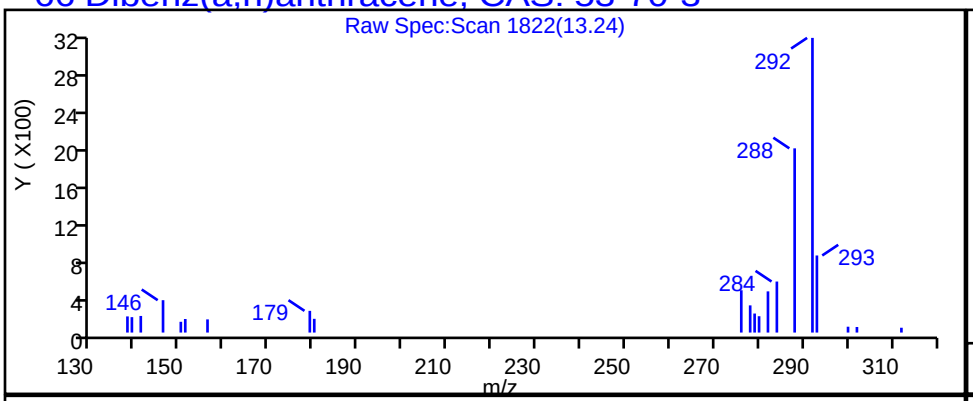
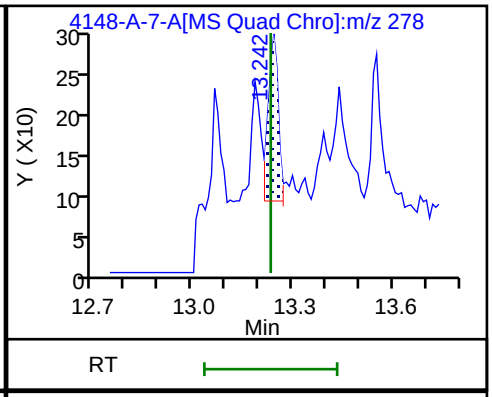
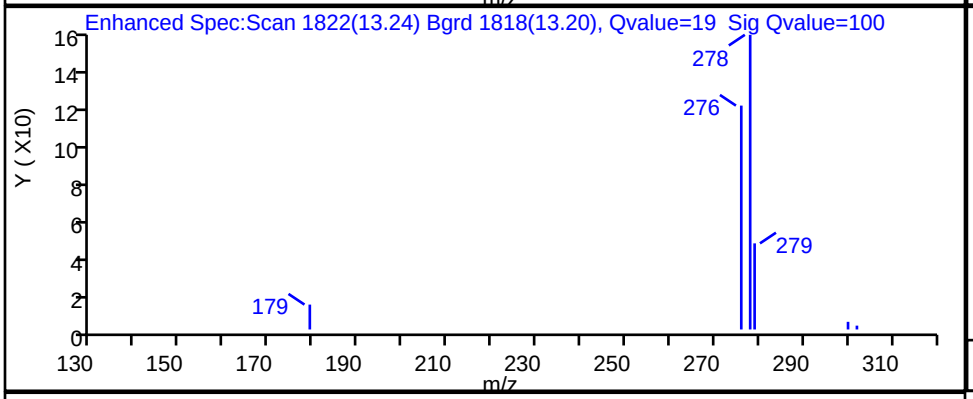
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D

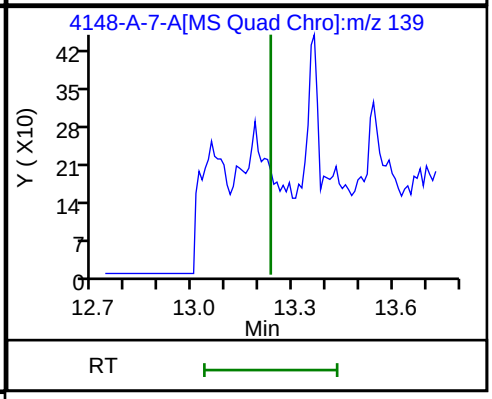
Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10		
Client ID:	1804576-844-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

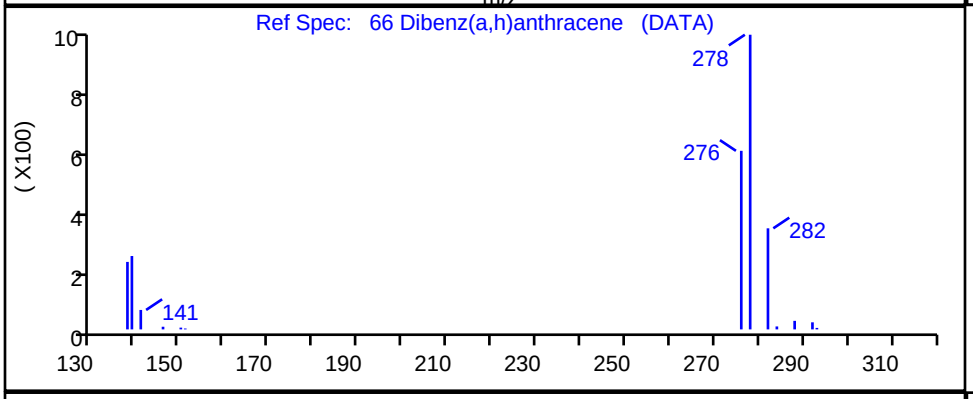
66 Dibenz(a,h)anthracene, CAS: 53-70-3

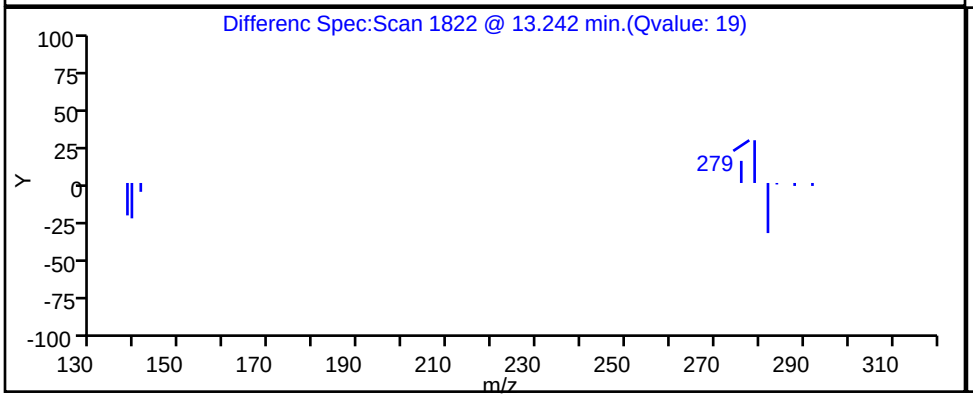


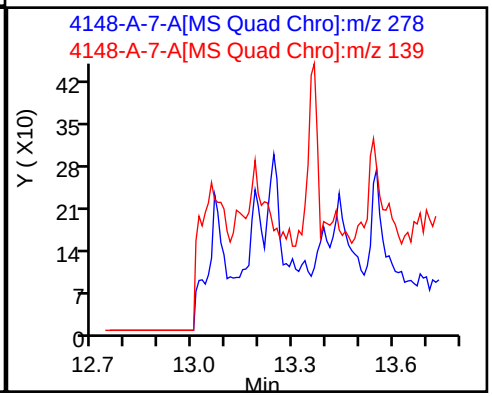












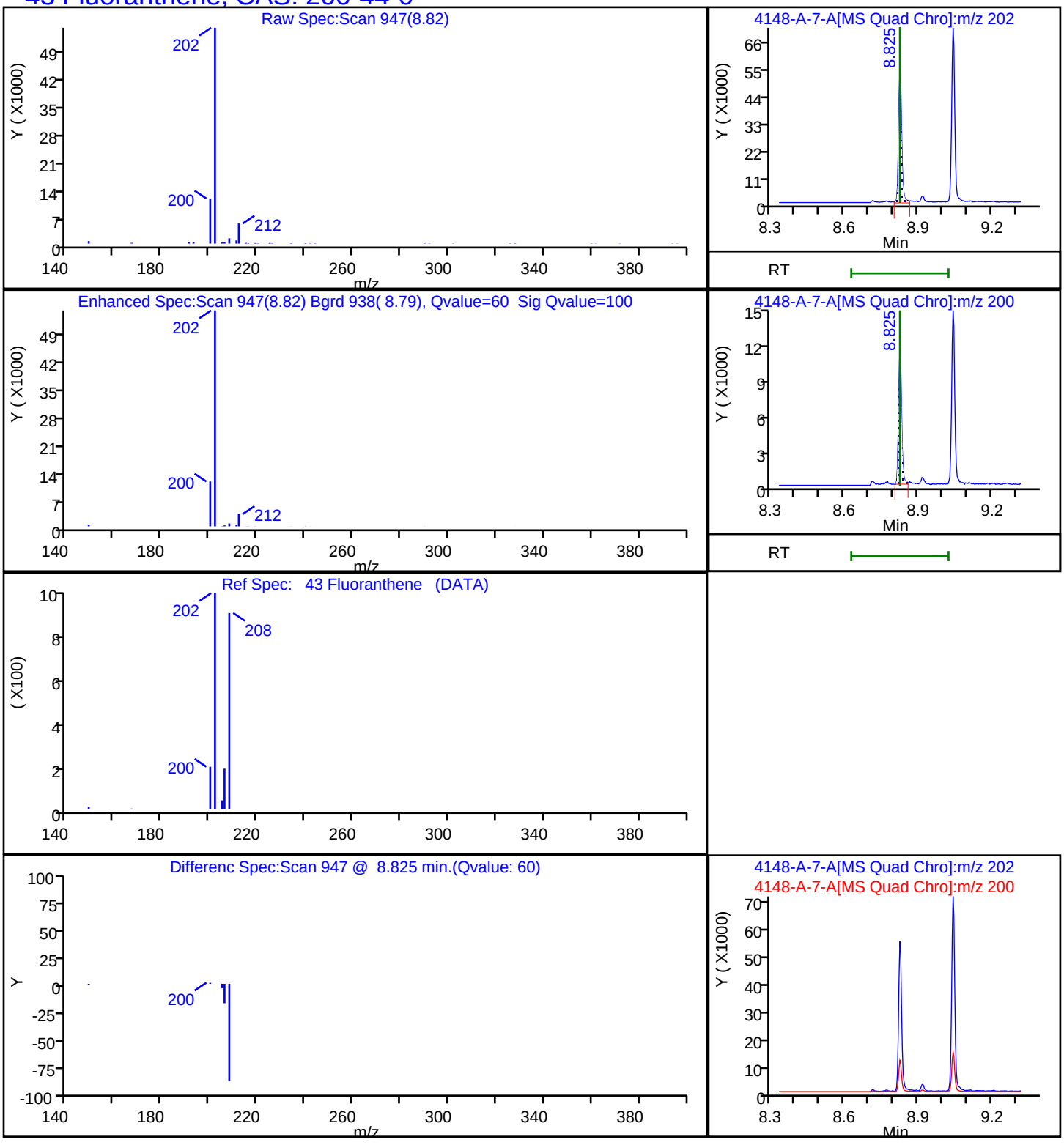
Report Date: 17-Nov-2023 12:15:40 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D

Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10
Client ID:	1804576-844-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

43 Fluoranthene, CAS: 206-44-0



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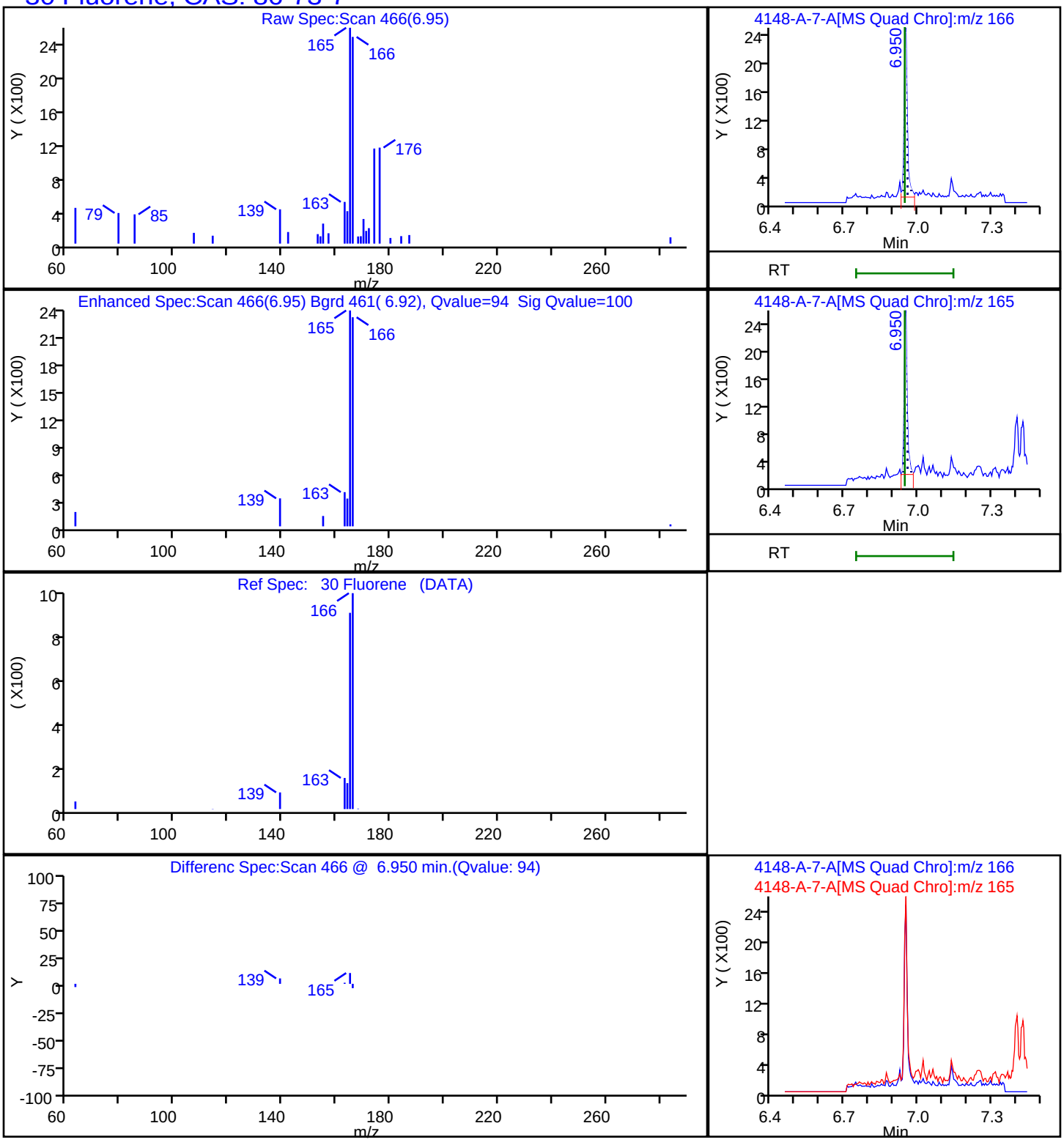
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D

Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10
Client ID:	1804576-844-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

30 Fluorene, CAS: 86-73-7



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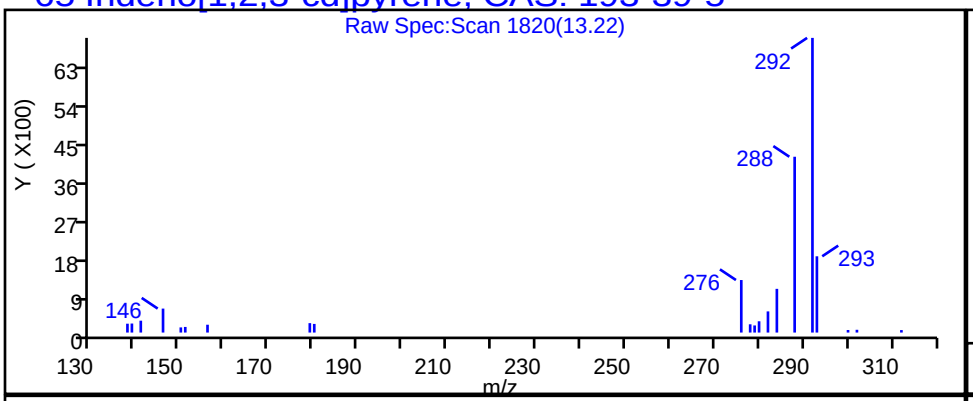
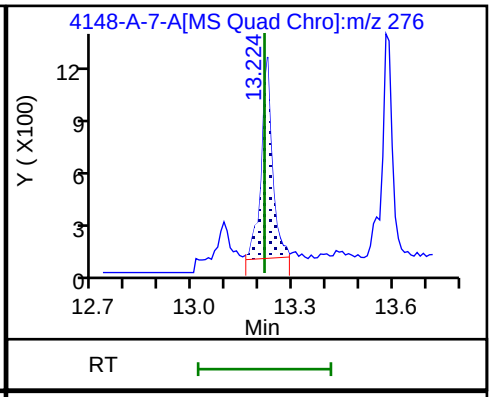
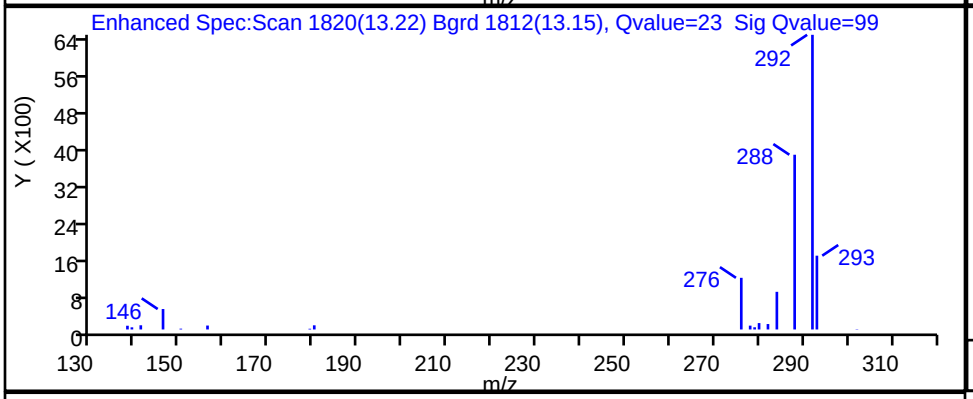
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D

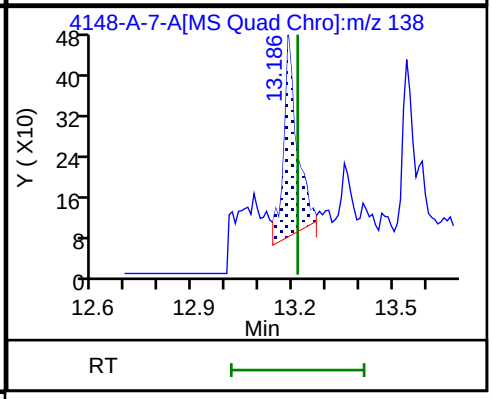
Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10		
Client ID:	1804576-844-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

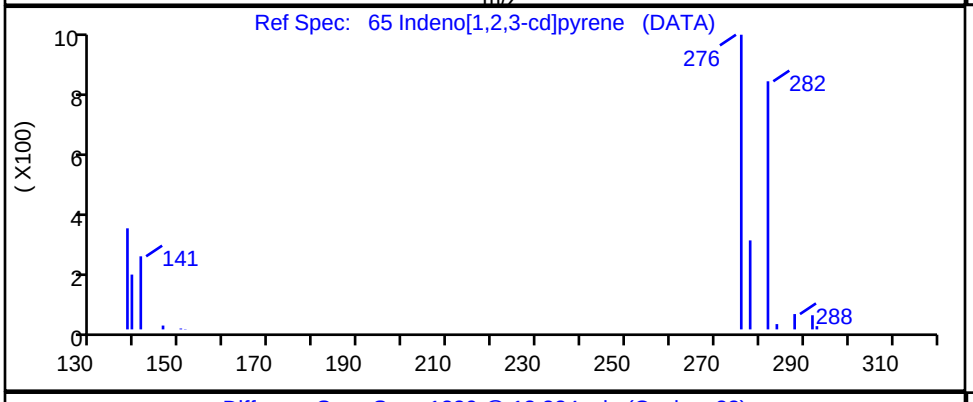
65 Indeno[1,2,3-cd]pyrene, CAS: 193-39-5

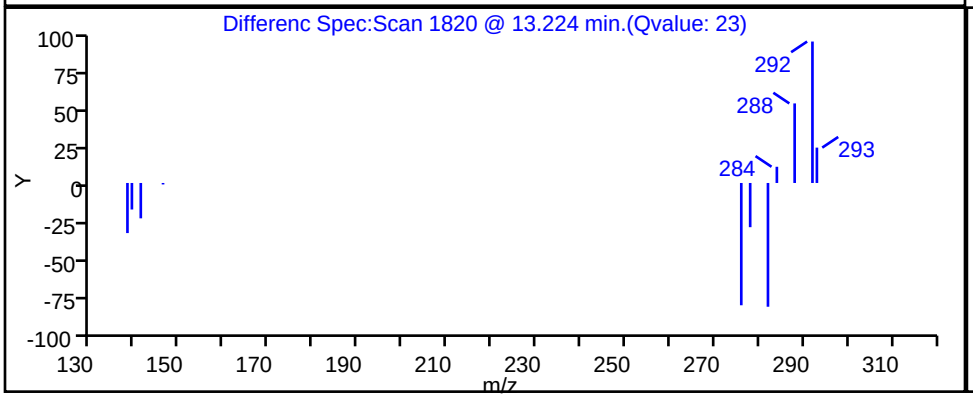


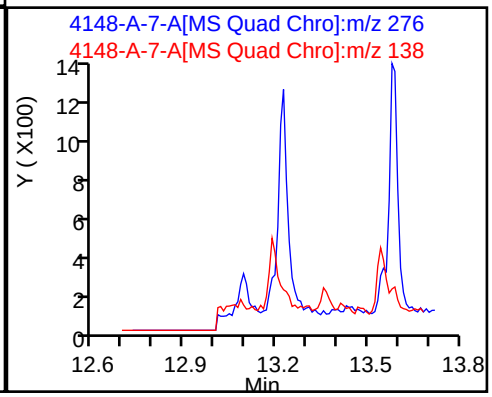












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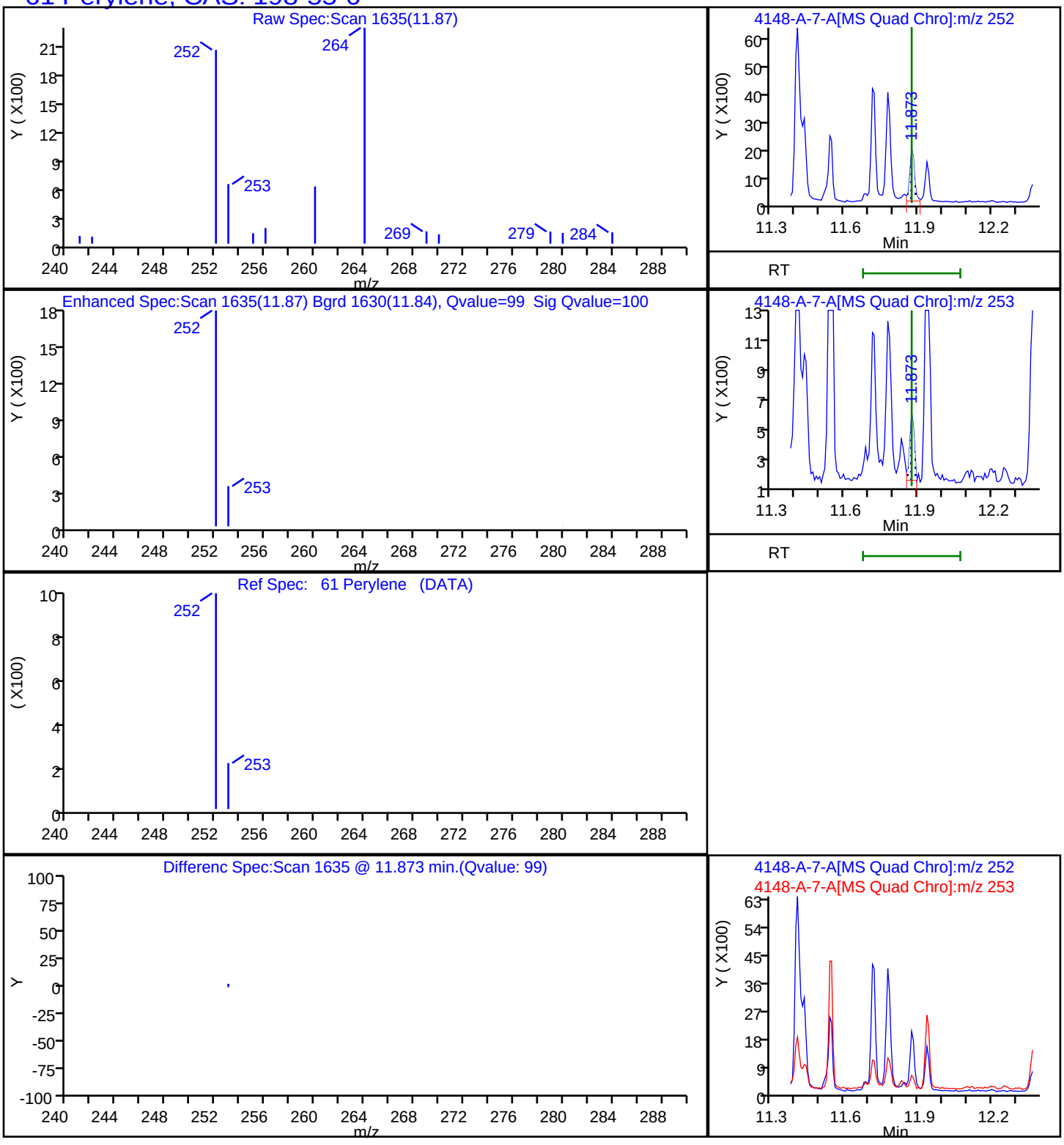
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D

Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10
Client ID:	1804576-844-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

61 Perylene, CAS: 198-55-0



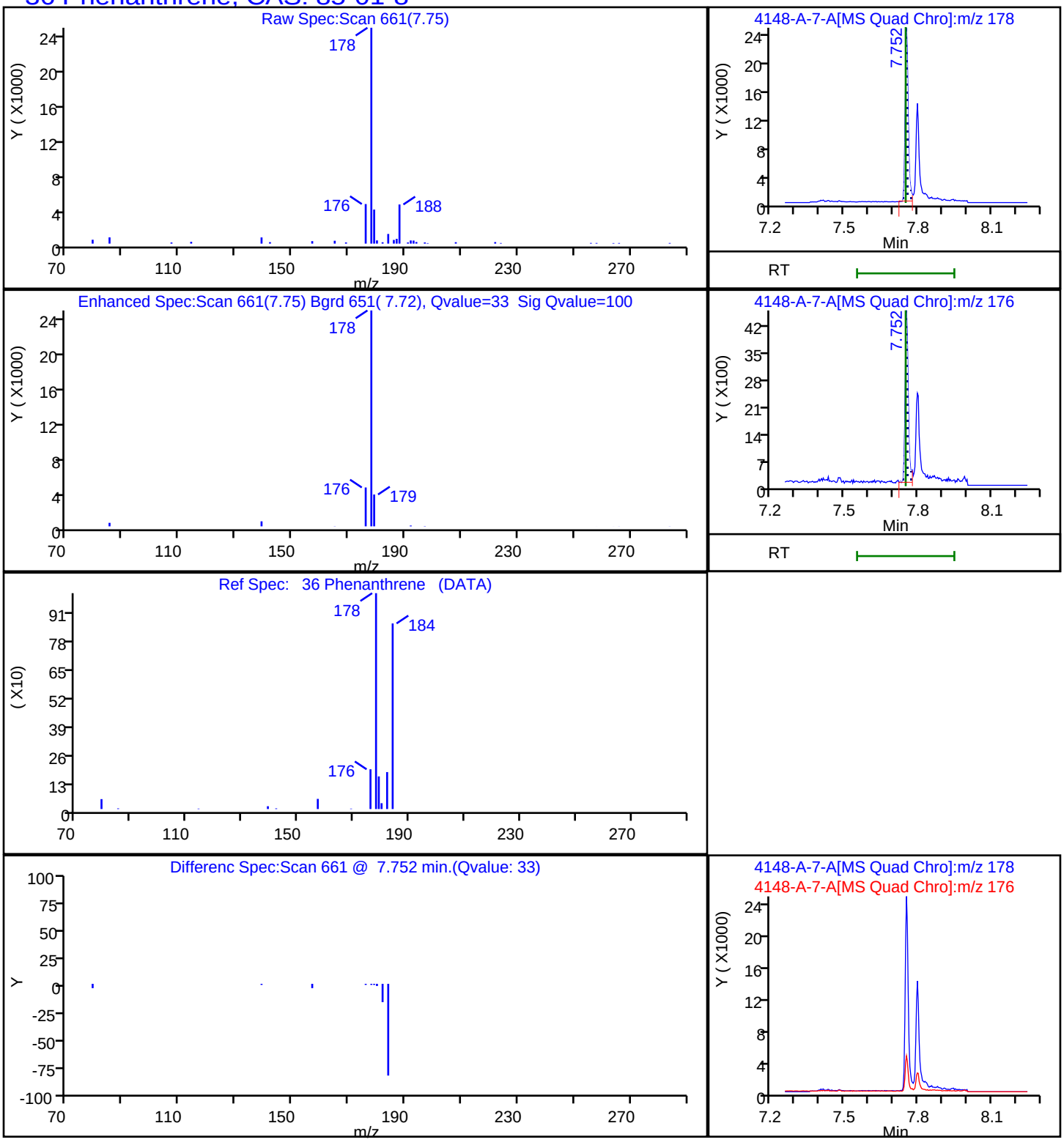
Report Date: 17-Nov-2023 12:15:40 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D

Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10
Client ID:	1804576-844-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

36 Phenanthrene, CAS: 85-01-8



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Eurofins Knoxville

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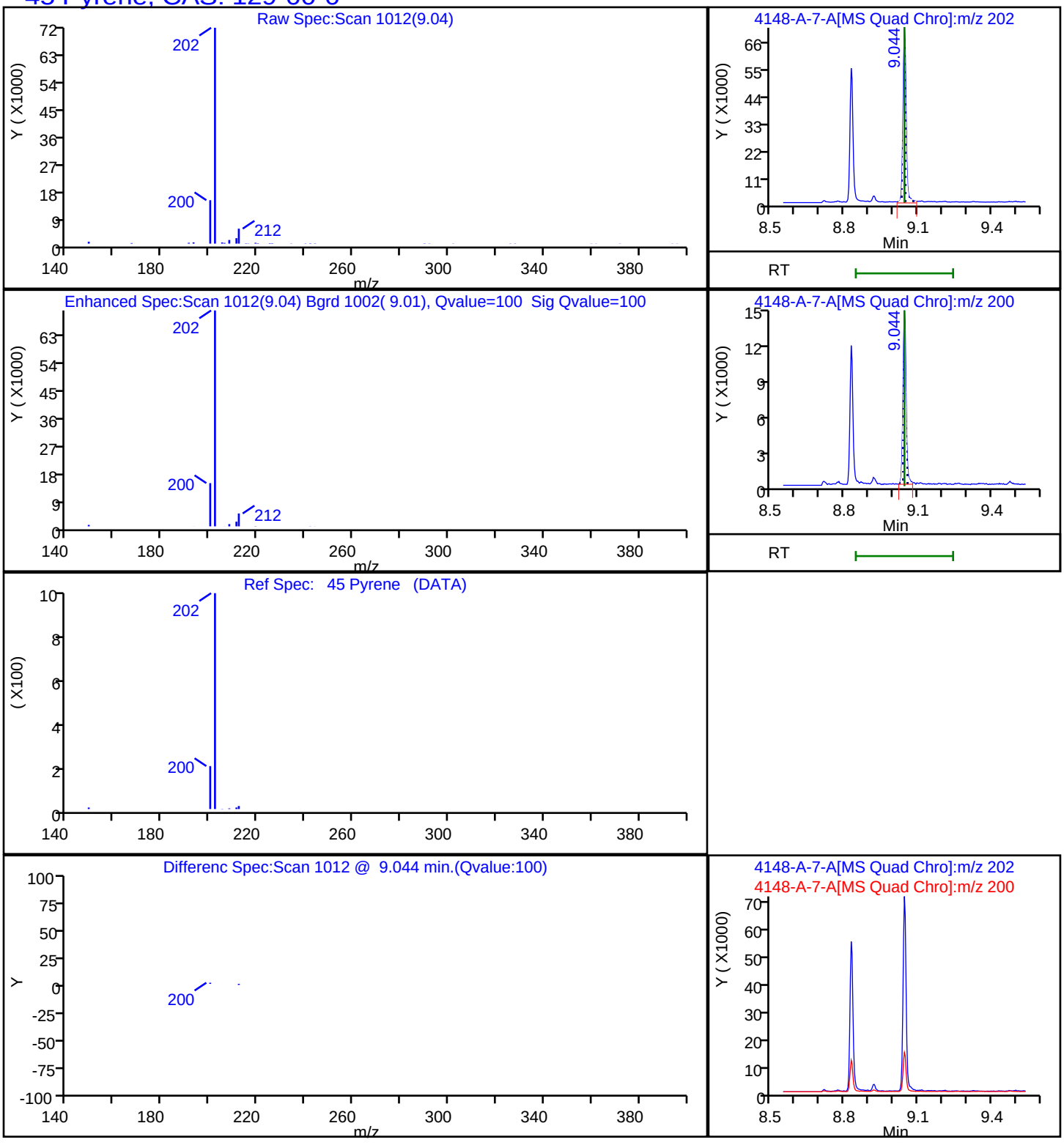
Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10
Client ID:	1804576-844-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

45 Pyrene, CAS: 129-00-0



Report Date: 17-Nov-2023 12:15:41 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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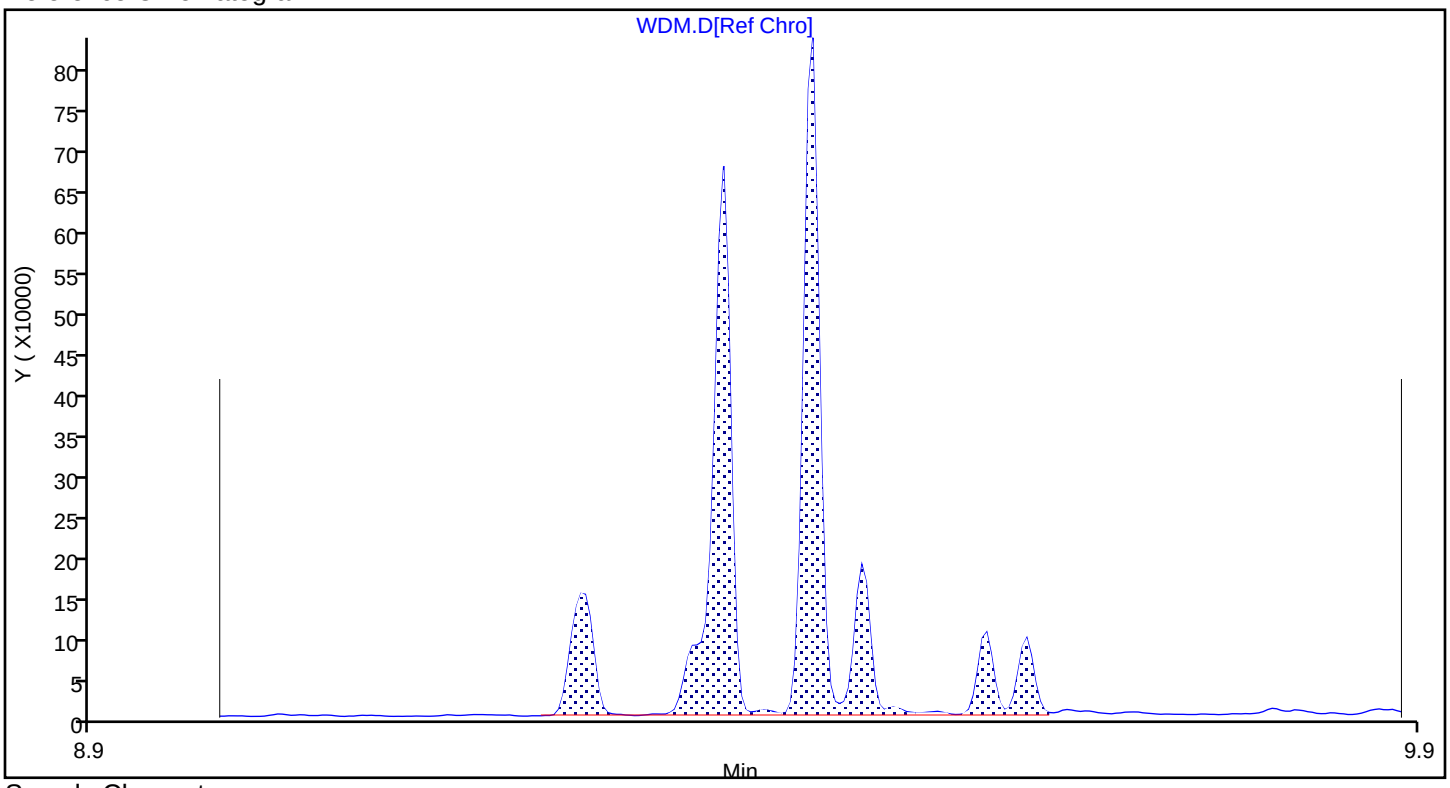
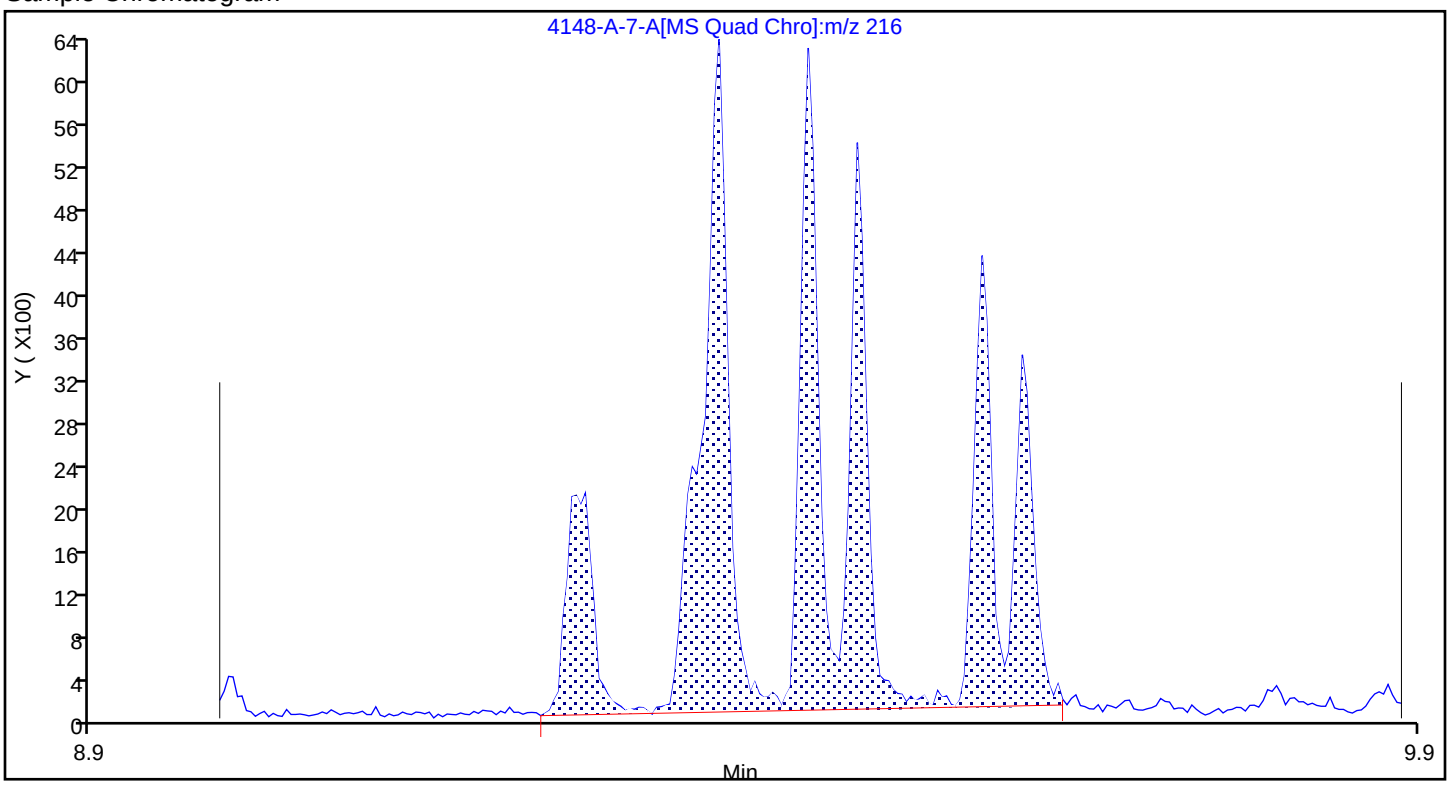
Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10		
Client ID:	1804576-844-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 100 C1-Fluoranthenes/pyrene, CAS: STL00912

Reference Chromatogram



Sample Chromatogram



Report Date: 17-Nov-2023 12:15:41 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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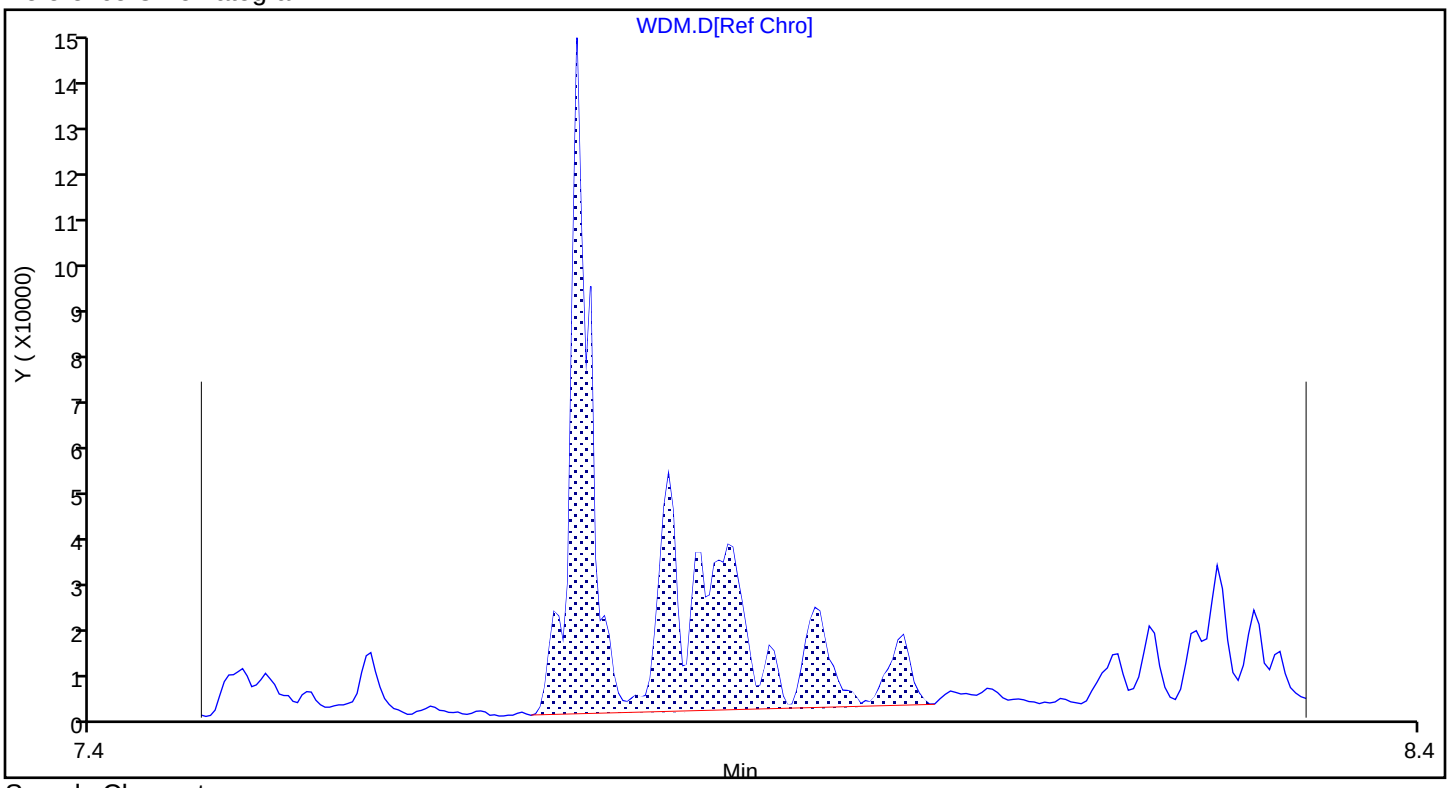
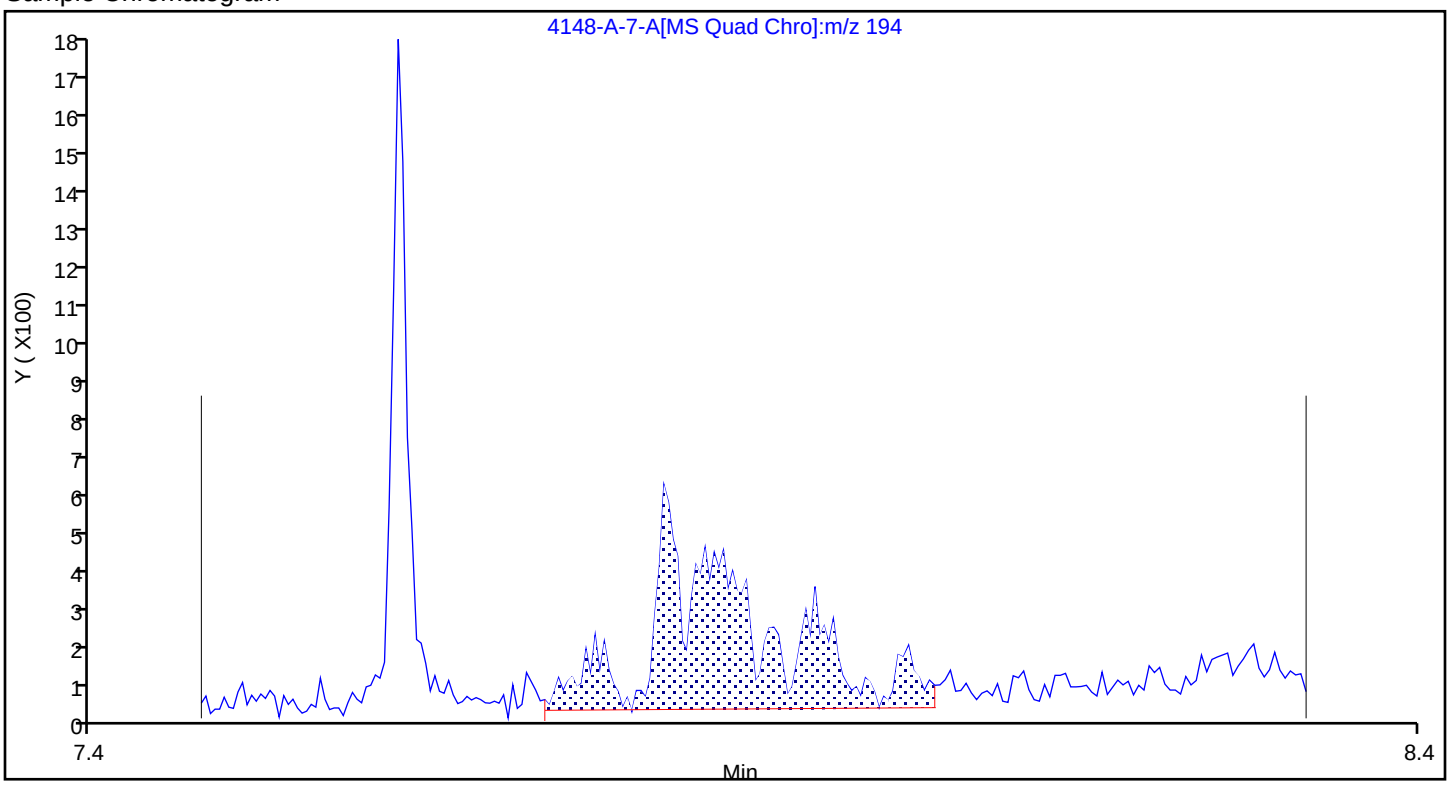
Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10		
Client ID:	1804576-844-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 90 C2-Fluorenes, CAS: STL00914

Reference Chromatogram



Sample Chromatogram



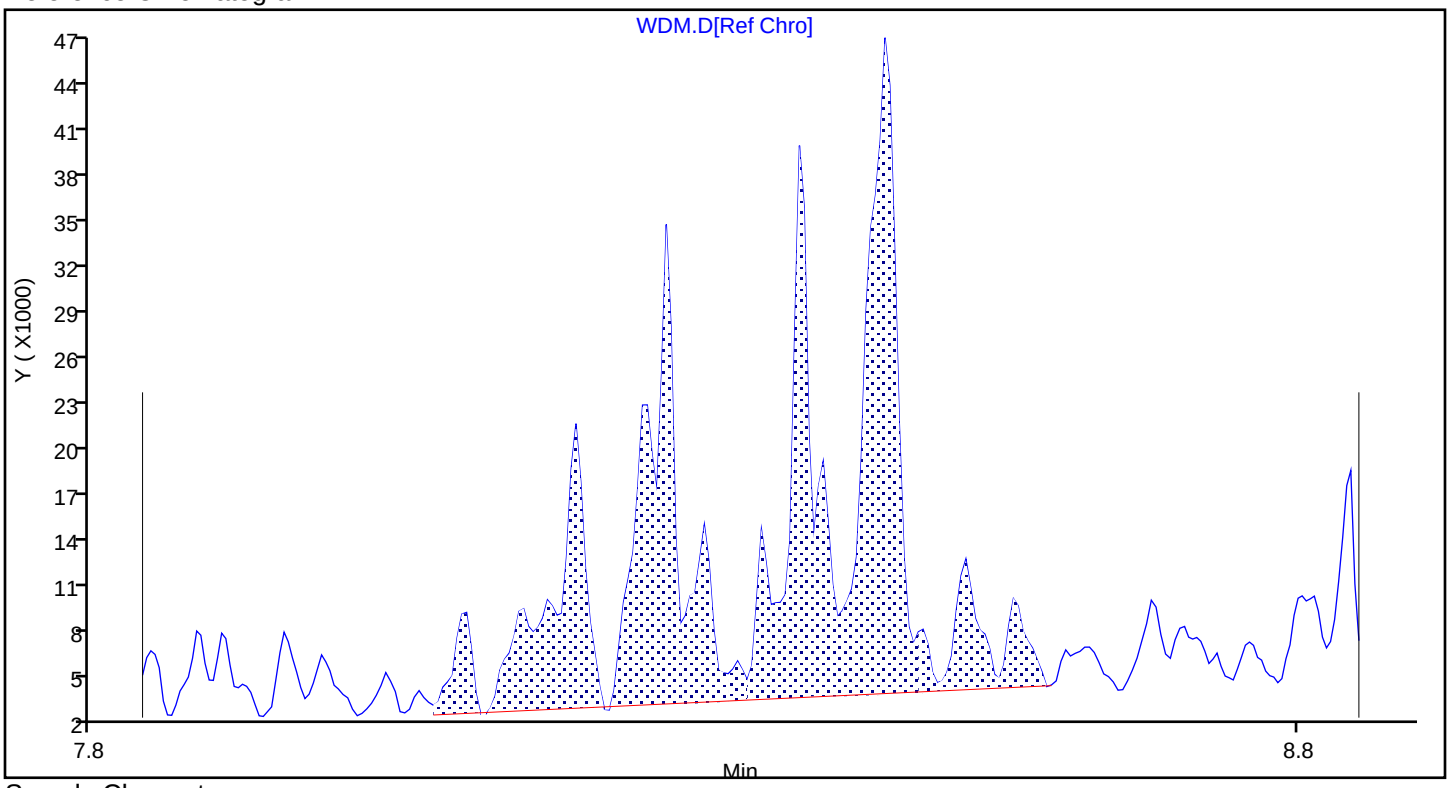
Report Date: 17-Nov-2023 12:15:41 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

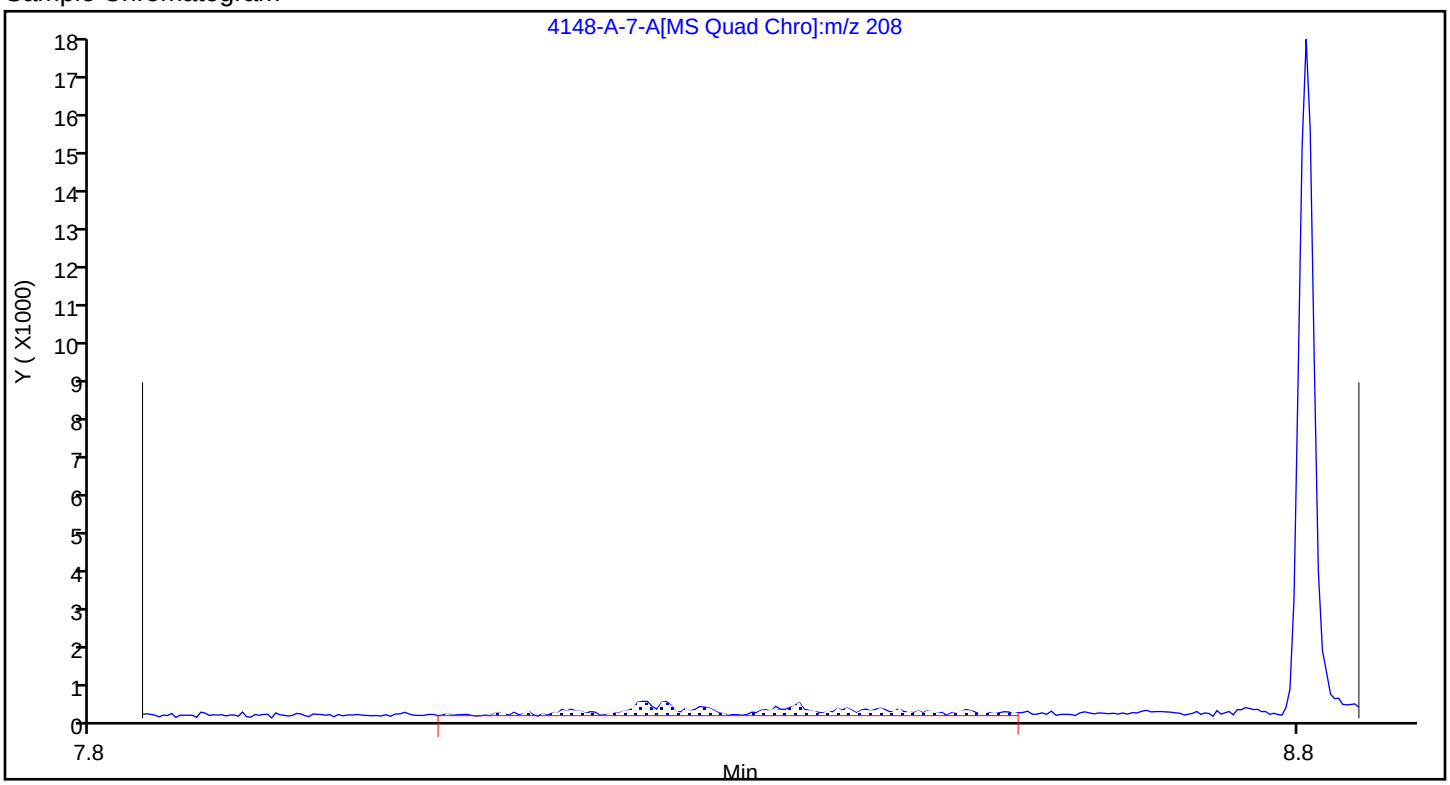
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D				
Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10		
Client ID:	1804576-844-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 91 C3-Fluorenes, CAS: STL00915

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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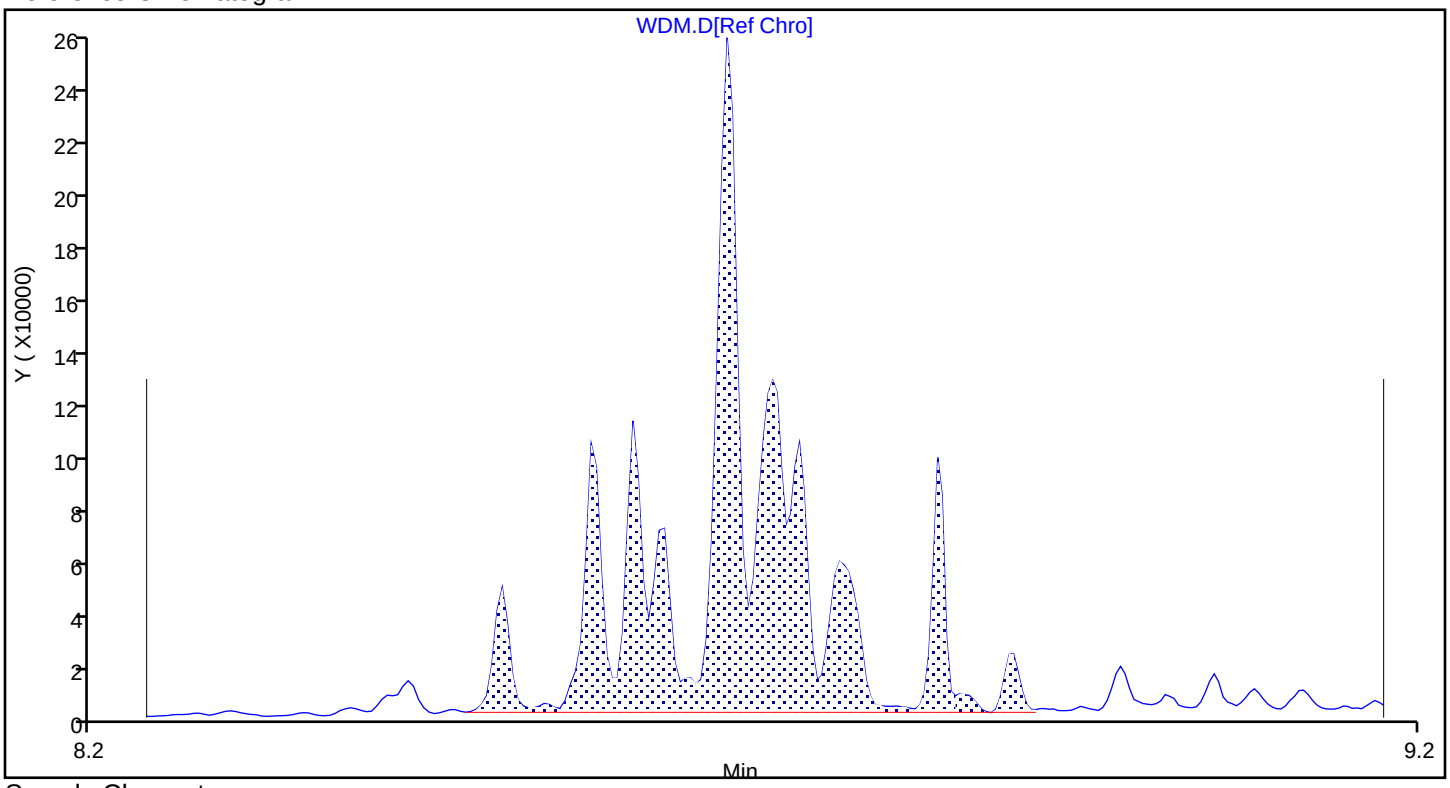
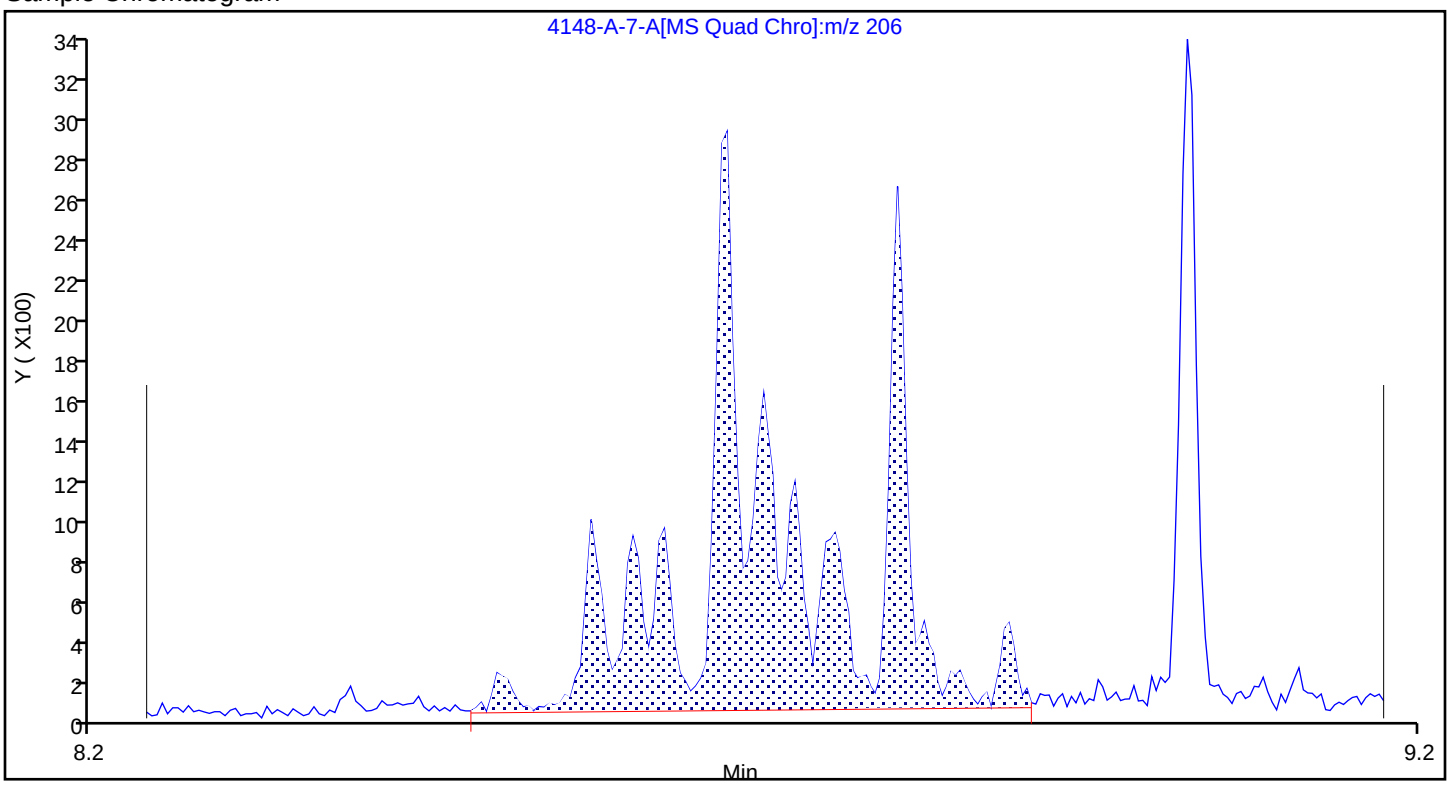
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10		
Client ID:	1804576-844-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 97 C2-Phenanthrenes/Anthracenes, CAS: STL00902

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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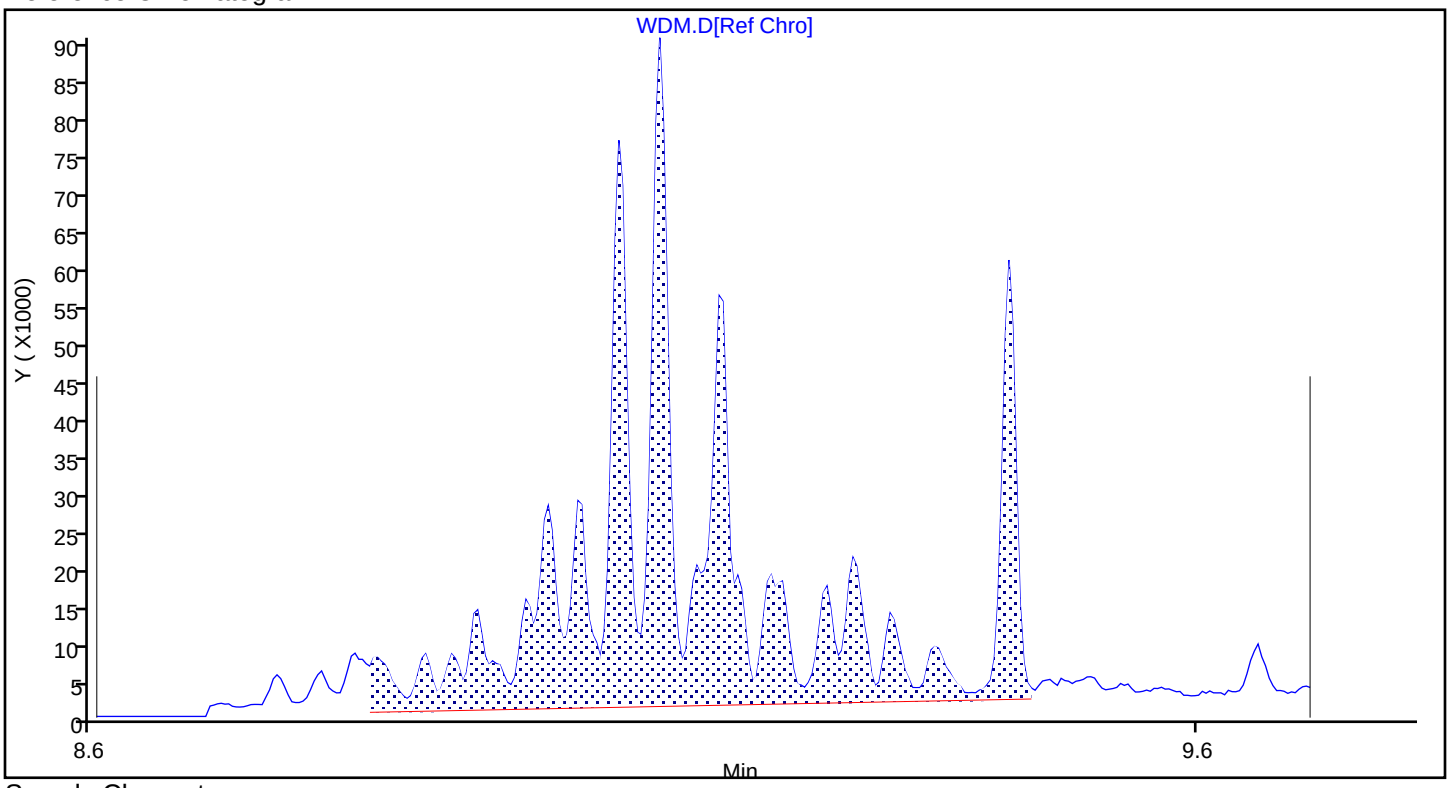
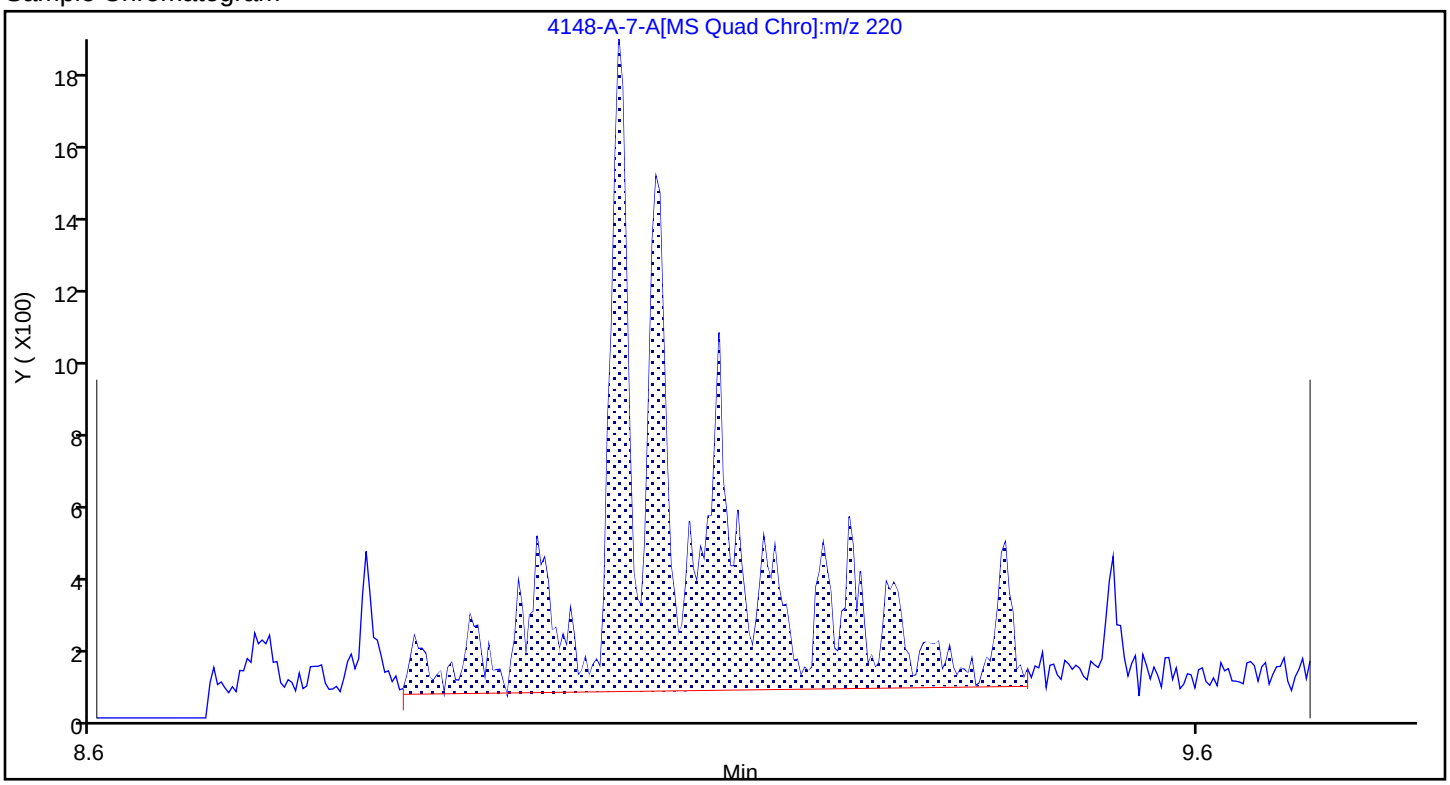
Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10		
Client ID:	1804576-844-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 98 C3-Phenanthrenes/Anthracenes, CAS: STL00903

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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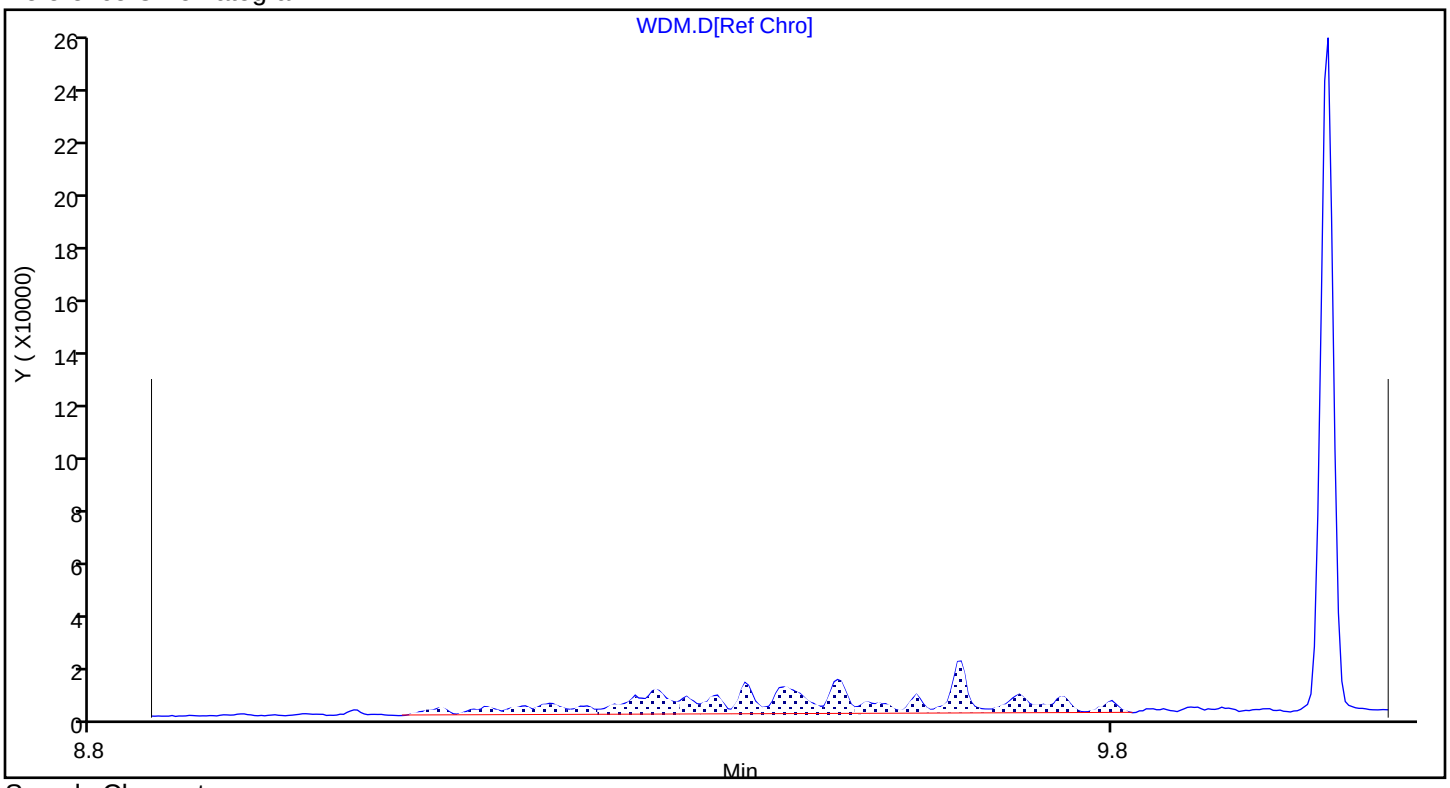
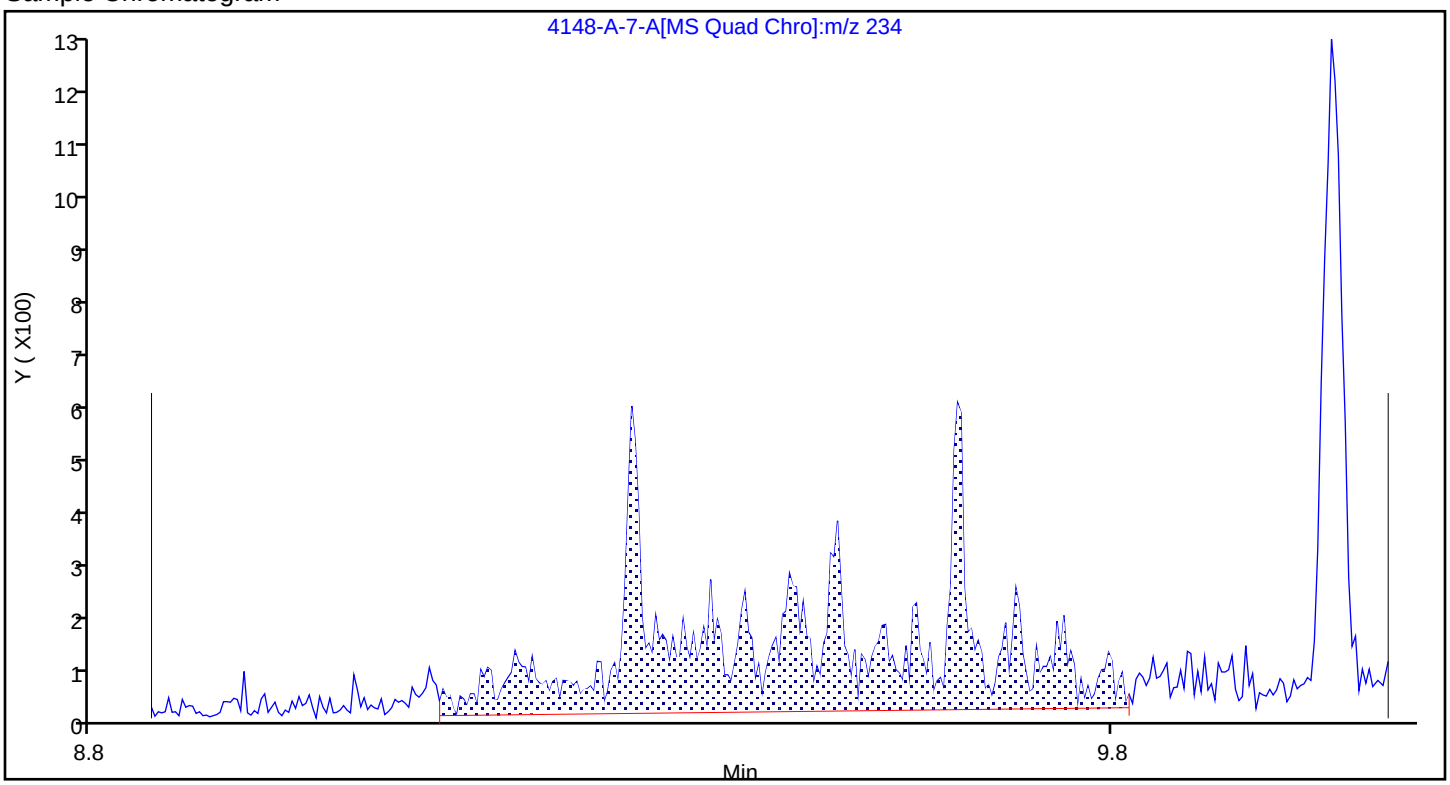
Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10		
Client ID:	1804576-844-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 99 C4-Phenanthrenes/Anthracenes, CAS: STL00904

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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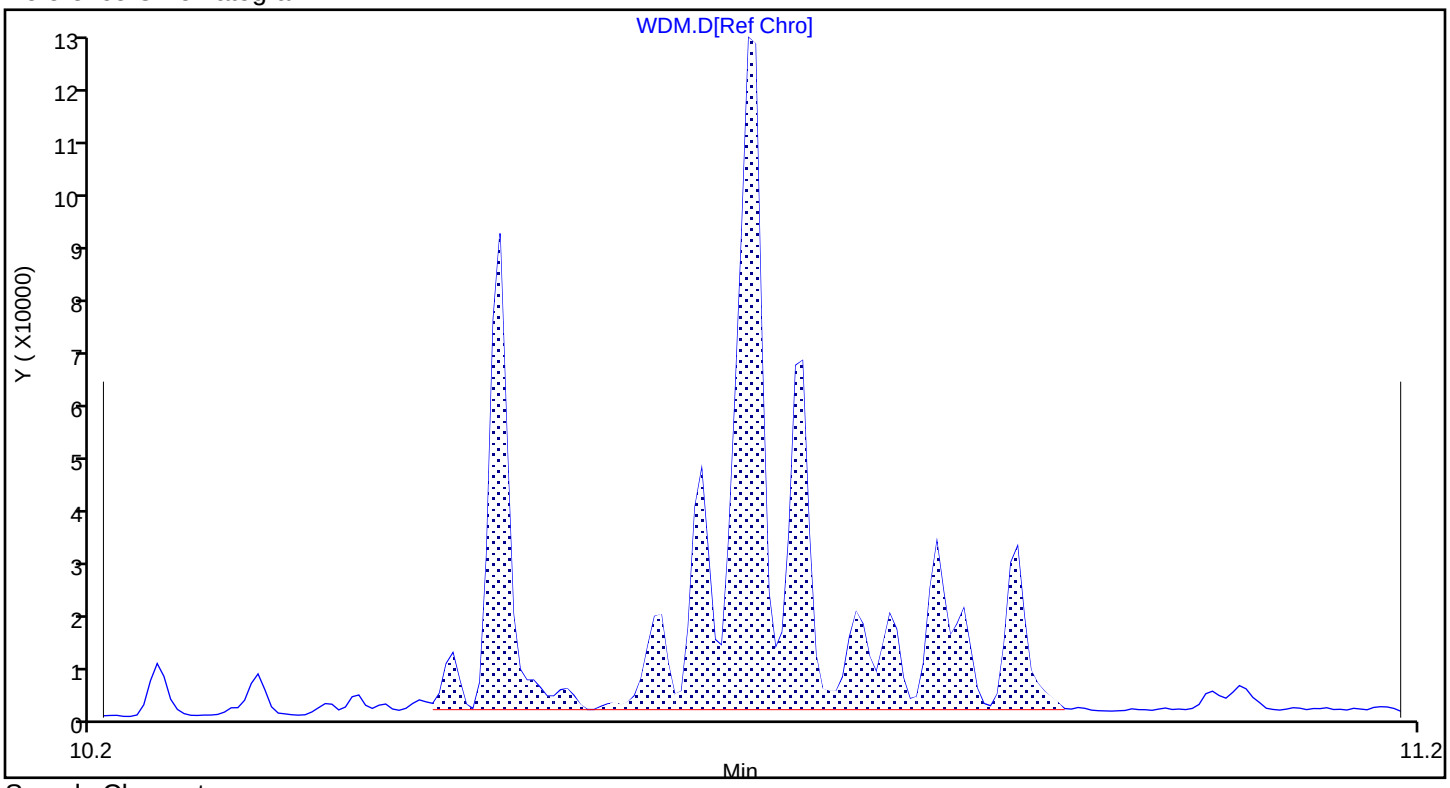
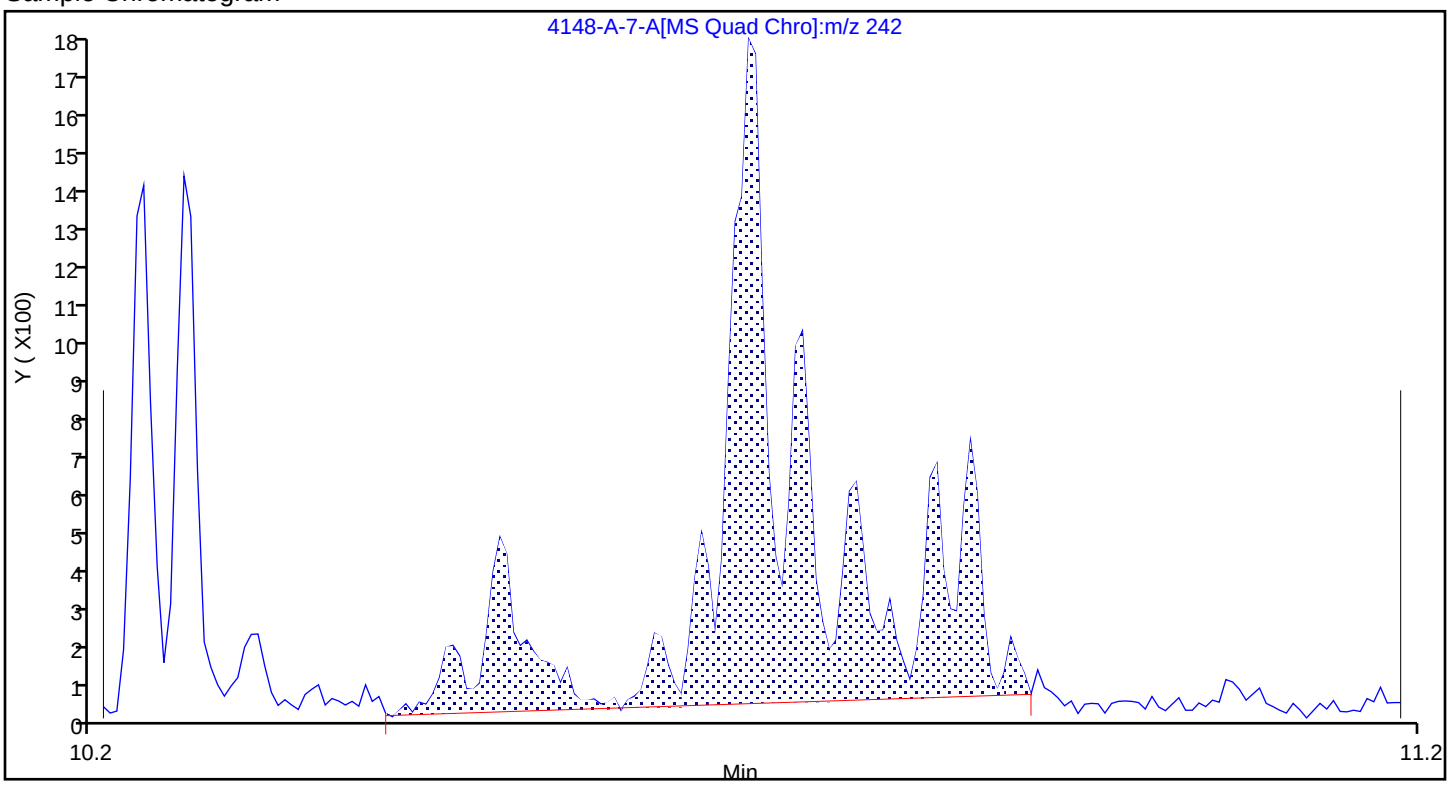
Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10		
Client ID:	1804576-844-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 101 C1-Chrysenes/Benz(a)anthracenes, CAS: STL02218

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1		
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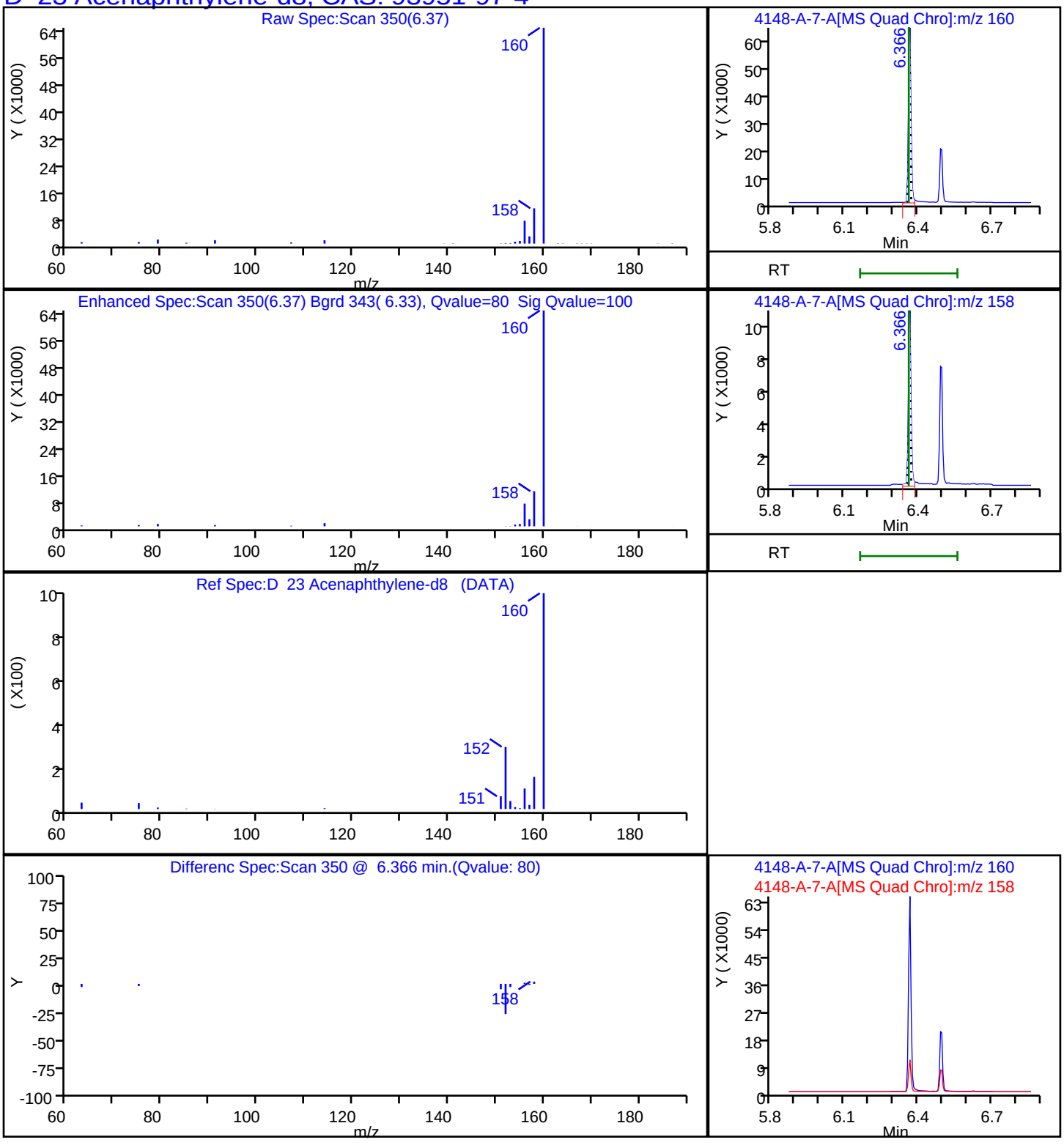
Client ID:	1804576-844-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 23 Acenaphthylene-d8, CAS: 93951-97-4



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Eurofins Knoxville

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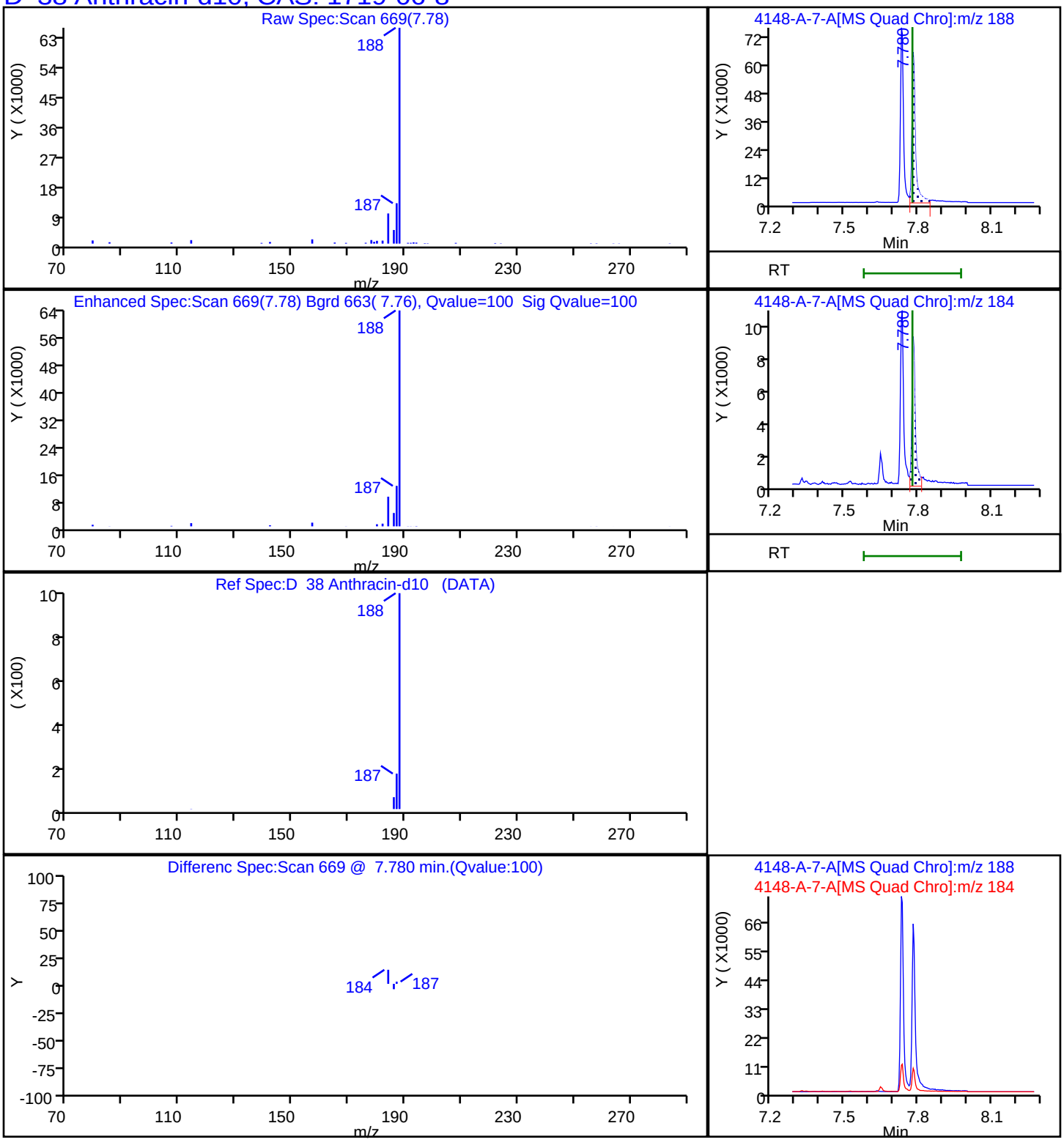
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10		
Client ID:	1804576-844-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 38 Anthracin-d10, CAS: 1719-06-8



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Eurofins Knoxville

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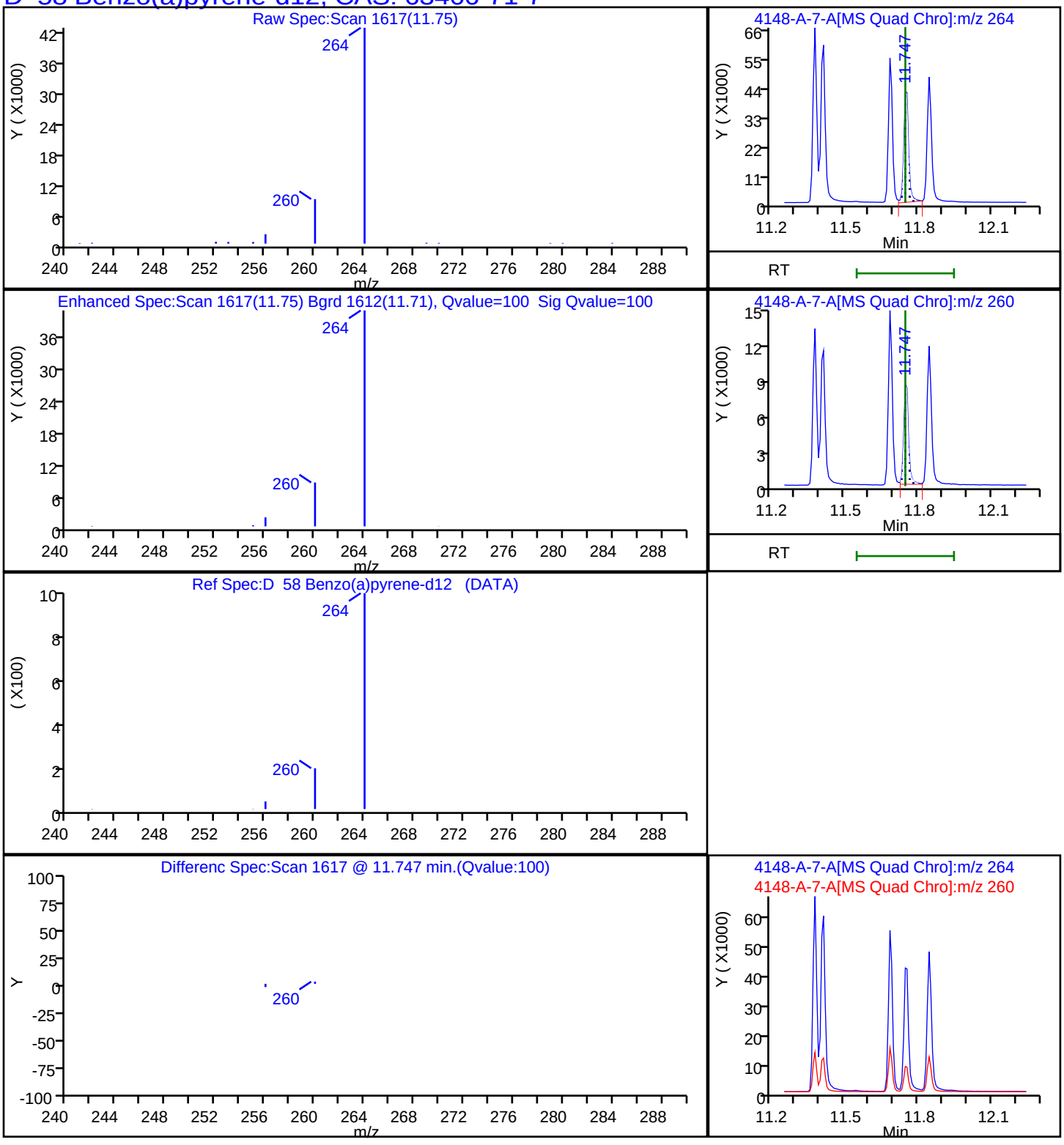
Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10
Client ID:	1804576-844-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

D 58 Benzo(a)pyrene-d12, CAS: 63466-71-7



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Eurofins Knoxville

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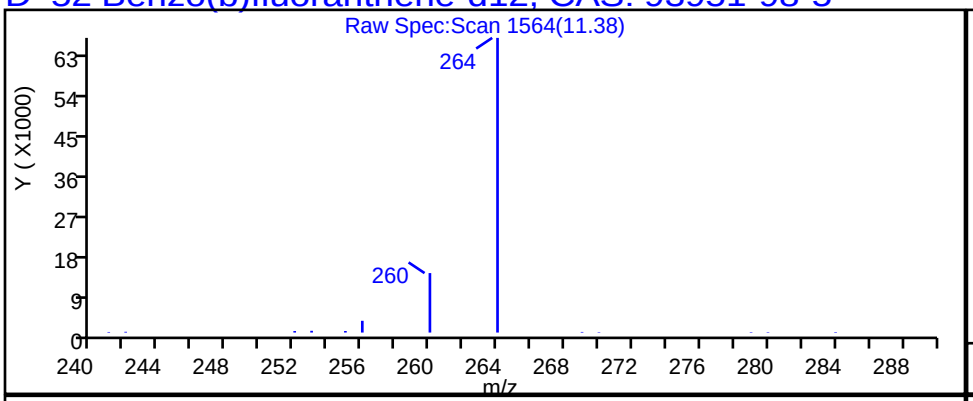
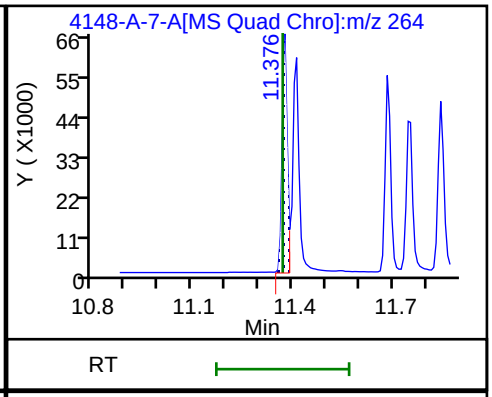
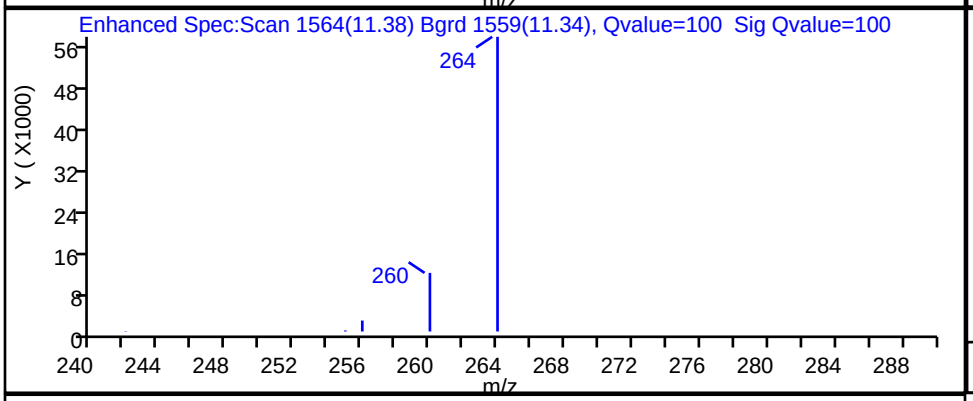
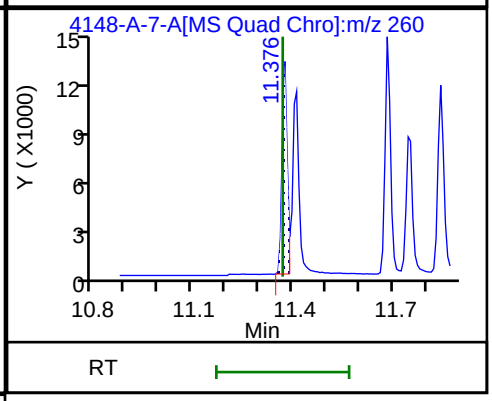
Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10		
Client ID:	1804576-844-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

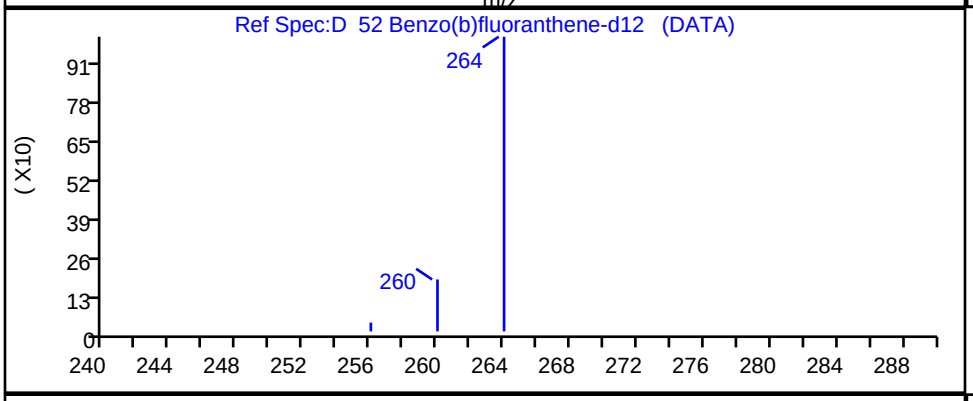
D 52 Benzo(b)fluoranthene-d12, CAS: 93951-98-5

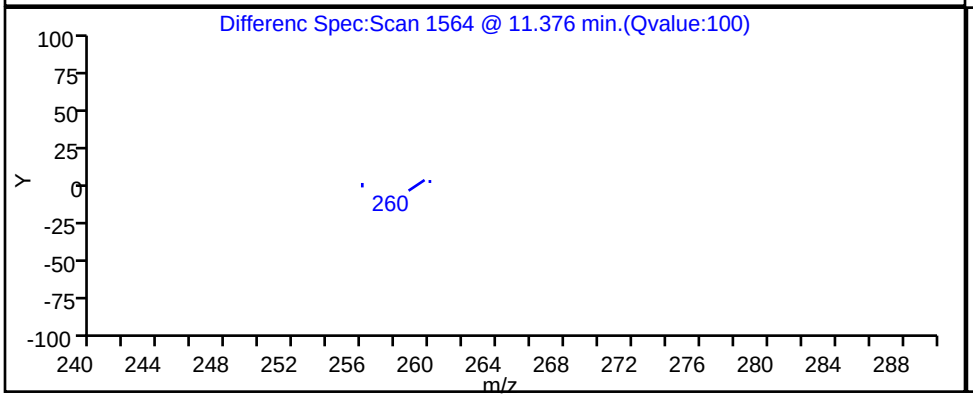


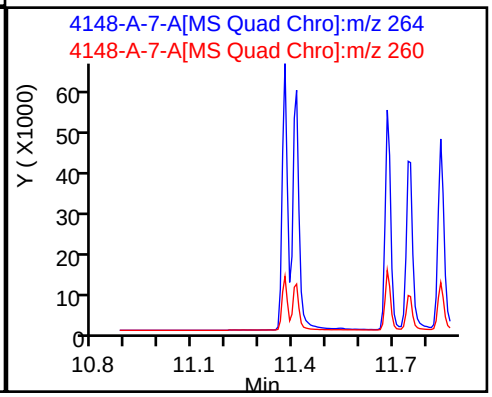












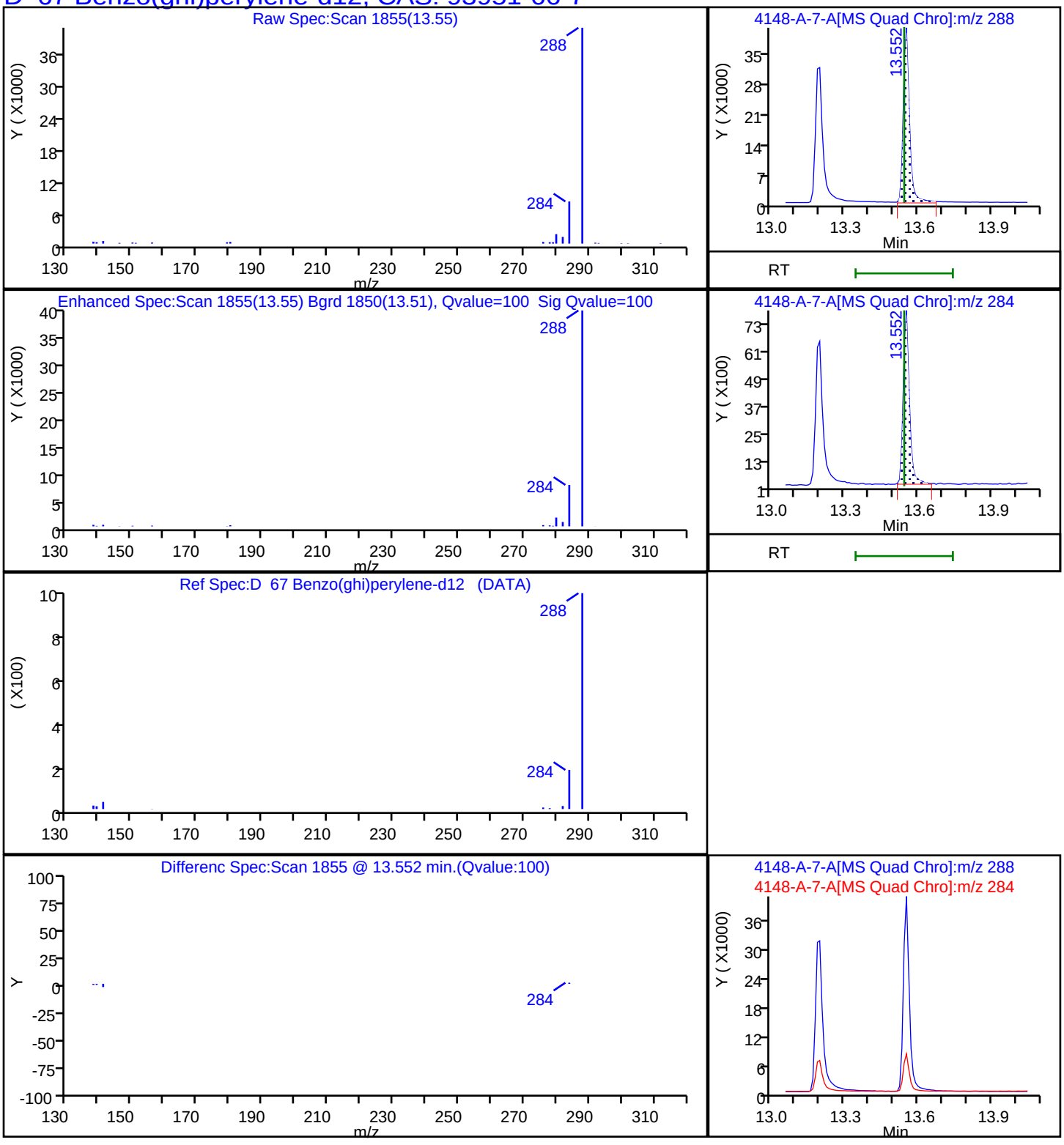
Report Date: 17-Nov-2023 12:15:41 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D

Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10		
Client ID:	1804576-844-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 67 Benzo(ghi)perylene-d12, CAS: 93951-66-7



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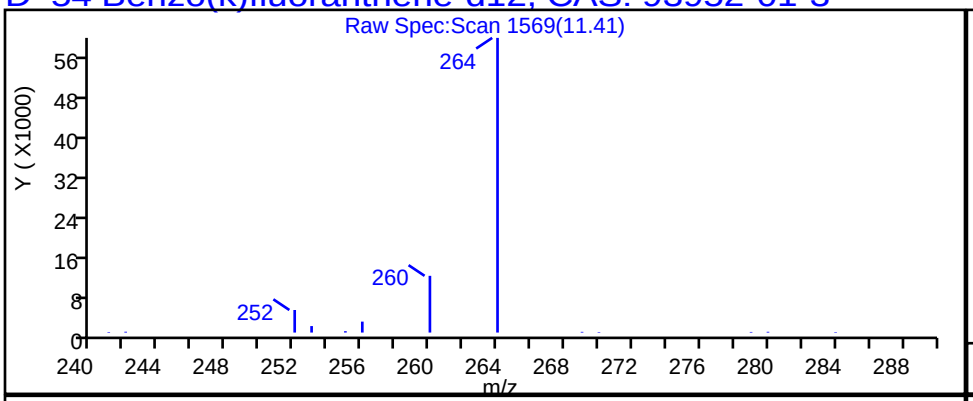
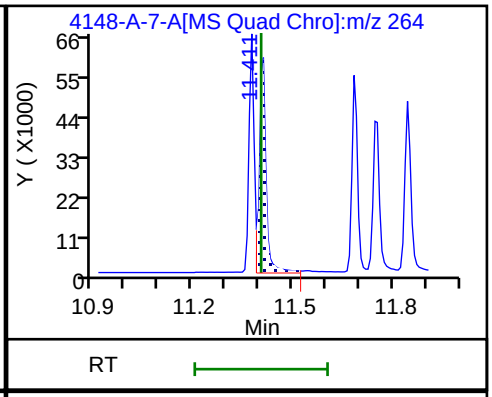
Eurofins Knoxville

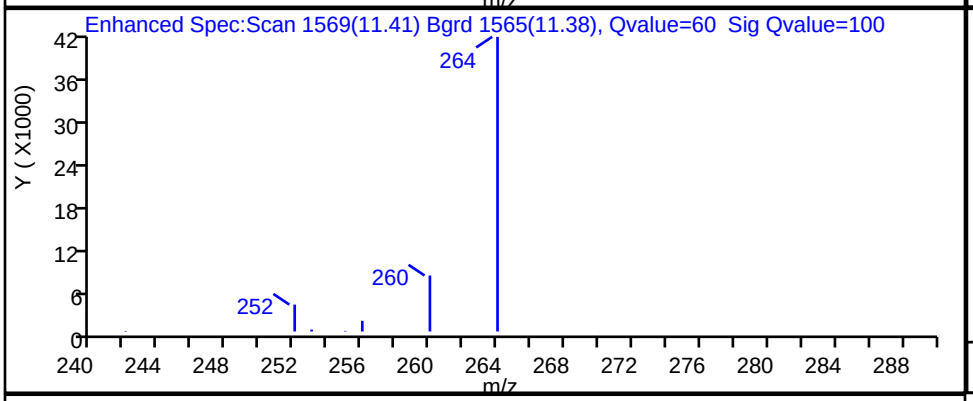
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D

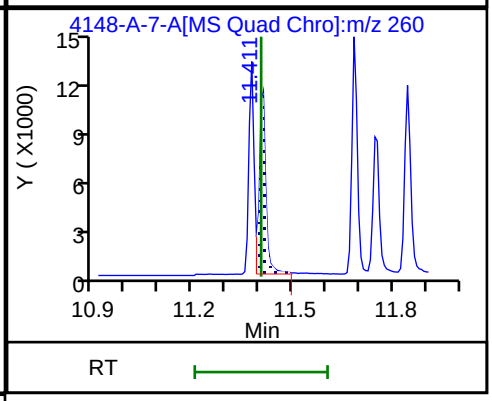
Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10		
Client ID:	1804576-844-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

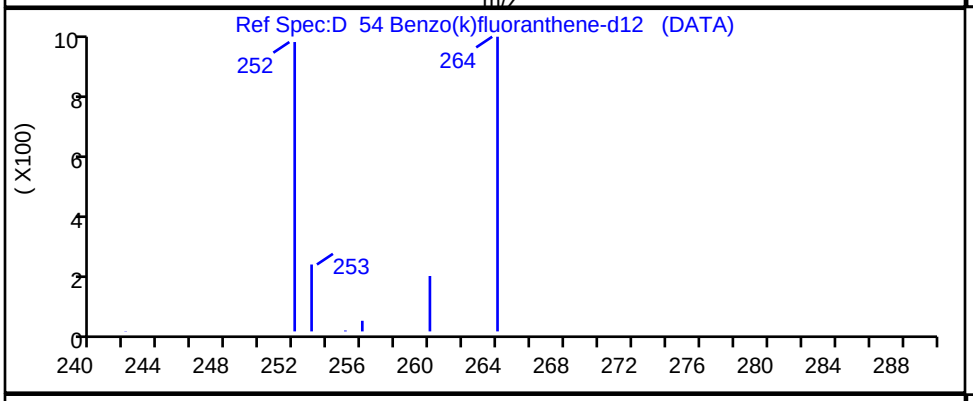
D 54 Benzo(k)fluoranthene-d12, CAS: 93952-01-3

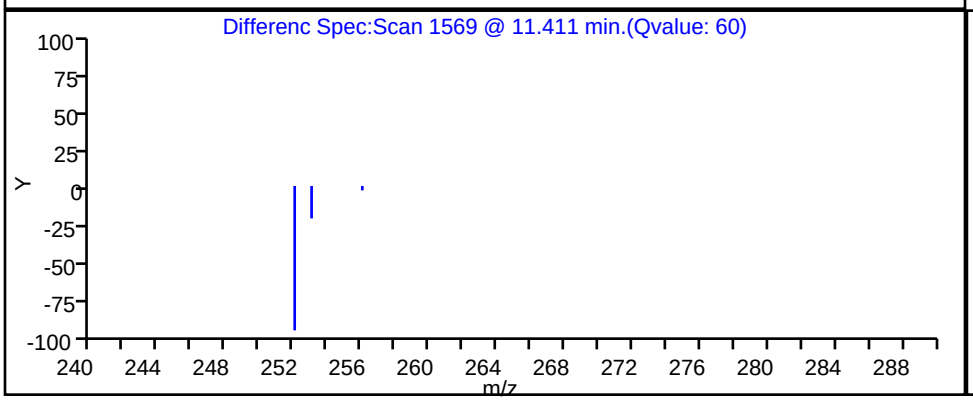


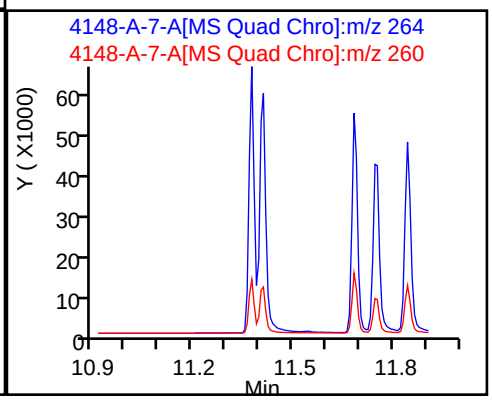












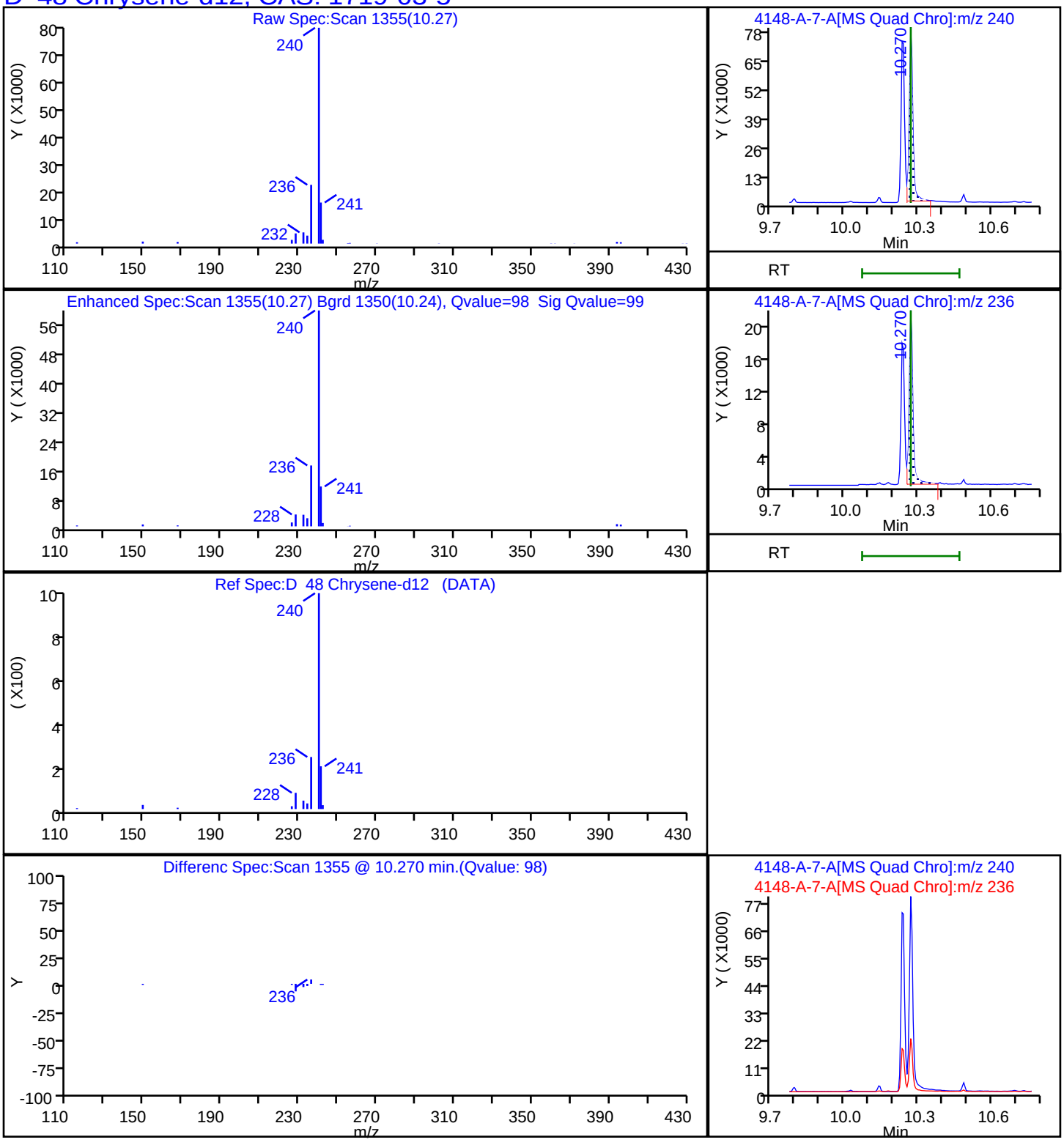
Report Date: 17-Nov-2023 12:15:40 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D

Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10		
Client ID:	1804576-844-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 48 Chrysene-d12, CAS: 1719-03-5



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Eurofins Knoxville

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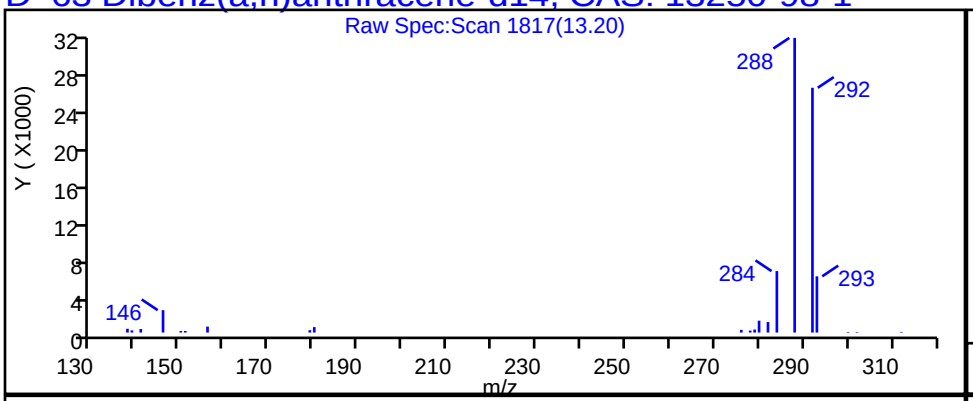
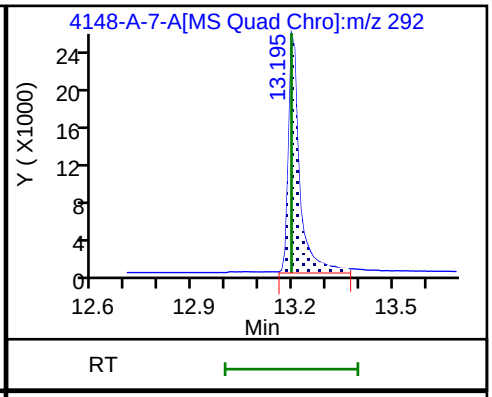
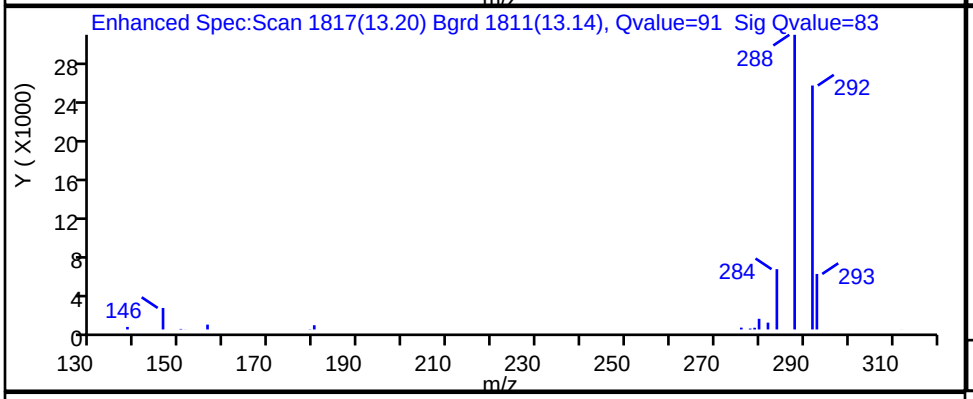
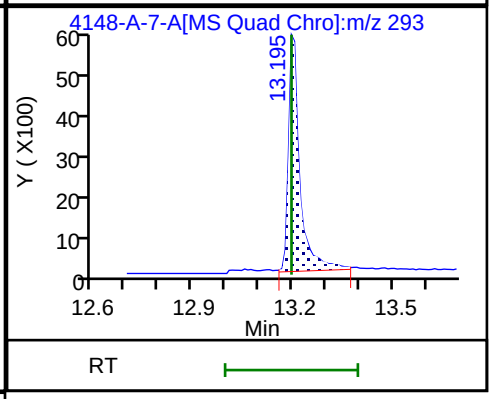
Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10		
Client ID:	1804576-844-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

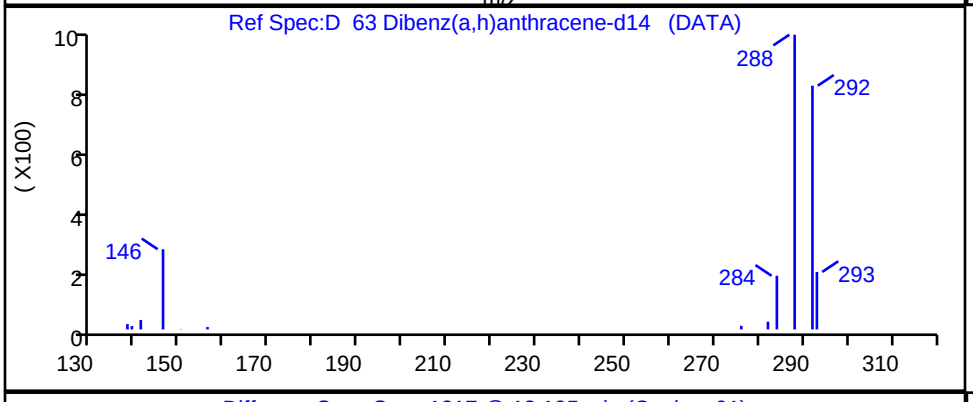
D 63 Dibenz(a,h)anthracene-d14, CAS: 13250-98-1

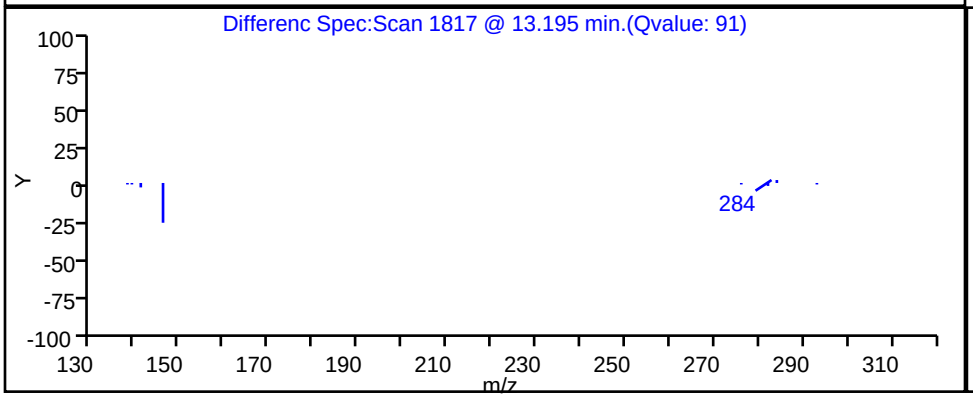


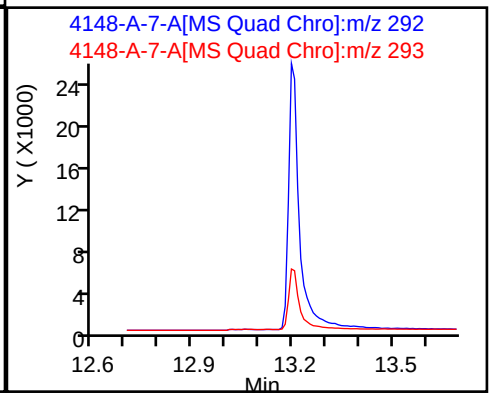












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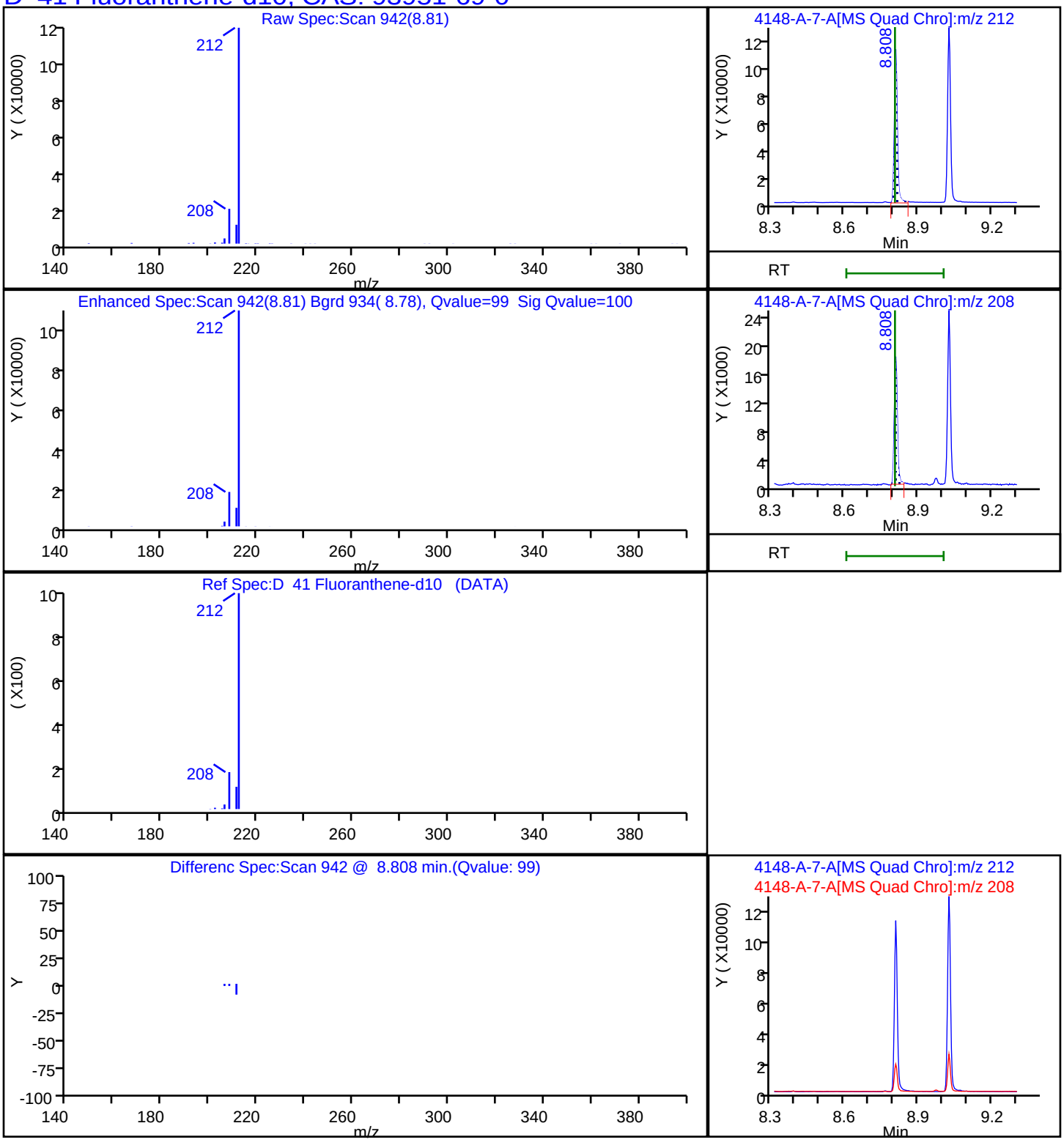
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D

Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10		
Client ID:	1804576-844-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 41 Fluoranthene-d10, CAS: 93951-69-0



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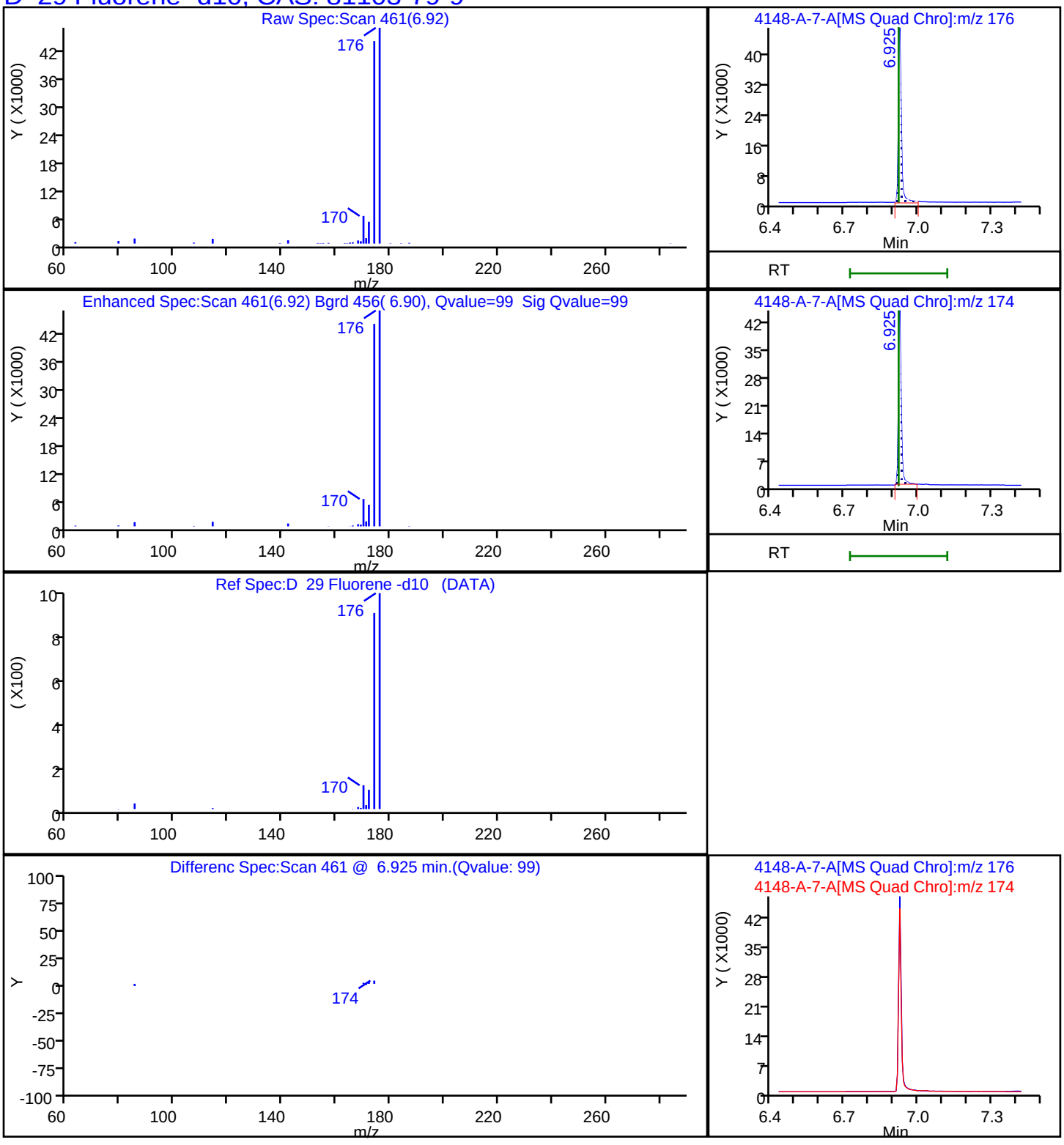
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D

Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10
Client ID:	1804576-844-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

D 29 Fluorene -d10, CAS: 81103-79-9



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Eurofins Knoxville

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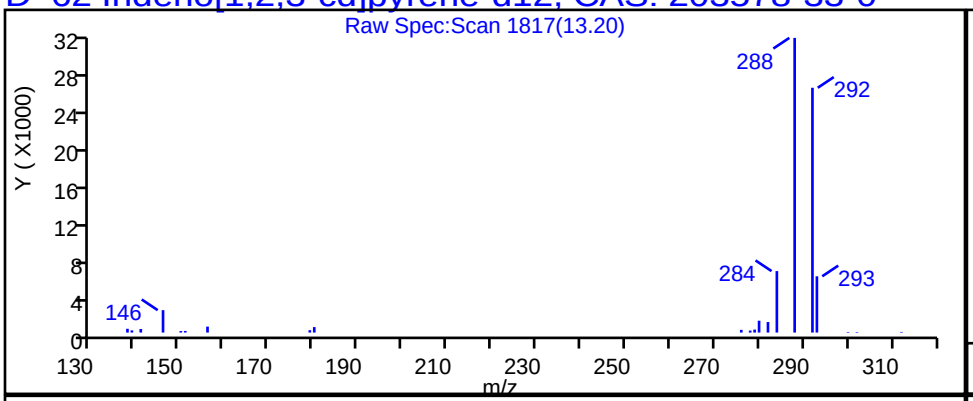
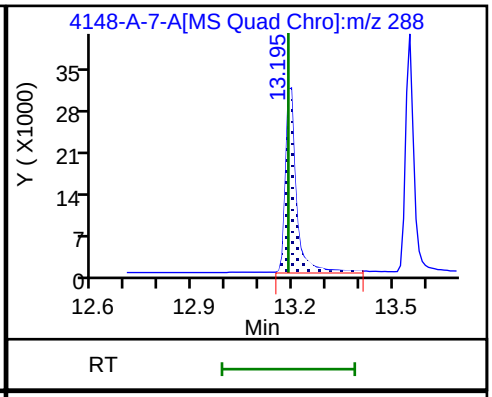
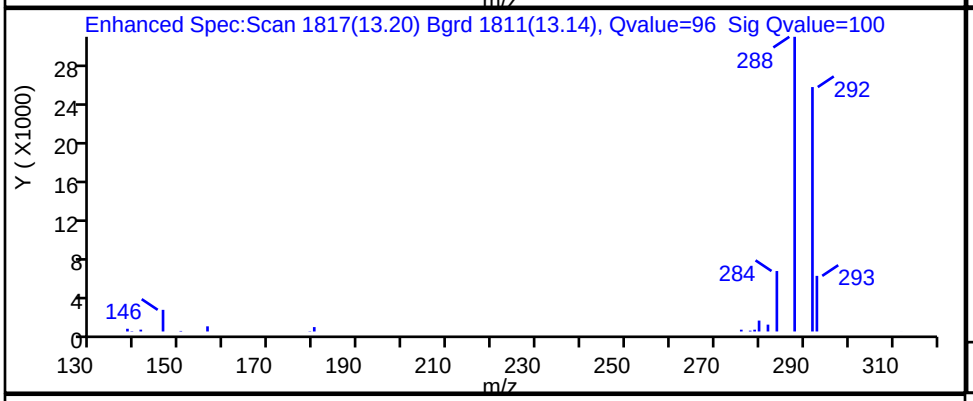
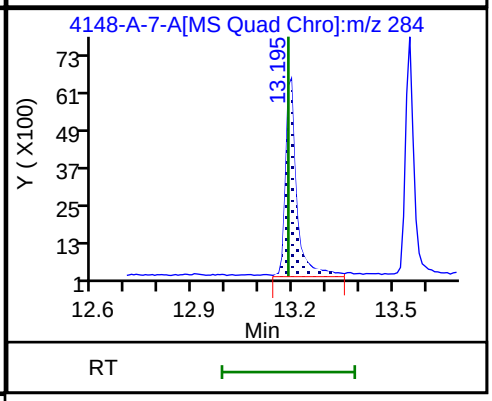
Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10		
Client ID:	1804576-844-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

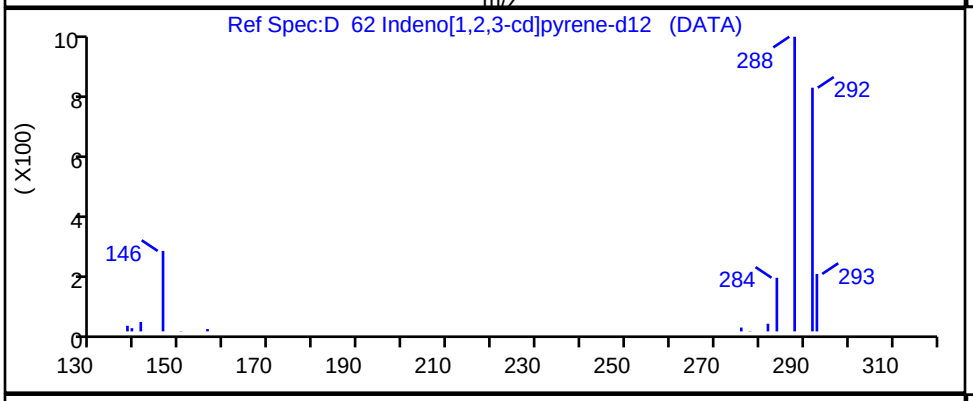
D 62 Indeno[1,2,3-cd]pyrene-d12, CAS: 203578-33-0

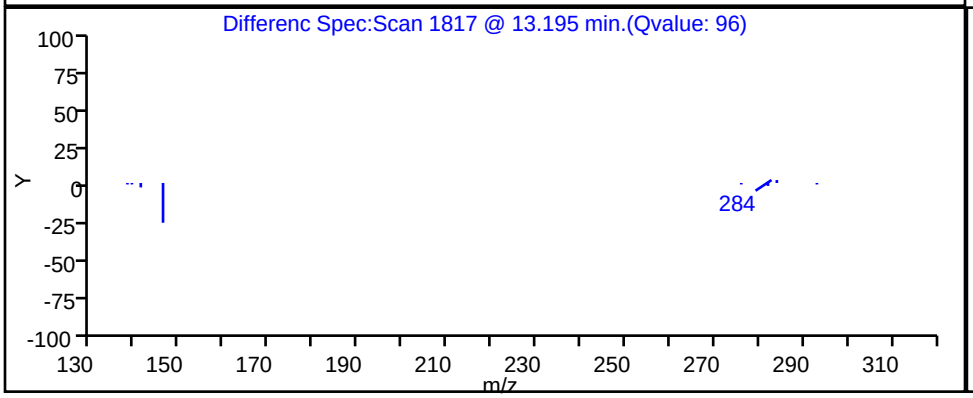


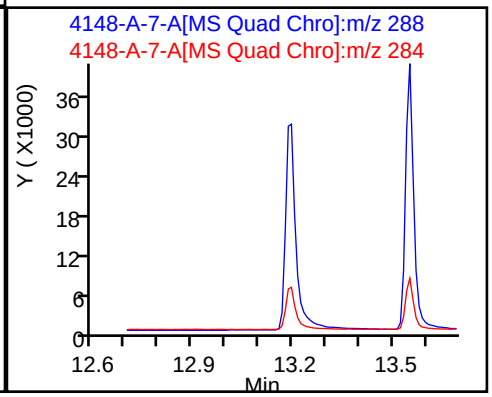












Report Date: 17-Nov-2023 12:15:40 Chrom Revision: 2.3 15-Nov-2023 20:54:34

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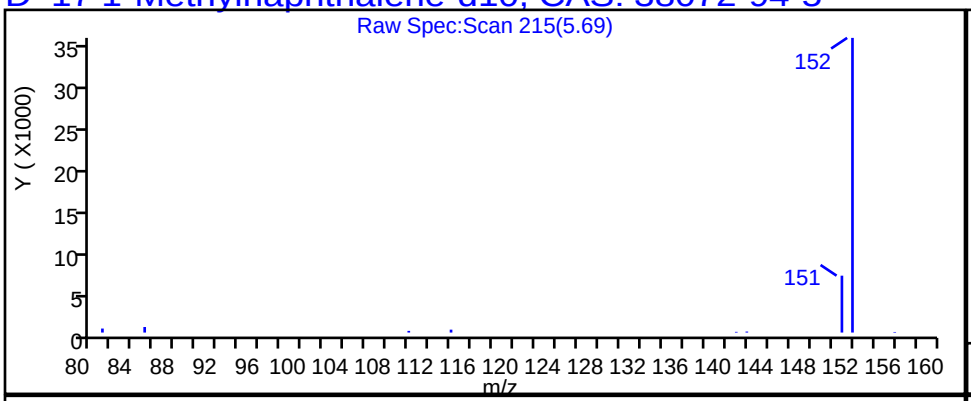
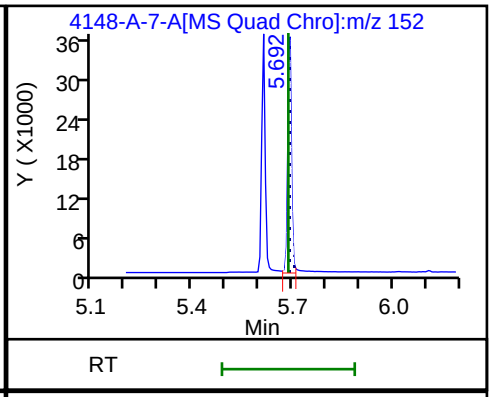
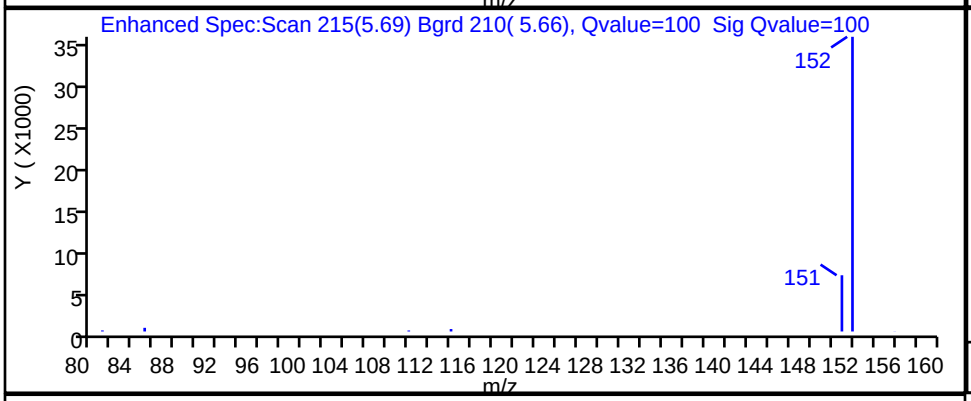
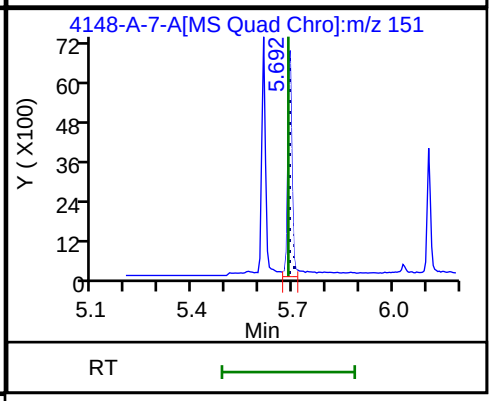
Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10		
Client ID:	1804576-844-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

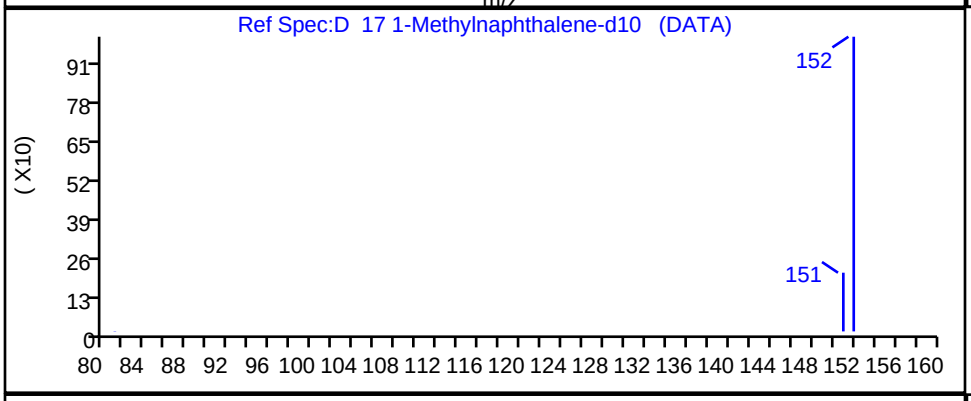
D 17 1-Methylnaphthalene-d10, CAS: 38072-94-5

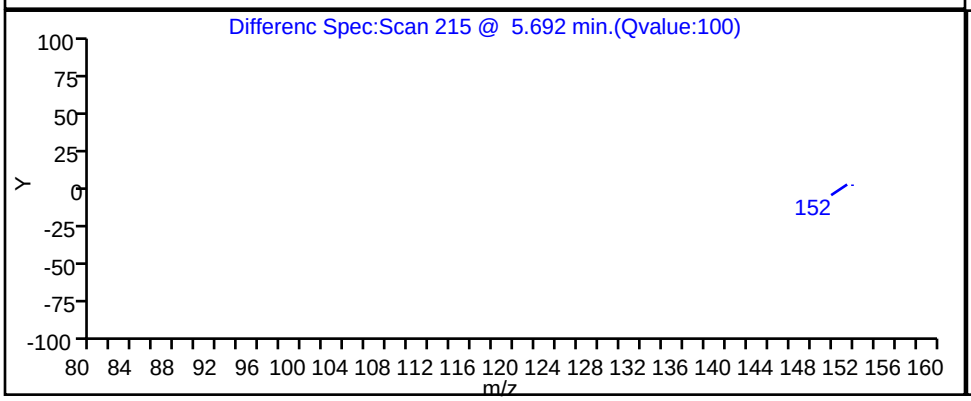


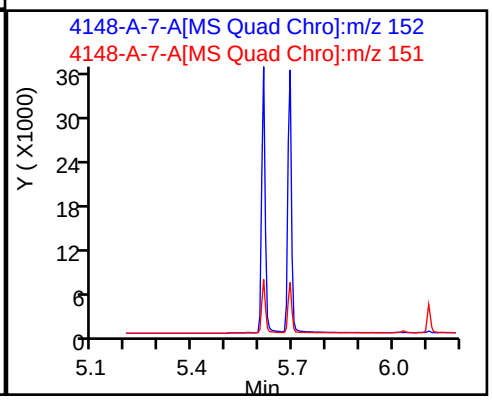












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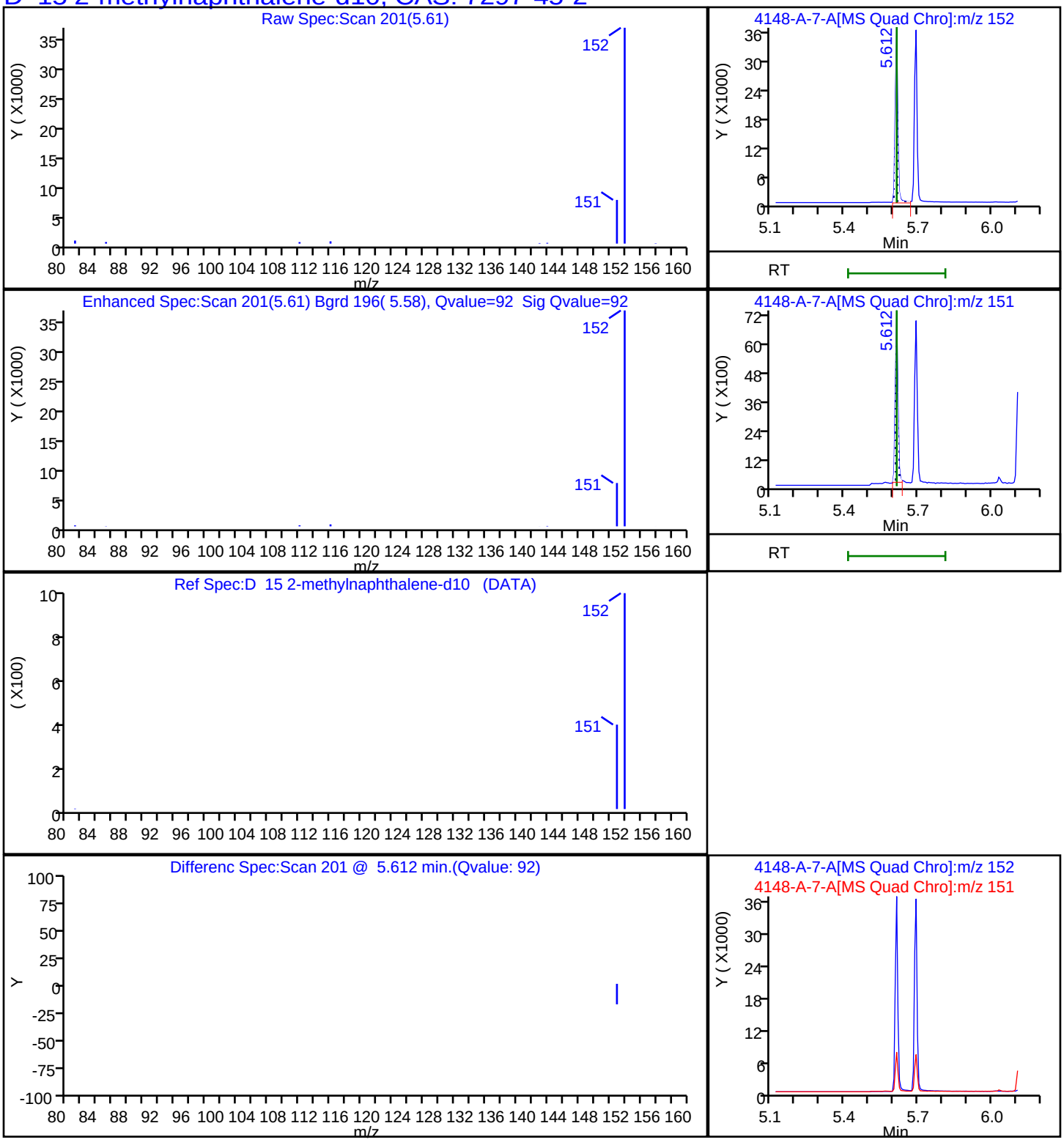
Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D				
Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10		
Client ID:	1804576-844-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 15 2-methylnaphthalene-d10, CAS: 7297-45-2



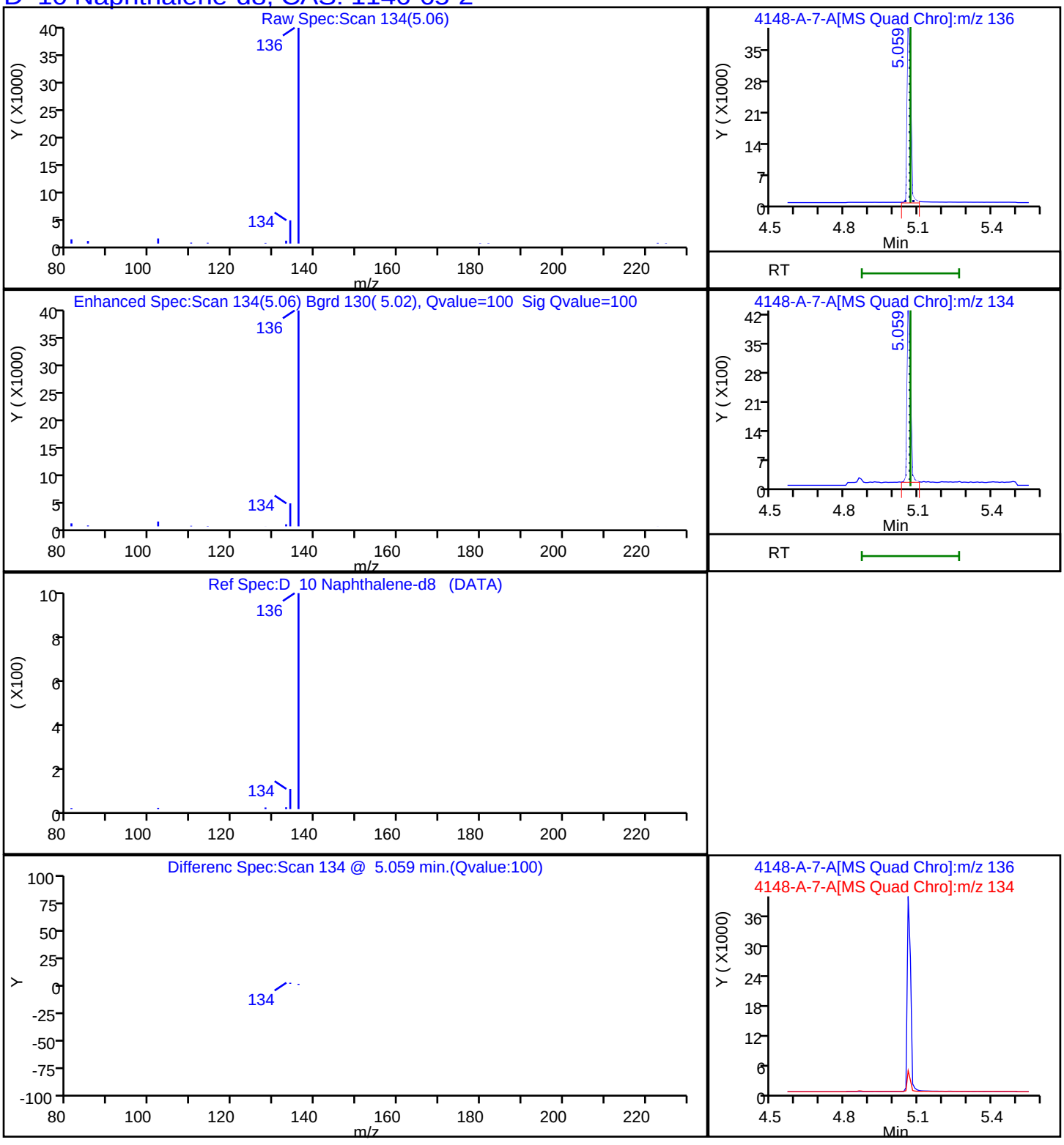
Report Date: 17-Nov-2023 12:15:40 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D

Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10		
Client ID:	1804576-844-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D_10 Naphthalene-d8, CAS: 1146-65-2



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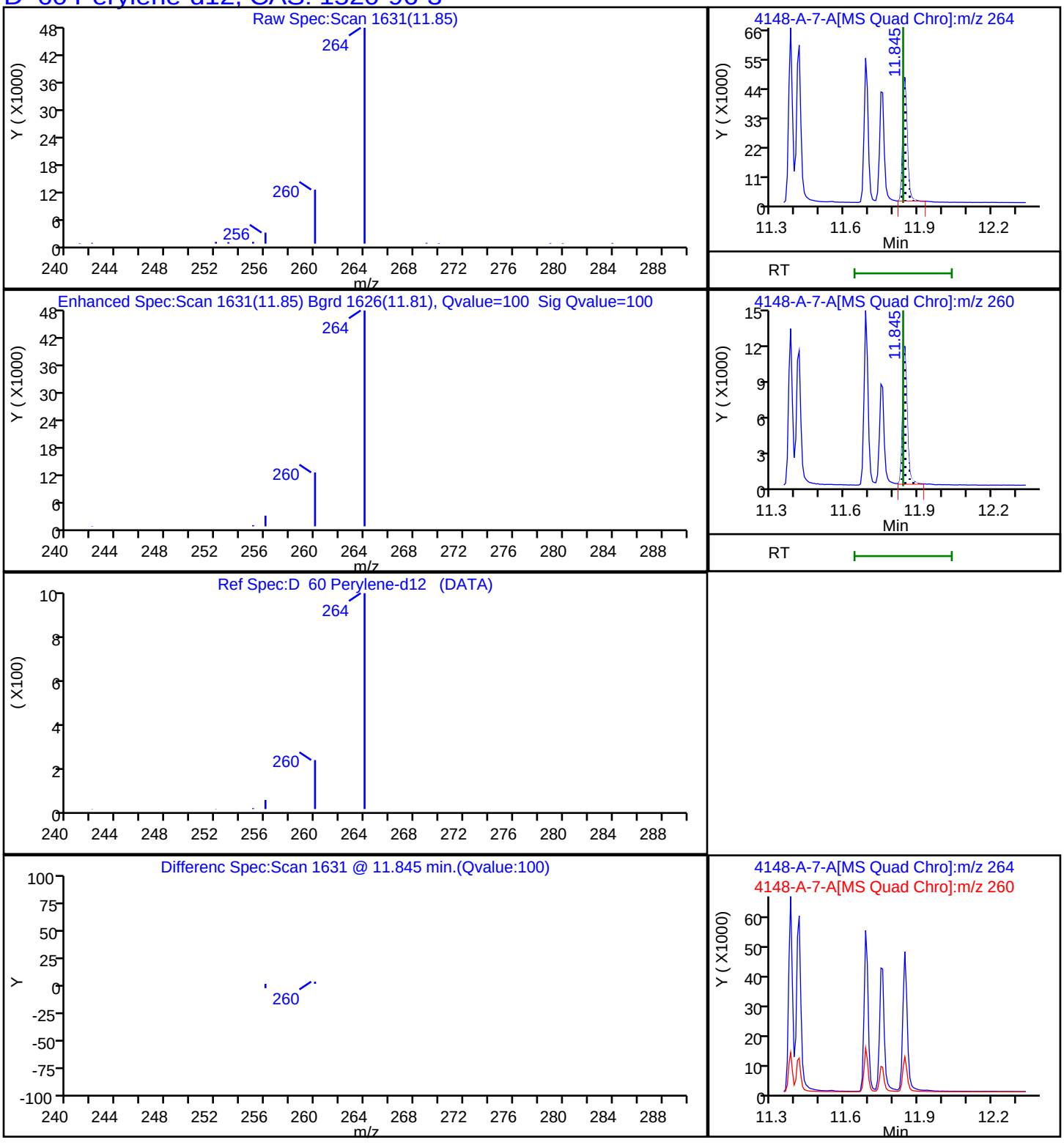
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D

Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10		
Client ID:	1804576-844-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 60 Perylene-d12, CAS: 1520-96-3



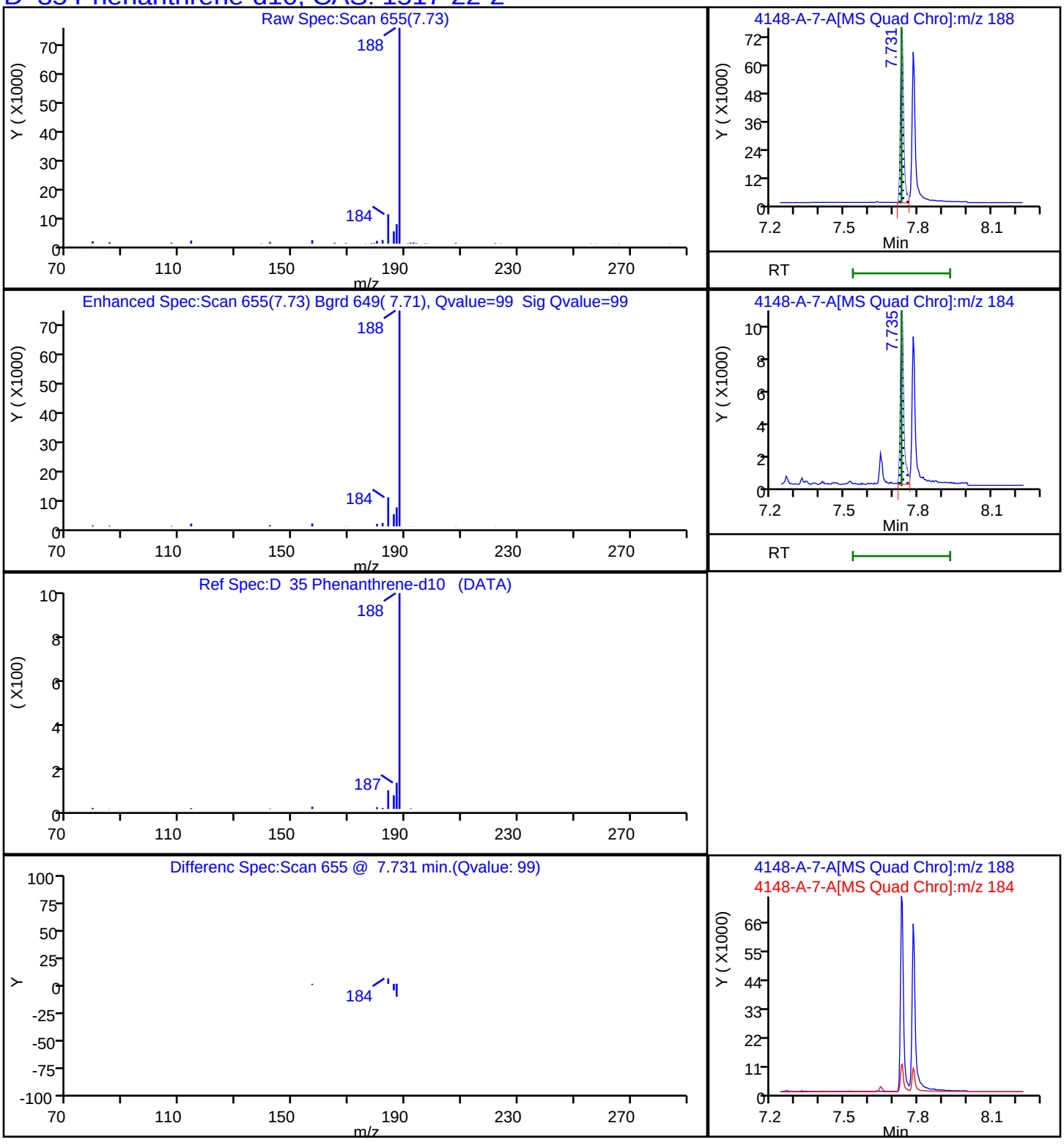
Report Date: 17-Nov-2023 12:15:40 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D

Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10		
Client ID:	1804576-844-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D_35 Phenanthrene-d10, CAS: 1517-22-2



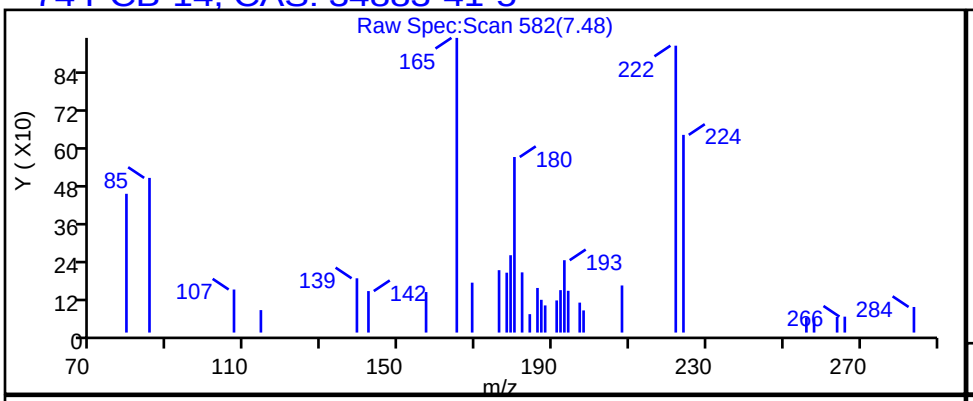
Report Date: 17-Nov-2023 12:15:41 Chrom Revision: 2.3 15-Nov-2023 20:54:34

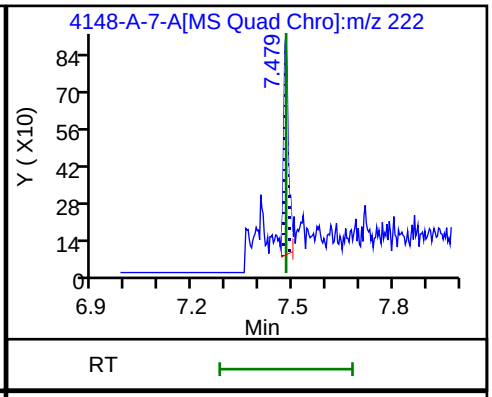
Eurofins Knoxville

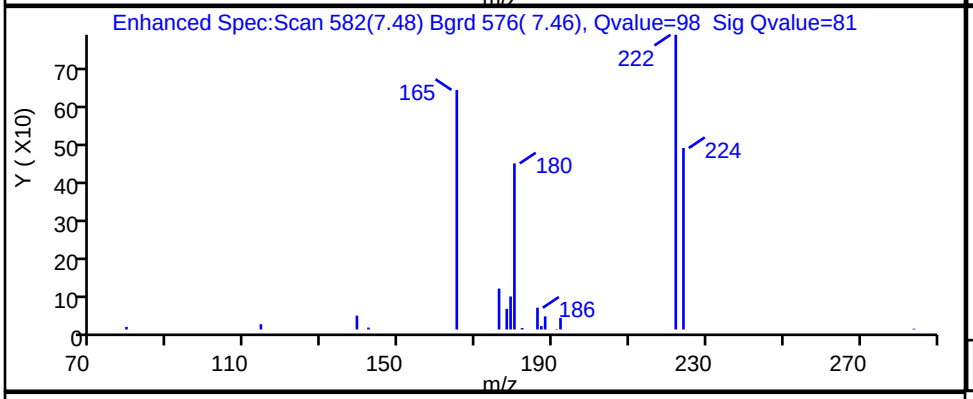
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D

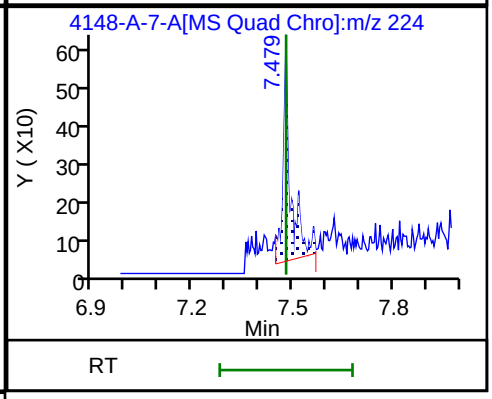
Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10
Client ID:	1804576-844-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

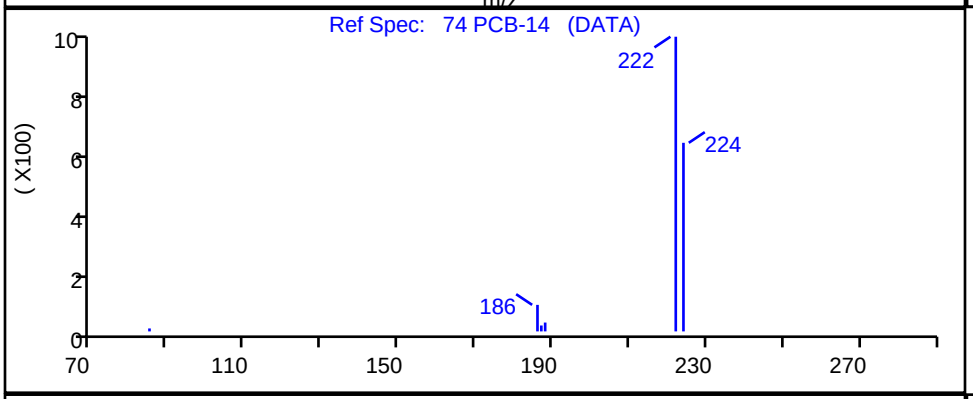
74 PCB-14, CAS: 34883-41-5

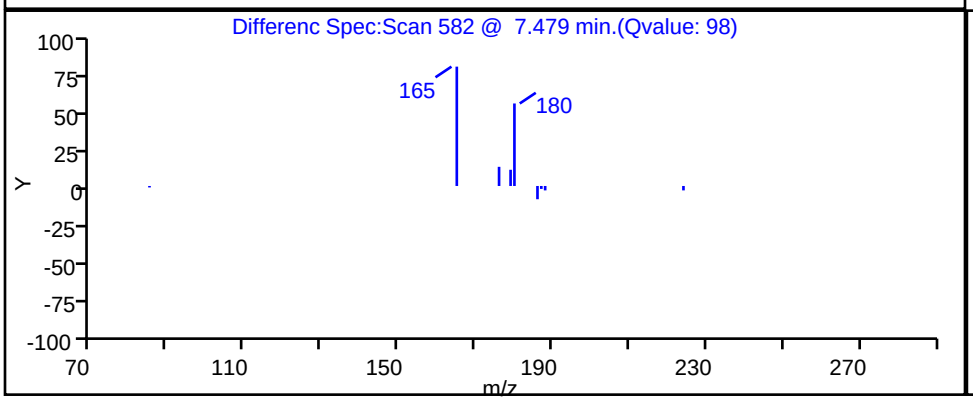


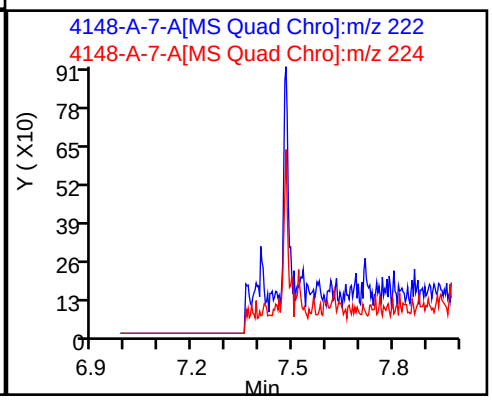












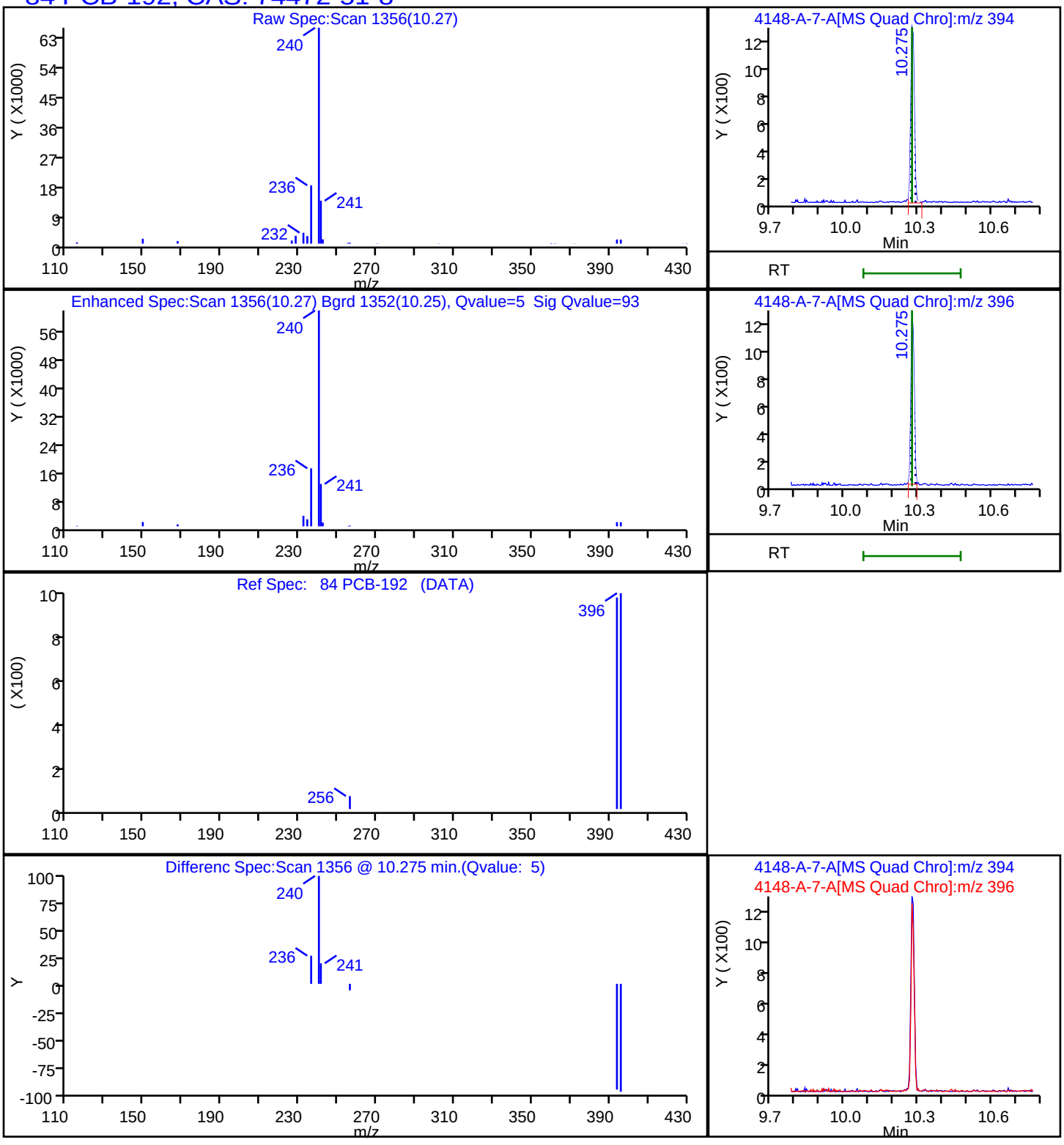
Report Date: 17-Nov-2023 12:15:41 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D

Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10		
Client ID:	1804576-844-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

84 PCB-192, CAS: 74472-51-8



Report Date: 17-Nov-2023 12:15:41 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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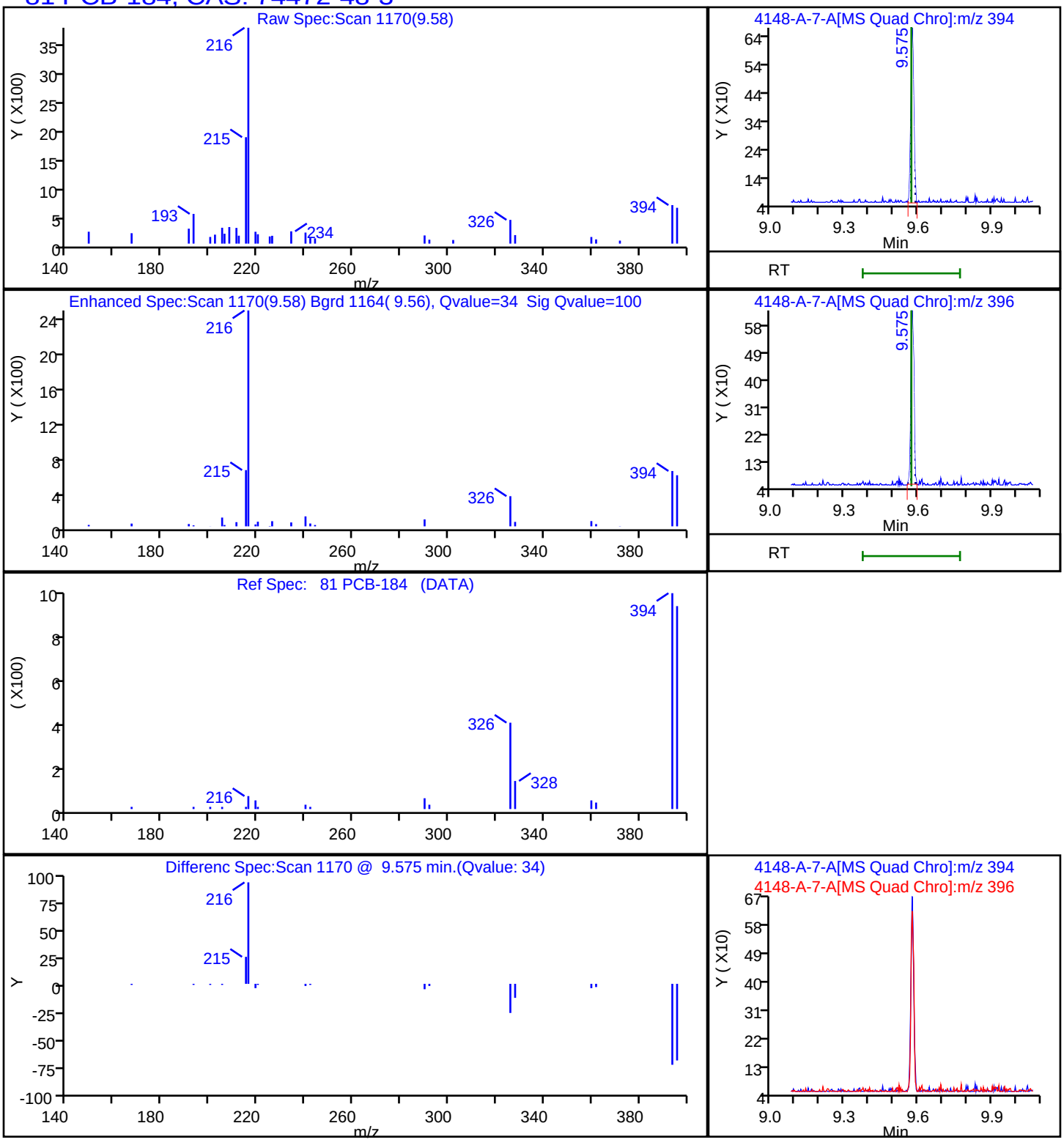
Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10		
Client ID:	1804576-844-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

81 PCB-184, CAS: 74472-48-3



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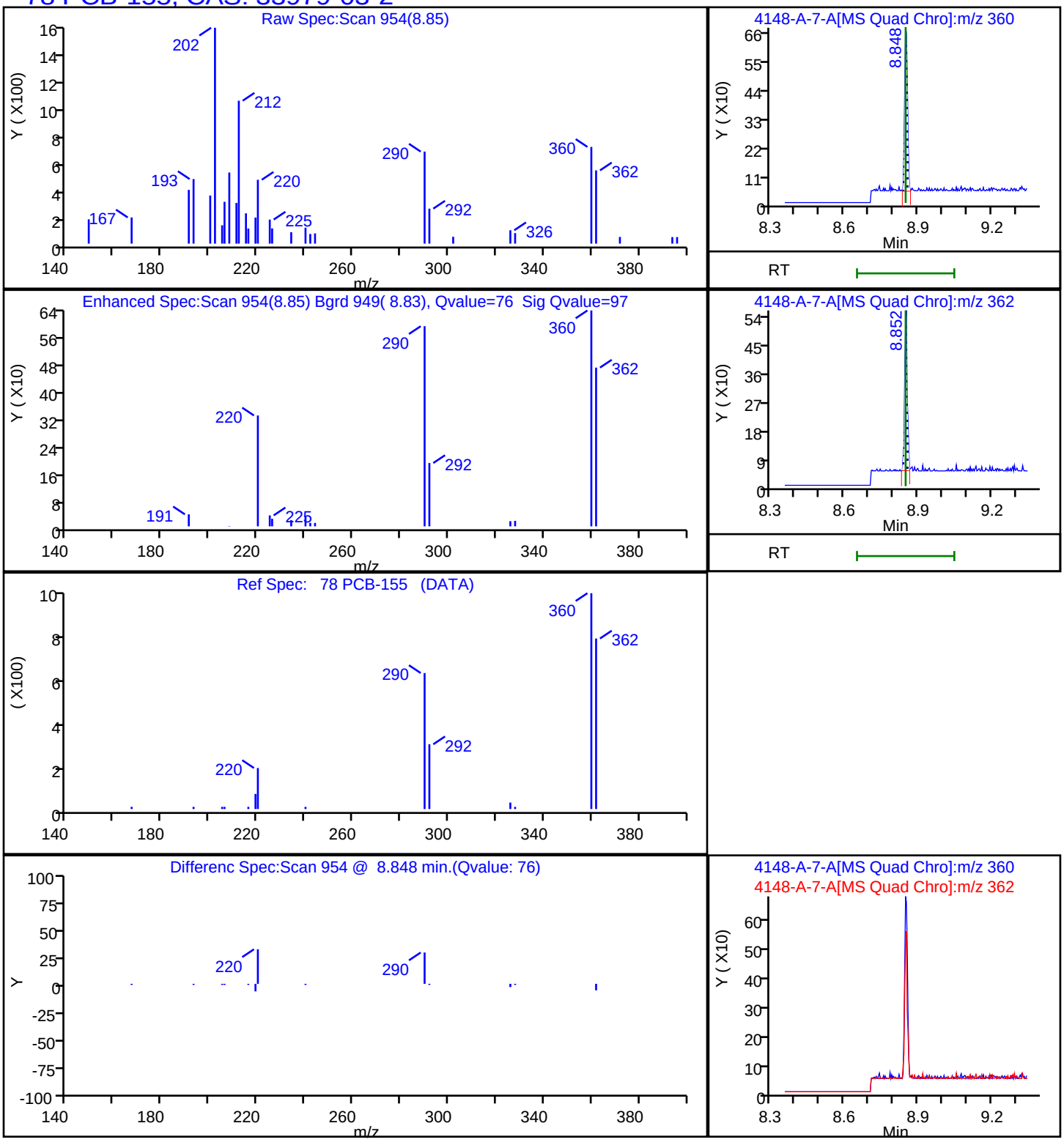
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D

Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10
Client ID:	1804576-844-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

78 PCB-155, CAS: 33979-03-2



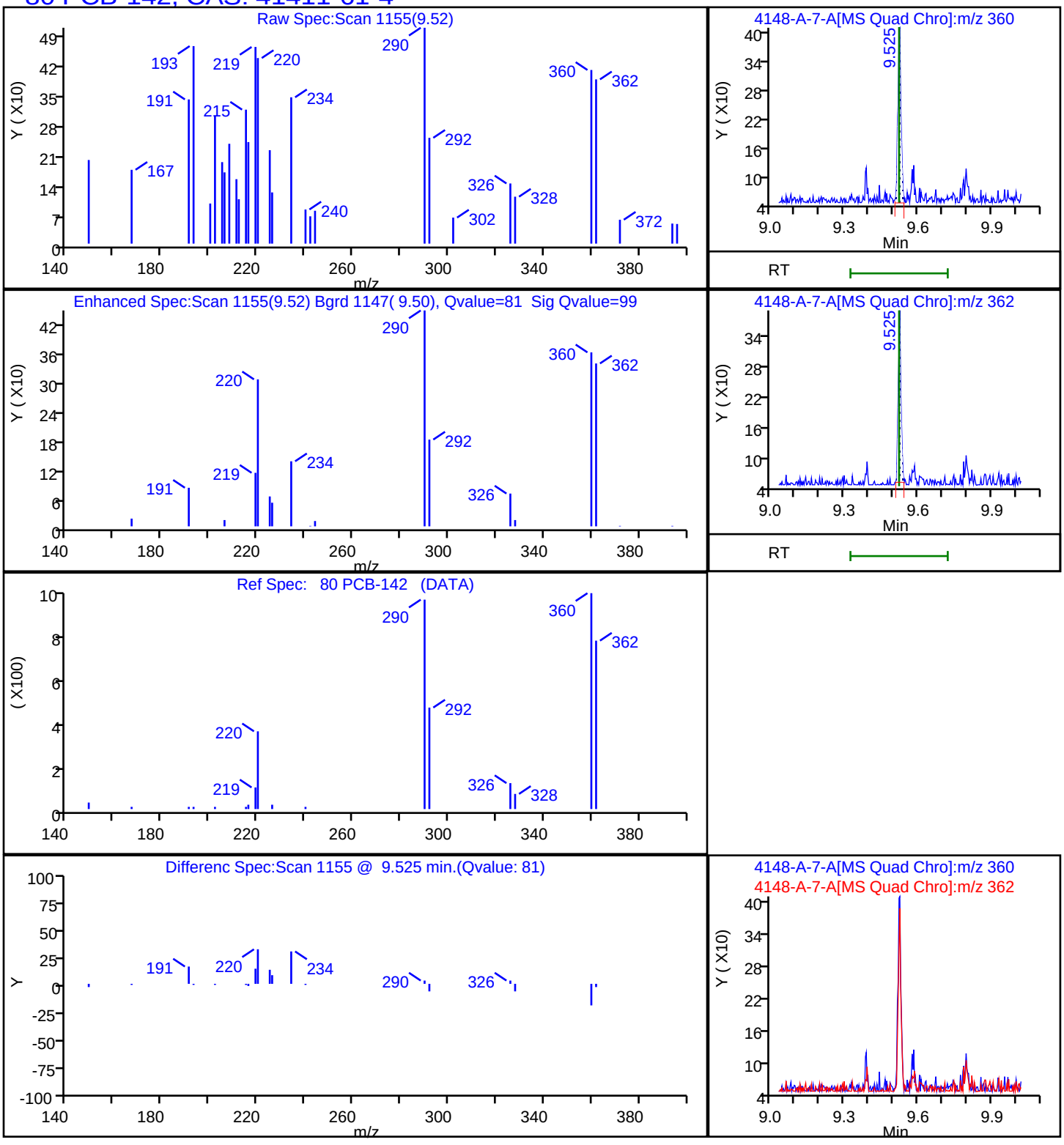
Report Date: 17-Nov-2023 12:15:41 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D

Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10
Client ID:	1804576-844-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

80 PCB-142, CAS: 41411-61-4



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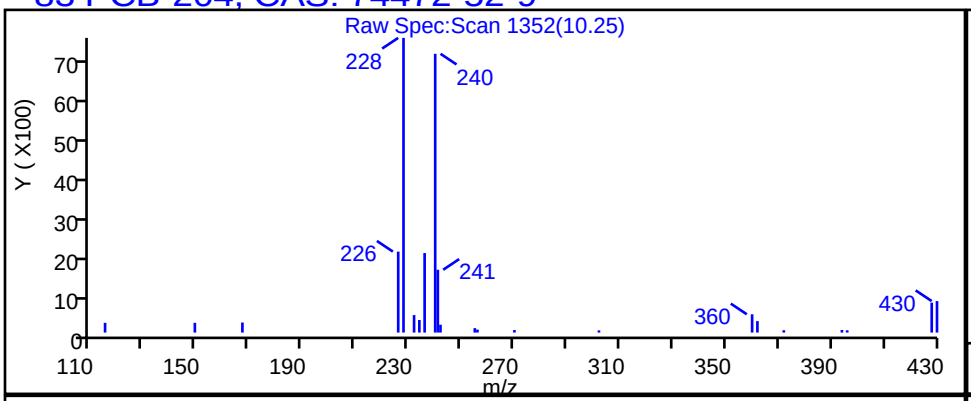
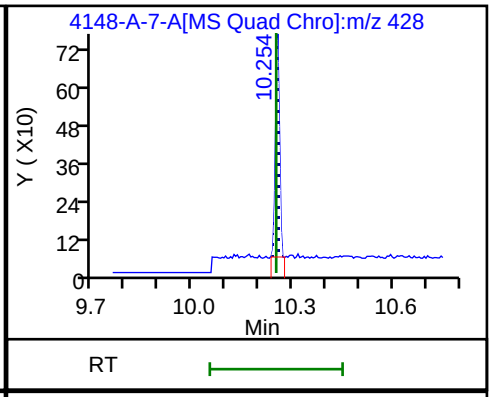
Eurofins Knoxville

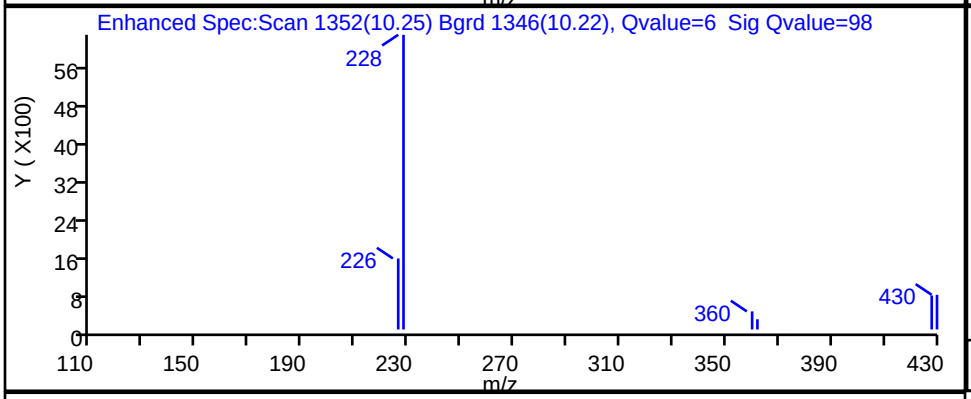
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D

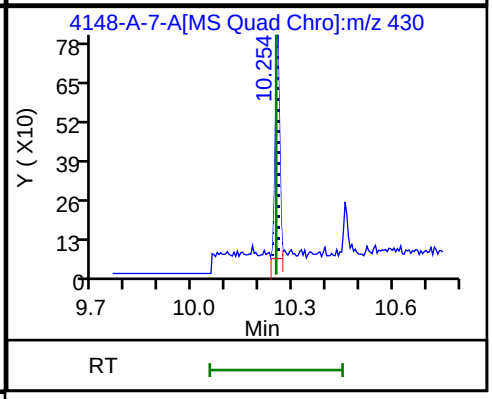
Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10		
Client ID:	1804576-844-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

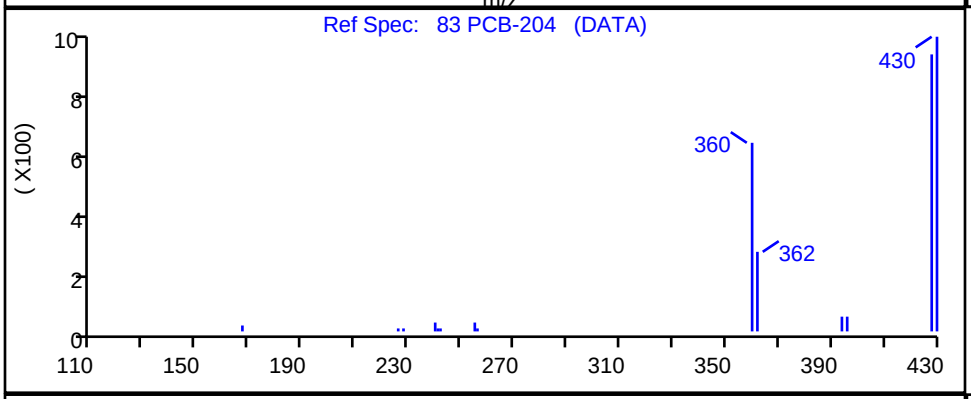
83 PCB-204, CAS: 74472-52-9

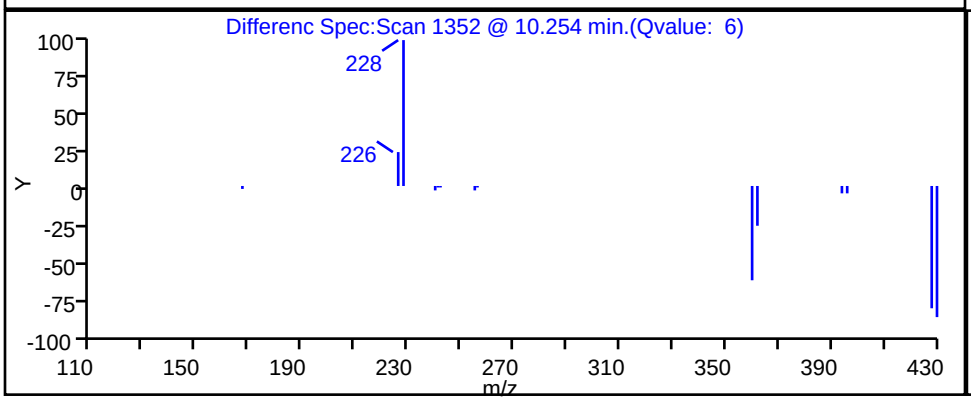


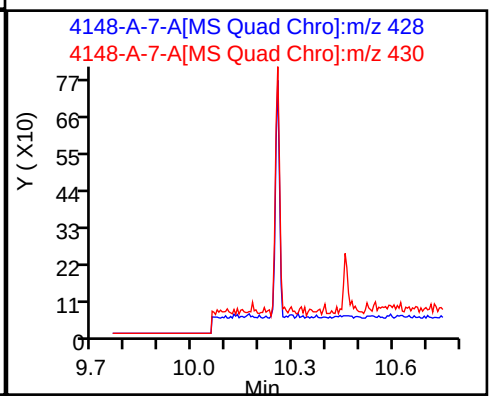












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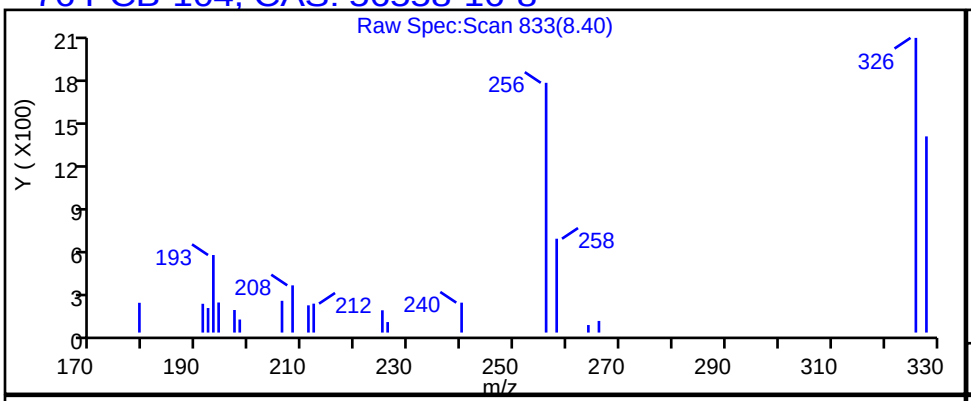
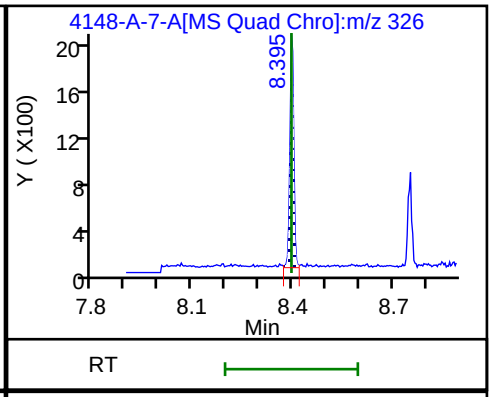
Eurofins Knoxville

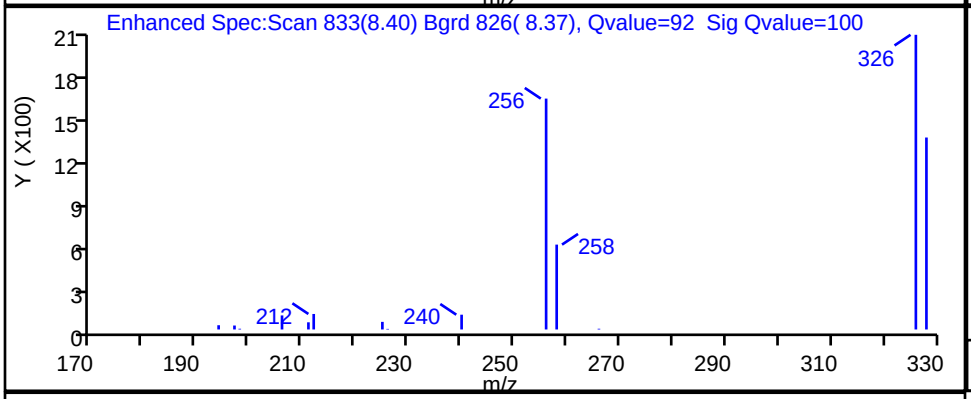
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D

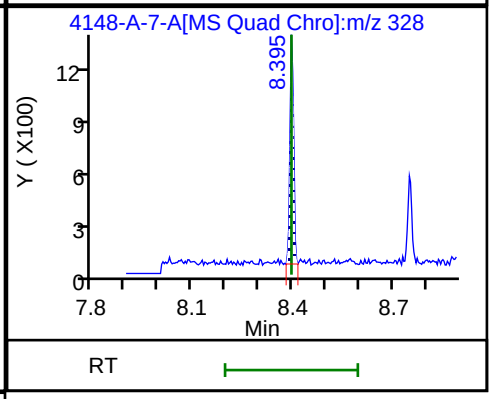
Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10		
Client ID:	1804576-844-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

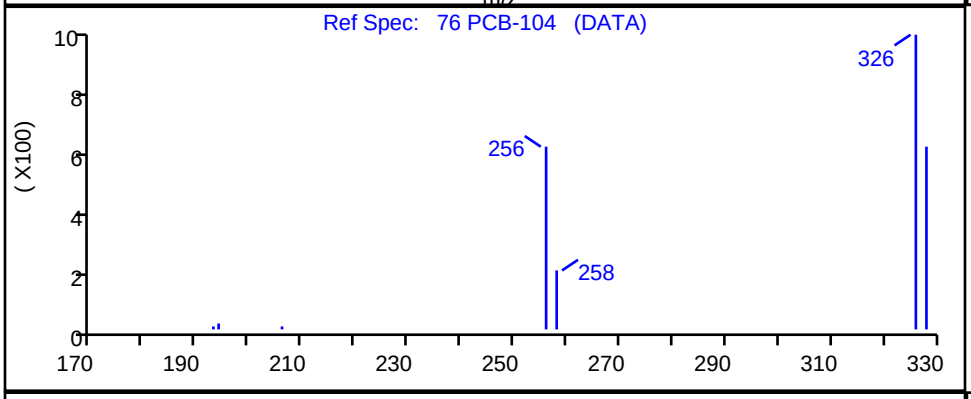
76 PCB-104, CAS: 56558-16-8

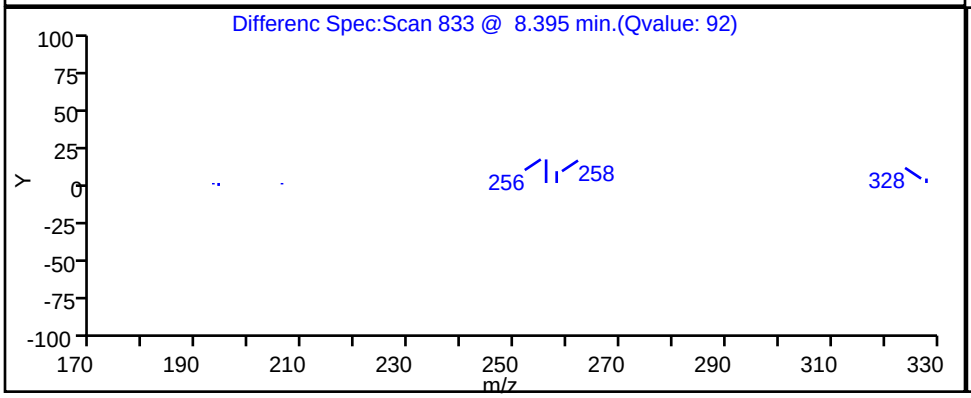


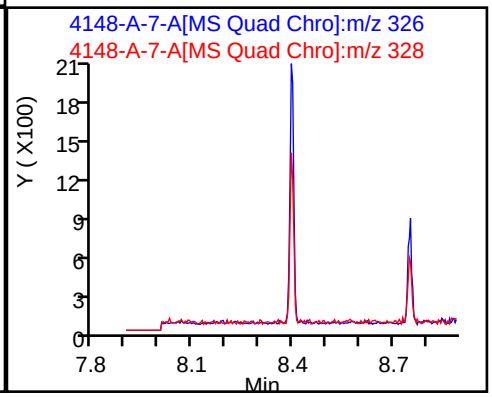












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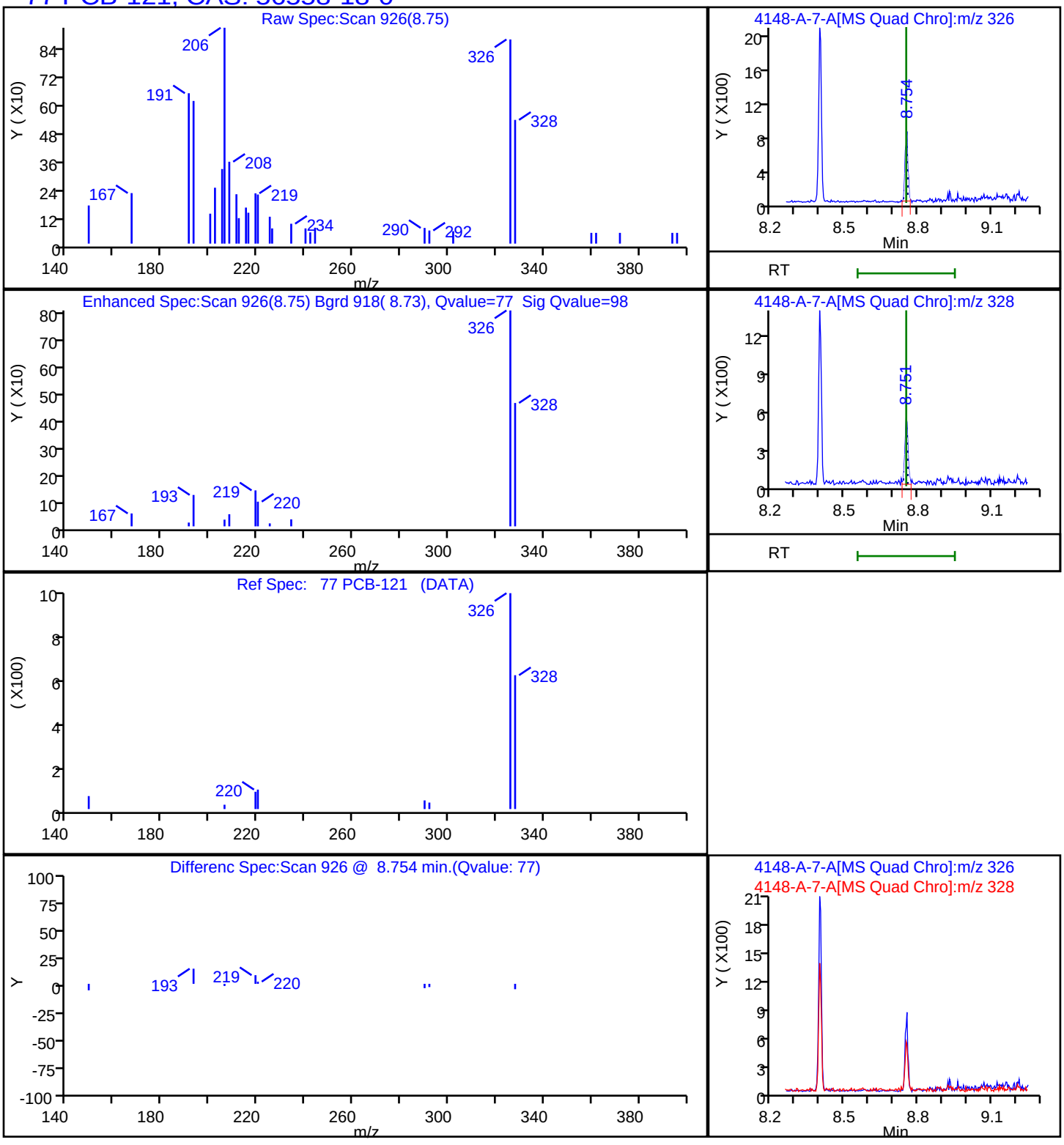
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D

Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10
Client ID:	1804576-844-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

77 PCB-121, CAS: 56558-18-0



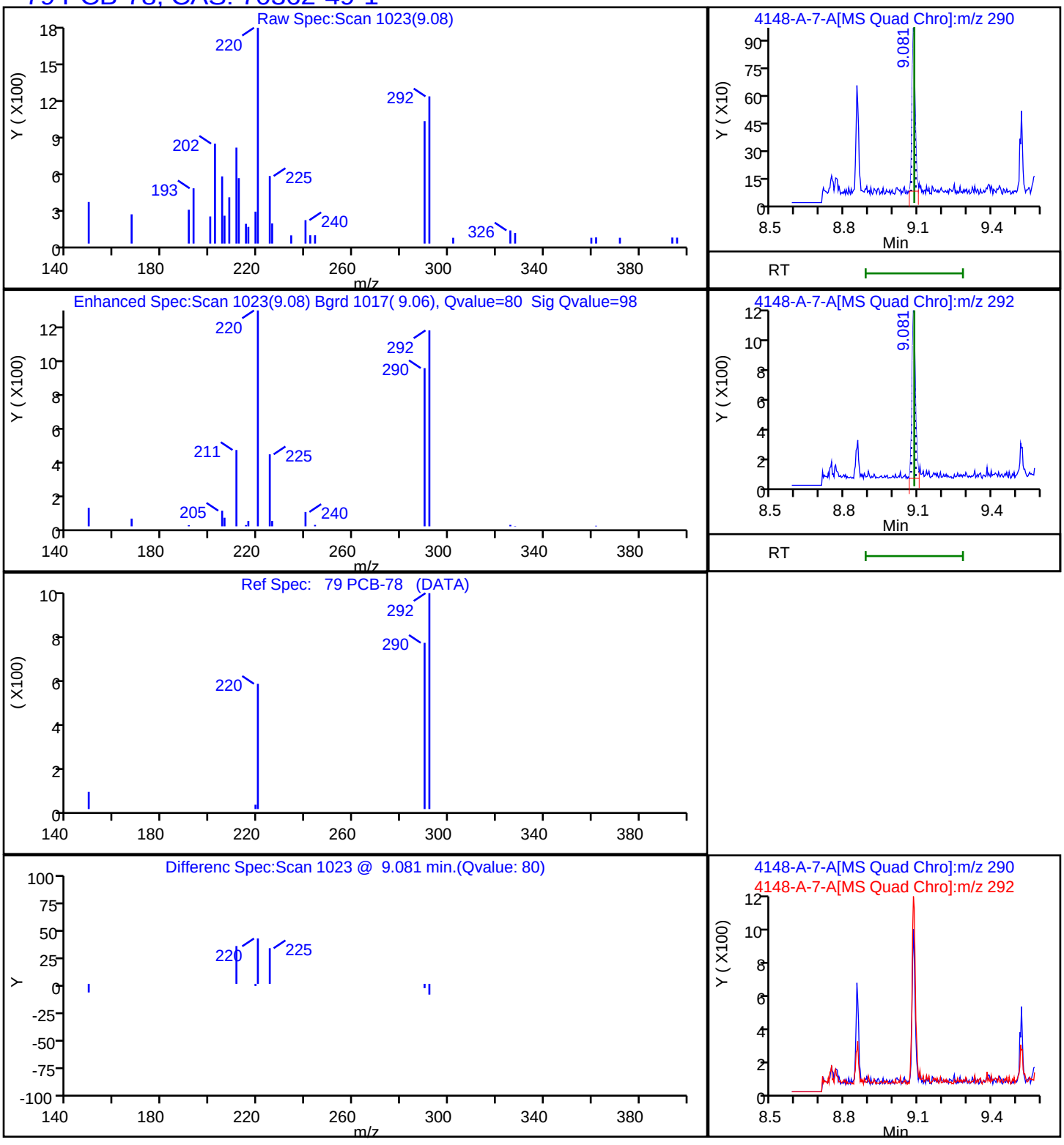
Report Date: 17-Nov-2023 12:15:41 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D

Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10
Client ID:	1804576-844-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

79 PCB-78, CAS: 70362-49-1



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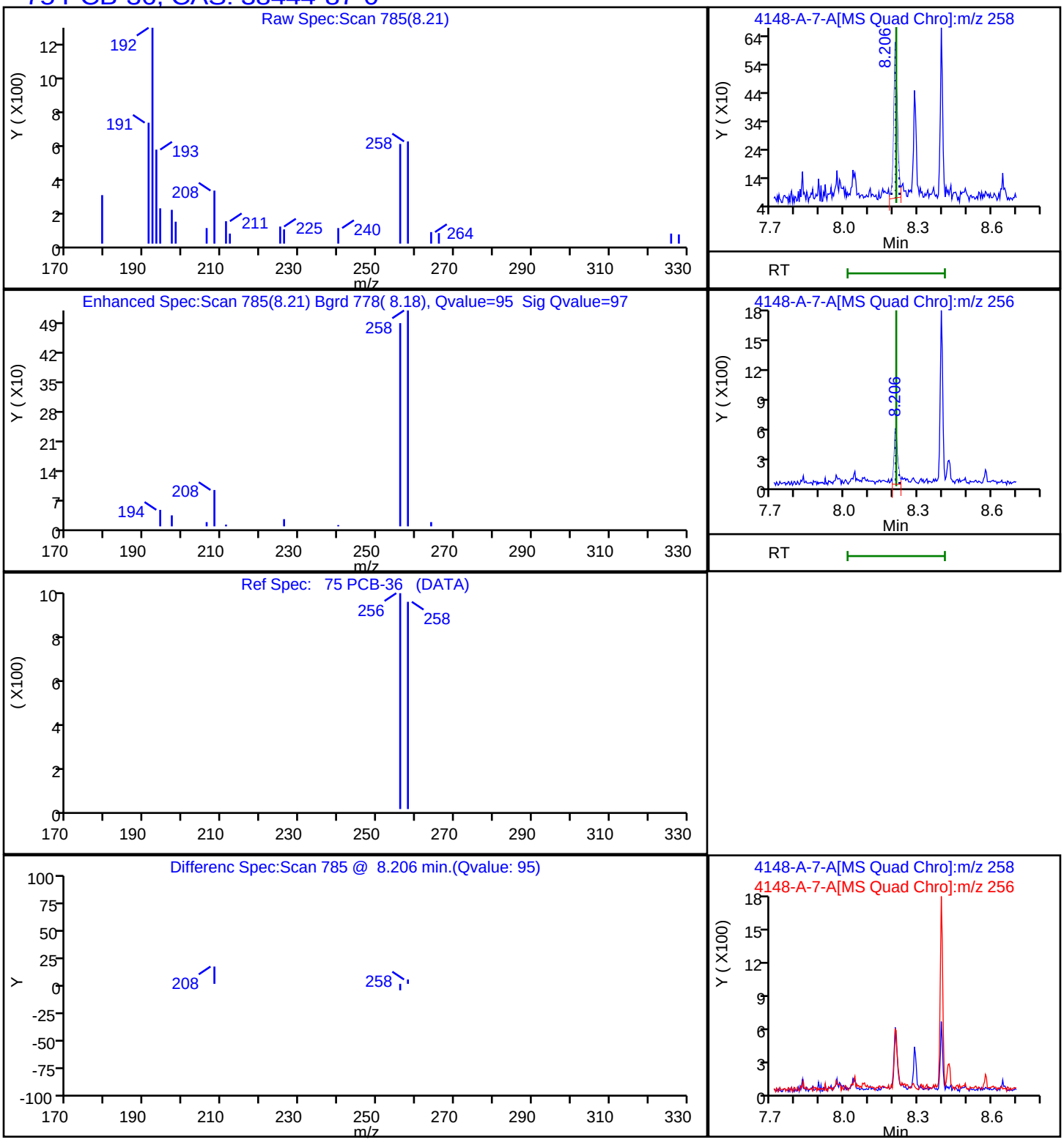
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D

Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10		
Client ID:	1804576-844-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

75 PCB-36, CAS: 38444-87-0



Manual Integration/User Assign Peak Report

Eurofins Knoxville

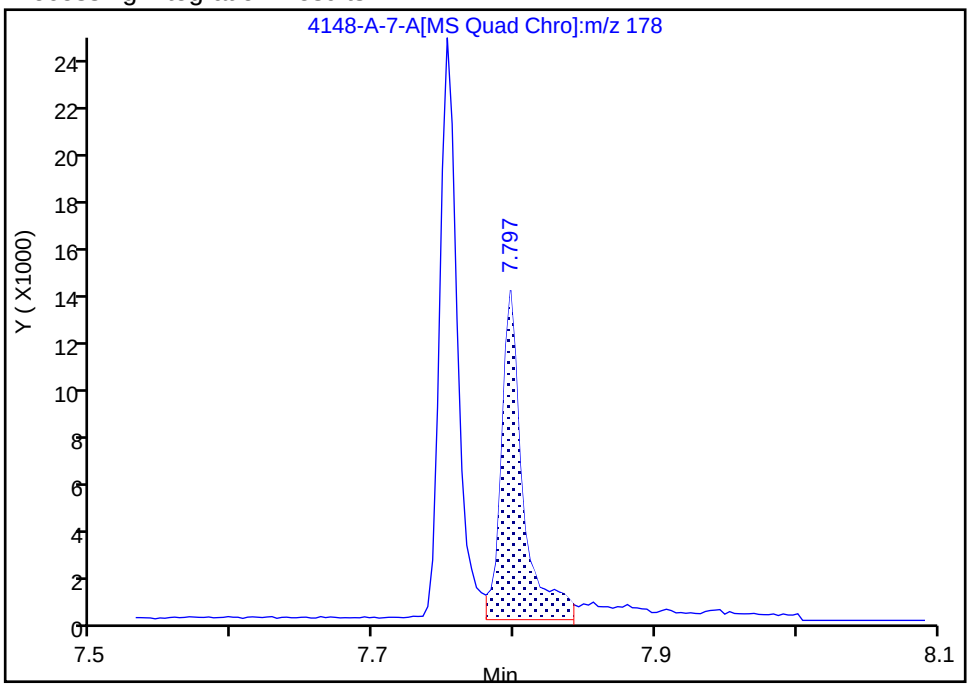
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D				
Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10		
Client ID:	1804576-844-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

39 Anthracene, CAS: 120-12-7

Signal: 1

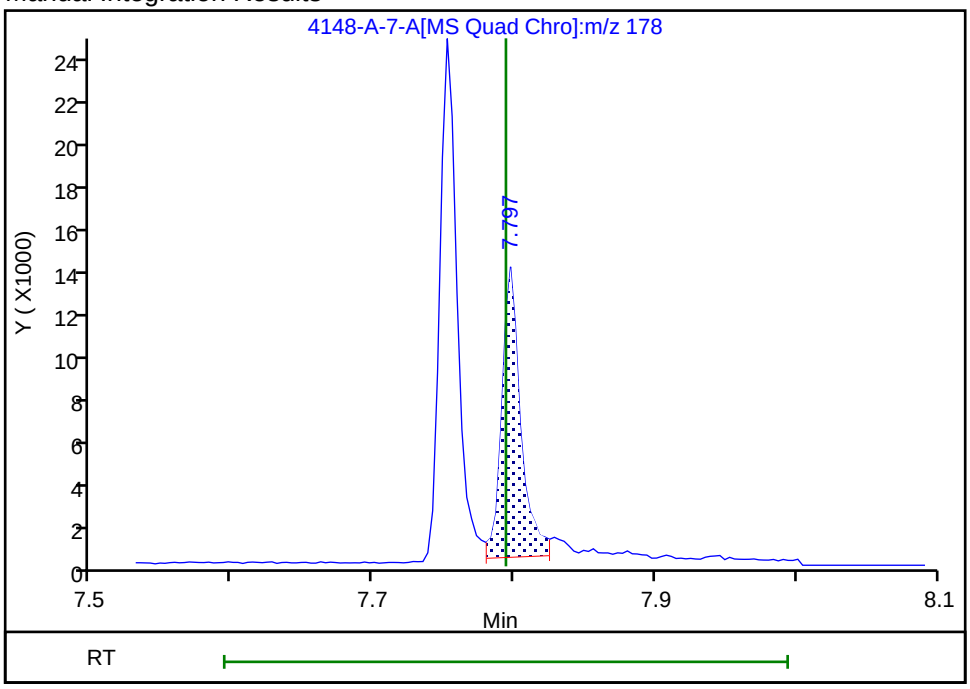
Processing Integration Results

RT: 7.80
Area: 15093
Amount: 0.095990
Amount Units: ug/ml



Manual Integration Results

RT: 7.80
Area: 12928
Amount: 0.082221
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 09:36:16 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

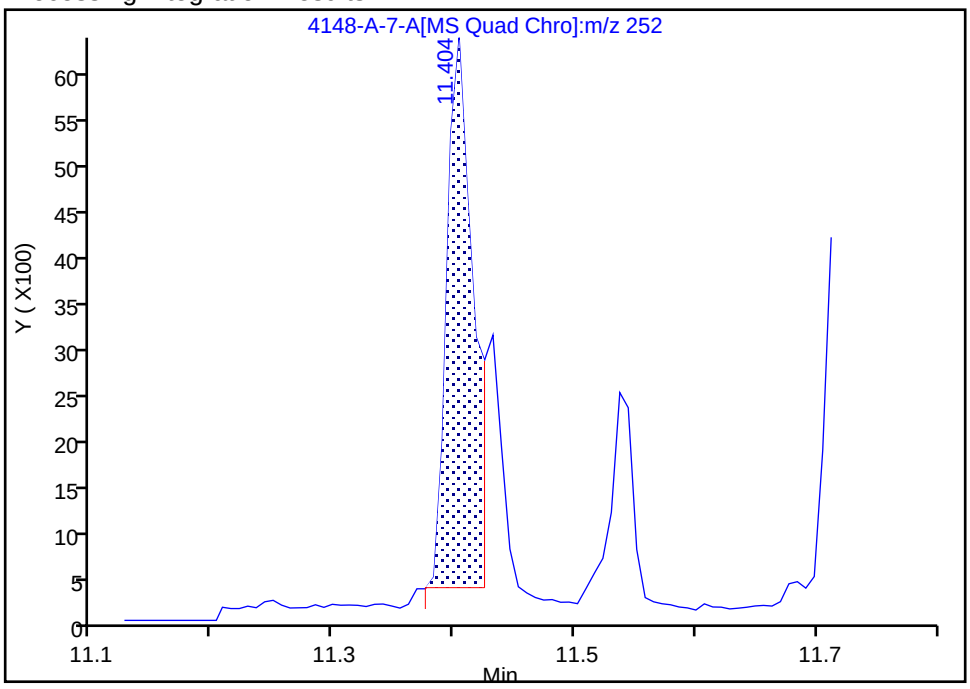
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D				
Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10		
Client ID:	1804576-844-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

55 Benzo[k]fluoranthene, CAS: 207-08-9

Signal: 1

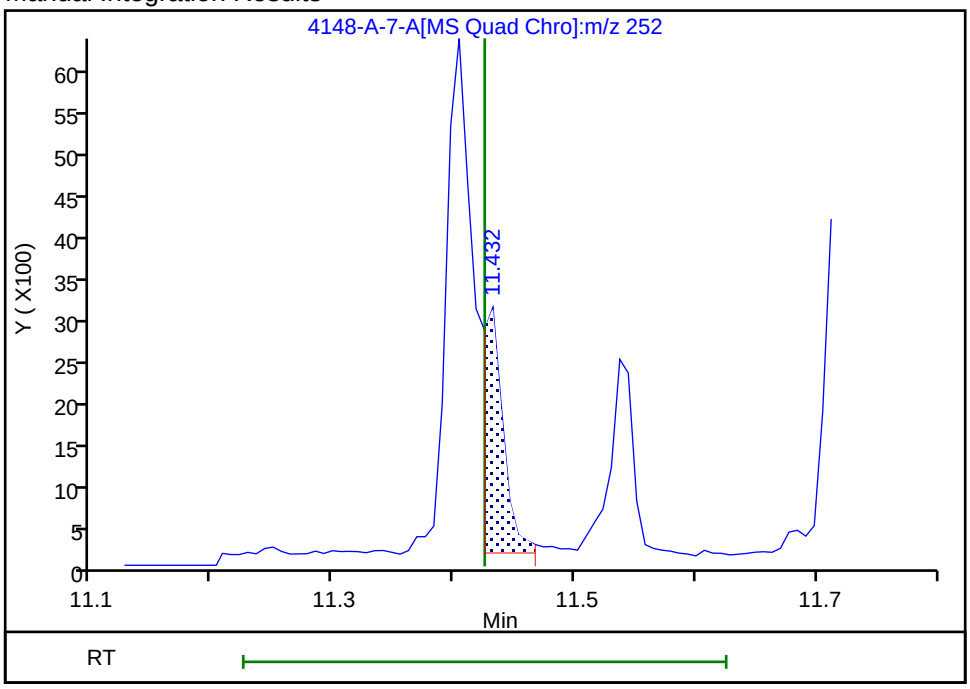
Processing Integration Results

RT: 11.40
Area: 9269
Amount: 0.038036
Amount Units: ug/ml



Manual Integration Results

RT: 11.43
Area: 3573
Amount: 0.014662
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 09:37:23 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

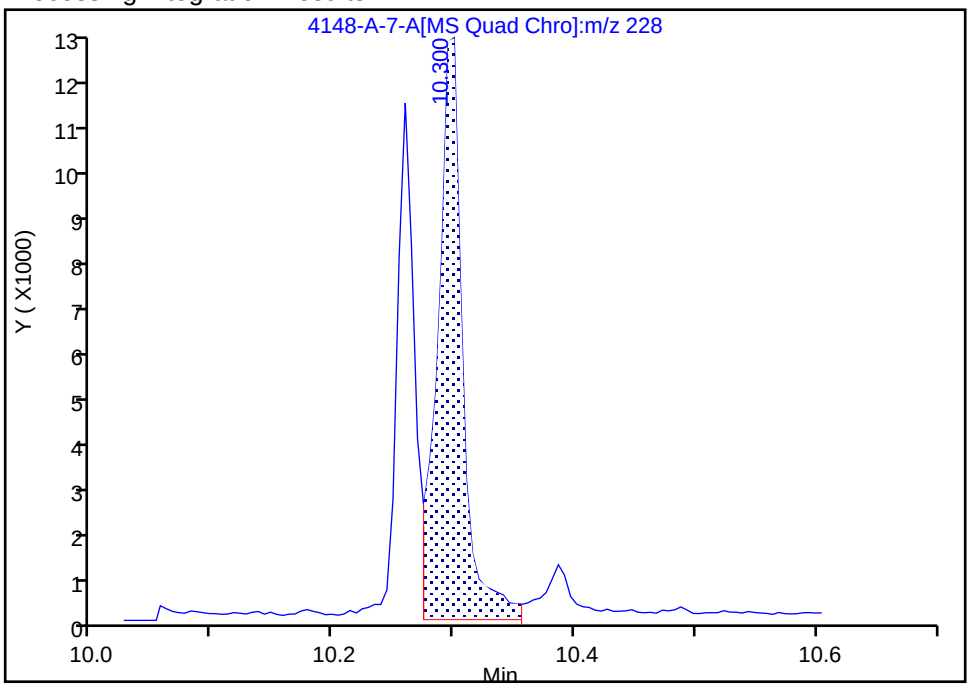
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D				
Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10		
Client ID:	1804576-844-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

50 Chrysene, CAS: 218-01-9

Signal: 1

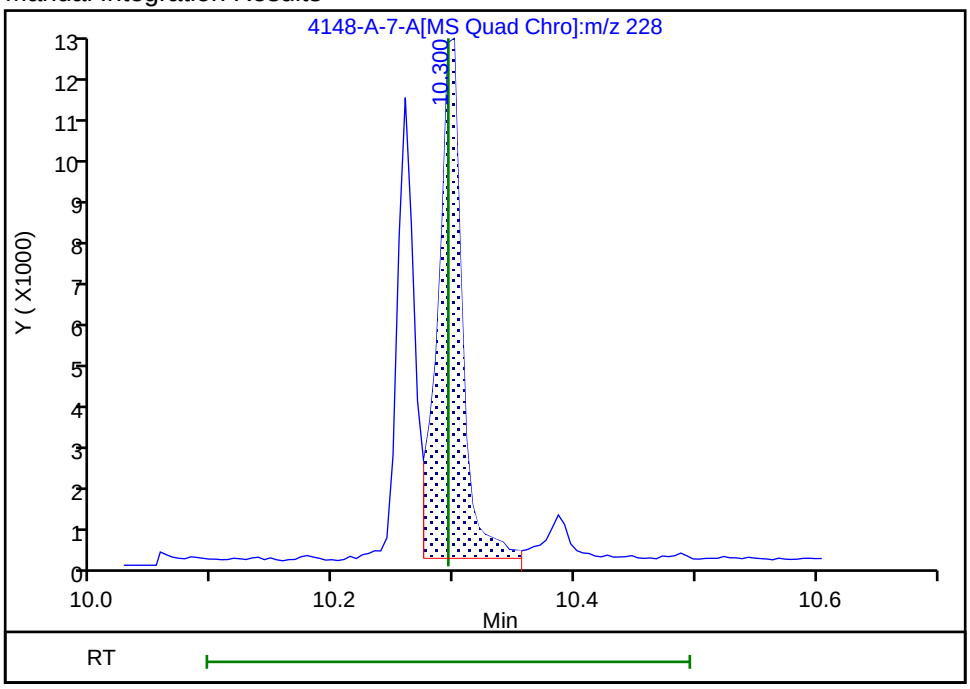
Processing Integration Results

RT: 10.30
Area: 17533
Amount: 0.073733
Amount Units: ug/ml



Manual Integration Results

RT: 10.30
Area: 16775
Amount: 0.070545
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 09:36:43 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

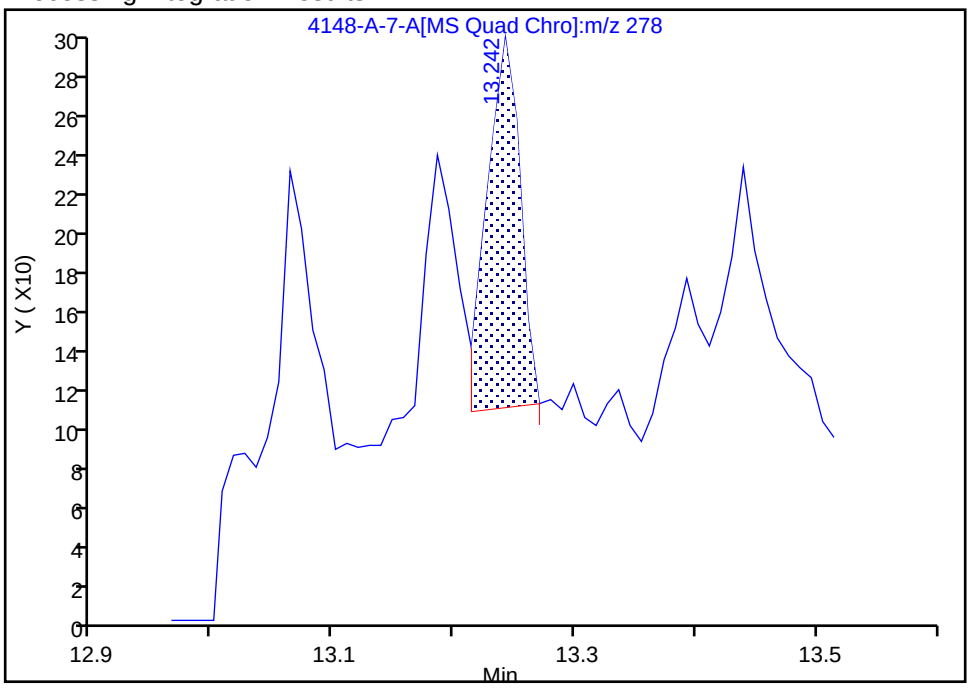
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D				
Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10		
Client ID:	1804576-844-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

66 Dibenz(a,h)anthracene, CAS: 53-70-3

Signal: 1

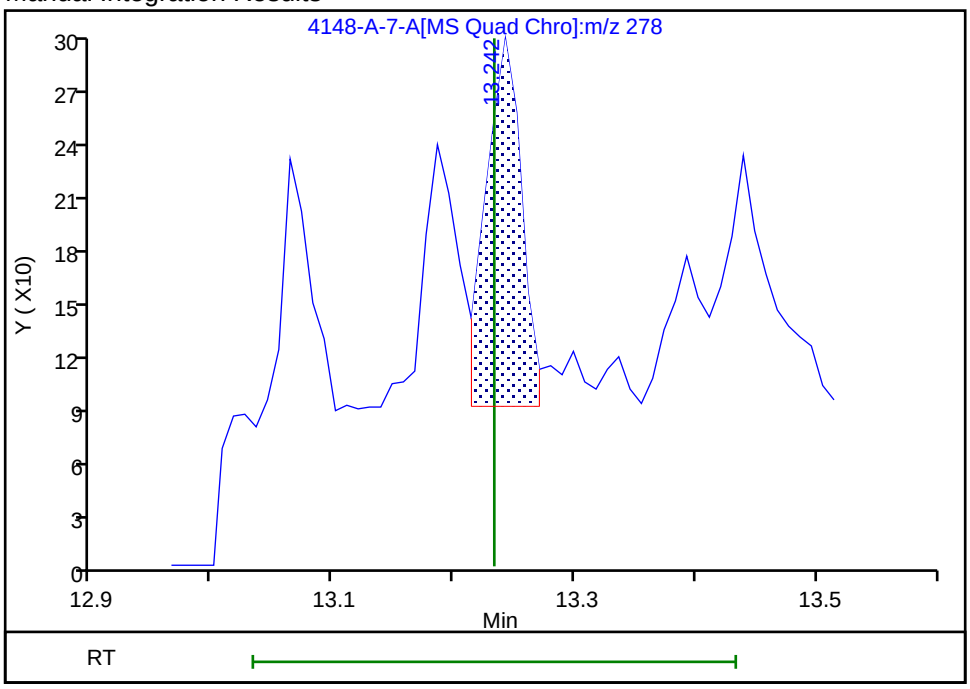
Processing Integration Results

RT: 13.24
Area: 358
Amount: 0.001908
Amount Units: ug/ml



Manual Integration Results

RT: 13.24
Area: 429
Amount: 0.002286
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 09:38:18 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

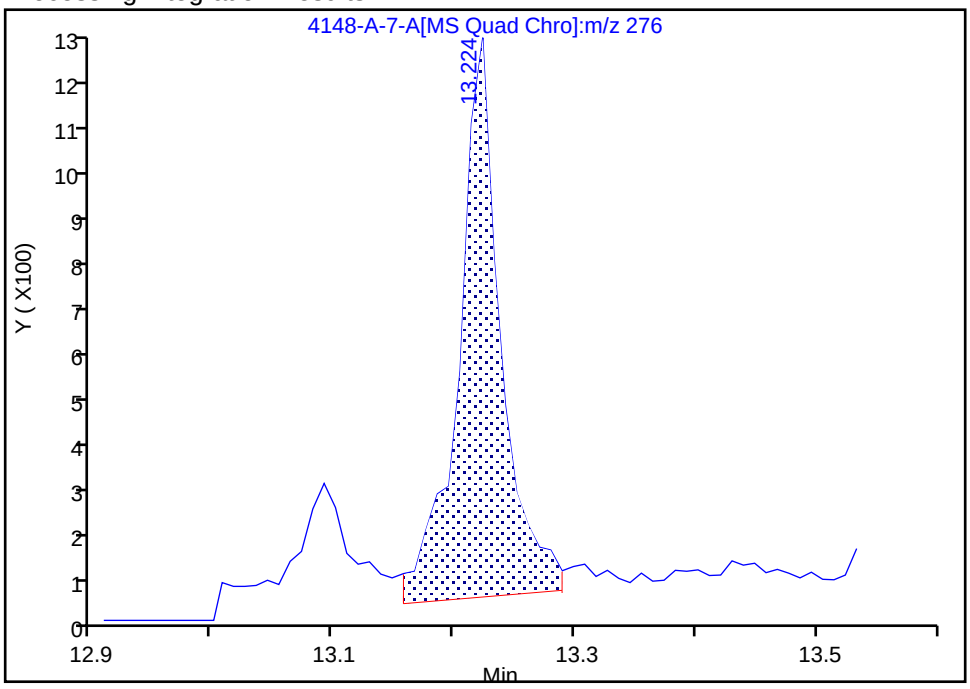
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D				
Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10		
Client ID:	1804576-844-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

65 Indeno[1,2,3-cd]pyrene, CAS: 193-39-5

Signal: 1

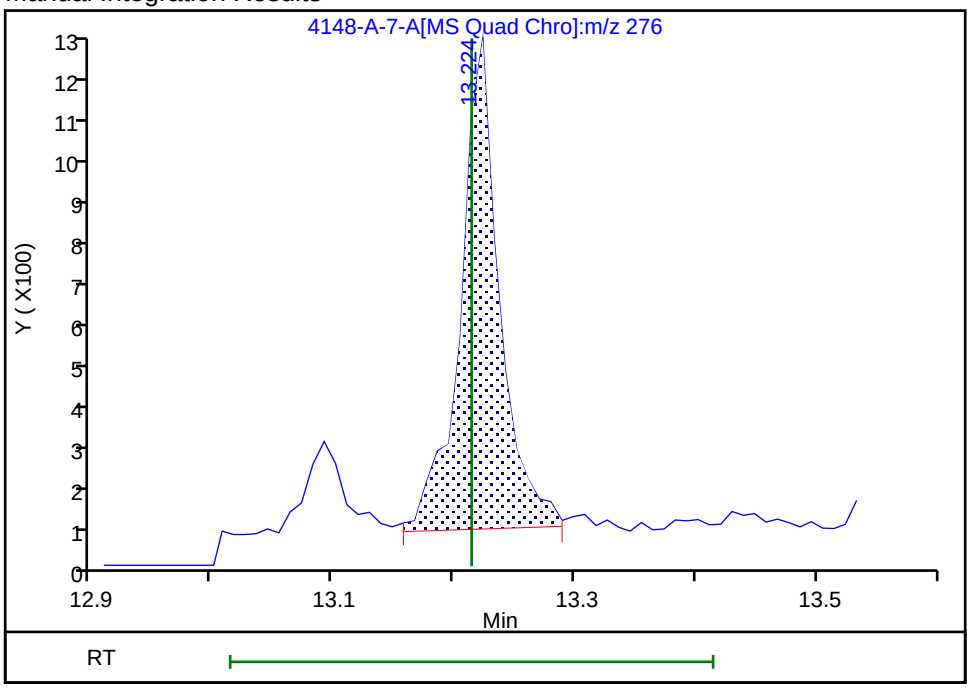
Processing Integration Results

RT: 13.22
Area: 2890
Amount: 0.012571
Amount Units: ug/ml



Manual Integration Results

RT: 13.22
Area: 2599
Amount: 0.011305
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 09:38:09 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

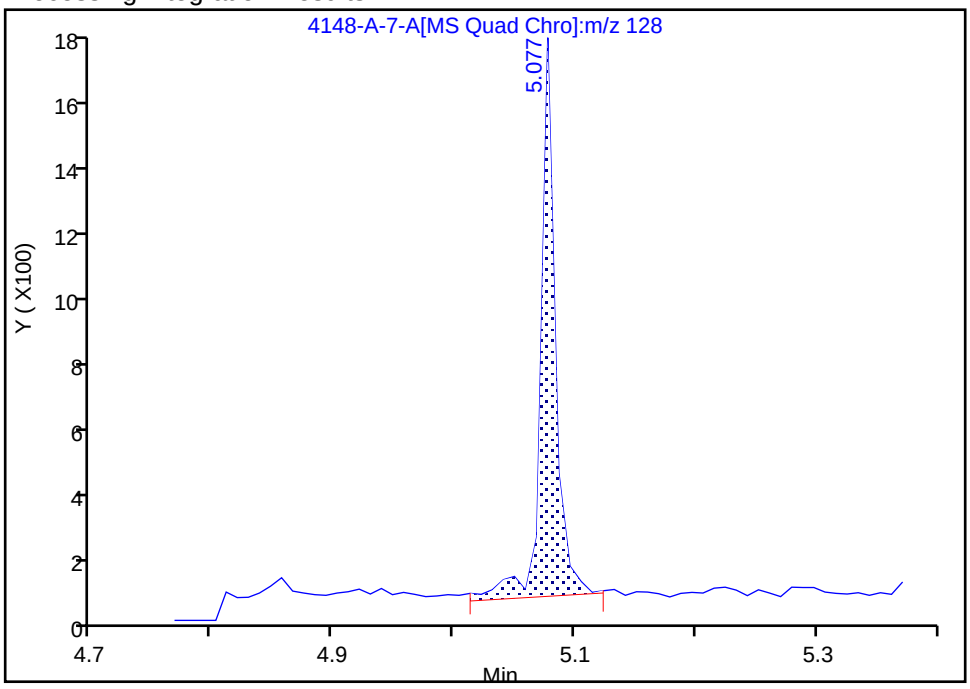
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-7-A.D				
Injection Date:	16-Nov-2023 17:24:38	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-10-A	Lab Sample ID:	140-34148-10		
Client ID:	1804576-844-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	18
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

12 Naphthalene, CAS: 91-20-3

Signal: 1

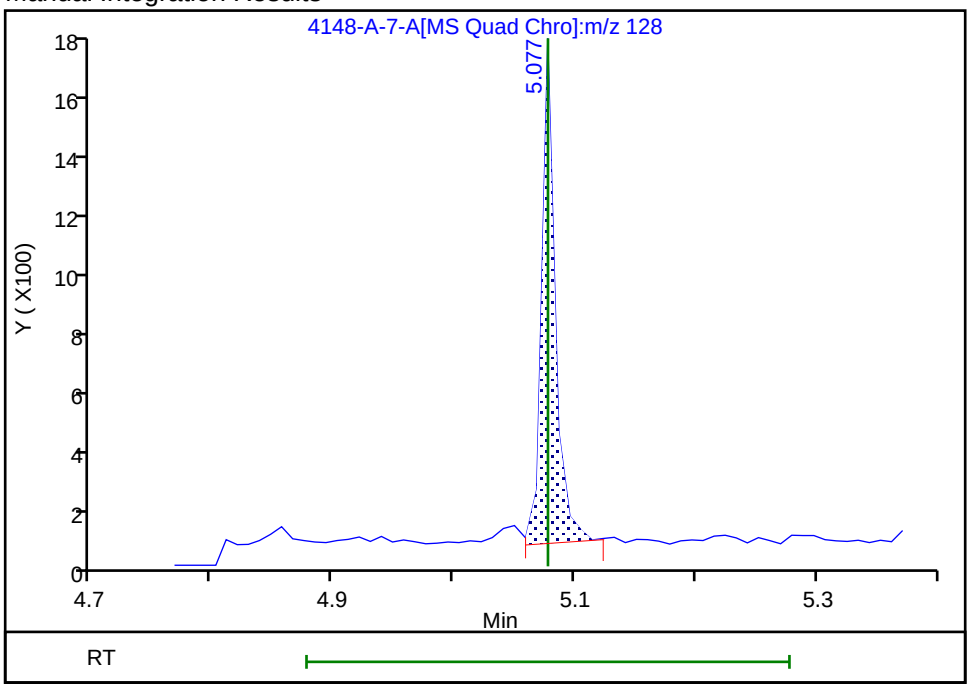
Processing Integration Results

RT: 5.08
Area: 1458
Amount: 0.016119
Amount Units: ug/ml



Manual Integration Results

RT: 5.08
Area: 1351
Amount: 0.014936
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 09:35:38 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: 1804576-844-S3 | Lab Sample ID: 140-34148-11

Matrix: PE | Lab File ID: 140-34148-A-8-A.D

Analysis Method: ID-0016 | Date Collected: 10/26/2023 14:00

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.008(g) | Date Analyzed: 11/16/2023 17:48

Con. Extract Vol.: 500(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80349 | Units: ng/g

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
83-32-9	Acenaphthene	59000		1300	330
208-96-8	Acenaphthylene	1400		1300	91
120-12-7	Anthracene	25000		1300	400
56-55-3	Benzo[a]anthracene	53000		1300	460
50-32-8	Benzo[a]pyrene	31000		1300	350
205-99-2	Benzo[b]fluoranthene	31000		1300	440
192-97-2	Benzo[e]pyrene	19000		1300	200
191-24-2	Benzo[g,h,i]perylene	8900		1300	140
207-08-9	Benzo[k]fluoranthene	18000		1300	290
218-01-9	Chrysene	55000		1300	160
53-70-3	Dibenz(a,h)anthracene	2500		1300	100
206-44-0	Fluoranthene	130000		1300	1000
86-73-7	Fluorene	16000		1300	400
193-39-5	Indeno[1,2,3-cd]pyrene	9000		1300	140
90-12-0	1-Methylnaphthalene	950	J	6300	630
91-57-6	2-Methylnaphthalene	ND		6300	880
91-20-3	Naphthalene	ND		25000	3600
198-55-0	Perylene	6300		1300	640
85-01-8	Phenanthrene	110000		2500	2200
129-00-0	Pyrene	190000		2500	380
STL00912	C1-Fluoranthenes/pyrene	110000		1300	1300
STL00913	C1-Fluorenes	19000		2500	1600
STL00914	C2-Fluorenes	31000		1300	1300
STL00915	C3-Fluorenes	38000		1300	1300
STL00917	C2-Naphthalenes	43000		2500	2500
STL00918	C3-Naphthalenes	93000		2500	2500
STL00919	C4-Naphthalenes	69000		3800	3500
STL00901	C1-Phenanthrenes/Anthracenes	65000		5000	4300
STL00902	C2-Phenanthrenes/Anthracenes	100000		1300	1300
STL00903	C3-Phenanthrenes/Anthracenes	67000		1300	1300
STL00904	C4-Phenanthrenes/Anthracenes	31000		1300	1300
STL02218	C1-Chrysenes/Benz(a)anthracenes	37000		1300	1300

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: 1804576-844-S3 | Lab Sample ID: 140-34148-11

Matrix: PE | Lab File ID: 140-34148-A-8-A.D

Analysis Method: ID-0016 | Date Collected: 10/26/2023 14:00

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.008(g) | Date Analyzed: 11/16/2023 17:48

Con. Extract Vol.: 500(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80349 | Units: ng/g

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
STL02219	C2-Chrysenes/Benz(a)anthracenes	14000		1300	1300
STL02220	C3-Chrysenes/Benz(a)anthracenes	5000		1300	1300
STL02221	C4-Chrysenes/Benz(a)anthracenes	1300		1300	1300
34883-41-5	PCB-14	380	J	1300	13
74472-51-8	PCB-192	2100		1300	13
74472-48-3	PCB-184	810	J	1300	13
33979-03-2	PCB-155	510	J	1300	13
41411-61-4	PCB-142	500	J	1300	13
74472-52-9	PCB-204	1600		1300	13
56558-16-8	PCB-104	1200	J	1300	13
56558-18-0	PCB-121	550	J	1300	13
70362-49-1	PCB-78	1100	J	1300	13
38444-87-0	PCB-36	460	J	1300	13

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
93951-97-4	Acenaphthylene-d8	76		30-120
1719-06-8	Anthracene-d10	84		30-120
63466-71-7	Benzo(a)pyrene-d12	86		30-120
93951-98-5	Benzo(b)fluoranthene-d12	91		30-120
93951-66-7	Benzo(ghi)perylene-d12	90		30-120
93952-01-3	Benzo(k)fluoranthene-d12	87		30-120
1719-03-5	Chrysene-d12	77		30-120
13250-98-1	Dibenz(a,h)anthracene-d14	88		30-120
93951-69-0	Fluoranthene-d10	88		30-120
81103-79-9	Fluorene -d10	77		30-120
203578-33-0	Indeno[1,2,3-cd]pyrene-d12	93		30-120
38072-94-5	1-Methylnaphthalene-d10	72		30-120
7297-45-2	2-Methylnaphthalene-d10	70		30-120
1146-65-2	Naphthalene-d8	63		30-120
1520-96-3	Perylene-d12	80		30-120
1517-22-2	Phenanthrene-d10	83		30-120

Report Date: 22-Nov-2023 14:15:30 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-8-A.D
Lims ID: 140-34148-A-11-A
Client ID: 1804576-844-S3
Sample Type: Client
Inject. Date: 16-Nov-2023 17:48:22 ALS Bottle#: 0 Worklist Smp#: 19
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030519-019
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 22-Nov-2023 14:15:29 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1637

First Level Reviewer: SK9U Date: 22-Nov-2023 12:11:50

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/ml	%Rec	Flags
D 10 Naphthalene-d8	136	5.059	5.068	-0.009	100	29261	0.3146	62.9	
11 Naphthalene	128	5.078	5.078	0.000	34	1403	0.0204		M
D 15 2-methylnaphthalene-d10	152	5.606	5.612	-0.006	92	21097	0.3488	69.8	
D 17 1-Methylnaphthalene-d10	152	5.686	5.686	0.000	100	21690	0.3579	71.6	
18 1-Methylnaphthalene	142	5.715	5.715	0.000	91	798	0.0152		
D 23 Acenaphthylene-d8	160	6.362	6.362	0.000	52	38970	0.3796	75.9	
24 Acenaphthylene	152	6.377	6.372	0.005	52	2121	0.0232		
* 26 Acenaphthene-d10	164	6.492	6.492	0.000	98	33365	0.5000		
27 Acenaphthene	154	6.517	6.517	0.000	98	55672	0.9487		
D 29 Fluorene -d10	176	6.925	6.920	0.005	98	30774	0.3871	77.4	
30 Fluorene	166	6.945	6.945	0.000	98	20409	0.2553		
D 35 Phenanthrene-d10	188	7.732	7.732	0.000	99	54726	0.4147	82.9	
36 Phenanthrene	178	7.749	7.749	0.000	36	230544	1.75		
D 38 Anthracin-d10	188	7.777	7.777	0.000	97	53788	0.4175	83.5	
39 Anthracene	178	7.794	7.794	0.000	99	51993	0.3926		
D 41 Fluoranthene-d10	212	8.808	8.805	0.003	94	75103	0.4387	87.7	
43 Fluoranthene	202	8.825	8.825	0.000	56	399512	2.08		
* 44 Pyrene-d10 (IS)	212	9.027	9.024	0.003	97	84616	0.5000		
45 Pyrene	202	9.044	9.044	0.000	97	600220	3.06		
47 Benzo[a]anthracene	228	10.260	10.260	0.000	100	140178	0.8523		
D 48 Chrysene-d12	240	10.270	10.270	0.000	96	63322	0.3835	76.7	
50 Chrysene	228	10.295	10.295	0.000	24	162678	0.8826		
D 52 Benzo(b)fluoranthene-d12	264	11.376	11.369	0.007	100	59393	0.4539	90.8	
53 Benzo[b]fluoranthene	252	11.404	11.397	0.007	85	99925	0.4993		M
D 54 Benzo(k)fluoranthene-d12	264	11.411	11.404	0.007	86	66625	0.4334	86.7	
55 Benzo[k]fluoranthene	252	11.418	11.425	-0.007	100	54703	0.2803		M
* 56 Benzo(e)pyrene-d12	264	11.684	11.684	0.000	99	51664	0.5000		
57 Benzo[e]pyrene	252	11.712	11.712	0.000	100	51872	0.3113		
D 58 Benzo(a)pyrene-d12	264	11.747	11.747	0.000	100	49444	0.4309	86.2	
59 Benzo[a]pyrene	252	11.775	11.775	0.000	100	79905	0.4887		
D 60 Perylene-d12	264	11.845	11.838	0.007	99	51192	0.4020	80.4	
61 Perylene	252	11.873	11.873	0.000	100	14713	0.1006		

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/ml	%Rec	Flags
D 62 Indeno[1,2,3-cd]pyrene-d12	288	13.186	13.186	0.000	80	57726	0.4630	92.6	
D 63 Dibenz(a,h)anthracene-d14	292	13.196	13.186	0.000	94	49267	0.4417	88.3	
65 Indeno[1,2,3-cd]pyrene	276	13.224	13.214	0.010	34	27756	0.1437		
66 Dibenz(a,h)anthracene	278	13.243	13.233	0.010	18	6282	0.0399		
D 67 Benzo(ghi)perylene-d12	288	13.552	13.543	0.009	100	55464	0.4480	89.6	
68 Benzo[g,h,i]perylene	276	13.580	13.580	0.000	92	23065	0.1420		
74 PCB-14	222	7.472	7.479	-0.007	16	718	0.006028		M
75 PCB-36	258	8.202	8.206	-0.008	4	460	0.007336		
76 PCB-104	326	8.395	8.393	-0.001	94	919	0.0189		
77 PCB-121	326	8.751	8.748	0.000	42	344	0.008802		
78 PCB-155	360	8.849	8.852	0.000	27	299	0.008183		
79 PCB-78	290	9.081	9.077	-0.003	23	540	0.0174		
80 PCB-142	360	9.525	9.519	0.003	19	212	0.007973		
81 PCB-184	394	9.576	9.579	0.004	10	347	0.0130		
* 82 PCB-167L	372	10.023	10.027	-0.004	70	12995	0.4000		
83 PCB-204	428	10.255	10.246	0.005	1	441	0.0255		
84 PCB-192	394	10.280	10.275	0.005	9	833	0.0341		
A 86 C2-Naphthalenes	156	6.244	(6.068-6.407)		0	47177	0.6855		
A 87 C3-Naphthalenes	170	6.699	(6.348-7.050)		0	102205	1.49		
A 88 C4-Naphthalenes	184	7.119	(6.678-7.562)		0	75549	1.10		
A 89 C1-Fluorenes	180	7.426	(7.364-7.505)		0	24564	0.3073		
A 90 C2-Fluorenes	194	7.883	(7.730-8.069)		0	39291	0.4915		
A 91 C3-Fluorenes	208	8.253	(8.092-8.605)		0	48088	0.6015		
A 96 C1-Phenanthrenes/Anthracenes	191	8.232	(8.155-8.332)		0	138001	1.05		
A 97 C2-Phenanthrenes/Anthracenes	206	8.698	(8.490-8.926)		0	210766	1.60		
A 98 C3-Phenanthrenes/Anthracenes	220	9.162	(8.851-9.456)		0	142486	1.08		
A 99 C4-Phenanthrenes/Anthracenes	234	9.459	(9.106-9.824)		0	64611	0.4894		
A 100 C1-Fluoranthenes/pyrene	216	9.451	(9.246-9.640)		0	340349	1.74		
A 101 C1-Chrysenes/Benz(a)anthracenes	242	10.691	(10.456-10.941)		0	108843	0.5905		
A 102 C2-Chrysenes/Benz(a)anthracenes	256	11.009	(10.667-11.381)		0	41684	0.2261		
A 103 C3-Chrysenes/Benz(a)anthracenes	270	11.635	(11.002-11.867)		0	14889	0.0808		
A 104 C4-Chrysenes/Benz(a)anthracenes	284	12.119	(11.475-12.553)		0	3919	0.0213		

QC Flag Legend

Processing Flags

Review Flags

M - Manually Integrated

Reagents:

60ISPCB_00001 Amount Added: 5.00 Units: uL

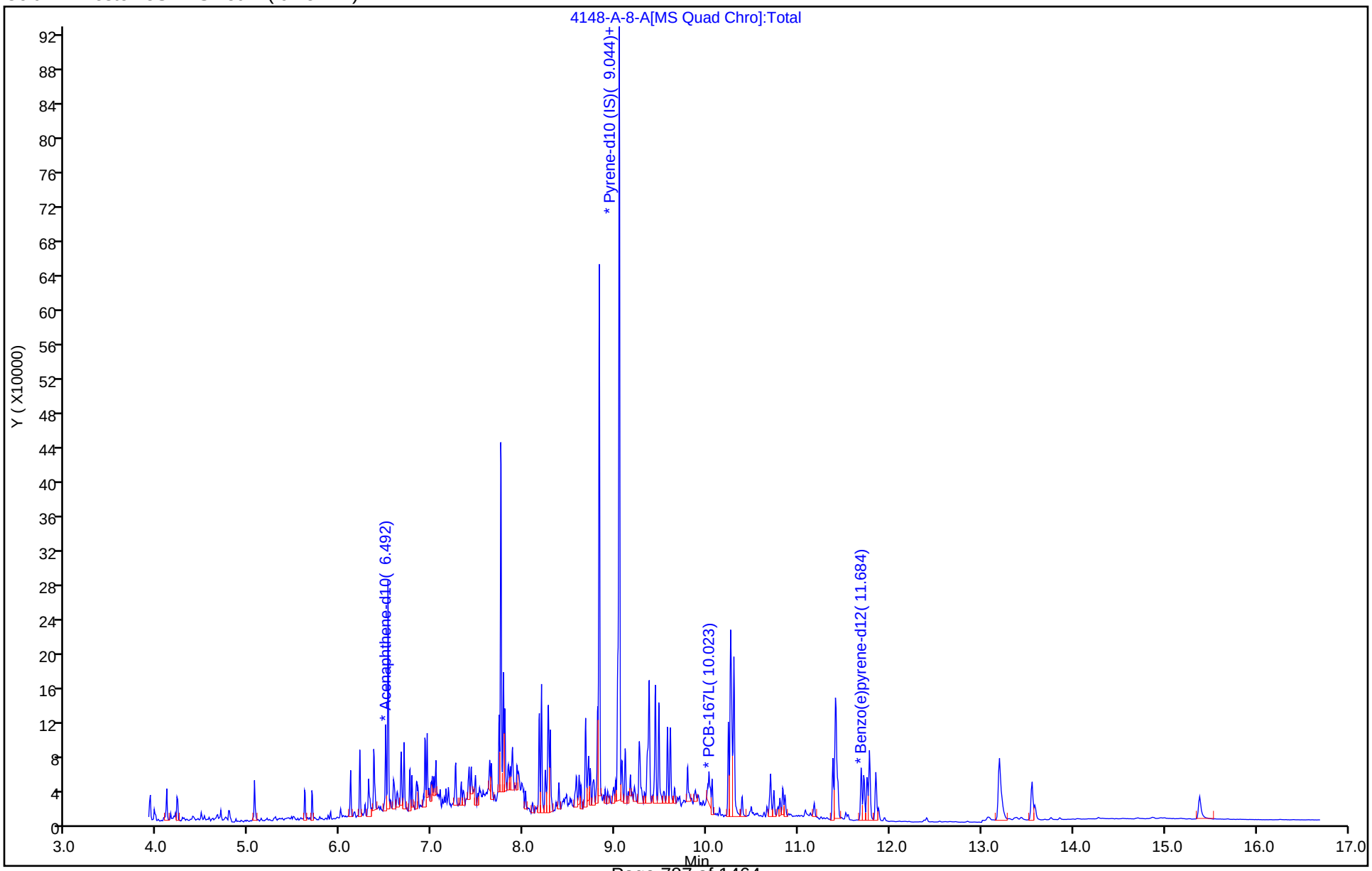
Report Date: 22-Nov-2023 14:15:30 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-8-A.D

Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11	Worklist Smp#:	19
Client ID:	1804576-844-S3				
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)

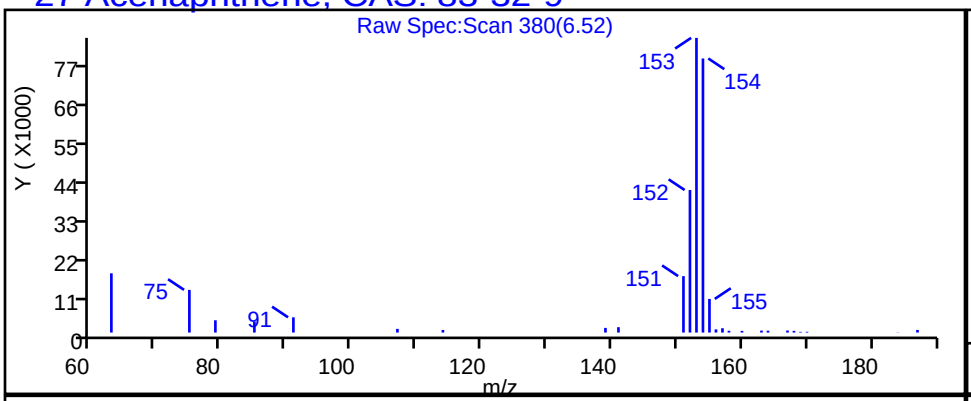


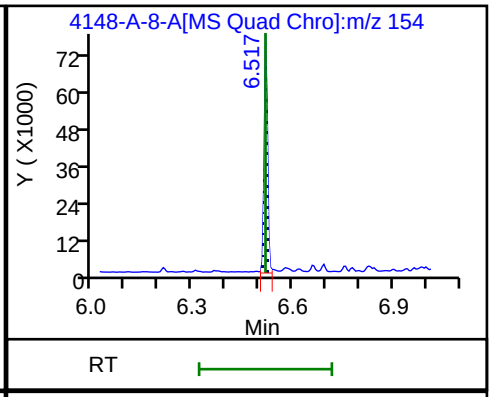
Report Date: 22-Nov-2023 14:15:30 Chrom Revision: 2.3 15-Nov-2023 20:54:34

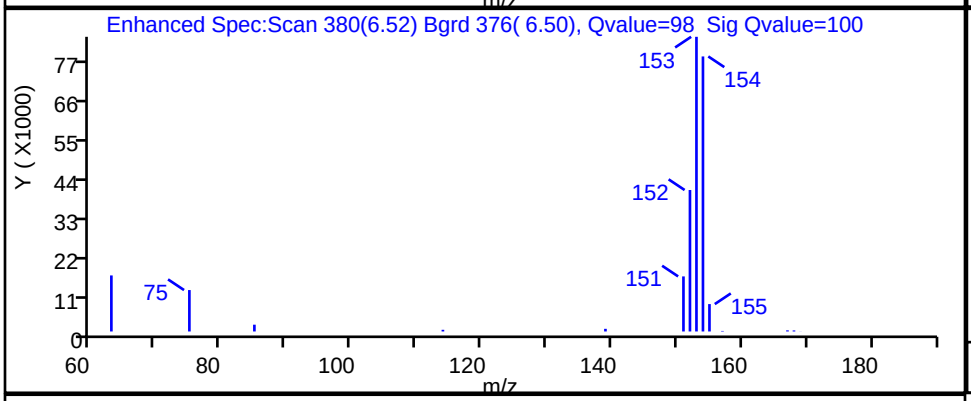
Eurofins Knoxville

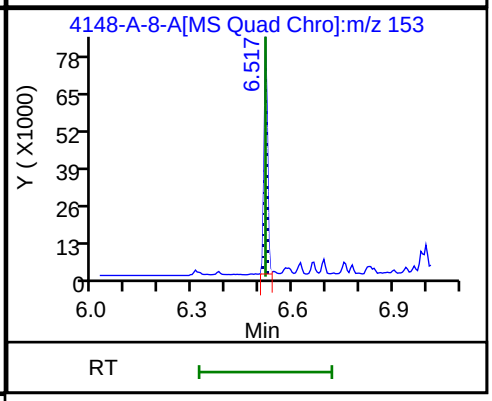
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-8-A.D				
Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11		
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

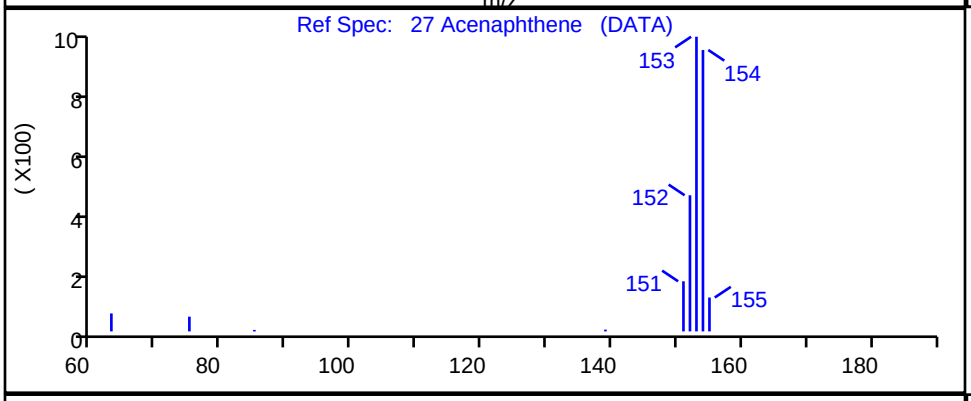
27 Acenaphthene, CAS: 83-32-9

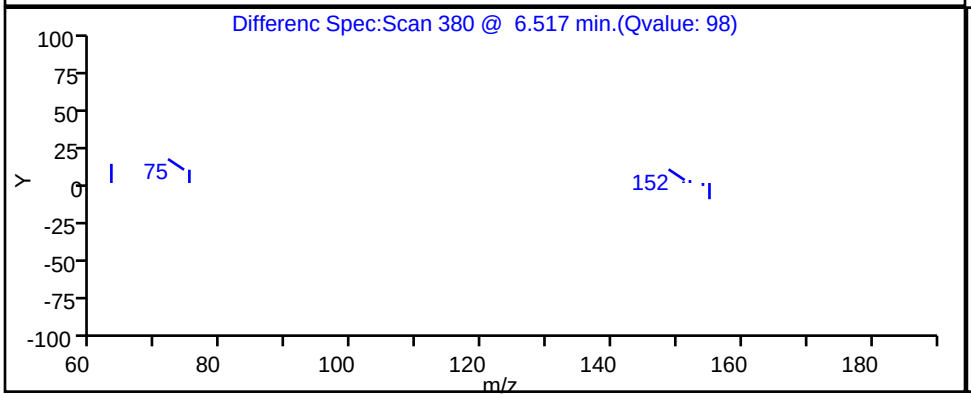


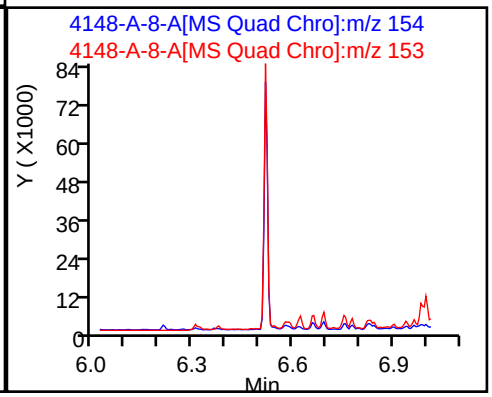












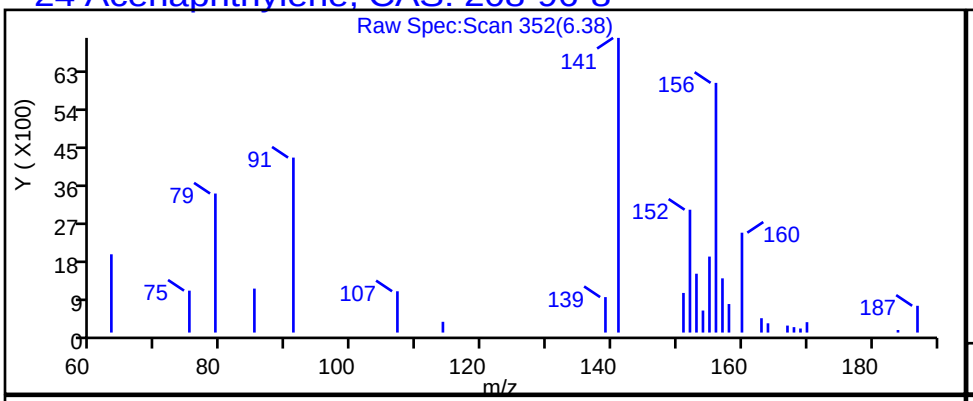
Report Date: 22-Nov-2023 14:15:30 Chrom Revision: 2.3 15-Nov-2023 20:54:34

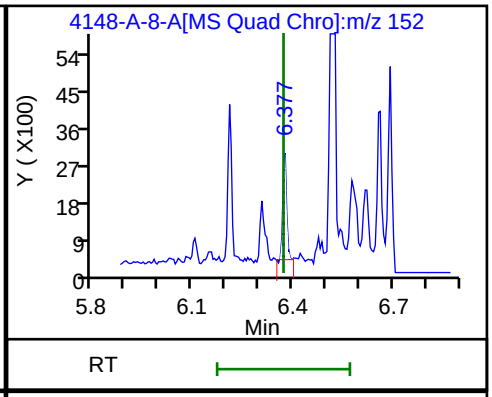
Eurofins Knoxville

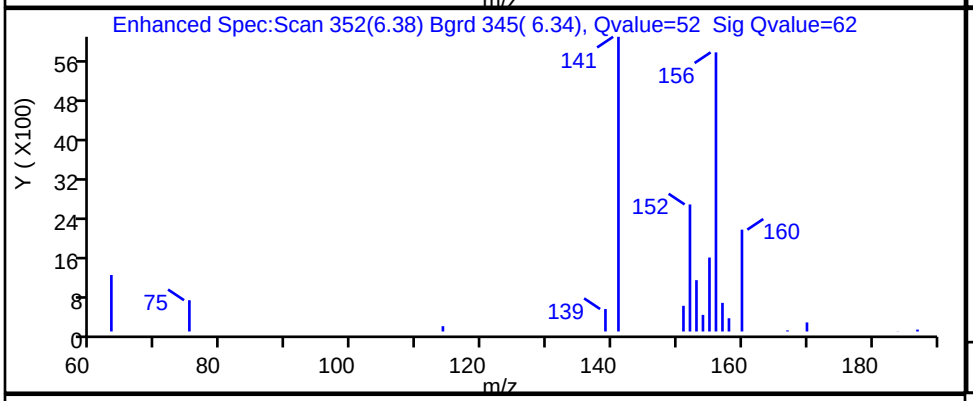
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-8-A.D

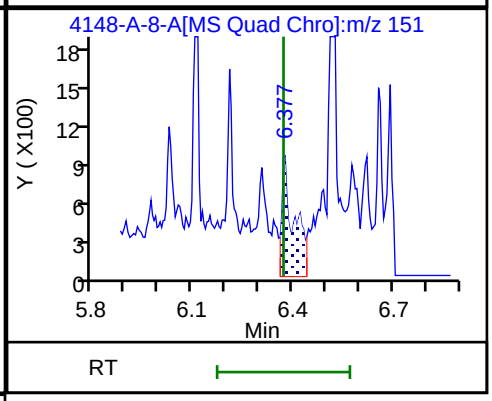
Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11		
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

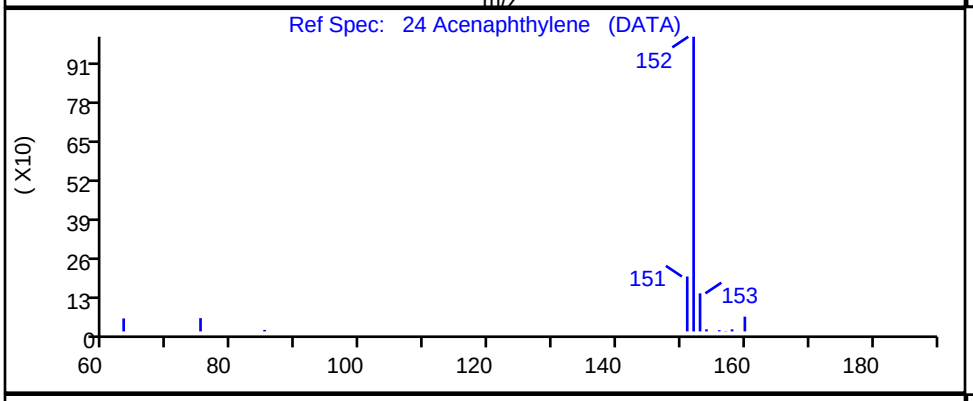
24 Acenaphthylene, CAS: 208-96-8

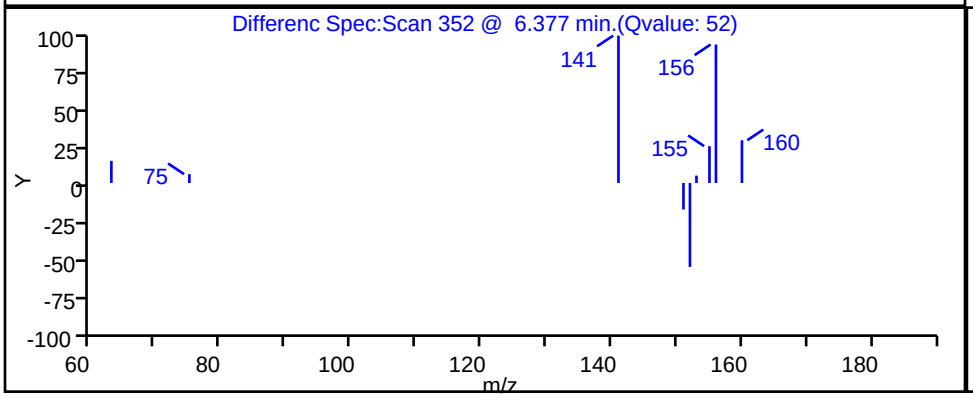


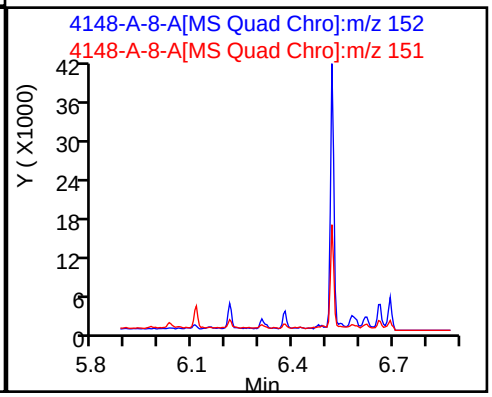












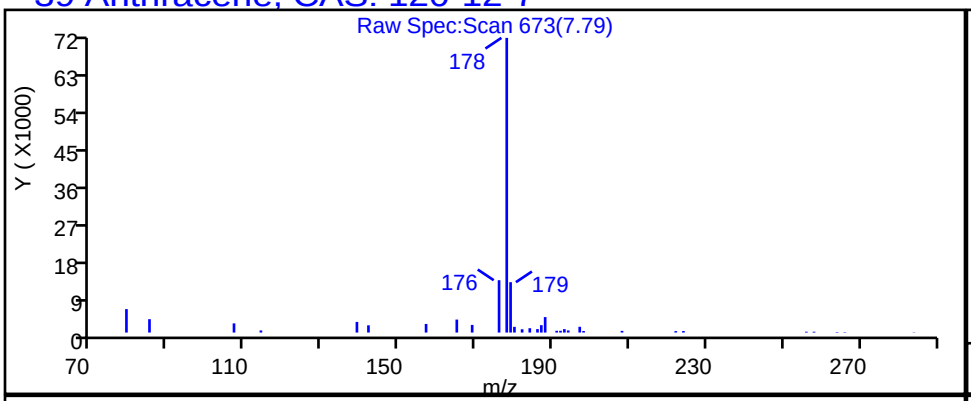
Report Date: 22-Nov-2023 14:15:30 Chrom Revision: 2.3 15-Nov-2023 20:54:34

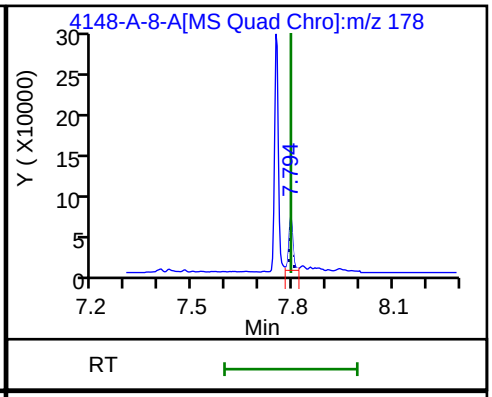
Eurofins Knoxville

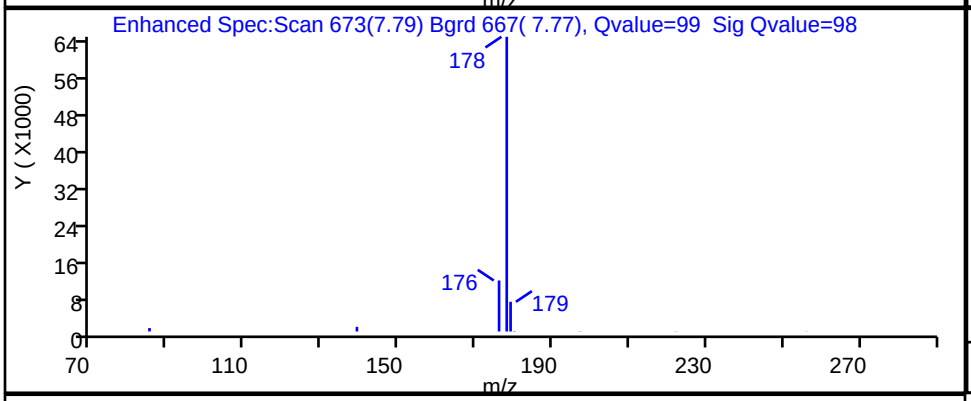
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-8-A.D

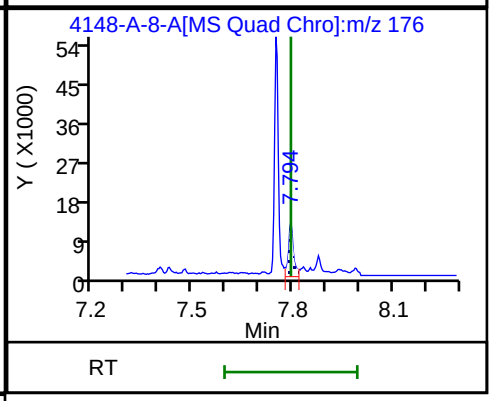
Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11
Client ID:	1804576-844-S3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

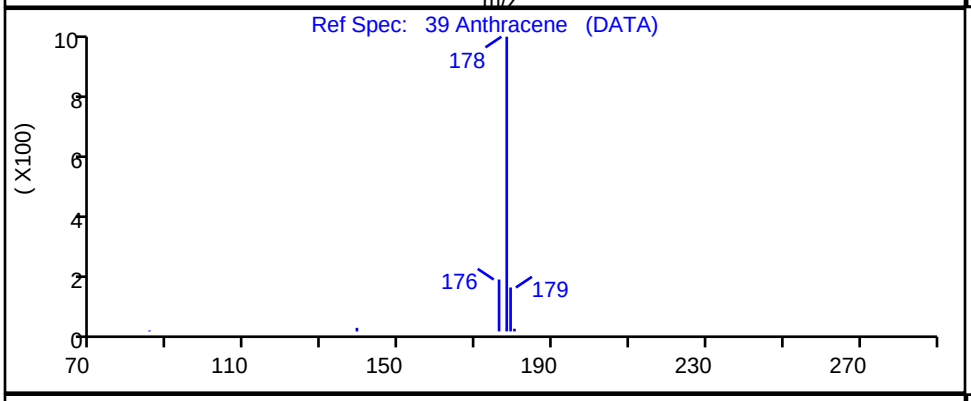
39 Anthracene, CAS: 120-12-7

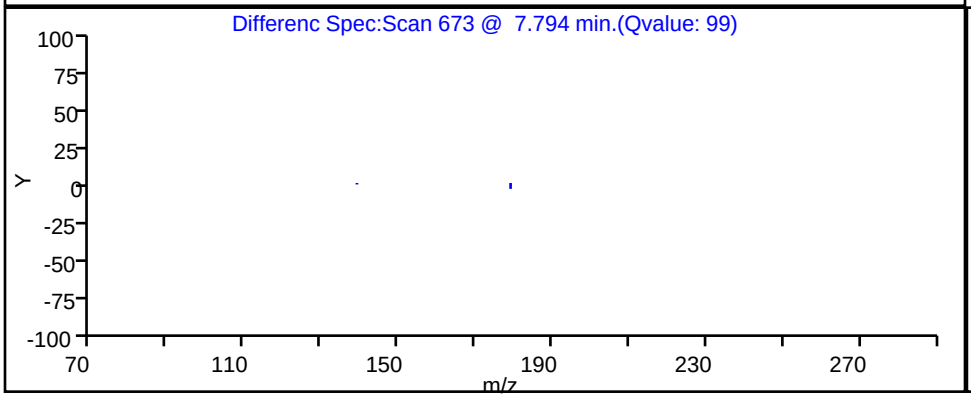


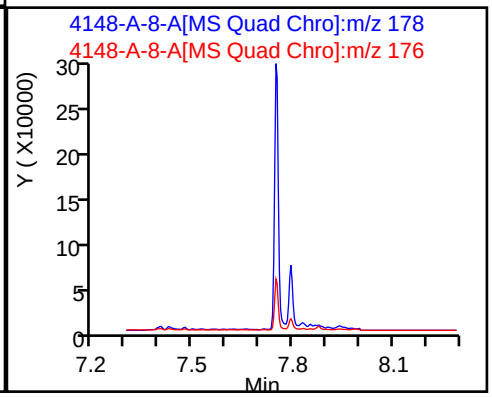












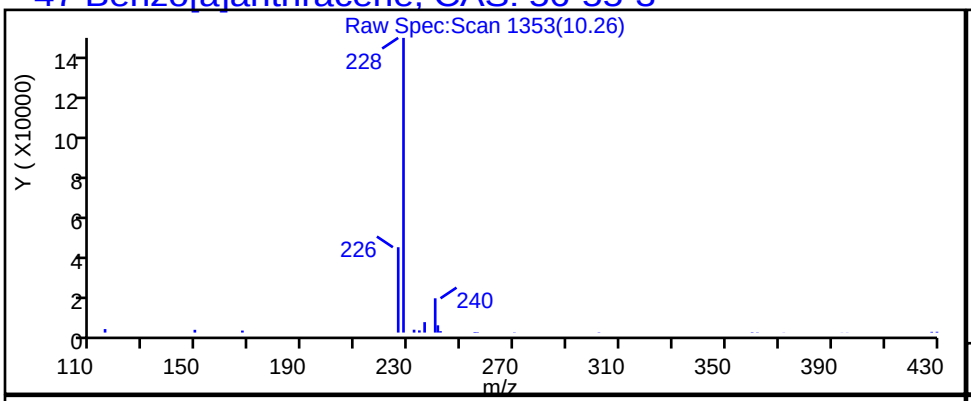
Report Date: 22-Nov-2023 14:15:30 Chrom Revision: 2.3 15-Nov-2023 20:54:34

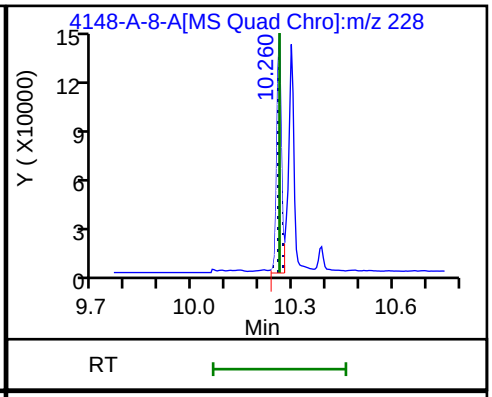
Eurofins Knoxville

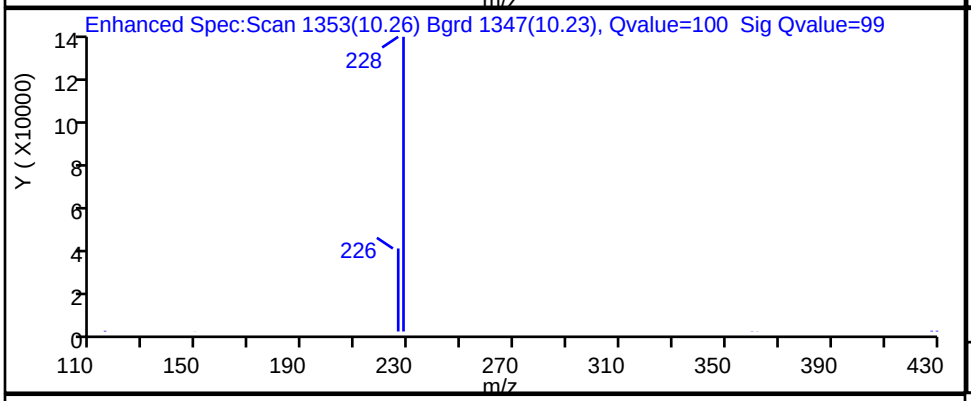
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-8-A.D

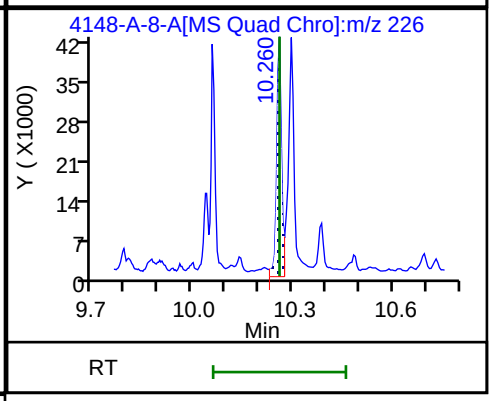
Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11		
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

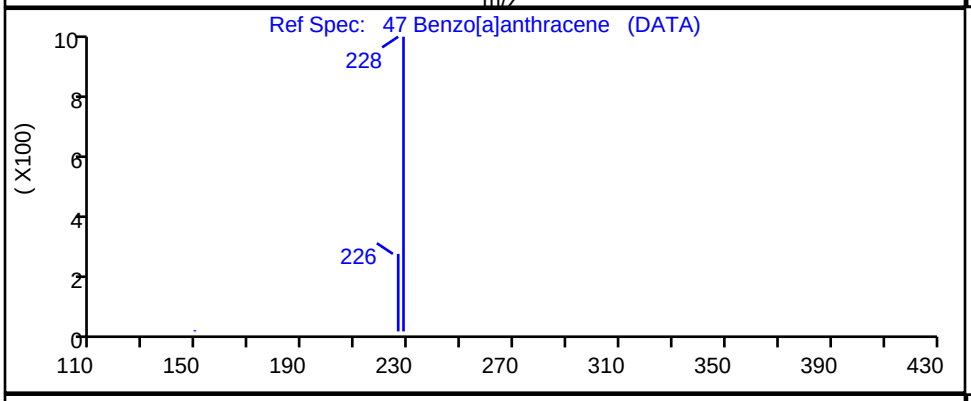
47 Benzo[a]anthracene, CAS: 56-55-3

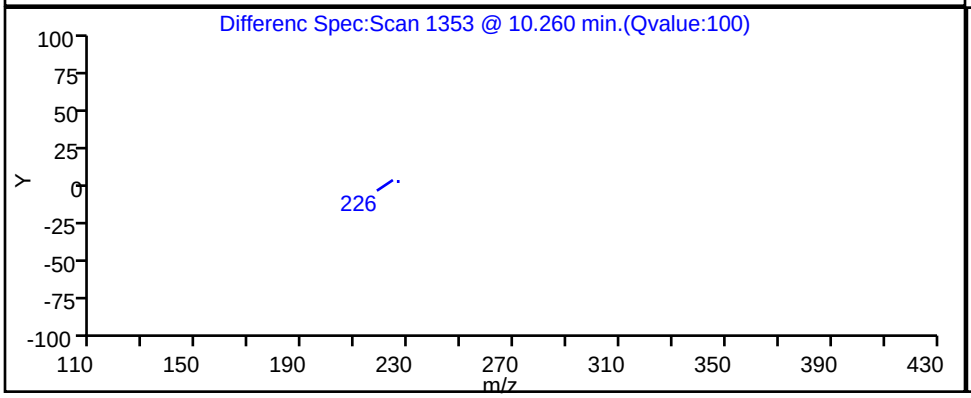


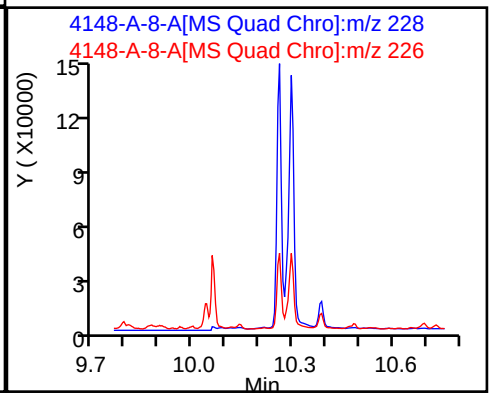












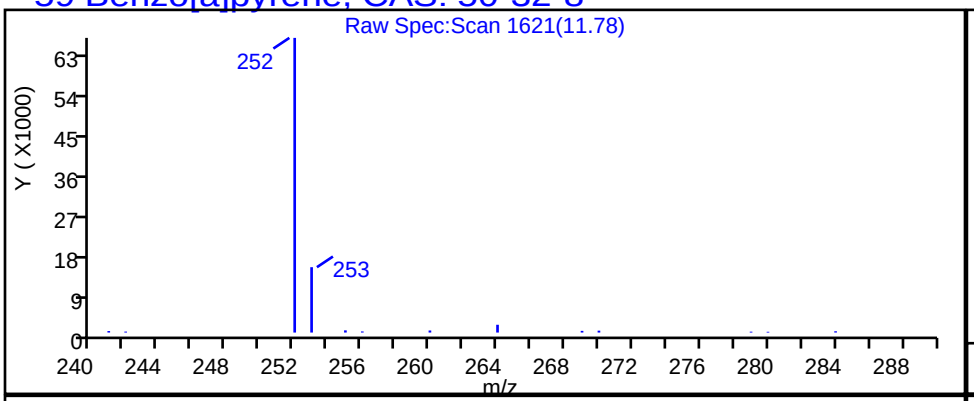
Report Date: 22-Nov-2023 14:15:30 Chrom Revision: 2.3 15-Nov-2023 20:54:34

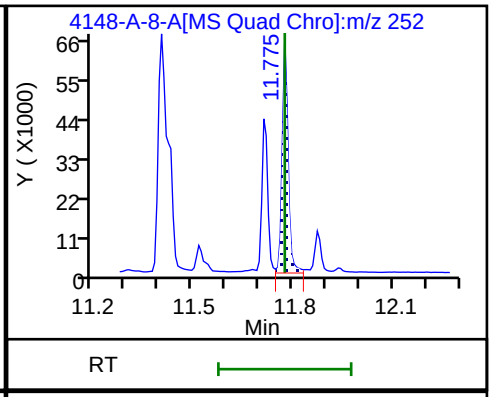
Eurofins Knoxville

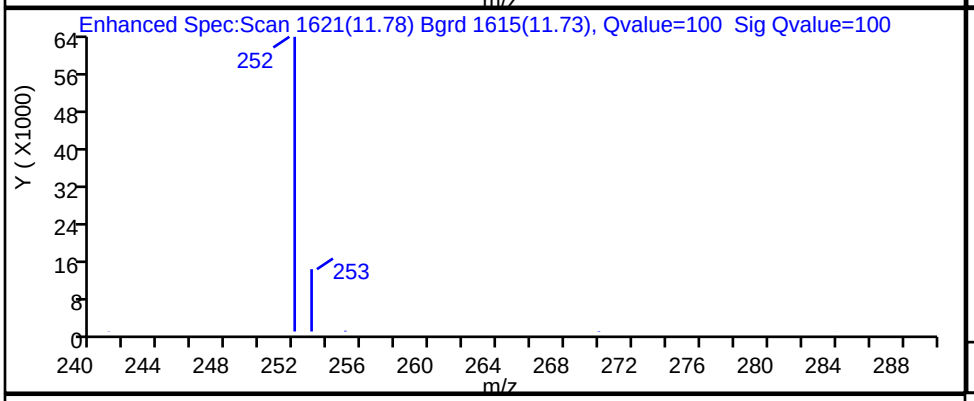
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-8-A.D

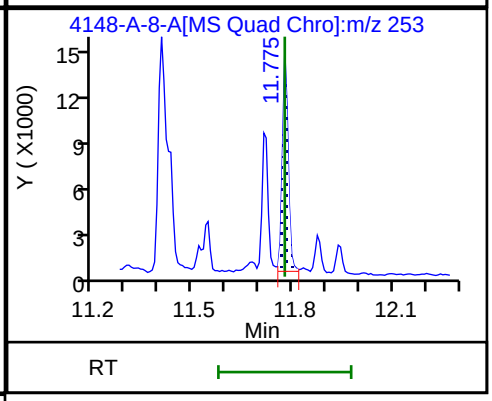
Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11
Client ID:	1804576-844-S3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

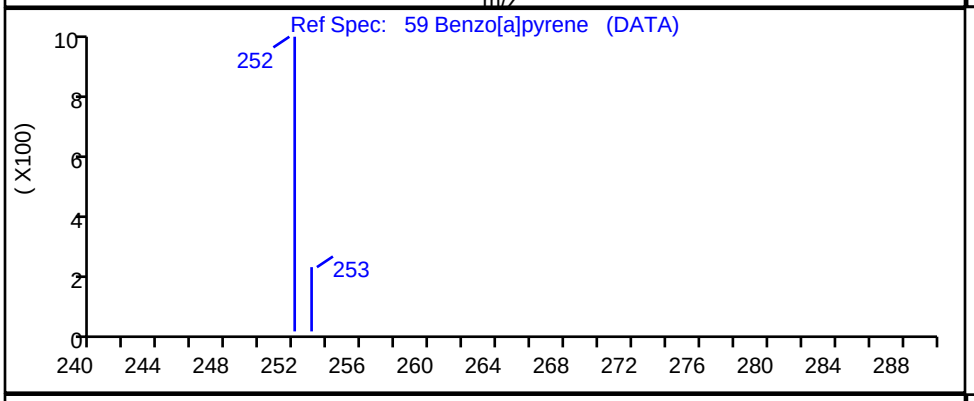
59 Benzo[a]pyrene, CAS: 50-32-8

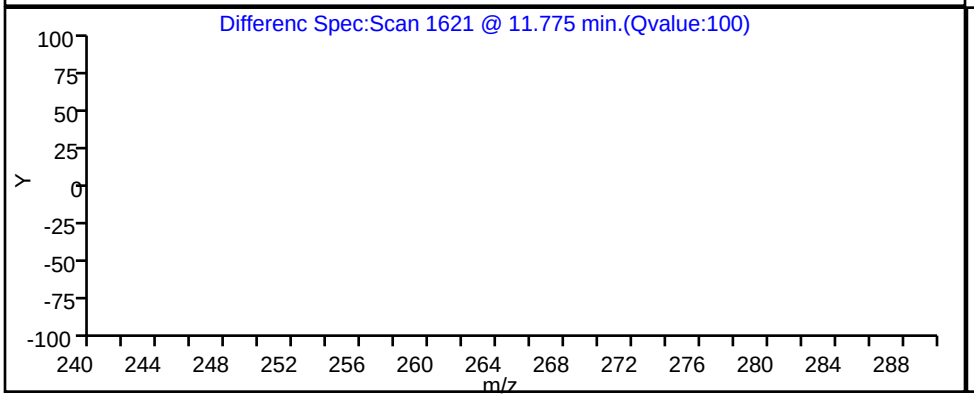


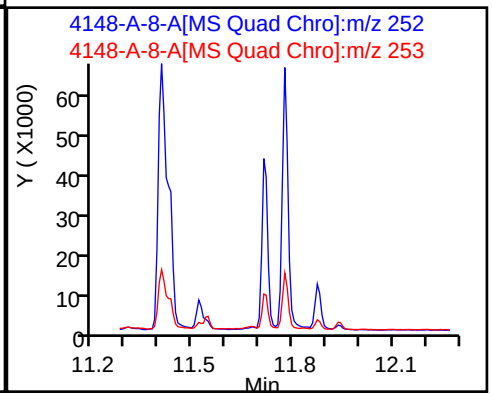










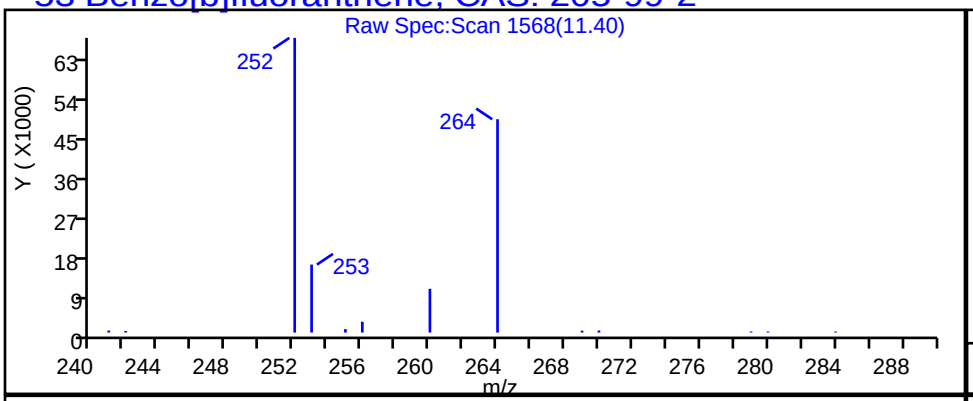


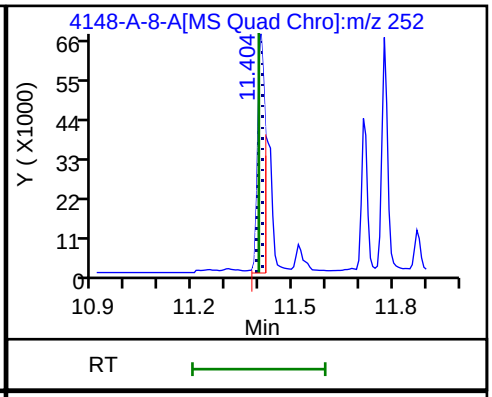
Report Date: 22-Nov-2023 14:15:30 Chrom Revision: 2.3 15-Nov-2023 20:54:34

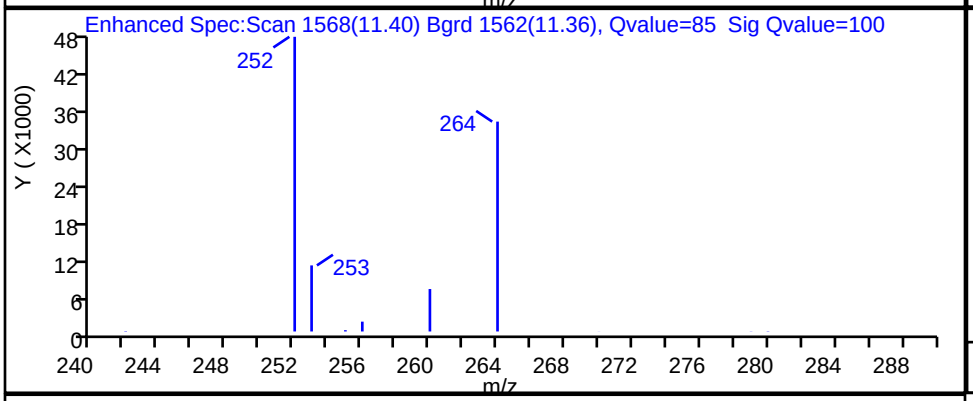
Eurofins Knoxville

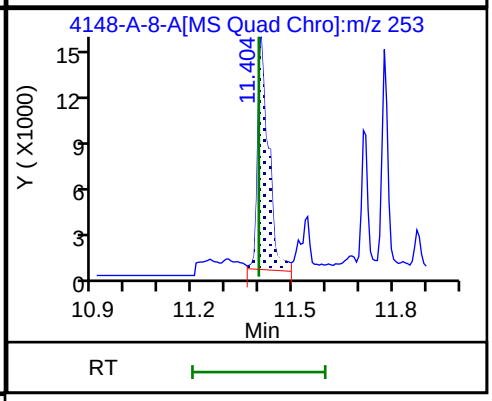
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-8-A.D				
Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11		
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

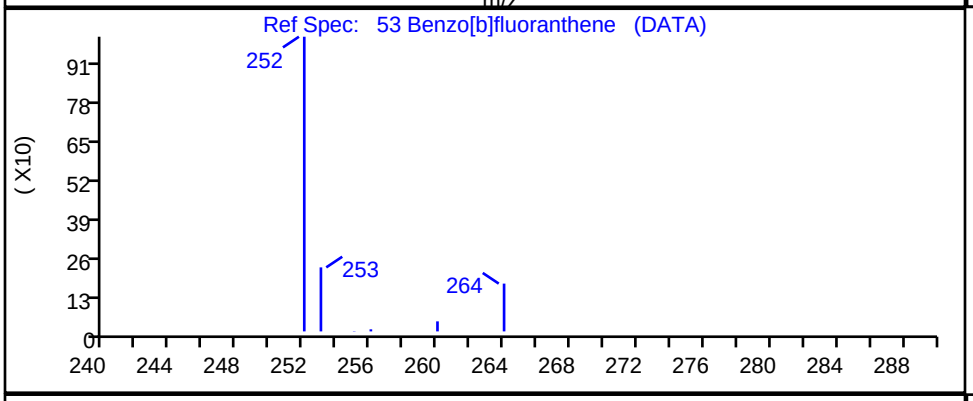
53 Benzo[b]fluoranthene, CAS: 205-99-2

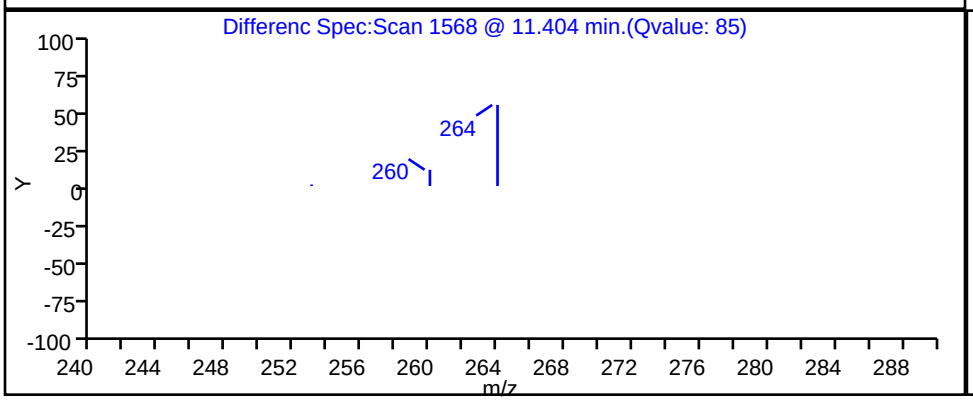


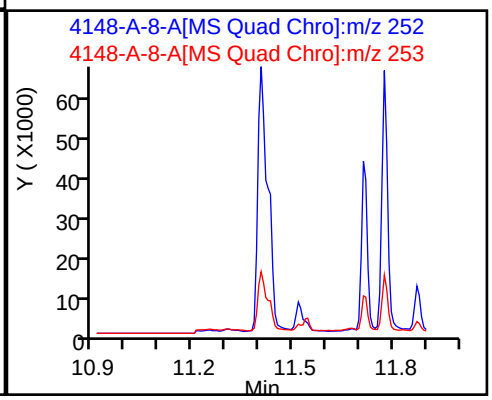












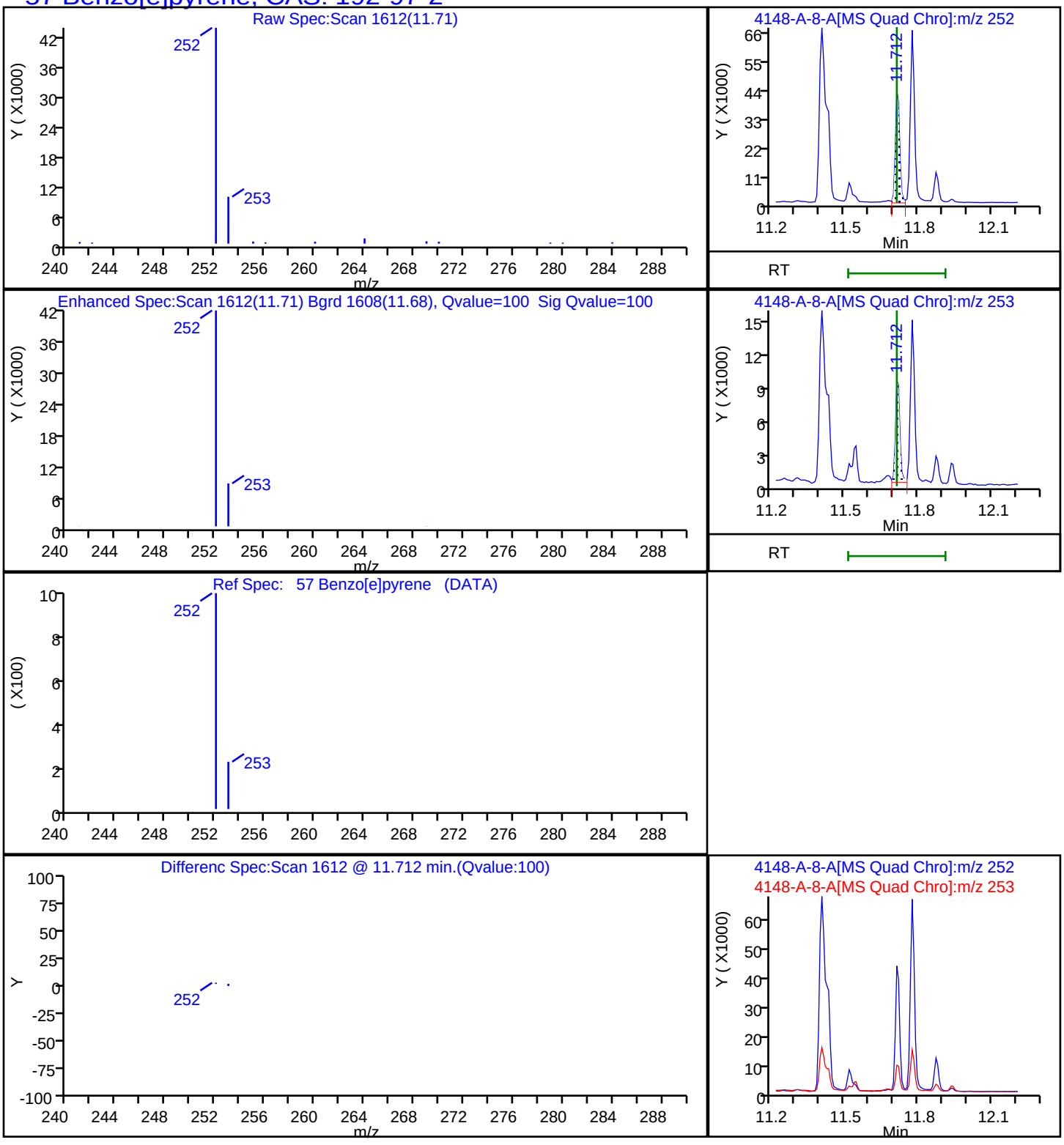
Report Date: 22-Nov-2023 14:15:30 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-8-A.D

Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11		
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

57 Benzo[e]pyrene, CAS: 192-97-2



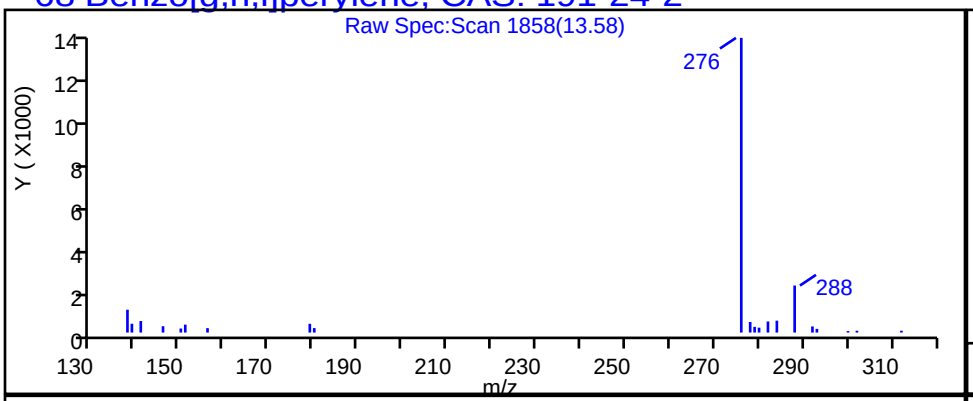
Report Date: 22-Nov-2023 14:15:31 Chrom Revision: 2.3 15-Nov-2023 20:54:34

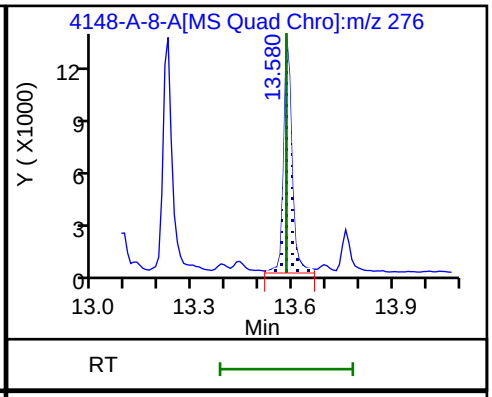
Eurofins Knoxville

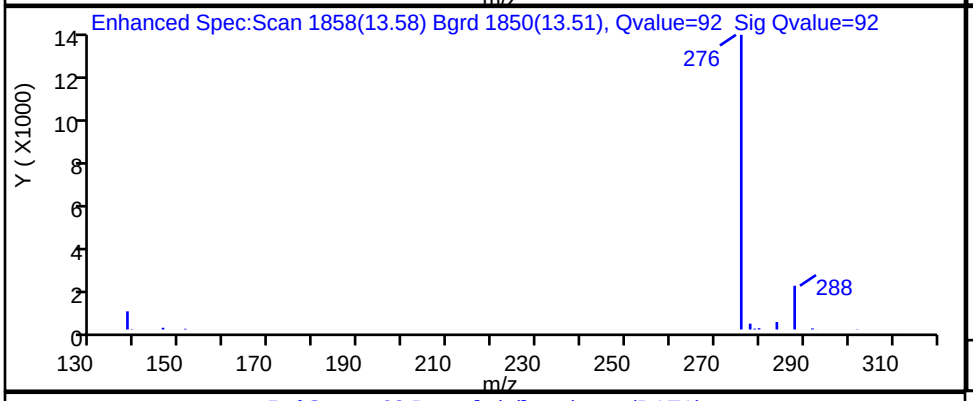
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-8-A.D

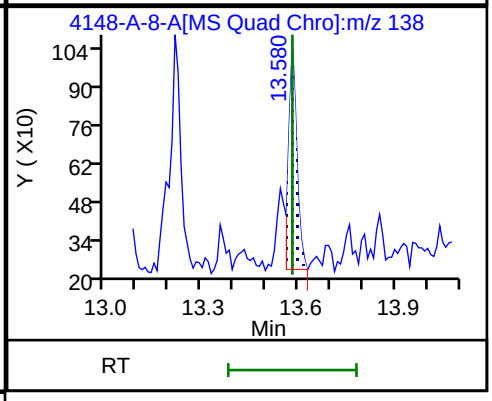
Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11		
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

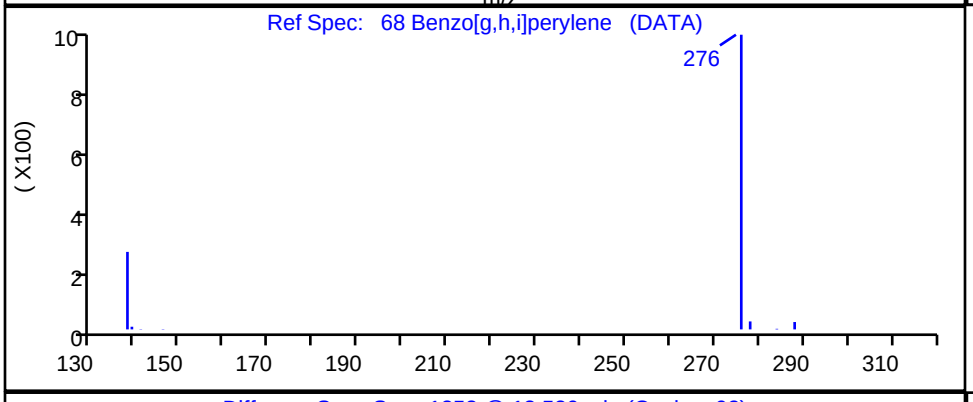
68 Benzo[g,h,i]perylene, CAS: 191-24-2

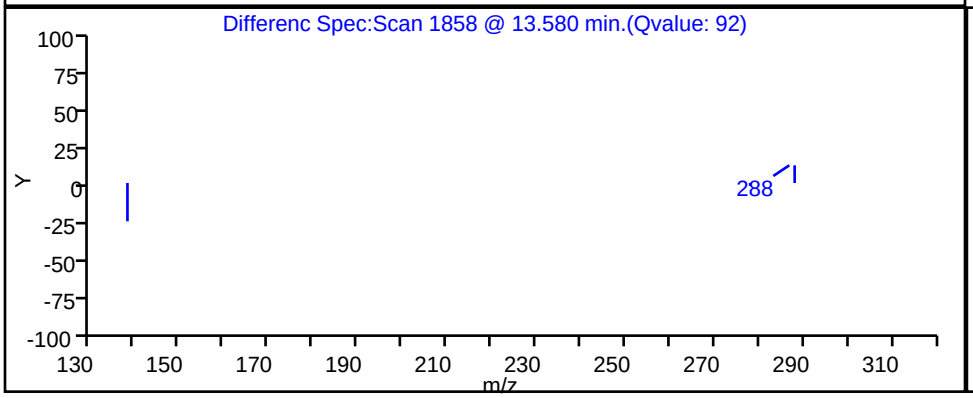


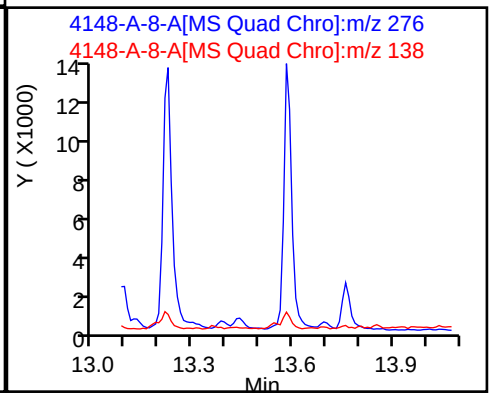












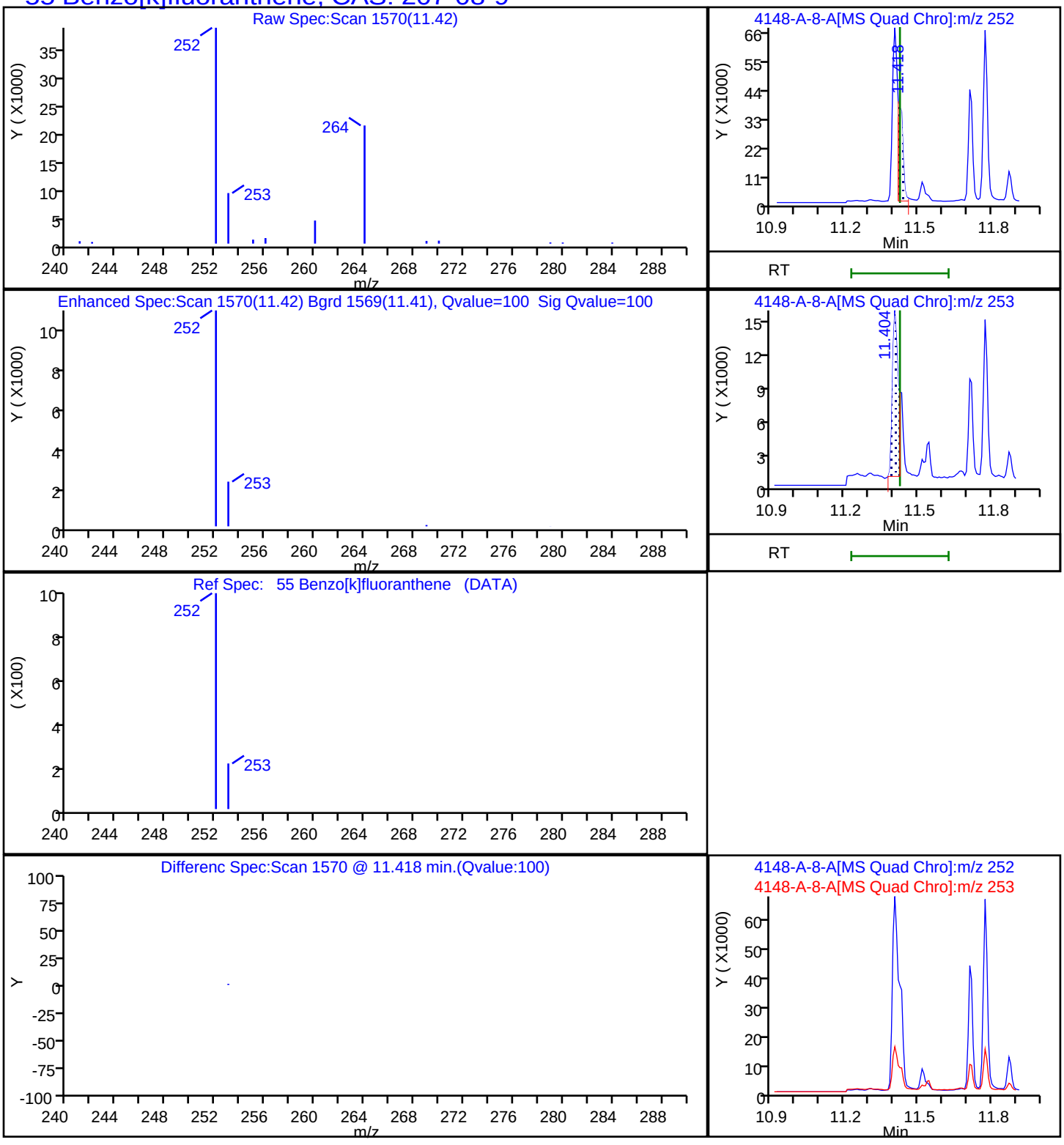
Report Date: 22-Nov-2023 14:15:30 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-8-A.D

Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11		
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

55 Benzo[k]fluoranthene, CAS: 207-08-9



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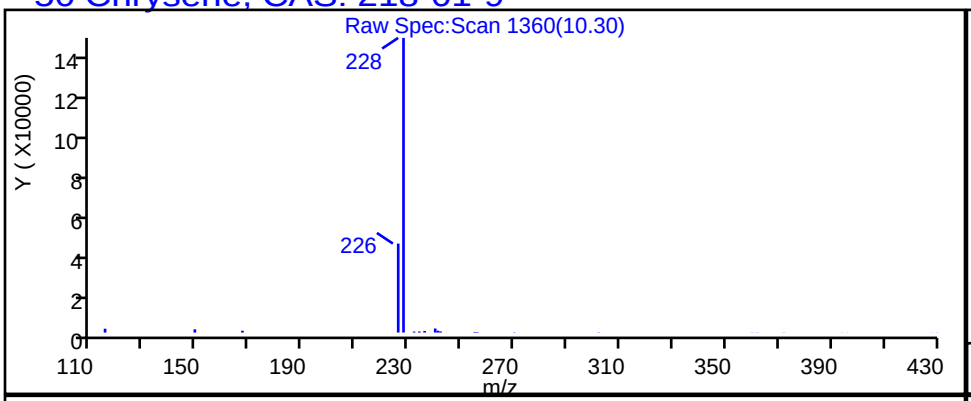
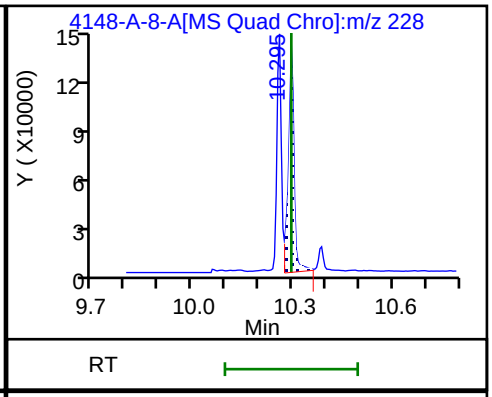
Eurofins Knoxville

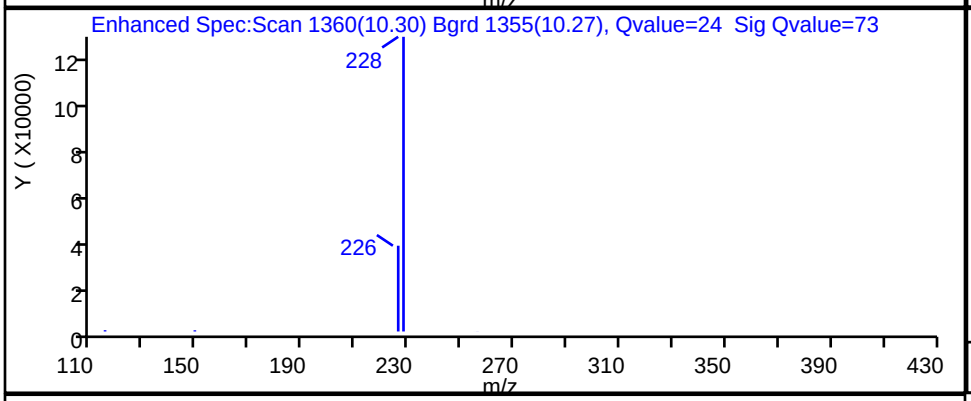
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-8-A.D

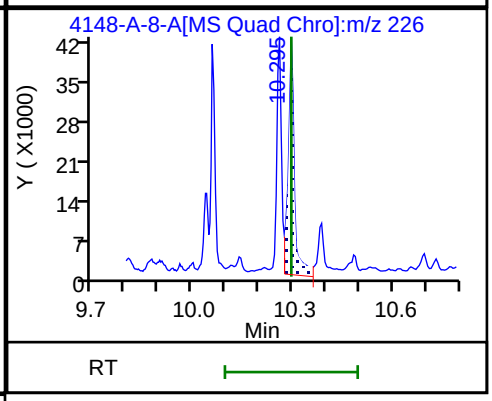
Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11		
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

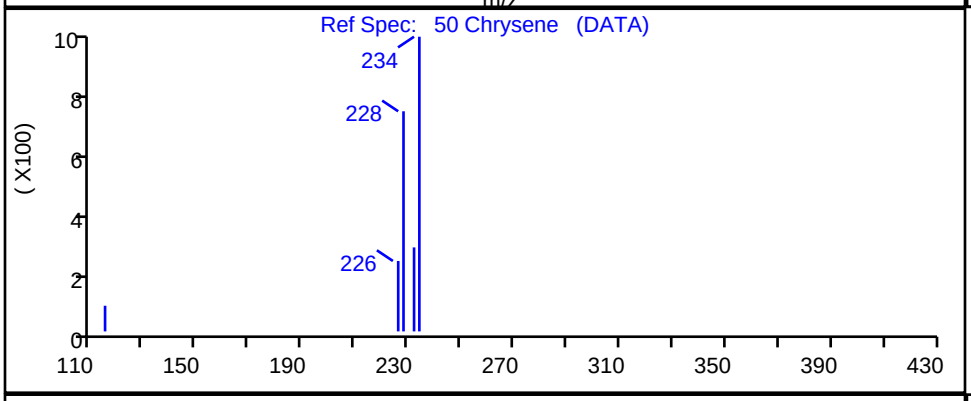
50 Chrysene, CAS: 218-01-9

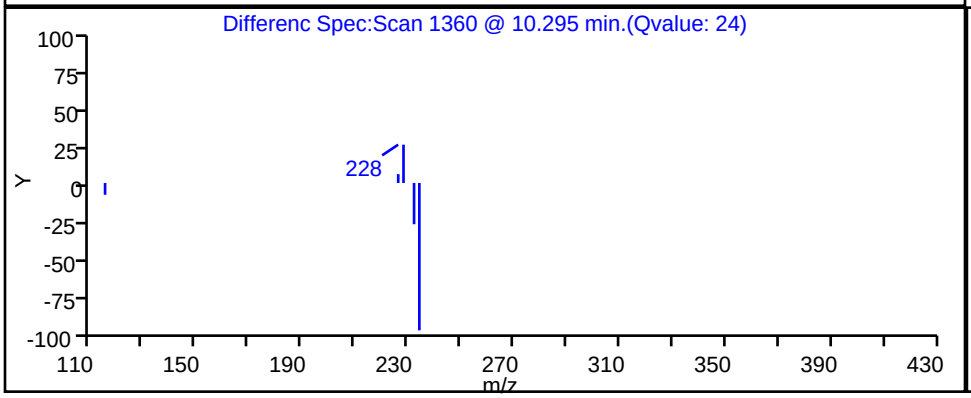


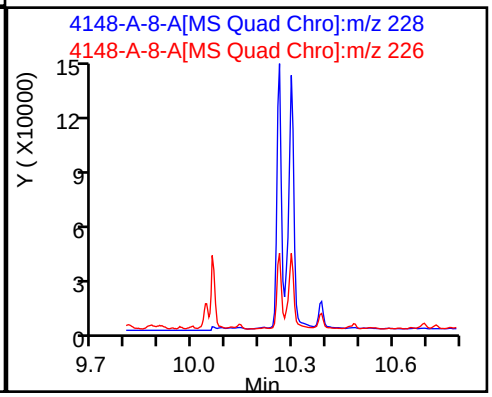










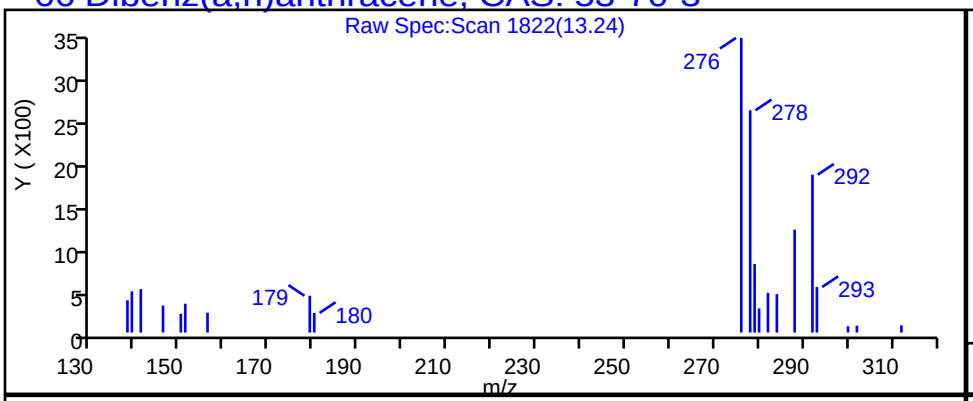


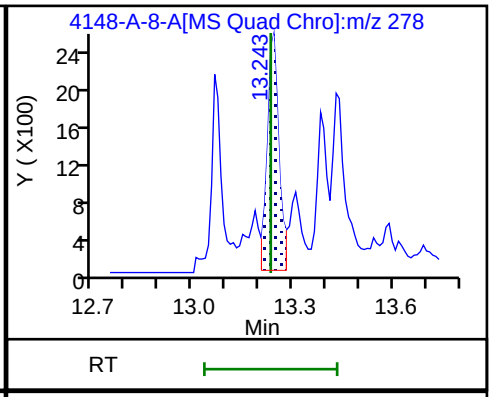
Report Date: 22-Nov-2023 14:15:31 Chrom Revision: 2.3 15-Nov-2023 20:54:34

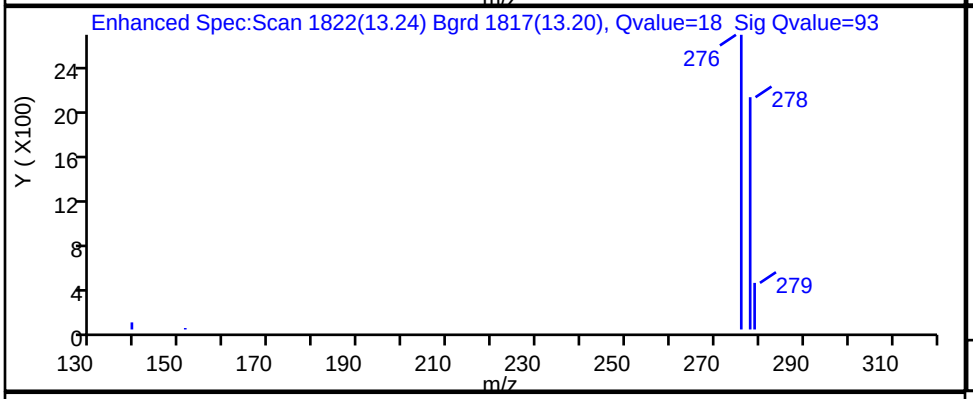
Eurofins Knoxville

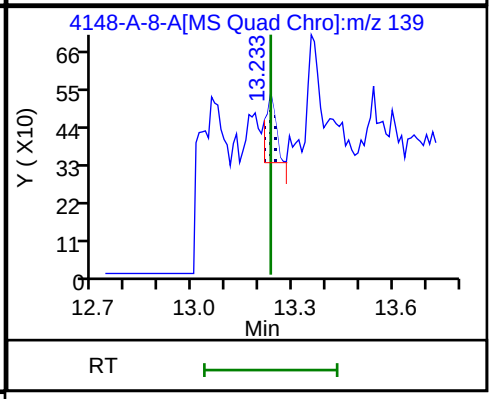
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-8-A.D		
Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11
Client ID:	1804576-844-S3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

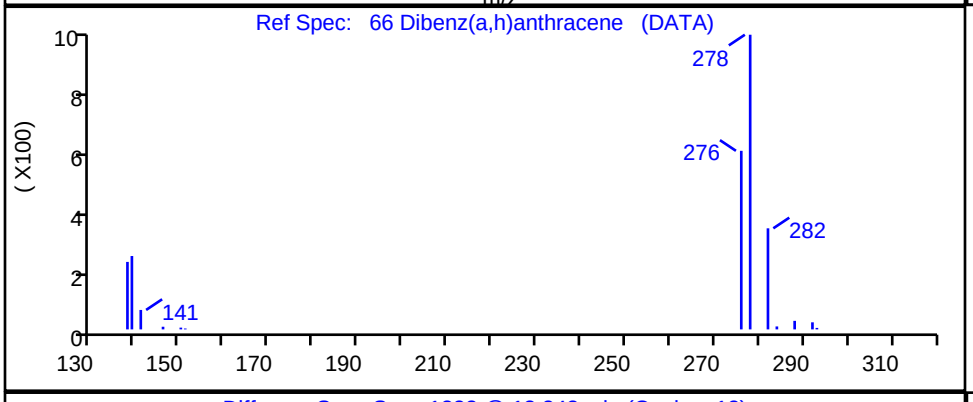
66 Dibenz(a,h)anthracene, CAS: 53-70-3

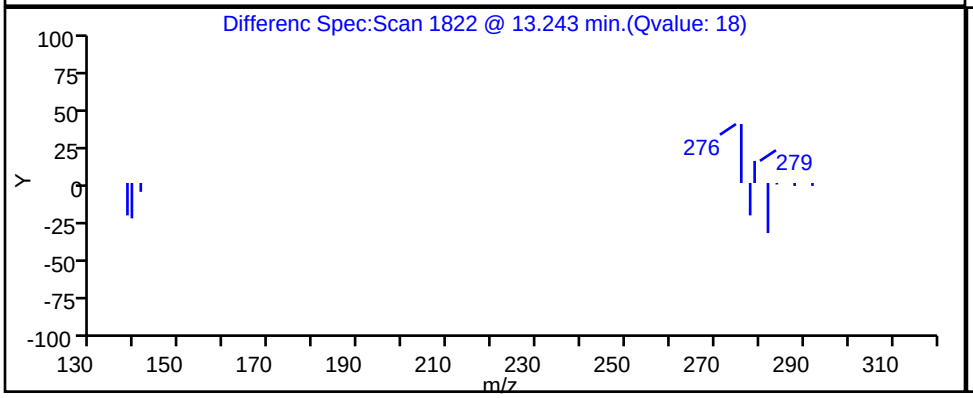


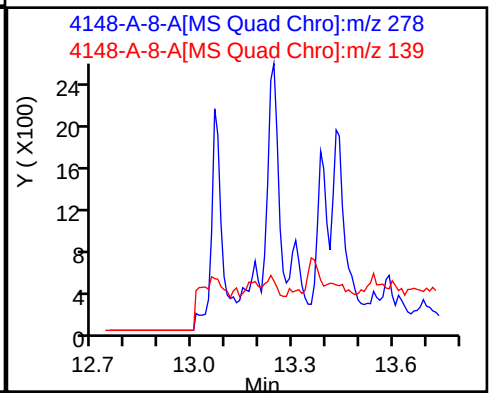












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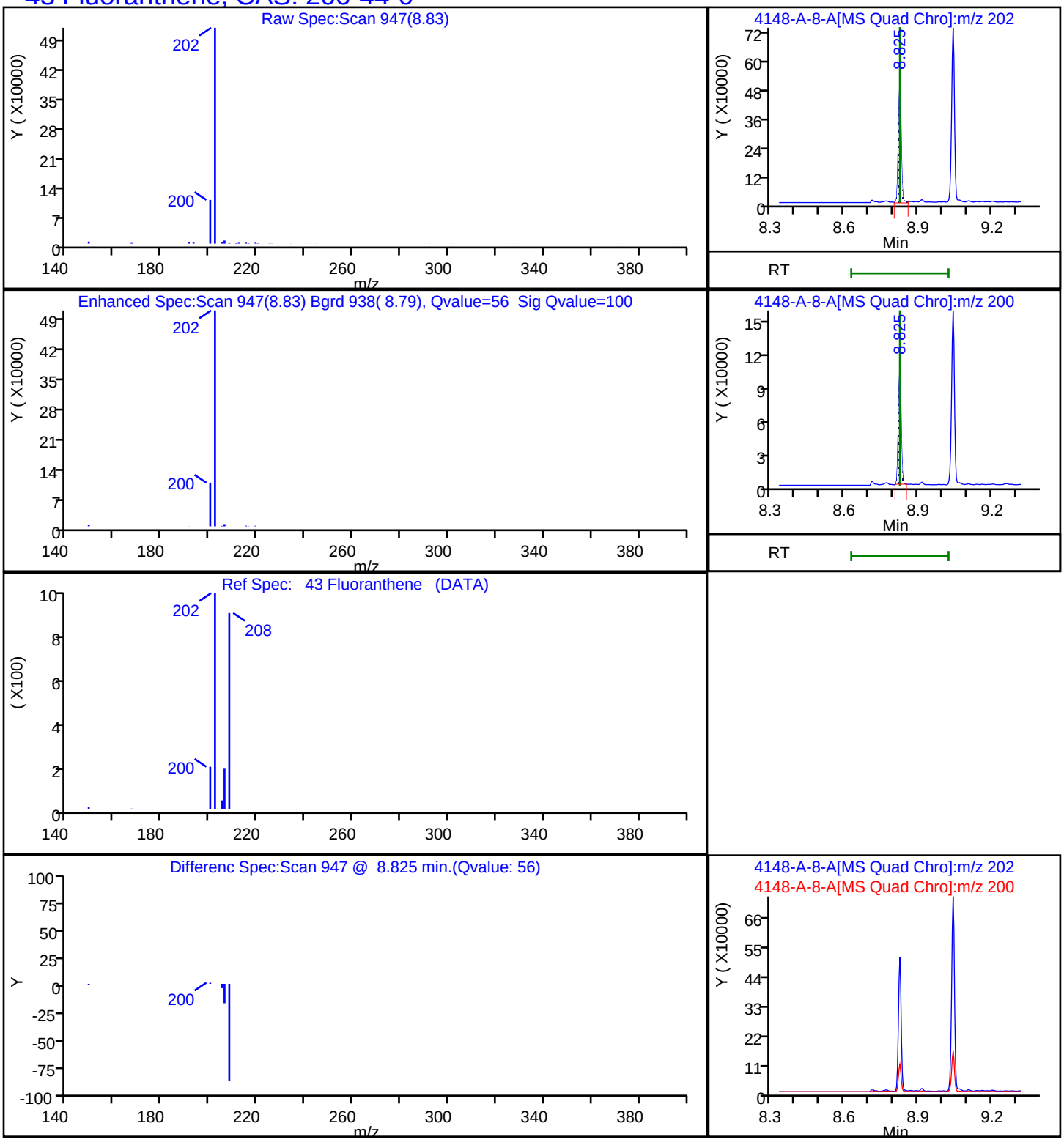
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-8-A.D

Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11		
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

43 Fluoranthene, CAS: 206-44-0



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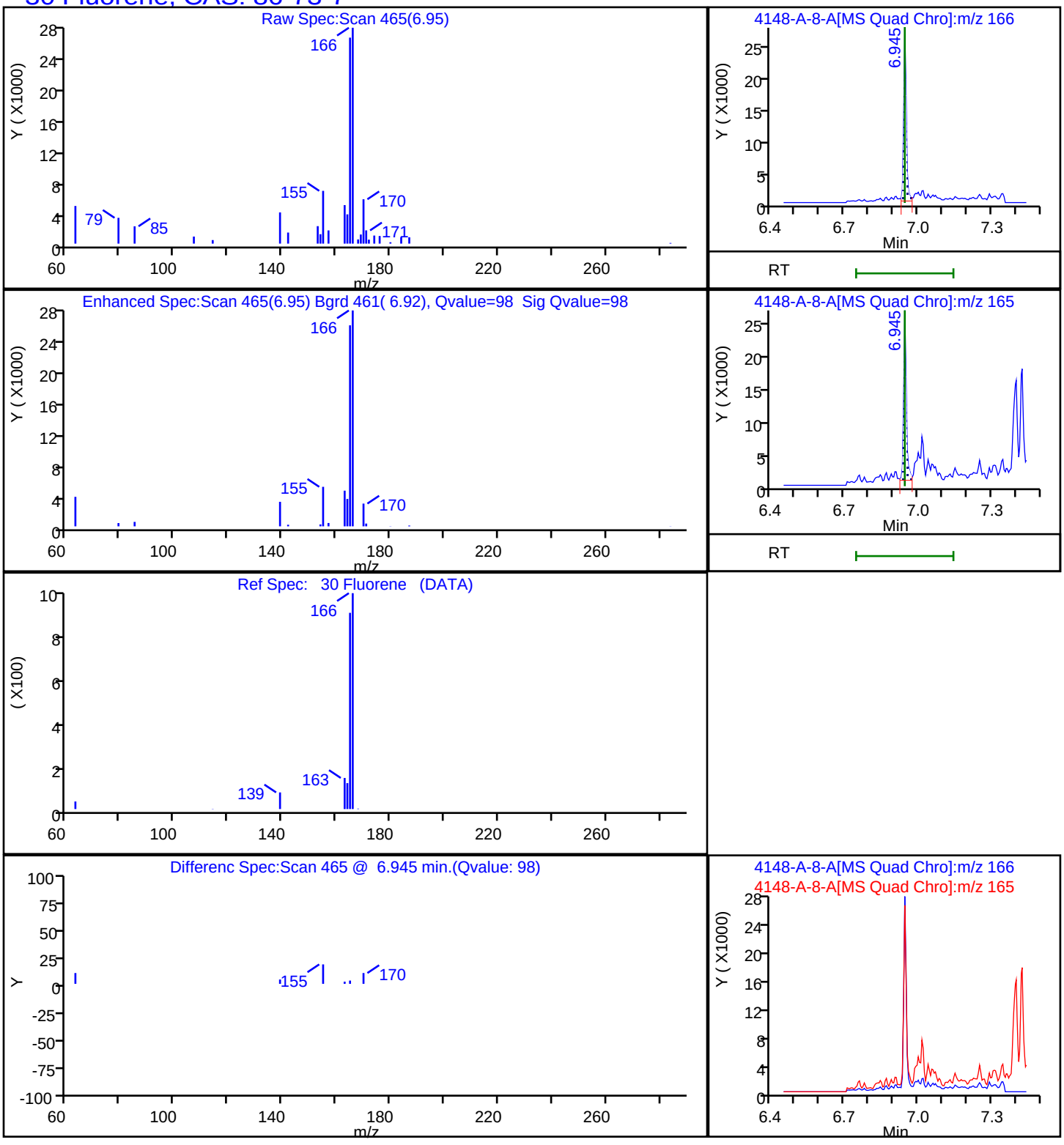
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-8-A.D

Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11
Client ID:	1804576-844-S3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

30 Fluorene, CAS: 86-73-7



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Eurofins Knoxville

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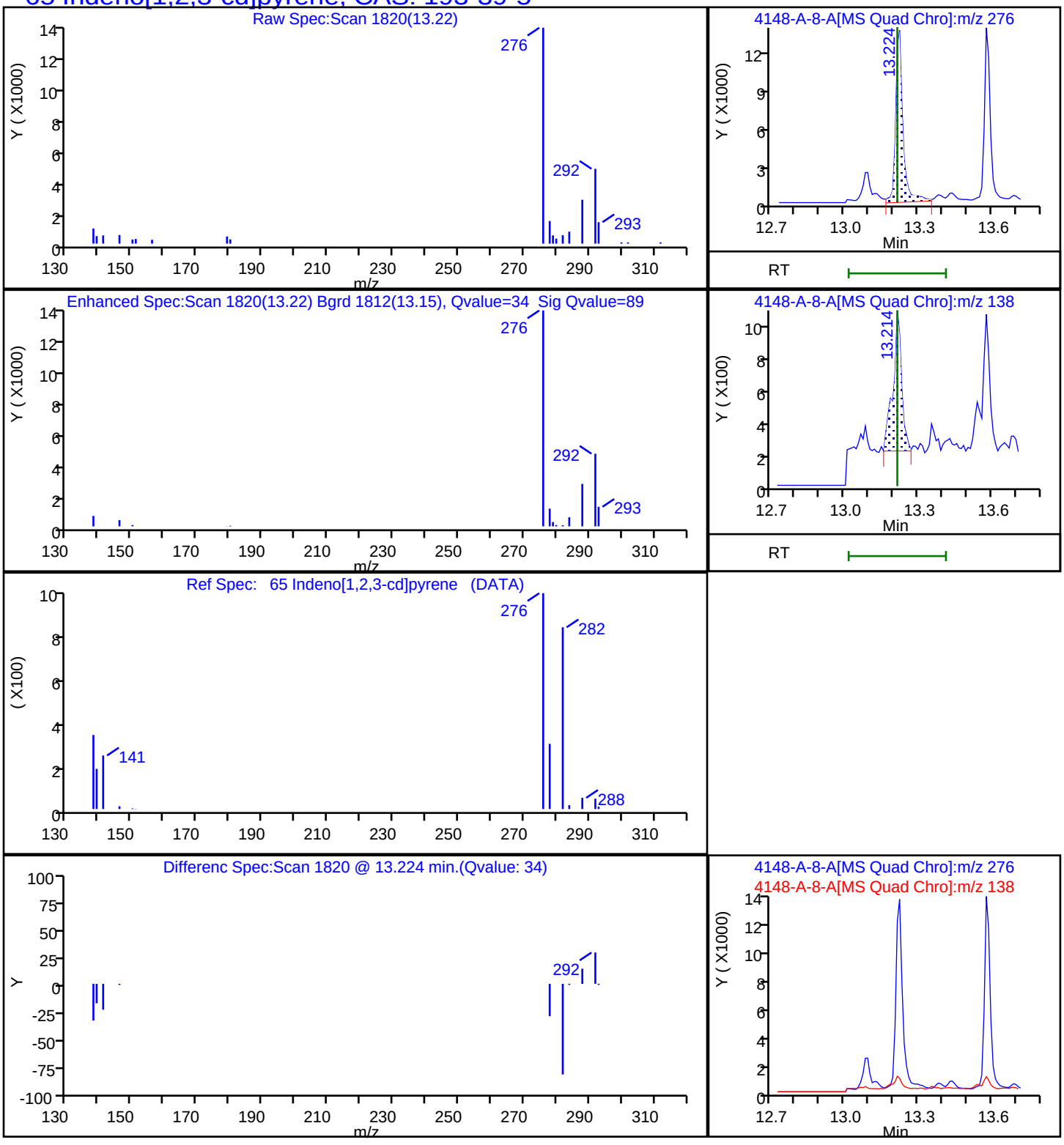
Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11		
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

65 Indeno[1,2,3-cd]pyrene, CAS: 193-39-5



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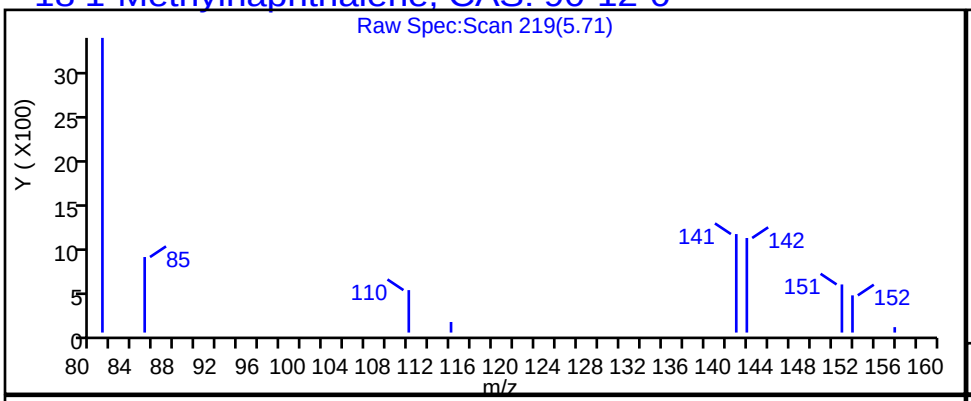
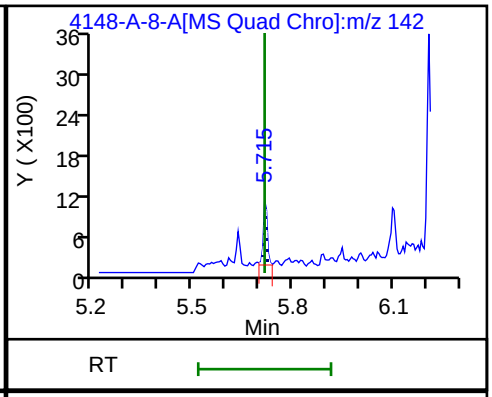
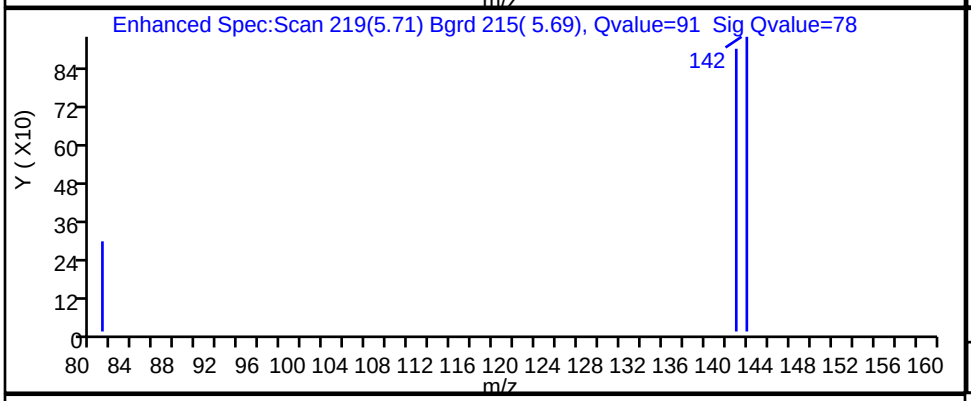
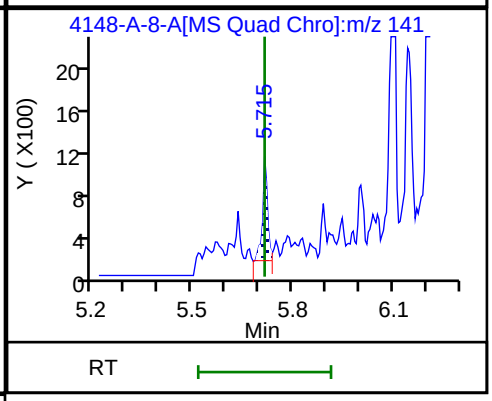
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-8-A.D				
Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11		
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

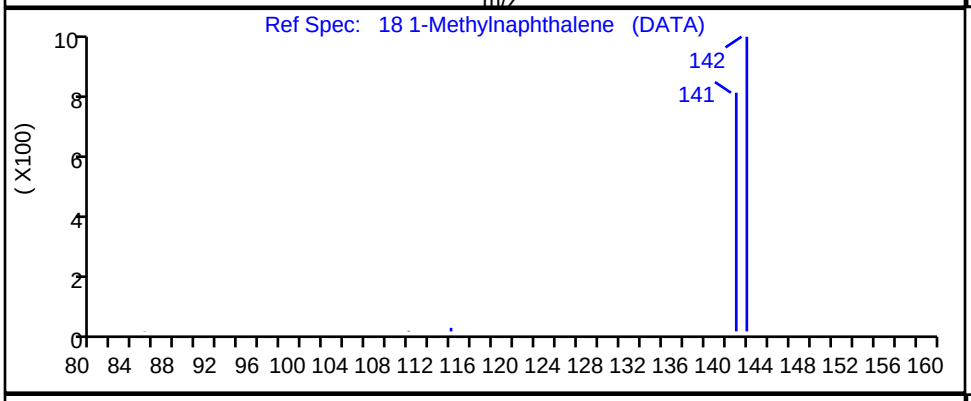
18 1-Methylnaphthalene, CAS: 90-12-0

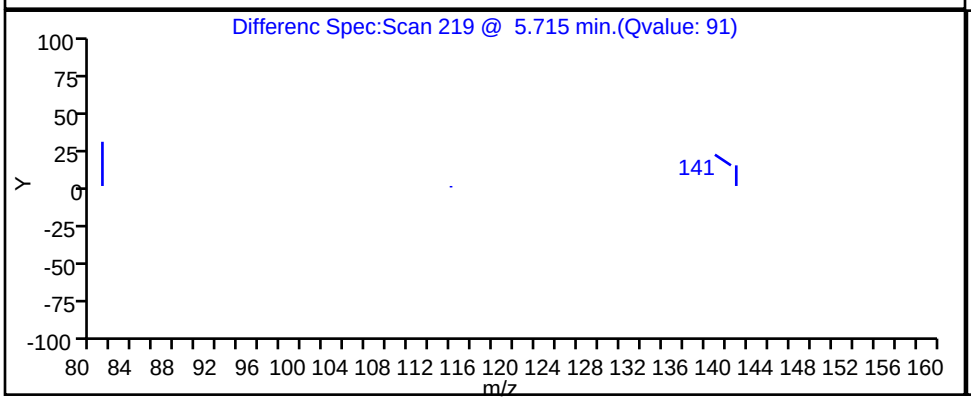


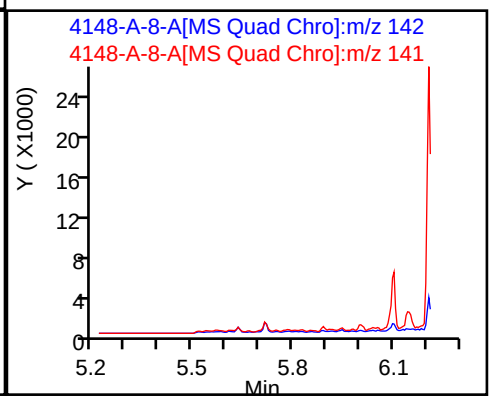












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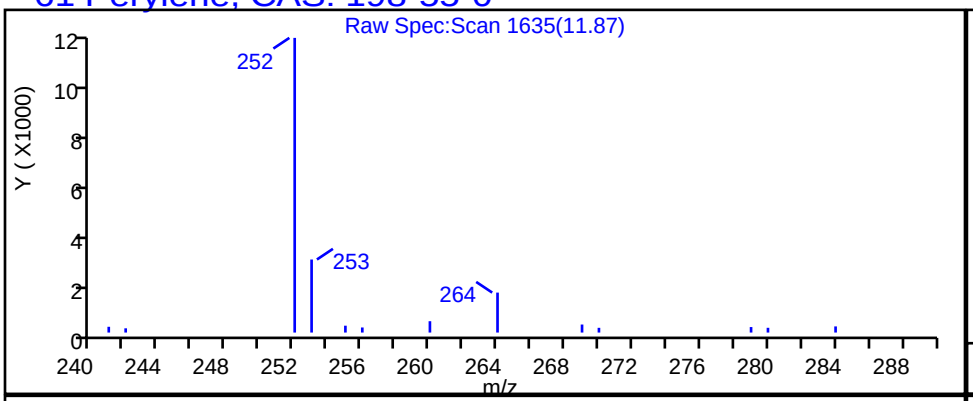
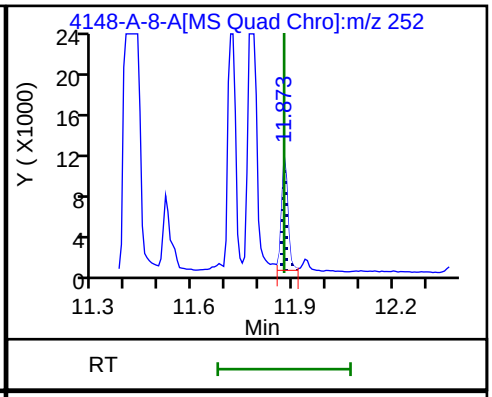
Eurofins Knoxville

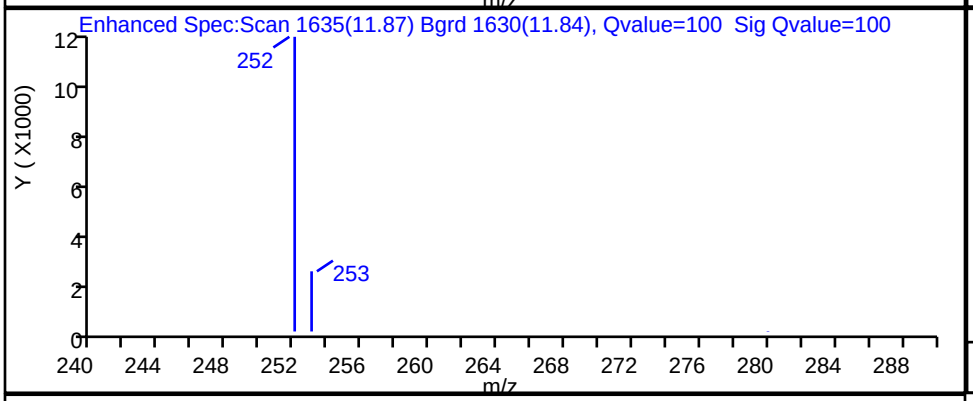
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-8-A.D

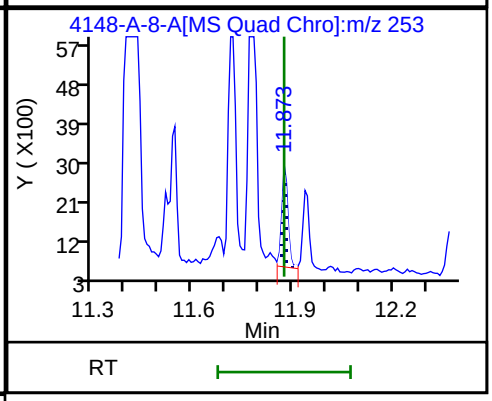
Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11
Client ID:	1804576-844-S3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

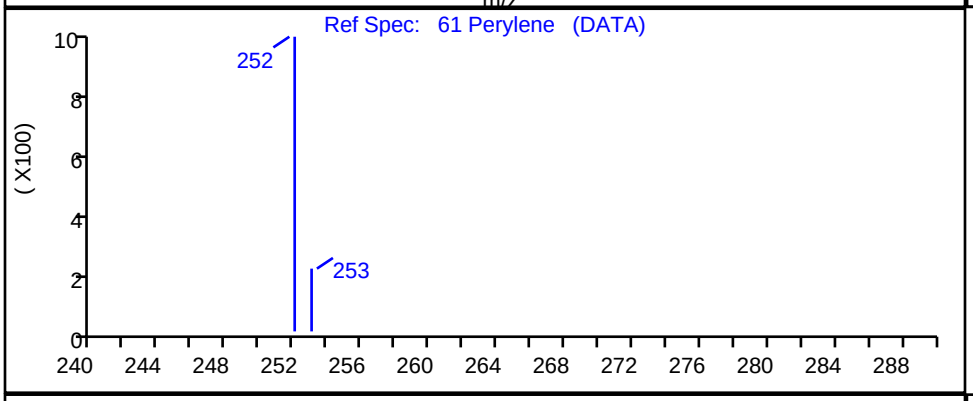
61 Perylene, CAS: 198-55-0

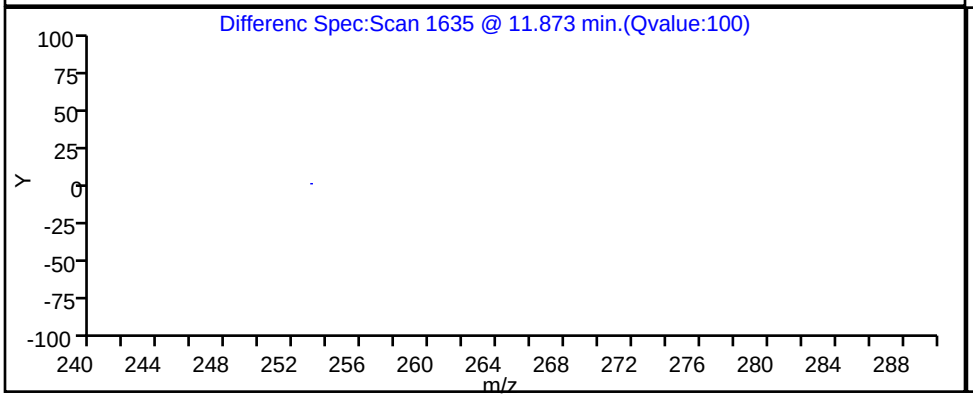


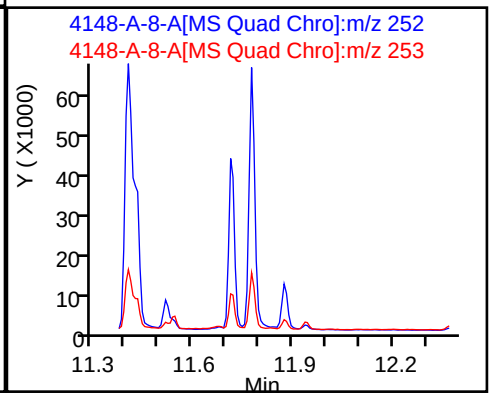












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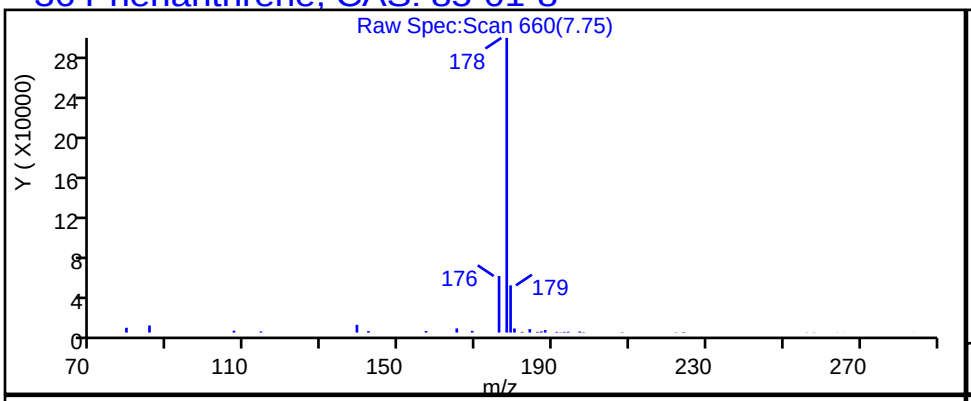
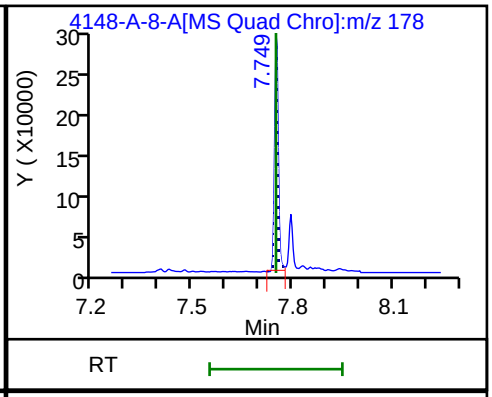
Eurofins Knoxville

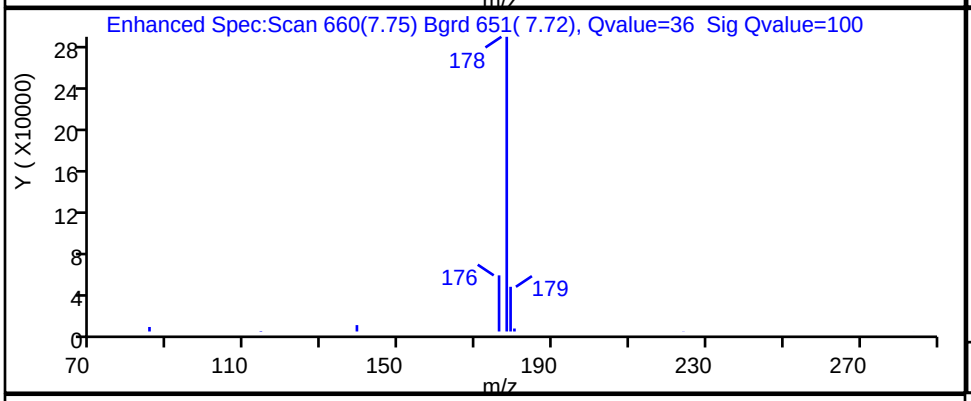
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-8-A.D

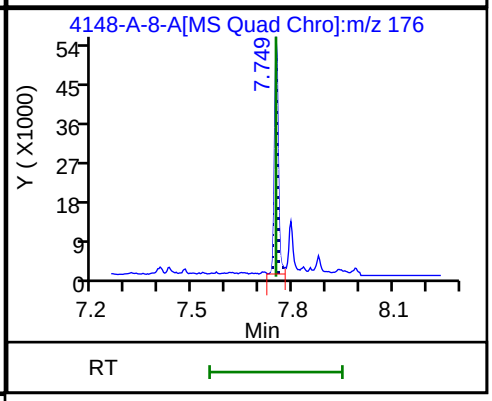
Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11
Client ID:	1804576-844-S3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

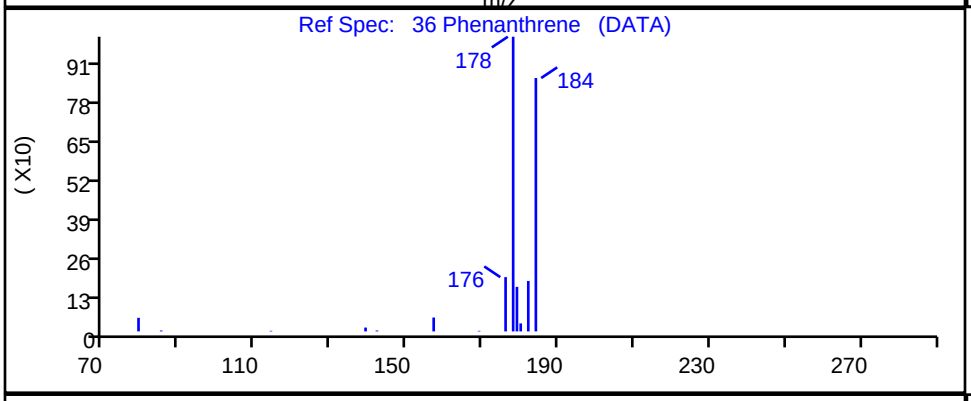
36 Phenanthrene, CAS: 85-01-8

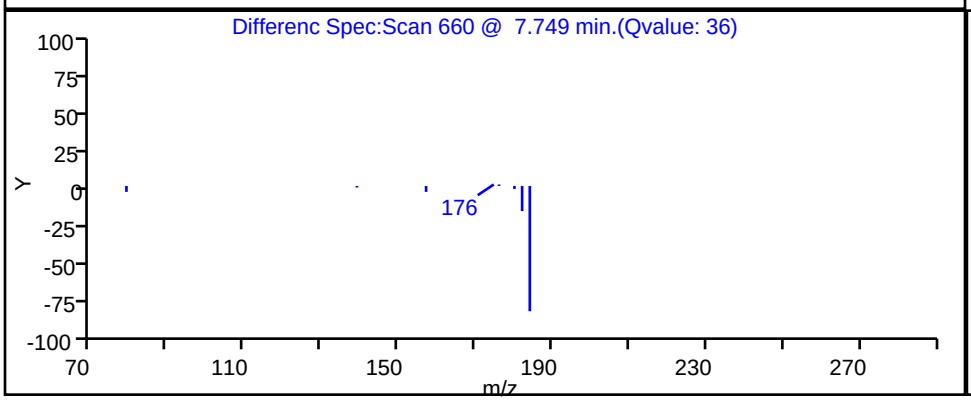


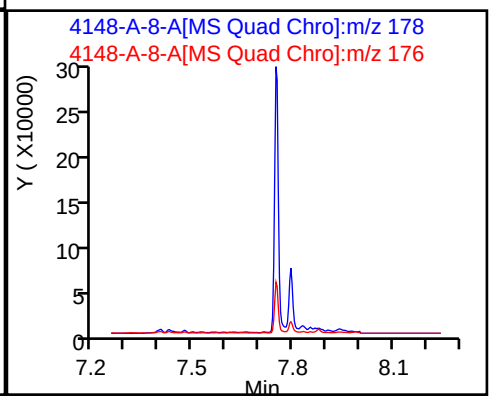












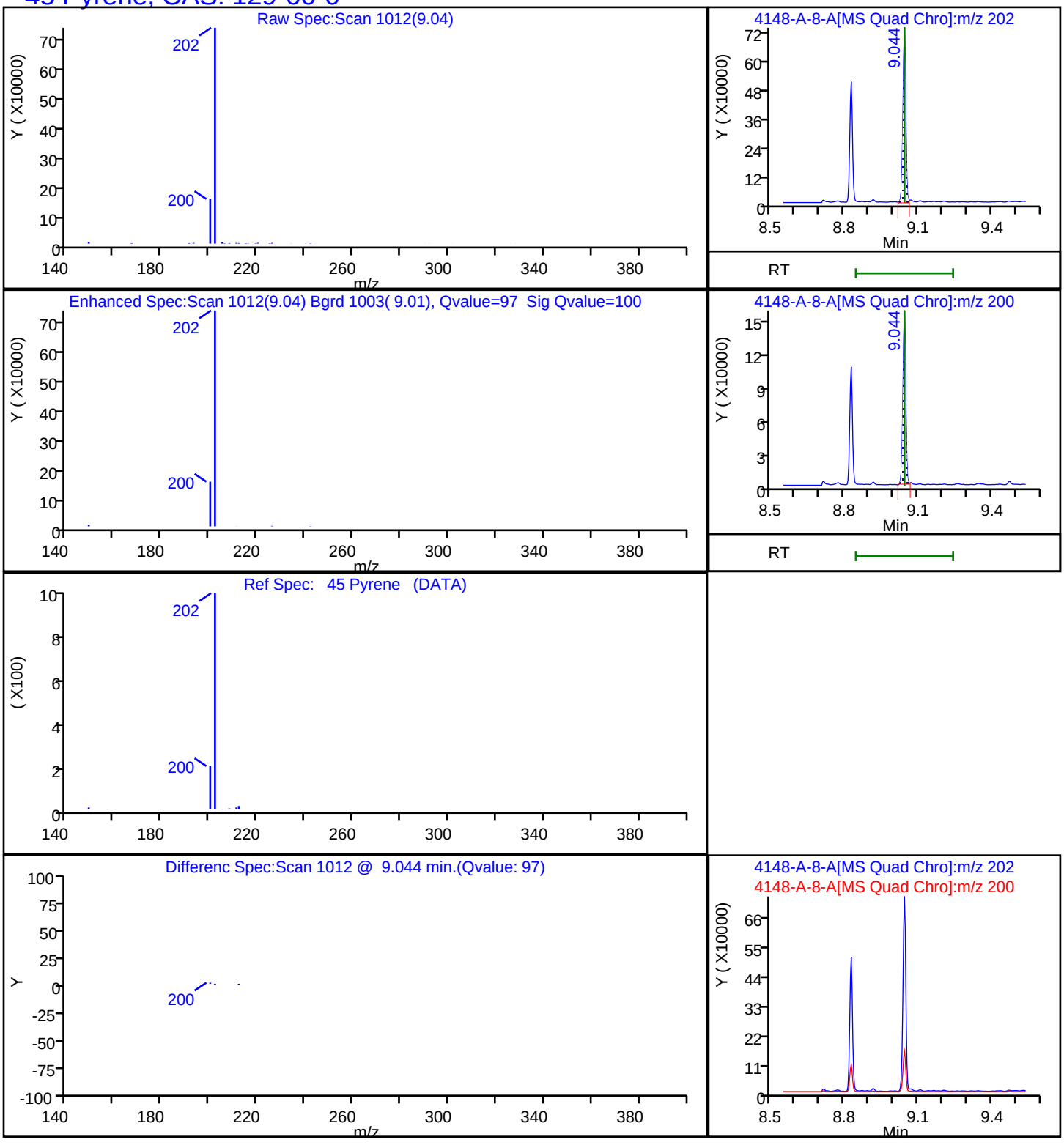
Report Date: 22-Nov-2023 14:15:30 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-8-A.D

Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11
Client ID:	1804576-844-S3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

45 Pyrene, CAS: 129-00-0



Report Date: 22-Nov-2023 14:15:31 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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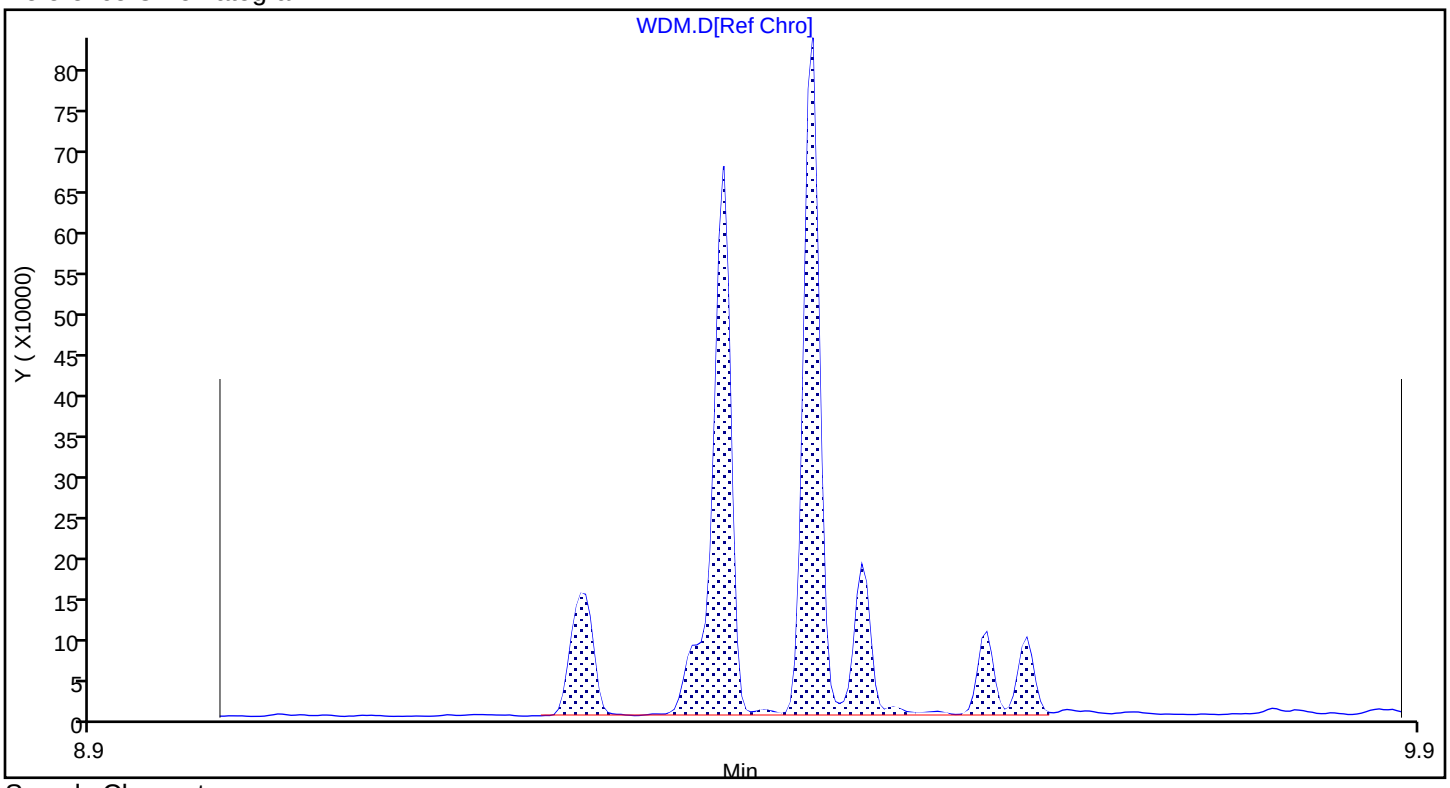
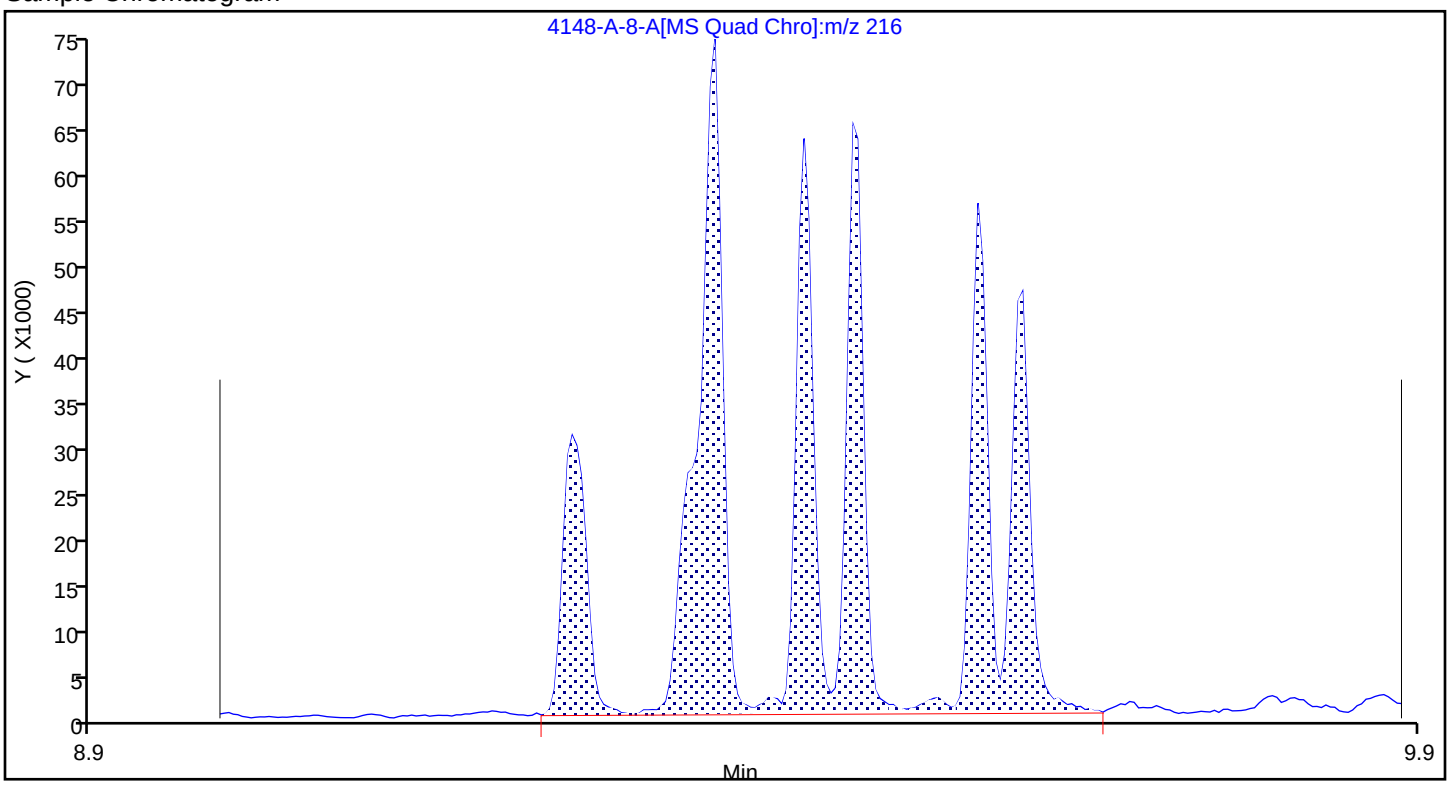
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11		
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 100 C1-Fluoranthenes/pyrene, CAS: STL00912

Reference Chromatogram



Sample Chromatogram



Report Date: 22-Nov-2023 14:15:31 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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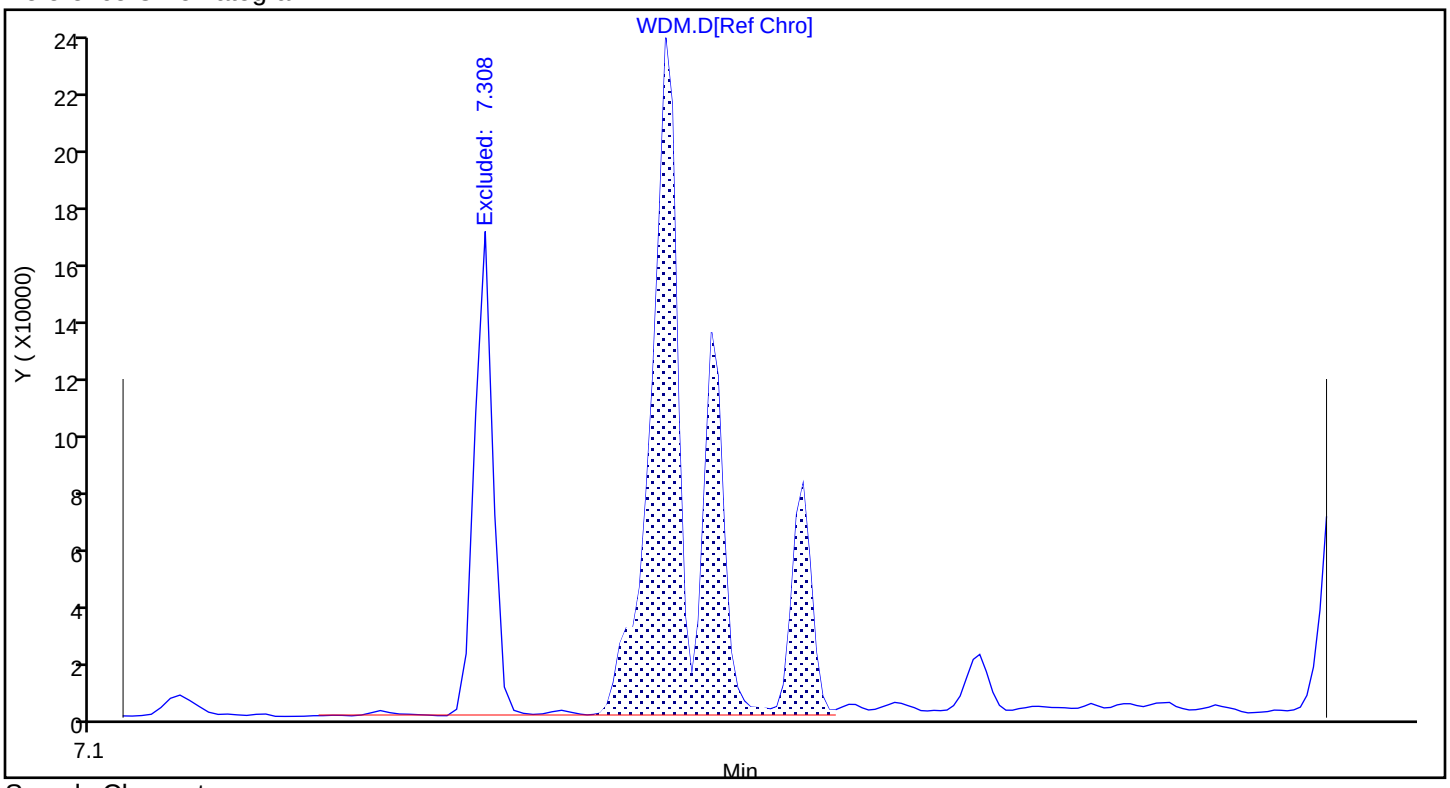
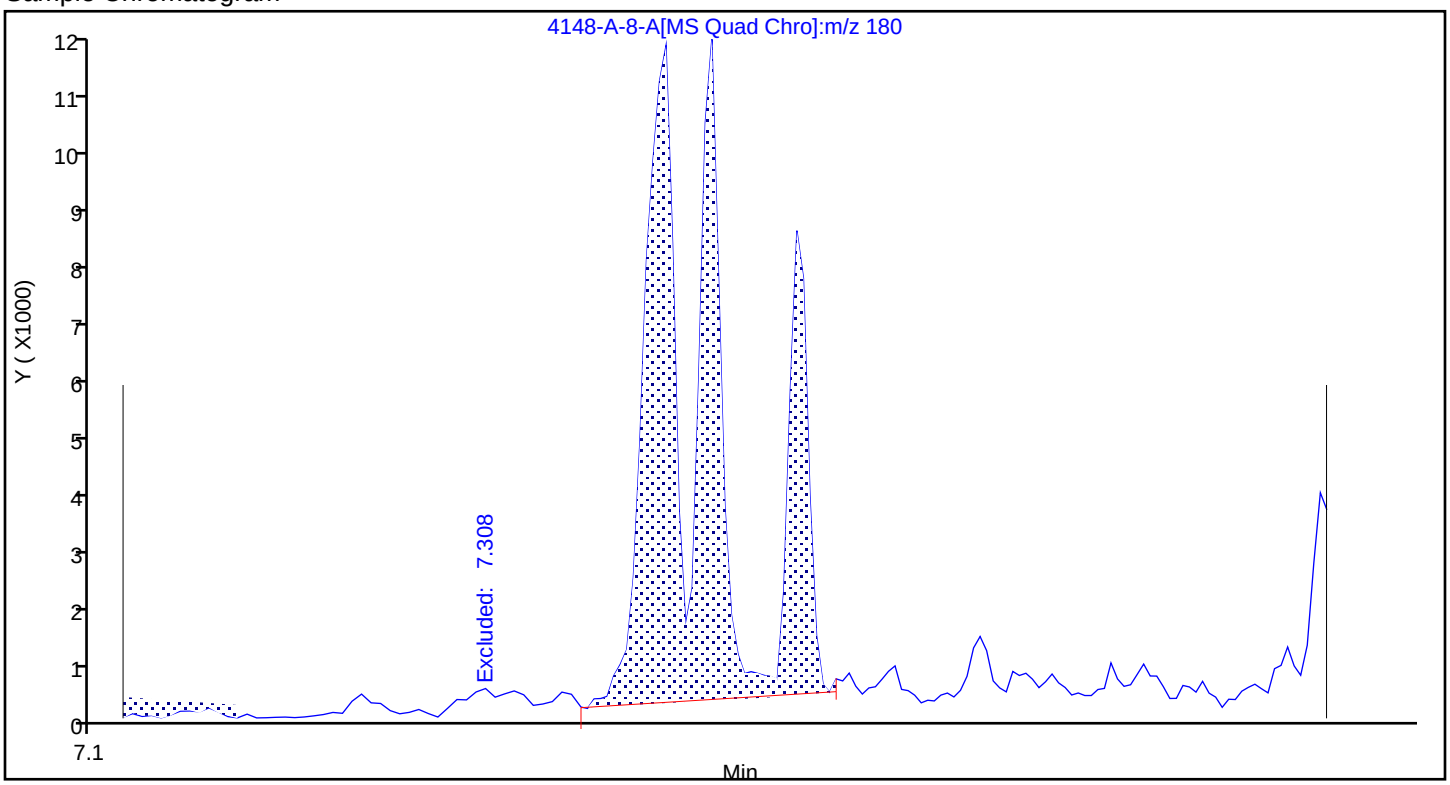
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11		
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 89 C1-Fluorenes, CAS: STL00913

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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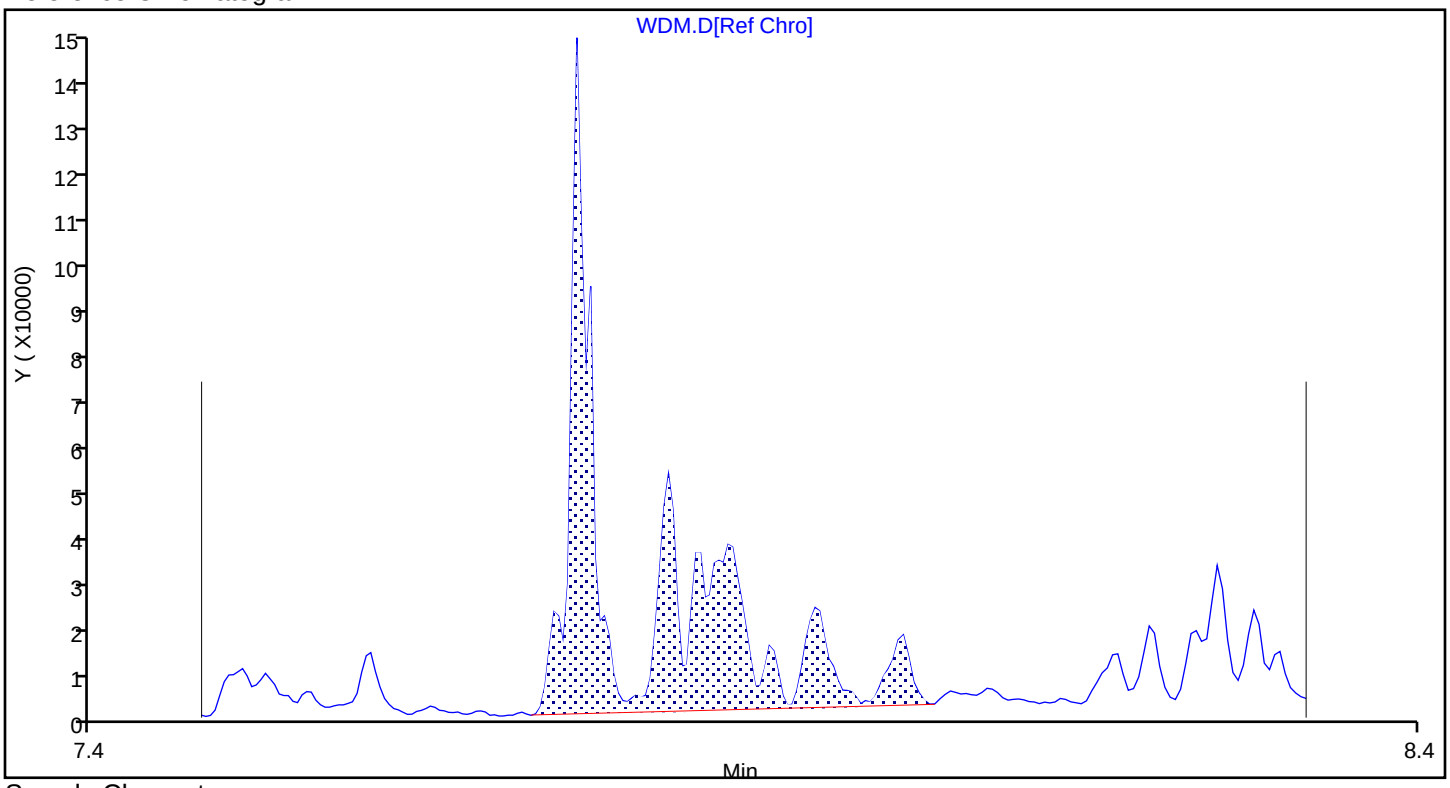
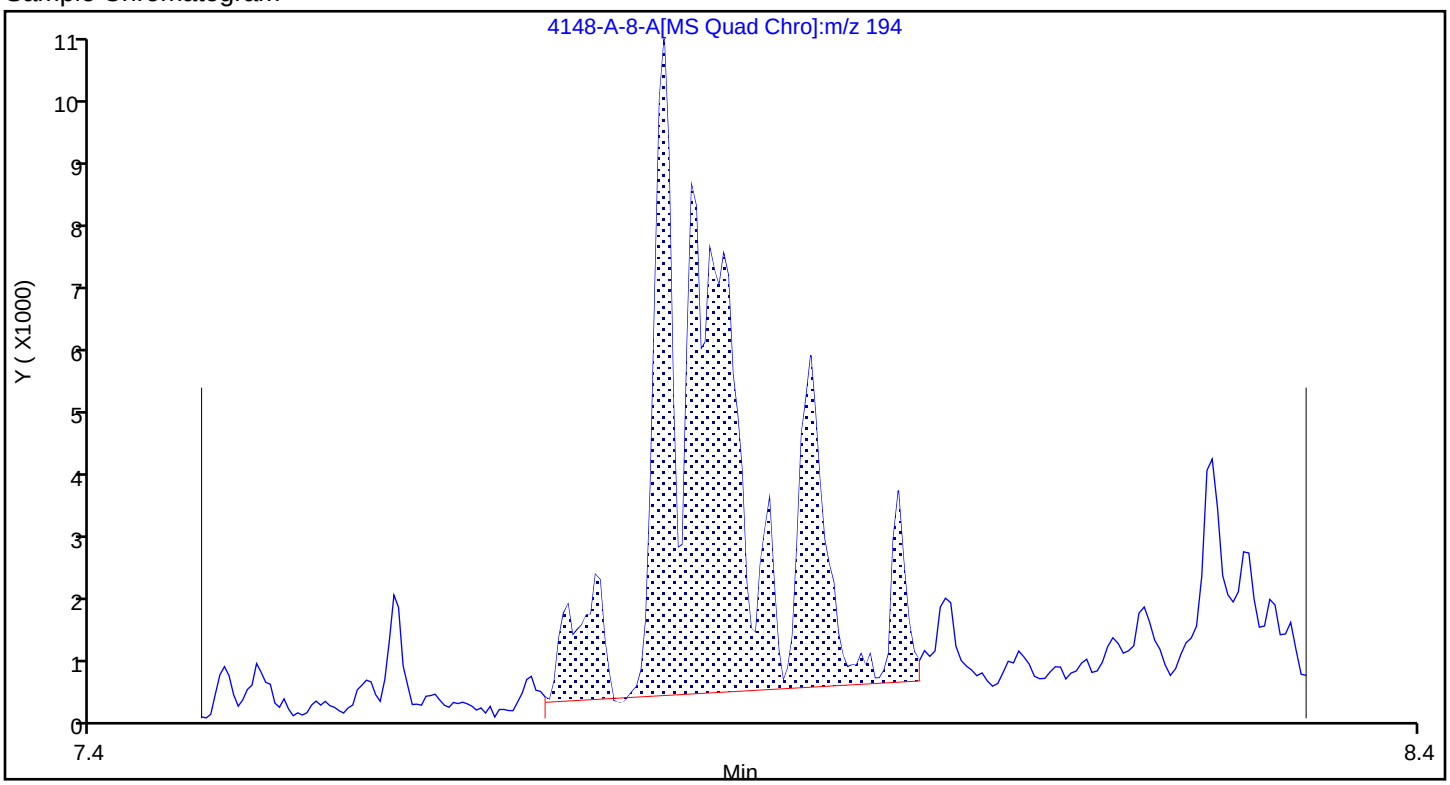
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11		
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 90 C2-Fluorenes, CAS: STL00914

Reference Chromatogram



Sample Chromatogram



Report Date: 22-Nov-2023 14:15:31 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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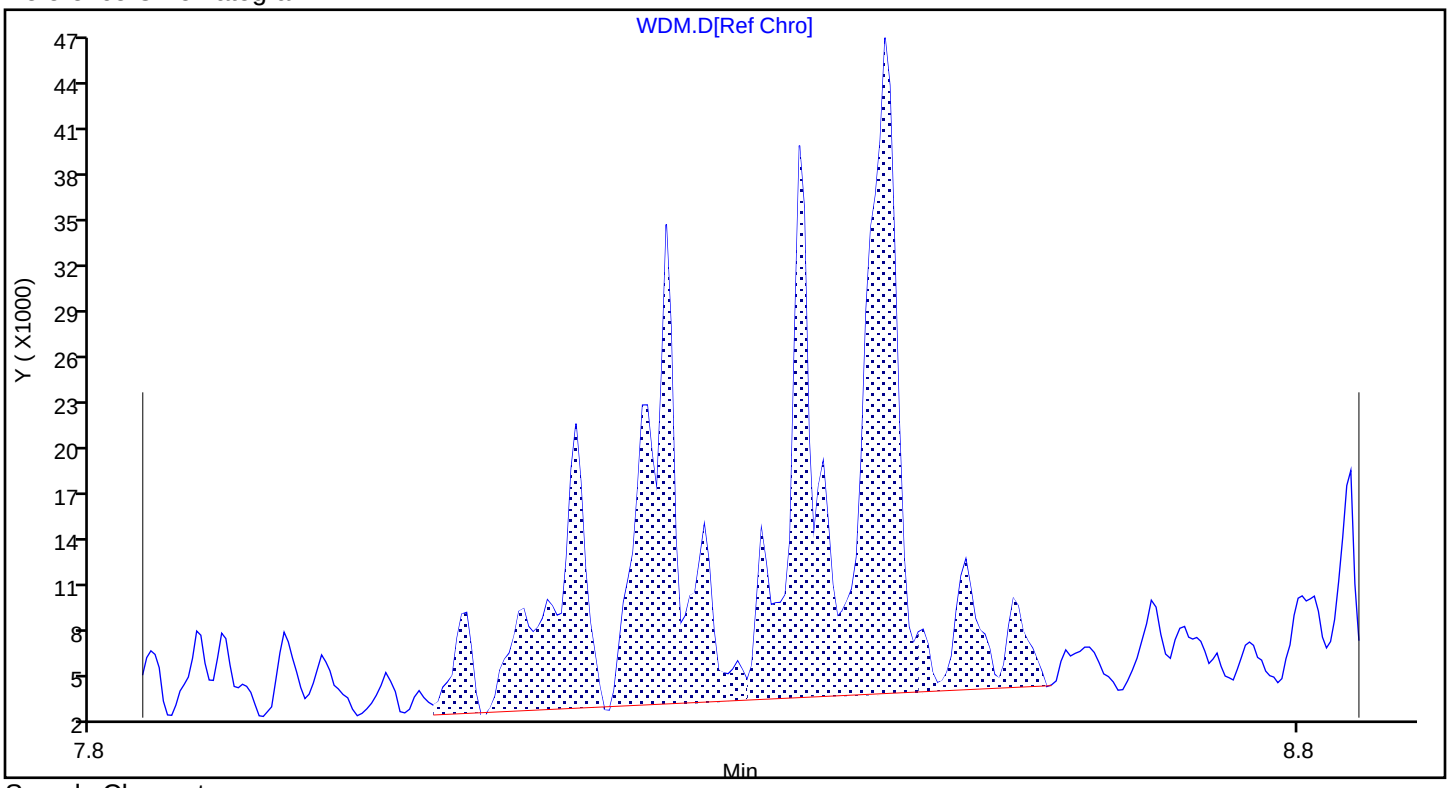
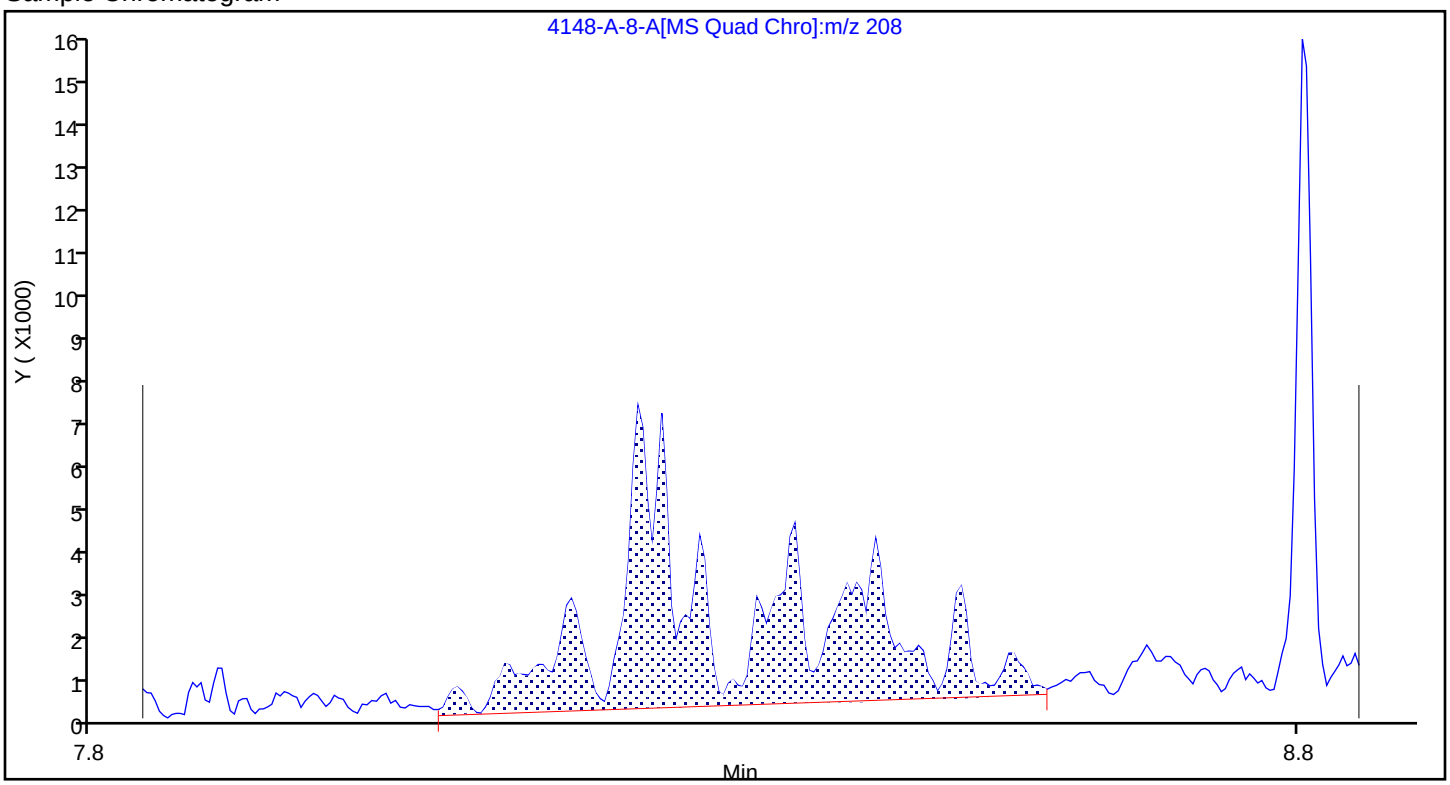
Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11		
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 91 C3-Fluorenes, CAS: STL00915

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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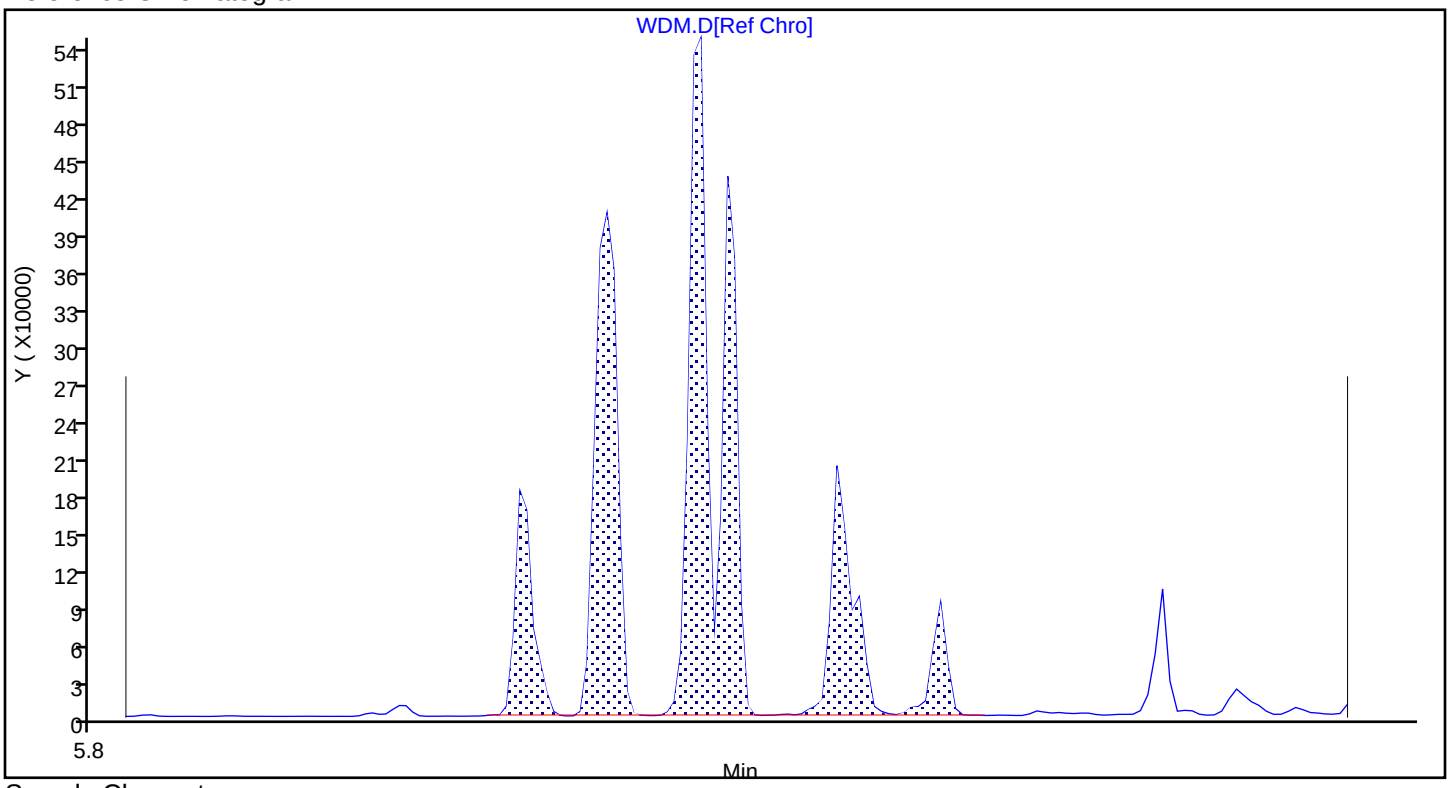
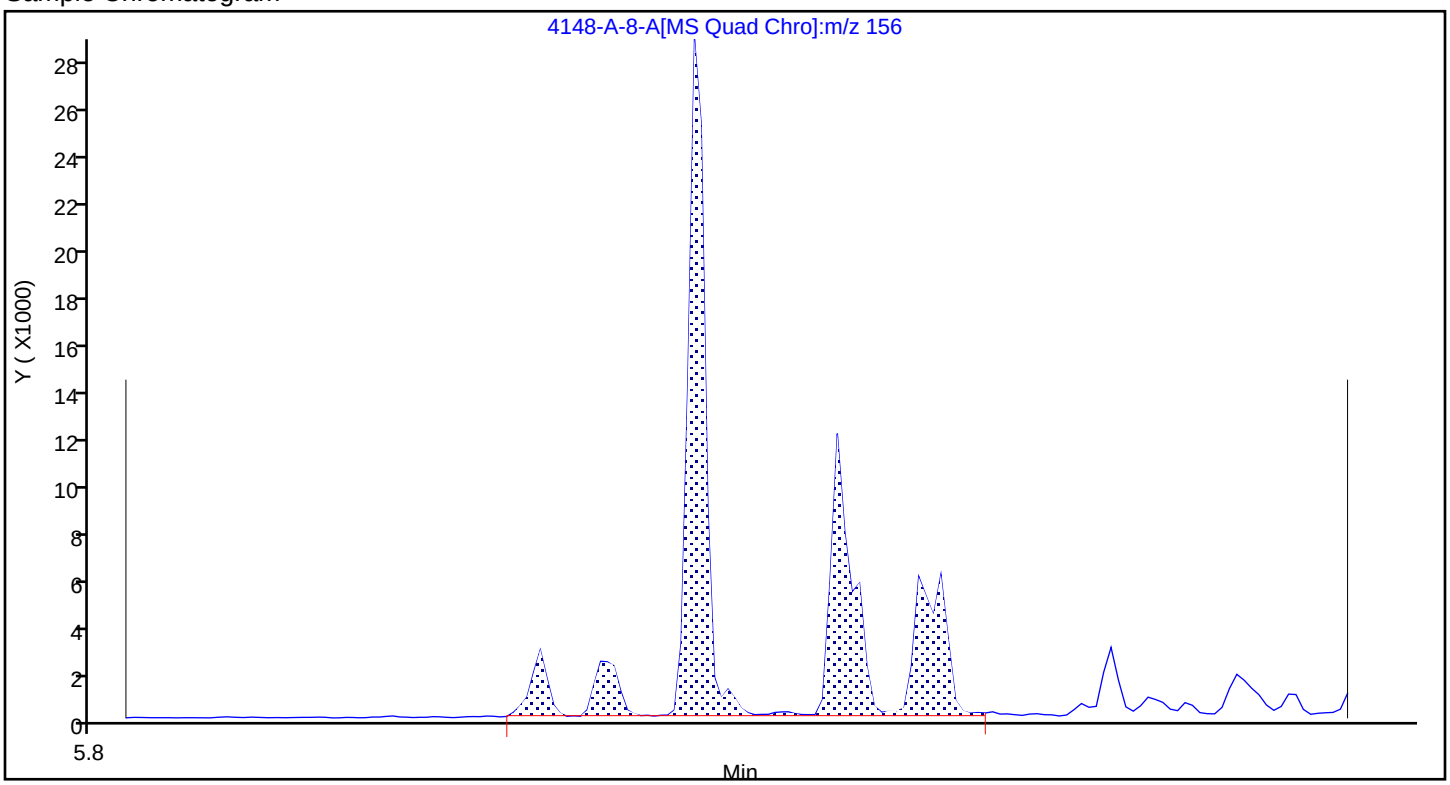
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 86 C2-Naphthalenes, CAS: STL00917

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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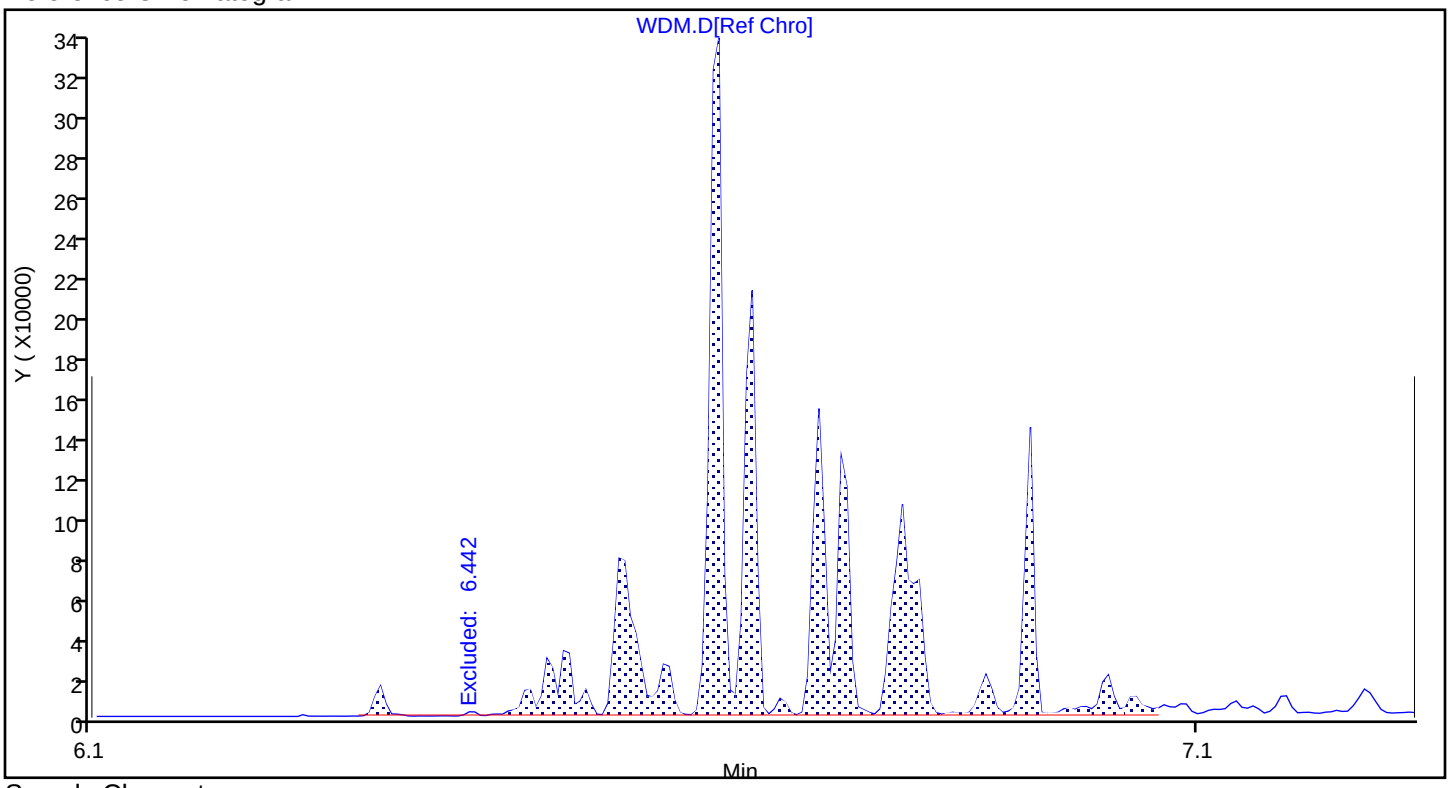
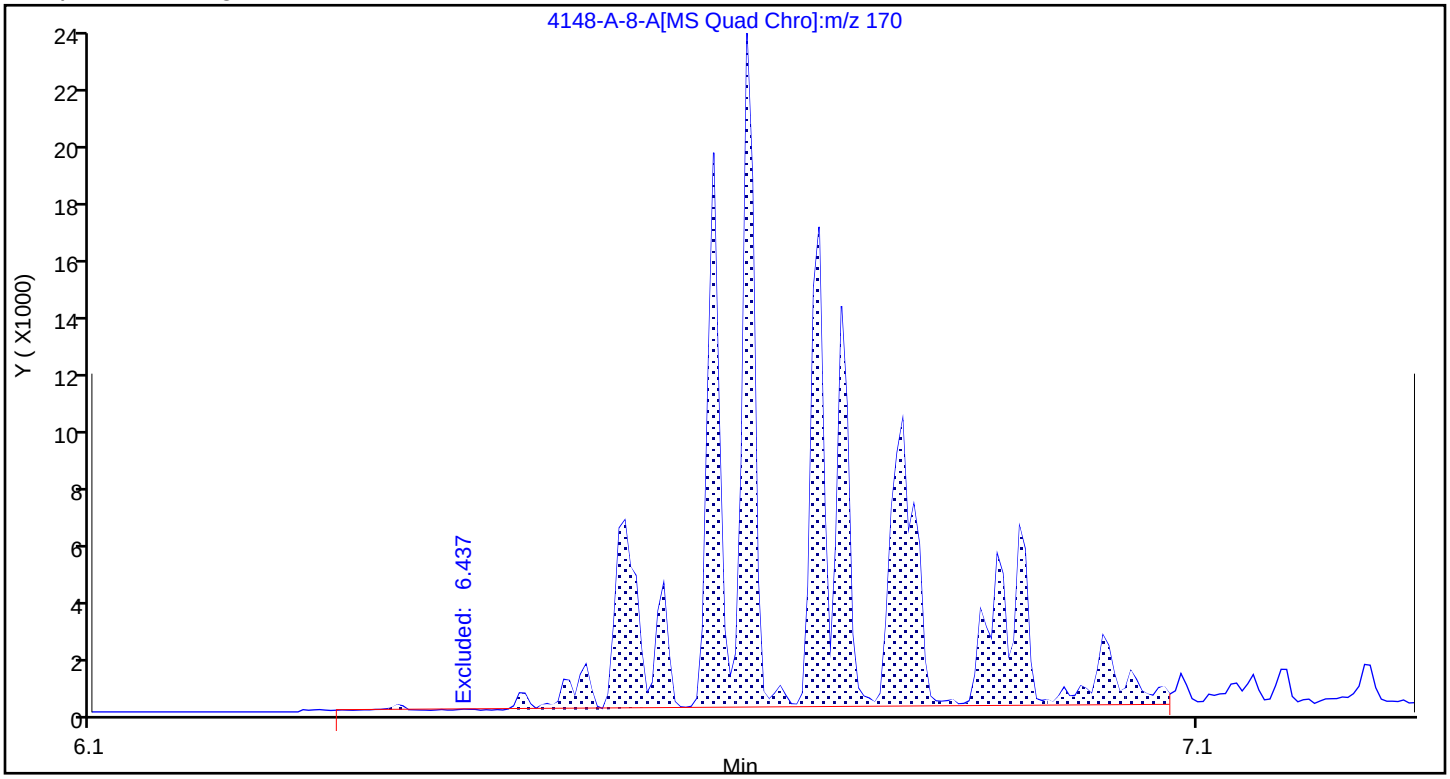
Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11		
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 87 C3-Naphthalenes, CAS: STL00918

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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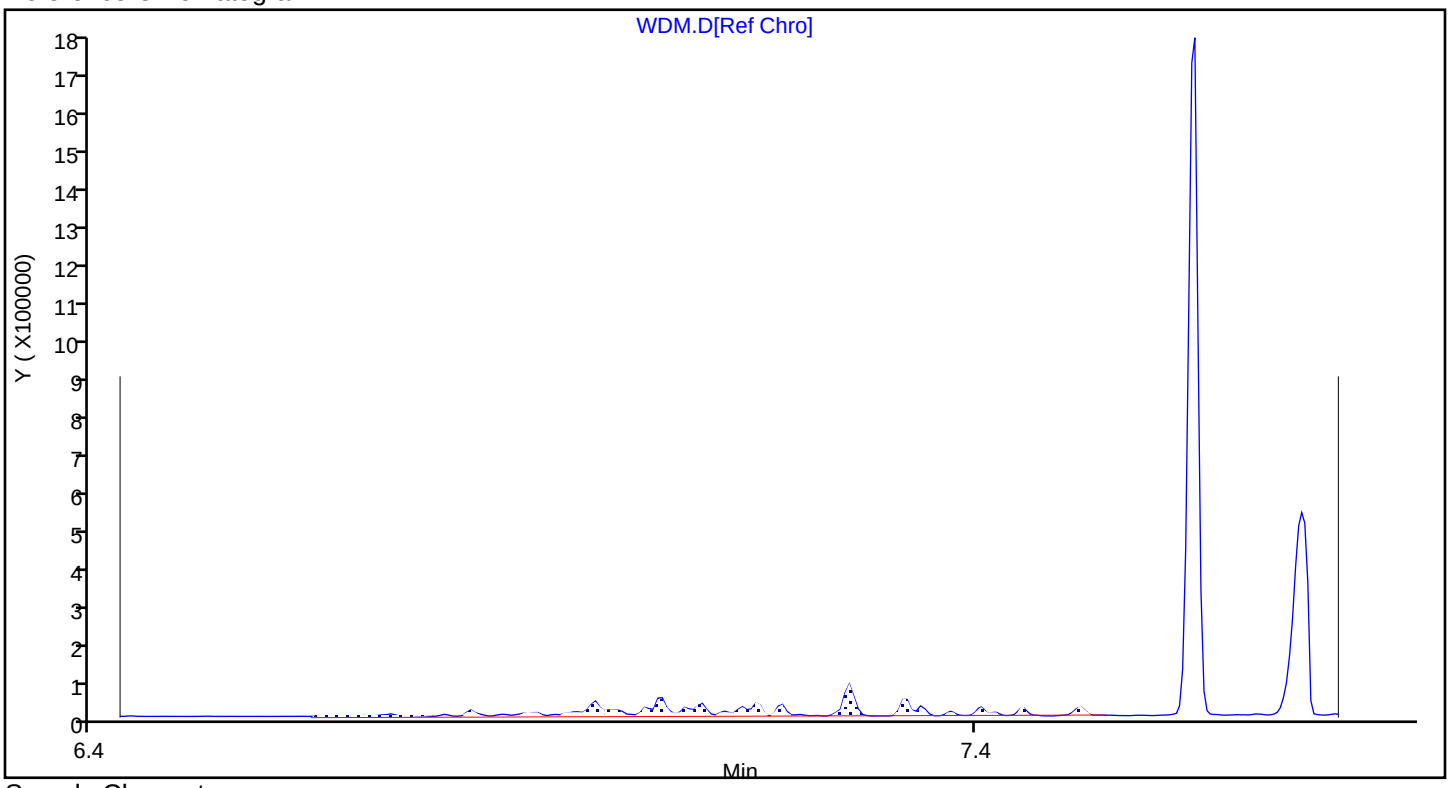
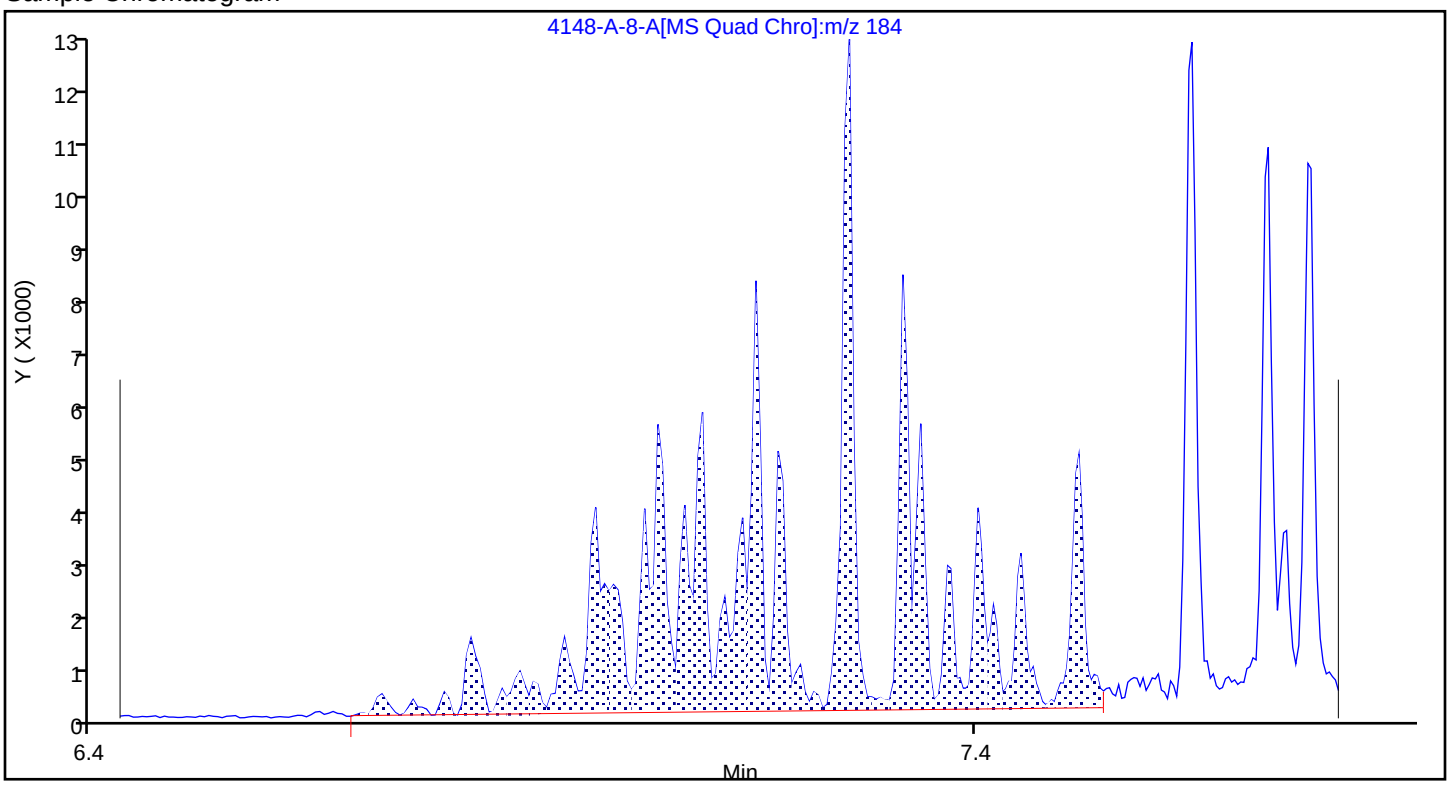
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11		
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 88 C4-Naphthalenes, CAS: STL00919

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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Client ID:	1804576-844-S3				
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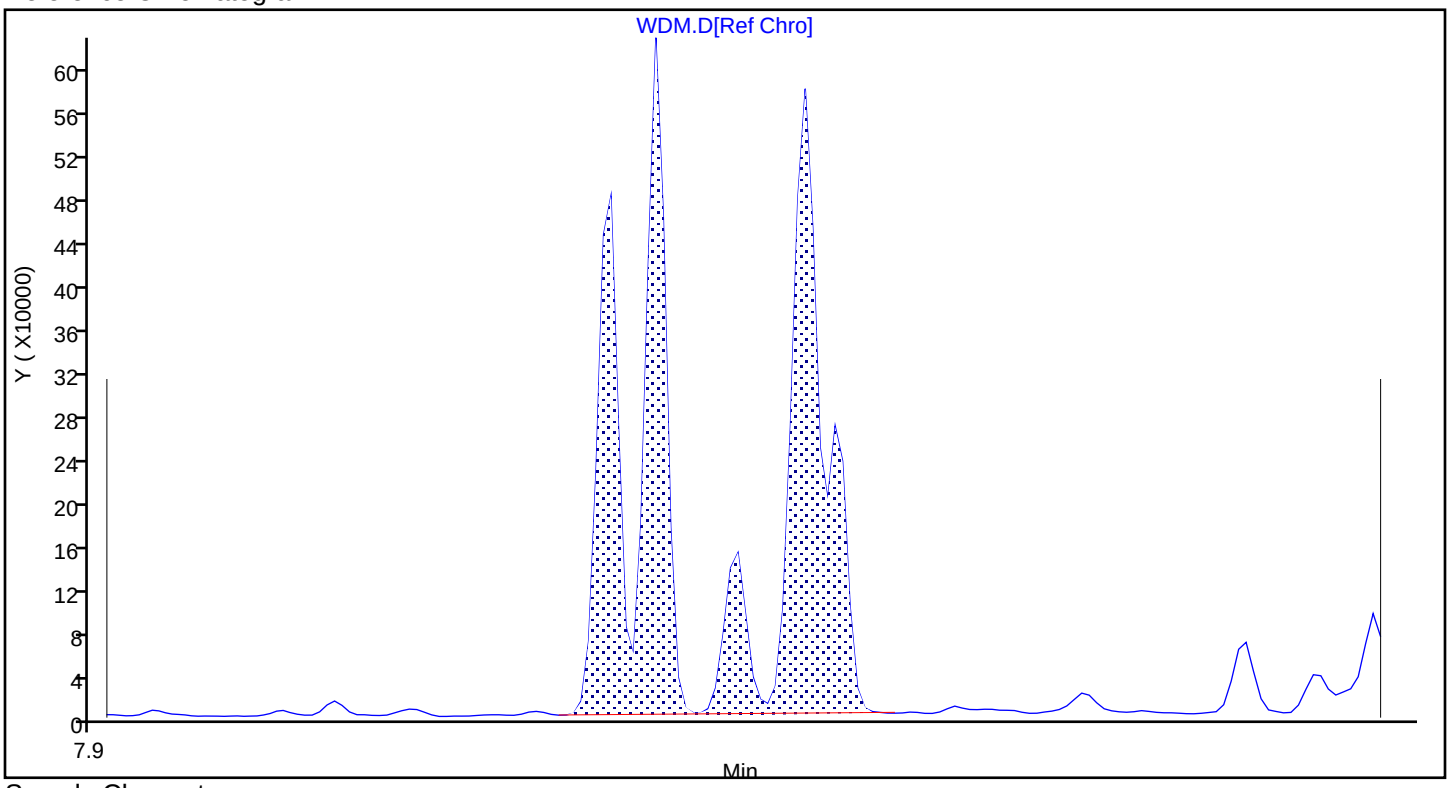
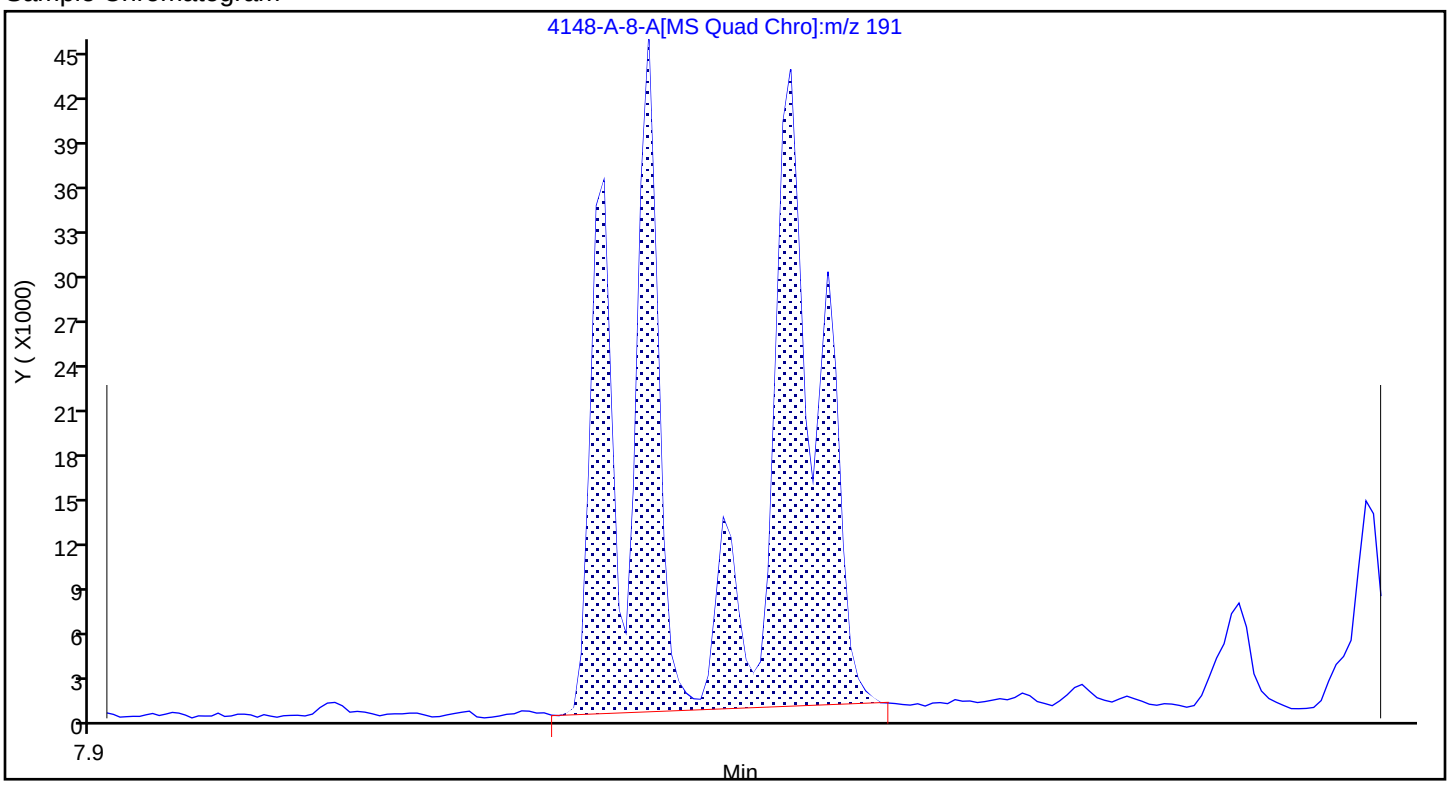
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 96 C1-Phenanthrenes/Anthracenes, CAS: STL00901

Reference Chromatogram



Sample Chromatogram



Report Date: 22-Nov-2023 14:15:31 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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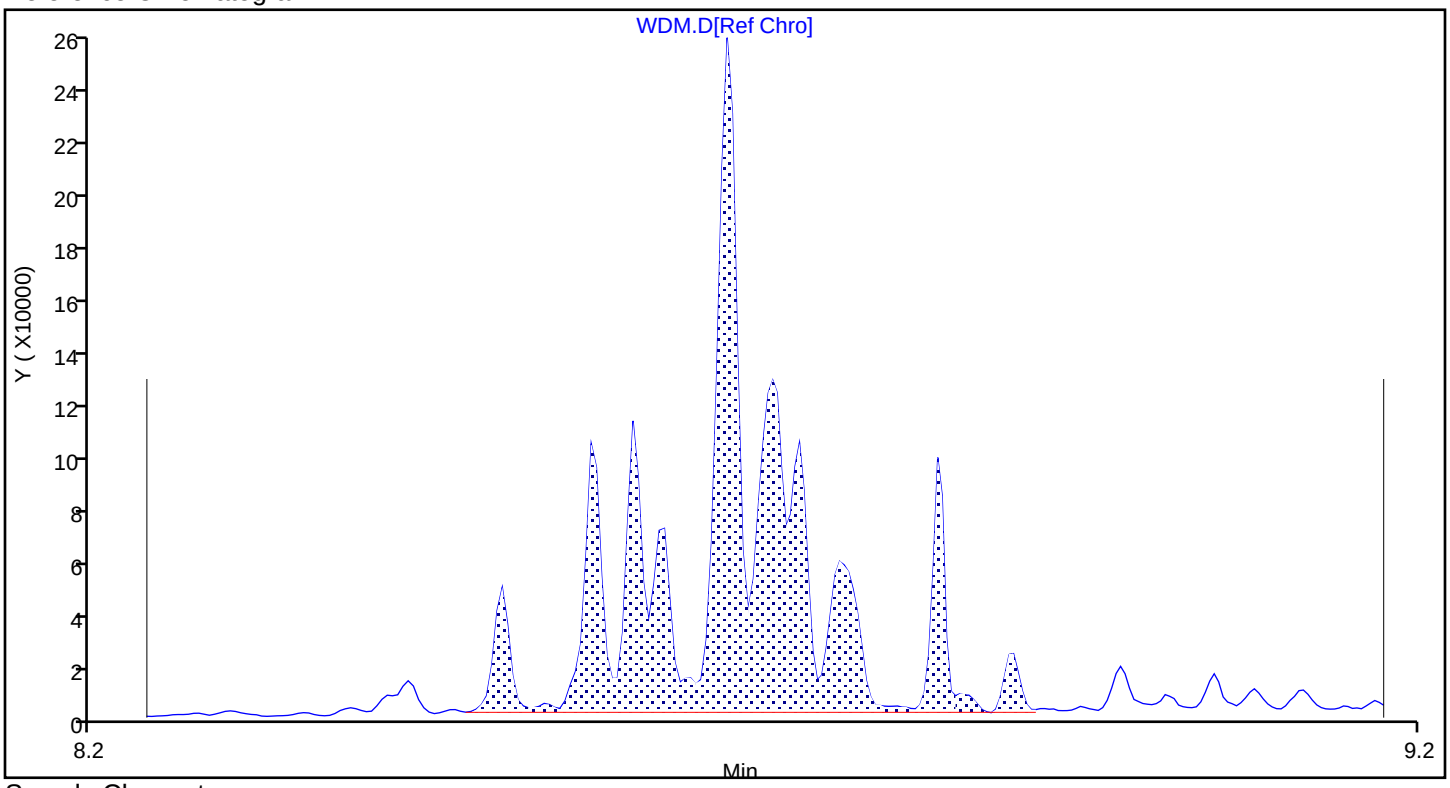
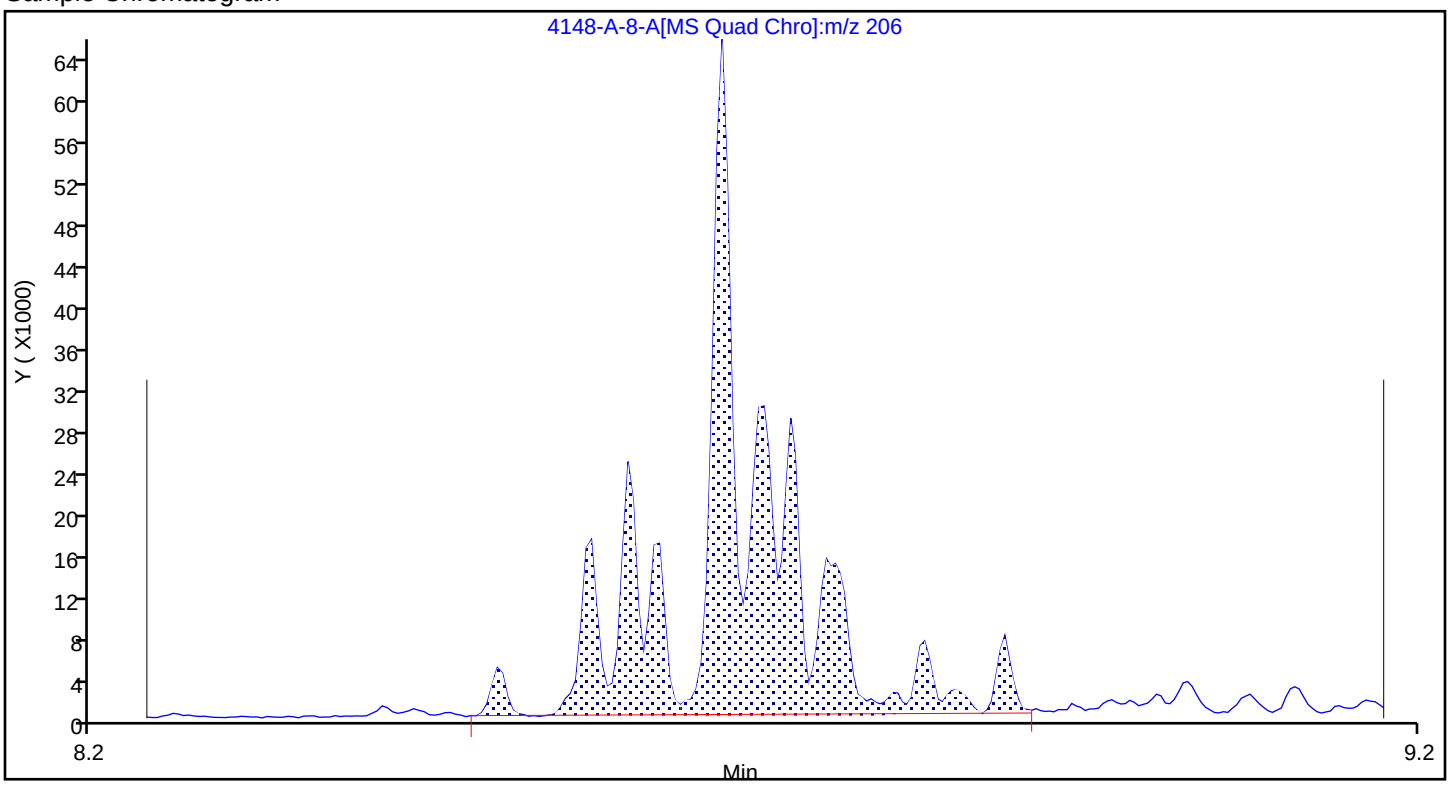
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 97 C2-Phenanthrenes/Anthracenes, CAS: STL00902

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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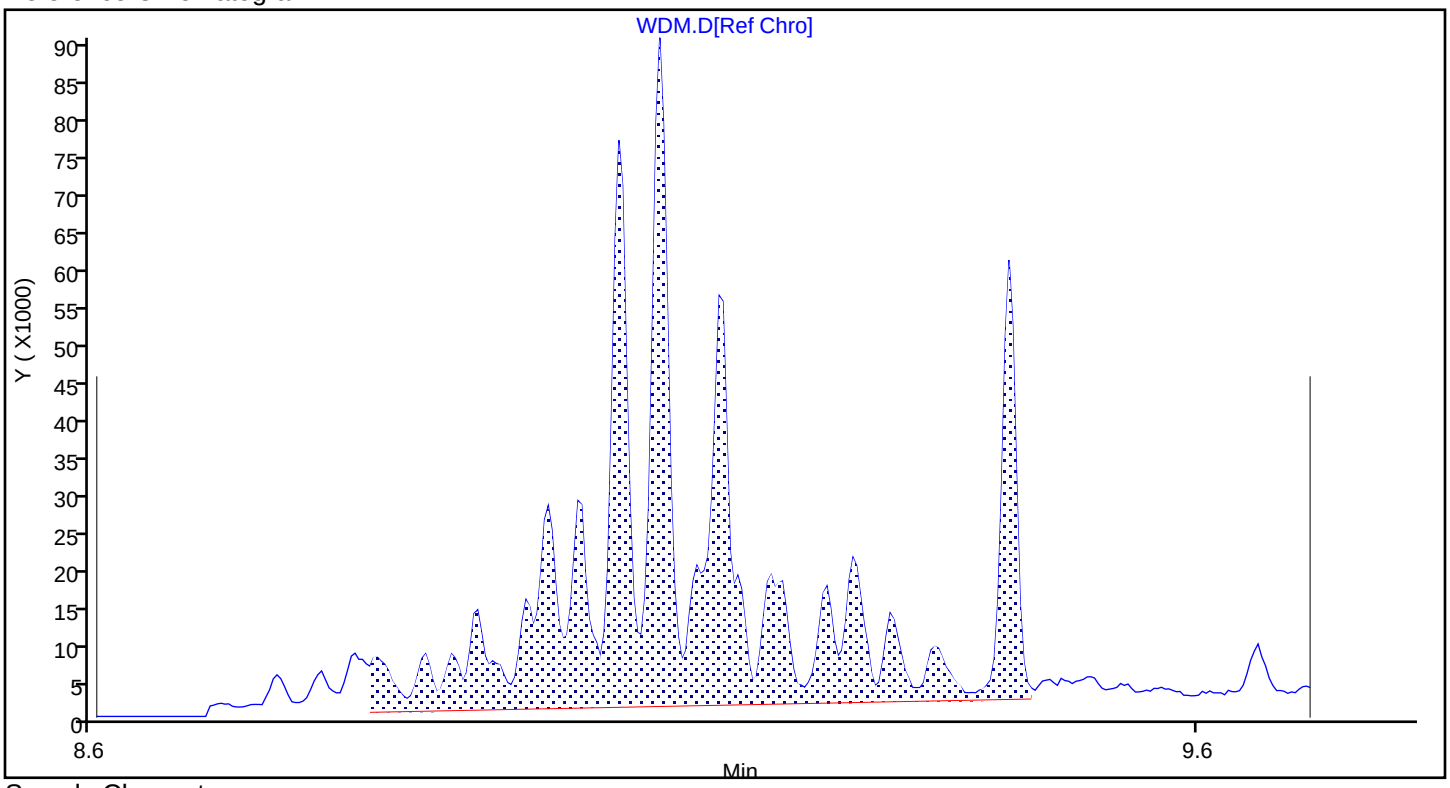
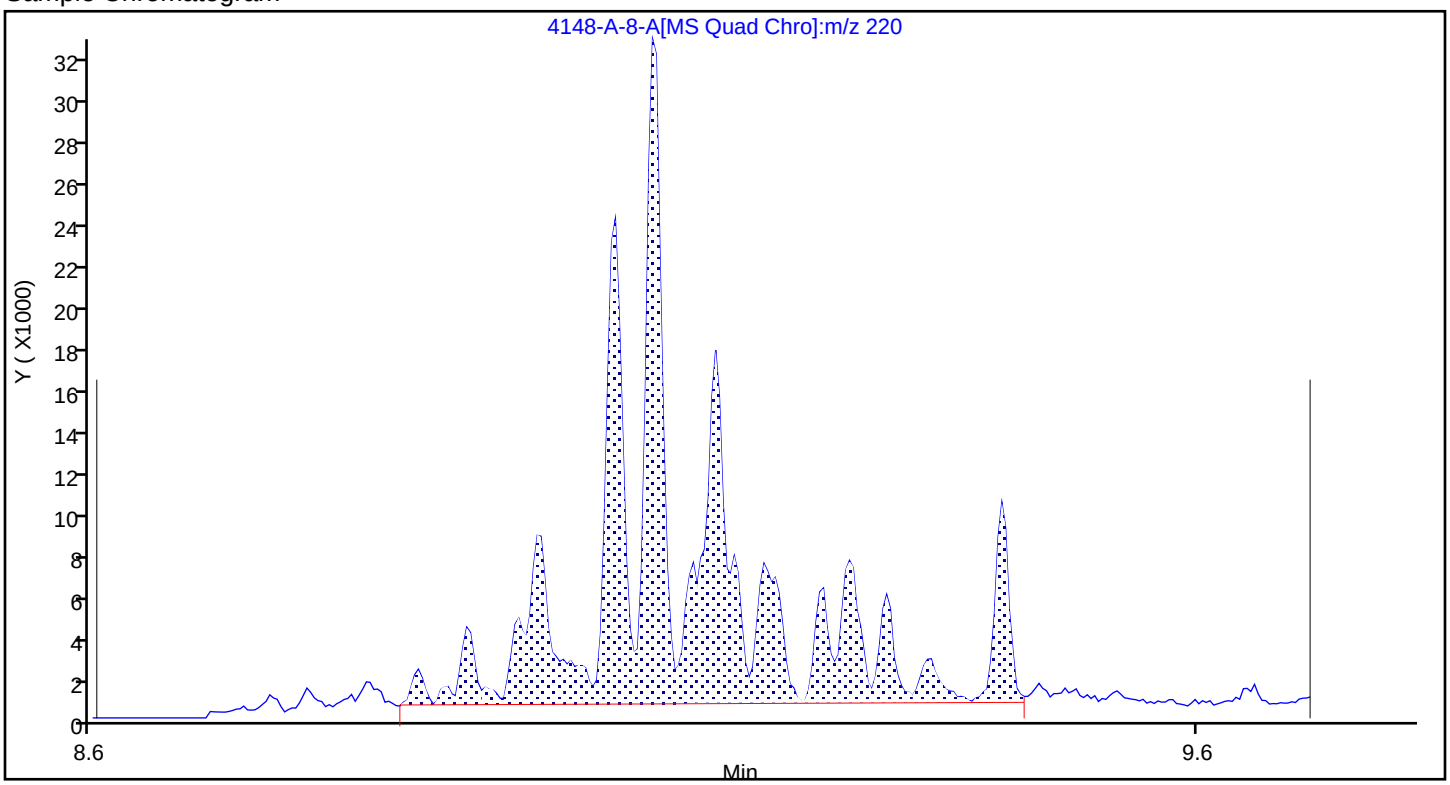
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 98 C3-Phenanthrenes/Anthracenes, CAS: STL00903

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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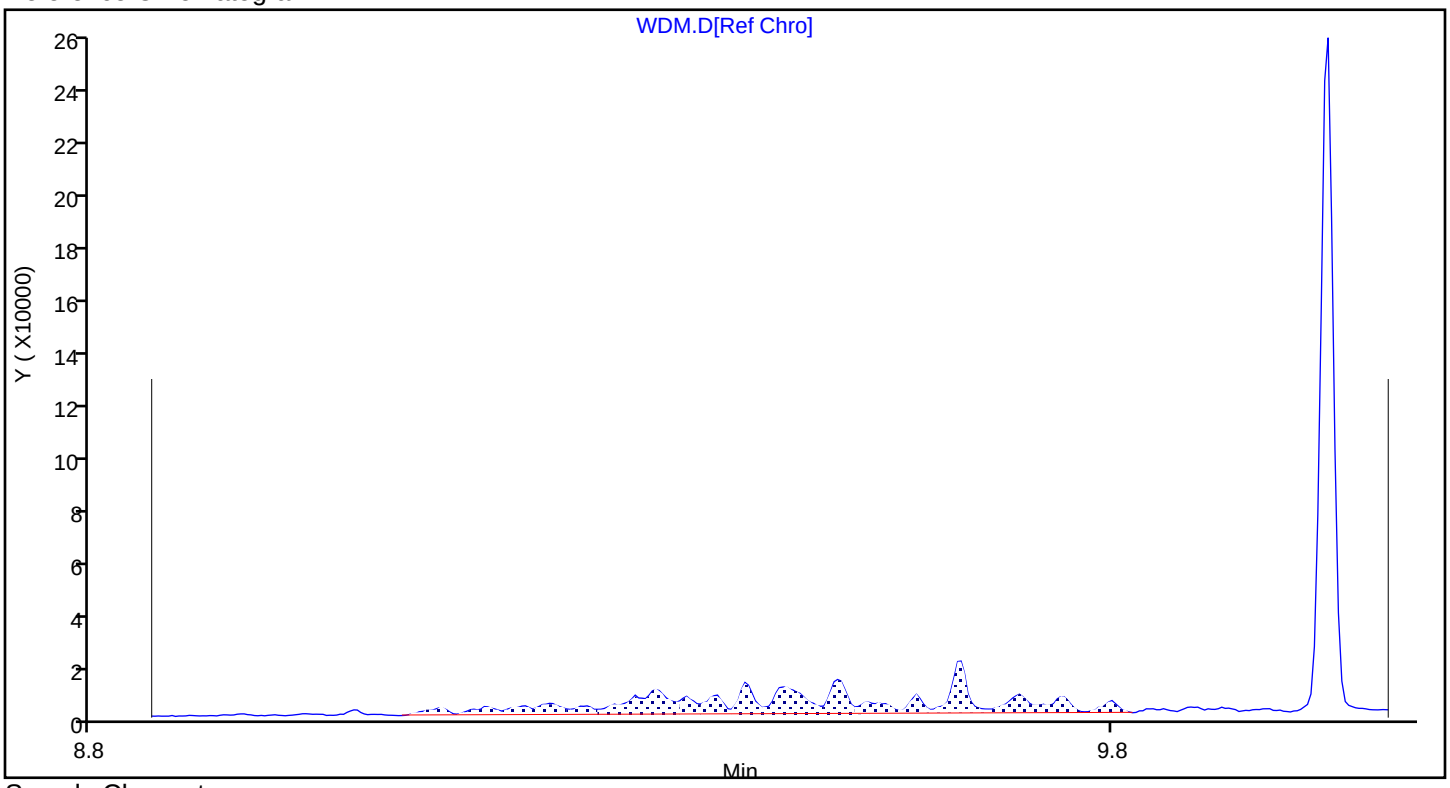
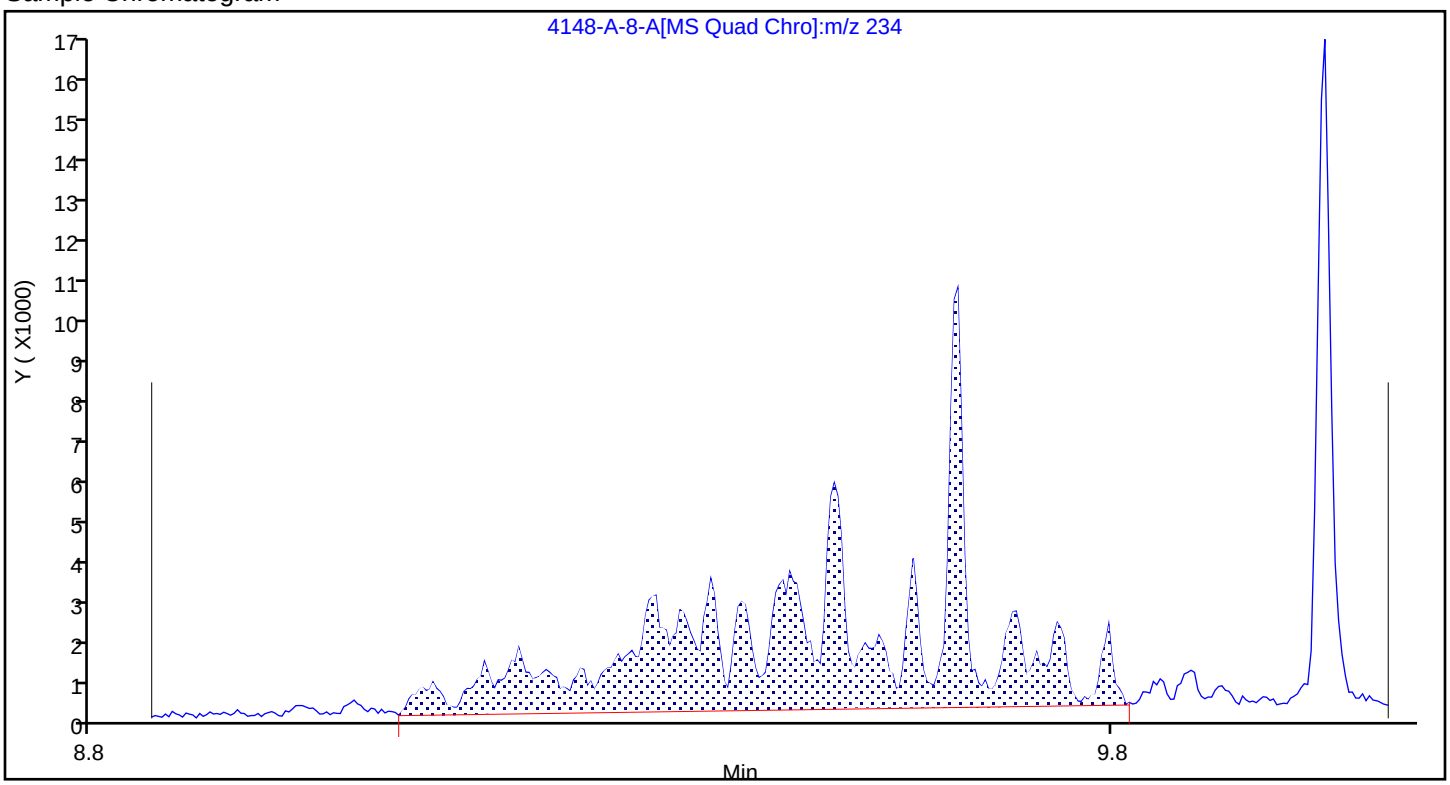
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 99 C4-Phenanthrenes/Anthracenes, CAS: STL00904

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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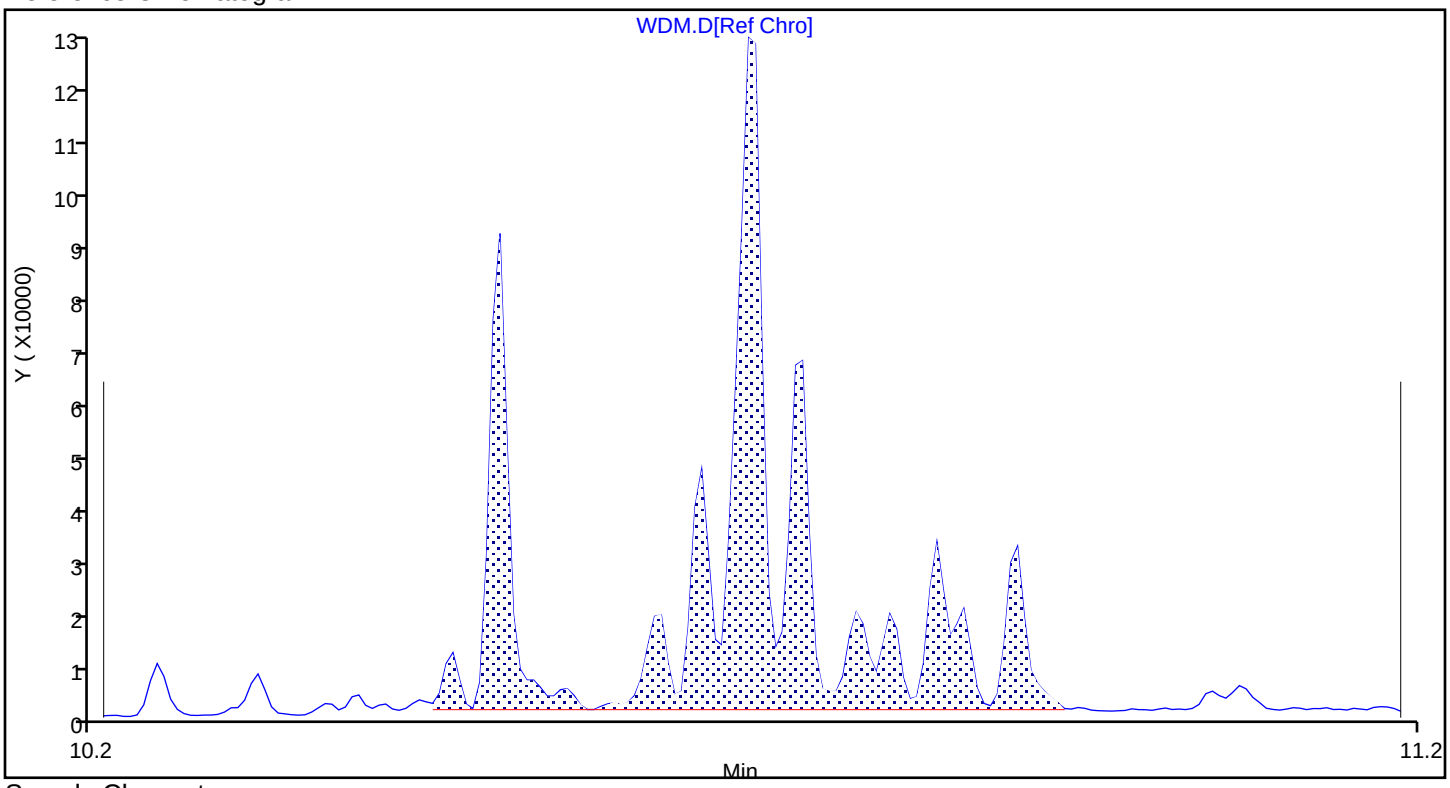
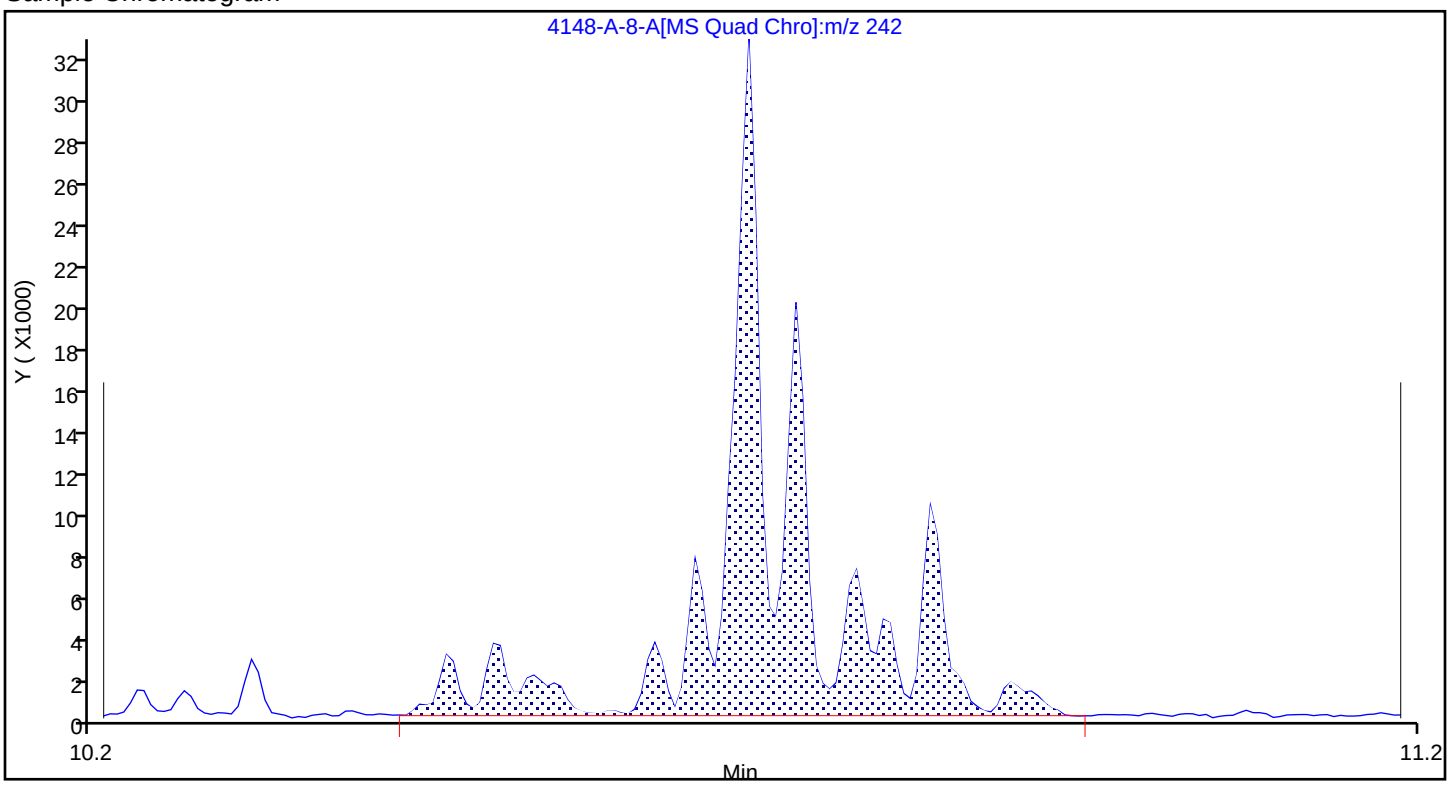
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 101 C1-Chrysenes/Benz(a)anthracenes, CAS: STL02218

Reference Chromatogram



Sample Chromatogram



Report Date: 22-Nov-2023 14:15:31 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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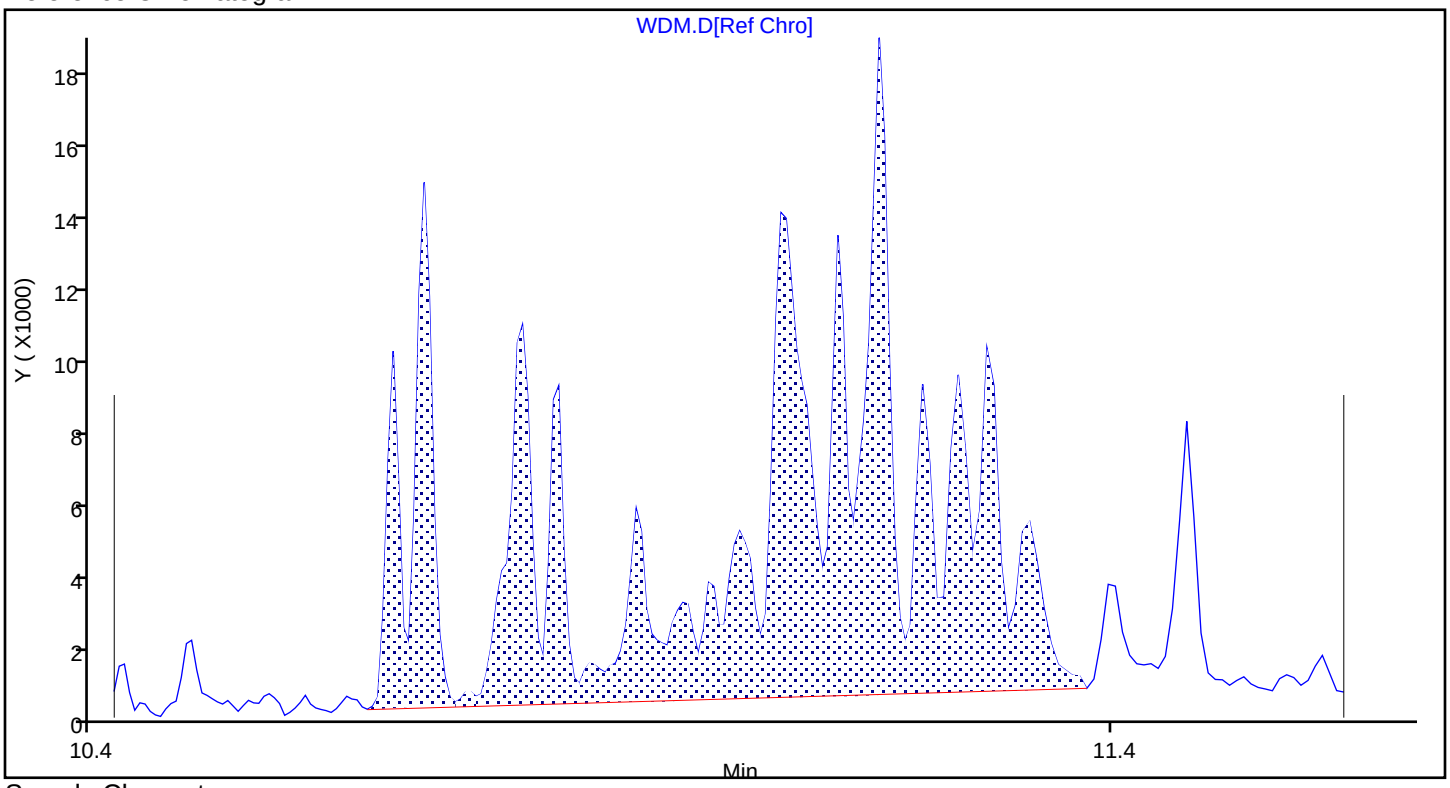
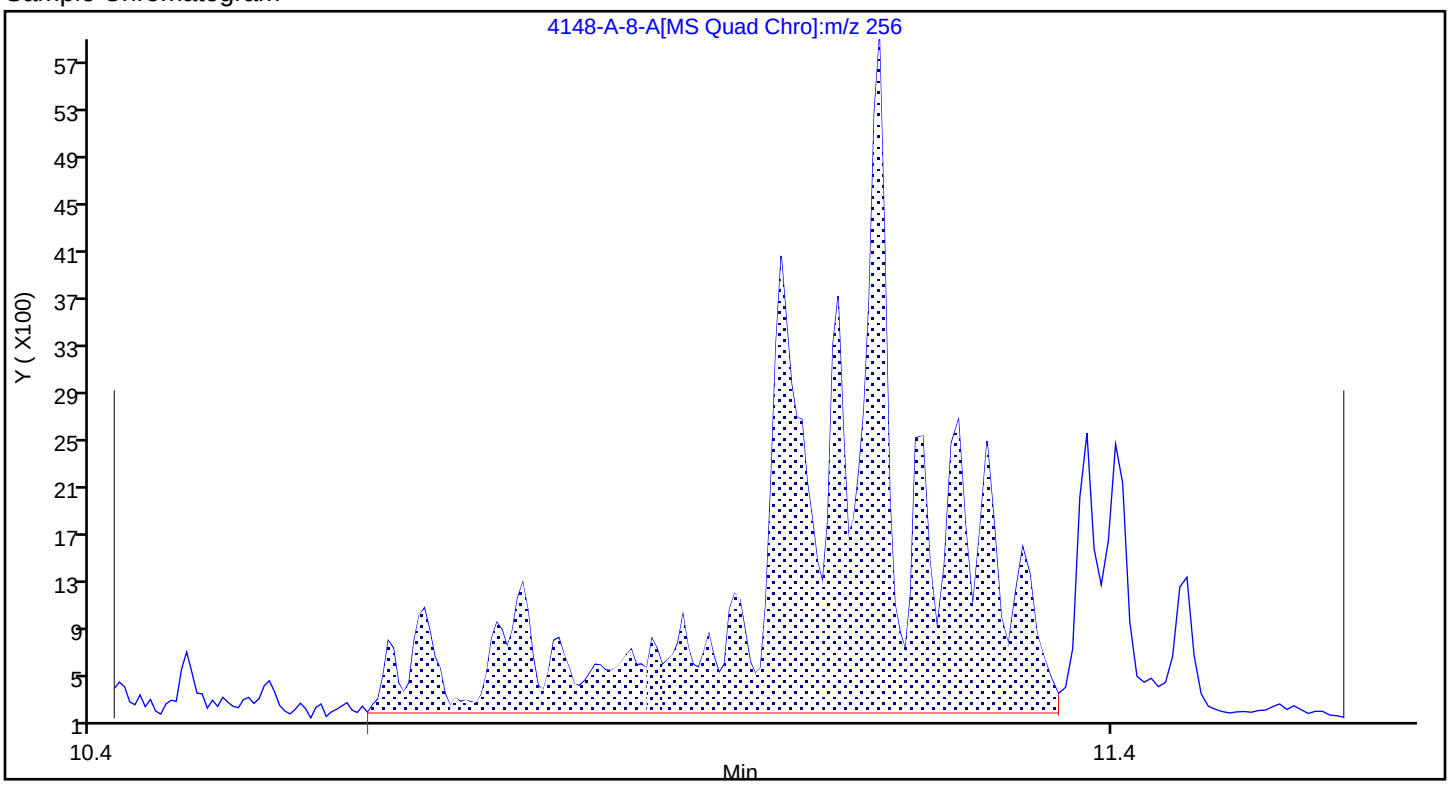
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11		
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 102 C2-Chrysenes/Benz(a)anthracenes, CAS: STL02219

Reference Chromatogram



Sample Chromatogram



Report Date: 22-Nov-2023 14:15:31 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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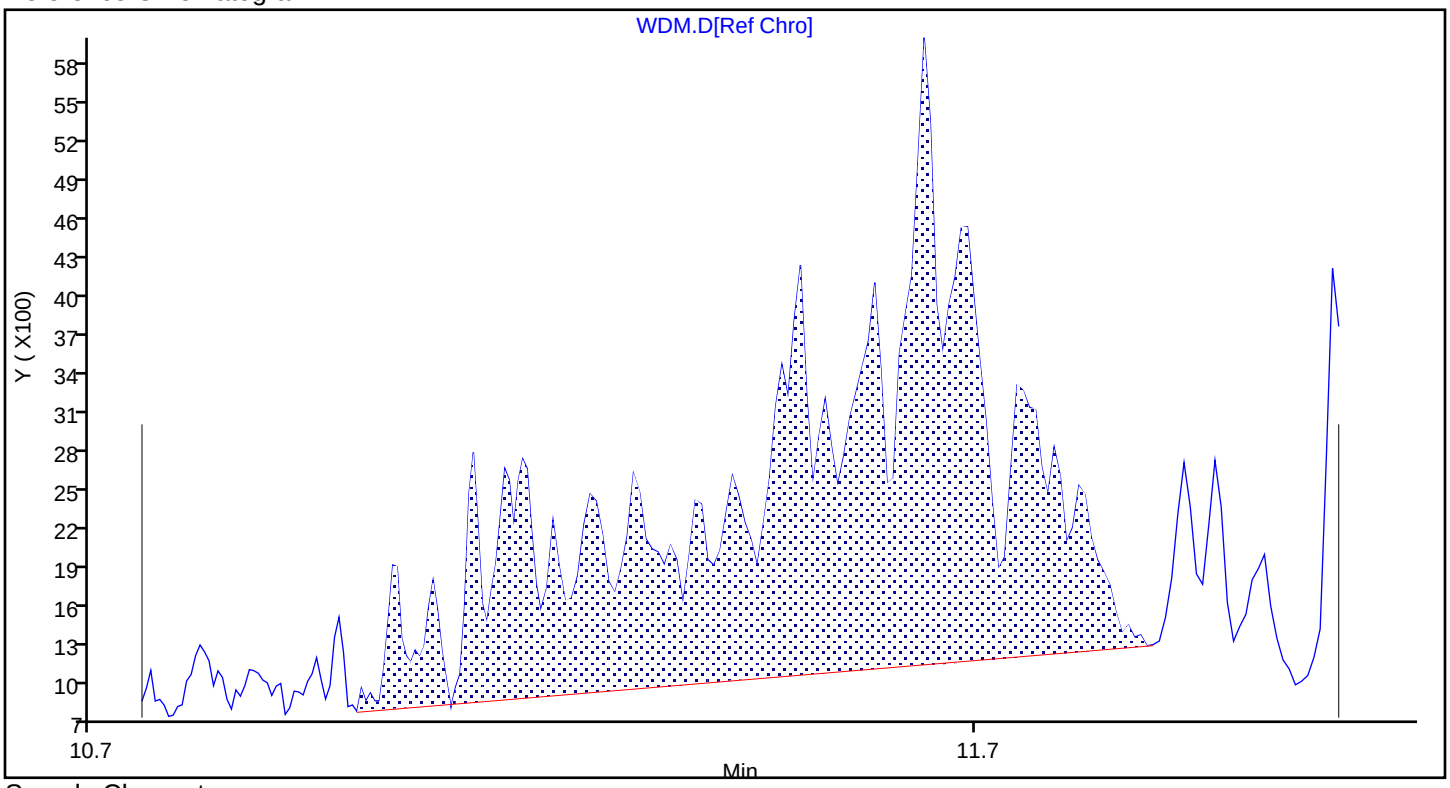
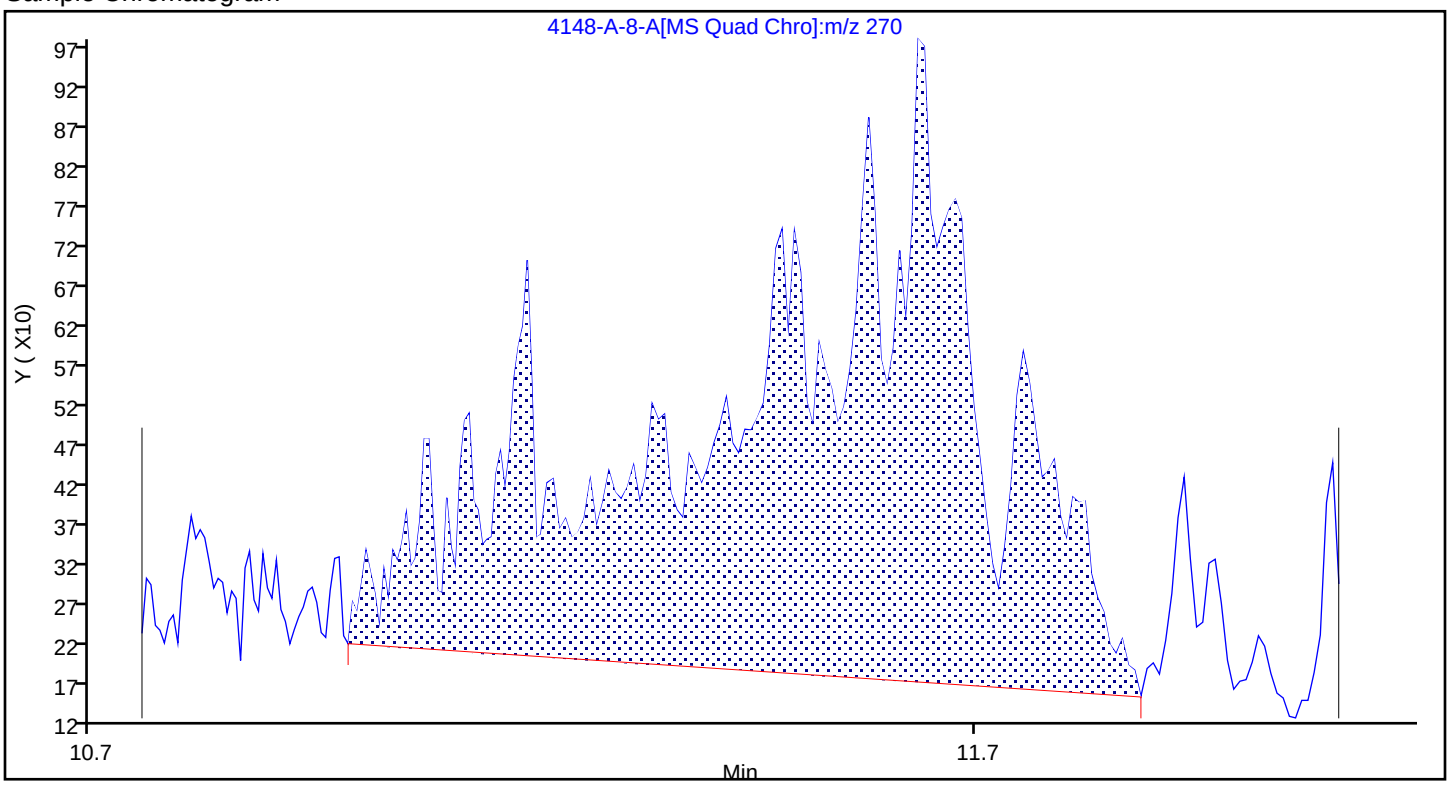
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 103 C3-Chrysenes/Benz(a)anthracenes, CAS: STL02220

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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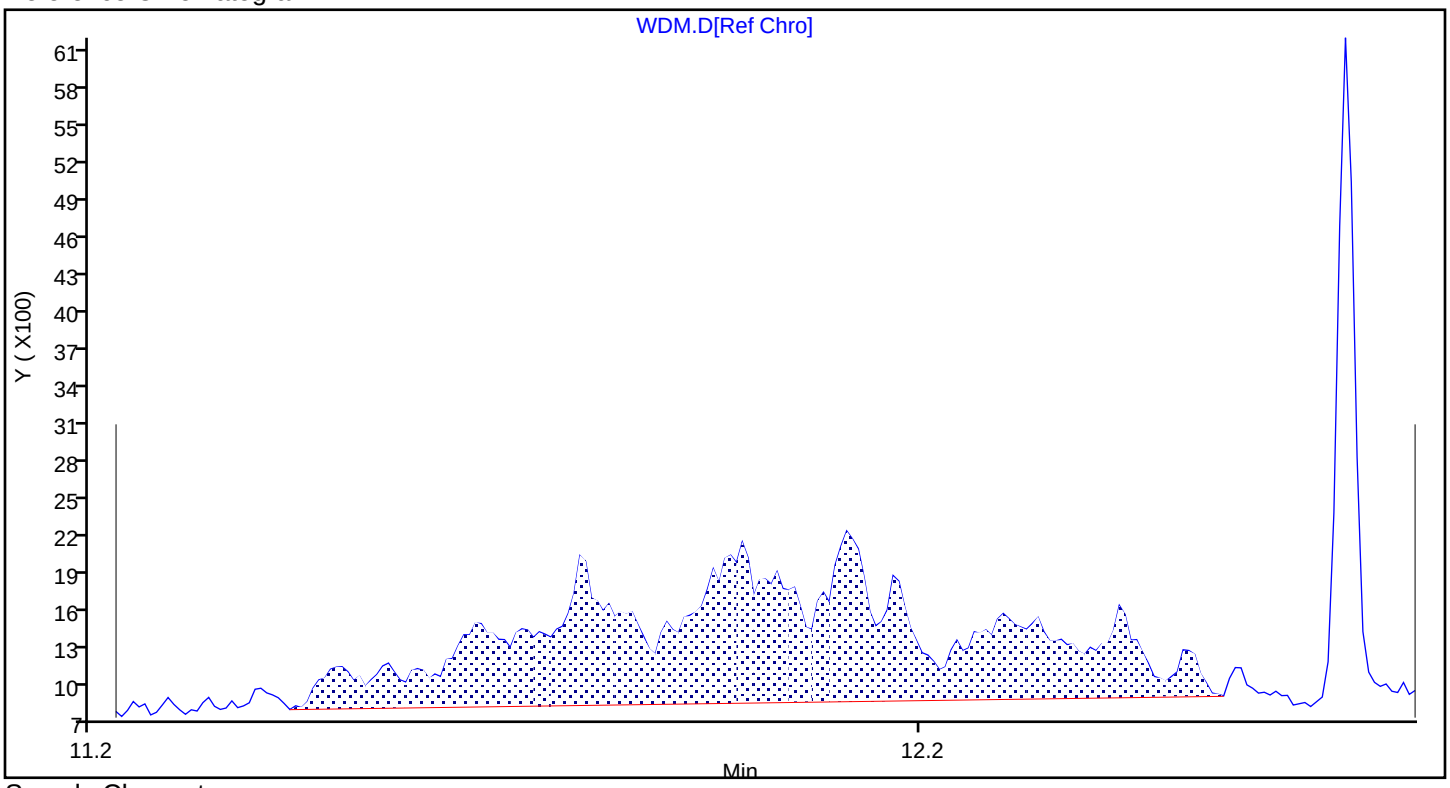
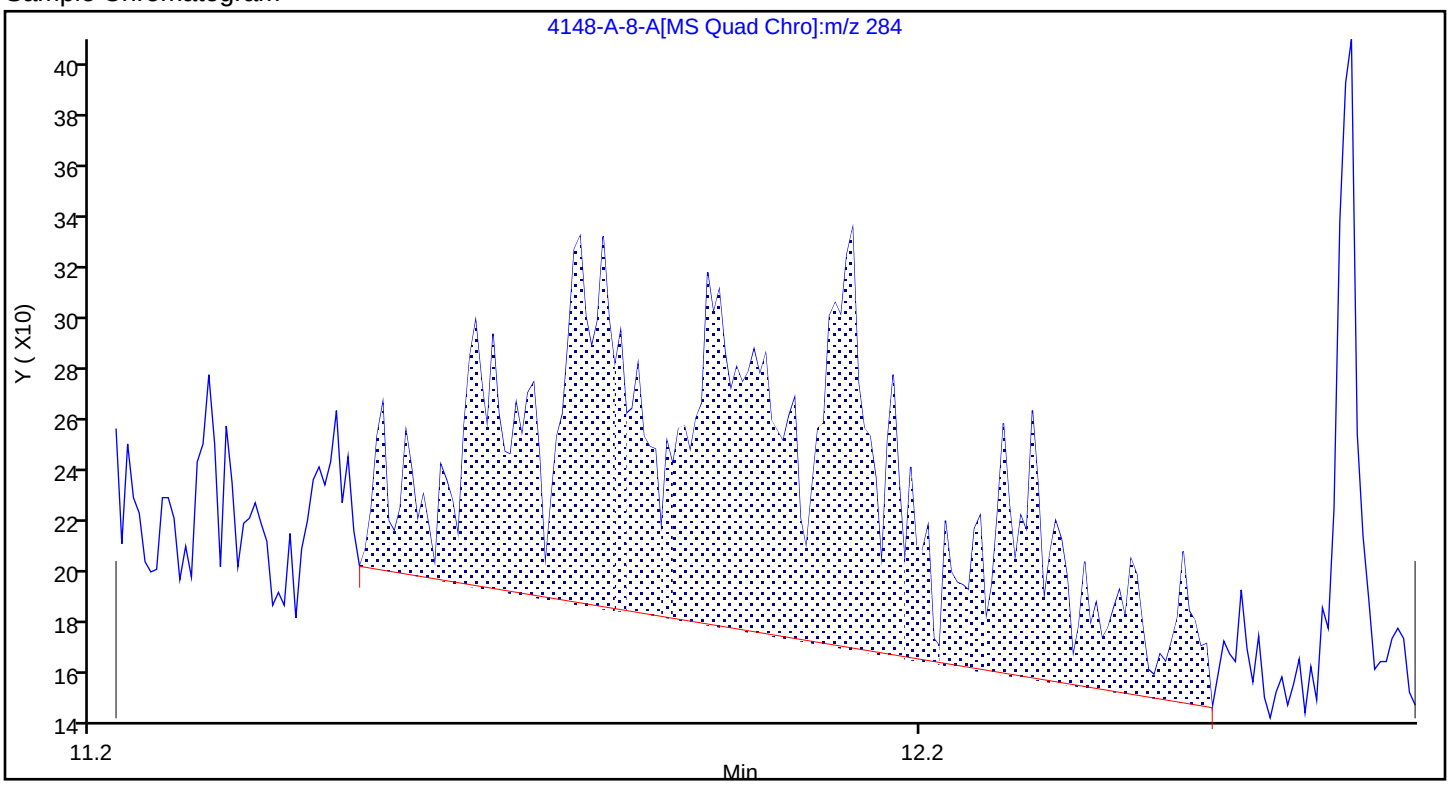
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 104 C4-Chrysenes/Benz(a)anthracenes, CAS: STL02221

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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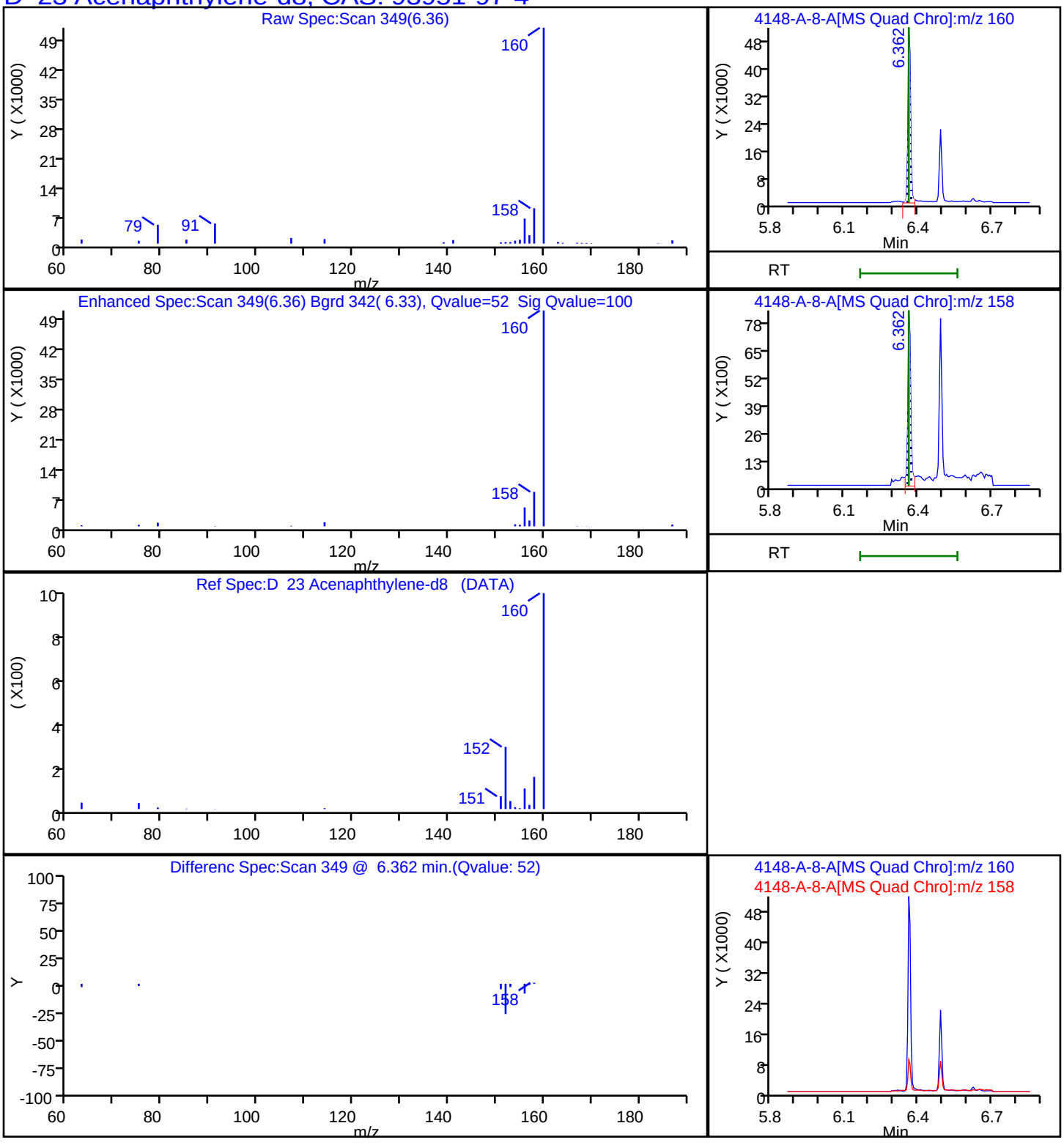
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D_23 Acenaphthylene-d8, CAS: 93951-97-4



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Eurofins Knoxville

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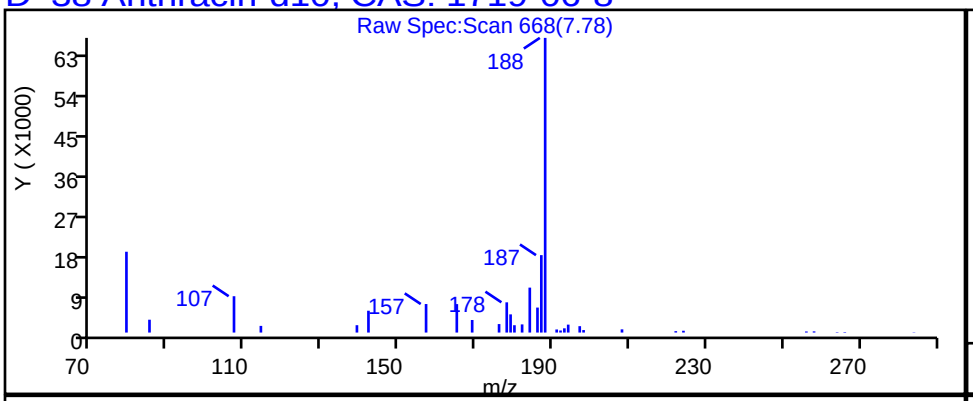
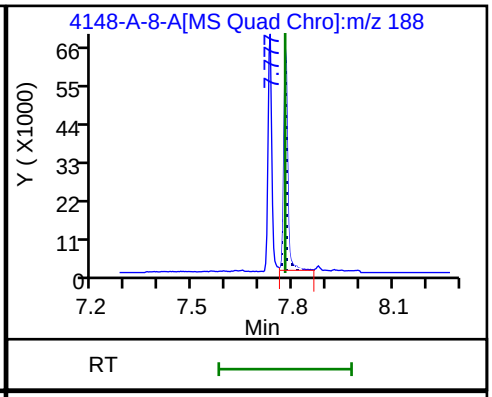
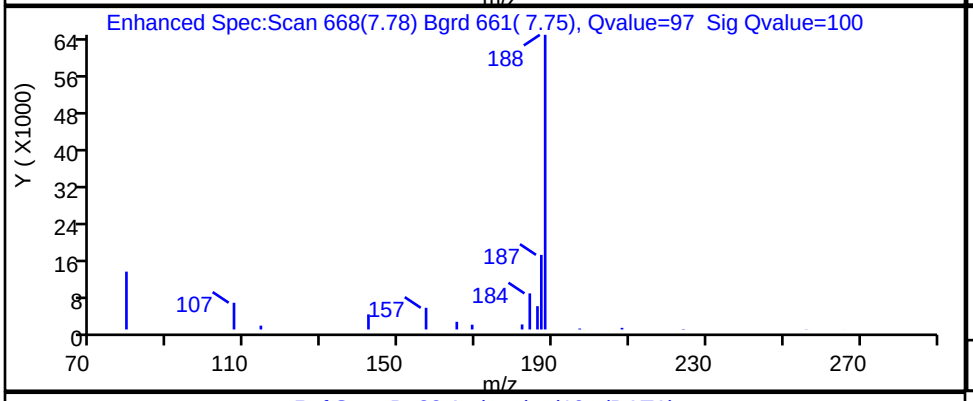
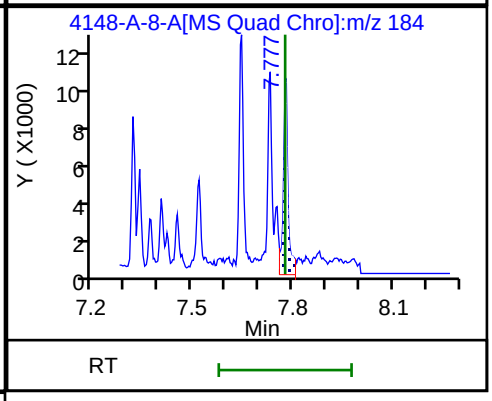
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11
Client ID:	1804576-844-S3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

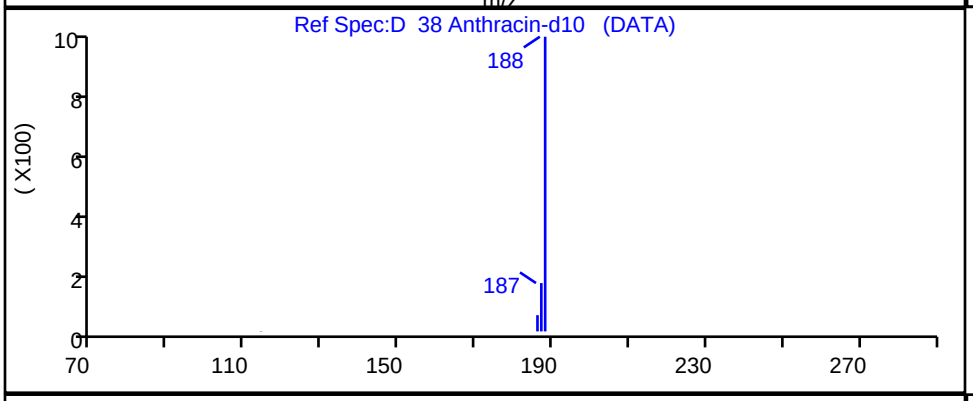
D 38 Anthracin-d10, CAS: 1719-06-8

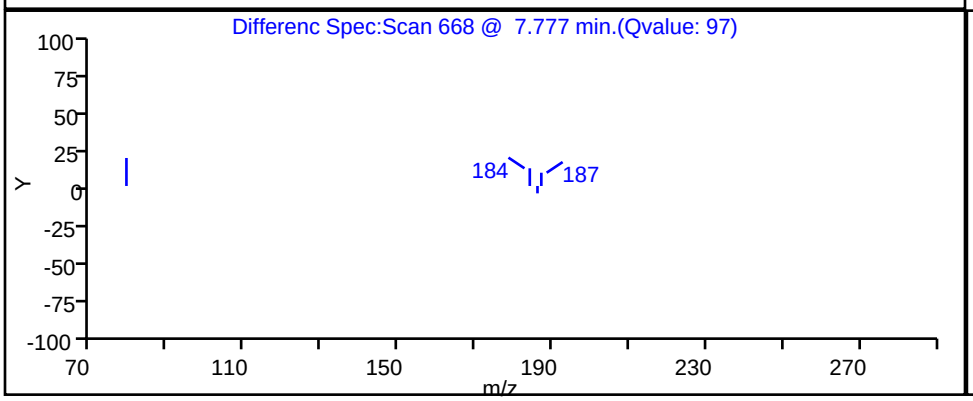


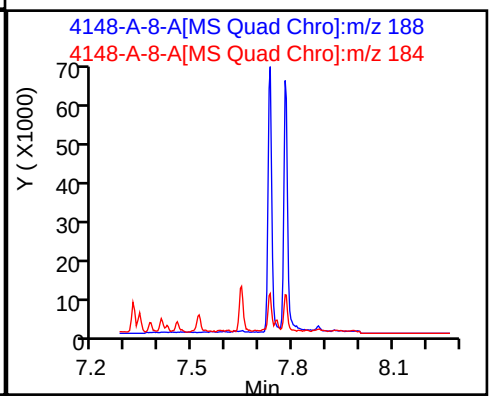












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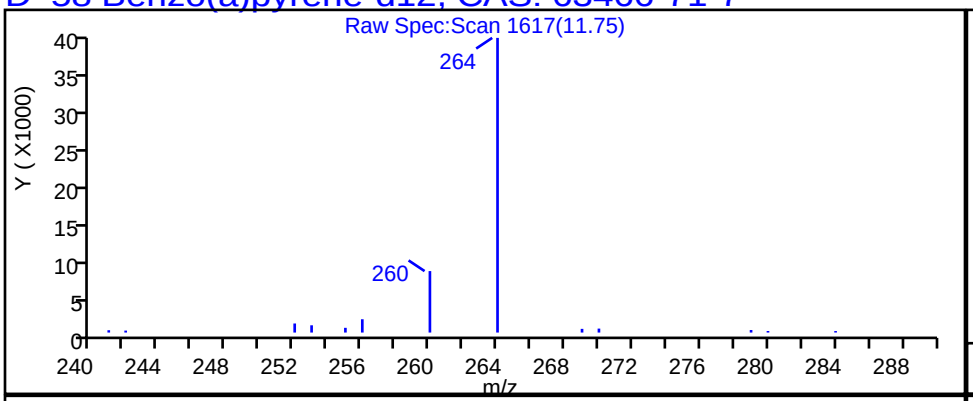
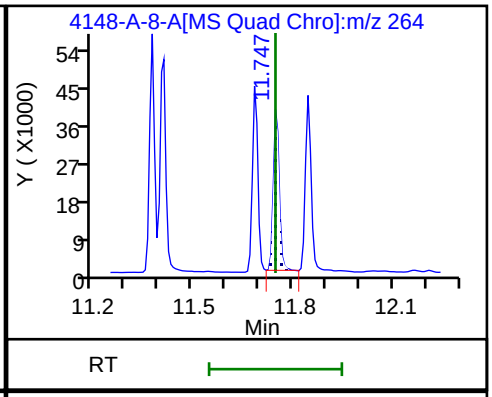
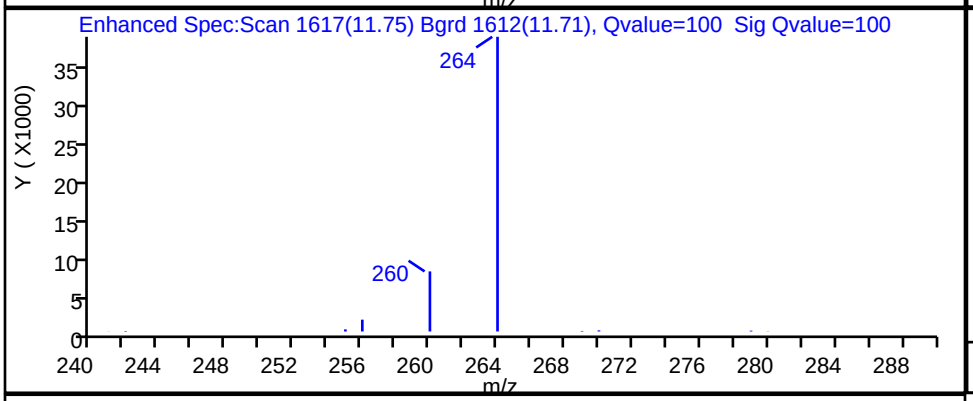
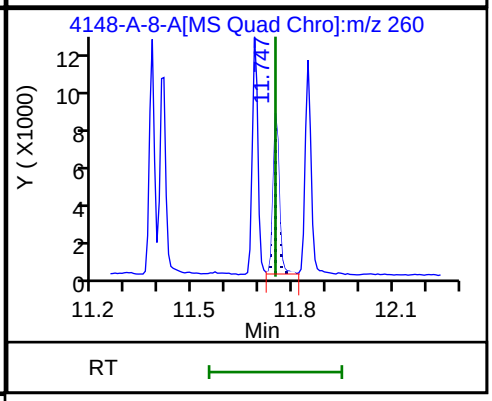
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

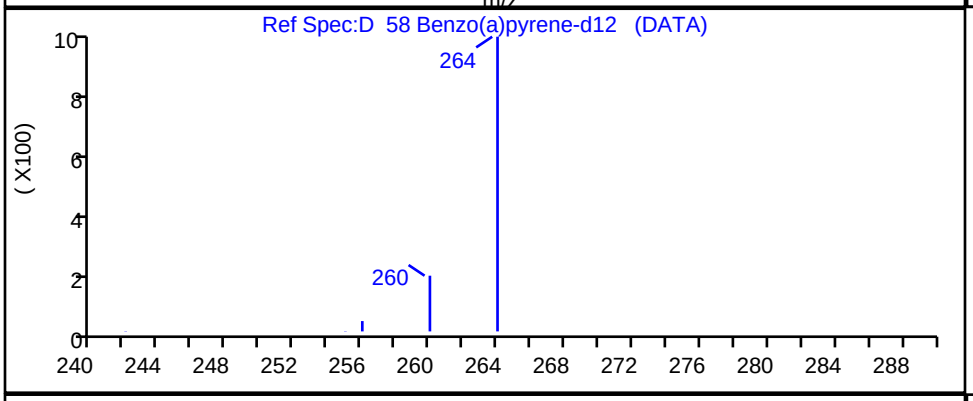
D 58 Benzo(a)pyrene-d12, CAS: 63466-71-7

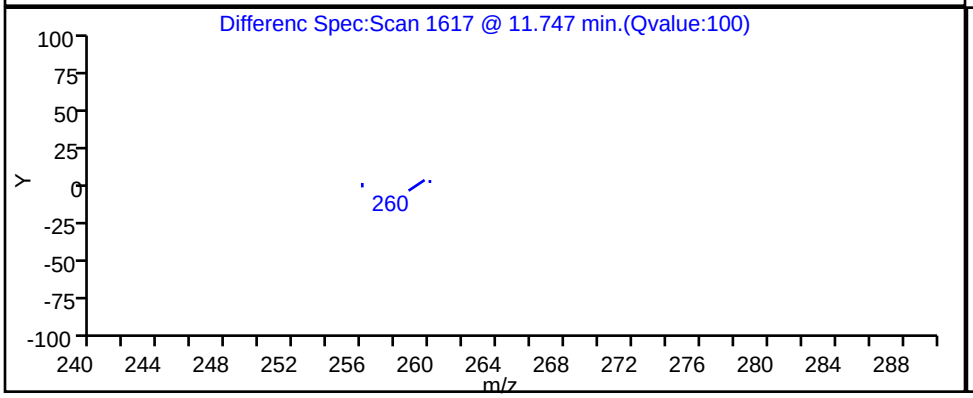


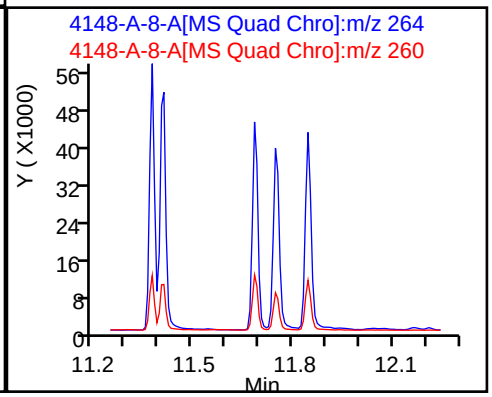












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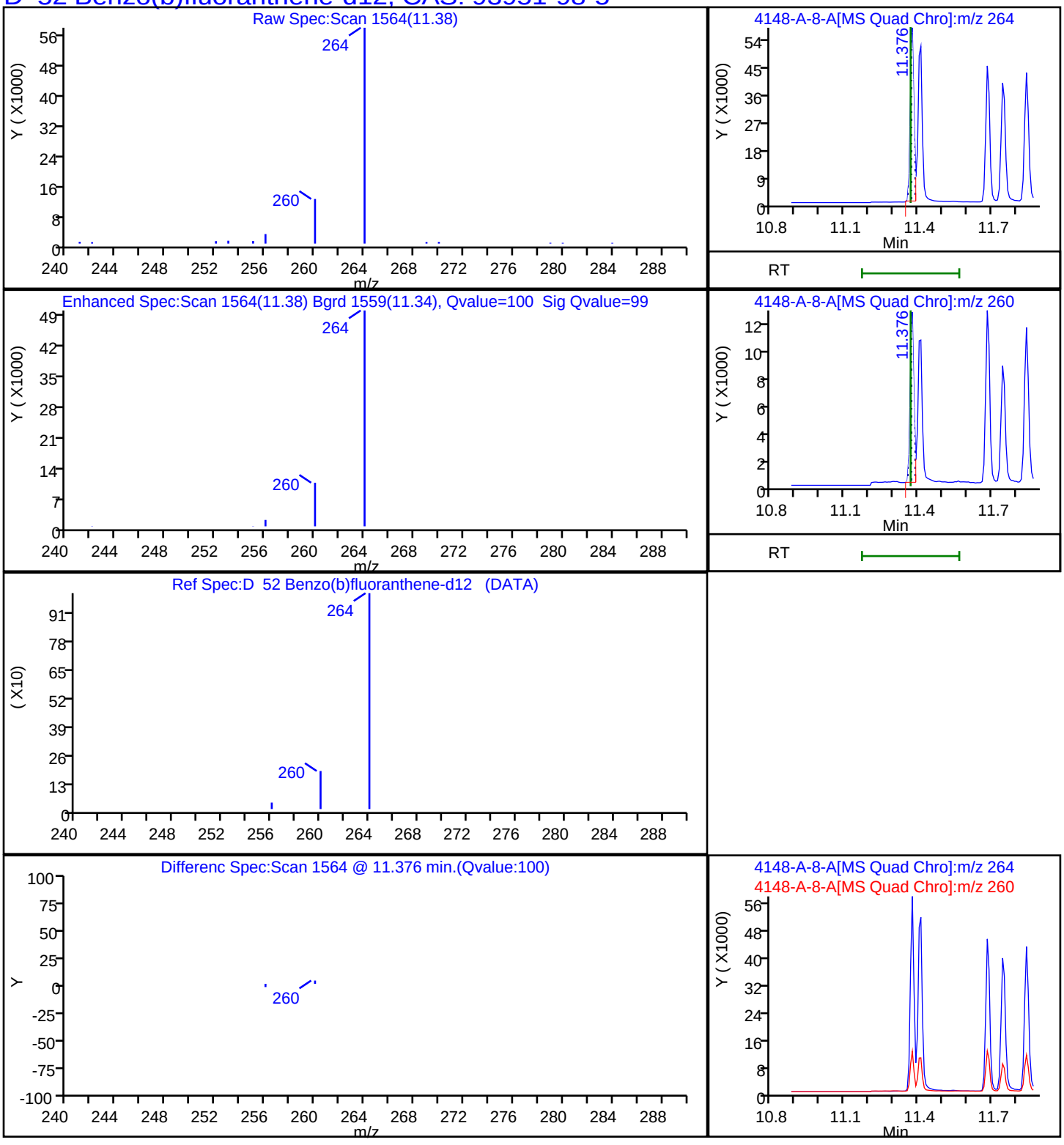
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 52 Benzo(b)fluoranthene-d12, CAS: 93951-98-5



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Eurofins Knoxville

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Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
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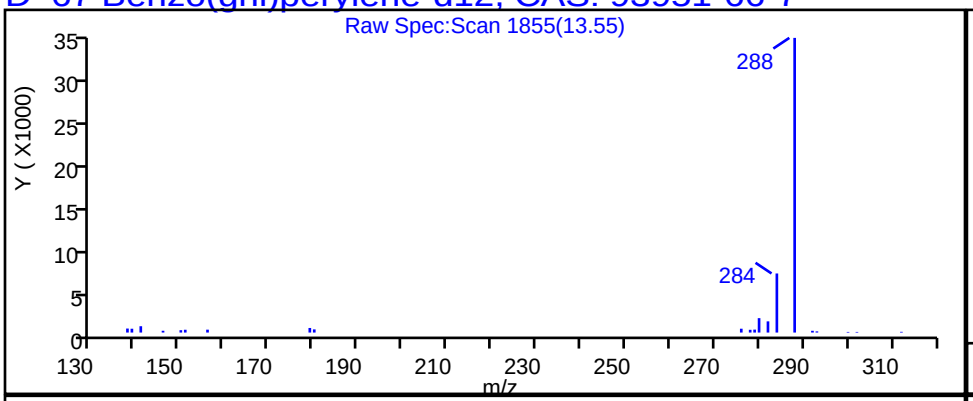
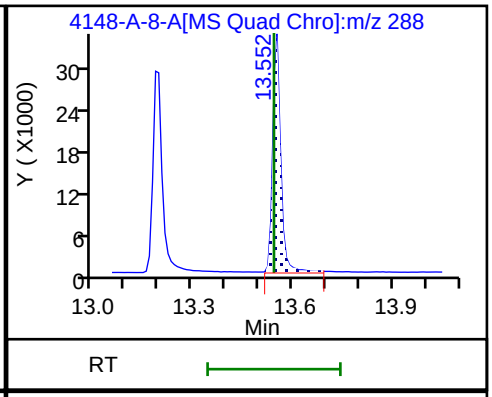
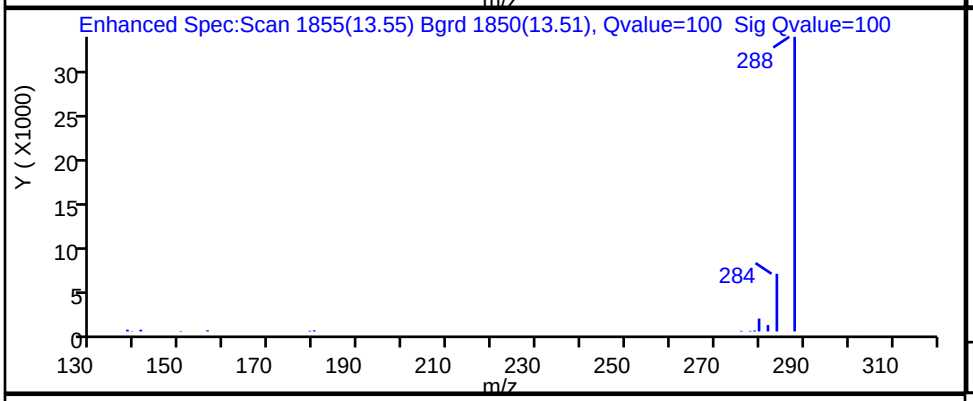
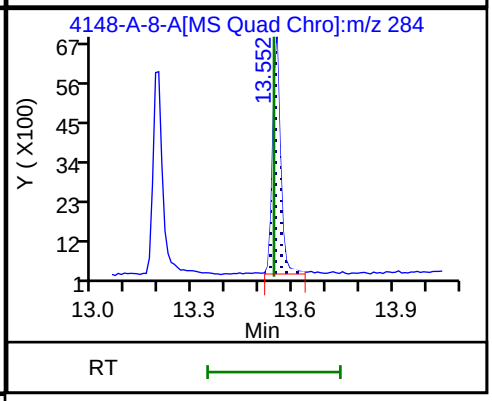
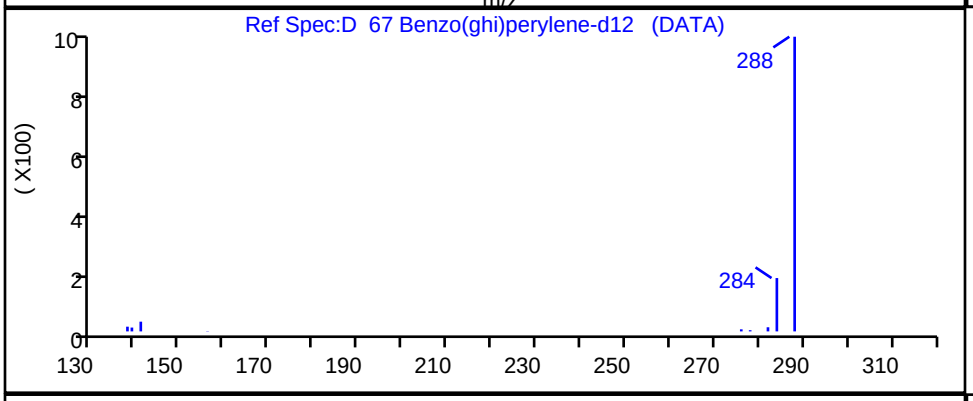
D 67 Benzo(ghi)perylene-d12, CAS: 93951-66-7

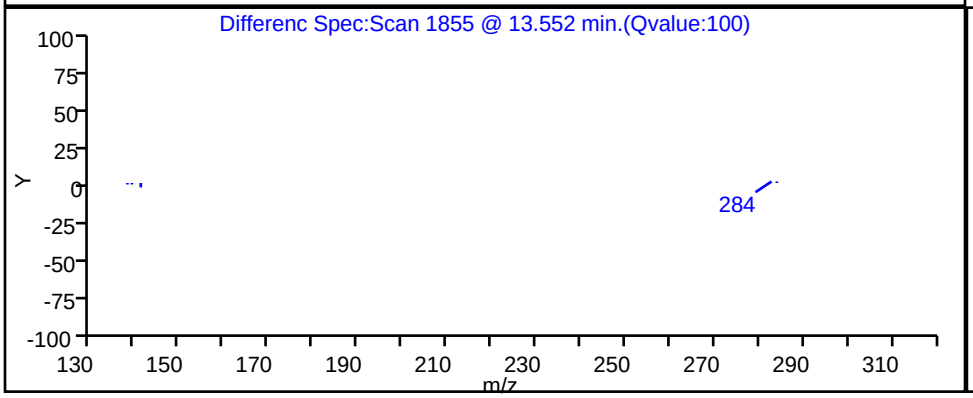


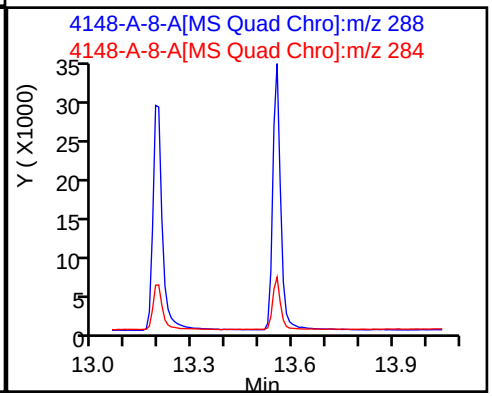












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Eurofins Knoxville

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Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
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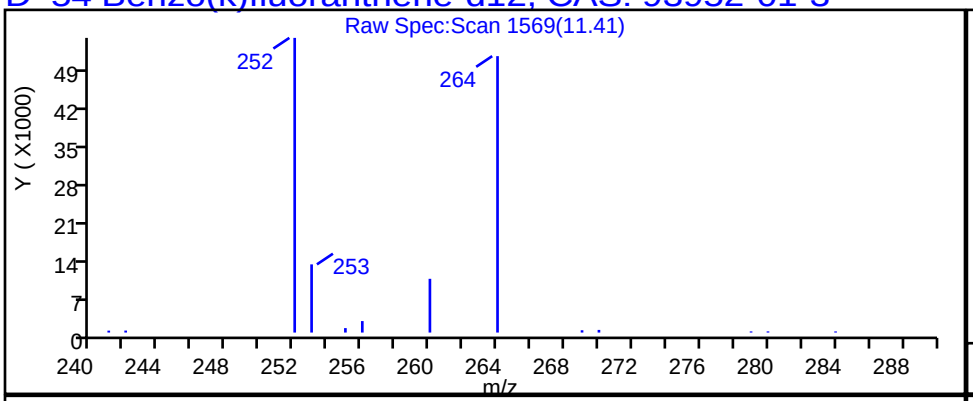
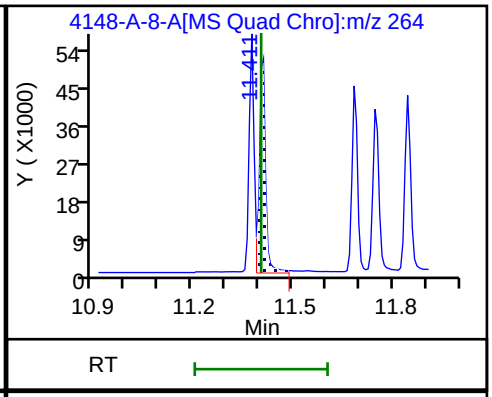
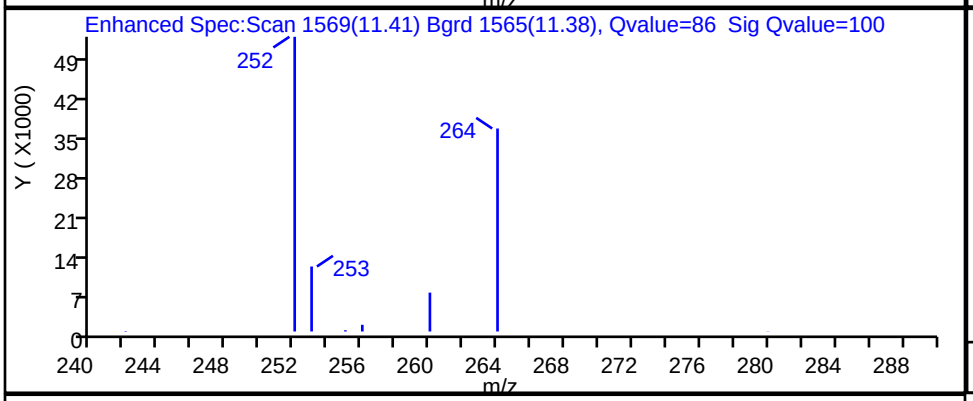
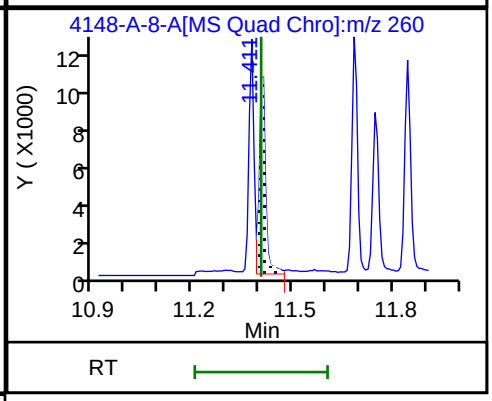
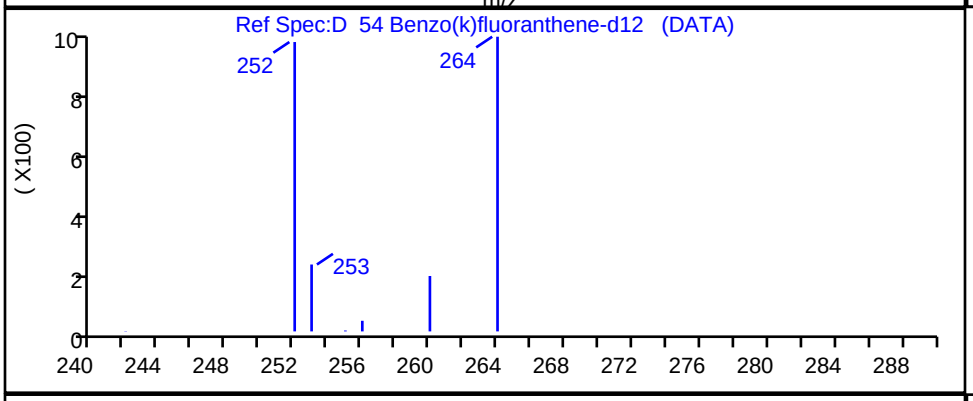
D 54 Benzo(k)fluoranthene-d12, CAS: 93952-01-3

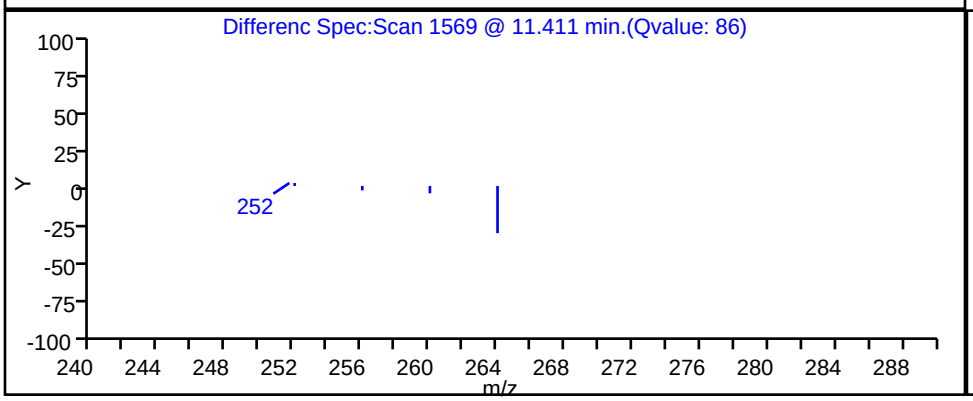


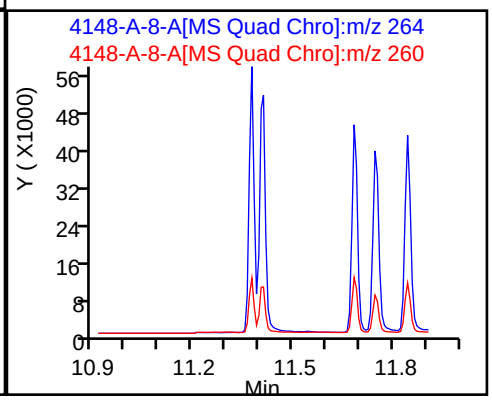












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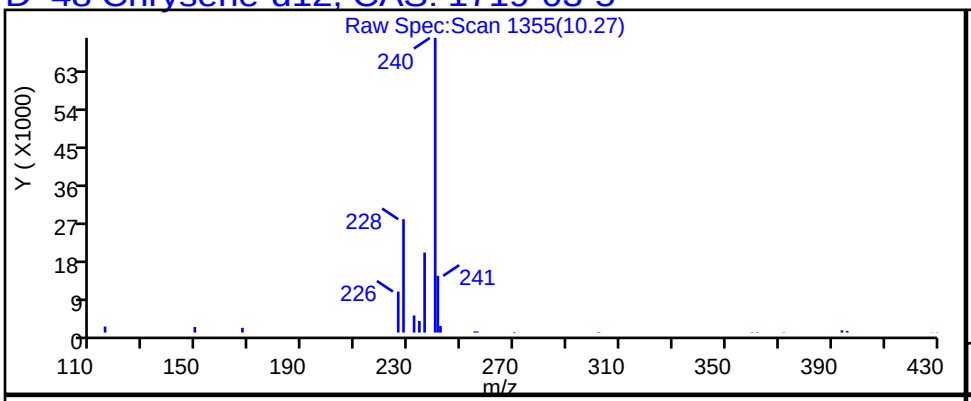
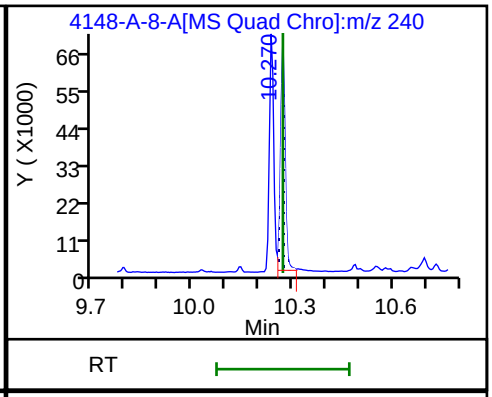
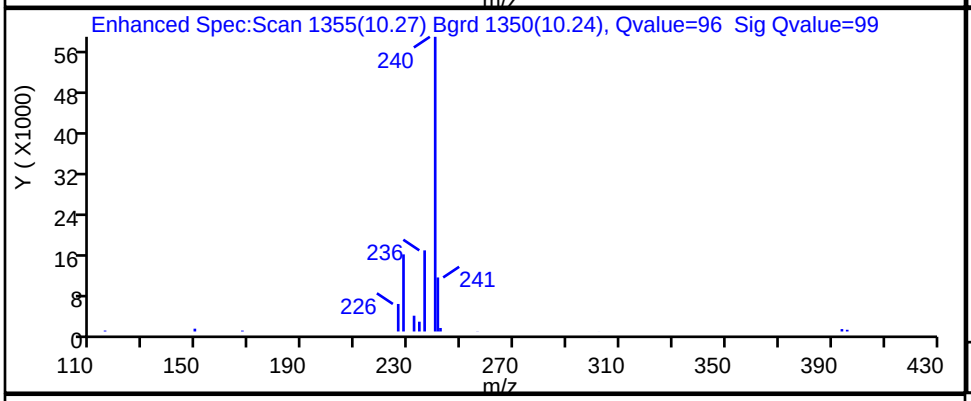
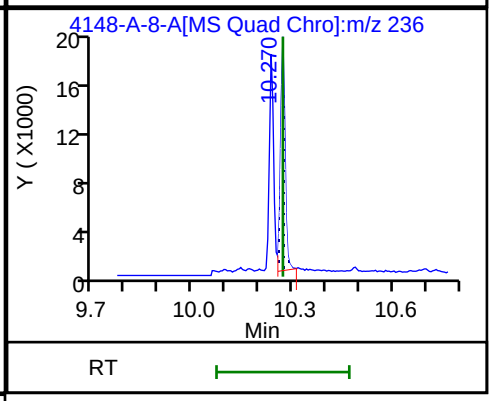
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

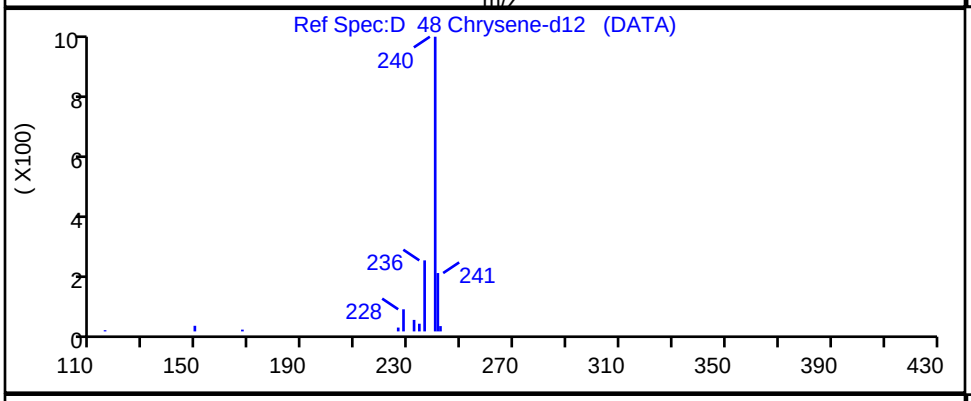
D 48 Chrysene-d12, CAS: 1719-03-5

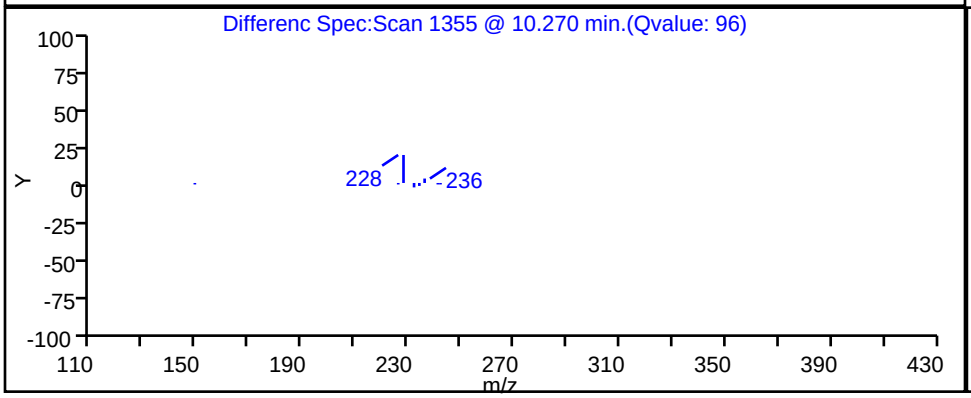


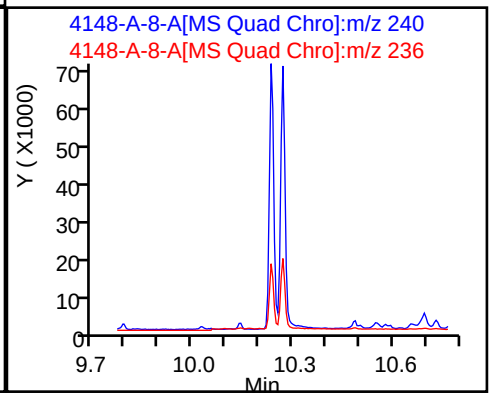












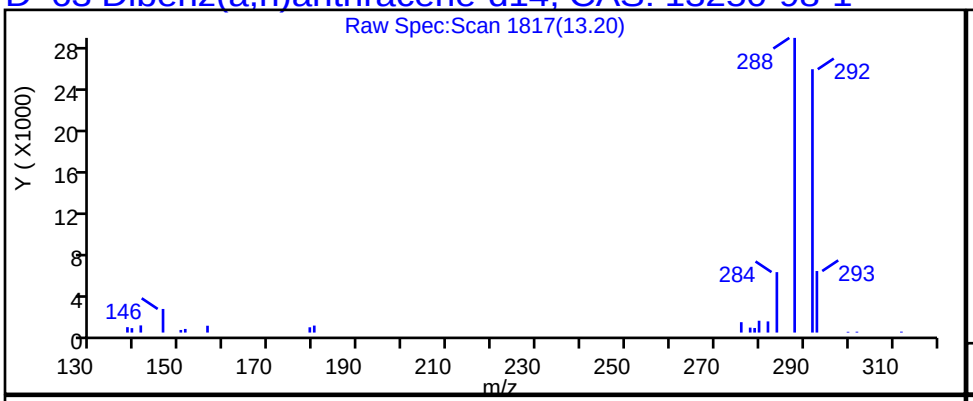
Report Date: 22-Nov-2023 14:15:31 Chrom Revision: 2.3 15-Nov-2023 20:54:34

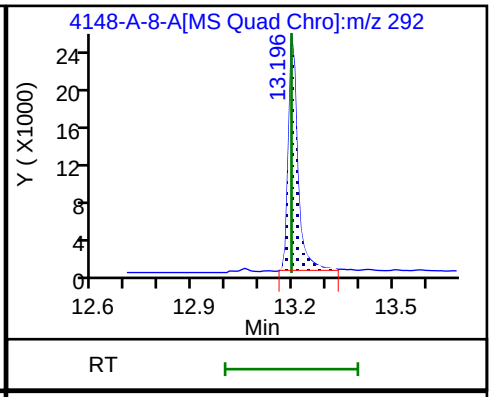
Eurofins Knoxville

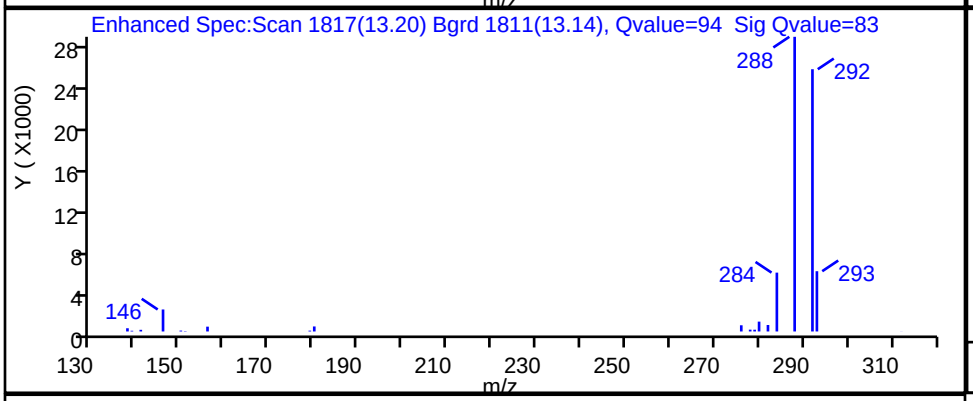
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-8-A.D

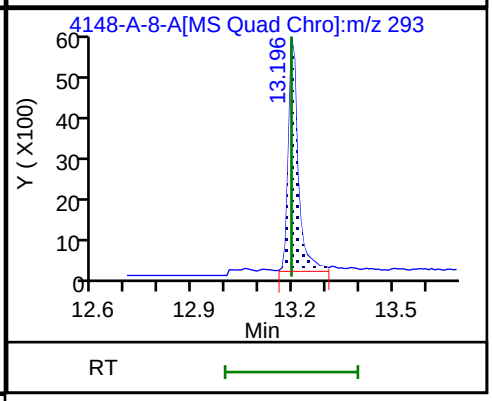
Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11		
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

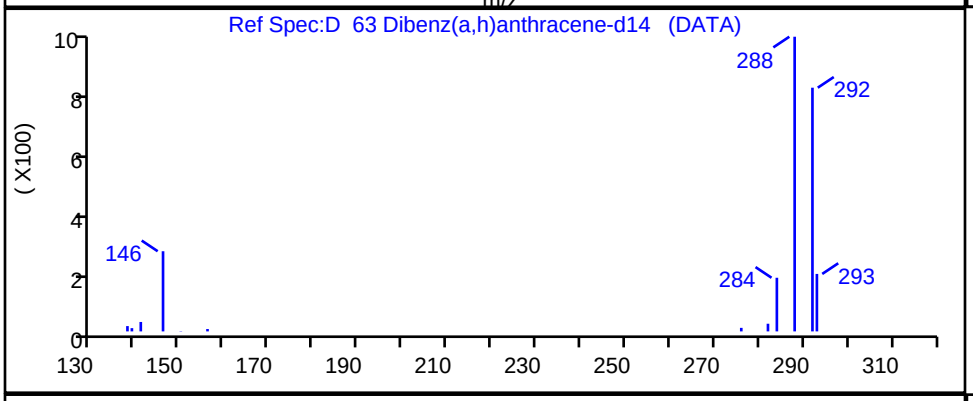
D 63 Dibenz(a,h)anthracene-d14, CAS: 13250-98-1

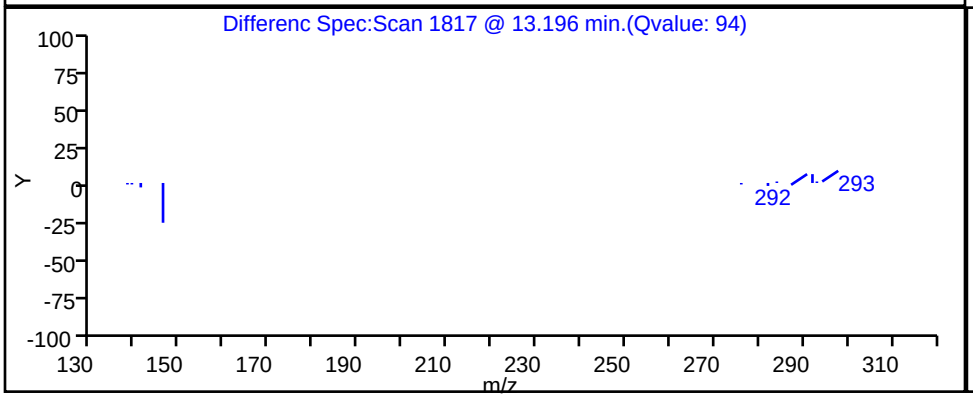


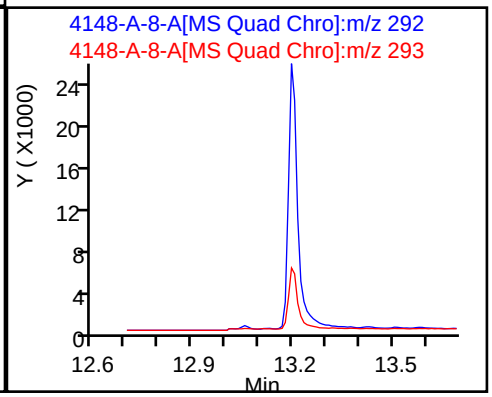












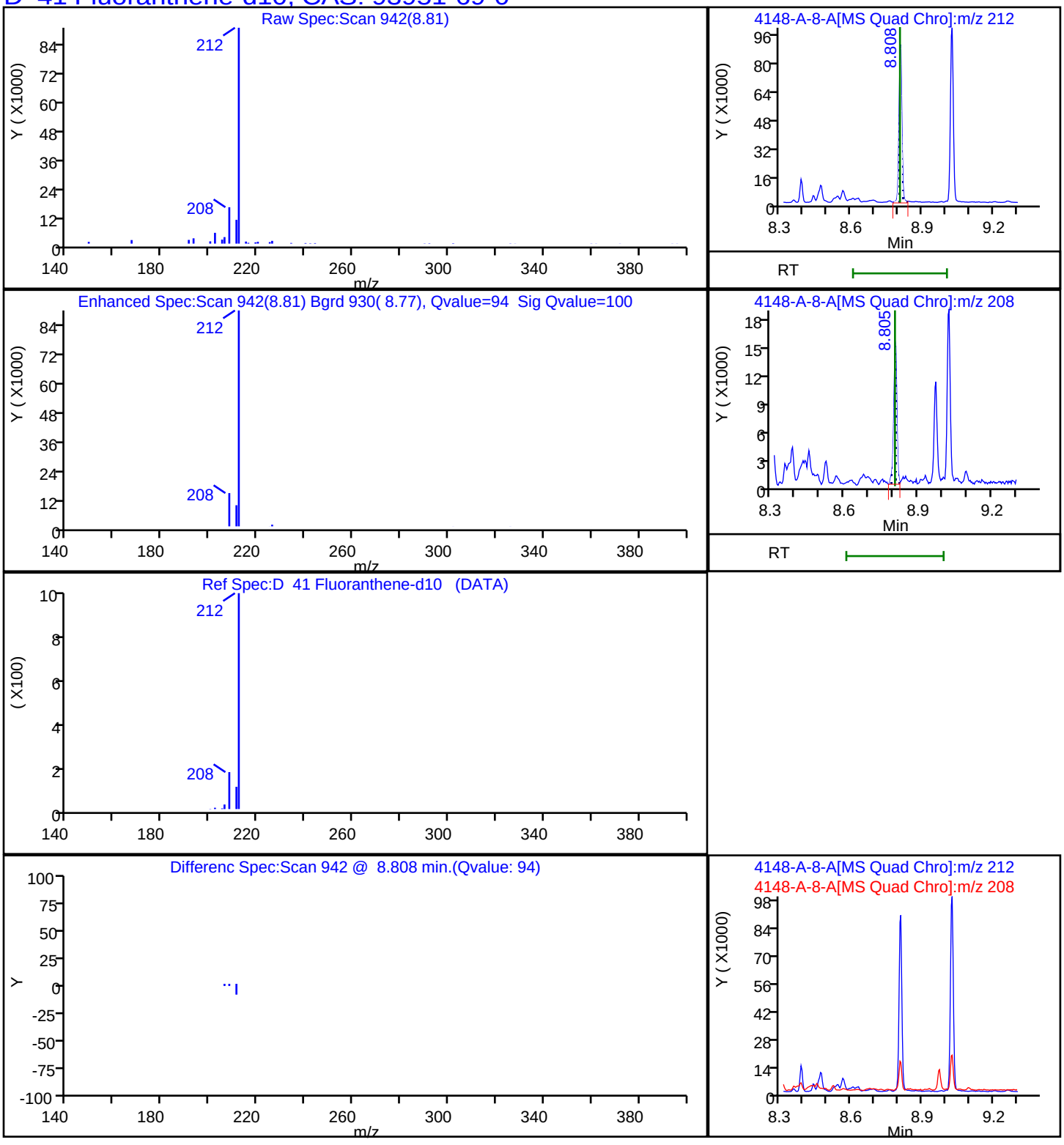
Report Date: 22-Nov-2023 14:15:30 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-8-A.D

Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11		
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D_41 Fluoranthene-d10, CAS: 93951-69-0



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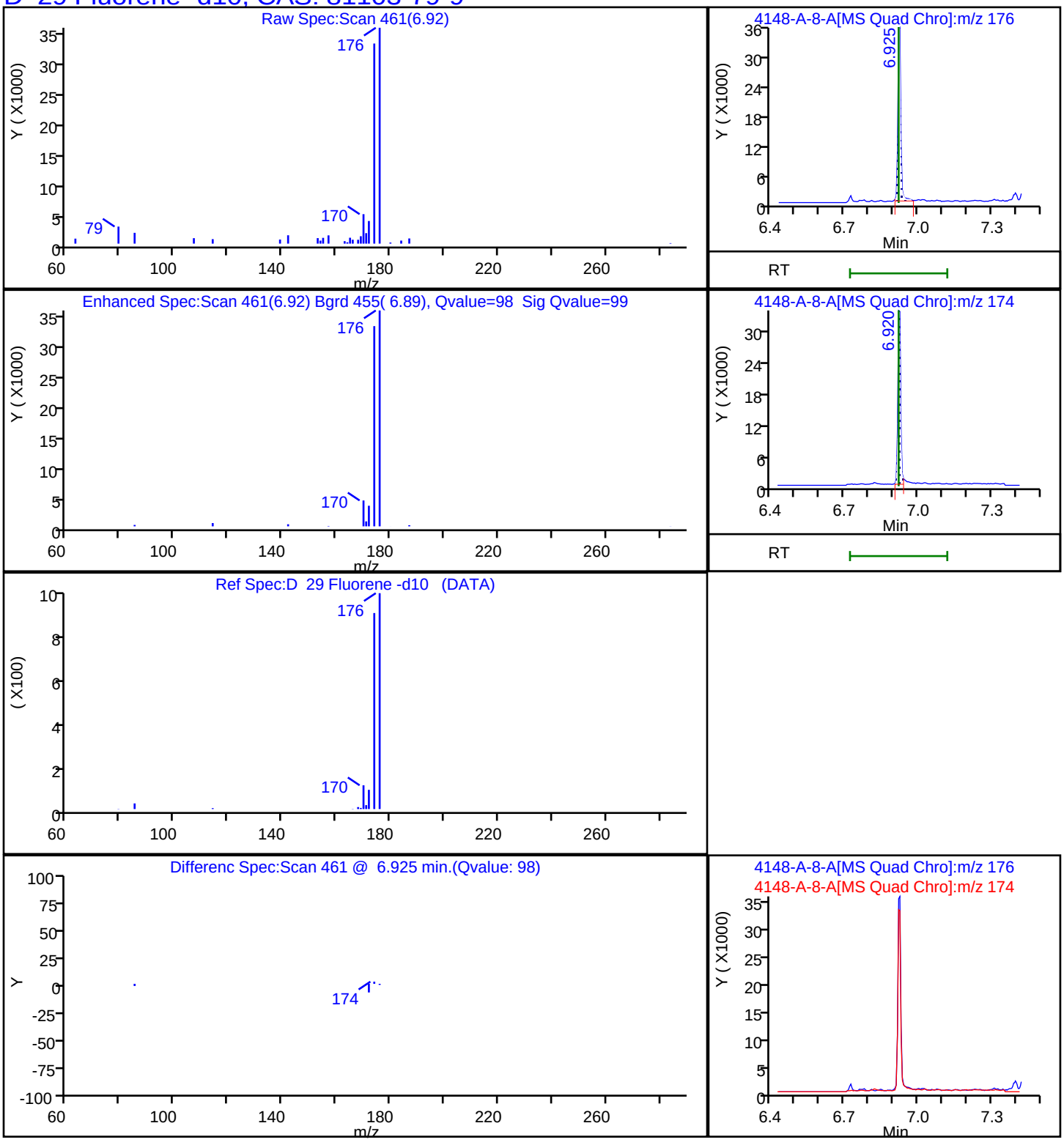
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-8-A.D

Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11		
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 29 Fluorene -d10, CAS: 81103-79-9



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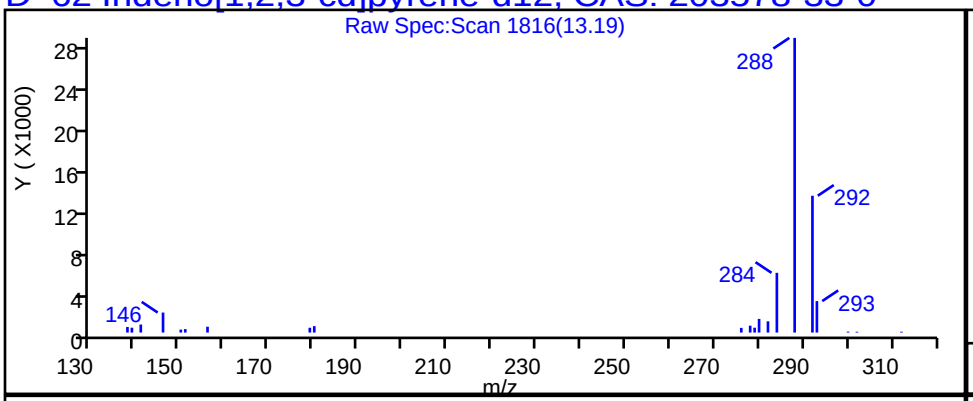
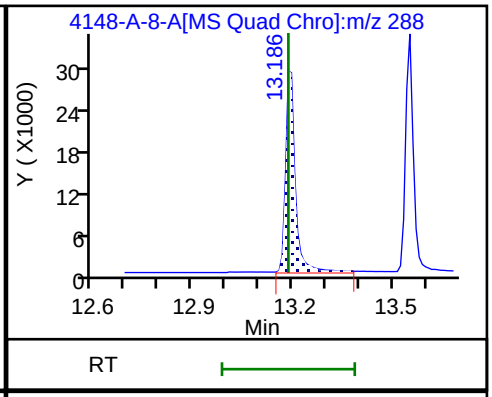
Eurofins Knoxville

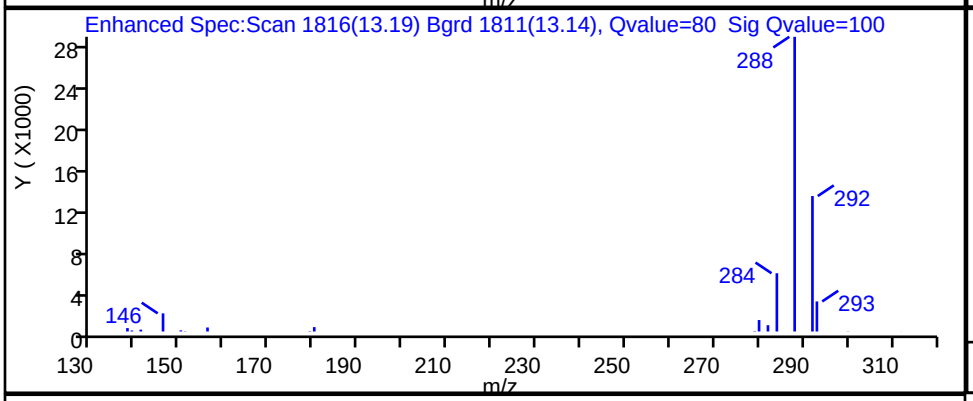
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-8-A.D

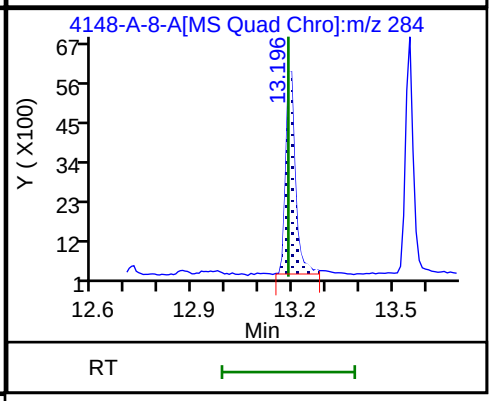
Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11		
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

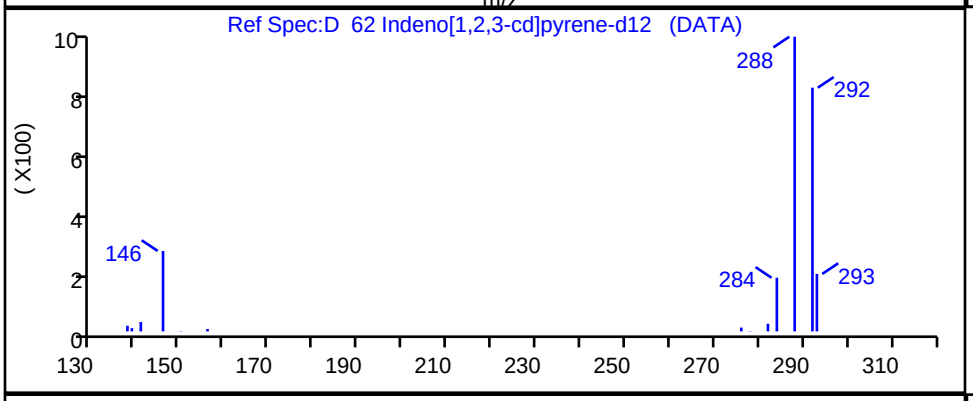
D 62 Indeno[1,2,3-cd]pyrene-d12, CAS: 203578-33-0

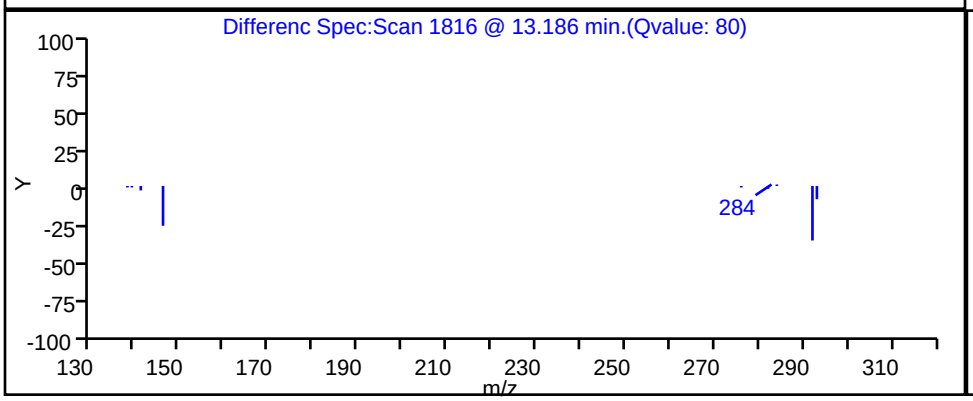


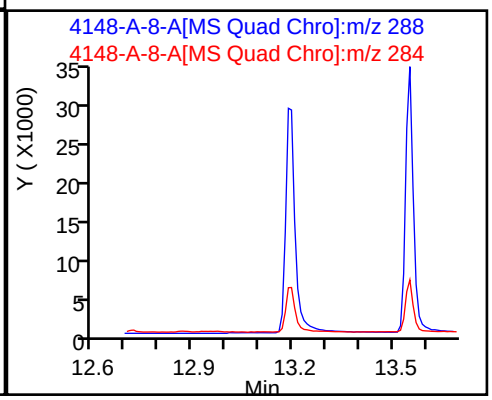












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Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-8-A.D				
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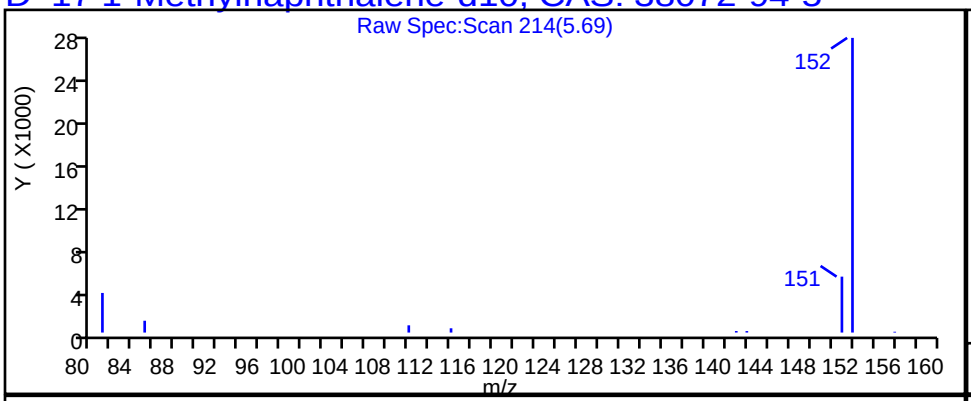
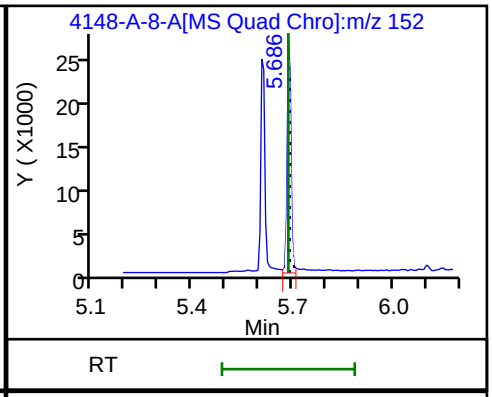
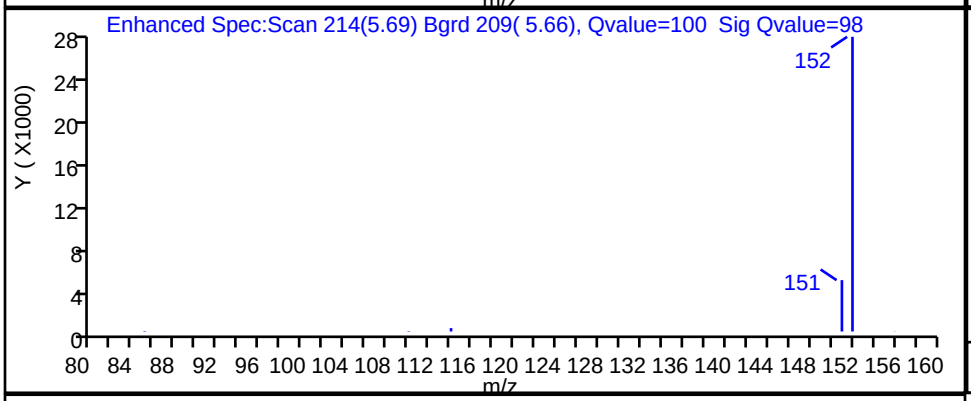
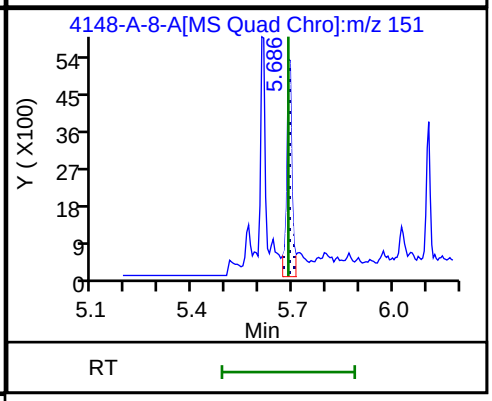
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11		
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

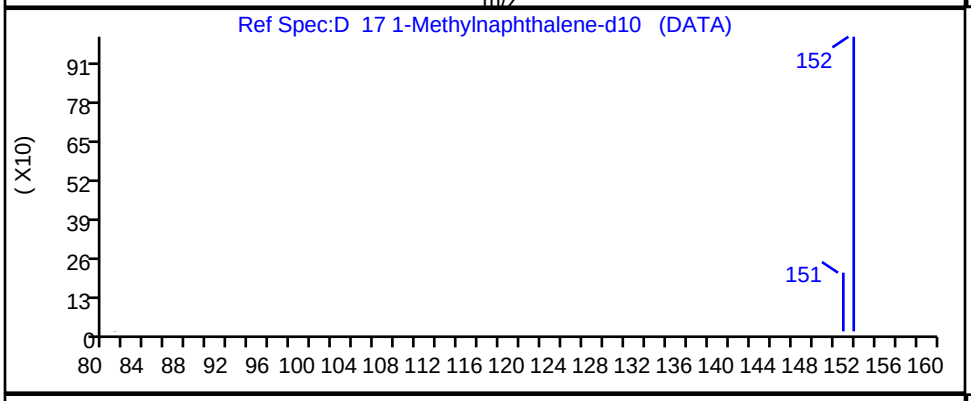
D 17 1-Methylnaphthalene-d10, CAS: 38072-94-5

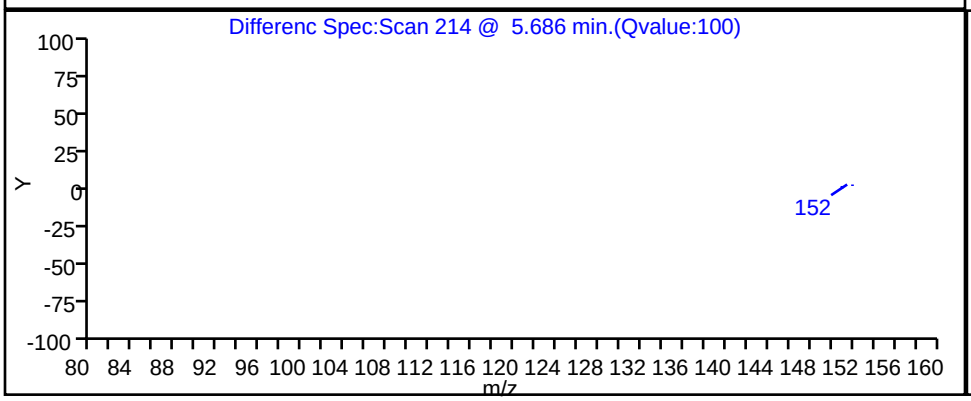


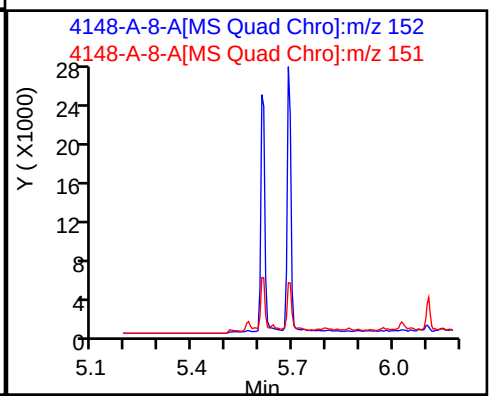












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Eurofins Knoxville

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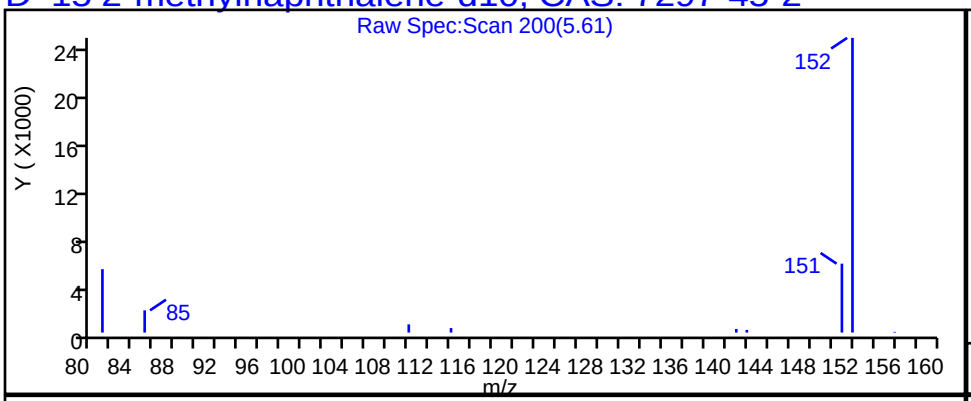
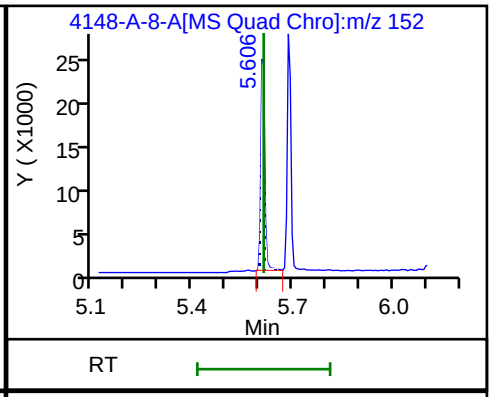
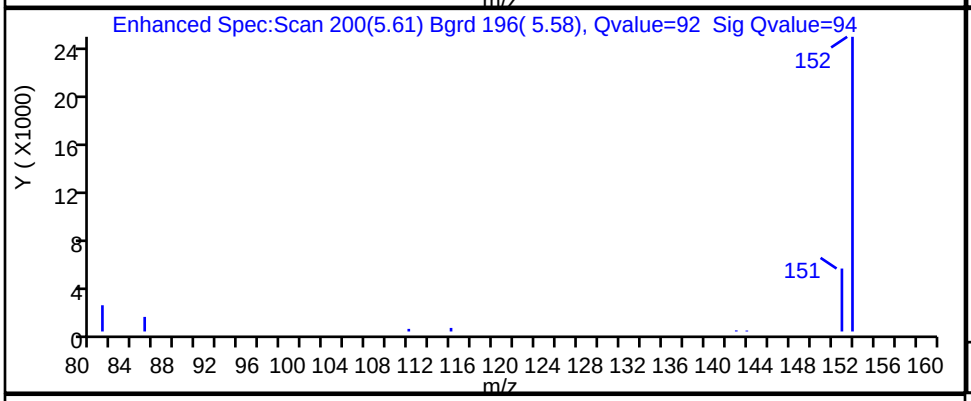
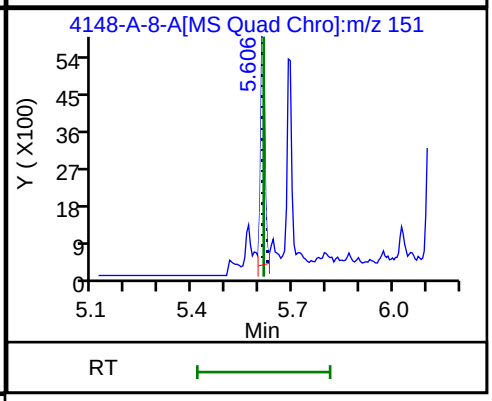
Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11		
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

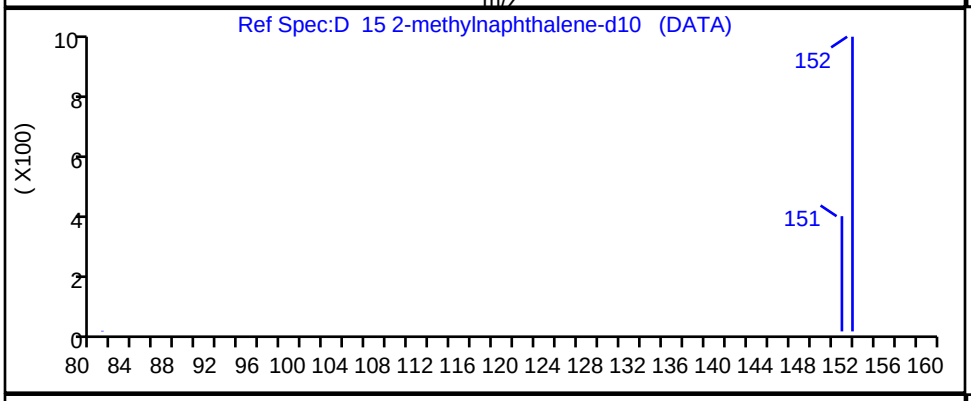
D 15 2-methylnaphthalene-d10, CAS: 7297-45-2

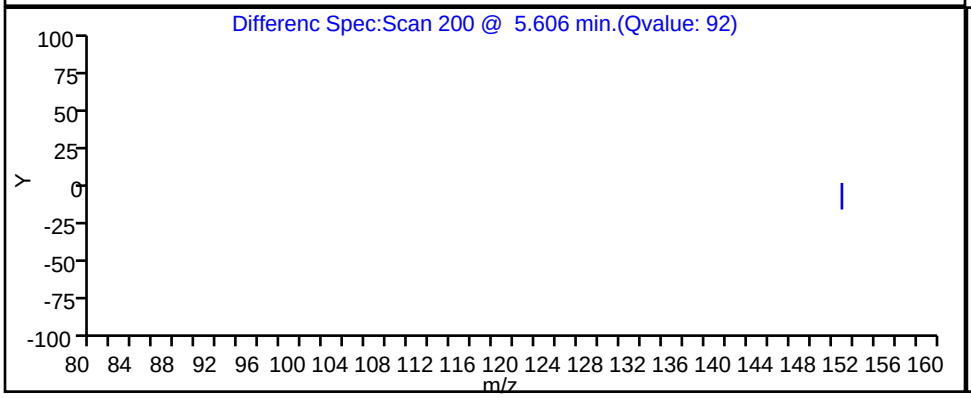


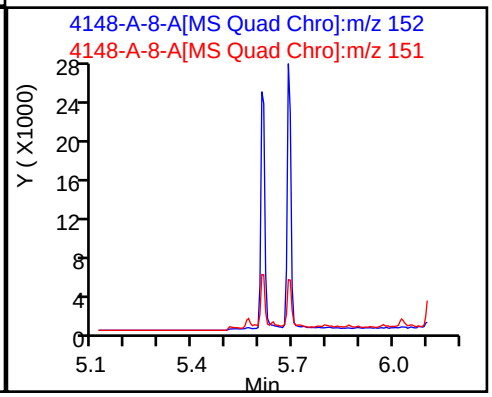












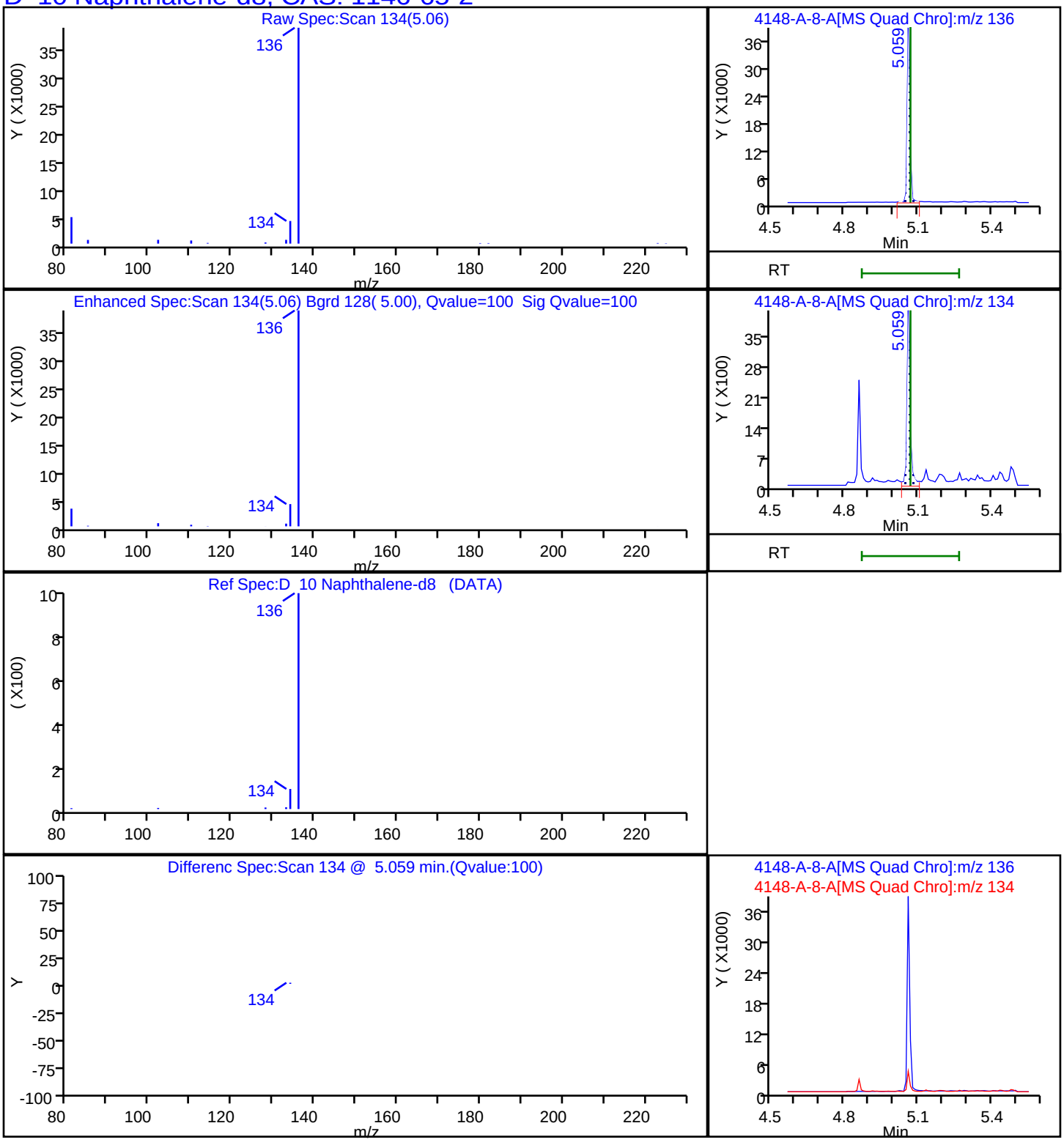
Report Date: 22-Nov-2023 14:15:30 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-8-A.D

Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11		
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D_10 Naphthalene-d8, CAS: 1146-65-2



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Eurofins Knoxville

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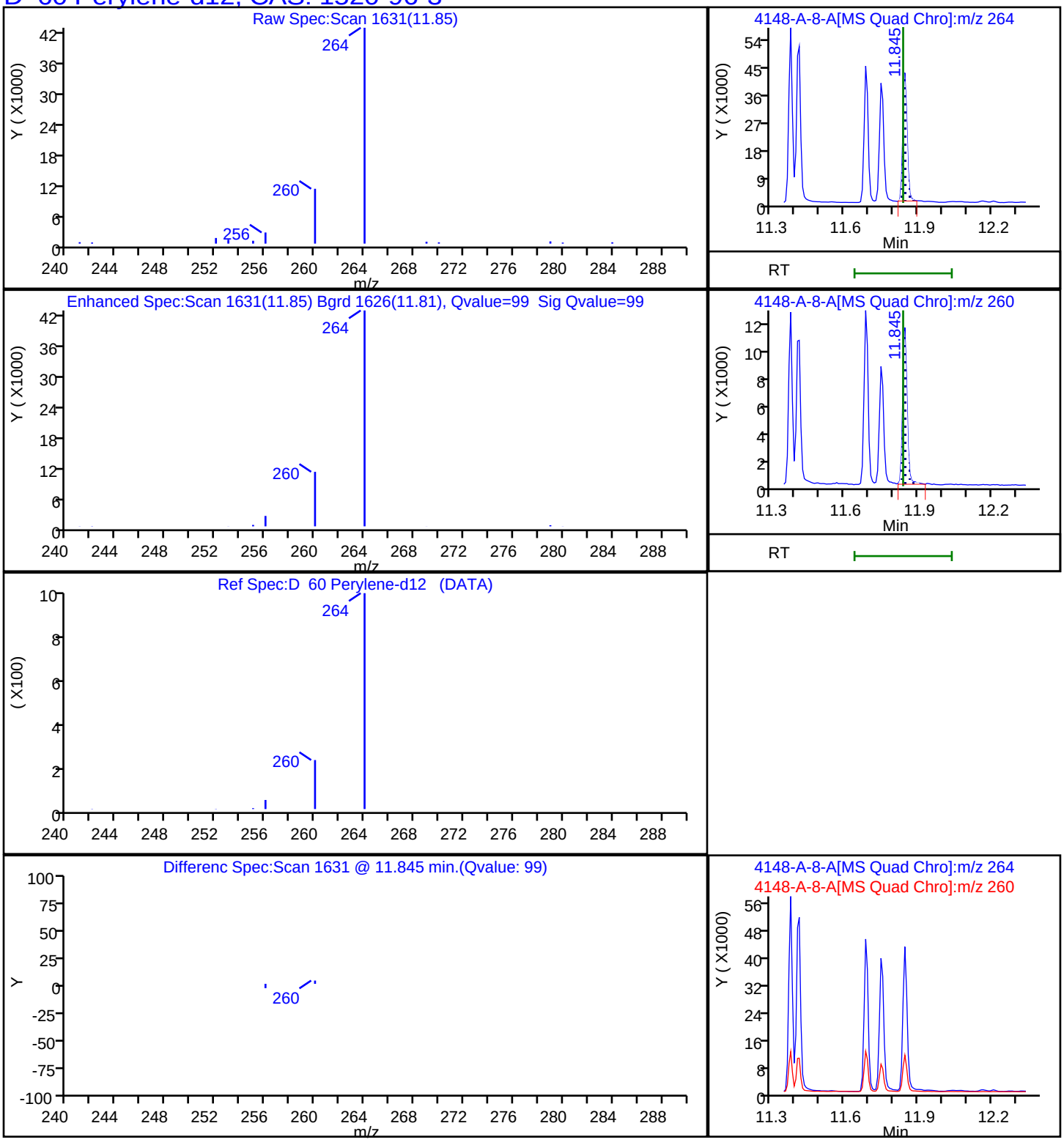
Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11		
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 60 Perylene-d12, CAS: 1520-96-3



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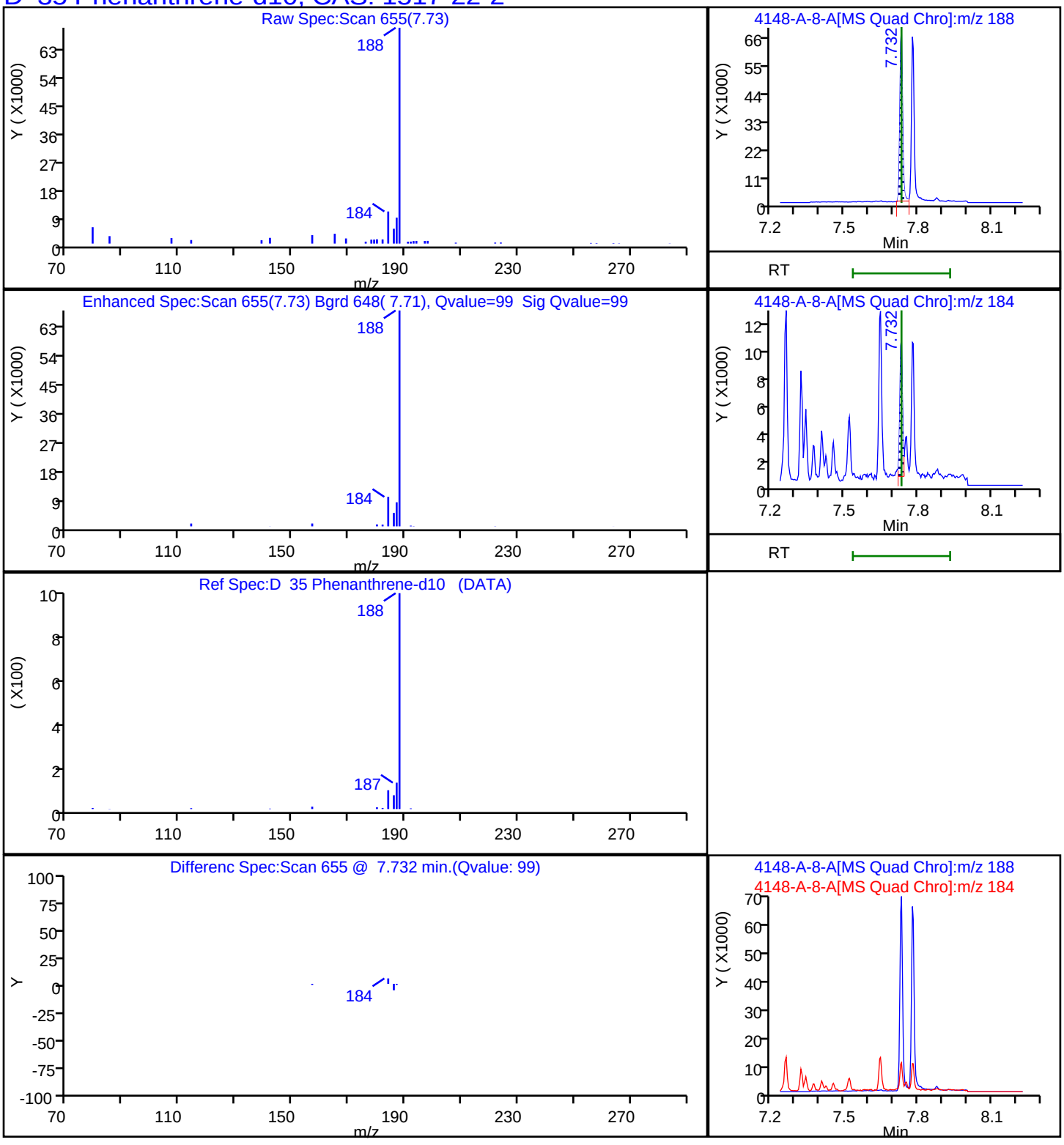
Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-8-A.D				
Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11		
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D_35 Phenanthrene-d10, CAS: 1517-22-2



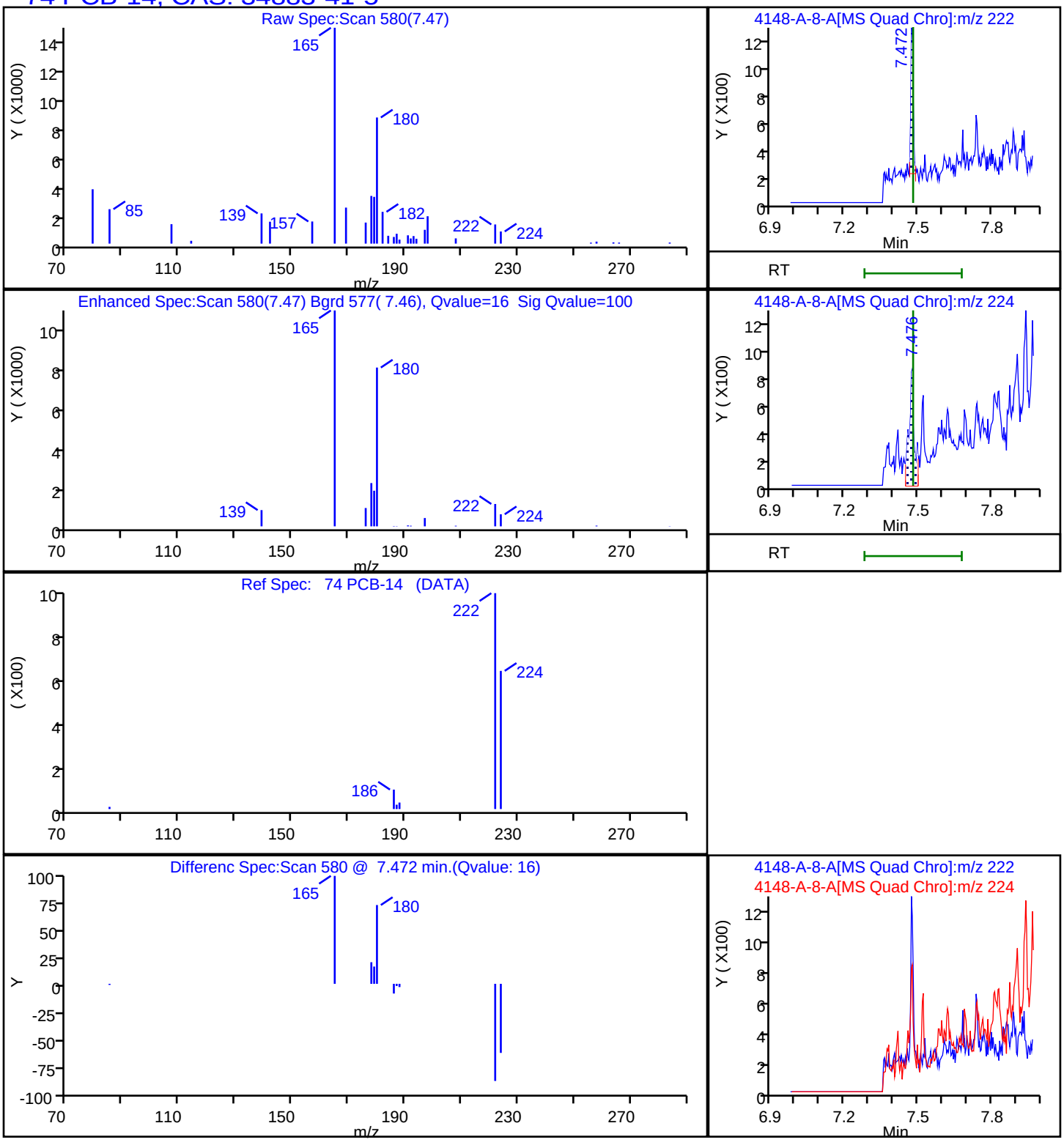
Report Date: 22-Nov-2023 14:15:31 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-8-A.D

Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11		
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

74 PCB-14, CAS: 34883-41-5



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Eurofins Knoxville

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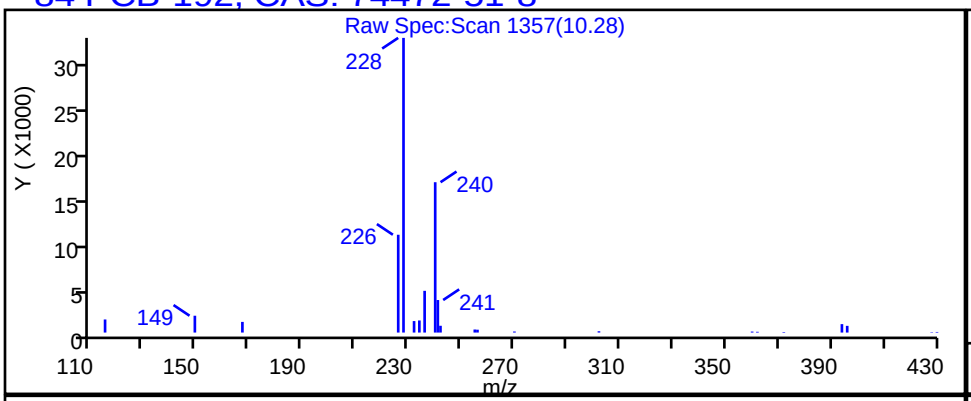
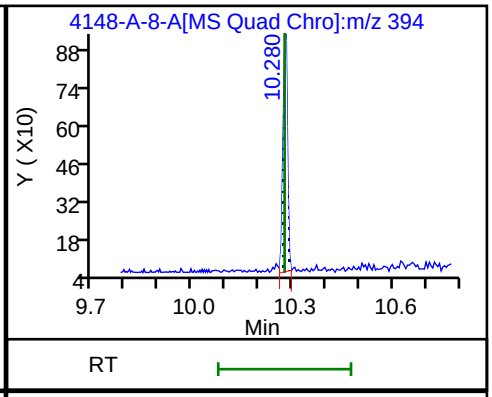
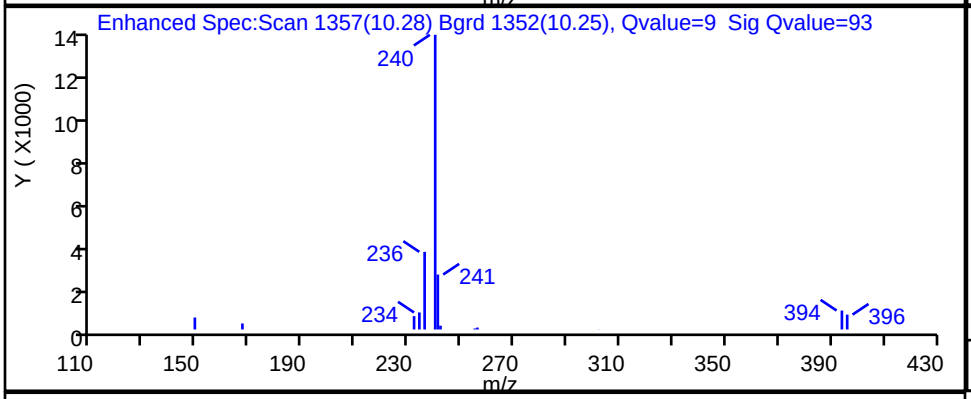
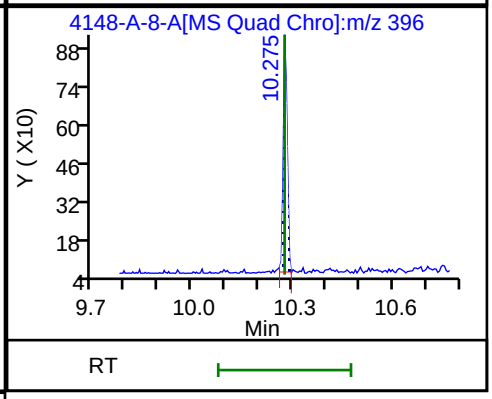
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11
Client ID:	1804576-844-S3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

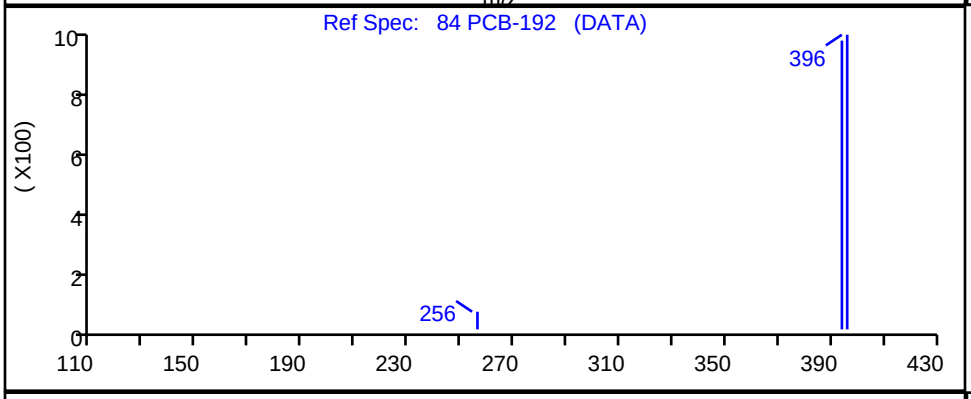
84 PCB-192, CAS: 74472-51-8

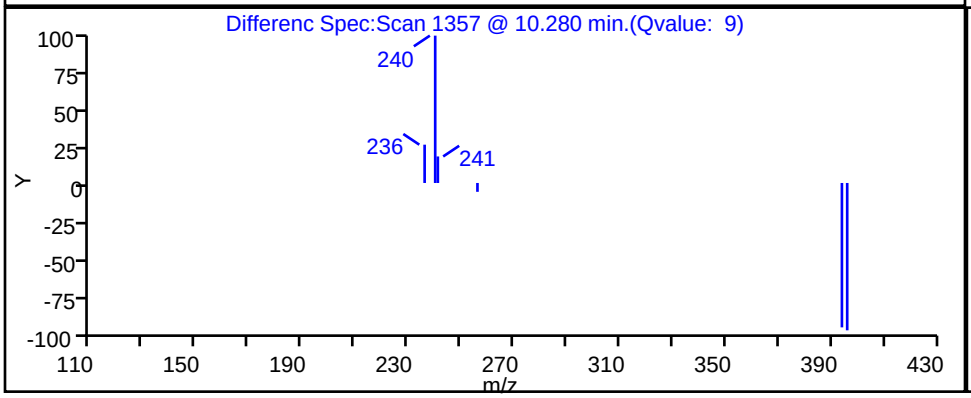


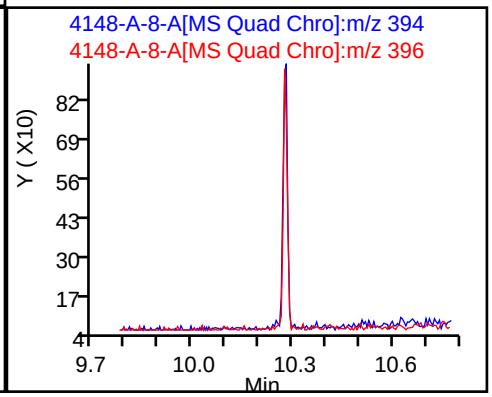












Report Date: 22-Nov-2023 14:15:31 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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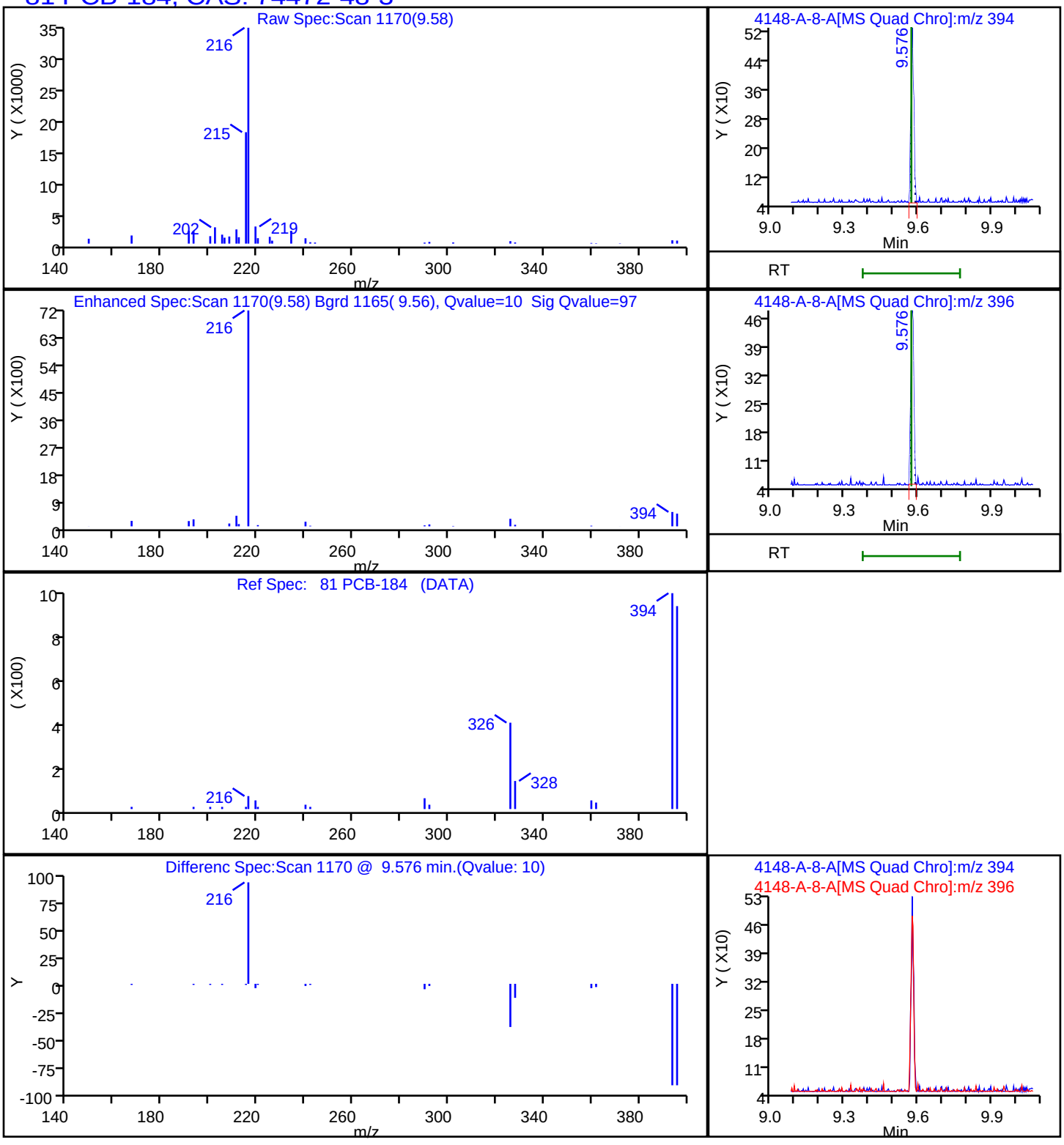
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11		
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

81 PCB-184, CAS: 74472-48-3



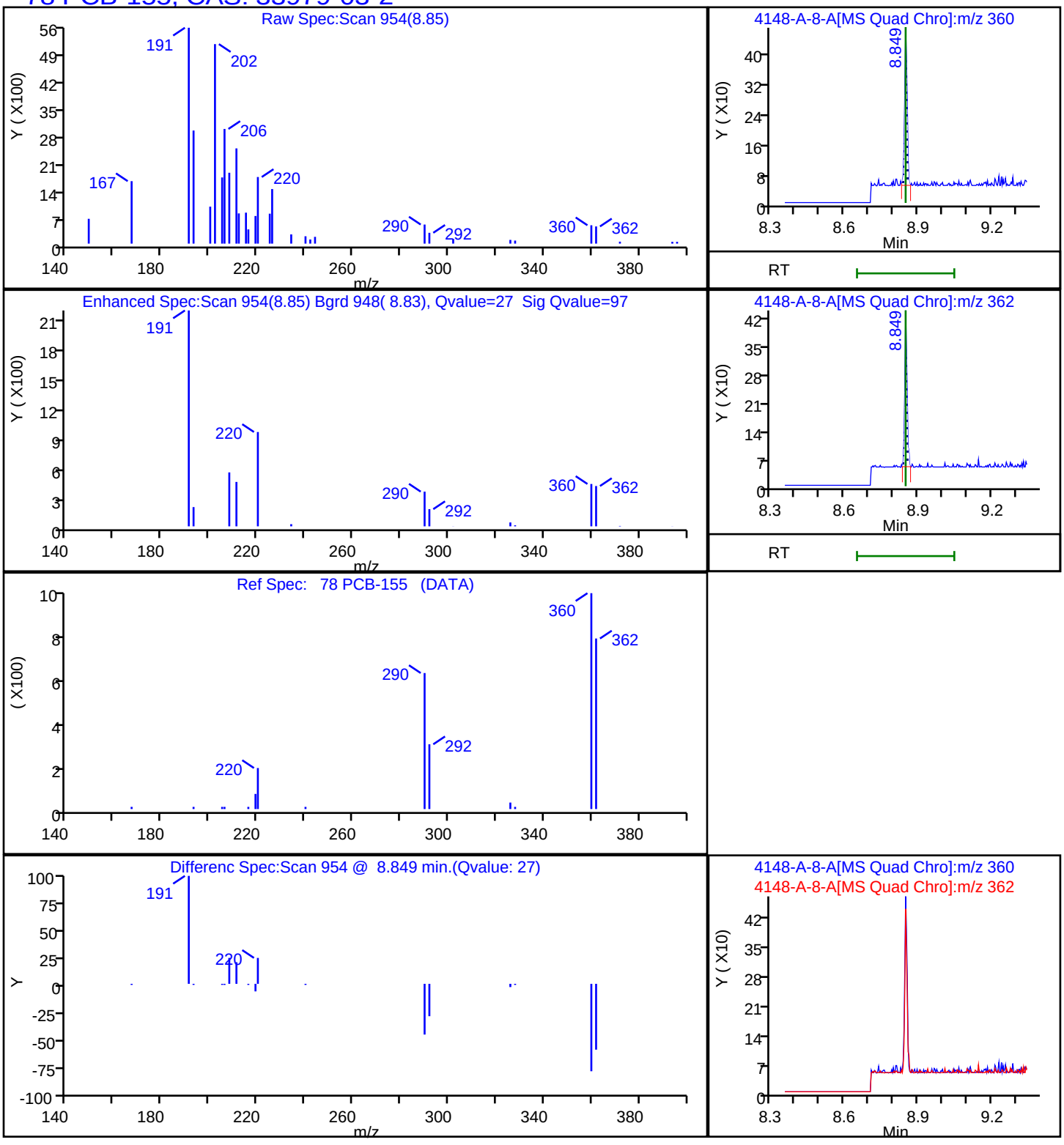
Report Date: 22-Nov-2023 14:15:31 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-8-A.D

Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11		
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

78 PCB-155, CAS: 33979-03-2



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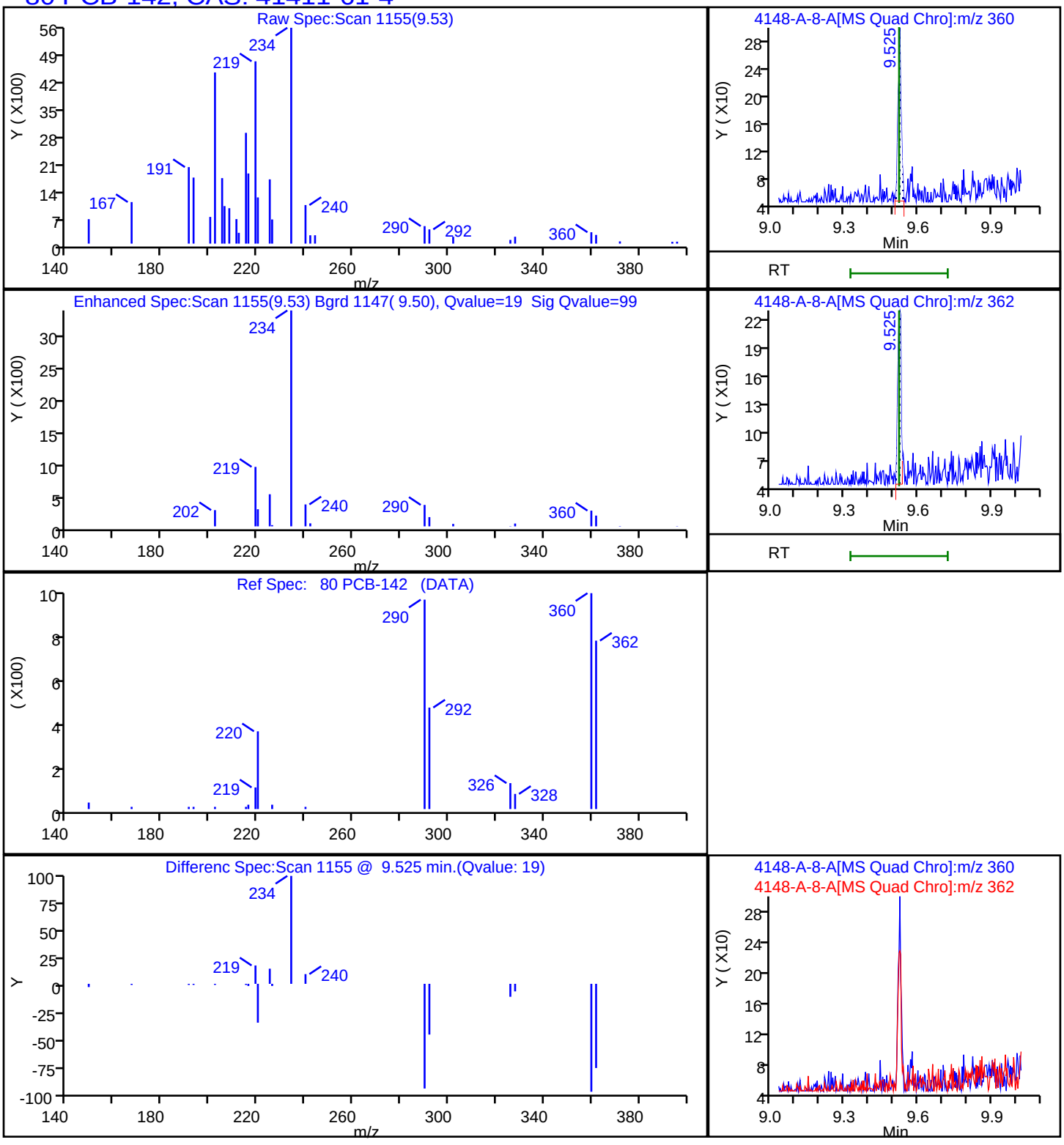
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-8-A.D

Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11
Client ID:	1804576-844-S3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

80 PCB-142, CAS: 41411-61-4



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Eurofins Knoxville

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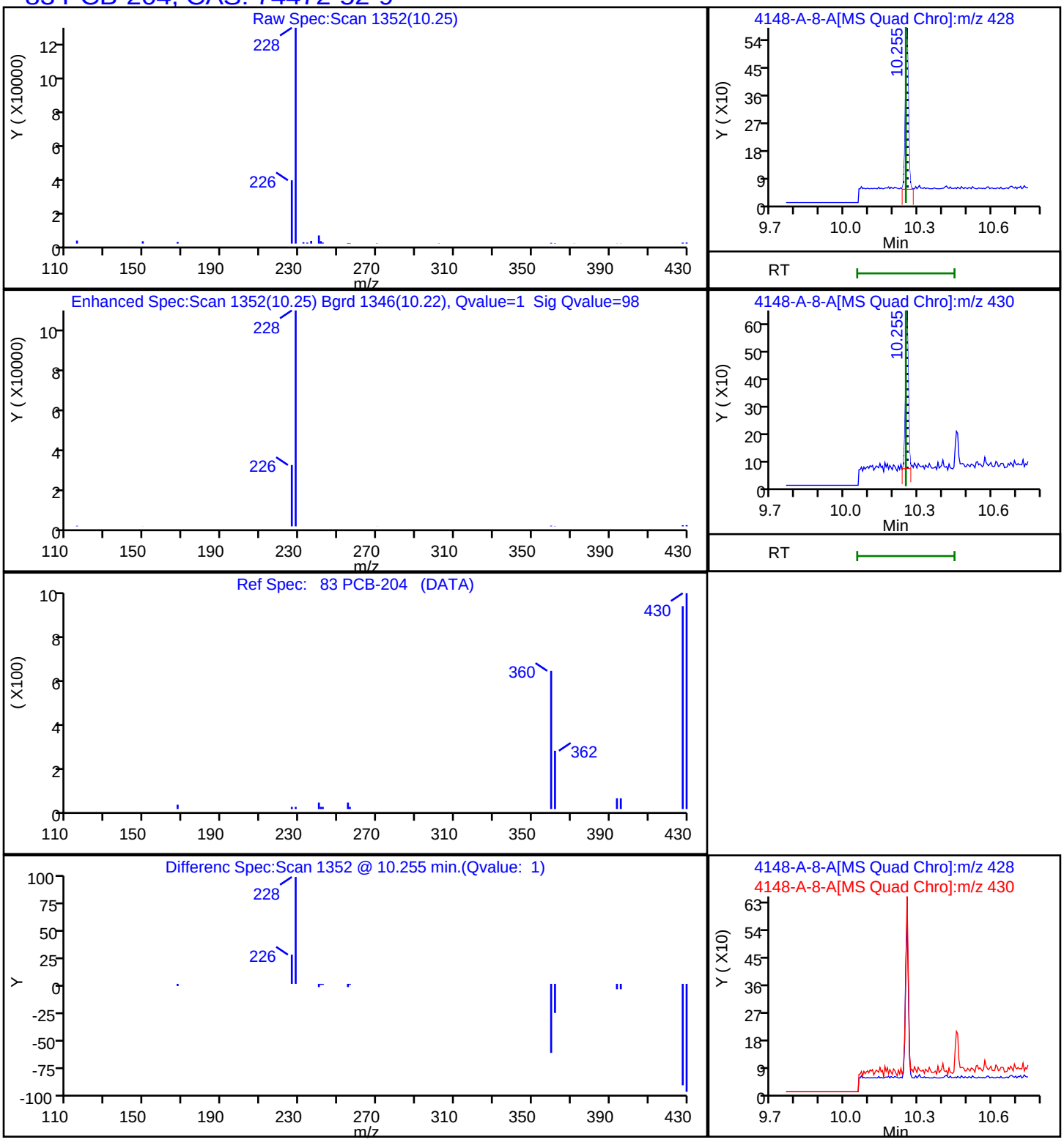
Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11		
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

83 PCB-204, CAS: 74472-52-9



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Eurofins Knoxville

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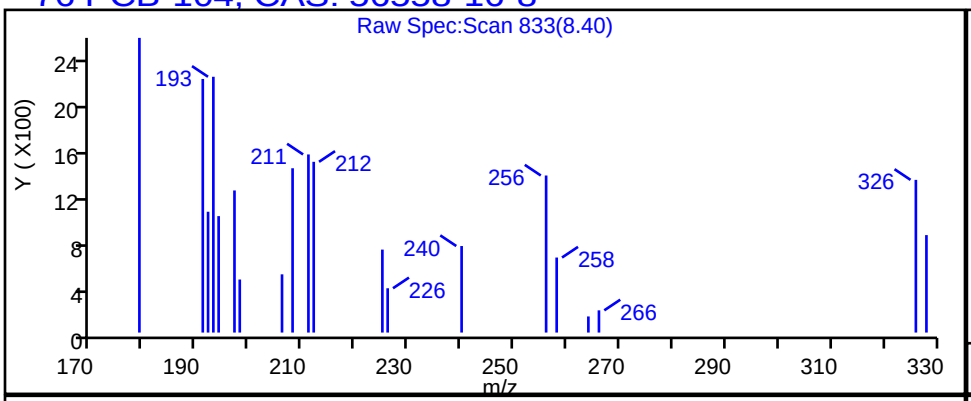
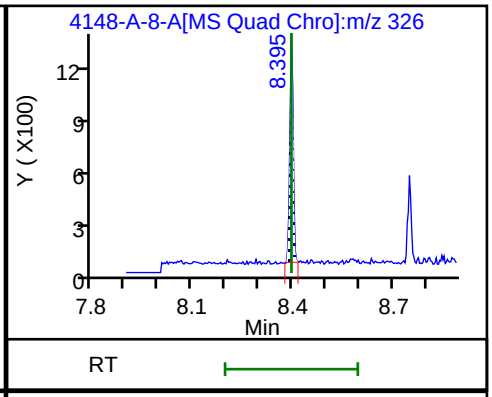
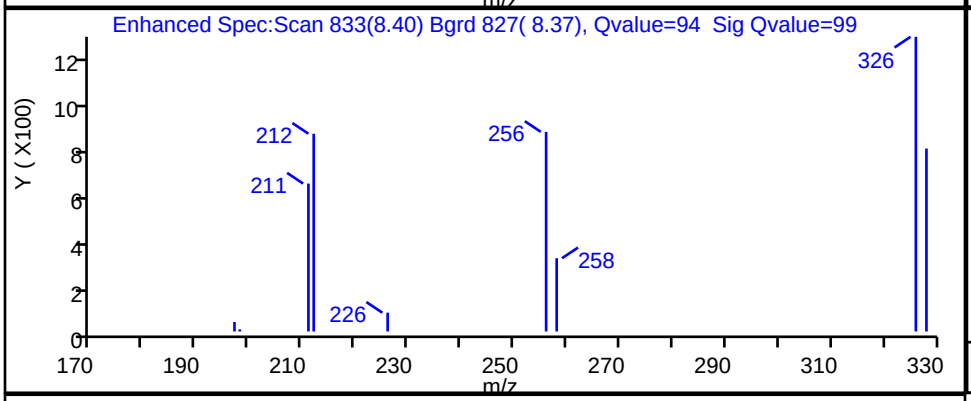
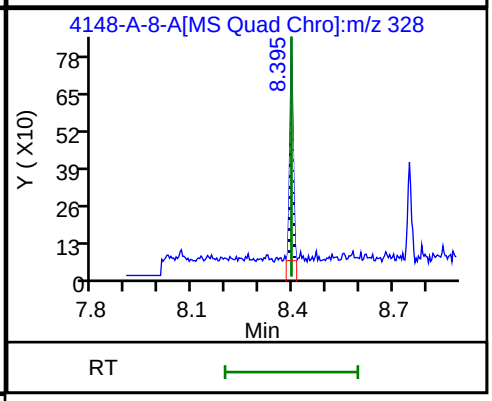
Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11		
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

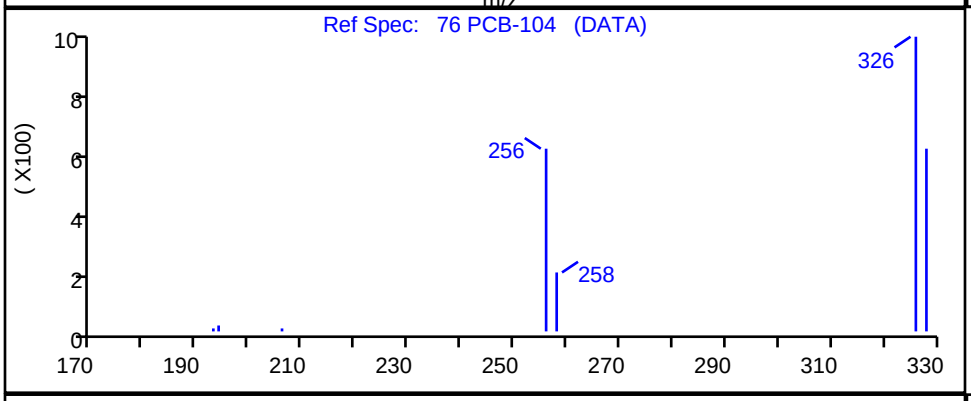
76 PCB-104, CAS: 56558-16-8

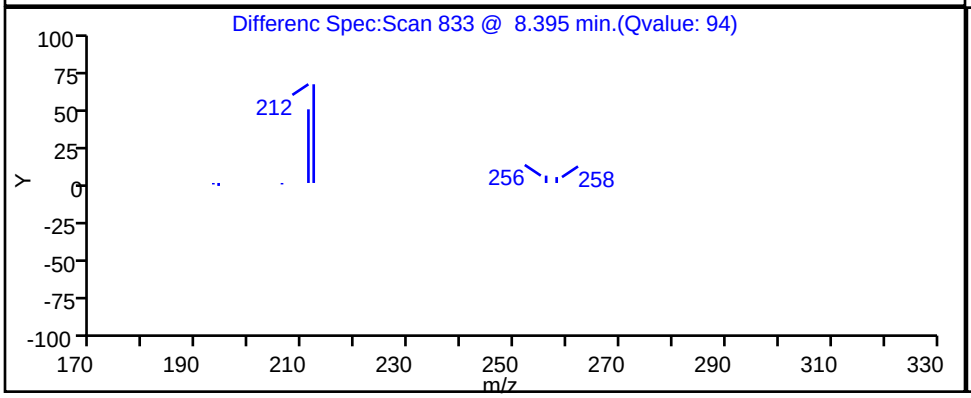


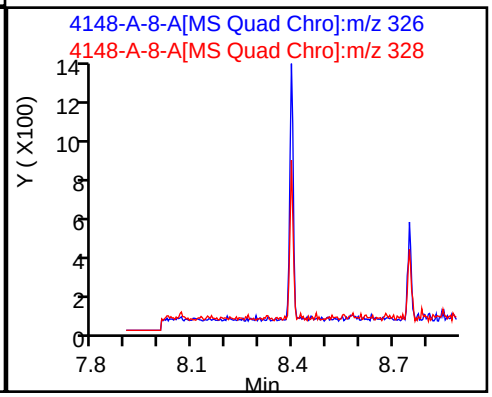












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Eurofins Knoxville

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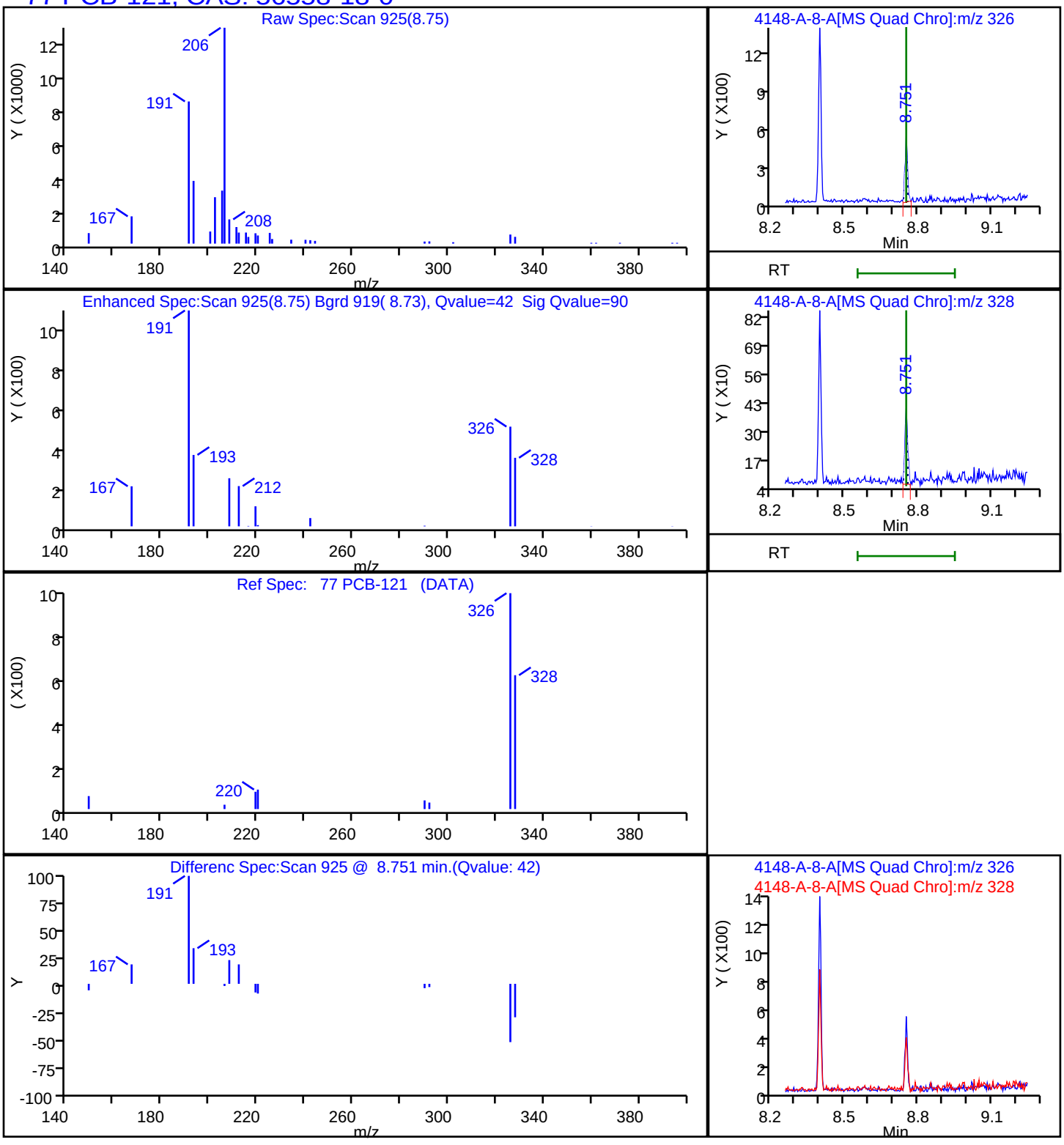
Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11
Client ID:	1804576-844-S3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

77 PCB-121, CAS: 56558-18-0



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Eurofins Knoxville

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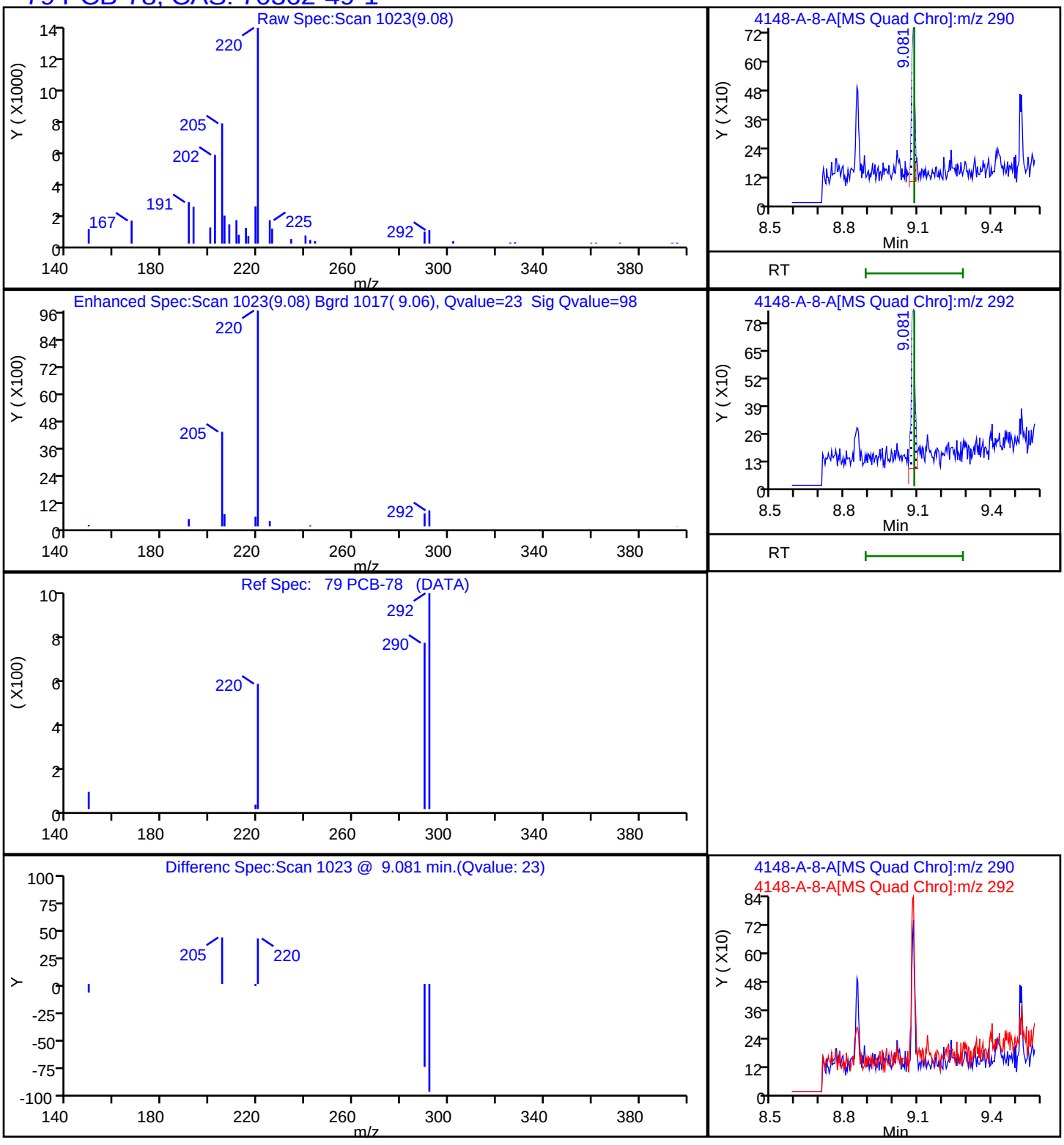
Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11
Client ID:	1804576-844-S3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

79 PCB-78, CAS: 70362-49-1



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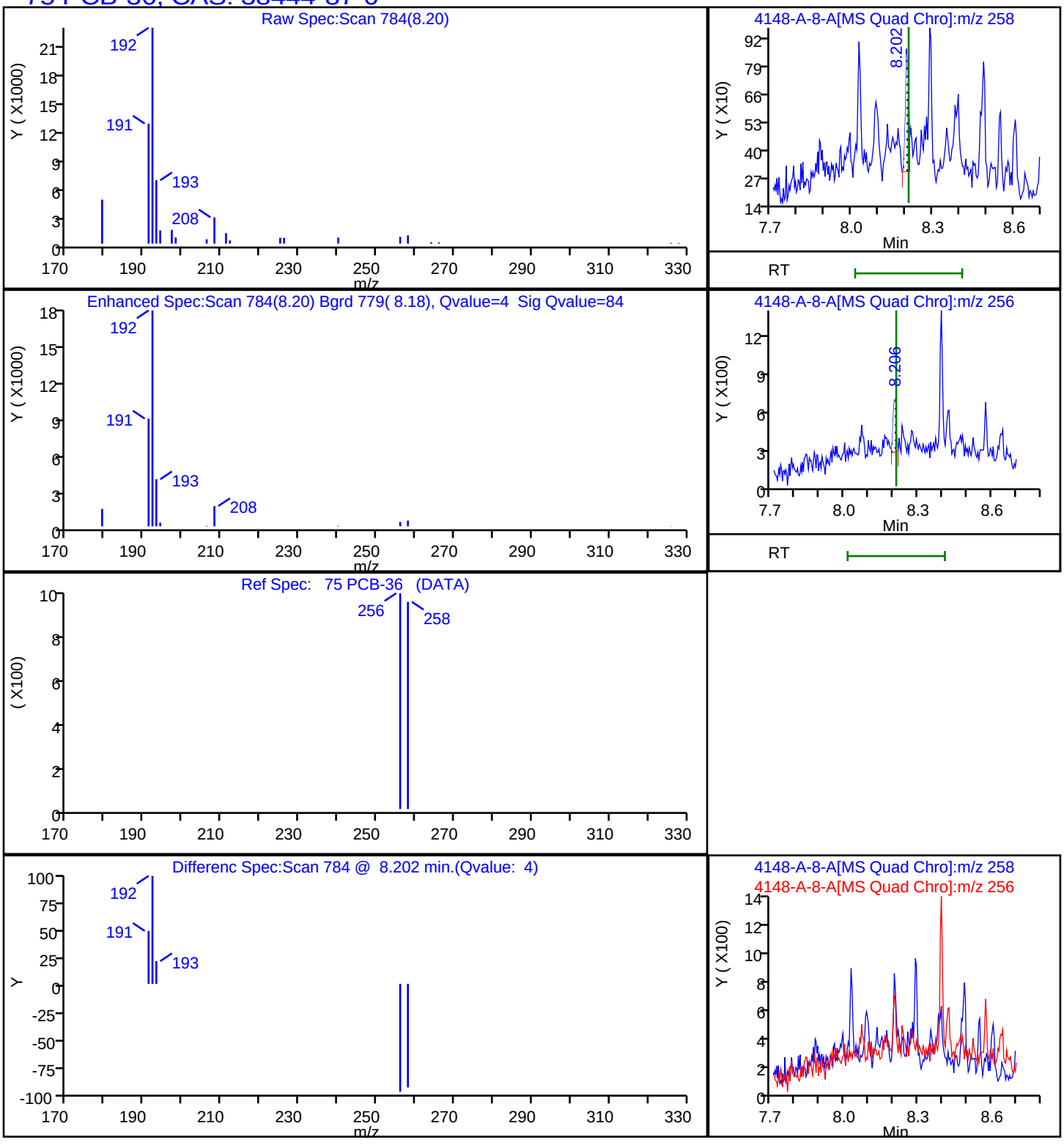
Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11		
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

75 PCB-36, CAS: 38444-87-0



Manual Integration/User Assign Peak Report

Eurofins Knoxville

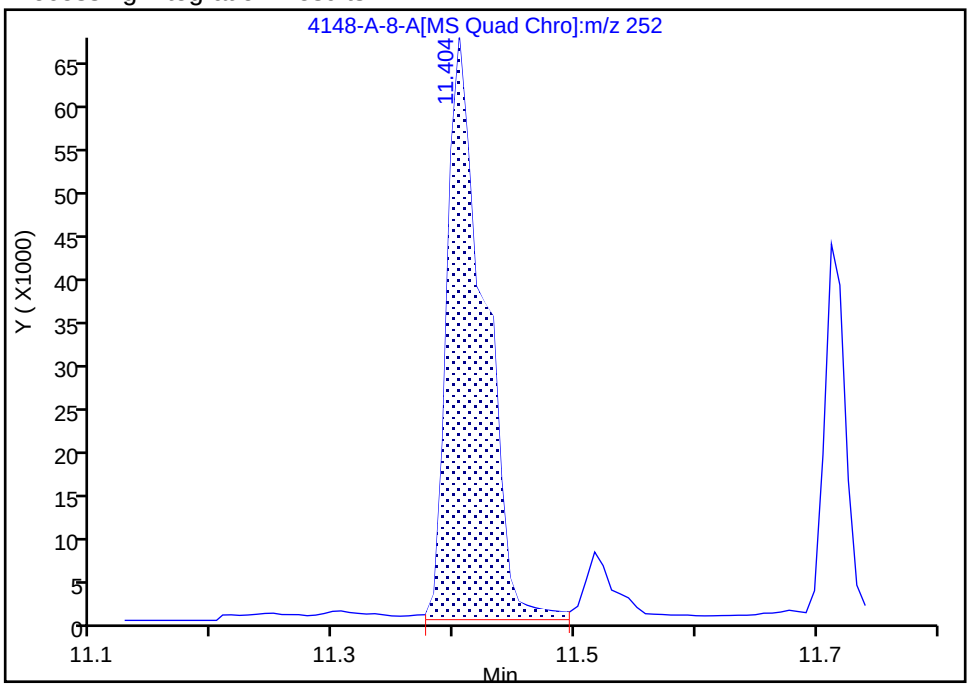
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-8-A.D				
Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11		
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

53 Benzo[b]fluoranthene, CAS: 205-99-2

Signal: 1

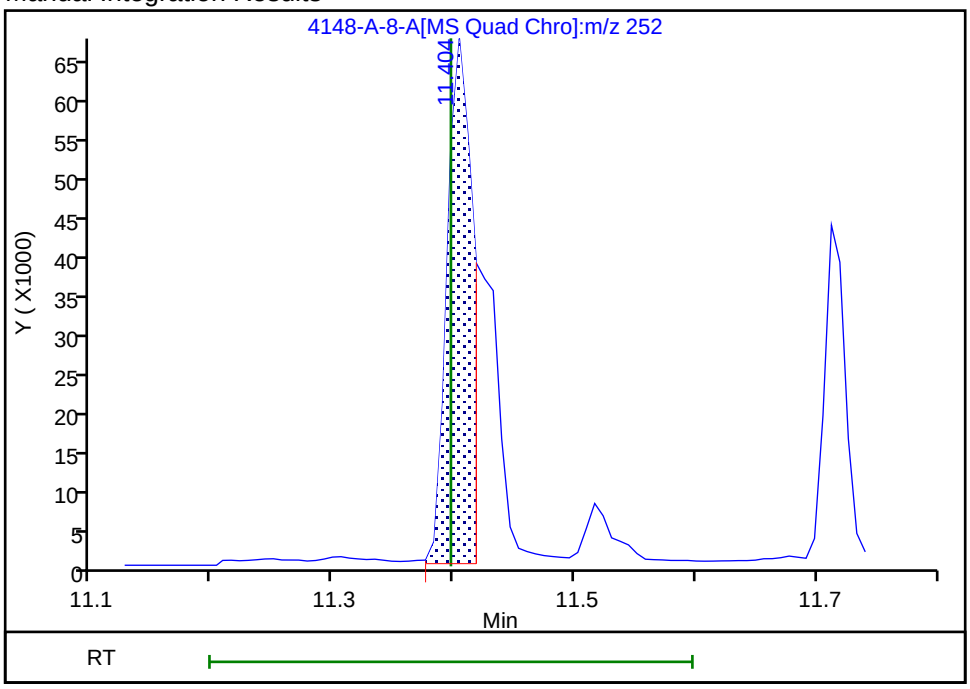
Processing Integration Results

RT: 11.40
Area: 141960
Amount: 0.709400
Amount Units: ug/ml



Manual Integration Results

RT: 11.40
Area: 99925
Amount: 0.499343
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 09:44:12 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

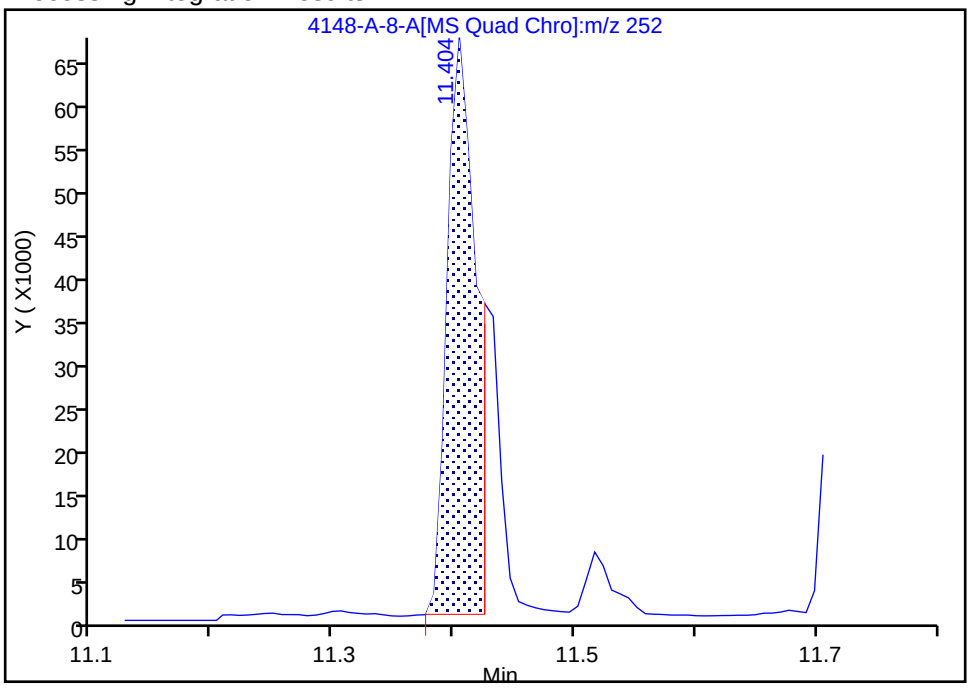
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-8-A.D				
Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11		
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

55 Benzo[k]fluoranthene, CAS: 207-08-9

Signal: 1

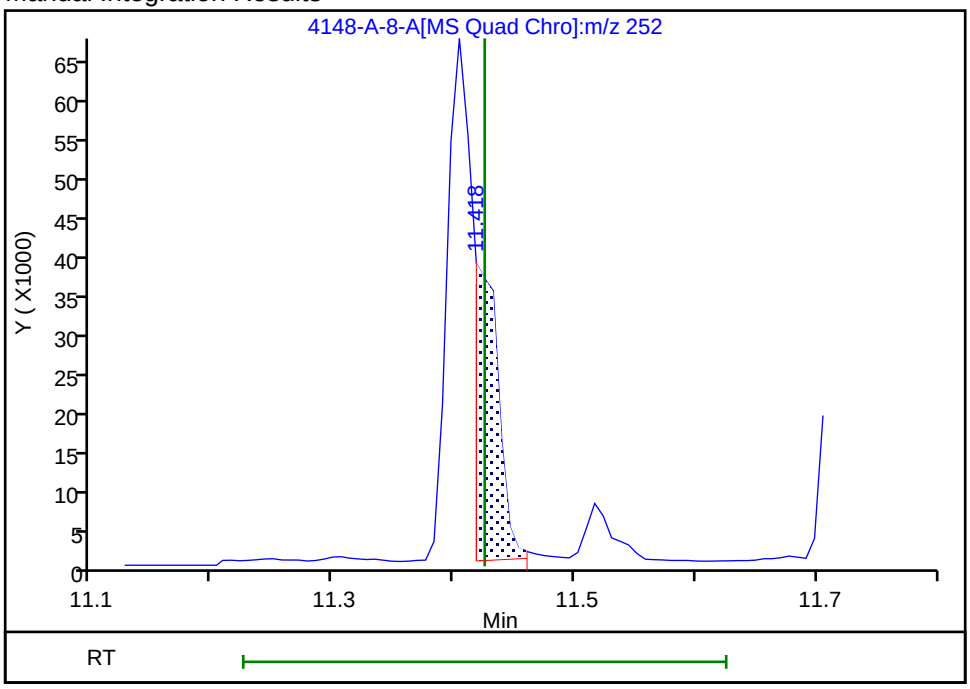
Processing Integration Results

RT: 11.40
Area: 113520
Amount: 0.581615
Amount Units: ug/ml



Manual Integration Results

RT: 11.42
Area: 54703
Amount: 0.280269
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 09:45:50 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

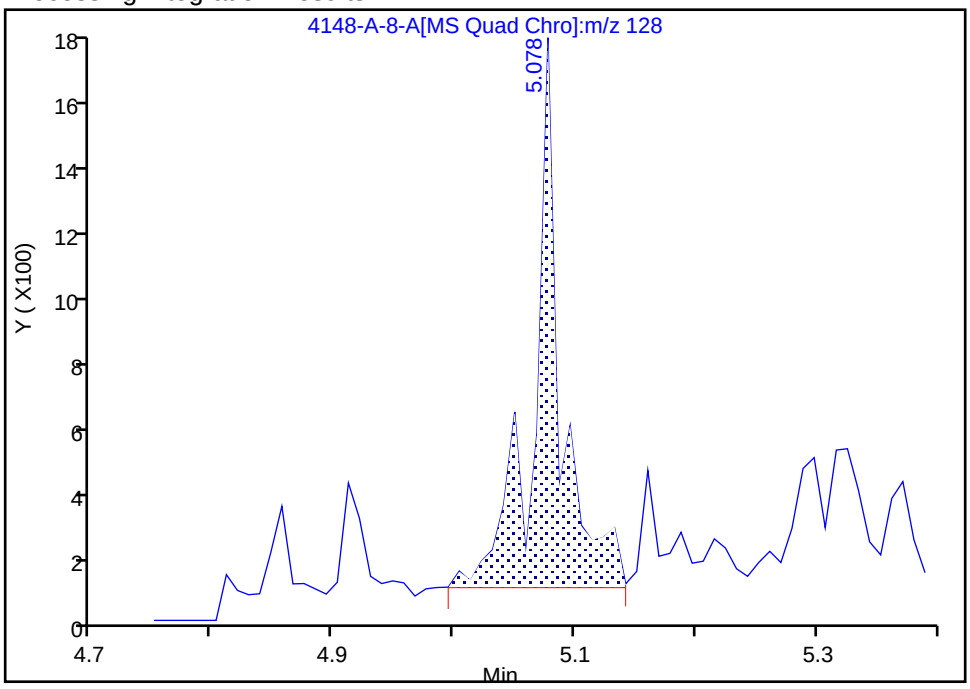
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-8-A.D				
Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11		
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

11 Naphthalene, CAS: 91-20-3

Signal: 1

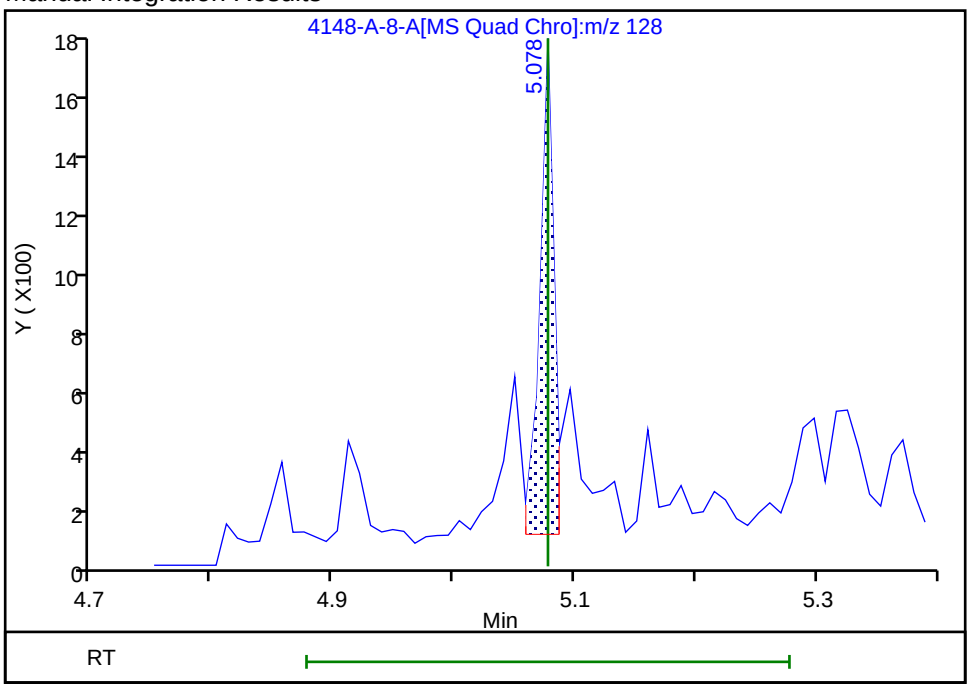
Processing Integration Results

RT: 5.08
Area: 2619
Amount: 0.038057
Amount Units: ug/ml



Manual Integration Results

RT: 5.08
Area: 1403
Amount: 0.020387
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 09:46:27 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Eurofins Knoxville

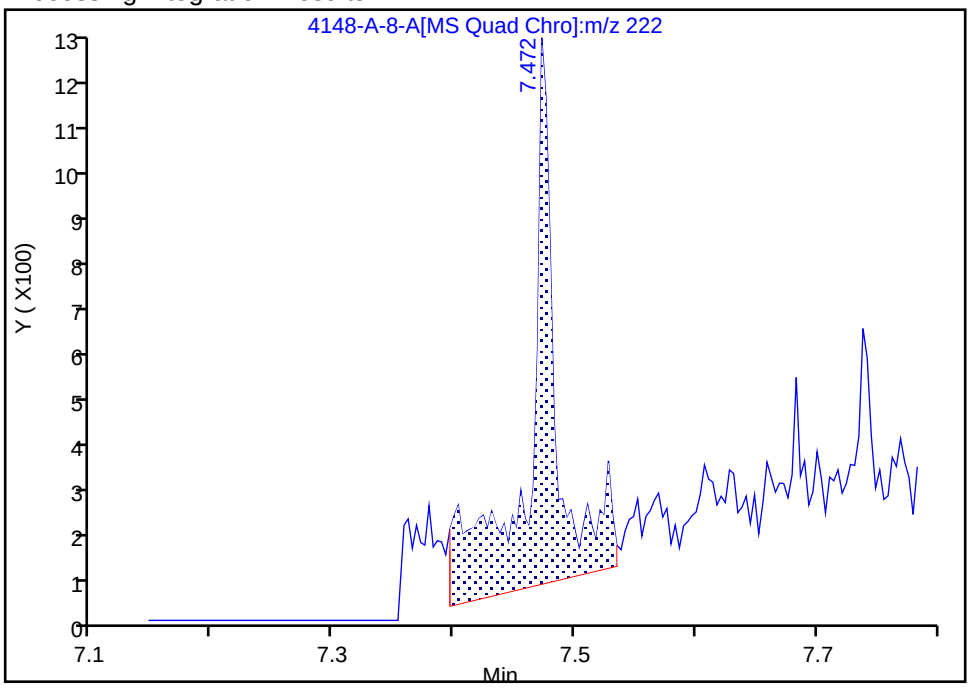
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-8-A.D				
Injection Date:	16-Nov-2023 17:48:22	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-11-A	Lab Sample ID:	140-34148-11		
Client ID:	1804576-844-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

74 PCB-14, CAS: 34883-41-5

Signal: 1

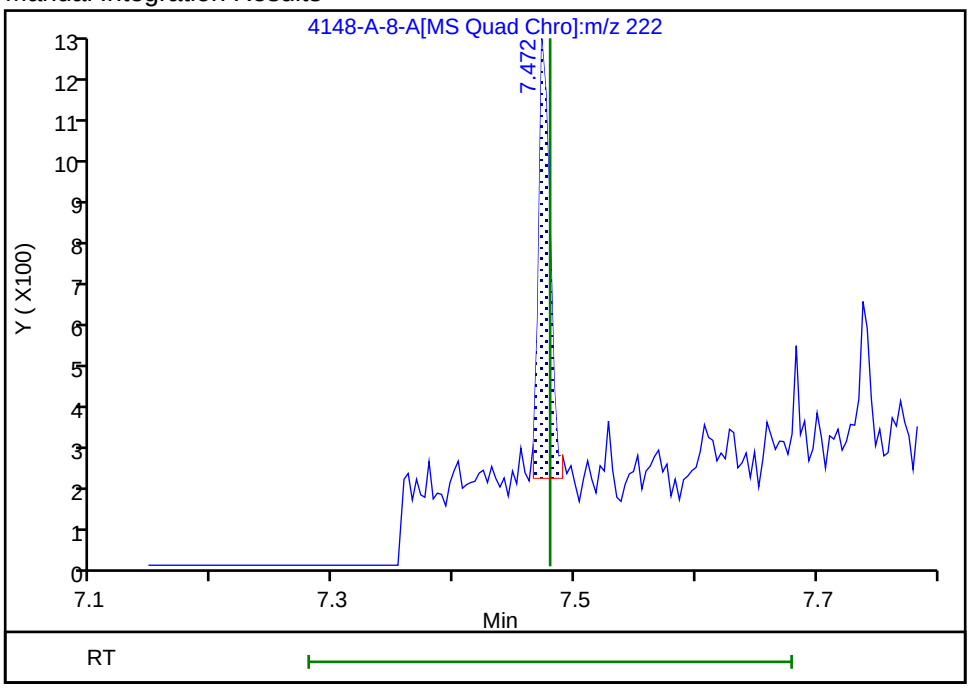
Processing Integration Results

RT: 7.47
Area: 1907
Amount: 0.016009
Amount Units: ug/ml



Manual Integration Results

RT: 7.47
Area: 718
Amount: 0.006028
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 09:43:14 -05:00:00 (UTC)
Audit Action: Assigned New Baseline Audit Reason: Baseline

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: 1804576-854-S1 | Lab Sample ID: 140-34148-12

Matrix: PE | Lab File ID: 140-34148-A-9-A.D

Analysis Method: ID-0016 | Date Collected: 10/26/2023 14:00

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.008(g) | Date Analyzed: 11/16/2023 18:11

Con. Extract Vol.: 500(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80349 | Units: ng/g

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
83-32-9	Acenaphthene	1500		1300	330
208-96-8	Acenaphthylene	190	J	1300	91
120-12-7	Anthracene	1600		1300	400
56-55-3	Benzo[a]anthracene	4600		1300	460
50-32-8	Benzo[a]pyrene	3100		1300	350
205-99-2	Benzo[b]fluoranthene	4700		1300	440
192-97-2	Benzo[e]pyrene	2900		1300	200
191-24-2	Benzo[g,h,i]perylene	1300		1300	140
207-08-9	Benzo[k]fluoranthene	2400		1300	290
218-01-9	Chrysene	6500		1300	160
53-70-3	Dibenz(a,h)anthracene	310	J	1300	100
206-44-0	Fluoranthene	15000		1300	1000
86-73-7	Fluorene	600	J	1300	400
193-39-5	Indeno[1,2,3-cd]pyrene	1200	J	1300	140
90-12-0	1-Methylnaphthalene	ND		6300	630
91-57-6	2-Methylnaphthalene	ND		6300	880
91-20-3	Naphthalene	ND		25000	3600
198-55-0	Perylene	2200		1300	640
85-01-8	Phenanthrene	6100		2500	2200
129-00-0	Pyrene	17000		2500	380
STL00912	C1-Fluoranthenes/pyrene	12000		1300	1300
STL00913	C1-Fluorenes	1700	J	2500	1600
STL00914	C2-Fluorenes	4600		1300	1300
STL00915	C3-Fluorenes	8000		1300	1300
STL00917	C2-Naphthalenes	ND		2500	2500
STL00918	C3-Naphthalenes	5600		2500	2500
STL00919	C4-Naphthalenes	8900		3800	3500
STL00901	C1-Phenanthrenes/Anthracenes	5100		5000	4300
STL00902	C2-Phenanthrenes/Anthracenes	11000		1300	1300
STL00903	C3-Phenanthrenes/Anthracenes	11000		1300	1300
STL00904	C4-Phenanthrenes/Anthracenes	5400		1300	1300
STL02218	C1-Chrysenes/Benz(a)anthracenes	4900		1300	1300

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: 1804576-854-S1 | Lab Sample ID: 140-34148-12

Matrix: PE | Lab File ID: 140-34148-A-9-A.D

Analysis Method: ID-0016 | Date Collected: 10/26/2023 14:00

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.008(g) | Date Analyzed: 11/16/2023 18:11

Con. Extract Vol.: 500(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80349 | Units: ng/g

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
STL02219	C2-Chrysenes/Benz(a)anthracenes	2400		1300	1300
STL02220	C3-Chrysenes/Benz(a)anthracenes	ND		1300	1300
STL02221	C4-Chrysenes/Benz(a)anthracenes	ND		1300	1300
34883-41-5	PCB-14	170	J	1300	13
74472-51-8	PCB-192	2900		1300	13
74472-48-3	PCB-184	1100	J	1300	13
33979-03-2	PCB-155	690	J	1300	13
41411-61-4	PCB-142	460	J	1300	13
74472-52-9	PCB-204	2000		1300	13
56558-16-8	PCB-104	990	J	1300	13
56558-18-0	PCB-121	790	J	1300	13
70362-49-1	PCB-78	800	J	1300	13
38444-87-0	PCB-36	190	J	1300	13

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
93951-97-4	Acenaphthylene-d8	86		30-120
1719-06-8	Anthracene-d10	88		30-120
63466-71-7	Benzo(a)pyrene-d12	91		30-120
93951-98-5	Benzo(b)fluoranthene-d12	90		30-120
93951-66-7	Benzo(ghi)perylene-d12	93		30-120
93952-01-3	Benzo(k)fluoranthene-d12	88		30-120
1719-03-5	Chrysene-d12	81		30-120
13250-98-1	Dibenz(a,h)anthracene-d14	89		30-120
93951-69-0	Fluoranthene-d10	87		30-120
81103-79-9	Fluorene -d10	83		30-120
203578-33-0	Indeno[1,2,3-cd]pyrene-d12	91		30-120
38072-94-5	1-Methylnaphthalene-d10	83		30-120
7297-45-2	2-Methylnaphthalene-d10	81		30-120
1146-65-2	Naphthalene-d8	78		30-120
1520-96-3	Perylene-d12	87		30-120
1517-22-2	Phenanthrene-d10	85		30-120

Report Date: 17-Nov-2023 12:15:26 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-9-A.D
Lims ID: 140-34148-A-12-A
Client ID: 1804576-854-S1
Sample Type: Client
Inject. Date: 16-Nov-2023 18:11:58 ALS Bottle#: 0 Worklist Smp#: 20
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030519-020
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 17-Nov-2023 12:14:52 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1635

First Level Reviewer: SK9U Date: 17-Nov-2023 09:53:00

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/ml	%Rec	Flags
D 10 Naphthalene-d8	136	5.059	5.068	-0.009	100	35888	0.3884	77.7	
12 Naphthalene	128	5.078	5.078	0.000	43	1429	0.0169		7M
D 15 2-methylnaphthalene-d10	152	5.612	5.612	0.000	92	24405	0.4062	81.2	
D 17 1-Methylnaphthalene-d10	152	5.692	5.686	0.006	100	24967	0.4148	83.0	
D 23 Acenaphthylene-d8	160	6.367	6.362	0.005	90	43867	0.4302	86.0	
24 Acenaphthylene	152	6.377	6.372	0.005	20	315	0.003054		M
* 26 Acenaphthene-d10	164	6.492	6.492	0.000	97	33140	0.5000		
27 Acenaphthene	154	6.522	6.517	0.005	96	1533	0.0232		
D 29 Fluorene -d10	176	6.925	6.920	0.005	99	32950	0.4173	83.5	
30 Fluorene	166	6.950	6.945	0.005	92	819	0.009568		
D 35 Phenanthrene-d10	188	7.732	7.732	0.000	99	58248	0.4238	84.8	
36 Phenanthrene	178	7.752	7.749	0.003	38	13741	0.0978		
D 38 Anthracin-d10	188	7.780	7.777	0.003	99	58863	0.4387	87.7	
39 Anthracene	178	7.797	7.794	0.003	95	3713	0.0256		
D 41 Fluoranthene-d10	212	8.808	8.805	0.003	99	77262	0.4334	86.7	
43 Fluoranthene	202	8.825	8.825	0.000	56	47114	0.2383		
* 44 Pyrene-d10 (IS)	212	9.027	9.024	0.003	98	88126	0.5000		
45 Pyrene	202	9.044	9.044	0.000	97	55976	0.2774		
47 Benzo[a]anthracene	228	10.260	10.260	0.000	100	13216	0.0731		M
D 48 Chrysene-d12	240	10.270	10.270	0.000	99	69647	0.4050	81.0	
50 Chrysene	228	10.295	10.295	0.000	15	21241	0.1048		
D 52 Benzo(b)fluoranthene-d12	264	11.376	11.369	0.007	100	59975	0.4502	90.0	
53 Benzo[b]fluoranthene	252	11.404	11.397	0.007	20	15218	0.0753		
D 54 Benzo(k)fluoranthene-d12	264	11.404	11.404	0.000	67	69200	0.4422	88.4	
55 Benzo[k]fluoranthene	252	11.425	11.425	0.000	99	7898	0.0390		M
* 56 Benzo(e)pyrene-d12	264	11.684	11.684	0.000	99	52594	0.5000		
57 Benzo[e]pyrene	252	11.712	11.712	0.000	100	8301	0.0461		
D 58 Benzo(a)pyrene-d12	264	11.747	11.747	0.000	100	53441	0.4575	91.5	
59 Benzo[a]pyrene	252	11.775	11.775	0.000	100	8706	0.0493		
D 60 Perylene-d12	264	11.845	11.838	0.007	100	56457	0.4355	87.1	
61 Perylene	252	11.873	11.873	0.000	100	5708	0.0354		
D 62 Indeno[1,2,3-cd]pyrene-d12	288	13.196	13.186	0.010	91	58007	0.4571	91.4	

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/ml	%Rec	Flags
D 63 Dibenz(a,h)anthracene-d14	292	13.196	13.196	0.000	91	50507	0.4448	89.0	
65 Indeno[1,2,3-cd]pyrene	276	13.224	13.214	0.010	27	3824	0.0197		
66 Dibenz(a,h)anthracene	278	13.243	13.233	0.009	41	809	0.005016		M
D 67 Benzo(ghi)perylene-d12	288	13.552	13.543	0.009	100	58540	0.4645	92.9	
68 Benzo[g,h,i]perylene	276	13.580	13.580	0.000	86	3610	0.0211		M
74 PCB-14	222	7.479	7.479	0.000	47	308	0.002714		M
75 PCB-36	258	8.210	8.206	0.000	70	179	0.002996		
76 PCB-104	326	8.395	8.393	-0.001	92	735	0.0159		
77 PCB-121	326	8.751	8.748	0.000	70	471	0.0126		
78 PCB-155	360	8.849	8.852	0.000	73	382	0.0110		
79 PCB-78	290	9.081	9.077	-0.003	70	376	0.0127		
80 PCB-142	360	9.522	9.519	0.000	52	187	0.007381		
81 PCB-184	394	9.575	9.572	0.003	29	439	0.0173		
* 82 PCB-167L	372	10.023	10.027	-0.004	71	12382	0.4000		
83 PCB-204	428	10.254	10.246	0.004	3	536	0.0325		
84 PCB-192	394	10.275	10.275	0.000	10	1069	0.0460		
A 87 C3-Naphthalenes	170	6.689	(6.348-7.050)		0	7618	0.0903		
A 88 C4-Naphthalenes	184	7.131	(6.678-7.562)		0	12003	0.1422		
A 89 C1-Fluorenes	180	7.427	(7.364-7.505)		0	2269	0.0265		
A 90 C2-Fluorenes	194	7.884	(7.730-8.069)		0	6232	0.0728		
A 91 C3-Fluorenes	208	8.340	(8.092-8.605)		0	11002	0.1285		
A 96 C1-Phenanthrenes/Anthracenes	191	8.243	(8.155-8.332)		0	11481	0.0817		
A 97 C2-Phenanthrenes/Anthracenes	206	8.701	(8.490-8.926)		0	25040	0.1782		
A 98 C3-Phenanthrenes/Anthracenes	220	9.138	(8.851-9.456)		0	25251	0.1797		
A 99 C4-Phenanthrenes/Anthracenes	234	9.474	(9.106-9.824)		0	12154	0.0865		
A 100 C1-Fluoranthenes/pyrene	216	9.436	(9.246-9.640)		0	39214	0.1944		
A 101 C1-Chrysenes/Benz(a)anthracenes	242	10.691	(10.456-10.941)		0	15937	0.0786		
A 102 C2-Chrysenes/Benz(a)anthracenes	256	11.009	(10.667-11.381)		0	7874	0.0388		

QC Flag Legend

Processing Flags

7 - Failed Limit of Detection

Review Flags

M - Manually Integrated

Reagents:

60ISPCB_00001 Amount Added: 5.00 Units: uL

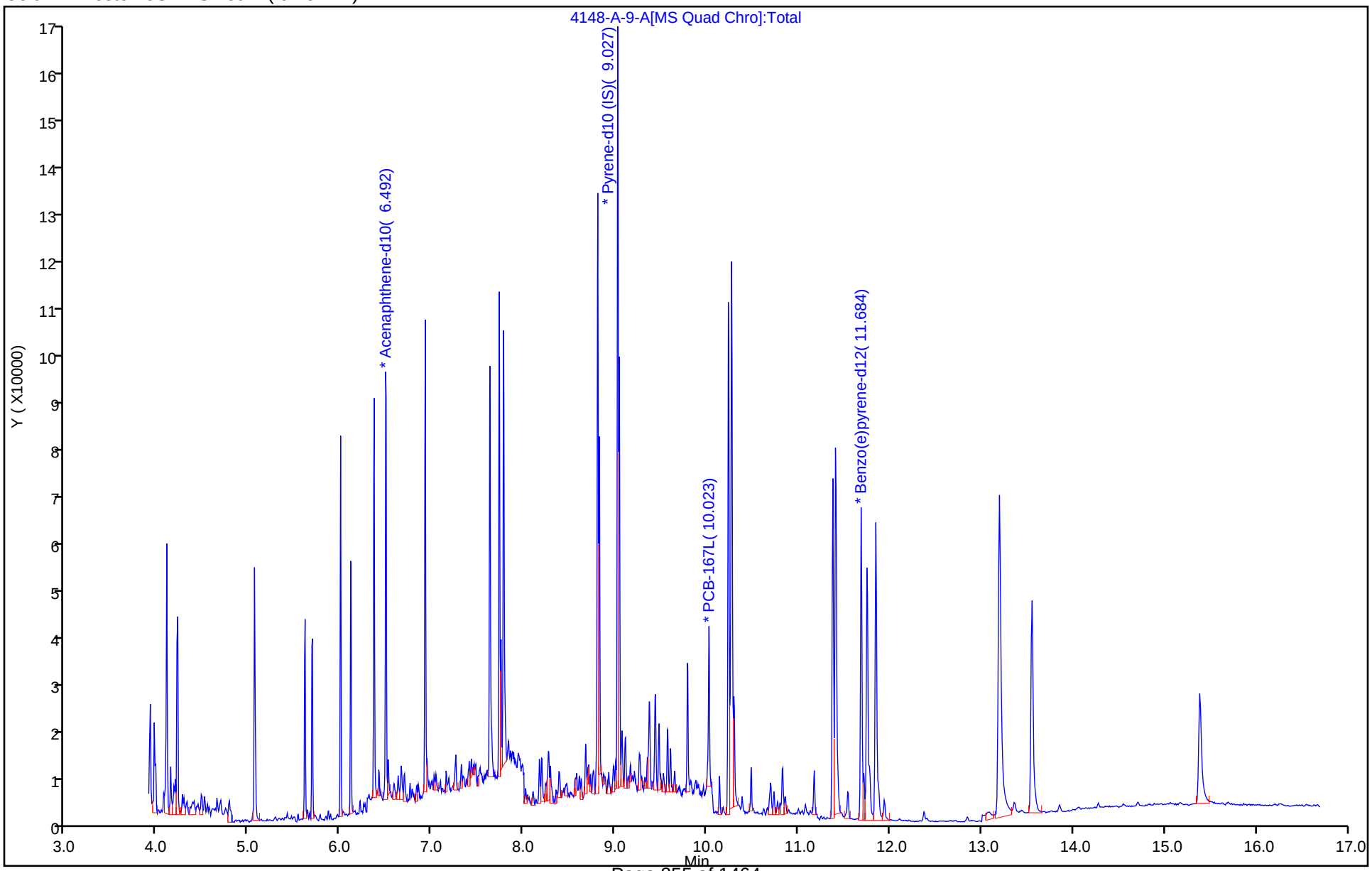
Report Date: 17-Nov-2023 12:15:26 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-9-A.D

Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12	Worklist Smp#:	20
Client ID:	1804576-854-S1				
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



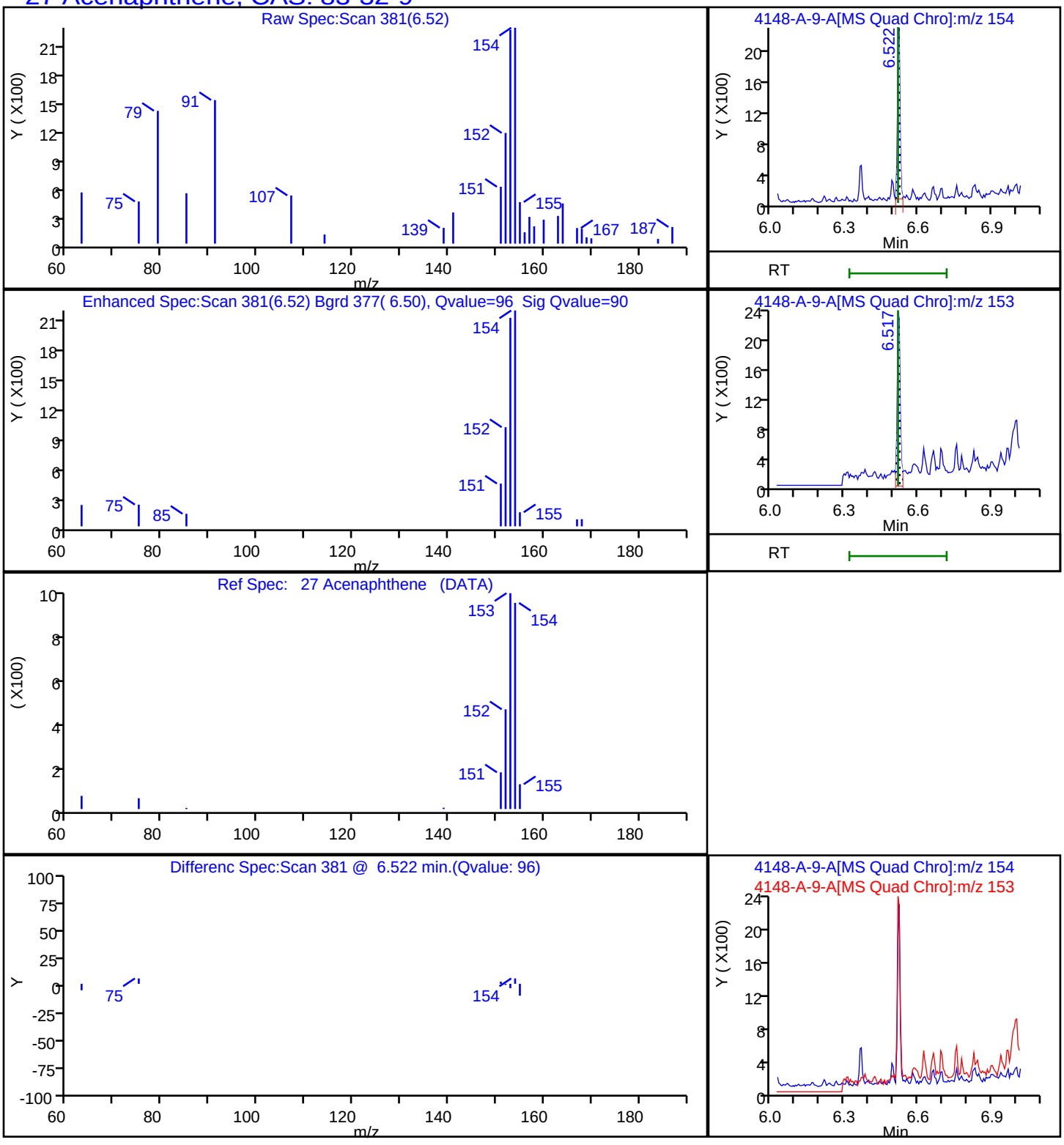
Report Date: 17-Nov-2023 12:15:26 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-9-A.D

Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12		
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

27 Acenaphthene, CAS: 83-32-9



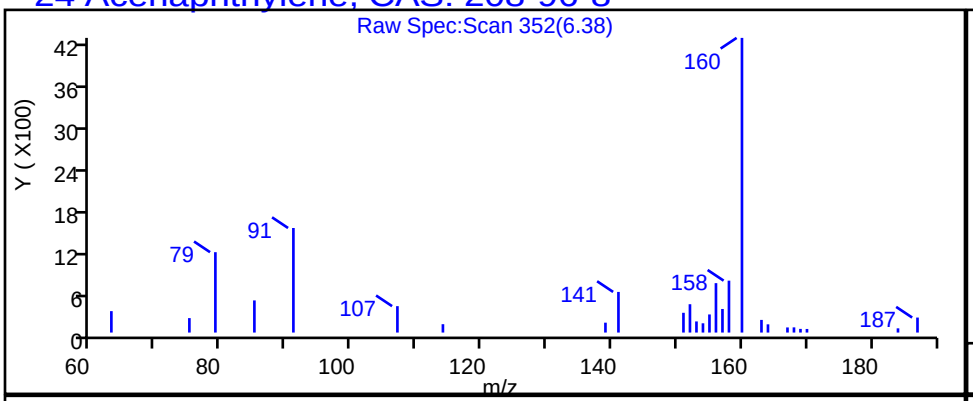
Report Date: 17-Nov-2023 12:15:26 Chrom Revision: 2.3 15-Nov-2023 20:54:34

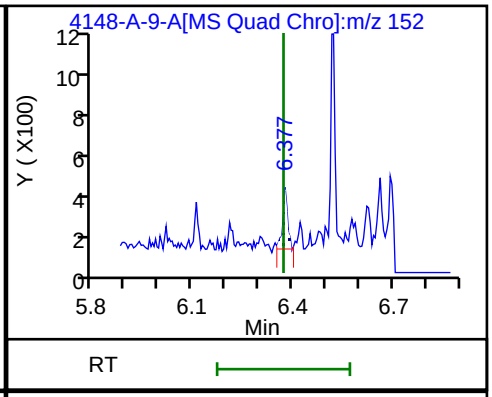
Eurofins Knoxville

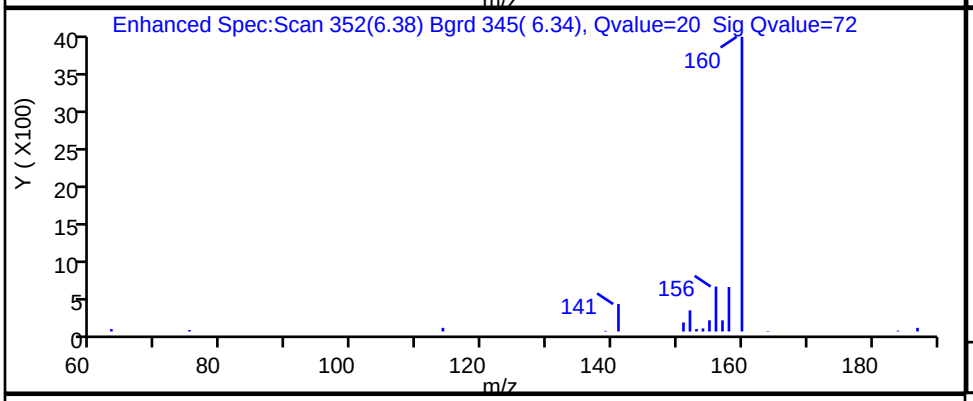
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-9-A.D

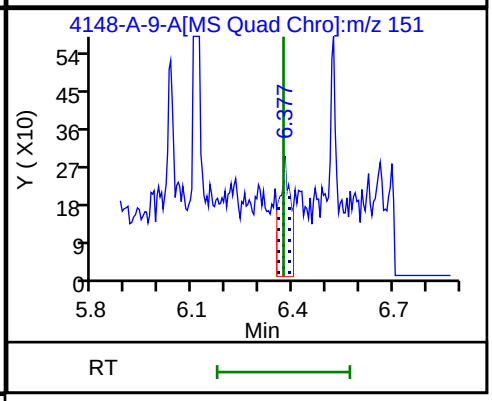
Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12
Client ID:	1804576-854-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

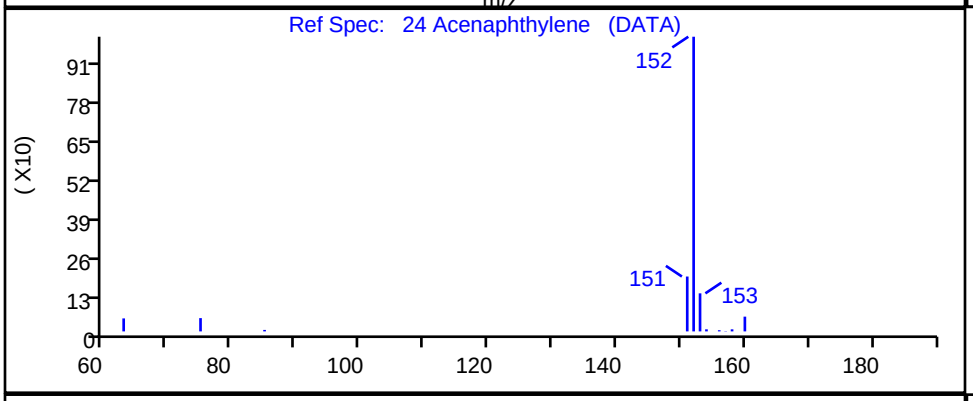
24 Acenaphthylene, CAS: 208-96-8

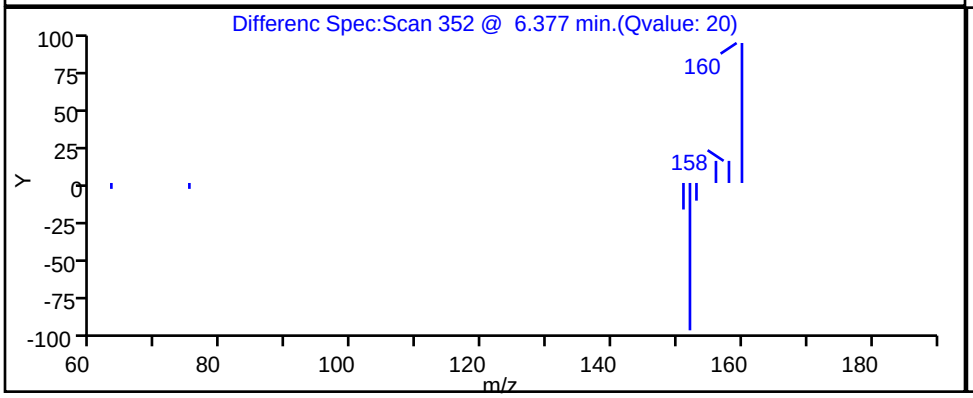


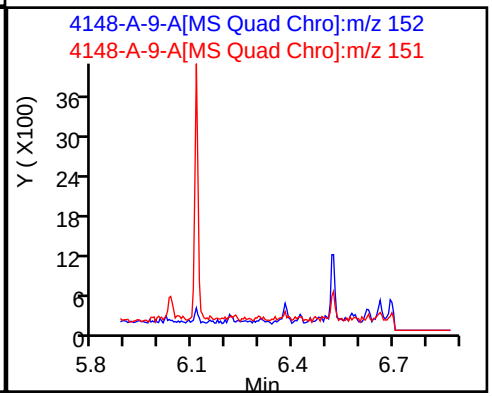












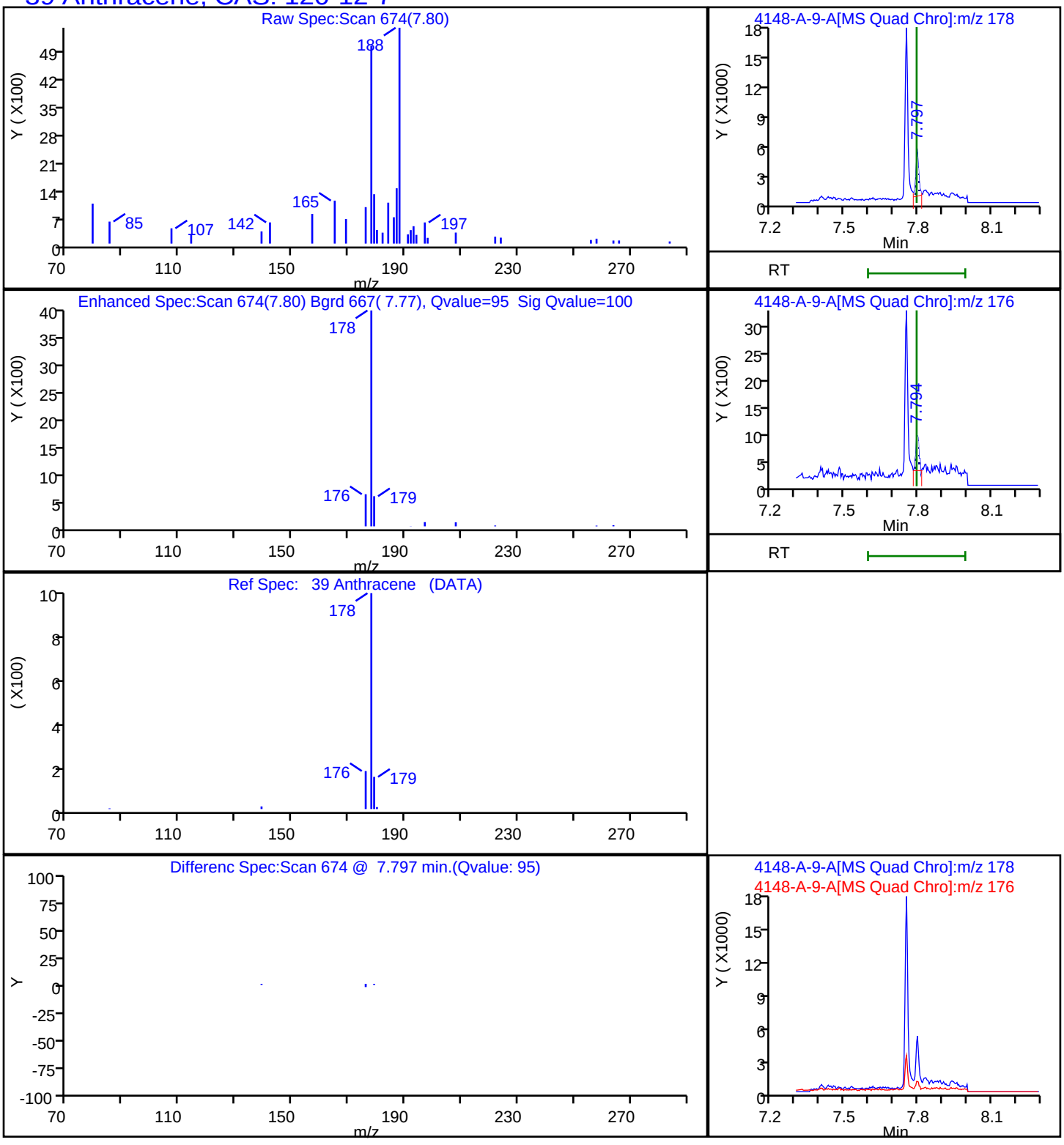
Report Date: 17-Nov-2023 12:15:26 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-9-A.D

Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12
Client ID:	1804576-854-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

39 Anthracene, CAS: 120-12-7



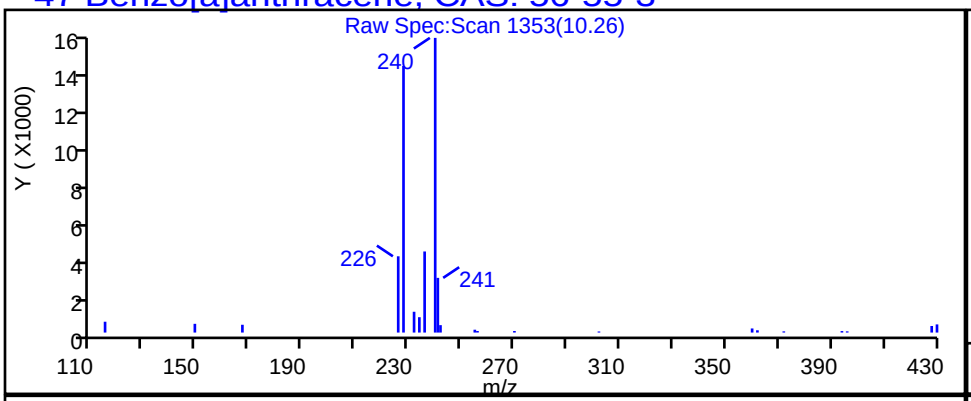
Report Date: 17-Nov-2023 12:15:26 Chrom Revision: 2.3 15-Nov-2023 20:54:34

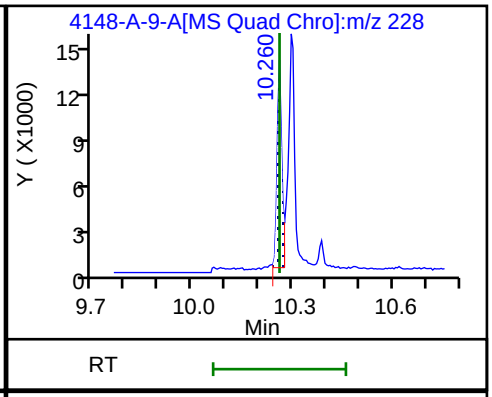
Eurofins Knoxville

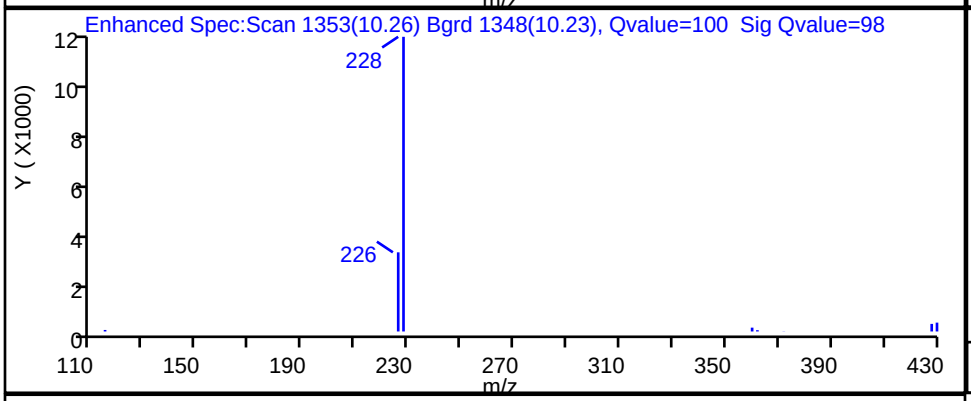
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-9-A.D

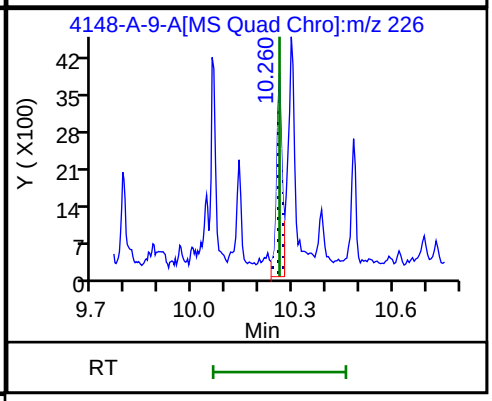
Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12		
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

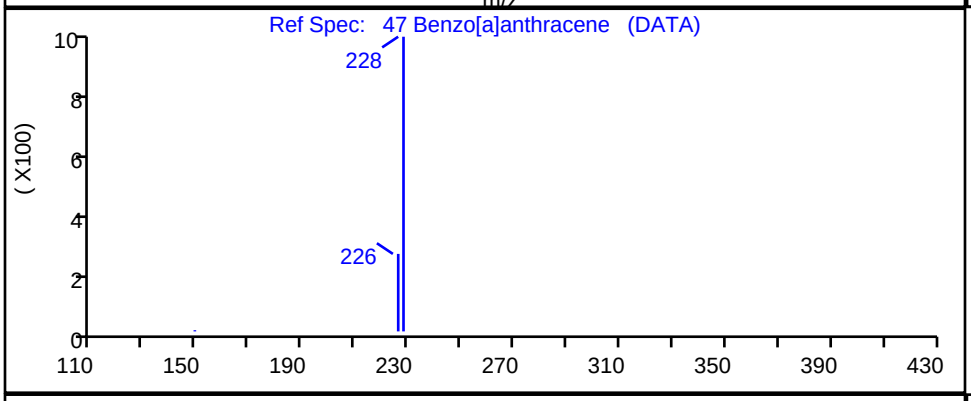
47 Benzo[a]anthracene, CAS: 56-55-3

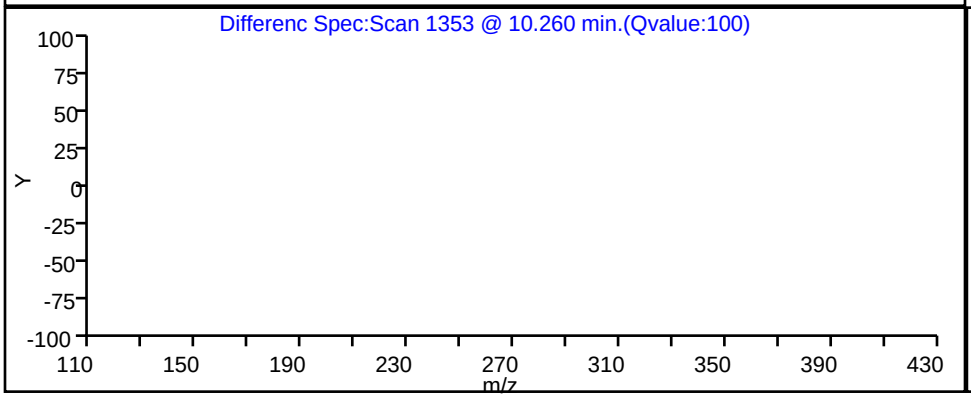


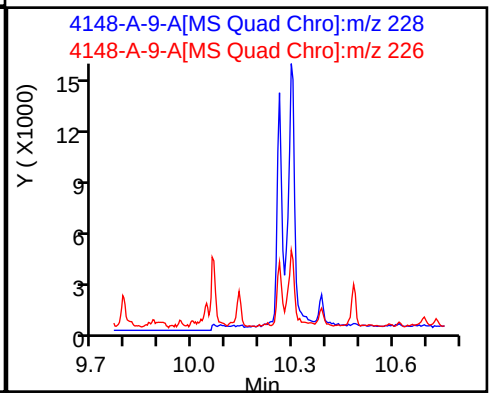










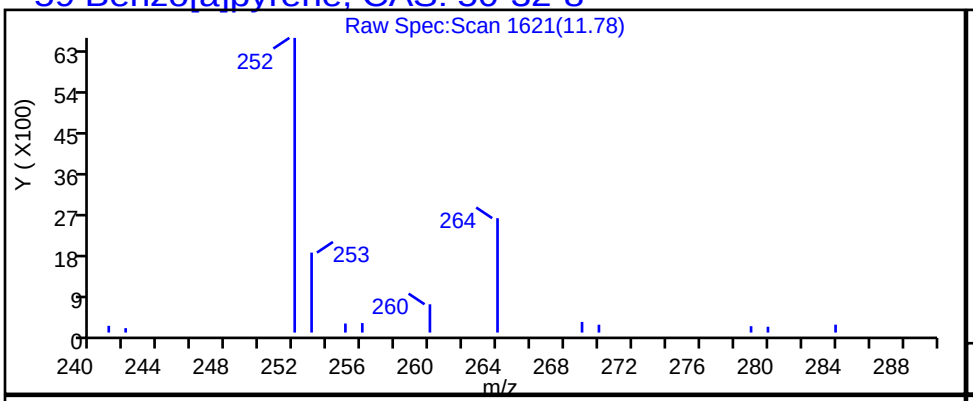


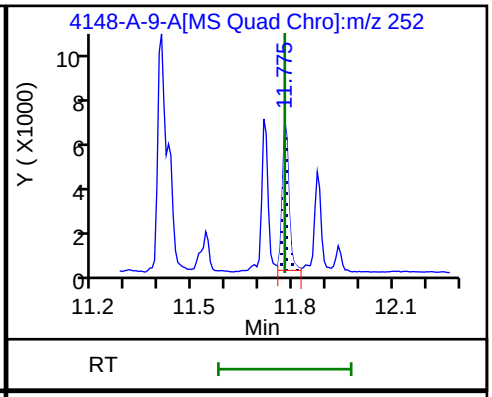
Report Date: 17-Nov-2023 12:15:27 Chrom Revision: 2.3 15-Nov-2023 20:54:34

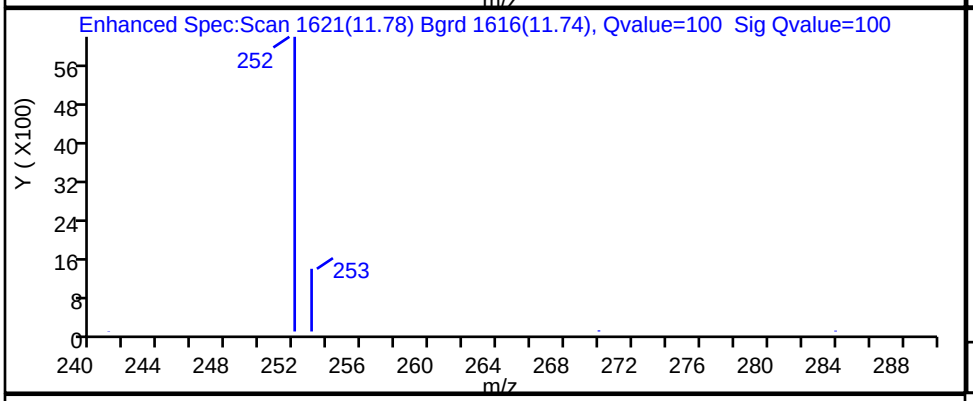
Eurofins Knoxville

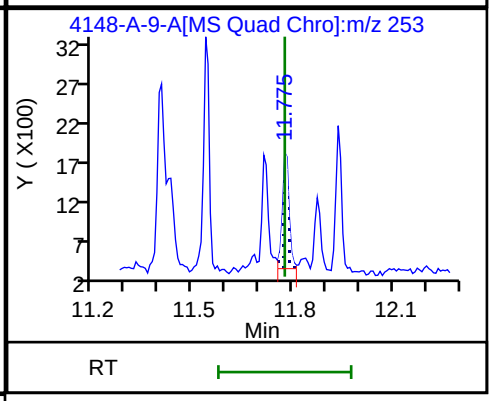
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-9-A.D				
Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12		
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

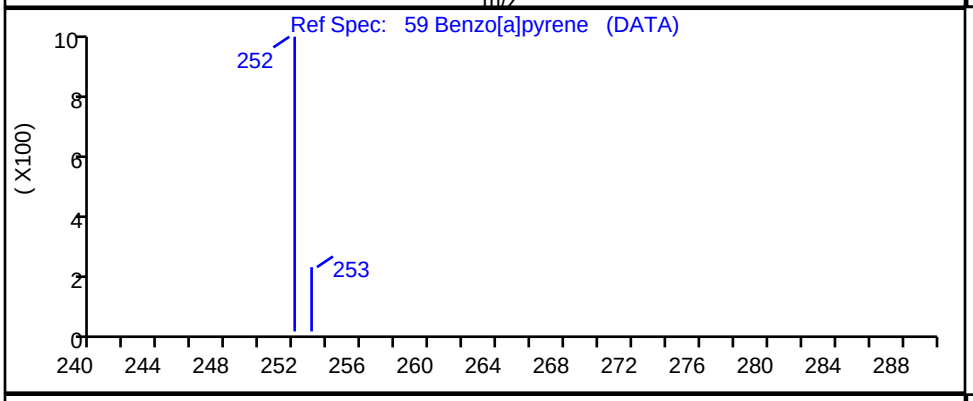
59 Benzo[a]pyrene, CAS: 50-32-8

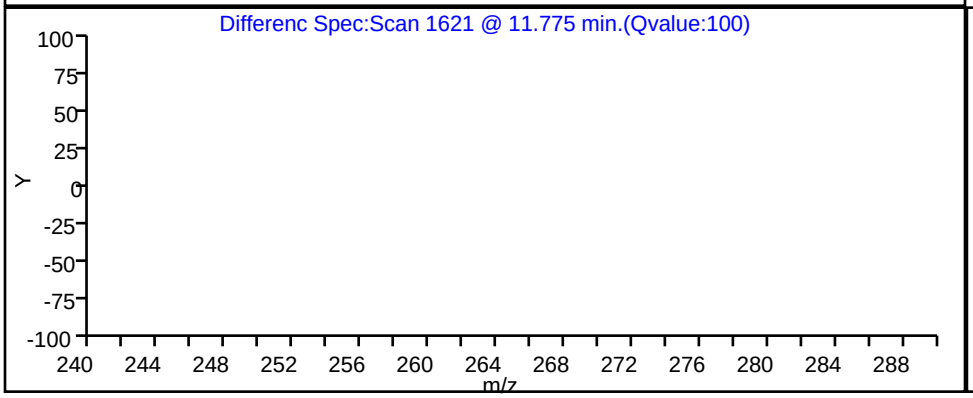


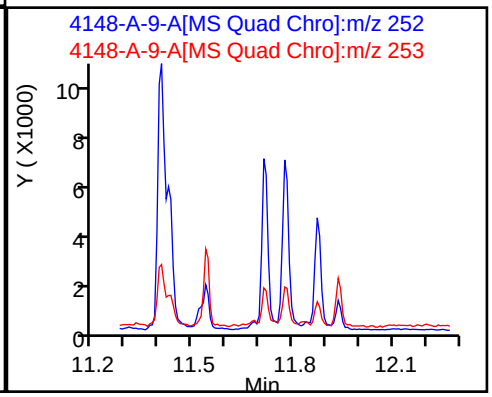










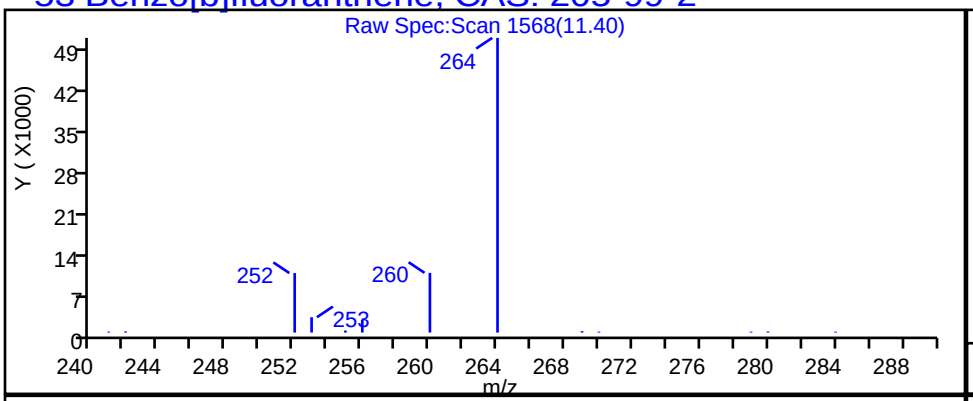


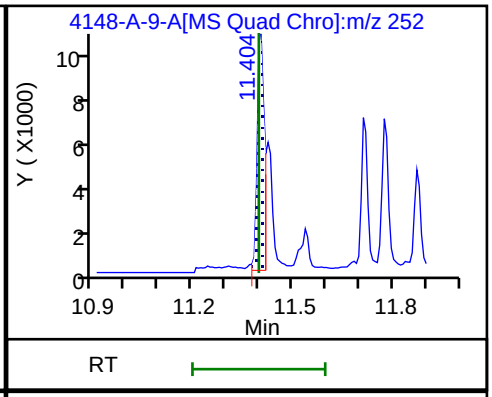
Report Date: 17-Nov-2023 12:15:27 Chrom Revision: 2.3 15-Nov-2023 20:54:34

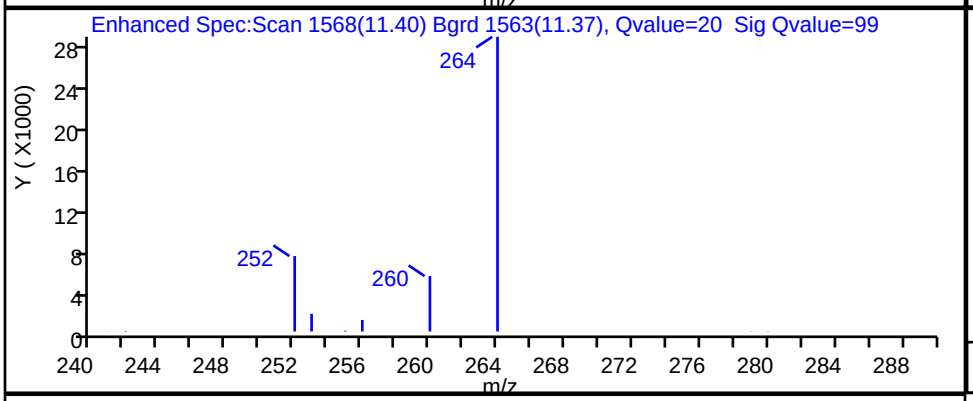
Eurofins Knoxville

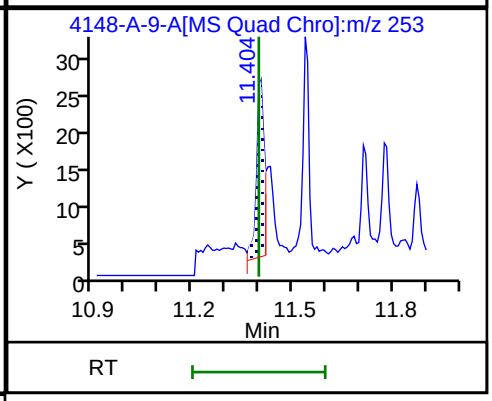
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-9-A.D				
Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12		
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

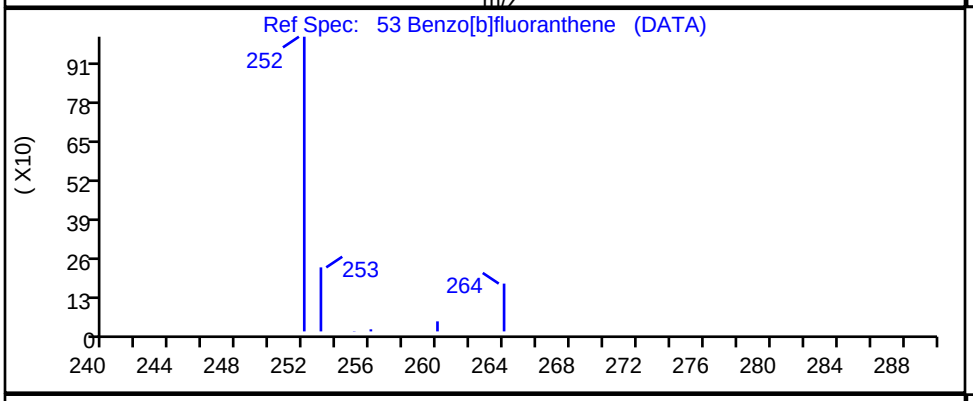
53 Benzo[b]fluoranthene, CAS: 205-99-2

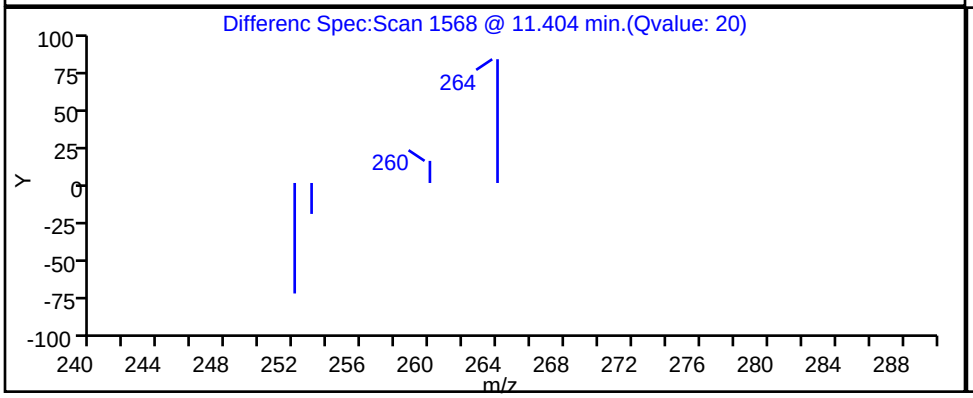


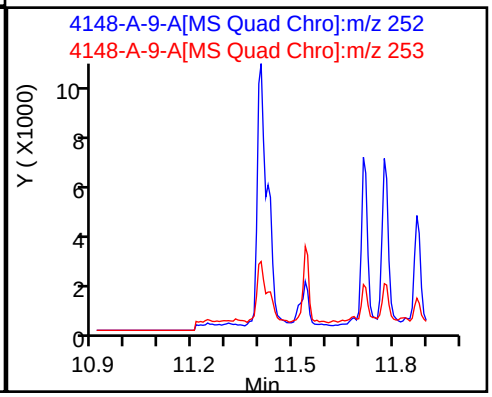












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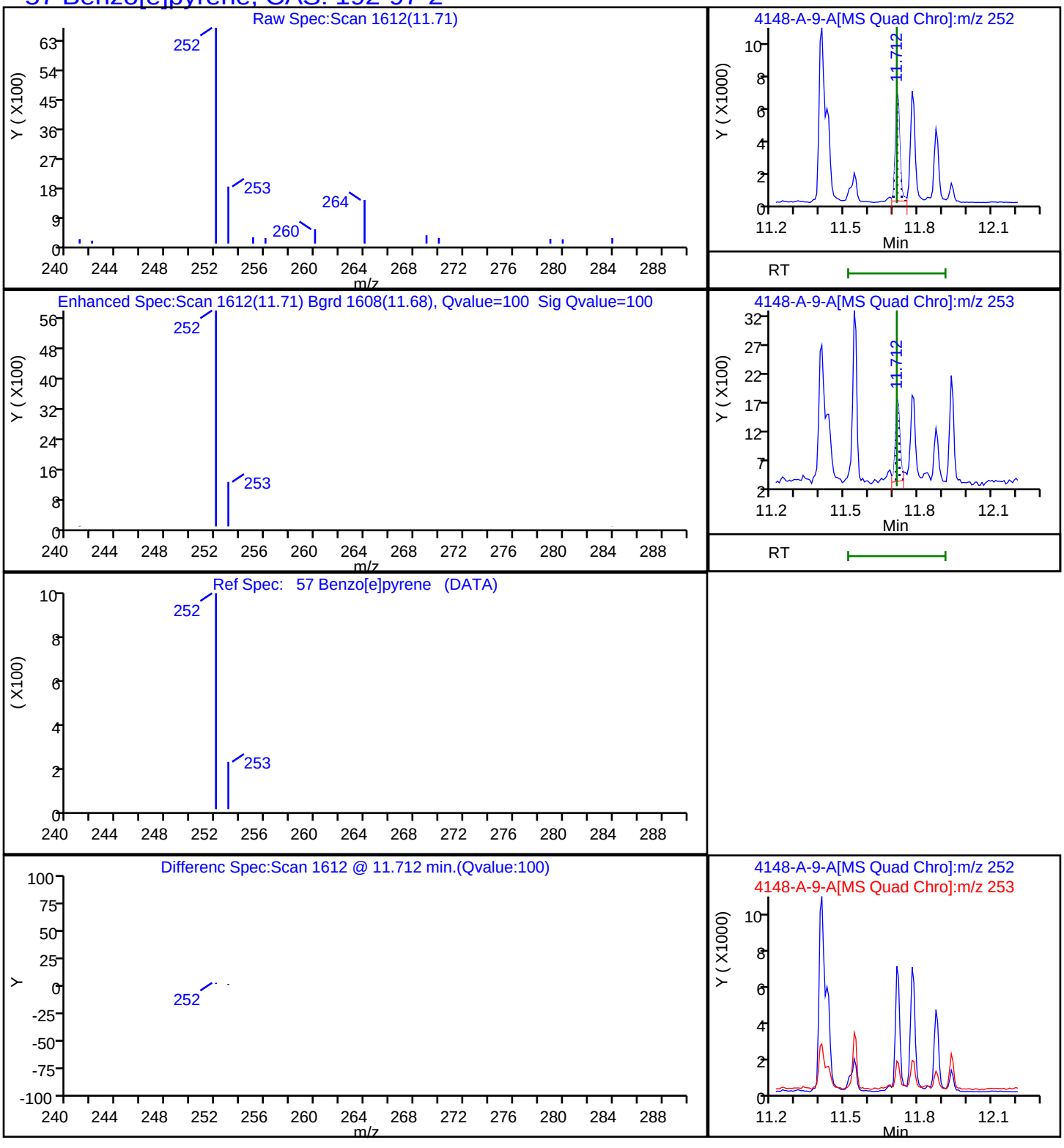
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-9-A.D

Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12
Client ID:	1804576-854-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

57 Benzo[e]pyrene, CAS: 192-97-2



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Eurofins Knoxville

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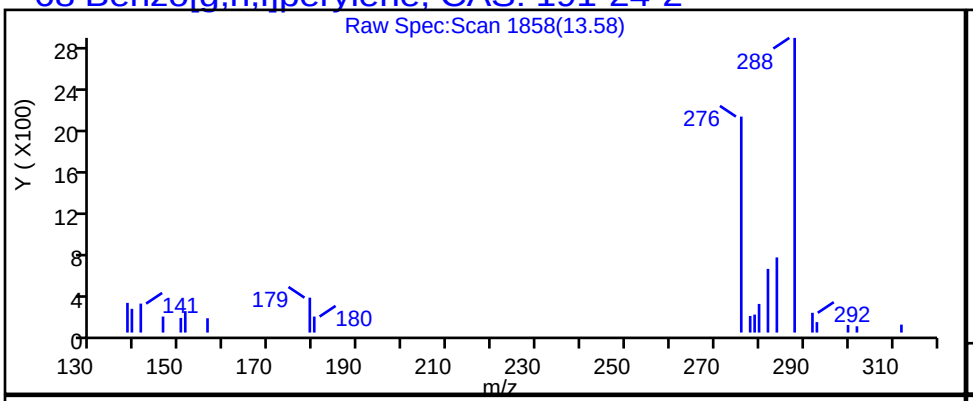
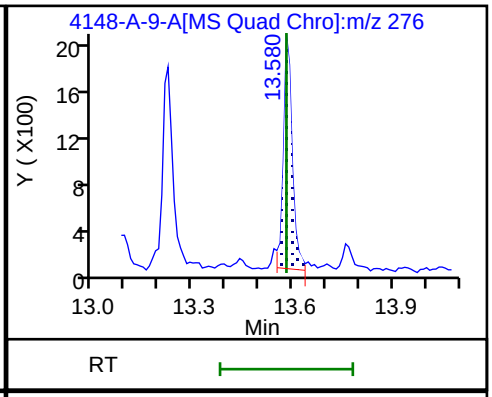
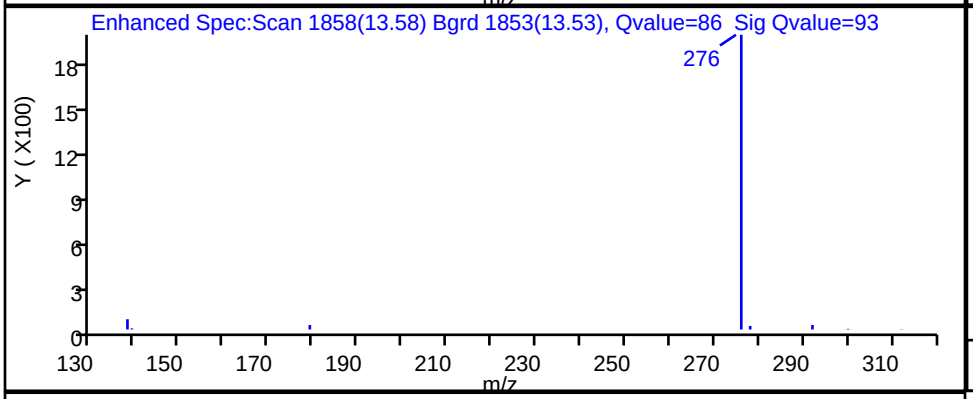
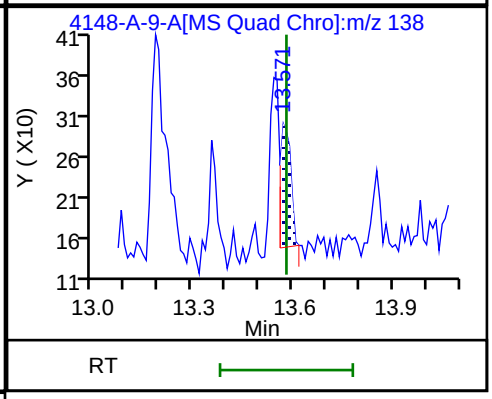
Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12		
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

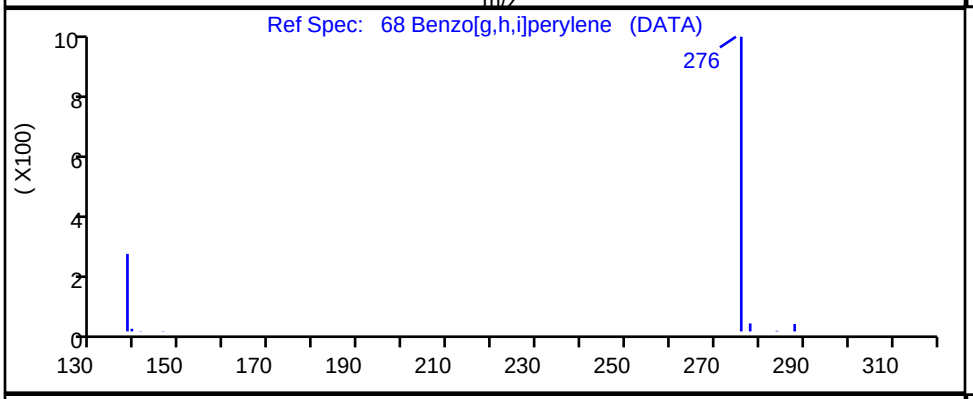
68 Benzo[g,h,i]perylene, CAS: 191-24-2

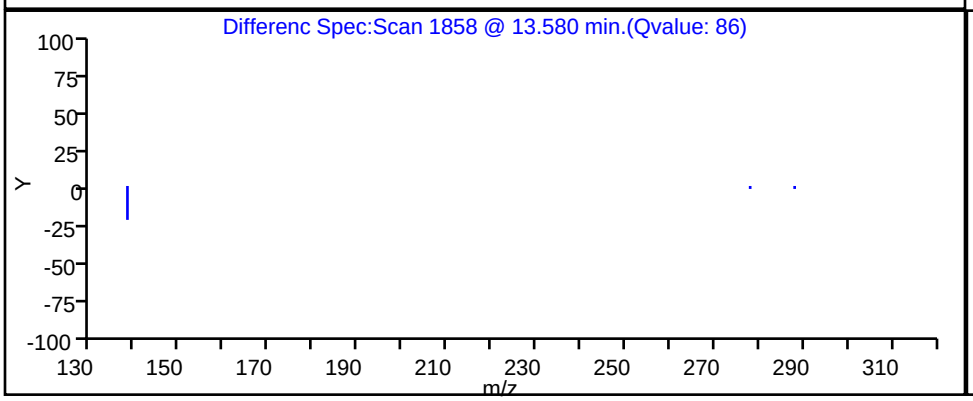


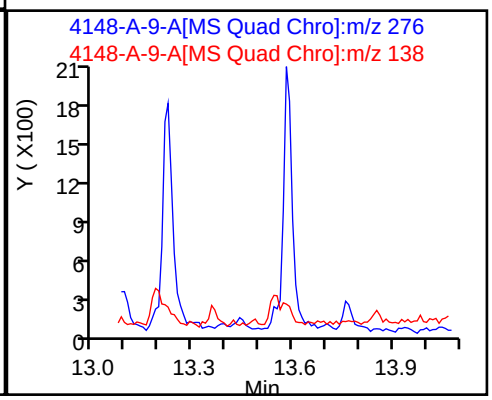












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Eurofins Knoxville

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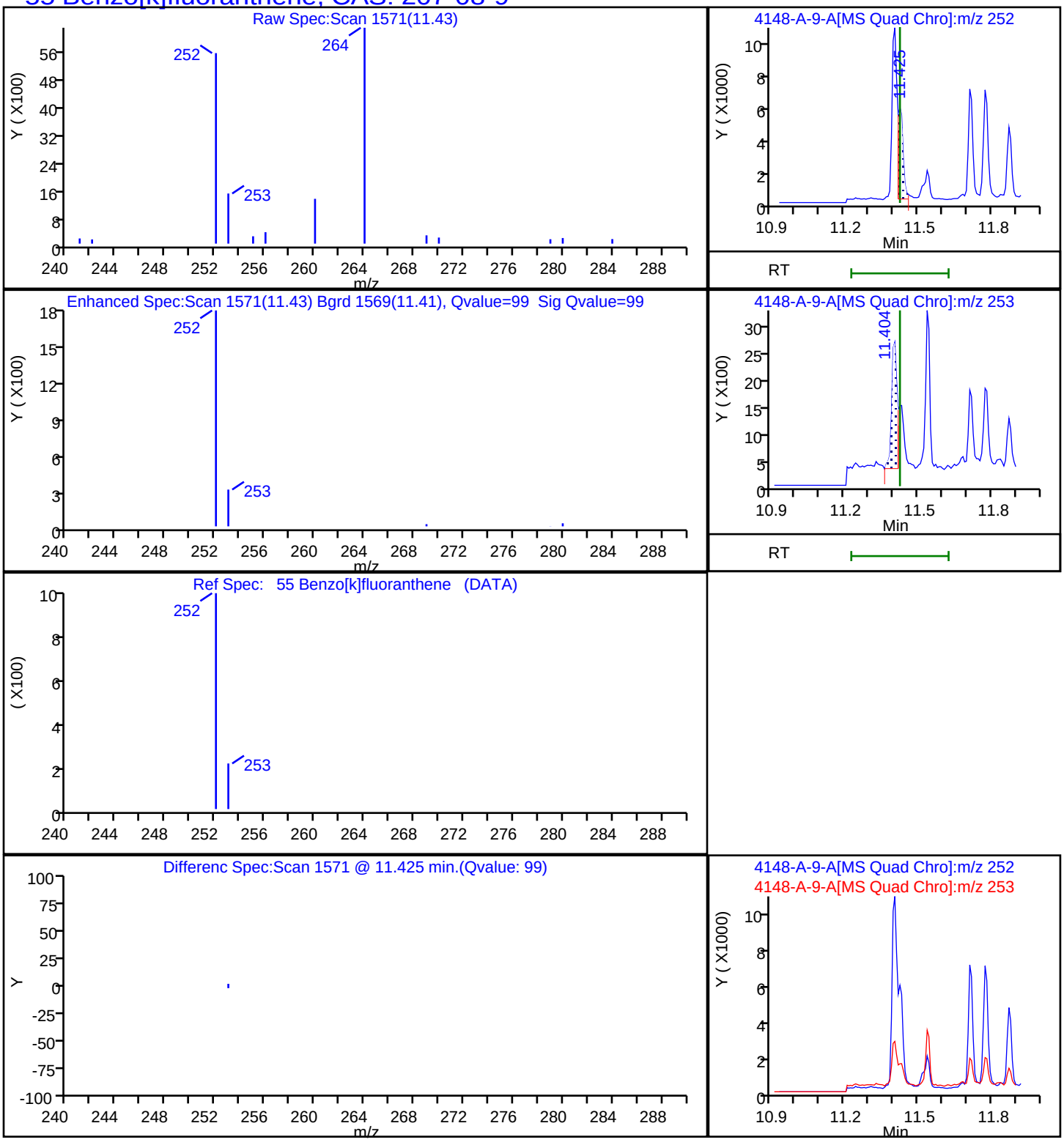
Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12		
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

55 Benzo[k]fluoranthene, CAS: 207-08-9



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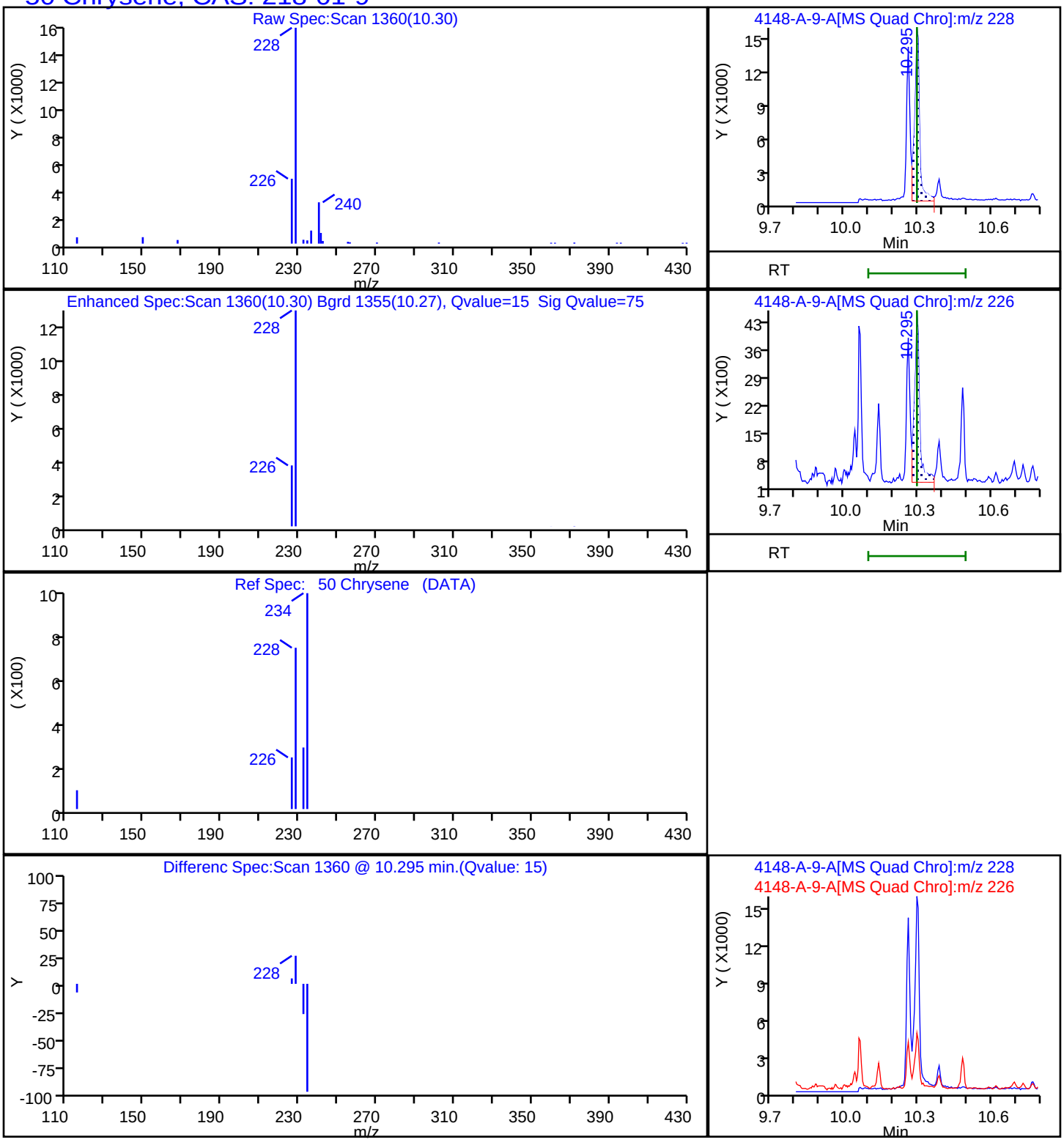
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-9-A.D

Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12		
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

50 Chrysene, CAS: 218-01-9



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Eurofins Knoxville

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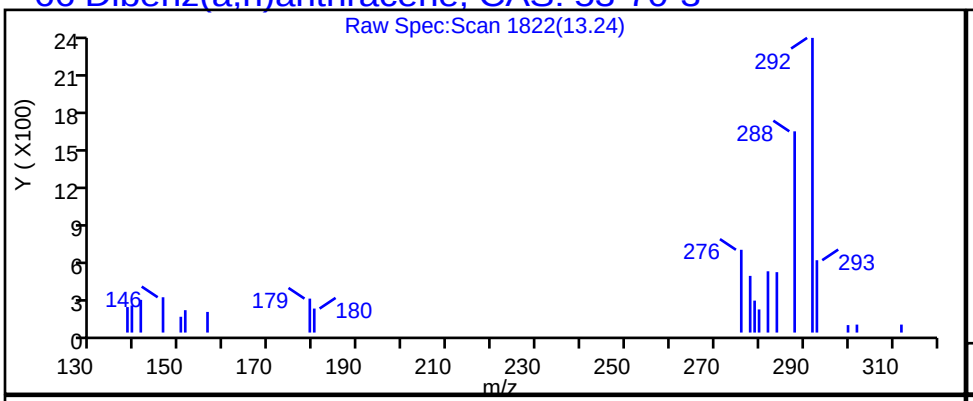
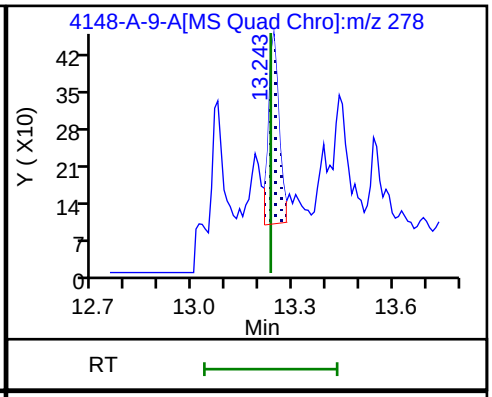
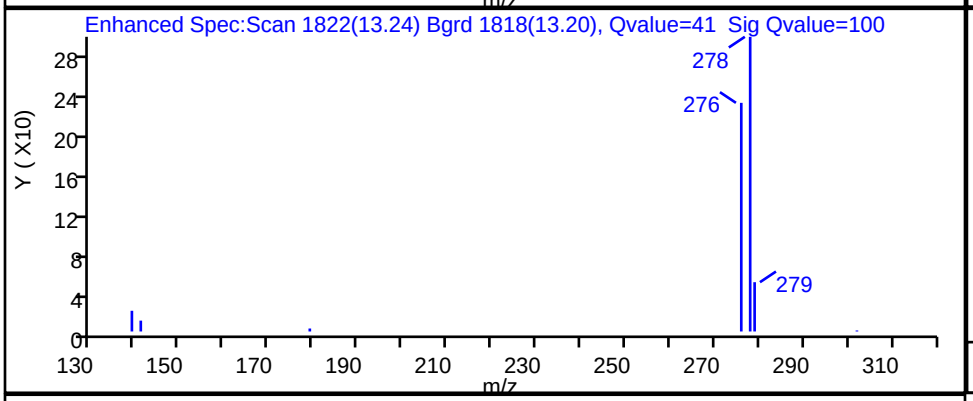
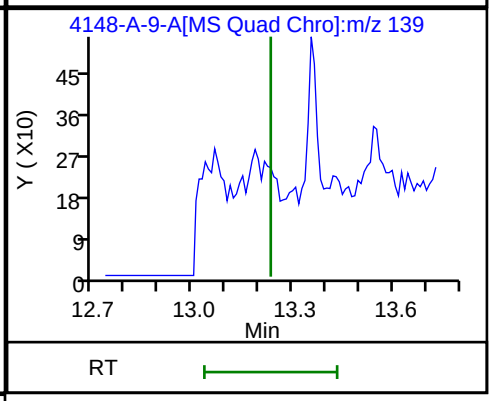
Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12
Client ID:	1804576-854-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

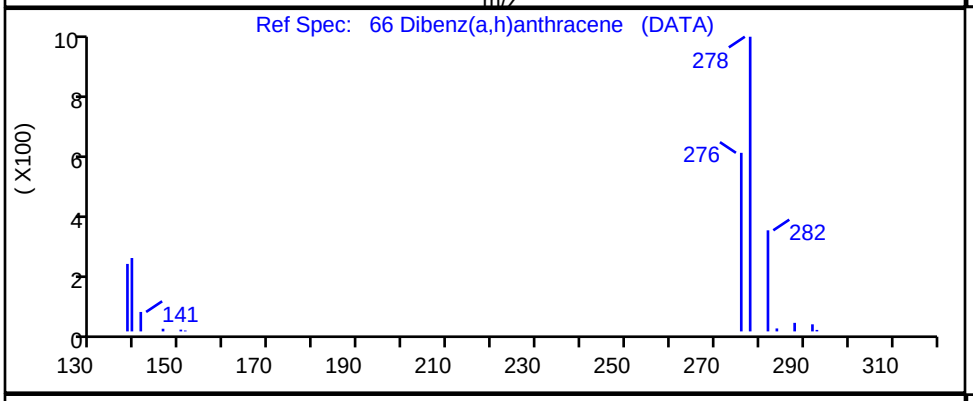
66 Dibenz(a,h)anthracene, CAS: 53-70-3

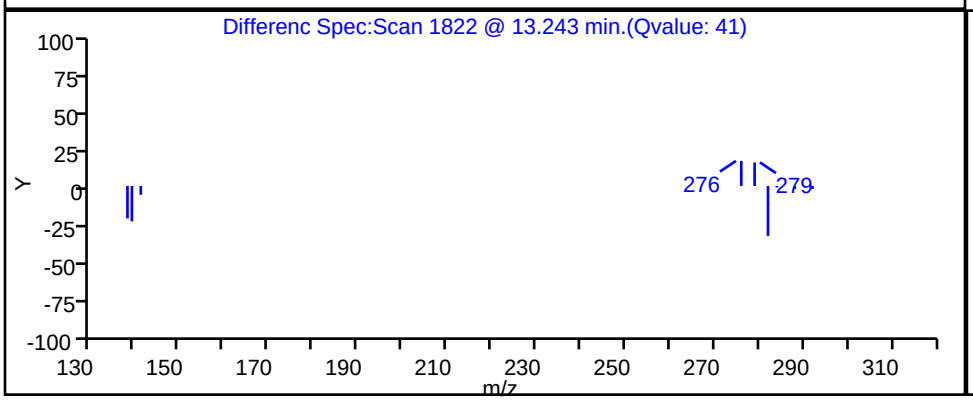


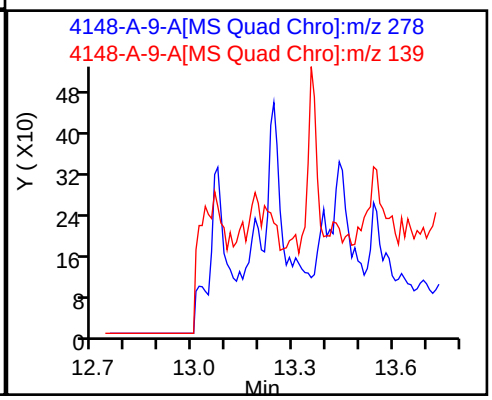












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Eurofins Knoxville

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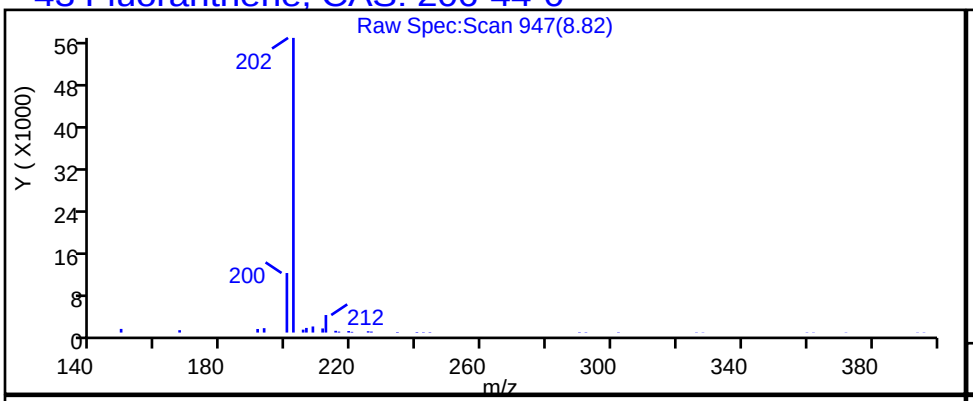
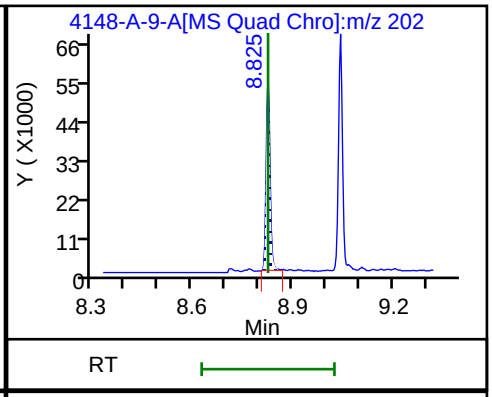
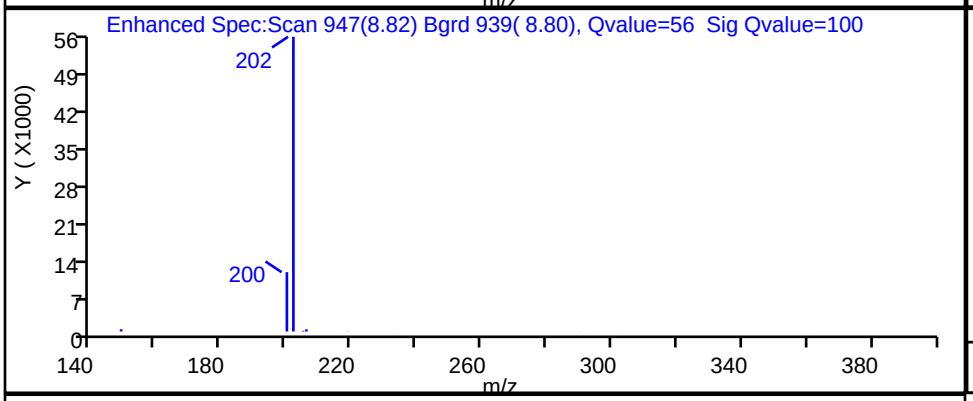
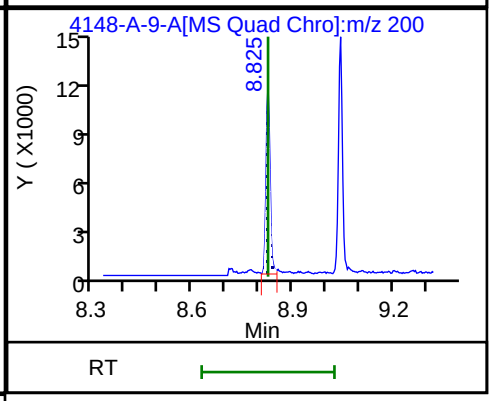
Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12
Client ID:	1804576-854-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

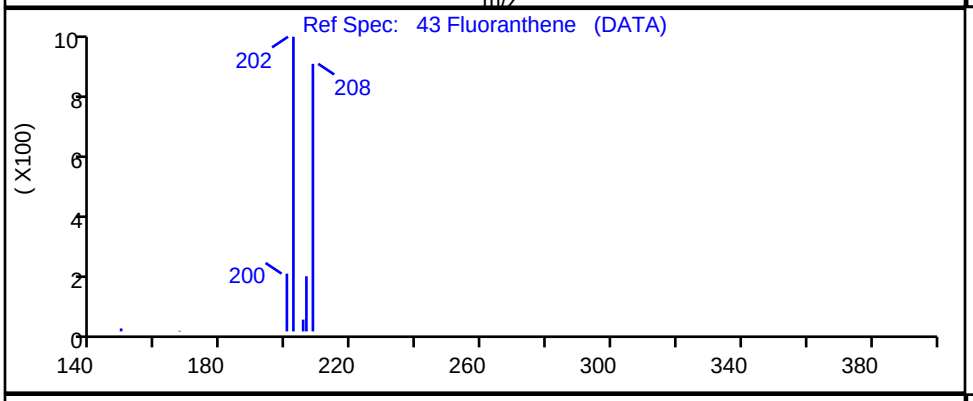
43 Fluoranthene, CAS: 206-44-0

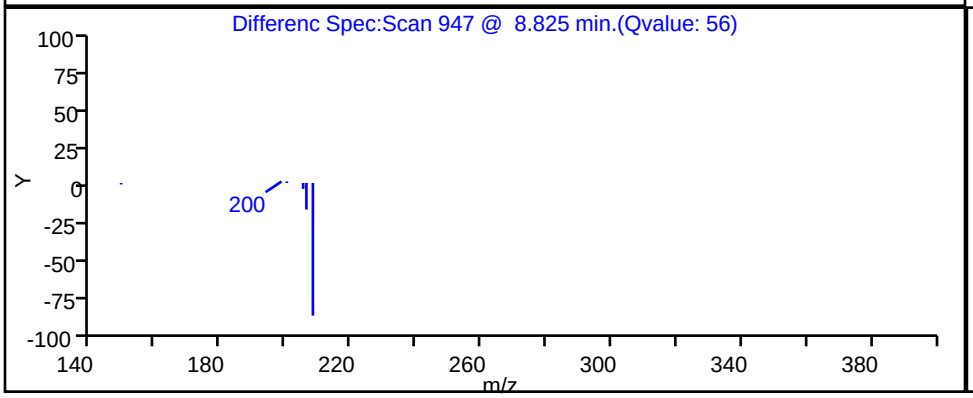


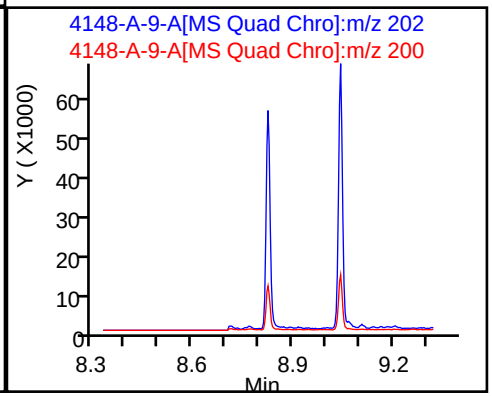












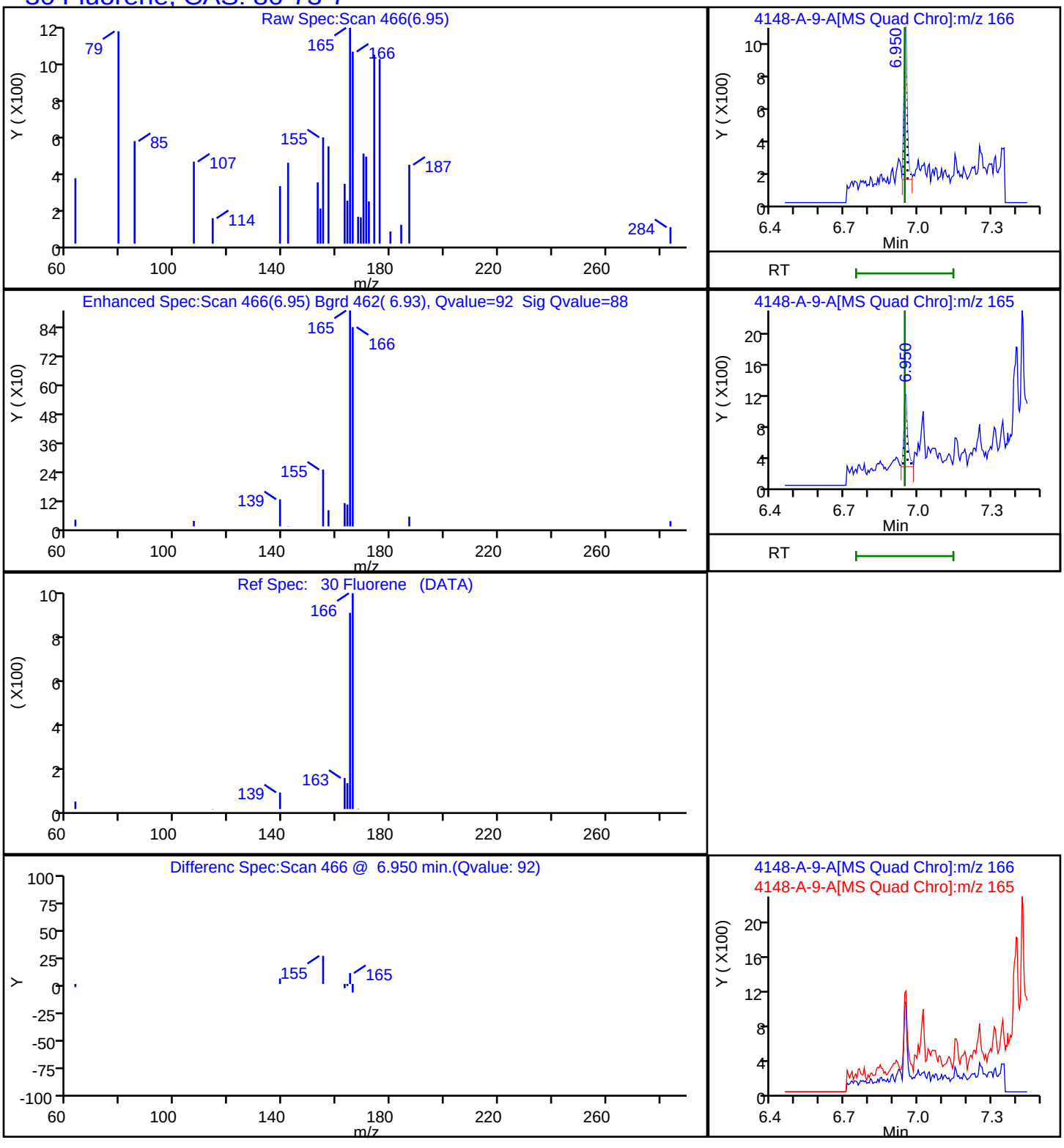
Report Date: 17-Nov-2023 12:15:26 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-9-A.D

Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12
Client ID:	1804576-854-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

30 Fluorene, CAS: 86-73-7



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Eurofins Knoxville

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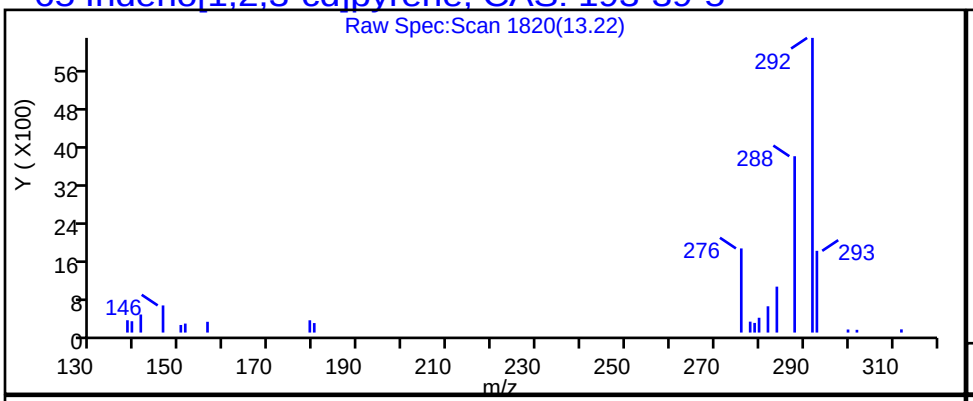
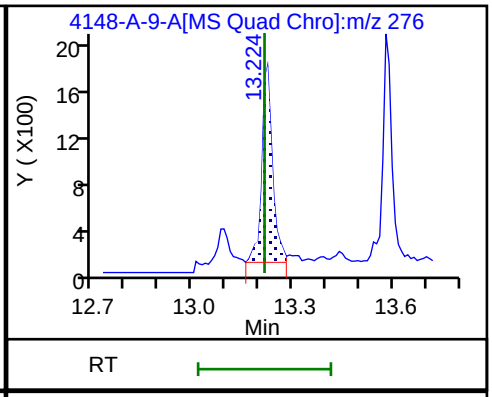
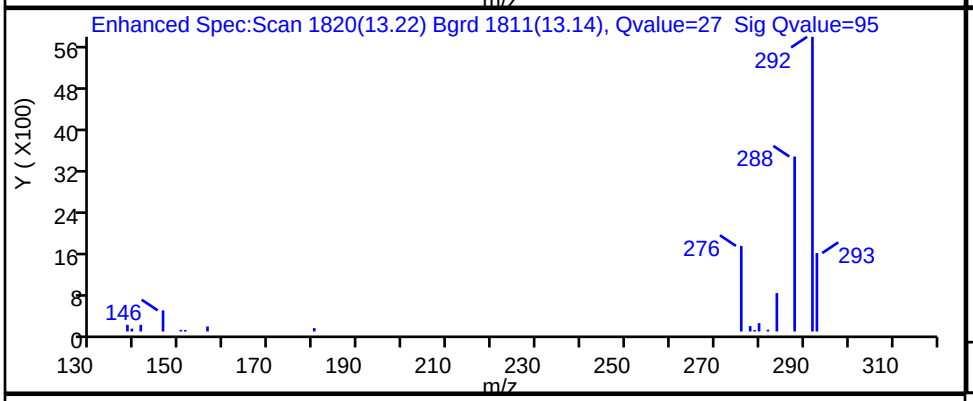
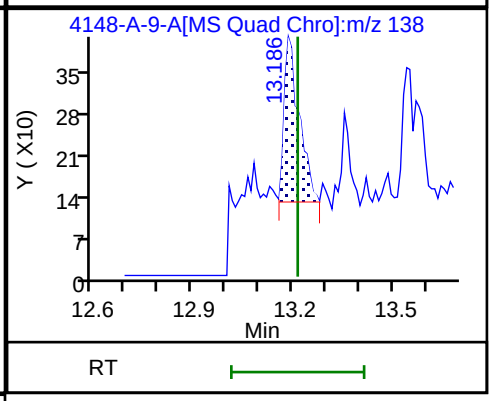
Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12
Client ID:	1804576-854-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

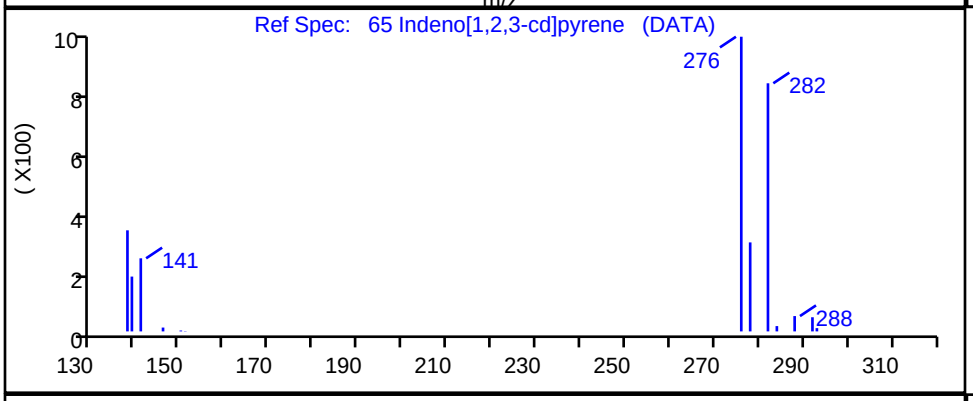
65 Indeno[1,2,3-cd]pyrene, CAS: 193-39-5

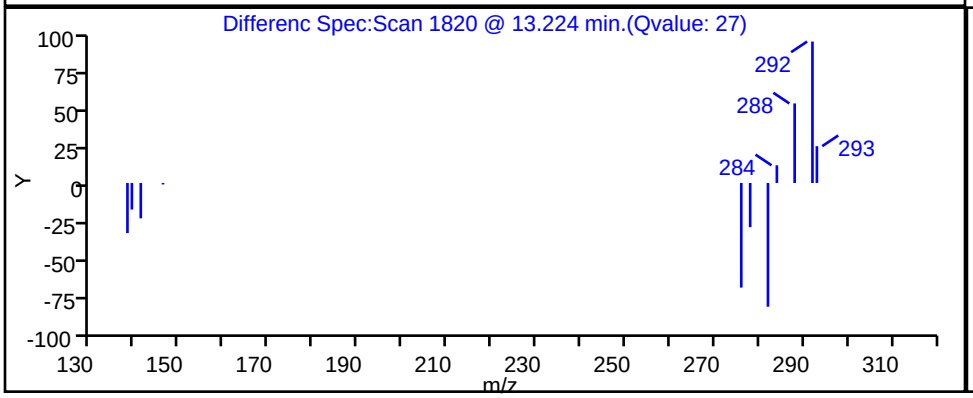


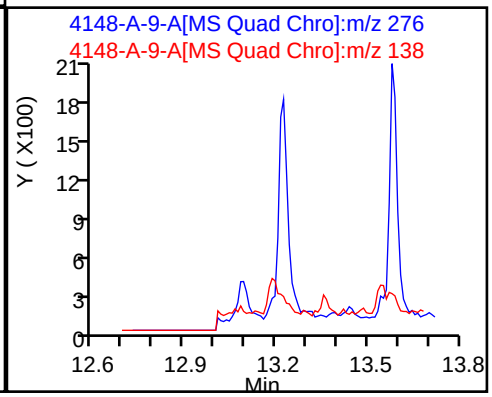












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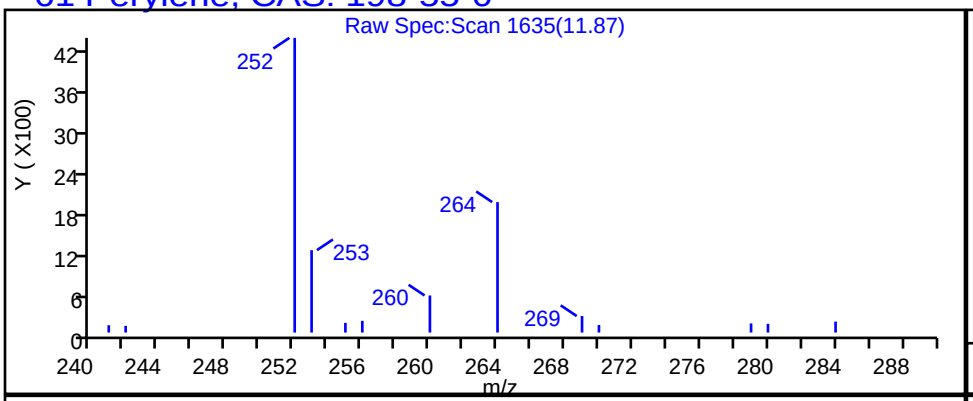
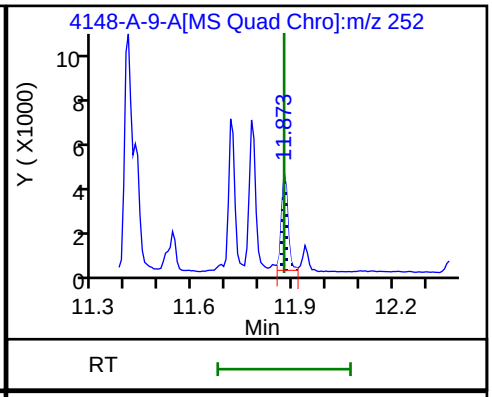
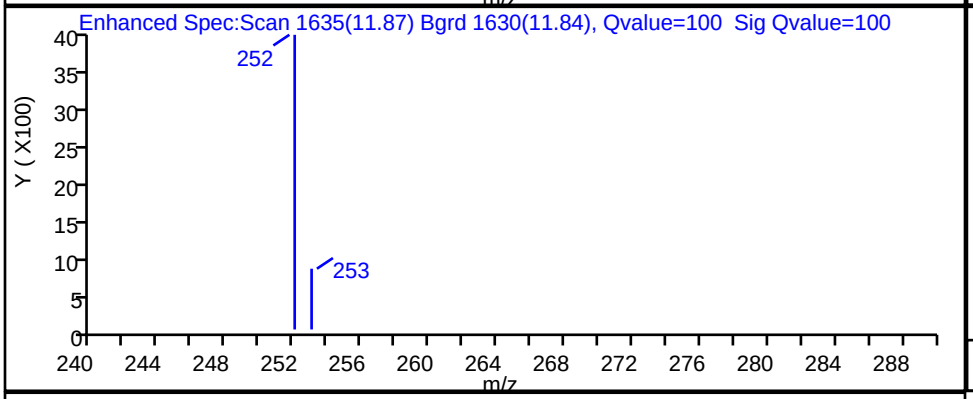
Eurofins Knoxville

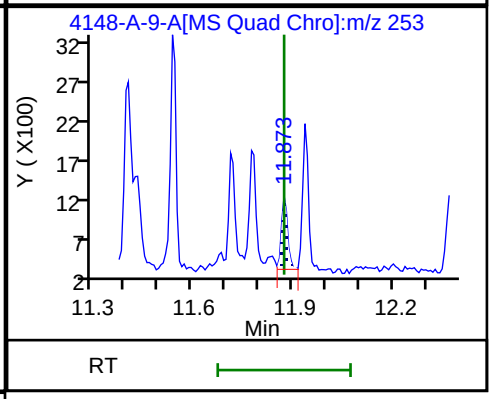
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-9-A.D				
Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12		
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

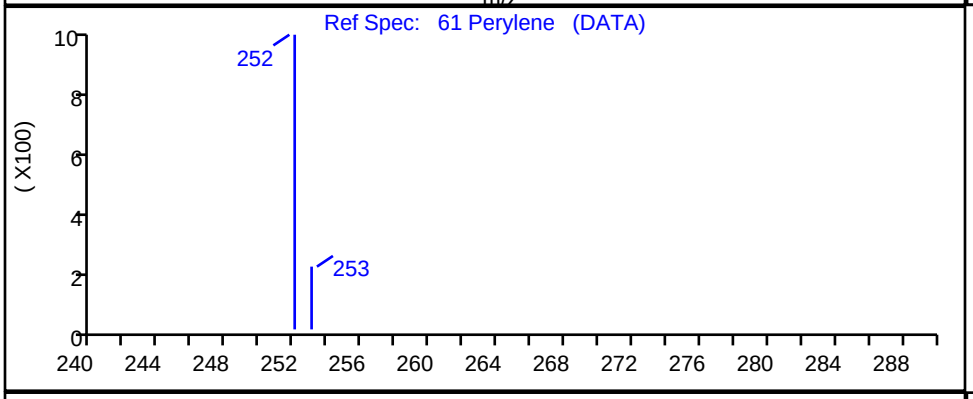
61 Perylene, CAS: 198-55-0

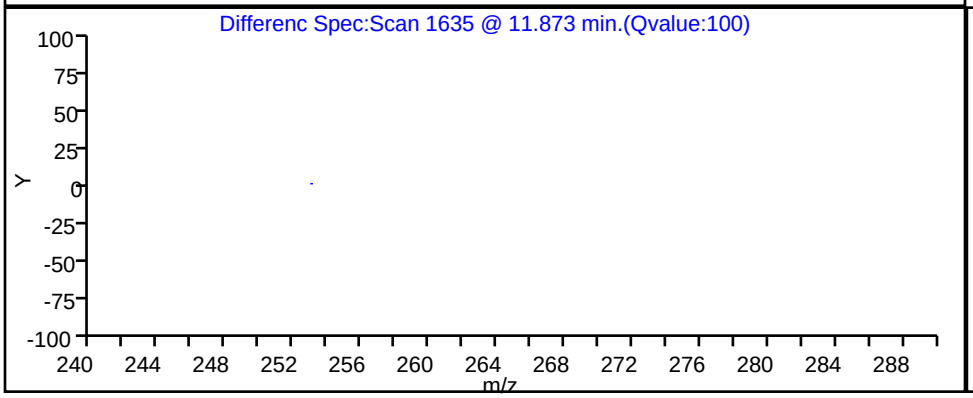


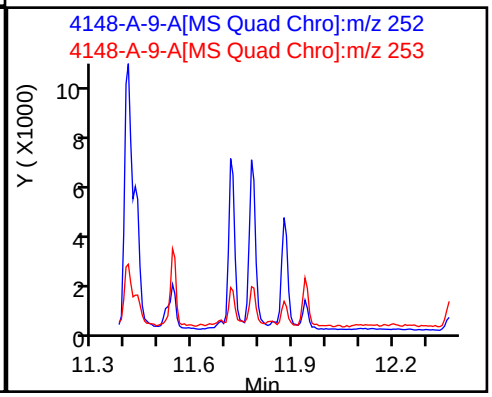












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Eurofins Knoxville

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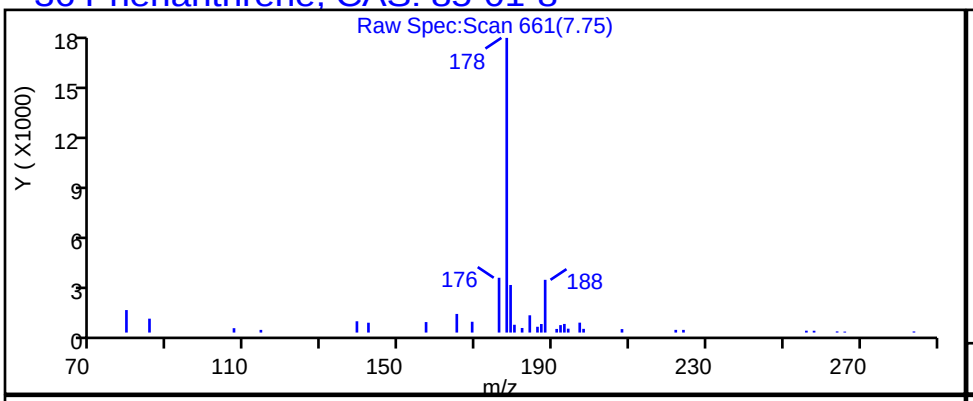
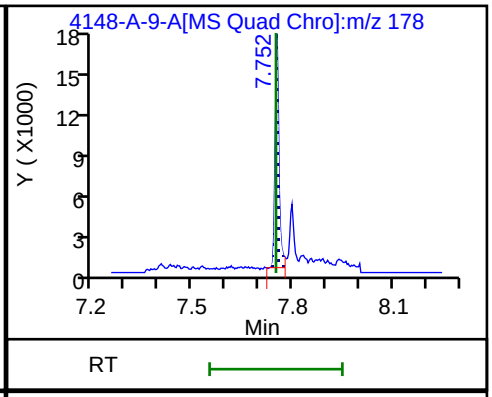
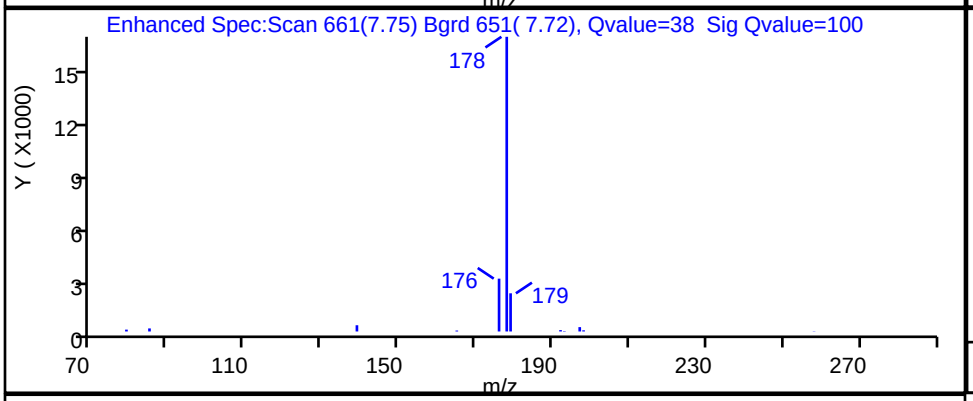
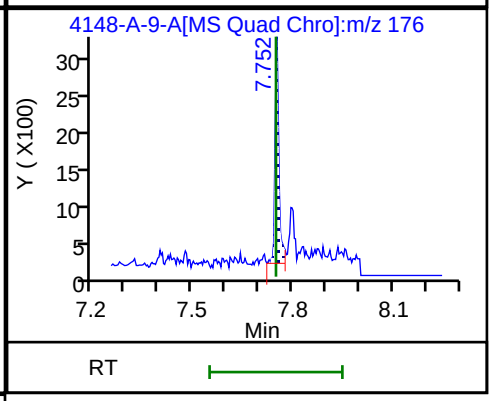
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12
Client ID:	1804576-854-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

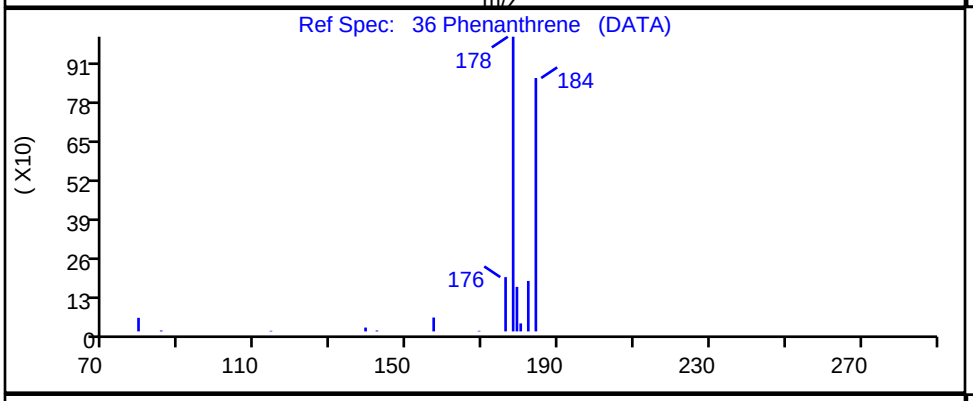
36 Phenanthrene, CAS: 85-01-8

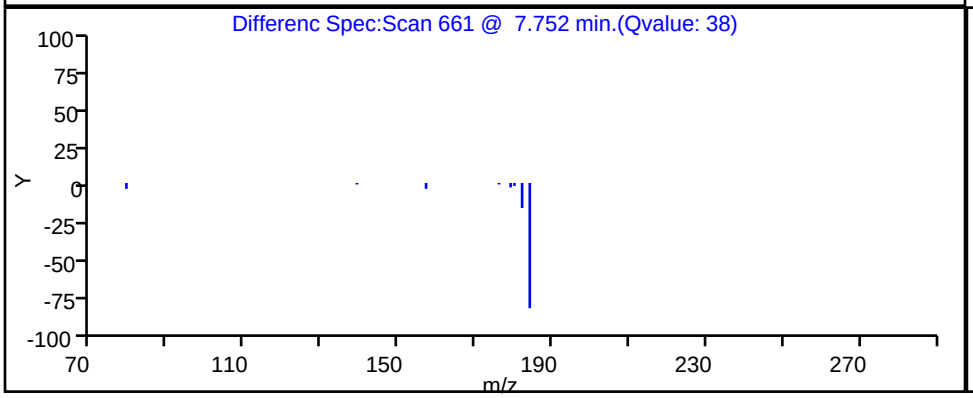


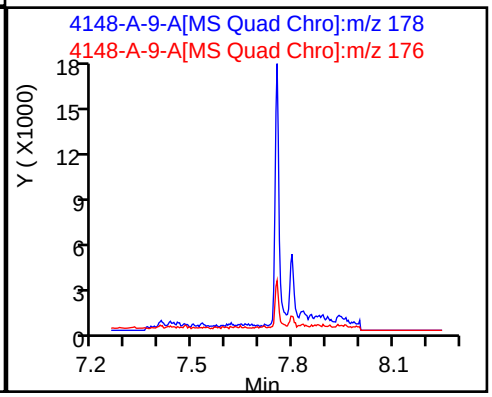












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Eurofins Knoxville

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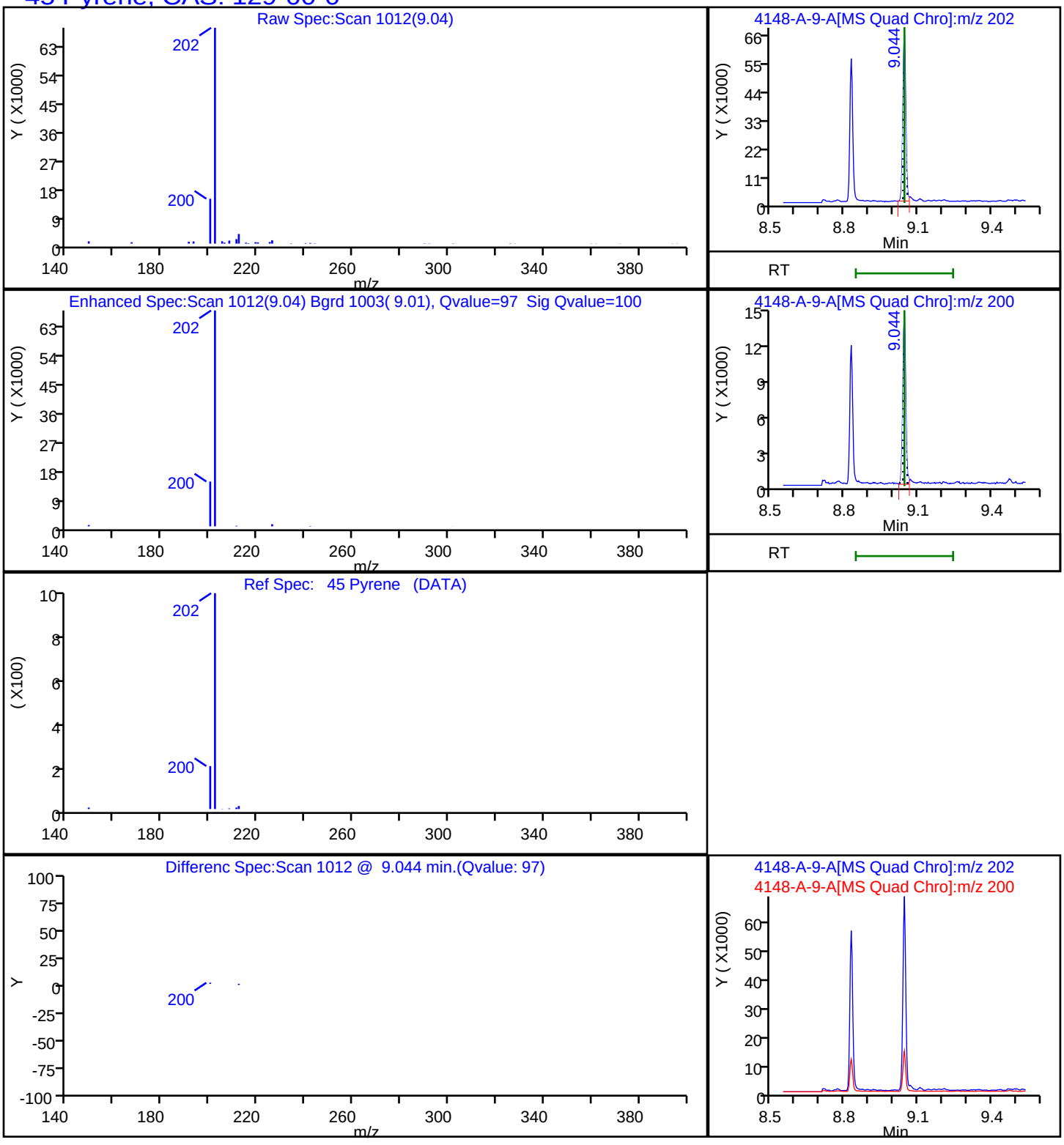
Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12
Client ID:	1804576-854-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

45 Pyrene, CAS: 129-00-0



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Eurofins Knoxville

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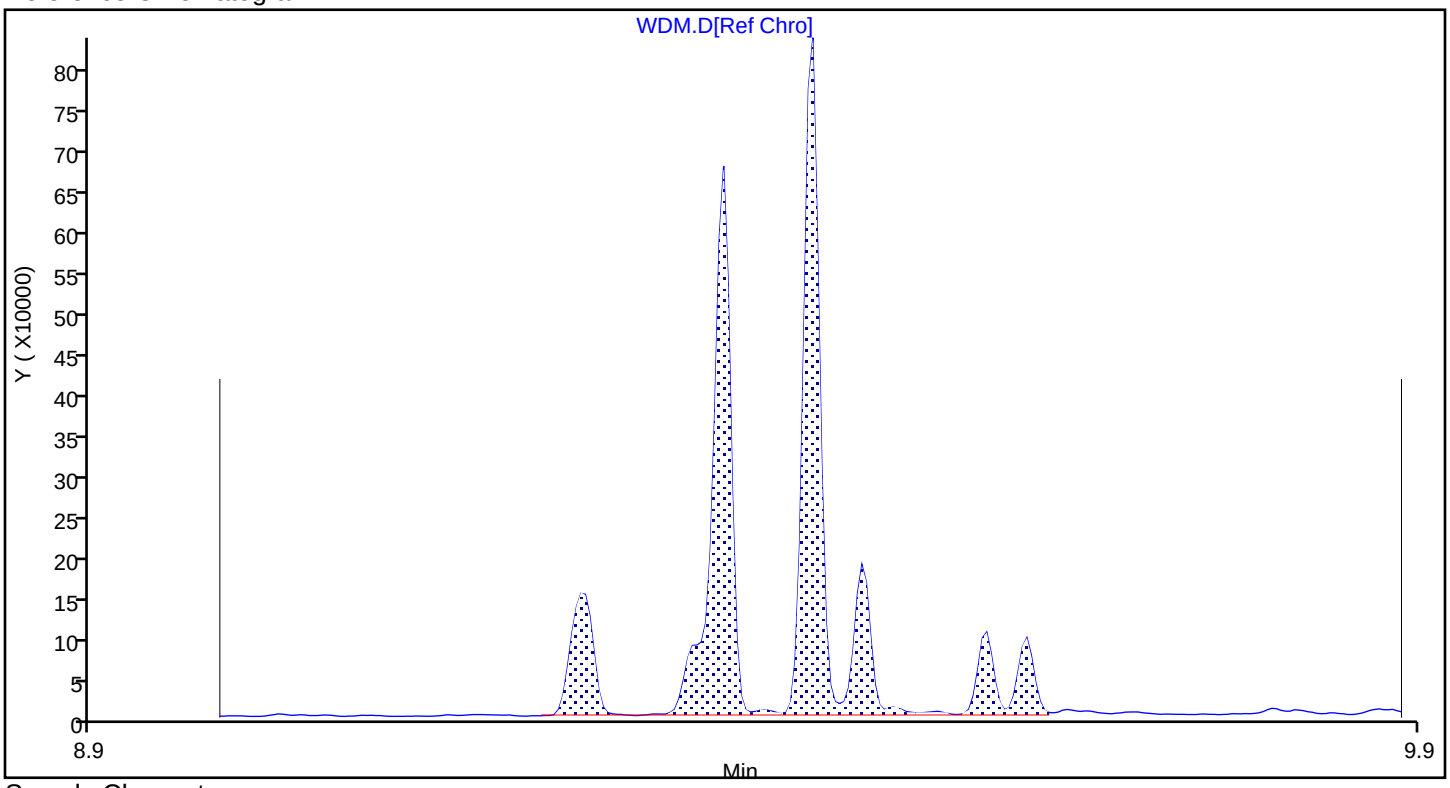
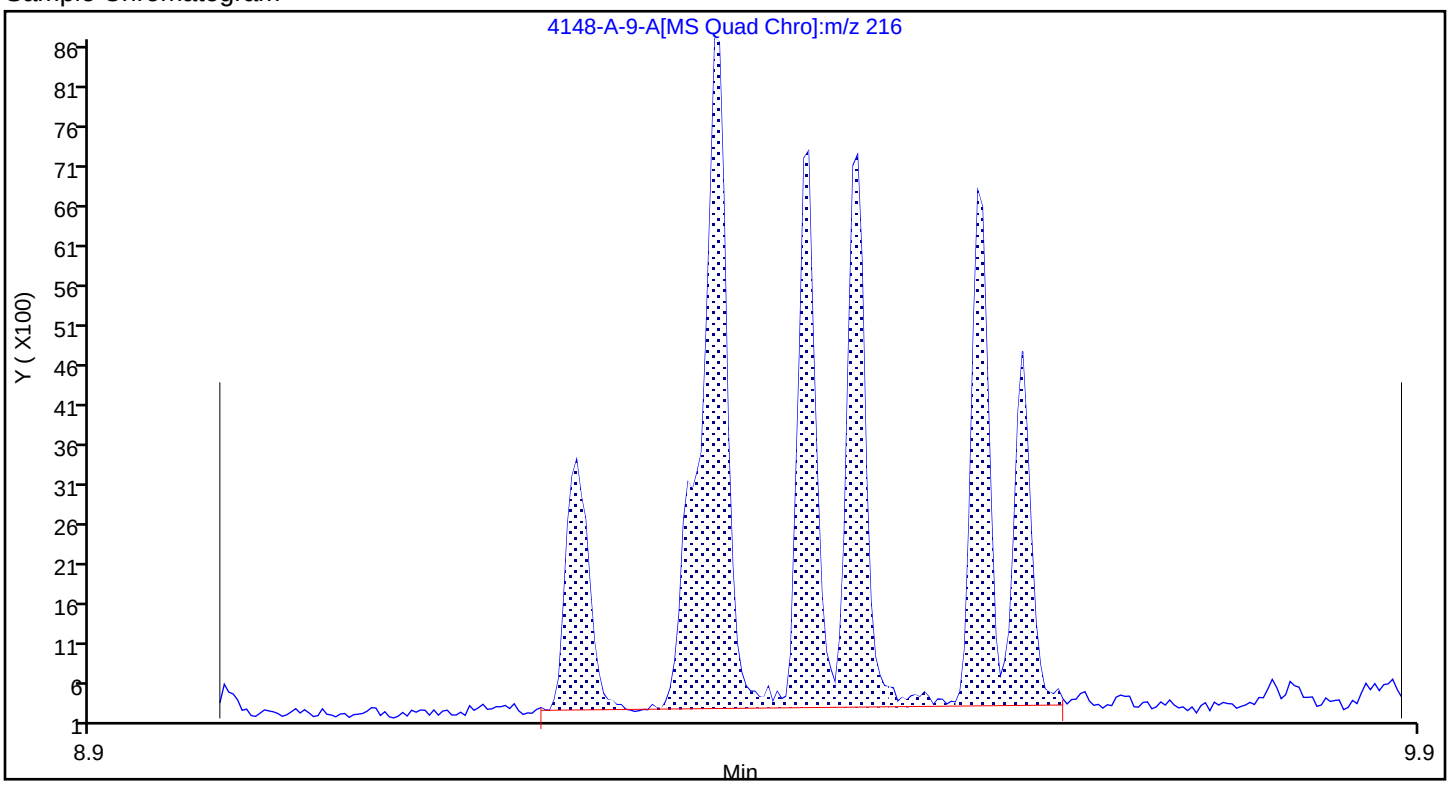
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12		
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 100 C1-Fluoranthenes/pyrene, CAS: STL00912

Reference Chromatogram



Sample Chromatogram



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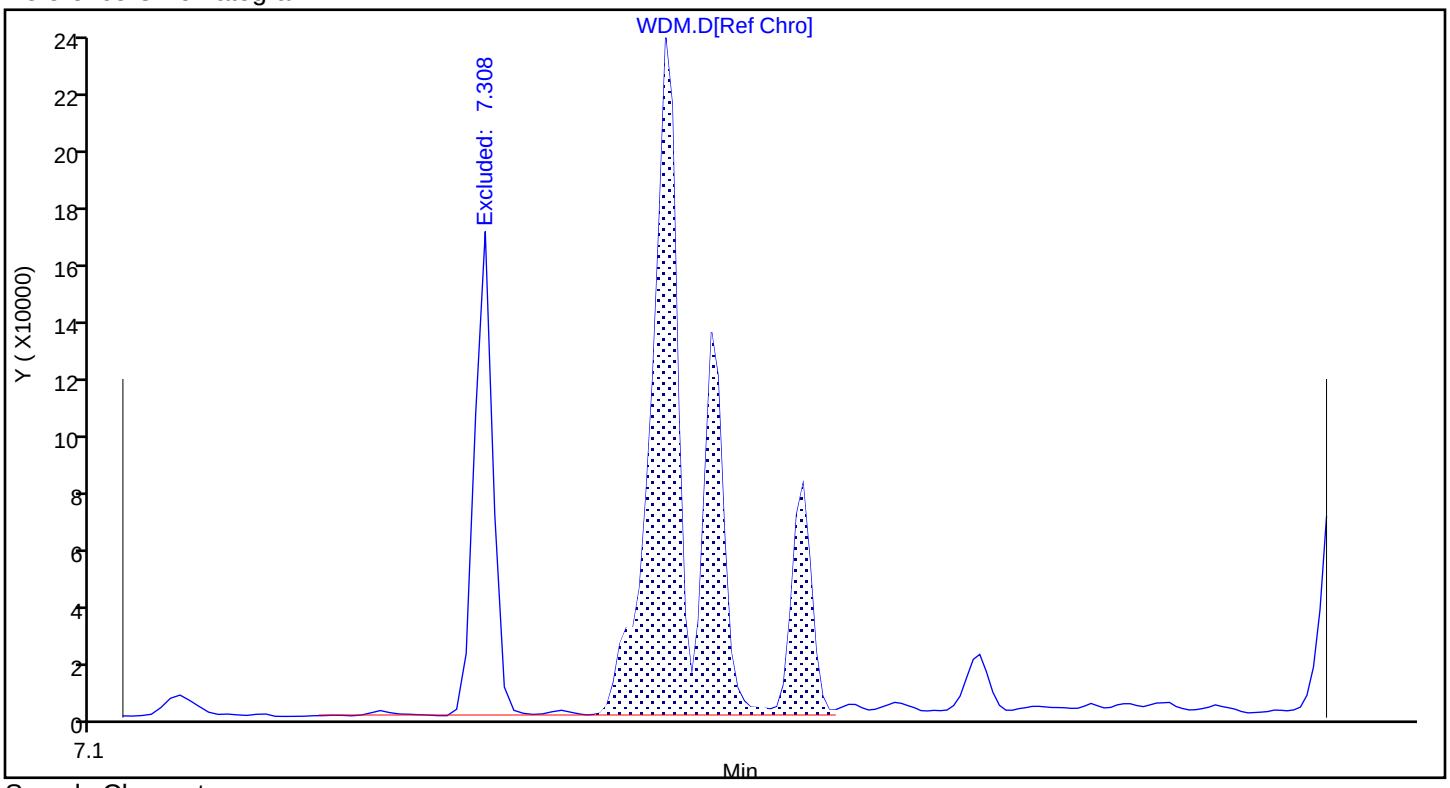
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12		
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 89 C1-Fluorenes, CAS: STL00913

Reference Chromatogram



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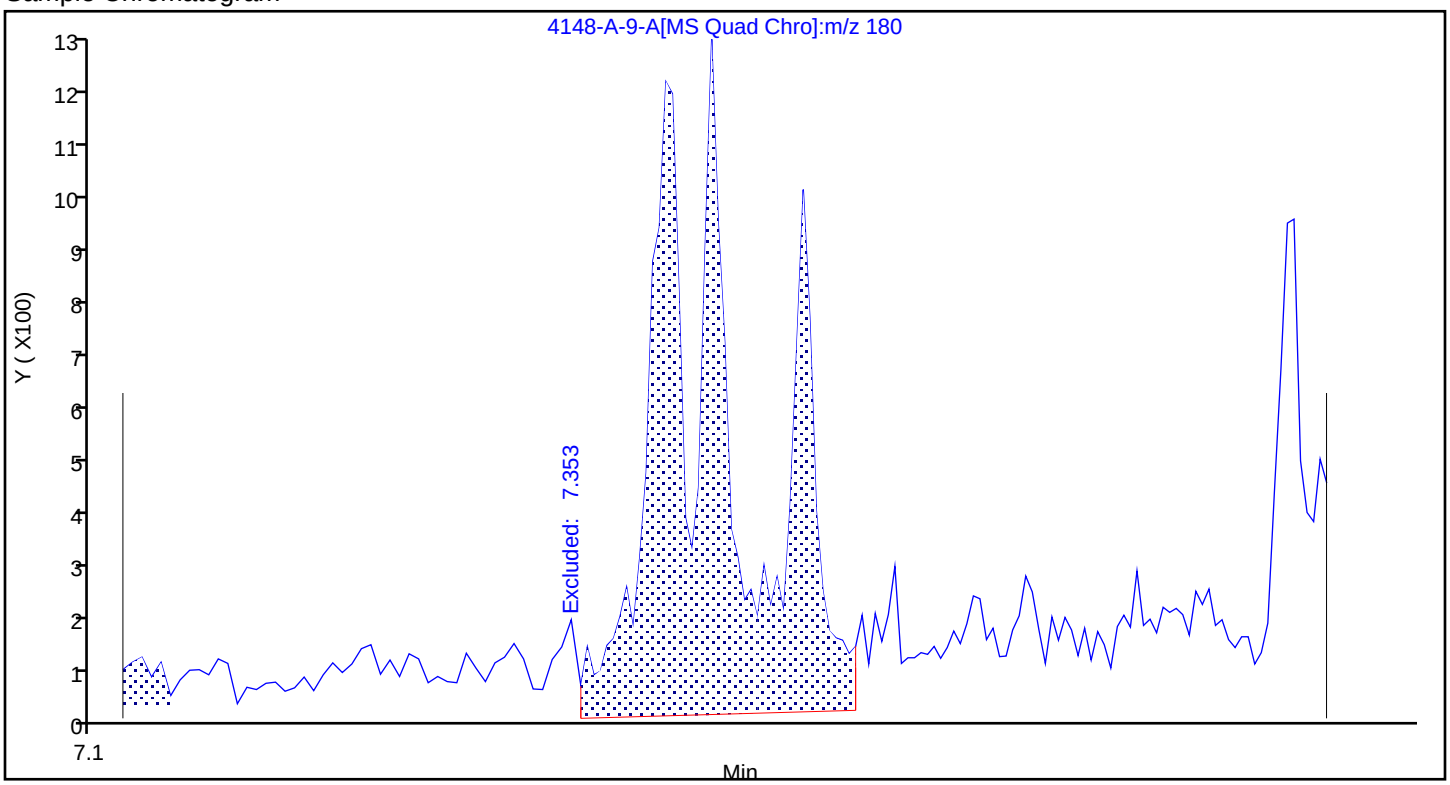

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Eurofins Knoxville

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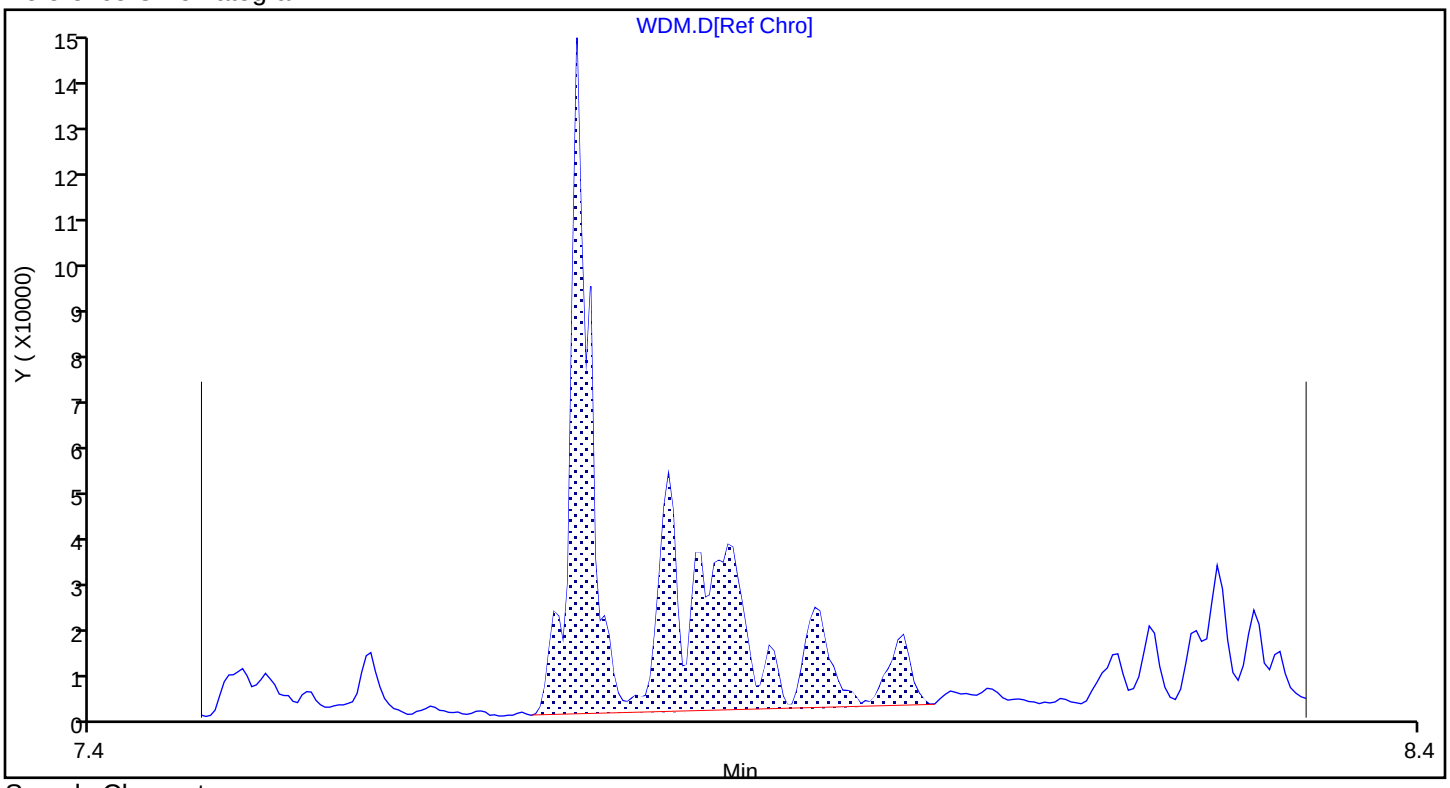
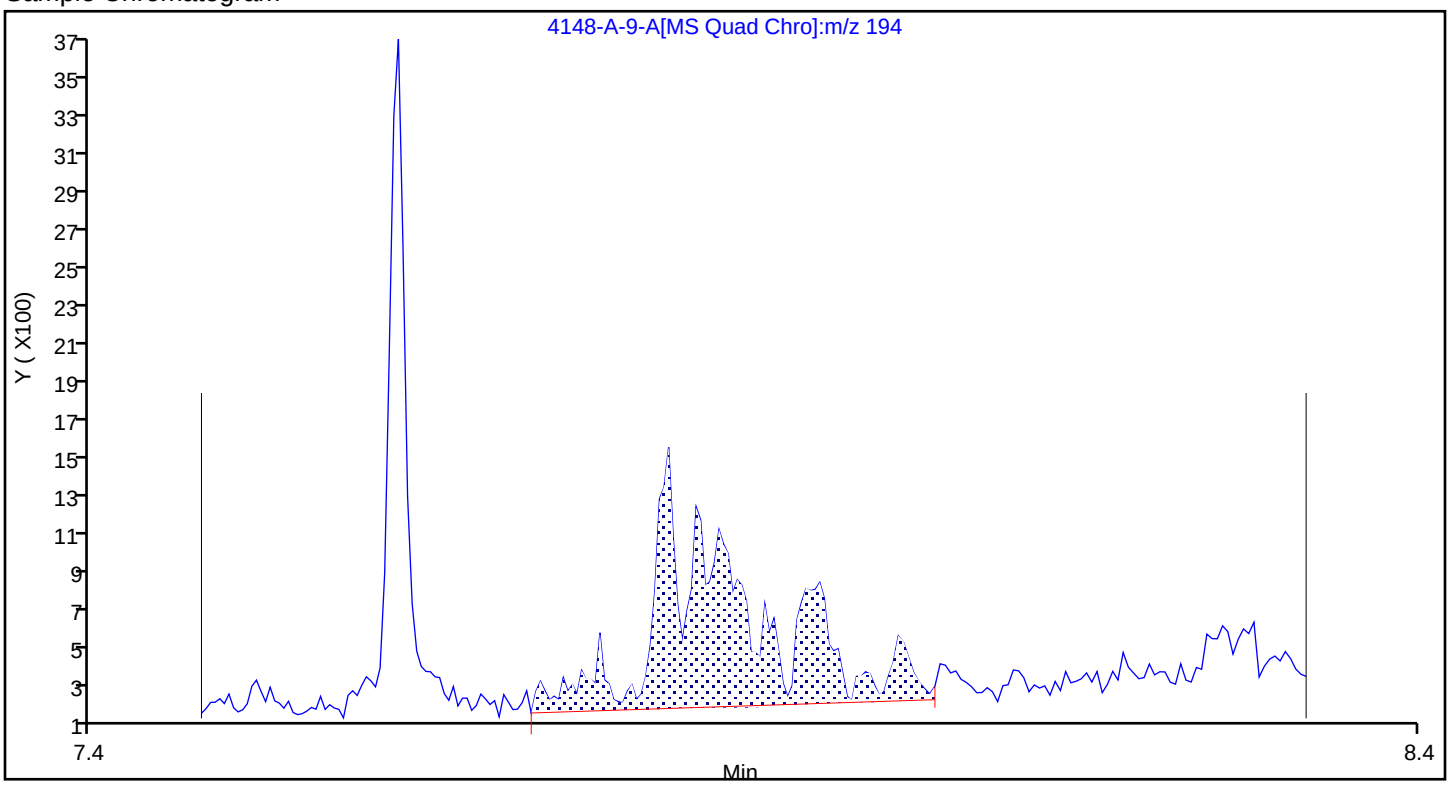
Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12		
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 90 C2-Fluorenes, CAS: STL00914

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12		
Client ID:	1804576-854-S1				
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Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
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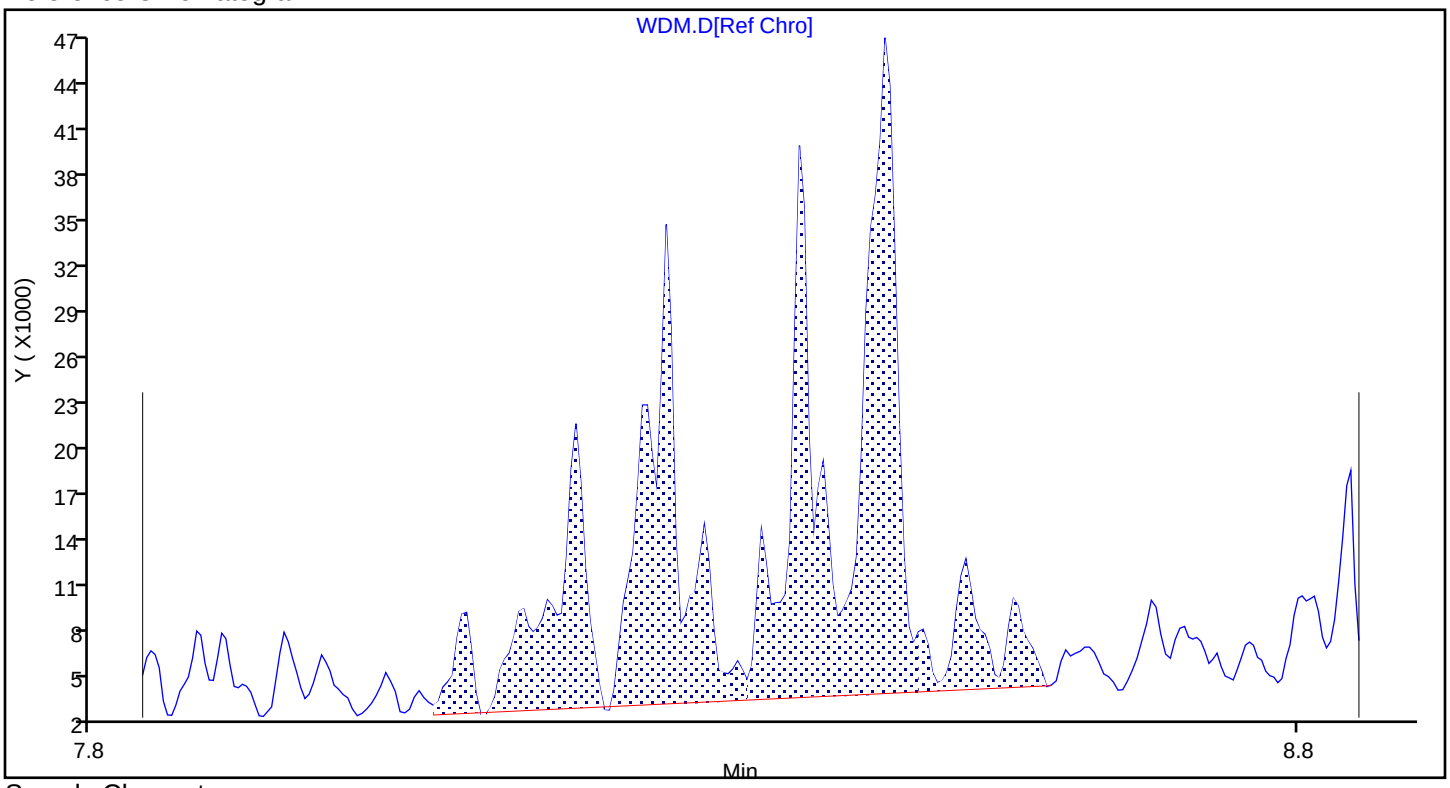
A 91 C3-Fluorenes, CAS: STL00915

Reference Chromatogram



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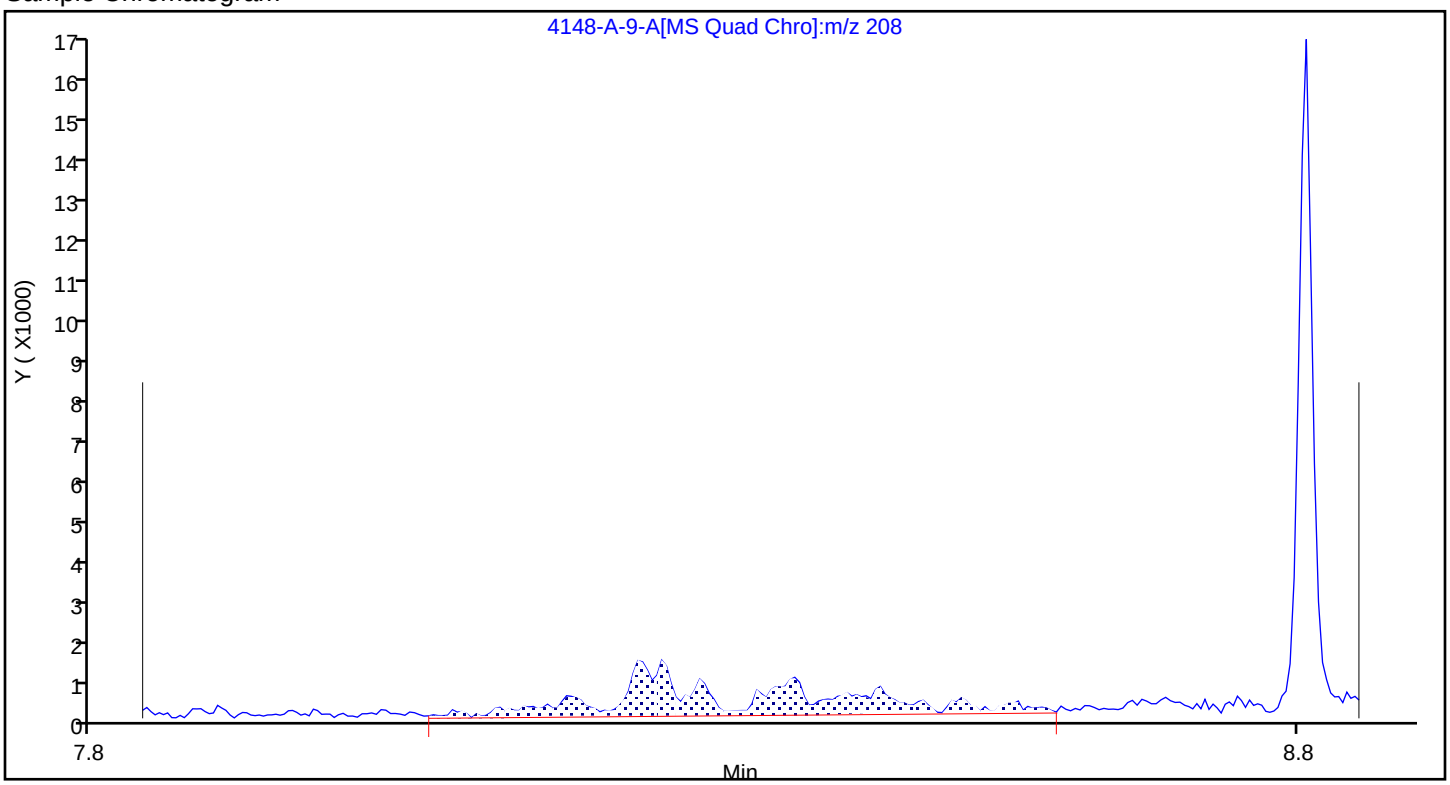

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Eurofins Knoxville

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Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12		
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
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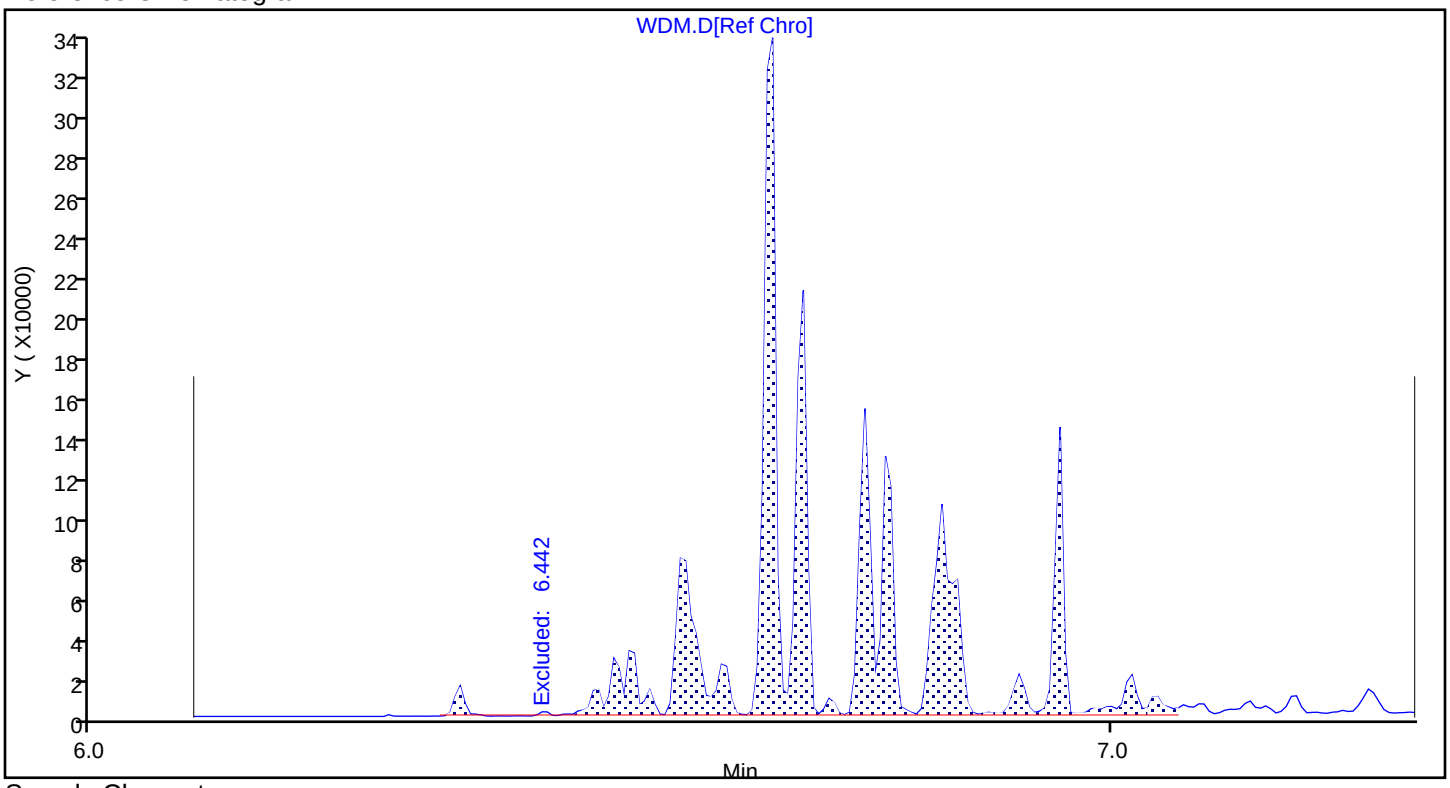
A 87 C3-Naphthalenes, CAS: STL00918

Reference Chromatogram



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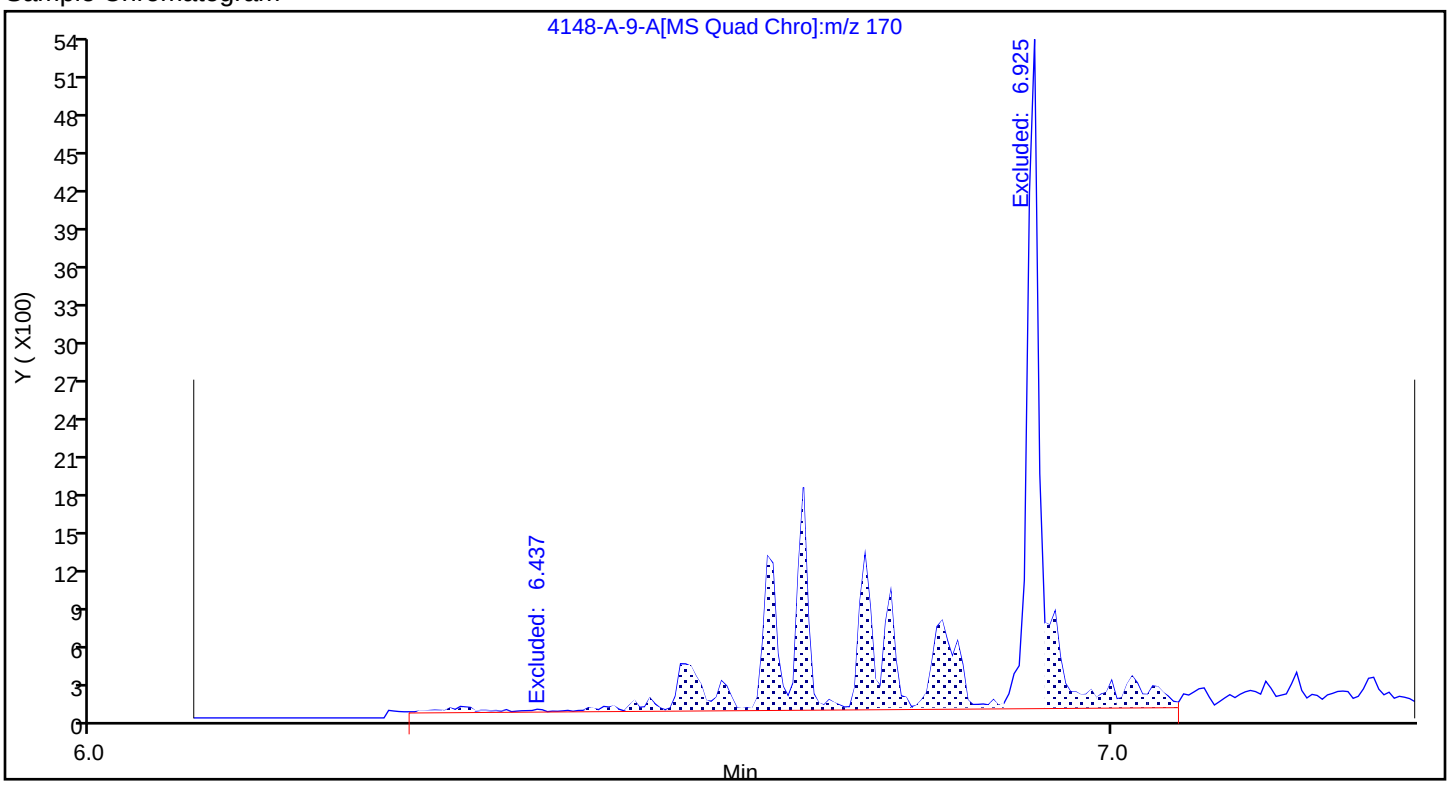


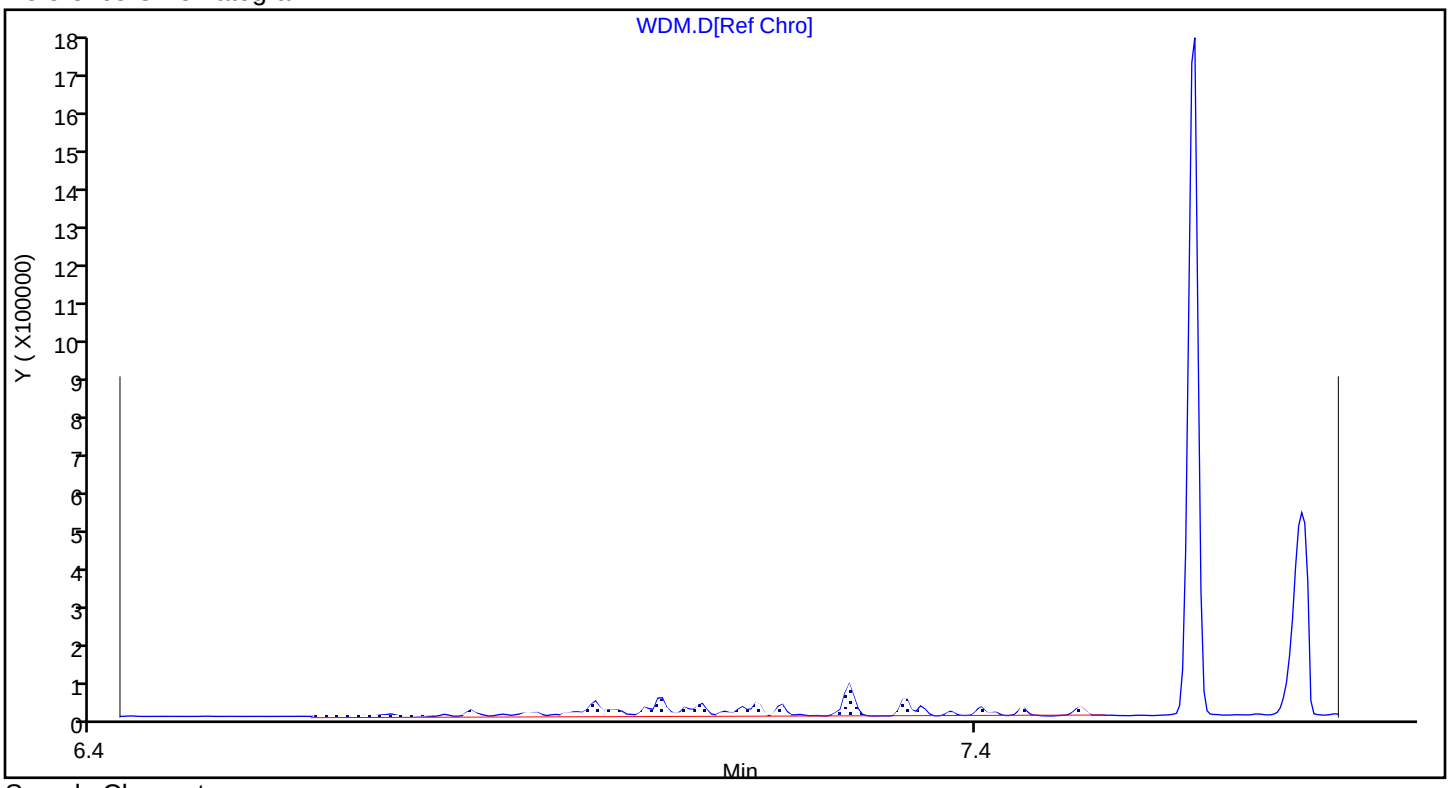
Report Date: 17-Nov-2023 12:15:27 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

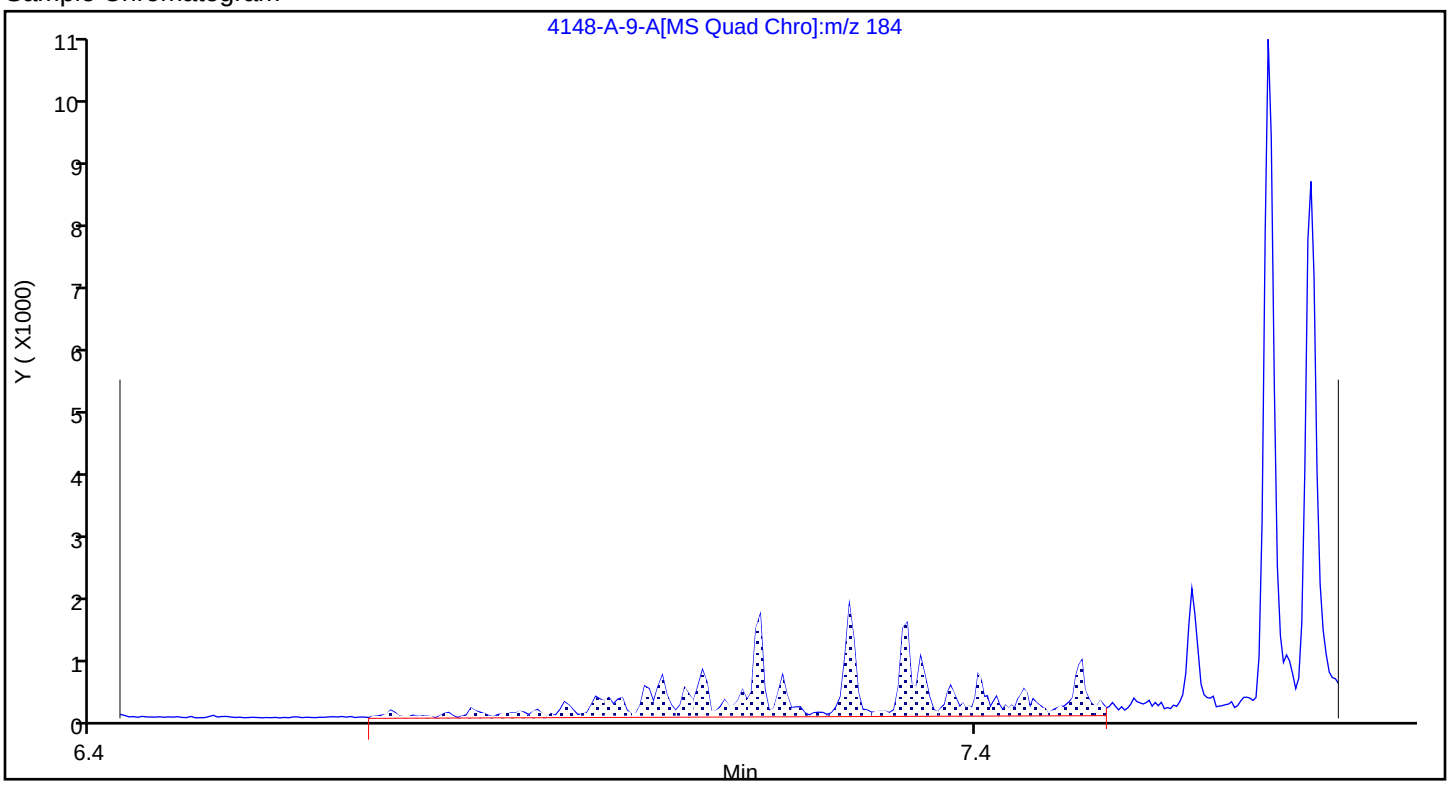
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-9-A.D				
Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12		
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 88 C4-Naphthalenes, CAS: STL00919

Reference Chromatogram



Sample Chromatogram



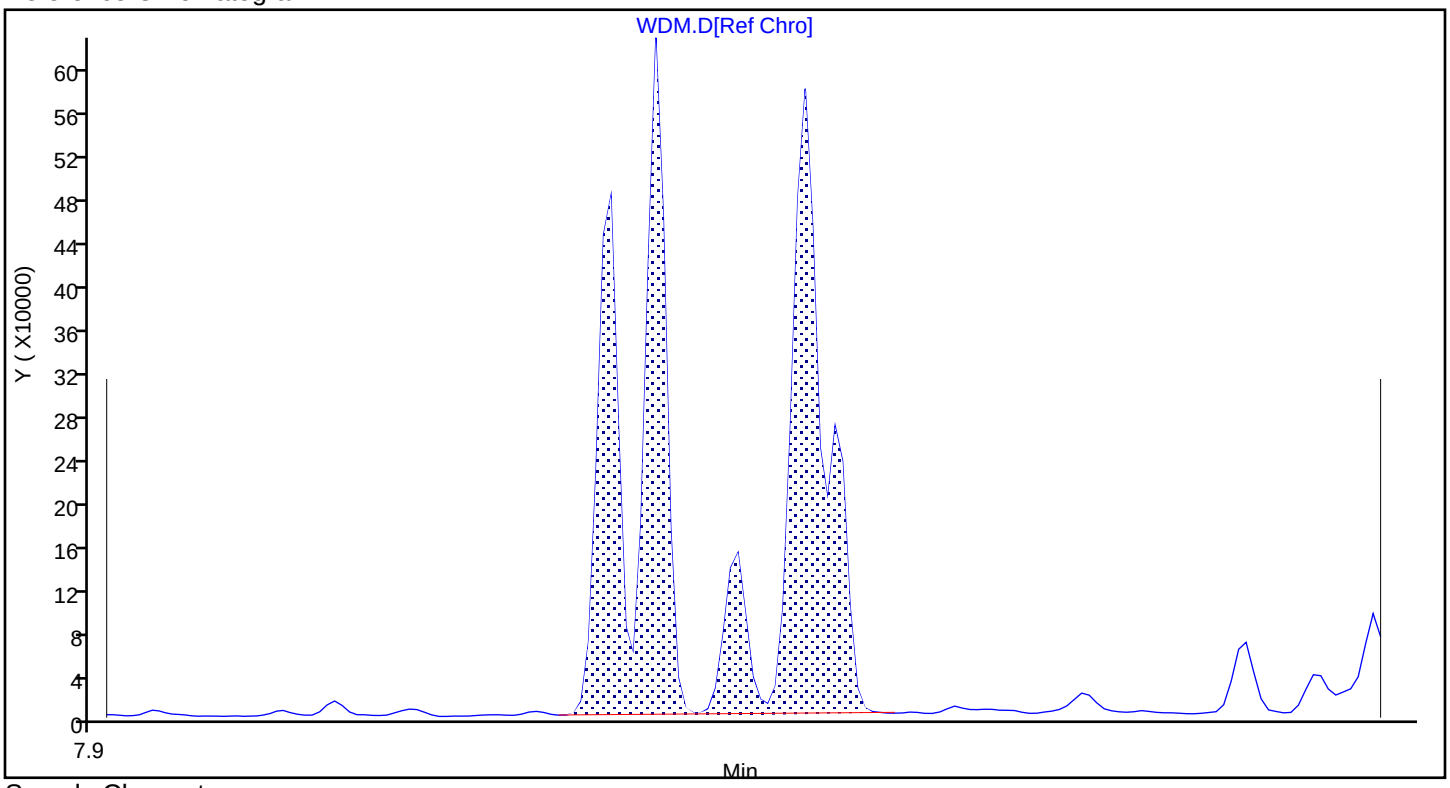
Report Date: 17-Nov-2023 12:15:27 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

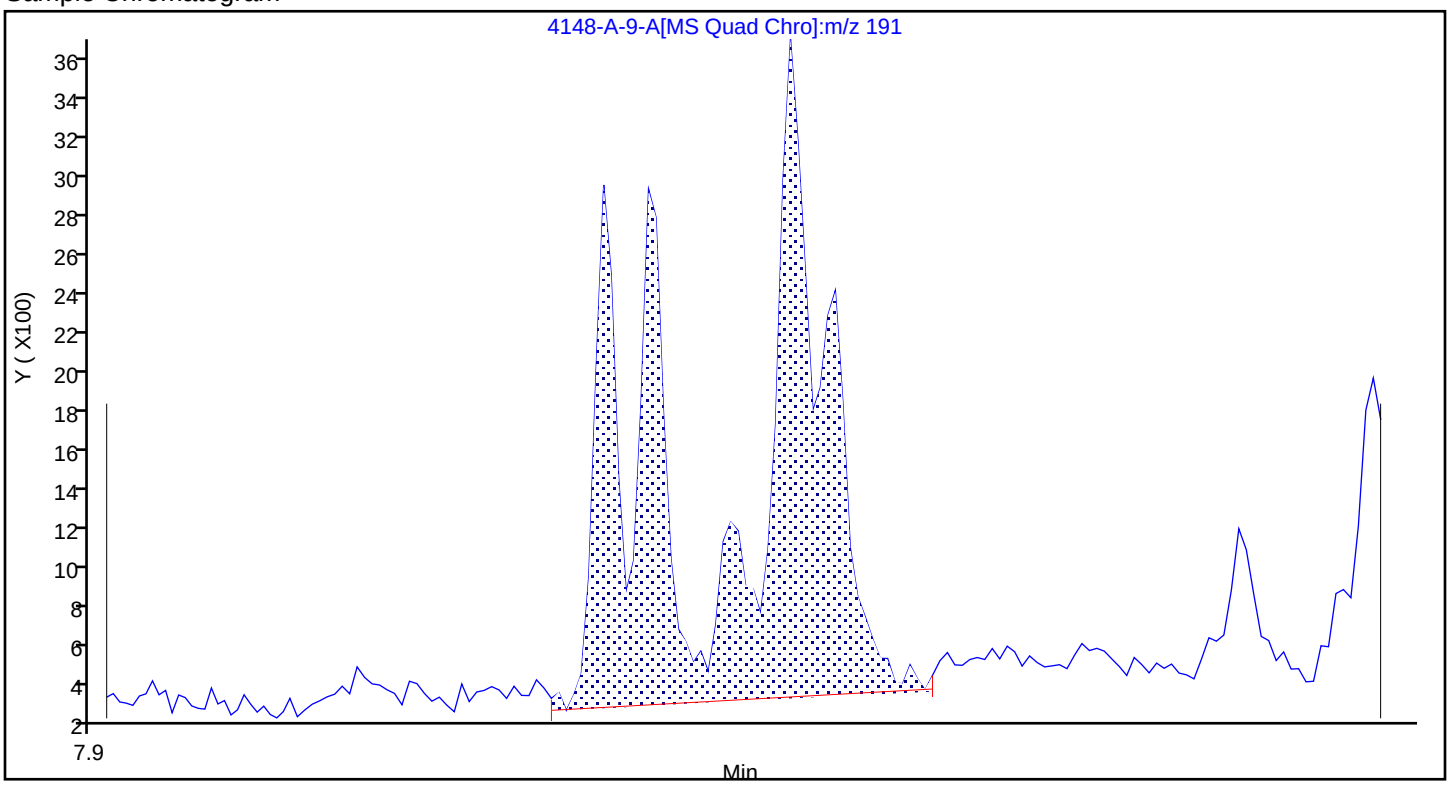
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-9-A.D				
Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12		
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 96 C1-Phenanthrenes/Anthracenes, CAS: STL00901

Reference Chromatogram



Sample Chromatogram



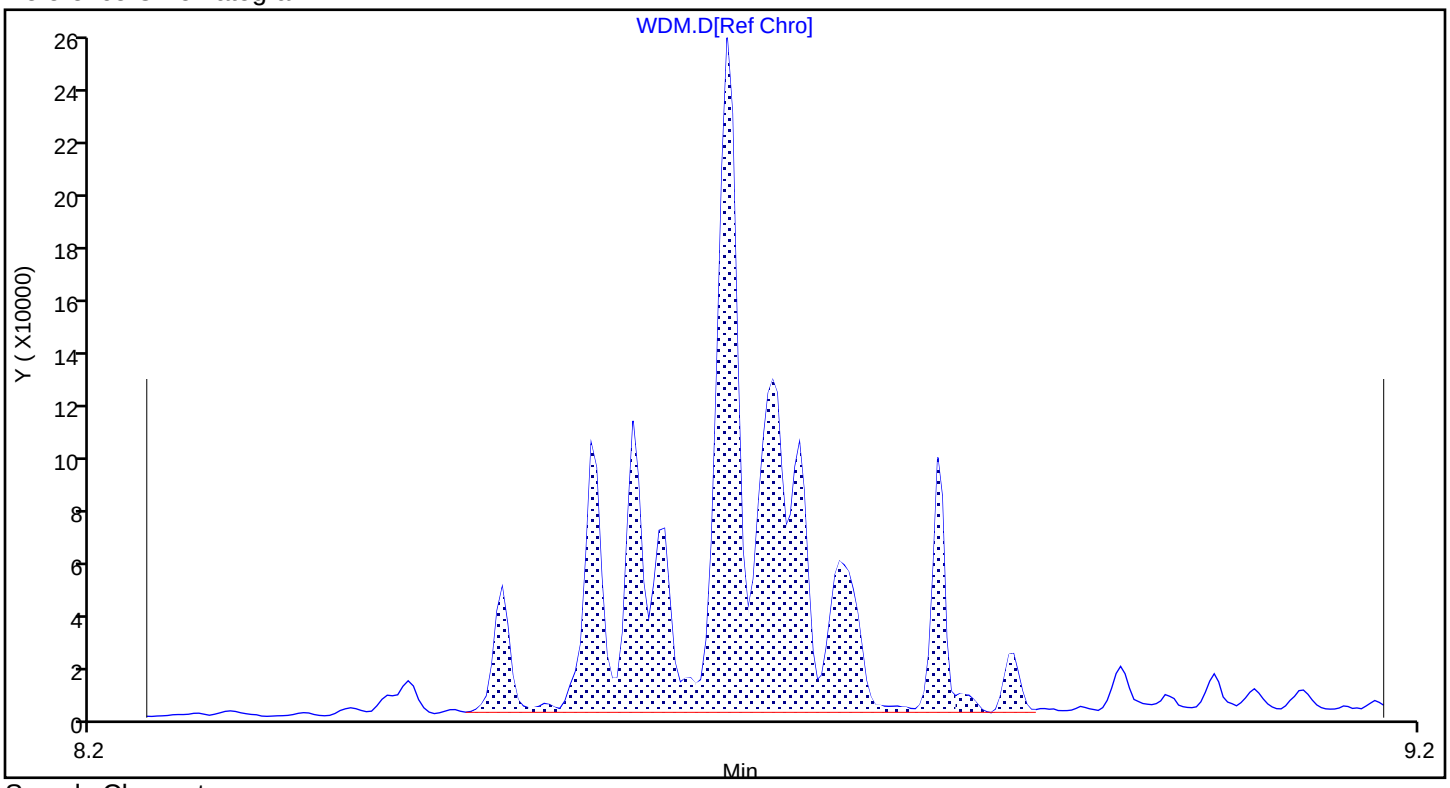
Report Date: 17-Nov-2023 12:15:27 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

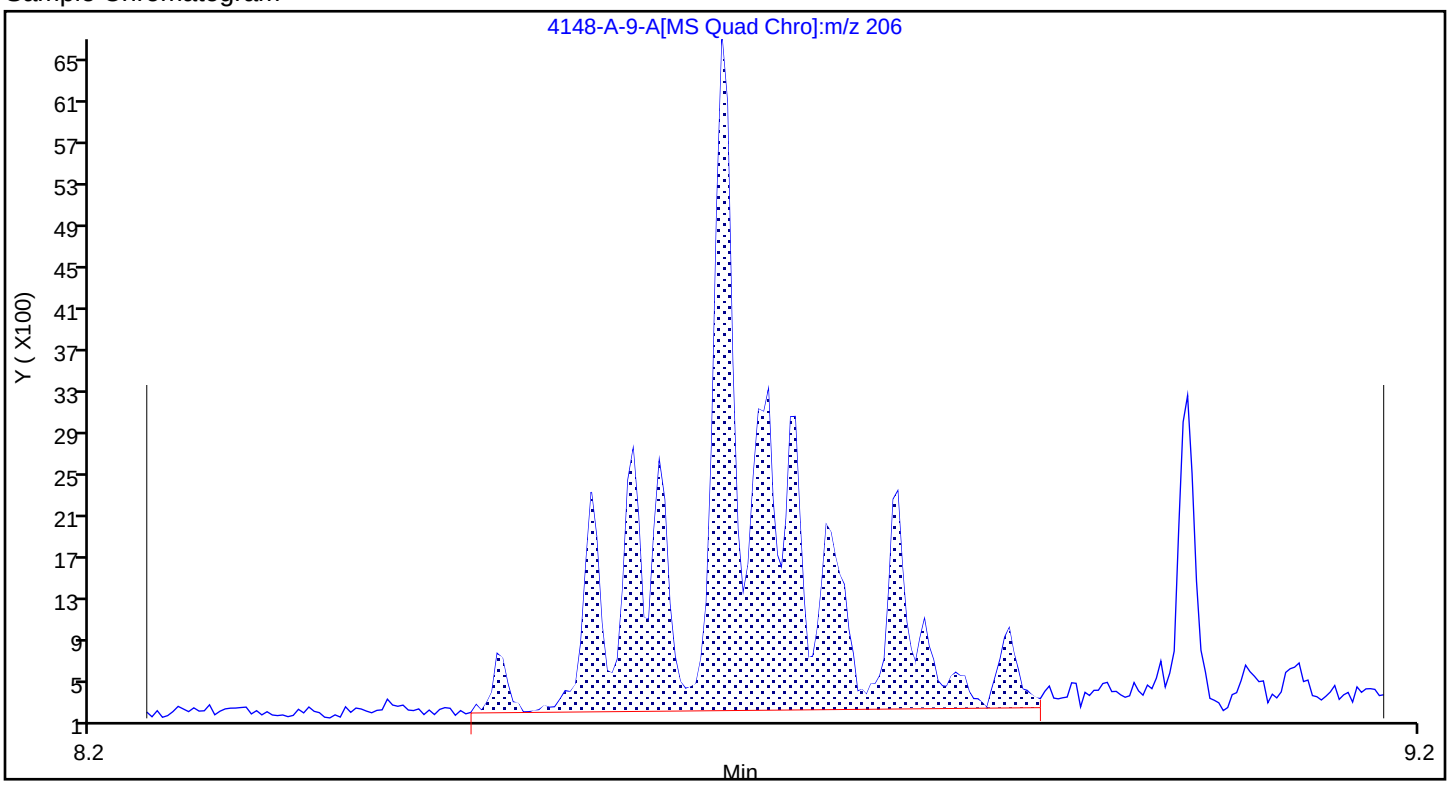
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-9-A.D				
Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12		
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 97 C2-Phenanthrenes/Anthracenes, CAS: STL00902

Reference Chromatogram



Sample Chromatogram



Report Date: 17-Nov-2023 12:15:27 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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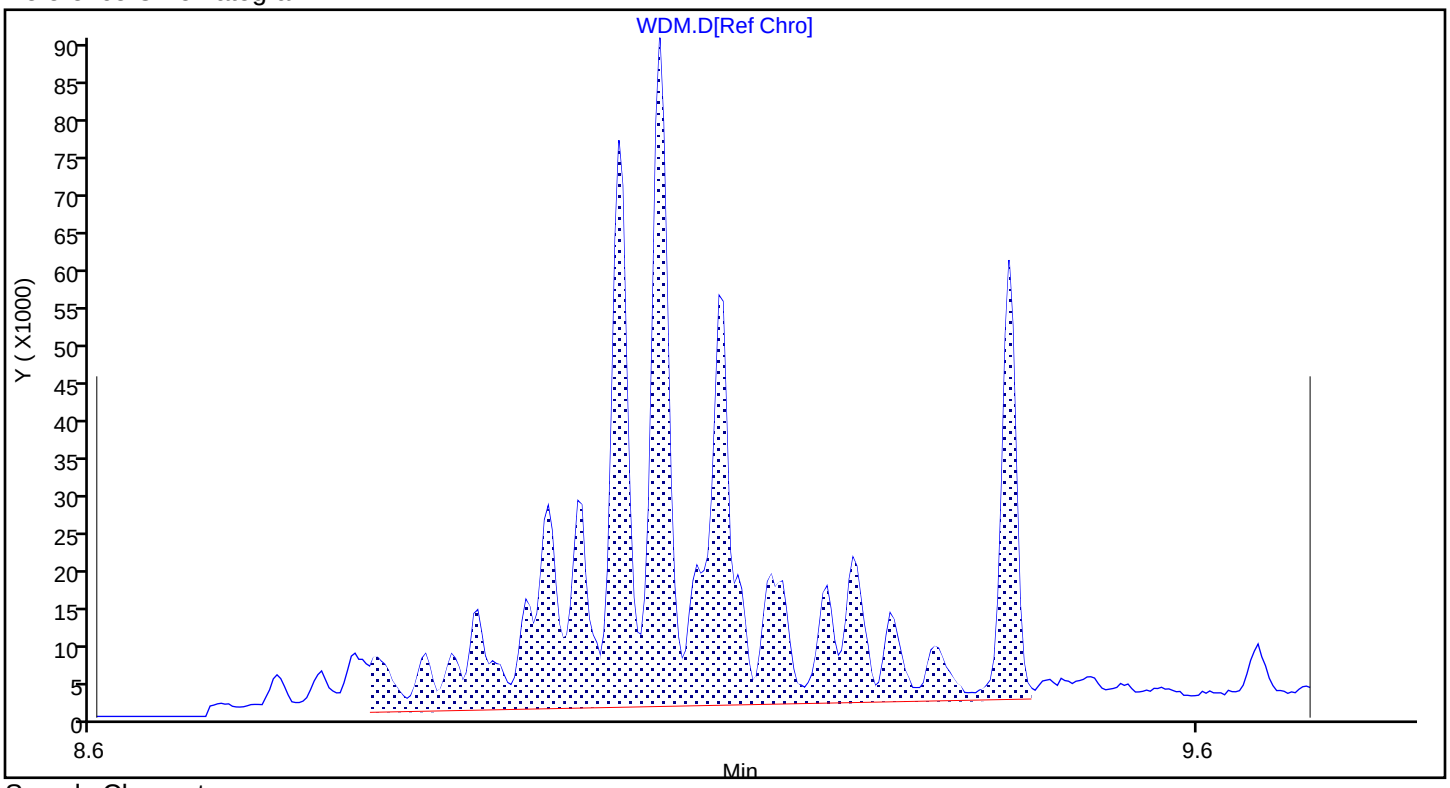
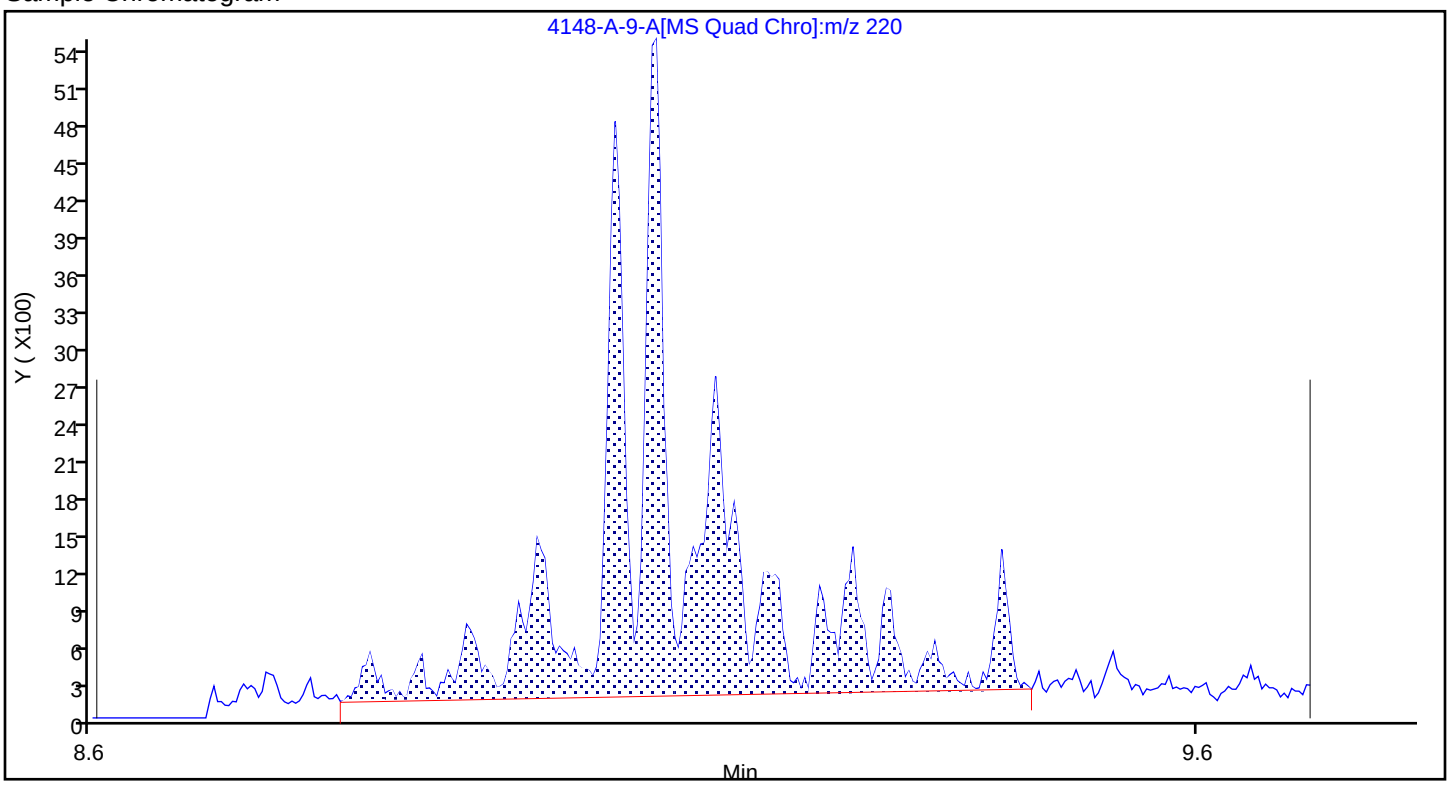
Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12		
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 98 C3-Phenanthrenes/Anthracenes, CAS: STL00903

Reference Chromatogram



Sample Chromatogram



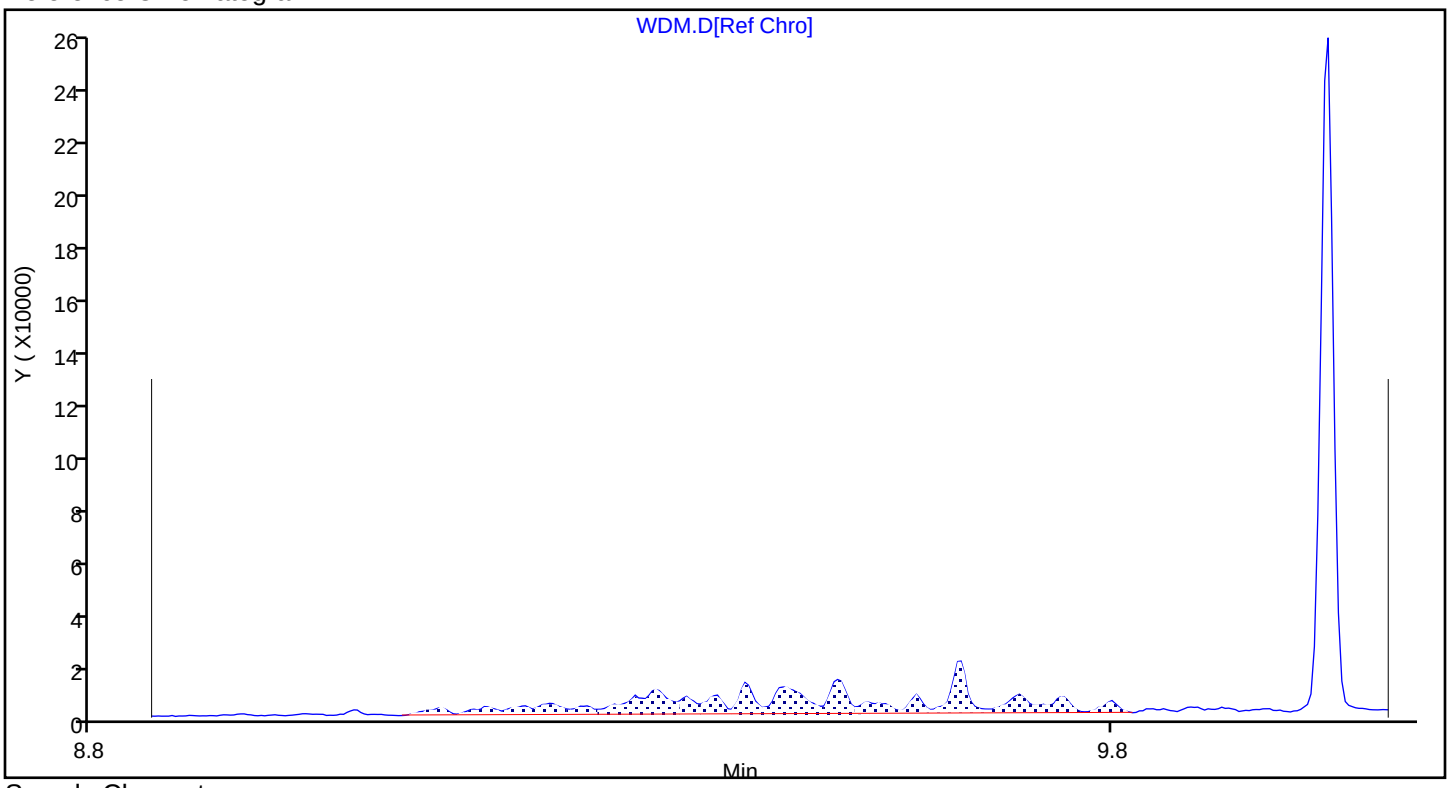
Report Date: 17-Nov-2023 12:15:27 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

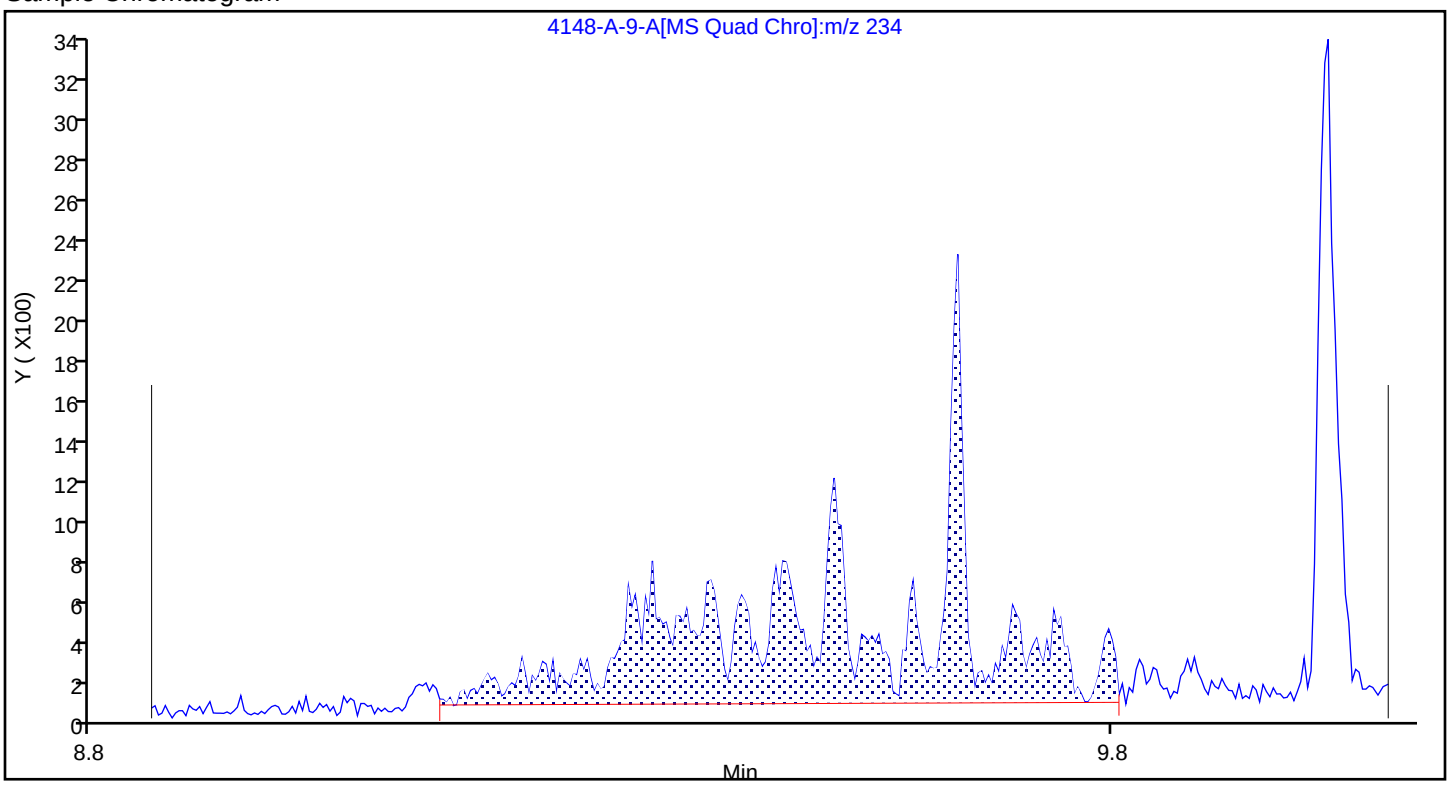
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-9-A.D				
Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12		
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 99 C4-Phenanthrenes/Anthracenes, CAS: STL00904

Reference Chromatogram



Sample Chromatogram



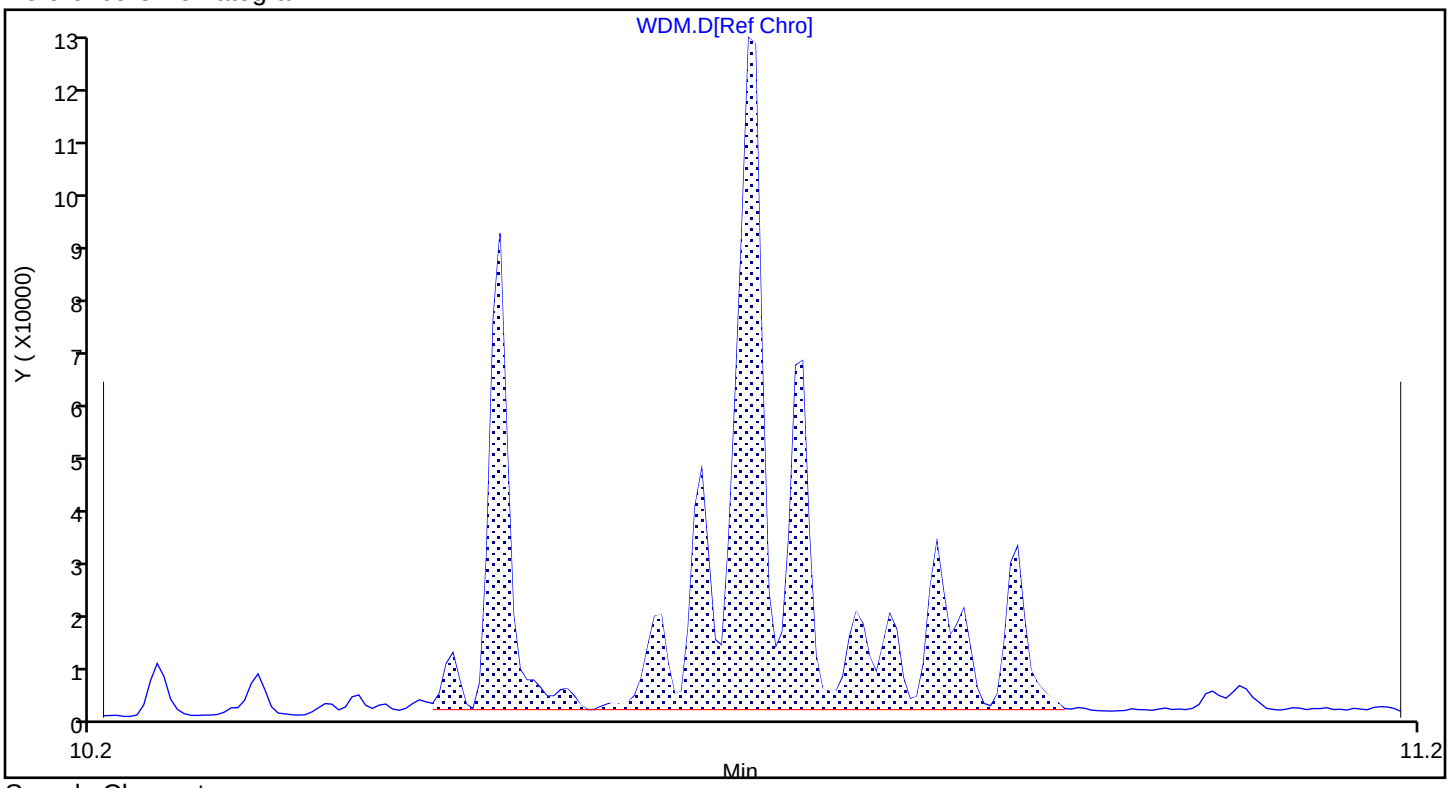
Report Date: 17-Nov-2023 12:15:27 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

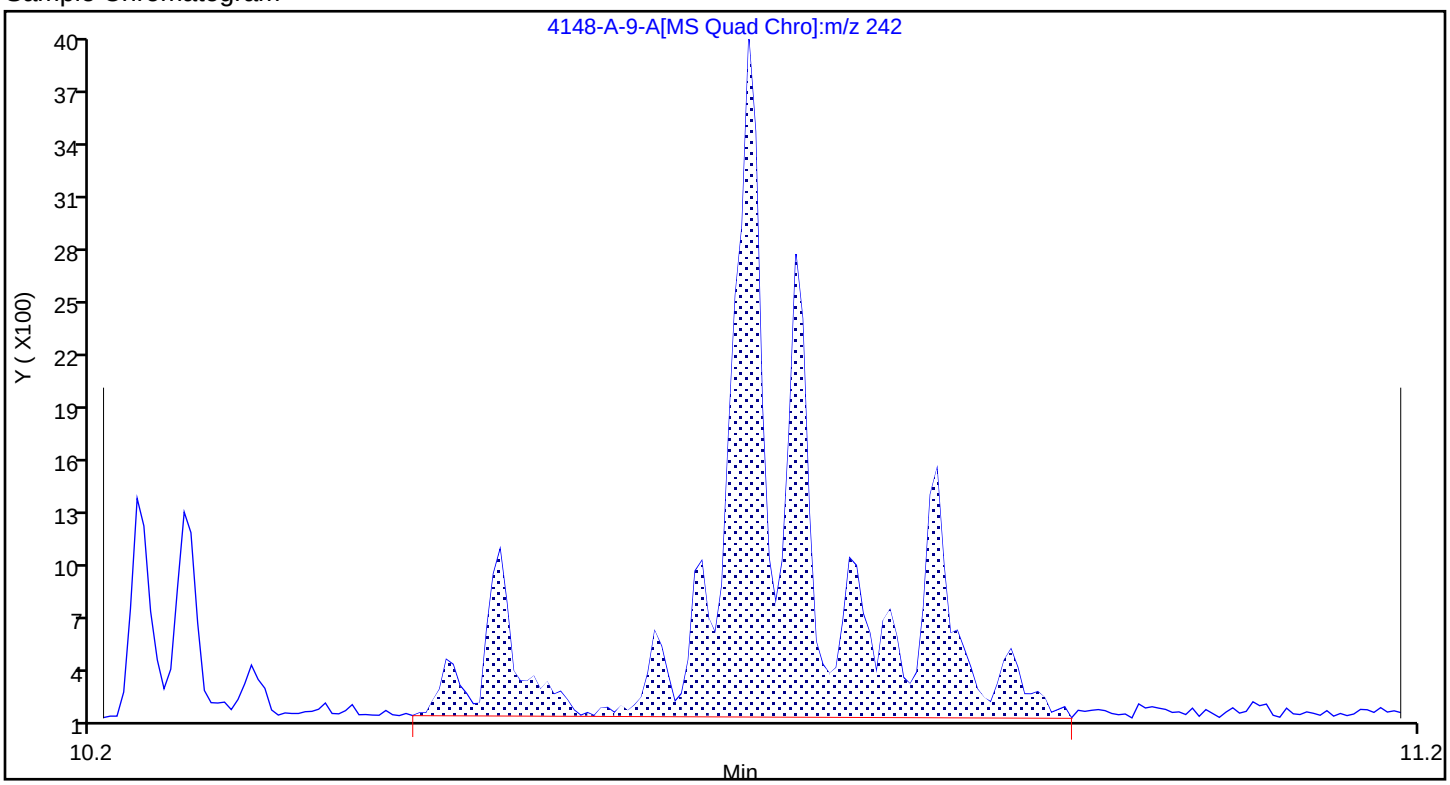
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-9-A.D				
Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12		
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 101 C1-Chrysenes/Benz(a)anthracenes, CAS: STL02218

Reference Chromatogram



Sample Chromatogram



Report Date: 17-Nov-2023 12:15:28 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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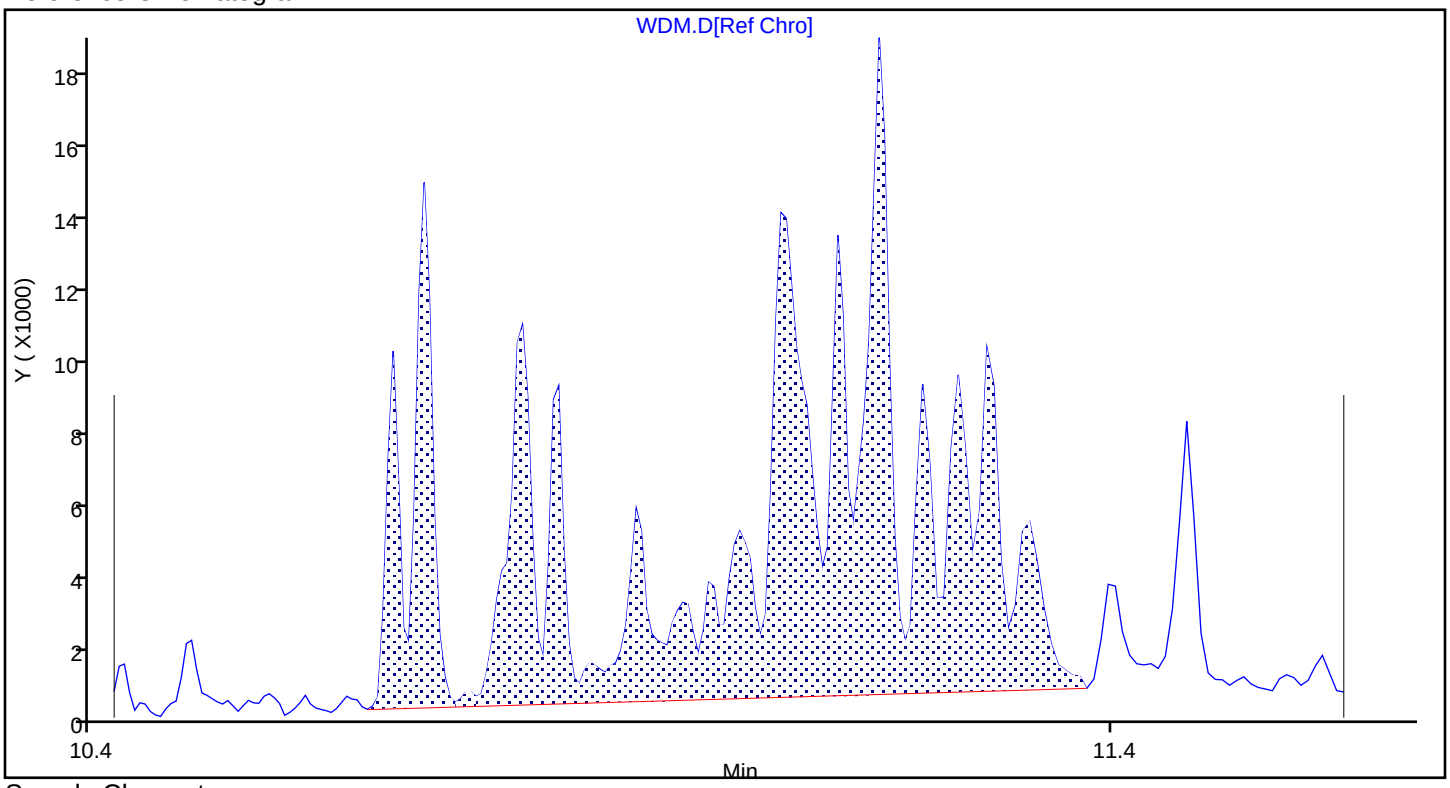
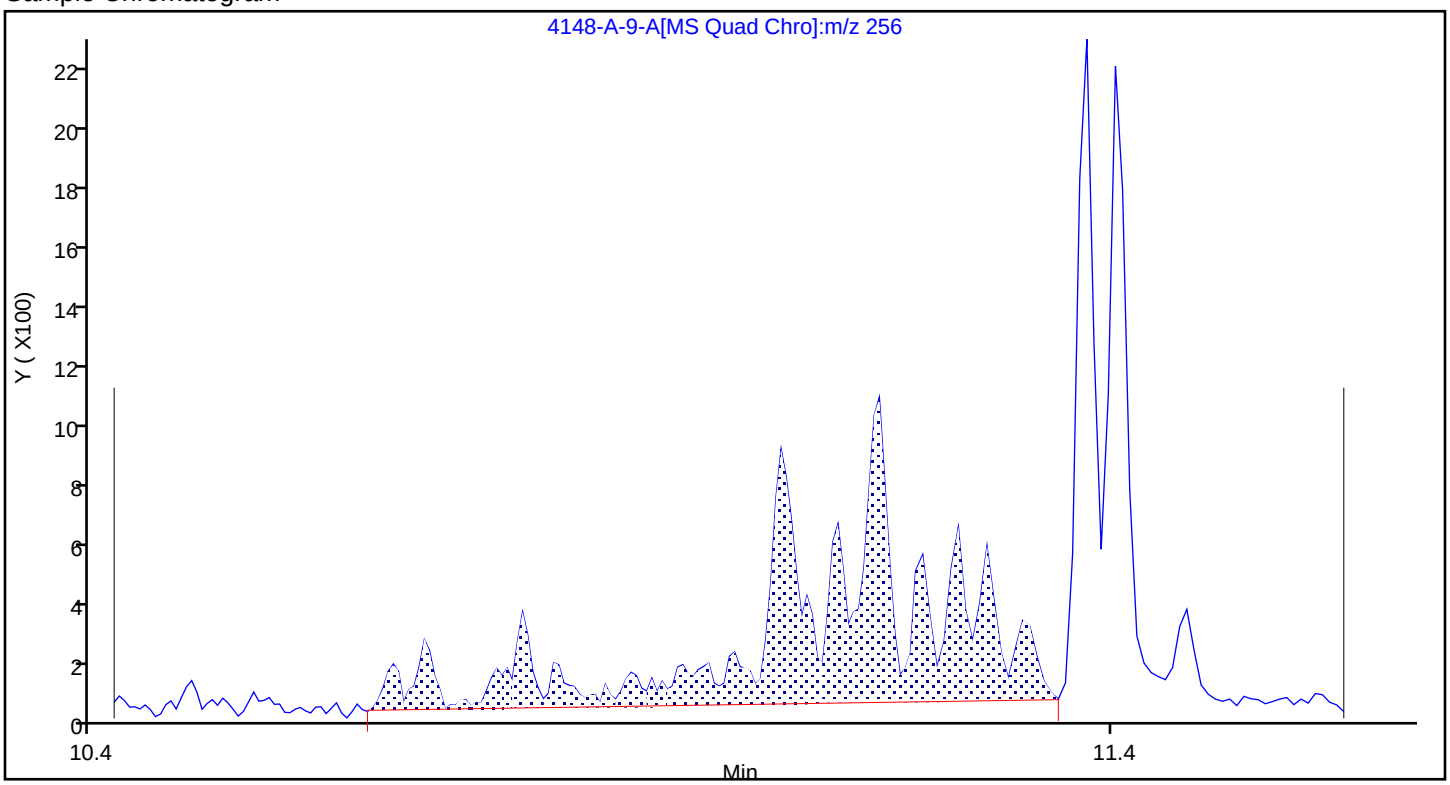
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12		
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 102 C2-Chrysenes/Benz(a)anthracenes, CAS: STL02219

Reference Chromatogram



Sample Chromatogram



Report Date: 17-Nov-2023 12:15:26 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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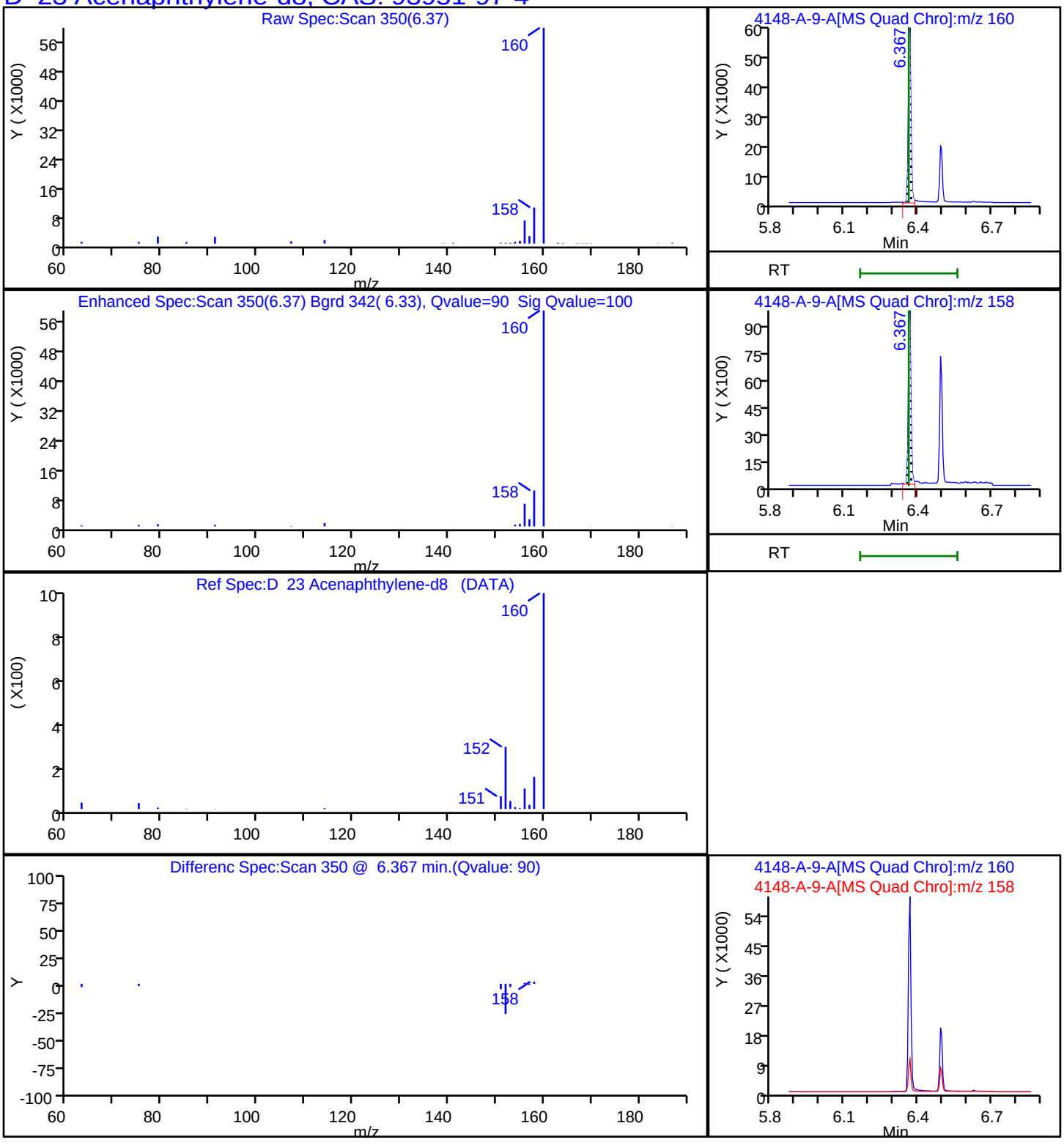
Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12		
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 23 Acenaphthylene-d8, CAS: 93951-97-4



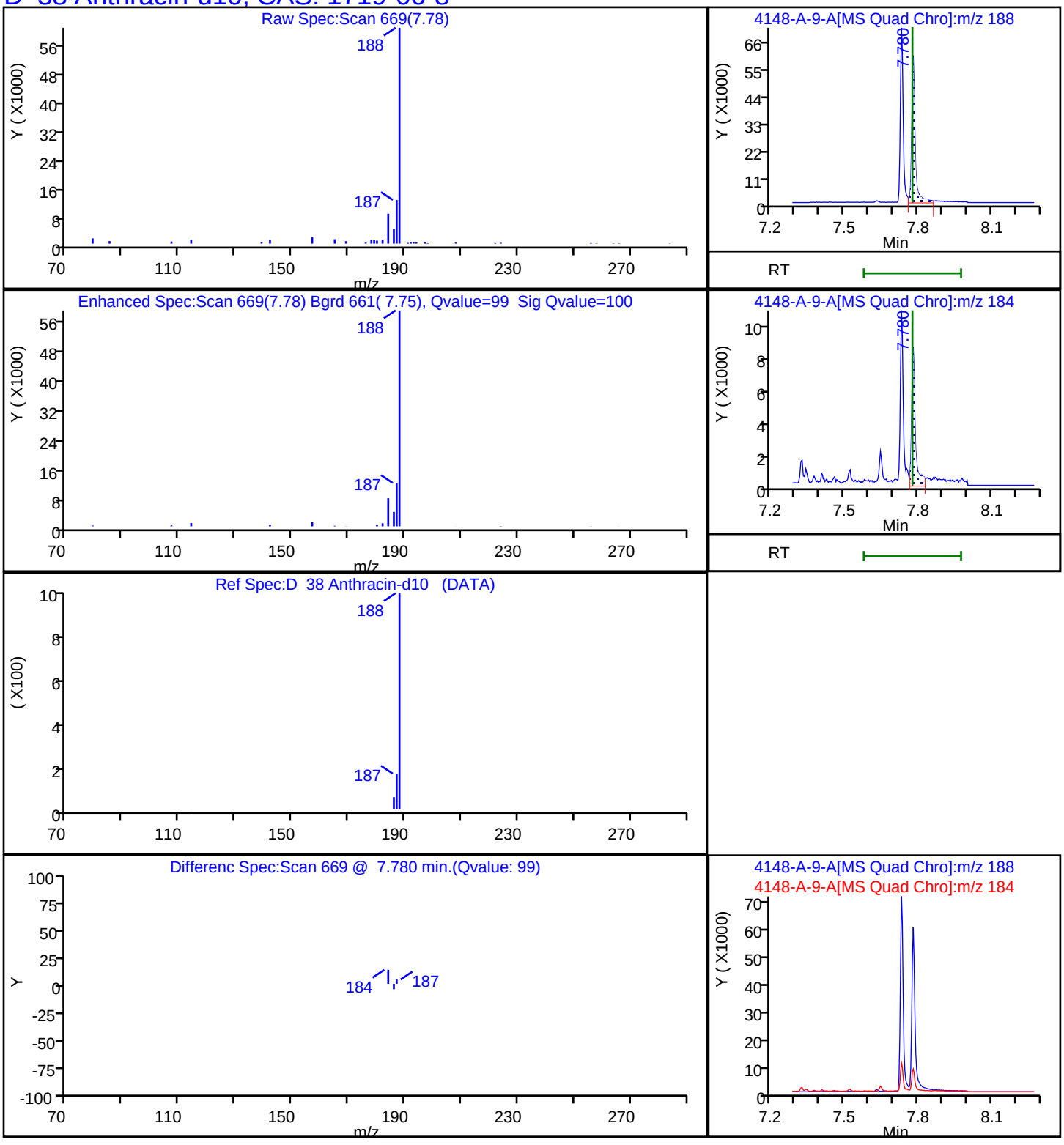
Report Date: 17-Nov-2023 12:15:26 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-9-A.D

Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12		
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 38 Anthracin-d10, CAS: 1719-06-8



Report Date: 17-Nov-2023 12:15:27 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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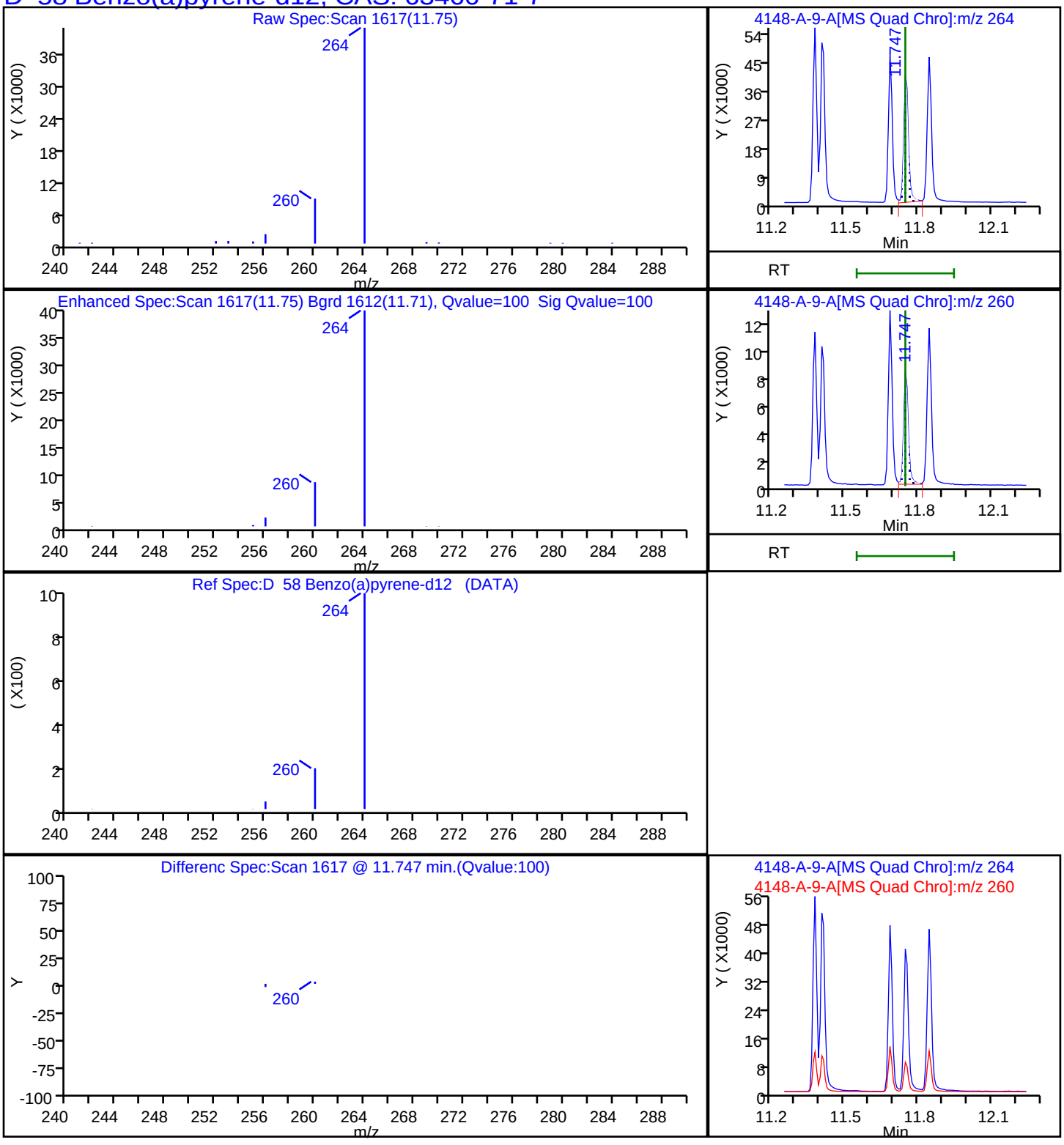
Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12
Client ID:	1804576-854-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

D 58 Benzo(a)pyrene-d12, CAS: 63466-71-7



Report Date: 17-Nov-2023 12:15:27 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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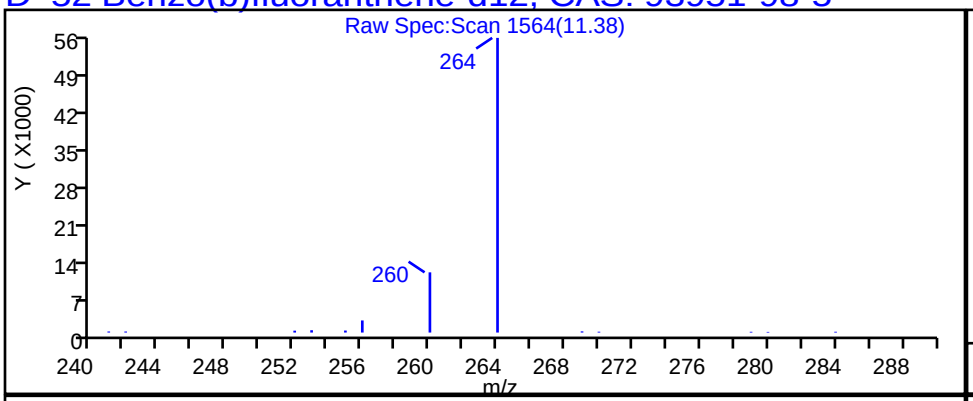
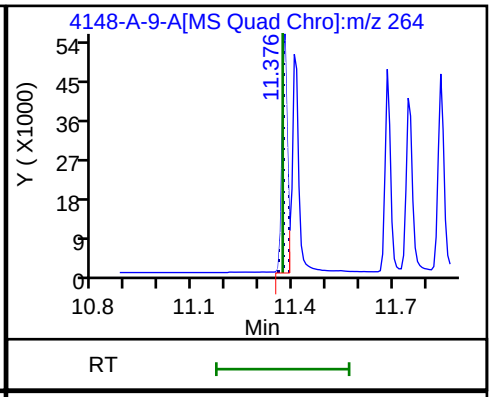
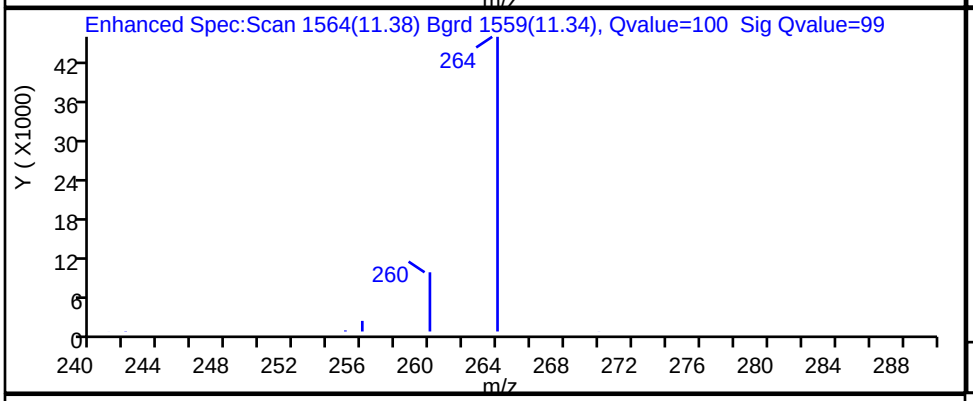
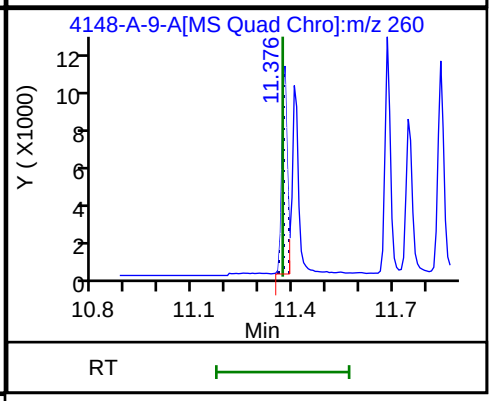
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12		
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

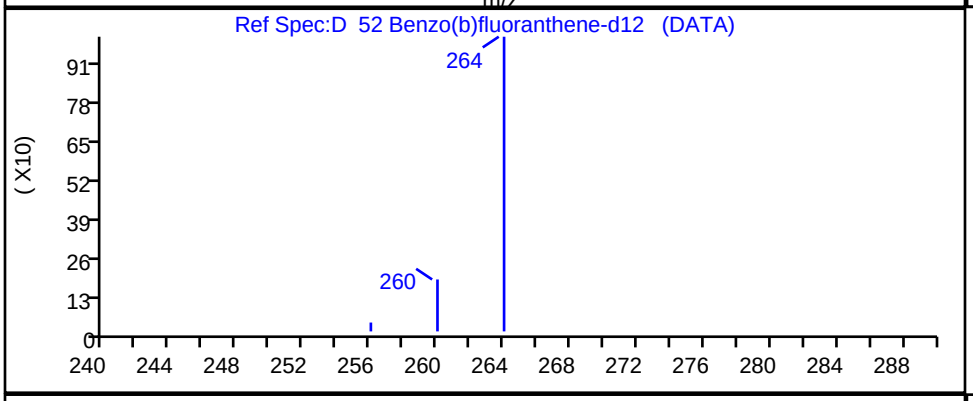
D 52 Benzo(b)fluoranthene-d12, CAS: 93951-98-5

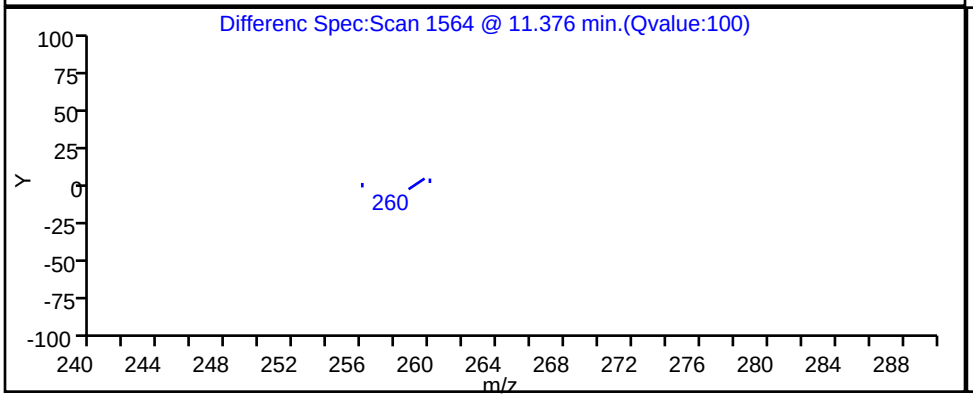


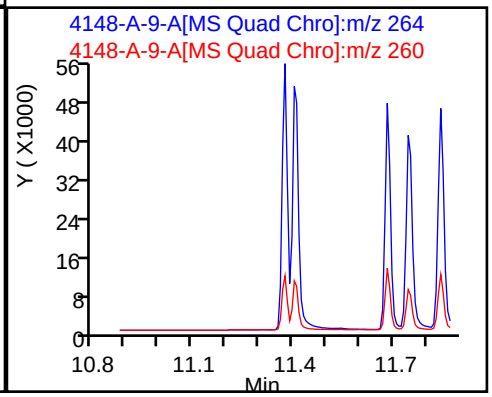










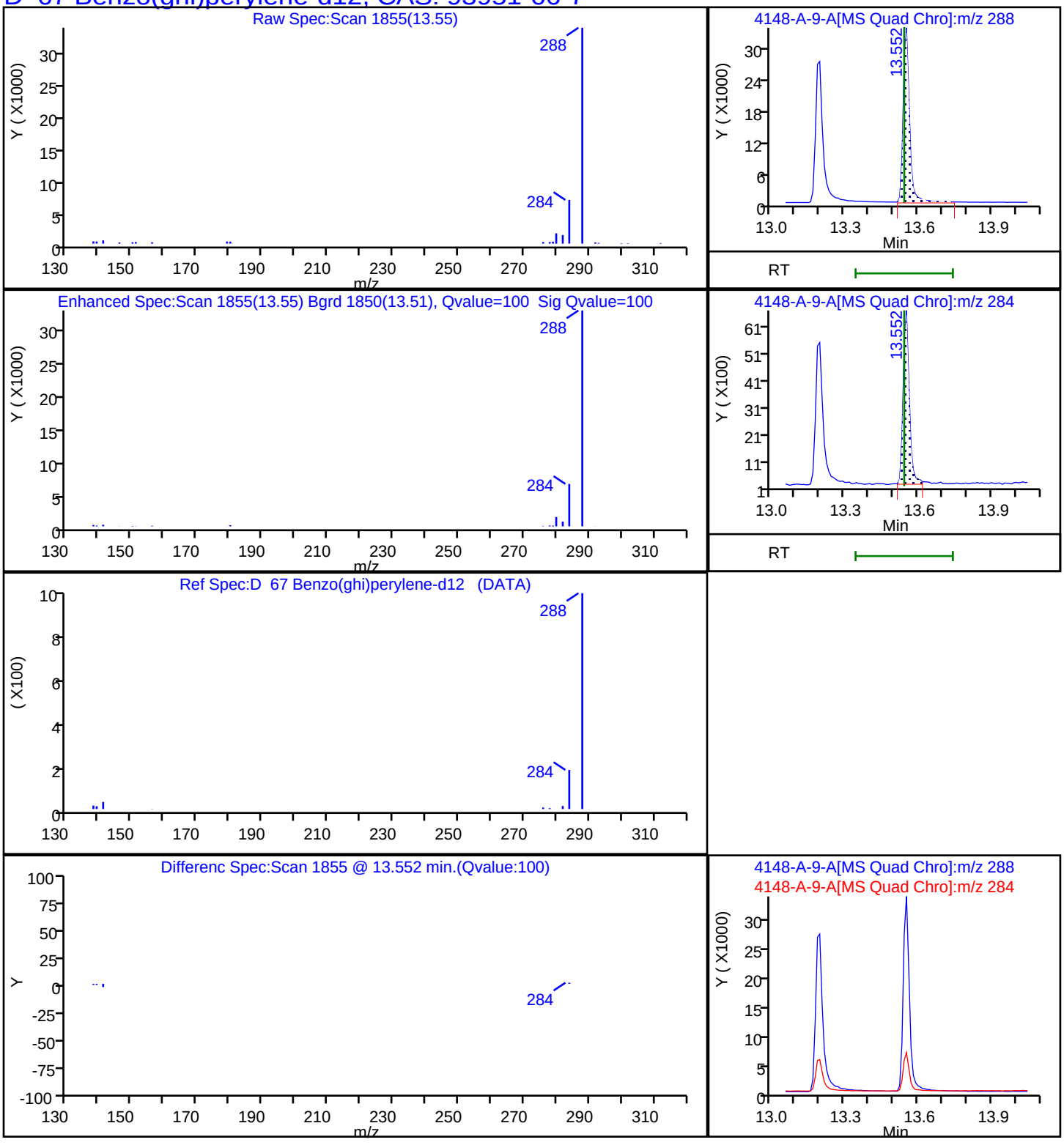


Report Date: 17-Nov-2023 12:15:27 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-9-A.D				
Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12		
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 67 Benzo(ghi)perylene-d12, CAS: 93951-66-7



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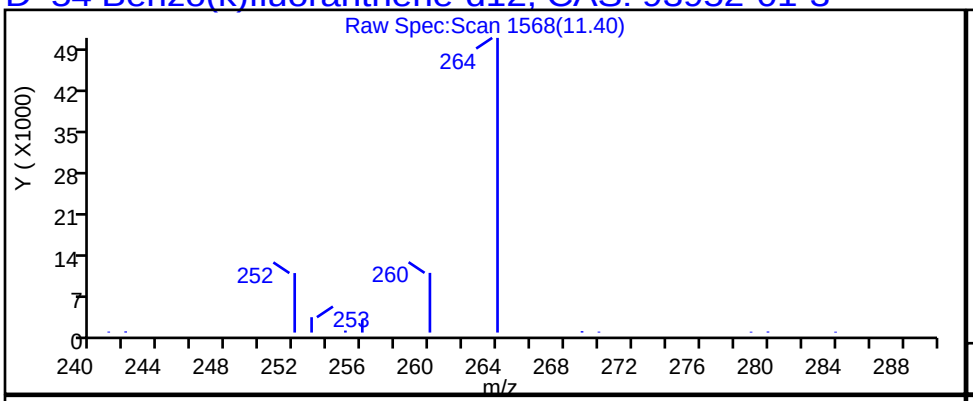
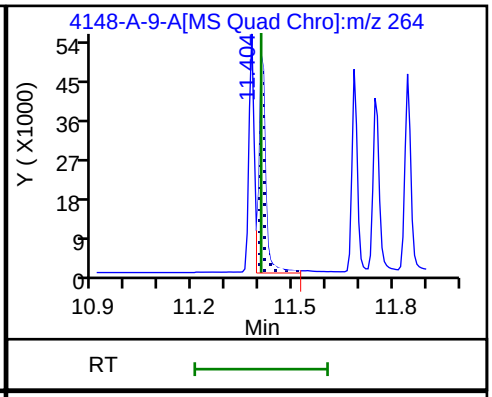
Eurofins Knoxville

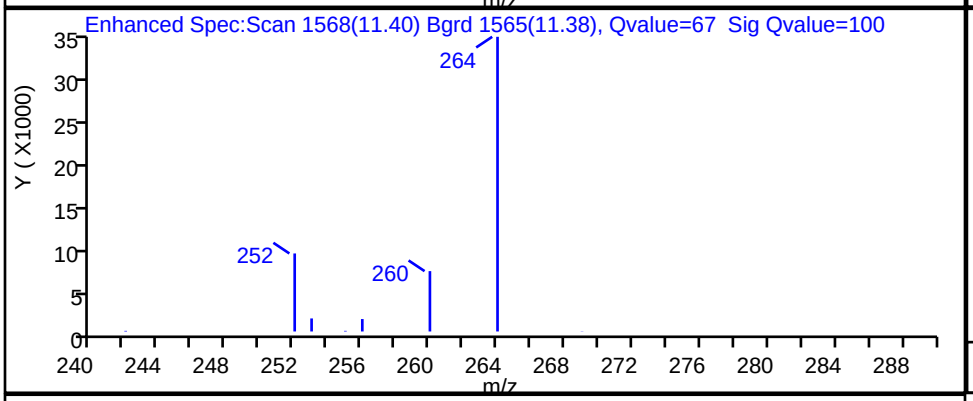
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-9-A.D

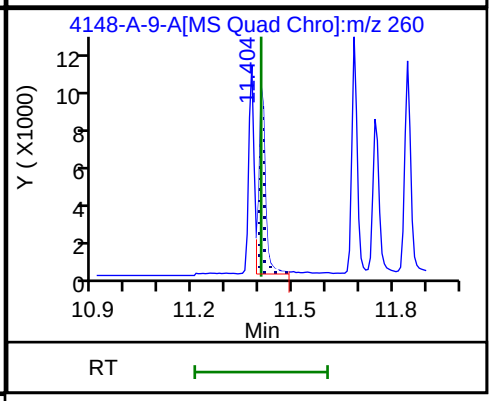
Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12
Client ID:	1804576-854-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

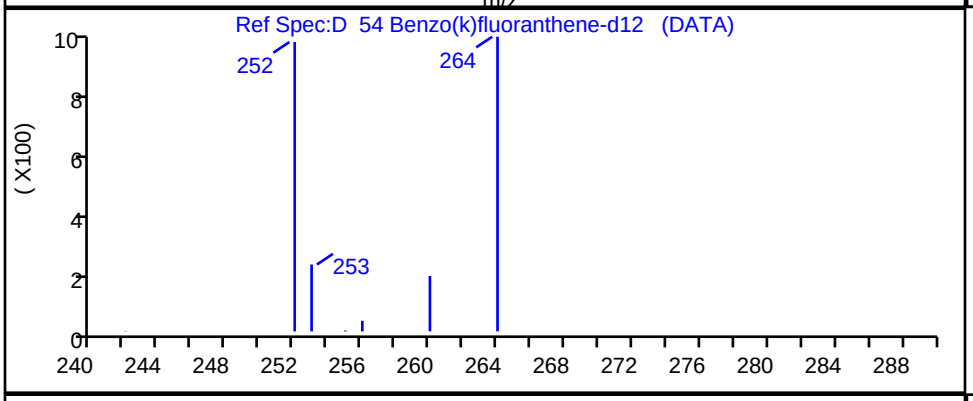
D 54 Benzo(k)fluoranthene-d12, CAS: 93952-01-3

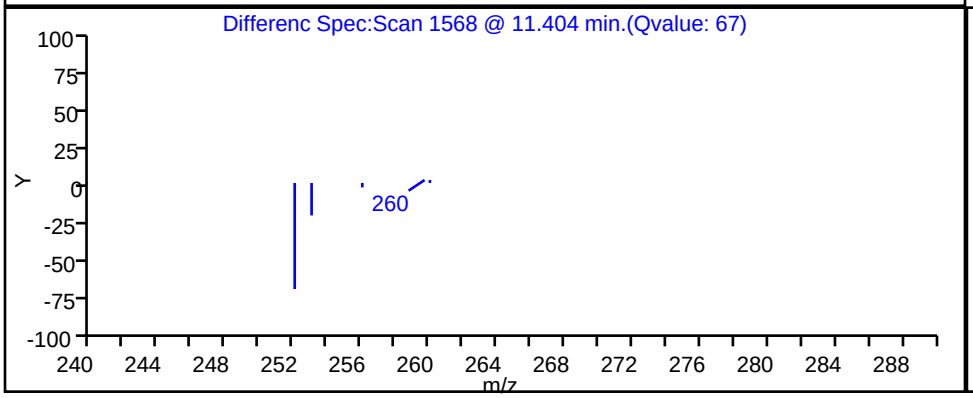


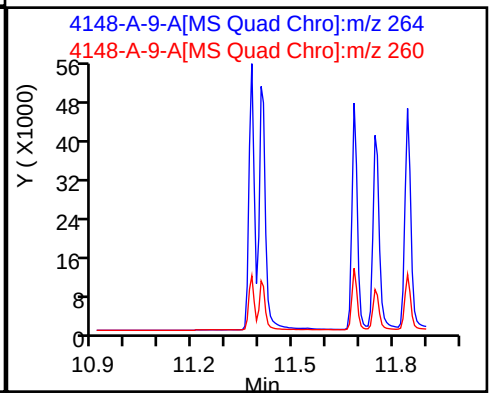












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Eurofins Knoxville

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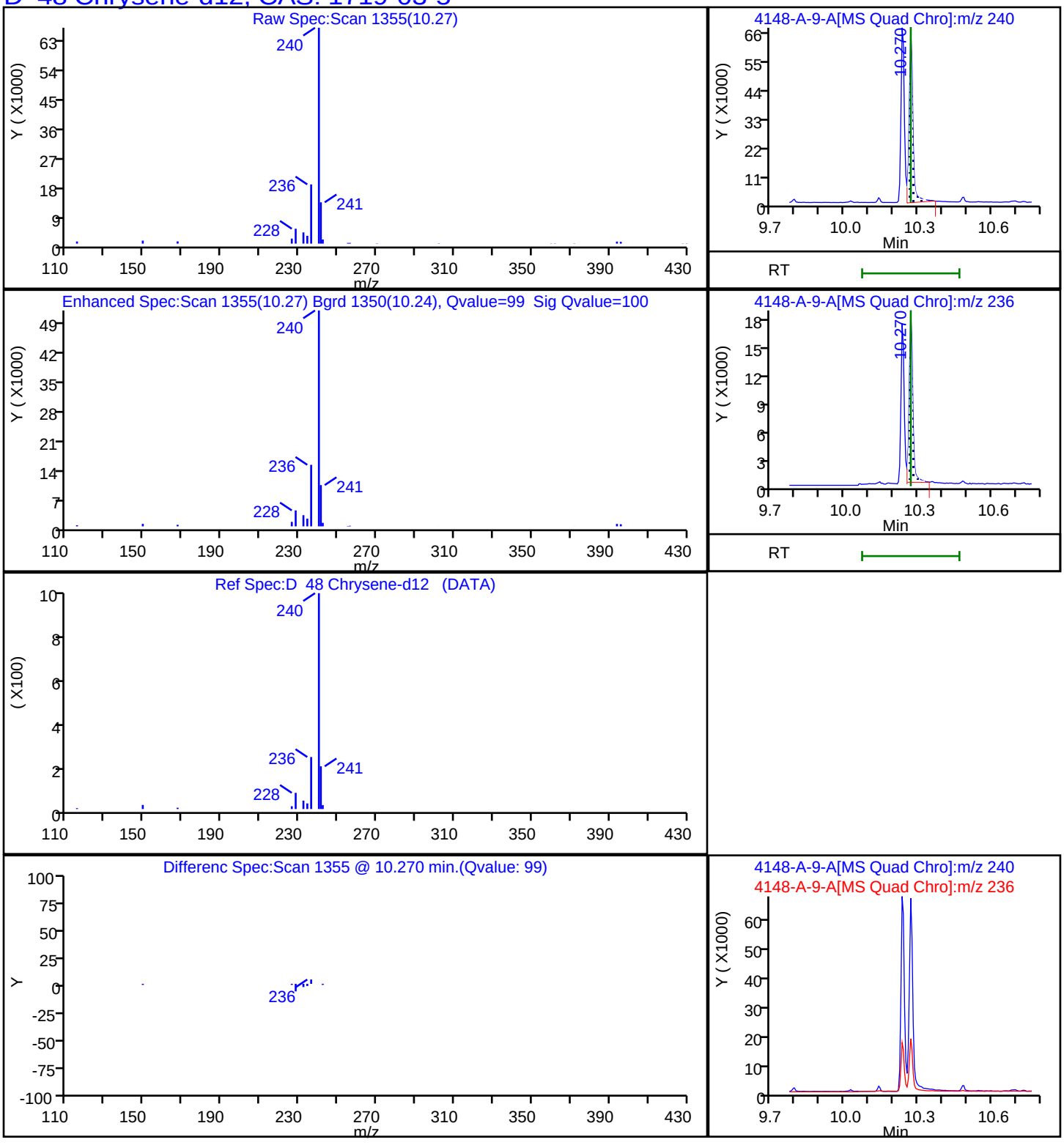
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12		
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 48 Chrysene-d12, CAS: 1719-03-5



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Eurofins Knoxville

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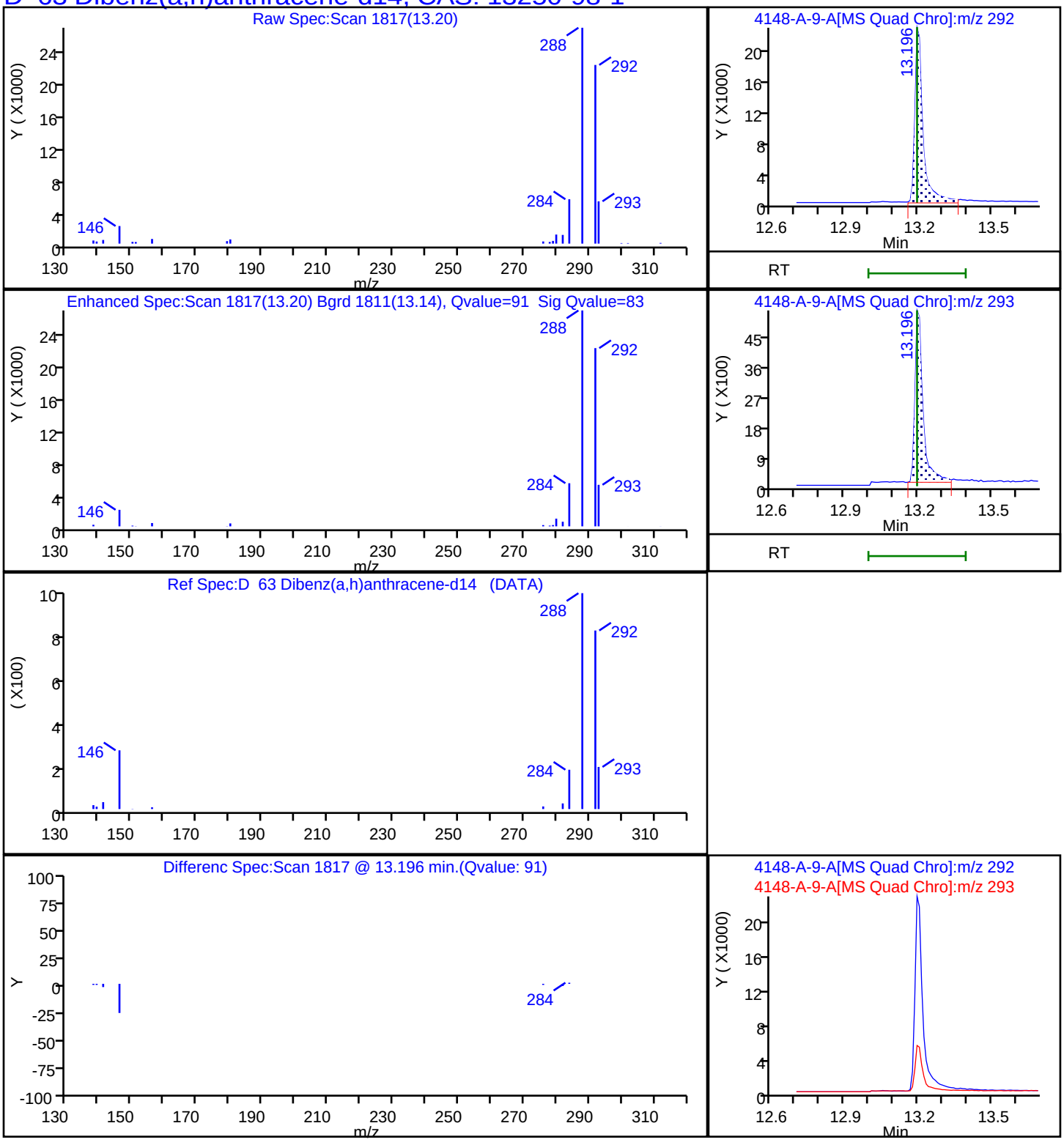
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 63 Dibenz(a,h)anthracene-d14, CAS: 13250-98-1



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Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1		
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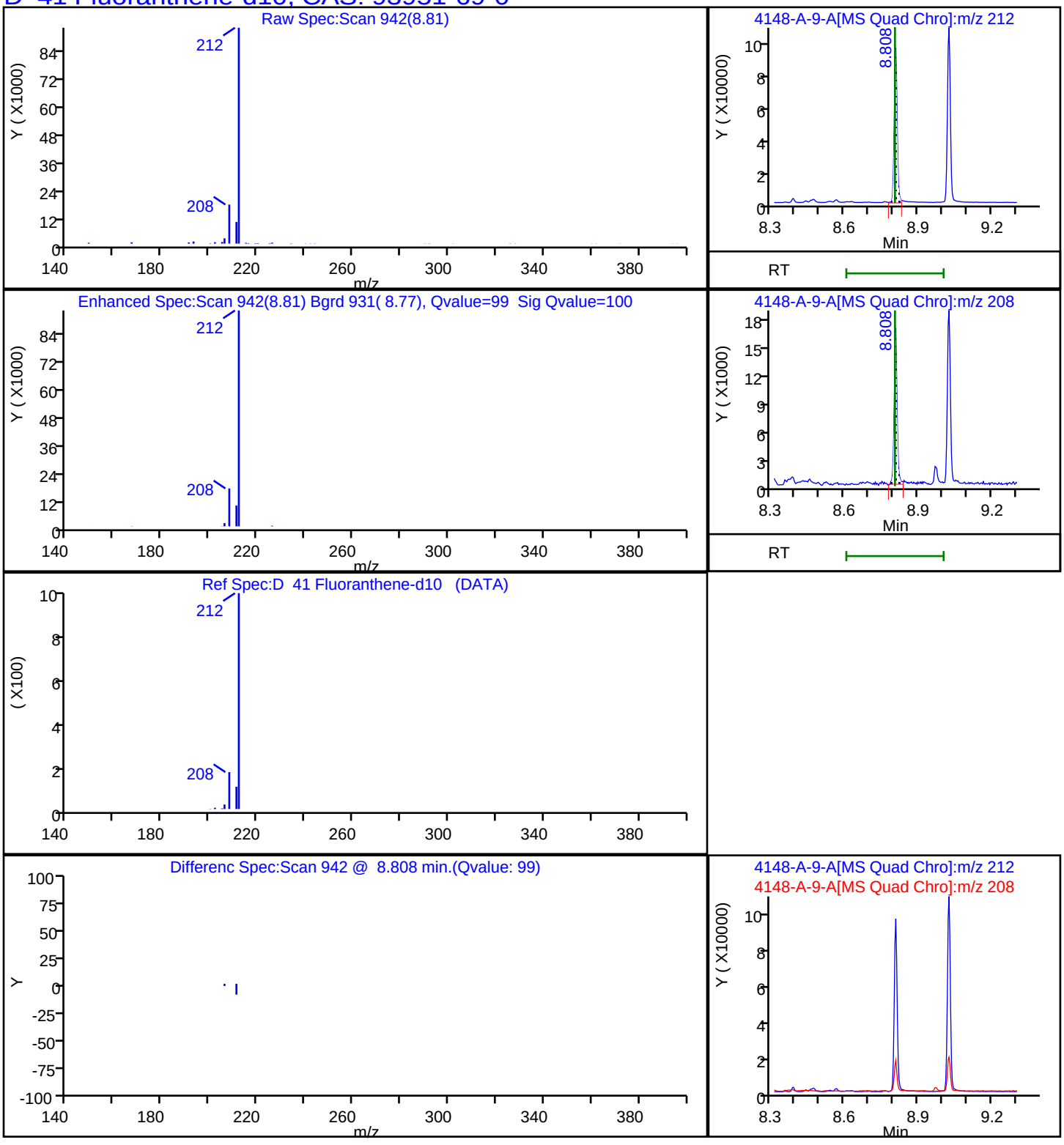
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 41 Fluoranthene-d10, CAS: 93951-69-0



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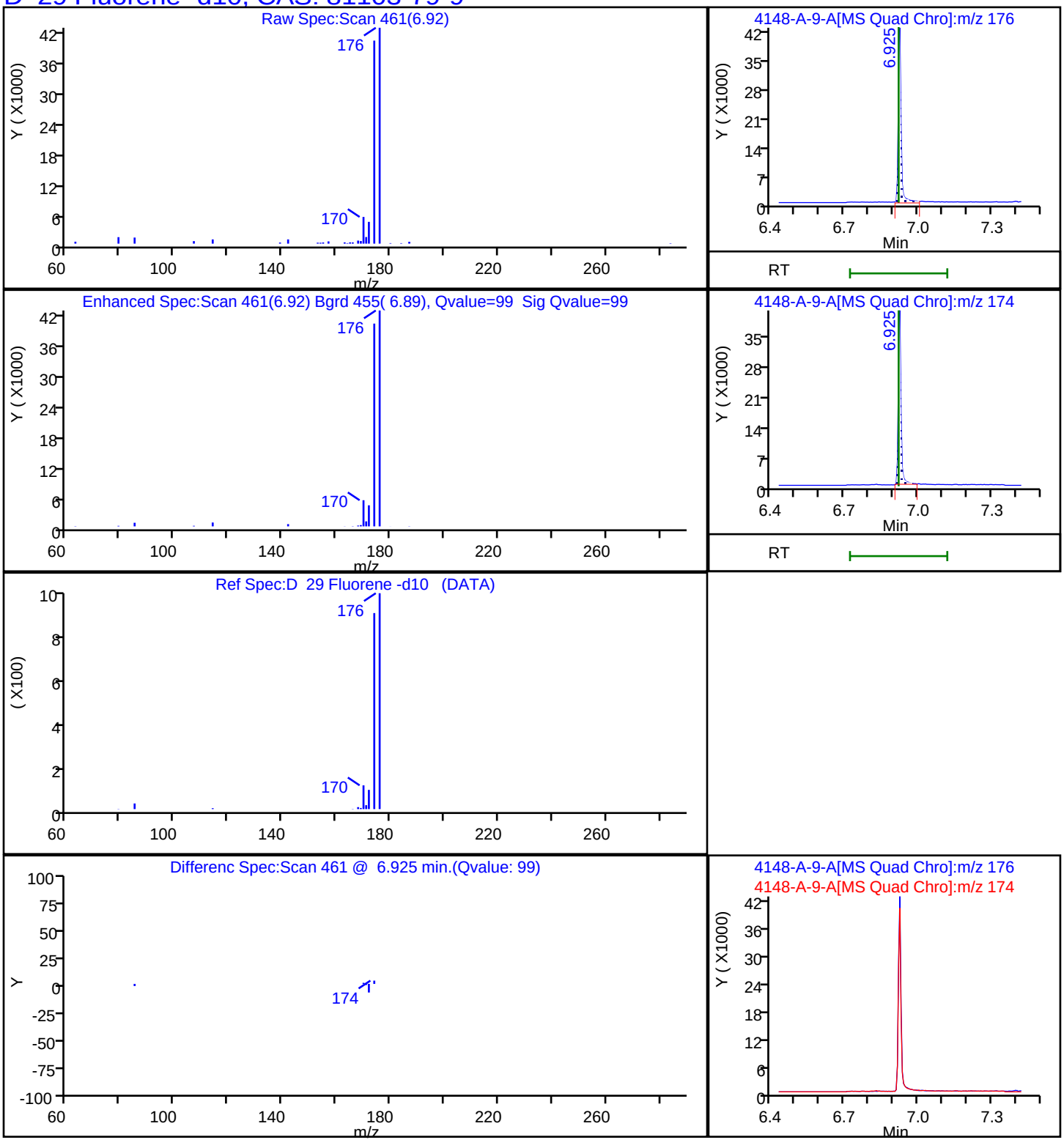
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12
Client ID:	1804576-854-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

D 29 Fluorene -d10, CAS: 81103-79-9



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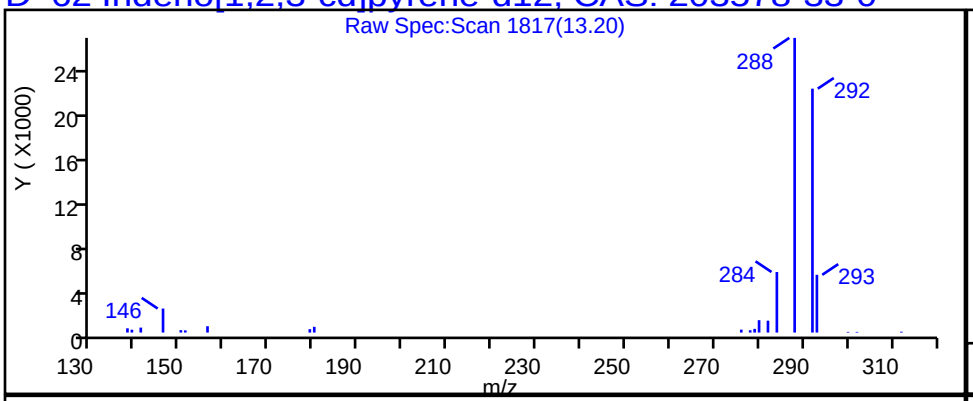
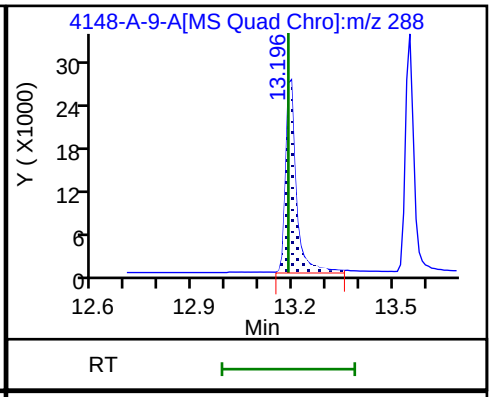
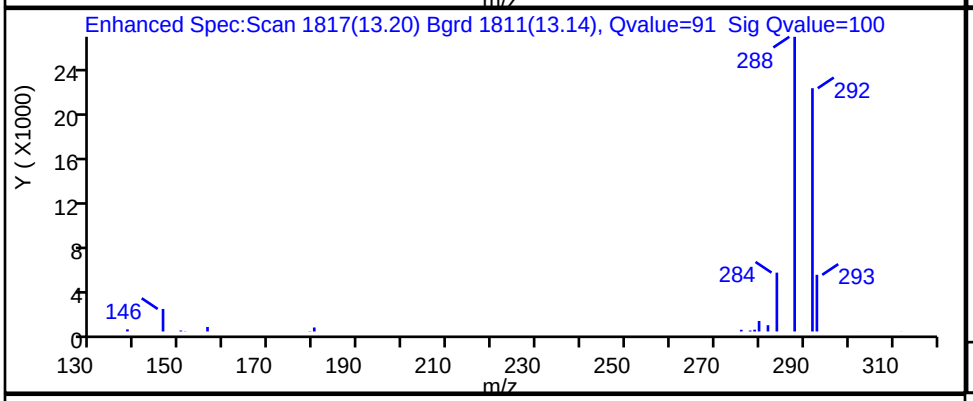
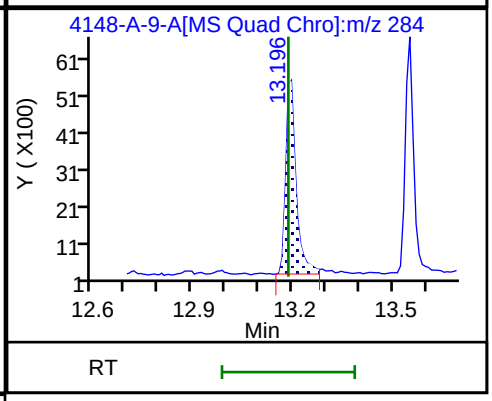
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

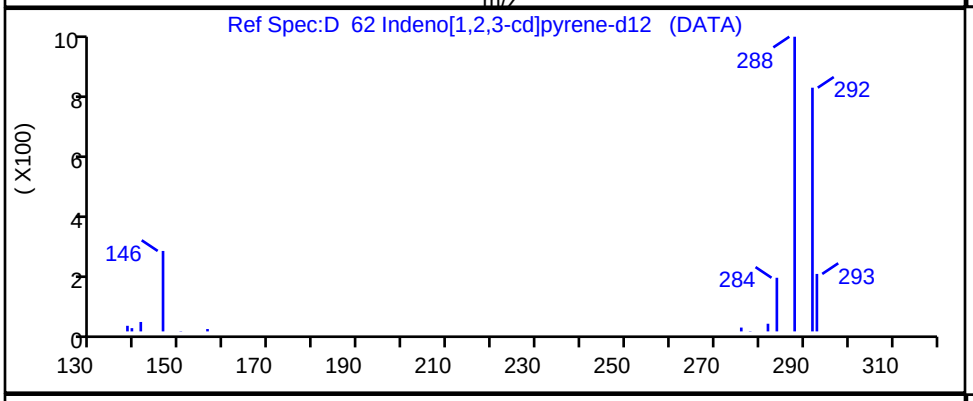
D 62 Indeno[1,2,3-cd]pyrene-d12, CAS: 203578-33-0

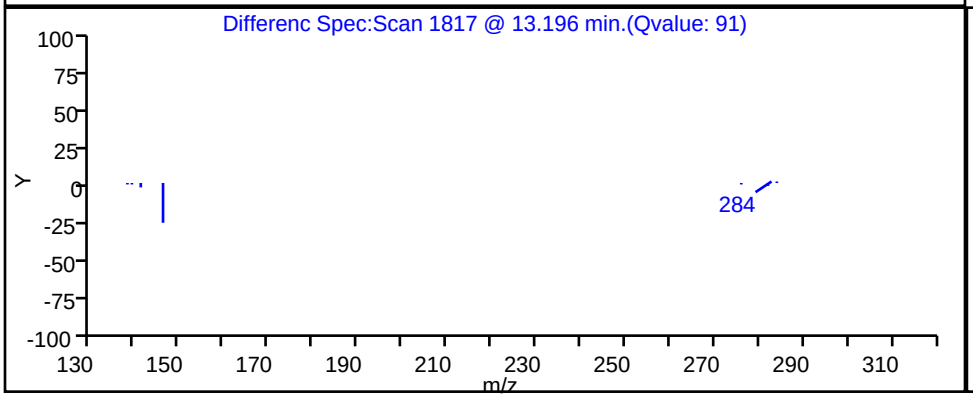


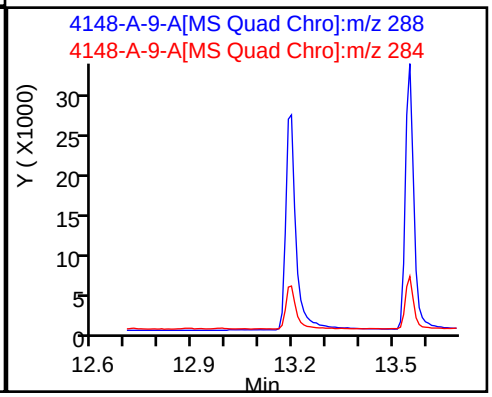












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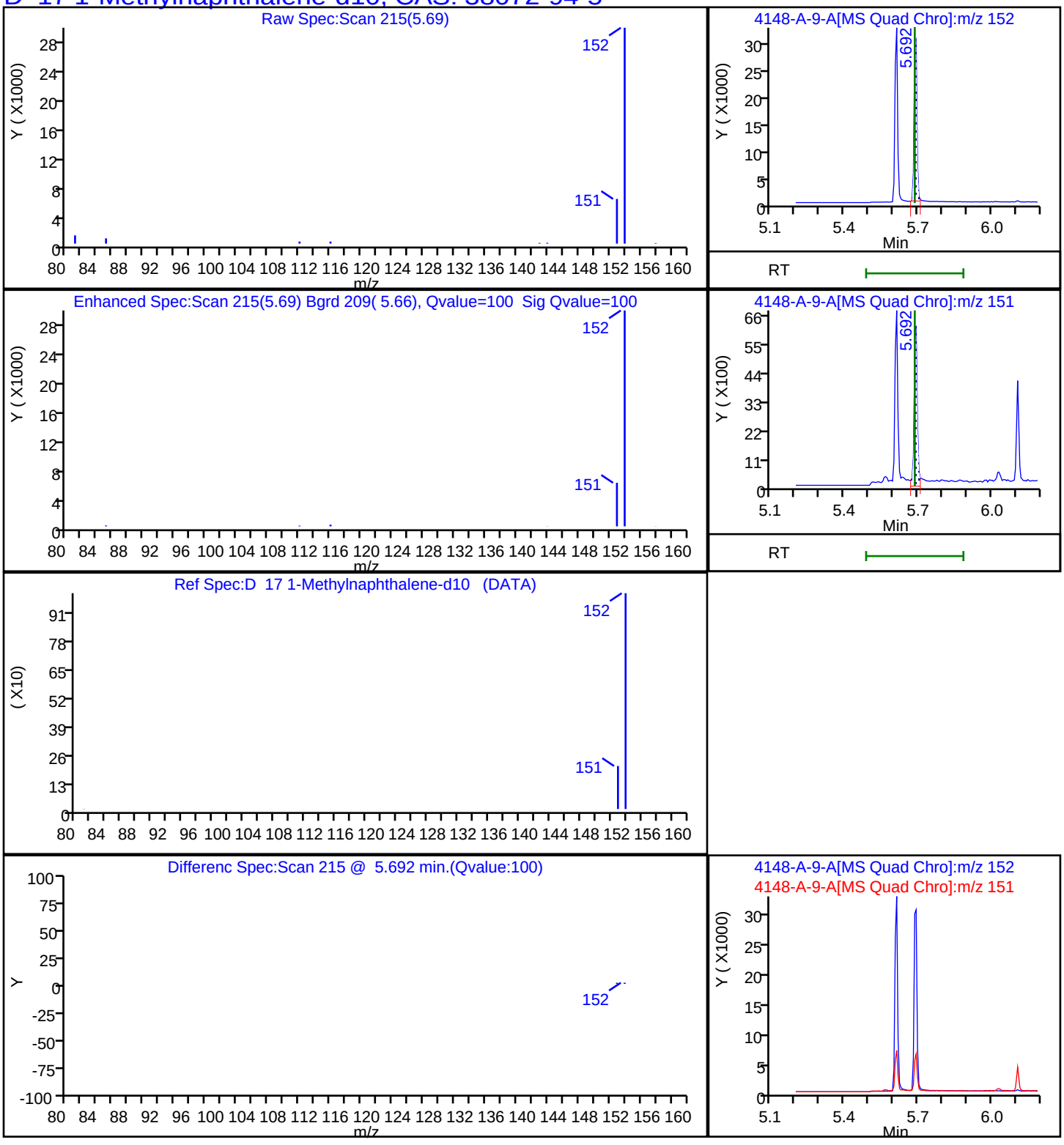
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 17 1-Methylnaphthalene-d10, CAS: 38072-94-5



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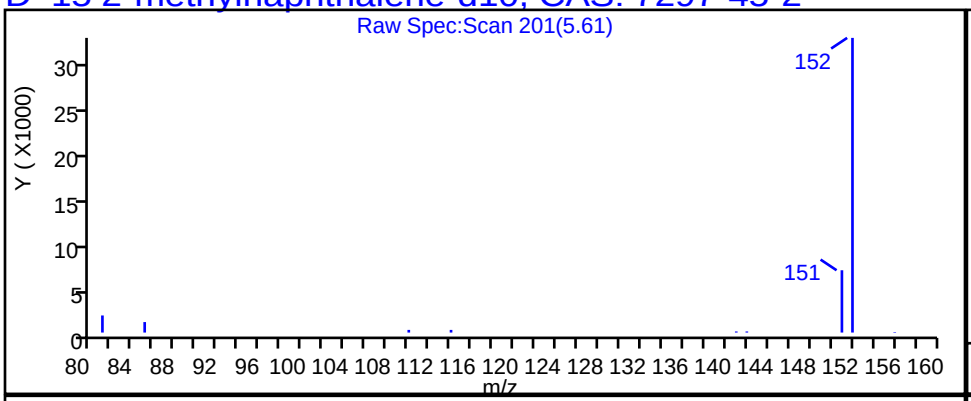
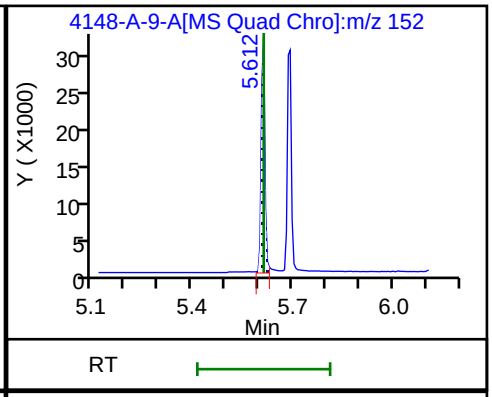
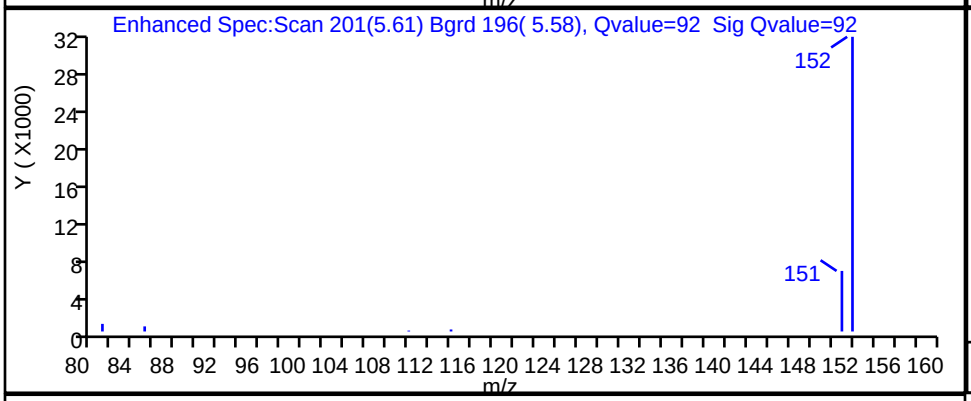
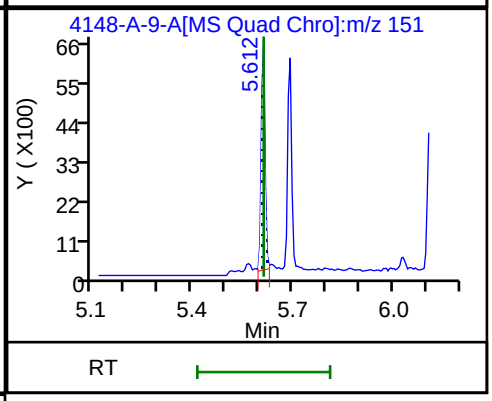
Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12		
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

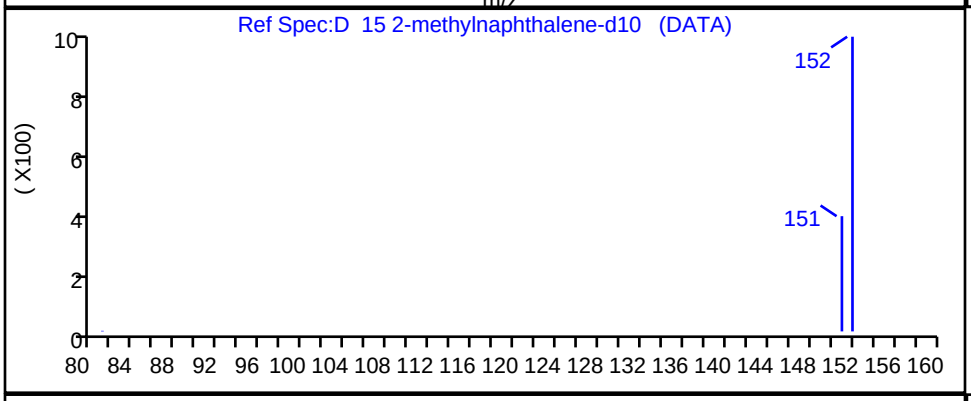
D 15 2-methylnaphthalene-d10, CAS: 7297-45-2

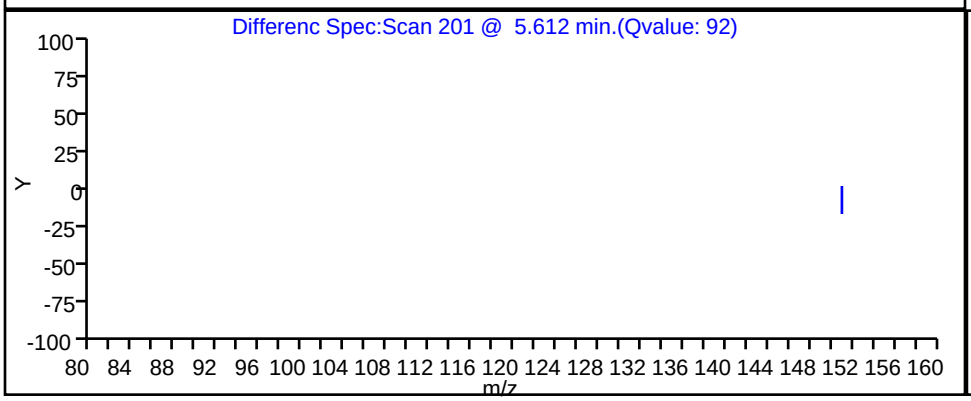


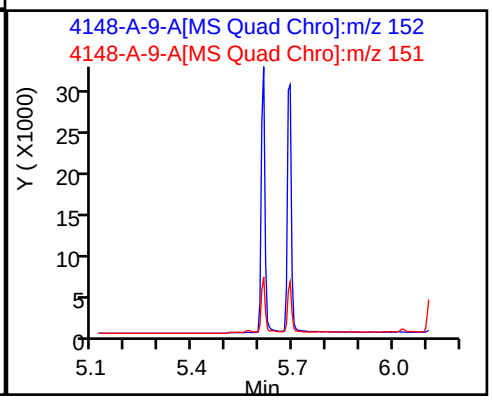












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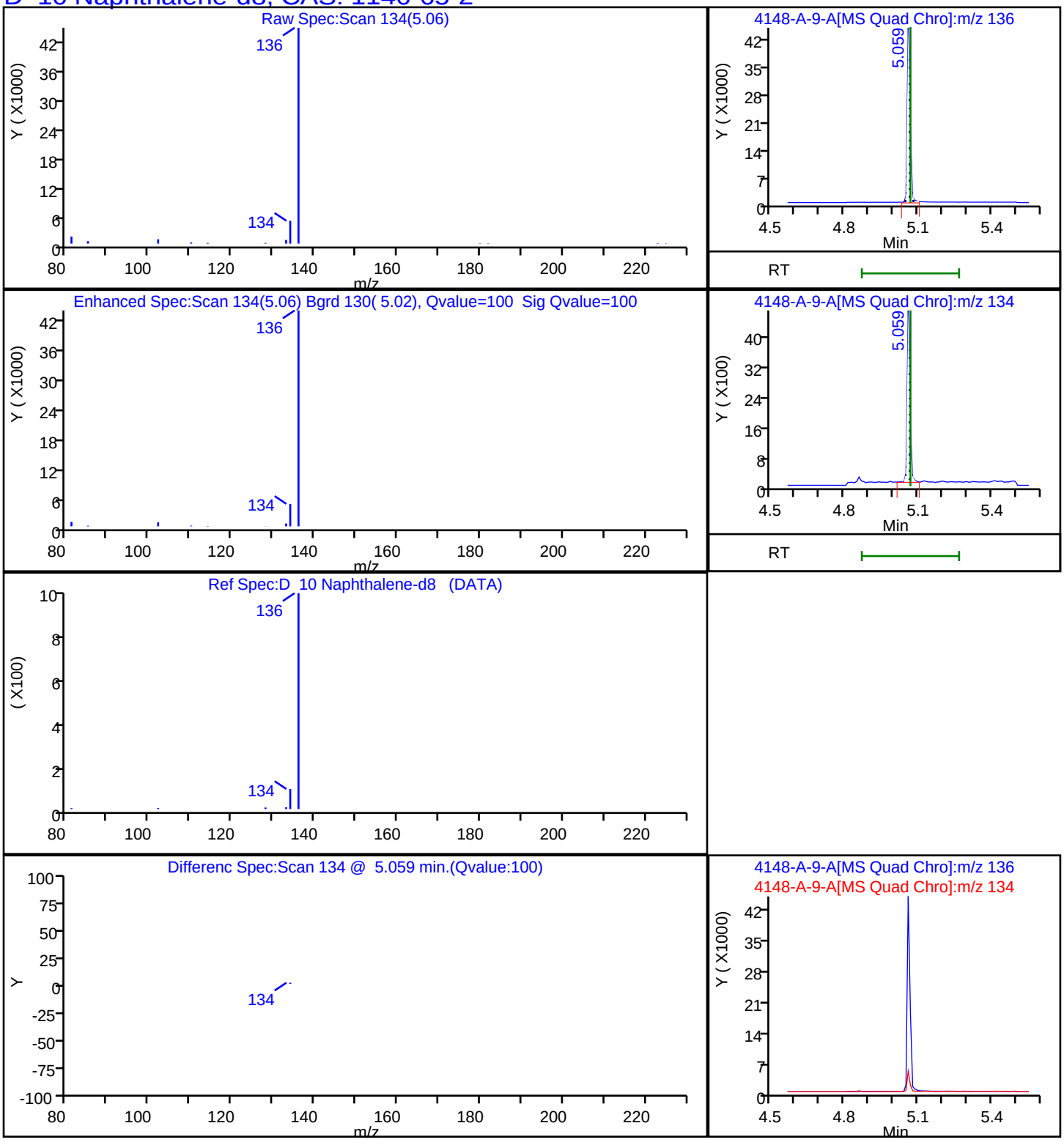
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D_10 Naphthalene-d8, CAS: 1146-65-2



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Client ID:	1804576-854-S1				
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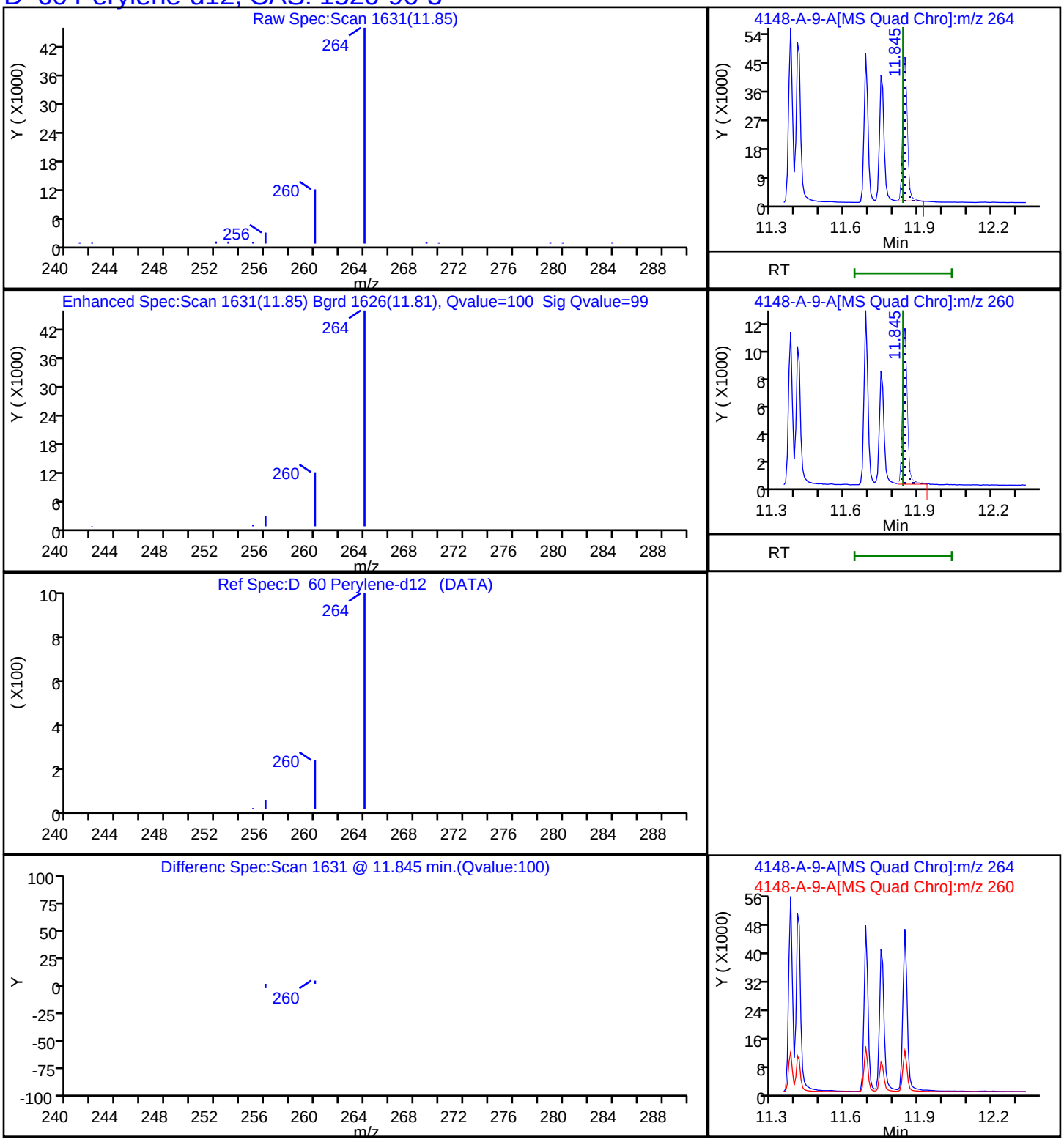
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 60 Perylene-d12, CAS: 1520-96-3



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Eurofins Knoxville

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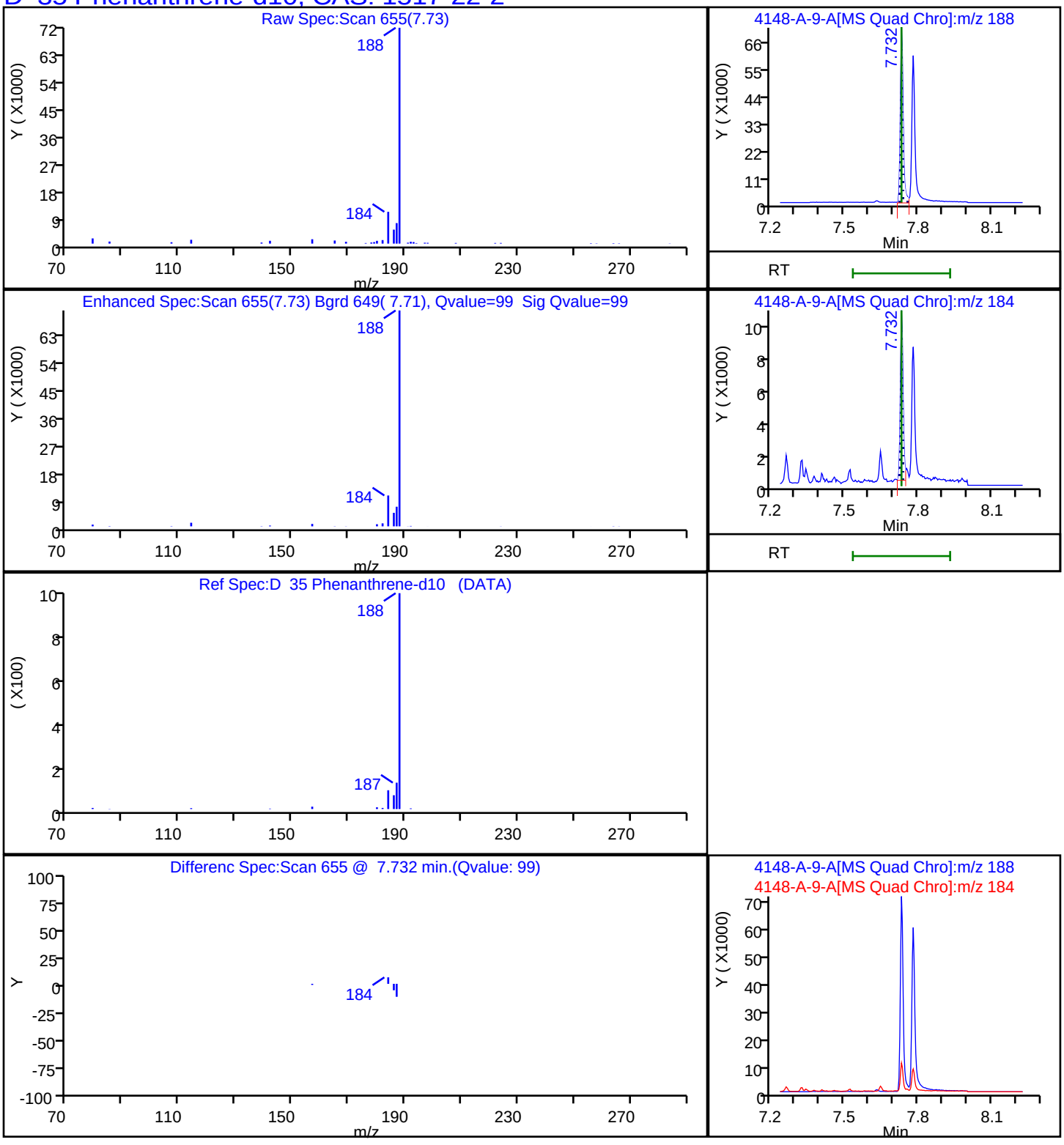
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D_35 Phenanthrene-d10, CAS: 1517-22-2



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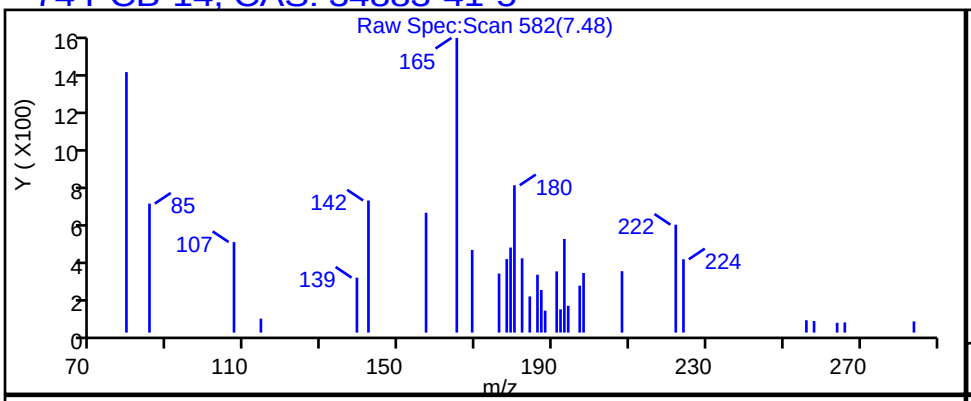
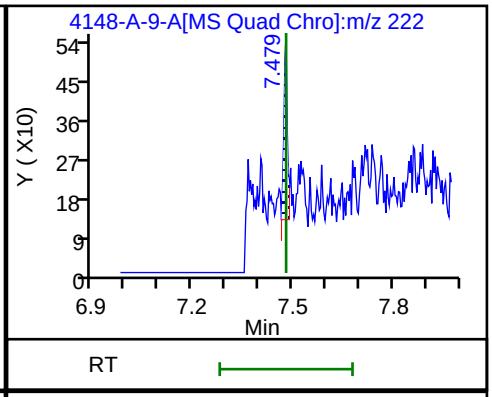
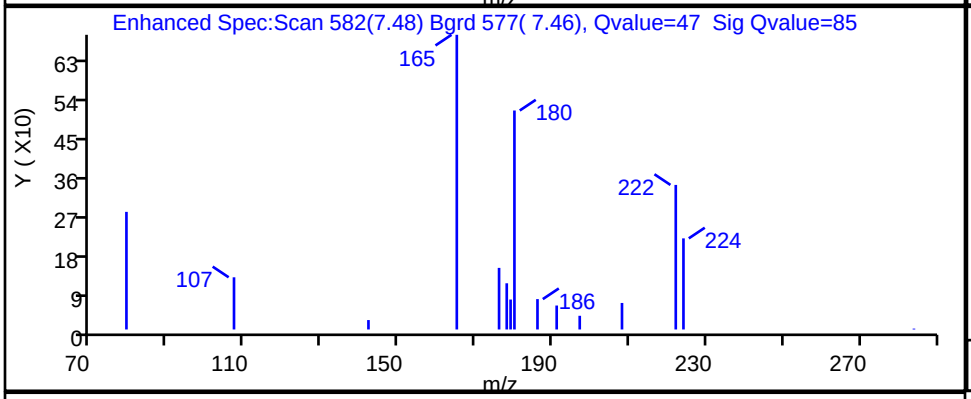
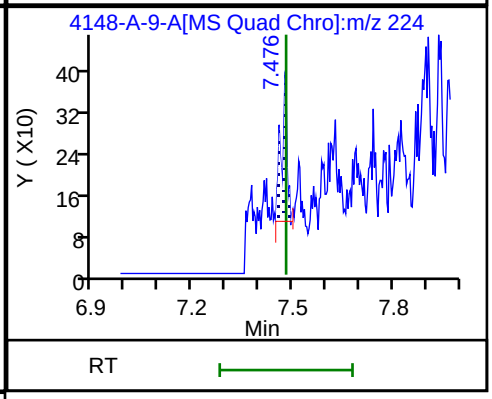
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

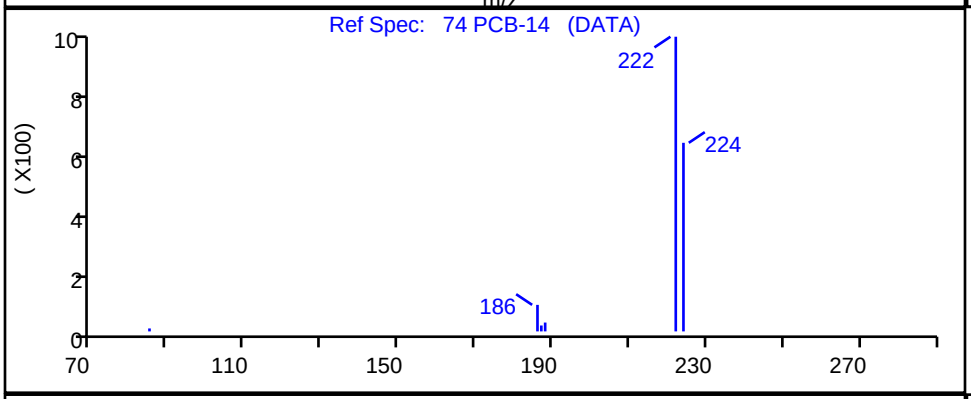
74 PCB-14, CAS: 34883-41-5

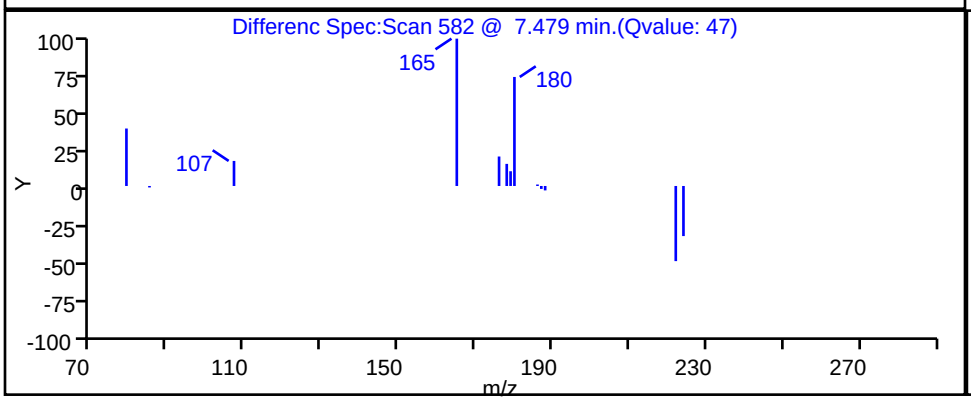


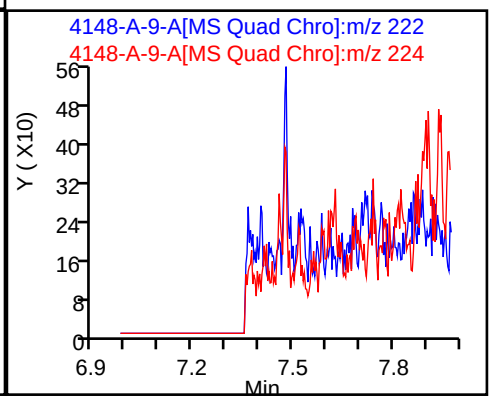












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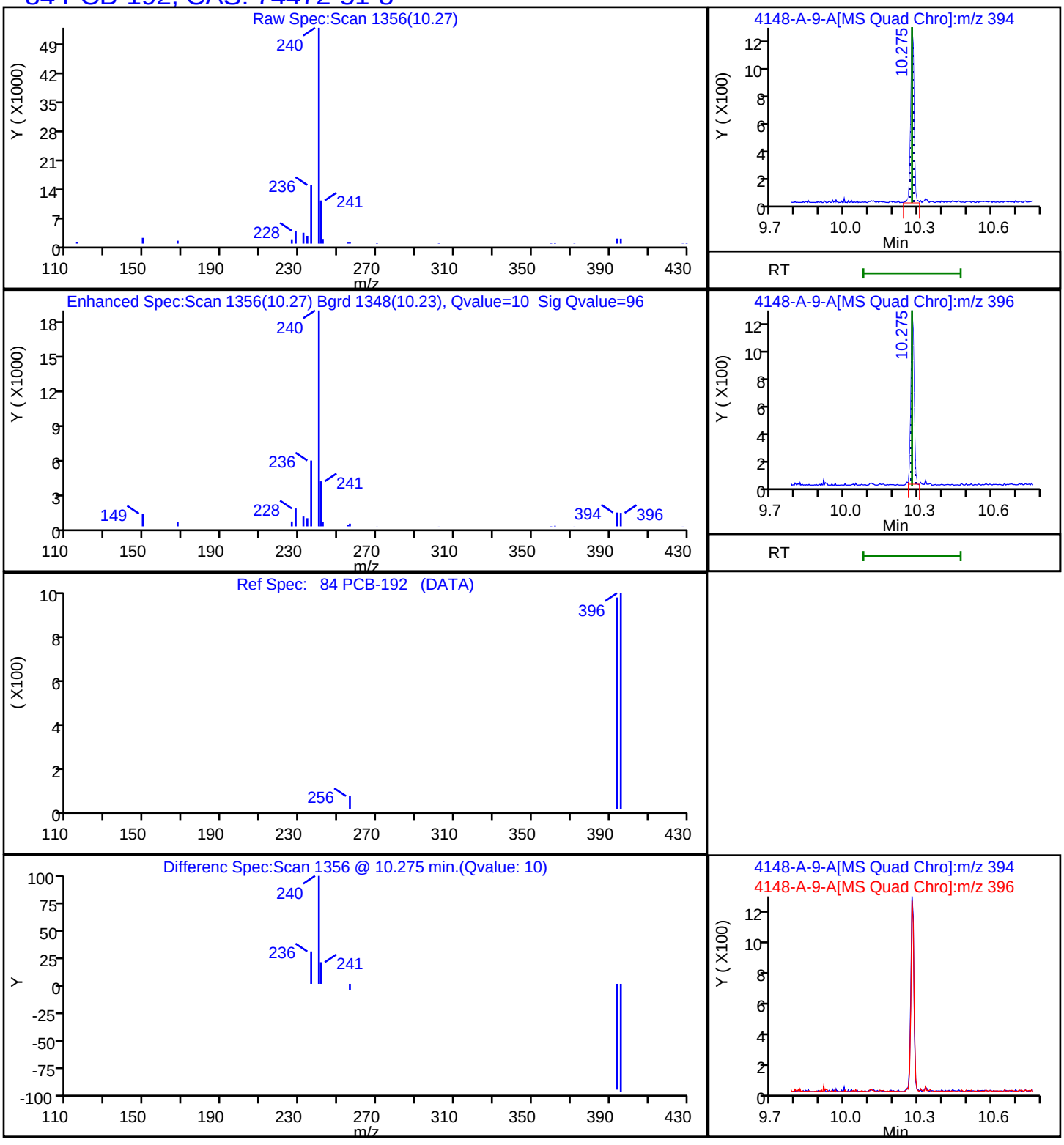
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

84 PCB-192, CAS: 74472-51-8



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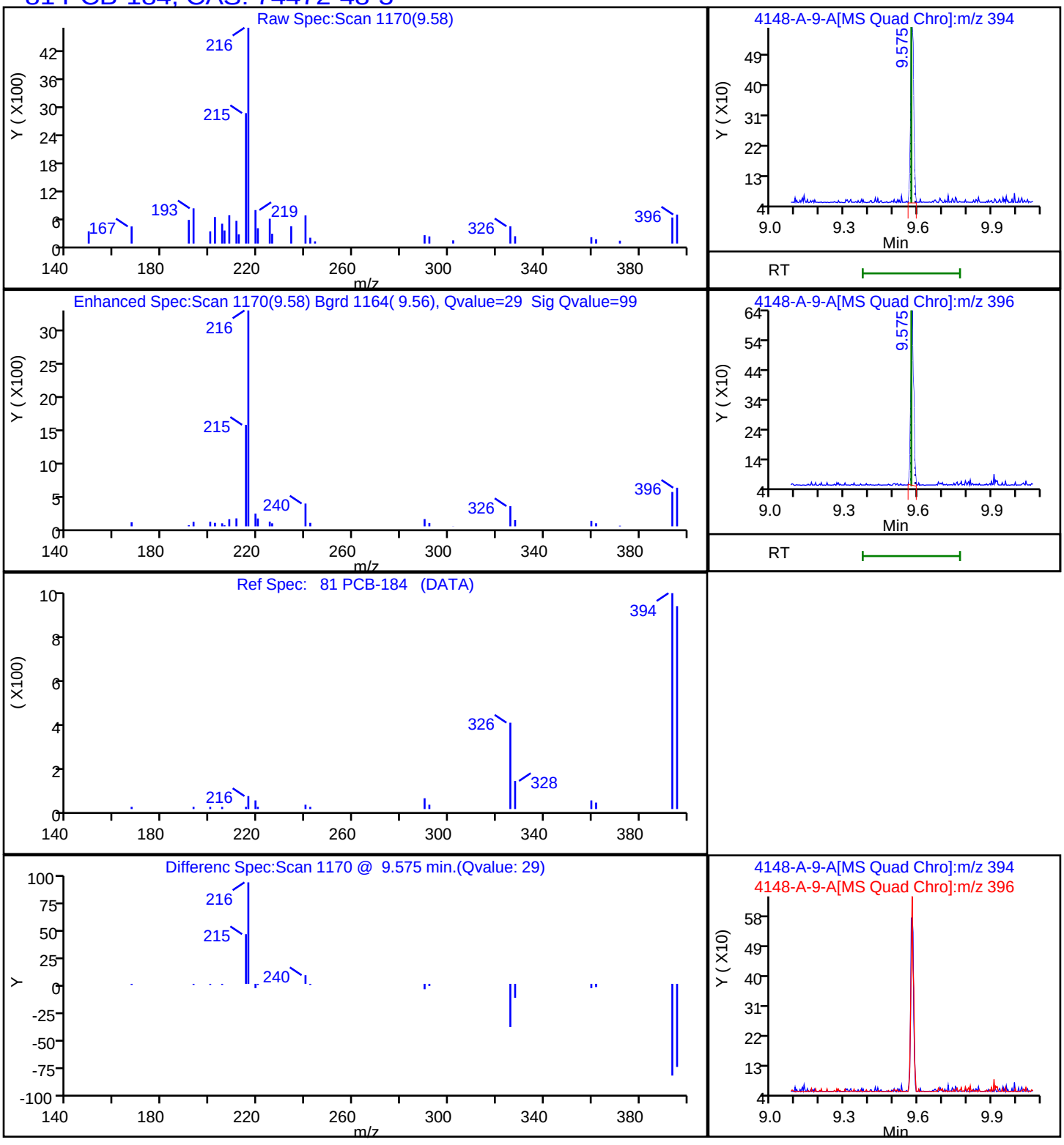
Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12
Client ID:	1804576-854-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

81 PCB-184, CAS: 74472-48-3



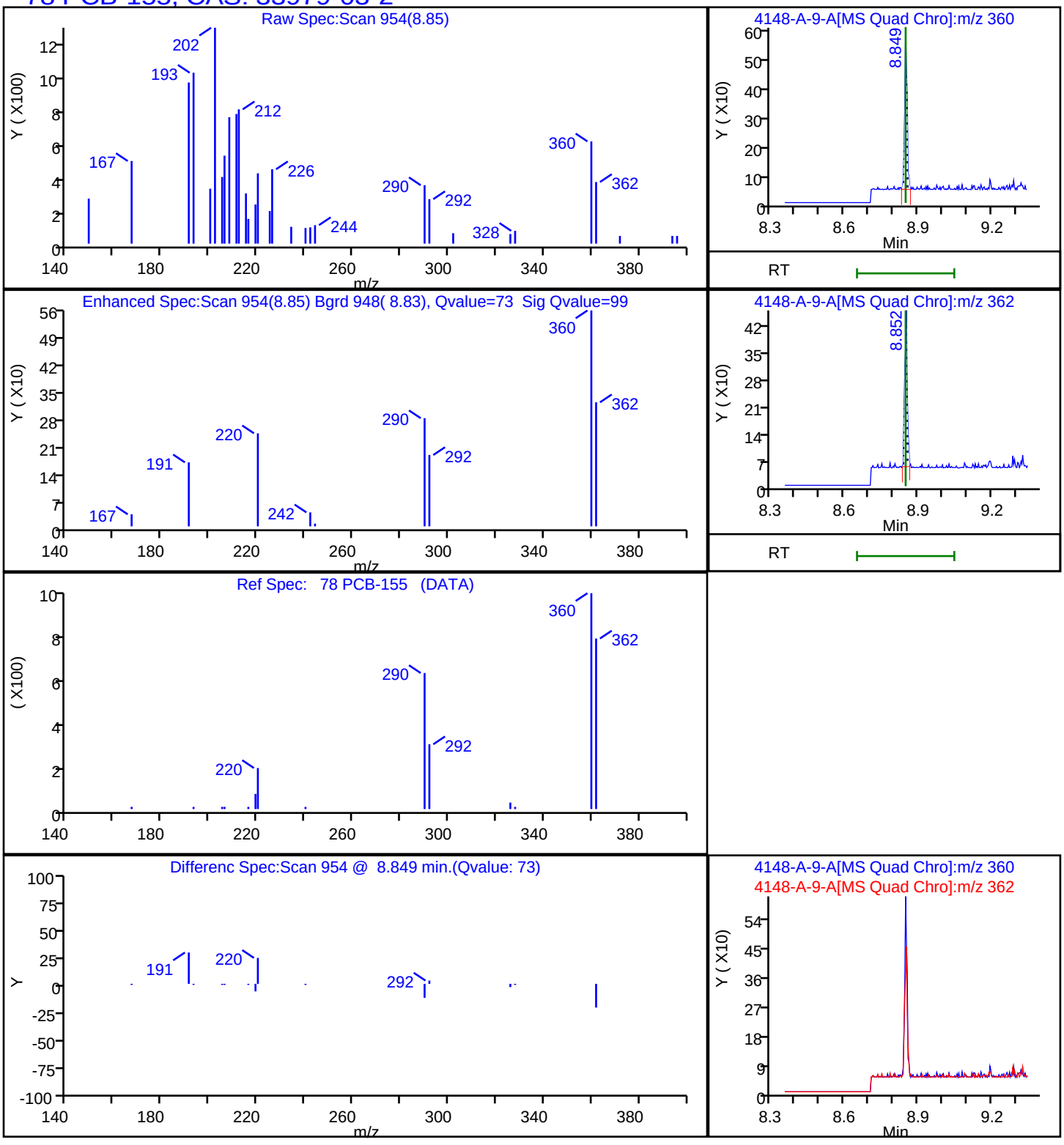
Report Date: 17-Nov-2023 12:15:27 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-9-A.D

Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12
Client ID:	1804576-854-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

78 PCB-155, CAS: 33979-03-2

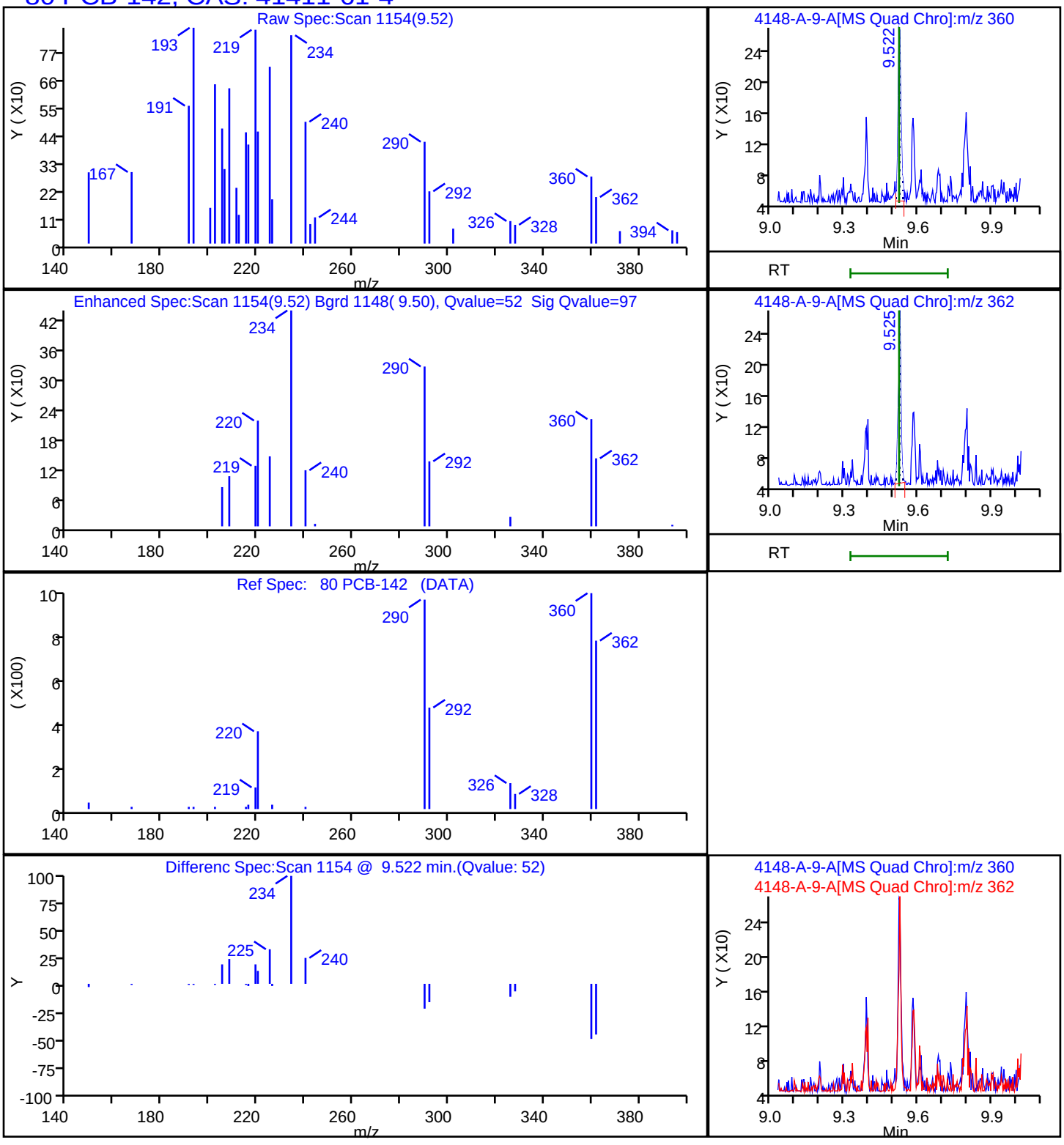


Report Date: 17-Nov-2023 12:15:27 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-9-A.D				
Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12		
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

80 PCB-142, CAS: 41411-61-4



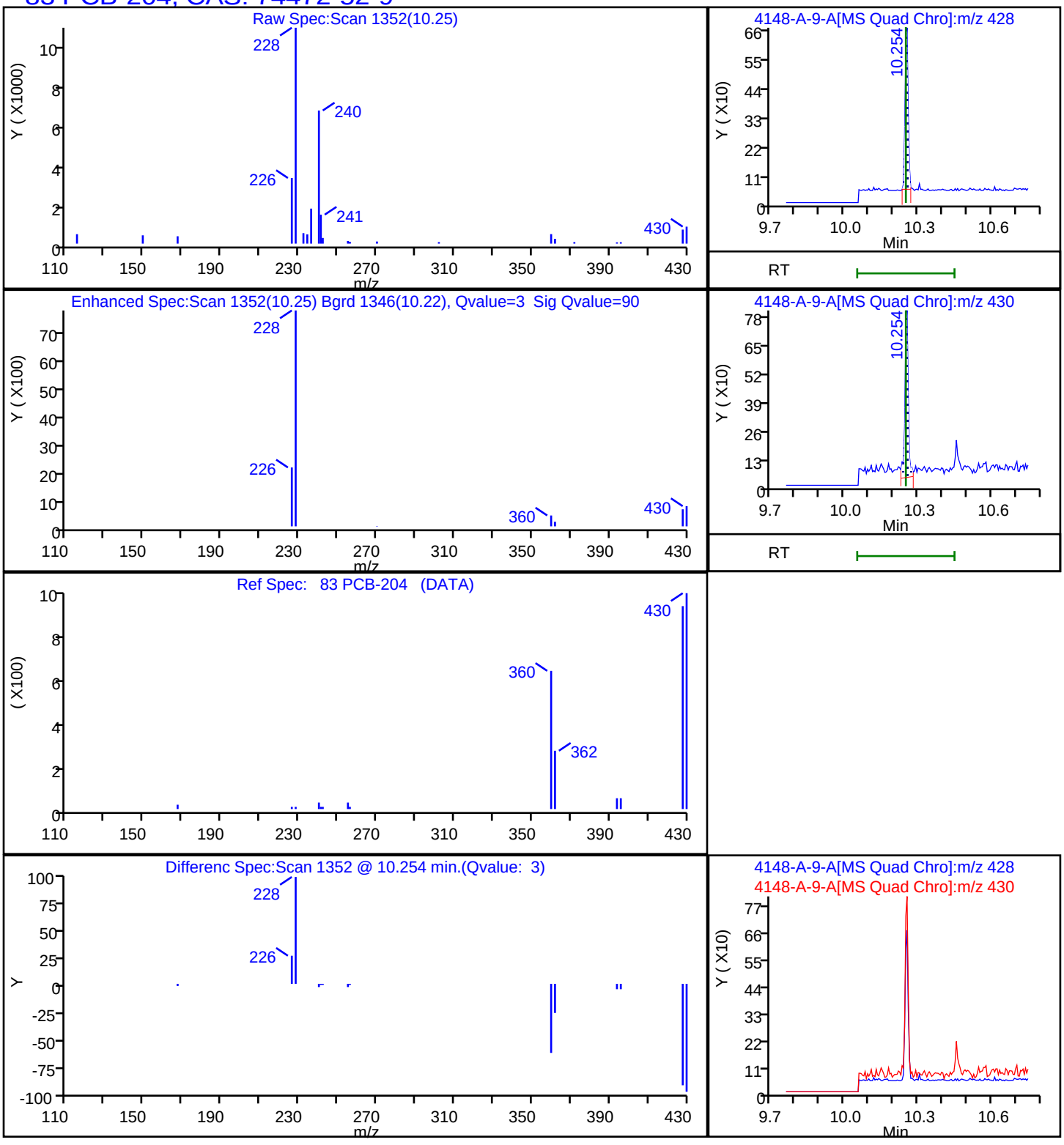
Report Date: 17-Nov-2023 12:15:27 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-9-A.D

Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12		
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

83 PCB-204, CAS: 74472-52-9



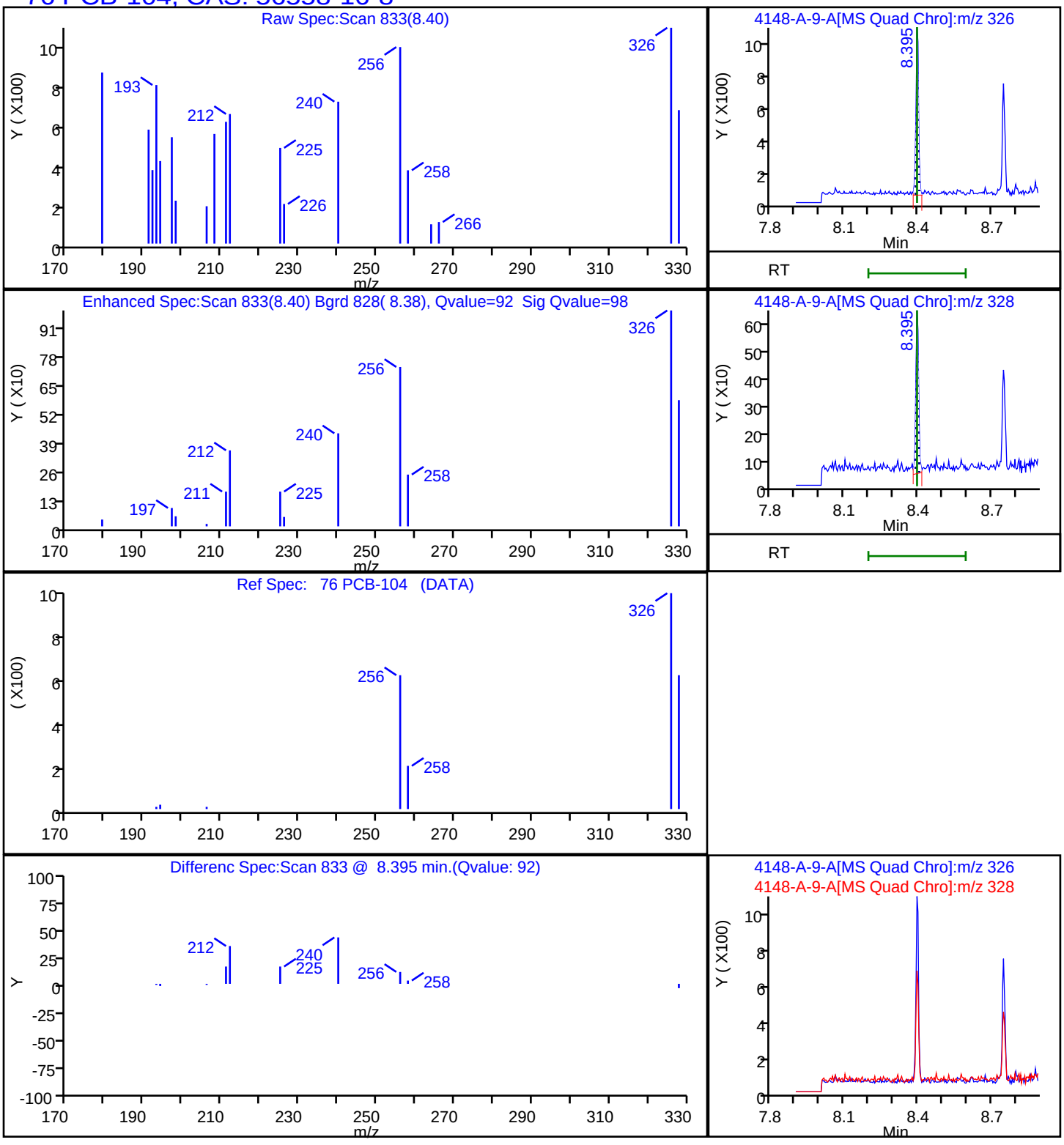
Report Date: 17-Nov-2023 12:15:27 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-9-A.D

Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12		
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

76 PCB-104, CAS: 56558-16-8



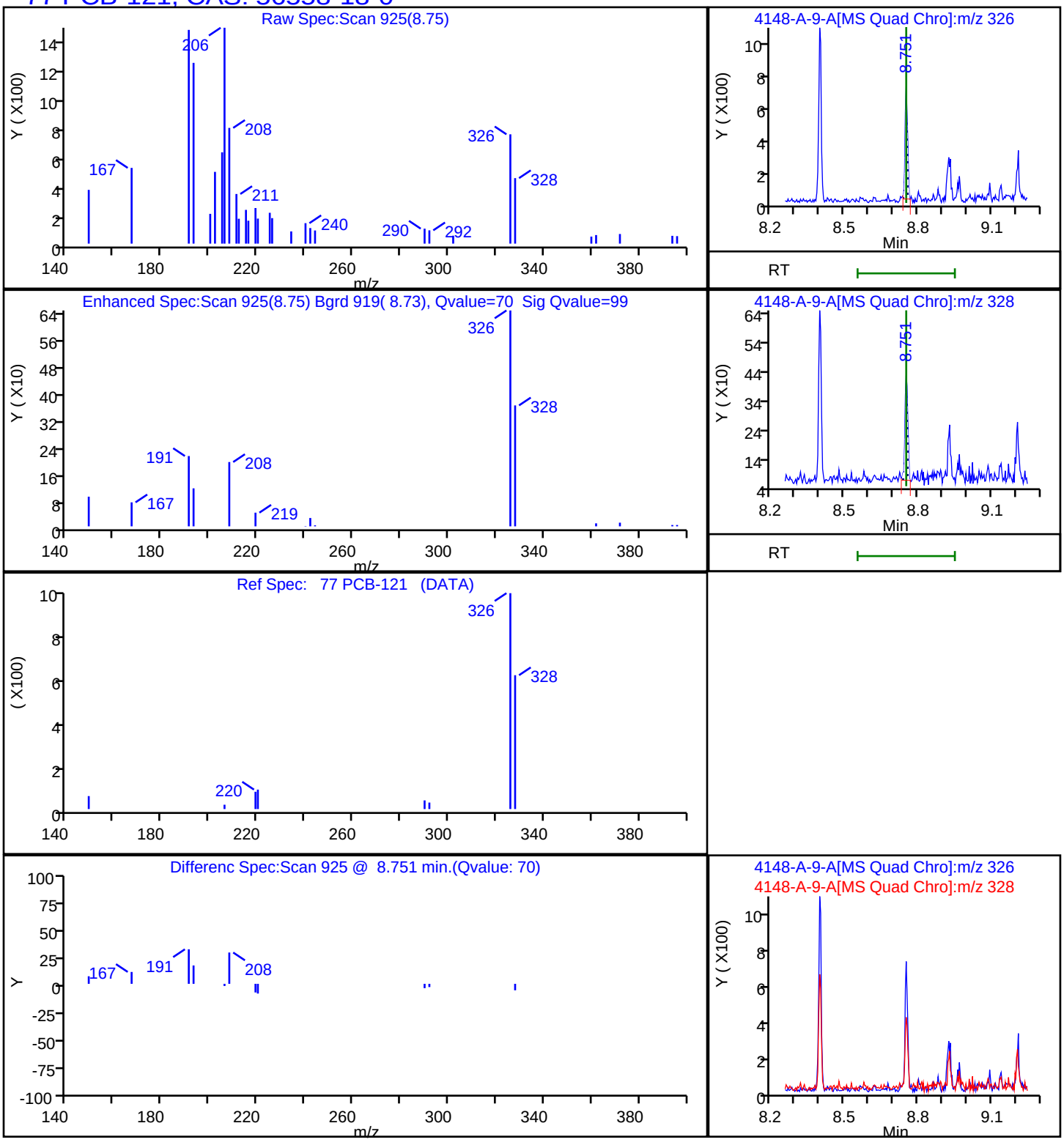
Report Date: 17-Nov-2023 12:15:27 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-9-A.D

Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12
Client ID:	1804576-854-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

77 PCB-121, CAS: 56558-18-0



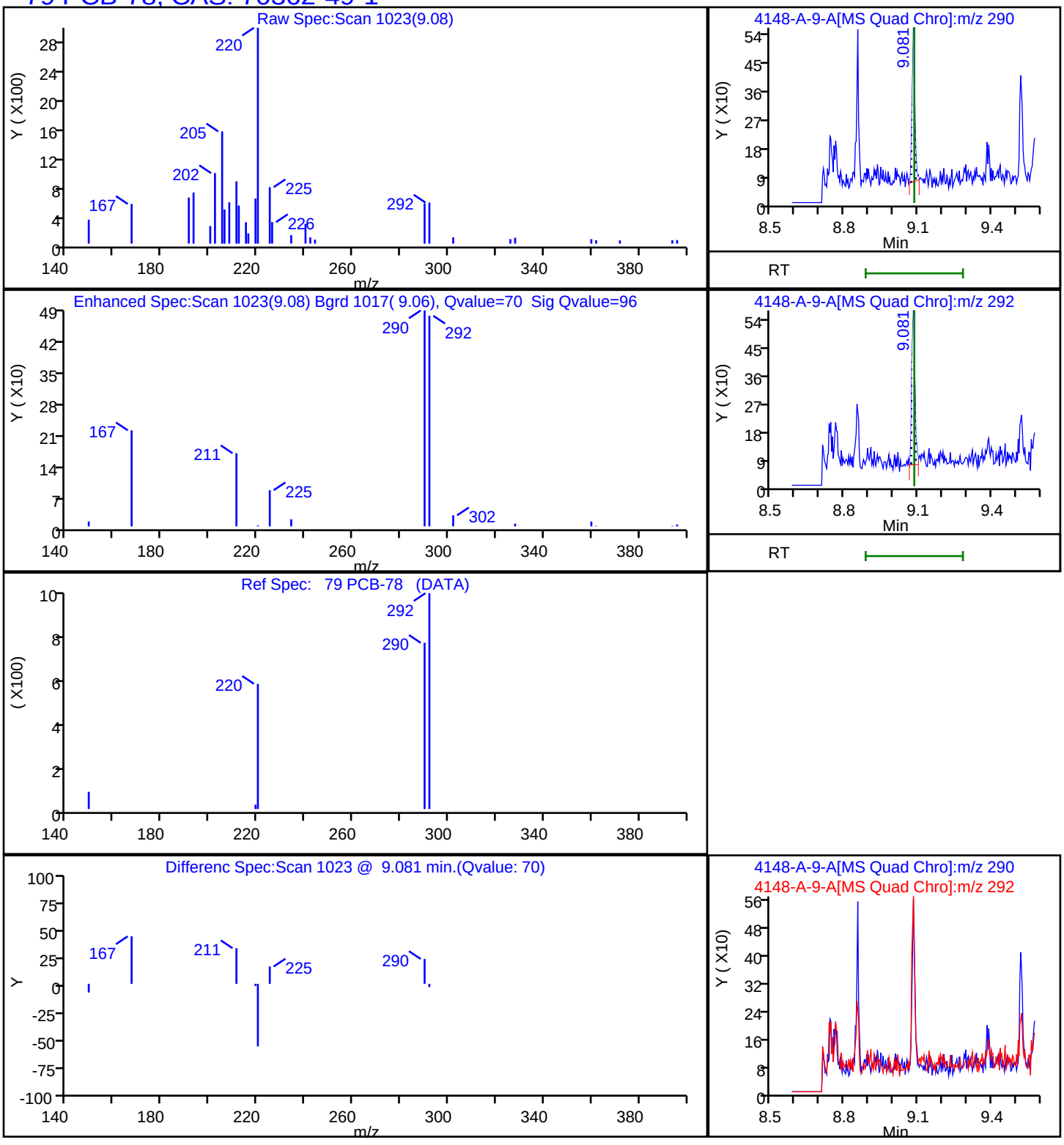
Report Date: 17-Nov-2023 12:15:27 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-9-A.D

Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12		
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

79 PCB-78, CAS: 70362-49-1



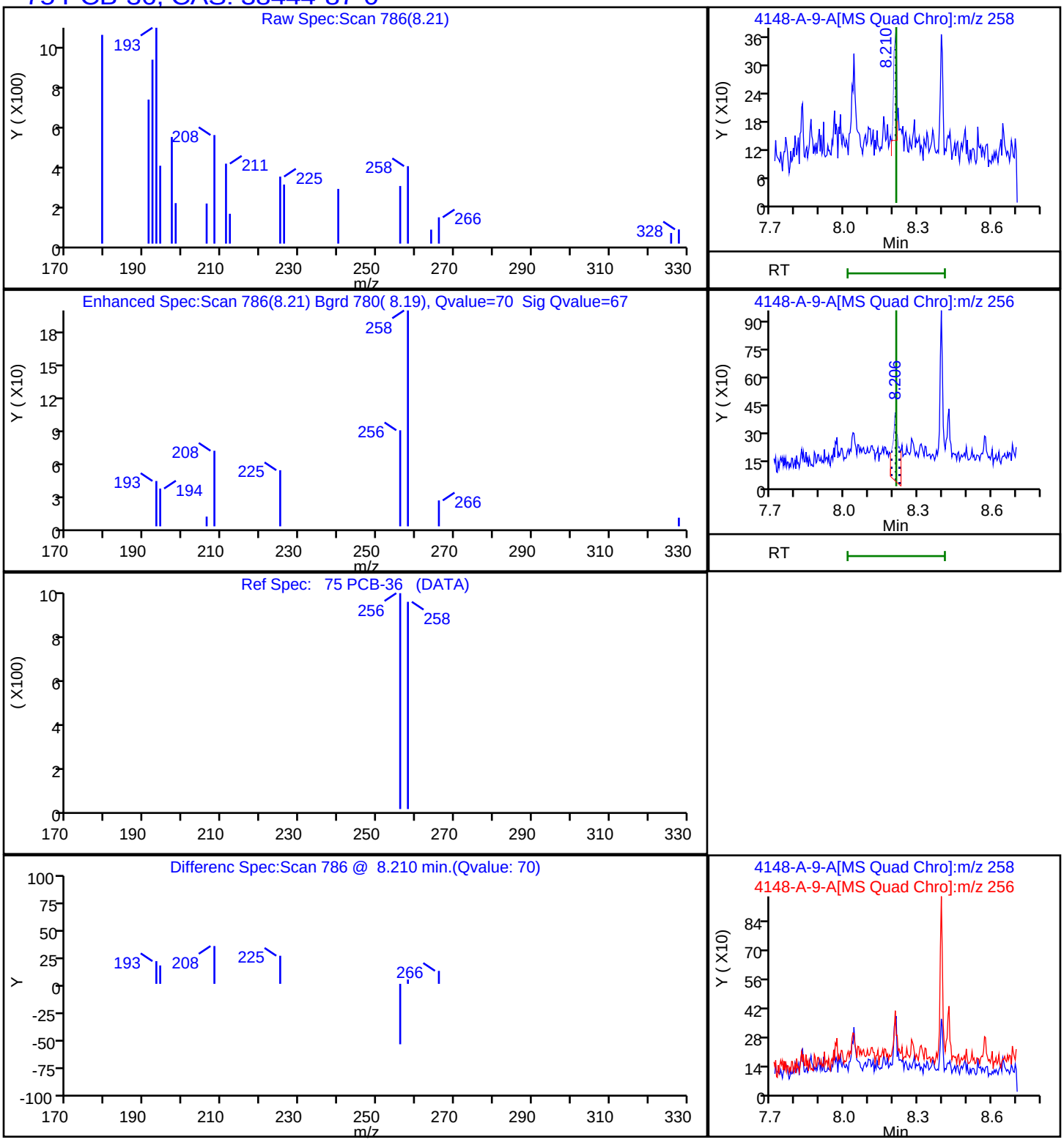
Report Date: 17-Nov-2023 12:15:27 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-9-A.D

Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12		
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

75 PCB-36, CAS: 38444-87-0



Manual Integration/User Assign Peak Report

Eurofins Knoxville

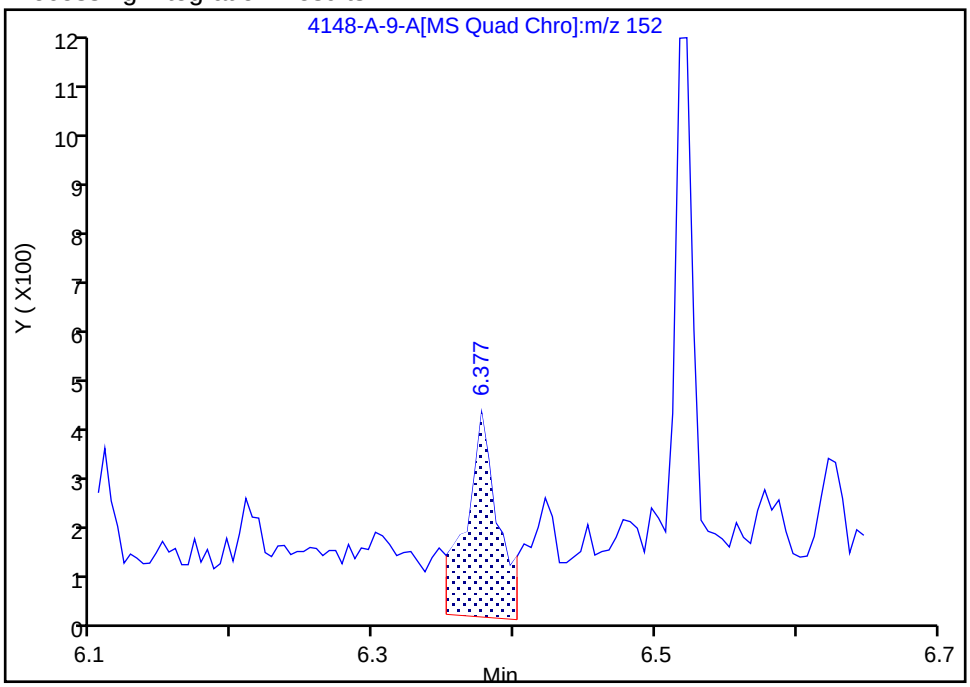
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-9-A.D				
Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12		
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

24 Acenaphthylene, CAS: 208-96-8

Signal: 1

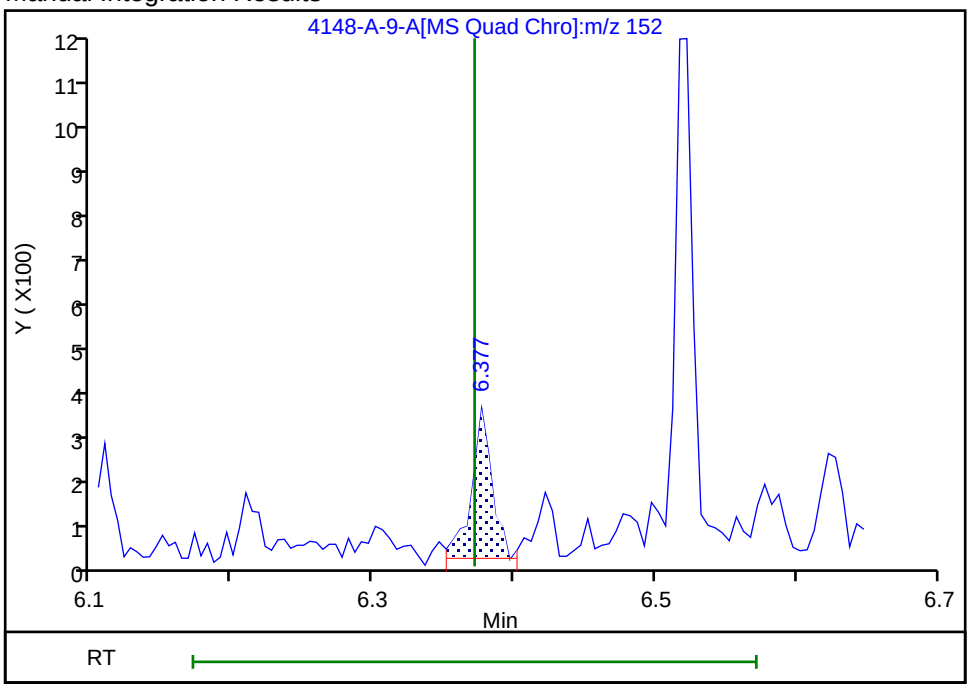
Processing Integration Results

RT: 6.38
Area: 651
Amount: 0.006312
Amount Units: ug/ml



Manual Integration Results

RT: 6.38
Area: 315
Amount: 0.003054
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 09:52:06 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Eurofins Knoxville

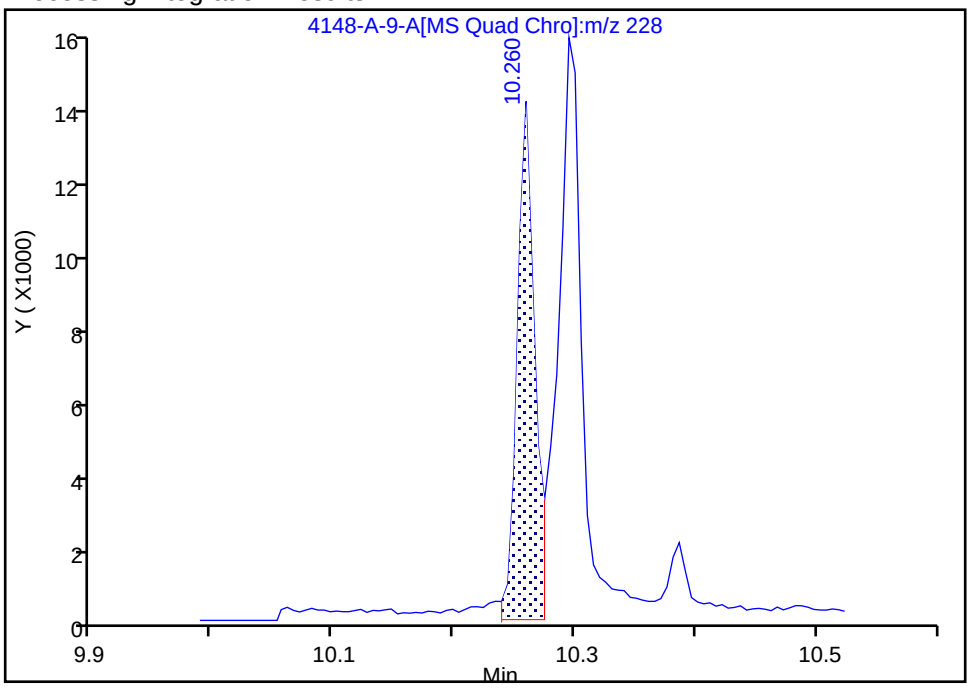
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-9-A.D				
Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12		
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

47 Benzo[a]anthracene, CAS: 56-55-3

Signal: 1

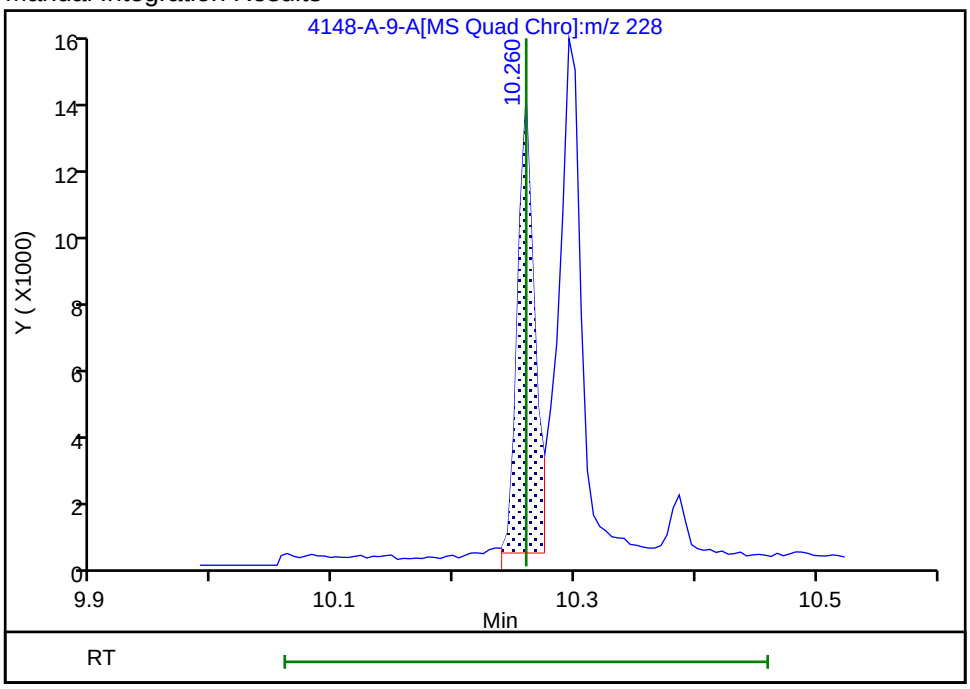
Processing Integration Results

RT: 10.26
Area: 14000
Amount: 0.077396
Amount Units: ug/ml



Manual Integration Results

RT: 10.26
Area: 13216
Amount: 0.073062
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 09:51:32 -05:00:00 (UTC)
Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

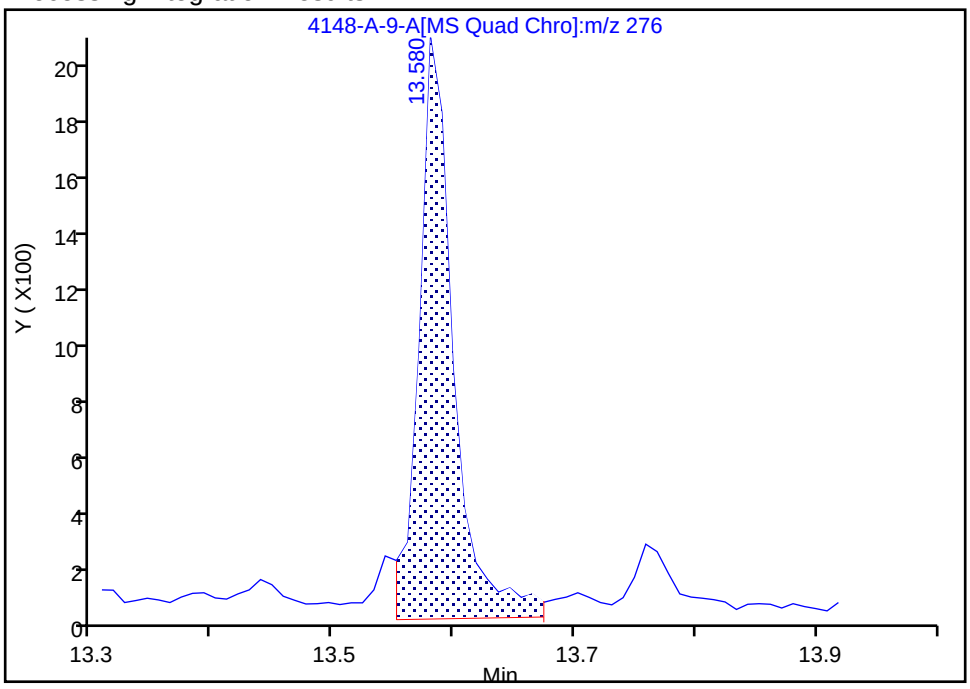
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-9-A.D				
Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12		
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

68 Benzo[g,h,i]perylene, CAS: 191-24-2

Signal: 1

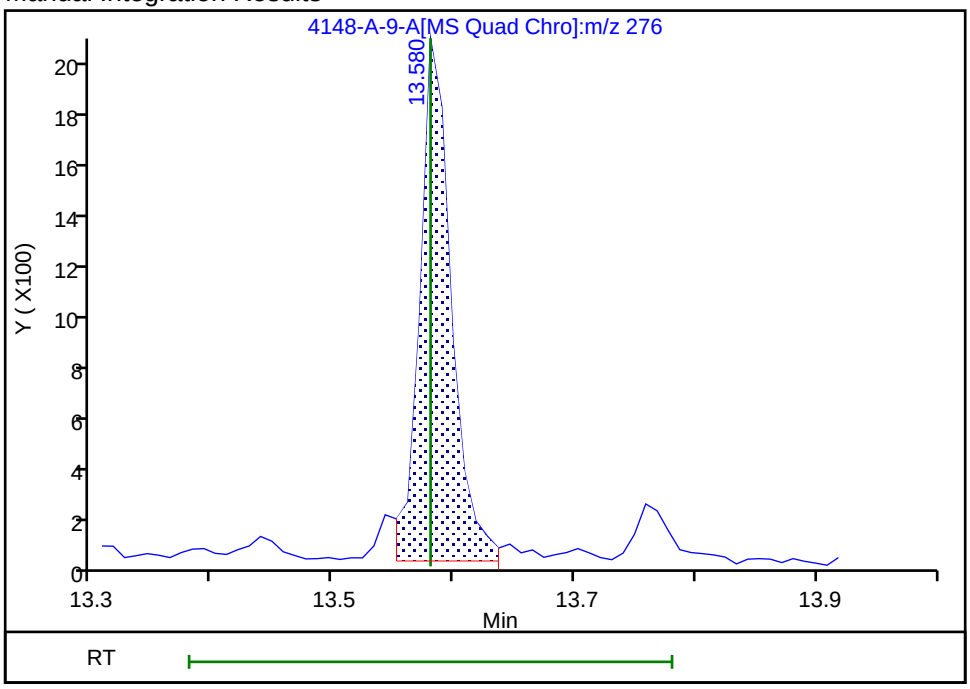
Processing Integration Results

RT: 13.58
Area: 4060
Amount: 0.023684
Amount Units: ug/ml



Manual Integration Results

RT: 13.58
Area: 3610
Amount: 0.021059
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 09:50:24 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

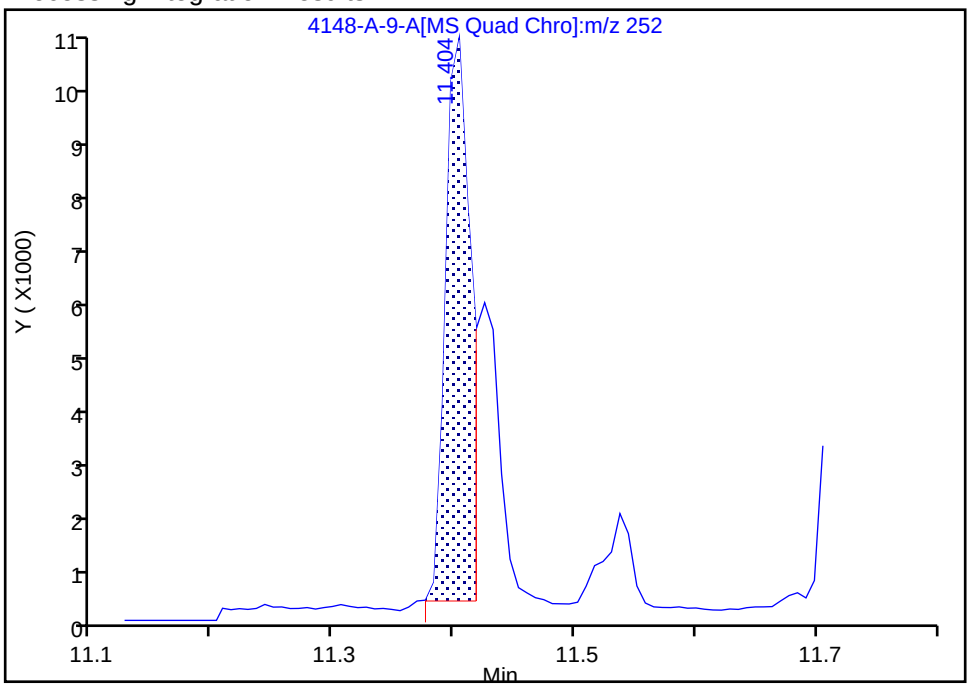
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-9-A.D				
Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12		
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

55 Benzo[k]fluoranthene, CAS: 207-08-9

Signal: 1

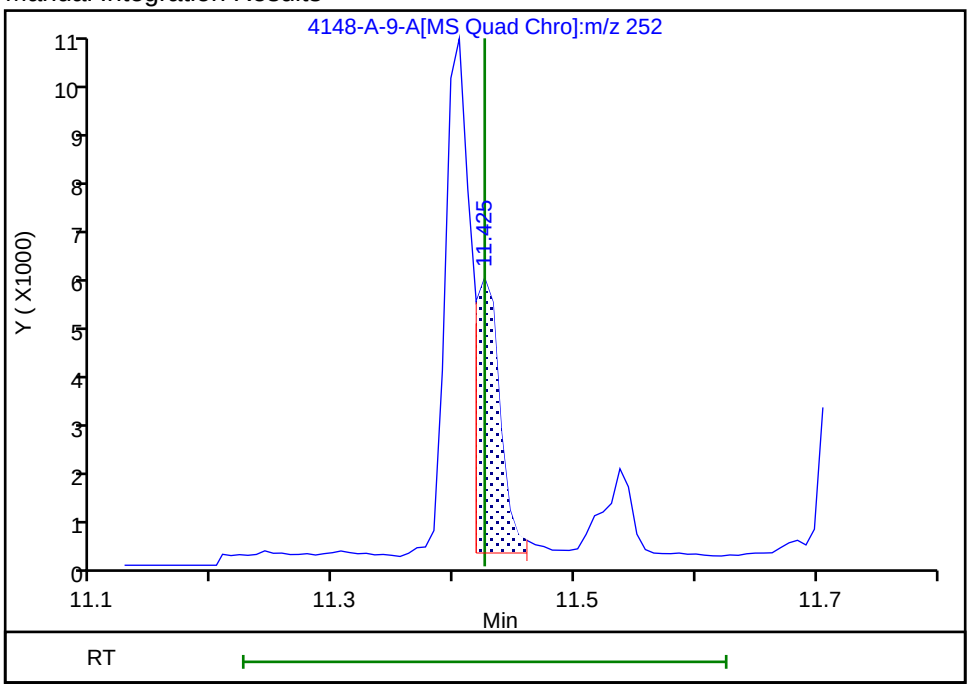
Processing Integration Results

RT: 11.40
Area: 14421
Amount: 0.071136
Amount Units: ug/ml



Manual Integration Results

RT: 11.43
Area: 7898
Amount: 0.038959
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 09:51:12 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

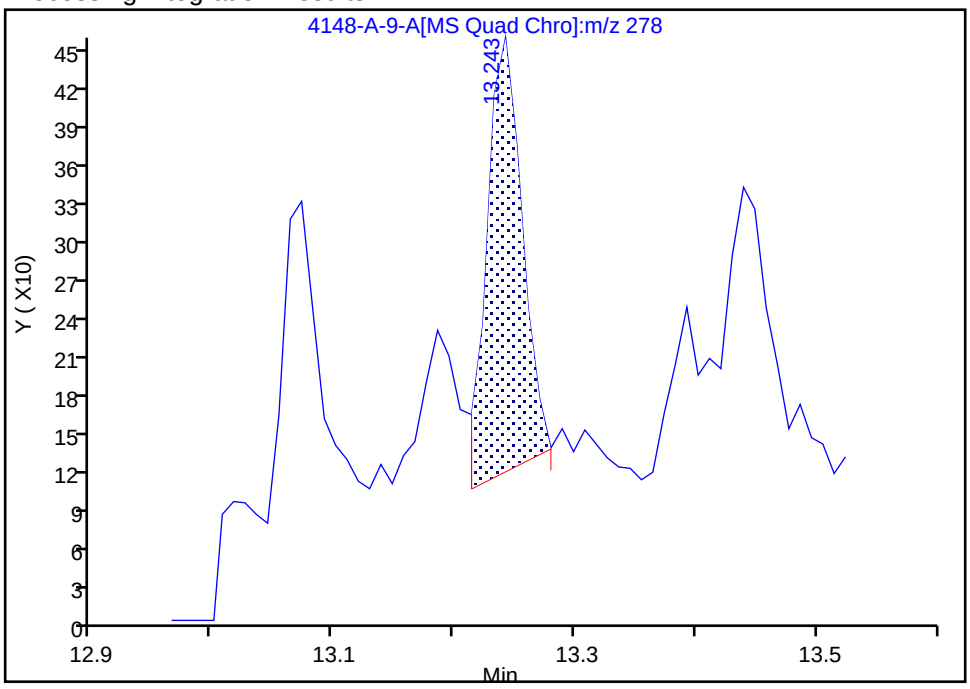
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-9-A.D				
Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12		
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

66 Dibenz(a,h)anthracene, CAS: 53-70-3

Signal: 1

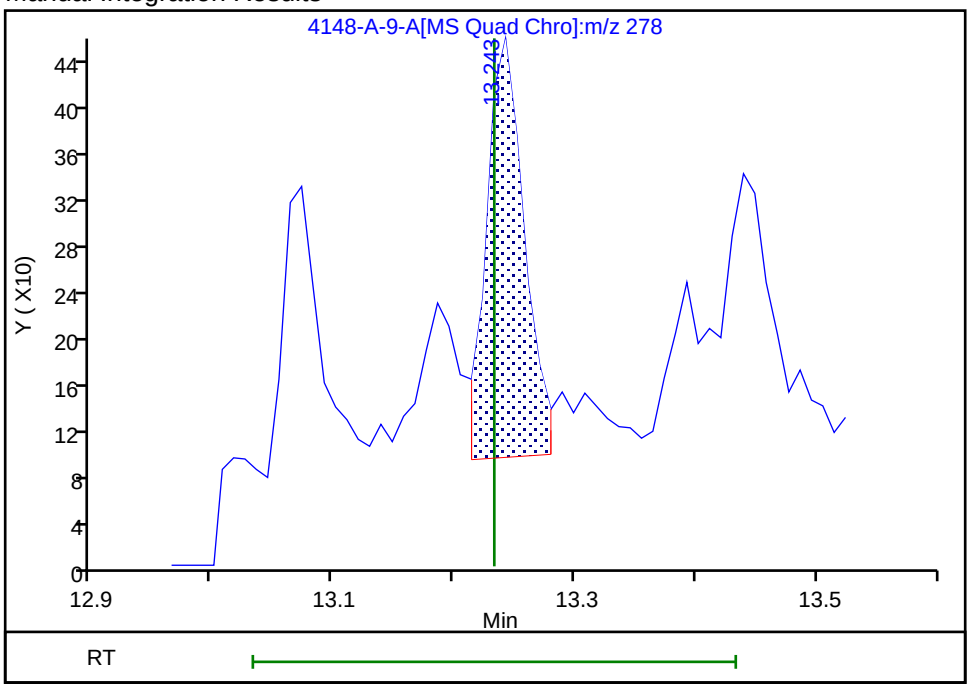
Processing Integration Results

RT: 13.24
Area: 694
Amount: 0.004303
Amount Units: ug/ml



Manual Integration Results

RT: 13.24
Area: 809
Amount: 0.005016
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 09:50:35 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

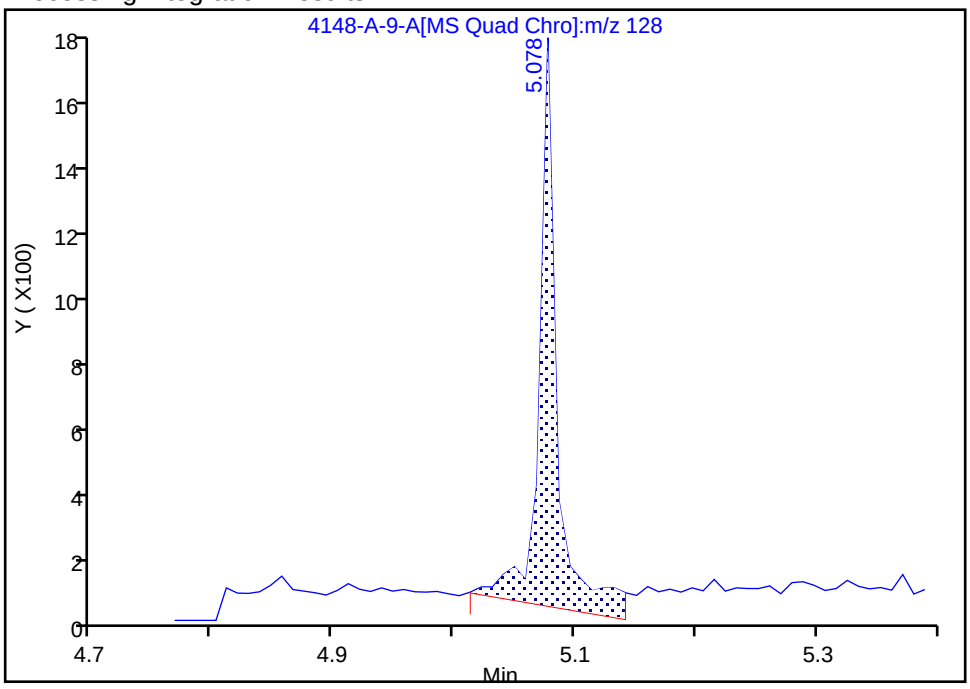
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-9-A.D				
Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12		
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

12 Naphthalene, CAS: 91-20-3

Signal: 1

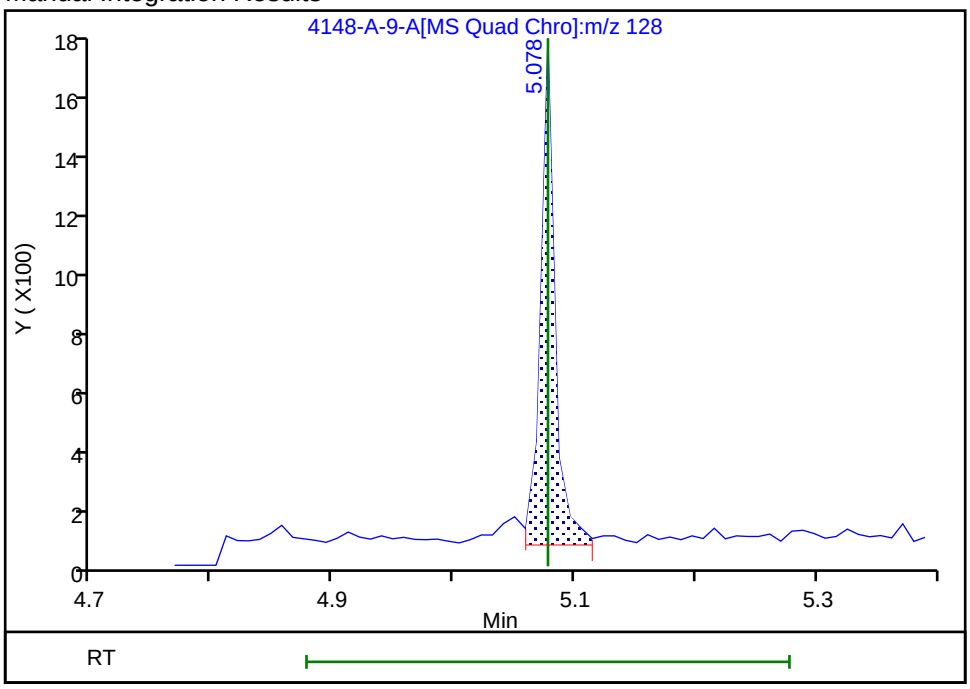
Processing Integration Results

RT: 5.08
Area: 1839
Amount: 0.021788
Amount Units: ug/ml



Manual Integration Results

RT: 5.08
Area: 1429
Amount: 0.016930
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 09:52:51 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

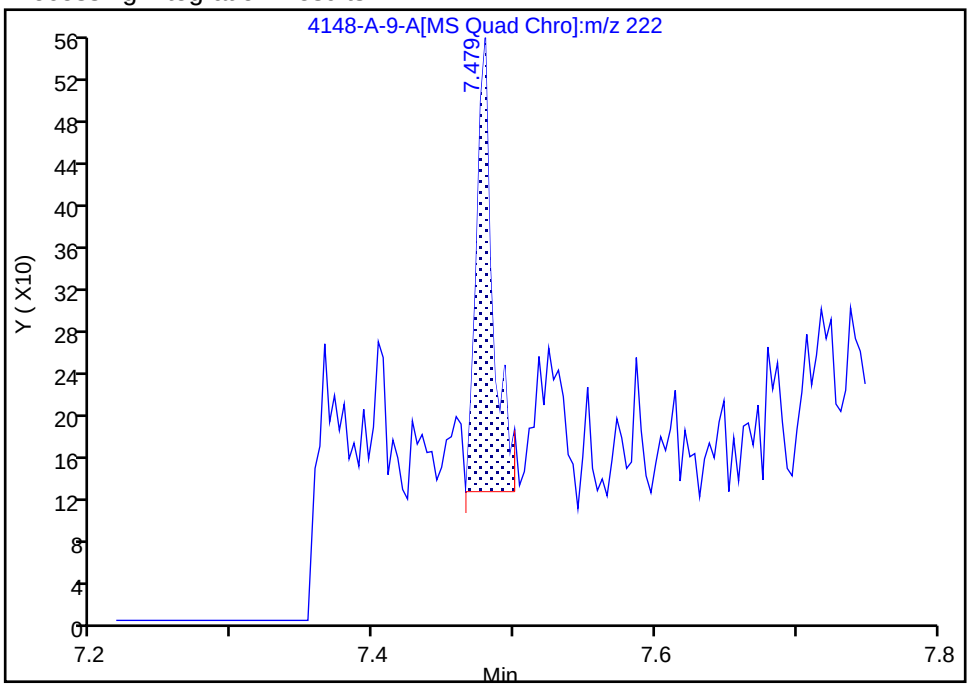
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-9-A.D				
Injection Date:	16-Nov-2023 18:11:58	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-12-A	Lab Sample ID:	140-34148-12		
Client ID:	1804576-854-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

74 PCB-14, CAS: 34883-41-5

Signal: 1

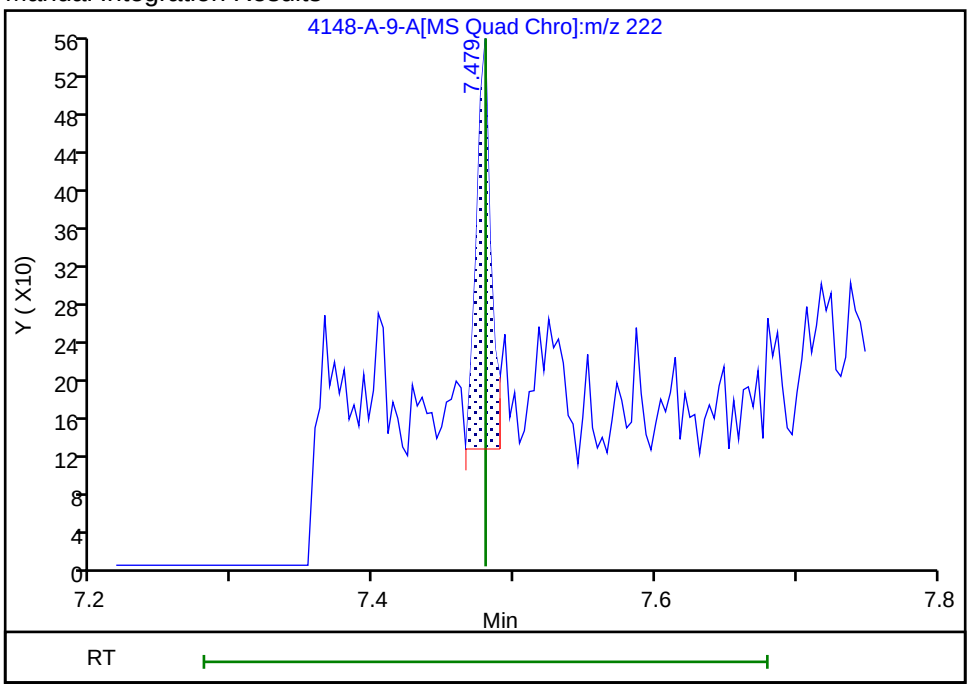
Processing Integration Results

RT: 7.48
Area: 353
Amount: 0.003110
Amount Units: ug/ml



Manual Integration Results

RT: 7.48
Area: 308
Amount: 0.002714
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 09:49:47 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: 1804576-854-S2 | Lab Sample ID: 140-34148-13

Matrix: PE | Lab File ID: 140-34148-A-10-A.D

Analysis Method: ID-0016 | Date Collected: 10/26/2023 14:00

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.012(g) | Date Analyzed: 11/16/2023 18:35

Con. Extract Vol.: 500(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80349 | Units: ng/g

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
83-32-9	Acenaphthene	9000		830	220
208-96-8	Acenaphthylene	680	J	830	61
120-12-7	Anthracene	21000		830	270
56-55-3	Benzo[a]anthracene	21000		830	310
50-32-8	Benzo[a]pyrene	9800		830	230
205-99-2	Benzo[b]fluoranthene	9700		830	290
192-97-2	Benzo[e]pyrene	6200		830	130
191-24-2	Benzo[g,h,i]perylene	2600		830	92
207-08-9	Benzo[k]fluoranthene	5300		830	190
218-01-9	Chrysene	22000		830	110
53-70-3	Dibenz(a,h)anthracene	640	J	830	68
206-44-0	Fluoranthene	78000		830	680
86-73-7	Fluorene	6800		830	270
193-39-5	Indeno[1,2,3-cd]pyrene	2700		830	92
90-12-0	1-Methylnaphthalene	ND		4200	420
91-57-6	2-Methylnaphthalene	ND		4200	580
91-20-3	Naphthalene	ND		17000	2400
198-55-0	Perylene	6200		830	430
85-01-8	Phenanthrene	71000		1700	1400
129-00-0	Pyrene	98000		1700	250
STL00912	C1-Fluoranthenes/pyrene	53000		830	830
STL00913	C1-Fluorenes	18000		1700	1100
STL00914	C2-Fluorenes	30000		830	830
STL00915	C3-Fluorenes	26000		830	830
STL00917	C2-Naphthalenes	14000		1700	1700
STL00918	C3-Naphthalenes	65000		1700	1700
STL00919	C4-Naphthalenes	56000		2500	2300
STL00901	C1-Phenanthrenes/Anthracenes	51000		3300	2800
STL00902	C2-Phenanthrenes/Anthracenes	64000		830	830
STL00903	C3-Phenanthrenes/Anthracenes	32000		830	830
STL00904	C4-Phenanthrenes/Anthracenes	11000		830	830
STL02218	C1-Chrysenes/Benz(a)anthracenes	15000		830	830

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: 1804576-854-S2 | Lab Sample ID: 140-34148-13

Matrix: PE | Lab File ID: 140-34148-A-10-A.D

Analysis Method: ID-0016 | Date Collected: 10/26/2023 14:00

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.012(g) | Date Analyzed: 11/16/2023 18:35

Con. Extract Vol.: 500(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80349 | Units: ng/g

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
STL02219	C2-Chrysenes/Benz(a)anthracenes	5100		830	830
STL02220	C3-Chrysenes/Benz(a)anthracenes	1600		830	830
STL02221	C4-Chrysenes/Benz(a)anthracenes	ND		830	830
34883-41-5	PCB-14	500	J	830	8.3
74472-51-8	PCB-192	2200		830	8.3
74472-48-3	PCB-184	900		830	8.3
33979-03-2	PCB-155	700	J	830	8.3
41411-61-4	PCB-142	540	J	830	8.3
74472-52-9	PCB-204	1500		830	8.3
56558-16-8	PCB-104	1400		830	8.3
56558-18-0	PCB-121	990		830	8.3
70362-49-1	PCB-78	1200		830	8.3
38444-87-0	PCB-36	400	J	830	8.3

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
93951-97-4	Acenaphthylene-d8	82		30-120
1719-06-8	Anthracene-d10	80		30-120
63466-71-7	Benzo(a)pyrene-d12	86		30-120
93951-98-5	Benzo(b)fluoranthene-d12	91		30-120
93951-66-7	Benzo(ghi)perylene-d12	91		30-120
93952-01-3	Benzo(k)fluoranthene-d12	85		30-120
1719-03-5	Chrysene-d12	77		30-120
13250-98-1	Dibenz(a,h)anthracene-d14	88		30-120
93951-69-0	Fluoranthene-d10	88		30-120
81103-79-9	Fluorene -d10	81		30-120
203578-33-0	Indeno[1,2,3-cd]pyrene-d12	91		30-120
38072-94-5	1-Methylnaphthalene-d10	75		30-120
7297-45-2	2-Methylnaphthalene-d10	73		30-120
1146-65-2	Naphthalene-d8	68		30-120
1520-96-3	Perylene-d12	81		30-120
1517-22-2	Phenanthrene-d10	84		30-120

Report Date: 22-Nov-2023 11:25:28 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-10-A.D
Lims ID: 140-34148-A-13-A
Client ID: 1804576-854-S2
Sample Type: Client
Inject. Date: 16-Nov-2023 18:35:29 ALS Bottle#: 0 Worklist Smp#: 21
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030519-021
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 22-Nov-2023 11:25:26 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1637

First Level Reviewer: SK9U Date: 17-Nov-2023 10:05:39

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/ml	%Rec	Flags
D 10 Naphthalene-d8	136	5.068	5.068	0.000	100	31414	0.3403	68.1	
12 Naphthalene	128	5.078	5.078	0.000	35	1370	0.0185		7M
D 15 2-methylnaphthalene-d10	152	5.612	5.612	0.000	92	21892	0.3647	72.9	
D 17 1-Methylnaphthalene-d10	152	5.686	5.686	0.000	99	22632	0.3763	75.3	
D 23 Acenaphthylene-d8	160	6.361	6.362	-0.001	52	41573	0.4081	81.6	
24 Acenaphthylene	152	6.377	6.372	0.005	57	1599	0.0164		M
* 26 Acenaphthene-d10	164	6.492	6.492	0.000	98	33109	0.5000		
27 Acenaphthene	154	6.517	6.517	0.000	97	13479	0.2153		
D 29 Fluorene -d10	176	6.920	6.920	0.000	99	31949	0.4050	81.0	
30 Fluorene	166	6.945	6.945	0.000	96	13451	0.1621		
D 35 Phenanthrene-d10	188	7.732	7.732	0.000	99	63033	0.4194	83.9	
36 Phenanthrene	178	7.749	7.749	0.000	36	258039	1.70		
D 38 Anthracin-d10	188	7.776	7.777	-0.001	100	58411	0.3981	79.6	M
39 Anthracene	178	7.794	7.794	0.000	97	73526	0.5112		
D 41 Fluoranthene-d10	212	8.808	8.805	0.003	94	85405	0.4380	87.6	
43 Fluoranthene	202	8.825	8.825	0.000	56	411275	1.88		
* 44 Pyrene-d10 (IS)	212	9.027	9.024	0.003	98	96381	0.5000		
45 Pyrene	202	9.044	9.044	0.000	97	523318	2.35		
47 Benzo[a]anthracene	228	10.260	10.260	0.000	100	95753	0.5082		
D 48 Chrysene-d12	240	10.270	10.270	0.000	97	72548	0.3858	77.2	
50 Chrysene	228	10.295	10.295	0.000	14	109865	0.5202		
D 52 Benzo(b)fluoranthene-d12	264	11.376	11.369	0.007	100	66342	0.4527	90.5	
53 Benzo[b]fluoranthene	252	11.404	11.397	0.007	40	52180	0.2334		M
D 54 Benzo(k)fluoranthene-d12	264	11.404	11.404	0.000	87	72847	0.4232	84.6	
55 Benzo[k]fluoranthene	252	11.425	11.425	0.000	99	27193	0.1274		M
* 56 Benzo(e)pyrene-d12	264	11.684	11.684	0.000	99	57858	0.5000		
57 Benzo[e]pyrene	252	11.712	11.712	0.000	100	27704	0.1488		
D 58 Benzo(a)pyrene-d12	264	11.747	11.747	0.000	100	55251	0.4299	86.0	
59 Benzo[a]pyrene	252	11.775	11.775	0.000	100	42946	0.2350		
D 60 Perylene-d12	264	11.845	11.838	0.007	100	57862	0.4057	81.1	
61 Perylene	252	11.873	11.873	0.000	100	24765	0.1498		
D 62 Indeno[1,2,3-cd]pyrene-d12	288	13.186	13.186	0.000	83	63405	0.4542	90.8	

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/ml	%Rec	Flags
D 63 Dibenz(a,h)anthracene-d14	292	13.196	13.196	0.000	89	54950	0.4399	88.0	
65 Indeno[1,2,3-cd]pyrene	276	13.224	13.214	0.010	31	13904	0.0655		
66 Dibenz(a,h)anthracene	278	13.233	13.233	0.000	9	2697	0.0154		M
D 67 Benzo(ghi)perylene-d12	288	13.543	13.543	0.000	100	62840	0.4532	90.6	
68 Benzo[g,h,i]perylene	276	13.580	13.580	0.000	90	11326	0.0615		
74 PCB-14	222	7.472	7.479	-0.007	25	1467	0.0120		M
75 PCB-36	258	8.202	8.206	-0.008	5	615	0.009556		M
76 PCB-104	326	8.395	8.393	-0.001	88	1734	0.0347		
77 PCB-121	326	8.751	8.748	0.000	50	953	0.0237		
78 PCB-155	360	8.852	8.852	0.003	46	630	0.0168		
79 PCB-78	290	9.077	9.077	-0.007	27	899	0.0281		M
80 PCB-142	360	9.525	9.519	0.003	32	352	0.0129		
81 PCB-184	394	9.575	9.579	0.003	18	591	0.0216		
* 82 PCB-167L	372	10.023	10.027	-0.004	71	13337	0.4000		
83 PCB-204	428	10.254	10.246	0.004	1	626	0.0352		
84 PCB-192	394	10.275	10.275	0.000	6	1301	0.0519		
A 85 C2-Naphthalenes	156	6.237	(6.068-6.407)		0	25170	0.3407		
A 87 C3-Naphthalenes	170	6.689	(6.348-7.050)		0	116102	1.57		
A 88 C4-Naphthalenes	184	7.121	(6.678-7.562)		0	100045	1.35		
A 89 C1-Fluorenes	180	7.403	(7.364-7.505)		0	35056	0.4224		
A 90 C2-Fluorenes	194	7.868	(7.730-8.069)		0	59733	0.7197		
A 91 C3-Fluorenes	208	8.340	(8.092-8.605)		0	50872	0.6129		
A 96 C1-Phenanthrenes/Anthracenes	191	8.232	(8.155-8.332)		0	186549	1.23		
A 97 C2-Phenanthrenes/Anthracenes	206	8.704	(8.490-8.926)		0	233765	1.54		
A 98 C3-Phenanthrenes/Anthracenes	220	9.161	(8.851-9.456)		0	115843	0.7618		
A 99 C4-Phenanthrenes/Anthracenes	234	9.459	(9.106-9.824)		0	41790	0.2748		
A 100 C1-Fluoranthenes/pyrene	216	9.436	(9.246-9.640)		0	281684	1.26		
A 101 C1-Chrysenes/Benz(a)anthracenes	242	10.701	(10.456-10.941)		0	74229	0.3515		
A 102 C2-Chrysenes/Benz(a)anthracenes	256	11.012	(10.667-11.381)		0	25746	0.1219		
A 103 C3-Chrysenes/Benz(a)anthracenes	270	11.447	(11.002-11.867)		0	8161	0.0386		

QC Flag Legend

Processing Flags

7 - Failed Limit of Detection

Review Flags

M - Manually Integrated

Reagents:

60ISPCB_00001 Amount Added: 5.00 Units: uL

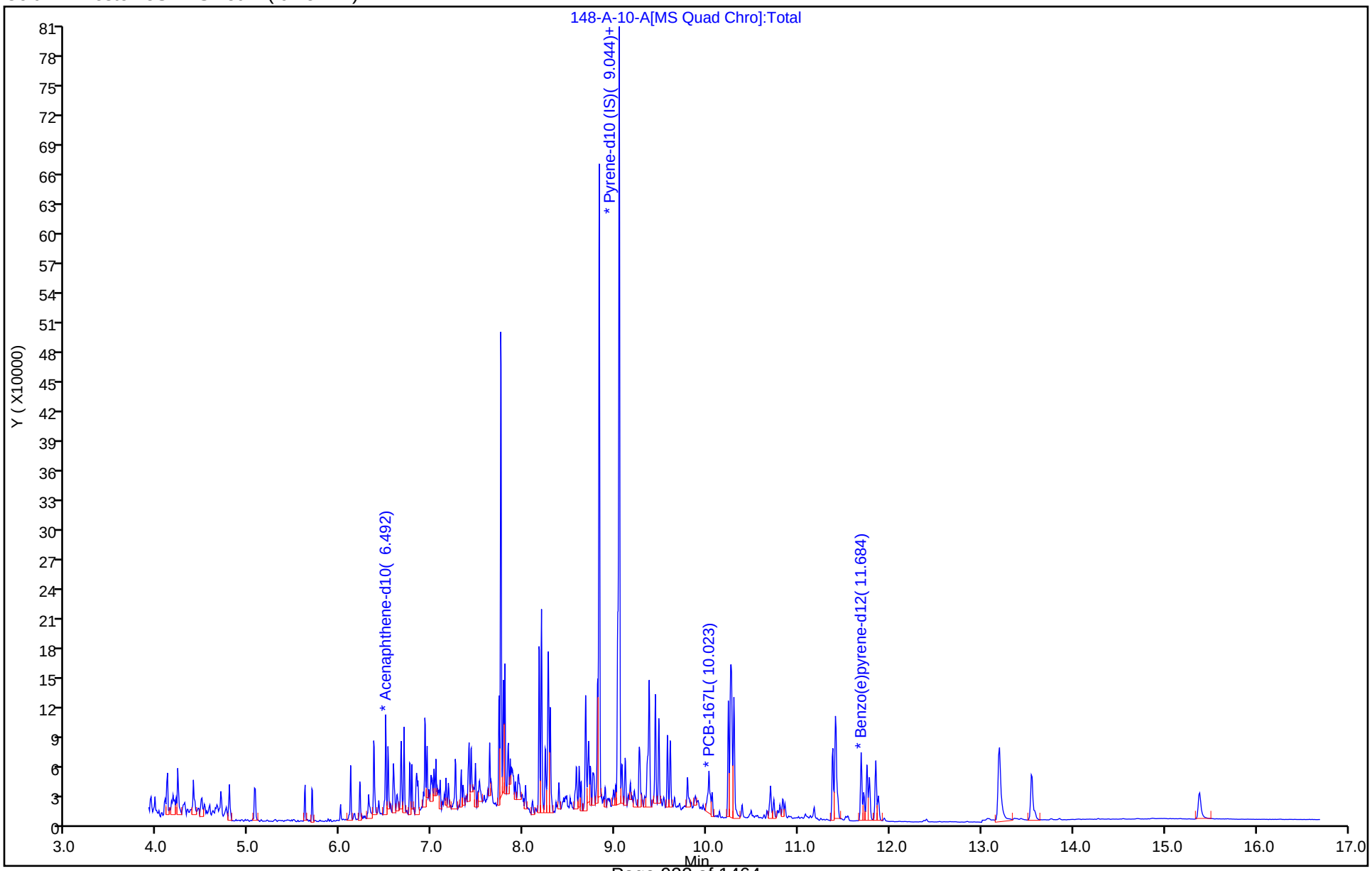
Report Date: 22-Nov-2023 11:25:28 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-10-A.D

Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13	Worklist Smp#:	21
Client ID:	1804576-854-S2				
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



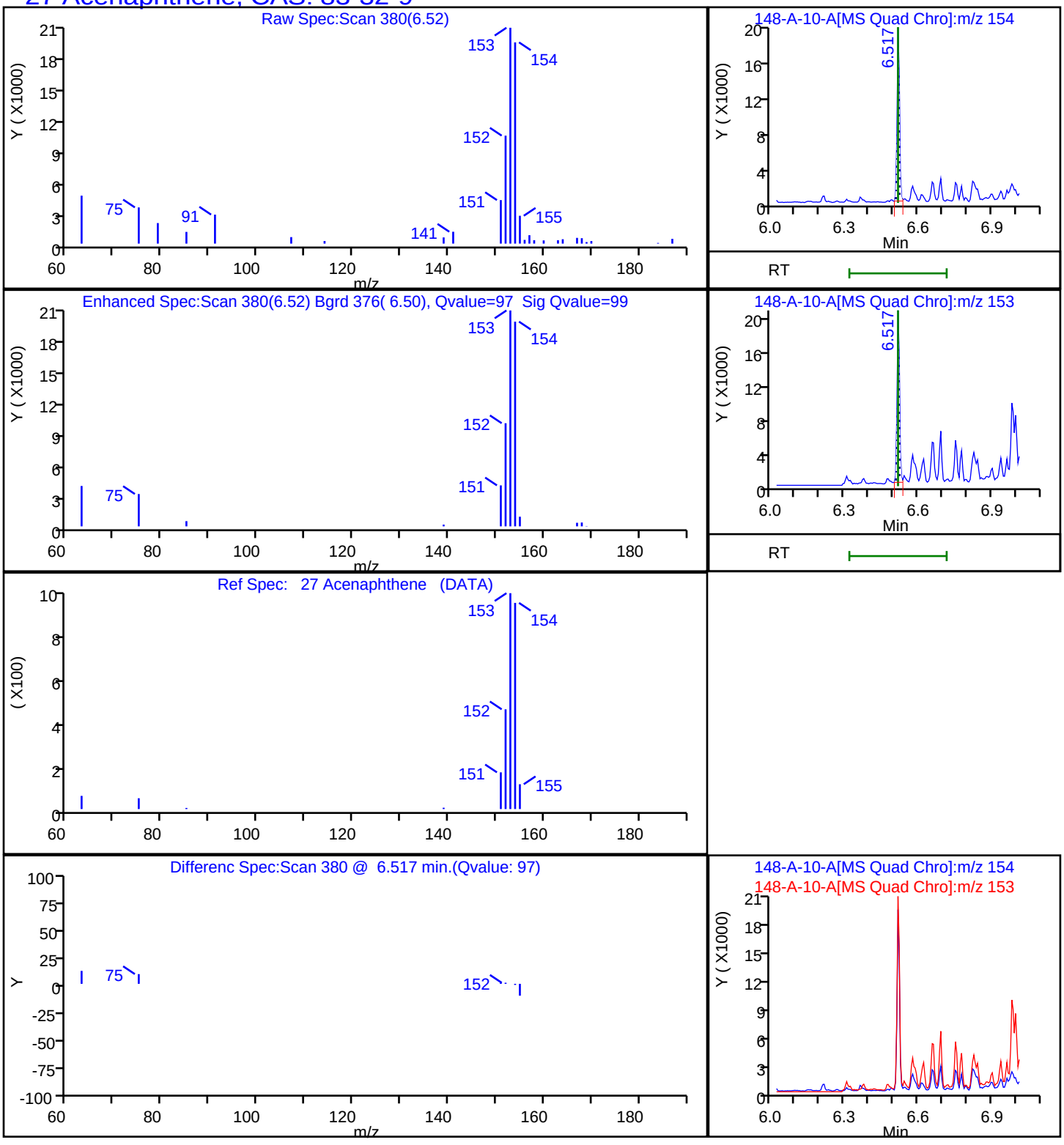
Report Date: 22-Nov-2023 11:25:28 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-10-A.D

Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13
Client ID:	1804576-854-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

27 Acenaphthene, CAS: 83-32-9



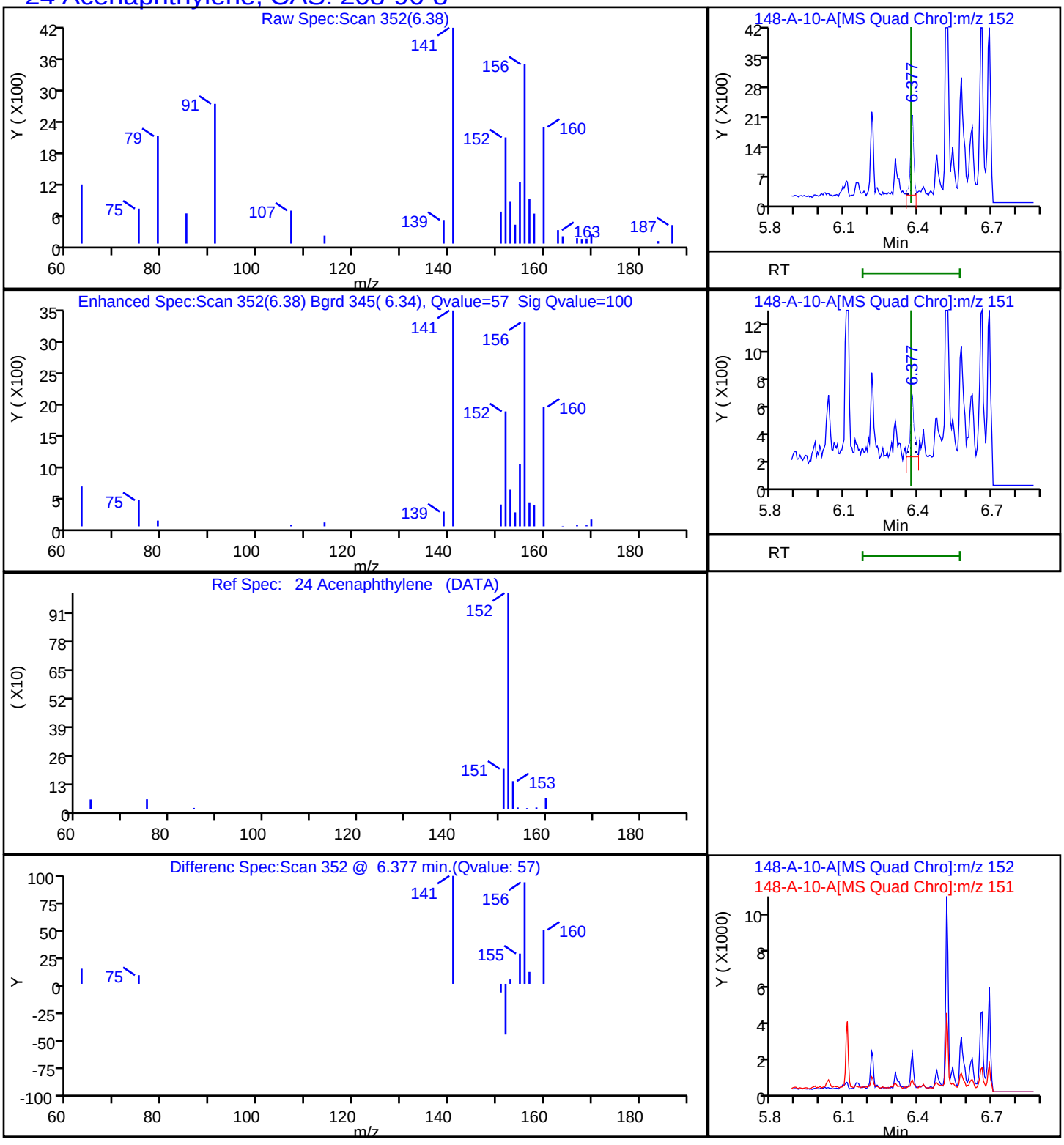
Report Date: 22-Nov-2023 11:25:28 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-10-A.D

Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

24 Acenaphthylene, CAS: 208-96-8



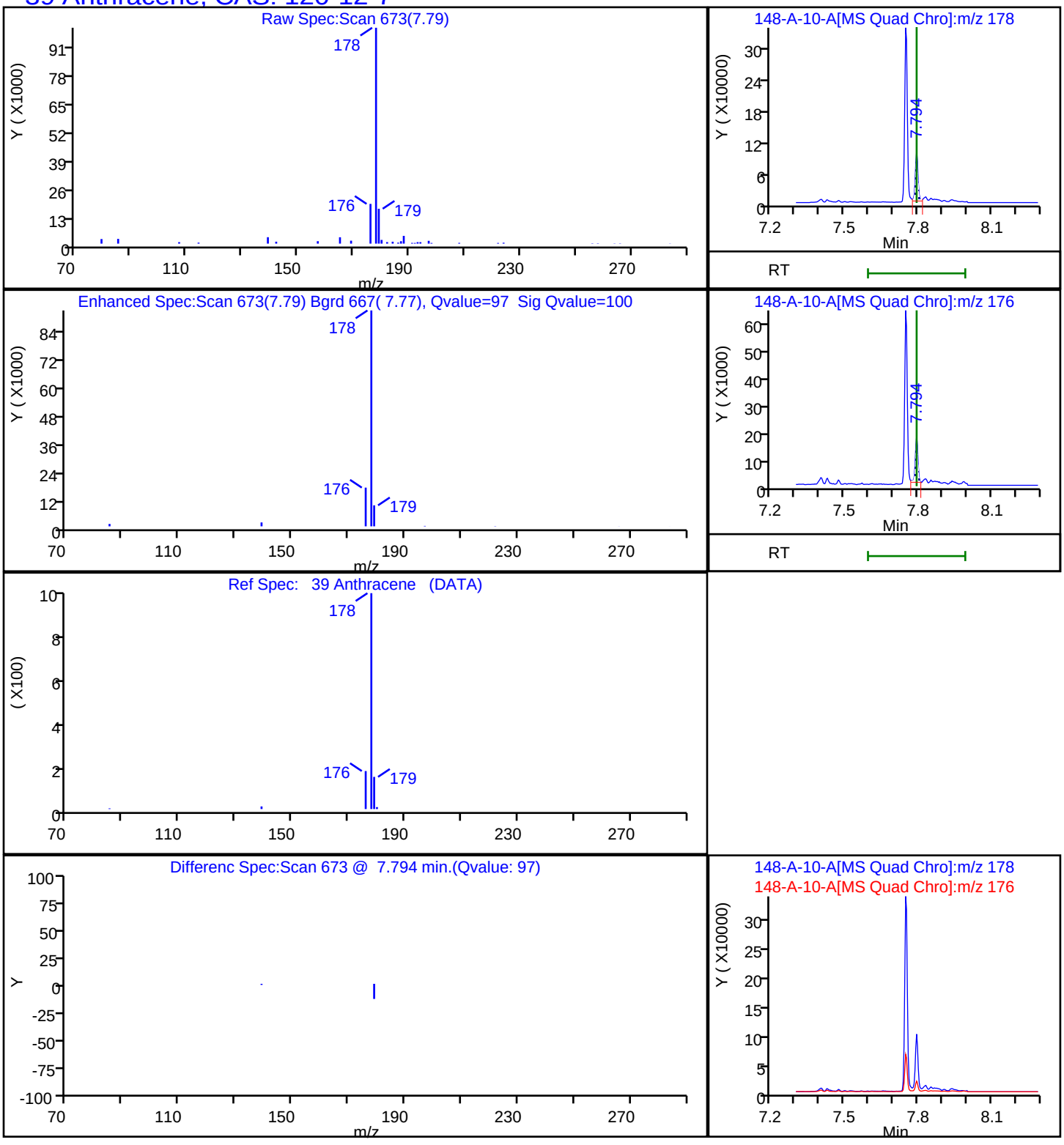
Report Date: 22-Nov-2023 11:25:28 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-10-A.D

Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

39 Anthracene, CAS: 120-12-7



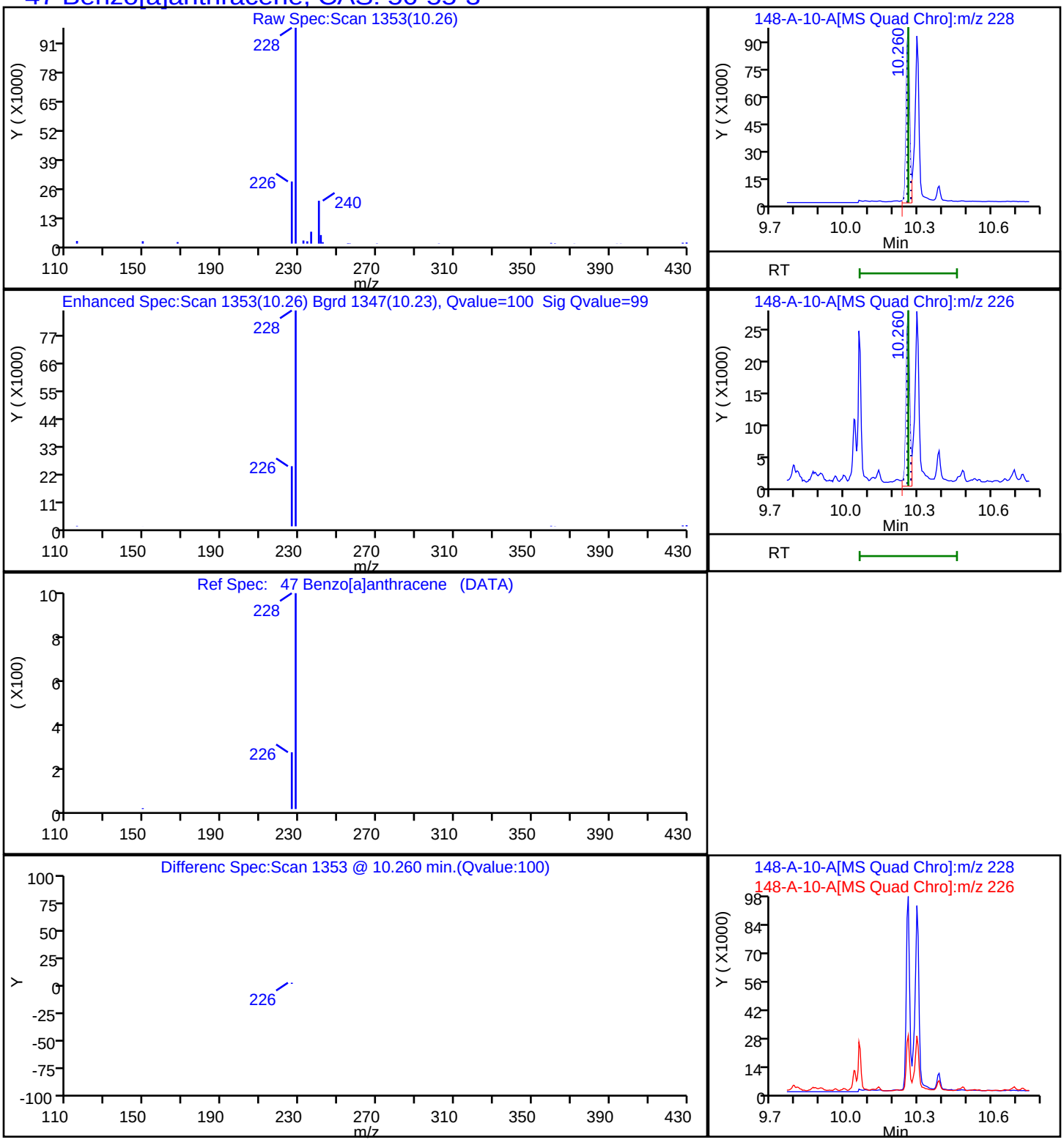
Report Date: 22-Nov-2023 11:25:28 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-10-A.D

Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

47 Benzo[a]anthracene, CAS: 56-55-3



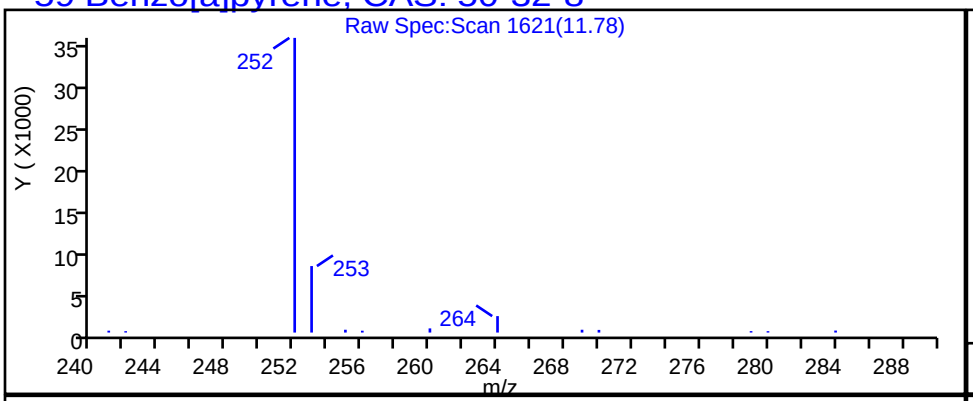
Report Date: 22-Nov-2023 11:25:28 Chrom Revision: 2.3 15-Nov-2023 20:54:34

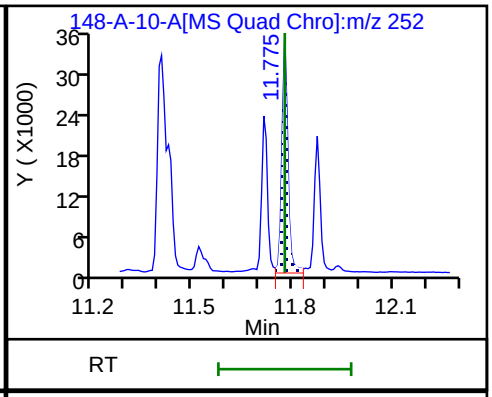
Eurofins Knoxville

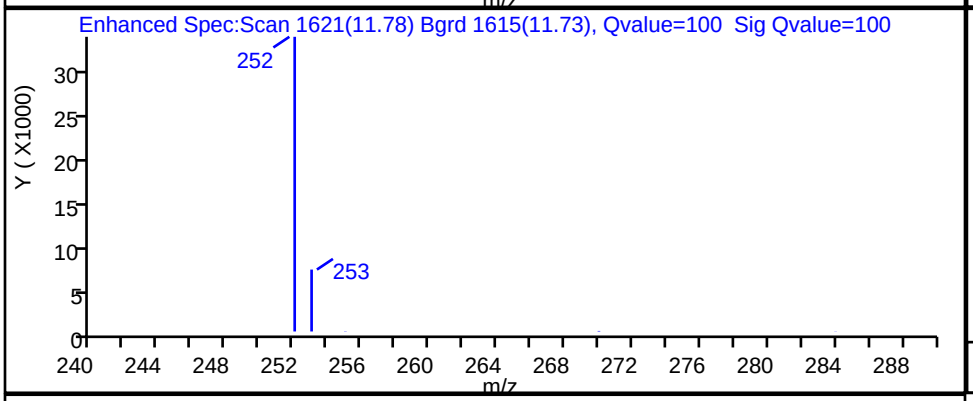
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-10-A.D

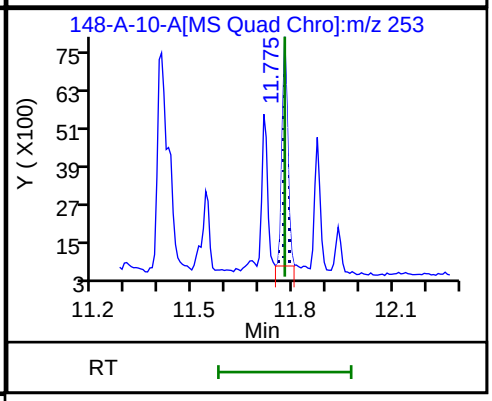
Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

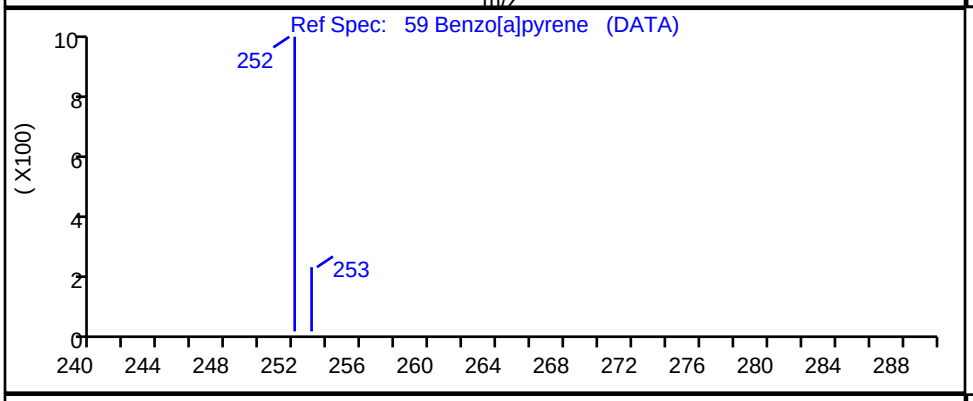
59 Benzo[a]pyrene, CAS: 50-32-8

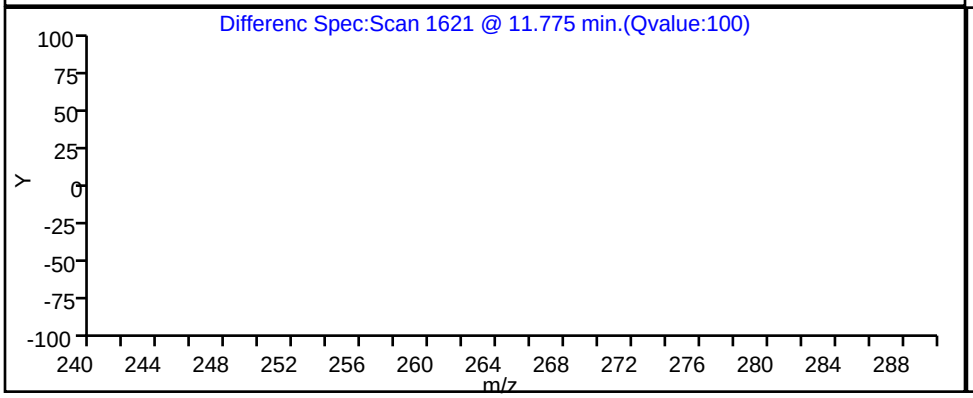


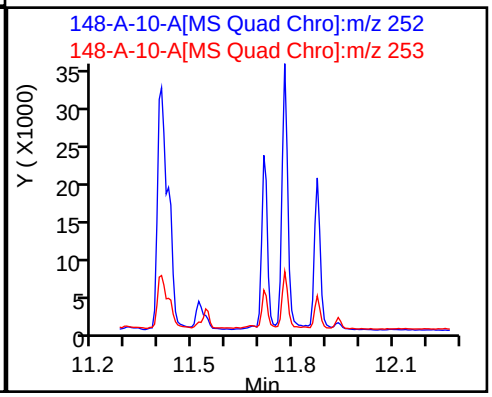










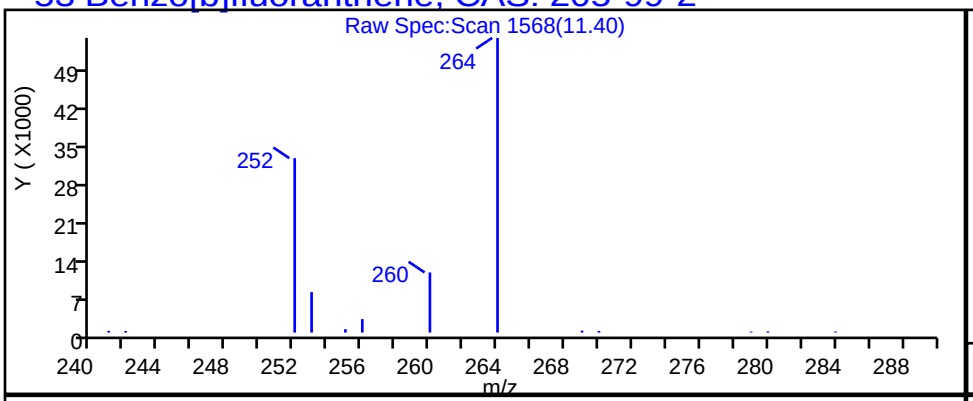


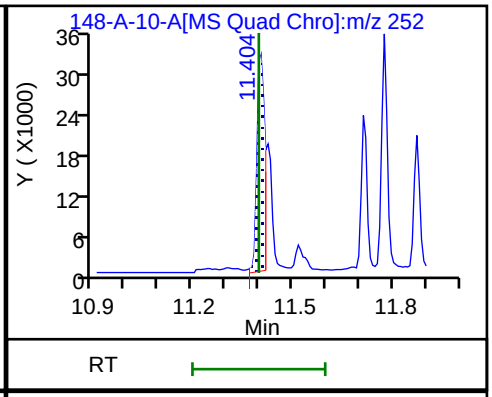
Report Date: 22-Nov-2023 11:25:28 Chrom Revision: 2.3 15-Nov-2023 20:54:34

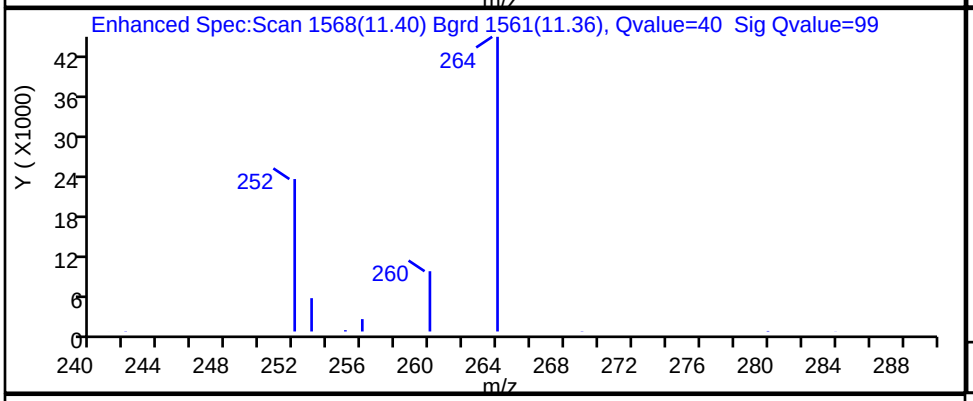
Eurofins Knoxville

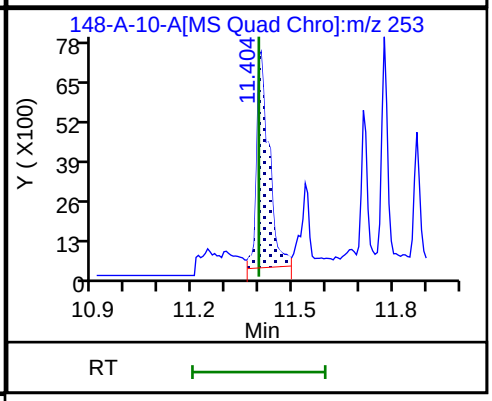
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-10-A.D		
Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13
Client ID:	1804576-854-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

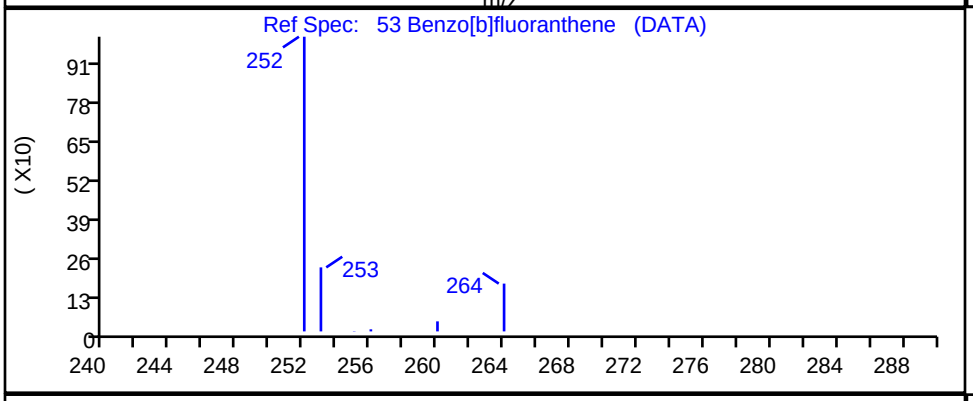
53 Benzo[b]fluoranthene, CAS: 205-99-2

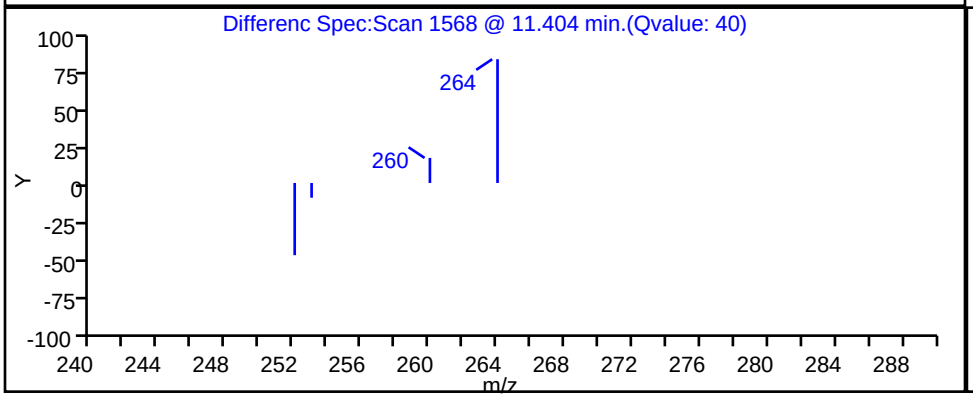


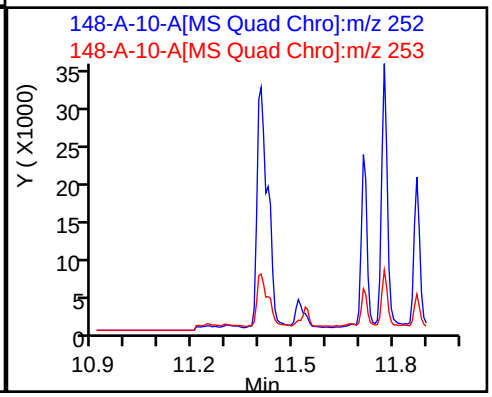










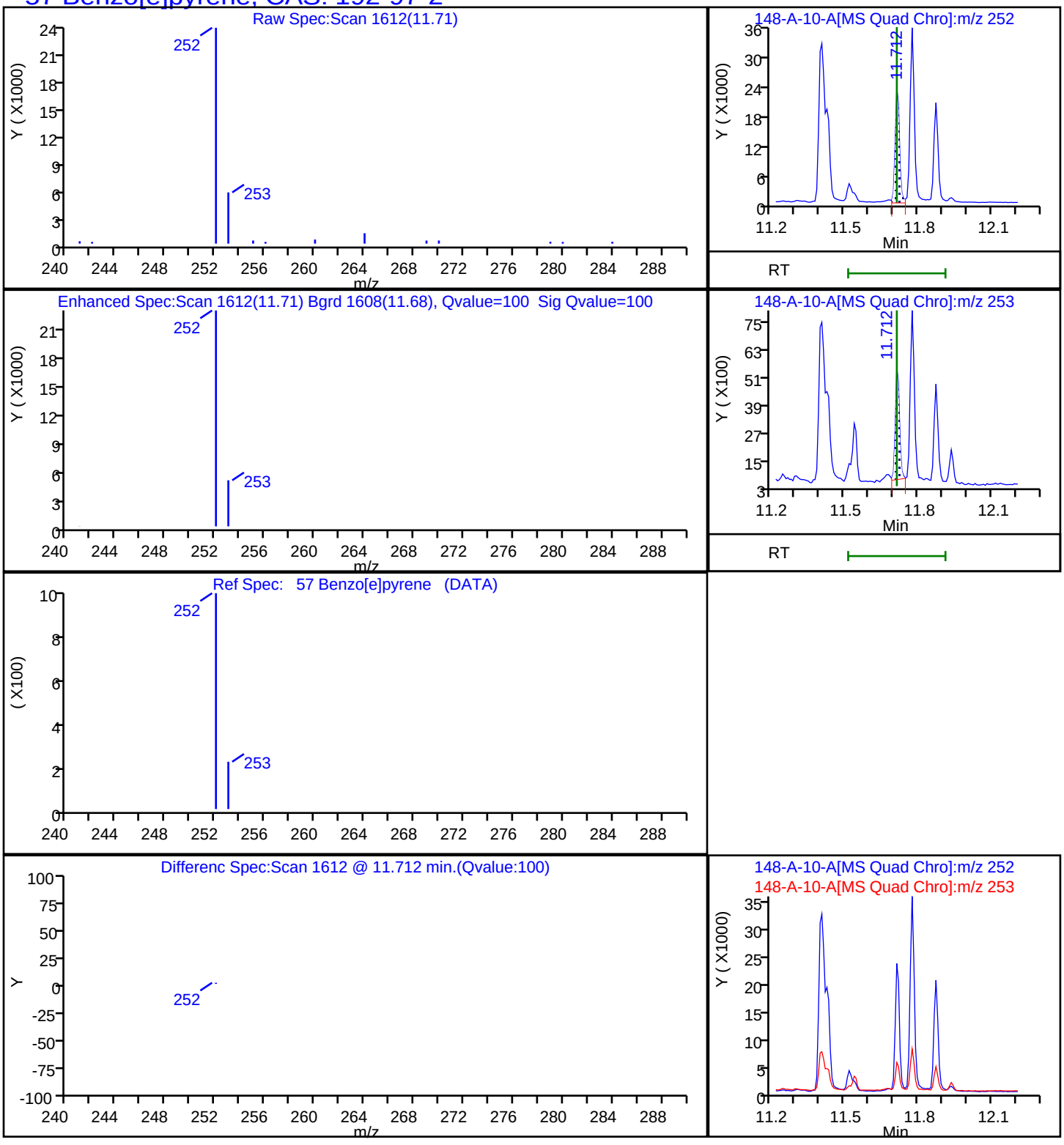


Report Date: 22-Nov-2023 11:25:28 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-10-A.D				
Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

57 Benzo[e]pyrene, CAS: 192-97-2



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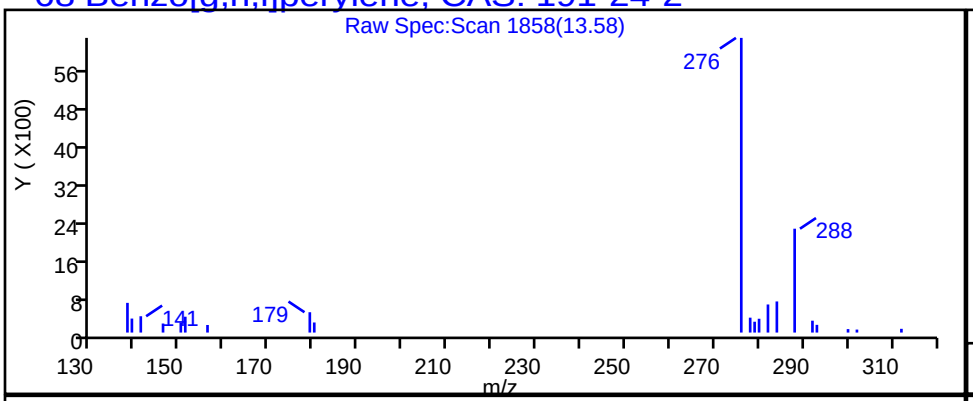
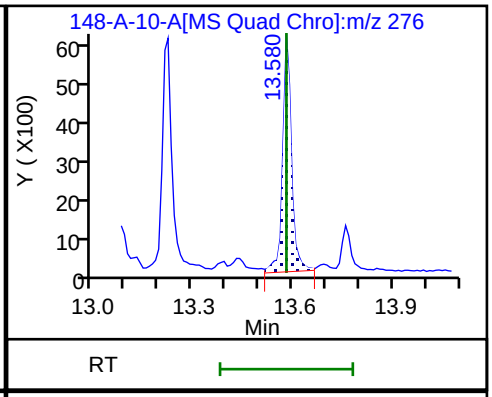
Eurofins Knoxville

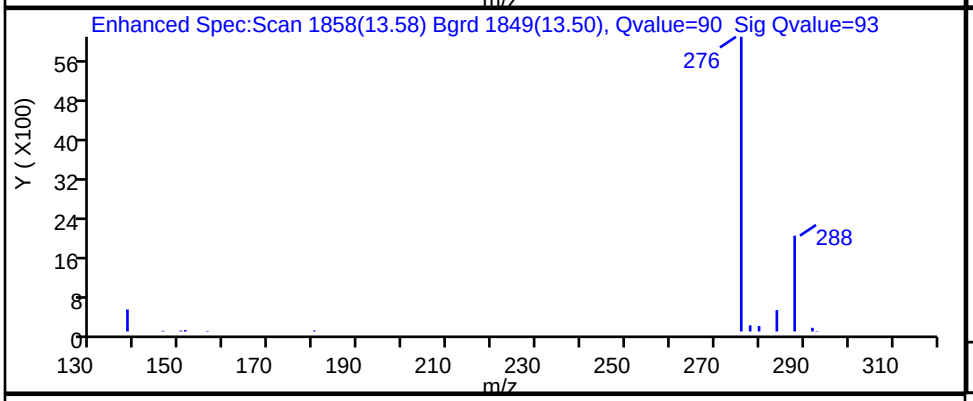
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-10-A.D

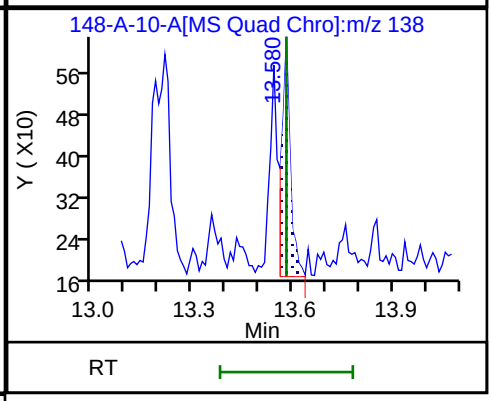
Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

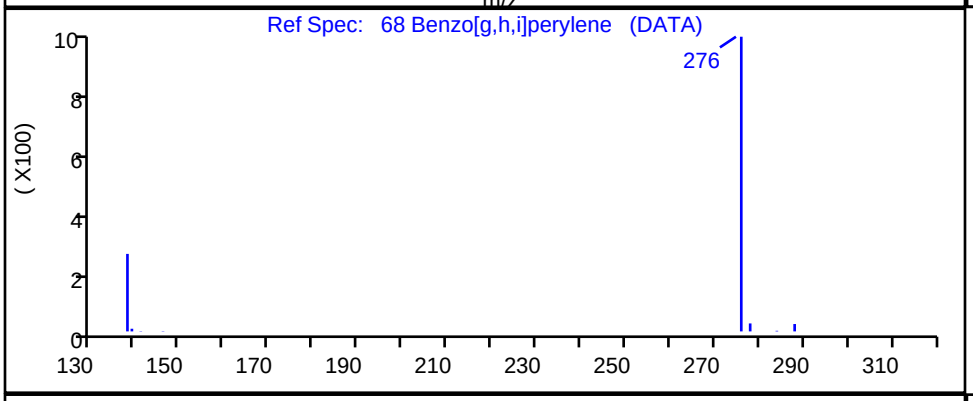
68 Benzo[g,h,i]perylene, CAS: 191-24-2

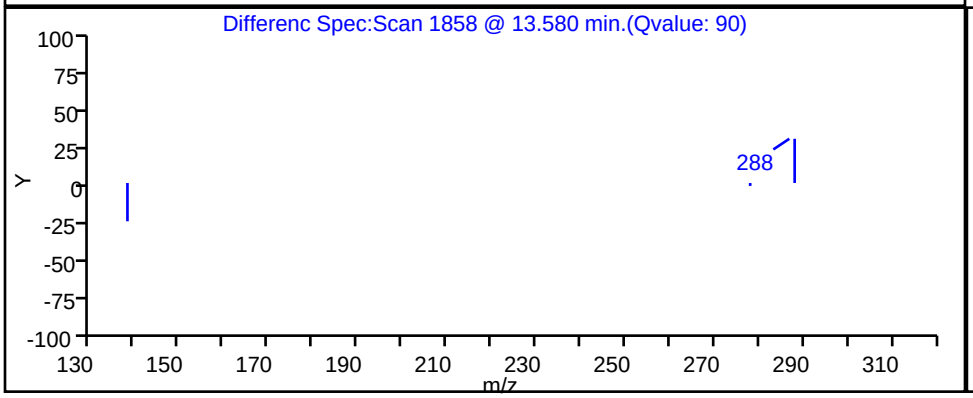


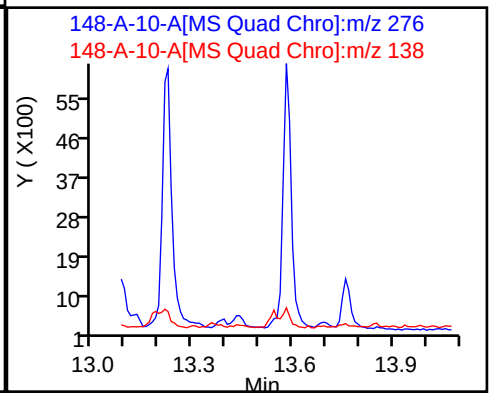












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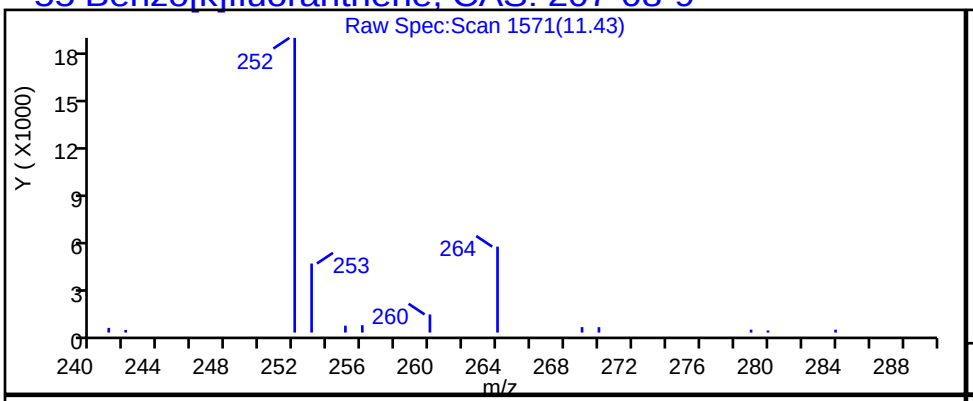
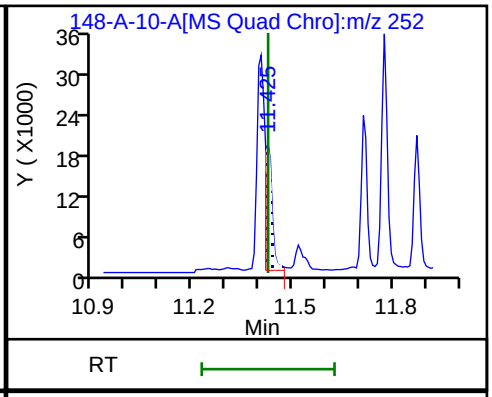
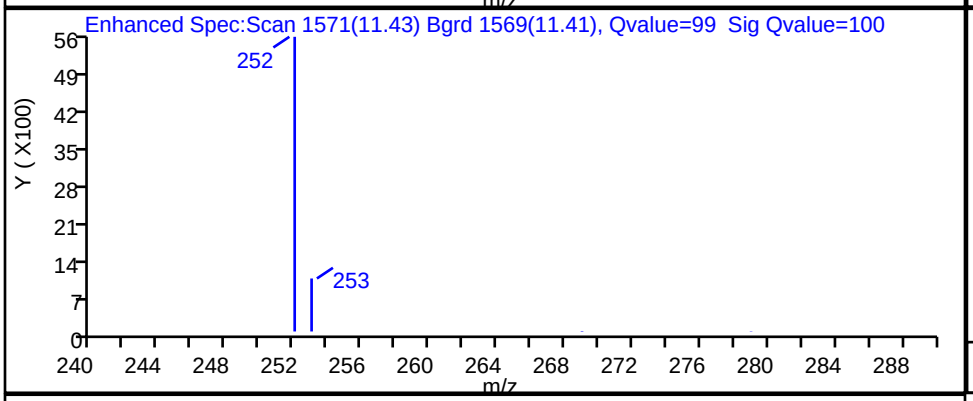
Eurofins Knoxville

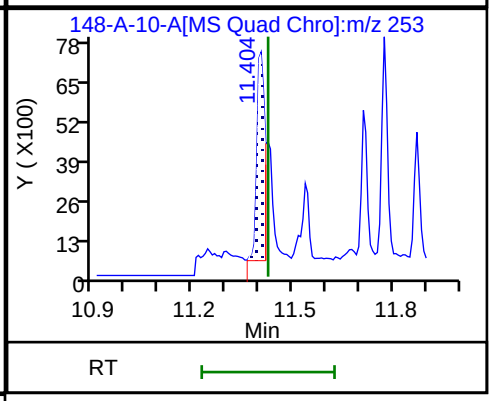
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-10-A.D		
Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13
Client ID:	1804576-854-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

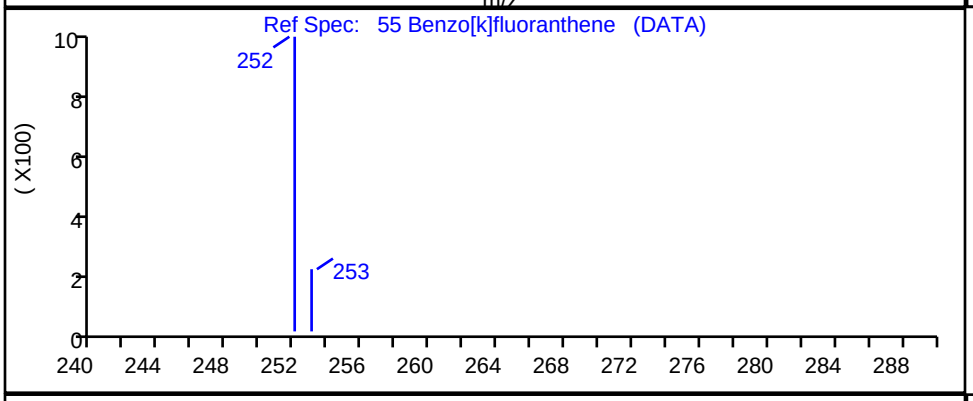
55 Benzo[k]fluoranthene, CAS: 207-08-9

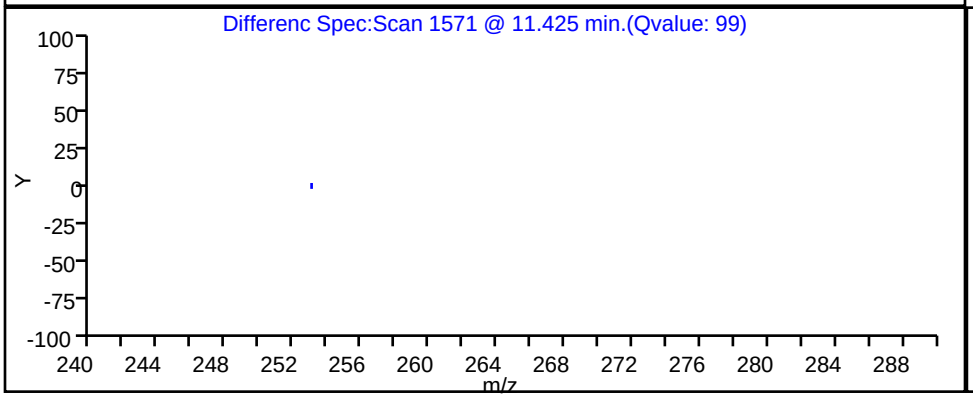


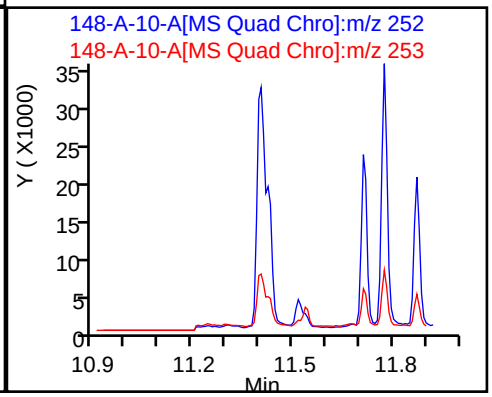












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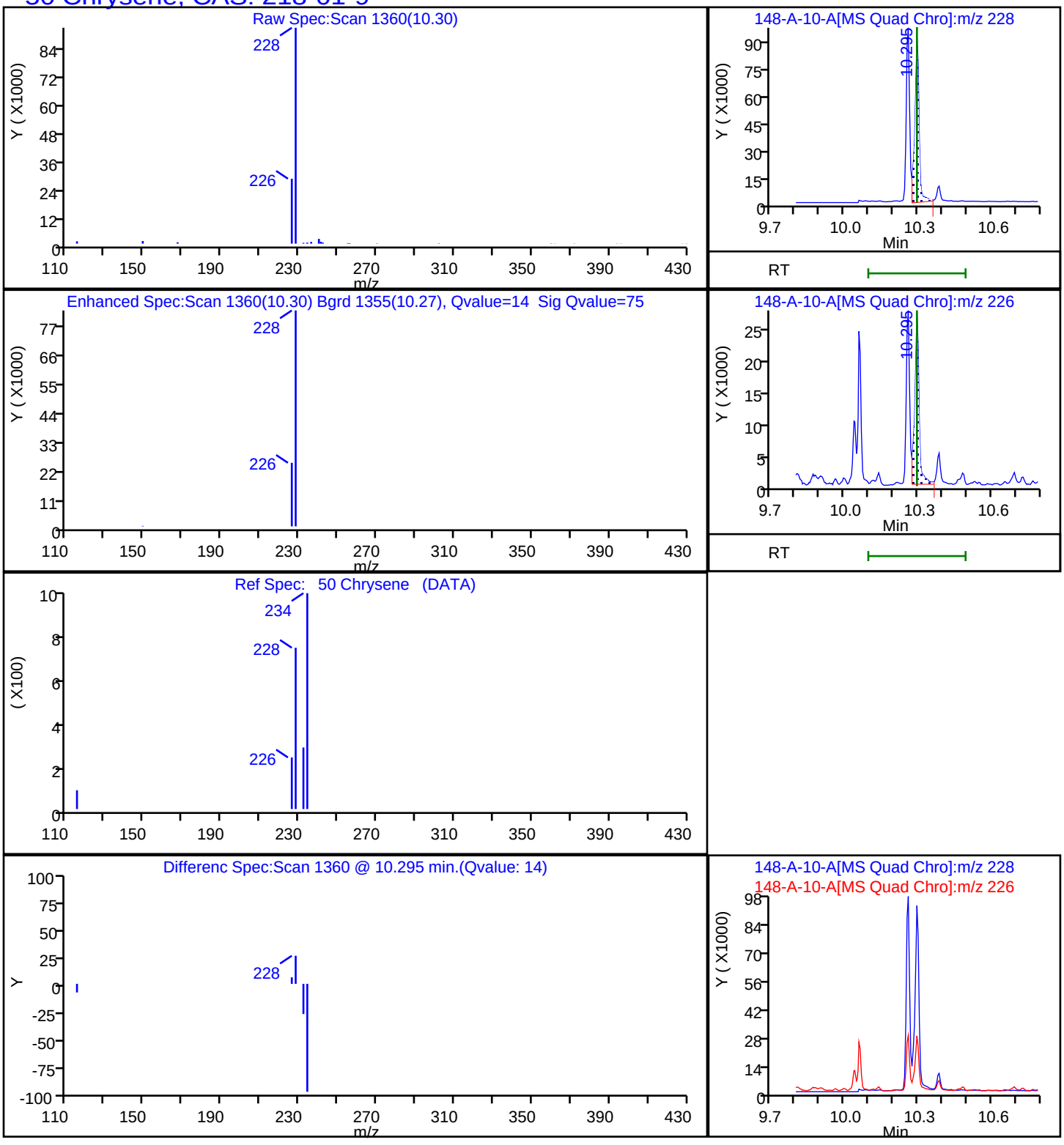
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-10-A.D

Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

50 Chrysene, CAS: 218-01-9



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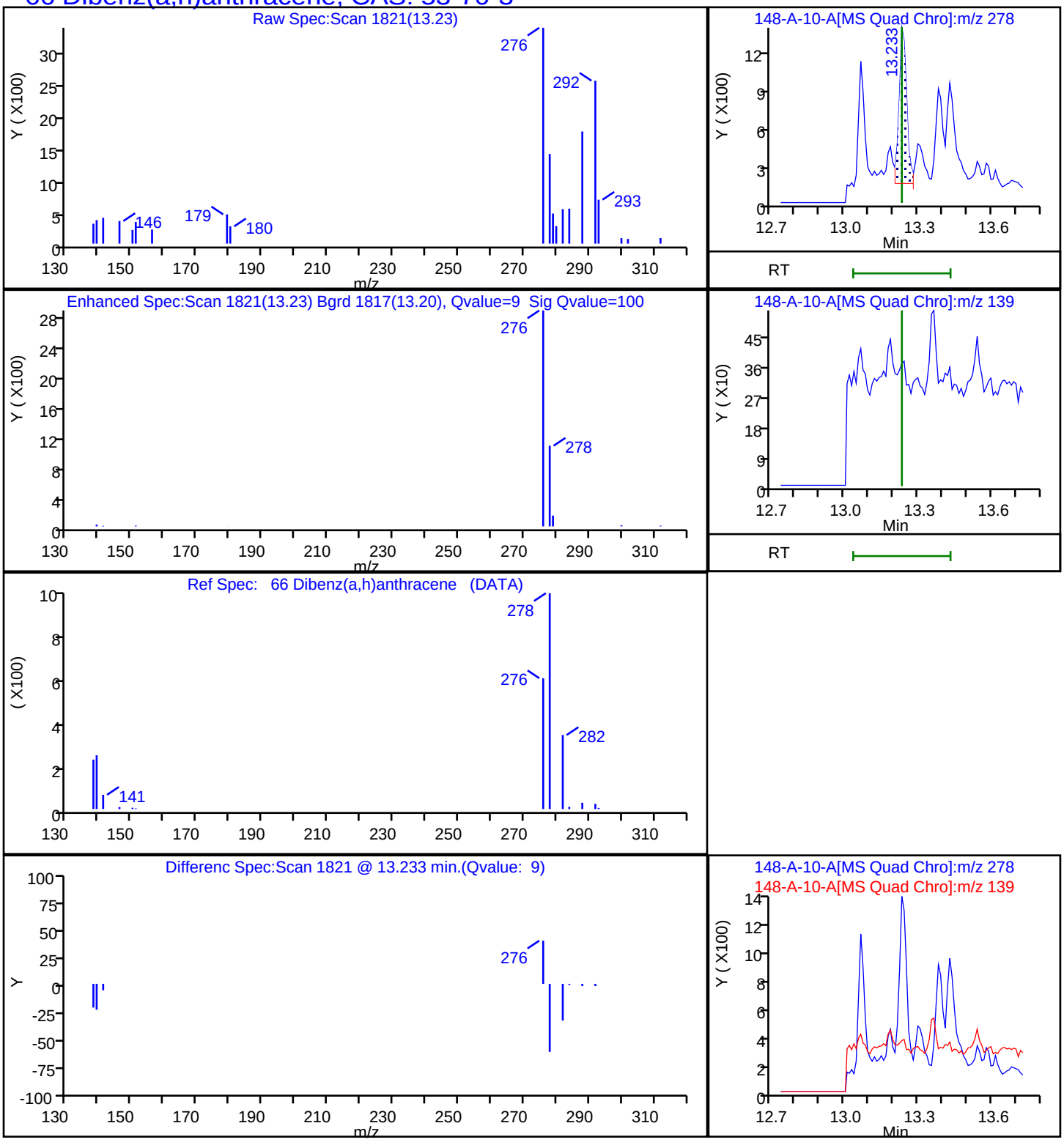
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-10-A.D

Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13
Client ID:	1804576-854-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

66 Dibenz(a,h)anthracene, CAS: 53-70-3



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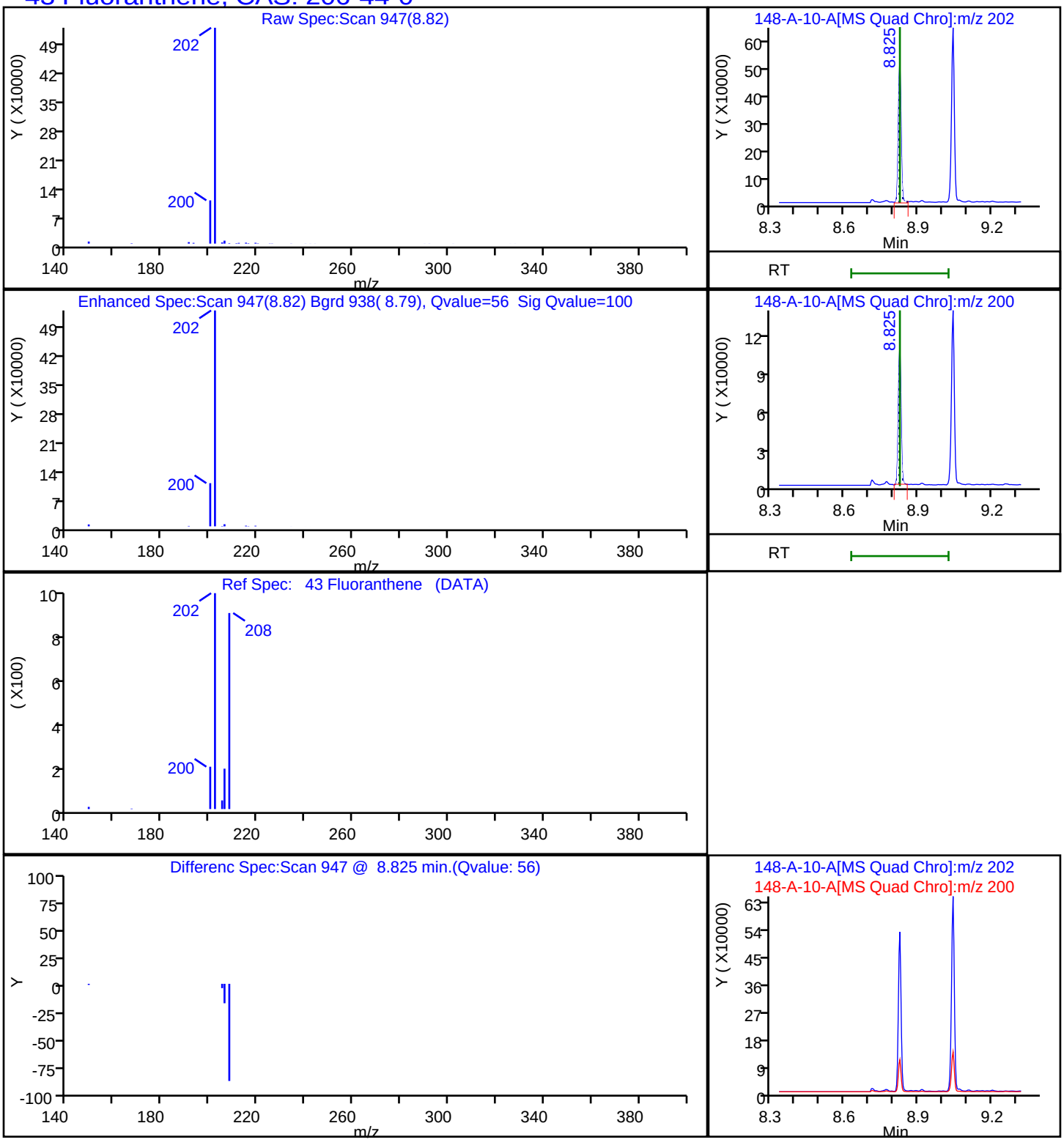
Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

43 Fluoranthene, CAS: 206-44-0



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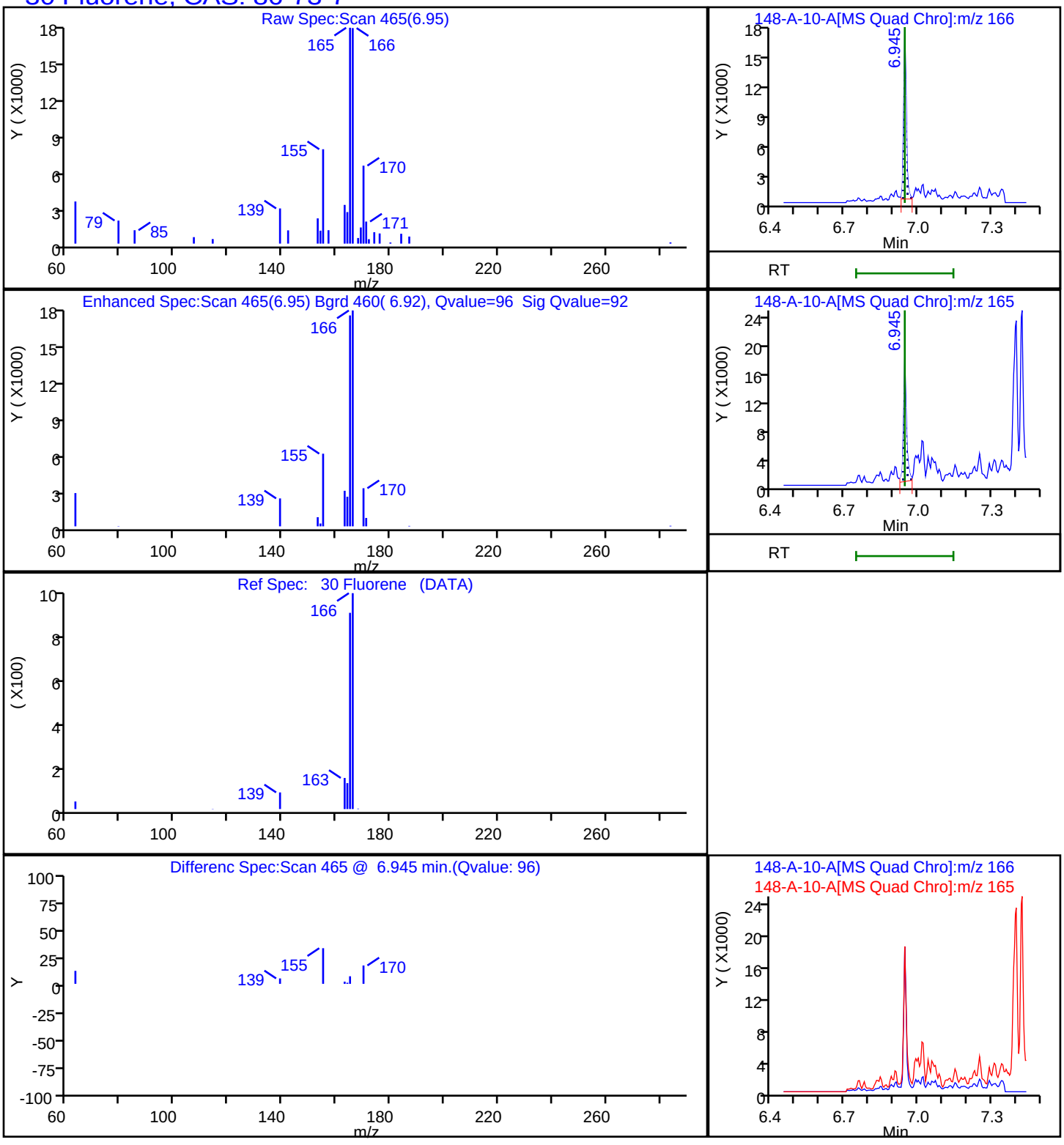
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-10-A.D

Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13
Client ID:	1804576-854-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

30 Fluorene, CAS: 86-73-7



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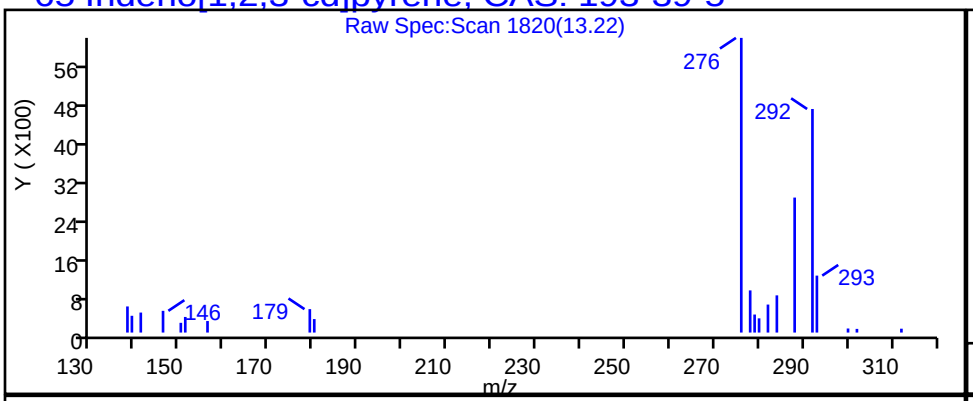
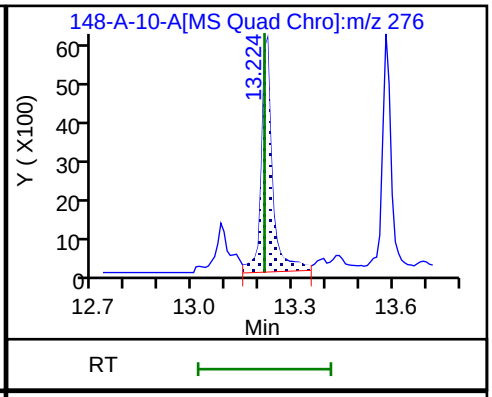
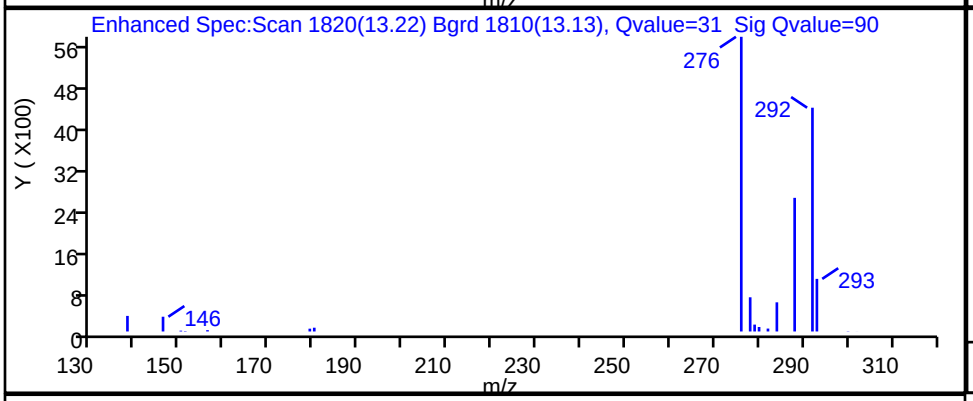
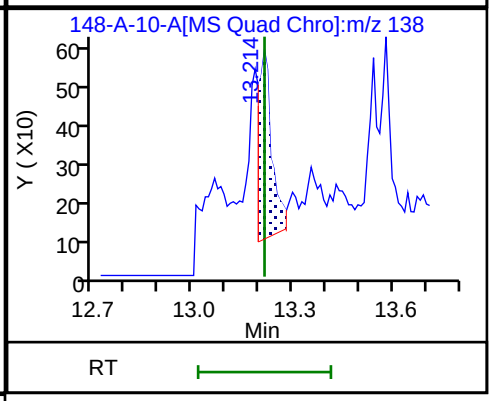
Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

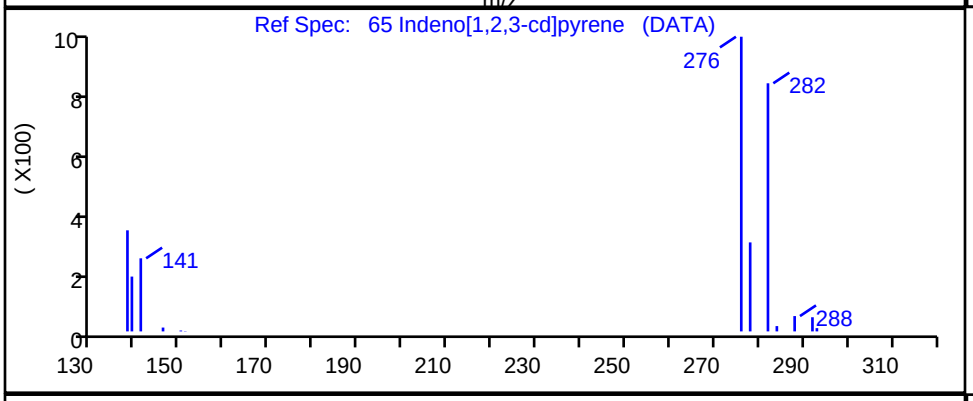
65 Indeno[1,2,3-cd]pyrene, CAS: 193-39-5

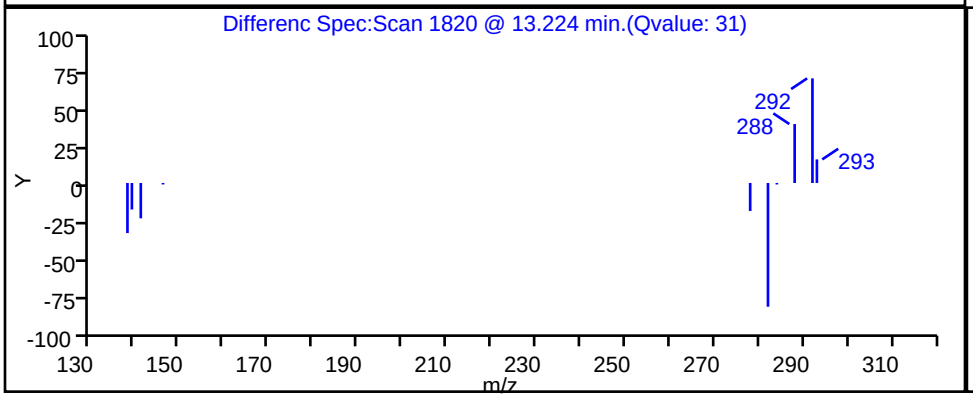


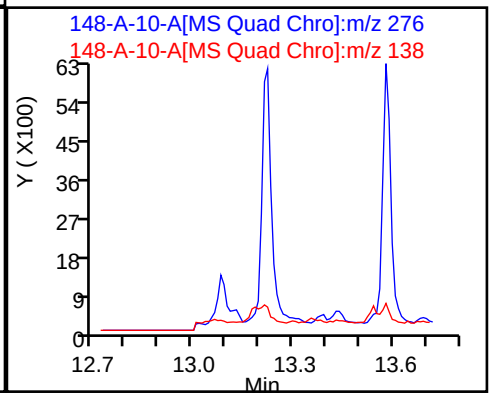












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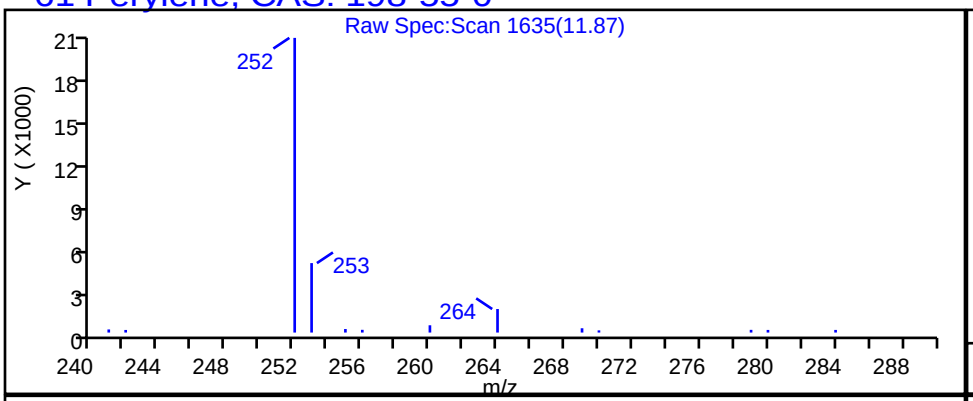
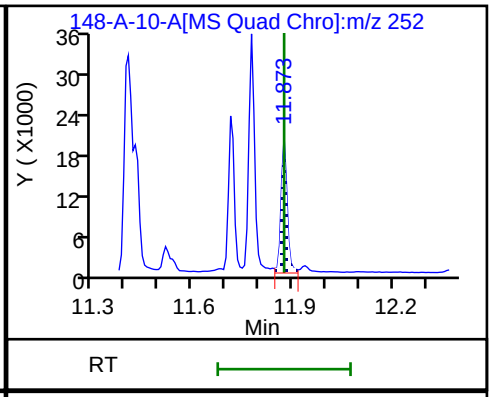
Eurofins Knoxville

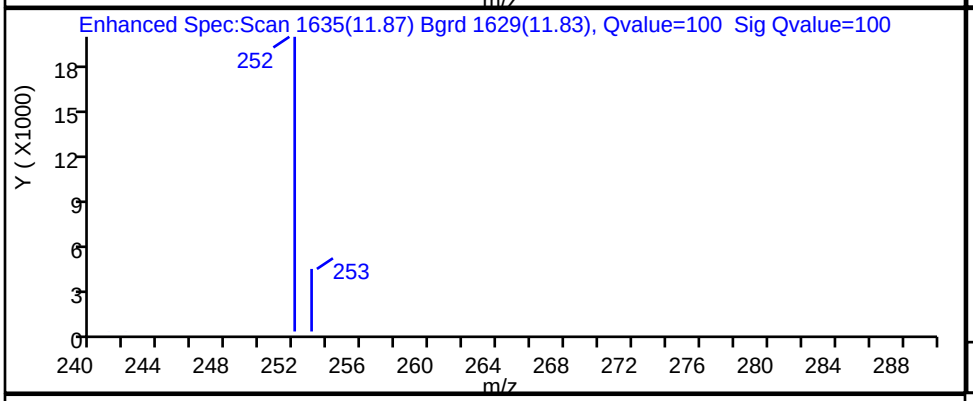
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-10-A.D

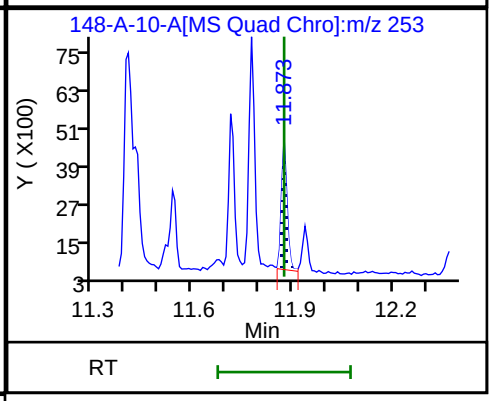
Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

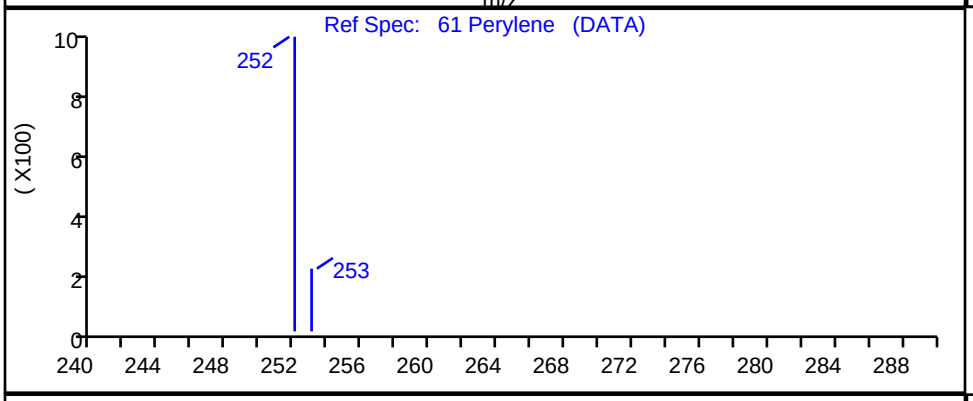
61 Perylene, CAS: 198-55-0

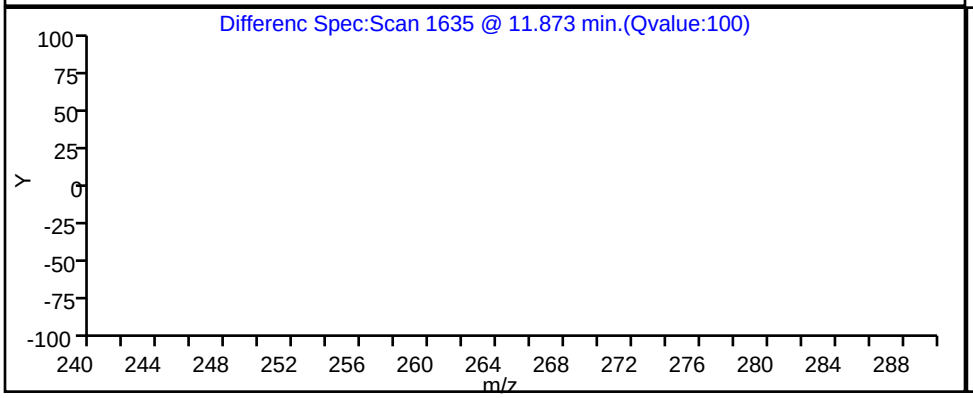


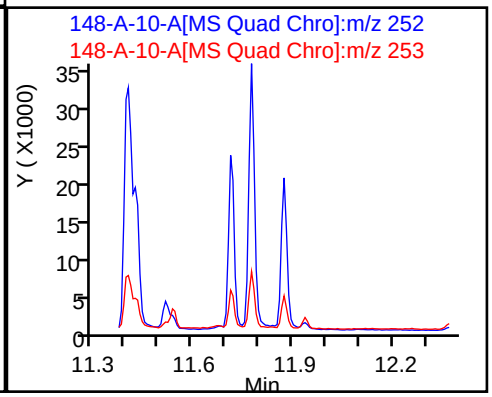












Report Date: 22-Nov-2023 11:25:28 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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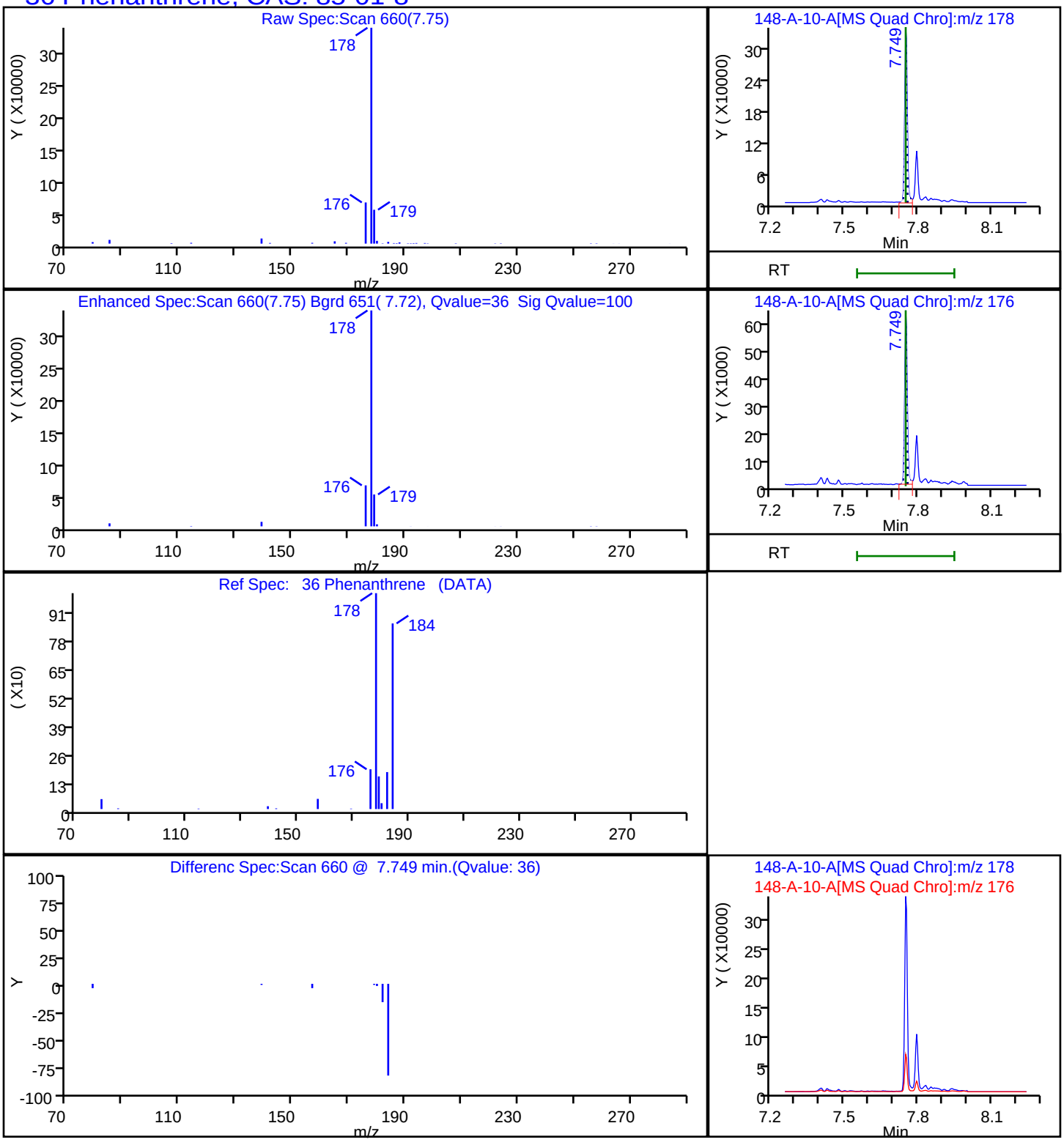
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

36 Phenanthrene, CAS: 85-01-8



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Eurofins Knoxville

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Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13
Client ID:	1804576-854-S2		
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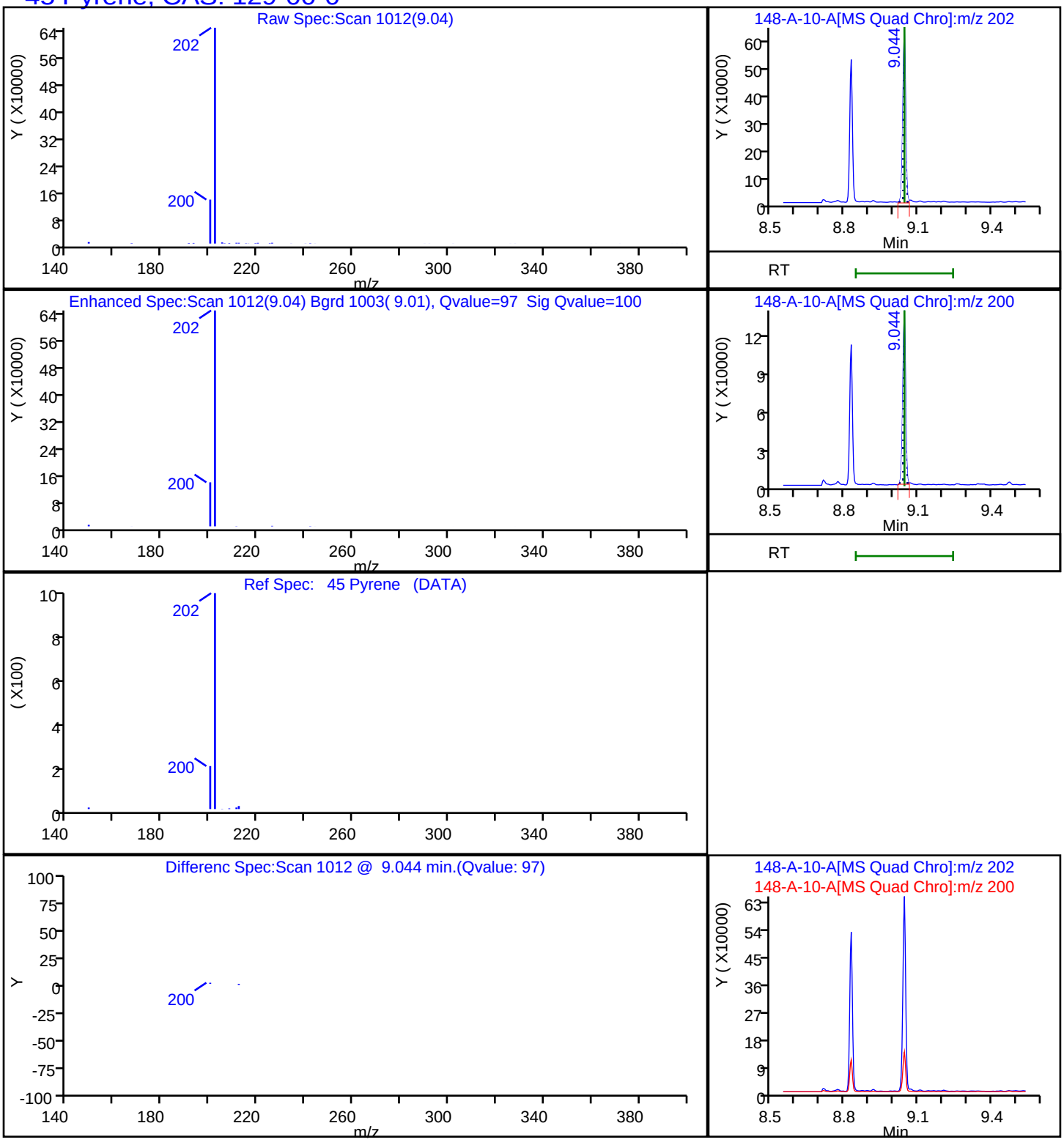
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

45 Pyrene, CAS: 129-00-0



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Eurofins Knoxville

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Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
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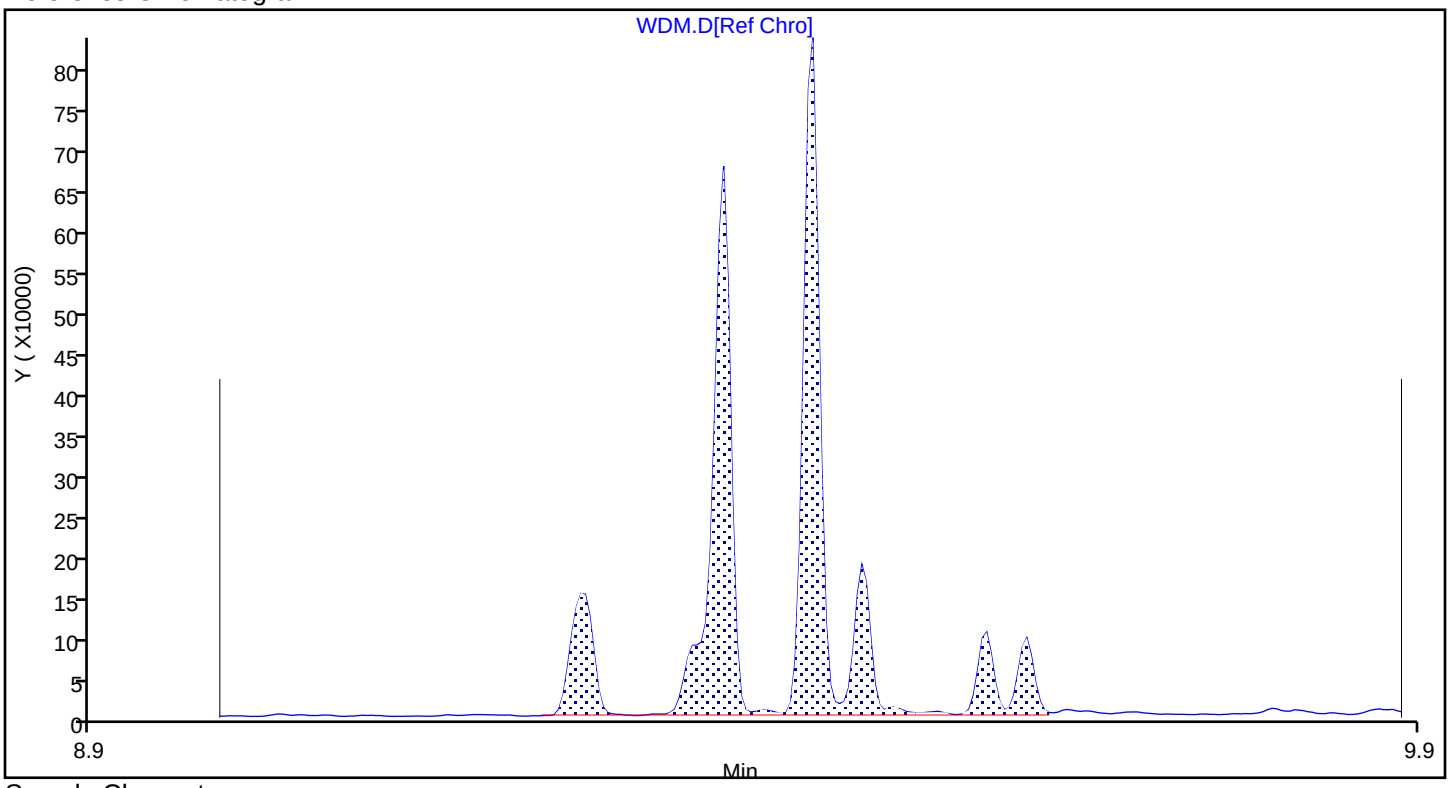
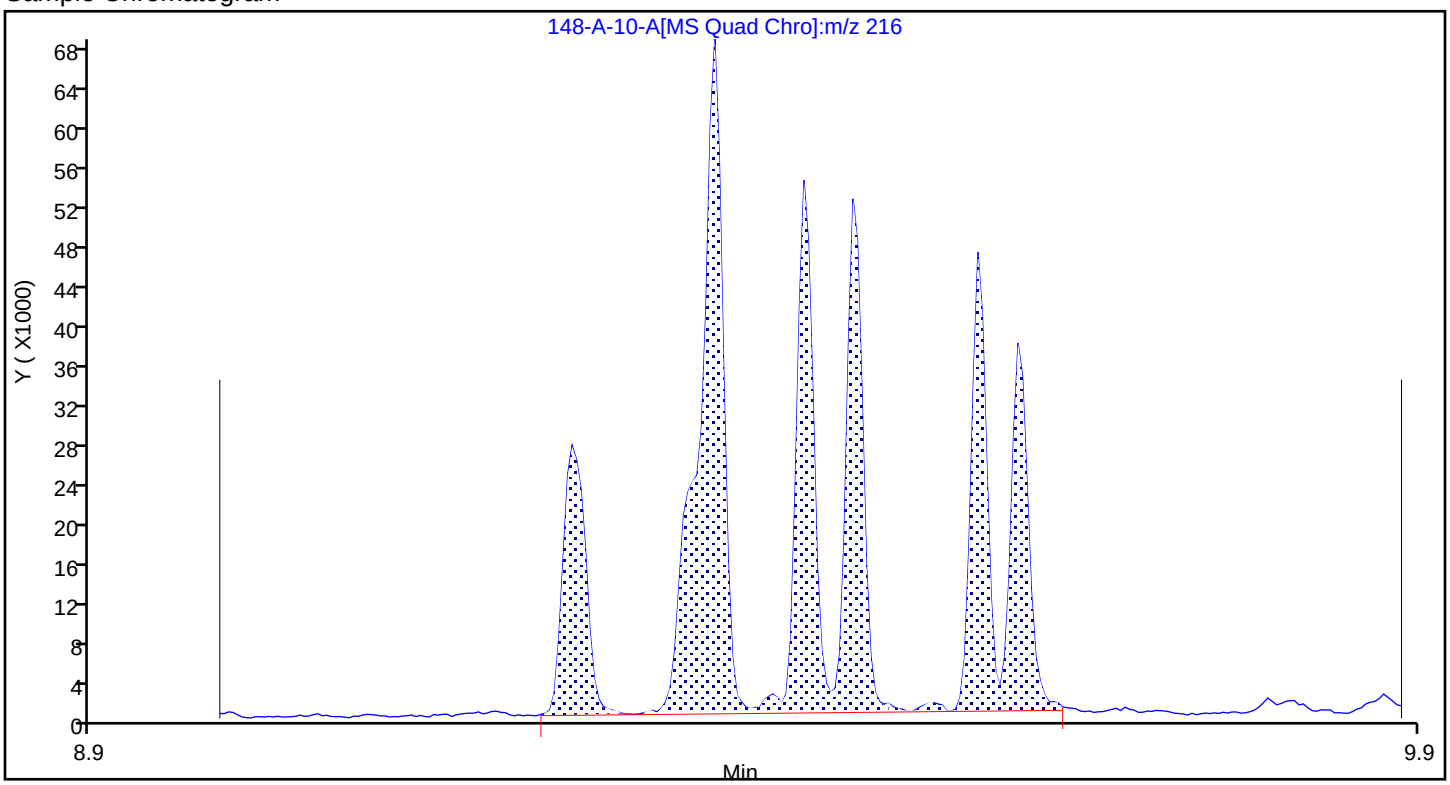
A 100 C1-Fluoranthenes/pyrene, CAS: STL00912

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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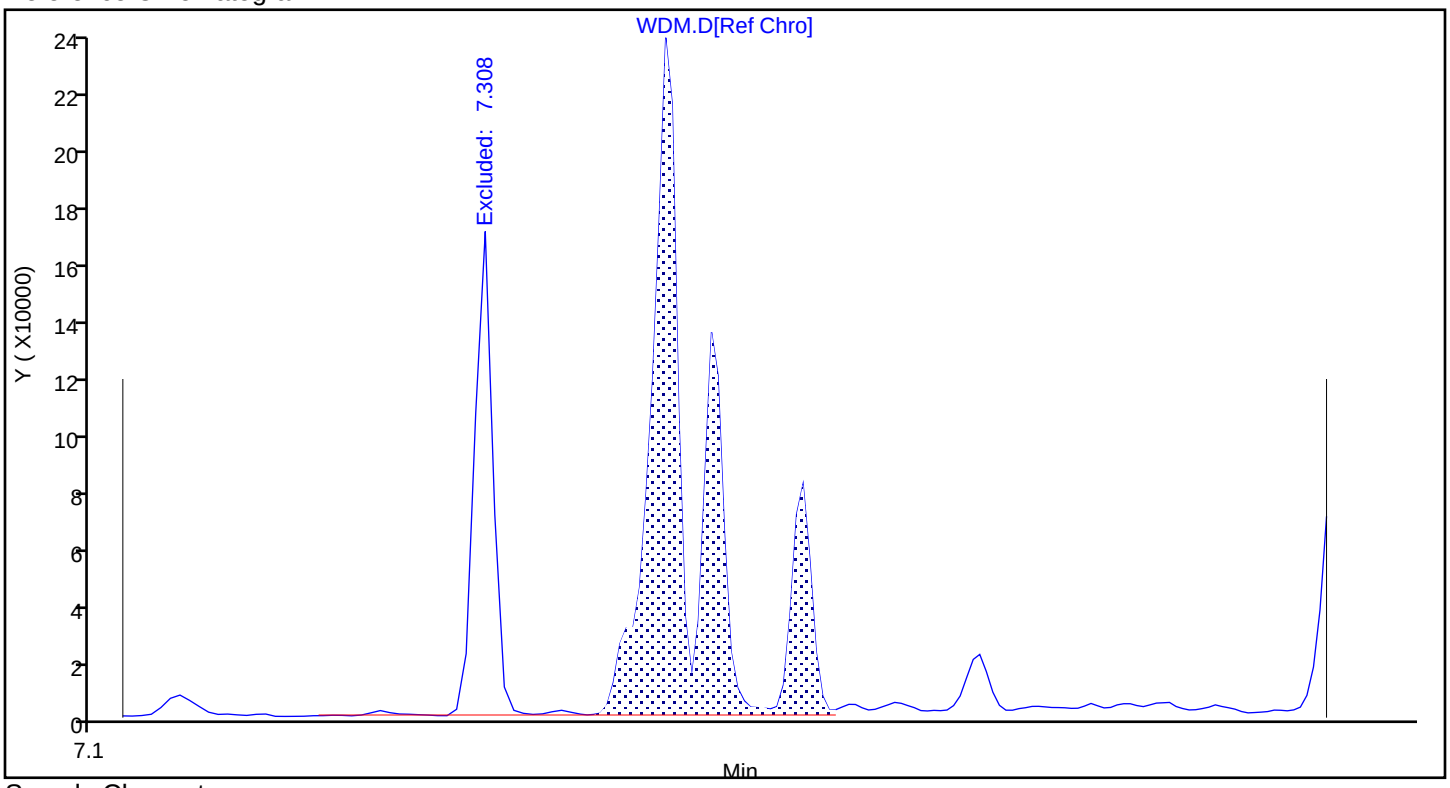
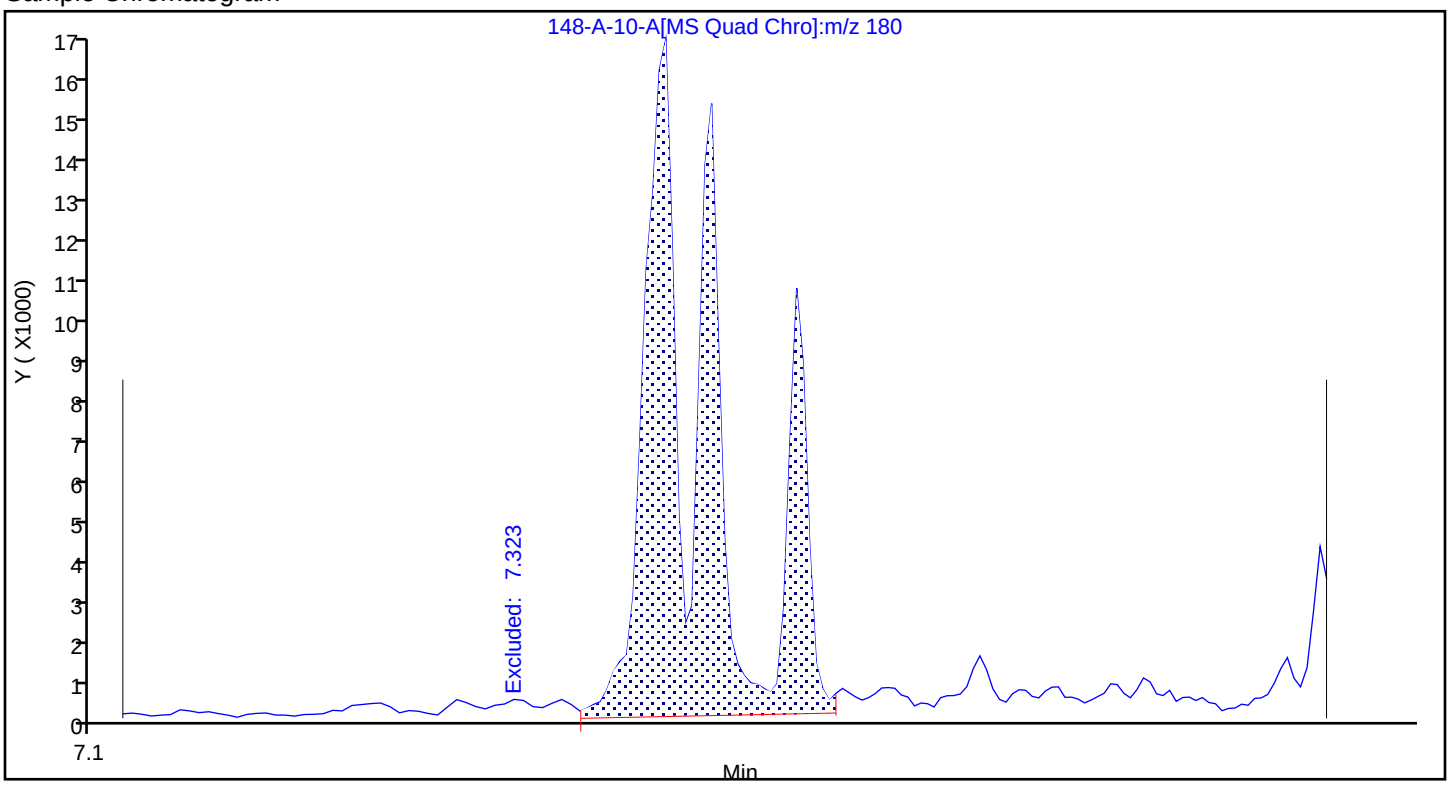
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 89 C1-Fluorenes, CAS: STL00913

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-10-A.D				
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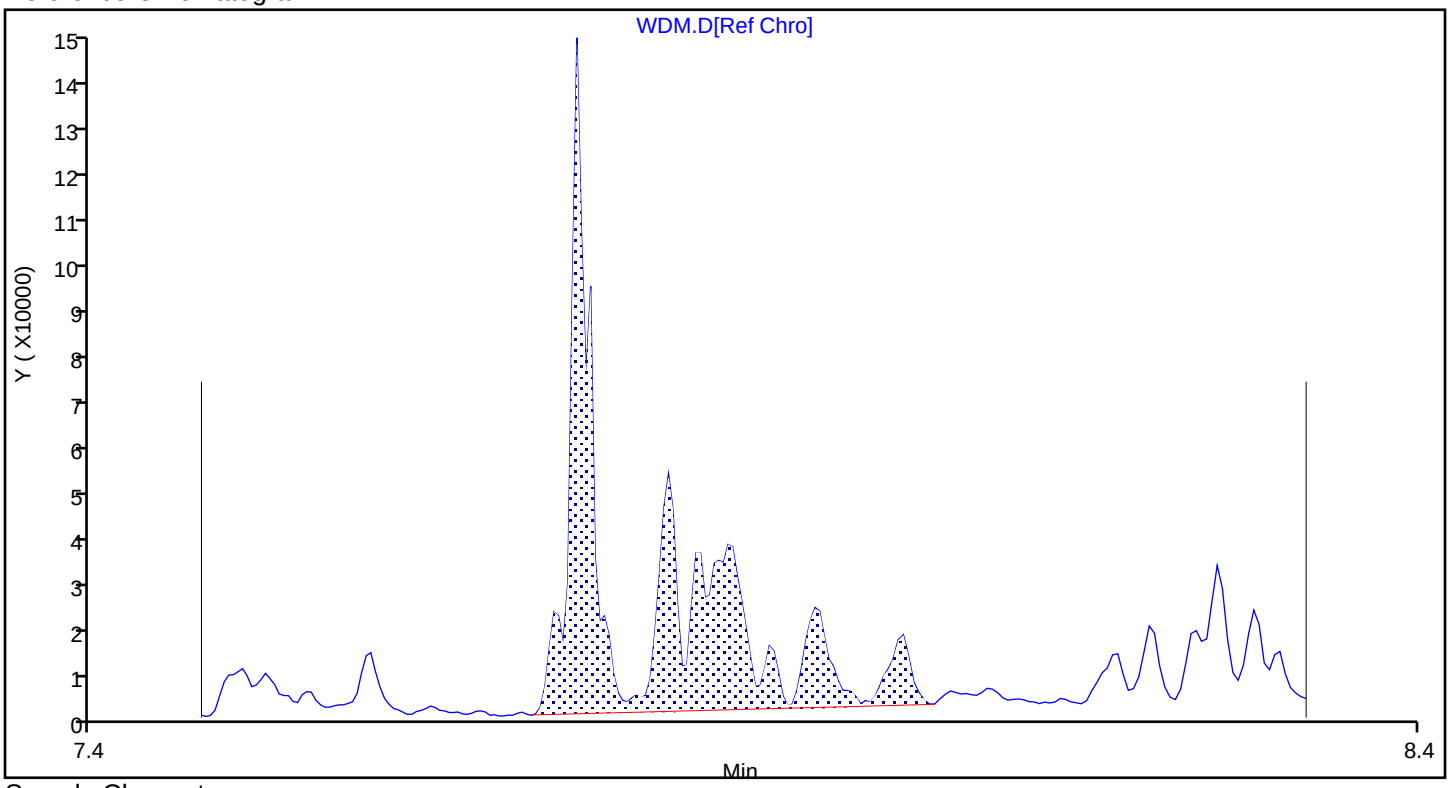
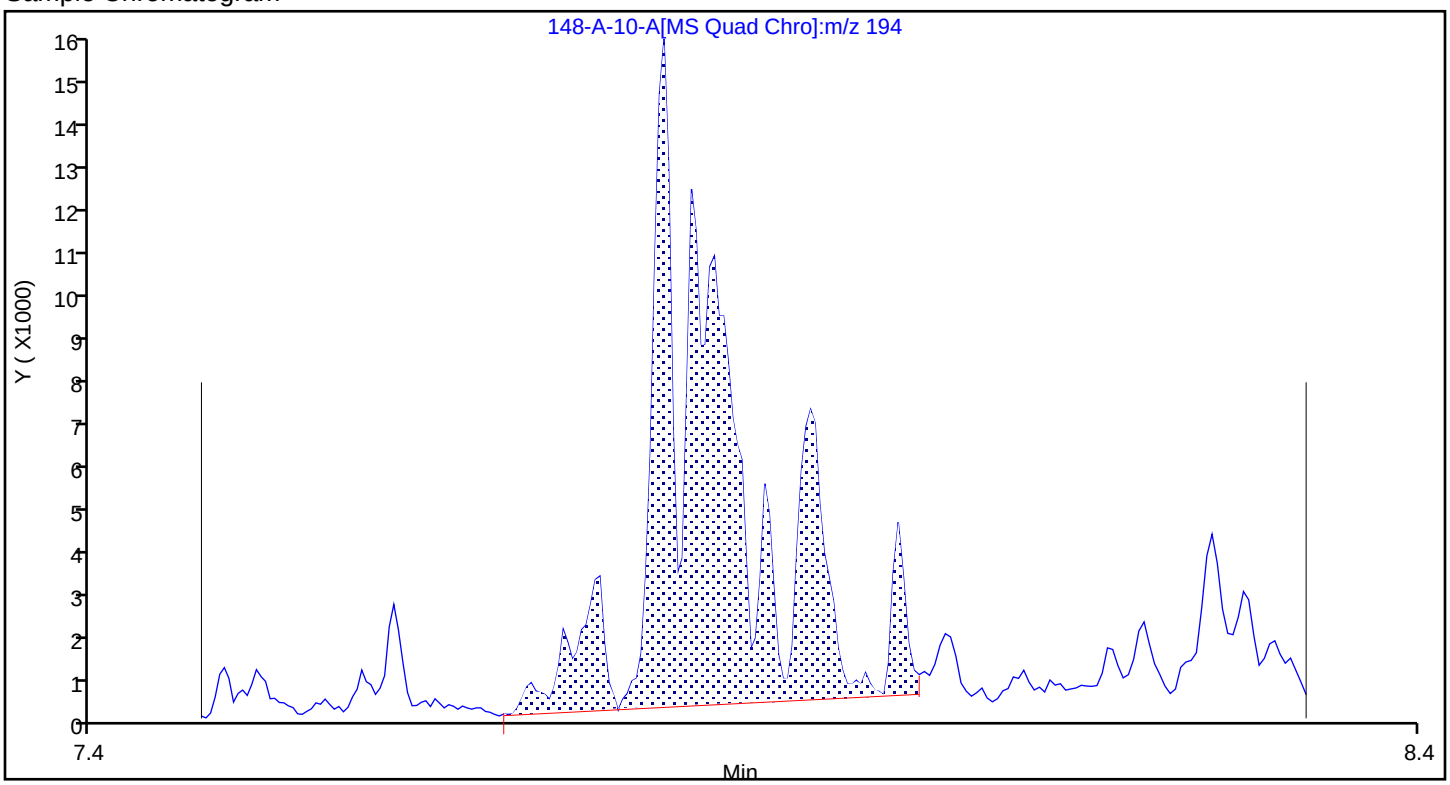
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 90 C2-Fluorenes, CAS: STL00914

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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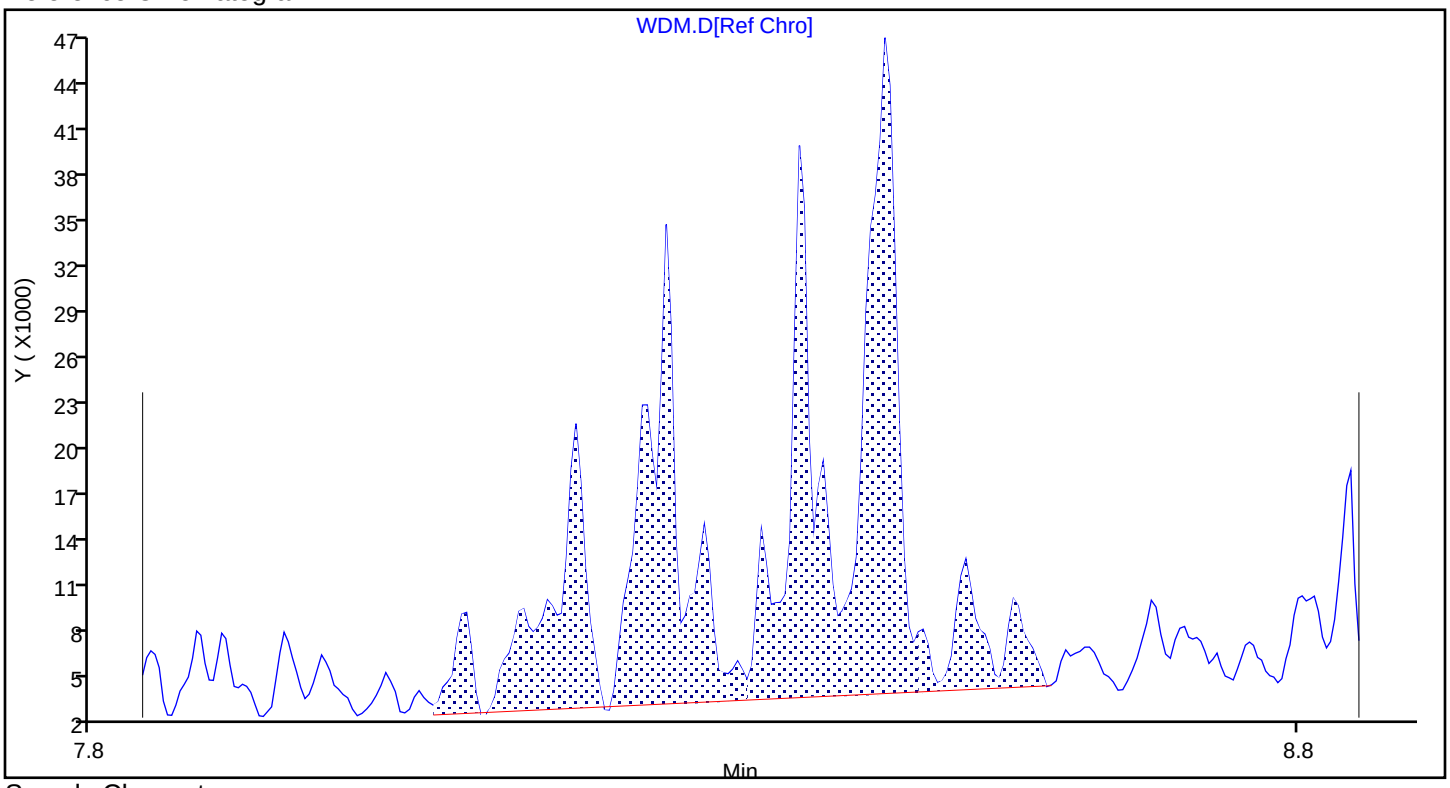
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 91 C3-Fluorenes, CAS: STL00915

Reference Chromatogram



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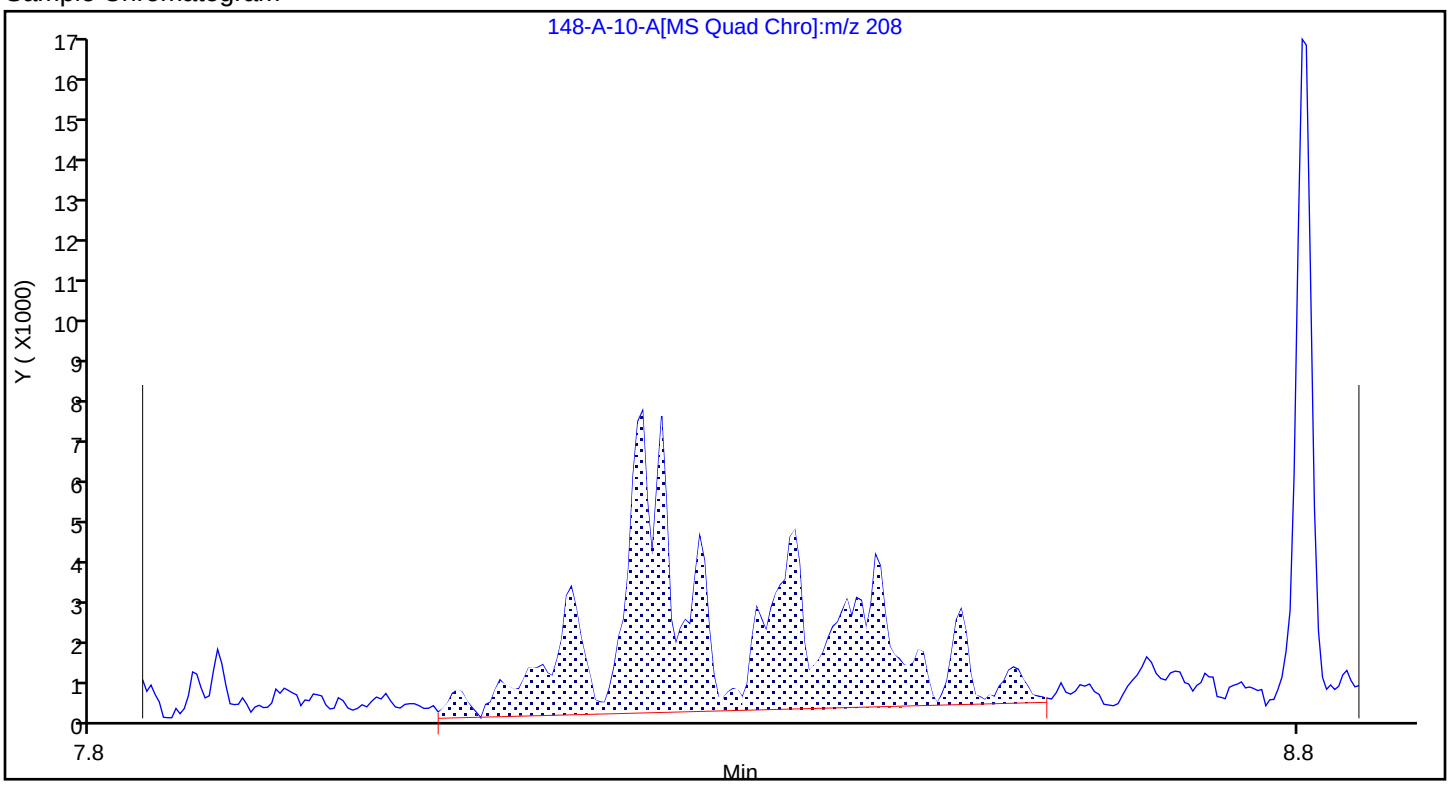

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Eurofins Knoxville

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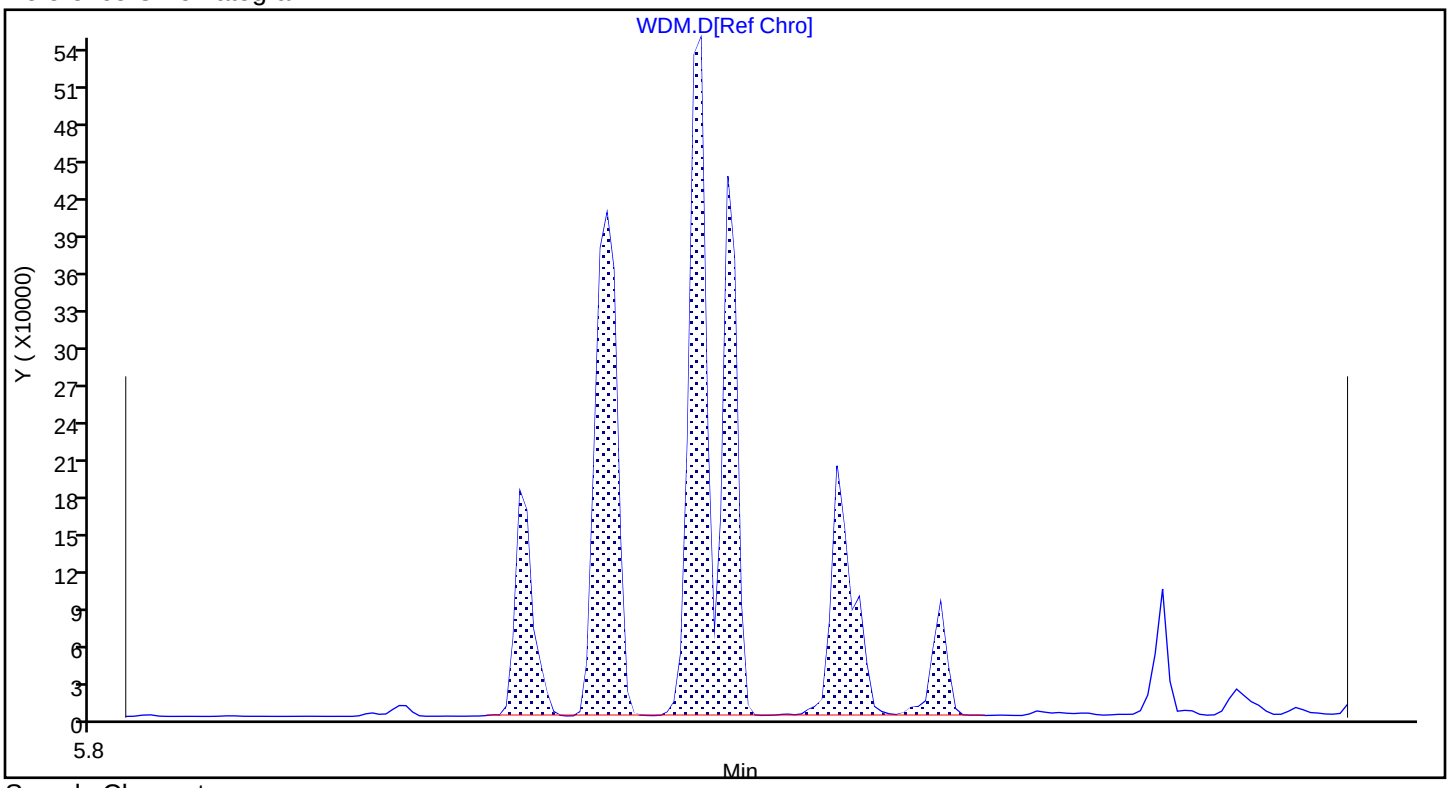
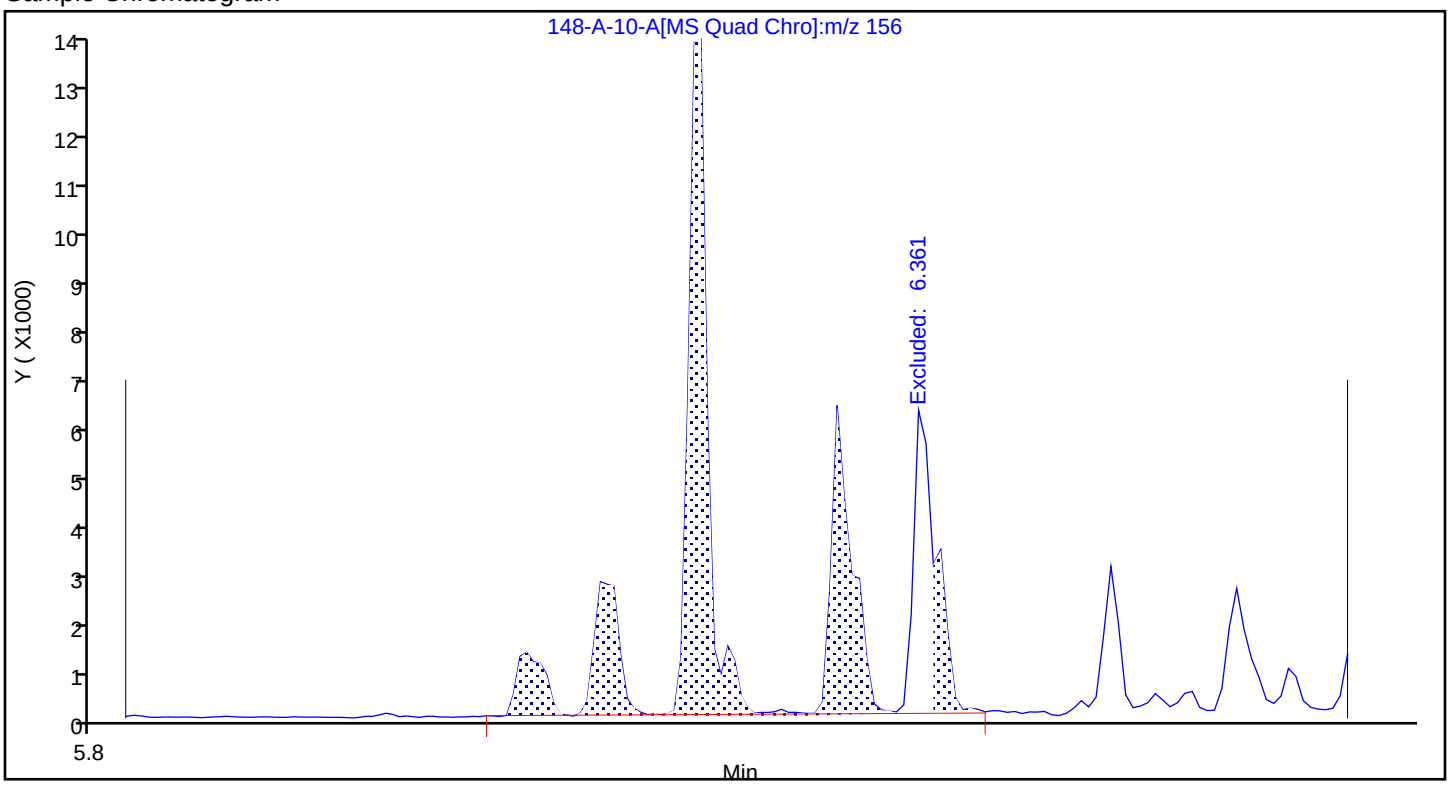
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 85 C2-Naphthalenes, CAS: STL00917

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
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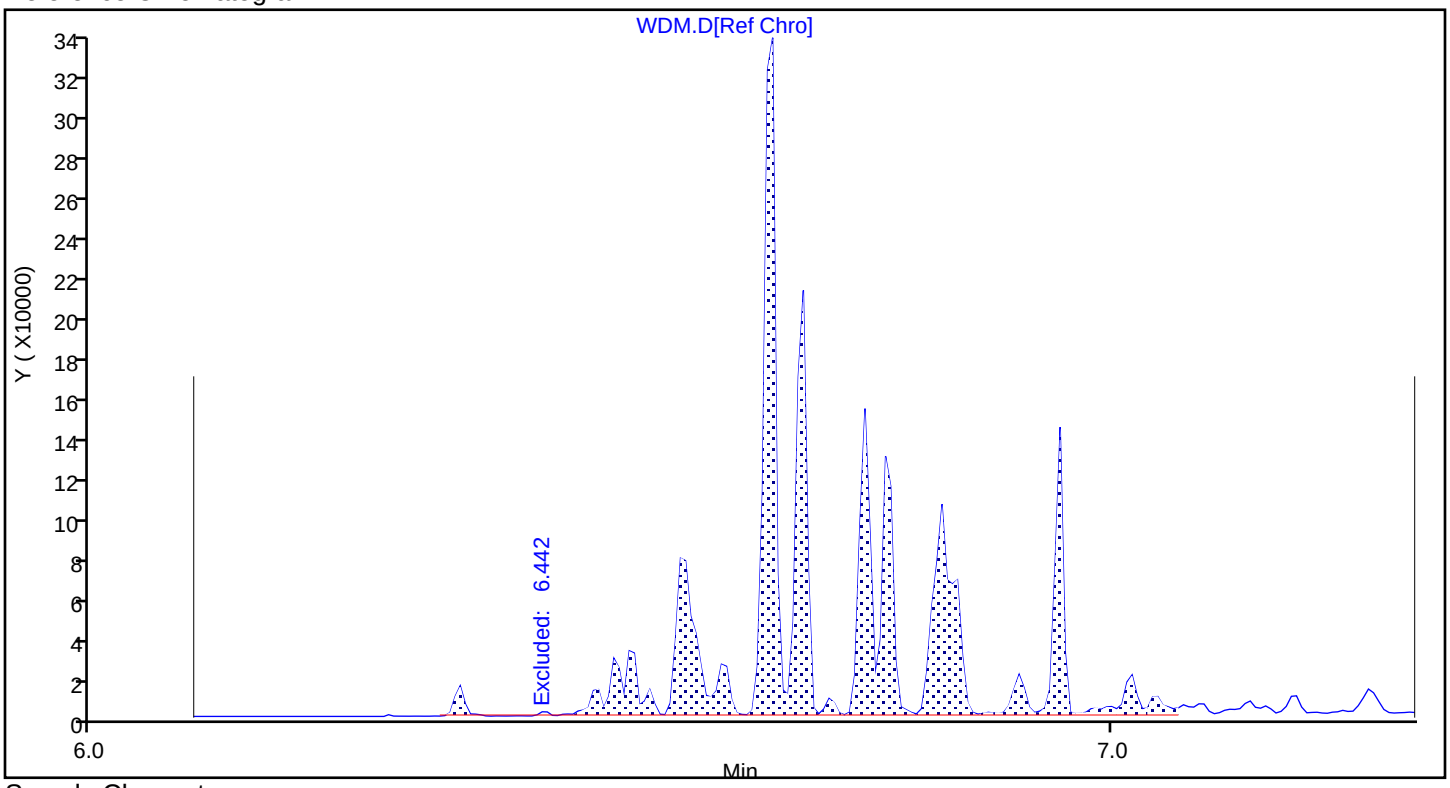
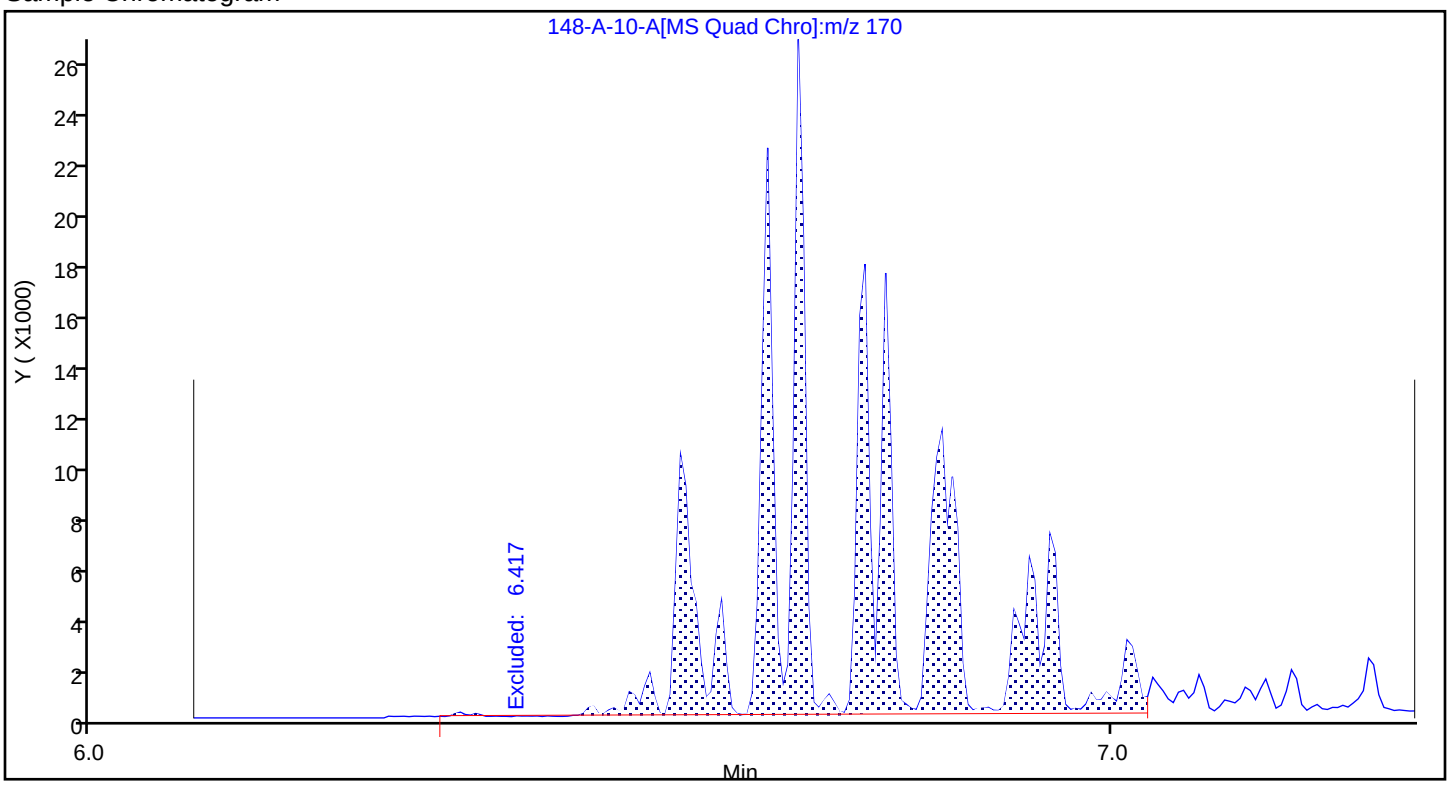
A 87 C3-Naphthalenes, CAS: STL00918

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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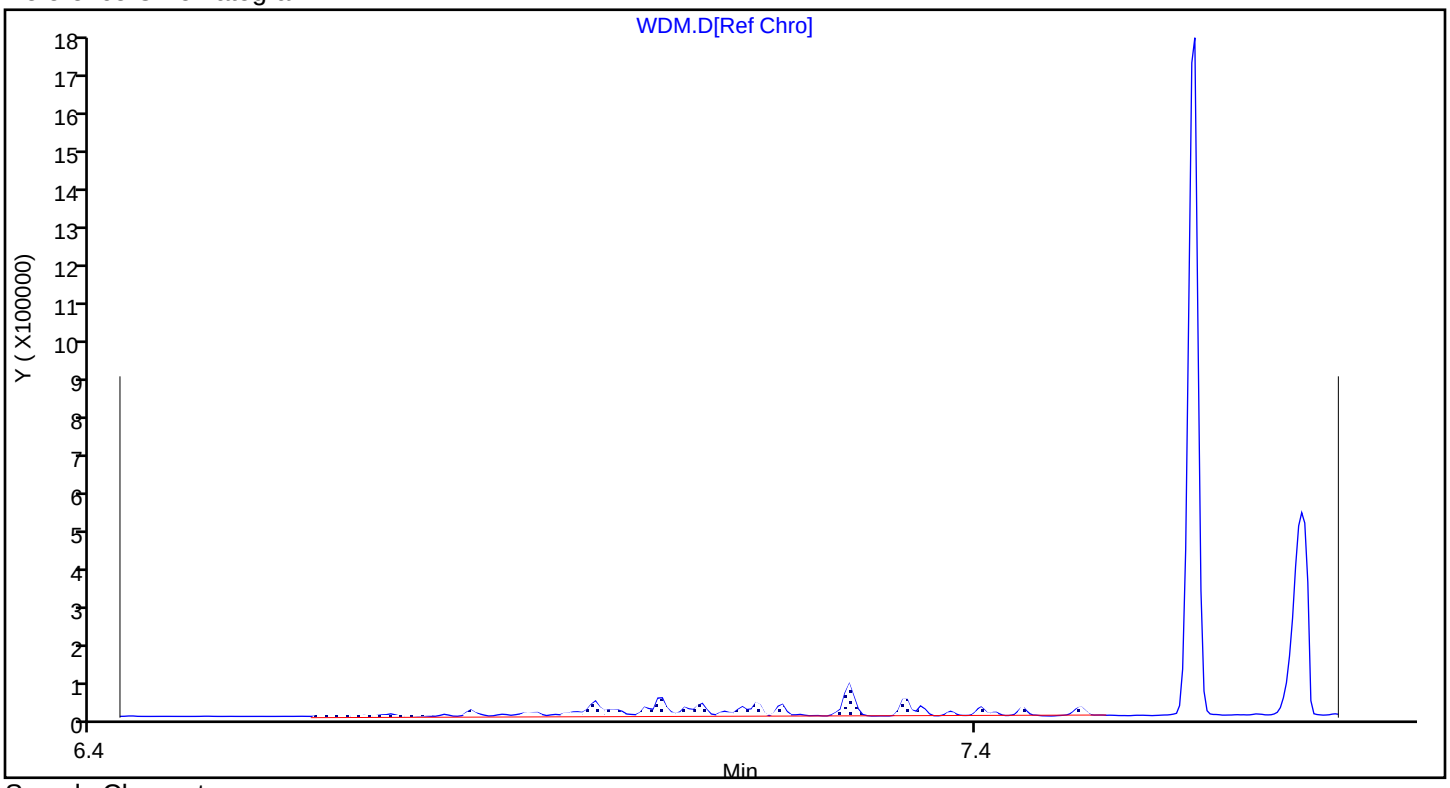
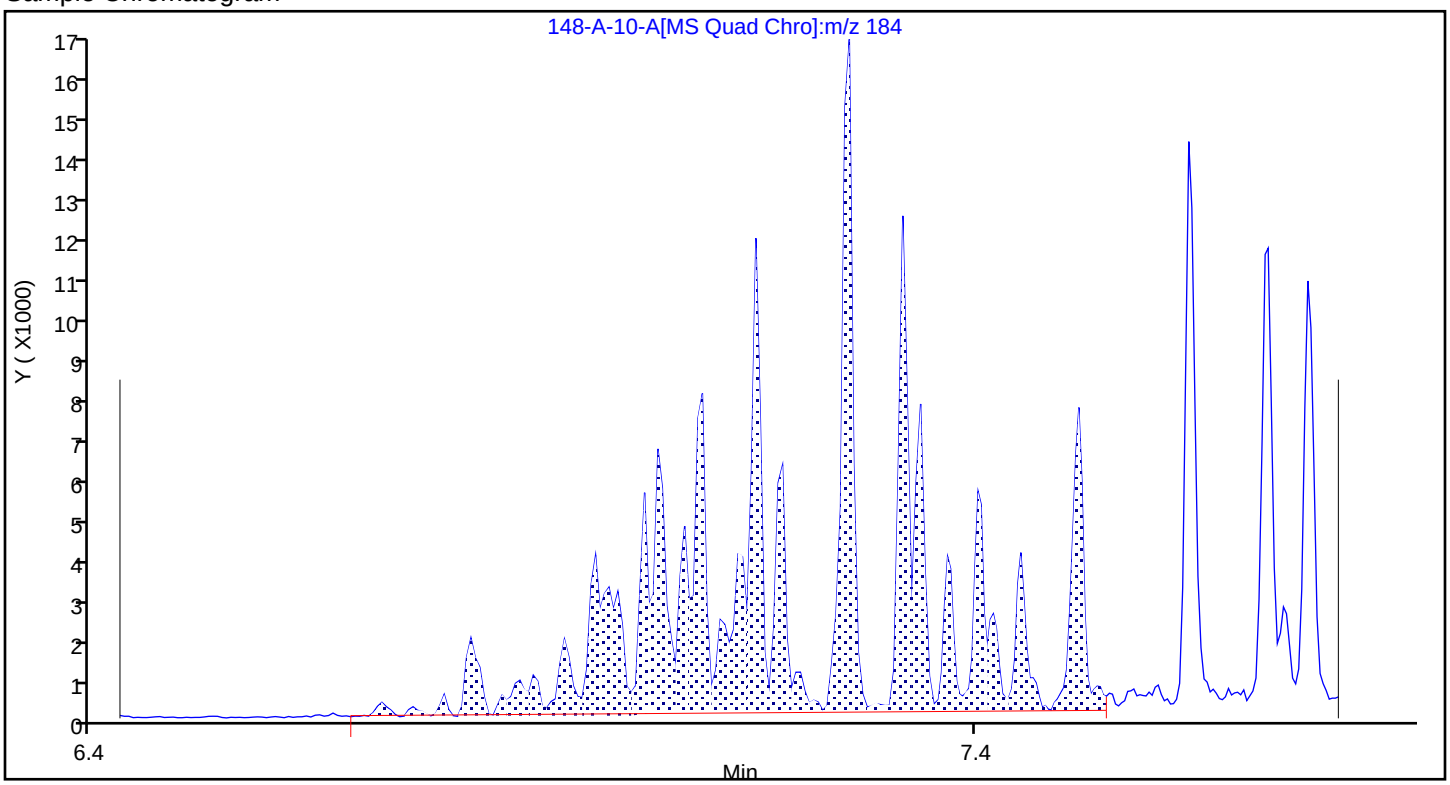
Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 88 C4-Naphthalenes, CAS: STL00919

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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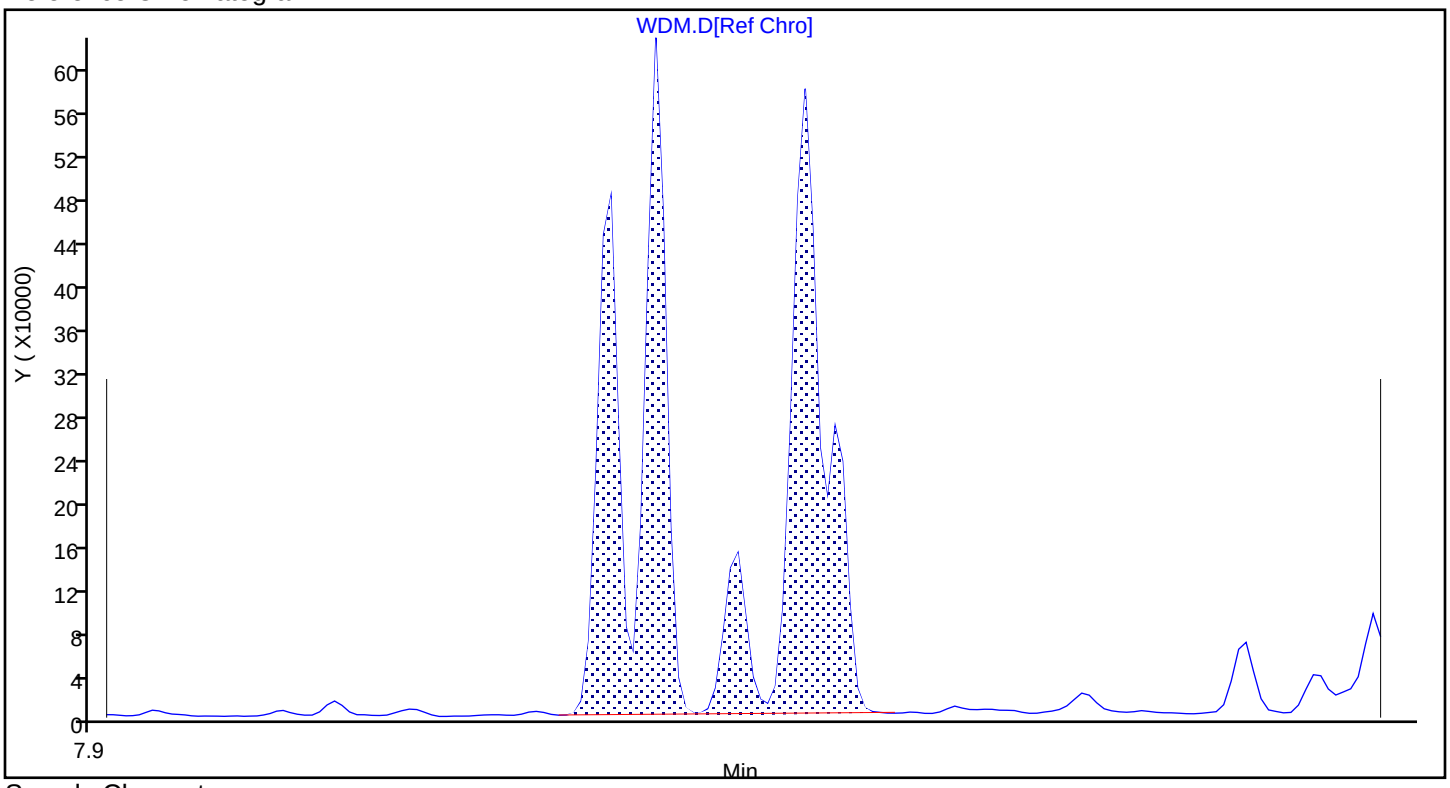
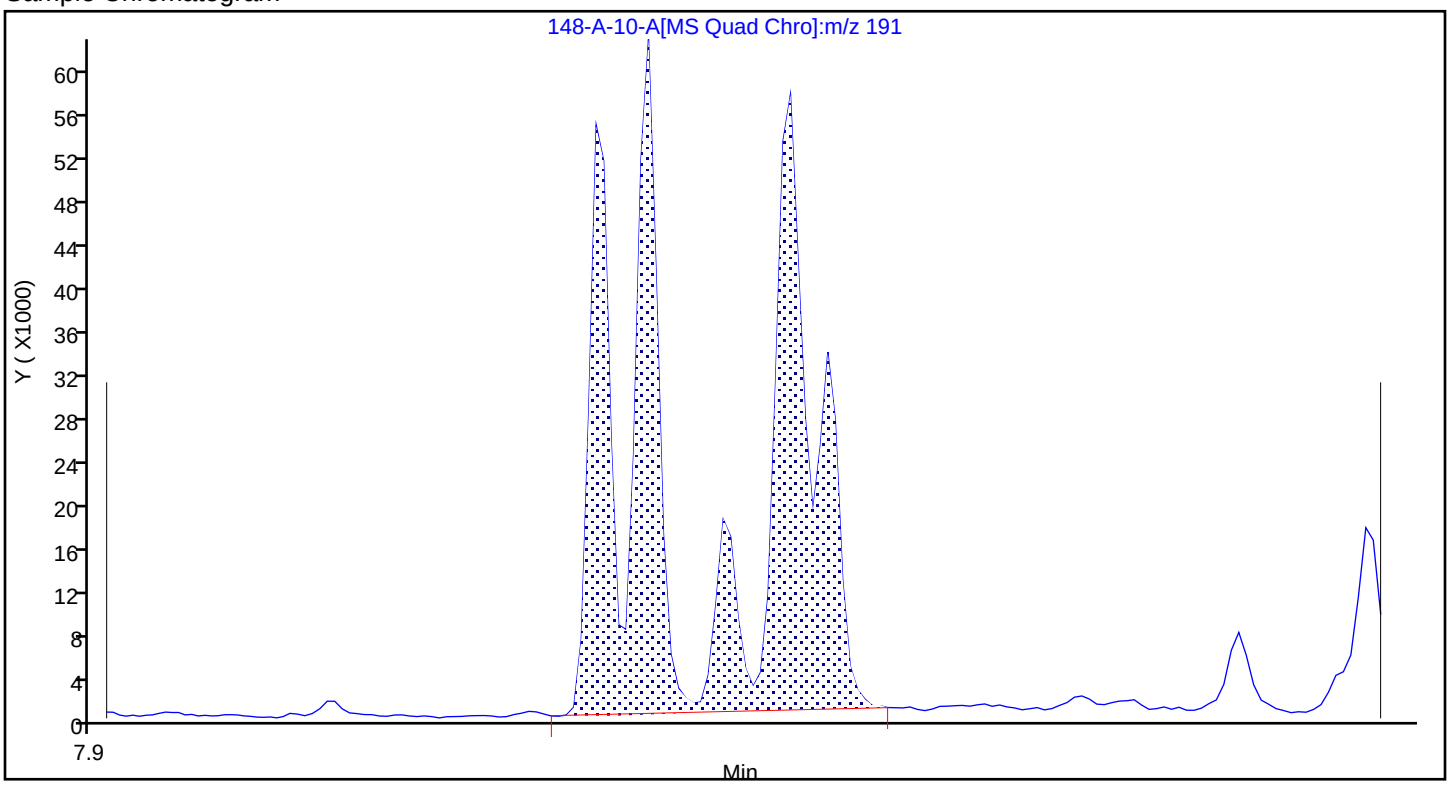
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 96 C1-Phenanthrenes/Anthracenes, CAS: STL00901

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
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Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
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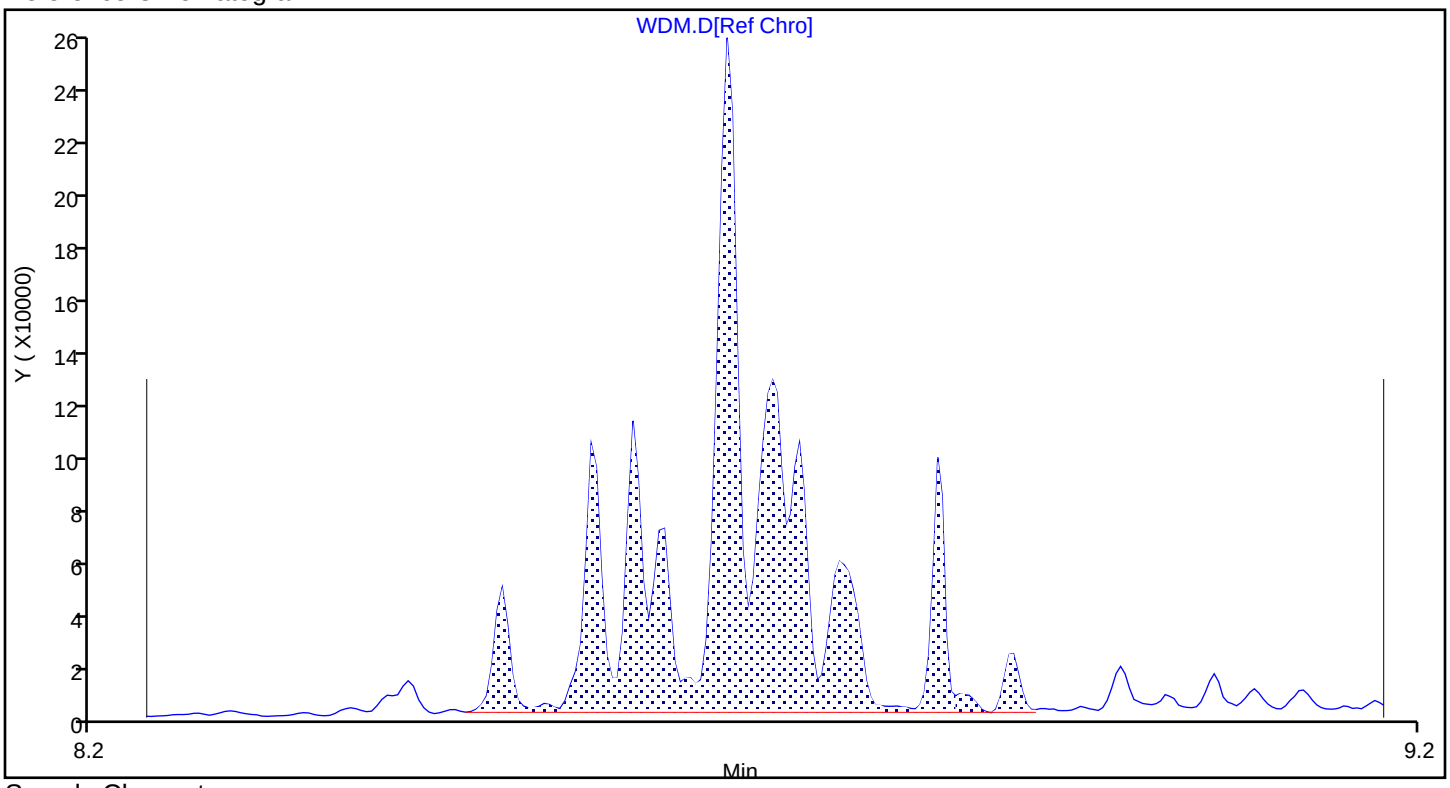
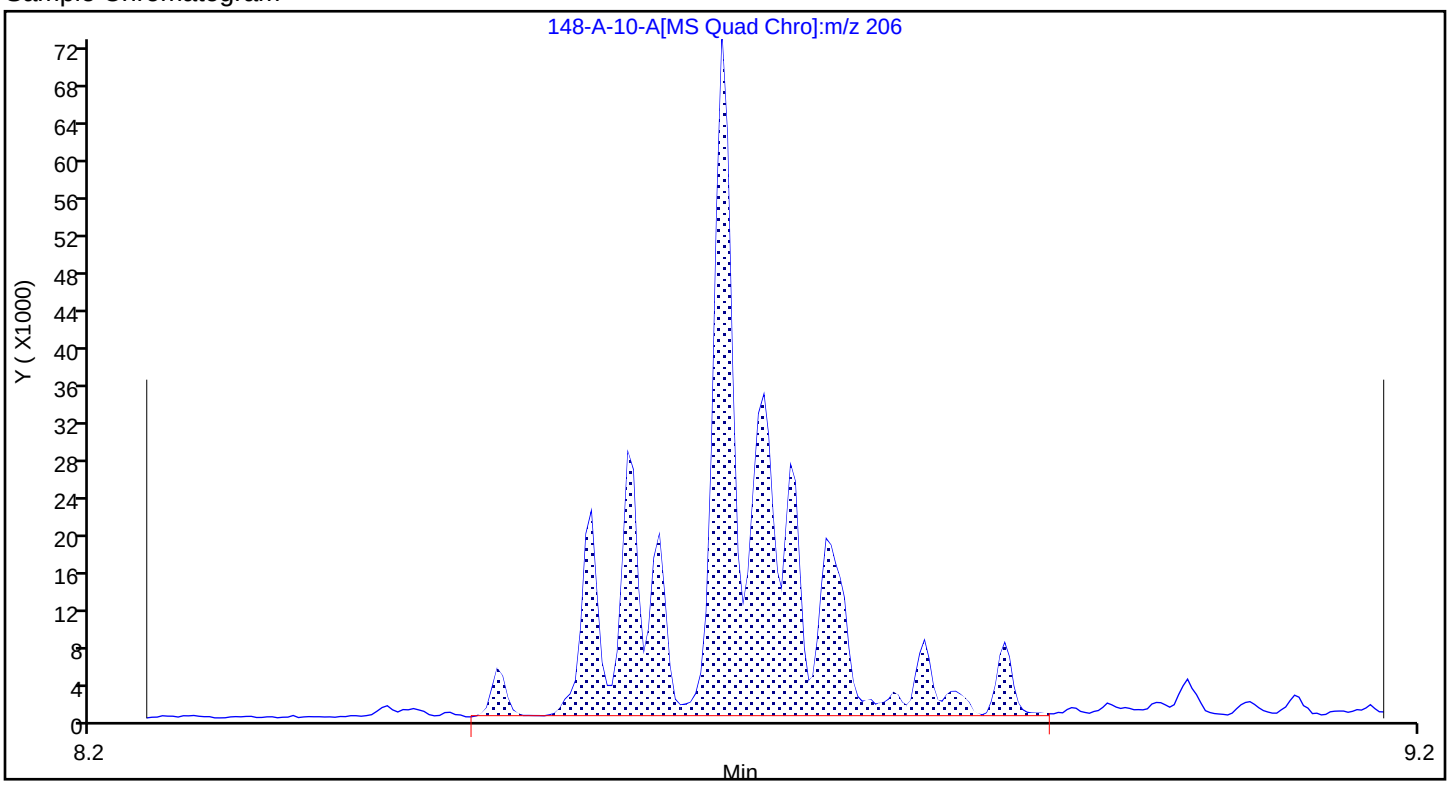
A 97 C2-Phenanthrenes/Anthracenes, CAS: STL00902

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
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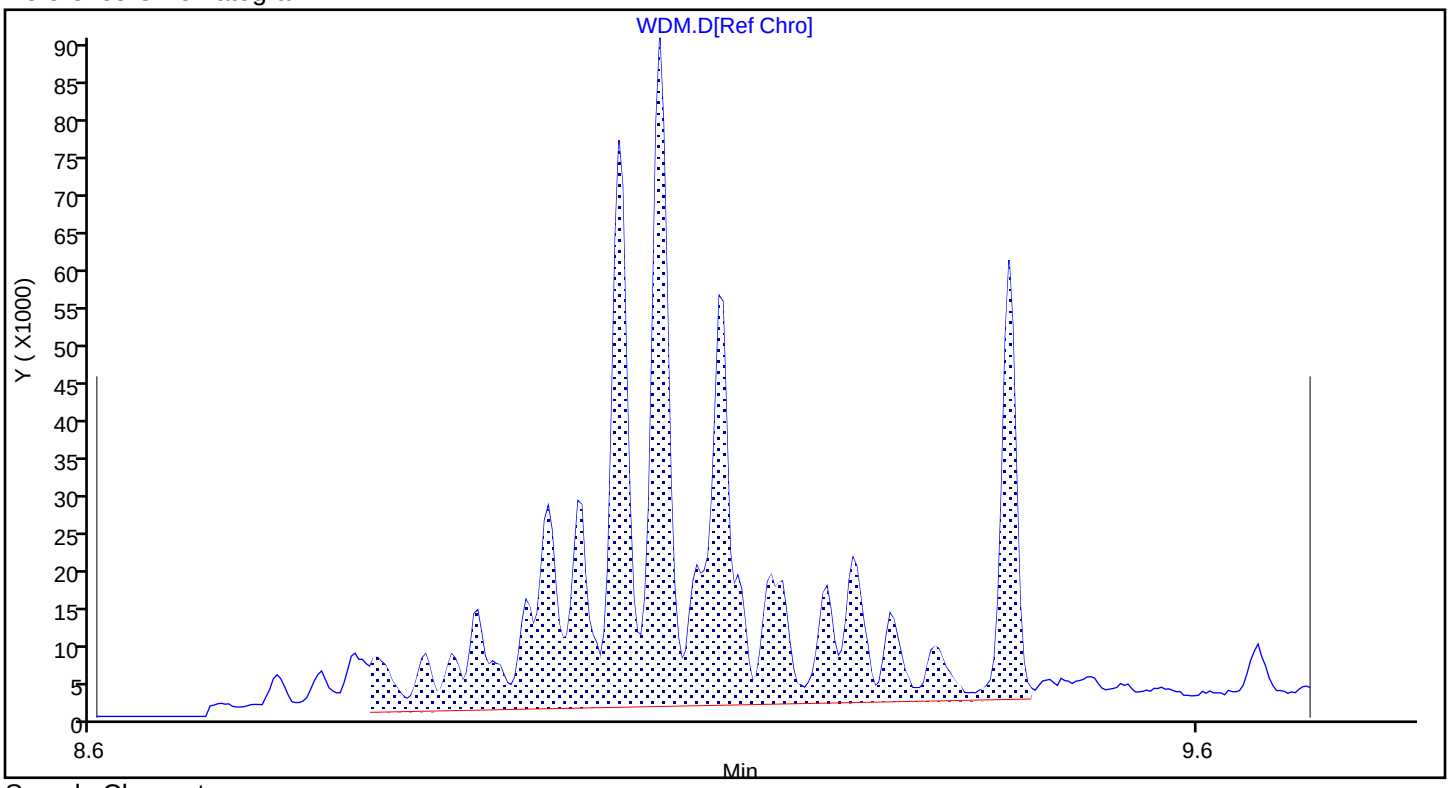
A 98 C3-Phenanthrenes/Anthracenes, CAS: STL00903

Reference Chromatogram



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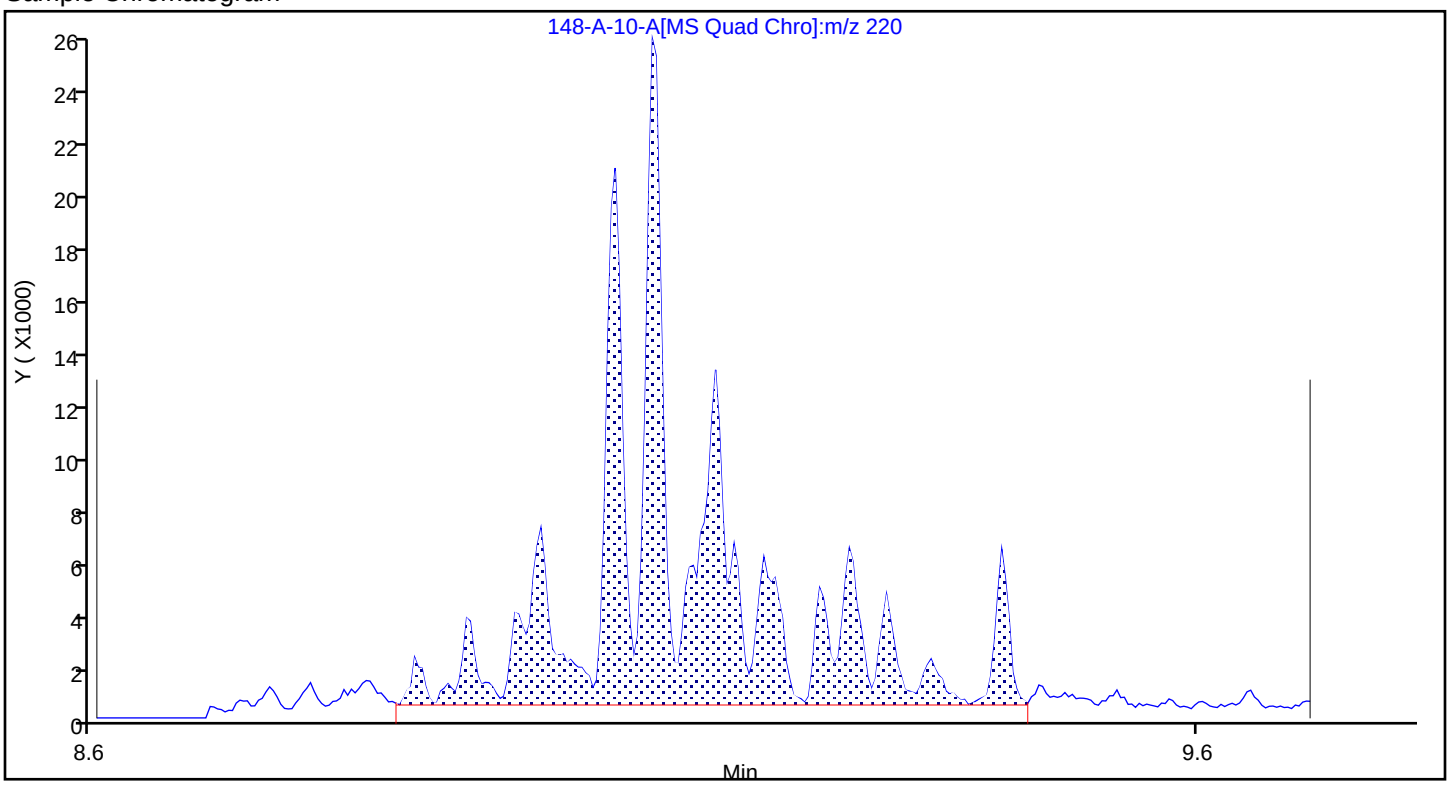

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Eurofins Knoxville

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Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
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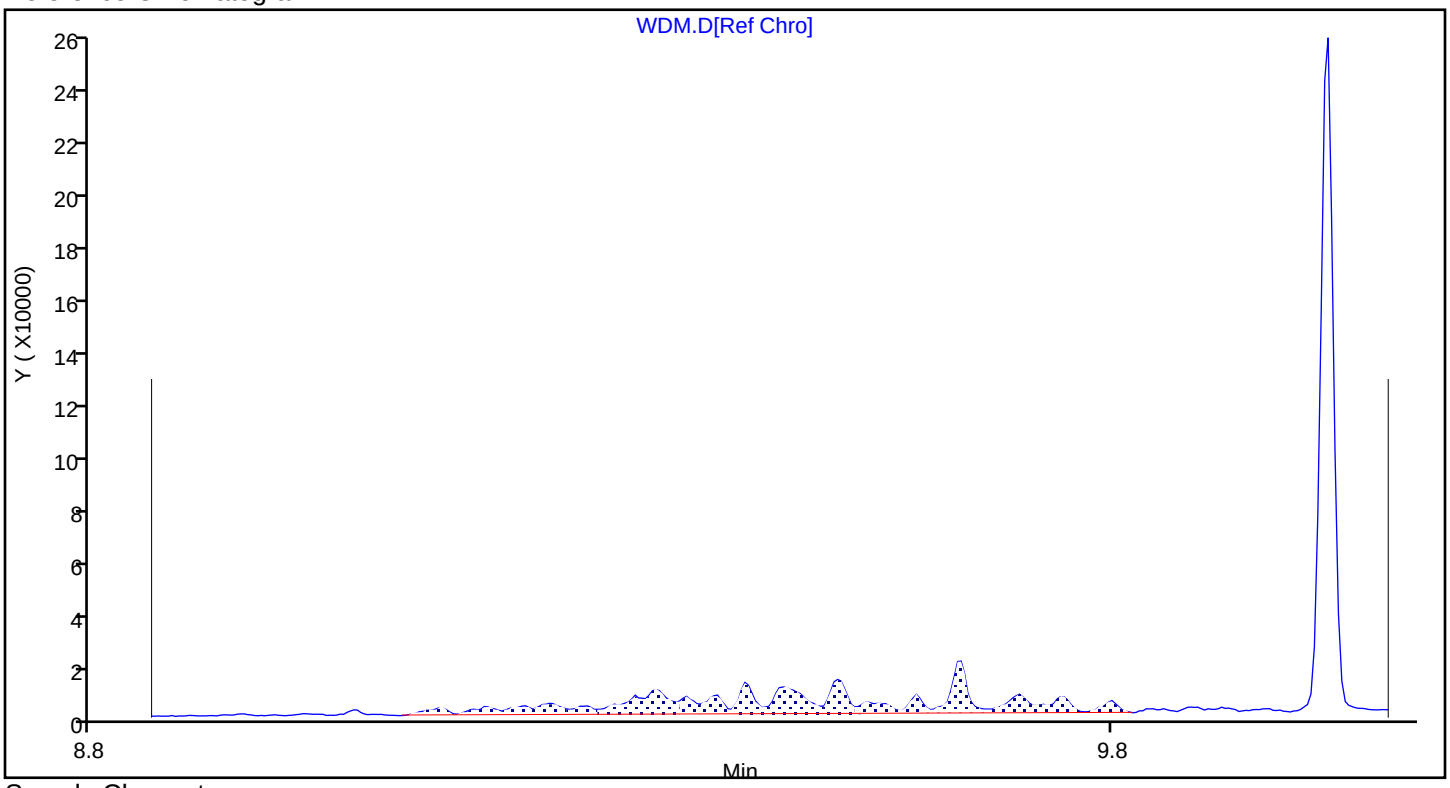
A 99 C4-Phenanthrenes/Anthracenes, CAS: STL00904

Reference Chromatogram



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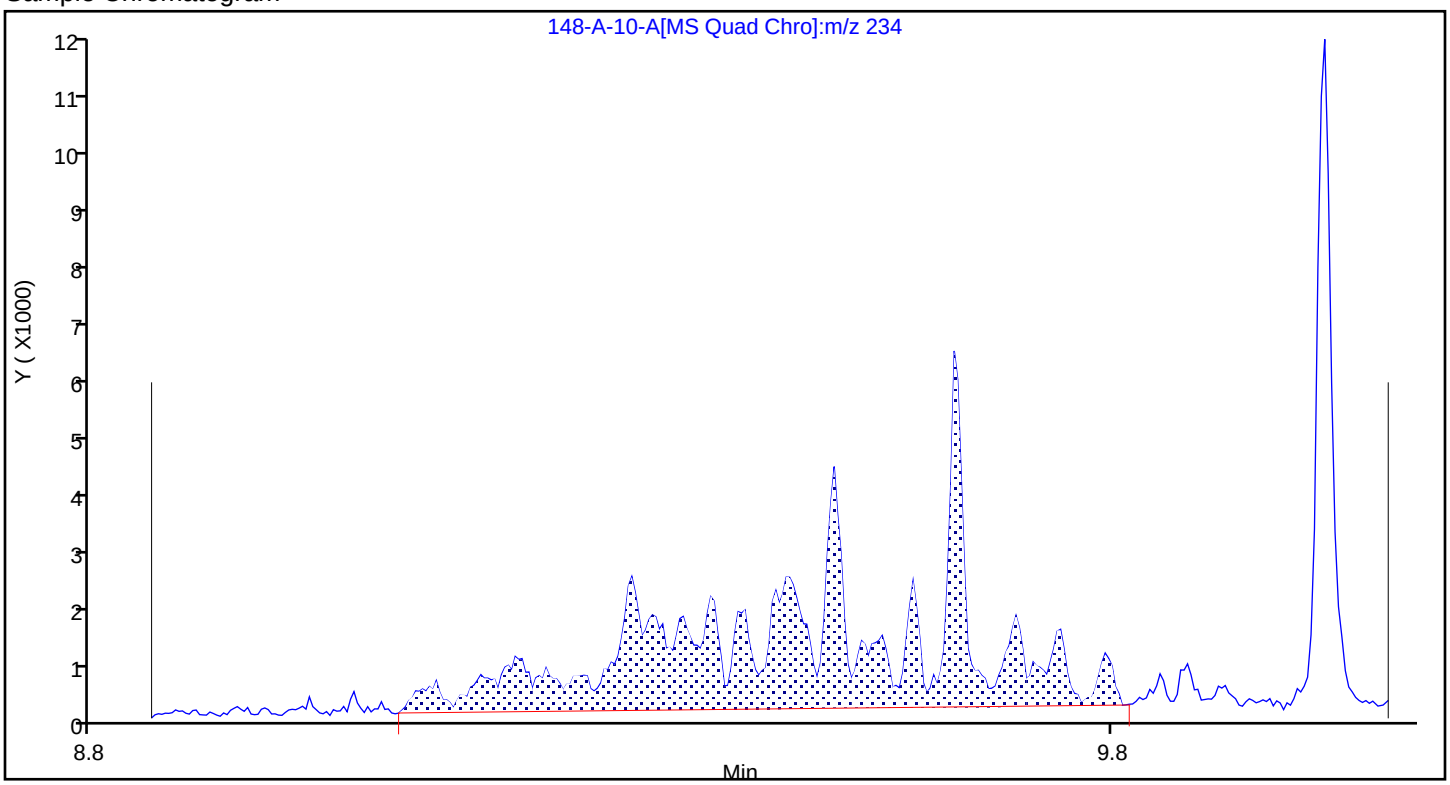

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Eurofins Knoxville

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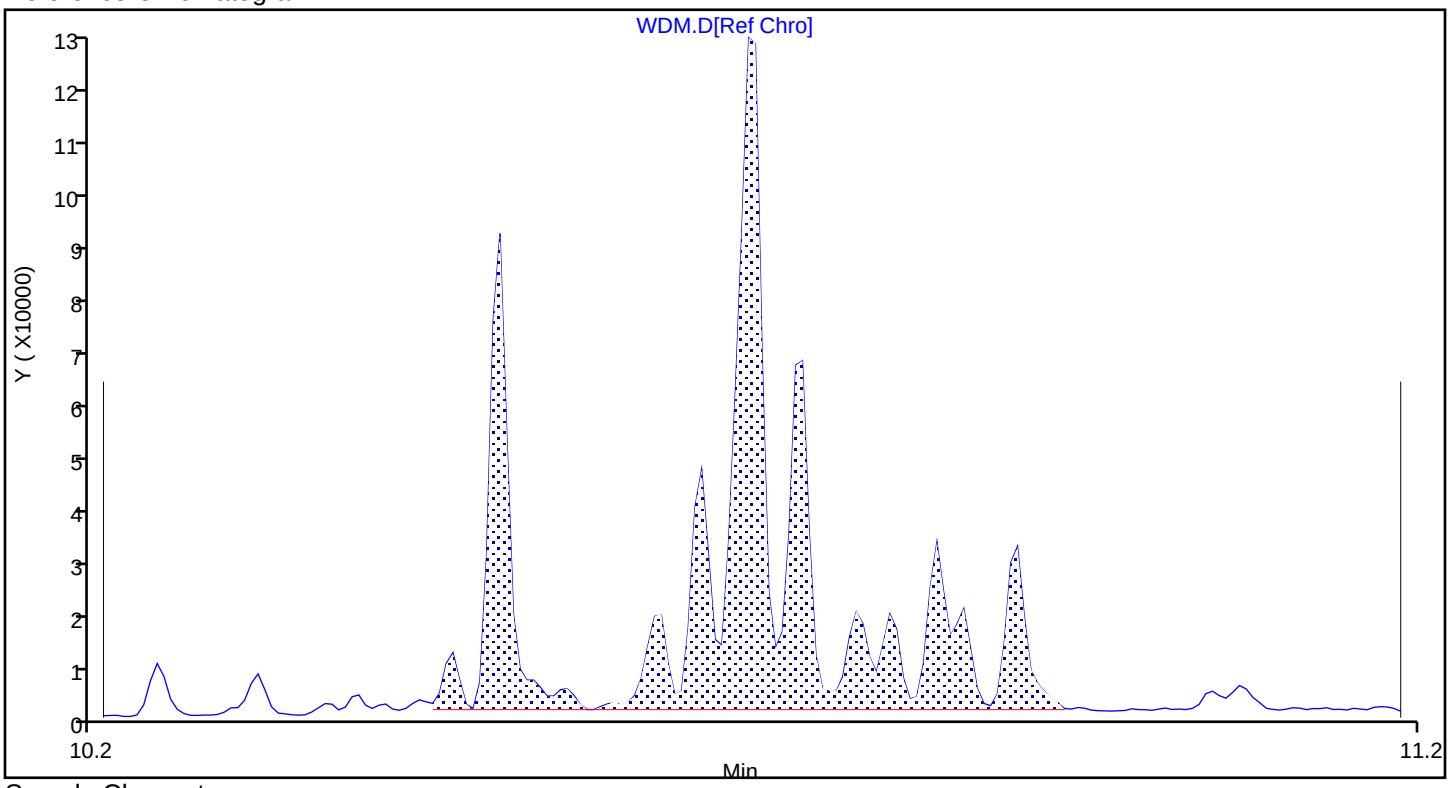
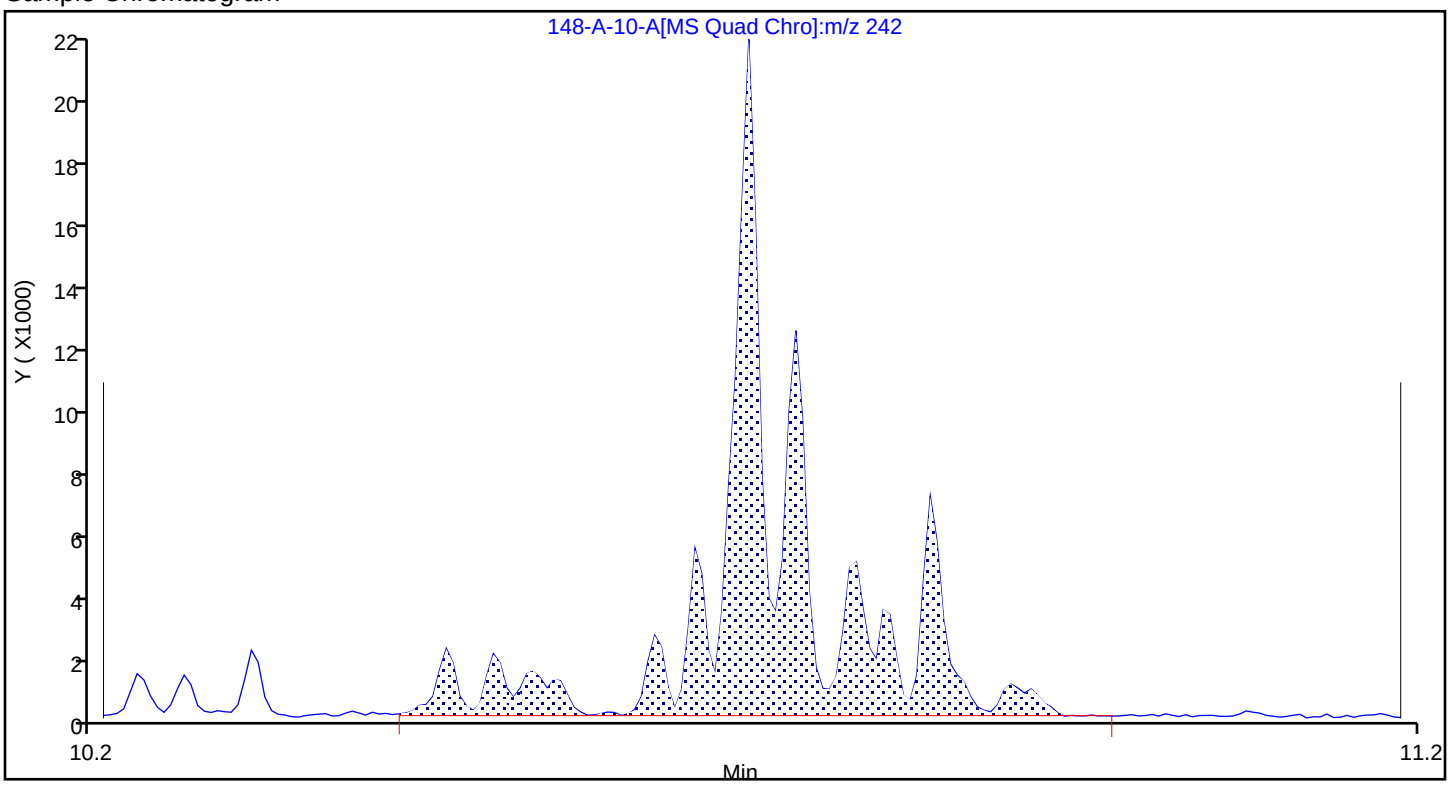
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 101 C1-Chrysenes/Benz(a)anthracenes, CAS: STL02218

Reference Chromatogram



Sample Chromatogram



Report Date: 22-Nov-2023 11:25:29 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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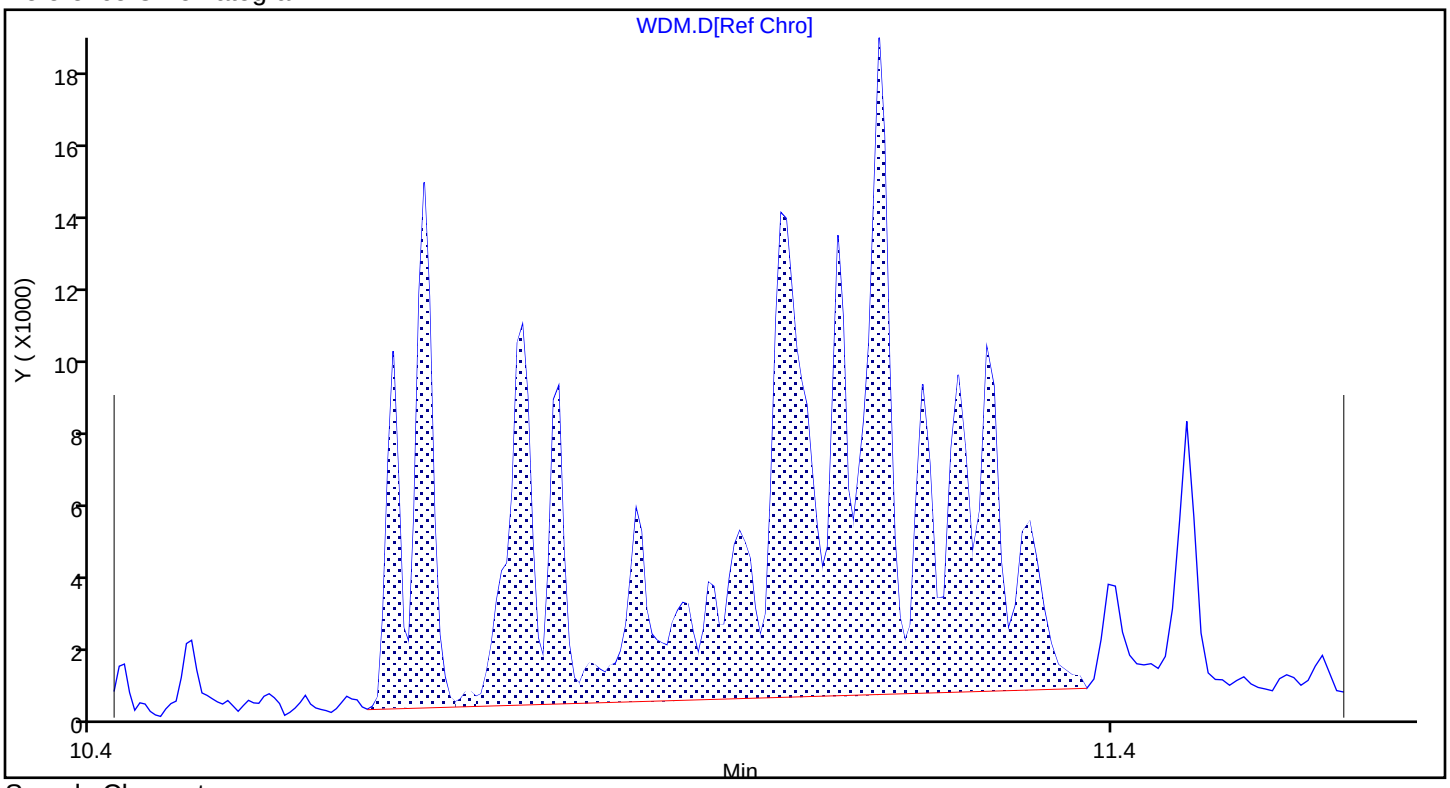
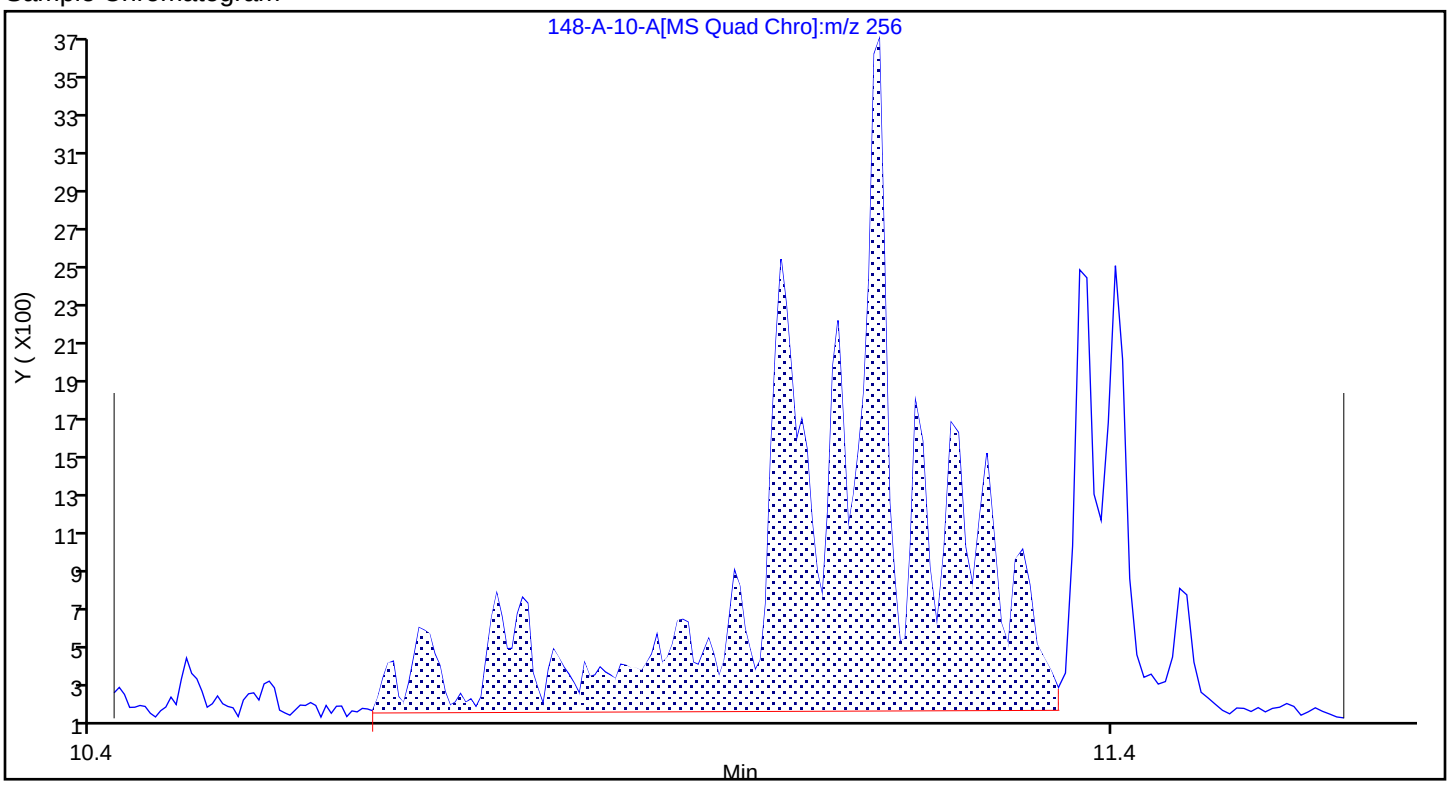
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 102 C2-Chrysenes/Benz(a)anthracenes, CAS: STL02219

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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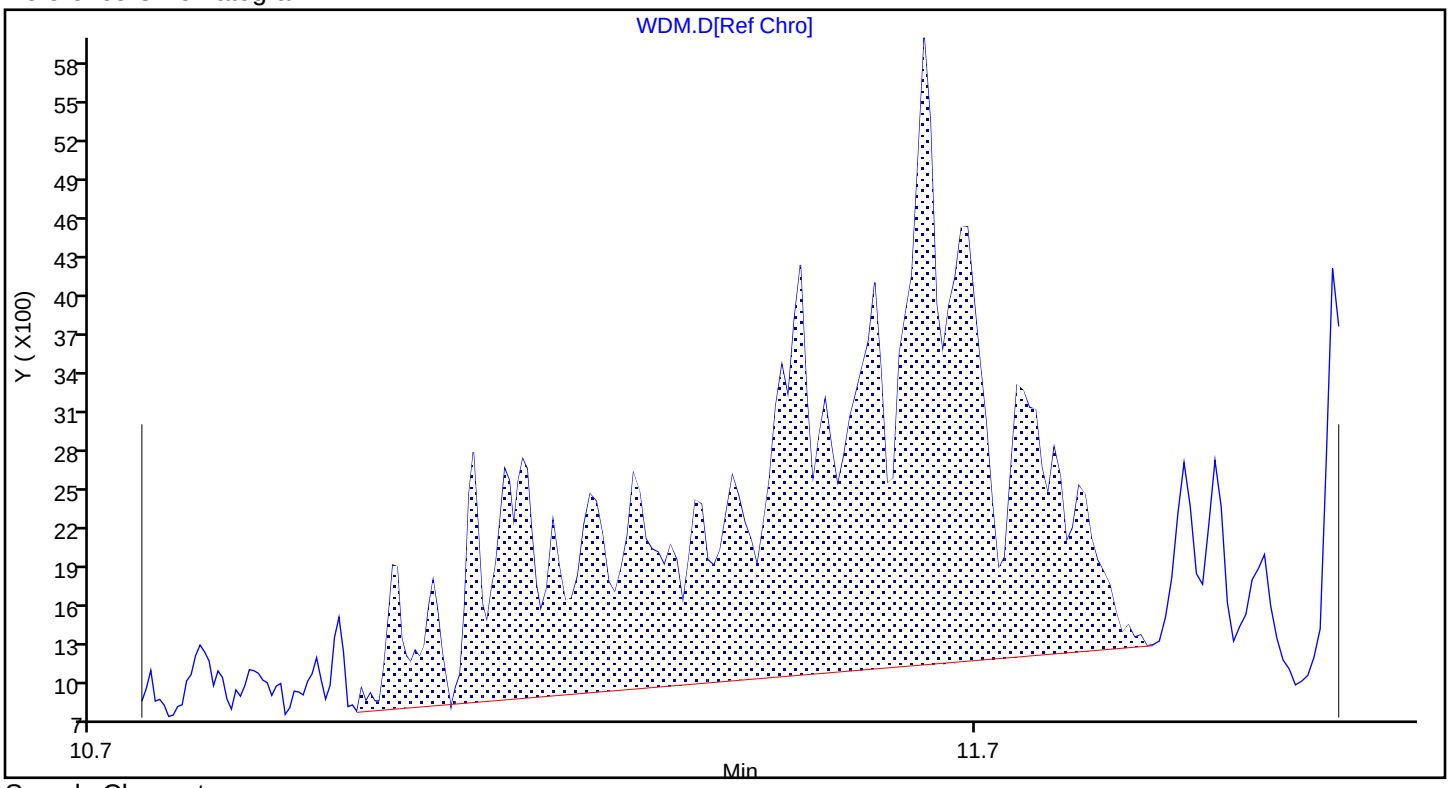
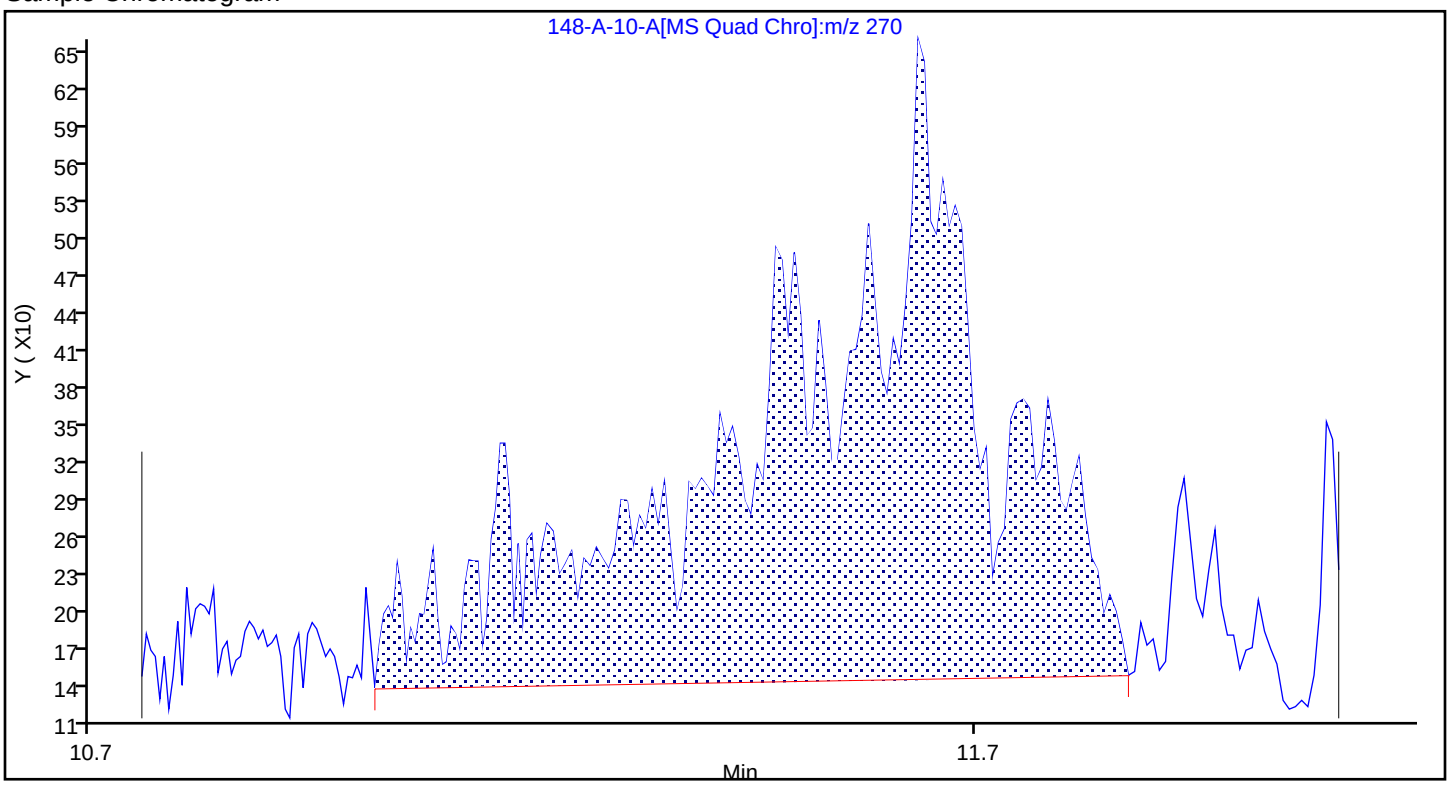
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 103 C3-Chrysenes/Benz(a)anthracenes, CAS: STL02220

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1		
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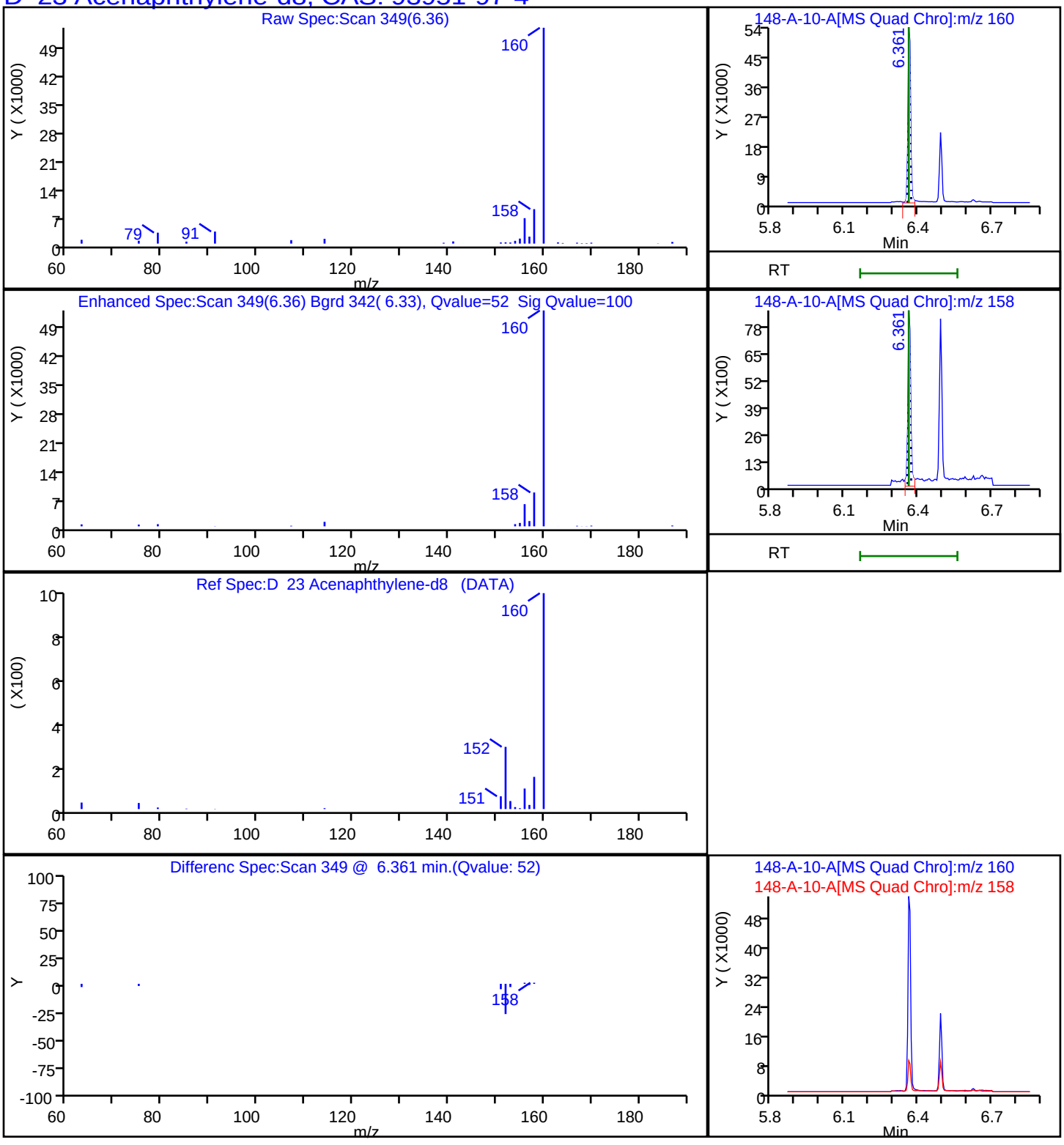
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 23 Acenaphthylene-d8, CAS: 93951-97-4



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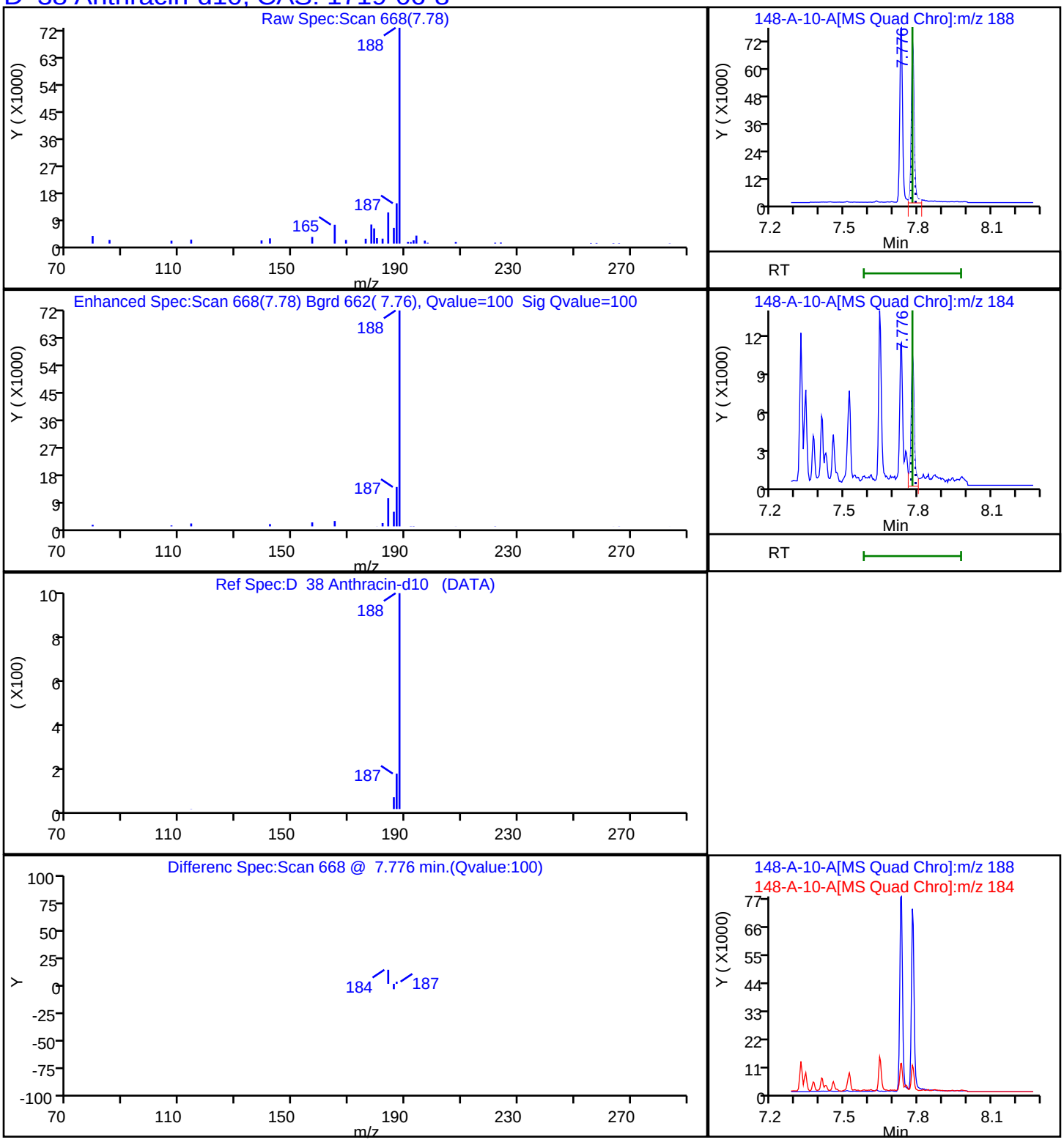
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 38 Anthracin-d10, CAS: 1719-06-8



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Eurofins Knoxville

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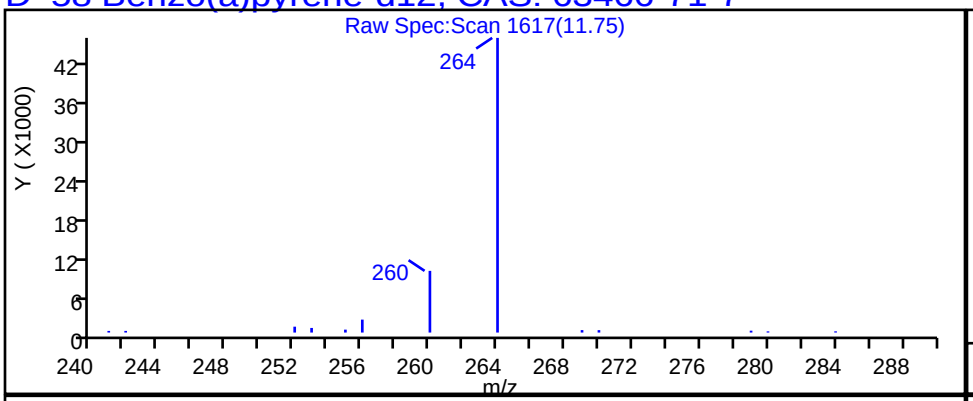
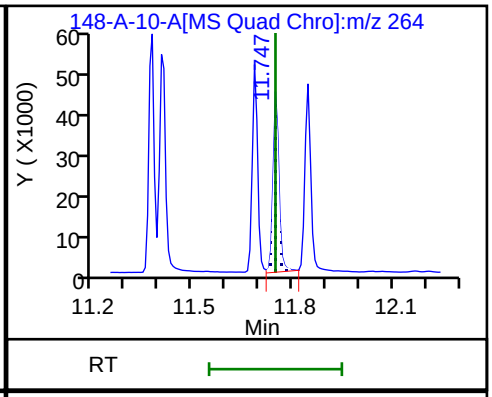
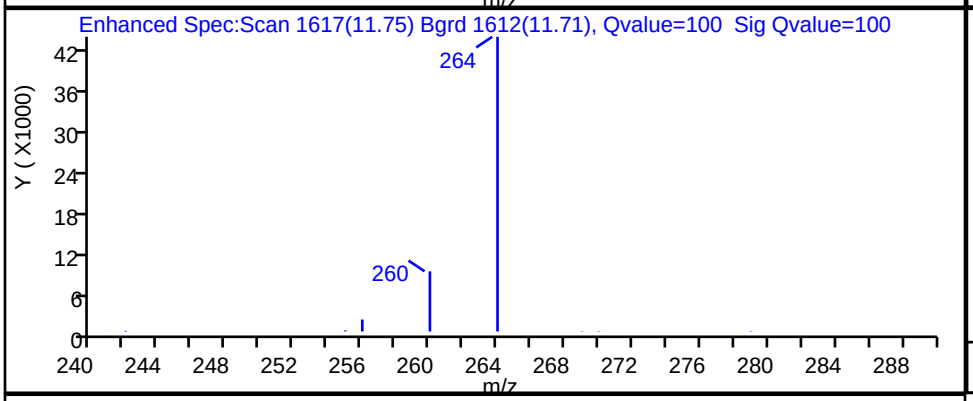
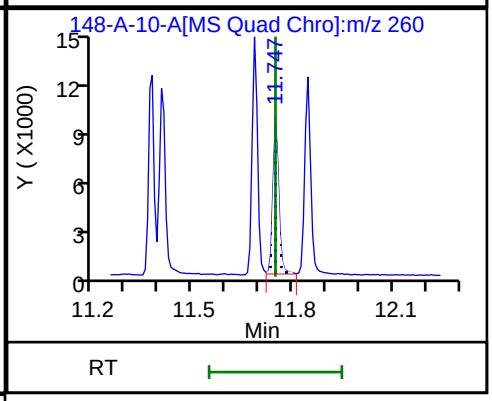
Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13
Client ID:	1804576-854-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

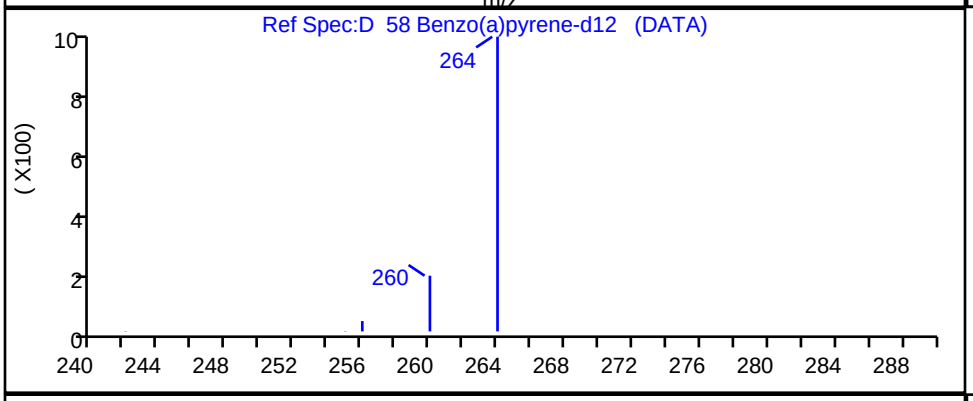
D 58 Benzo(a)pyrene-d12, CAS: 63466-71-7

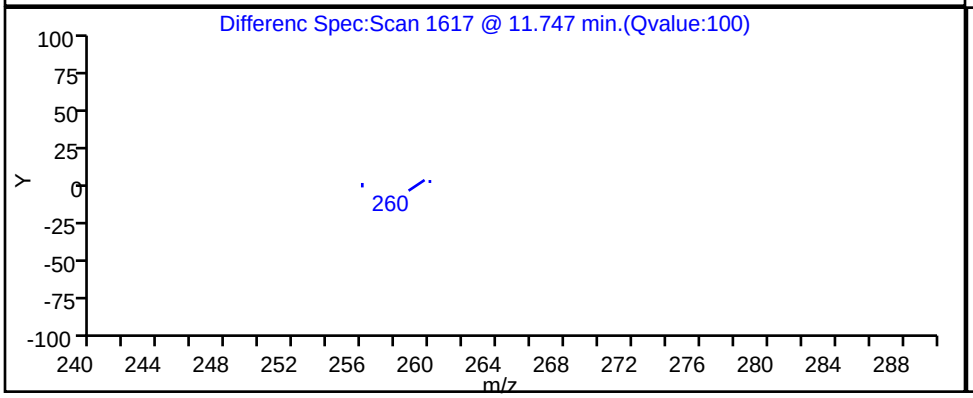


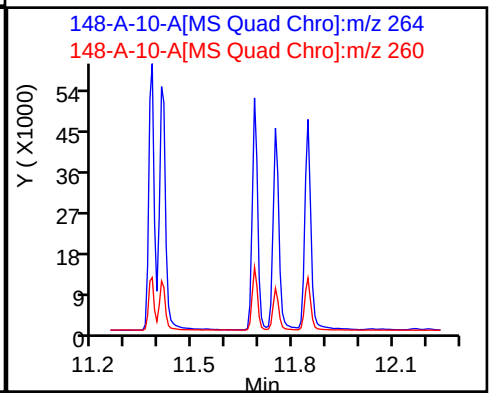












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Eurofins Knoxville

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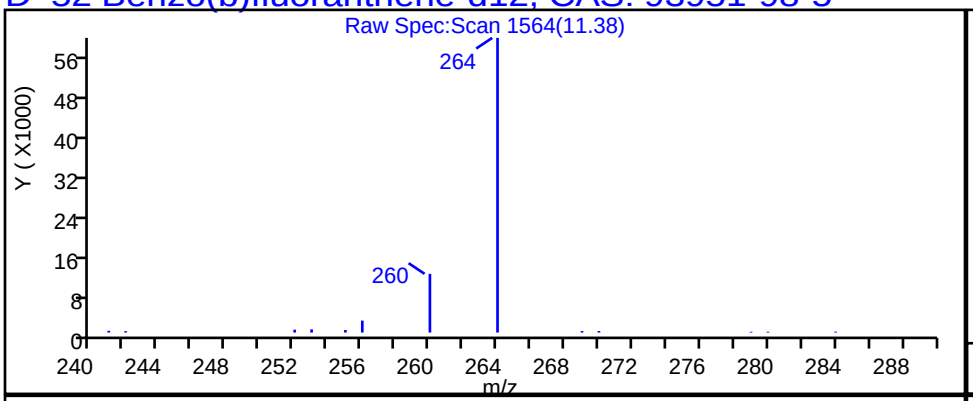
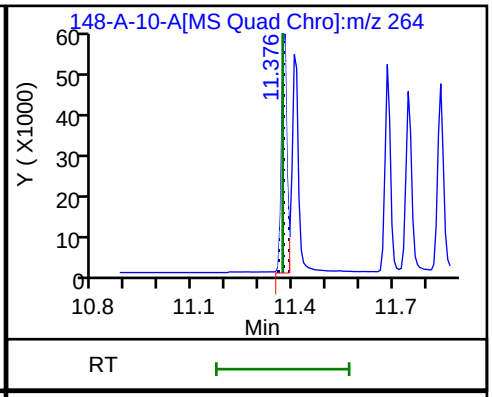
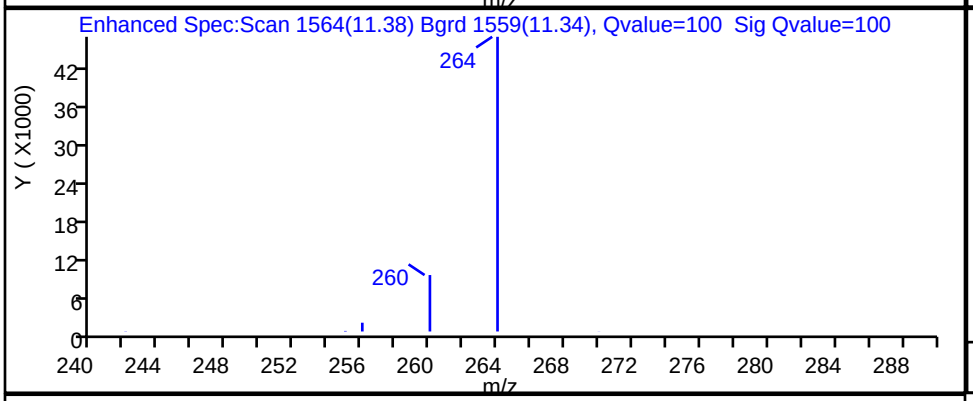
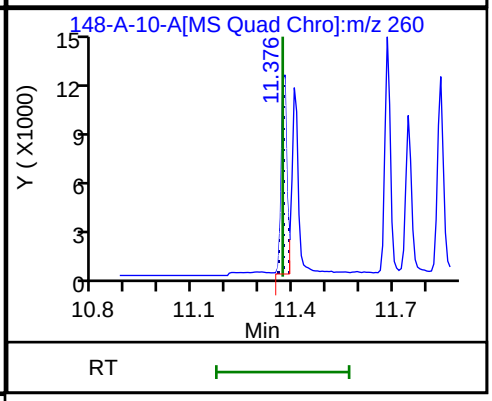
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

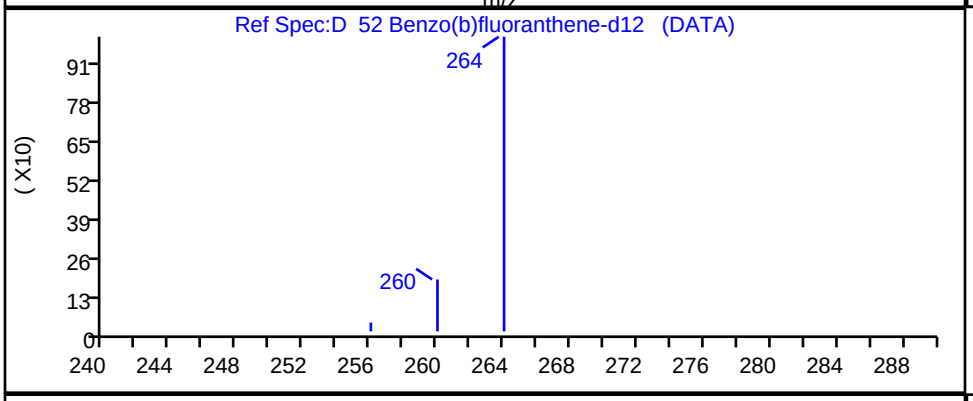
D 52 Benzo(b)fluoranthene-d12, CAS: 93951-98-5

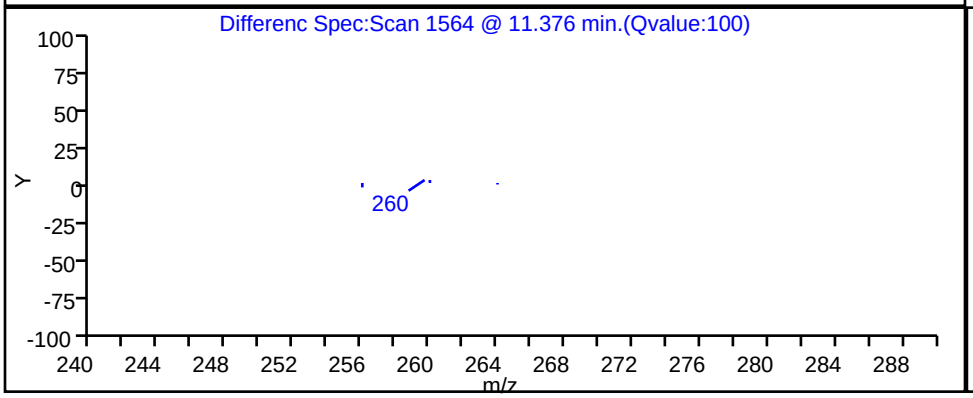


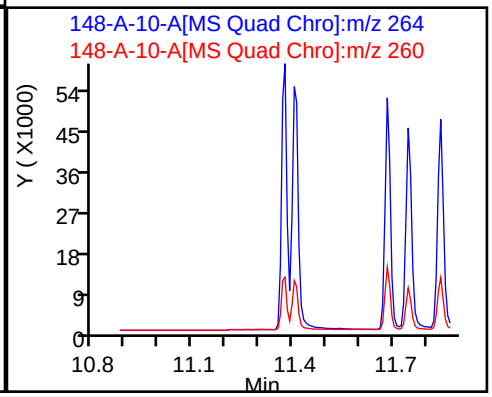












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Eurofins Knoxville

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Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1		
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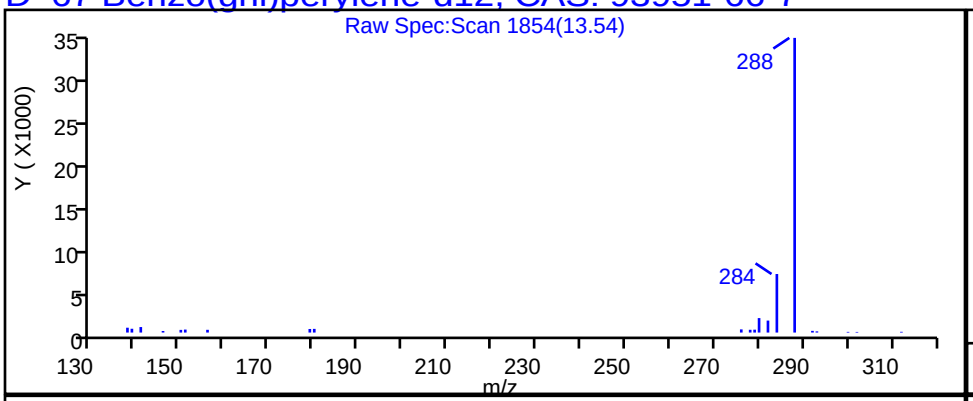
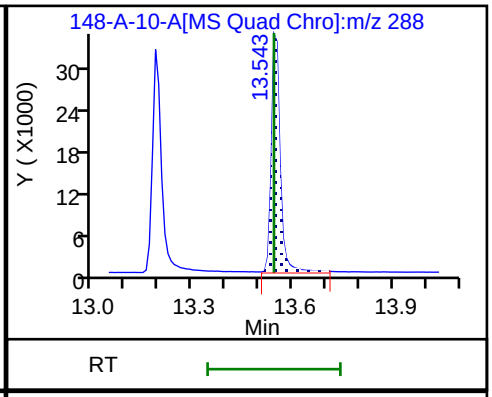
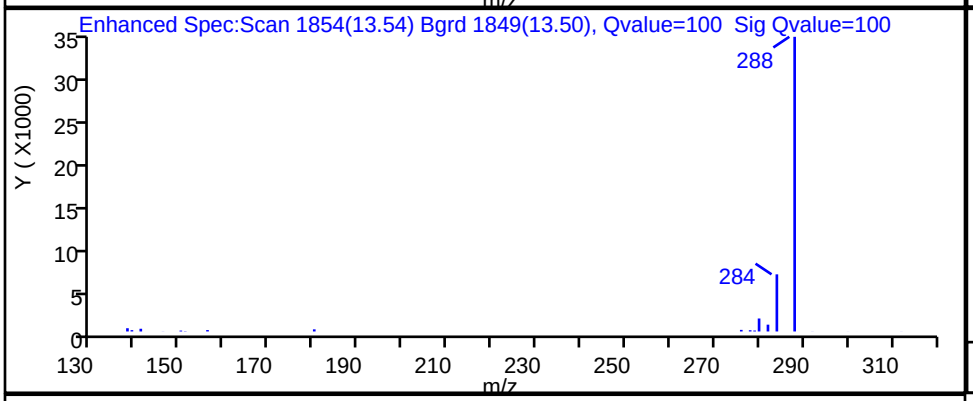
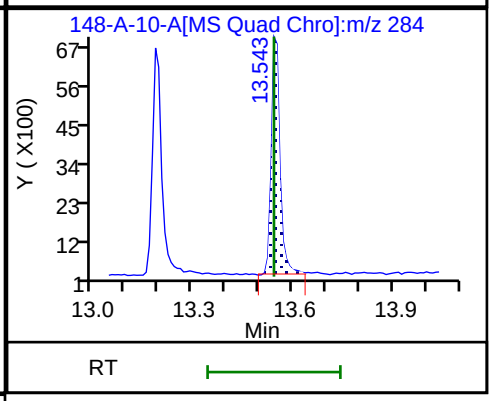
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

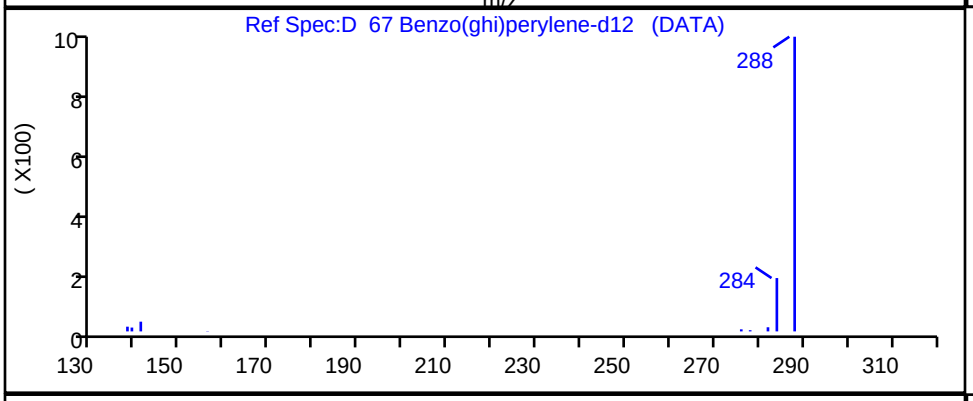
D 67 Benzo(ghi)perylene-d12, CAS: 93951-66-7

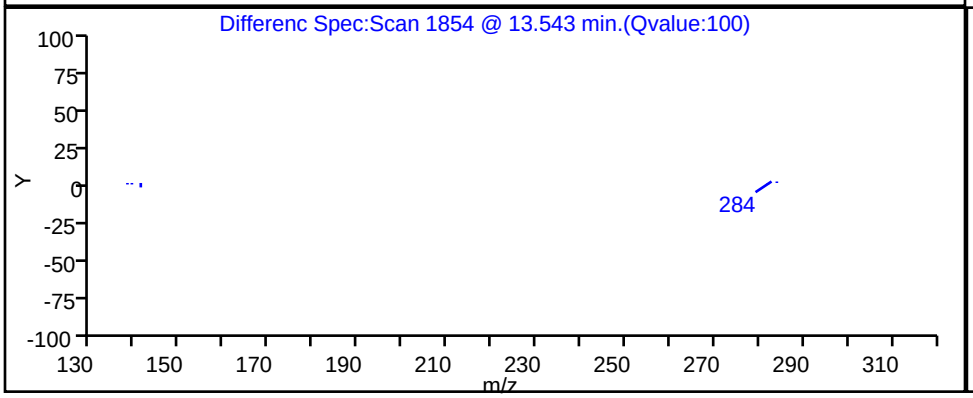


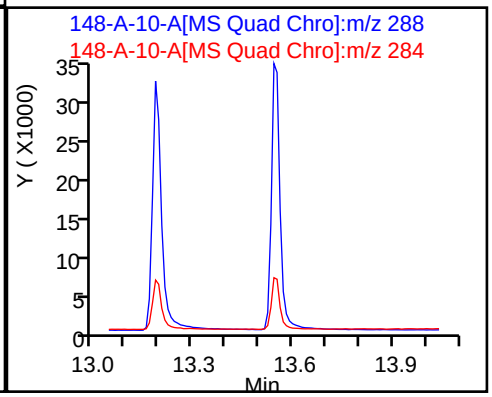












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Eurofins Knoxville

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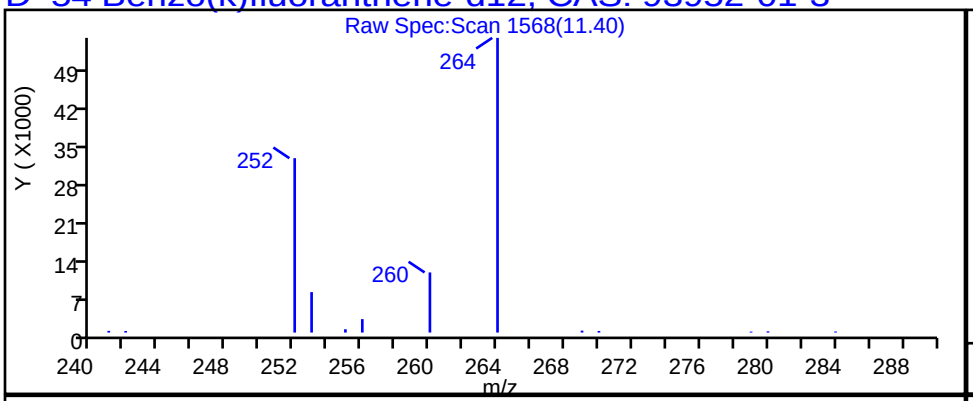
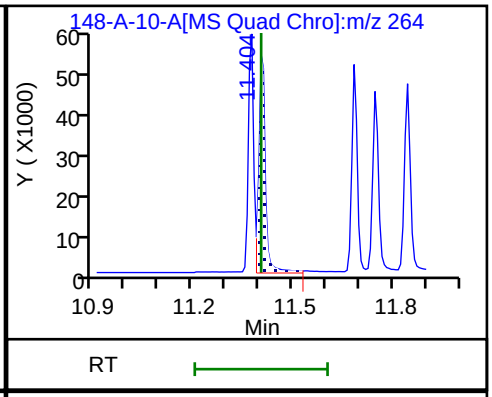
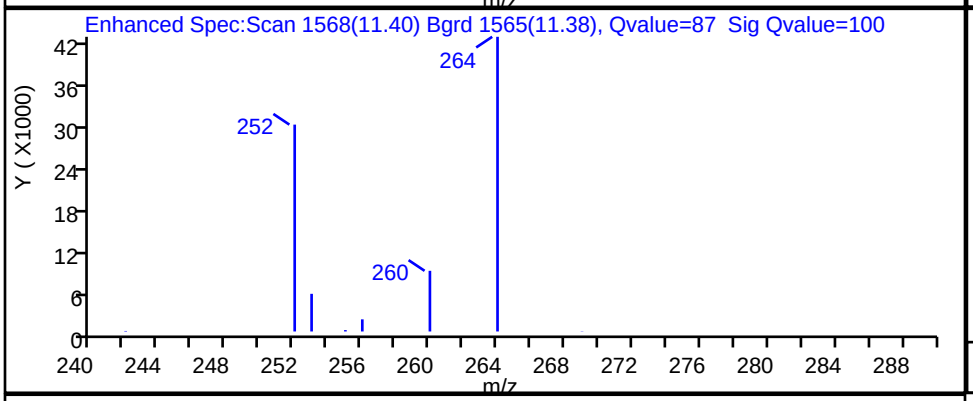
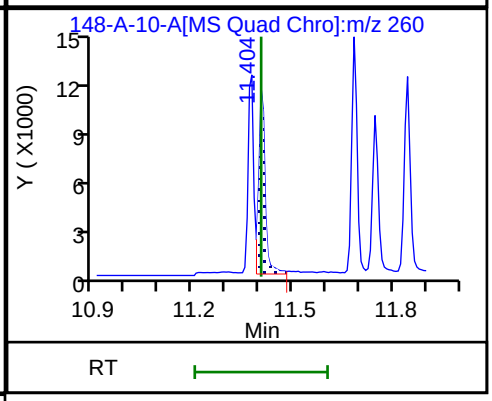
Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13
Client ID:	1804576-854-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

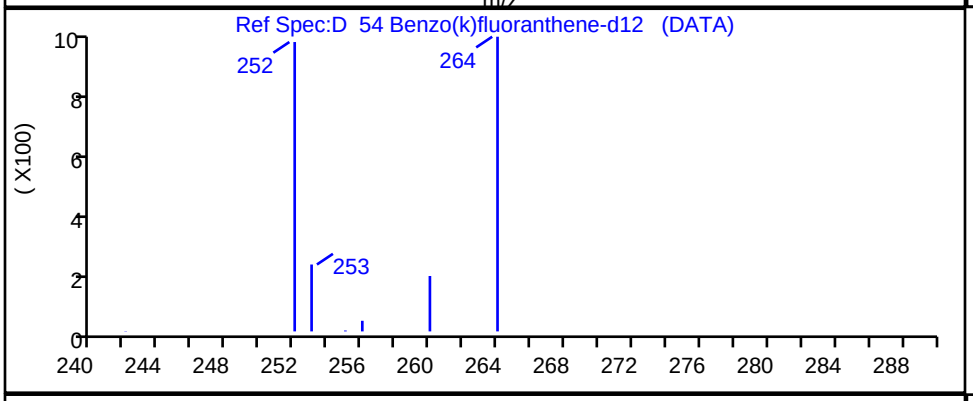
D 54 Benzo(k)fluoranthene-d12, CAS: 93952-01-3

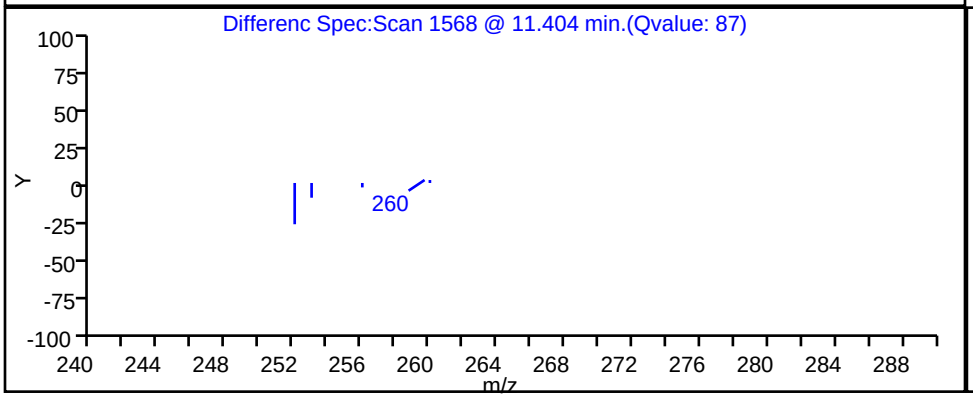


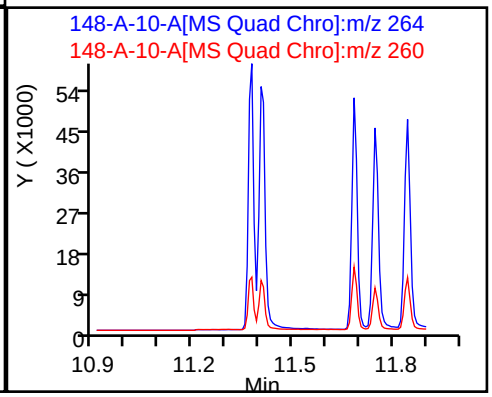












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Eurofins Knoxville

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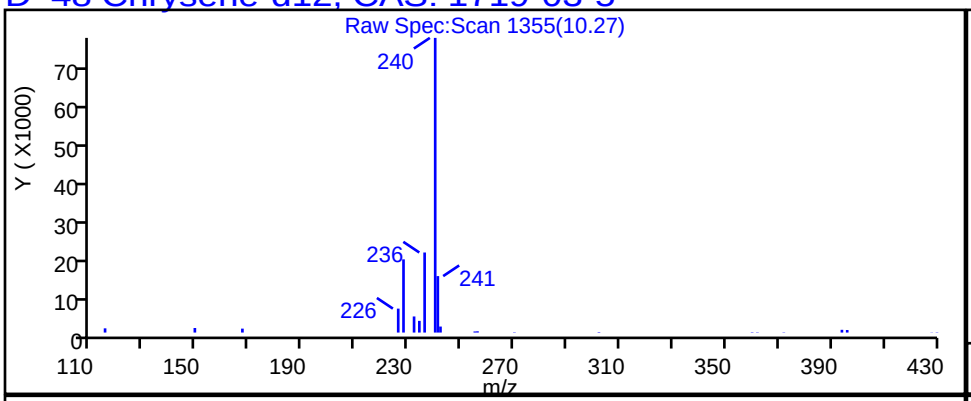
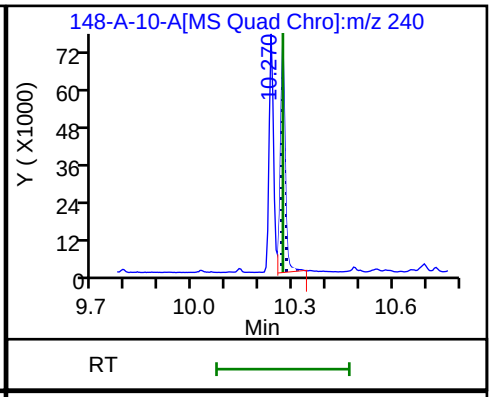
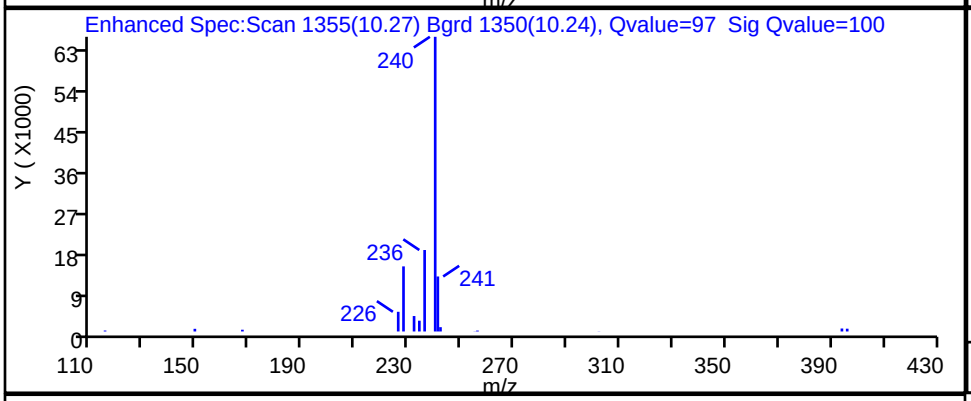
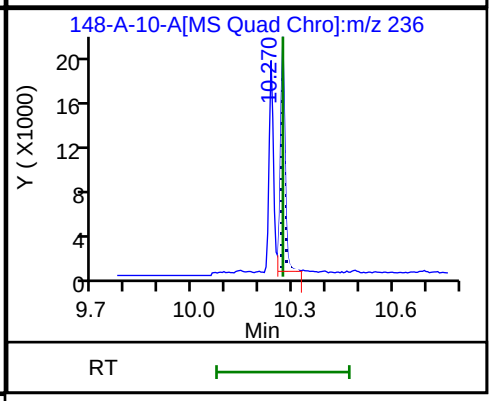
Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

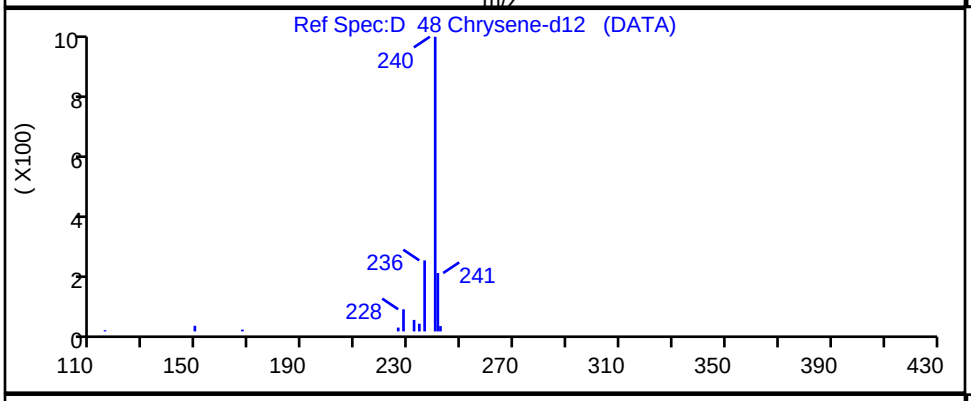
D 48 Chrysene-d12, CAS: 1719-03-5

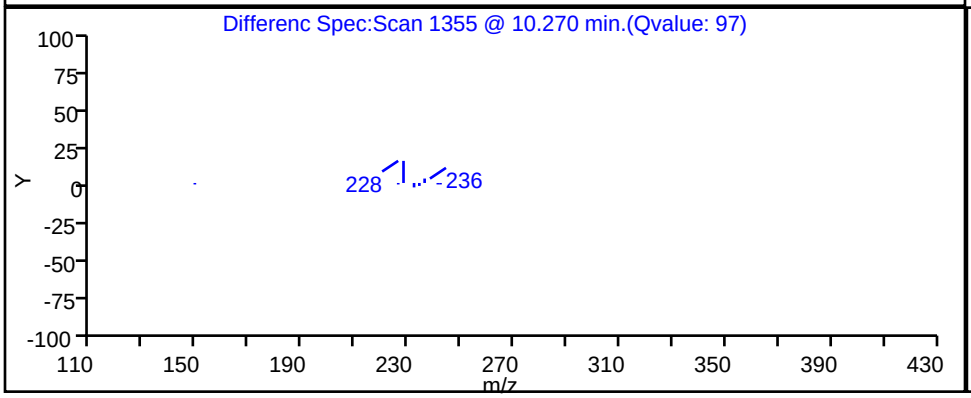


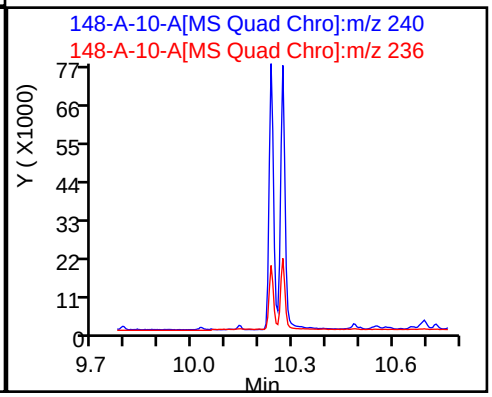












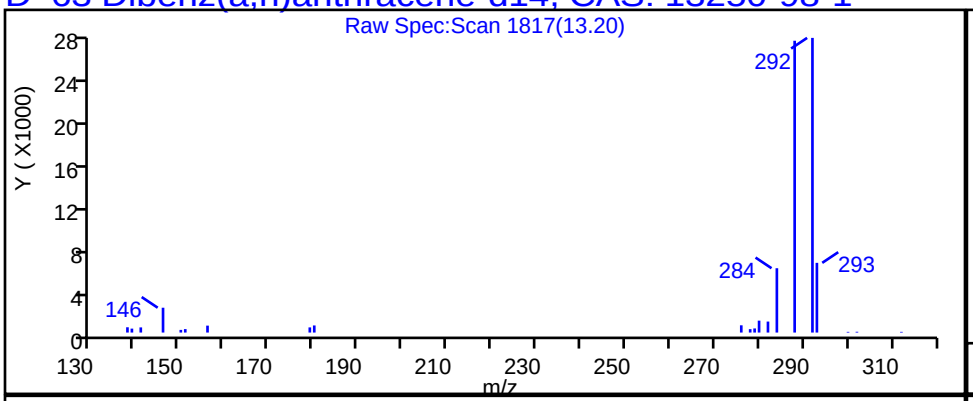
Report Date: 22-Nov-2023 11:25:28 Chrom Revision: 2.3 15-Nov-2023 20:54:34

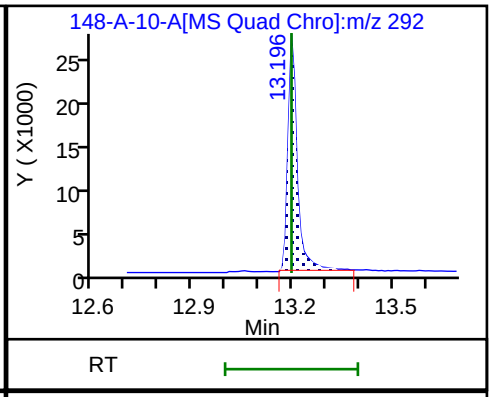
Eurofins Knoxville

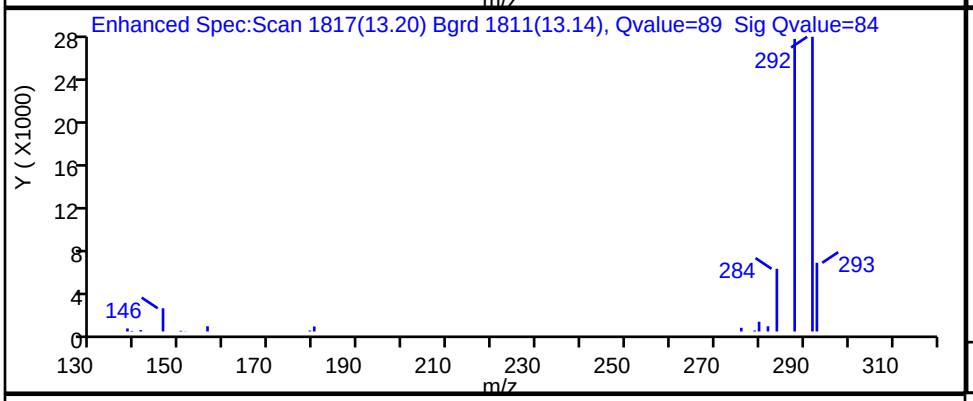
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-10-A.D

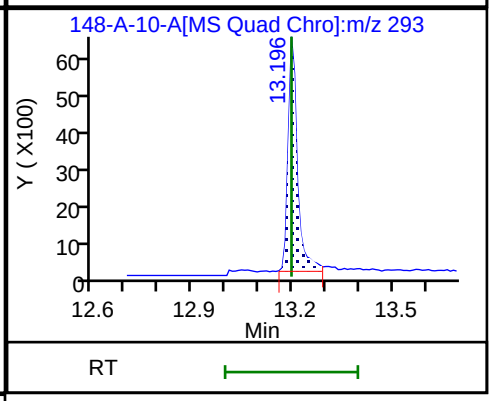
Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

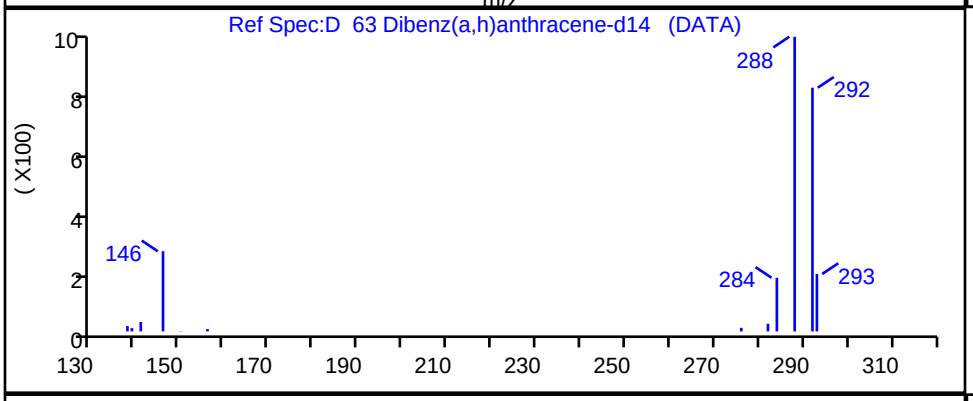
D 63 Dibenz(a,h)anthracene-d14, CAS: 13250-98-1

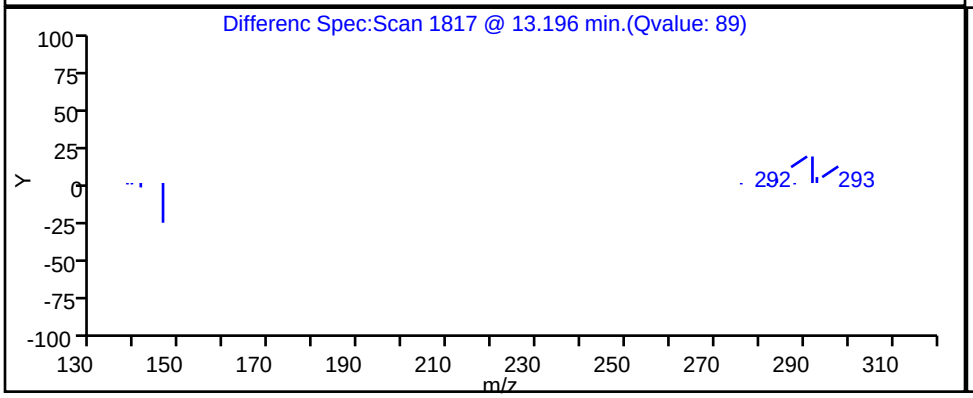


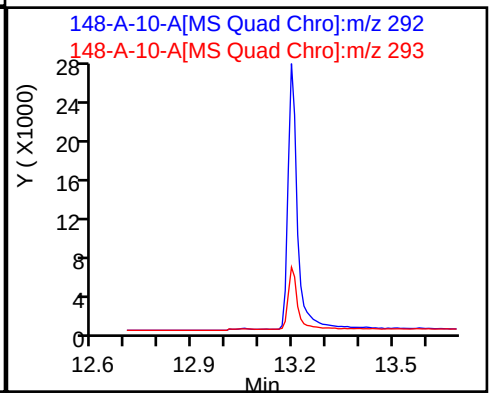












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Eurofins Knoxville

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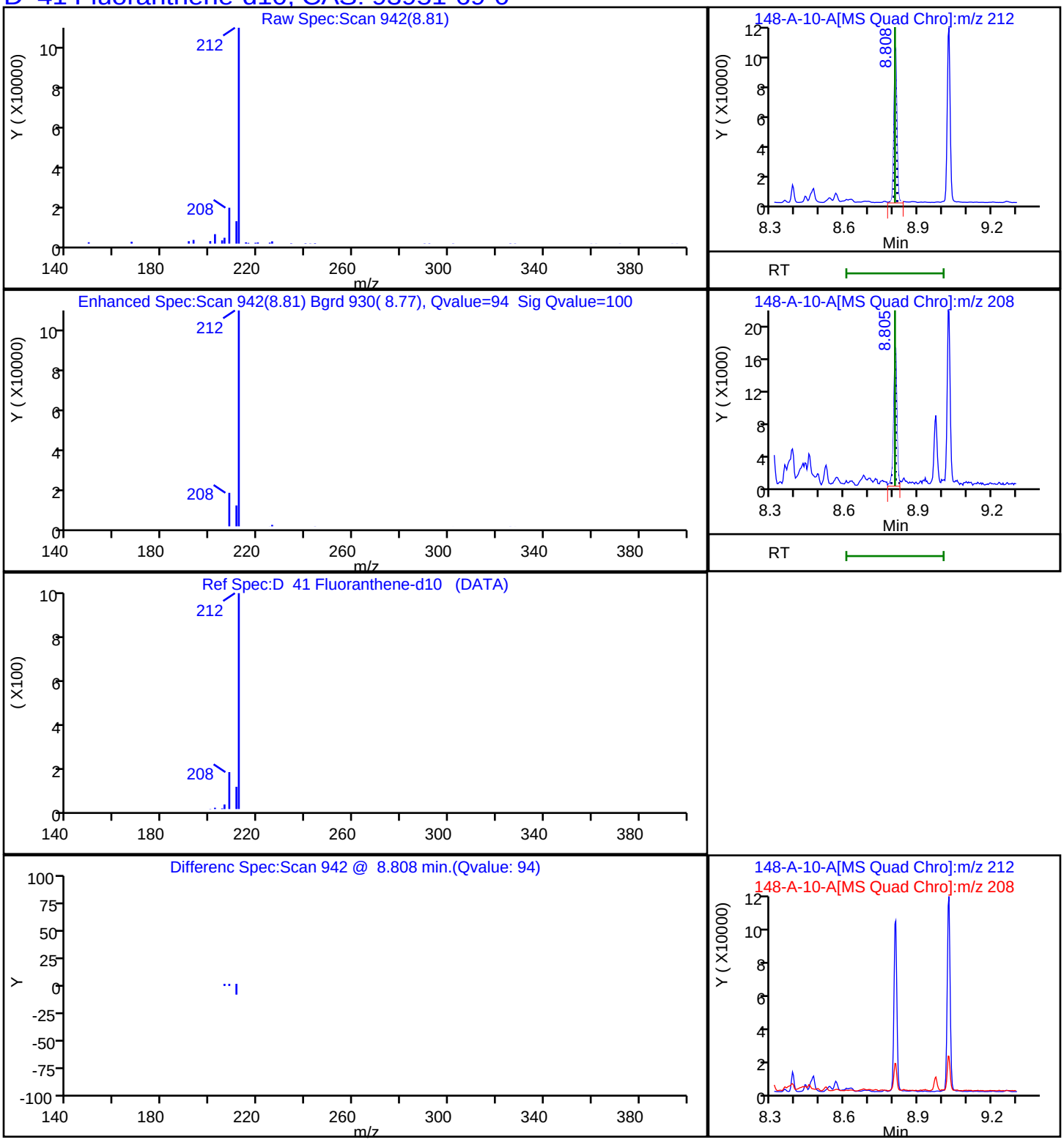
Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 41 Fluoranthene-d10, CAS: 93951-69-0



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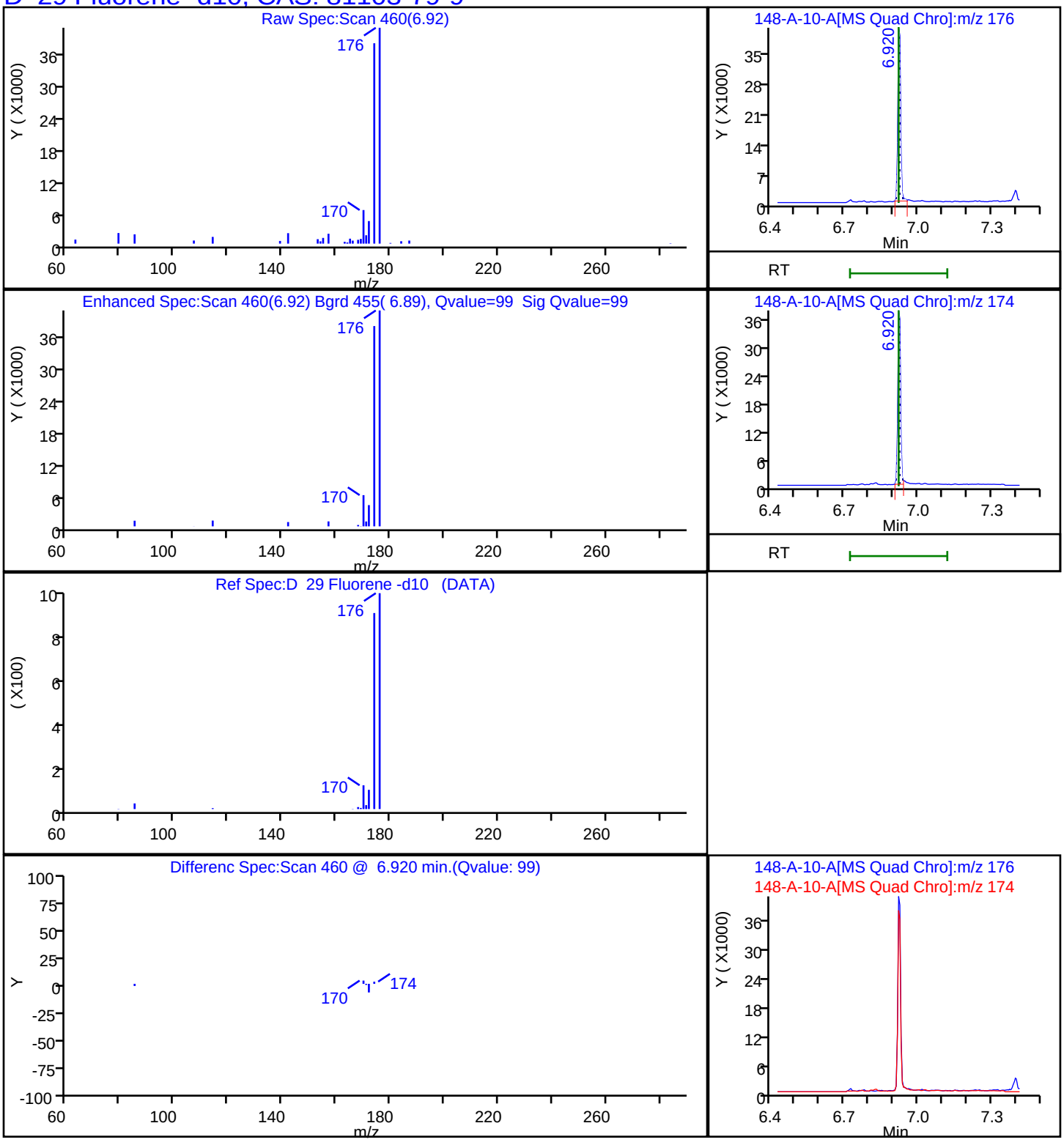
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-10-A.D

Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 29 Fluorene -d10, CAS: 81103-79-9



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Eurofins Knoxville

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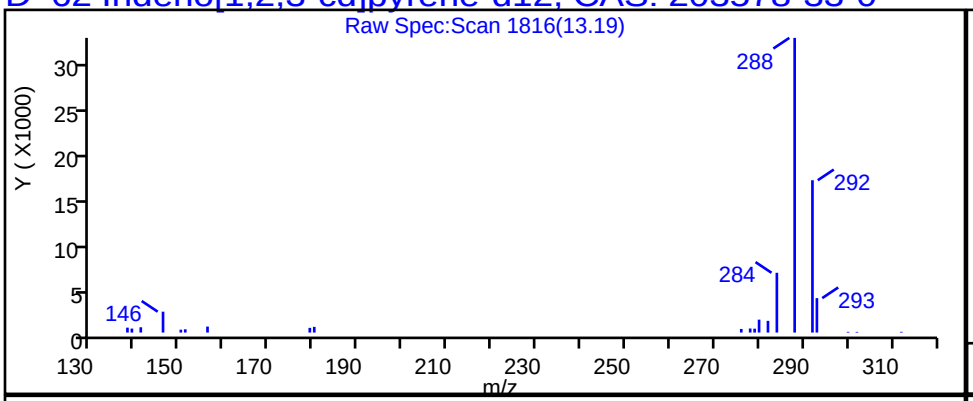
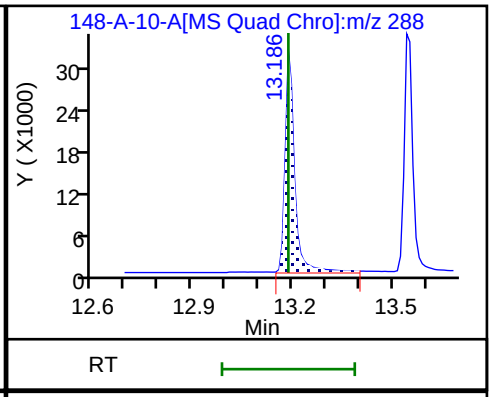
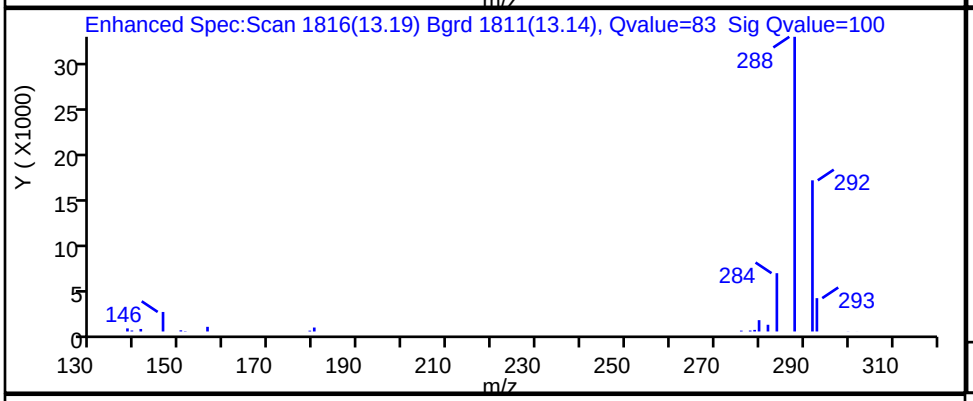
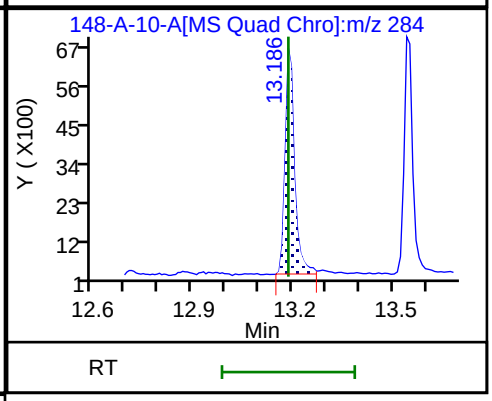
Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

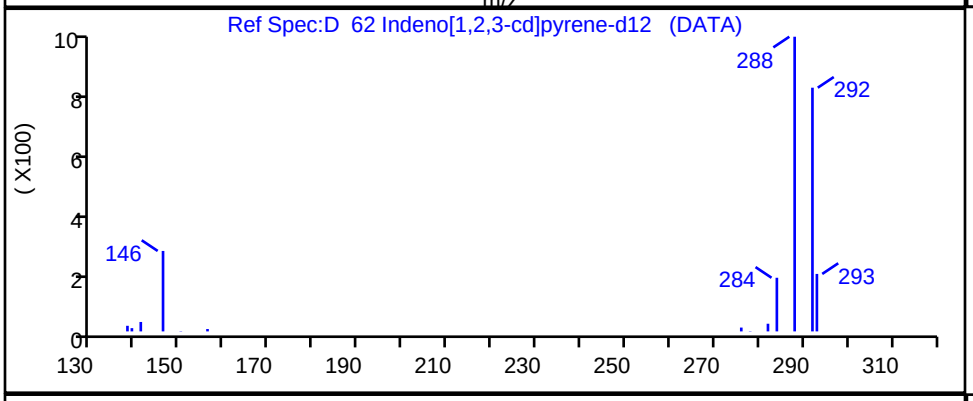
D 62 Indeno[1,2,3-cd]pyrene-d12, CAS: 203578-33-0

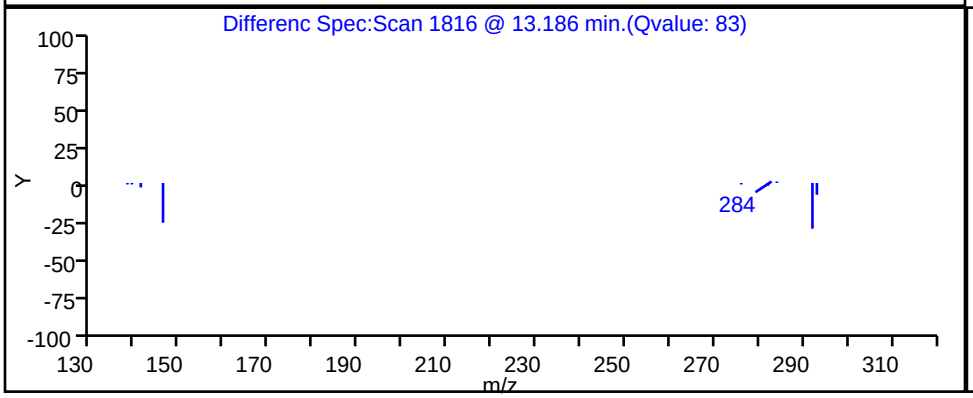


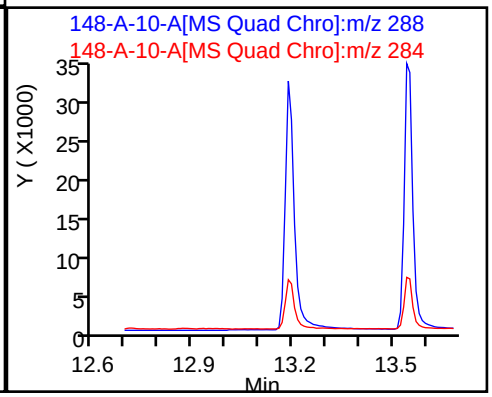












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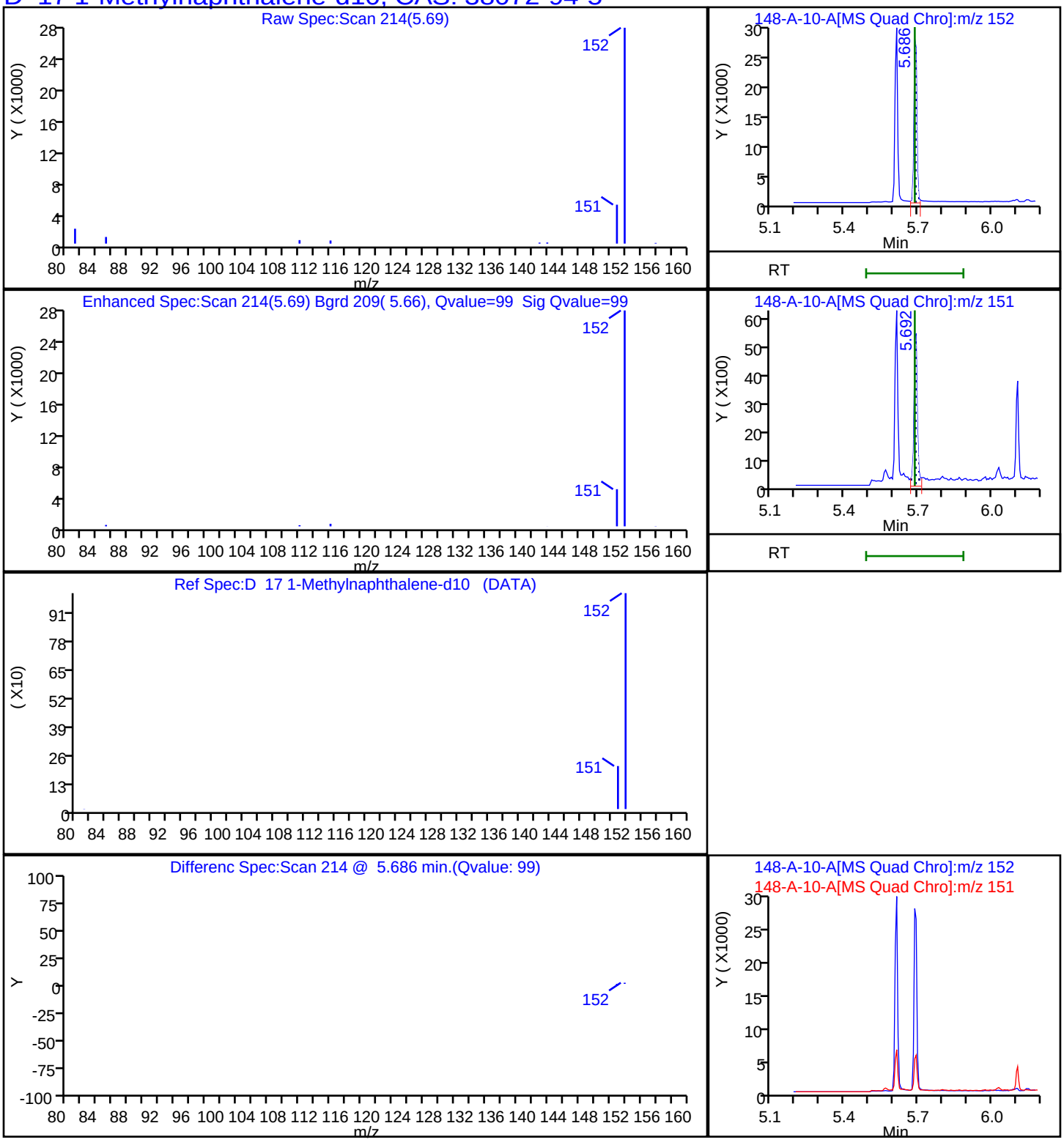
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-10-A.D

Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 17 1-Methylnaphthalene-d10, CAS: 38072-94-5



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Eurofins Knoxville

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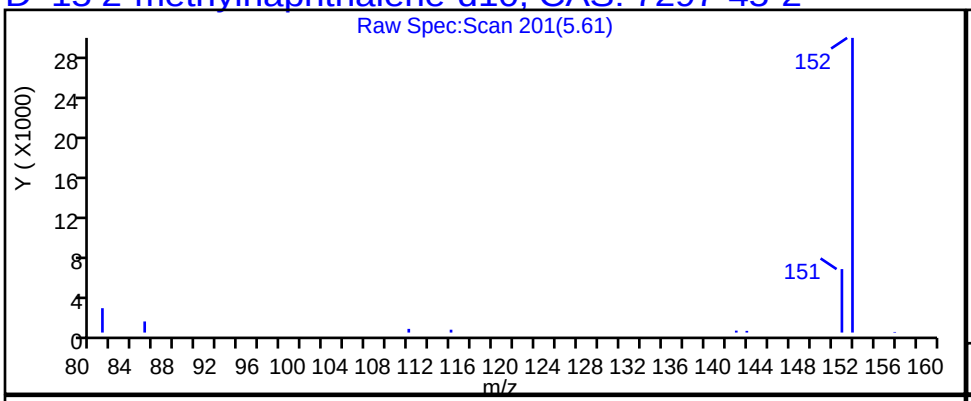
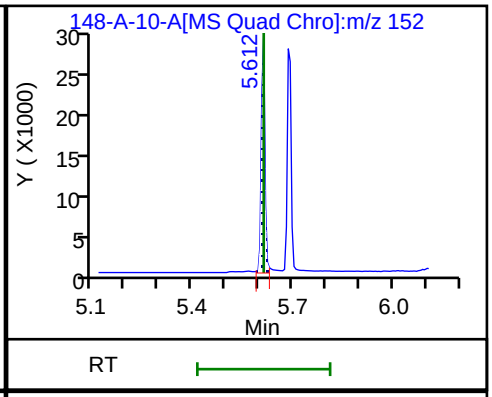
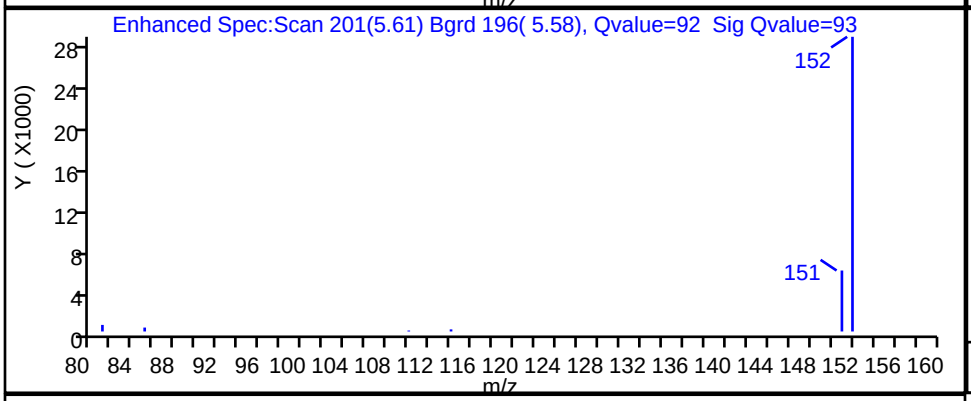
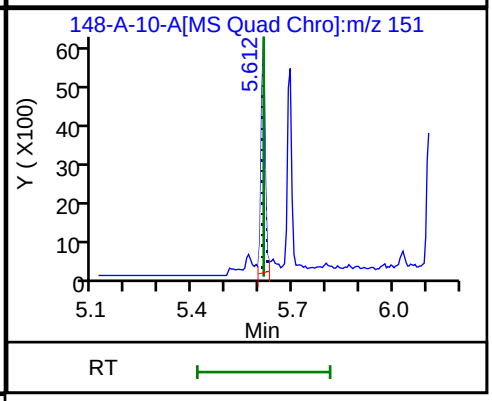
Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

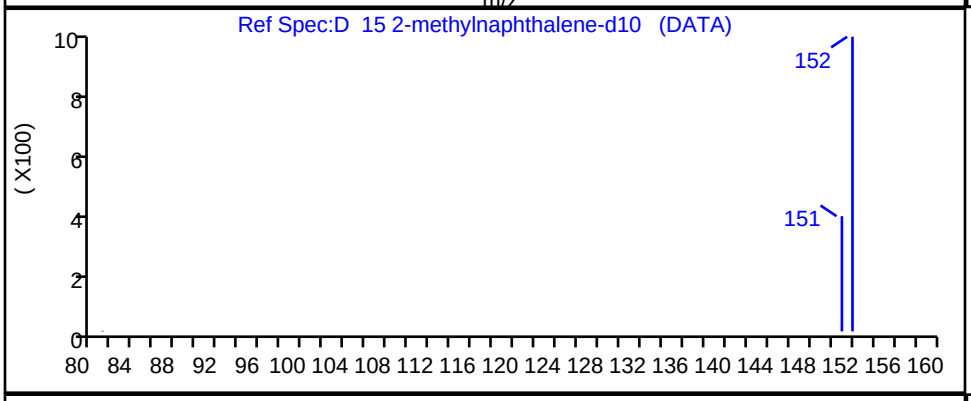
D 15 2-methylnaphthalene-d10, CAS: 7297-45-2

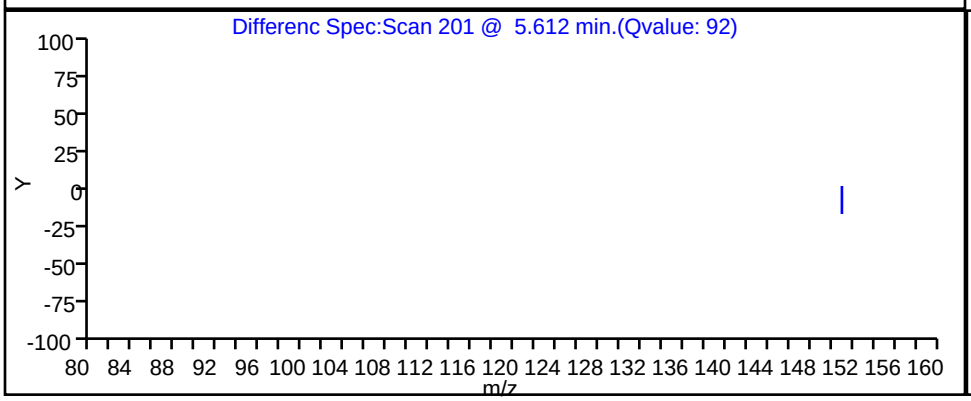


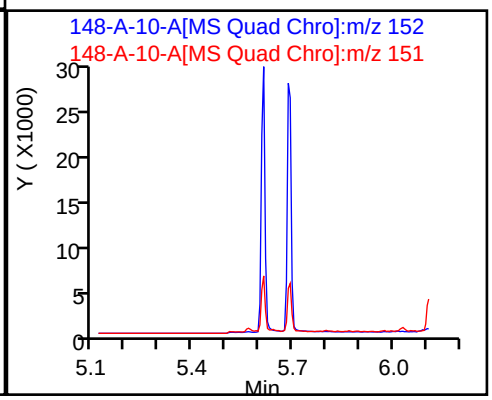












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Eurofins Knoxville

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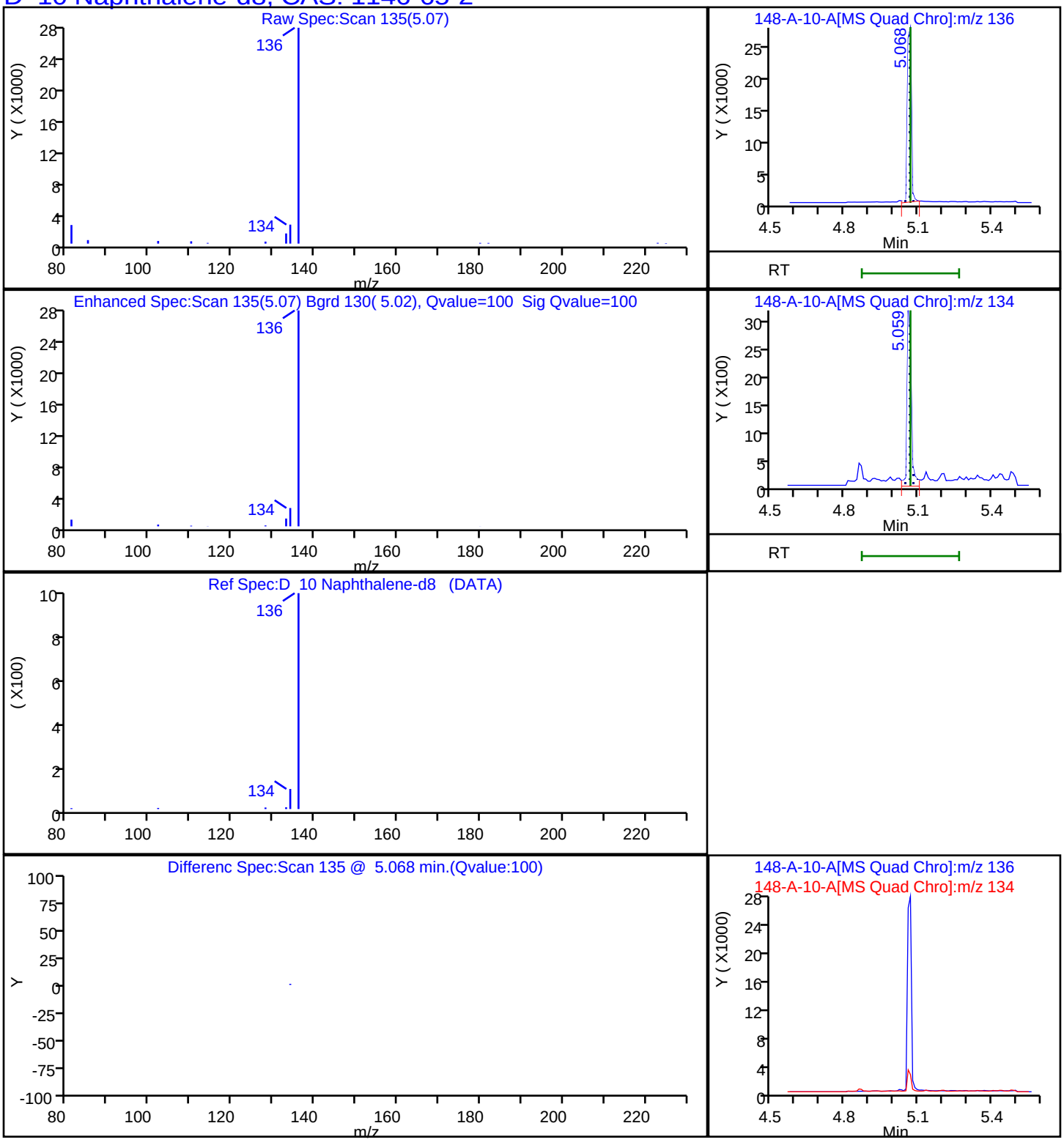
Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D_10 Naphthalene-d8, CAS: 1146-65-2



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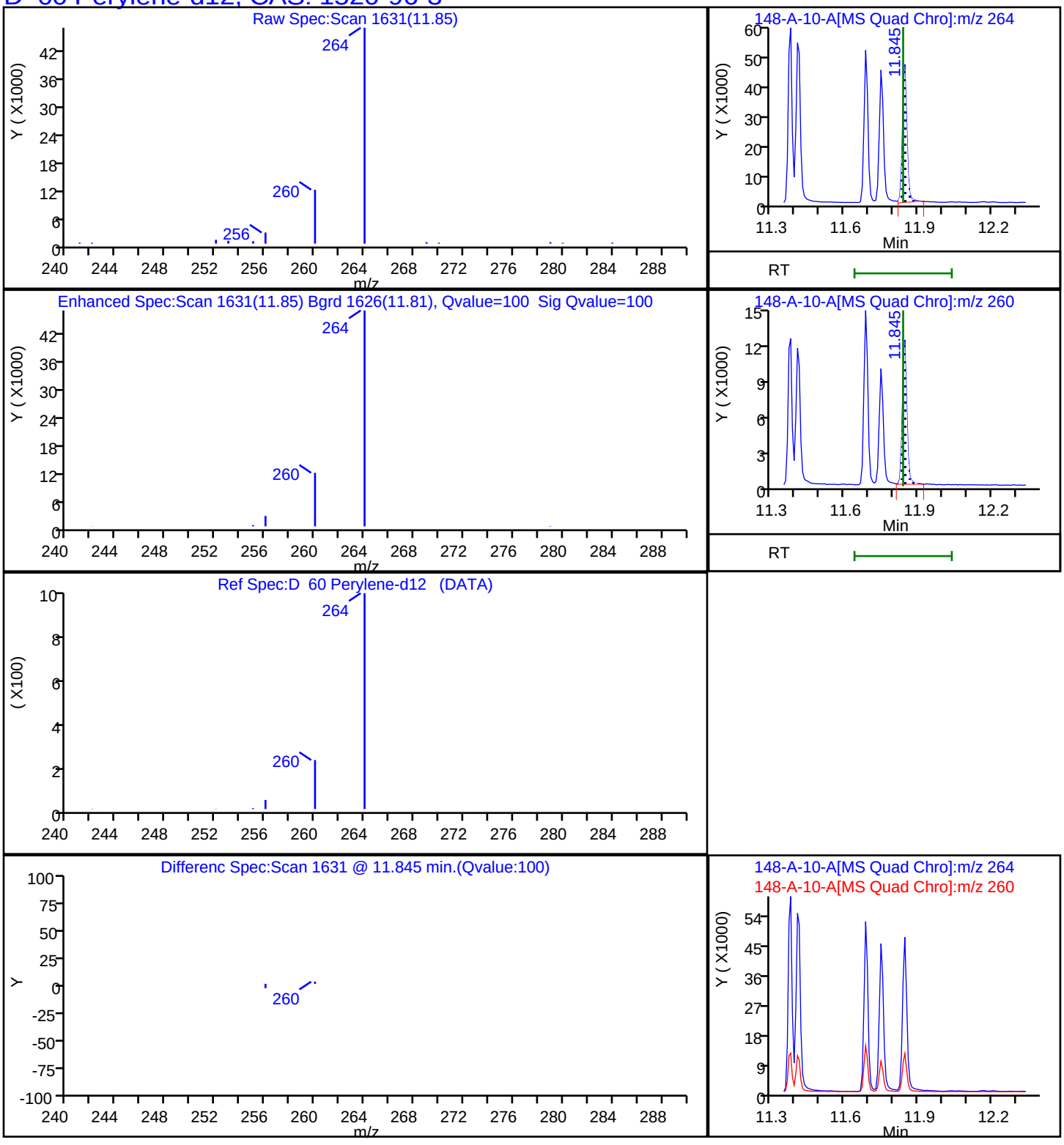
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-10-A.D

Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13
Client ID:	1804576-854-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

D 60 Perylene-d12, CAS: 1520-96-3



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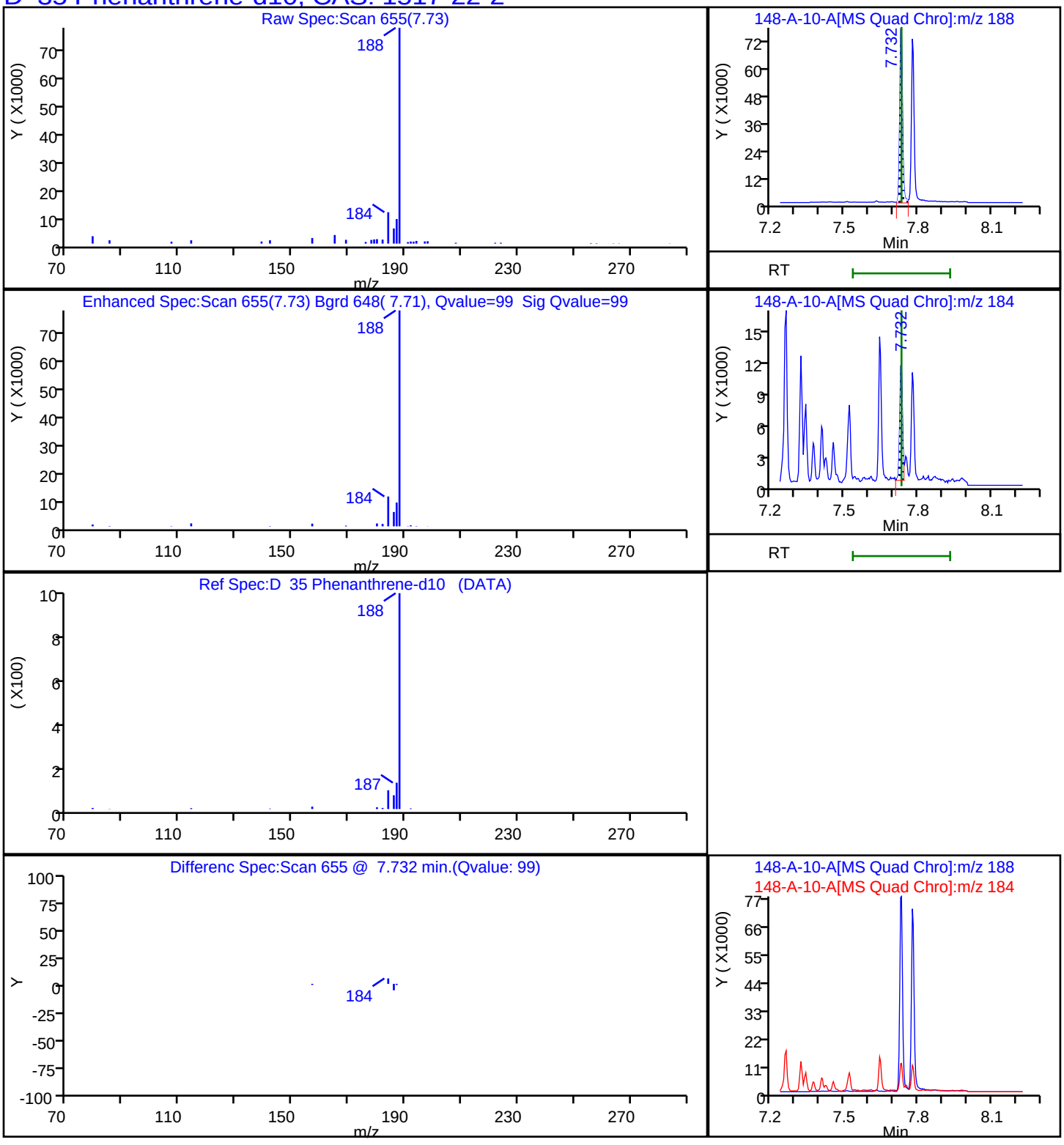
Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-10-A.D				
Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D_35 Phenanthrene-d10, CAS: 1517-22-2



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Eurofins Knoxville

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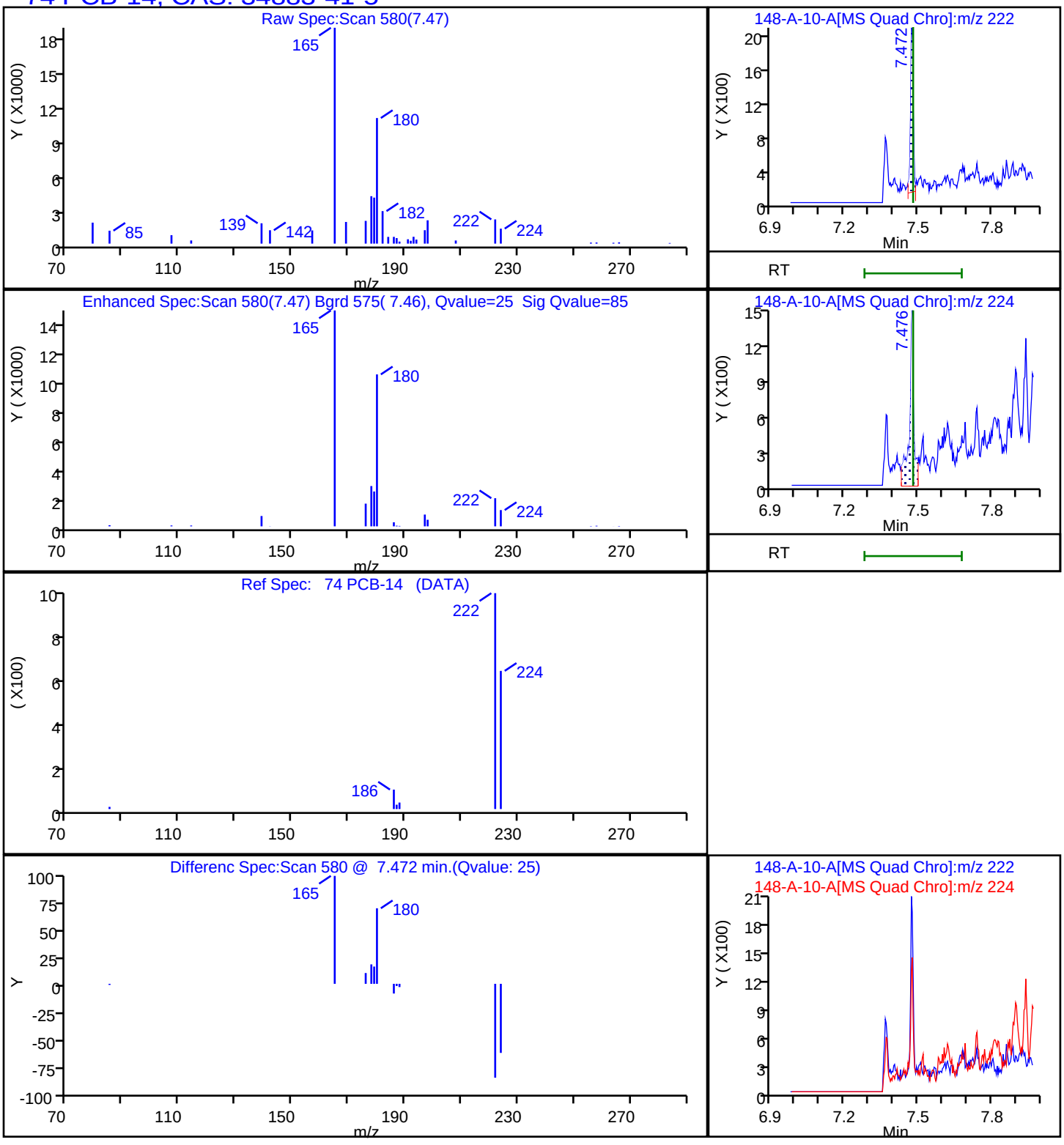
Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13
Client ID:	1804576-854-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

74 PCB-14, CAS: 34883-41-5



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Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-10-A.D

Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
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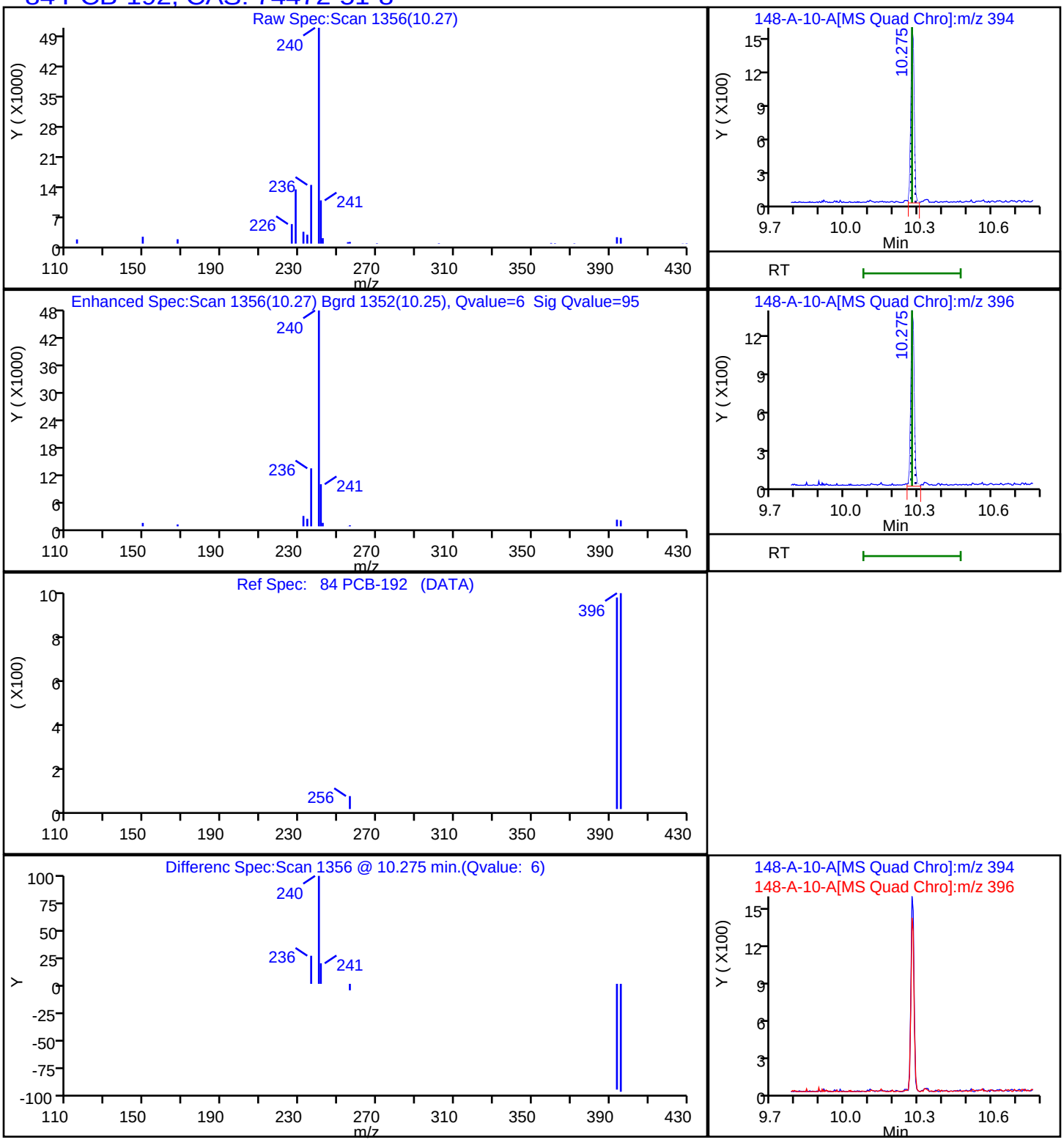
84 PCB-192, CAS: 74472-51-8



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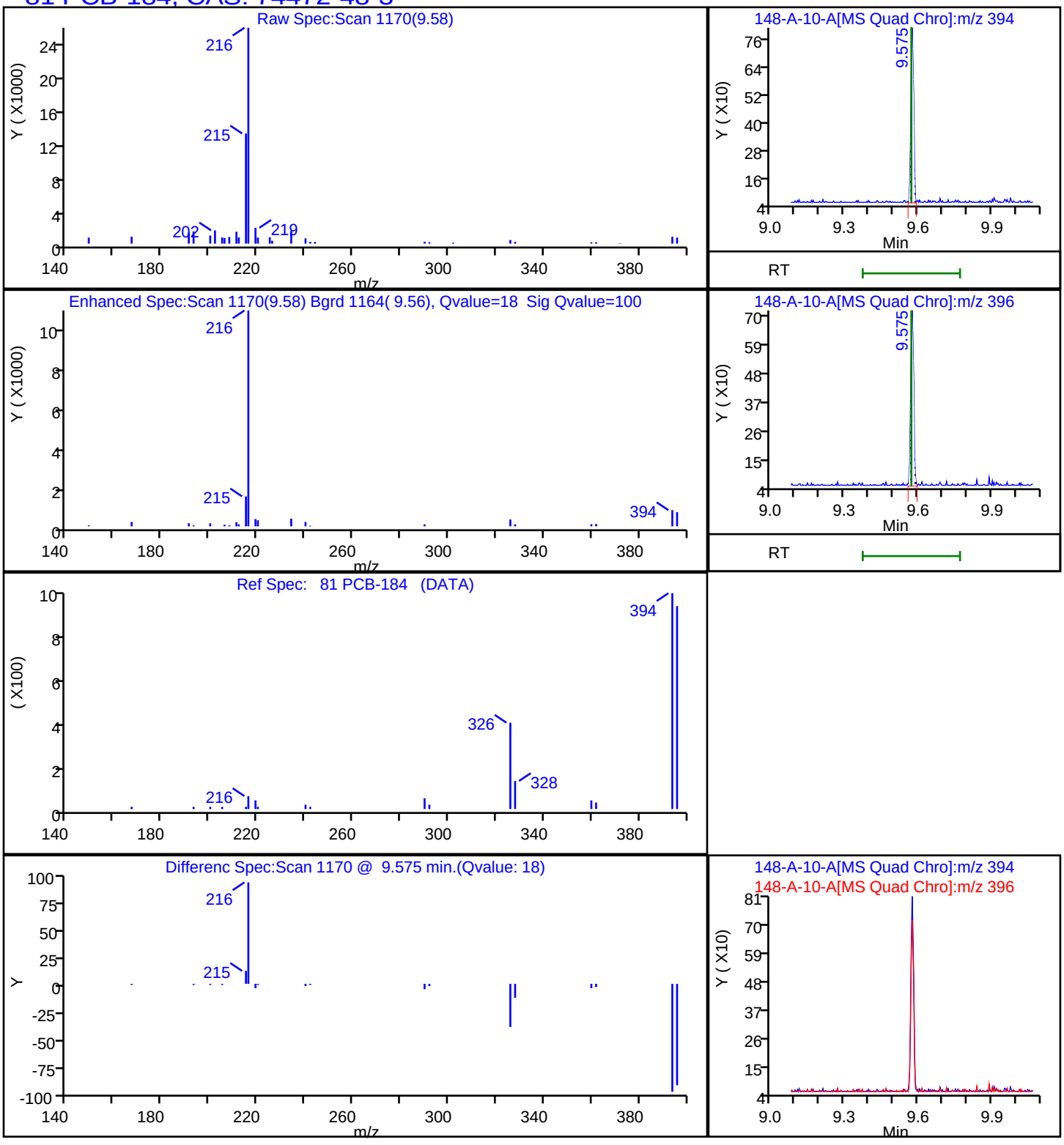
Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-10-A.D		
Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13
Client ID:	1804576-854-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

81 PCB-184, CAS: 74472-48-3



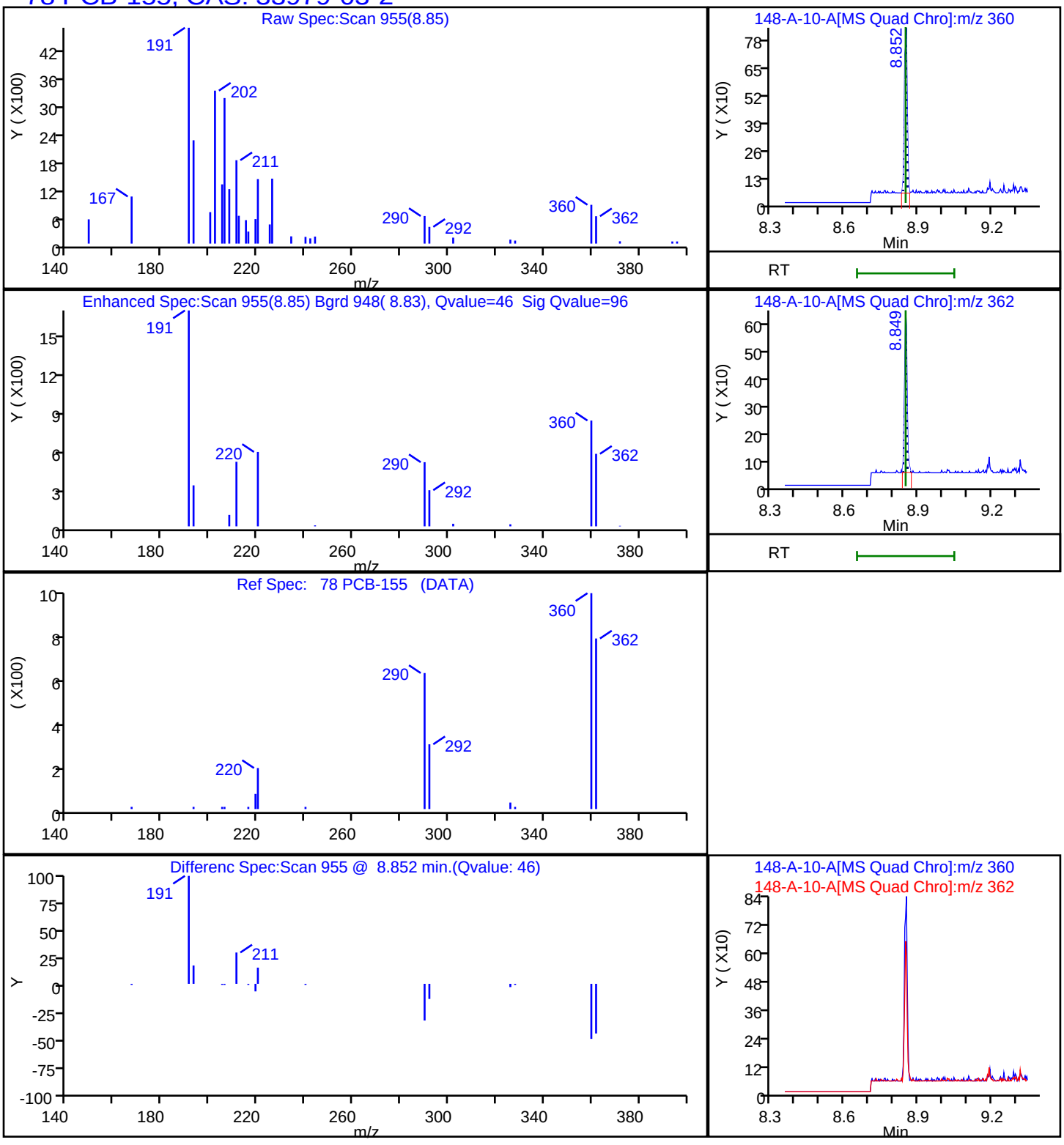
Report Date: 22-Nov-2023 11:25:29 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-10-A.D

Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13
Client ID:	1804576-854-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

78 PCB-155, CAS: 33979-03-2



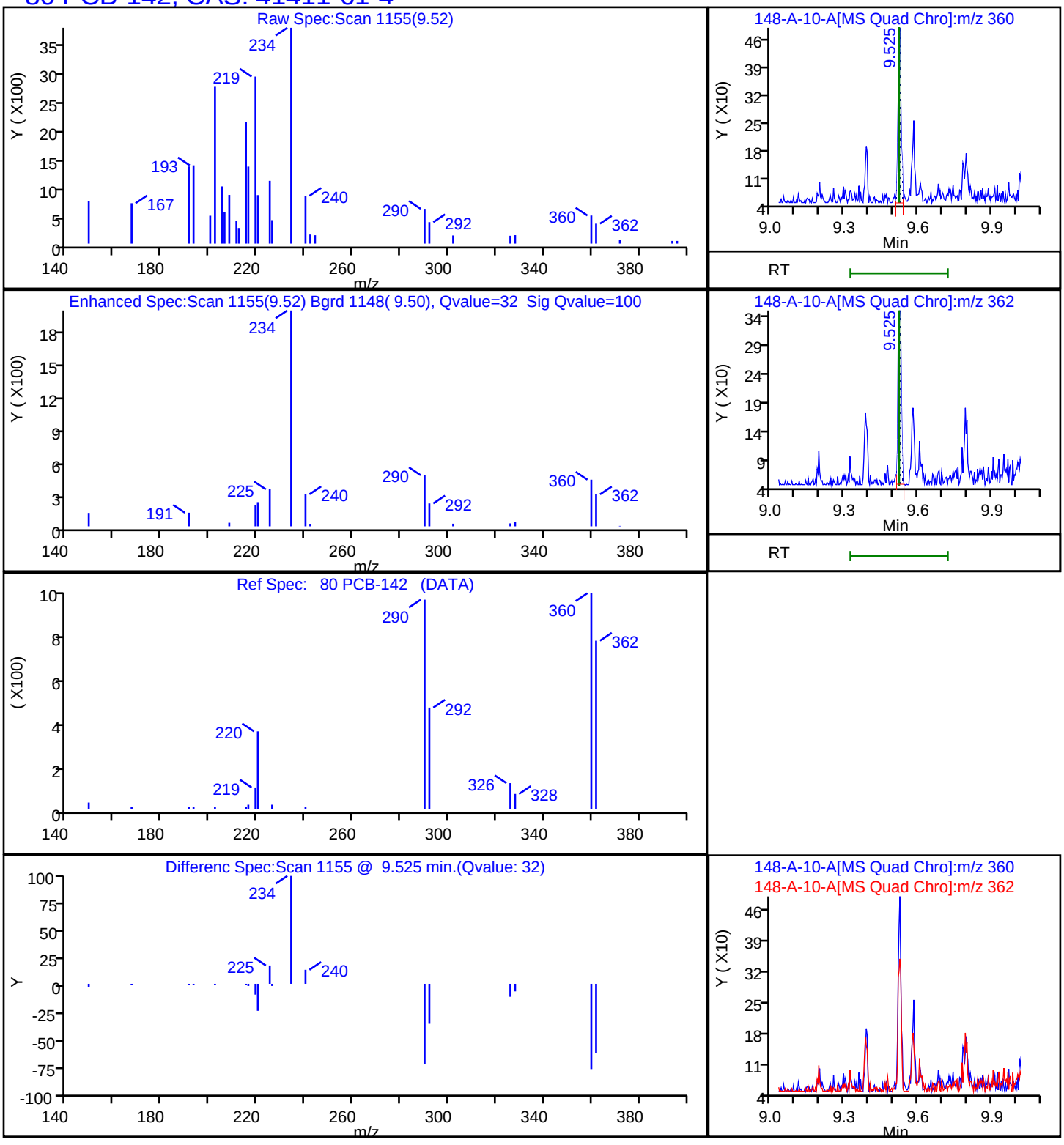
Report Date: 22-Nov-2023 11:25:29 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-10-A.D

Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13
Client ID:	1804576-854-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

80 PCB-142, CAS: 41411-61-4



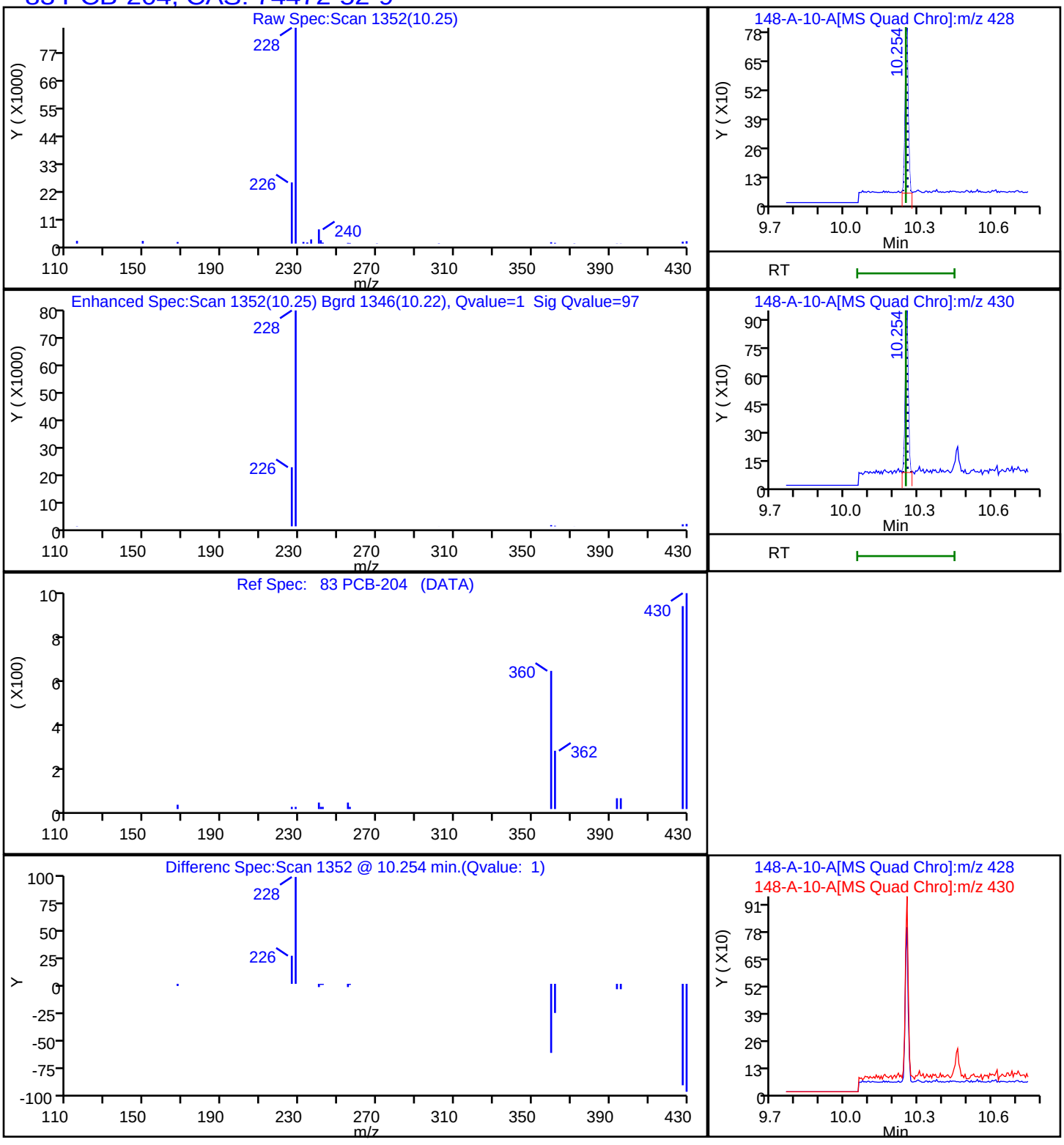
Report Date: 22-Nov-2023 11:25:29 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-10-A.D

Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

83 PCB-204, CAS: 74472-52-9



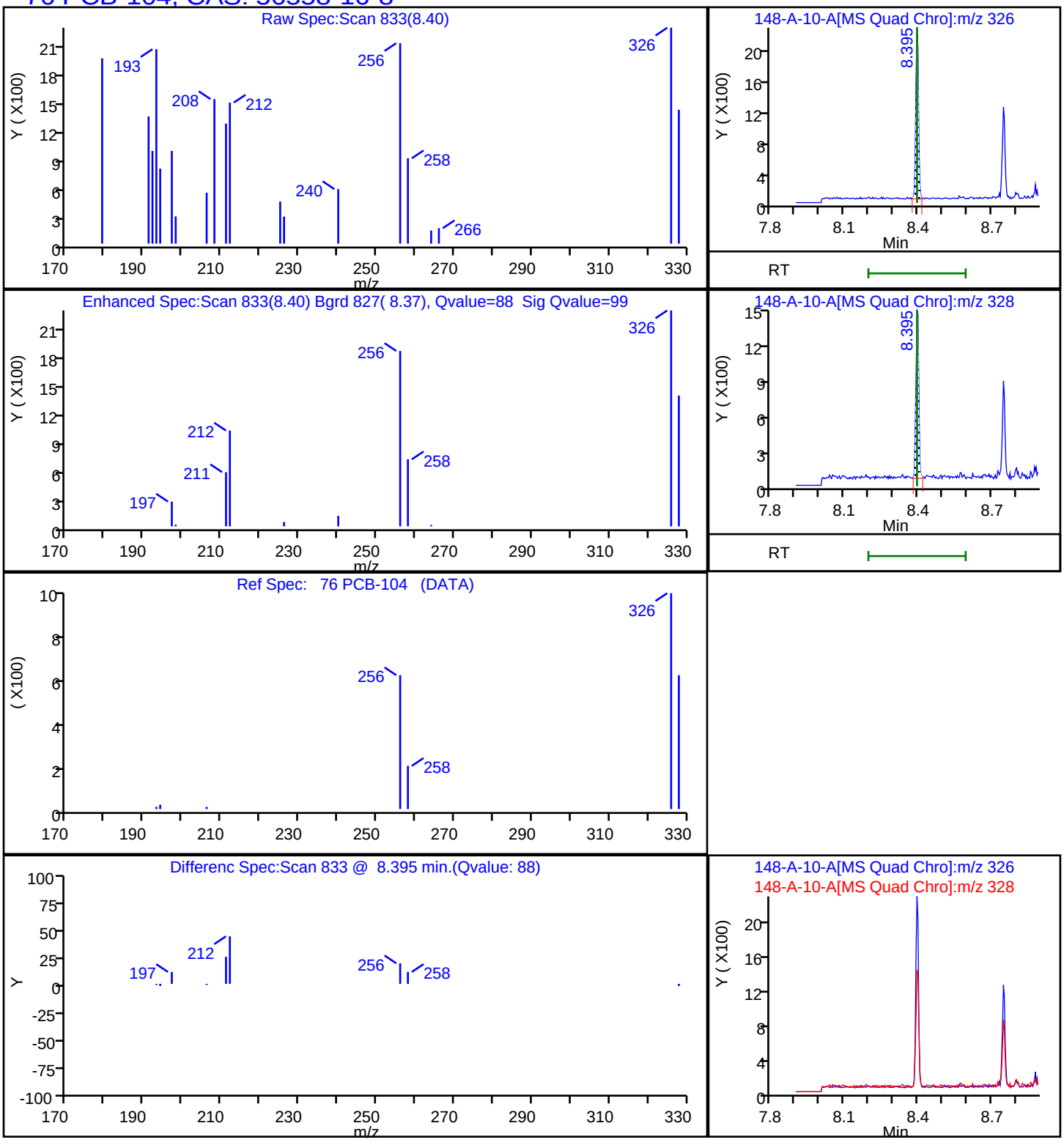
Report Date: 22-Nov-2023 11:25:29 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-10-A.D

Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

76 PCB-104, CAS: 56558-16-8



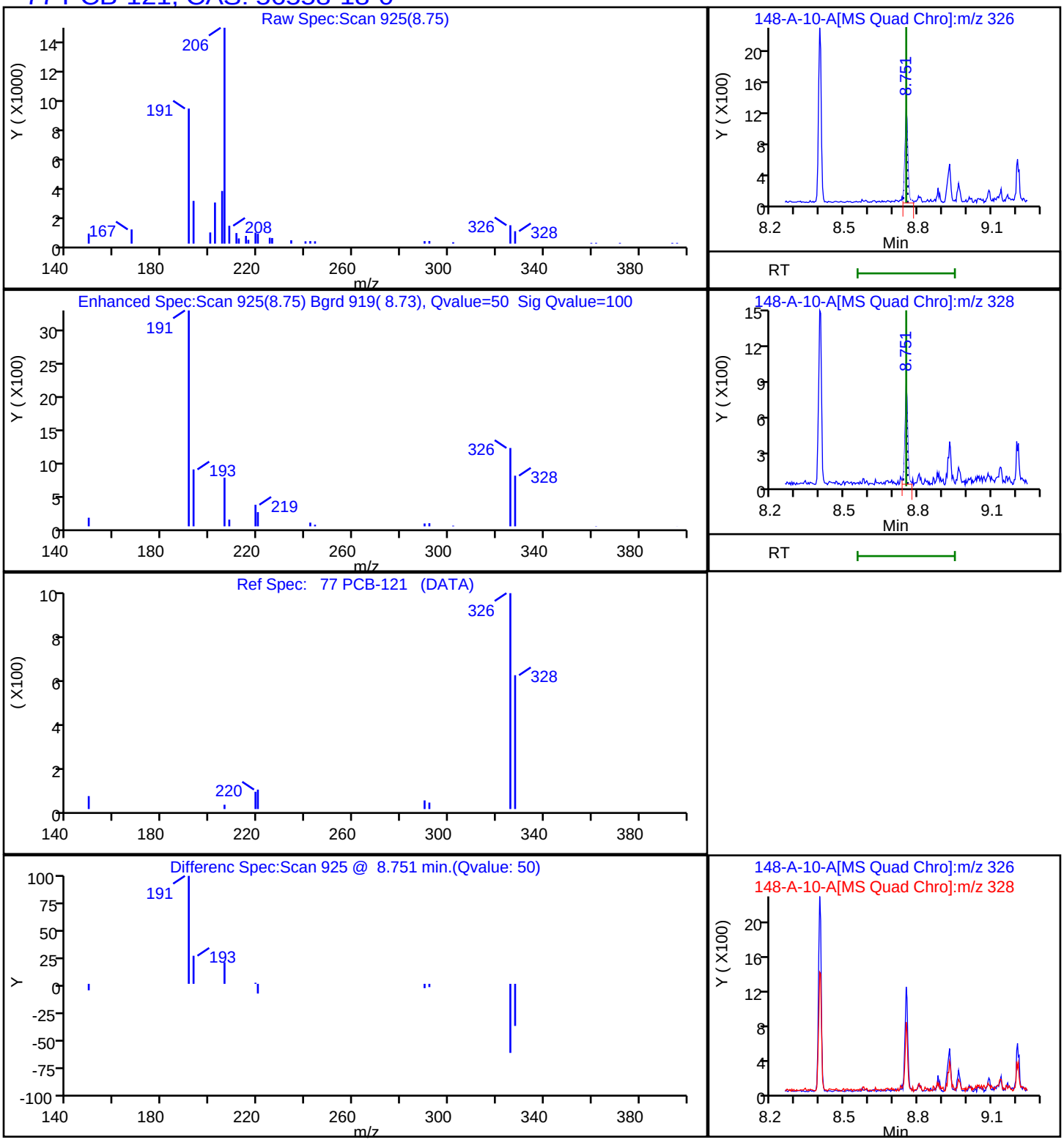
Report Date: 22-Nov-2023 11:25:29 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-10-A.D

Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

77 PCB-121, CAS: 56558-18-0



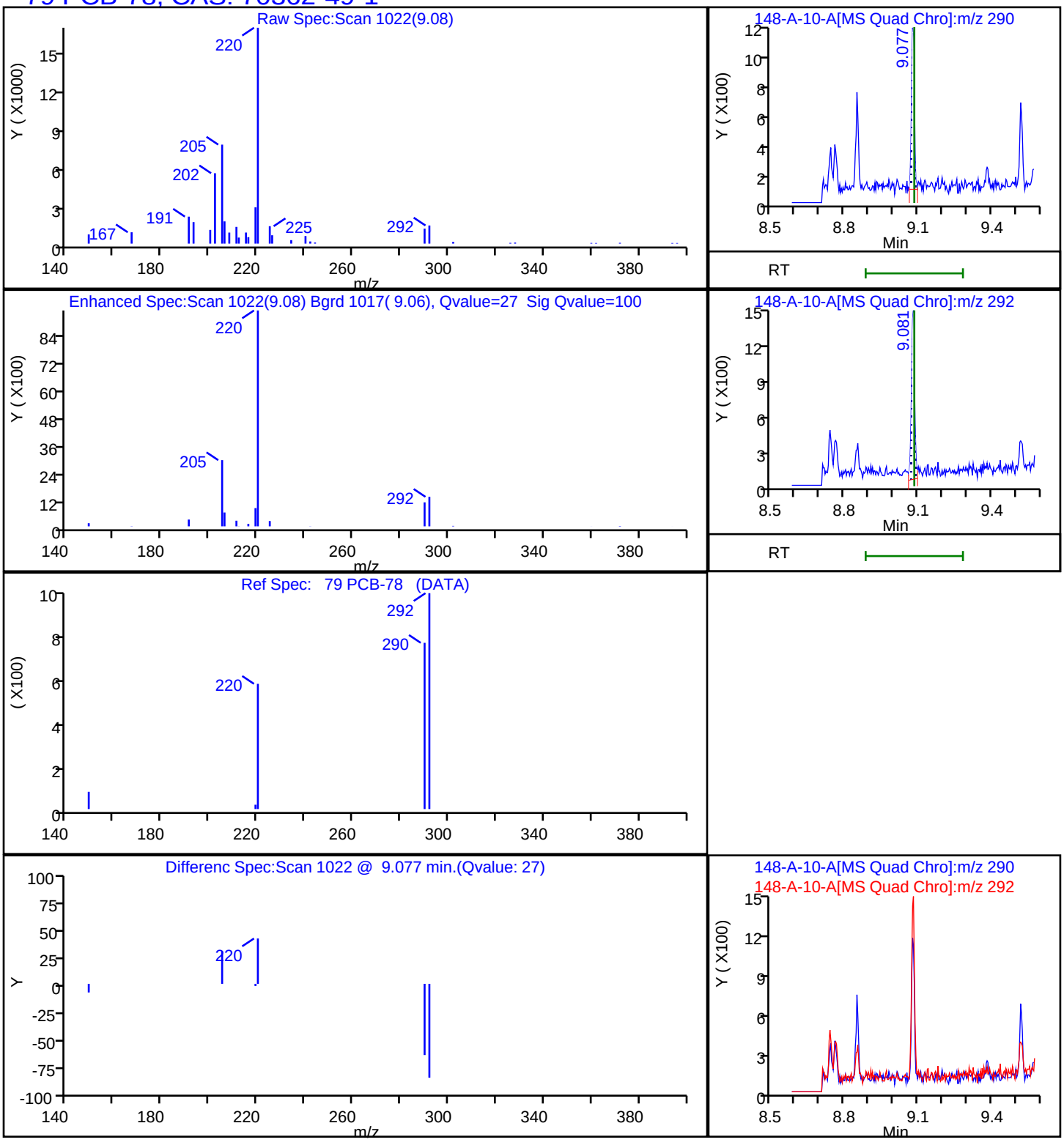
Report Date: 22-Nov-2023 11:25:29 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-10-A.D

Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13
Client ID:	1804576-854-S2		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

79 PCB-78, CAS: 70362-49-1



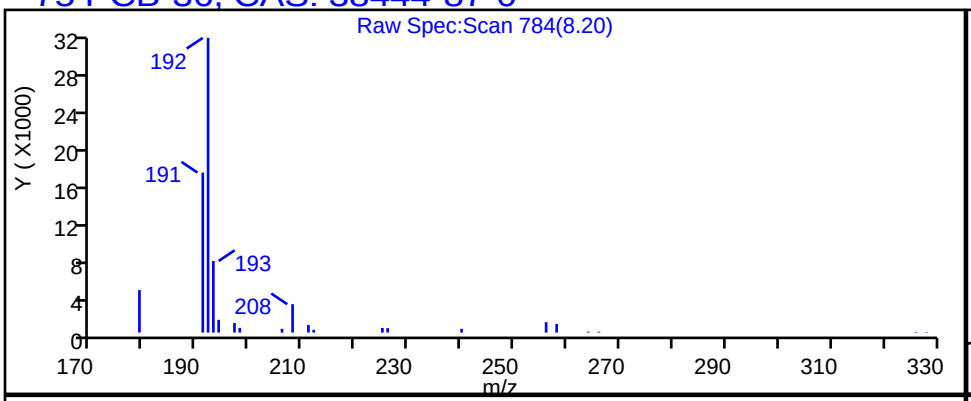
Report Date: 22-Nov-2023 11:25:29 Chrom Revision: 2.3 15-Nov-2023 20:54:34

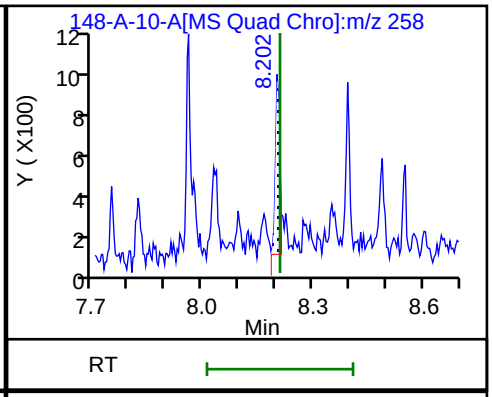
Eurofins Knoxville

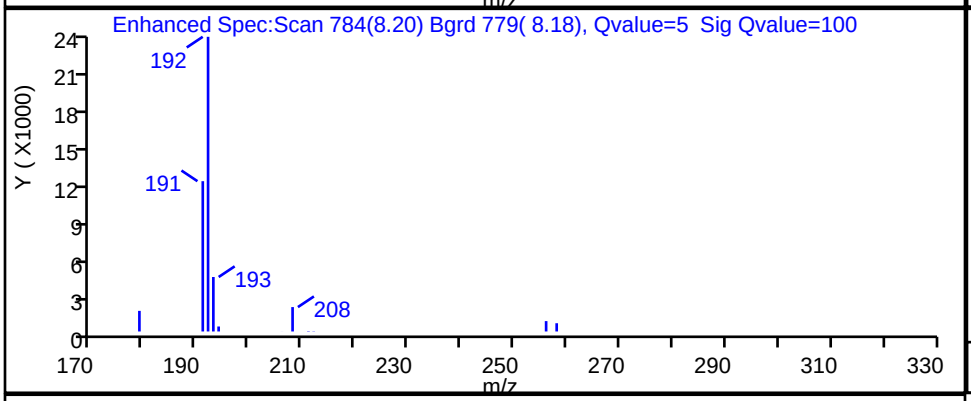
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-10-A.D

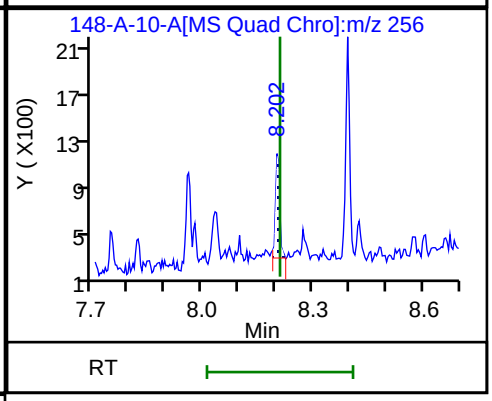
Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

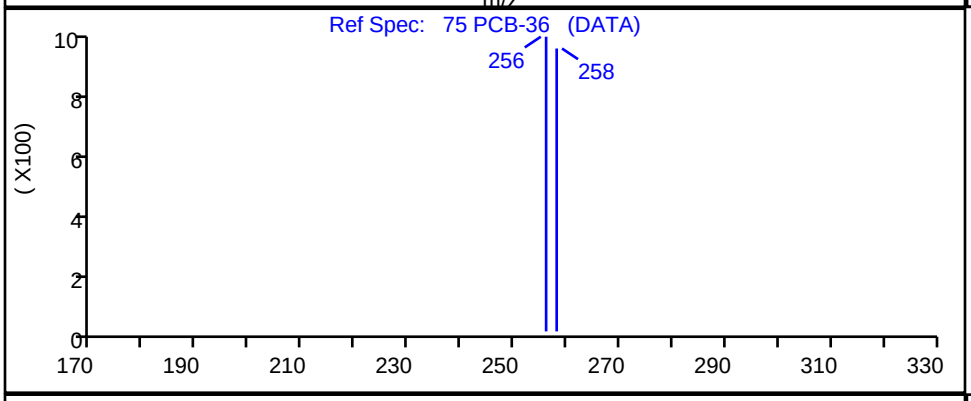
75 PCB-36, CAS: 38444-87-0

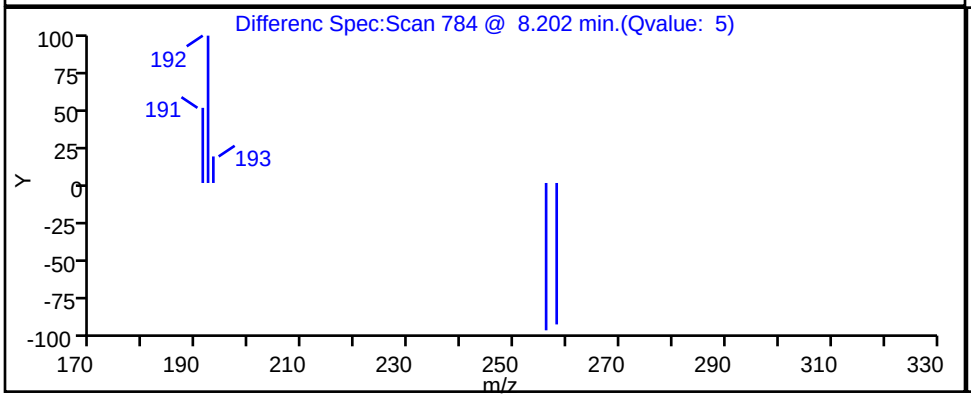


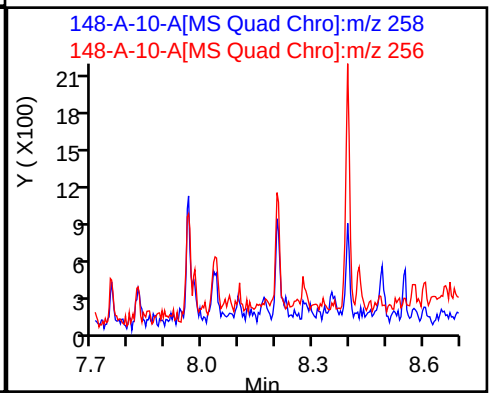












Manual Integration/User Assign Peak Report

Eurofins Knoxville

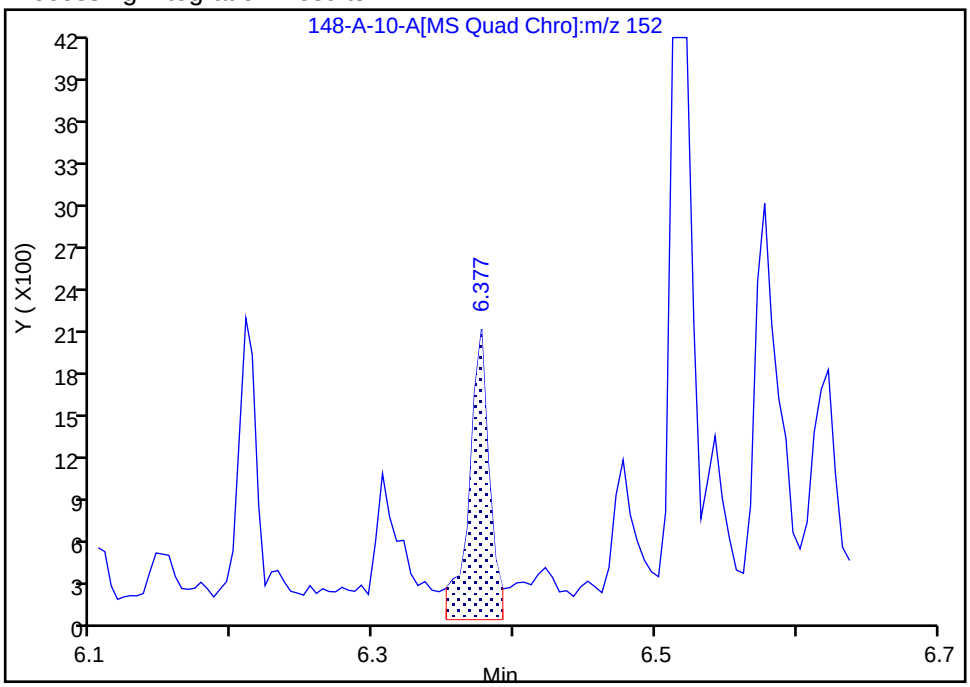
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-10-A.D				
Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

24 Acenaphthylene, CAS: 208-96-8

Signal: 1

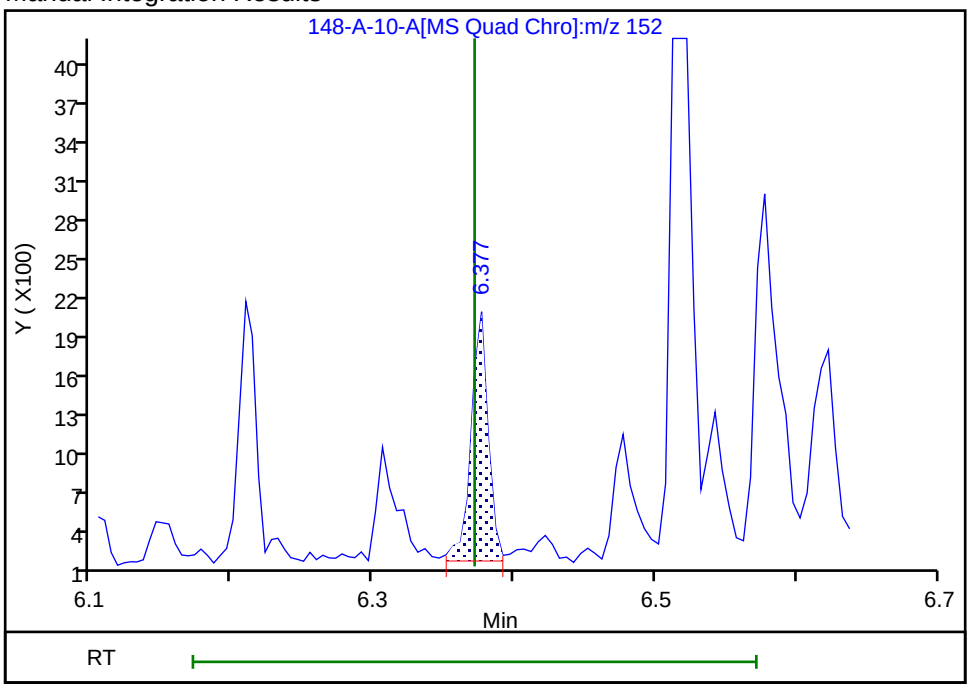
Processing Integration Results

RT: 6.38
Area: 2071
Amount: 0.021189
Amount Units: ug/ml



Manual Integration Results

RT: 6.38
Area: 1599
Amount: 0.016360
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:01:03 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

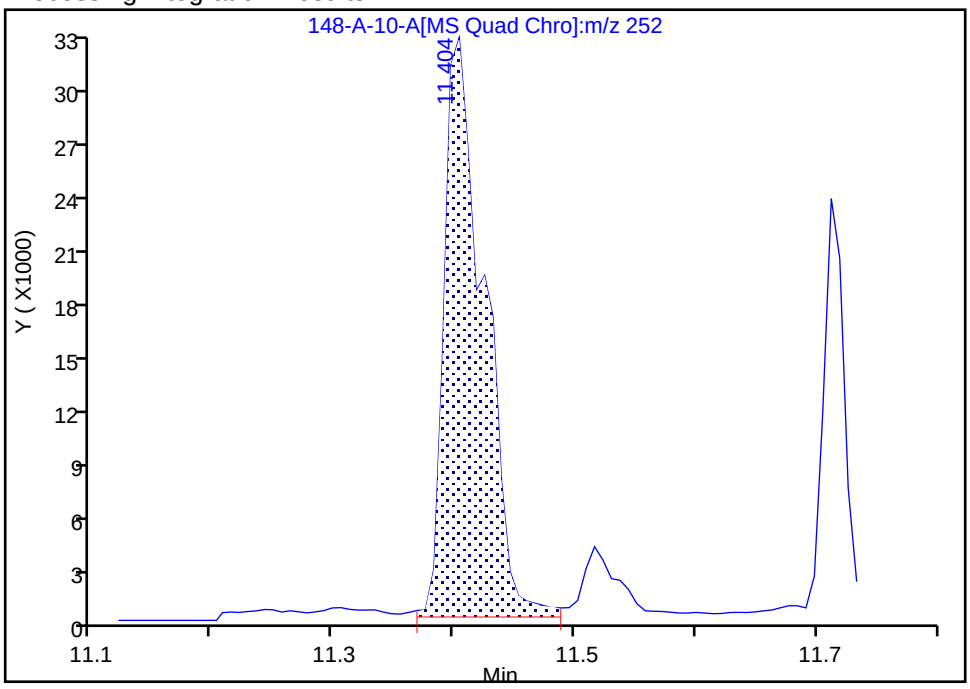
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-10-A.D				
Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

53 Benzo[b]fluoranthene, CAS: 205-99-2

Signal: 1

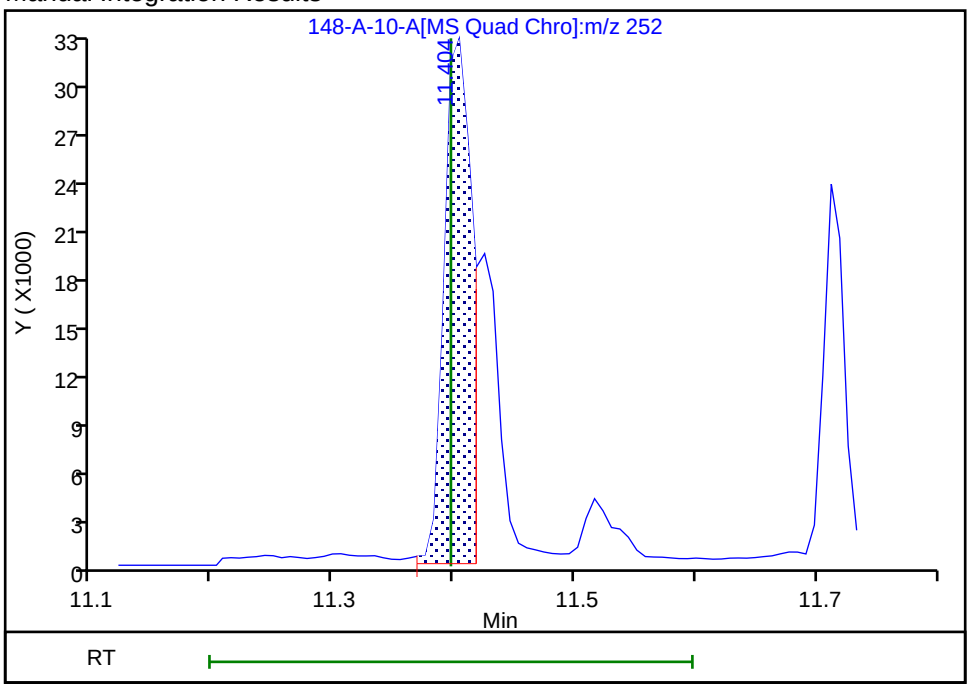
Processing Integration Results

RT: 11.40
Area: 73079
Amount: 0.326937
Amount Units: ug/ml



Manual Integration Results

RT: 11.40
Area: 52180
Amount: 0.233440
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:01:55 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

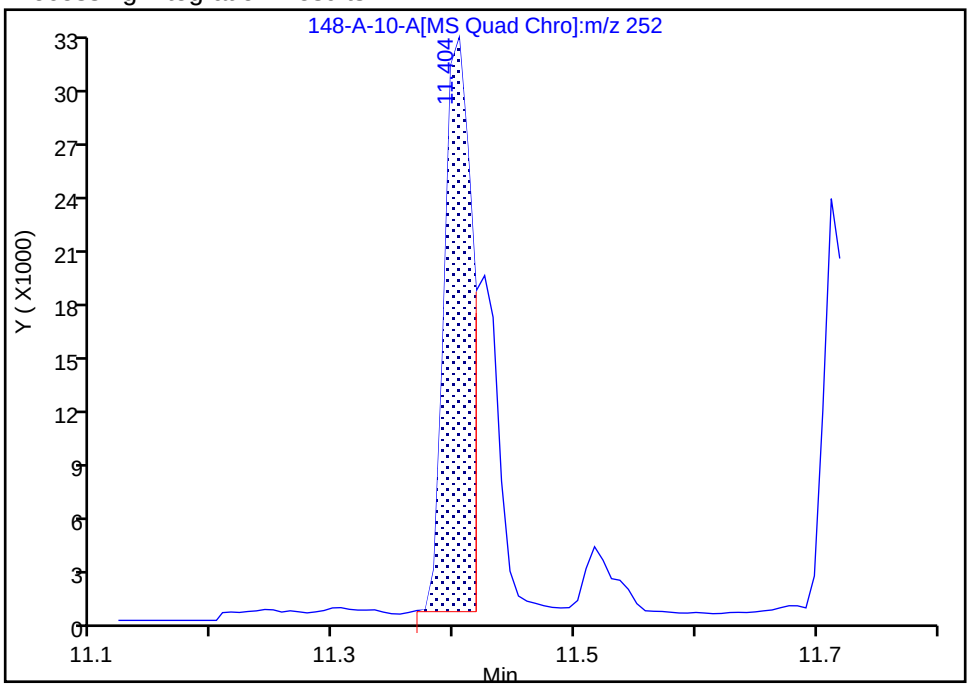
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-10-A.D				
Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

55 Benzo[k]fluoranthene, CAS: 207-08-9

Signal: 1

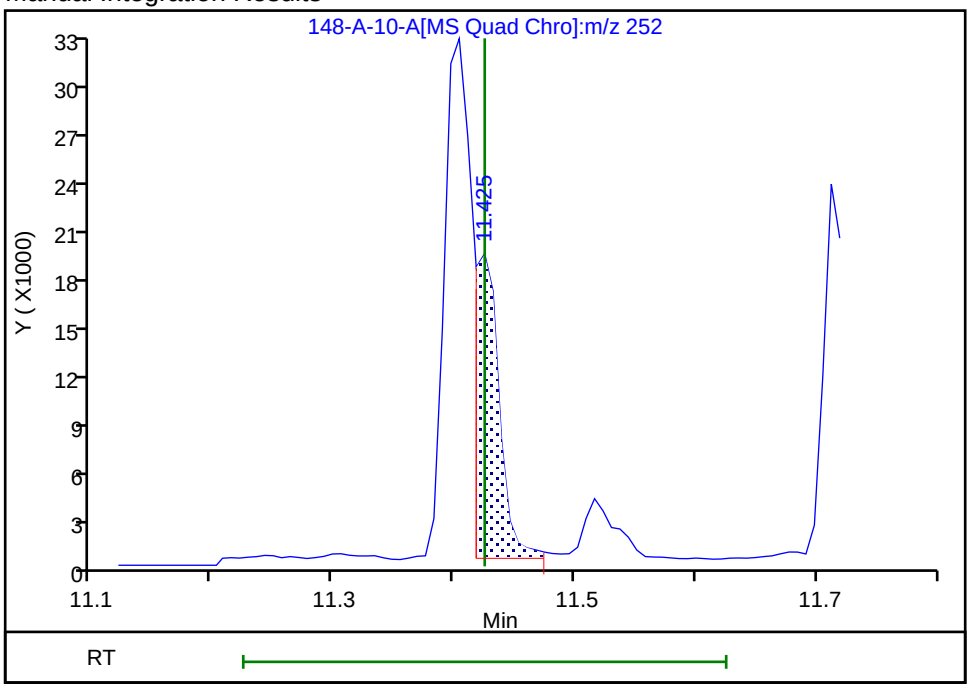
Processing Integration Results

RT: 11.40
Area: 50820
Amount: 0.238135
Amount Units: ug/ml



Manual Integration Results

RT: 11.43
Area: 27193
Amount: 0.127422
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:02:29 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

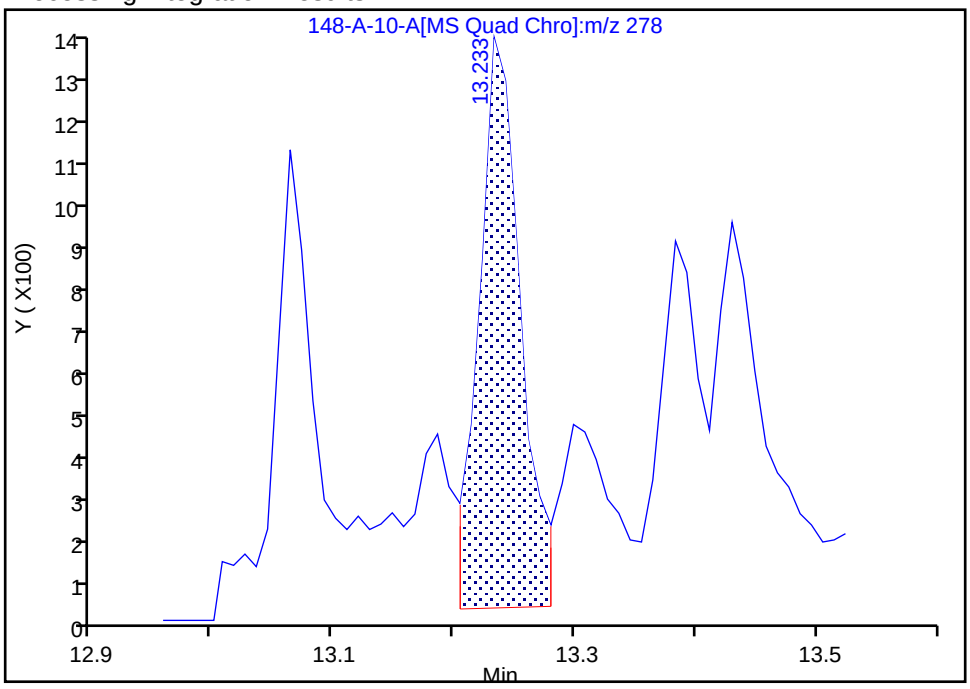
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-10-A.D				
Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

66 Dibenz(a,h)anthracene, CAS: 53-70-3

Signal: 1

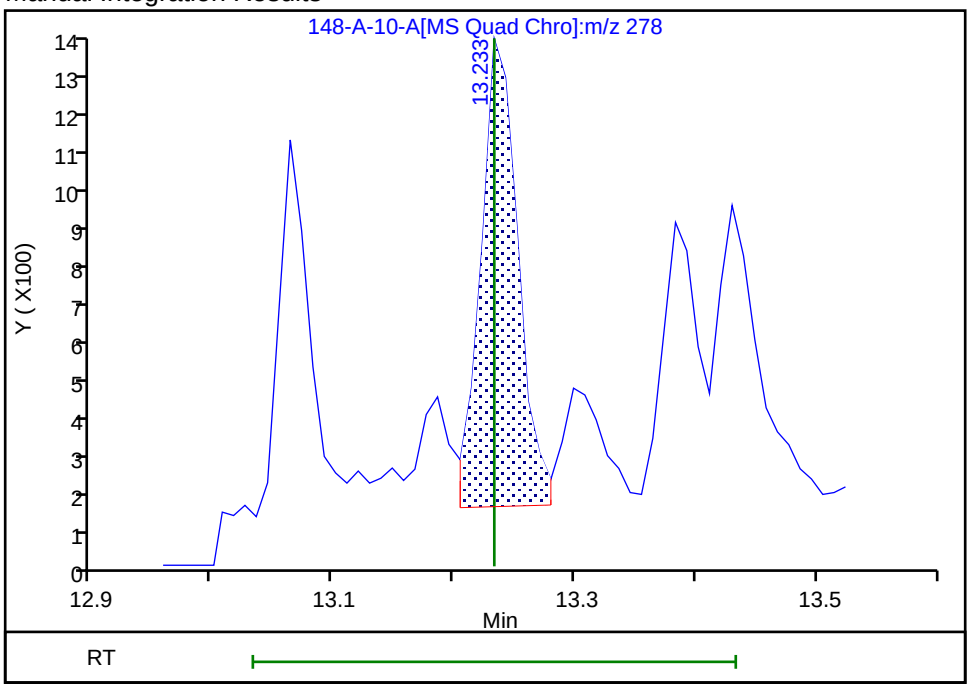
Processing Integration Results

RT: 13.23
Area: 3330
Amount: 0.018977
Amount Units: ug/ml



Manual Integration Results

RT: 13.23
Area: 2697
Amount: 0.015370
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:03:10 -05:00:00 (UTC)
Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

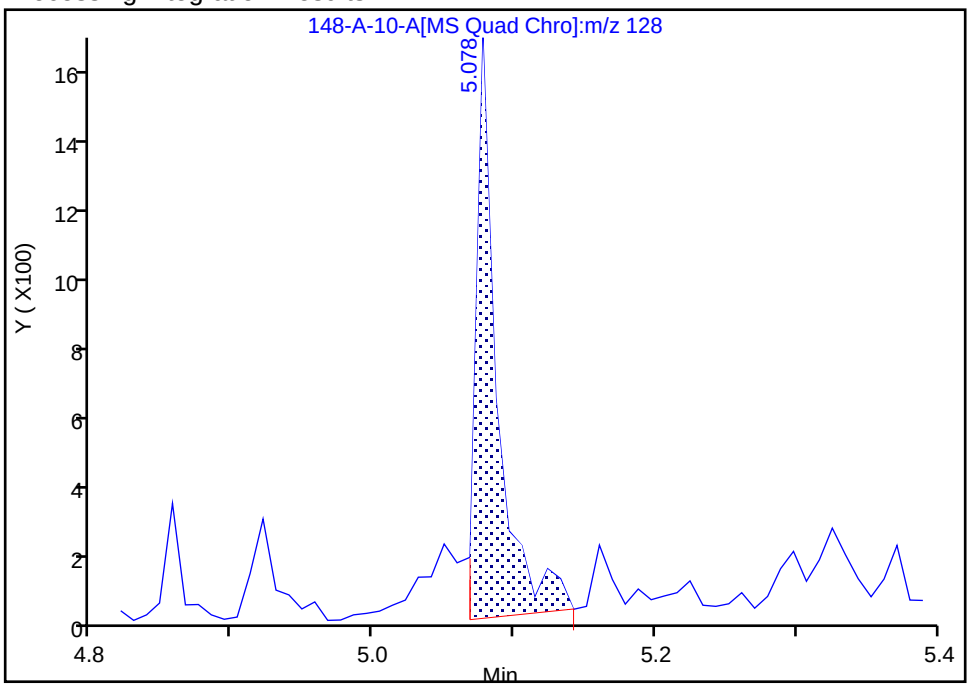
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-10-A.D				
Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

12 Naphthalene, CAS: 91-20-3

Signal: 1

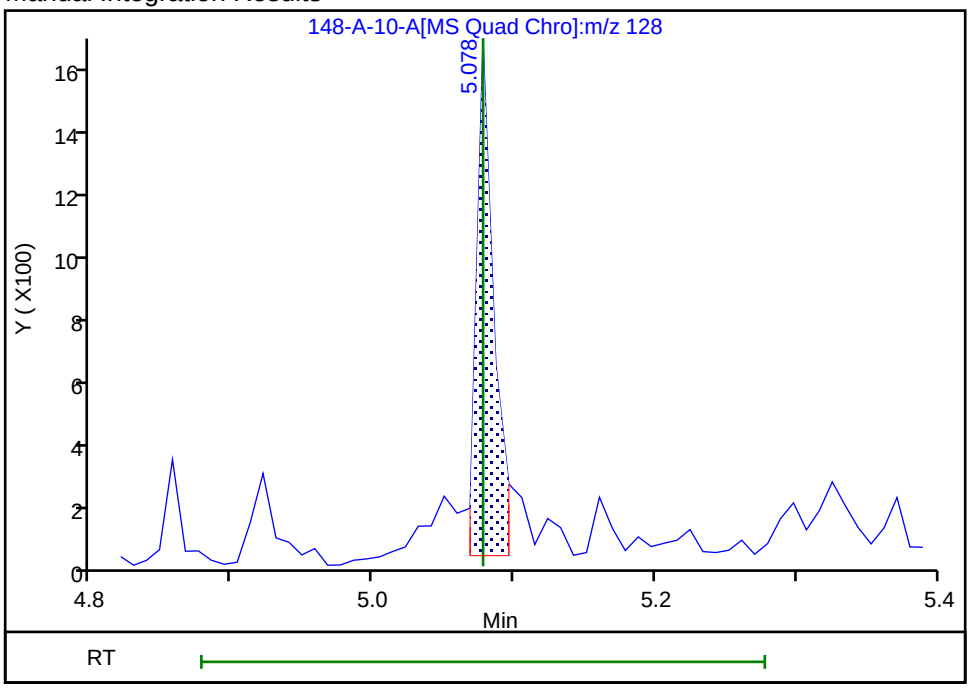
Processing Integration Results

RT: 5.08
Area: 1648
Amount: 0.022306
Amount Units: ug/ml



Manual Integration Results

RT: 5.08
Area: 1370
Amount: 0.018543
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:00:50 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Eurofins Knoxville

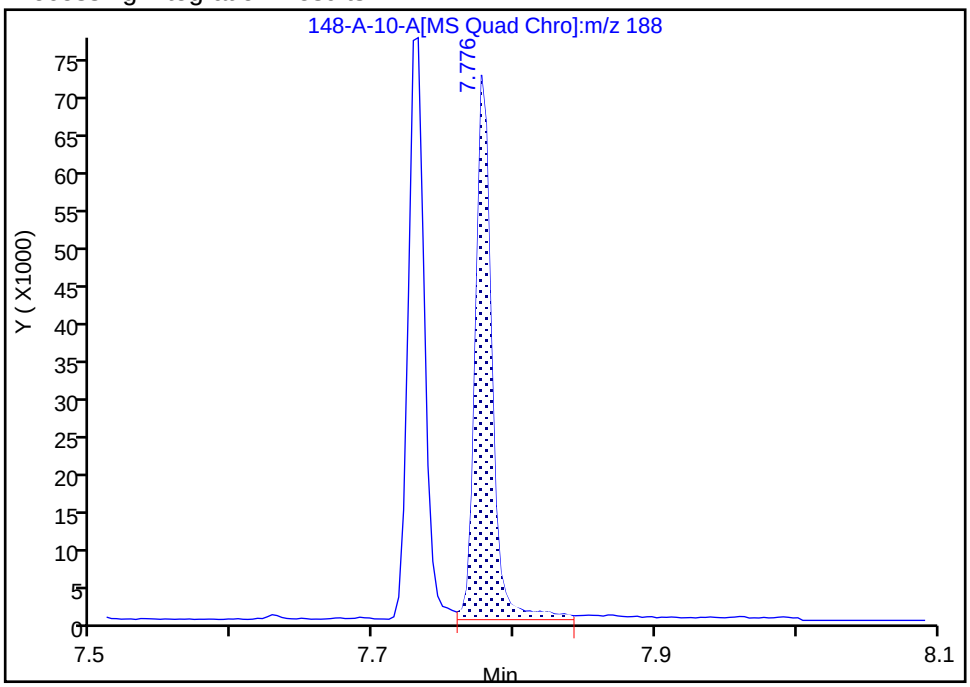
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-10-A.D				
Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 38 Anthracin-d10, CAS: 1719-06-8

Signal: 1

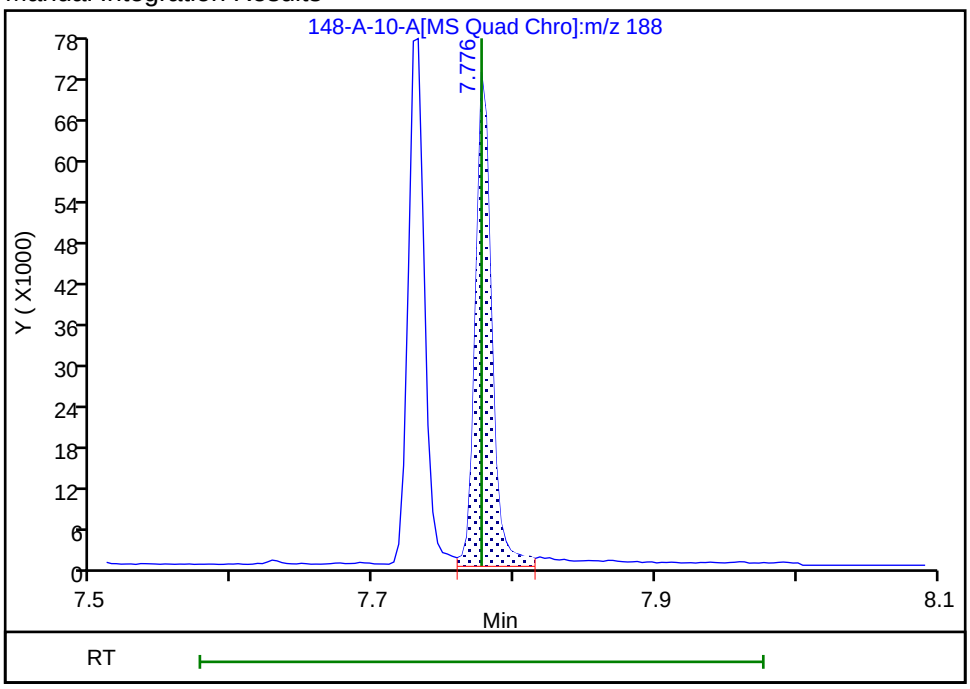
Processing Integration Results

RT: 7.78
Area: 59901
Amount: 0.408234
Amount Units: ug/ml



Manual Integration Results

RT: 7.78
Area: 58411
Amount: 0.398080
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:01:23 -05:00:00 (UTC)
Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

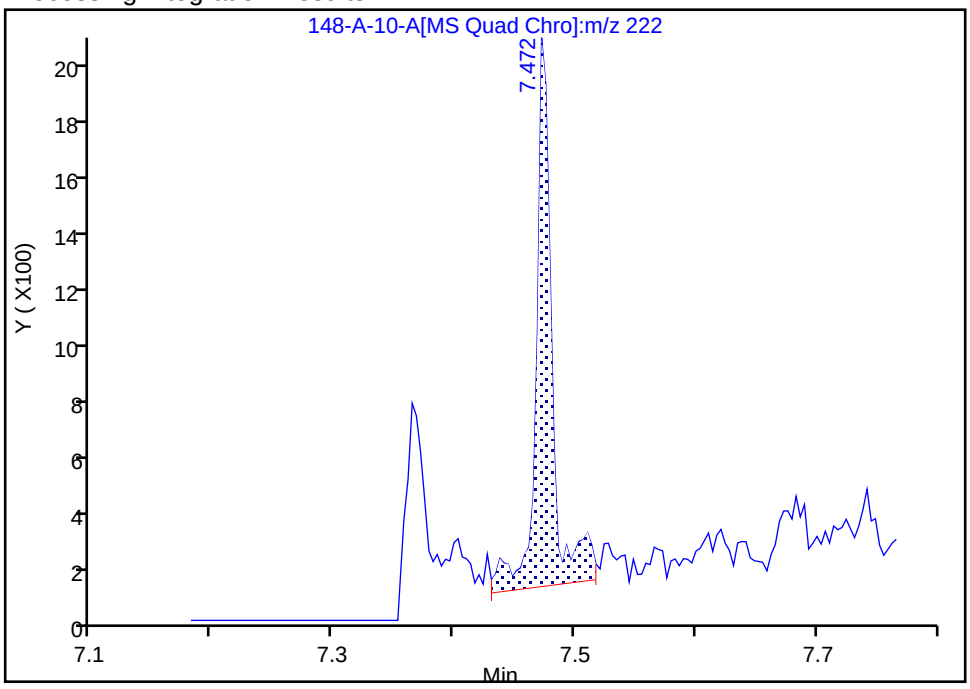
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-10-A.D				
Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

74 PCB-14, CAS: 34883-41-5

Signal: 1

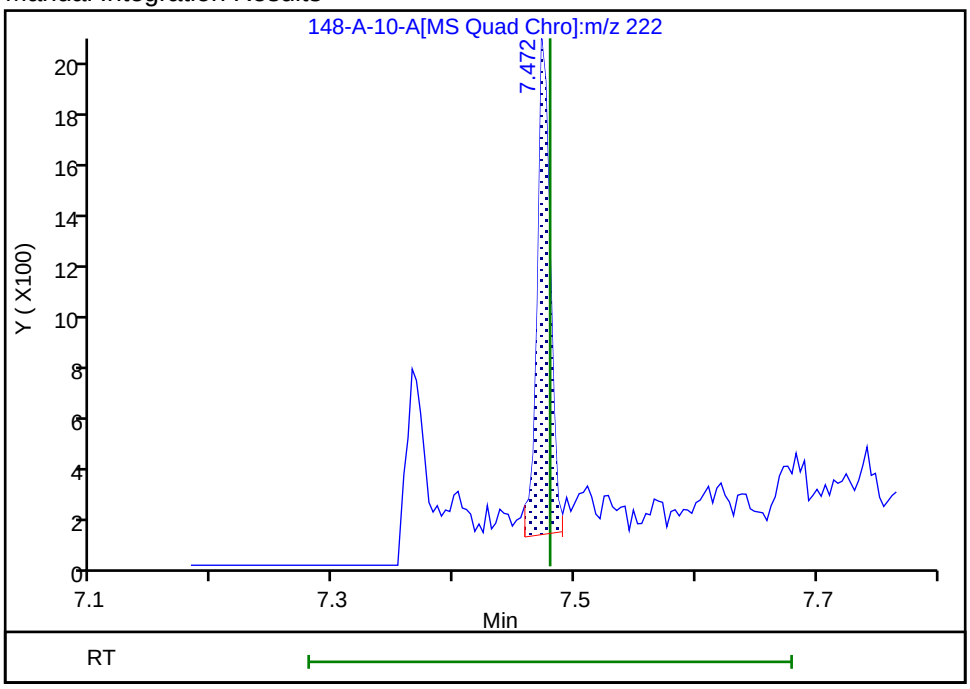
Processing Integration Results

RT: 7.47
Area: 1792
Amount: 0.014658
Amount Units: ug/ml



Manual Integration Results

RT: 7.47
Area: 1467
Amount: 0.012000
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:03:32 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

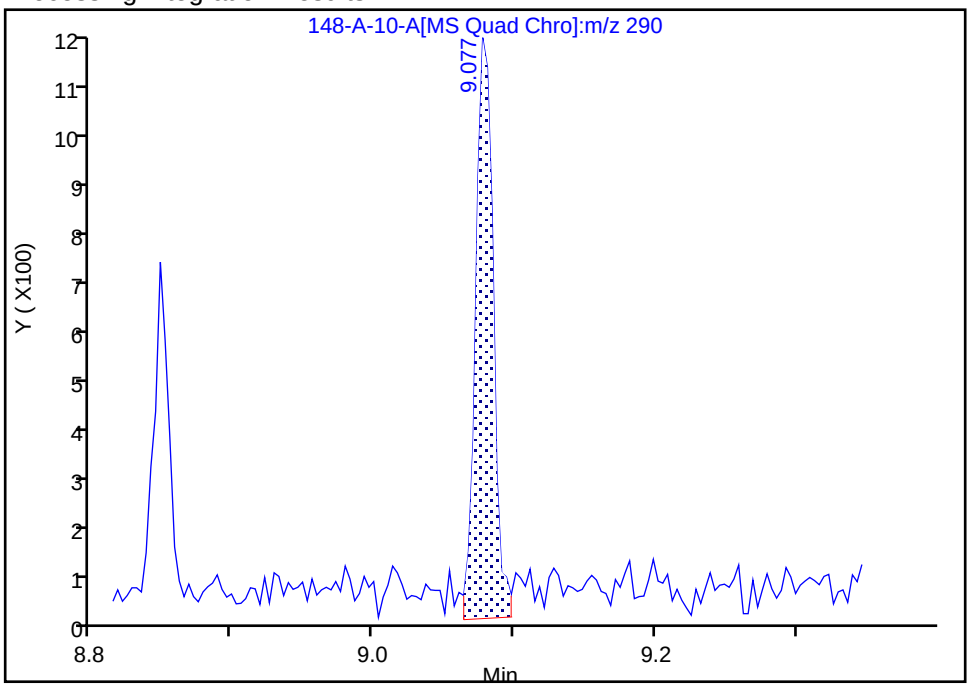
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-10-A.D				
Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

79 PCB-78, CAS: 70362-49-1

Signal: 1

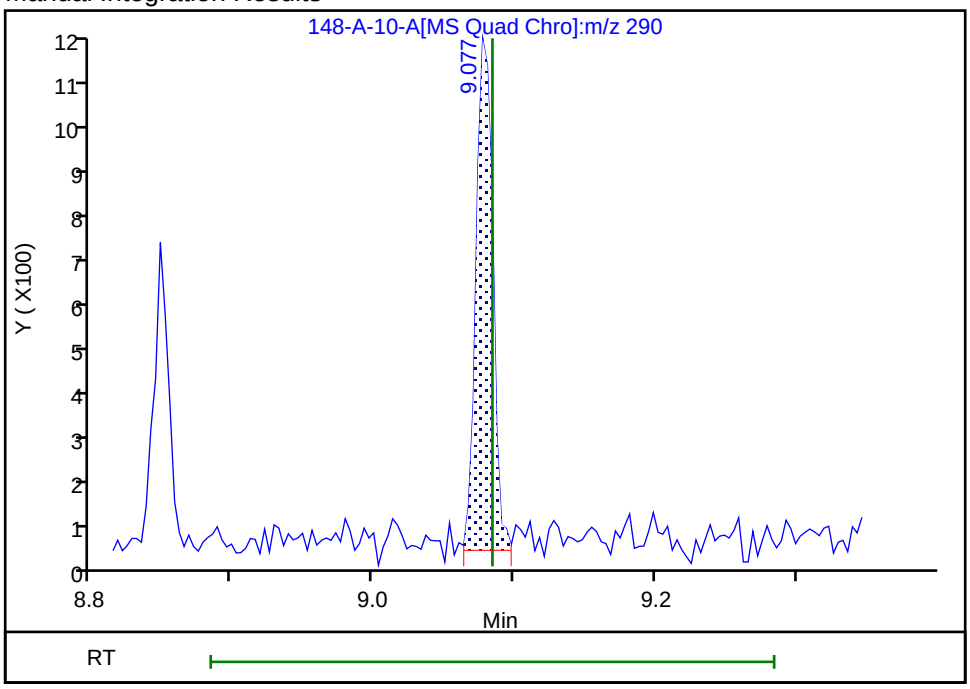
Processing Integration Results

RT: 9.08
Area: 980
Amount: 0.030647
Amount Units: ug/ml



Manual Integration Results

RT: 9.08
Area: 899
Amount: 0.028132
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:04:07 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

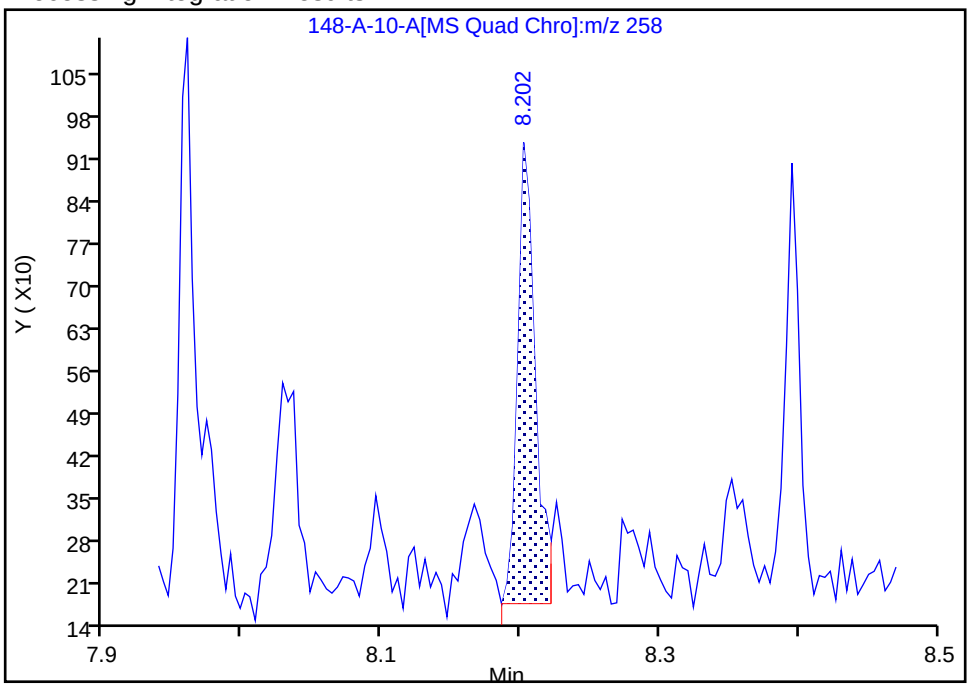
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-10-A.D				
Injection Date:	16-Nov-2023 18:35:29	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-13-A	Lab Sample ID:	140-34148-13		
Client ID:	1804576-854-S2				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

75 PCB-36, CAS: 38444-87-0

Signal: 1

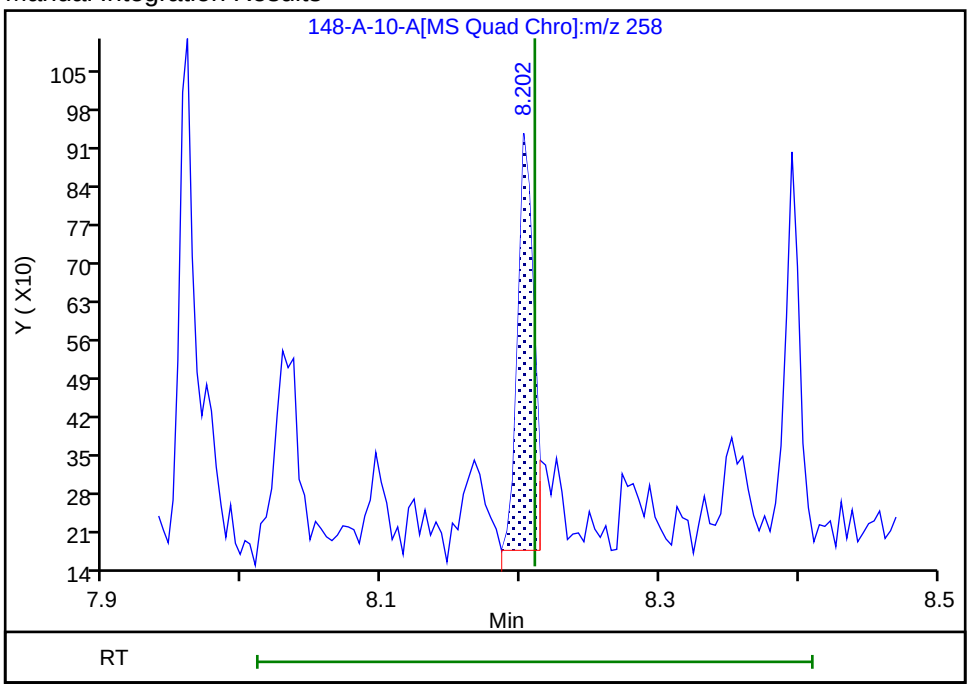
Processing Integration Results

RT: 8.20
Area: 677
Amount: 0.010519
Amount Units: ug/ml



Manual Integration Results

RT: 8.20
Area: 615
Amount: 0.009556
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:03:44 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: 1804576-846-S1 | Lab Sample ID: 140-34148-14

Matrix: PE | Lab File ID: 140-34148-A-11-A.D

Analysis Method: ID-0016 | Date Collected: 10/26/2023 14:00

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.010(g) | Date Analyzed: 11/16/2023 18:59

Con. Extract Vol.: 500(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80349 | Units: ng/g

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
83-32-9	Acenaphthene	400	J	1000	260
208-96-8	Acenaphthylene	ND		1000	73
120-12-7	Anthracene	380	J	1000	320
56-55-3	Benzo[a]anthracene	1500		1000	370
50-32-8	Benzo[a]pyrene	1200		1000	280
205-99-2	Benzo[b]fluoranthene	1700		1000	350
192-97-2	Benzo[e]pyrene	1300		1000	160
191-24-2	Benzo[g,h,i]perylene	710	J	1000	110
207-08-9	Benzo[k]fluoranthene	810	J	1000	230
218-01-9	Chrysene	1900		1000	130
53-70-3	Dibenz(a,h)anthracene	130	J	1000	82
206-44-0	Fluoranthene	5100		1000	810
86-73-7	Fluorene	ND		1000	320
193-39-5	Indeno[1,2,3-cd]pyrene	530	J	1000	110
90-12-0	1-Methylnaphthalene	ND		5000	500
91-57-6	2-Methylnaphthalene	ND		5000	700
91-20-3	Naphthalene	ND		20000	2900
198-55-0	Perylene	880	J	1000	510
85-01-8	Phenanthrene	ND		2000	1700
129-00-0	Pyrene	6300		2000	300
STL00912	C1-Fluoranthenes/pyrene	4100		1000	1000
STL00913	C1-Fluorenes	ND		2000	1300
STL00914	C2-Fluorenes	1300		1000	1000
STL00915	C3-Fluorenes	2100		1000	1000
STL00917	C2-Naphthalenes	ND		2000	2000
STL00918	C3-Naphthalenes	ND		2000	2000
STL00919	C4-Naphthalenes	ND		3000	2800
STL00901	C1-Phenanthrenes/Anthracenes	ND		4000	3400
STL00902	C2-Phenanthrenes/Anthracenes	3100		1000	1000
STL00903	C3-Phenanthrenes/Anthracenes	2800		1000	1000
STL00904	C4-Phenanthrenes/Anthracenes	1600		1000	1000
STL02218	C1-Chrysenes/Benz(a)anthracenes	1500		1000	1000

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: 1804576-846-S1 | Lab Sample ID: 140-34148-14

Matrix: PE | Lab File ID: 140-34148-A-11-A.D

Analysis Method: ID-0016 | Date Collected: 10/26/2023 14:00

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.010(g) | Date Analyzed: 11/16/2023 18:59

Con. Extract Vol.: 500(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80349 | Units: ng/g

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
STL02219	C2-Chrysenes/Benz(a)anthracenes	ND		1000	1000
STL02220	C3-Chrysenes/Benz(a)anthracenes	ND		1000	1000
STL02221	C4-Chrysenes/Benz(a)anthracenes	ND		1000	1000
34883-41-5	PCB-14	240	J	1000	10
74472-51-8	PCB-192	1700		1000	10
74472-48-3	PCB-184	720	J	1000	10
33979-03-2	PCB-155	500	J	1000	10
41411-61-4	PCB-142	420	J	1000	10
74472-52-9	PCB-204	1300		1000	10
56558-16-8	PCB-104	1200		1000	10
56558-18-0	PCB-121	450	J	1000	10
70362-49-1	PCB-78	890	J	1000	10
38444-87-0	PCB-36	290	J	1000	10

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
93951-97-4	Acenaphthylene-d8	82		30-120
1719-06-8	Anthracene-d10	77		30-120
63466-71-7	Benzo(a)pyrene-d12	80		30-120
93951-98-5	Benzo(b)fluoranthene-d12	88		30-120
93951-66-7	Benzo(ghi)perylene-d12	89		30-120
93952-01-3	Benzo(k)fluoranthene-d12	85		30-120
1719-03-5	Chrysene-d12	80		30-120
13250-98-1	Dibenz(a,h)anthracene-d14	85		30-120
93951-69-0	Fluoranthene-d10	85		30-120
81103-79-9	Fluorene -d10	85		30-120
203578-33-0	Indeno[1,2,3-cd]pyrene-d12	88		30-120
38072-94-5	1-Methylnaphthalene-d10	83		30-120
7297-45-2	2-Methylnaphthalene-d10	82		30-120
1146-65-2	Naphthalene-d8	77		30-120
1520-96-3	Perylene-d12	75		30-120
1517-22-2	Phenanthrene-d10	77		30-120

Report Date: 22-Nov-2023 12:11:20 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-11-A.D
Lims ID: 140-34148-A-14-A
Client ID: 1804576-846-S1
Sample Type: Client
Inject. Date: 16-Nov-2023 18:59:04 ALS Bottle#: 0 Worklist Smp#: 22
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030519-022
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 22-Nov-2023 12:09:21 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1637

First Level Reviewer: SK9U Date: 22-Nov-2023 12:11:19

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/ml	%Rec	Flags
D 10 Naphthalene-d8	136	5.059	5.068	-0.009	99	35782	0.3861	77.2	
11 Naphthalene	128	5.078	5.078	0.000	52	1025	0.0122		7M
D 15 2-methylnaphthalene-d10	152	5.612	5.612	0.000	92	24840	0.4122	82.4	
D 17 1-Methylnaphthalene-d10	152	5.686	5.686	0.000	99	24984	0.4138	82.8	
D 23 Acenaphthylene-d8	160	6.367	6.362	0.005	58	42135	0.4119	82.4	
24 Acenaphthylene	152	6.377	6.372	0.005	75	138	0.001393		7M
* 26 Acenaphthene-d10	164	6.492	6.492	0.000	97	33245	0.5000		
27 Acenaphthene	154	6.517	6.517	0.000	69	511	0.008054		
D 29 Fluorene -d10	176	6.925	6.920	0.005	100	33507	0.4230	84.6	
30 Fluorene	166	6.950	6.945	0.005	86	450	0.005170		7M
D 35 Phenanthrene-d10	188	7.732	7.732	0.000	99	59964	0.3871	77.4	
36 Phenanthrene	178	7.752	7.749	0.003	32	2318	0.0160		
D 38 Anthracin-d10	188	7.780	7.777	0.003	100	58420	0.3863	77.3	
39 Anthracene	178	7.797	7.794	0.003	94	1091	0.007585		M
D 41 Fluoranthene-d10	212	8.808	8.805	0.003	99	85419	0.4251	85.0	
43 Fluoranthene	202	8.825	8.825	0.000	41	22312	0.1021		
* 44 Pyrene-d10 (IS)	212	9.027	9.024	0.003	99	99338	0.5000		
45 Pyrene	202	9.044	9.044	0.000	100	28268	0.1267		
47 Benzo[a]anthracene	228	10.260	10.260	0.000	99	6120	0.0303		M
D 48 Chrysene-d12	240	10.270	10.270	0.000	98	77691	0.4008	80.2	
50 Chrysene	228	10.295	10.295	0.000	15	8615	0.0381		M
D 52 Benzo(b)fluoranthene-d12	264	11.376	11.369	0.007	100	66070	0.4381	87.6	
53 Benzo[b]fluoranthene	252	11.404	11.397	0.007	12	7587	0.0341		
D 54 Benzo(k)fluoranthene-d12	264	11.404	11.404	0.000	61	75352	0.4253	85.1	
55 Benzo[k]fluoranthene	252	11.425	11.425	0.000	100	3555	0.0161		M
* 56 Benzo(e)pyrene-d12	264	11.684	11.684	0.000	99	59540	0.5000		
57 Benzo[e]pyrene	252	11.712	11.712	0.000	100	4668	0.0262		
D 58 Benzo(a)pyrene-d12	264	11.747	11.747	0.000	100	52822	0.3994	79.9	
59 Benzo[a]pyrene	252	11.775	11.775	0.000	100	4038	0.0231		
D 60 Perylene-d12	264	11.845	11.838	0.007	99	54676	0.3725	74.5	
61 Perylene	252	11.873	11.873	0.000	100	2736	0.0175		
D 62 Indeno[1,2,3-cd]pyrene-d12	288	13.186	13.186	0.000	82	63057	0.4389	87.8	

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/ml	%Rec	Flags
D 63 Dibenz(a,h)anthracene-d14	292	13.196	13.186	0.000	95	54345	0.4228	84.6	
65 Indeno[1,2,3-cd]pyrene	276	13.224	13.214	0.010	1	2224	0.0105		
66 Dibenz(a,h)anthracene	278	13.243	13.233	0.010	37	437	0.002518		M
D 67 Benzo(ghi)perylene-d12	288	13.552	13.543	0.009	100	63815	0.4473	89.5	
68 Benzo[g,h,i]perylene	276	13.580	13.580	0.000	48	2642	0.0141		
74 PCB-14	222	7.479	7.479	0.000	89	650	0.004795		M
75 PCB-36	258	8.210	8.206	0.000	100	409	0.005732		
76 PCB-104	326	8.395	8.393	-0.001	92	1317	0.0238		
77 PCB-121	326	8.751	8.748	0.000	69	396	0.008904		M
78 PCB-155	360	8.852	8.852	0.003	85	413	0.0099		
79 PCB-78	290	9.081	9.077	-0.003	95	630	0.0178		
80 PCB-142	360	9.525	9.519	0.003	75	256	0.008461		
81 PCB-184	394	9.579	9.579	0.007	65	436	0.0144		
* 82 PCB-167L	372	10.023	10.027	-0.004	73	14788	0.4000		
83 PCB-204	428	10.254	10.246	0.004	10	502	0.0255		
84 PCB-192	394	10.280	10.275	0.005	7	941	0.0339		
A 87 C3-Naphthalenes	170	6.804	(6.348-7.050)		0	1824	0.0217		
A 88 C4-Naphthalenes	184	7.132	(6.678-7.562)		0	2677	0.0318		
A 90 C2-Fluorenes	194	7.888	(7.730-8.069)		0	2290	0.0263		
A 91 C3-Fluorenes	208	8.277	(8.092-8.605)		0	3729	0.0428		
A 96 C1-Phenanthrenes/Anthracenes	191	8.273	(8.155-8.332)		0	2565	0.0177		7
A 97 C2-Phenanthrenes/Anthracenes	206	8.698	(8.490-8.926)		0	9037	0.0625		
A 98 C3-Phenanthrenes/Anthracenes	220	9.168	(8.851-9.456)		0	8111	0.0561		
A 99 C4-Phenanthrenes/Anthracenes	234	9.469	(9.106-9.824)		0	4554	0.0315		
A 100 C1-Fluoranthenes/pyrene	216	9.436	(9.246-9.640)		0	18242	0.0818		
A 101 C1-Chrysenes/Benz(a)anthracenes	242	10.681	(10.456-10.941)		0	6603	0.0292		

QC Flag Legend

Processing Flags

7 - Failed Limit of Detection

Review Flags

M - Manually Integrated

Reagents:

60ISPCB_00001 Amount Added: 5.00 Units: uL

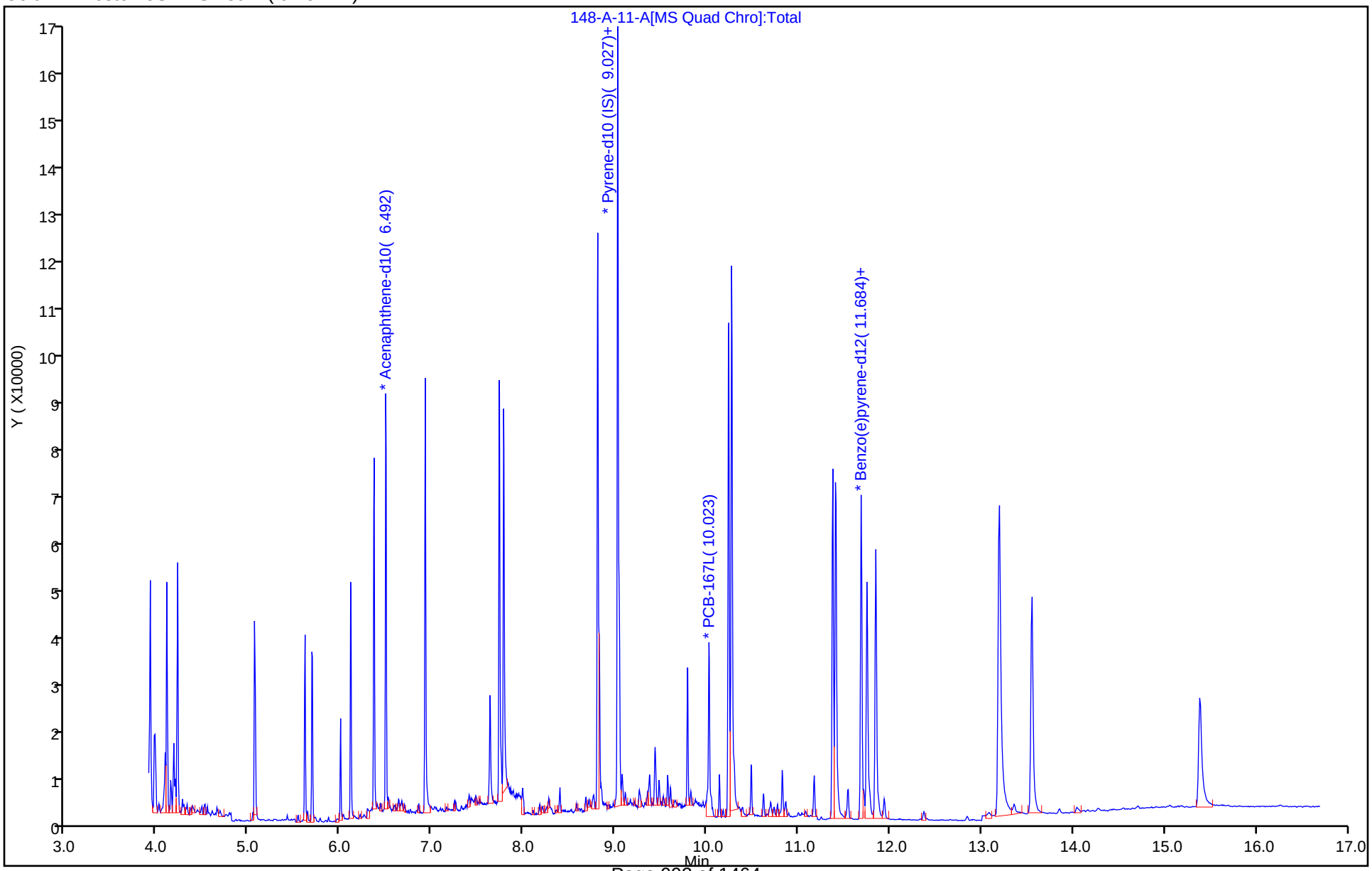
Report Date: 22-Nov-2023 12:11:20 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-11-A.D

Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14	Worklist Smp#:	22
Client ID:	1804576-846-S1				
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



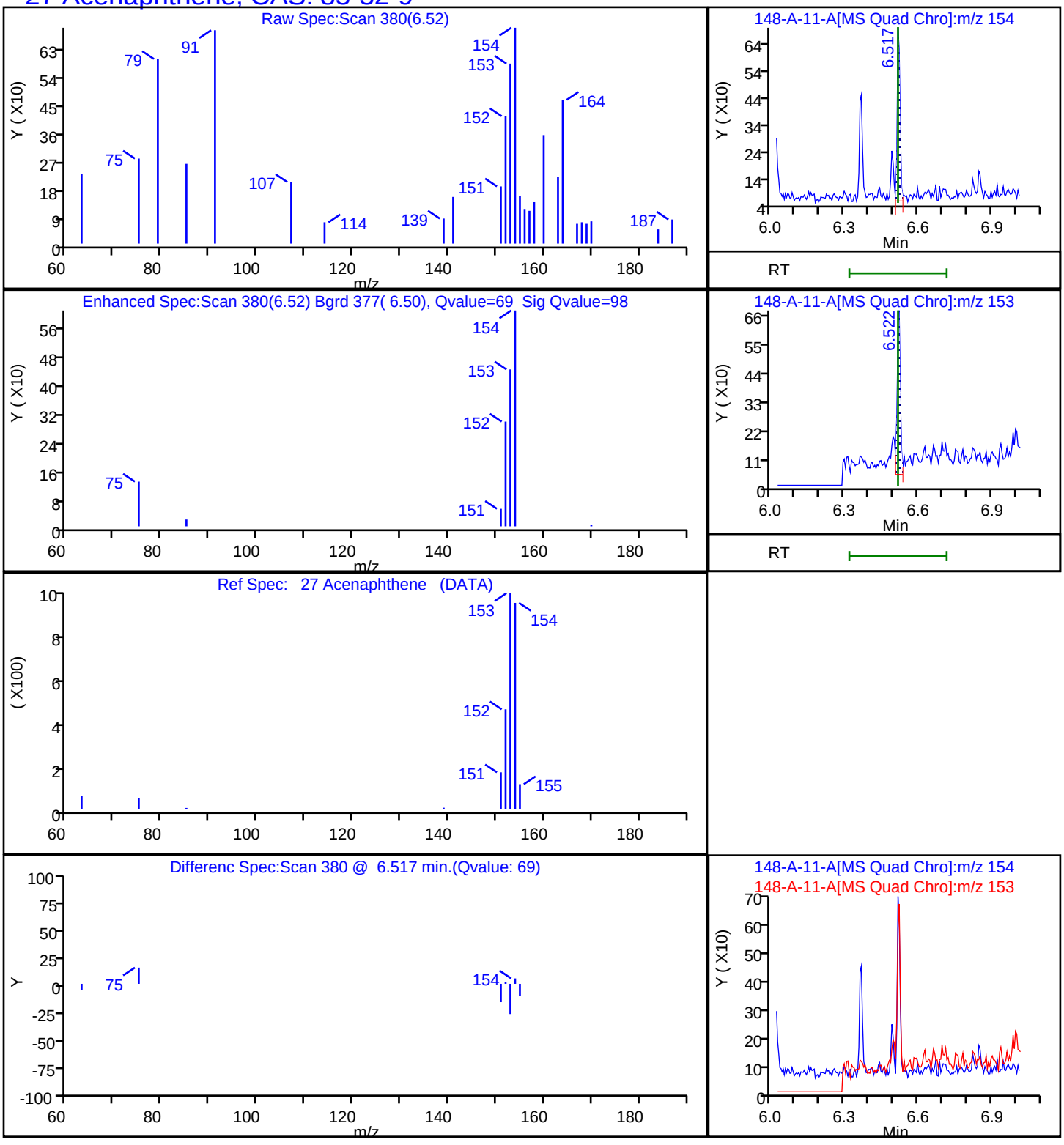
Report Date: 22-Nov-2023 12:11:20 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-11-A.D

Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14
Client ID:	1804576-846-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

27 Acenaphthene, CAS: 83-32-9



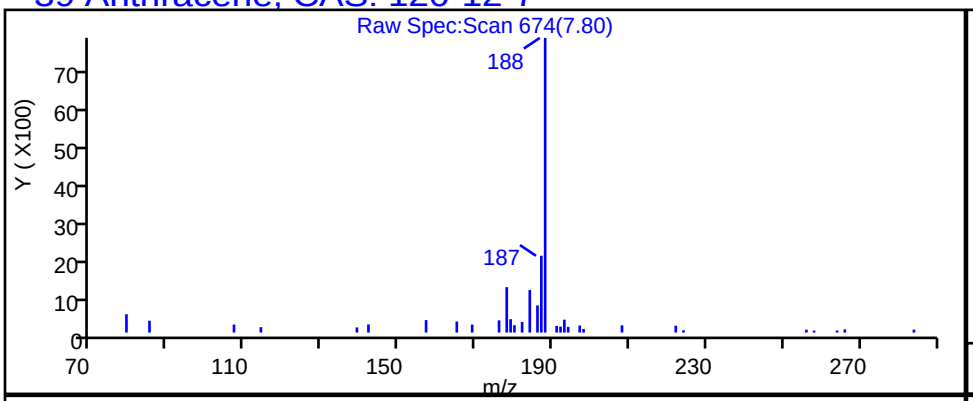
Report Date: 22-Nov-2023 12:11:20 Chrom Revision: 2.3 15-Nov-2023 20:54:34

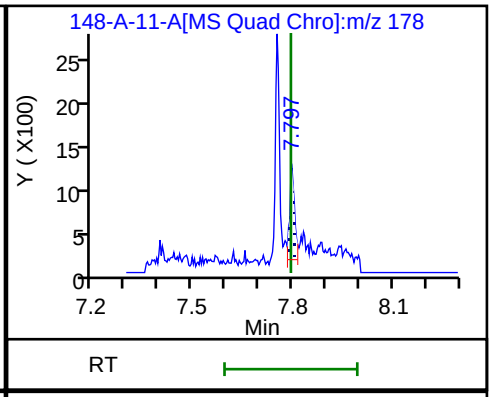
Eurofins Knoxville

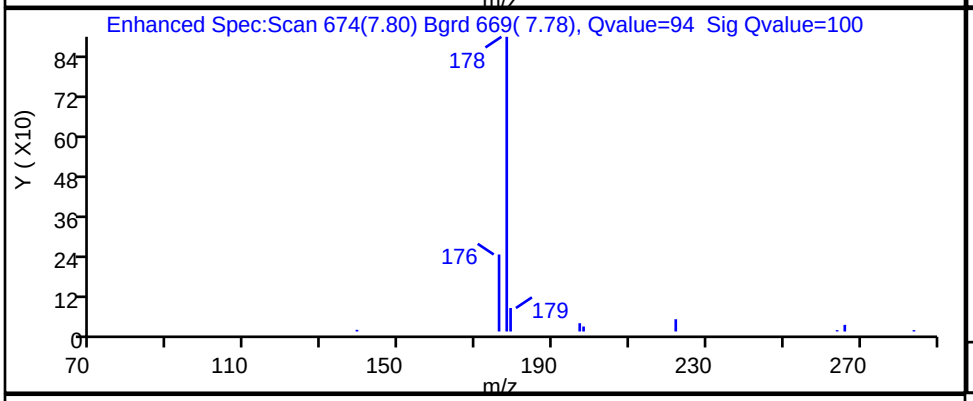
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-11-A.D

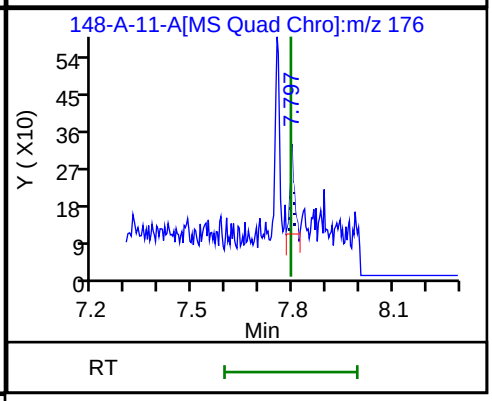
Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14
Client ID:	1804576-846-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

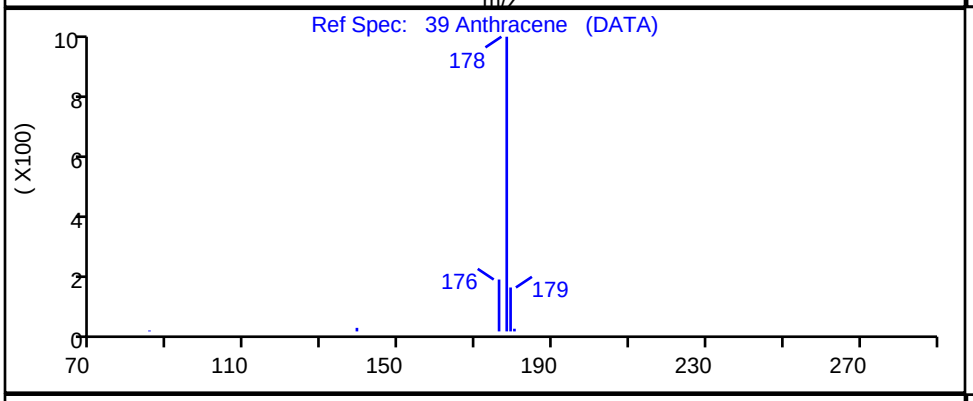
39 Anthracene, CAS: 120-12-7

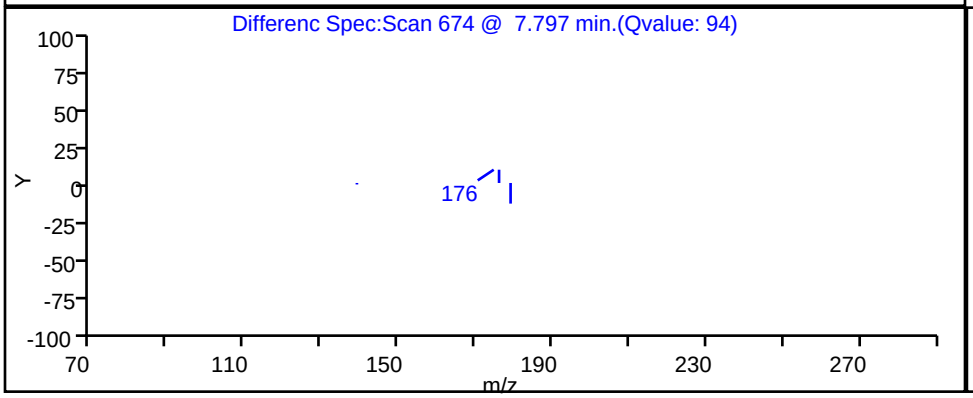


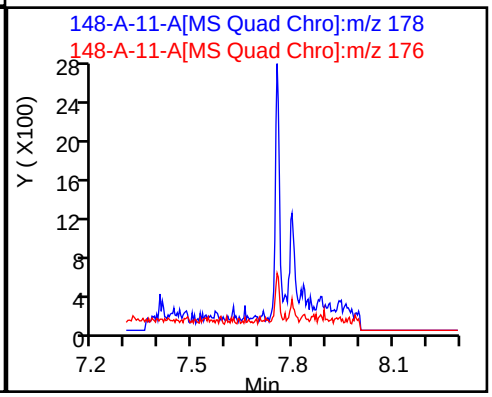










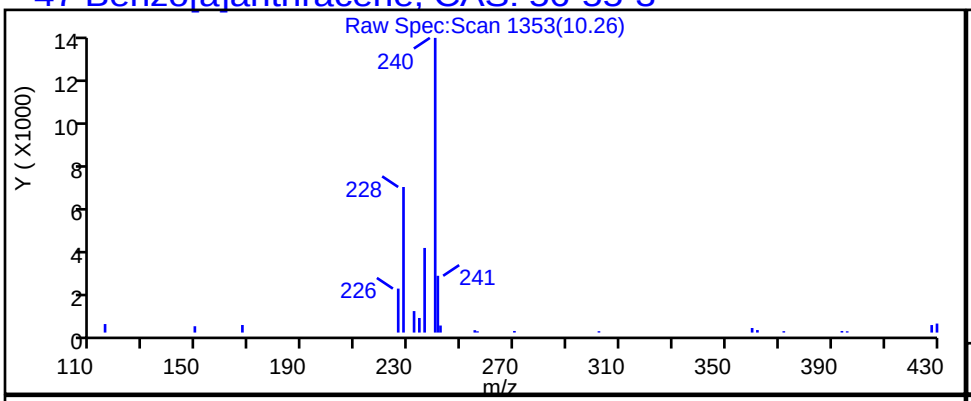


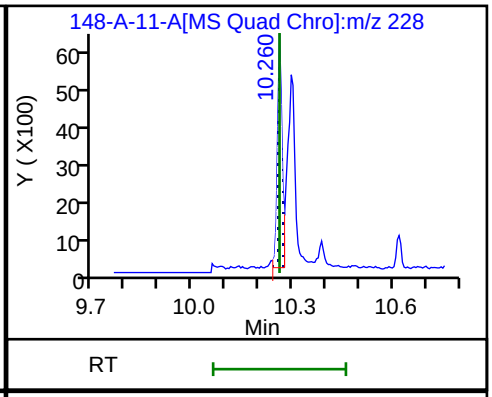
Report Date: 22-Nov-2023 12:11:20 Chrom Revision: 2.3 15-Nov-2023 20:54:34

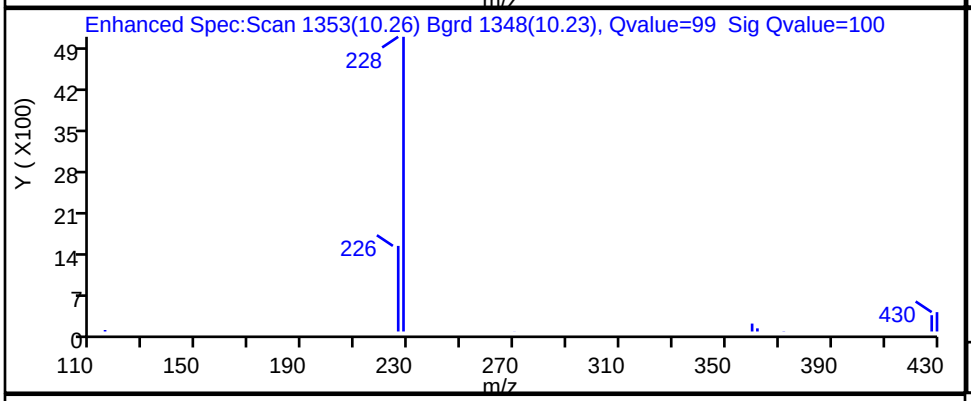
Eurofins Knoxville

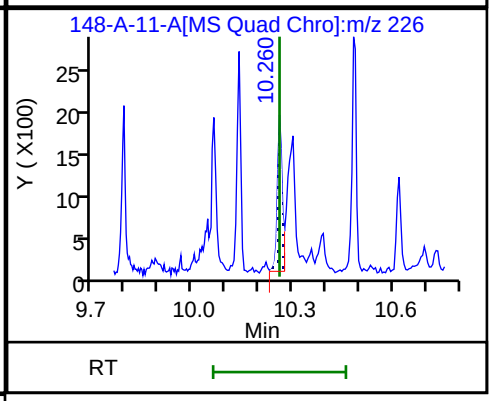
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-11-A.D		
Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14
Client ID:	1804576-846-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

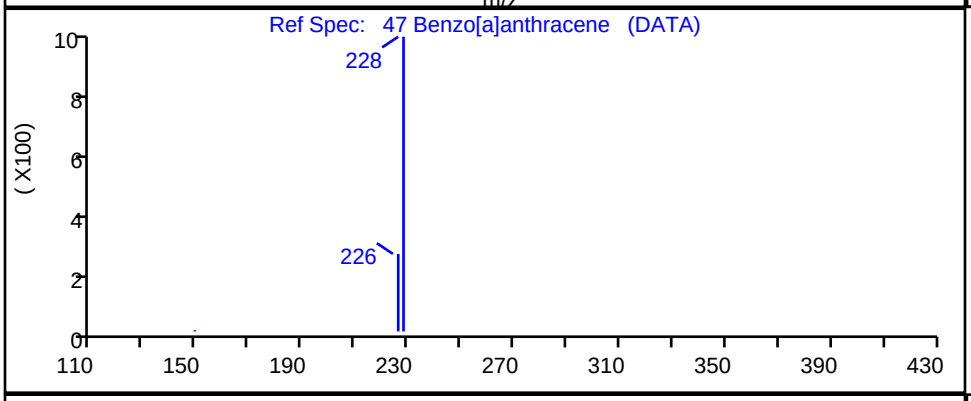
47 Benzo[a]anthracene, CAS: 56-55-3

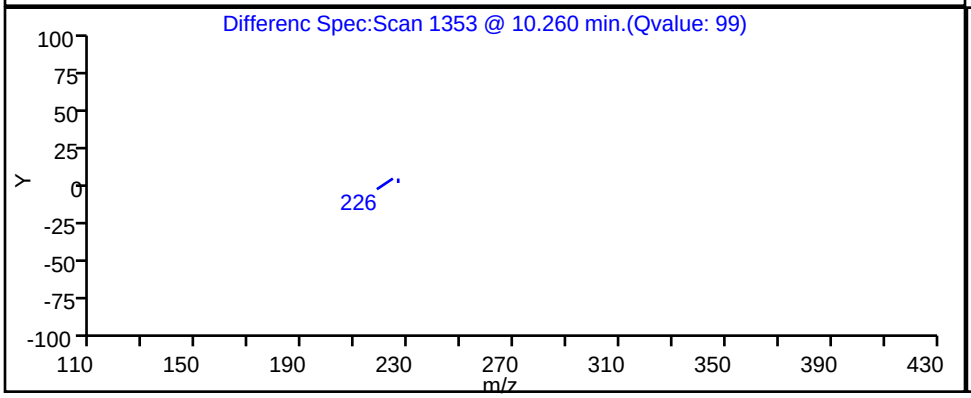


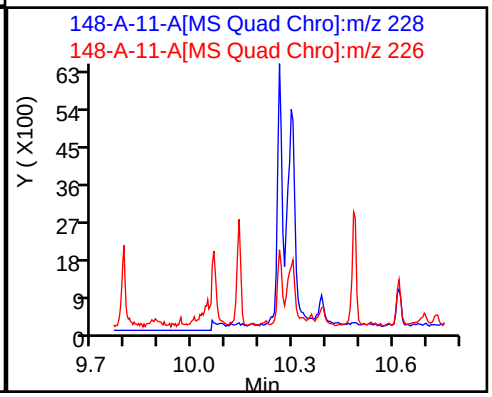












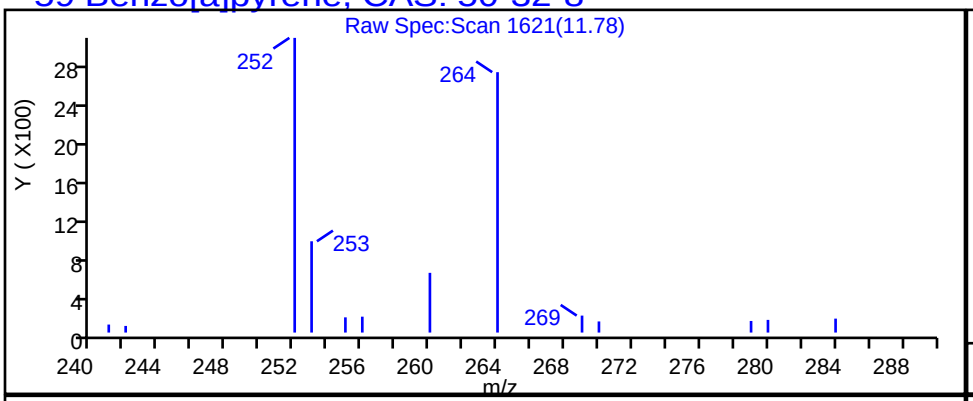
Report Date: 22-Nov-2023 12:11:20 Chrom Revision: 2.3 15-Nov-2023 20:54:34

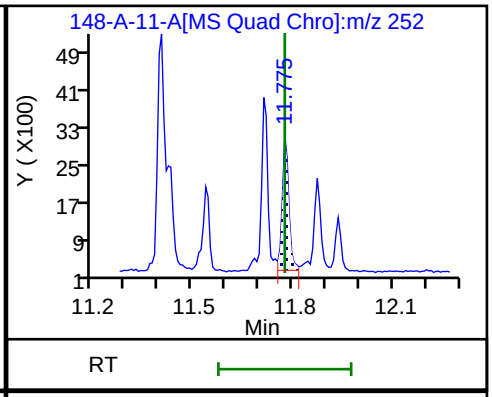
Eurofins Knoxville

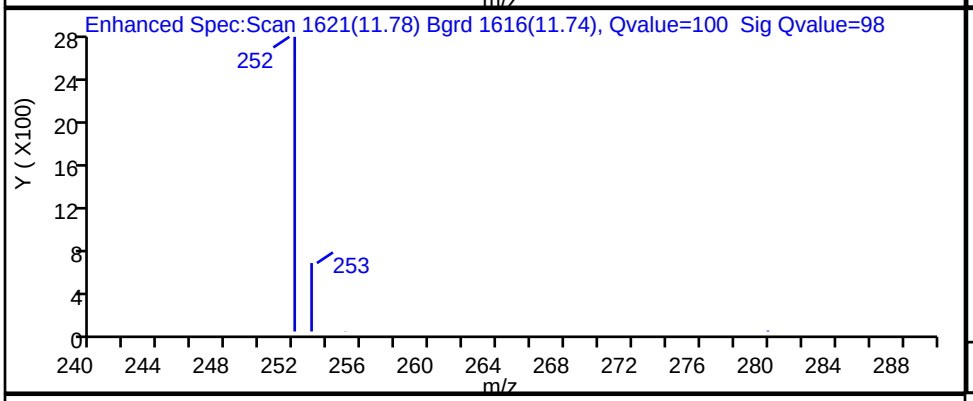
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-11-A.D

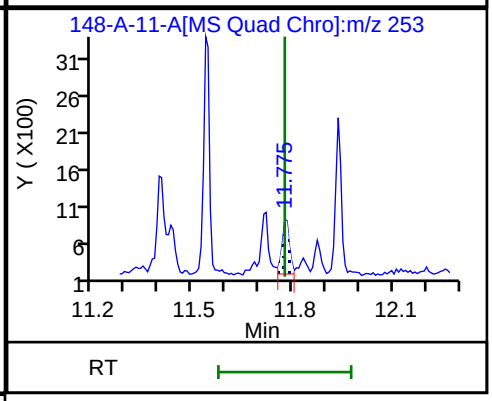
Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14
Client ID:	1804576-846-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

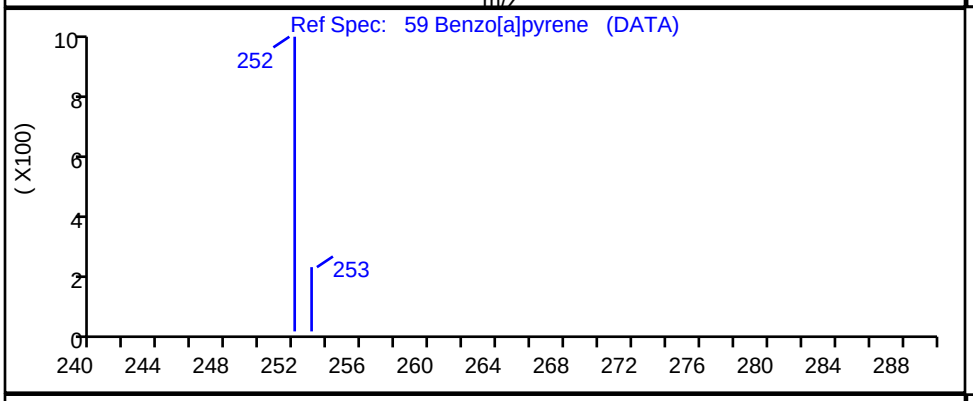
59 Benzo[a]pyrene, CAS: 50-32-8

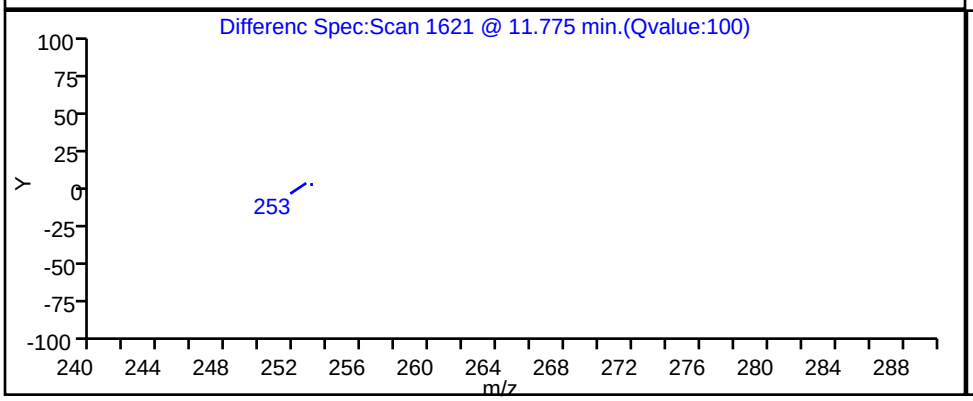


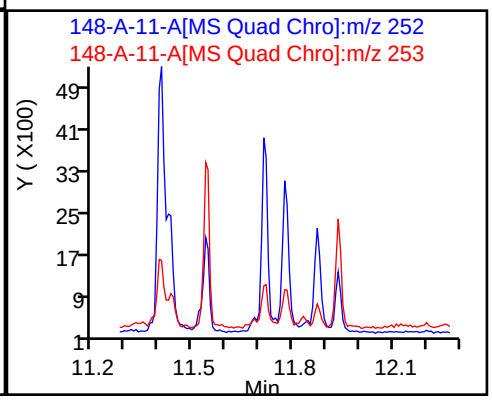












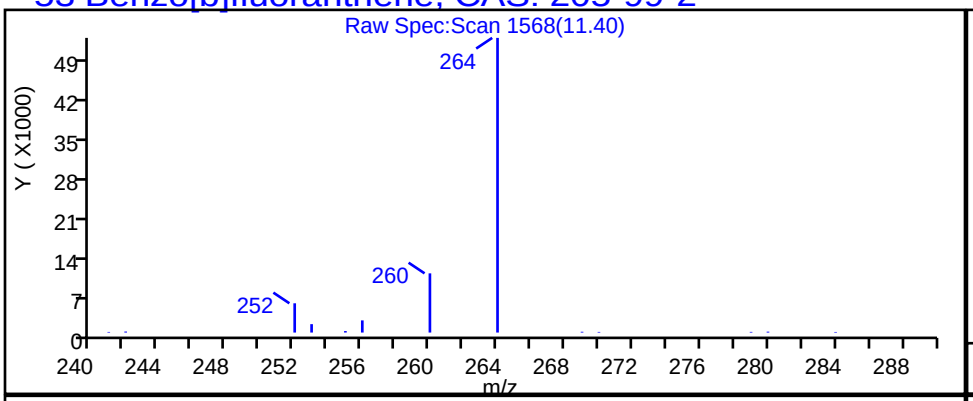
Report Date: 22-Nov-2023 12:11:20 Chrom Revision: 2.3 15-Nov-2023 20:54:34

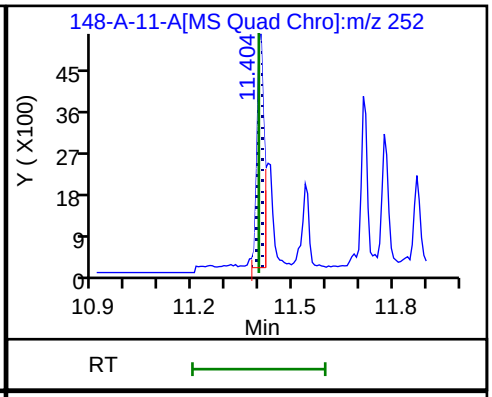
Eurofins Knoxville

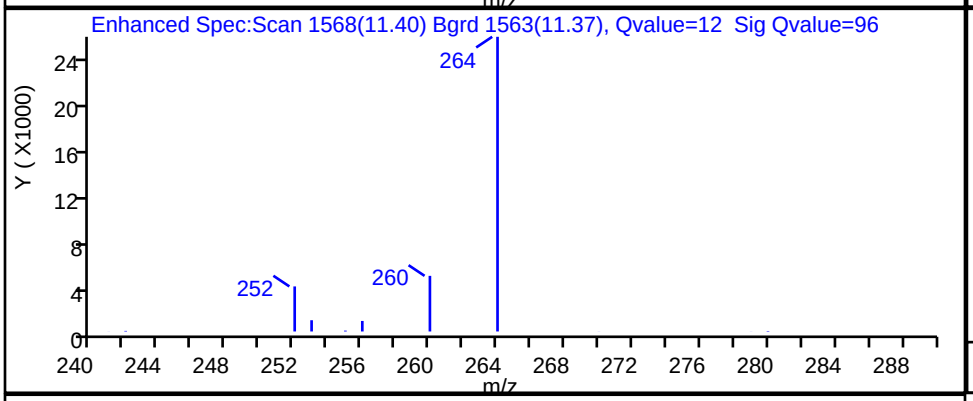
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-11-A.D

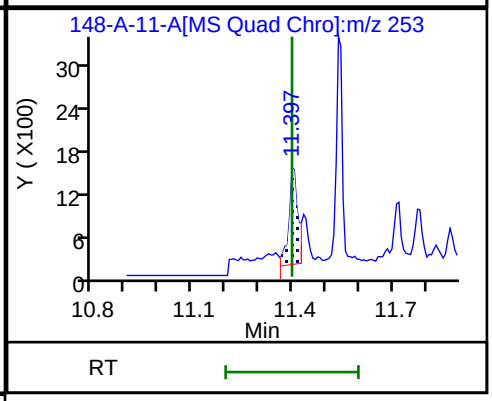
Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14		
Client ID:	1804576-846-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

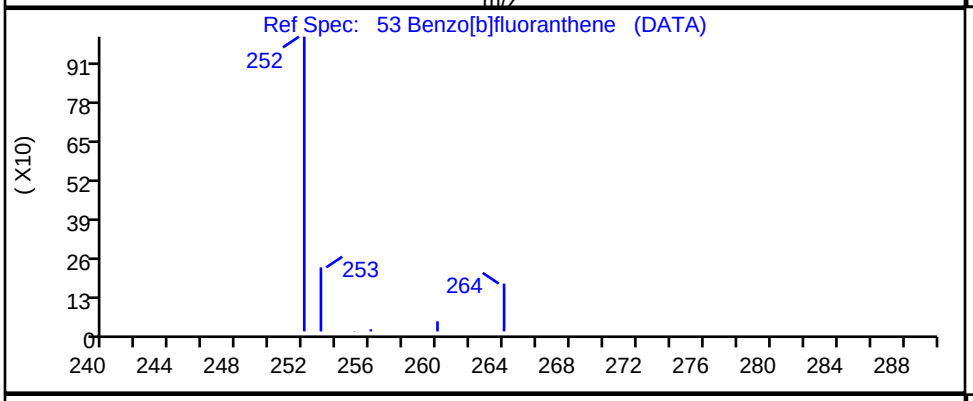
53 Benzo[b]fluoranthene, CAS: 205-99-2

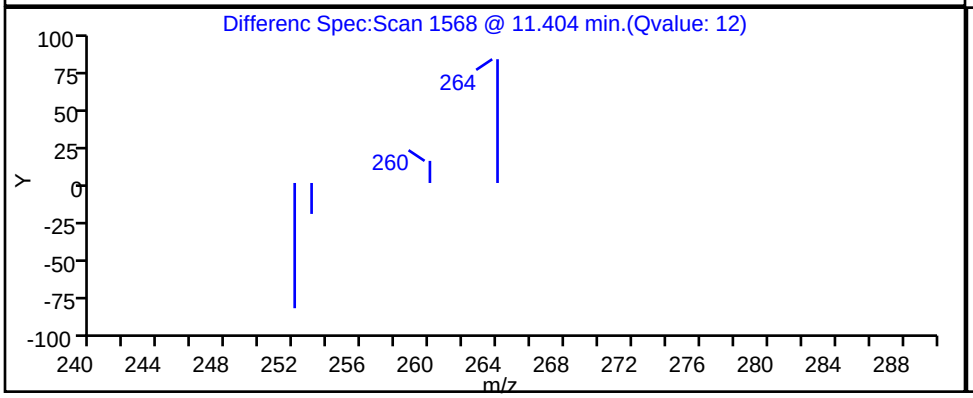


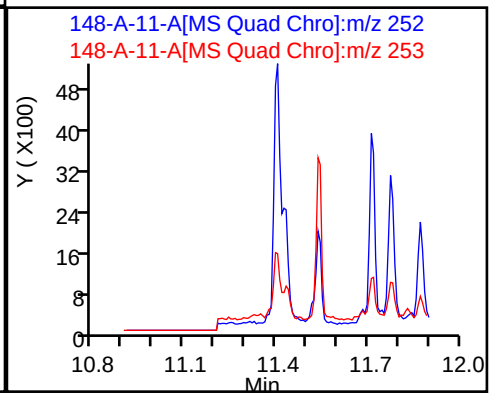












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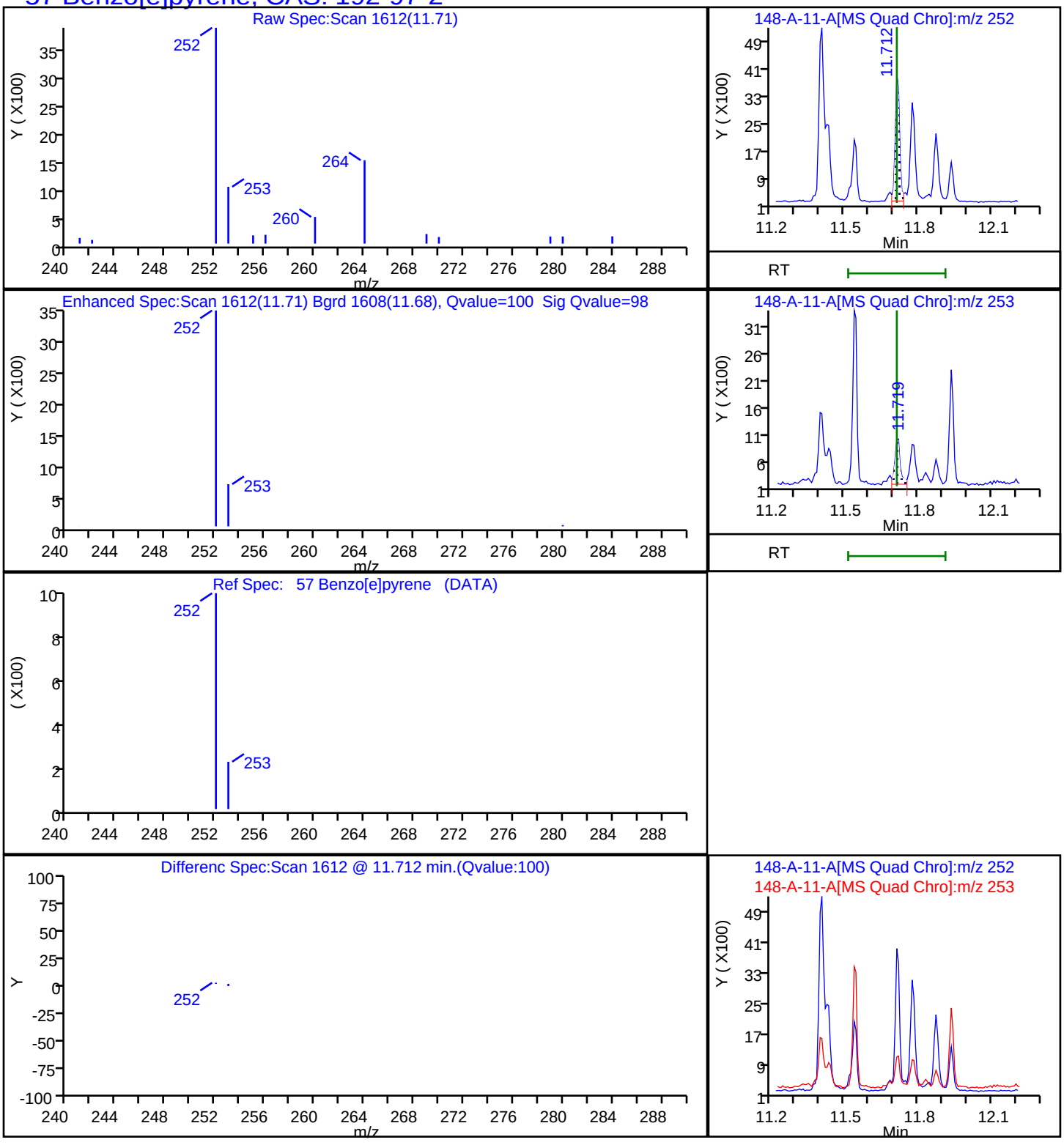
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-11-A.D

Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14
Client ID:	1804576-846-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

57 Benzo[e]pyrene, CAS: 192-97-2



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Eurofins Knoxville

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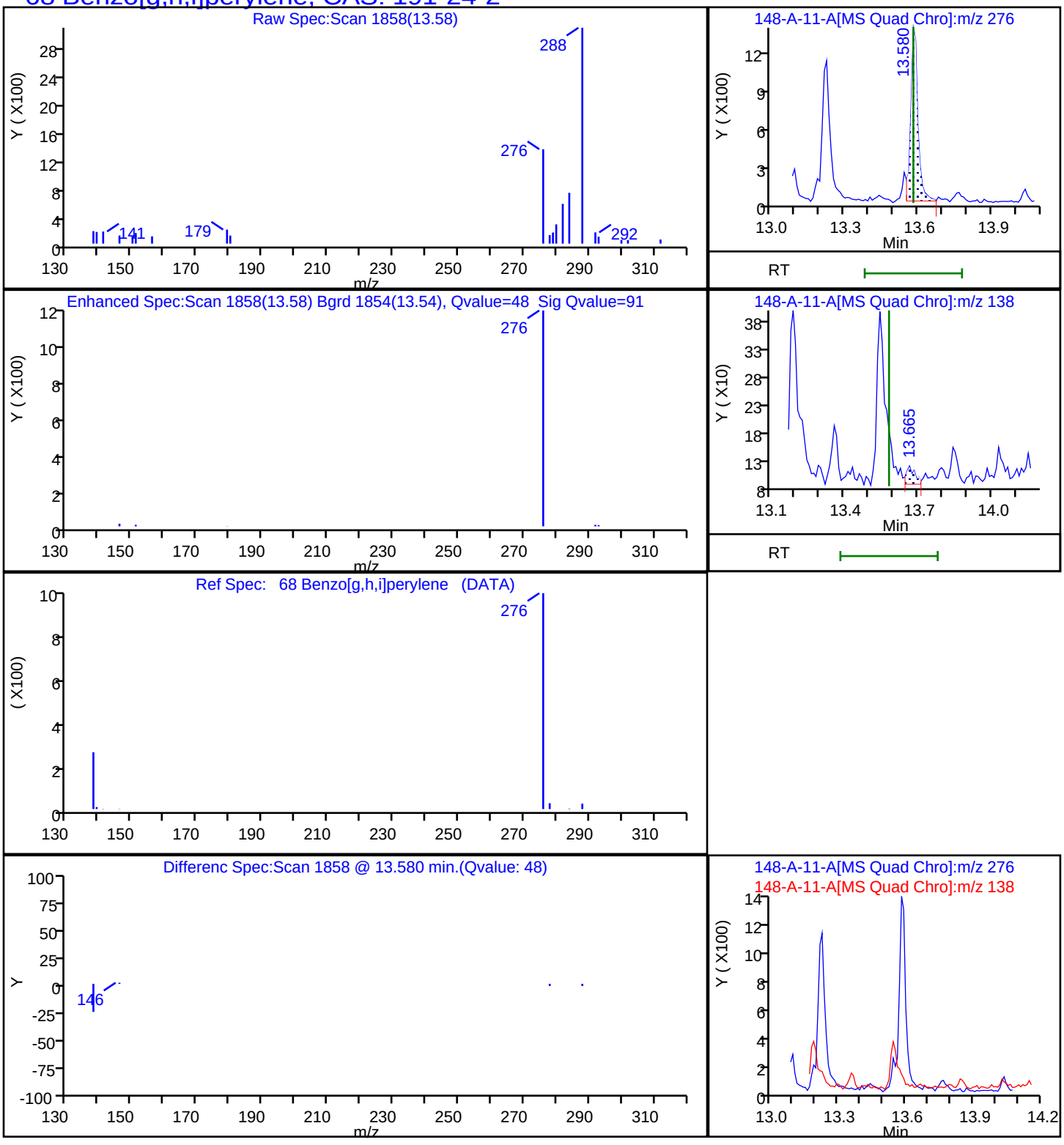
Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14		
Client ID:	1804576-846-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

68 Benzo[g,h,i]perylene, CAS: 191-24-2



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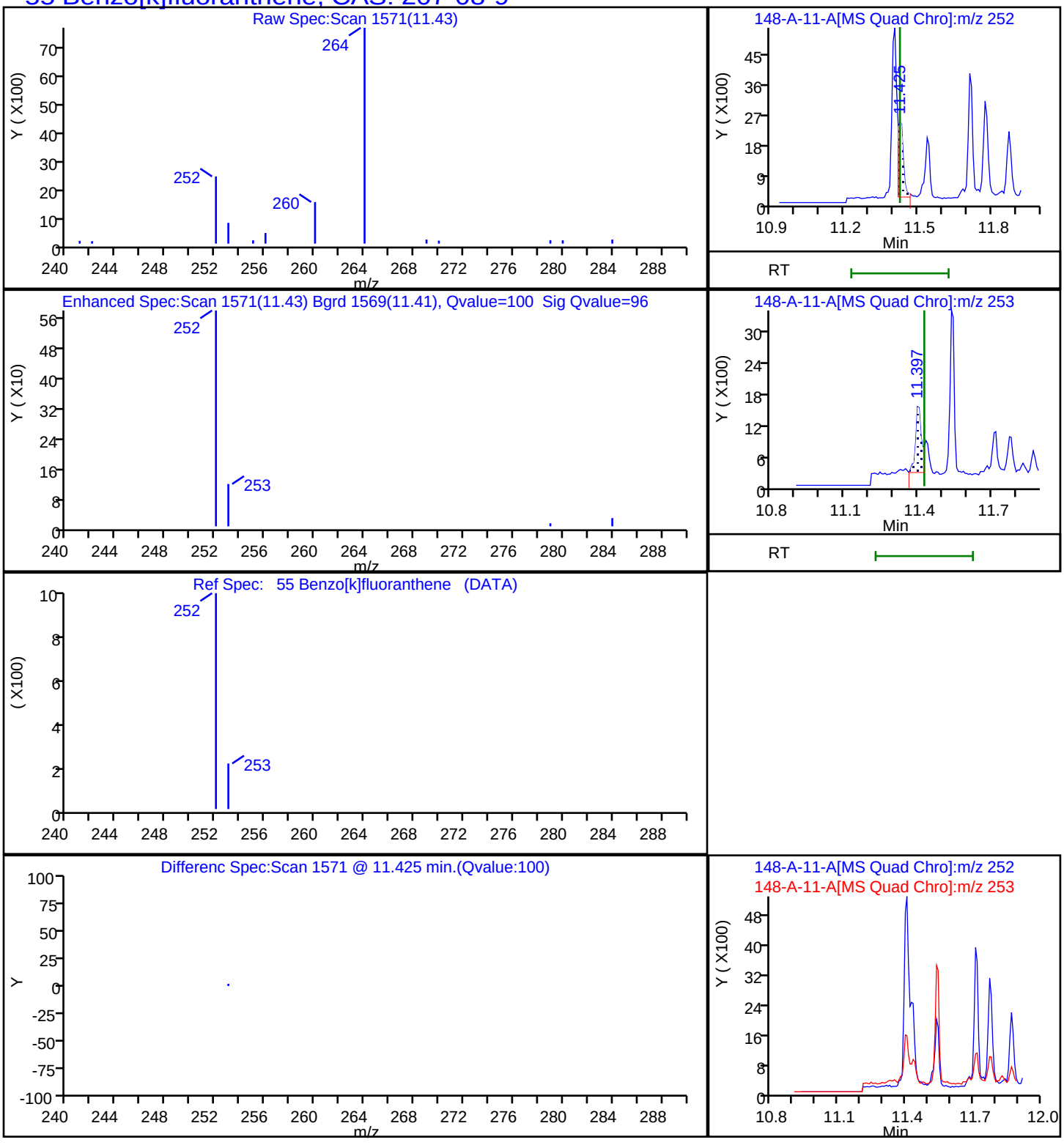
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-11-A.D

Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14
Client ID:	1804576-846-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

55 Benzo[k]fluoranthene, CAS: 207-08-9



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Eurofins Knoxville

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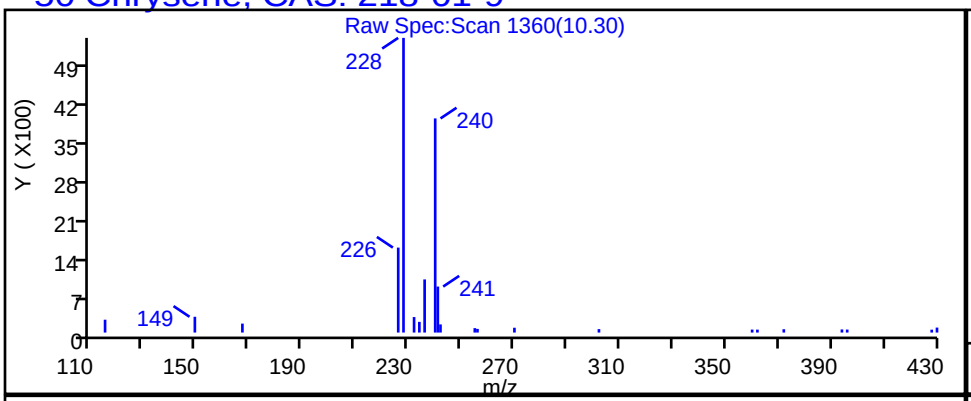
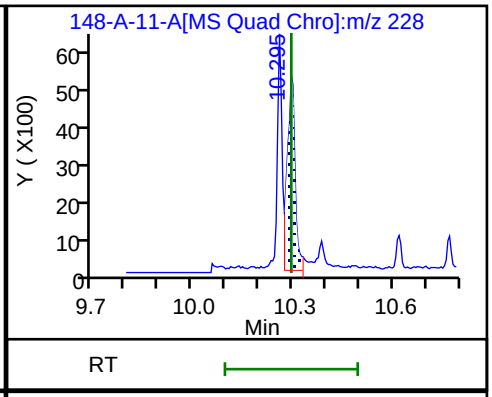
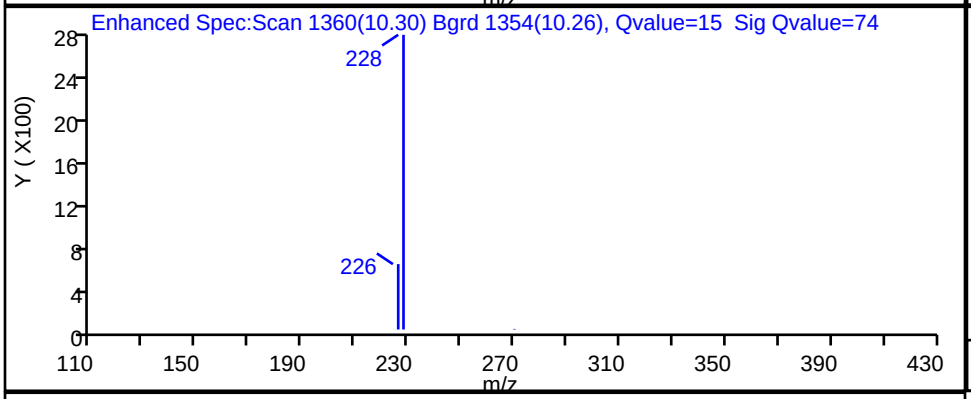
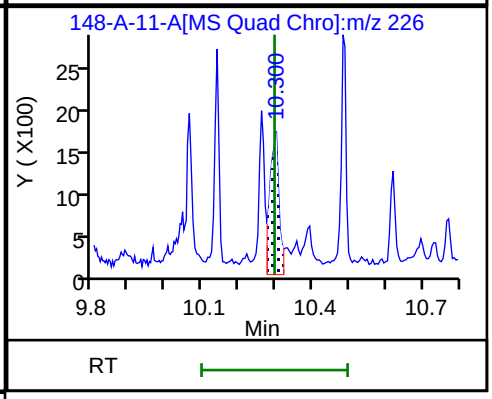
Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14		
Client ID:	1804576-846-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

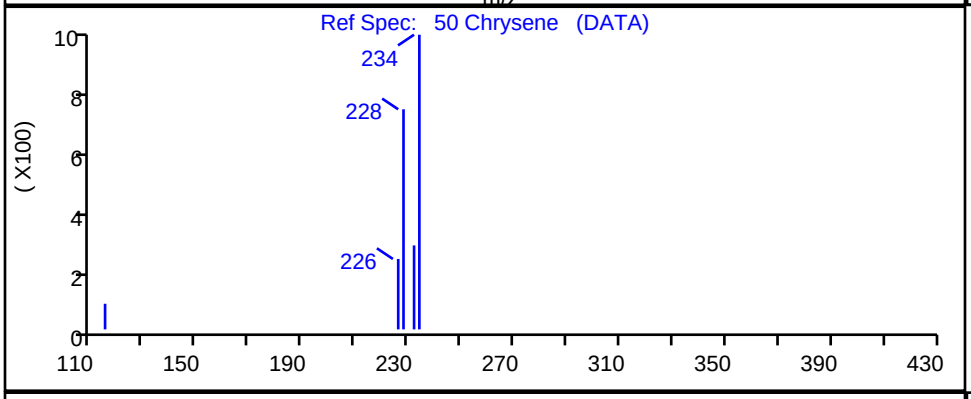
50 Chrysene, CAS: 218-01-9

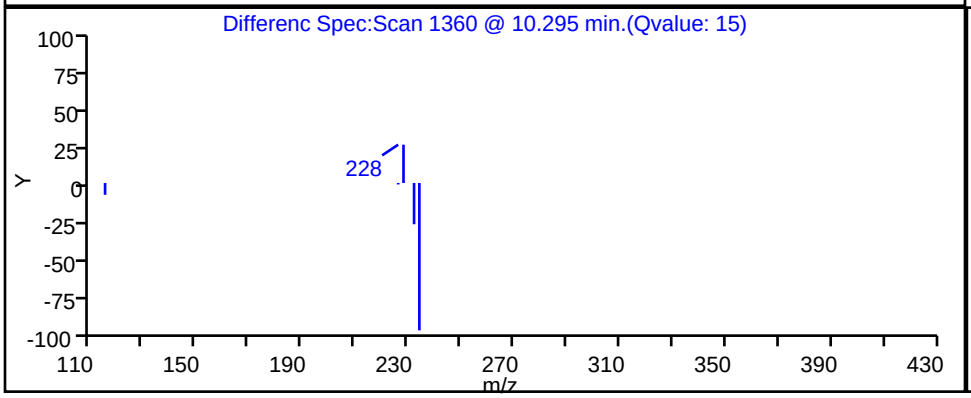


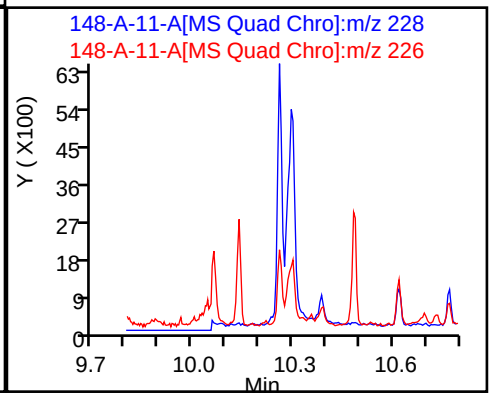












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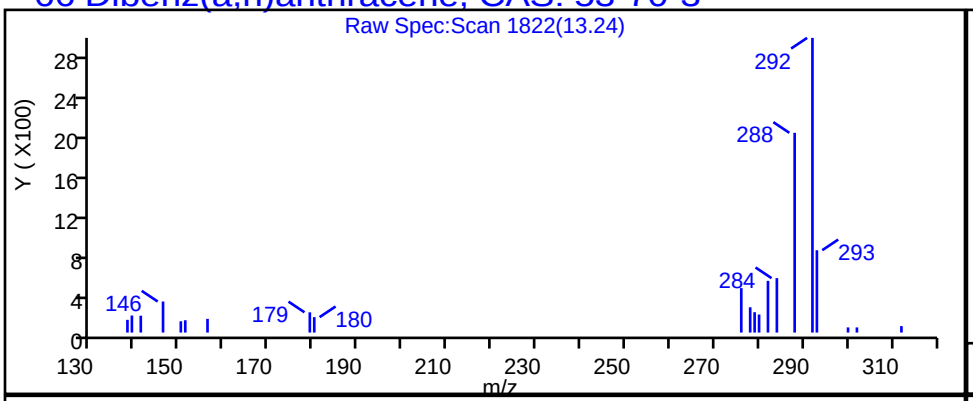
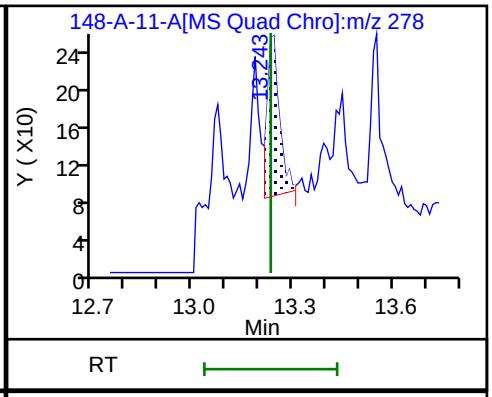
Eurofins Knoxville

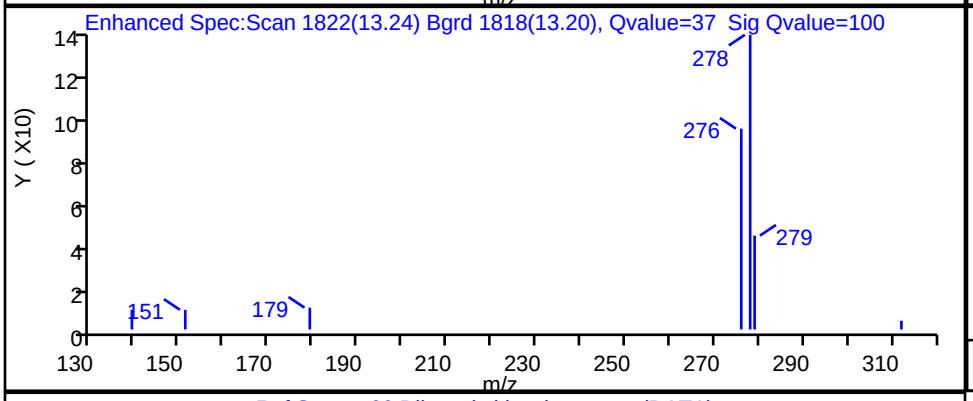
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-11-A.D

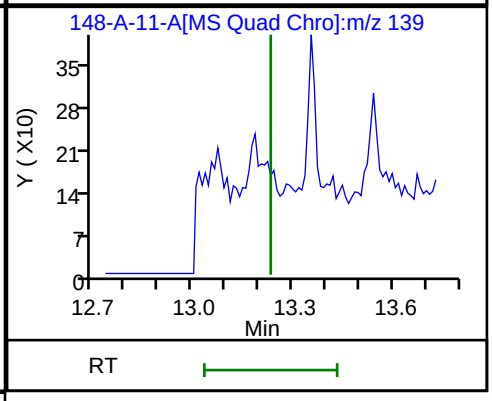
Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14
Client ID:	1804576-846-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

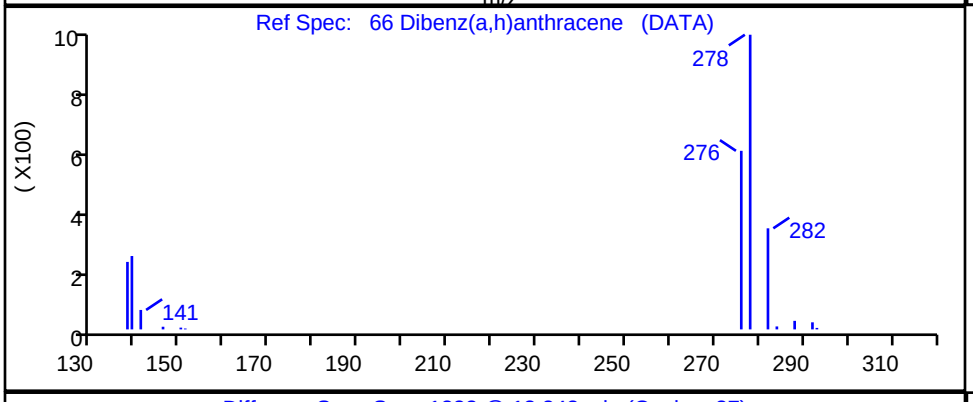
66 Dibenz(a,h)anthracene, CAS: 53-70-3

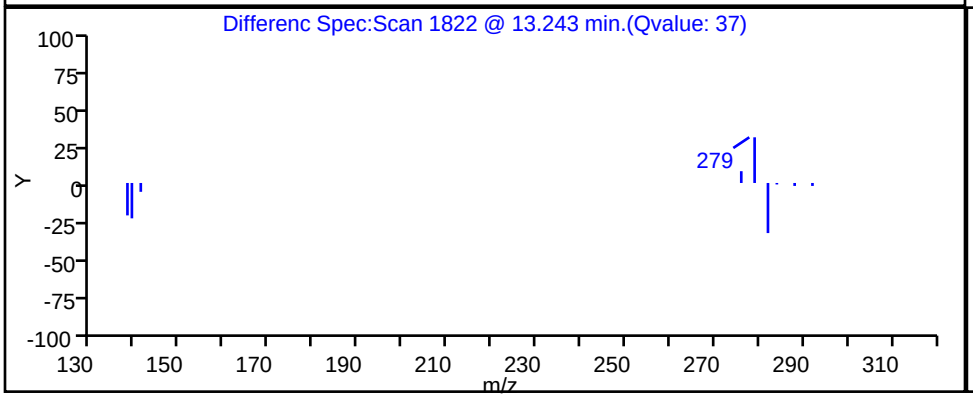


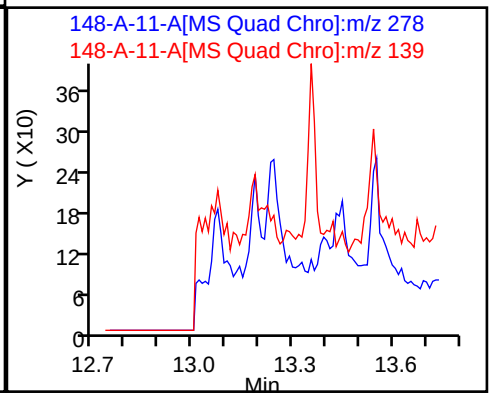










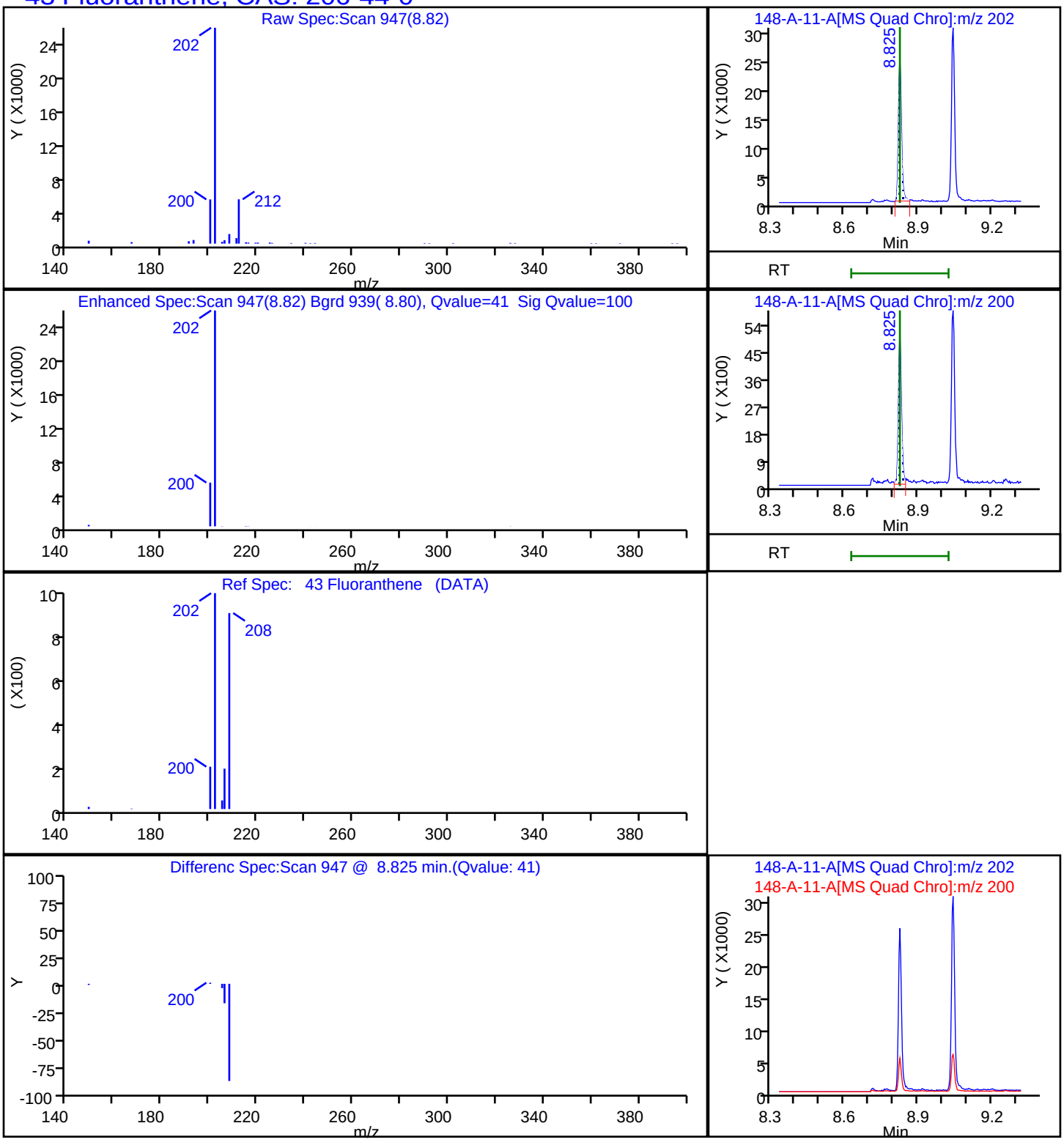


Report Date: 22-Nov-2023 12:11:20 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-11-A.D		
Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14
Client ID:	1804576-846-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

43 Fluoranthene, CAS: 206-44-0



Report Date: 22-Nov-2023 12:11:21 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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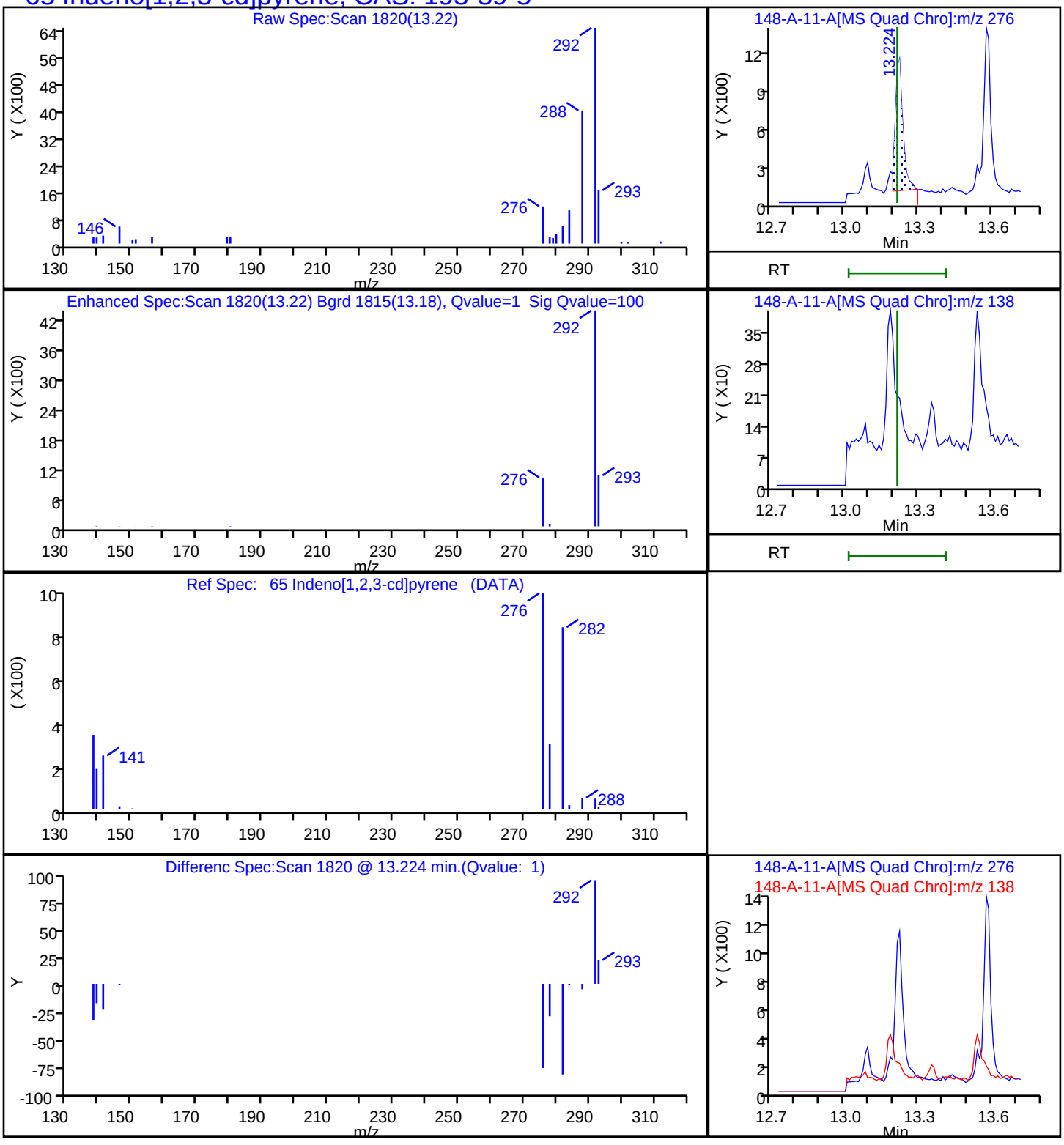
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14		
Client ID:	1804576-846-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

65 Indeno[1,2,3-cd]pyrene, CAS: 193-39-5



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Eurofins Knoxville

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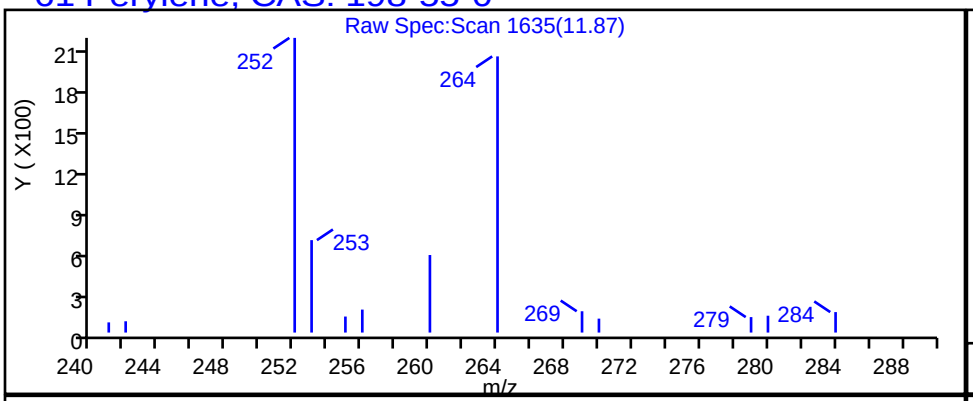
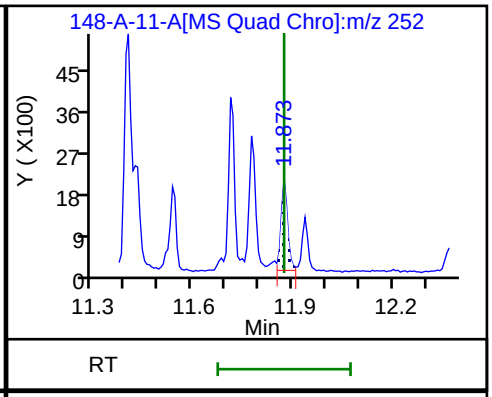
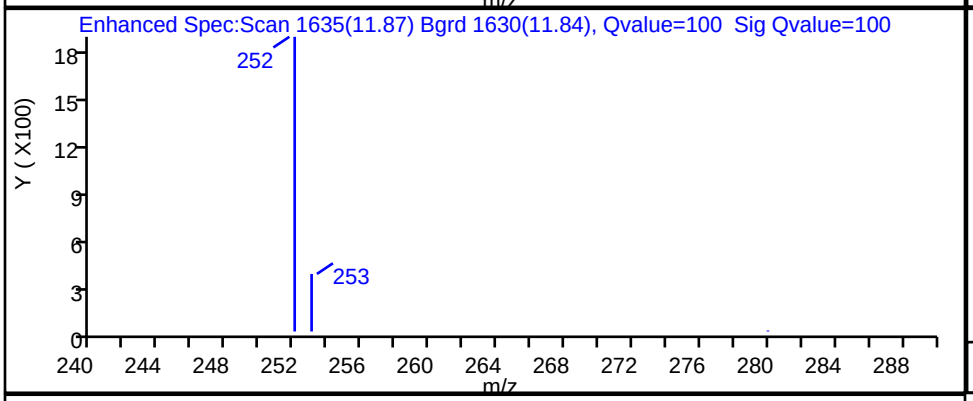
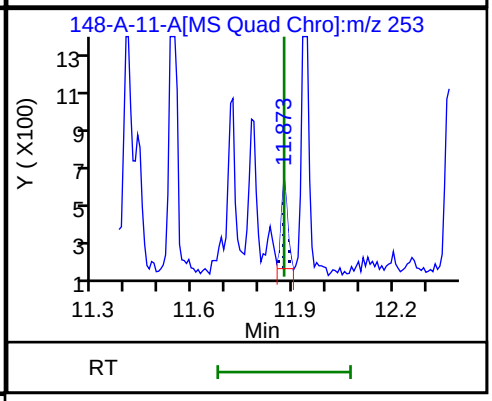
Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14		
Client ID:	1804576-846-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

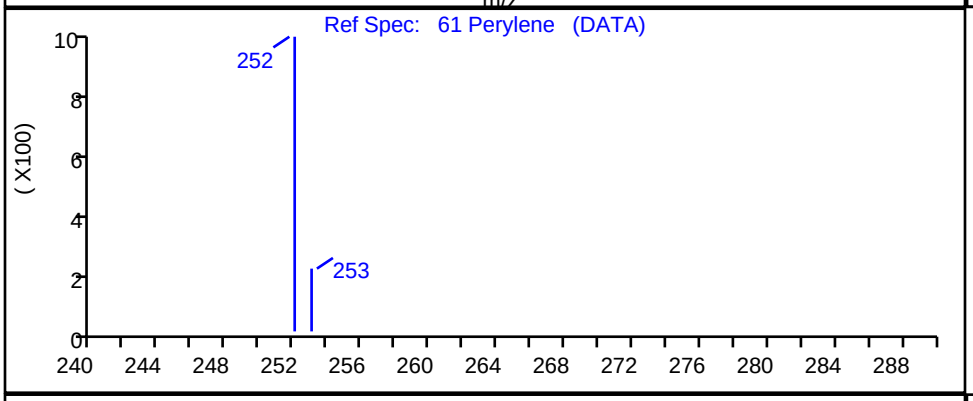
61 Perylene, CAS: 198-55-0

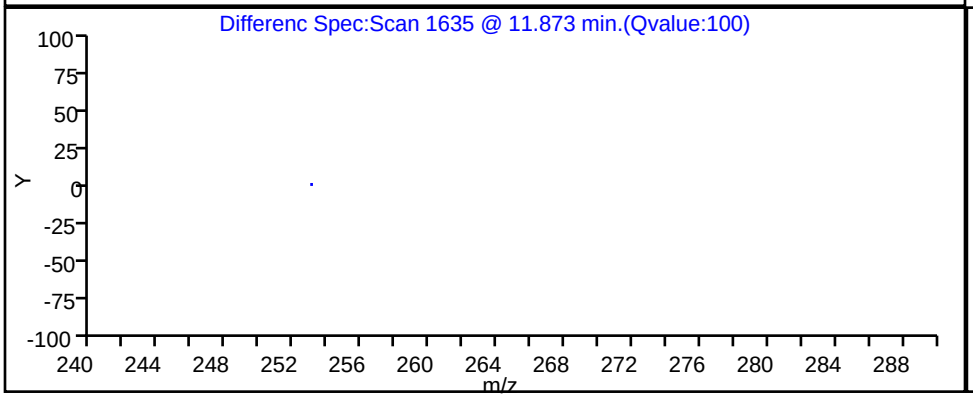


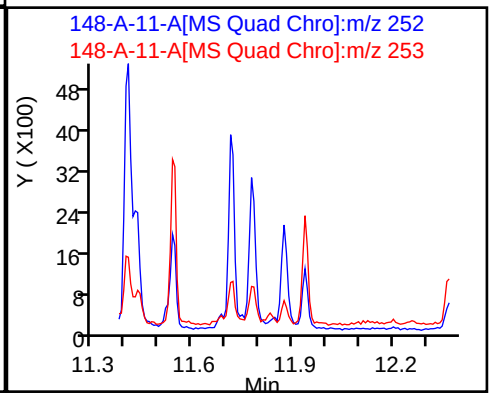












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Eurofins Knoxville

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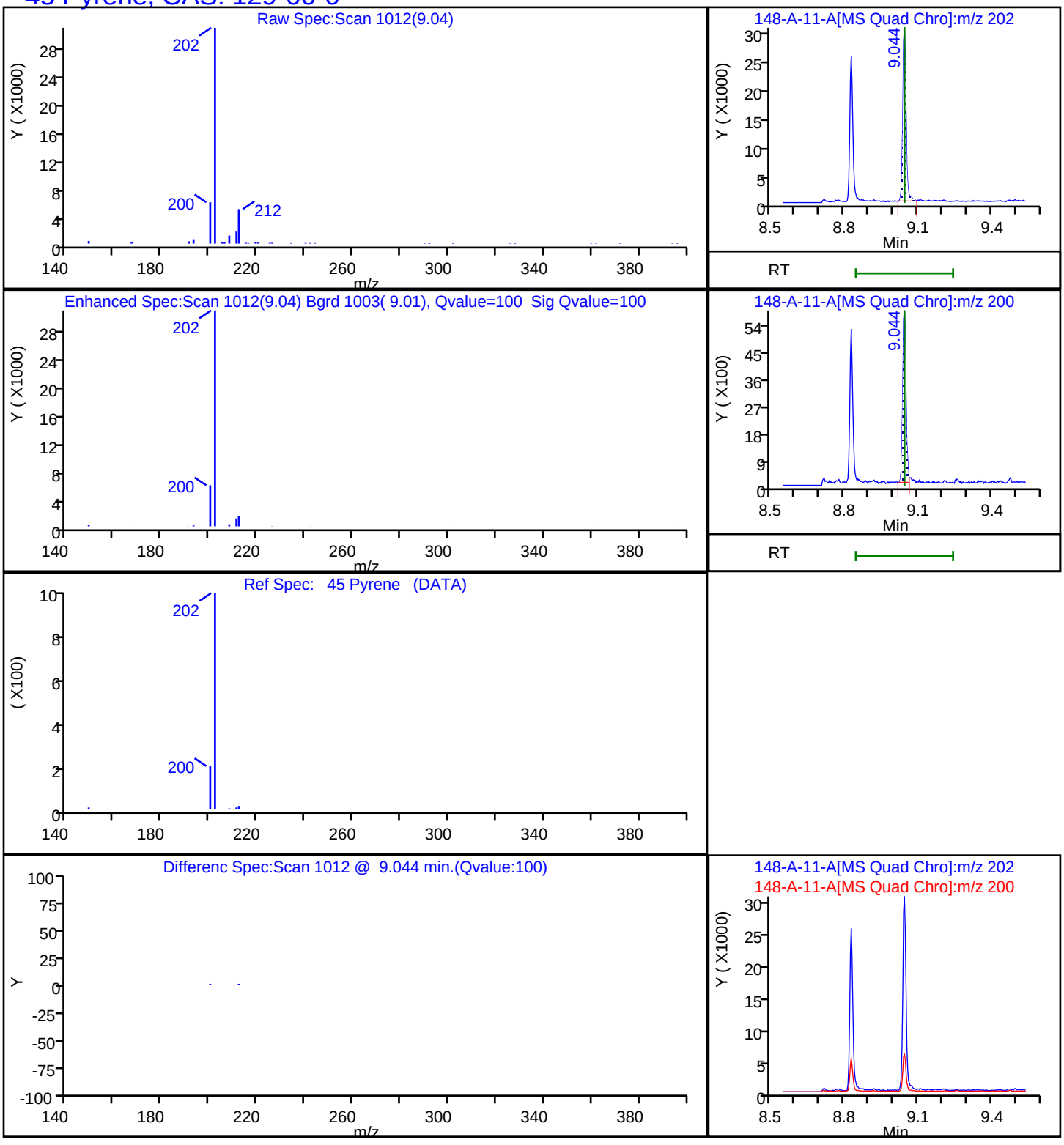
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14
Client ID:	1804576-846-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

45 Pyrene, CAS: 129-00-0



Report Date: 22-Nov-2023 12:11:21 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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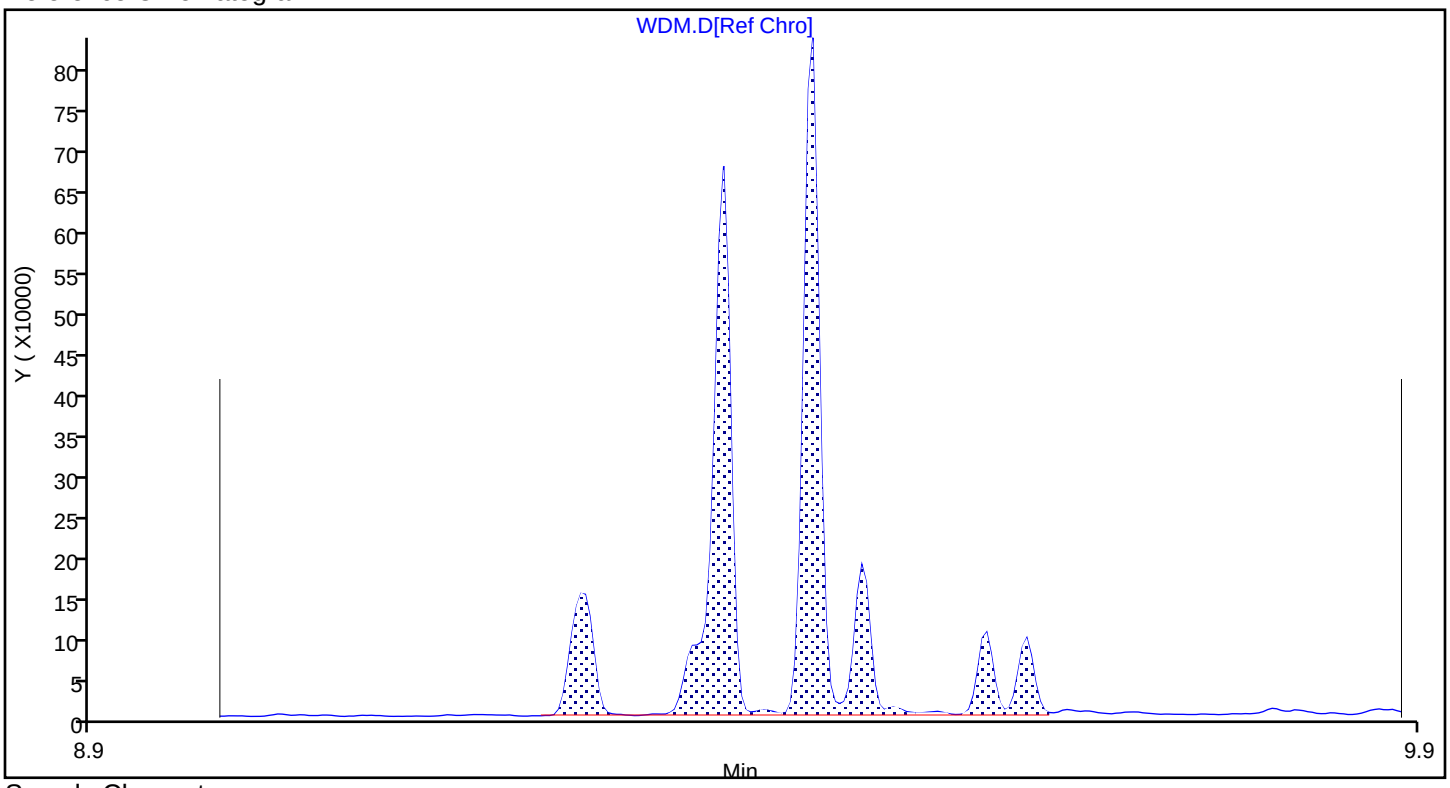
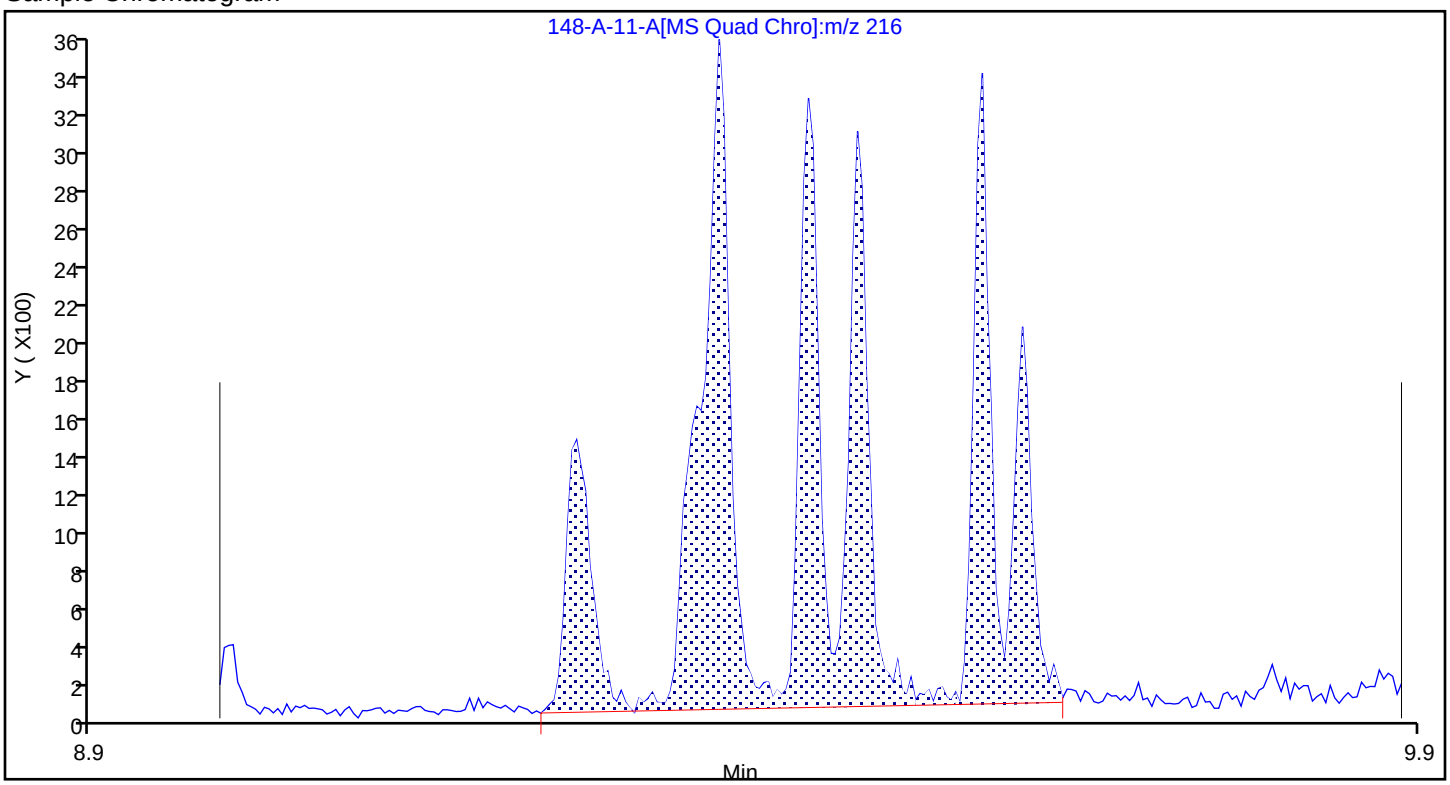
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14		
Client ID:	1804576-846-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 100 C1-Fluoranthenes/pyrene, CAS: STL00912

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-11-A.D				
Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14		
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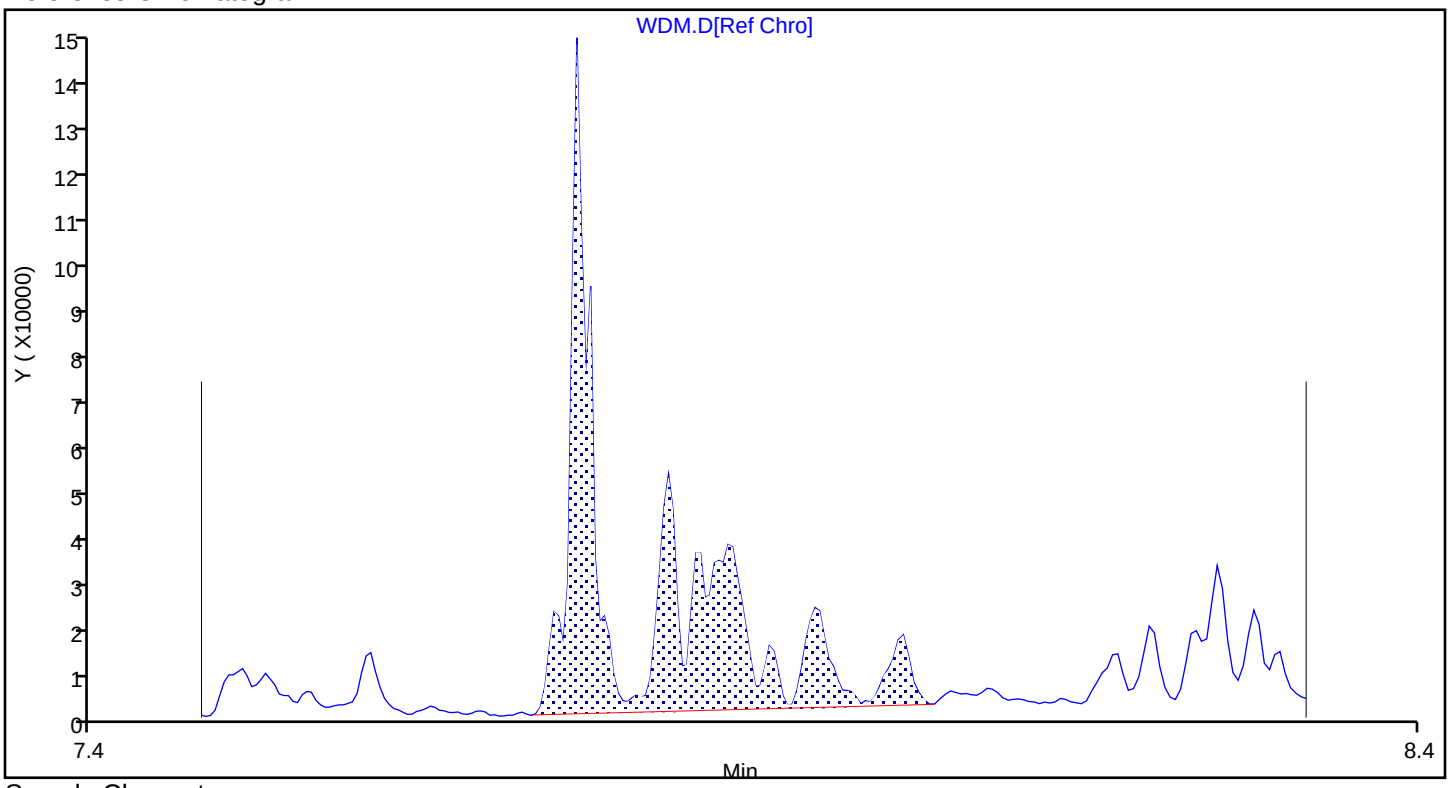
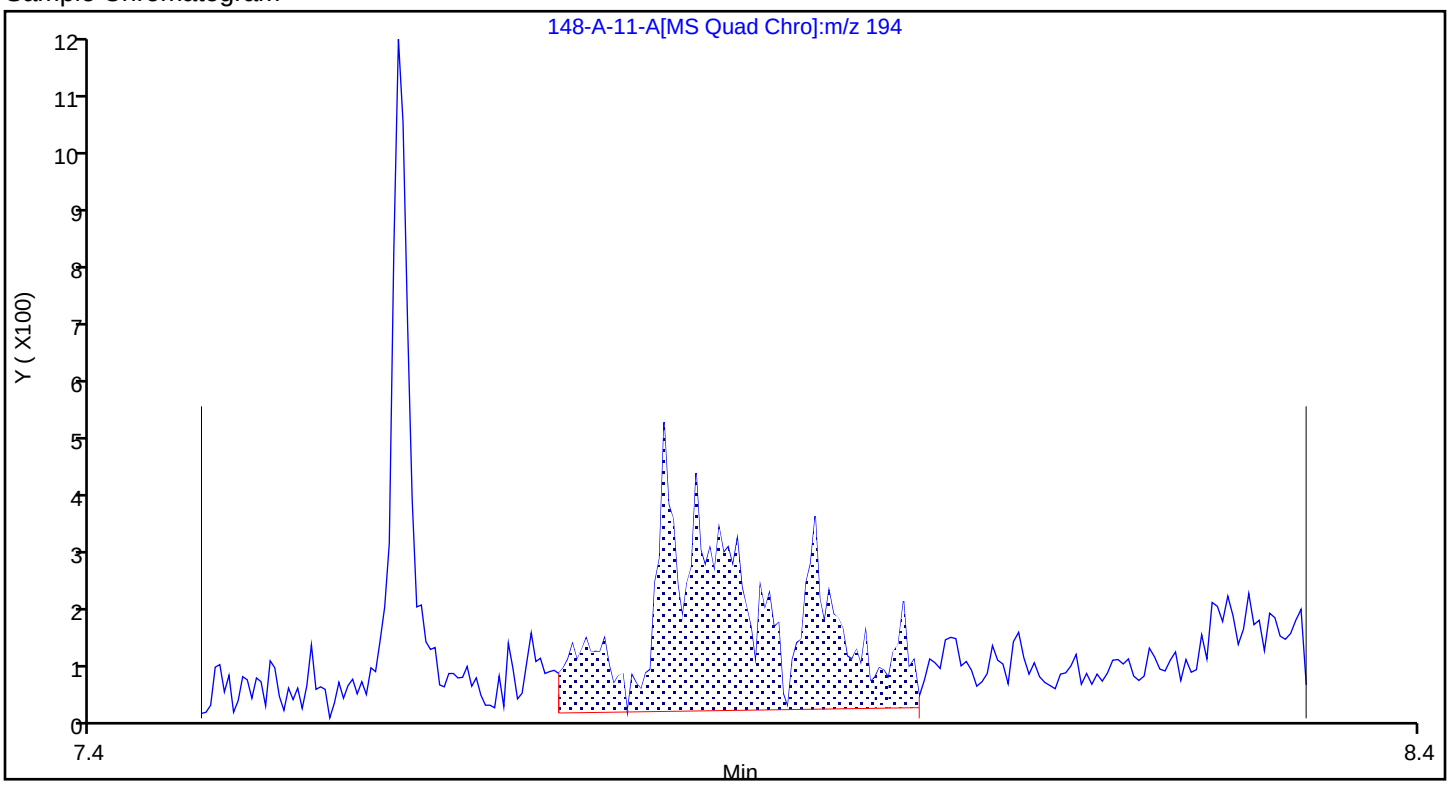
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 90 C2-Fluorenes, CAS: STL00914

Reference Chromatogram



Sample Chromatogram



Report Date: 22-Nov-2023 12:11:21 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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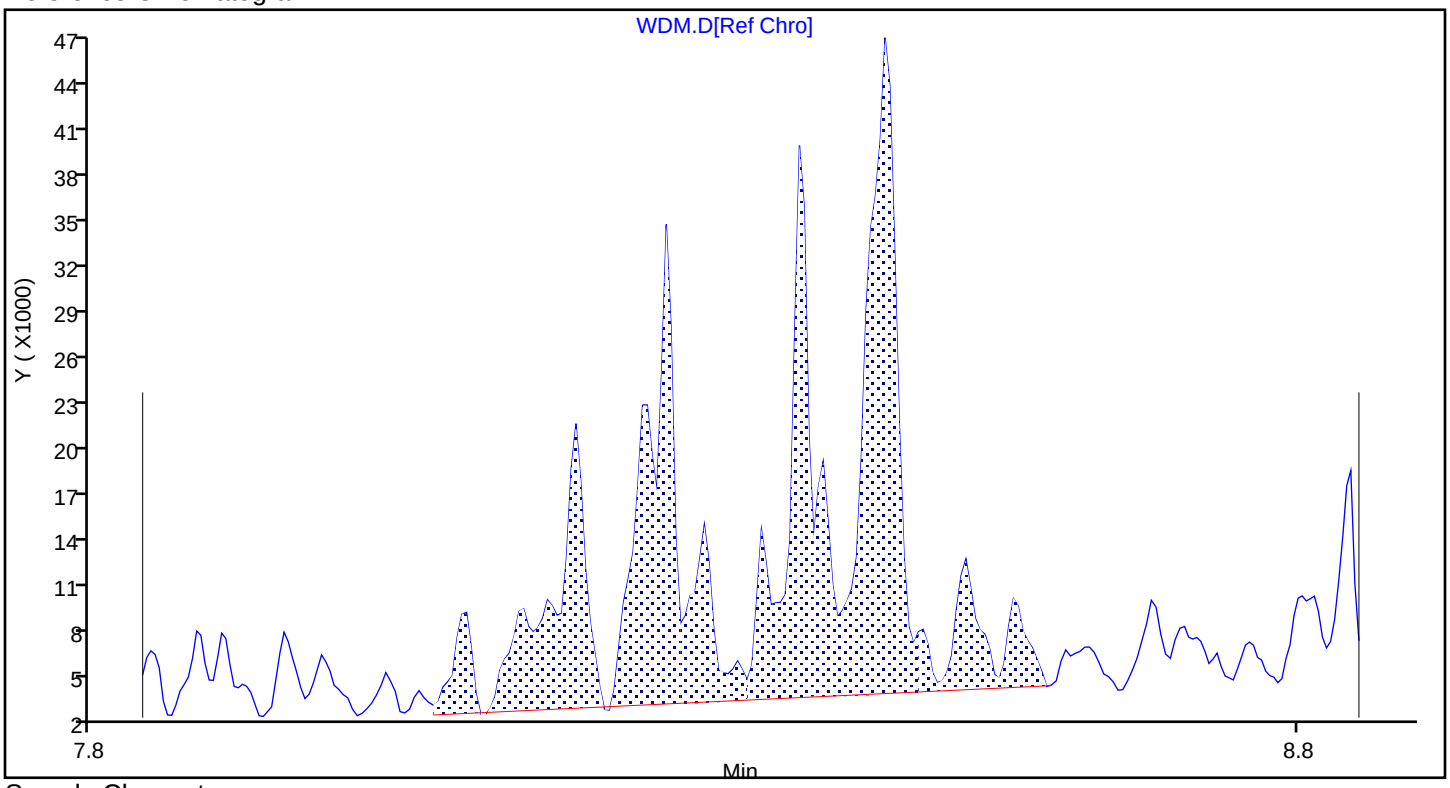
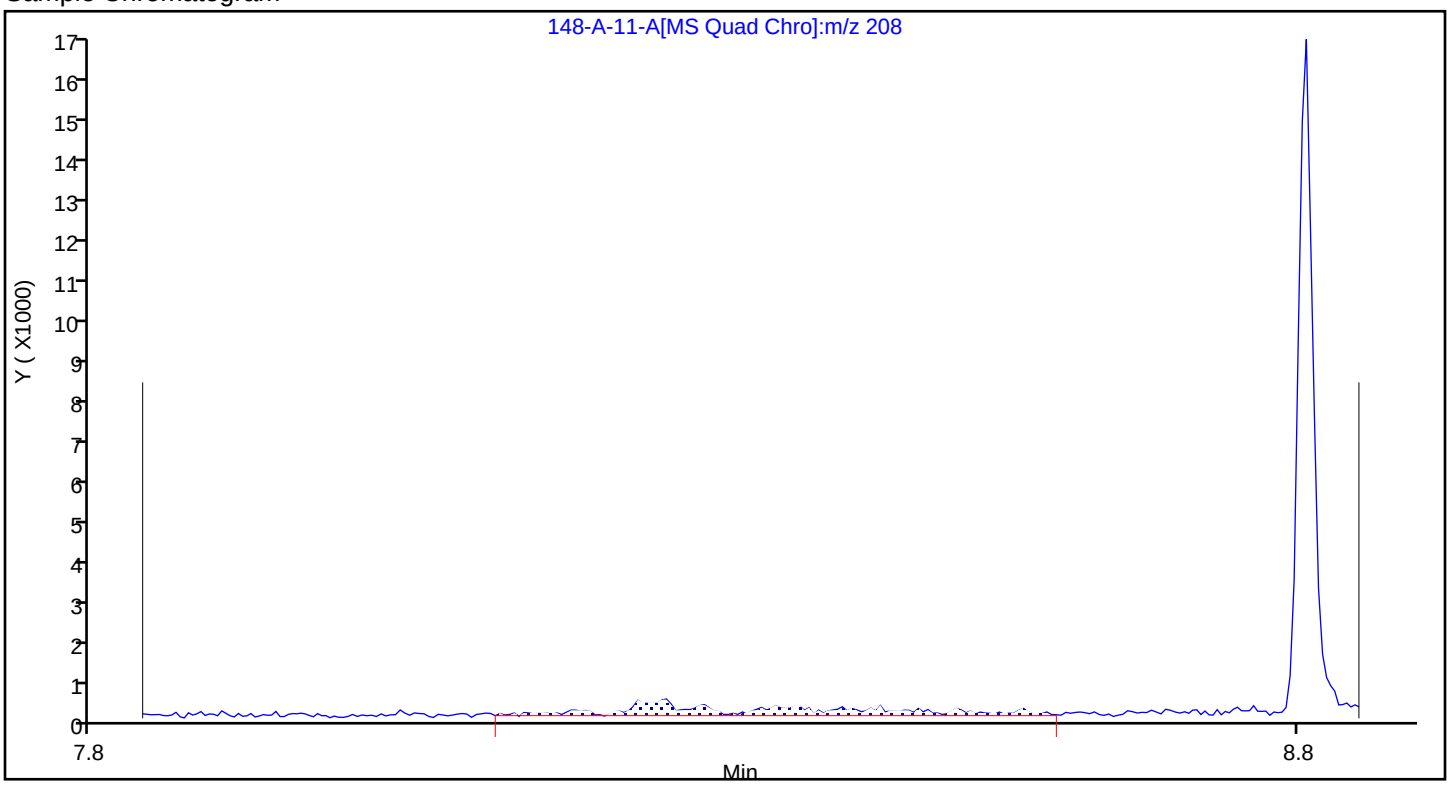
Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14		
Client ID:	1804576-846-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 91 C3-Fluorenes, CAS: STL00915

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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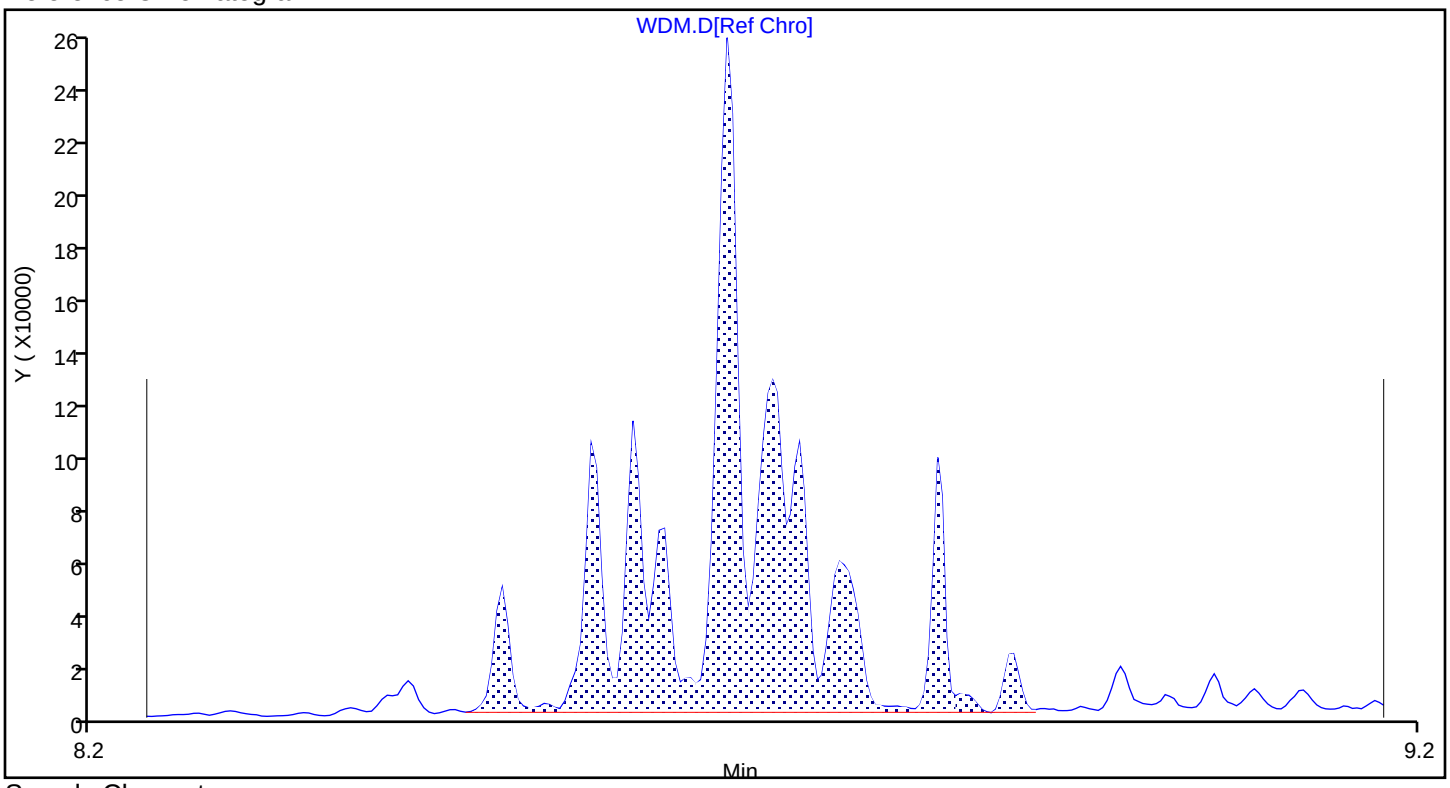
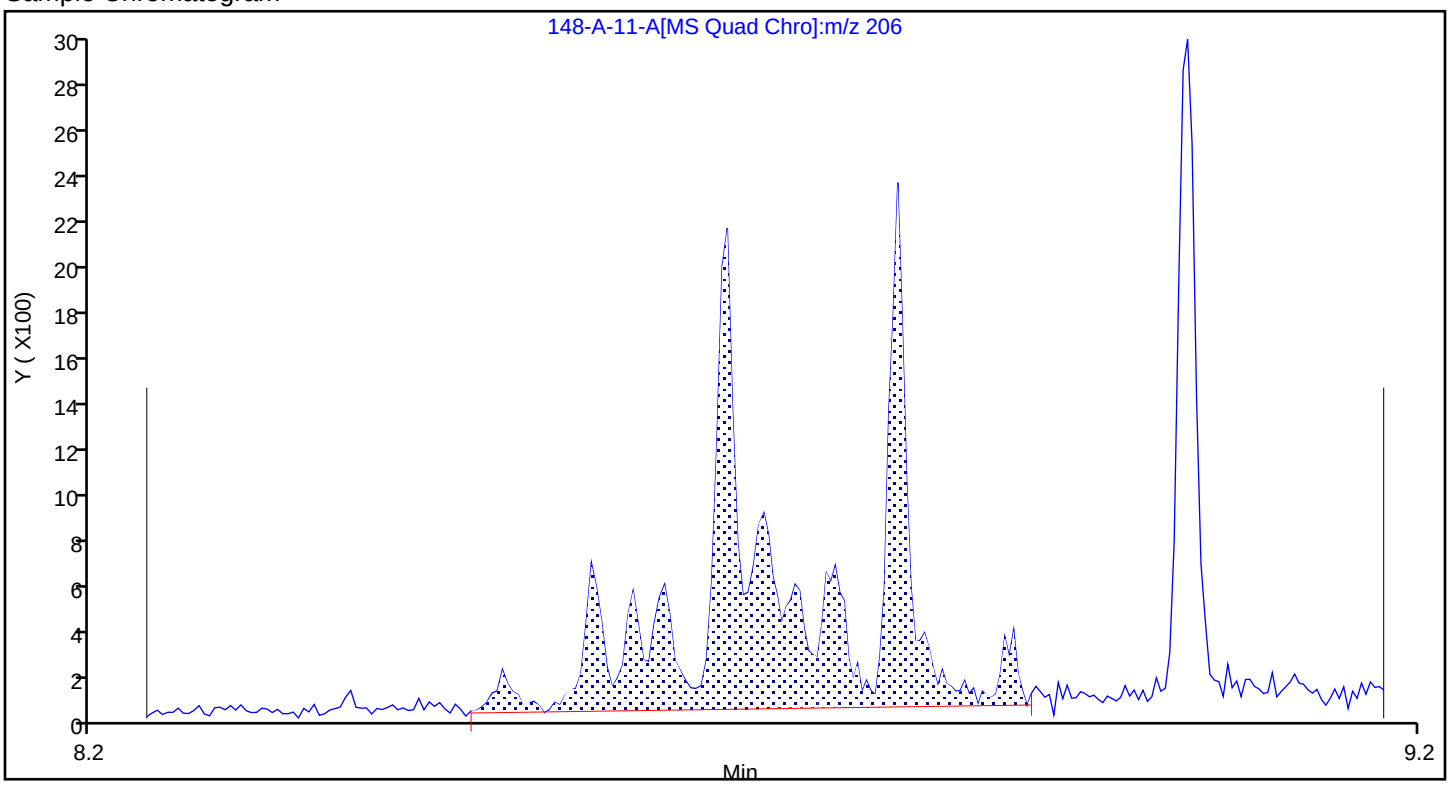
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14		
Client ID:	1804576-846-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 97 C2-Phenanthrenes/Anthracenes, CAS: STL00902

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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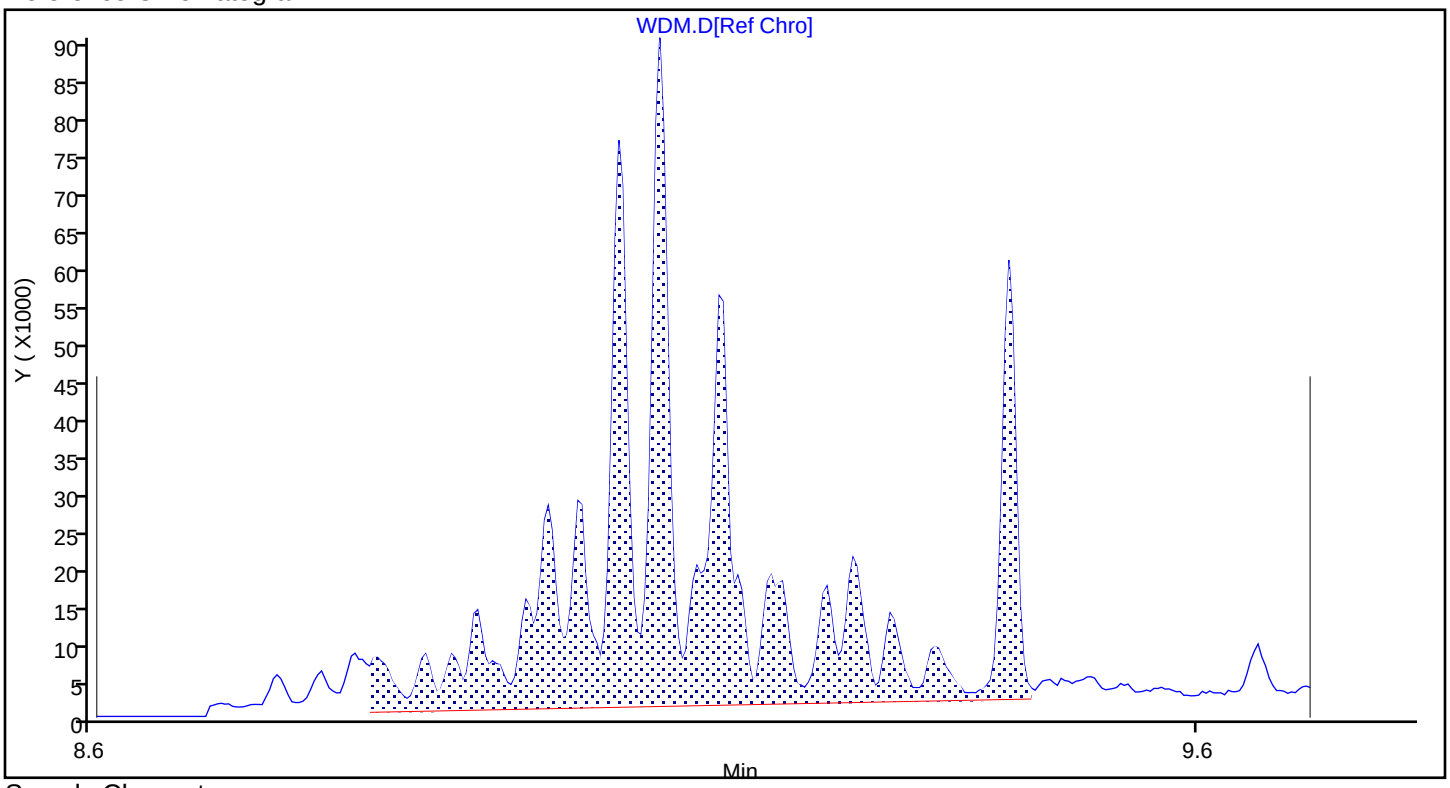
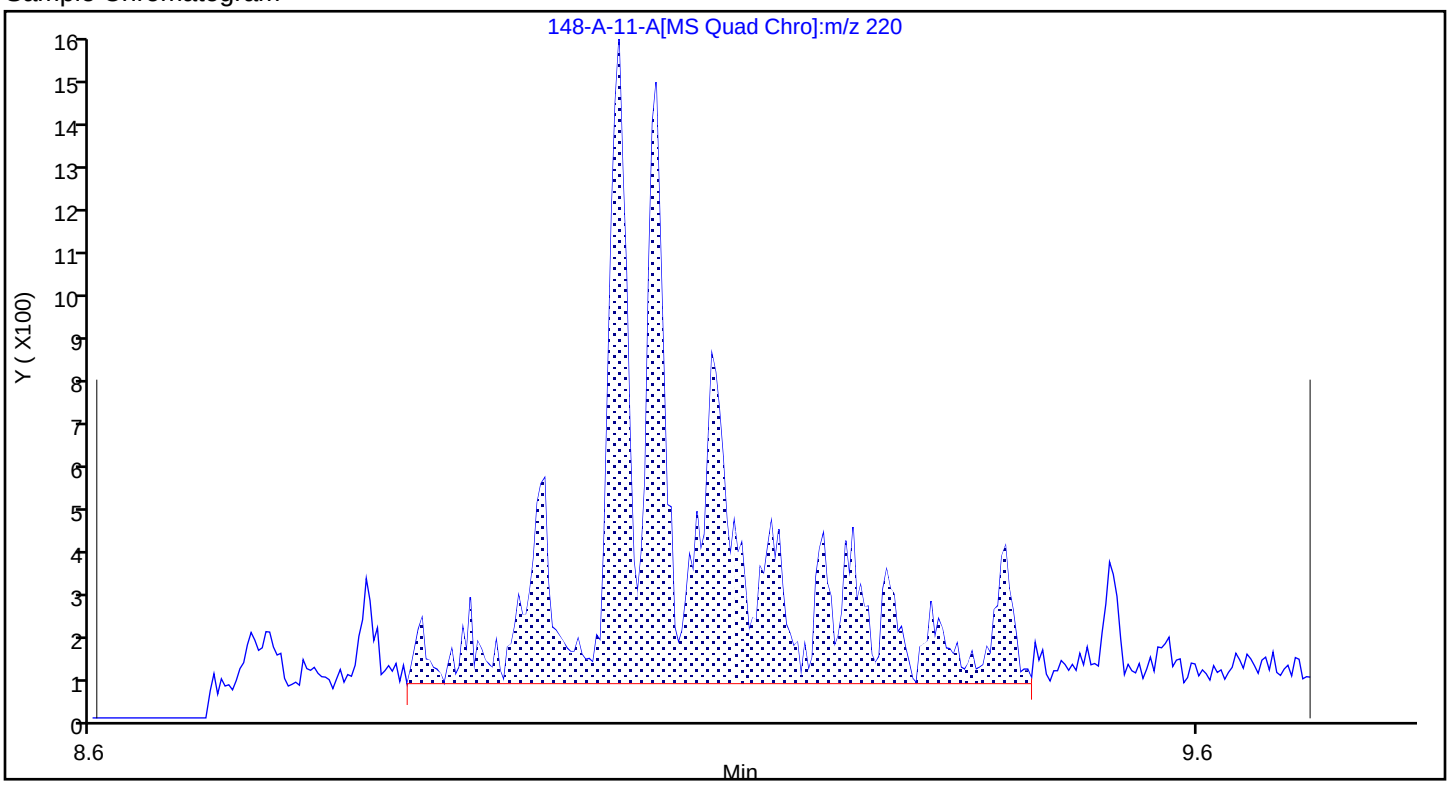
Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14		
Client ID:	1804576-846-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 98 C3-Phenanthrenes/Anthracenes, CAS: STL00903

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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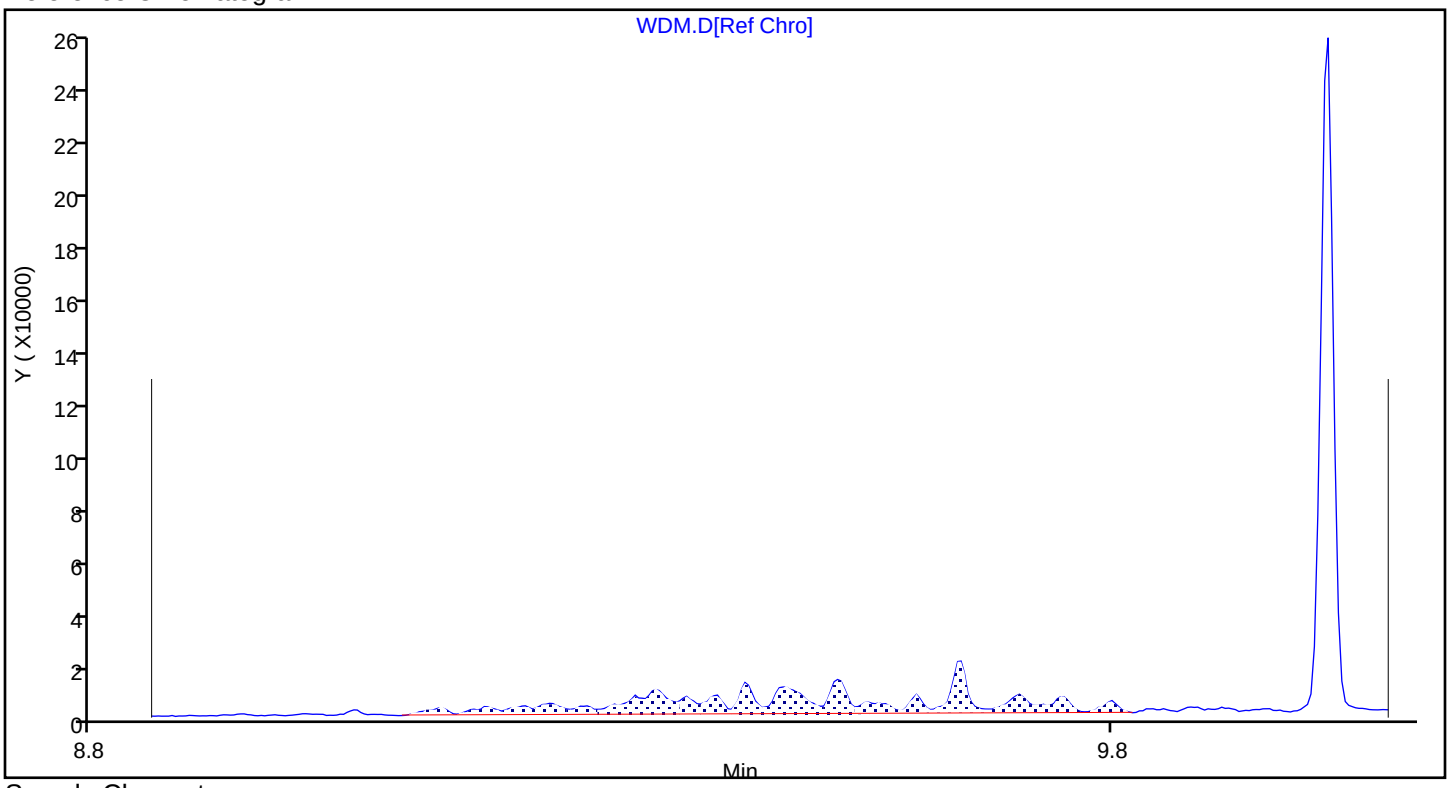
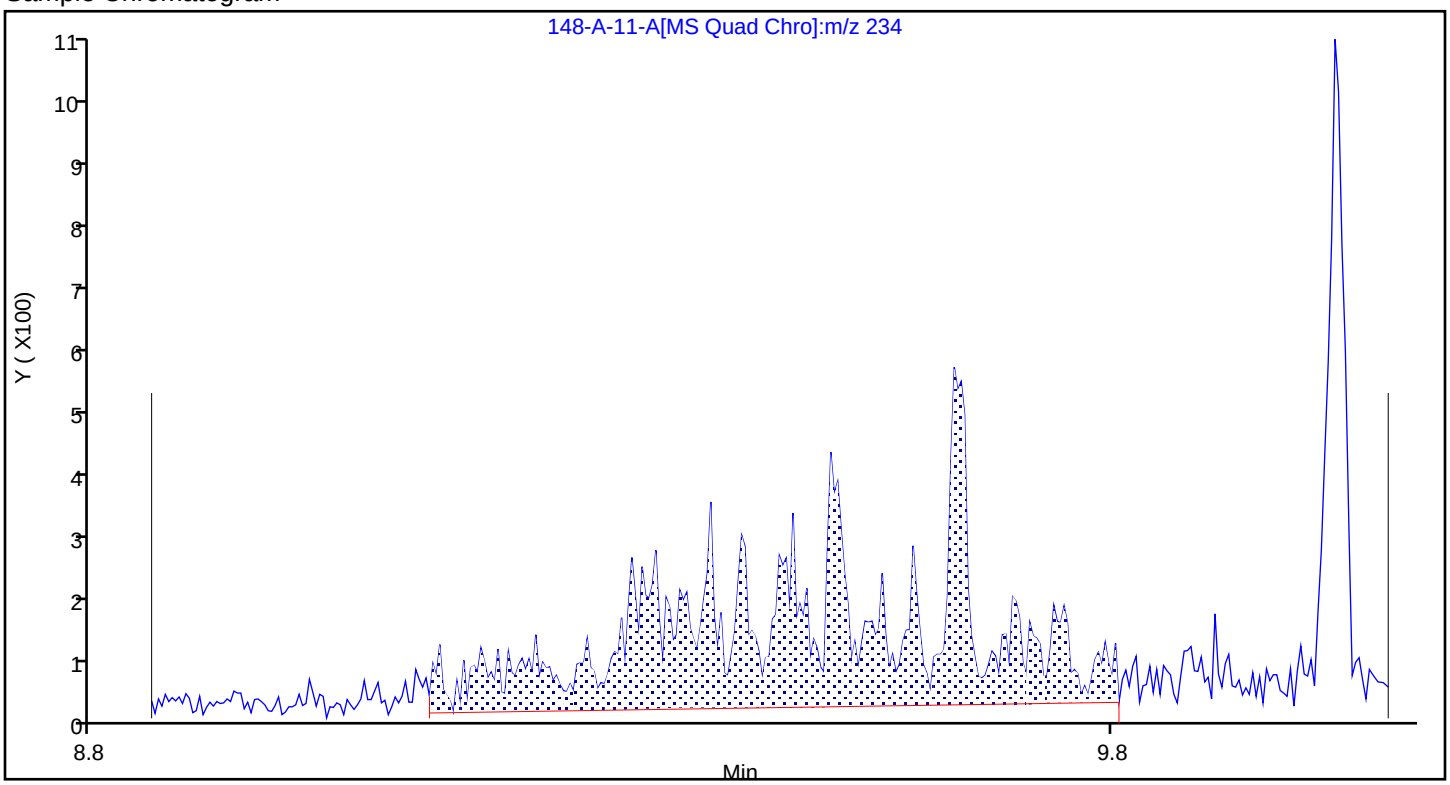
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14		
Client ID:	1804576-846-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 99 C4-Phenanthrenes/Anthracenes, CAS: STL00904

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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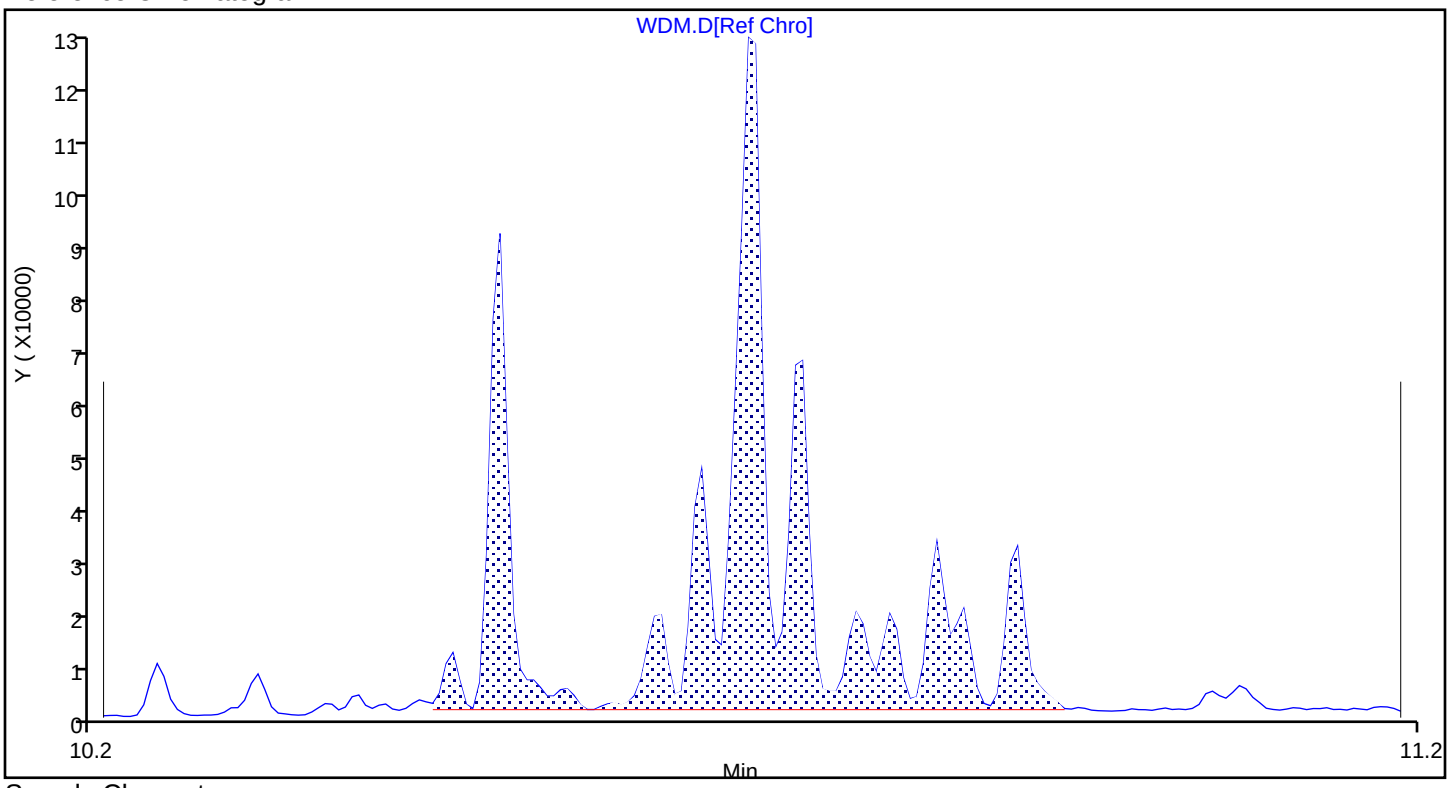
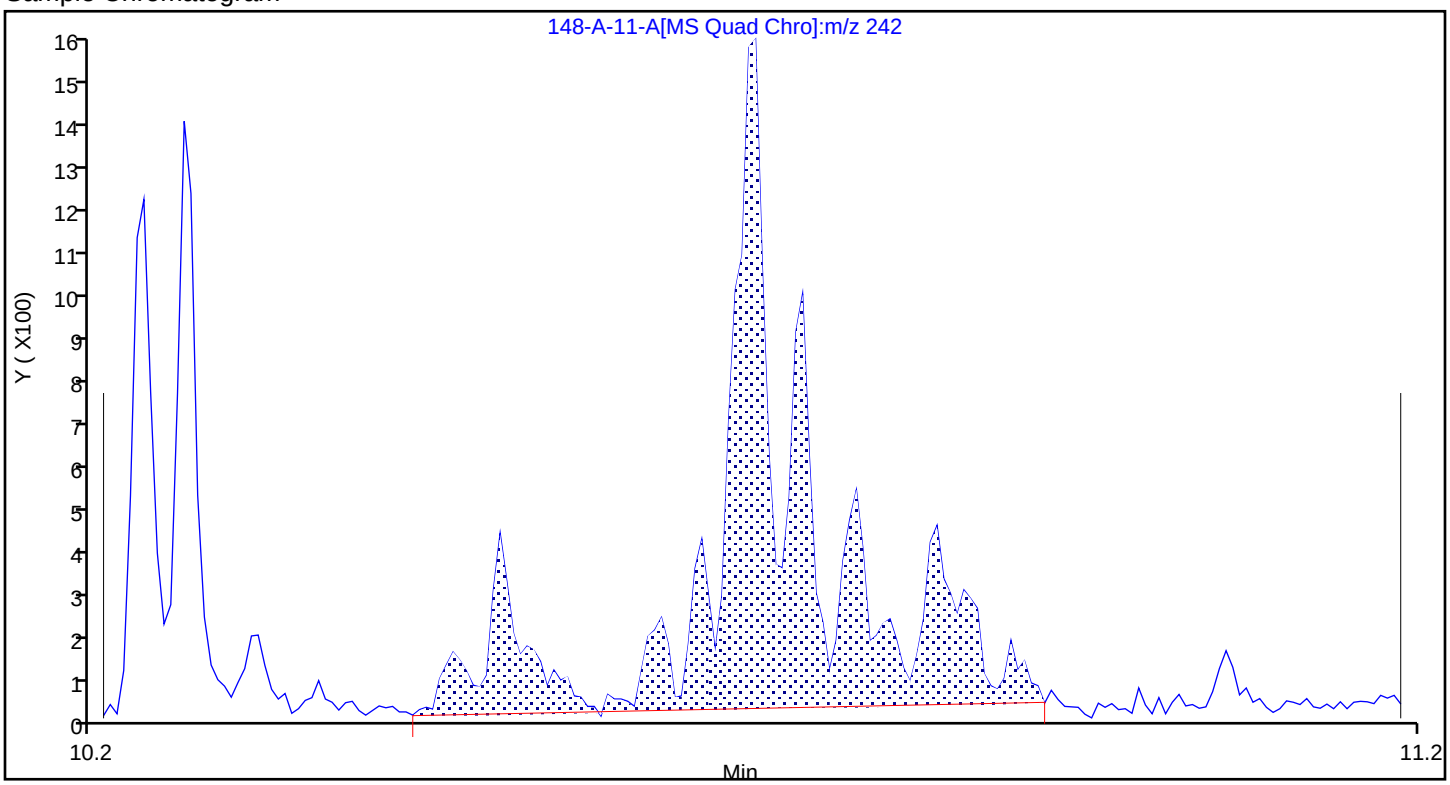
Client ID:	1804576-846-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 101 C1-Chrysenes/Benz(a)anthracenes, CAS: STL02218

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1		
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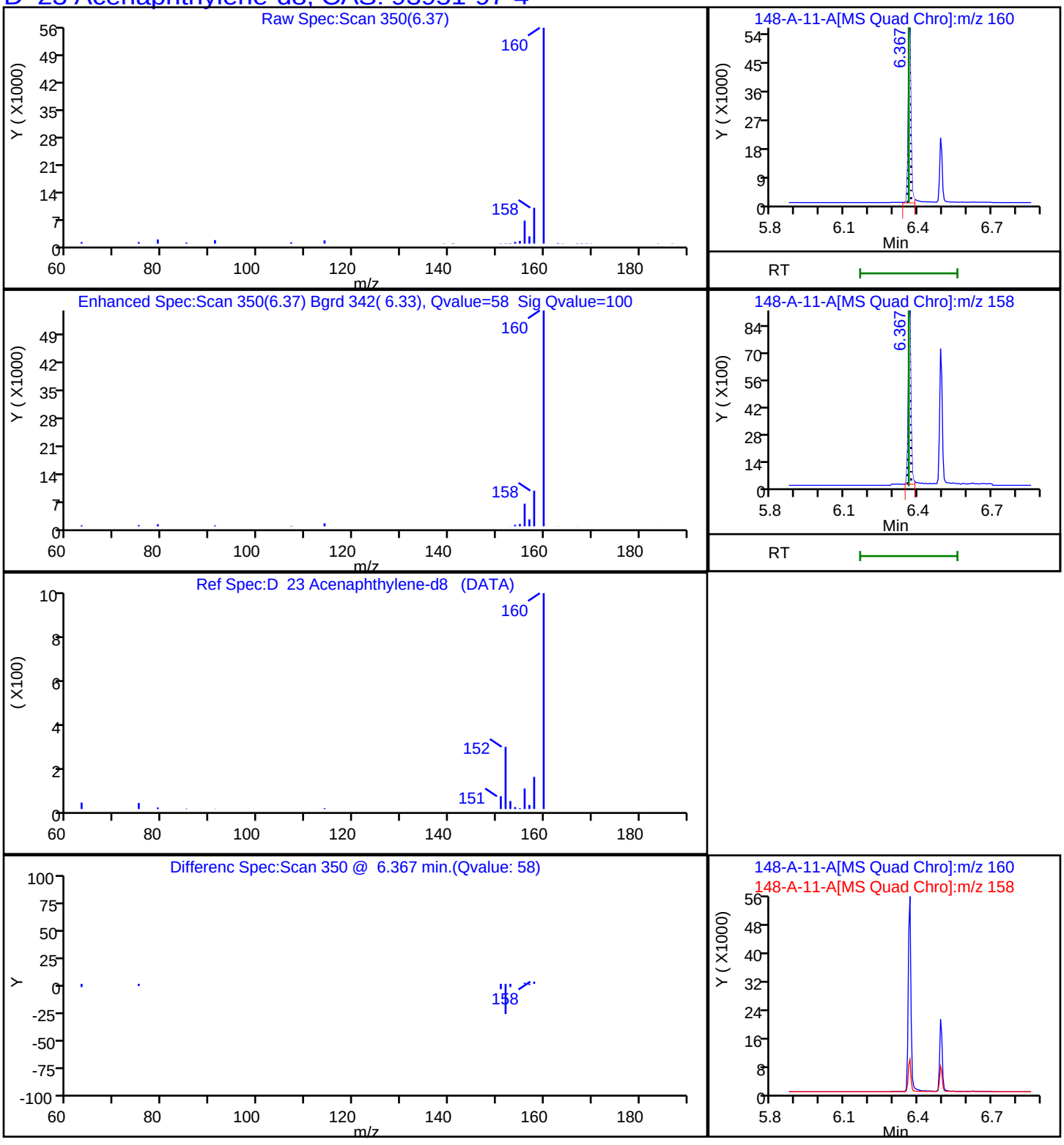
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 23 Acenaphthylene-d8, CAS: 93951-97-4



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Eurofins Knoxville

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Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14		
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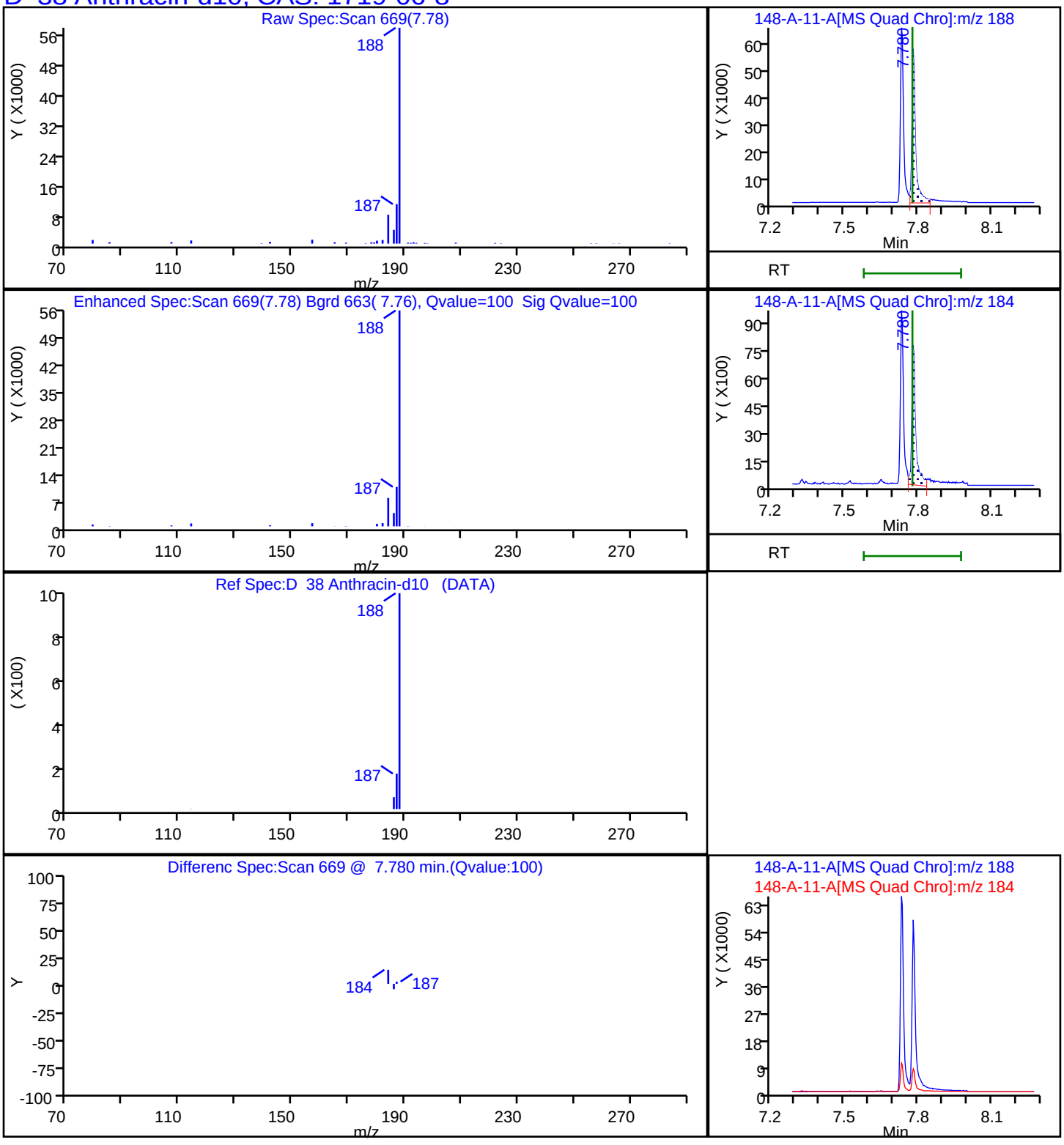
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 38 Anthracin-d10, CAS: 1719-06-8



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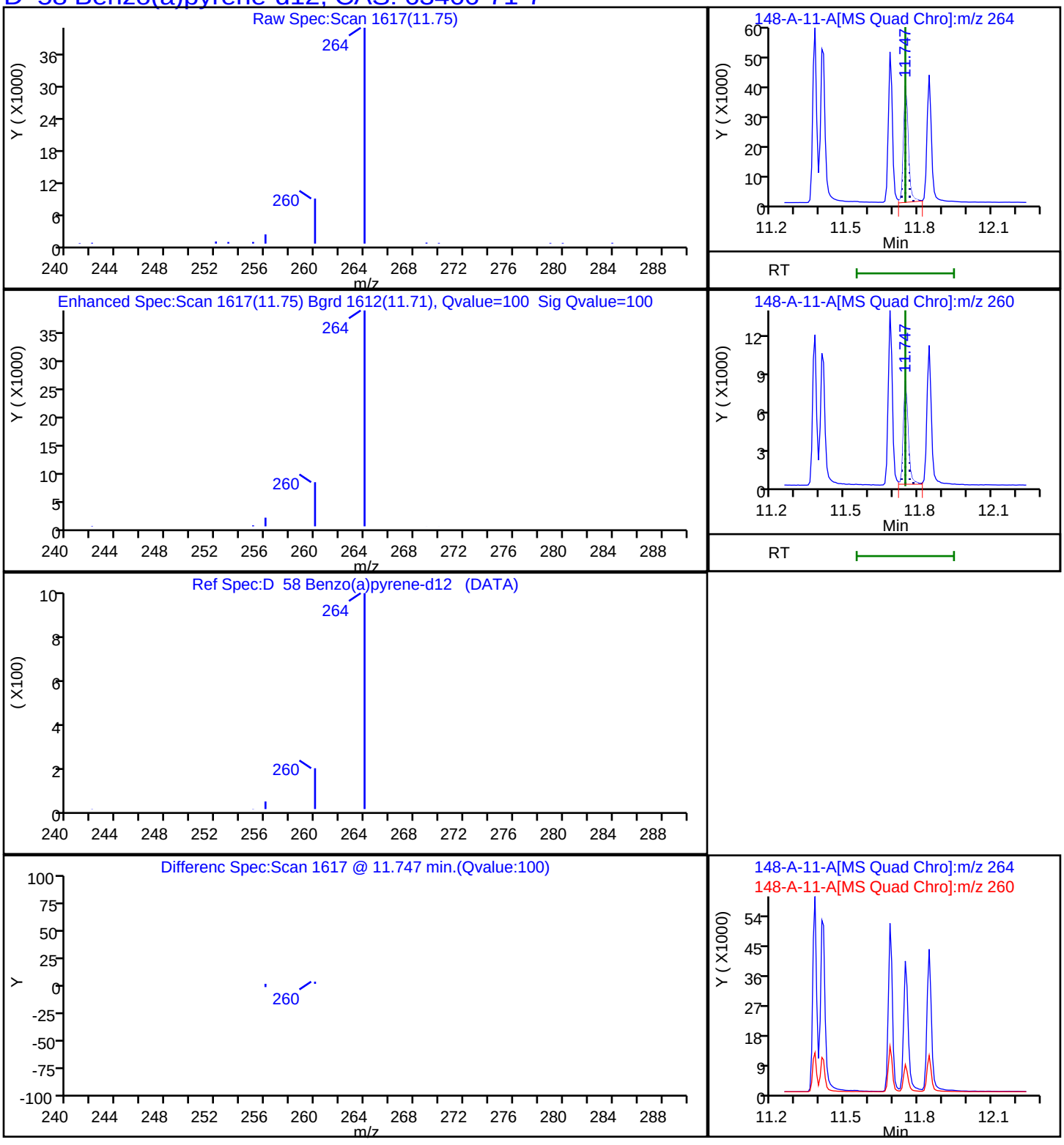
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-11-A.D

Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14		
Client ID:	1804576-846-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 58 Benzo(a)pyrene-d12, CAS: 63466-71-7



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Eurofins Knoxville

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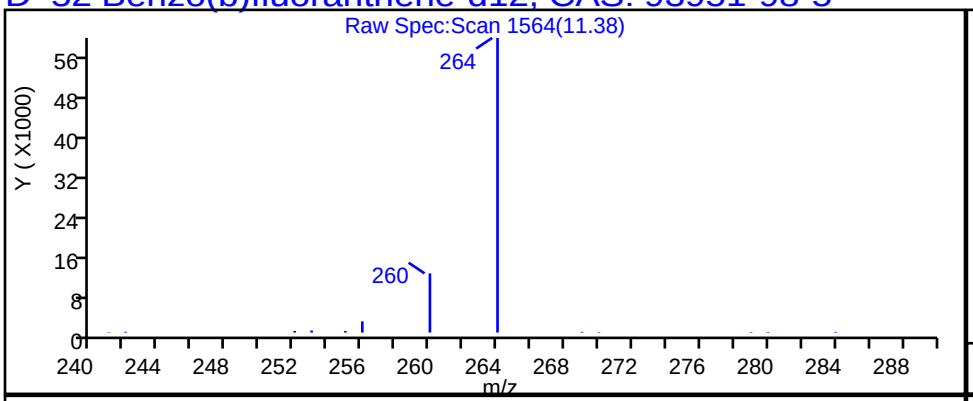
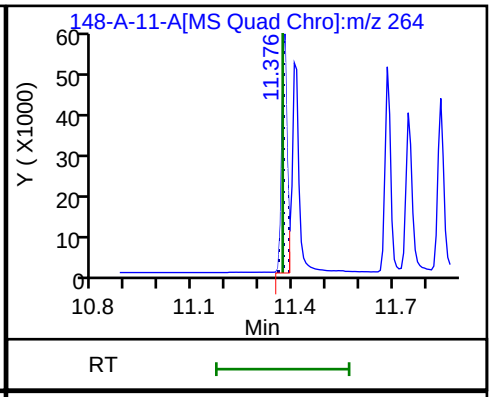
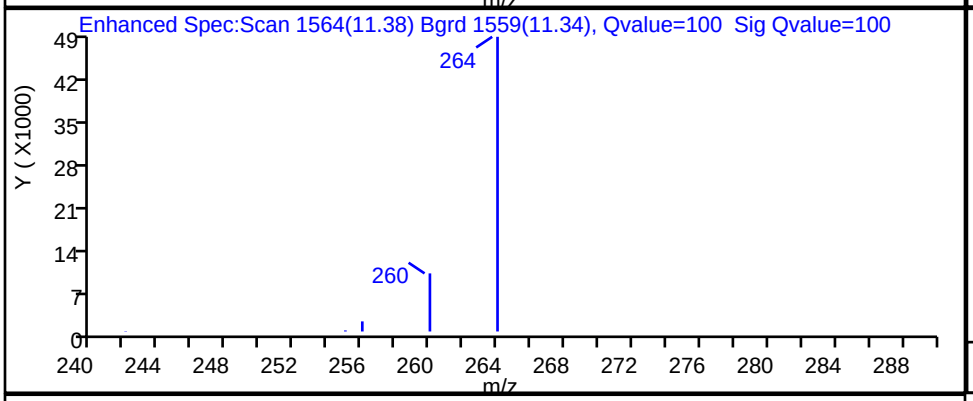
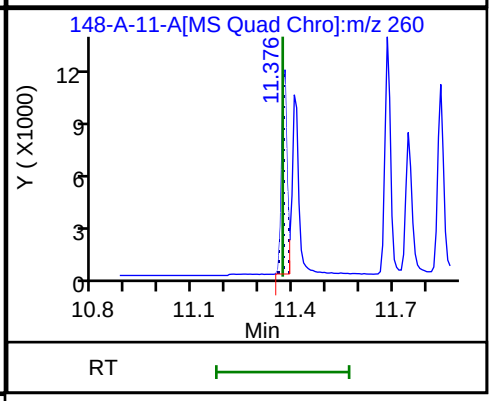
Client ID:	1804576-846-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

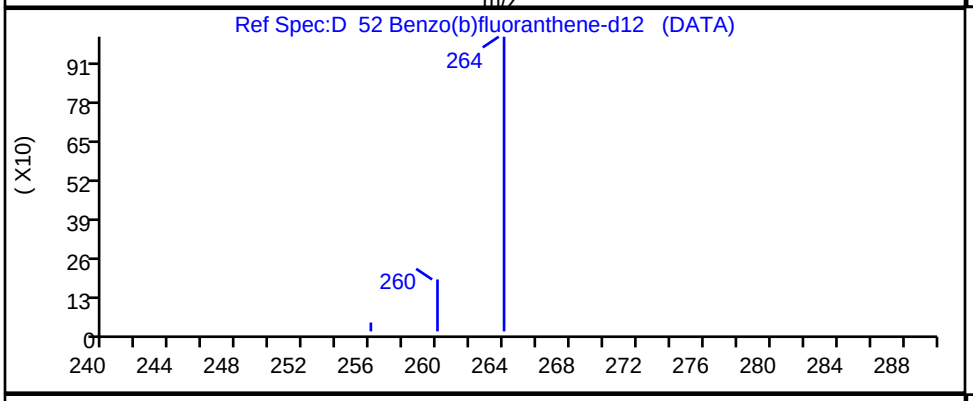
D 52 Benzo(b)fluoranthene-d12, CAS: 93951-98-5

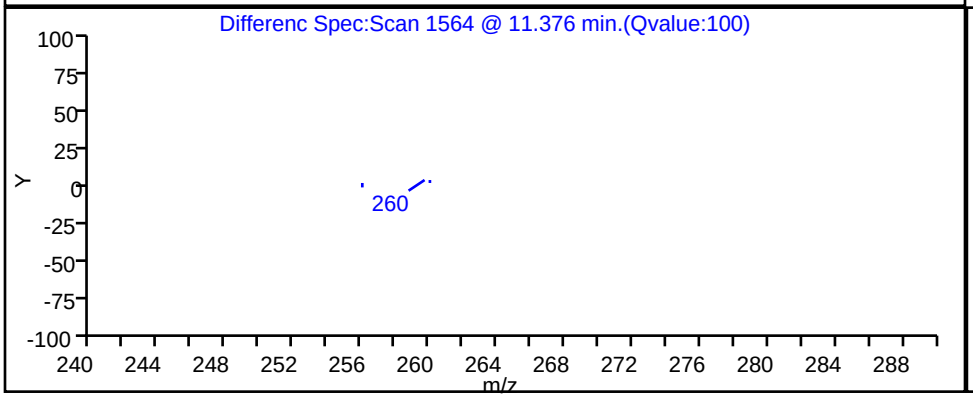


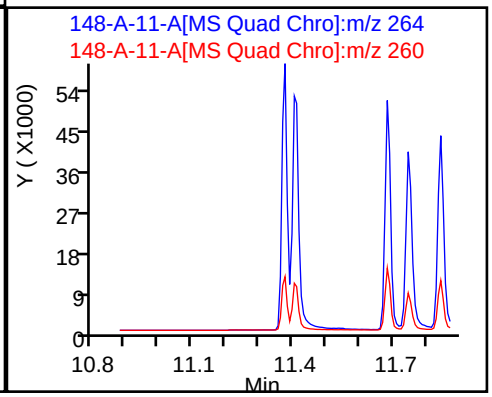












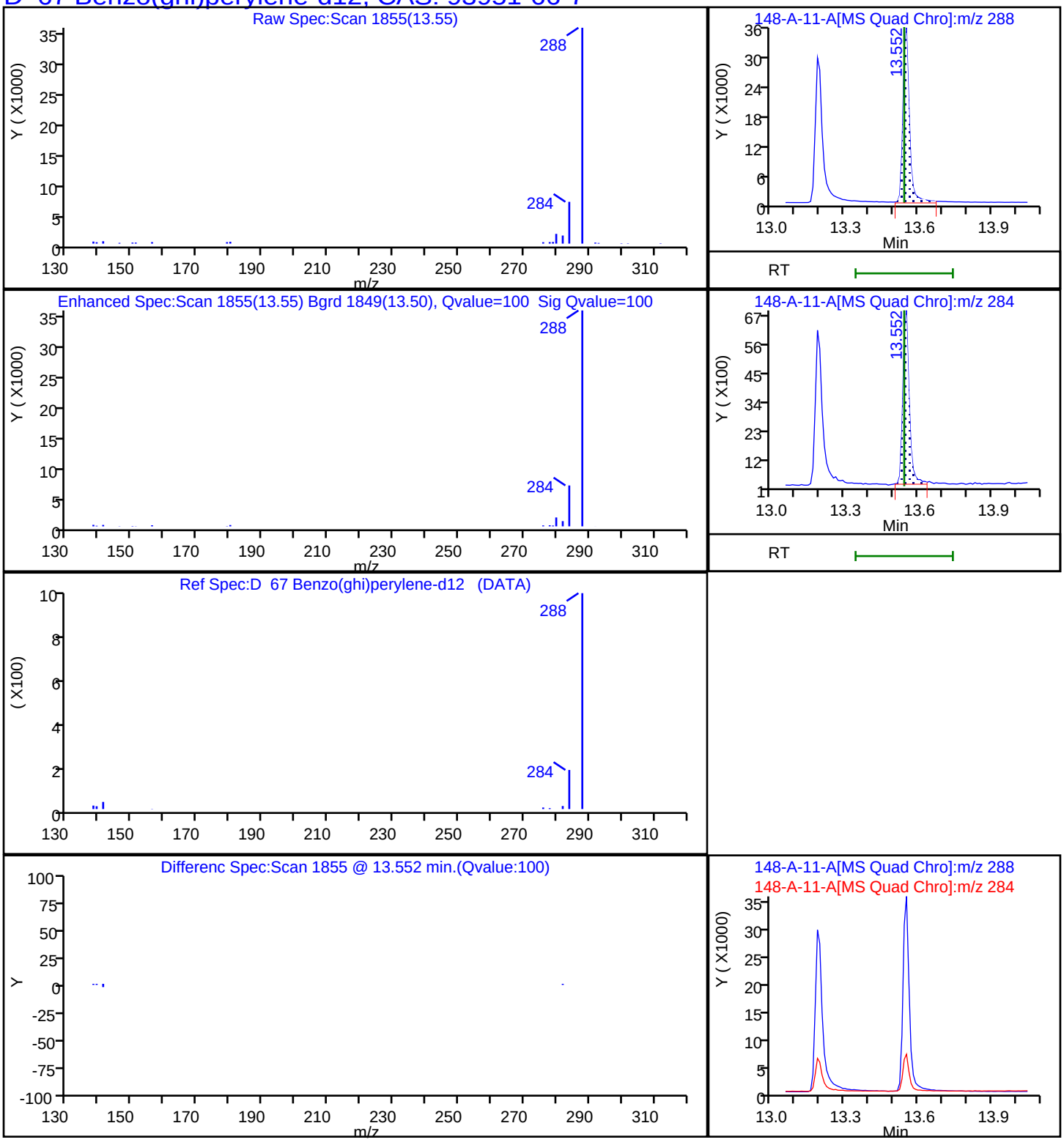
Report Date: 22-Nov-2023 12:11:21 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-11-A.D

Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14		
Client ID:	1804576-846-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 67 Benzo(ghi)perylene-d12, CAS: 93951-66-7



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Eurofins Knoxville

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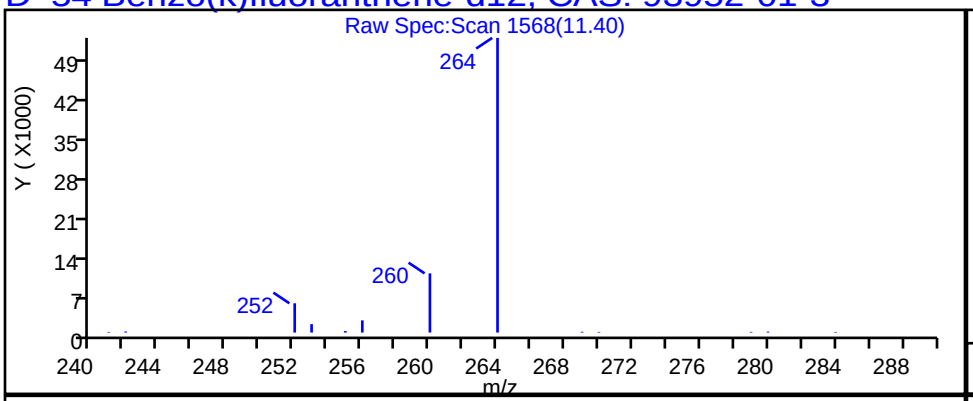
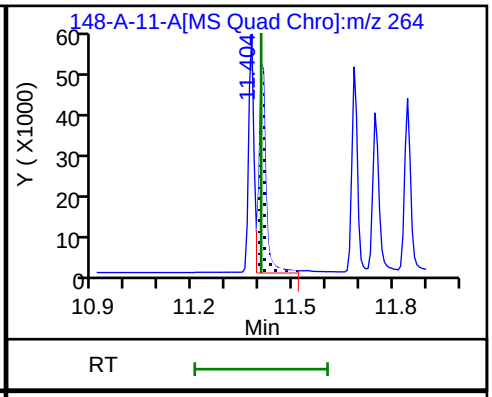
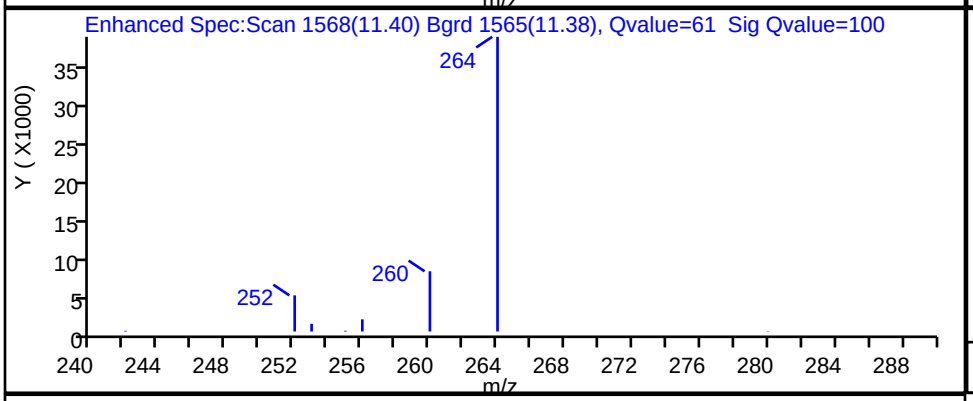
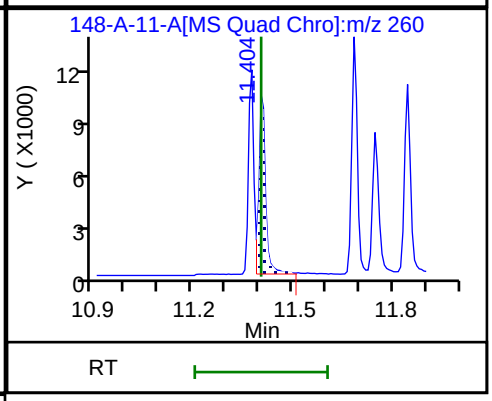
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14		
Client ID:	1804576-846-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

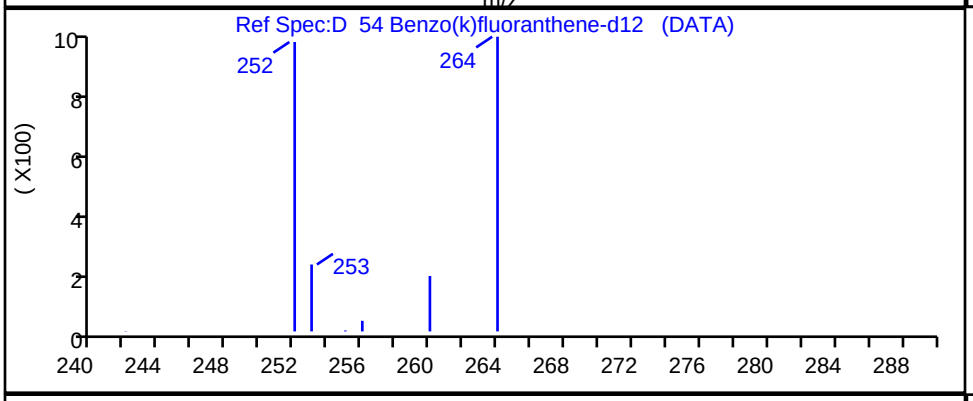
D 54 Benzo(k)fluoranthene-d12, CAS: 93952-01-3

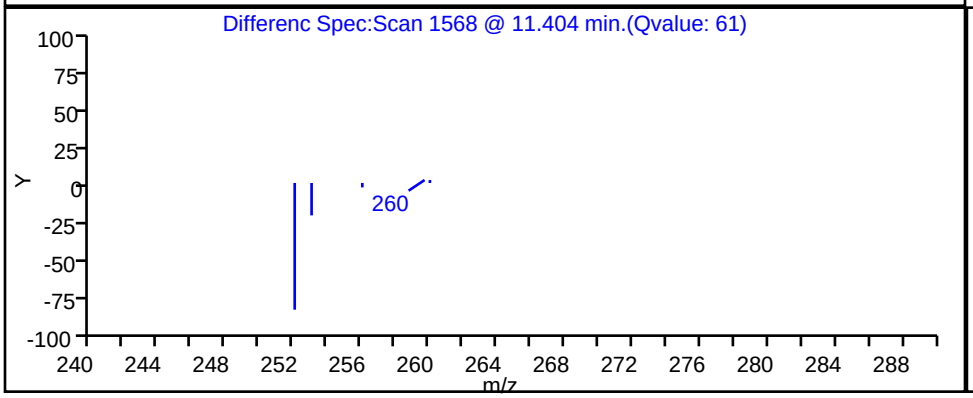


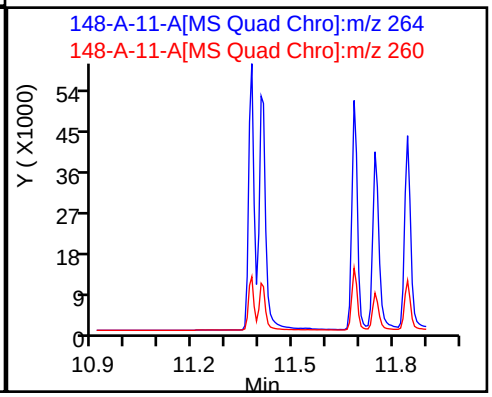












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Eurofins Knoxville

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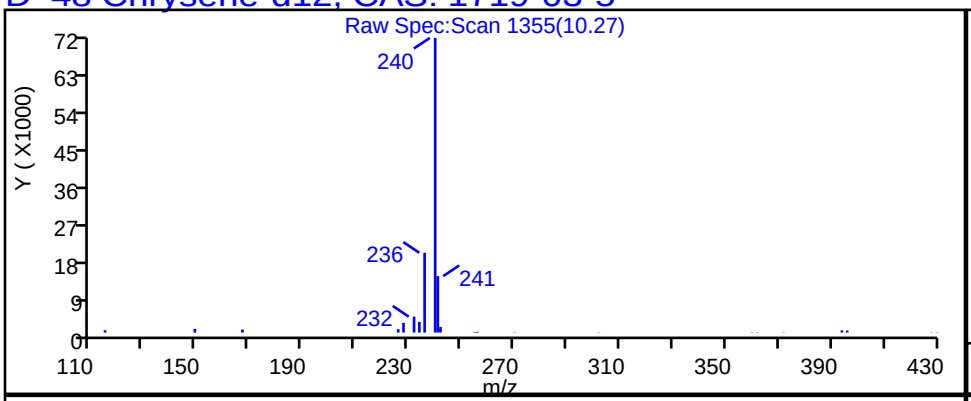
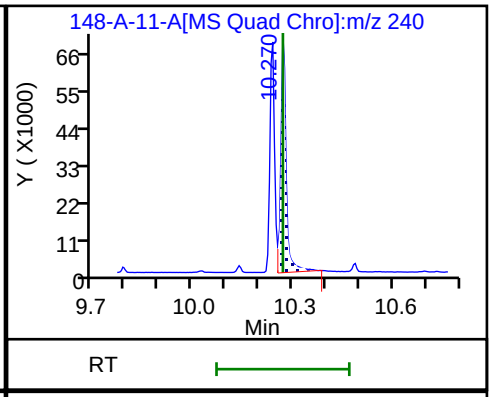
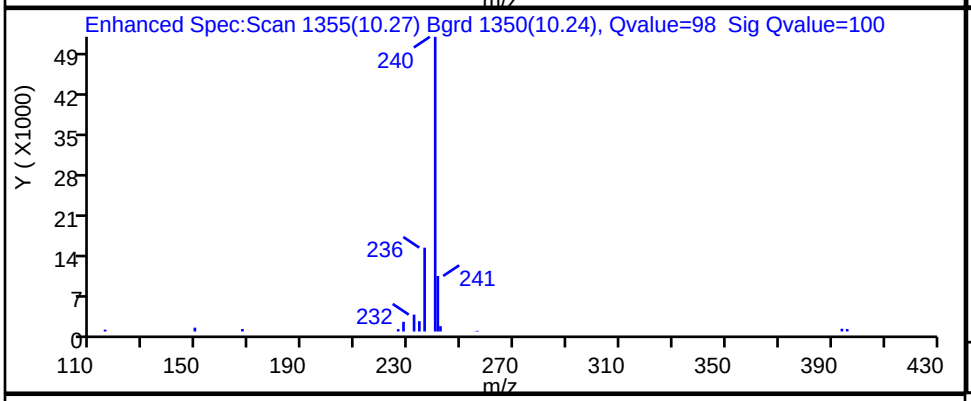
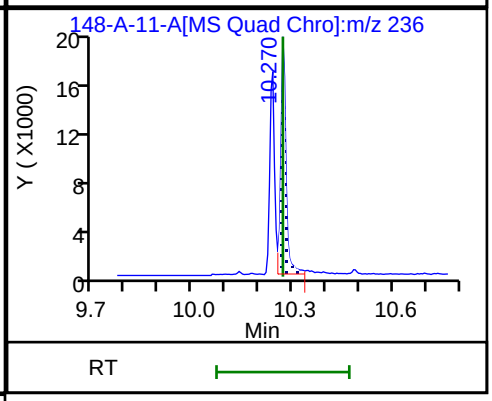
Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14		
Client ID:	1804576-846-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

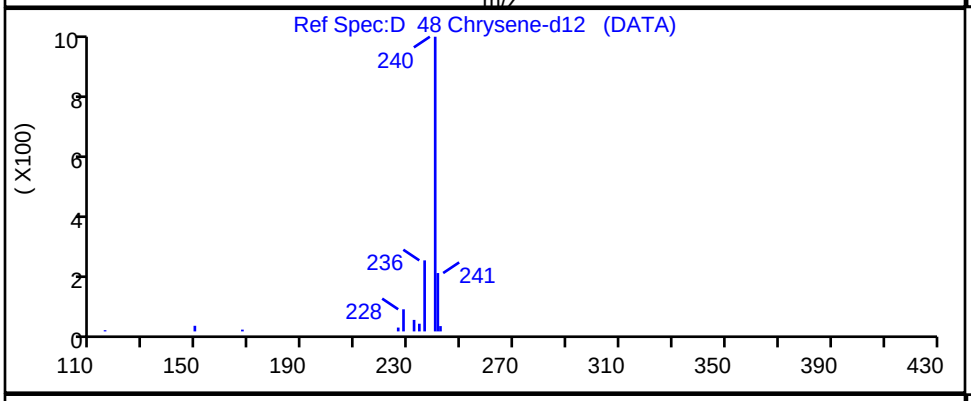
D 48 Chrysene-d12, CAS: 1719-03-5

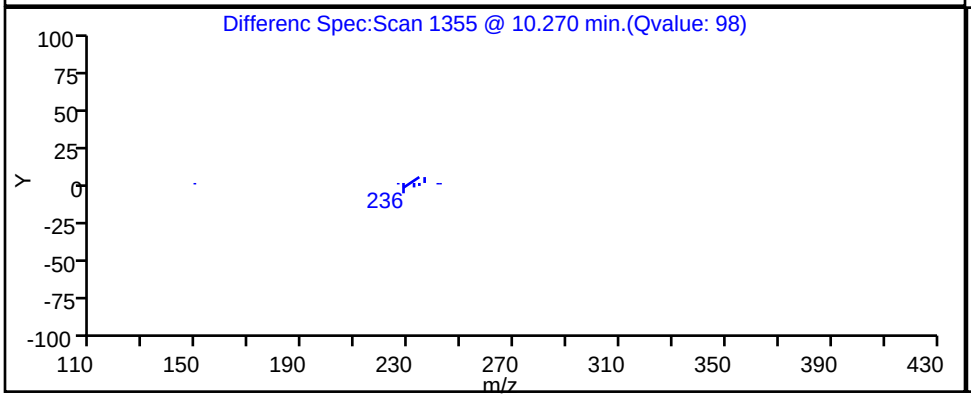


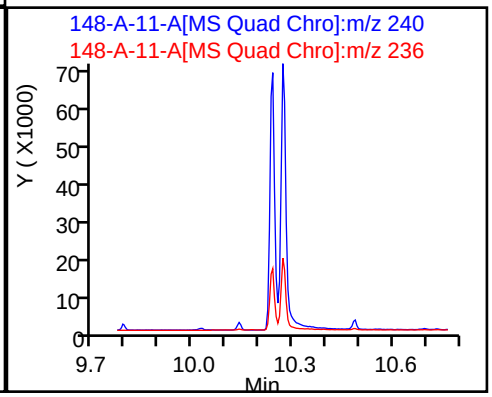












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Eurofins Knoxville

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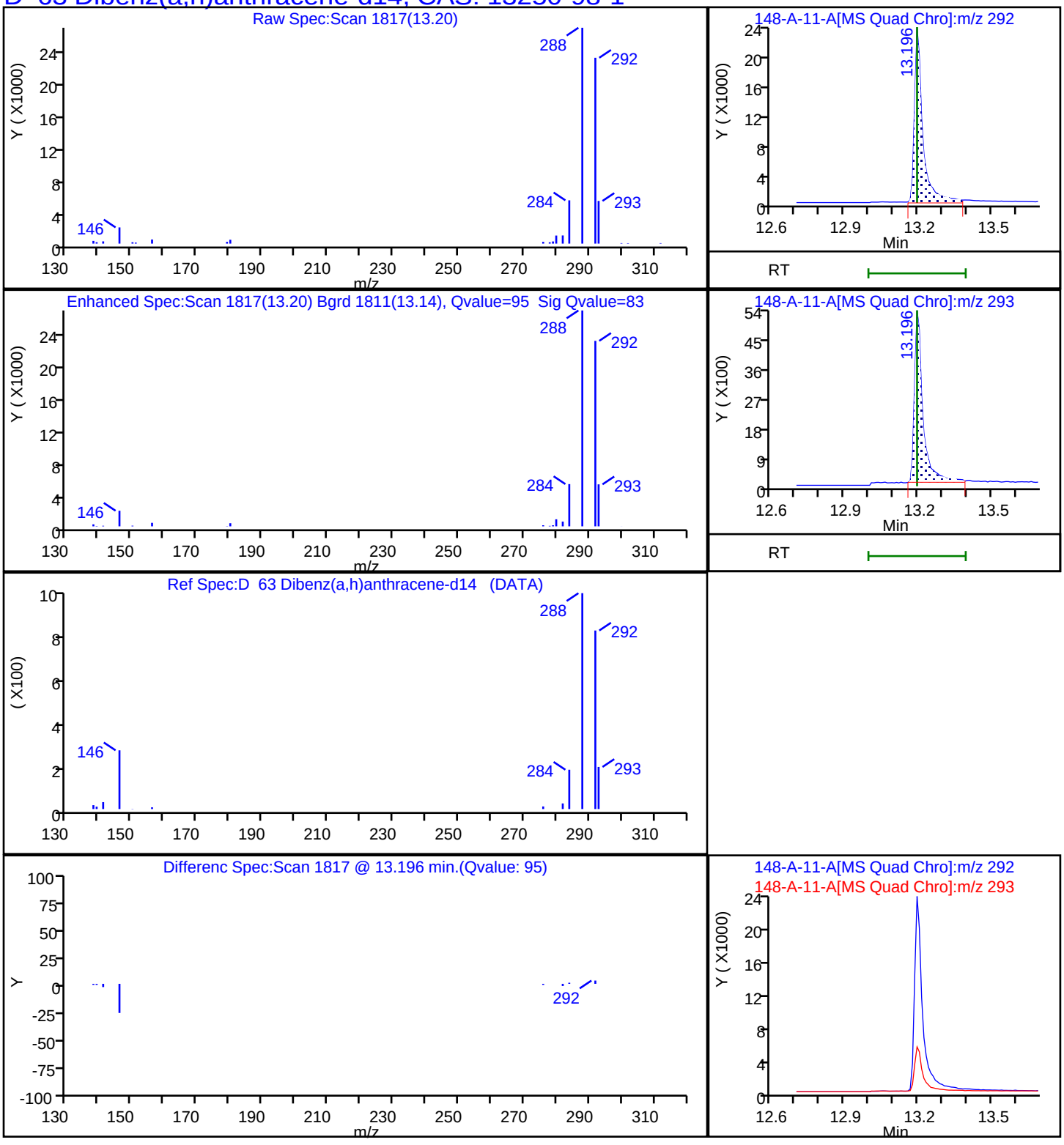
Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14		
Client ID:	1804576-846-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 63 Dibenz(a,h)anthracene-d14, CAS: 13250-98-1



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Eurofins Knoxville

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Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14		
Client ID:	1804576-846-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
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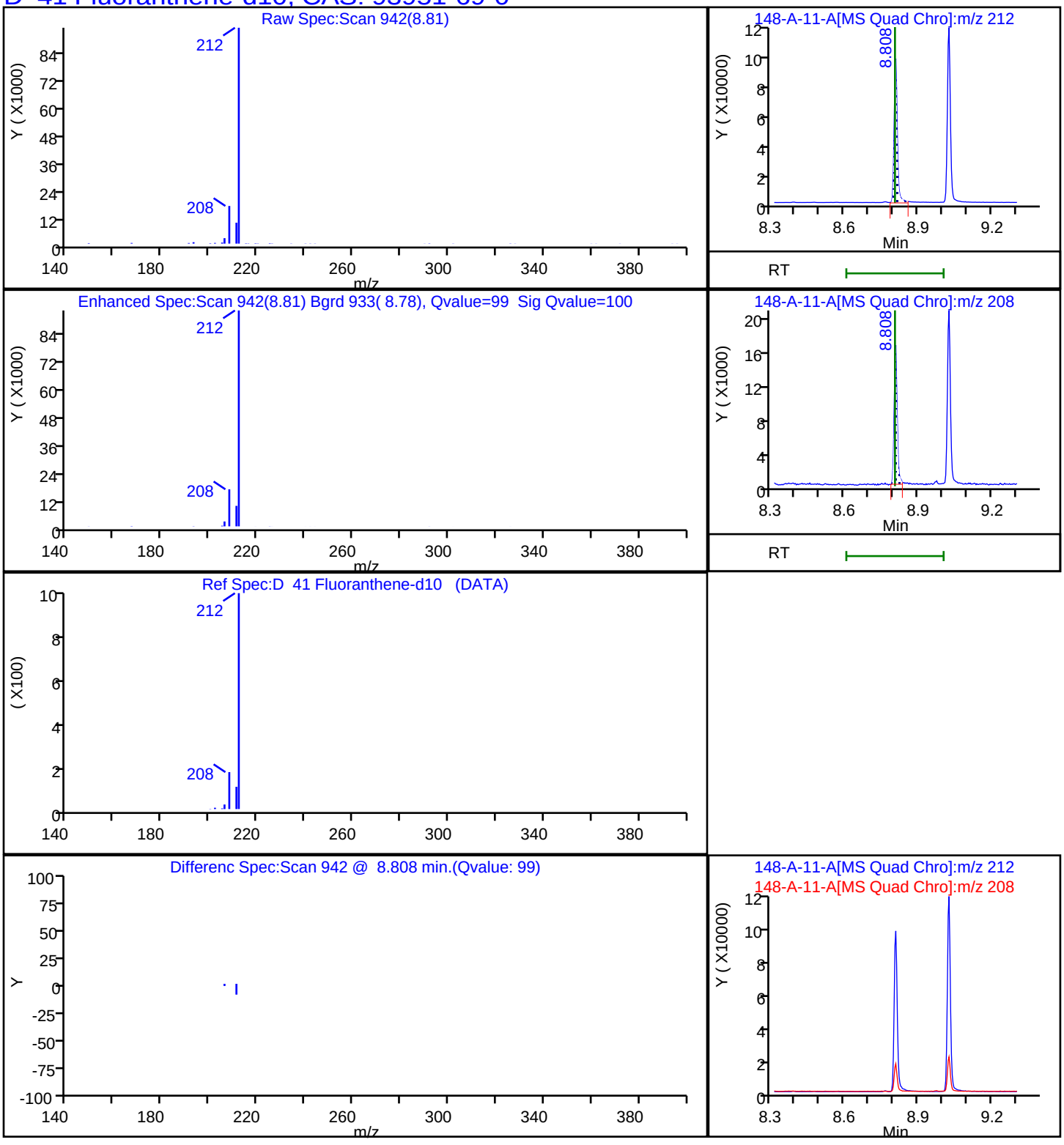
D_41 Fluoranthene-d10, CAS: 93951-69-0



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Eurofins Knoxville

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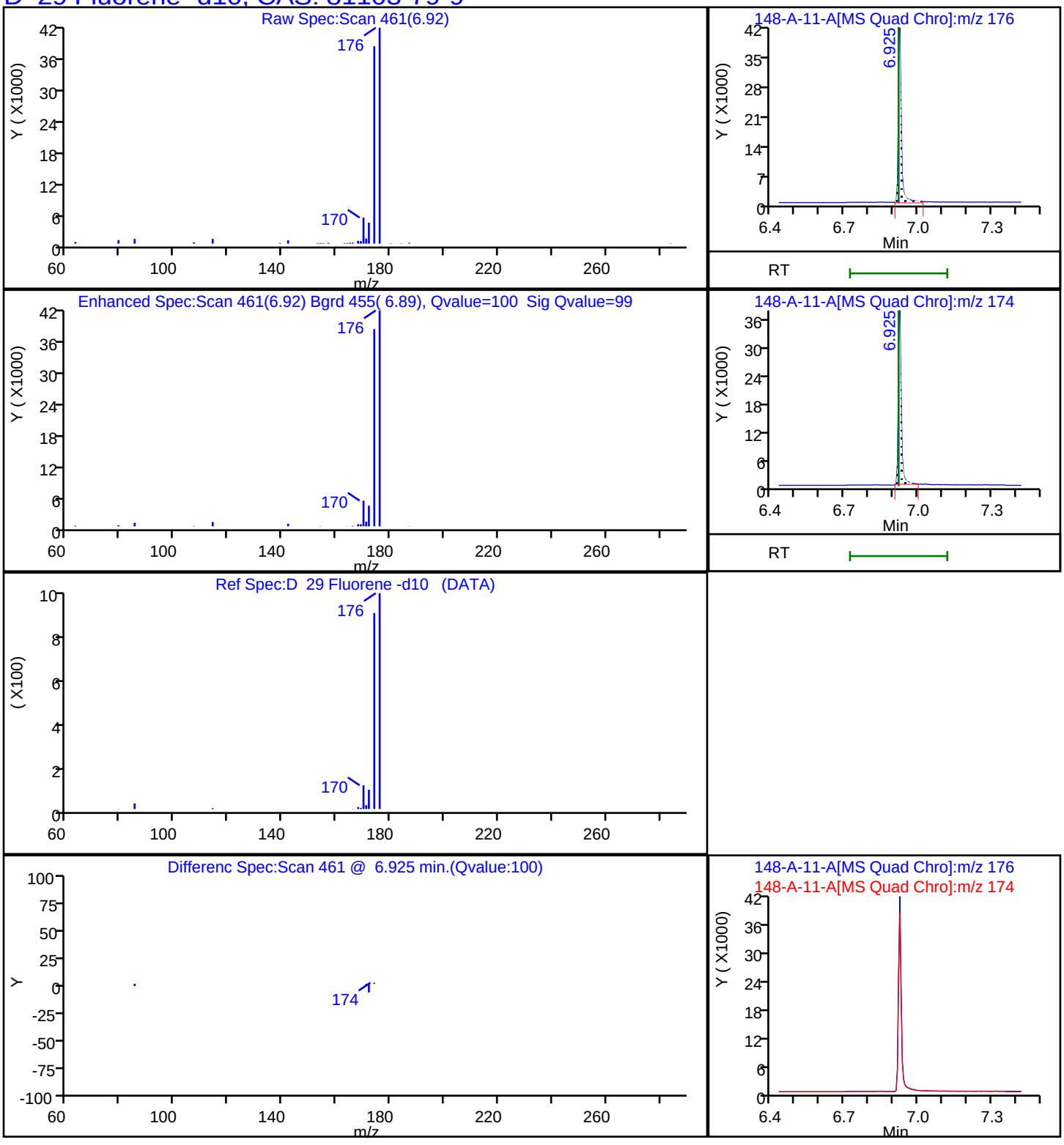
Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14		
Client ID:	1804576-846-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 29 Fluorene -d10, CAS: 81103-79-9



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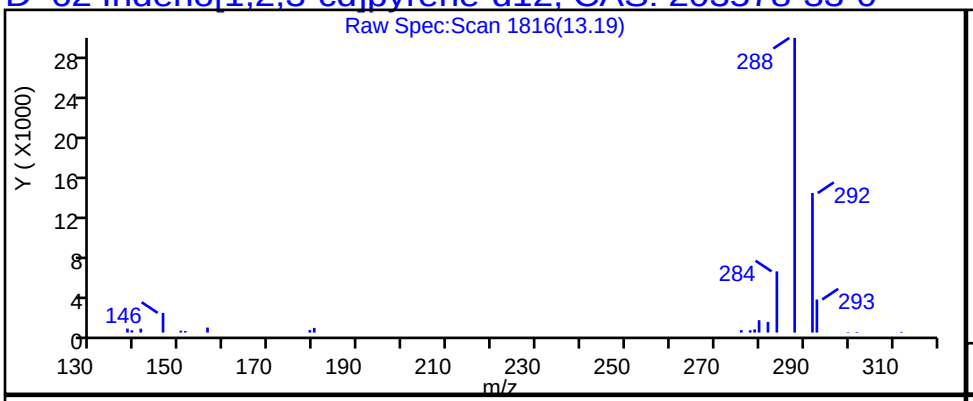
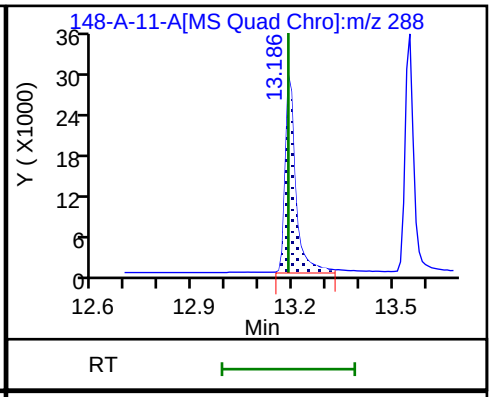
Eurofins Knoxville

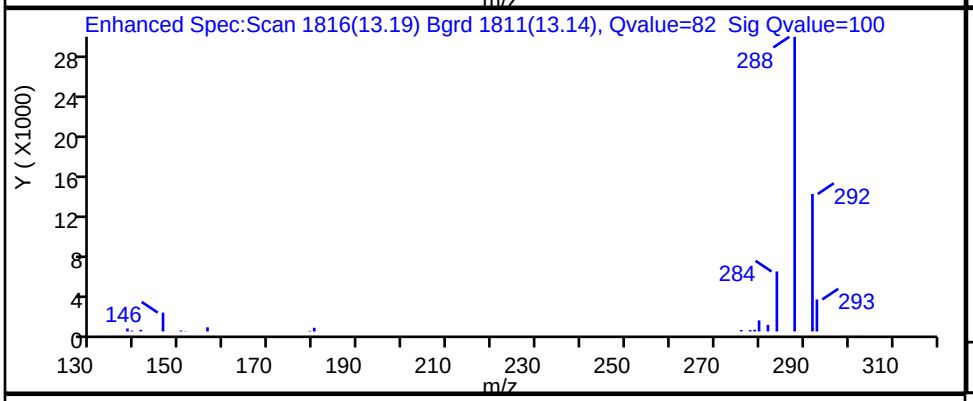
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-11-A.D

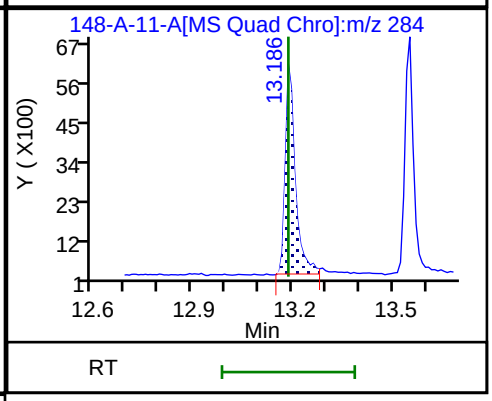
Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14		
Client ID:	1804576-846-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

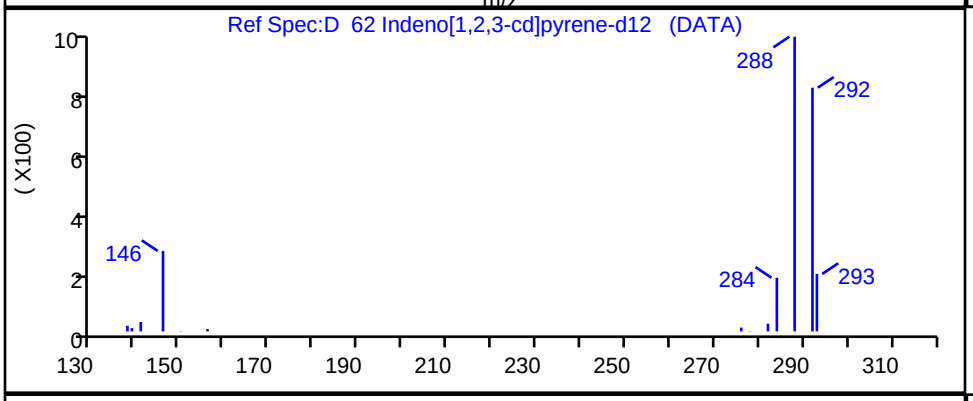
D 62 Indeno[1,2,3-cd]pyrene-d12, CAS: 203578-33-0

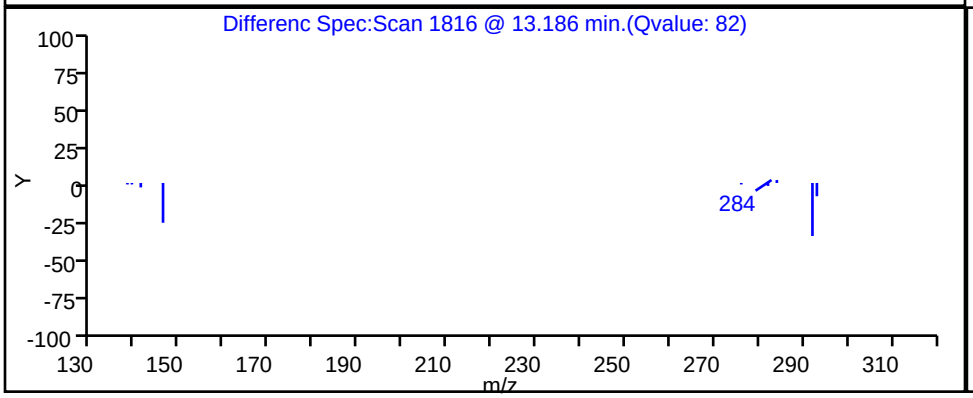


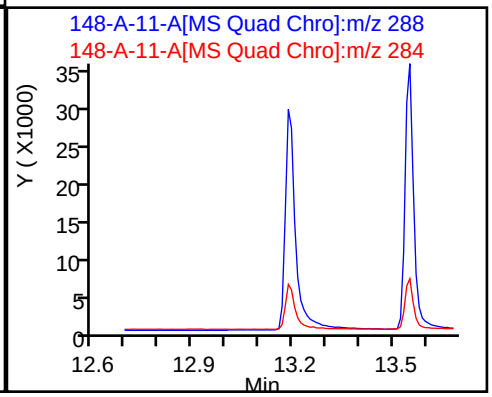










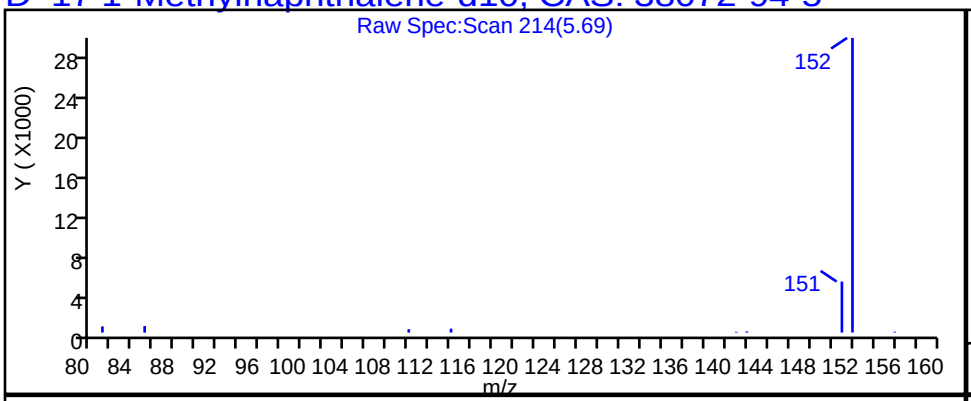


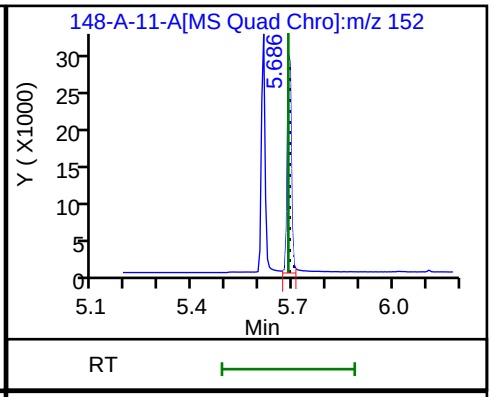
Report Date: 22-Nov-2023 12:11:20 Chrom Revision: 2.3 15-Nov-2023 20:54:34

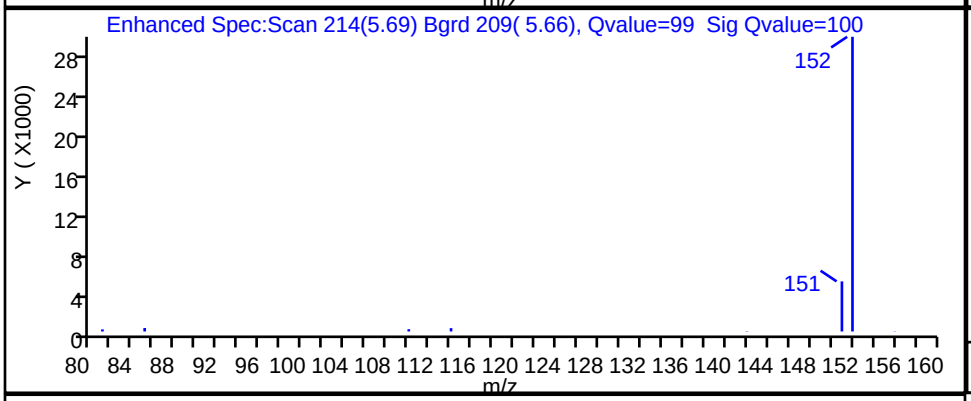
Eurofins Knoxville

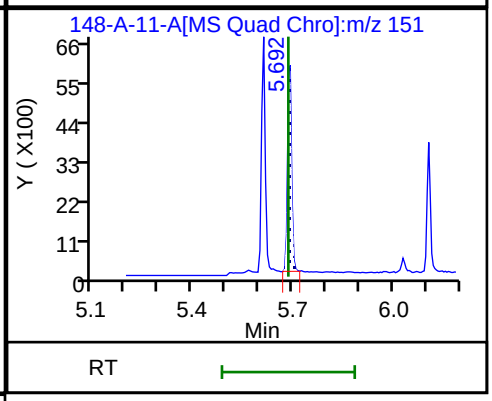
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-11-A.D				
Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14		
Client ID:	1804576-846-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

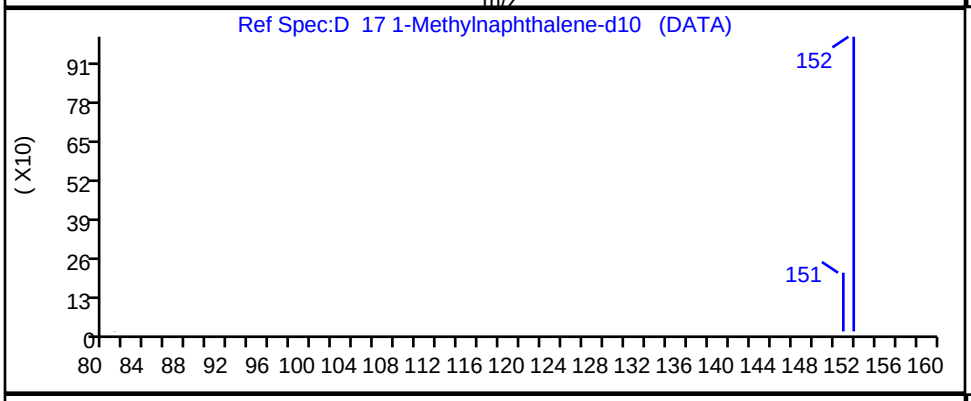
D 17 1-Methylnaphthalene-d10, CAS: 38072-94-5

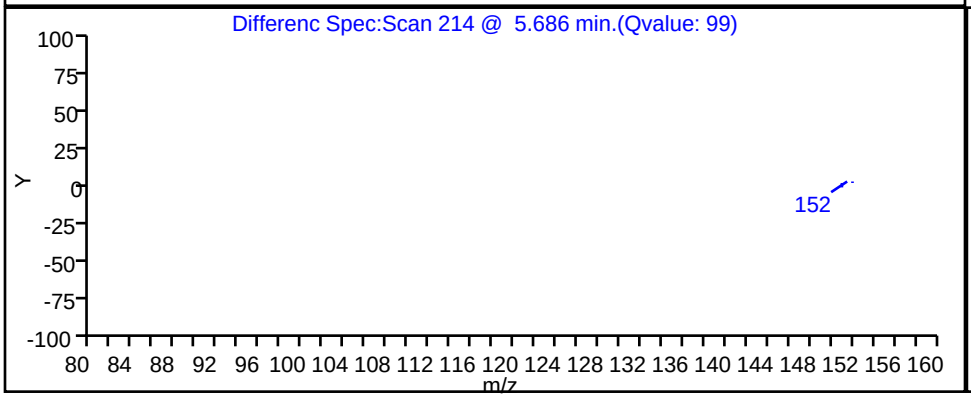


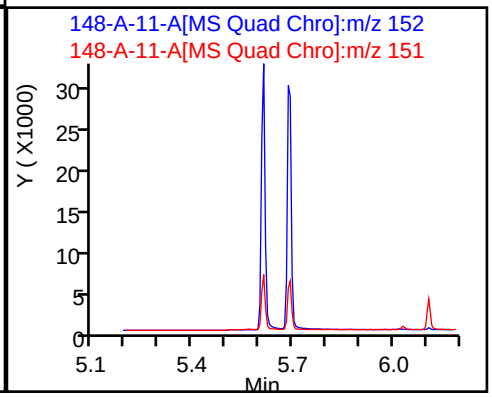












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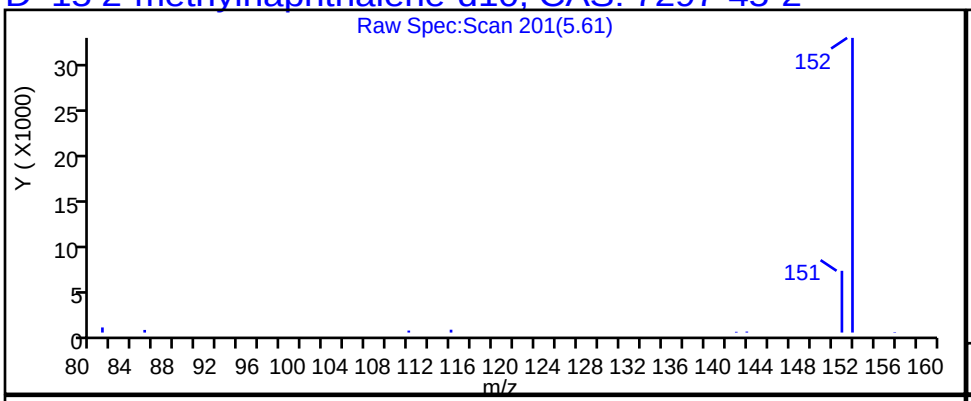
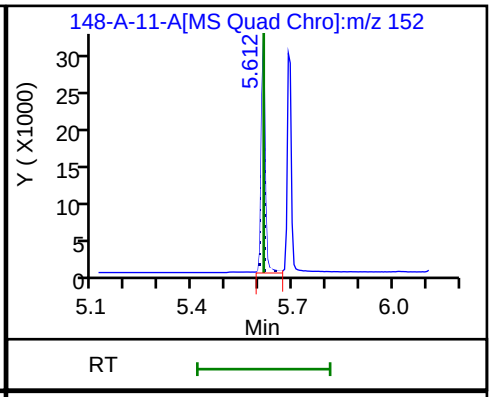
Eurofins Knoxville

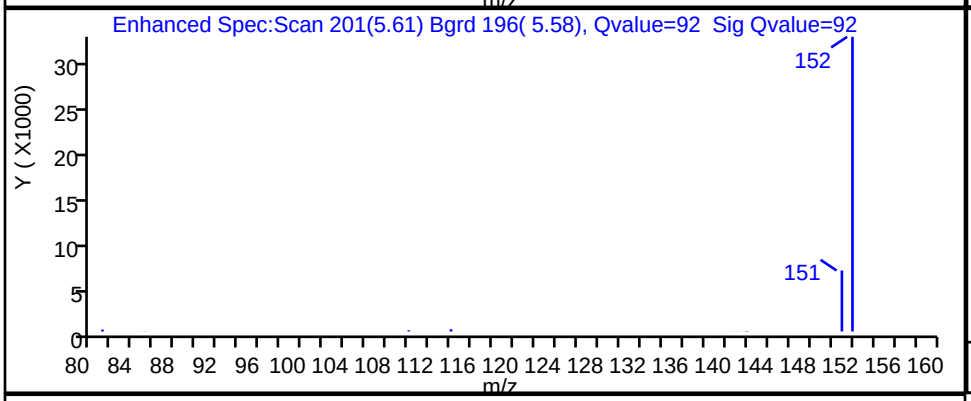
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-11-A.D

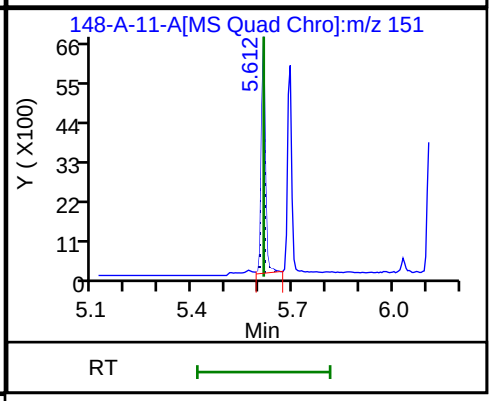
Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14		
Client ID:	1804576-846-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

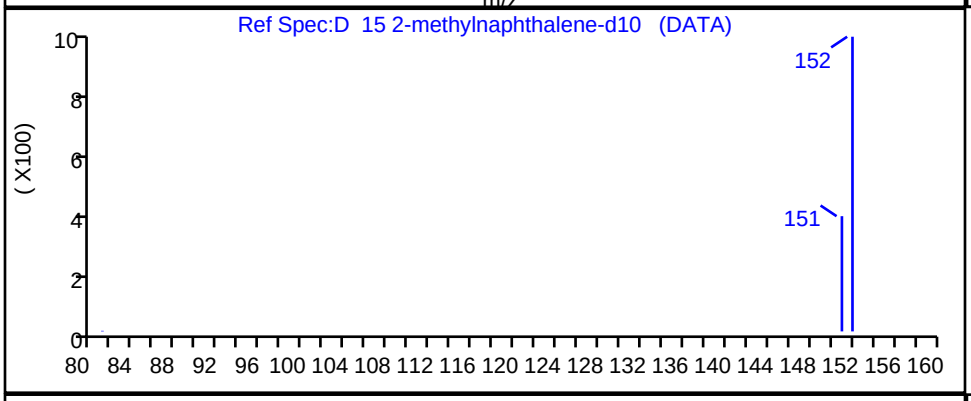
D 15 2-methylnaphthalene-d10, CAS: 7297-45-2

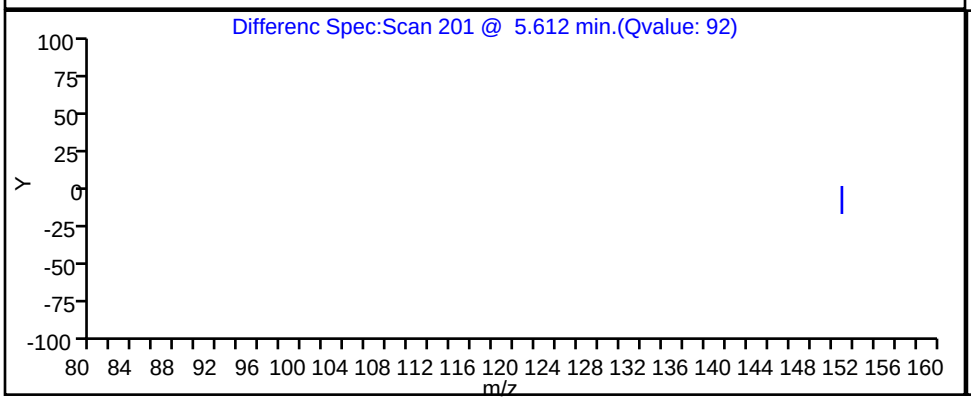


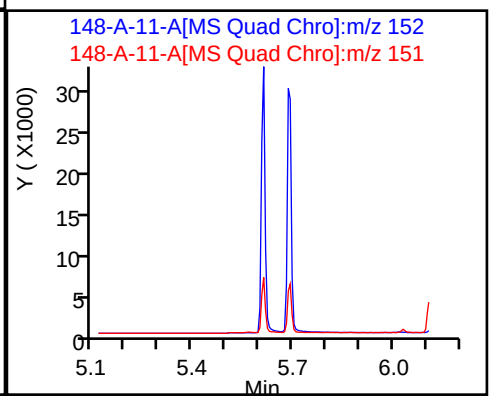












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Eurofins Knoxville

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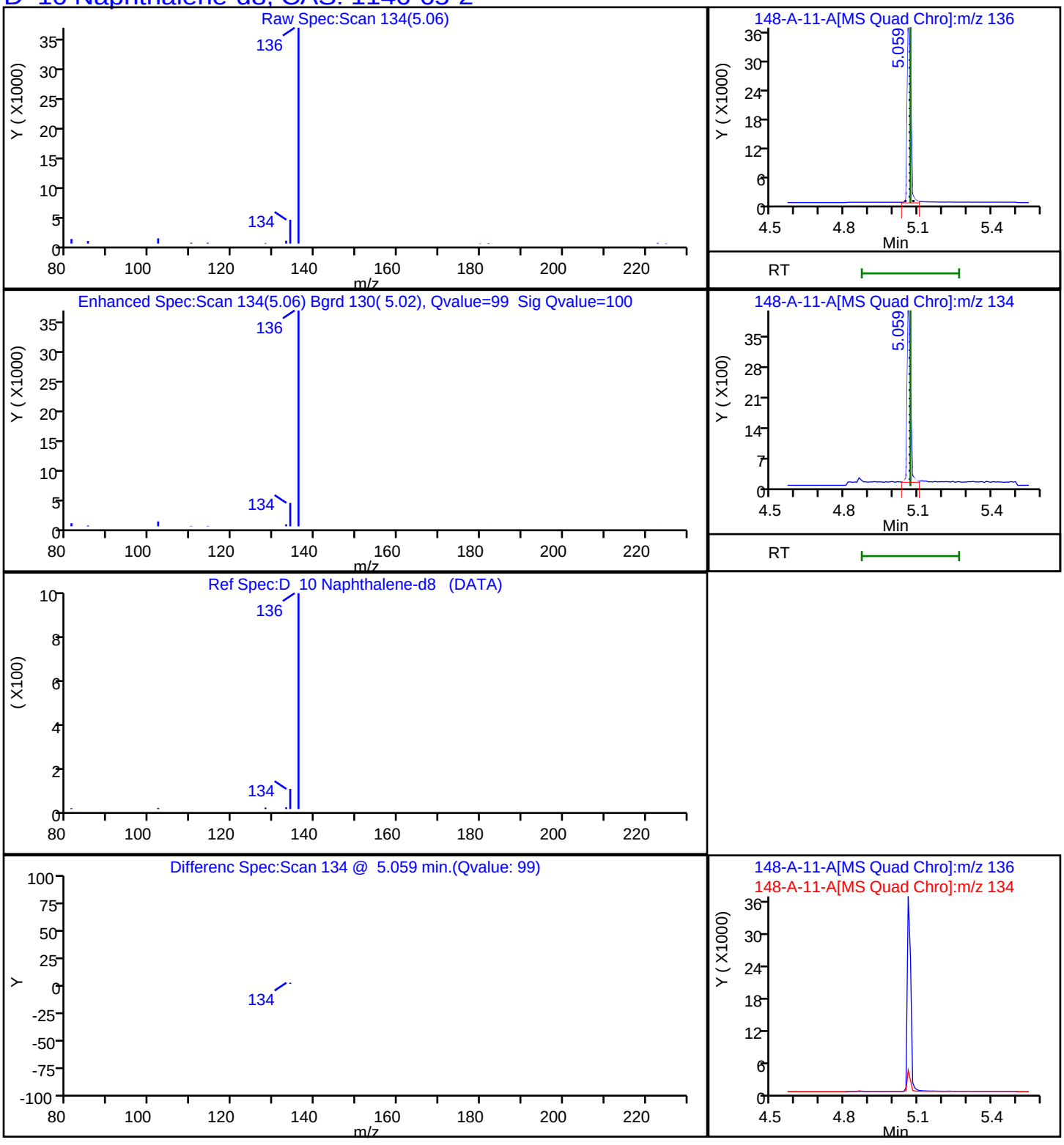
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14		
Client ID:	1804576-846-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D_10 Naphthalene-d8, CAS: 1146-65-2



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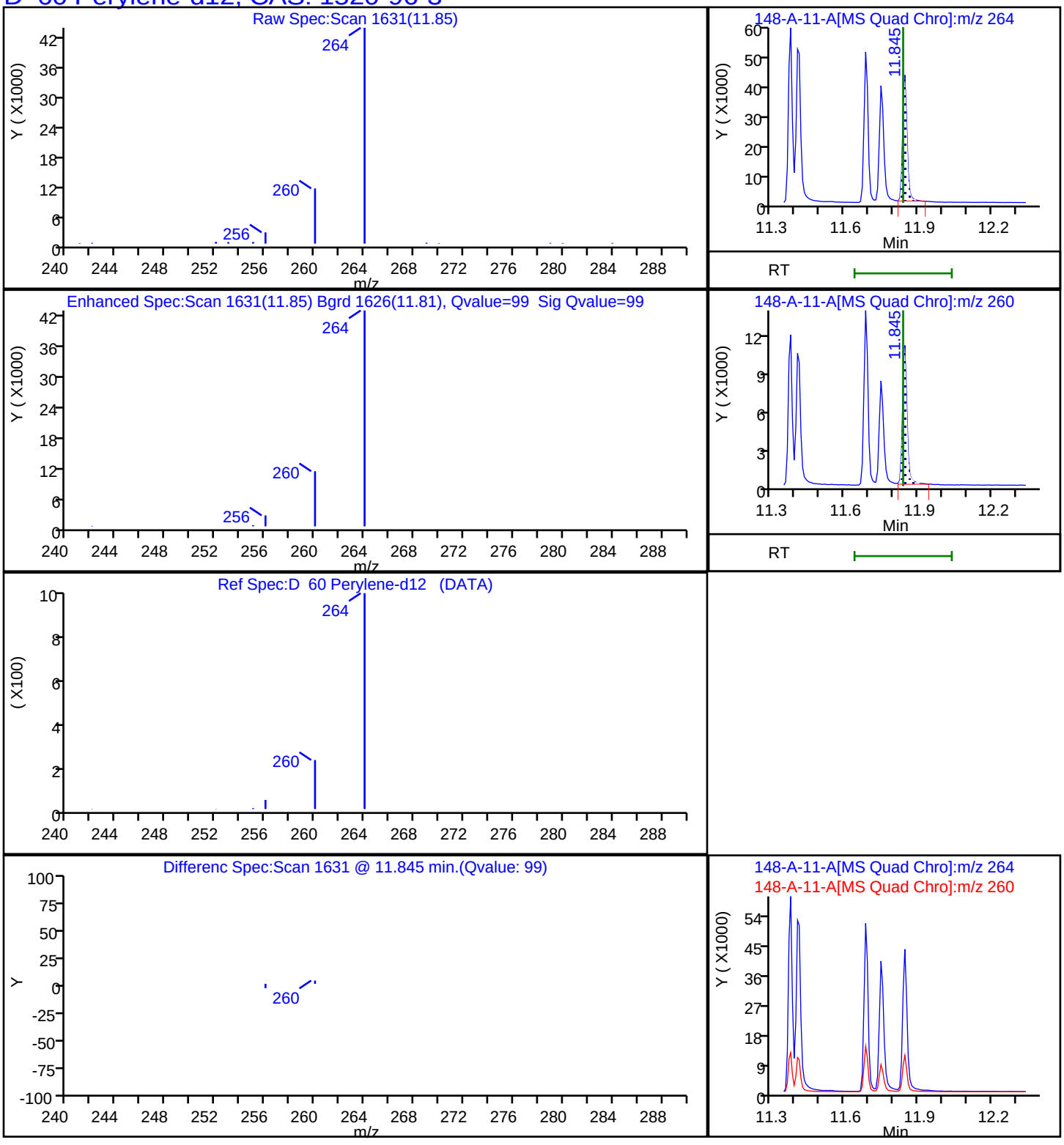
Client ID:	1804576-846-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 60 Perylene-d12, CAS: 1520-96-3



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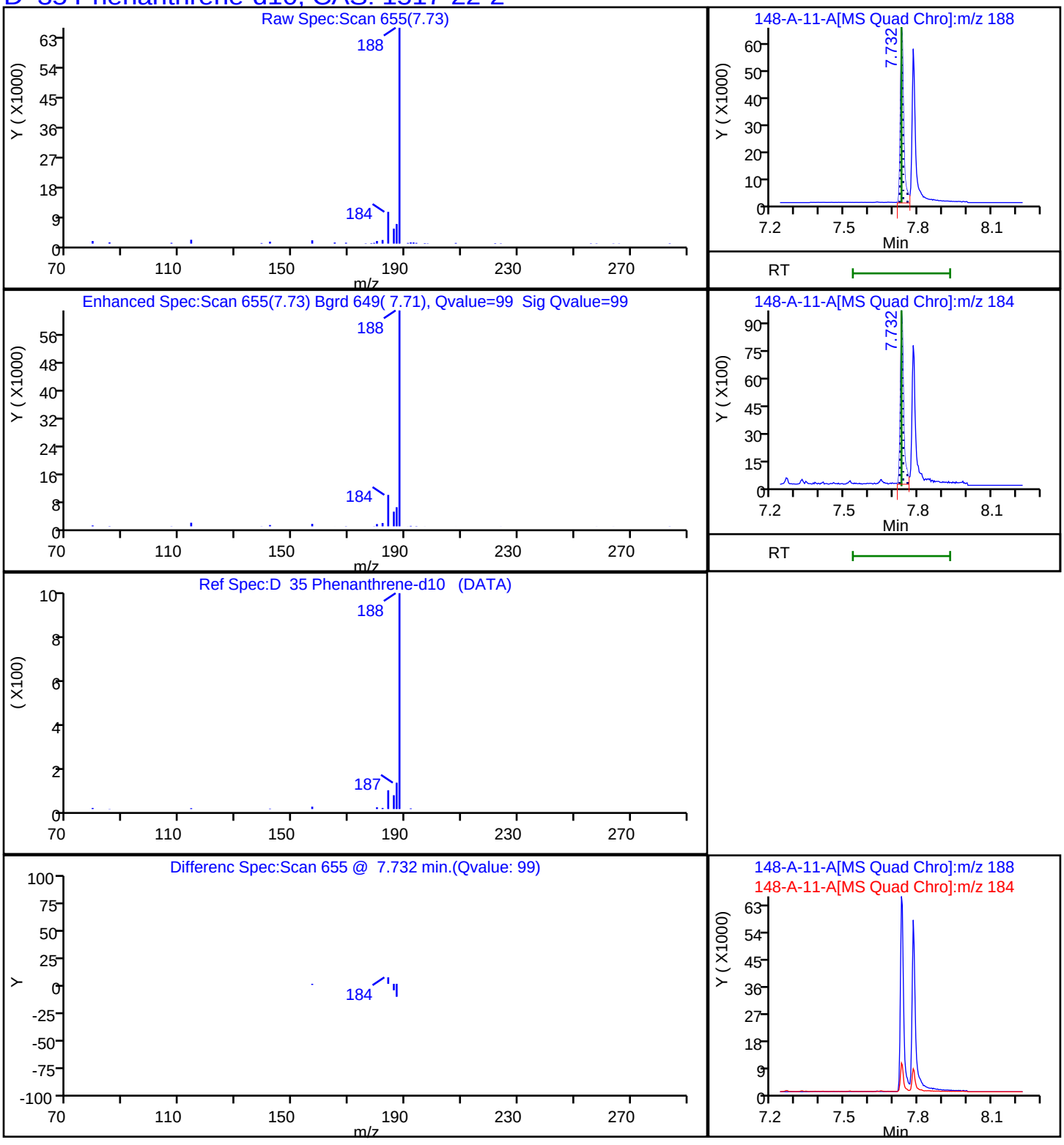
Client ID:	1804576-846-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D_35 Phenanthrene-d10, CAS: 1517-22-2



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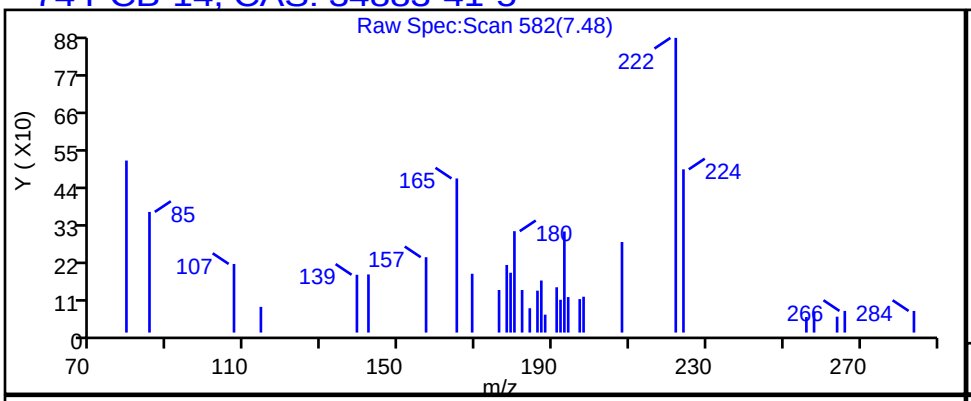
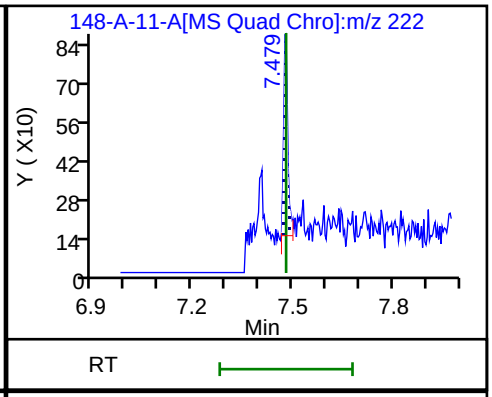
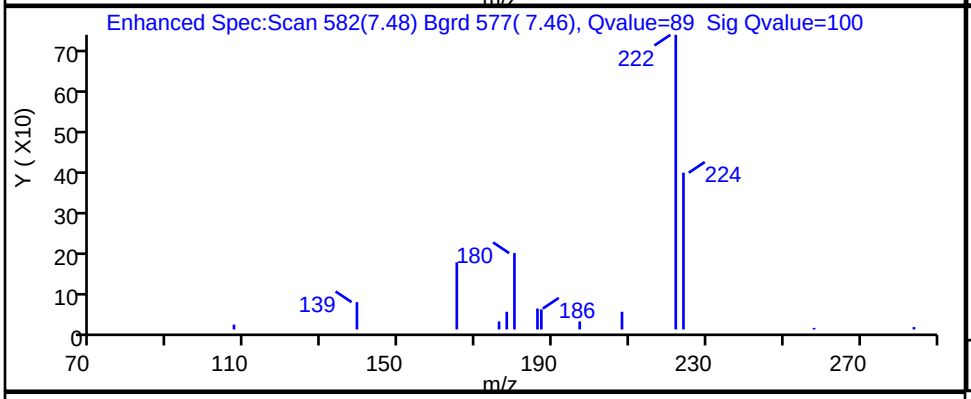
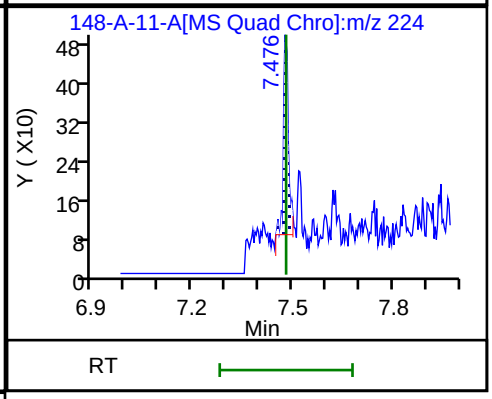
Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14
Client ID:	1804576-846-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

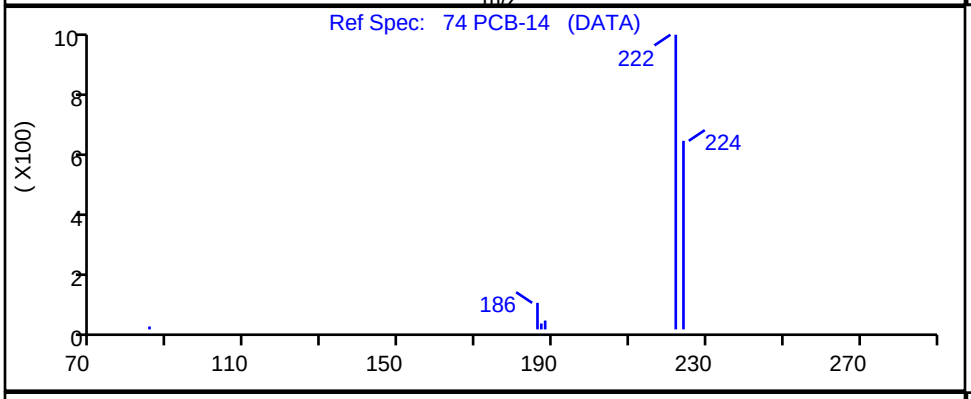
74 PCB-14, CAS: 34883-41-5

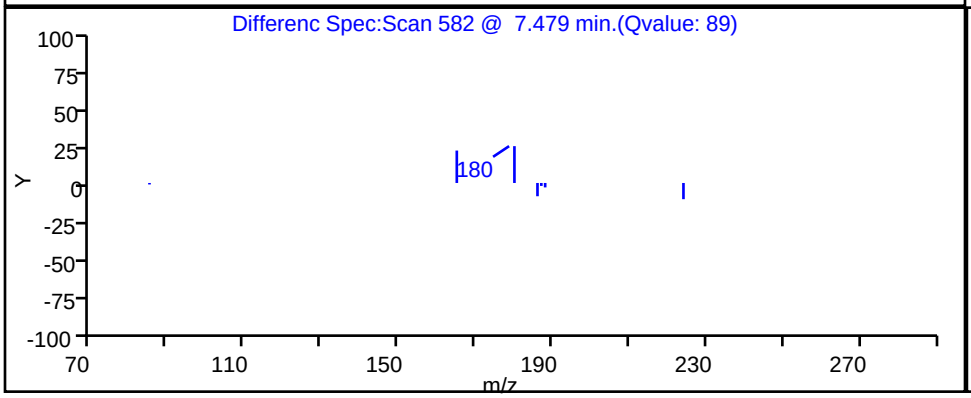


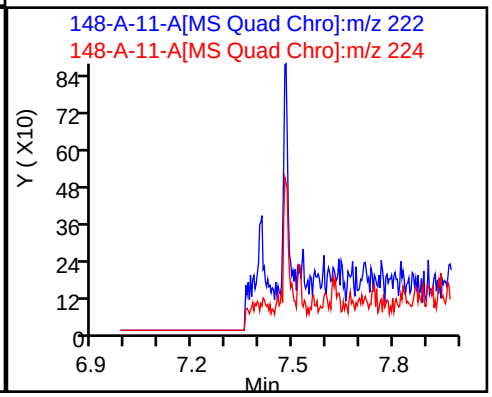












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Eurofins Knoxville

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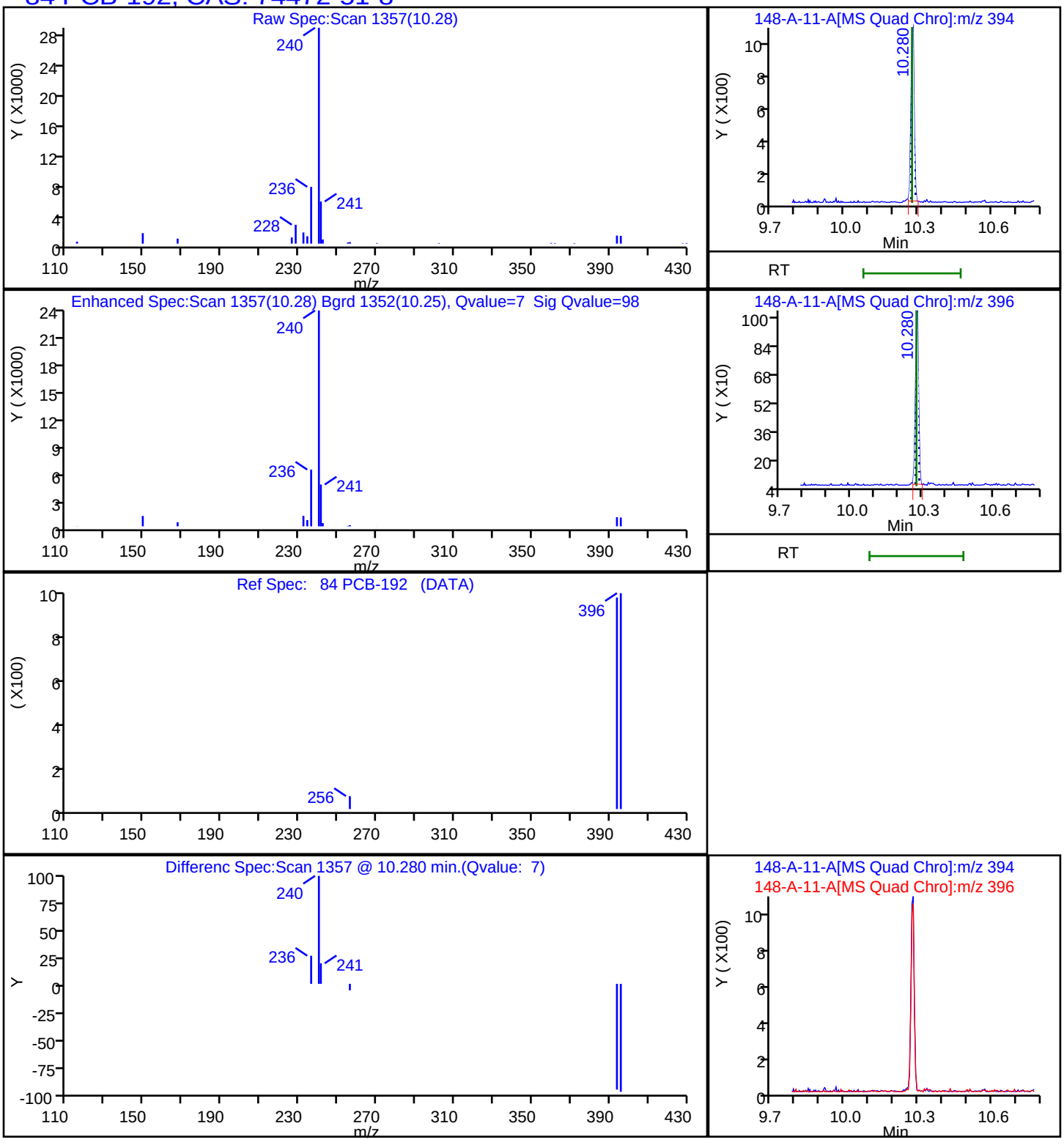
Client ID:	1804576-846-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

84 PCB-192, CAS: 74472-51-8



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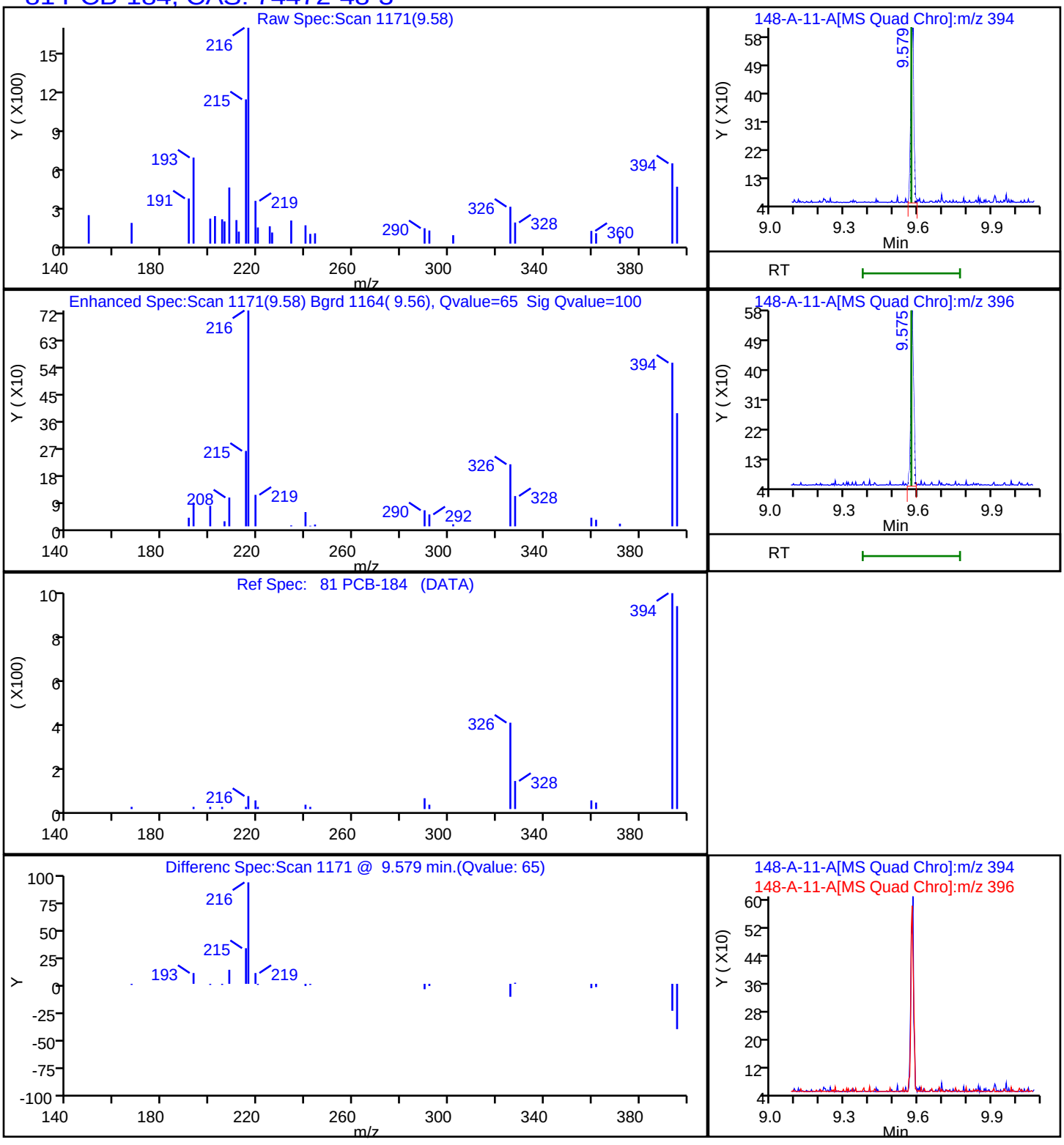
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14
Client ID:	1804576-846-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

81 PCB-184, CAS: 74472-48-3



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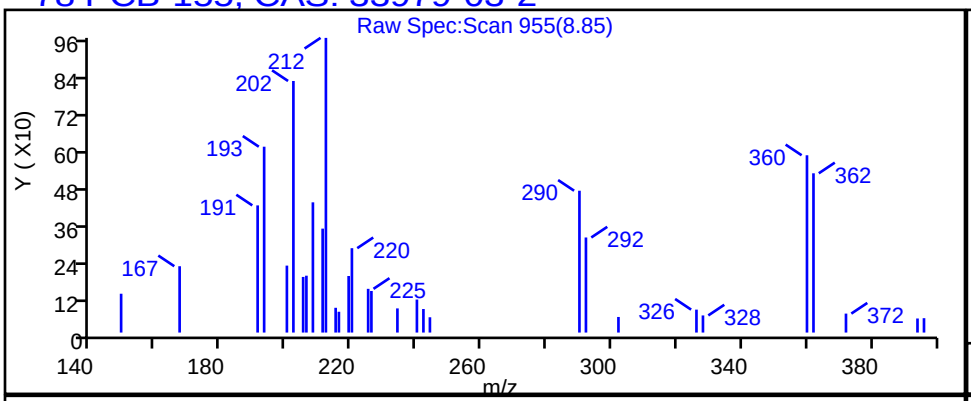
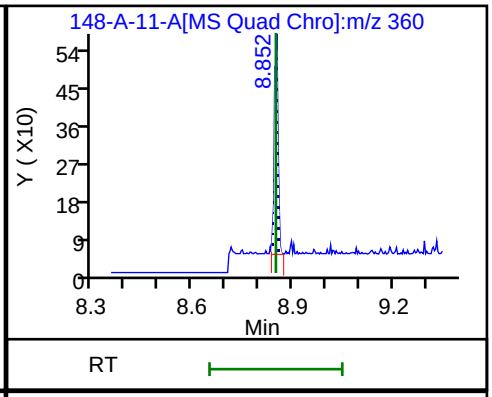
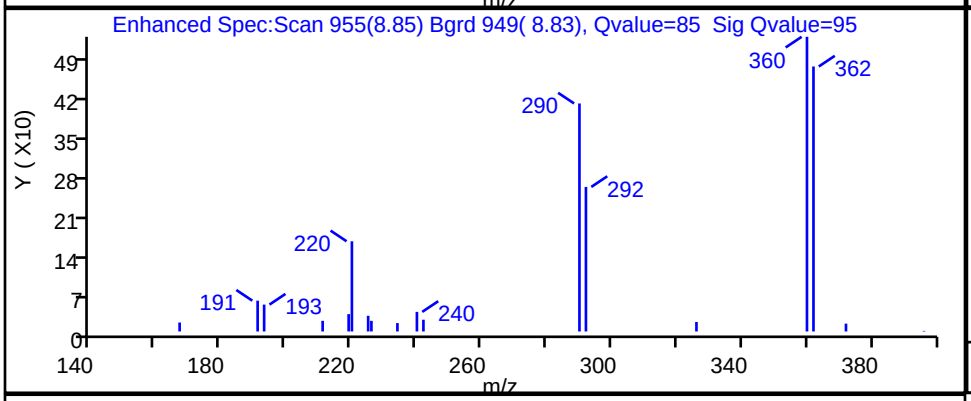
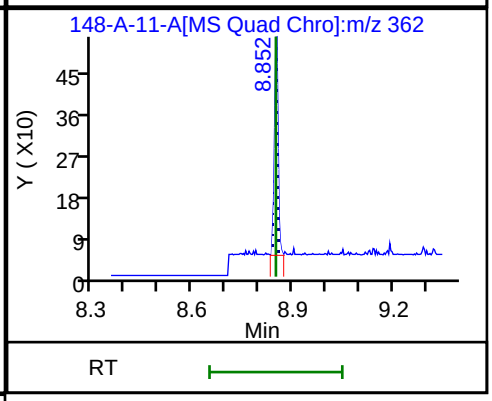
Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14		
Client ID:	1804576-846-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

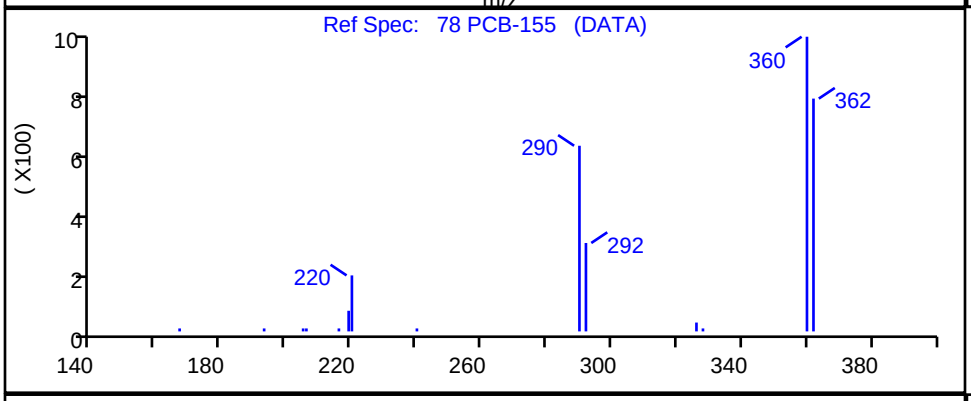
78 PCB-155, CAS: 33979-03-2

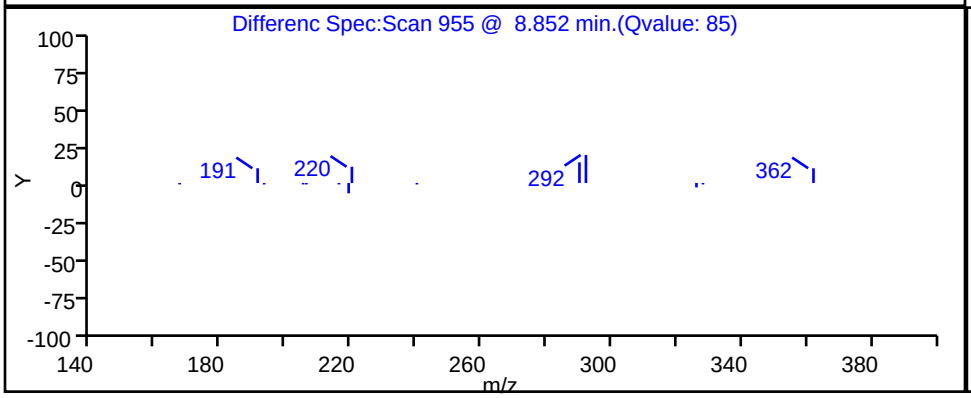


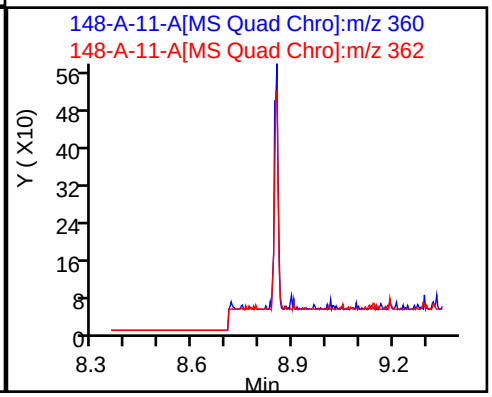












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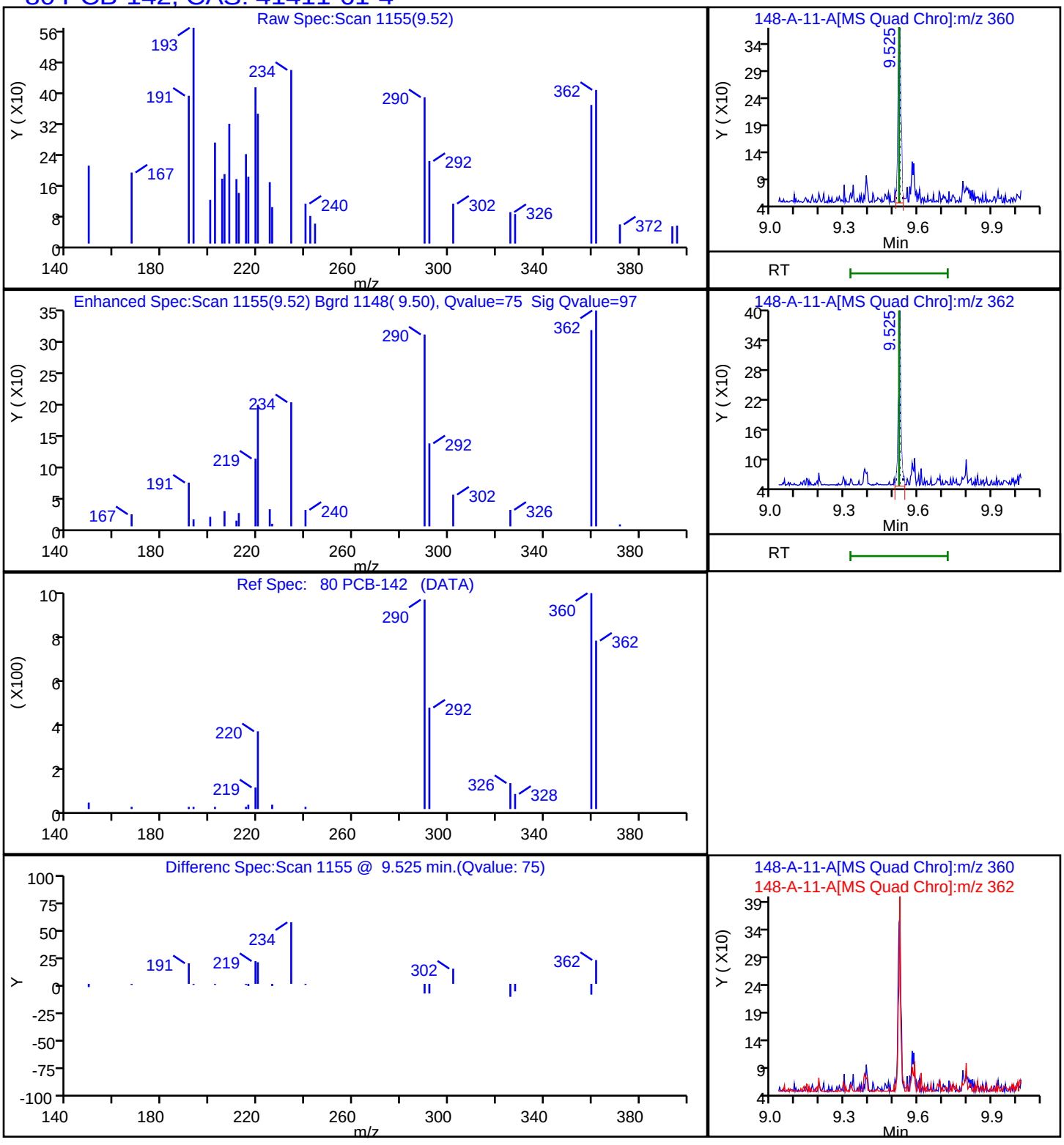
Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14
Client ID:	1804576-846-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

80 PCB-142, CAS: 41411-61-4



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Eurofins Knoxville

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Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14		
Client ID:	1804576-846-S1				
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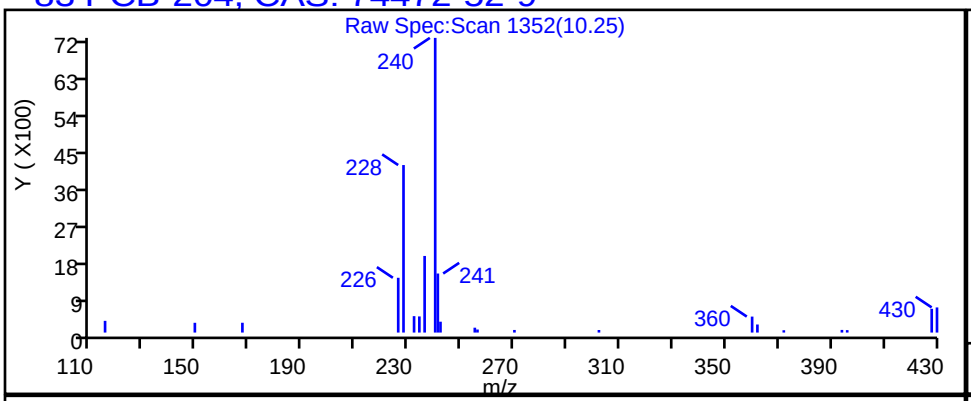
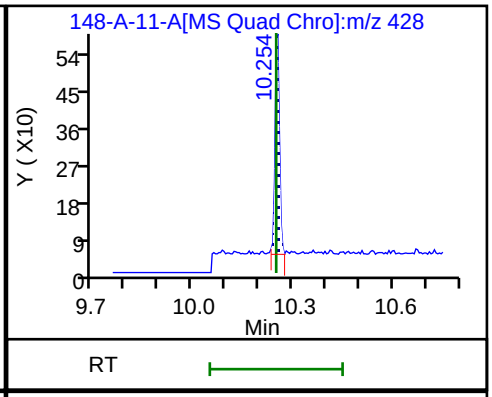
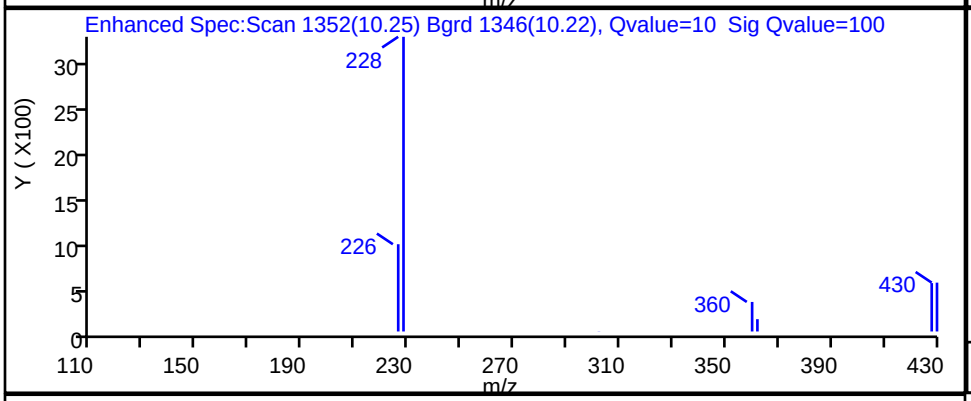
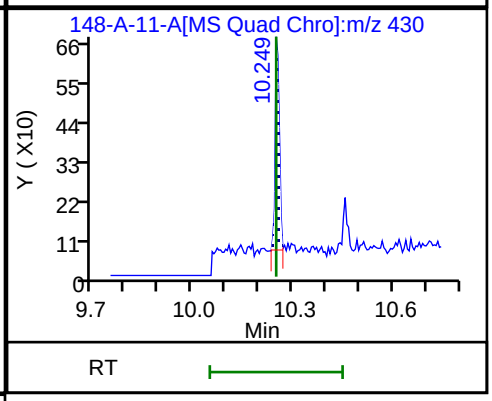
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

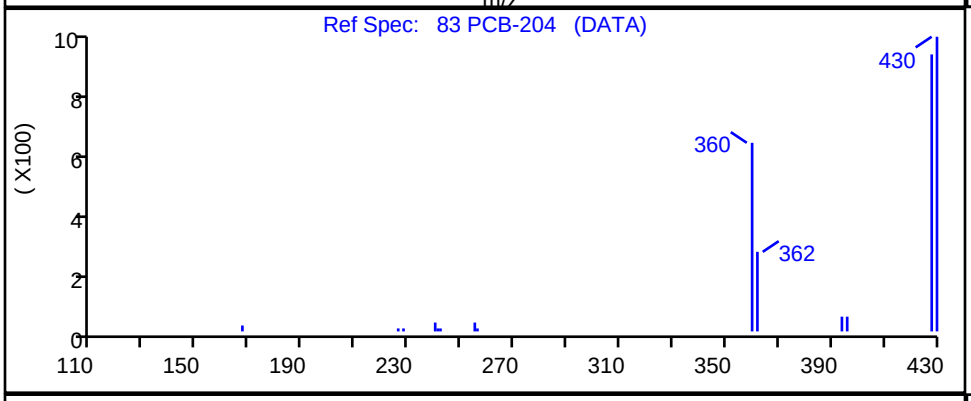
83 PCB-204, CAS: 74472-52-9

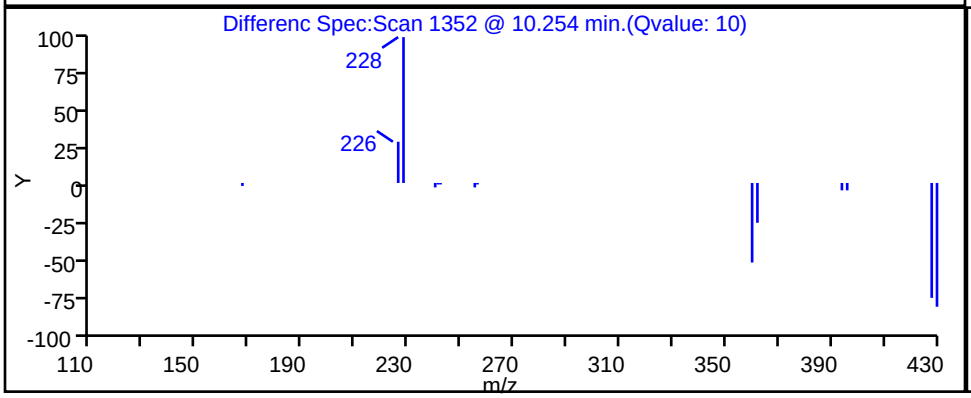


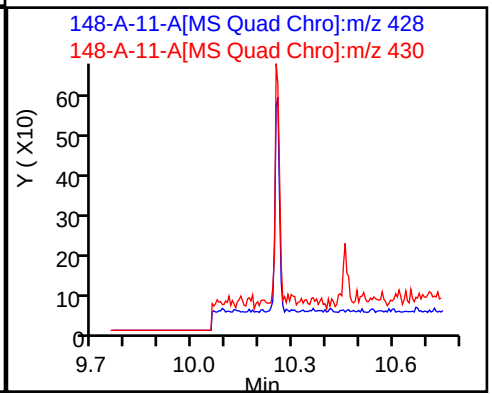












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Eurofins Knoxville

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Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
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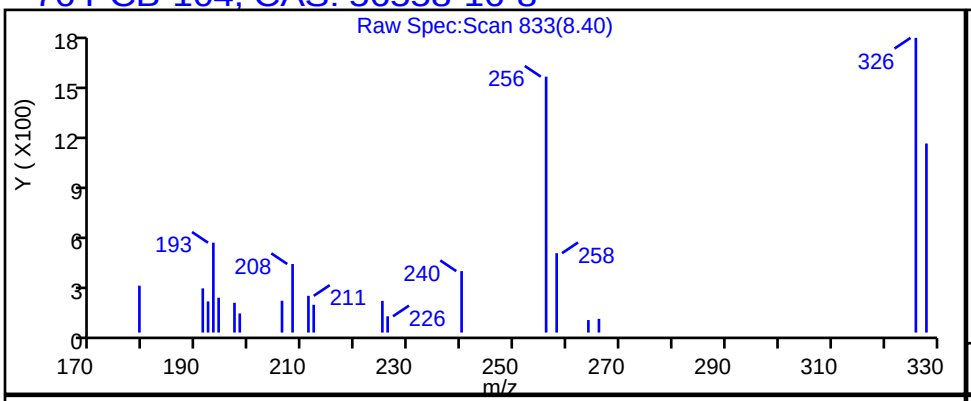
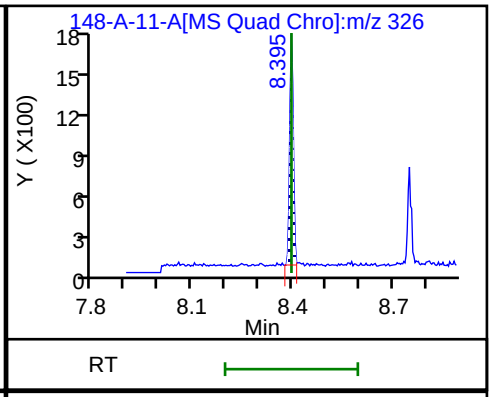
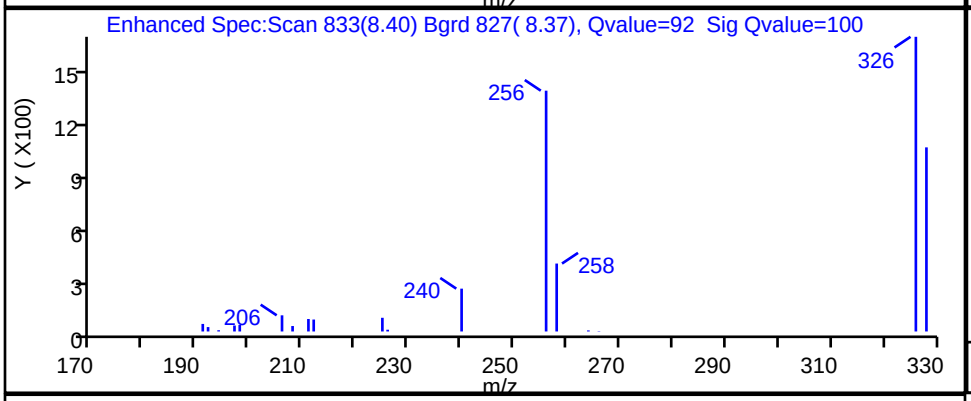
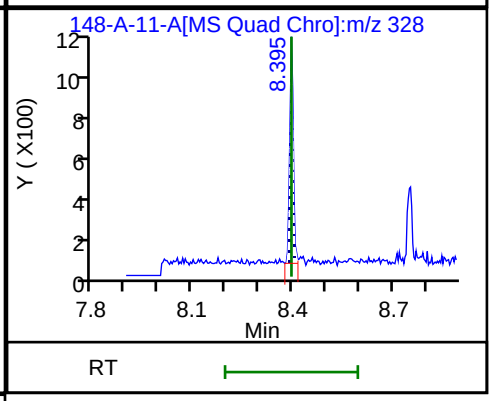
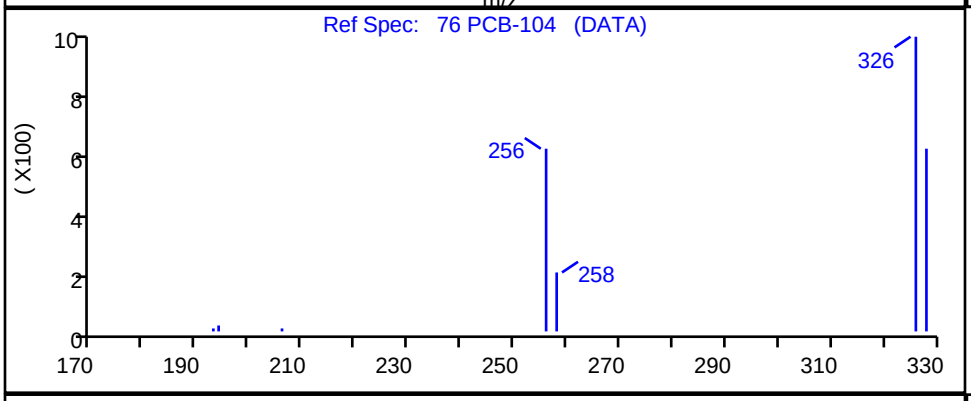
76 PCB-104, CAS: 56558-16-8

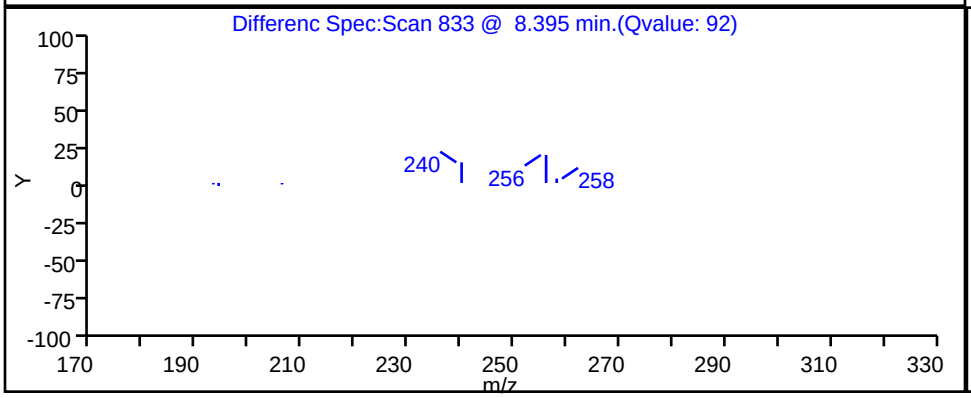


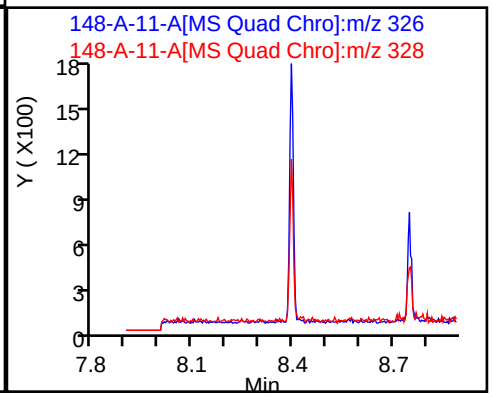












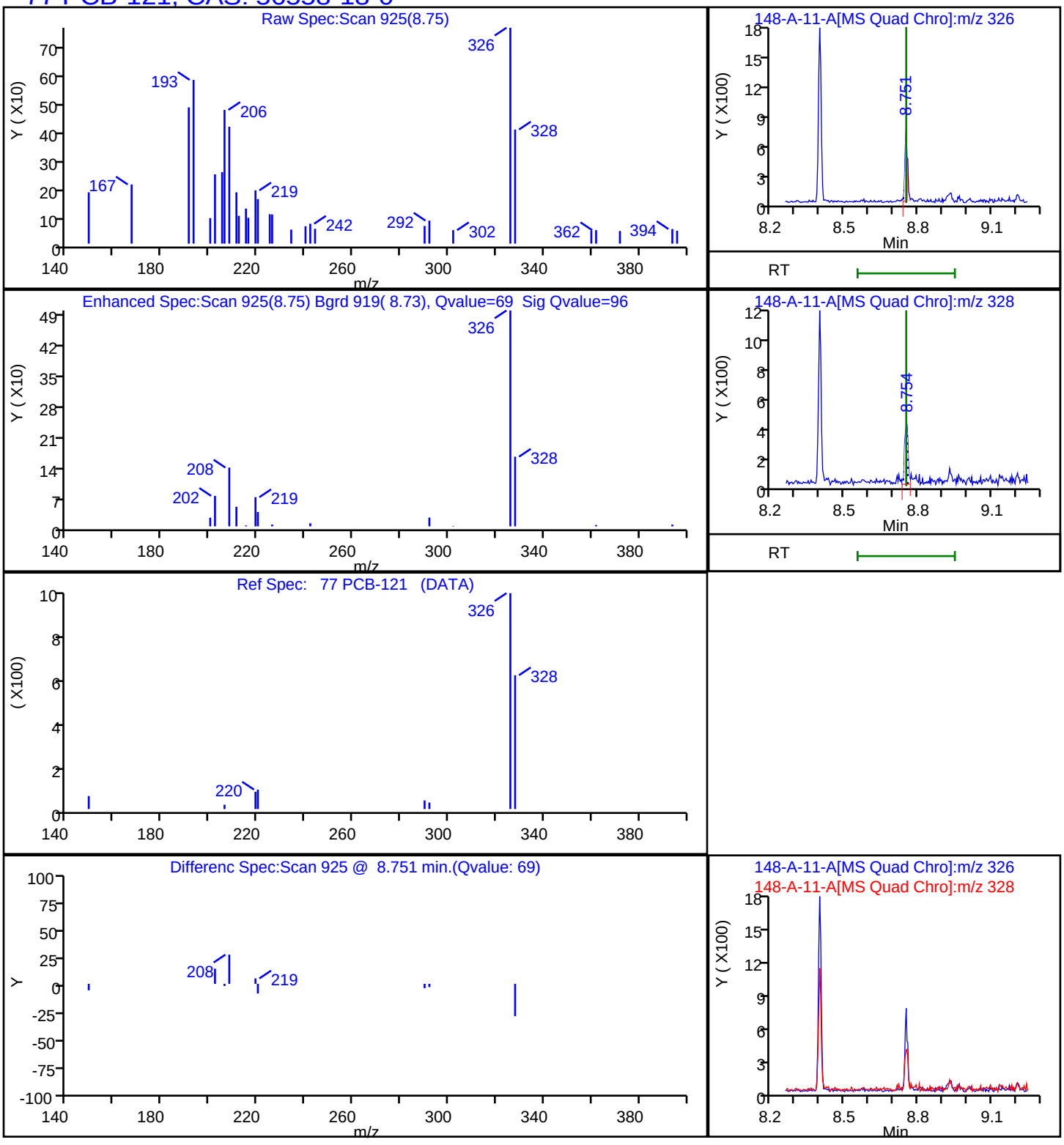
Report Date: 22-Nov-2023 12:11:21 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-11-A.D

Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14
Client ID:	1804576-846-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

77 PCB-121, CAS: 56558-18-0



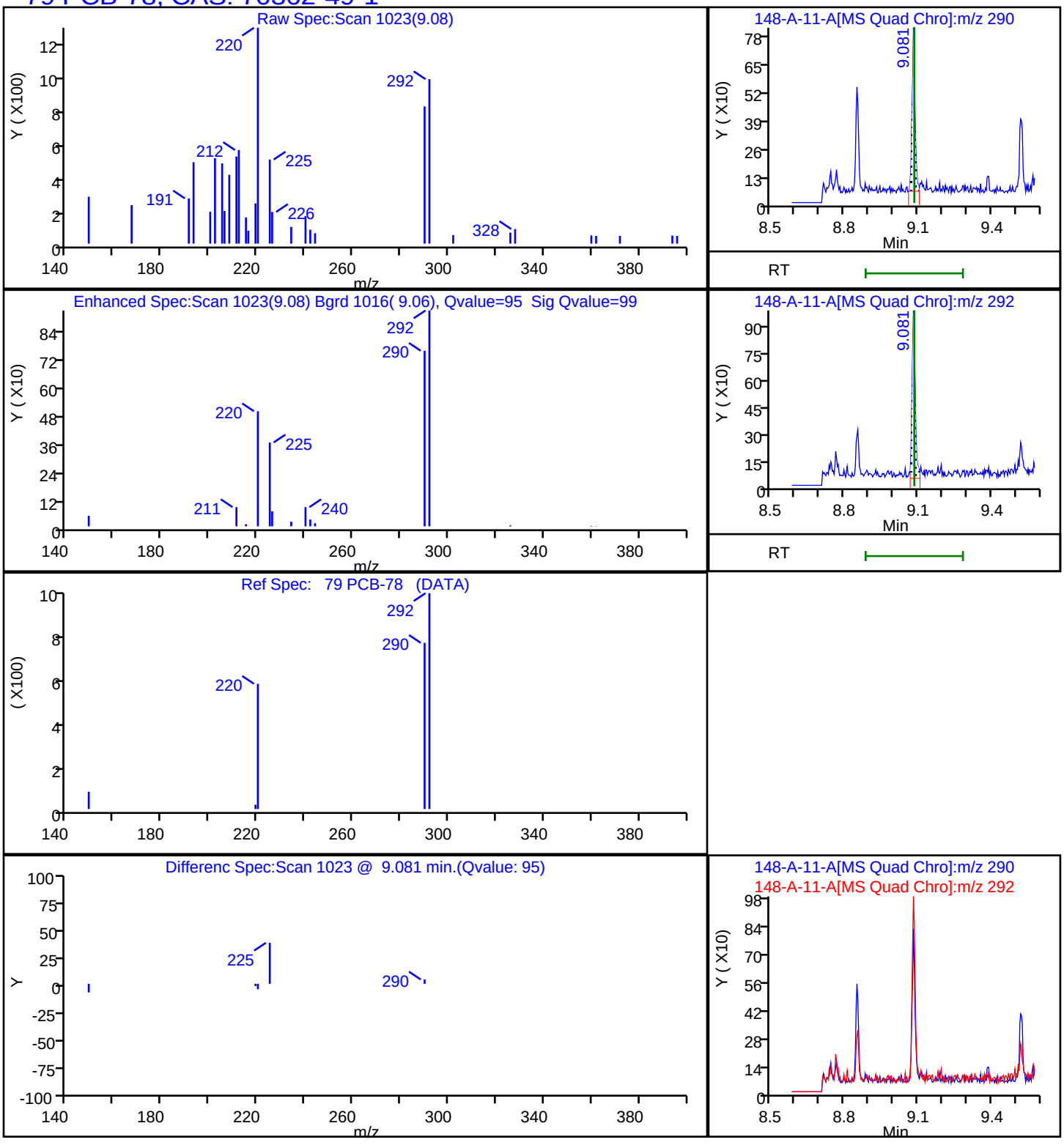
Report Date: 22-Nov-2023 12:11:21 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-11-A.D

Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14
Client ID:	1804576-846-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

79 PCB-78, CAS: 70362-49-1



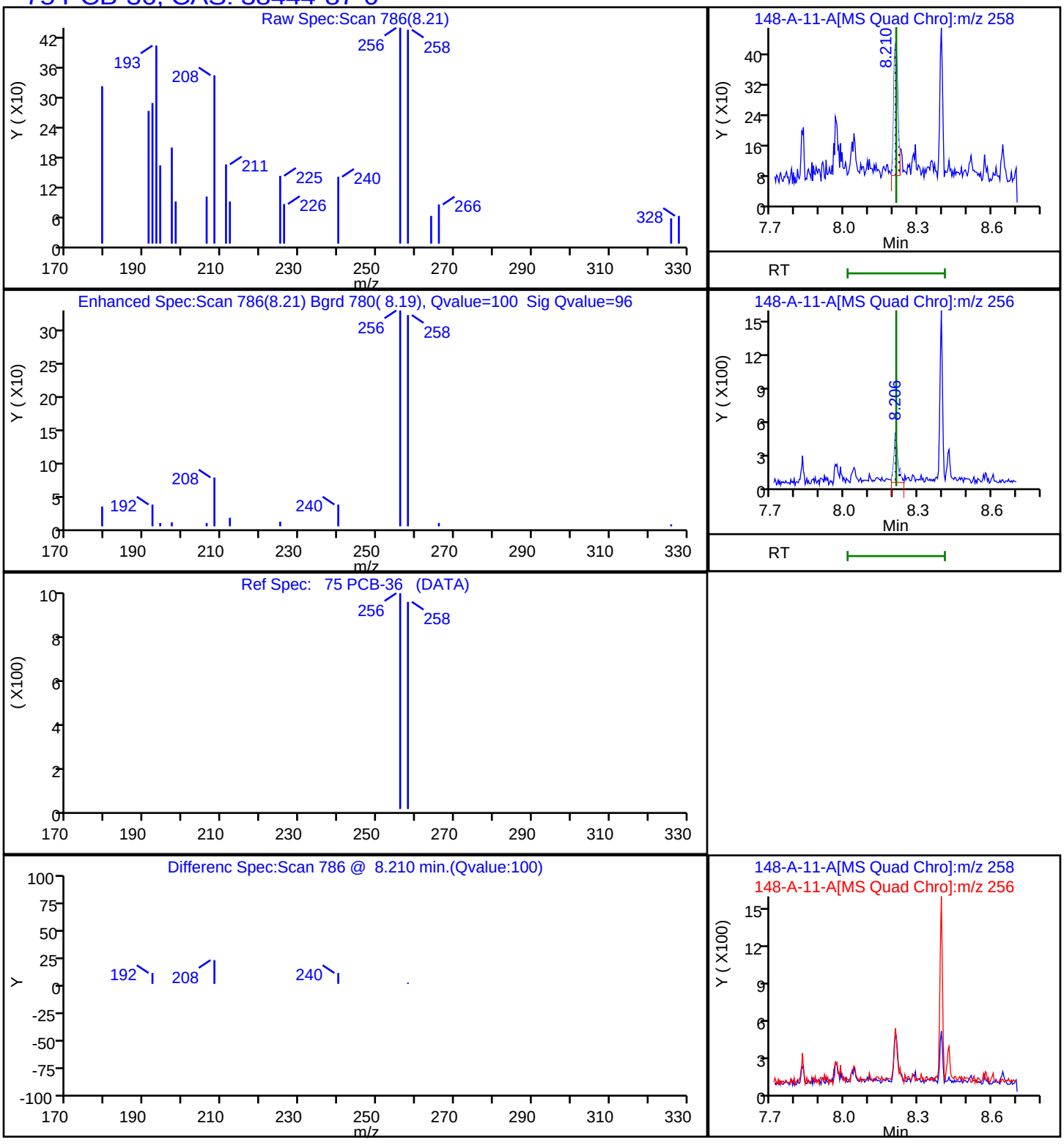
Report Date: 22-Nov-2023 12:11:21 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-11-A.D

Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14
Client ID:	1804576-846-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

75 PCB-36, CAS: 38444-87-0



Manual Integration/User Assign Peak Report

Eurofins Knoxville

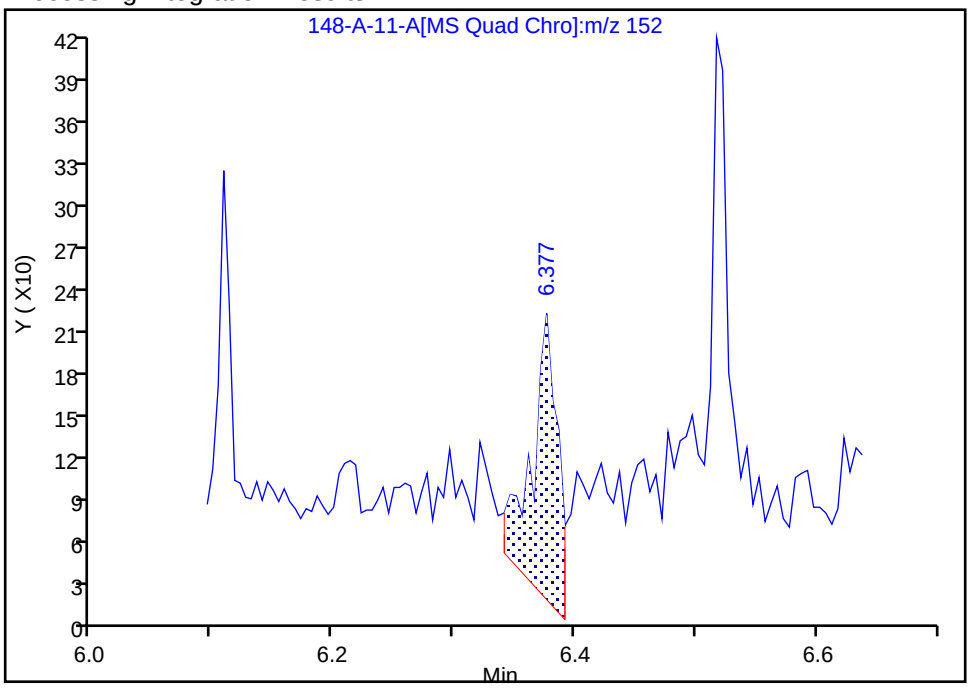
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-11-A.D				
Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14		
Client ID:	1804576-846-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

24 Acenaphthylene, CAS: 208-96-8

Signal: 1

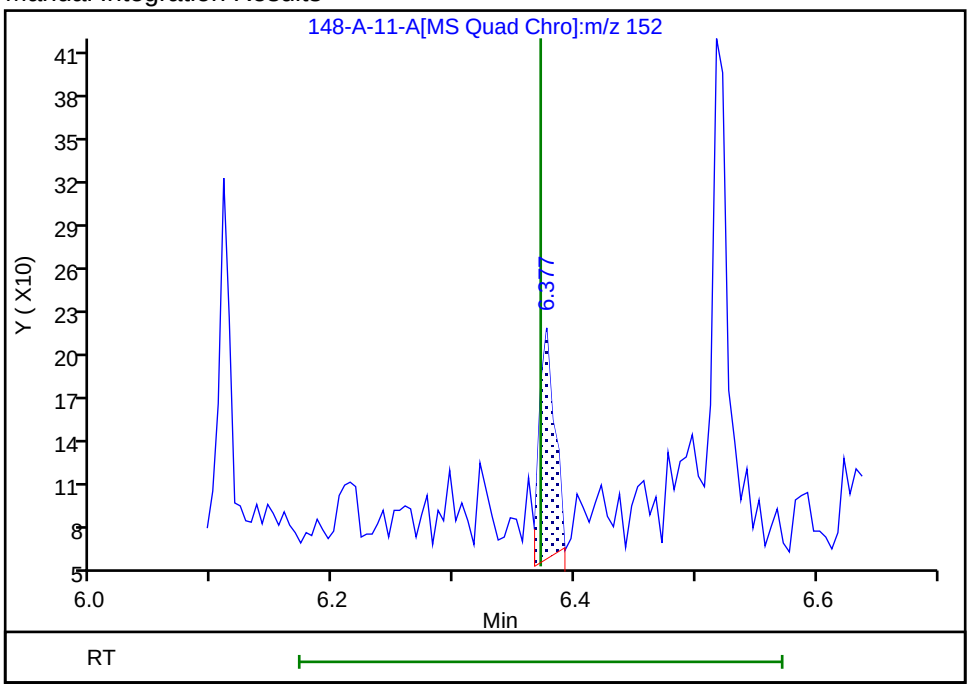
Processing Integration Results

RT: 6.38
Area: 306
Amount: 0.003089
Amount Units: ug/ml



Manual Integration Results

RT: 6.38
Area: 138
Amount: 0.001393
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:06:53 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

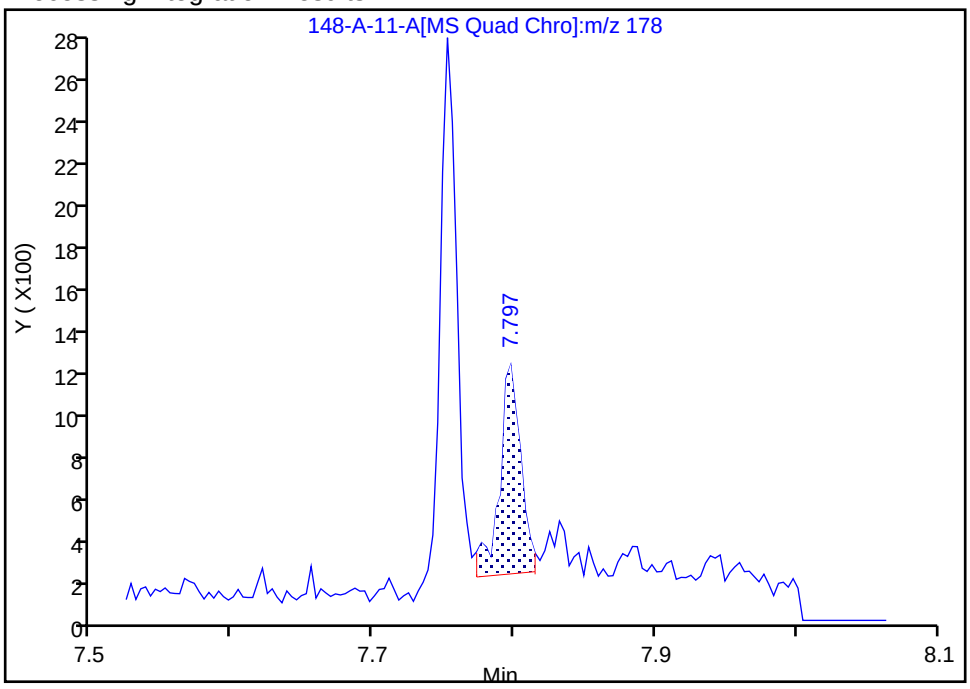
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-11-A.D				
Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14		
Client ID:	1804576-846-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

39 Anthracene, CAS: 120-12-7

Signal: 1

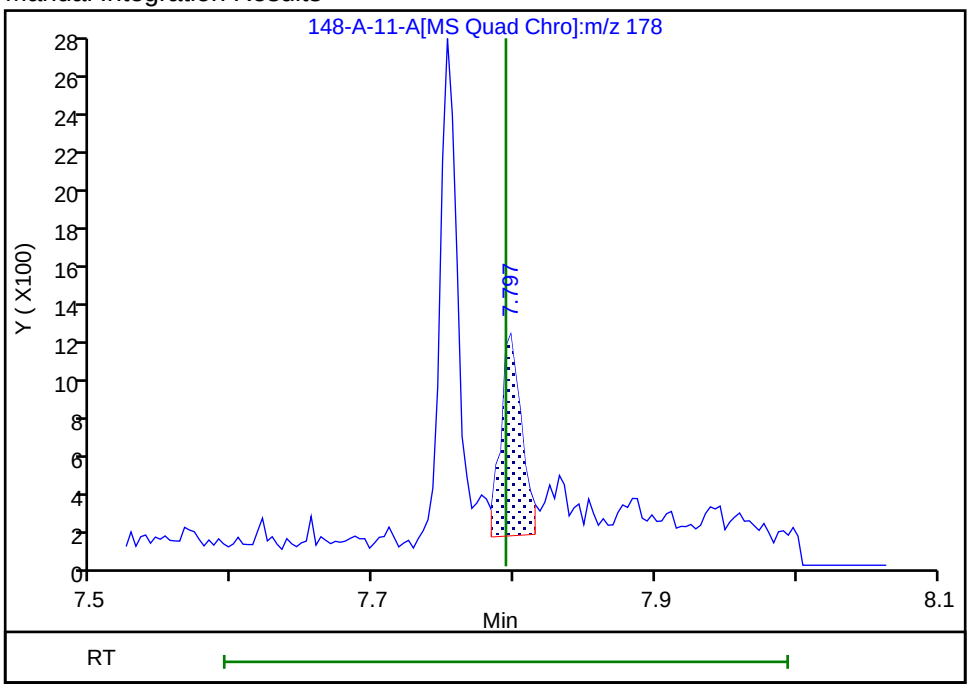
Processing Integration Results

RT: 7.80
Area: 1043
Amount: 0.007251
Amount Units: ug/ml



Manual Integration Results

RT: 7.80
Area: 1091
Amount: 0.007585
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:07:43 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Eurofins Knoxville

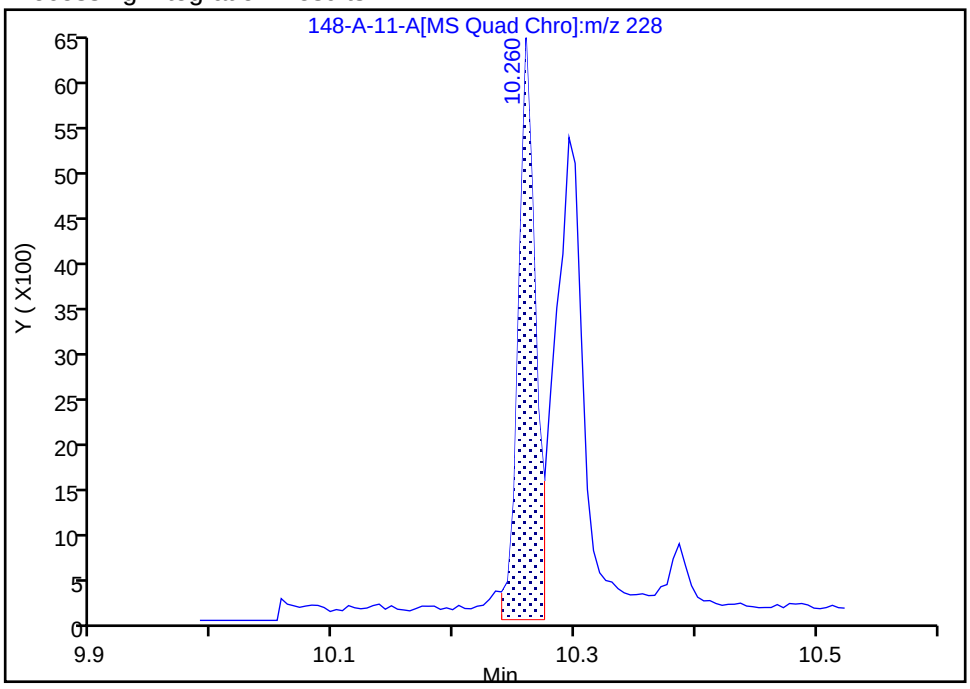
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-11-A.D				
Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14		
Client ID:	1804576-846-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

47 Benzo[a]anthracene, CAS: 56-55-3

Signal: 1

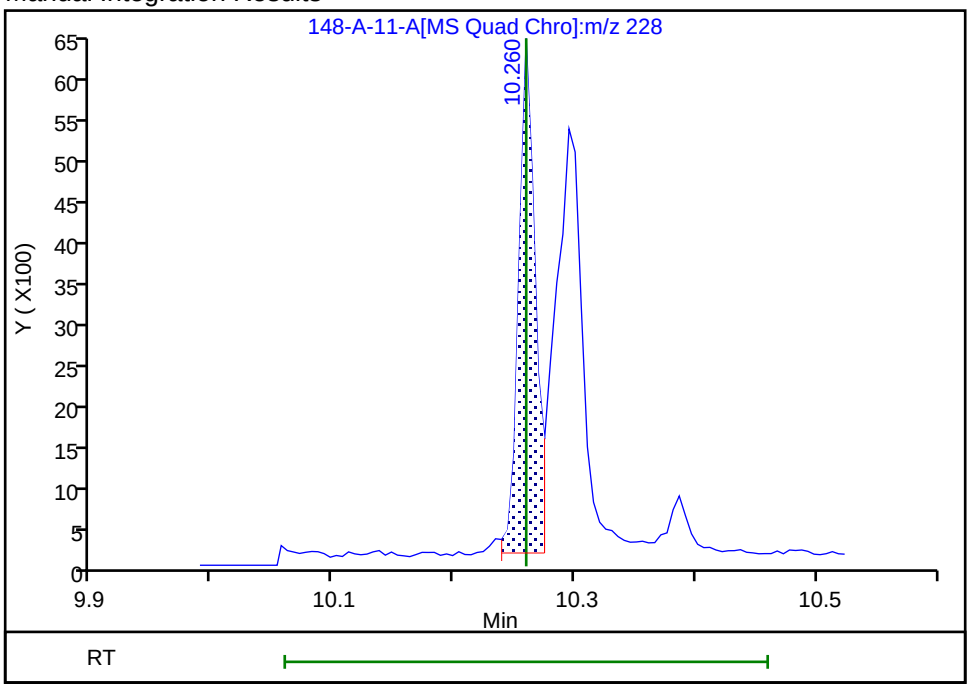
Processing Integration Results

RT: 10.26
Area: 6488
Amount: 0.032154
Amount Units: ug/ml



Manual Integration Results

RT: 10.26
Area: 6120
Amount: 0.030330
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:07:57 -05:00:00 (UTC)
Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

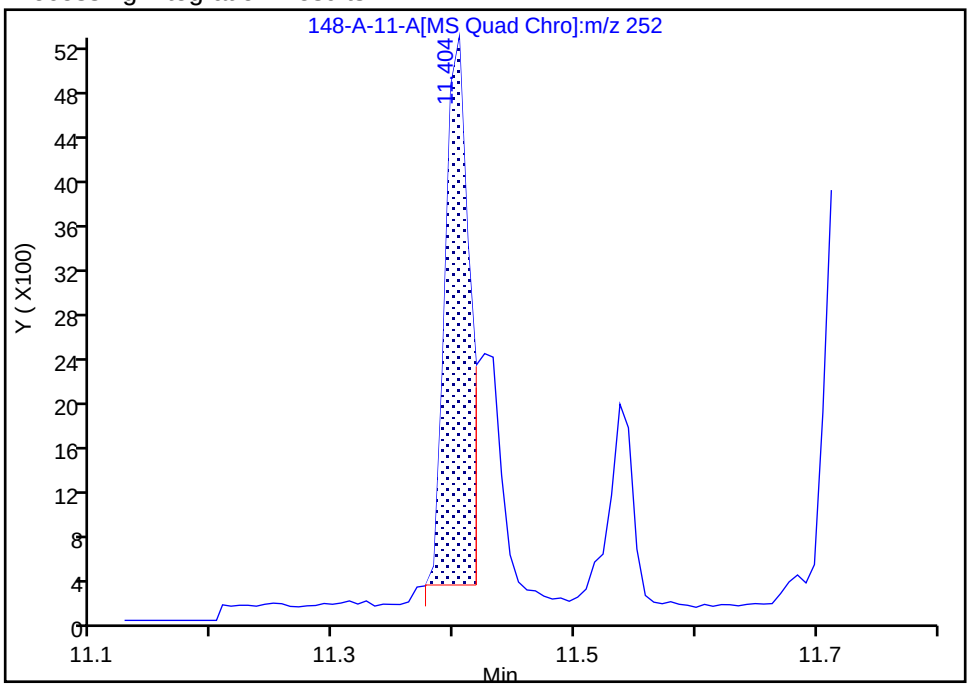
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-11-A.D				
Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14		
Client ID:	1804576-846-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

55 Benzo[k]fluoranthene, CAS: 207-08-9

Signal: 1

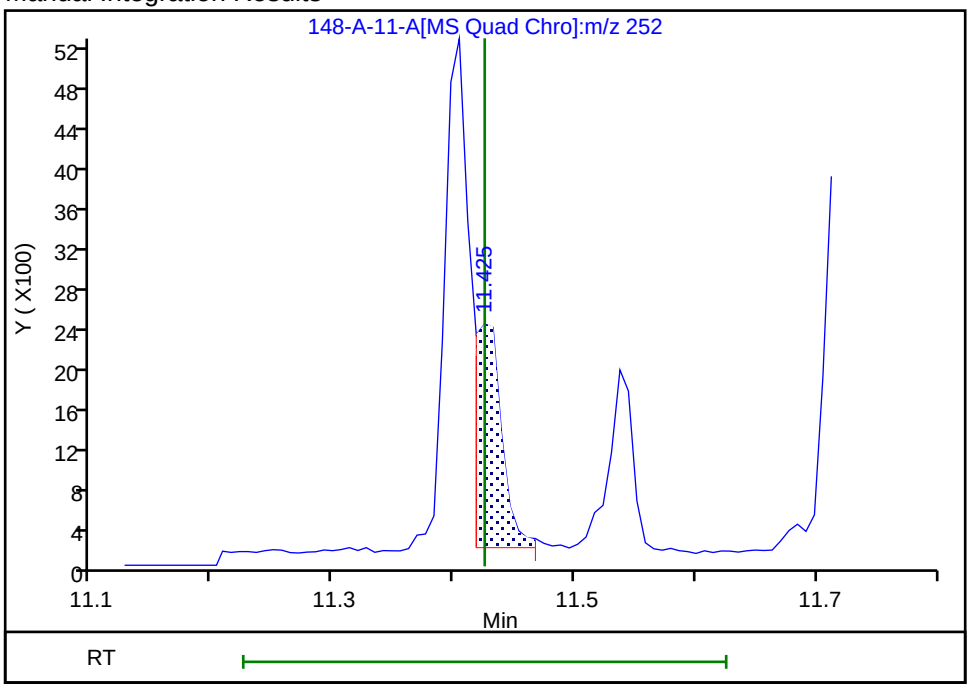
Processing Integration Results

RT: 11.40
Area: 6949
Amount: 0.031480
Amount Units: ug/ml



Manual Integration Results

RT: 11.43
Area: 3555
Amount: 0.016104
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:10:19 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

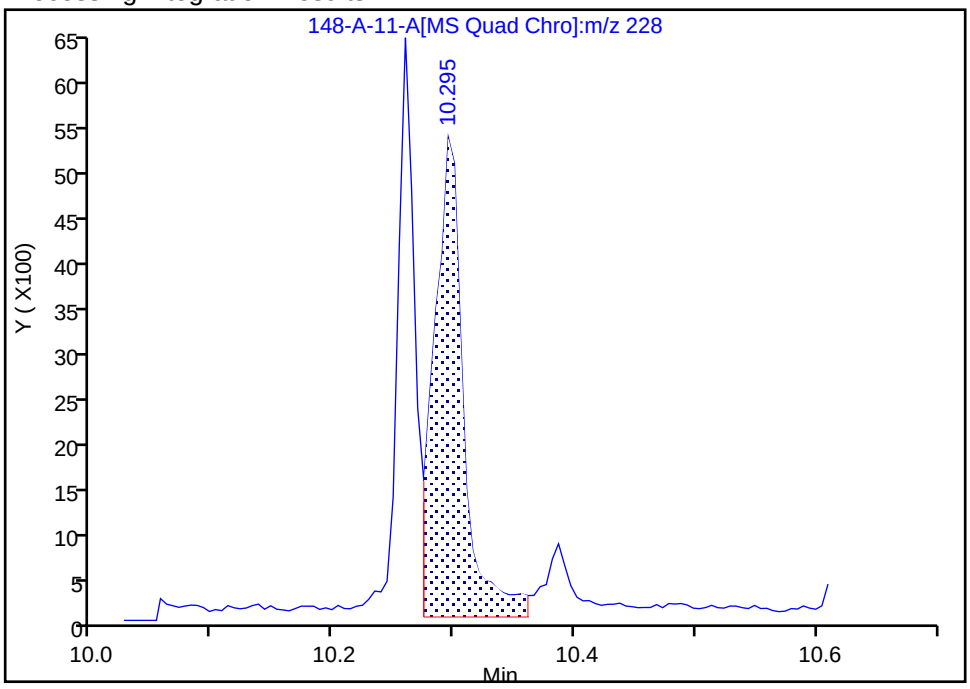
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-11-A.D				
Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14		
Client ID:	1804576-846-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

50 Chrysene, CAS: 218-01-9

Signal: 1

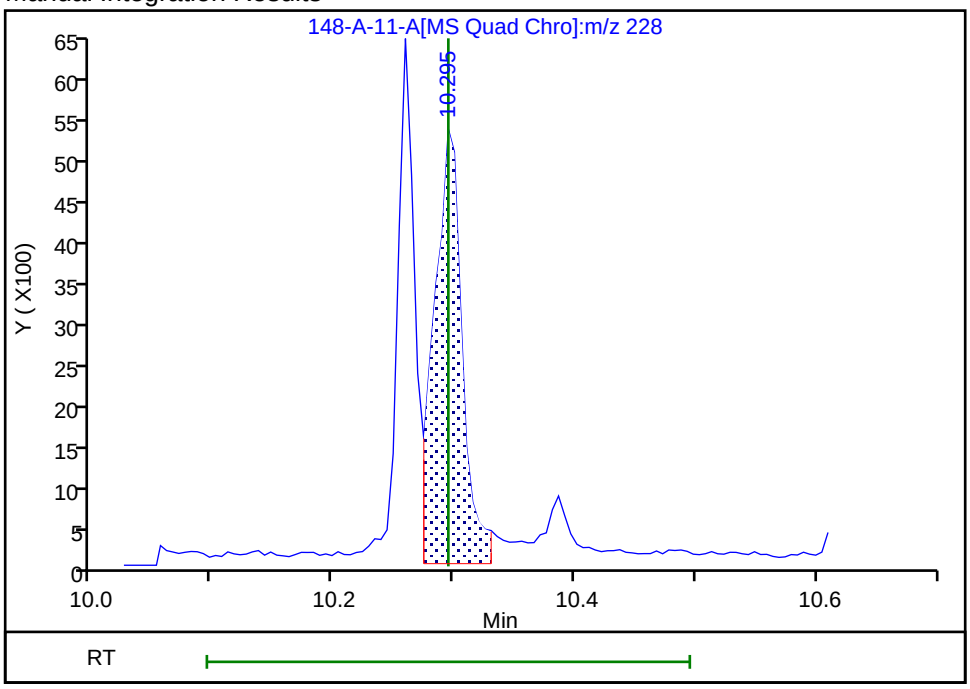
Processing Integration Results

RT: 10.30
Area: 9097
Amount: 0.040225
Amount Units: ug/ml



Manual Integration Results

RT: 10.30
Area: 8615
Amount: 0.038094
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:08:14 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

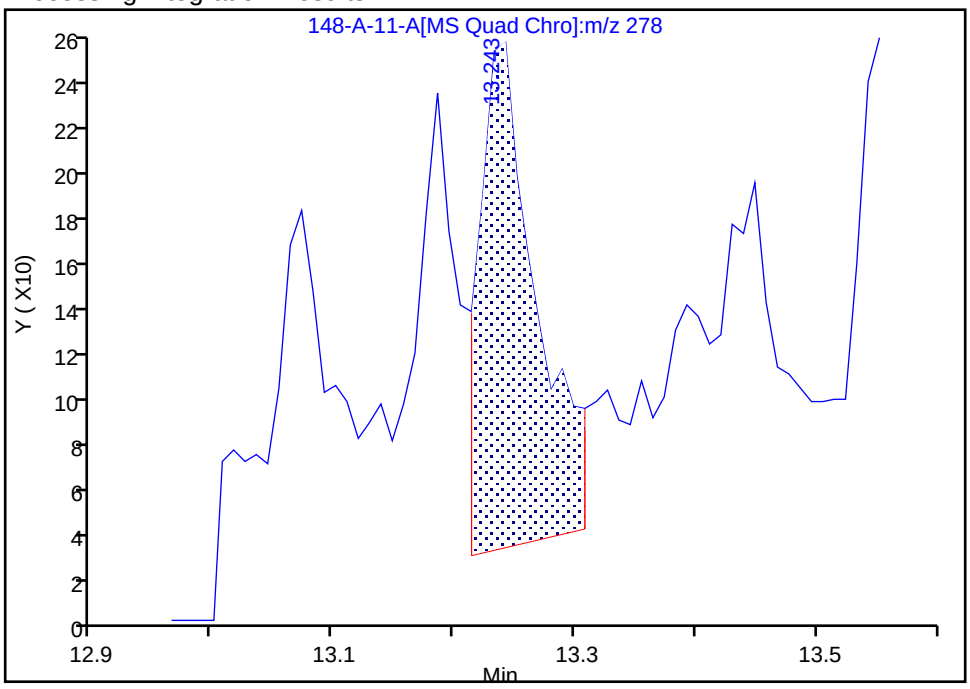
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-11-A.D				
Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14		
Client ID:	1804576-846-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

66 Dibenz(a,h)anthracene, CAS: 53-70-3

Signal: 1

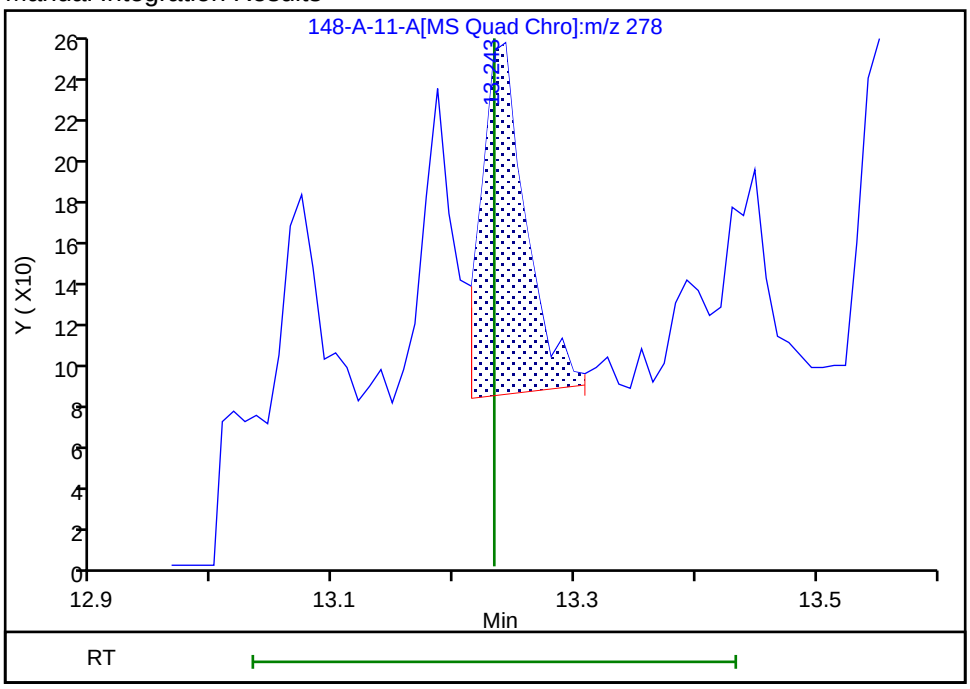
Processing Integration Results

RT: 13.24
Area: 741
Amount: 0.004270
Amount Units: ug/ml



Manual Integration Results

RT: 13.24
Area: 437
Amount: 0.002518
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:10:53 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

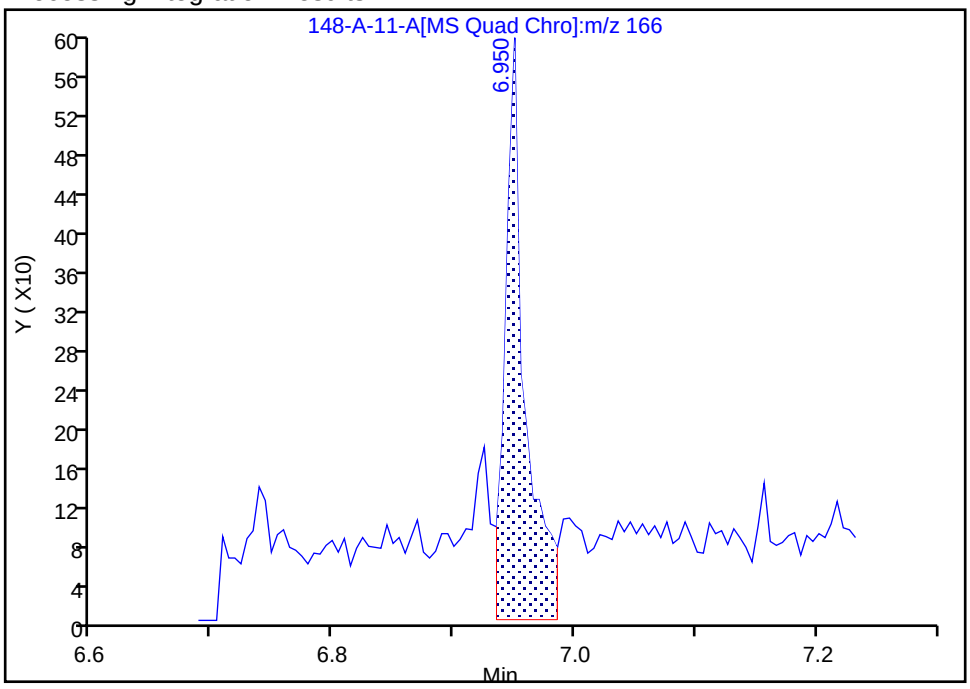
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-11-A.D				
Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14		
Client ID:	1804576-846-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

30 Fluorene, CAS: 86-73-7

Signal: 1

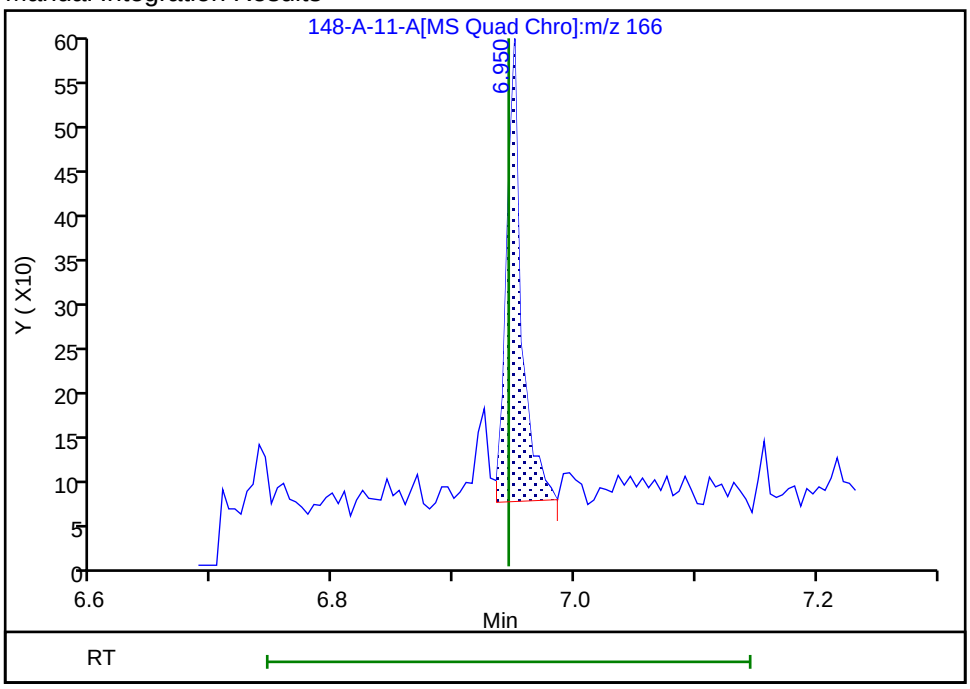
Processing Integration Results

RT: 6.95
Area: 689
Amount: 0.007915
Amount Units: ug/ml



Manual Integration Results

RT: 6.95
Area: 450
Amount: 0.005170
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:07:14 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

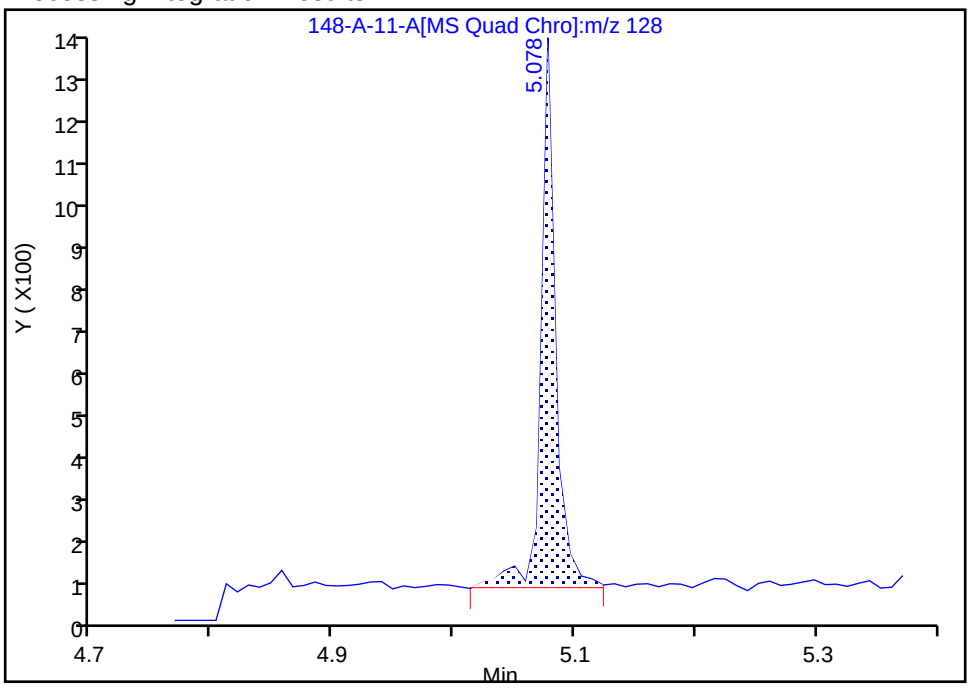
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-11-A.D				
Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14		
Client ID:	1804576-846-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

11 Naphthalene, CAS: 91-20-3

Signal: 1

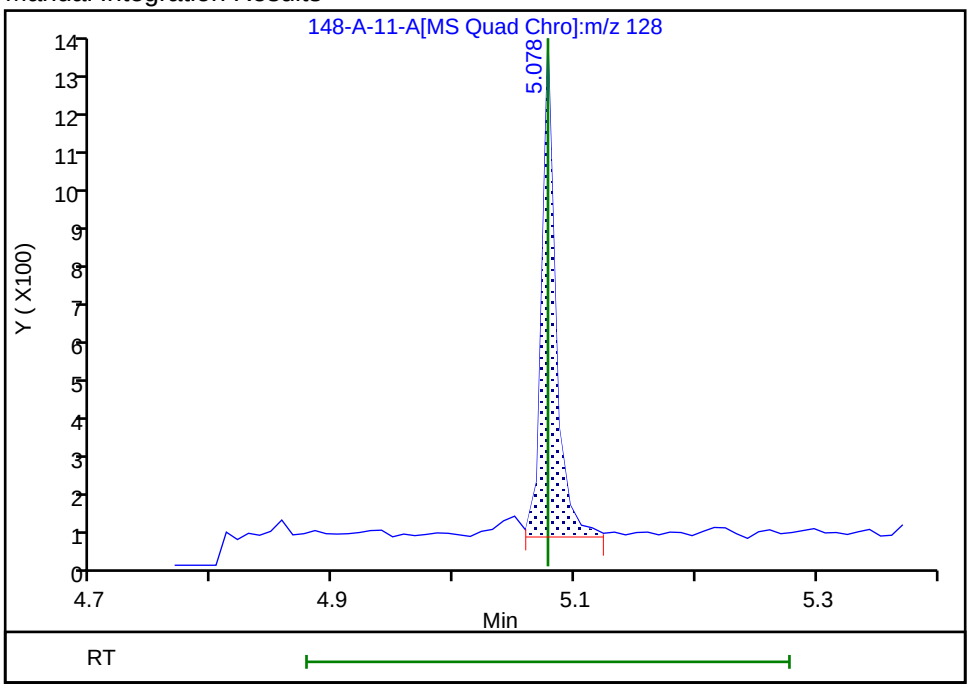
Processing Integration Results

RT: 5.08
Area: 1092
Amount: 0.012976
Amount Units: ug/ml



Manual Integration Results

RT: 5.08
Area: 1025
Amount: 0.012180
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:06:21 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

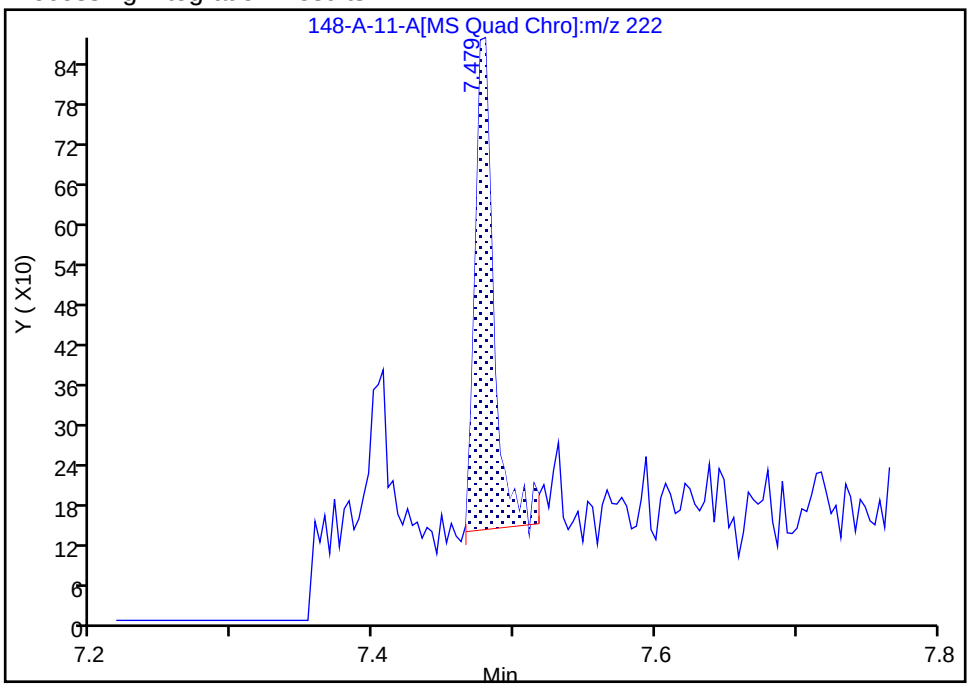
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-11-A.D				
Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14		
Client ID:	1804576-846-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

74 PCB-14, CAS: 34883-41-5

Signal: 1

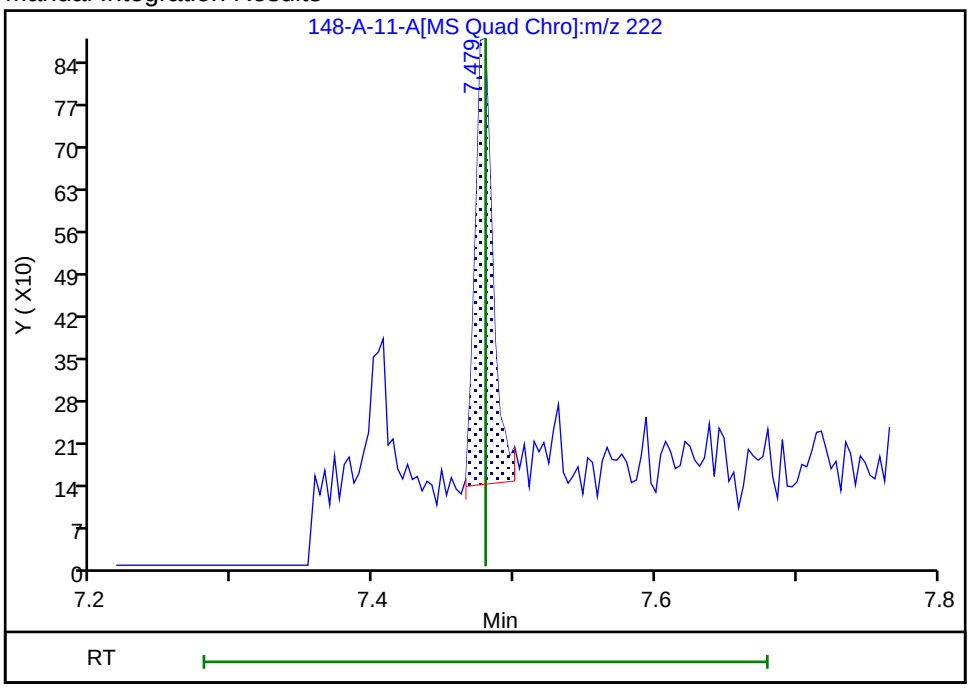
Processing Integration Results

RT: 7.48
Area: 686
Amount: 0.005061
Amount Units: ug/ml



Manual Integration Results

RT: 7.48
Area: 650
Amount: 0.004795
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:11:13 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

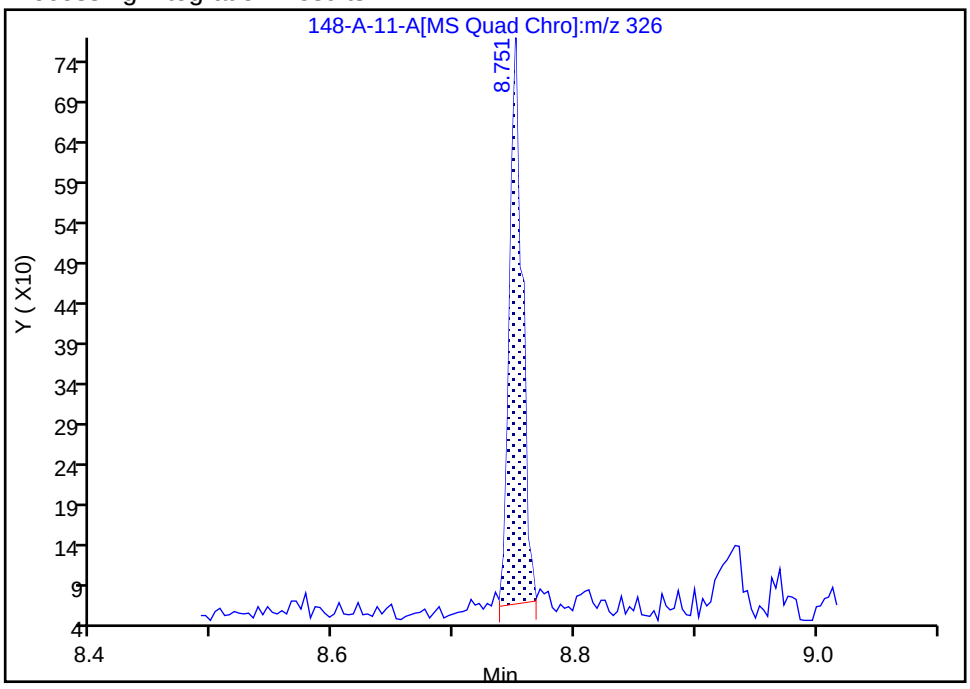
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-11-A.D				
Injection Date:	16-Nov-2023 18:59:04	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-14-A	Lab Sample ID:	140-34148-14		
Client ID:	1804576-846-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

77 PCB-121, CAS: 56558-18-0

Signal: 1

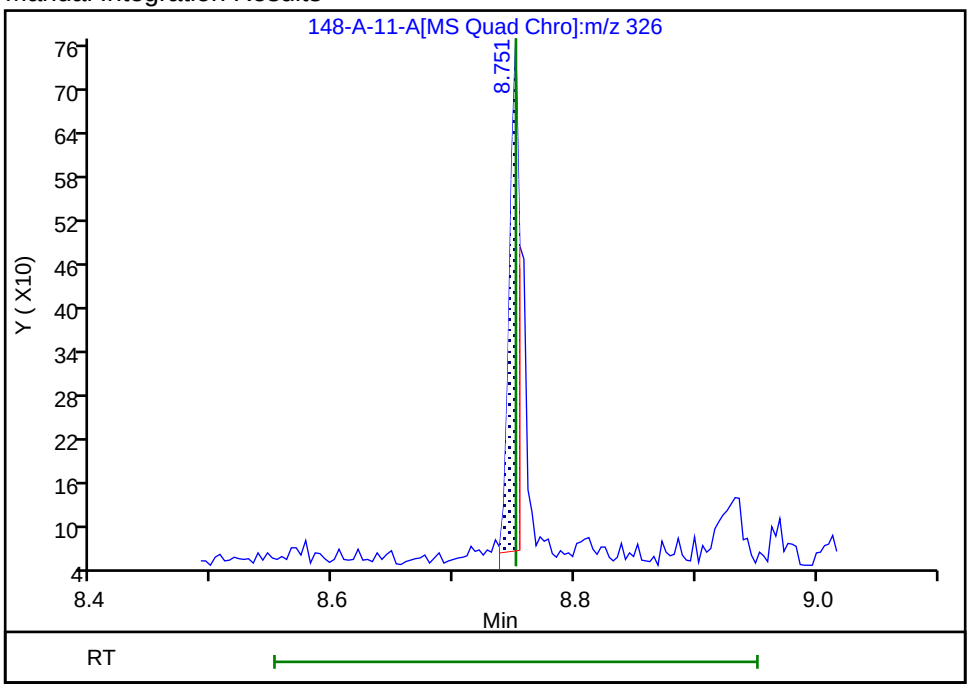
Processing Integration Results

RT: 8.75
Area: 503
Amount: 0.011306
Amount Units: ug/ml



Manual Integration Results

RT: 8.75
Area: 396
Amount: 0.008904
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:11:28 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: 1804576-846-S3 | Lab Sample ID: 140-34148-15

Matrix: PE | Lab File ID: 140-34148-A-12-A.D

Analysis Method: ID-0016 | Date Collected: 10/26/2023 14:00

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.011(g) | Date Analyzed: 11/16/2023 19:22

Con. Extract Vol.: 500(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80349 | Units: ng/g

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
83-32-9	Acenaphthene	13000		910	240
208-96-8	Acenaphthylene	320	J	910	66
120-12-7	Anthracene	5300		910	290
56-55-3	Benzo[a]anthracene	7300		910	340
50-32-8	Benzo[a]pyrene	3900		910	250
205-99-2	Benzo[b]fluoranthene	5500		910	320
192-97-2	Benzo[e]pyrene	3400		910	150
191-24-2	Benzo[g,h,i]perylene	1400		910	100
207-08-9	Benzo[k]fluoranthene	2700		910	210
218-01-9	Chrysene	9300		910	120
53-70-3	Dibenz(a,h)anthracene	340	J	910	75
206-44-0	Fluoranthene	33000		910	740
86-73-7	Fluorene	730	J	910	290
193-39-5	Indeno[1,2,3-cd]pyrene	1400		910	100
90-12-0	1-Methylnaphthalene	ND		4500	450
91-57-6	2-Methylnaphthalene	ND		4500	640
91-20-3	Naphthalene	ND		18000	2600
198-55-0	Perylene	1500		910	460
85-01-8	Phenanthrene	19000		1800	1600
129-00-0	Pyrene	42000		1800	270
STL00912	C1-Fluoranthenes/pyrene	22000		910	910
STL00913	C1-Fluorenes	6300		1800	1200
STL00914	C2-Fluorenes	9800		910	910
STL00915	C3-Fluorenes	12000		910	910
STL00917	C2-Naphthalenes	9100		1800	1800
STL00918	C3-Naphthalenes	21000		1800	1800
STL00919	C4-Naphthalenes	18000		2700	2500
STL00901	C1-Phenanthrenes/Anthracenes	15000		3600	3100
STL00902	C2-Phenanthrenes/Anthracenes	29000		910	910
STL00903	C3-Phenanthrenes/Anthracenes	26000		910	910
STL00904	C4-Phenanthrenes/Anthracenes	13000		910	910
STL02218	C1-Chrysenes/Benz(a)anthracenes	6800		910	910

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: 1804576-846-S3 | Lab Sample ID: 140-34148-15

Matrix: PE | Lab File ID: 140-34148-A-12-A.D

Analysis Method: ID-0016 | Date Collected: 10/26/2023 14:00

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.011(g) | Date Analyzed: 11/16/2023 19:22

Con. Extract Vol.: 500(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80349 | Units: ng/g

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
STL02219	C2-Chrysenes/Benz(a)anthracenes	3500		910	910
STL02220	C3-Chrysenes/Benz(a)anthracenes	1300		910	910
STL02221	C4-Chrysenes/Benz(a)anthracenes	ND		910	910
34883-41-5	PCB-14	380	J	910	9.1
74472-51-8	PCB-192	1900		910	9.1
74472-48-3	PCB-184	750	J	910	9.1
33979-03-2	PCB-155	430	J	910	9.1
41411-61-4	PCB-142	490	J	910	9.1
74472-52-9	PCB-204	1300		910	9.1
56558-16-8	PCB-104	1200		910	9.1
56558-18-0	PCB-121	630	J	910	9.1
70362-49-1	PCB-78	1100		910	9.1
38444-87-0	PCB-36	340	J	910	9.1

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
93951-97-4	Acenaphthylene-d8	86		30-120
1719-06-8	Anthracene-d10	86		30-120
63466-71-7	Benzo(a)pyrene-d12	87		30-120
93951-98-5	Benzo(b)fluoranthene-d12	93		30-120
93951-66-7	Benzo(ghi)perylene-d12	93		30-120
93952-01-3	Benzo(k)fluoranthene-d12	86		30-120
1719-03-5	Chrysene-d12	84		30-120
13250-98-1	Dibenz(a,h)anthracene-d14	88		30-120
93951-69-0	Fluoranthene-d10	90		30-120
81103-79-9	Fluorene -d10	85		30-120
203578-33-0	Indeno[1,2,3-cd]pyrene-d12	90		30-120
38072-94-5	1-Methylnaphthalene-d10	86		30-120
7297-45-2	2-Methylnaphthalene-d10	84		30-120
1146-65-2	Naphthalene-d8	81		30-120
1520-96-3	Perylene-d12	84		30-120
1517-22-2	Phenanthrene-d10	85		30-120

Report Date: 22-Nov-2023 11:26:28 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D
Lims ID: 140-34148-A-15-A
Client ID: 1804576-846-S3
Sample Type: Client
Inject. Date: 16-Nov-2023 19:22:32 ALS Bottle#: 0 Worklist Smp#: 23
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030519-023
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 22-Nov-2023 11:26:27 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1637

First Level Reviewer: SK9U Date: 17-Nov-2023 10:36:18

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/ml	%Rec	Flags
D 10 Naphthalene-d8	136	5.059	5.068	-0.009	100	33740	0.4035	80.7	
12 Naphthalene	128	5.078	5.078	0.000	38	2203	0.0278		M
D 15 2-methylnaphthalene-d10	152	5.612	5.612	0.000	92	22725	0.4179	83.6	
16 2-Methylnaphthalene	142	5.635	5.635	0.000	97	527	0.009323		7M
D 17 1-Methylnaphthalene-d10	152	5.686	5.686	0.000	99	23429	0.4301	86.0	
D 23 Acenaphthylene-d8	160	6.367	6.362	0.005	80	39496	0.4280	85.6	
24 Acenaphthylene	152	6.377	6.372	0.005	36	663	0.007140		
* 26 Acenaphthene-d10	164	6.492	6.492	0.000	97	29994	0.5000		
27 Acenaphthene	154	6.517	6.517	0.000	96	17493	0.2941		
D 29 Fluorene -d10	176	6.925	6.920	0.005	98	30331	0.4244	84.9	
30 Fluorene	166	6.945	6.945	0.000	66	1274	0.0162		M
D 35 Phenanthrene-d10	188	7.732	7.732	0.000	99	55780	0.4275	85.5	
36 Phenanthrene	178	7.749	7.749	0.000	41	56856	0.4225		
D 38 Anthracin-d10	188	7.777	7.777	0.000	100	55043	0.4321	86.4	
39 Anthracene	178	7.794	7.794	0.000	97	15668	0.1156		
D 41 Fluoranthene-d10	212	8.805	8.805	0.000	98	76095	0.4495	89.9	
43 Fluoranthene	202	8.822	8.825	-0.003	56	140643	0.7223		
* 44 Pyrene-d10 (IS)	212	9.024	9.024	0.000	96	83674	0.5000		
45 Pyrene	202	9.040	9.044	-0.004	97	182953	0.9207		
47 Benzo[a]anthracene	228	10.255	10.260	-0.005	99	28383	0.1596		M
D 48 Chrysene-d12	240	10.270	10.270	0.000	99	68485	0.4195	83.9	
50 Chrysene	228	10.295	10.295	0.000	23	40744	0.2044		M
D 52 Benzo(b)fluoranthene-d12	264	11.376	11.369	0.007	100	59772	0.4667	93.3	
53 Benzo[b]fluoranthene	252	11.397	11.397	0.000	45	24178	0.1201		M
D 54 Benzo(k)fluoranthene-d12	264	11.404	11.404	0.000	70	64819	0.4308	86.2	
55 Benzo[k]fluoranthene	252	11.425	11.425	0.000	100	11263	0.0593		M
* 56 Benzo(e)pyrene-d12	264	11.684	11.684	0.000	99	50565	0.5000		
57 Benzo[e]pyrene	252	11.712	11.712	0.000	100	12203	0.0740		
D 58 Benzo(a)pyrene-d12	264	11.747	11.747	0.000	100	48941	0.4358	87.2	
59 Benzo[a]pyrene	252	11.775	11.775	0.000	100	13920	0.0860		
D 60 Perylene-d12	264	11.845	11.838	0.007	100	52380	0.4202	84.0	
61 Perylene	252	11.873	11.873	0.000	100	4893	0.0327		

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/ml	%Rec	Flags
D 62 Indeno[1,2,3-cd]pyrene-d12	288	13.186	13.186	0.000	84	55087	0.4515	90.3	
D 63 Dibenz(a,h)anthracene-d14	292	13.196	13.196	0.000	89	47940	0.4391	87.8	
65 Indeno[1,2,3-cd]pyrene	276	13.214	13.214	0.000	26	5731	0.0311		M
66 Dibenz(a,h)anthracene	278	13.243	13.233	0.010	7	1156	0.007551		M
D 67 Benzo(ghi)perylene-d12	288	13.552	13.543	0.009	100	56318	0.4648	93.0	
68 Benzo[g,h,i]perylene	276	13.580	13.580	0.000	89	5094	0.0309		
74 PCB-14	222	7.476	7.479	-0.003	36	1018	0.008408		M
75 PCB-36	258	8.206	8.206	-0.004	94	477	0.007484		M
76 PCB-104	326	8.395	8.393	-0.001	95	1307	0.0264		
77 PCB-121	326	8.748	8.748	-0.003	84	550	0.0138		
78 PCB-155	360	8.849	8.852	0.000	50	353	0.009505		
79 PCB-78	290	9.077	9.077	-0.007	58	743	0.0235		
80 PCB-142	360	9.522	9.519	0.000	30	294	0.0109		
81 PCB-184	394	9.572	9.579	0.000	16	447	0.0165		
* 82 PCB-167L	372	10.023	10.027	-0.004	74	13208	0.4000		
83 PCB-204	428	10.249	10.246	-0.001	2	507	0.0288		
84 PCB-192	394	10.275	10.275	0.000	6	1032	0.0416		
A 85 C2-Naphthalenes	156	6.244	(6.068-6.407)		0	15915	0.2006		
A 87 C3-Naphthalenes	170	6.819	(6.348-7.050)		0	36597	0.4612		
A 88 C4-Naphthalenes	184	7.124	(6.678-7.562)		0	30759	0.3876		
A 89 C1-Fluorenes	180	7.403	(7.364-7.505)		0	10961	0.1391		
A 90 C2-Fluorenes	194	7.883	(7.730-8.069)		0	17039	0.2162		
A 91 C3-Fluorenes	208	8.273	(8.092-8.605)		0	21031	0.2669		
A 96 C1-Phenanthrenes/Anthracenes	191	8.232	(8.155-8.332)		0	45864	0.3408		
A 97 C2-Phenanthrenes/Anthracenes	206	8.698	(8.490-8.926)		0	85595	0.6361		
A 98 C3-Phenanthrenes/Anthracenes	220	9.128	(8.851-9.456)		0	78004	0.5797		
A 99 C4-Phenanthrenes/Anthracenes	234	9.454	(9.106-9.824)		0	38346	0.2850		
A 100 C1-Fluoranthenes/pyrene	216	9.421	(9.246-9.640)		0	94115	0.4736		
A 101 C1-Chrysenes/Benz(a)anthracenes	242	10.686	(10.456-10.941)		0	29802	0.1495		
A 102 C2-Chrysenes/Benz(a)anthracenes	256	11.014	(10.667-11.381)		0	15175	0.0761		
A 103 C3-Chrysenes/Benz(a)anthracenes	270	11.430	(11.002-11.867)		0	5915	0.0297		

QC Flag Legend

Processing Flags

7 - Failed Limit of Detection

Review Flags

M - Manually Integrated

Reagents:

60ISPCB_00001 Amount Added: 5.00 Units: uL

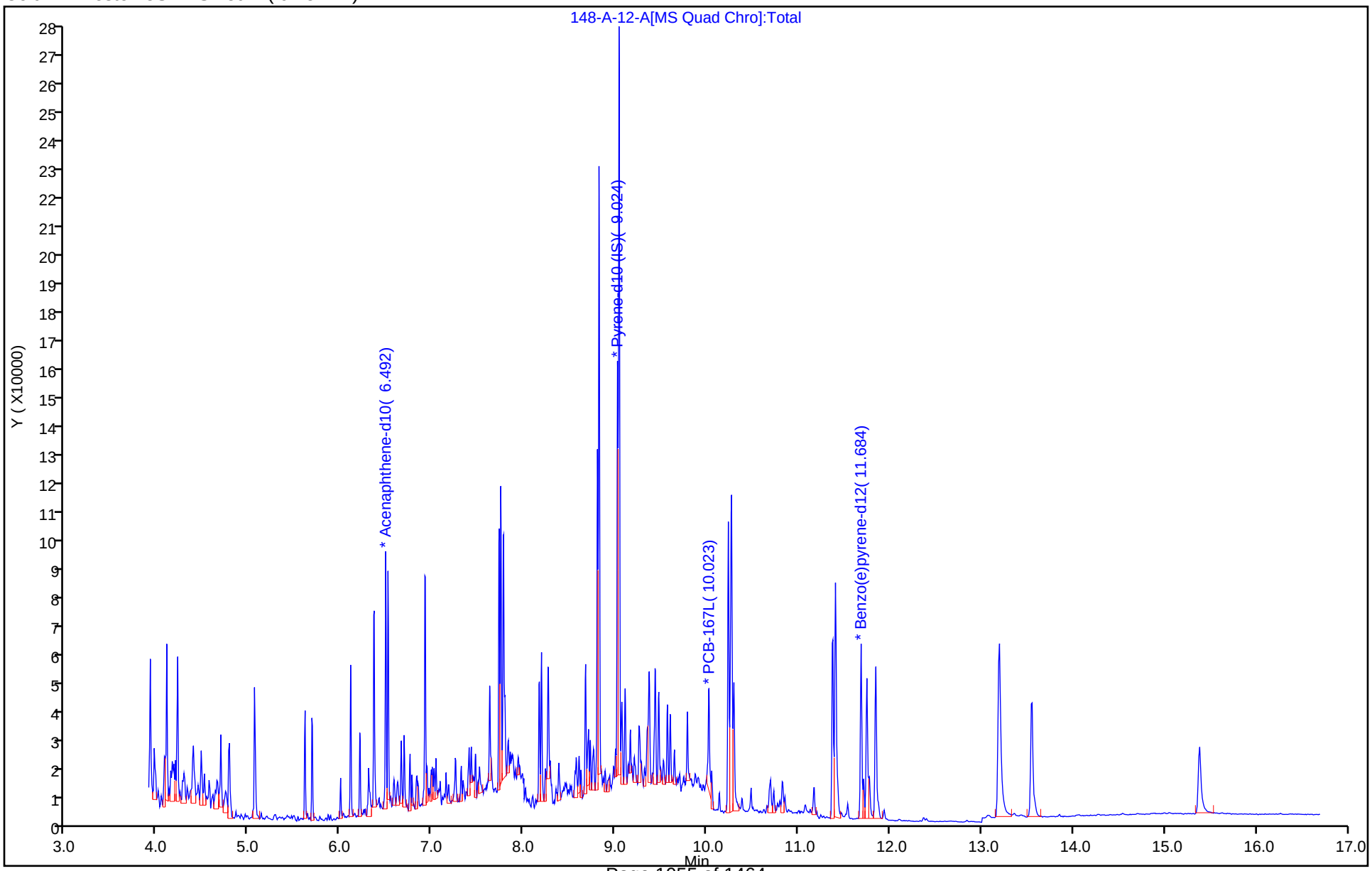
Report Date: 22-Nov-2023 11:26:28 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D

Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15	Worklist Smp#:	23
Client ID:	1804576-846-S3				
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



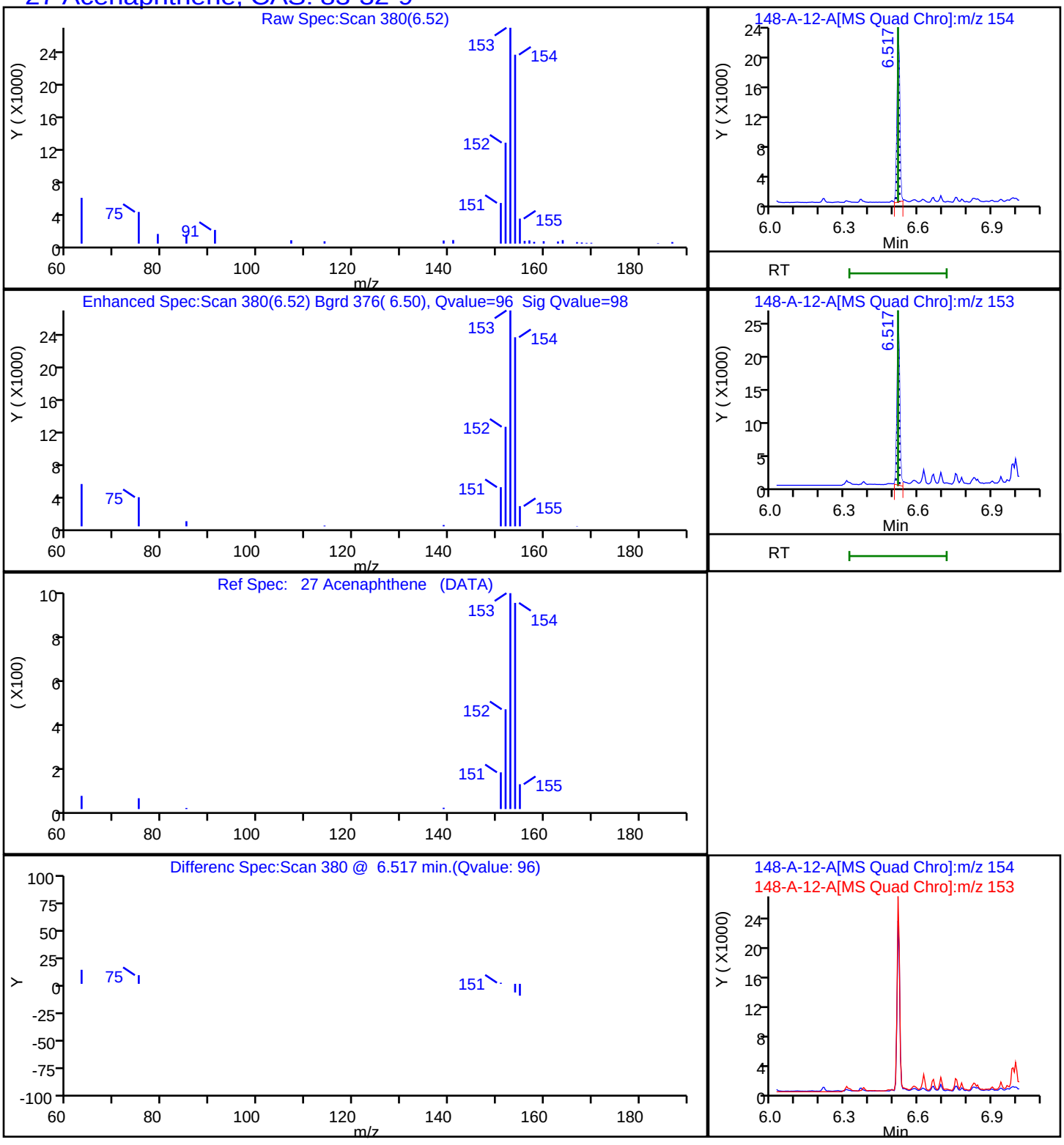
Report Date: 22-Nov-2023 11:26:28 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D

Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

27 Acenaphthene, CAS: 83-32-9



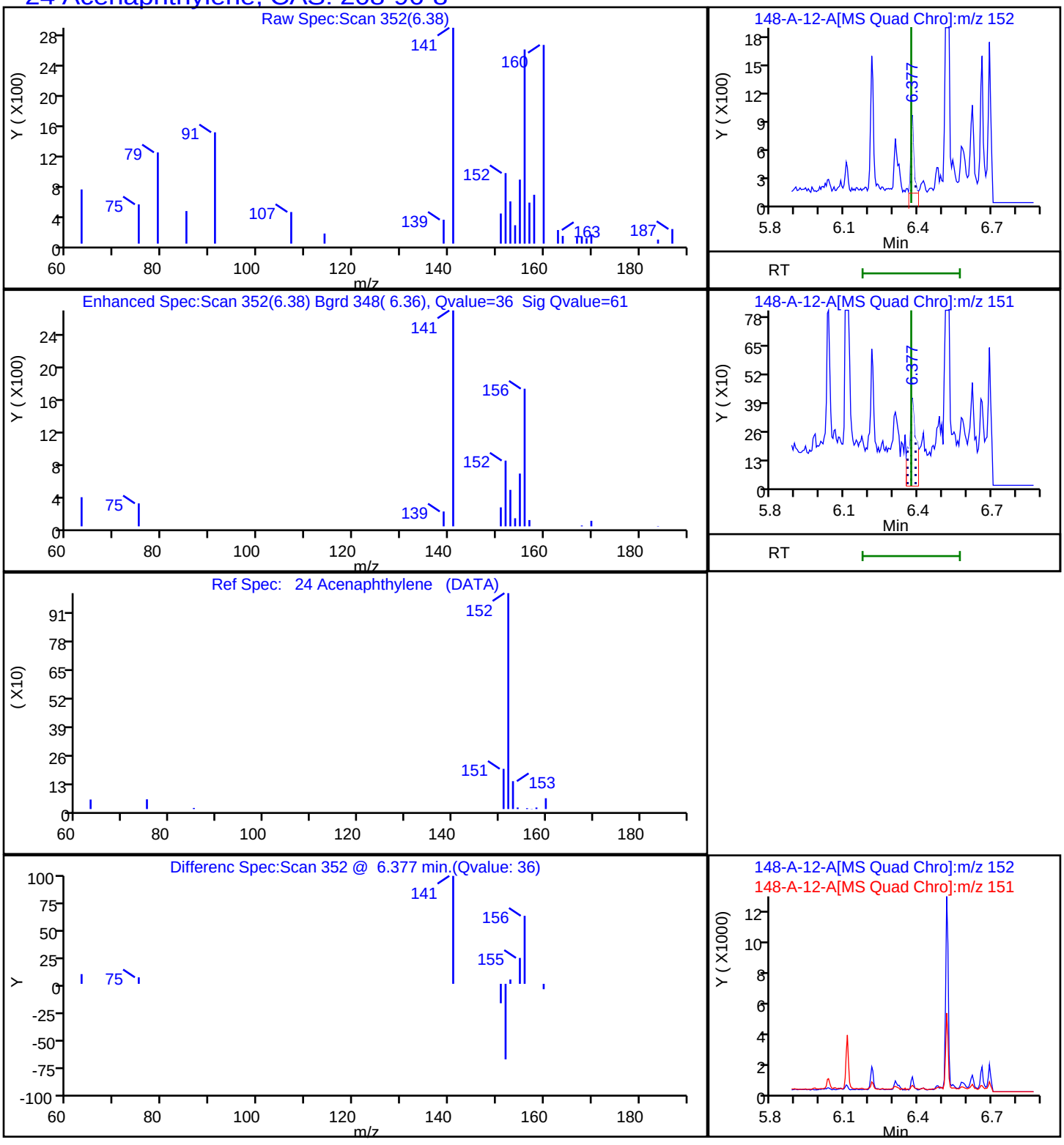
Report Date: 22-Nov-2023 11:26:28 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D

Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

24 Acenaphthylene, CAS: 208-96-8

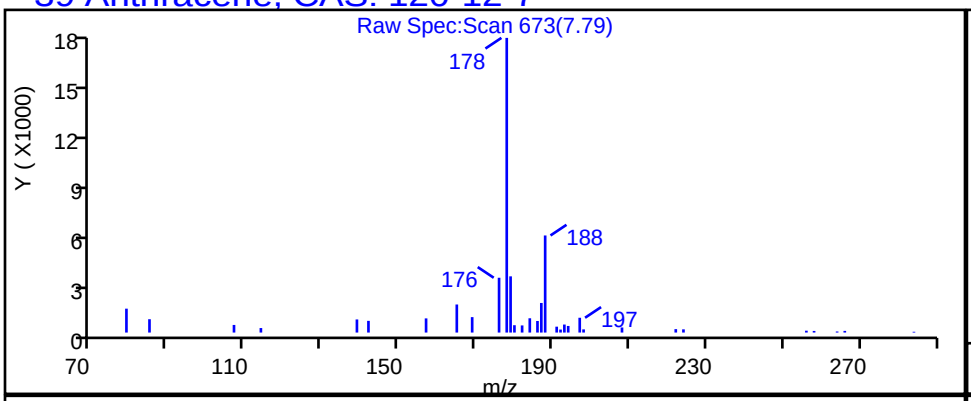


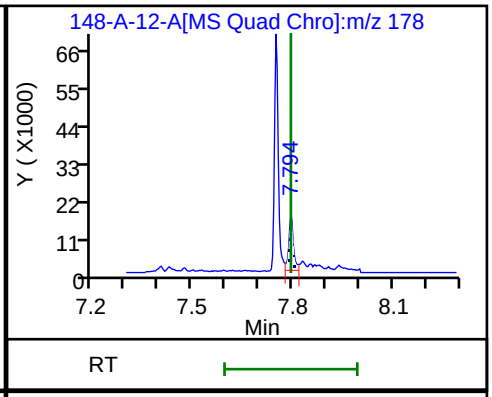
Report Date: 22-Nov-2023 11:26:28 Chrom Revision: 2.3 15-Nov-2023 20:54:34

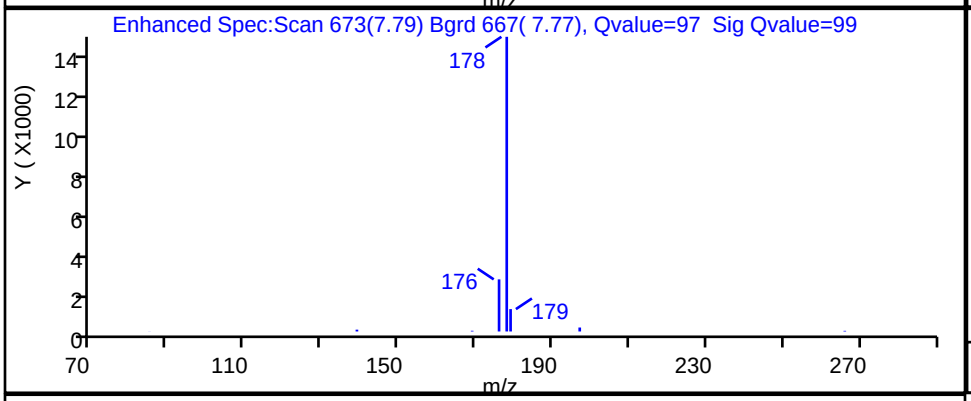
Eurofins Knoxville

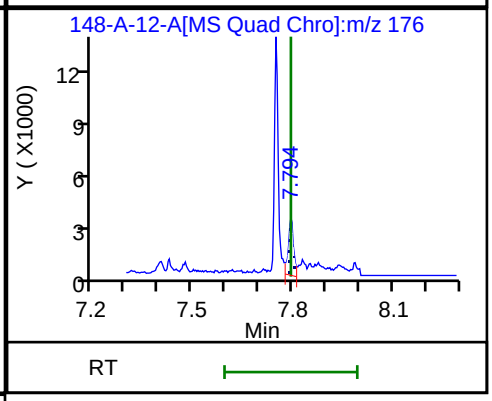
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D		
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15
Client ID:	1804576-846-S3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

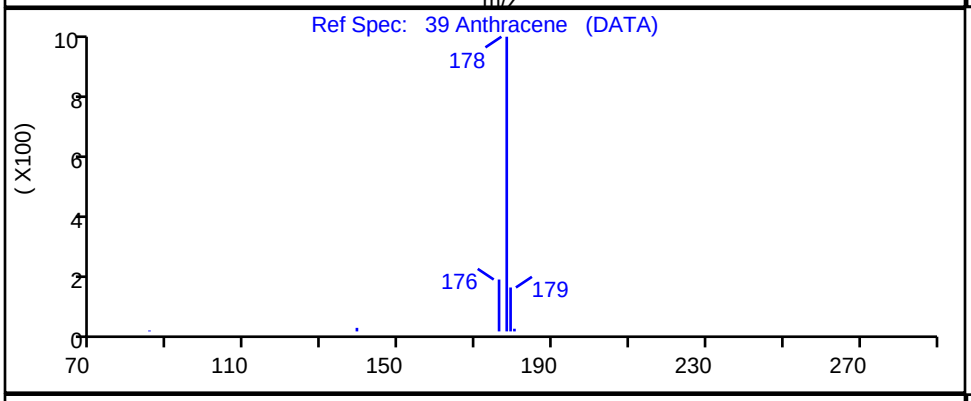
39 Anthracene, CAS: 120-12-7

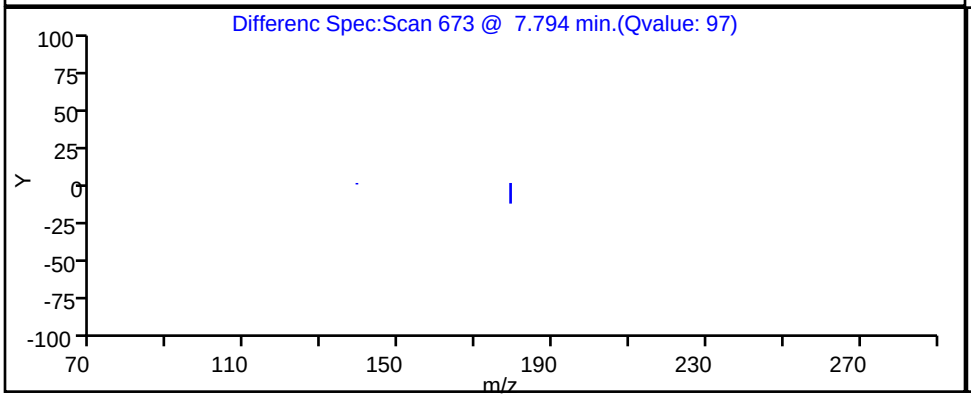


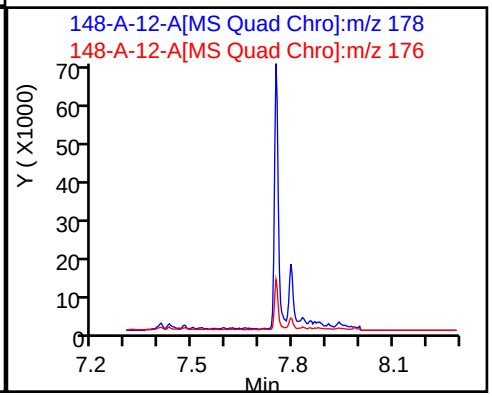










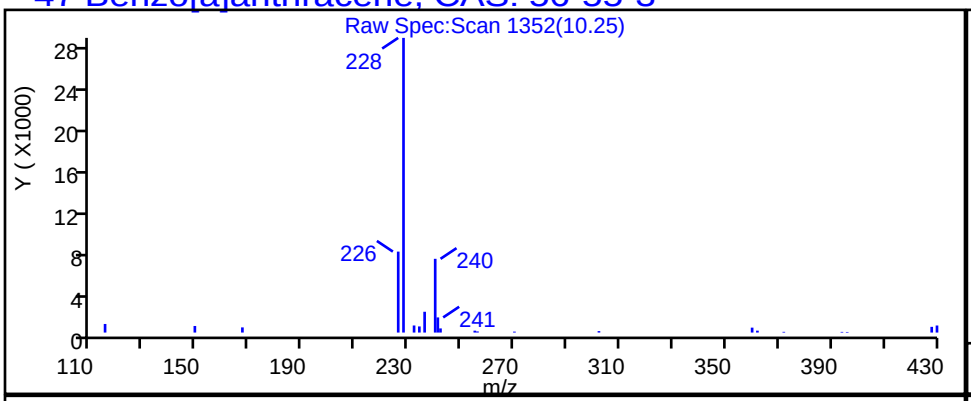


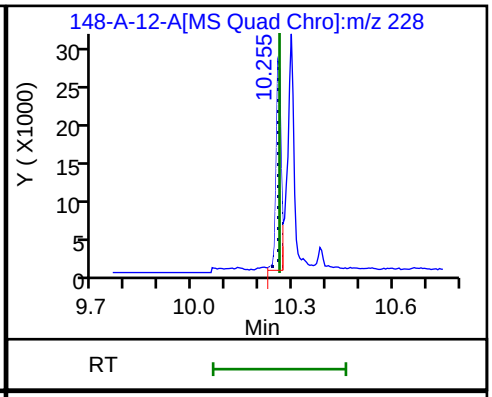
Report Date: 22-Nov-2023 11:26:28 Chrom Revision: 2.3 15-Nov-2023 20:54:34

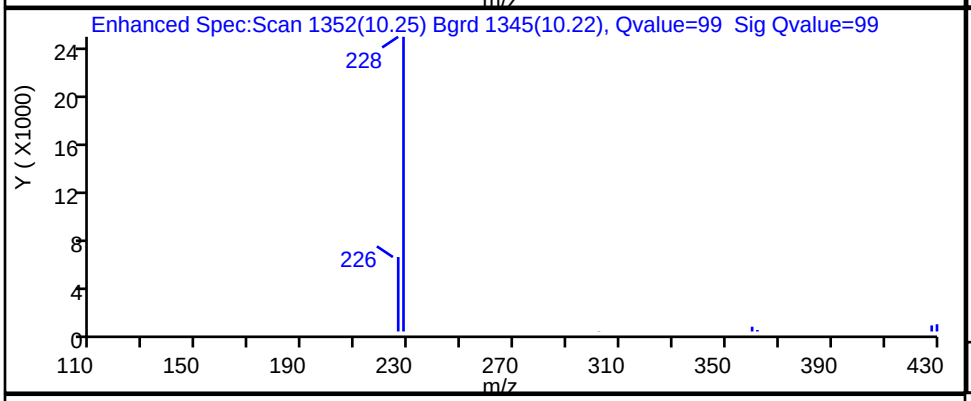
Eurofins Knoxville

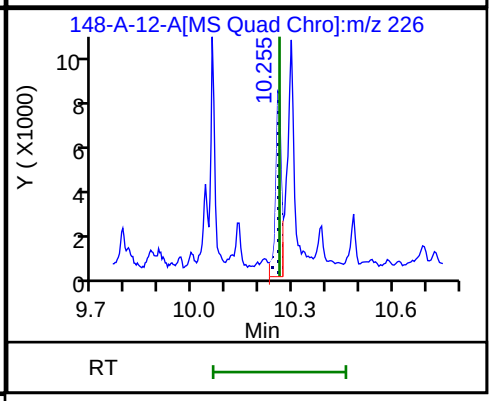
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D		
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15
Client ID:	1804576-846-S3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

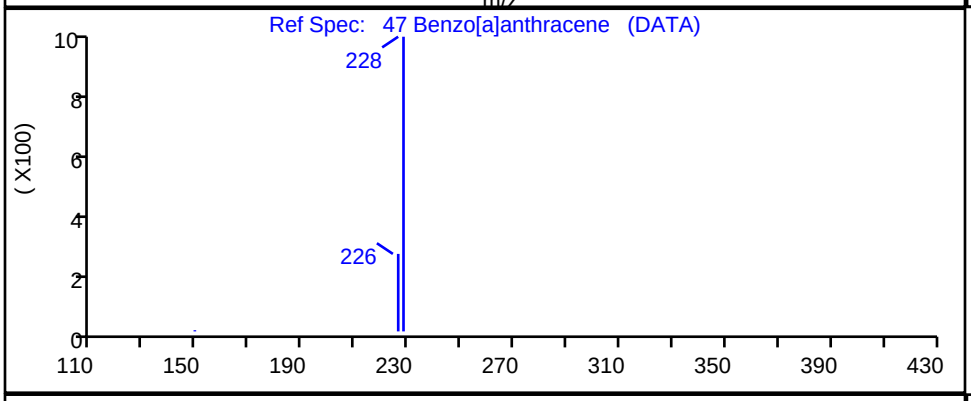
47 Benzo[a]anthracene, CAS: 56-55-3

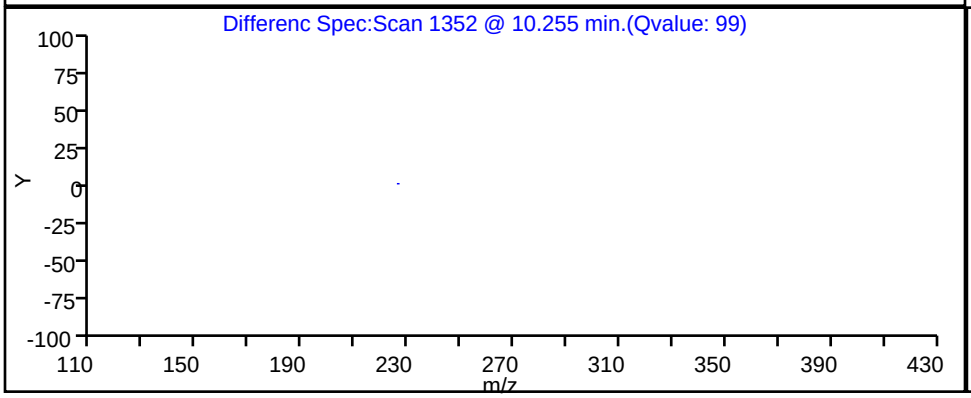


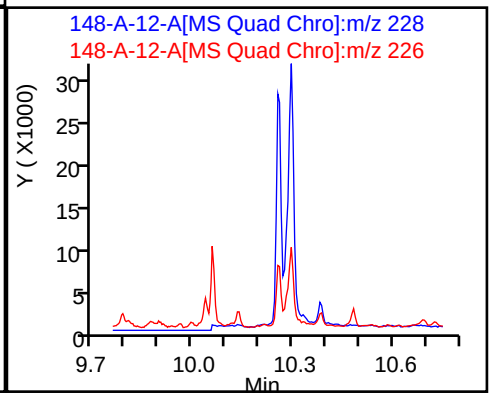












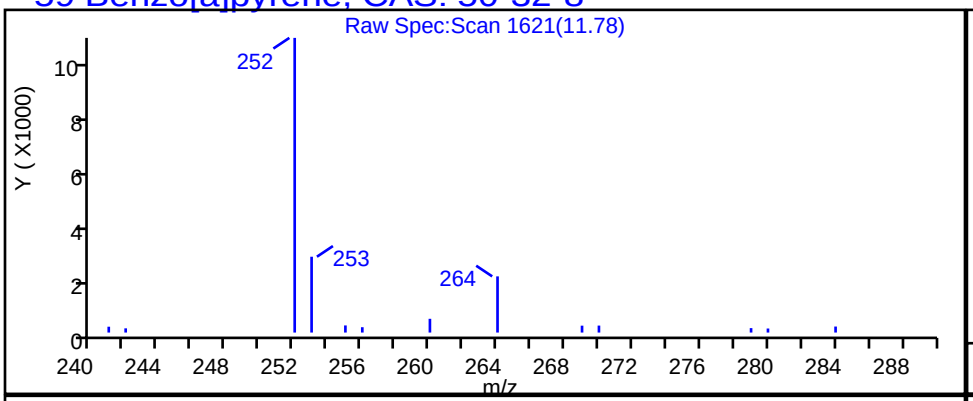
Report Date: 22-Nov-2023 11:26:29 Chrom Revision: 2.3 15-Nov-2023 20:54:34

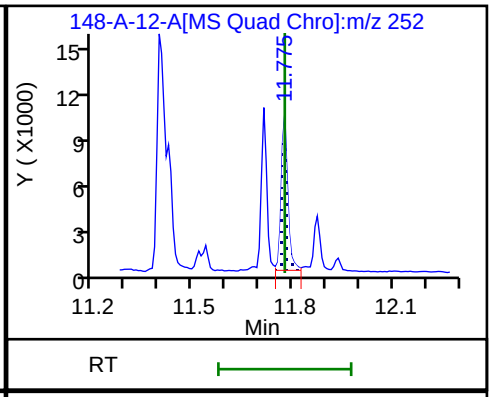
Eurofins Knoxville

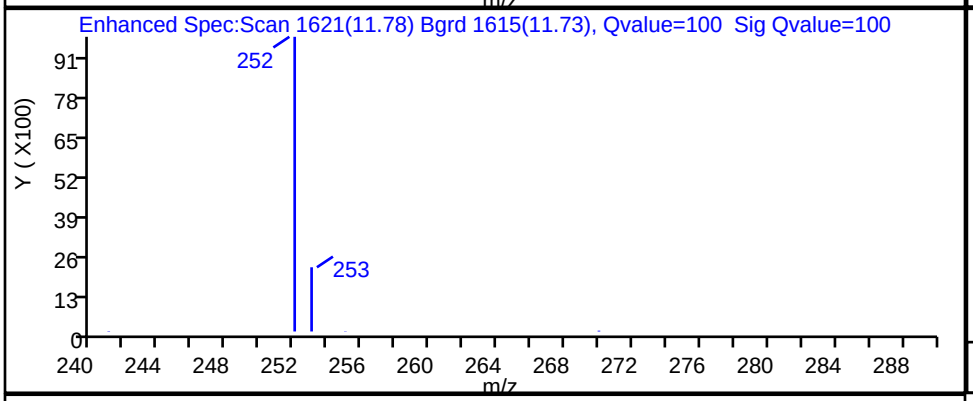
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D

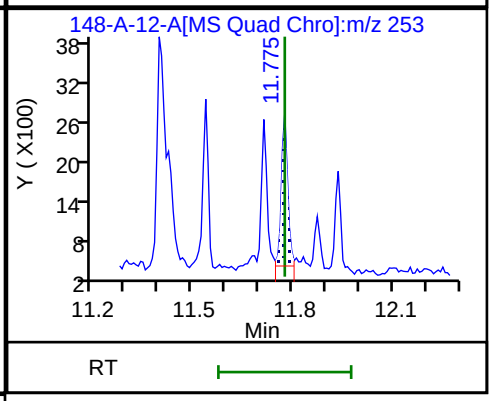
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15
Client ID:	1804576-846-S3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

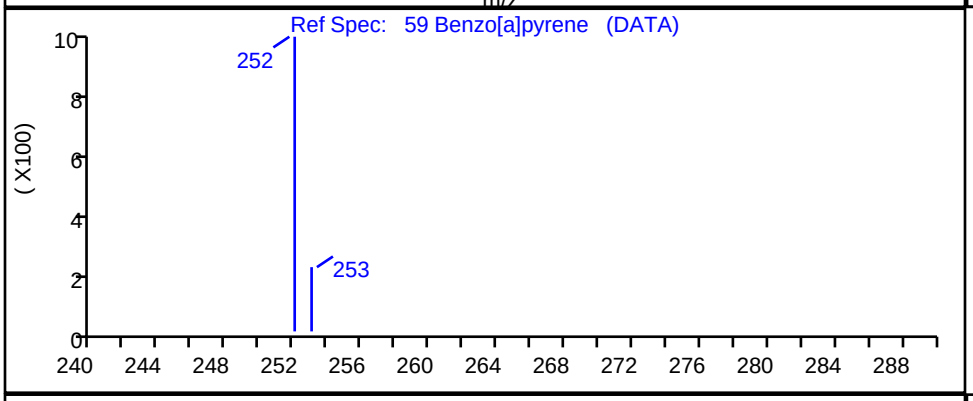
59 Benzo[a]pyrene, CAS: 50-32-8

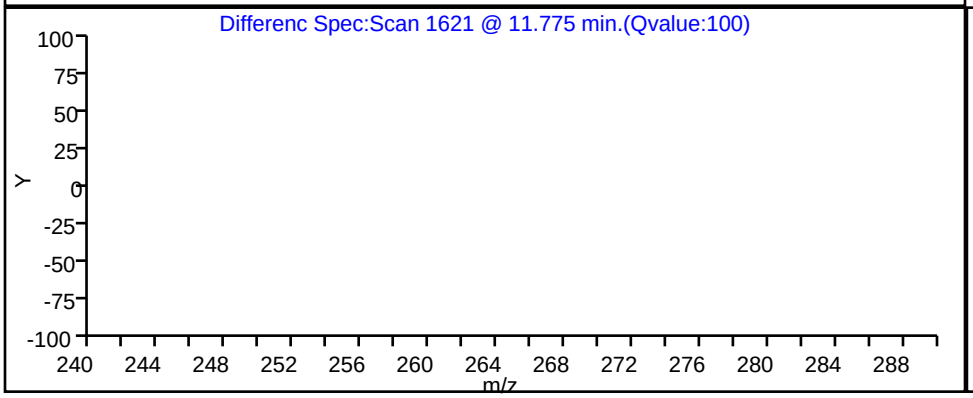


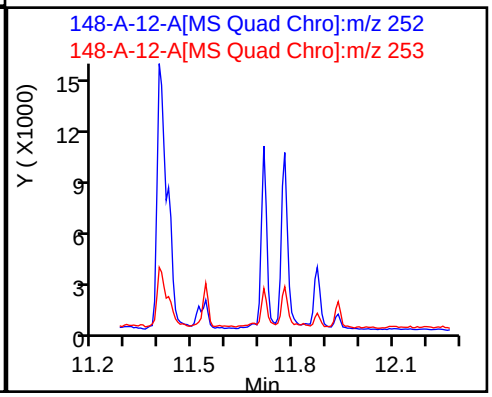












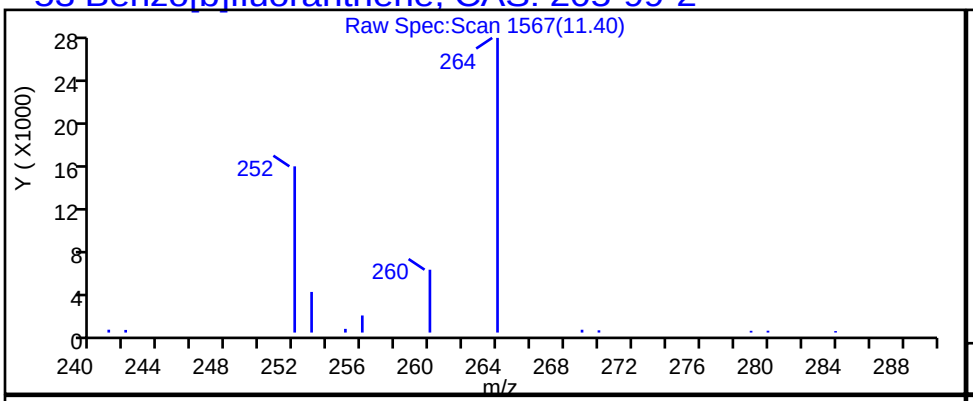
Report Date: 22-Nov-2023 11:26:28 Chrom Revision: 2.3 15-Nov-2023 20:54:34

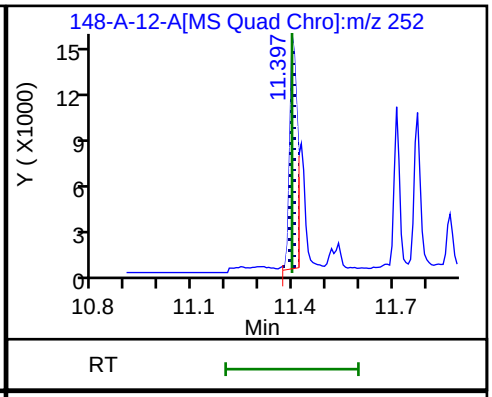
Eurofins Knoxville

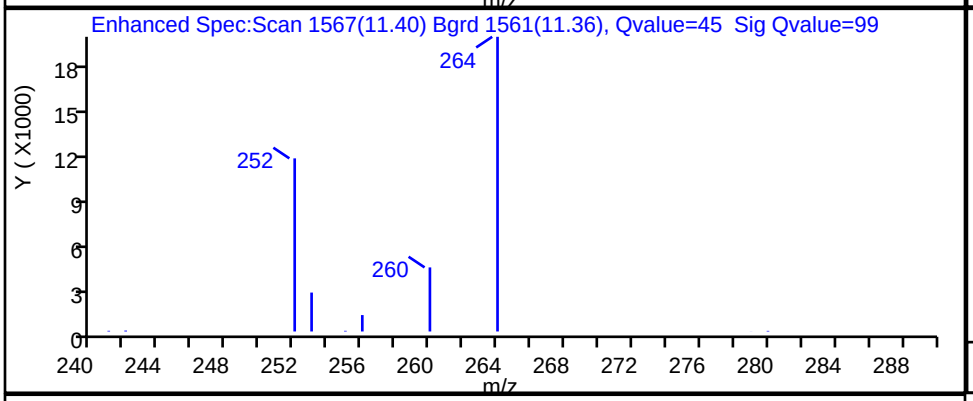
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D

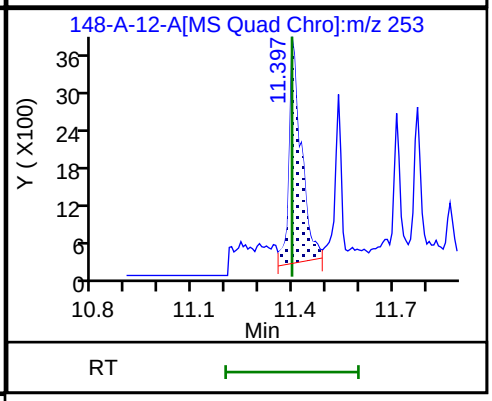
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15
Client ID:	1804576-846-S3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

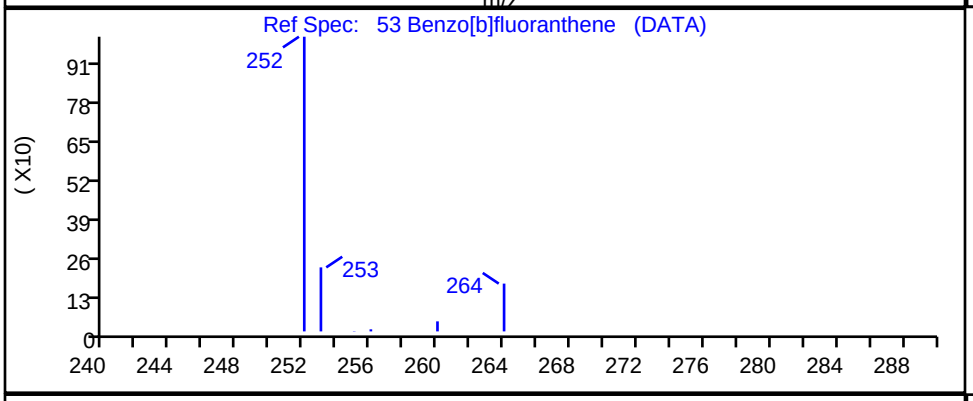
53 Benzo[b]fluoranthene, CAS: 205-99-2

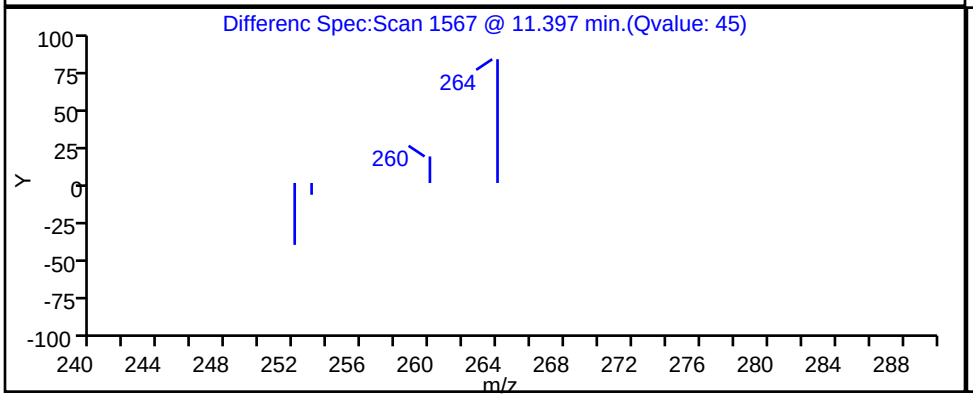


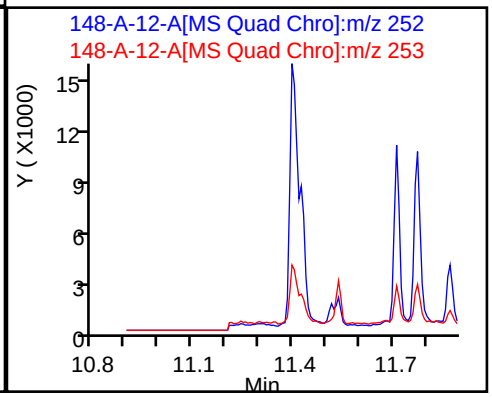












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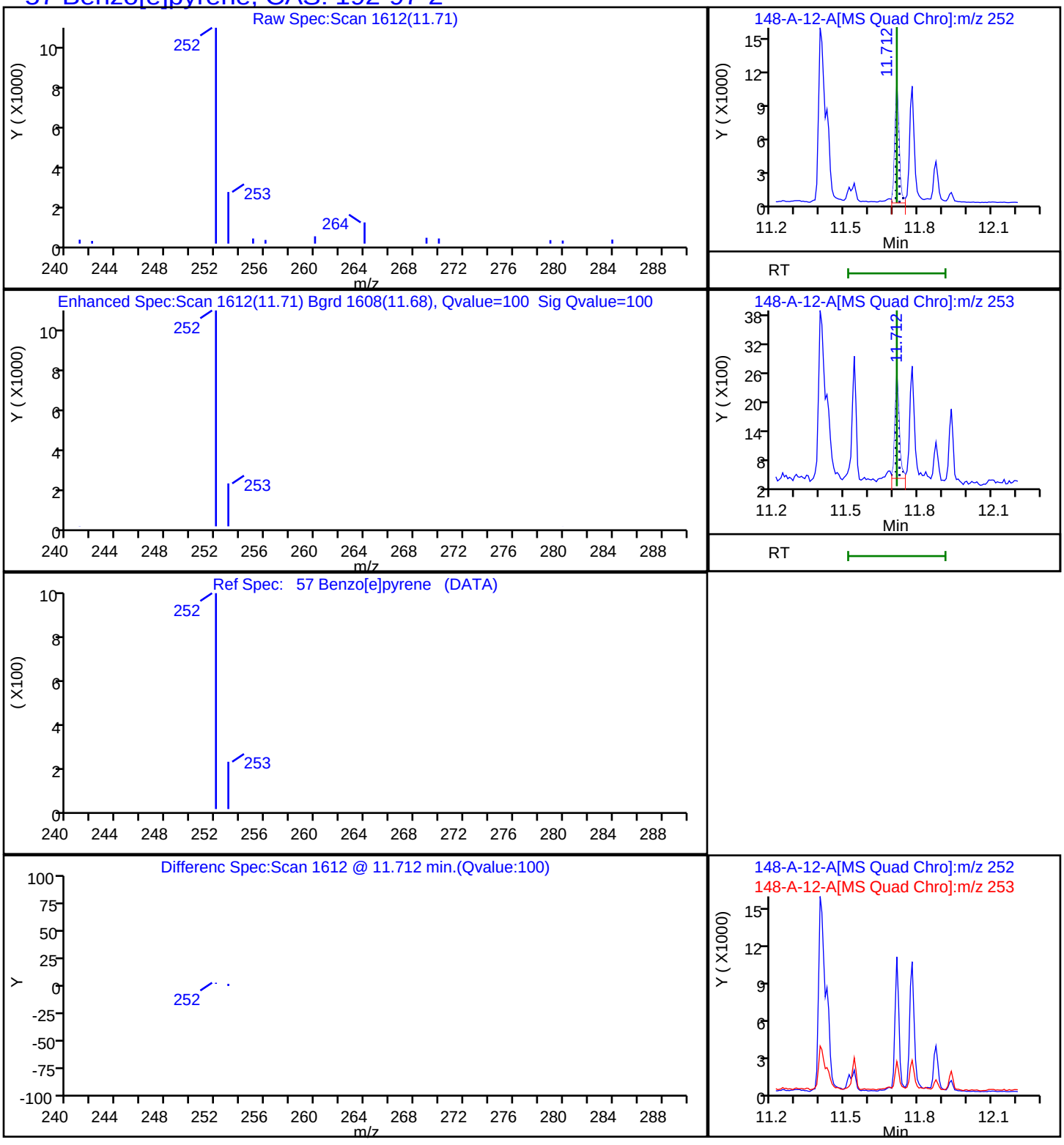
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D

Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15
Client ID:	1804576-846-S3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

57 Benzo[e]pyrene, CAS: 192-97-2



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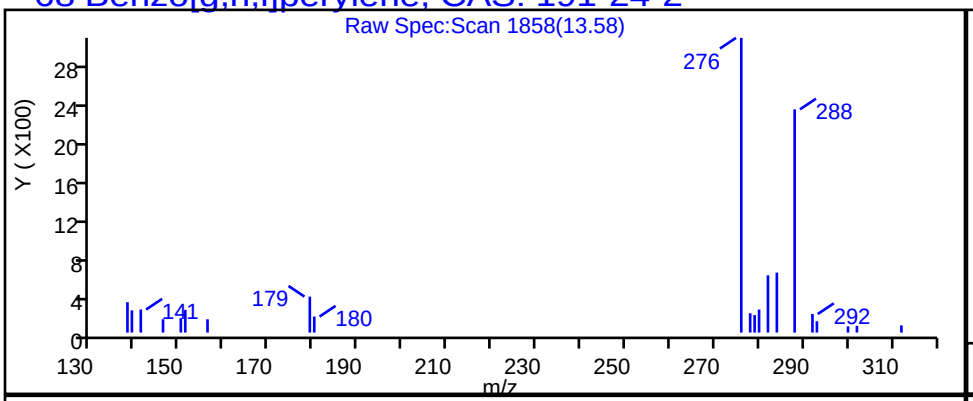
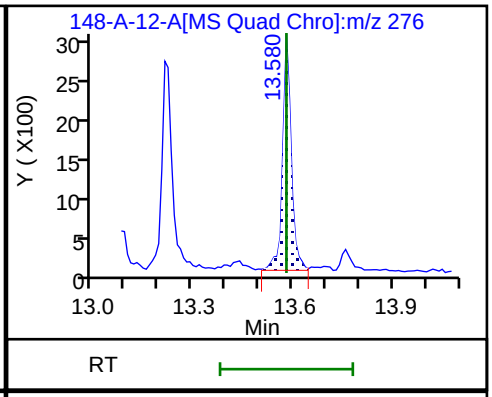
Eurofins Knoxville

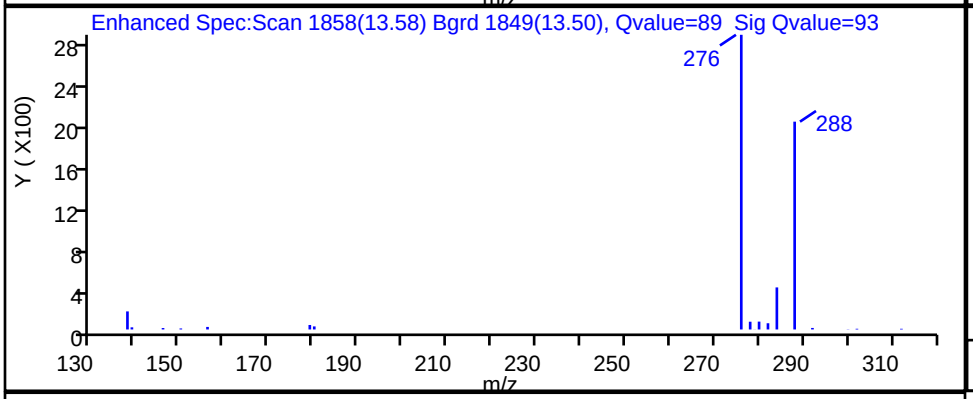
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D

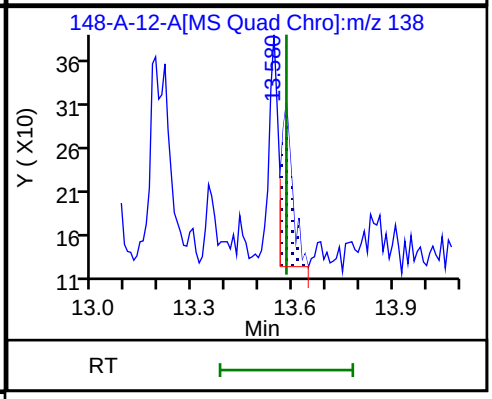
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

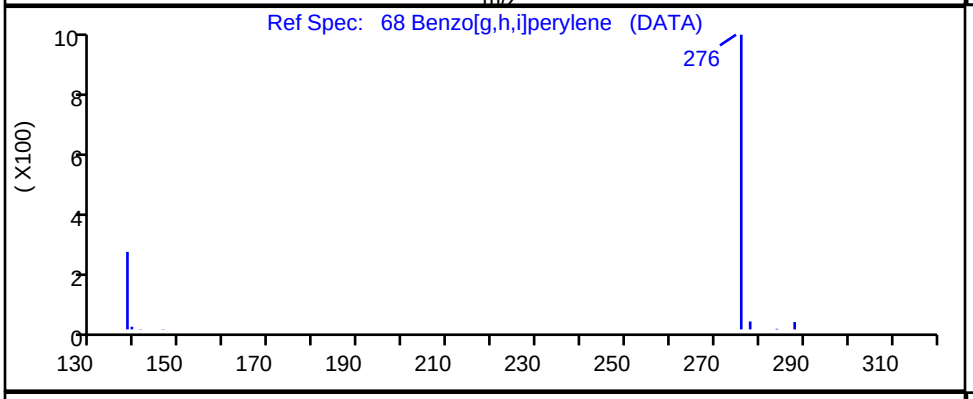
68 Benzo[g,h,i]perylene, CAS: 191-24-2

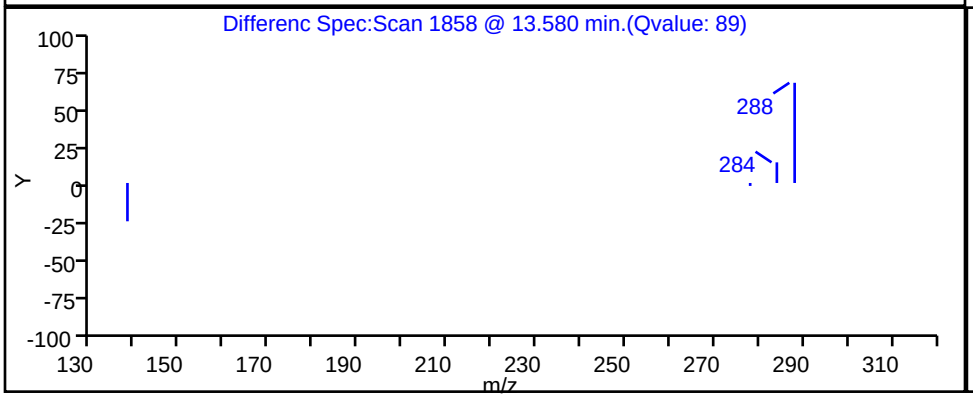


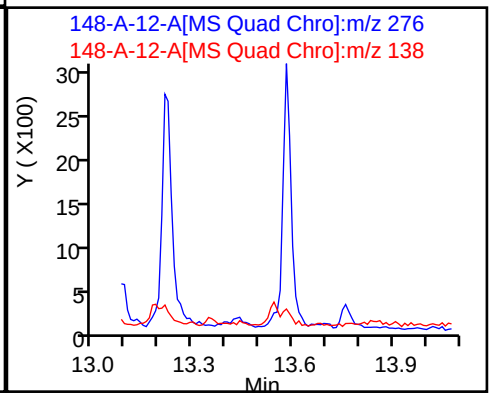










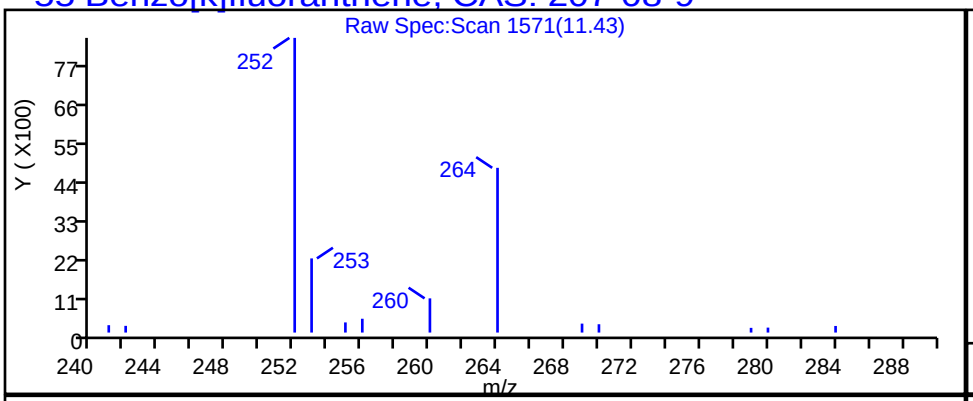


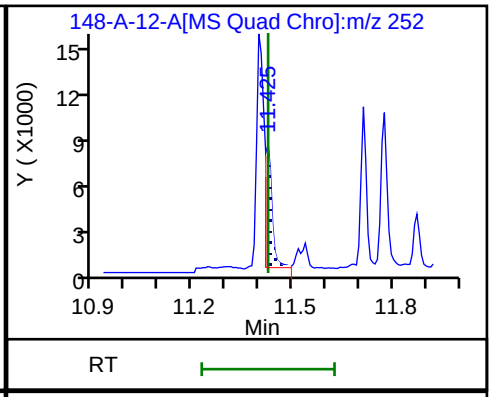
Report Date: 22-Nov-2023 11:26:29 Chrom Revision: 2.3 15-Nov-2023 20:54:34

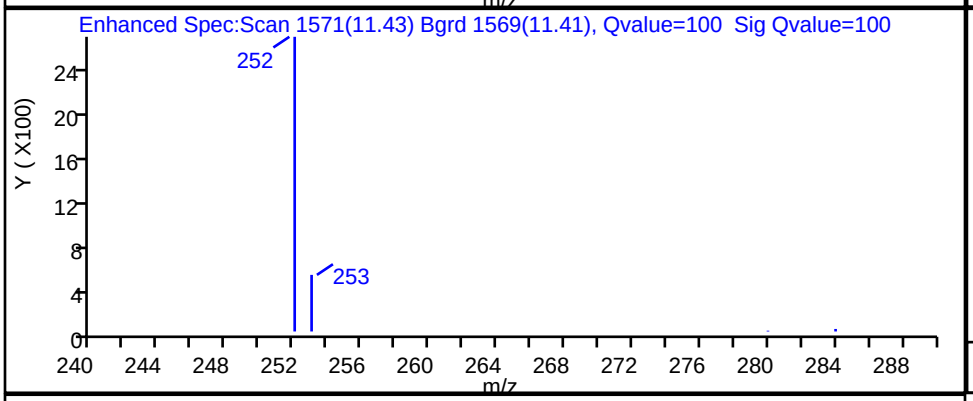
Eurofins Knoxville

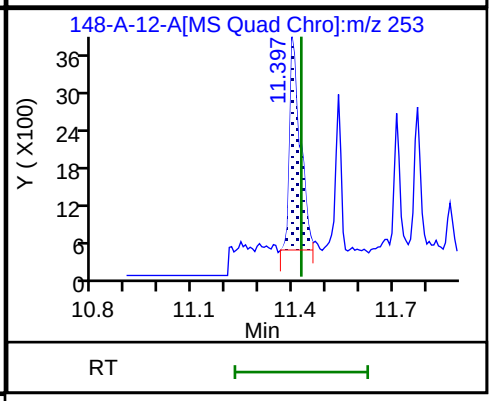
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D		
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15
Client ID:	1804576-846-S3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

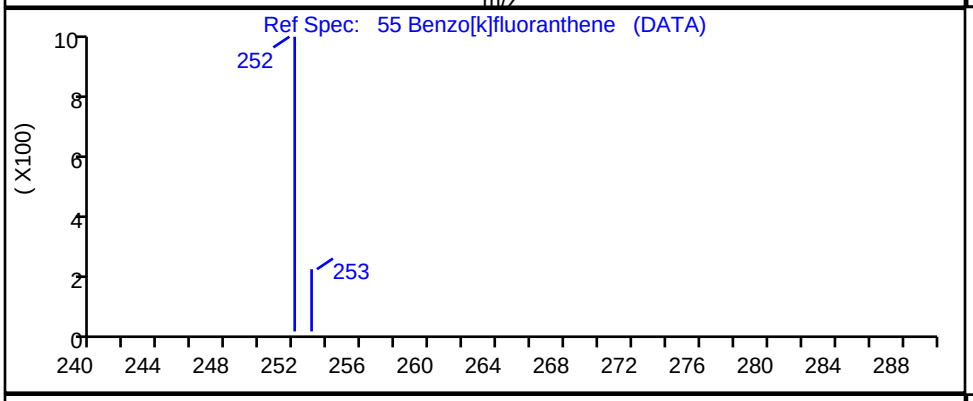
55 Benzo[k]fluoranthene, CAS: 207-08-9

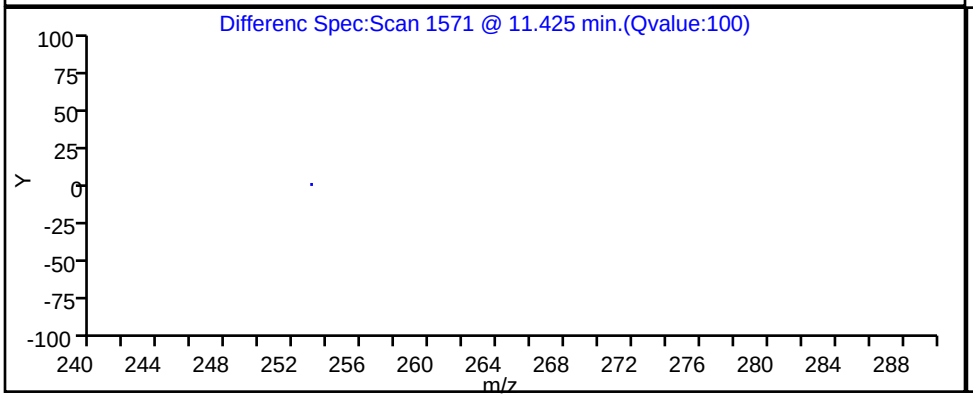


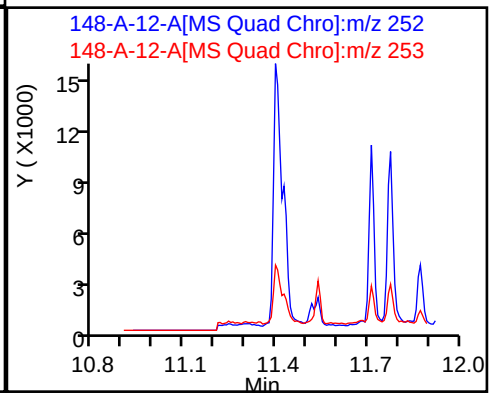












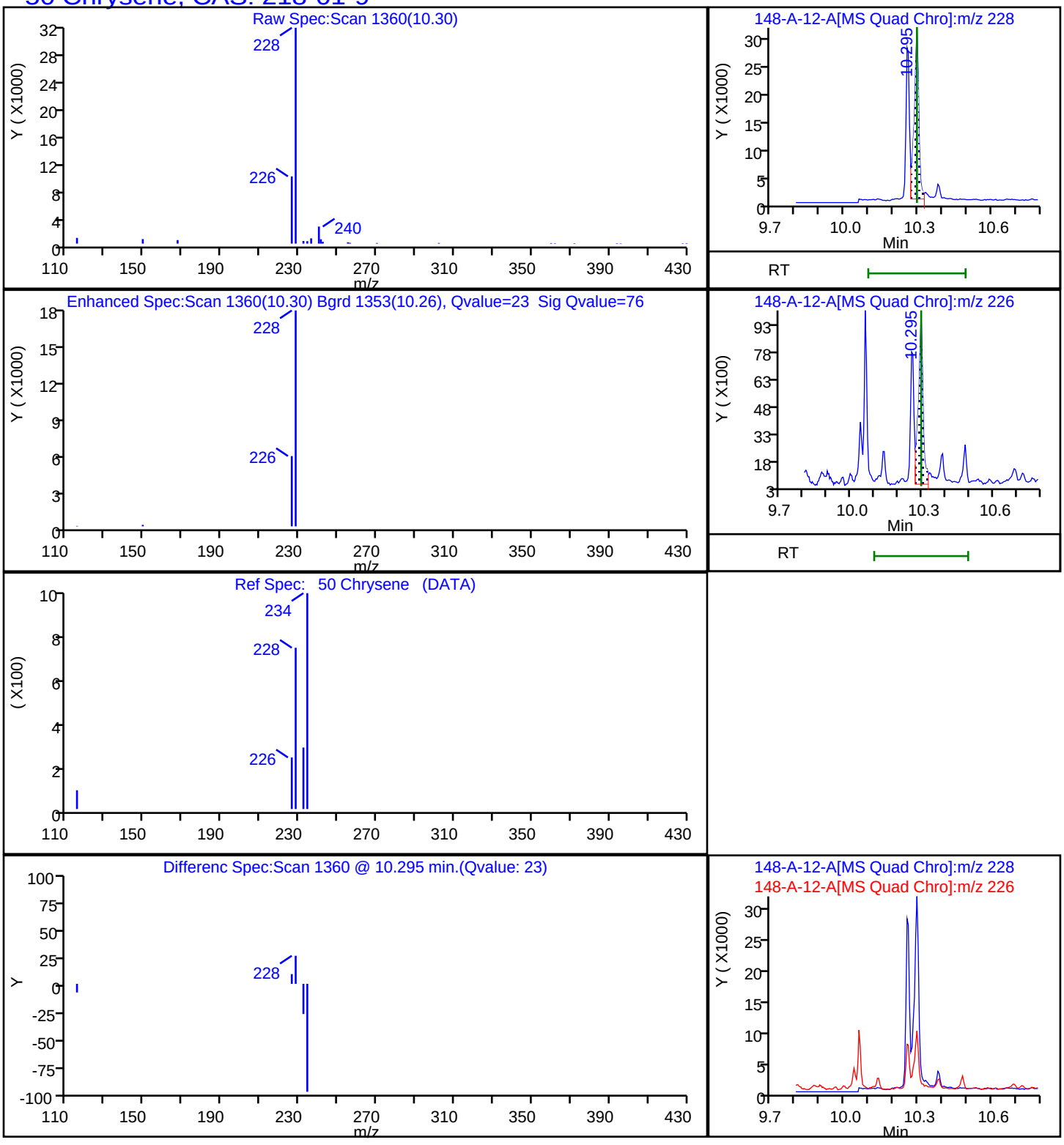
Report Date: 22-Nov-2023 11:26:28 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D

Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

50 Chrysene, CAS: 218-01-9



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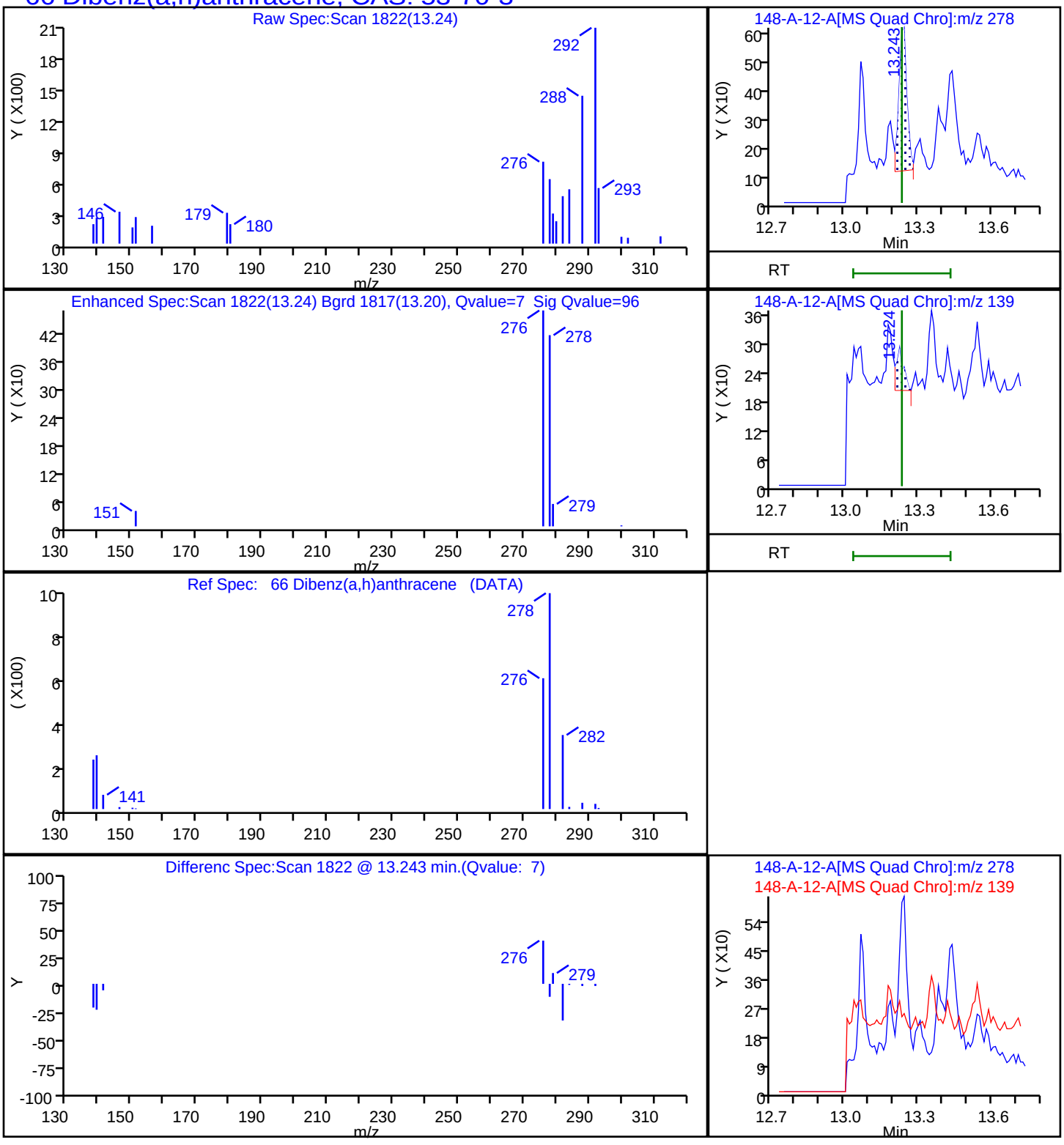
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D

Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

66 Dibenz(a,h)anthracene, CAS: 53-70-3



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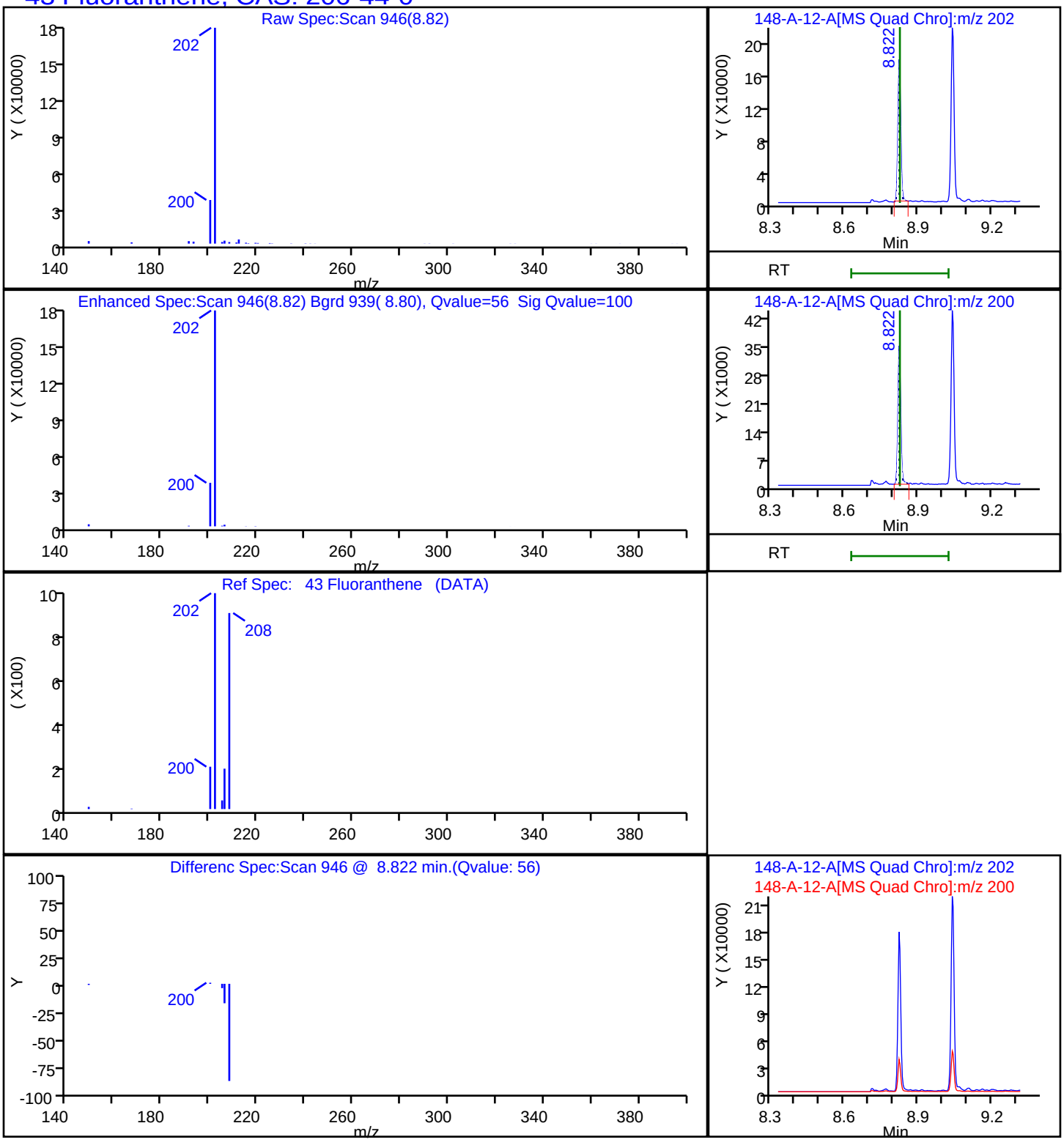
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D

Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15
Client ID:	1804576-846-S3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

43 Fluoranthene, CAS: 206-44-0



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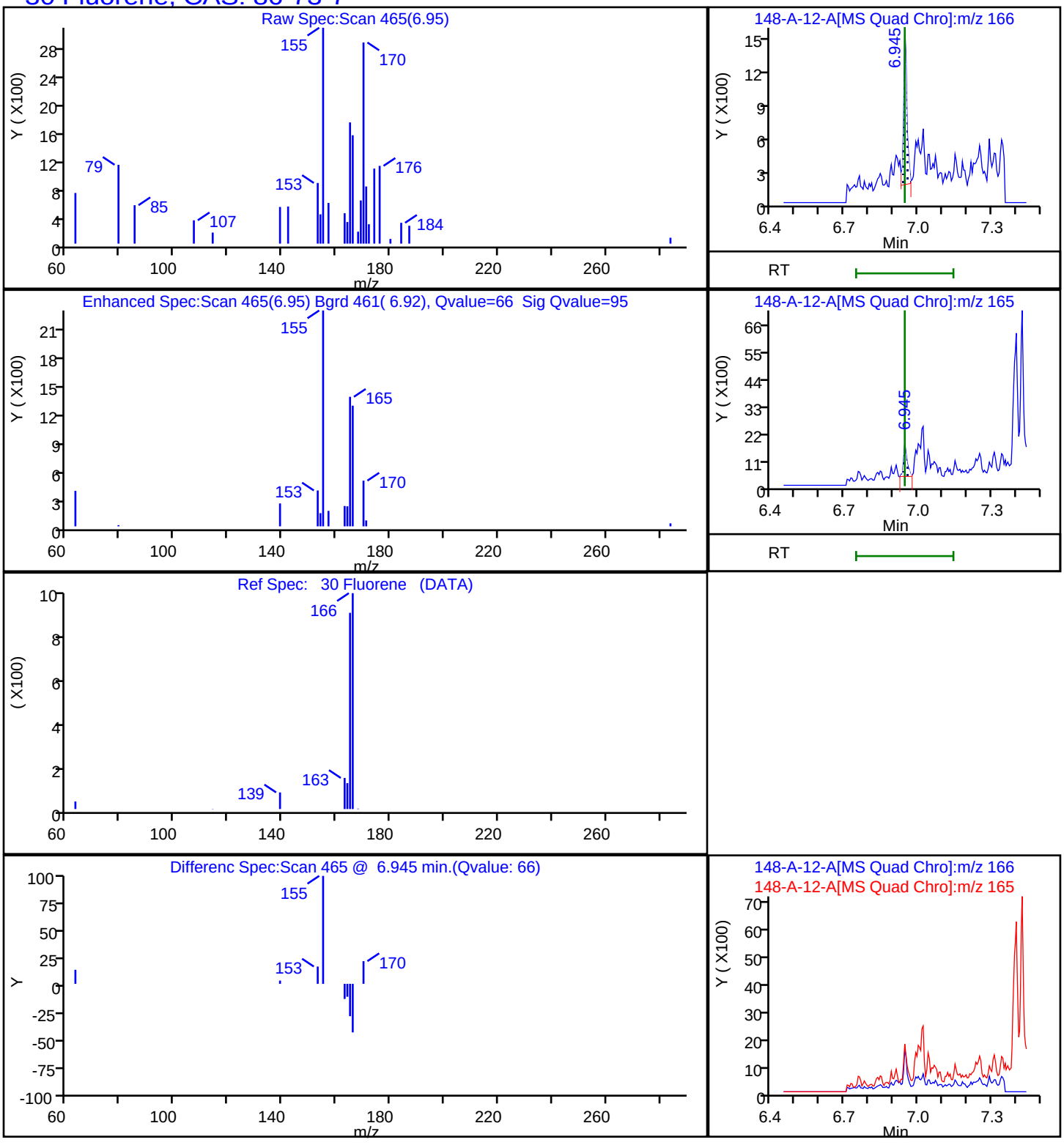
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D

Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15
Client ID:	1804576-846-S3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

30 Fluorene, CAS: 86-73-7



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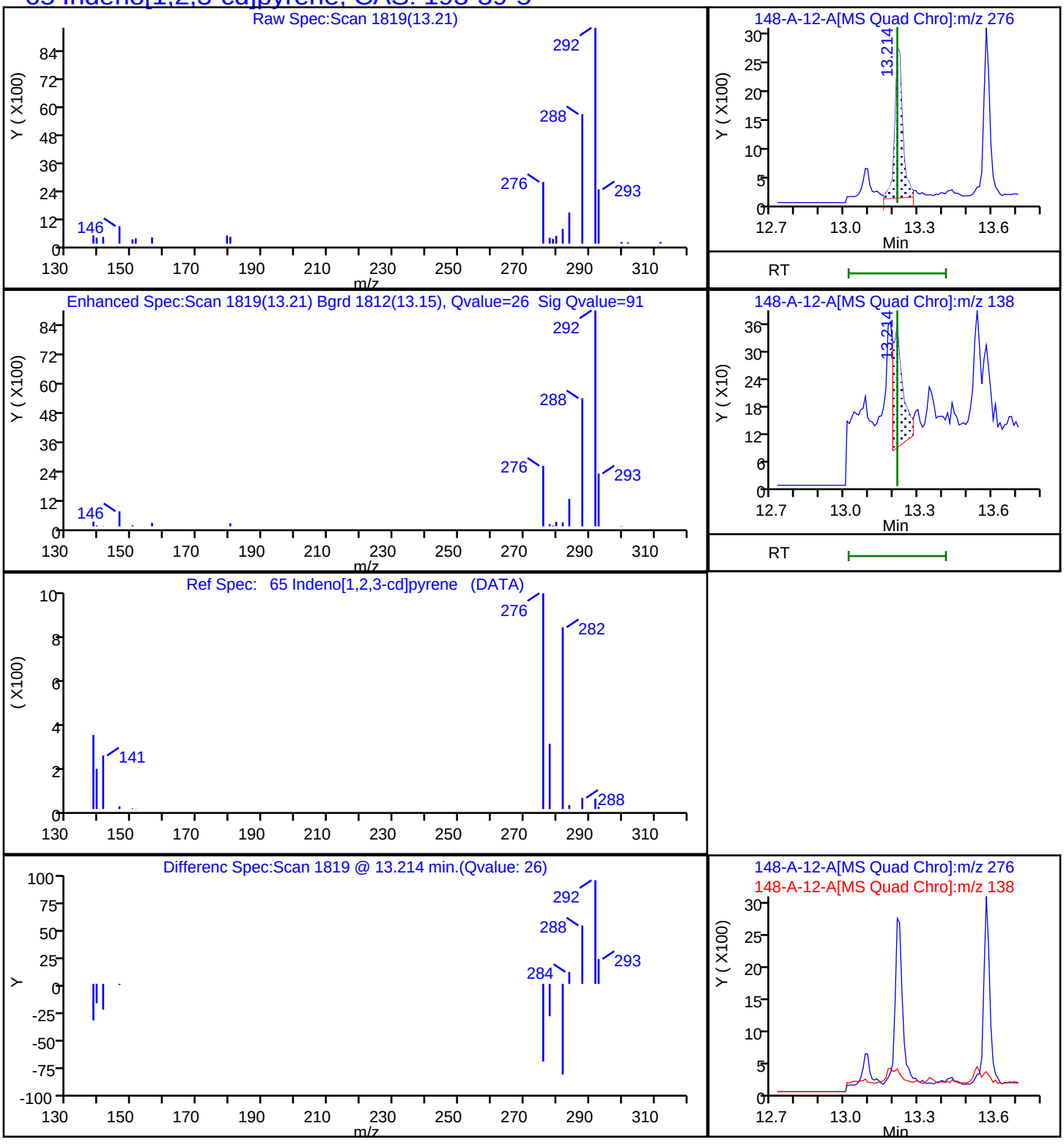
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D

Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

65 Indeno[1,2,3-cd]pyrene, CAS: 193-39-5



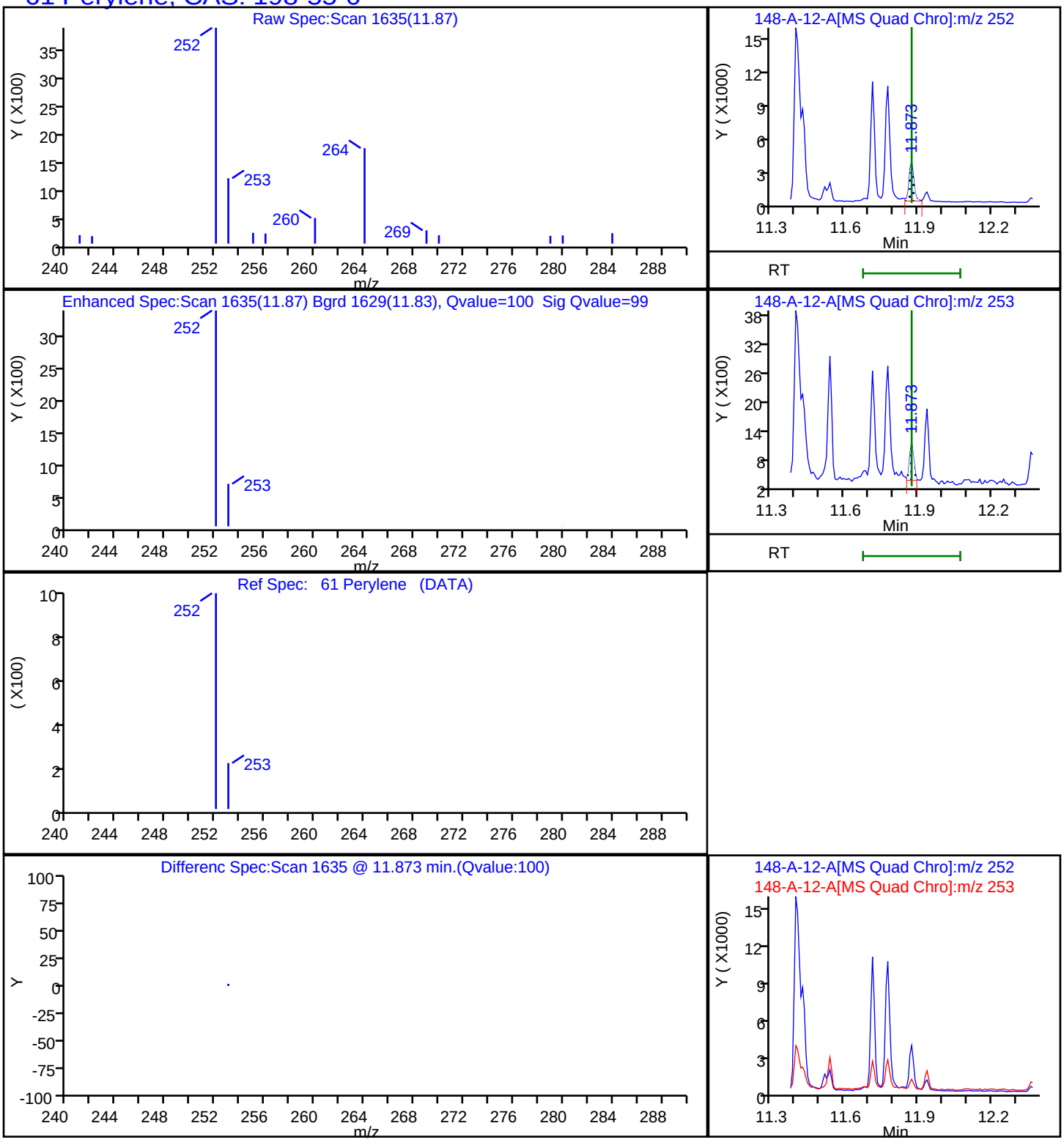
Report Date: 22-Nov-2023 11:26:29 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D

Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15
Client ID:	1804576-846-S3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

61 Perylene, CAS: 198-55-0



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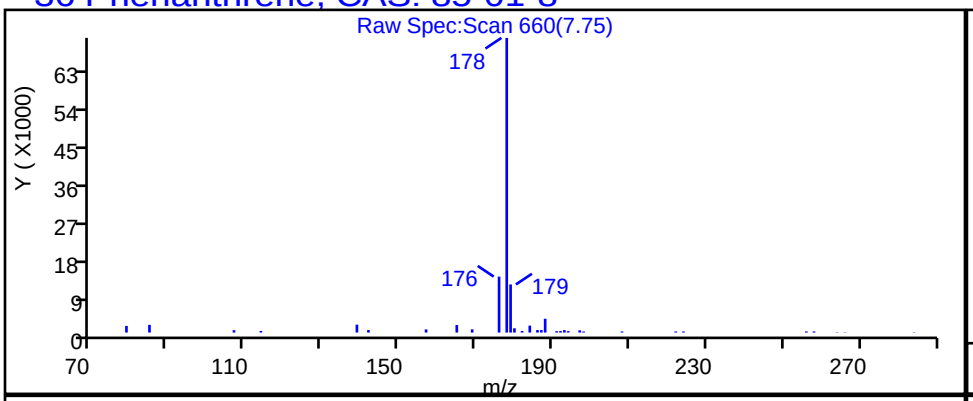
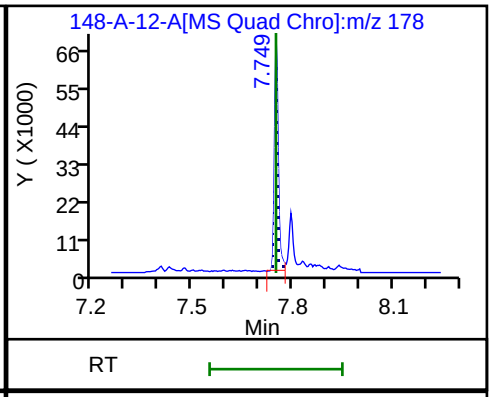
Eurofins Knoxville

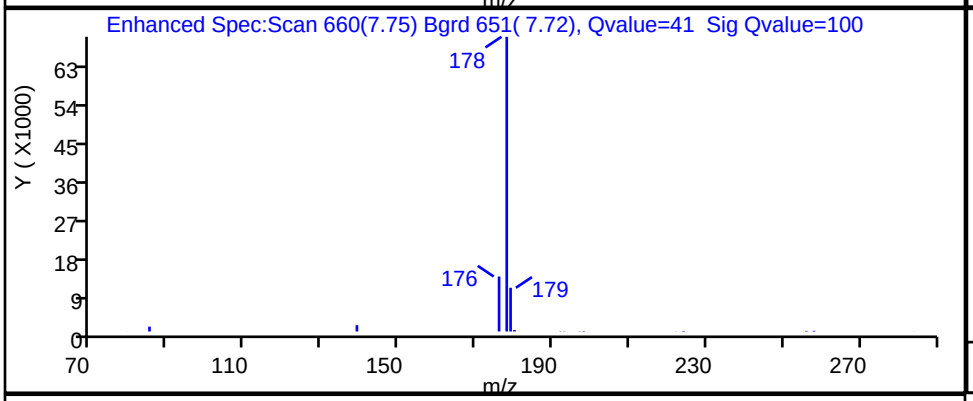
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D

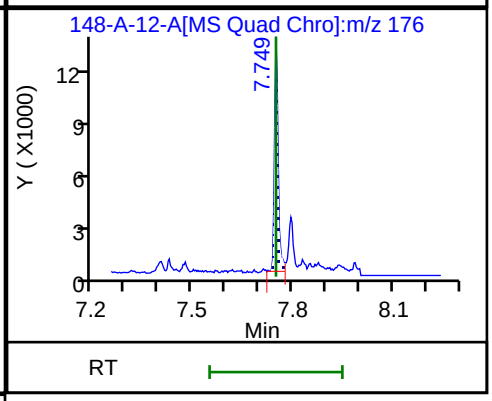
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

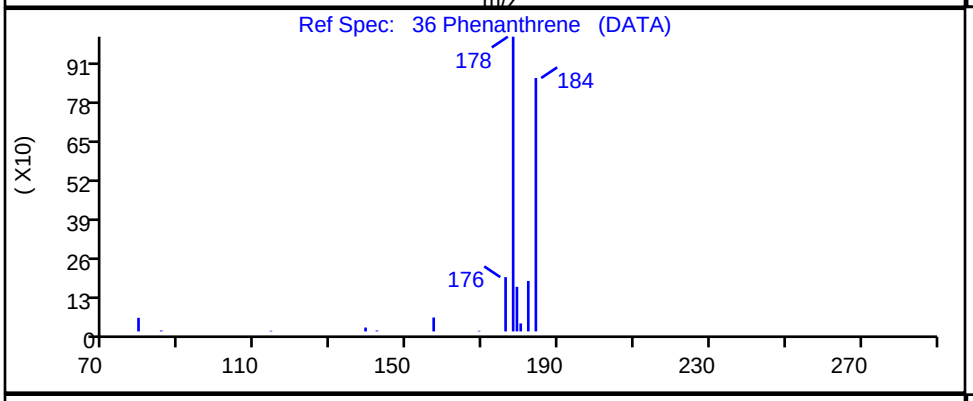
36 Phenanthrene, CAS: 85-01-8

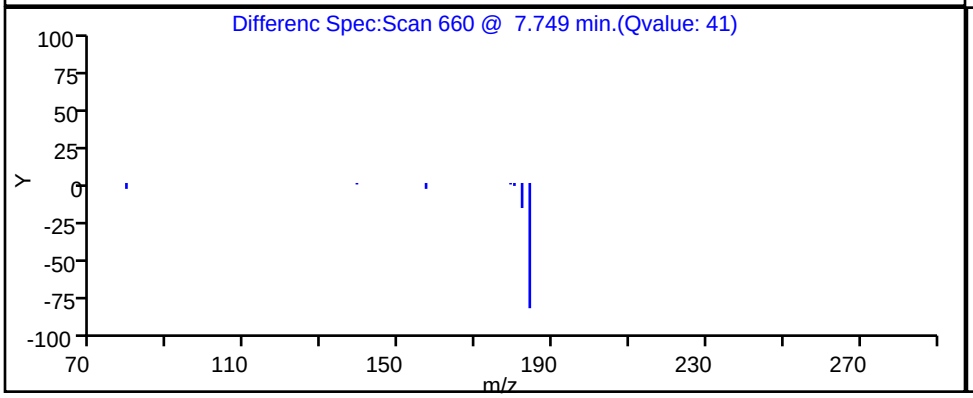


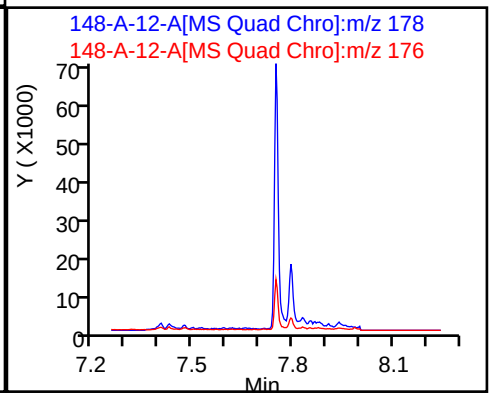












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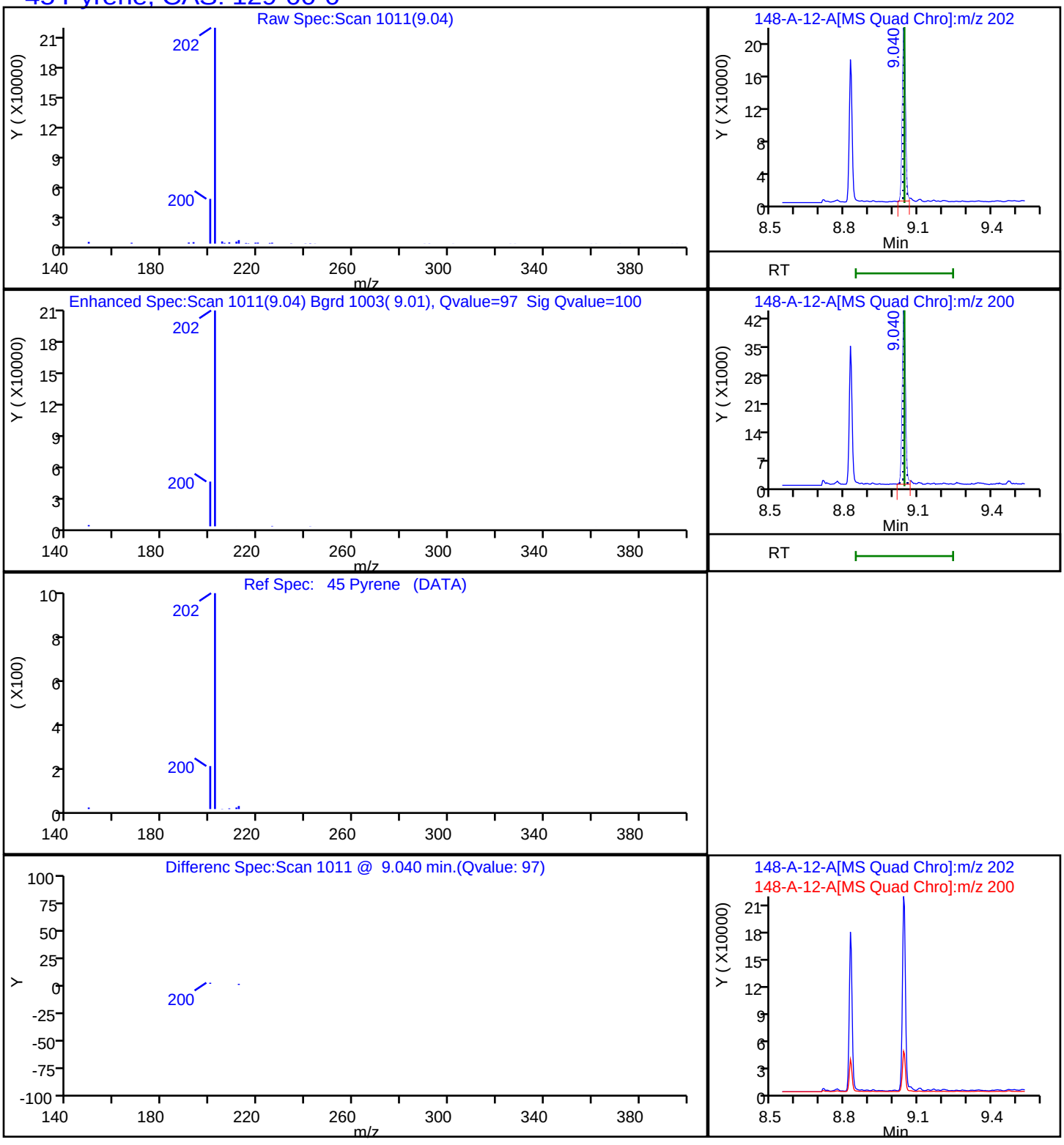
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D

Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15
Client ID:	1804576-846-S3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

45 Pyrene, CAS: 129-00-0



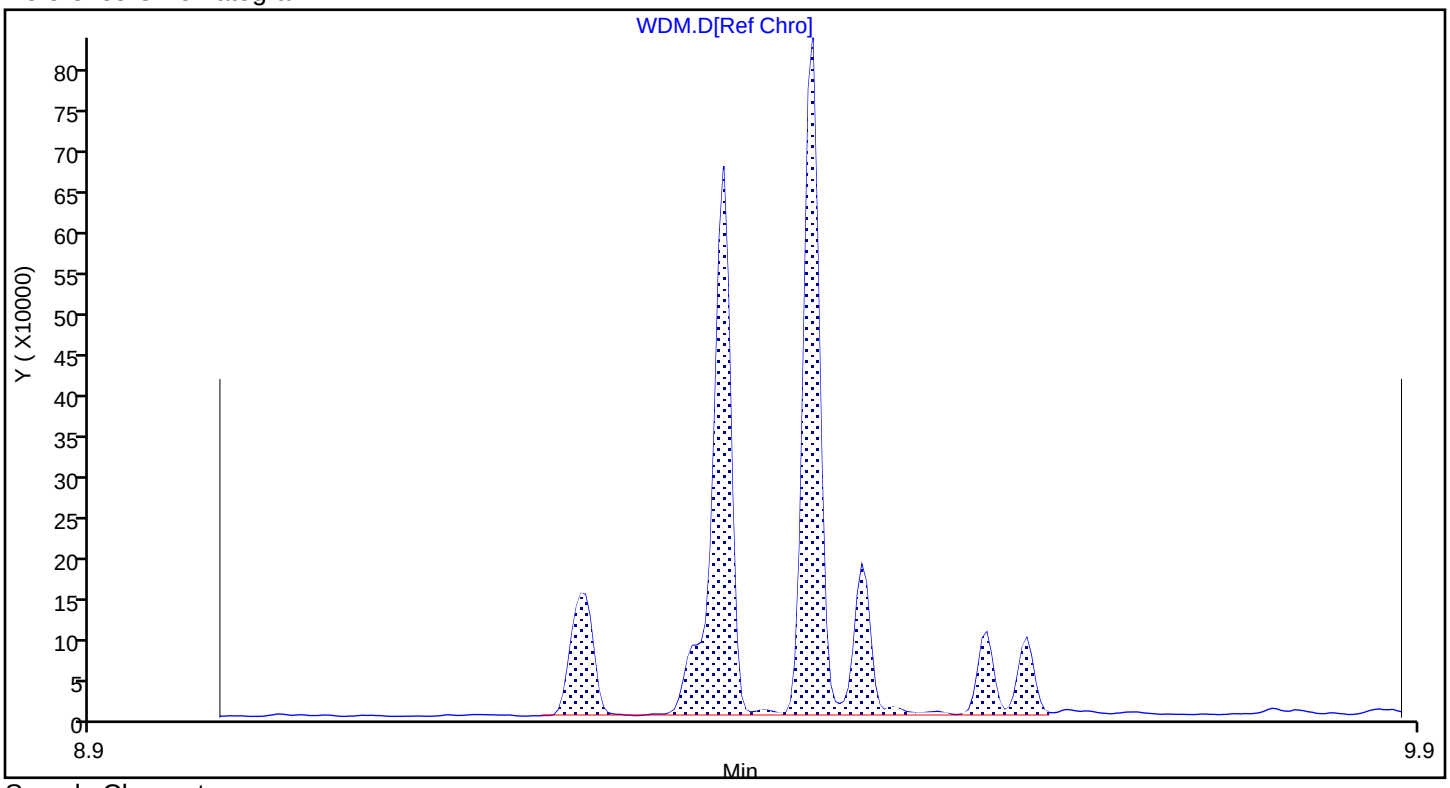
Report Date: 22-Nov-2023 11:26:29 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

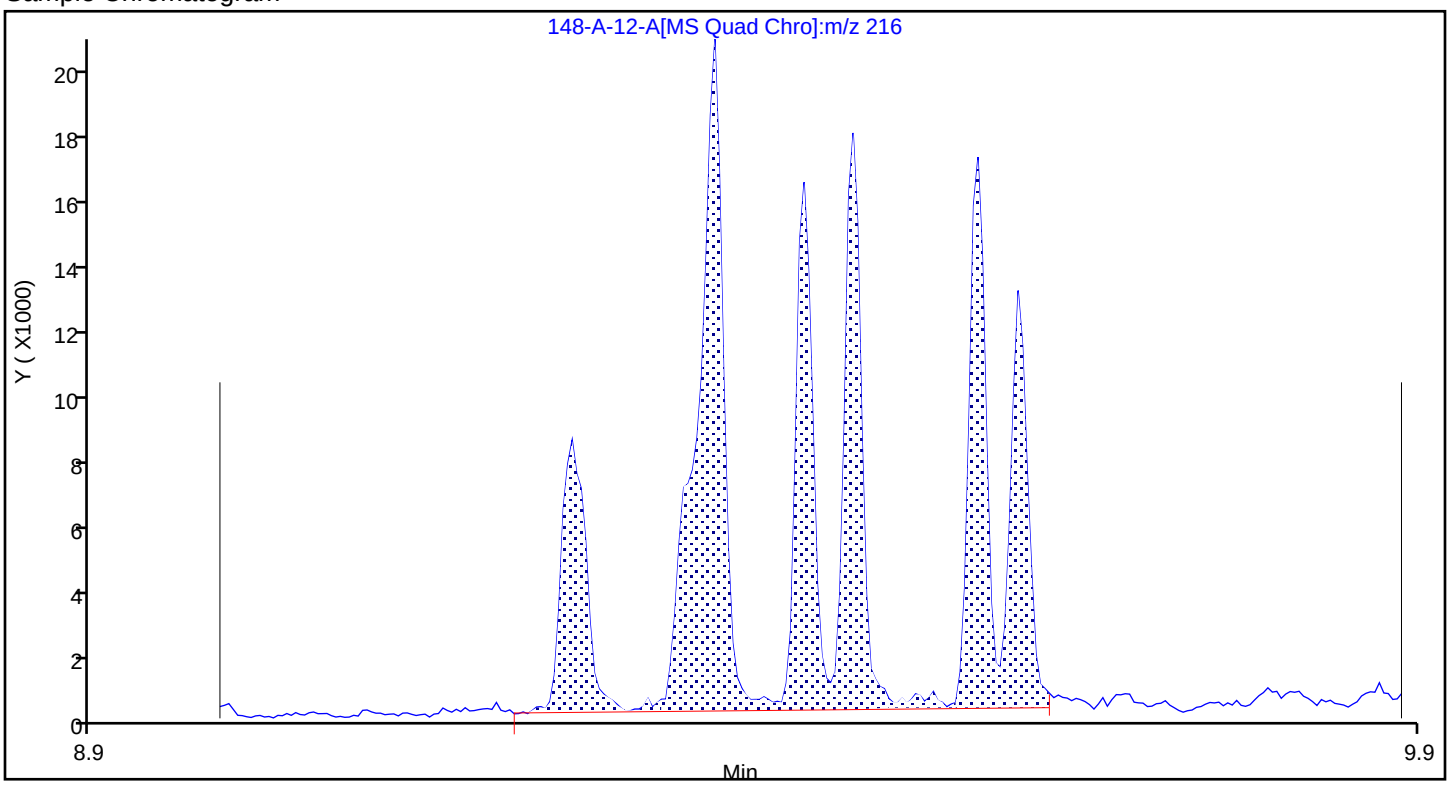
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D				
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 100 C1-Fluoranthenes/pyrene, CAS: STL00912

Reference Chromatogram



Sample Chromatogram



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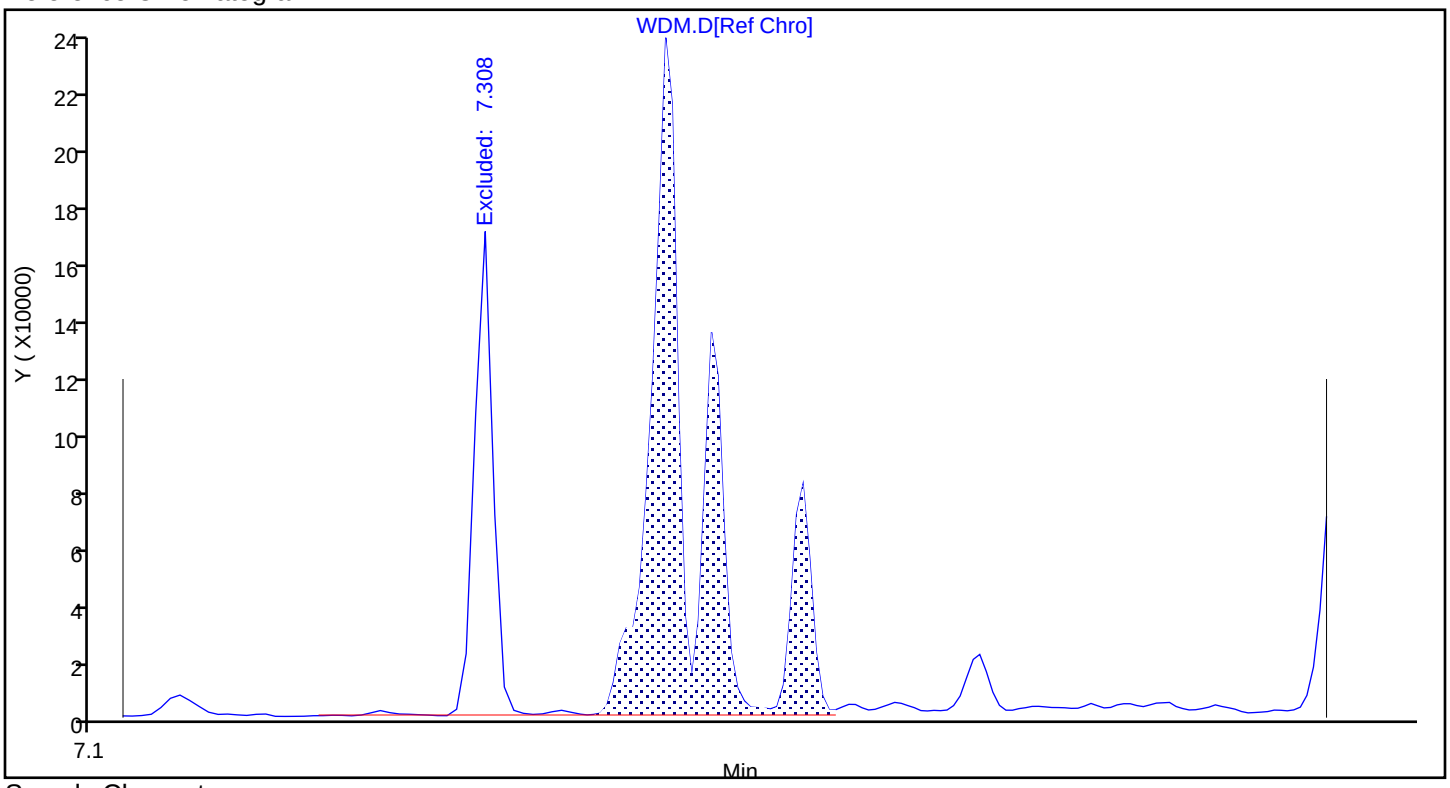
Eurofins Knoxville

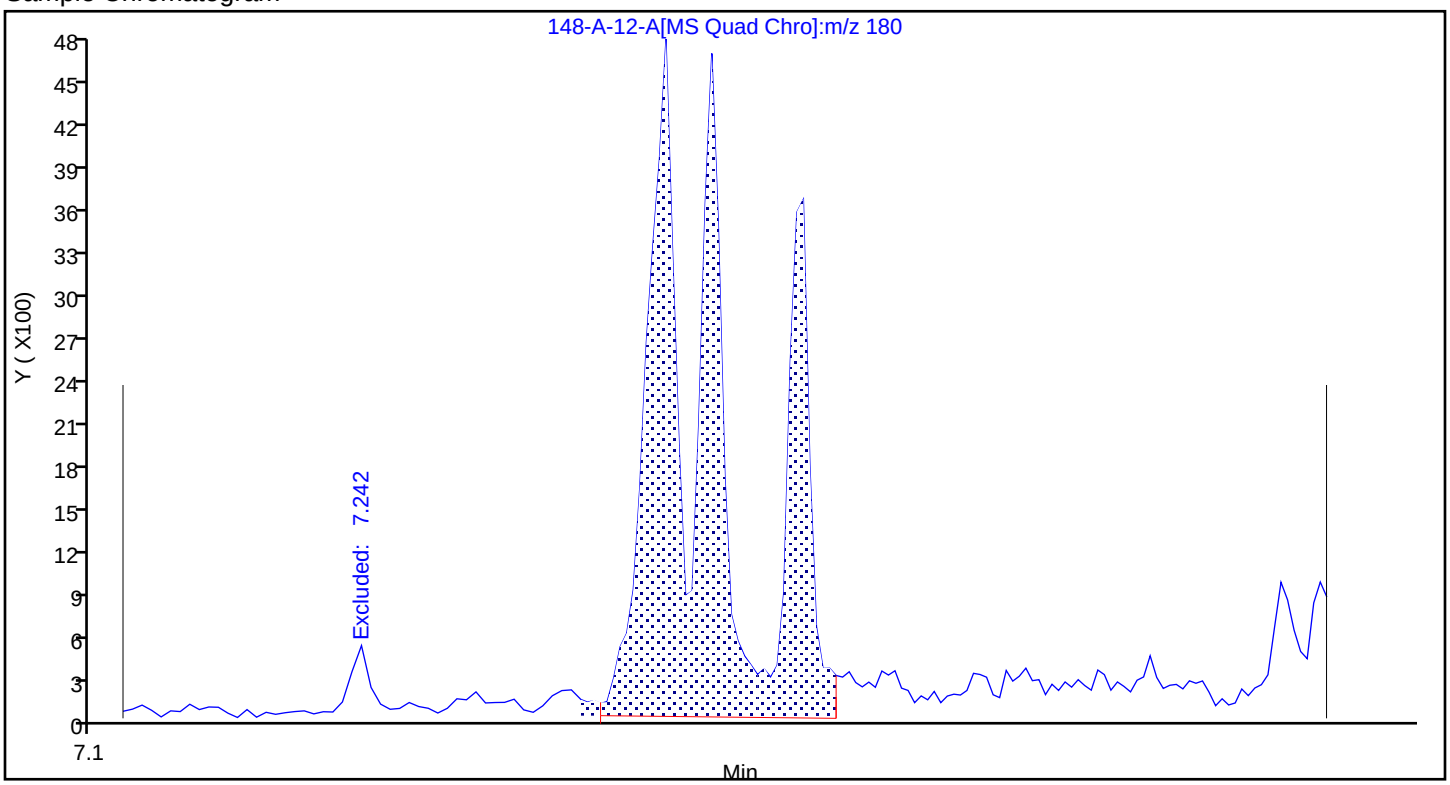
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D				
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 89 C1-Fluorenes, CAS: STL00913

Reference Chromatogram



Sample Chromatogram



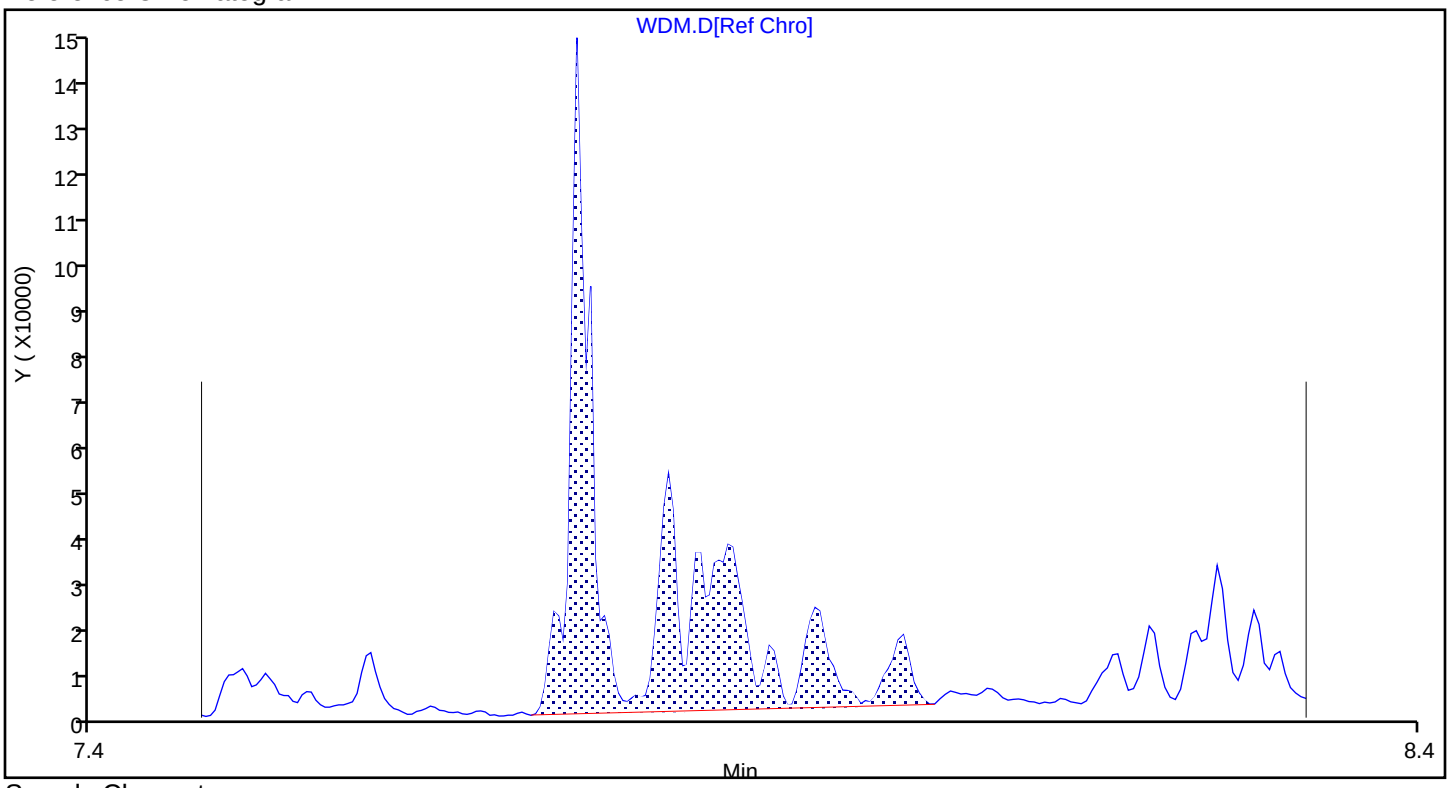
Report Date: 22-Nov-2023 11:26:29 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

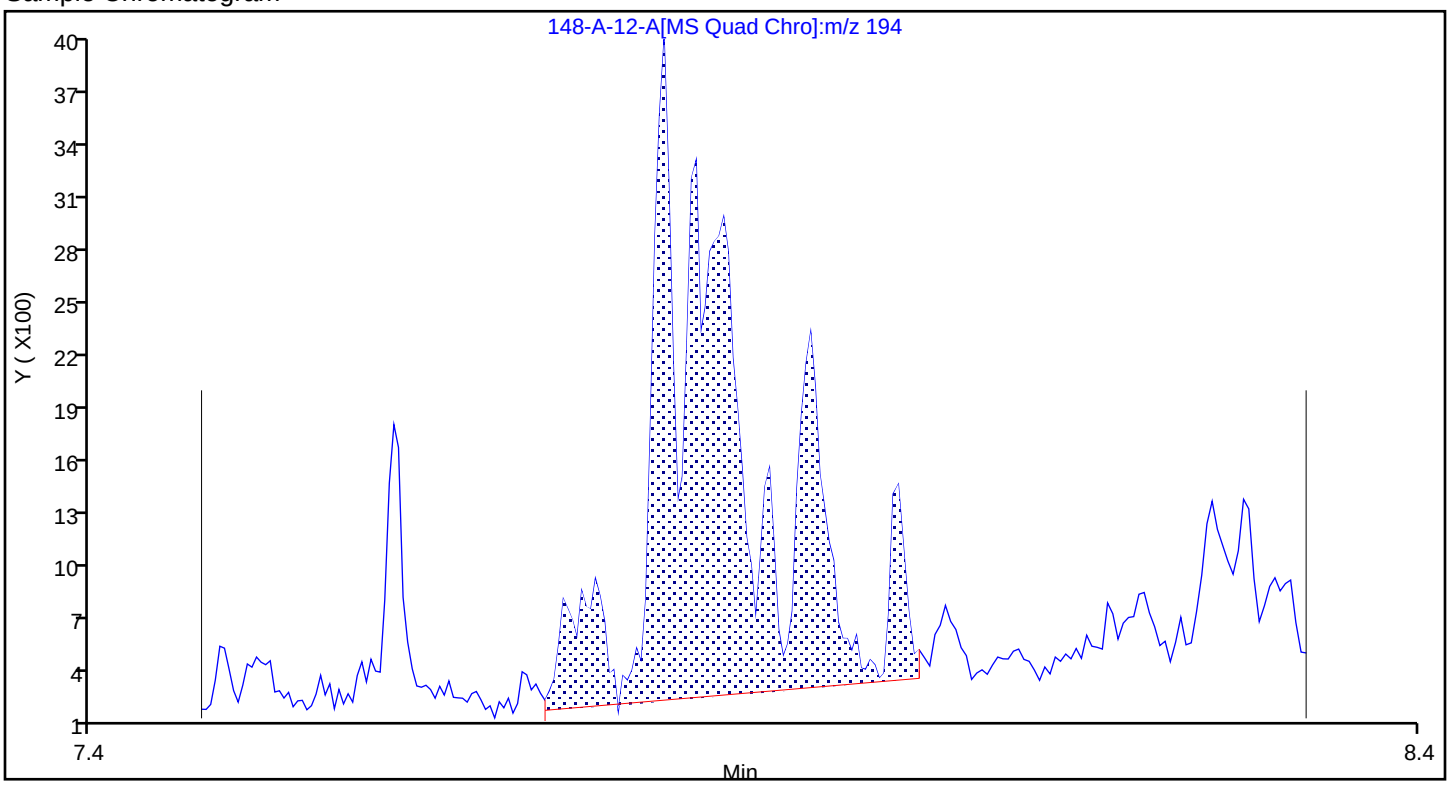
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D				
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 90 C2-Fluorenes, CAS: STL00914

Reference Chromatogram



Sample Chromatogram



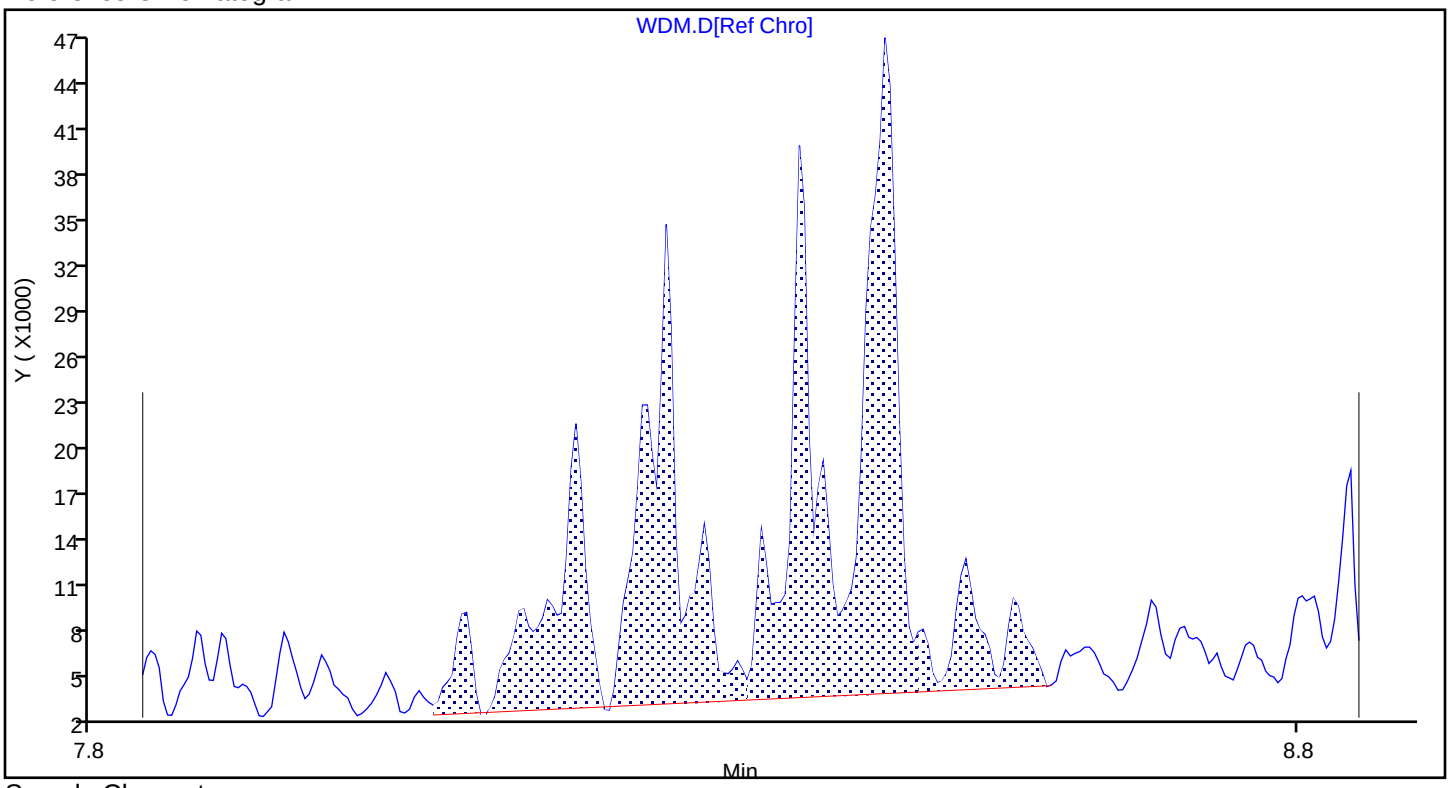
Report Date: 22-Nov-2023 11:26:29 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

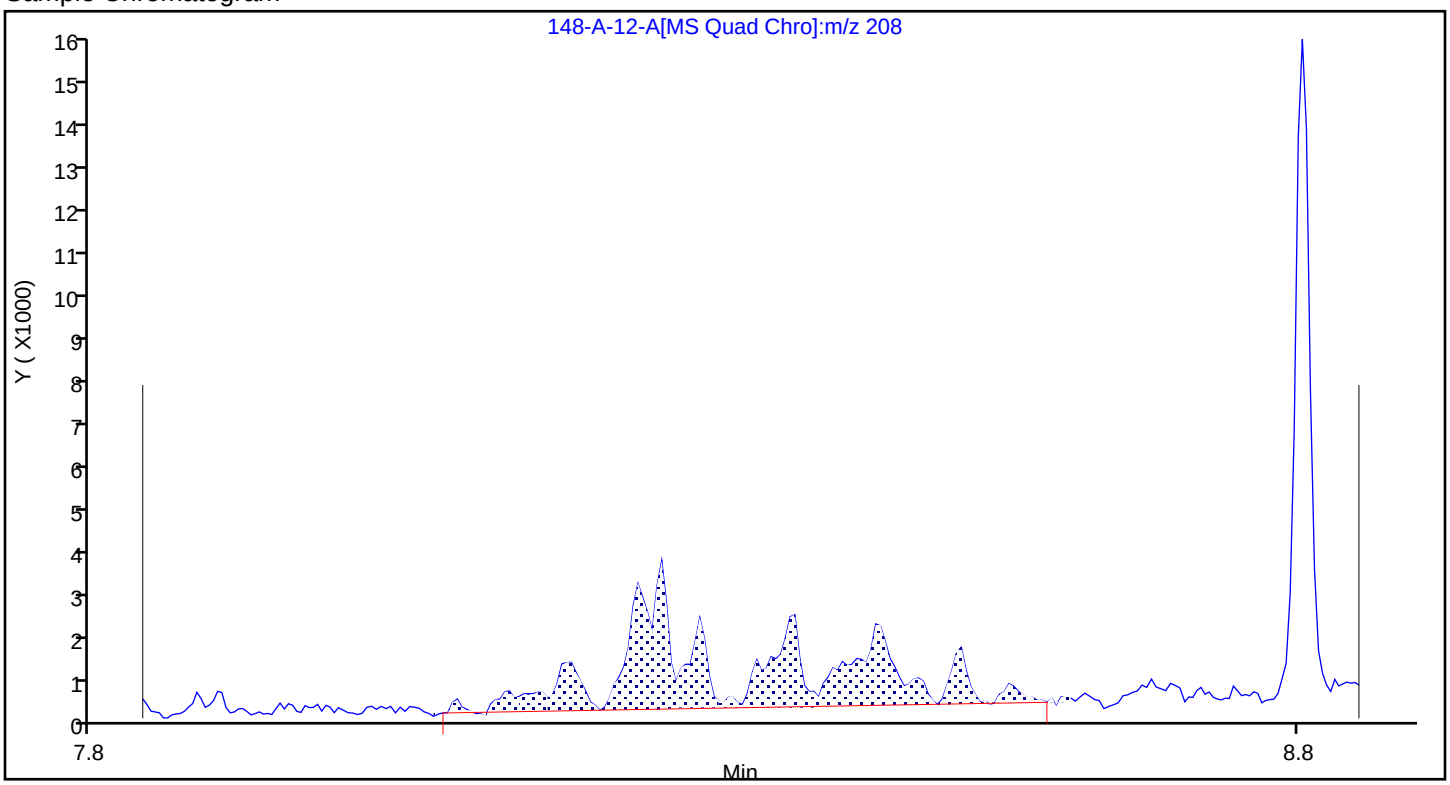
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D				
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 91 C3-Fluorenes, CAS: STL00915

Reference Chromatogram



Sample Chromatogram



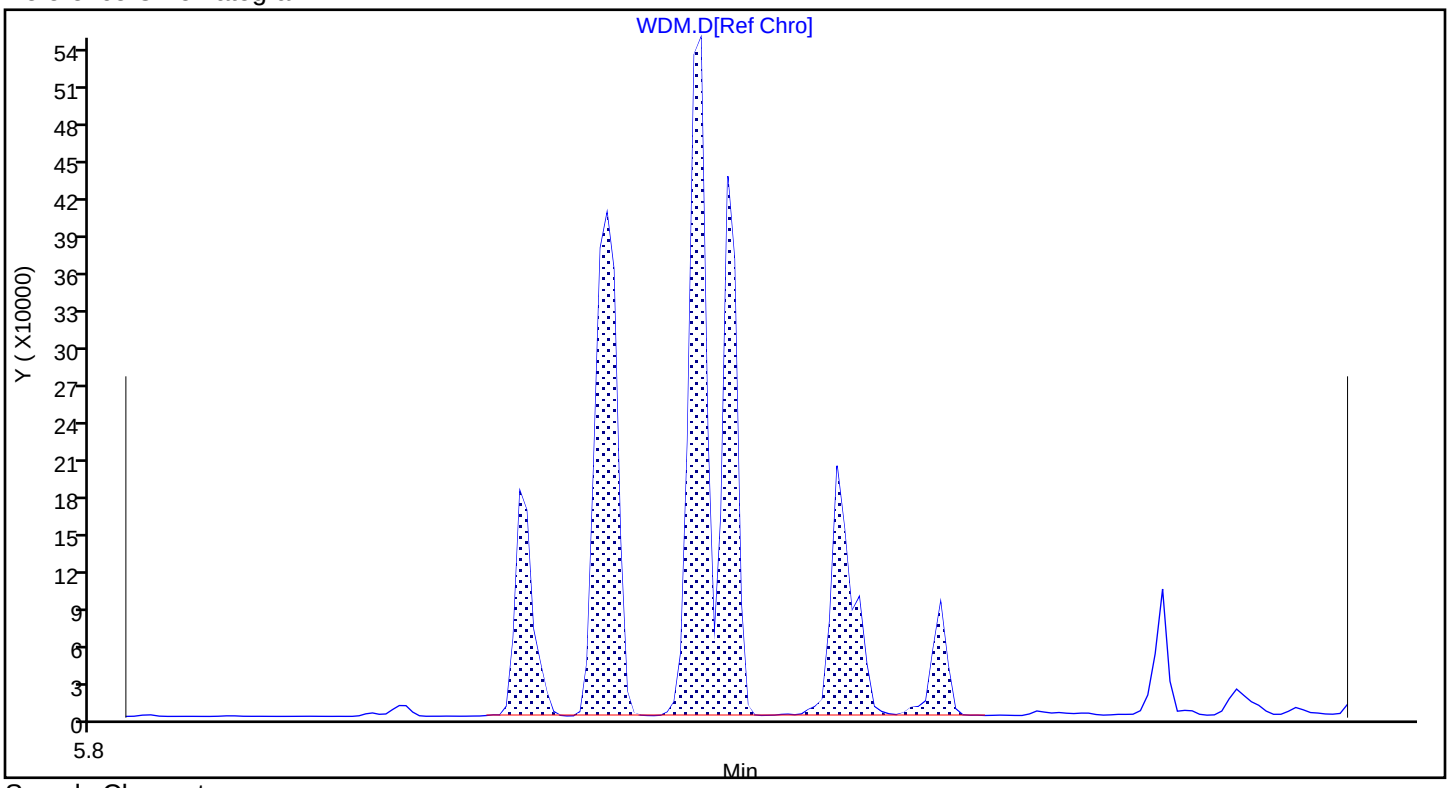
Report Date: 22-Nov-2023 11:26:29 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

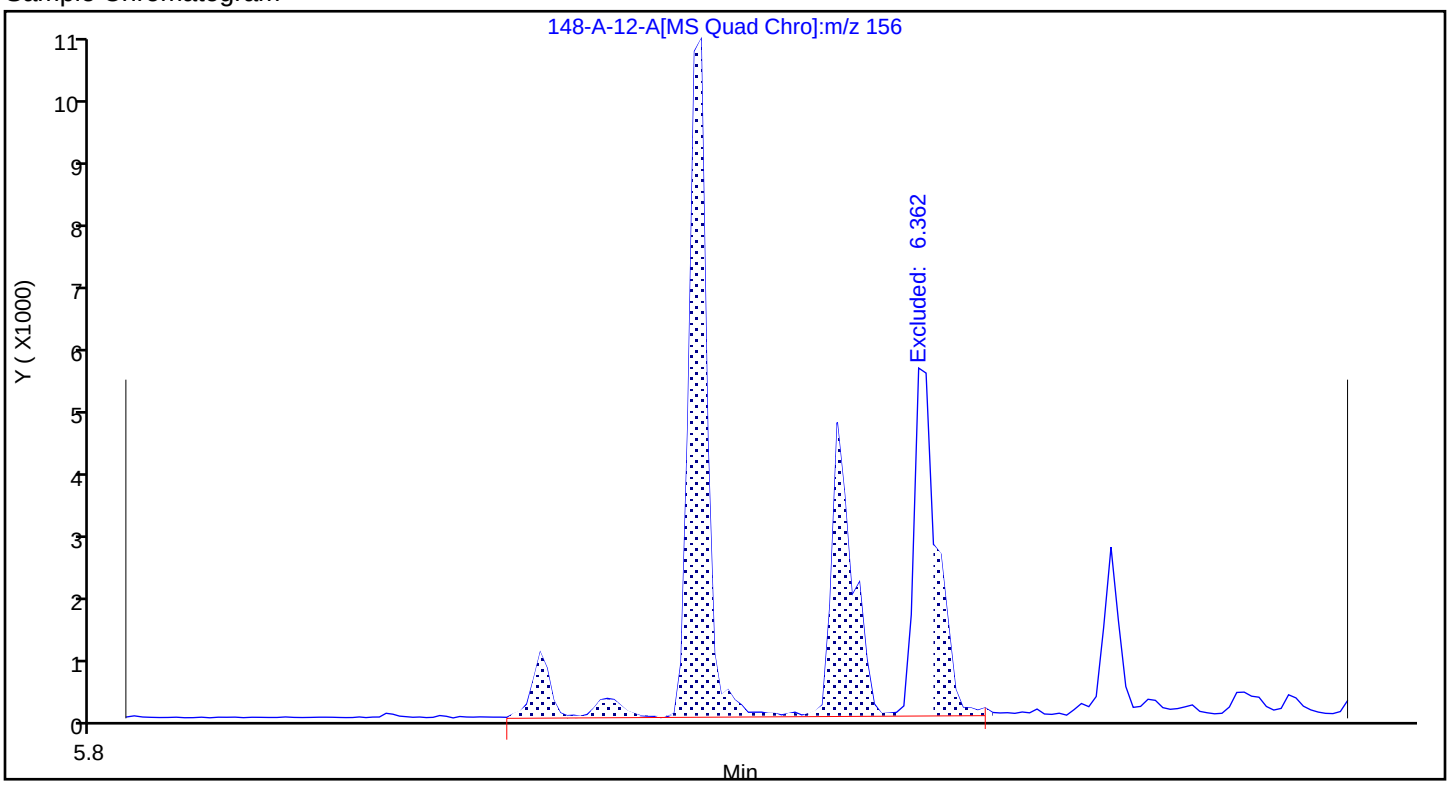
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D				
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 85 C2-Naphthalenes, CAS: STL00917

Reference Chromatogram



Sample Chromatogram



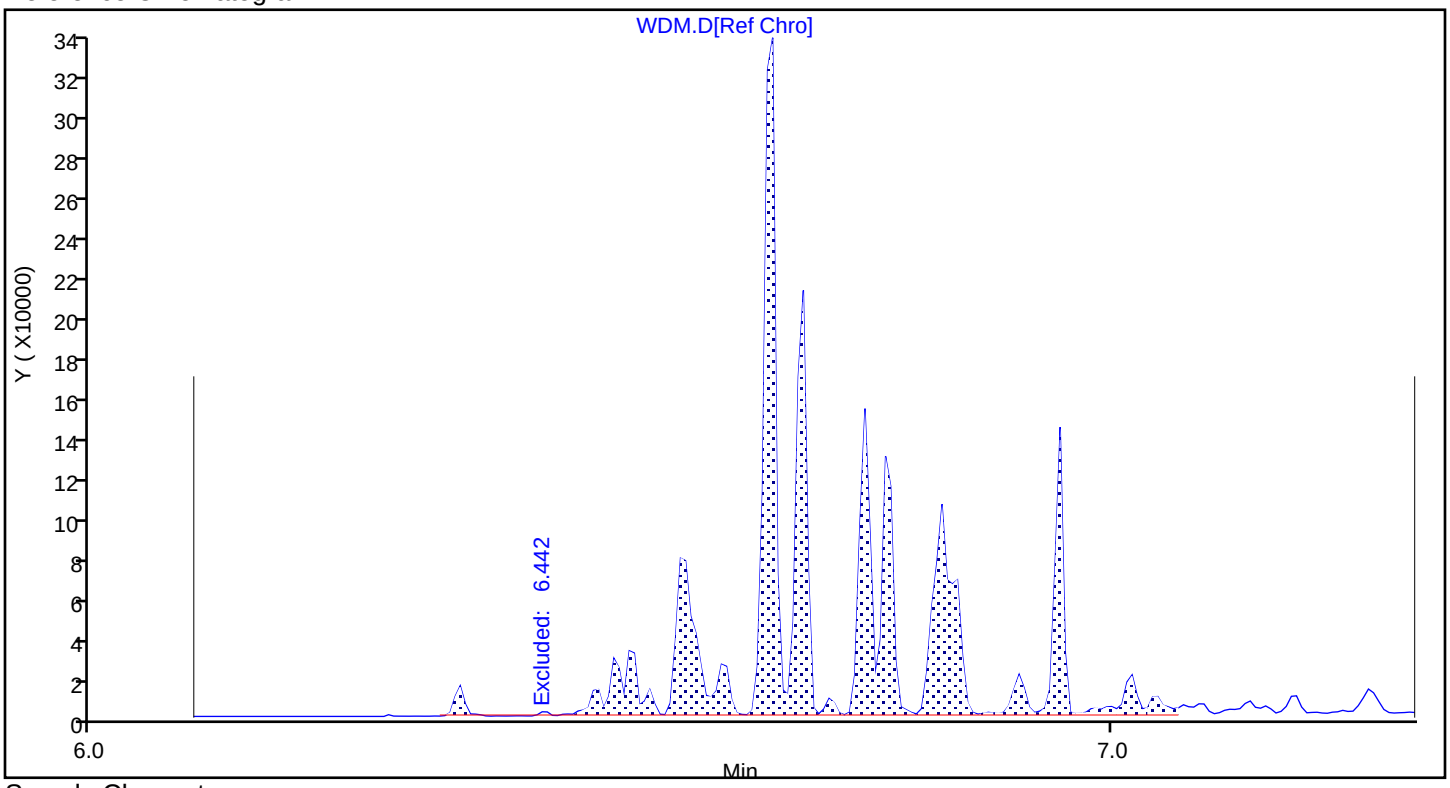
Report Date: 22-Nov-2023 11:26:29 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

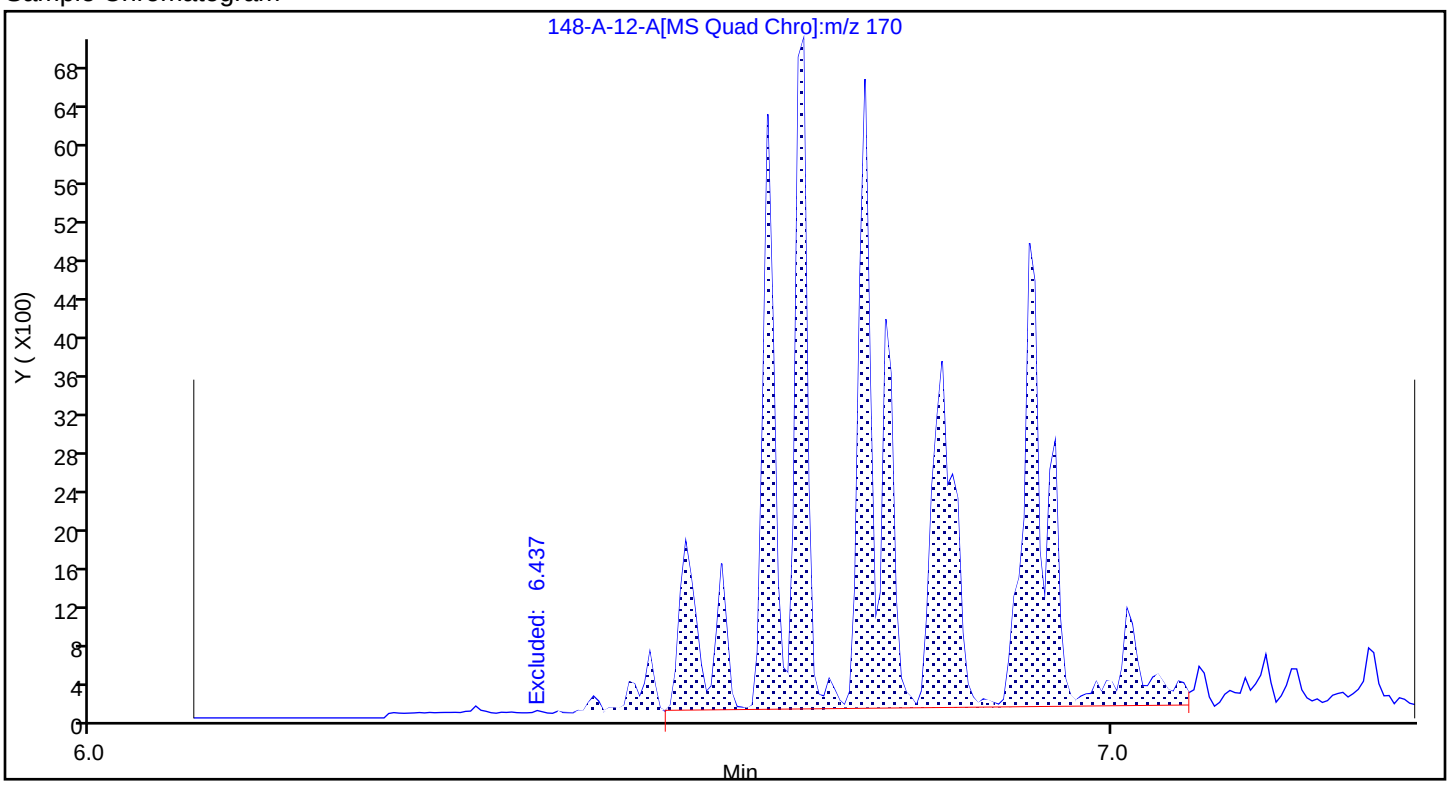
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D				
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 87 C3-Naphthalenes, CAS: STL00918

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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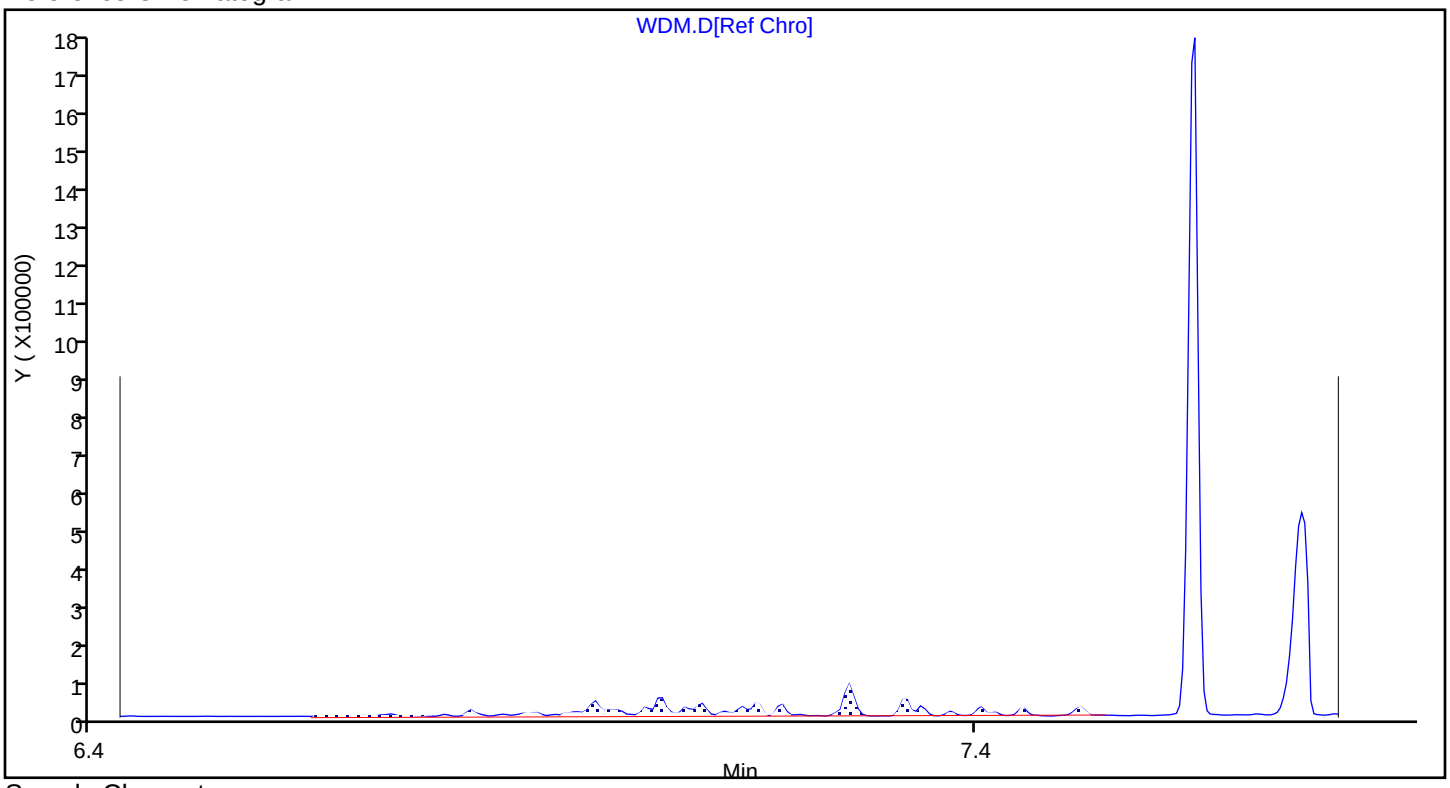
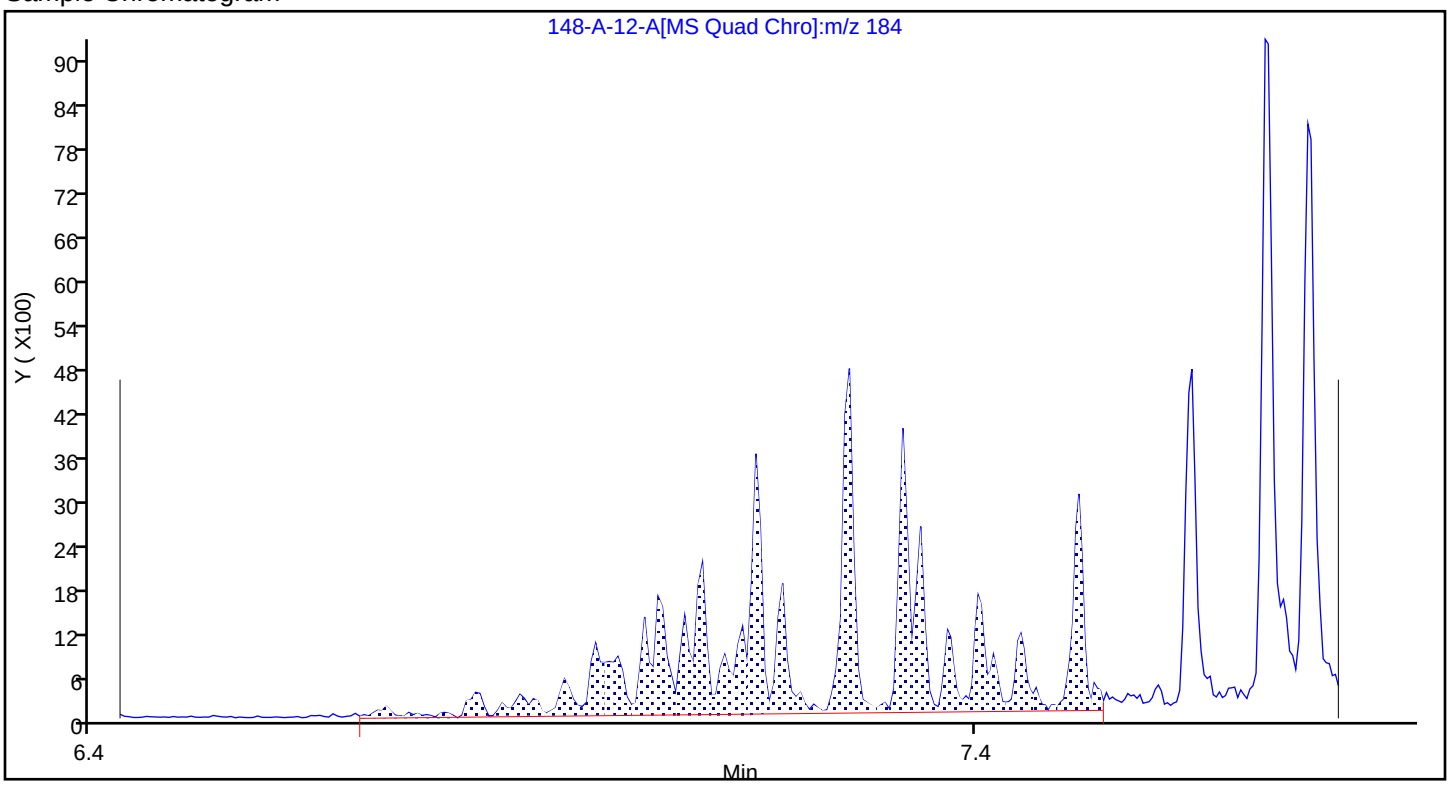
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 88 C4-Naphthalenes, CAS: STL00919

Reference Chromatogram



Sample Chromatogram



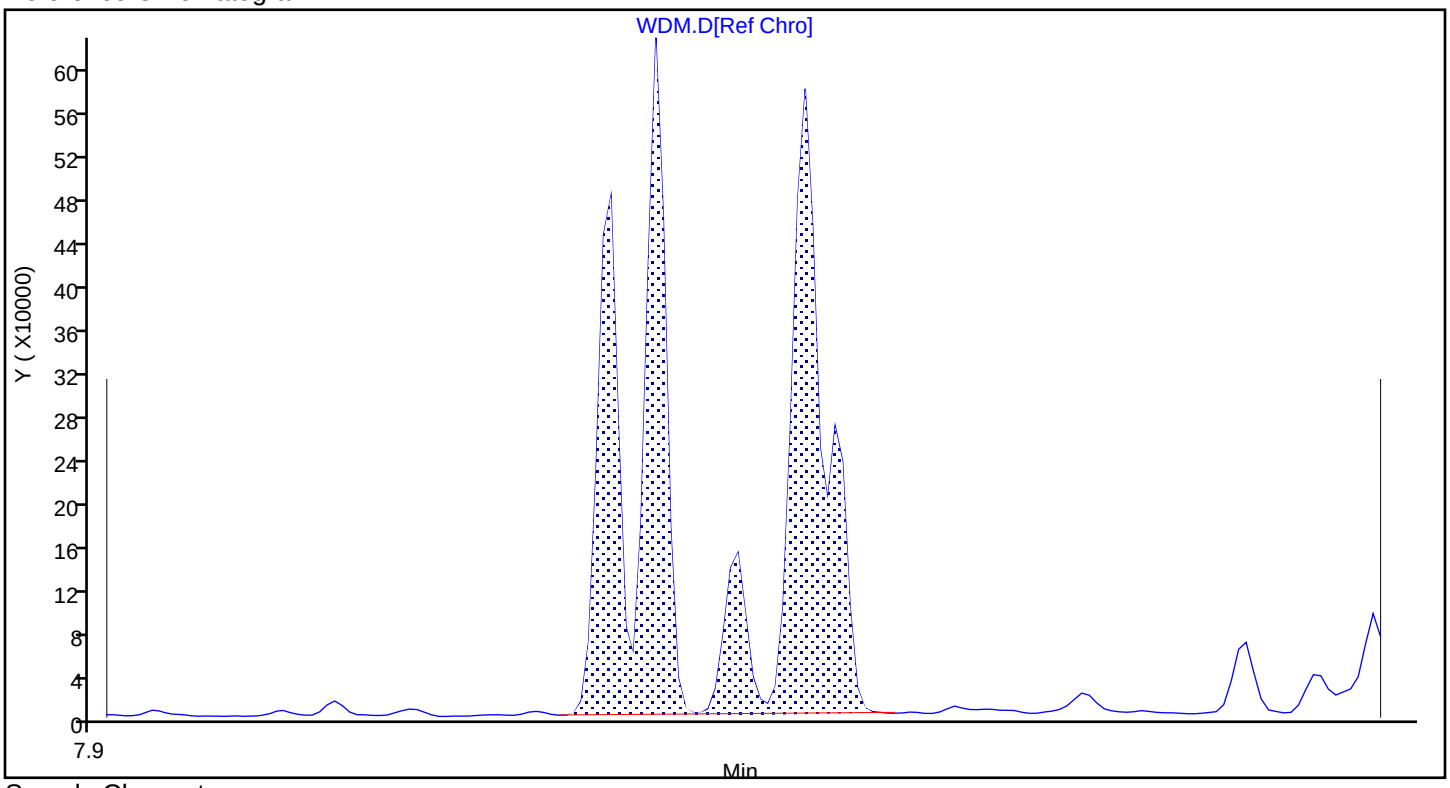
Report Date: 22-Nov-2023 11:26:29 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

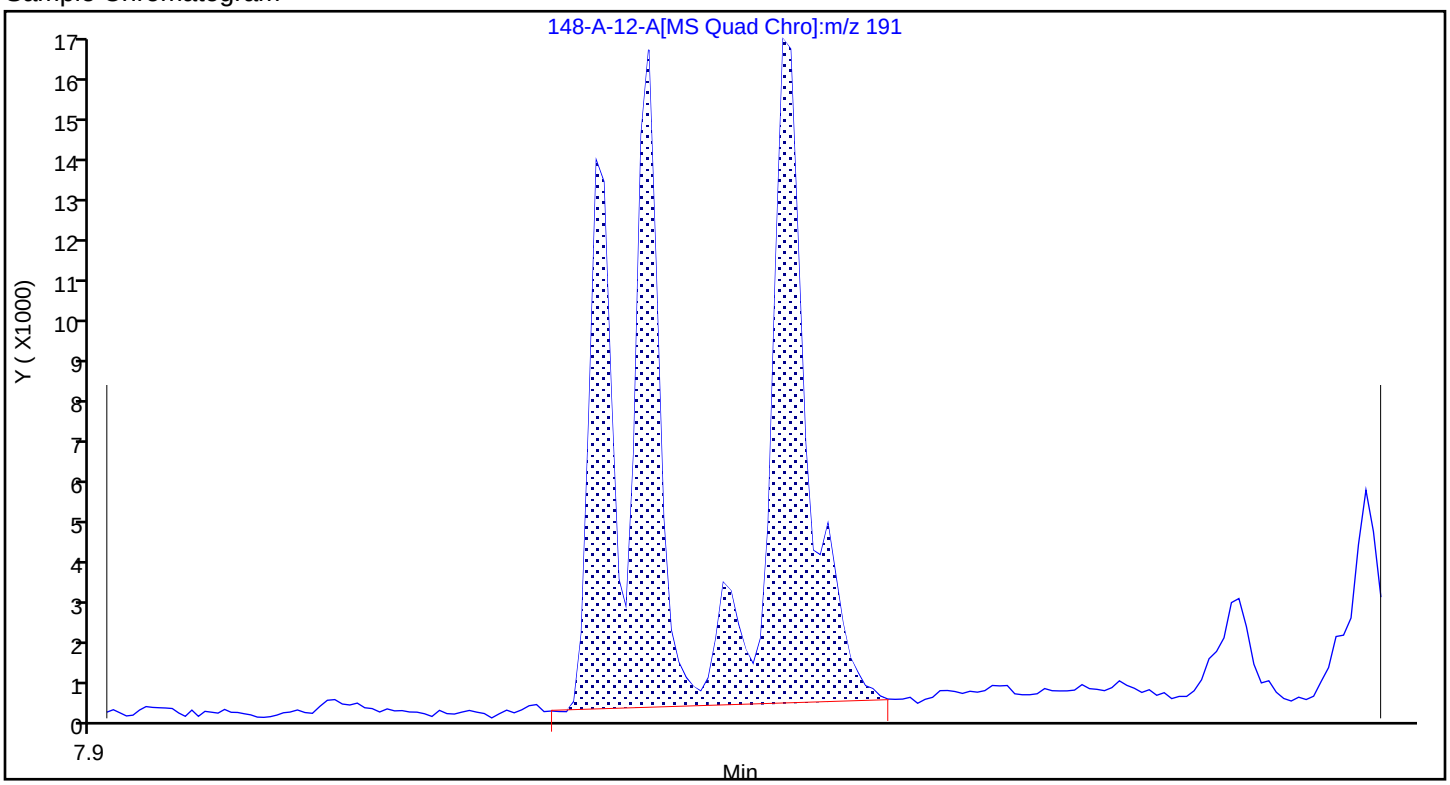
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D				
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 96 C1-Phenanthrenes/Anthracenes, CAS: STL00901

Reference Chromatogram



Sample Chromatogram



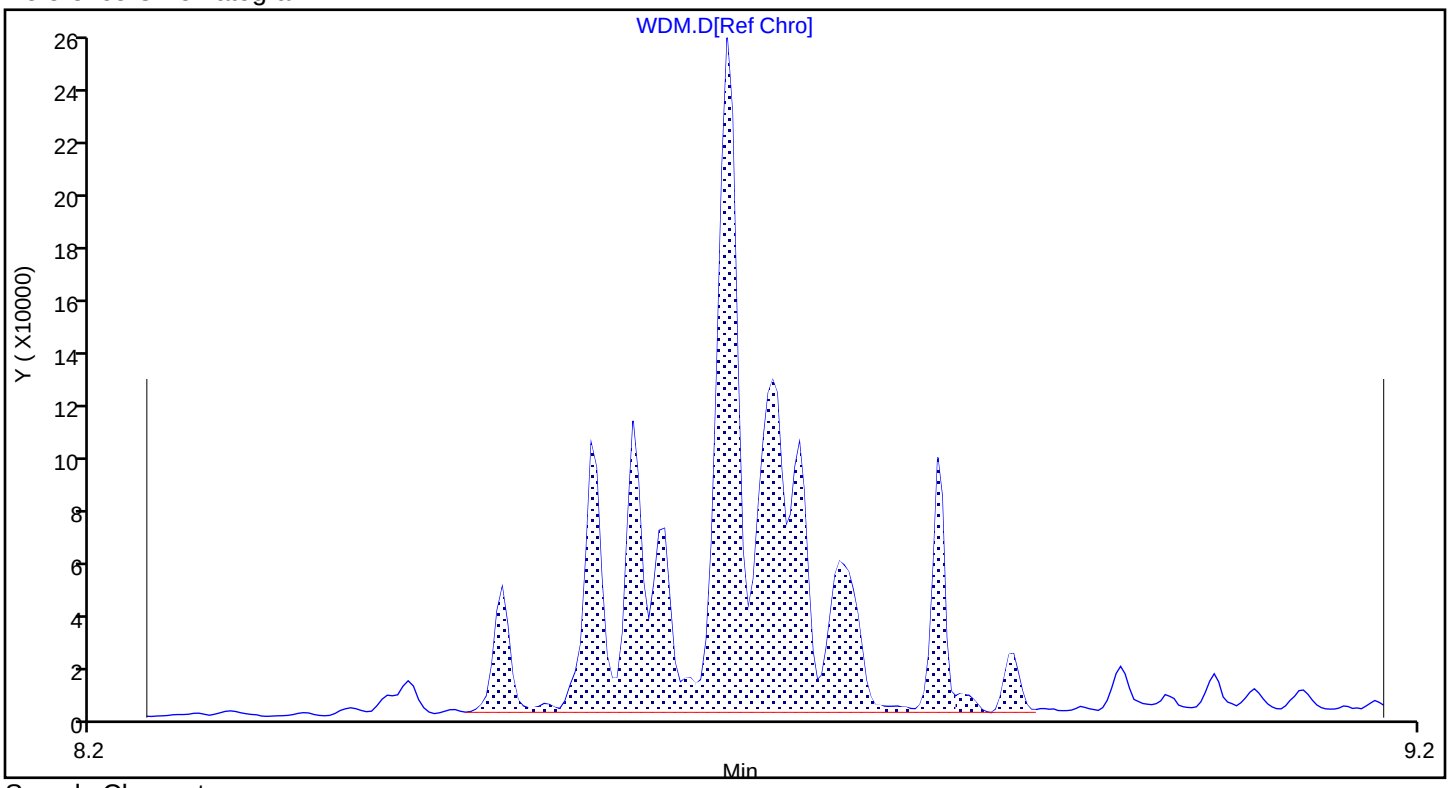
Report Date: 22-Nov-2023 11:26:29 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

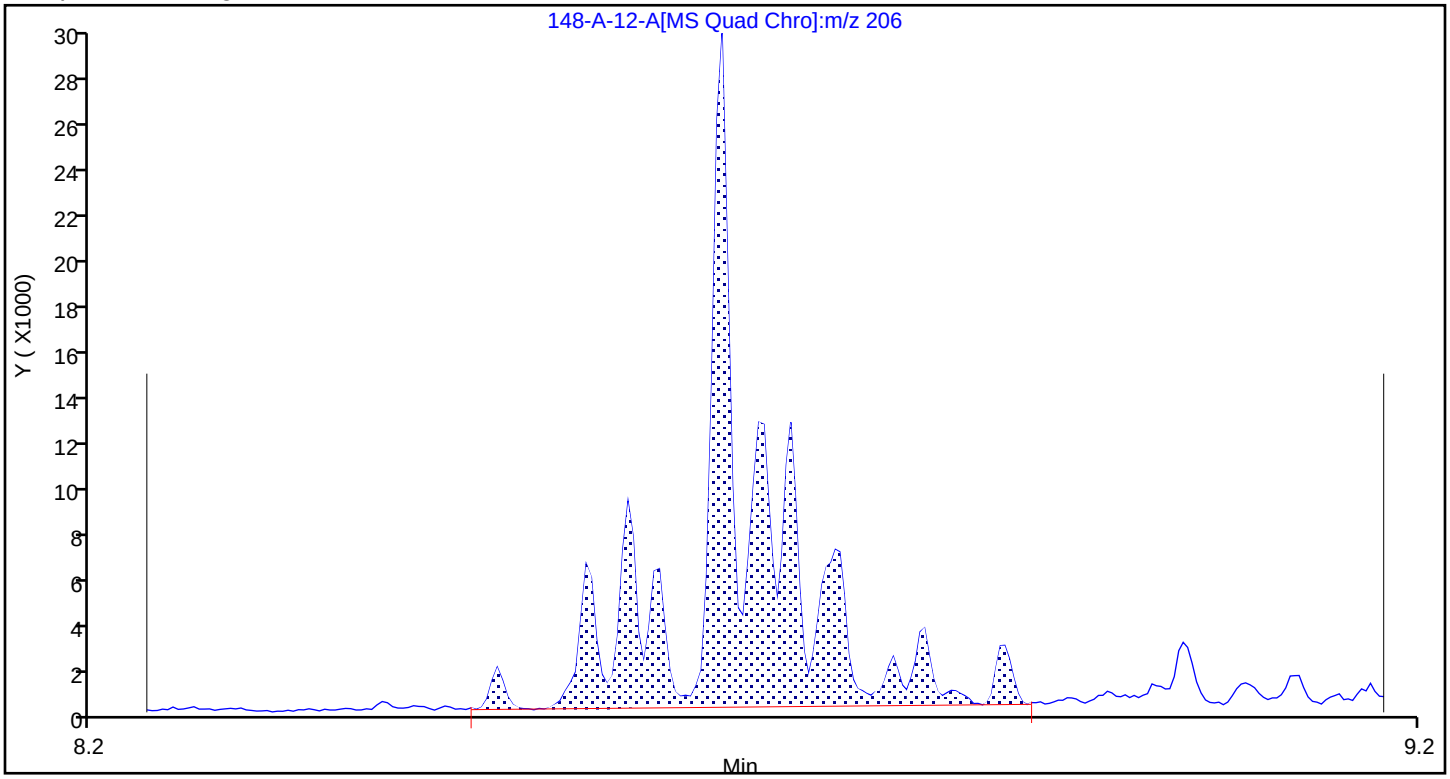
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D				
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 97 C2-Phenanthrenes/Anthracenes, CAS: STL00902

Reference Chromatogram



Sample Chromatogram



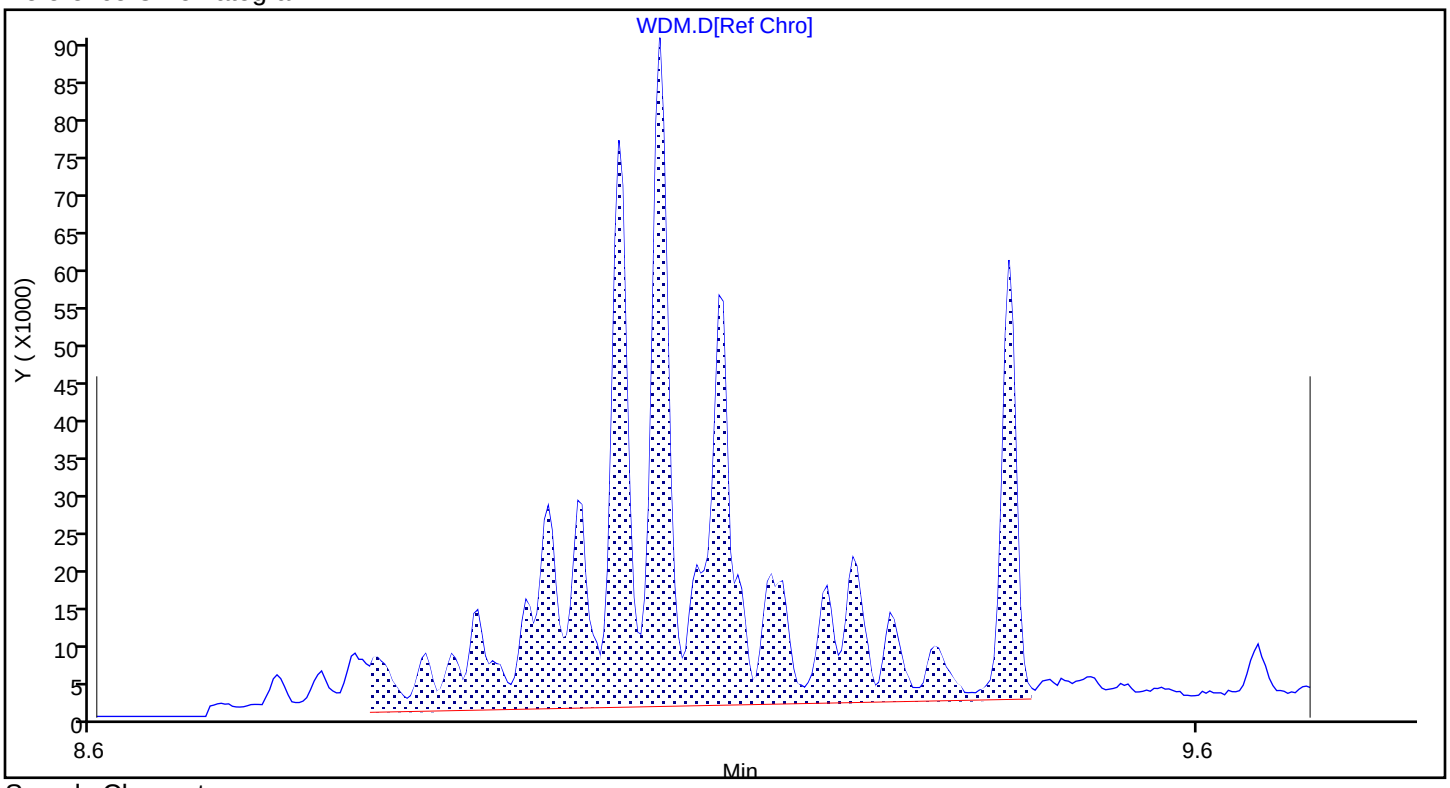
Report Date: 22-Nov-2023 11:26:29 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

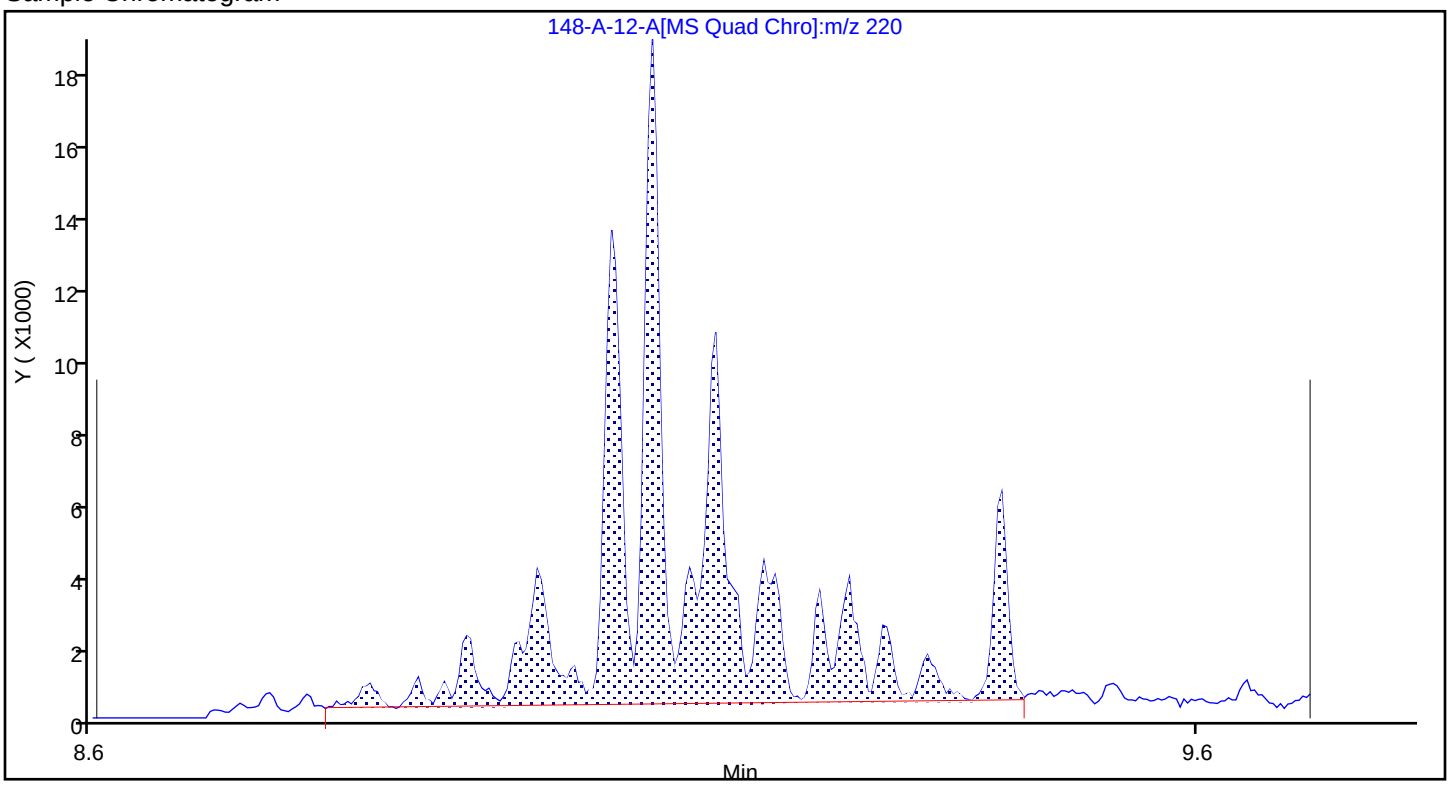
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D				
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 98 C3-Phenanthrenes/Anthracenes, CAS: STL00903

Reference Chromatogram



Sample Chromatogram



Report Date: 22-Nov-2023 11:26:29 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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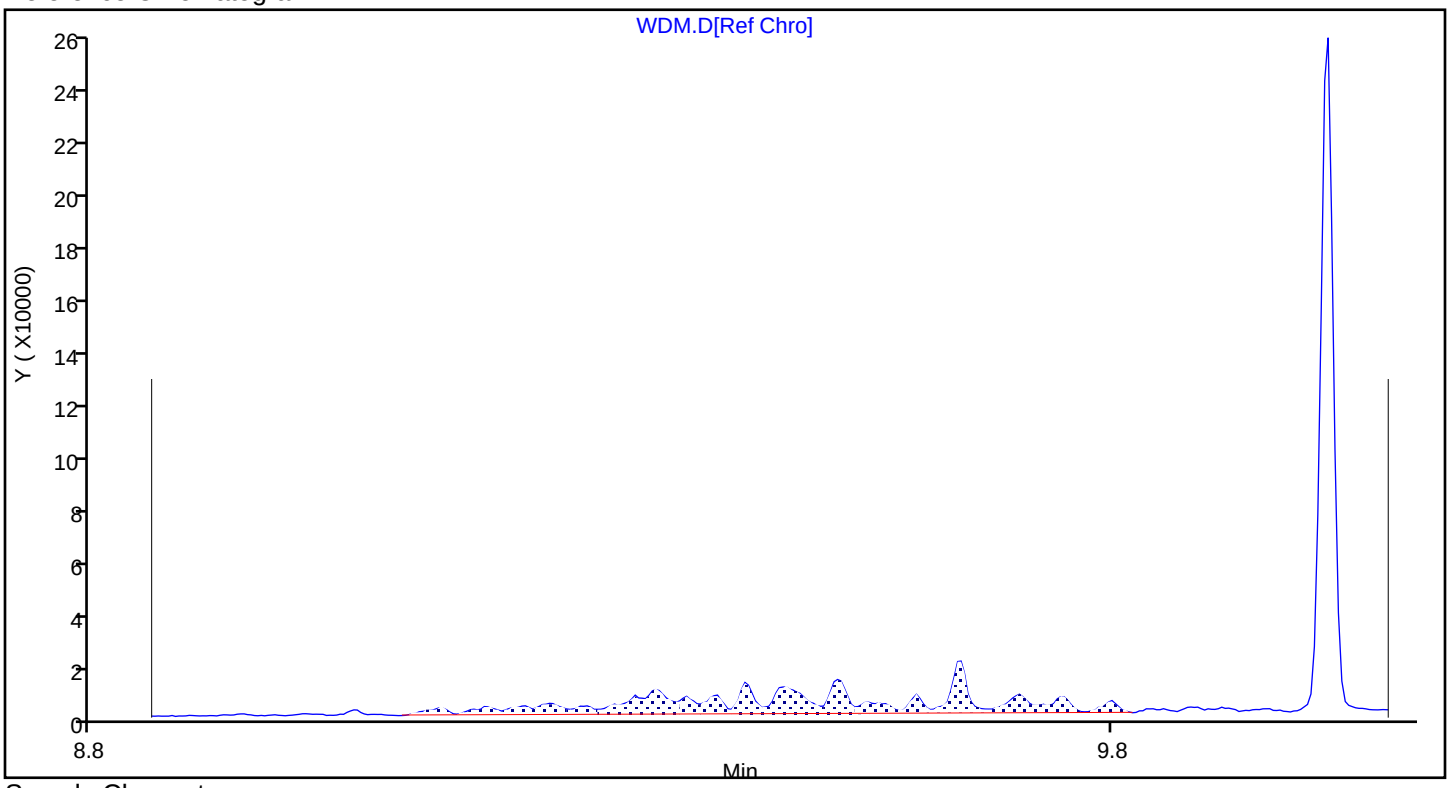
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 99 C4-Phenanthrenes/Anthracenes, CAS: STL00904

Reference Chromatogram



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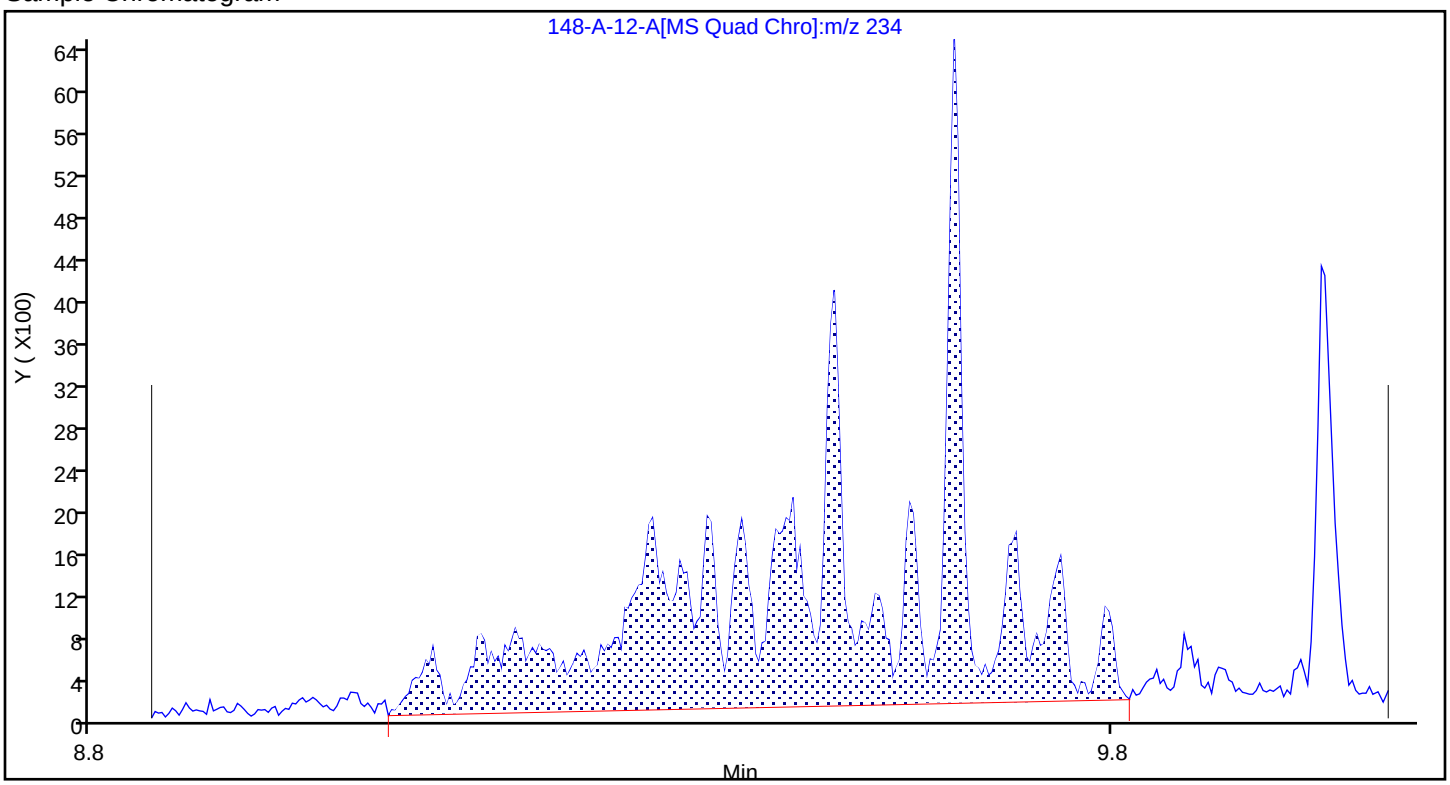

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Eurofins Knoxville

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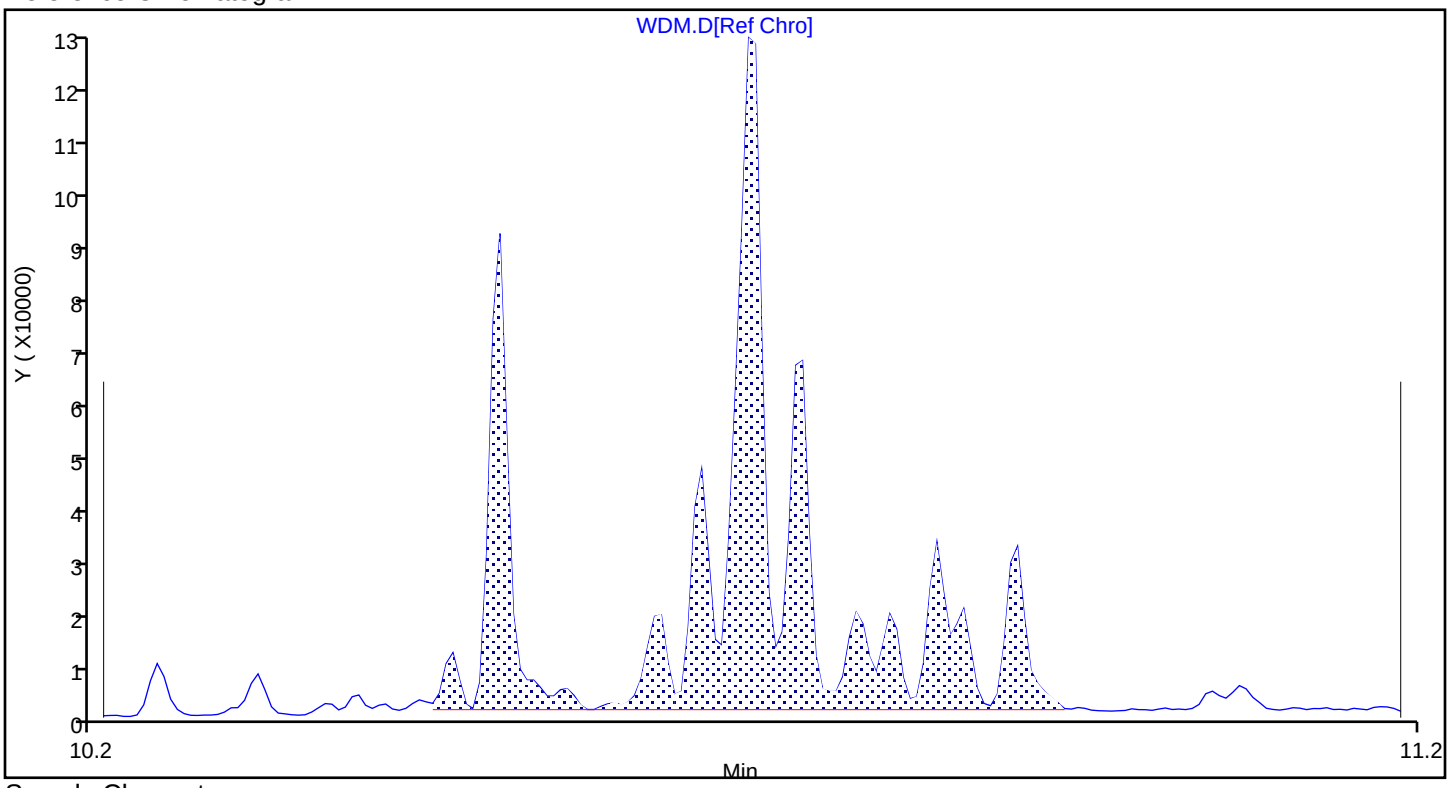
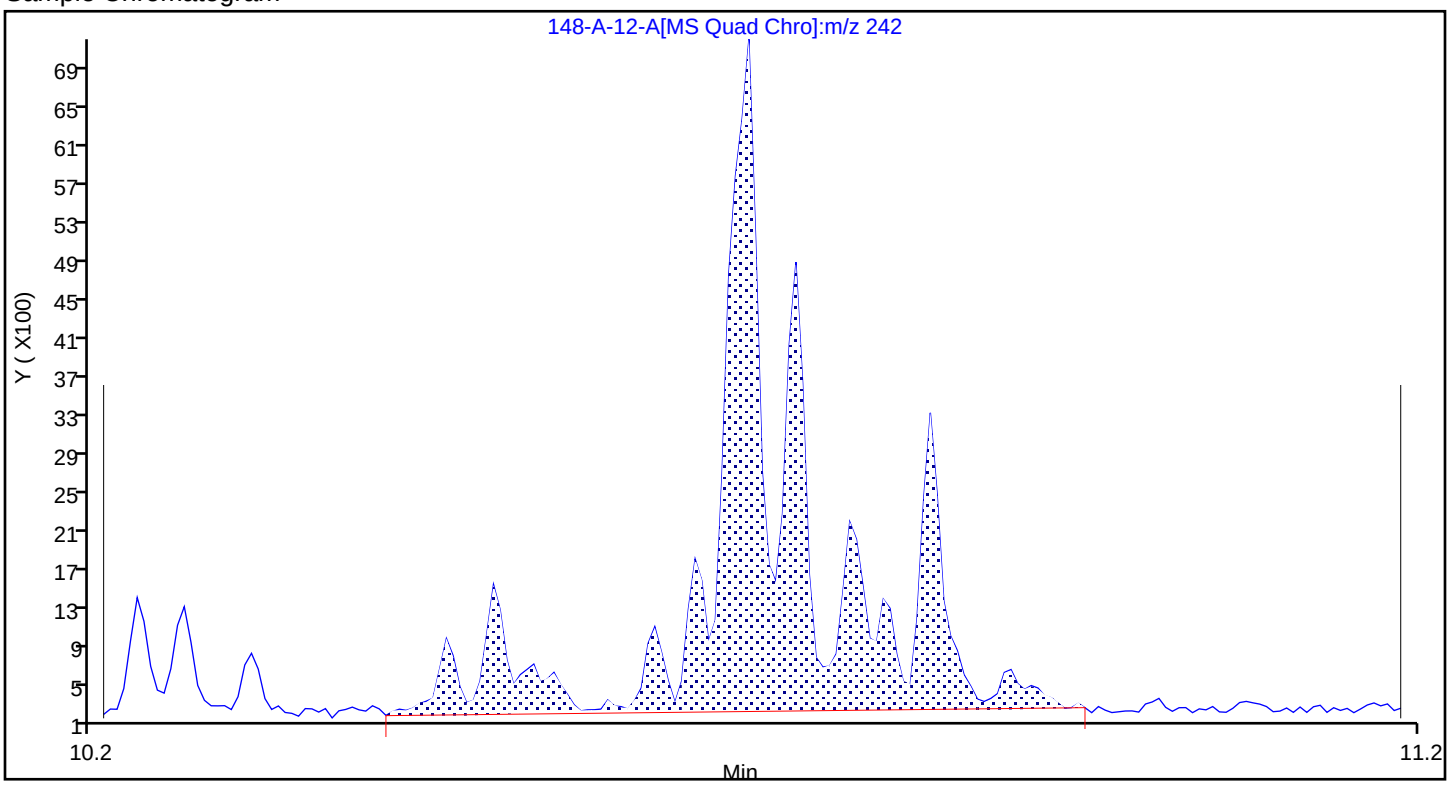
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 101 C1-Chrysenes/Benz(a)anthracenes, CAS: STL02218

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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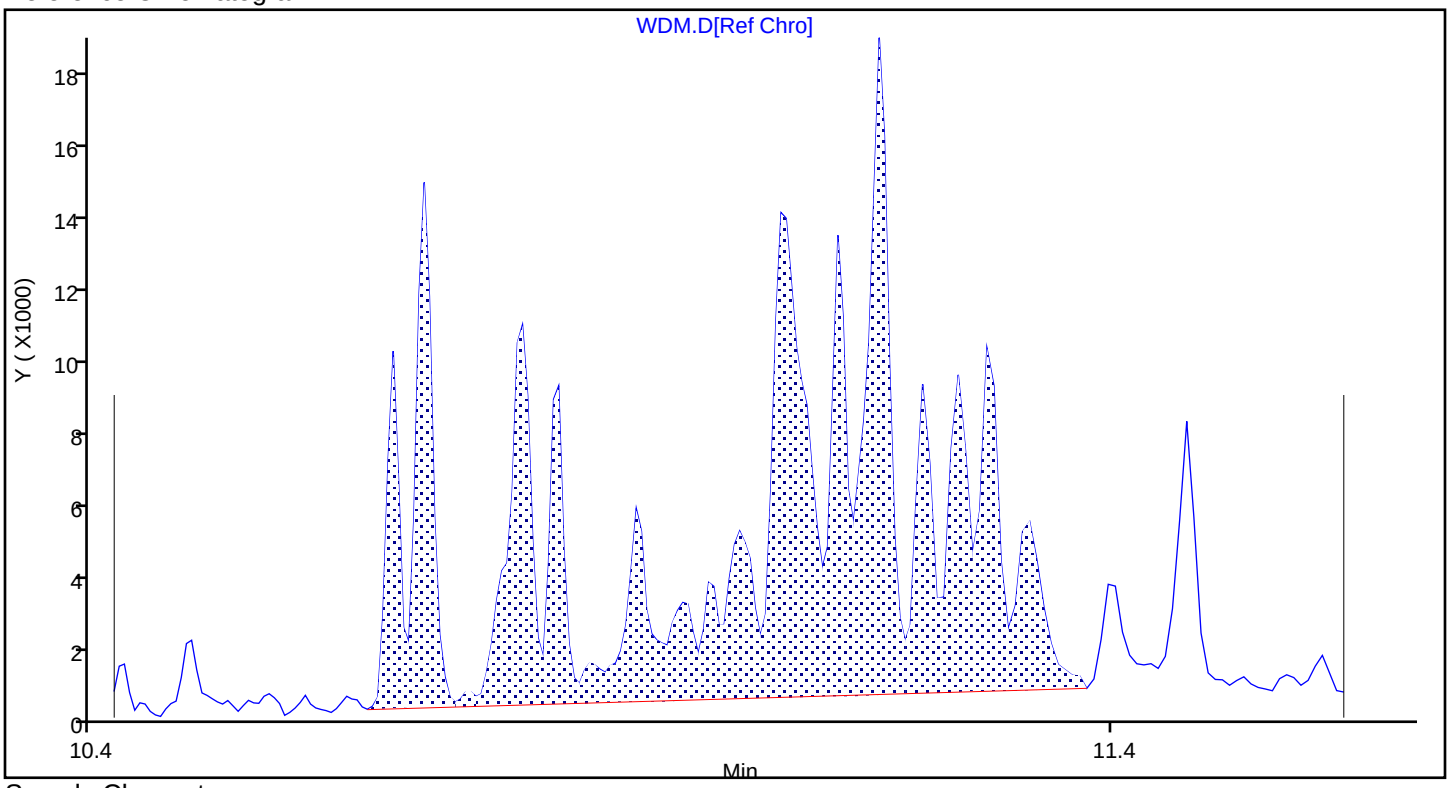
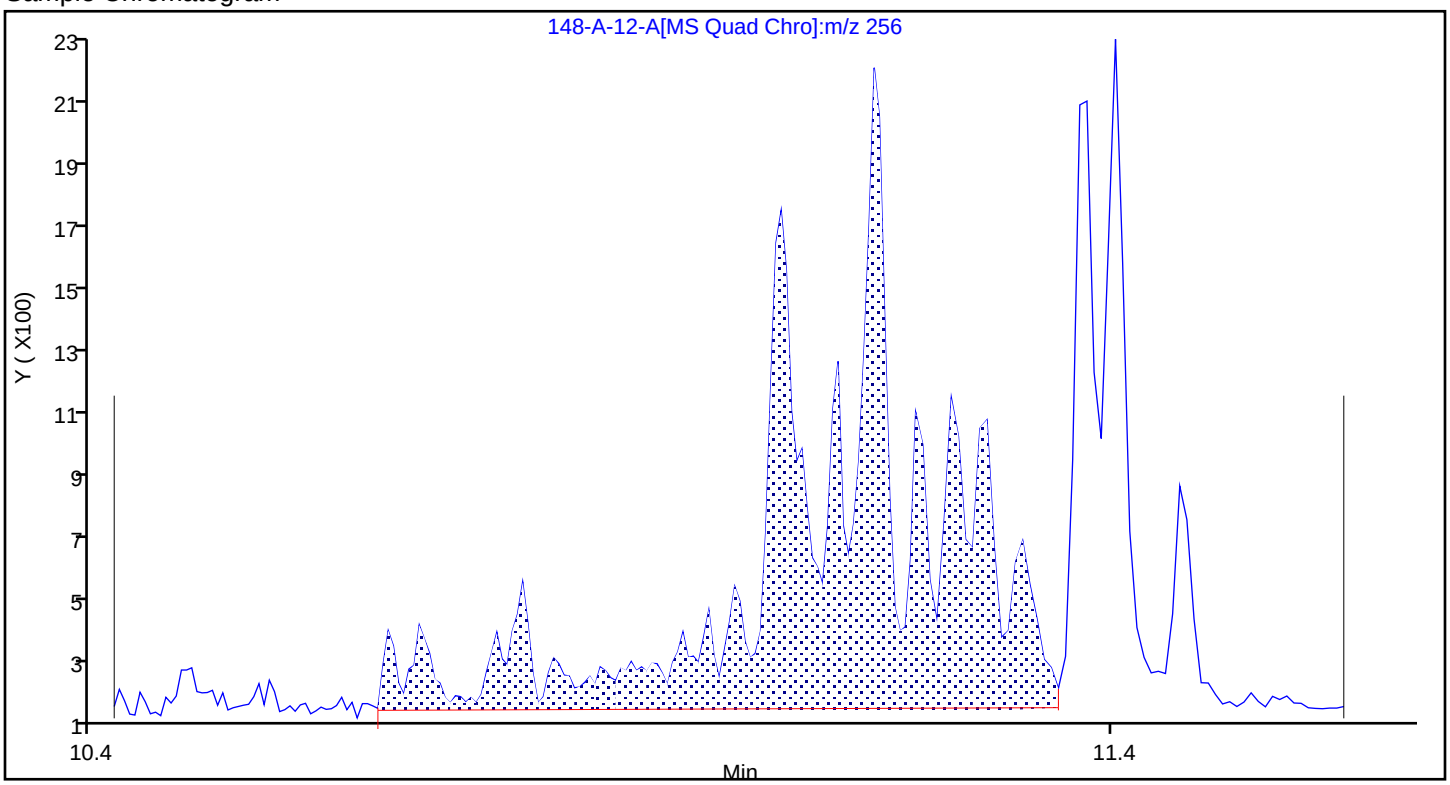
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 102 C2-Chrysenes/Benz(a)anthracenes, CAS: STL02219

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
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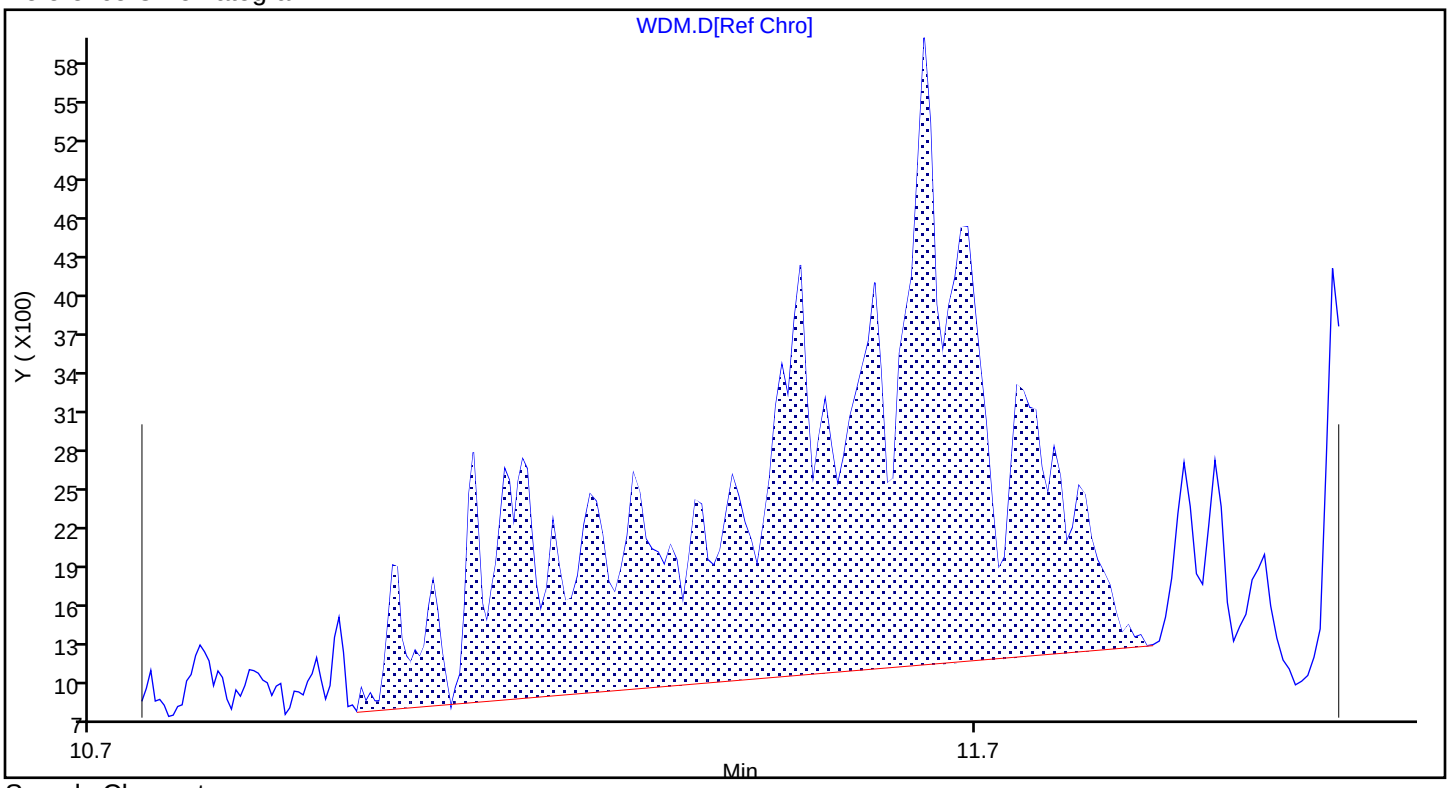
A 103 C3-Chrysenes/Benz(a)anthracenes, CAS: STL02220

Reference Chromatogram



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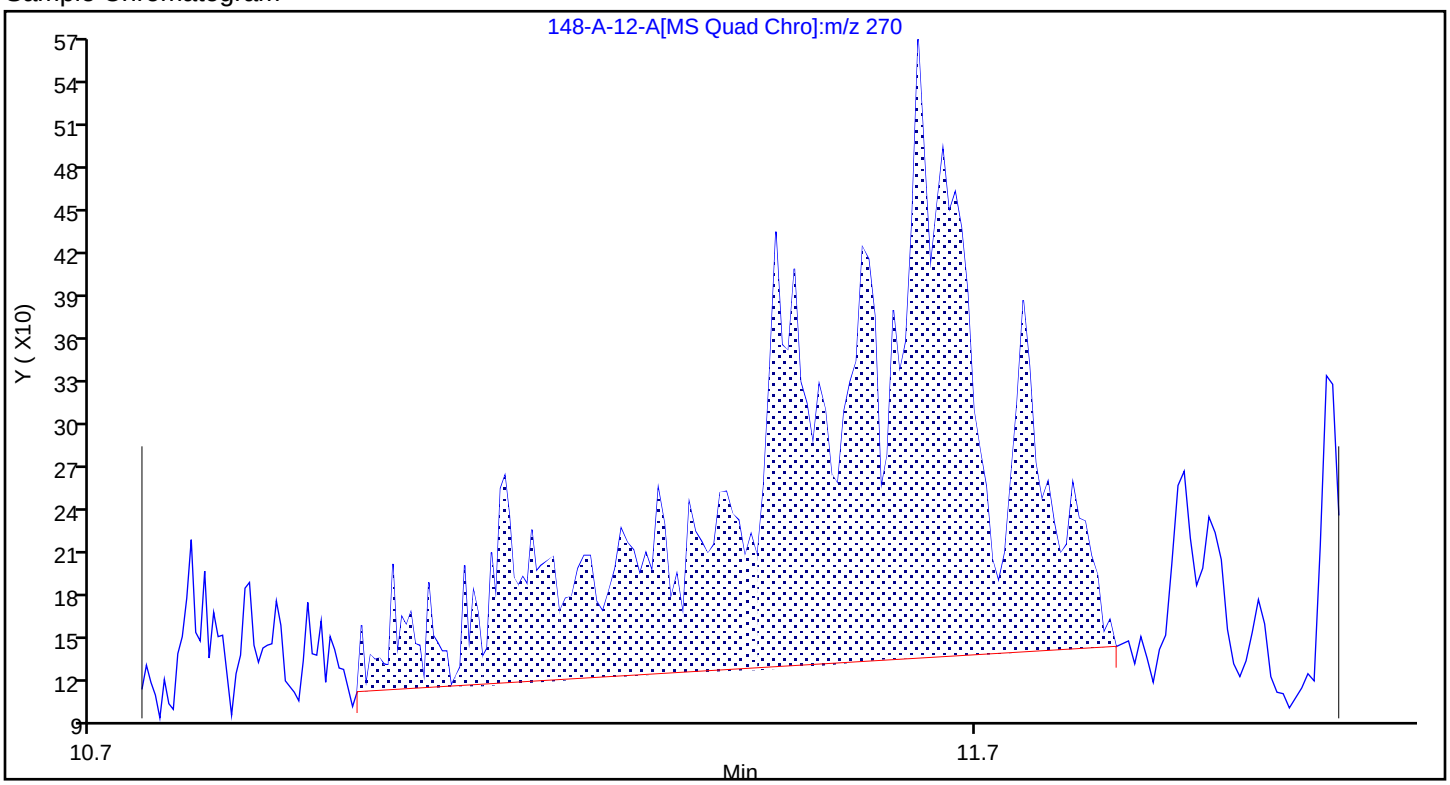

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Eurofins Knoxville

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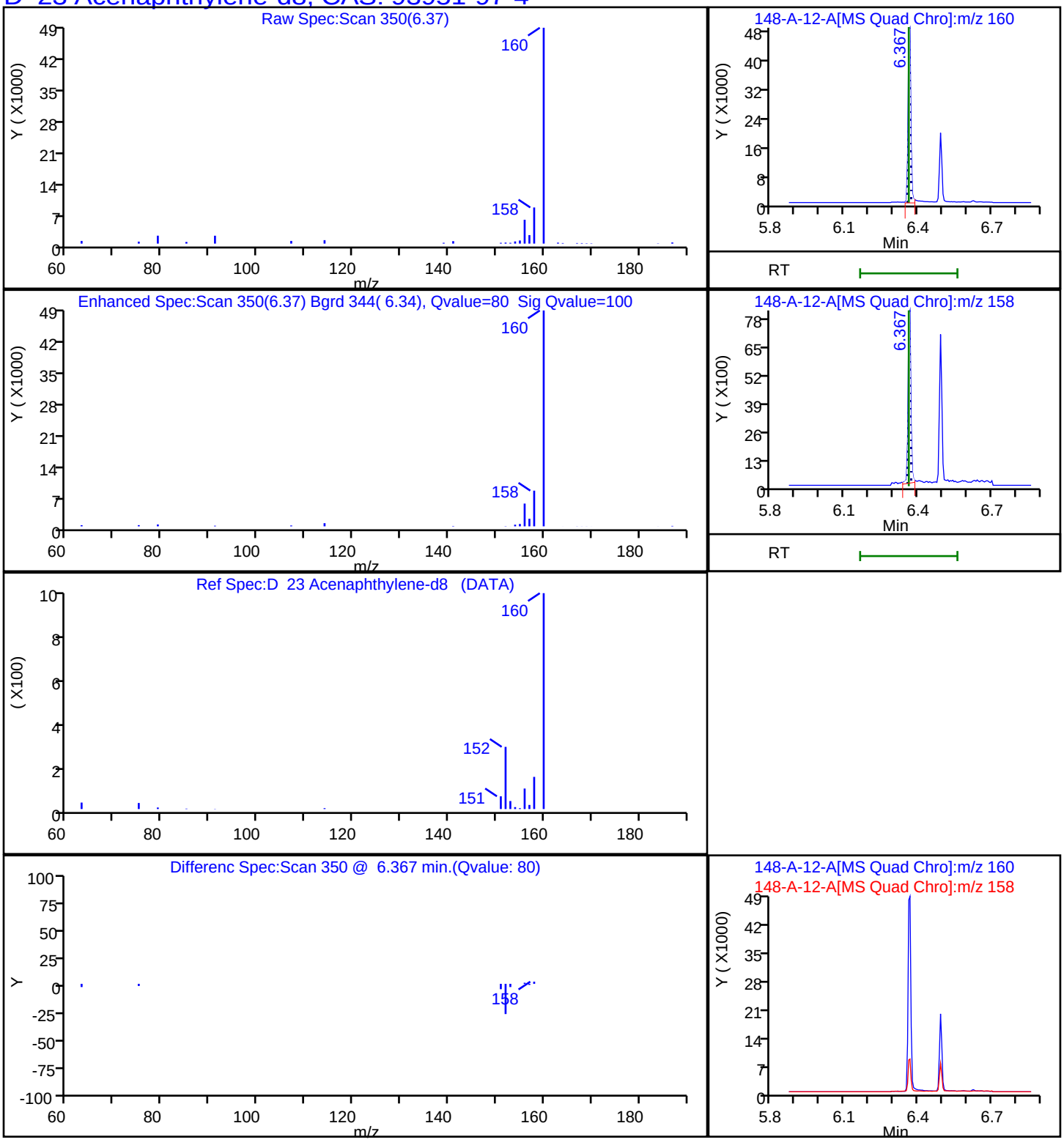
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 23 Acenaphthylene-d8, CAS: 93951-97-4



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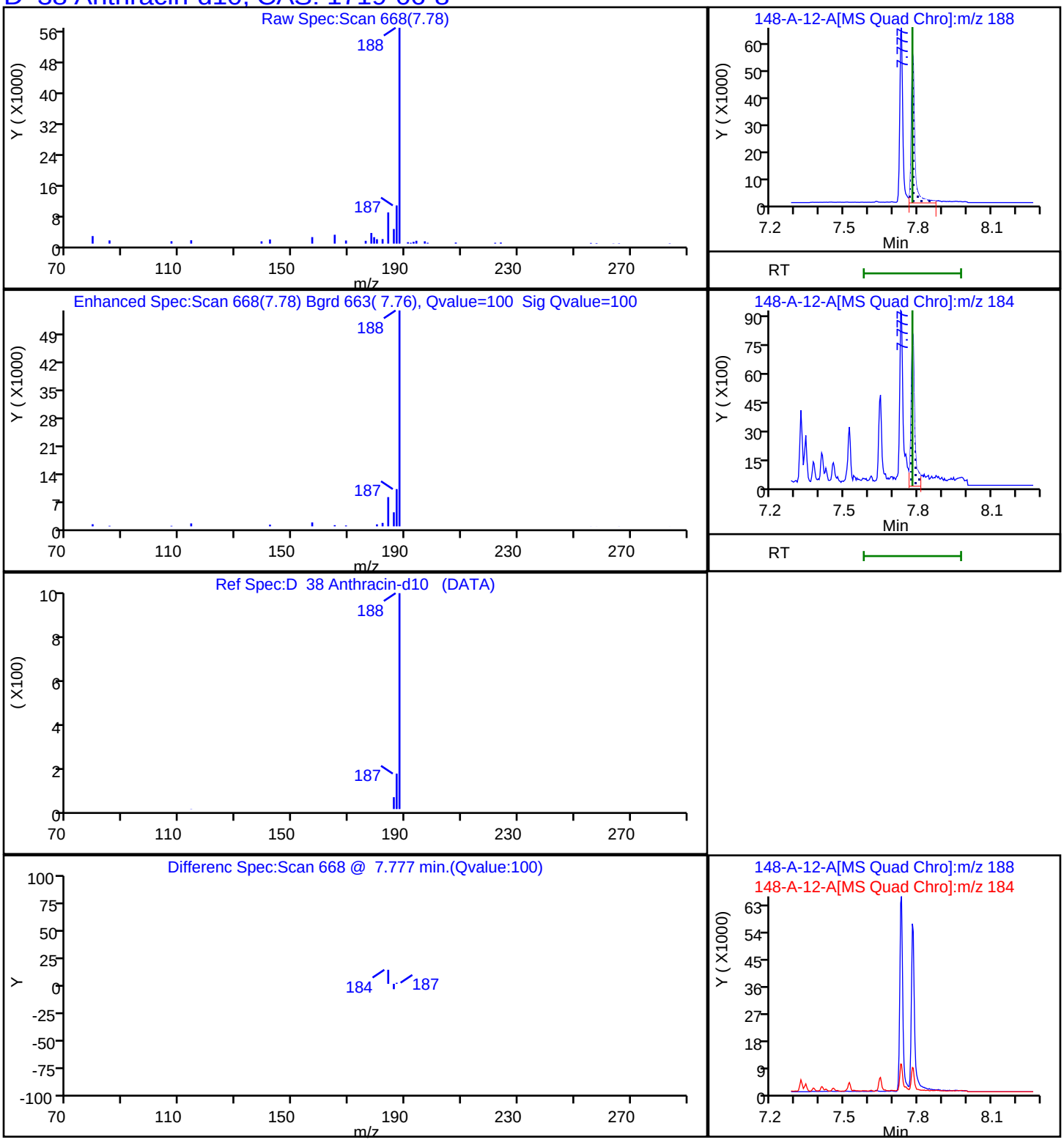
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

D 38 Anthracin-d10, CAS: 1719-06-8



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Eurofins Knoxville

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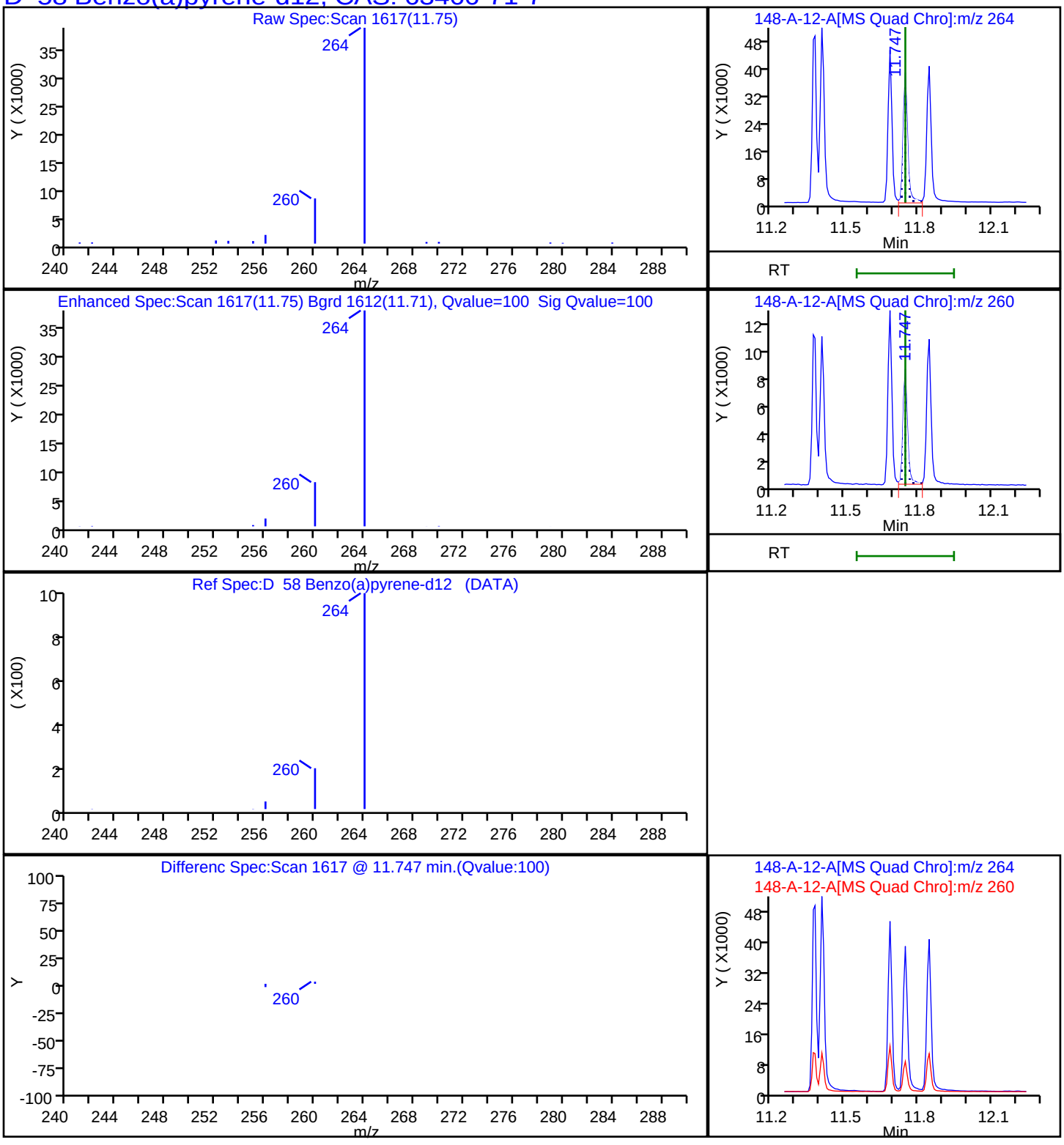
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

D 58 Benzo(a)pyrene-d12, CAS: 63466-71-7



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Eurofins Knoxville

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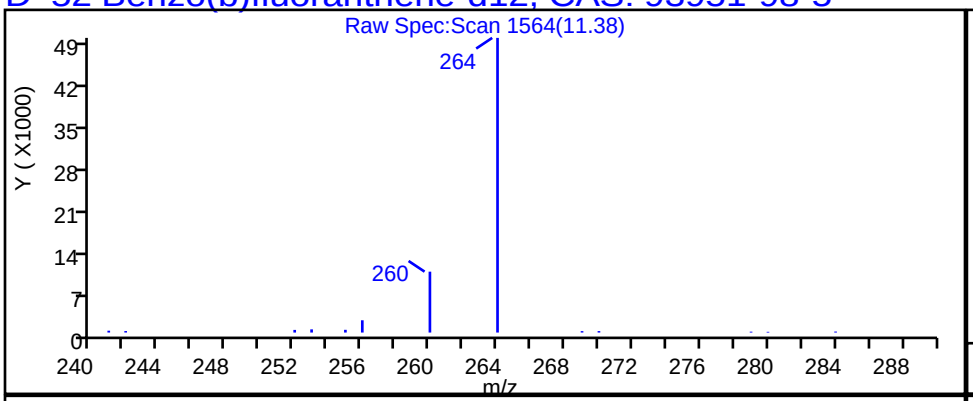
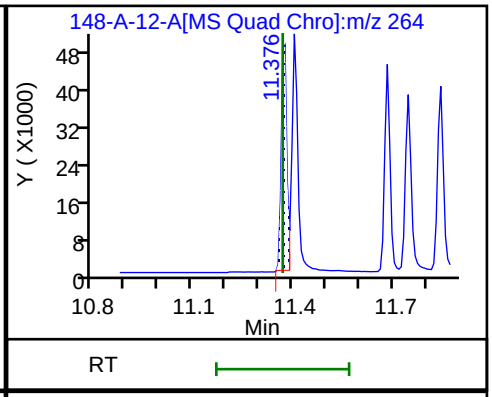
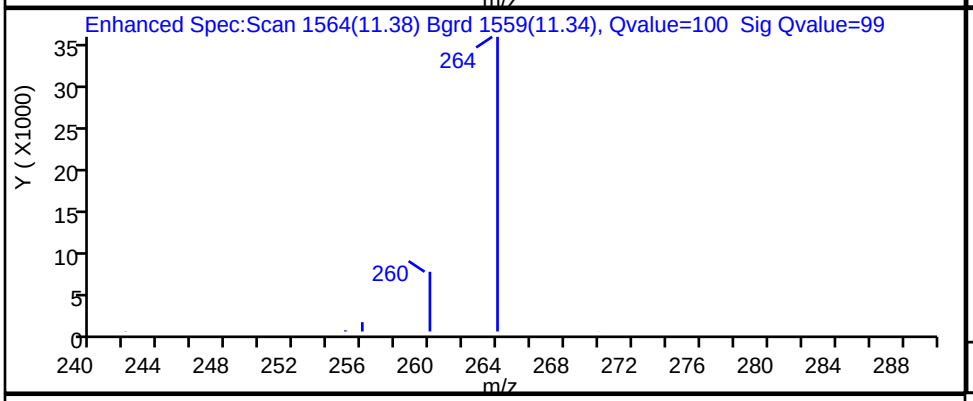
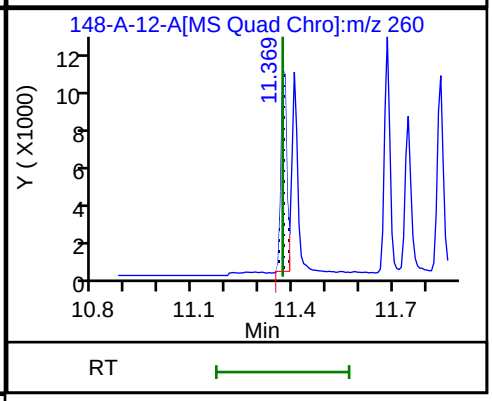
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

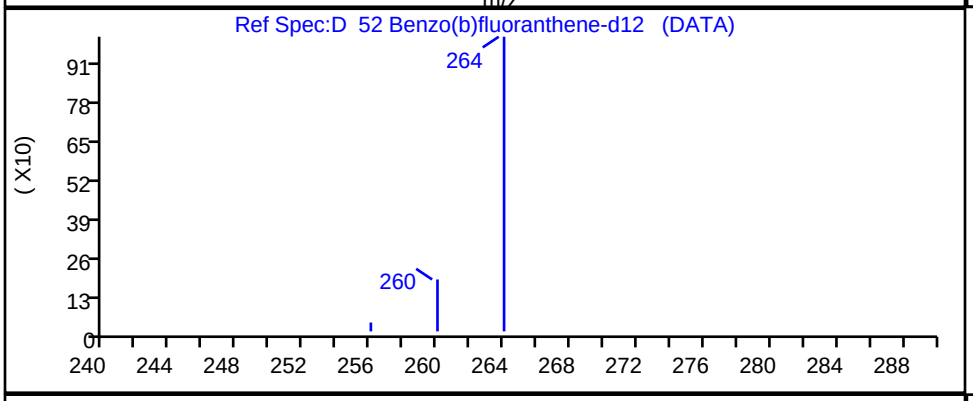
D 52 Benzo(b)fluoranthene-d12, CAS: 93951-98-5

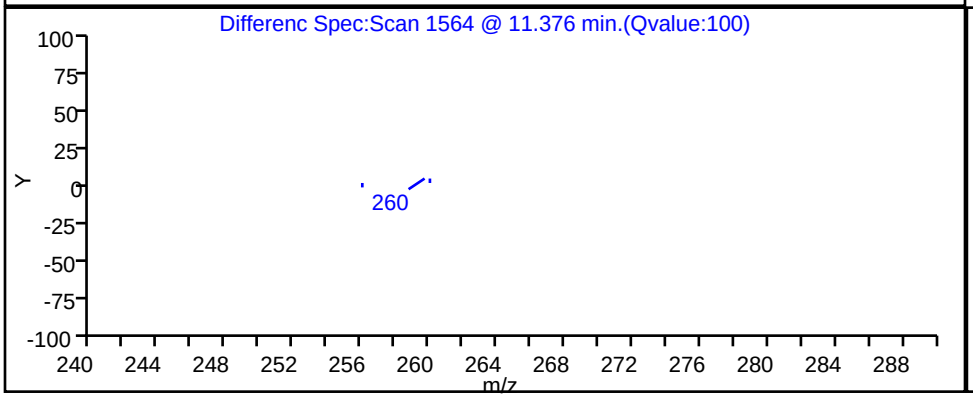


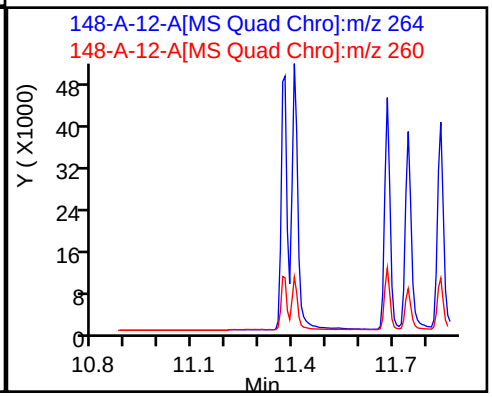












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Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
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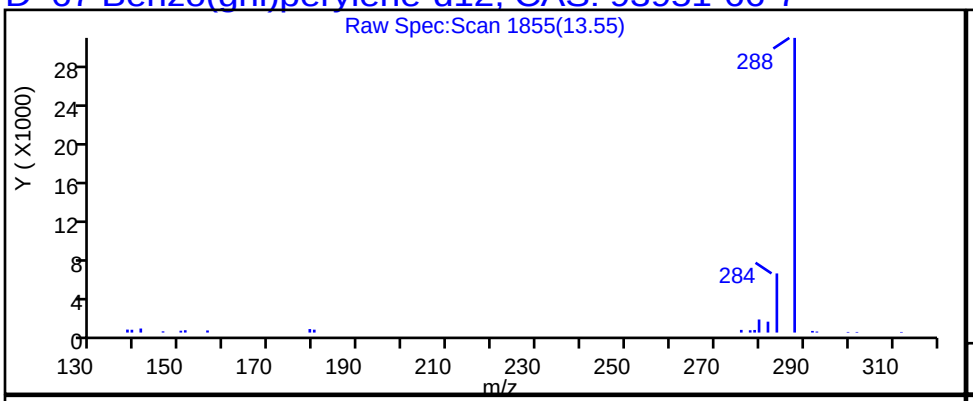
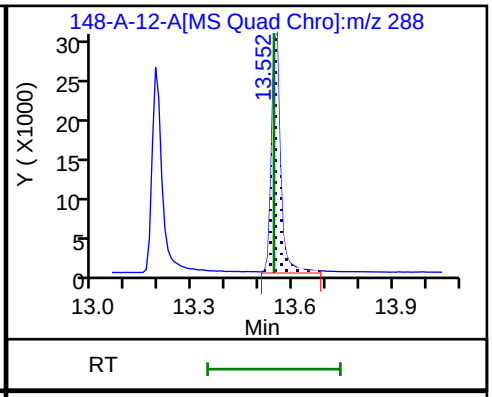
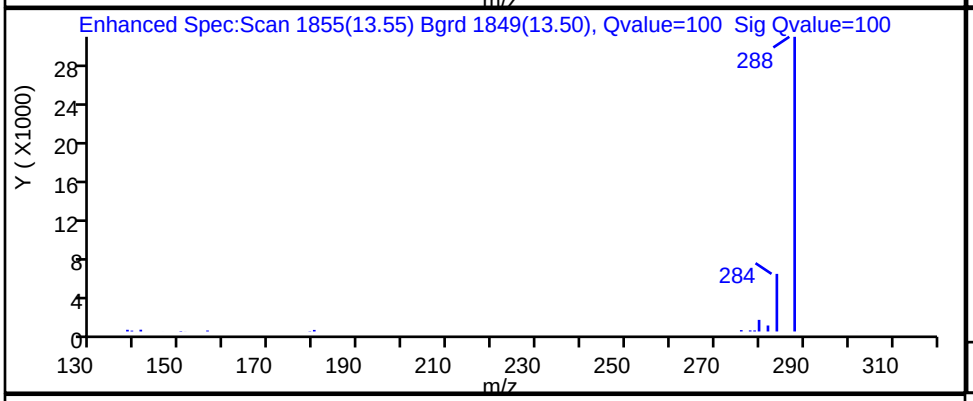
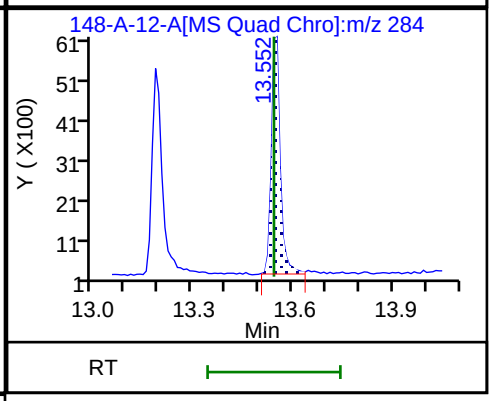
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

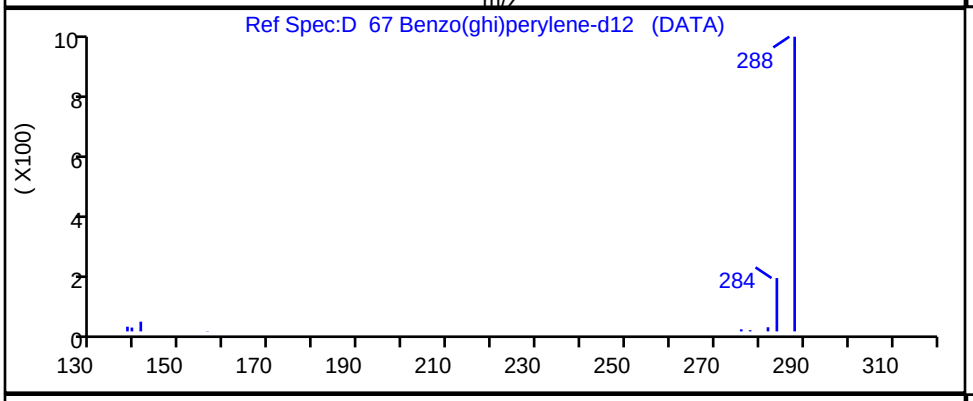
D 67 Benzo(ghi)perylene-d12, CAS: 93951-66-7

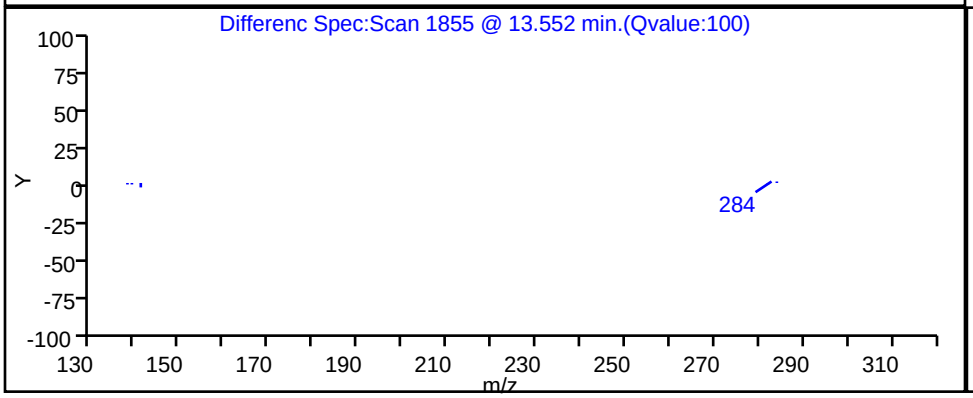


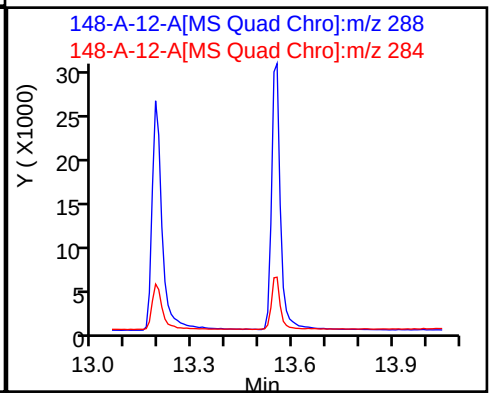












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Eurofins Knoxville

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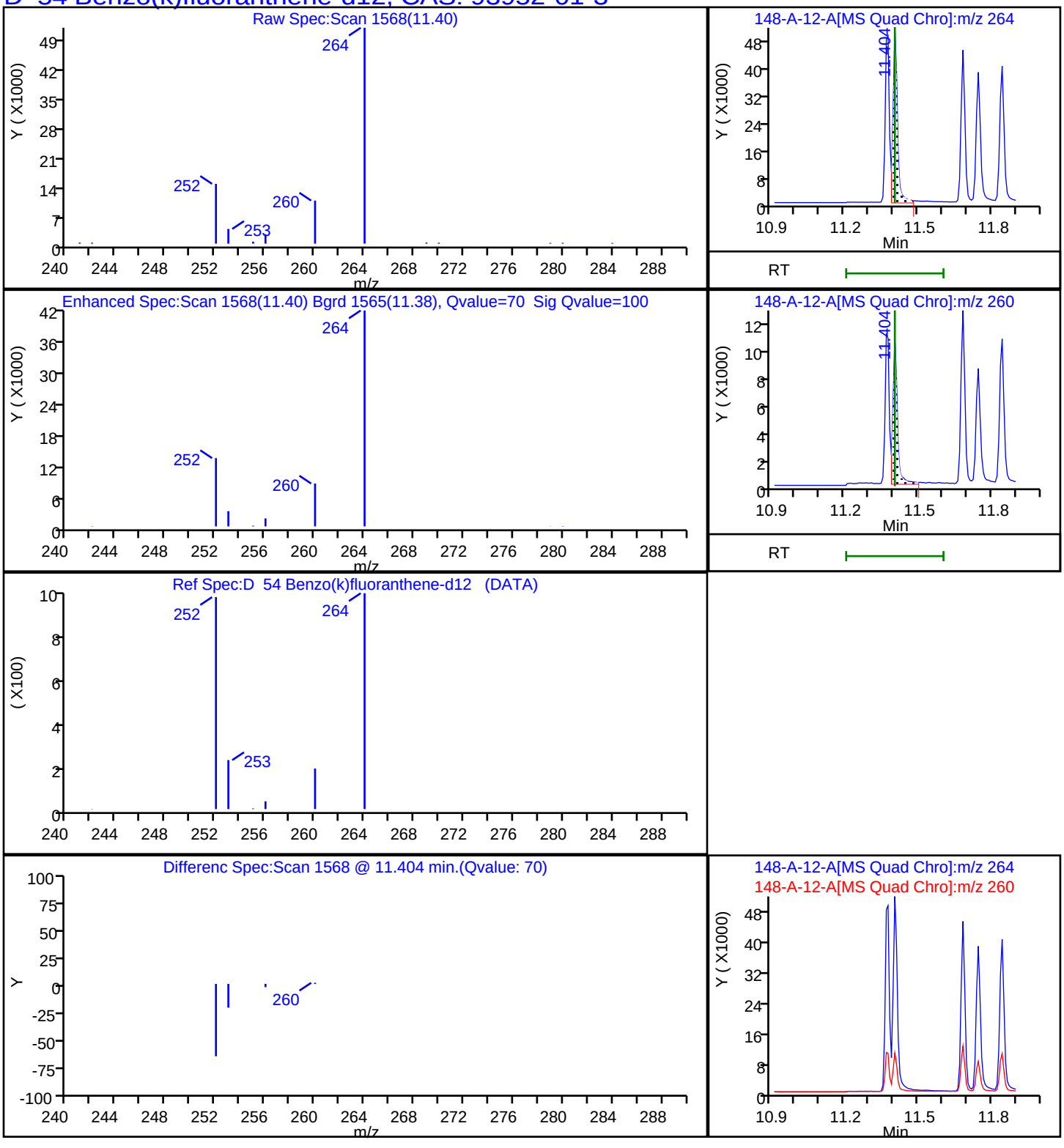
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15
Client ID:	1804576-846-S3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

D 54 Benzo(k)fluoranthene-d12, CAS: 93952-01-3



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Eurofins Knoxville

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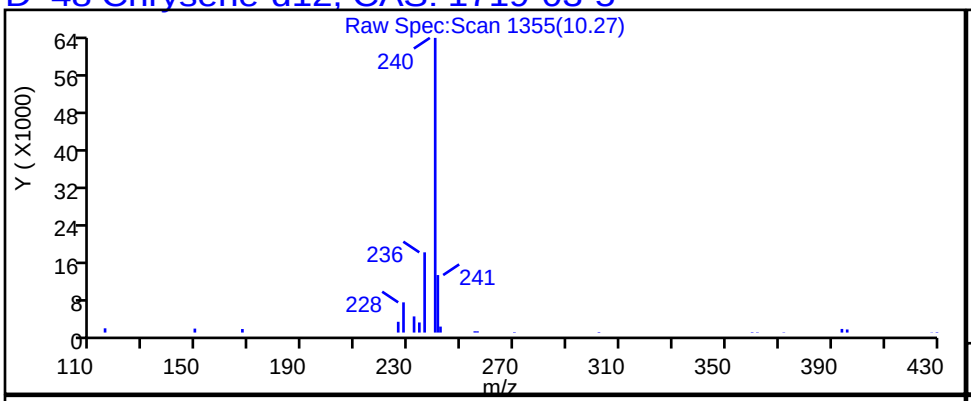
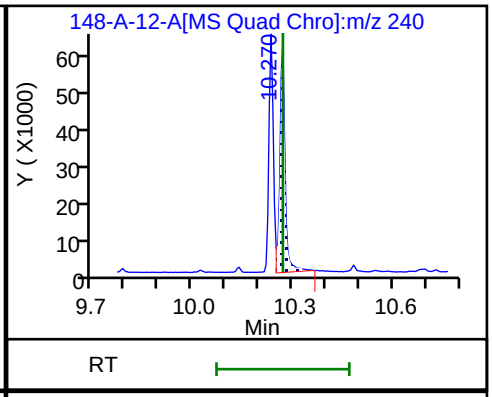
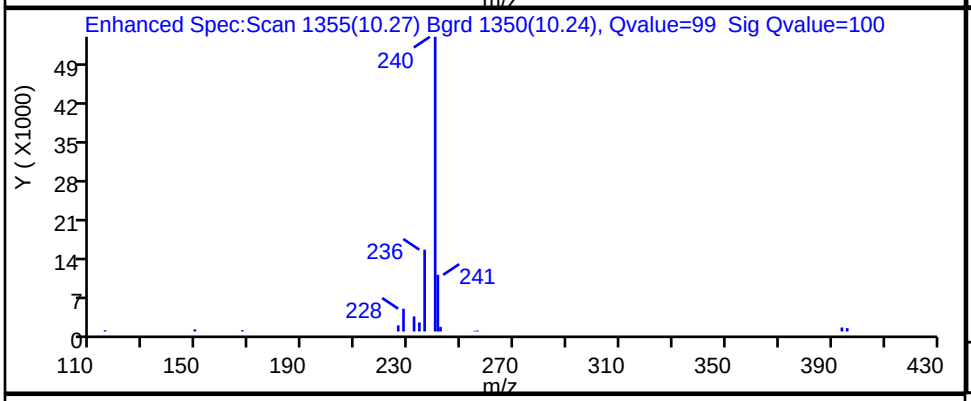
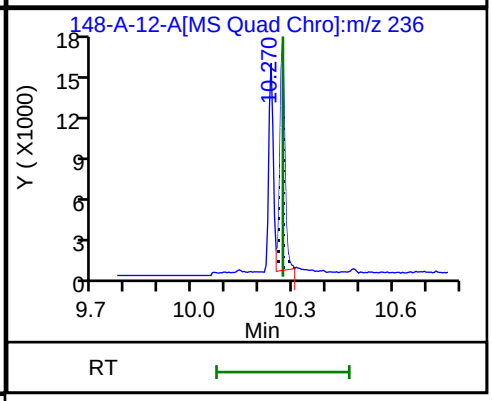
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

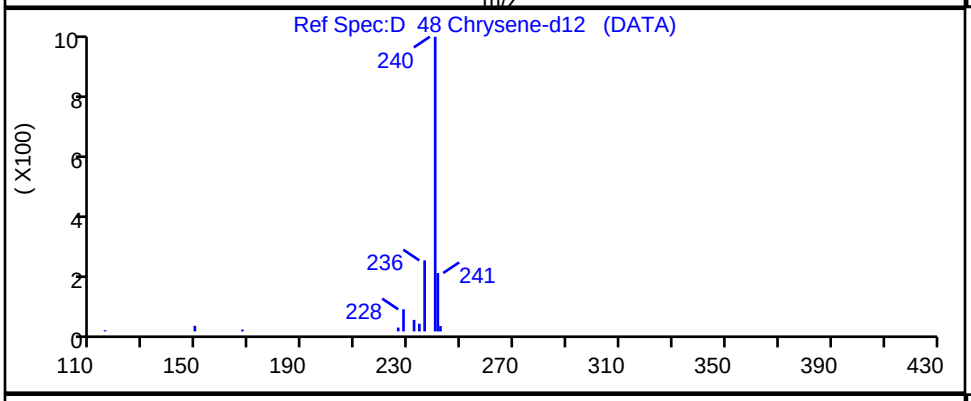
D 48 Chrysene-d12, CAS: 1719-03-5

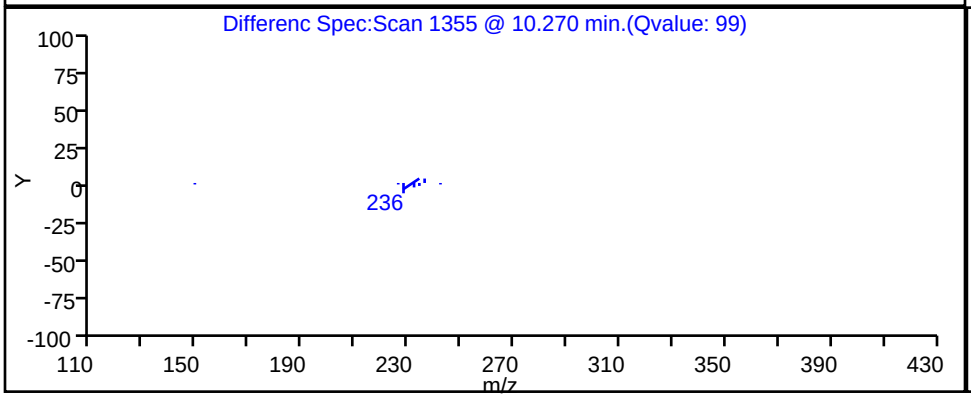


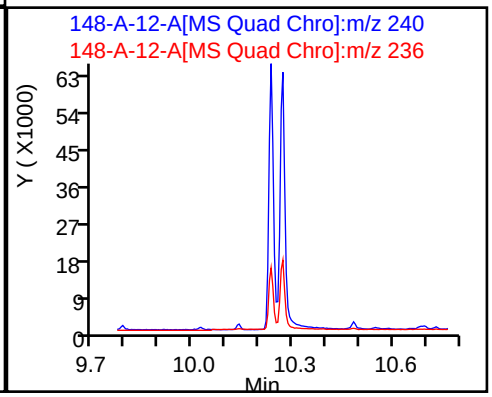












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Eurofins Knoxville

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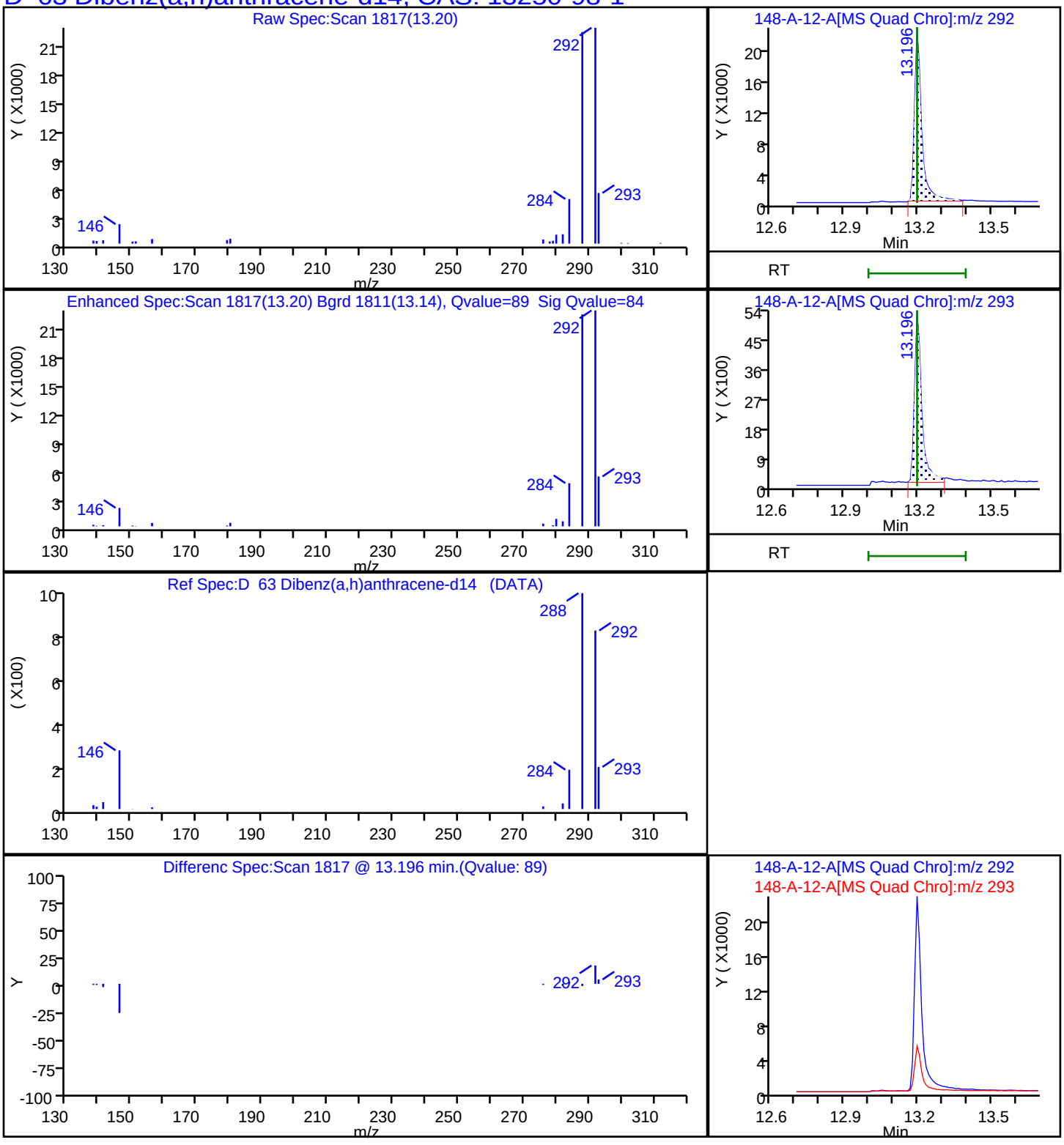
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 63 Dibenz(a,h)anthracene-d14, CAS: 13250-98-1



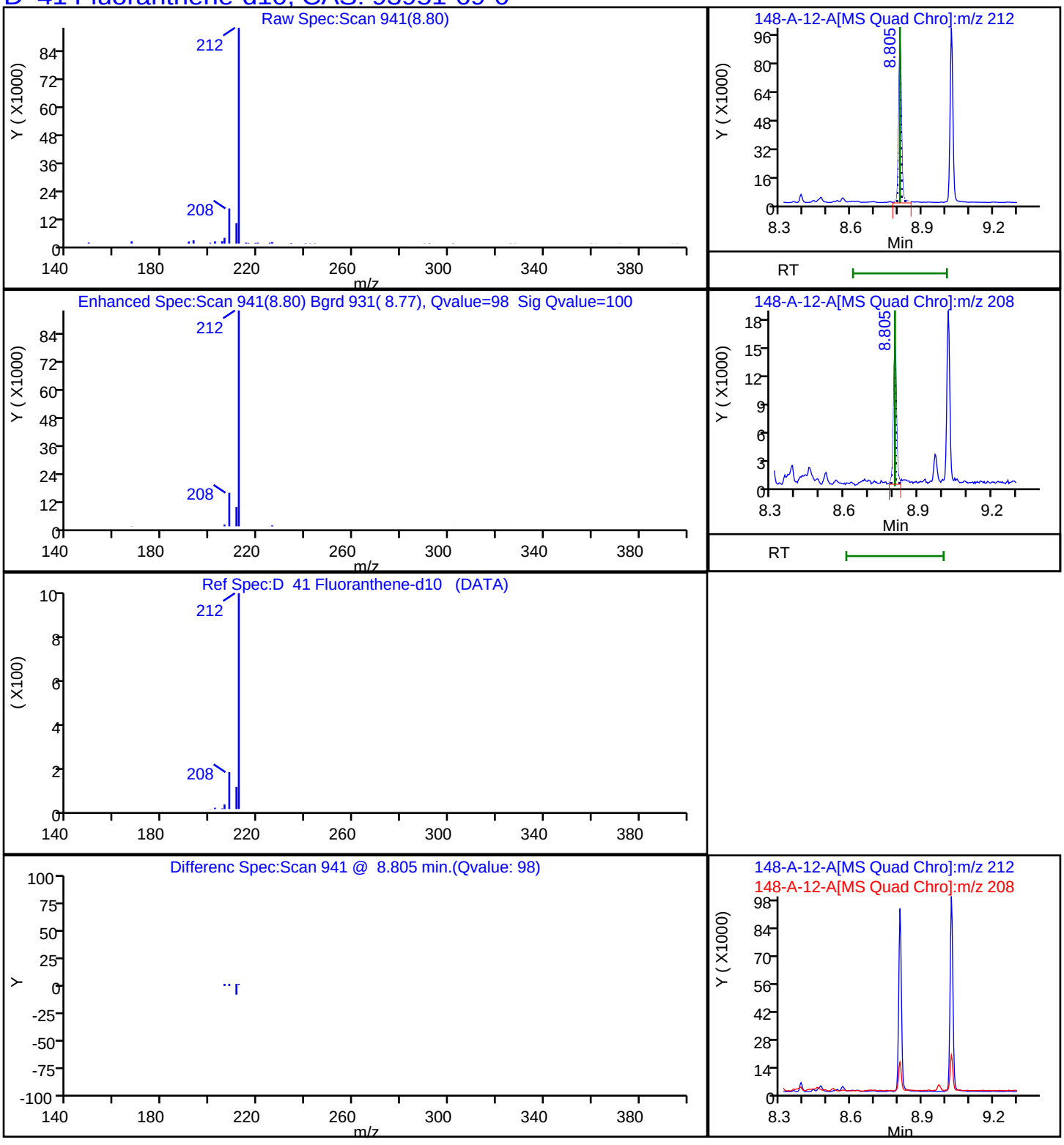
Report Date: 22-Nov-2023 11:26:28 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D

Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D_41 Fluoranthene-d10, CAS: 93951-69-0



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Eurofins Knoxville

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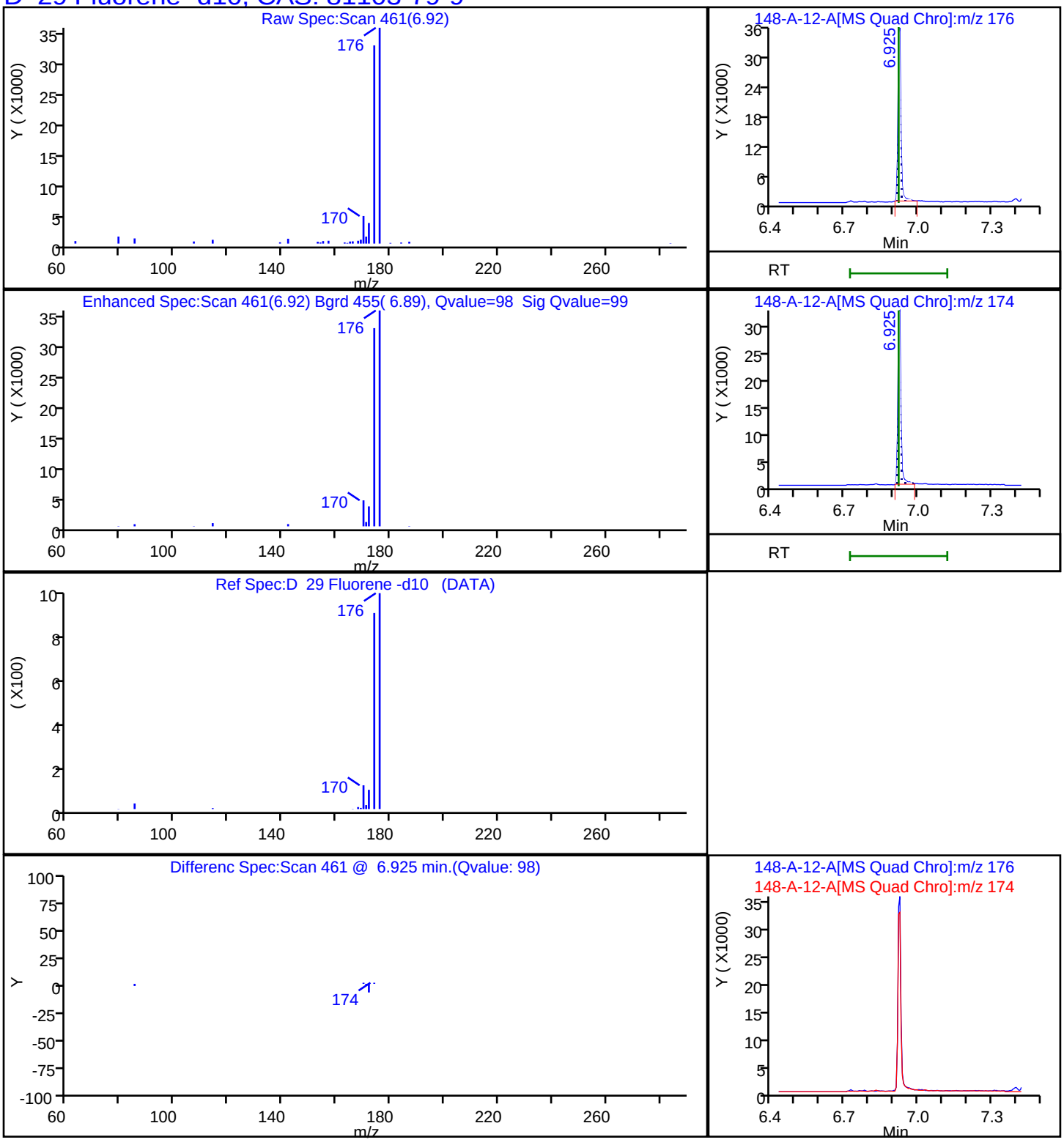
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 29 Fluorene -d10, CAS: 81103-79-9



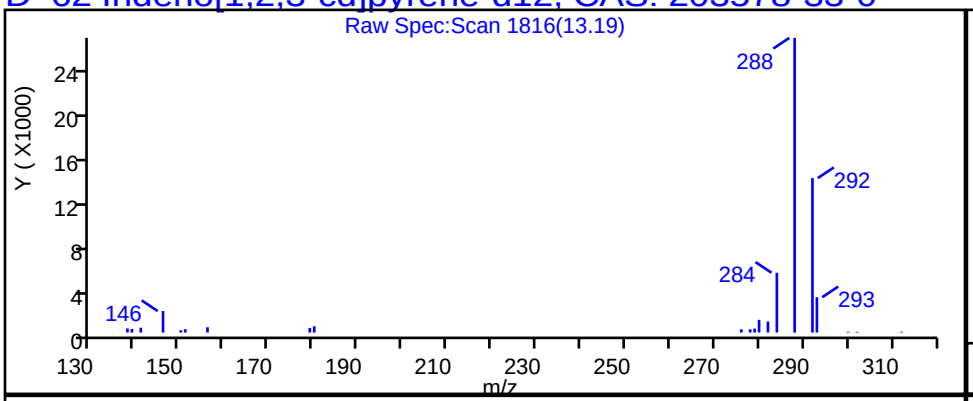
Report Date: 22-Nov-2023 11:26:29 Chrom Revision: 2.3 15-Nov-2023 20:54:34

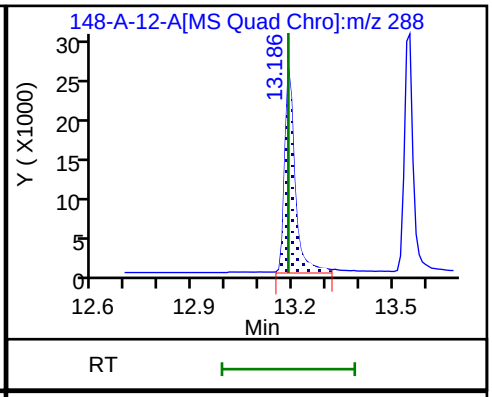
Eurofins Knoxville

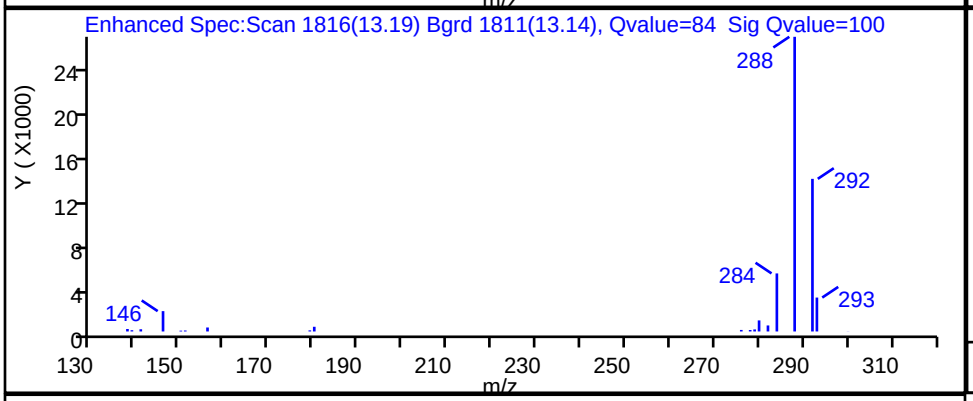
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D

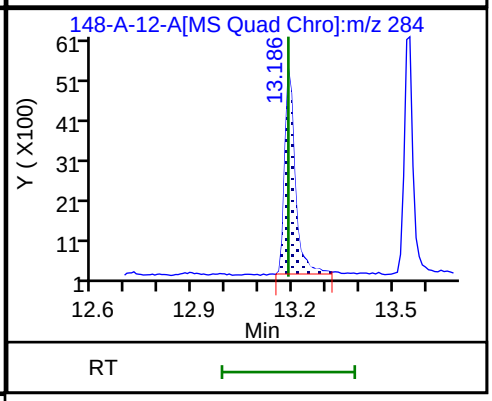
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

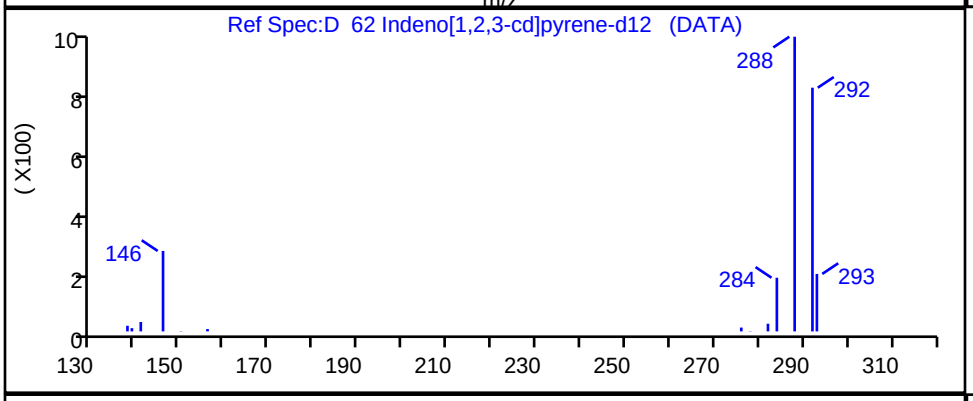
D 62 Indeno[1,2,3-cd]pyrene-d12, CAS: 203578-33-0

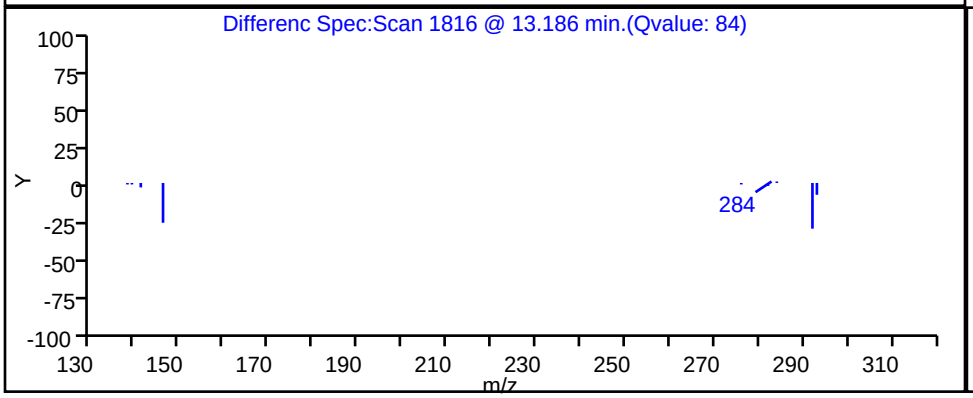


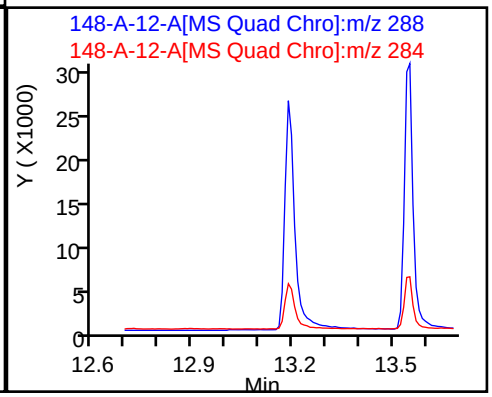










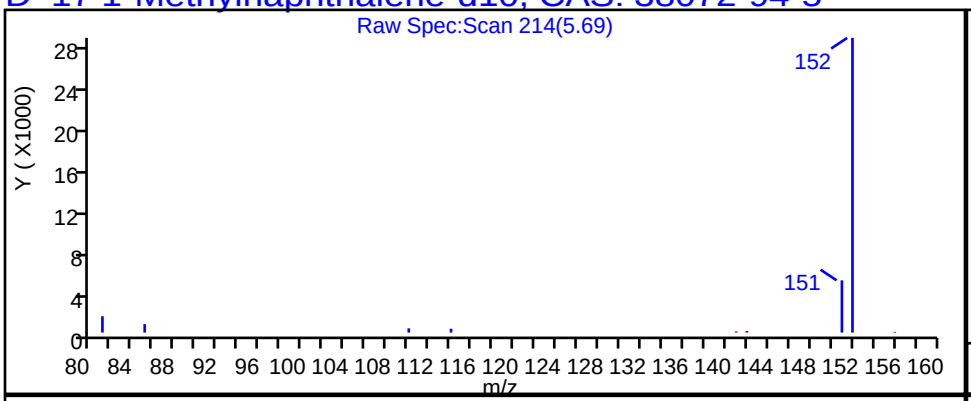


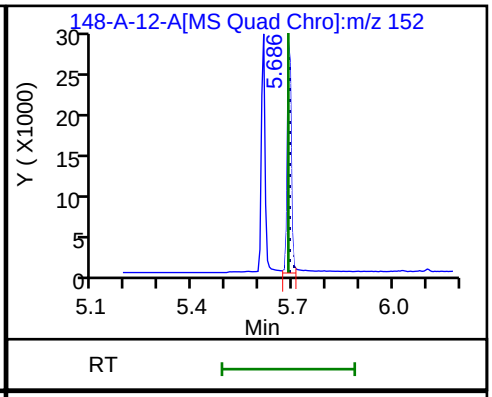
Report Date: 22-Nov-2023 11:26:28 Chrom Revision: 2.3 15-Nov-2023 20:54:34

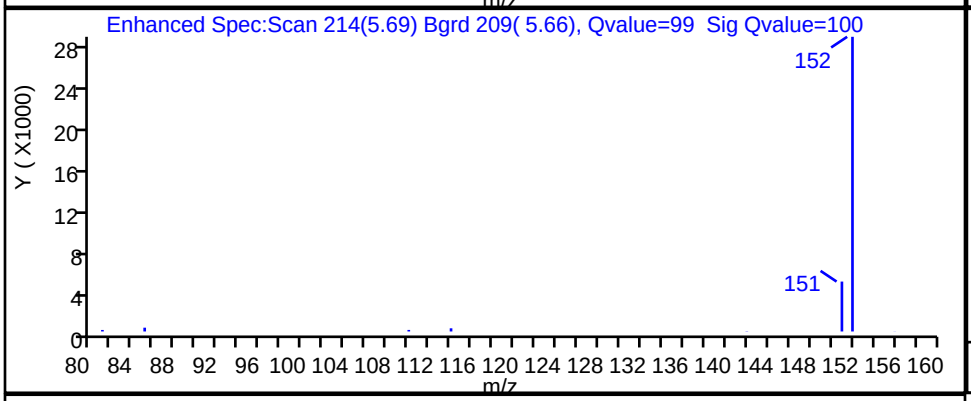
Eurofins Knoxville

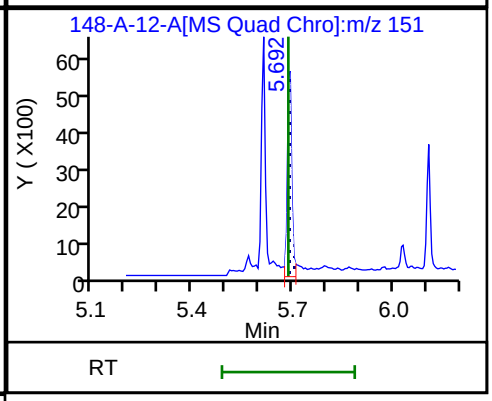
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D				
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

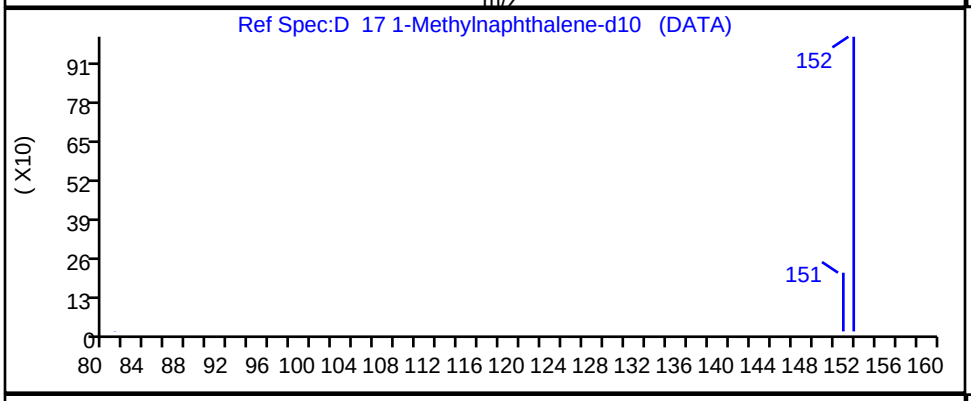
D 17 1-Methylnaphthalene-d10, CAS: 38072-94-5

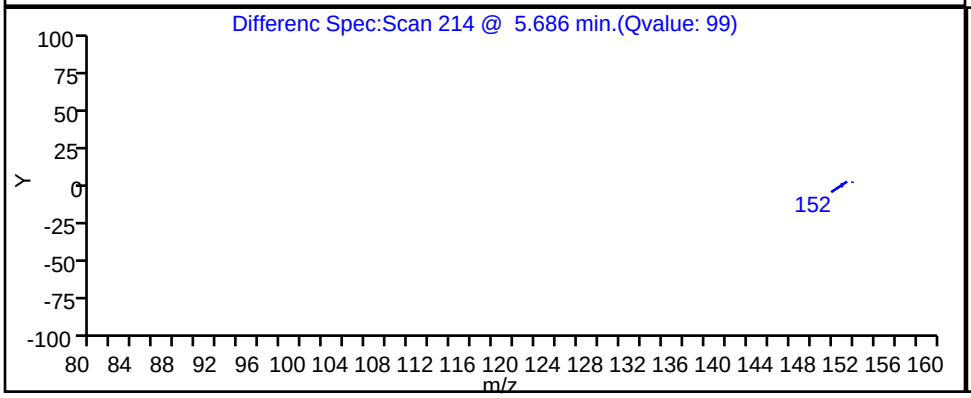


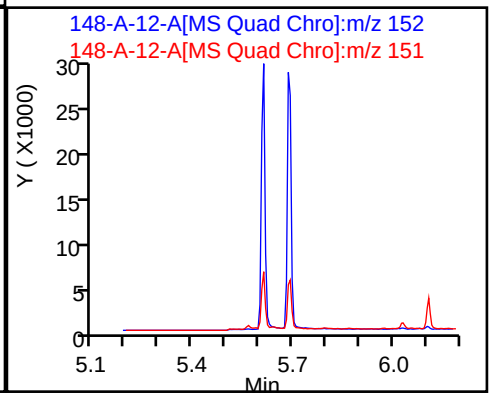












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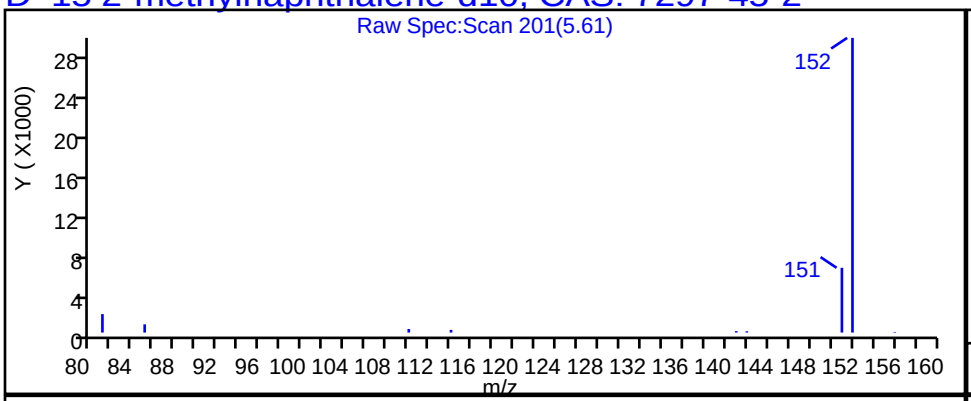
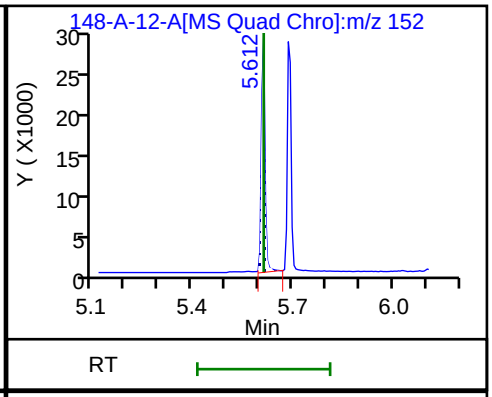
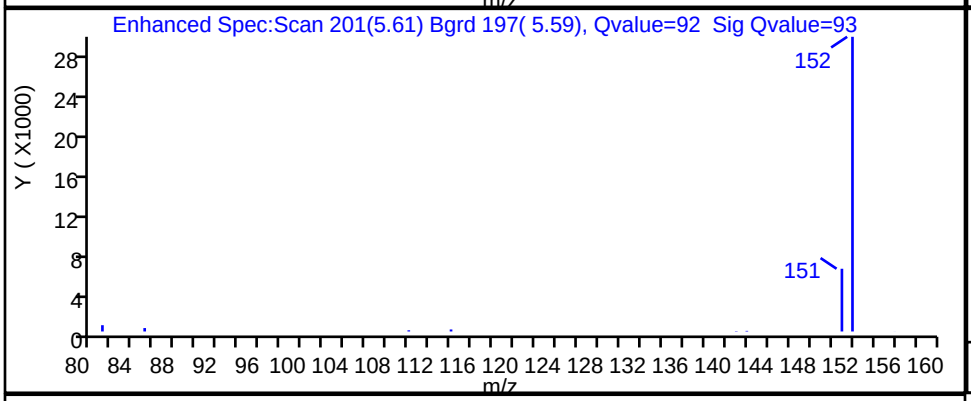
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D

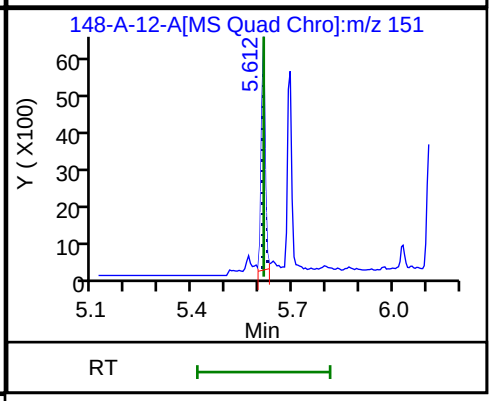
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

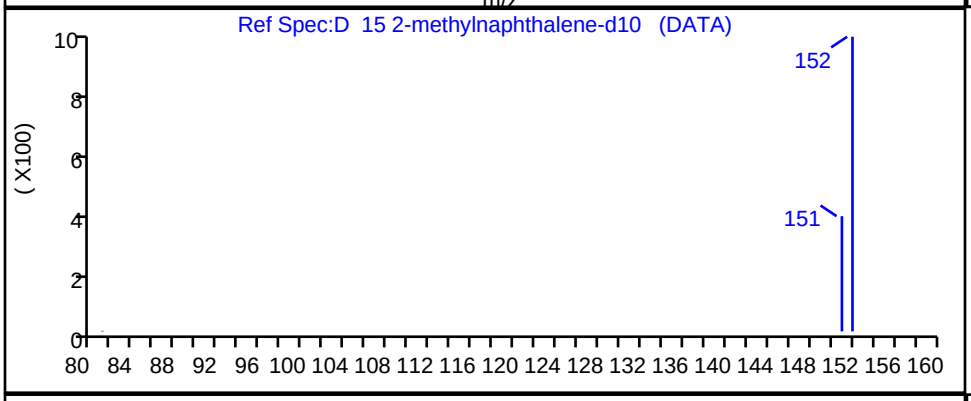
D 15 2-methylnaphthalene-d10, CAS: 7297-45-2

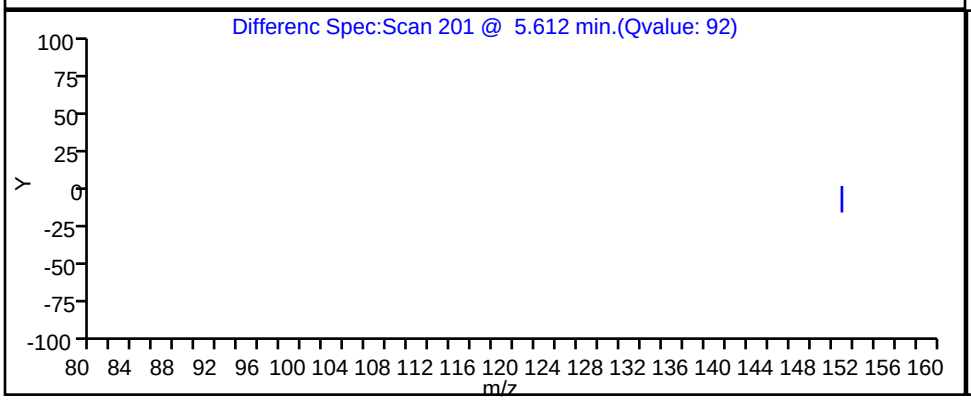


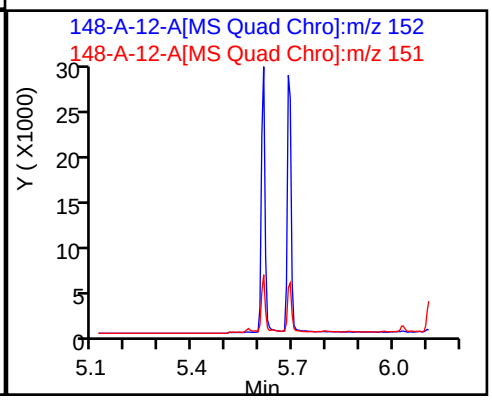












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Eurofins Knoxville

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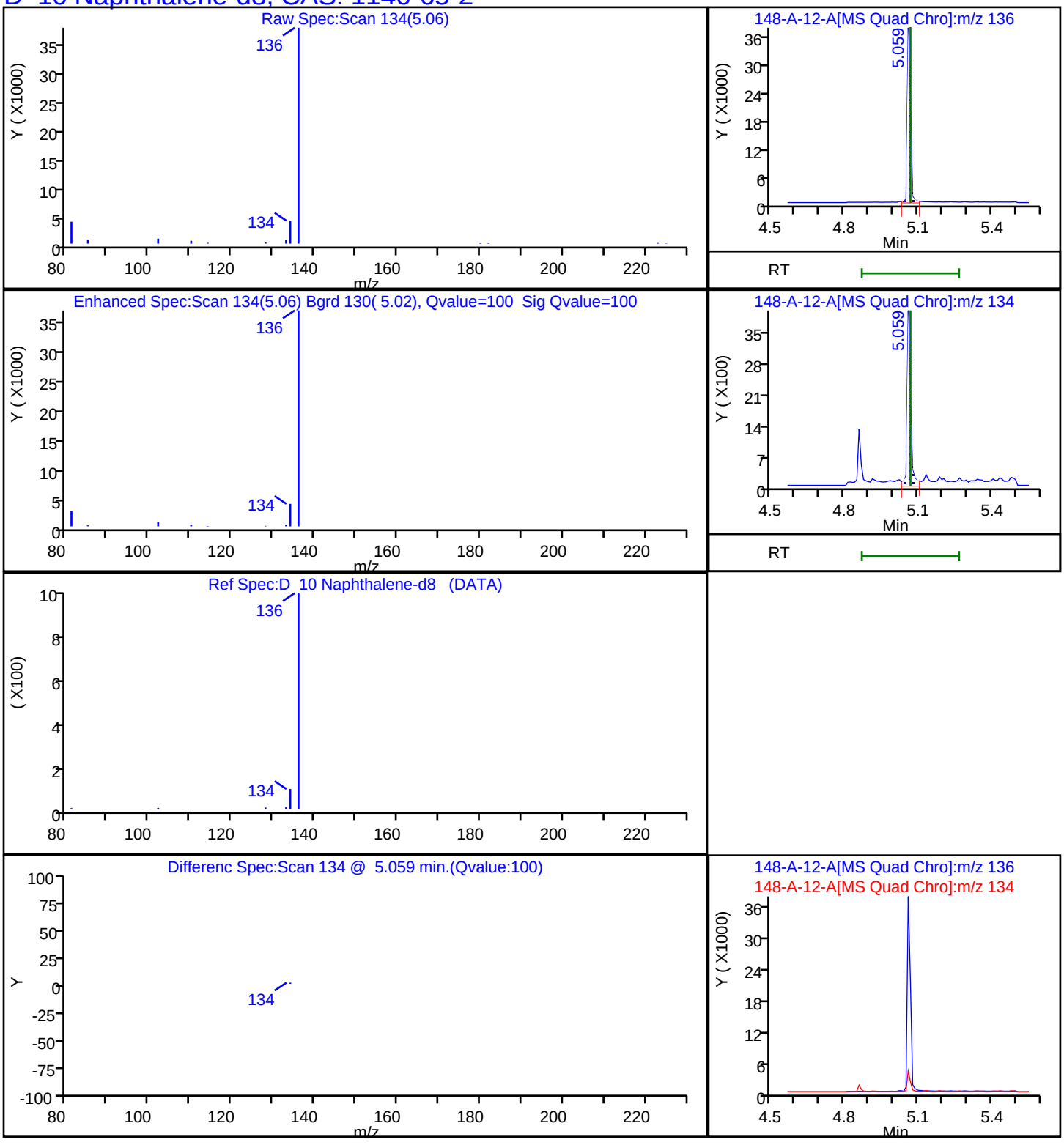
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D_10 Naphthalene-d8, CAS: 1146-65-2



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Eurofins Knoxville

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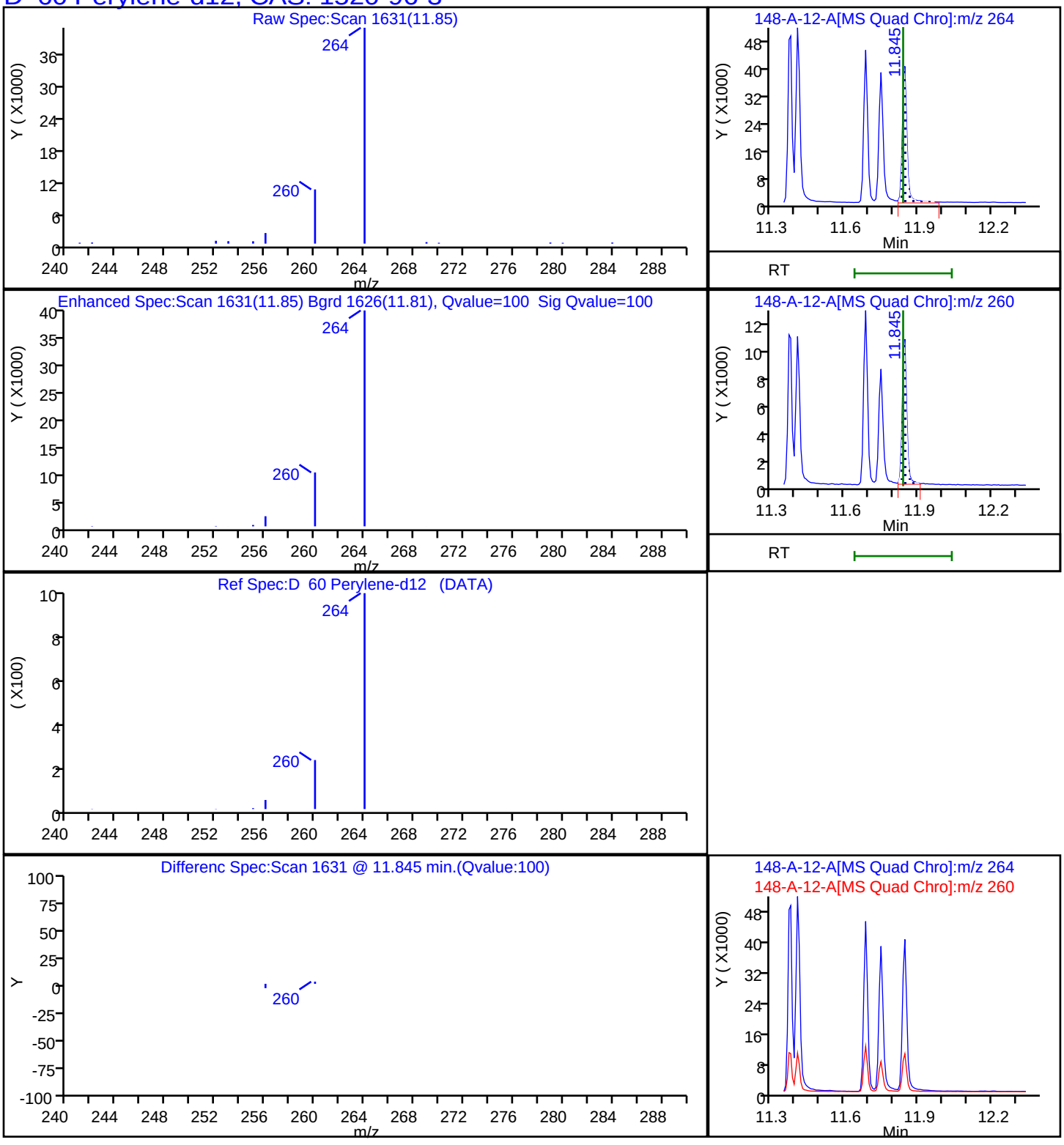
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 60 Perylene-d12, CAS: 1520-96-3



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Eurofins Knoxville

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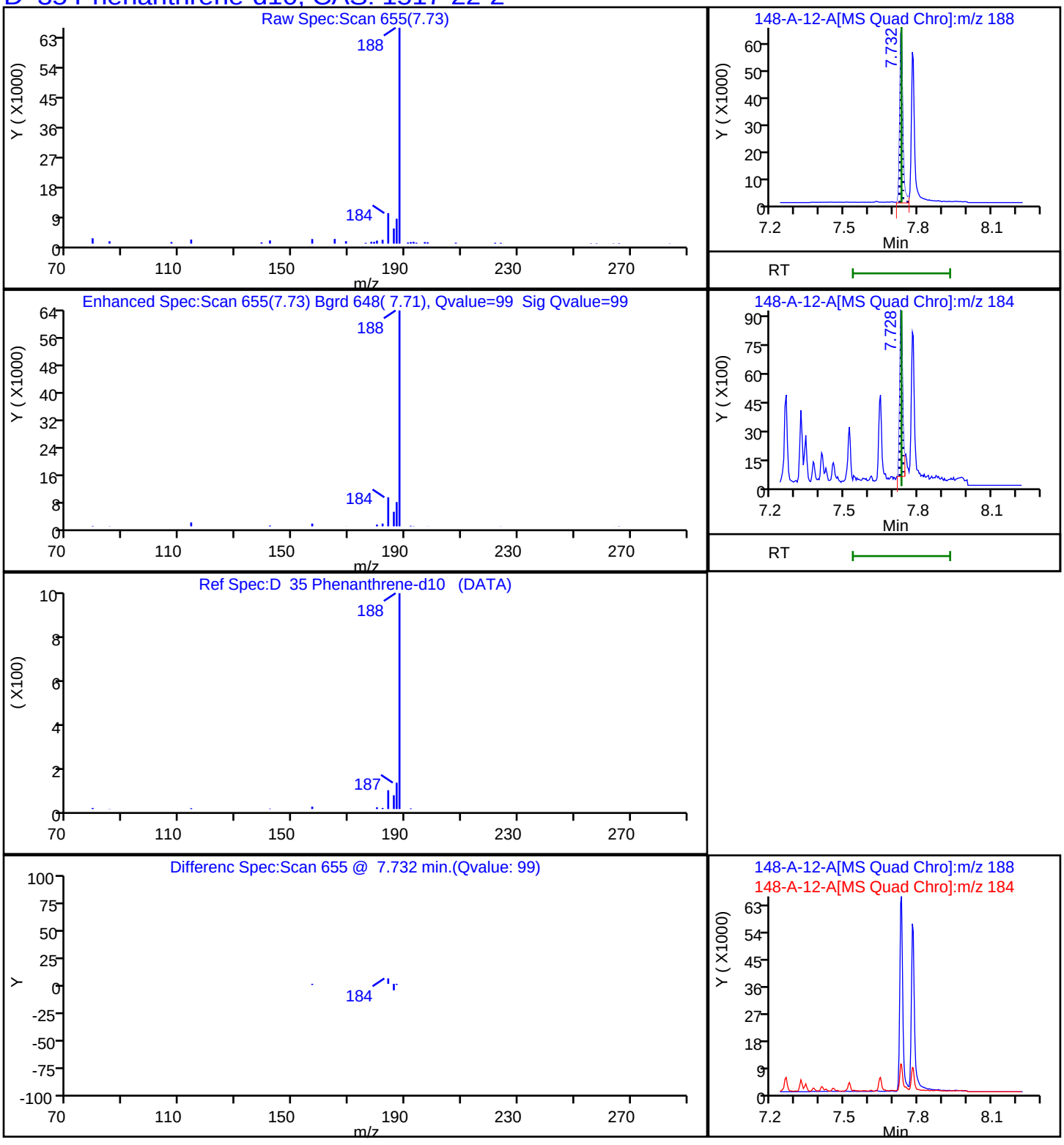
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15
Client ID:	1804576-846-S3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

D_35 Phenanthrene-d10, CAS: 1517-22-2



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Eurofins Knoxville

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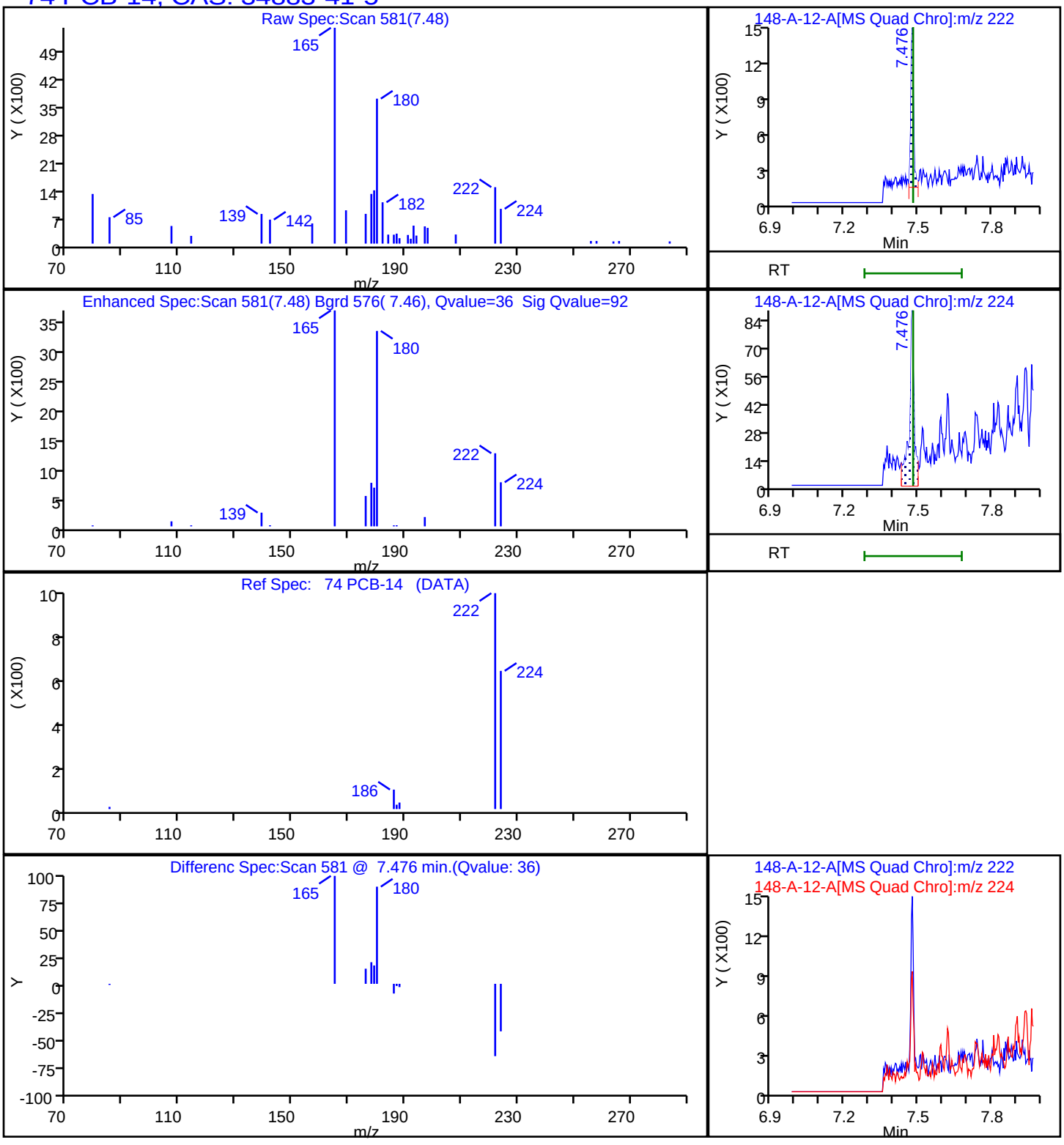
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15
Client ID:	1804576-846-S3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

74 PCB-14, CAS: 34883-41-5



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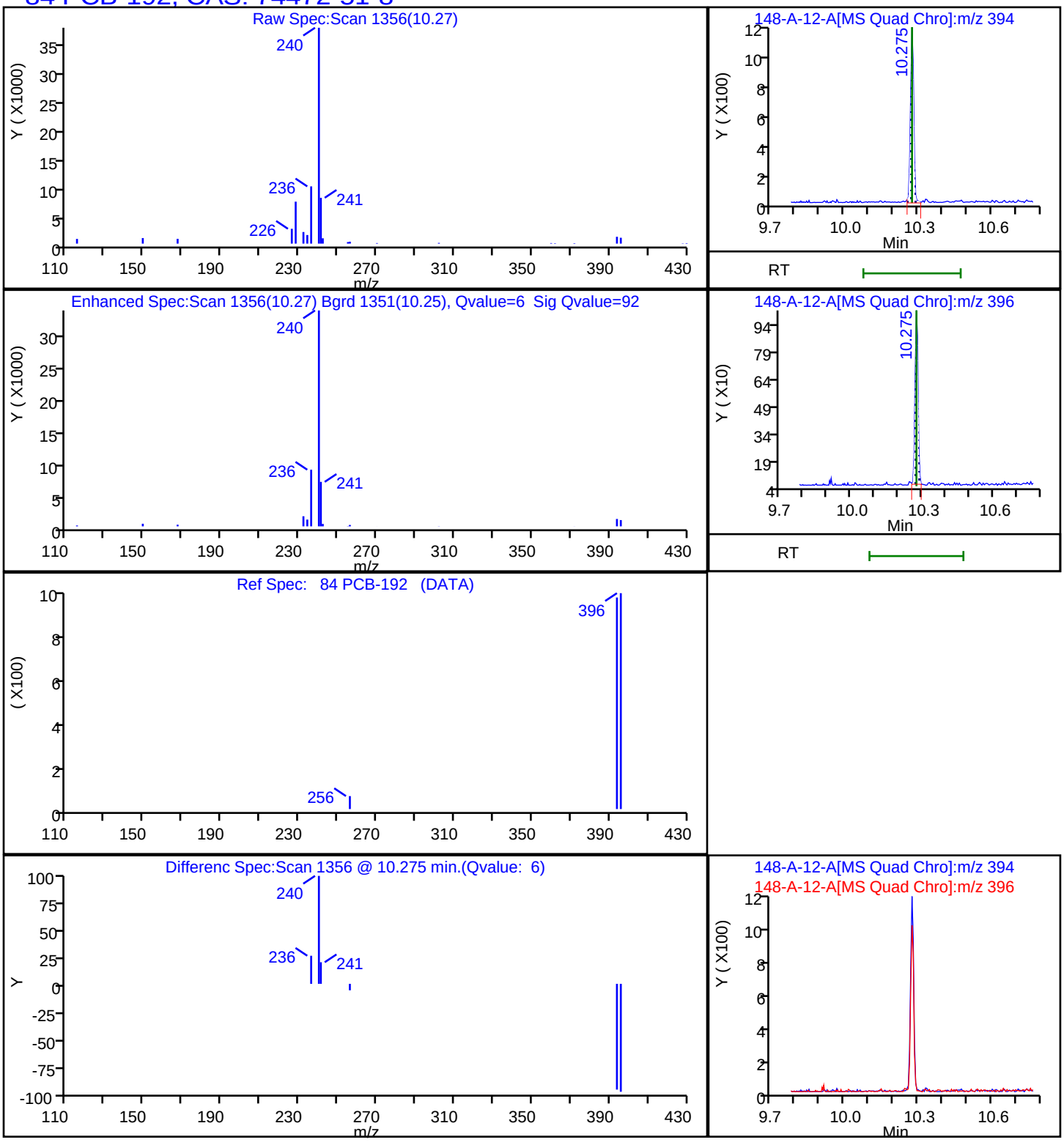
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

84 PCB-192, CAS: 74472-51-8



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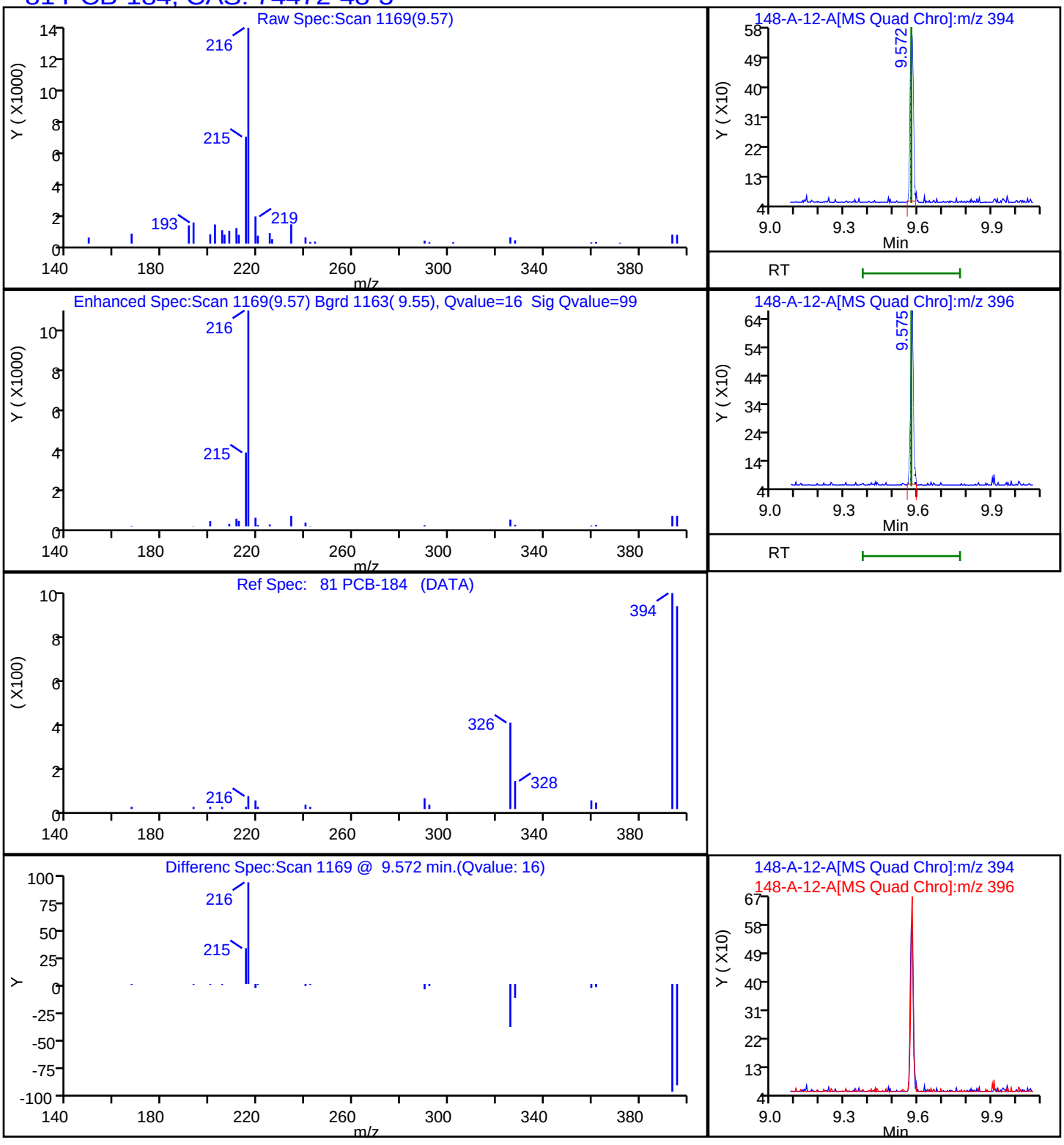
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D

Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15
Client ID:	1804576-846-S3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

81 PCB-184, CAS: 74472-48-3



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Eurofins Knoxville

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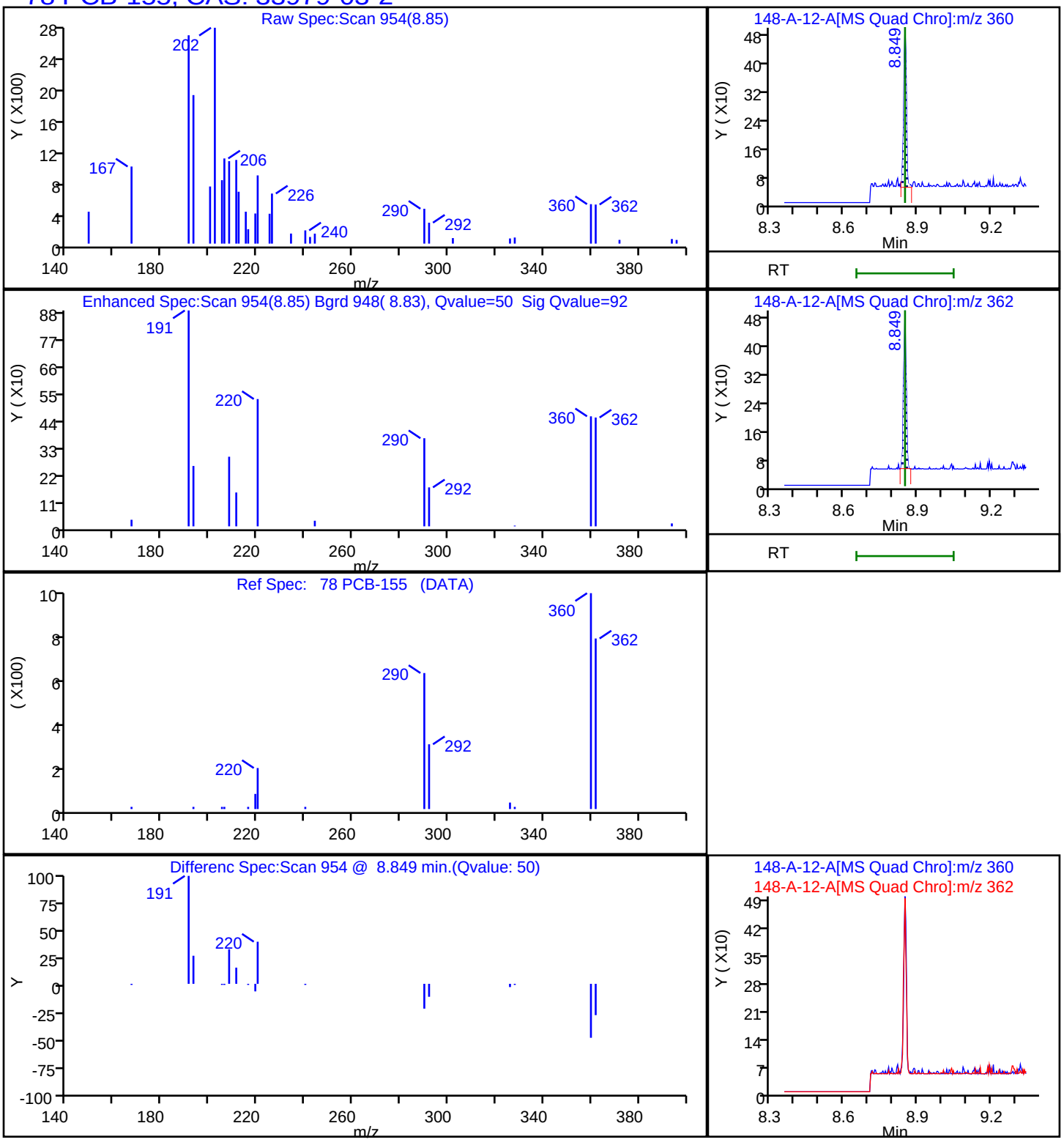
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

78 PCB-155, CAS: 33979-03-2



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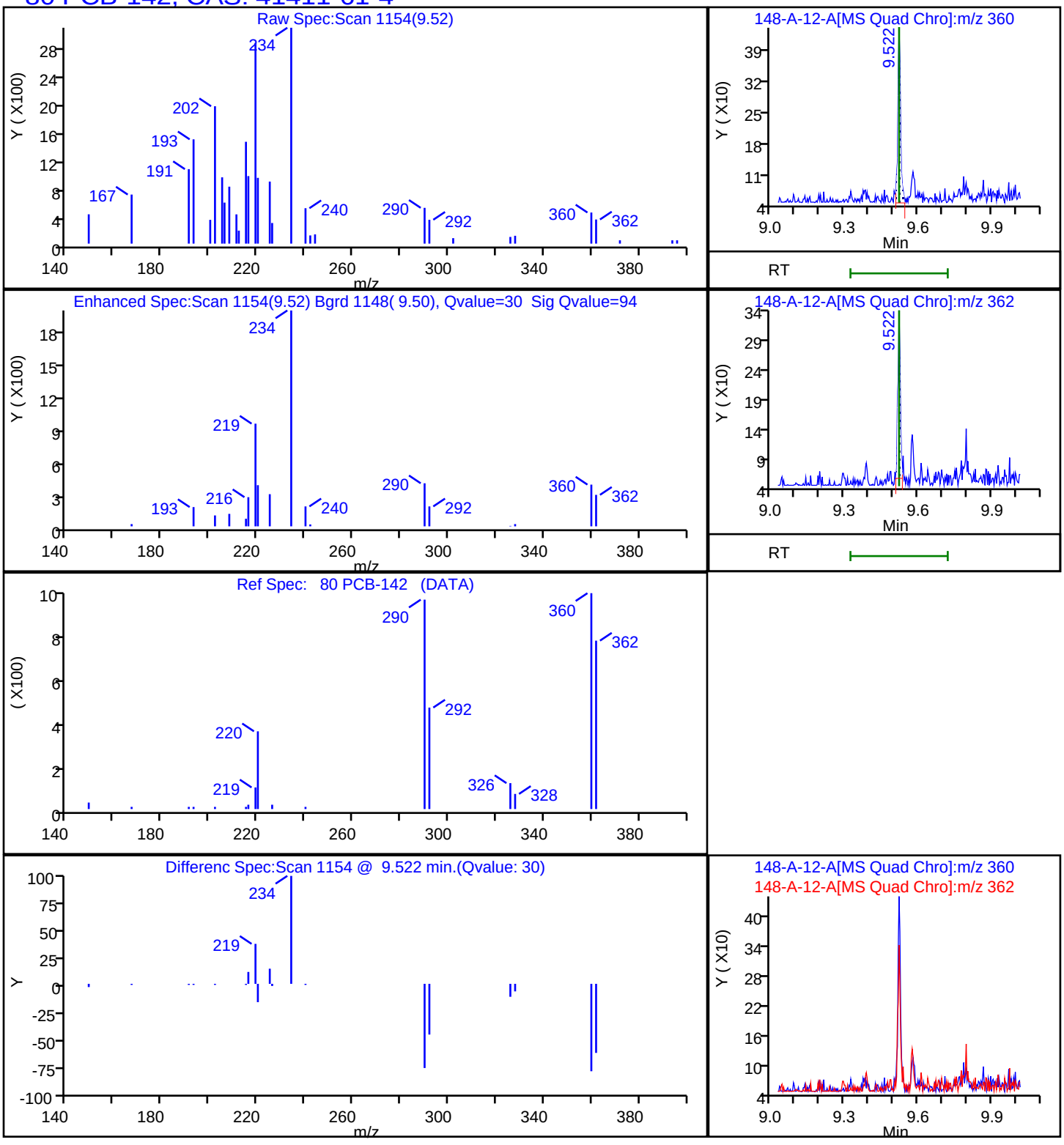
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15
Client ID:	1804576-846-S3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

80 PCB-142, CAS: 41411-61-4



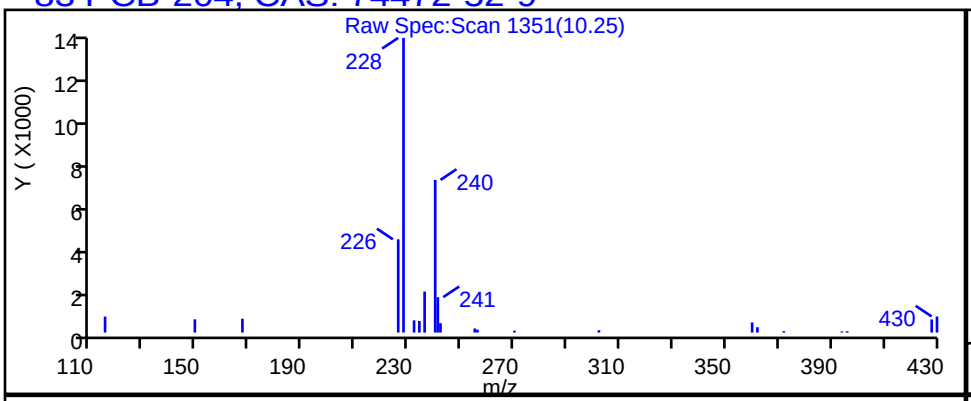
Report Date: 22-Nov-2023 11:26:29 Chrom Revision: 2.3 15-Nov-2023 20:54:34

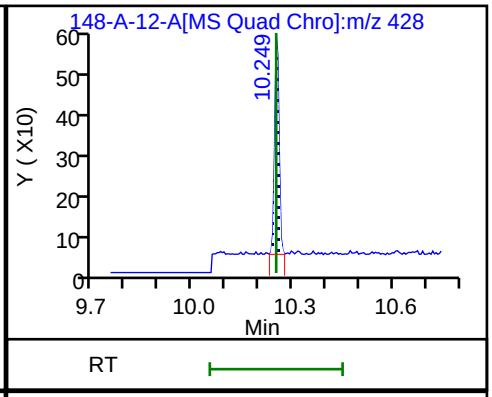
Eurofins Knoxville

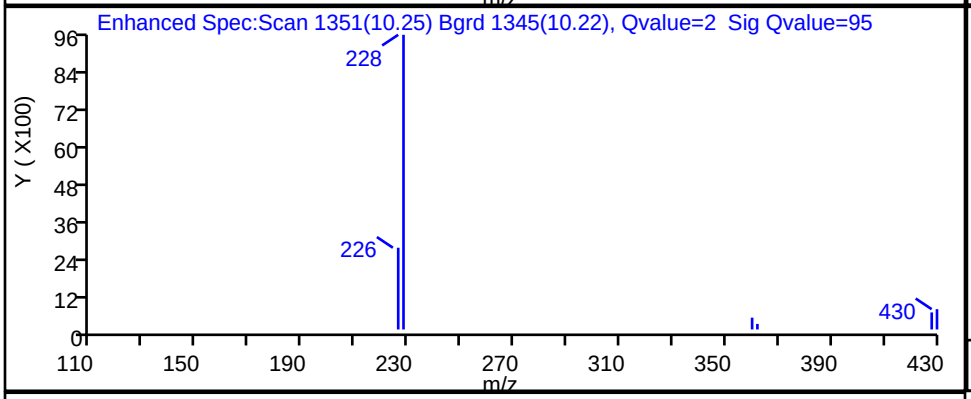
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D

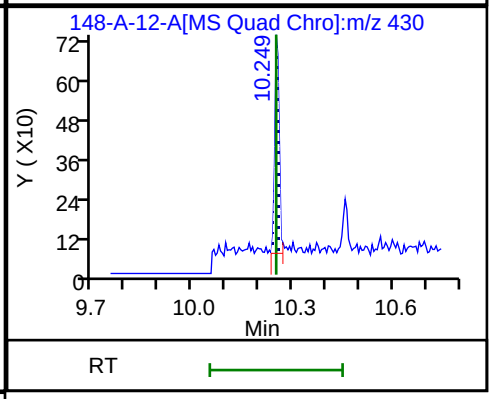
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

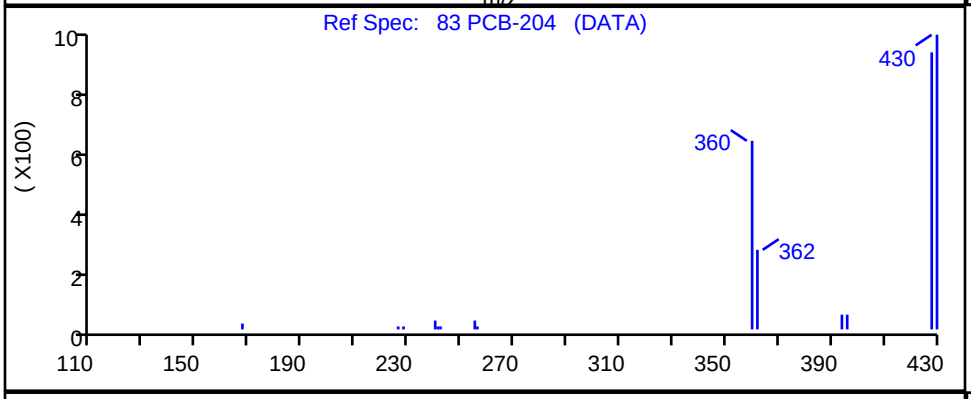
83 PCB-204, CAS: 74472-52-9

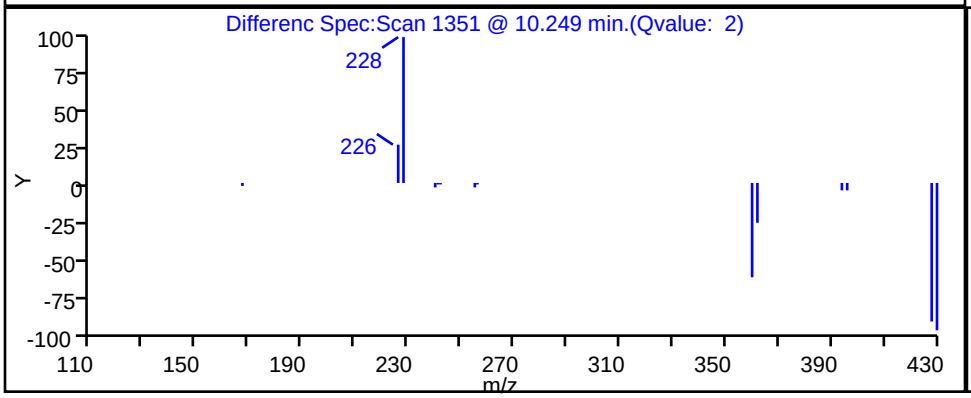


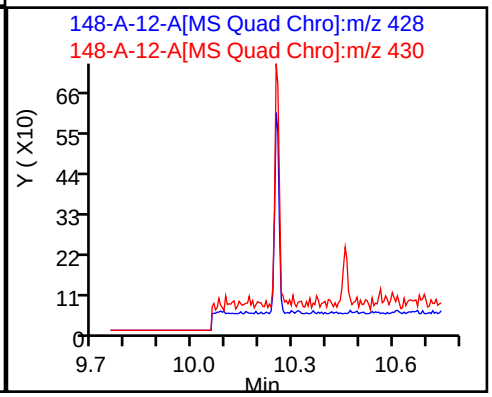












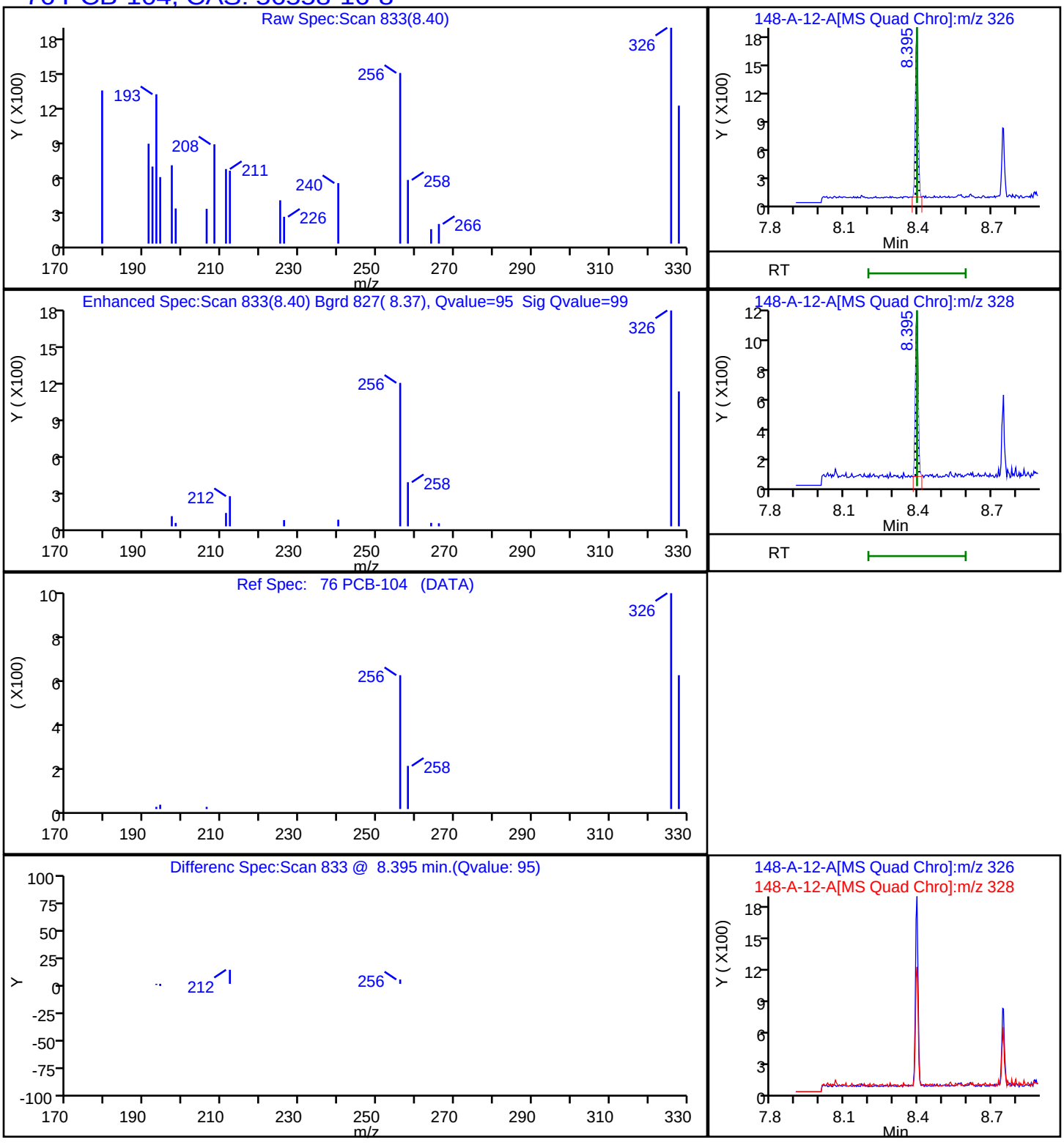
Report Date: 22-Nov-2023 11:26:29 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D

Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

76 PCB-104, CAS: 56558-16-8

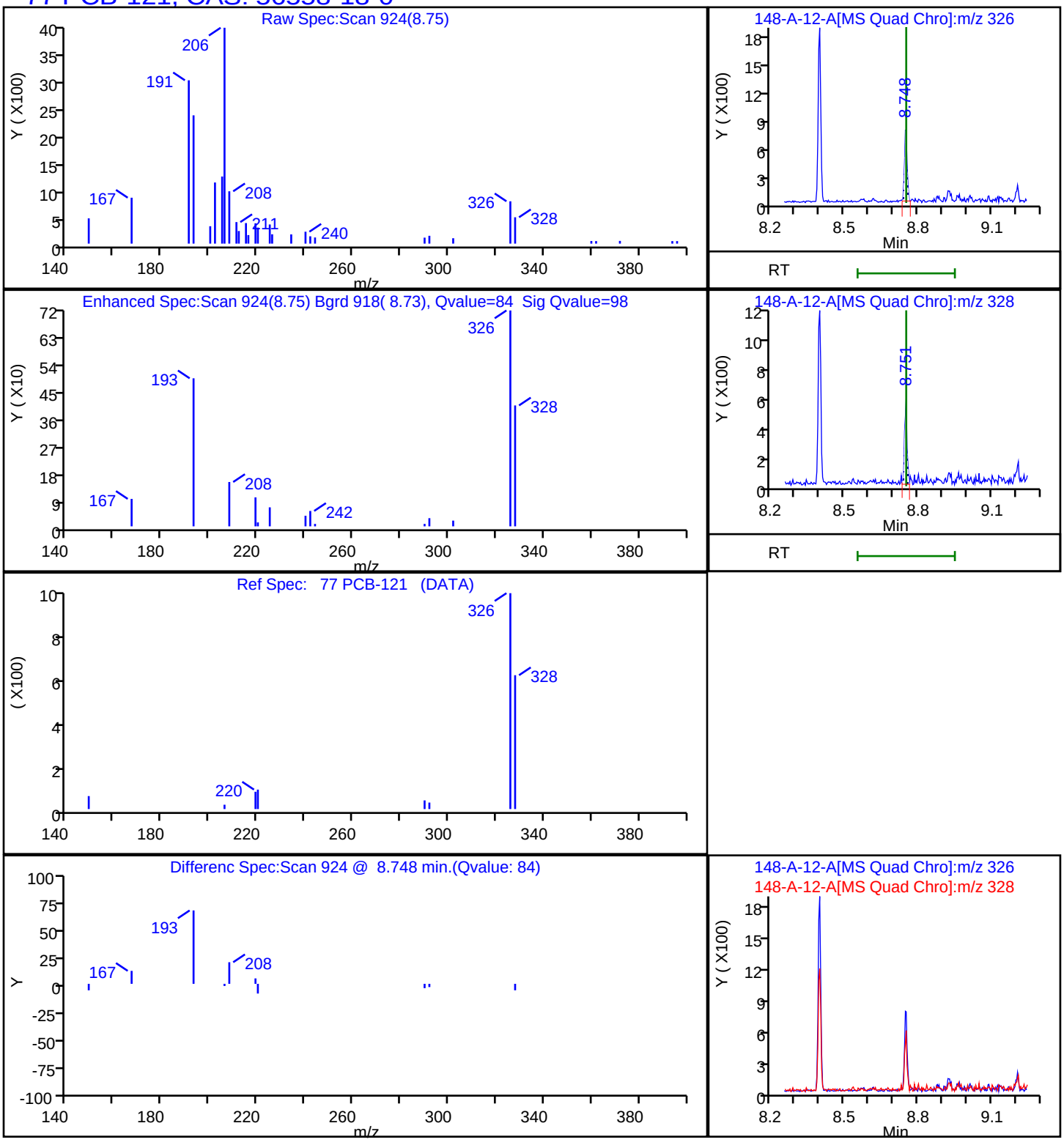


Report Date: 22-Nov-2023 11:26:29 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D		
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15
Client ID:	1804576-846-S3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

77 PCB-121, CAS: 56558-18-0



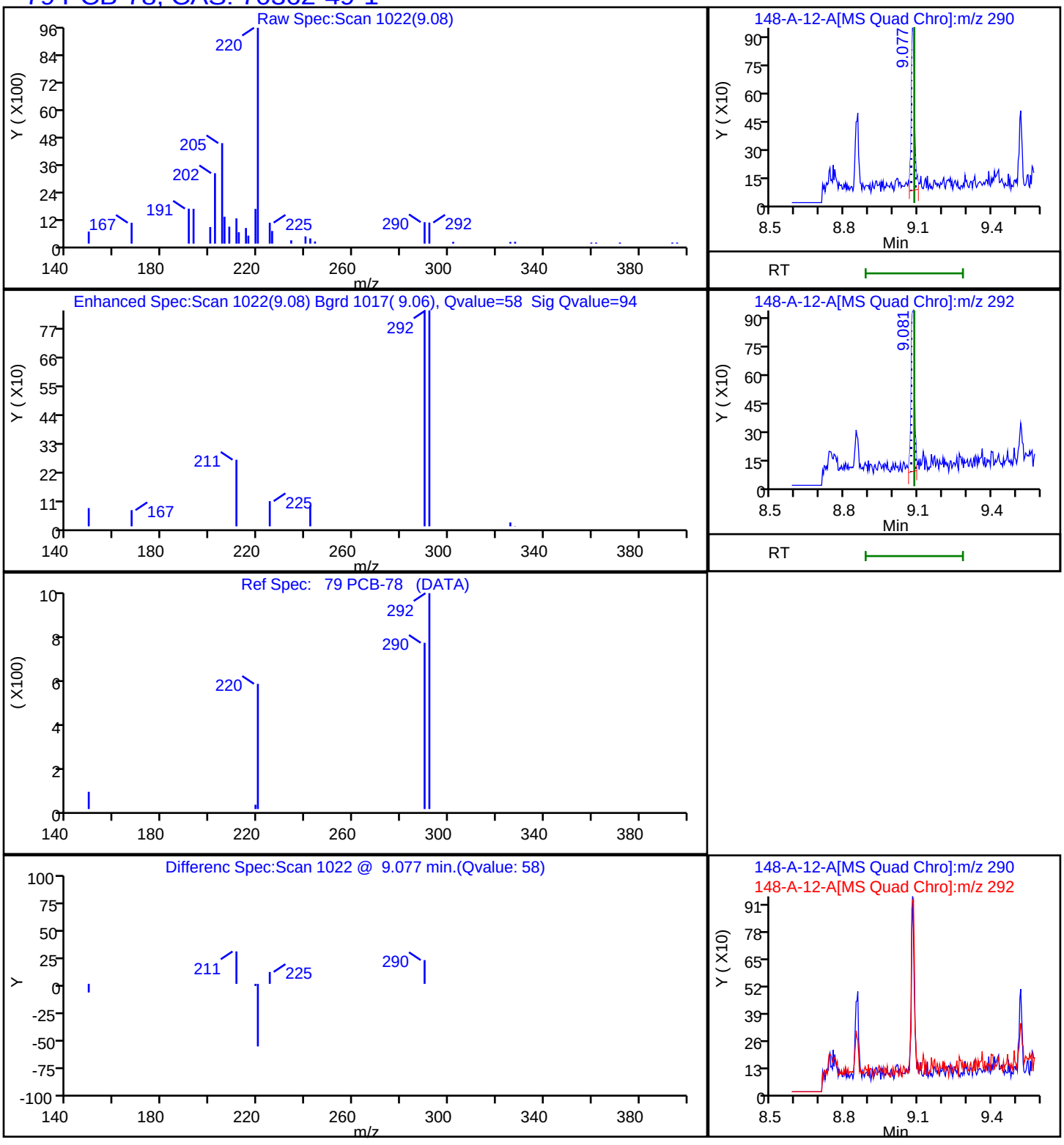
Report Date: 22-Nov-2023 11:26:29 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D

Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15
Client ID:	1804576-846-S3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

79 PCB-78, CAS: 70362-49-1



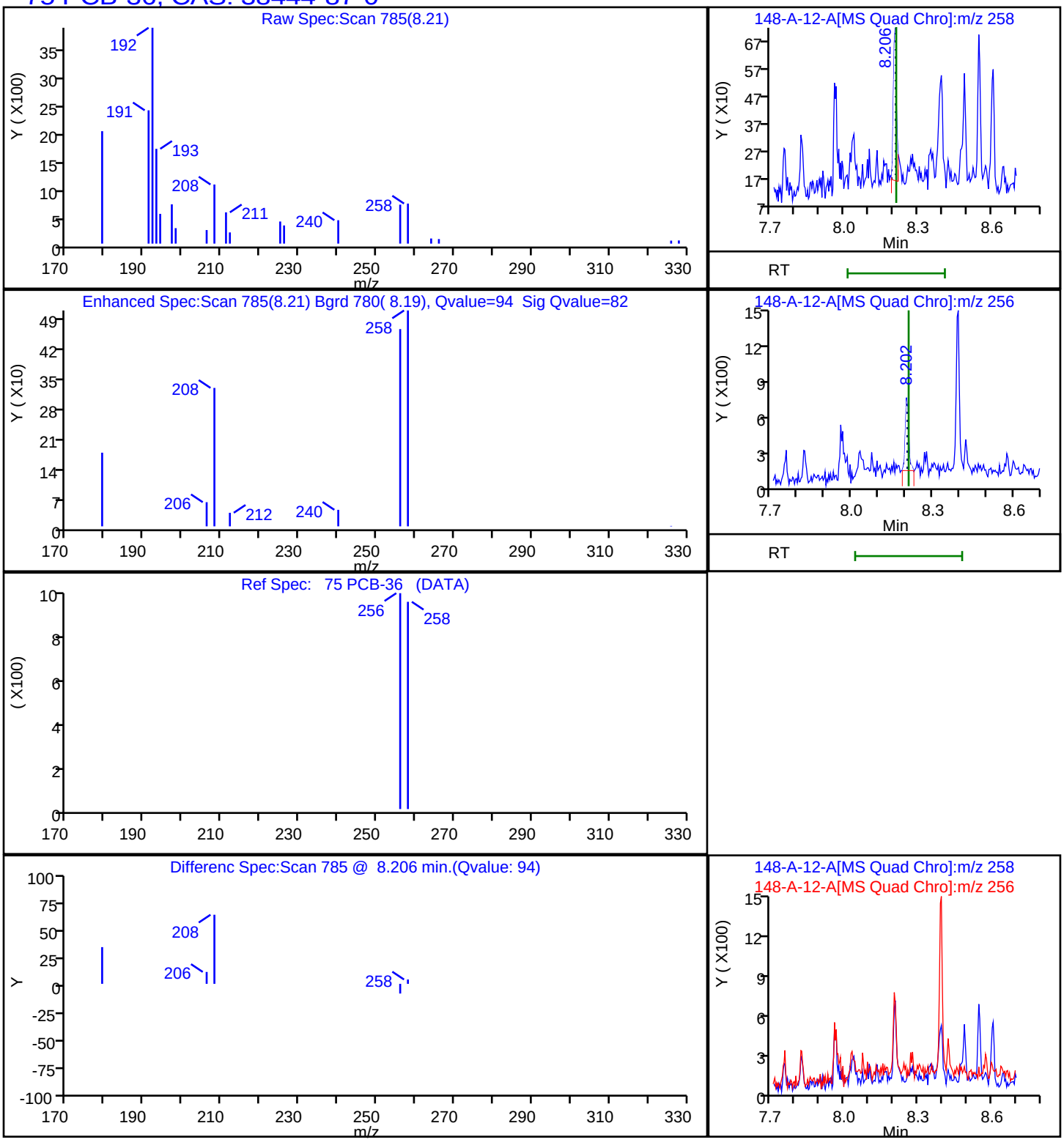
Report Date: 22-Nov-2023 11:26:29 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D

Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15
Client ID:	1804576-846-S3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

75 PCB-36, CAS: 38444-87-0



Eurofins Knoxville

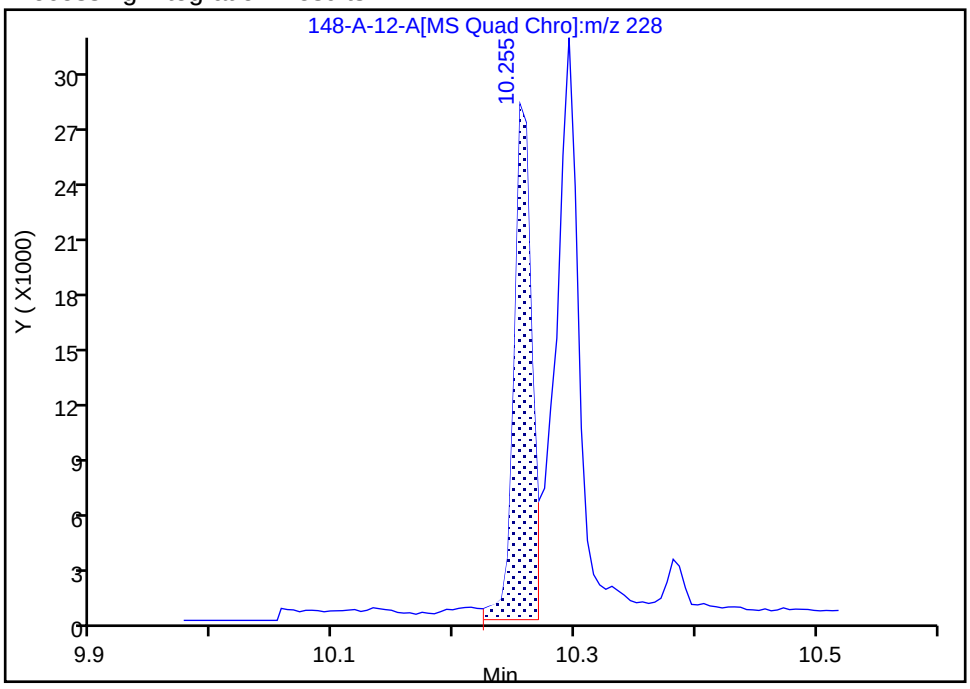
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D				
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

47 Benzo[a]anthracene, CAS: 56-55-3

Signal: 1

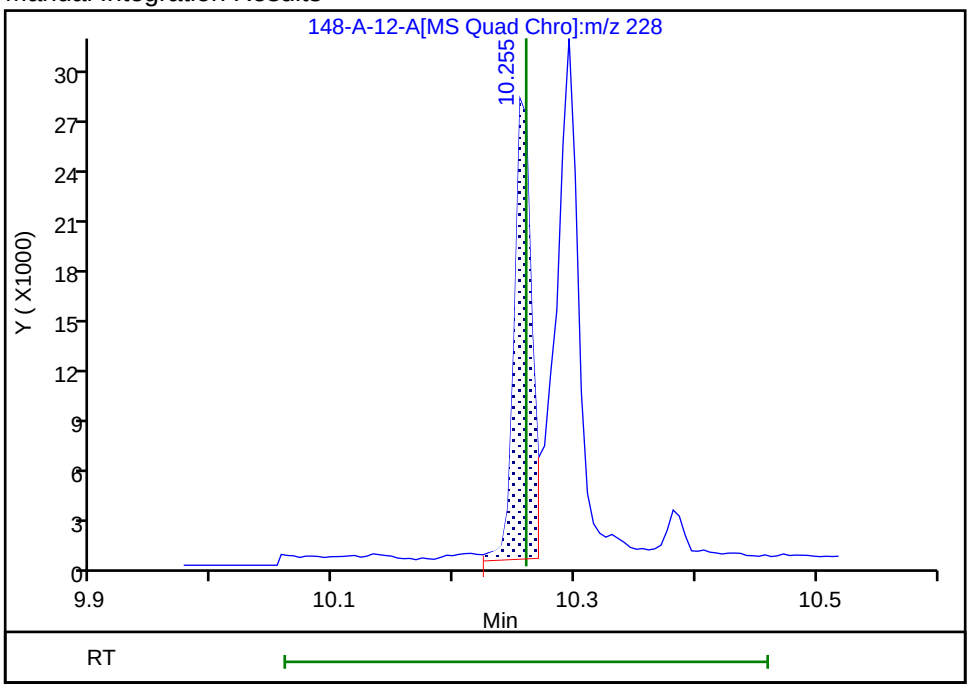
Processing Integration Results

RT: 10.25
Area: 29433
Amount: 0.165474
Amount Units: ug/ml



Manual Integration Results

RT: 10.25
Area: 28383
Amount: 0.159571
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:27:56 -05:00:00 (UTC)
Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

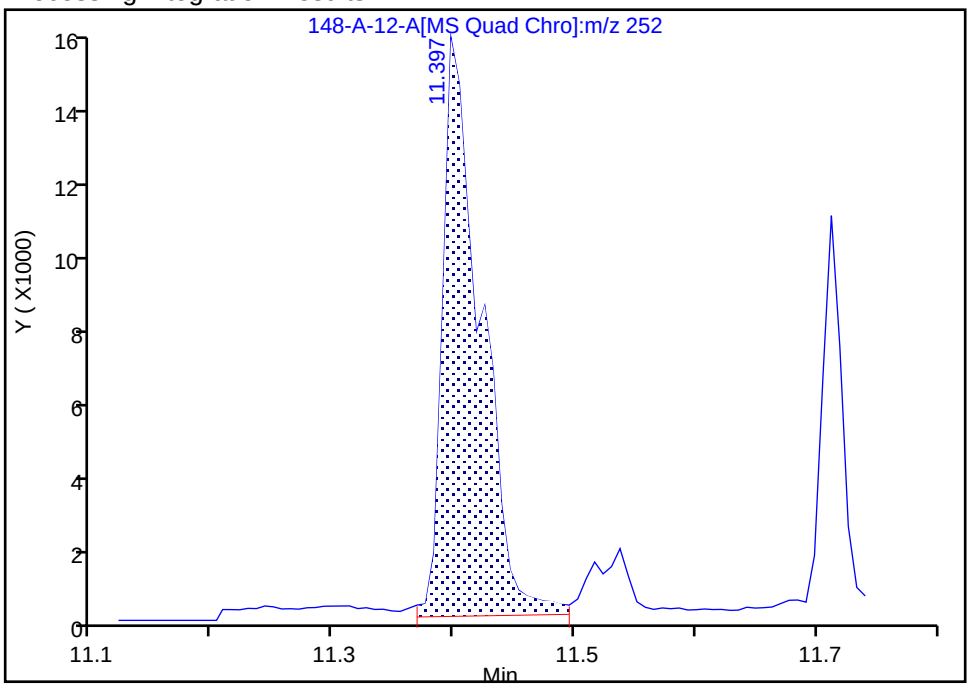
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D				
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

53 Benzo[b]fluoranthene, CAS: 205-99-2

Signal: 1

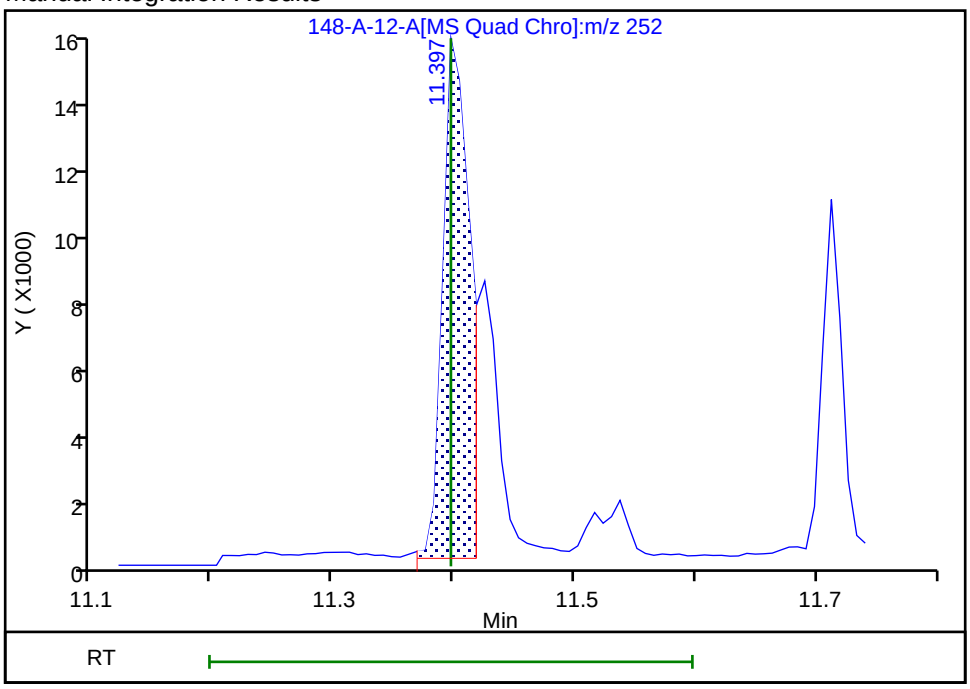
Processing Integration Results

RT: 11.40
Area: 33894
Amount: 0.168301
Amount Units: ug/ml



Manual Integration Results

RT: 11.40
Area: 24178
Amount: 0.120056
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:28:41 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

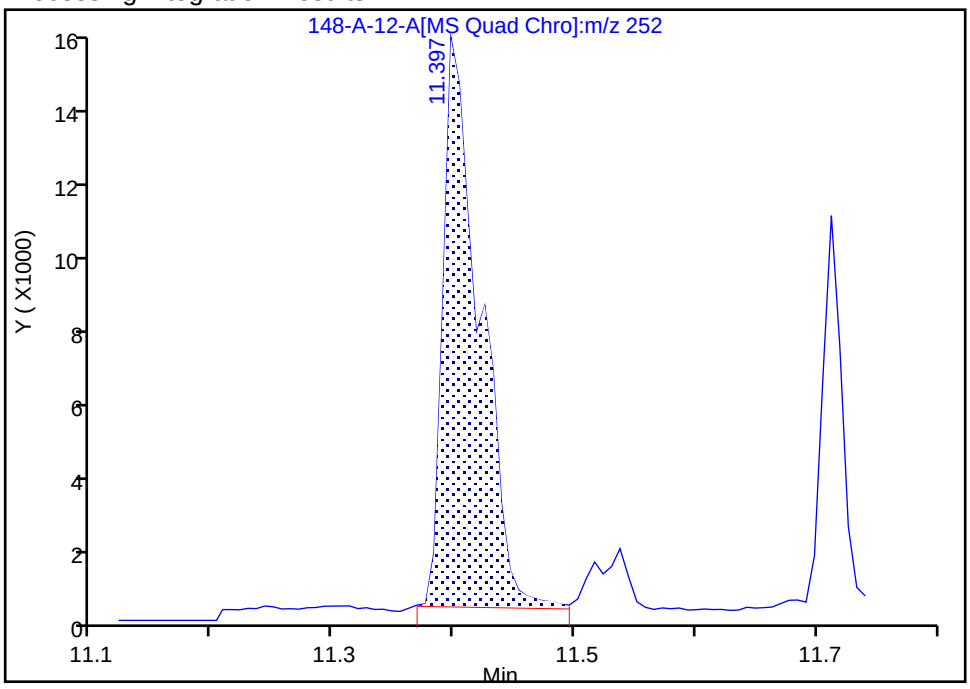
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D				
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

55 Benzo[k]fluoranthene, CAS: 207-08-9

Signal: 1

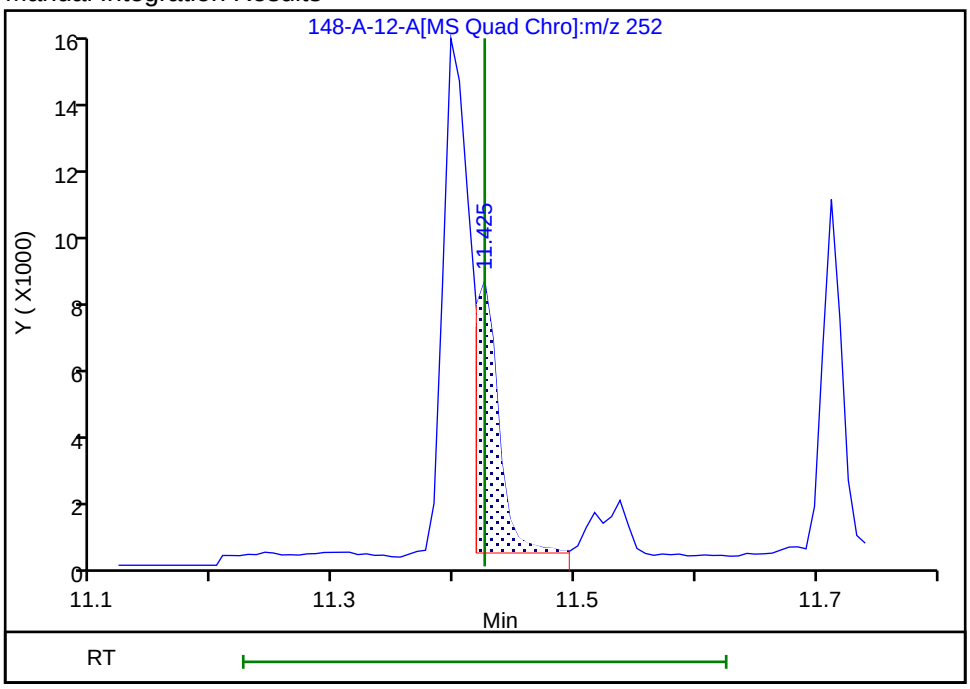
Processing Integration Results

RT: 11.40
Area: 31819
Amount: 0.167566
Amount Units: ug/ml



Manual Integration Results

RT: 11.43
Area: 11263
Amount: 0.059313
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:28:53 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

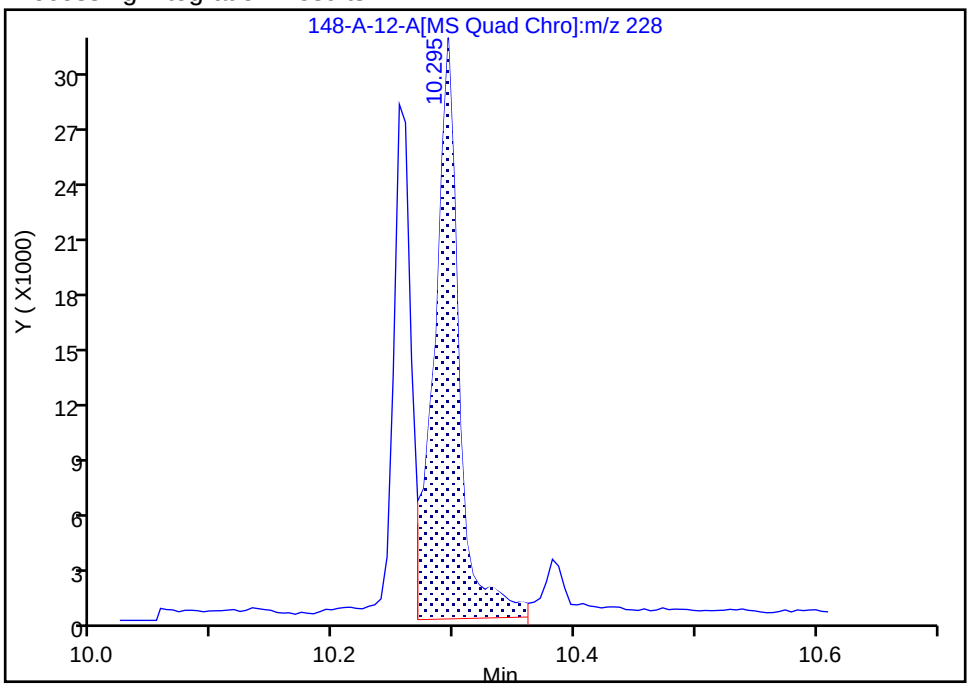
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D				
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

50 Chrysene, CAS: 218-01-9

Signal: 1

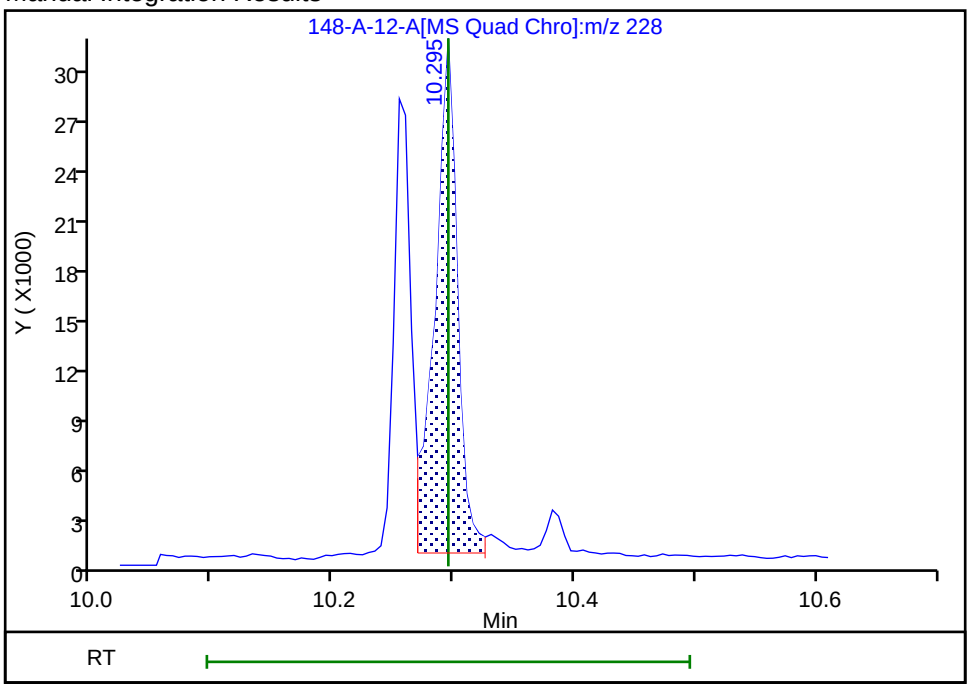
Processing Integration Results

RT: 10.30
Area: 45532
Amount: 0.228399
Amount Units: ug/ml



Manual Integration Results

RT: 10.30
Area: 40744
Amount: 0.204381
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:28:12 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

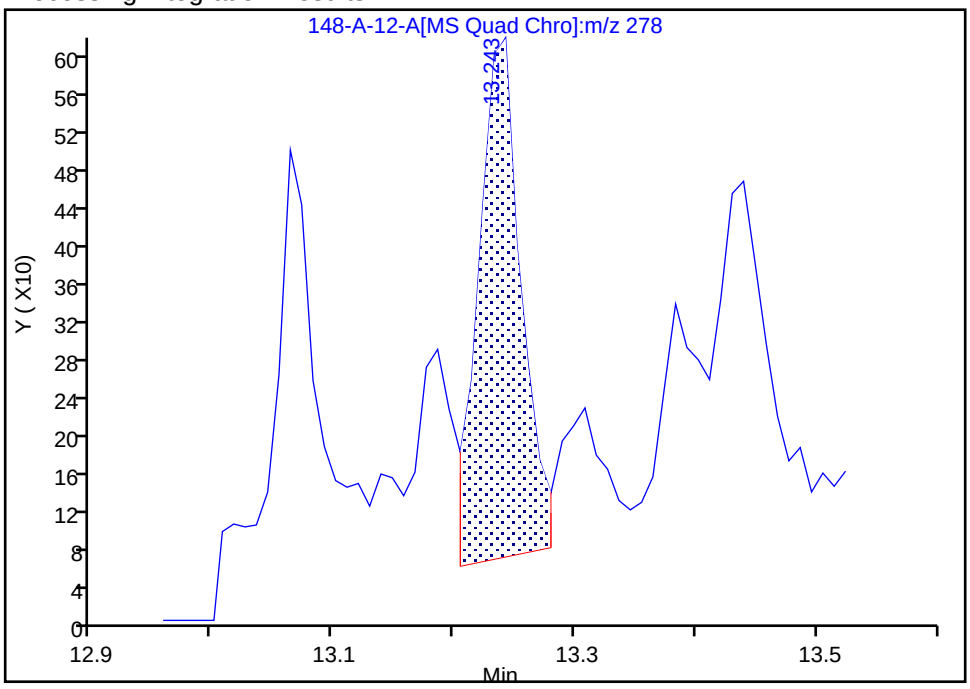
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D				
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

66 Dibenz(a,h)anthracene, CAS: 53-70-3

Signal: 1

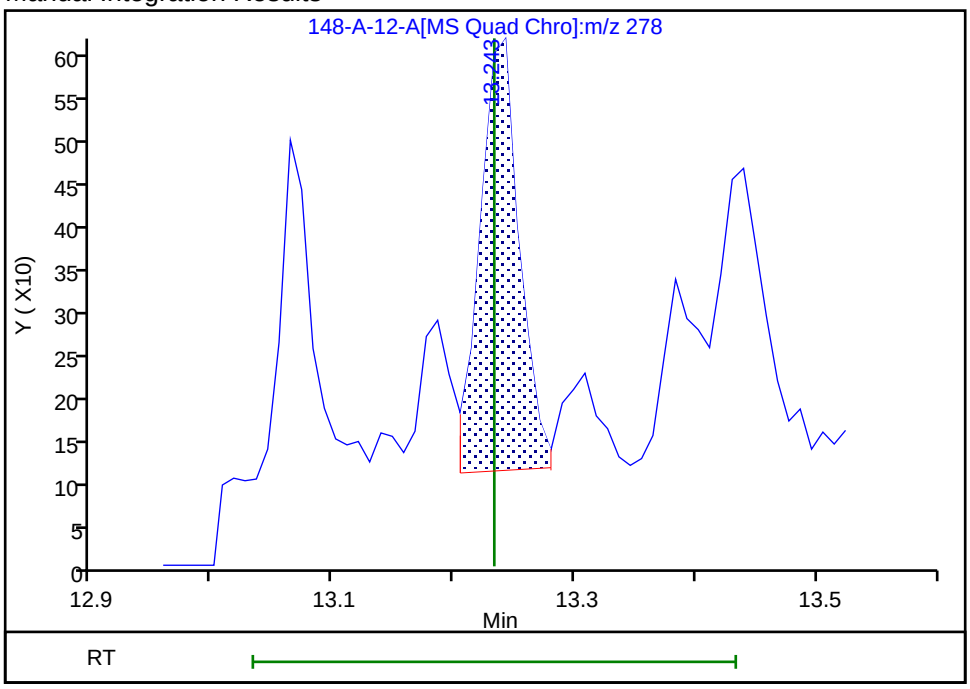
Processing Integration Results

RT: 13.24
Area: 1387
Amount: 0.009060
Amount Units: ug/ml



Manual Integration Results

RT: 13.24
Area: 1156
Amount: 0.007551
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:29:28 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

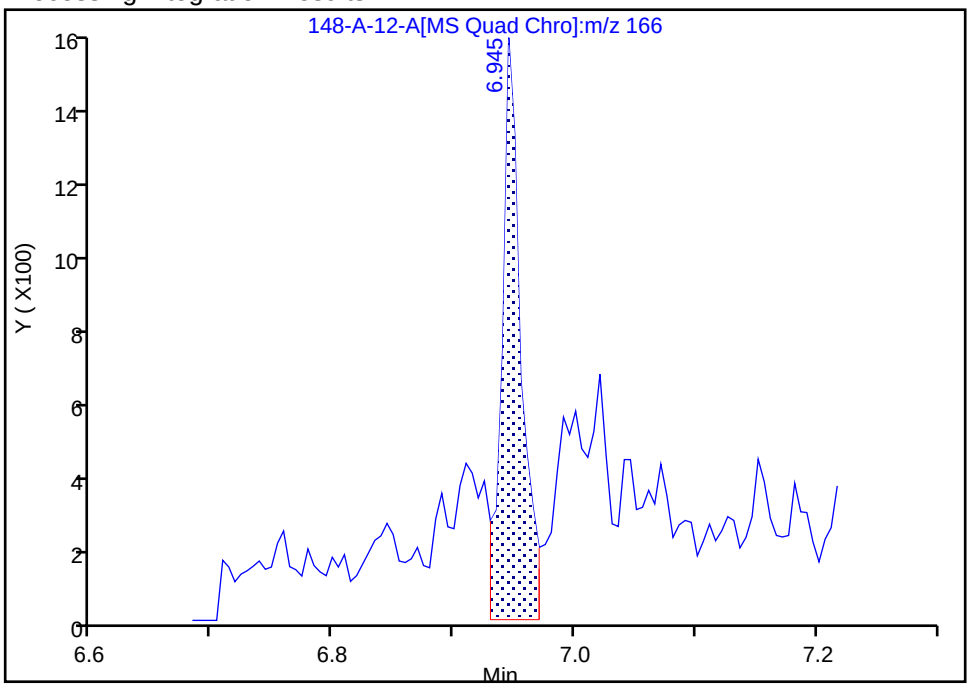
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D				
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

30 Fluorene, CAS: 86-73-7

Signal: 1

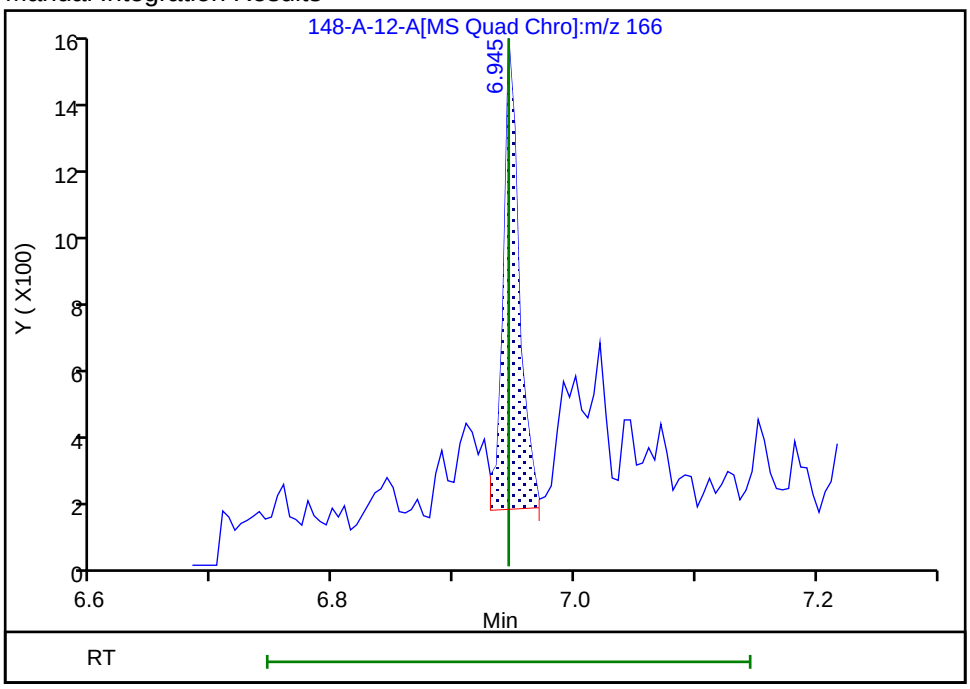
Processing Integration Results

RT: 6.95
Area: 1725
Amount: 0.021892
Amount Units: ug/ml



Manual Integration Results

RT: 6.95
Area: 1274
Amount: 0.016168
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:27:35 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

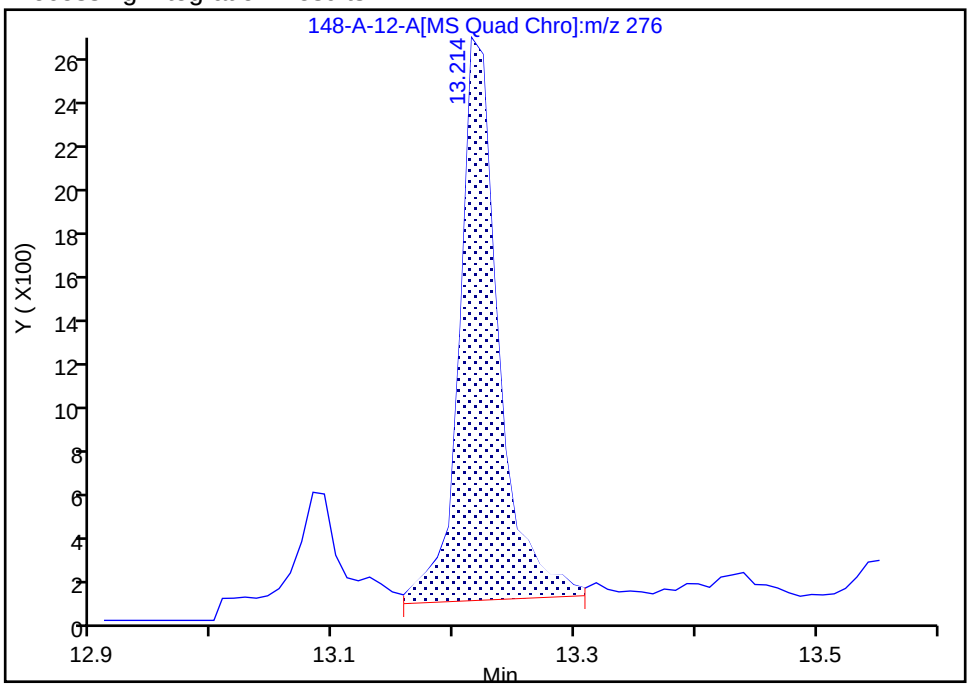
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D				
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

65 Indeno[1,2,3-cd]pyrene, CAS: 193-39-5

Signal: 1

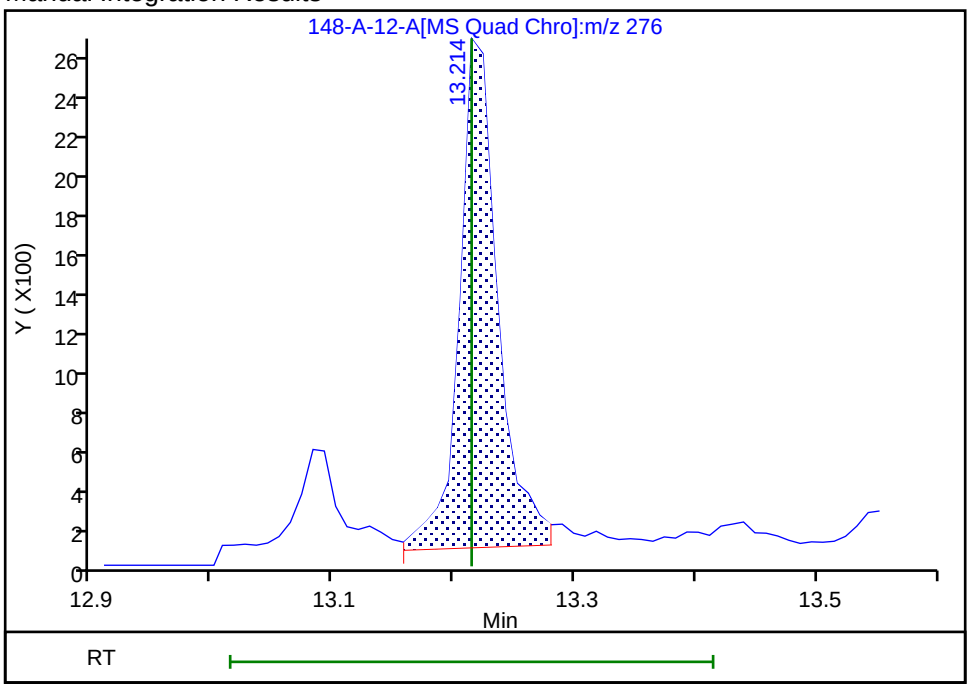
Processing Integration Results

RT: 13.21
Area: 5830
Amount: 0.031621
Amount Units: ug/ml



Manual Integration Results

RT: 13.21
Area: 5731
Amount: 0.031084
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:29:15 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

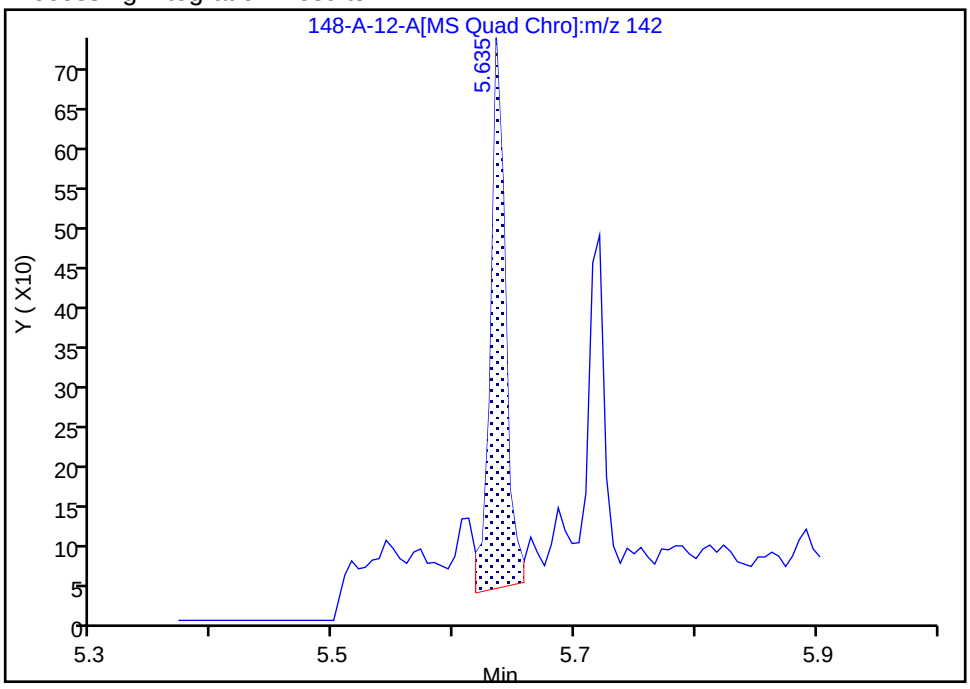
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D				
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

16 2-Methylnaphthalene, CAS: 91-57-6

Signal: 1

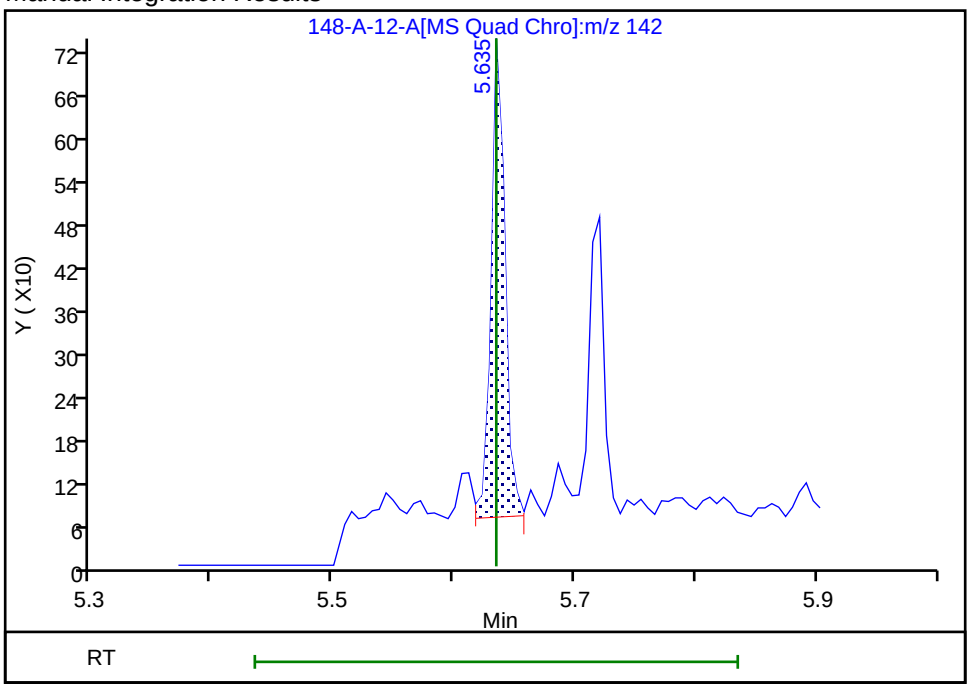
Processing Integration Results

RT: 5.63
Area: 602
Amount: 0.010649
Amount Units: ug/ml



Manual Integration Results

RT: 5.63
Area: 527
Amount: 0.009323
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:27:20 -05:00:00 (UTC)
Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

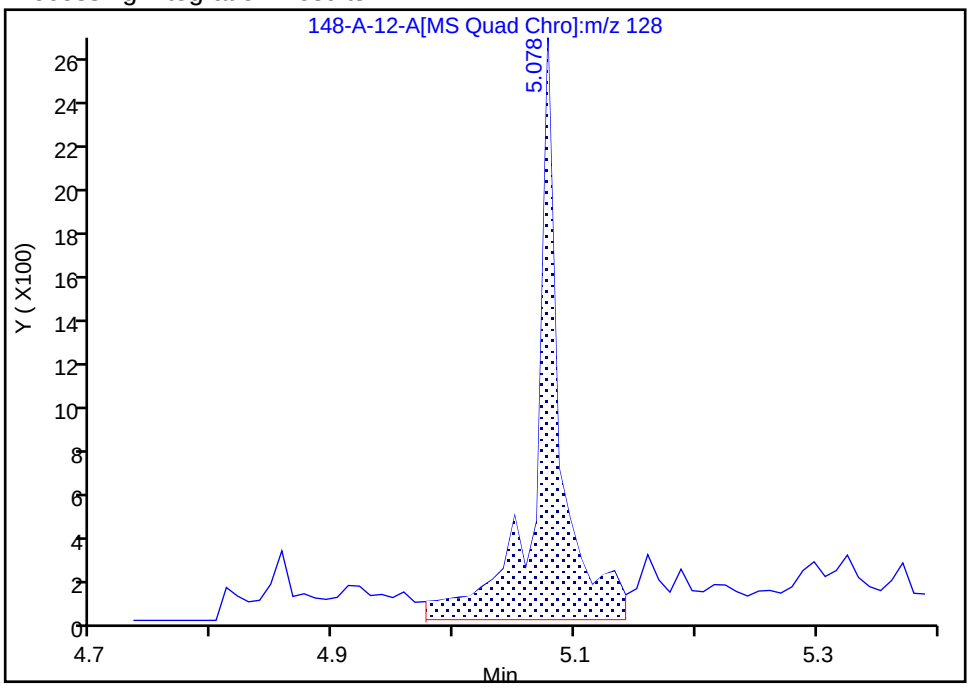
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D				
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

12 Naphthalene, CAS: 91-20-3

Signal: 1

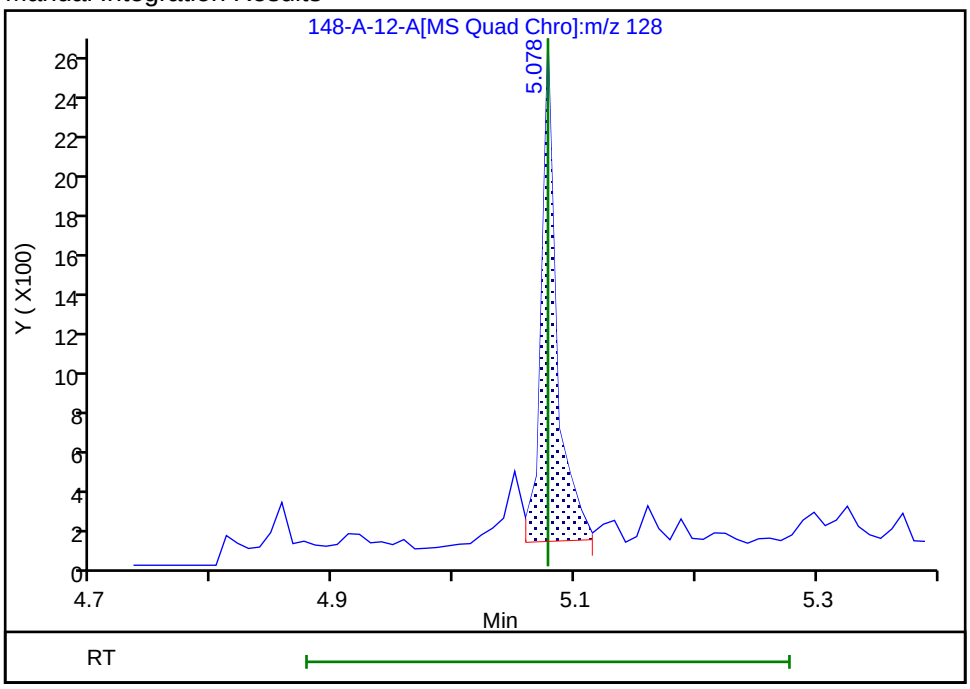
Processing Integration Results

RT: 5.08
Area: 3804
Amount: 0.047938
Amount Units: ug/ml



Manual Integration Results

RT: 5.08
Area: 2203
Amount: 0.027762
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:18:18 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

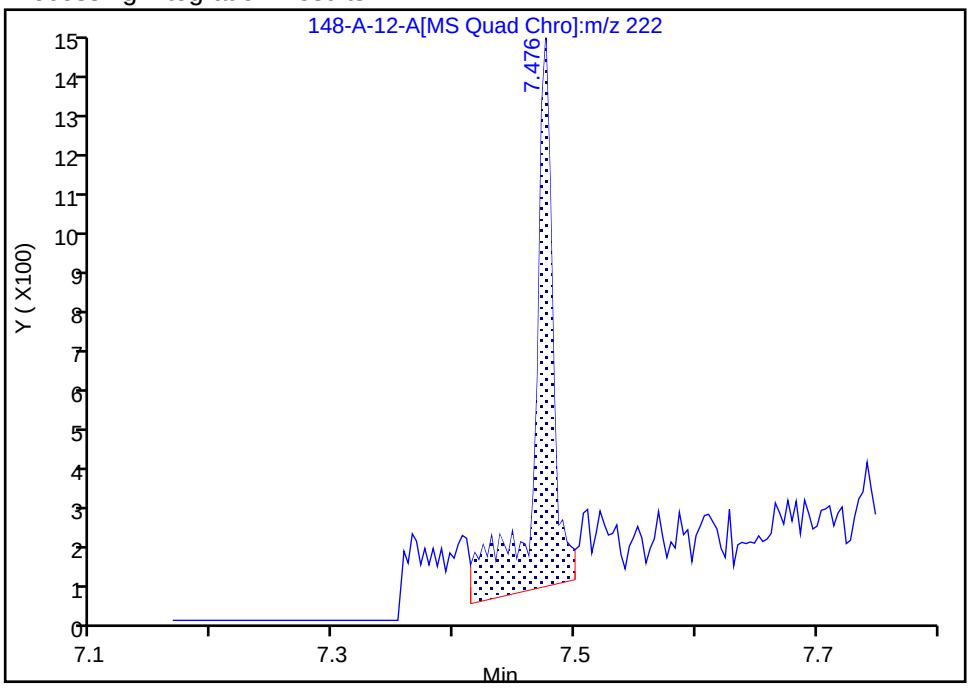
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D				
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

74 PCB-14, CAS: 34883-41-5

Signal: 1

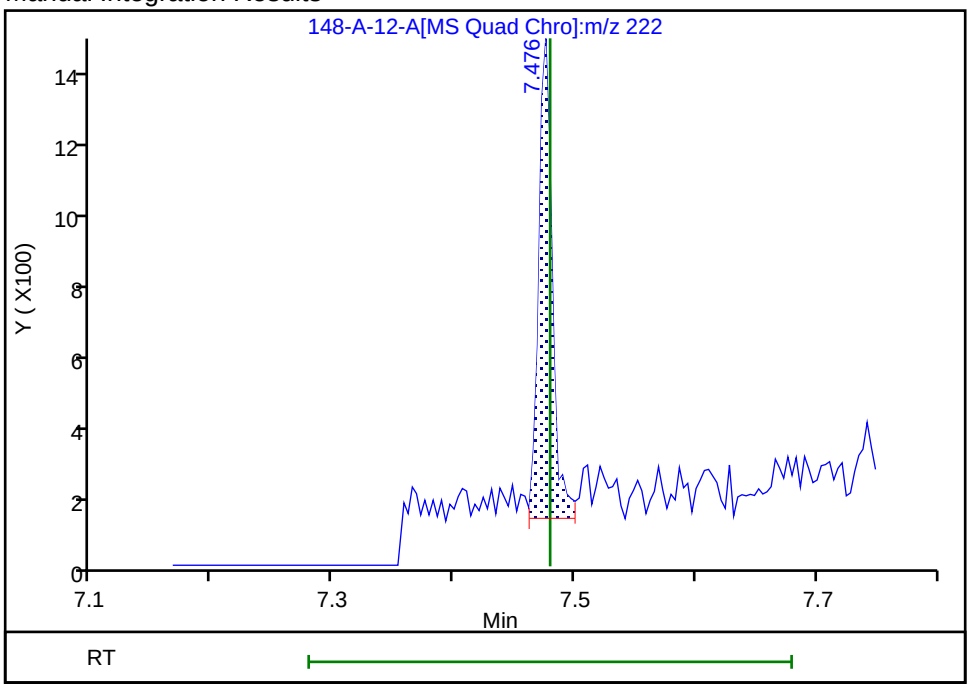
Processing Integration Results

RT: 7.48
Area: 1456
Amount: 0.012026
Amount Units: ug/ml



Manual Integration Results

RT: 7.48
Area: 1018
Amount: 0.008408
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:29:51 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

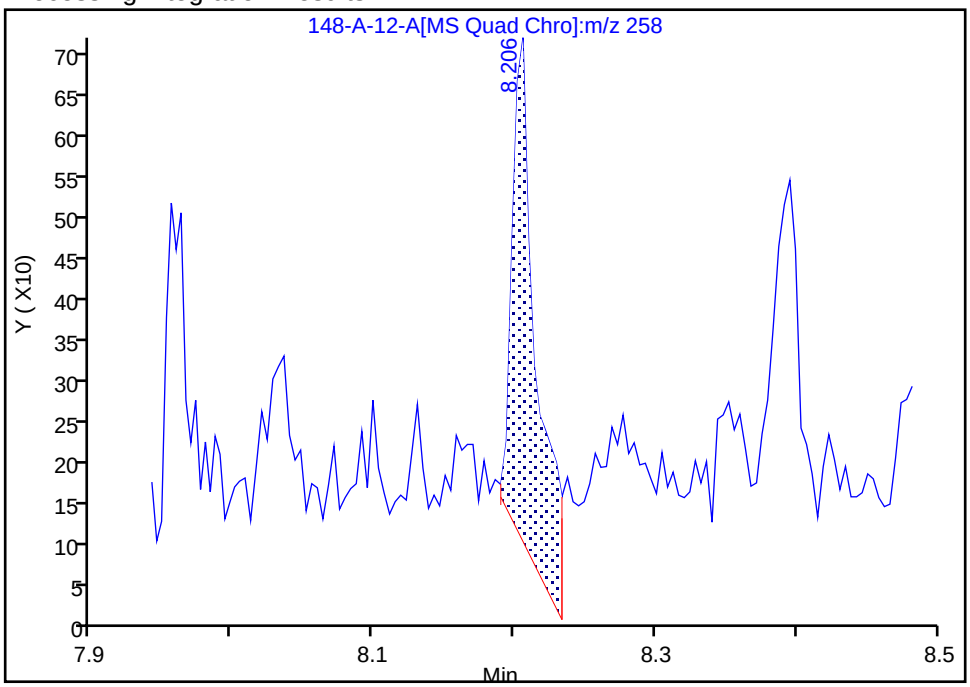
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-12-A.D				
Injection Date:	16-Nov-2023 19:22:32	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-15-A	Lab Sample ID:	140-34148-15		
Client ID:	1804576-846-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	23
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

75 PCB-36, CAS: 38444-87-0

Signal: 1

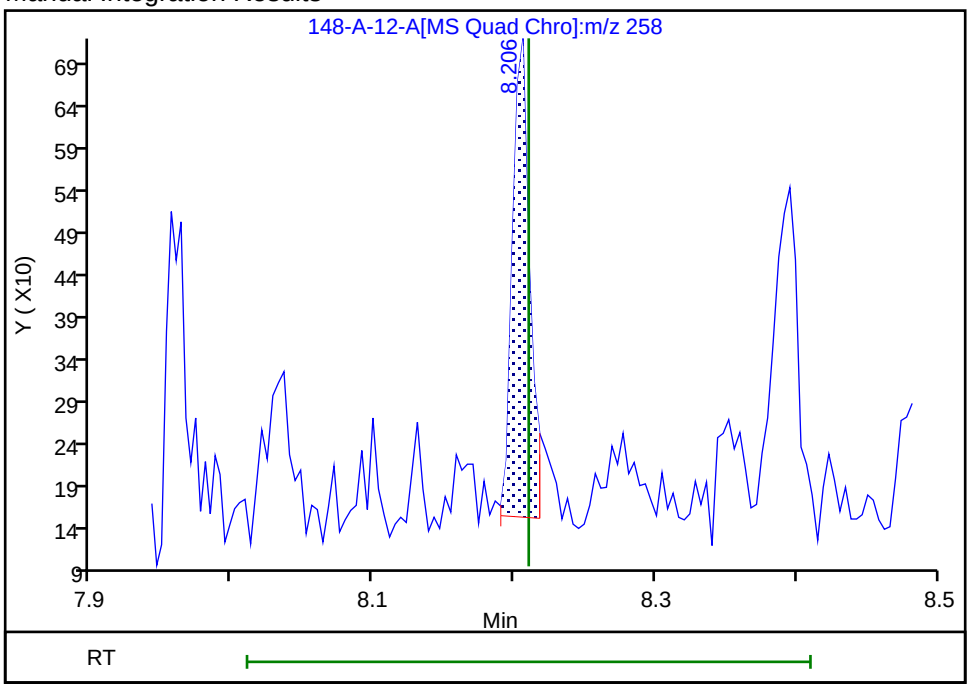
Processing Integration Results

RT: 8.21
Area: 741
Amount: 0.011626
Amount Units: ug/ml



Manual Integration Results

RT: 8.21
Area: 477
Amount: 0.007484
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:30:08 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Split Peak

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: 1804576-853-S1 | Lab Sample ID: 140-34148-16

Matrix: PE | Lab File ID: 140-34148-A-13-A.D

Analysis Method: ID-0016 | Date Collected: 10/26/2023 14:00

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.011(g) | Date Analyzed: 11/16/2023 19:45

Con. Extract Vol.: 500(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80349 | Units: ng/g

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
83-32-9	Acenaphthene	740	J	910	240
208-96-8	Acenaphthylene	140	J	910	66
120-12-7	Anthracene	530	J	910	290
56-55-3	Benzo[a]anthracene	2300		910	340
50-32-8	Benzo[a]pyrene	1300		910	250
205-99-2	Benzo[b]fluoranthene	1900		910	320
192-97-2	Benzo[e]pyrene	1300		910	150
191-24-2	Benzo[g,h,i]perylene	410	J	910	100
207-08-9	Benzo[k]fluoranthene	900	J	910	210
218-01-9	Chrysene	3100		910	120
53-70-3	Dibenz(a,h)anthracene	ND		910	75
206-44-0	Fluoranthene	6600		910	740
86-73-7	Fluorene	870	J	910	290
193-39-5	Indeno[1,2,3-cd]pyrene	420	J	910	100
90-12-0	1-Methylnaphthalene	ND		4500	450
91-57-6	2-Methylnaphthalene	ND		4500	640
91-20-3	Naphthalene	ND		18000	2600
198-55-0	Perylene	1400		910	460
85-01-8	Phenanthrene	3900		1800	1600
129-00-0	Pyrene	9500		1800	270
STL00912	C1-Fluoranthenes/pyrene	7600		910	910
STL00913	C1-Fluorenes	1600	J	1800	1200
STL00914	C2-Fluorenes	7100		910	910
STL00915	C3-Fluorenes	9700		910	910
STL00917	C2-Naphthalenes	4400		1800	1800
STL00918	C3-Naphthalenes	25000		1800	1800
STL00919	C4-Naphthalenes	25000		2700	2500
STL00901	C1-Phenanthrenes/Anthracenes	4900		3600	3100
STL00902	C2-Phenanthrenes/Anthracenes	14000		910	910
STL00903	C3-Phenanthrenes/Anthracenes	12000		910	910
STL00904	C4-Phenanthrenes/Anthracenes	5200		910	910
STL02218	C1-Chrysenes/Benz(a)anthracenes	2800		910	910

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: 1804576-853-S1 | Lab Sample ID: 140-34148-16

Matrix: PE | Lab File ID: 140-34148-A-13-A.D

Analysis Method: ID-0016 | Date Collected: 10/26/2023 14:00

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.011(g) | Date Analyzed: 11/16/2023 19:45

Con. Extract Vol.: 500(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80349 | Units: ng/g

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
STL02219	C2-Chrysenes/Benz(a)anthracenes	1300		910	910
STL02220	C3-Chrysenes/Benz(a)anthracenes	ND		910	910
STL02221	C4-Chrysenes/Benz(a)anthracenes	ND		910	910
34883-41-5	PCB-14	420	J	910	9.1
74472-51-8	PCB-192	1800		910	9.1
74472-48-3	PCB-184	790	J	910	9.1
33979-03-2	PCB-155	540	J	910	9.1
41411-61-4	PCB-142	470	J	910	9.1
74472-52-9	PCB-204	1300		910	9.1
56558-16-8	PCB-104	1200		910	9.1
56558-18-0	PCB-121	900	J	910	9.1
70362-49-1	PCB-78	1100		910	9.1
38444-87-0	PCB-36	420	J	910	9.1

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
93951-97-4	Acenaphthylene-d8	80		30-120
1719-06-8	Anthracene-d10	75		30-120
63466-71-7	Benzo(a)pyrene-d12	81		30-120
93951-98-5	Benzo(b)fluoranthene-d12	86		30-120
93951-66-7	Benzo(ghi)perylene-d12	88		30-120
93952-01-3	Benzo(k)fluoranthene-d12	84		30-120
1719-03-5	Chrysene-d12	74		30-120
13250-98-1	Dibenz(a,h)anthracene-d14	82		30-120
93951-69-0	Fluoranthene-d10	83		30-120
81103-79-9	Fluorene -d10	79		30-120
203578-33-0	Indeno[1,2,3-cd]pyrene-d12	88		30-120
38072-94-5	1-Methylnaphthalene-d10	79		30-120
7297-45-2	2-Methylnaphthalene-d10	77		30-120
1146-65-2	Naphthalene-d8	73		30-120
1520-96-3	Perylene-d12	76		30-120
1517-22-2	Phenanthrene-d10	80		30-120

Report Date: 22-Nov-2023 12:10:36 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-13-A.D
Lims ID: 140-34148-A-16-A
Client ID: 1804576-853-S1
Sample Type: Client
Inject. Date: 16-Nov-2023 19:45:56 ALS Bottle#: 0 Worklist Smp#: 24
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030519-024
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 22-Nov-2023 12:09:21 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1637

First Level Reviewer: SK9U Date: 17-Nov-2023 10:42:56

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/ml	%Rec	Flags
D 10 Naphthalene-d8	136	5.059	5.068	-0.009	100	31096	0.3672	73.4	
11 Naphthalene	128	5.078	5.078	0.000	40	1382	0.0189		7M
D 15 2-methylnaphthalene-d10	152	5.612	5.612	0.000	92	21146	0.3841	76.8	
D 17 1-Methylnaphthalene-d10	152	5.686	5.686	0.000	99	21904	0.3971	79.4	
D 23 Acenaphthylene-d8	160	6.361	6.362	-0.001	58	37243	0.3985	79.7	
24 Acenaphthylene	152	6.377	6.372	0.005	26	277	0.003164		M
* 26 Acenaphthene-d10	164	6.492	6.492	0.000	98	30372	0.5000		
27 Acenaphthene	154	6.517	6.517	0.000	85	913	0.0163		
D 29 Fluorene -d10	176	6.920	6.920	0.000	99	28558	0.3946	78.9	
30 Fluorene	166	6.945	6.945	0.000	89	1426	0.0192		M
D 35 Phenanthrene-d10	188	7.728	7.732	-0.004	99	52956	0.3993	79.9	
36 Phenanthrene	178	7.749	7.749	0.000	32	10902	0.0853		
D 38 Anthracin-d10	188	7.780	7.777	0.003	99	48405	0.3738	74.8	M
39 Anthracene	178	7.794	7.794	0.000	71	1387	0.0116		
D 41 Fluoranthene-d10	212	8.805	8.805	0.000	99	71014	0.4127	82.5	
43 Fluoranthene	202	8.825	8.825	0.000	56	26421	0.1454		
* 44 Pyrene-d10 (IS)	212	9.024	9.024	0.000	97	85049	0.5000		
45 Pyrene	202	9.040	9.044	-0.004	95	38616	0.2082		
47 Benzo[a]anthracene	228	10.260	10.260	0.000	54	8190	0.0512		M
D 48 Chrysene-d12	240	10.270	10.270	0.000	98	61551	0.3709	74.2	
50 Chrysene	228	10.295	10.295	0.000	14	12337	0.0689		M
D 52 Benzo(b)fluoranthene-d12	264	11.376	11.369	0.007	100	55761	0.4298	86.0	
53 Benzo[b]fluoranthene	252	11.404	11.397	0.007	12	7665	0.0408		
D 54 Benzo(k)fluoranthene-d12	264	11.404	11.404	0.000	61	63856	0.4190	83.8	
55 Benzo[k]fluoranthene	252	11.425	11.425	0.000	99	3708	0.0198		M
* 56 Benzo(e)pyrene-d12	264	11.684	11.684	0.000	99	51219	0.5000		
57 Benzo[e]pyrene	252	11.712	11.712	0.000	100	4301	0.0278		
D 58 Benzo(a)pyrene-d12	264	11.747	11.747	0.000	100	45865	0.4032	80.6	
59 Benzo[a]pyrene	252	11.775	11.775	0.000	100	4334	0.0286		
D 60 Perylene-d12	264	11.845	11.838	0.007	100	48252	0.3822	76.4	
61 Perylene	252	11.873	11.873	0.000	100	4157	0.0301		
D 62 Indeno[1,2,3-cd]pyrene-d12	288	13.186	13.186	0.000	81	54481	0.4408	88.2	

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/ml	%Rec	Flags
D 63 Dibenz(a,h)anthracene-d14	292	13.196	13.186	0.000	89	45571	0.4121	82.4	
65 Indeno[1,2,3-cd]pyrene	276	13.224	13.214	0.010	18	1690	0.009268		
66 Dibenz(a,h)anthracene	278	13.224	13.233	-0.009	12	138	0.000948		7M
D 67 Benzo(ghi)perylene-d12	288	13.543	13.543	0.000	100	53958	0.4396	87.9	
68 Benzo[g,h,i]perylene	276	13.580	13.580	0.000	48	1412	0.008936		
74 PCB-14	222	7.472	7.479	-0.007	94	1152	0.009190		M
75 PCB-36	258	8.206	8.206	-0.004	98	606	0.009183		M
76 PCB-104	326	8.395	8.393	-0.001	93	1367	0.0267		
77 PCB-121	326	8.748	8.748	-0.003	93	815	0.0198		
78 PCB-155	360	8.849	8.852	-0.001	74	457	0.0119		
79 PCB-78	290	9.081	9.077	-0.003	64	787	0.0240		
80 PCB-142	360	9.522	9.519	0.000	76	290	0.0104		
81 PCB-184	394	9.572	9.579	0.000	26	489	0.0175		
* 82 PCB-167L	372	10.023	10.027	-0.004	73	13676	0.4000		
83 PCB-204	428	10.254	10.246	0.004	4	517	0.0284		
84 PCB-192	394	10.275	10.275	0.000	6	1035	0.0403		
A 86 C2-Naphthalenes	156	6.265	(6.068-6.407)		0	7122	0.0974		
A 87 C3-Naphthalenes	170	6.704	(6.348-7.050)		0	39707	0.5429		
A 88 C4-Naphthalenes	184	7.125	(6.678-7.562)		0	40413	0.5526		
A 89 C1-Fluorenes	180	7.431	(7.364-7.505)		0	2651	0.0357		
A 90 C2-Fluorenes	194	7.883	(7.730-8.069)		0	11661	0.1572		
A 91 C3-Fluorenes	208	8.336	(8.092-8.605)		0	15874	0.2140		
A 96 C1-Phenanthrenes/Anthracenes	191	8.237	(8.155-8.332)		0	13634	0.1067		
A 97 C2-Phenanthrenes/Anthracenes	206	8.698	(8.490-8.926)		0	38867	0.3042		
A 98 C3-Phenanthrenes/Anthracenes	220	9.135	(8.851-9.456)		0	32440	0.2539		
A 99 C4-Phenanthrenes/Anthracenes	234	9.454	(9.106-9.824)		0	14598	0.1143		
A 100 C1-Fluoranthenes/pyrene	216	9.436	(9.246-9.640)		0	31091	0.1677		
A 101 C1-Chrysenes/Benz(a)anthracenes	242	10.696	(10.456-10.941)		0	11019	0.0615		
A 102 C2-Chrysenes/Benz(a)anthracenes	256	11.012	(10.667-11.381)		0	5196	0.0290		

QC Flag Legend

Processing Flags

7 - Failed Limit of Detection

Review Flags

M - Manually Integrated

Reagents:

60ISPCB_00001 Amount Added: 5.00 Units: uL

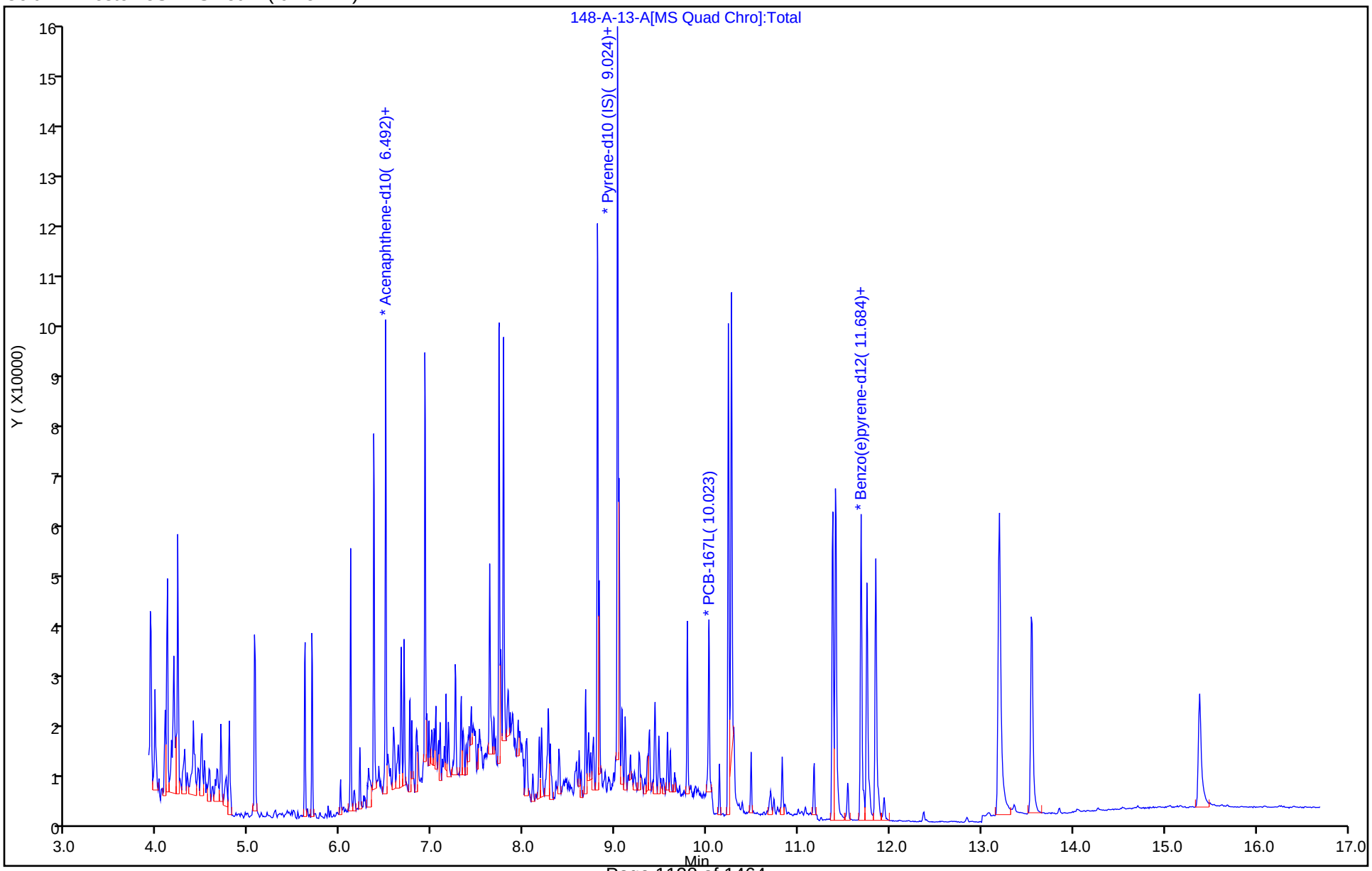
Report Date: 22-Nov-2023 12:10:37 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-13-A.D

Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16	Worklist Smp#:	24
Client ID:	1804576-853-S1				
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



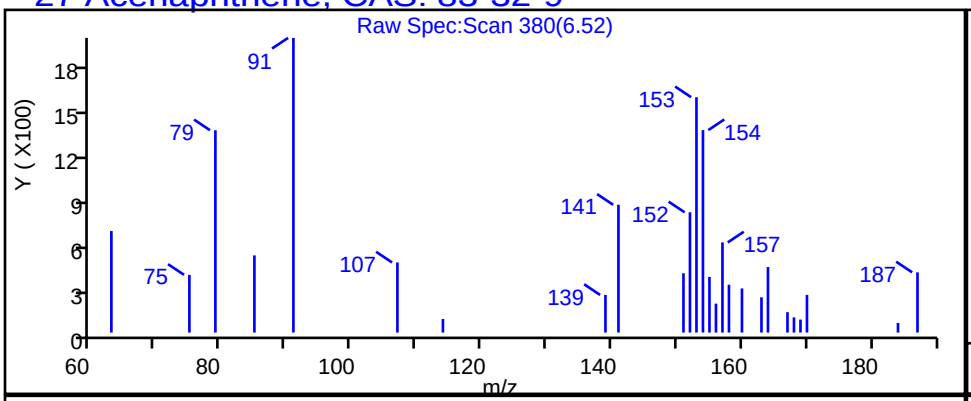
Report Date: 22-Nov-2023 12:10:37 Chrom Revision: 2.3 15-Nov-2023 20:54:34

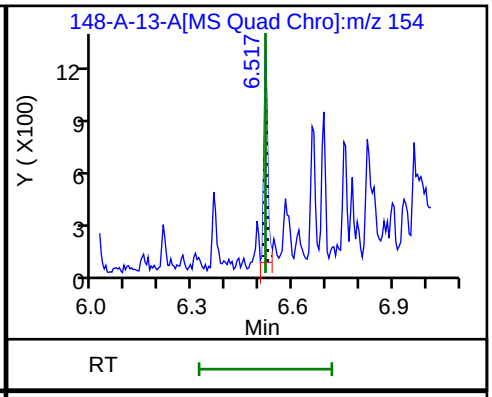
Eurofins Knoxville

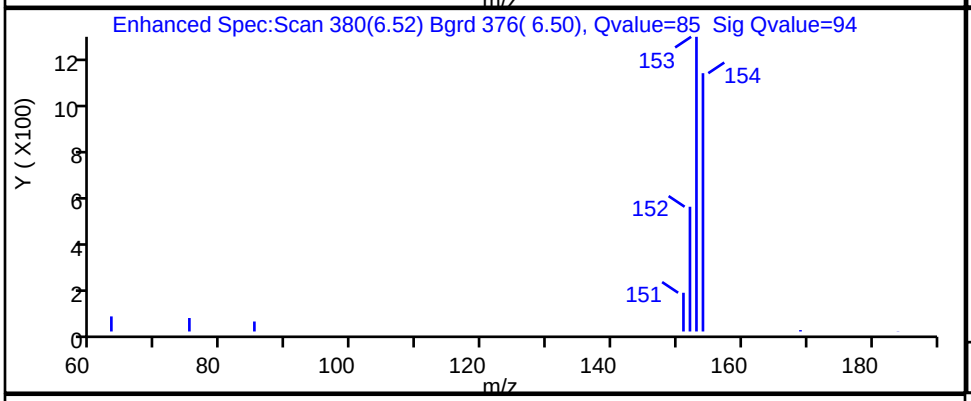
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-13-A.D

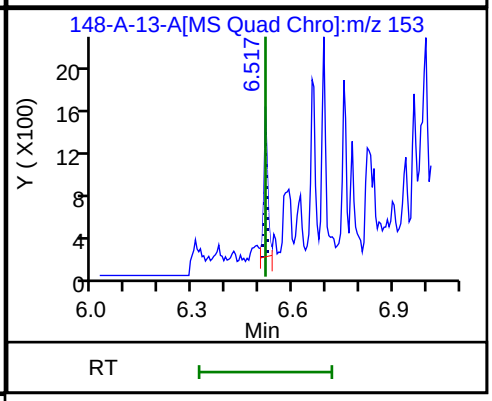
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16		
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

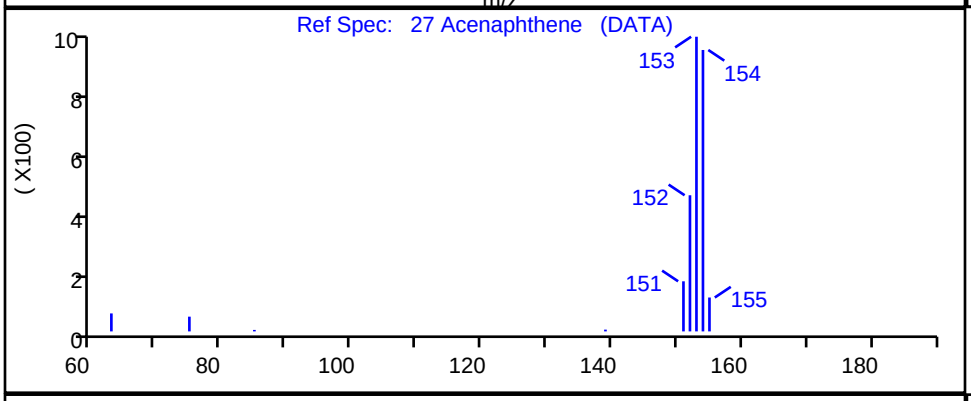
27 Acenaphthene, CAS: 83-32-9

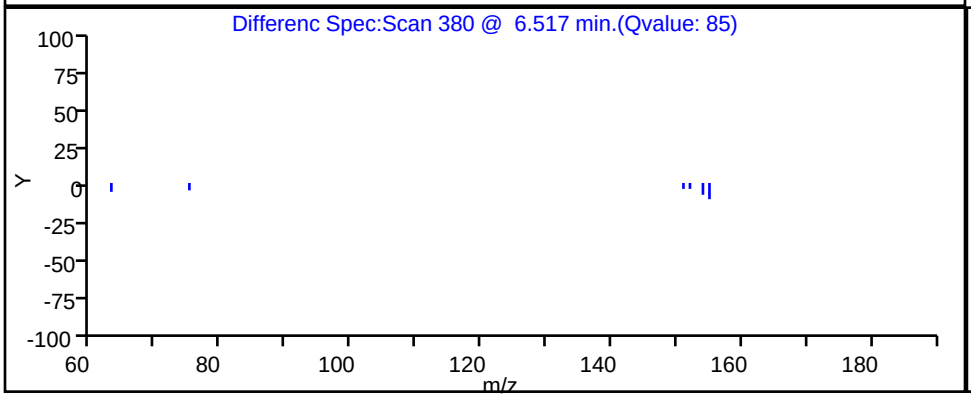


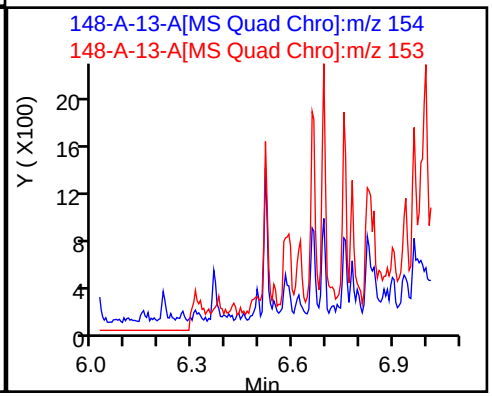












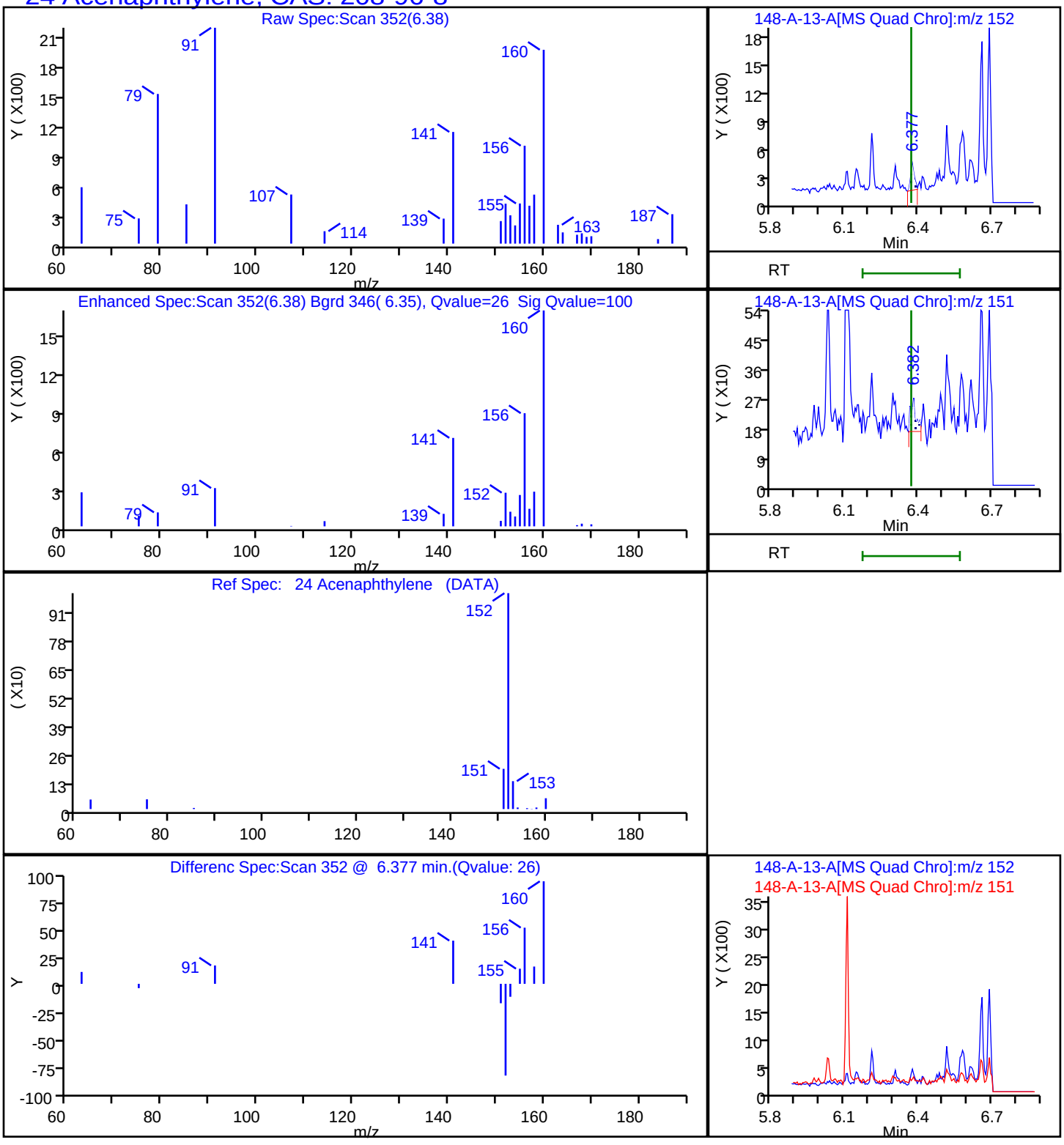
Report Date: 22-Nov-2023 12:10:37 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-13-A.D

Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16
Client ID:	1804576-853-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

24 Acenaphthylene, CAS: 208-96-8



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Eurofins Knoxville

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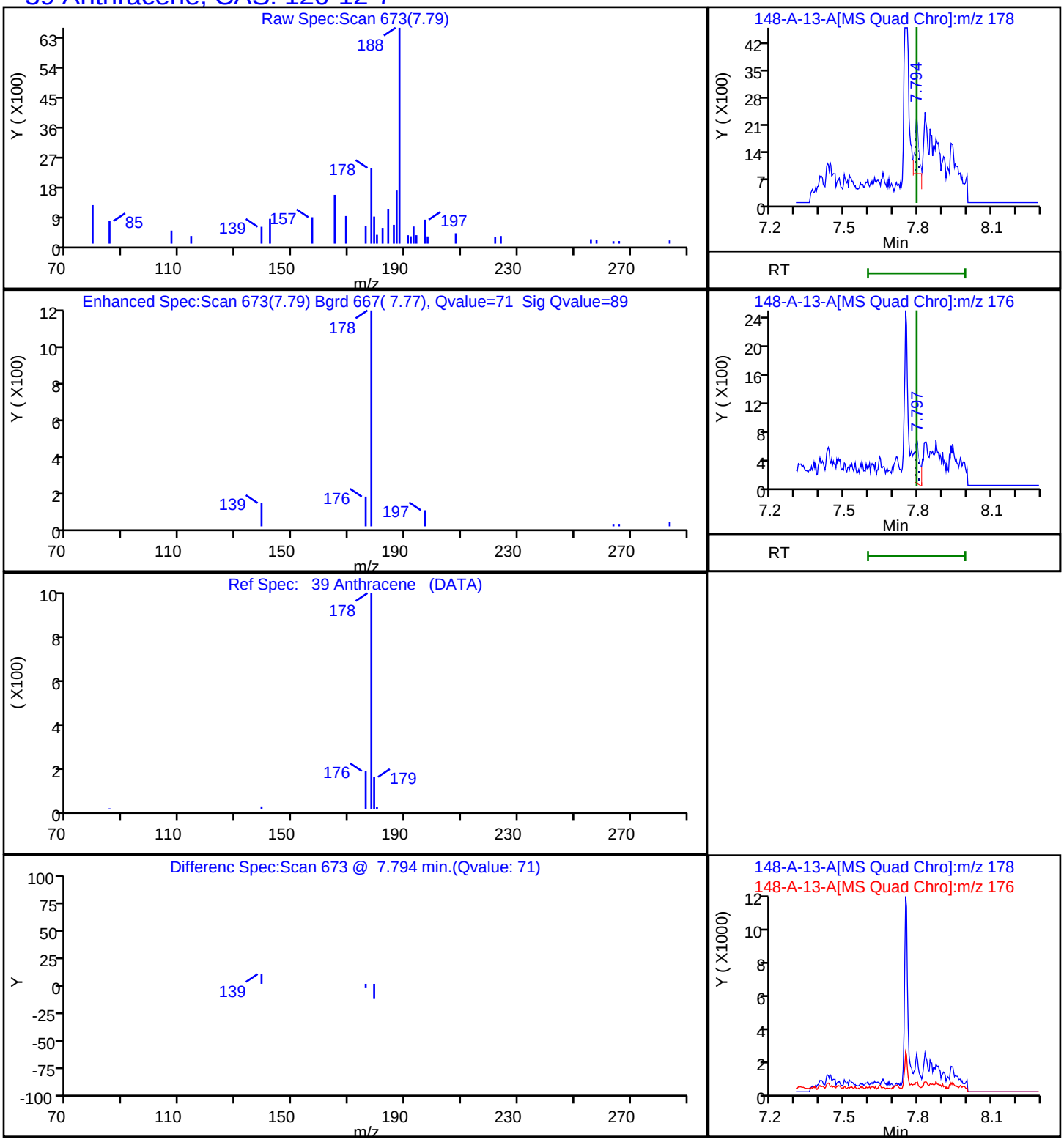
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16		
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

39 Anthracene, CAS: 120-12-7



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Eurofins Knoxville

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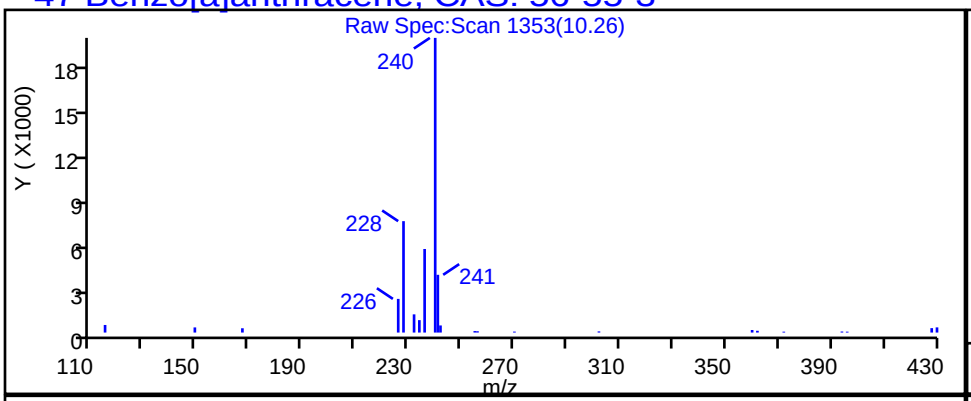
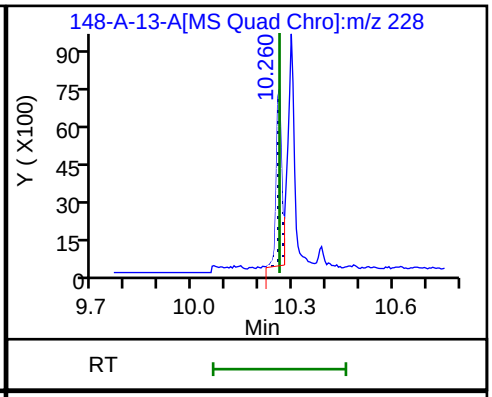
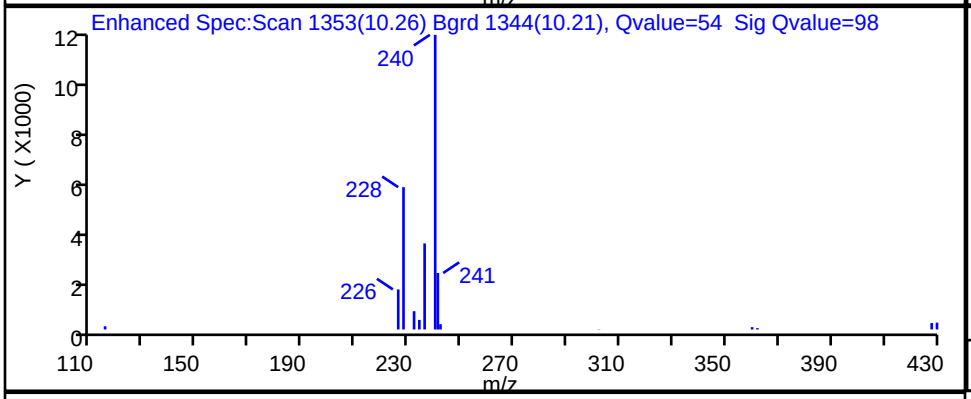
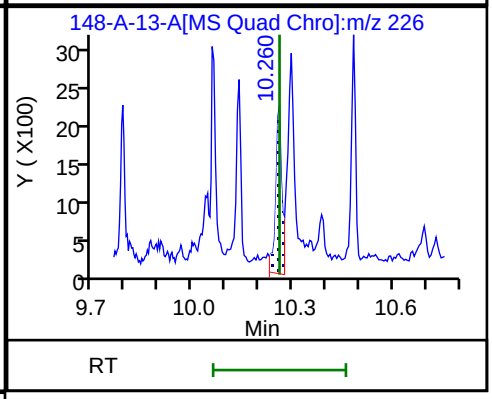
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16
Client ID:	1804576-853-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

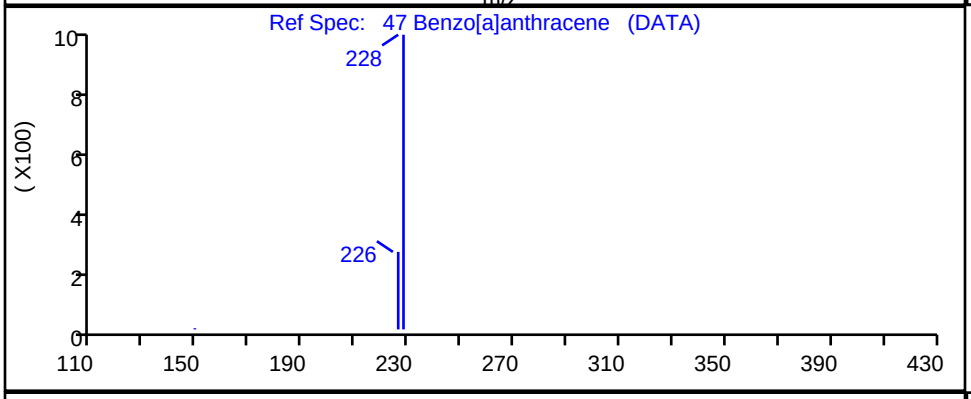
47 Benzo[a]anthracene, CAS: 56-55-3

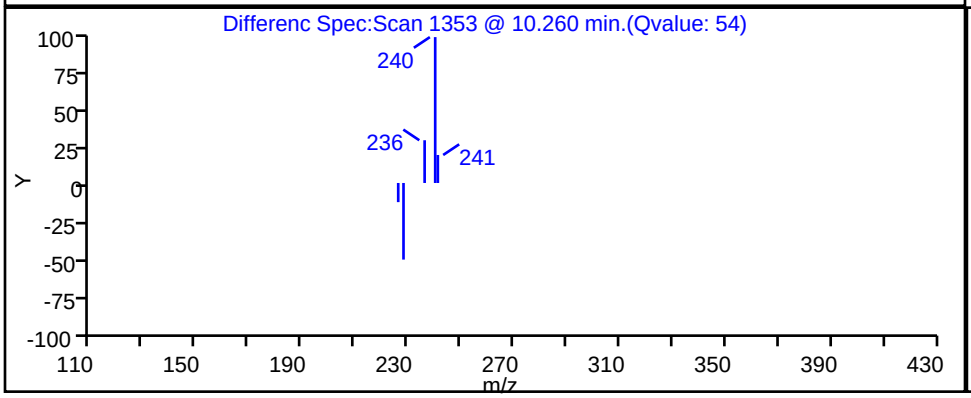


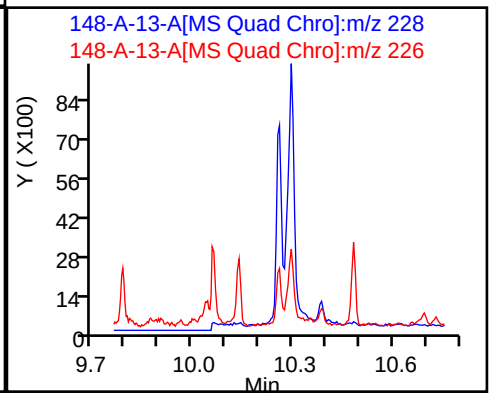












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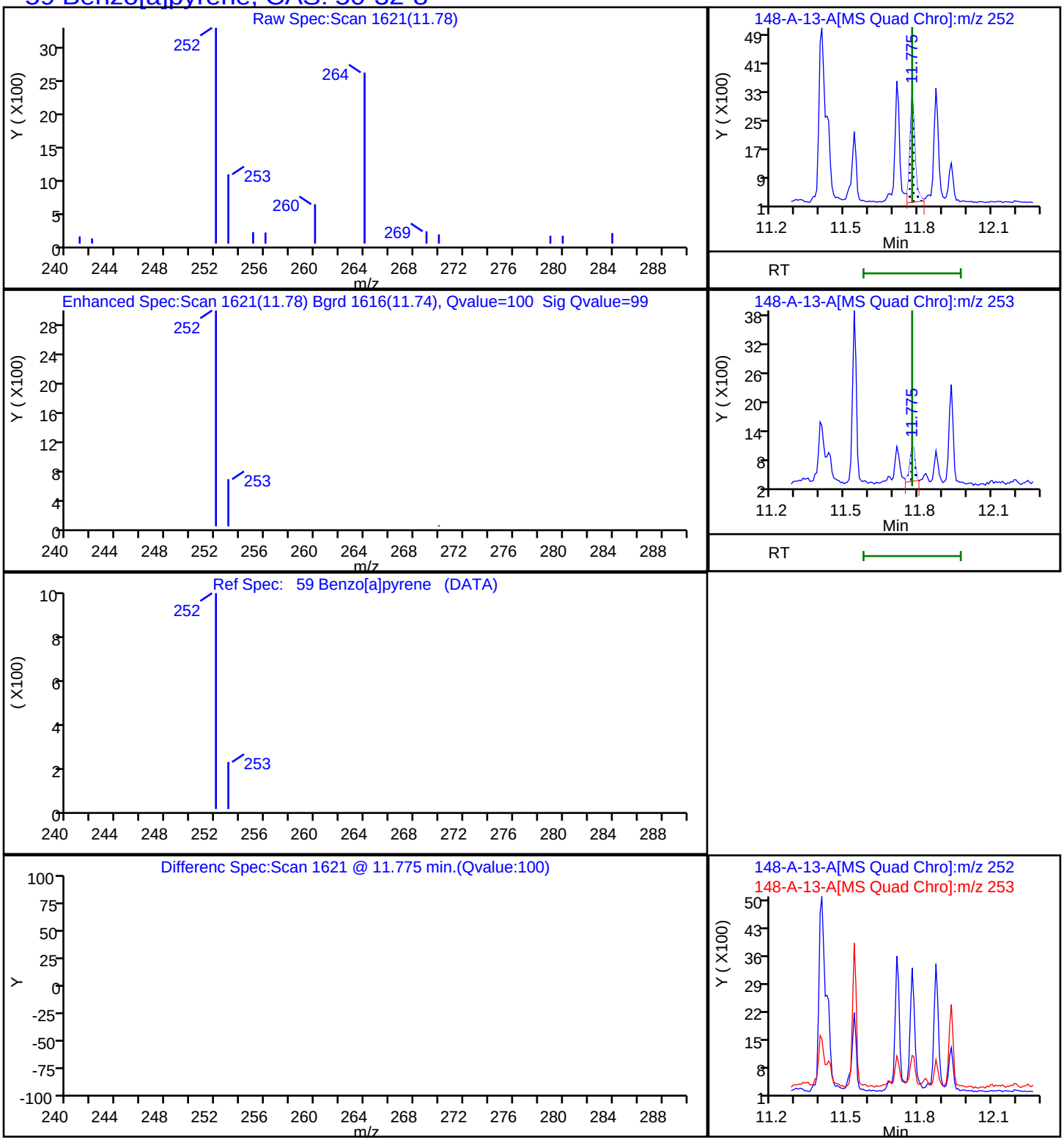
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-13-A.D

Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16		
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

59 Benzo[a]pyrene, CAS: 50-32-8



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Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-13-A.D		
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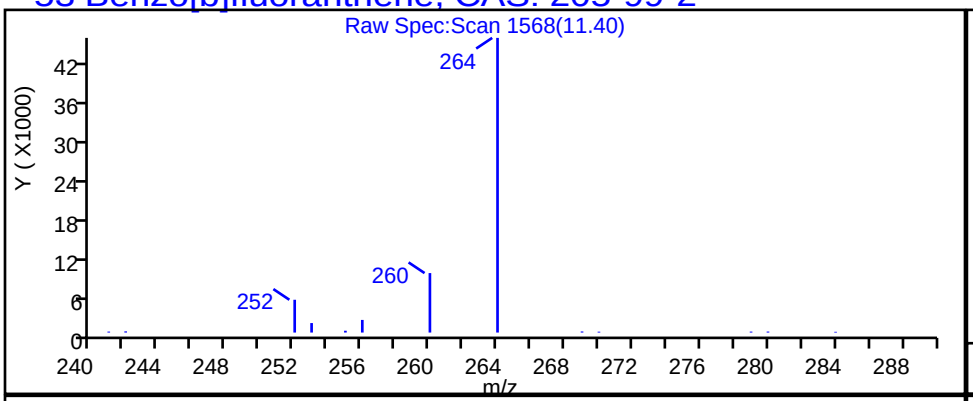
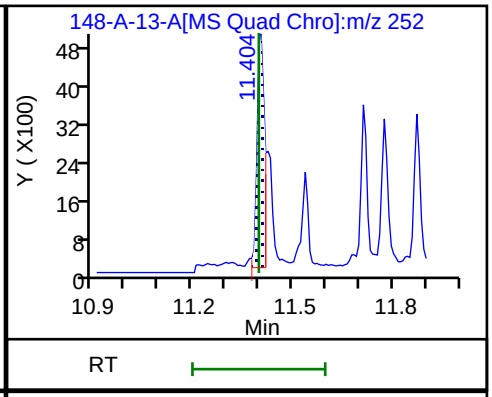
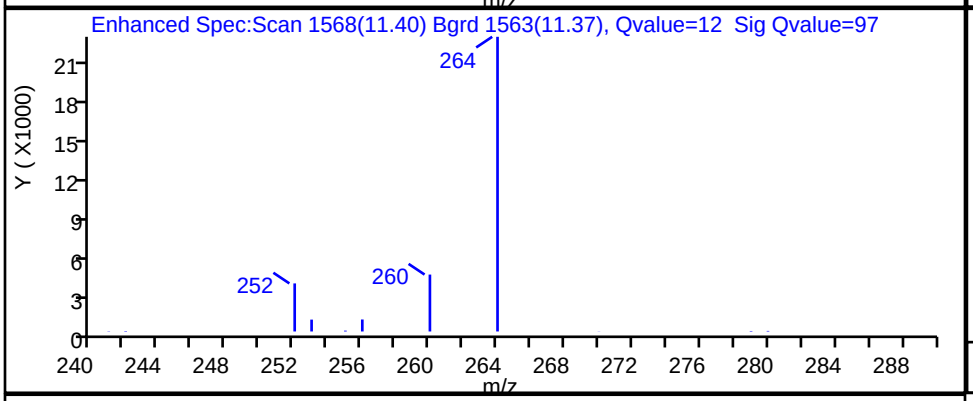
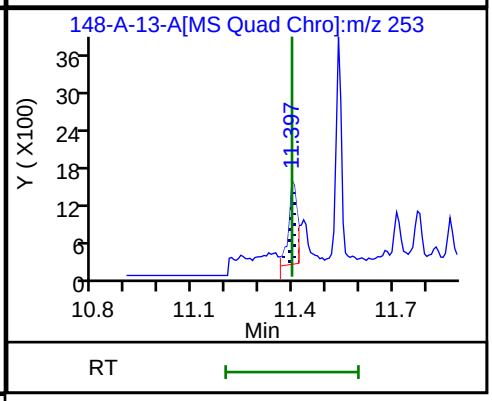
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16
Client ID:	1804576-853-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

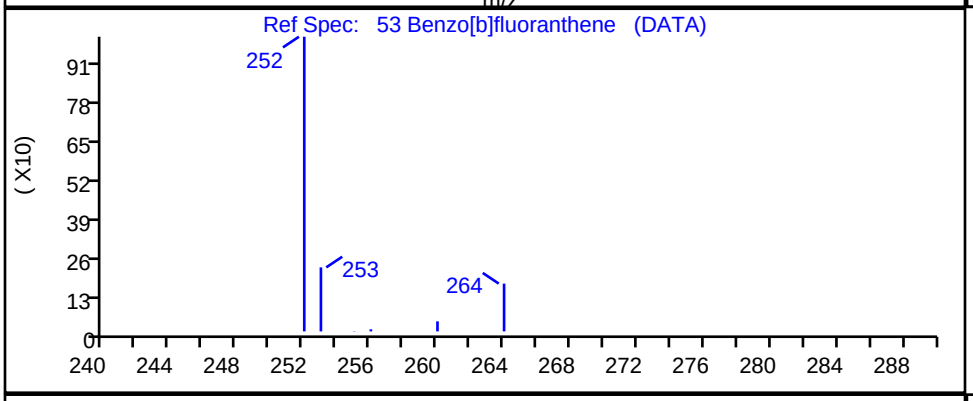
53 Benzo[b]fluoranthene, CAS: 205-99-2

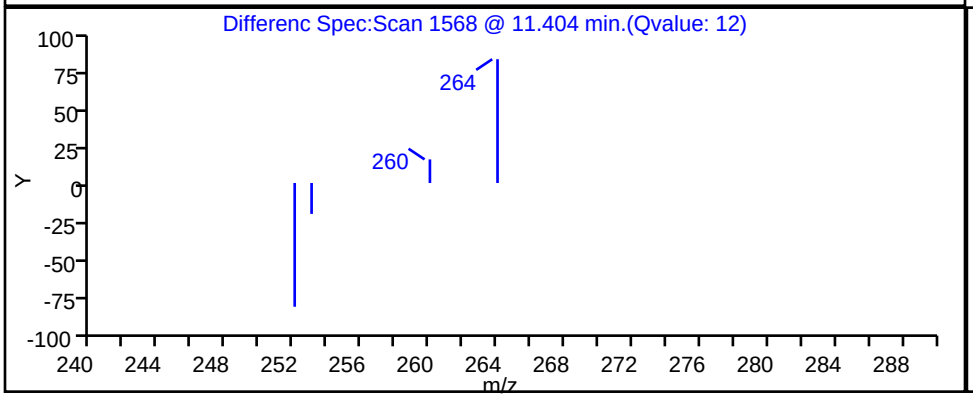


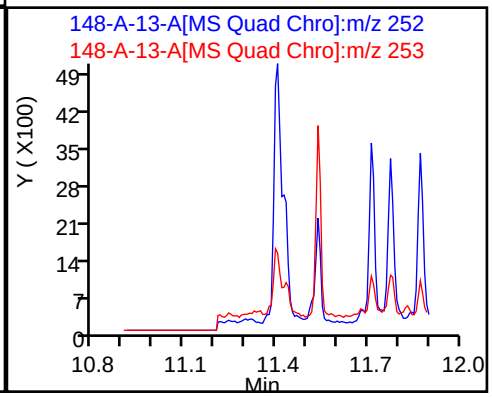












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Eurofins Knoxville

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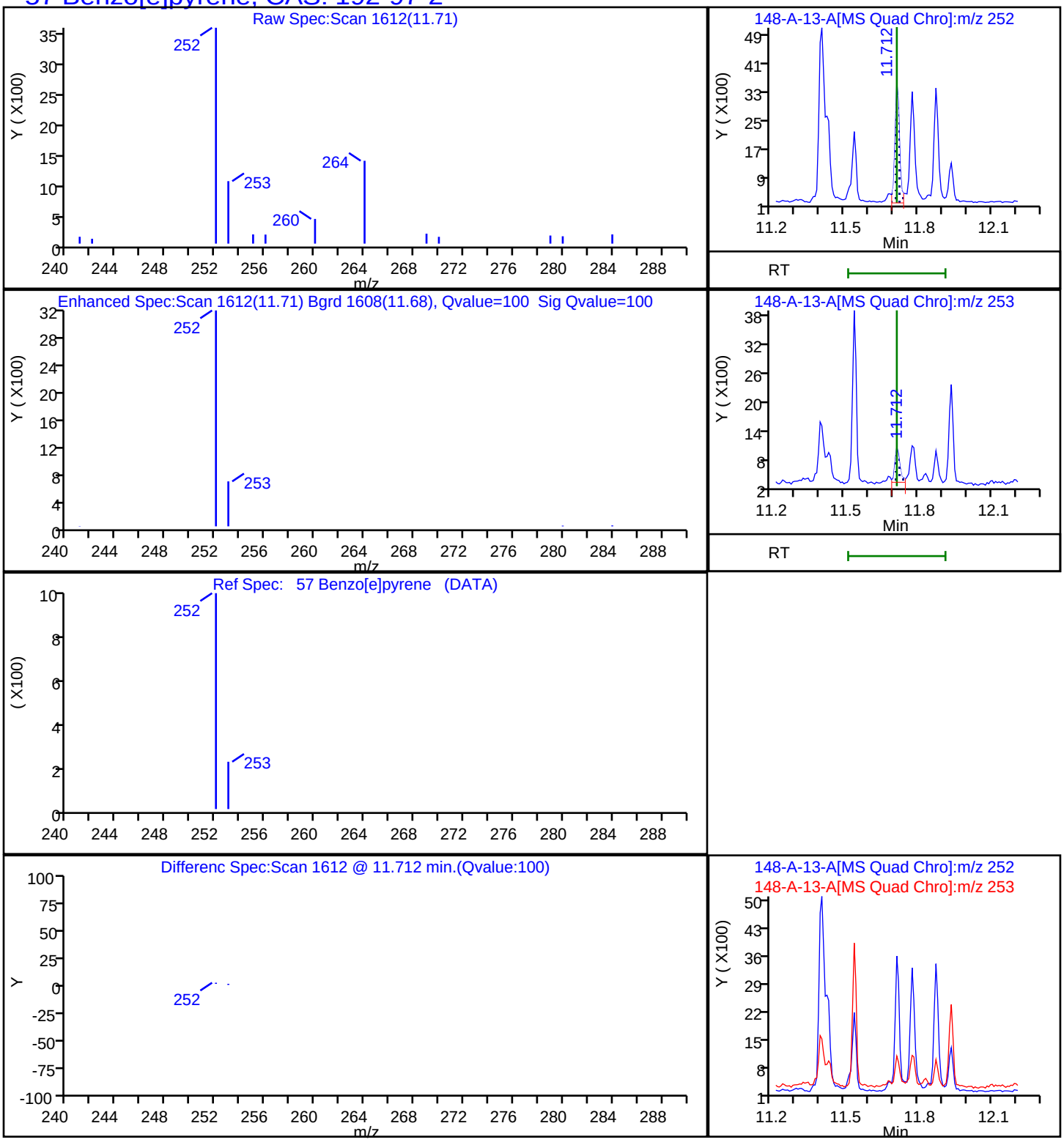
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16
Client ID:	1804576-853-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

57 Benzo[e]pyrene, CAS: 192-97-2



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Eurofins Knoxville

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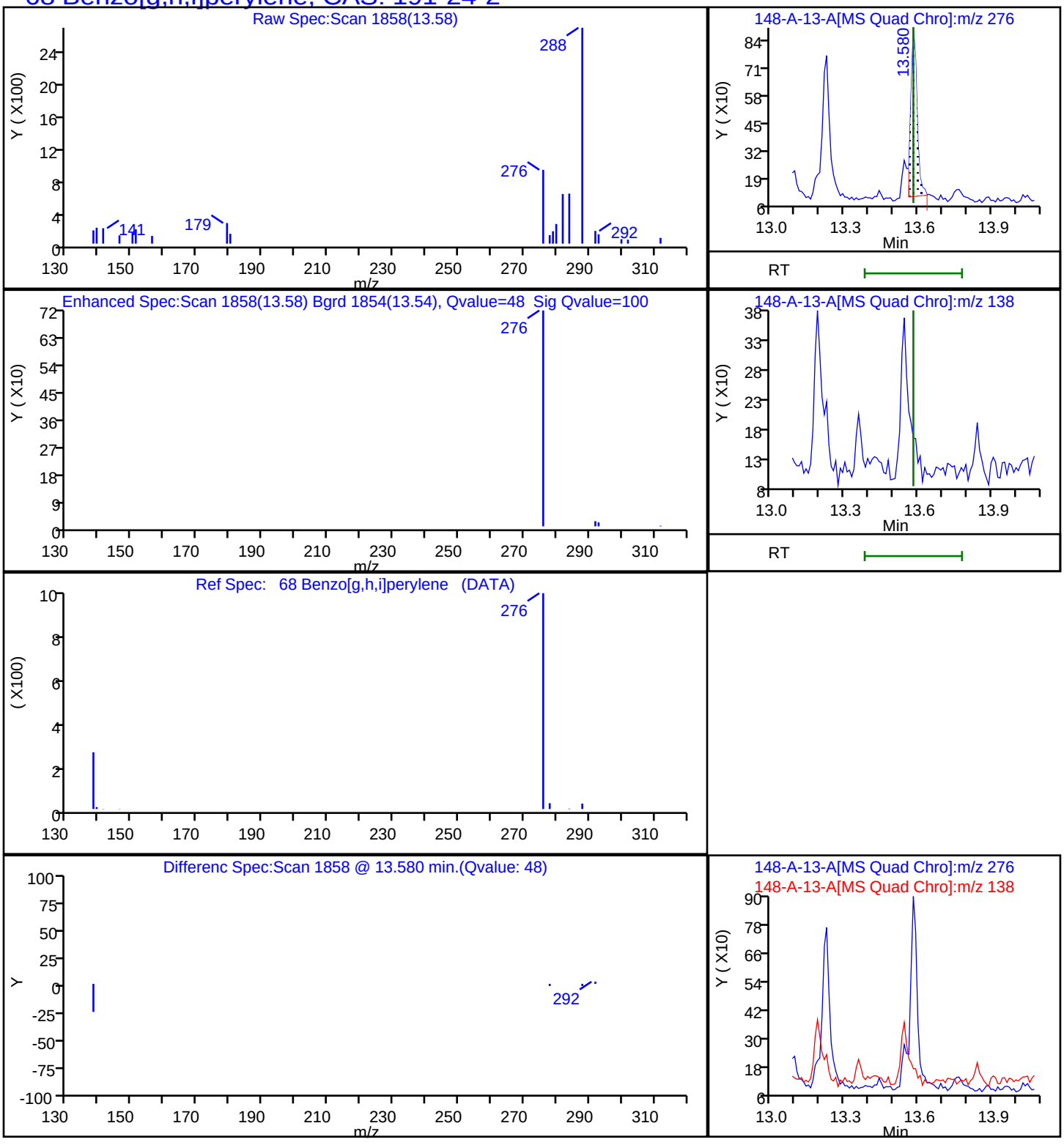
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16		
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

68 Benzo[g,h,i]perylene, CAS: 191-24-2



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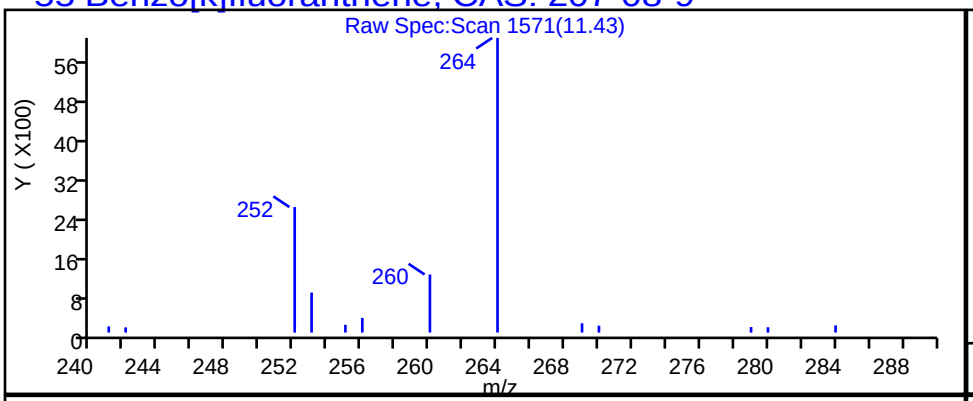
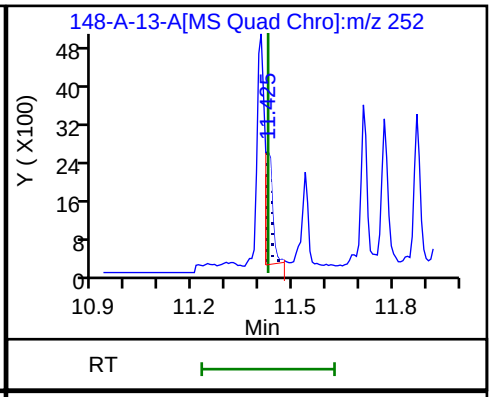
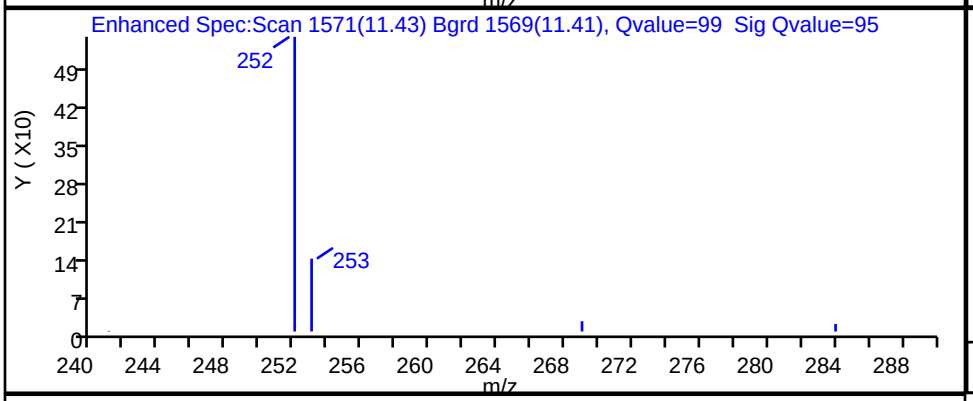
Eurofins Knoxville

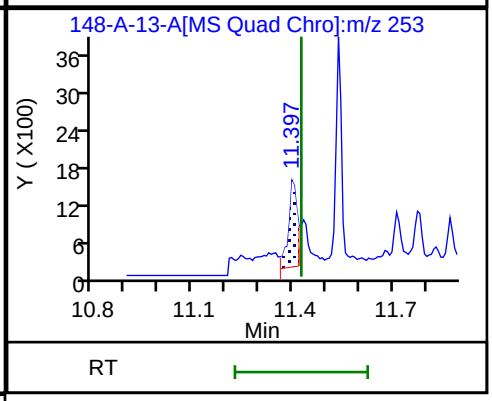
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-13-A.D		
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16
Client ID:	1804576-853-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

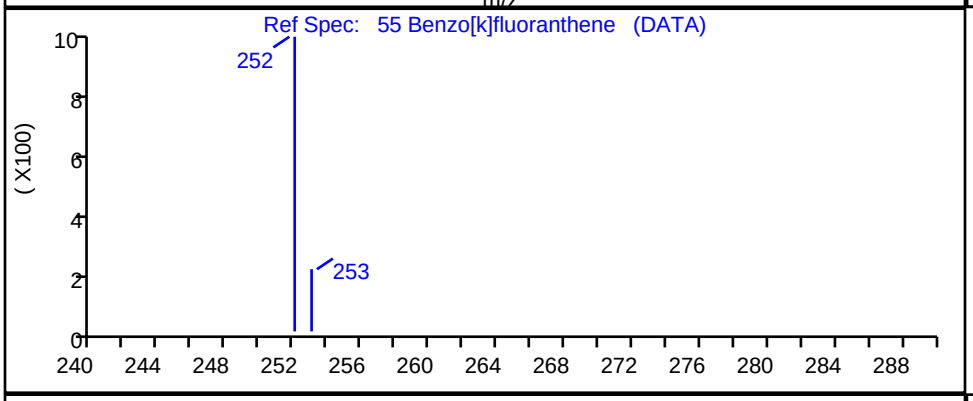
55 Benzo[k]fluoranthene, CAS: 207-08-9

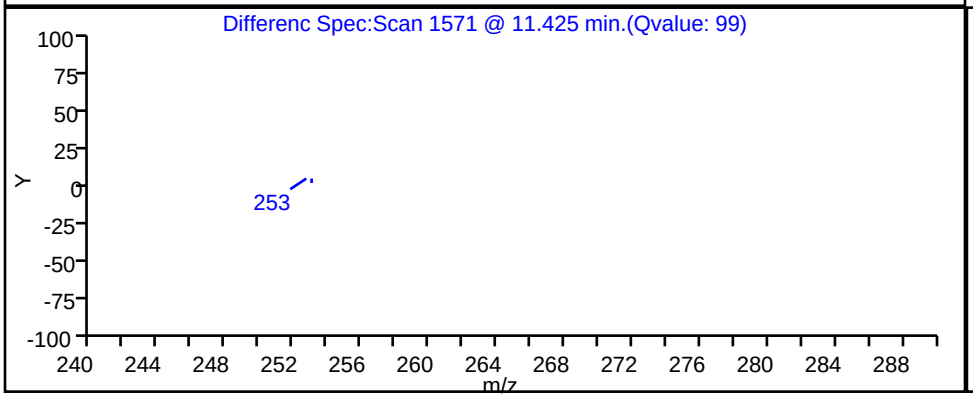


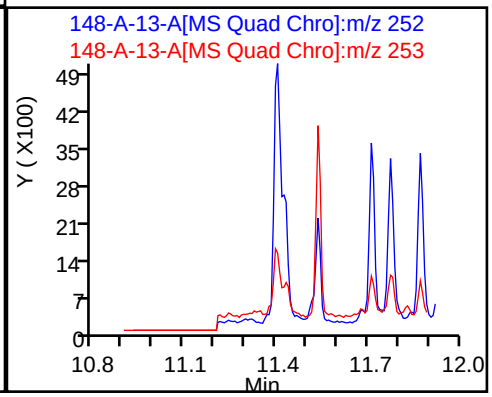












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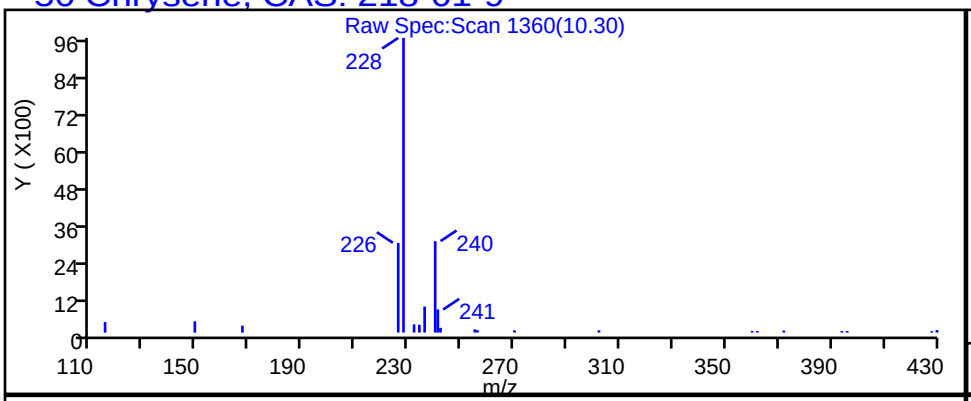
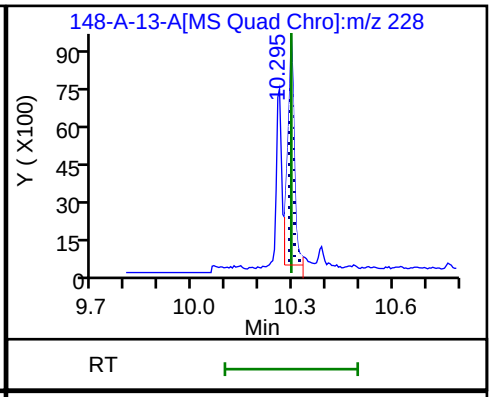
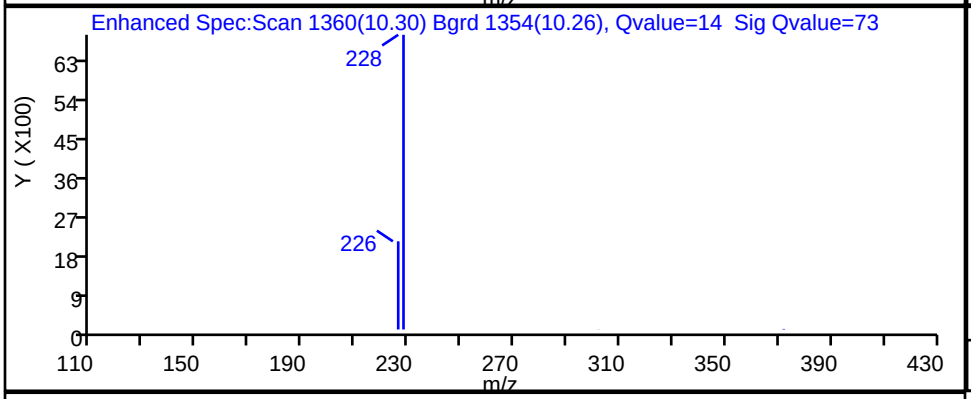
Eurofins Knoxville

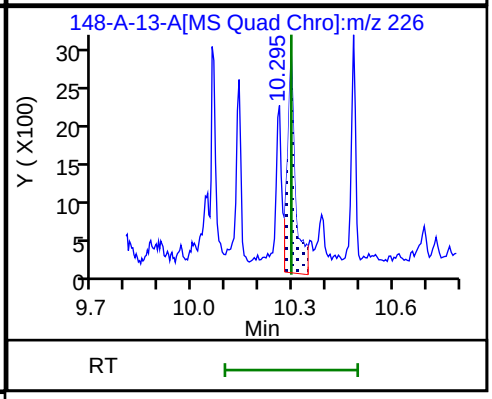
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-13-A.D		
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16
Client ID:	1804576-853-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

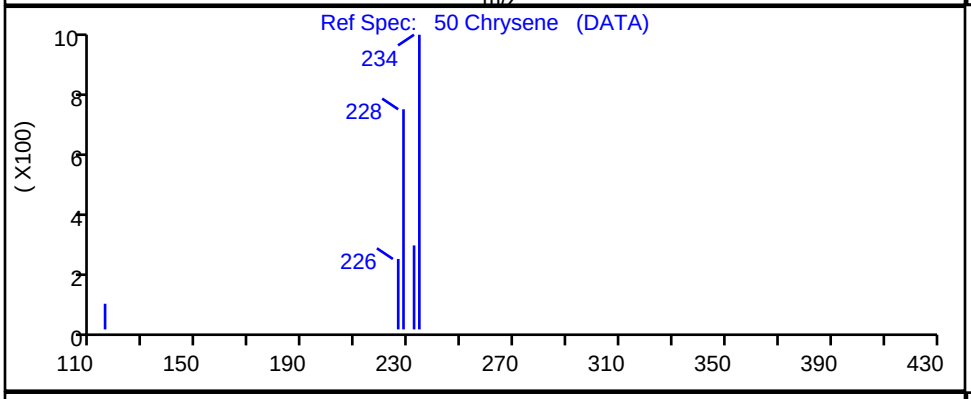
50 Chrysene, CAS: 218-01-9

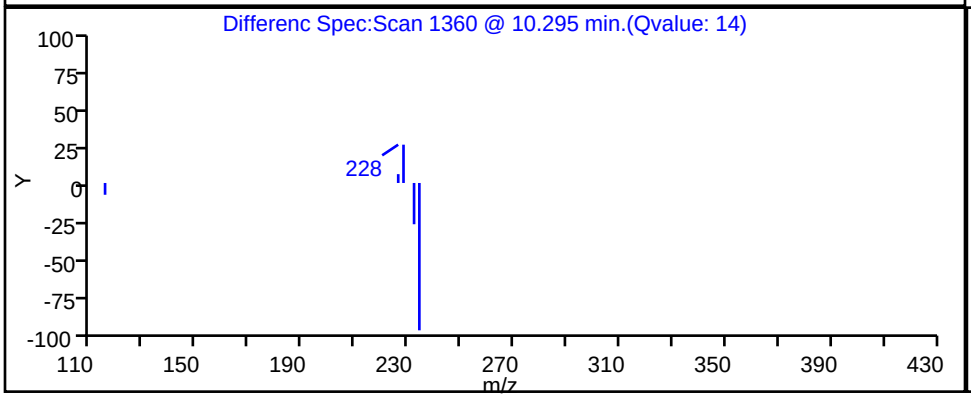


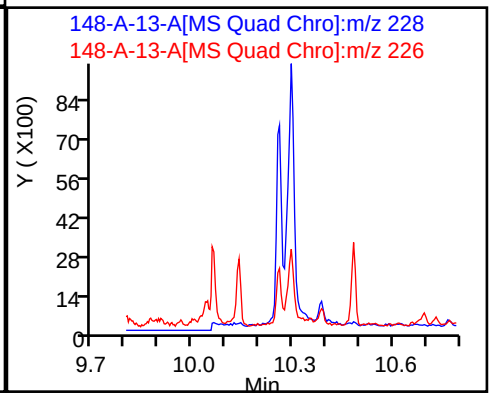












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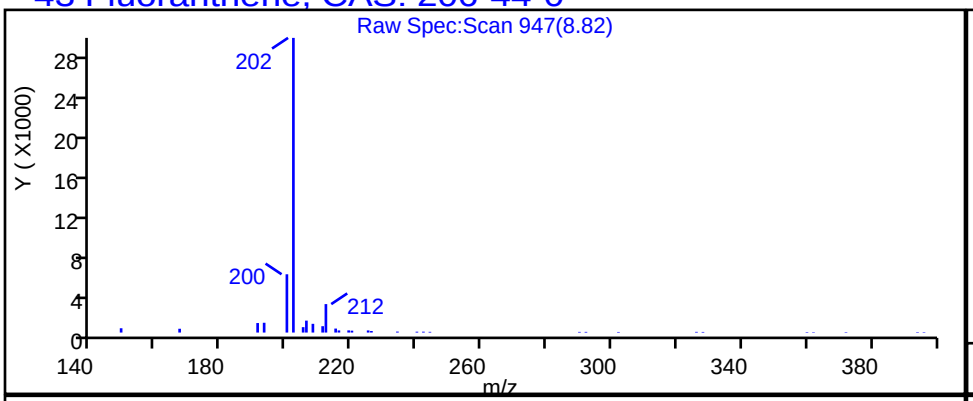
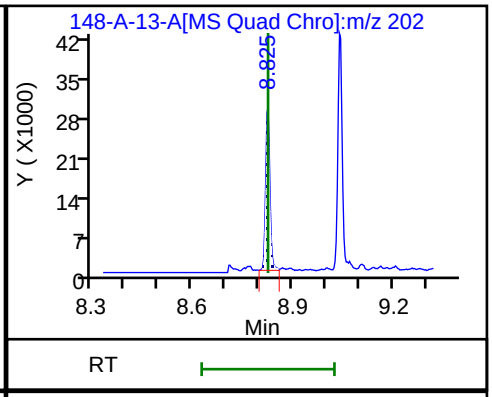
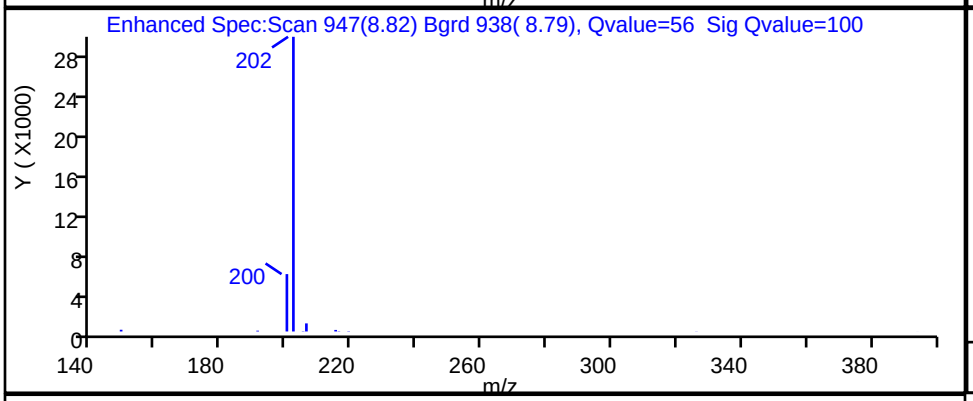
Eurofins Knoxville

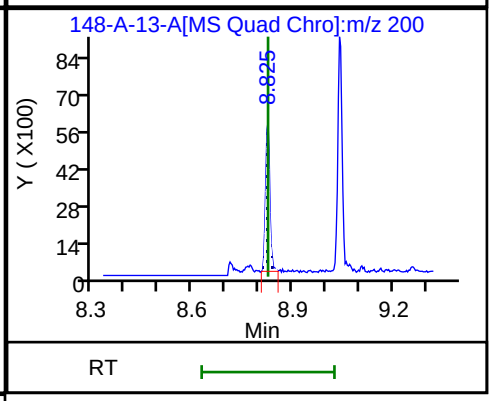
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-13-A.D		
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16
Client ID:	1804576-853-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

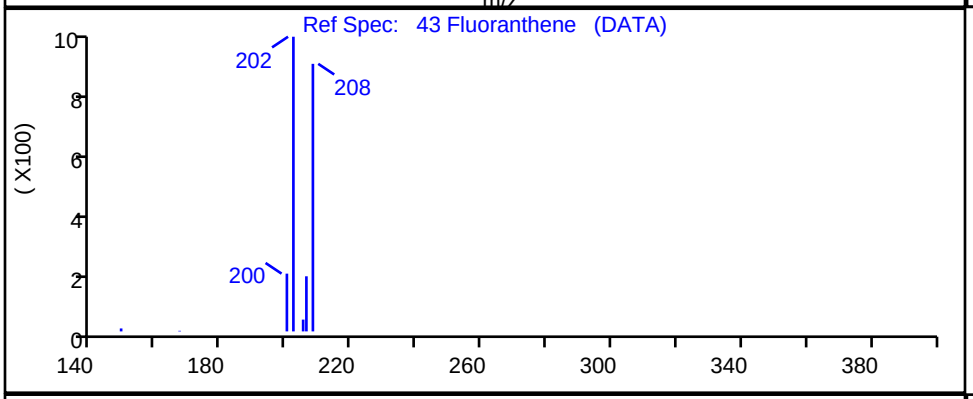
43 Fluoranthene, CAS: 206-44-0

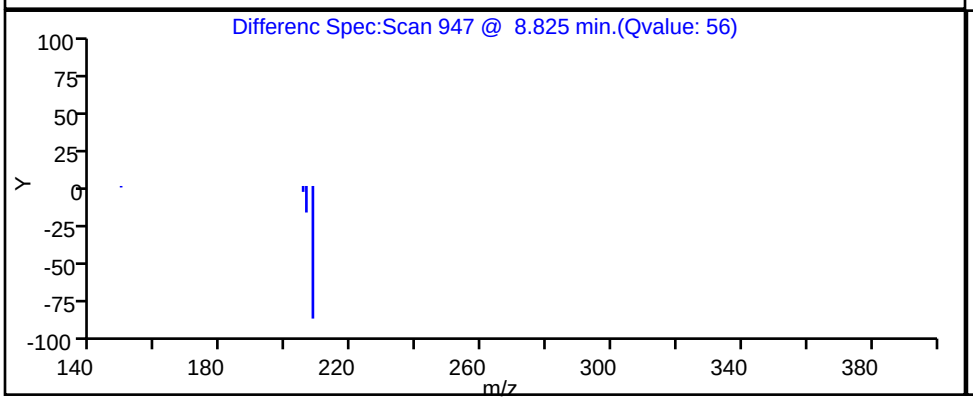


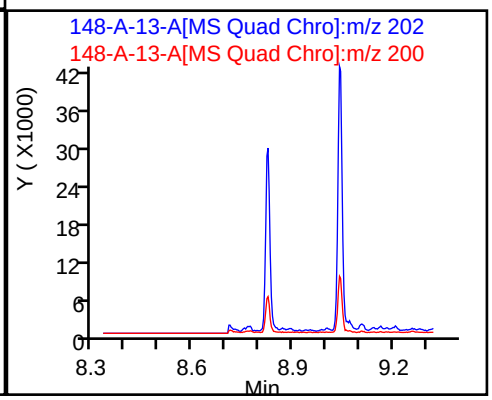












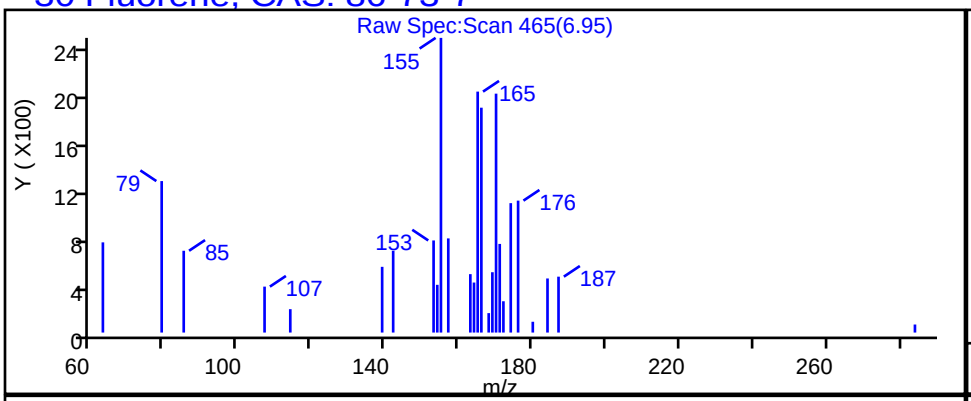
Report Date: 22-Nov-2023 12:10:37 Chrom Revision: 2.3 15-Nov-2023 20:54:34

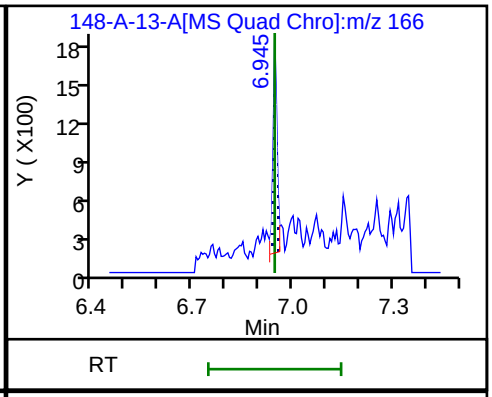
Eurofins Knoxville

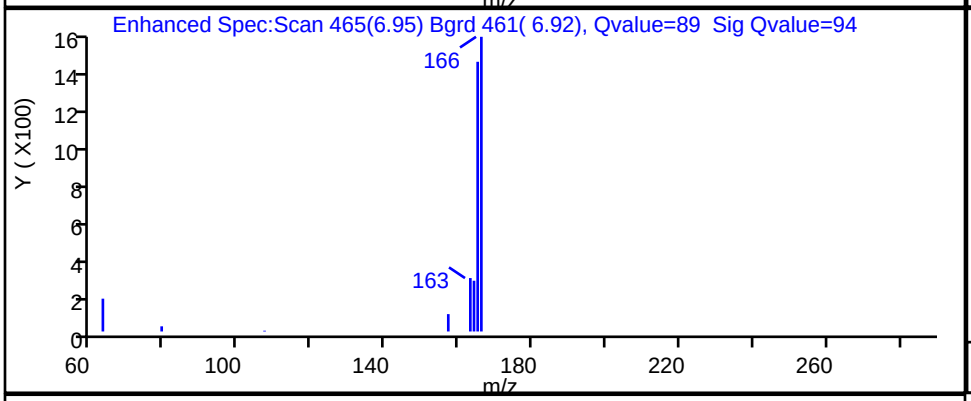
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-13-A.D

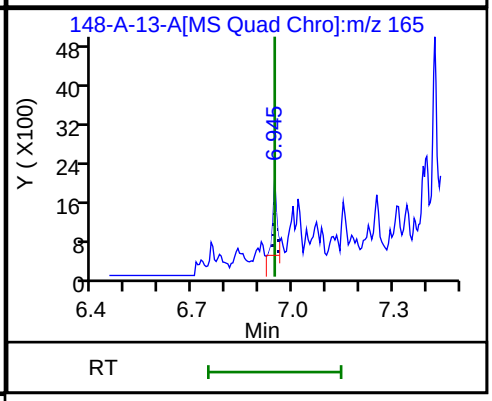
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16
Client ID:	1804576-853-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

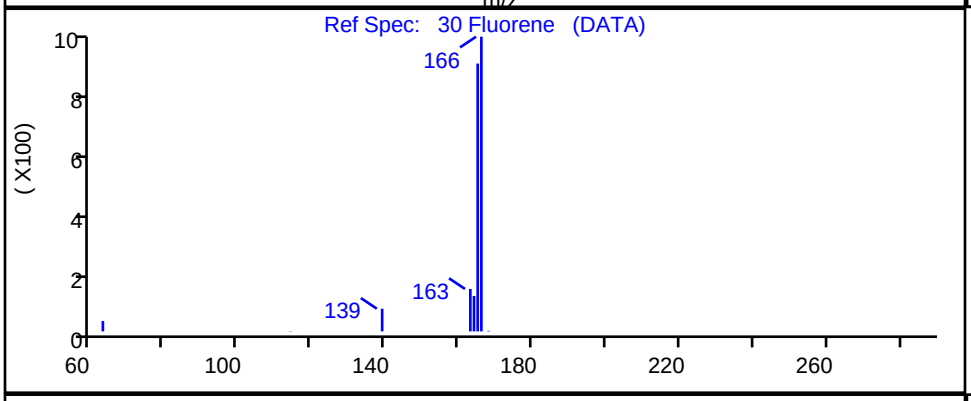
30 Fluorene, CAS: 86-73-7

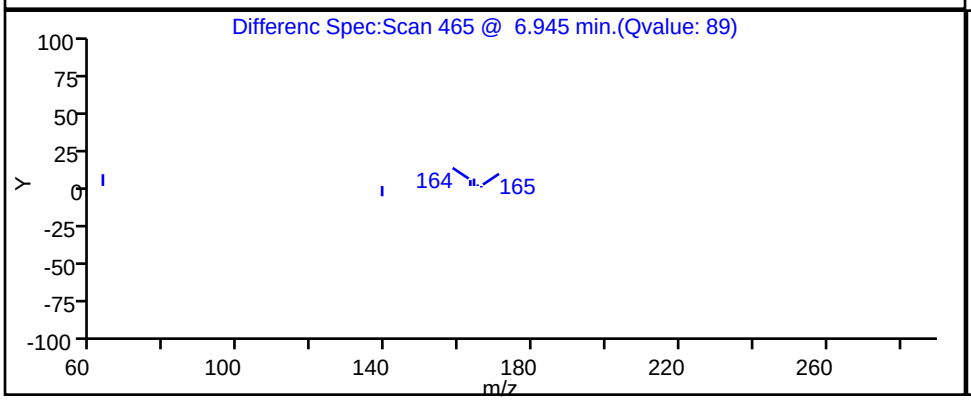


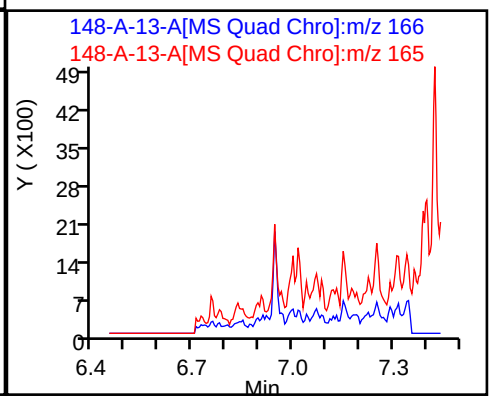












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Eurofins Knoxville

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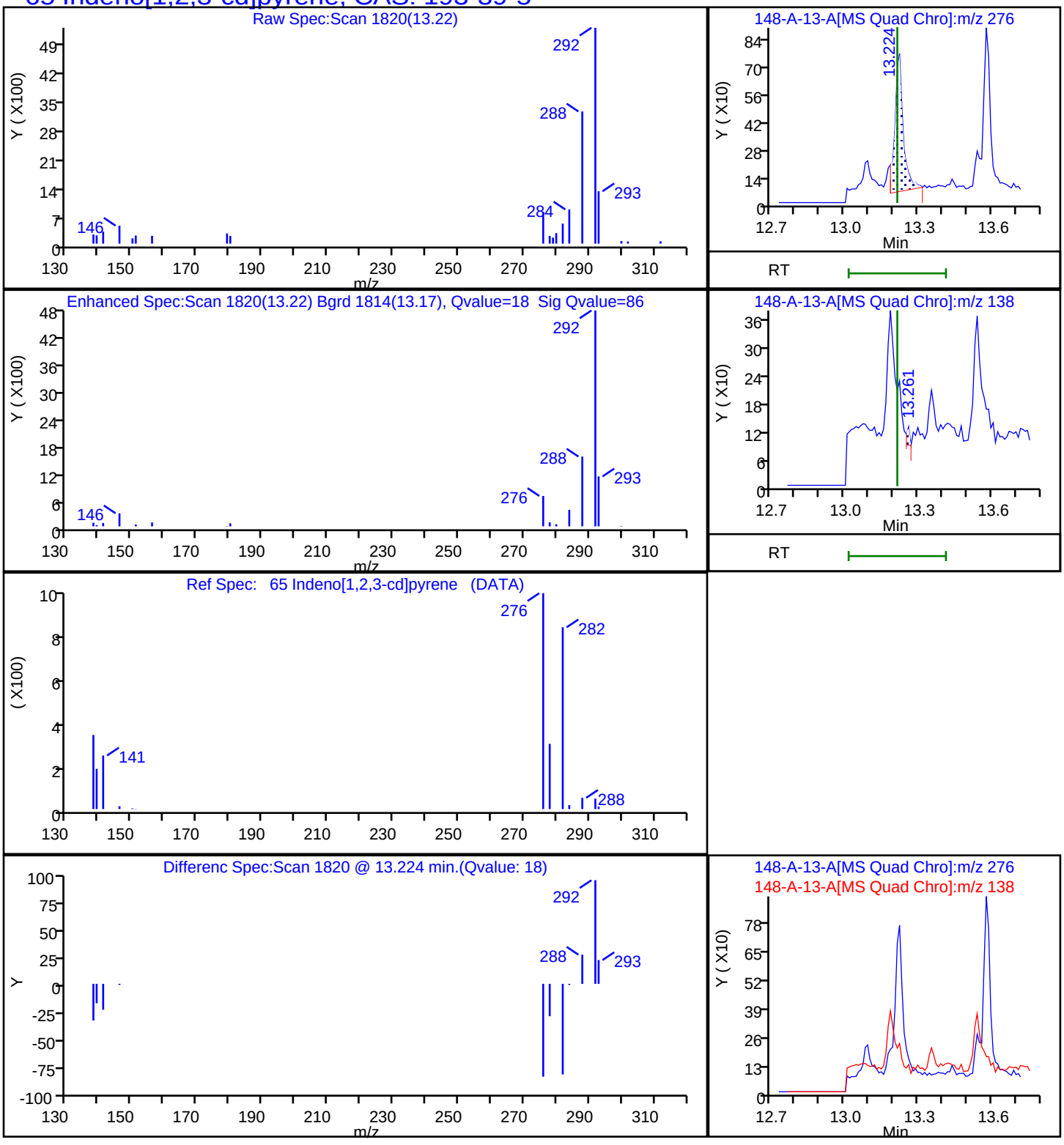
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16		
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

65 Indeno[1,2,3-cd]pyrene, CAS: 193-39-5



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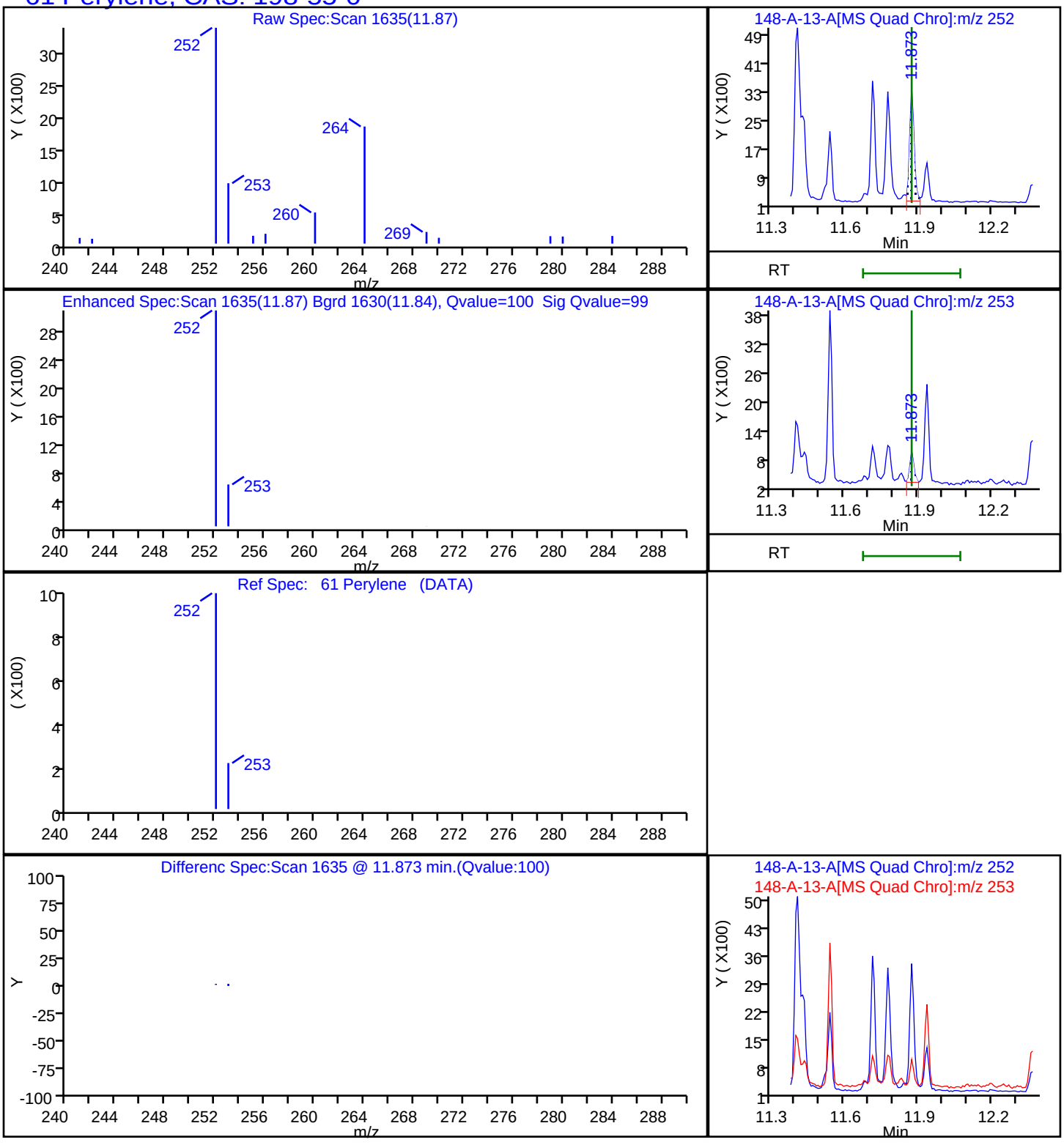
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-13-A.D

Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16
Client ID:	1804576-853-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

61 Perylene, CAS: 198-55-0



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Eurofins Knoxville

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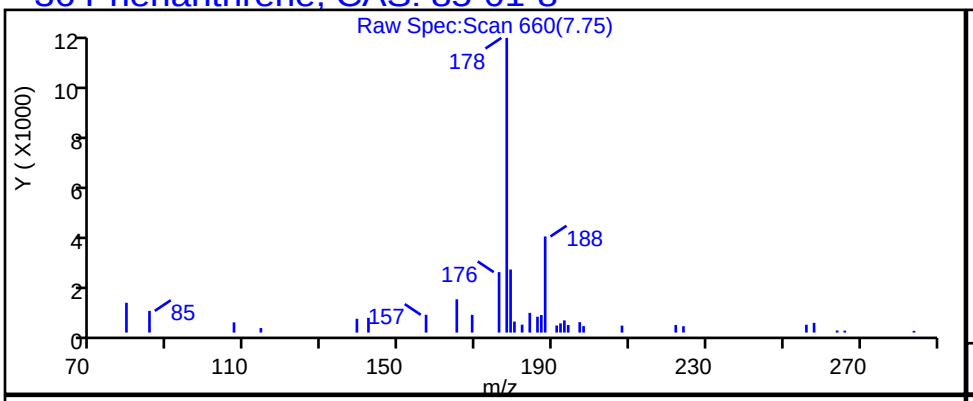
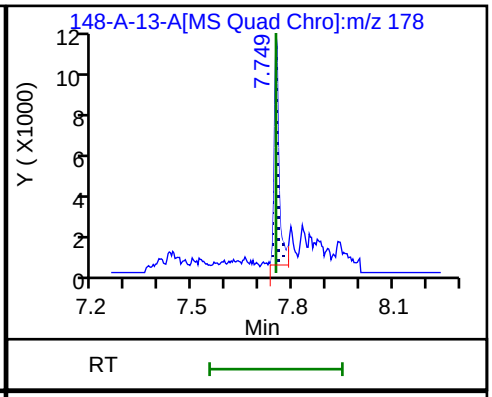
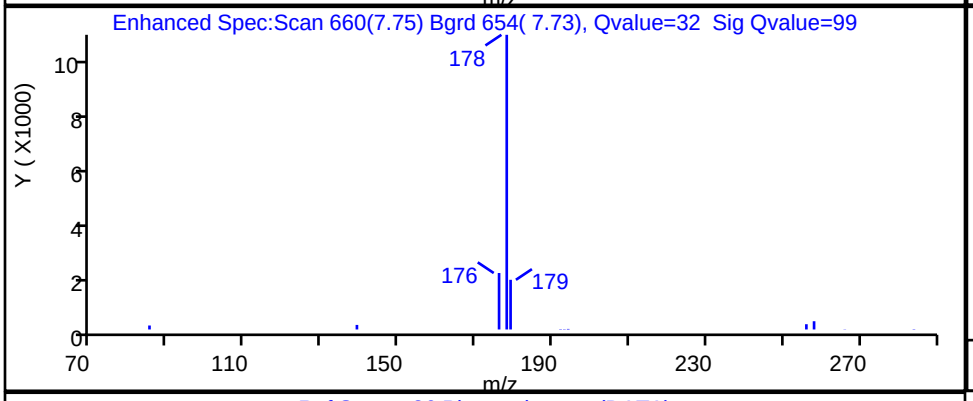
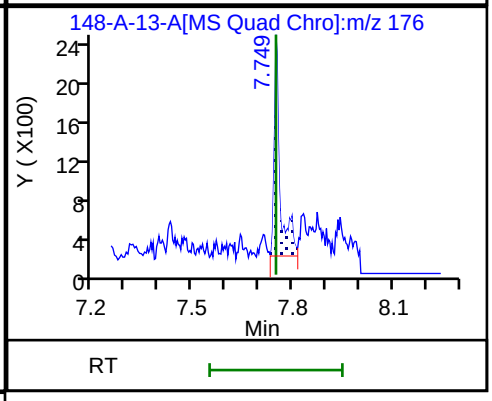
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16		
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

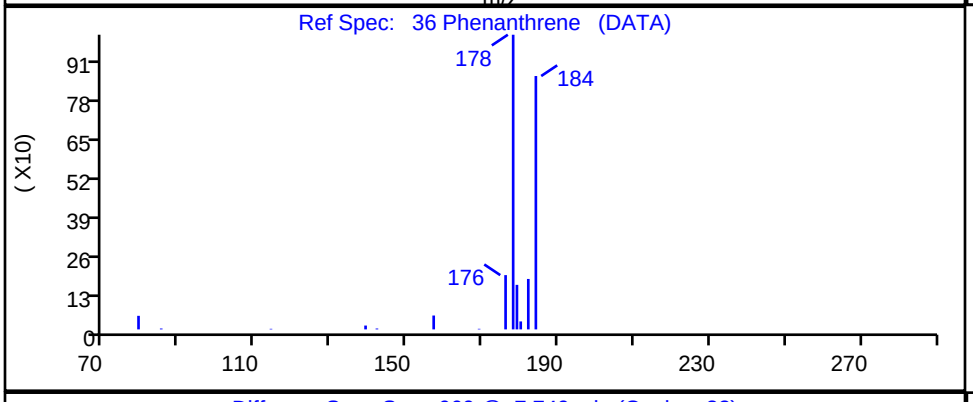
36 Phenanthrene, CAS: 85-01-8

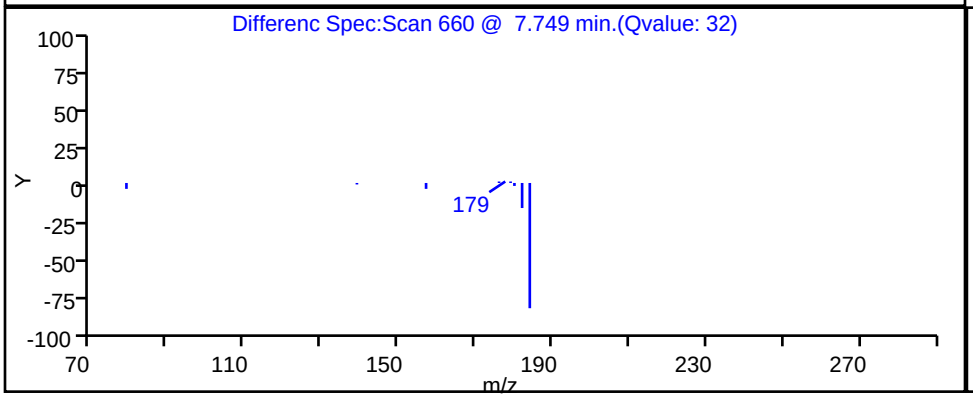


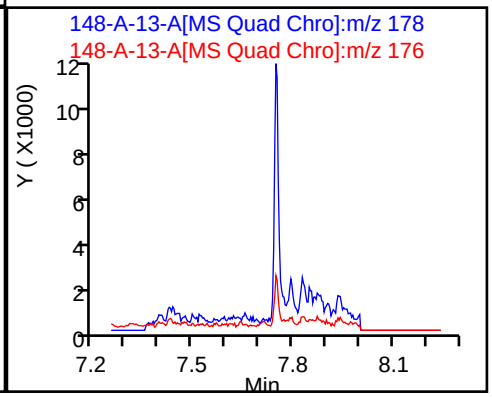












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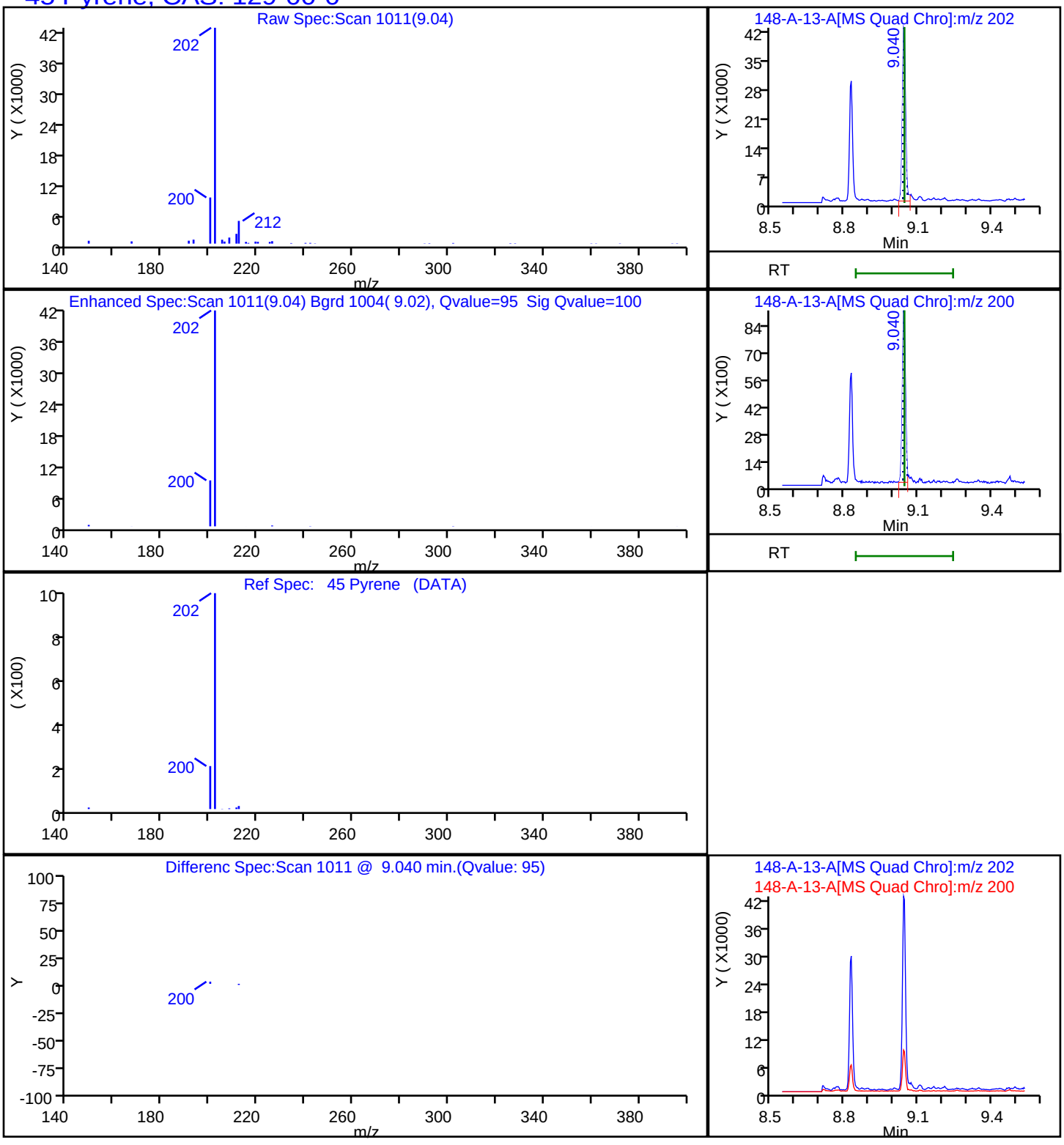
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-13-A.D

Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16
Client ID:	1804576-853-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

45 Pyrene, CAS: 129-00-0



Report Date: 22-Nov-2023 12:10:38 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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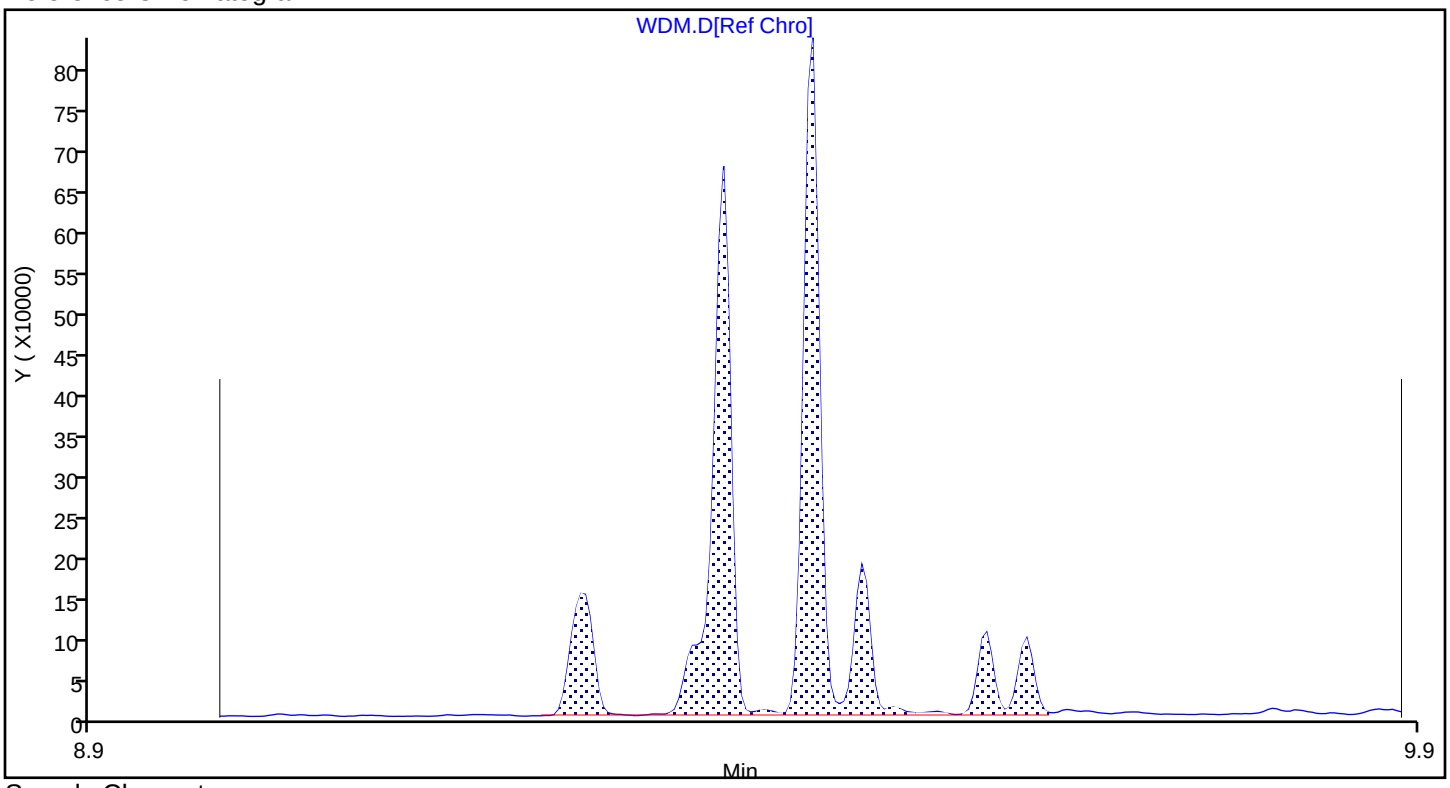
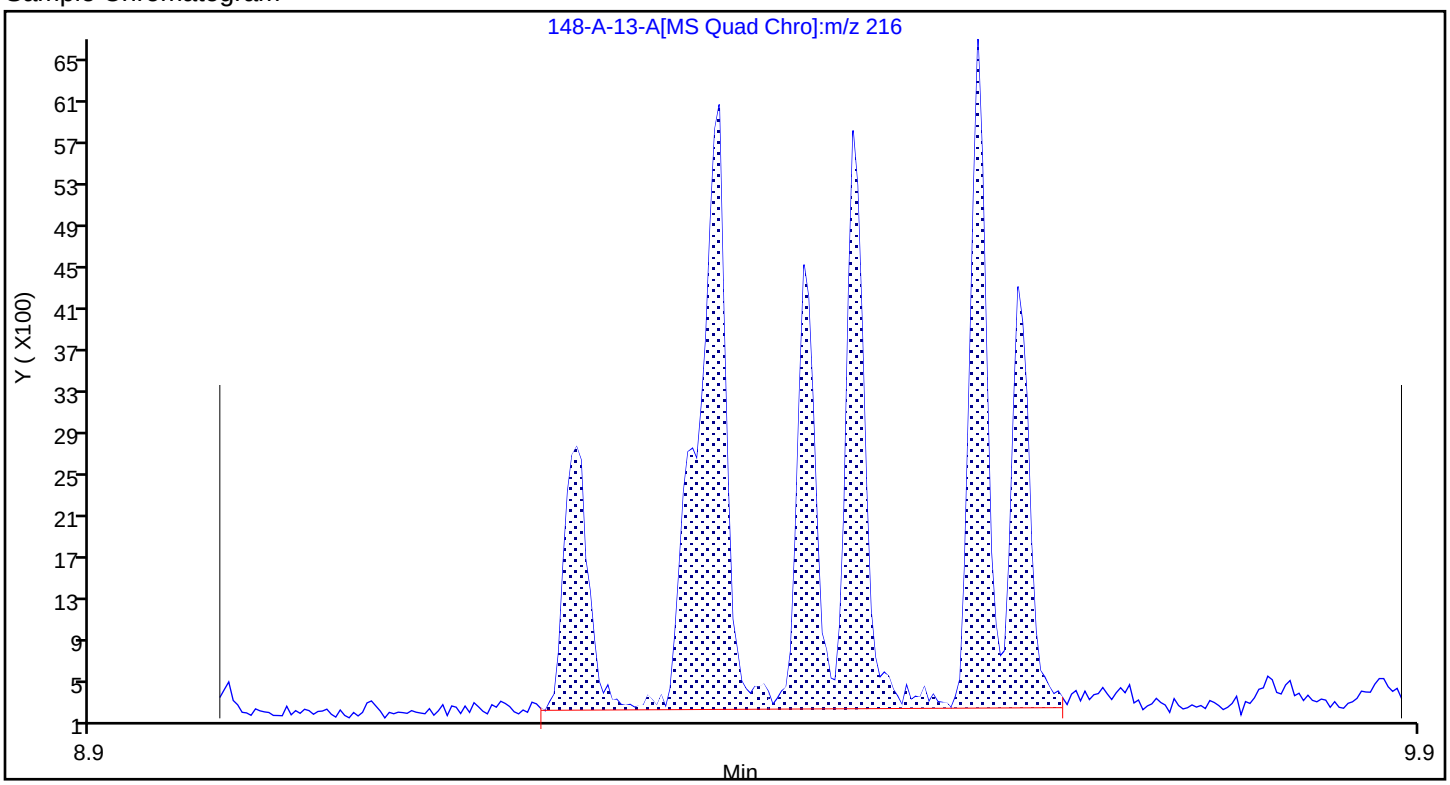
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16		
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 100 C1-Fluoranthenes/pyrene, CAS: STL00912

Reference Chromatogram



Sample Chromatogram



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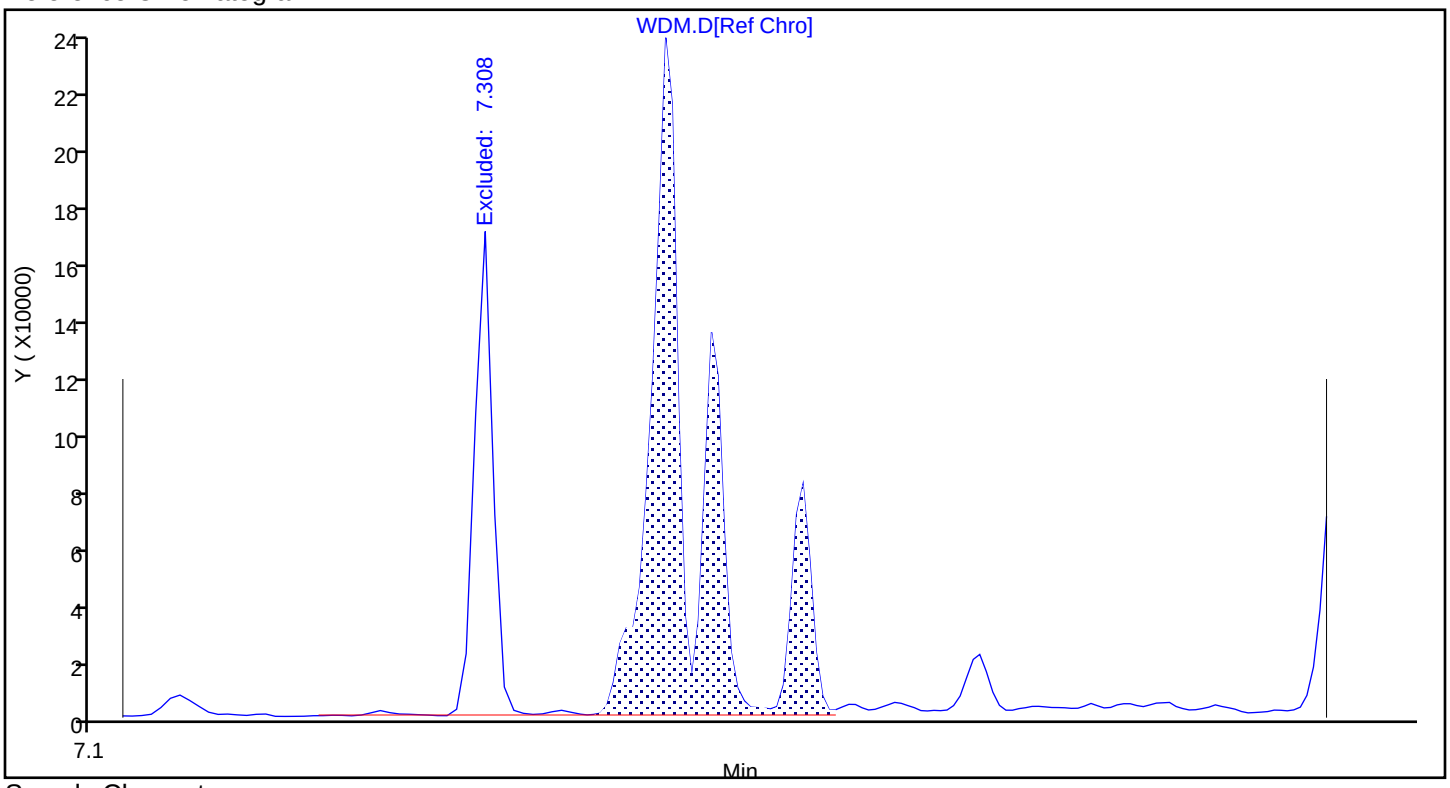
Eurofins Knoxville

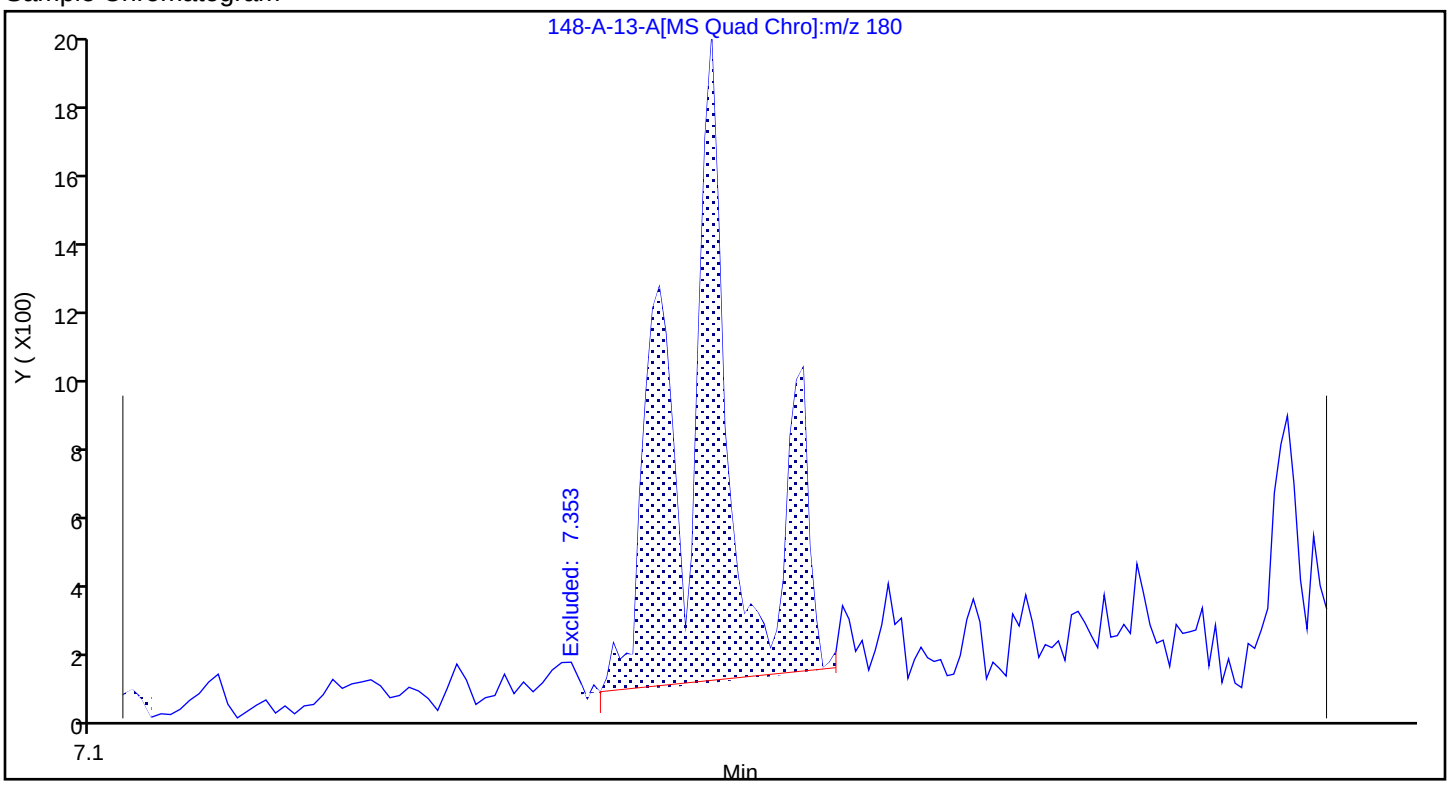
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-13-A.D				
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16		
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 89 C1-Fluorenes, CAS: STL00913

Reference Chromatogram



Sample Chromatogram



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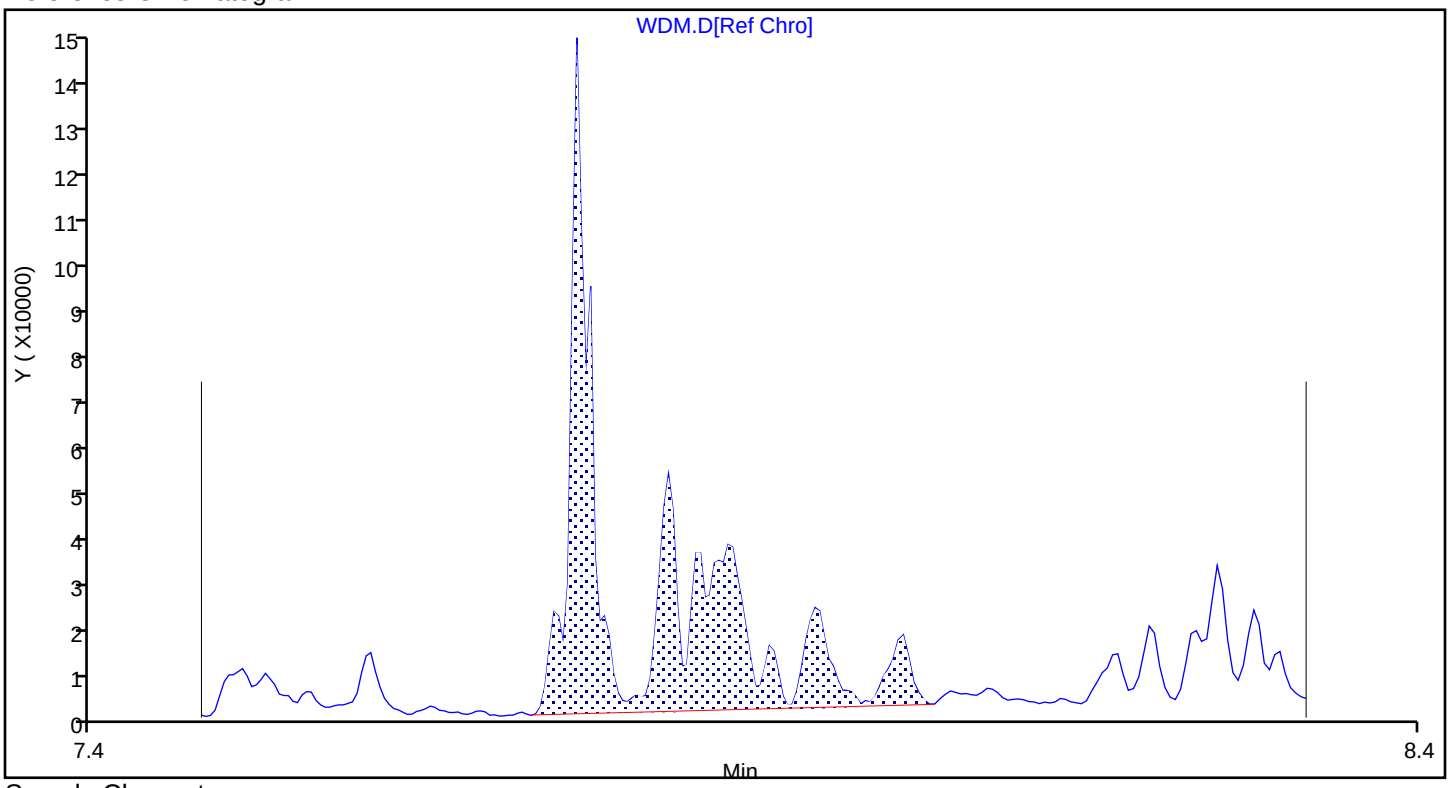
Eurofins Knoxville

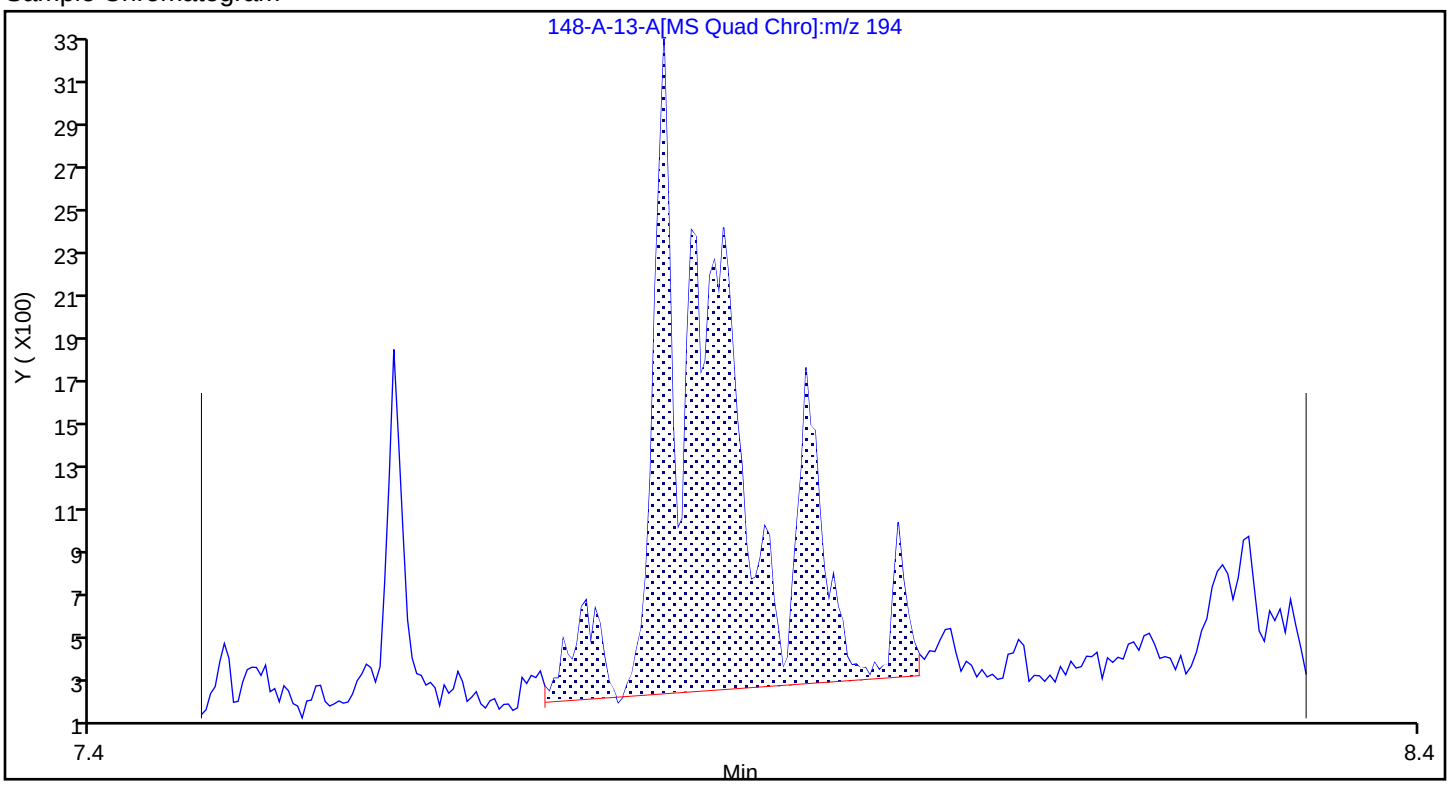
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-13-A.D				
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16		
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 90 C2-Fluorenes, CAS: STL00914

Reference Chromatogram



Sample Chromatogram



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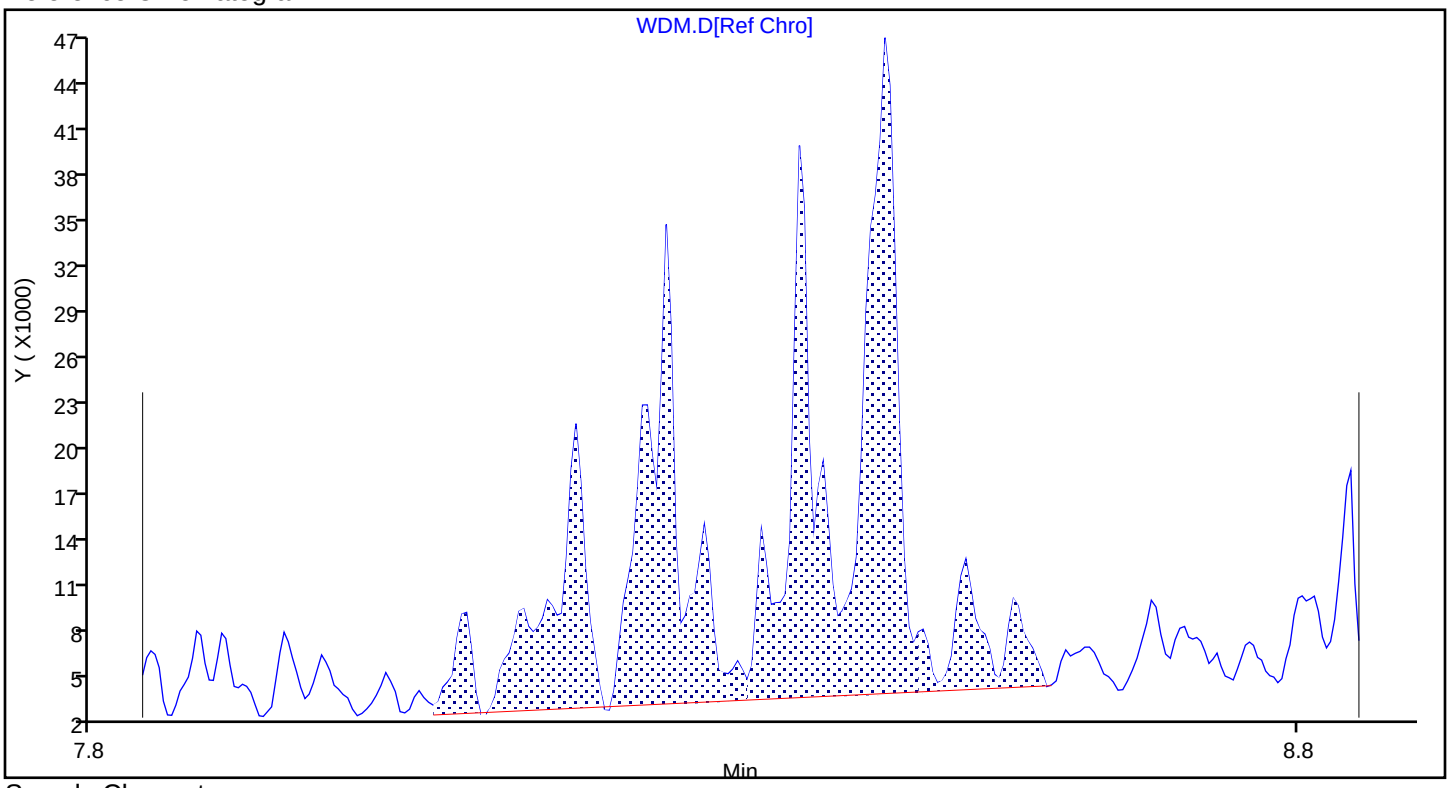
Eurofins Knoxville

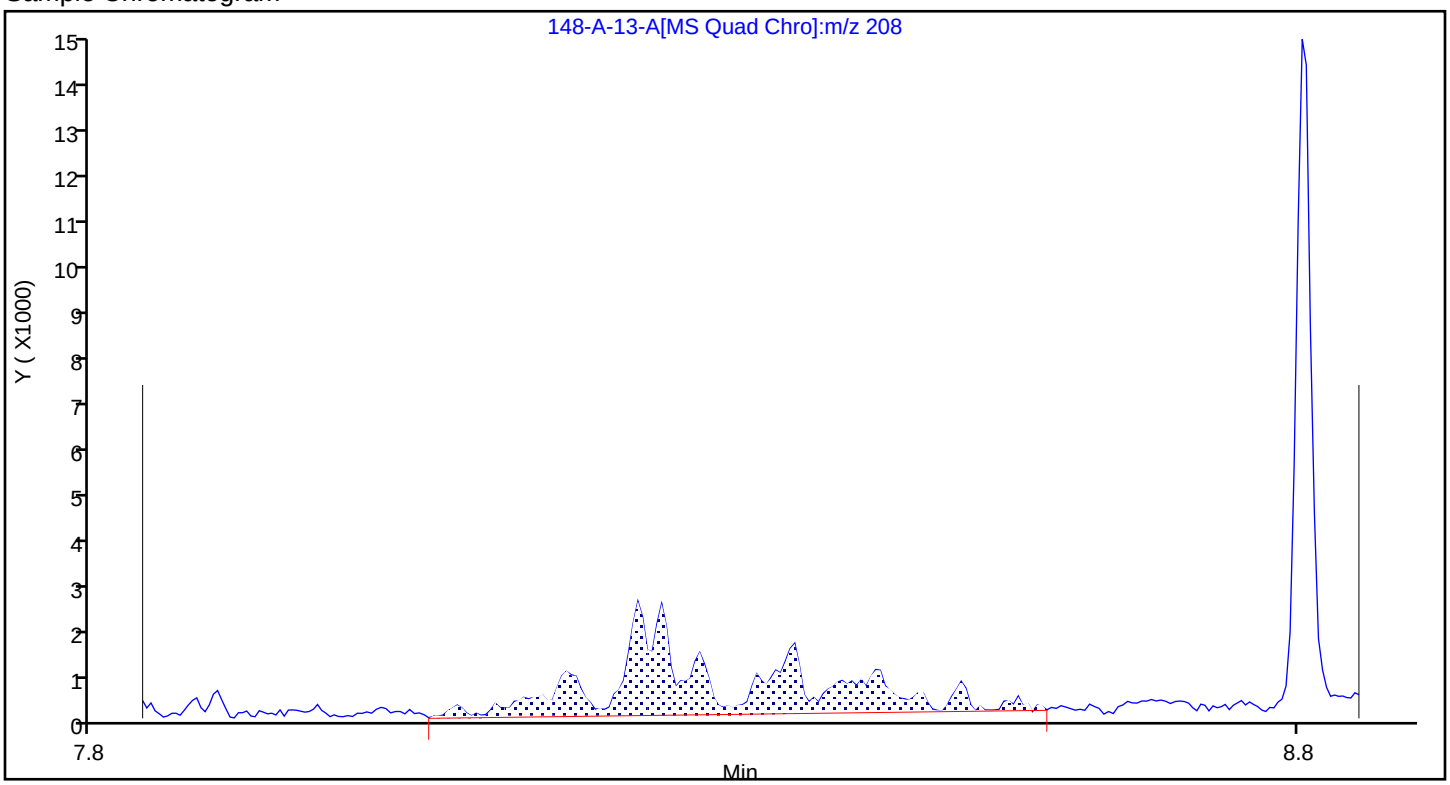
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-13-A.D				
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16		
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 91 C3-Fluorenes, CAS: STL00915

Reference Chromatogram



Sample Chromatogram



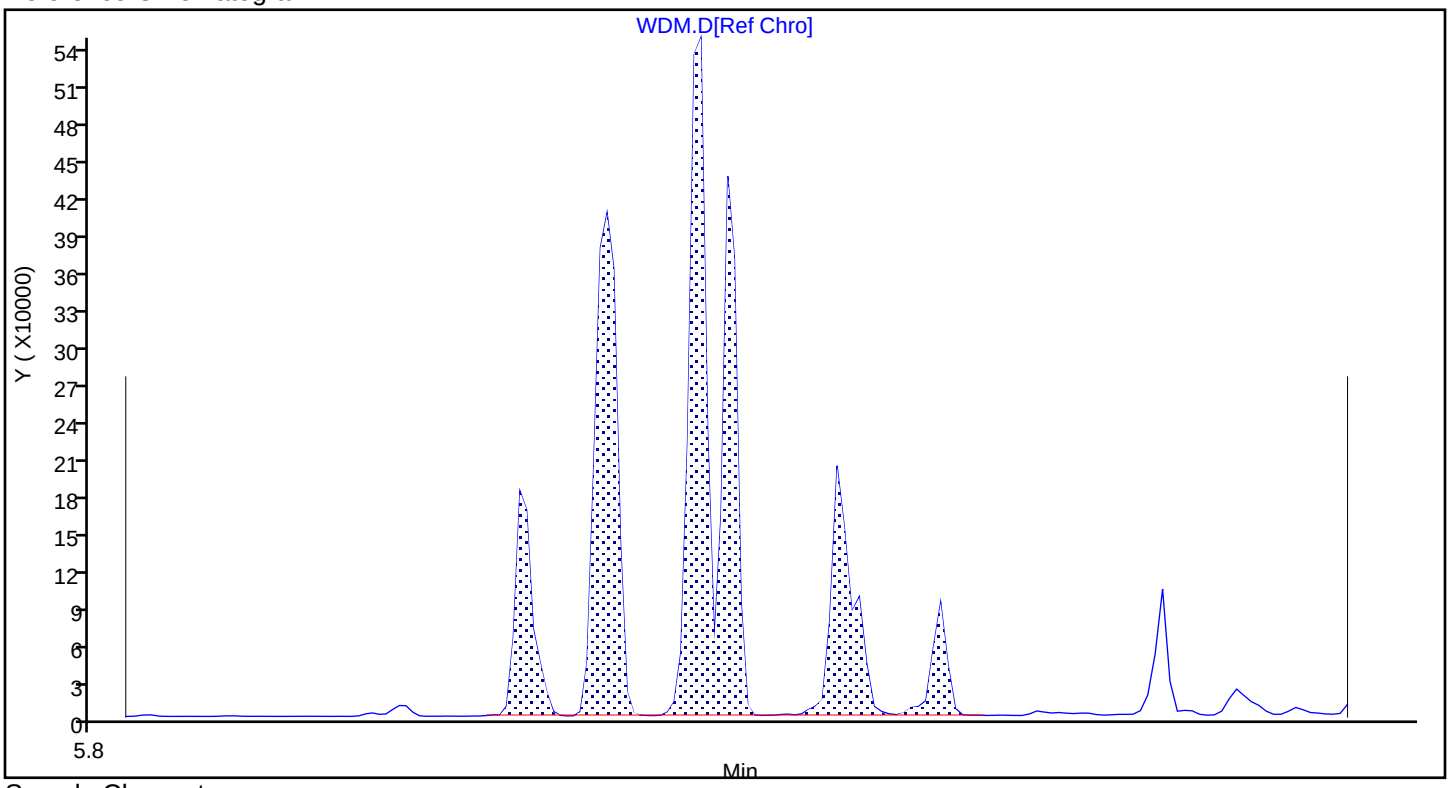
Report Date: 22-Nov-2023 12:10:38 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

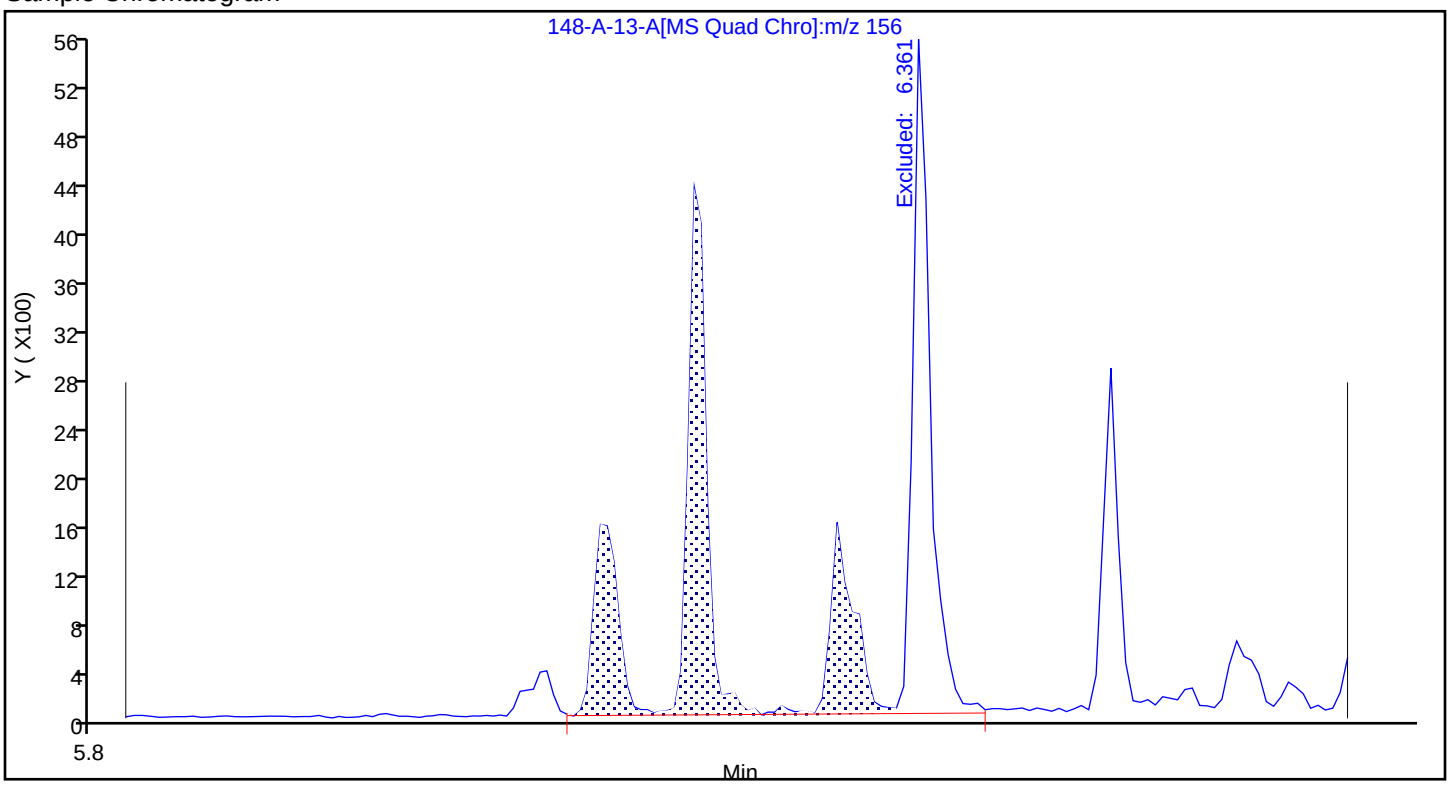
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-13-A.D				
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16		
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 86 C2-Naphthalenes, CAS: STL00917

Reference Chromatogram



Sample Chromatogram



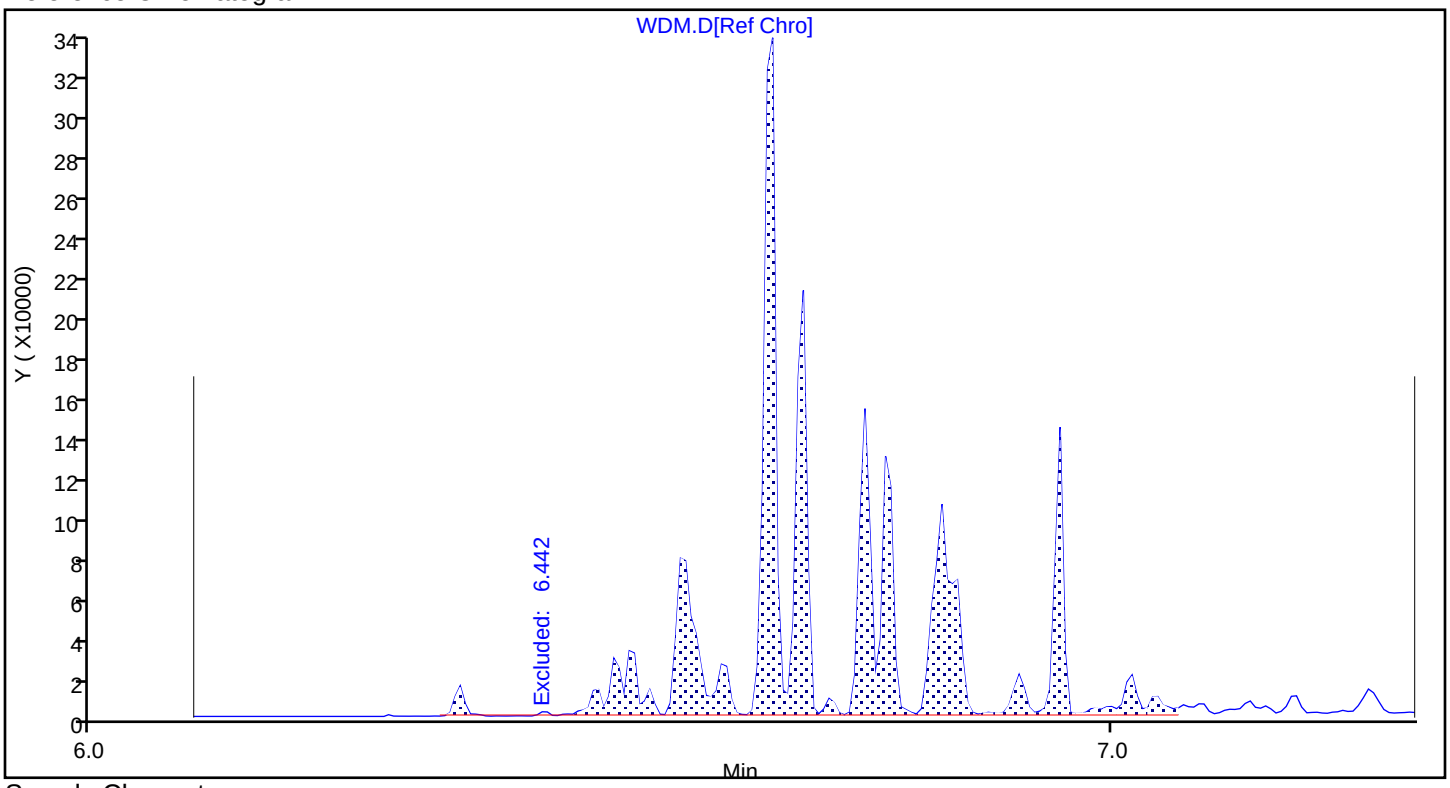
Report Date: 22-Nov-2023 12:10:38 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

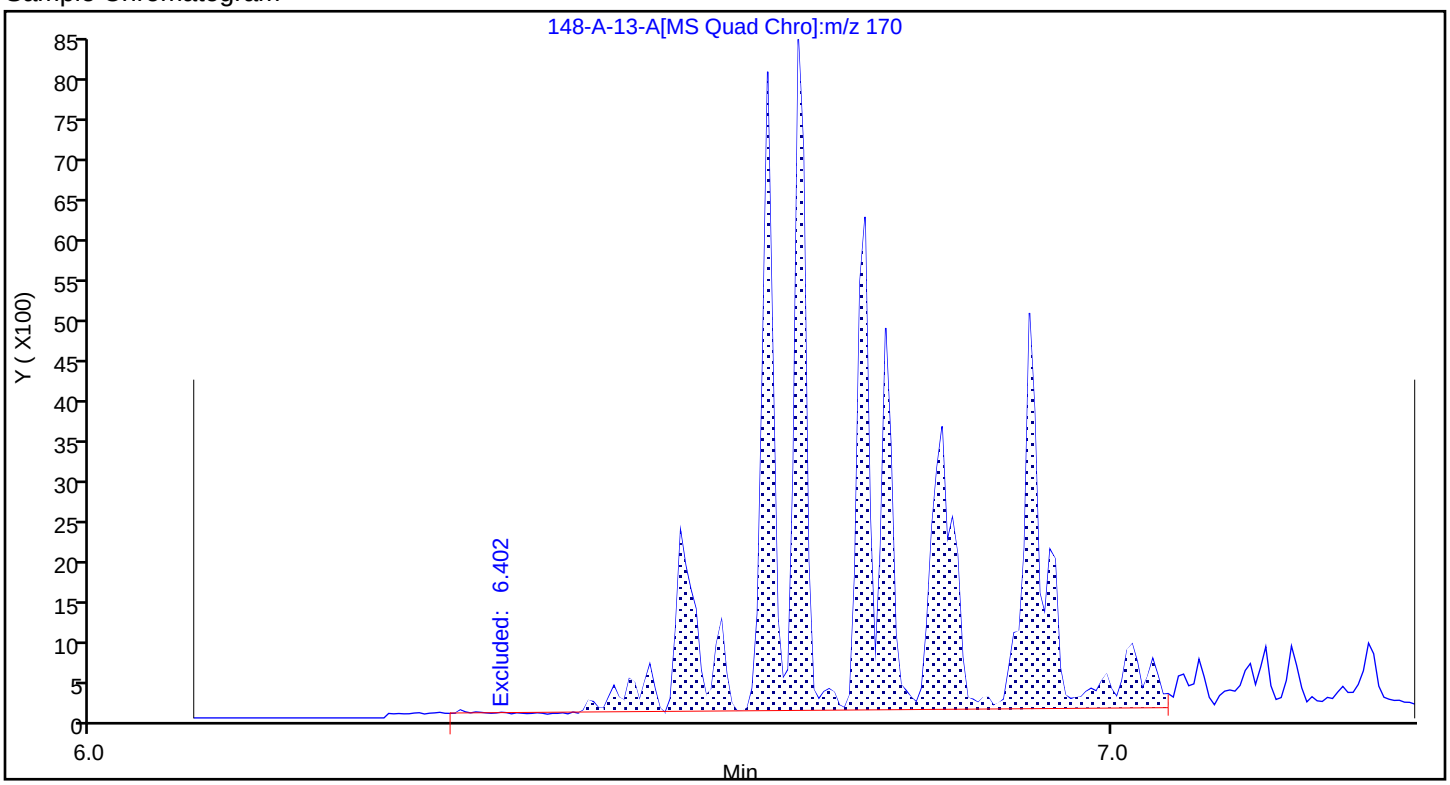
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-13-A.D				
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16		
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 87 C3-Naphthalenes, CAS: STL00918

Reference Chromatogram



Sample Chromatogram



Report Date: 22-Nov-2023 12:10:38 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16		
Client ID:	1804576-853-S1				
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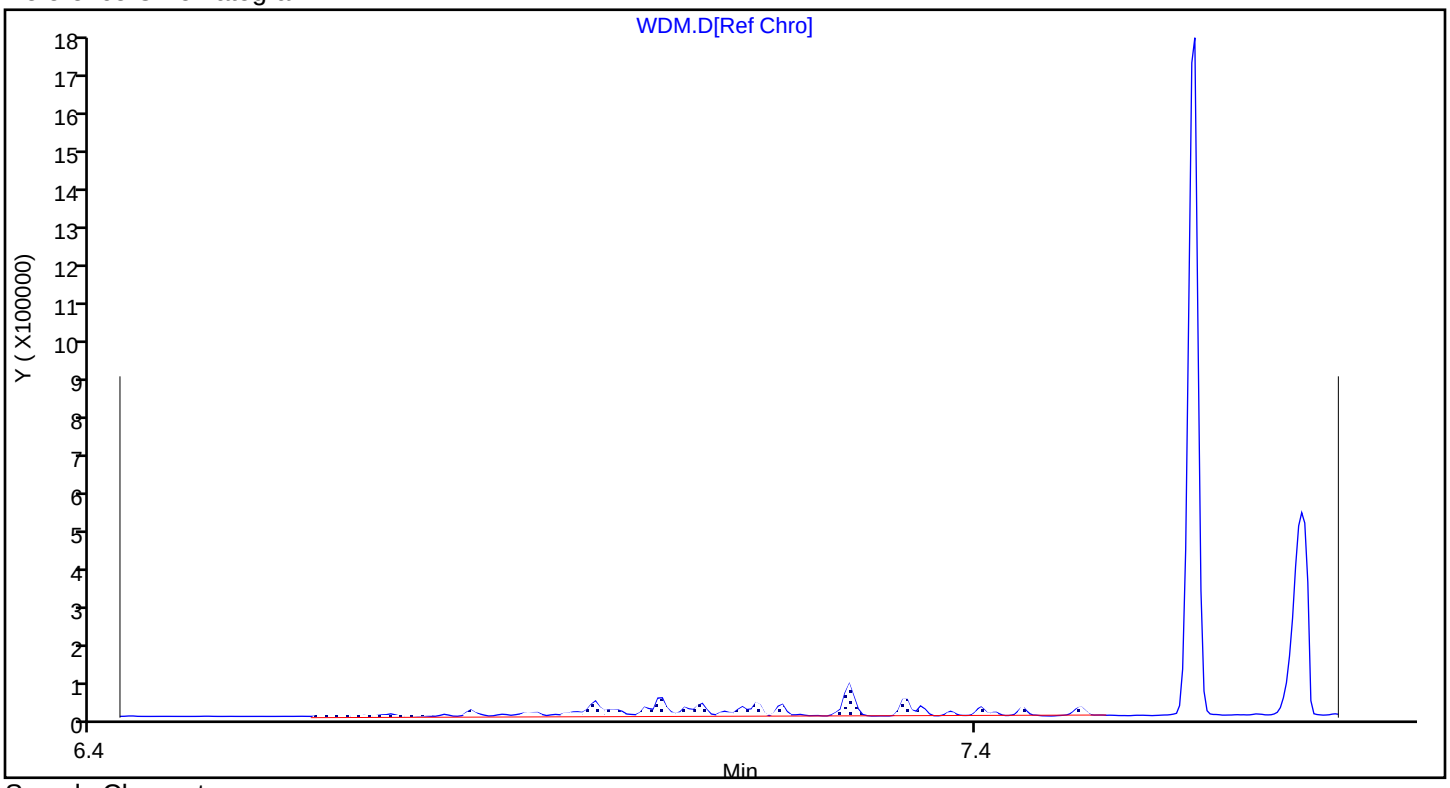
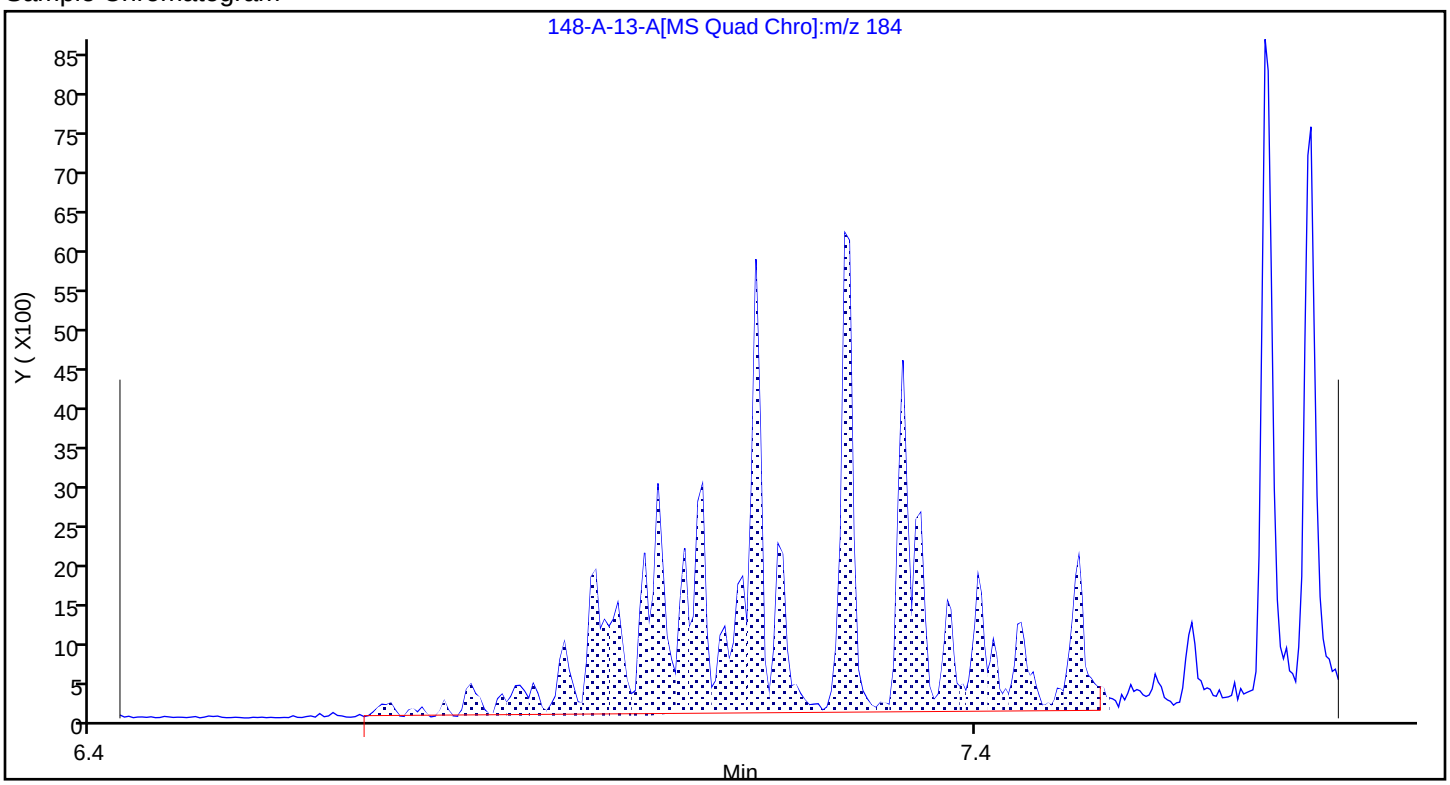
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 88 C4-Naphthalenes, CAS: STL00919

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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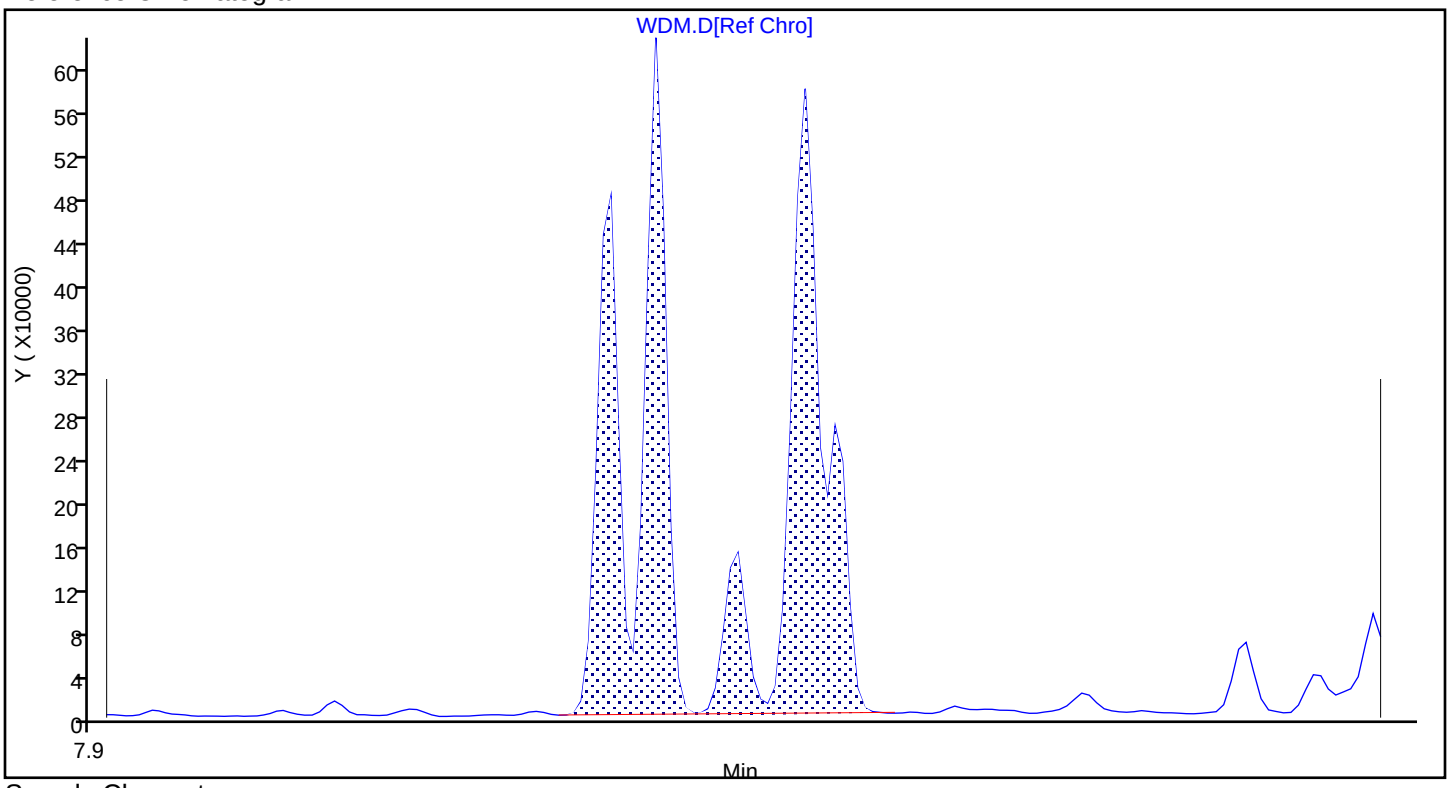
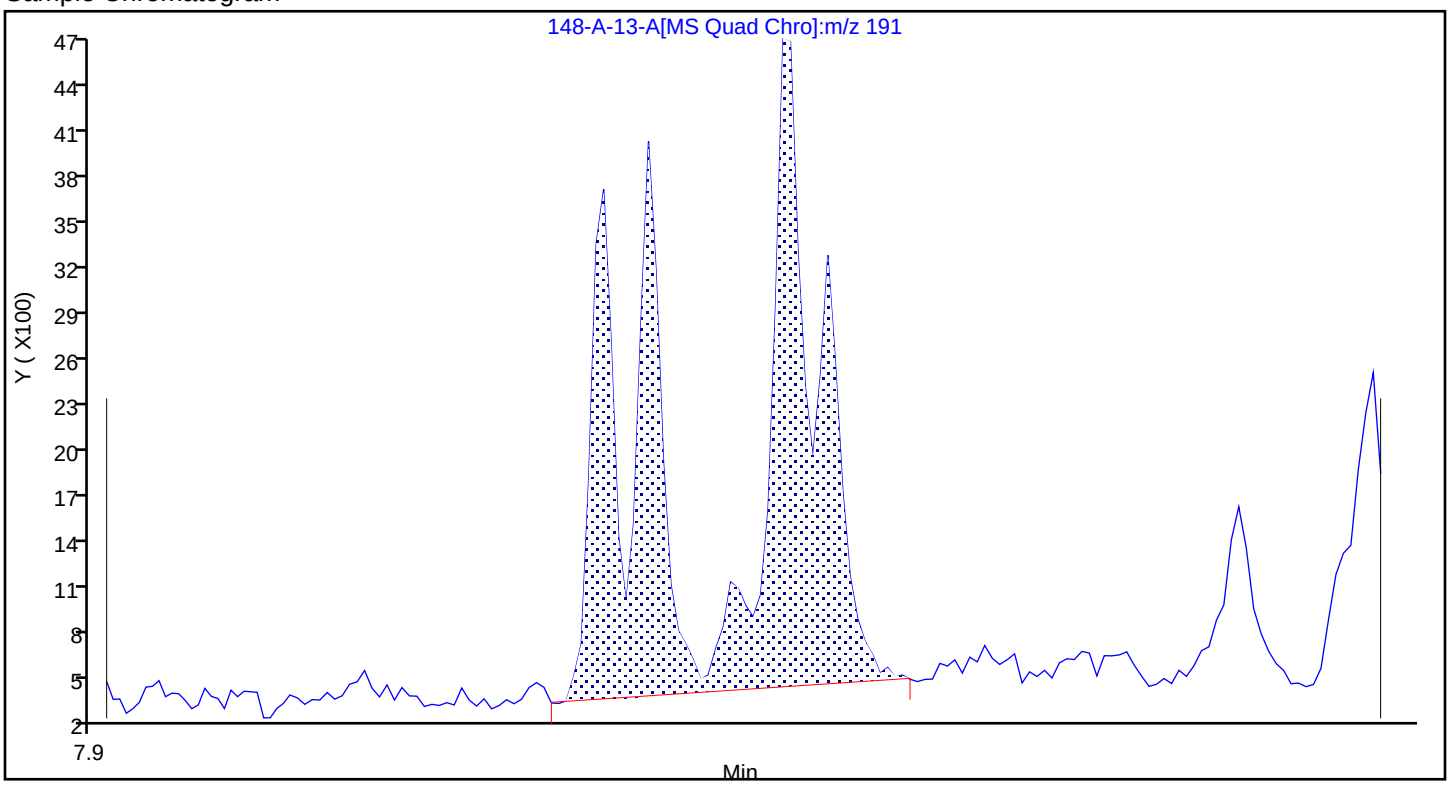
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 96 C1-Phenanthrenes/Anthracenes, CAS: STL00901

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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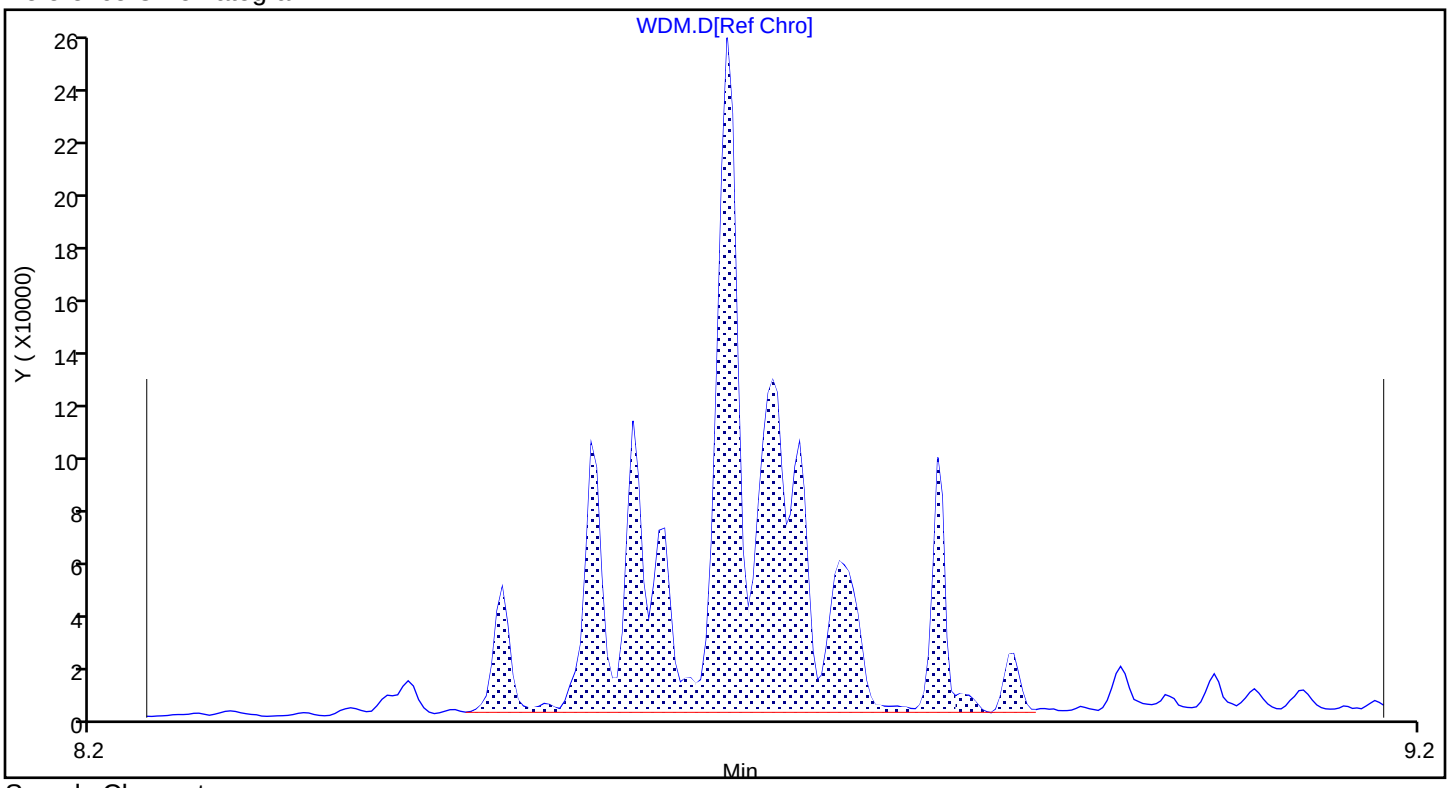
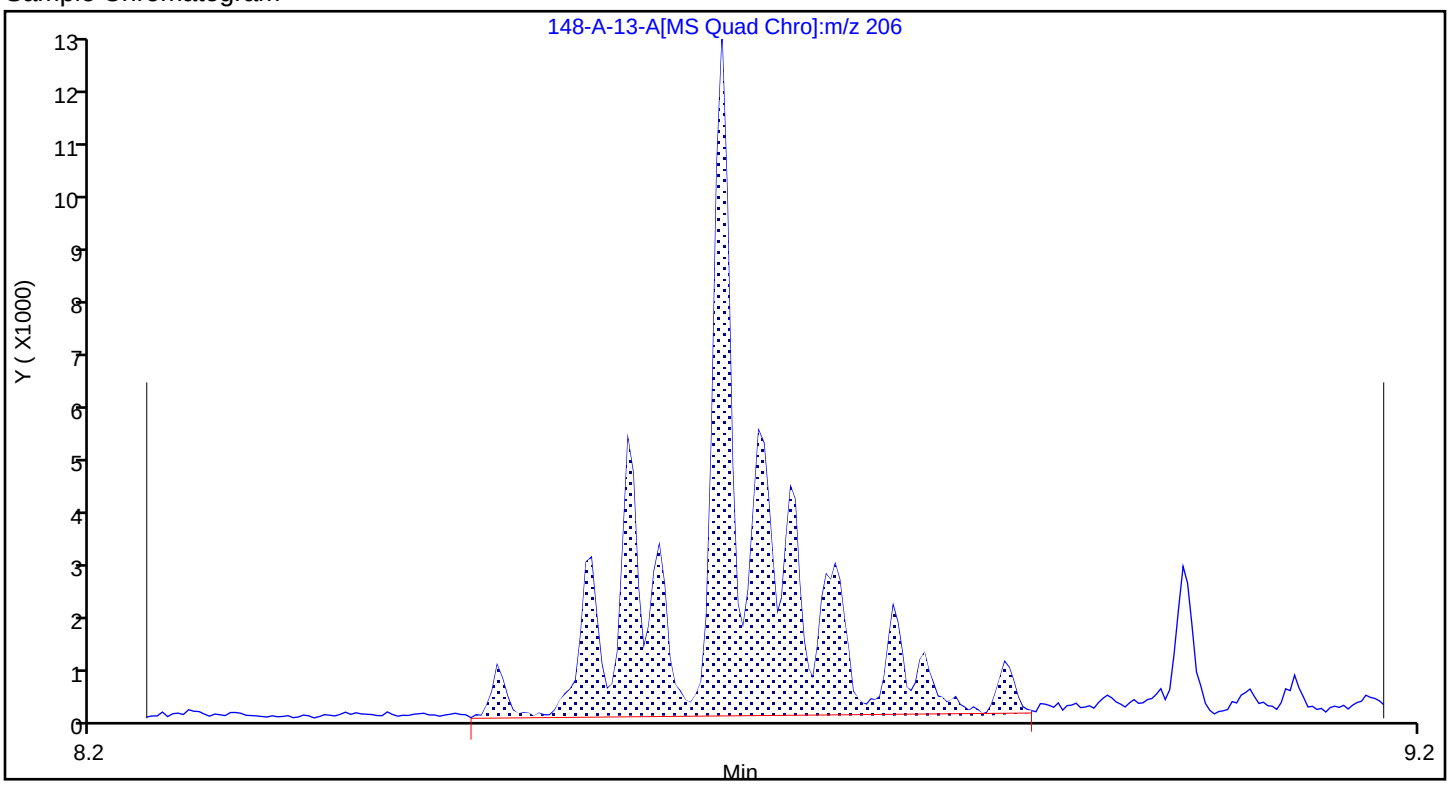
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 97 C2-Phenanthrenes/Anthracenes, CAS: STL00902

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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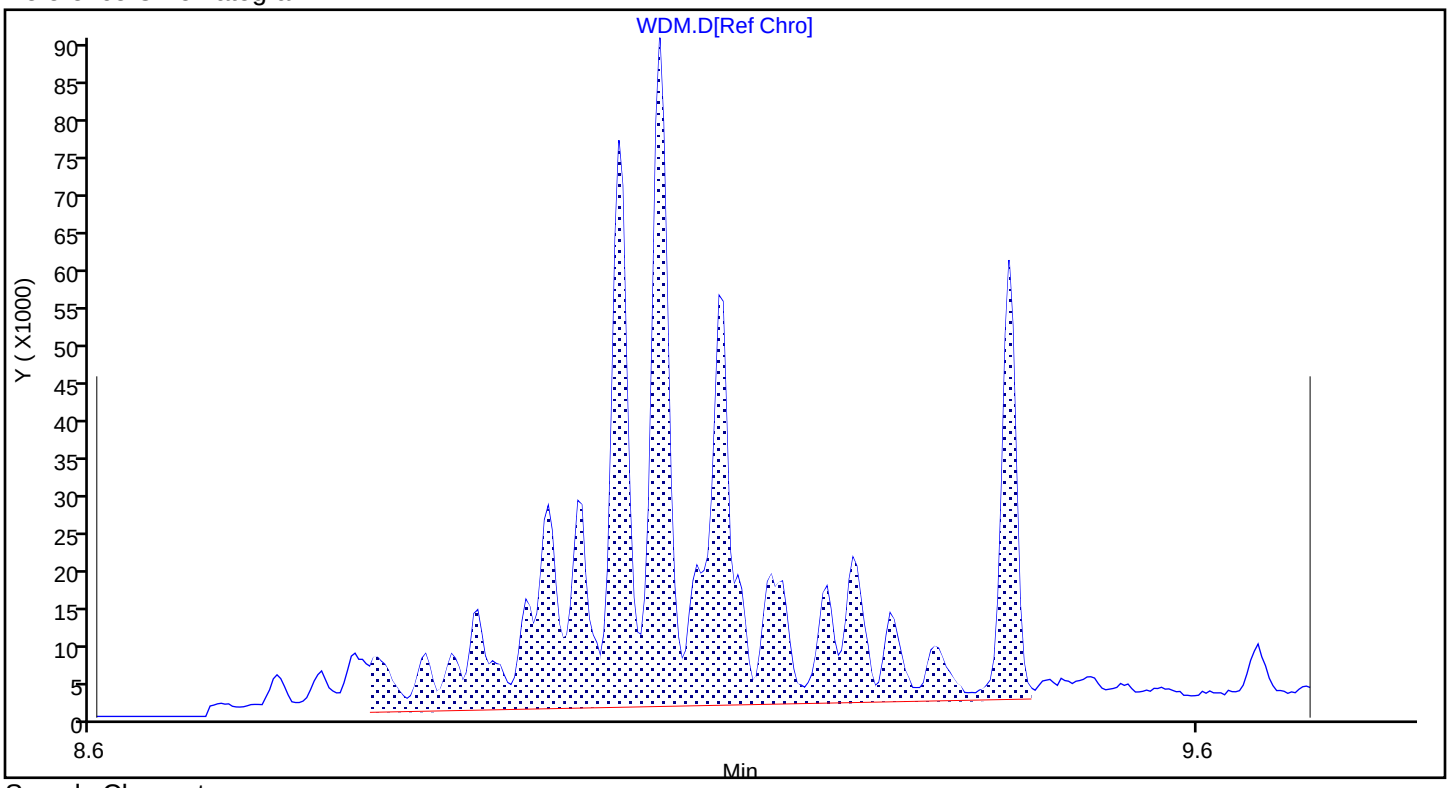
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 98 C3-Phenanthrenes/Anthracenes, CAS: STL00903

Reference Chromatogram



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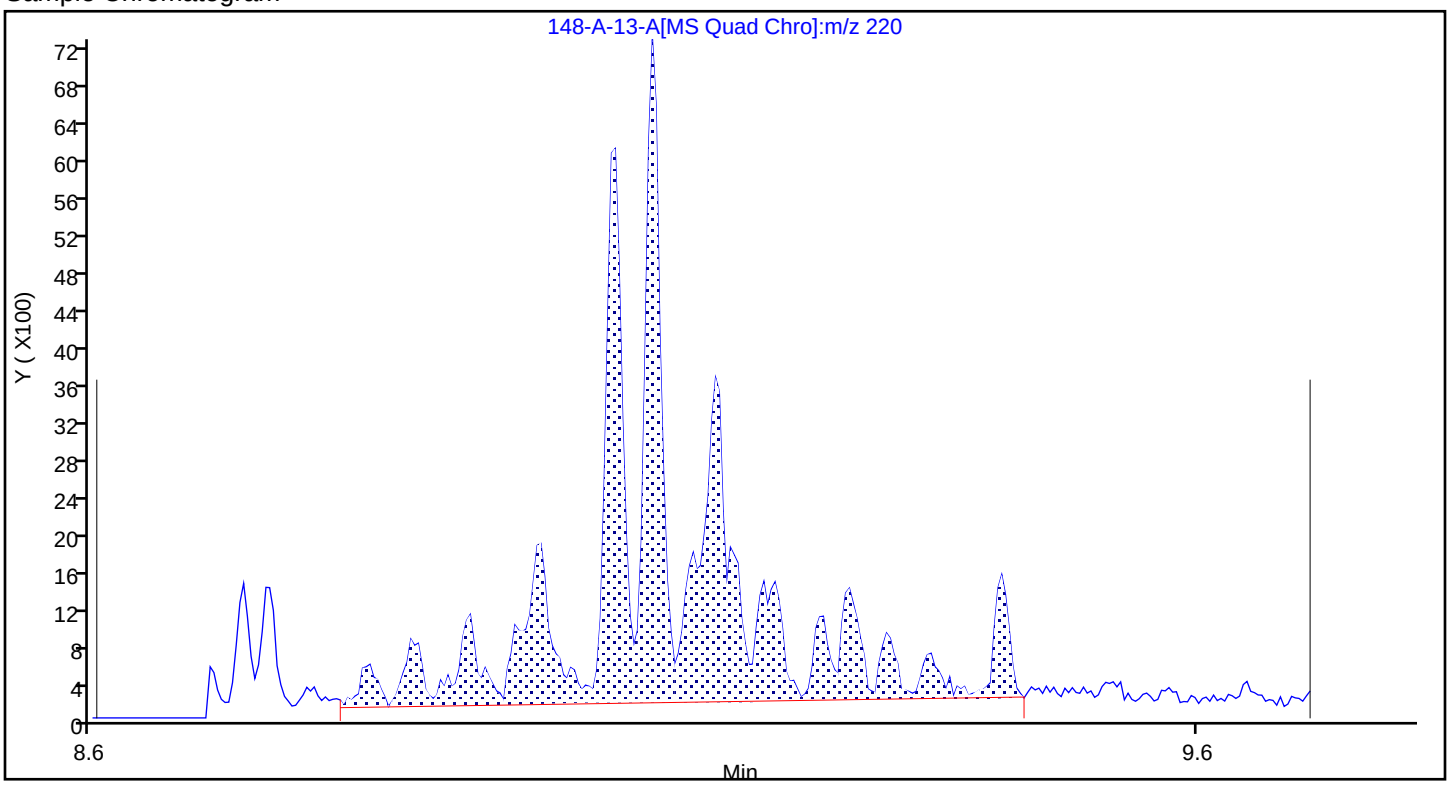

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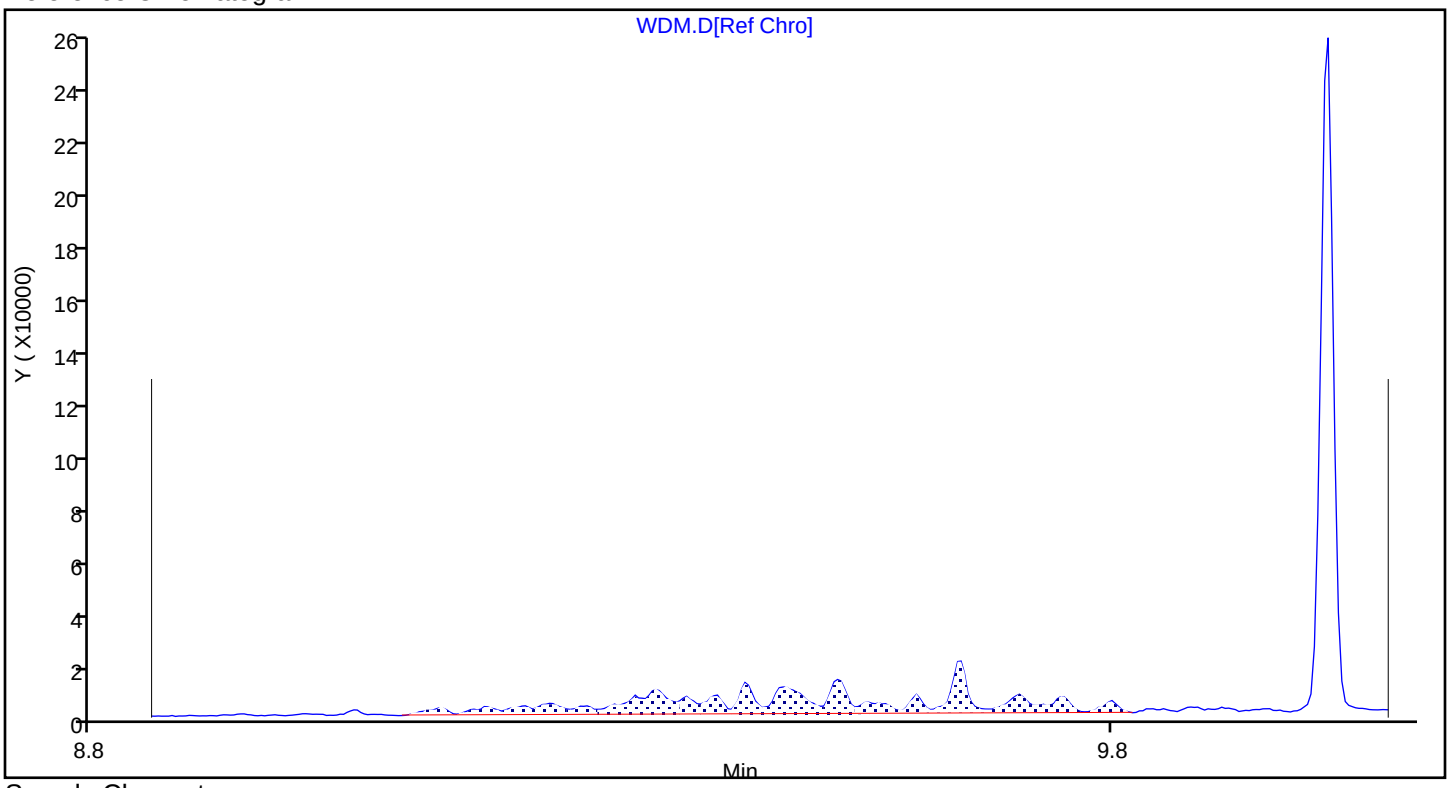
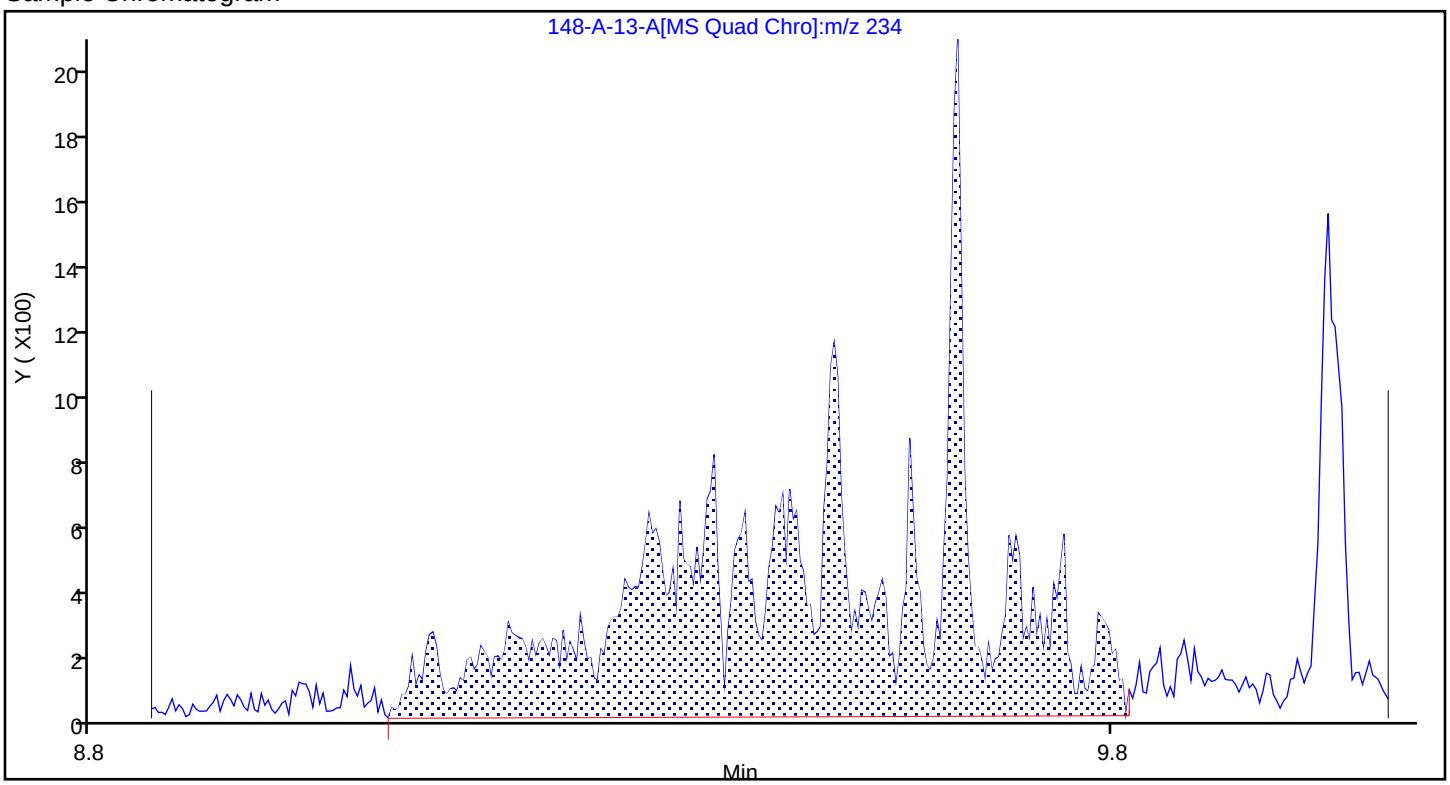
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 99 C4-Phenanthrenes/Anthracenes, CAS: STL00904

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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Client ID:	1804576-853-S1				
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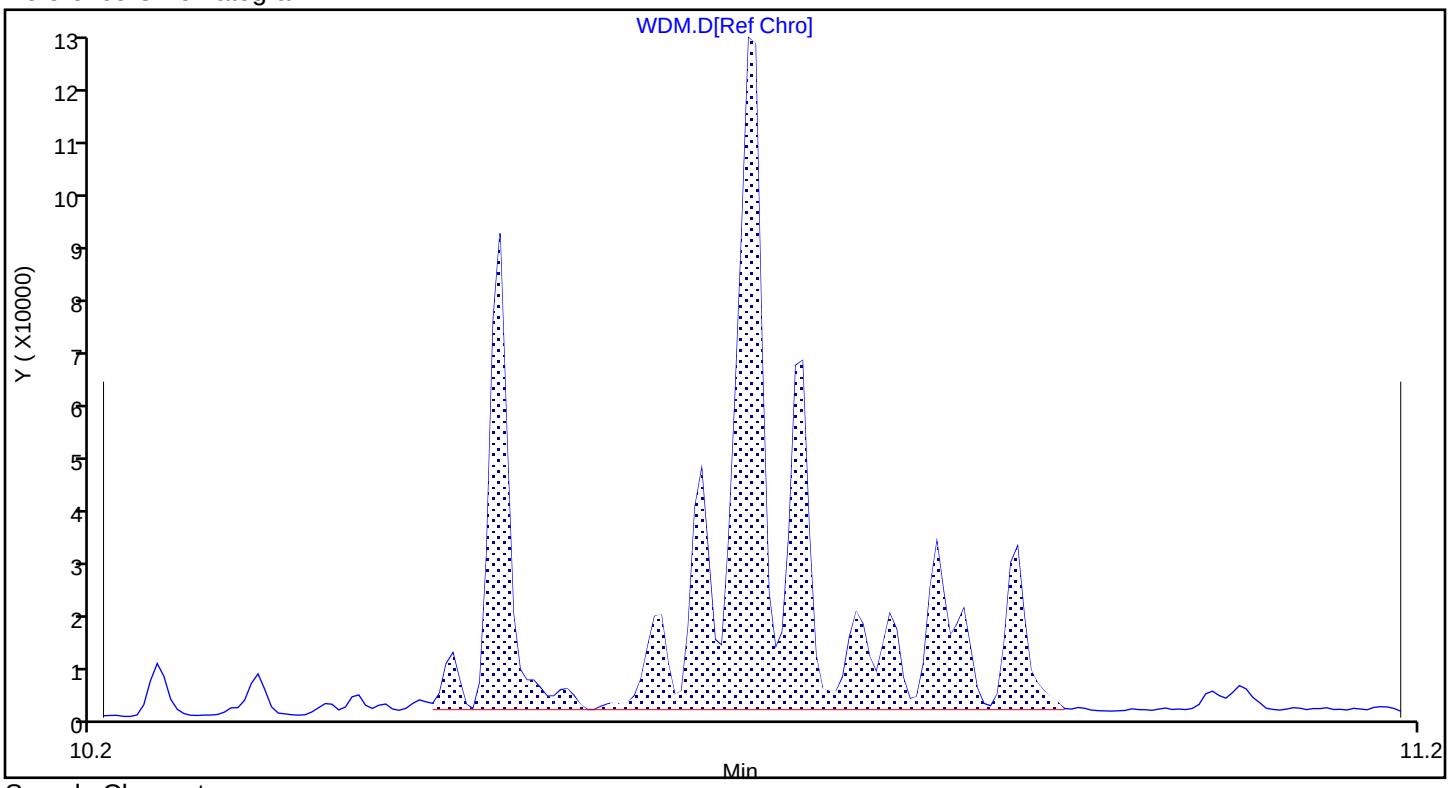
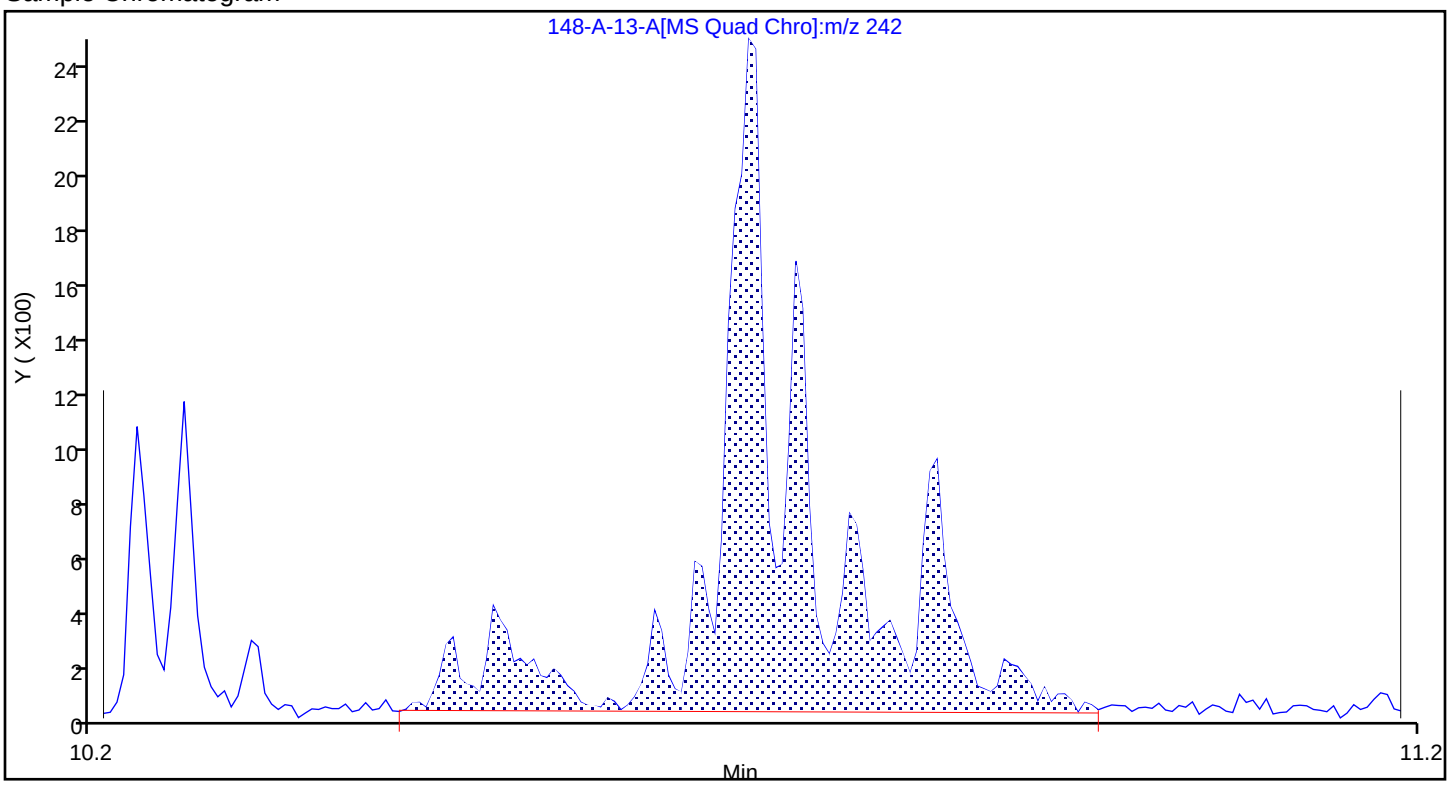
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 101 C1-Chrysenes/Benz(a)anthracenes, CAS: STL02218

Reference Chromatogram



Sample Chromatogram



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Eurofins Knoxville

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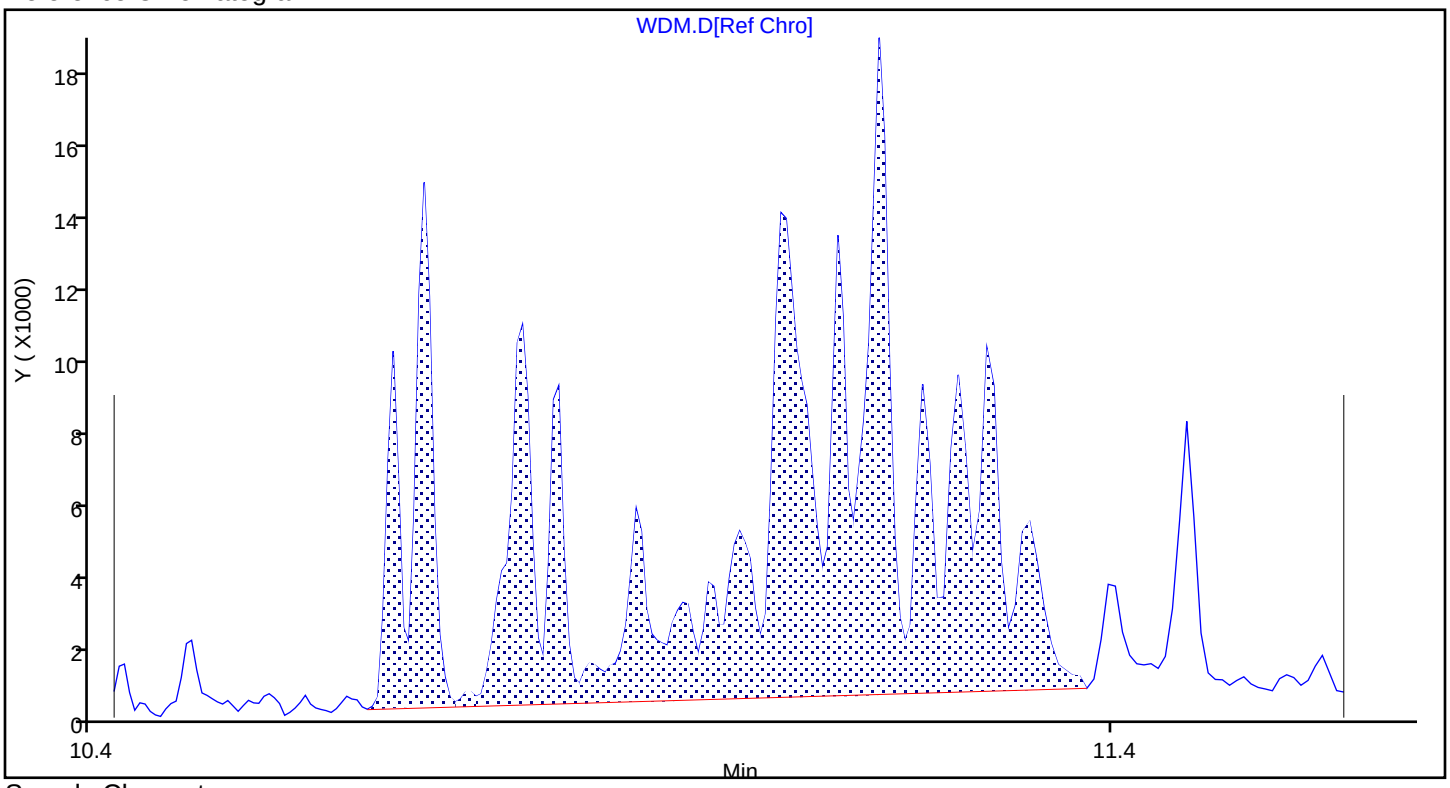
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 102 C2-Chrysenes/Benz(a)anthracenes, CAS: STL02219

Reference Chromatogram



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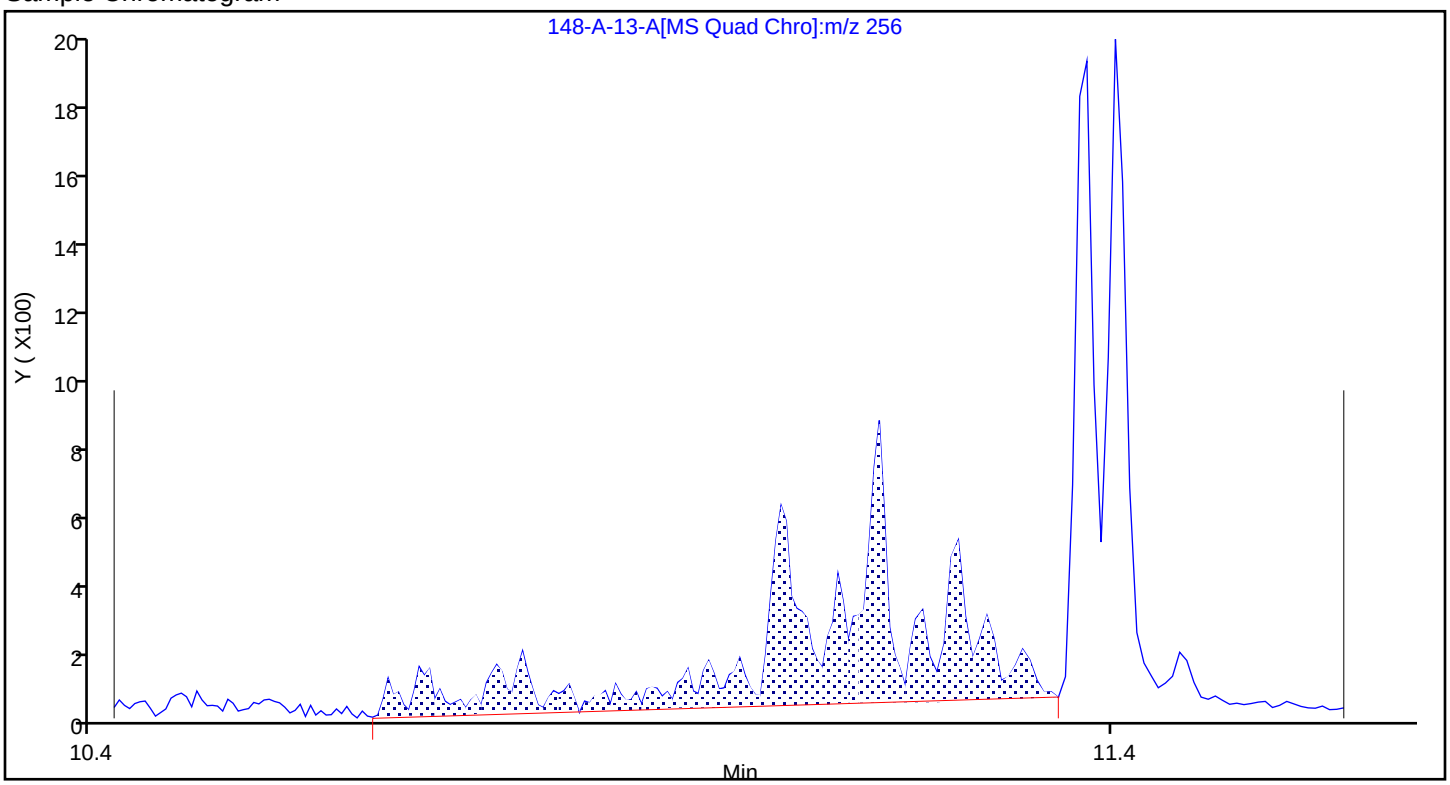

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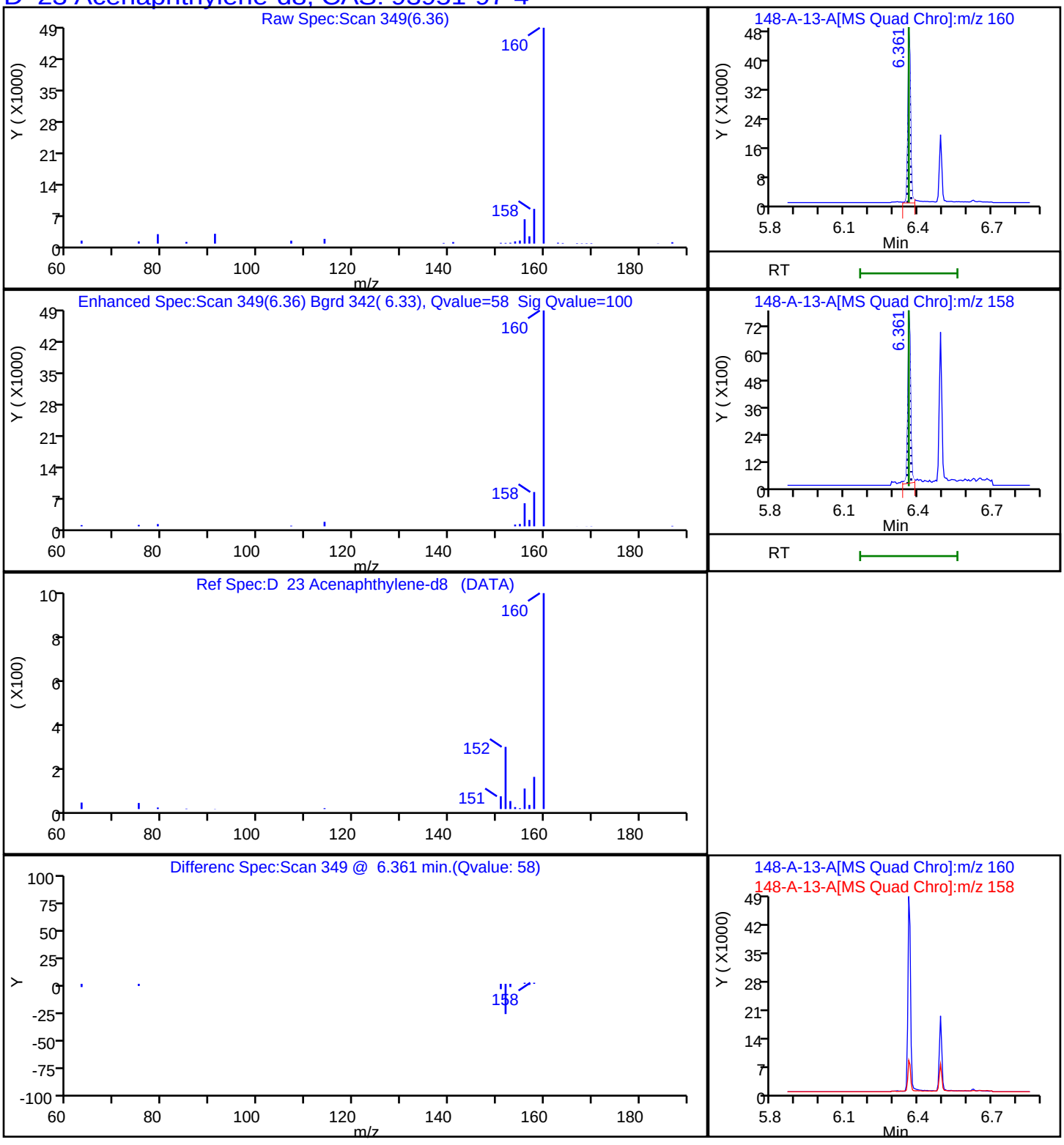
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 23 Acenaphthylene-d8, CAS: 93951-97-4



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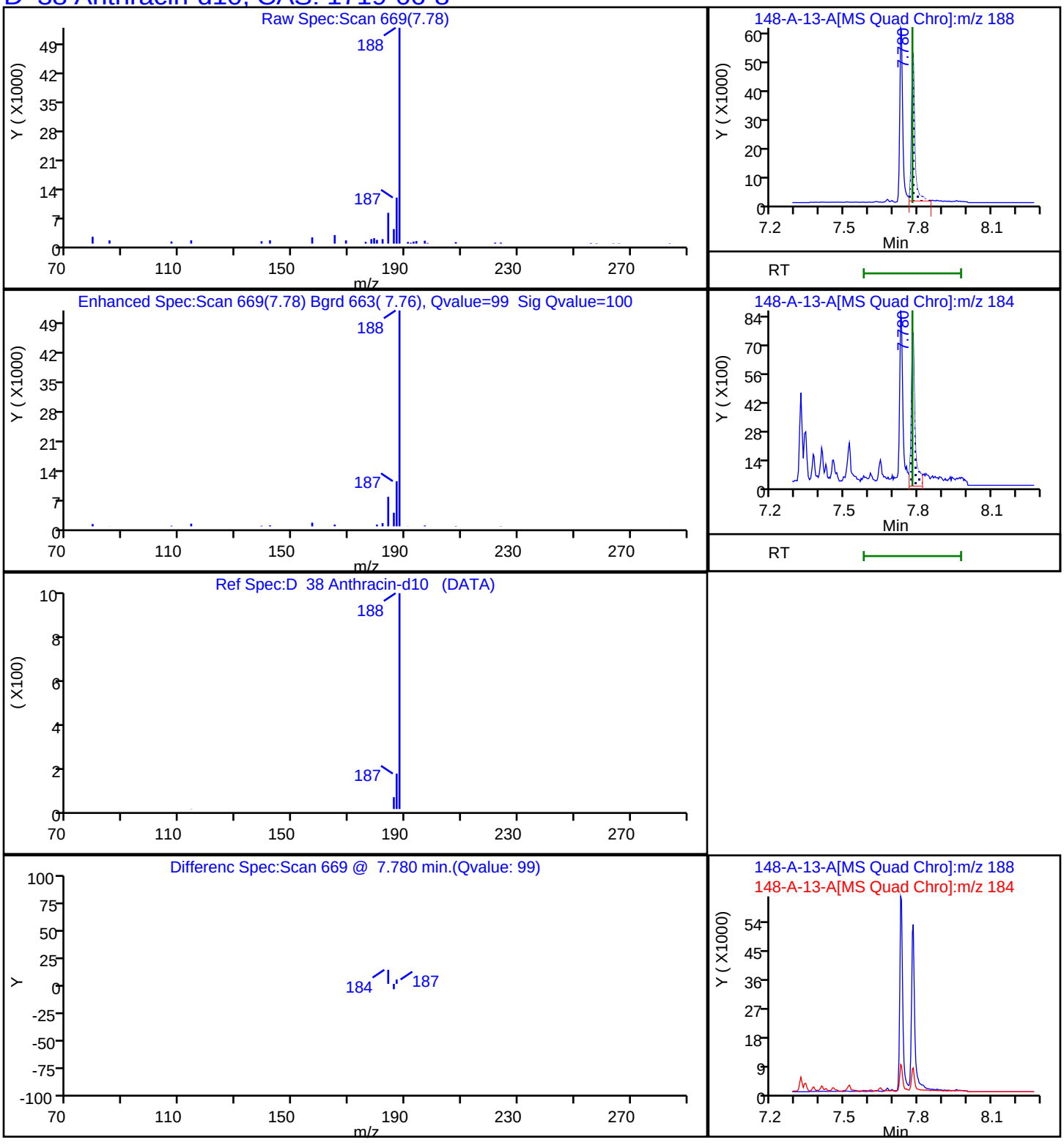
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 38 Anthracin-d10, CAS: 1719-06-8



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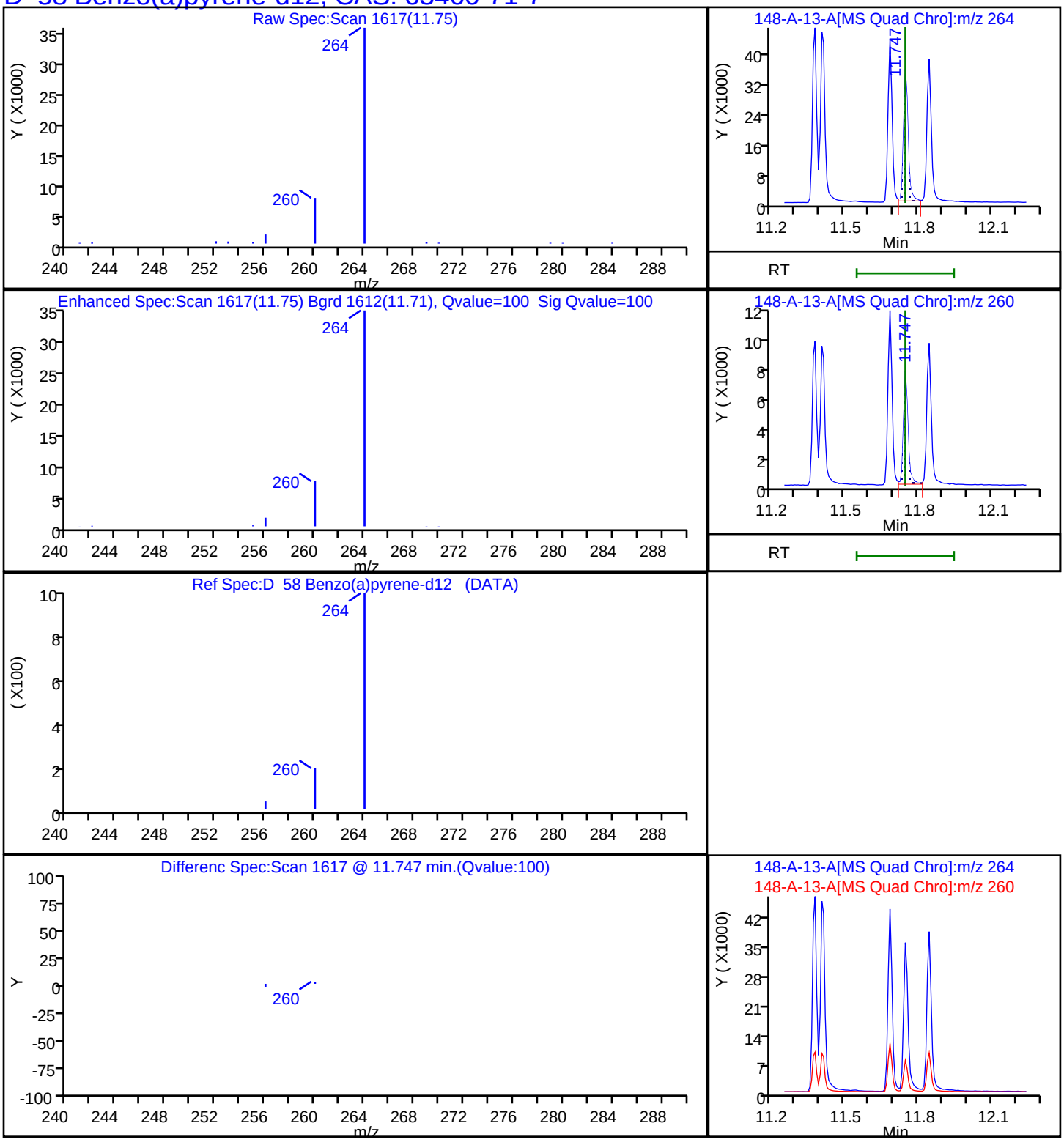
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 58 Benzo(a)pyrene-d12, CAS: 63466-71-7



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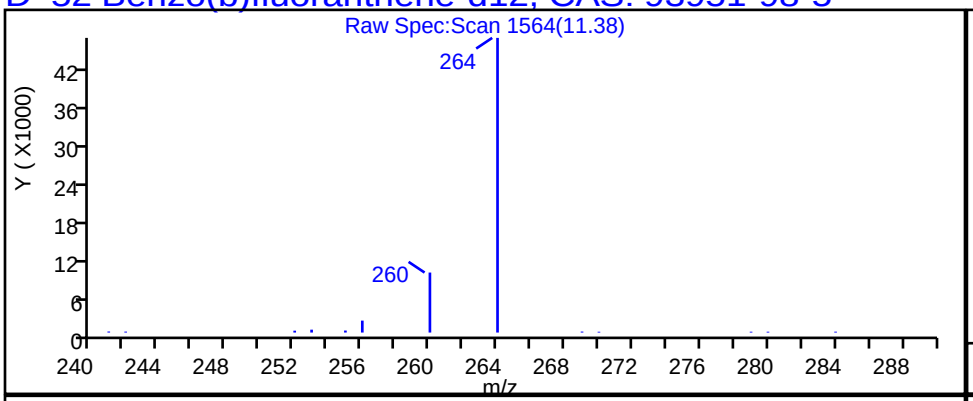
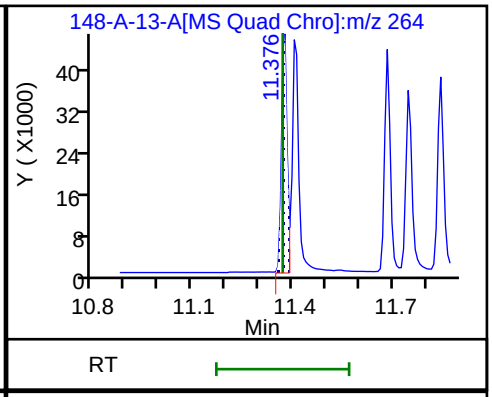
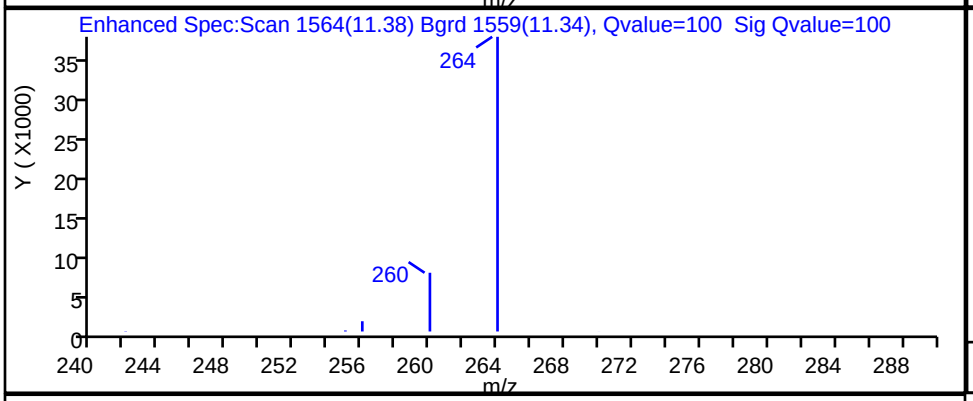
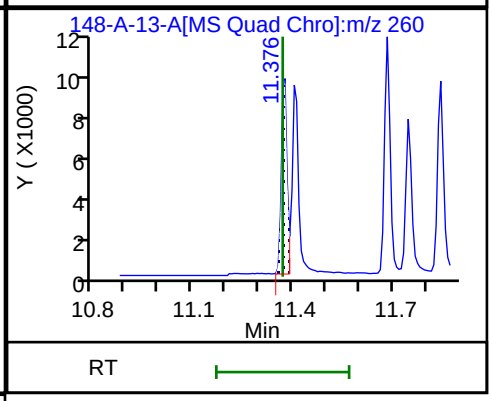
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

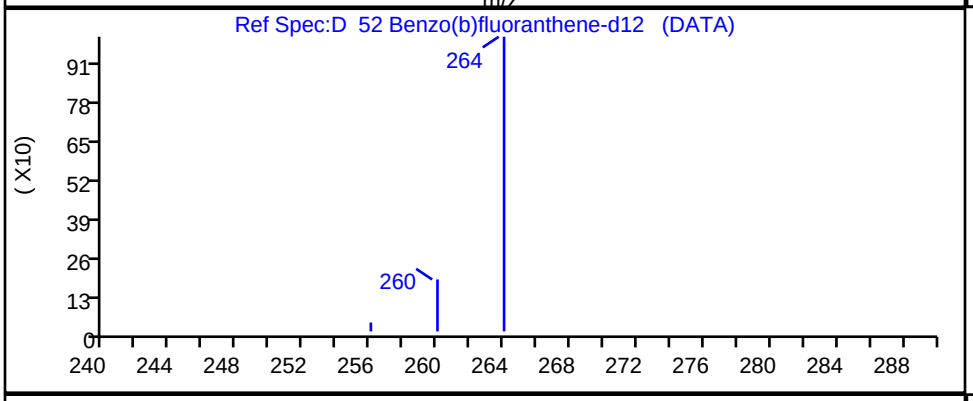
D 52 Benzo(b)fluoranthene-d12, CAS: 93951-98-5

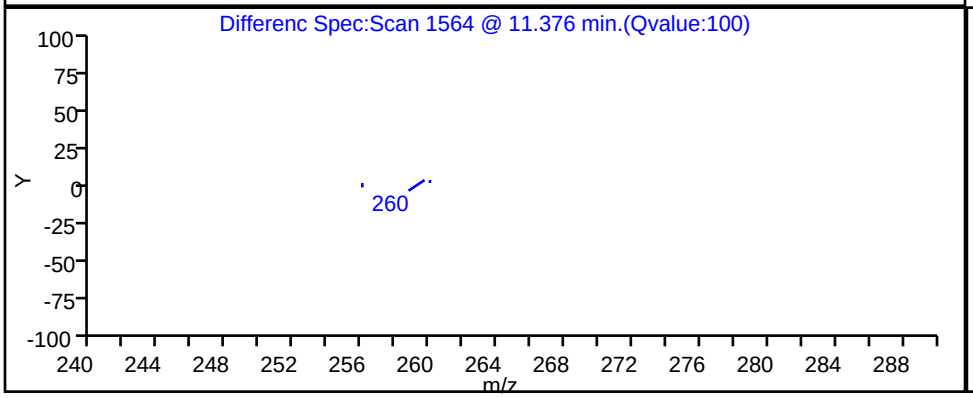


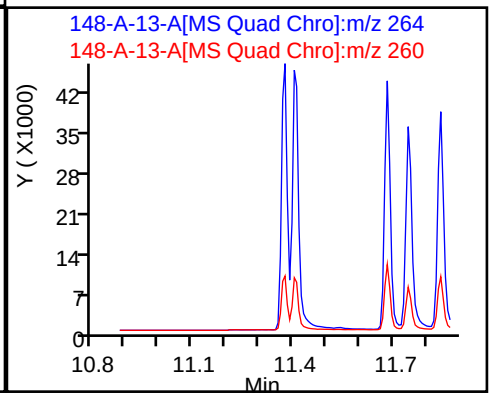












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Eurofins Knoxville

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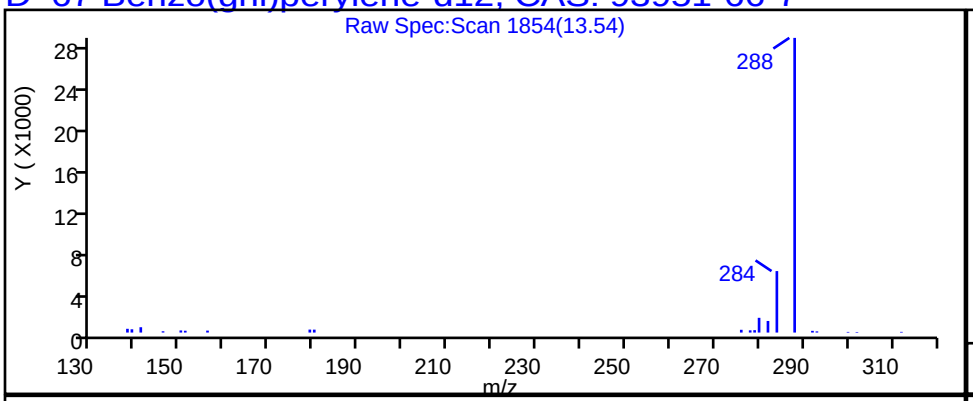
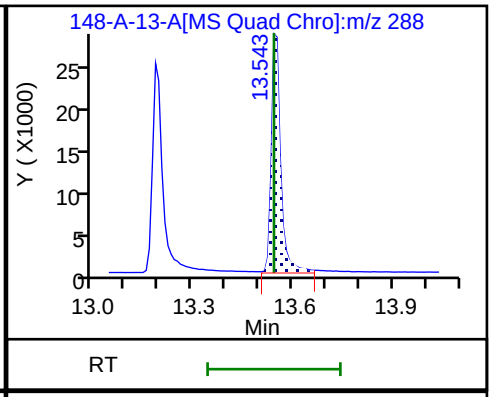
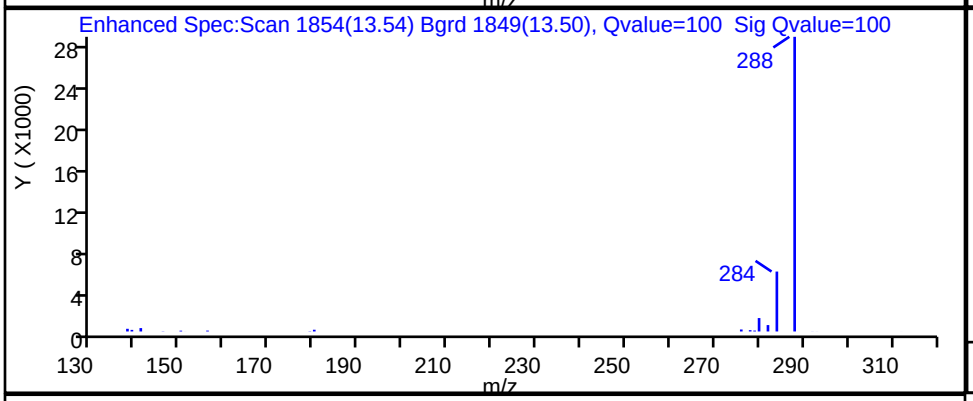
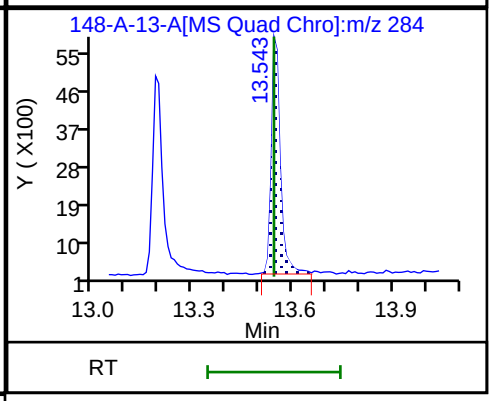
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

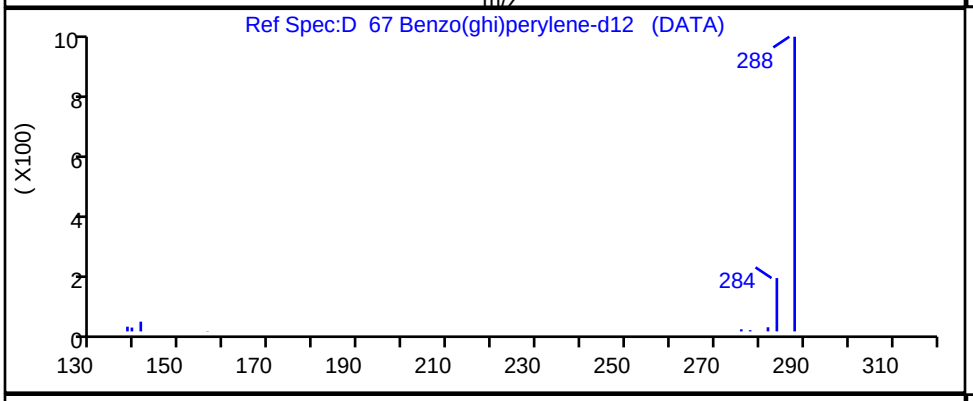
D 67 Benzo(ghi)perylene-d12, CAS: 93951-66-7

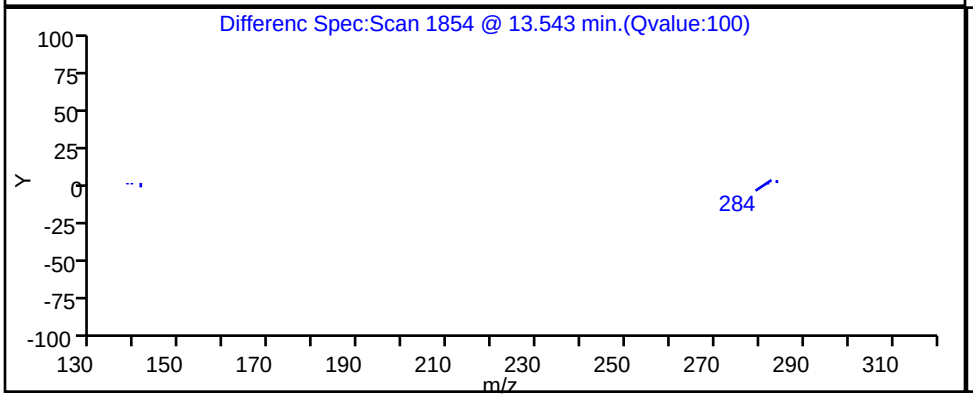


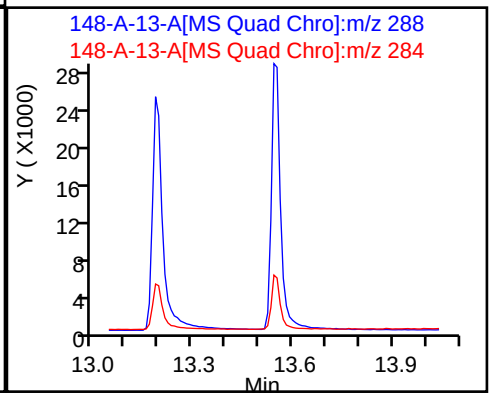












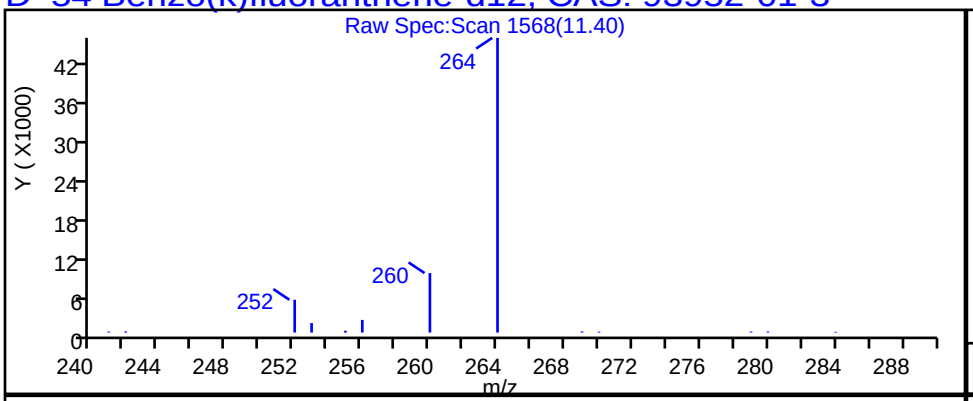
Report Date: 22-Nov-2023 12:10:37 Chrom Revision: 2.3 15-Nov-2023 20:54:34

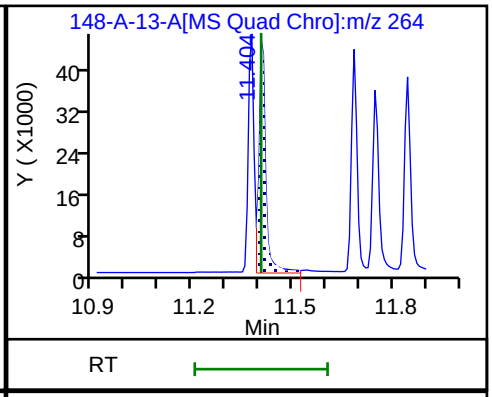
Eurofins Knoxville

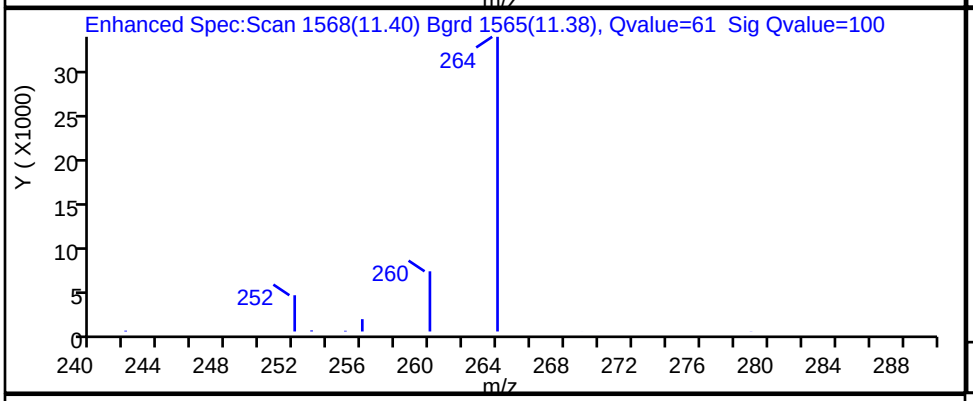
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-13-A.D

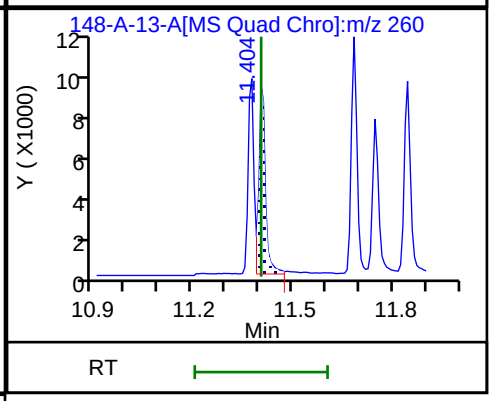
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16
Client ID:	1804576-853-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

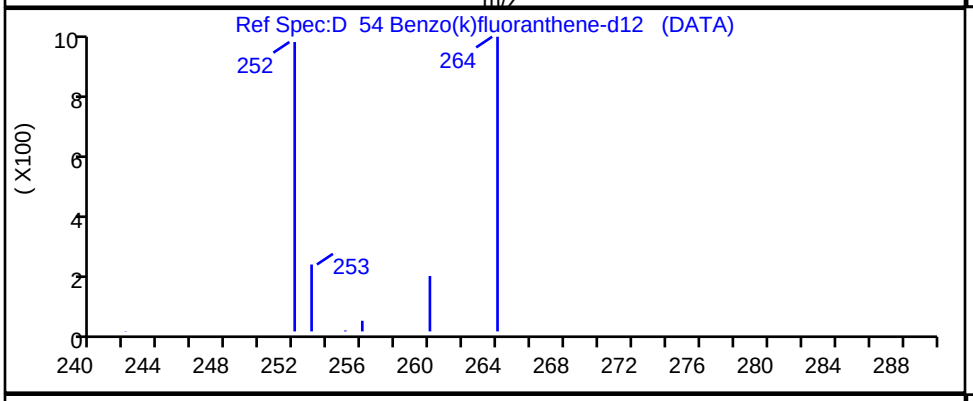
D 54 Benzo(k)fluoranthene-d12, CAS: 93952-01-3

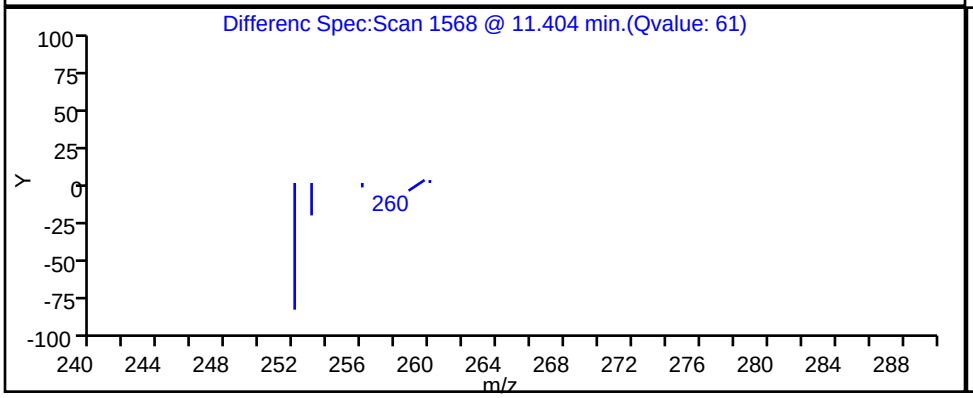


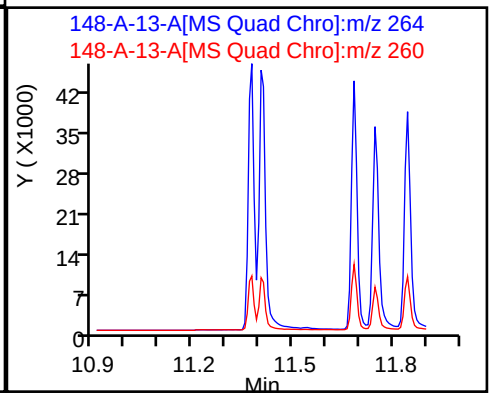












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Eurofins Knoxville

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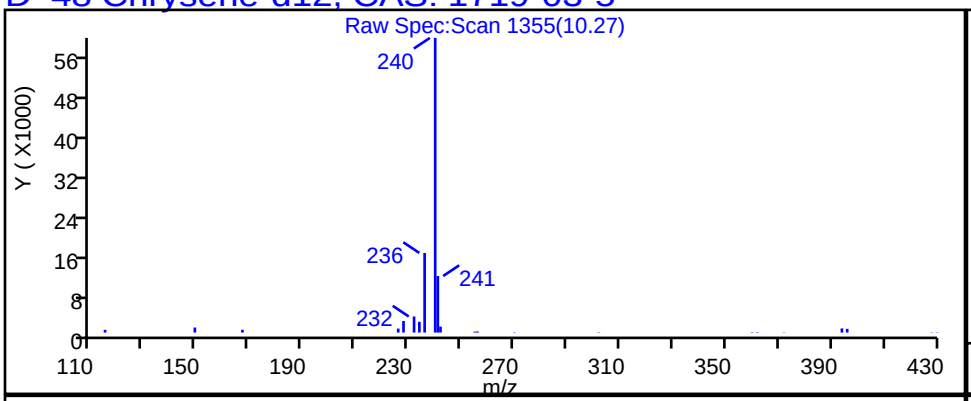
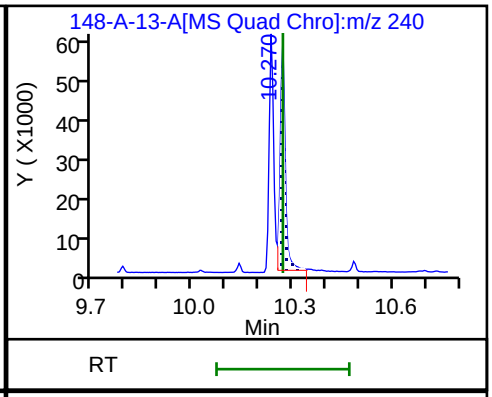
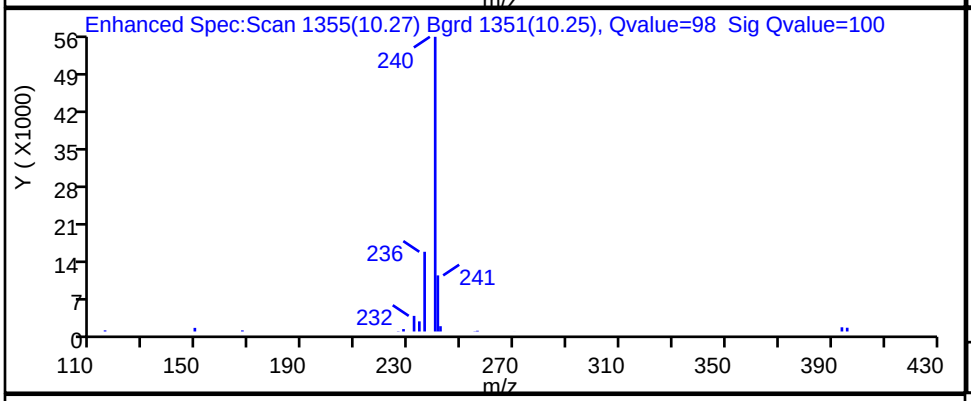
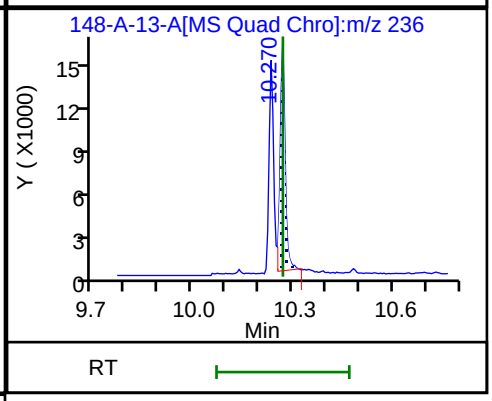
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16		
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

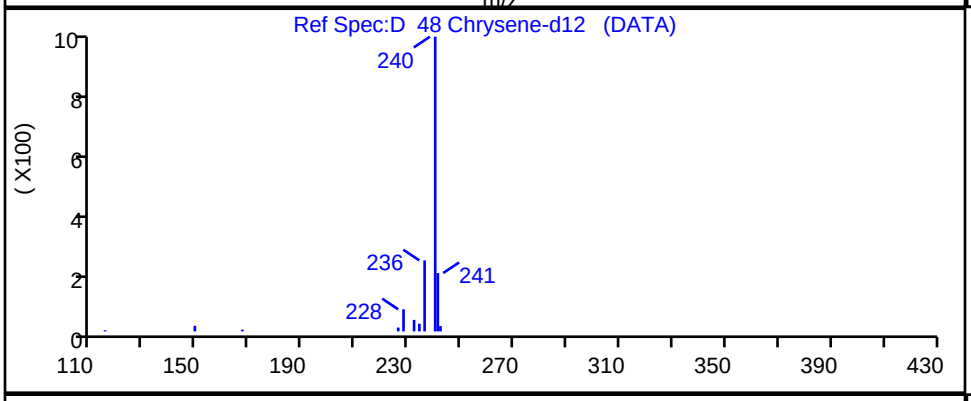
D 48 Chrysene-d12, CAS: 1719-03-5

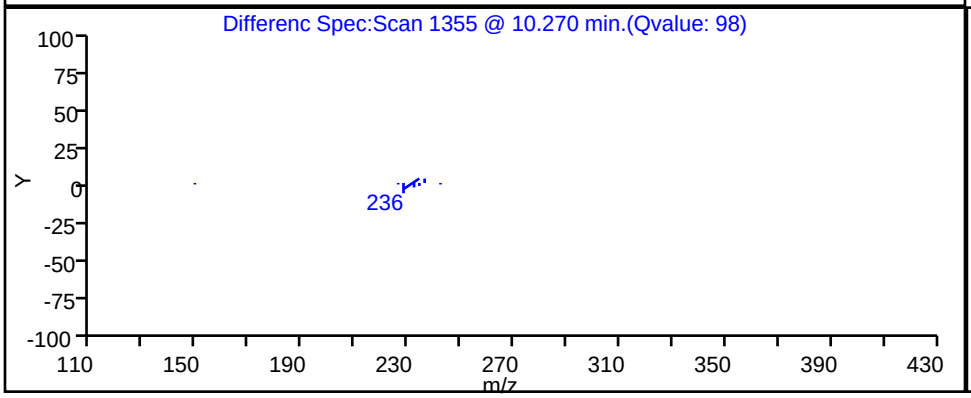


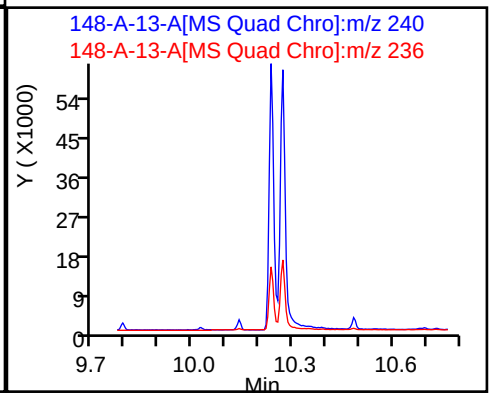












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Eurofins Knoxville

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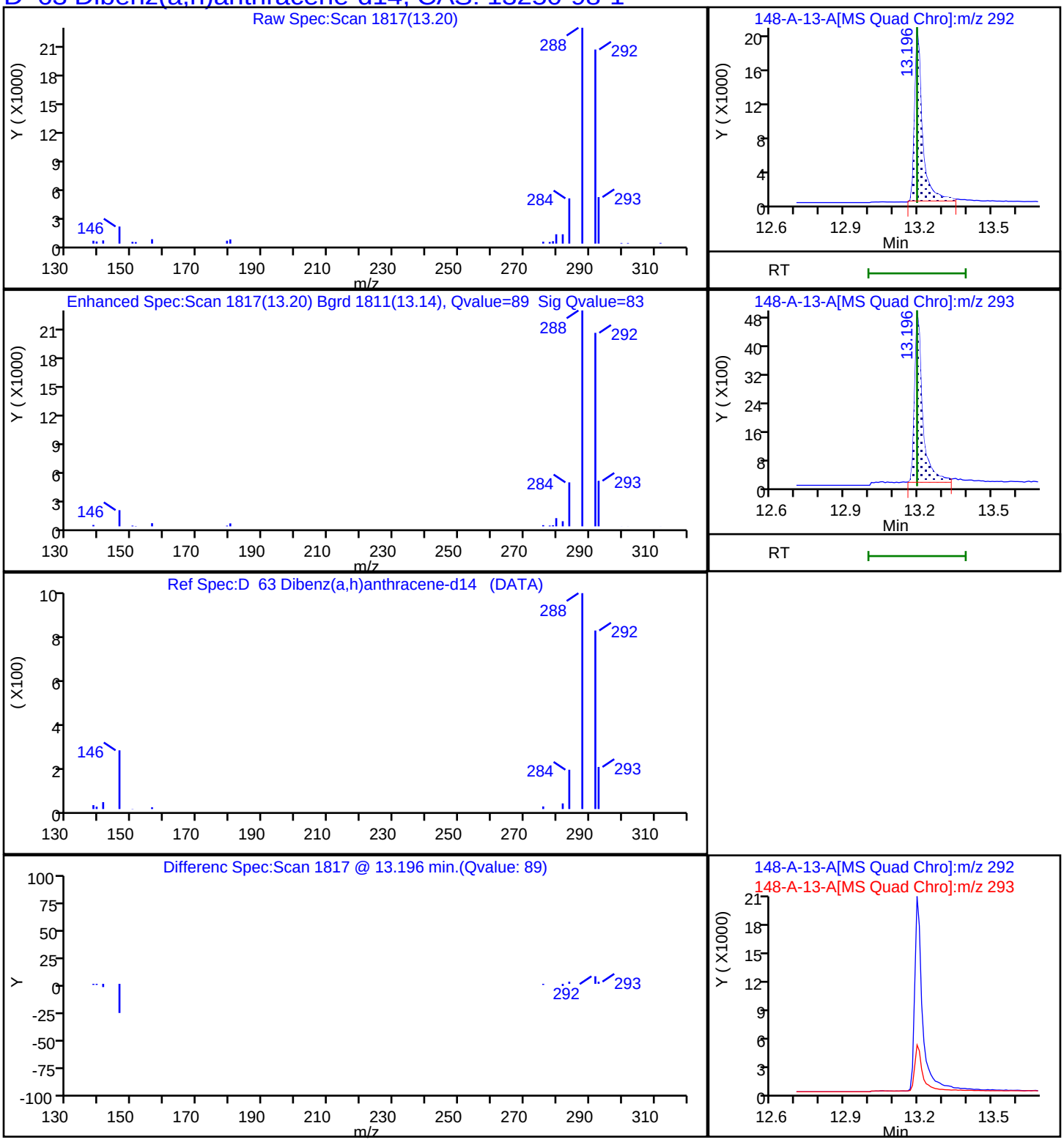
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16		
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D_63 Dibenz(a,h)anthracene-d14, CAS: 13250-98-1



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Eurofins Knoxville

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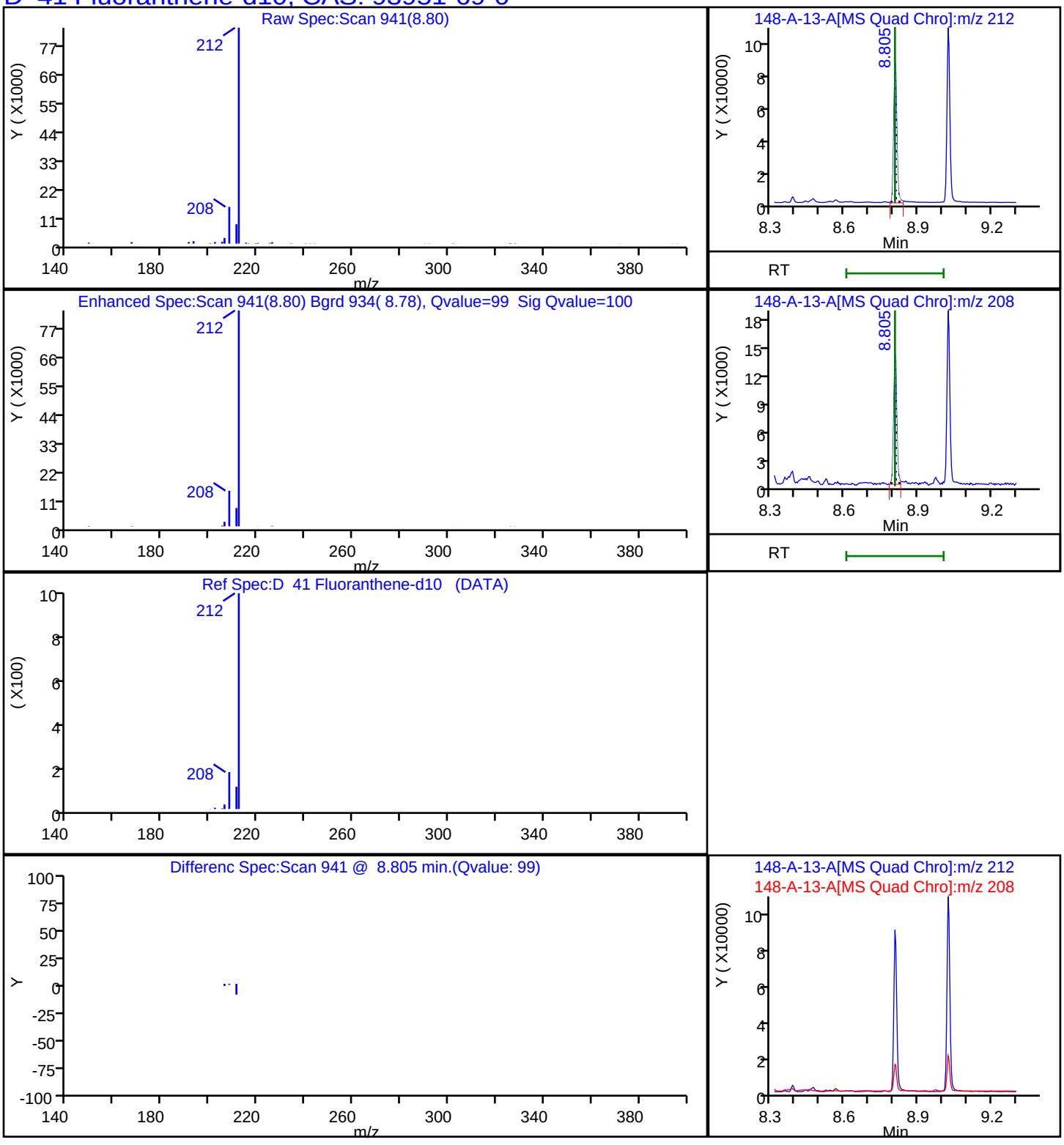
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 41 Fluoranthene-d10, CAS: 93951-69-0



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Eurofins Knoxville

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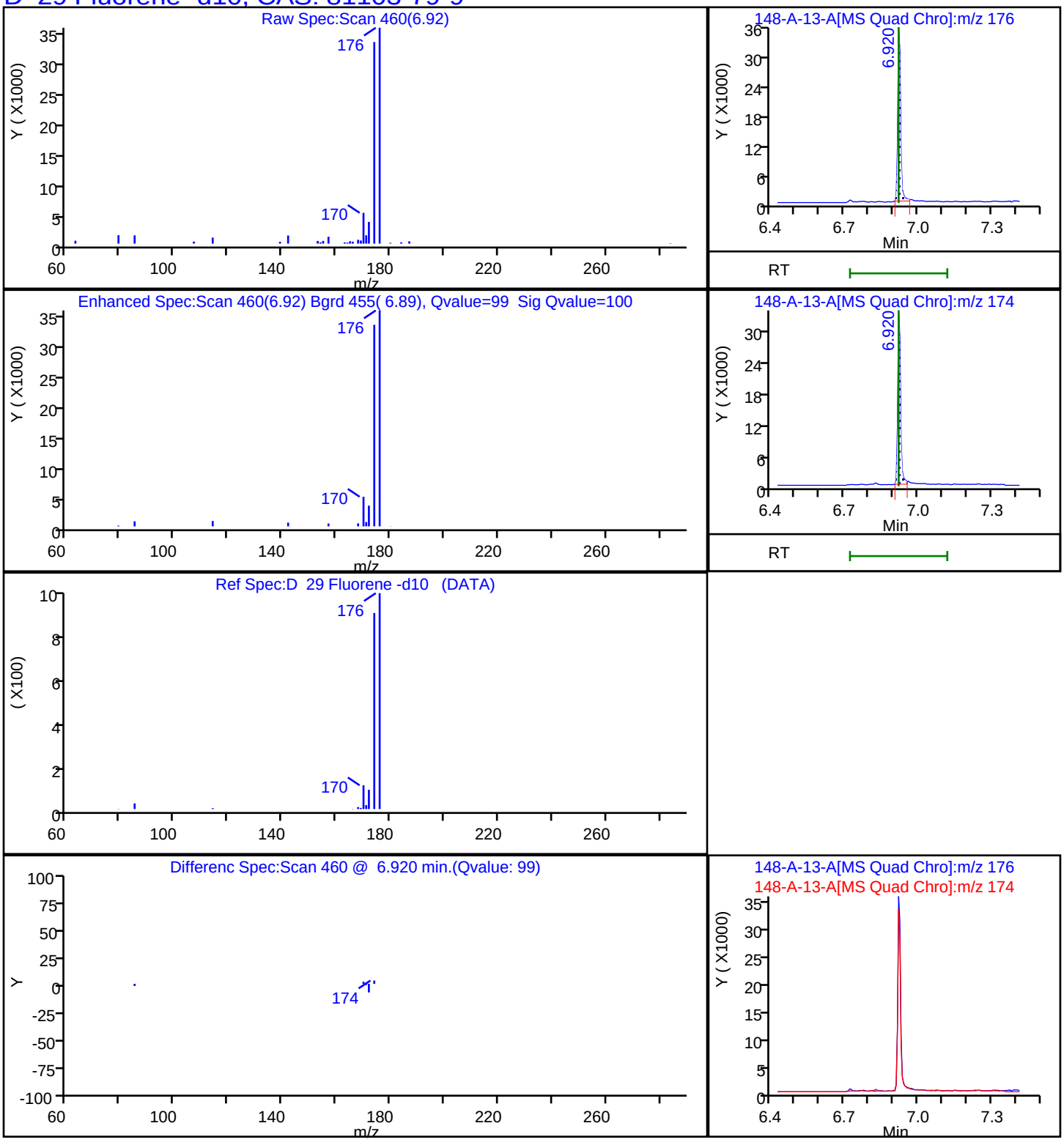
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16		
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 29 Fluorene -d10, CAS: 81103-79-9



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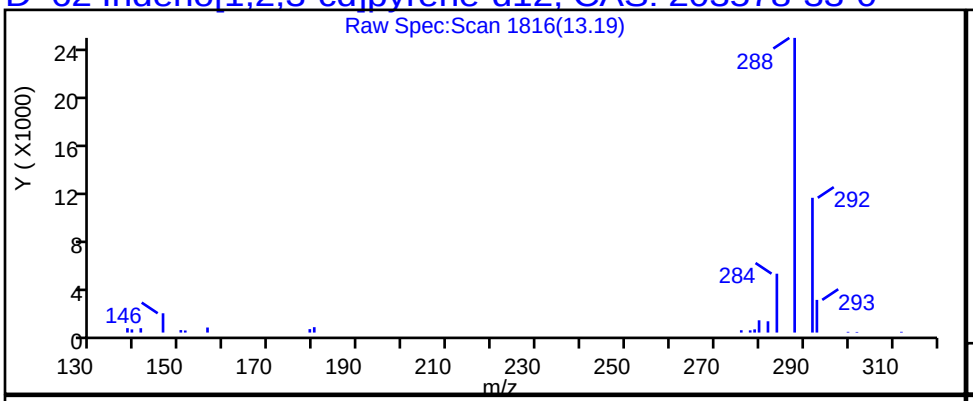
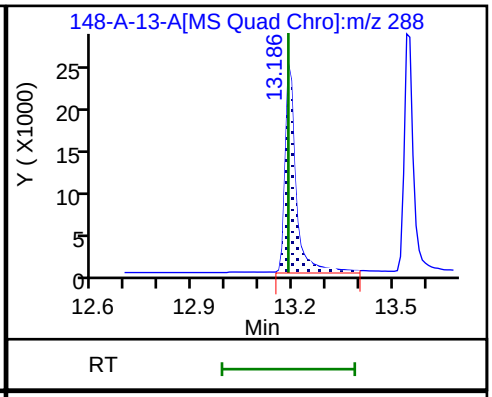
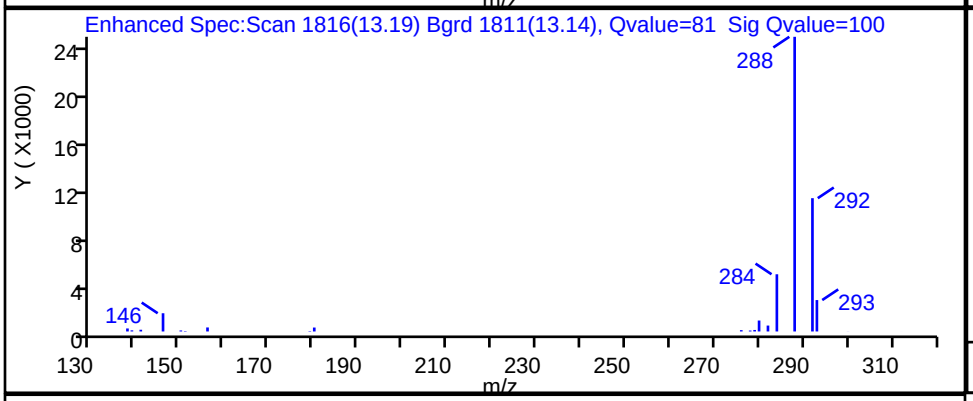
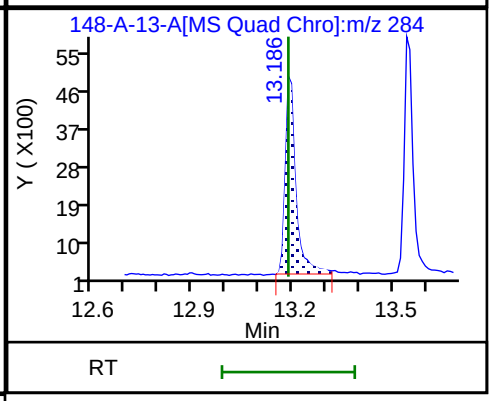
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16		
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

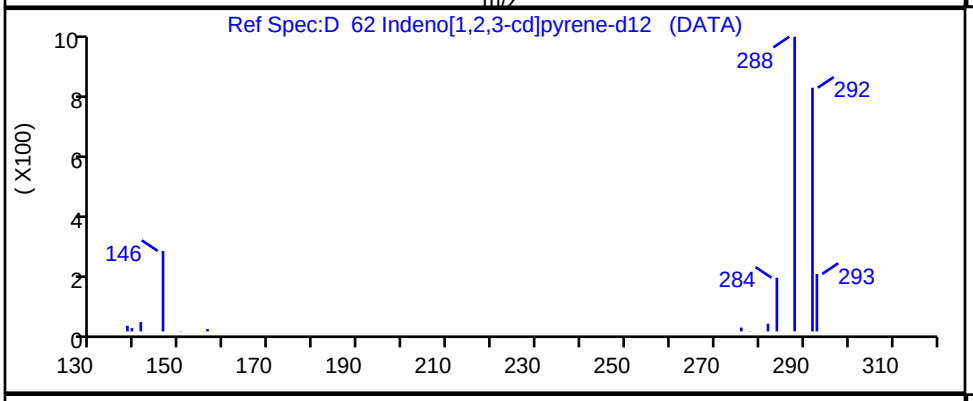
D 62 Indeno[1,2,3-cd]pyrene-d12, CAS: 203578-33-0

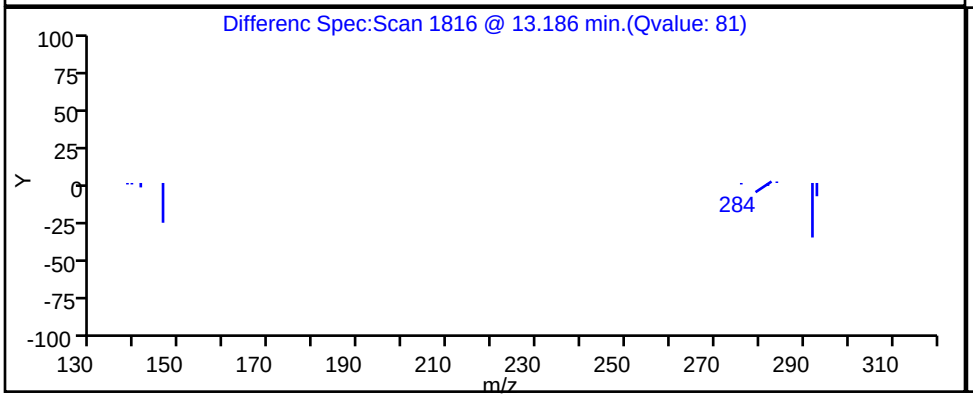


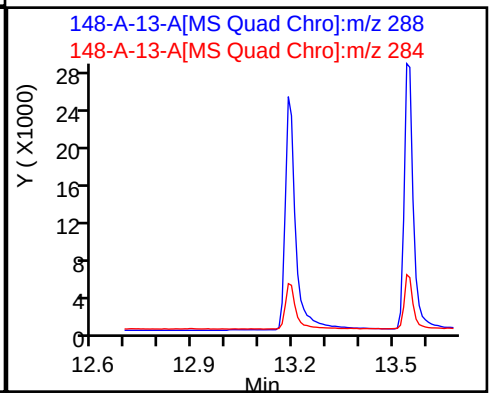












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Eurofins Knoxville

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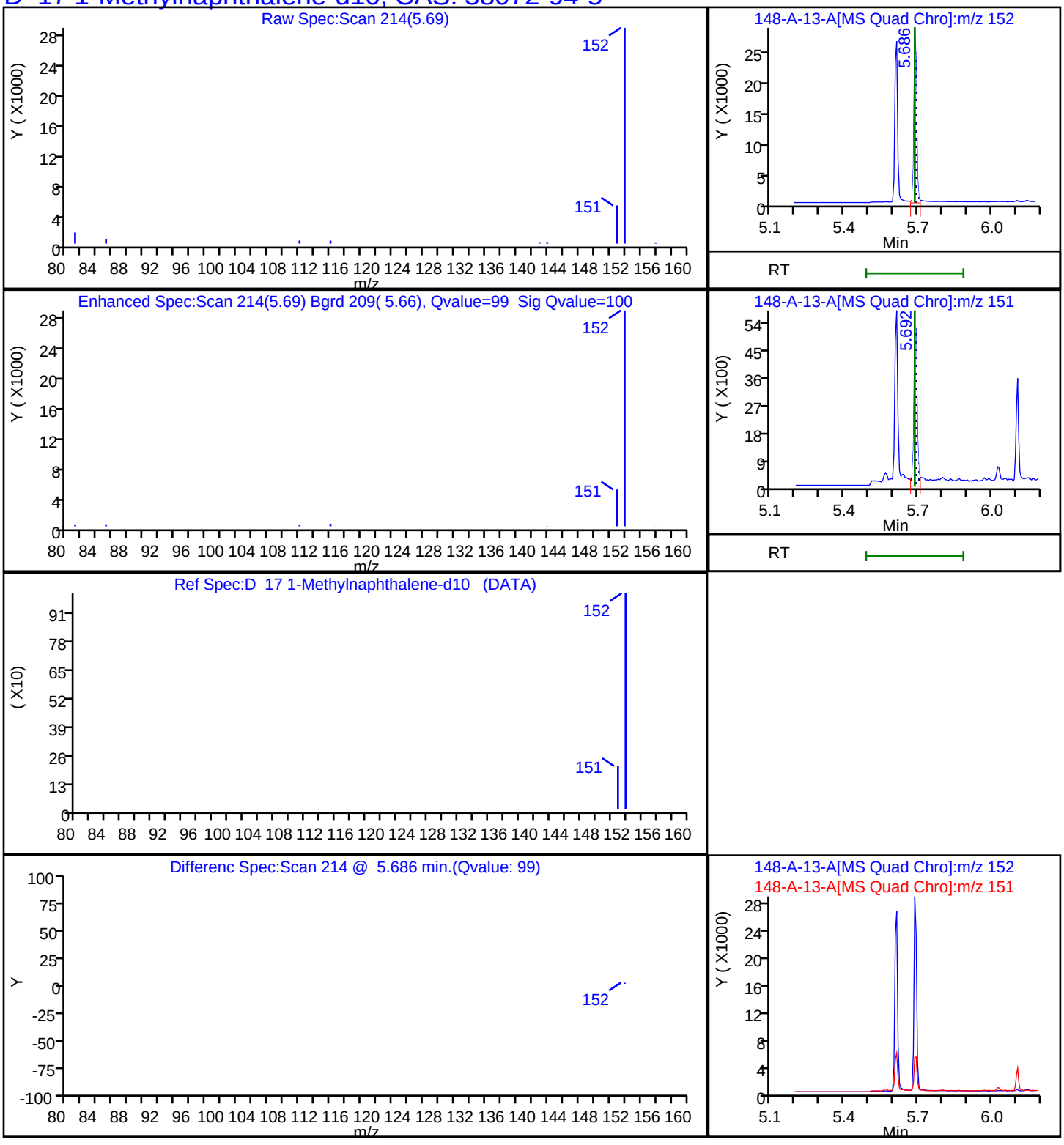
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16		
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 17 1-Methylnaphthalene-d10, CAS: 38072-94-5



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Eurofins Knoxville

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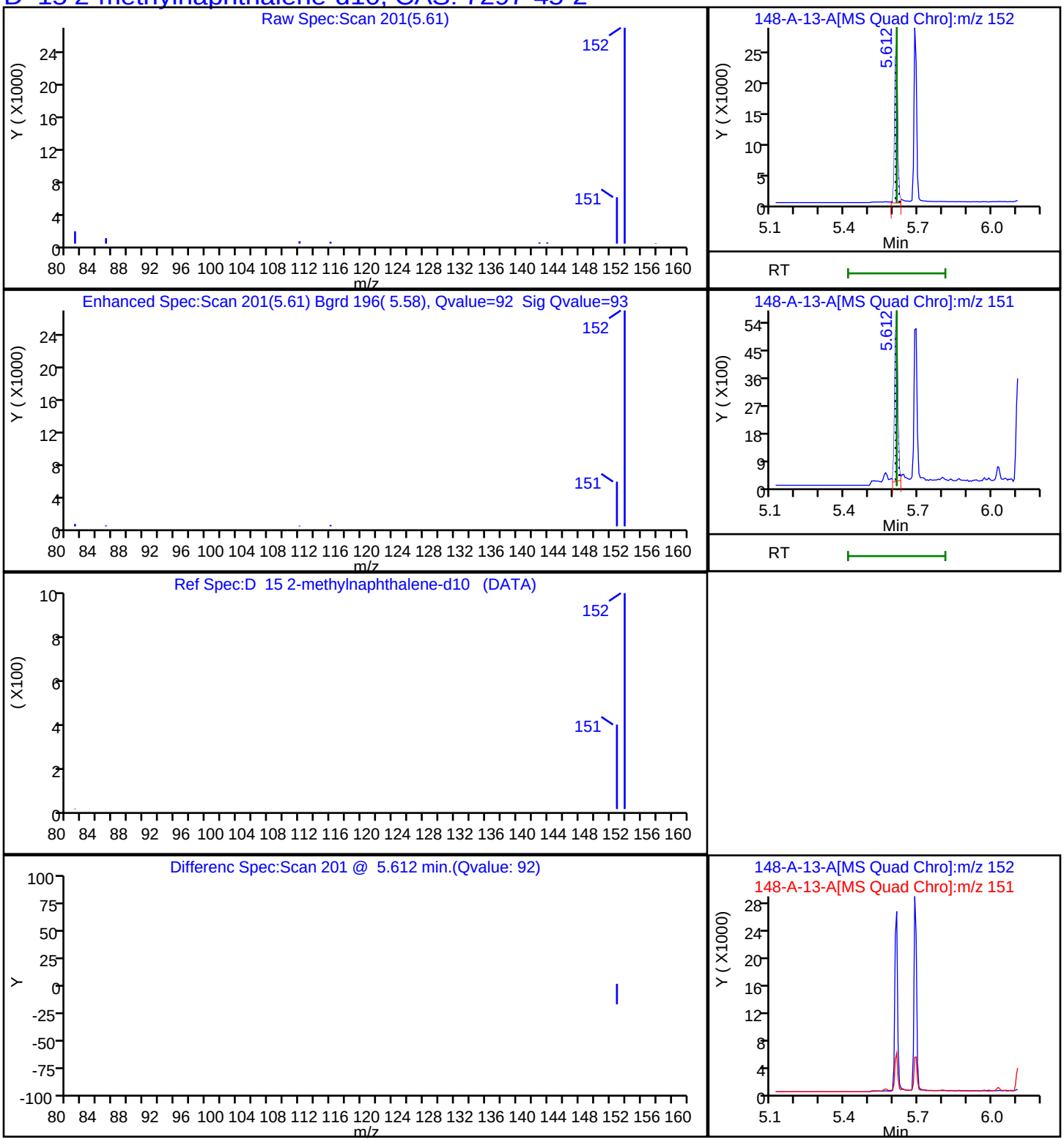
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16		
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 15 2-methylnaphthalene-d10, CAS: 7297-45-2



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Eurofins Knoxville

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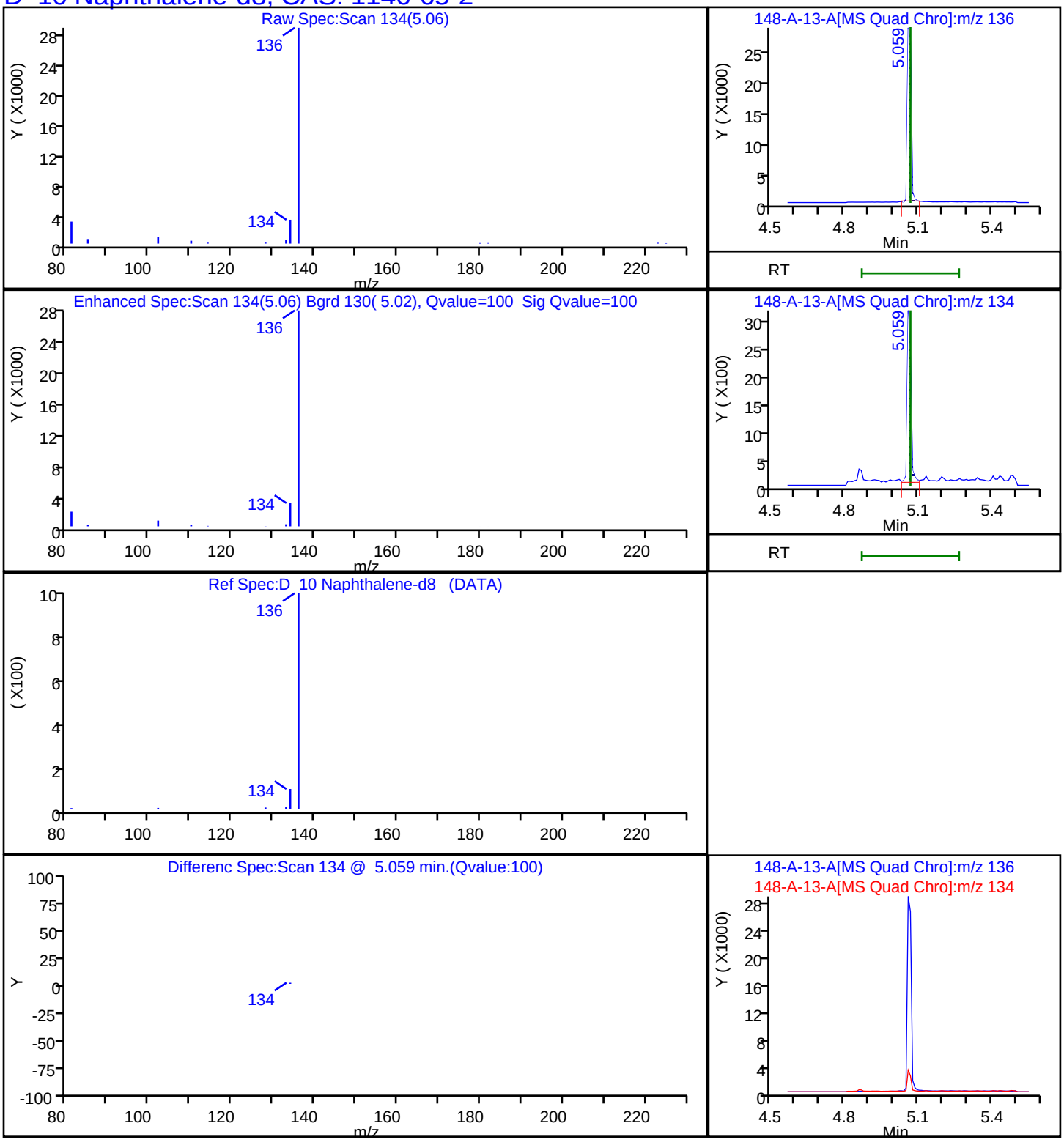
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16		
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D_10 Naphthalene-d8, CAS: 1146-65-2



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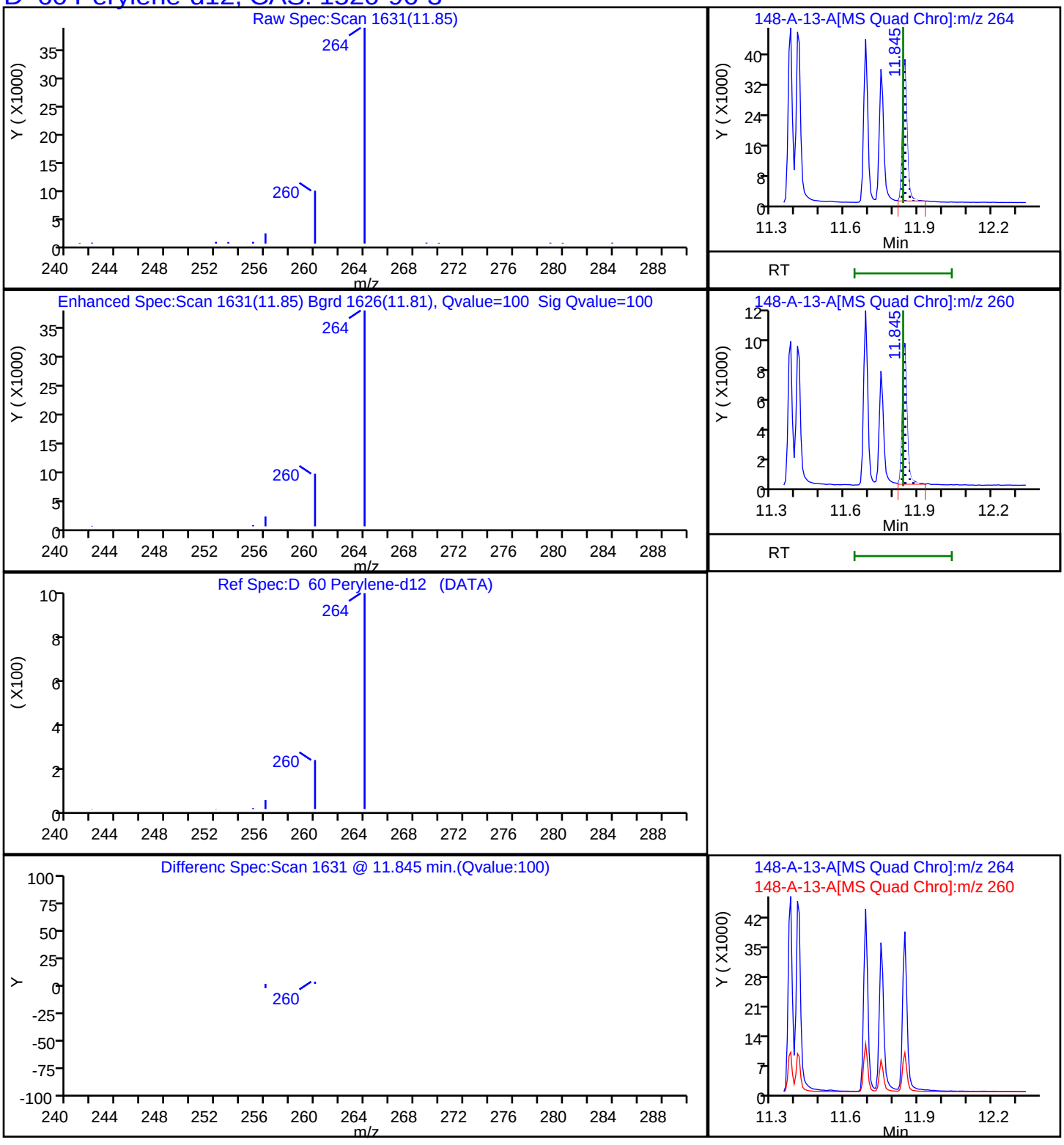
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16		
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 60 Perylene-d12, CAS: 1520-96-3



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Eurofins Knoxville

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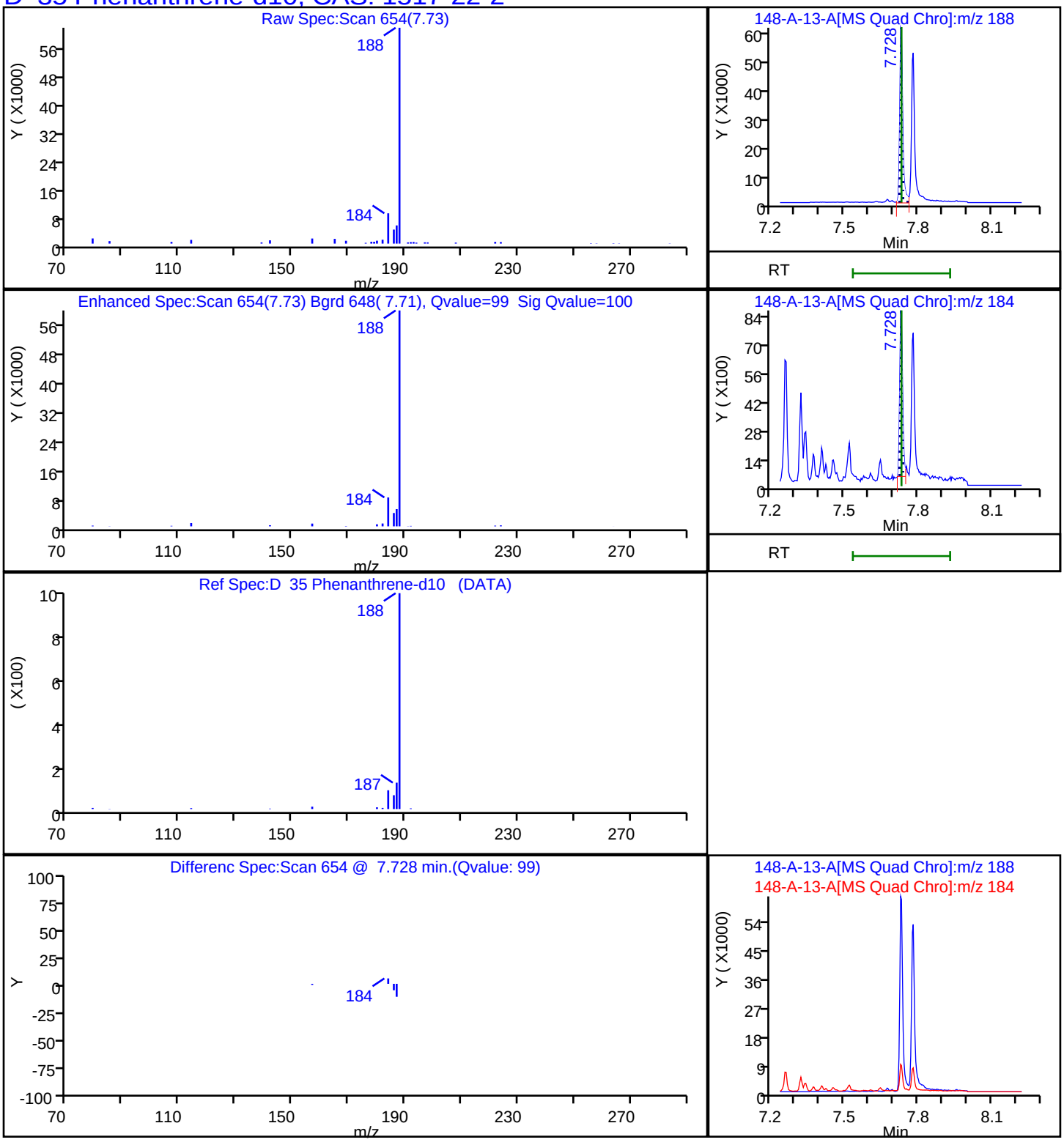
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16		
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D_35 Phenanthrene-d10, CAS: 1517-22-2



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Eurofins Knoxville

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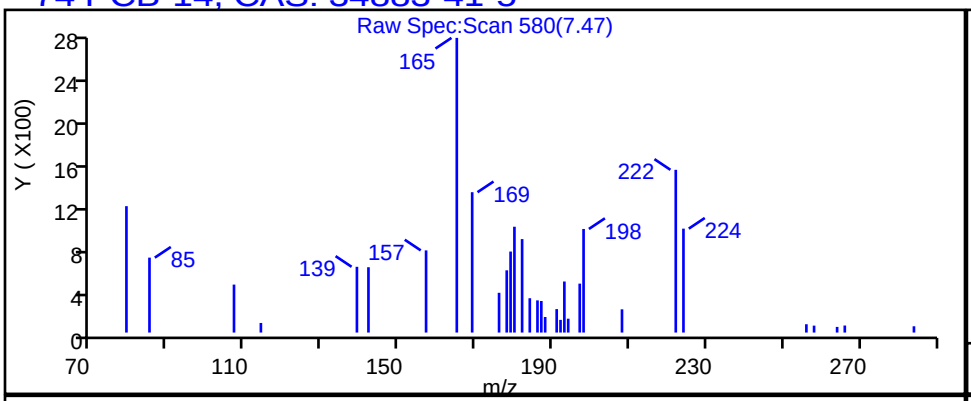
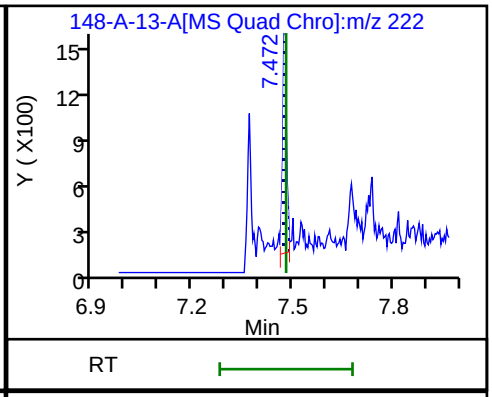
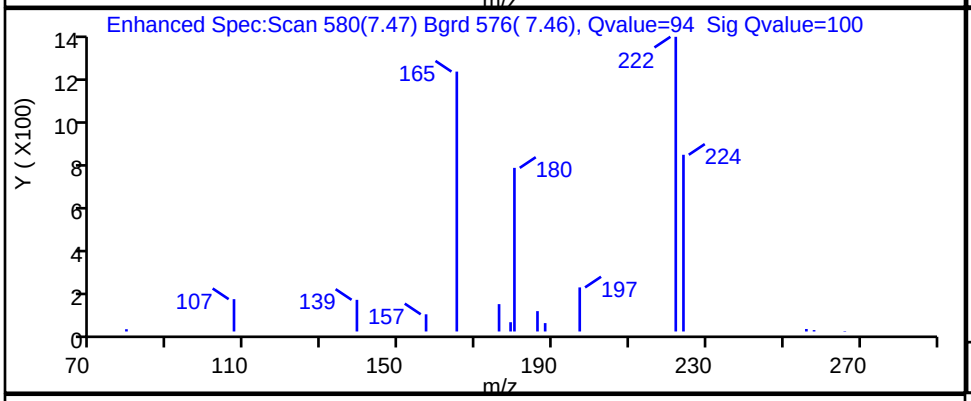
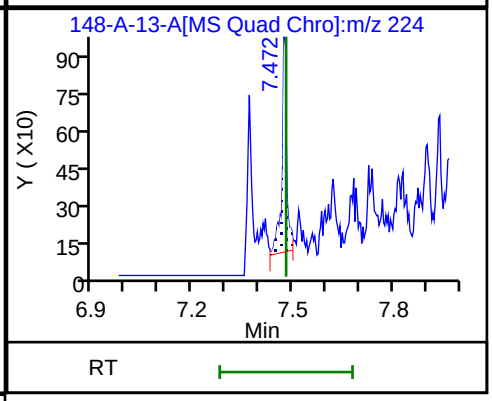
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16
Client ID:	1804576-853-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

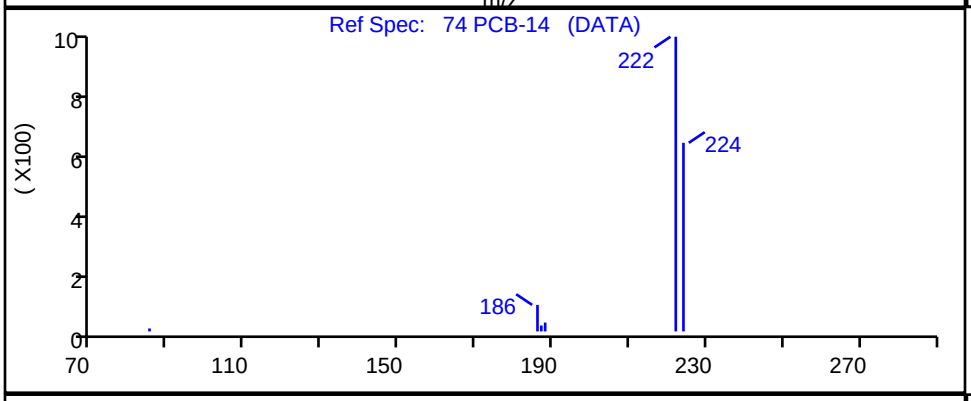
74 PCB-14, CAS: 34883-41-5

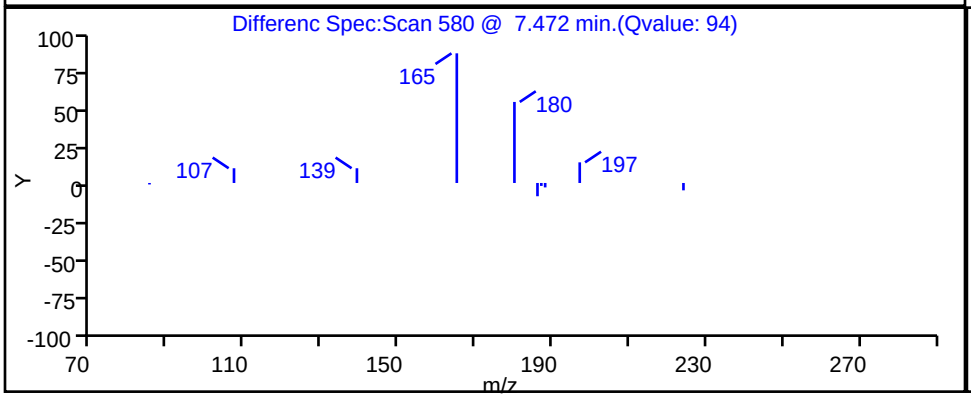


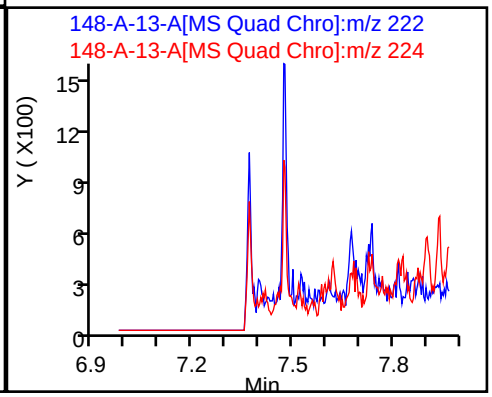










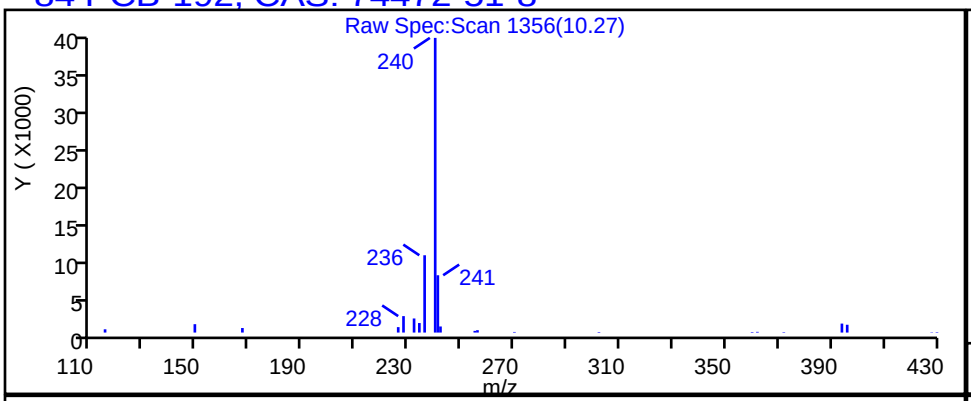


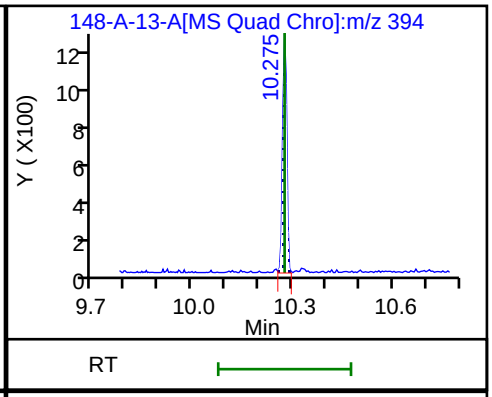
Report Date: 22-Nov-2023 12:10:38 Chrom Revision: 2.3 15-Nov-2023 20:54:34

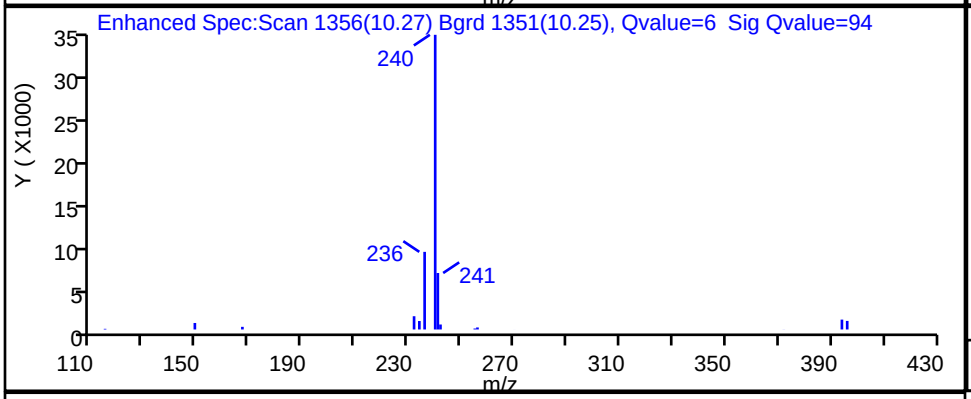
Eurofins Knoxville

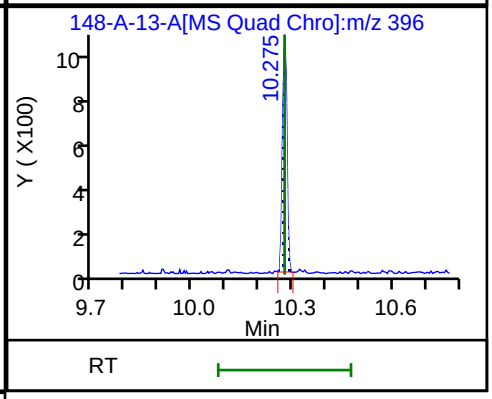
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-13-A.D		
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16
Client ID:	1804576-853-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

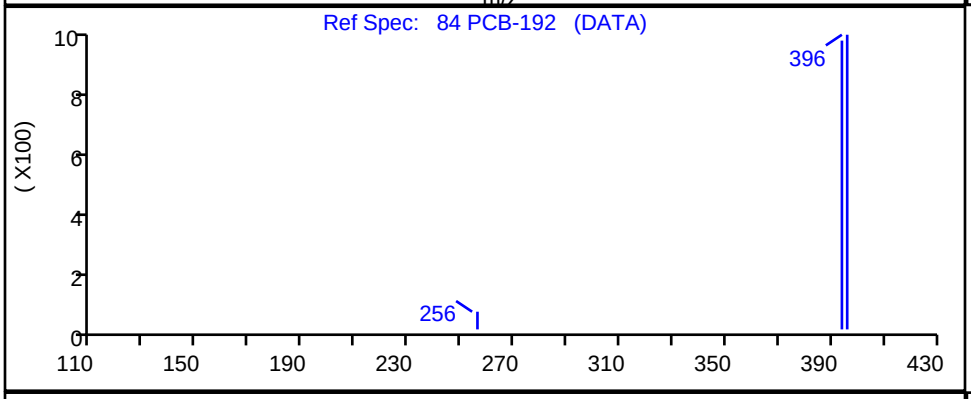
84 PCB-192, CAS: 74472-51-8

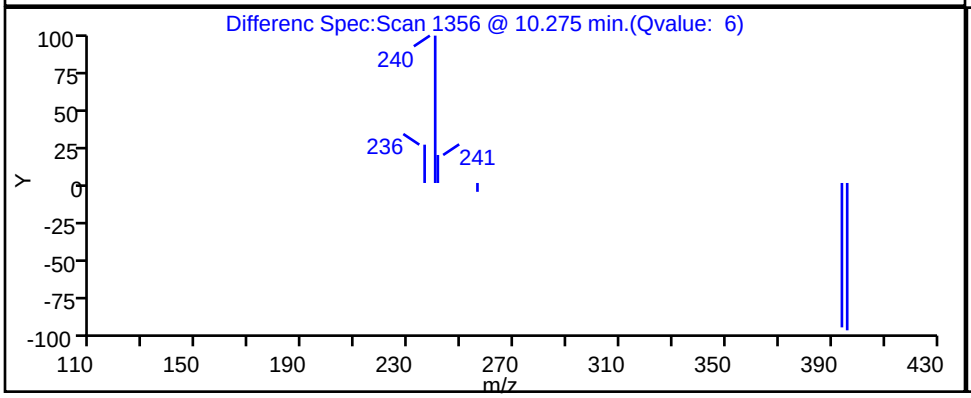


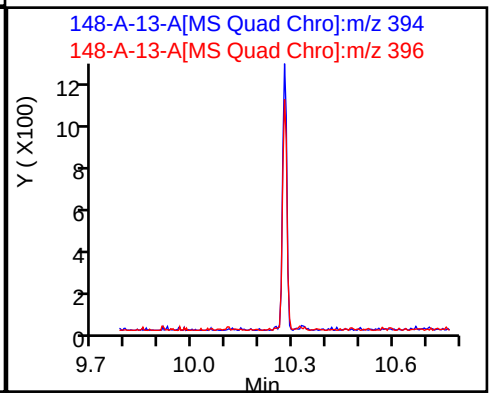












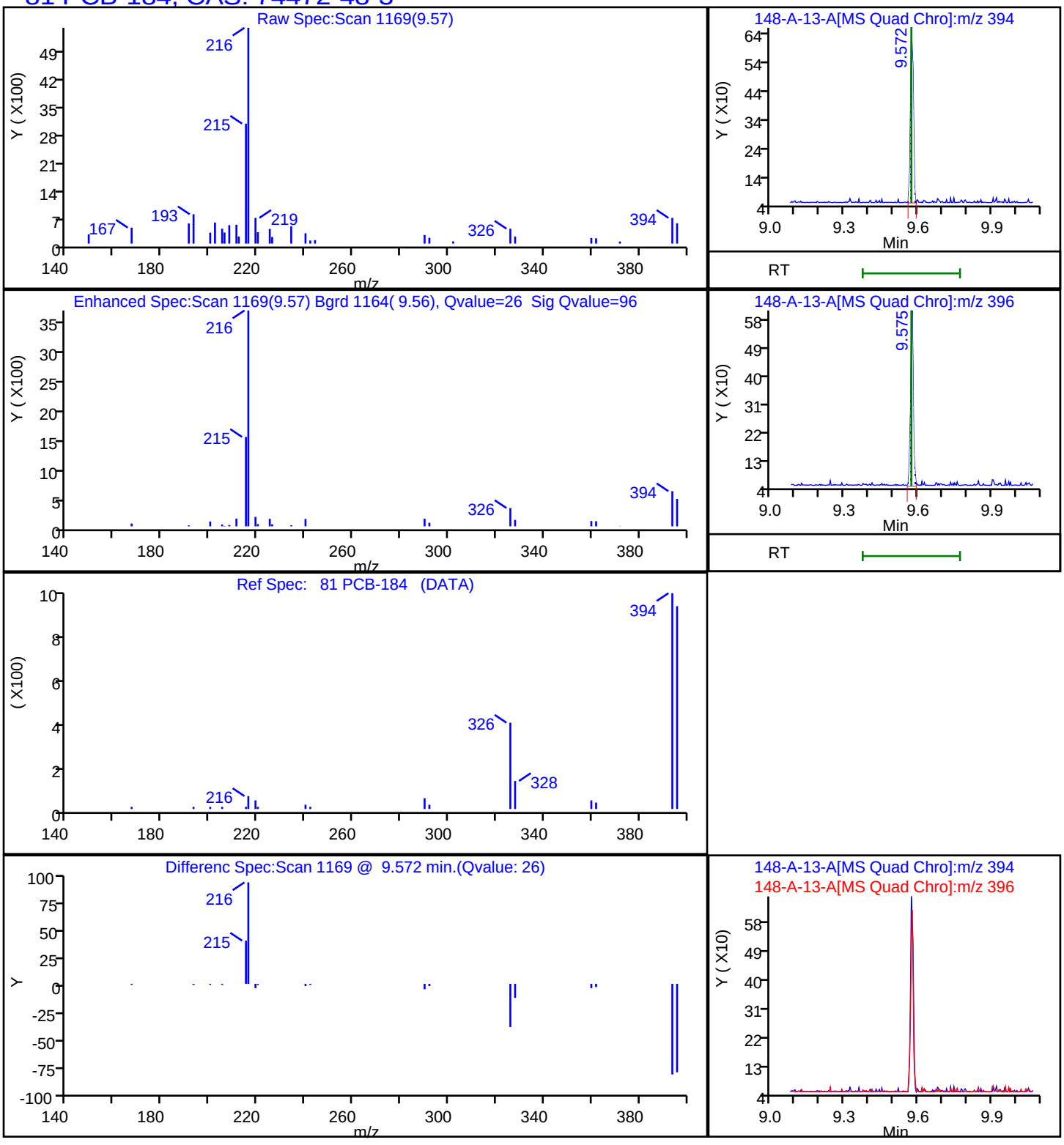
Report Date: 22-Nov-2023 12:10:38 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-13-A.D

Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16
Client ID:	1804576-853-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

81 PCB-184, CAS: 74472-48-3



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Eurofins Knoxville

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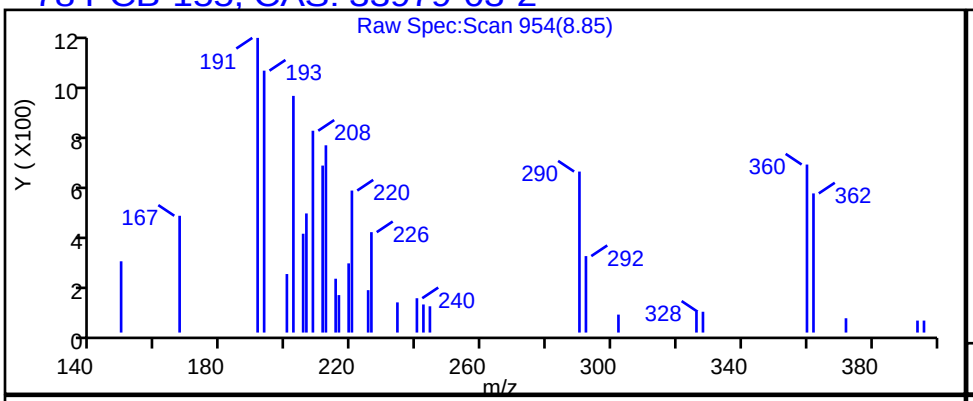
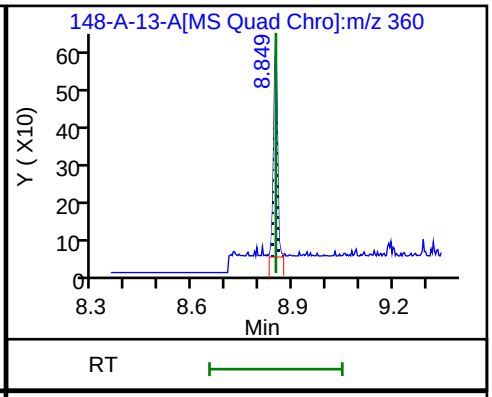
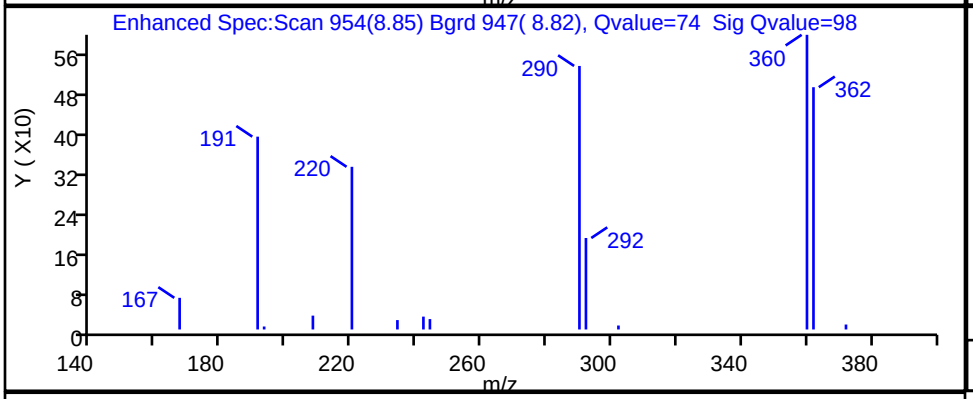
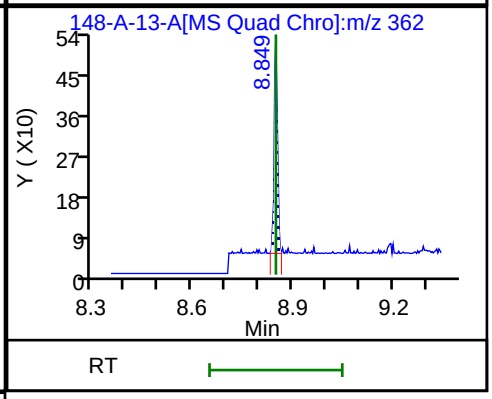
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16		
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

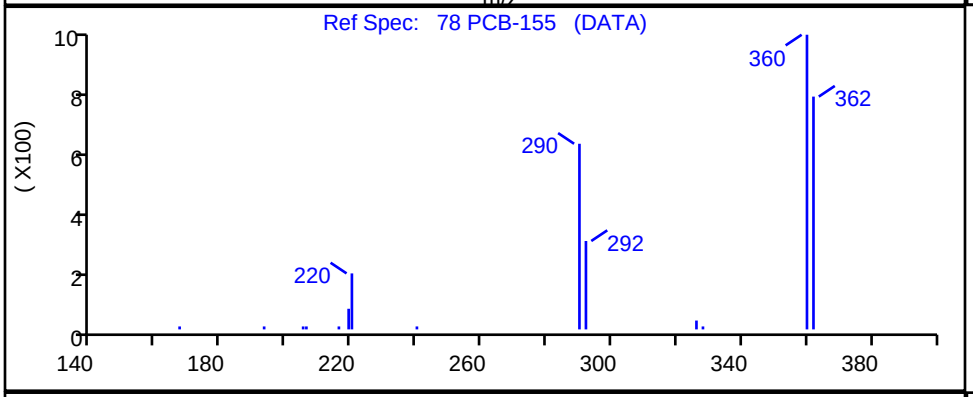
78 PCB-155, CAS: 33979-03-2

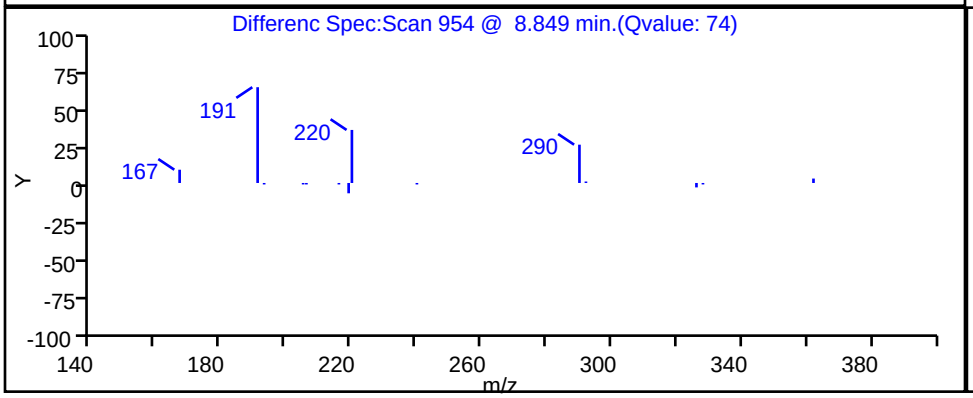


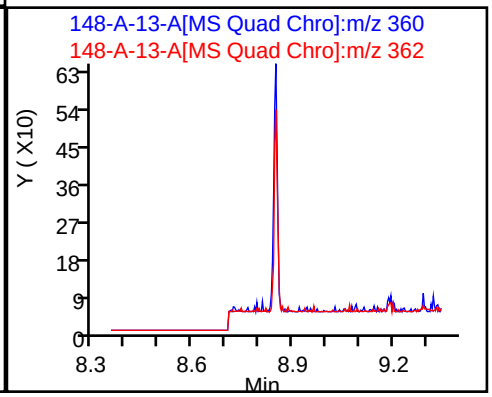












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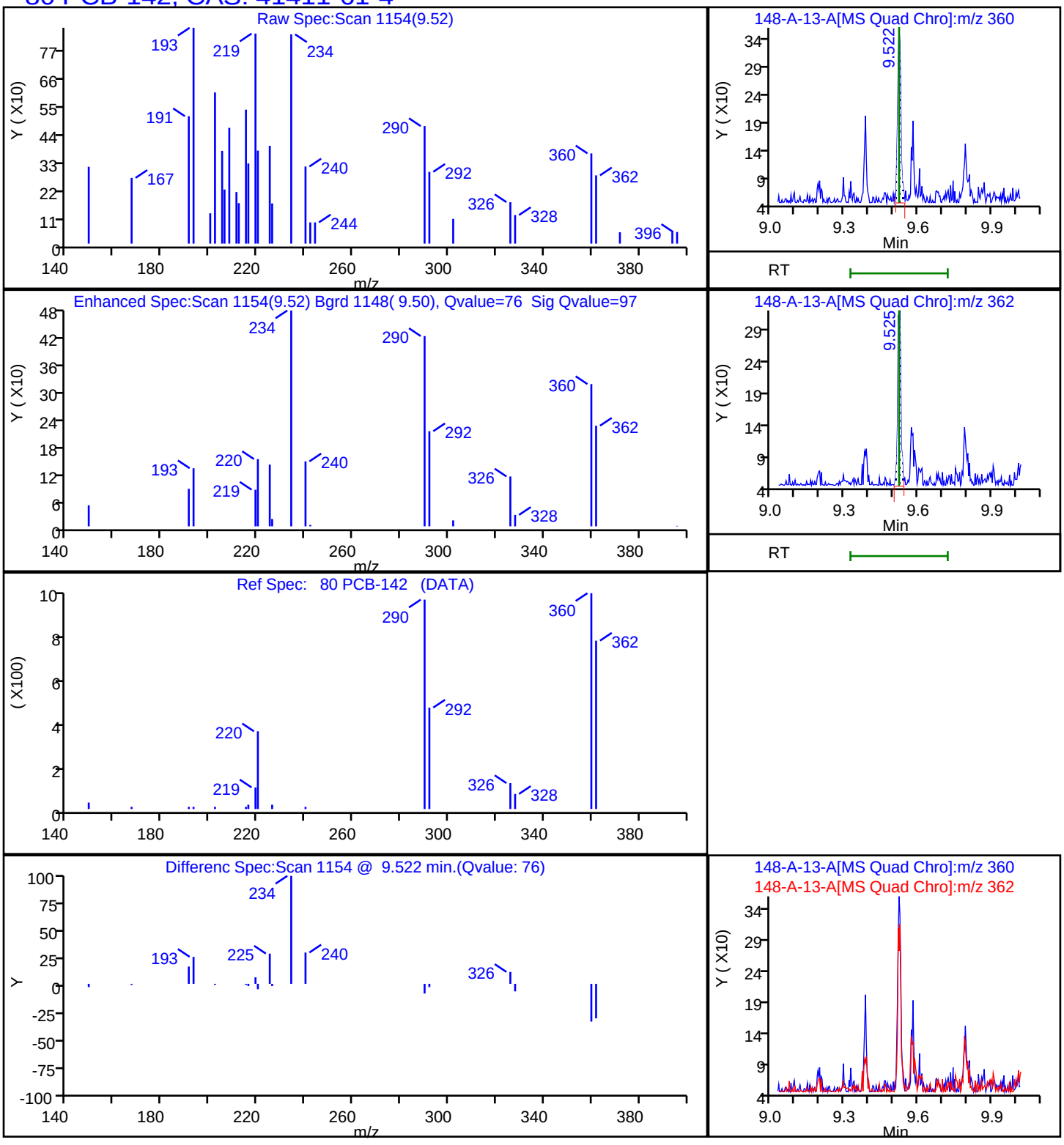
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-13-A.D

Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16
Client ID:	1804576-853-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

80 PCB-142, CAS: 41411-61-4



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Eurofins Knoxville

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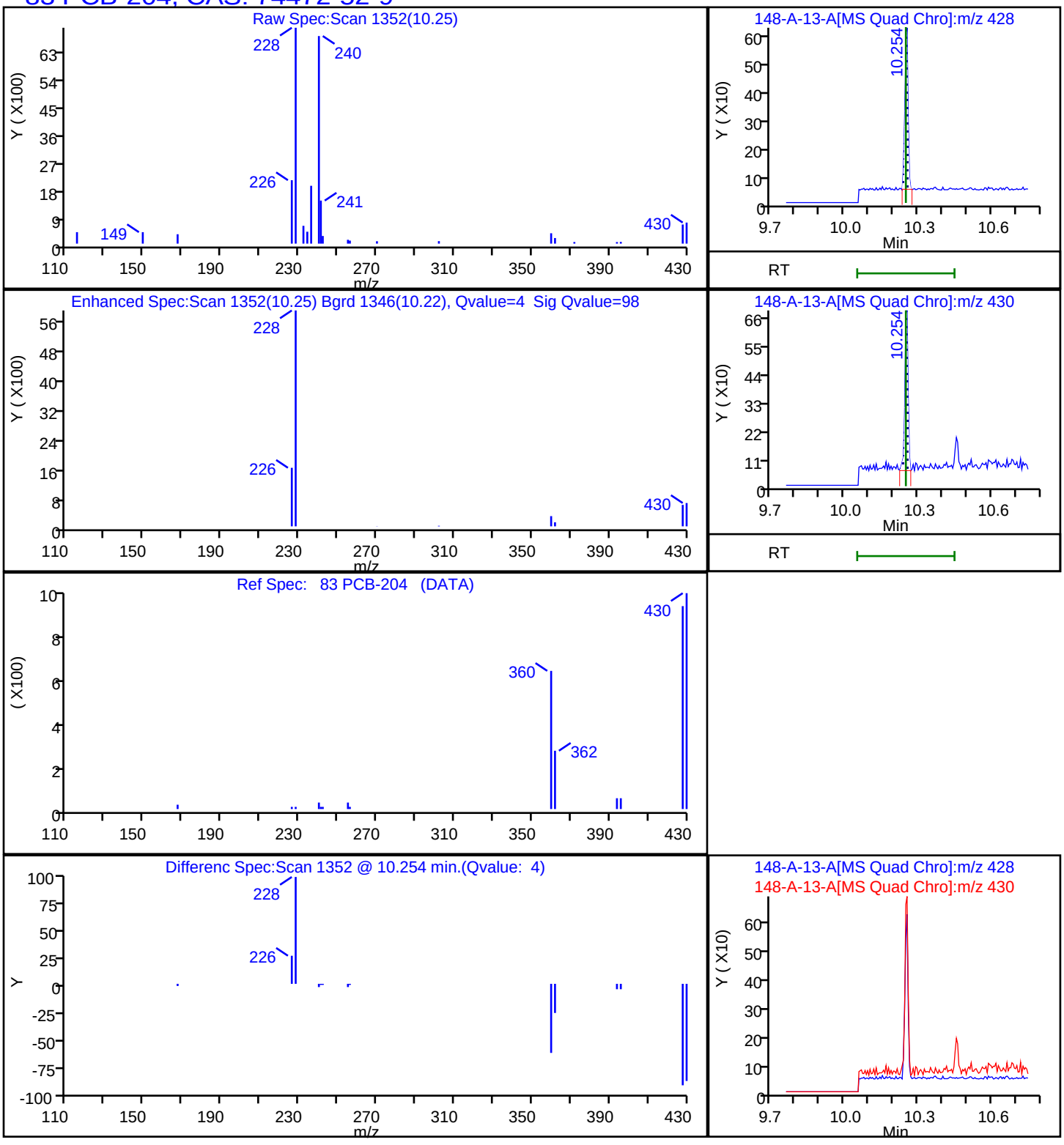
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16
Client ID:	1804576-853-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

83 PCB-204, CAS: 74472-52-9



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Eurofins Knoxville

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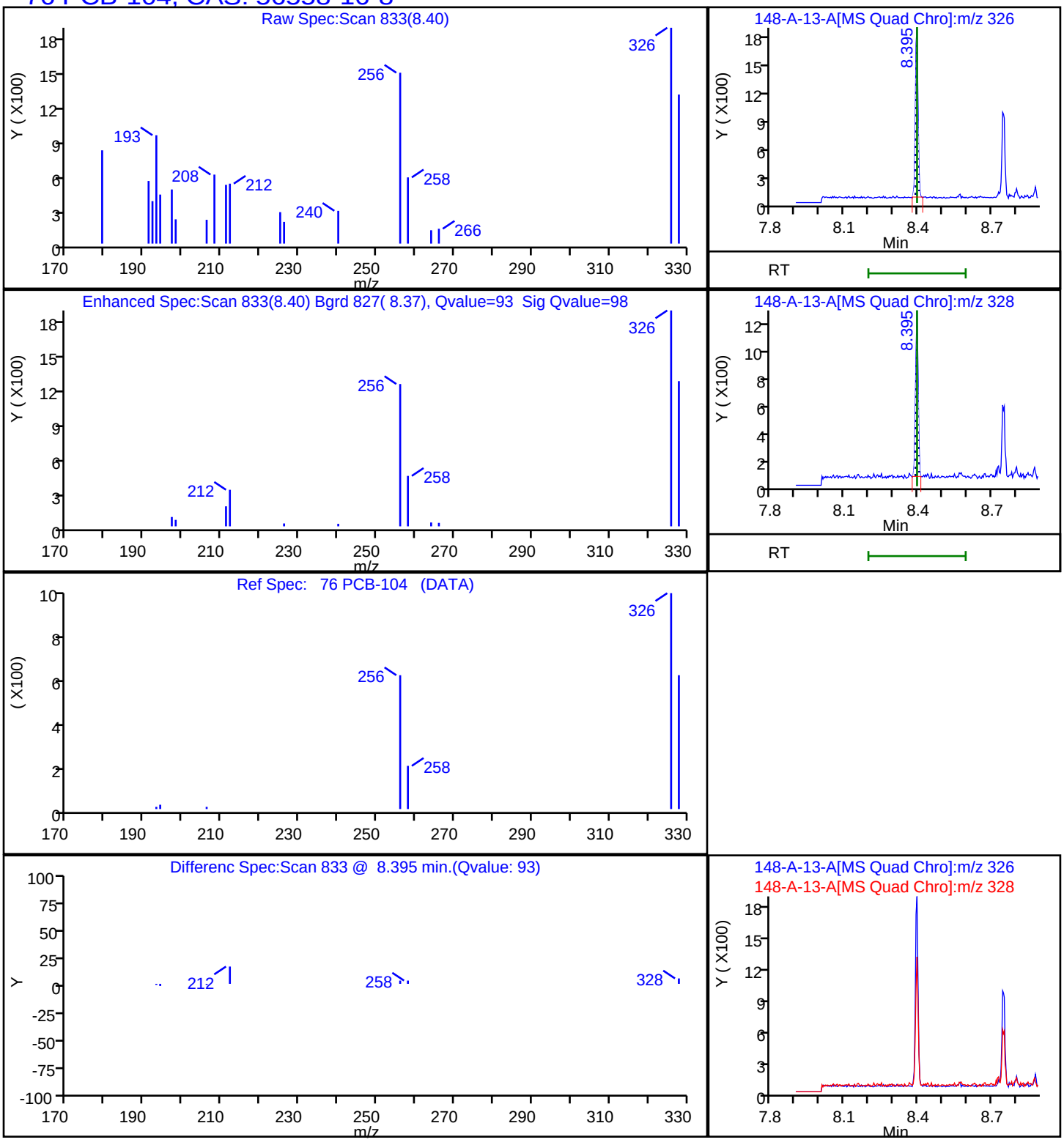
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16		
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

76 PCB-104, CAS: 56558-16-8



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Eurofins Knoxville

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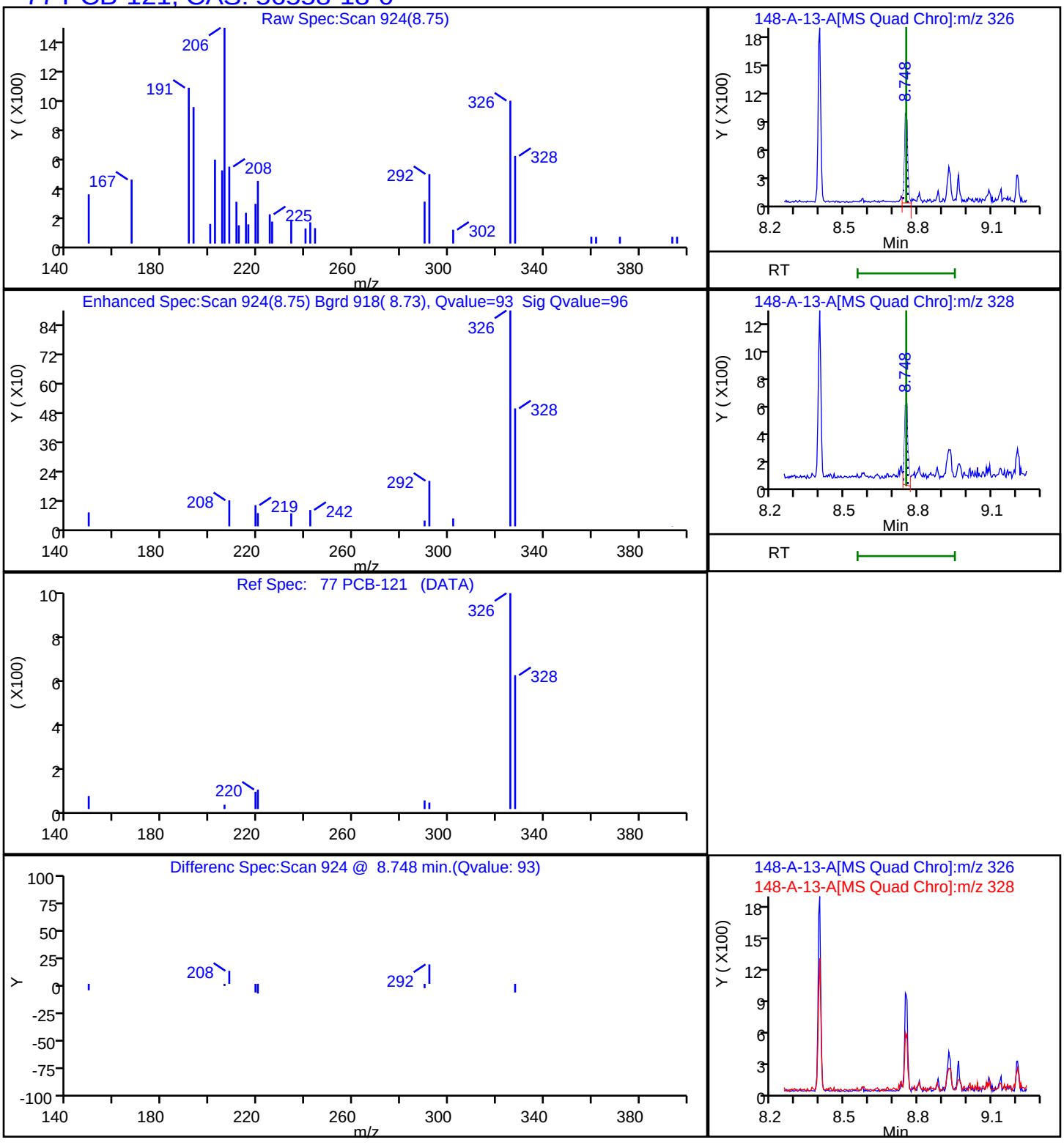
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16
Client ID:	1804576-853-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

77 PCB-121, CAS: 56558-18-0



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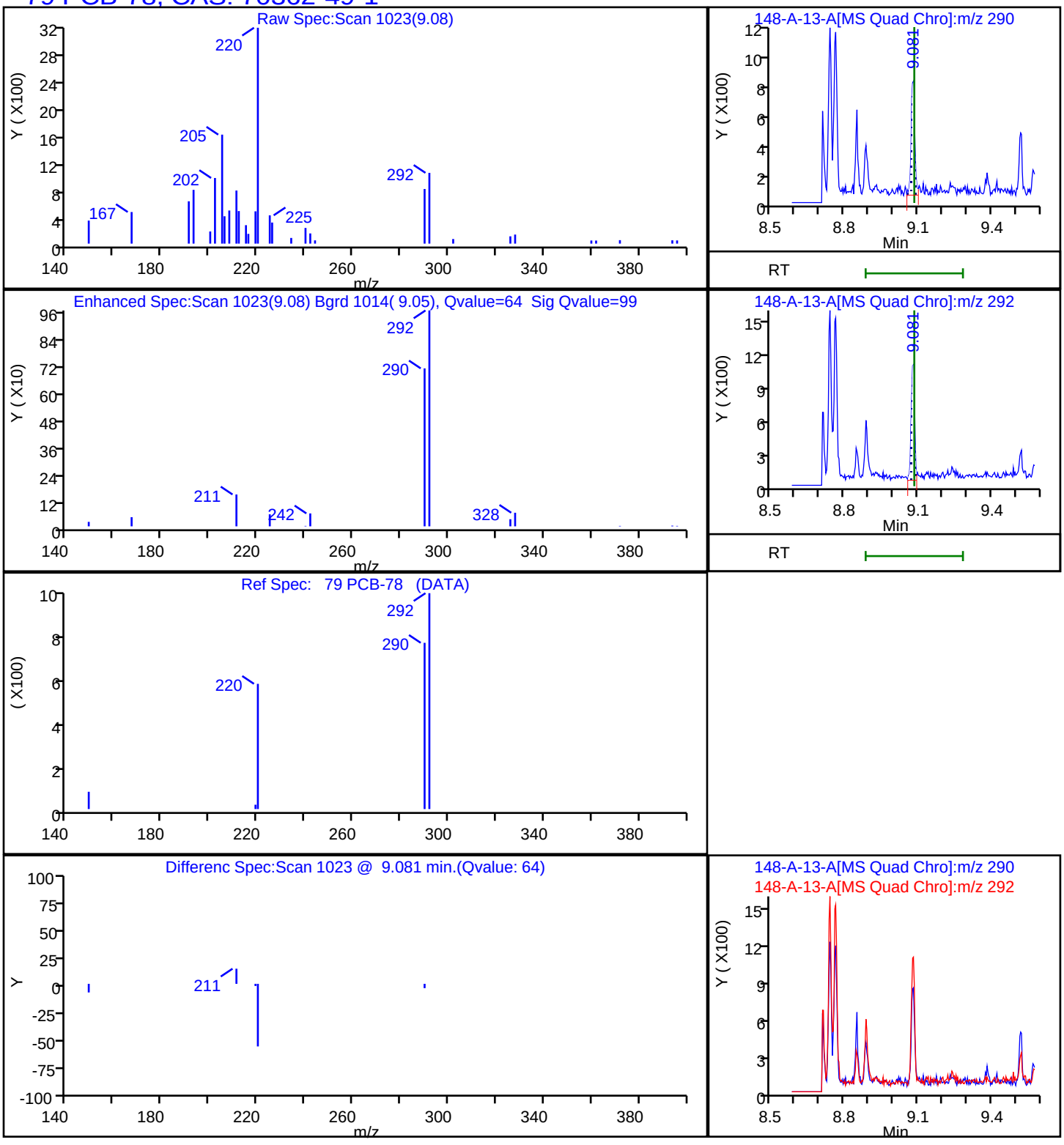
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-13-A.D

Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16
Client ID:	1804576-853-S1		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

79 PCB-78, CAS: 70362-49-1



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Eurofins Knoxville

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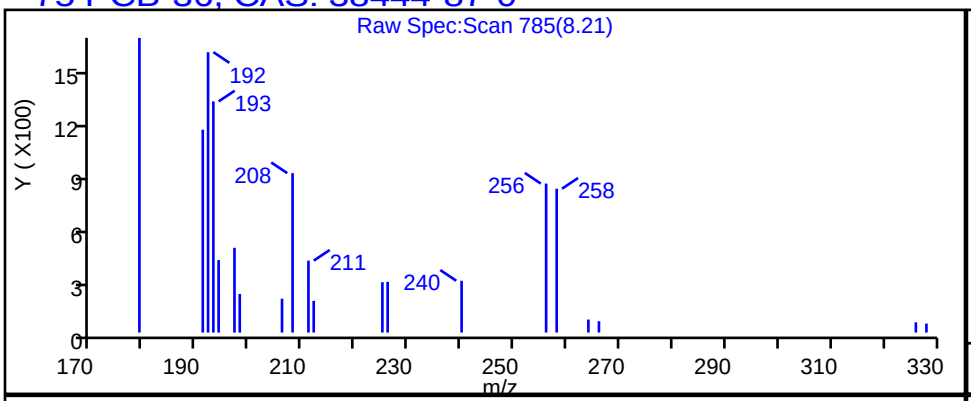
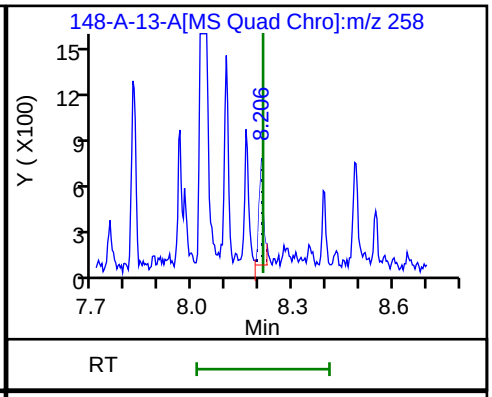
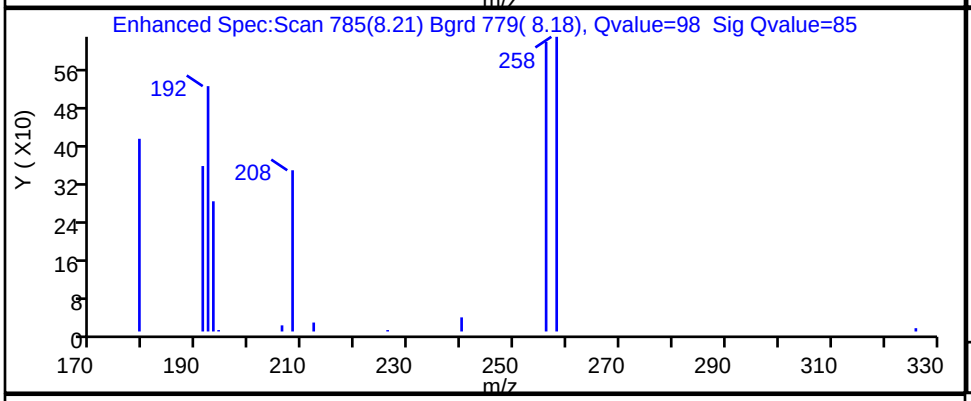
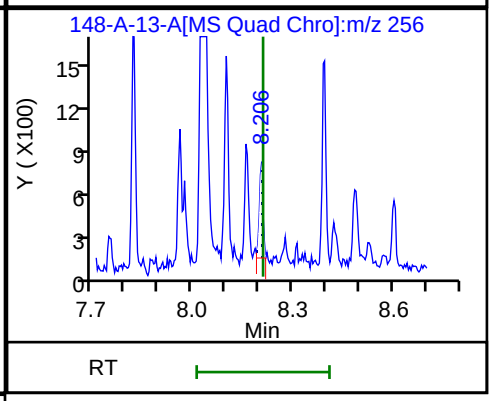
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16		
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

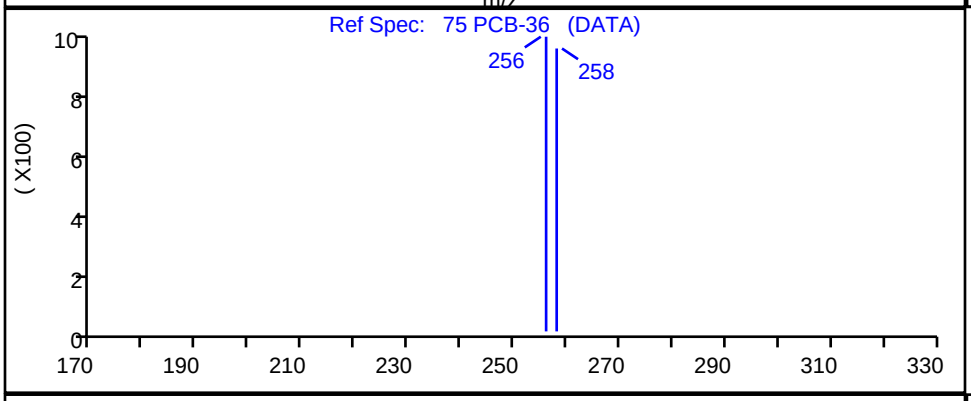
75 PCB-36, CAS: 38444-87-0

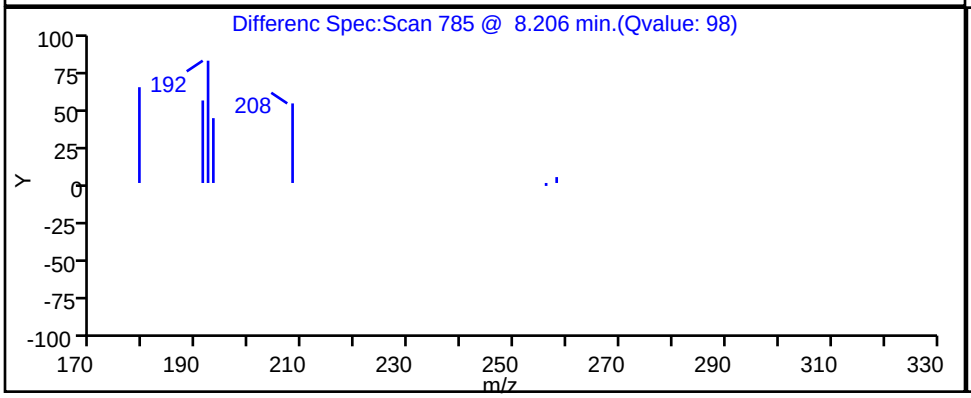


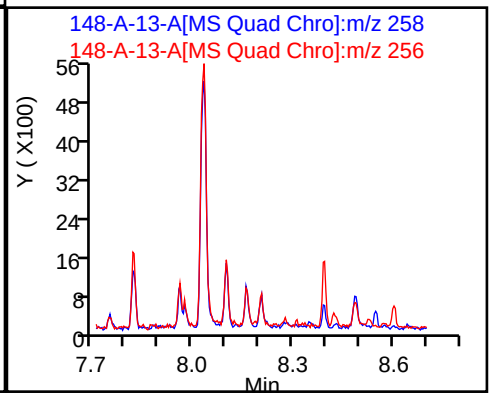












Manual Integration/User Assign Peak Report

Eurofins Knoxville

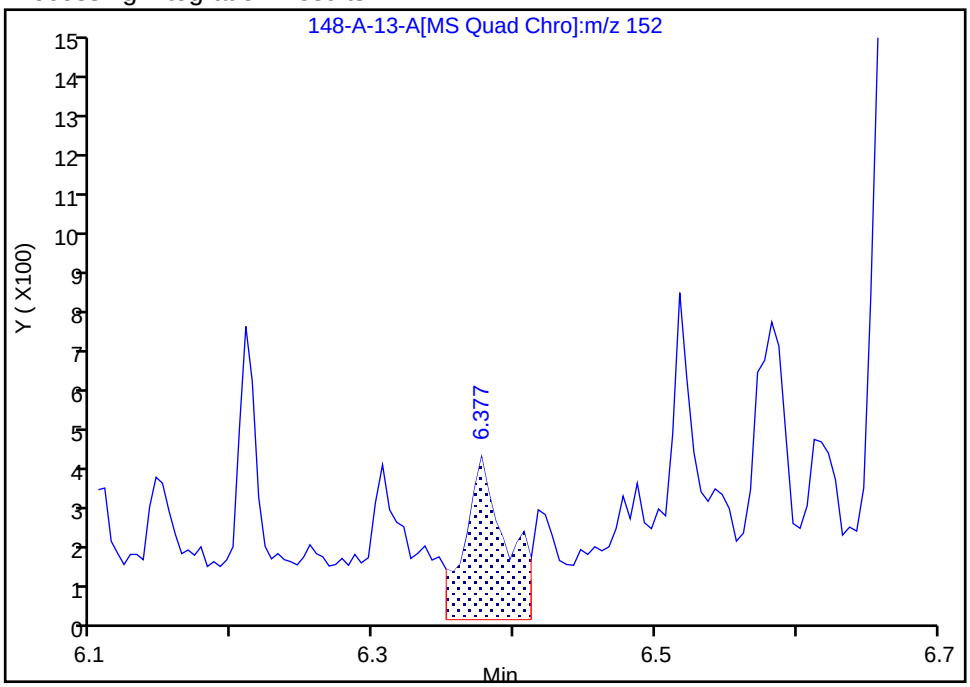
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-13-A.D				
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16		
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

24 Acenaphthylene, CAS: 208-96-8

Signal: 1

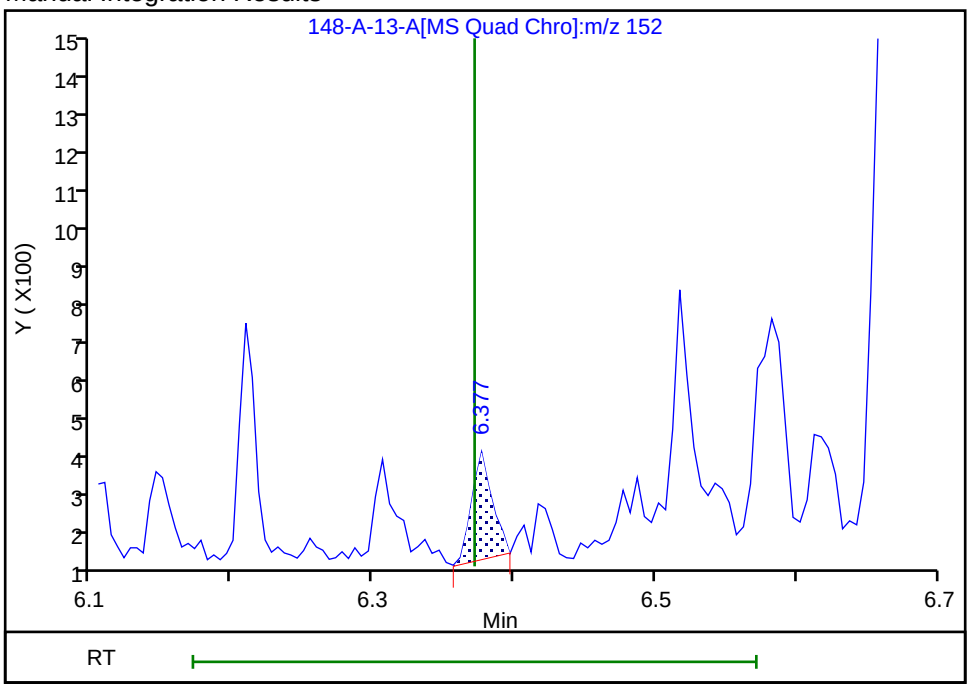
Processing Integration Results

RT: 6.38
Area: 851
Amount: 0.009719
Amount Units: ug/ml



Manual Integration Results

RT: 6.38
Area: 277
Amount: 0.003164
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:38:21 -05:00:00 (UTC)

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

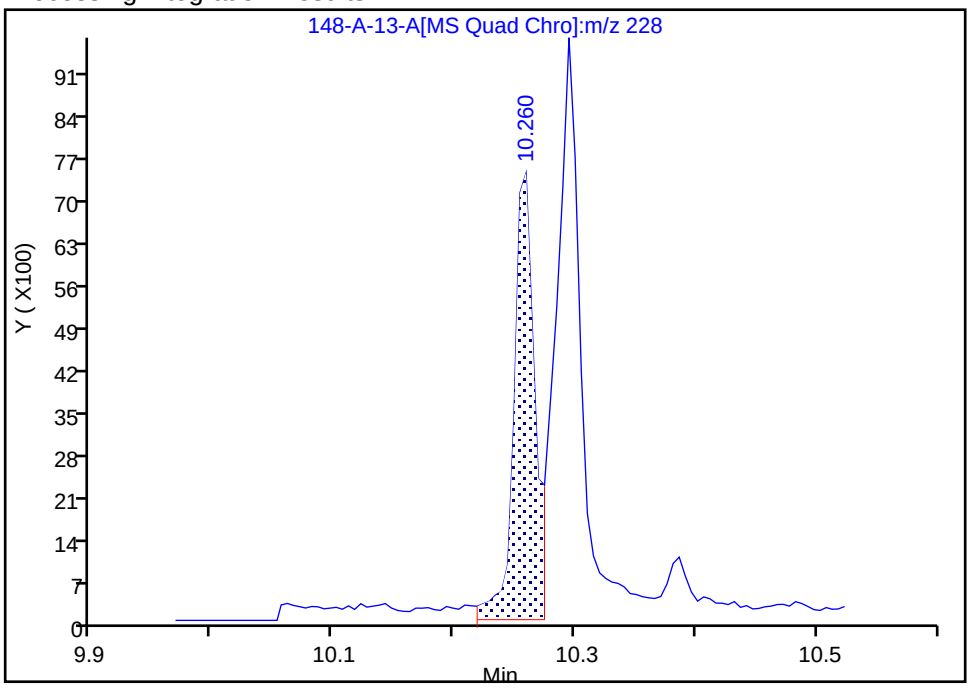
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-13-A.D				
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16		
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

47 Benzo[a]anthracene, CAS: 56-55-3

Signal: 1

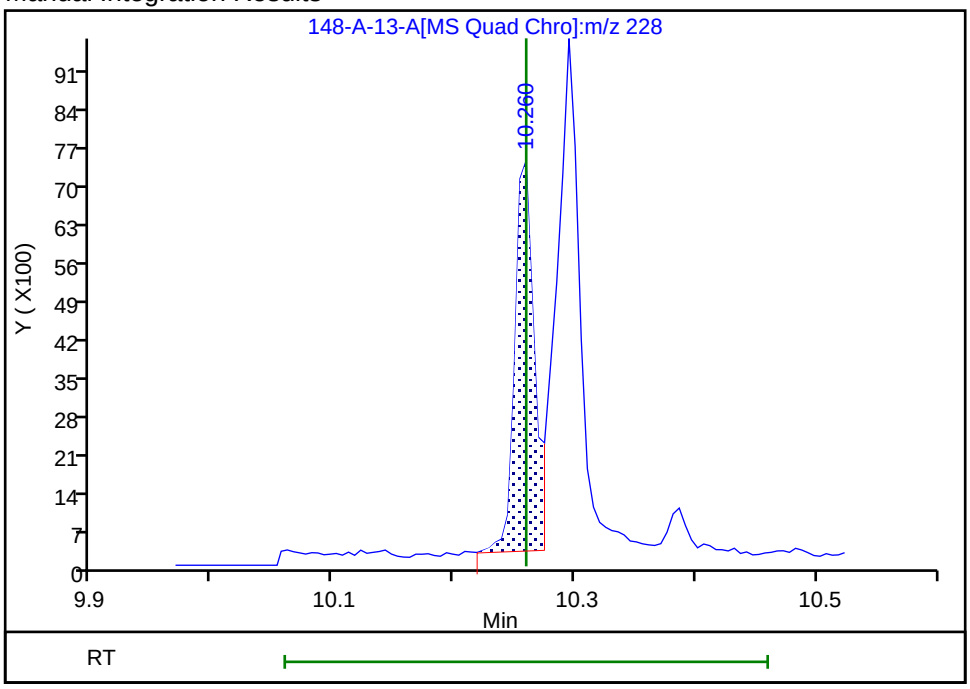
Processing Integration Results

RT: 10.26
Area: 9072
Amount: 0.056749
Amount Units: ug/ml



Manual Integration Results

RT: 10.26
Area: 8190
Amount: 0.051232
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:39:16 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

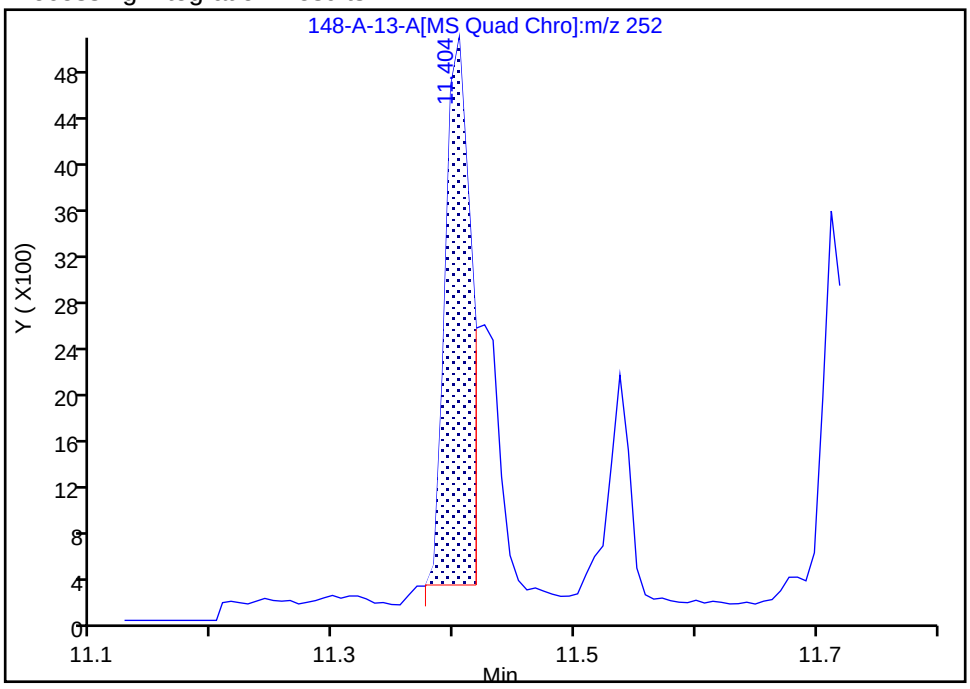
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-13-A.D				
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16		
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

55 Benzo[k]fluoranthene, CAS: 207-08-9

Signal: 1

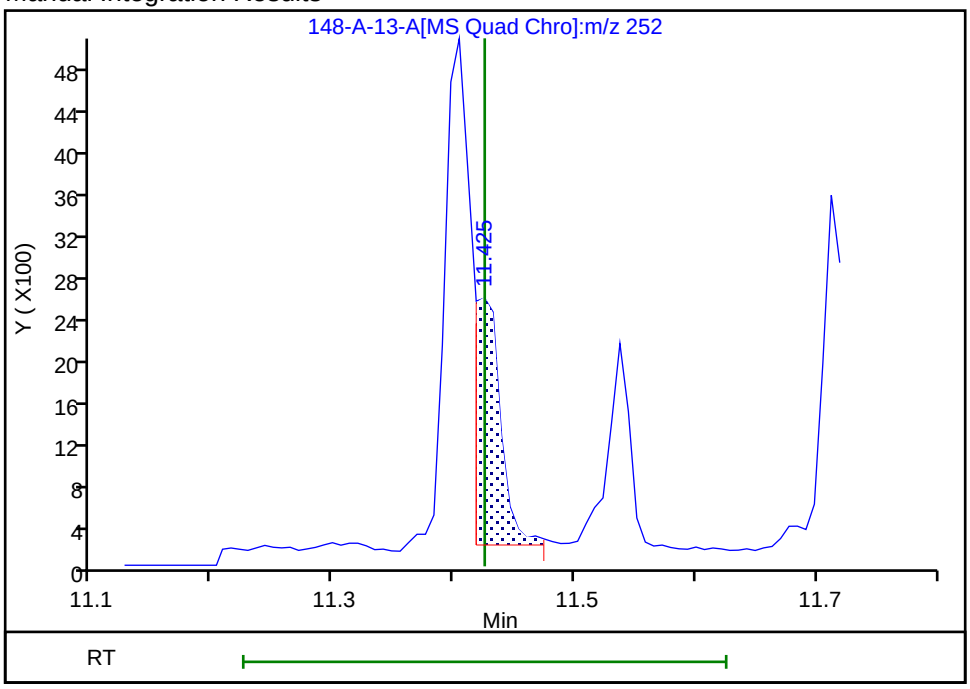
Processing Integration Results

RT: 11.40
Area: 7096
Amount: 0.037933
Amount Units: ug/ml



Manual Integration Results

RT: 11.43
Area: 3708
Amount: 0.019822
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:36:56 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

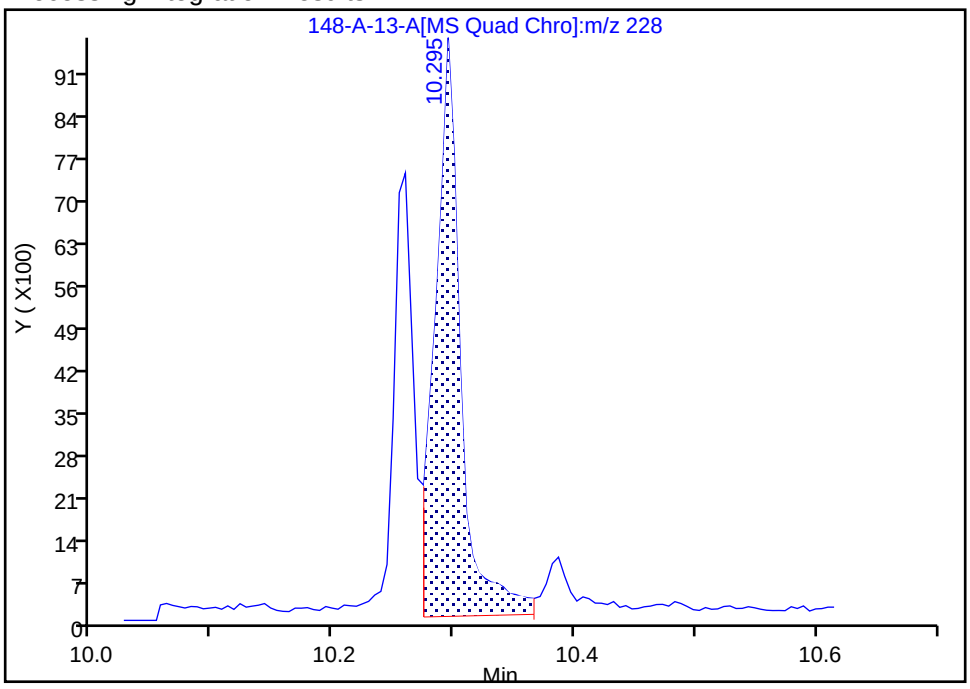
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-13-A.D				
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16		
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

50 Chrysene, CAS: 218-01-9

Signal: 1

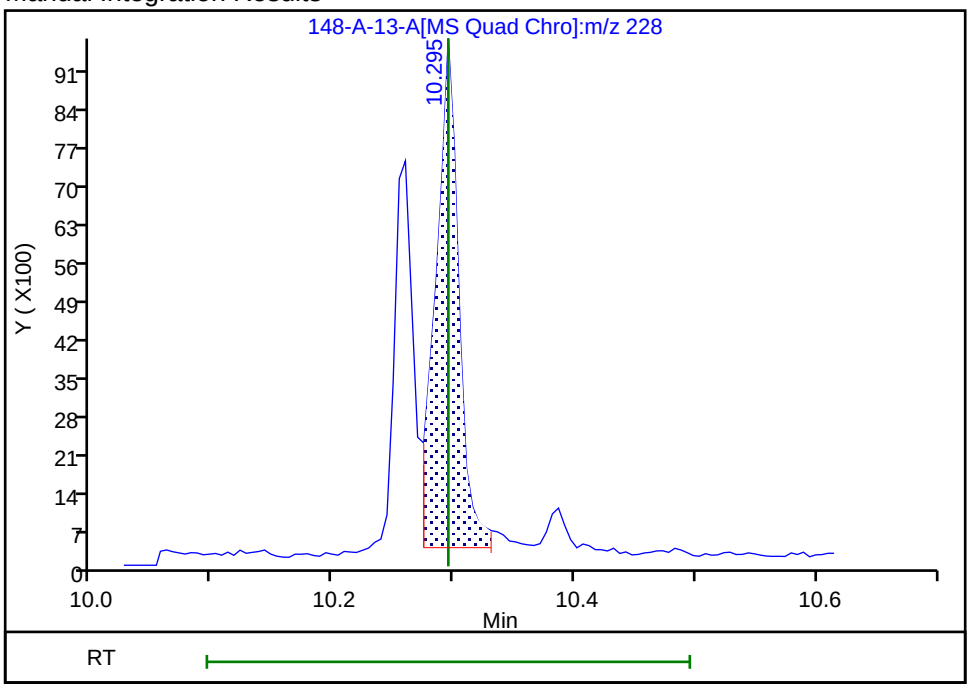
Processing Integration Results

RT: 10.30
Area: 14064
Amount: 0.078496
Amount Units: ug/ml



Manual Integration Results

RT: 10.30
Area: 12337
Amount: 0.068857
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:39:36 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

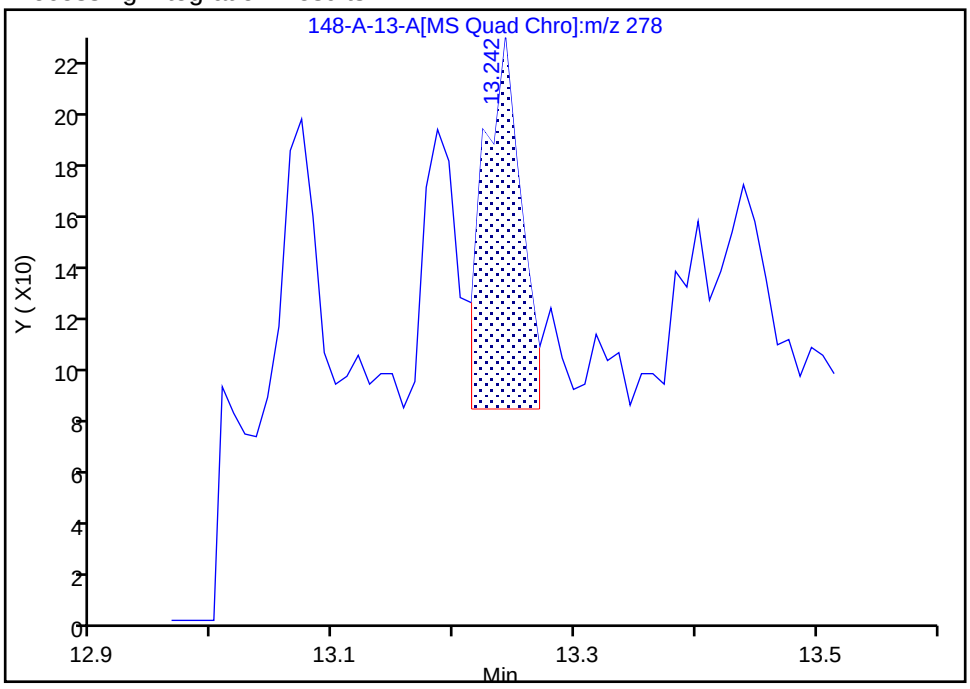
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-13-A.D				
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16		
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

66 Dibenz(a,h)anthracene, CAS: 53-70-3

Signal: 1

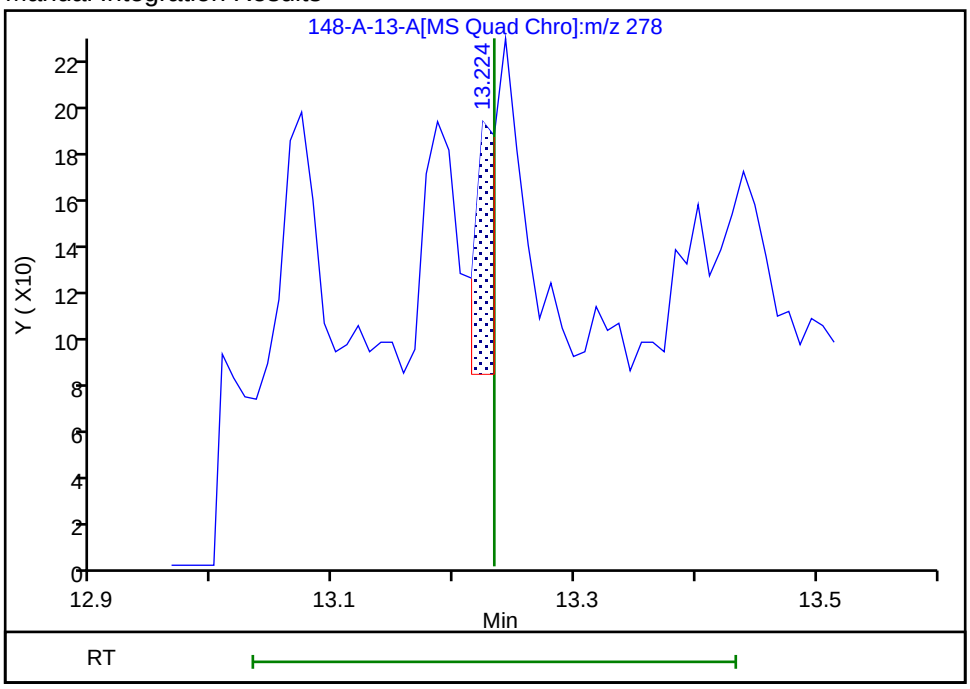
Processing Integration Results

RT: 13.24
Area: 314
Amount: 0.002158
Amount Units: ug/ml



Manual Integration Results

RT: 13.22
Area: 138
Amount: 0.000948
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:40:09 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

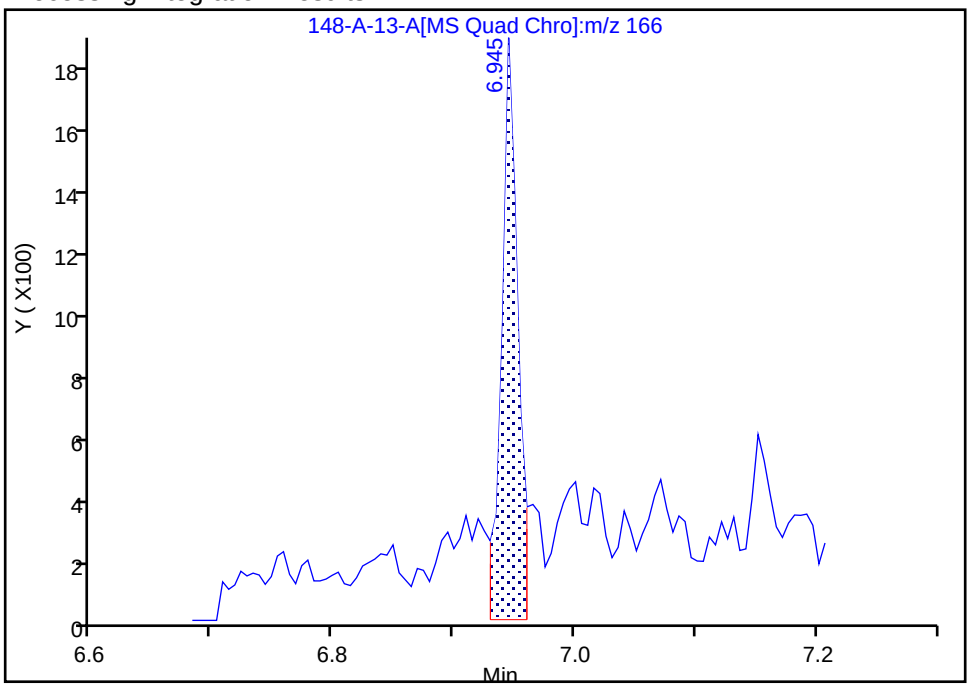
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-13-A.D				
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16		
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

30 Fluorene, CAS: 86-73-7

Signal: 1

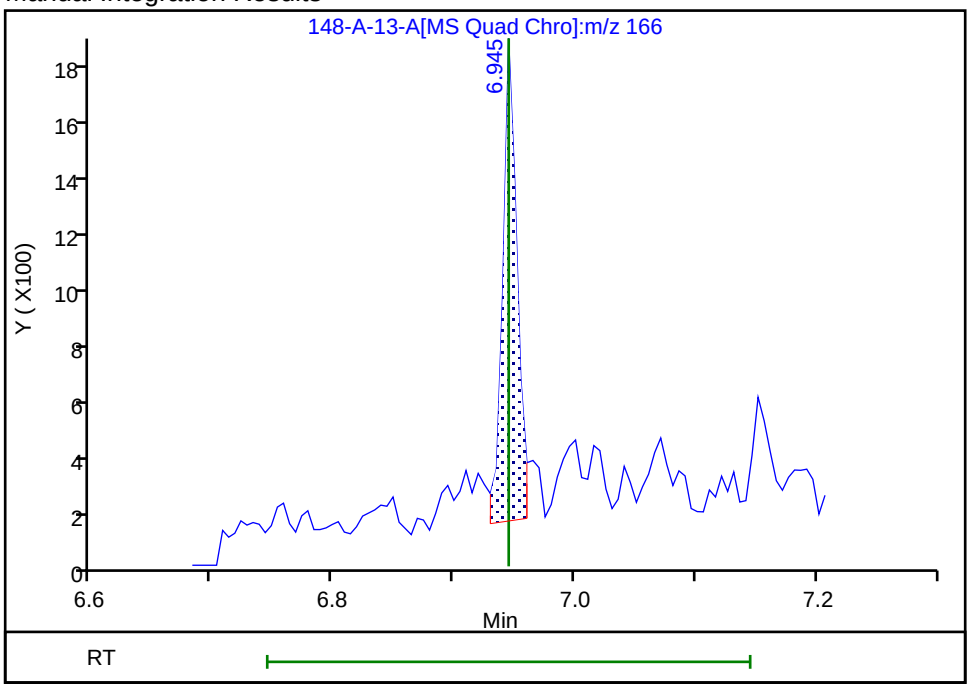
Processing Integration Results

RT: 6.95
Area: 1765
Amount: 0.023790
Amount Units: ug/ml



Manual Integration Results

RT: 6.95
Area: 1426
Amount: 0.019221
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:38:38 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

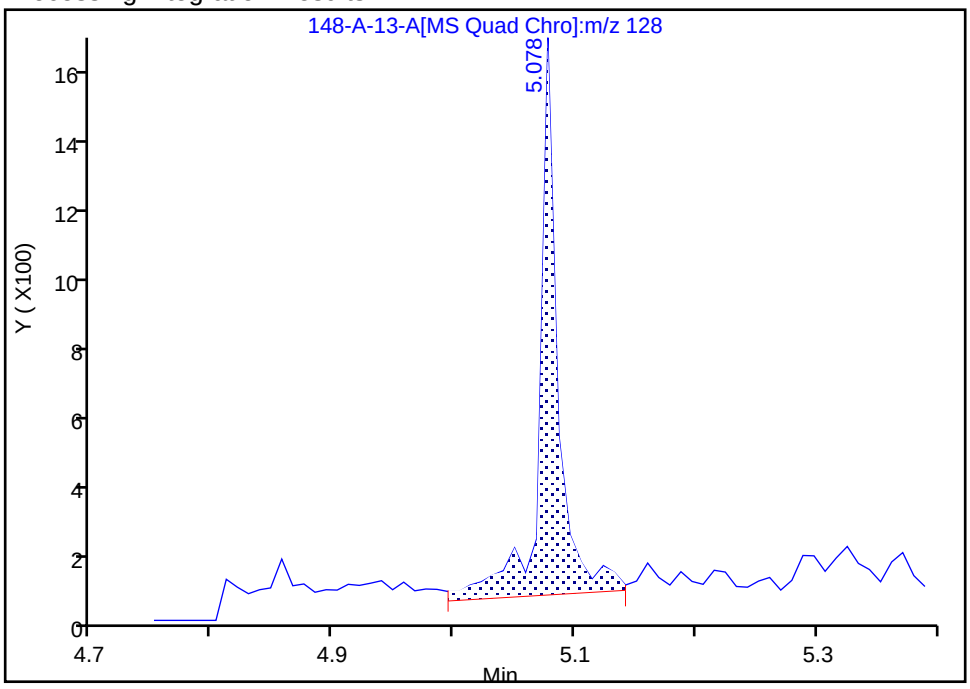
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-13-A.D				
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16		
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

11 Naphthalene, CAS: 91-20-3

Signal: 1

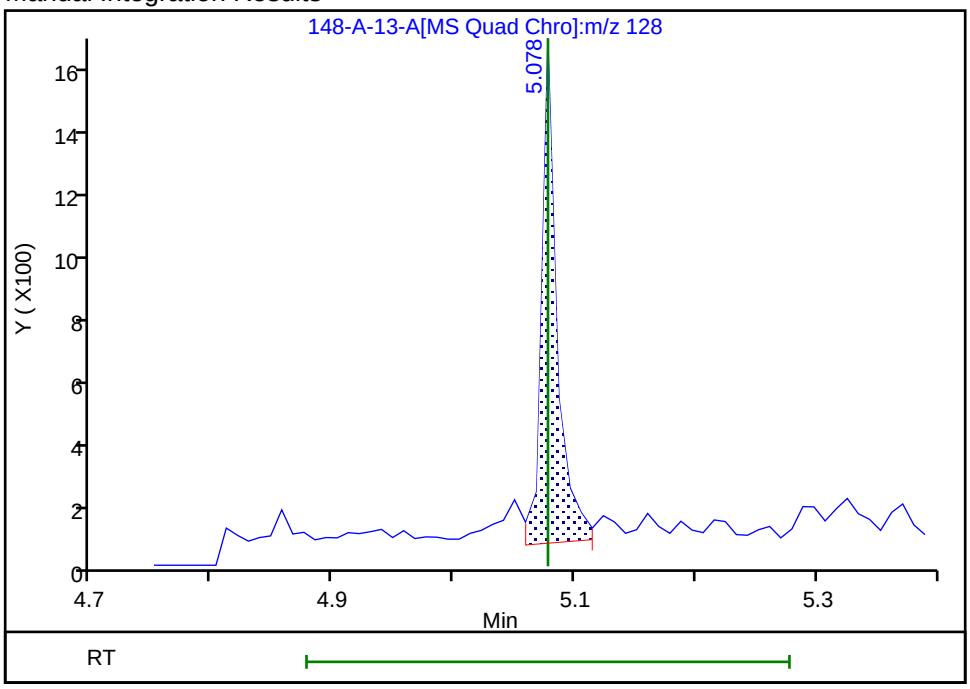
Processing Integration Results

RT: 5.08
Area: 1685
Amount: 0.023040
Amount Units: ug/ml



Manual Integration Results

RT: 5.08
Area: 1382
Amount: 0.018897
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:37:24 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

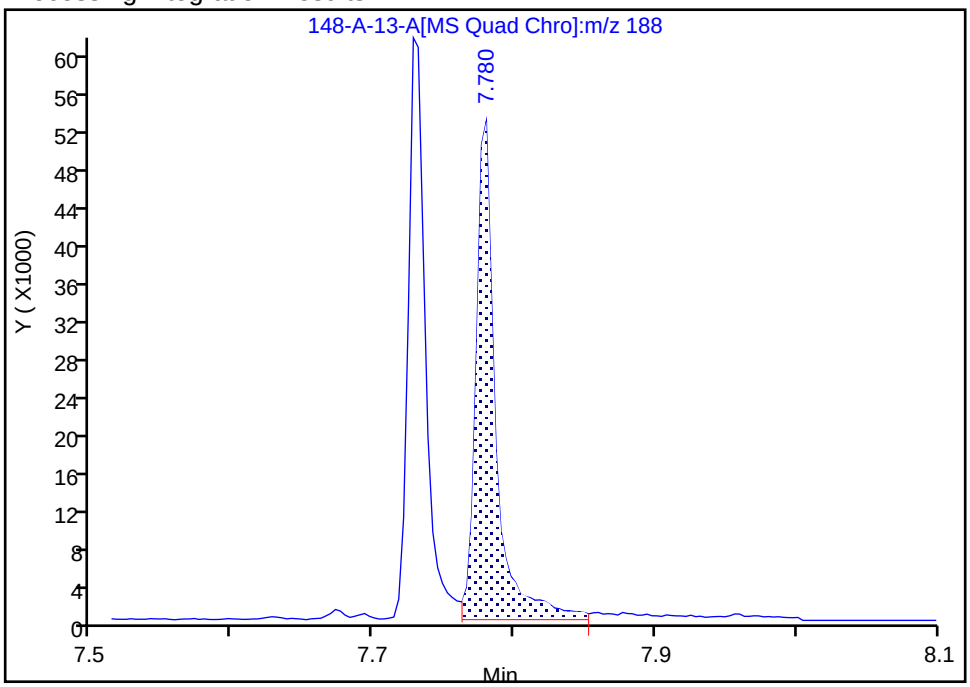
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-13-A.D				
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16		
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 38 Anthracin-d10, CAS: 1719-06-8

Signal: 1

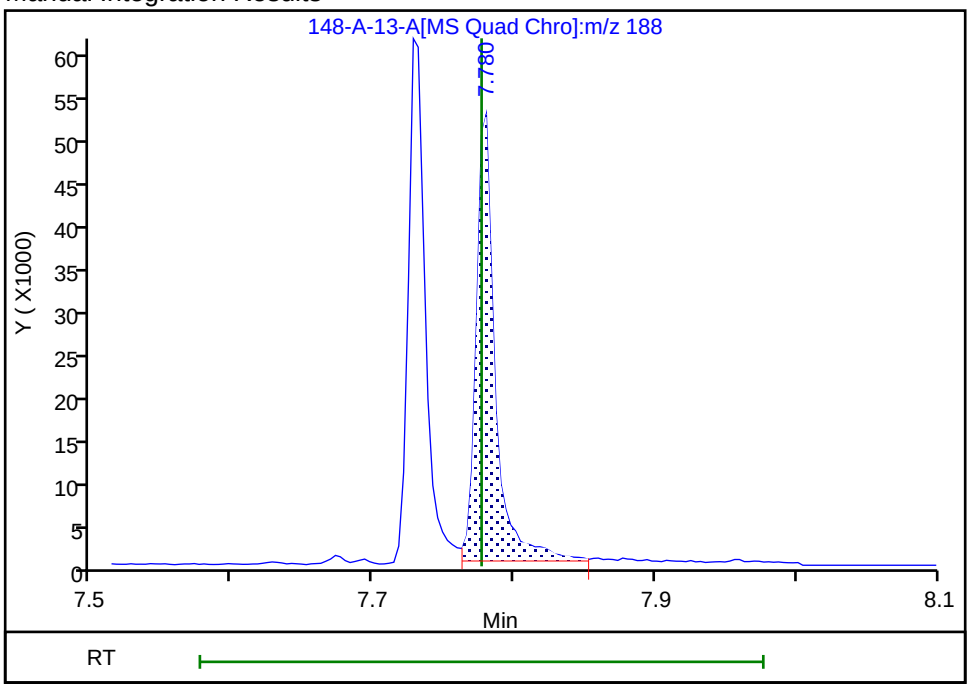
Processing Integration Results

RT: 7.78
Area: 51790
Amount: 0.399985
Amount Units: ug/ml



Manual Integration Results

RT: 7.78
Area: 48405
Amount: 0.373842
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:38:54 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

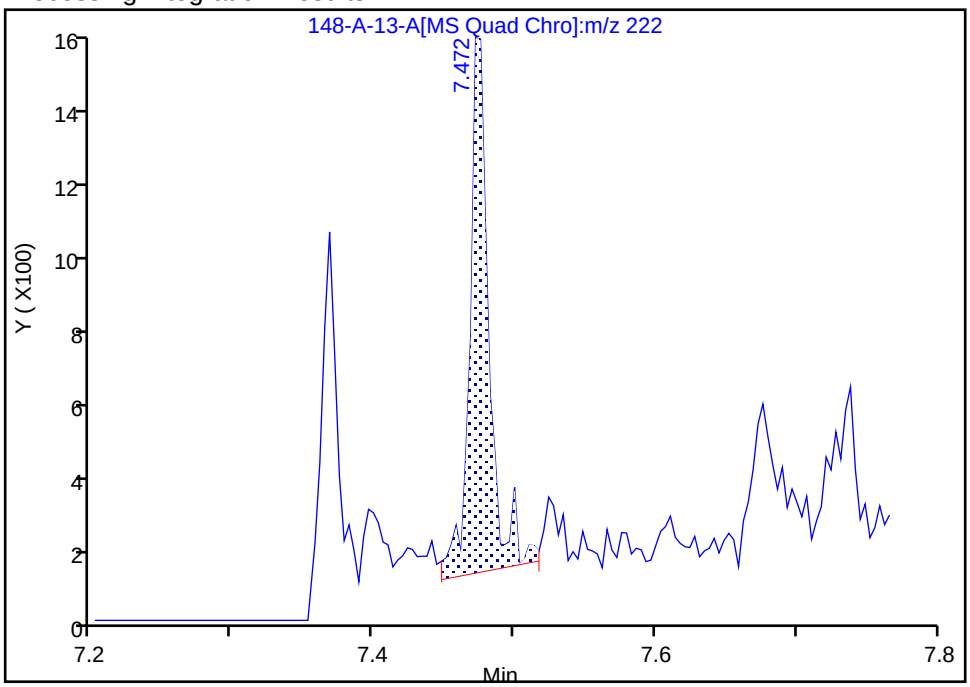
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-13-A.D				
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16		
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

74 PCB-14, CAS: 34883-41-5

Signal: 1

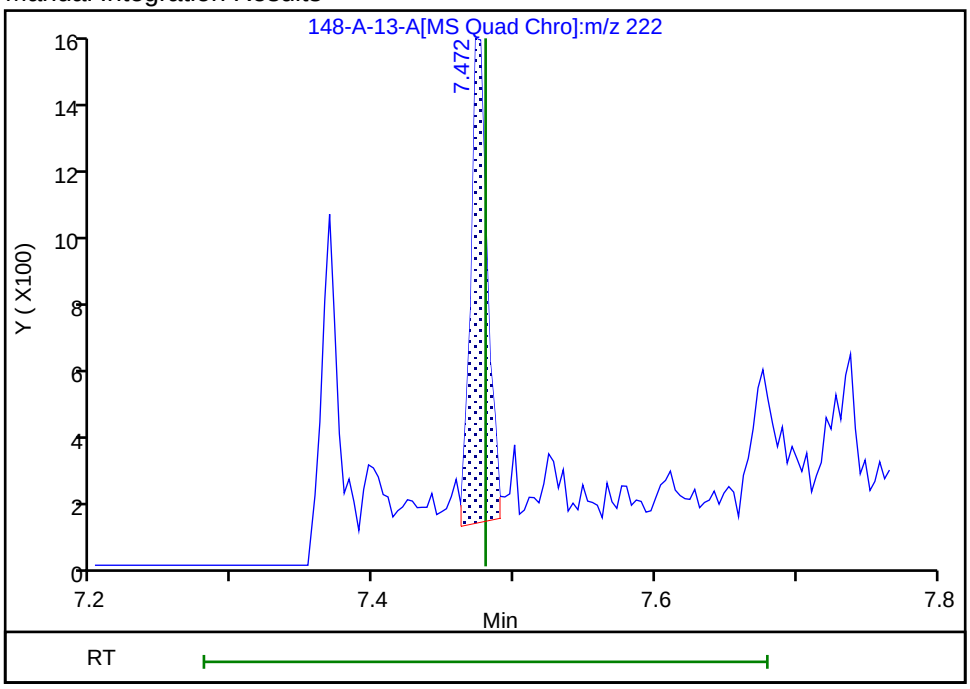
Processing Integration Results

RT: 7.47
Area: 1312
Amount: 0.010466
Amount Units: ug/ml



Manual Integration Results

RT: 7.47
Area: 1152
Amount: 0.009190
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:40:30 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

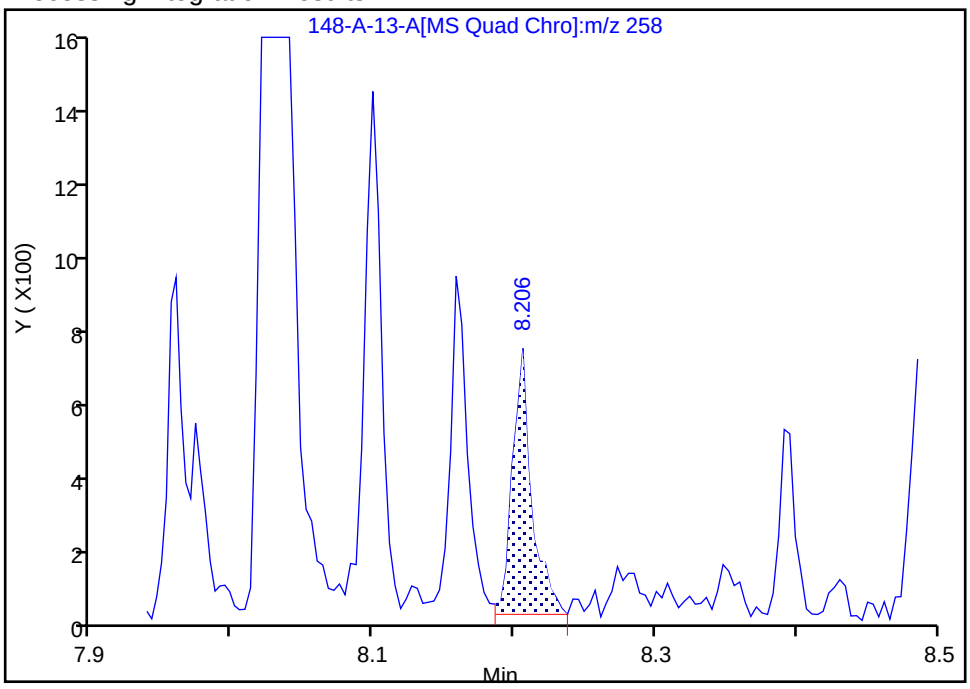
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-13-A.D				
Injection Date:	16-Nov-2023 19:45:56	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-16-A	Lab Sample ID:	140-34148-16		
Client ID:	1804576-853-S1				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

75 PCB-36, CAS: 38444-87-0

Signal: 1

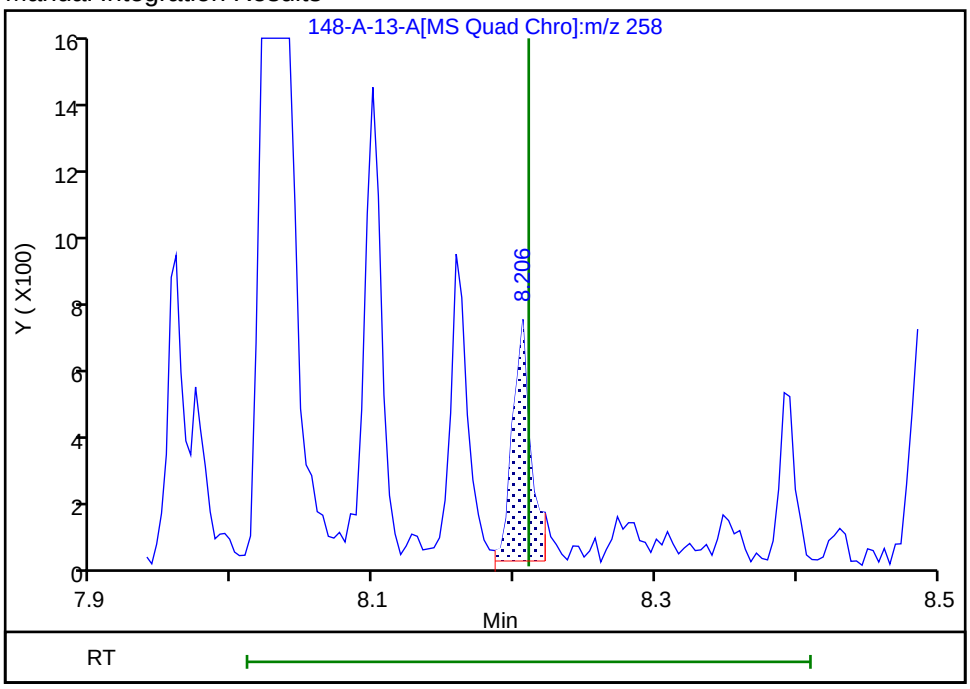
Processing Integration Results

RT: 8.21
Area: 635
Amount: 0.009622
Amount Units: ug/ml



Manual Integration Results

RT: 8.21
Area: 606
Amount: 0.009183
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:40:38 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: 1804576-853-S3 | Lab Sample ID: 140-34148-17

Matrix: PE | Lab File ID: 140-34148-A-14-A.D

Analysis Method: ID-0016 | Date Collected: 10/26/2023 14:00

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.010(g) | Date Analyzed: 11/16/2023 20:09

Con. Extract Vol.: 500(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80349 | Units: ng/g

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
83-32-9	Acenaphthene	ND		1000	260
208-96-8	Acenaphthylene	ND		1000	73
120-12-7	Anthracene	ND		1000	320
56-55-3	Benzo[a]anthracene	ND		1000	370
50-32-8	Benzo[a]pyrene	ND		1000	280
205-99-2	Benzo[b]fluoranthene	ND		1000	350
192-97-2	Benzo[e]pyrene	ND		1000	160
191-24-2	Benzo[g,h,i]perylene	ND		1000	110
207-08-9	Benzo[k]fluoranthene	ND		1000	230
218-01-9	Chrysene	ND		1000	130
53-70-3	Dibenz(a,h)anthracene	ND		1000	82
206-44-0	Fluoranthene	ND		1000	810
86-73-7	Fluorene	ND		1000	320
193-39-5	Indeno[1,2,3-cd]pyrene	ND		1000	110
90-12-0	1-Methylnaphthalene	ND		5000	500
91-57-6	2-Methylnaphthalene	ND		5000	700
91-20-3	Naphthalene	ND		20000	2900
198-55-0	Perylene	3000		1000	510
85-01-8	Phenanthrene	ND		2000	1700
129-00-0	Pyrene	ND		2000	300
STL00912	C1-Fluoranthenes/pyrene	ND		1000	1000
STL00913	C1-Fluorenes	ND		2000	1300
STL00914	C2-Fluorenes	ND		1000	1000
STL00915	C3-Fluorenes	ND		1000	1000
STL00917	C2-Naphthalenes	ND		2000	2000
STL00918	C3-Naphthalenes	ND		2000	2000
STL00919	C4-Naphthalenes	ND		3000	2800
STL00901	C1-Phenanthrenes/Anthracenes	ND		4000	3400
STL00902	C2-Phenanthrenes/Anthracenes	ND		1000	1000
STL00903	C3-Phenanthrenes/Anthracenes	ND		1000	1000
STL00904	C4-Phenanthrenes/Anthracenes	ND		1000	1000
STL02218	C1-Chrysenes/Benz(a)anthracenes	ND		1000	1000

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: 1804576-853-S3 | Lab Sample ID: 140-34148-17

Matrix: PE | Lab File ID: 140-34148-A-14-A.D

Analysis Method: ID-0016 | Date Collected: 10/26/2023 14:00

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.010(g) | Date Analyzed: 11/16/2023 20:09

Con. Extract Vol.: 500(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80349 | Units: ng/g

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
STL02219	C2-Chrysenes/Benz(a)anthracenes	ND		1000	1000
STL02220	C3-Chrysenes/Benz(a)anthracenes	ND		1000	1000
STL02221	C4-Chrysenes/Benz(a)anthracenes	ND		1000	1000
34883-41-5	PCB-14	400	J	1000	10
74472-51-8	PCB-192	1900		1000	10
74472-48-3	PCB-184	820	J	1000	10
33979-03-2	PCB-155	600	J	1000	10
41411-61-4	PCB-142	590	J	1000	10
74472-52-9	PCB-204	1400		1000	10
56558-16-8	PCB-104	1700		1000	10
56558-18-0	PCB-121	720	J	1000	10
70362-49-1	PCB-78	1100		1000	10
38444-87-0	PCB-36	340	J	1000	10

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
93951-97-4	Acenaphthylene-d8	77		30-120
1719-06-8	Anthracene-d10	73		30-120
63466-71-7	Benzo(a)pyrene-d12	73		30-120
93951-98-5	Benzo(b)fluoranthene-d12	81		30-120
93951-66-7	Benzo(ghi)perylene-d12	84		30-120
93952-01-3	Benzo(k)fluoranthene-d12	82		30-120
1719-03-5	Chrysene-d12	71		30-120
13250-98-1	Dibenz(a,h)anthracene-d14	76		30-120
93951-69-0	Fluoranthene-d10	82		30-120
81103-79-9	Fluorene -d10	77		30-120
203578-33-0	Indeno[1,2,3-cd]pyrene-d12	80		30-120
38072-94-5	1-Methylnaphthalene-d10	79		30-120
7297-45-2	2-Methylnaphthalene-d10	78		30-120
1146-65-2	Naphthalene-d8	74		30-120
1520-96-3	Perylene-d12	70		30-120
1517-22-2	Phenanthrene-d10	71		30-120

Report Date: 17-Nov-2023 12:14:55 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-14-A.D
Lims ID: 140-34148-A-17-A
Client ID: 1804576-853-S3
Sample Type: Client
Inject. Date: 16-Nov-2023 20:09:18 ALS Bottle#: 0 Worklist Smp#: 25
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030519-025
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 17-Nov-2023 12:14:52 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1635

First Level Reviewer: SK9U Date: 17-Nov-2023 11:01:24

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/ml	%Rec	Flags
D 10 Naphthalene-d8	136	5.059	5.068	-0.009	100	29343	0.3684	73.7	
12 Naphthalene	128	5.078	5.078	0.000	49	1114	0.0161		7M
D 15 2-methylnaphthalene-d10	152	5.612	5.612	0.000	92	20072	0.3876	77.5	
D 17 1-Methylnaphthalene-d10	152	5.692	5.686	0.006	100	20599	0.3970	79.4	
D 23 Acenaphthylene-d8	160	6.367	6.362	0.004	68	33704	0.3835	76.7	
24 Acenaphthylene	152	6.377	6.372	0.005	1	30	0.000379		7M
* 26 Acenaphthene-d10	164	6.497	6.492	0.005	98	28566	0.5000		
D 29 Fluorene -d10	176	6.925	6.920	0.005	100	26063	0.3829	76.6	
D 35 Phenanthrene-d10	188	7.735	7.732	0.003	99	46260	0.3564	71.3	
36 Phenanthrene	178	7.752	7.749	0.003	32	1109	0.0099		7M
D 38 Anthracin-d10	188	7.783	7.777	0.006	99	46120	0.3640	72.8	
D 41 Fluoranthene-d10	212	8.808	8.805	0.003	100	68655	0.4078	81.6	
43 Fluoranthene	202	8.828	8.825	0.003	36	772	0.004394		M
* 44 Pyrene-d10 (IS)	212	9.027	9.024	0.003	99	83226	0.5000		
45 Pyrene	202	9.044	9.044	0.000	94	543	0.003029		7M
47 Benzo[a]anthracene	228	10.270	10.260	0.010	11	349	0.002336		7M
D 48 Chrysene-d12	240	10.270	10.270	0.000	98	57526	0.3543	70.9	
50 Chrysene	228	10.300	10.295	0.005	1	142	0.000848		7M
D 52 Benzo(b)fluoranthene-d12	264	11.376	11.369	0.007	100	50633	0.4033	80.7	
53 Benzo[b]fluoranthene	252	11.397	11.397	0.000	15	343	0.002011		7M
D 54 Benzo(k)fluoranthene-d12	264	11.404	11.404	0.000	40	60340	0.4092	81.8	
55 Benzo[k]fluoranthene	252	11.425	11.425	0.000	11	78	0.000441		7M
* 56 Benzo(e)pyrene-d12	264	11.684	11.684	0.000	99	49563	0.5000		
57 Benzo[e]pyrene	252	11.712	11.712	0.000	1	87	0.000643		7M
D 58 Benzo(a)pyrene-d12	264	11.747	11.747	0.000	100	40139	0.3646	72.9	
D 60 Perylene-d12	264	11.845	11.838	0.007	100	42513	0.3480	69.6	
61 Perylene	252	11.873	11.873	0.000	100	7324	0.0603		
D 62 Indeno[1,2,3-cd]pyrene-d12	288	13.196	13.186	0.010	91	47664	0.3985	79.7	
D 63 Dibenz(a,h)anthracene-d14	292	13.205	13.196	0.009	85	40889	0.3821	76.4	
65 Indeno[1,2,3-cd]pyrene	276	13.205	13.214	-0.009	6	114	0.000715		7M
66 Dibenz(a,h)anthracene	278	13.224	13.233	-0.009	1	49	0.000375		7M
D 67 Benzo(ghi)perylene-d12	288	13.552	13.543	0.009	100	49734	0.4187	83.7	

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	OnCol Amt ug/ml	%Rec	Flags
68 Benzo[g,h,i]perylene	276	13.562	13.580	-0.018	1	122	0.000838		7M
74 PCB-14	222	7.483	7.479	0.004	95	1003	0.008032		M
75 PCB-36	258	8.210	8.206	0.000	97	453	0.006891		
76 PCB-104	326	8.395	8.393	-0.001	98	1709	0.0335		
77 PCB-121	326	8.751	8.748	0.000	91	594	0.0145		
78 PCB-155	360	8.848	8.852	-0.001	91	460	0.0120		
79 PCB-78	290	9.081	9.077	-0.003	89	747	0.0229		
80 PCB-142	360	9.525	9.519	0.003	84	327	0.0117		
81 PCB-184	394	9.575	9.572	0.003	92	459	0.0164		
* 82 PCB-167L	372	10.023	10.027	-0.004	74	13623	0.4000		
83 PCB-204	428	10.249	10.246	-0.001	71	505	0.0278		
84 PCB-192	394	10.275	10.275	0.000	6	952	0.0372		

QC Flag Legend

Processing Flags

7 - Failed Limit of Detection

Review Flags

M - Manually Integrated

Reagents:

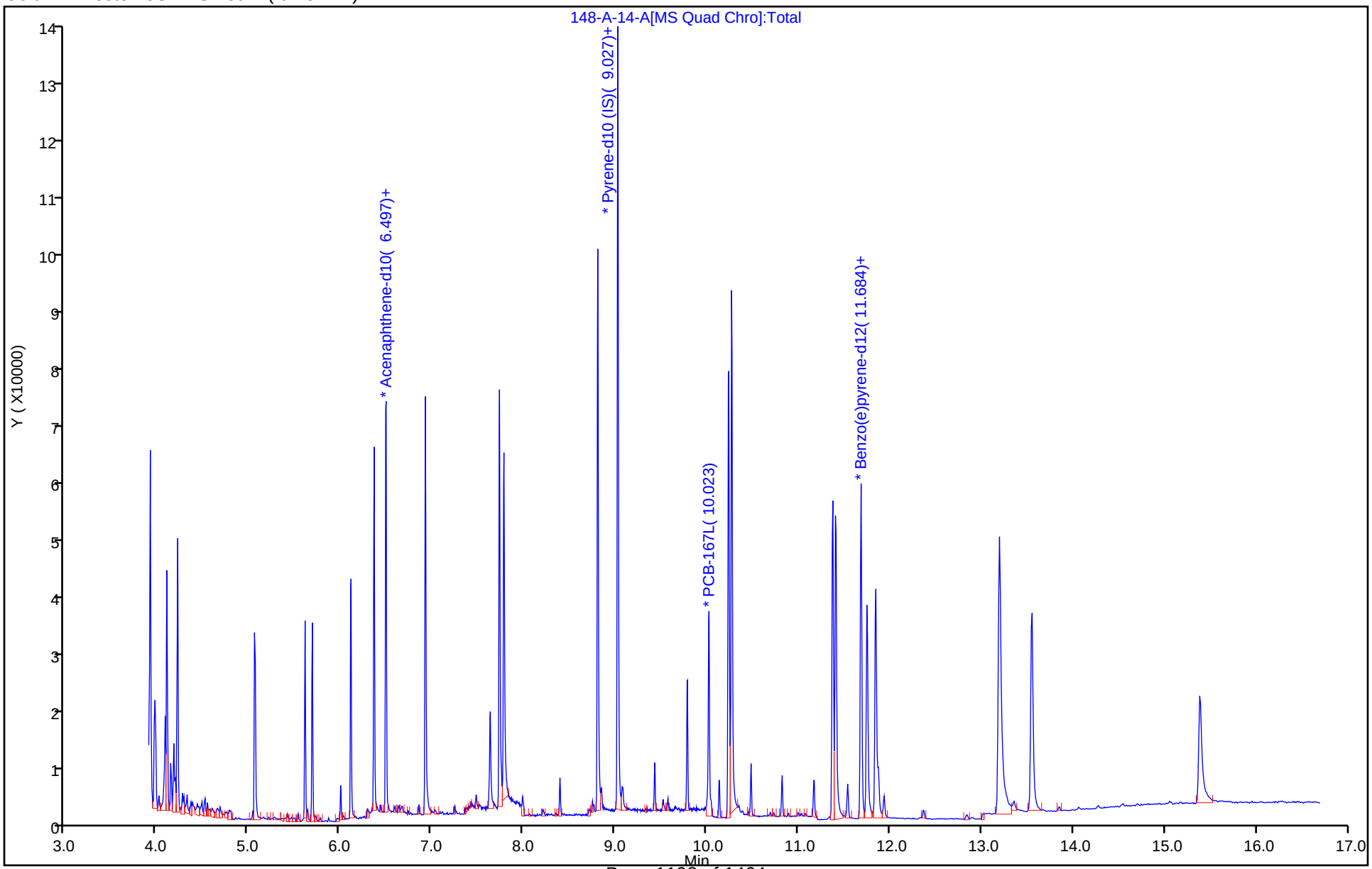
60ISPCB_00001 Amount Added: 5.00 Units: uL

Report Date: 17-Nov-2023 12:14:55 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-14-A.D				
Injection Date:	16-Nov-2023 20:09:18	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17	Worklist Smp#:	25
Client ID:	1804576-853-S3				
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



Report Date: 17-Nov-2023 12:14:56 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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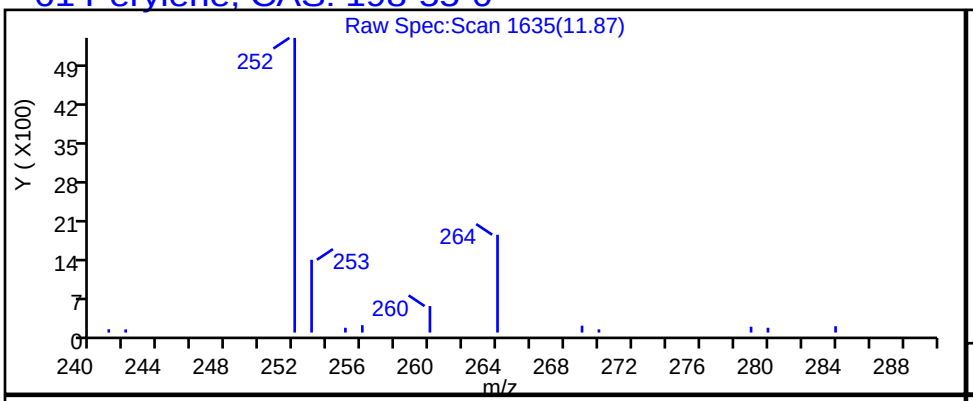
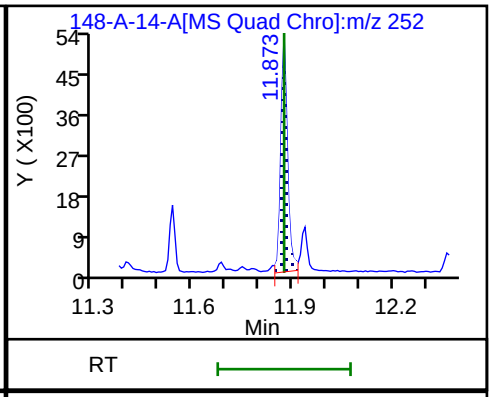
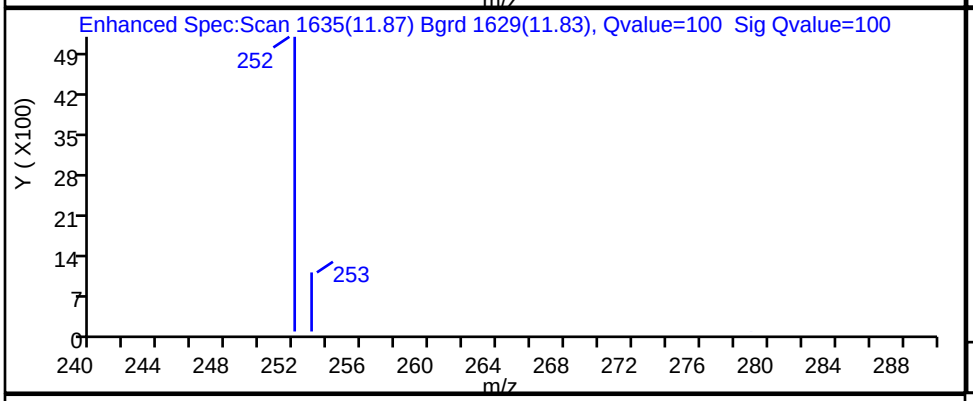
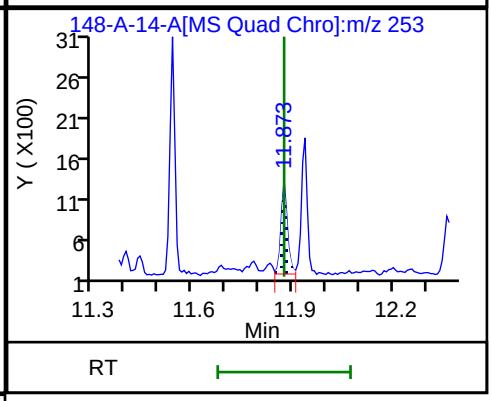
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

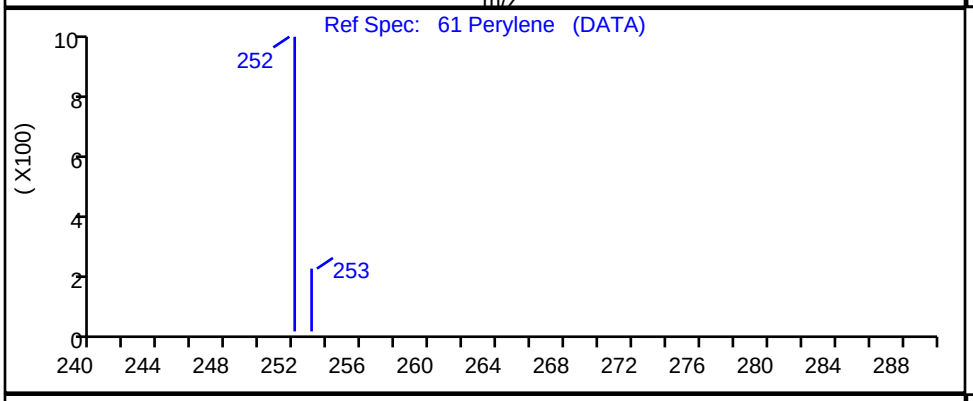
61 Perylene, CAS: 198-55-0

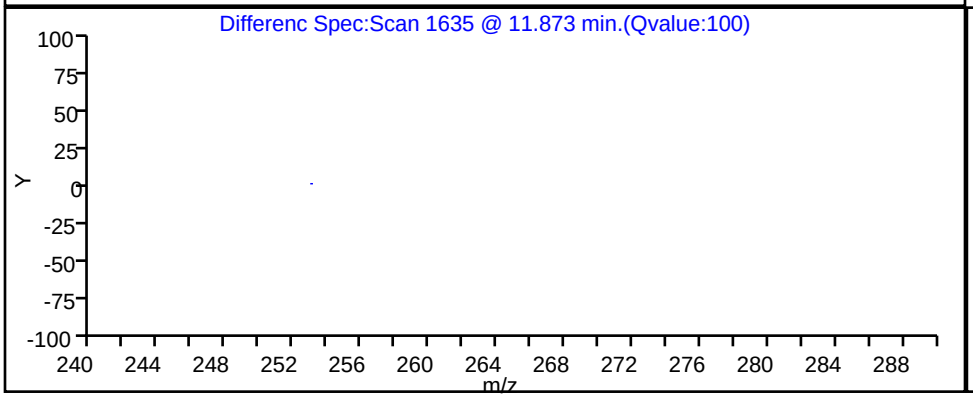


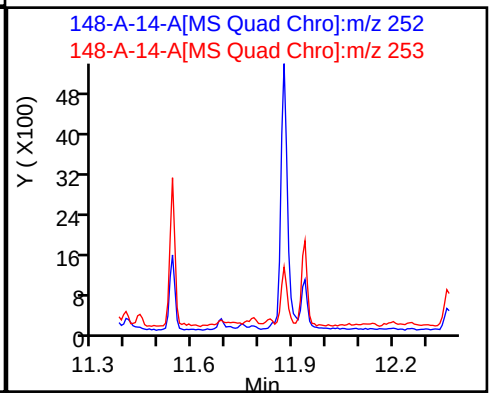












Report Date: 17-Nov-2023 12:14:55 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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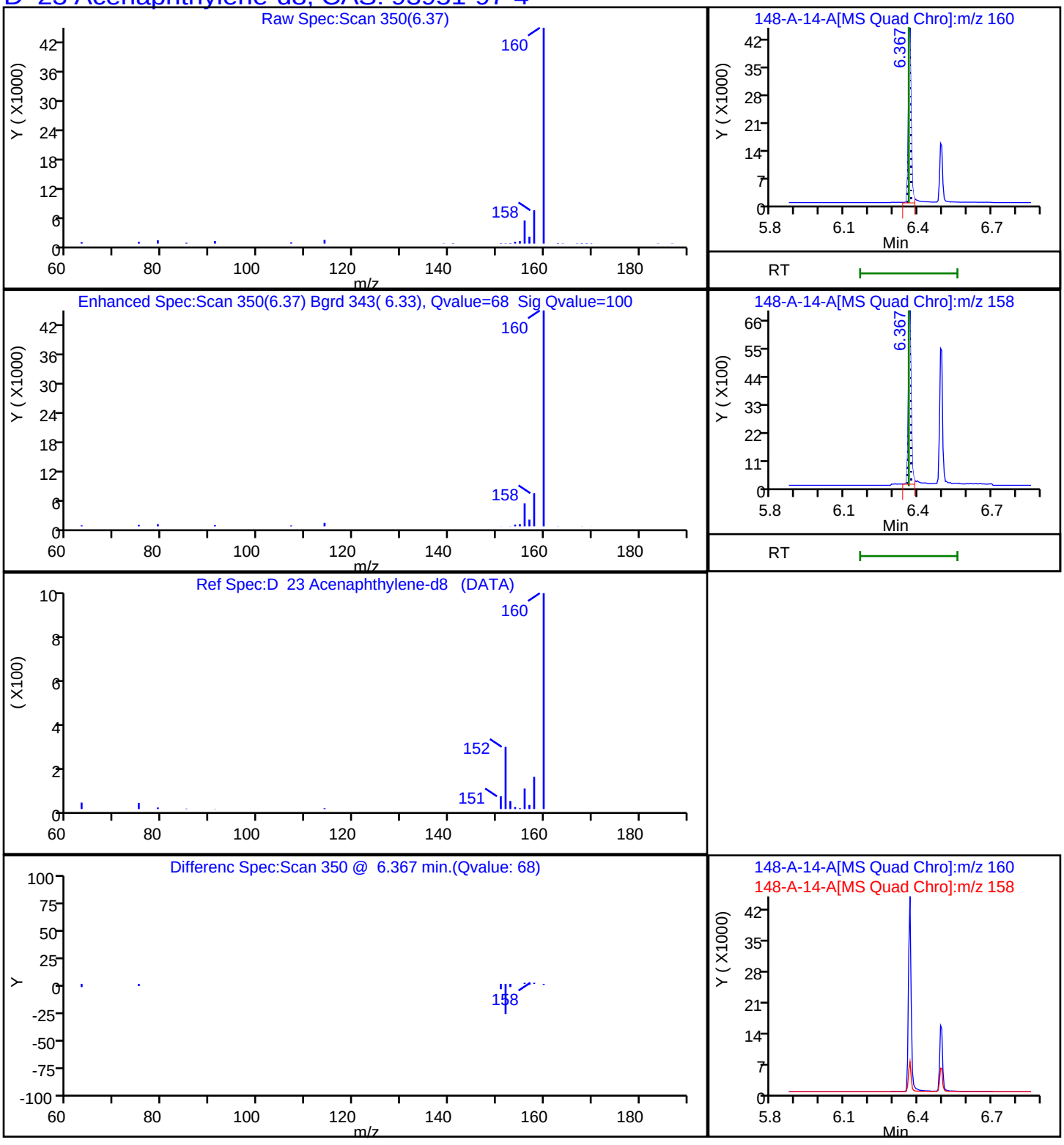
Injection Date:	16-Nov-2023 20:09:18	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 23 Acenaphthylene-d8, CAS: 93951-97-4



Report Date: 17-Nov-2023 12:14:55 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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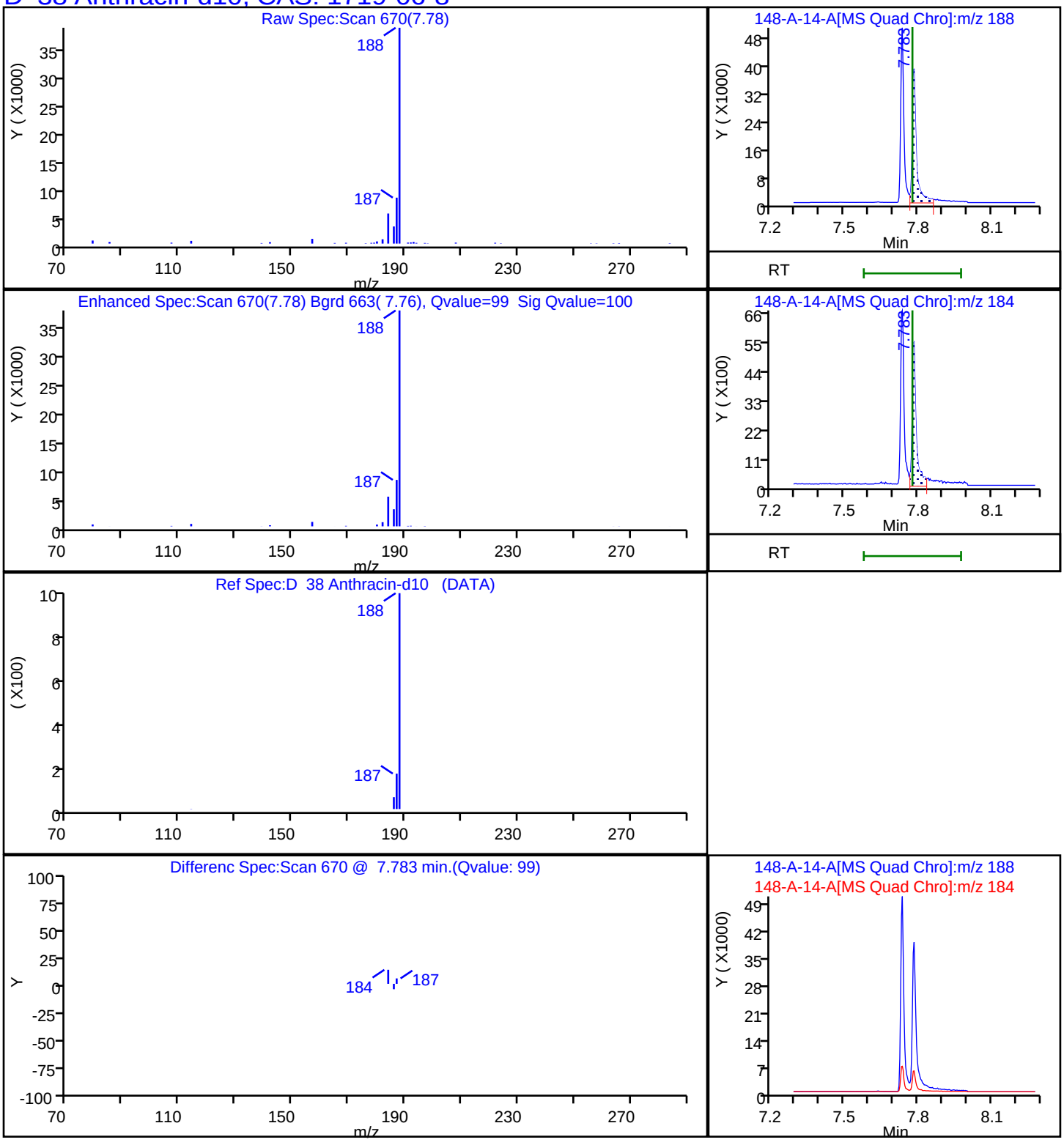
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D_38 Anthracin-d10, CAS: 1719-06-8



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Eurofins Knoxville

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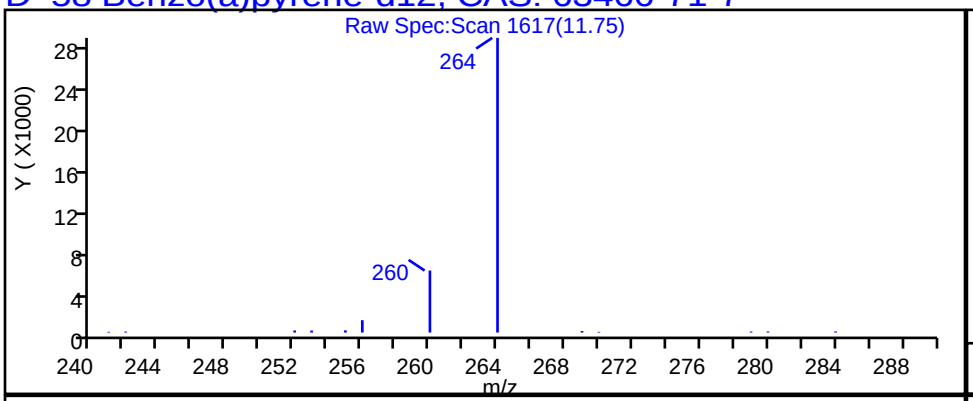
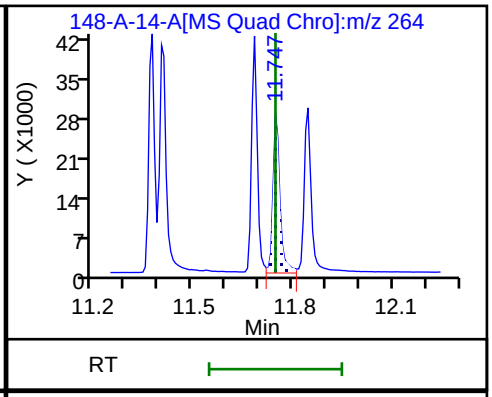
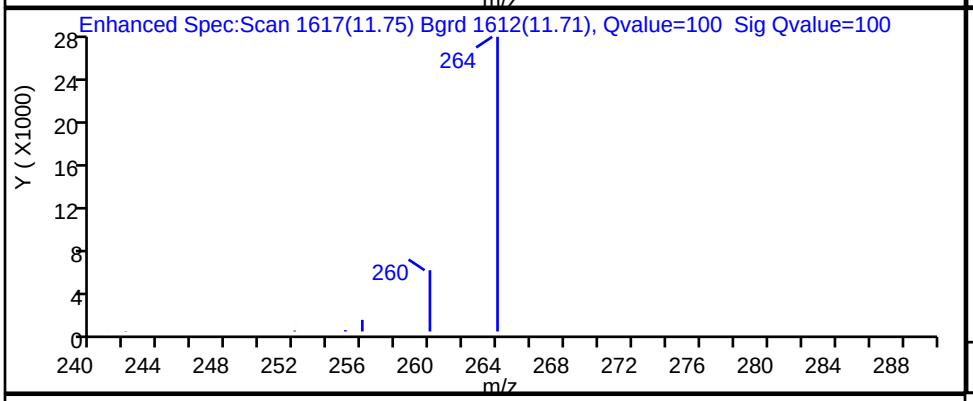
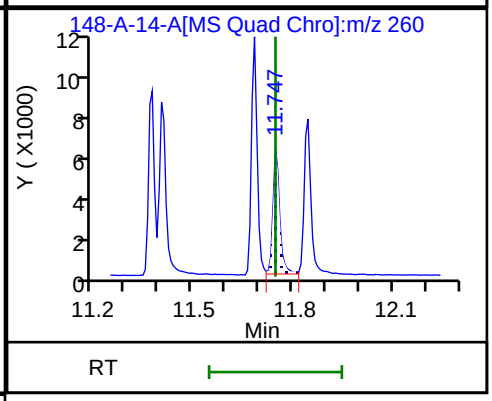
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

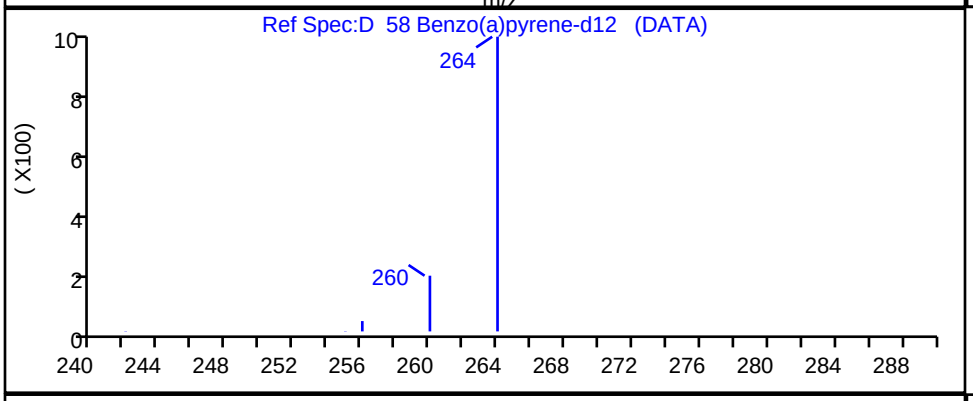
D 58 Benzo(a)pyrene-d12, CAS: 63466-71-7

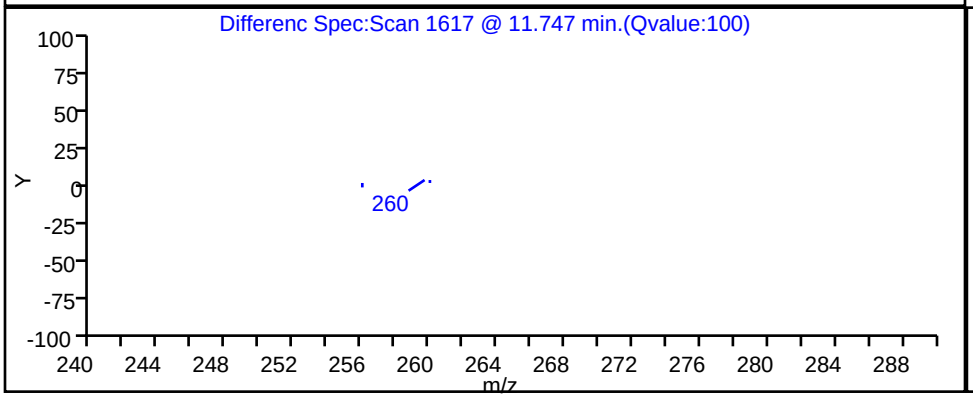


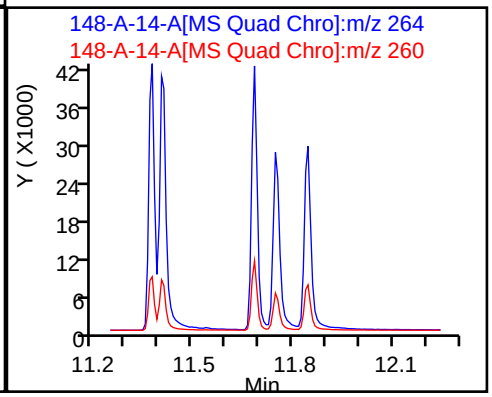












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Eurofins Knoxville

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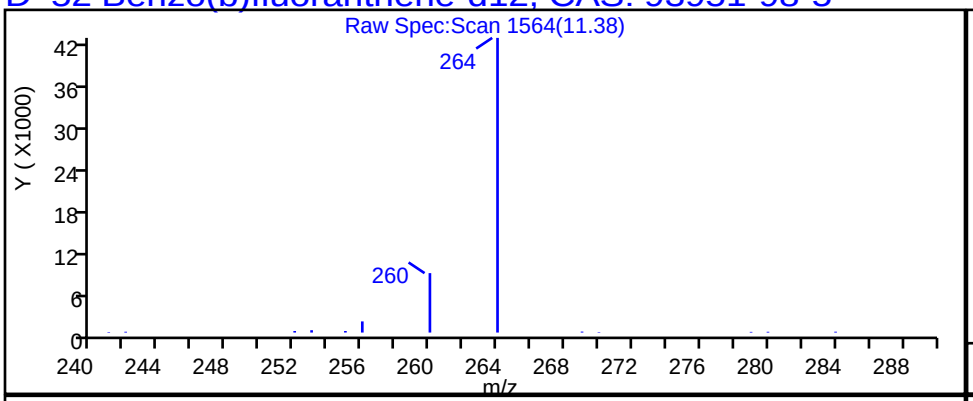
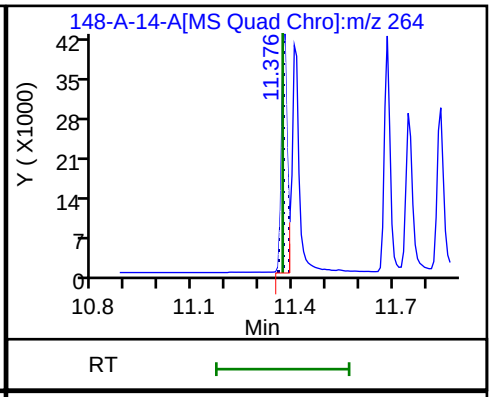
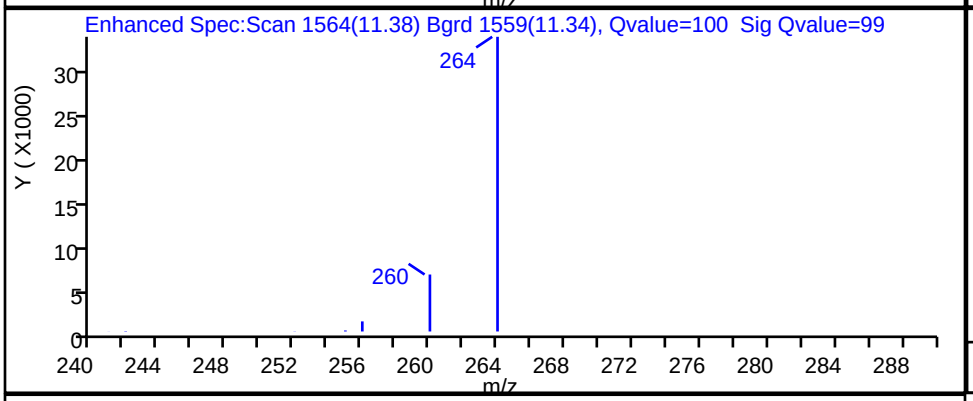
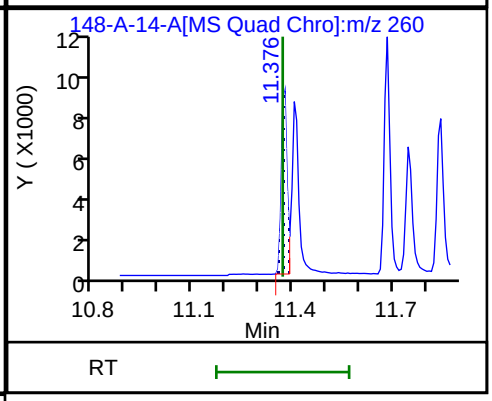
Injection Date:	16-Nov-2023 20:09:18	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

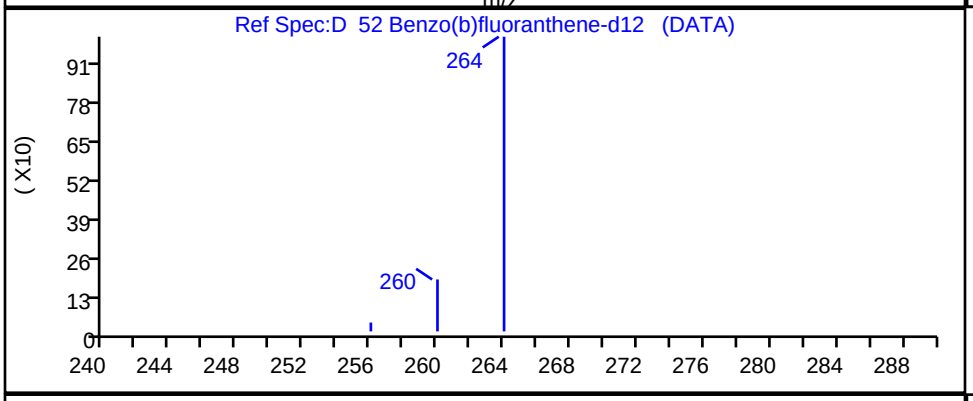
D 52 Benzo(b)fluoranthene-d12, CAS: 93951-98-5

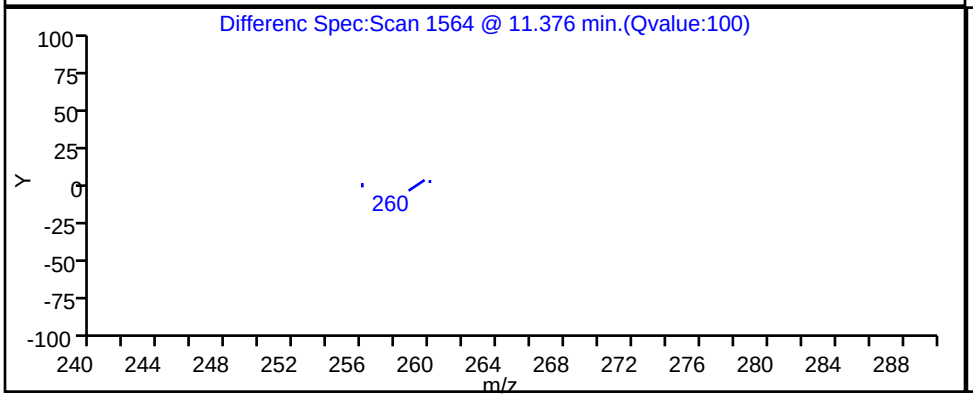


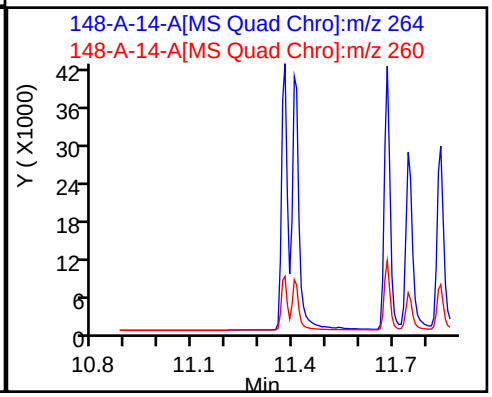












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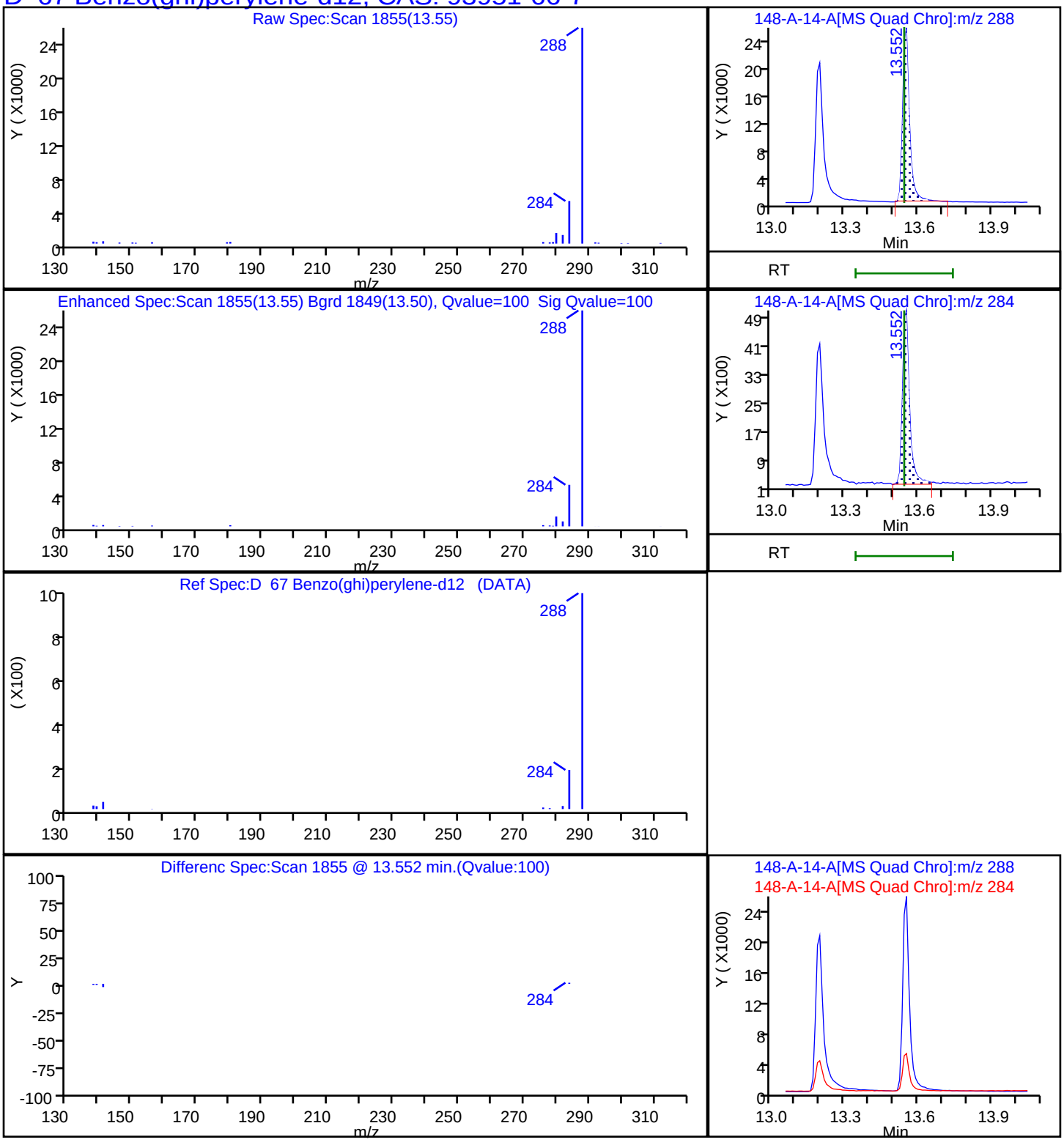
Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-14-A.D				
Injection Date:	16-Nov-2023 20:09:18	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 67 Benzo(ghi)perylene-d12, CAS: 93951-66-7



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Eurofins Knoxville

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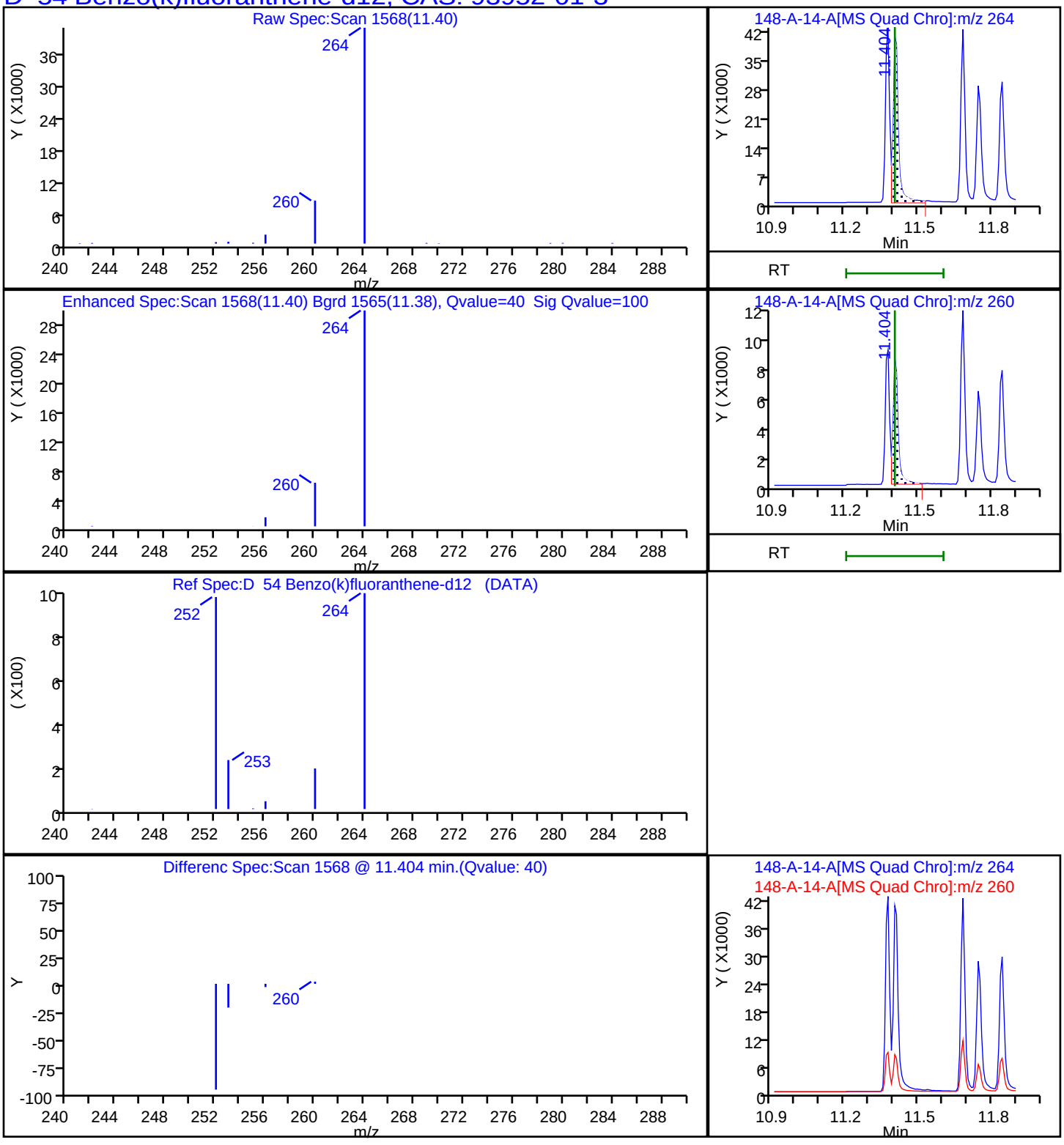
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 54 Benzo(k)fluoranthene-d12, CAS: 93952-01-3



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Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-14-A.D				
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Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
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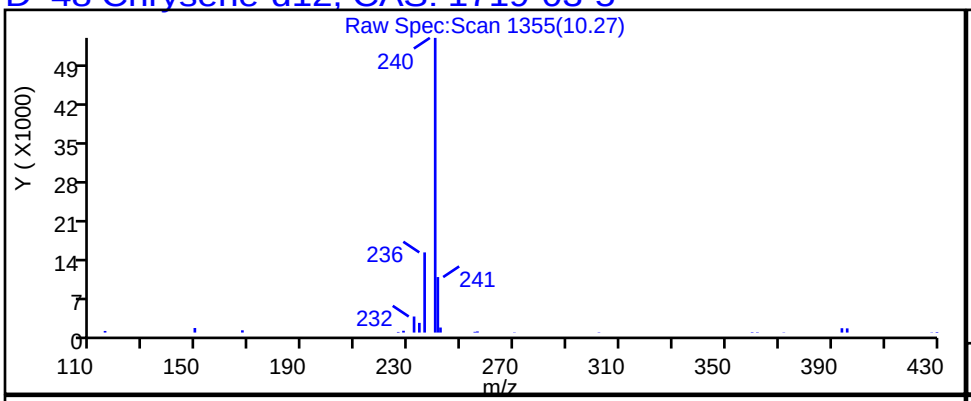
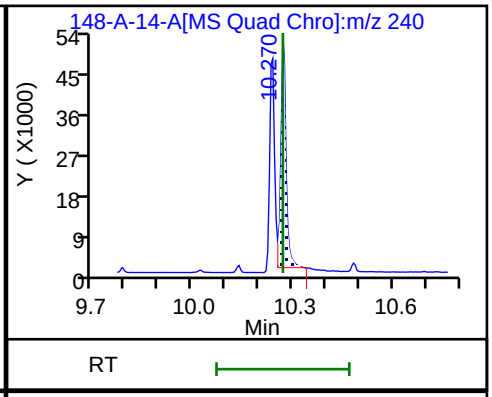
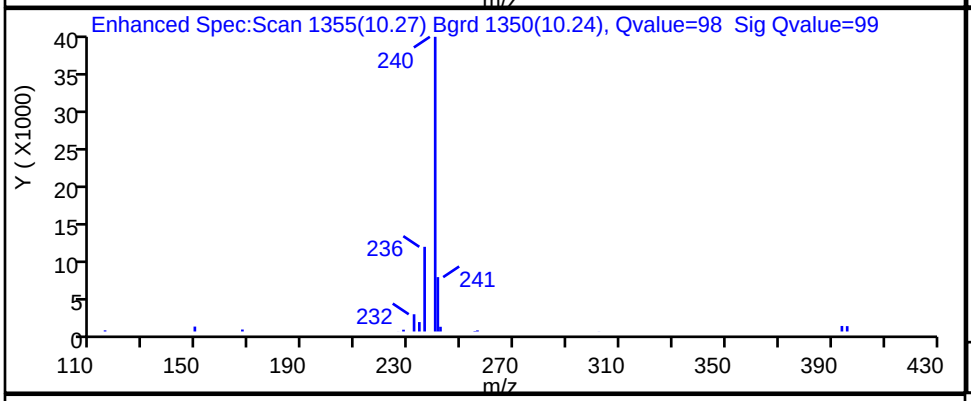
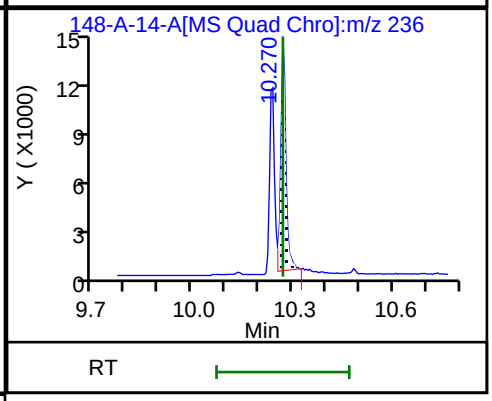
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

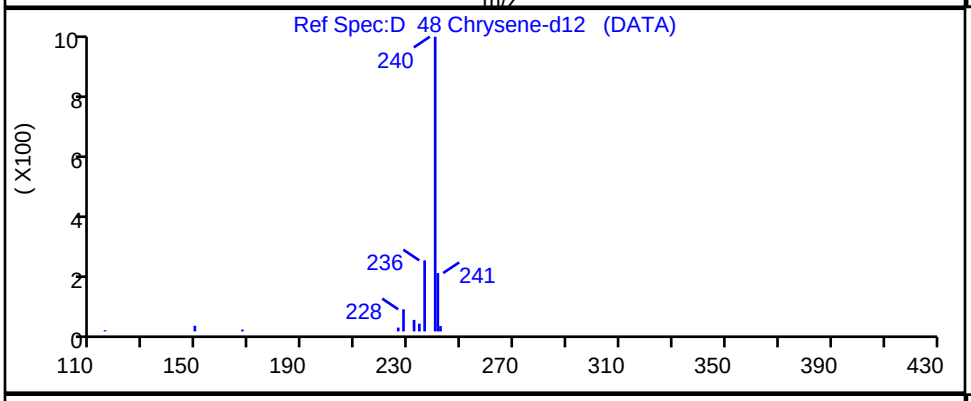
D 48 Chrysene-d12, CAS: 1719-03-5

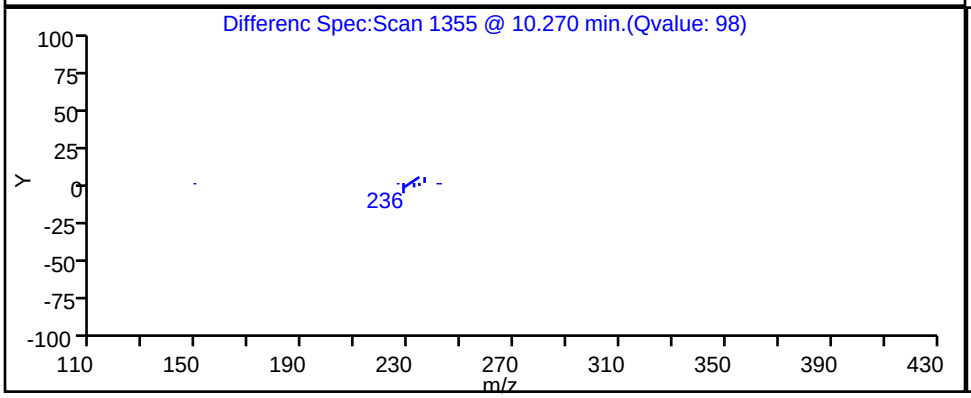


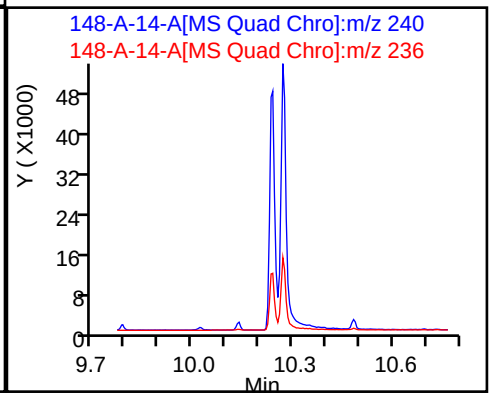












Report Date: 17-Nov-2023 12:14:56 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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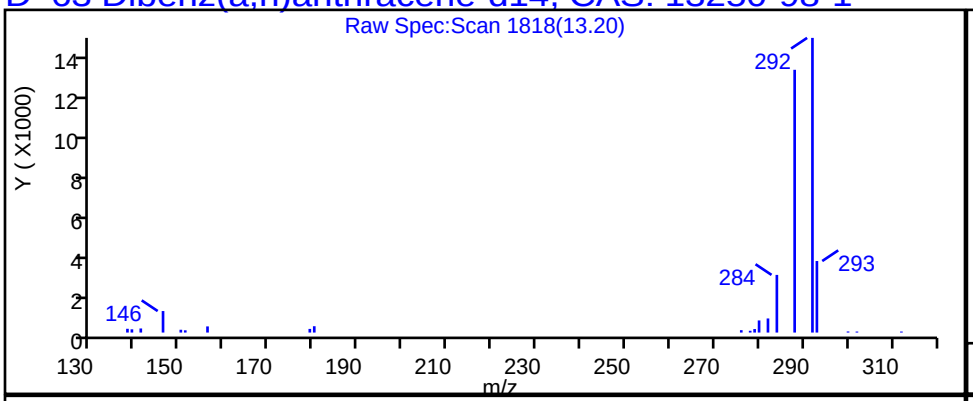
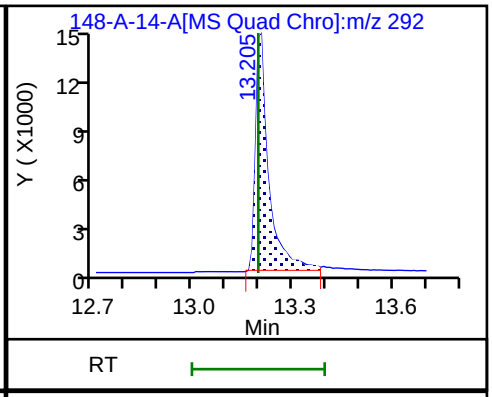
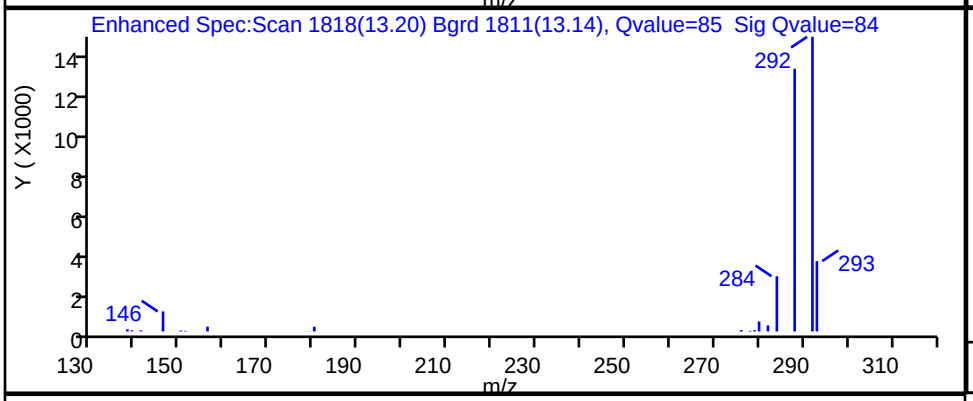
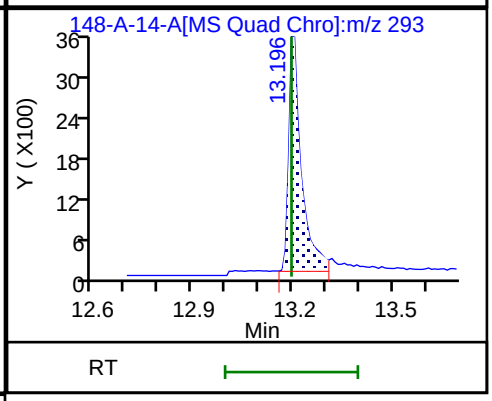
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

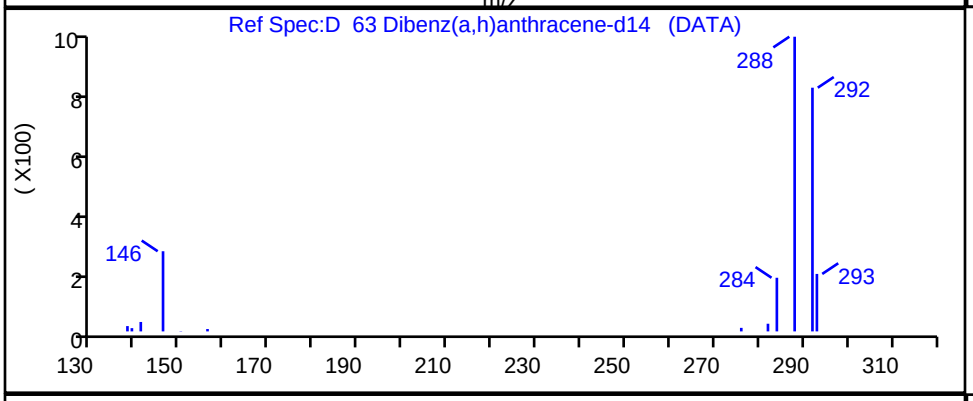
D_63 Dibenz(a,h)anthracene-d14, CAS: 13250-98-1

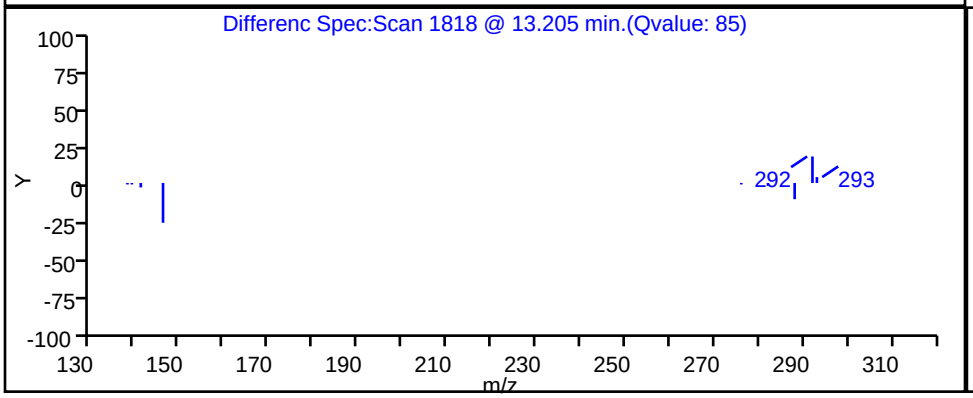


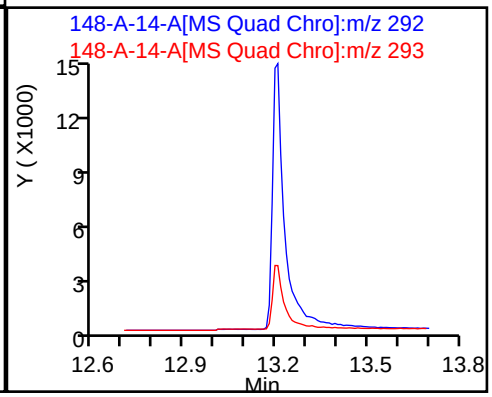












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Eurofins Knoxville

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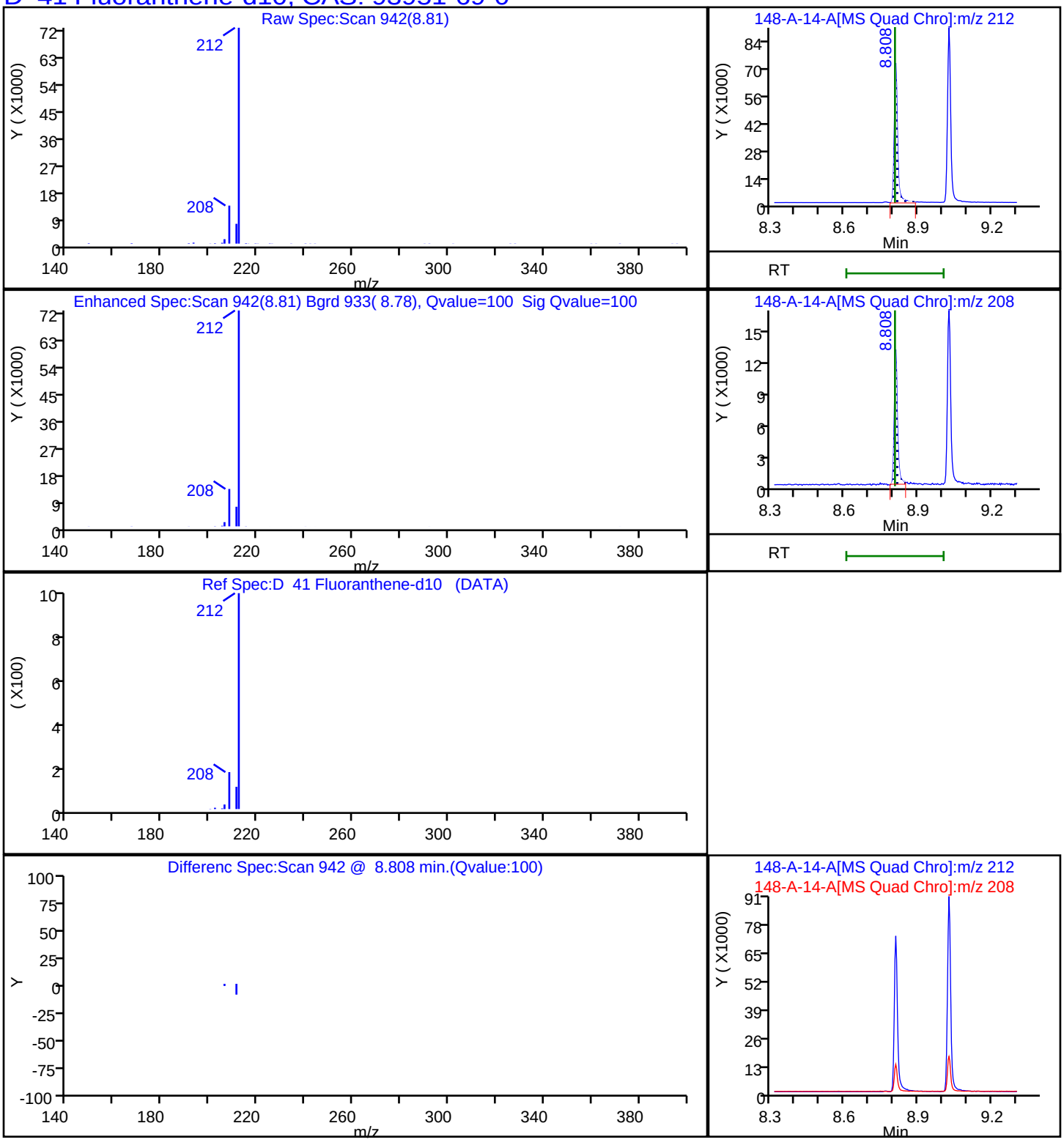
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 41 Fluoranthene-d10, CAS: 93951-69-0



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Eurofins Knoxville

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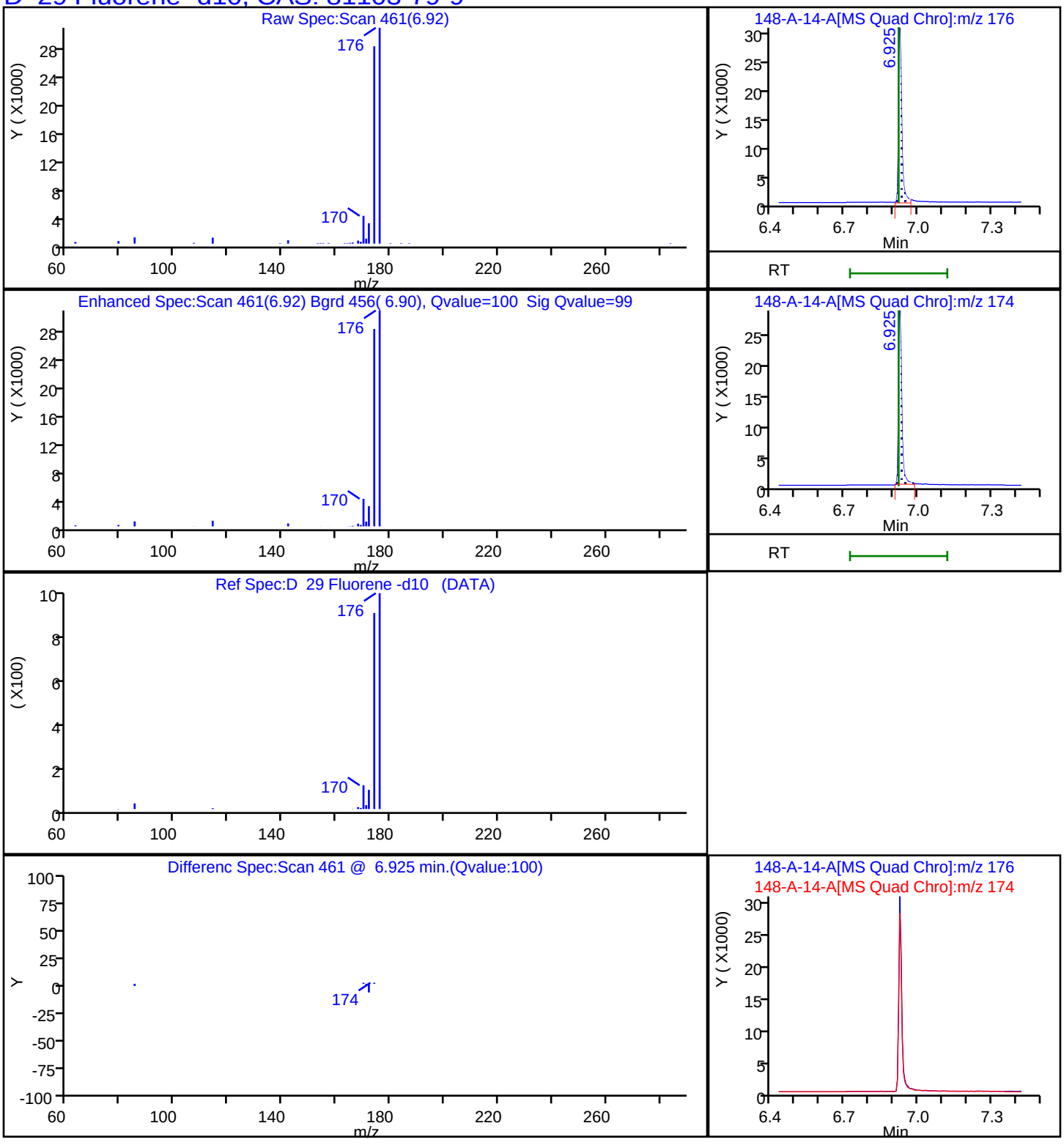
Injection Date:	16-Nov-2023 20:09:18	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 29 Fluorene -d10, CAS: 81103-79-9



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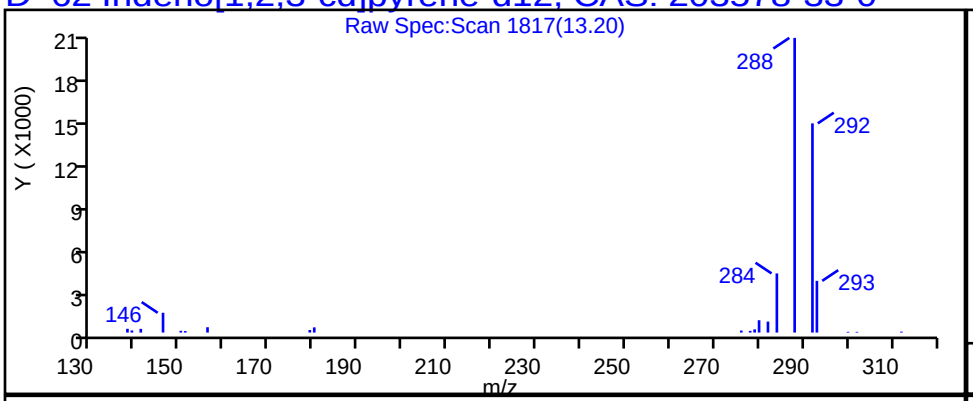
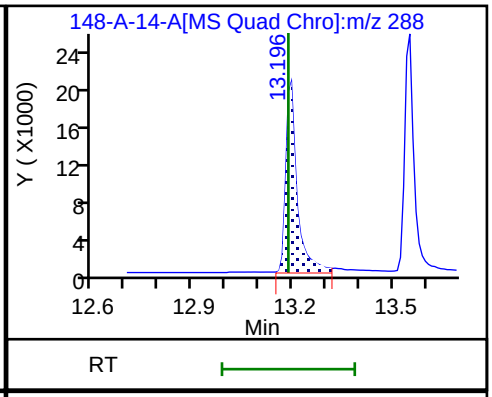
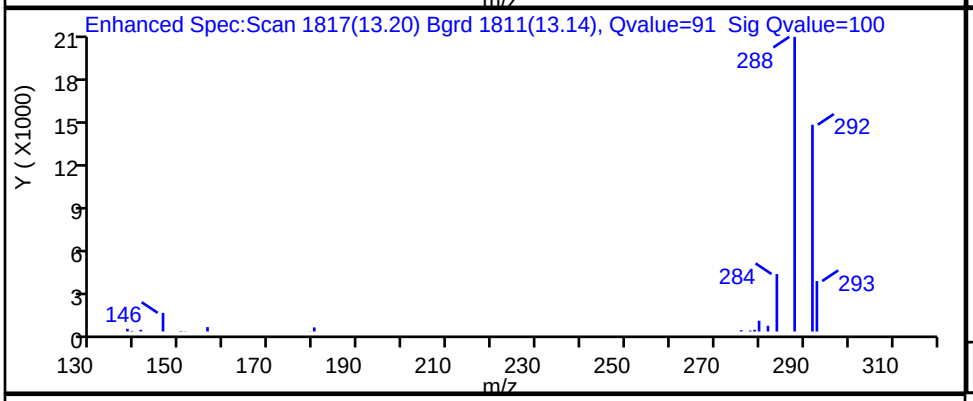
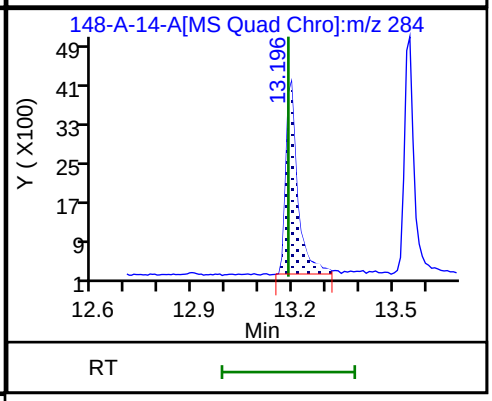
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

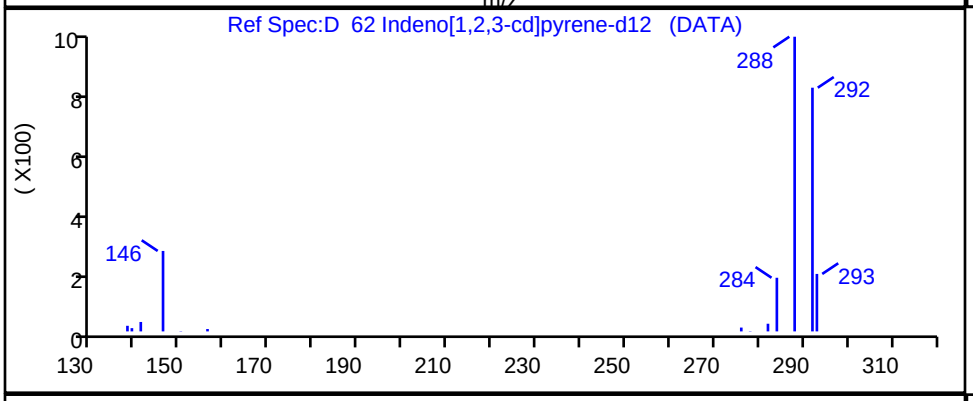
D 62 Indeno[1,2,3-cd]pyrene-d12, CAS: 203578-33-0

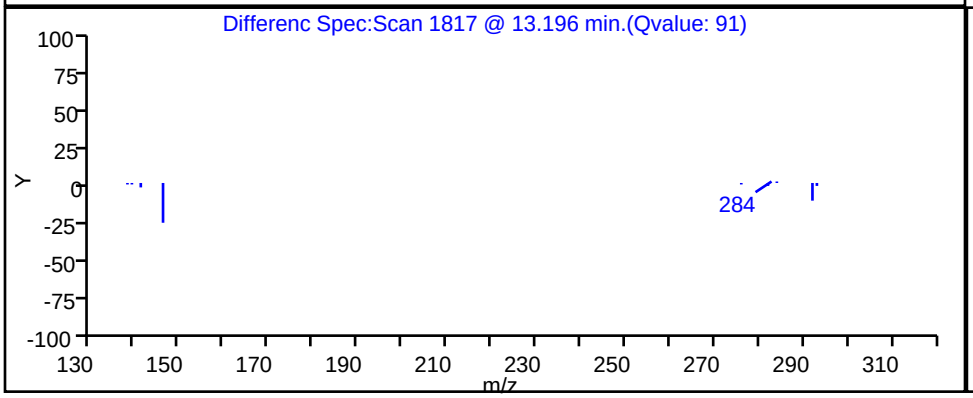


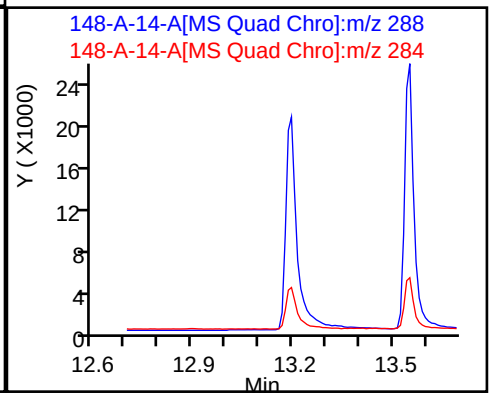












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Eurofins Knoxville

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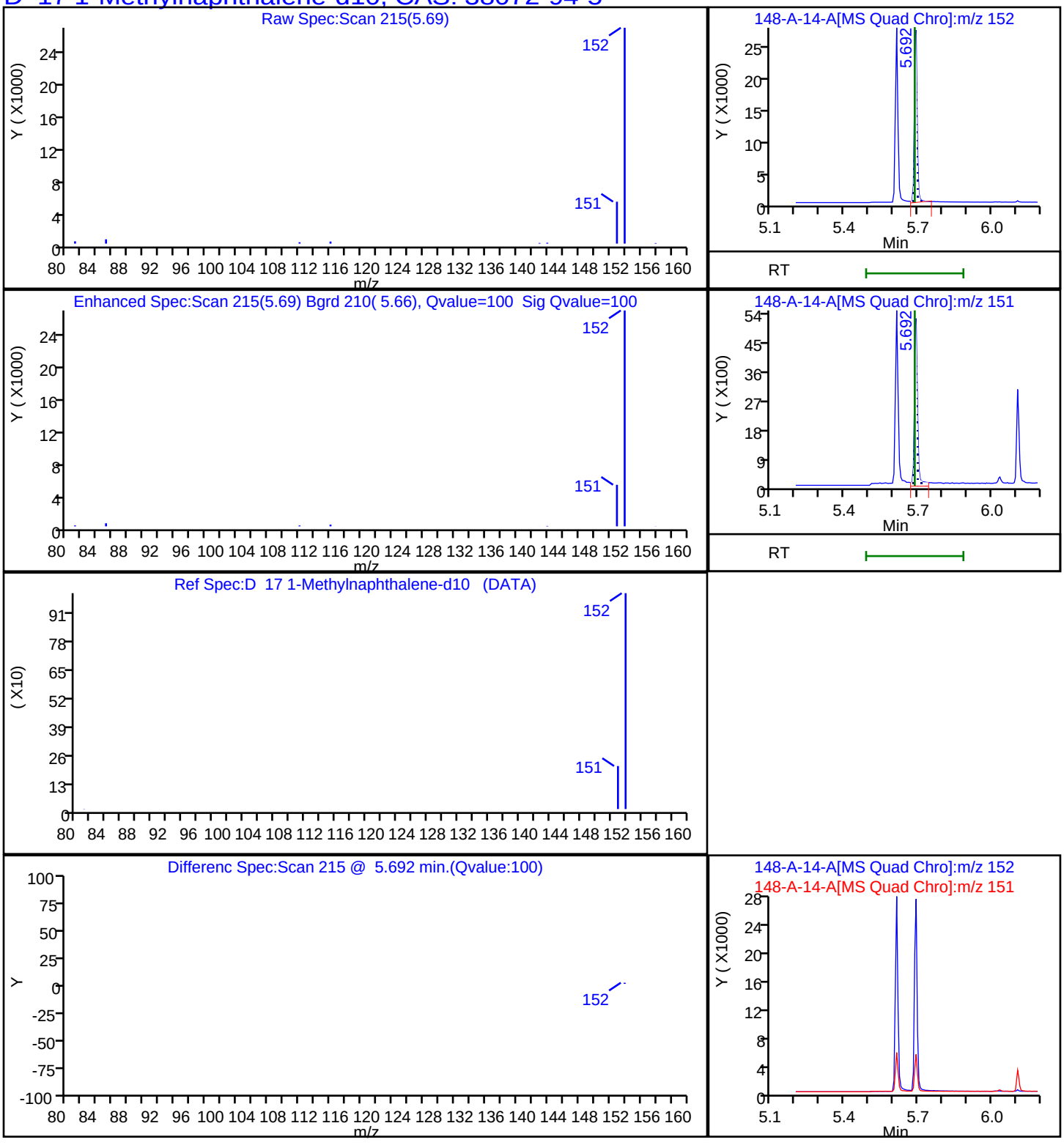
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 17 1-Methylnaphthalene-d10, CAS: 38072-94-5



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Eurofins Knoxville

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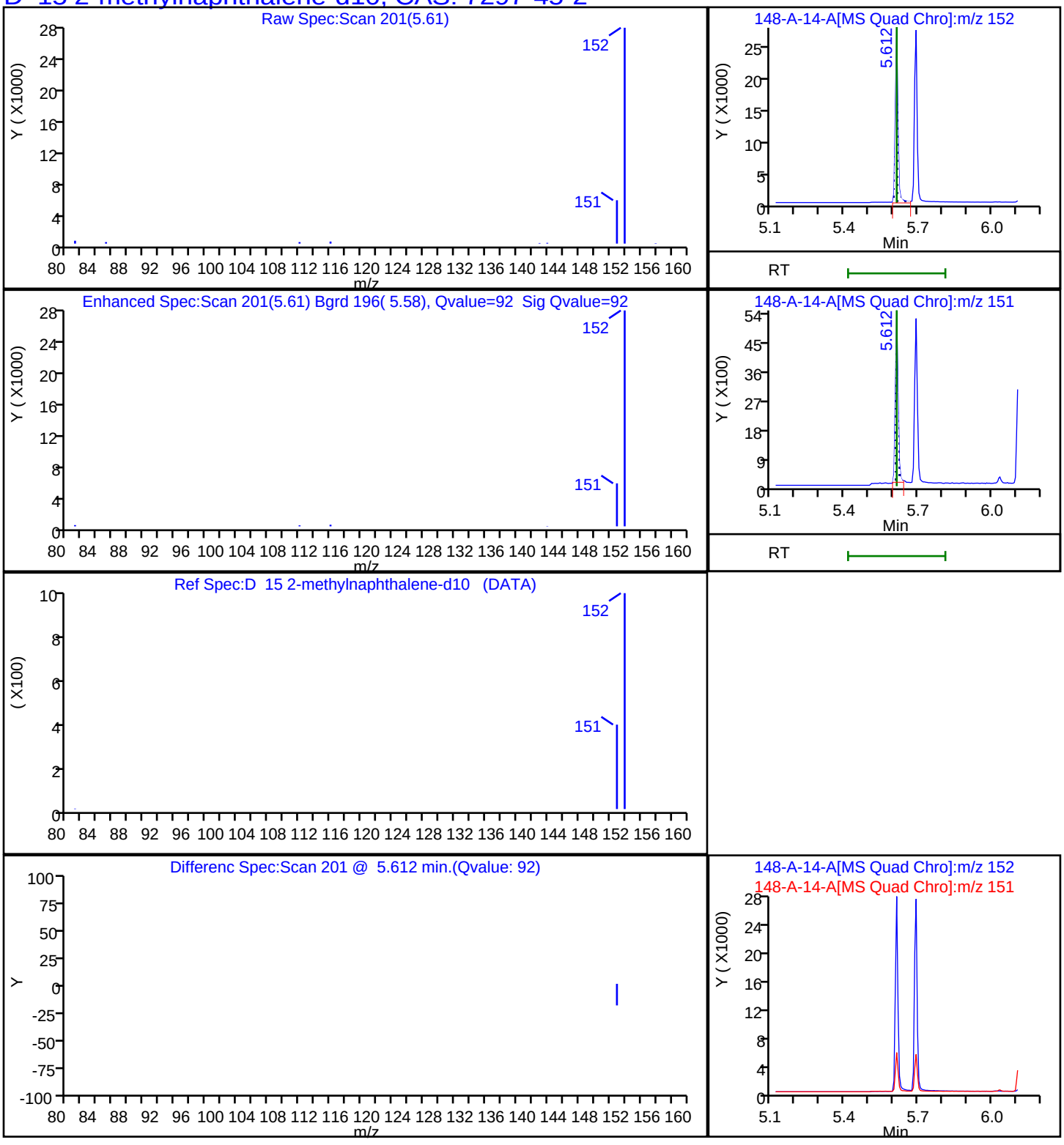
Injection Date:	16-Nov-2023 20:09:18	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 15 2-methylnaphthalene-d10, CAS: 7297-45-2



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Eurofins Knoxville

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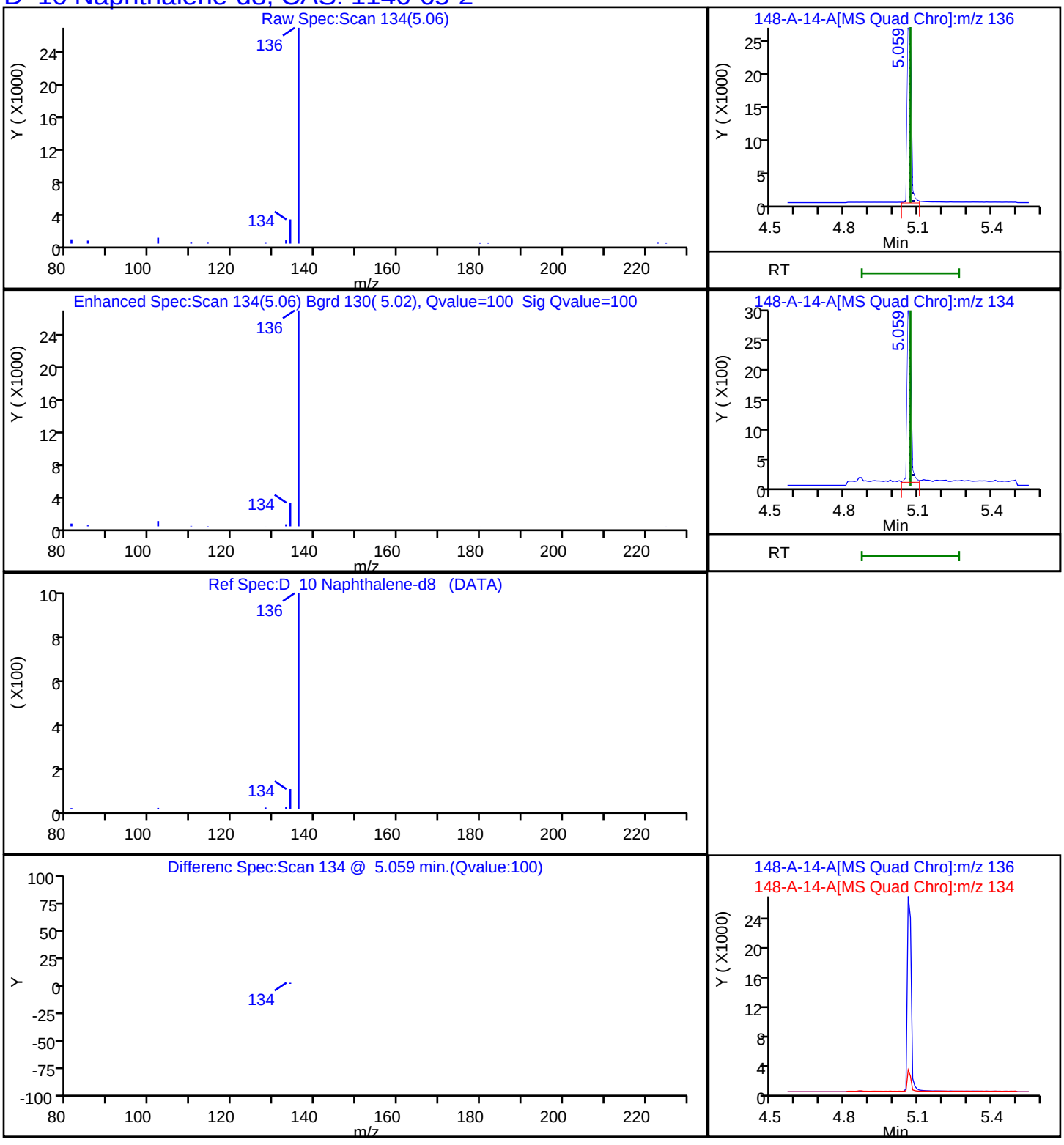
Injection Date:	16-Nov-2023 20:09:18	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D_10 Naphthalene-d8, CAS: 1146-65-2



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Eurofins Knoxville

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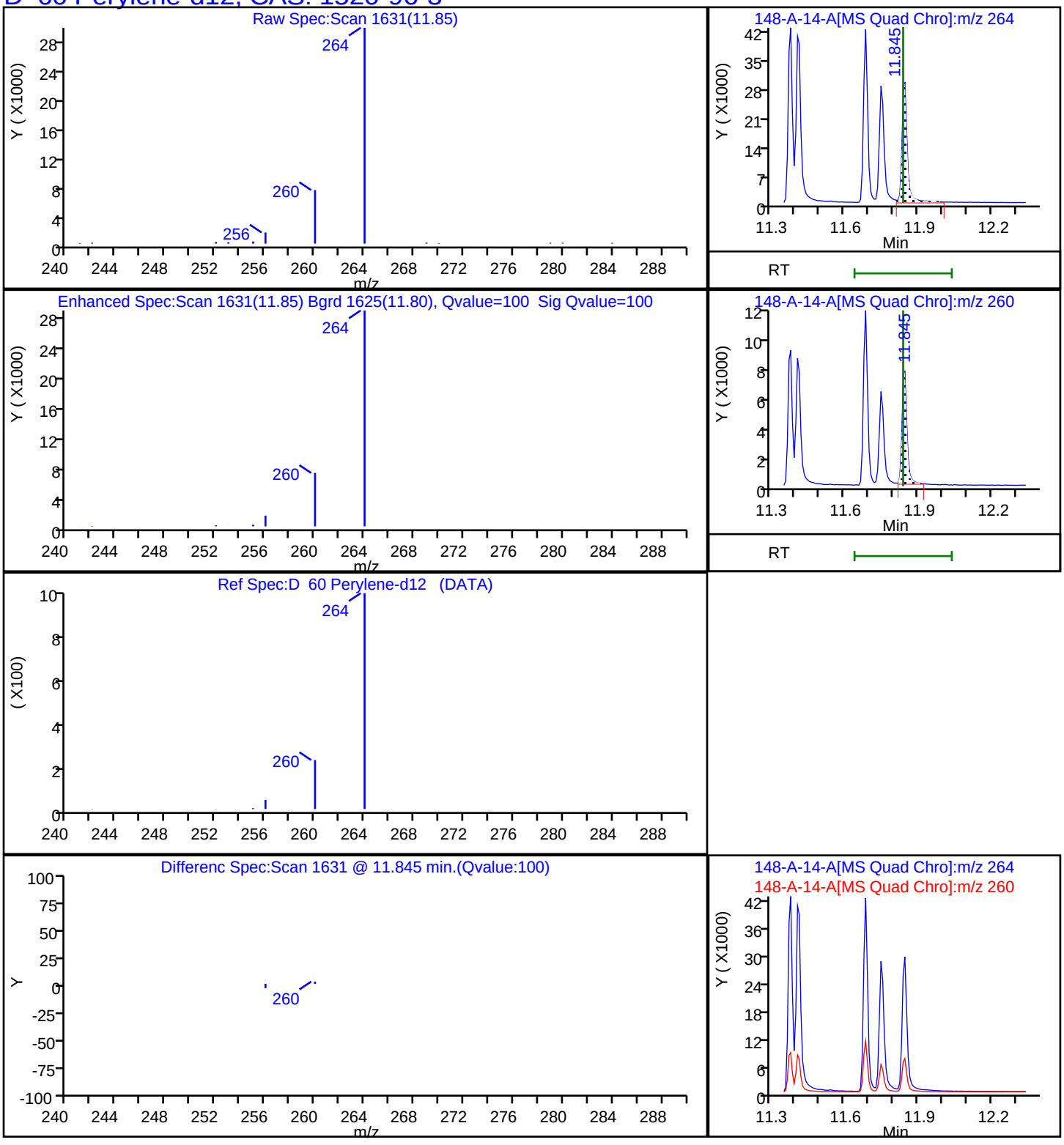
Injection Date:	16-Nov-2023 20:09:18	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 60 Perylene-d12, CAS: 1520-96-3



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Eurofins Knoxville

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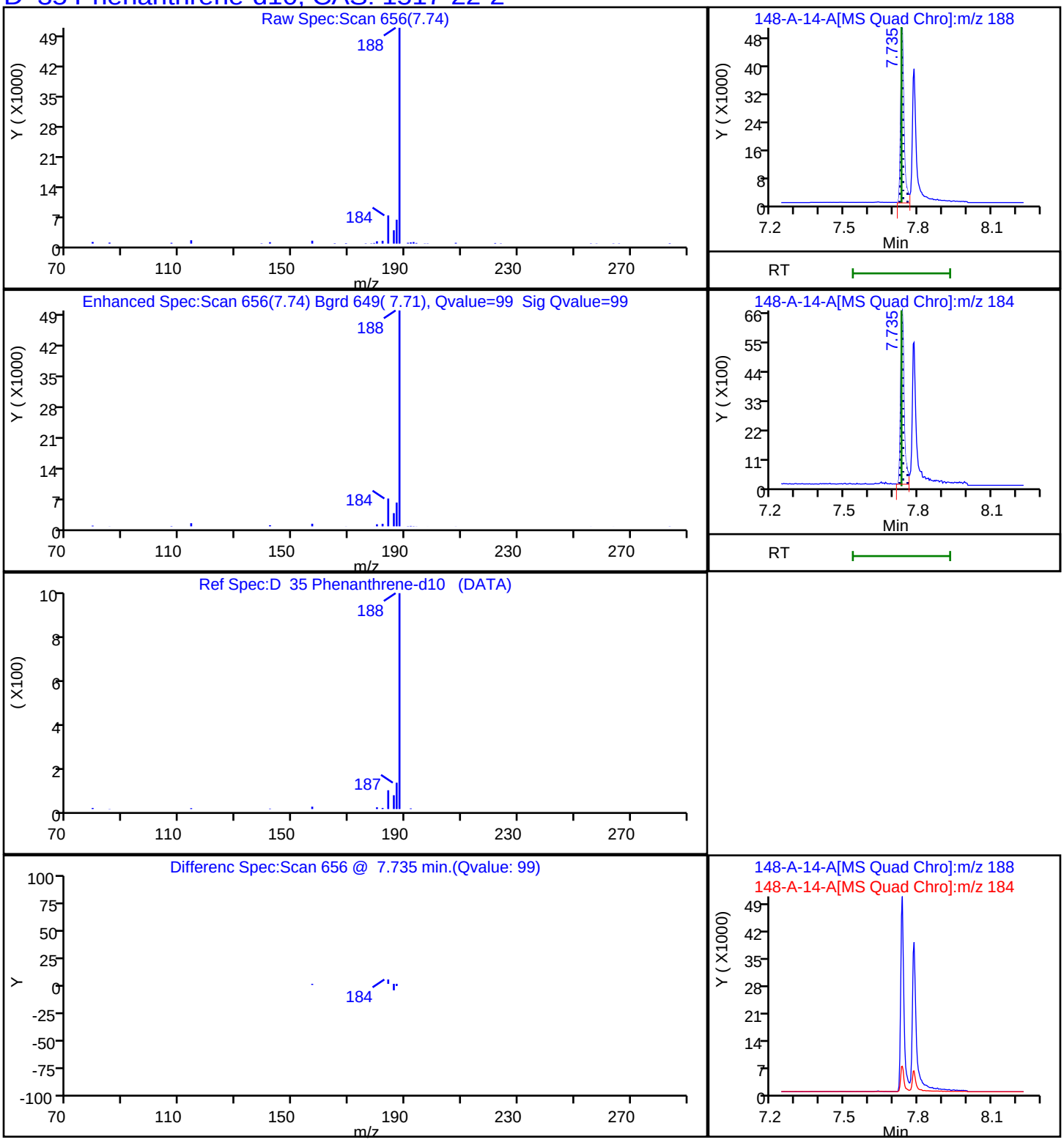
Injection Date:	16-Nov-2023 20:09:18	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D_35 Phenanthrene-d10, CAS: 1517-22-2



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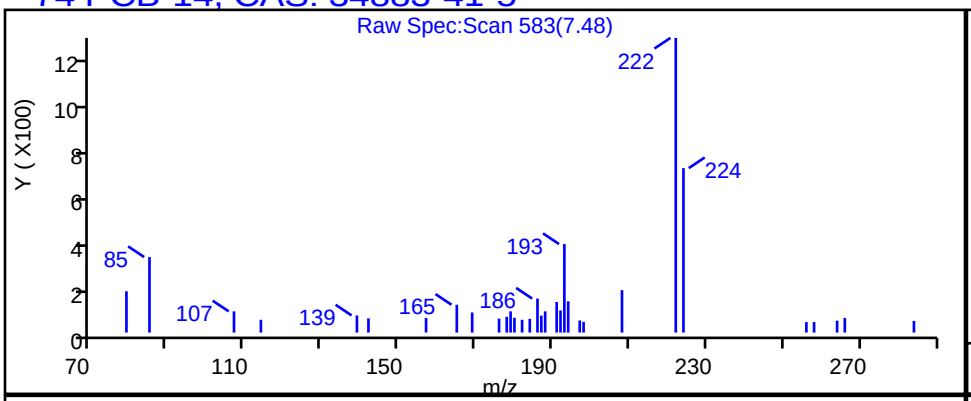
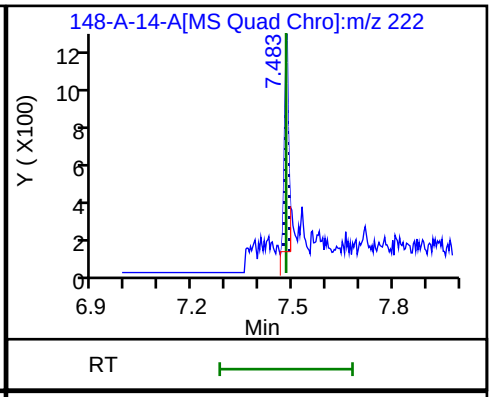
Eurofins Knoxville

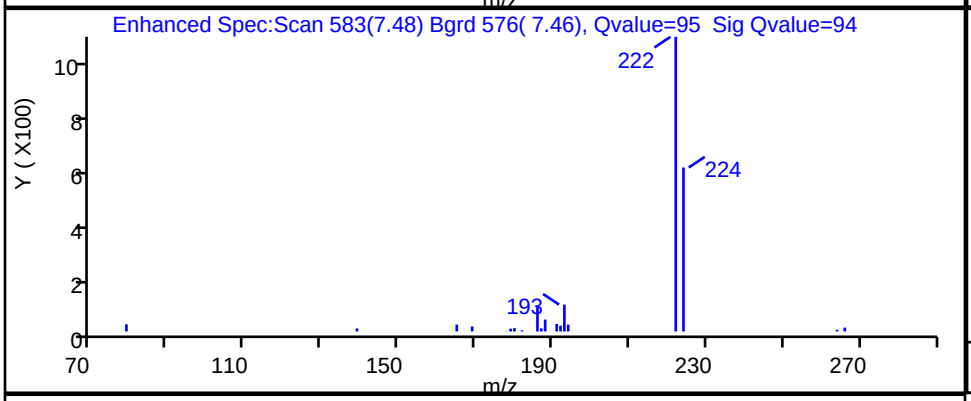
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-14-A.D

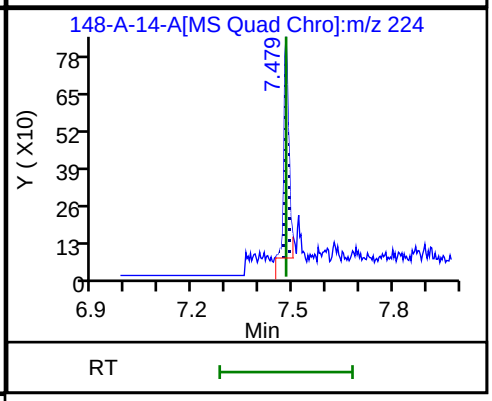
Injection Date:	16-Nov-2023 20:09:18	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

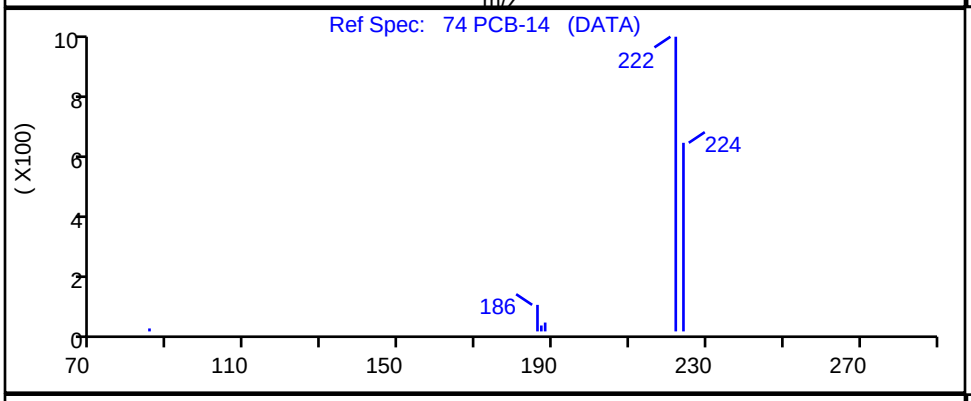
74 PCB-14, CAS: 34883-41-5

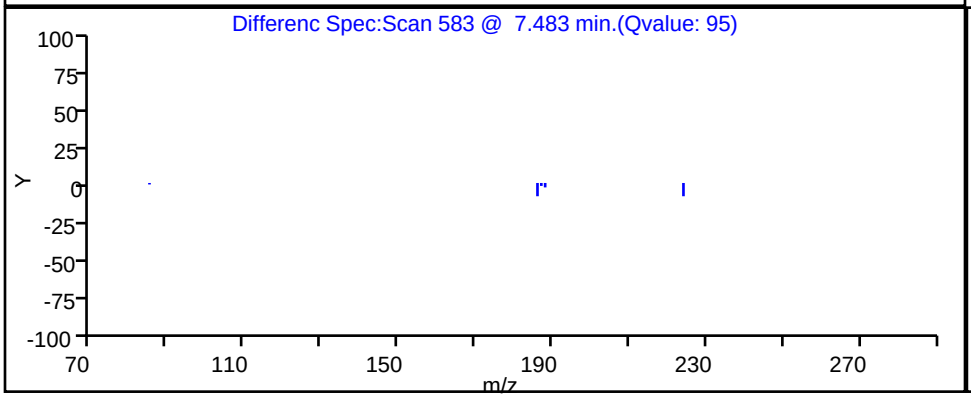


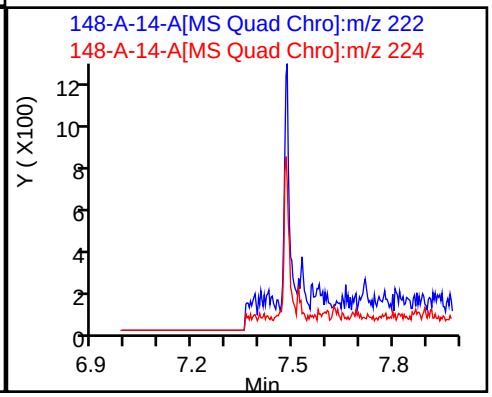












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Eurofins Knoxville

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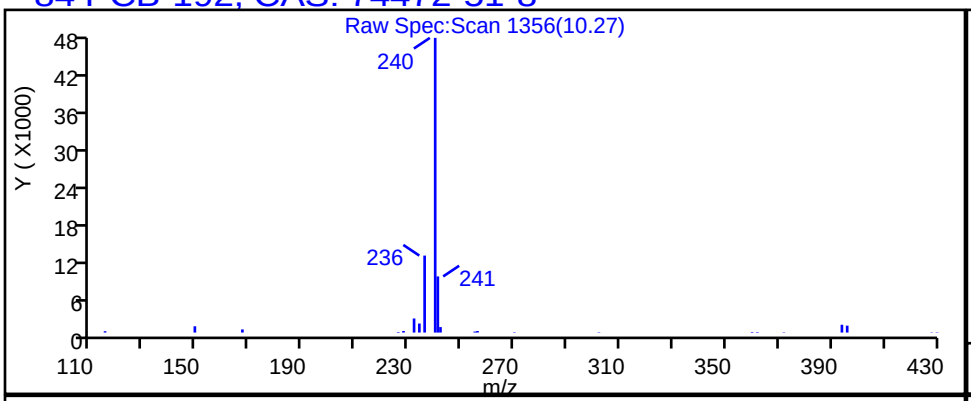
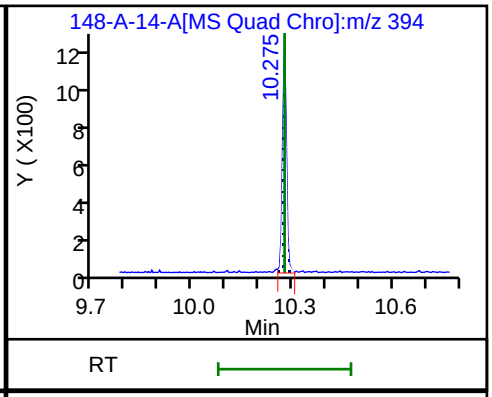
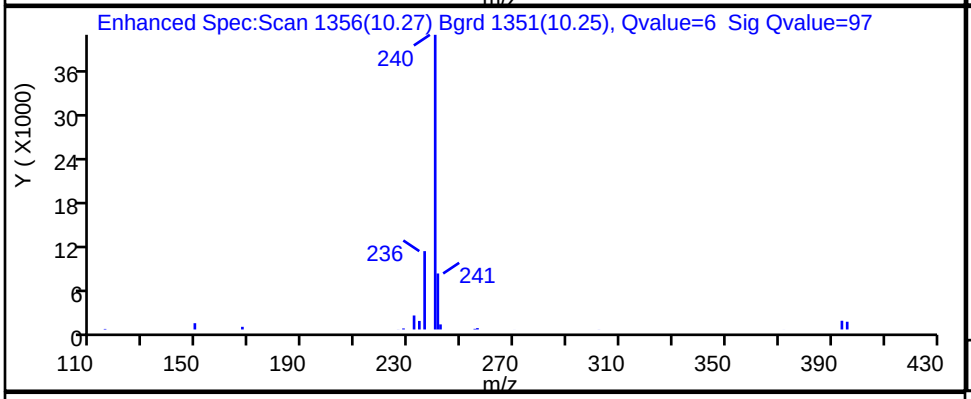
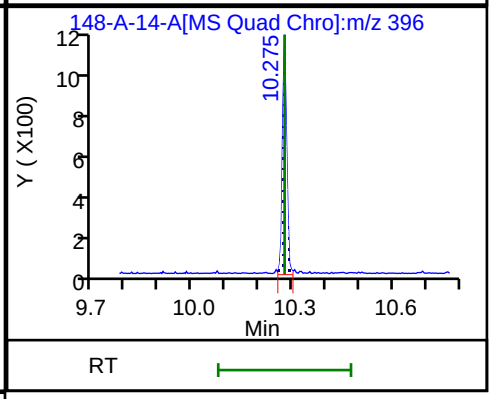
Injection Date:	16-Nov-2023 20:09:18	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

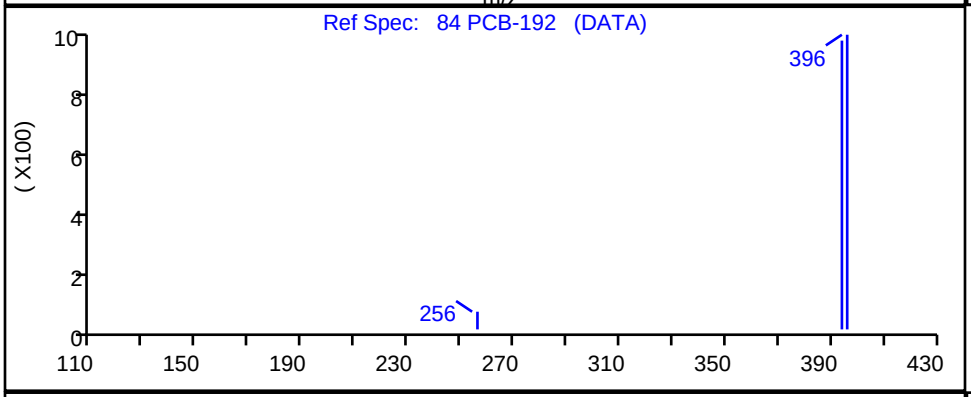
84 PCB-192, CAS: 74472-51-8

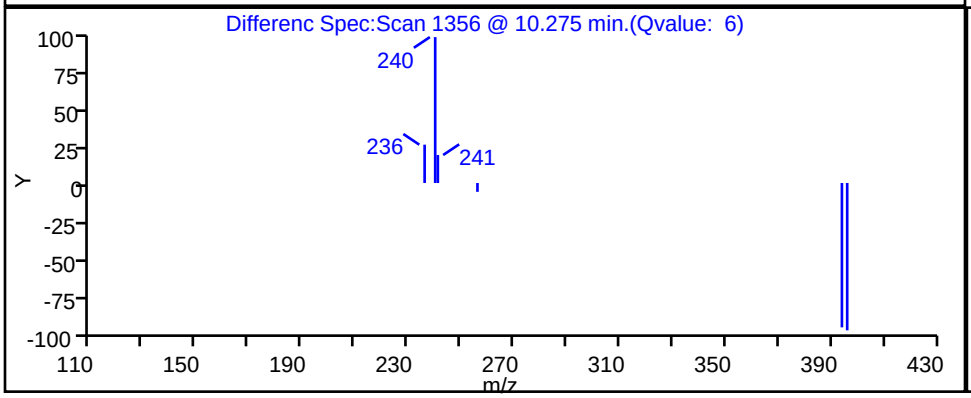


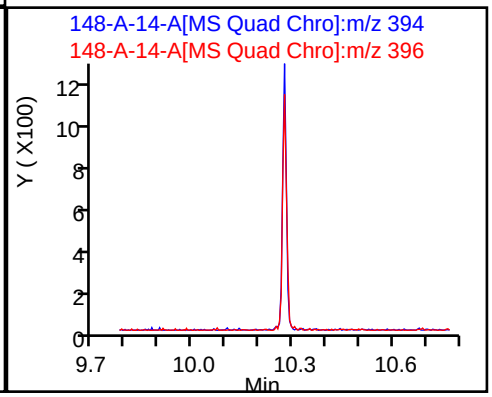










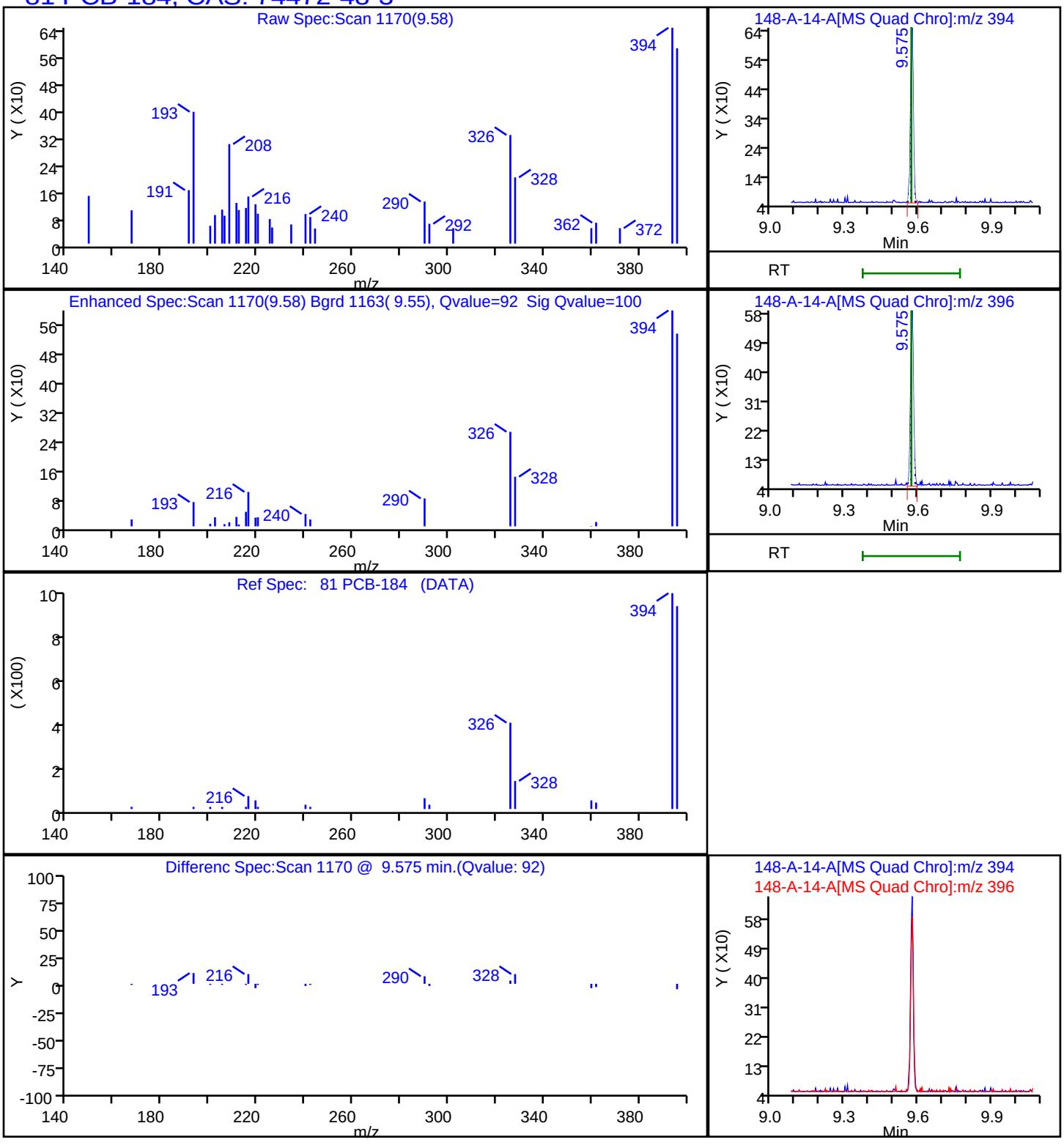


Report Date: 17-Nov-2023 12:14:56 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-14-A.D				
Injection Date:	16-Nov-2023 20:09:18	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

81 PCB-184, CAS: 74472-48-3



Report Date: 17-Nov-2023 12:14:56 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

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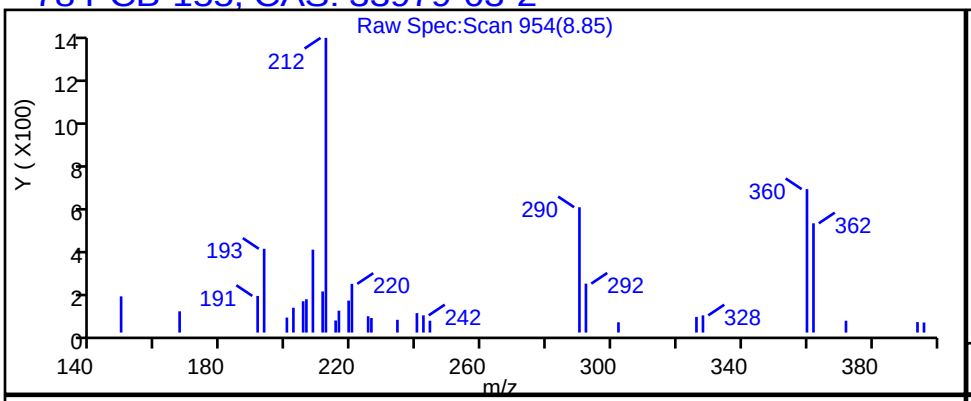
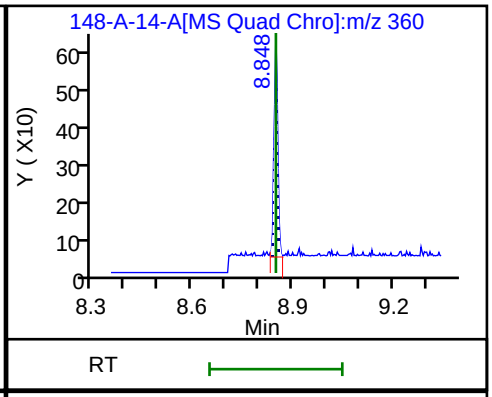
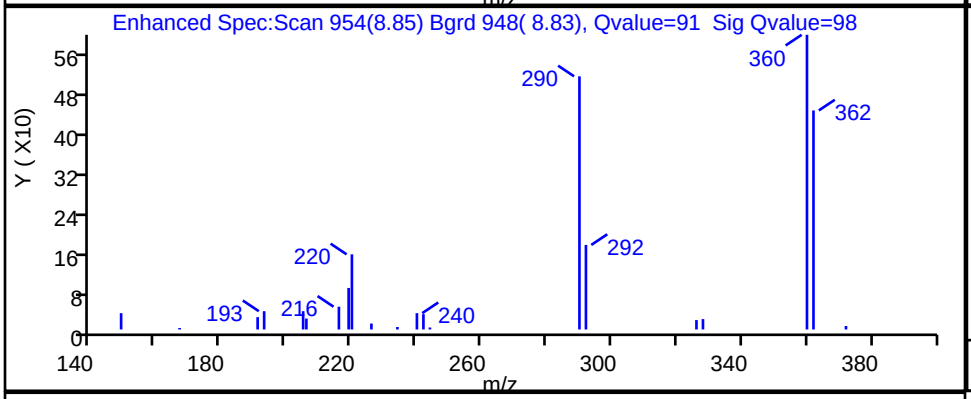
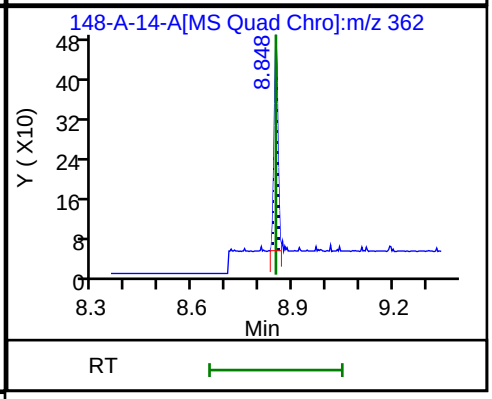
Injection Date:	16-Nov-2023 20:09:18	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

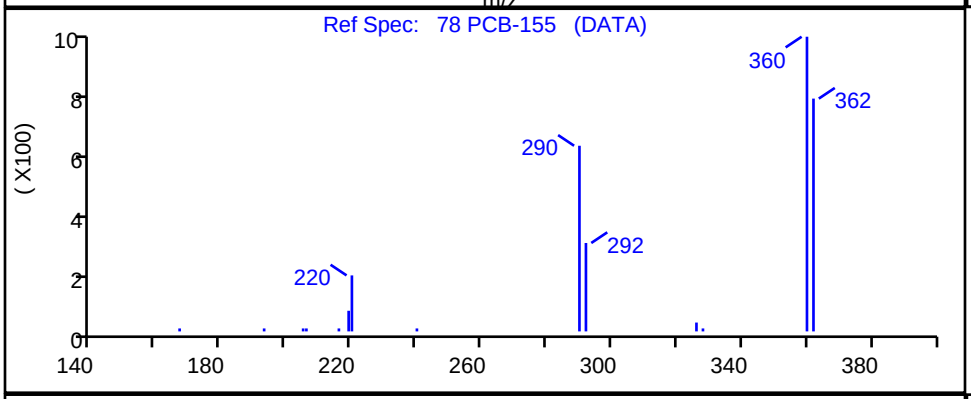
78 PCB-155, CAS: 33979-03-2

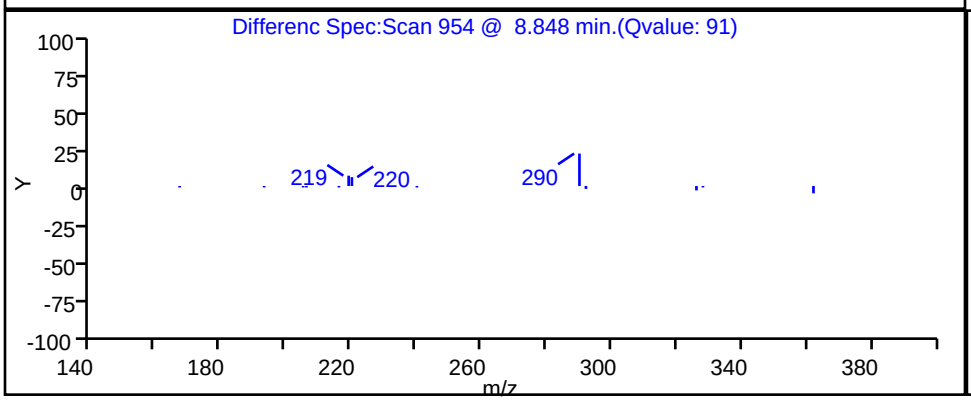


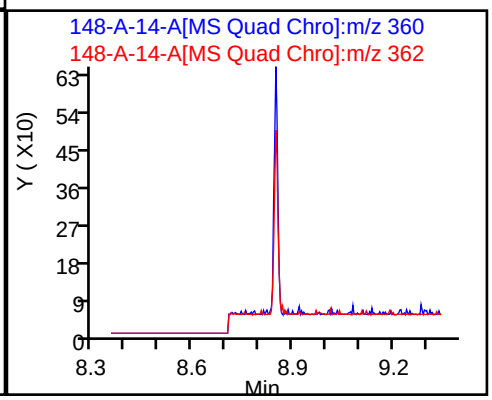












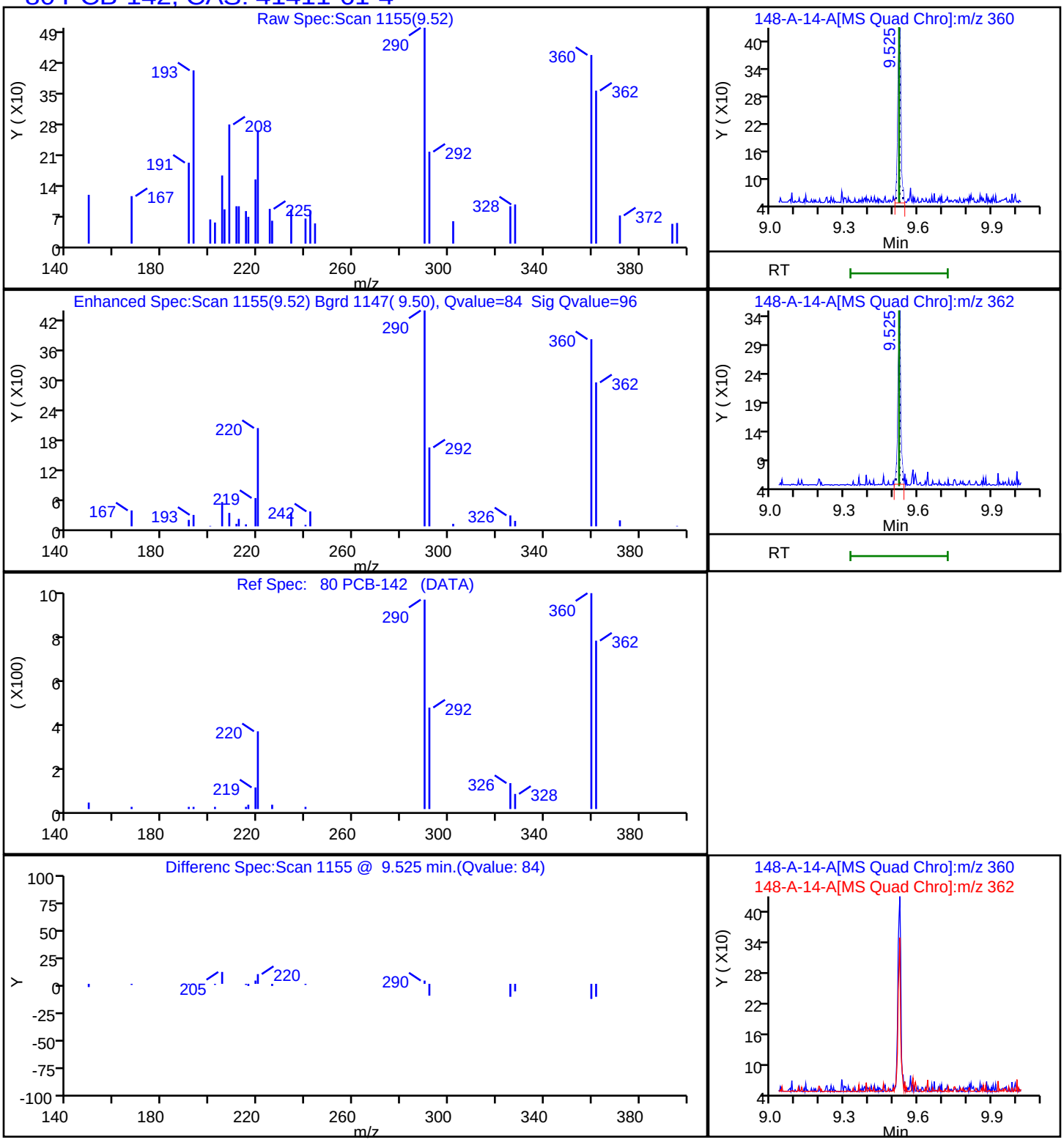
Report Date: 17-Nov-2023 12:14:56 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-14-A.D

Injection Date:	16-Nov-2023 20:09:18	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

80 PCB-142, CAS: 41411-61-4



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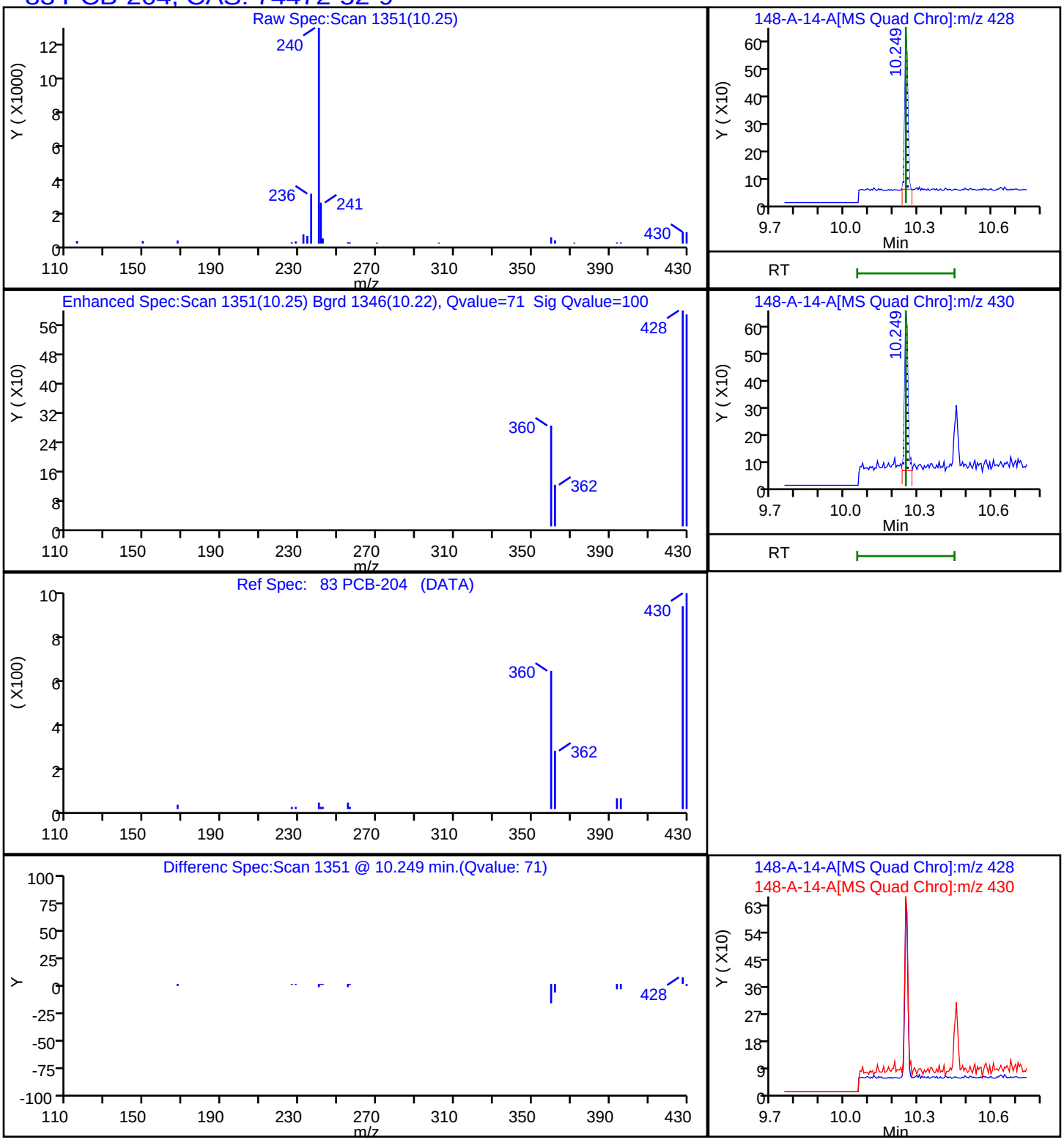
Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-14-A.D

Injection Date:	16-Nov-2023 20:09:18	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

83 PCB-204, CAS: 74472-52-9



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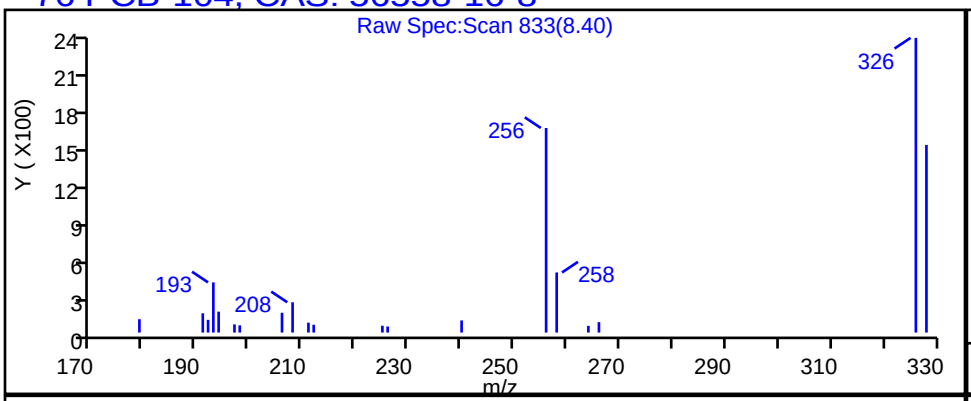
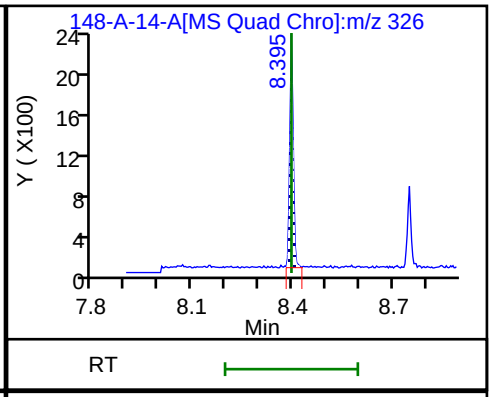
Eurofins Knoxville

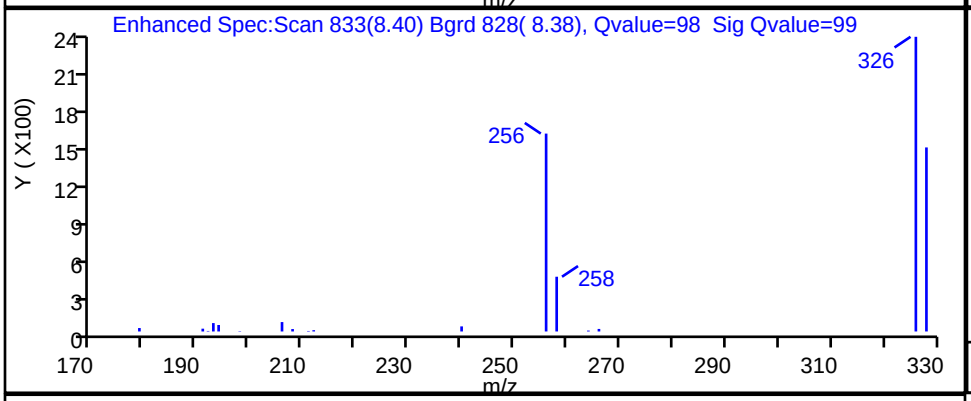
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-14-A.D

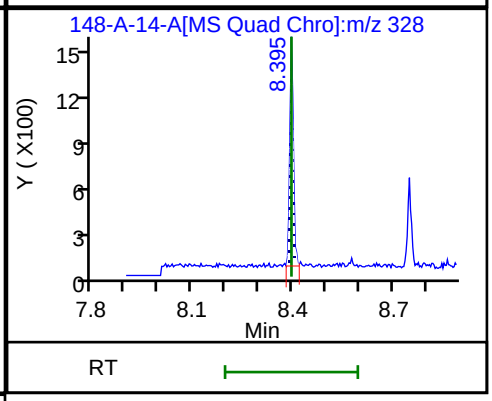
Injection Date:	16-Nov-2023 20:09:18	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

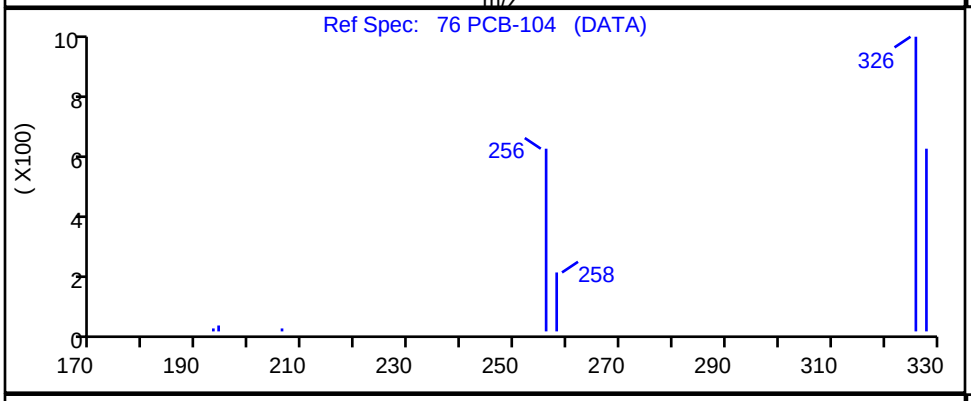
76 PCB-104, CAS: 56558-16-8

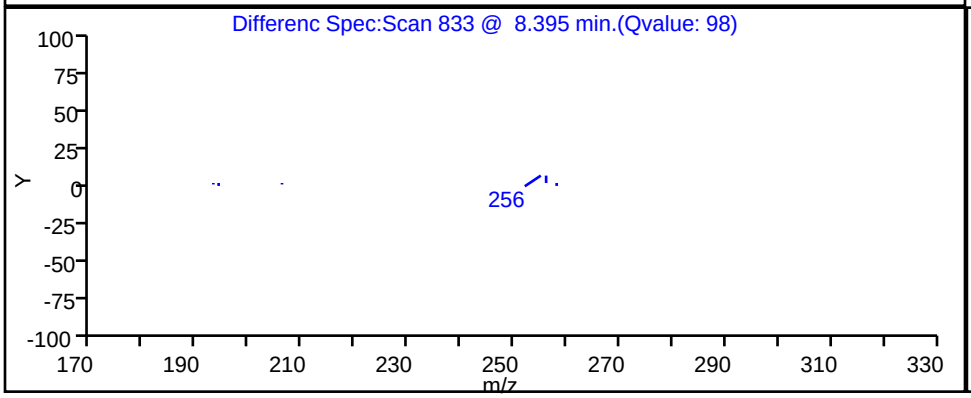


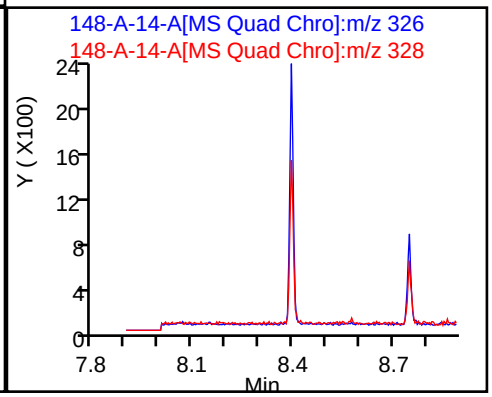












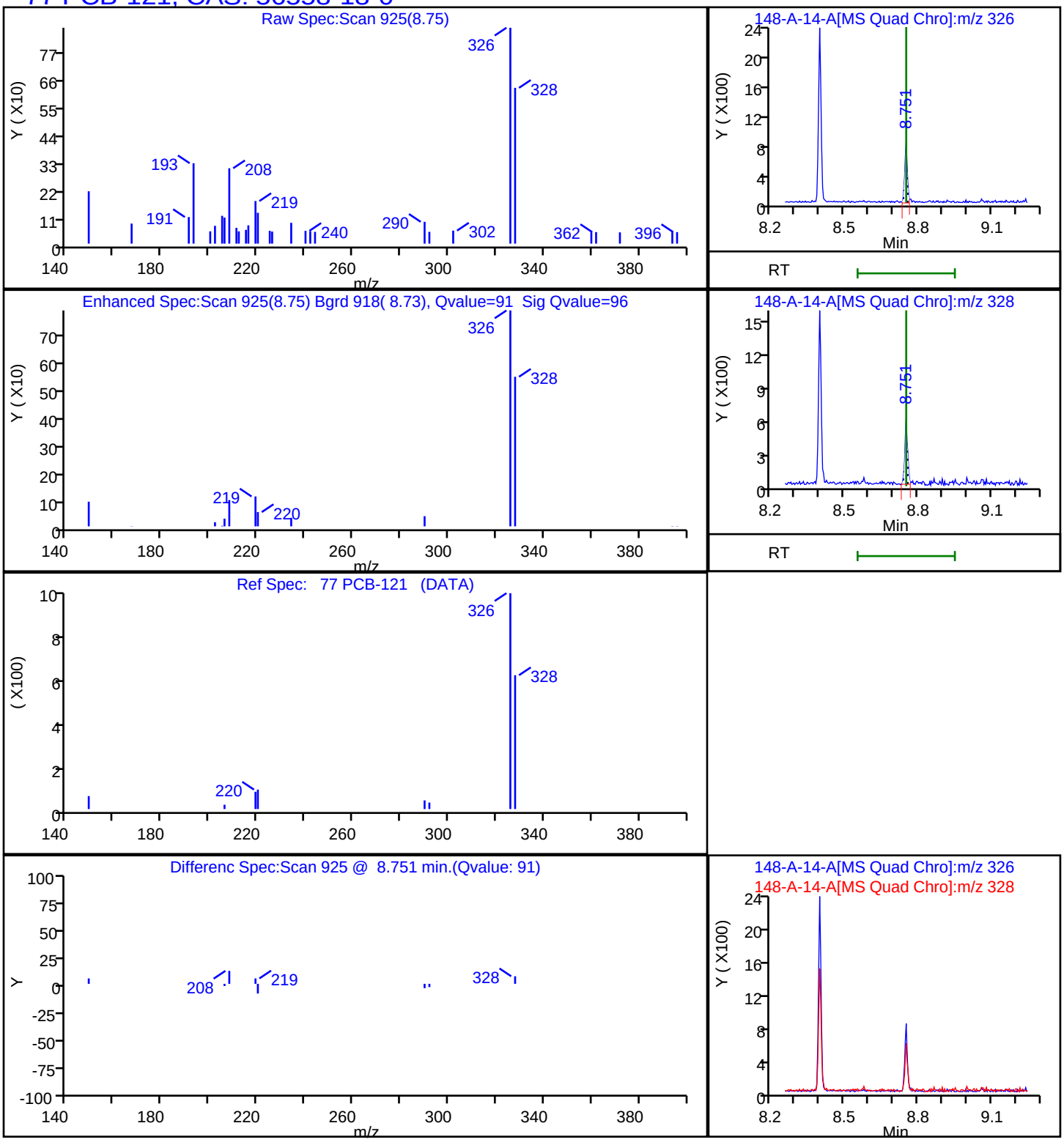
Report Date: 17-Nov-2023 12:14:56 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-14-A.D

Injection Date:	16-Nov-2023 20:09:18	Instrument ID:	GCMS1
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17
Client ID:	1804576-853-S3		
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0 Worklist Smp#: 25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN

77 PCB-121, CAS: 56558-18-0



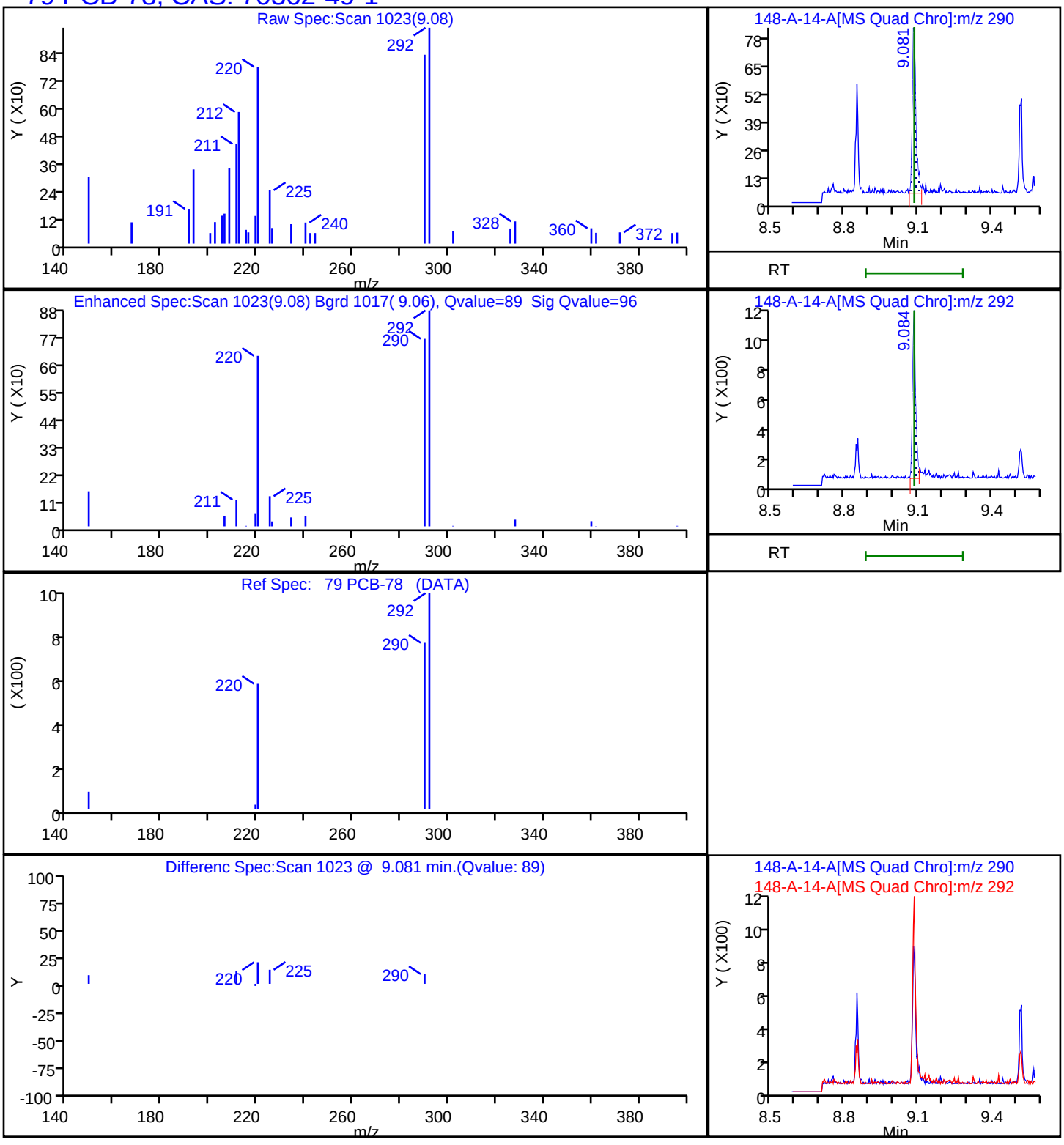
Report Date: 17-Nov-2023 12:14:56 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-14-A.D

Injection Date:	16-Nov-2023 20:09:18	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

79 PCB-78, CAS: 70362-49-1



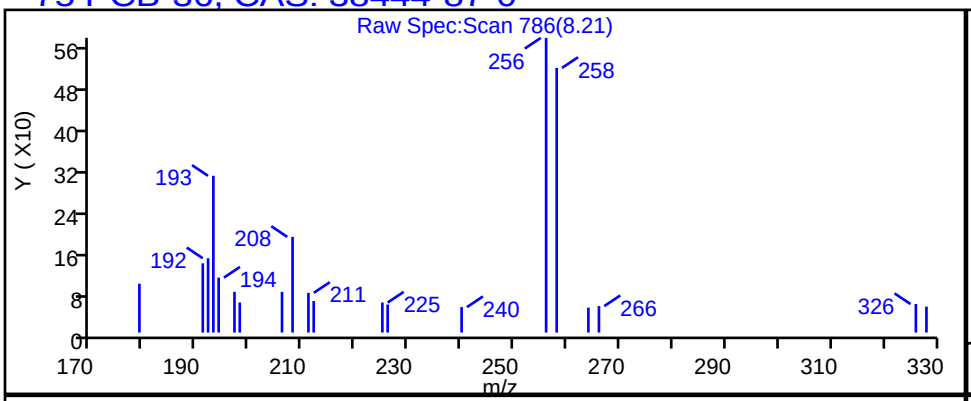
Report Date: 17-Nov-2023 12:14:56 Chrom Revision: 2.3 15-Nov-2023 20:54:34

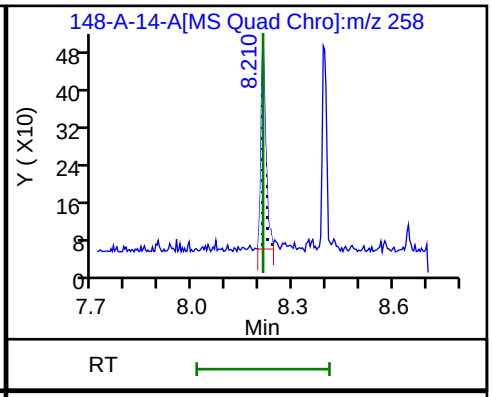
Eurofins Knoxville

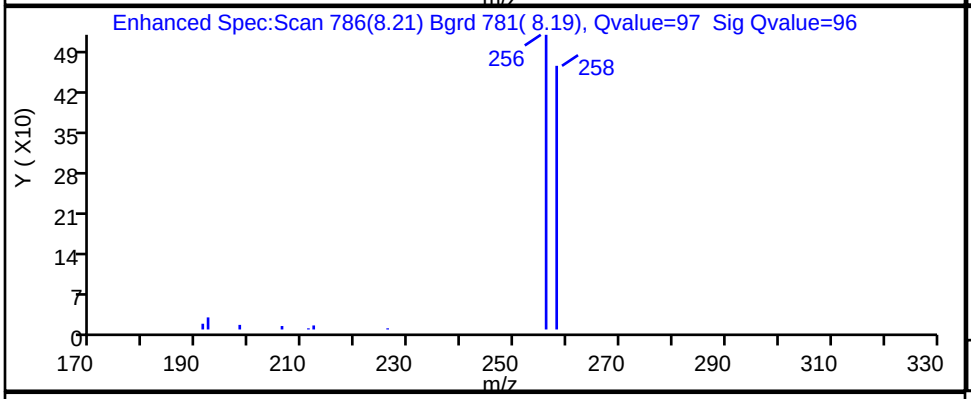
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-14-A.D

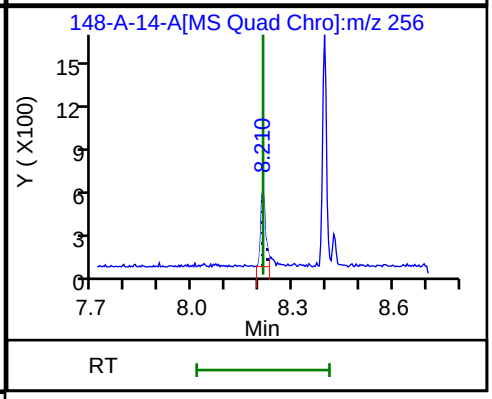
Injection Date:	16-Nov-2023 20:09:18	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

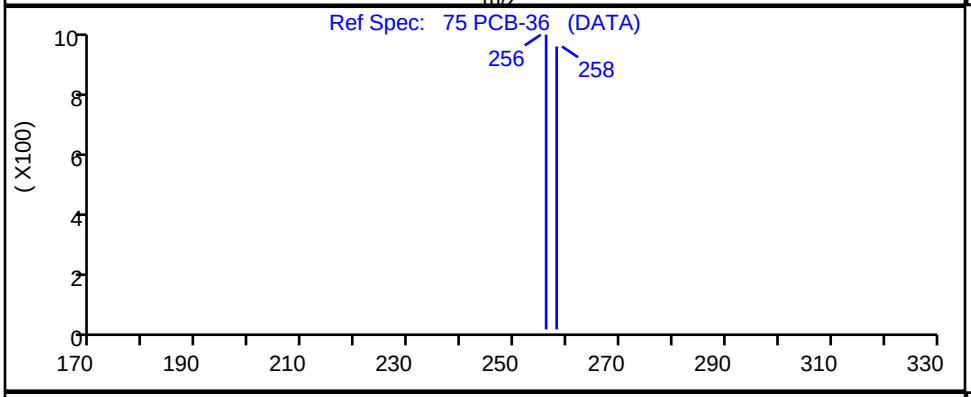
75 PCB-36, CAS: 38444-87-0

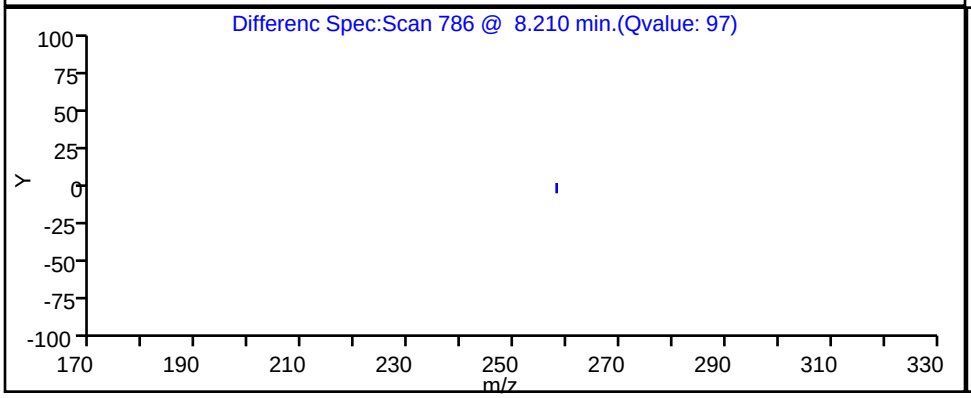


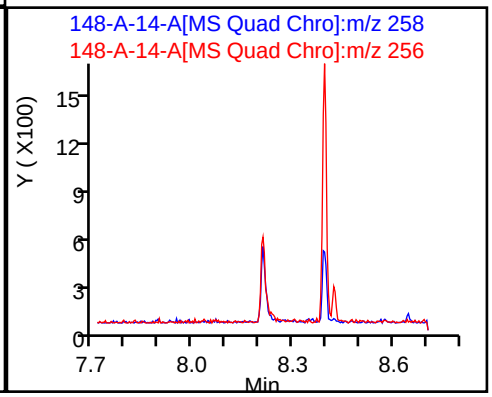












Manual Integration/User Assign Peak Report

Eurofins Knoxville

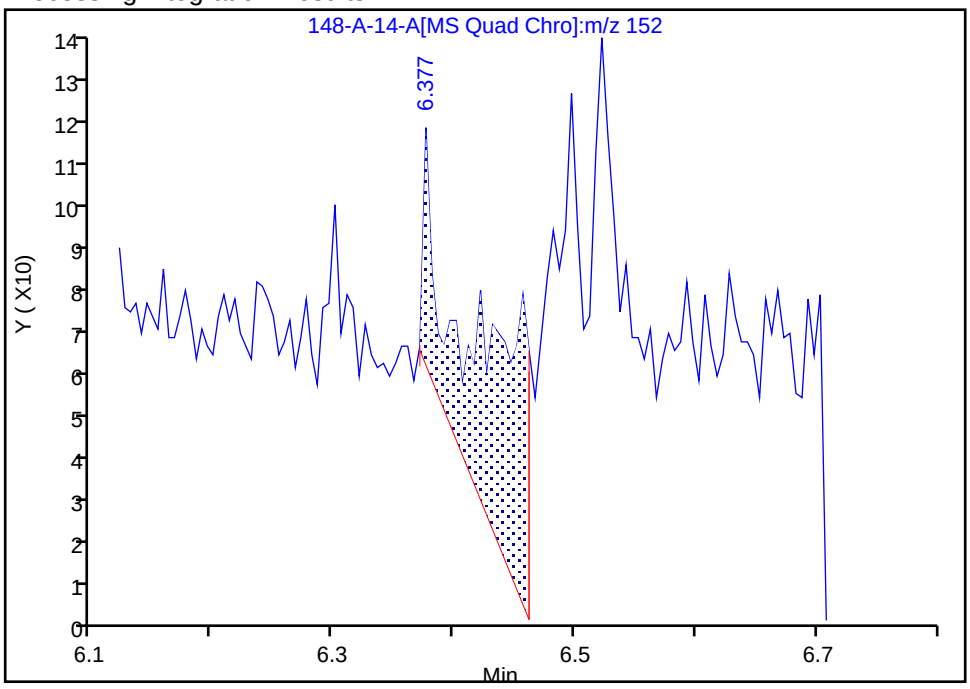
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-14-A.D				
Injection Date:	16-Nov-2023 20:09:18	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

24 Acenaphthylene, CAS: 208-96-8

Signal: 1

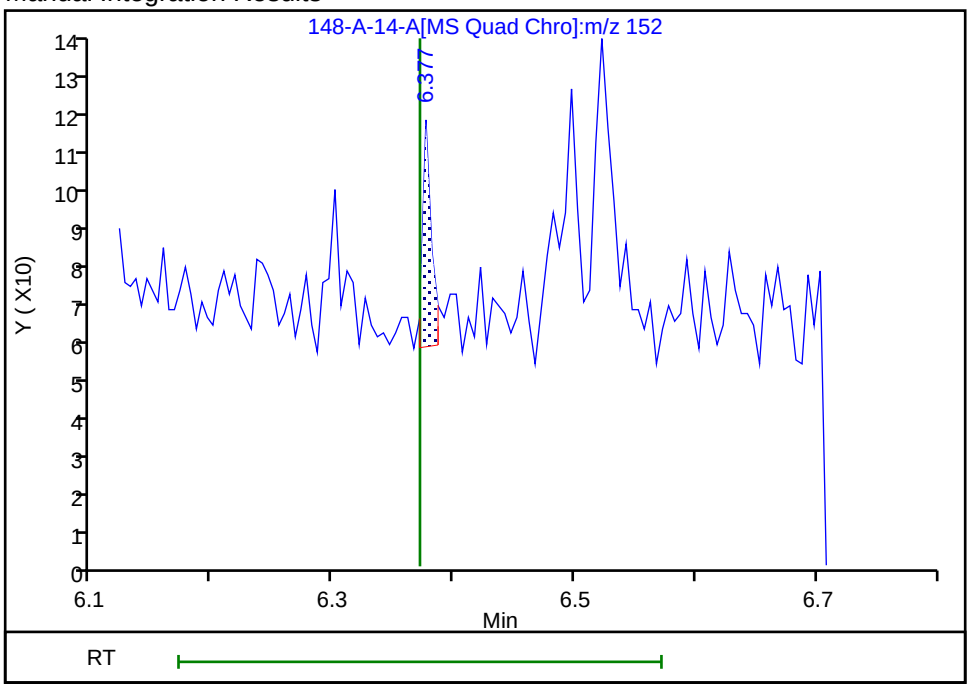
Processing Integration Results

RT: 6.38
Area: 214
Amount: 0.002701
Amount Units: ug/ml



Manual Integration Results

RT: 6.38
Area: 30
Amount: 0.000379
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:56:17 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

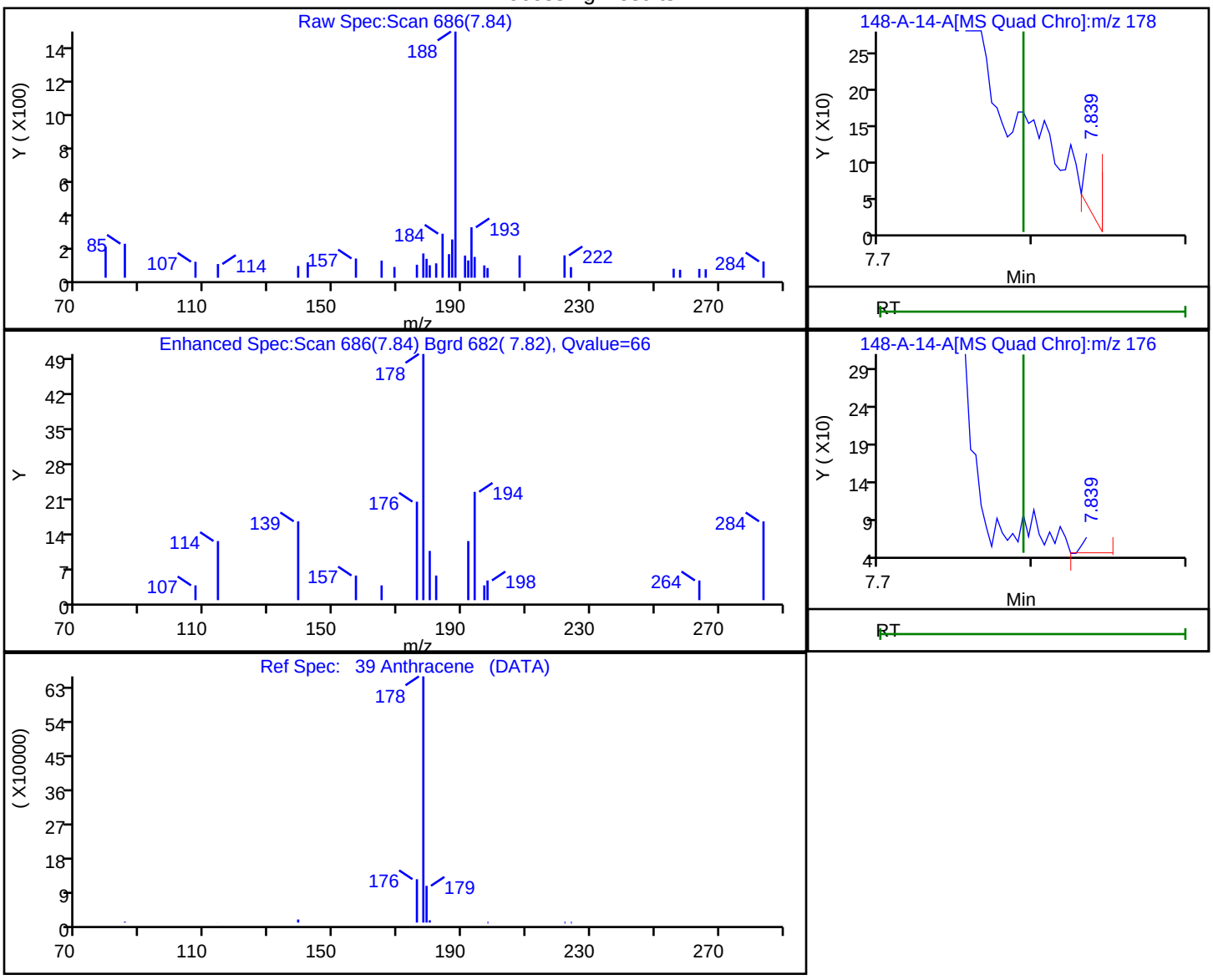
User Disabled Compound Report

Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-14-A.D				
Injection Date:	16-Nov-2023 20:09:18	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

39 Anthracene, CAS: 120-12-7

Processing Results



RT	Mass	Response	Amount
7.84	178.00	70	0.000616
7.84	176.00	23	

Reviewer: SK9U, 17-Nov-2023 10:57:12 -05:00:00 (UTC)

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

Manual Integration/User Assign Peak Report

Eurofins Knoxville

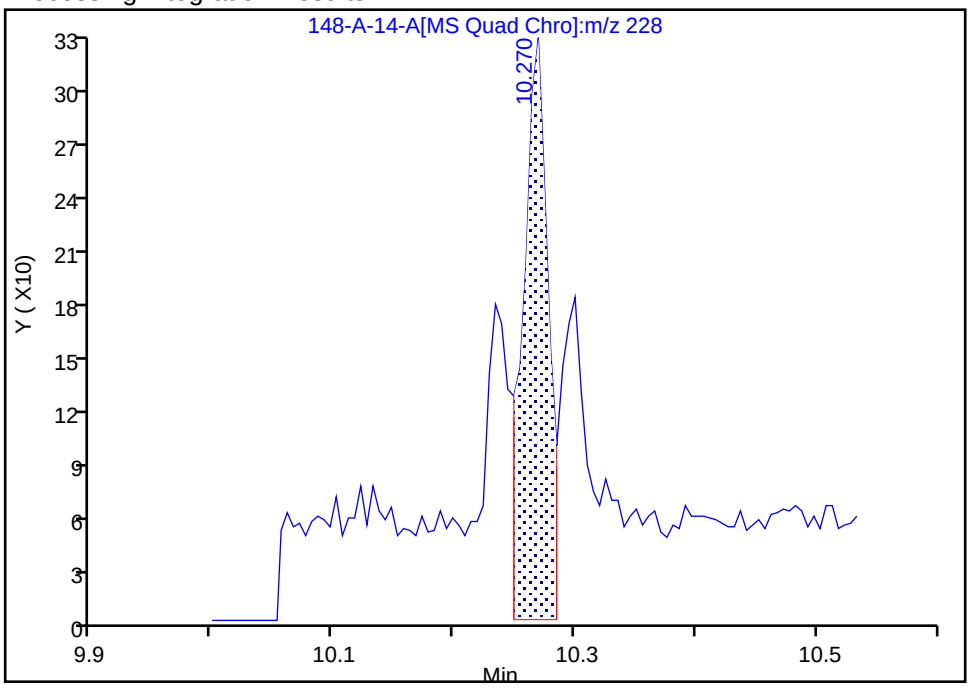
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-14-A.D				
Injection Date:	16-Nov-2023 20:09:18	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

47 Benzo[a]anthracene, CAS: 56-55-3

Signal: 1

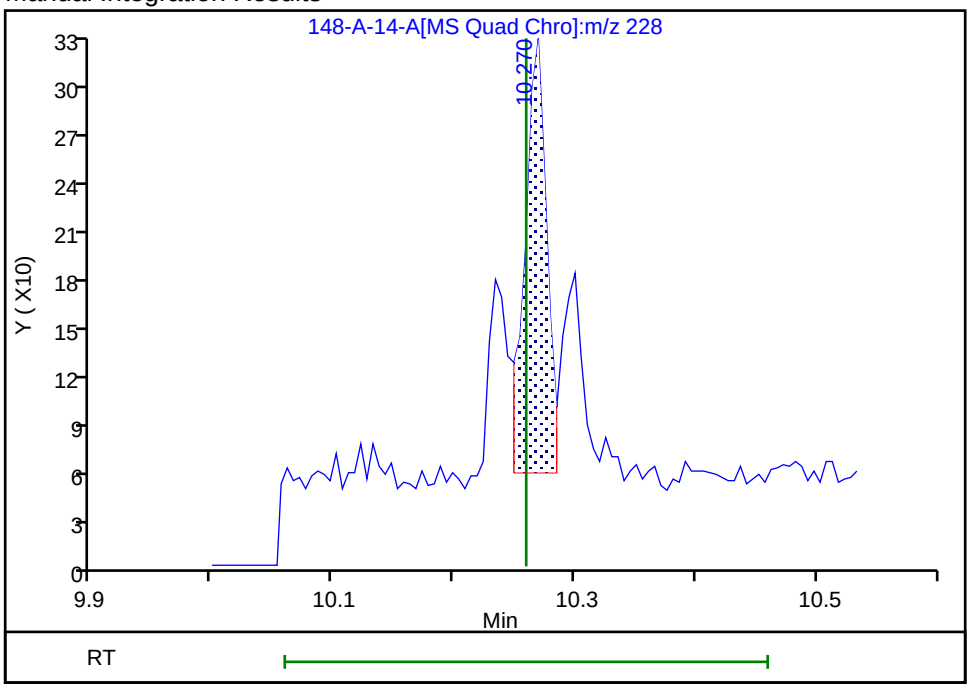
Processing Integration Results

RT: 10.27
Area: 488
Amount: 0.003266
Amount Units: ug/ml



Manual Integration Results

RT: 10.27
Area: 349
Amount: 0.002336
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:57:48 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

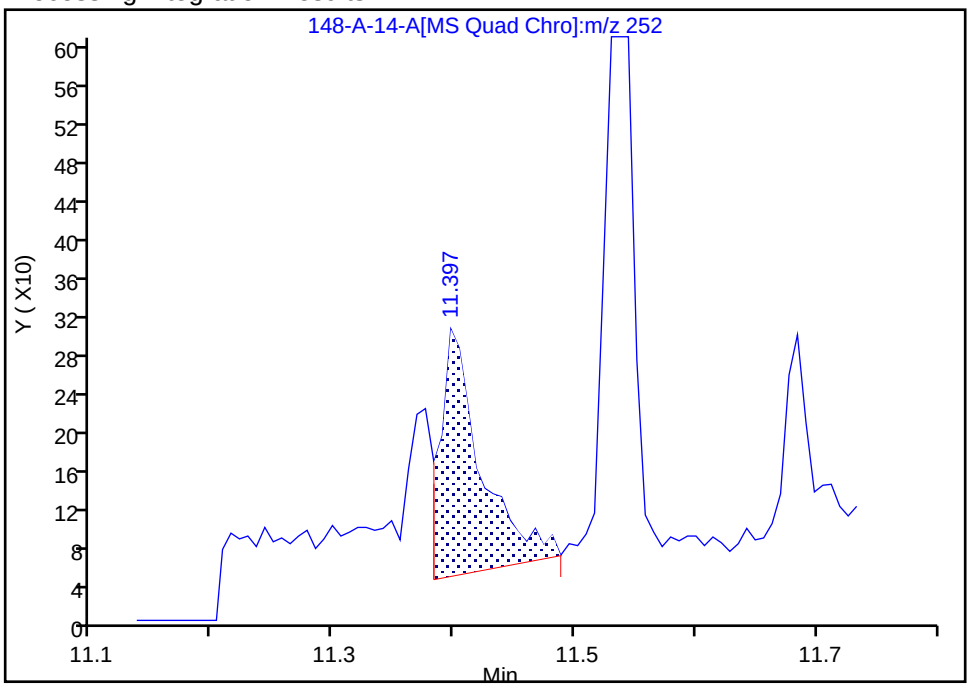
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-14-A.D				
Injection Date:	16-Nov-2023 20:09:18	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

53 Benzo[b]fluoranthene, CAS: 205-99-2

Signal: 1

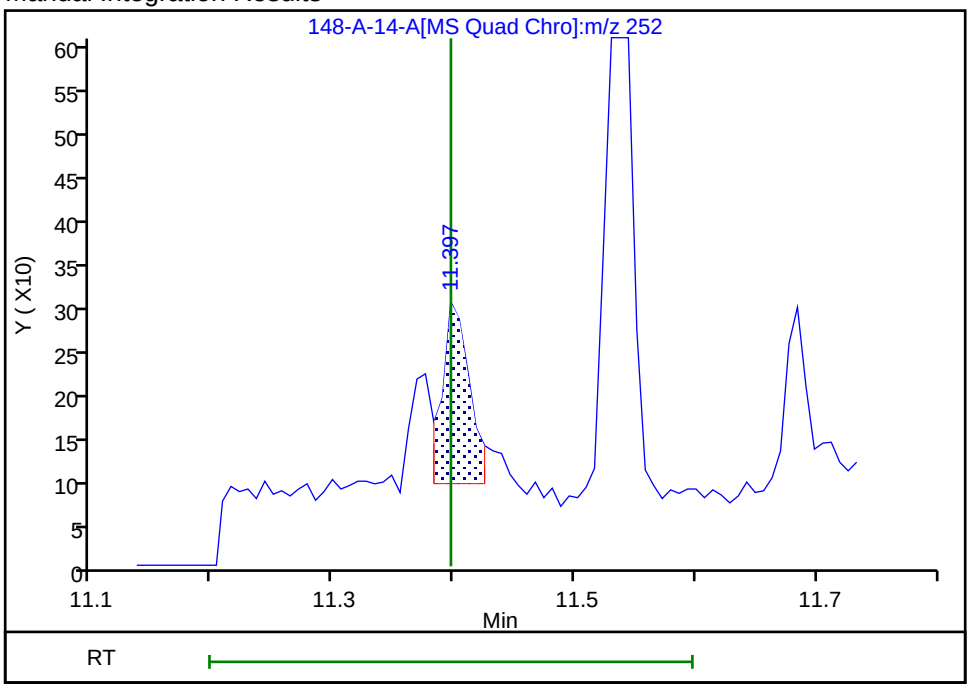
Processing Integration Results

RT: 11.40
Area: 610
Amount: 0.003576
Amount Units: ug/ml



Manual Integration Results

RT: 11.40
Area: 343
Amount: 0.002011
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:58:23 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

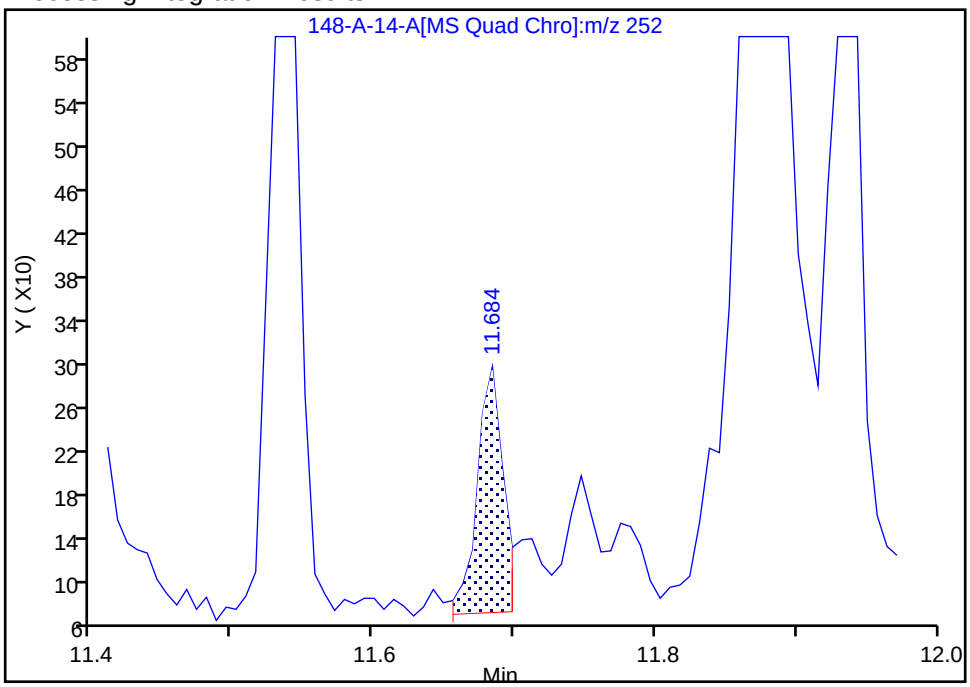
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-14-A.D				
Injection Date:	16-Nov-2023 20:09:18	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

57 Benzo[e]pyrene, CAS: 192-97-2

Signal: 1

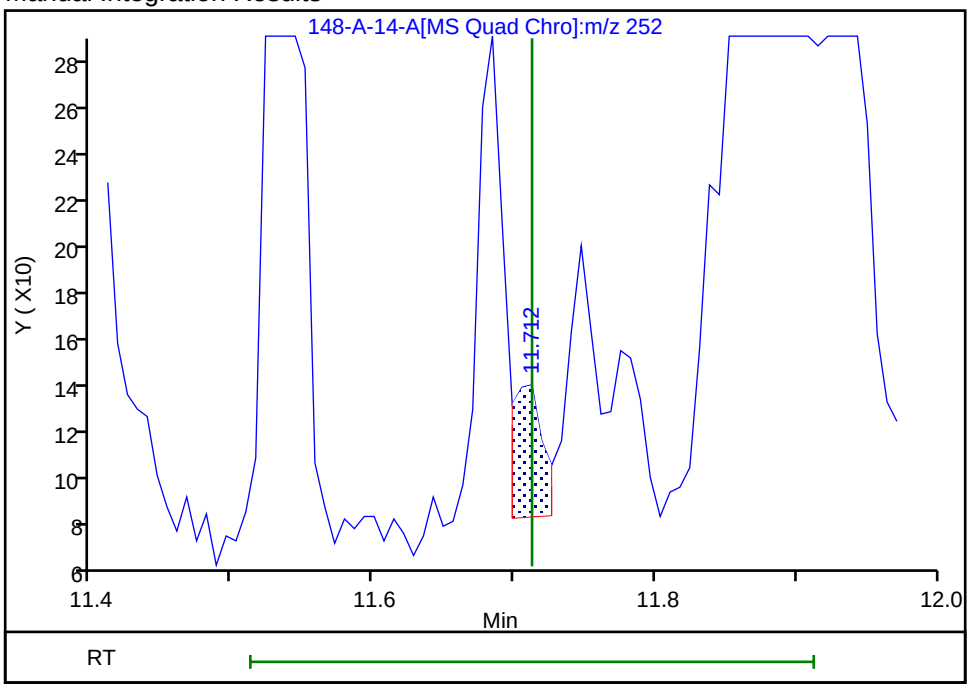
Processing Integration Results

RT: 11.68
Area: 291
Amount: 0.002151
Amount Units: ug/ml



Manual Integration Results

RT: 11.71
Area: 87
Amount: 0.000643
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:59:16 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

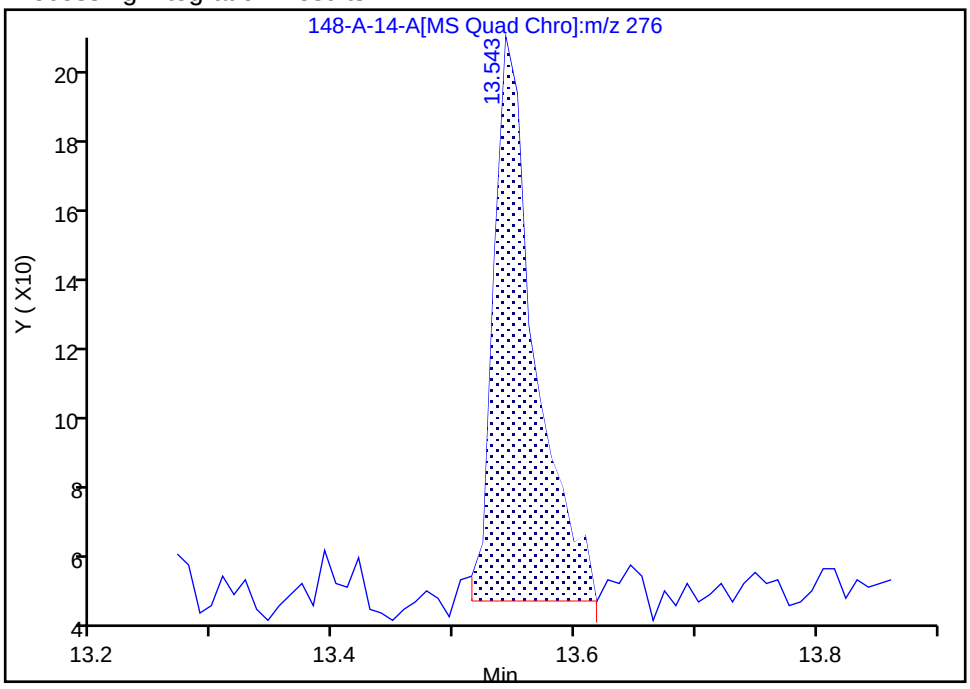
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-14-A.D				
Injection Date:	16-Nov-2023 20:09:18	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

68 Benzo[g,h,i]perylene, CAS: 191-24-2

Signal: 1

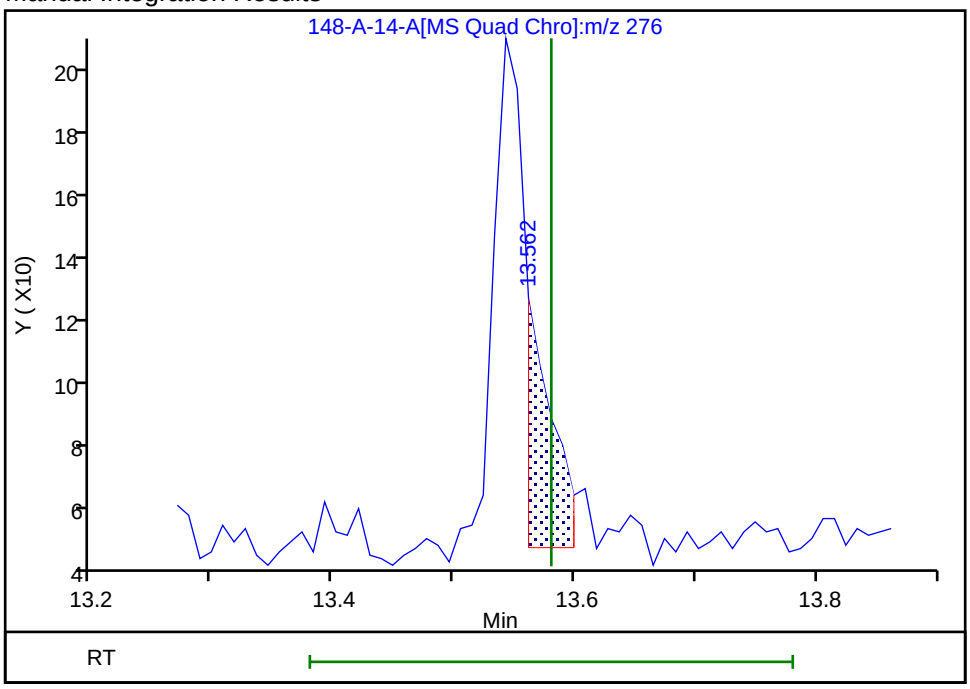
Processing Integration Results

RT: 13.54
Area: 362
Amount: 0.002486
Amount Units: ug/ml



Manual Integration Results

RT: 13.56
Area: 122
Amount: 0.000838
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 11:00:30 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

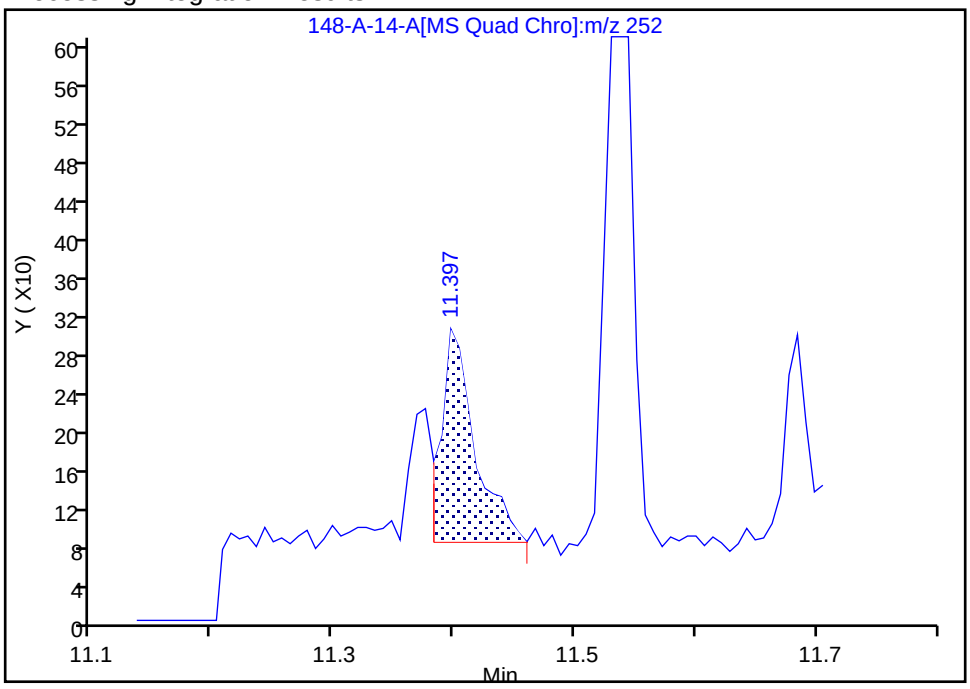
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-14-A.D				
Injection Date:	16-Nov-2023 20:09:18	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

55 Benzo[k]fluoranthene, CAS: 207-08-9

Signal: 1

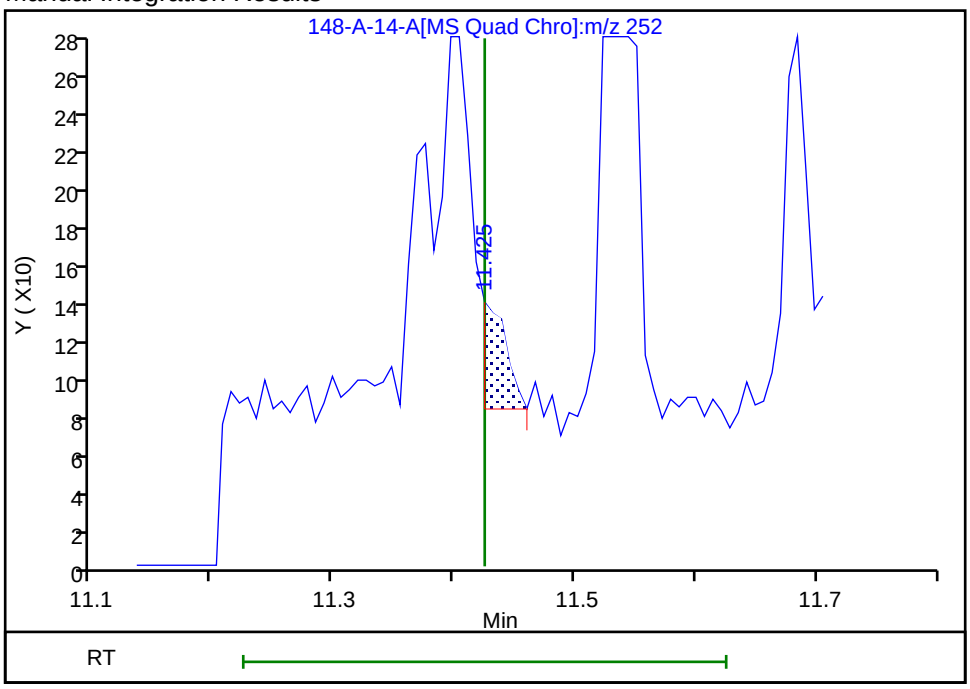
Processing Integration Results

RT: 11.40
Area: 430
Amount: 0.002433
Amount Units: ug/ml



Manual Integration Results

RT: 11.43
Area: 78
Amount: 0.000441
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:58:38 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

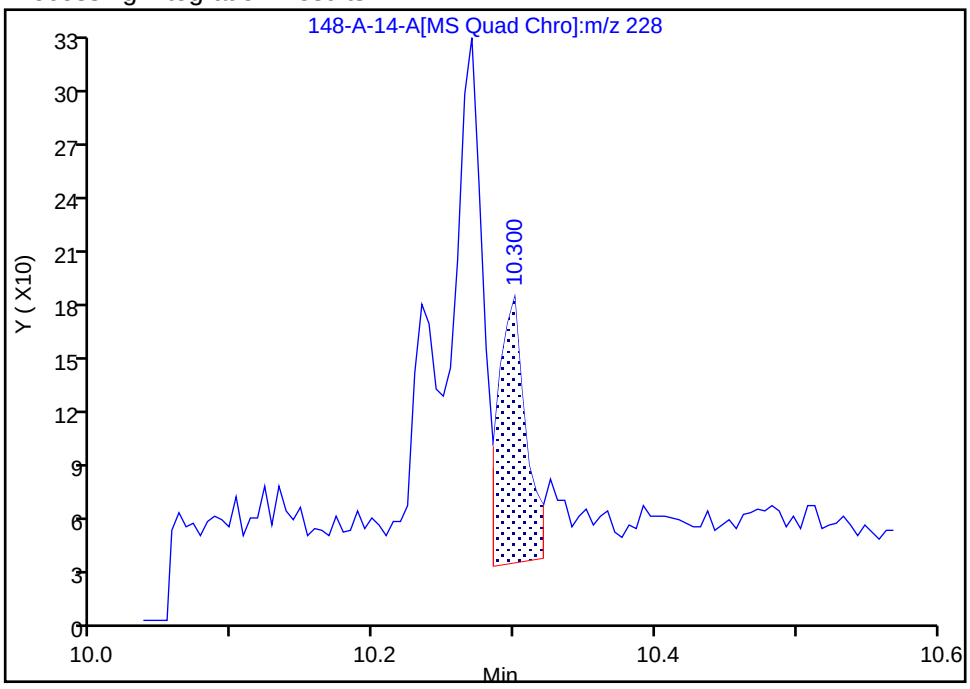
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-14-A.D				
Injection Date:	16-Nov-2023 20:09:18	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

50 Chrysene, CAS: 218-01-9

Signal: 1

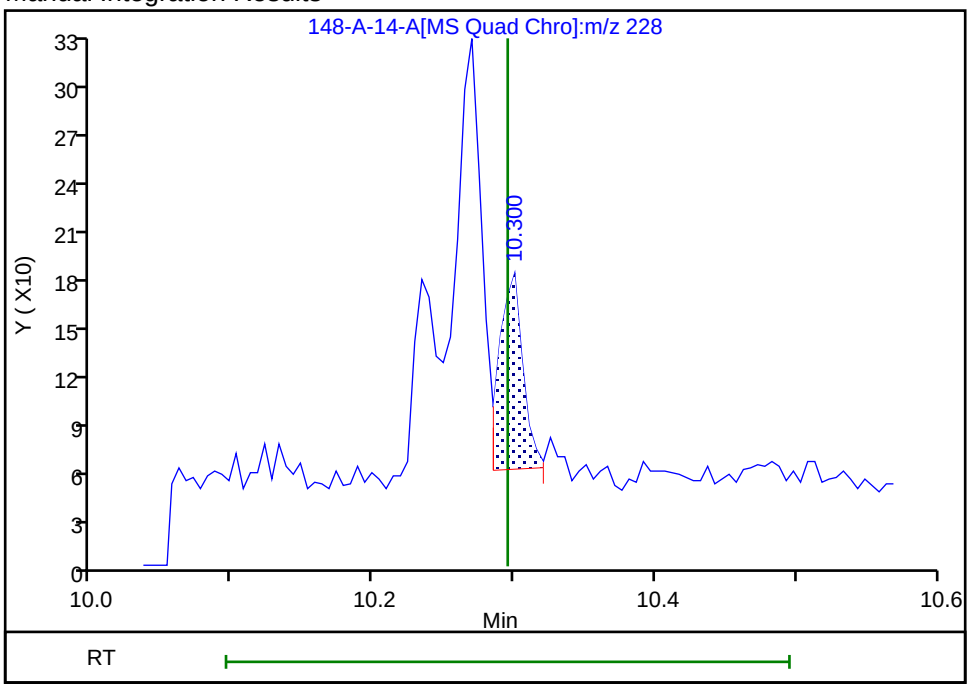
Processing Integration Results

RT: 10.30
Area: 210
Amount: 0.001254
Amount Units: ug/ml



Manual Integration Results

RT: 10.30
Area: 142
Amount: 0.000848
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:58:04 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

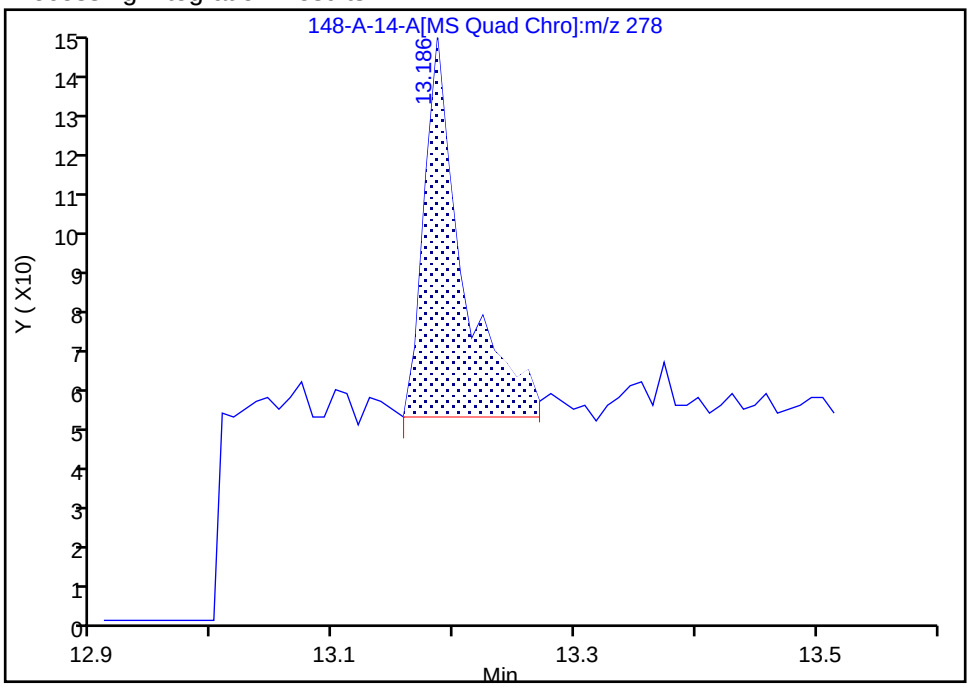
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-14-A.D				
Injection Date:	16-Nov-2023 20:09:18	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

66 Dibenz(a,h)anthracene, CAS: 53-70-3

Signal: 1

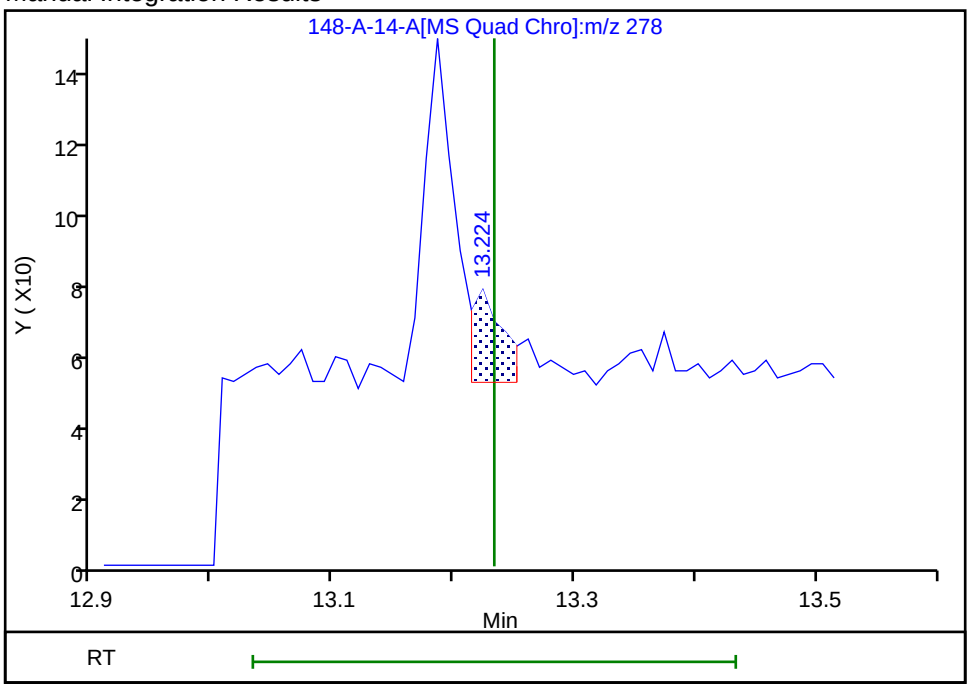
Processing Integration Results

RT: 13.19
Area: 215
Amount: 0.001647
Amount Units: ug/ml



Manual Integration Results

RT: 13.22
Area: 49
Amount: 0.000375
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:59:59 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

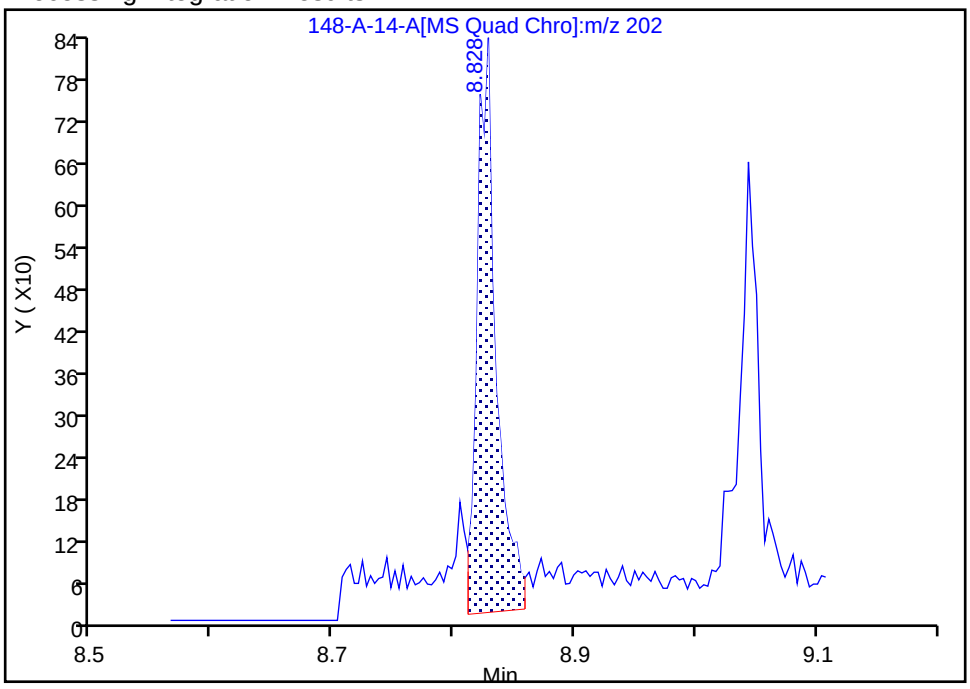
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-14-A.D				
Injection Date:	16-Nov-2023 20:09:18	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

43 Fluoranthene, CAS: 206-44-0

Signal: 1

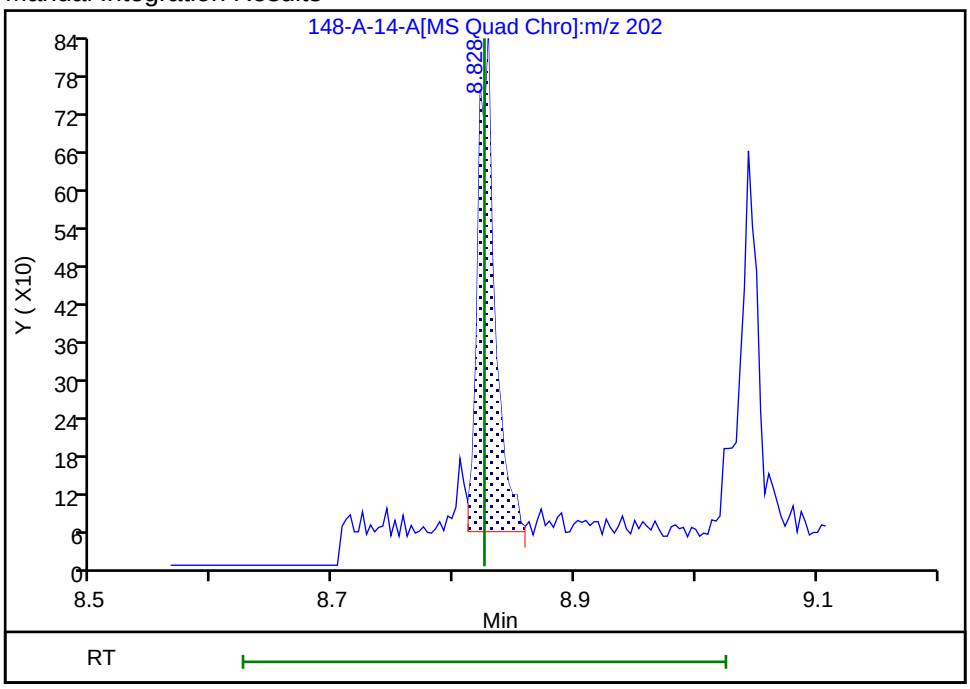
Processing Integration Results

RT: 8.83
Area: 892
Amount: 0.005077
Amount Units: ug/ml



Manual Integration Results

RT: 8.83
Area: 772
Amount: 0.004394
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:57:27 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

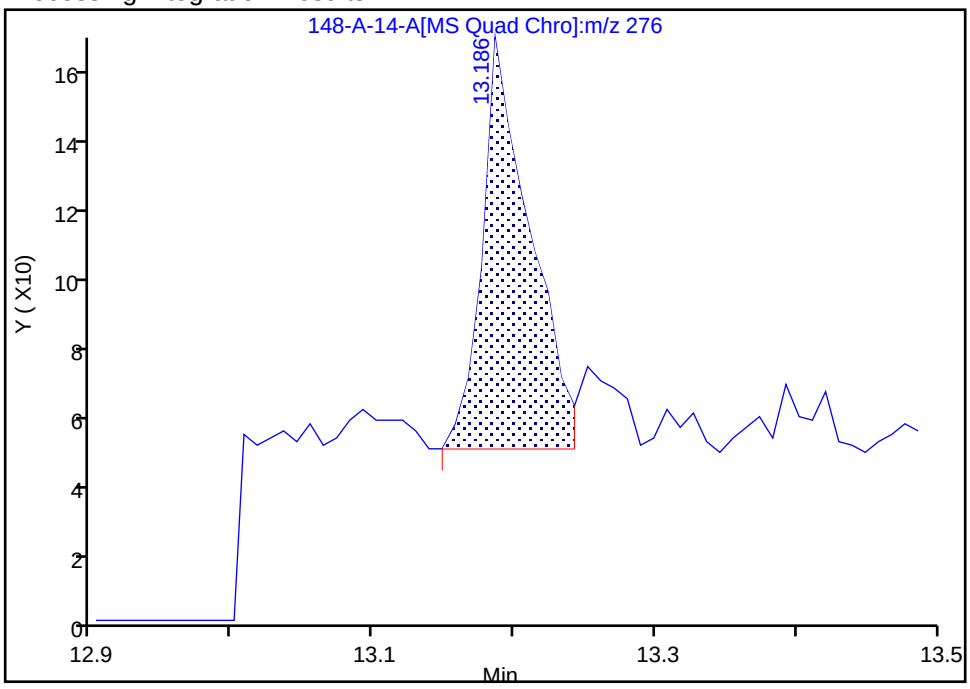
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-14-A.D				
Injection Date:	16-Nov-2023 20:09:18	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

65 Indeno[1,2,3-cd]pyrene, CAS: 193-39-5

Signal: 1

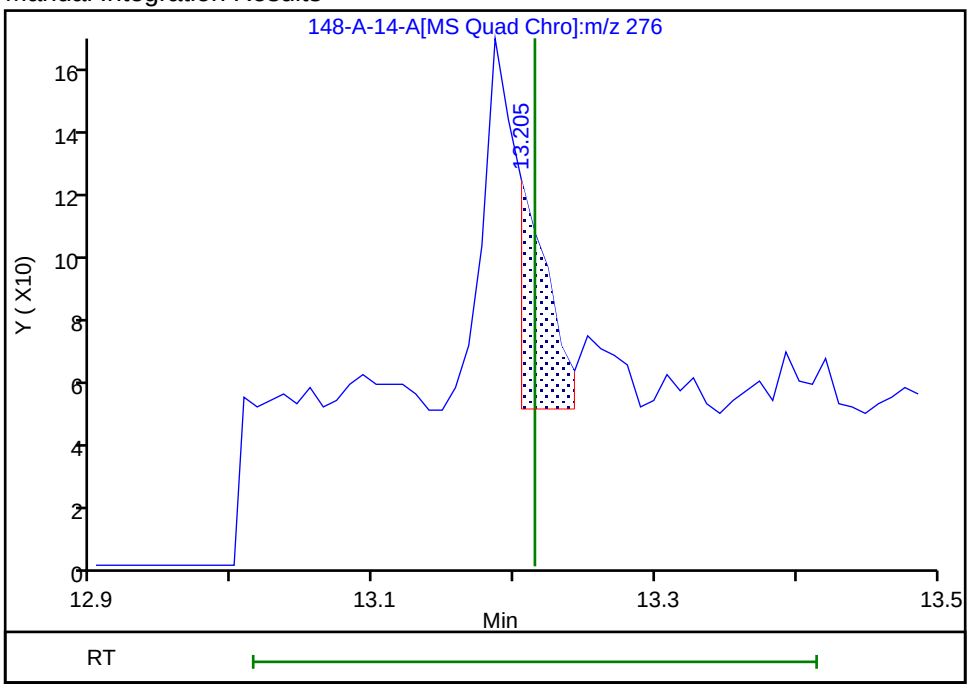
Processing Integration Results

RT: 13.19
Area: 273
Amount: 0.001711
Amount Units: ug/ml



Manual Integration Results

RT: 13.20
Area: 114
Amount: 0.000715
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 11:00:11 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

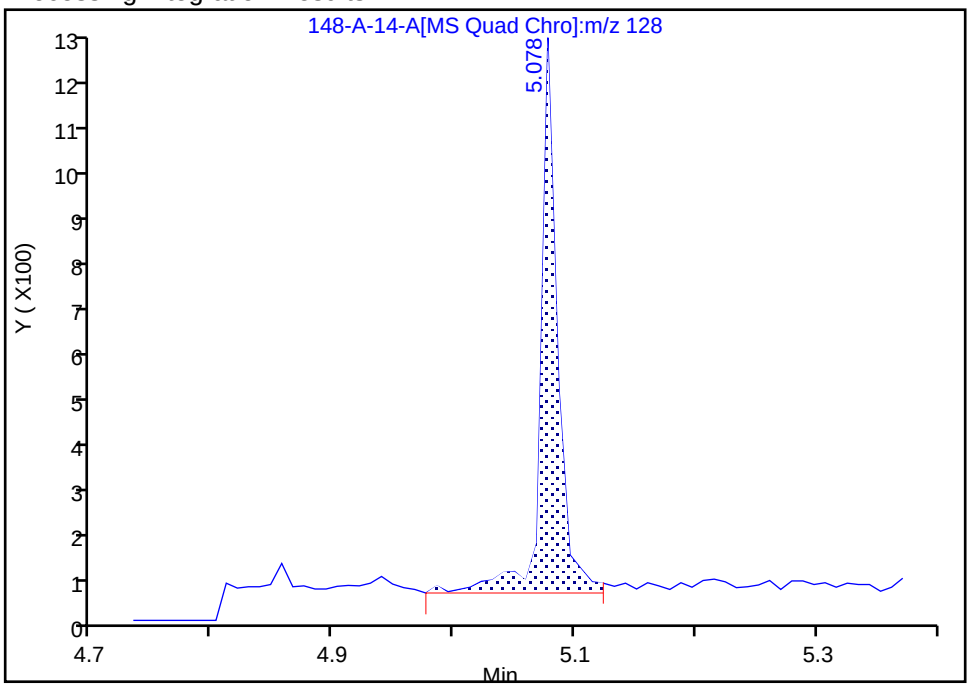
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-14-A.D				
Injection Date:	16-Nov-2023 20:09:18	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

12 Naphthalene, CAS: 91-20-3

Signal: 1

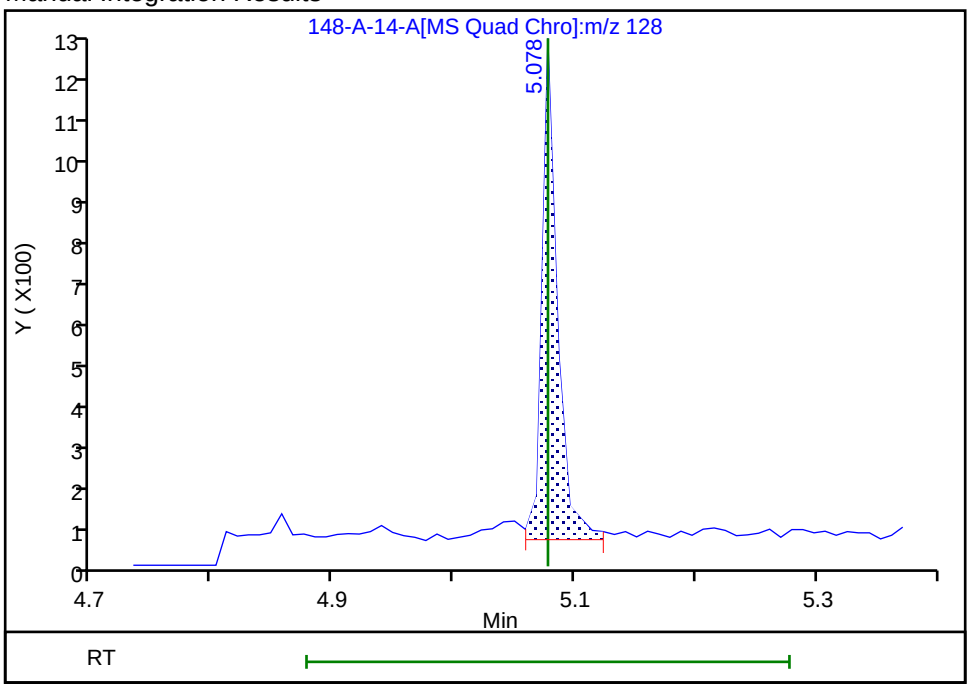
Processing Integration Results

RT: 5.08
Area: 1218
Amount: 0.017649
Amount Units: ug/ml



Manual Integration Results

RT: 5.08
Area: 1114
Amount: 0.016142
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:55:43 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

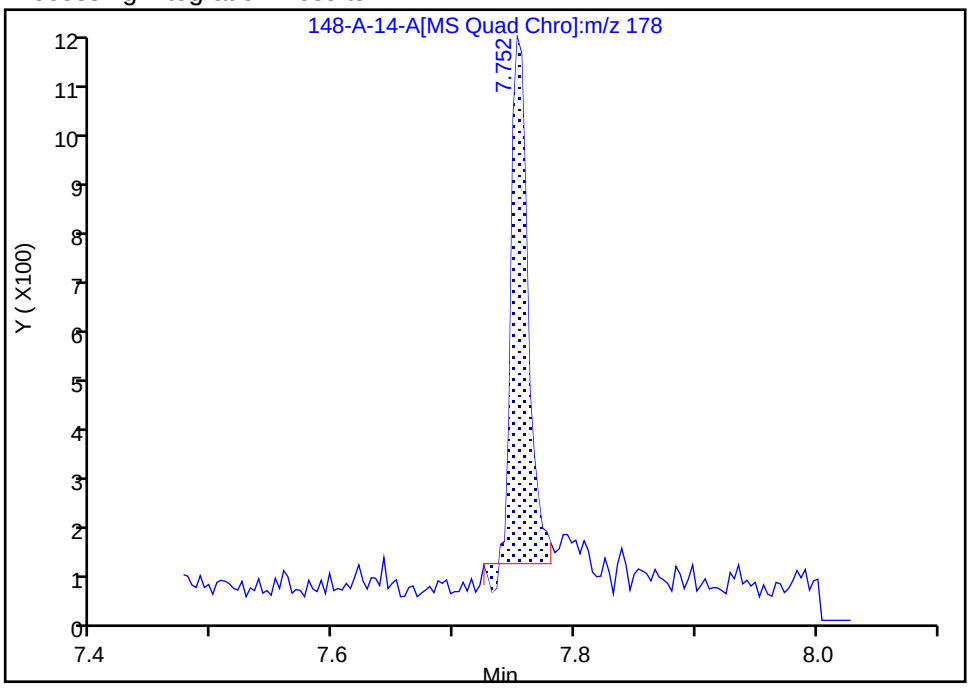
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-14-A.D				
Injection Date:	16-Nov-2023 20:09:18	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

36 Phenanthrene, CAS: 85-01-8

Signal: 1

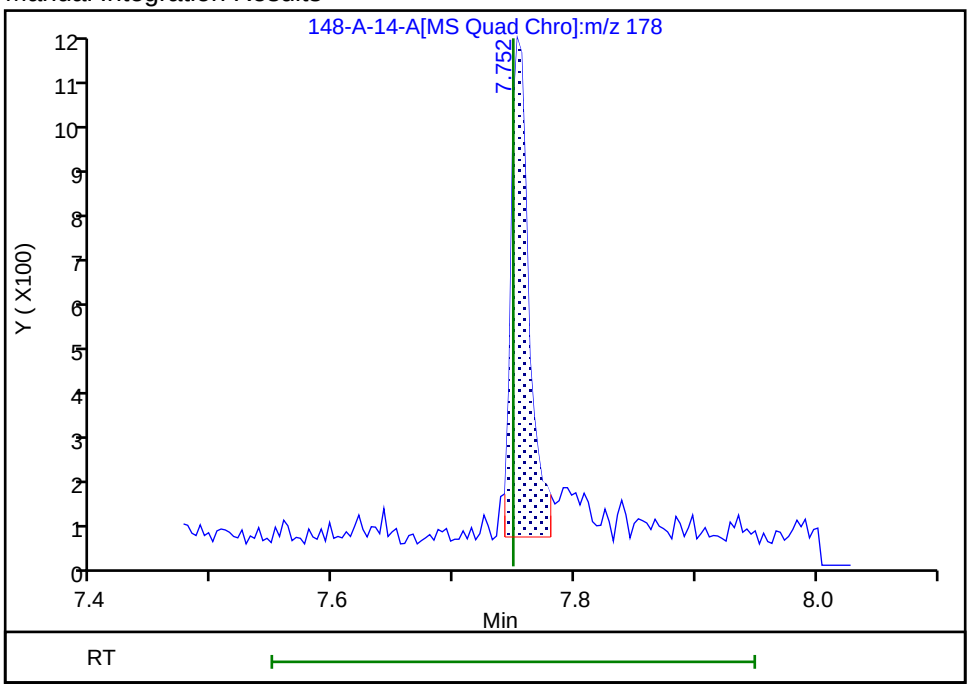
Processing Integration Results

RT: 7.75
Area: 980
Amount: 0.008781
Amount Units: ug/ml



Manual Integration Results

RT: 7.75
Area: 1109
Amount: 0.009937
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:56:54 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

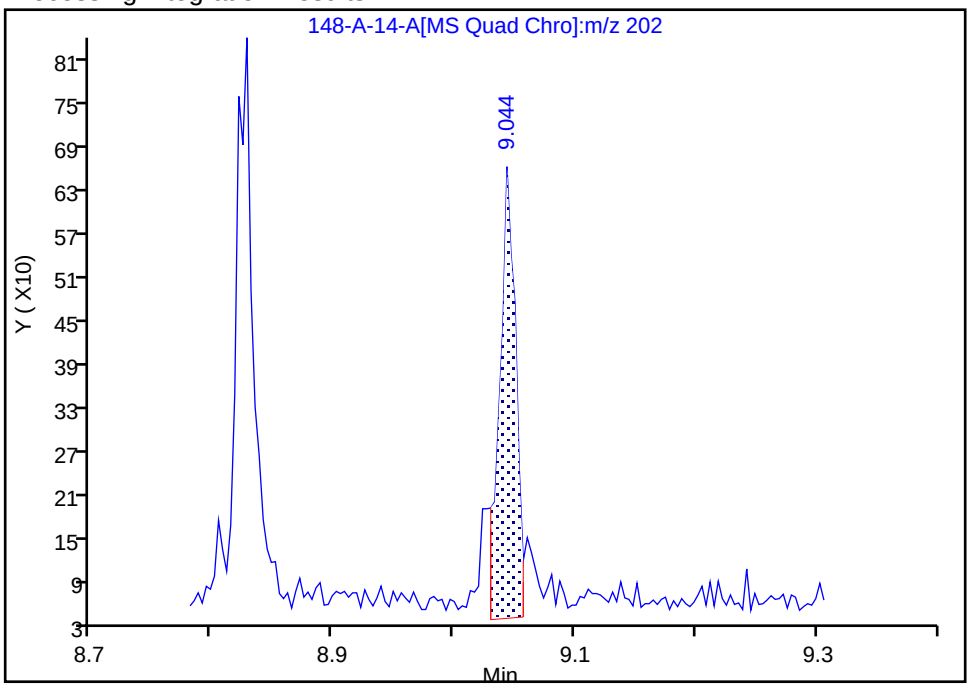
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-14-A.D				
Injection Date:	16-Nov-2023 20:09:18	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

45 Pyrene, CAS: 129-00-0

Signal: 1

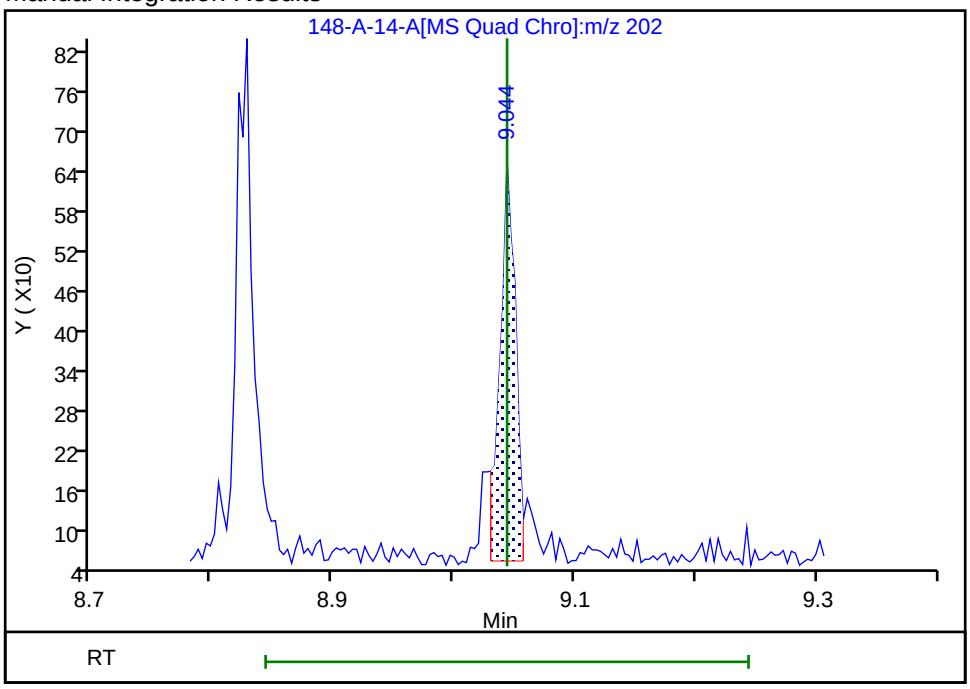
Processing Integration Results

RT: 9.04
Area: 579
Amount: 0.003229
Amount Units: ug/ml



Manual Integration Results

RT: 9.04
Area: 543
Amount: 0.003029
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 10:57:38 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

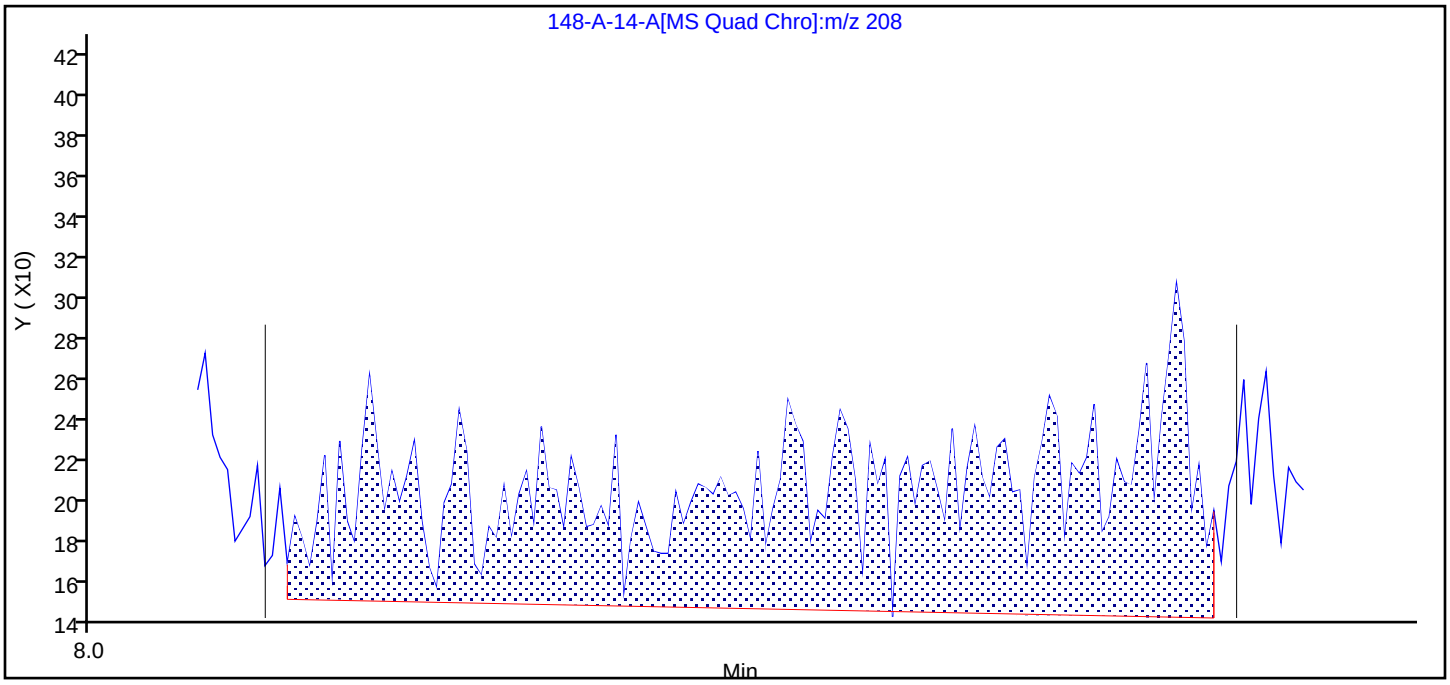
User Disabled Compound Report

Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-14-A.D				
Injection Date:	16-Nov-2023 20:09:18	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

A 91 C3-Fluorenes, CAS: STL00915

Processing Results



Exp RT	RT	Response	Amount
8.35	8.35	1730	0.025551
8.35	8.34	2065	0

Reviewer: SK9U, 17-Nov-2023 10:44:32 -05:00:00 (UTC)

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

Manual Integration/User Assign Peak Report

Eurofins Knoxville

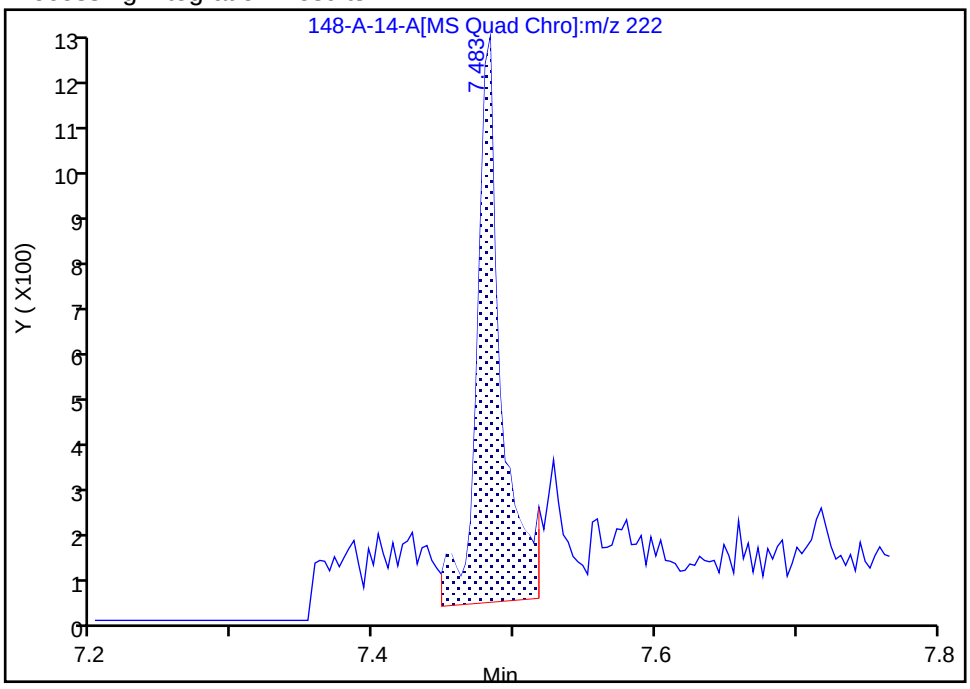
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\140-34148-A-14-A.D				
Injection Date:	16-Nov-2023 20:09:18	Instrument ID:	GCMS1		
Lims ID:	140-34148-A-17-A	Lab Sample ID:	140-34148-17		
Client ID:	1804576-853-S3				
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

74 PCB-14, CAS: 34883-41-5

Signal: 1

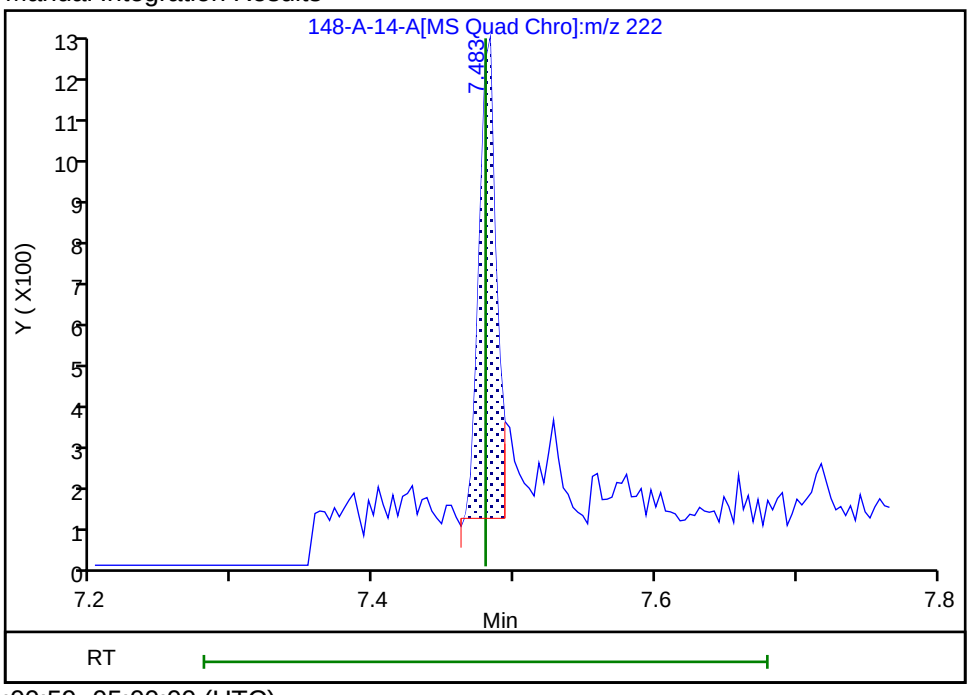
Processing Integration Results

RT: 7.48
Area: 1520
Amount: 0.012172
Amount Units: ug/ml



Manual Integration Results

RT: 7.48
Area: 1003
Amount: 0.008032
Amount Units: ug/ml



Reviewer: SK9U, 17-Nov-2023 11:00:59 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

FORM VI
GC/MS SEMI VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: Eurofins Knoxville Job No.: 140-34148-1 Analy Batch No.: 80177

SDG No.:

Instrument ID: GCMS1 GC Column: Rxi-5SilMS ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/13/2023 13:12 Calibration End Date: 11/13/2023 15:31 Calibration ID: 4716

Calibration Files

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 140-80177/14	IC PCB1.D
Level 2	IC 140-80177/13	IC PCB2.D
Level 3	IC 140-80177/12	IC PCB3.D
Level 4	IC 140-80177/11	IC PCB4.D
Level 5	IC 140-80177/10	IC PCB5.D
Level 6	IC 140-80177/9	IC PCB6.D
Level 7	IC 140-80177/8	IC PCB7.D

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD /RSE	#	MAX %RSD /RSE	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
PCB-14	3.1993 3.9792	3.5403 4.1546	3.4616	3.6260	3.7049	Ave		3.6666				8.7		30.0			
PCB-36	1.6221 2.2063	1.6310 2.3387	1.7532	1.8819	2.0783	Ave		1.9302				14.7		30.0			
PCB-104	1.4680 1.5136	1.4289 1.7414	1.4353	1.4243	1.4745	Ave		1.4980				7.5		30.0			
PCB-121	1.3794 1.5649	1.2303 1.8060	1.4330	1.4127	1.4954	QuaF		1.2012	0.2017706						0.9970		0.9900
PCB-155	0.9992 1.1664	1.0770 1.3268	1.0804	1.0998	1.1235	Ave		1.1247				9.1		30.0			
PCB-78	1.1777 1.4207	1.0521 1.7028	1.0101	1.1989	1.3300	QuaF		0.9513	0.2530554						0.9960		0.9900
PCB-142	0.7488 0.8612	0.7503 0.9857	0.7762	0.7817	0.8251	Ave		0.8184				10.3		30.0			
PCB-184	0.8091 0.8322	0.8115 0.9078	0.7791	0.7880	0.8080	Ave		0.8194				5.2		30.0			
PCB-204	0.5394 0.5390	0.5540 0.5693	0.5177	0.4945	0.5181	Ave		0.5331				4.7		30.0			
PCB-192	0.6679 0.7822	0.7549 0.8568	0.7348	0.7116	0.7512	Ave		0.7513				7.9		30.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type. RSD is calculated for Ave curve types. RSE is used for all other types.

FORM VI
GC/MS SEMI VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1 | Analy Batch No.: 80177

SDG No.:

Instrument ID: GCMS1 | GC Column: Rxi-5SilMS ID: 0.25(mm) | Heated Purge: (Y/N) N

Calibration Start Date: 11/13/2023 13:12 | Calibration End Date: 11/13/2023 15:31 | Calibration ID: 4716

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 140-80177/14	IC PCB1.D
Level 2	IC 140-80177/13	IC PCB2.D
Level 3	IC 140-80177/12	IC PCB3.D
Level 4	IC 140-80177/11	IC PCB4.D
Level 5	IC 140-80177/10	IC PCB5.D
Level 6	IC 140-80177/9	IC PCB6.D
Level 7	IC 140-80177/8	IC PCB7.D

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
PCB-14	PCB167L	Ave	2491 461092	9375 547789	49679	98635	222973	0.0196 2.24	0.0560 2.80	0.280	0.560	1.12
PCB-36	PCB167L	Ave	1263 255651	4319 308361	25161	51191	125081	0.0196 2.24	0.0560 2.80	0.280	0.560	1.12
PCB-104	PCB167L	Ave	1143 175391	3784 229603	20598	38745	88741	0.0196 2.24	0.0560 2.80	0.280	0.560	1.12
PCB-121	PCB167L	QuaF	1074 181328	3258 238123	20566	38428	89998	0.0196 2.24	0.0560 2.80	0.280	0.560	1.12
PCB-155	PCB167L	Ave	778 135152	2852 174944	15505	29916	67617	0.0196 2.24	0.0560 2.80	0.280	0.560	1.12
PCB-78	PCB167L	QuaF	917 164626	2786 224519	14497	32612	80044	0.0196 2.24	0.0560 2.80	0.280	0.560	1.12
PCB-142	PCB167L	Ave	583 99796	1987 129963	11139	21263	49656	0.0196 2.24	0.0560 2.80	0.280	0.560	1.12
PCB-184	PCB167L	Ave	630 96428	2149 119692	11181	21436	48631	0.0196 2.24	0.0560 2.80	0.280	0.560	1.12
PCB-204	PCB167L	Ave	420 62458	1467 75057	7430	13451	31180	0.0196 2.24	0.0560 2.80	0.280	0.560	1.12
PCB-192	PCB167L	Ave	520 90639	1999 112969	10545	19356	45209	0.0196 2.24	0.0560 2.80	0.280	0.560	1.12

FORM VI

GC/MS SEMI VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA

RESPONSE AND CONCENTRATION

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1 | Analy Batch No.: 80177

SDG No.:

Instrument ID: GCMS1 | GC Column: Rxi-5SilMS ID: 0.25(mm) | Heated Purge: (Y/N) N

Calibration Start Date: 11/13/2023 13:12 | Calibration End Date: 11/13/2023 15:31 | Calibration ID: 4716

Curve Type Legend:

Ave = Average ISTD

QuaF = Quadratic ISTD forced zero

Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PCB7.D
Lims ID: ic pcb7
Client ID:
Sample Type: IC Calib Level: 7
Inject. Date: 13-Nov-2023 13:12:45 ALS Bottle#: 0 Worklist Smp#: 8
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030467-008
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1
Sublist: chrom-SIM_PAH_GCMS1*sub1

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 15-Nov-2023 14:41:49 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1623

First Level Reviewer: SK9U Date: 13-Nov-2023 14:01:40

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
74 PCB-14	222	7.472	7.479	-0.007	100	547789	2.80	3.17	
75 PCB-36	258	8.202	8.210	-0.008	100	308361	2.80	3.39	
76 PCB-104	326	8.395	8.396	-0.001	93	229603	2.80	3.25	
77 PCB-121	326	8.751	8.751	0.000	99	238123	2.80	2.85	
78 PCB-155	360	8.848	8.849	-0.001	89	174944	2.80	3.30	
79 PCB-78	290	9.077	9.084	-0.007	92	224519	2.80	2.85	
80 PCB-142	360	9.521	9.522	-0.001	87	129963	2.80	3.37	
81 PCB-184	394	9.575	9.572	0.003	94	119692	2.80	3.10	
* 82 PCB-167L	372	10.023	10.027	-0.004	71	18836	0.4000	0.4000	
83 PCB-204	428	10.249	10.250	-0.001	86	75057	2.80	2.99	
84 PCB-192	394	10.274	10.275	-0.001	96	112969	2.80	3.19	

QC Flag Legend
Processing Flags

Reagents:
60L7SIMPCB_00018 Amount Added: 1.00 Units: mL

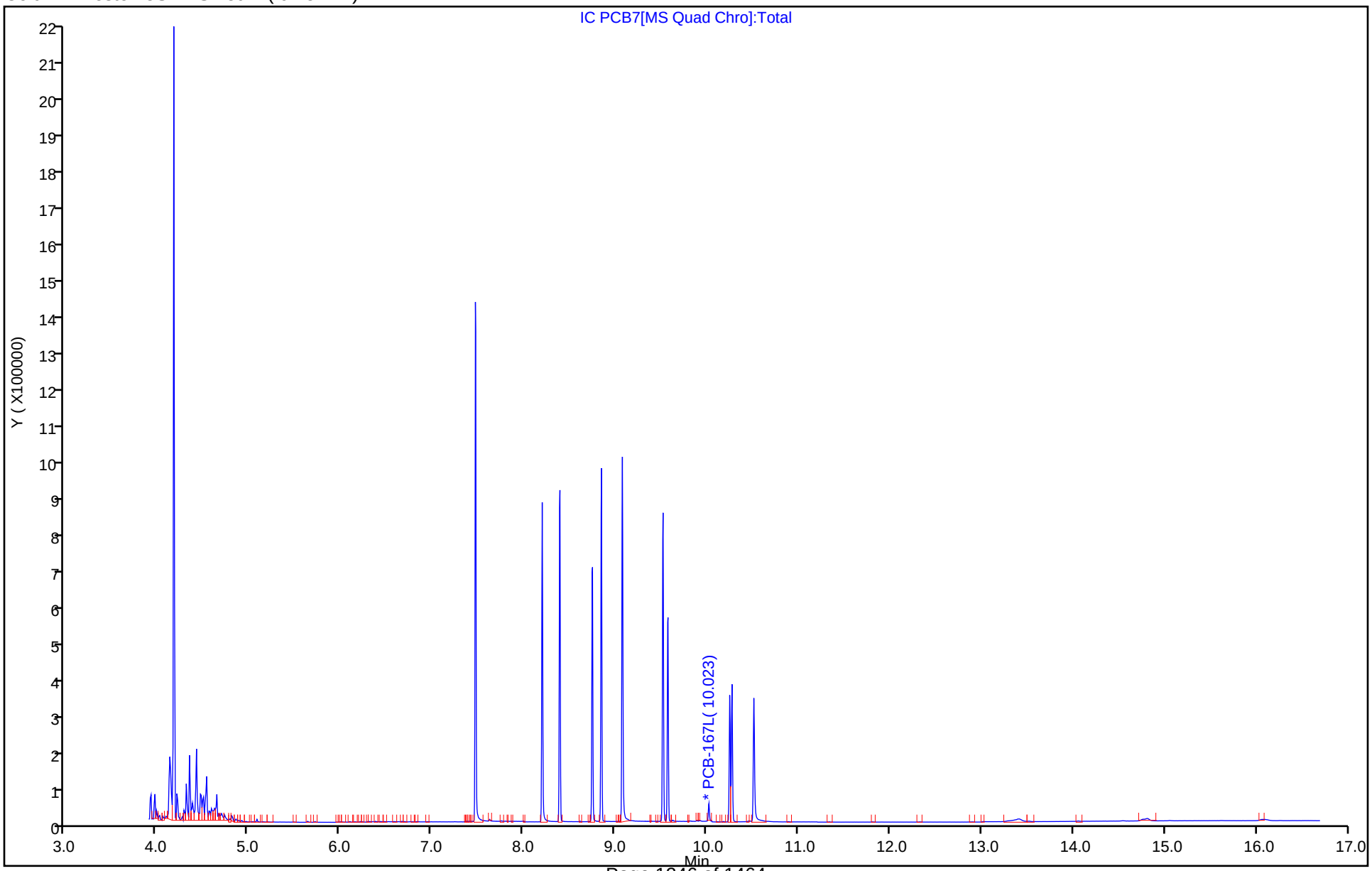
Report Date: 15-Nov-2023 14:41:49 Chrom Revision: 2.3 13-Nov-2023 16:16:38

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PCB7.D

Injection Date:	13-Nov-2023 13:12:45	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	ic pcb7			Worklist Smp#:	8
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PCB6.D
Lims ID: ic pcb6
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 13-Nov-2023 13:35:55 ALS Bottle#: 0 Worklist Smp#: 9
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030467-009
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1
Sublist: chrom-SIM_PAH_GCMS1*sub1

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 15-Nov-2023 14:41:50 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1623

First Level Reviewer: SK9U Date: 13-Nov-2023 15:28:47

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
74 PCB-14	222	7.476	7.479	-0.003	100	461092	2.24	2.43	
75 PCB-36	258	8.202	8.210	-0.008	100	255651	2.24	2.56	
76 PCB-104	326	8.395	8.396	-0.001	95	175391	2.24	2.26	
77 PCB-121	326	8.751	8.751	0.000	98	181328	2.24	2.15	
78 PCB-155	360	8.848	8.849	-0.001	93	135152	2.24	2.32	
79 PCB-78	290	9.077	9.084	-0.007	93	164626	2.24	2.13	
80 PCB-142	360	9.522	9.522	0.000	91	99796	2.24	2.36	
81 PCB-184	394	9.575	9.572	0.003	96	96428	2.24	2.27	
* 82 PCB-167L	372	10.023	10.027	-0.004	73	20692	0.4000	0.4000	
83 PCB-204	428	10.249	10.250	-0.001	88	62458	2.24	2.26	
84 PCB-192	394	10.275	10.275	0.000	96	90639	2.24	2.33	

QC Flag Legend
Processing Flags

Reagents:
60L6SIMPCB_00013 Amount Added: 1.00 Units: mL

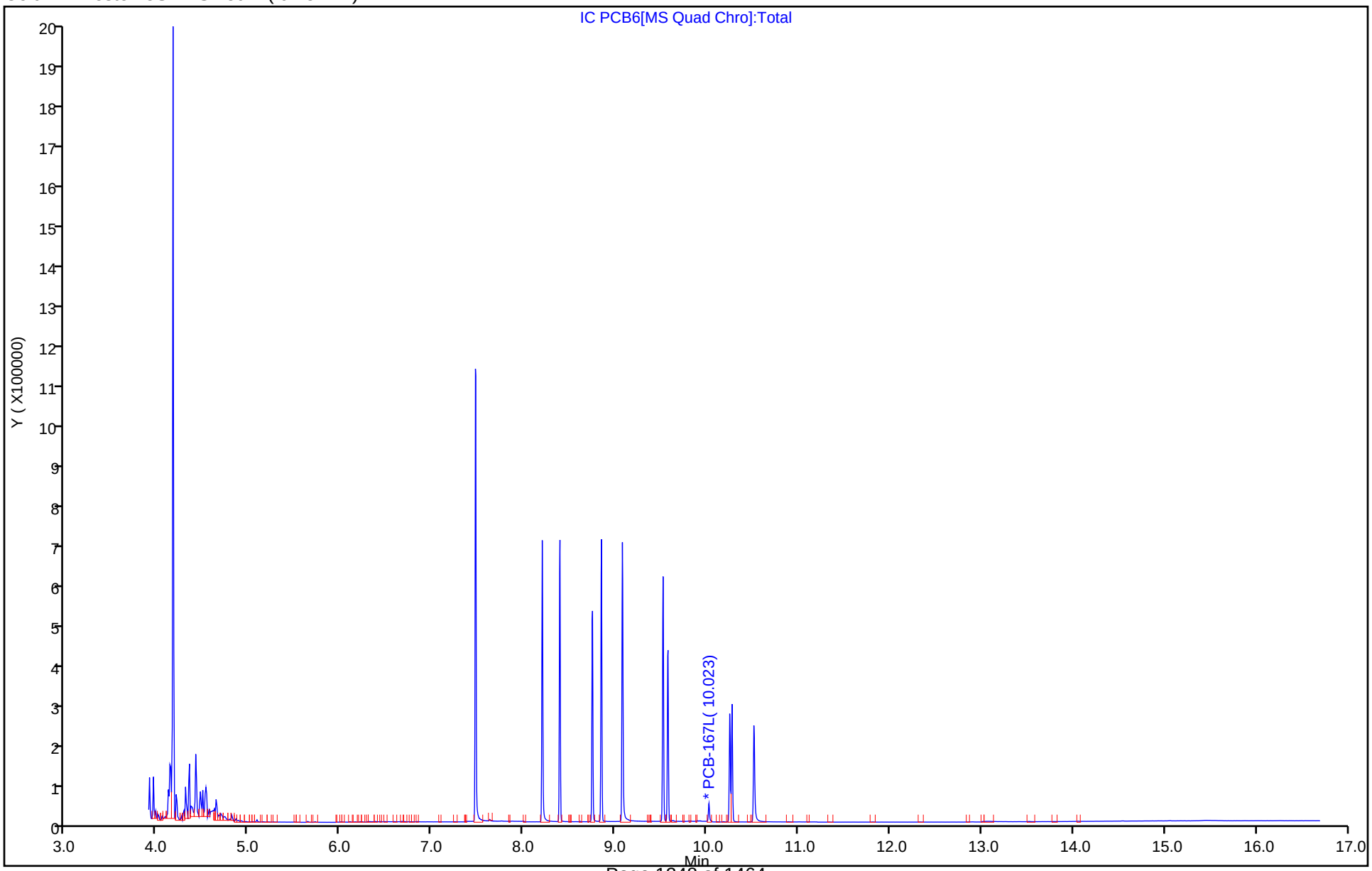
Report Date: 15-Nov-2023 14:41:51 Chrom Revision: 2.3 13-Nov-2023 16:16:38

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PCB6.D

Injection Date:	13-Nov-2023 13:35:55	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	ic pcb6			Worklist Smp#:	9
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PCB5.D
Lims ID: ic pcb5
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 13-Nov-2023 13:59:07 ALS Bottle#: 0 Worklist Smp#: 10
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030467-010
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1
Sublist: chrom-SIM_PAH_GCMS1*sub1

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 15-Nov-2023 14:41:52 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1623

First Level Reviewer: SK9U Date: 13-Nov-2023 15:29:00

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
74 PCB-14	222	7.476	7.479	-0.003	100	222973	1.12	1.13	
75 PCB-36	258	8.206	8.210	-0.004	100	125081	1.12	1.21	
76 PCB-104	326	8.395	8.396	-0.001	95	88741	1.12	1.10	
77 PCB-121	326	8.751	8.751	0.000	99	89998	1.12	1.17	
78 PCB-155	360	8.848	8.849	-0.001	94	67617	1.12	1.12	
79 PCB-78	290	9.081	9.084	-0.003	95	80044	1.12	1.19	
80 PCB-142	360	9.522	9.522	0.000	92	49656	1.12	1.13	
81 PCB-184	394	9.572	9.572	0.000	95	48631	1.12	1.10	
* 82 PCB-167L	372	10.023	10.027	-0.004	73	21494	0.4000	0.4000	
83 PCB-204	428	10.249	10.250	-0.001	86	31180	1.12	1.09	
84 PCB-192	394	10.275	10.275	0.000	96	45209	1.12	1.12	

QC Flag Legend
Processing Flags

Reagents:
60L5SIMPCB_00013 Amount Added: 1.00 Units: mL

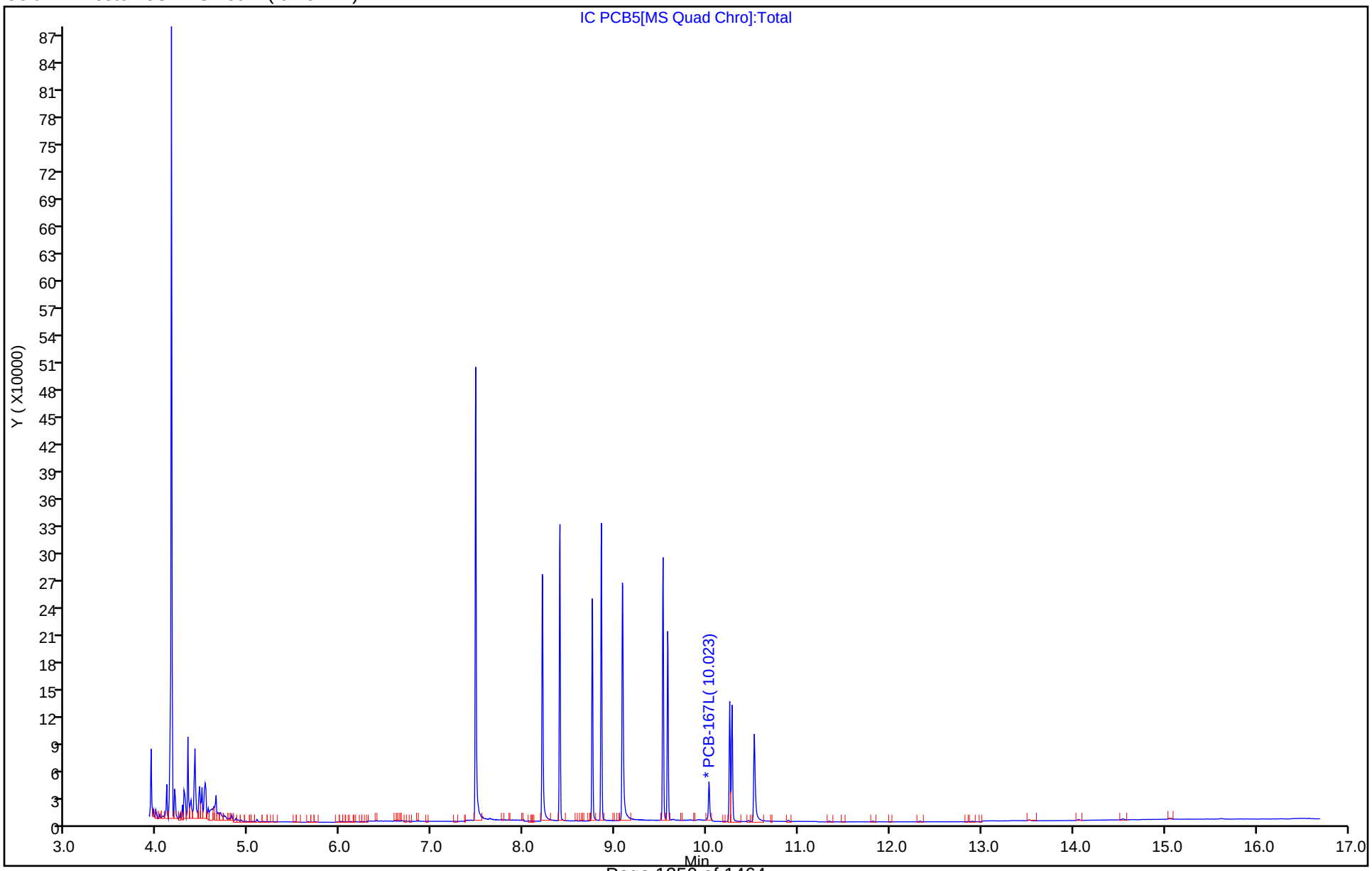
Report Date: 15-Nov-2023 14:41:52 Chrom Revision: 2.3 13-Nov-2023 16:16:38

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PCB5.D

Injection Date:	13-Nov-2023 13:59:07	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	ic pcb5			Worklist Smp#:	10
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PCB4.D
Lims ID: ic pcb4
Client ID:
Sample Type: IC Calib Level: 4
Inject. Date: 13-Nov-2023 14:22:15 ALS Bottle#: 0 Worklist Smp#: 11
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030467-011
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1
Sublist: chrom-SIM_PAH_GCMS1*sub1

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 15-Nov-2023 14:41:54 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1623

First Level Reviewer: SK9U Date: 13-Nov-2023 15:29:18

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
74 PCB-14	222	7.479	7.479	0.000	99	98635	0.5600	0.5538	
75 PCB-36	258	8.210	8.210	0.000	100	51191	0.5600	0.5460	
76 PCB-104	326	8.396	8.396	0.000	95	38745	0.5600	0.5325	
77 PCB-121	326	8.751	8.751	0.000	97	38428	0.5600	0.5985	
78 PCB-155	360	8.849	8.849	0.000	94	29916	0.5600	0.5476	
79 PCB-78	290	9.084	9.084	0.000	95	32612	0.5600	0.6076	
80 PCB-142	360	9.522	9.522	0.000	91	21263	0.5600	0.5349	
81 PCB-184	394	9.572	9.572	0.000	95	21436	0.5600	0.5386	
* 82 PCB-167L	372	10.027	10.027	0.000	72	19430	0.4000	0.4000	
83 PCB-204	428	10.250	10.250	0.000	87	13451	0.5600	0.5194	
84 PCB-192	394	10.275	10.275	0.000	96	19356	0.5600	0.5304	

QC Flag Legend
Processing Flags

Reagents:
60L4SIMPCB_00016 Amount Added: 1.00 Units: mL

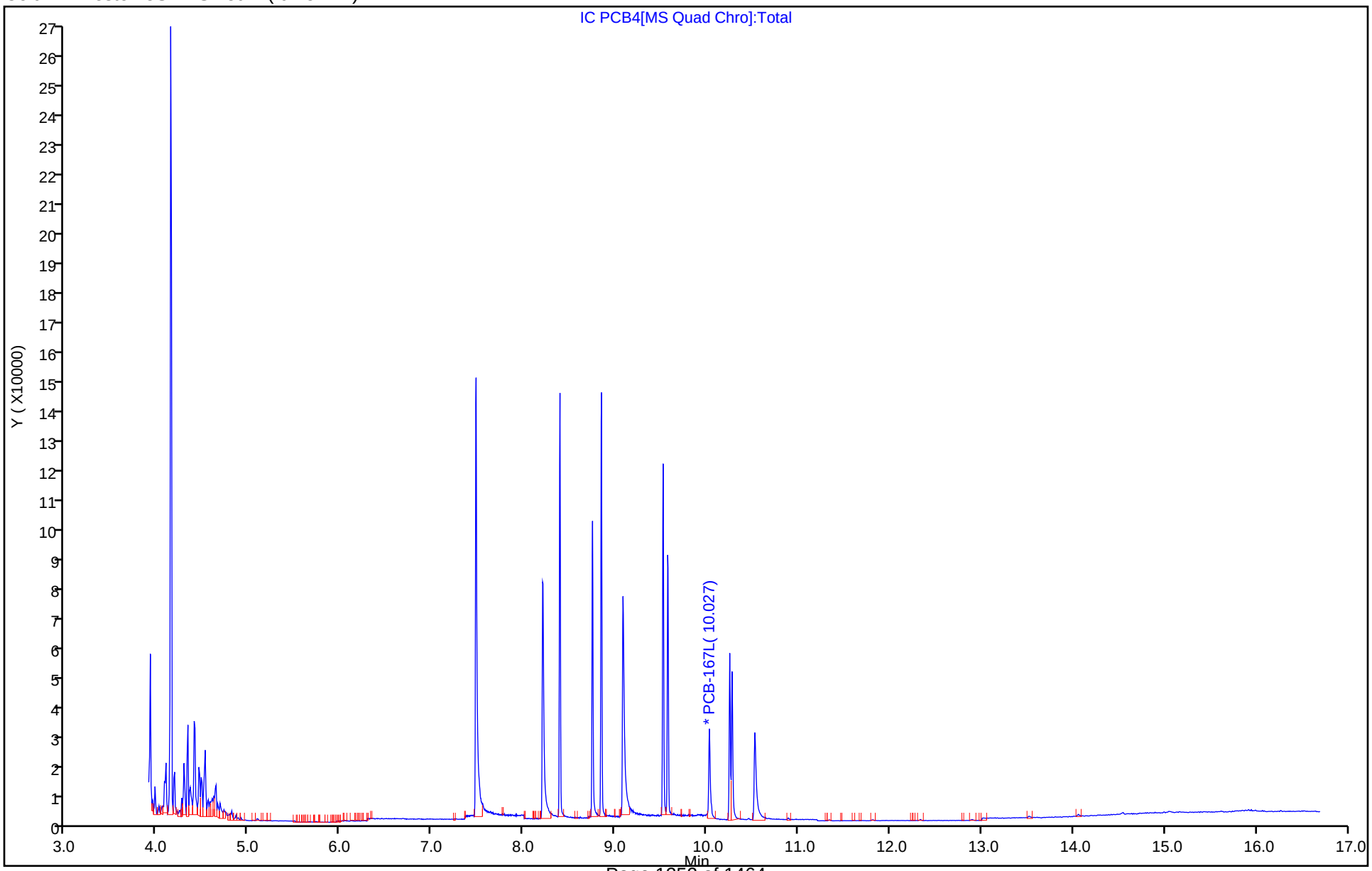
Report Date: 15-Nov-2023 14:41:54 Chrom Revision: 2.3 13-Nov-2023 16:16:38

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PCB4.D

Injection Date:	13-Nov-2023 14:22:15	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	ic pcb4			Worklist Smp#:	11
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PCB3.D
Lims ID: ic pcb3
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 13-Nov-2023 14:45:21 ALS Bottle#: 0 Worklist Smp#: 12
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030467-012
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1
Sublist: chrom-SIM_PAH_GCMS1*sub1

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 15-Nov-2023 14:41:56 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1623

First Level Reviewer: SK9U Date: 13-Nov-2023 15:29:33

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
74 PCB-14	222	7.490	7.479	0.011	100	49679	0.2800	0.2643	
75 PCB-36	258	8.218	8.210	0.008	99	25161	0.2800	0.2543	
76 PCB-104	326	8.395	8.396	-0.001	94	20598	0.2800	0.2683	
77 PCB-121	326	8.754	8.751	0.003	97	20566	0.2800	0.3172	
78 PCB-155	360	8.849	8.849	0.000	91	15505	0.2800	0.2690	
79 PCB-78	290	9.094	9.084	0.010	94	14497	0.2800	0.2769	
80 PCB-142	360	9.525	9.522	0.003	89	11139	0.2800	0.2655	
81 PCB-184	394	9.576	9.572	0.004	96	11181	0.2800	0.2662	
* 82 PCB-167L	372	10.030	10.027	0.003	76	20502	0.4000	0.4000	
83 PCB-204	428	10.250	10.250	0.000	87	7430	0.2800	0.2719	
84 PCB-192	394	10.280	10.275	0.005	98	10545	0.2800	0.2738	

QC Flag Legend
Processing Flags

Reagents:
60L3SIMPCB_00013 Amount Added: 1.00 Units: mL

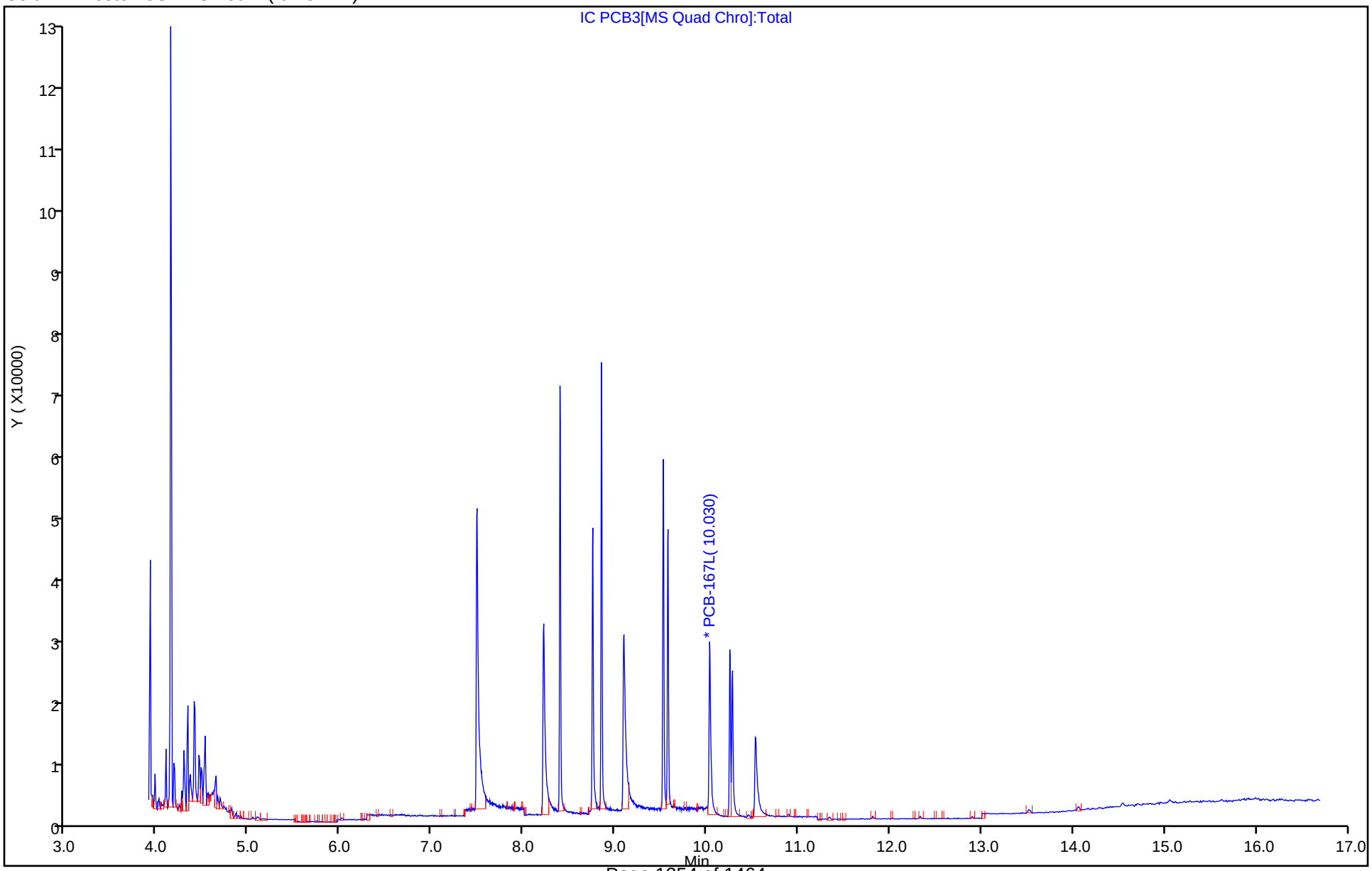
Report Date: 15-Nov-2023 14:41:56 Chrom Revision: 2.3 13-Nov-2023 16:16:38

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PCB3.D

Injection Date:	13-Nov-2023 14:45:21	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	ic pcb3			Worklist Smp#:	12
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PCB2.D
Lims ID: ic pcb2
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 13-Nov-2023 15:08:37 ALS Bottle#: 0 Worklist Smp#: 13
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030467-013
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1
Sublist: chrom-SIM_PAH_GCMS1*sub1

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 15-Nov-2023 14:41:57 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1623

First Level Reviewer: SK9U Date: 13-Nov-2023 15:31:42

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
74 PCB-14	222	7.538	7.479	0.059	96	9375	0.0560	0.0541	M
75 PCB-36	258	8.257	8.210	0.047	100	4319	0.0560	0.0473	M
76 PCB-104	326	8.403	8.396	0.007	98	3784	0.0560	0.0534	
77 PCB-121	326	8.765	8.751	0.014	98	3258	0.0560	0.0568	
78 PCB-155	360	8.856	8.849	0.007	92	2852	0.0560	0.0536	
79 PCB-78	290	9.112	9.084	0.028	94	2786	0.0560	0.0609	M
80 PCB-142	360	9.532	9.522	0.010	90	1987	0.0560	0.0513	
81 PCB-184	394	9.583	9.572	0.011	86	2149	0.0560	0.0555	
* 82 PCB-167L	372	10.040	10.027	0.013	74	18915	0.4000	0.4000	
83 PCB-204	428	10.255	10.250	0.005	88	1467	0.0560	0.0582	
84 PCB-192	394	10.285	10.275	0.010	93	1999	0.0560	0.0563	

QC Flag Legend

Processing Flags
Review Flags
M - Manually Integrated

Reagents:

60L2SIMPCB_00013 Amount Added: 1.00 Units: mL

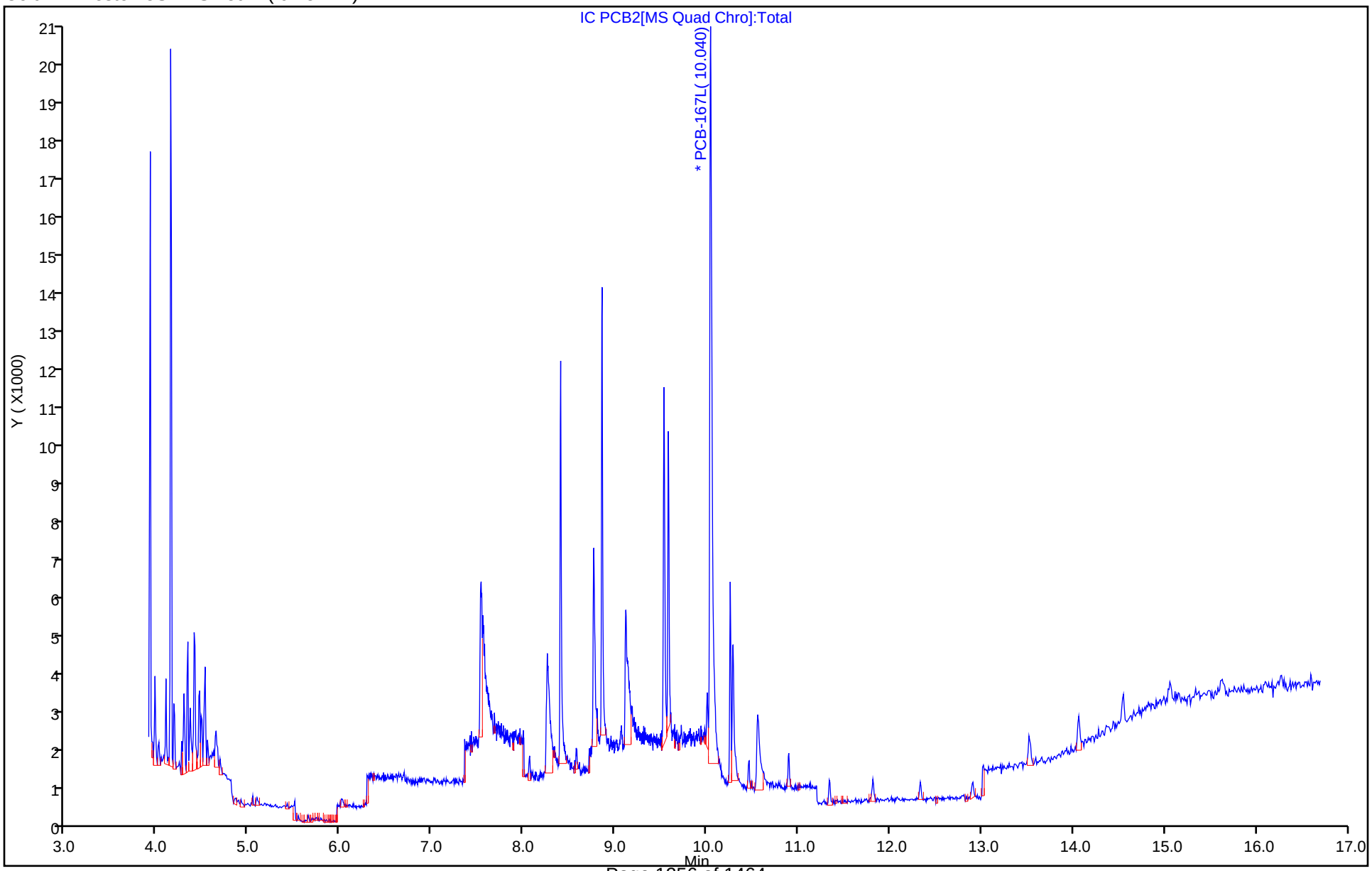
Report Date: 15-Nov-2023 14:41:58 Chrom Revision: 2.3 13-Nov-2023 16:16:38

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PCB2.D

Injection Date:	13-Nov-2023 15:08:37	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	ic pcb2			Worklist Smp#:	13
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



Manual Integration/User Assign Peak Report

Eurofins Knoxville

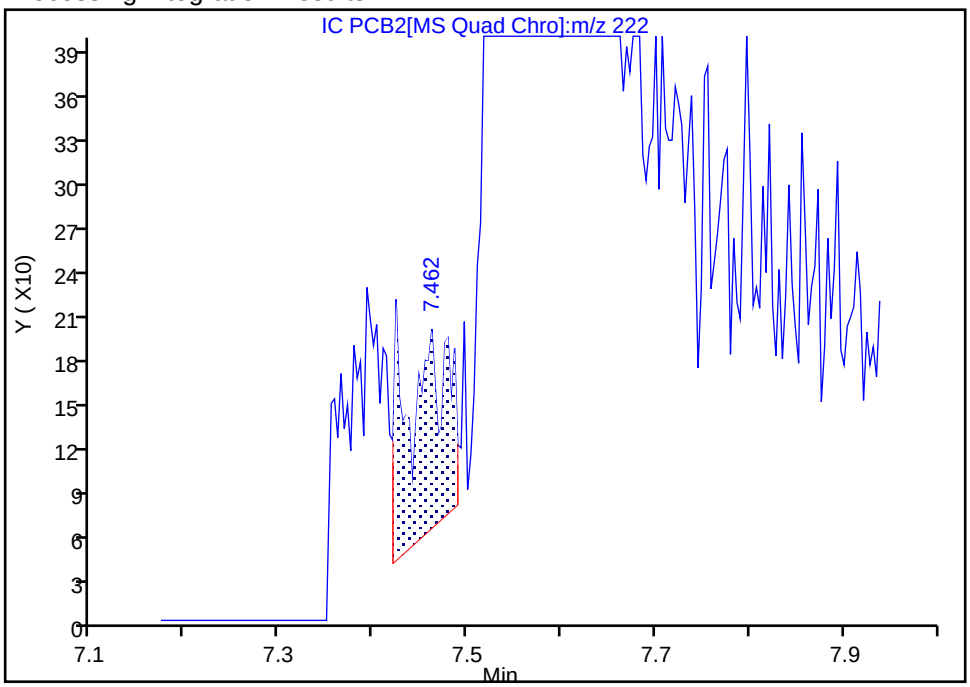
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PCB2.D				
Injection Date:	13-Nov-2023 15:08:37	Instrument ID:	GCMS1		
Lims ID:	ic pcb2				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	13
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

74 PCB-14, CAS: 34883-41-5

Signal: 1

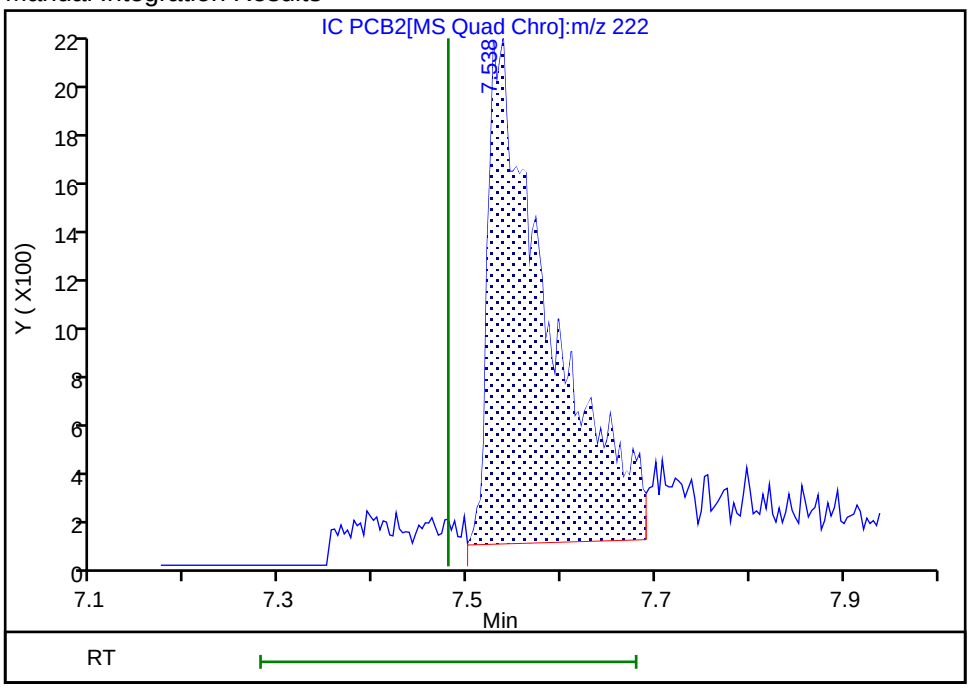
Processing Integration Results

RT: 7.46
Area: 416
Amount: 0.002591
Amount Units: ug/ml



Manual Integration Results

RT: 7.54
Area: 9375
Amount: 0.054071
Amount Units: ug/ml



Reviewer: SK9U, 13-Nov-2023 15:54:08 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

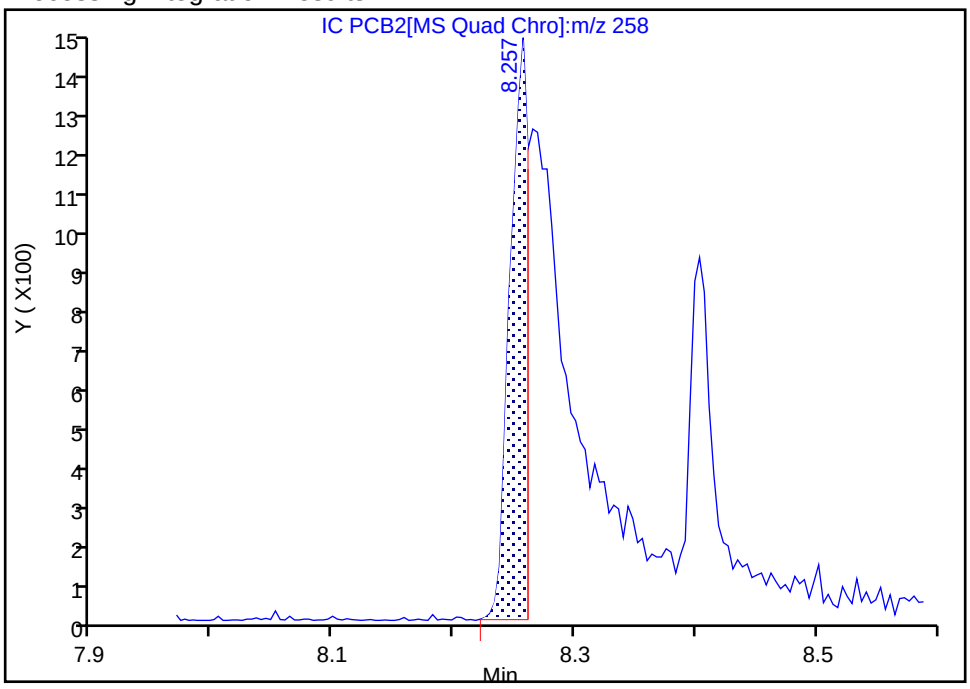
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PCB2.D
Injection Date: 13-Nov-2023 15:08:37 Instrument ID: GCMS1
Lims ID: ic pcb2
Client ID:
Operator ID: TAI\knxinstgcms1 ALS Bottle#: 0 Worklist Smp#: 13
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: SIM_PAH_GCMS1 Limit Group: SOG - PAH IsoDil - ICAL
Column: Restek-5Sil MS 25um (0.25 mm) Detector MS SCAN

75 PCB-36, CAS: 38444-87-0

Signal: 1

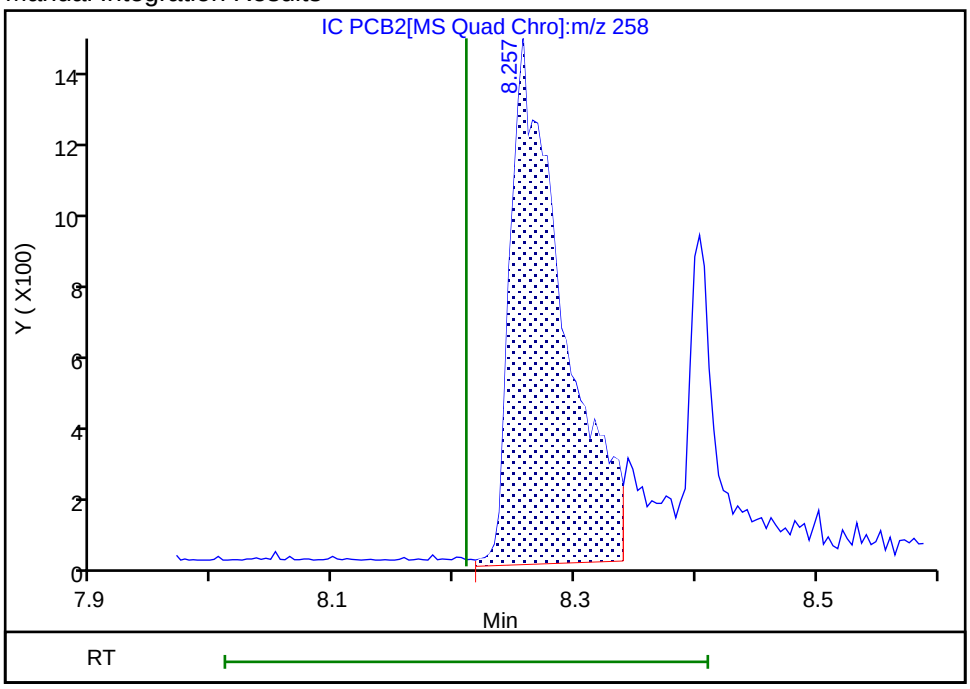
Processing Integration Results

RT: 8.26
Area: 1473
Amount: 0.035336
Amount Units: ug/ml



Manual Integration Results

RT: 8.26
Area: 4319
Amount: 0.047319
Amount Units: ug/ml



Reviewer: SK9U, 13-Nov-2023 16:03:19 -05:00:00 (UTC)
Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

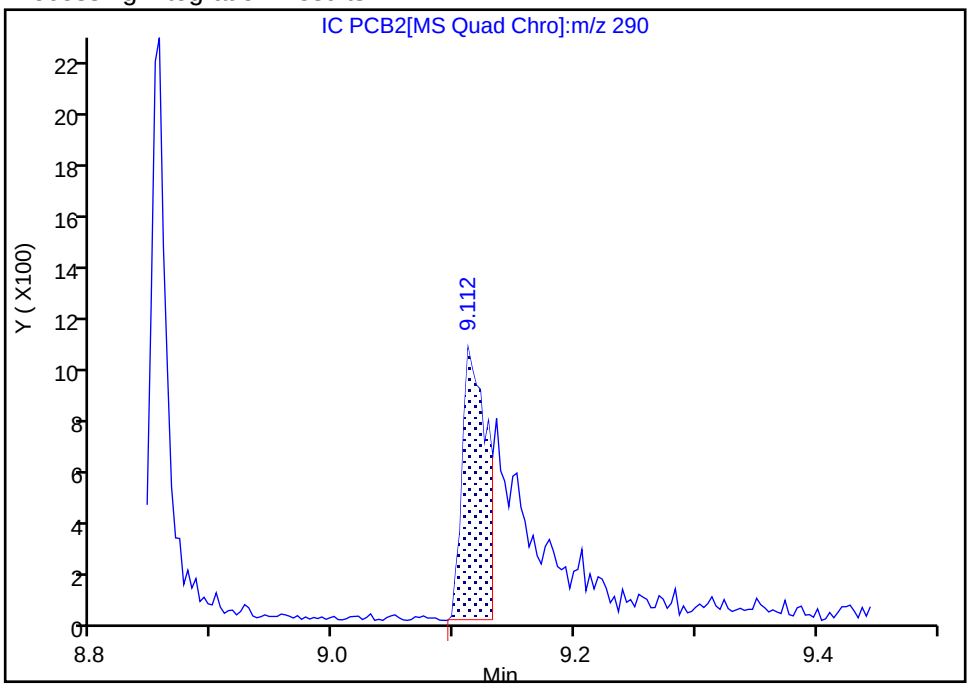
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PCB2.D				
Injection Date:	13-Nov-2023 15:08:37	Instrument ID:	GCMS1		
Lims ID:	ic pcb2				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	13
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

79 PCB-78, CAS: 70362-49-1

Signal: 1

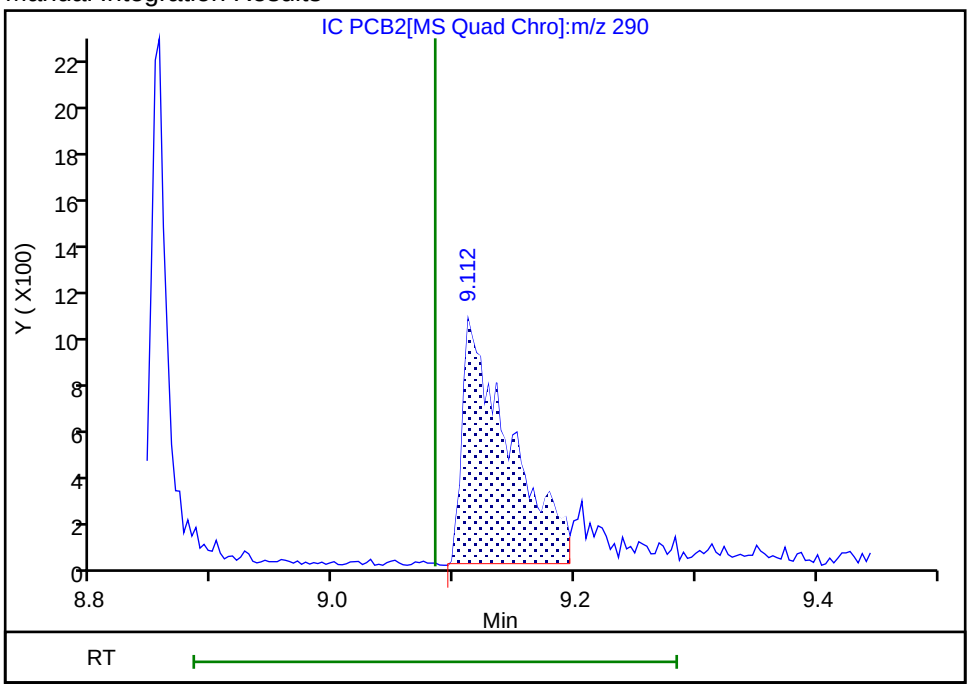
Processing Integration Results

RT: 9.11
Area: 1441
Amount: 0.031833
Amount Units: ug/ml



Manual Integration Results

RT: 9.11
Area: 2786
Amount: 0.060944
Amount Units: ug/ml



Reviewer: SK9U, 13-Nov-2023 15:59:16 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PCB1.D
Lims ID: ic pcb1
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 13-Nov-2023 15:31:44 ALS Bottle#: 0 Worklist Smp#: 14
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030467-014
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1
Sublist: chrom-SIM_PAH_GCMS1*sub1

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 15-Nov-2023 14:41:59 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1623

First Level Reviewer: SK9U Date: 13-Nov-2023 15:53:09

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
74 PCB-14	222	7.500	7.479	0.021	91	2491	0.0196	0.0171	M
75 PCB-36	258	8.218	8.210	0.008	94	1263	0.0196	0.0165	
76 PCB-104	326	8.399	8.396	0.003	92	1143	0.0196	0.0192	
77 PCB-121	326	8.751	8.751	0.000	92	1074	0.0196	0.0224	
78 PCB-155	360	8.852	8.849	0.003	92	778	0.0196	0.0174	
79 PCB-78	290	9.091	9.084	0.007	96	917	0.0196	0.0241	M
80 PCB-142	360	9.525	9.522	0.003	90	583	0.0196	0.0179	
81 PCB-184	394	9.575	9.572	0.003	89	630	0.0196	0.0194	
* 82 PCB-167L	372	10.026	10.027	-0.001	74	15890	0.4000	0.4000	
83 PCB-204	428	10.254	10.250	0.004	72	420	0.0196	0.0198	
84 PCB-192	394	10.280	10.275	0.005	98	520	0.0196	0.0174	

QC Flag Legend

Processing Flags
Review Flags
M - Manually Integrated

Reagents:

60L1SIMPCB_00014 Amount Added: 1.00 Units: mL

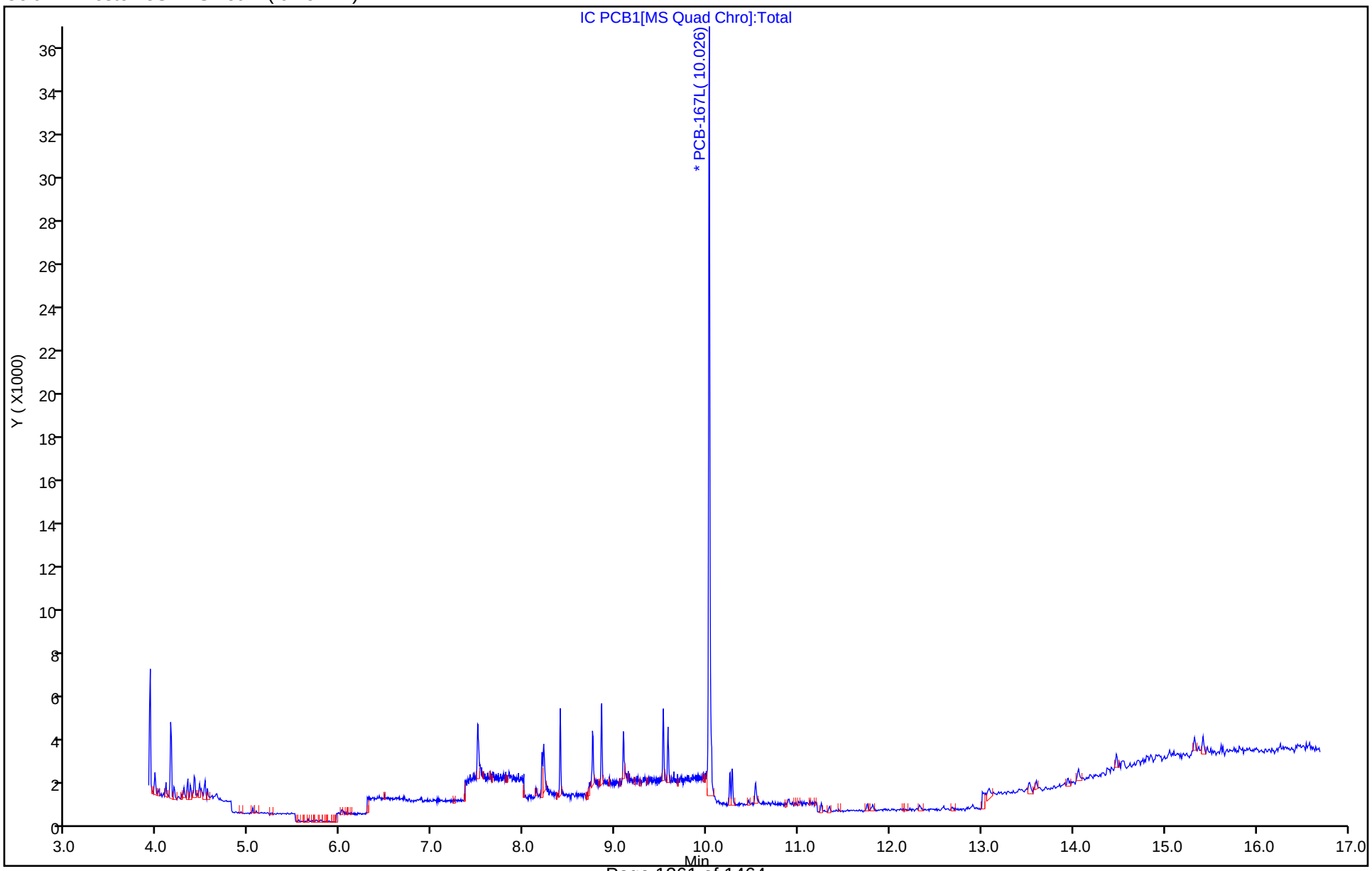
Report Date: 15-Nov-2023 14:41:59 Chrom Revision: 2.3 13-Nov-2023 16:16:38

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PCB1.D

Injection Date:	13-Nov-2023 15:31:44	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	ic pcb1			Worklist Smp#:	14
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



Manual Integration/User Assign Peak Report

Eurofins Knoxville

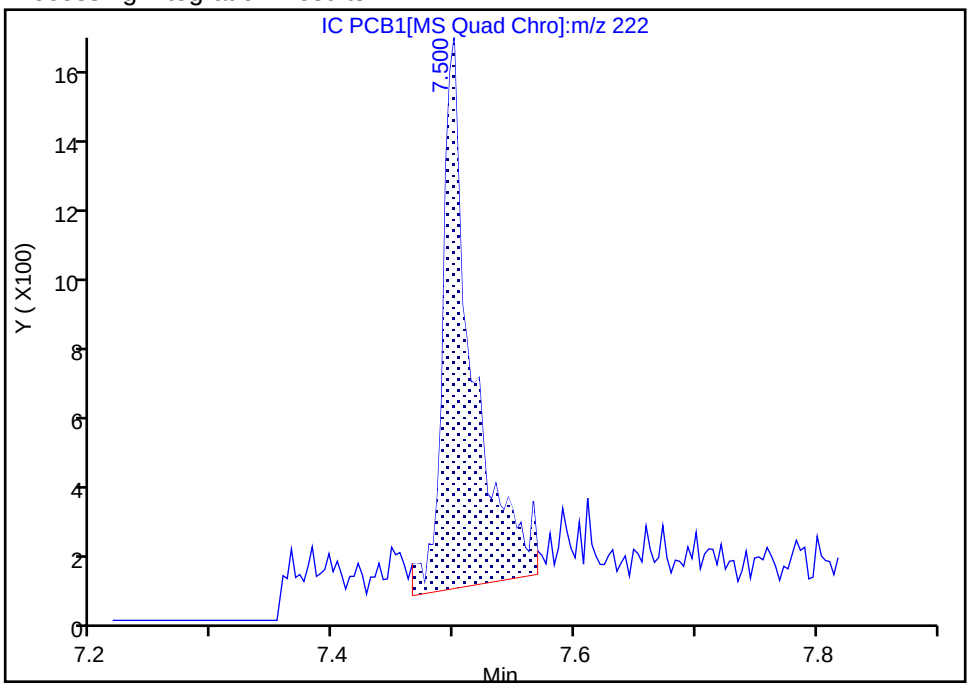
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PCB1.D				
Injection Date:	13-Nov-2023 15:31:44	Instrument ID:	GCMS1		
Lims ID:	ic pcb1				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

74 PCB-14, CAS: 34883-41-5

Signal: 1

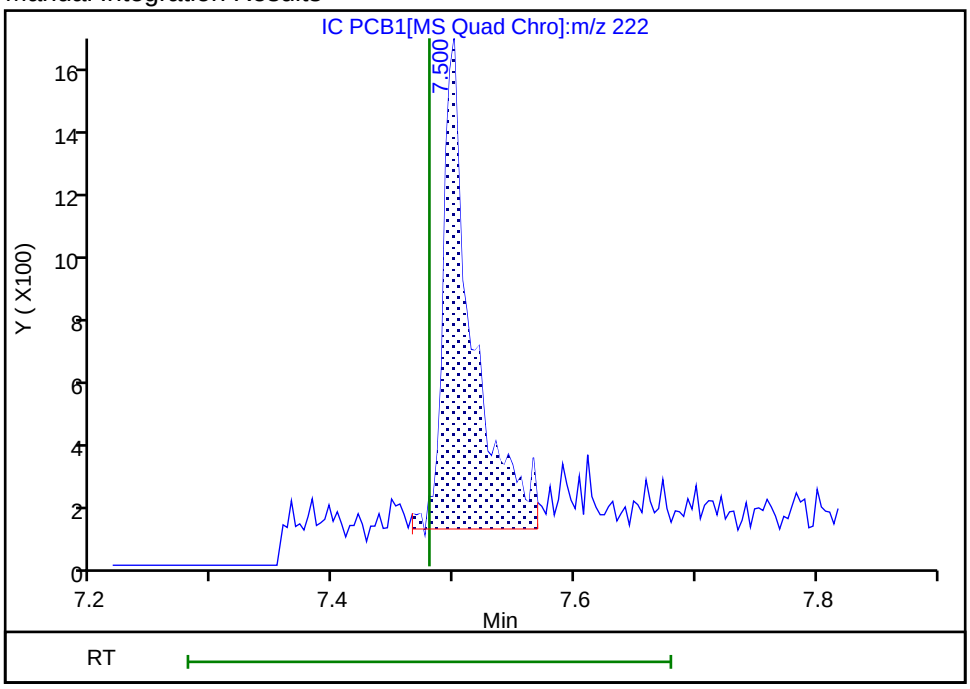
Processing Integration Results

RT: 7.50
Area: 2601
Amount: 0.019228
Amount Units: ug/ml



Manual Integration Results

RT: 7.50
Area: 2491
Amount: 0.017102
Amount Units: ug/ml



Reviewer: SK9U, 13-Nov-2023 15:51:55 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

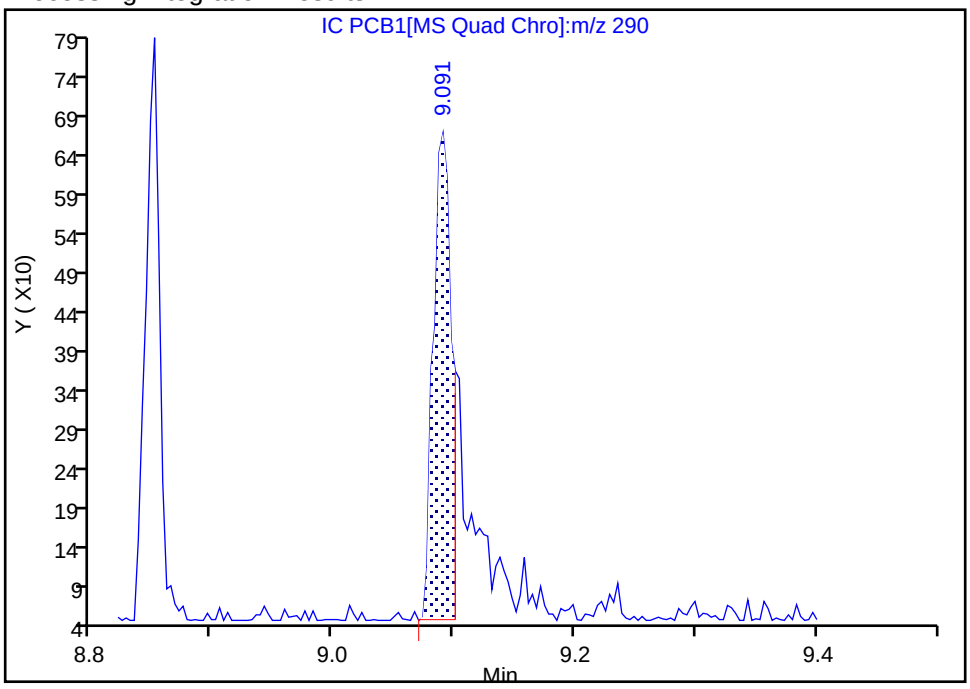
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PCB1.D				
Injection Date:	13-Nov-2023 15:31:44	Instrument ID:	GCMS1		
Lims ID:	ic pcb1				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	14
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

79 PCB-78, CAS: 70362-49-1

Signal: 1

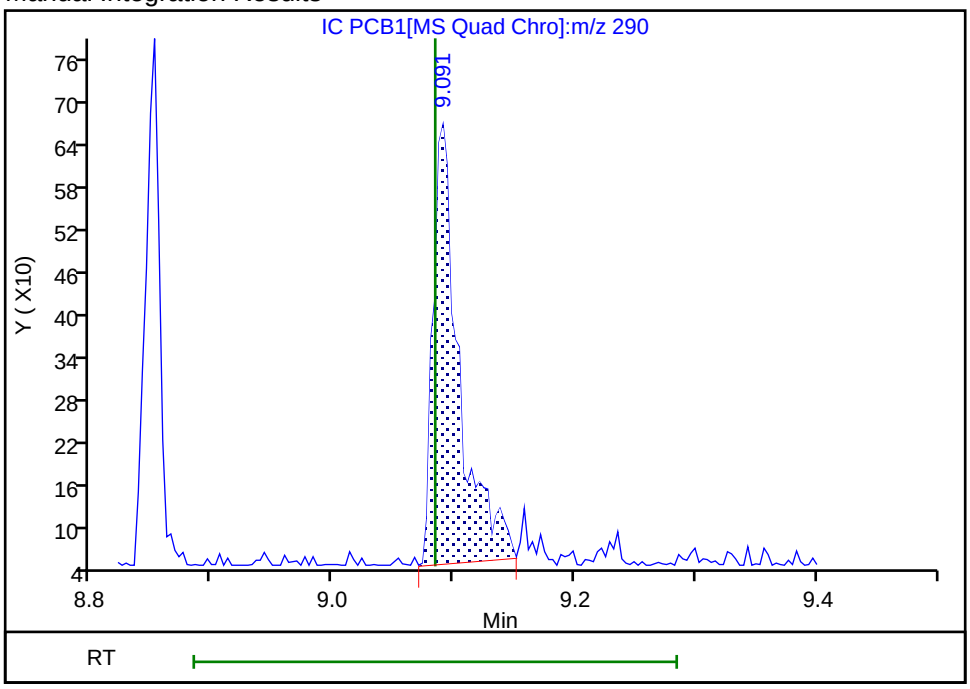
Processing Integration Results

RT: 9.09
Area: 648
Amount: 0.013511
Amount Units: ug/ml



Manual Integration Results

RT: 9.09
Area: 917
Amount: 0.024111
Amount Units: ug/ml



Reviewer: SK9U, 13-Nov-2023 15:58:49 -05:00:00 (UTC)

Audit Action: Manually Integrated Audit Reason: Baseline

Calibration / PCB-14

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	ISTD
Response Base:	AREA
RF Rounding:	0

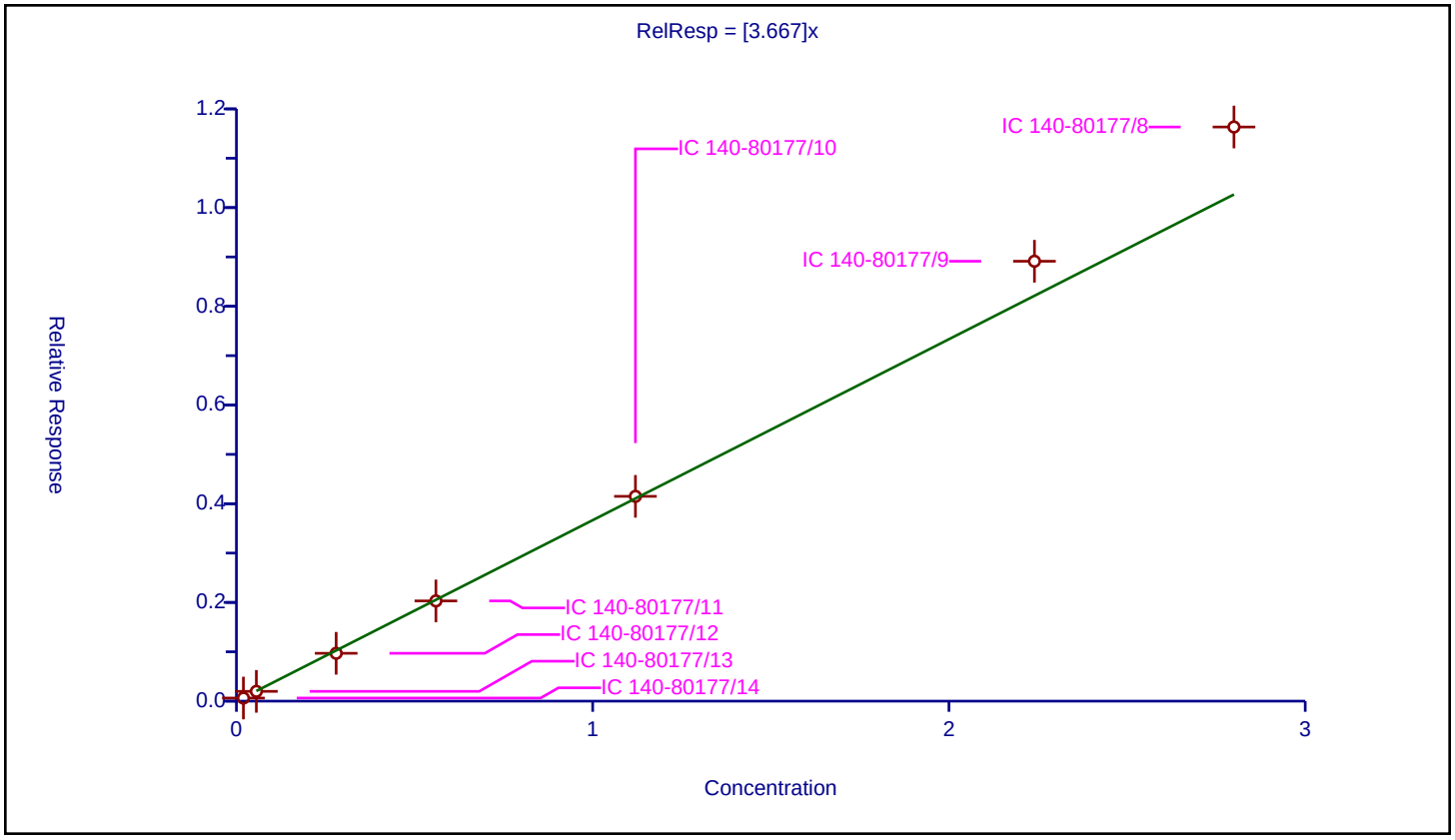
Curve Coefficients

Intercept:	0
Slope:	3.667

Error Coefficients

Standard Error:	309000
Relative Standard Error:	8.7
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.992

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/14	0.0196	0.062706	0.4	15890.0	3.199291	Y
2	IC 140-80177/13	0.056	0.198255	0.4	18915.0	3.540274	Y
3	IC 140-80177/12	0.28	0.969252	0.4	20502.0	3.461614	Y
4	IC 140-80177/11	0.56	2.030571	0.4	19430.0	3.62602	Y
5	IC 140-80177/10	1.12	4.149493	0.4	21494.0	3.704904	Y
6	IC 140-80177/9	2.24	8.913435	0.4	20692.0	3.979212	Y
7	IC 140-80177/8	2.8	11.63281	0.4	18836.0	4.154575	Y



Calibration / PCB-36

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	ISTD
Response Base:	AREA
RF Rounding:	0

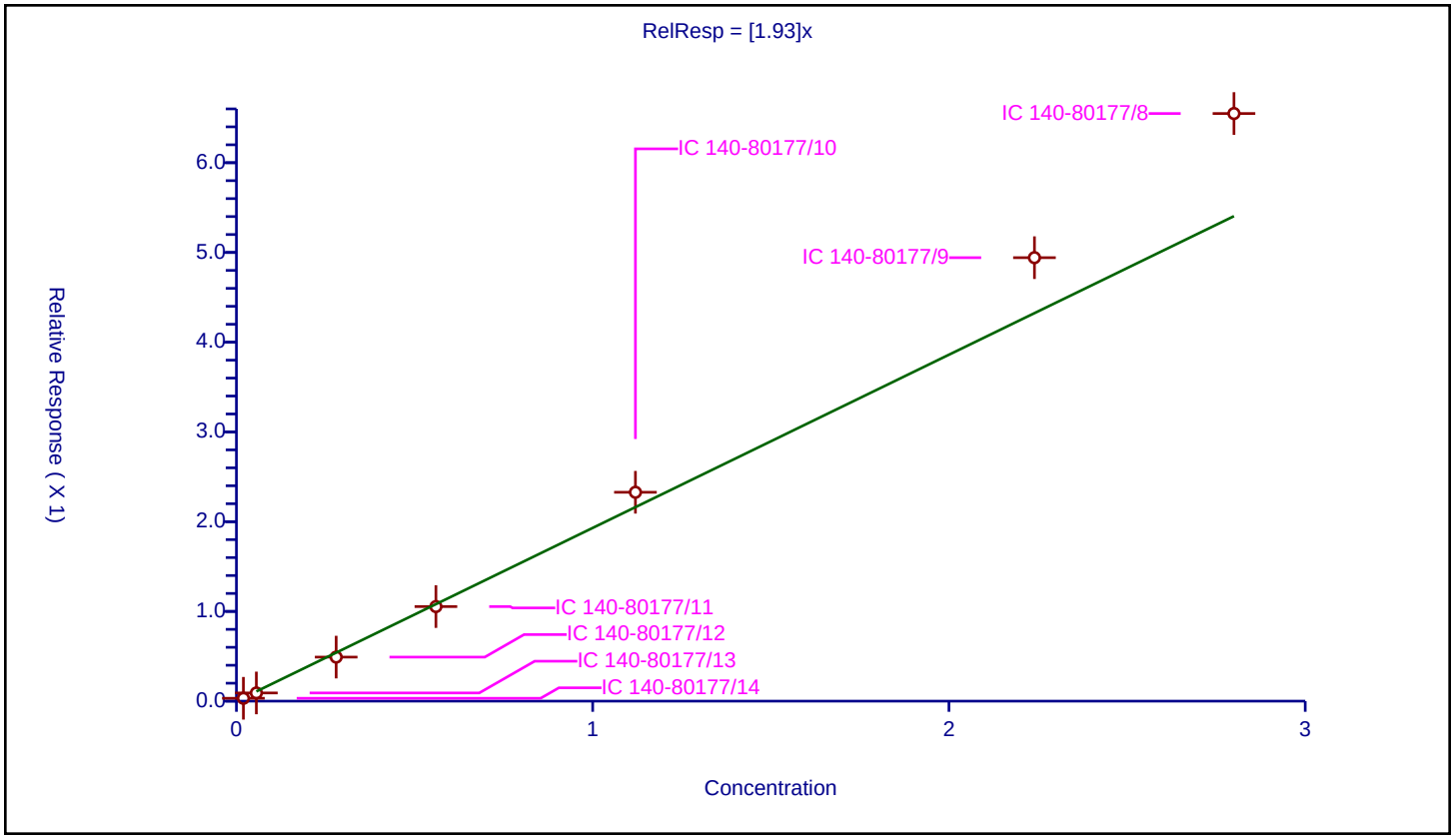
Curve Coefficients

Intercept:	0
Slope:	1.93

Error Coefficients

Standard Error:	173000
Relative Standard Error:	14.7
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.977

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/14	0.0196	0.031794	0.4	15890.0	1.622121	Y
2	IC 140-80177/13	0.056	0.091335	0.4	18915.0	1.630981	Y
3	IC 140-80177/12	0.28	0.490898	0.4	20502.0	1.753209	Y
4	IC 140-80177/11	0.56	1.053855	0.4	19430.0	1.881884	Y
5	IC 140-80177/10	1.12	2.327738	0.4	21494.0	2.078337	Y
6	IC 140-80177/9	2.24	4.942026	0.4	20692.0	2.206262	Y
7	IC 140-80177/8	2.8	6.548333	0.4	18836.0	2.33869	Y



Calibration / PCB-104

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	ISTD
Response Base:	AREA
RF Rounding:	0

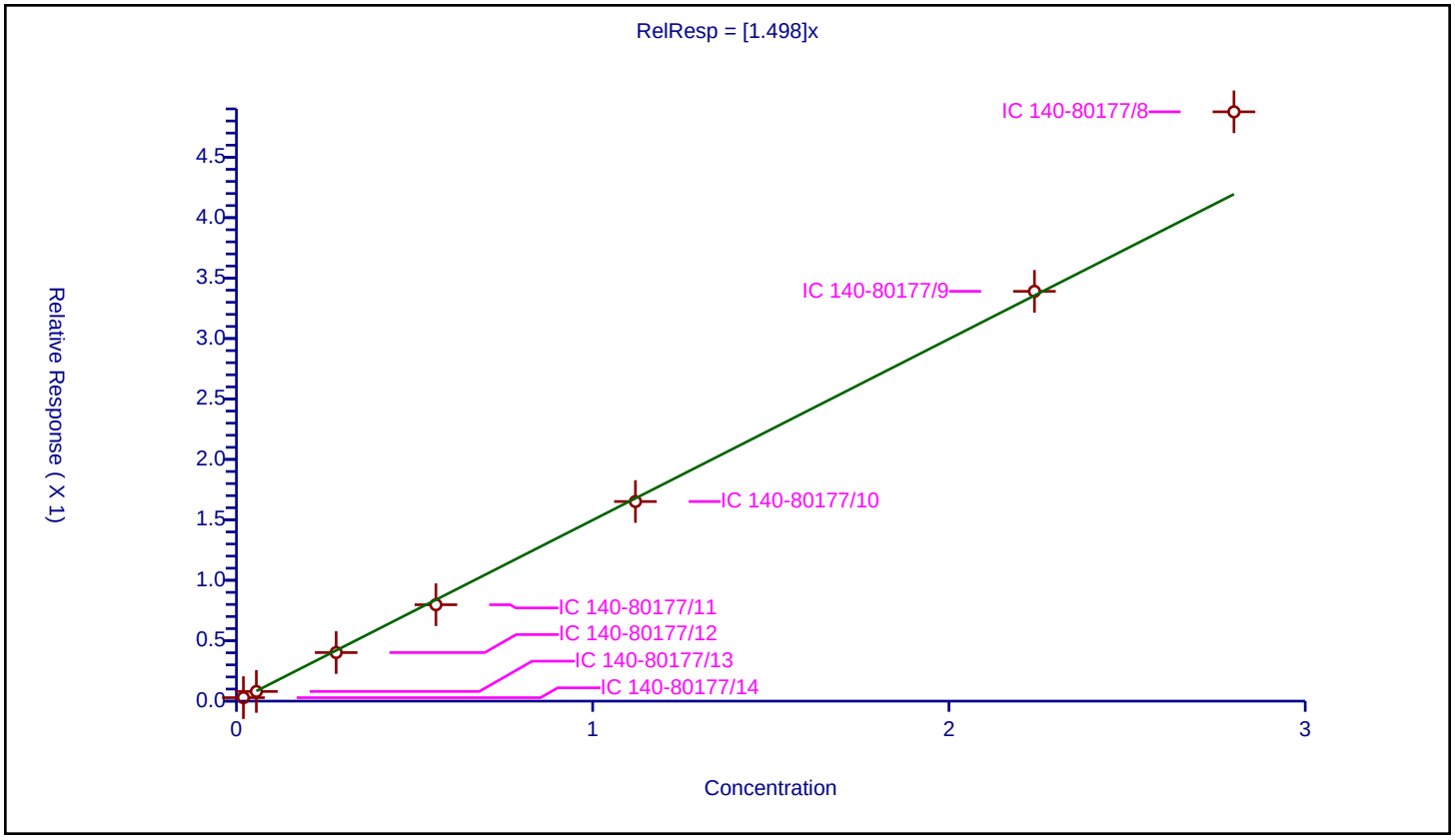
Curve Coefficients

Intercept:	0
Slope:	1.498

Error Coefficients

Standard Error:	125000
Relative Standard Error:	7.5
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.994

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/14	0.0196	0.028773	0.4	15890.0	1.468001	Y
2	IC 140-80177/13	0.056	0.080021	0.4	18915.0	1.428949	Y
3	IC 140-80177/12	0.28	0.401873	0.4	20502.0	1.435261	Y
4	IC 140-80177/11	0.56	0.797633	0.4	19430.0	1.424344	Y
5	IC 140-80177/10	1.12	1.651456	0.4	21494.0	1.474514	Y
6	IC 140-80177/9	2.24	3.390508	0.4	20692.0	1.51362	Y
7	IC 140-80177/8	2.8	4.875834	0.4	18836.0	1.741369	Y



Calibration / PCB-121

Curve Type:	Quadratic
Weighting:	None
Origin:	Force
Dependency:	Response
Calib Mode:	ISTD
Response Base:	AREA
RF Rounding:	0

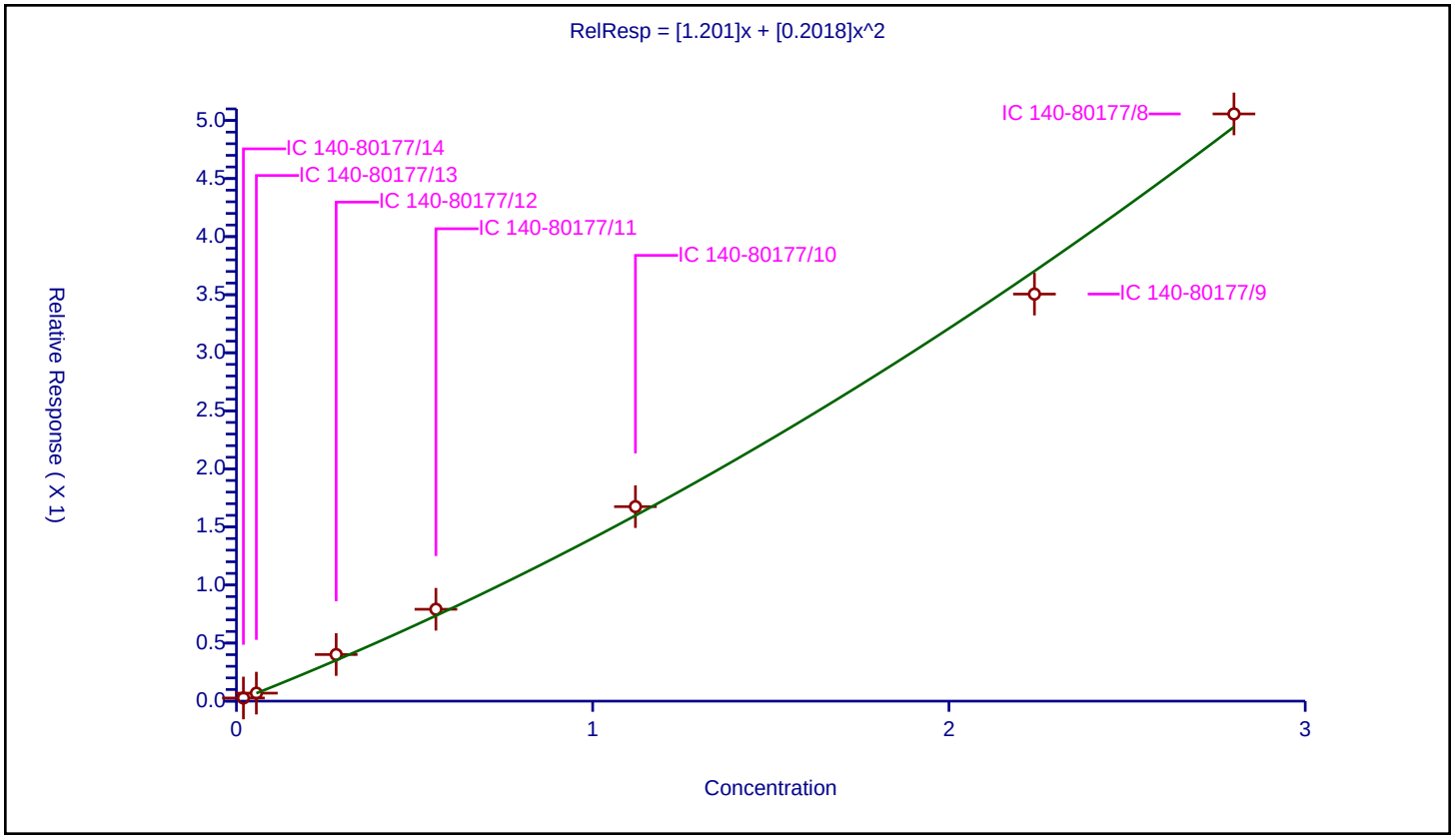
Curve Coefficients

Intercept:	0
Slope:	1.201
Second Order:	0.2018

Error Coefficients

Standard Error:	141000
Relative Standard Error:	9.7
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/14	0.0196	0.027036	0.4	15890.0	1.379381	Y
2	IC 140-80177/13	0.056	0.068898	0.4	18915.0	1.230316	Y
3	IC 140-80177/12	0.28	0.401249	0.4	20502.0	1.433031	Y
4	IC 140-80177/11	0.56	0.791107	0.4	19430.0	1.41269	Y
5	IC 140-80177/10	1.12	1.674849	0.4	21494.0	1.495401	Y
6	IC 140-80177/9	2.24	3.505277	0.4	20692.0	1.564856	Y
7	IC 140-80177/8	2.8	5.056764	0.4	18836.0	1.805987	Y



Calibration / PCB-155

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	ISTD
Response Base:	AREA
RF Rounding:	0

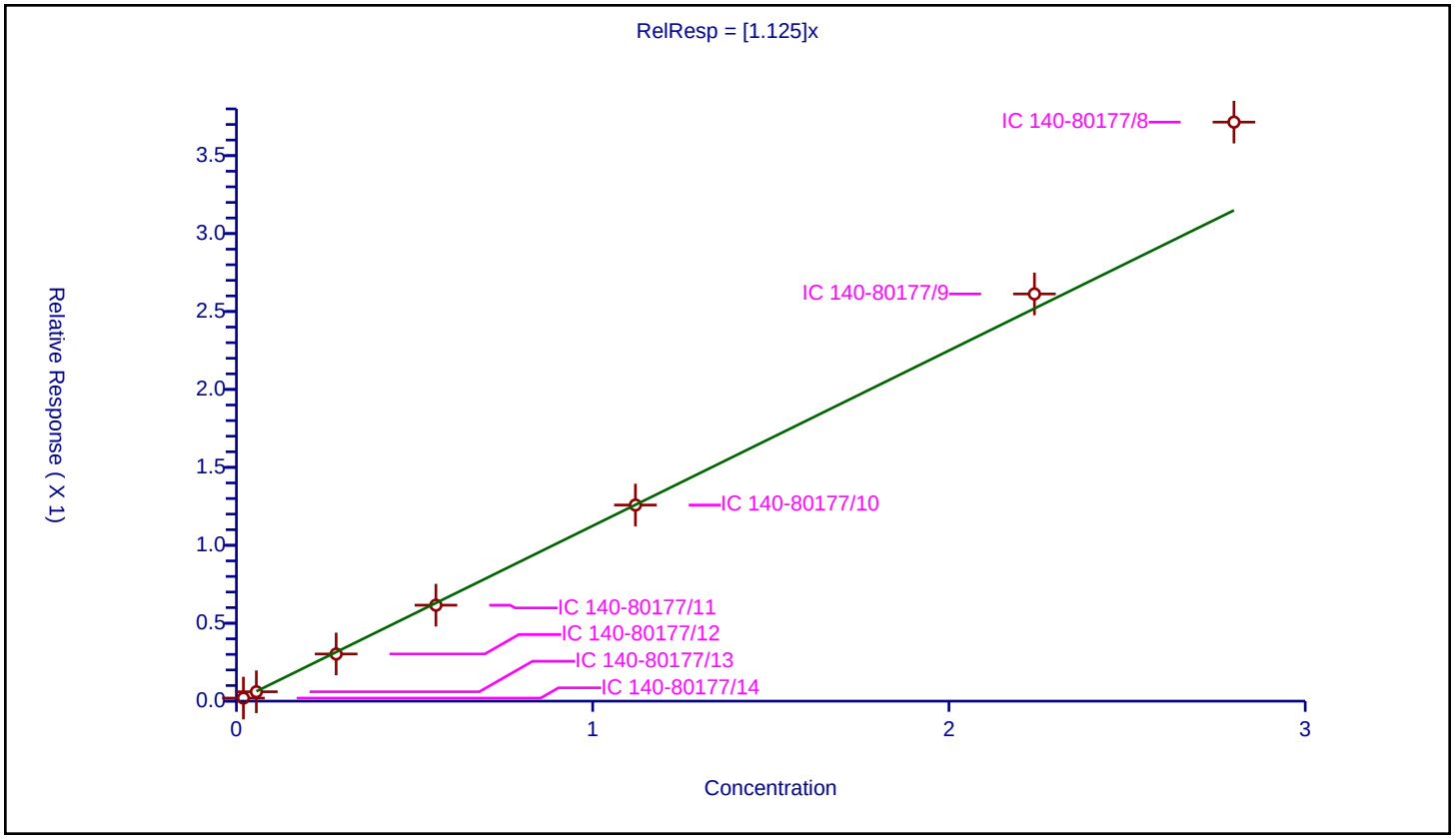
Curve Coefficients

Intercept:	0
Slope:	1.125

Error Coefficients

Standard Error:	95400
Relative Standard Error:	9.1
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.991

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/14	0.0196	0.019585	0.4	15890.0	0.999217	Y
2	IC 140-80177/13	0.056	0.060312	0.4	18915.0	1.076999	Y
3	IC 140-80177/12	0.28	0.302507	0.4	20502.0	1.080382	Y
4	IC 140-80177/11	0.56	0.615872	0.4	19430.0	1.099772	Y
5	IC 140-80177/10	1.12	1.258342	0.4	21494.0	1.12352	Y
6	IC 140-80177/9	2.24	2.612643	0.4	20692.0	1.166358	Y
7	IC 140-80177/8	2.8	3.715099	0.4	18836.0	1.326821	Y



Calibration / PCB-78

Curve Type:	Quadratic
Weighting:	None
Origin:	Force
Dependency:	Response
Calib Mode:	ISTD
Response Base:	AREA
RF Rounding:	0

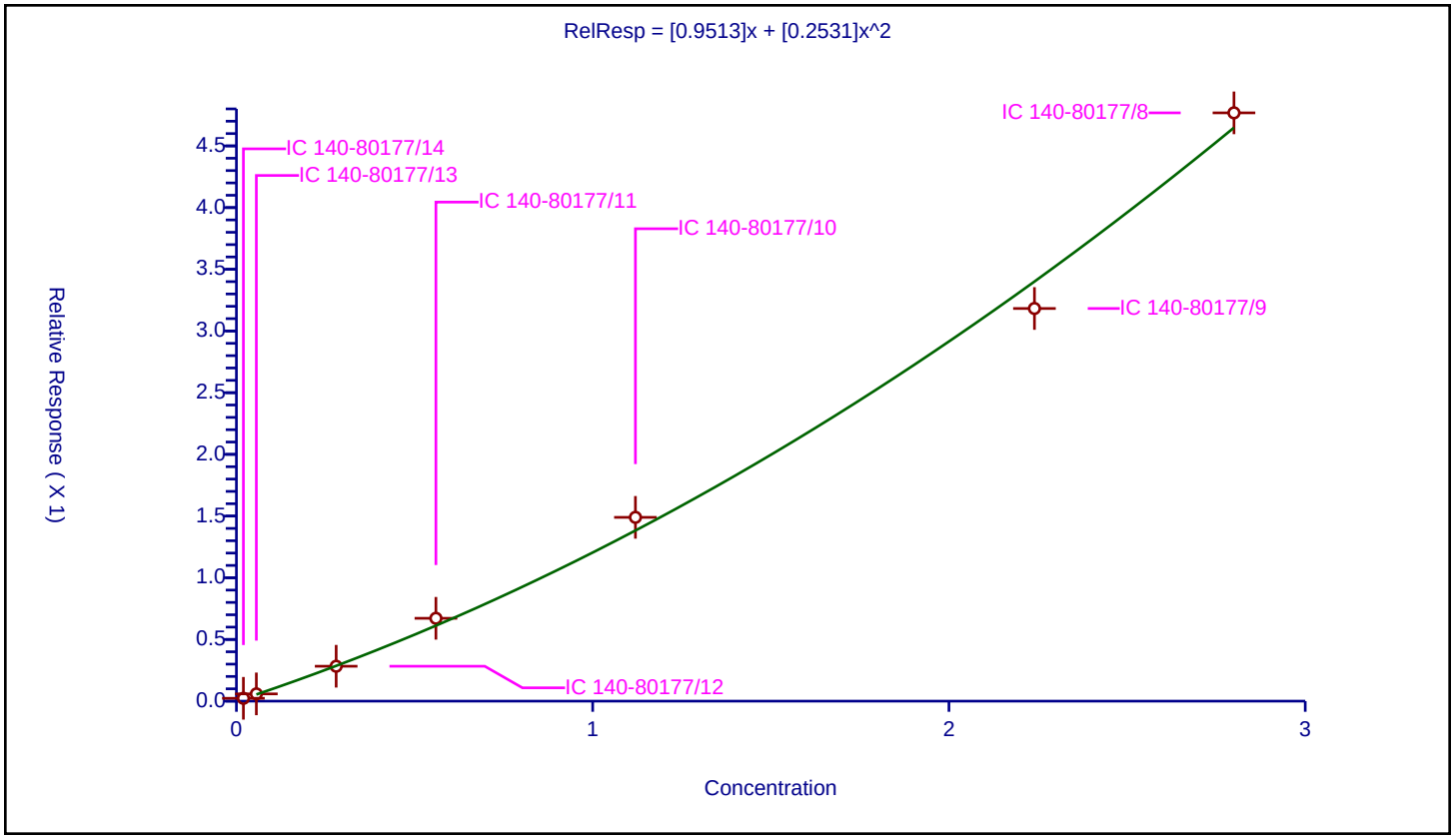
Curve Coefficients

Intercept:	0
Slope:	0.9513
Second Order:	0.2531

Error Coefficients

Standard Error:	131000
Relative Standard Error:	12.2
Correlation Coefficient:	0.997
Coefficient of Determination (Adjusted):	0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/14	0.0196	0.023084	0.4	15890.0	1.17774	Y
2	IC 140-80177/13	0.056	0.058916	0.4	18915.0	1.052075	Y
3	IC 140-80177/12	0.28	0.282841	0.4	20502.0	1.010145	Y
4	IC 140-80177/11	0.56	0.671374	0.4	19430.0	1.198882	Y
5	IC 140-80177/10	1.12	1.489606	0.4	21494.0	1.330006	Y
6	IC 140-80177/9	2.24	3.182409	0.4	20692.0	1.420718	Y
7	IC 140-80177/8	2.8	4.76787	0.4	18836.0	1.702811	Y



Calibration / PCB-142

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	ISTD
Response Base:	AREA
RF Rounding:	0

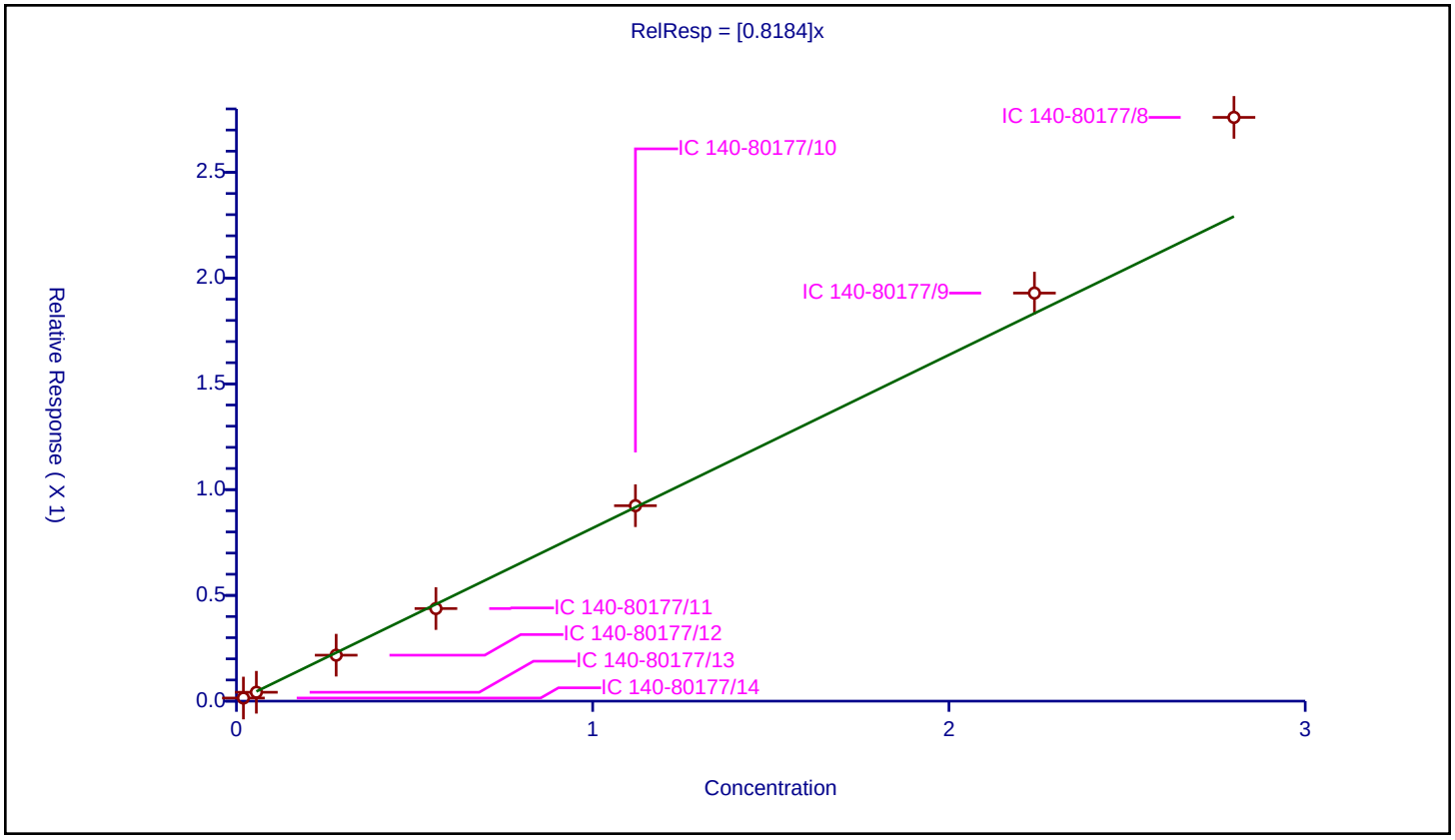
Curve Coefficients

Intercept:	0
Slope:	0.8184

Error Coefficients

Standard Error:	70600
Relative Standard Error:	10.3
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.988

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/14	0.0196	0.014676	0.4	15890.0	0.74877	Y
2	IC 140-80177/13	0.056	0.04202	0.4	18915.0	0.750349	Y
3	IC 140-80177/12	0.28	0.217325	0.4	20502.0	0.776161	Y
4	IC 140-80177/11	0.56	0.437735	0.4	19430.0	0.78167	Y
5	IC 140-80177/10	1.12	0.92409	0.4	21494.0	0.825081	Y
6	IC 140-80177/9	2.24	1.929171	0.4	20692.0	0.861237	Y
7	IC 140-80177/8	2.8	2.759885	0.4	18836.0	0.985673	Y



Calibration / PCB-184

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	ISTD
Response Base:	AREA
RF Rounding:	0

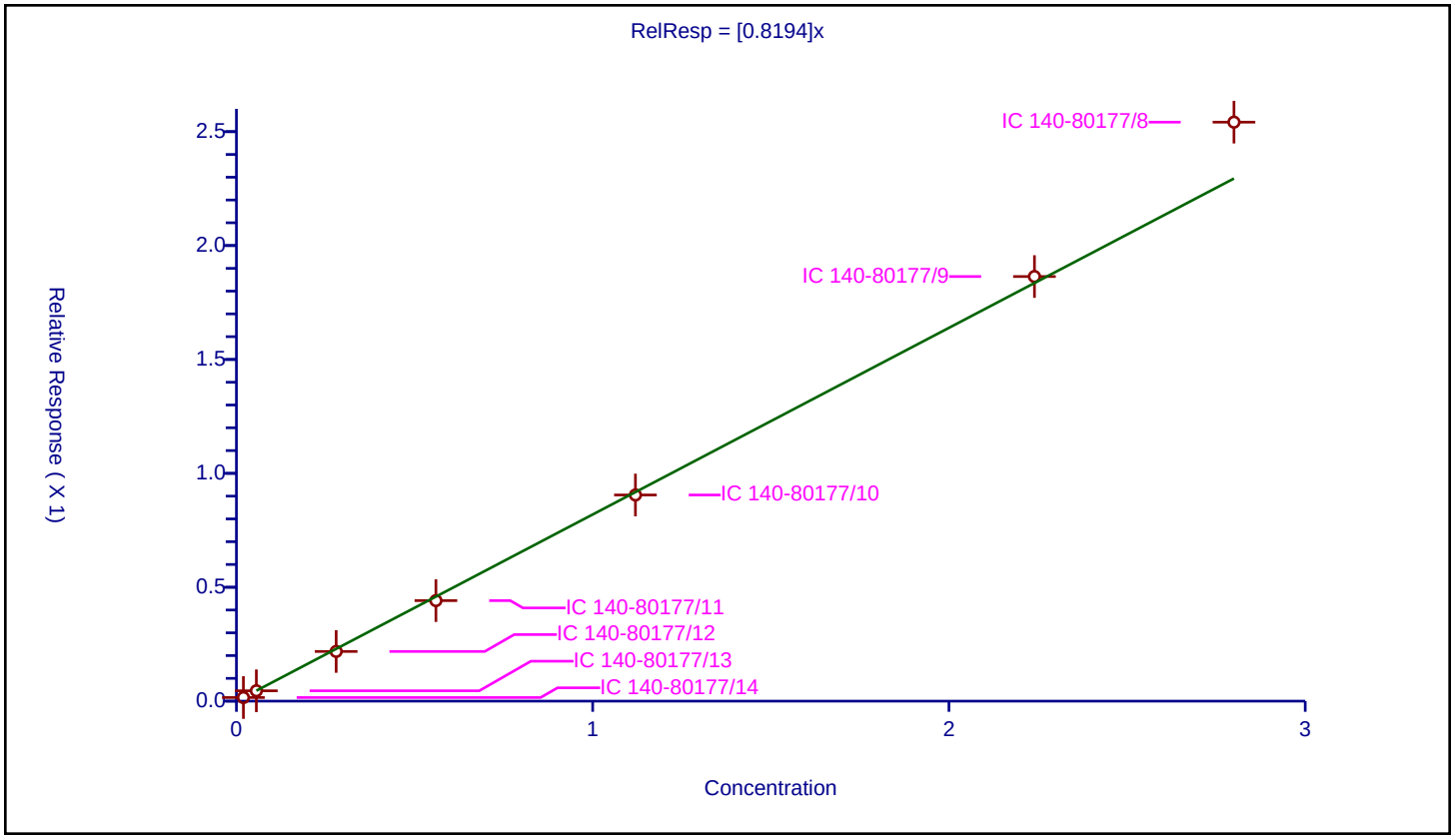
Curve Coefficients

Intercept:	0
Slope:	0.8194

Error Coefficients

Standard Error:	66600
Relative Standard Error:	5.2
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/14	0.0196	0.015859	0.4	15890.0	0.809134	Y
2	IC 140-80177/13	0.056	0.045445	0.4	18915.0	0.811525	Y
3	IC 140-80177/12	0.28	0.218145	0.4	20502.0	0.779088	Y
4	IC 140-80177/11	0.56	0.441297	0.4	19430.0	0.78803	Y
5	IC 140-80177/10	1.12	0.905015	0.4	21494.0	0.808049	Y
6	IC 140-80177/9	2.24	1.864063	0.4	20692.0	0.832171	Y
7	IC 140-80177/8	2.8	2.541771	0.4	18836.0	0.907775	Y



Calibration / PCB-204

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	ISTD
Response Base:	AREA
RF Rounding:	0

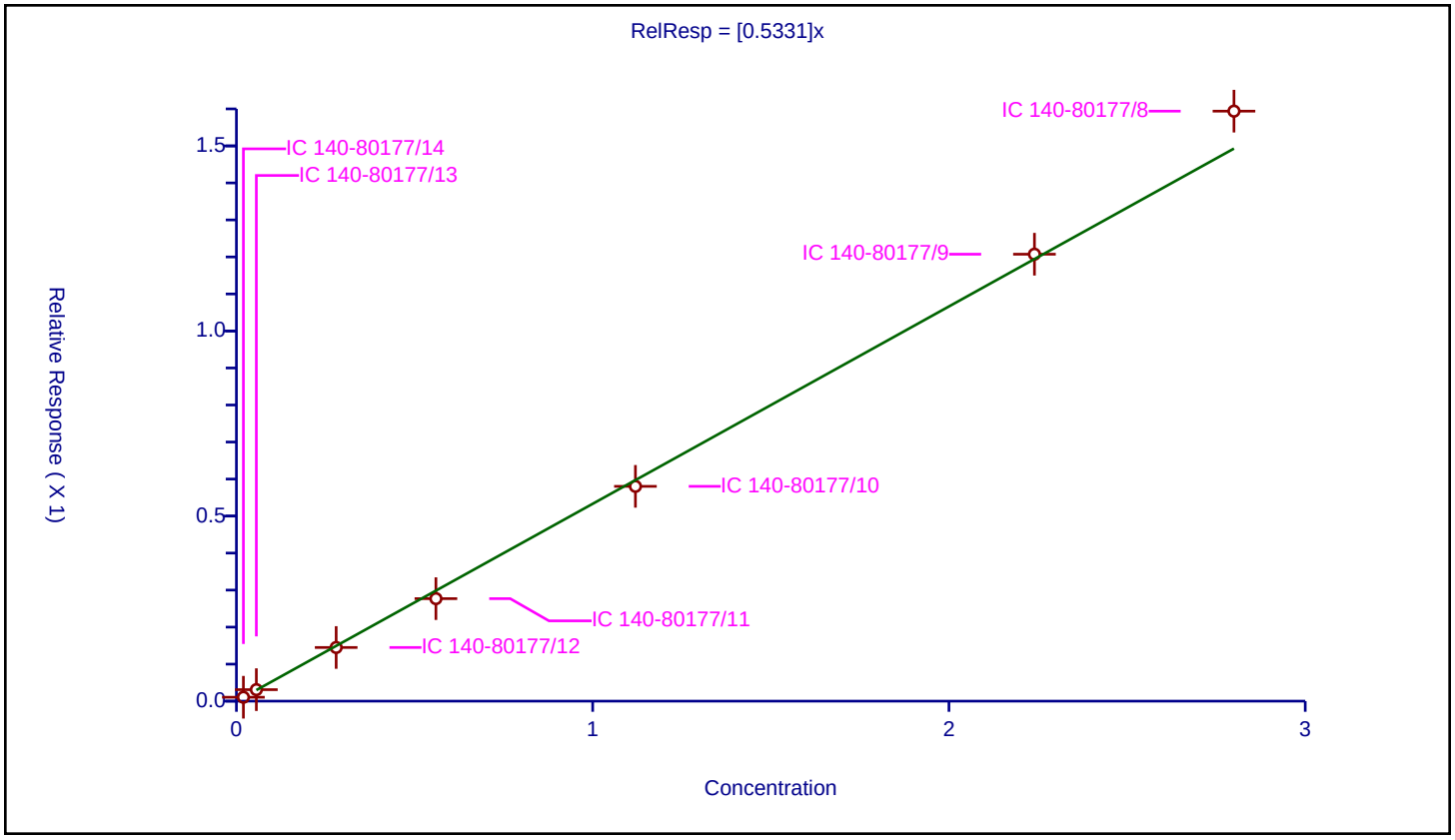
Curve Coefficients

Intercept:	0
Slope:	0.5331

Error Coefficients

Standard Error:	42300
Relative Standard Error:	4.7
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/14	0.0196	0.010573	0.4	15890.0	0.539423	Y
2	IC 140-80177/13	0.056	0.031023	0.4	18915.0	0.553982	Y
3	IC 140-80177/12	0.28	0.144961	0.4	20502.0	0.51772	Y
4	IC 140-80177/11	0.56	0.276912	0.4	19430.0	0.494486	Y
5	IC 140-80177/10	1.12	0.580255	0.4	21494.0	0.518085	Y
6	IC 140-80177/9	2.24	1.207384	0.4	20692.0	0.539011	Y
7	IC 140-80177/8	2.8	1.593905	0.4	18836.0	0.569252	Y



Calibration / PCB-192

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	ISTD
Response Base:	AREA
RF Rounding:	0

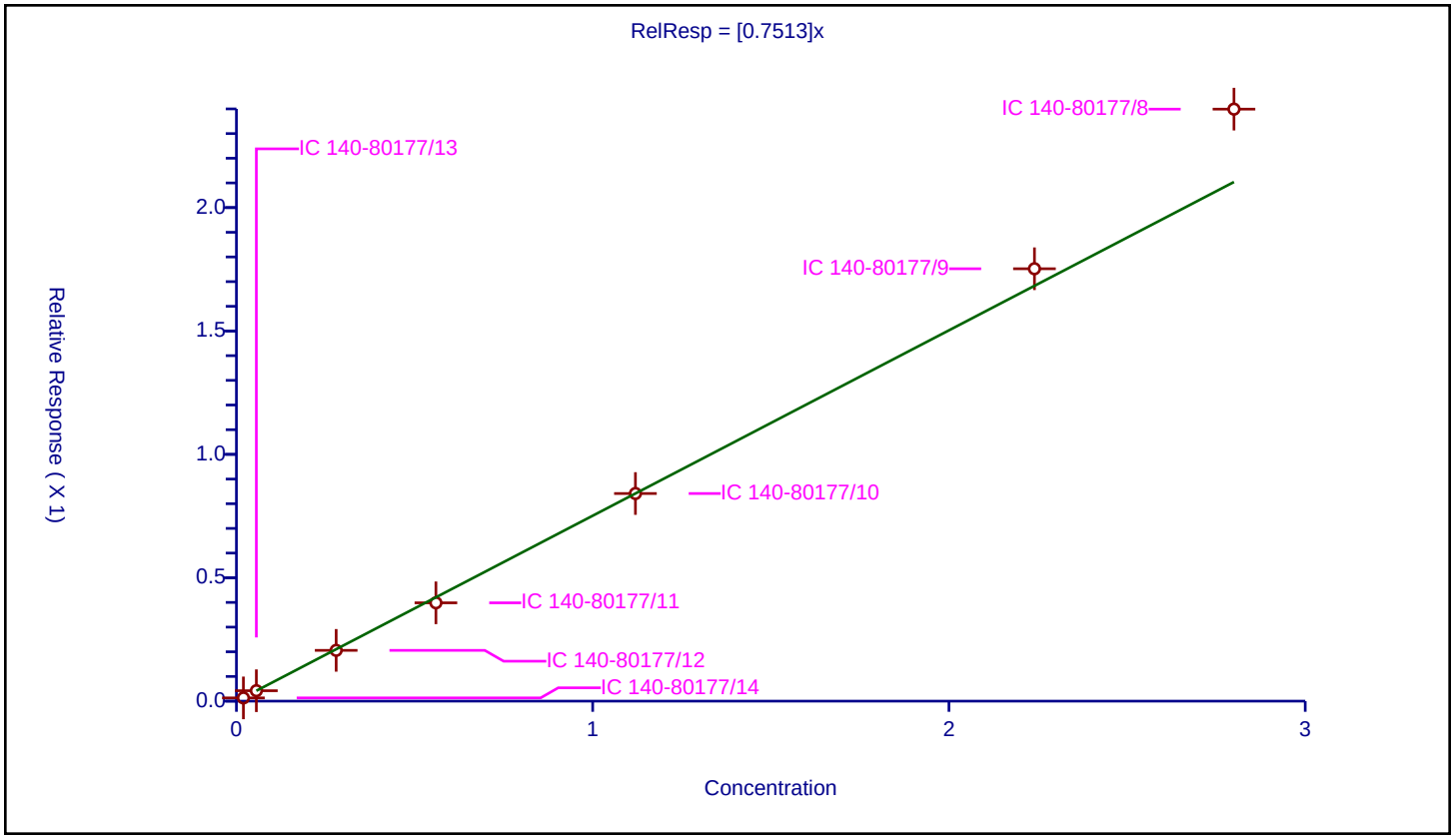
Curve Coefficients

Intercept:	0
Slope:	0.7513

Error Coefficients

Standard Error:	62600
Relative Standard Error:	7.9
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.993

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/14	0.0196	0.01309	0.4	15890.0	0.667857	Y
2	IC 140-80177/13	0.056	0.042273	0.4	18915.0	0.754881	Y
3	IC 140-80177/12	0.28	0.205736	0.4	20502.0	0.734772	Y
4	IC 140-80177/11	0.56	0.398477	0.4	19430.0	0.711565	Y
5	IC 140-80177/10	1.12	0.841332	0.4	21494.0	0.75119	Y
6	IC 140-80177/9	2.24	1.752155	0.4	20692.0	0.782212	Y
7	IC 140-80177/8	2.8	2.399002	0.4	18836.0	0.856786	Y



FORM VI
GC/MS SEMI VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: Eurofins Knoxville Job No.: 140-34148-1 Analy Batch No.: 80177

SDG No.:

Instrument ID: GCMS1 GC Column: Rxi-5SilMS ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/13/2023 17:27 Calibration End Date: 11/13/2023 19:48 Calibration ID: 4718

Calibration Files

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 140-80177/25	IC PAH1.D
Level 2	IC 140-80177/24	IC PAH2.D
Level 3	IC 140-80177/23	IC PAH3.D
Level 4	IC 140-80177/22	IC PAH4.D
Level 5	IC 140-80177/21	IC PAH5.D
Level 6	IC 140-80177/20	IC PAH6.D
Level 7	IC 140-80177/19	IC PAH7.D

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD /RSE	#	MAX %RSD /RSE	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Naphthalene	1.2227 1.1421	1.0659 1.3834	1.1225	1.1693	1.1259	AveID		1.1759				8.8		30.0			
2-Methylnaphthalene	1.2841 1.2639	1.1742 1.4010	1.1821	1.1917	1.2094	AveID		1.2438				6.5		30.0			
1-Methylnaphthalene	1.2315 1.2357	1.1322 1.3906	1.1962	1.1311	1.1785	AveID		1.2137				7.3		30.0			
1,1'-Biphenyl	1.5611 1.6355	1.4854 1.8385	1.5584	1.5551	1.5935	AveID		1.6039				7.0		30.0			
2,6-Dimethylnaphthalene	1.2200 1.2108	1.1130 1.3769	1.1423	1.1471	1.1803	AveID		1.1986				7.3		30.0			
Acenaphthylene	1.1702 1.1824	1.0903 1.3079	1.1851	1.1358	1.1569	AveID		1.1755				5.7		30.0			
Acenaphthene	0.8110 0.7481	0.6965 0.8389	0.7347	0.7112	0.7299	AveID		0.7529				7.0		30.0			
2,3,5-Trimethylnaphthalene	1.2499 1.2831	1.2120 1.5127	1.2493	1.2282	1.2530	AveID		1.2840				8.0		30.0			
Fluorene	1.2271 1.3200	1.2658 1.4728	1.2609	1.2354	1.3106	AveID		1.2989				6.5		30.0			
Hexachlorobenzene	0.4050 0.3674	0.3821 0.3884	0.3730	0.3555	0.3607	AveID		0.3760				4.6		30.0			
Pentachlorophenol	0.1381 0.2719	0.1896 0.3351	0.2212	0.2455	0.2644	QuaIF		0.1466	0.0059098						0.9930		0.9900
Dibenzothiophene	0.9837 1.0444	1.0123 1.1557	1.0532	1.0308	1.0436	AveID		1.0462				5.1		30.0			
13C6-Phenanthrene (PRC)	1.7165	1.1641	1.1054	1.1318	1.1460	AveID		1.2528				20.8		30.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type. RSD is calculated for Ave curve types. RSE is used for all other types.

FORM VI
GC/MS SEMI VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: Eurofins Knoxville Job No.: 140-34148-1 Analy Batch No.: 80177

SDG No.:

Instrument ID: GCMS1 GC Column: Rxi-5SilMS ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/13/2023 17:27 Calibration End Date: 11/13/2023 19:48 Calibration ID: 4718

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD /RSE	#	MAX %RSD /RSE	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Phenanthrene	1.2486 1.1829	1.1320 1.3292	1.1721	1.1714	1.2076	AveID		1.2063				5.4		30.0			
Anthracene	1.1887 1.2658	1.1780 1.3855	1.2049	1.1533	1.2416	AveID		1.2311				6.3		30.0			
1-Methylphenanthrene	0.5618 0.5478	0.5115 0.6385	0.5352	0.5412	0.5461	AveID		0.5546				7.2		30.0			
13C6-Fluoranthene (PRC)	2.0645	1.3221	1.2939	1.2508	1.2504	AveID		1.4363				24.5		30.0			
Fluoranthene	1.2514 1.2674	1.2106 1.4075	1.2591	1.2713	1.2889	AveID		1.2794				4.8		30.0			
Pyrene	1.4018 1.2650	1.2343 1.4123	1.2744	1.2786	1.2735	AveID		1.3057				5.4		30.0			
Benzo[a]anthracene	1.2227 1.3583	1.0978 1.4951	1.2373	1.3259	1.3531	AveID		1.2986				9.7		30.0			
13C6-Chrysene (PRC)	0.9743	0.7533	0.8124	0.8698	0.8699	AveID		0.8560				9.6		30.0			
Chrysene	1.5248 1.3754	1.4125 1.4632	1.4573	1.4923	1.4627	AveID		1.4554				3.4		30.0			
Benzo[b]fluoranthene	2.0087 1.5525	1.7325 1.7995	1.5761	1.5563	1.5670	AveID		1.6846				10.3		30.0			
Benzo[k]fluoranthene	1.4852 1.4879	1.3683 1.3954	1.5199	1.5058	1.4909	AveID		1.4648				4.0		30.0			
Benzo[e]pyrene	1.9172 1.6100	1.6223 1.7506	1.6265	1.6185	1.6503	AveID		1.6850				6.7		30.0			
Benzo[a]pyrene	1.7482 1.6379	1.5933 1.7356	1.6004	1.6126	1.6468	AveID		1.6535				3.8		30.0			
Perylene	1.5449 1.3946	1.3532 1.5059	1.3901	1.4103	1.4038	AveID		1.4290				4.8		30.0			
13C6-Indeno(1,2,3-cd)pyrene (PRC)	1.7888	1.2319	1.2028	1.1988	1.2112	AveID		1.3267				19.5		30.0			
Indeno[1,2,3-cd]pyrene	1.8490 1.6147	1.6026 1.7211	1.6669	1.6217	1.6383	AveID		1.6735				5.2		30.0			
Dibenz(a,h)anthracene	1.5982 1.5252	1.5660 1.6164	1.6322	1.6271	1.6118	AveID		1.5967				2.4		30.0			
Benzo[g,h,i]perylene	1.6612 1.4056	1.4095 1.5053	1.4292	1.3853	1.4530	AveID		1.4642				6.5		30.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type. RSD is calculated for Ave curve types. RSE is used for all other types.

FORM VI
GC/MS SEMI VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: Eurofins Knoxville Job No.: 140-34148-1 Analy Batch No.: 80177

SDG No.:

Instrument ID: GCMS1 GC Column: Rxi-5SilMS ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/13/2023 17:27 Calibration End Date: 11/13/2023 19:48 Calibration ID: 4718

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD /RSE	#	MAX %RSD /RSE	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Naphthalene-d8	1.4601 1.4051	1.4515 1.2693	1.4428	1.3612	1.3678	Ave		1.3940				4.9		30.0			
2-Methylnaphthalene-d10	0.9259 0.9031	0.9116 0.8433	0.9505	0.9082	0.9023	Ave		0.9064				3.6		30.0			
1-Methylnaphthalene-d10	0.9702 0.8759	0.9368 0.8166	0.9227	0.9356	0.8993	Ave		0.9082				5.5		30.0			
2,6-Dimethylnaphthalene-d12	1.0438 1.0022	0.9950 0.9499	1.0339	1.0333	1.0054	Ave		1.0091				3.2		30.0			
Acenaphthylene-d8	1.5501 1.5441	1.5274 1.4764	1.5603	1.5716	1.5390	Ave		1.5384				2.0		30.0			
Fluorene -d10	1.2135 1.1670	1.1794 1.1632	1.2295	1.2071	1.1803	Ave		1.1914				2.1		30.0			
Dibenzothiophene-d8	0.8615 0.8962	0.8991 0.8041	0.9036	0.8802	0.8954	Ave		0.8772				4.0		30.0			
Phenanthrene-d10	0.7377 0.8054	0.7775 0.7191	0.8181	0.8002	0.8005	Ave		0.7798				4.8		30.0			
Anthracene-d10	0.8639 0.7333	0.7721 0.6690	0.7815	0.7785	0.7302	Ave		0.7612				7.9		30.0			
Fluoranthene-d10	1.0151 1.0290	1.0141 0.9737	1.0272	1.0040	1.0172	Ave		1.0115				1.8		30.0			
Chrysene-d12	1.0778 0.9414	1.0463 0.9277	1.0023	0.9168	0.9167	Ave		0.9756				6.8		30.0			
Benzo(b)fluoranthene-d12	1.1746 1.3032	1.2067 1.2426	1.3321	1.3141	1.2916	Ave		1.2664				4.7		30.0			
Benzo(k)fluoranthene-d12	1.6256 1.4525	1.5544 1.4467	1.4958	1.4319	1.4069	Ave		1.4877				5.2		30.0			
Benzo(a)pyrene-d12	1.1077 1.1170	1.1124 1.0705	1.1499	1.1228	1.0938	Ave		1.1106				2.2		30.0			
Perylene-d12	1.2671 1.2135	1.2524 1.1760	1.2873	1.2334	1.1977	Ave		1.2325				3.2		30.0			
Indeno[1,2,3-cd]pyrene-d12	1.1416 1.2450	1.1703 1.2409	1.2294	1.2147	1.2036	Ave		1.2065				3.2		30.0			
Dibenz(a,h)anthracene-d14	1.0181 1.1147	1.0447 1.1333	1.0952	1.0743	1.0761	Ave		1.0795				3.7		30.0			
Benzo(ghi)perylene-d12	1.1739 1.1913	1.1958 1.1999	1.2310	1.2228	1.1726	Ave		1.1982				1.9		30.0			

Note: The M1 coefficient is the same as Ave RRF for an Ave curve type. RSD is calculated for Ave curve types. RSE is used for all other types.

FORM VI
GC/MS SEMI VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1 | Analy Batch No.: 80177

SDG No.:

Instrument ID: GCMS1 | GC Column: Rxi-5SilMS ID: 0.25(mm) | Heated Purge: (Y/N) N

Calibration Start Date: 11/13/2023 17:27 | Calibration End Date: 11/13/2023 19:48 | Calibration ID: 4718

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 140-80177/25	IC PAH1.D
Level 2	IC 140-80177/24	IC PAH2.D
Level 3	IC 140-80177/23	IC PAH3.D
Level 4	IC 140-80177/22	IC PAH4.D
Level 5	IC 140-80177/21	IC PAH5.D
Level 6	IC 140-80177/20	IC PAH6.D
Level 7	IC 140-80177/19	IC PAH7.D

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Naphthalene		AveID	3610 448879	16321 788856	43247	87260	167649	0.0200 2.50	0.100 5.00	0.250	0.500	1.00
2-Methylnaphthalene		AveID	2404 319283	11292 530793	30004	59339	118803	0.0200 2.50	0.100 5.00	0.250	0.500	1.00
1-Methylnaphthalene		AveID	2416 302751	11189 510164	29476	58023	115372	0.0200 2.50	0.100 5.00	0.250	0.500	1.00
1,1'-Biphenyl		AveID	3295 458515	15592 784576	43028	88099	174407	0.0200 2.50	0.100 5.00	0.250	0.500	1.00
2,6-Dimethylnaphthalene		AveID	2575 339444	11683 587573	31540	64985	129185	0.0200 2.50	0.100 5.00	0.250	0.500	1.00
Acenaphthylene		AveID	3668 510695	17568 867519	49378	97871	193834	0.0200 2.50	0.100 5.00	0.250	0.500	1.00
Acenaphthene		AveID	2542 323118	11223 556417	30611	61279	122289	0.0200 2.50	0.100 5.00	0.250	0.500	1.00
2,3,5-Trimethylnaphthalene		AveID	2638 359727	12722 645516	34493	69578	137146	0.0200 2.50	0.100 5.00	0.250	0.500	1.00
Fluorene		AveID	3011 430895	15748 769669	41402	81761	168401	0.0200 2.50	0.100 5.00	0.250	0.500	1.00
Hexachlorobenzene		AveID	1548 218499	7980 377755	21326	40966	82146	0.0200 2.50	0.100 5.00	0.250	0.500	1.00
Pentachlorophenol		QuaIF	52791 1617304	197969 1955437	505955	848658	1204164	2.00 25.0	5.00 30.0	10.0	15.0	20.0
Dibenzothiophene		AveID	4390 691214	24449 1257008	66517	130673	265851	0.0200 2.50	0.100 5.00	0.250	0.500	1.00
13C6-Phenanthrene (PRC)		AveID	6560	24314	63202	130423	261003	0.0200	0.100	0.250	0.500	1.00
Phenanthrene		AveID	4772 703502	23643 1292789	67019	134982	275031	0.0200 2.50	0.100 5.00	0.250	0.500	1.00
Anthracene		AveID	5320 685401	24432 1253753	65811	129295	257934	0.0200 2.50	0.100 5.00	0.250	0.500	1.00
1-Methylphenanthrene		AveID	2147	10683	30603	62362	124367	0.0200	0.100	0.250	0.500	1.00

FORM VI
GC/MS SEMI VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins Knoxville Job No.: 140-34148-1 Analy Batch No.: 80177

SDG No.:

Instrument ID: GCMS1 GC Column: Rxi-5SilMS ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/13/2023 17:27 Calibration End Date: 11/13/2023 19:48 Calibration ID: 4718

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
			325796	621062				2.50	5.00			
13C6-Fluoranthene (PRC)		AveID	10857	36017	92888	180852	361861	0.0200	0.100	0.250	0.500	1.00
Fluoranthene		AveID	6581 963009	32979 1853789	90388	183819	373010	0.0200 2.50	0.100 5.00	0.250	0.500	1.00
Pyrene		AveID	7372 961214	33626 1860099	91490	184873	368554	0.0200 2.50	0.100 5.00	0.250	0.500	1.00
Benzo[a]anthracene		AveID	6827 944265	30856 1876117	86680	175070	352904	0.0200 2.50	0.100 5.00	0.250	0.500	1.00
13C6-Chrysene (PRC)		AveID	5440	21174	56911	114851	226881	0.0200	0.100	0.250	0.500	1.00
Chrysene		AveID	8514 956134	39702 1836105	102086	197036	381476	0.0200 2.50	0.100 5.00	0.250	0.500	1.00
Benzo[b]fluoranthene		AveID	7862 948562	36097 2032613	92958	185667	369256	0.0200 2.50	0.100 5.00	0.250	0.500	1.00
Benzo[k]fluoranthene		AveID	8045 1013292	36723 1835010	100657	195746	382723	0.0200 2.50	0.100 5.00	0.250	0.500	1.00
Benzo[e]pyrene		AveID	7077 843197	31159 1703423	82802	164984	329347	0.0200 2.50	0.100 5.00	0.250	0.500	1.00
Benzo[a]pyrene		AveID	6453 857801	30602 1688843	81477	164381	328647	0.0200 2.50	0.100 5.00	0.250	0.500	1.00
Perylene		AveID	6523 793457	29262 1609844	79232	157926	306774	0.0200 2.50	0.100 5.00	0.250	0.500	1.00
13C6-Indeno(1,2,3-cd)pyrene (PRC)		AveID	6805	24892	65467	132207	265984	0.0200	0.100	0.250	0.500	1.00
Indeno[1,2,3-cd]pyrene		AveID	7034 942551	32381 1941483	90728	178846	359760	0.0200 2.50	0.100 5.00	0.250	0.500	1.00
Dibenz(a,h)anthracene		AveID	5422 797128	28248 1665209	79141	158694	316441	0.0200 2.50	0.100 5.00	0.250	0.500	1.00
Benzo[g,h,i]perylene		AveID	6498 785123	29101 1641889	77898	153796	310856	0.0200 2.50	0.100 5.00	0.250	0.500	1.00
Naphthalene-d8	ANT	Ave	73814 78608	76560 57023	77058	74629	74453	0.500 0.500	0.500 0.500	0.500	0.500	0.500
2-Methylnaphthalene-d10	ANT	Ave	46805 50525	48084 37887	50765	49793	49116	0.500 0.500	0.500 0.500	0.500	0.500	0.500
1-Methylnaphthalene-d10	ANT	Ave	49045 49002	49412 36686	49283	51298	48949	0.500 0.500	0.500 0.500	0.500	0.500	0.500
2,6-Dimethylnaphthalene-d12	ANT	Ave	52766 56070	52484 42674	55221	56652	54726	0.500 0.500	0.500 0.500	0.500	0.500	0.500
Acenaphthylene-d8	ANT	Ave	78362 86384	80563 66328	83334	86168	83775	0.500 0.500	0.500 0.500	0.500	0.500	0.500

FORM VI
GC/MS SEMI VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: Eurofins Knoxville Job No.: 140-34148-1 Analy Batch No.: 80177

SDG No.:

Instrument ID: GCMS1 GC Column: Rxi-5SilMS ID: 0.25(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/13/2023 17:27 Calibration End Date: 11/13/2023 19:48 Calibration ID: 4718

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Fluorene -d10	ANT	Ave	61344 65288	62208 52258	65669	66183	64246	0.500 0.500	0.500 0.500	0.500	0.500	0.500
Dibenzothiophene-d8	PYR10	Ave	111573 132367	120758 108763	126315	126765	127371	0.500 0.500	0.500 0.500	0.500	0.500	0.500
Phenanthrene-d10	PYR10	Ave	95545 118943	104432 97264	114355	115234	113874	0.500 0.500	0.500 0.500	0.500	0.500	0.500
Anthracene-d10	PYR10	Ave	111887 108297	103704 90493	109239	112111	103873	0.500 0.500	0.500 0.500	0.500	0.500	0.500
Fluoranthene-d10	PYR10	Ave	131473 151969	136213 131710	143581	144590	144703	0.500 0.500	0.500 0.500	0.500	0.500	0.500
Chrysene-d12	PYR10	Ave	139591 139033	140536 125486	140107	132037	130404	0.500 0.500	0.500 0.500	0.500	0.500	0.500
Benzo(b)fluoranthene-d12	BePd12	Ave	97848 122201	104177 112954	117956	119303	117826	0.500 0.500	0.500 0.500	0.500	0.500	0.500
Benzo(k)fluoranthene-d12	BePd12	Ave	135420 136203	134192 131507	132451	129996	128352	0.500 0.500	0.500 0.500	0.500	0.500	0.500
Benzo(a)pyrene-d12	BePd12	Ave	92281 104746	96036 97307	101819	101934	99784	0.500 0.500	0.500 0.500	0.500	0.500	0.500
Perylene-d12	BePd12	Ave	105559 113791	108121 106899	113992	111978	109265	0.500 0.500	0.500 0.500	0.500	0.500	0.500
Indeno[1,2,3-cd]pyrene-d12	BePd12	Ave	95103 116748	101028 112802	108861	110281	109798	0.500 0.500	0.500 0.500	0.500	0.500	0.500
Dibenz(a,h)anthracene-d14	BePd12	Ave	84815 104527	90191 103019	96976	97532	98166	0.500 0.500	0.500 0.500	0.500	0.500	0.500
Benzo(ghi)perylene-d12	BePd12	Ave	97790 111713	103235 109074	109008	111018	106974	0.500 0.500	0.500 0.500	0.500	0.500	0.500

Curve Type Legend:

Ave = Average ISTD
AveID = Average isotope dilution
QuaIF = Quadratic ISO forced zero

Report Date: 15-Nov-2023 14:42:02 Chrom Revision: 2.3 13-Nov-2023 16:16:38

Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH7.D
Lims ID: ic pah7
Client ID:
Sample Type: IC Calib Level: 7
Inject. Date: 13-Nov-2023 17:27:41 ALS Bottle#: 0 Worklist Smp#: 19
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030467-019
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1
Sublist: chrom-SIM_PAH_GCMS1*sub4

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 15-Nov-2023 14:42:01 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1623

First Level Reviewer: SK9U Date: 14-Nov-2023 09:28:26

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
D 3 1,4-Dichlorobenzene-d4	115	4.093	4.110	-0.017	21	16349	NC	NC	
4 1,4-Dichlorobenzene	146	4.101	4.118	-0.017	86	352937	NC	NC	
D 5 1,2-Dichlorobenzene-d4	115	4.204	4.221	-0.017	41	15944	NC	NC	
6 1,2-Dichlorobenzene	146	4.221	4.229	-0.008	92	315739	NC	NC	
9 1,2,4-Trichlorobenzene	180	5.013	5.022	-0.009	99	372997	NC	NC	
D 10 Naphthalene-d8	136	5.059	5.068	-0.009	99	57023	0.5000	0.4553	
$ 12 13C6-Naphthalene	134	5.078	5.078	0.000	93	764422	NC	NC	
11 Naphthalene	128	5.078	5.078	0.000	93	788856	5.00	5.88	
D 15 2-methylnaphthalene-d10	152	5.606	5.612	-0.006	92	37887	0.5000	0.4652	
16 2-Methylnaphthalene	142	5.635	5.635	0.000	98	530793	5.00	5.63	
D 17 1-Methylnaphthalene-d10	152	5.686	5.692	-0.006	100	36686	0.5000	0.4496	
18 1-Methylnaphthalene	142	5.715	5.720	-0.005	98	510164	5.00	5.73	
19 1,1'-Biphenyl	154	6.013	6.013	0.000	100	784576	5.00	5.73	
D 20 2,6-Dimethylnaphthalene-d12	168	6.109	6.109	0.000	99	42674	0.5000	0.4707	
21 2,6-Dimethylnaphthalene	156	6.145	6.145	0.000	99	587573	5.00	5.74	
D 23 Acenaphthylene-d8	160	6.362	6.367	-0.004	90	66328	0.5000	0.4798	
24 Acenaphthylene	152	6.377	6.377	0.000	98	867519	5.00	5.56	
* 26 Acenaphthene-d10	164	6.492	6.492	0.000	98	44925	0.5000	0.5000	
27 Acenaphthene	154	6.517	6.517	0.000	97	556417	5.00	5.57	
28 2,3,5-Trimethylnaphthalene	170	6.834	6.834	0.000	93	645516	5.00	5.89	
D 29 Fluorene -d10	176	6.920	6.925	-0.005	93	52258	0.5000	0.4882	
30 Fluorene	166	6.945	6.945	0.000	98	769669	5.00	5.67	
31 Hexachlorobenzene	284	7.421	7.417	0.004	0	377755	5.00	5.16	
32 Pentachlorophenol	266	7.580	7.576	0.004	0	1955437	30.0	30.7	
D 33 Dibenzothiophene-d8	192	7.631	7.628	0.003	100	108763	0.5000	0.4583	
34 Dibenzothiophene	184	7.645	7.645	0.000	92	1257008	5.00	5.52	
D 35 Phenanthrene-d10	188	7.732	7.728	0.004	99	97264	0.5000	0.4611	
36 Phenanthrene	178	7.752	7.749	0.003	46	1292789	5.00	5.51	
D 38 Anthracin-d10	188	7.780	7.776	0.004	99	90493	0.5000	0.4394	
39 Anthracene	178	7.797	7.794	0.003	100	1253753	5.00	5.63	
40 1-Methylphenanthrene	191	8.293	8.289	0.004	100	621062	5.00	5.76	

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
D 41 Fluoranthene-d10	212	8.808	8.808	0.000	99	131710	0.5000	0.4813	
43 Fluoranthene	202	8.825	8.825	0.000	41	1853789	5.00	5.50	
* 44 Pyrene-d10 (IS)	212	9.027	9.027	0.000	99	135263	0.5000	0.5000	
45 Pyrene	202	9.044	9.044	0.000	100	1860099	5.00	5.41	
$ 46 Terphenyl-d14	244	9.188	9.188	0.000	100	606294	NC	NC	
47 Benzo[a]anthracene	228	10.260	10.260	0.000	100	1876117	5.00	5.76	
D 48 Chrysene-d12	240	10.270	10.270	0.000	39	125486	0.5000	0.4755	
50 Chrysene	228	10.300	10.295	0.005	24	1836105	5.00	5.03	
D 52 Benzo(b)fluoranthene-d12	264	11.376	11.369	0.007	100	112954	0.5000	0.4906	
53 Benzo[b]fluoranthene	252	11.404	11.397	0.007	97	2032613	5.00	5.34	
D 54 Benzo(k)fluoranthene-d12	264	11.411	11.404	0.007	61	131507	0.5000	0.4862	
55 Benzo[k]fluoranthene	252	11.432	11.425	0.007	100	1835010	5.00	4.76	M
* 56 Benzo(e)pyrene-d12	264	11.684	11.684	0.000	99	90902	0.5000	0.5000	
57 Benzo[e]pyrene	252	11.719	11.712	0.007	100	1703423	5.00	5.19	
D 58 Benzo(a)pyrene-d12	264	11.747	11.747	0.000	100	97307	0.5000	0.4819	
59 Benzo[a]pyrene	252	11.775	11.775	0.000	100	1688843	5.00	5.25	
D 60 Perylene-d12	264	11.845	11.845	0.000	100	106899	0.5000	0.4771	
61 Perylene	252	11.873	11.873	0.000	100	1609844	5.00	5.27	M
D 62 Indeno[1,2,3-cd]pyrene-d12	288	13.186	13.186	0.000	84	112802	0.5000	0.5143	
D 63 Dibenz(a,h)anthracene-d14	292	13.196	13.196	0.000	80	103019	0.5000	0.5249	
65 Indeno[1,2,3-cd]pyrene	276	13.224	13.214	0.010	56	1941483	5.00	5.14	M
66 Dibenz(a,h)anthracene	278	13.243	13.242	0.000	62	1665209	5.00	5.06	
D 67 Benzo(ghi)perylene-d12	288	13.552	13.543	0.009	100	109074	0.5000	0.5007	
68 Benzo[g,h,i]perylene	276	13.590	13.580	0.010	87	1641889	5.00	5.14	
69 Dibenzo(def,p)chrysene	302	14.922	14.922	0.000	84	992205	NC	NC	
70 Dibenzo[a,e]pyrene	302	15.373	15.382	-0.009	81	1140143	NC	NC	
D 71 Coronene-d12	312	15.373	15.382	-0.009	37	82330	NC	NC	
72 Dibenz(a,i)pyrene	302	15.542	15.570	-0.028	89	740159	NC	NC	
73 Dibenzo[a,h]pyrene	302	15.626	15.654	-0.028	87	747652	NC	NC	
S 105 Benzo(b)fluoranthene / Benzo(k)f					0			10.1	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

60L7SIMPAH_00025 Amount Added: 1.00 Units: mL

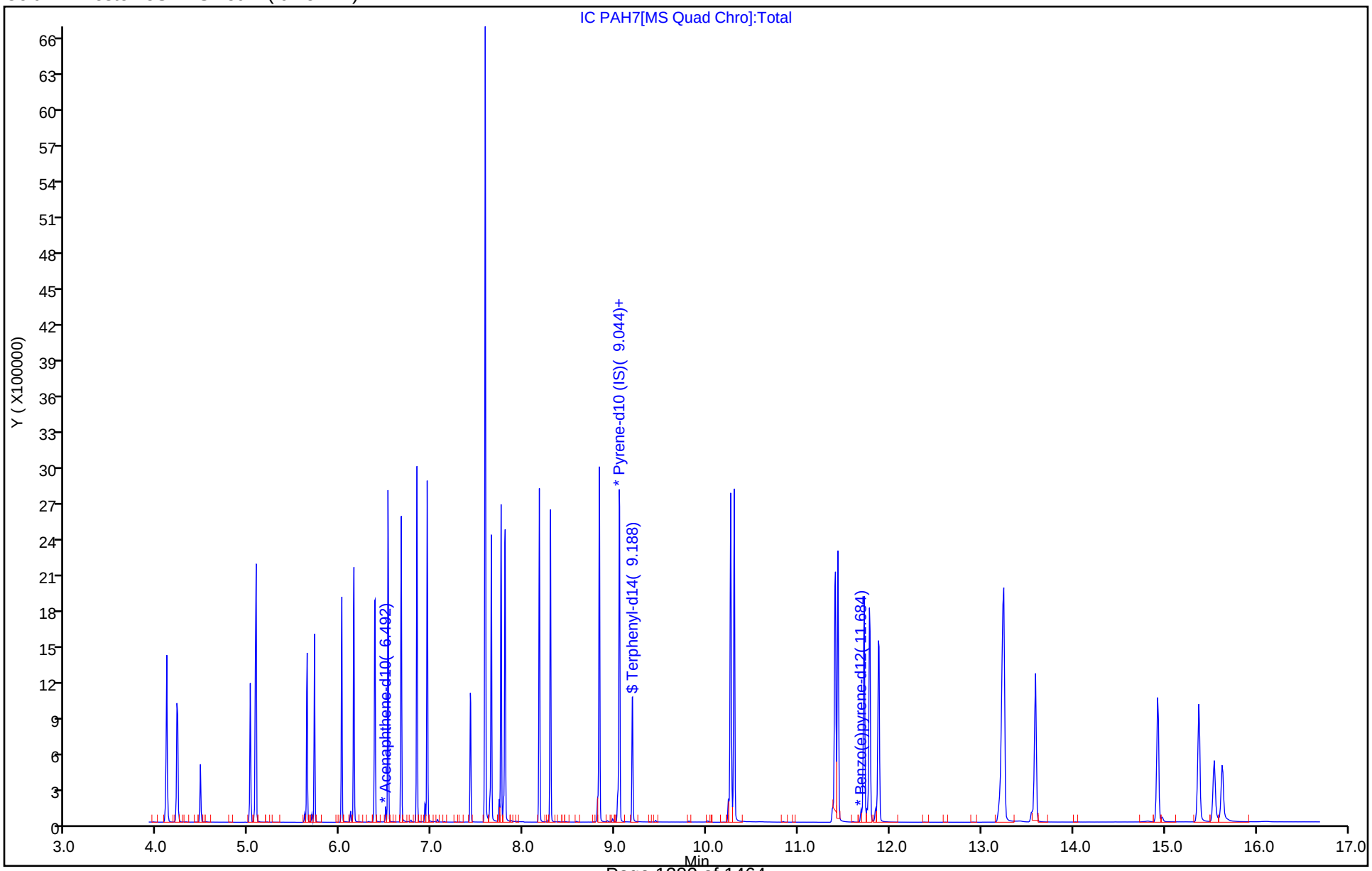
Report Date: 15-Nov-2023 14:42:02 Chrom Revision: 2.3 13-Nov-2023 16:16:38

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH7.D

Injection Date:	13-Nov-2023 17:27:41	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	ic pah7			Worklist Smp#:	19
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



Manual Integration/User Assign Peak Report

Eurofins Knoxville

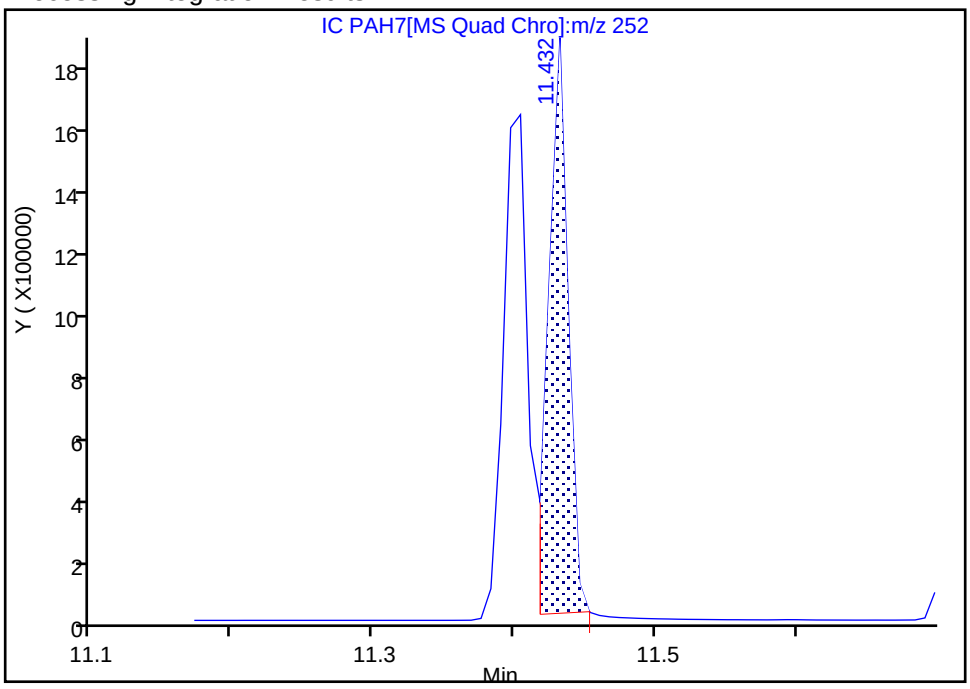
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH7.D				
Injection Date:	13-Nov-2023 17:27:41	Instrument ID:	GCMS1		
Lims ID:	ic pah7				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

55 Benzo[k]fluoranthene, CAS: 207-08-9

Signal: 1

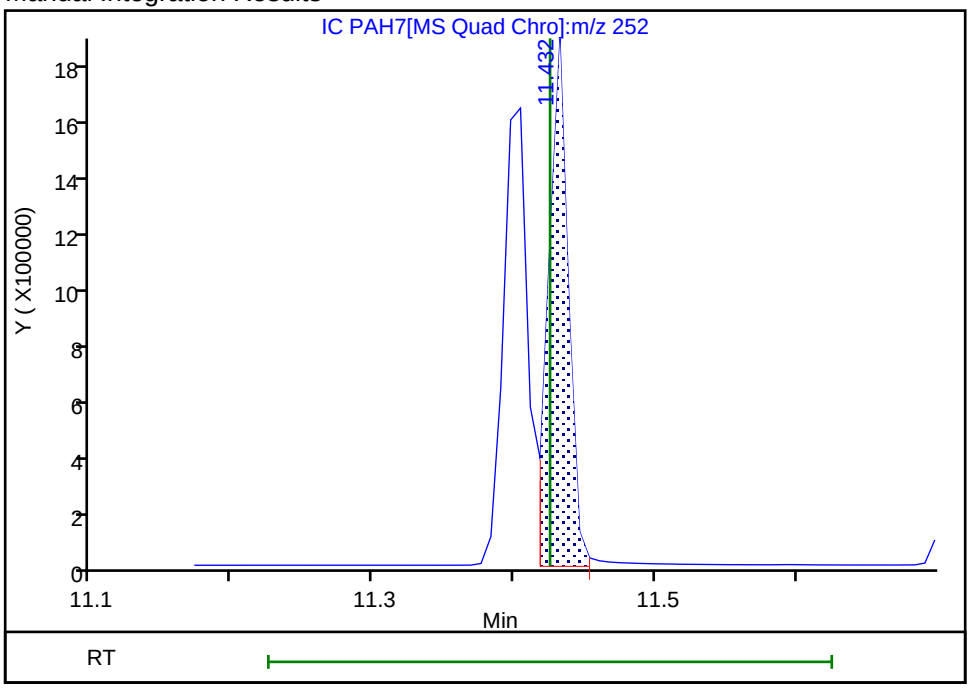
Processing Integration Results

RT: 11.43
Area: 1778524
Amount: 4.635906
Amount Units: ug/ml



Manual Integration Results

RT: 11.43
Area: 1835010
Amount: 4.763105
Amount Units: ug/ml



Reviewer: SK9U, 14-Nov-2023 09:27:12 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

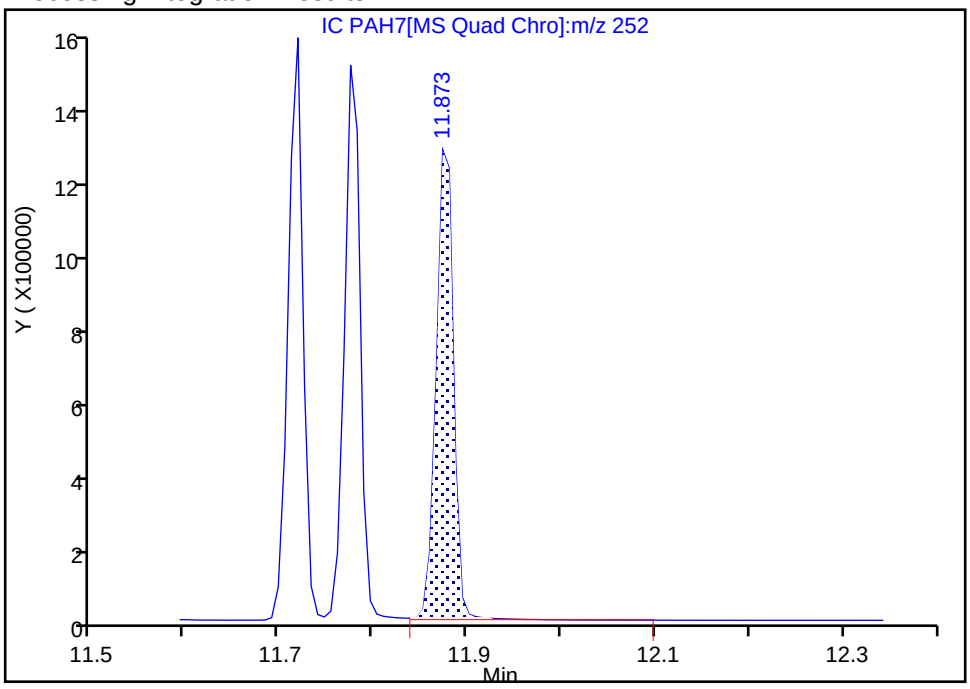
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH7.D
Injection Date: 13-Nov-2023 17:27:41 Instrument ID: GCMS1
Lims ID: ic pah7
Client ID:
Operator ID: TAI\knxinstgcms1 ALS Bottle#: 0 Worklist Smp#: 19
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: SIM_PAH_GCMS1 Limit Group: SOG - PAH IsoDil - ICAL
Column: Restek-5Sil MS 25um (0.25 mm) Detector MS SCAN

61 Perylene, CAS: 198-55-0

Signal: 1

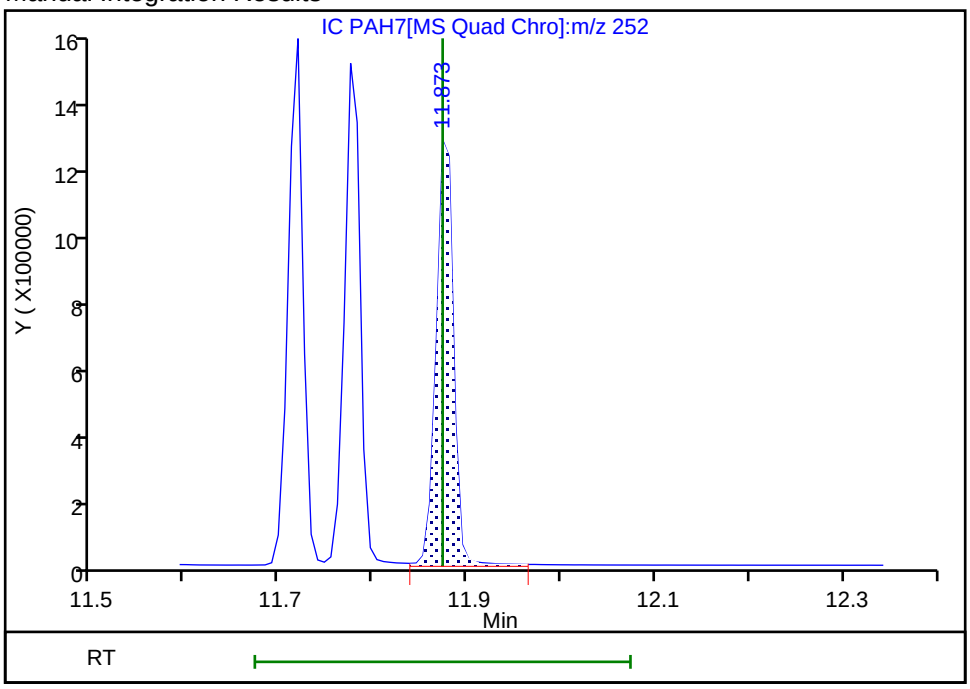
Processing Integration Results

RT: 11.87
Area: 1614553
Amount: 5.279664
Amount Units: ug/ml



Manual Integration Results

RT: 11.87
Area: 1609844
Amount: 5.269301
Amount Units: ug/ml



Reviewer: SK9U, 14-Nov-2023 09:27:36 -05:00:00 (UTC)
Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

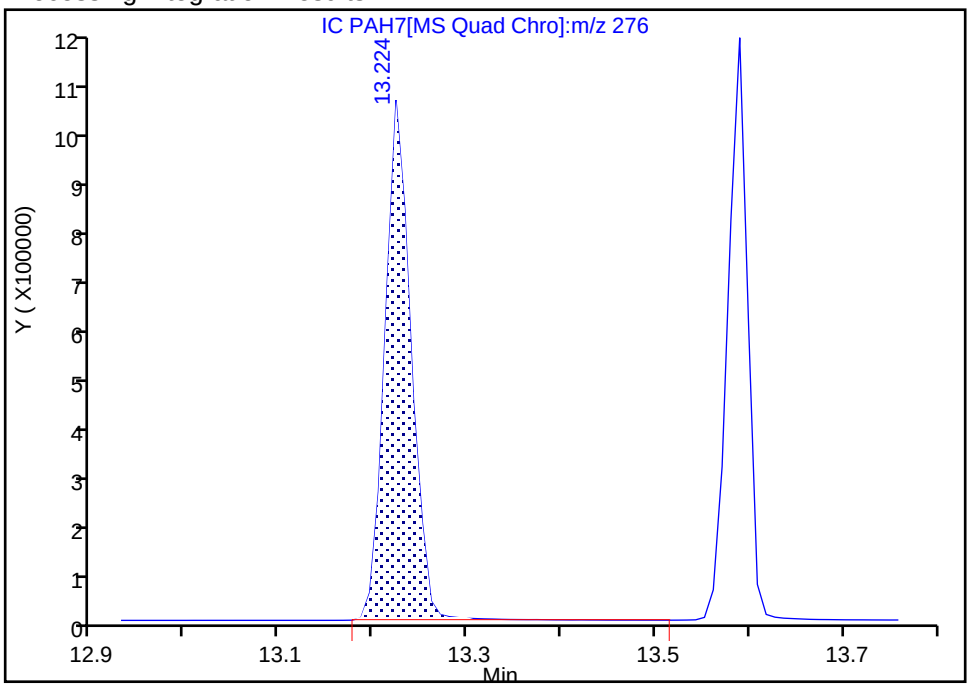
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH7.D				
Injection Date:	13-Nov-2023 17:27:41	Instrument ID:	GCMS1		
Lims ID:	ic pah7				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	19
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

65 Indeno[1,2,3-cd]pyrene, CAS: 193-39-5

Signal: 1

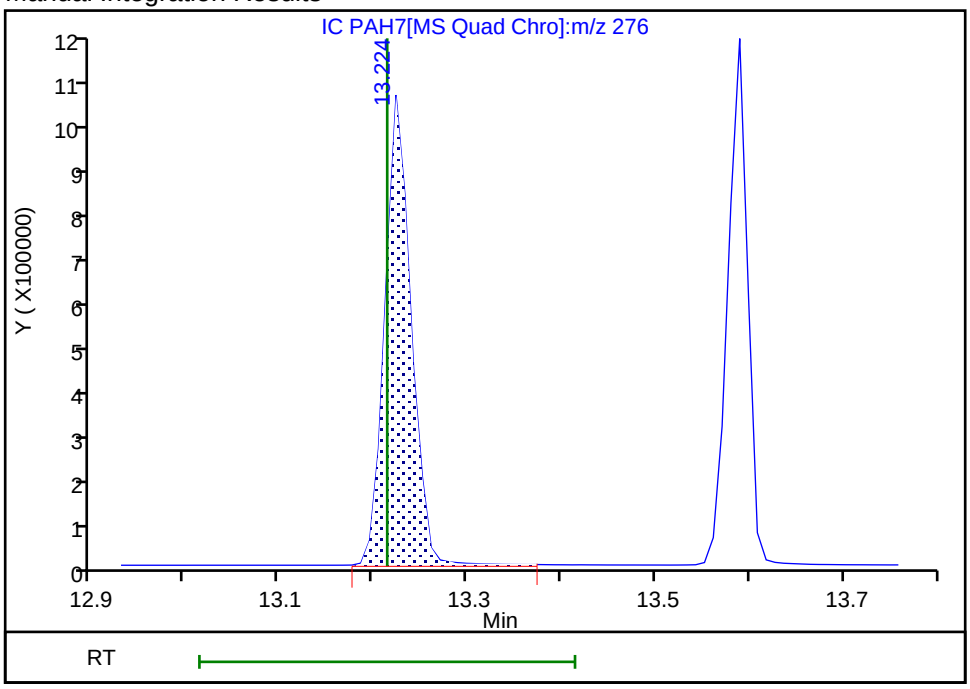
Processing Integration Results

RT: 13.22
Area: 1944170
Amount: 5.148496
Amount Units: ug/ml



Manual Integration Results

RT: 13.22
Area: 1941483
Amount: 5.142426
Amount Units: ug/ml



Reviewer: SK9U, 14-Nov-2023 09:27:58 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Report Date: 15-Nov-2023 14:42:09 Chrom Revision: 2.3 13-Nov-2023 16:16:38

Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH6.D
Lims ID: ic pah6
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 13-Nov-2023 17:51:08 ALS Bottle#: 0 Worklist Smp#: 20
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030467-020
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1
Sublist: chrom-SIM_PAH_GCMS1*sub4

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 15-Nov-2023 14:42:08 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1623

First Level Reviewer: SK9U Date: 14-Nov-2023 09:35:33

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
D 3 1,4-Dichlorobenzene-d4	115	4.084	4.110	-0.026	58	20727	NC	NC	
4 1,4-Dichlorobenzene	146	4.101	4.118	-0.017	88	215230	NC	NC	
D 5 1,2-Dichlorobenzene-d4	115	4.204	4.221	-0.017	56	20905	NC	NC	
6 1,2-Dichlorobenzene	146	4.221	4.229	-0.008	95	190704	NC	NC	
9 1,2,4-Trichlorobenzene	180	5.013	5.022	-0.009	98	219504	NC	NC	
D 10 Naphthalene-d8	136	5.059	5.068	-0.009	100	78608	0.5000	0.5040	
$ 11 13C6-Naphthalene	134	5.078	5.078	0.000	94	423672	NC	NC	
12 Naphthalene	128	5.069	5.078	-0.010	80	448879	2.50	2.43	
D 15 2-methylnaphthalene-d10	152	5.606	5.612	-0.006	92	50525	0.5000	0.4982	
16 2-Methylnaphthalene	142	5.635	5.635	0.000	97	319283	2.50	2.54	
D 17 1-Methylnaphthalene-d10	152	5.686	5.692	-0.006	100	49002	0.5000	0.4822	
18 1-Methylnaphthalene	142	5.715	5.720	-0.005	98	302751	2.50	2.55	
19 1,1'-Biphenyl	154	6.014	6.013	0.001	100	458515	2.50	2.55	
D 20 2,6-Dimethylnaphthalene-d12	168	6.109	6.109	0.000	99	56070	0.5000	0.4966	
21 2,6-Dimethylnaphthalene	156	6.146	6.145	0.001	98	339444	2.50	2.53	
D 23 Acenaphthylene-d8	160	6.362	6.367	-0.004	92	86384	0.5000	0.5018	
24 Acenaphthylene	152	6.372	6.377	-0.005	98	510695	2.50	2.51	
* 26 Acenaphthene-d10	164	6.492	6.492	0.000	98	55945	0.5000	0.5000	
27 Acenaphthene	154	6.517	6.517	0.000	98	323118	2.50	2.48	
28 2,3,5-Trimethylnaphthalene	170	6.834	6.834	0.000	92	359727	2.50	2.50	
D 29 Fluorene -d10	176	6.925	6.925	0.000	94	65288	0.5000	0.4897	
30 Fluorene	166	6.945	6.945	0.000	98	430895	2.50	2.54	
31 Hexachlorobenzene	284	7.417	7.417	0.000	0	218499	2.50	2.44	
32 Pentachlorophenol	266	7.580	7.576	0.004	0	1617304	25.0	23.7	
D 33 Dibenzothiophene-d8	192	7.628	7.628	0.000	99	132367	0.5000	0.5109	
34 Dibenzothiophene	184	7.645	7.645	0.000	91	691214	2.50	2.50	
D 35 Phenanthrene-d10	188	7.732	7.728	0.004	99	118943	0.5000	0.5164	
37 Phenanthrene	178	7.749	7.749	0.000	41	703502	2.50	2.45	
D 38 Anthracin-d10	188	7.777	7.776	0.001	100	108297	0.5000	0.4817	
39 Anthracene	178	7.794	7.794	0.000	100	685401	2.50	2.57	M
40 1-Methylphenanthrene	191	8.289	8.289	0.000	100	325796	2.50	2.47	

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
D 41 Fluoranthene-d10	212	8.808	8.808	0.000	100	151969	0.5000	0.5086	
43 Fluoranthene	202	8.825	8.825	0.000	42	963009	2.50	2.48	
* 44 Pyrene-d10 (IS)	212	9.027	9.027	0.000	99	147690	0.5000	0.5000	
45 Pyrene	202	9.044	9.044	0.000	97	961214	2.50	2.42	
$ 46 Terphenyl-d14	244	9.189	9.188	0.001	100	299235	NC	NC	
47 Benzo[a]anthracene	228	10.260	10.260	0.000	100	944265	2.50	2.61	
D 48 Chrysene-d12	240	10.270	10.270	0.000	76	139033	0.5000	0.4825	M
50 Chrysene	228	10.295	10.295	0.000	24	956134	2.50	2.36	M
D 52 Benzo(b)fluoranthene-d12	264	11.376	11.369	0.007	100	122201	0.5000	0.5145	
53 Benzo[b]fluoranthene	252	11.397	11.397	0.000	96	948562	2.50	2.30	
D 54 Benzo(k)fluoranthene-d12	264	11.404	11.404	0.000	59	136203	0.5000	0.4882	
55 Benzo[k]fluoranthene	252	11.425	11.425	0.000	100	1013292	2.50	2.54	
* 56 Benzo(e)pyrene-d12	264	11.684	11.684	0.000	99	93773	0.5000	0.5000	
57 Benzo[e]pyrene	252	11.712	11.712	0.000	100	843197	2.50	2.39	
D 58 Benzo(a)pyrene-d12	264	11.747	11.747	0.000	100	104746	0.5000	0.5029	
59 Benzo[a]pyrene	252	11.775	11.775	0.000	100	857801	2.50	2.48	
D 60 Perylene-d12	264	11.846	11.845	0.001	100	113791	0.5000	0.4923	
61 Perylene	252	11.874	11.873	0.001	100	793457	2.50	2.44	M
D 62 Indeno[1,2,3-cd]pyrene-d12	288	13.186	13.186	0.000	93	116748	0.5000	0.5160	
D 63 Dibenz(a,h)anthracene-d14	292	13.196	13.196	0.000	75	104527	0.5000	0.5163	
65 Indeno[1,2,3-cd]pyrene	276	13.214	13.214	0.000	59	942551	2.50	2.41	
66 Dibenz(a,h)anthracene	278	13.243	13.242	0.001	75	797128	2.50	2.39	M
D 67 Benzo(ghi)perylene-d12	288	13.543	13.543	0.000	100	111713	0.5000	0.4971	
68 Benzo[g,h,i]perylene	276	13.580	13.580	0.000	87	785123	2.50	2.40	
69 Dibenzo(def,p)chrysene	302	14.922	14.922	0.000	82	465265	NC	NC	
70 Dibenzo[a,e]pyrene	302	15.364	15.382	-0.018	83	545606	NC	NC	
D 71 Coronene-d12	312	15.373	15.382	-0.009	41	82847	NC	NC	
72 Dibenz(a,i)pyrene	302	15.542	15.570	-0.028	89	329579	NC	NC	
73 Dibenzo[a,h]pyrene	302	15.626	15.654	-0.028	70	381345	NC	NC	
S 105 Benzo(b)fluoranthene / Benzo(k)f					0			4.84	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

60L6SIMPAH_00026 Amount Added: 1.00 Units: mL

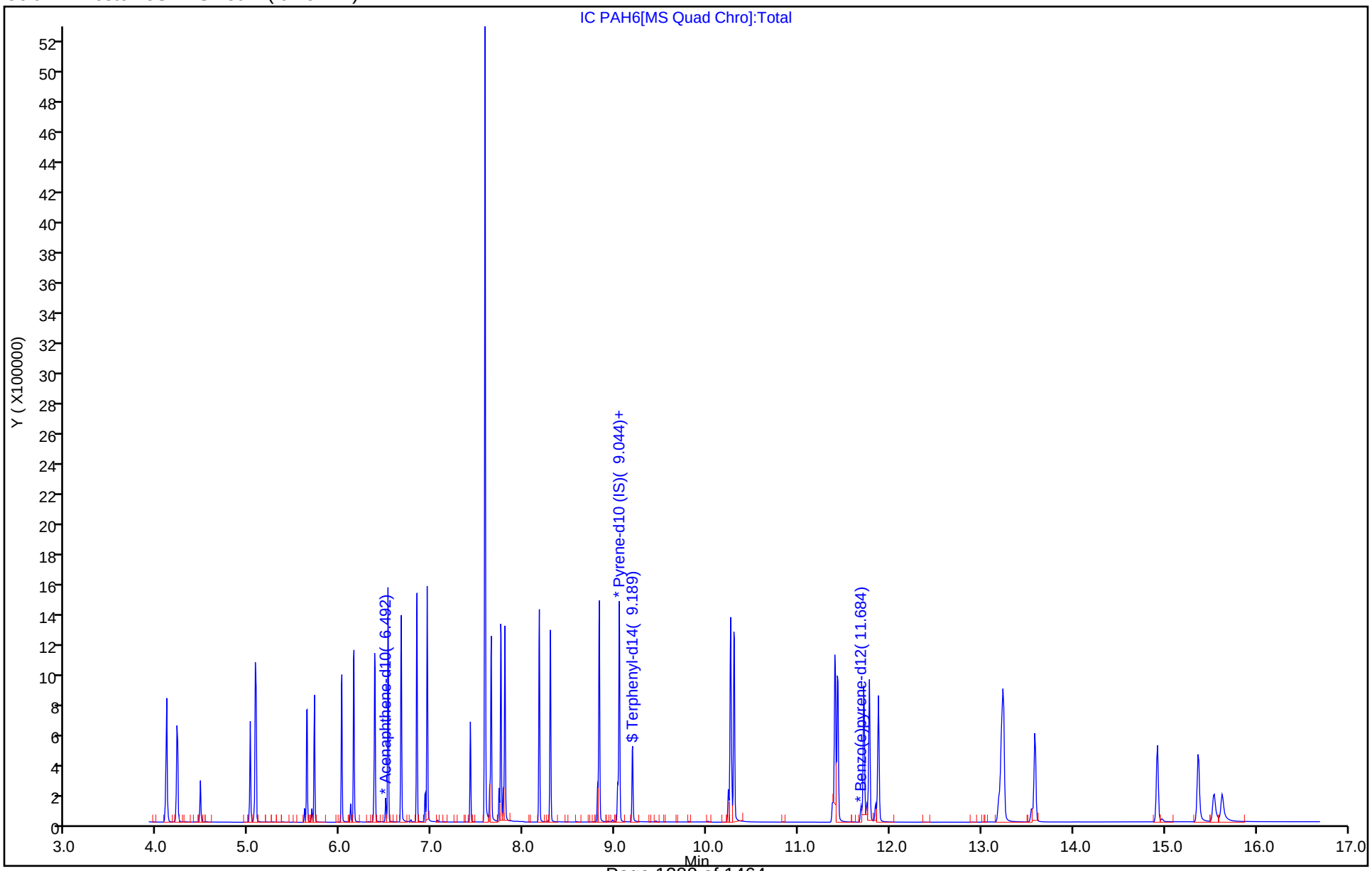
Report Date: 15-Nov-2023 14:42:09 Chrom Revision: 2.3 13-Nov-2023 16:16:38

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH6.D

Injection Date:	13-Nov-2023 17:51:08	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	ic pah6			Worklist Smp#:	20
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



Manual Integration/User Assign Peak Report

Eurofins Knoxville

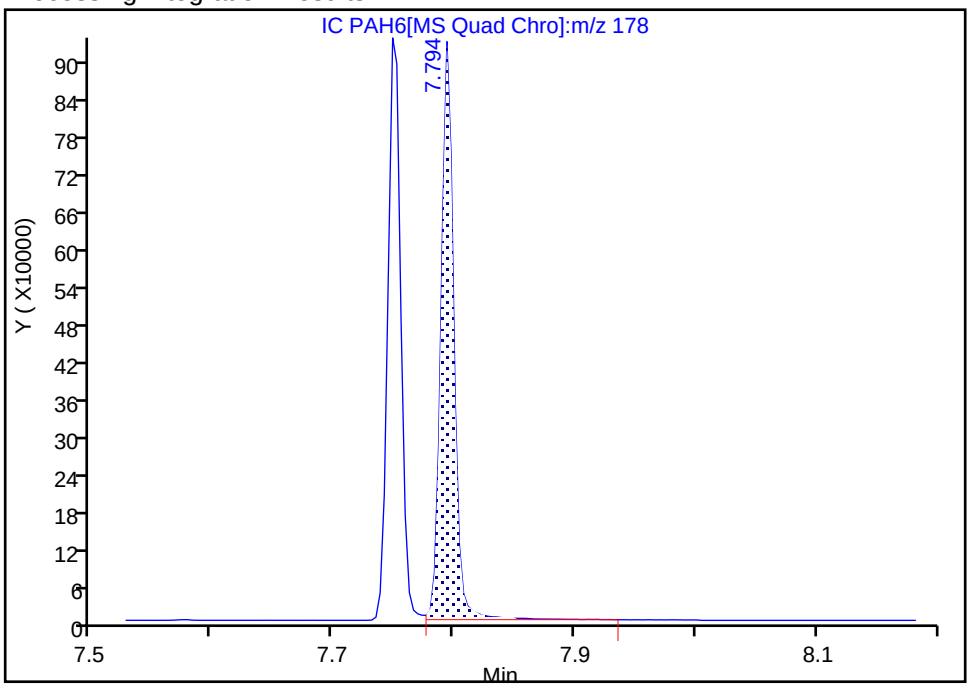
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH6.D				
Injection Date:	13-Nov-2023 17:51:08	Instrument ID:	GCMS1		
Lims ID:	ic pah6				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

39 Anthracene, CAS: 120-12-7

Signal: 1

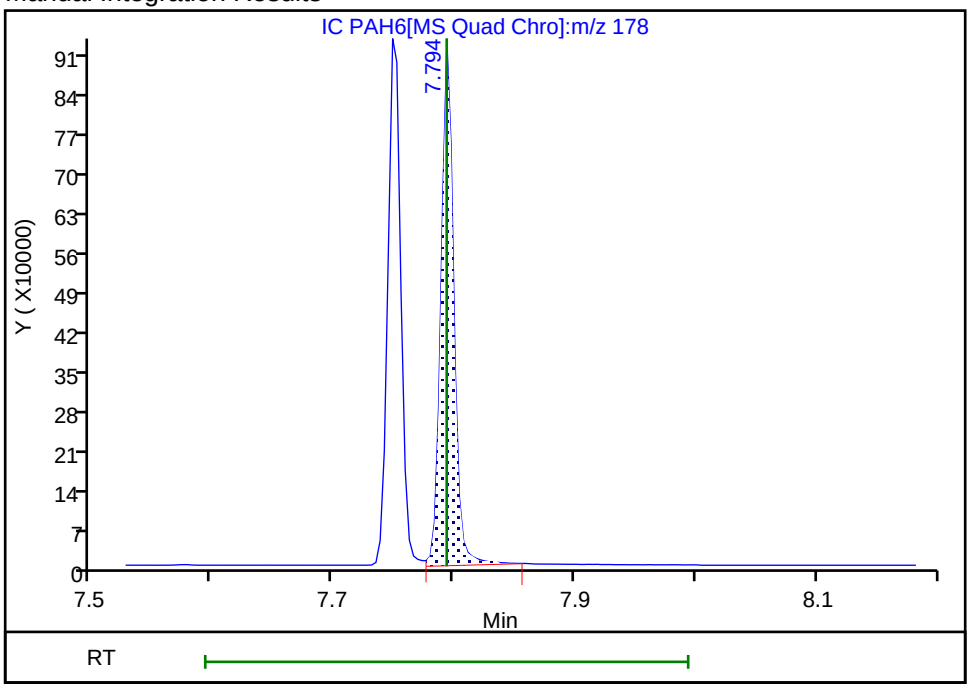
Processing Integration Results

RT: 7.79
Area: 689854
Amount: 2.634284
Amount Units: ug/ml



Manual Integration Results

RT: 7.79
Area: 685401
Amount: 2.570432
Amount Units: ug/ml



Reviewer: SK9U, 14-Nov-2023 09:33:34 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

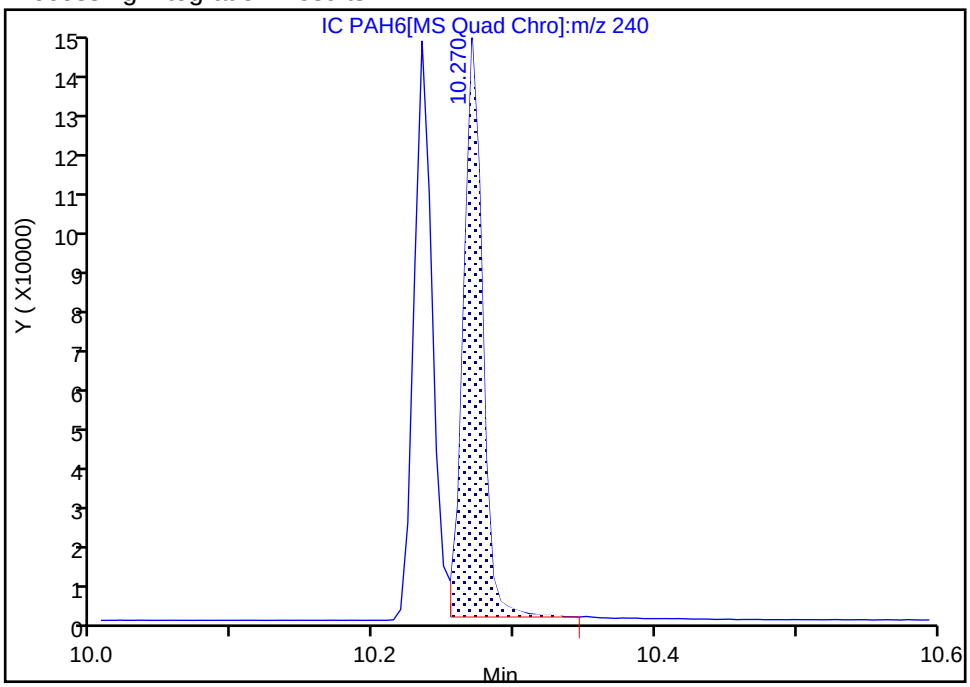
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH6.D
Injection Date: 13-Nov-2023 17:51:08 Instrument ID: GCMS1
Lims ID: ic pah6
Client ID:
Operator ID: TAI\knxinstgcms1 ALS Bottle#: 0 Worklist Smp#: 20
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: SIM_PAH_GCMS1 Limit Group: SOG - PAH IsoDil - ICAL
Column: Restek-5Sil MS 25um (0.25 mm) Detector MS SCAN

D 48 Chrysene-d12, CAS: 1719-03-5

Signal: 1

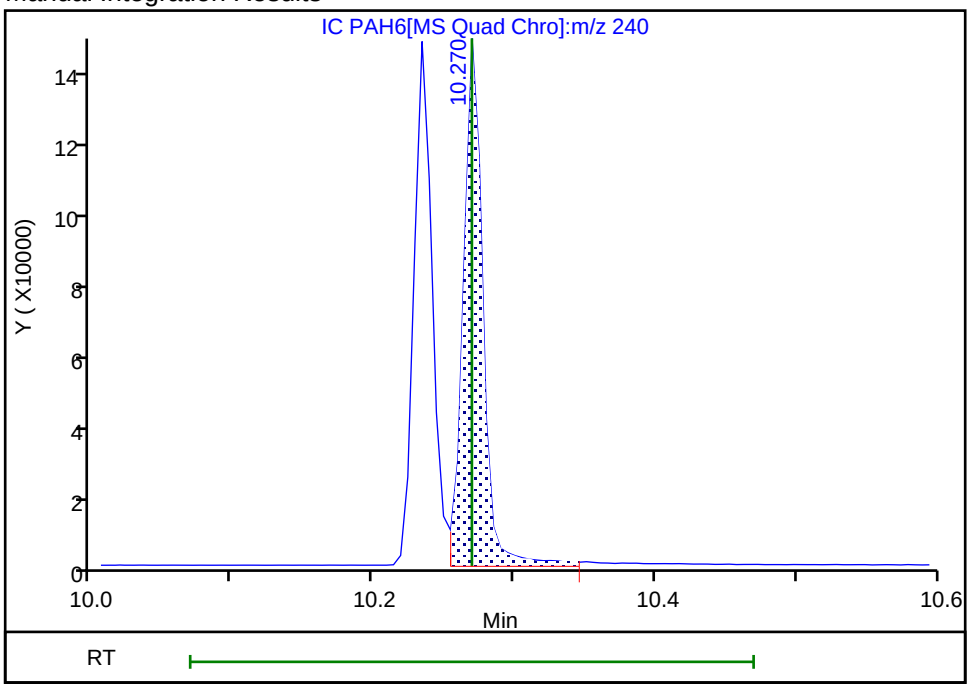
Processing Integration Results

RT: 10.27
Area: 134555
Amount: 0.469014
Amount Units: ug/ml



Manual Integration Results

RT: 10.27
Area: 139033
Amount: 0.482471
Amount Units: ug/ml



Reviewer: SK9U, 14-Nov-2023 09:34:10 -05:00:00 (UTC)
Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

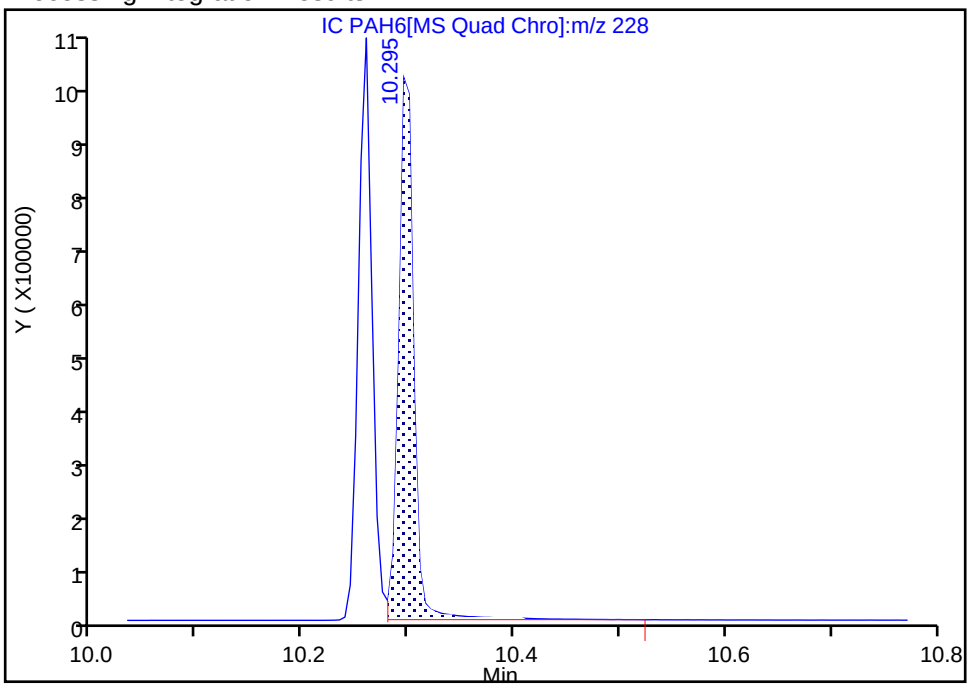
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH6.D				
Injection Date:	13-Nov-2023 17:51:08	Instrument ID:	GCMS1		
Lims ID:	ic pah6				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

50 Chrysene, CAS: 218-01-9

Signal: 1

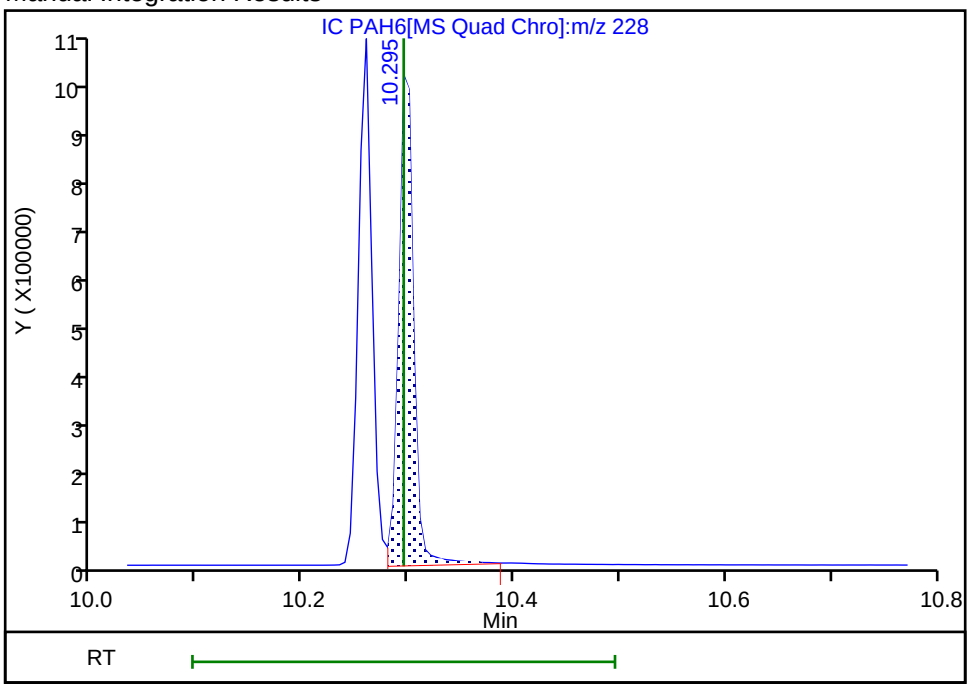
Processing Integration Results

RT: 10.30
Area: 968834
Amount: 2.389607
Amount Units: ug/ml



Manual Integration Results

RT: 10.30
Area: 956134
Amount: 2.362512
Amount Units: ug/ml



Reviewer: SK9U, 14-Nov-2023 09:34:28 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

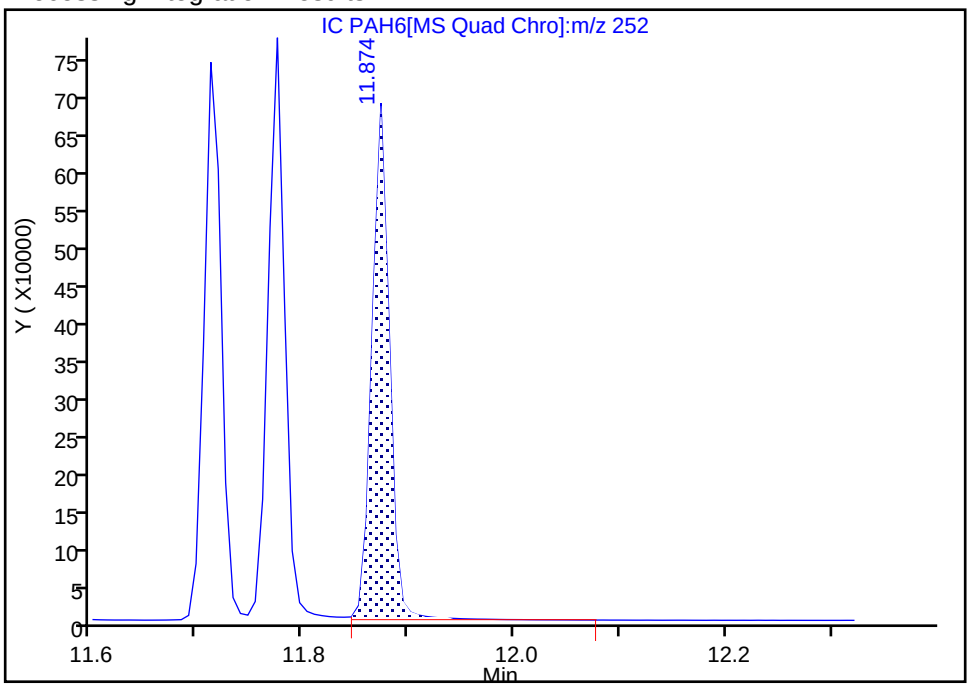
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH6.D				
Injection Date:	13-Nov-2023 17:51:08	Instrument ID:	GCMS1		
Lims ID:	ic pah6				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

61 Perylene, CAS: 198-55-0

Signal: 1

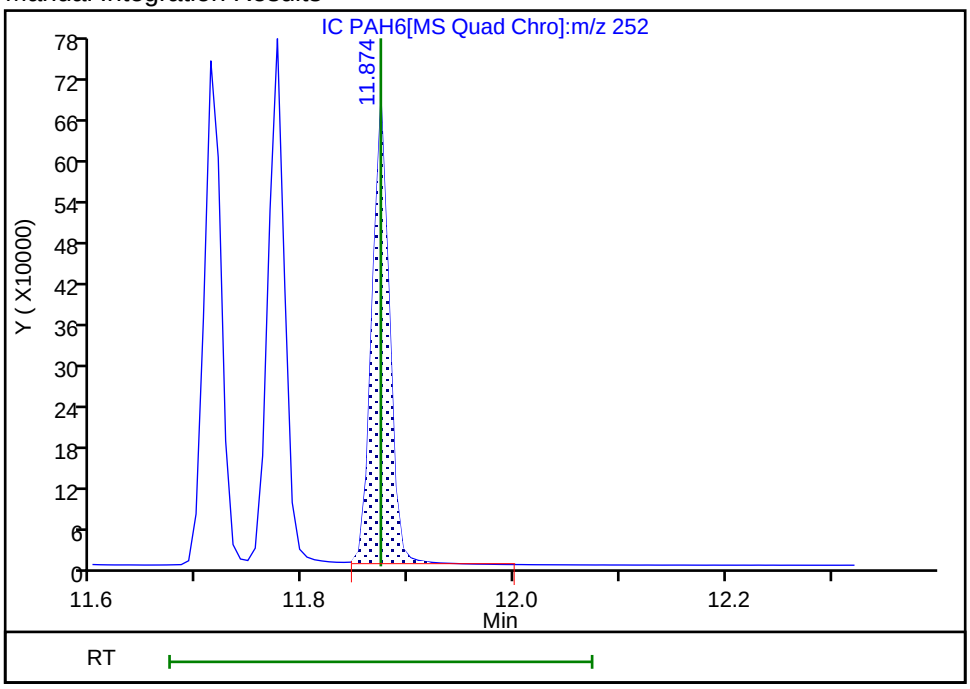
Processing Integration Results

RT: 11.87
Area: 794619
Amount: 2.442898
Amount Units: ug/ml



Manual Integration Results

RT: 11.87
Area: 793457
Amount: 2.439823
Amount Units: ug/ml



Reviewer: SK9U, 14-Nov-2023 09:52:15 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

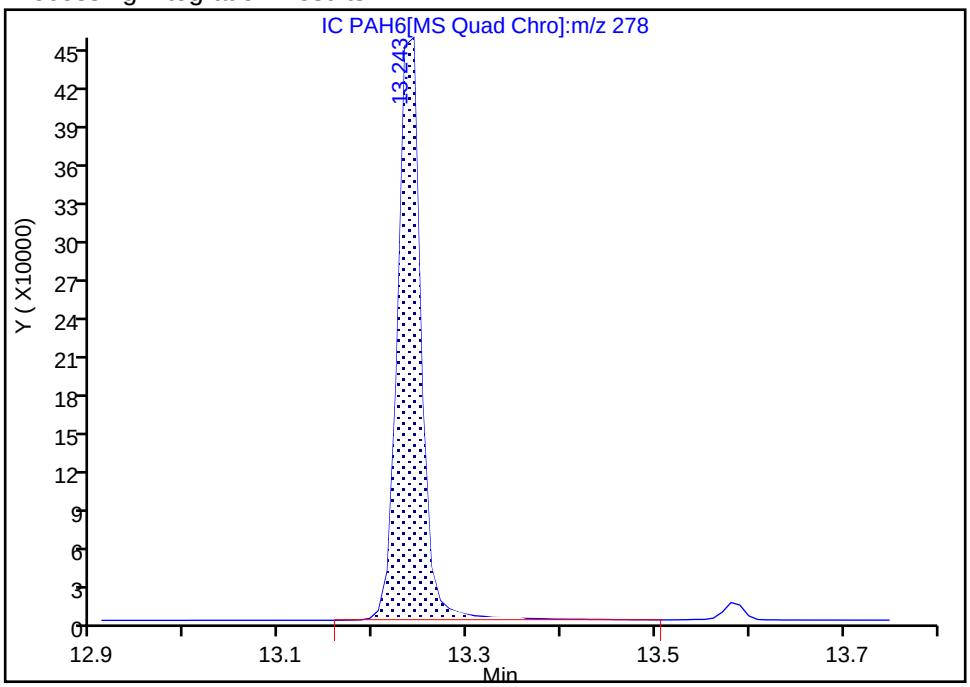
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH6.D				
Injection Date:	13-Nov-2023 17:51:08	Instrument ID:	GCMS1		
Lims ID:	ic pah6				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	20
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

66 Dibenz(a,h)anthracene, CAS: 53-70-3

Signal: 1

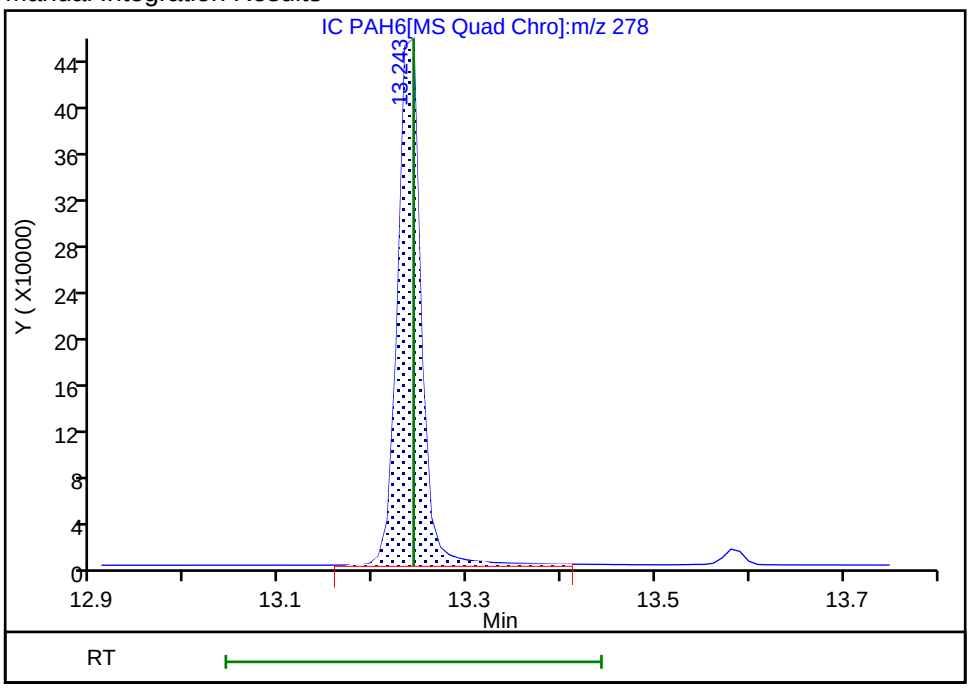
Processing Integration Results

RT: 13.24
Area: 800059
Amount: 2.442853
Amount Units: ug/ml



Manual Integration Results

RT: 13.24
Area: 797128
Amount: 2.388076
Amount Units: ug/ml



Reviewer: SK9U, 14-Nov-2023 09:35:18 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH5.D
Lims ID: ic pah5
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 13-Nov-2023 18:14:41 ALS Bottle#: 0 Worklist Smp#: 21
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030467-021
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1
Sublist: chrom-SIM_PAH_GCMS1*sub4

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 15-Nov-2023 14:42:13 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1623

First Level Reviewer: SK9U Date: 14-Nov-2023 09:38:00

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
D 3 1,4-Dichlorobenzene-d4	115	4.118	4.110	0.008	78	20164	NC	NC	
4 1,4-Dichlorobenzene	146	4.135	4.118	0.017	91	79098	NC	NC	
D 5 1,2-Dichlorobenzene-d4	115	4.238	4.221	0.017	47	20275	NC	NC	
6 1,2-Dichlorobenzene	146	4.246	4.229	0.017	87	71602	NC	NC	
9 1,2,4-Trichlorobenzene	180	5.022	5.022	0.000	99	81954	NC	NC	
D 10 Naphthalene-d8	136	5.068	5.068	0.000	98	74453	0.5000	0.4906	
$ 11 13C6-Naphthalene	134	5.087	5.078	0.009	92	158594	NC	NC	
12 Naphthalene	128	5.077	5.078	-0.001	80	167649	1.00	0.9574	
D 15 2-methylnaphthalene-d10	152	5.612	5.612	0.000	92	49116	0.5000	0.4977	
16 2-Methylnaphthalene	142	5.635	5.635	0.000	98	118803	1.00	0.9724	
D 17 1-Methylnaphthalene-d10	152	5.692	5.692	0.000	100	48949	0.5000	0.4951	
18 1-Methylnaphthalene	142	5.720	5.720	0.000	100	115372	1.00	0.9710	
19 1,1'-Biphenyl	154	6.013	6.013	0.000	100	174407	1.00	0.99	
D 20 2,6-Dimethylnaphthalene-d12	168	6.109	6.109	0.000	100	54726	0.5000	0.4982	
21 2,6-Dimethylnaphthalene	156	6.145	6.145	0.000	99	129185	1.00	0.9847	
D 23 Acenaphthylene-d8	160	6.366	6.367	0.000	97	83775	0.5000	0.5002	
24 Acenaphthylene	152	6.376	6.377	-0.001	99	193834	1.00	0.9841	
* 26 Acenaphthene-d10	164	6.492	6.492	0.000	98	54433	0.5000	0.5000	
27 Acenaphthene	154	6.517	6.517	0.000	97	122289	1.00	0.9694	
28 2,3,5-Trimethylnaphthalene	170	6.834	6.834	0.000	93	137146	1.00	0.9759	
D 29 Fluorene -d10	176	6.925	6.925	0.000	99	64246	0.5000	0.4953	
30 Fluorene	166	6.945	6.945	0.000	98	168401	1.00	1.01	
31 Hexachlorobenzene	284	7.417	7.417	0.000	0	82146	1.00	0.9593	
32 Pentachlorophenol	266	7.576	7.576	0.000	0	1204164	20.0	20.0	
D 33 Dibenzothiophene-d8	192	7.628	7.628	0.000	99	127371	0.5000	0.5104	
34 Dibenzothiophene	184	7.645	7.645	0.000	91	265851	1.00	1.00	
D 35 Phenanthrene-d10	188	7.731	7.728	0.003	81	113874	0.5000	0.5133	
37 Phenanthrene	178	7.749	7.749	0.000	96	275031	1.00	1.00	
36 13C6-Phenanthrene (PRC)	184	7.749	7.749	0.000	98	261003	1.00	0.9148	
D 38 Anthracin-d10	188	7.776	7.776	0.000	100	103873	0.5000	0.4796	
39 Anthracene	178	7.794	7.794	0.000	100	257934	1.00	1.01	

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
40 1-Methylphenanthrene	191	8.289	8.289	0.000	100	124367	1.00	0.9847	M
D 41 Fluoranthene-d10	212	8.805	8.808	-0.003	99	144703	0.5000	0.5028	
42 13C6-Fluoranthene (PRC)	208	8.825	8.825	0.000	95	361861	1.00	0.8705	M
43 Fluoranthene	202	8.825	8.825	0.000	100	373010	1.00	1.01	
* 44 Pyrene-d10 (IS)	212	9.023	9.027	-0.004	97	142251	0.5000	0.5000	
45 Pyrene	202	9.044	9.044	0.000	100	368554	1.00	0.9753	
$ 46 Terphenyl-d14	244	9.188	9.188	0.000	100	108304	NC	NC	
47 Benzo[a]anthracene	228	10.259	10.260	-0.001	100	352904	1.00	1.04	
D 48 Chrysene-d12	240	10.270	10.270	0.000	95	130404	0.5000	0.4698	
49 13C6-Chrysene (PRC)	234	10.295	10.295	0.000	73	226881	1.00	1.02	
50 Chrysene	228	10.295	10.295	0.000	72	381476	1.00	1.00	
D 52 Benzo(b)fluoranthene-d12	264	11.369	11.369	0.000	99	117826	0.5000	0.5099	
53 Benzo[b]fluoranthene	252	11.397	11.397	0.000	99	369256	1.00	0.9301	
D 54 Benzo(k)fluoranthene-d12	264	11.404	11.404	0.000	71	128352	0.5000	0.4729	
55 Benzo[k]fluoranthene	252	11.425	11.425	0.000	100	382723	1.00	1.02	
* 56 Benzo(e)pyrene-d12	264	11.684	11.684	0.000	99	91228	0.5000	0.5000	
57 Benzo[e]pyrene	252	11.712	11.712	0.000	100	329347	1.00	0.9794	
D 58 Benzo(a)pyrene-d12	264	11.747	11.747	0.000	100	99784	0.5000	0.4924	
59 Benzo[a]pyrene	252	11.775	11.775	0.000	100	328647	1.00	1.00	
D 60 Perylene-d12	264	11.838	11.845	-0.007	99	109265	0.5000	0.4859	
61 Perylene	252	11.873	11.873	0.000	100	306774	1.00	0.9824	M
D 62 Indeno[1,2,3-cd]pyrene-d12	288	13.186	13.186	0.000	95	109798	0.5000	0.4988	
D 63 Dibenz(a,h)anthracene-d14	292	13.195	13.196	-0.001	73	98166	0.5000	0.4984	
64 13C6-Indeno(1,2,3-cd)pyrene (PRC	282	13.214	13.214	0.000	87	265984	1.00	0.9130	
65 Indeno[1,2,3-cd]pyrene	276	13.214	13.214	0.000	86	359760	1.00	0.9790	
66 Dibenz(a,h)anthracene	278	13.233	13.242	-0.009	86	316441	1.00	1.01	
D 67 Benzo(ghi)perylene-d12	288	13.543	13.543	0.000	100	106974	0.5000	0.4893	
68 Benzo[g,h,i]perylene	276	13.580	13.580	0.000	86	310856	1.00	0.99	M
69 Dibenzo(def,p)chrysene	302	14.922	14.922	0.000	82	175217	NC	NC	
70 Dibenzo[a,e]pyrene	302	15.373	15.382	-0.009	82	200397	NC	NC	
D 71 Coronene-d12	312	15.373	15.382	-0.009	57	77208	NC	NC	
72 Dibenz(a,i)pyrene	302	15.551	15.570	-0.019	89	113044	NC	NC	
73 Dibenzo[a,h]pyrene	302	15.635	15.654	-0.019	86	142621	NC	NC	
S 105 Benzo(b)fluoranthene / Benzo(k)f					0			1.95	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

60L5SIMPAH_00025 Amount Added: 1.00 Units: mL

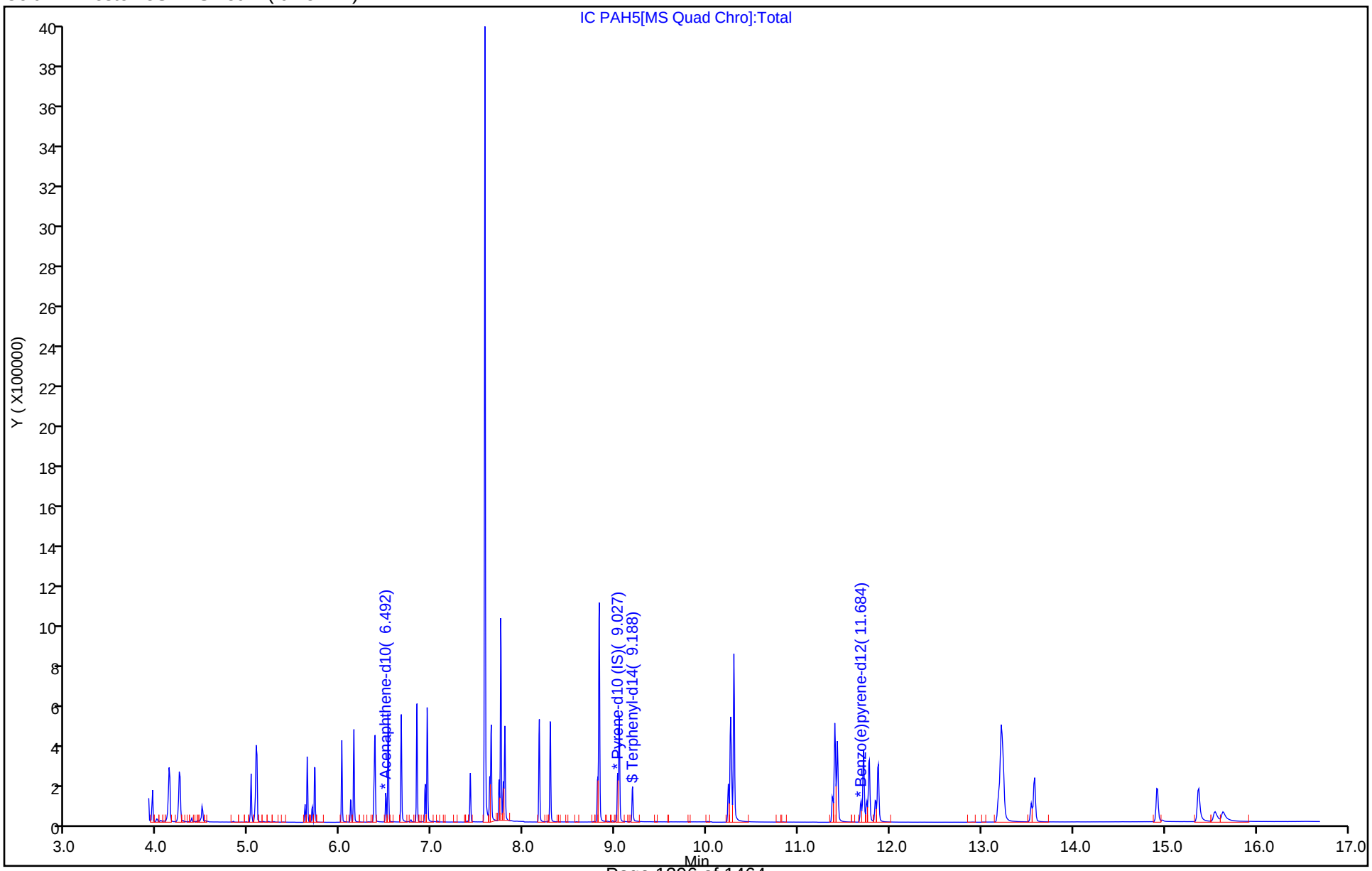
Report Date: 15-Nov-2023 14:42:14 Chrom Revision: 2.3 13-Nov-2023 16:16:38

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH5.D

Injection Date:	13-Nov-2023 18:14:41	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	ic pah5			Worklist Smp#:	21
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



Eurofins Knoxville

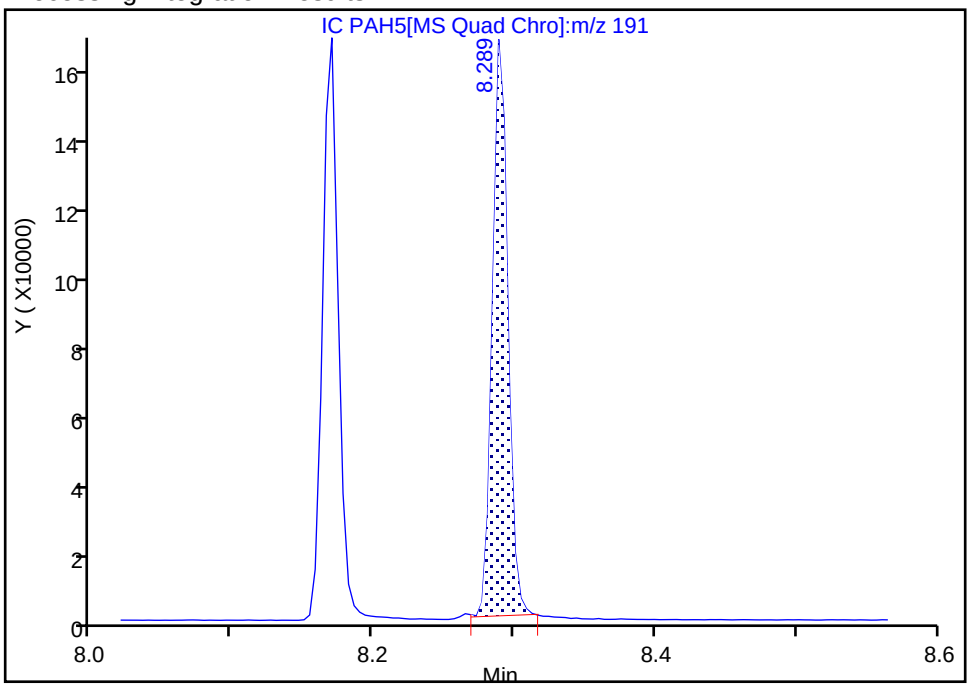
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH5.D				
Injection Date:	13-Nov-2023 18:14:41	Instrument ID:	GCMS1		
Lims ID:	ic pah5				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

40 1-Methylphenanthrene, CAS: 832-69-9

Signal: 1

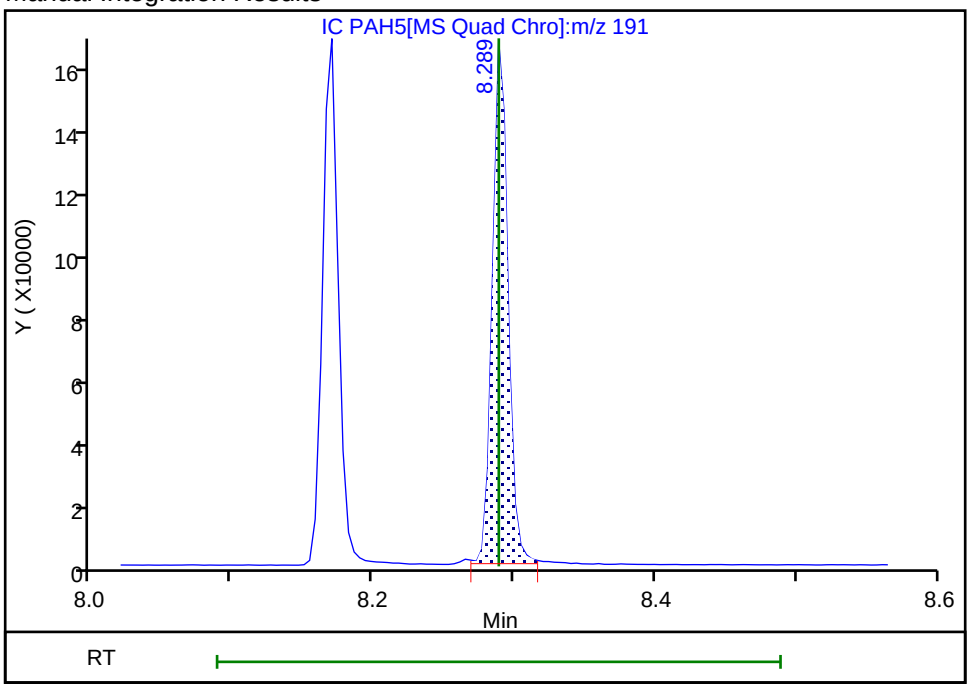
Processing Integration Results

RT: 8.29
Area: 121867
Amount: 0.948410
Amount Units: ug/ml



Manual Integration Results

RT: 8.29
Area: 124367
Amount: 0.984653
Amount Units: ug/ml



Reviewer: SK9U, 14-Nov-2023 09:37:13 -05:00:00 (UTC)
Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

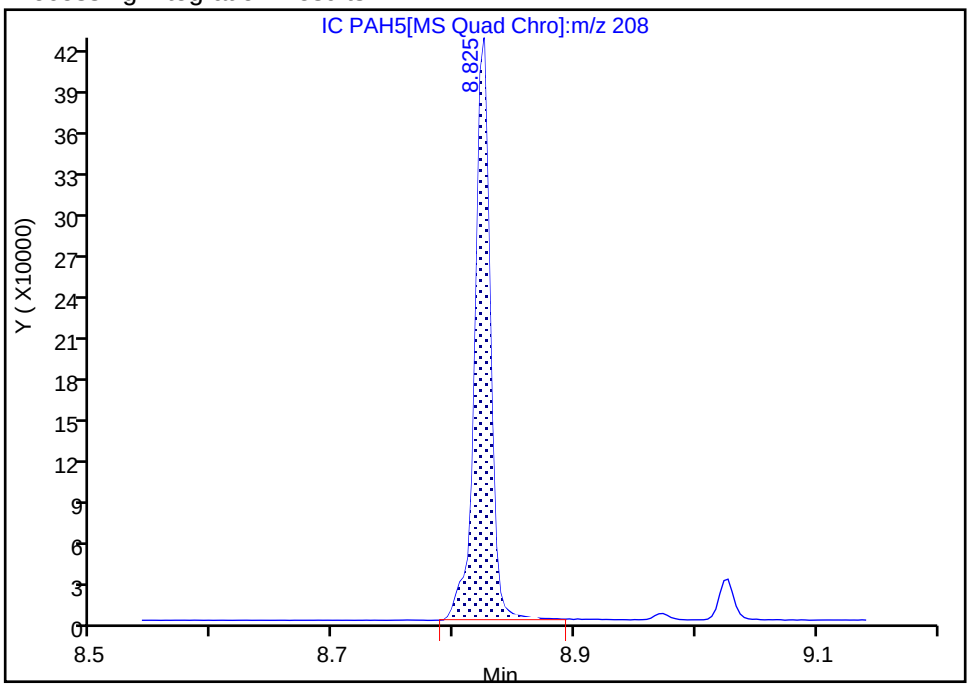
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH5.D				
Injection Date:	13-Nov-2023 18:14:41	Instrument ID:	GCMS1		
Lims ID:	ic pah5				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

42 13C6-Fluoranthene (PRC), CAS: 917378-10-0

Signal: 1

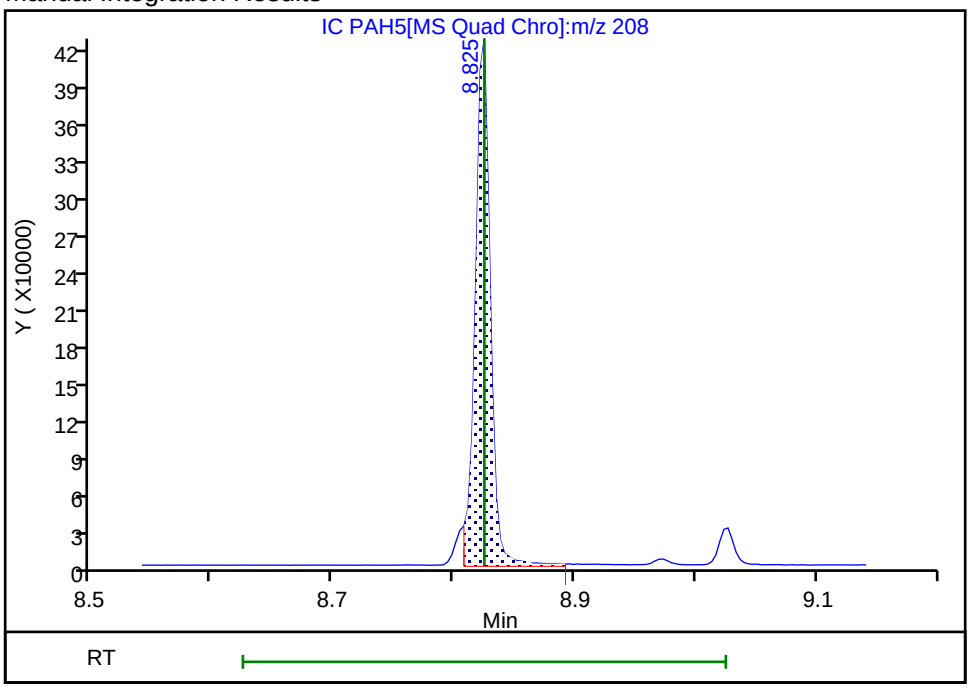
Processing Integration Results

RT: 8.82
Area: 373352
Amount: 0.893234
Amount Units: ug/ml



Manual Integration Results

RT: 8.82
Area: 361861
Amount: 0.870528
Amount Units: ug/ml



Reviewer: SK9U, 14-Nov-2023 10:09:45 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

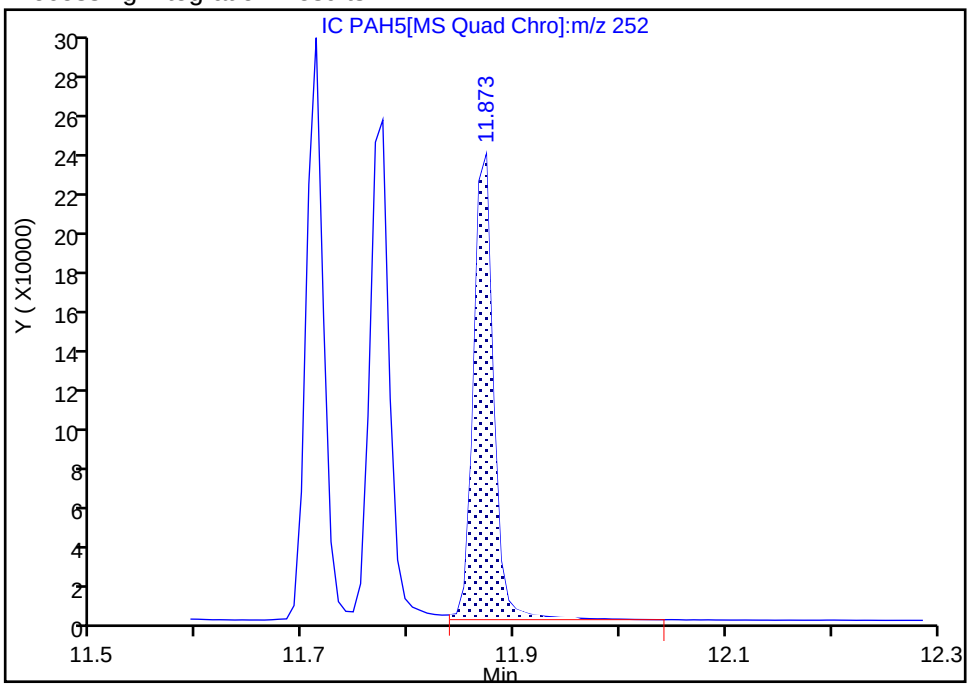
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH5.D				
Injection Date:	13-Nov-2023 18:14:41	Instrument ID:	GCMS1		
Lims ID:	ic pah5				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

61 Perylene, CAS: 198-55-0

Signal: 1

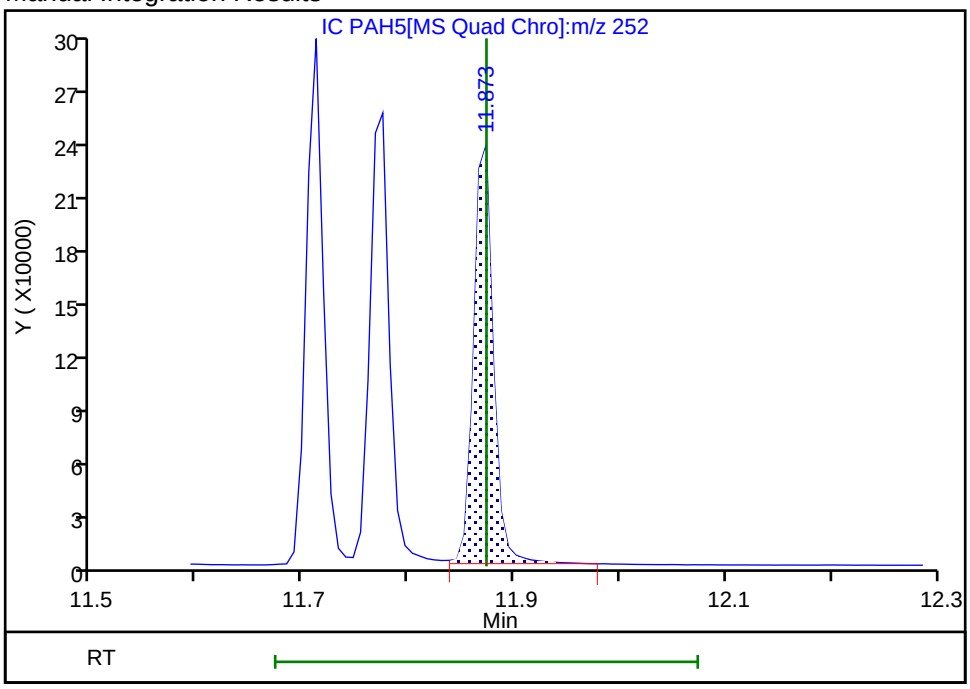
Processing Integration Results

RT: 11.87
Area: 307456
Amount: 0.984058
Amount Units: ug/ml



Manual Integration Results

RT: 11.87
Area: 306774
Amount: 0.982382
Amount Units: ug/ml



Reviewer: SK9U, 14-Nov-2023 09:36:13 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

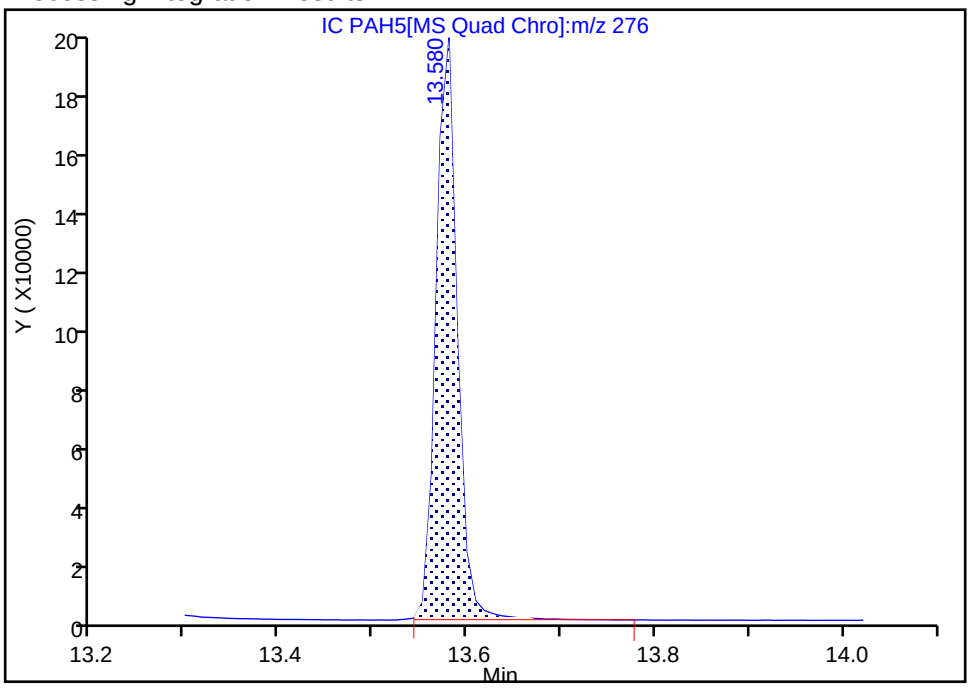
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH5.D				
Injection Date:	13-Nov-2023 18:14:41	Instrument ID:	GCMS1		
Lims ID:	ic pah5				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	21
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

68 Benzo[g,h,i]perylene, CAS: 191-24-2

Signal: 1

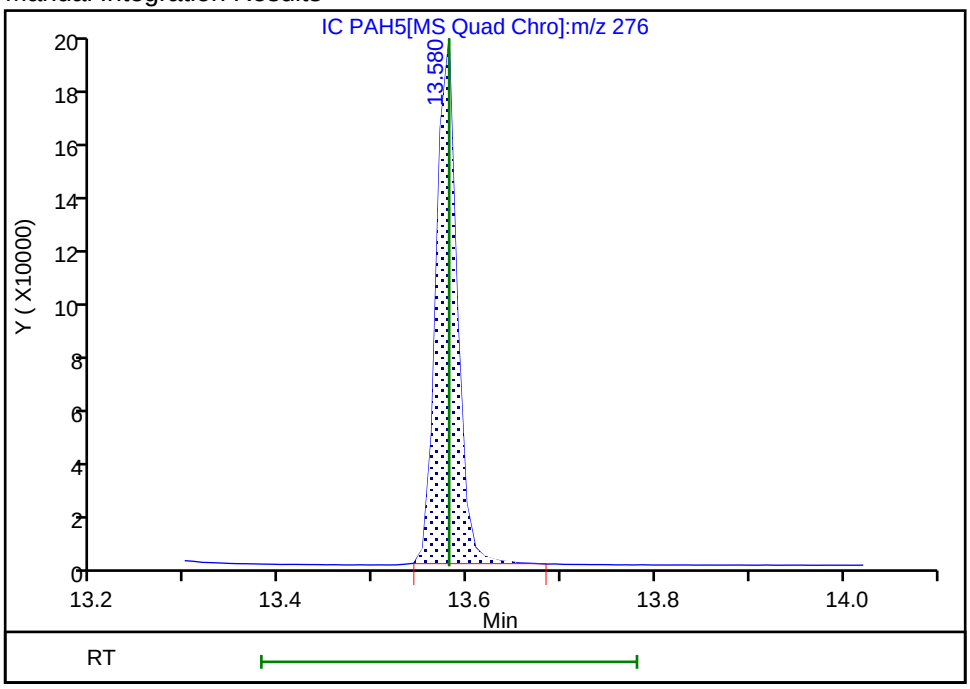
Processing Integration Results

RT: 13.58
Area: 311653
Amount: 0.994533
Amount Units: ug/ml



Manual Integration Results

RT: 13.58
Area: 310856
Amount: 0.992350
Amount Units: ug/ml



Reviewer: SK9U, 14-Nov-2023 09:35:51 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH4.D
Lims ID: ic pah4
Client ID:
Sample Type: IC Calib Level: 4
Inject. Date: 13-Nov-2023 18:38:16 ALS Bottle#: 0 Worklist Smp#: 22
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030467-022
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1
Sublist: chrom-SIM_PAH_GCMS1*sub4

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 15-Nov-2023 14:42:20 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1623

First Level Reviewer: SK9U Date: 14-Nov-2023 09:39:14

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
D 3 1,4-Dichlorobenzene-d4	115	4.110	4.110	0.000	73	19882	NC	NC	
4 1,4-Dichlorobenzene	146	4.118	4.118	0.000	87	41171	NC	NC	
D 5 1,2-Dichlorobenzene-d4	115	4.221	4.221	0.000	84	21446	NC	NC	
6 1,2-Dichlorobenzene	146	4.229	4.229	0.000	56	36979	NC	NC	
9 1,2,4-Trichlorobenzene	180	5.022	5.022	0.000	94	42328	NC	NC	
D 10 Naphthalene-d8	136	5.068	5.068	0.000	99	74629	0.5000	0.4882	
$ 11 13C6-Naphthalene	134	5.078	5.078	0.000	86	88901	NC	NC	
12 Naphthalene	128	5.078	5.078	0.000	86	87260	0.5000	0.4972	
D 15 2-methylnaphthalene-d10	152	5.612	5.612	0.000	92	49793	0.5000	0.5010	
16 2-Methylnaphthalene	142	5.635	5.635	0.000	98	59339	0.5000	0.4791	
D 17 1-Methylnaphthalene-d10	152	5.692	5.692	0.000	100	51298	0.5000	0.5151	
18 1-Methylnaphthalene	142	5.720	5.720	0.000	100	58023	0.5000	0.4660	
19 1,1'-Biphenyl	154	6.013	6.013	0.000	100	88099	0.5000	0.4848	
D 20 2,6-Dimethylnaphthalene-d12	168	6.109	6.109	0.000	100	56652	0.5000	0.5120	
21 2,6-Dimethylnaphthalene	156	6.145	6.145	0.000	98	64985	0.5000	0.4785	
D 23 Acenaphthylene-d8	160	6.367	6.367	0.000	97	86168	0.5000	0.5108	
24 Acenaphthylene	152	6.377	6.377	0.000	99	97871	0.5000	0.4831	
* 26 Acenaphthene-d10	164	6.492	6.492	0.000	98	54827	0.5000	0.5000	
27 Acenaphthene	154	6.517	6.517	0.000	96	61279	0.5000	0.4723	
28 2,3,5-Trimethylnaphthalene	170	6.834	6.834	0.000	94	69578	0.5000	0.4783	
D 29 Fluorene -d10	176	6.925	6.925	0.000	100	66183	0.5000	0.5066	
30 Fluorene	166	6.945	6.945	0.000	97	81761	0.5000	0.4755	
31 Hexachlorobenzene	284	7.417	7.417	0.000	0	40966	0.5000	0.4727	
32 Pentachlorophenol	266	7.576	7.576	0.000	0	848658	15.0	15.5	
D 33 Dibenzothiophene-d8	192	7.628	7.628	0.000	99	126765	0.5000	0.5017	
34 Dibenzothiophene	184	7.645	7.645	0.000	91	130673	0.5000	0.4926	
D 35 Phenanthrene-d10	188	7.728	7.728	0.000	99	115234	0.5000	0.5131	
37 Phenanthrene	178	7.749	7.749	0.000	98	134982	0.5000	0.4855	
36 13C6-Phenanthrene (PRC)	184	7.749	7.749	0.000	100	130423	0.5000	0.4517	
D 38 Anthracin-d10	188	7.776	7.776	0.000	99	112111	0.5000	0.5113	
39 Anthracene	178	7.794	7.794	0.000	100	129295	0.5000	0.4684	M

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
40 1-Methylphenanthrene	191	8.289	8.289	0.000	100	62362	0.5000	0.4879	M
D 41 Fluoranthene-d10	212	8.808	8.808	0.000	99	144590	0.5000	0.4963	
42 13C6-Fluoranthene (PRC)	208	8.825	8.825	0.000	95	180852	0.5000	0.4354	M
43 Fluoranthene	202	8.825	8.825	0.000	100	183819	0.5000	0.4968	
* 44 Pyrene-d10 (IS)	212	9.027	9.027	0.000	99	144013	0.5000	0.5000	
45 Pyrene	202	9.044	9.044	0.000	100	184873	0.5000	0.4896	
$ 46 Terphenyl-d14	244	9.188	9.188	0.000	100	53512	NC	NC	
47 Benzo[a]anthracene	228	10.260	10.260	0.000	100	175070	0.5000	0.5105	
D 48 Chrysene-d12	240	10.270	10.270	0.000	84	132037	0.5000	0.4699	
49 13C6-Chrysene (PRC)	234	10.295	10.295	0.000	73	114851	0.5000	0.5081	
50 Chrysene	228	10.295	10.295	0.000	71	197036	0.5000	0.5127	
D 52 Benzo(b)fluoranthene-d12	264	11.369	11.369	0.000	100	119303	0.5000	0.5188	
53 Benzo[b]fluoranthene	252	11.397	11.397	0.000	99	185667	0.5000	0.4619	
D 54 Benzo(k)fluoranthene-d12	264	11.404	11.404	0.000	98	129996	0.5000	0.4812	
55 Benzo[k]fluoranthene	252	11.425	11.425	0.000	100	195746	0.5000	0.5140	
* 56 Benzo(e)pyrene-d12	264	11.684	11.684	0.000	99	90787	0.5000	0.5000	
57 Benzo[e]pyrene	252	11.712	11.712	0.000	100	164984	0.5000	0.4803	
D 58 Benzo(a)pyrene-d12	264	11.747	11.747	0.000	100	101934	0.5000	0.5055	
59 Benzo[a]pyrene	252	11.775	11.775	0.000	100	164381	0.5000	0.4876	
D 60 Perylene-d12	264	11.845	11.845	0.000	100	111978	0.5000	0.5004	
61 Perylene	252	11.873	11.873	0.000	100	157926	0.5000	0.4935	
D 62 Indeno[1,2,3-cd]pyrene-d12	288	13.186	13.186	0.000	86	110281	0.5000	0.5034	
D 63 Dibenz(a,h)anthracene-d14	292	13.196	13.196	0.000	82	97532	0.5000	0.4976	
64 13C6-Indeno(1,2,3-cd)pyrene (PRC	282	13.214	13.214	0.000	86	132207	0.5000	0.4518	
65 Indeno[1,2,3-cd]pyrene	276	13.214	13.214	0.000	85	178846	0.5000	0.4845	
66 Dibenz(a,h)anthracene	278	13.242	13.242	0.000	82	158694	0.5000	0.5095	
D 67 Benzo(ghi)perylene-d12	288	13.543	13.543	0.000	100	111018	0.5000	0.5103	
68 Benzo[g,h,i]perylene	276	13.580	13.580	0.000	93	153796	0.5000	0.4731	
69 Dibenzo(def,p)chrysene	302	14.922	14.922	0.000	83	84345	NC	NC	
70 Dibenzo[a,e]pyrene	302	15.382	15.382	0.000	69	99677	NC	NC	
D 71 Coronene-d12	312	15.382	15.382	0.000	78	83458	NC	NC	
72 Dibenz(a,i)pyrene	302	15.570	15.570	0.000	89	48568	NC	NC	
73 Dibenzo[a,h]pyrene	302	15.654	15.654	0.000	70	71069	NC	NC	
S 105 Benzo(b)fluoranthene / Benzo(k)f					0			0.9759	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

60L4SIMPAH_00029 Amount Added: 1.00 Units: mL

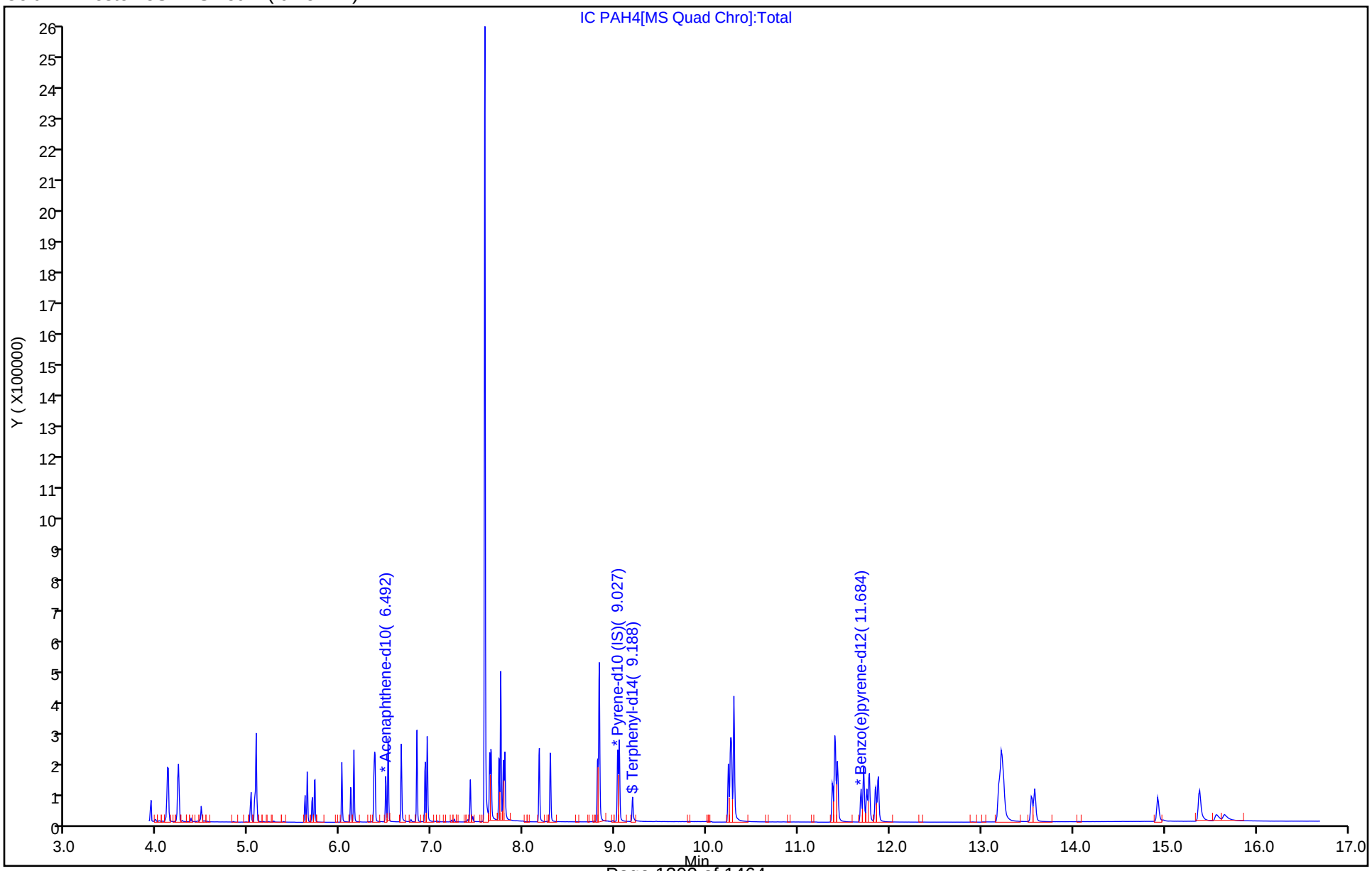
Report Date: 15-Nov-2023 14:42:23 Chrom Revision: 2.3 13-Nov-2023 16:16:38

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH4.D

Injection Date:	13-Nov-2023 18:38:16	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	ic pah4			Worklist Smp#:	22
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



Manual Integration/User Assign Peak Report

Eurofins Knoxville

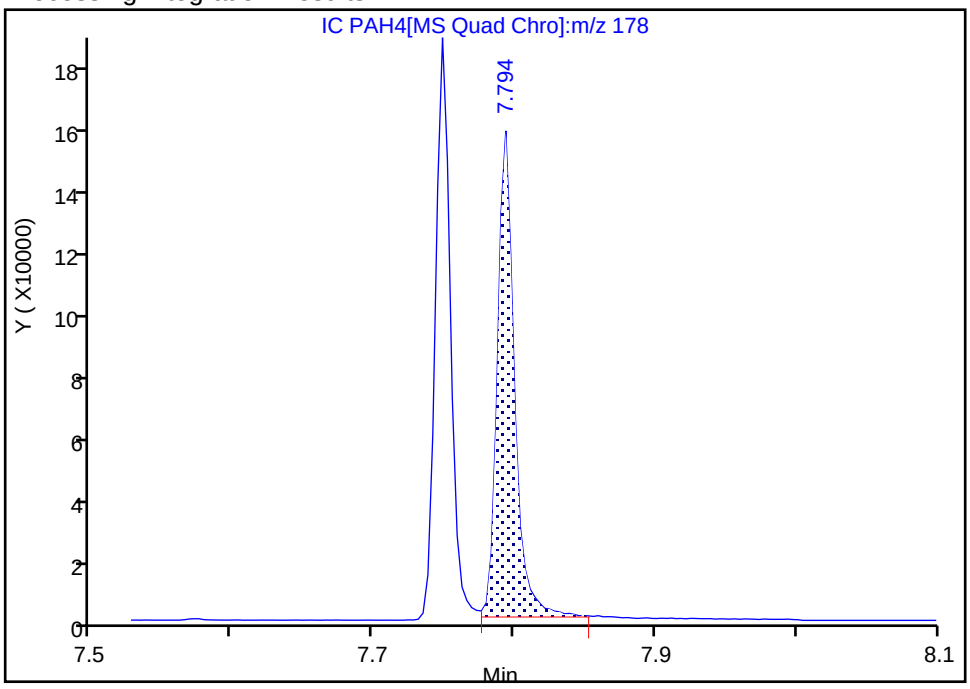
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH4.D
Injection Date: 13-Nov-2023 18:38:16 Instrument ID: GCMS1
Lims ID: ic pah4
Client ID:
Operator ID: TAI\knxinstgcms1 ALS Bottle#: 0 Worklist Smp#: 22
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: SIM_PAH_GCMS1 Limit Group: SOG - PAH IsoDil - ICAL
Column: Restek-5Sil MS 25um (0.25 mm) Detector MS SCAN

39 Anthracene, CAS: 120-12-7

Signal: 1

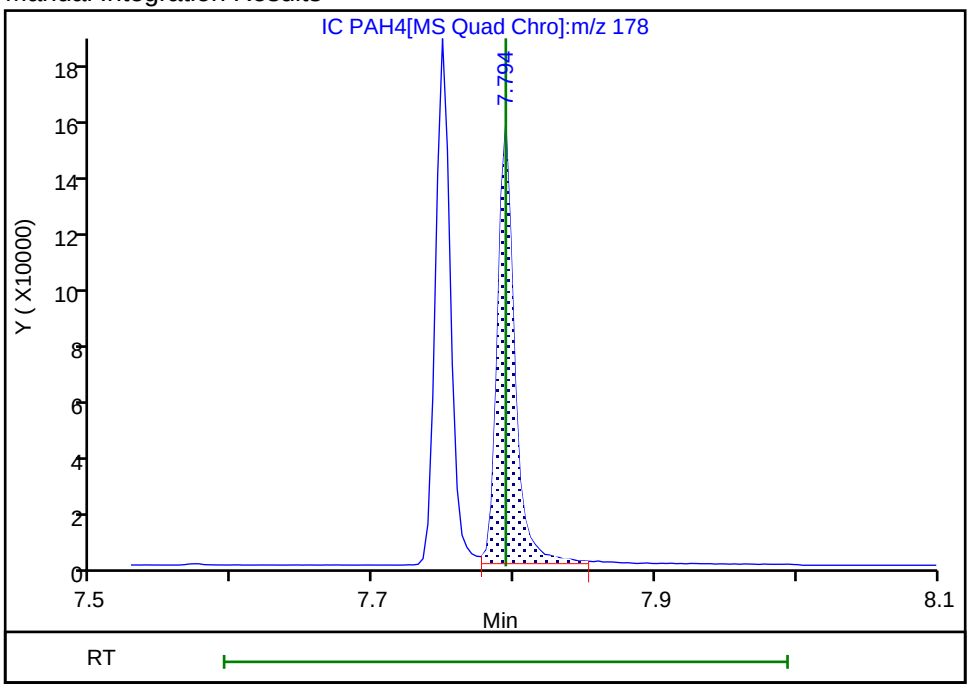
Processing Integration Results

RT: 7.79
Area: 125242
Amount: 0.455623
Amount Units: ug/ml



Manual Integration Results

RT: 7.79
Area: 129295
Amount: 0.468394
Amount Units: ug/ml



Reviewer: SK9U, 14-Nov-2023 09:55:09 -05:00:00 (UTC)
Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

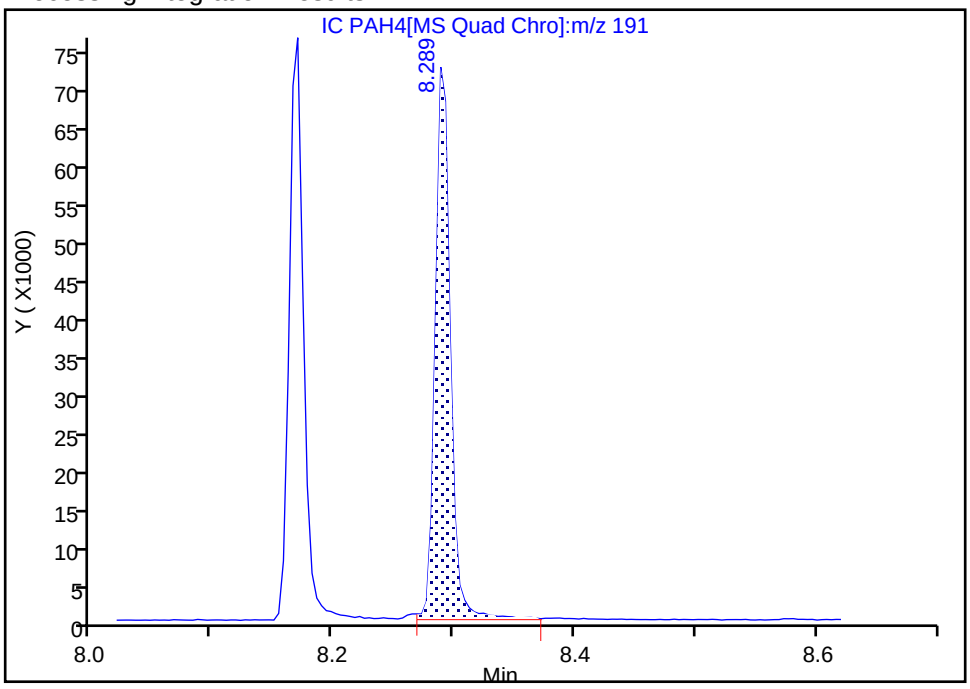
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH4.D				
Injection Date:	13-Nov-2023 18:38:16	Instrument ID:	GCMS1		
Lims ID:	ic pah4				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

40 1-Methylphenanthrene, CAS: 832-69-9

Signal: 1

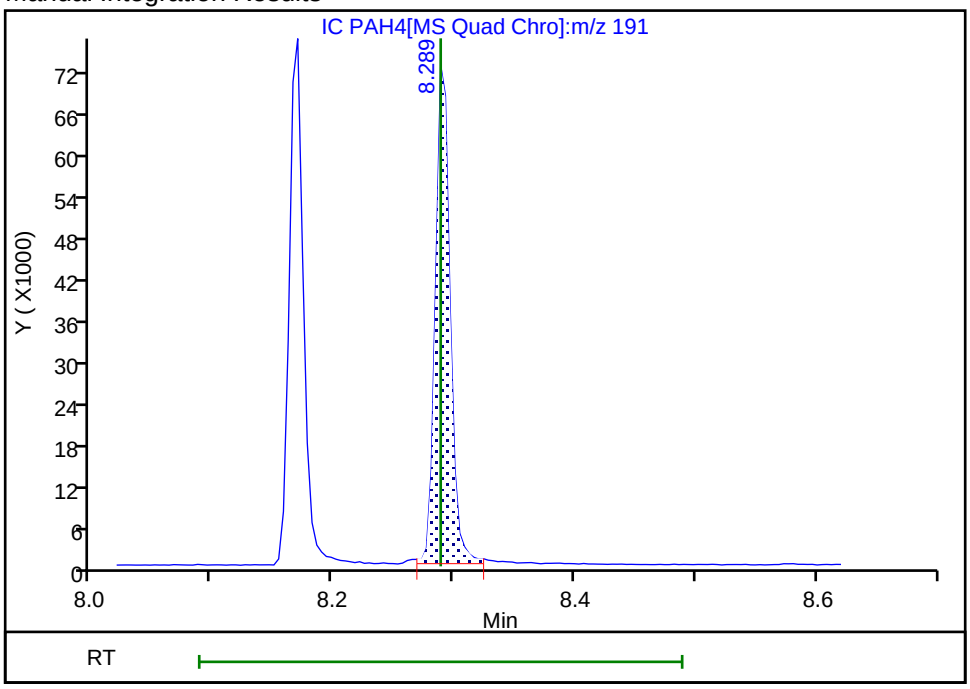
Processing Integration Results

RT: 8.29
Area: 63190
Amount: 0.493478
Amount Units: ug/ml



Manual Integration Results

RT: 8.29
Area: 62362
Amount: 0.487913
Amount Units: ug/ml



Reviewer: SK9U, 14-Nov-2023 09:55:22 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

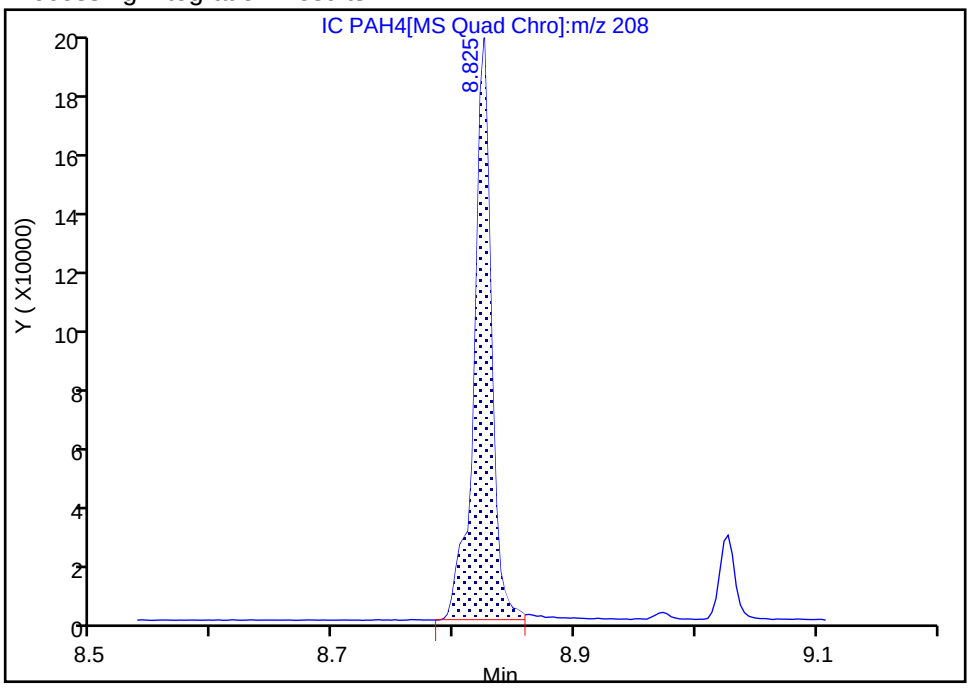
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH4.D				
Injection Date:	13-Nov-2023 18:38:16	Instrument ID:	GCMS1		
Lims ID:	ic pah4				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	22
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

42 13C6-Fluoranthene (PRC), CAS: 917378-10-0

Signal: 1

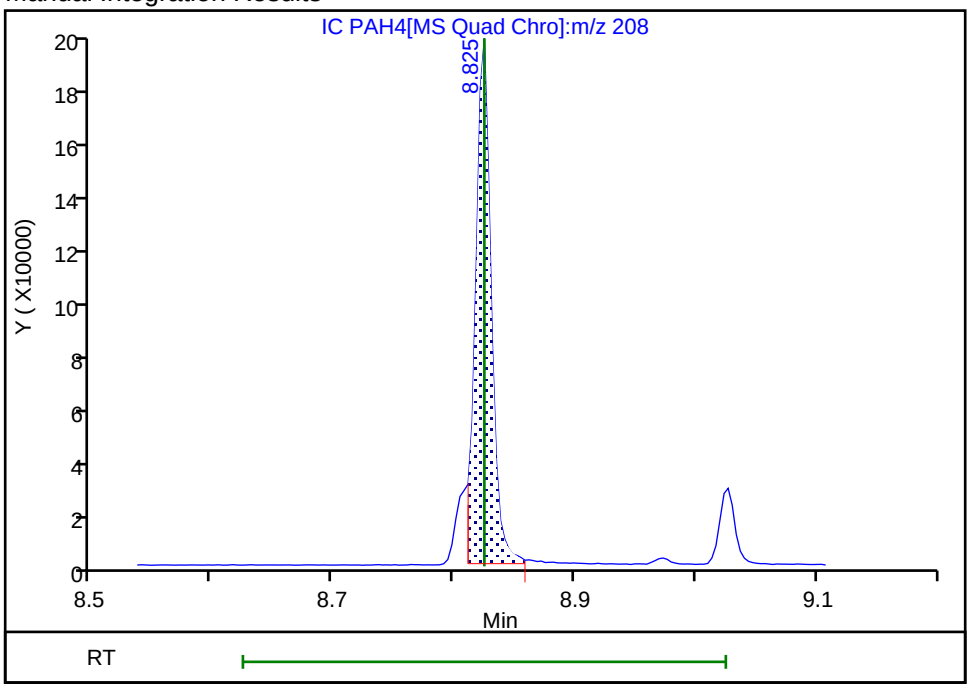
Processing Integration Results

RT: 8.82
Area: 197374
Amount: 0.465219
Amount Units: ug/ml



Manual Integration Results

RT: 8.82
Area: 180852
Amount: 0.435415
Amount Units: ug/ml



Reviewer: SK9U, 14-Nov-2023 10:09:22 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH3.D
Lims ID: ic pah3
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 13-Nov-2023 19:01:43 ALS Bottle#: 0 Worklist Smp#: 23
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030467-023
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1
Sublist: chrom-SIM_PAH_GCMS1*sub4

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 15-Nov-2023 14:42:29 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1623

First Level Reviewer: SK9U Date: 14-Nov-2023 09:40:35

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
D 3 1,4-Dichlorobenzene-d4	115	4.101	4.110	-0.009	79	20351	NC	NC	a
4 1,4-Dichlorobenzene	146	4.110	4.118	-0.008	85	21032	NC	NC	
D 5 1,2-Dichlorobenzene-d4	115	4.212	4.221	-0.009	85	21483	NC	NC	
6 1,2-Dichlorobenzene	146	4.221	4.229	-0.008	42	18709	NC	NC	
9 1,2,4-Trichlorobenzene	180	5.013	5.022	-0.009	97	20326	NC	NC	
D 10 Naphthalene-d8	136	5.059	5.068	-0.009	99	77058	0.5000	0.5175	
$ 11 13C6-Naphthalene	134	5.078	5.078	0.000	89	47247	NC	NC	
12 Naphthalene	128	5.078	5.078	0.000	89	43247	0.2500	0.2386	
D 15 2-methylnaphthalene-d10	152	5.606	5.612	-0.006	91	50765	0.5000	0.5243	
16 2-Methylnaphthalene	142	5.635	5.635	0.000	100	30004	0.2500	0.2376	
D 17 1-Methylnaphthalene-d10	152	5.686	5.692	-0.006	99	49283	0.5000	0.5080	
18 1-Methylnaphthalene	142	5.715	5.720	-0.005	94	29476	0.2500	0.2464	
19 1,1'-Biphenyl	154	6.013	6.013	0.000	100	43028	0.2500	0.2429	
D 20 2,6-Dimethylnaphthalene-d12	168	6.109	6.109	0.000	100	55221	0.5000	0.5123	
21 2,6-Dimethylnaphthalene	156	6.145	6.145	0.000	97	31540	0.2500	0.2383	
D 23 Acenaphthylene-d8	160	6.366	6.367	0.000	93	83334	0.5000	0.5071	
24 Acenaphthylene	152	6.377	6.377	0.000	99	49378	0.2500	0.2520	
* 26 Acenaphthene-d10	164	6.492	6.492	0.000	98	53409	0.5000	0.5000	
27 Acenaphthene	154	6.522	6.517	0.005	99	30611	0.2500	0.2439	
28 2,3,5-Trimethylnaphthalene	170	6.834	6.834	0.000	97	34493	0.2500	0.2432	
D 29 Fluorene -d10	176	6.925	6.925	0.000	100	65669	0.5000	0.5160	
30 Fluorene	166	6.950	6.945	0.005	100	41402	0.2500	0.2427	
31 Hexachlorobenzene	284	7.417	7.417	0.000	0	21326	0.2500	0.2480	
32 Pentachlorophenol	266	7.576	7.576	0.000	0	505955	10.0	10.6	
D 33 Dibenzothiophene-d8	192	7.628	7.628	0.000	99	126315	0.5000	0.5151	
34 Dibenzothiophene	184	7.645	7.645	0.000	98	66517	0.2500	0.2517	
D 35 Phenanthrene-d10	188	7.732	7.728	0.004	100	114355	0.5000	0.5246	
37 Phenanthrene	178	7.749	7.749	0.000	99	67019	0.2500	0.2429	
36 13C6-Phenanthrene (PRC)	184	7.749	7.749	0.000	100	63202	0.2500	0.2206	
D 38 Anthracin-d10	188	7.780	7.776	0.004	99	109239	0.5000	0.5133	
39 Anthracene	178	7.794	7.794	0.000	100	65811	0.2500	0.2447	

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
40 1-Methylphenanthrene	191	8.293	8.289	0.004	99	30603	0.2500	0.2413	
D 41 Fluoranthene-d10	212	8.808	8.808	0.000	99	143581	0.5000	0.5078	
42 13C6-Fluoranthene (PRC)	208	8.825	8.825	0.000	93	92888	0.2500	0.2252	
43 Fluoranthene	202	8.825	8.825	0.000	98	90388	0.2500	0.2460	
* 44 Pyrene-d10 (IS)	212	9.027	9.027	0.000	98	139784	0.5000	0.5000	
45 Pyrene	202	9.044	9.044	0.000	100	91490	0.2500	0.2440	
$ 46 Terphenyl-d14	244	9.192	9.188	0.004	100	24571	NC	NC	
47 Benzo[a]anthracene	228	10.260	10.260	0.000	100	86680	0.2500	0.2382	
D 48 Chrysene-d12	240	10.270	10.270	0.000	99	140107	0.5000	0.5137	
49 13C6-Chrysene (PRC)	234	10.295	10.295	0.000	71	56911	0.2500	0.2373	
50 Chrysene	228	10.295	10.295	0.000	71	102086	0.2500	0.2503	
D 52 Benzo(b)fluoranthene-d12	264	11.369	11.369	0.000	100	117956	0.5000	0.5259	
53 Benzo[b]fluoranthene	252	11.397	11.397	0.000	94	92958	0.2500	0.2339	
D 54 Benzo(k)fluoranthene-d12	264	11.404	11.404	0.000	78	132451	0.5000	0.5027	
55 Benzo[k]fluoranthene	252	11.425	11.425	0.000	100	100657	0.2500	0.2594	
* 56 Benzo(e)pyrene-d12	264	11.684	11.684	0.000	99	88549	0.5000	0.5000	
57 Benzo[e]pyrene	252	11.712	11.712	0.000	100	82802	0.2500	0.2413	
D 58 Benzo(a)pyrene-d12	264	11.747	11.747	0.000	100	101819	0.5000	0.5177	
59 Benzo[a]pyrene	252	11.775	11.775	0.000	100	81477	0.2500	0.2420	
D 60 Perylene-d12	264	11.845	11.845	0.000	100	113992	0.5000	0.5222	
61 Perylene	252	11.873	11.873	0.000	100	79232	0.2500	0.2432	
D 62 Indeno[1,2,3-cd]pyrene-d12	288	13.186	13.186	0.000	80	108861	0.5000	0.5095	
D 63 Dibenz(a,h)anthracene-d14	292	13.196	13.196	0.000	90	96976	0.5000	0.5073	
64 13C6-Indeno(1,2,3-cd)pyrene (PRC	282	13.214	13.214	0.000	81	65467	0.2500	0.2266	
65 Indeno[1,2,3-cd]pyrene	276	13.214	13.214	0.000	81	90728	0.2500	0.2490	
66 Dibenz(a,h)anthracene	278	13.242	13.242	0.000	88	79141	0.2500	0.2556	
D 67 Benzo(ghi)perylene-d12	288	13.543	13.543	0.000	100	109008	0.5000	0.5137	
68 Benzo[g,h,i]perylene	276	13.580	13.580	0.000	92	77898	0.2500	0.2440	
69 Dibenzo(def,p)chrysene	302	14.932	14.922	0.010	82	40402	NC	NC	M
70 Dibenzo[a,e]pyrene	302	15.392	15.382	0.010	51	46750	NC	NC	
D 71 Coronene-d12	312	15.382	15.382	0.000	78	77094	NC	NC	
72 Dibenz(a,i)pyrene	302	15.589	15.570	0.019	89	20505	NC	NC	
73 Dibenzo[a,h]pyrene	302	15.673	15.654	0.019	65	32951	NC	NC	
S 105 Benzo(b)fluoranthene / Benzo(k)f					0			0.4933	

QC Flag Legend

Processing Flags
NC - Not Calibrated
Review Flags
M - Manually Integrated
a - User Assigned ID

Reagents:

60L3SIMPAH_00026 Amount Added: 1.00 Units: mL

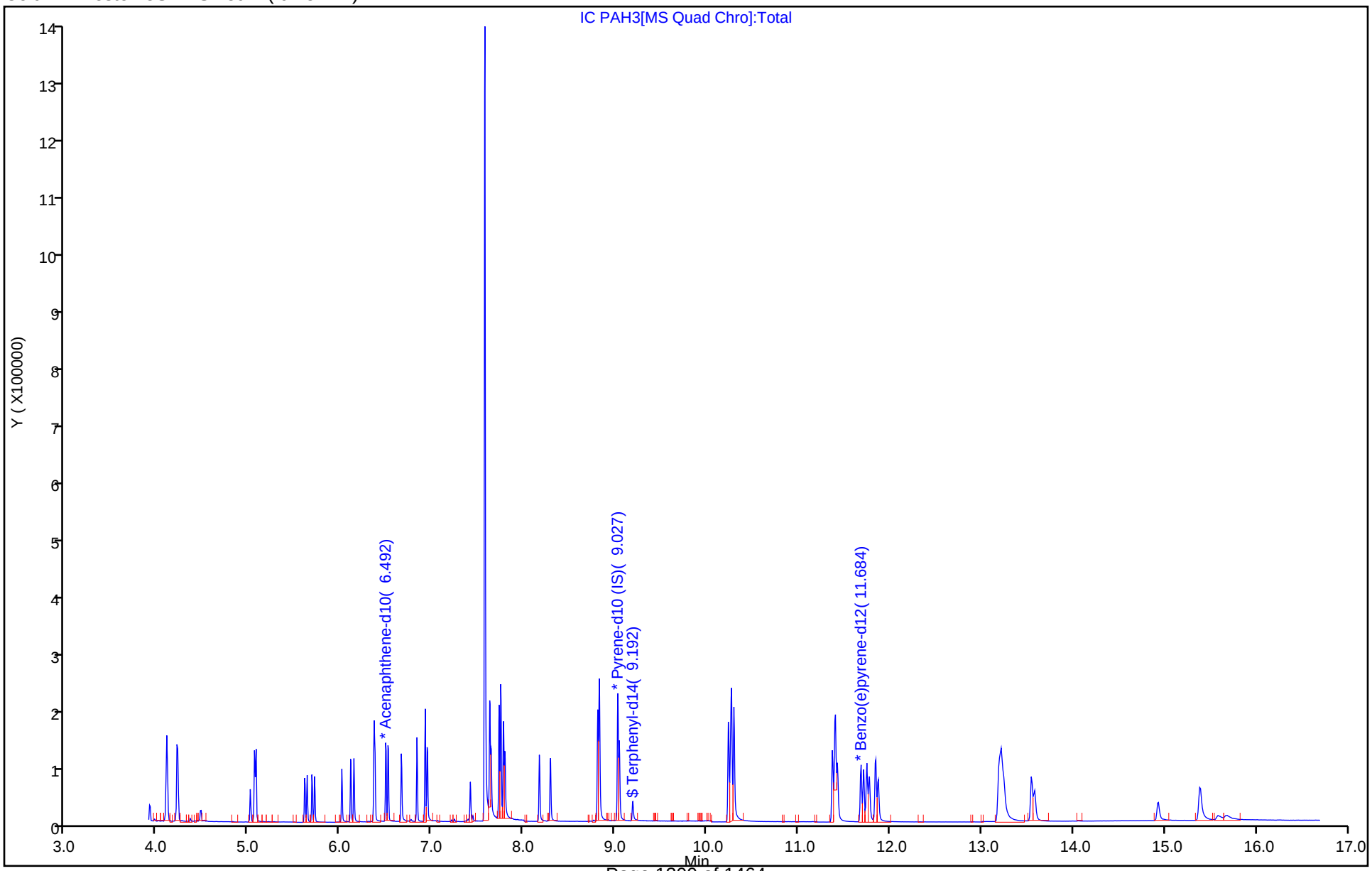
Report Date: 15-Nov-2023 14:42:31 Chrom Revision: 2.3 13-Nov-2023 16:16:38

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH3.D

Injection Date:	13-Nov-2023 19:01:43	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	ic pah3			Worklist Smp#:	23
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



Report Date: 15-Nov-2023 14:42:37 Chrom Revision: 2.3 13-Nov-2023 16:16:38

Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH2.D
Lims ID: ic pah2
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 13-Nov-2023 19:25:07 ALS Bottle#: 0 Worklist Smp#: 24
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030467-024
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1
Sublist: chrom-SIM_PAH_GCMS1*sub4

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 15-Nov-2023 14:42:36 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1623

First Level Reviewer: SK9U Date: 14-Nov-2023 09:42:30

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
D 3 1,4-Dichlorobenzene-d4	115	4.093	4.110	-0.017	86	21082	NC	NC	
4 1,4-Dichlorobenzene	146	4.101	4.118	-0.017	38	7942	NC	NC	
D 5 1,2-Dichlorobenzene-d4	115	4.212	4.221	-0.009	90	19671	NC	NC	
6 1,2-Dichlorobenzene	146	4.221	4.229	-0.008	71	7348	NC	NC	
9 1,2,4-Trichlorobenzene	180	5.013	5.022	-0.009	98	7718	NC	NC	
D 10 Naphthalene-d8	136	5.059	5.068	-0.009	100	76560	0.5000	0.5206	
$ 11 13C6-Naphthalene	134	5.078	5.078	0.000	80	13730	NC	NC	M
12 Naphthalene	128	5.078	5.078	0.000	83	16321	0.1000	0.0906	
D 15 2-methylnaphthalene-d10	152	5.606	5.612	-0.006	92	48084	0.5000	0.5029	
16 2-Methylnaphthalene	142	5.635	5.635	0.000	99	11292	0.1000	0.0944	
D 17 1-Methylnaphthalene-d10	152	5.686	5.692	-0.006	100	49412	0.5000	0.5158	
18 1-Methylnaphthalene	142	5.715	5.720	-0.005	96	11189	0.1000	0.0933	
19 1,1'-Biphenyl	154	6.013	6.013	0.000	100	15592	0.1000	0.0926	
D 20 2,6-Dimethylnaphthalene-d12	168	6.109	6.109	0.000	100	52484	0.5000	0.4930	
21 2,6-Dimethylnaphthalene	156	6.145	6.145	0.000	97	11683	0.1000	0.0929	
D 23 Acenaphthylene-d8	160	6.366	6.367	0.000	91	80563	0.5000	0.4964	
24 Acenaphthylene	152	6.377	6.377	0.000	96	17568	0.1000	0.0928	
* 26 Acenaphthene-d10	164	6.492	6.492	0.000	98	52746	0.5000	0.5000	
27 Acenaphthene	154	6.522	6.517	0.005	98	11223	0.1000	0.0925	
28 2,3,5-Trimethylnaphthalene	170	6.834	6.834	0.000	97	12722	0.1000	0.0944	
D 29 Fluorene -d10	176	6.925	6.925	0.000	100	62208	0.5000	0.4949	
30 Fluorene	166	6.950	6.945	0.005	99	15748	0.1000	0.0974	
31 Hexachlorobenzene	284	7.420	7.417	0.003	0	7980	0.1000	0.1016	
32 Pentachlorophenol	266	7.576	7.576	0.000	0	197969	5.00	5.32	
D 33 Dibenzothiophene-d8	192	7.631	7.628	0.003	100	120758	0.5000	0.5125	
34 Dibenzothiophene	184	7.645	7.645	0.000	98	24449	0.1000	0.0968	
D 35 Phenanthrene-d10	188	7.732	7.728	0.004	99	104432	0.5000	0.4985	
37 Phenanthrene	178	7.752	7.749	0.003	95	23643	0.1000	0.0938	
36 13C6-Phenanthrene (PRC)	184	7.752	7.749	0.003	95	24314	0.1000	0.0929	
D 38 Anthracin-d10	188	7.780	7.776	0.004	99	103704	0.5000	0.5071	
39 Anthracene	178	7.797	7.794	0.003	100	24432	0.1000	0.0957	M

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
40 1-Methylphenanthrene	191	8.293	8.289	0.004	99	10683	0.1000	0.0922	M
D 41 Fluoranthene-d10	212	8.811	8.808	0.003	100	136213	0.5000	0.5013	
42 13C6-Fluoranthene (PRC)	208	8.828	8.825	0.003	88	36017	0.1000	0.0920	M
43 Fluoranthene	202	8.828	8.825	0.003	96	32979	0.1000	0.0946	
* 44 Pyrene-d10 (IS)	212	9.027	9.027	0.000	97	134317	0.5000	0.5000	
45 Pyrene	202	9.047	9.044	0.003	99	33626	0.1000	0.0945	
$ 46 Terphenyl-d14	244	9.192	9.188	0.004	100	8909	NC	NC	
47 Benzo[a]anthracene	228	10.260	10.260	0.000	100	30856	0.1000	0.0845	
D 48 Chrysene-d12	240	10.270	10.270	0.000	98	140536	0.5000	0.5362	
49 13C6-Chrysene (PRC)	234	10.300	10.295	0.005	69	21174	0.1000	0.0880	
50 Chrysene	228	10.300	10.295	0.005	69	39702	0.1000	0.0971	
D 52 Benzo(b)fluoranthene-d12	264	11.376	11.369	0.007	100	104177	0.5000	0.4764	
53 Benzo[b]fluoranthene	252	11.397	11.397	0.000	62	36097	0.1000	0.1028	
D 54 Benzo(k)fluoranthene-d12	264	11.411	11.404	0.007	64	134192	0.5000	0.5224	
55 Benzo[k]fluoranthene	252	11.432	11.425	0.007	100	36723	0.1000	0.0934	
* 56 Benzo(e)pyrene-d12	264	11.684	11.684	0.000	99	86329	0.5000	0.5000	
57 Benzo[e]pyrene	252	11.712	11.712	0.000	100	31159	0.1000	0.0963	
D 58 Benzo(a)pyrene-d12	264	11.754	11.747	0.007	100	96036	0.5000	0.5008	
59 Benzo[a]pyrene	252	11.775	11.775	0.000	100	30602	0.1000	0.0964	
D 60 Perylene-d12	264	11.845	11.845	0.000	100	108121	0.5000	0.5081	
61 Perylene	252	11.873	11.873	0.000	100	29262	0.1000	0.0947	
D 62 Indeno[1,2,3-cd]pyrene-d12	288	13.196	13.186	0.010	80	101028	0.5000	0.4850	
D 63 Dibenz(a,h)anthracene-d14	292	13.205	13.196	0.009	92	90191	0.5000	0.4839	
64 13C6-Indeno(1,2,3-cd)pyrene (PRC	282	13.224	13.214	0.010	52	24892	0.1000	0.0929	
65 Indeno[1,2,3-cd]pyrene	276	13.224	13.214	0.010	53	32381	0.1000	0.0958	
66 Dibenz(a,h)anthracene	278	13.252	13.242	0.010	89	28248	0.1000	0.0981	
D 67 Benzo(ghi)perylene-d12	288	13.552	13.543	0.009	100	103235	0.5000	0.4990	
68 Benzo[g,h,i]perylene	276	13.590	13.580	0.010	90	29101	0.1000	0.0963	
69 Dibenzo(def,p)chrysene	302	14.941	14.922	0.019	82	16435	NC	NC	
70 Dibenzo[a,e]pyrene	302	15.420	15.382	0.038	41	17230	NC	NC	
D 71 Coronene-d12	312	15.391	15.382	0.009	67	77169	NC	NC	
72 Dibenz(a,i)pyrene	302	15.626	15.570	0.056	89	5123	NC	NC	
73 Dibenzo[a,h]pyrene	302	15.711	15.654	0.057	69	10245	NC	NC	M
S 105 Benzo(b)fluoranthene / Benzo(k)f	1				0			0.1963	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

60L2SIMPAH_00025 Amount Added: 1.00 Units: mL

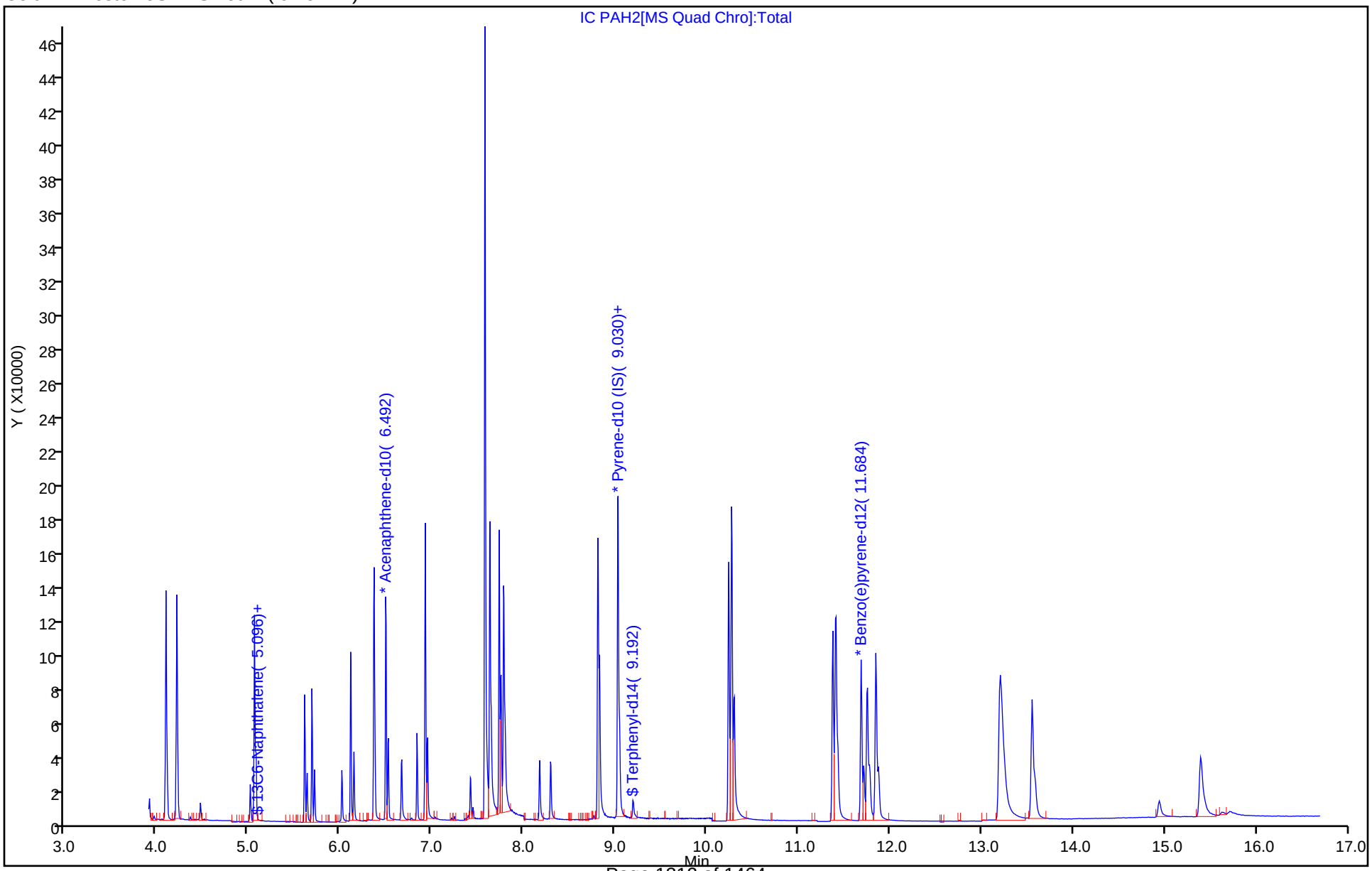
Report Date: 15-Nov-2023 14:42:37 Chrom Revision: 2.3 13-Nov-2023 16:16:38

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH2.D

Injection Date:	13-Nov-2023 19:25:07	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	ic pah2			Worklist Smp#:	24
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



Manual Integration/User Assign Peak Report

Eurofins Knoxville

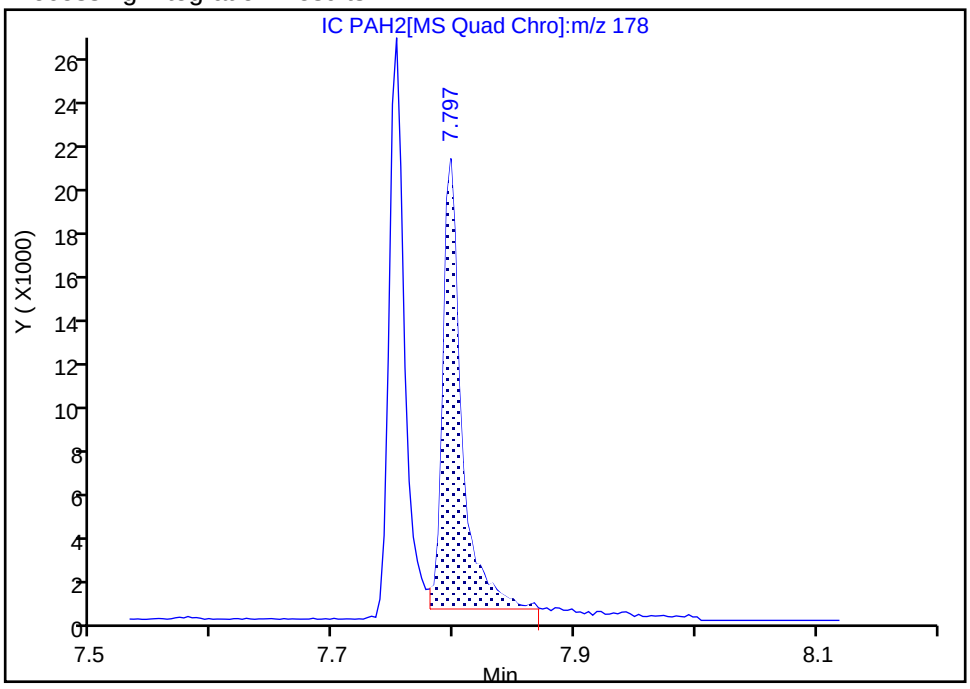
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH2.D				
Injection Date:	13-Nov-2023 19:25:07	Instrument ID:	GCMS1		
Lims ID:	ic pah2				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

39 Anthracene, CAS: 120-12-7

Signal: 1

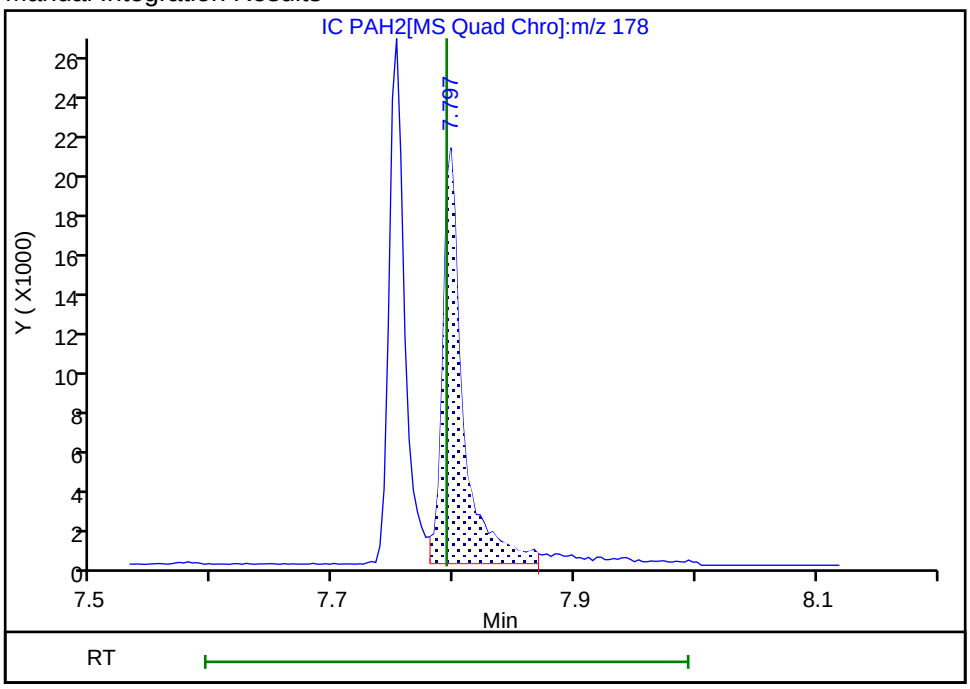
Processing Integration Results

RT: 7.80
Area: 21812
Amount: 0.087065
Amount Units: ug/ml



Manual Integration Results

RT: 7.80
Area: 24432
Amount: 0.095684
Amount Units: ug/ml



Reviewer: SK9U, 14-Nov-2023 09:41:11 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

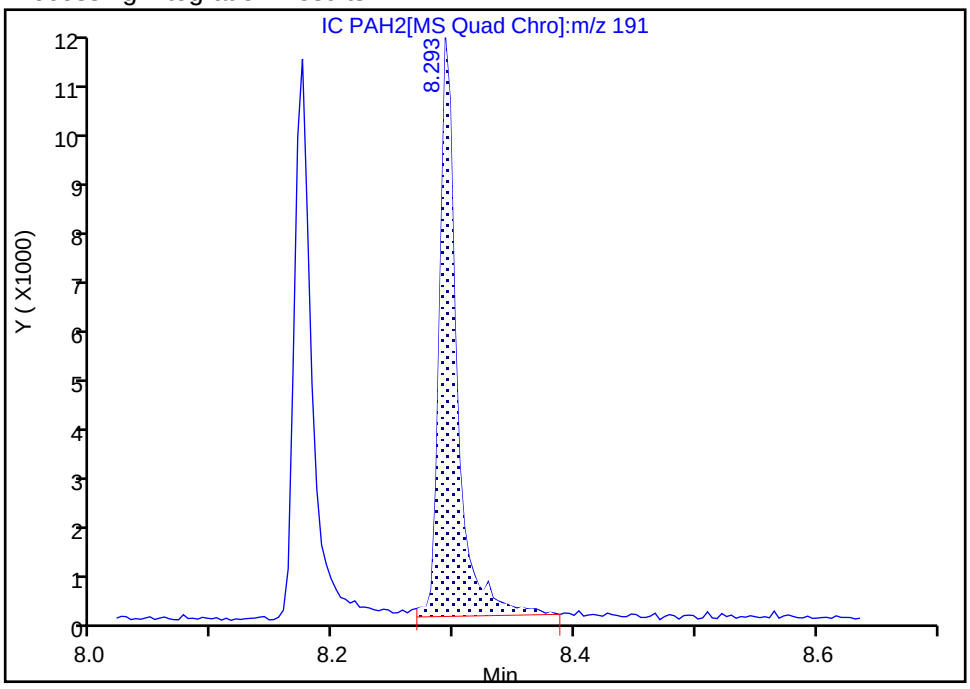
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH2.D				
Injection Date:	13-Nov-2023 19:25:07	Instrument ID:	GCMS1		
Lims ID:	ic pah2				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

40 1-Methylphenanthrene, CAS: 832-69-9

Signal: 1

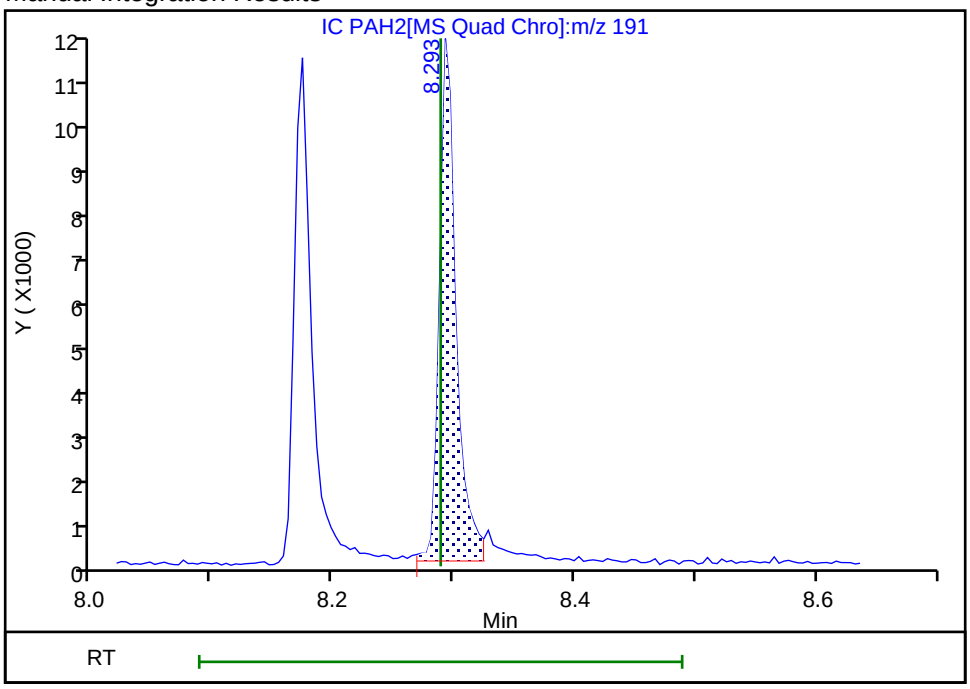
Processing Integration Results

RT: 8.29
Area: 11316
Amount: 0.095761
Amount Units: ug/ml



Manual Integration Results

RT: 8.29
Area: 10683
Amount: 0.092228
Amount Units: ug/ml



Reviewer: SK9U, 14-Nov-2023 09:41:27 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Eurofins Knoxville

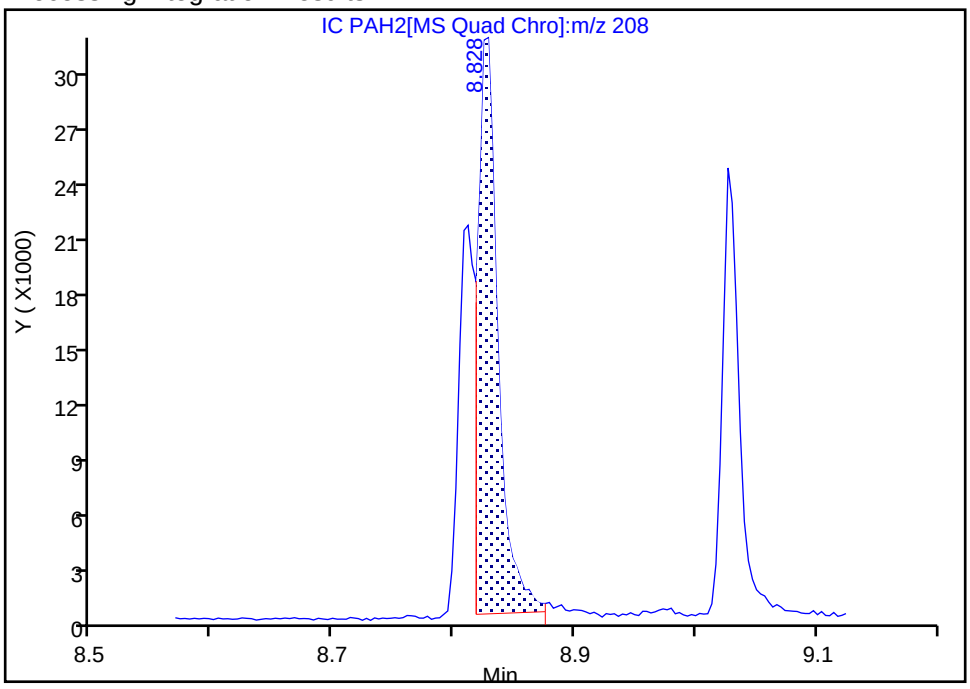
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH2.D				
Injection Date:	13-Nov-2023 19:25:07	Instrument ID:	GCMS1		
Lims ID:	ic pah2				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	24
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

42 13C6-Fluoranthene (PRC), CAS: 917378-10-0

Signal: 1

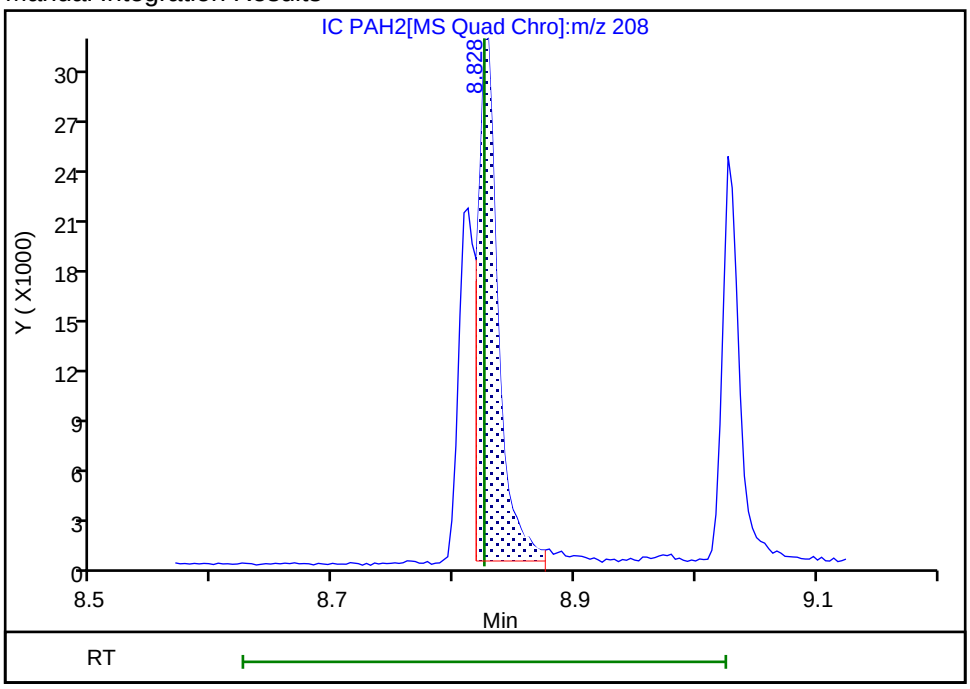
Processing Integration Results

RT: 8.83
Area: 35321
Amount: 0.061312
Amount Units: ug/ml



Manual Integration Results

RT: 8.83
Area: 36017
Amount: 0.092047
Amount Units: ug/ml



Reviewer: SK9U, 14-Nov-2023 09:41:45 -05:00:00 (UTC)
Audit Action: Assigned New Baseline Audit Reason: Baseline

Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D
Lims ID: ic pah1
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 13-Nov-2023 19:48:36 ALS Bottle#: 0 Worklist Smp#: 25
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030467-025
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1
Sublist: chrom-SIM_PAH_GCMS1*sub4

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 15-Nov-2023 14:42:41 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1623

First Level Reviewer: SK9U Date: 14-Nov-2023 09:43:42

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
D 3 1,4-Dichlorobenzene-d4	115	4.093	4.110	-0.017	79	19986	NC	NC	
4 1,4-Dichlorobenzene	146	4.101	4.118	-0.017	28	1686	NC	NC	
D 5 1,2-Dichlorobenzene-d4	115	4.204	4.221	-0.017	76	20078	NC	NC	
6 1,2-Dichlorobenzene	146	4.221	4.229	-0.008	38	1684	NC	NC	M
9 1,2,4-Trichlorobenzene	180	5.013	5.022	-0.009	97	1709	NC	NC	
D 10 Naphthalene-d8	136	5.059	5.068	-0.009	100	73814	0.5000	0.5237	
$ 11 13C6-Naphthalene	134	5.077	5.078	-0.001	79	4134	NC	NC	M
12 Naphthalene	128	5.077	5.078	-0.001	89	3610	0.0200	0.0208	
D 15 2-methylnaphthalene-d10	152	5.606	5.612	-0.006	91	46805	0.5000	0.5107	
16 2-Methylnaphthalene	142	5.635	5.635	0.000	98	2404	0.0200	0.0206	M
D 17 1-Methylnaphthalene-d10	152	5.686	5.692	-0.006	100	49045	0.5000	0.5341	
18 1-Methylnaphthalene	142	5.715	5.720	-0.005	92	2416	0.0200	0.0203	
19 1,1'-Biphenyl	154	6.018	6.013	0.005	100	3295	0.0200	0.0195	
D 20 2,6-Dimethylnaphthalene-d12	168	6.109	6.109	0.000	100	52766	0.5000	0.5172	
21 2,6-Dimethylnaphthalene	156	6.145	6.145	0.000	98	2575	0.0200	0.0204	
D 23 Acenaphthylene-d8	160	6.366	6.367	0.000	90	78362	0.5000	0.5038	
24 Acenaphthylene	152	6.377	6.377	-0.001	47	3668	0.0200	0.0199	
* 26 Acenaphthene-d10	164	6.497	6.492	0.005	98	50553	0.5000	0.5000	
27 Acenaphthene	154	6.522	6.517	0.005	97	2542	0.0200	0.0215	
28 2,3,5-Trimethylnaphthalene	170	6.839	6.834	0.005	90	2638	0.0200	0.0195	
D 29 Fluorene -d10	176	6.925	6.925	0.000	98	61344	0.5000	0.5092	
30 Fluorene	166	6.950	6.945	0.005	98	3011	0.0200	0.0189	
31 Hexachlorobenzene	284	7.420	7.417	0.003	0	1548	0.0200	0.0215	
32 Pentachlorophenol	266	7.579	7.576	0.003	0	52791	2.00	1.76	
D 33 Dibenzothiophene-d8	192	7.631	7.628	0.003	99	111573	0.5000	0.4911	
34 Dibenzothiophene	184	7.649	7.645	0.004	32	4390	0.0200	0.0188	
D 35 Phenanthrene-d10	188	7.735	7.728	0.007	98	95545	0.5000	0.4730	
37 Phenanthrene	178	7.756	7.749	0.007	66	4772	0.0200	0.0207	M
36 13C6-Phenanthrene (PRC)	184	7.752	7.749	0.003	94	6560	0.0200	0.0274	M
D 38 Anthracin-d10	188	7.787	7.776	0.011	99	111887	0.5000	0.5675	
39 Anthracene	178	7.801	7.794	0.007	99	5320	0.0200	0.0193	

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
40 1-Methylphenanthrene	191	8.297	8.289	0.008	99	2147	0.0200	0.0203	M
D 41 Fluoranthene-d10	212	8.811	8.808	0.003	100	131473	0.5000	0.5018	
42 13C6-Fluoranthene (PRC)	208	8.828	8.825	0.003	94	10857	0.0200	0.0287	M
43 Fluoranthene	202	8.832	8.825	0.007	49	6581	0.0200	0.0196	
* 44 Pyrene-d10 (IS)	212	9.030	9.027	0.003	99	129512	0.5000	0.5000	
45 Pyrene	202	9.047	9.044	0.003	55	7372	0.0200	0.0215	
$ 46 Terphenyl-d14	244	9.202	9.188	0.014	94	1658	NC	NC	
47 Benzo[a]anthracene	228	10.265	10.260	0.005	42	6827	0.0200	0.0188	
D 48 Chrysene-d12	240	10.275	10.270	0.005	98	139591	0.5000	0.5524	
49 13C6-Chrysene (PRC)	234	10.300	10.295	0.005	34	5440	0.0200	0.0228	
50 Chrysene	228	10.300	10.295	0.005	39	8514	0.0200	0.0210	
D 52 Benzo(b)fluoranthene-d12	264	11.376	11.369	0.007	100	97848	0.5000	0.4637	
53 Benzo[b]fluoranthene	252	11.404	11.397	0.007	11	7862	0.0200	0.0238	
D 54 Benzo(k)fluoranthene-d12	264	11.411	11.404	0.007	58	135420	0.5000	0.5463	
55 Benzo[k]fluoranthene	252	11.432	11.425	0.007	100	8045	0.0200	0.0203	
* 56 Benzo(e)pyrene-d12	264	11.684	11.684	0.000	99	83306	0.5000	0.5000	
57 Benzo[e]pyrene	252	11.712	11.712	0.000	99	7077	0.0200	0.0228	
D 58 Benzo(a)pyrene-d12	264	11.754	11.747	0.007	100	92281	0.5000	0.4987	
59 Benzo[a]pyrene	252	11.775	11.775	0.000	100	6453	0.0200	0.0211	
D 60 Perylene-d12	264	11.845	11.845	0.000	100	105559	0.5000	0.5140	
61 Perylene	252	11.873	11.873	0.000	100	6523	0.0200	0.0216	
D 62 Indeno[1,2,3-cd]pyrene-d12	288	13.196	13.186	0.010	75	95103	0.5000	0.4731	
D 63 Dibenz(a,h)anthracene-d14	292	13.214	13.196	0.018	83	84815	0.5000	0.4716	
64 13C6-Indeno(1,2,3-cd)pyrene (PRC	282	13.224	13.214	0.010	22	6805	0.0200	0.0270	
65 Indeno[1,2,3-cd]pyrene	276	13.224	13.214	0.010	23	7034	0.0200	0.0221	
66 Dibenz(a,h)anthracene	278	13.252	13.242	0.010	29	5422	0.0200	0.0200	M
D 67 Benzo(ghi)perylene-d12	288	13.552	13.543	0.009	100	97790	0.5000	0.4898	
68 Benzo[g,h,i]perylene	276	13.590	13.580	0.010	47	6498	0.0200	0.0227	
69 Dibenzo(def,p)chrysene	302	14.950	14.922	0.028	80	3004	NC	NC	
70 Dibenzo[a,e]pyrene	302	15.401	15.382	0.019	24	423	NC	NC	
D 71 Coronene-d12	312	15.391	15.382	0.009	66	72705	NC	NC	
72 Dibenz(a,i)pyrene	302	15.701	15.570	0.131	56	891	NC	NC	M
73 Dibenzo[a,h]pyrene	302	15.804	15.654	0.150	53	1896	NC	NC	M
S 105 Benzo(b)fluoranthene / Benzo(k)f					0			0.0441	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

60L1SIMPAH_00029 Amount Added: 1.00 Units: mL

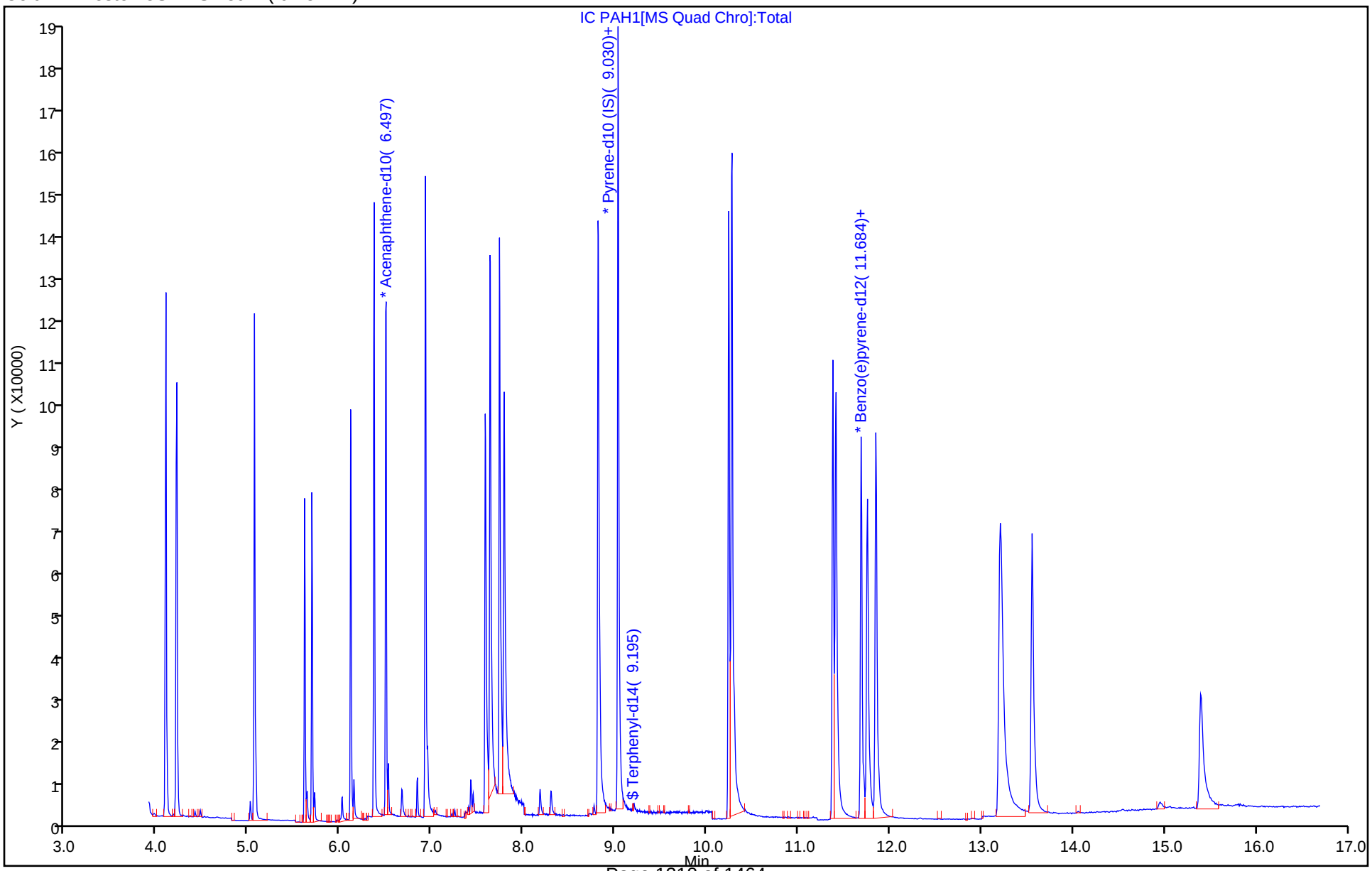
Report Date: 15-Nov-2023 14:42:42 Chrom Revision: 2.3 13-Nov-2023 16:16:38

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Injection Date:	13-Nov-2023 19:48:36	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	ic pah1			Worklist Smp#:	25
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



Manual Integration/User Assign Peak Report

Eurofins Knoxville

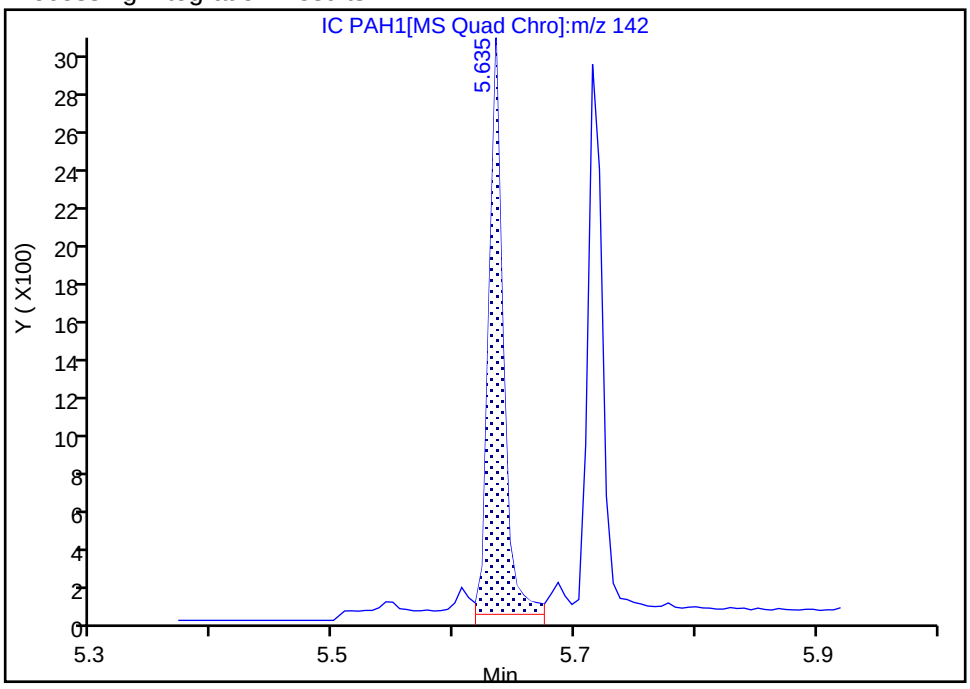
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D
Injection Date: 13-Nov-2023 19:48:36 Instrument ID: GCMS1
Lims ID: ic pah1
Client ID:
Operator ID: TAI\knxinstgcms1 ALS Bottle#: 0 Worklist Smp#: 25
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: SIM_PAH_GCMS1 Limit Group: SOG - PAH IsoDil - ICAL
Column: Restek-5Sil MS 25um (0.25 mm) Detector MS SCAN

16 2-Methylnaphthalene, CAS: 91-57-6

Signal: 1

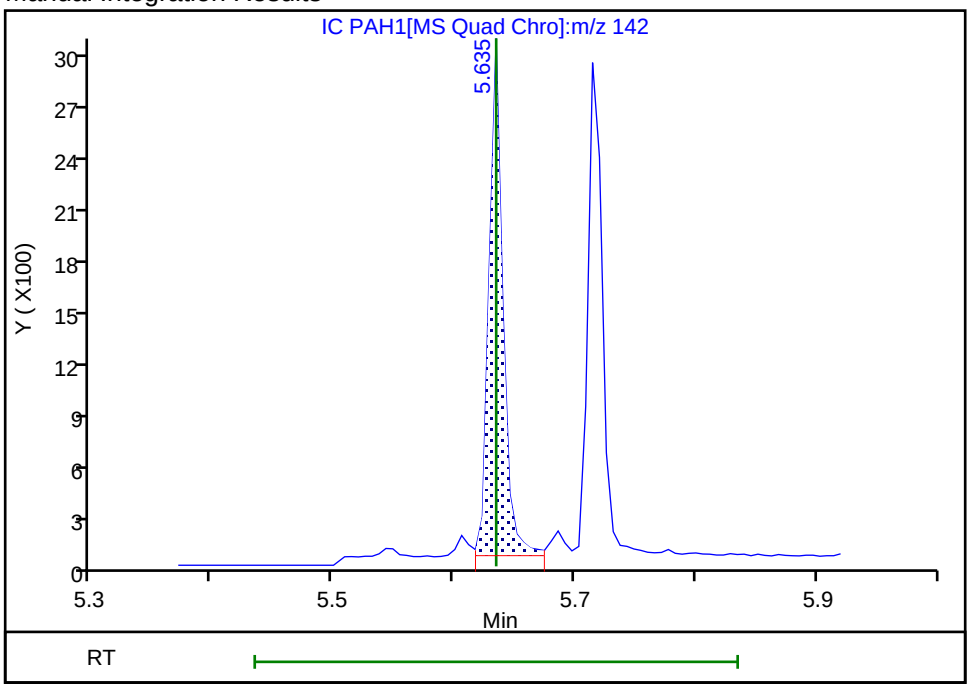
Processing Integration Results

RT: 5.63
Area: 2489
Amount: 0.021267
Amount Units: ug/ml



Manual Integration Results

RT: 5.63
Area: 2404
Amount: 0.020648
Amount Units: ug/ml



Reviewer: SK9U, 14-Nov-2023 09:45:22 -05:00:00 (UTC)
Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

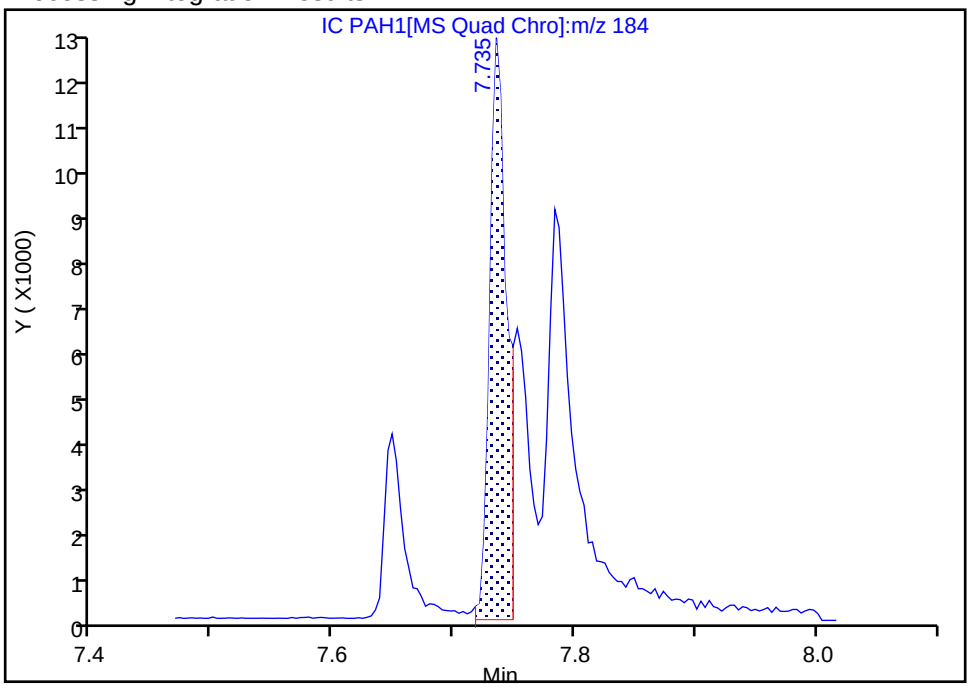
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D
Injection Date: 13-Nov-2023 19:48:36 Instrument ID: GCMS1
Lims ID: ic pah1
Client ID:
Operator ID: TAI\knxinstgcms1 ALS Bottle#: 0 Worklist Smp#: 25
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: SIM_PAH_GCMS1 Limit Group: SOG - PAH IsoDil - ICAL
Column: Restek-5Sil MS 25um (0.25 mm) Detector MS SCAN

36 13C6-Phenanthrene (PRC), CAS: 1189955-53-0

Signal: 1

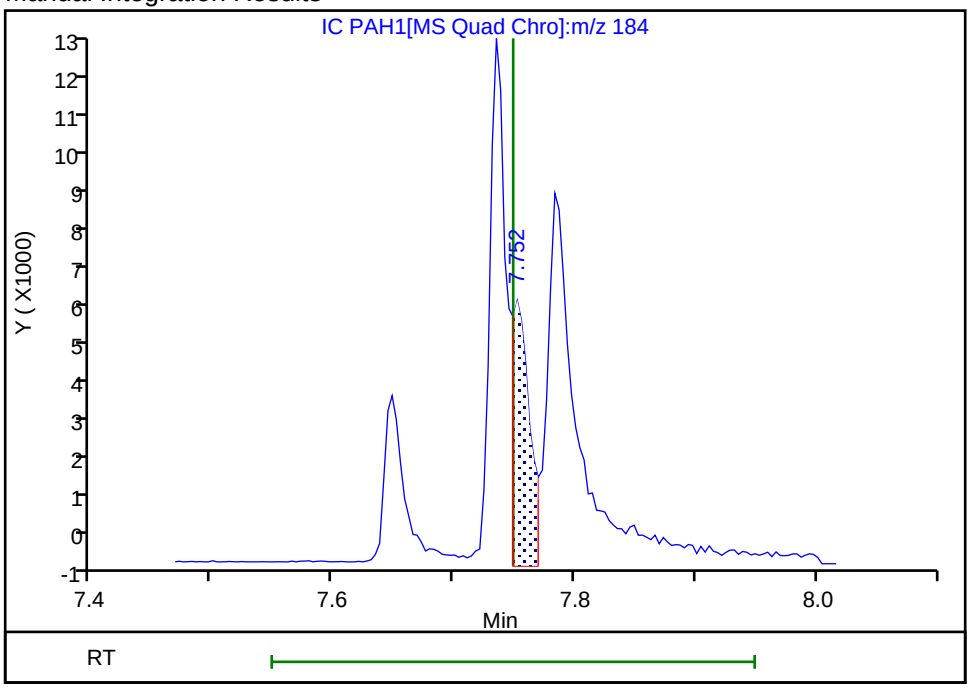
Processing Integration Results

RT: 7.73
Area: 12831
Amount: 0.042473
Amount Units: ug/ml



Manual Integration Results

RT: 7.75
Area: 6560
Amount: 0.027403
Amount Units: ug/ml



Reviewer: SK9U, 14-Nov-2023 09:44:21 -05:00:00 (UTC)
Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

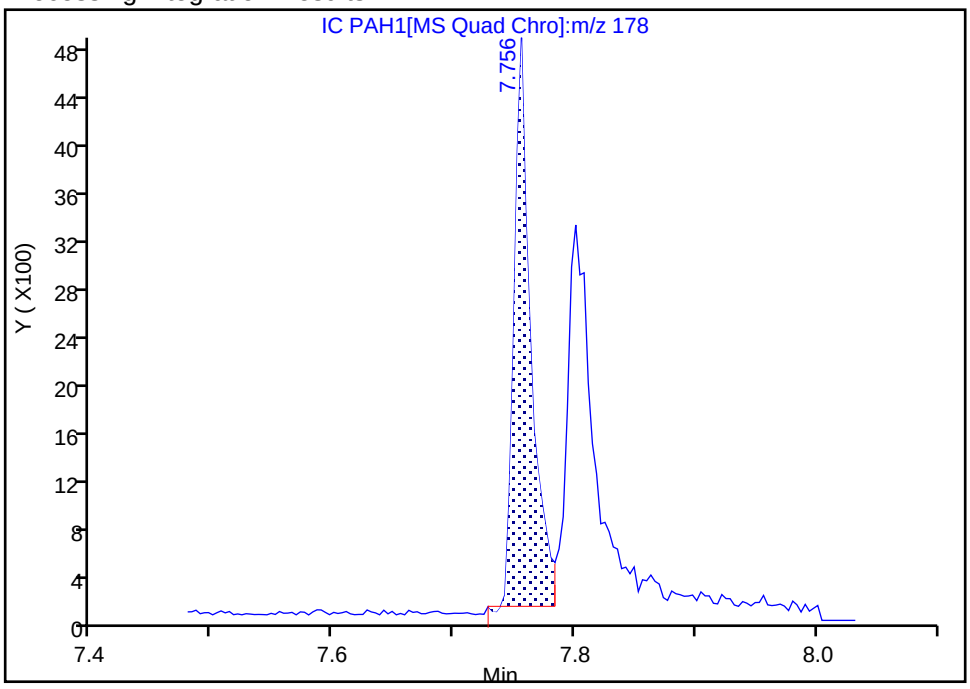
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D				
Injection Date:	13-Nov-2023 19:48:36	Instrument ID:	GCMS1		
Lims ID:	ic pah1				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

37 Phenanthrene, CAS: 85-01-8

Signal: 1

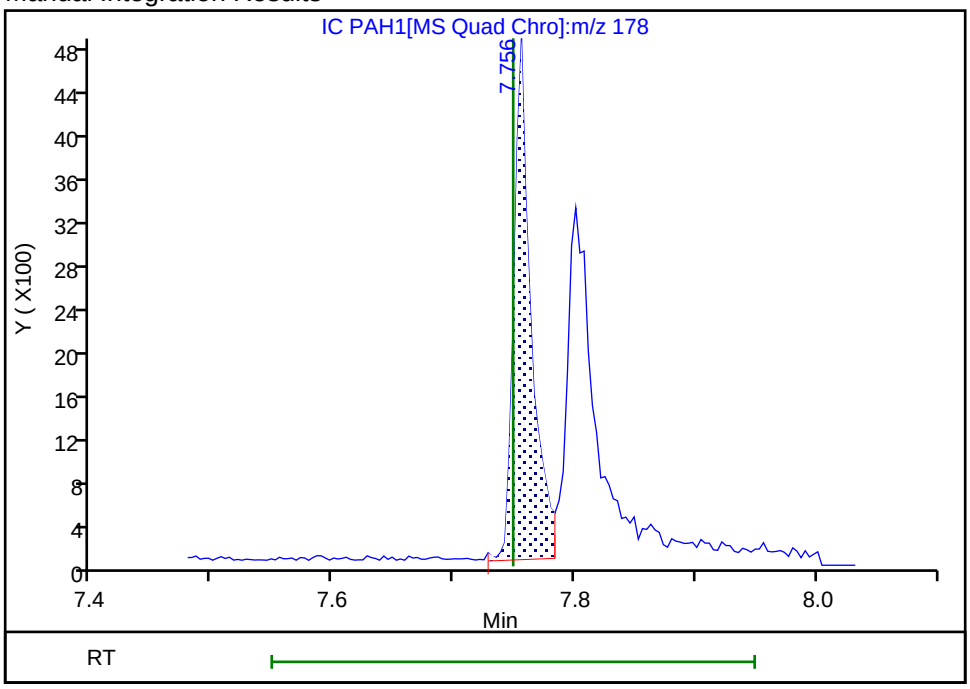
Processing Integration Results

RT: 7.76
Area: 4541
Amount: 0.019842
Amount Units: ug/ml



Manual Integration Results

RT: 7.76
Area: 4772
Amount: 0.020703
Amount Units: ug/ml



Reviewer: SK9U, 14-Nov-2023 09:44:33 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

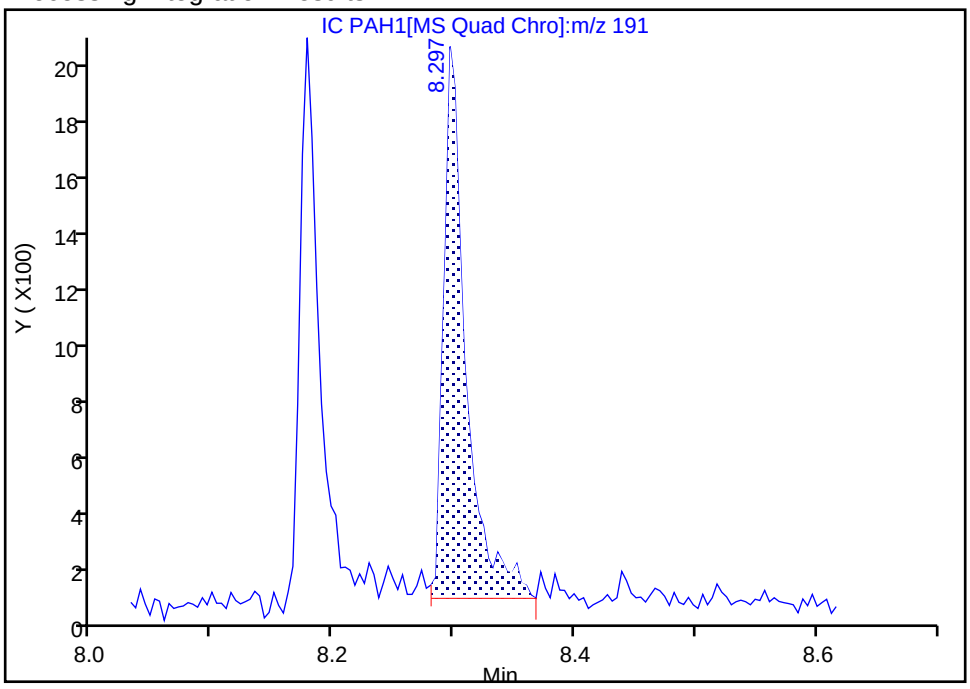
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D				
Injection Date:	13-Nov-2023 19:48:36	Instrument ID:	GCMS1		
Lims ID:	ic pah1				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

40 1-Methylphenanthrene, CAS: 832-69-9

Signal: 1

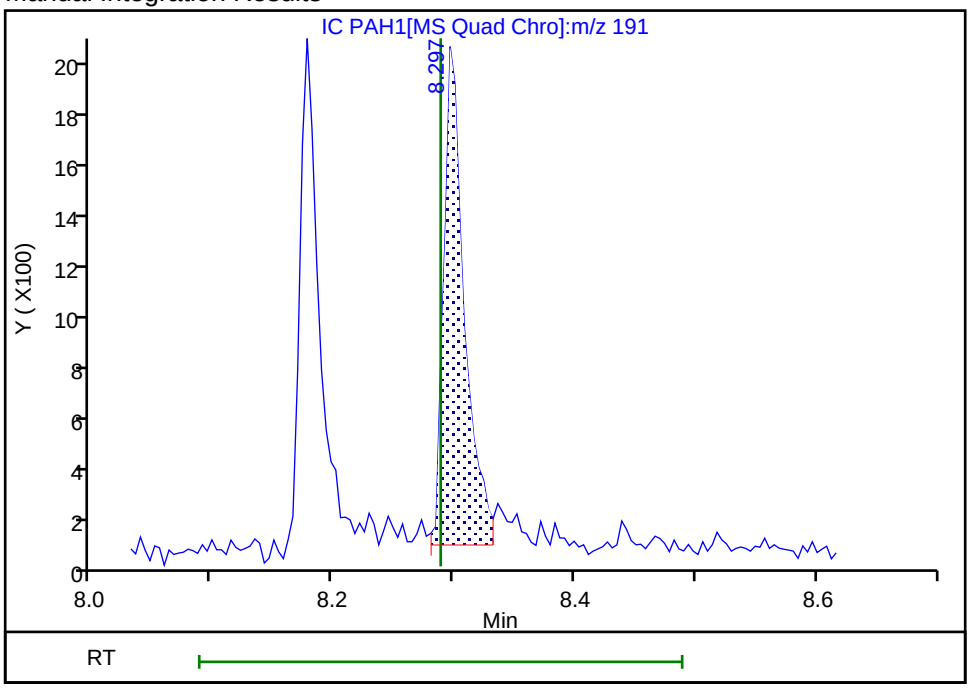
Processing Integration Results

RT: 8.30
Area: 2303
Amount: 0.021466
Amount Units: ug/ml



Manual Integration Results

RT: 8.30
Area: 2147
Amount: 0.020259
Amount Units: ug/ml



Reviewer: SK9U, 14-Nov-2023 09:43:28 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

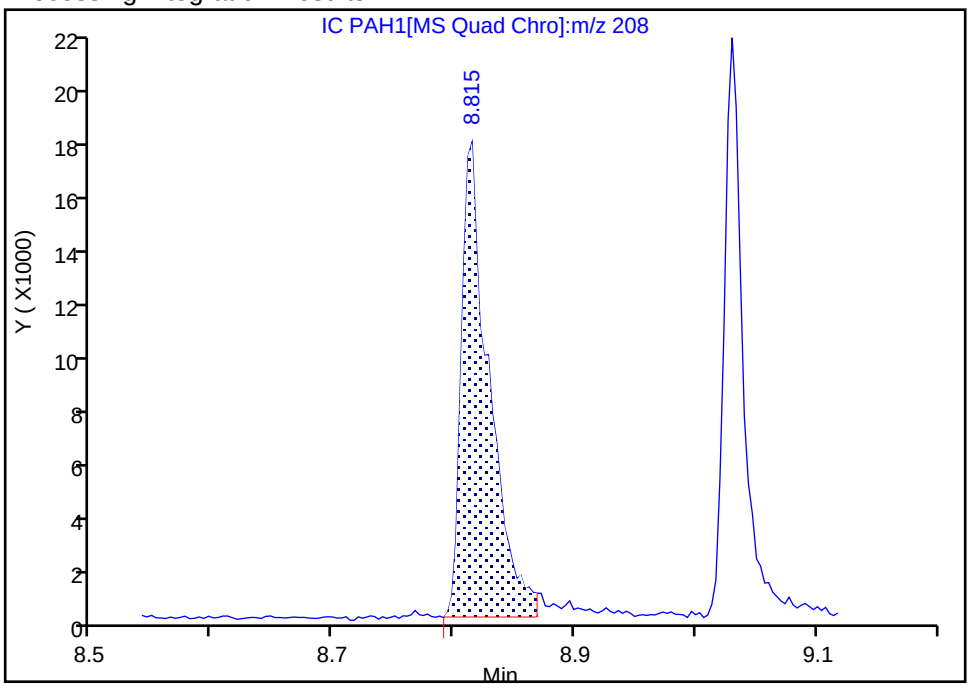
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D				
Injection Date:	13-Nov-2023 19:48:36	Instrument ID:	GCMS1		
Lims ID:	ic pah1				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	25
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

42 13C6-Fluoranthene (PRC), CAS: 917378-10-0

Signal: 1

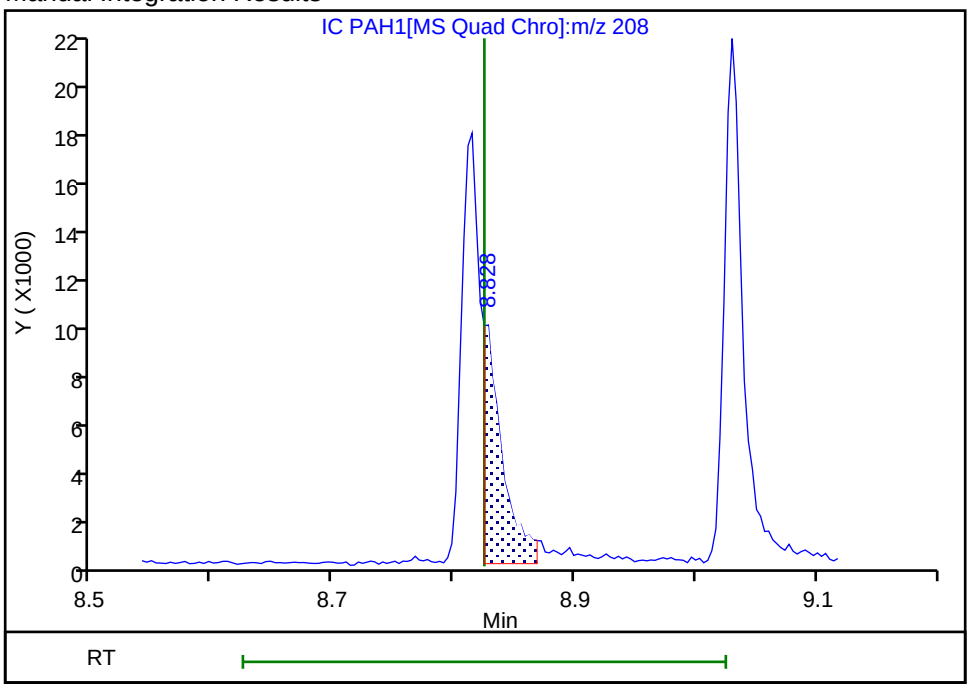
Processing Integration Results

RT: 8.81
Area: 28018
Amount: 0.050267
Amount Units: ug/ml



Manual Integration Results

RT: 8.83
Area: 10857
Amount: 0.028747
Amount Units: ug/ml



Reviewer: SK9U, 14-Nov-2023 10:08:42 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

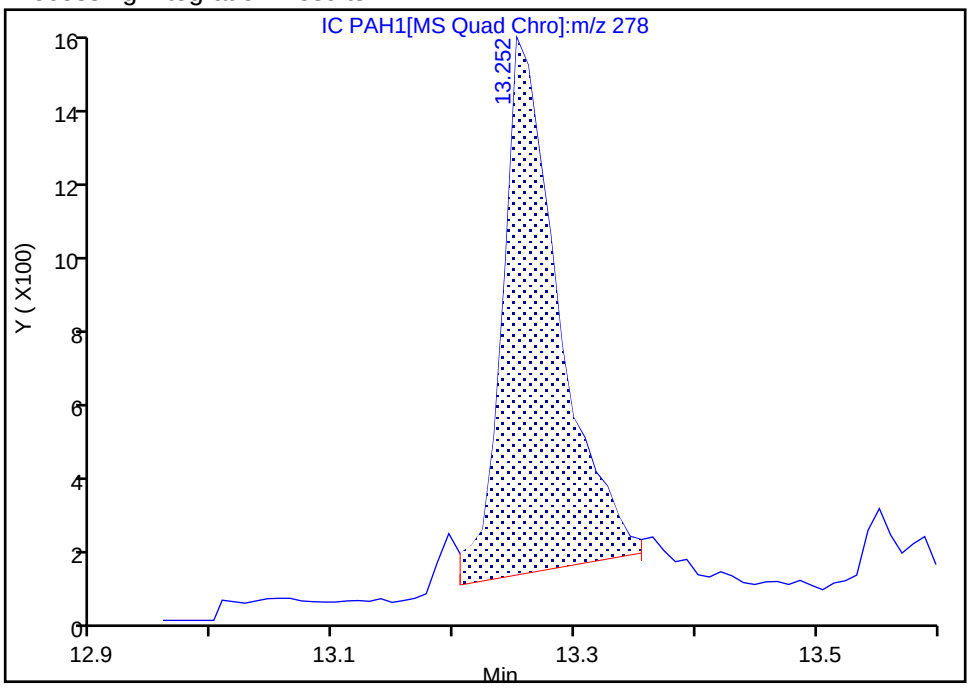
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D
Injection Date: 13-Nov-2023 19:48:36 Instrument ID: GCMS1
Lims ID: ic pah1
Client ID:
Operator ID: TAI\knxinstgcms1 ALS Bottle#: 0 Worklist Smp#: 25
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: SIM_PAH_GCMS1 Limit Group: SOG - PAH IsoDil - ICAL
Column: Restek-5Sil MS 25um (0.25 mm) Detector MS SCAN

66 Dibenz(a,h)anthracene, CAS: 53-70-3

Signal: 1

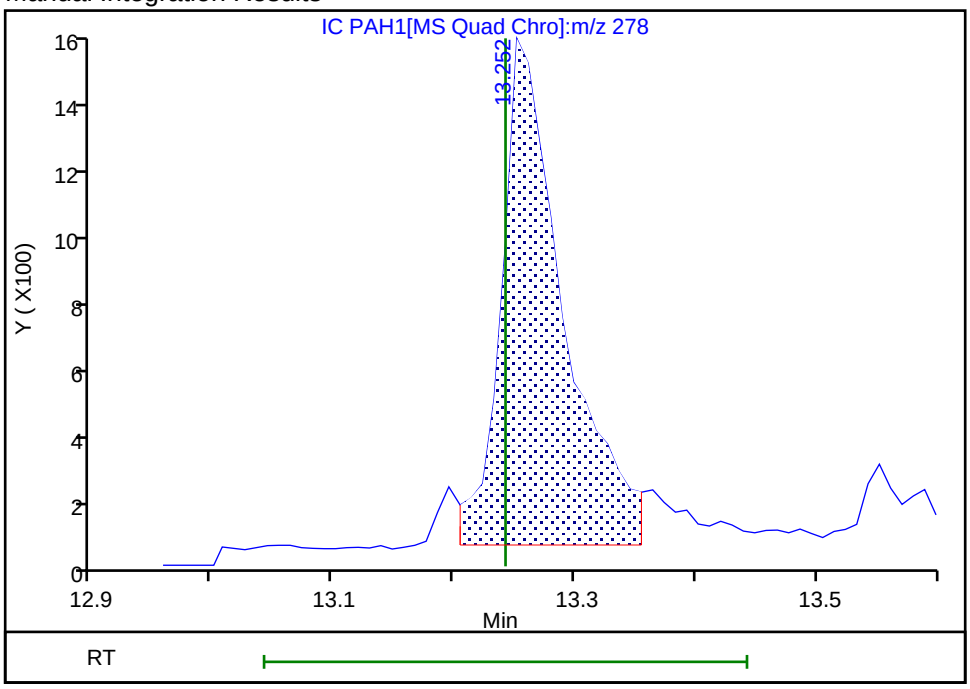
Processing Integration Results

RT: 13.25
Area: 4689
Amount: 0.017654
Amount Units: ug/ml



Manual Integration Results

RT: 13.25
Area: 5422
Amount: 0.020019
Amount Units: ug/ml



Reviewer: SK9U, 14-Nov-2023 09:42:45 -05:00:00 (UTC)
Audit Action: Assigned New Baseline Audit Reason: Baseline

Calibration / Naphthalene

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

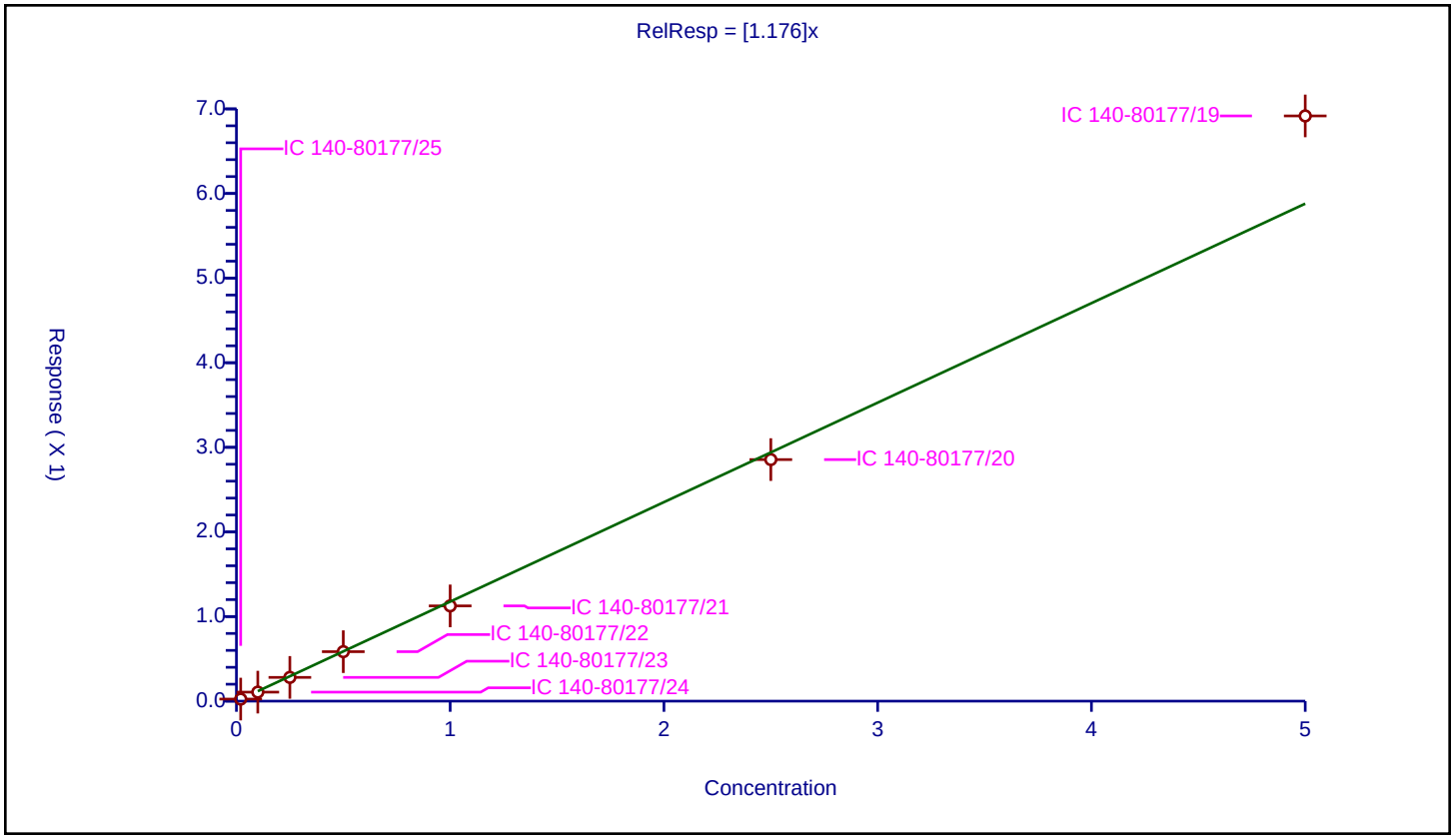
Curve Coefficients

Intercept:	0
Slope:	1.176

Error Coefficients

Standard Error:	379000
Relative Standard Error:	8.8
Correlation Coefficient:	0.996
Coefficient of Determination (Adjusted):	0.991

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/25	0.02	0.024453	0.5	73814.0	1.222668	Y
2	IC 140-80177/24	0.1	0.10659	0.5	76560.0	1.065896	Y
3	IC 140-80177/23	0.25	0.280613	0.5	77058.0	1.122453	Y
4	IC 140-80177/22	0.5	0.584625	0.5	74629.0	1.169251	Y
5	IC 140-80177/21	1.0	1.125871	0.5	74453.0	1.125871	Y
6	IC 140-80177/20	2.5	2.855174	0.5	78608.0	1.14207	Y
7	IC 140-80177/19	5.0	6.916998	0.5	57023.0	1.3834	Y



Calibration / 2-Methylnaphthalene

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

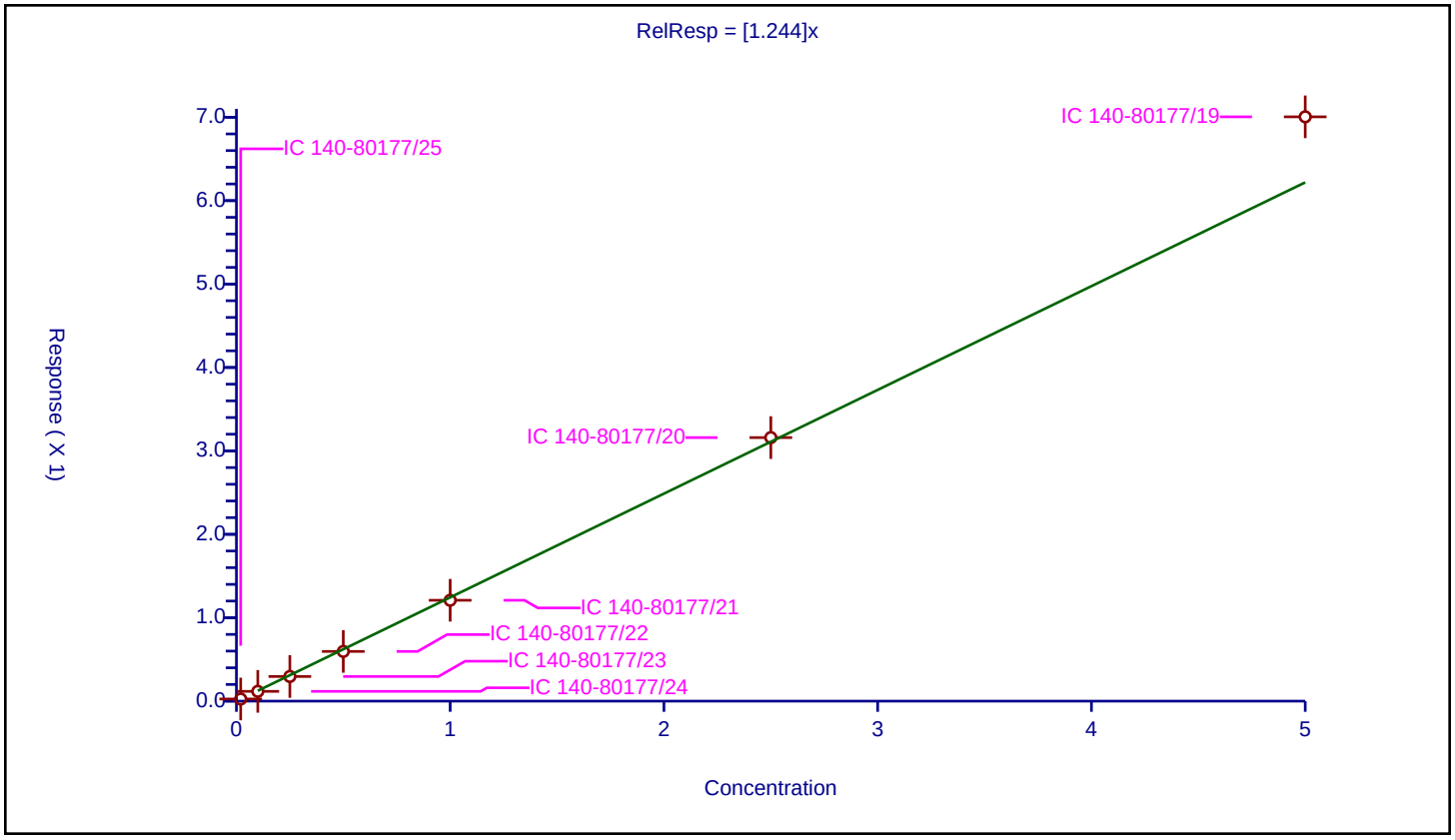
Curve Coefficients

Intercept:	0
Slope:	1.244

Error Coefficients

Standard Error:	259000
Relative Standard Error:	6.5
Correlation Coefficient:	0.991
Coefficient of Determination (Adjusted):	0.995

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/25	0.02	0.025681	0.5	46805.0	1.284051	Y
2	IC 140-80177/24	0.1	0.11742	0.5	48084.0	1.174195	Y
3	IC 140-80177/23	0.25	0.295519	0.5	50765.0	1.182074	Y
4	IC 140-80177/22	0.5	0.595857	0.5	49793.0	1.191714	Y
5	IC 140-80177/21	1.0	1.209412	0.5	49116.0	1.209412	Y
6	IC 140-80177/20	2.5	3.159654	0.5	50525.0	1.263861	Y
7	IC 140-80177/19	5.0	7.004949	0.5	37887.0	1.40099	Y



Calibration / 1-Methylnaphthalene

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

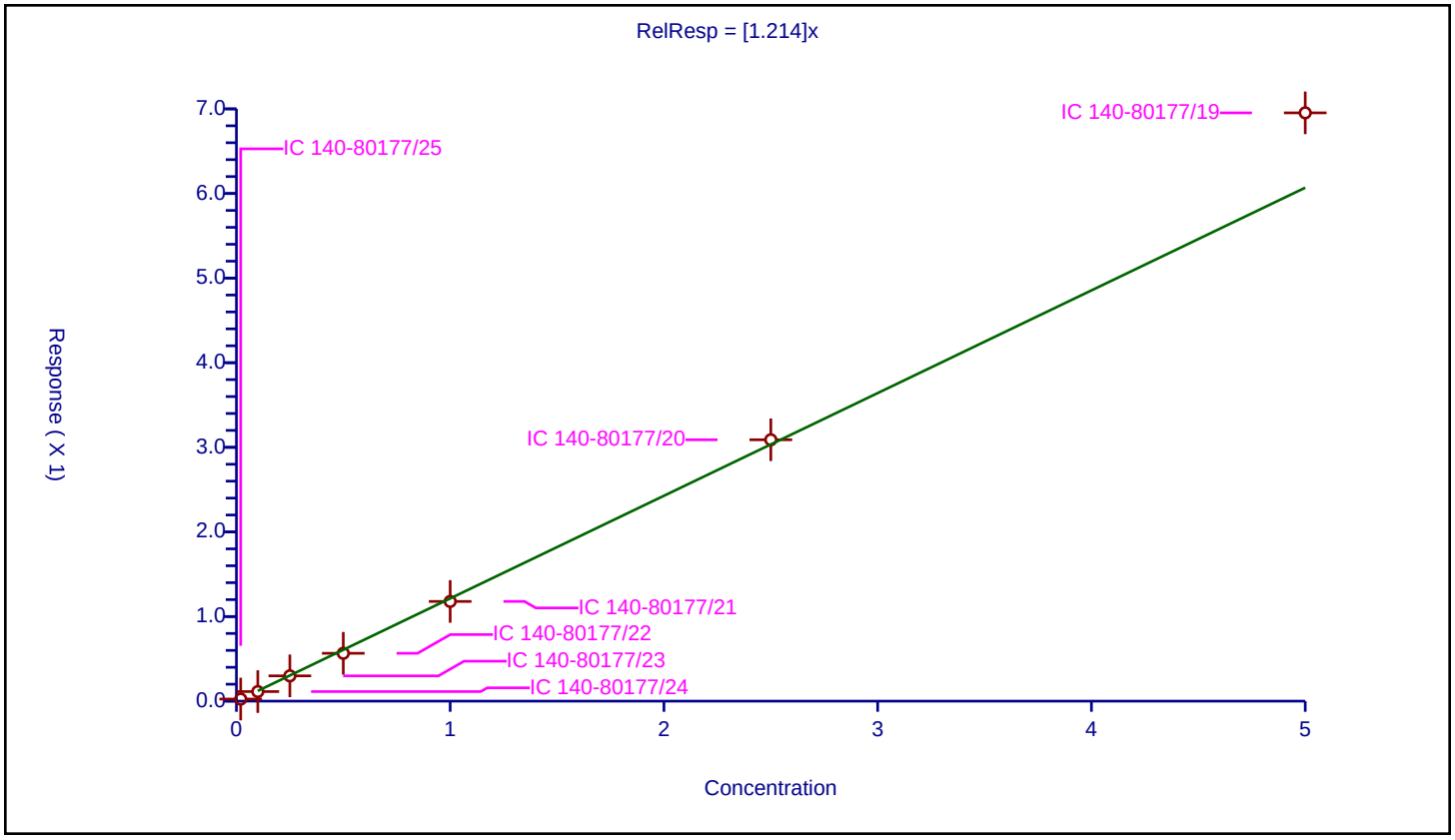
Curve Coefficients

Intercept:	0
Slope:	1.214

Error Coefficients

Standard Error:	248000
Relative Standard Error:	7.3
Correlation Coefficient:	0.992
Coefficient of Determination (Adjusted):	0.994

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/25	0.02	0.02463	0.5	49045.0	1.231522	Y
2	IC 140-80177/24	0.1	0.113221	0.5	49412.0	1.132215	Y
3	IC 140-80177/23	0.25	0.299048	0.5	49283.0	1.196193	Y
4	IC 140-80177/22	0.5	0.565548	0.5	51298.0	1.131097	Y
5	IC 140-80177/21	1.0	1.178492	0.5	48949.0	1.178492	Y
6	IC 140-80177/20	2.5	3.08917	0.5	49002.0	1.235668	Y
7	IC 140-80177/19	5.0	6.953116	0.5	36686.0	1.390623	Y



Calibration / 1,1'-Biphenyl

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

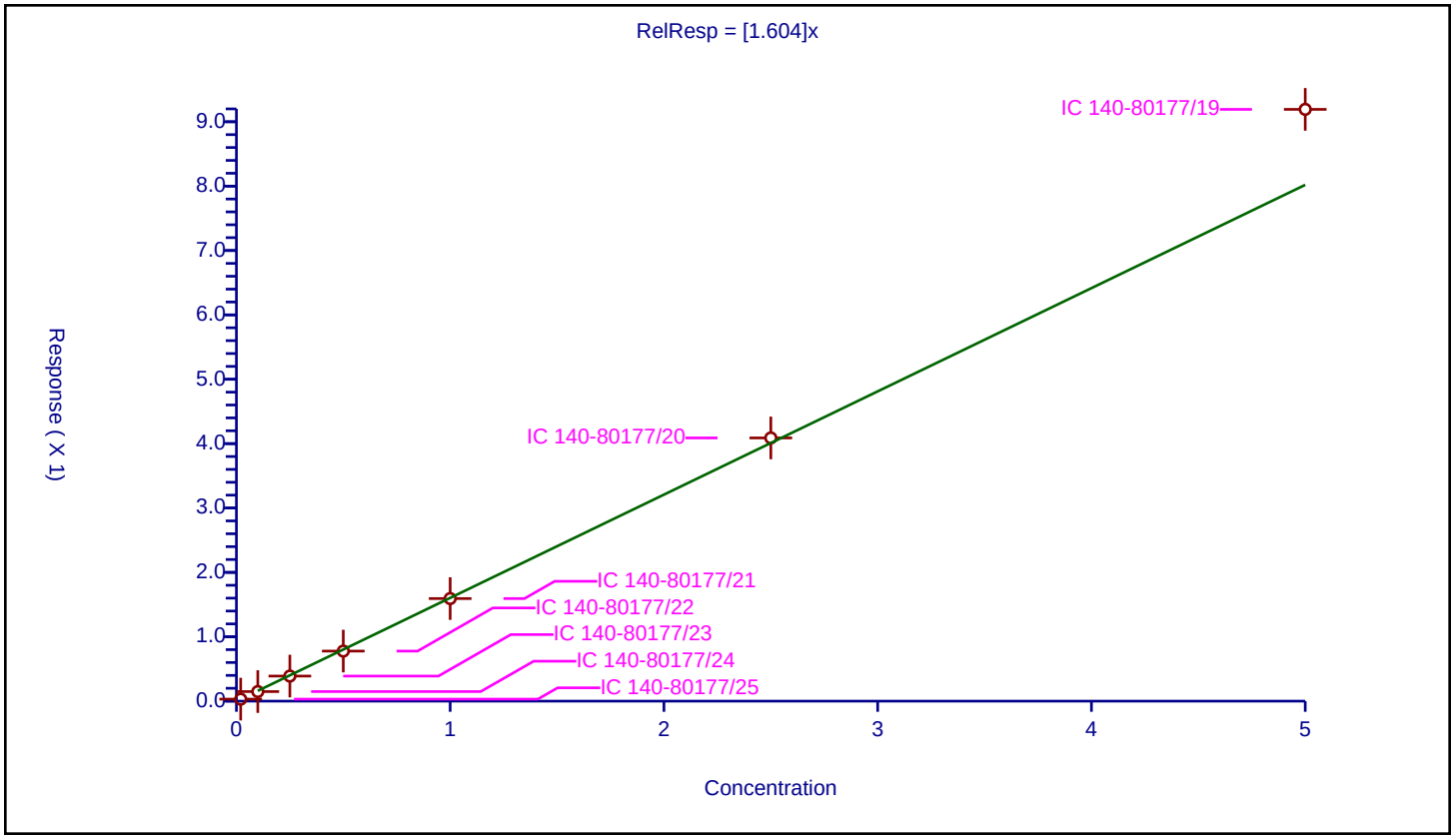
Curve Coefficients

Intercept:	0
Slope:	1.604

Error Coefficients

Standard Error:	380000
Relative Standard Error:	7.0
Correlation Coefficient:	0.994
Coefficient of Determination (Adjusted):	0.994

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/25	0.02	0.031223	0.5	52766.0	1.561138	Y
2	IC 140-80177/24	0.1	0.148541	0.5	52484.0	1.485405	Y
3	IC 140-80177/23	0.25	0.389598	0.5	55221.0	1.558393	Y
4	IC 140-80177/22	0.5	0.777545	0.5	56652.0	1.555091	Y
5	IC 140-80177/21	1.0	1.593456	0.5	54726.0	1.593456	Y
6	IC 140-80177/20	2.5	4.088773	0.5	56070.0	1.635509	Y
7	IC 140-80177/19	5.0	9.19267	0.5	42674.0	1.838534	Y



Calibration / 2,6-Dimethylnaphthalene

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

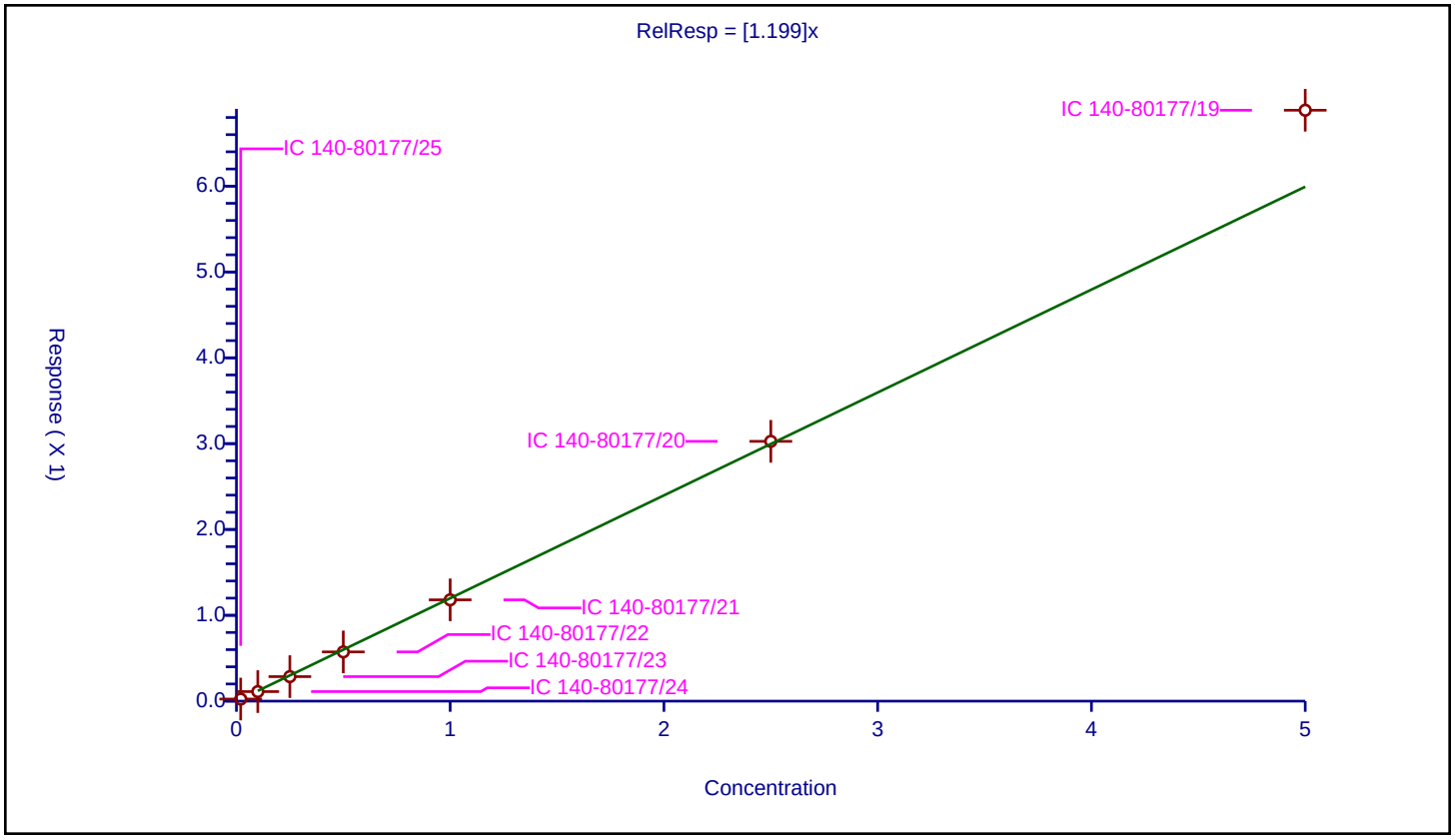
Curve Coefficients

Intercept:	0
Slope:	1.199

Error Coefficients

Standard Error:	284000
Relative Standard Error:	7.3
Correlation Coefficient:	0.995
Coefficient of Determination (Adjusted):	0.994

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/25	0.02	0.0244	0.5	52766.0	1.220009	Y
2	IC 140-80177/24	0.1	0.111301	0.5	52484.0	1.113006	Y
3	IC 140-80177/23	0.25	0.28558	0.5	55221.0	1.142319	Y
4	IC 140-80177/22	0.5	0.573546	0.5	56652.0	1.147091	Y
5	IC 140-80177/21	1.0	1.180289	0.5	54726.0	1.180289	Y
6	IC 140-80177/20	2.5	3.026966	0.5	56070.0	1.210787	Y
7	IC 140-80177/19	5.0	6.884438	0.5	42674.0	1.376888	Y



Calibration / Acenaphthylene

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

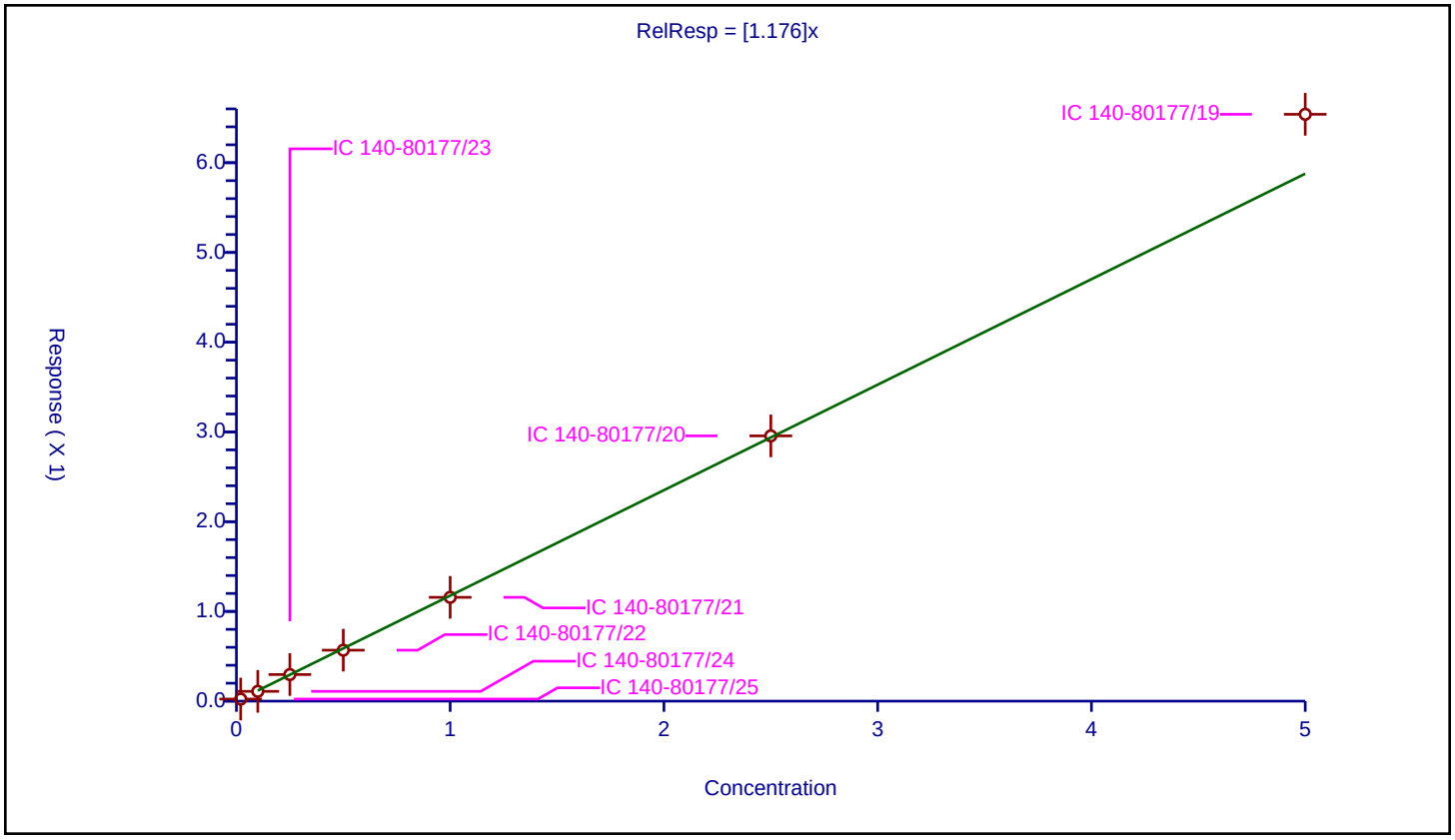
Curve Coefficients

Intercept:	0
Slope:	1.176

Error Coefficients

Standard Error:	421000
Relative Standard Error:	5.7
Correlation Coefficient:	0.993
Coefficient of Determination (Adjusted):	0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/25	0.02	0.023404	0.5	78362.0	1.17021	Y
2	IC 140-80177/24	0.1	0.109033	0.5	80563.0	1.090327	Y
3	IC 140-80177/23	0.25	0.296266	0.5	83334.0	1.185063	Y
4	IC 140-80177/22	0.5	0.567908	0.5	86168.0	1.135816	Y
5	IC 140-80177/21	1.0	1.156873	0.5	83775.0	1.156873	Y
6	IC 140-80177/20	2.5	2.955958	0.5	86384.0	1.182383	Y
7	IC 140-80177/19	5.0	6.539614	0.5	66328.0	1.307923	Y



Calibration / Acenaphthene

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

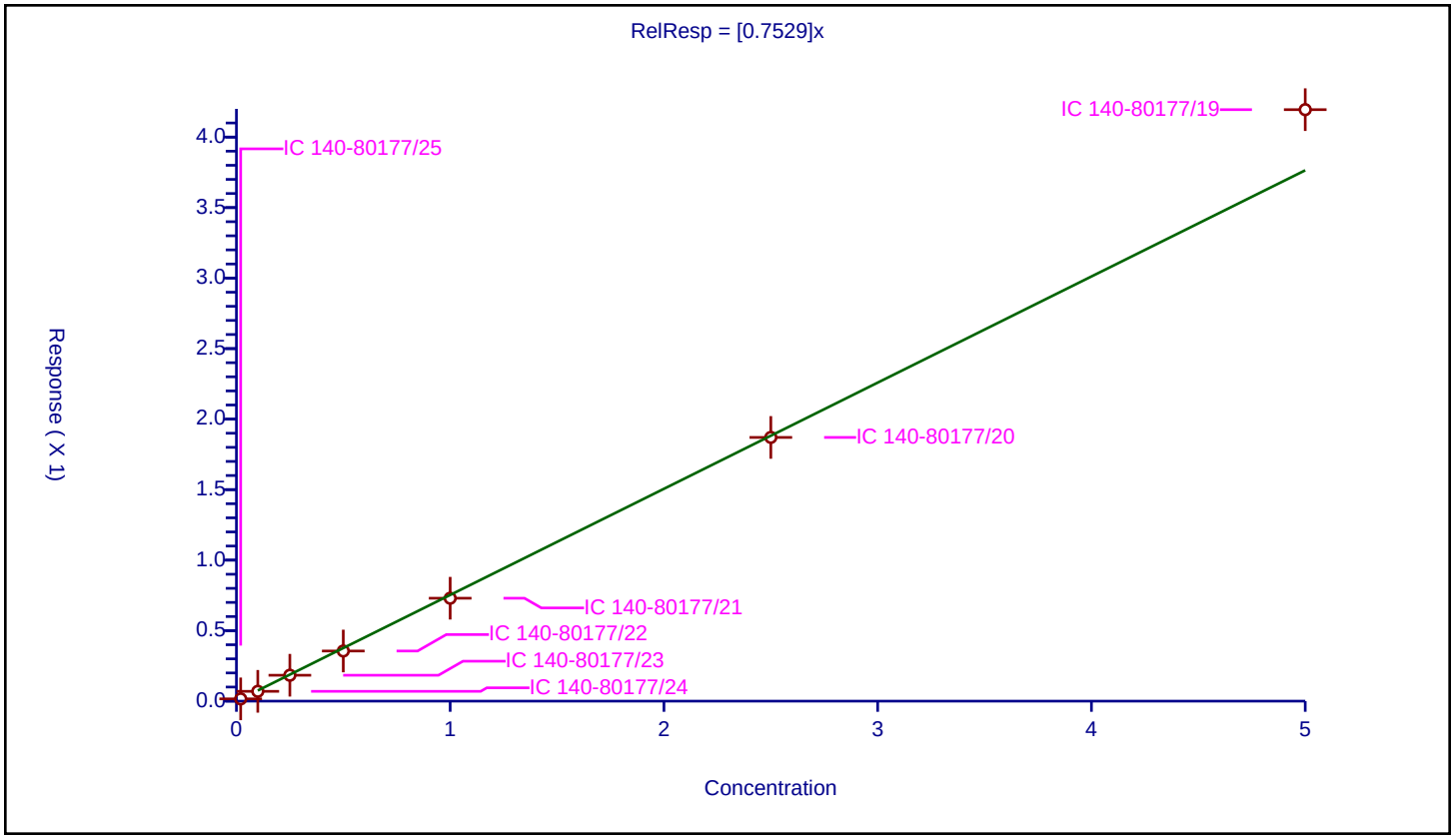
Curve Coefficients

Intercept:	0
Slope:	0.7529

Error Coefficients

Standard Error:	269000
Relative Standard Error:	7.0
Correlation Coefficient:	0.994
Coefficient of Determination (Adjusted):	0.994

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/25	0.02	0.01622	0.5	78362.0	0.81098	Y
2	IC 140-80177/24	0.1	0.069654	0.5	80563.0	0.696536	Y
3	IC 140-80177/23	0.25	0.183665	0.5	83334.0	0.734658	Y
4	IC 140-80177/22	0.5	0.355579	0.5	86168.0	0.711157	Y
5	IC 140-80177/21	1.0	0.729866	0.5	83775.0	0.729866	Y
6	IC 140-80177/20	2.5	1.870242	0.5	86384.0	0.748097	Y
7	IC 140-80177/19	5.0	4.194435	0.5	66328.0	0.838887	Y



Calibration / 2,3,5-Trimethylnaphthalene

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

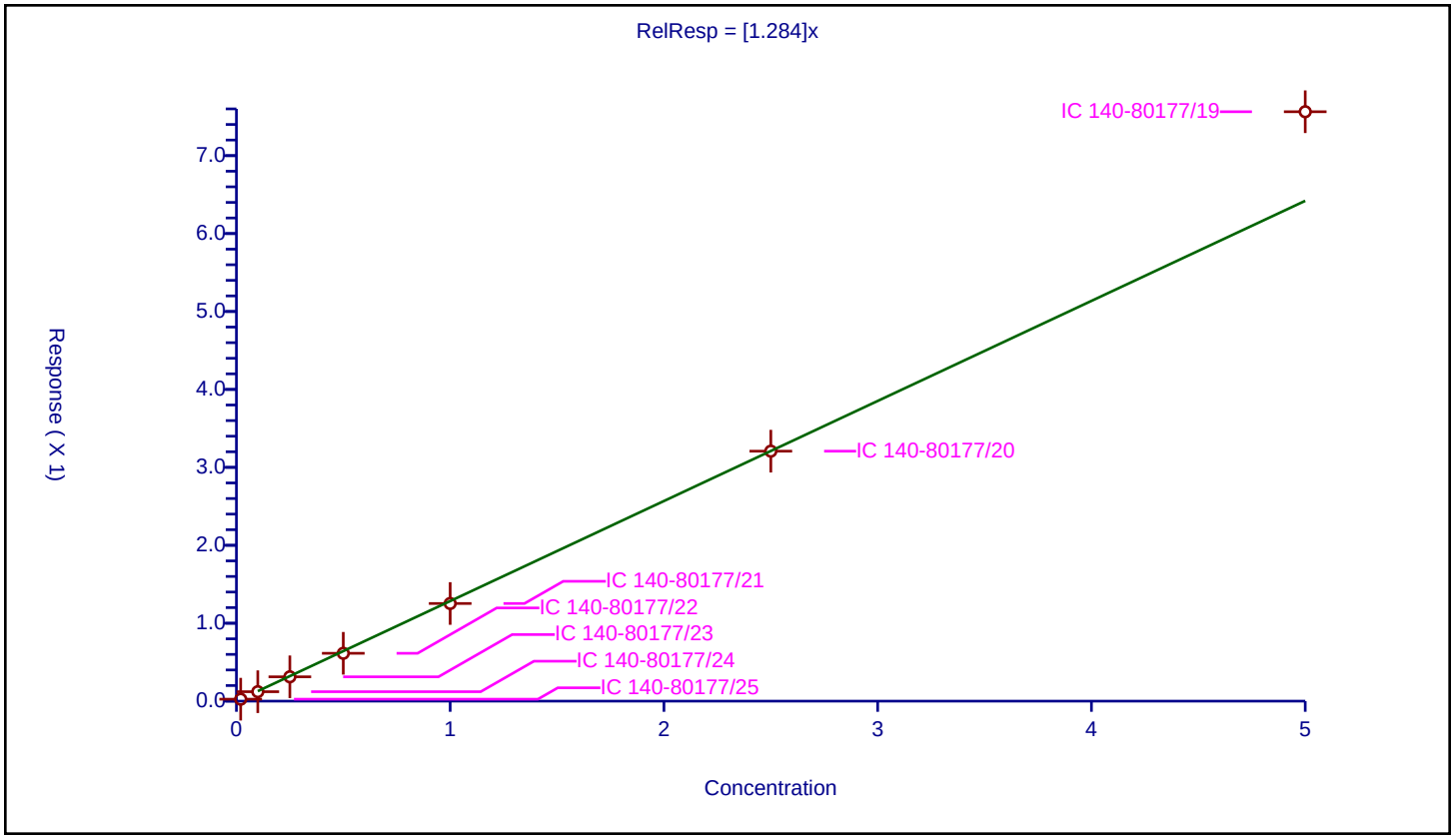
Curve Coefficients

Intercept:	0
Slope:	1.284

Error Coefficients

Standard Error:	309000
Relative Standard Error:	8.0
Correlation Coefficient:	0.997
Coefficient of Determination (Adjusted):	0.993

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/25	0.02	0.024997	0.5	52766.0	1.249858	Y
2	IC 140-80177/24	0.1	0.121199	0.5	52484.0	1.211988	Y
3	IC 140-80177/23	0.25	0.312318	0.5	55221.0	1.249271	Y
4	IC 140-80177/22	0.5	0.614082	0.5	56652.0	1.228165	Y
5	IC 140-80177/21	1.0	1.253024	0.5	54726.0	1.253024	Y
6	IC 140-80177/20	2.5	3.207838	0.5	56070.0	1.283135	Y
7	IC 140-80177/19	5.0	7.563341	0.5	42674.0	1.512668	Y



Calibration / Fluorene

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

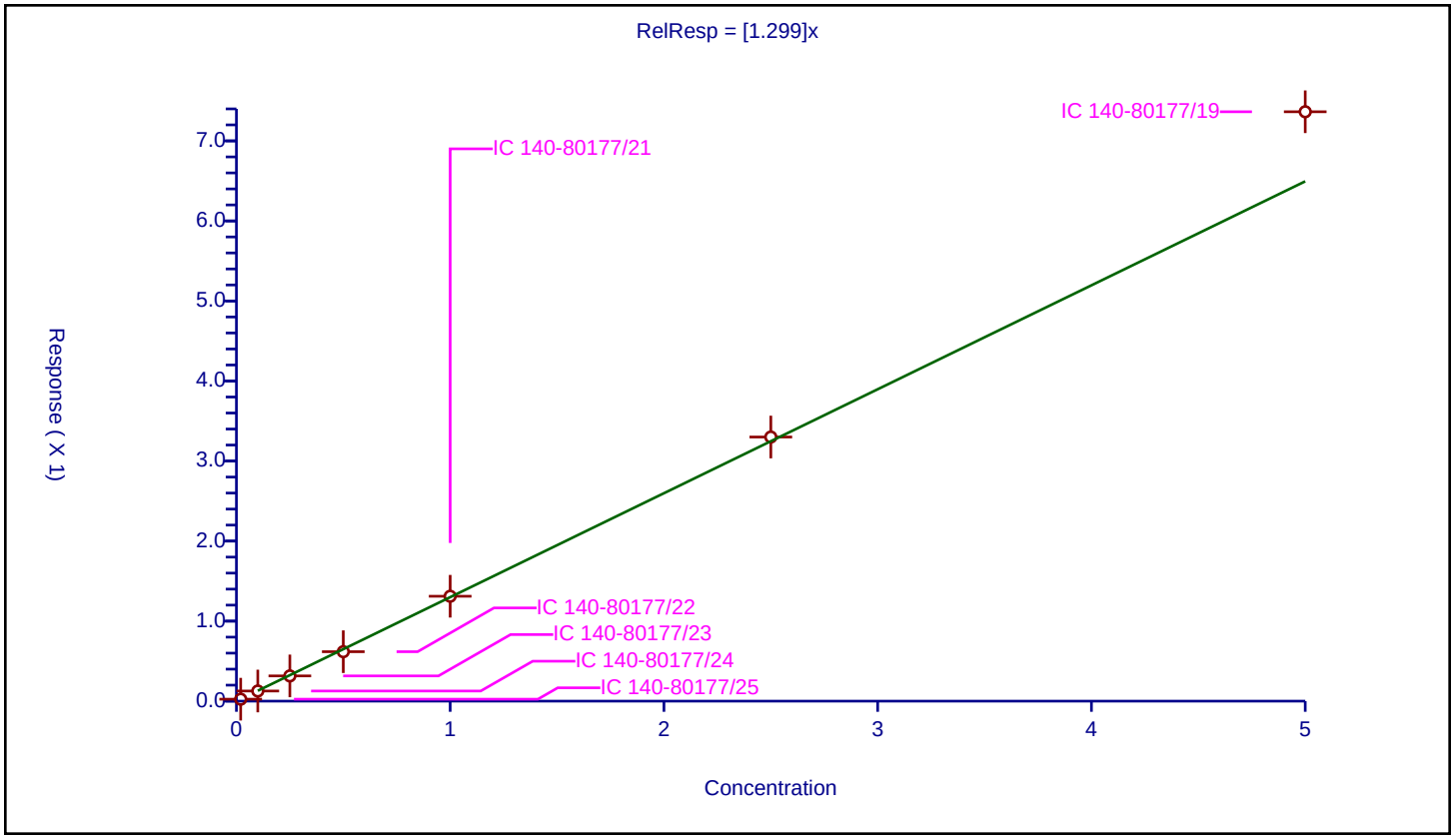
Curve Coefficients

Intercept:	0
Slope:	1.299

Error Coefficients

Standard Error:	369000
Relative Standard Error:	6.5
Correlation Coefficient:	0.997
Coefficient of Determination (Adjusted):	0.995

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/25	0.02	0.024542	0.5	61344.0	1.227096	Y
2	IC 140-80177/24	0.1	0.126575	0.5	62208.0	1.265754	Y
3	IC 140-80177/23	0.25	0.315232	0.5	65669.0	1.26093	Y
4	IC 140-80177/22	0.5	0.617689	0.5	66183.0	1.235378	Y
5	IC 140-80177/21	1.0	1.310595	0.5	64246.0	1.310595	Y
6	IC 140-80177/20	2.5	3.299956	0.5	65288.0	1.319982	Y
7	IC 140-80177/19	5.0	7.364126	0.5	52258.0	1.472825	Y



Calibration / Hexachlorobenzene

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

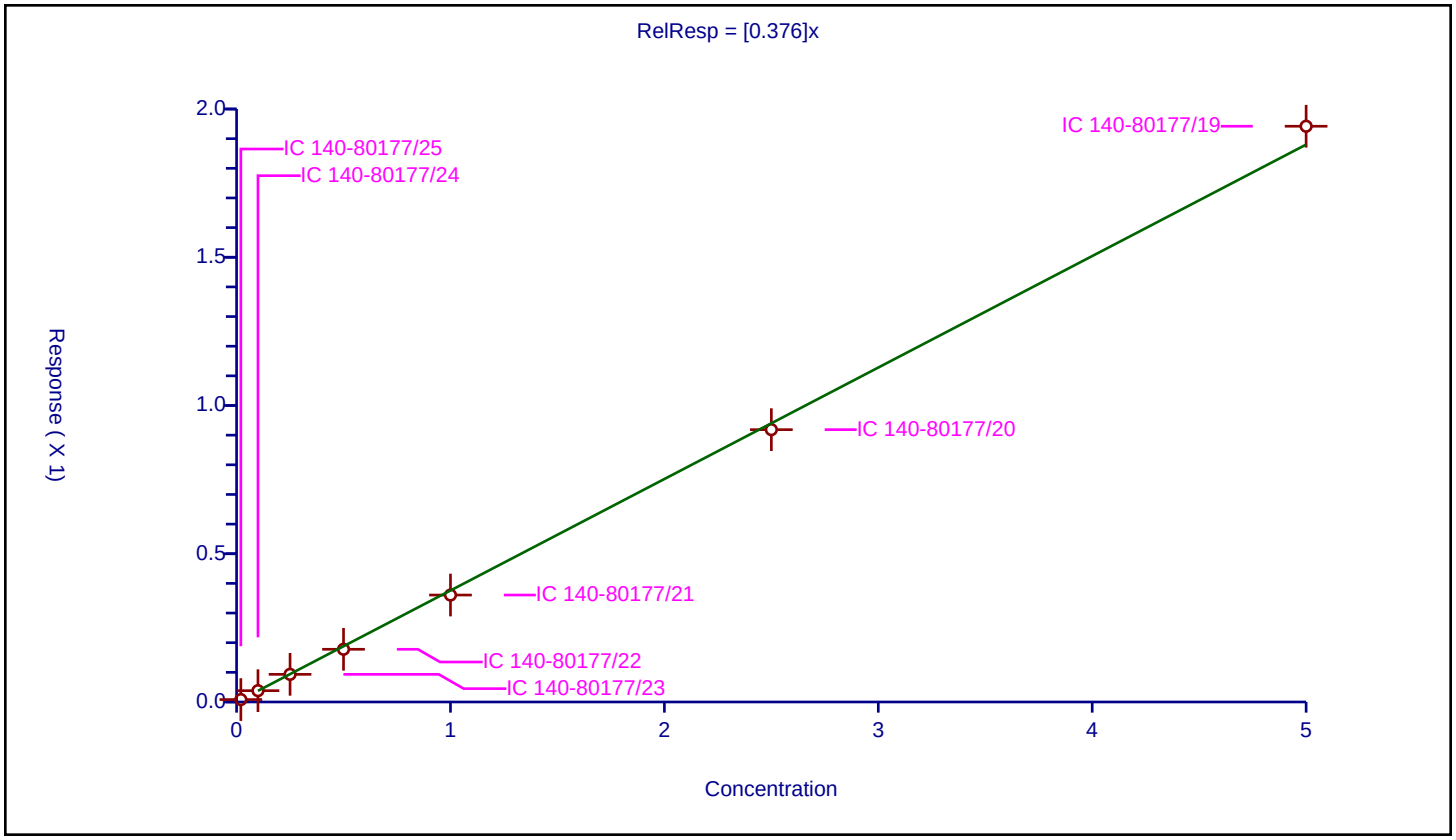
Curve Coefficients

Intercept:	0
Slope:	0.376

Error Coefficients

Standard Error:	182000
Relative Standard Error:	4.6
Correlation Coefficient:	0.995
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/25	0.02	0.008101	0.5	95545.0	0.405045	Y
2	IC 140-80177/24	0.1	0.038207	0.5	104432.0	0.382067	Y
3	IC 140-80177/23	0.25	0.093245	0.5	114355.0	0.372979	Y
4	IC 140-80177/22	0.5	0.177751	0.5	115234.0	0.355503	Y
5	IC 140-80177/21	1.0	0.360688	0.5	113874.0	0.360688	Y
6	IC 140-80177/20	2.5	0.918503	0.5	118943.0	0.367401	Y
7	IC 140-80177/19	5.0	1.941906	0.5	97264.0	0.388381	Y



Calibration / Pentachlorophenol

Curve Type:	Quadratic
Weighting:	None
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

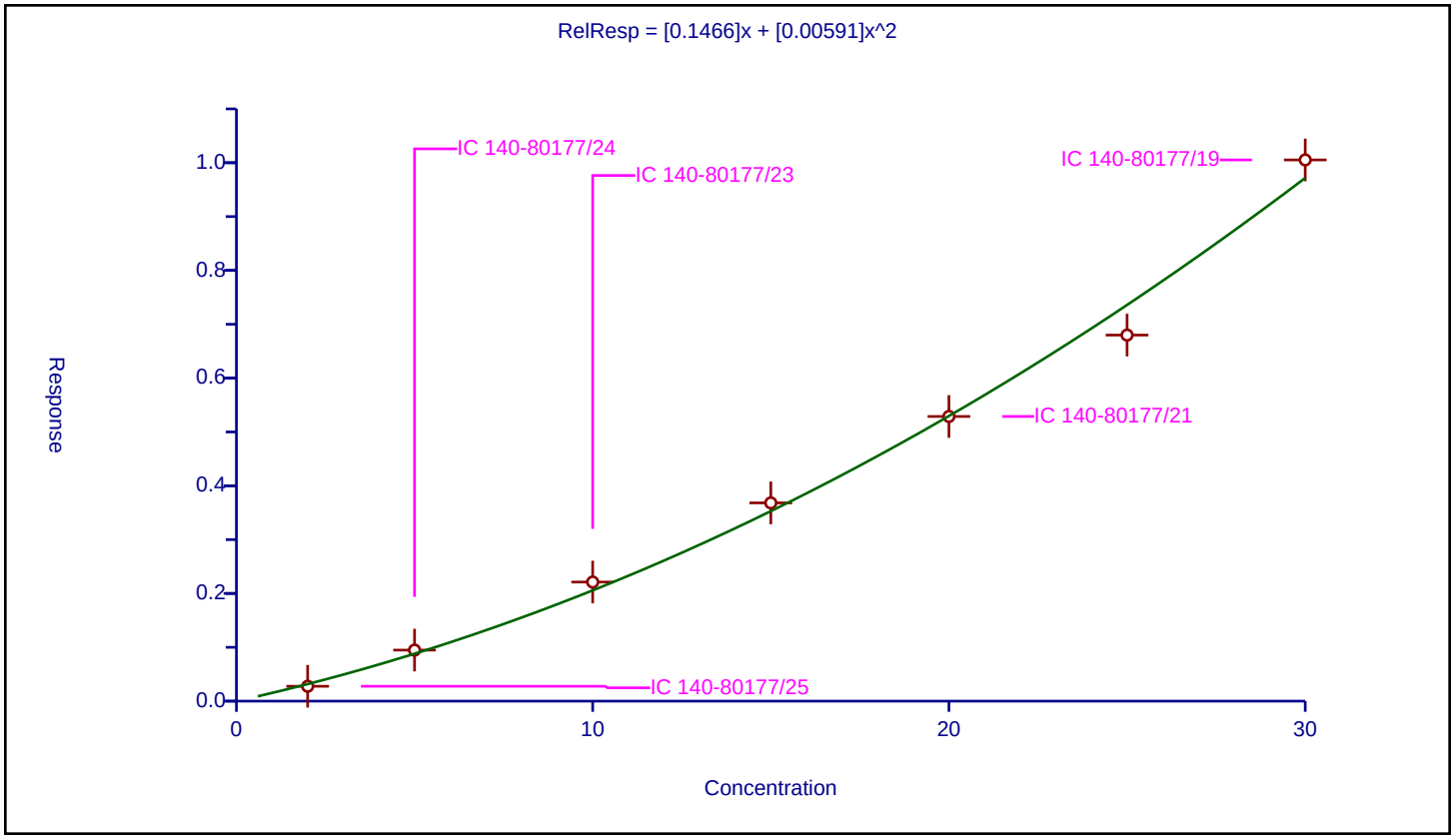
Curve Coefficients

Intercept:	0
Slope:	0.1466
Second Order:	0.00591

Error Coefficients

Standard Error:	1330000
Relative Standard Error:	7.2
Correlation Coefficient:	0.991
Coefficient of Determination (Adjusted):	0.993

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/25	2.0	0.276262	0.5	95545.0	0.138131	Y
2	IC 140-80177/24	5.0	0.947837	0.5	104432.0	0.189567	Y
3	IC 140-80177/23	10.0	2.212212	0.5	114355.0	0.221221	Y
4	IC 140-80177/22	15.0	3.682325	0.5	115234.0	0.245488	Y
5	IC 140-80177/21	20.0	5.287265	0.5	113874.0	0.264363	Y
6	IC 140-80177/20	25.0	6.798651	0.5	118943.0	0.271946	Y
7	IC 140-80177/19	30.0	10.052214	0.5	97264.0	0.335074	Y



Calibration / Dibenzothiophene

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

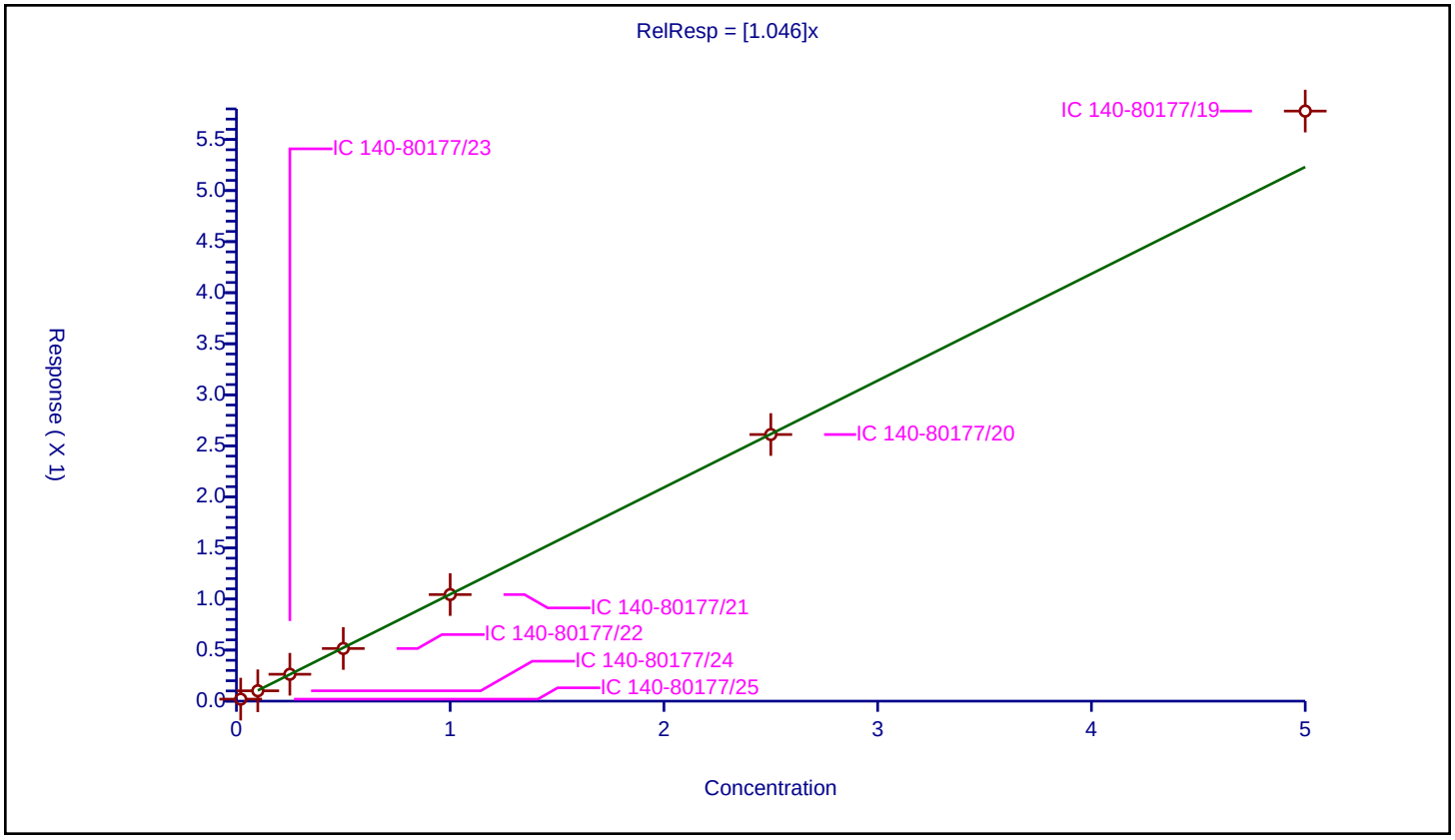
Curve Coefficients

Intercept:	0
Slope:	1.046

Error Coefficients

Standard Error:	599000
Relative Standard Error:	5.1
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/25	0.02	0.019673	0.5	111573.0	0.983661	Y
2	IC 140-80177/24	0.1	0.101231	0.5	120758.0	1.012314	Y
3	IC 140-80177/23	0.25	0.263298	0.5	126315.0	1.053192	Y
4	IC 140-80177/22	0.5	0.515414	0.5	126765.0	1.030829	Y
5	IC 140-80177/21	1.0	1.043609	0.5	127371.0	1.043609	Y
6	IC 140-80177/20	2.5	2.610976	0.5	132367.0	1.04439	Y
7	IC 140-80177/19	5.0	5.778656	0.5	108763.0	1.155731	Y



Calibration / 13C6-Phenanthrene (PRC)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

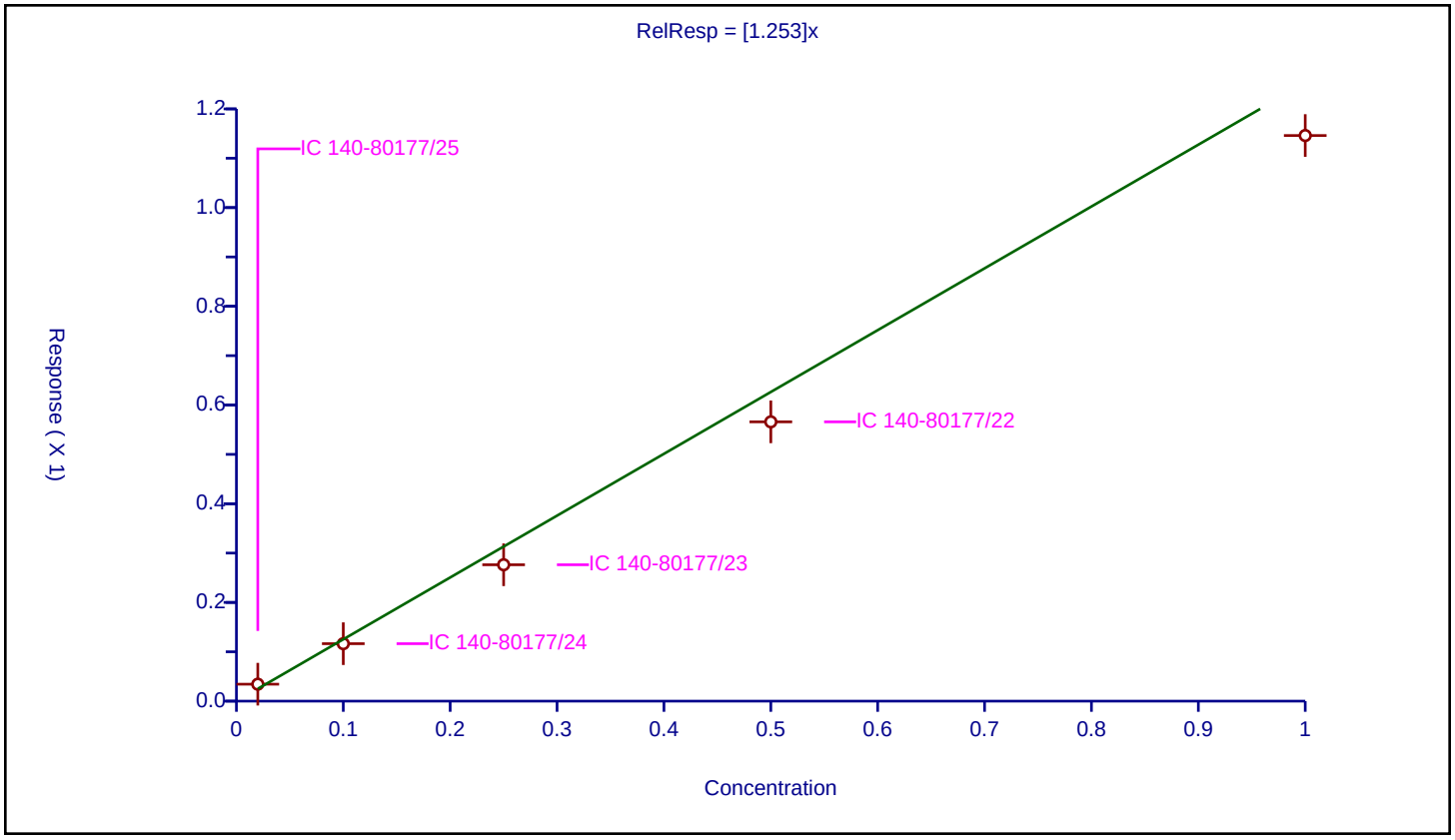
Curve Coefficients

Intercept:	0
Slope:	1.253

Error Coefficients

Standard Error:	150000
Relative Standard Error:	20.8
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.930

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/25	0.02	0.034329	0.5	95545.0	1.716469	Y
2	IC 140-80177/24	0.1	0.116411	0.5	104432.0	1.164107	Y
3	IC 140-80177/23	0.25	0.276341	0.5	114355.0	1.105365	Y
4	IC 140-80177/22	0.5	0.565905	0.5	115234.0	1.13181	Y
5	IC 140-80177/21	1.0	1.146017	0.5	113874.0	1.146017	Y



Calibration / Phenanthrene

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

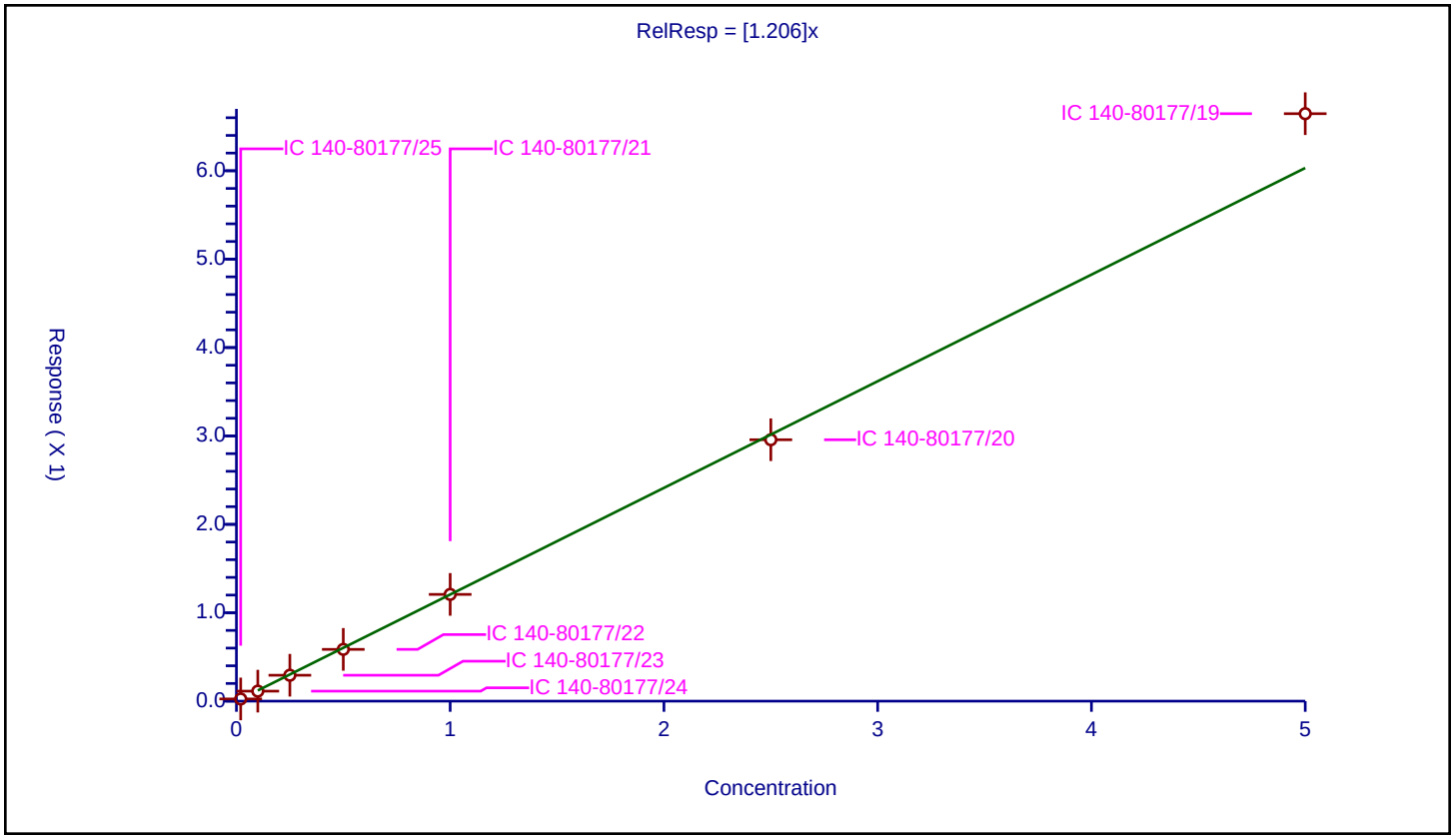
Curve Coefficients

Intercept:	0
Slope:	1.206

Error Coefficients

Standard Error:	614000
Relative Standard Error:	5.4
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/25	0.02	0.024973	0.5	95545.0	1.248626	Y
2	IC 140-80177/24	0.1	0.113198	0.5	104432.0	1.131981	Y
3	IC 140-80177/23	0.25	0.29303	0.5	114355.0	1.172122	Y
4	IC 140-80177/22	0.5	0.585687	0.5	115234.0	1.171373	Y
5	IC 140-80177/21	1.0	1.207611	0.5	113874.0	1.207611	Y
6	IC 140-80177/20	2.5	2.957307	0.5	118943.0	1.182923	Y
7	IC 140-80177/19	5.0	6.645773	0.5	97264.0	1.329155	Y



Calibration / Anthracene

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

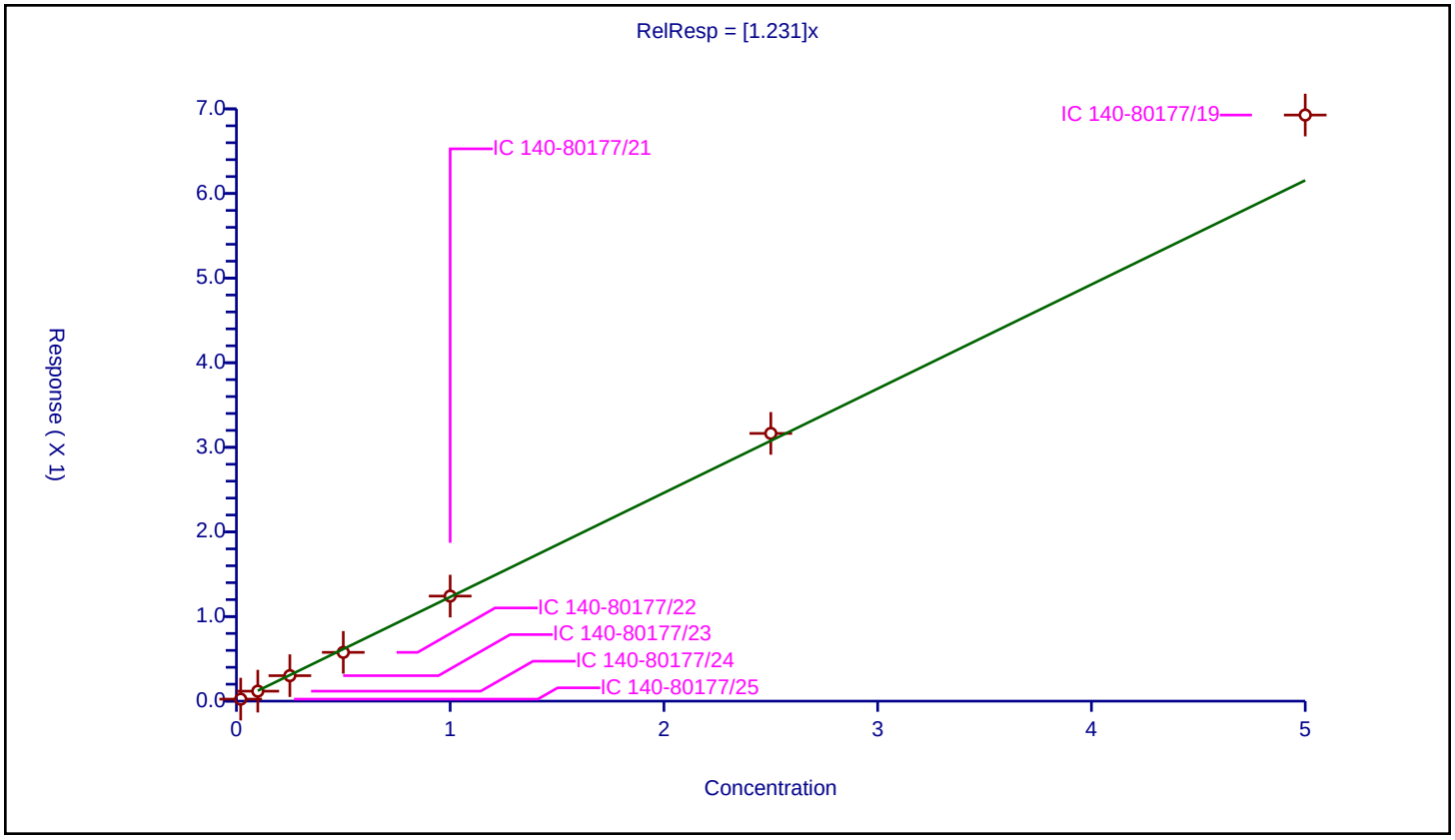
Curve Coefficients

Intercept:	0
Slope:	1.231

Error Coefficients

Standard Error:	596000
Relative Standard Error:	6.3
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.996

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/25	0.02	0.023774	0.5	111887.0	1.188699	Y
2	IC 140-80177/24	0.1	0.117797	0.5	103704.0	1.177968	Y
3	IC 140-80177/23	0.25	0.301225	0.5	109239.0	1.204899	Y
4	IC 140-80177/22	0.5	0.576638	0.5	112111.0	1.153277	Y
5	IC 140-80177/21	1.0	1.241583	0.5	103873.0	1.241583	Y
6	IC 140-80177/20	2.5	3.164451	0.5	108297.0	1.26578	Y
7	IC 140-80177/19	5.0	6.927348	0.5	90493.0	1.38547	Y



Calibration / 1-Methylphenanthrene

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

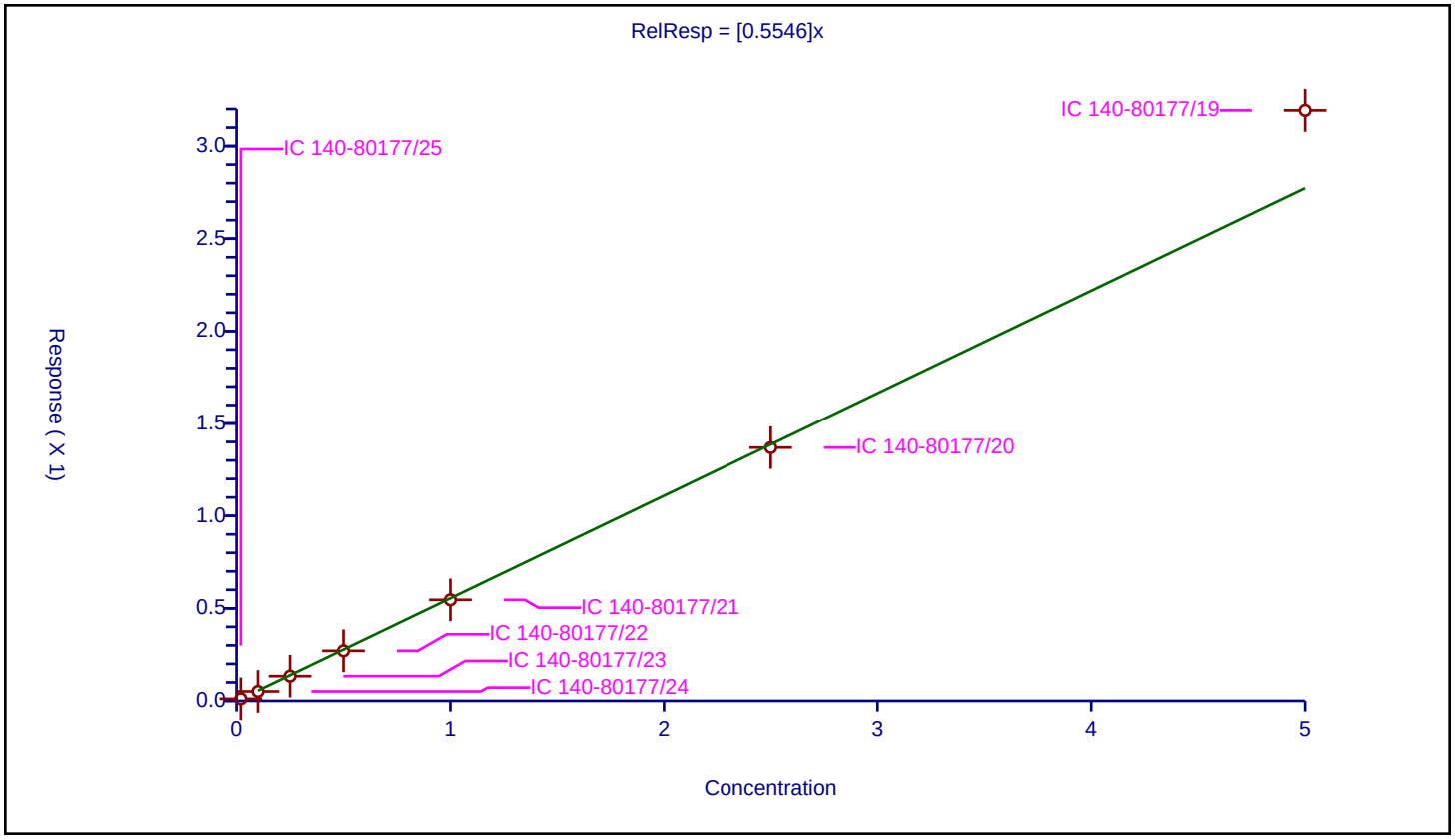
Curve Coefficients

Intercept:	0
Slope:	0.5546

Error Coefficients

Standard Error:	292000
Relative Standard Error:	7.2
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.994

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/25	0.02	0.011236	0.5	95545.0	0.561777	Y
2	IC 140-80177/24	0.1	0.051148	0.5	104432.0	0.511481	Y
3	IC 140-80177/23	0.25	0.133807	0.5	114355.0	0.535228	Y
4	IC 140-80177/22	0.5	0.270589	0.5	115234.0	0.541177	Y
5	IC 140-80177/21	1.0	0.546073	0.5	113874.0	0.546073	Y
6	IC 140-80177/20	2.5	1.369547	0.5	118943.0	0.547819	Y
7	IC 140-80177/19	5.0	3.192661	0.5	97264.0	0.638532	Y



Calibration / 13C6-Fluoranthene (PRC)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

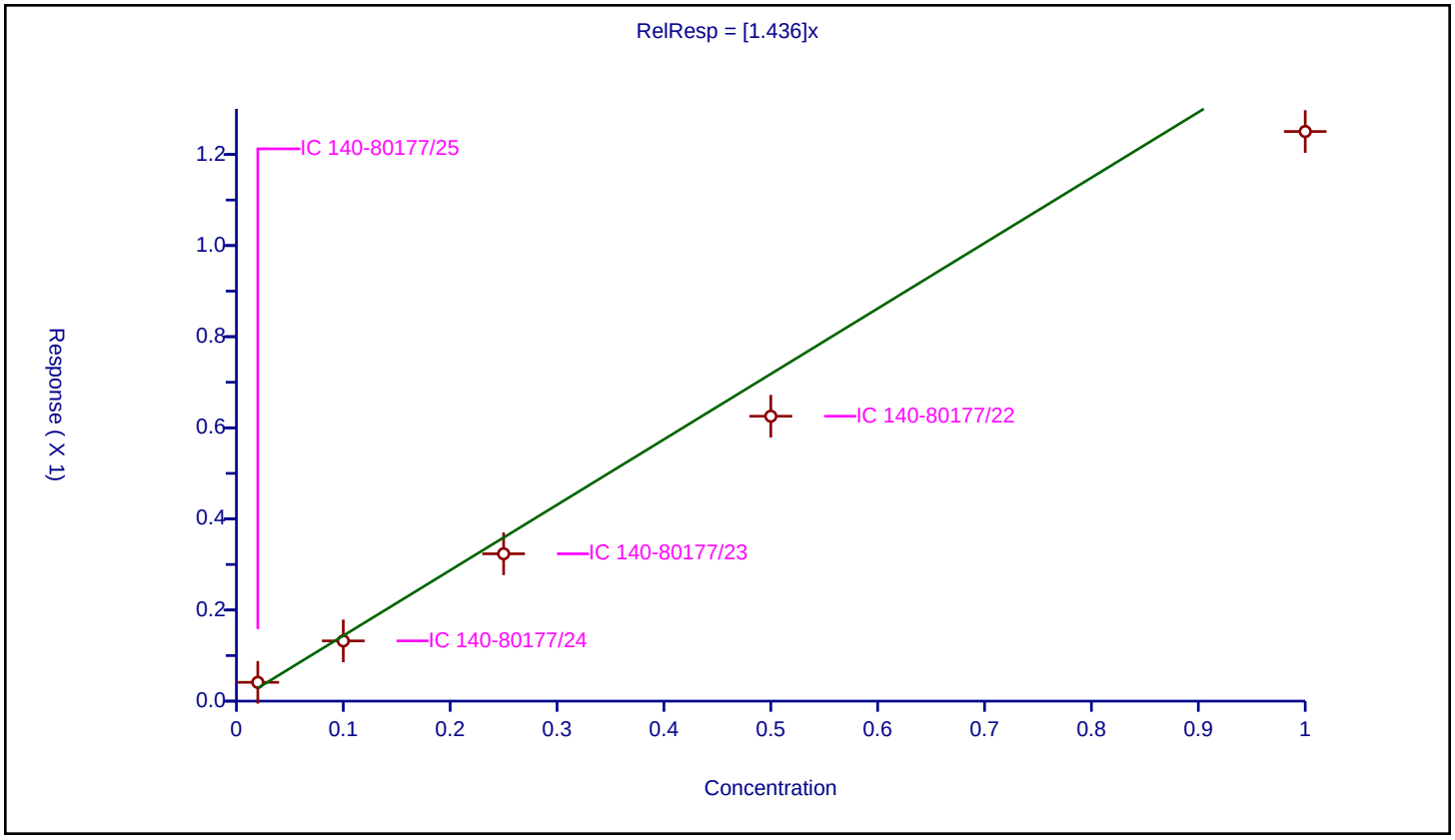
Curve Coefficients

Intercept:	0
Slope:	1.436

Error Coefficients

Standard Error:	208000
Relative Standard Error:	24.5
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.897

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/25	0.02	0.04129	0.5	131473.0	2.064492	Y
2	IC 140-80177/24	0.1	0.132208	0.5	136213.0	1.322084	Y
3	IC 140-80177/23	0.25	0.323469	0.5	143581.0	1.293876	Y
4	IC 140-80177/22	0.5	0.625396	0.5	144590.0	1.250792	Y
5	IC 140-80177/21	1.0	1.250358	0.5	144703.0	1.250358	Y



Calibration / Fluoranthene

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

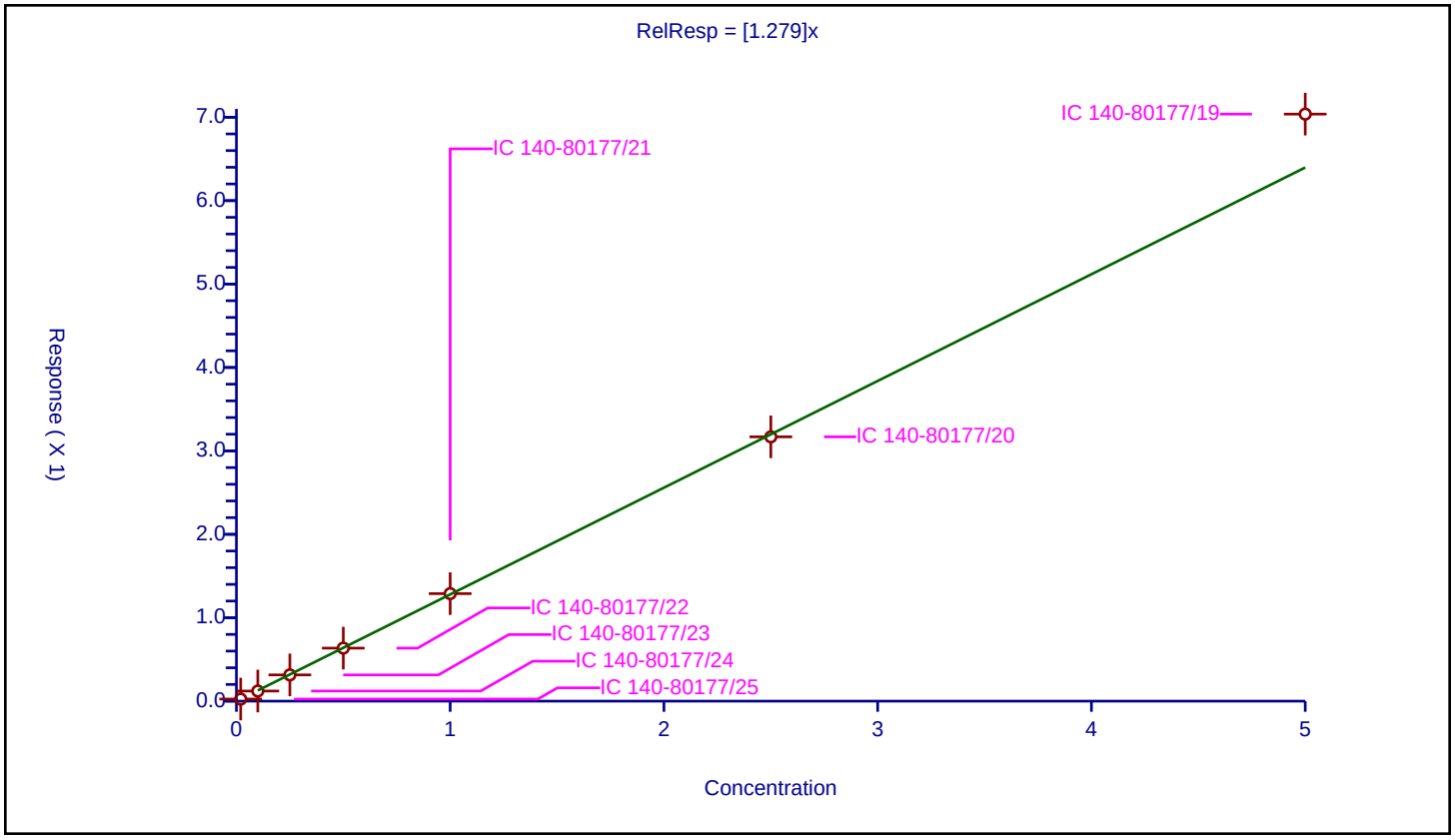
Curve Coefficients

Intercept:	0
Slope:	1.279

Error Coefficients

Standard Error:	870000
Relative Standard Error:	4.8
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/25	0.02	0.025028	0.5	131473.0	1.251398	Y
2	IC 140-80177/24	0.1	0.121057	0.5	136213.0	1.210567	Y
3	IC 140-80177/23	0.25	0.314763	0.5	143581.0	1.259052	Y
4	IC 140-80177/22	0.5	0.635656	0.5	144590.0	1.271312	Y
5	IC 140-80177/21	1.0	1.288881	0.5	144703.0	1.288881	Y
6	IC 140-80177/20	2.5	3.168439	0.5	151969.0	1.267376	Y
7	IC 140-80177/19	5.0	7.037389	0.5	131710.0	1.407478	Y



Calibration / Pyrene

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

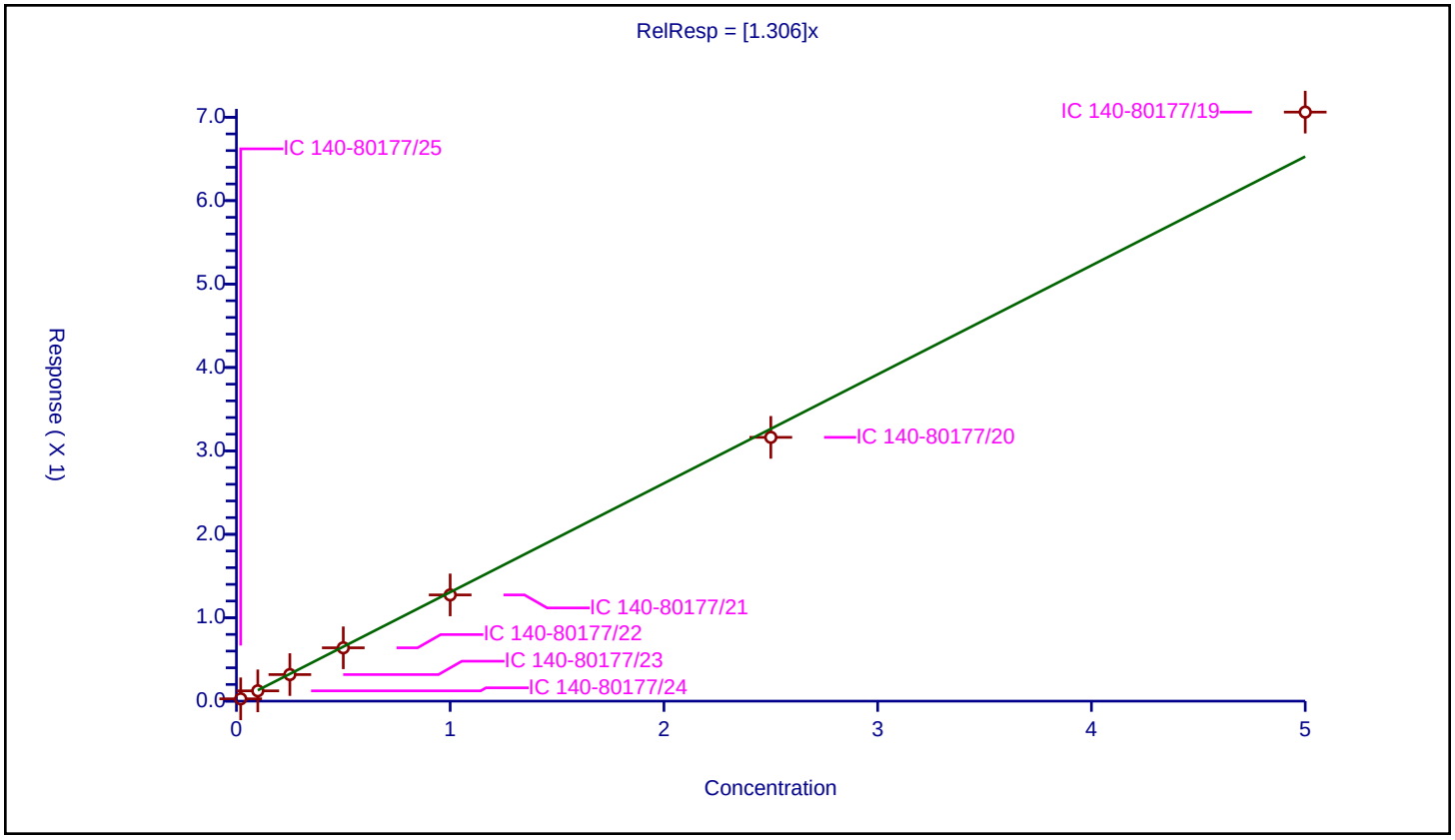
Curve Coefficients

Intercept:	0
Slope:	1.306

Error Coefficients

Standard Error:	872000
Relative Standard Error:	5.4
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/25	0.02	0.028036	0.5	131473.0	1.401809	Y
2	IC 140-80177/24	0.1	0.123432	0.5	136213.0	1.234317	Y
3	IC 140-80177/23	0.25	0.318601	0.5	143581.0	1.274403	Y
4	IC 140-80177/22	0.5	0.639301	0.5	144590.0	1.278602	Y
5	IC 140-80177/21	1.0	1.273484	0.5	144703.0	1.273484	Y
6	IC 140-80177/20	2.5	3.162533	0.5	151969.0	1.265013	Y
7	IC 140-80177/19	5.0	7.061343	0.5	131710.0	1.412269	Y



Calibration / Benzo[a]anthracene

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

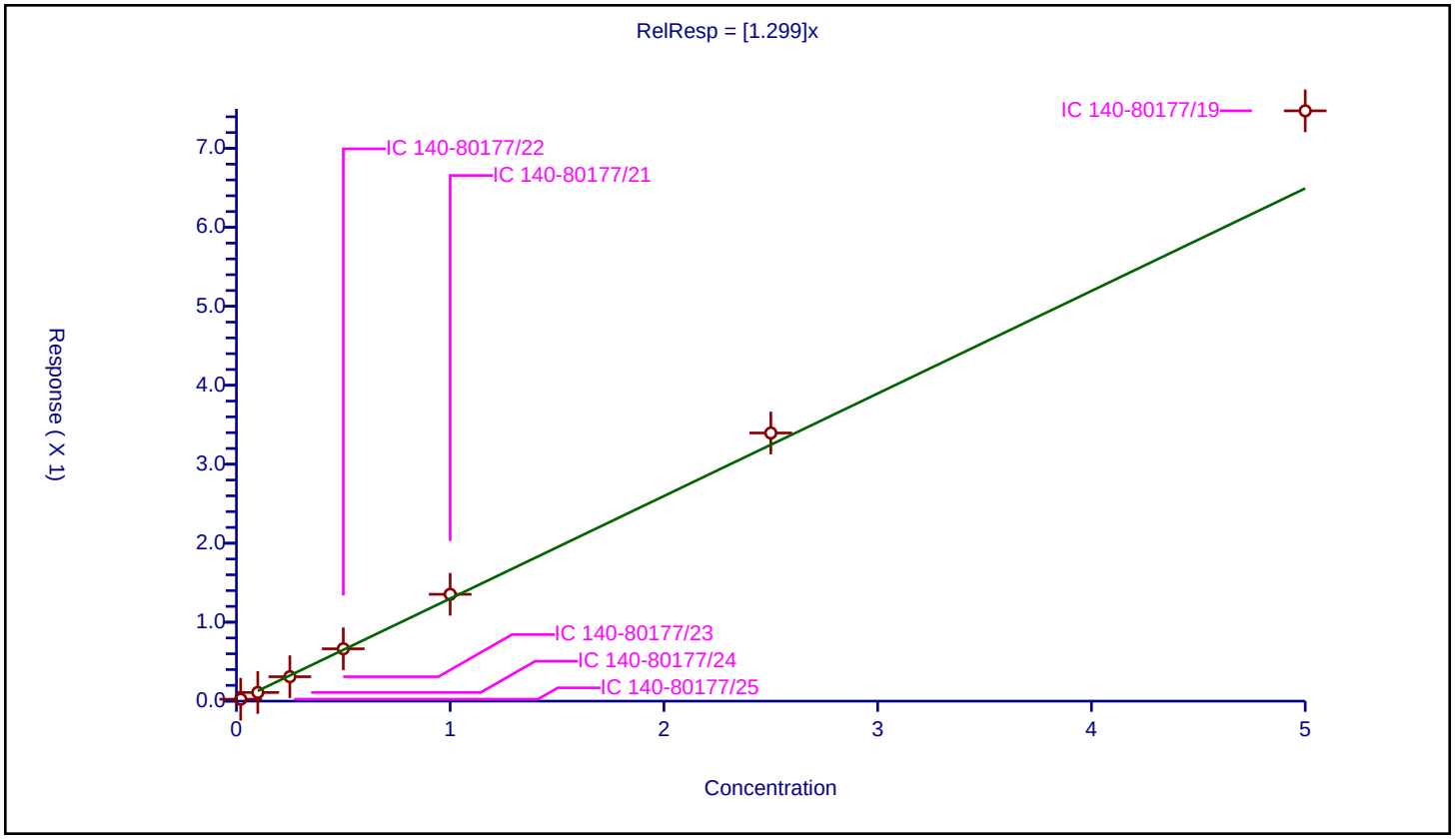
Curve Coefficients

Intercept:	0
Slope:	1.299

Error Coefficients

Standard Error:	873000
Relative Standard Error:	9.7
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.990

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/25	0.02	0.024454	0.5	139591.0	1.222679	Y
2	IC 140-80177/24	0.1	0.10978	0.5	140536.0	1.097797	Y
3	IC 140-80177/23	0.25	0.309335	0.5	140107.0	1.23734	Y
4	IC 140-80177/22	0.5	0.662958	0.5	132037.0	1.325916	Y
5	IC 140-80177/21	1.0	1.353118	0.5	130404.0	1.353118	Y
6	IC 140-80177/20	2.5	3.39583	0.5	139033.0	1.358332	Y
7	IC 140-80177/19	5.0	7.475404	0.5	125486.0	1.495081	Y



Calibration / 13C6-Chrysene (PRC)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

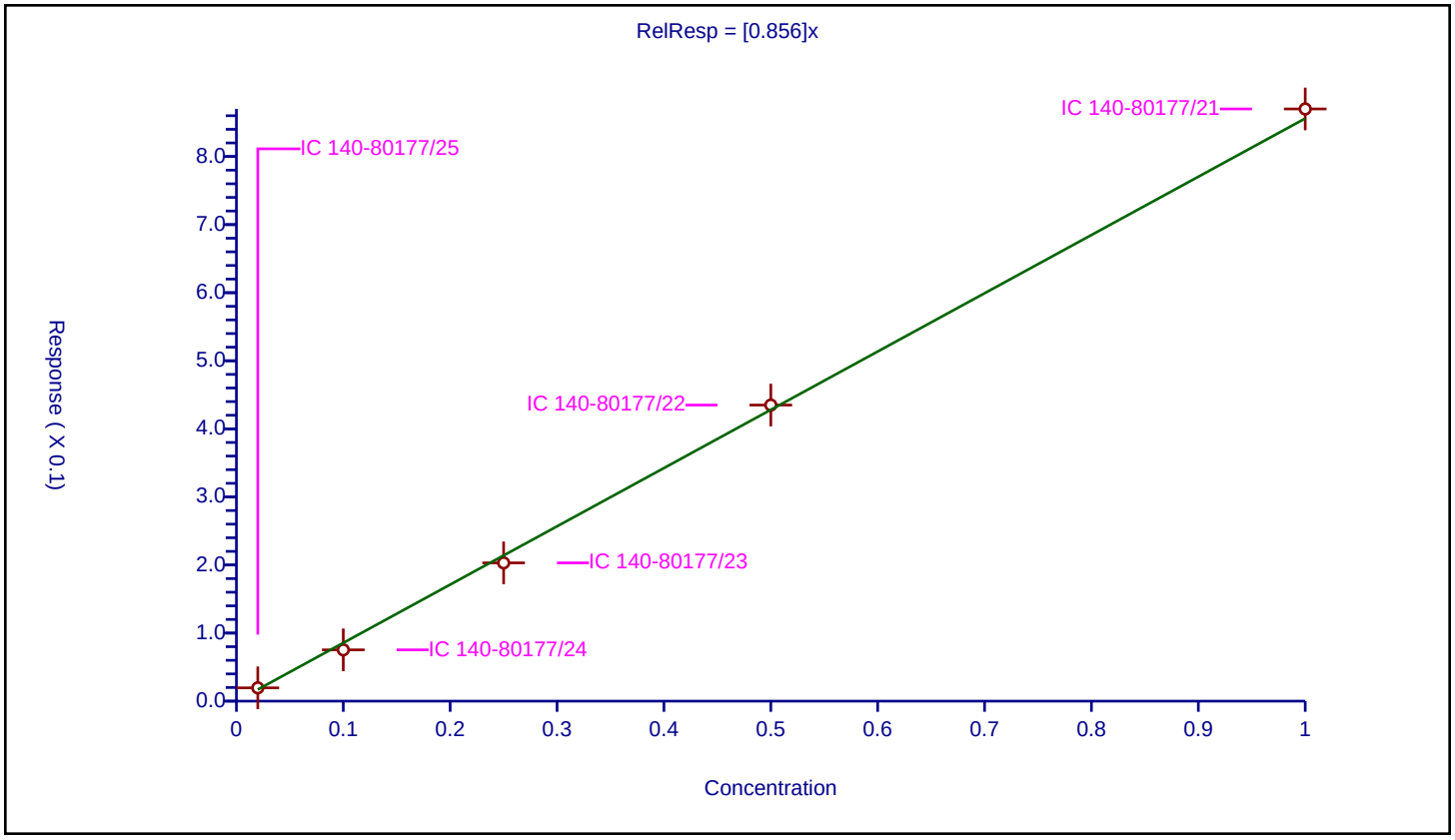
Curve Coefficients

Intercept:	0
Slope:	0.856

Error Coefficients

Standard Error:	131000
Relative Standard Error:	9.6
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.988

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/25	0.02	0.019485	0.5	139591.0	0.974275	Y
2	IC 140-80177/24	0.1	0.075333	0.5	140536.0	0.75333	Y
3	IC 140-80177/23	0.25	0.203098	0.5	140107.0	0.812393	Y
4	IC 140-80177/22	0.5	0.43492	0.5	132037.0	0.86984	Y
5	IC 140-80177/21	1.0	0.869916	0.5	130404.0	0.869916	Y



Calibration / Chrysene

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

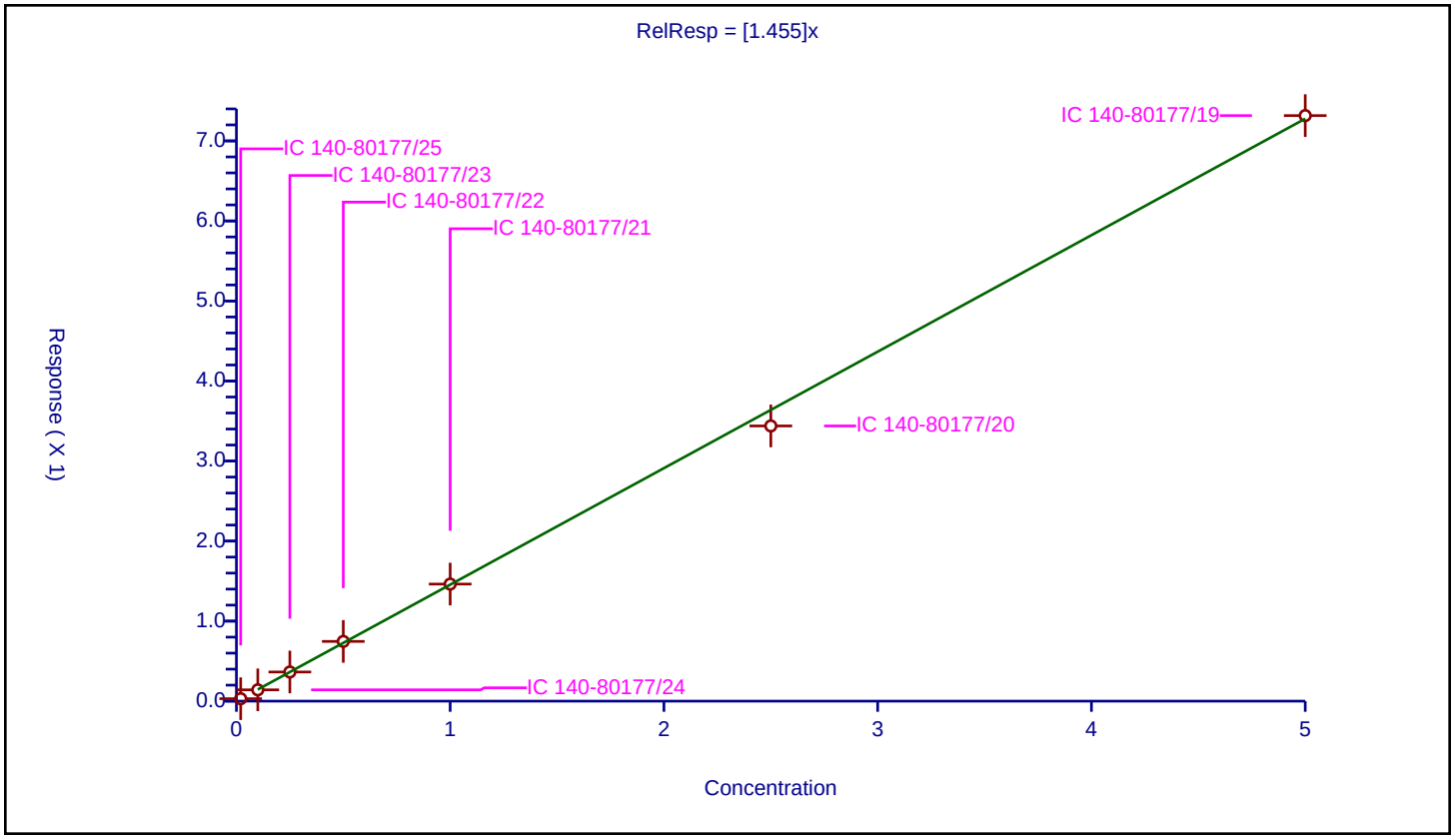
Curve Coefficients

Intercept:	0
Slope:	1.455

Error Coefficients

Standard Error:	864000
Relative Standard Error:	3.4
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/25	0.02	0.030496	0.5	139591.0	1.524812	Y
2	IC 140-80177/24	0.1	0.141252	0.5	140536.0	1.412521	Y
3	IC 140-80177/23	0.25	0.364314	0.5	140107.0	1.457258	Y
4	IC 140-80177/22	0.5	0.746139	0.5	132037.0	1.492279	Y
5	IC 140-80177/21	1.0	1.46267	0.5	130404.0	1.46267	Y
6	IC 140-80177/20	2.5	3.438515	0.5	139033.0	1.375406	Y
7	IC 140-80177/19	5.0	7.315975	0.5	125486.0	1.463195	Y



Calibration / Benzo[b]fluoranthene

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

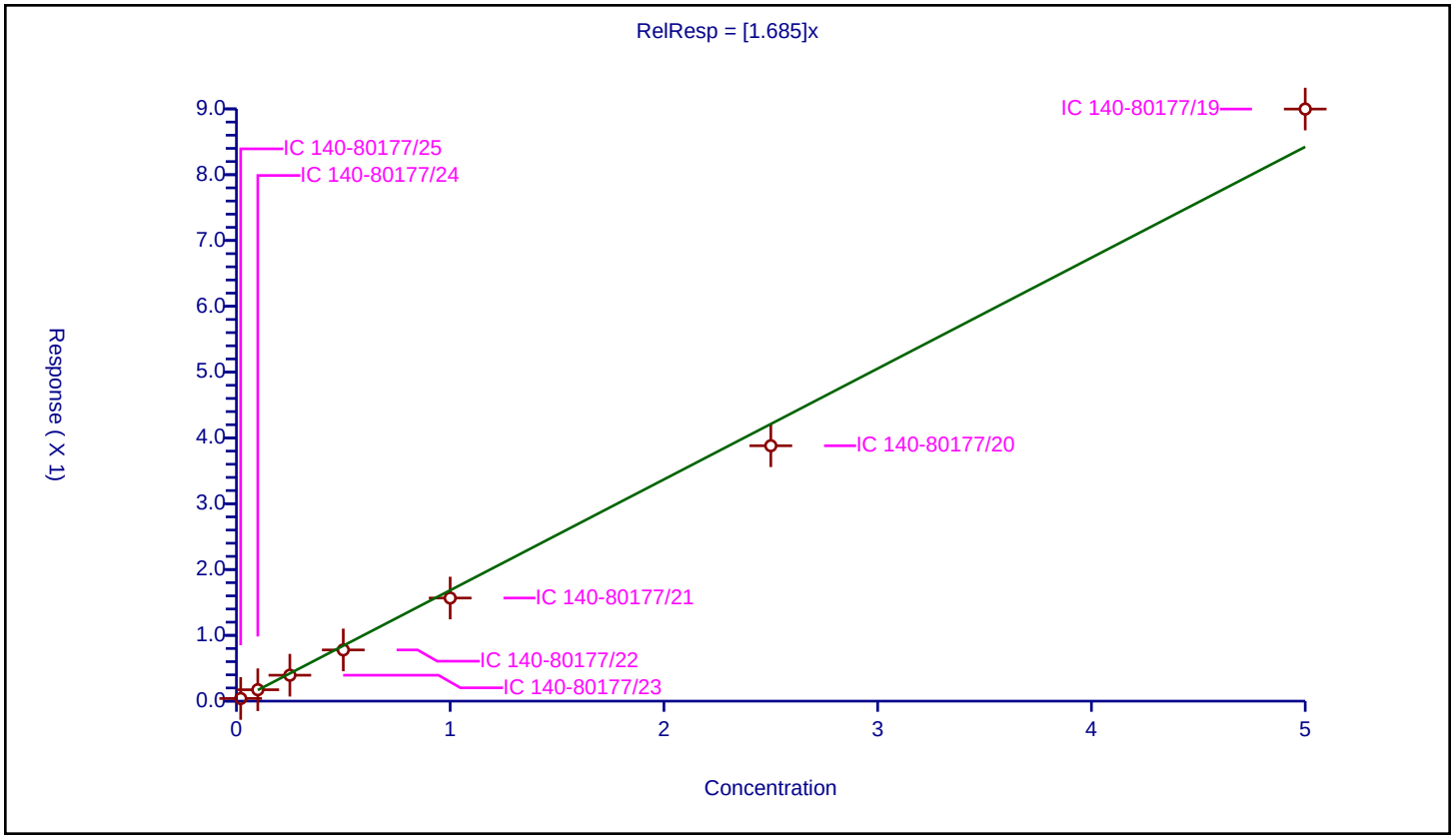
Curve Coefficients

Intercept:	0
Slope:	1.685

Error Coefficients

Standard Error:	932000
Relative Standard Error:	10.3
Correlation Coefficient:	0.999
Coefficient of Determination (Adjusted):	0.987

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/25	0.02	0.040175	0.5	97848.0	2.008728	Y
2	IC 140-80177/24	0.1	0.173248	0.5	104177.0	1.732484	Y
3	IC 140-80177/23	0.25	0.394037	0.5	117956.0	1.576147	Y
4	IC 140-80177/22	0.5	0.778132	0.5	119303.0	1.556264	Y
5	IC 140-80177/21	1.0	1.566955	0.5	117826.0	1.566955	Y
6	IC 140-80177/20	2.5	3.881155	0.5	122201.0	1.552462	Y
7	IC 140-80177/19	5.0	8.997526	0.5	112954.0	1.799505	Y



Calibration / Benzo[k]fluoranthene

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

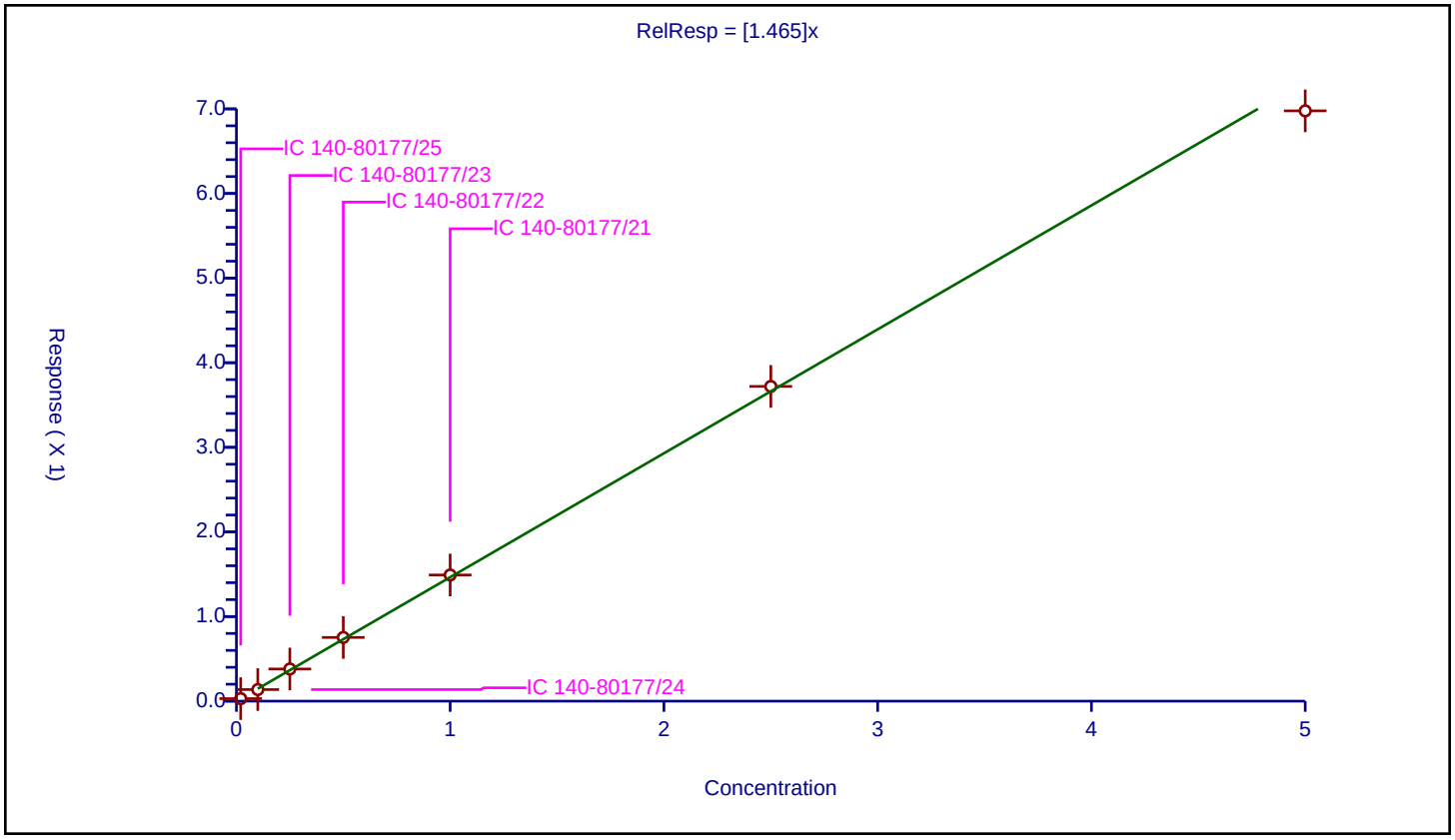
Curve Coefficients

Intercept:	0
Slope:	1.465

Error Coefficients

Standard Error:	875000
Relative Standard Error:	4.0
Correlation Coefficient:	0.998
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/25	0.02	0.029704	0.5	135420.0	1.485194	Y
2	IC 140-80177/24	0.1	0.13683	0.5	134192.0	1.368301	Y
3	IC 140-80177/23	0.25	0.379978	0.5	132451.0	1.519913	Y
4	IC 140-80177/22	0.5	0.752892	0.5	129996.0	1.505785	Y
5	IC 140-80177/21	1.0	1.490912	0.5	128352.0	1.490912	Y
6	IC 140-80177/20	2.5	3.719786	0.5	136203.0	1.487914	Y
7	IC 140-80177/19	5.0	6.976853	0.5	131507.0	1.395371	Y



Calibration / Benzo[e]pyrene

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

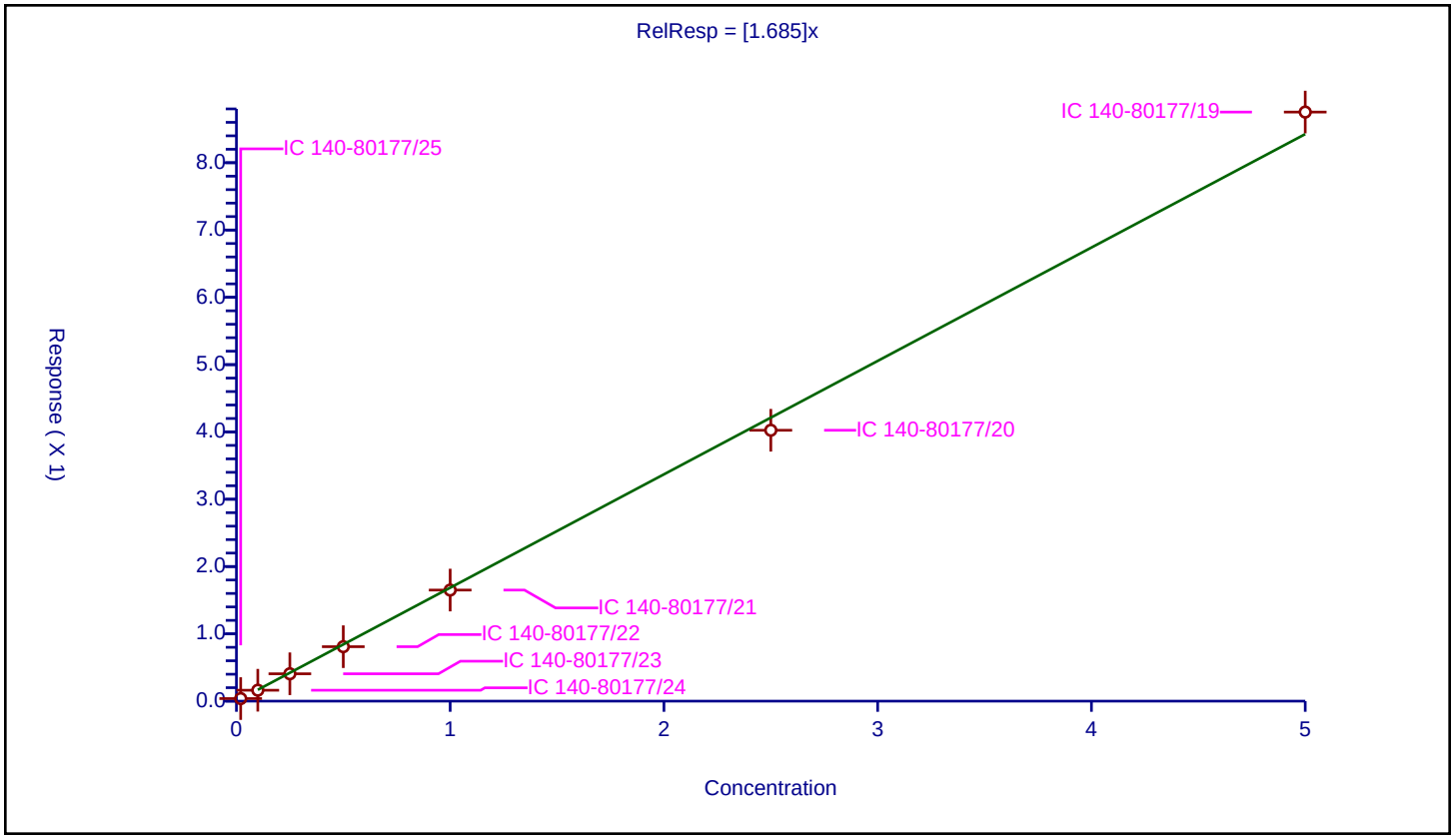
Curve Coefficients

Intercept:	0
Slope:	1.685

Error Coefficients

Standard Error:	791000
Relative Standard Error:	6.7
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.995

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/25	0.02	0.038345	0.5	92281.0	1.917242	Y
2	IC 140-80177/24	0.1	0.162226	0.5	96036.0	1.622256	Y
3	IC 140-80177/23	0.25	0.406614	0.5	101819.0	1.626455	Y
4	IC 140-80177/22	0.5	0.809269	0.5	101934.0	1.618537	Y
5	IC 140-80177/21	1.0	1.6503	0.5	99784.0	1.6503	Y
6	IC 140-80177/20	2.5	4.02496	0.5	104746.0	1.609984	Y
7	IC 140-80177/19	5.0	8.752829	0.5	97307.0	1.750566	Y



Calibration / Benzo[a]pyrene

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

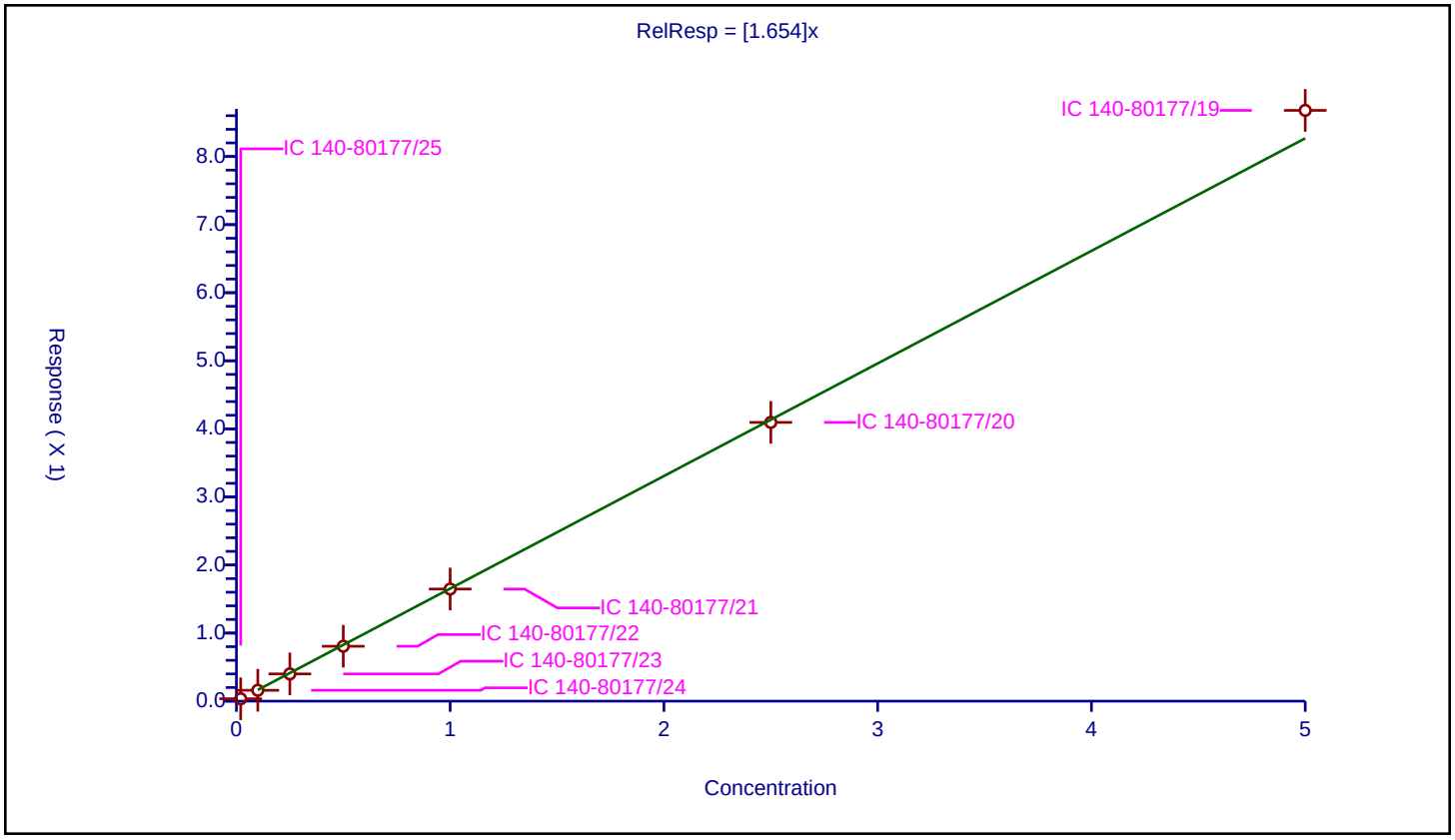
Curve Coefficients

Intercept:	0
Slope:	1.654

Error Coefficients

Standard Error:	789000
Relative Standard Error:	3.8
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.998

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/25	0.02	0.034964	0.5	92281.0	1.748193	Y
2	IC 140-80177/24	0.1	0.159326	0.5	96036.0	1.593257	Y
3	IC 140-80177/23	0.25	0.400107	0.5	101819.0	1.600428	Y
4	IC 140-80177/22	0.5	0.806311	0.5	101934.0	1.612622	Y
5	IC 140-80177/21	1.0	1.646792	0.5	99784.0	1.646792	Y
6	IC 140-80177/20	2.5	4.094672	0.5	104746.0	1.637869	Y
7	IC 140-80177/19	5.0	8.677911	0.5	97307.0	1.735582	Y



Calibration / Perylene

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

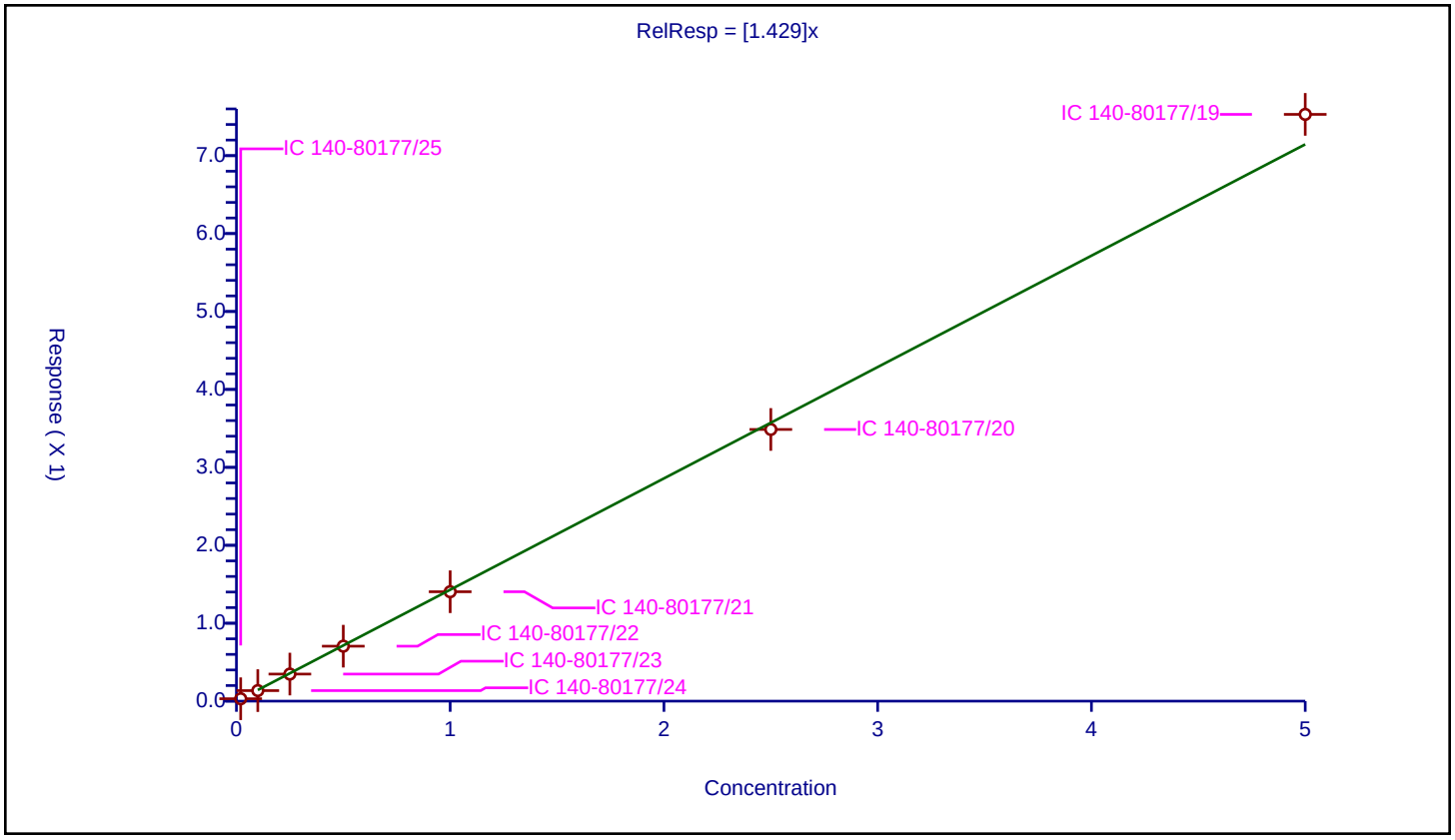
Curve Coefficients

Intercept:	0
Slope:	1.429

Error Coefficients

Standard Error:	747000
Relative Standard Error:	4.8
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/25	0.02	0.030897	0.5	105559.0	1.544871	Y
2	IC 140-80177/24	0.1	0.135321	0.5	108121.0	1.353206	Y
3	IC 140-80177/23	0.25	0.347533	0.5	113992.0	1.390133	Y
4	IC 140-80177/22	0.5	0.705165	0.5	111978.0	1.410331	Y
5	IC 140-80177/21	1.0	1.403807	0.5	109265.0	1.403807	Y
6	IC 140-80177/20	2.5	3.486466	0.5	113791.0	1.394587	Y
7	IC 140-80177/19	5.0	7.529743	0.5	106899.0	1.505949	Y



Calibration / 13C6-Indeno(1,2,3-cd)pyrene (PRC)

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

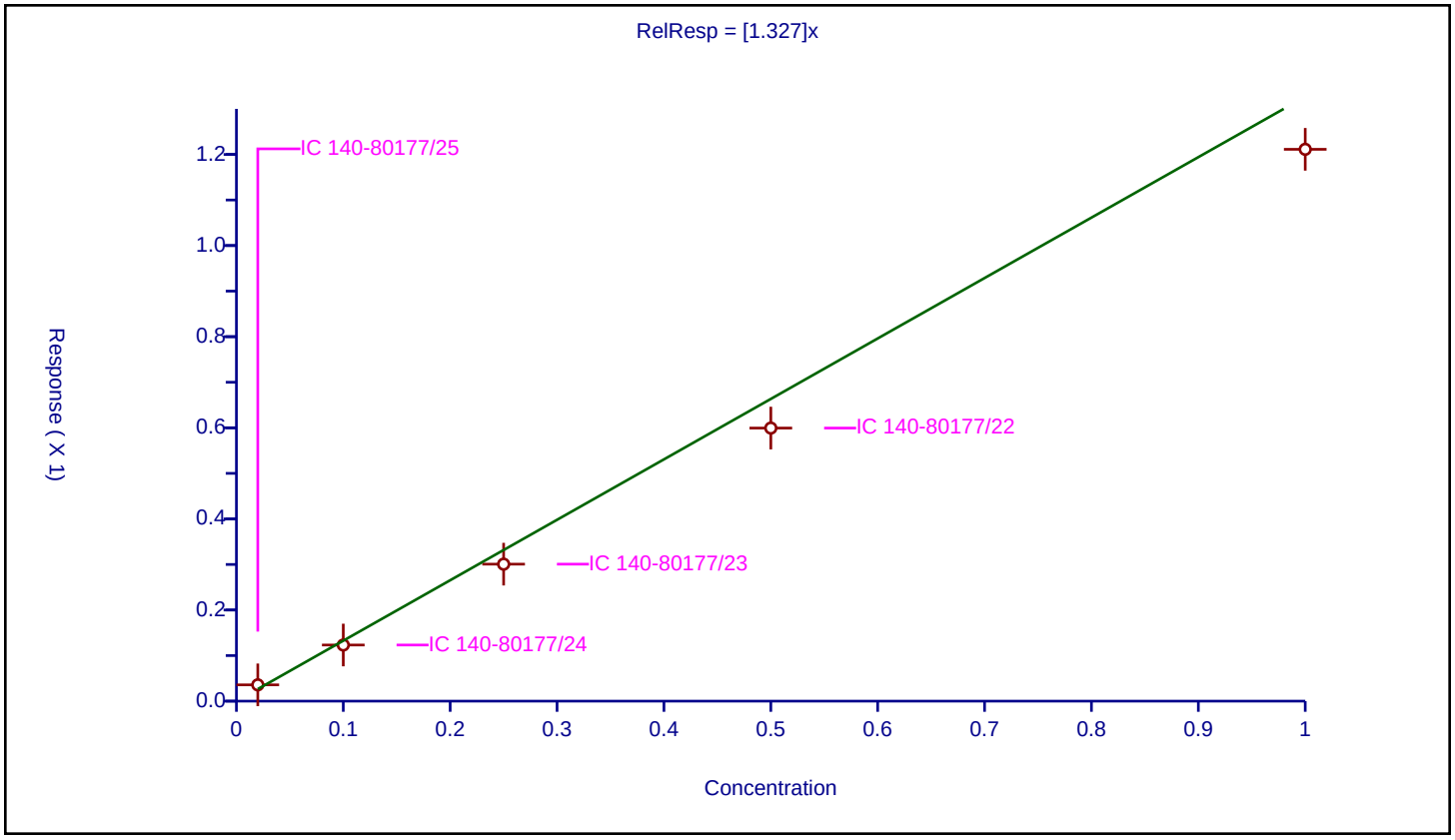
Curve Coefficients

Intercept:	0
Slope:	1.327

Error Coefficients

Standard Error:	153000
Relative Standard Error:	19.5
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.940

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/25	0.02	0.035777	0.5	95103.0	1.78885	Y
2	IC 140-80177/24	0.1	0.123194	0.5	101028.0	1.231936	Y
3	IC 140-80177/23	0.25	0.300691	0.5	108861.0	1.202763	Y
4	IC 140-80177/22	0.5	0.59941	0.5	110281.0	1.198819	Y
5	IC 140-80177/21	1.0	1.211242	0.5	109798.0	1.211242	Y



Calibration / Indeno[1,2,3-cd]pyrene

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

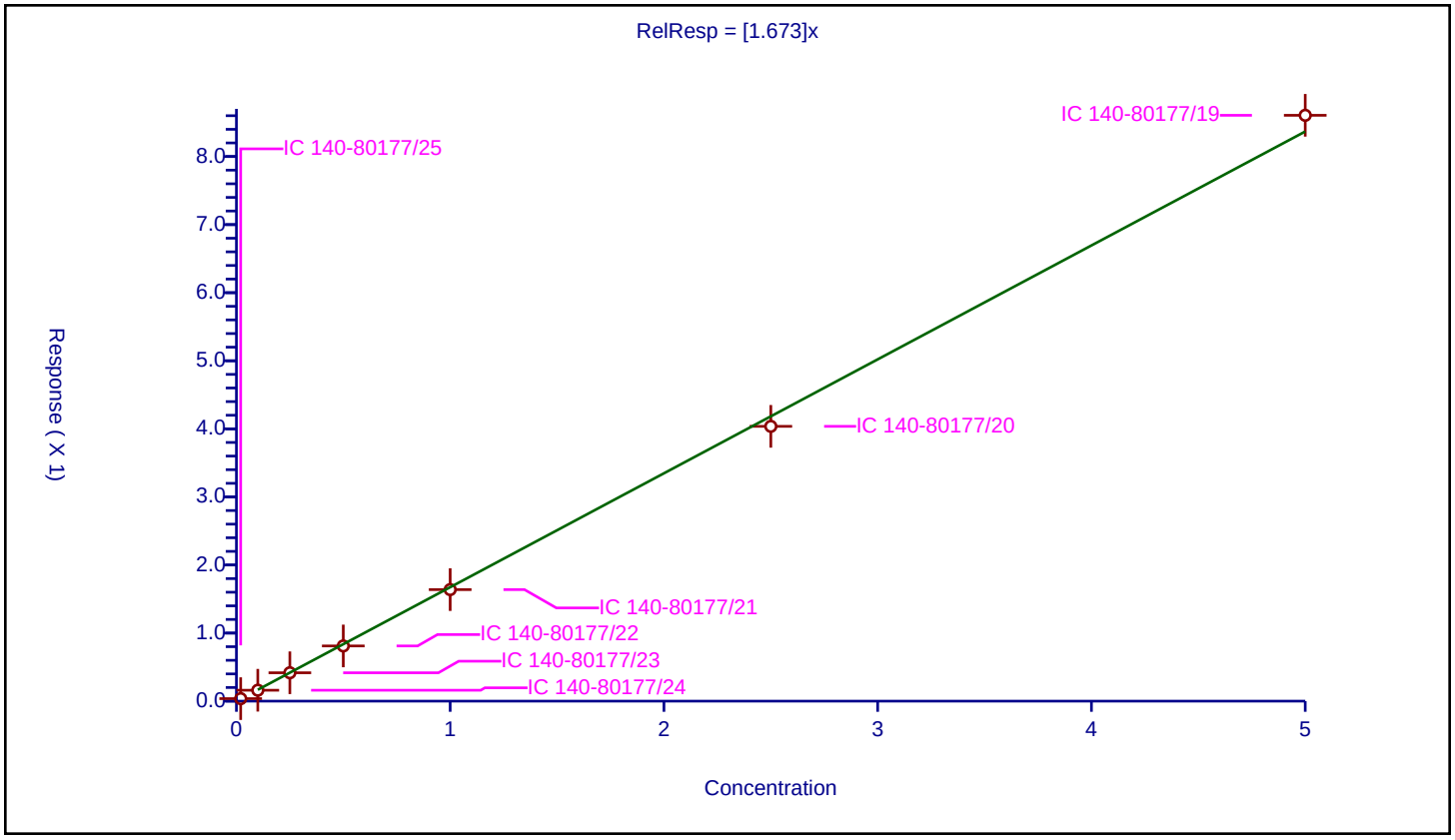
Curve Coefficients

Intercept:	0
Slope:	1.673

Error Coefficients

Standard Error:	897000
Relative Standard Error:	5.2
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.997

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/25	0.02	0.036981	0.5	95103.0	1.849048	Y
2	IC 140-80177/24	0.1	0.160258	0.5	101028.0	1.602576	Y
3	IC 140-80177/23	0.25	0.416715	0.5	108861.0	1.66686	Y
4	IC 140-80177/22	0.5	0.810865	0.5	110281.0	1.62173	Y
5	IC 140-80177/21	1.0	1.638281	0.5	109798.0	1.638281	Y
6	IC 140-80177/20	2.5	4.03669	0.5	116748.0	1.614676	Y
7	IC 140-80177/19	5.0	8.605712	0.5	112802.0	1.721142	Y



Calibration / Dibenz(a,h)anthracene

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

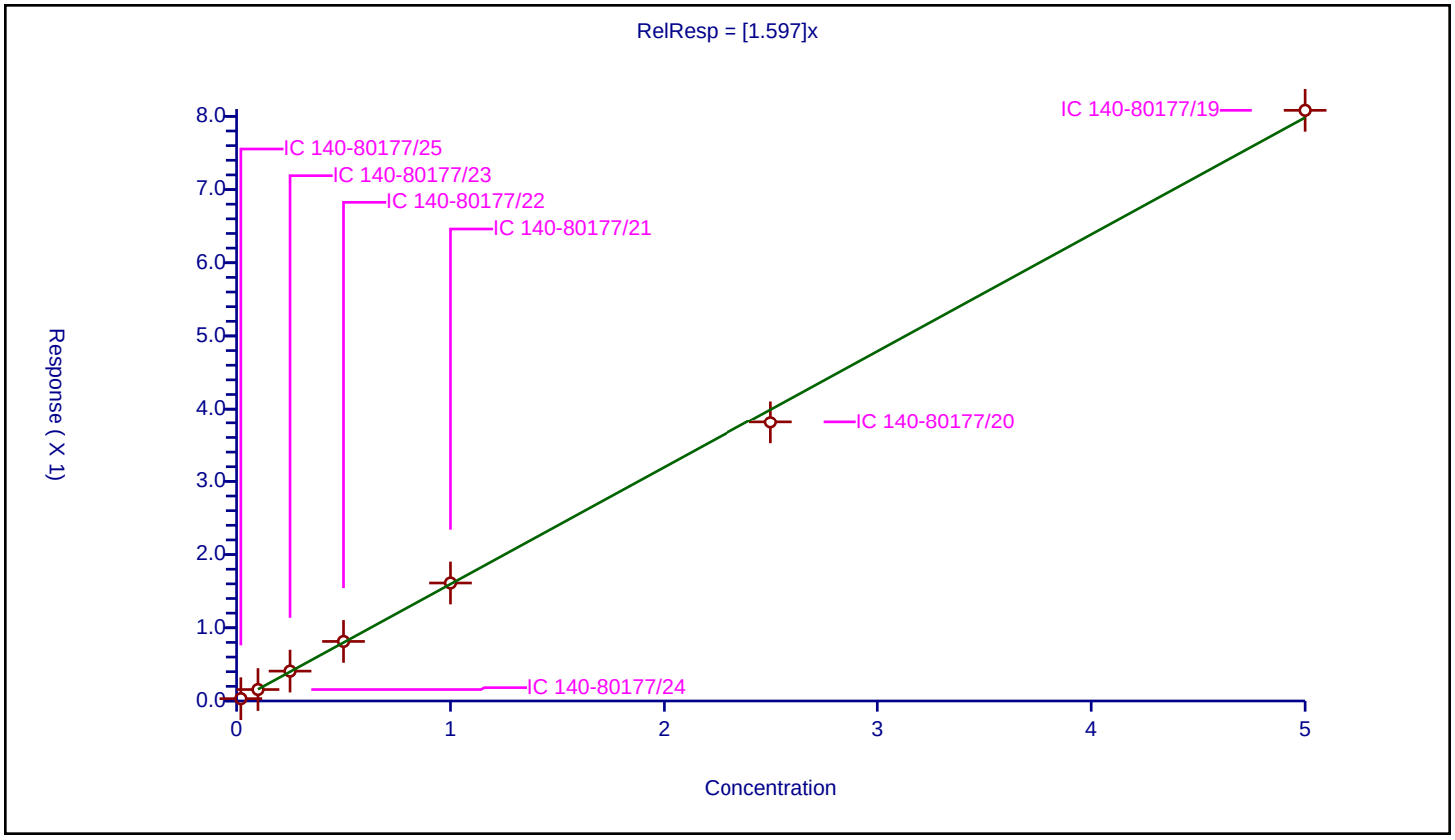
Curve Coefficients

Intercept:	0
Slope:	1.597

Error Coefficients

Standard Error:	768000
Relative Standard Error:	2.4
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.999

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/25	0.02	0.031964	0.5	84815.0	1.598184	Y
2	IC 140-80177/24	0.1	0.156601	0.5	90191.0	1.56601	Y
3	IC 140-80177/23	0.25	0.408044	0.5	96976.0	1.632177	Y
4	IC 140-80177/22	0.5	0.813548	0.5	97532.0	1.627097	Y
5	IC 140-80177/21	1.0	1.611765	0.5	98166.0	1.611765	Y
6	IC 140-80177/20	2.5	3.813024	0.5	104527.0	1.52521	Y
7	IC 140-80177/19	5.0	8.082048	0.5	103019.0	1.61641	Y



Calibration / Benzo[g,h,i]perylene

Curve Type:	Average
Weighting:	Conc_Sq
Origin:	Force
Dependency:	Response
Calib Mode:	IsoDil
Response Base:	AREA
RF Rounding:	0

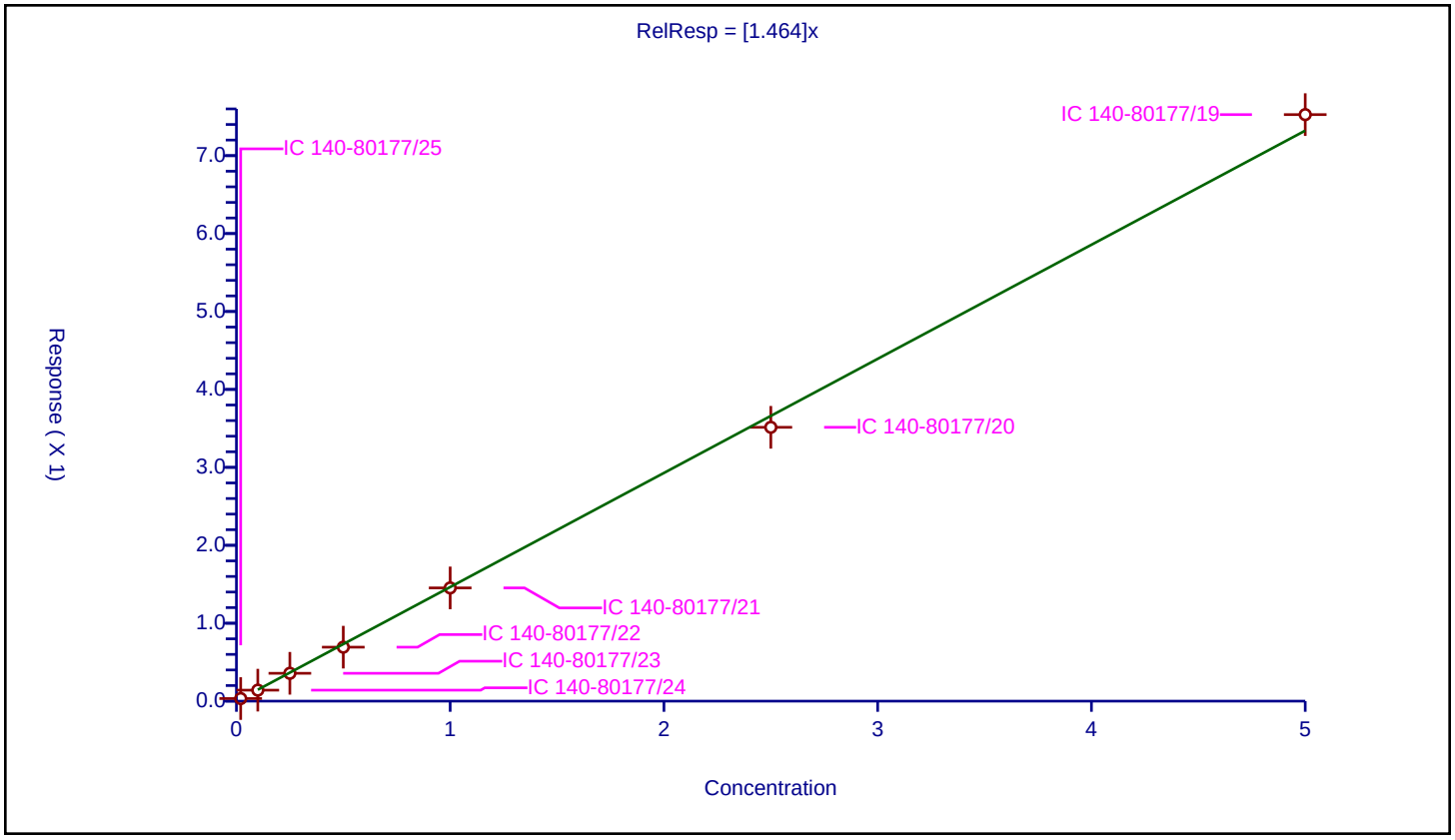
Curve Coefficients

Intercept:	0
Slope:	1.464

Error Coefficients

Standard Error:	757000
Relative Standard Error:	6.5
Correlation Coefficient:	1.000
Coefficient of Determination (Adjusted):	0.995

ID	Level	Concentration	Rel. Resp.	IS Amount	IS Response	RRF	Used
1	IC 140-80177/25	0.02	0.033224	0.5	97790.0	1.661213	Y
2	IC 140-80177/24	0.1	0.140945	0.5	103235.0	1.409454	Y
3	IC 140-80177/23	0.25	0.357304	0.5	109008.0	1.429216	Y
4	IC 140-80177/22	0.5	0.692662	0.5	111018.0	1.385325	Y
5	IC 140-80177/21	1.0	1.452951	0.5	106974.0	1.452951	Y
6	IC 140-80177/20	2.5	3.514018	0.5	111713.0	1.405607	Y
7	IC 140-80177/19	5.0	7.526491	0.5	109074.0	1.505298	Y



FORM VII
GC/MS SEMI VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Lab Sample ID: ICV 140-80177/26 Calibration Date: 11/13/2023 20:12

Instrument ID: GCMS1 Calib Start Date: 11/13/2023 17:27

GC Column: Rxi-5SilMS 25 ID: 0.25(mm) Calib End Date: 11/13/2023 19:48

Lab File ID: ICV SIMPAH.D Conc. Units: ng/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Naphthalene	AveID	1.176	1.072		456000	500000	-8.8	30.0
2-Methylnaphthalene	AveID	1.244	1.193		479000	500000	-4.1	30.0
1-Methylnaphthalene	AveID	1.214	1.141		470000	500000	-6.0	30.0
1,1'-Biphenyl	AveID	1.604	1.582		493000	500000	-1.4	30.0
2,6-Dimethylnaphthalene	AveID	1.199	1.213		506000	500000	1.2	30.0
Acenaphthylene	AveID	1.176	1.185		504000	500000	0.8	30.0
Acenaphthene	AveID	0.7529	0.7272		483000	500000	-3.4	30.0
2,3,5-Trimethylnaphthalene	AveID	1.284	1.314		512000	500000	2.3	30.0
Fluorene	AveID	1.299	1.279		492000	500000	-1.5	30.0
Hexachlorobenzene	AveID	0.3760	0.3723		495000	500000	-1.0	30.0
Pentachlorophenol	QuaIF		0.2736		16700000	15000000	11.5	30.0
Dibenzothiophene	AveID	1.046	1.099		525000	500000	5.0	30.0
Phenanthrene	AveID	1.206	1.173		486000	500000	-2.8	30.0
Anthracene	AveID	1.231	1.202		488000	500000	-2.3	30.0
1-Methylphenanthrene	AveID	0.5546	0.5817		524000	500000	4.9	30.0
Fluoranthene	AveID	1.279	1.273		498000	500000	-0.5	30.0
Pyrene	AveID	1.306	1.293		495000	500000	-1.0	30.0
Benzo[a]anthracene	AveID	1.299	1.265		487000	500000	-2.6	30.0
Chrysene	AveID	1.455	1.471		505000	500000	1.1	30.0
Benzo[b]fluoranthene	AveID	1.685	1.519		451000	500000	-9.8	30.0
Benzo[k]fluoranthene	AveID	1.465	1.520		519000	500000	3.8	30.0
Benzo[e]pyrene	AveID	1.685	1.733		514000	500000	2.9	30.0
Benzo[a]pyrene	AveID	1.654	1.627		492000	500000	-1.6	30.0
Perylene	AveID	1.429	1.395		488000	500000	-2.4	30.0
Indeno[1,2,3-cd]pyrene	AveID	1.673	1.683		503000	500000	0.6	30.0
Dibenz(a,h)anthracene	AveID	1.597	1.608		504000	500000	0.7	30.0
Benzo[g,h,i]perylene	AveID	1.464	1.417		484000	500000	-3.3	30.0
Naphthalene-d8	Ave	1.394	1.439		516000	500000	3.2	30.0
2-Methylnaphthalene-d10	Ave	0.9064	0.9312		514000	500000	2.7	30.0
1-Methylnaphthalene-d10	Ave	0.9082	0.9441		520000	500000	4.0	30.0
2,6-Dimethylnaphthalene-d12	Ave	1.009	1.016		504000	500000	0.7	30.0
Acenaphthylene-d8	Ave	1.538	1.549		503000	500000	0.7	30.0
Fluorene -d10	Ave	1.191	1.190		499000	500000	-0.2	30.0
Dibenzothiophene-d8	Ave	0.8772	0.8783		501000	500000	0.1	30.0
Phenanthrene-d10	Ave	0.7798	0.7987		512000	500000	2.4	30.0
Anthracene-d10	Ave	0.7612	0.7701		506000	500000	1.2	30.0
Fluoranthene-d10	Ave	1.011	1.022		505000	500000	1.0	30.0
Chrysene-d12	Ave	0.9756	0.9891		507000	500000	1.4	30.0
Benzo(b)fluoranthene-d12	Ave	1.266	1.294		511000	500000	2.2	30.0
Benzo(k)fluoranthene-d12	Ave	1.488	1.474		495000	500000	-0.9	30.0

FORM VII
GC/MS SEMI VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Lab Sample ID: ICV 140-80177/26 Calibration Date: 11/13/2023 20:12

Instrument ID: GCMS1 Calib Start Date: 11/13/2023 17:27

GC Column: Rxi-5SilMS 25 ID: 0.25(mm) Calib End Date: 11/13/2023 19:48

Lab File ID: ICV SIMPAH.D Conc. Units: ng/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Benzo(a)pyrene-d12	Ave	1.111	1.132		510000	500000	1.9	30.0
Perylene-d12	Ave	1.232	1.238		502000	500000	0.4	30.0
Indeno[1,2,3-cd]pyrene-d12	Ave	1.206	1.191		494000	500000	-1.2	30.0
Dibenz(a,h)anthracene-d14	Ave	1.079	1.046		484000	500000	-3.1	30.0
Benzo(ghi)perylene-d12	Ave	1.198	1.178		491000	500000	-1.7	30.0

Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\ICV SIMPAH.D
Lims ID: icv simpah
Client ID:
Sample Type: ICV
Inject. Date: 13-Nov-2023 20:12:01 ALS Bottle#: 0 Worklist Smp#: 26
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030467-026
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1
Sublist:

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 15-Nov-2023 14:49:04 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1623

First Level Reviewer: SK9U Date: 15-Nov-2023 14:49:04

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
D 3 1,4-Dichlorobenzene-d4	115	4.093	4.110	-0.017	72	19772	NC	NC	
D 5 1,2-Dichlorobenzene-d4	115	4.204	4.221	-0.017	77	19365	NC	NC	
D 10 Naphthalene-d8	136	5.059	5.068	-0.009	100	71821	0.5000	0.5162	
12 Naphthalene	128	5.078	5.078	0.000	39	76996	0.5000	0.4558	
D 15 2-methylnaphthalene-d10	152	5.606	5.612	-0.006	91	46471	0.5000	0.5137	
16 2-Methylnaphthalene	142	5.635	5.635	0.000	99	55417	0.5000	0.4794	
D 17 1-Methylnaphthalene-d10	152	5.686	5.692	-0.006	100	47112	0.5000	0.5198	
18 1-Methylnaphthalene	142	5.715	5.720	-0.005	97	53748	0.5000	0.4700	
19 1,1'-Biphenyl	154	6.014	6.013	0.001	100	80247	0.5000	0.4932	
D 20 2,6-Dimethylnaphthalene-d12	168	6.109	6.109	0.000	100	50721	0.5000	0.5036	
21 2,6-Dimethylnaphthalene	156	6.146	6.145	0.001	98	61529	0.5000	0.5060	
D 23 Acenaphthylene-d8	160	6.367	6.367	0.001	96	77309	0.5000	0.5035	
24 Acenaphthylene	152	6.377	6.377	0.000	99	91645	0.5000	0.5042	
* 26 Acenaphthene-d10	164	6.492	6.492	0.000	97	49903	0.5000	0.5000	
27 Acenaphthene	154	6.517	6.517	0.000	96	56217	0.5000	0.4829	
28 2,3,5-Trimethylnaphthalene	170	6.834	6.834	0.000	95	66657	0.5000	0.5117	
D 29 Fluorene -d10	176	6.925	6.925	0.000	99	59365	0.5000	0.4992	
30 Fluorene	166	6.945	6.945	0.000	97	75921	0.5000	0.4923	
31 Hexachlorobenzene	284	7.417	7.417	0.000	0	38524	0.5000	0.4951	
32 Pentachlorophenol	266	7.576	7.576	0.000	0	849210	15.0	16.7	
D 33 Dibenzothiophene-d8	192	7.631	7.628	0.003	100	113795	0.5000	0.5007	
34 Dibenzothiophene	184	7.645	7.645	0.000	92	125027	0.5000	0.5251	
D 35 Phenanthrene-d10	188	7.732	7.728	0.004	99	103476	0.5000	0.5121	
36 Phenanthrene	178	7.752	7.749	0.003	36	121334	0.5000	0.4860	
D 38 Anthracin-d10	188	7.780	7.776	0.004	99	99768	0.5000	0.5058	
39 Anthracene	178	7.794	7.794	0.000	100	119961	0.5000	0.4883	
40 1-Methylphenanthrene	191	8.293	8.289	0.004	100	60192	0.5000	0.5244	
D 41 Fluoranthene-d10	212	8.808	8.808	0.000	99	132379	0.5000	0.5051	
43 Fluoranthene	202	8.828	8.825	0.003	56	168580	0.5000	0.4977	
* 44 Pyrene-d10 (IS)	212	9.030	9.027	0.003	99	129556	0.5000	0.5000	
45 Pyrene	202	9.047	9.044	0.003	97	171188	0.5000	0.4952	

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
47 Benzo[a]anthracene	228	10.260	10.260	0.000	100	162095	0.5000	0.4870	
D 48 Chrysene-d12	240	10.270	10.270	0.000	94	128150	0.5000	0.5070	
50 Chrysene	228	10.295	10.295	0.000	24	188538	0.5000	0.5054	
D 52 Benzo(b)fluoranthene-d12	264	11.376	11.369	0.007	100	108816	0.5000	0.5108	
53 Benzo[b]fluoranthene	252	11.397	11.397	0.000	100	165323	0.5000	0.4509	
D 54 Benzo(k)fluoranthene-d12	264	11.404	11.404	0.000	90	123940	0.5000	0.4953	
55 Benzo[k]fluoranthene	252	11.425	11.425	0.000	100	188425	0.5000	0.5190	
* 56 Benzo(e)pyrene-d12	264	11.684	11.684	0.000	99	84104	0.5000	0.5000	
57 Benzo[e]pyrene	252	11.712	11.712	0.000	100	164993	0.5000	0.5143	
D 58 Benzo(a)pyrene-d12	264	11.747	11.747	0.000	100	95201	0.5000	0.5096	
59 Benzo[a]pyrene	252	11.775	11.775	0.000	100	154887	0.5000	0.4920	
D 60 Perylene-d12	264	11.845	11.845	0.000	100	104083	0.5000	0.5021	
61 Perylene	252	11.873	11.873	0.000	100	145186	0.5000	0.4881	
D 62 Indeno[1,2,3-cd]pyrene-d12	288	13.186	13.186	0.000	77	100207	0.5000	0.4938	
D 63 Dibenz(a,h)anthracene-d14	292	13.205	13.196	0.009	79	87939	0.5000	0.4843	
65 Indeno[1,2,3-cd]pyrene	276	13.224	13.214	0.010	59	168626	0.5000	0.5028	
66 Dibenz(a,h)anthracene	278	13.243	13.242	0.001	68	141410	0.5000	0.5036	
D 67 Benzo(ghi)perylene-d12	288	13.552	13.543	0.009	100	99034	0.5000	0.4914	
68 Benzo[g,h,i]perylene	276	13.580	13.580	0.000	87	140287	0.5000	0.4837	
D 71 Coronene-d12	312	15.401	15.382	0.019	65	69676	NC	NC	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

60ICVSIMPAH_00024 Amount Added: 1.00 Units: mL

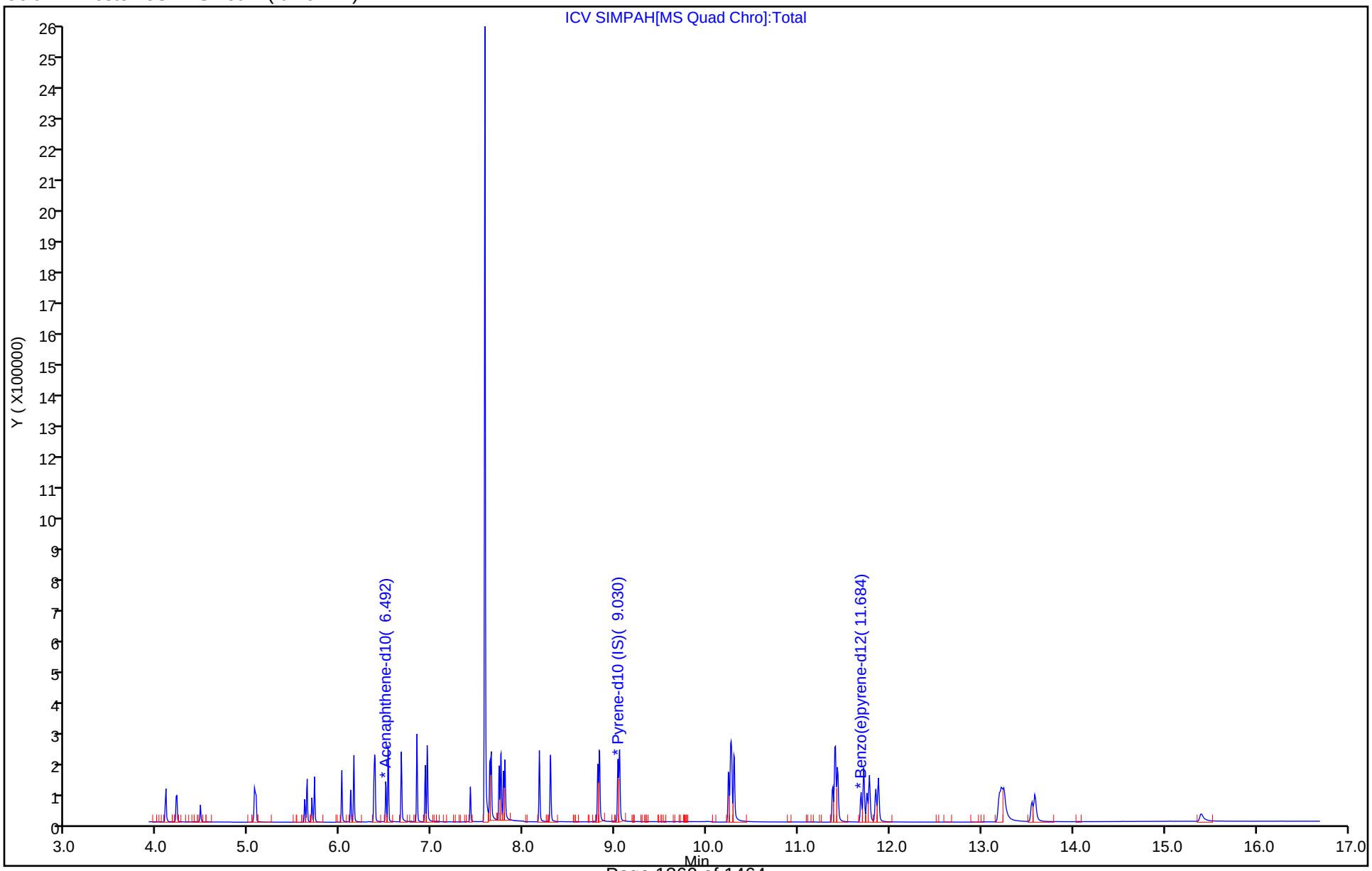
Report Date: 15-Nov-2023 14:49:05 Chrom Revision: 2.3 13-Nov-2023 16:16:38

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\ICV SIMPAH.D

Injection Date:	13-Nov-2023 20:12:01	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	icv simpah			Worklist Smp#:	26
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



FORM VII
GC/MS SEMI VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Lab Sample ID: CCV 140-80349/2 Calibration Date: 11/16/2023 11:08

Instrument ID: GCMS1 Calib Start Date: 11/13/2023 17:27

GC Column: Rxi-5SilMS 25 ID: 0.25(mm) Calib End Date: 11/13/2023 19:48

Lab File ID: CCV pah.D Conc. Units: ng/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Naphthalene	AveID	1.176	1.121		477000	500000	-4.7	30.0
2-Methylnaphthalene	AveID	1.244	1.198		482000	500000	-3.7	30.0
1-Methylnaphthalene	AveID	1.214	1.177		485000	500000	-3.0	30.0
1,1'-Biphenyl	AveID	1.604	1.585		494000	500000	-1.2	30.0
2,6-Dimethylnaphthalene	AveID	1.199	1.164		486000	500000	-2.8	30.0
Acenaphthylene	AveID	1.176	1.140		485000	500000	-3.0	30.0
Acenaphthene	AveID	0.7529	0.7132		474000	500000	-5.3	30.0
2,3,5-Trimethylnaphthalene	AveID	1.284	1.265		492000	500000	-1.5	30.0
Fluorene	AveID	1.299	1.305		502000	500000	0.5	30.0
Hexachlorobenzene	AveID	0.3760	0.4185		556000	500000	11.3	30.0
Pentachlorophenol	QuaIF		0.2807		17000000	15000000	13.5	30.0
Dibenzothiophene	AveID	1.046	1.021		488000	500000	-2.4	30.0
13C6-Phenanthrene (PRC)	AveID	1.253	1.226		489000	500000	-2.1	30.0
Phenanthrene	AveID	1.206	1.199		497000	500000	-0.6	30.0
Anthracene	AveID	1.231	1.255		510000	500000	1.9	30.0
1-Methylphenanthrene	AveID	0.5546	0.5529		498000	500000	-0.3	30.0
13C6-Fluoranthene (PRC)	AveID	1.436	1.326		462000	500000	-7.7	30.0
Fluoranthene	AveID	1.279	1.284		502000	500000	0.4	30.0
Pyrene	AveID	1.306	1.262		483000	500000	-3.3	30.0
Benzo[a]anthracene	AveID	1.299	1.340		516000	500000	3.2	30.0
13C6-Chrysene (PRC)	AveID	0.8560	0.8888		519000	500000	3.8	30.0
Chrysene	AveID	1.455	1.459		501000	500000	0.2	30.0
Benzo[b]fluoranthene	AveID	1.685	1.573		467000	500000	-6.6	30.0
Benzo[k]fluoranthene	AveID	1.465	1.504		513000	500000	2.7	30.0
Benzo[e]pyrene	AveID	1.685	1.633		484000	500000	-3.1	30.0
Benzo[a]pyrene	AveID	1.654	1.645		498000	500000	-0.5	30.0
Perylene	AveID	1.429	1.413		495000	500000	-1.1	30.0
13C6-Indeno(1,2,3-cd)pyrene (PRC)	AveID	1.327	1.265		477000	500000	-4.7	30.0
Indeno[1,2,3-cd]pyrene	AveID	1.673	1.640		490000	500000	-2.0	30.0
Dibenz(a,h)anthracene	AveID	1.597	1.608		504000	500000	0.7	30.0
Benzo[g,h,i]perylene	AveID	1.464	1.412		482000	500000	-3.6	30.0
Naphthalene-d8	Ave	1.394	1.310		470000	500000	-6.0	30.0
2-Methylnaphthalene-d10	Ave	0.9064	0.8780		484000	500000	-3.1	30.0
1-Methylnaphthalene-d10	Ave	0.9082	0.8616		474000	500000	-5.1	30.0
2,6-Dimethylnaphthalene-d12	Ave	1.009	0.9944		493000	500000	-1.5	30.0
Acenaphthylene-d8	Ave	1.538	1.530		497000	500000	-0.6	30.0
Fluorene -d10	Ave	1.191	1.164		489000	500000	-2.3	30.0
Dibenzothiophene-d8	Ave	0.8772	0.8408		479000	500000	-4.1	30.0
Phenanthrene-d10	Ave	0.7798	0.7517		482000	500000	-3.6	30.0
Anthracene-d10	Ave	0.7612	0.6932		455000	500000	-8.9	30.0

FORM VII
GC/MS SEMI VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Lab Sample ID: CCV 140-80349/2 Calibration Date: 11/16/2023 11:08

Instrument ID: GCMS1 Calib Start Date: 11/13/2023 17:27

GC Column: Rxi-5SilMS 25 ID: 0.25(mm) Calib End Date: 11/13/2023 19:48

Lab File ID: CCV pah.D Conc. Units: ng/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Fluoranthene-d10	Ave	1.011	0.999		494000	500000	-1.2	30.0
Chrysene-d12	Ave	0.9756	0.9316		477000	500000	-4.5	30.0
Benzo(b)fluoranthene-d12	Ave	1.266	1.303		514000	500000	2.9	30.0
Benzo(k)fluoranthene-d12	Ave	1.488	1.363		458000	500000	-8.4	30.0
Benzo(a)pyrene-d12	Ave	1.111	1.099		495000	500000	-1.1	30.0
Perylene-d12	Ave	1.232	1.178		478000	500000	-4.4	30.0
Indeno[1,2,3-cd]pyrene-d12	Ave	1.206	1.234		511000	500000	2.3	30.0
Dibenz(a,h)anthracene-d14	Ave	1.079	1.109		514000	500000	2.7	30.0
Benzo(ghi)perylene-d12	Ave	1.198	1.190		497000	500000	-0.7	30.0

Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\CCV pah.D
Lims ID: ccv
Client ID:
Sample Type: CCV
Inject. Date: 16-Nov-2023 11:08:22 ALS Bottle#: 0 Worklist Smp#: 2
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030519-002
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1
Sublist: chrom-SIM_PAH_GCMS1*sub4

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 17-Nov-2023 12:14:45 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1635

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
D 3 1,4-Dichlorobenzene-d4	115	4.118	4.118	0.000	86	19742	NC	NC	
4 1,4-Dichlorobenzene	146	4.135	4.135	0.000	87	38169	NC	NC	
D 5 1,2-Dichlorobenzene-d4	115	4.238	4.238	0.000	73	19947	NC	NC	
6 1,2-Dichlorobenzene	146	4.247	4.247	0.000	77	35641	NC	NC	
9 1,2,4-Trichlorobenzene	180	5.023	5.023	0.000	98	45401	NC	NC	
D 10 Naphthalene-d8	136	5.068	5.068	0.000	100	80705	0.5000	0.4698	
$ 11 13C6-Naphthalene	134	5.078	5.078	0.000	83	93119	NC	NC	
12 Naphthalene	128	5.078	5.078	0.000	83	90459	0.5000	0.4766	
D 15 2-methylnaphthalene-d10	152	5.612	5.612	0.000	92	54096	0.5000	0.4843	
16 2-Methylnaphthalene	142	5.635	5.635	0.000	99	64819	0.5000	0.4817	
D 17 1-Methylnaphthalene-d10	152	5.686	5.686	0.000	99	53089	0.5000	0.4744	
18 1-Methylnaphthalene	142	5.715	5.715	0.000	94	62478	0.5000	0.4848	
19 1,1'-Biphenyl	154	6.014	6.014	0.000	100	97108	0.5000	0.4941	
D 20 2,6-Dimethylnaphthalene-d12	168	6.109	6.109	0.000	100	61269	0.5000	0.4927	
21 2,6-Dimethylnaphthalene	156	6.146	6.146	0.000	99	71347	0.5000	0.4858	
D 23 Acenaphthylene-d8	160	6.362	6.362	0.000	90	94242	0.5000	0.4971	
24 Acenaphthylene	152	6.372	6.372	0.000	97	107439	0.5000	0.4849	
* 26 Acenaphthene-d10	164	6.492	6.492	0.000	97	61615	0.5000	0.5000	
27 Acenaphthene	154	6.517	6.517	0.000	97	67213	0.5000	0.4736	
28 2,3,5-Trimethylnaphthalene	170	6.834	6.834	0.000	89	77490	0.5000	0.4925	
D 29 Fluorene -d10	176	6.920	6.920	0.000	98	71730	0.5000	0.4886	
30 Fluorene	166	6.945	6.945	0.000	98	93603	0.5000	0.5023	
31 Hexachlorobenzene	284	7.417	7.417	0.000	0	54632	0.5000	0.5565	
32 Pentachlorophenol	266	7.576	7.576	0.000	0	1099260	15.0	17.0	
D 33 Dibenzothiophene-d8	192	7.628	7.628	0.000	100	146015	0.5000	0.4793	
34 Dibenzothiophene	184	7.645	7.645	0.000	91	149026	0.5000	0.4878	
D 35 Phenanthrene-d10	188	7.732	7.732	0.000	100	130545	0.5000	0.4820	
36 Phenanthrene	178	7.749	7.749	0.000	96	156569	0.5000	0.4971	
37 13C6-Phenanthrene (PRC)	184	7.749	7.749	0.000	97	160047	0.5000	0.4893	
D 38 Anthracin-d10	188	7.777	7.777	0.000	100	120392	0.5000	0.4554	
39 Anthracene	178	7.794	7.794	0.000	100	151062	0.5000	0.5096	
40 1-Methylphenanthrene	191	8.289	8.289	0.000	100	72175	0.5000	0.4985	

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
D 41 Fluoranthene-d10	212	8.805	8.805	0.000	99	173547	0.5000	0.4940	
42 13C6-Fluoranthene (PRC)	208	8.825	8.825	0.000	96	230171	0.5000	0.4617	
43 Fluoranthene	202	8.825	8.825	0.000	98	222840	0.5000	0.5018	
* 44 Pyrene-d10 (IS)	212	9.024	9.024	0.000	98	173664	0.5000	0.5000	
45 Pyrene	202	9.044	9.044	0.000	100	219032	0.5000	0.4833	
$ 46 Terphenyl-d14	244	9.185	9.185	0.000	100	72009	NC	NC	
47 Benzo[a]anthracene	228	10.260	10.260	0.000	100	216769	0.5000	0.5159	
D 48 Chrysene-d12	240	10.270	10.270	0.000	98	161794	0.5000	0.4775	
49 13C6-Chrysene (PRC)	234	10.295	10.295	0.000	74	143799	0.5000	0.5192	
50 Chrysene	228	10.295	10.295	0.000	74	236071	0.5000	0.5012	
D 52 Benzo(b)fluoranthene-d12	264	11.369	11.369	0.000	99	145962	0.5000	0.5143	
53 Benzo[b]fluoranthene	252	11.397	11.397	0.000	99	229627	0.5000	0.4669	
D 54 Benzo(k)fluoranthene-d12	264	11.404	11.404	0.000	96	152752	0.5000	0.4582	
55 Benzo[k]fluoranthene	252	11.425	11.425	0.000	100	229754	0.5000	0.5134	
* 56 Benzo(e)pyrene-d12	264	11.684	11.684	0.000	99	112044	0.5000	0.5000	
57 Benzo[e]pyrene	252	11.712	11.712	0.000	100	200960	0.5000	0.4844	
D 58 Benzo(a)pyrene-d12	264	11.747	11.747	0.000	100	123097	0.5000	0.4946	
59 Benzo[a]pyrene	252	11.775	11.775	0.000	100	202542	0.5000	0.4975	
D 60 Perylene-d12	264	11.838	11.838	0.000	99	132043	0.5000	0.4781	
61 Perylene	252	11.873	11.873	0.000	100	186619	0.5000	0.4945	
D 62 Indeno[1,2,3-cd]pyrene-d12	288	13.186	13.186	0.000	94	138282	0.5000	0.5115	
D 63 Dibenz(a,h)anthracene-d14	292	13.196	13.196	0.000	75	124242	0.5000	0.5136	
64 13C6-Indeno(1,2,3-cd)pyrene (PRC	282	13.214	13.214	0.000	87	174909	0.5000	0.4767	
65 Indeno[1,2,3-cd]pyrene	276	13.214	13.214	0.000	86	226801	0.5000	0.4900	
66 Dibenz(a,h)anthracene	278	13.233	13.233	0.000	88	199801	0.5000	0.5036	
D 67 Benzo(ghi)perylene-d12	288	13.543	13.543	0.000	100	133373	0.5000	0.4967	
68 Benzo[g,h,i]perylene	276	13.580	13.580	0.000	86	188291	0.5000	0.4821	
69 Dibenzo(def,p)chrysene	302	14.922	14.922	0.000	81	113431	NC	NC	
70 Dibenzo[a,e]pyrene	302	15.373	15.373	0.000	78	140793	NC	NC	
D 71 Coronene-d12	312	15.382	15.382	0.000	85	107708	NC	NC	
72 Dibenz(a,i)pyrene	302	15.542	15.542	0.000	90	83142	NC	NC	
73 Dibenzo[a,h]pyrene	302	15.636	15.636	0.000	87	99229	NC	NC	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

60CVPAHTARGET_00023 Amount Added: 1.00 Units: mL

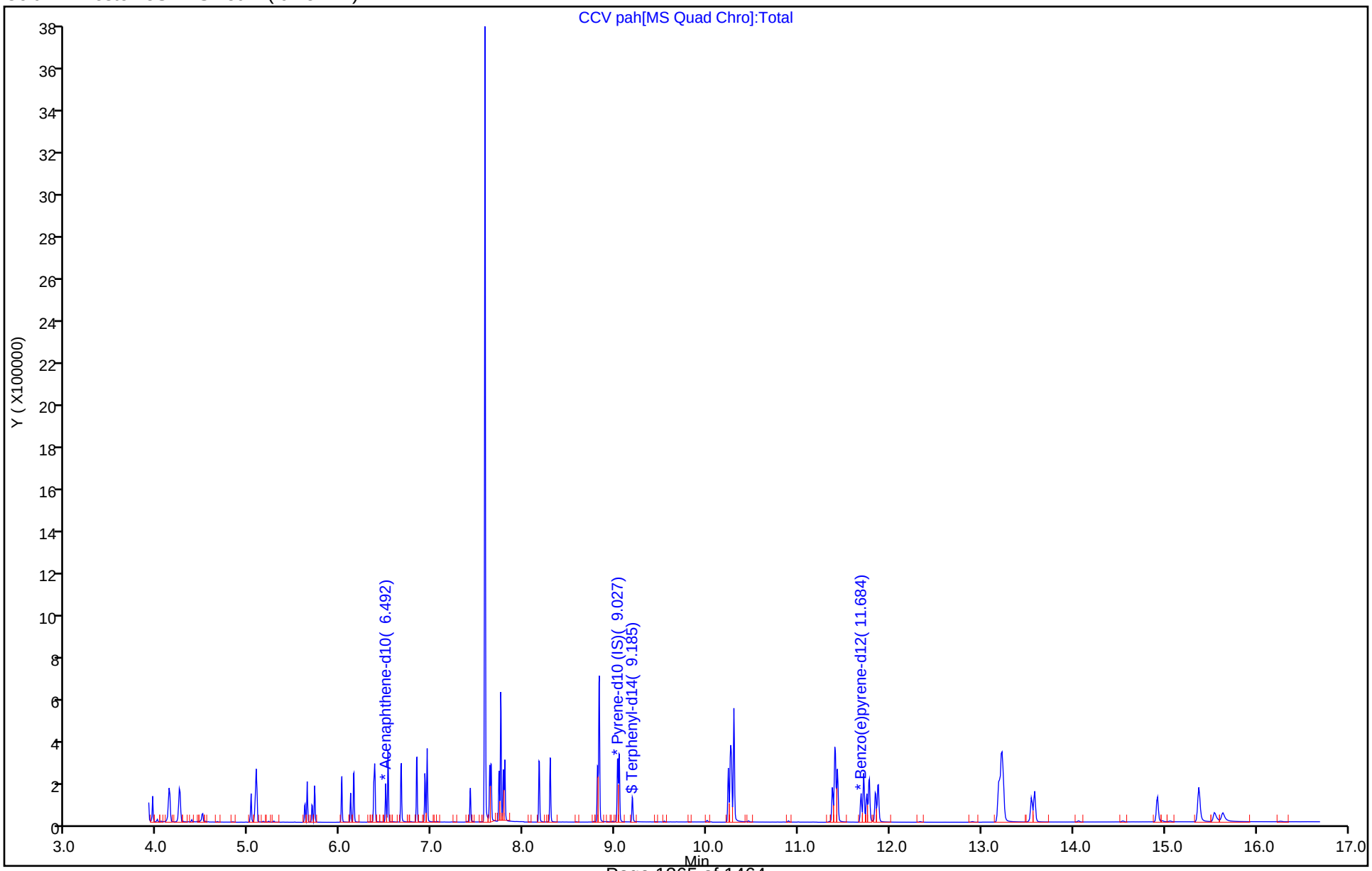
Report Date: 17-Nov-2023 12:14:46 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\CCV pah.D

Injection Date:	16-Nov-2023 11:08:22	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	ccv			Worklist Smp#:	2
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



FORM VII
GC/MS SEMI VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Lab Sample ID: CCV 140-80349/3 Calibration Date: 11/16/2023 11:31

Instrument ID: GCMS1 Calib Start Date: 11/13/2023 13:12

GC Column: Rxi-5SilMS 25 ID: 0.25(mm) Calib End Date: 11/13/2023 15:31

Lab File ID: CCV PCB1.D Conc. Units: ng/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
PCB-14	Ave	3.667	3.600		550000	560000	-1.8	30.0
PCB-36	Ave	1.930	1.815		526000	560000	-6.0	30.0
PCB-104	Ave	1.498	1.411		528000	560000	-5.8	30.0
PCB-121	QuaF		1.398		593000	560000	5.9	30.0
PCB-155	Ave	1.125	1.092		543000	560000	-3.0	30.0
PCB-78	QuaF		1.155		588000	560000	5.0	30.0
PCB-142	Ave	0.8184	0.7846		537000	560000	-4.1	30.0
PCB-184	Ave	0.8194	0.7677		525000	560000	-6.3	30.0
PCB-204	Ave	0.5331	0.4929		518000	560000	-7.5	30.0
PCB-192	Ave	0.7513	0.6421		479000	560000	-14.5	30.0

Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\CCV PCB1.D
Lims ID: ccv pcb
Client ID:
Sample Type: CCV
Inject. Date: 16-Nov-2023 11:31:16 ALS Bottle#: 0 Worklist Smp#: 3
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030519-003
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1
Sublist: chrom-SIM_PAH_GCMS1*sub1

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 17-Nov-2023 12:14:50 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1635

First Level Reviewer: SK9U Date: 16-Nov-2023 13:24:56

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
74 PCB-14	222	7.479	7.479	0.000	99	61296	0.5600	0.5498	
75 PCB-36	258	8.210	8.206	0.000	99	30900	0.5600	0.5265	
76 PCB-104	326	8.395	8.393	-0.001	95	24030	0.5600	0.5275	
77 PCB-121	326	8.751	8.748	0.000	97	23808	0.5600	0.5928	
78 PCB-155	360	8.848	8.852	-0.001	94	18587	0.5600	0.5435	
79 PCB-78	290	9.091	9.077	0.007	95	19663	0.5600	0.5878	
80 PCB-142	360	9.522	9.519	0.000	92	13360	0.5600	0.5368	
81 PCB-184	394	9.575	9.572	0.003	96	13073	0.5600	0.5247	
* 82 PCB-167L	372	10.030	10.027	0.003	74	12163	0.4000	0.4000	
83 PCB-204	428	10.249	10.246	-0.001	89	8393	0.5600	0.5177	
84 PCB-192	394	10.280	10.275	0.005	97	10933	0.5600	0.4786	

QC Flag Legend
Processing Flags

Reagents:
60L4SIMPCB_00016 Amount Added: 1.00 Units: mL

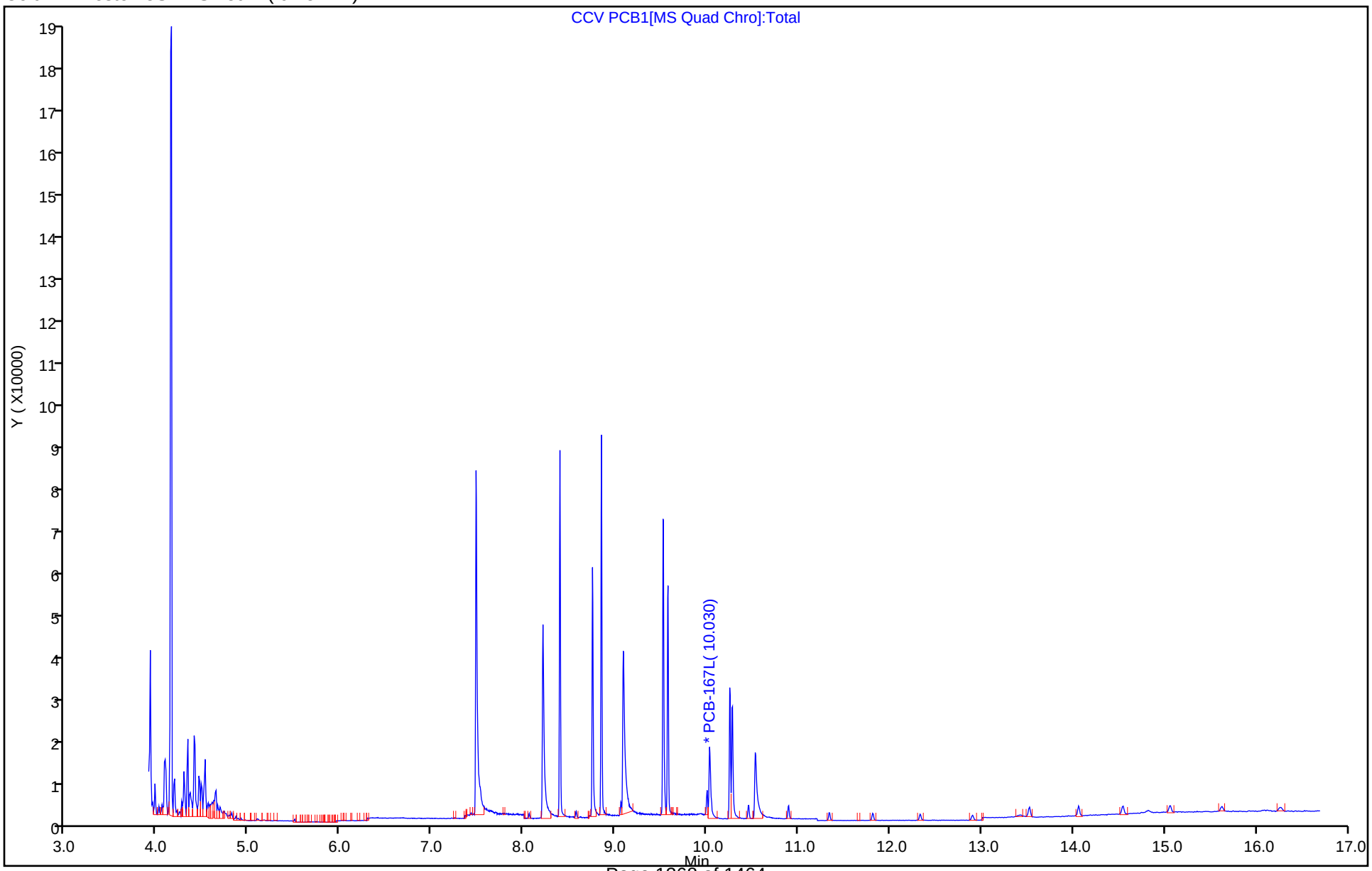
Report Date: 17-Nov-2023 12:14:50 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\CCV PCB1.D

Injection Date:	16-Nov-2023 11:31:16	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	ccv pcb			Worklist Smp#:	3
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



FORM VII
GC/MS SEMI VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Lab Sample ID: CCV 140-80412/2 Calibration Date: 11/17/2023 13:46

Instrument ID: GCMS1 Calib Start Date: 11/13/2023 17:27

GC Column: Rxi-5SilMS 25 ID: 0.25(mm) Calib End Date: 11/13/2023 19:48

Lab File ID: CCV.D Conc. Units: ng/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Naphthalene	AveID	1.176	1.138		484000	500000	-3.3	30.0
2-Methylnaphthalene	AveID	1.244	1.188		477000	500000	-4.5	30.0
1-Methylnaphthalene	AveID	1.214	1.165		480000	500000	-4.0	30.0
1,1'-Biphenyl	AveID	1.604	1.590		496000	500000	-0.9	30.0
2,6-Dimethylnaphthalene	AveID	1.199	1.177		491000	500000	-1.8	30.0
Acenaphthylene	AveID	1.176	1.117		475000	500000	-5.0	30.0
Acenaphthene	AveID	0.7529	0.7027		467000	500000	-6.7	30.0
2,3,5-Trimethylnaphthalene	AveID	1.284	1.266		493000	500000	-1.4	30.0
Fluorene	AveID	1.299	1.271		489000	500000	-2.2	30.0
Hexachlorobenzene	AveID	0.3760	0.4024		535000	500000	7.0	30.0
Pentachlorophenol	QuaIF		0.2392		15200000	15000000	1.2	30.0
Dibenzothiophene	AveID	1.046	1.002		479000	500000	-4.2	30.0
13C6-Phenanthrene (PRC)	AveID	1.253	1.201		479000	500000	-4.1	30.0
Phenanthrene	AveID	1.206	1.174		486000	500000	-2.7	30.0
Anthracene	AveID	1.231	1.219		495000	500000	-1.0	30.0
1-Methylphenanthrene	AveID	0.5546	0.5472		493000	500000	-1.3	30.0
13C6-Fluoranthene (PRC)	AveID	1.436	1.331		463000	500000	-7.3	30.0
Fluoranthene	AveID	1.279	1.263		494000	500000	-1.2	30.0
Pyrene	AveID	1.306	1.258		482000	500000	-3.6	30.0
Benzo[a]anthracene	AveID	1.299	1.398		538000	500000	7.7	30.0
13C6-Chrysene (PRC)	AveID	0.8560	0.9241		540000	500000	8.0	30.0
Chrysene	AveID	1.455	1.473		506000	500000	1.2	30.0
Benzo[b]fluoranthene	AveID	1.685	1.538		456000	500000	-8.7	30.0
Benzo[k]fluoranthene	AveID	1.465	1.530		522000	500000	4.4	30.0
Benzo[e]pyrene	AveID	1.685	1.584		470000	500000	-6.0	30.0
Benzo[a]pyrene	AveID	1.654	1.602		484000	500000	-3.1	30.0
Perylene	AveID	1.429	1.389		486000	500000	-2.8	30.0
13C6-Indeno(1,2,3-cd)pyrene (PRC)	AveID	1.327	1.260		475000	500000	-5.0	30.0
Indeno[1,2,3-cd]pyrene	AveID	1.673	1.644		491000	500000	-1.8	30.0
Dibenz(a,h)anthracene	AveID	1.597	1.629		510000	500000	2.0	30.0
Benzo[g,h,i]perylene	AveID	1.464	1.418		484000	500000	-3.2	30.0
Naphthalene-d8	Ave	1.394	1.280		459000	500000	-8.1	30.0
2-Methylnaphthalene-d10	Ave	0.9064	0.8764		483000	500000	-3.3	30.0
1-Methylnaphthalene-d10	Ave	0.9082	0.8707		479000	500000	-4.1	30.0
2,6-Dimethylnaphthalene-d12	Ave	1.009	0.9778		485000	500000	-3.1	30.0
Acenaphthylene-d8	Ave	1.538	1.541		501000	500000	0.2	30.0
Fluorene -d10	Ave	1.191	1.185		497000	500000	-0.6	30.0
Dibenzothiophene-d8	Ave	0.8772	0.8347		476000	500000	-4.8	30.0
Phenanthrene-d10	Ave	0.7798	0.7662		491000	500000	-1.7	30.0
Anthracene-d10	Ave	0.7612	0.7058		464000	500000	-7.3	30.0

FORM VII
GC/MS SEMI VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Lab Sample ID: CCV 140-80412/2 Calibration Date: 11/17/2023 13:46

Instrument ID: GCMS1 Calib Start Date: 11/13/2023 17:27

GC Column: Rxi-5SilMS 25 ID: 0.25(mm) Calib End Date: 11/13/2023 19:48

Lab File ID: CCV.D Conc. Units: ng/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Fluoranthene-d10	Ave	1.011	0.9901		489000	500000	-2.1	30.0
Chrysene-d12	Ave	0.9756	0.8667		444000	500000	-11.2	30.0
Benzo(b)fluoranthene-d12	Ave	1.266	1.274		503000	500000	0.6	30.0
Benzo(k)fluoranthene-d12	Ave	1.488	1.396		469000	500000	-6.1	30.0
Benzo(a)pyrene-d12	Ave	1.111	1.116		502000	500000	0.5	30.0
Perylene-d12	Ave	1.232	1.178		478000	500000	-4.4	30.0
Indeno[1,2,3-cd]pyrene-d12	Ave	1.206	1.225		508000	500000	1.5	30.0
Dibenz(a,h)anthracene-d14	Ave	1.079	1.092		506000	500000	1.2	30.0
Benzo(ghi)perylene-d12	Ave	1.198	1.196		499000	500000	-0.2	30.0

Report Date: 20-Nov-2023 10:27:52 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\CCV.D
Lims ID: ccv
Client ID:
Sample Type: CCV
Inject. Date: 17-Nov-2023 13:46:59 ALS Bottle#: 0 Worklist Smp#: 2
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030536-002
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1
Sublist: chrom-SIM_PAH_GCMS1*sub4

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 20-Nov-2023 10:27:51 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1622

First Level Reviewer: SK9U Date: 17-Nov-2023 15:56:06

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
D 3 1,4-Dichlorobenzene-d4	115	4.118	4.118	0.000	86	19191	NC	NC	
4 1,4-Dichlorobenzene	146	4.135	4.135	0.000	91	39292	NC	NC	
D 5 1,2-Dichlorobenzene-d4	115	4.238	4.238	0.000	72	20355	NC	NC	
6 1,2-Dichlorobenzene	146	4.247	4.247	0.000	82	36806	NC	NC	
9 1,2,4-Trichlorobenzene	180	5.022	5.022	0.000	94	46015	NC	NC	
D 10 Naphthalene-d8	136	5.068	5.068	0.000	100	83379	0.5000	0.4593	
$ 11 13C6-Naphthalene	134	5.077	5.077	0.000	85	98898	NC	NC	
12 Naphthalene	128	5.077	5.077	0.000	85	94854	0.5000	0.4837	
D 15 2-methylnaphthalene-d10	152	5.612	5.612	0.000	92	57070	0.5000	0.4834	
16 2-Methylnaphthalene	142	5.635	5.635	0.000	99	67771	0.5000	0.4774	
D 17 1-Methylnaphthalene-d10	152	5.686	5.686	0.000	99	56703	0.5000	0.4794	
18 1-Methylnaphthalene	142	5.715	5.715	0.000	95	66077	0.5000	0.4801	
19 1,1'-Biphenyl	154	6.013	6.013	0.000	100	101231	0.5000	0.4956	
D 20 2,6-Dimethylnaphthalene-d12	168	6.109	6.109	0.000	100	63676	0.5000	0.4845	
21 2,6-Dimethylnaphthalene	156	6.145	6.145	0.000	99	74944	0.5000	0.4910	
D 23 Acenaphthylene-d8	160	6.361	6.361	0.000	90	100360	0.5000	0.5009	
24 Acenaphthylene	152	6.377	6.377	0.000	99	112065	0.5000	0.4750	
* 26 Acenaphthene-d10	164	6.492	6.492	0.000	97	65121	0.5000	0.5000	
27 Acenaphthene	154	6.517	6.517	0.000	98	70527	0.5000	0.4667	
28 2,3,5-Trimethylnaphthalene	170	6.834	6.834	0.000	91	80638	0.5000	0.4931	
D 29 Fluorene -d10	176	6.925	6.925	0.000	100	77156	0.5000	0.4972	
30 Fluorene	166	6.945	6.945	0.000	98	98038	0.5000	0.4891	
31 Hexachlorobenzene	284	7.417	7.417	0.000	0	54674	0.5000	0.5351	
32 Pentachlorophenol	266	7.579	7.579	0.000	0	974977	15.0	15.2	
D 33 Dibenzothiophene-d8	192	7.628	7.628	0.000	99	148004	0.5000	0.4758	
34 Dibenzothiophene	184	7.645	7.645	0.000	91	148312	0.5000	0.4789	
D 35 Phenanthrene-d10	188	7.732	7.732	0.000	99	135859	0.5000	0.4913	
36 13C6-Phenanthrene (PRC)	184	7.749	7.749	0.000	97	163136	0.5000	0.4793	
37 Phenanthrene	178	7.749	7.749	0.000	96	159454	0.5000	0.4865	
D 38 Anthracin-d10	188	7.776	7.776	0.000	100	125164	0.5000	0.4636	
39 Anthracene	178	7.794	7.794	0.000	100	152552	0.5000	0.4950	

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
40 1-Methylphenanthrene	191	8.289	8.289	0.000	100	74343	0.5000	0.4933	
D 41 Fluoranthene-d10	212	8.805	8.805	0.000	99	175562	0.5000	0.4894	
42 13C6-Fluoranthene (PRC)	208	8.825	8.825	0.000	96	233684	0.5000	0.4634	
43 Fluoranthene	202	8.825	8.825	0.000	98	221815	0.5000	0.4938	
* 44 Pyrene-d10 (IS)	212	9.027	9.027	0.000	99	177324	0.5000	0.5000	
45 Pyrene	202	9.044	9.044	0.000	96	220897	0.5000	0.4818	
$ 46 Terphenyl-d14	244	9.188	9.188	0.000	100	71223	NC	NC	
47 Benzo[a]anthracene	228	10.259	10.259	0.000	100	214905	0.5000	0.5384	
D 48 Chrysene-d12	240	10.270	10.270	0.000	99	153686	0.5000	0.4442	
49 13C6-Chrysene (PRC)	234	10.295	10.295	0.000	73	142022	0.5000	0.5398	
50 Chrysene	228	10.295	10.295	0.000	73	226365	0.5000	0.5060	
D 52 Benzo(b)fluoranthene-d12	264	11.376	11.376	0.000	100	142082	0.5000	0.5031	
53 Benzo[b]fluoranthene	252	11.397	11.397	0.000	98	218526	0.5000	0.4565	
D 54 Benzo(k)fluoranthene-d12	264	11.404	11.404	0.000	84	155714	0.5000	0.4693	
55 Benzo[k]fluoranthene	252	11.425	11.425	0.000	100	238216	0.5000	0.5222	
* 56 Benzo(e)pyrene-d12	264	11.684	11.684	0.000	99	111506	0.5000	0.5000	
57 Benzo[e]pyrene	252	11.712	11.712	0.000	100	197020	0.5000	0.4699	
D 58 Benzo(a)pyrene-d12	264	11.747	11.747	0.000	100	124408	0.5000	0.5023	
59 Benzo[a]pyrene	252	11.775	11.775	0.000	100	199246	0.5000	0.4843	
D 60 Perylene-d12	264	11.845	11.845	0.000	99	131370	0.5000	0.4780	
61 Perylene	252	11.873	11.873	0.000	100	182440	0.5000	0.4859	
D 62 Indeno[1,2,3-cd]pyrene-d12	288	13.186	13.186	0.000	89	136562	0.5000	0.5075	
D 63 Dibenz(a,h)anthracene-d14	292	13.196	13.196	0.000	80	121802	0.5000	0.5060	
64 13C6-Indeno(1,2,3-cd)pyrene (PRC	282	13.224	13.224	0.000	87	172055	0.5000	0.4748	
65 Indeno[1,2,3-cd]pyrene	276	13.224	13.224	0.000	87	224500	0.5000	0.4912	
66 Dibenz(a,h)anthracene	278	13.233	13.233	0.000	92	198465	0.5000	0.5102	
D 67 Benzo(ghi)perylene-d12	288	13.552	13.552	0.000	100	133365	0.5000	0.4991	
68 Benzo[g,h,i]perylene	276	13.580	13.580	0.000	87	189046	0.5000	0.4841	
69 Dibenzo(def,p)chrysene	302	14.922	14.922	0.000	82	113106	NC	NC	
70 Dibenzo[a,e]pyrene	302	15.373	15.373	0.000	77	138881	NC	NC	
D 71 Coronene-d12	312	15.382	15.382	0.000	81	107385	NC	NC	
72 Dibenz(a,i)pyrene	302	15.542	15.542	0.000	90	82174	NC	NC	
73 Dibenzo[a,h]pyrene	302	15.635	15.635	0.000	88	97384	NC	NC	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

60CVPAHTARGET_00023 Amount Added: 1.00 Units: mL

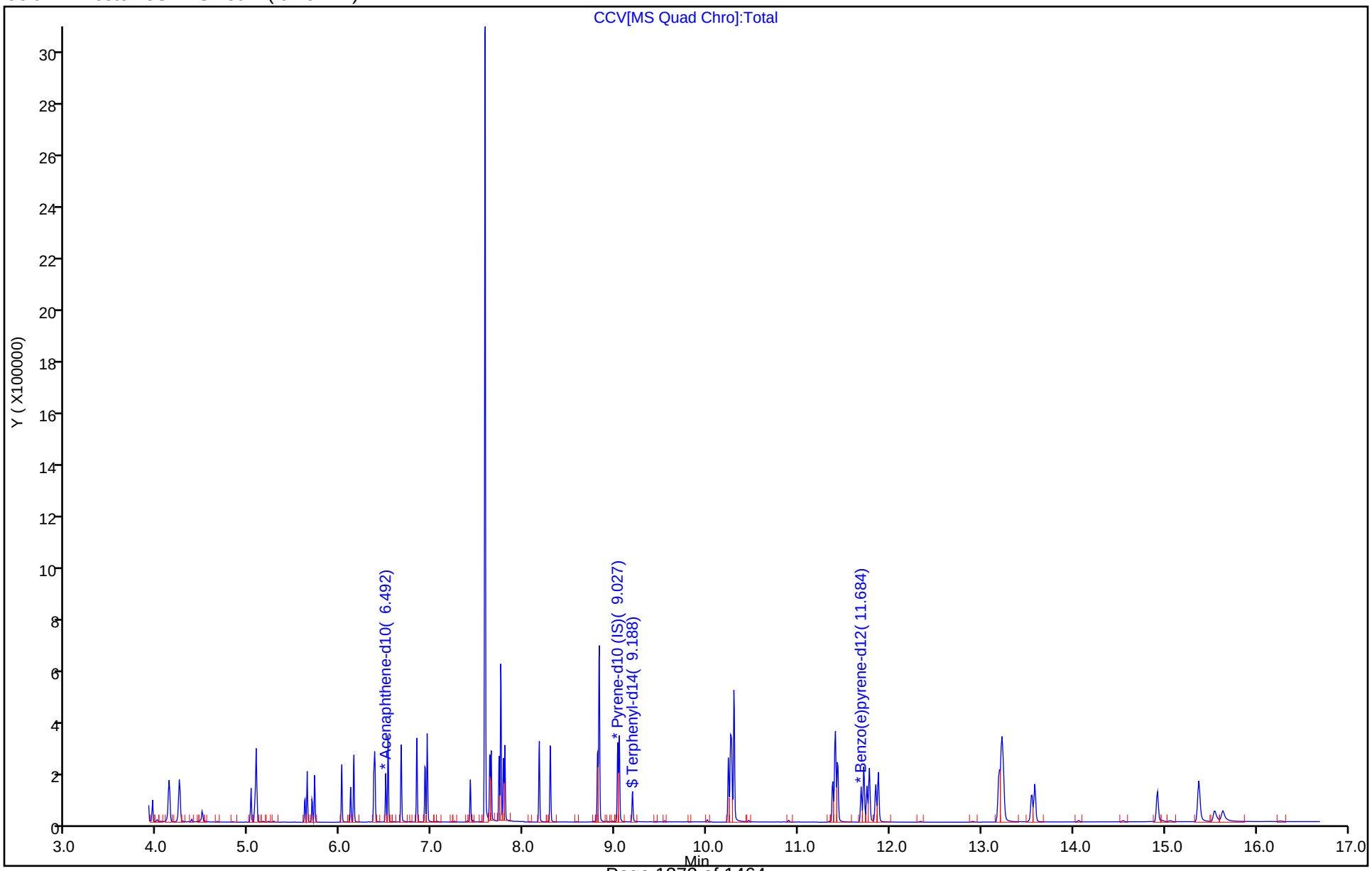
Report Date: 20-Nov-2023 10:27:52 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\CCV.D

Injection Date:	17-Nov-2023 13:46:59	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	ccv			Worklist Smp#:	2
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



FORM VII
GC/MS SEMI VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Lab Sample ID: CCV 140-80412/3 Calibration Date: 11/17/2023 14:10

Instrument ID: GCMS1 Calib Start Date: 11/13/2023 13:12

GC Column: Rxi-5SilMS 25 ID: 0.25(mm) Calib End Date: 11/13/2023 15:31

Lab File ID: CCV PCB.D Conc. Units: ng/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
PCB-14	Ave	3.667	3.615		552000	560000	-1.4	30.0
PCB-36	Ave	1.930	1.760		511000	560000	-8.8	30.0
PCB-104	Ave	1.498	1.456		544000	560000	-2.8	30.0
PCB-121	QuaF		1.438		608000	560000	8.7	30.0
PCB-155	Ave	1.125	1.110		553000	560000	-1.3	30.0
PCB-78	QuaF		1.172		596000	560000	6.3	30.0
PCB-142	Ave	0.8184	0.7983		546000	560000	-2.5	30.0
PCB-184	Ave	0.8194	0.7671		524000	560000	-6.4	30.0
PCB-204	Ave	0.5331	0.4930		518000	560000	-7.5	30.0
PCB-192	Ave	0.7513	0.7292		544000	560000	-2.9	30.0

Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\CCV PCB.D
Lims ID: ccv pcb
Client ID:
Sample Type: CCV
Inject. Date: 17-Nov-2023 14:10:08 ALS Bottle#: 0 Worklist Smp#: 3
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030536-003
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1
Sublist: chrom-SIM_PAH_GCMS1*sub1

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 20-Nov-2023 10:27:56 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1622

First Level Reviewer: SK9U Date: 20-Nov-2023 09:01:36

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
74 PCB-14	222	7.479	7.479	0.000	100	58895	0.5600	0.5521	
75 PCB-36	258	8.210	8.210	0.000	99	28668	0.5600	0.5105	
76 PCB-104	326	8.395	8.396	-0.001	94	23714	0.5600	0.5441	
77 PCB-121	326	8.751	8.751	0.000	99	23435	0.5600	0.6084	
78 PCB-155	360	8.849	8.849	0.000	93	18087	0.5600	0.5528	
79 PCB-78	290	9.087	9.084	0.003	91	19092	0.5600	0.5955	
80 PCB-142	360	9.522	9.522	0.000	90	13005	0.5600	0.5462	
81 PCB-184	394	9.575	9.572	0.003	95	12498	0.5600	0.5243	
* 82 PCB-167L	372	10.030	10.027	0.003	74	11637	0.4000	0.4000	
83 PCB-204	428	10.255	10.250	0.004	85	8032	0.5600	0.5178	
84 PCB-192	394	10.280	10.275	0.005	97	11880	0.5600	0.5435	

QC Flag Legend
Processing Flags

Reagents:
60L4SIMPCB_00016 Amount Added: 1.00 Units: mL

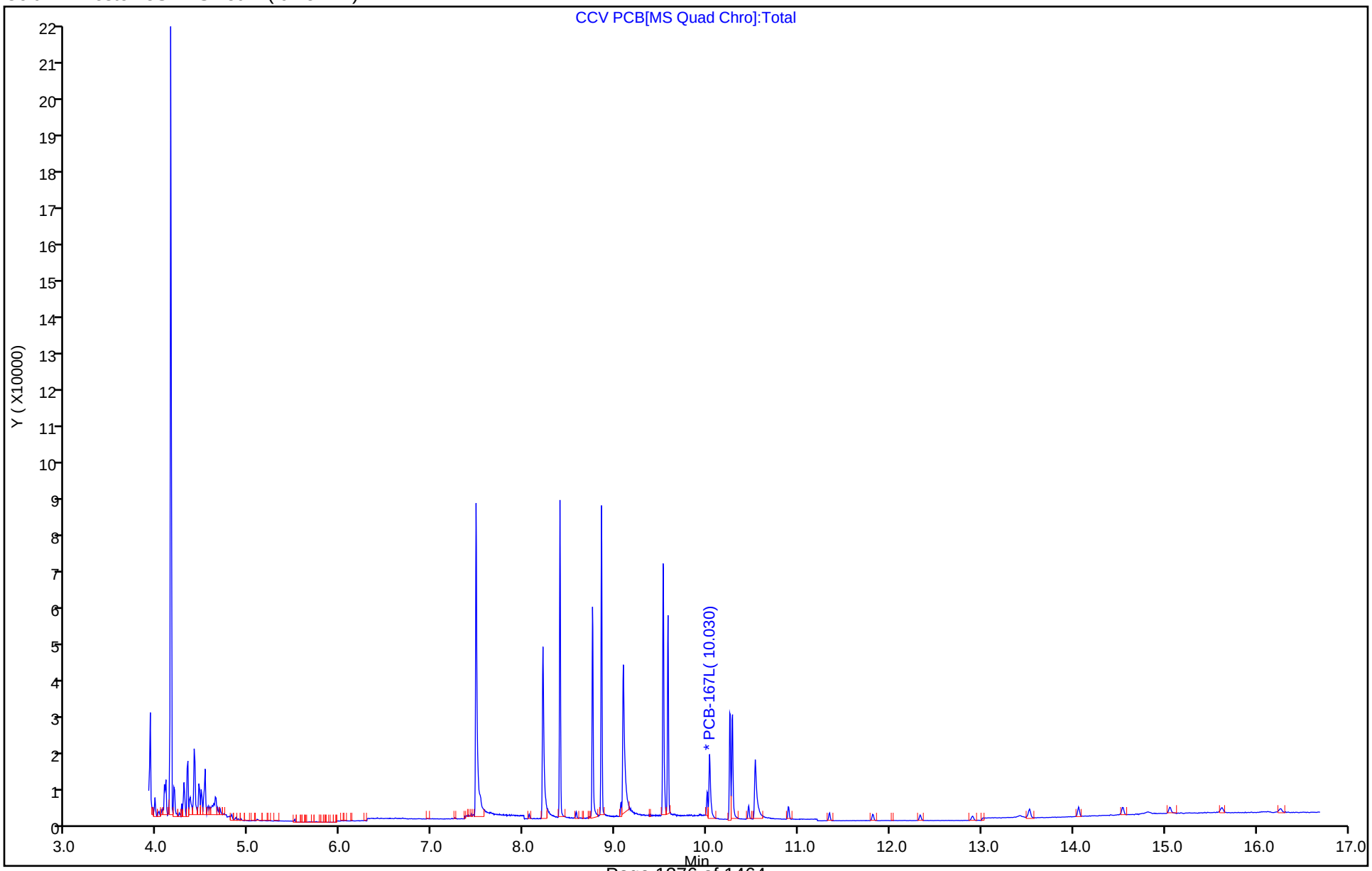
Report Date: 20-Nov-2023 10:27:56 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231117-30536.b\CCV PCB.D

Injection Date:	17-Nov-2023 14:10:08	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	ccv pcb			Worklist Smp#:	3
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



FORM VII
GC/MS SEMI VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Lab Sample ID: CCV 140-80832/2 Calibration Date: 12/01/2023 10:17

Instrument ID: GCMS1 Calib Start Date: 11/13/2023 17:27

GC Column: Rxi-5SilMS 25 ID: 0.25(mm) Calib End Date: 11/13/2023 19:48

Lab File ID: CCV3.D Conc. Units: ng/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Naphthalene	AveID	1.176	1.171		498000	500000	-0.4	30.0
2-Methylnaphthalene	AveID	1.244	1.165		468000	500000	-6.3	30.0
1-Methylnaphthalene	AveID	1.214	1.172		483000	500000	-3.5	30.0
1,1'-Biphenyl	AveID	1.604	1.567		488000	500000	-2.3	30.0
2,6-Dimethylnaphthalene	AveID	1.199	1.165		486000	500000	-2.8	30.0
Acenaphthylene	AveID	1.176	1.124		478000	500000	-4.4	30.0
Acenaphthene	AveID	0.7529	0.7112		472000	500000	-5.5	30.0
2,3,5-Trimethylnaphthalene	AveID	1.284	1.241		483000	500000	-3.4	30.0
Fluorene	AveID	1.299	1.275		491000	500000	-1.8	30.0
Hexachlorobenzene	AveID	0.3760	0.4000		532000	500000	6.4	30.0
Pentachlorophenol	QuaIF		0.2106		13800000	15000000	-7.8	30.0
Dibenzothiophene	AveID	1.046	1.016		485000	500000	-2.9	30.0
13C6-Phenanthrene (PRC)	AveID	1.253	1.170		467000	500000	-6.6	30.0
Phenanthrene	AveID	1.206	1.172		486000	500000	-2.9	30.0
Anthracene	AveID	1.231	1.209		491000	500000	-1.8	30.0
1-Methylphenanthrene	AveID	0.5546	0.5378		485000	500000	-3.0	30.0
13C6-Fluoranthene (PRC)	AveID	1.436	1.423		495000	500000	-0.9	30.0
Fluoranthene	AveID	1.279	1.245		486000	500000	-2.7	30.0
Pyrene	AveID	1.306	1.249		478000	500000	-4.4	30.0
Benzo[a]anthracene	AveID	1.299	1.281		493000	500000	-1.4	30.0
13C6-Chrysene (PRC)	AveID	0.8560	0.8734		510000	500000	2.0	30.0
Chrysene	AveID	1.455	1.389		477000	500000	-4.5	30.0
Benzo[b]fluoranthene	AveID	1.685	1.541		457000	500000	-8.5	30.0
Benzo[k]fluoranthene	AveID	1.465	1.437		490000	500000	-1.9	30.0
Benzo[e]pyrene	AveID	1.685	1.589		472000	500000	-5.7	30.0
Benzo[a]pyrene	AveID	1.654	1.592		481000	500000	-3.7	30.0
Perylene	AveID	1.429	1.338		468000	500000	-6.4	30.0
13C6-Indeno(1,2,3-cd)pyrene (PRC)	AveID	1.327	1.259		474000	500000	-5.1	30.0
Indeno[1,2,3-cd]pyrene	AveID	1.673	1.624		485000	500000	-3.0	30.0
Dibenz(a,h)anthracene	AveID	1.597	1.570		492000	500000	-1.7	30.0
Benzo[g,h,i]perylene	AveID	1.464	1.403		479000	500000	-4.2	30.0
Naphthalene-d8	Ave	1.394	1.288		462000	500000	-7.6	30.0
2-Methylnaphthalene-d10	Ave	0.9064	0.8972		495000	500000	-1.0	30.0
1-Methylnaphthalene-d10	Ave	0.9082	0.8755		482000	500000	-3.6	30.0
2,6-Dimethylnaphthalene-d12	Ave	1.009	0.9912		491000	500000	-1.8	30.0
Acenaphthylene-d8	Ave	1.538	1.511		491000	500000	-1.8	30.0
Fluorene -d10	Ave	1.191	1.149		482000	500000	-3.6	30.0
Dibenzothiophene-d8	Ave	0.8772	0.8353		476000	500000	-4.8	30.0
Phenanthrene-d10	Ave	0.7798	0.7759		498000	500000	-0.5	30.0
Anthracene-d10	Ave	0.7612	0.7113		467000	500000	-6.6	30.0

FORM VII
GC/MS SEMI VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Lab Sample ID: CCV 140-80832/2 Calibration Date: 12/01/2023 10:17

Instrument ID: GCMS1 Calib Start Date: 11/13/2023 17:27

GC Column: Rxi-5SilMS 25 ID: 0.25(mm) Calib End Date: 11/13/2023 19:48

Lab File ID: CCV3.D Conc. Units: ng/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Fluoranthene-d10	Ave	1.011	0.9919		490000	500000	-1.9	30.0
Chrysene-d12	Ave	0.9756	0.9402		482000	500000	-3.6	30.0
Benzo(b)fluoranthene-d12	Ave	1.266	1.297		512000	500000	2.4	30.0
Benzo(k)fluoranthene-d12	Ave	1.488	1.354		455000	500000	-9.0	30.0
Benzo(a)pyrene-d12	Ave	1.111	1.078		485000	500000	-2.9	30.0
Perylene-d12	Ave	1.232	1.192		484000	500000	-3.3	30.0
Dibenz(a,h)anthracene-d14	Ave	1.079	1.085		502000	500000	0.5	30.0
Indeno[1,2,3-cd]pyrene-d12	Ave	1.206	1.195		495000	500000	-0.9	30.0
Benzo(ghi)perylene-d12	Ave	1.198	1.176		491000	500000	-1.9	30.0

Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\CCV3.D
Lims ID: ccv
Client ID:
Sample Type: CCV
Inject. Date: 01-Dec-2023 10:17:44 ALS Bottle#: 0 Worklist Smp#: 2
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030650-002
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1
Sublist: chrom-SIM_PAH_GCMS1*sub4

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 04-Dec-2023 15:45:11 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1686

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
D 3 1,4-Dichlorobenzene-d4	115	4.118	4.118	0.000	84	17624	NC	NC	
4 1,4-Dichlorobenzene	146	4.135	4.135	0.000	91	36524	NC	NC	
D 5 1,2-Dichlorobenzene-d4	115	4.230	4.230	0.000	86	18579	NC	NC	
6 1,2-Dichlorobenzene	146	4.247	4.247	0.000	85	34057	NC	NC	
9 1,2,4-Trichlorobenzene	180	5.023	5.023	0.000	94	41234	NC	NC	
D 10 Naphthalene-d8	136	5.059	5.059	0.000	99	76424	0.5000	0.4619	
$ 11 13C6-Naphthalene	134	5.078	5.078	0.000	87	93555	NC	NC	
12 Naphthalene	128	5.078	5.078	0.000	87	89503	0.5000	0.4980	
D 15 2-methylnaphthalene-d10	152	5.606	5.606	0.000	92	53245	0.5000	0.4949	
16 2-Methylnaphthalene	142	5.635	5.635	0.000	97	62049	0.5000	0.4685	
D 17 1-Methylnaphthalene-d10	152	5.686	5.686	0.000	100	51955	0.5000	0.4820	
18 1-Methylnaphthalene	142	5.715	5.715	0.000	99	60878	0.5000	0.4827	
19 1,1'-Biphenyl	154	6.009	6.009	0.000	100	92140	0.5000	0.4883	
D 20 2,6-Dimethylnaphthalene-d12	168	6.105	6.105	0.000	100	58819	0.5000	0.4911	
21 2,6-Dimethylnaphthalene	156	6.141	6.141	0.000	98	68517	0.5000	0.4859	
D 23 Acenaphthylene-d8	160	6.362	6.362	0.000	93	89689	0.5000	0.4912	
24 Acenaphthylene	152	6.372	6.372	0.000	99	100818	0.5000	0.4781	
* 26 Acenaphthene-d10	164	6.492	6.492	0.000	98	59343	0.5000	0.5000	
27 Acenaphthene	154	6.517	6.517	0.000	99	63787	0.5000	0.4723	
28 2,3,5-Trimethylnaphthalene	170	6.829	6.829	0.000	97	72980	0.5000	0.4832	
D 29 Fluorene -d10	176	6.920	6.920	0.000	99	68176	0.5000	0.4821	
30 Fluorene	166	6.945	6.945	0.000	100	86952	0.5000	0.4909	
31 Hexachlorobenzene	284	7.414	7.414	0.000	0	49369	0.5000	0.5319	
32 Pentachlorophenol	266	7.576	7.576	0.000	0	779720	15.0	13.8	
D 33 Dibenzothiophene-d8	192	7.625	7.625	0.000	99	132848	0.5000	0.4761	
34 Dibenzothiophene	184	7.642	7.642	0.000	98	134924	0.5000	0.4854	
D 35 Phenanthrene-d10	188	7.728	7.728	0.000	99	123414	0.5000	0.4975	
36 13C6-Phenanthrene (PRC)	184	7.745	7.745	0.000	96	144408	0.5000	0.4670	
37 Phenanthrene	178	7.745	7.745	0.000	96	144613	0.5000	0.4857	
D 38 Anthracin-d10	188	7.773	7.773	0.000	100	113128	0.5000	0.4672	
39 Anthracene	178	7.790	7.790	0.000	100	136758	0.5000	0.4910	
40 1-Methylphenanthrene	191	8.289	8.289	0.000	100	66378	0.5000	0.4849	

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
D 41 Fluoranthene-d10	212	8.805	8.805	0.000	100	157769	0.5000	0.4903	
42 13C6-Fluoranthene (PRC)	208	8.822	8.822	0.000	97	224533	0.5000	0.4954	
43 Fluoranthene	202	8.822	8.822	0.000	97	196404	0.5000	0.4865	
* 44 Pyrene-d10 (IS)	212	9.024	9.024	0.000	99	159050	0.5000	0.5000	
45 Pyrene	202	9.040	9.040	0.000	97	197036	0.5000	0.4782	
$ 46 Terphenyl-d14	244	9.185	9.185	0.000	100	63031	NC	NC	
47 Benzo[a]anthracene	228	10.255	10.255	0.000	100	191571	0.5000	0.4932	
D 48 Chrysene-d12	240	10.265	10.265	0.000	93	149544	0.5000	0.4819	
49 13C6-Chrysene (PRC)	234	10.295	10.295	0.000	72	130615	0.5000	0.5102	
50 Chrysene	228	10.295	10.295	0.000	72	207786	0.5000	0.4773	
D 52 Benzo(b)fluoranthene-d12	264	11.369	11.369	0.000	100	137954	0.5000	0.5120	
53 Benzo[b]fluoranthene	252	11.397	11.397	0.000	96	212622	0.5000	0.4574	
D 54 Benzo(k)fluoranthene-d12	264	11.404	11.404	0.000	83	144058	0.5000	0.4551	
55 Benzo[k]fluoranthene	252	11.425	11.425	0.000	100	206958	0.5000	0.4904	
* 56 Benzo(e)pyrene-d12	264	11.684	11.684	0.000	99	106376	0.5000	0.5000	
57 Benzo[e]pyrene	252	11.712	11.712	0.000	100	182258	0.5000	0.4715	
D 58 Benzo(a)pyrene-d12	264	11.747	11.747	0.000	100	114689	0.5000	0.4854	
59 Benzo[a]pyrene	252	11.768	11.768	0.000	100	182576	0.5000	0.4814	
D 60 Perylene-d12	264	11.838	11.838	0.000	100	126806	0.5000	0.4836	
61 Perylene	252	11.866	11.866	0.000	100	169610	0.5000	0.4680	
D 62 Indeno[1,2,3-cd]pyrene-d12	288	13.186	13.186	0.000	91	127169	0.5000	0.4954	
D 63 Dibenz(a,h)anthracene-d14	292	13.186	13.186	0.000	91	115382	0.5000	0.5024	
64 13C6-Indeno(1,2,3-cd)pyrene (PRC	282	13.214	13.214	0.000	88	160088	0.5000	0.4744	
65 Indeno[1,2,3-cd]pyrene	276	13.214	13.214	0.000	87	206472	0.5000	0.4851	
66 Dibenz(a,h)anthracene	278	13.233	13.233	0.000	84	181113	0.5000	0.4915	
D 67 Benzo(ghi)perylene-d12	288	13.543	13.543	0.000	100	125098	0.5000	0.4907	
68 Benzo[g,h,i]perylene	276	13.580	13.580	0.000	92	175542	0.5000	0.4792	
69 Dibenzo(def,p)chrysene	302	14.913	14.913	0.000	84	101124	NC	NC	
70 Dibenzo[a,e]pyrene	302	15.363	15.363	0.000	79	120757	NC	NC	
D 71 Coronene-d12	312	15.373	15.373	0.000	82	98289	NC	NC	
72 Dibenz(a,i)pyrene	302	15.551	15.551	0.000	89	64841	NC	NC	
73 Dibenzo[a,h]pyrene	302	15.636	15.636	0.000	88	82077	NC	NC	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

60CVPAHTARGET_00023 Amount Added: 1.00 Units: mL

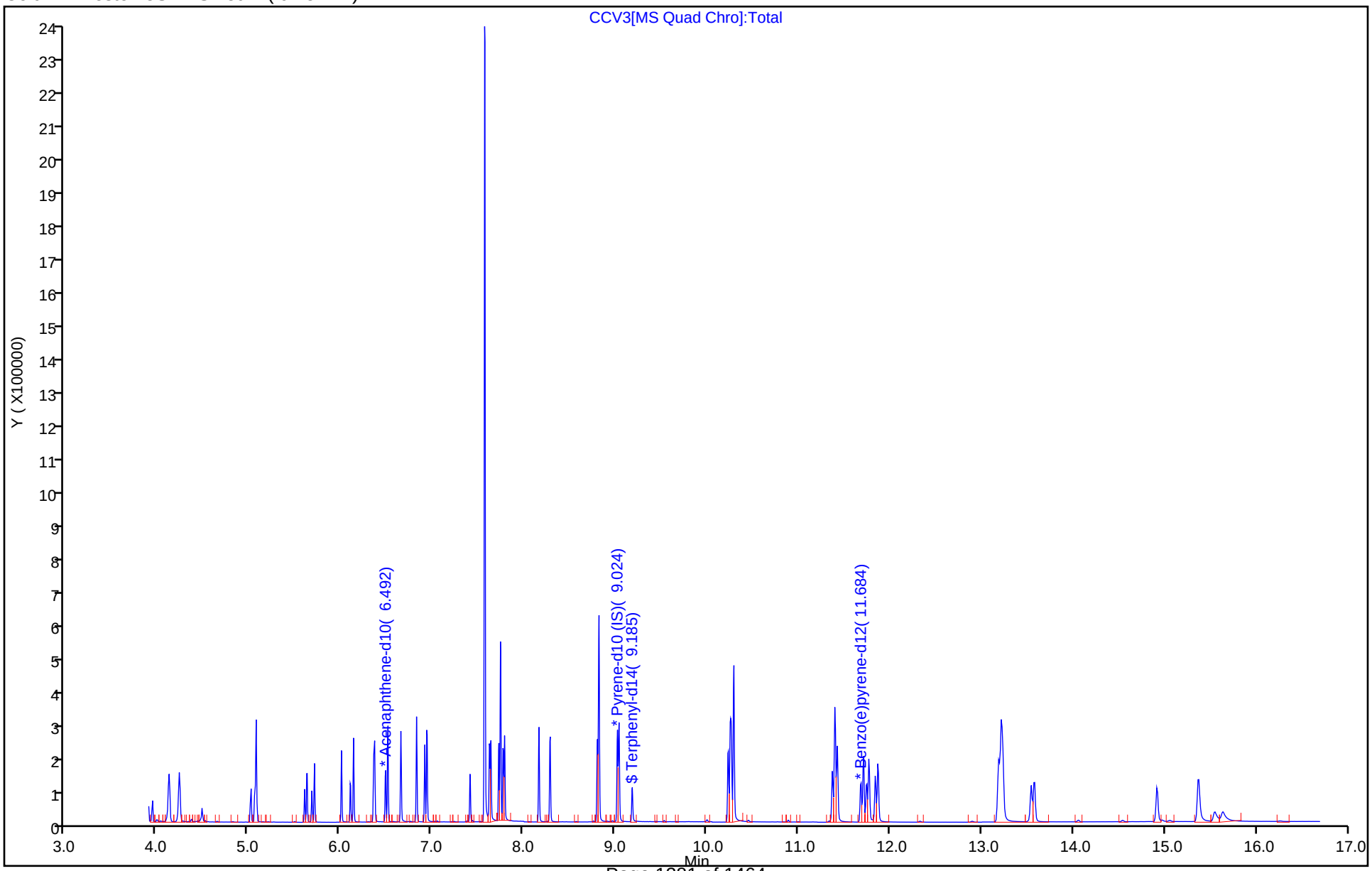
Report Date: 04-Dec-2023 15:45:12 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\CCV3.D

Injection Date:	01-Dec-2023 10:17:44	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	ccv			Worklist Smp#:	2
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



FORM VII
GC/MS SEMI VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Lab Sample ID: CCV 140-80832/3 Calibration Date: 12/01/2023 10:40

Instrument ID: GCMS1 Calib Start Date: 11/13/2023 13:12

GC Column: Rxi-5SilMS 25 ID: 0.25(mm) Calib End Date: 11/13/2023 15:31

Lab File ID: CCV PCB.D Conc. Units: ng/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
PCB-14	Ave	3.667	3.098		473000	560000	-15.5	30.0
PCB-36	Ave	1.930	1.726		501000	560000	-10.6	30.0
PCB-104	Ave	1.498	1.403		525000	560000	-6.3	30.0
PCB-121	QuaF		1.363		579000	560000	3.4	30.0
PCB-155	Ave	1.125	1.078		537000	560000	-4.1	30.0
PCB-78	QuaF		1.048		539000	560000	-3.7	30.0
PCB-142	Ave	0.8184	0.7581		519000	560000	-7.4	30.0
PCB-184	Ave	0.8194	0.7447		509000	560000	-9.1	30.0
PCB-204	Ave	0.5331	0.4487		471000	560000	-15.8	30.0
PCB-192	Ave	0.7513	0.6692		499000	560000	-10.9	30.0

Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\CCV PCB.D
Lims ID: ccv pcb
Client ID:
Sample Type: CCV
Inject. Date: 01-Dec-2023 10:40:18 ALS Bottle#: 0 Worklist Smp#: 3
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030650-003
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1
Sublist: chrom-SIM_PAH_GCMS1*sub1

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 04-Dec-2023 15:45:14 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1686

First Level Reviewer: SK9U Date: 01-Dec-2023 11:47:17

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
74 PCB-14	222	7.476	7.476	-0.003	100	55461	0.5600	0.4732	
75 PCB-36	258	8.206	8.210	-0.004	100	30906	0.5600	0.5009	
76 PCB-104	326	8.395	8.396	-0.001	96	25121	0.5600	0.5246	
77 PCB-121	326	8.748	8.748	-0.003	97	24404	0.5600	0.5792	
78 PCB-155	360	8.845	8.849	-0.004	92	19299	0.5600	0.5368	
79 PCB-78	290	9.084	9.084	0.000	96	18756	0.5600	0.5394	
80 PCB-142	360	9.522	9.522	0.000	93	13572	0.5600	0.5188	
81 PCB-184	394	9.572	9.572	0.000	95	13332	0.5600	0.5090	
* 82 PCB-167L	372	10.026	10.027	-0.001	75	12787	0.4000	0.4000	
83 PCB-204	428	10.250	10.250	0.000	88	8032	0.5600	0.4713	
84 PCB-192	394	10.275	10.275	0.000	96	11979	0.5600	0.4988	

QC Flag Legend
Processing Flags

Reagents:
60L4SIMPCB_00016 Amount Added: 1.00 Units: mL

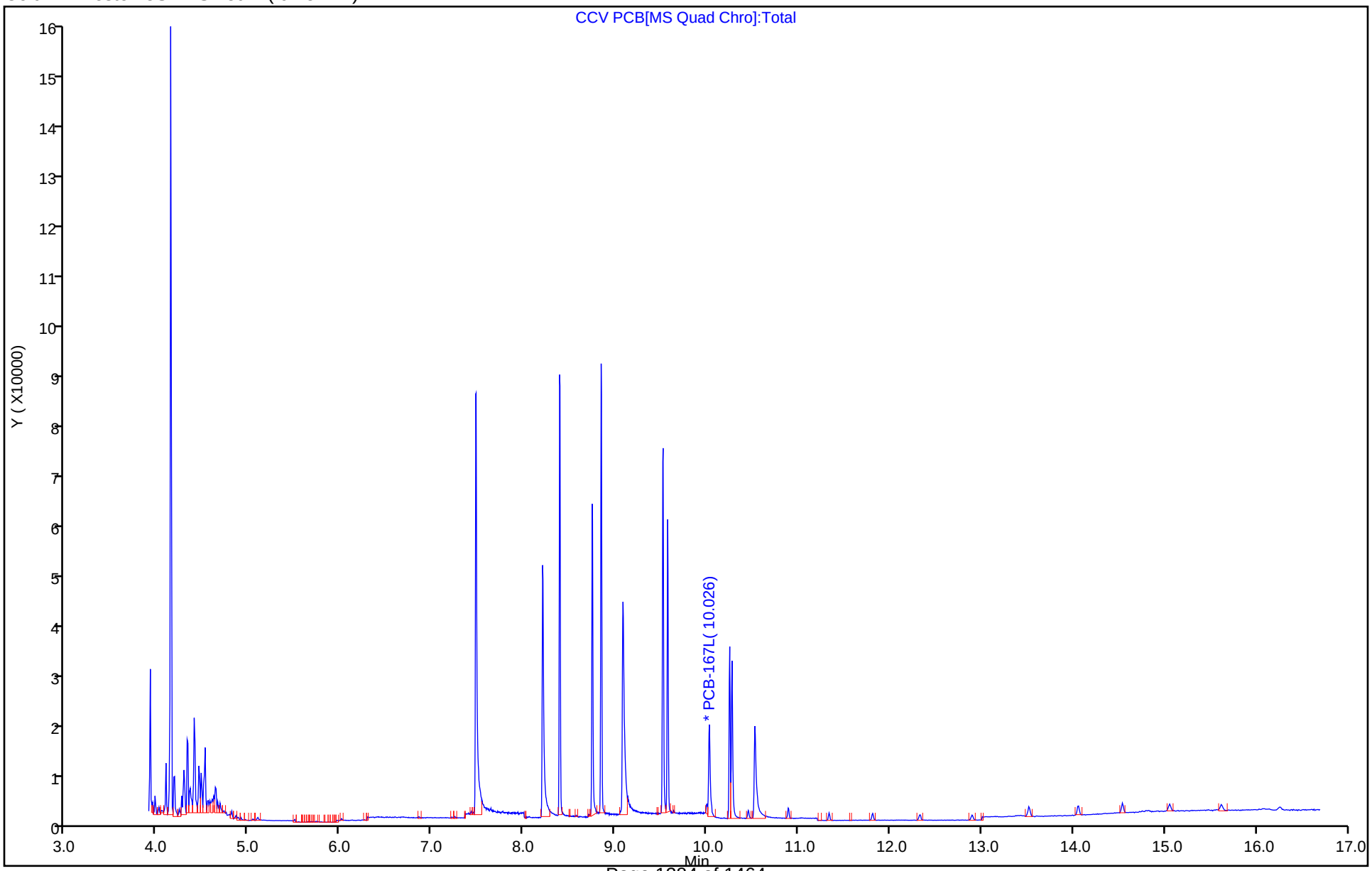
Report Date: 04-Dec-2023 15:45:15 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\CCV PCB.D

Injection Date:	01-Dec-2023 10:40:18	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	ccv pcb			Worklist Smp#:	3
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\WDM.D
Lims ID: wdm
Client ID:
Sample Type: WDM
Inject. Date: 13-Nov-2023 11:40:13 ALS Bottle#: 0 Worklist Smp#: 4
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030467-004
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 16-Nov-2023 11:21:30 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1650

First Level Reviewer: SK9U Date: 13-Nov-2023 12:17:55

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
A 85 C2-Naphthalenes	156	6.237	(6.068-6.407)		0	2930424	4500.0	4500.0	
A 87 C3-Naphthalenes	170	6.699	(6.348-7.050)		0	2025359	4500.0	4500.0	
A 88 C4-Naphthalenes	184	7.100	(6.678-7.562)		0	943525	4500.0	4500.0	
A 89 C1-Fluorenes	180	7.241	(7.364-7.505)		0	1005696	4500.0	4500.0	
A 90 C2-Fluorenes	194	7.884	(7.730-8.069)		0	607613	4500.0	4500.0	
A 91 C3-Fluorenes	208	8.336	(8.092-8.605)		0	474021	4500.0	4500.0	
A 92 C1-Dibenzothiophenes	198	8.111	(8.013-8.234)		0	746493	4500.0	4500.0	
A 93 C2-Dibenzothiophenes	212	8.526	(8.325-8.732)		0	728433	4500.0	4500.0	
A 94 C3-Dibenzothiophenes	226	8.955	(8.676-9.266)		0	566234	4500.0	4500.0	
A 95 C4-Dibenzothiophenes	240	9.273	(8.970-9.594)		0	268084	4500.0	4500.0	
A 96 C1-Phenanthrenes/Anthracenes	191	8.234	(8.155-8.332)		0	2943200	4500.0	4500.0	
A 97 C2-Phenanthrenes/Anthracenes	206	8.694	(8.490-8.926)		0	1763244	4500.0	4500.0	
A 98 C3-Phenanthrenes/Anthracenes	220	9.151	(8.851-9.456)		0	888505	4500.0	4500.0	
A 99 C4-Phenanthrenes/Anthracenes	234	9.459	(9.106-9.824)		0	310237	4500.0	4500.0	
A 100 C1-Fluoranthenes/pyrene	216	9.427	(9.246-9.640)		0	3382575	4500.0	4500.0	
A 101 C1-Chrysenes/Benz(a)anthracenes	242	10.696	(10.456-10.941)		0	920618	4500.0	4500.0	
A 102 C2-Chrysenes/Benz(a)anthracenes	256	11.023	(10.667-11.381)		0	357402	4500.0	4500.0	
A 103 C3-Chrysenes/Benz(a)anthracenes	270	11.642	(11.002-11.867)		0	155150	4500.0	4500.0	
A 104 C4-Chrysenes/Benz(a)anthracenes	284	12.105	(11.475-12.553)		0	78683	4500.0	4500.0	

QC Flag Legend
Processing Flags

Reagents:
60WDMALKYL_00008 Amount Added: 1.00 Units: mL

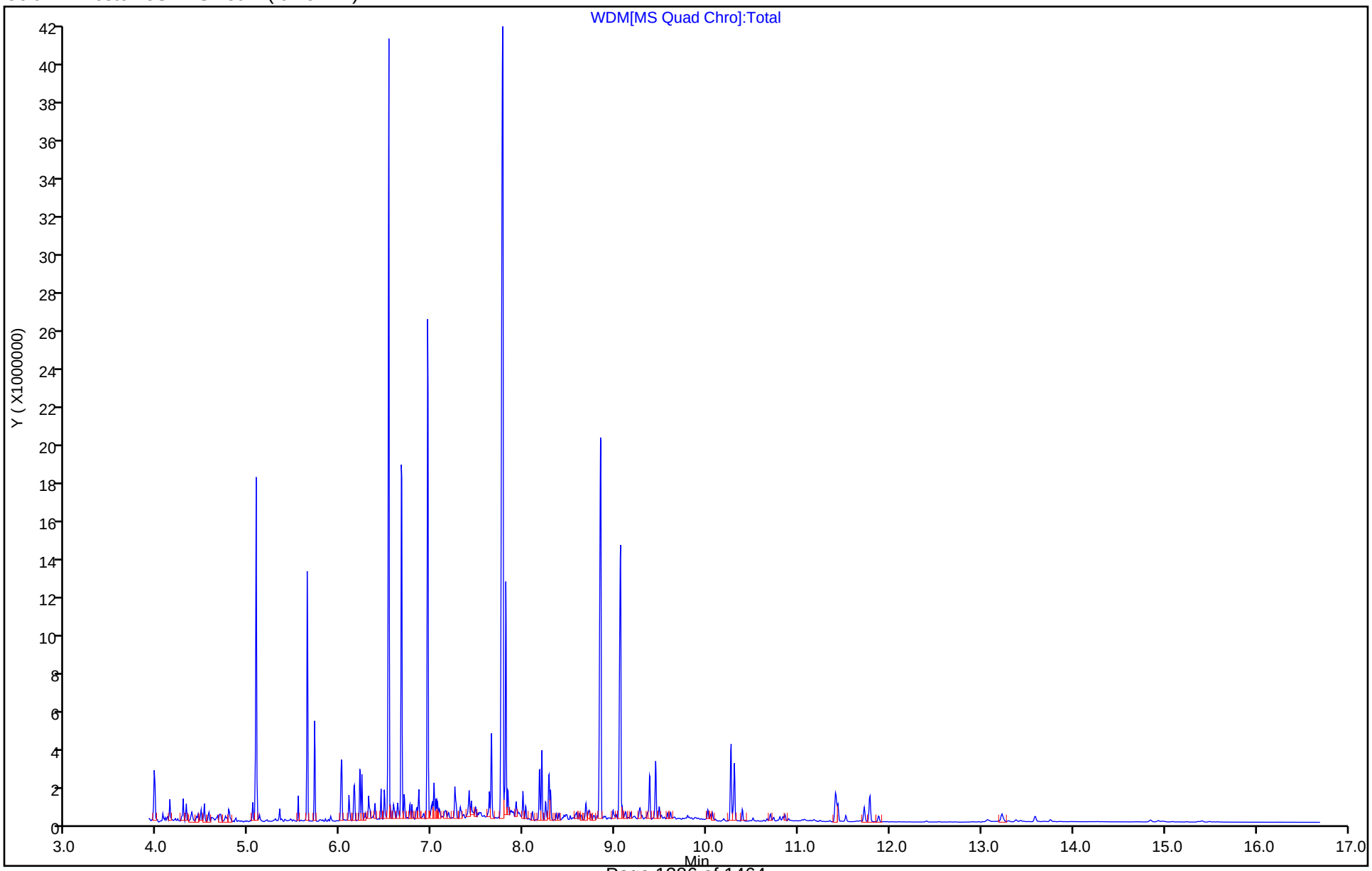
Report Date: 16-Nov-2023 11:21:30 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\WDM.D

Injection Date:	13-Nov-2023 11:40:13	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	wdm			Worklist Smp#:	4
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\WDM.D
Lims ID: wdm
Client ID:
Sample Type: WDM
Inject. Date: 16-Nov-2023 11:54:22 ALS Bottle#: 0 Worklist Smp#: 4
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030519-004
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 17-Nov-2023 12:14:52 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1635

First Level Reviewer: SK9U Date: 16-Nov-2023 13:37:22

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
A 85 C2-Naphthalenes	156	6.237	(6.068-6.407)		0	1625868	4500.0	4500.0	
A 87 C3-Naphthalenes	170	6.704	(6.348-7.050)		0	1124368	4500.0	4500.0	
A 88 C4-Naphthalenes	184	7.098	(6.678-7.562)		0	512759	4500.0	4500.0	
A 89 C1-Fluorenes	180	7.237	(7.364-7.505)		0	537880	4500.0	4500.0	
A 90 C2-Fluorenes	194	7.884	(7.730-8.069)		0	334314	4500.0	4500.0	
A 91 C3-Fluorenes	208	8.340	(8.092-8.605)		0	262370	4500.0	4500.0	
A 92 C1-Dibenzothiophenes	198	8.111	(8.013-8.234)		0	415271	4500.0	4500.0	
A 93 C2-Dibenzothiophenes	212	8.531	(8.325-8.732)		0	404956	4500.0	4500.0	
A 94 C3-Dibenzothiophenes	226	8.955	(8.676-9.266)		0	308853	4500.0	4500.0	
A 95 C4-Dibenzothiophenes	240	9.271	(8.970-9.594)		0	144414	4500.0	4500.0	
A 96 C1-Phenanthrenes/Anthracenes	191	8.235	(8.155-8.332)		0	1646270	4500.0	4500.0	
A 97 C2-Phenanthrenes/Anthracenes	206	8.697	(8.490-8.926)		0	983284	4500.0	4500.0	
A 98 C3-Phenanthrenes/Anthracenes	220	9.151	(8.851-9.456)		0	519926	4500.0	4500.0	
A 99 C4-Phenanthrenes/Anthracenes	234	9.463	(9.106-9.824)		0	178279	4500.0	4500.0	
A 100 C1-Fluoranthenes/pyrene	216	9.431	(9.246-9.640)		0	1881336	4500.0	4500.0	
A 101 C1-Chrysenes/Benz(a)anthracenes	242	10.696	(10.456-10.941)		0	488088	4500.0	4500.0	
A 102 C2-Chrysenes/Benz(a)anthracenes	256	11.023	(10.667-11.381)		0	182470	4500.0	4500.0	
A 103 C3-Chrysenes/Benz(a)anthracenes	270	11.451	(11.002-11.867)		0	72067	4500.0	4500.0	
A 104 C4-Chrysenes/Benz(a)anthracenes	284	12.003	(11.475-12.553)		0	38218	4500.0	4500.0	

QC Flag Legend
Processing Flags

Reagents:
60WDMALKYL_00008 Amount Added: 1.00 Units: mL

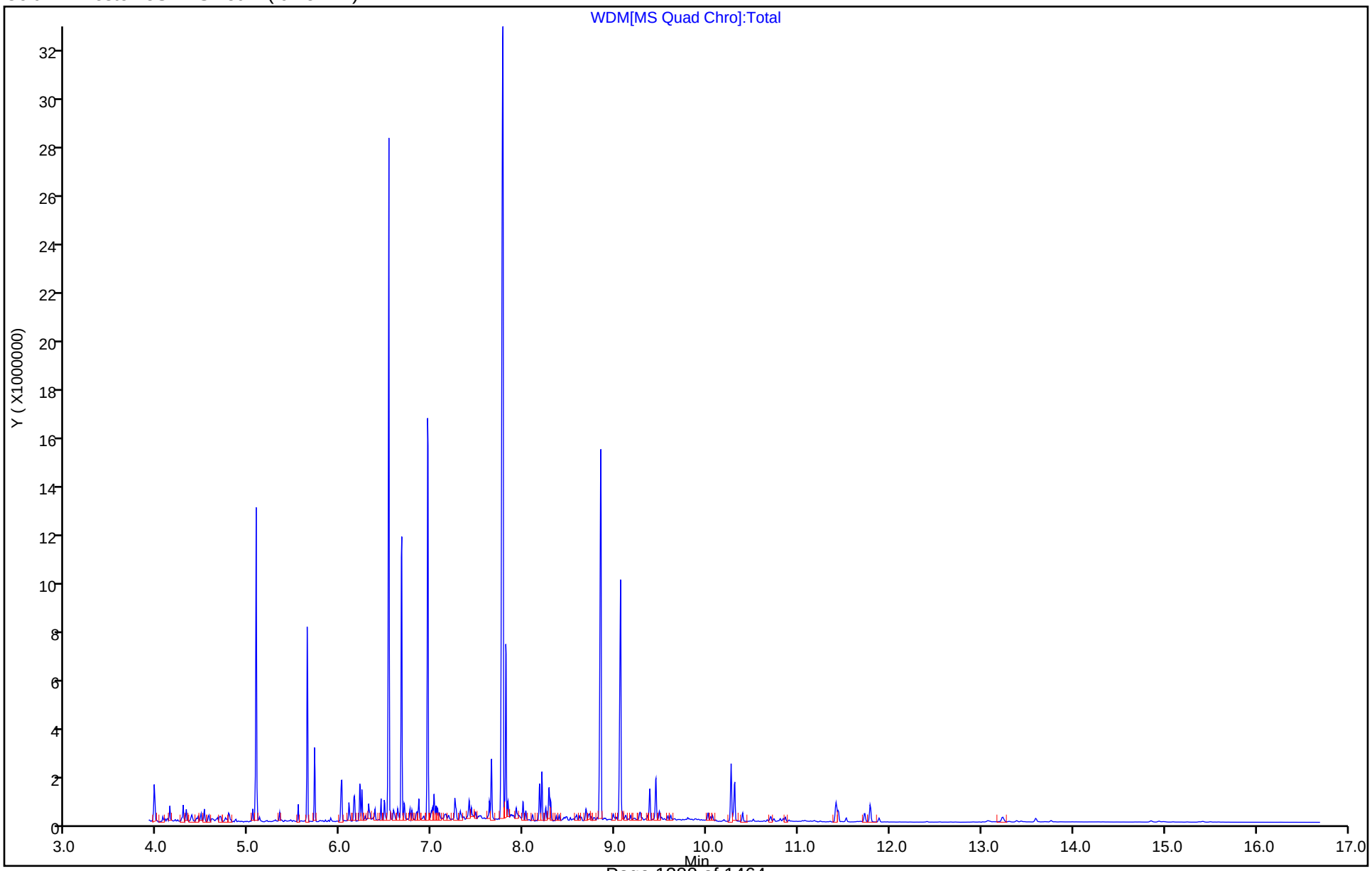
Report Date: 17-Nov-2023 12:14:52 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231116-30519.b\WDM.D

Injection Date:	16-Nov-2023 11:54:22	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	wdm			Worklist Smp#:	4
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\WDM.D
Lims ID: wdm
Client ID:
Sample Type: WDM
Inject. Date: 01-Dec-2023 11:03:04 ALS Bottle#: 0 Worklist Smp#: 4
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030677-004
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 06-Dec-2023 16:19:38 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1639

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
A 85 C2-Naphthalenes	156	6.231	(6.068-6.407)		0	1534531	4500.0	4500.0	
A 87 C3-Naphthalenes	170	6.663	(6.341-7.034)		0	1017648	4500.0	4500.0	
A 88 C4-Naphthalenes	184	7.094	(6.678-7.562)		0	477684	4500.0	4500.0	
A 89 C1-Fluorenes	180	7.237	(7.364-7.505)		0	497693	4500.0	4500.0	
A 90 C2-Fluorenes	194	7.884	(7.730-8.069)		0	287982	4500.0	4500.0	
A 91 C3-Fluorenes	208	8.336	(8.092-8.605)		0	236802	4500.0	4500.0	
A 92 C1-Dibenzothiophenes	198	8.108	(8.013-8.234)		0	367740	4500.0	4500.0	
A 93 C2-Dibenzothiophenes	212	8.526	(8.325-8.732)		0	361115	4500.0	4500.0	
A 94 C3-Dibenzothiophenes	226	8.801	(8.676-9.266)		0	264649	4500.0	4500.0	
A 95 C4-Dibenzothiophenes	240	9.276	(8.970-9.594)		0	128038	4500.0	4500.0	
A 96 C1-Phenanthrenes/Anthracenes	191	8.236	(8.155-8.332)		0	1466910	4500.0	4500.0	
A 97 C2-Phenanthrenes/Anthracenes	206	8.694	(8.490-8.926)		0	877833	4500.0	4500.0	
A 98 C3-Phenanthrenes/Anthracenes	220	9.148	(8.851-9.456)		0	426658	4500.0	4500.0	
A 99 C4-Phenanthrenes/Anthracenes	234	9.463	(9.106-9.824)		0	155895	4500.0	4500.0	
A 100 C1-Fluoranthenes/pyrene	216	9.431	(9.246-9.640)		0	1653795	4500.0	4500.0	
A 101 C1-Chrysenes/Benz(a)anthracenes	242	10.686	(10.456-10.941)		0	464132	4500.0	4500.0	
A 102 C2-Chrysenes/Benz(a)anthracenes	256	11.023	(10.667-11.381)		0	163046	4500.0	4500.0	
A 103 C3-Chrysenes/Benz(a)anthracenes	270	11.455	(11.002-11.867)		0	63916	4500.0	4500.0	
A 104 C4-Chrysenes/Benz(a)anthracenes	284	12.112	(11.475-12.553)		0	36608	4500.0	4500.0	

QC Flag Legend
Processing Flags

Reagents:
60WDMALKYL_00008 Amount Added: 1.00 Units: mL

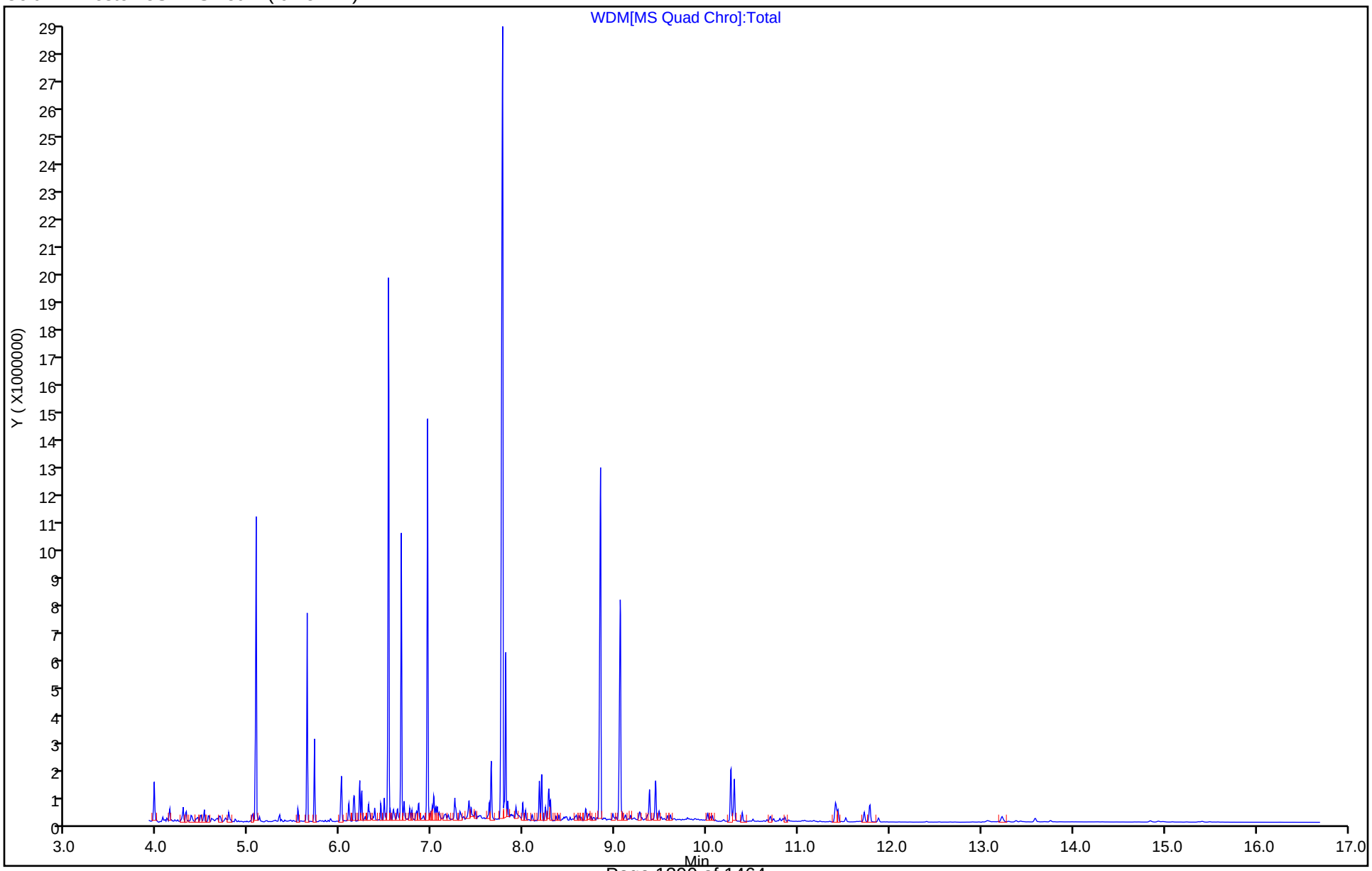
Report Date: 06-Dec-2023 16:19:39 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231201-30677.b\WDM.D

Injection Date:	01-Dec-2023 11:03:04	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	wdm			Worklist Smp#:	4
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 140-79842/19-A

Matrix: Sediment | Lab File ID: MB 140-7984219-A.D

Analysis Method: ID-0016 | Date Collected:

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.025(g) | Date Analyzed: 11/13/2023 20:58

Con. Extract Vol.: 500(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80177 | Units: ng/g

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
83-32-9	Acenaphthene	ND		400	100
208-96-8	Acenaphthylene	ND		400	29
120-12-7	Anthracene	ND		400	130
56-55-3	Benzo[a]anthracene	ND		400	150
50-32-8	Benzo[a]pyrene	ND		400	110
205-99-2	Benzo[b]fluoranthene	ND		400	140
192-97-2	Benzo[e]pyrene	ND		400	64
191-24-2	Benzo[g,h,i]perylene	ND		400	44
207-08-9	Benzo[k]fluoranthene	ND		400	92
218-01-9	Chrysene	ND		400	52
53-70-3	Dibenz(a,h)anthracene	ND		400	33
206-44-0	Fluoranthene	ND		400	320
86-73-7	Fluorene	ND		400	130
193-39-5	Indeno[1,2,3-cd]pyrene	ND		400	44
90-12-0	1-Methylnaphthalene	ND		2000	200
91-57-6	2-Methylnaphthalene	ND		2000	280
91-20-3	Naphthalene	ND		8000	1200
198-55-0	Perylene	ND		400	200
85-01-8	Phenanthrene	ND		800	690
129-00-0	Pyrene	ND		800	120
STL00912	C1-Fluoranthenes/pyrene	ND		400	400
STL00913	C1-Fluorenes	ND		800	520
STL00914	C2-Fluorenes	ND		400	400
STL00915	C3-Fluorenes	ND		400	400
STL00917	C2-Naphthalenes	ND		800	800
STL00918	C3-Naphthalenes	ND		800	800
STL00919	C4-Naphthalenes	ND		1200	1100
STL00901	C1-Phenanthrenes/Anthracenes	ND		1600	1400
STL00902	C2-Phenanthrenes/Anthracenes	ND		400	400
STL00903	C3-Phenanthrenes/Anthracenes	ND		400	400
STL00904	C4-Phenanthrenes/Anthracenes	ND		400	400
STL02218	C1-Chrysenes/Benz(a)anthracenes	ND		400	400

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 140-79842/19-A

Matrix: Sediment | Lab File ID: MB 140-7984219-A.D

Analysis Method: ID-0016 | Date Collected:

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.025(g) | Date Analyzed: 11/13/2023 20:58

Con. Extract Vol.: 500(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80177 | Units: ng/g

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
STL02219	C2-Chrysenes/Benz(a)anthracenes	ND		400	400
STL02220	C3-Chrysenes/Benz(a)anthracenes	ND		400	400
STL02221	C4-Chrysenes/Benz(a)anthracenes	ND		400	400
34883-41-5	PCB-14	ND		400	4.0
74472-51-8	PCB-192	ND		400	4.0
74472-48-3	PCB-184	ND		400	4.0
33979-03-2	PCB-155	ND		400	4.0
41411-61-4	PCB-142	ND		400	4.0
74472-52-9	PCB-204	ND		400	4.0
56558-16-8	PCB-104	ND		400	4.0
56558-18-0	PCB-121	ND		400	4.0
70362-49-1	PCB-78	ND		400	4.0
38444-87-0	PCB-36	ND		400	4.0

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
93951-97-4	Acenaphthylene-d8	65		30-120
1719-06-8	Anthracene-d10	61		30-120
63466-71-7	Benzo(a)pyrene-d12	70		30-120
93951-98-5	Benzo(b)fluoranthene-d12	83		30-120
93951-66-7	Benzo(ghi)perylene-d12	89		30-120
93952-01-3	Benzo(k)fluoranthene-d12	79		30-120
1719-03-5	Chrysene-d12	72		30-120
13250-98-1	Dibenz(a,h)anthracene-d14	81		30-120
93951-69-0	Fluoranthene-d10	73		30-120
81103-79-9	Fluorene -d10	73		30-120
203578-33-0	Indeno[1,2,3-cd]pyrene-d12	86		30-120
38072-94-5	1-Methylnaphthalene-d10	72		30-120
7297-45-2	2-Methylnaphthalene-d10	71		30-120
1146-65-2	Naphthalene-d8	69		30-120
1520-96-3	Perylene-d12	66		30-120
1517-22-2	Phenanthrene-d10	63		30-120

Report Date: 16-Nov-2023 15:51:06 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\MB 140-7984219-A.D
Lims ID: MB 140-79842/19-A
Client ID:
Sample Type: MB
Inject. Date: 13-Nov-2023 20:58:44 ALS Bottle#: 0 Worklist Smp#: 28
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030467-028
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 16-Nov-2023 15:51:06 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1650

First Level Reviewer: SK9U Date: 16-Nov-2023 15:51:06

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
1 Phenol	94	3.947	3.947	0.000	1	24		NC	
D 2 Phenol-d5	99	3.938	3.947	-0.009	1	234		NC	
D 3 1,4-Dichlorobenzene-d4	115	4.101	4.110	-0.009	85	9408	NC	NC	
4 1,4-Dichlorobenzene	146	4.118	4.118	0.000	17	1196		NC	
D 5 1,2-Dichlorobenzene-d4	115	4.221	4.221	0.000	86	9889	NC	NC	
6 1,2-Dichlorobenzene	146	4.341	4.229	0.112	1	12		NC	
7 Acetophenone	105	4.383	4.401	-0.018	1	1658		NC	
8 Hexachlorobutadiene	225	4.811	4.820	-0.009	46	57		NC	
9 1,2,4-Trichlorobenzene	180	5.123	5.022	0.101	15	1491		NC	
D 10 Naphthalene-d8	136	5.059	5.068	-0.009	100	40436	0.5000	0.3425	
$ 11 13C6-Naphthalene	134	5.059	5.078	-0.019	17	4122		NC	
12 Naphthalene	128	5.077	5.077	-0.001	44	1666		0.0175	7M
13 Hydroquinone	110	5.059	5.096	-0.037	13	69		NC	
D 14 Hydroquinone-d6	114	5.417	5.417	0.000	1	20		NC	
D 15 2-methylnaphthalene-d10	152	5.612	5.612	0.000	92	27436	0.5000	0.3574	
16 2-Methylnaphthalene	142	5.635	5.635	0.000	91	514		0.007531	7M
D 17 1-Methylnaphthalene-d10	152	5.692	5.692	0.000	100	27637	0.5000	0.3593	
18 1-Methylnaphthalene	142	5.720	5.720	0.000	94	269		0.004010	7M
D 20 2,6-Dimethylnaphthalene-d12	168	6.113	6.109	0.004	100	30226	0.5000	0.3537	
21 2,6-Dimethylnaphthalene	156	6.150	6.150	0.005	75	88		0.001214	7M
D 22 2,4-Dinitrophenol-d3	187	6.311	6.311	0.000	11	44		NC	
D 23 Acenaphthylene-d8	160	6.366	6.366	0.000	58	42619	0.5000	0.3271	
24 Acenaphthylene	152	6.376	6.376	-0.001	40	78		0.000778	7M
25 2,4-Dinitrophenol	184	6.422	6.402	0.020	1	8		NC	
* 26 Acenaphthene-d10	164	6.497	6.492	0.005	98	42347	0.5000	0.5000	
27 Acenaphthene	154	6.517	6.517	0.000	49	148		0.002306	M
D 29 Fluorene -d10	176	6.925	6.925	0.000	100	36690	0.5000	0.3636	
30 Fluorene	166	6.950	6.945	0.005	72	220		0.002308	7M
D 33 Dibenzothiophene-d8	192	7.635	7.628	0.007	99	16316	0.5000	0.0714	
34 Dibenzothiophene	184	7.648	7.645	0.003	12	136		0.003983	
D 35 Phenanthrene-d10	188	7.735	7.728	0.007	99	63762	0.5000	0.3139	
D 38 Anthracin-d10	188	7.783	7.783	0.007	99	60065	0.5000	0.3029	

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
39 Anthracene	178	7.797	7.794	0.003	68	189		0.001278	7M
D 41 Fluoranthene-d10	212	8.808	8.808	0.000	100	96292	0.5000	0.3654	
42 13C6-Fluoranthene (PRC)	208	8.808	8.825	-0.017	4	15530		0.0561	
43 Fluoranthene	202	8.828	8.822	0.003	33	695		0.002821	7M
* 44 Pyrene-d10 (IS)	212	9.027	9.027	0.000	99	130263	0.5000	0.5000	
$ 46 Terphenyl-d14	244	9.195	9.188	0.007	51	77		NC	
D 48 Chrysene-d12	240	10.270	10.270	0.000	96	91390	0.5000	0.3596	
49 13C6-Chrysene (PRC)	234	10.270	10.270	-0.025	21	3063		0.0196	M
50 Chrysene	228	10.295	10.295	0.000	1	157		0.000590	7M
51 Bis(2-ethylhexyl) phthalate	149	10.275	10.299	-0.024	8	763		NC	
D 52 Benzo(b)fluoranthene-d12	264	11.376	11.369	0.007	100	83810	0.5000	0.4130	
53 Benzo[b]fluoranthene	252	11.397	11.397	0.000	1	529		0.001873	7M
D 54 Benzo(k)fluoranthene-d12	264	11.404	11.404	0.000	56	93994	0.5000	0.3943	M
55 Benzo[k]fluoranthene	252	11.432	11.425	0.007	19	140		0.000508	7M
* 56 Benzo(e)pyrene-d12	264	11.684	11.684	0.000	99	80127	0.5000	0.5000	
57 Benzo[e]pyrene	252	11.712	11.712	0.000	63	117		0.000559	7M
D 58 Benzo(a)pyrene-d12	264	11.747	11.747	0.000	100	62141	0.5000	0.3492	
59 Benzo[a]pyrene	252	11.782	11.782	0.007	1	206		0.001002	7M
D 60 Perylene-d12	264	11.845	11.845	0.000	100	65256	0.5000	0.3304	
61 Perylene	252	11.873	11.866	0.000	17	55		0.000295	7M
D 62 Indeno[1,2,3-cd]pyrene-d12	288	13.186	13.186	0.000	81	82995	0.5000	0.4293	
D 63 Dibenz(a,h)anthracene-d14	292	13.195	13.196	-0.001	87	70350	0.5000	0.4067	
64 13C6-Indeno(1,2,3-cd)pyrene (PRC	282	13.205	13.205	-0.009	1	426		0.001934	7M
65 Indeno[1,2,3-cd]pyrene	276	13.205	13.196	-0.009	1	184		0.000662	7M
D 67 Benzo(ghi)perylene-d12	288	13.543	13.543	0.000	100	85389	0.5000	0.4447	
68 Benzo[g,h,i]perylene	276	13.561	13.580	-0.019	7	199		0.000796	7M
69 Dibenzo(def,p)chrysene	302	14.922	14.922	0.000	27	19		NC	
70 Dibenzo[a,e]pyrene	302	15.391	15.382	0.009	24	631		NC	
D 71 Coronene-d12	312	15.382	15.382	0.000	66	60012	NC	NC	
72 Dibenz(a,i)pyrene	302	15.551	15.570	-0.019	1	21		NC	
73 Dibenzo[a,h]pyrene	302	15.664	15.654	0.010	1	12		NC	
* 82 PCB-167L	372	10.023	10.027	-0.004	72	21187	0.4000	0.4000	

QC Flag Legend

Processing Flags

NC - Not Calibrated

7 - Failed Limit of Detection

Review Flags

M - Manually Integrated

Reagents:

60ISPCB_00001 Amount Added: 5.00 Units: uL

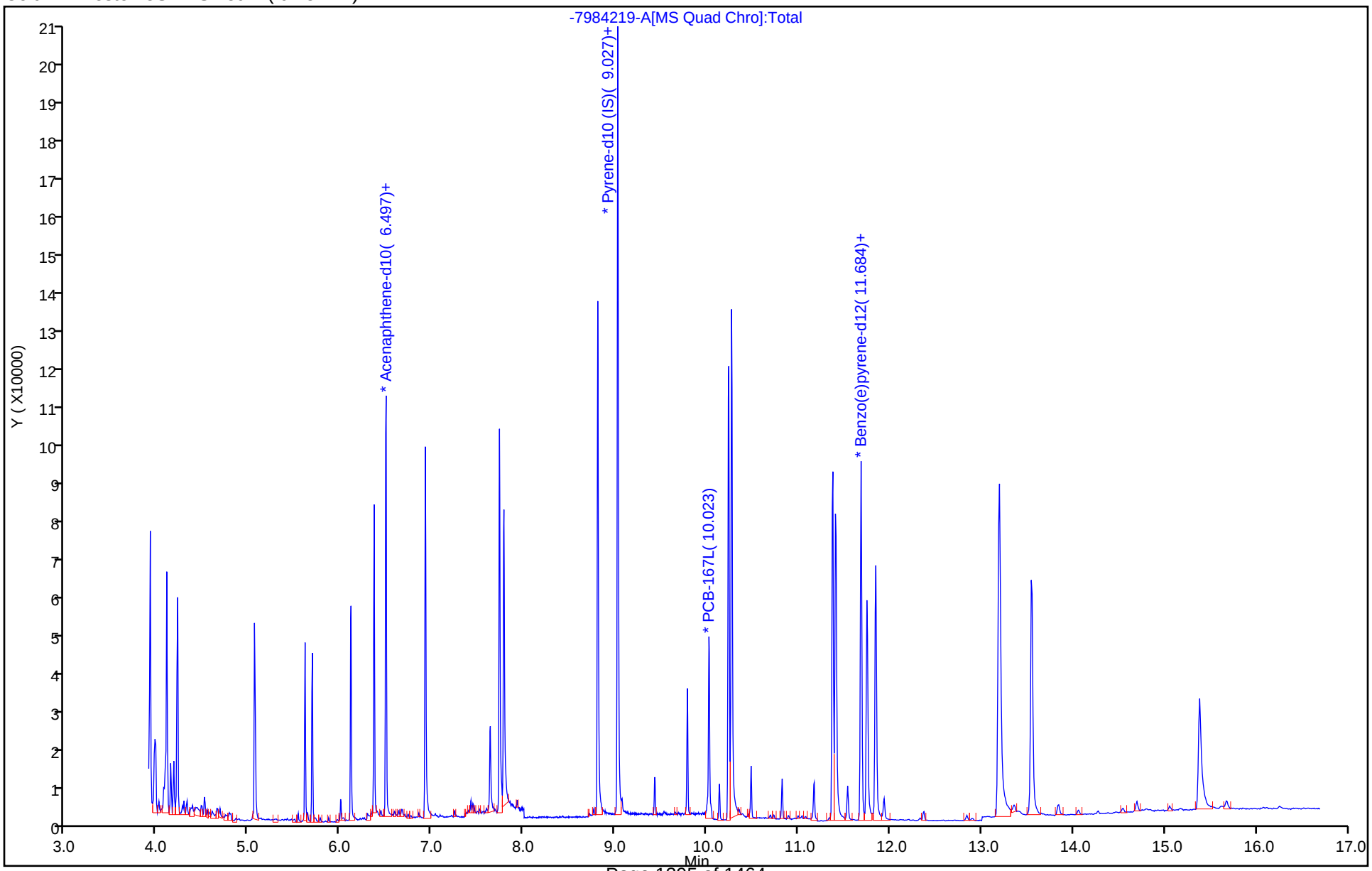
Report Date: 16-Nov-2023 15:51:06 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\MB 140-7984219-A.D

Injection Date:	13-Nov-2023 20:58:44	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	MB 140-79842/19-A			Worklist Smp#:	28
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



Report Date: 16-Nov-2023 15:51:07 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\MB 140-7984219-A.D

Injection Date: 13-Nov-2023 20:58:44 Instrument ID: GCMS1

Lims ID: MB 140-79842/19-A

Client ID:

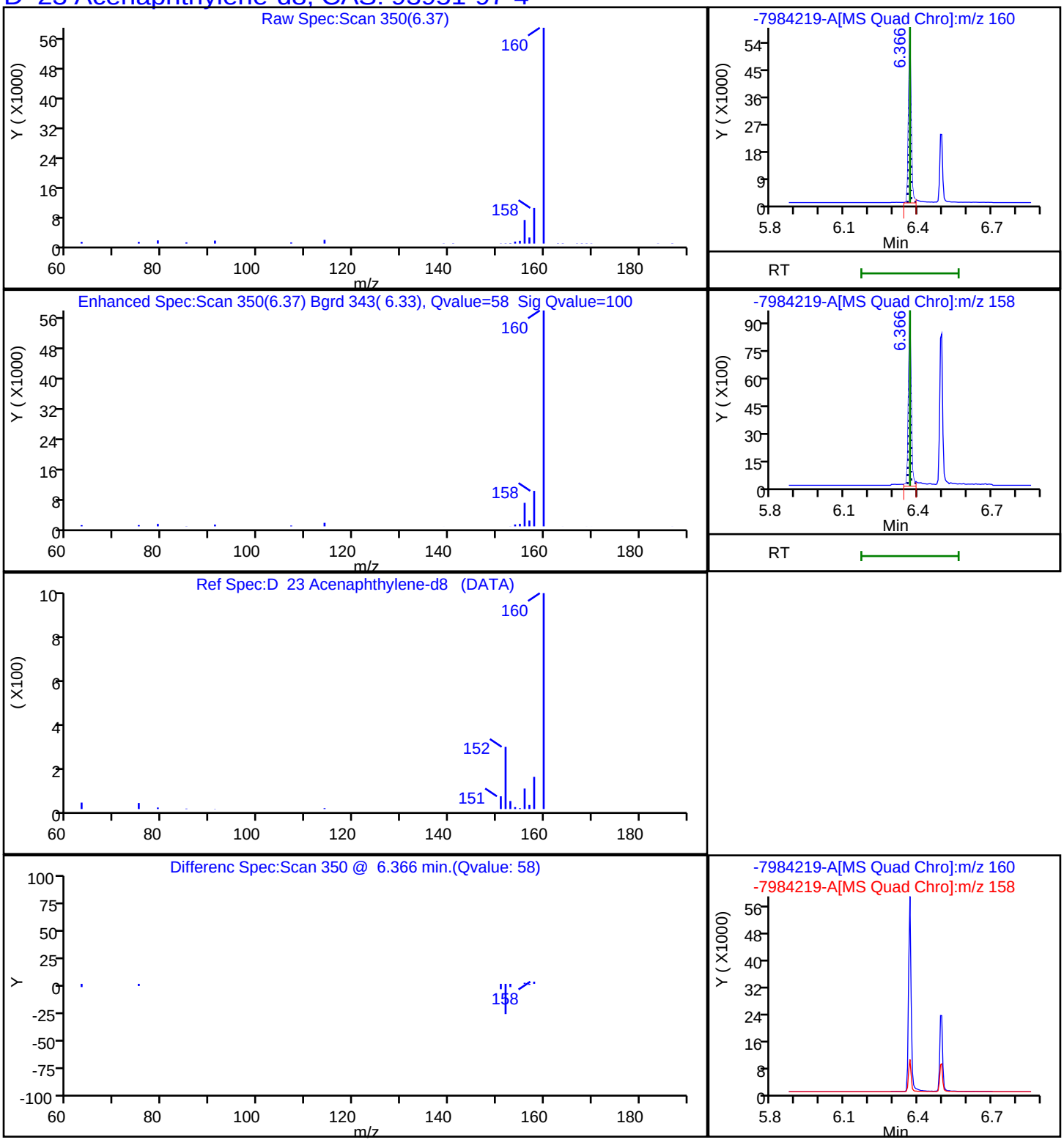
Operator ID: TAI\knxinstgcms1 ALS Bottle#: 0 Worklist Smp#: 28

Injection Vol: 1.0 ul Dil. Factor: 1.0000

Method: SIM_PAH_GCMS1 Limit Group: SOG - PAH IsoDil - ICAL

Column: Restek-5Sil MS 25um (0.25 mm) Detector MS SCAN

D 23 Acenaphthylene-d8, CAS: 93951-97-4



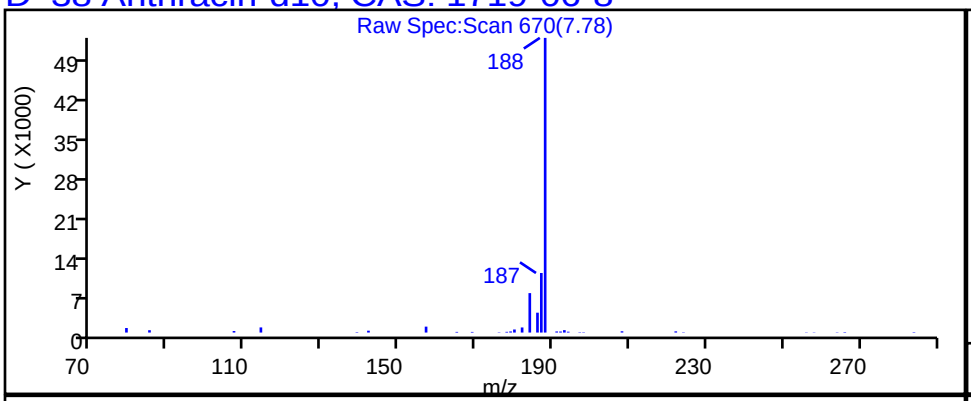
Report Date: 16-Nov-2023 15:51:07 Chrom Revision: 2.3 15-Nov-2023 20:54:34

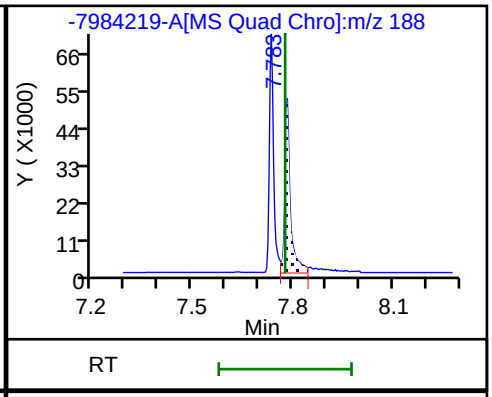
Eurofins Knoxville

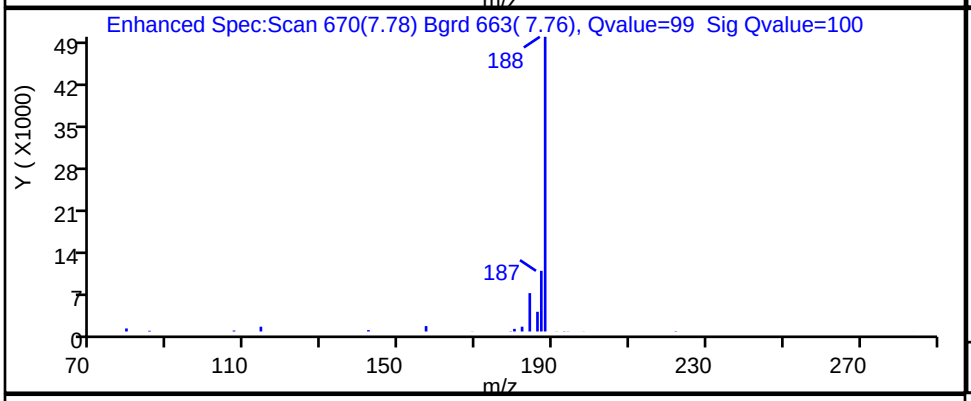
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\MB 140-7984219-A.D

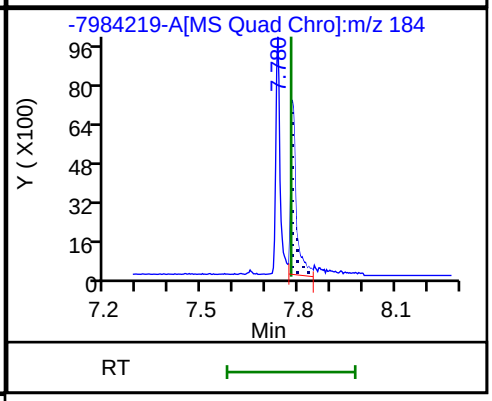
Injection Date:	13-Nov-2023 20:58:44	Instrument ID:	GCMS1		
Lims ID:	MB 140-79842/19-A				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	28
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

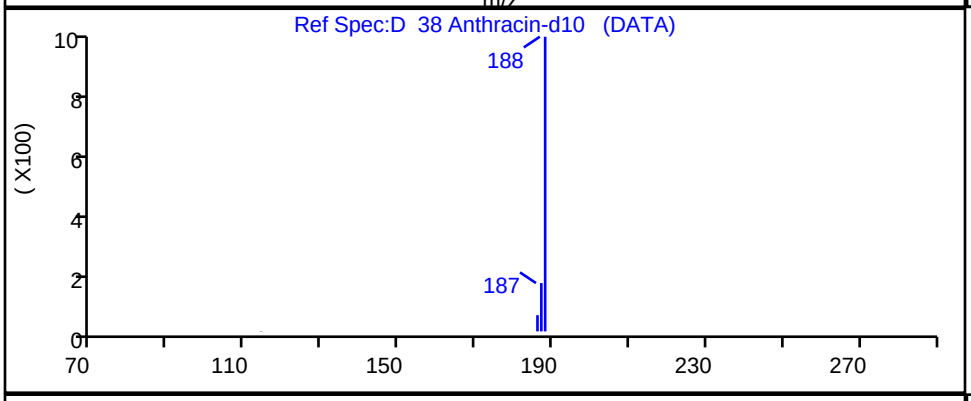
D 38 Anthracin-d10, CAS: 1719-06-8

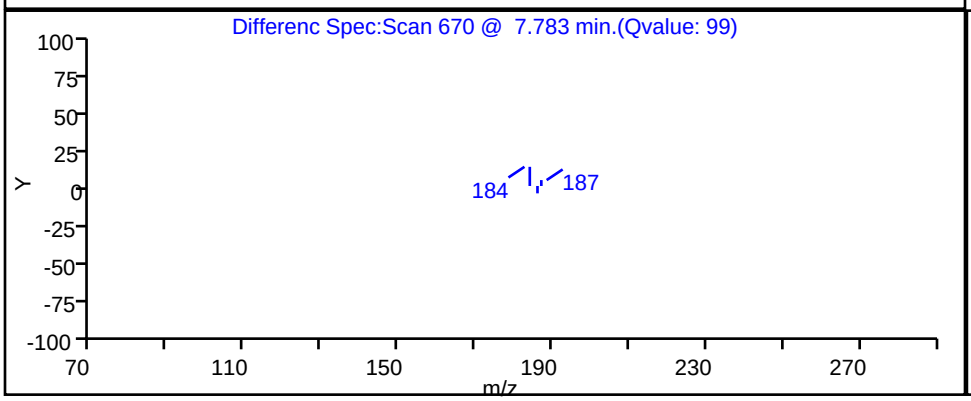


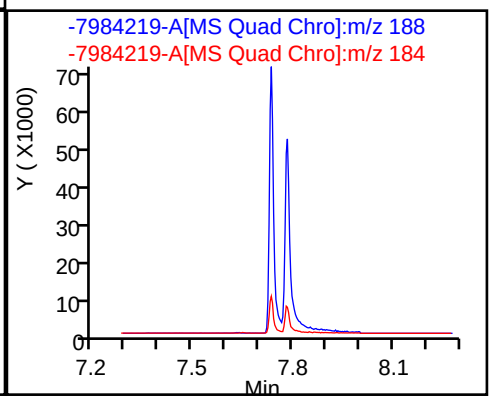












Report Date: 16-Nov-2023 15:51:08 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\MB 140-7984219-A.D

Injection Date: 13-Nov-2023 20:58:44 Instrument ID: GCMS1

Lims ID: MB 140-79842/19-A

Client ID:

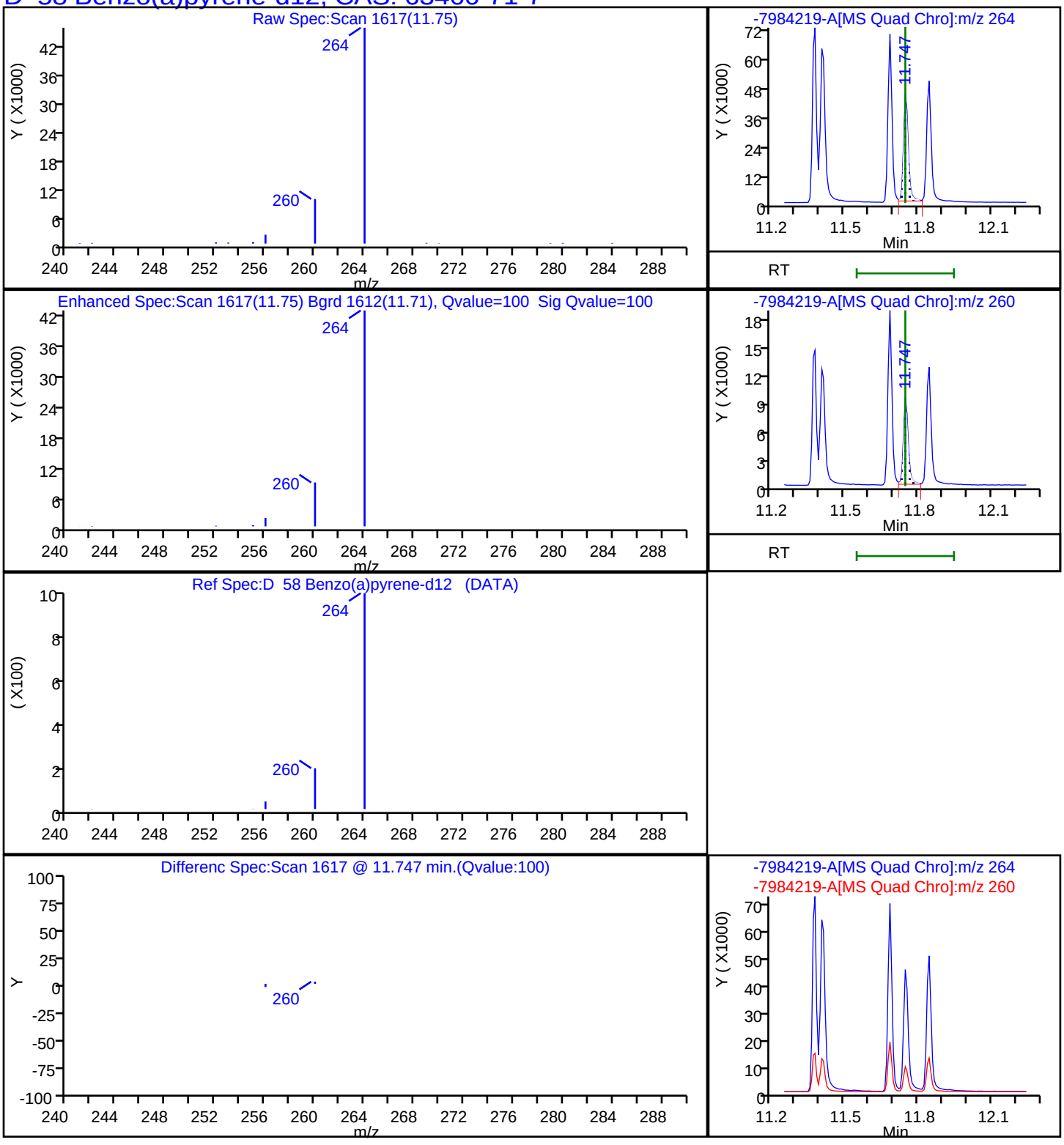
Operator ID: TAI\knxinstgcms1 ALS Bottle#: 0 Worklist Smp#: 28

Injection Vol: 1.0 ul Dil. Factor: 1.0000

Method: SIM_PAH_GCMS1 Limit Group: SOG - PAH IsoDil - ICAL

Column: Restek-5Sil MS 25um (0.25 mm) Detector MS SCAN

D 58 Benzo(a)pyrene-d12, CAS: 63466-71-7



Report Date: 16-Nov-2023 15:51:08 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\MB 140-7984219-A.D

Injection Date: 13-Nov-2023 20:58:44 Instrument ID: GCMS1

Lims ID: MB 140-79842/19-A

Client ID:

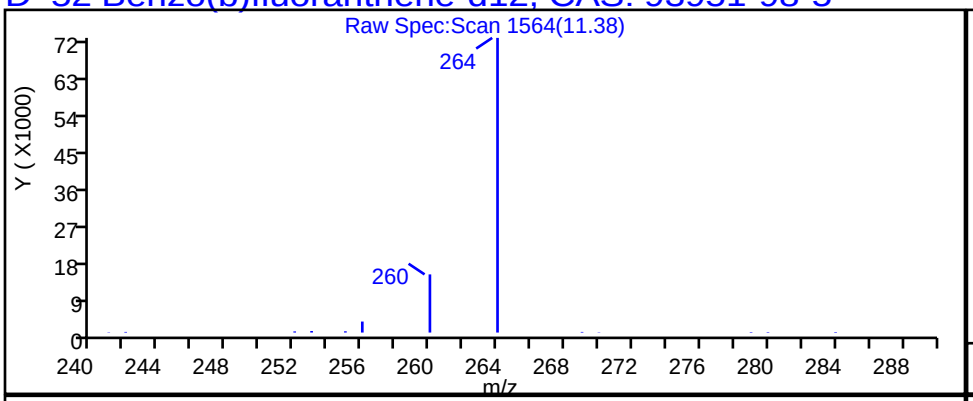
Operator ID: TAI\knxinstgcms1 ALS Bottle#: 0 Worklist Smp#: 28

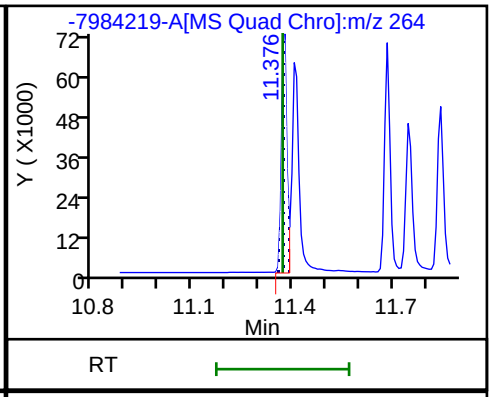
Injection Vol: 1.0 ul Dil. Factor: 1.0000

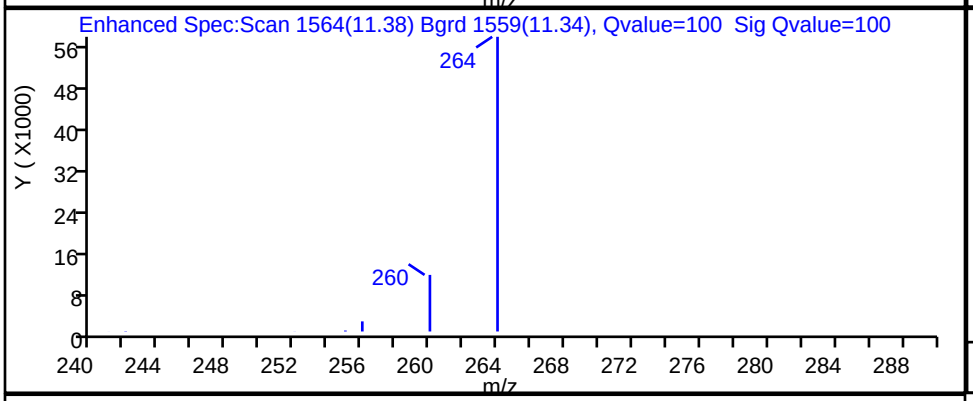
Method: SIM_PAH_GCMS1 Limit Group: SOG - PAH IsoDil - ICAL

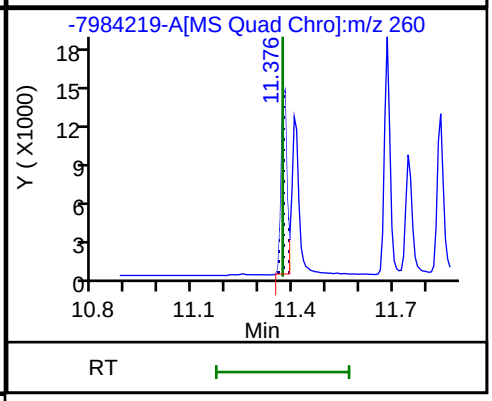
Column: Restek-5Sil MS 25um (0.25 mm) Detector MS SCAN

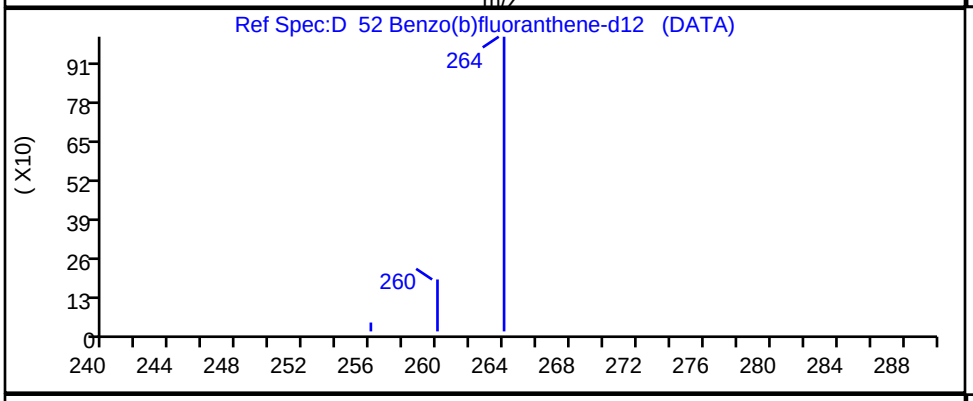
D 52 Benzo(b)fluoranthene-d12, CAS: 93951-98-5

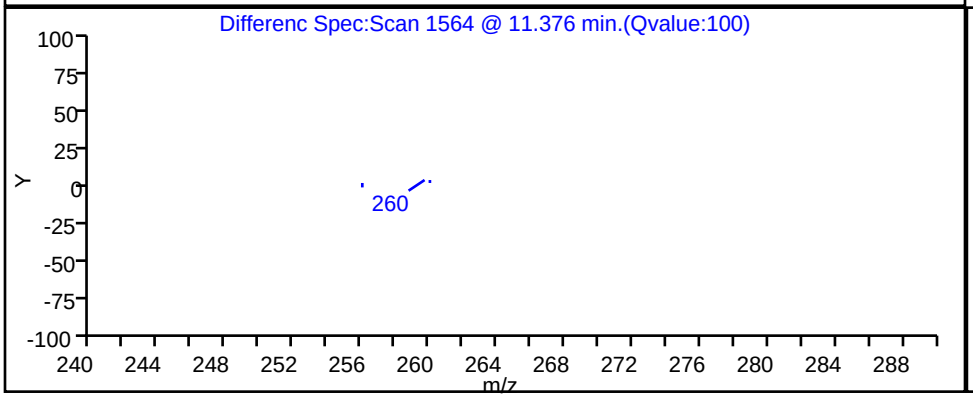


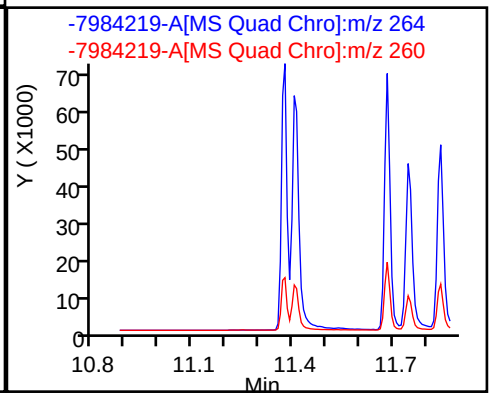












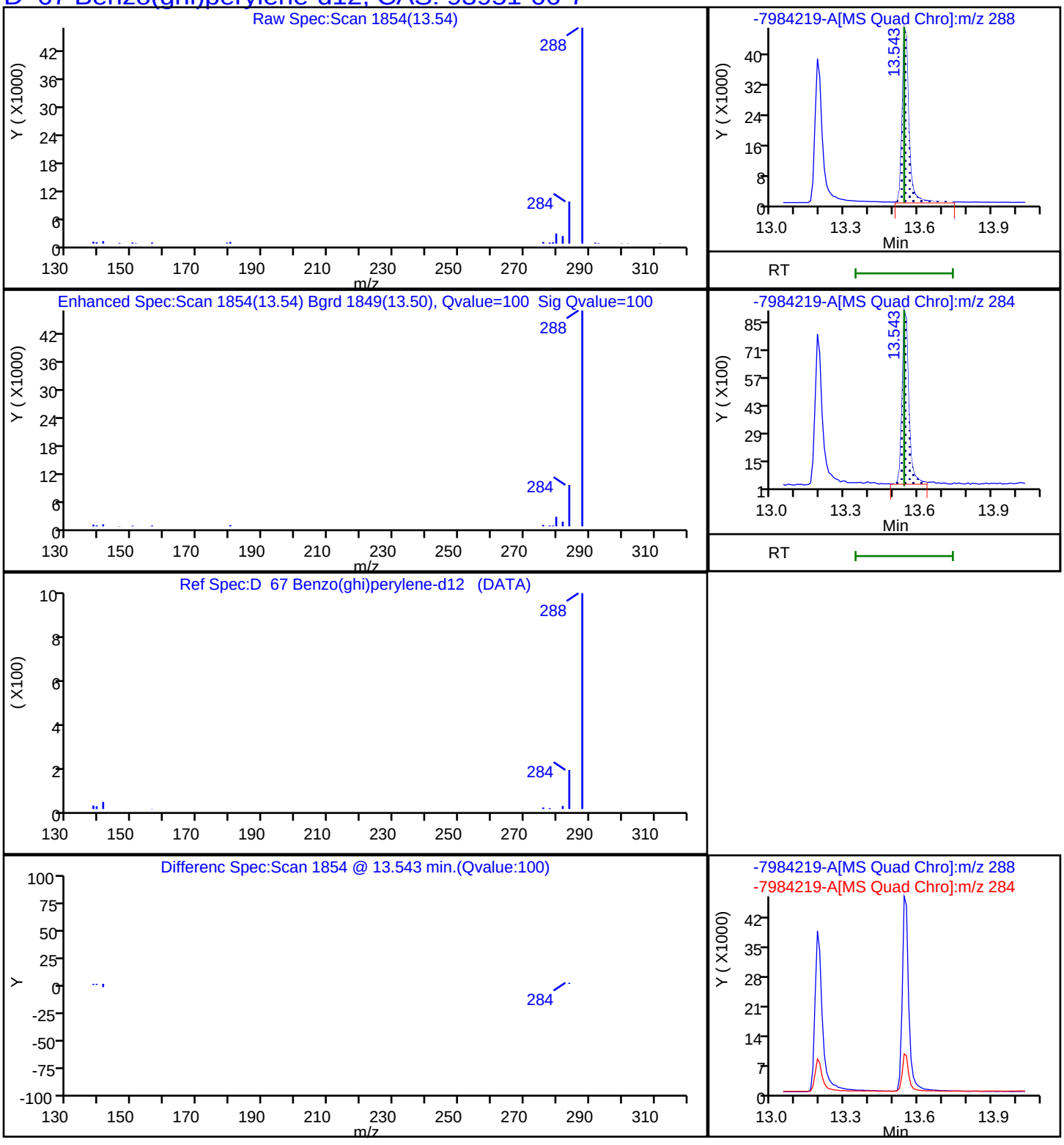
Report Date: 16-Nov-2023 15:51:08 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\MB 140-7984219-A.D

Injection Date:	13-Nov-2023 20:58:44	Instrument ID:	GCMS1		
Lims ID:	MB 140-79842/19-A				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	28
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D_67 Benzo(ghi)perylene-d12, CAS: 93951-66-7



Report Date: 16-Nov-2023 15:51:08 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\MB 140-7984219-A.D

Injection Date: 13-Nov-2023 20:58:44 Instrument ID: GCMS1

Lims ID: MB 140-79842/19-A

Client ID:

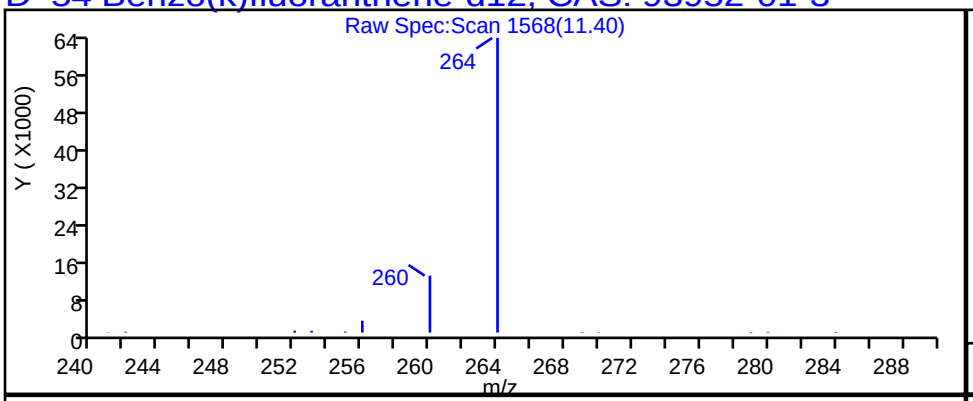
Operator ID: TAI\knxinstgcms1 ALS Bottle#: 0 Worklist Smp#: 28

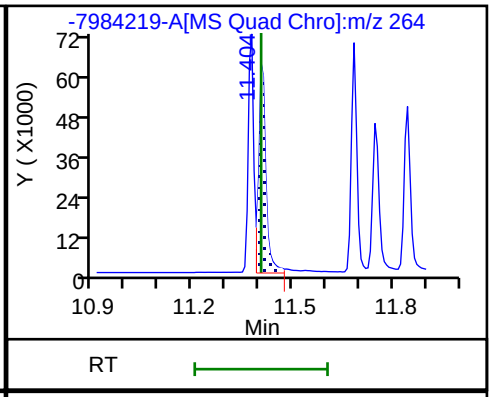
Injection Vol: 1.0 ul Dil. Factor: 1.0000

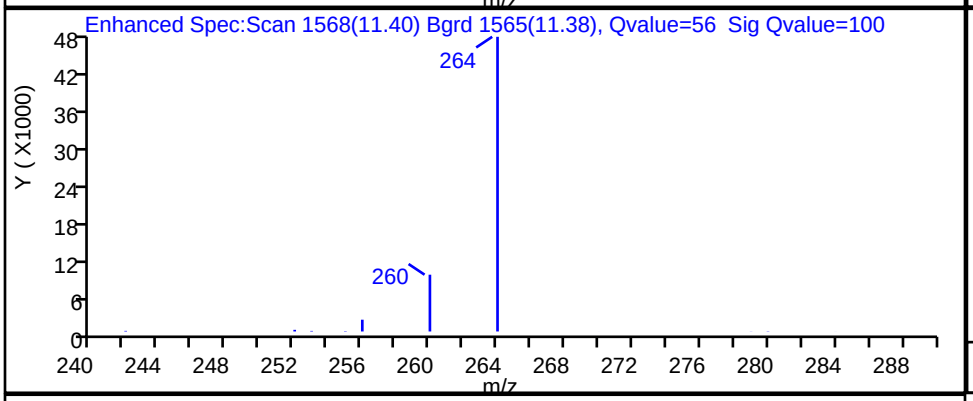
Method: SIM_PAH_GCMS1 Limit Group: SOG - PAH IsoDil - ICAL

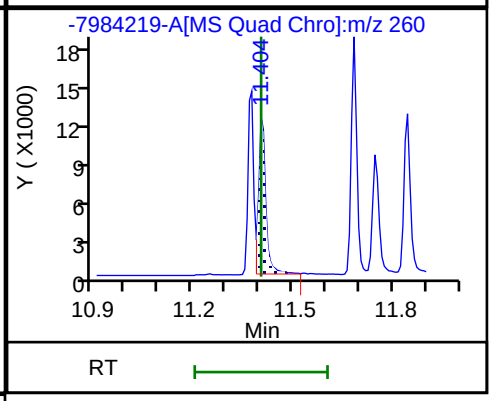
Column: Restek-5Sil MS 25um (0.25 mm) Detector MS SCAN

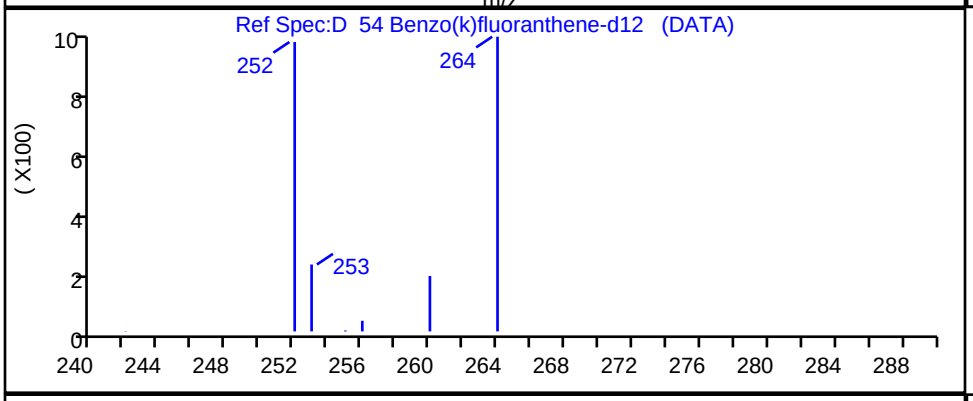
D 54 Benzo(k)fluoranthene-d12, CAS: 93952-01-3

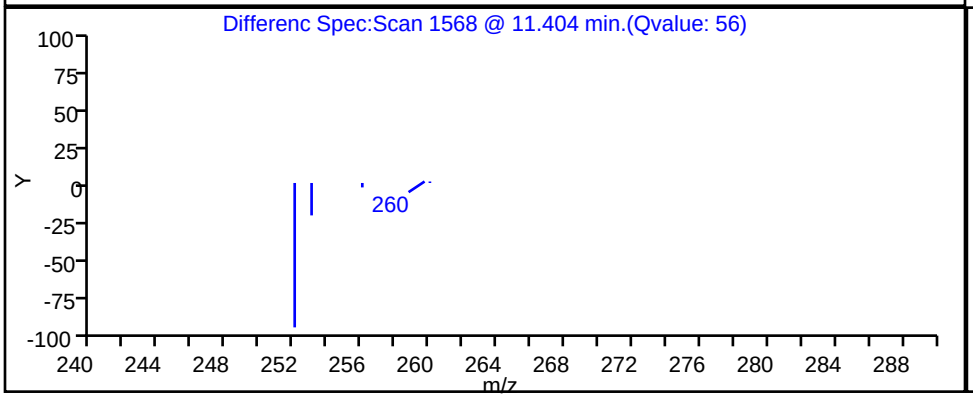


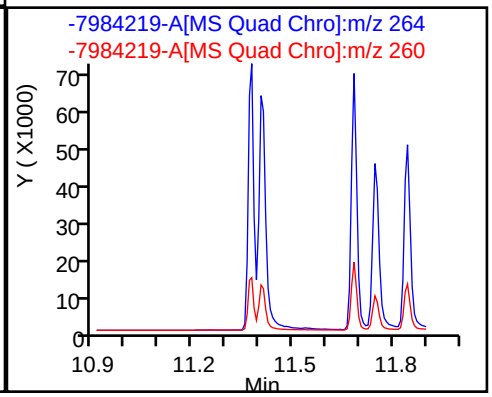












Report Date: 16-Nov-2023 15:51:07 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\MB 140-7984219-A.D

Injection Date: 13-Nov-2023 20:58:44 Instrument ID: GCMS1

Lims ID: MB 140-79842/19-A

Client ID:

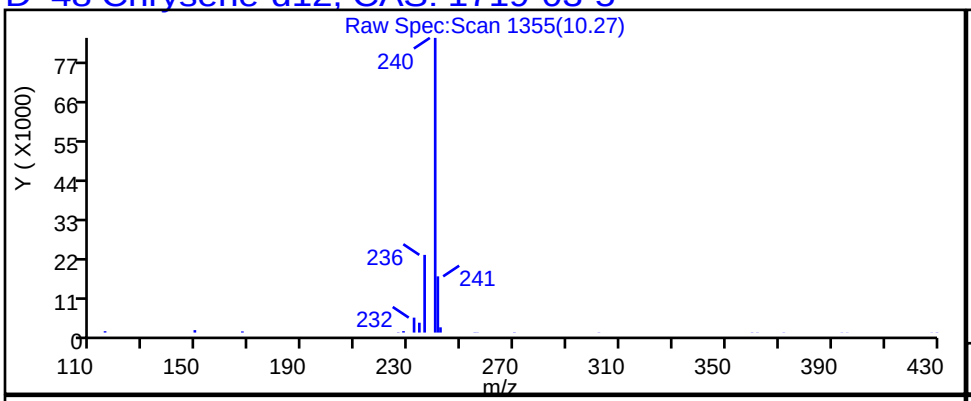
Operator ID: TAI\knxinstgcms1 ALS Bottle#: 0 Worklist Smp#: 28

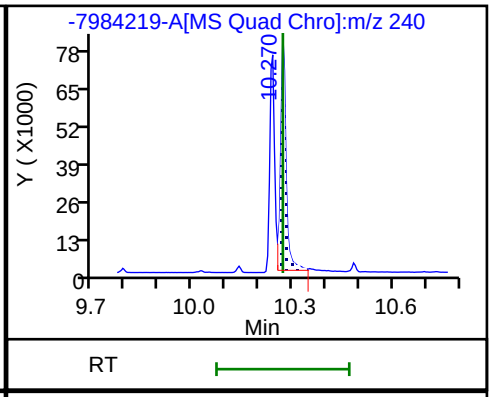
Injection Vol: 1.0 ul Dil. Factor: 1.0000

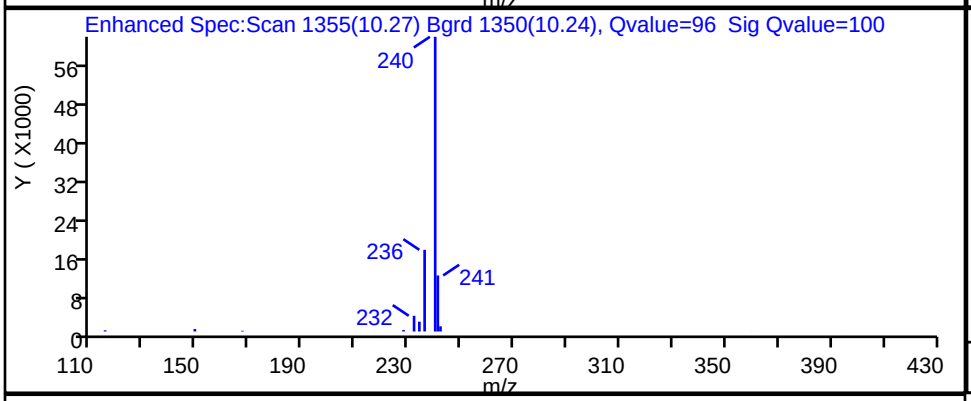
Method: SIM_PAH_GCMS1 Limit Group: SOG - PAH IsoDil - ICAL

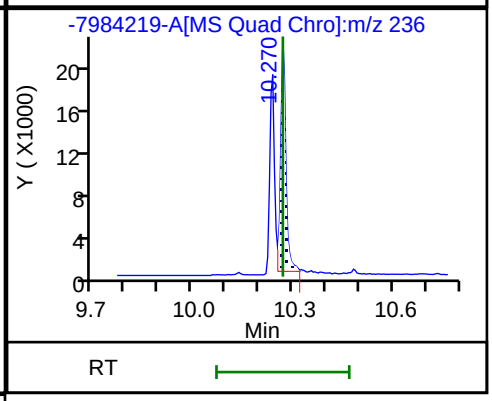
Column: Restek-5Sil MS 25um (0.25 mm) Detector MS SCAN

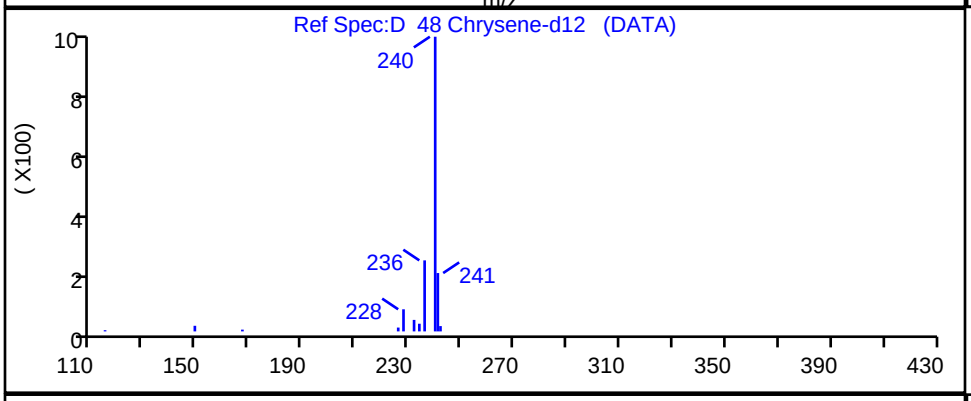
D 48 Chrysene-d12, CAS: 1719-03-5

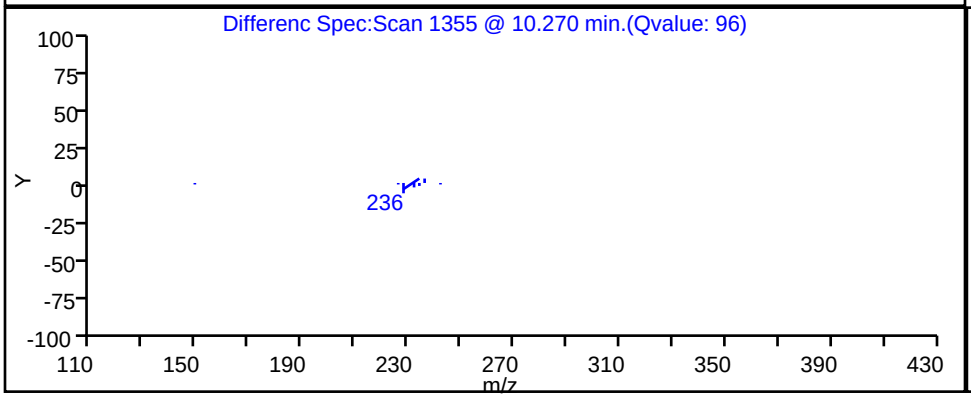


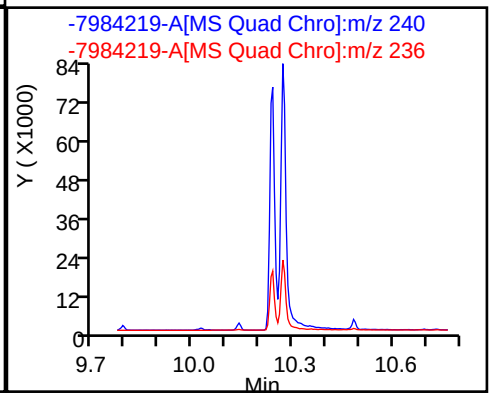












Report Date: 16-Nov-2023 15:51:08 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\MB 140-7984219-A.D

Injection Date: 13-Nov-2023 20:58:44 Instrument ID: GCMS1

Lims ID: MB 140-79842/19-A

Client ID:

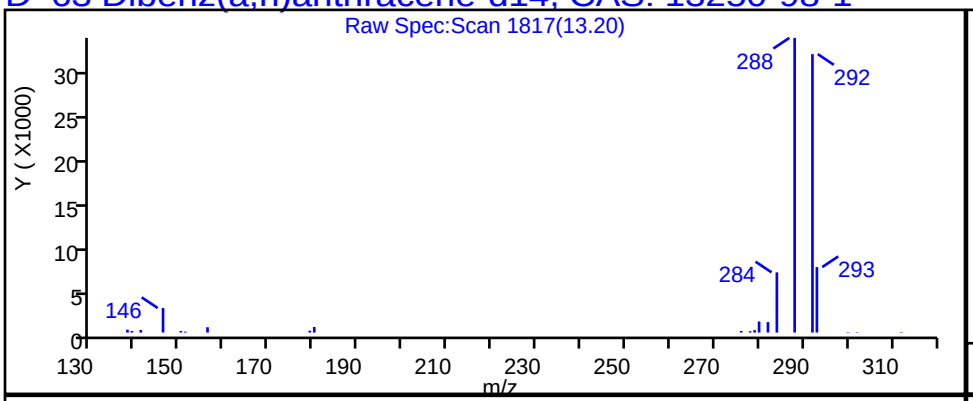
Operator ID: TAI\knxinstgcms1 ALS Bottle#: 0 Worklist Smp#: 28

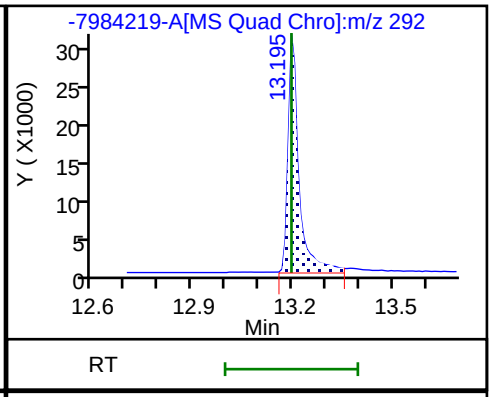
Injection Vol: 1.0 ul Dil. Factor: 1.0000

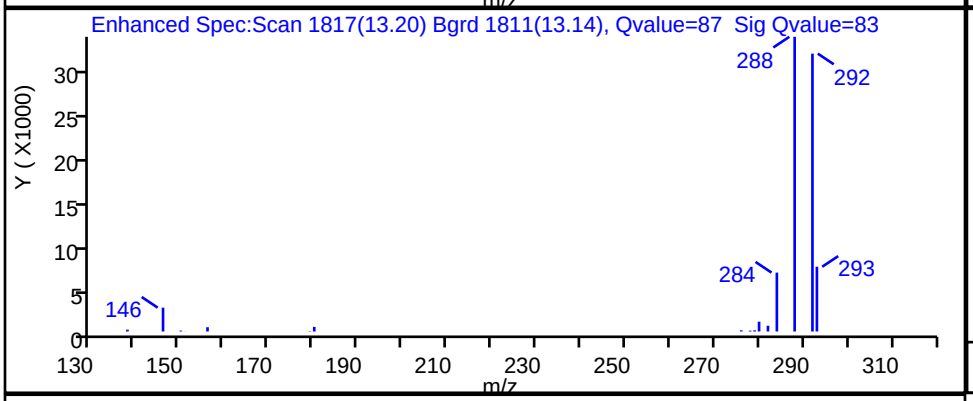
Method: SIM_PAH_GCMS1 Limit Group: SOG - PAH IsoDil - ICAL

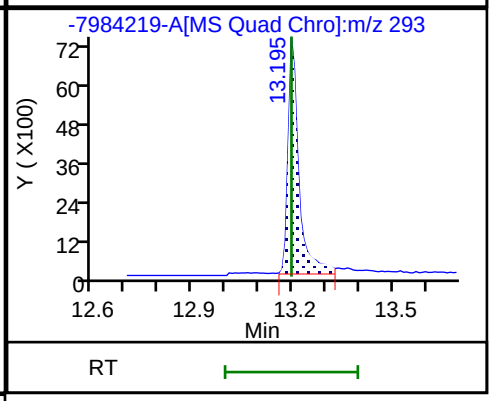
Column: Restek-5Sil MS 25um (0.25 mm) Detector MS SCAN

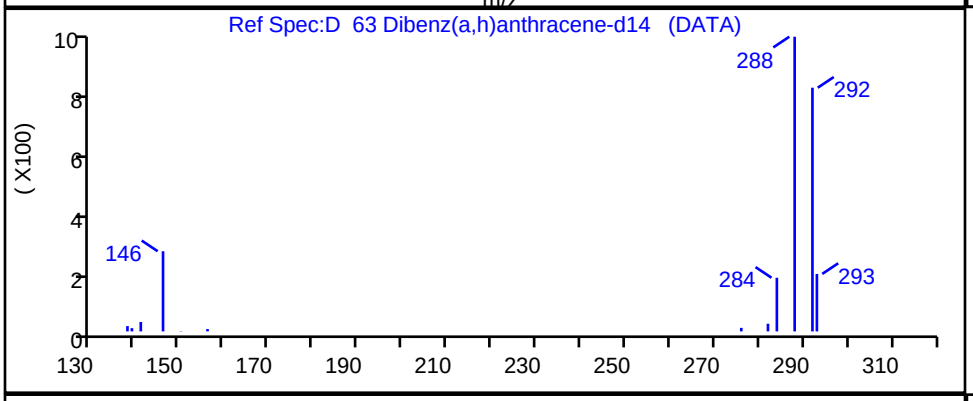
D_63 Dibenz(a,h)anthracene-d14, CAS: 13250-98-1

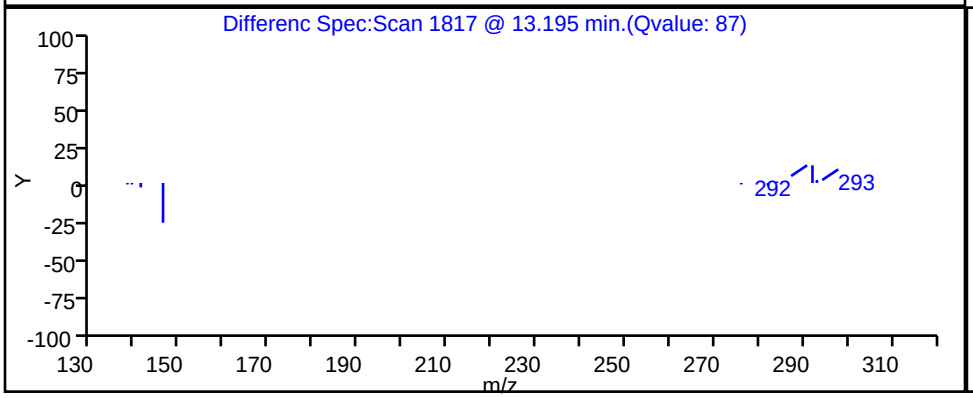


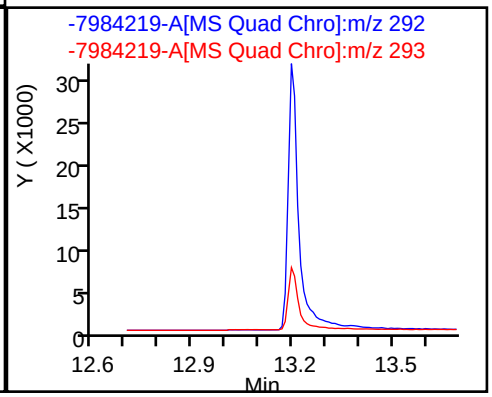












Report Date: 16-Nov-2023 15:51:07 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\MB 140-7984219-A.D

Injection Date: 13-Nov-2023 20:58:44 Instrument ID: GCMS1

Lims ID: MB 140-79842/19-A

Client ID:

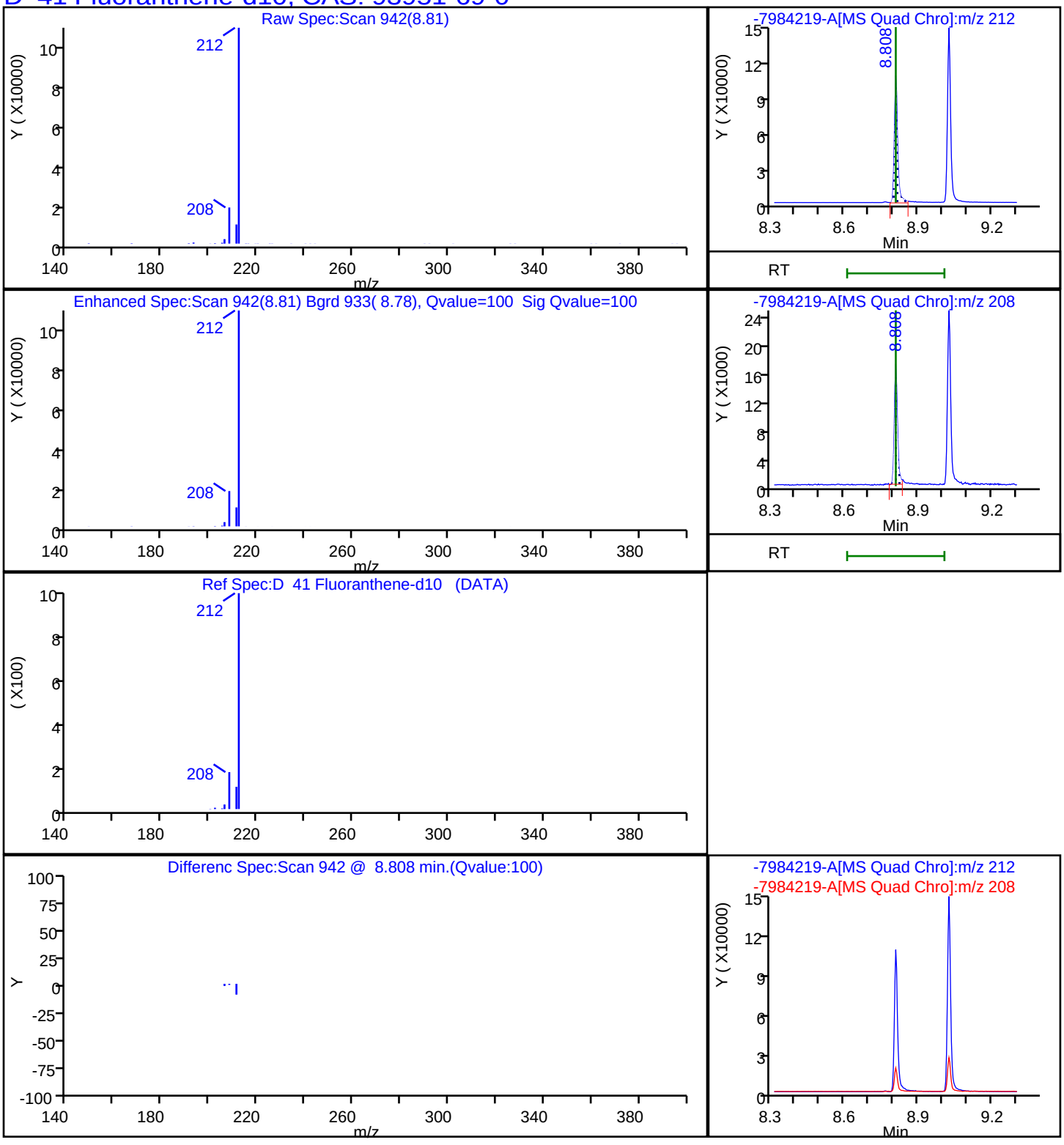
Operator ID: TAI\knxinstgcms1 ALS Bottle#: 0 Worklist Smp#: 28

Injection Vol: 1.0 ul Dil. Factor: 1.0000

Method: SIM_PAH_GCMS1 Limit Group: SOG - PAH IsoDil - ICAL

Column: Restek-5Sil MS 25um (0.25 mm) Detector MS SCAN

D 41 Fluoranthene-d10, CAS: 93951-69-0



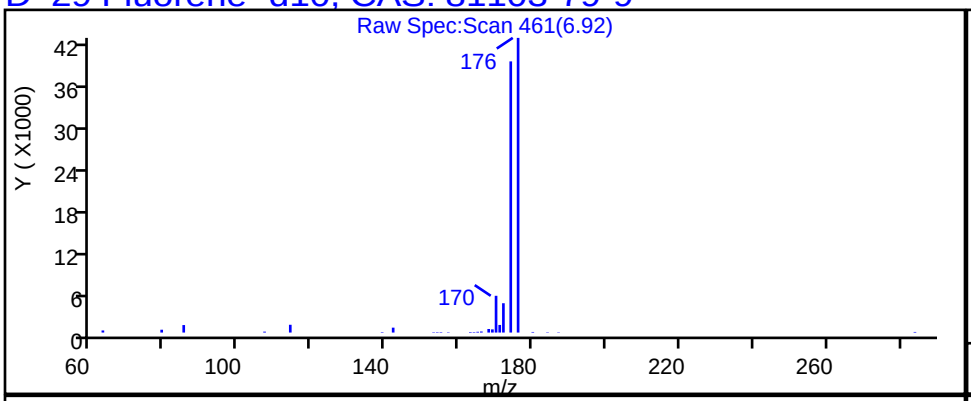
Report Date: 16-Nov-2023 15:51:07 Chrom Revision: 2.3 15-Nov-2023 20:54:34

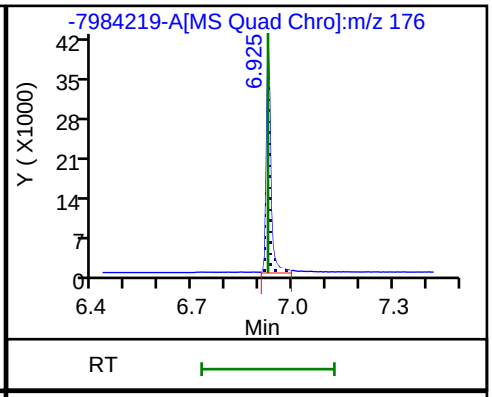
Eurofins Knoxville

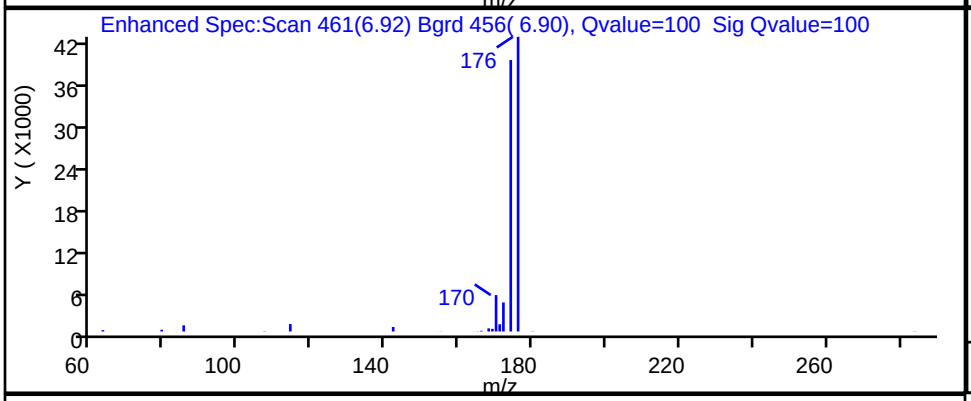
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\MB 140-7984219-A.D

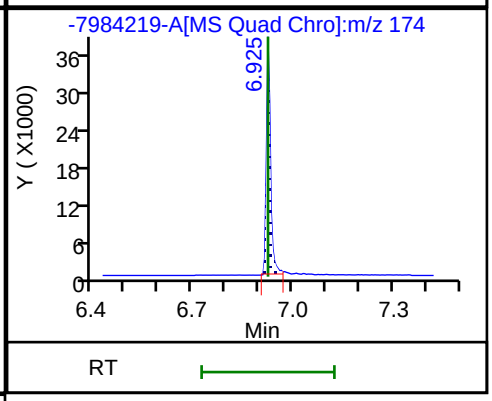
Injection Date:	13-Nov-2023 20:58:44	Instrument ID:	GCMS1		
Lims ID:	MB 140-79842/19-A				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	28
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

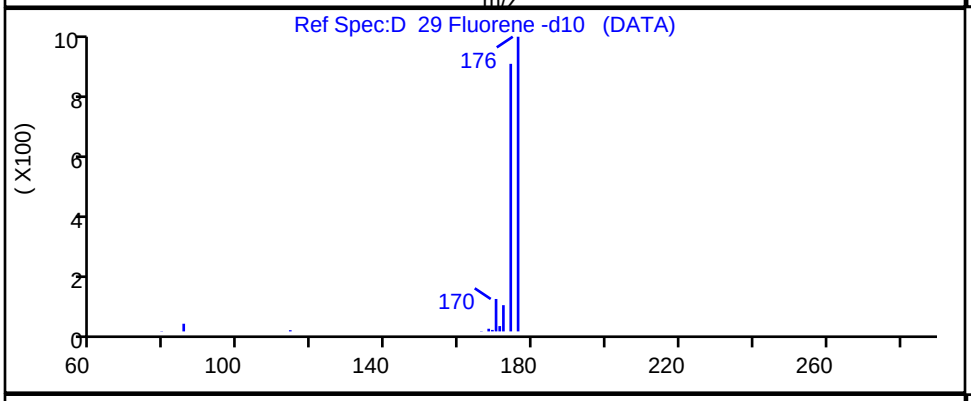
D 29 Fluorene -d10, CAS: 81103-79-9

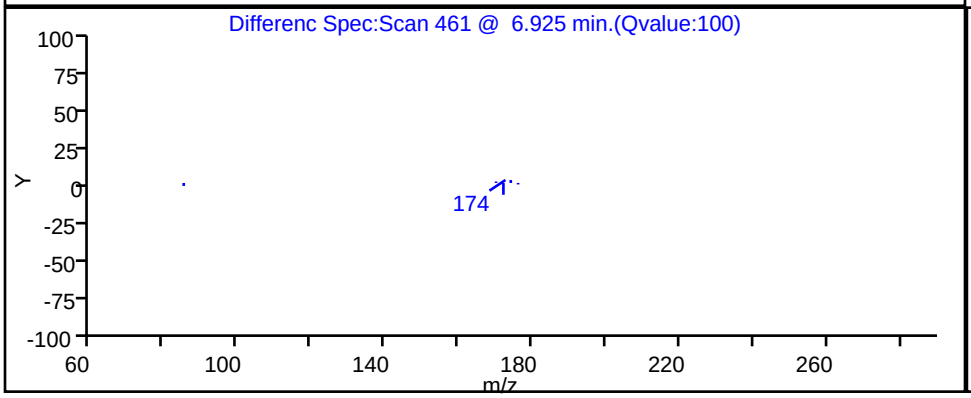


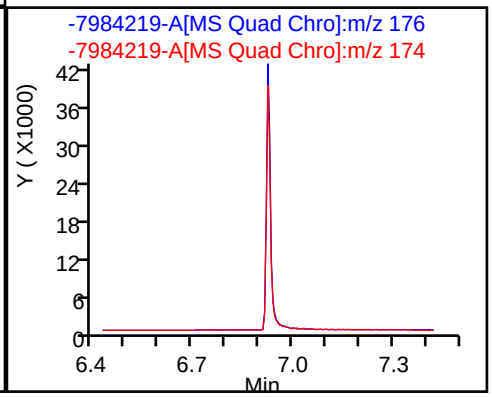












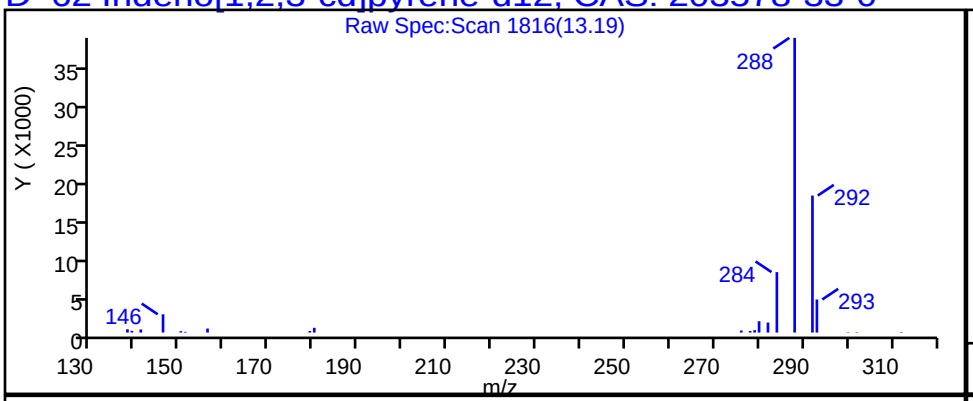
Report Date: 16-Nov-2023 15:51:08 Chrom Revision: 2.3 15-Nov-2023 20:54:34

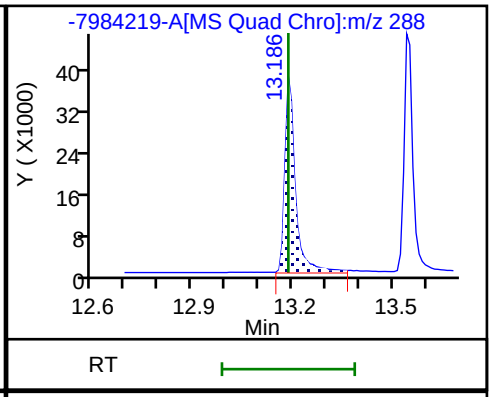
Eurofins Knoxville

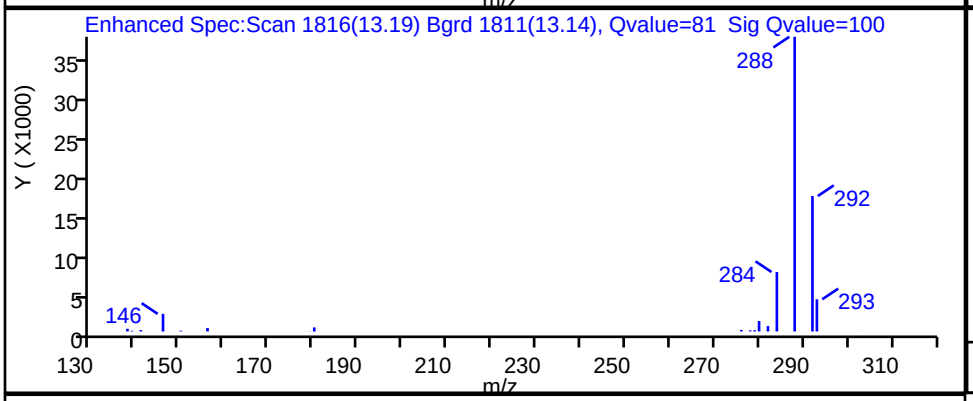
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\MB 140-7984219-A.D

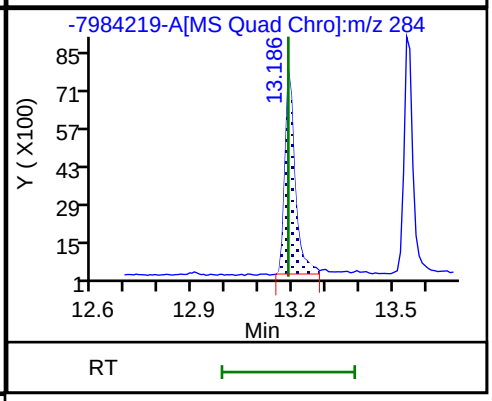
Injection Date:	13-Nov-2023 20:58:44	Instrument ID:	GCMS1		
Lims ID:	MB 140-79842/19-A				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	28
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

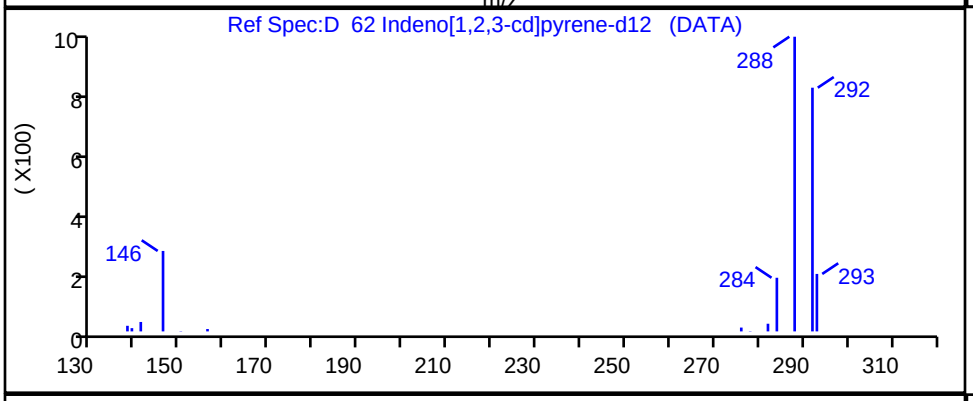
D 62 Indeno[1,2,3-cd]pyrene-d12, CAS: 203578-33-0

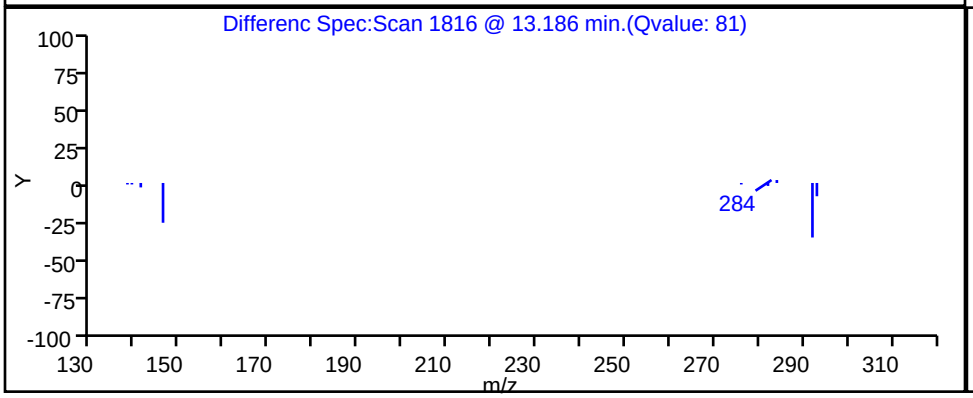


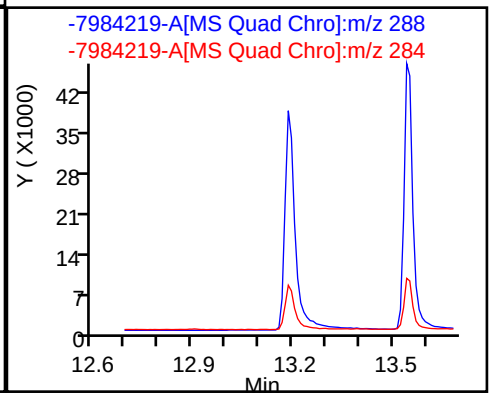












Report Date: 16-Nov-2023 15:51:07 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\MB 140-7984219-A.D

Injection Date: 13-Nov-2023 20:58:44 Instrument ID: GCMS1

Lims ID: MB 140-79842/19-A

Client ID:

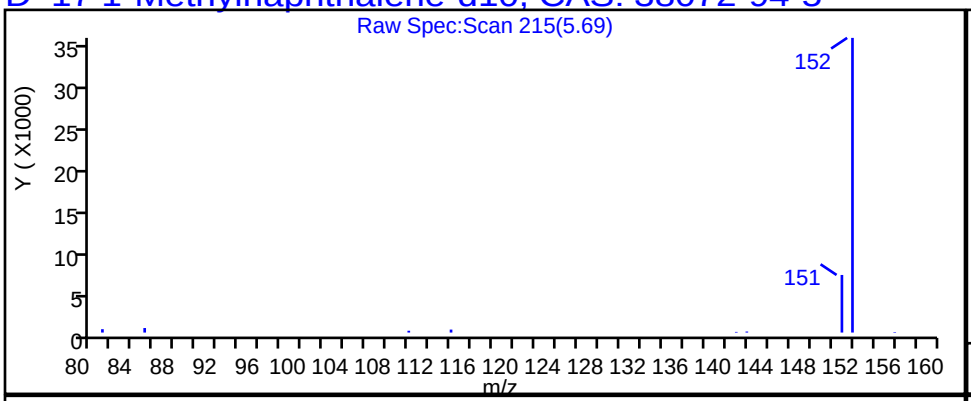
Operator ID: TAI\knxinstgcms1 ALS Bottle#: 0 Worklist Smp#: 28

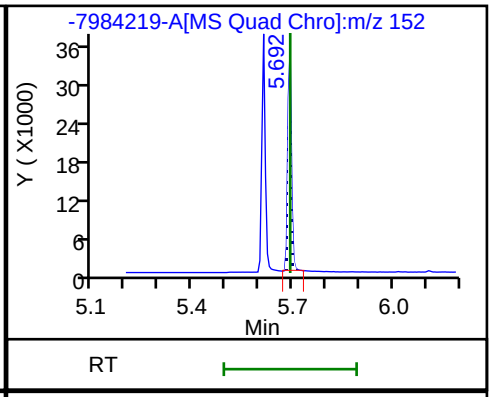
Injection Vol: 1.0 ul Dil. Factor: 1.0000

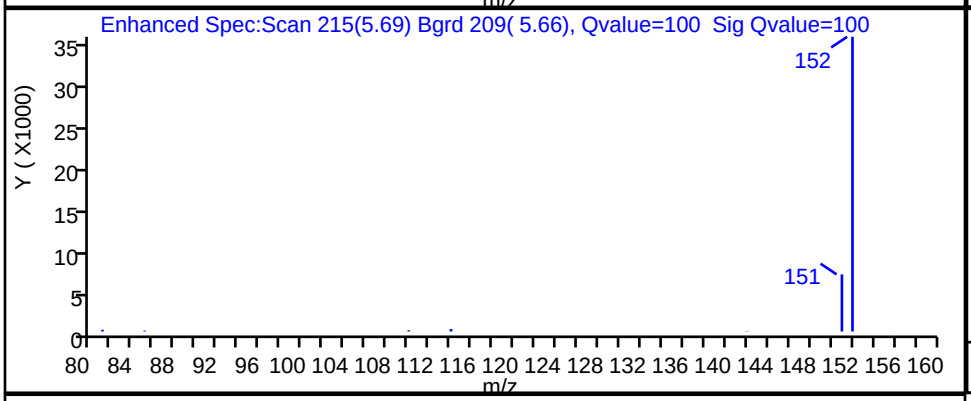
Method: SIM_PAH_GCMS1 Limit Group: SOG - PAH IsoDil - ICAL

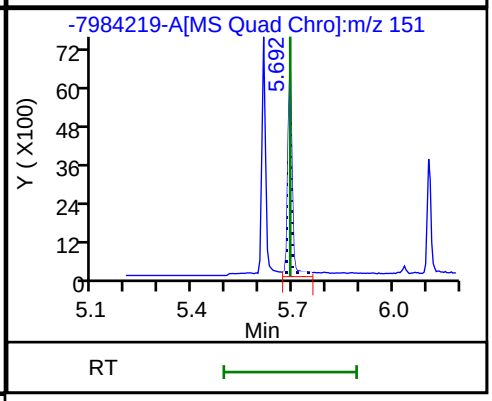
Column: Restek-5Sil MS 25um (0.25 mm) Detector MS SCAN

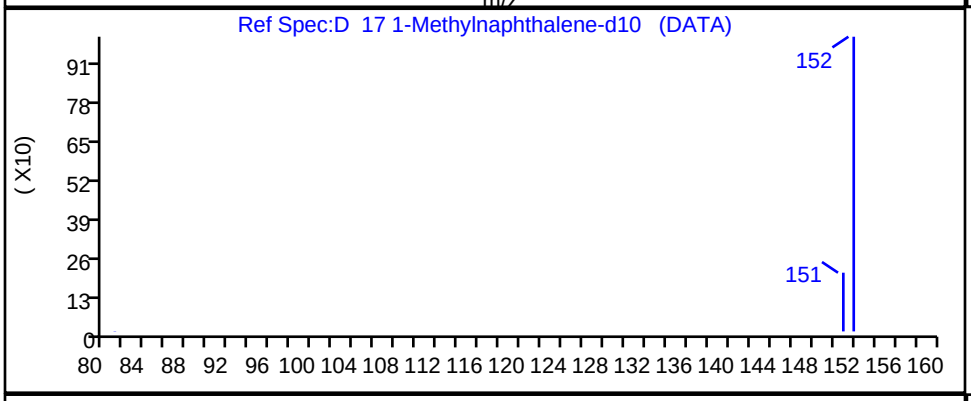
D 17 1-Methylnaphthalene-d10, CAS: 38072-94-5

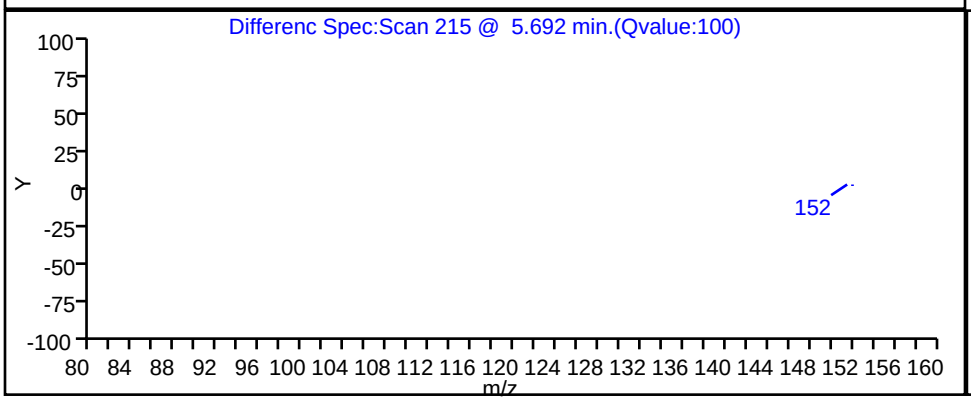


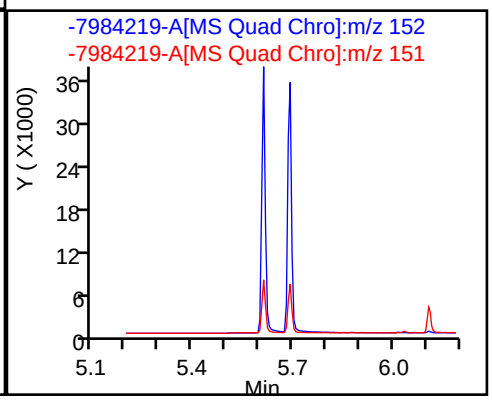












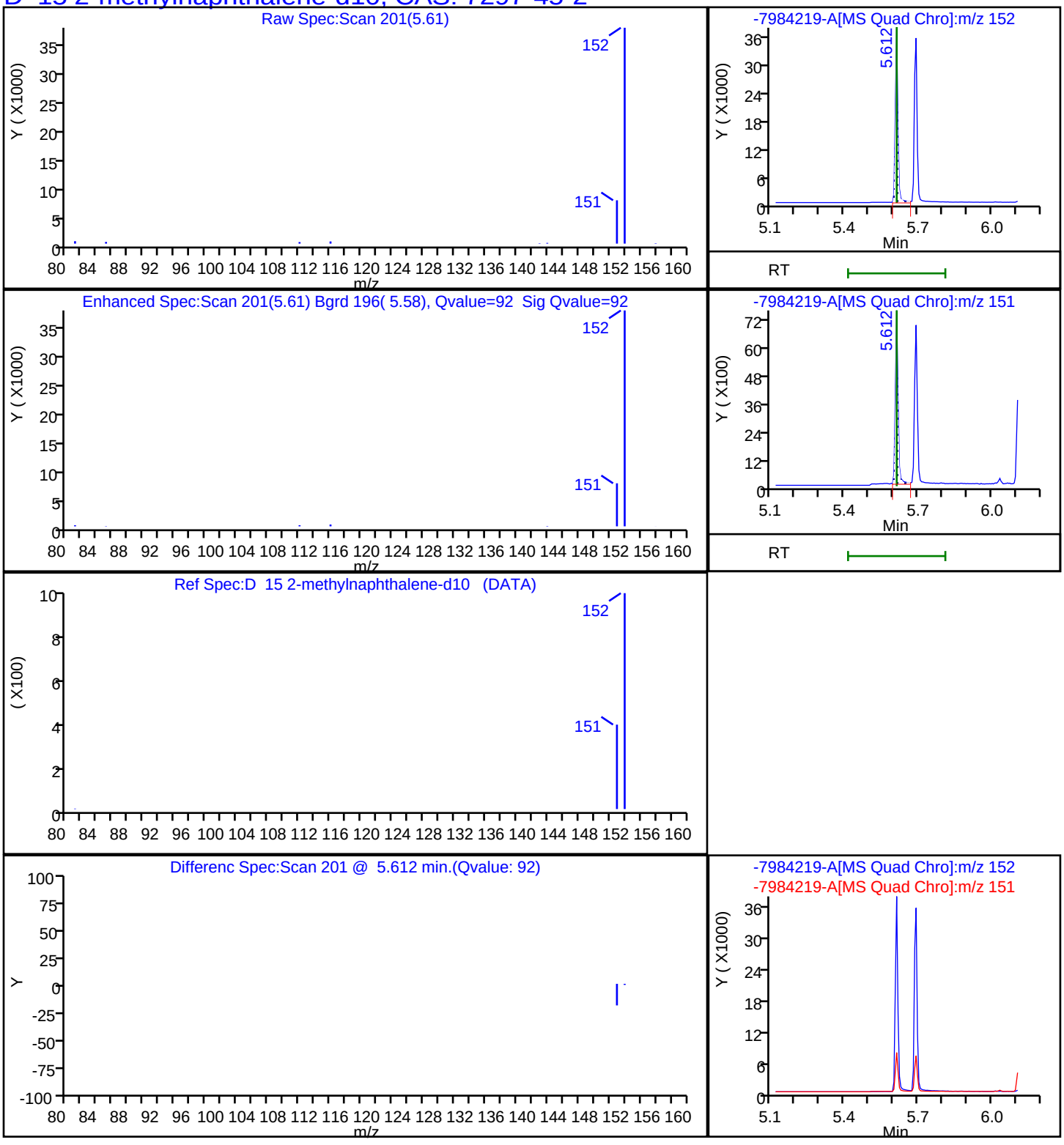
Report Date: 16-Nov-2023 15:51:07 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\MB 140-7984219-A.D

Injection Date:	13-Nov-2023 20:58:44	Instrument ID:	GCMS1		
Lims ID:	MB 140-79842/19-A				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	28
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 15 2-methylnaphthalene-d10, CAS: 7297-45-2



Report Date: 16-Nov-2023 15:51:06 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\MB 140-7984219-A.D

Injection Date: 13-Nov-2023 20:58:44 Instrument ID: GCMS1

Lims ID: MB 140-79842/19-A

Client ID:

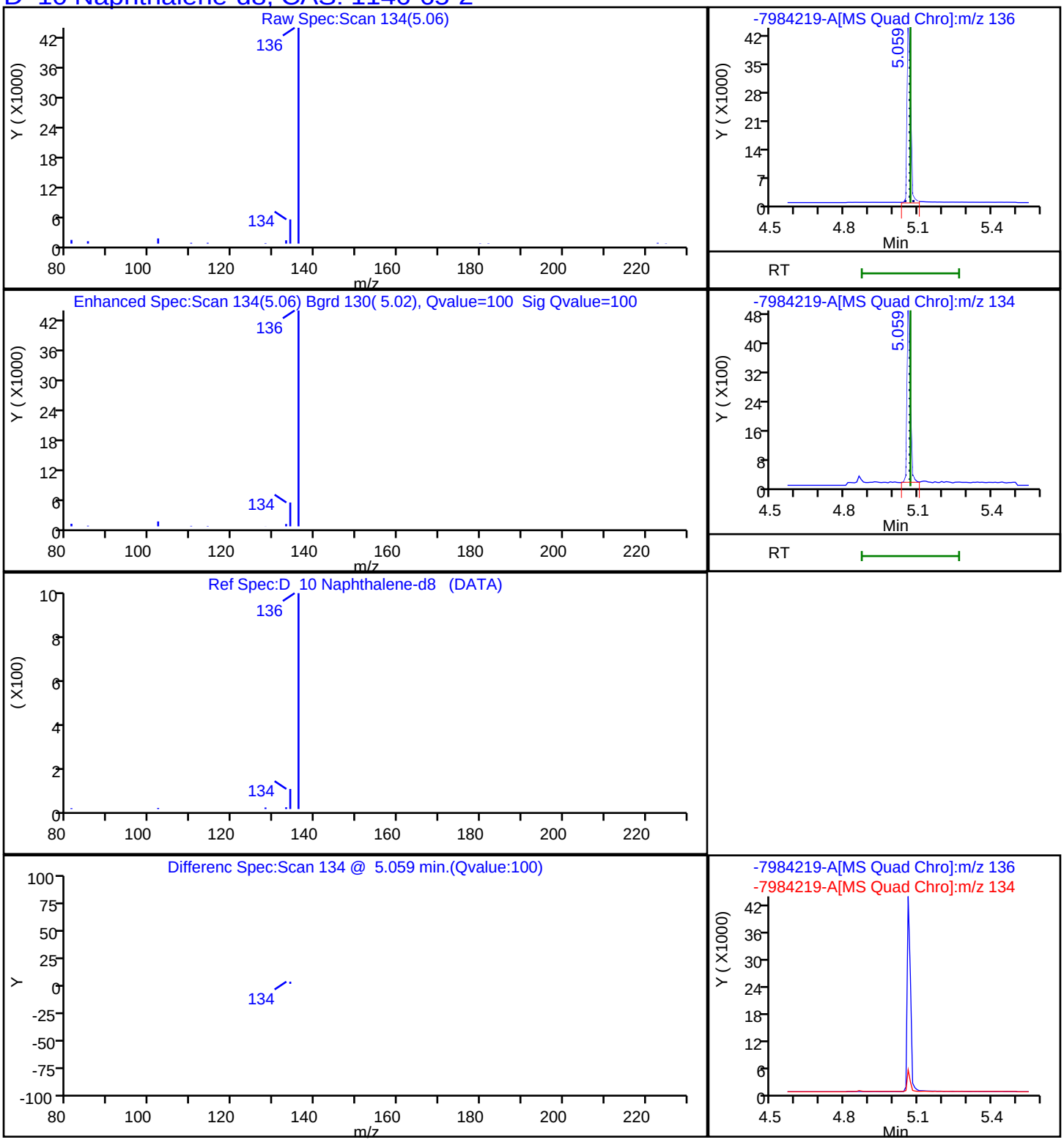
Operator ID: TAI\knxinstgcms1 ALS Bottle#: 0 Worklist Smp#: 28

Injection Vol: 1.0 ul Dil. Factor: 1.0000

Method: SIM_PAH_GCMS1 Limit Group: SOG - PAH IsoDil - ICAL

Column: Restek-5Sil MS 25um (0.25 mm) Detector MS SCAN

D_10 Naphthalene-d8, CAS: 1146-65-2



Report Date: 16-Nov-2023 15:51:08 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\MB 140-7984219-A.D

Injection Date: 13-Nov-2023 20:58:44 Instrument ID: GCMS1

Lims ID: MB 140-79842/19-A

Client ID:

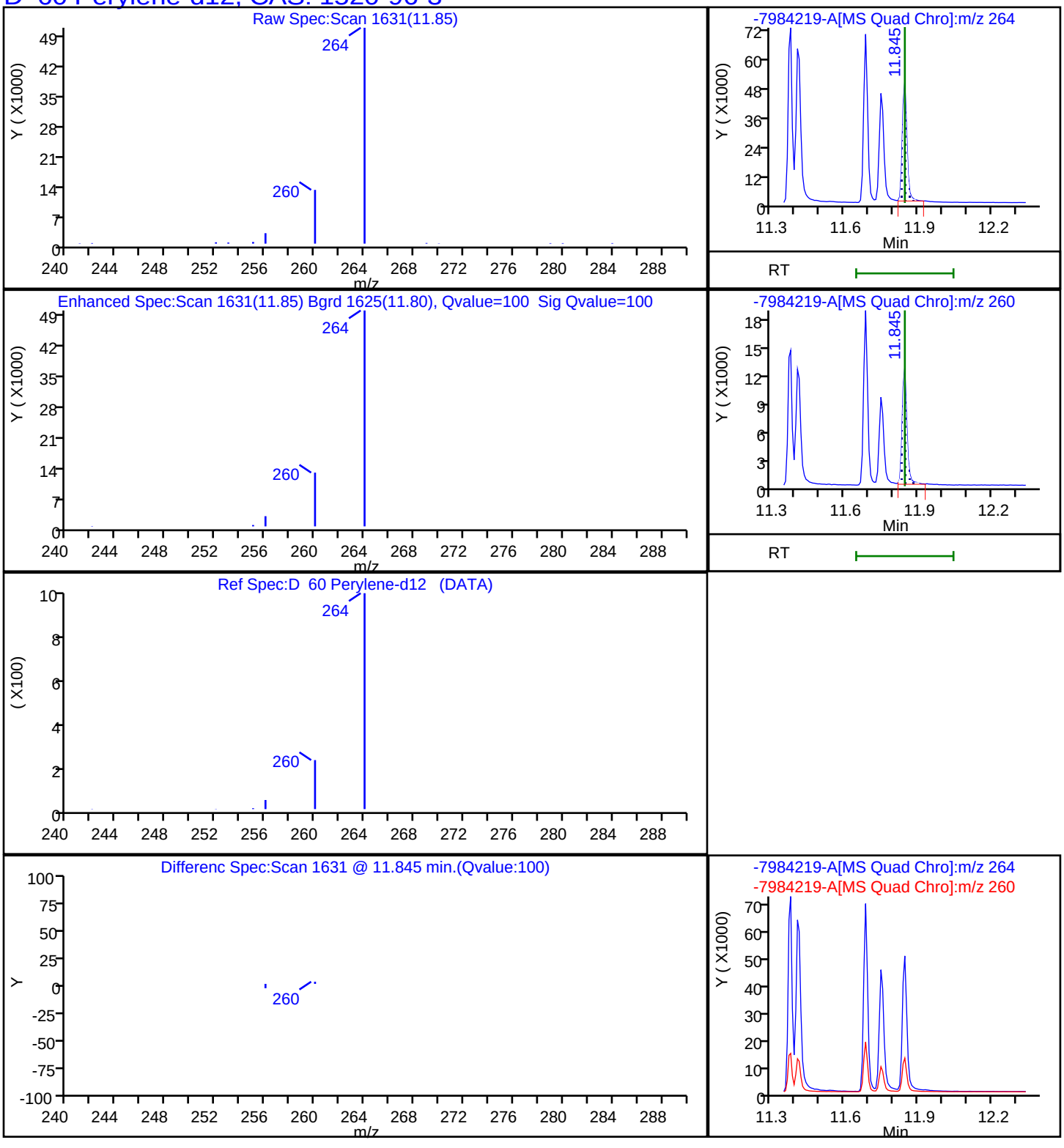
Operator ID: TAI\knxinstgcms1 ALS Bottle#: 0 Worklist Smp#: 28

Injection Vol: 1.0 ul Dil. Factor: 1.0000

Method: SIM_PAH_GCMS1 Limit Group: SOG - PAH IsoDil - ICAL

Column: Restek-5Sil MS 25um (0.25 mm) Detector MS SCAN

D 60 Perylene-d12, CAS: 1520-96-3



Report Date: 16-Nov-2023 15:51:07 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\MB 140-7984219-A.D

Injection Date: 13-Nov-2023 20:58:44 Instrument ID: GCMS1

Lims ID: MB 140-79842/19-A

Client ID:

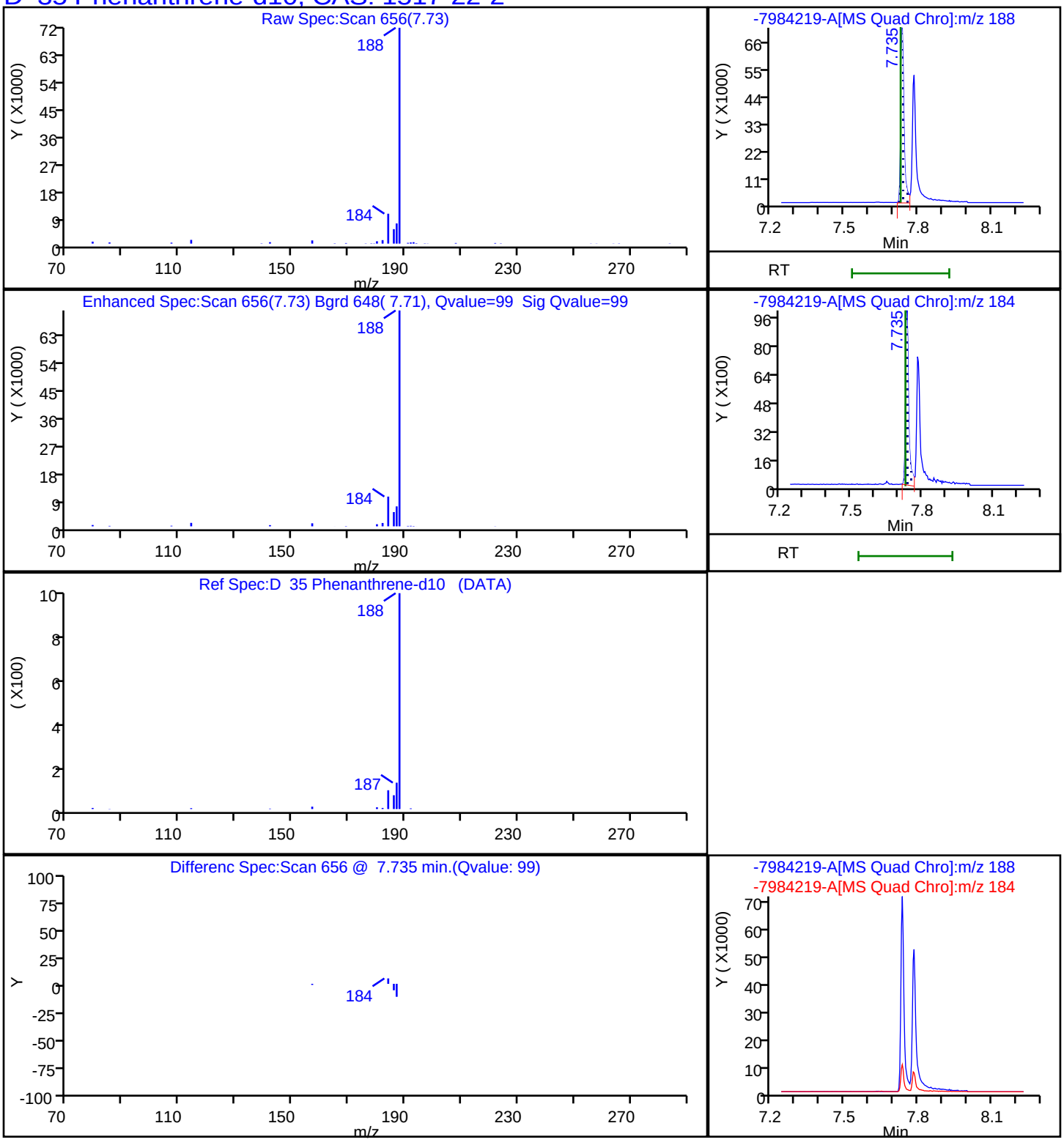
Operator ID: TAI\knxinstgcms1 ALS Bottle#: 0 Worklist Smp#: 28

Injection Vol: 1.0 ul Dil. Factor: 1.0000

Method: SIM_PAH_GCMS1 Limit Group: SOG - PAH IsoDil - ICAL

Column: Restek-5Sil MS 25um (0.25 mm) Detector MS SCAN

D_35 Phenanthrene-d10, CAS: 1517-22-2



Manual Integration/User Assign Peak Report

Eurofins Knoxville

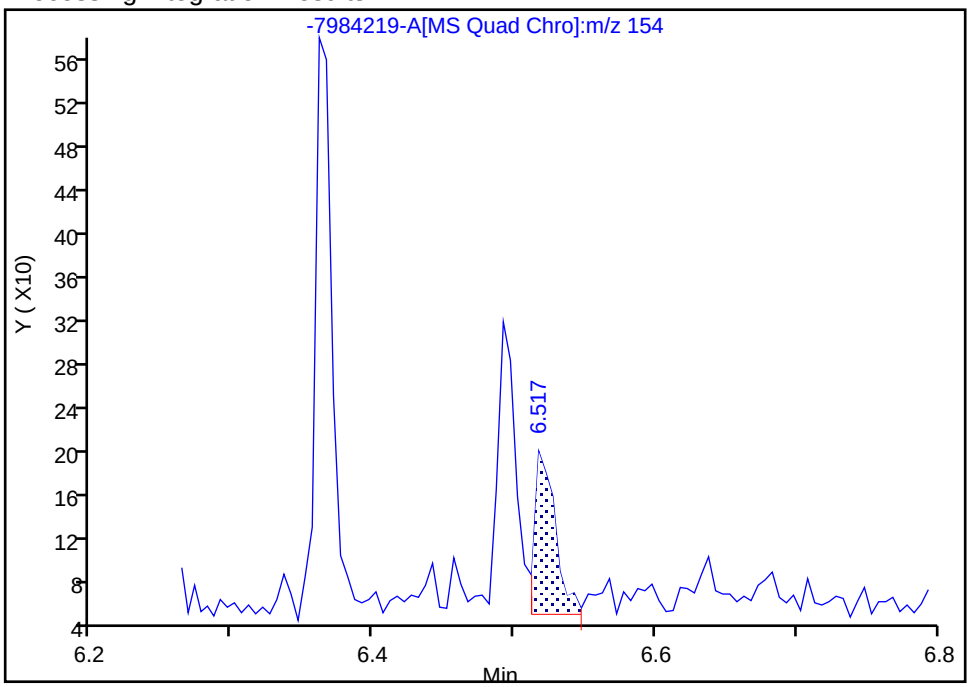
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\MB 140-7984219-A.D				
Injection Date:	13-Nov-2023 20:58:44	Instrument ID:	GCMS1		
Lims ID:	MB 140-79842/19-A				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	28
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

27 Acenaphthene, CAS: 83-32-9

Signal: 1

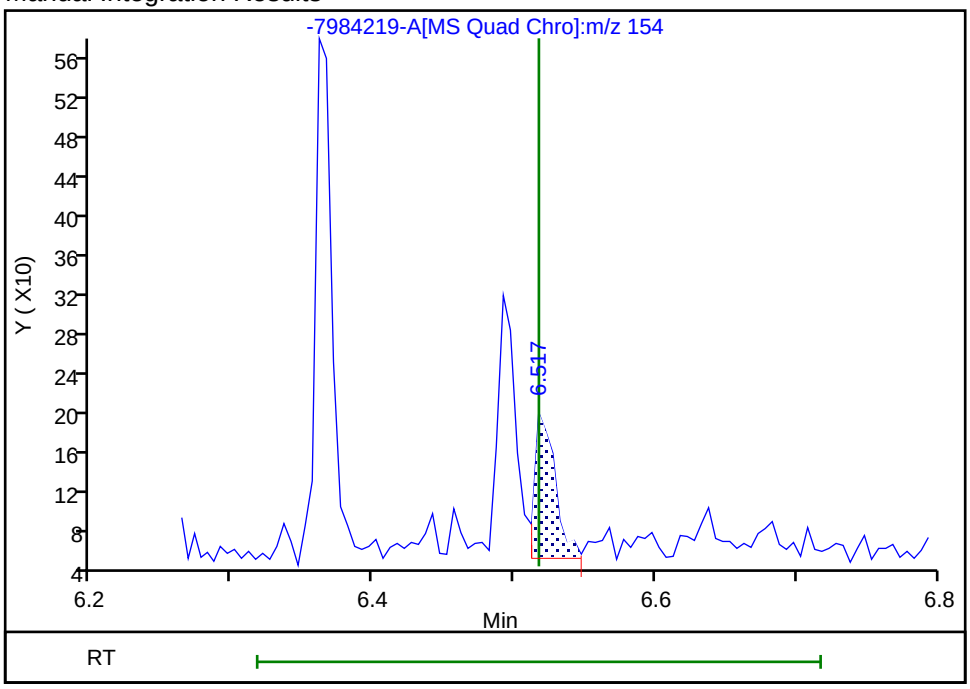
Processing Integration Results

RT: 6.52
Area: 151
Amount: 0.002353
Amount Units: ug/ml



Manual Integration Results

RT: 6.52
Area: 148
Amount: 0.002306
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 09:35:09 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

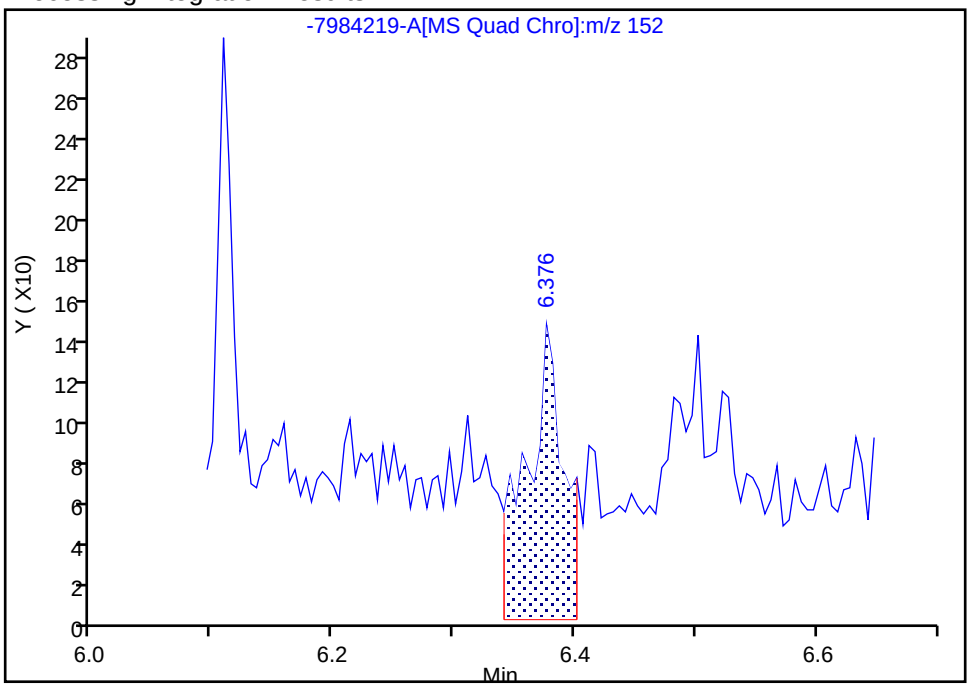
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\MB 140-7984219-A.D				
Injection Date:	13-Nov-2023 20:58:44	Instrument ID:	GCMS1		
Lims ID:	MB 140-79842/19-A				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	28
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

24 Acenaphthylene, CAS: 208-96-8

Signal: 1

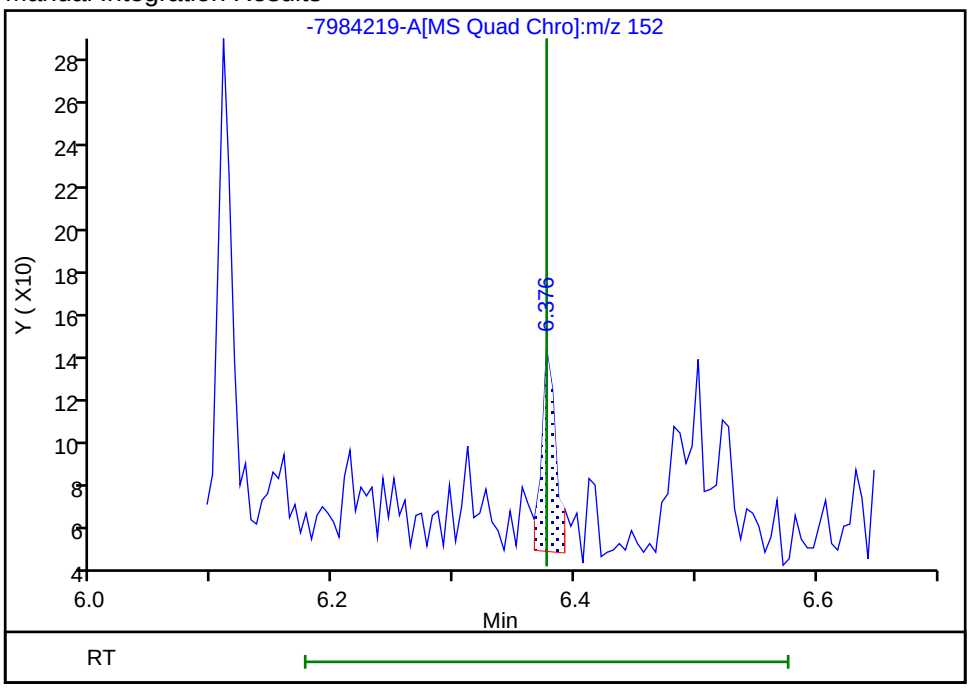
Processing Integration Results

RT: 6.38
Area: 319
Amount: 0.003184
Amount Units: ug/ml



Manual Integration Results

RT: 6.38
Area: 78
Amount: 0.000778
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 09:34:59 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

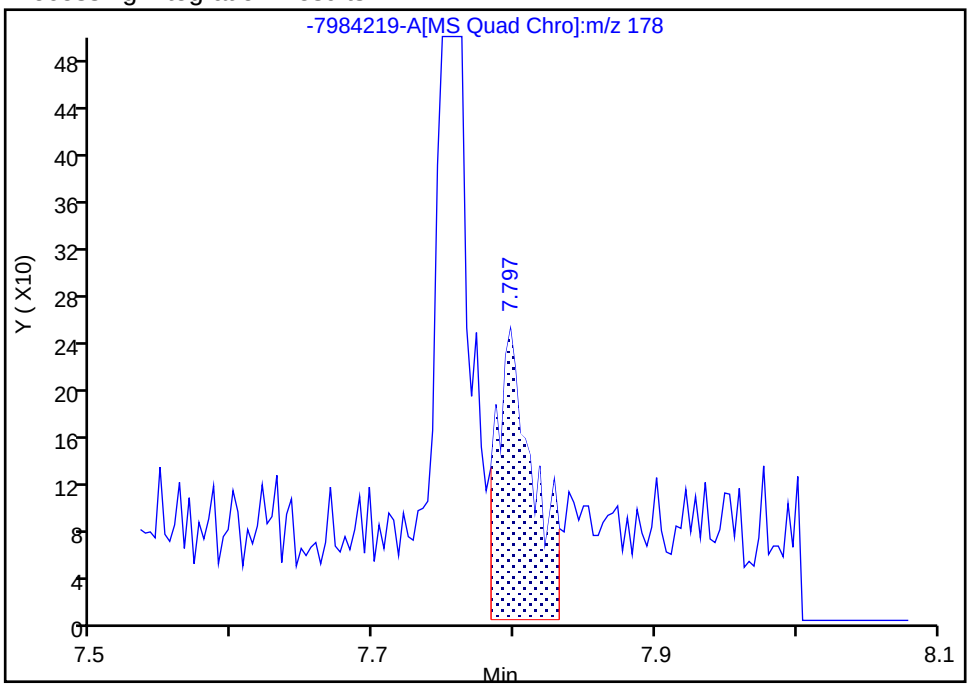
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\MB 140-7984219-A.D				
Injection Date:	13-Nov-2023 20:58:44	Instrument ID:	GCMS1		
Lims ID:	MB 140-79842/19-A				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	28
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

39 Anthracene, CAS: 120-12-7

Signal: 1

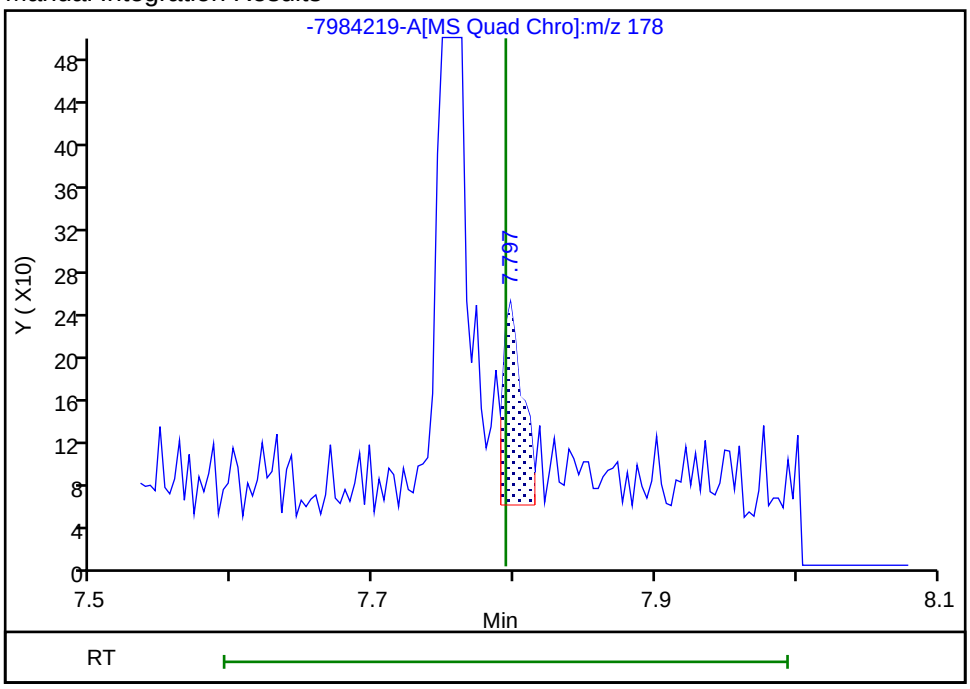
Processing Integration Results

RT: 7.80
Area: 446
Amount: 0.003016
Amount Units: ug/ml



Manual Integration Results

RT: 7.80
Area: 189
Amount: 0.001278
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 09:37:17 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

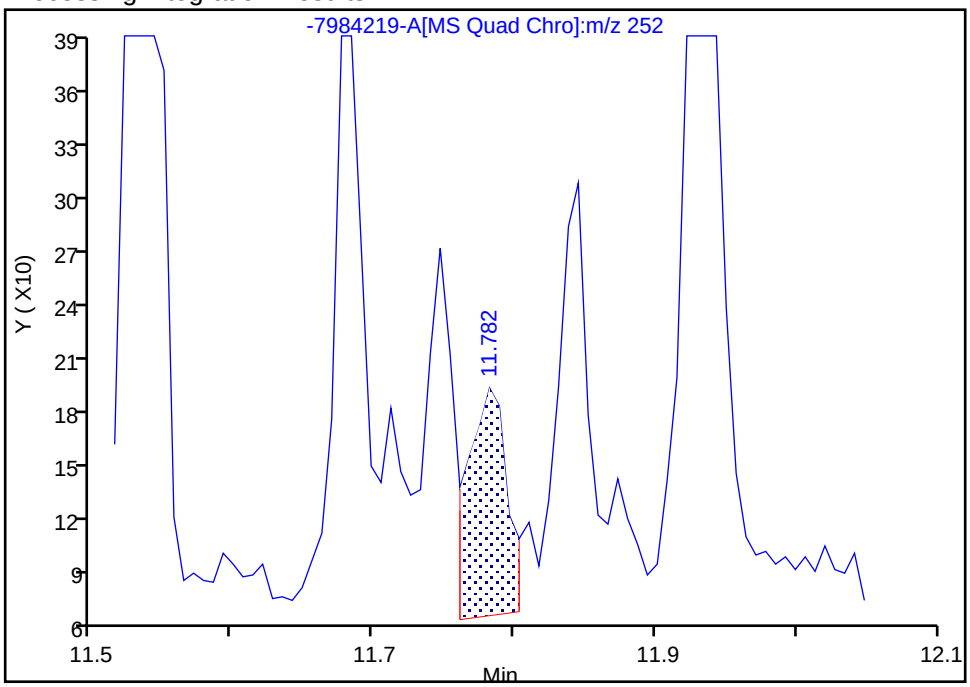
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\MB 140-7984219-A.D				
Injection Date:	13-Nov-2023 20:58:44	Instrument ID:	GCMS1		
Lims ID:	MB 140-79842/19-A				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	28
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

59 Benzo[a]pyrene, CAS: 50-32-8

Signal: 1

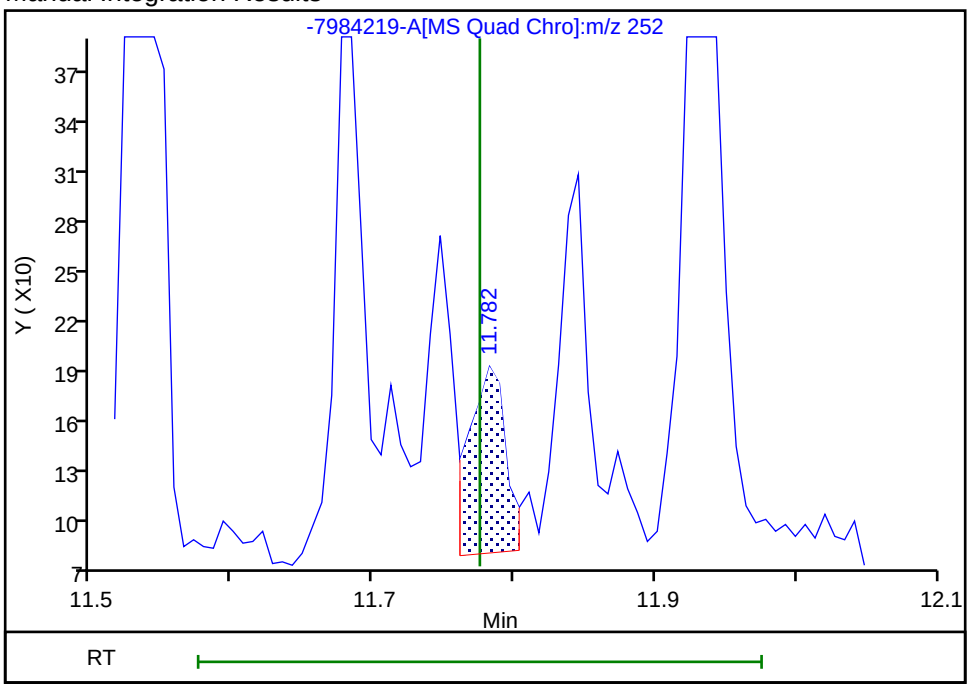
Processing Integration Results

RT: 11.78
Area: 253
Amount: 0.001231
Amount Units: ug/ml



Manual Integration Results

RT: 11.78
Area: 206
Amount: 0.001002
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 09:39:38 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

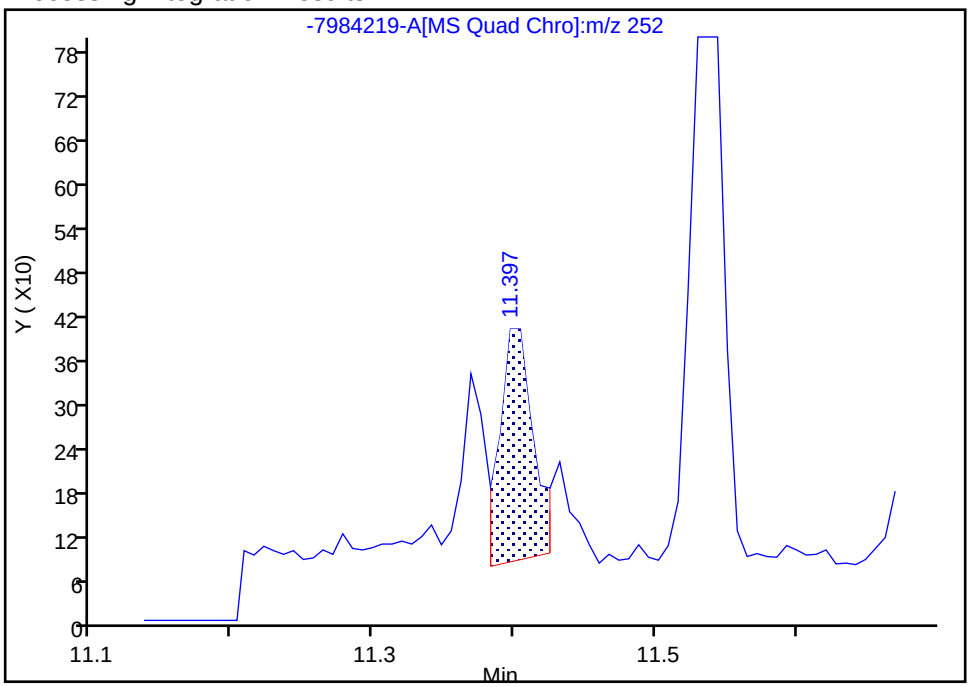
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\MB 140-7984219-A.D				
Injection Date:	13-Nov-2023 20:58:44	Instrument ID:	GCMS1		
Lims ID:	MB 140-79842/19-A				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	28
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

53 Benzo[b]fluoranthene, CAS: 205-99-2

Signal: 1

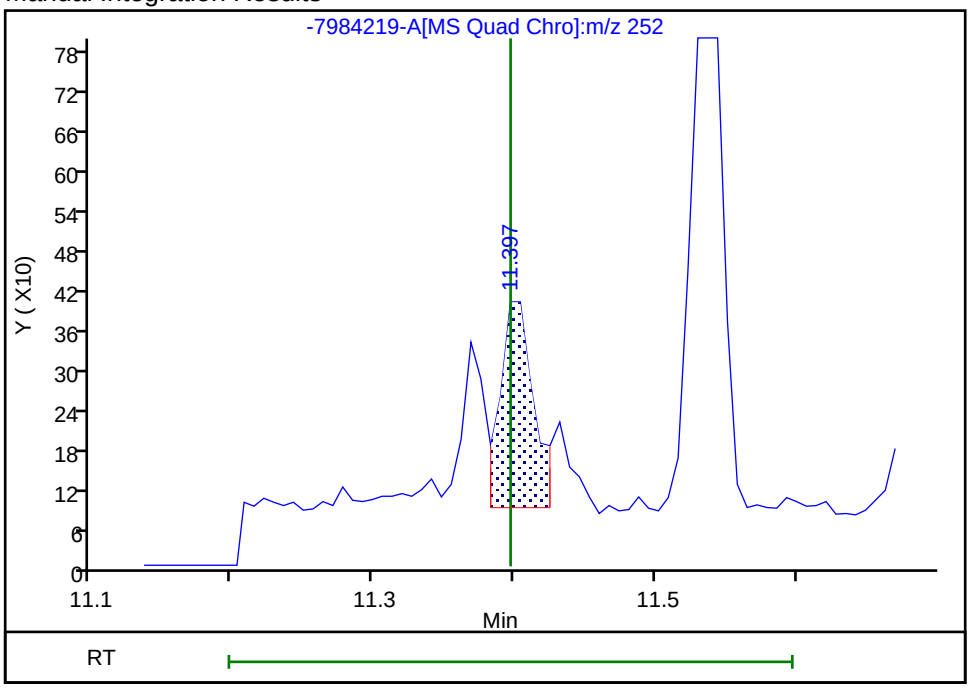
Processing Integration Results

RT: 11.40
Area: 539
Amount: 0.001909
Amount Units: ug/ml



Manual Integration Results

RT: 11.40
Area: 529
Amount: 0.001873
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 09:38:35 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

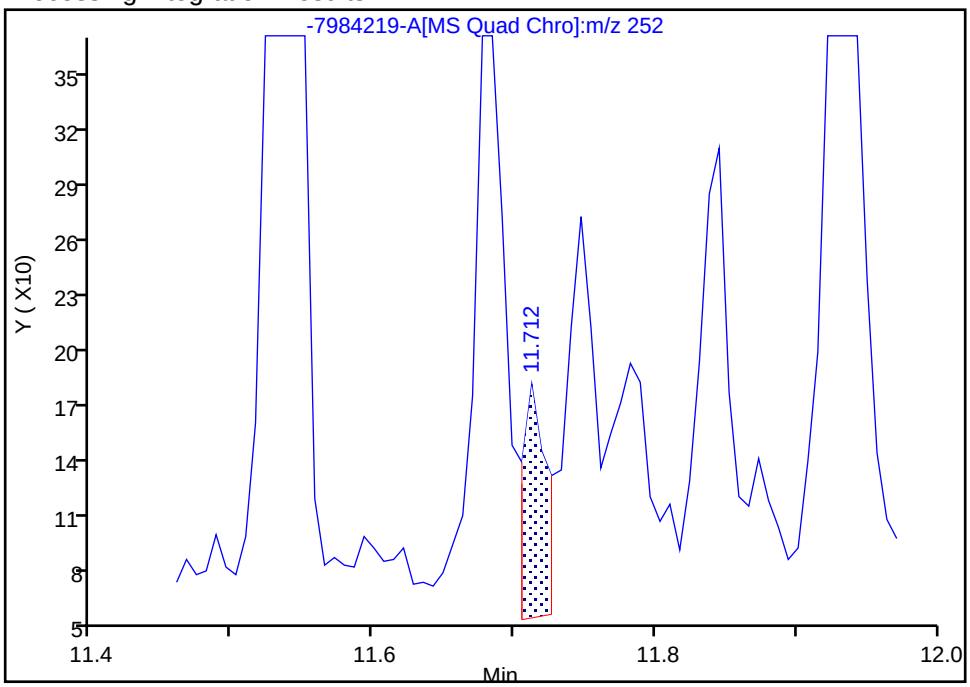
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\MB 140-7984219-A.D				
Injection Date:	13-Nov-2023 20:58:44	Instrument ID:	GCMS1		
Lims ID:	MB 140-79842/19-A				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	28
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

57 Benzo[e]pyrene, CAS: 192-97-2

Signal: 1

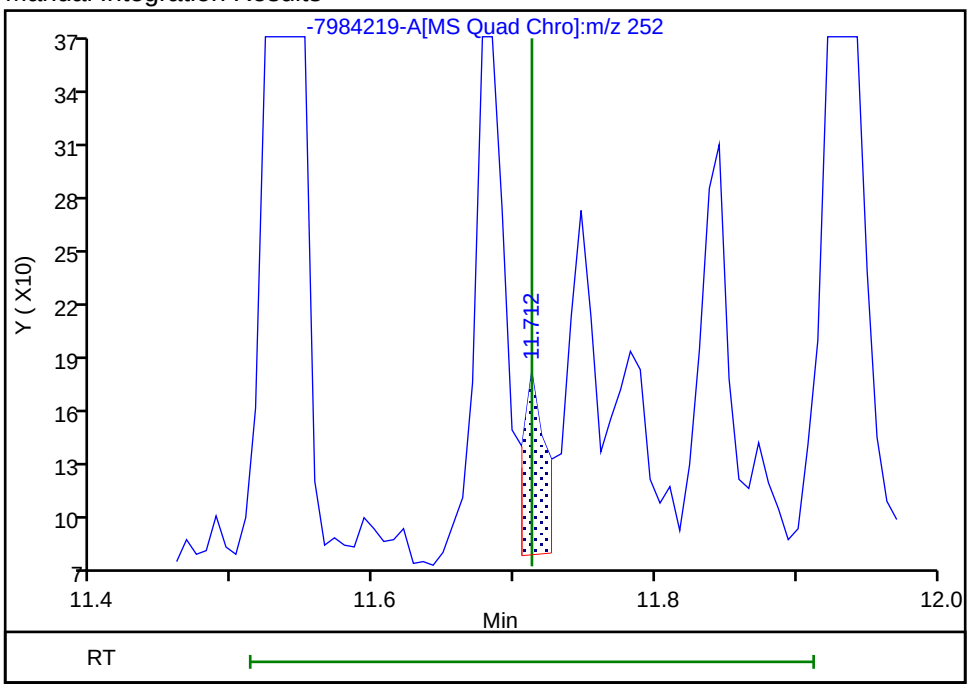
Processing Integration Results

RT: 11.71
Area: 154
Amount: 0.000735
Amount Units: ug/ml



Manual Integration Results

RT: 11.71
Area: 117
Amount: 0.000559
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 09:39:25 -05:00:00 (UTC)
Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

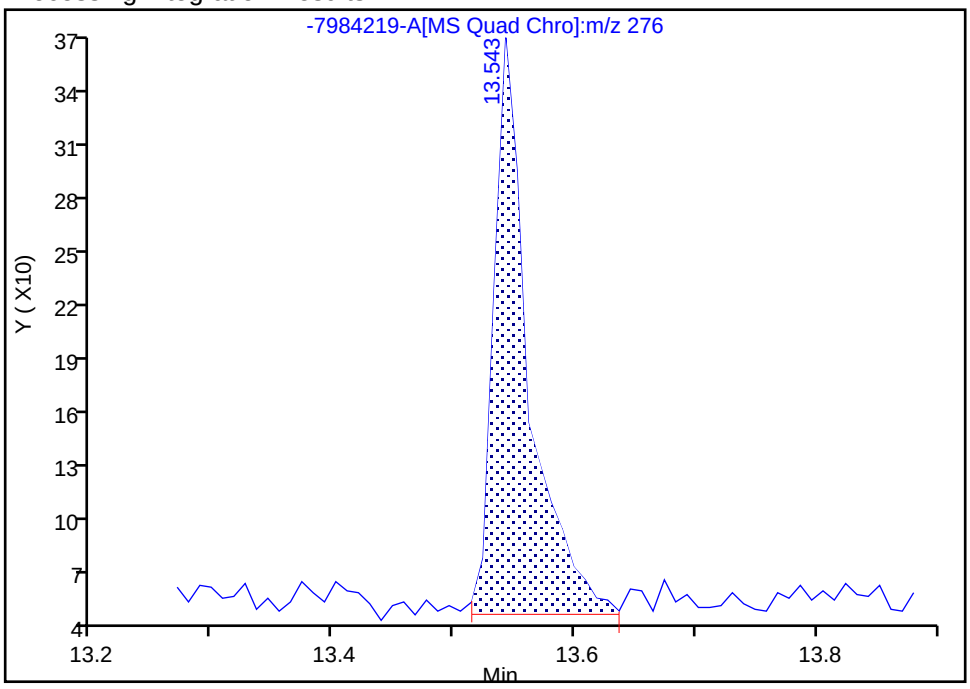
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\MB 140-7984219-A.D				
Injection Date:	13-Nov-2023 20:58:44	Instrument ID:	GCMS1		
Lims ID:	MB 140-79842/19-A				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	28
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

68 Benzo[g,h,i]perylene, CAS: 191-24-2

Signal: 1

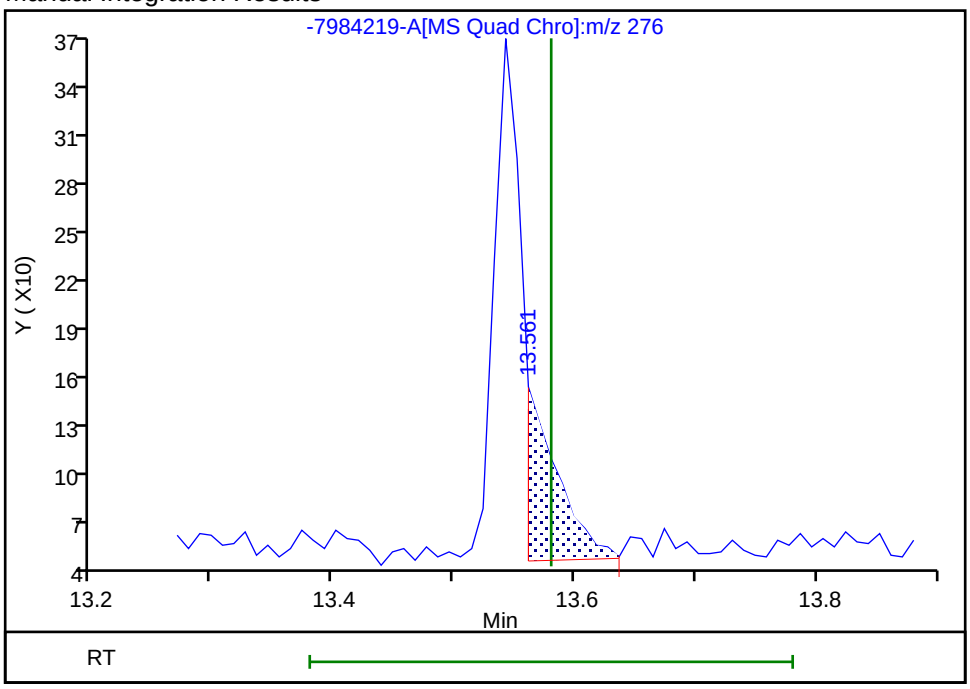
Processing Integration Results

RT: 13.54
Area: 632
Amount: 0.002528
Amount Units: ug/ml



Manual Integration Results

RT: 13.56
Area: 199
Amount: 0.000796
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 09:33:11 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

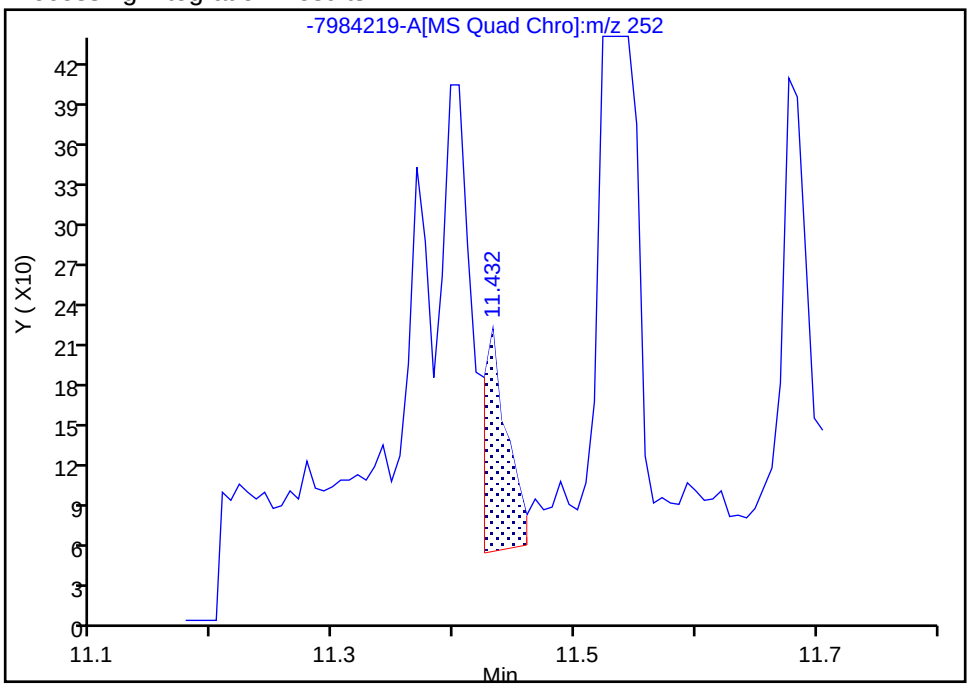
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\MB 140-7984219-A.D				
Injection Date:	13-Nov-2023 20:58:44	Instrument ID:	GCMS1		
Lims ID:	MB 140-79842/19-A				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	28
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

55 Benzo[k]fluoranthene, CAS: 207-08-9

Signal: 1

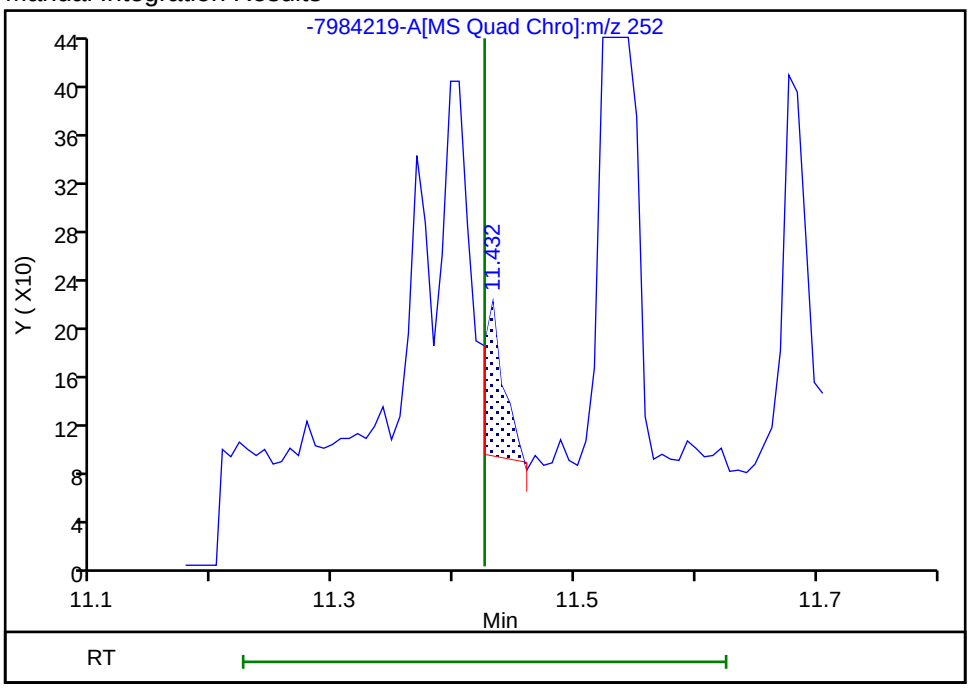
Processing Integration Results

RT: 11.43
Area: 228
Amount: 0.000828
Amount Units: ug/ml



Manual Integration Results

RT: 11.43
Area: 140
Amount: 0.000508
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 09:39:09 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

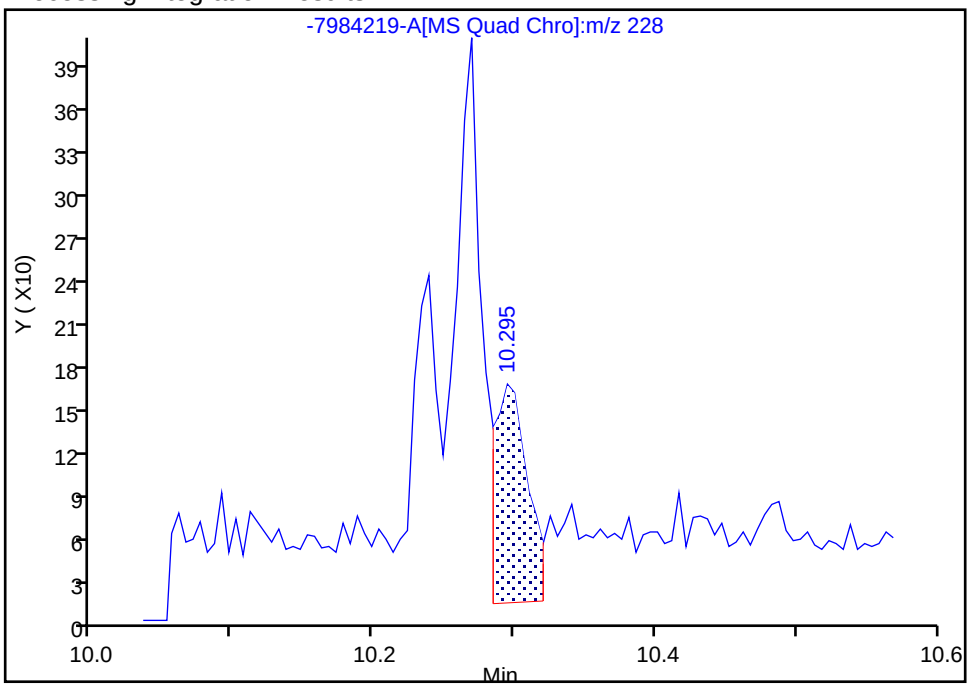
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\MB 140-7984219-A.D				
Injection Date:	13-Nov-2023 20:58:44	Instrument ID:	GCMS1		
Lims ID:	MB 140-79842/19-A				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	28
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

50 Chrysene, CAS: 218-01-9

Signal: 1

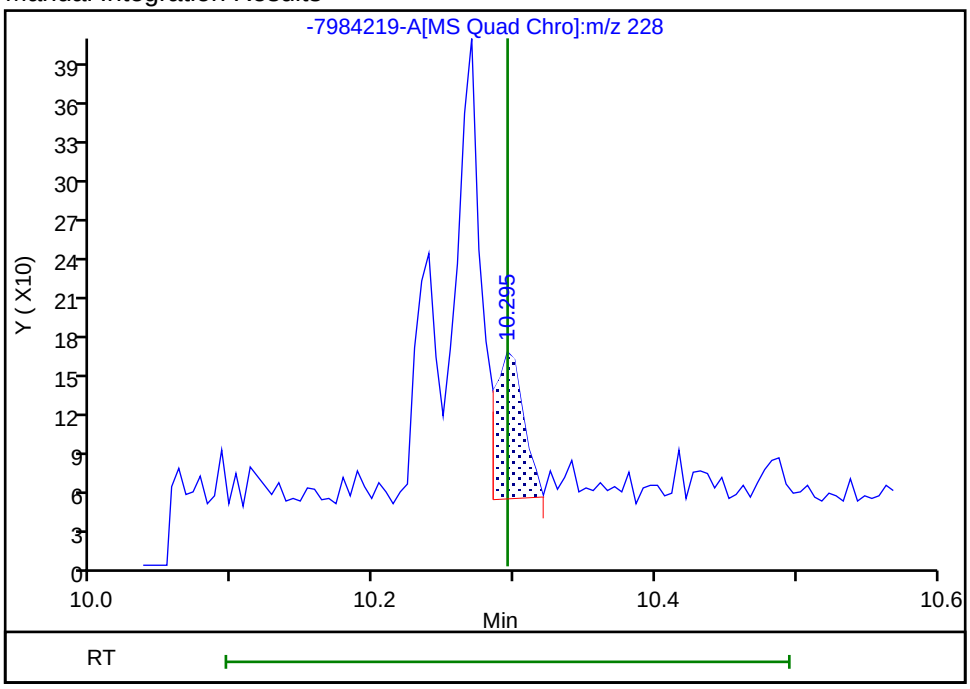
Processing Integration Results

RT: 10.29
Area: 252
Amount: 0.000947
Amount Units: ug/ml



Manual Integration Results

RT: 10.29
Area: 157
Amount: 0.000590
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 09:38:10 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

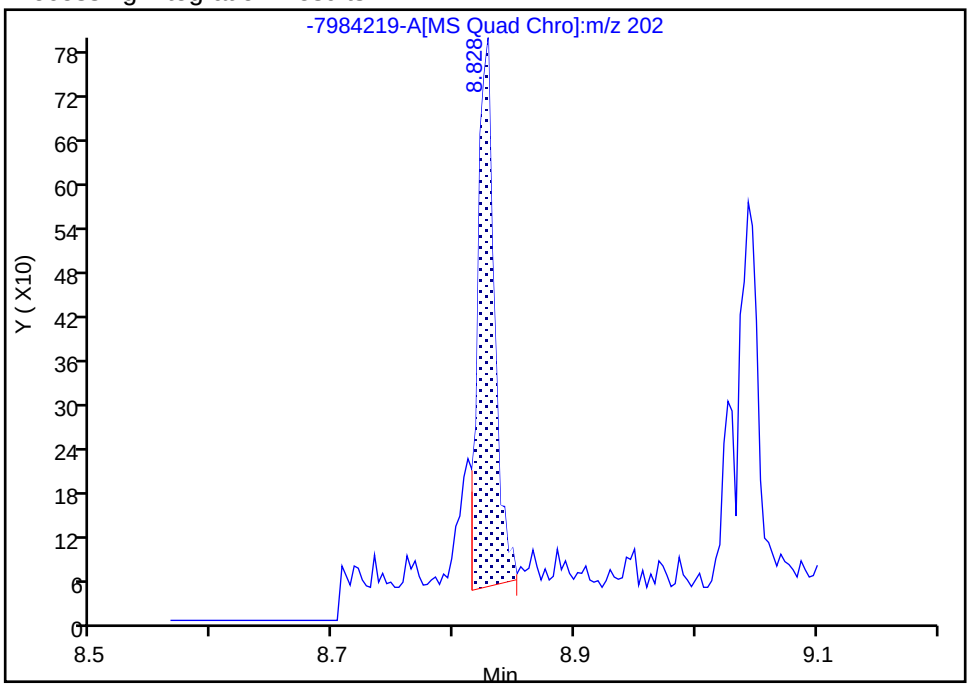
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\MB 140-7984219-A.D				
Injection Date:	13-Nov-2023 20:58:44	Instrument ID:	GCMS1		
Lims ID:	MB 140-79842/19-A				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	28
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

43 Fluoranthene, CAS: 206-44-0

Signal: 1

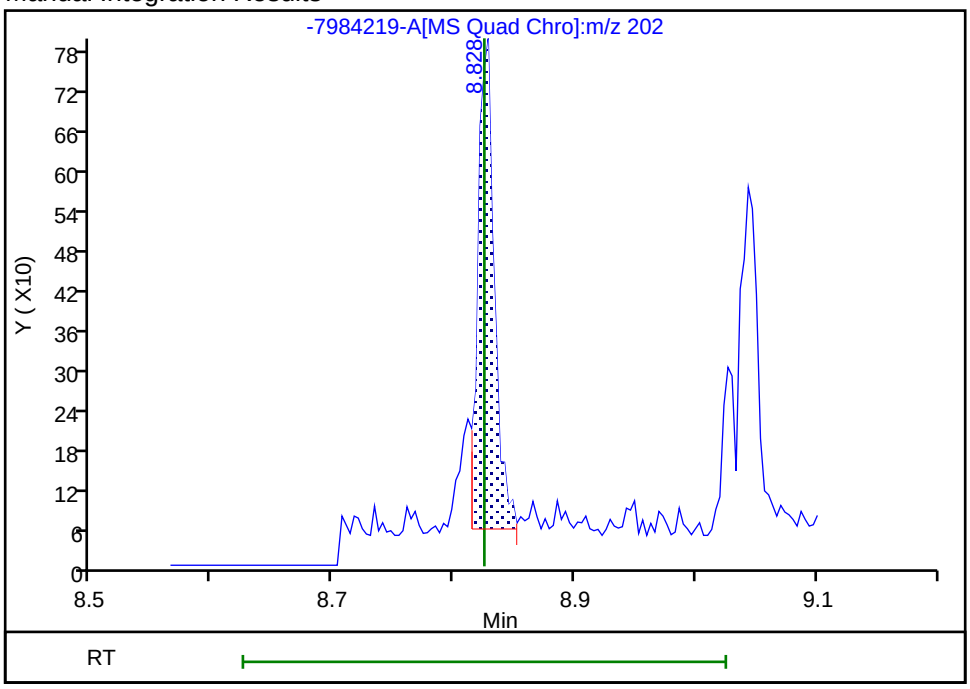
Processing Integration Results

RT: 8.83
Area: 707
Amount: 0.002869
Amount Units: ug/ml



Manual Integration Results

RT: 8.83
Area: 695
Amount: 0.002821
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 09:37:43 -05:00:00 (UTC)

Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

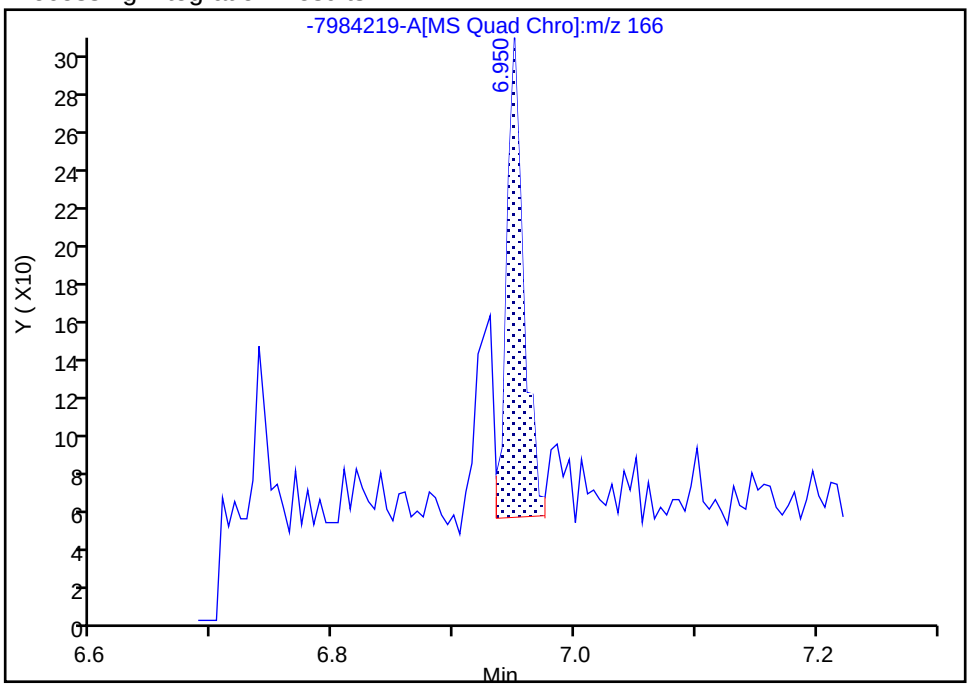
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\MB 140-7984219-A.D				
Injection Date:	13-Nov-2023 20:58:44	Instrument ID:	GCMS1		
Lims ID:	MB 140-79842/19-A				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	28
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

30 Fluorene, CAS: 86-73-7

Signal: 1

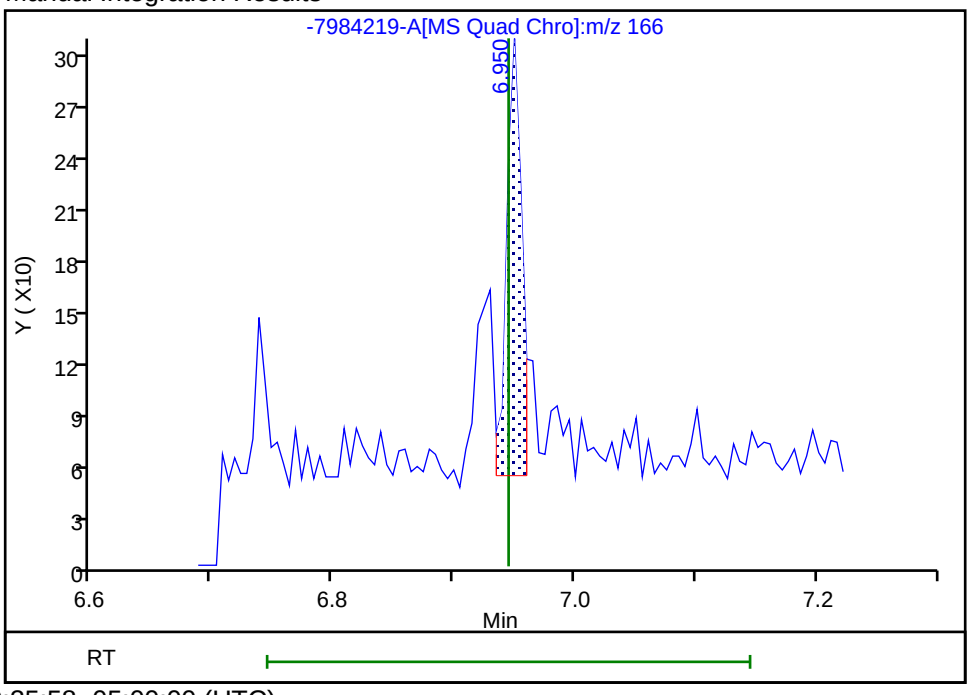
Processing Integration Results

RT: 6.95
Area: 244
Amount: 0.002560
Amount Units: ug/ml



Manual Integration Results

RT: 6.95
Area: 220
Amount: 0.002308
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 09:35:58 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

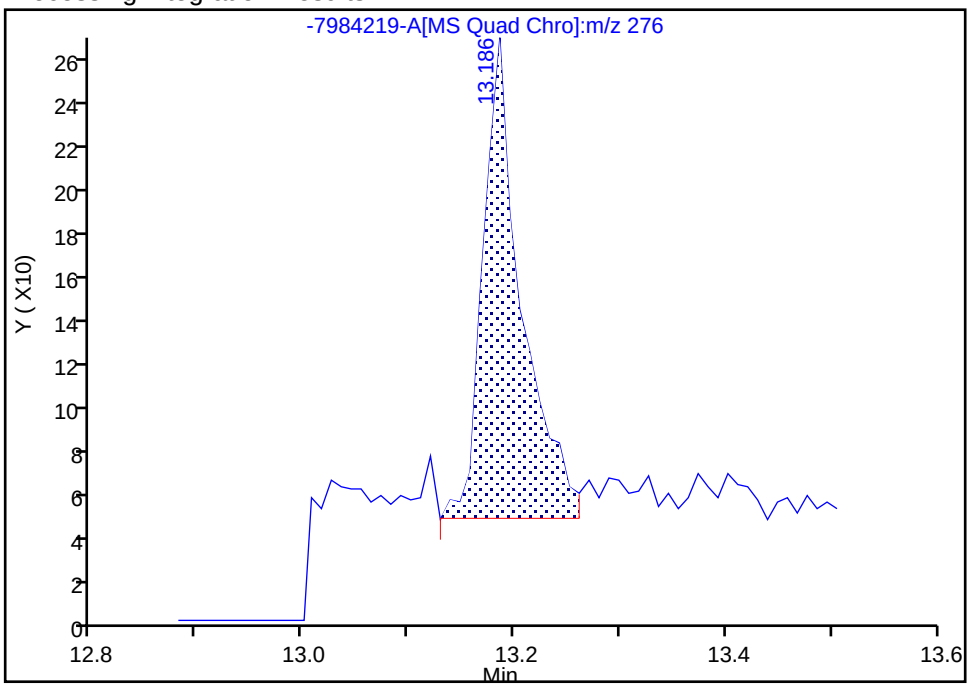
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\MB 140-7984219-A.D				
Injection Date:	13-Nov-2023 20:58:44	Instrument ID:	GCMS1		
Lims ID:	MB 140-79842/19-A				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	28
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

65 Indeno[1,2,3-cd]pyrene, CAS: 193-39-5

Signal: 1

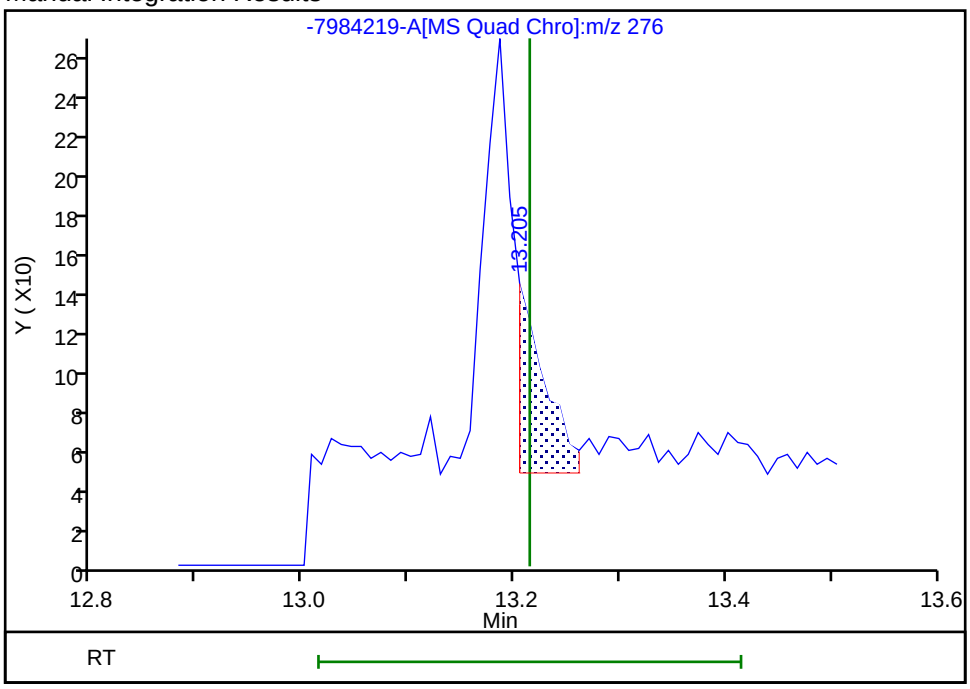
Processing Integration Results

RT: 13.19
Area: 560
Amount: 0.002016
Amount Units: ug/ml



Manual Integration Results

RT: 13.20
Area: 184
Amount: 0.000662
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 09:40:24 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Eurofins Knoxville

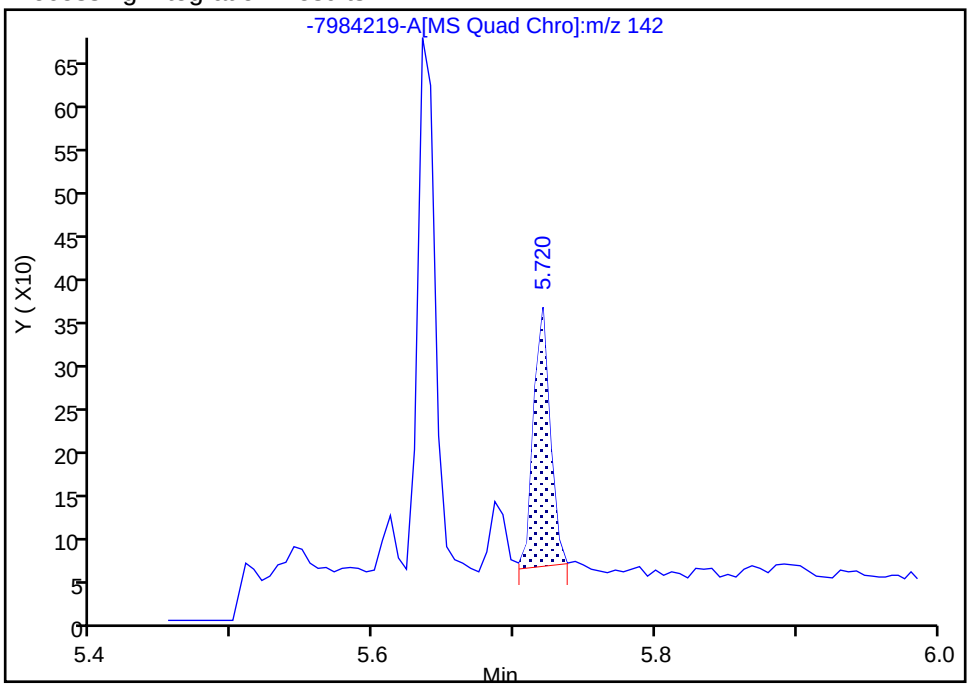
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\MB 140-7984219-A.D				
Injection Date:	13-Nov-2023 20:58:44	Instrument ID:	GCMS1		
Lims ID:	MB 140-79842/19-A				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	28
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

18 1-Methylnaphthalene, CAS: 90-12-0

Signal: 1

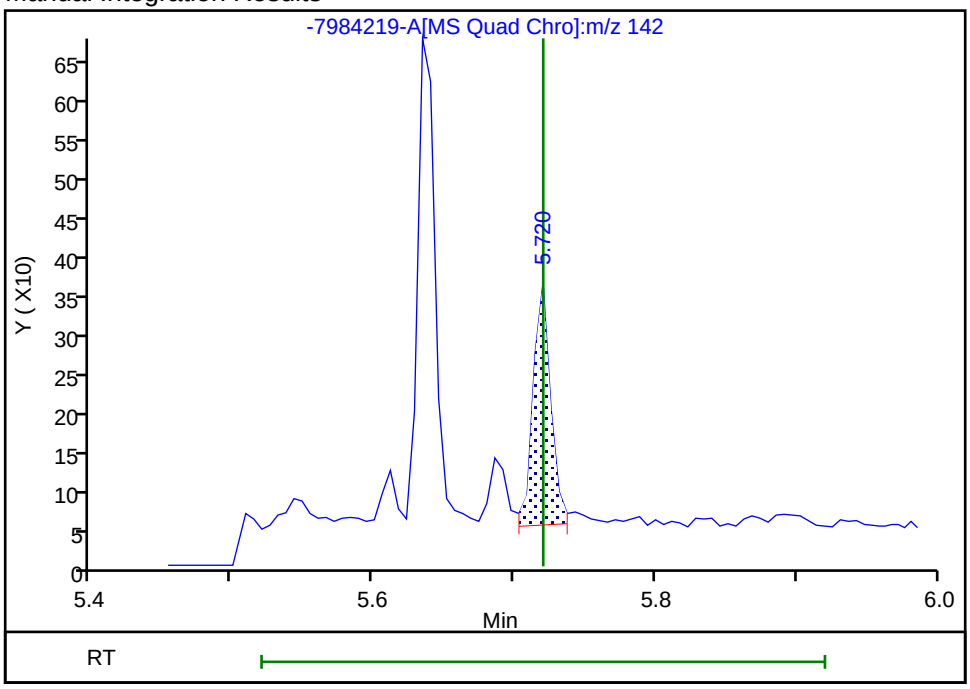
Processing Integration Results

RT: 5.72
Area: 241
Amount: 0.003592
Amount Units: ug/ml



Manual Integration Results

RT: 5.72
Area: 269
Amount: 0.004010
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 09:33:57 -05:00:00 (UTC)
Audit Action: Assigned New Baseline Audit Reason: Baseline

Eurofins Knoxville

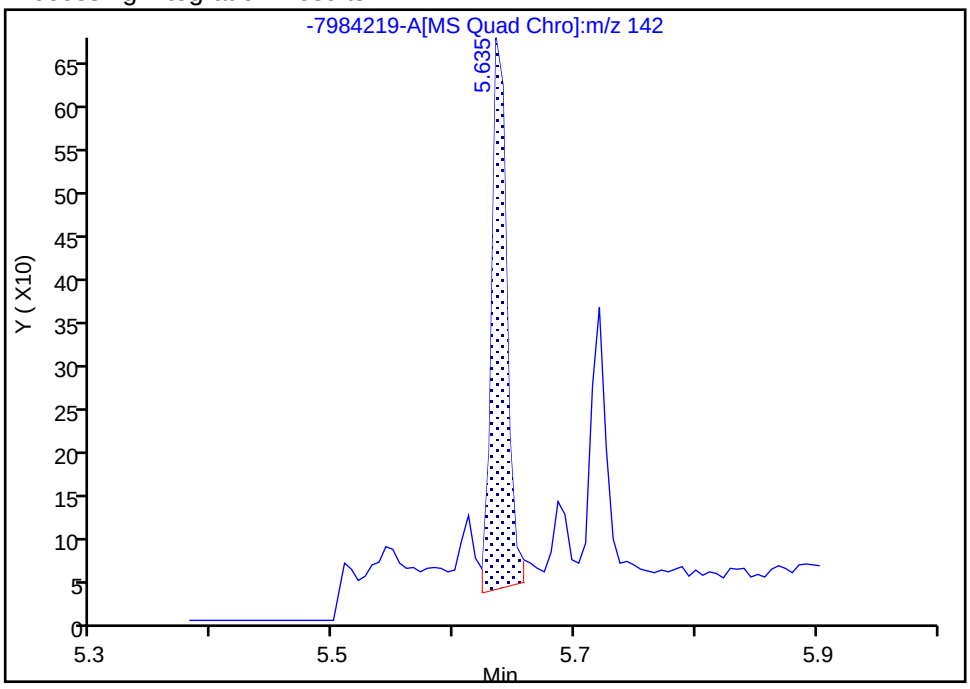
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\MB 140-7984219-A.D				
Injection Date:	13-Nov-2023 20:58:44	Instrument ID:	GCMS1		
Lims ID:	MB 140-79842/19-A				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	28
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

16 2-Methylnaphthalene, CAS: 91-57-6

Signal: 1

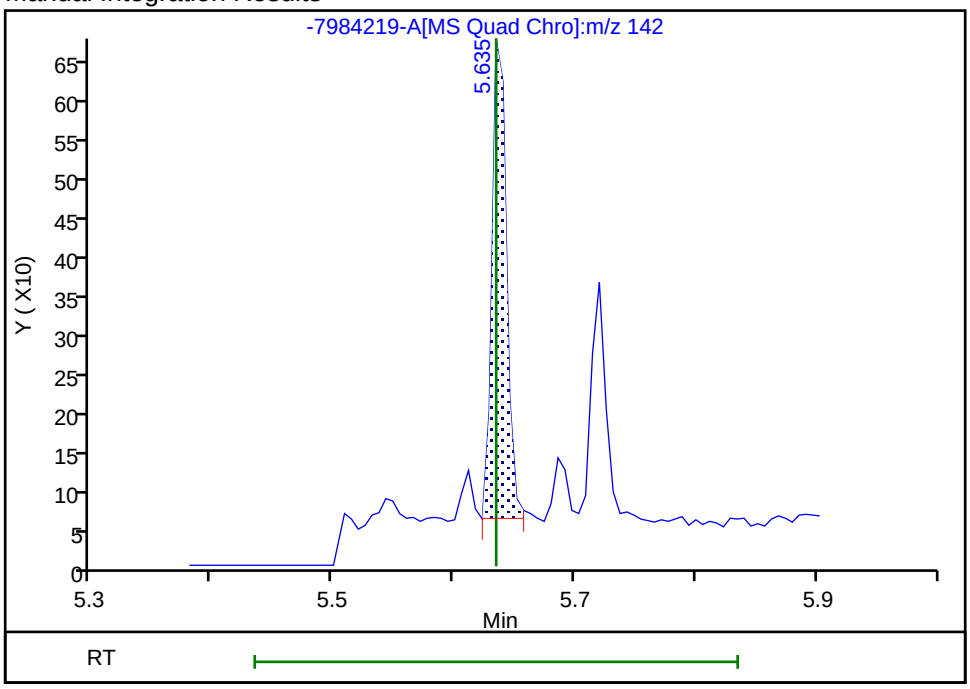
Processing Integration Results

RT: 5.63
Area: 564
Amount: 0.008264
Amount Units: ug/ml



Manual Integration Results

RT: 5.63
Area: 514
Amount: 0.007531
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 09:33:47 -05:00:00 (UTC)
Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

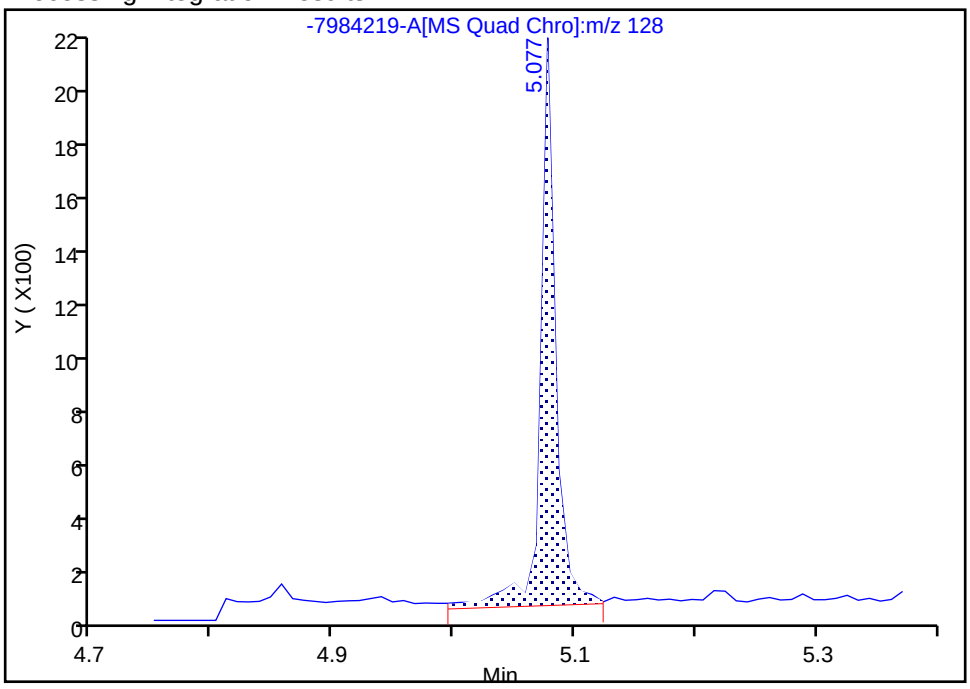
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\MB 140-7984219-A.D				
Injection Date:	13-Nov-2023 20:58:44	Instrument ID:	GCMS1		
Lims ID:	MB 140-79842/19-A				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	28
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

12 Naphthalene, CAS: 91-20-3

Signal: 1

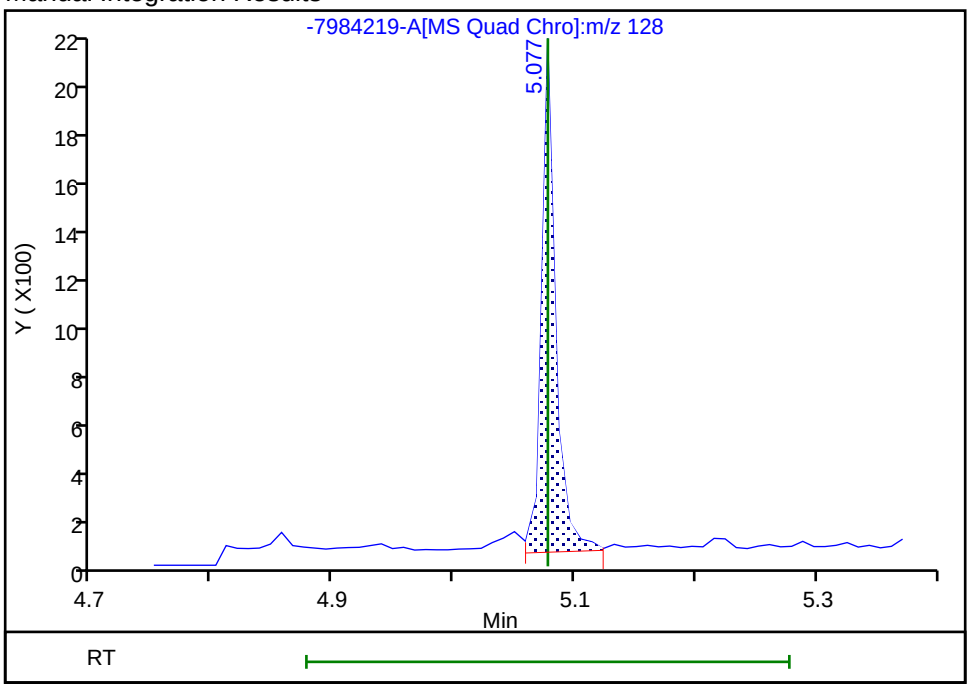
Processing Integration Results

RT: 5.08
Area: 1820
Amount: 0.019138
Amount Units: ug/ml



Manual Integration Results

RT: 5.08
Area: 1666
Amount: 0.017518
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 09:33:29 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

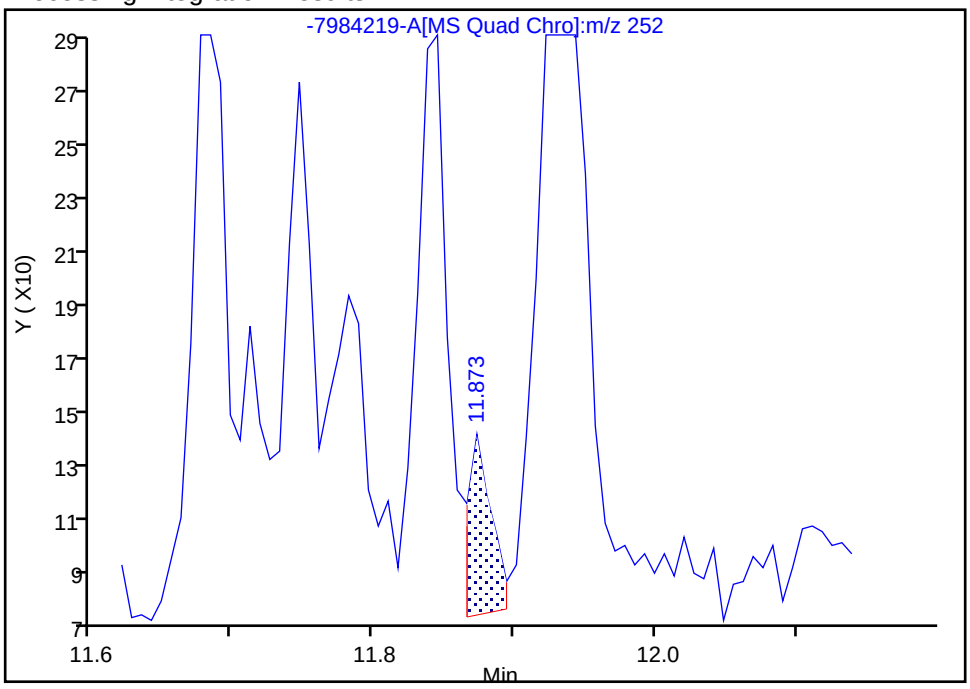
Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\MB 140-7984219-A.D
Injection Date: 13-Nov-2023 20:58:44 Instrument ID: GCMS1
Lims ID: MB 140-79842/19-A
Client ID:
Operator ID: TAI\knxinstgcms1 ALS Bottle#: 0 Worklist Smp#: 28
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Method: SIM_PAH_GCMS1 Limit Group: SOG - PAH IsoDil - ICAL
Column: Restek-5Sil MS 25um (0.25 mm) Detector MS SCAN

61 Perylene, CAS: 198-55-0

Signal: 1

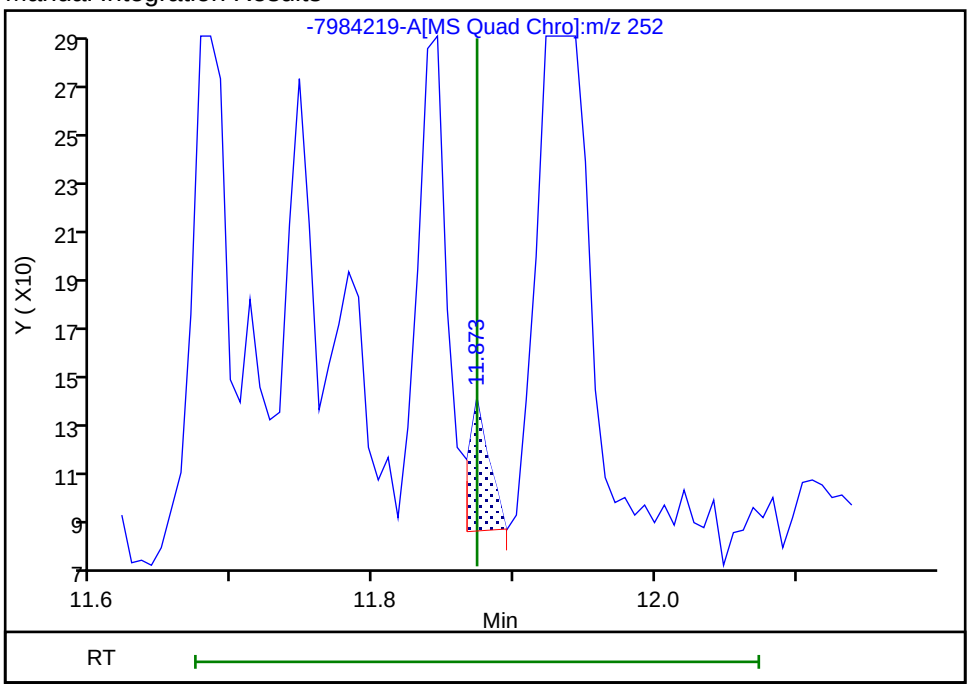
Processing Integration Results

RT: 11.87
Area: 78
Amount: 0.000418
Amount Units: ug/ml



Manual Integration Results

RT: 11.87
Area: 55
Amount: 0.000295
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 09:39:53 -05:00:00 (UTC)
Audit Action: Assigned New Baseline Audit Reason: Baseline

Manual Integration/User Assign Peak Report

Eurofins Knoxville

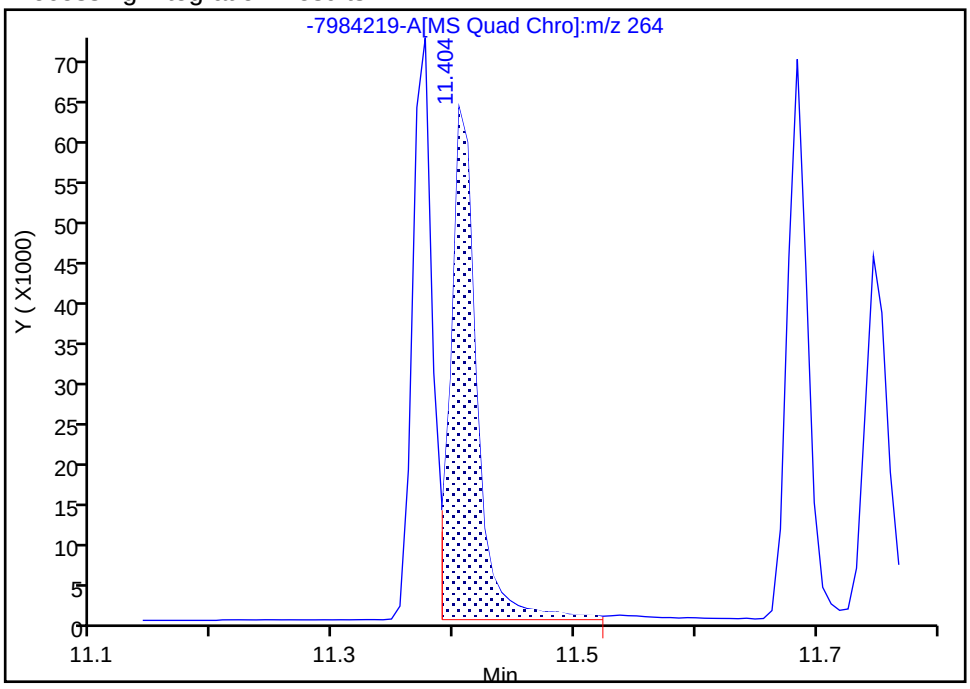
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\MB 140-7984219-A.D				
Injection Date:	13-Nov-2023 20:58:44	Instrument ID:	GCMS1		
Lims ID:	MB 140-79842/19-A				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	28
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 54 Benzo(k)fluoranthene-d12, CAS: 93952-01-3

Signal: 1

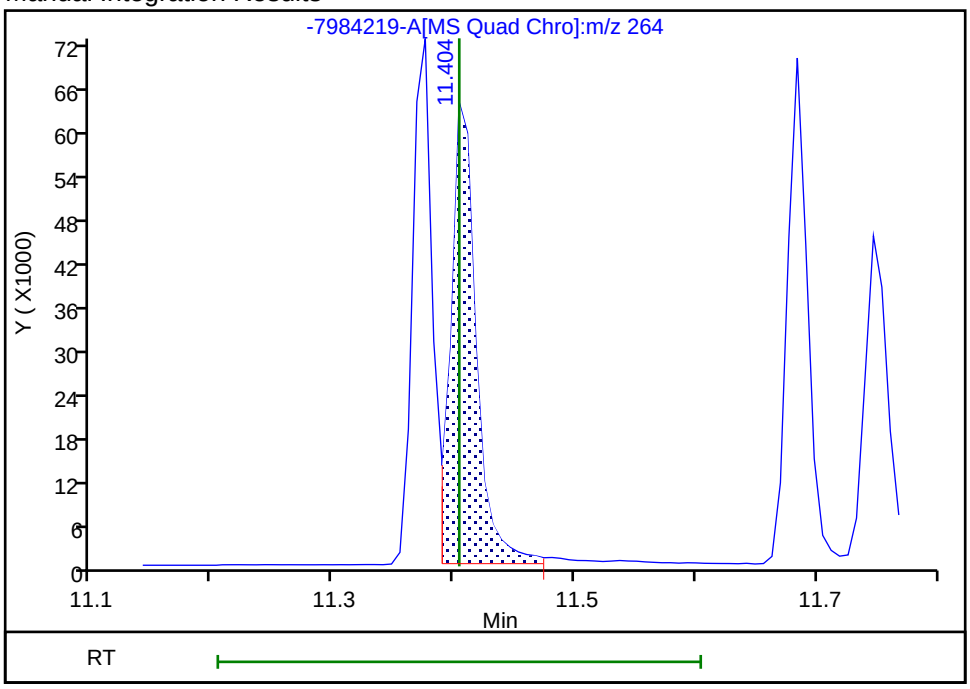
Processing Integration Results

RT: 11.40
Area: 96293
Amount: 0.403902
Amount Units: ug/ml



Manual Integration Results

RT: 11.40
Area: 93994
Amount: 0.394259
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 09:38:56 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

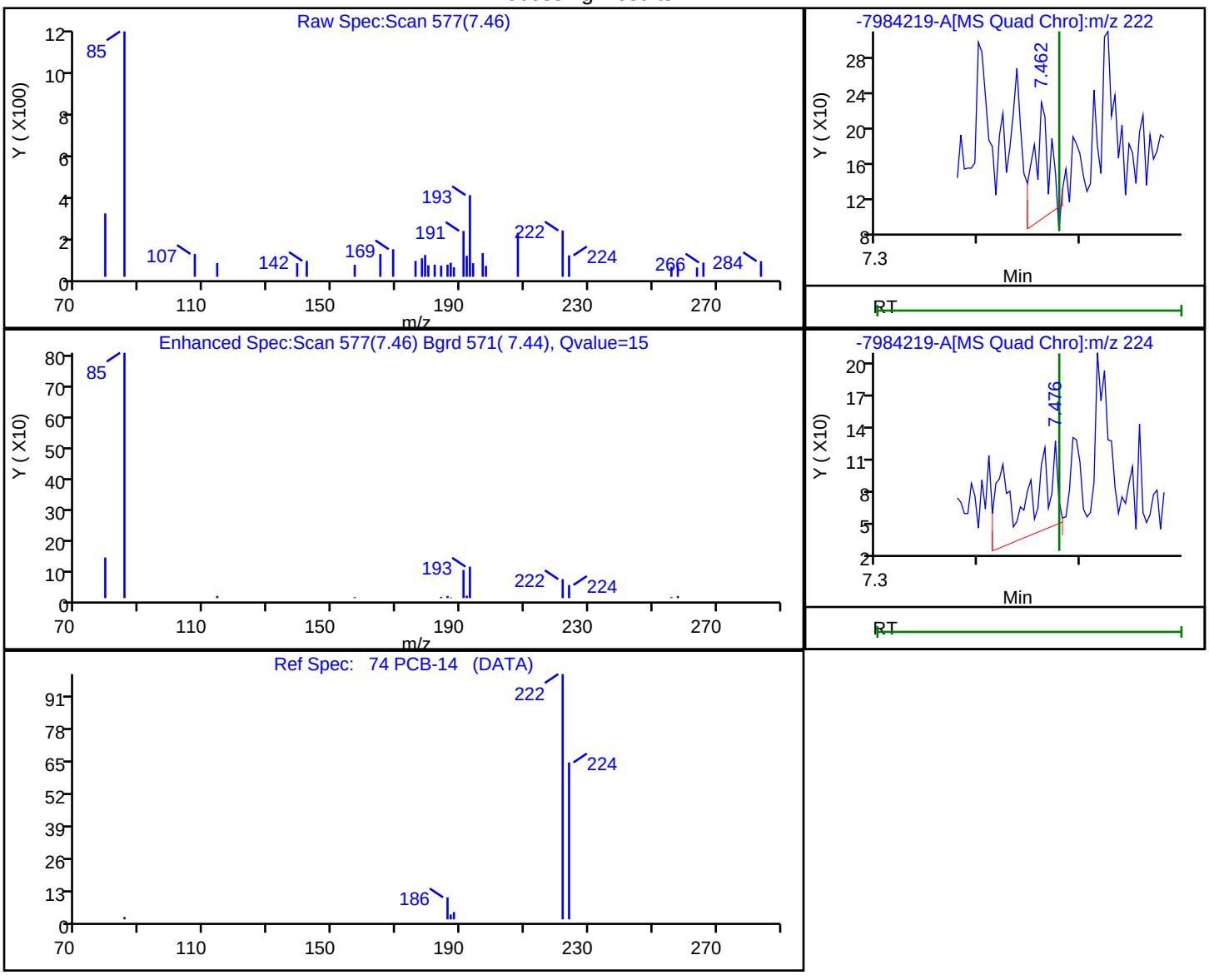
User Disabled Compound Report

Eurofins Knoxville

Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\MB 140-7984219-A.D				
Injection Date:	13-Nov-2023 20:58:44	Instrument ID:	GCMS1		
Lims ID:	MB 140-79842/19-A				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	28
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

74 PCB-14, CAS: 34883-41-5

Processing Results



RT	Mass	Response	Amount
7.46	222.00	131	0.000675
7.48	224.00	168	

Reviewer: SK9U, 16-Nov-2023 15:50:46 -05:00:00 (UTC)

Audit Action: Marked Compound Undetected Audit Reason: Invalid Compound ID

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCS 140-79842/18-A

Matrix: Sediment | Lab File ID: LCS 140-7984218-A.D

Analysis Method: ID-0016 | Date Collected:

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.032(g) | Date Analyzed: 11/13/2023 21:22

Con. Extract Vol.: 500(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80177 | Units: ng/g

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
83-32-9	Acenaphthene	7810		310	81
208-96-8	Acenaphthylene	7590		310	23
120-12-7	Anthracene	7990		310	100
56-55-3	Benzo[a]anthracene	7910		310	120
50-32-8	Benzo[a]pyrene	8140		310	88
205-99-2	Benzo[b]fluoranthene	7330		310	110
192-97-2	Benzo[e]pyrene	8990		310	50
191-24-2	Benzo[g,h,i]perylene	7860		310	34
207-08-9	Benzo[k]fluoranthene	8340		310	72
218-01-9	Chrysene	8110		310	41
53-70-3	Dibenz(a,h)anthracene	7890		310	26
206-44-0	Fluoranthene	7870		310	250
86-73-7	Fluorene	7770		310	100
193-39-5	Indeno[1,2,3-cd]pyrene	7840		310	34
90-12-0	1-Methylnaphthalene	7590		1600	160
91-57-6	2-Methylnaphthalene	7780		1600	220
91-20-3	Naphthalene	7930		6300	910
198-55-0	Perylene	8140		310	160
85-01-8	Phenanthrene	7740		630	540
129-00-0	Pyrene	7680		630	94

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins Knoxville | Job No.: 140-34148-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCS 140-79842/18-A

Matrix: Sediment | Lab File ID: LCS 140-7984218-A.D

Analysis Method: ID-0016 | Date Collected:

Extract. Method: Passive Sampler | Date Extracted: 11/03/2023 10:43

Sample wt/vol: 0.032(g) | Date Analyzed: 11/13/2023 21:22

Con. Extract Vol.: 500(uL) | Dilution Factor: 1

Injection Volume: 1(uL) | GC Column: Rxi-5SilMS 25 ID: 0.25(mm)

% Moisture: % Solids: | GPC Cleanup:(Y/N) N

Cleanup Factor: | Level: (low/med) Low

Analysis Batch No.: 80177 | Units: ng/g

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
93951-97-4	Acenaphthylene-d8	83		30-120
1719-06-8	Anthracene-d10	78		30-120
63466-71-7	Benzo(a)pyrene-d12	77		30-120
93951-98-5	Benzo(b)fluoranthene-d12	95		30-120
93951-66-7	Benzo(ghi)perylene-d12	93		30-120
93952-01-3	Benzo(k)fluoranthene-d12	84		30-120
1719-03-5	Chrysene-d12	80		30-120
13250-98-1	Dibenz(a,h)anthracene-d14	91		30-120
93951-69-0	Fluoranthene-d10	88		30-120
81103-79-9	Fluorene -d10	86		30-120
203578-33-0	Indeno[1,2,3-cd]pyrene-d12	93		30-120
38072-94-5	1-Methylnaphthalene-d10	87		30-120
7297-45-2	2-Methylnaphthalene-d10	86		30-120
1146-65-2	Naphthalene-d8	84		30-120
1520-96-3	Perylene-d12	72		30-120
1517-22-2	Phenanthrene-d10	84		30-120

Report Date: 16-Nov-2023 15:46:36 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville
Target Compound Quantitation Report

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\LCS 140-7984218-A.D
Lims ID: LCS 140-79842/18-A
Client ID:
Sample Type: LCS
Inject. Date: 13-Nov-2023 21:22:02 ALS Bottle#: 0 Worklist Smp#: 29
Injection Vol: 1.0 ul Dil. Factor: 1.0000
Sample Info: 140-0030467-029
Operator ID: TAI\knxinstgcms1 Instrument ID: GCMS1

Method: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\SIM_PAH_GCMS1.m
Limit Group: SOG - PAH IsoDil - ICAL
Last Update: 16-Nov-2023 15:46:08 Calib Date: 13-Nov-2023 19:48:36
Integrator: RTE ID Type: RT Order ID
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\IC PAH1.D

Column 1 : Restek-5Sil MS 25um (0.25 mm) Det: MS SCAN
Process Host: CTX1650

First Level Reviewer: SK9U Date: 16-Nov-2023 09:44:17

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
D 3 1,4-Dichlorobenzene-d4	115	4.101	4.110	-0.009	85	14449	NC	NC	
4 1,4-Dichlorobenzene	146	4.110	4.118	-0.008	58	28199	NC	NC	
D 5 1,2-Dichlorobenzene-d4	115	4.221	4.221	0.000	84	14762	NC	NC	
6 1,2-Dichlorobenzene	146	4.230	4.229	0.001	91	27069	NC	NC	
9 1,2,4-Trichlorobenzene	180	5.013	5.022	-0.009	95	32225	NC	NC	
D 10 Naphthalene-d8	136	5.059	5.068	-0.009	99	60680	0.5000	0.4212	
12 Naphthalene	128	5.078	5.077	0.000	23	72387	0.5000	0.5072	
D 15 2-methylnaphthalene-d10	152	5.612	5.612	0.000	92	40325	0.5000	0.4305	
16 2-Methylnaphthalene	142	5.635	5.635	0.000	100	49968	0.5000	0.4981	
D 17 1-Methylnaphthalene-d10	152	5.686	5.692	-0.006	99	40622	0.5000	0.4328	
18 1-Methylnaphthalene	142	5.715	5.720	-0.005	95	47922	0.5000	0.4860	
19 1,1'-Biphenyl	154	6.014	6.013	0.001	100	70273	0.5000	0.4930	
D 20 2,6-Dimethylnaphthalene-d12	168	6.109	6.109	0.000	100	44437	0.5000	0.4261	
21 2,6-Dimethylnaphthalene	156	6.146	6.150	0.001	99	52852	0.5000	0.4961	
D 23 Acenaphthylene-d8	160	6.362	6.366	-0.004	90	66011	0.5000	0.4152	
24 Acenaphthylene	152	6.377	6.376	0.000	99	75433	0.5000	0.4861	
* 26 Acenaphthene-d10	164	6.492	6.492	0.000	97	51675	0.5000	0.5000	
27 Acenaphthene	154	6.517	6.517	0.000	98	49699	0.5000	0.5000	
28 2,3,5-Trimethylnaphthalene	170	6.834	6.834	0.000	92	56963	0.5000	0.4992	
D 29 Fluorene -d10	176	6.925	6.925	0.000	100	53231	0.5000	0.4323	
30 Fluorene	166	6.945	6.945	0.000	98	68755	0.5000	0.4972	
D 33 Dibenzothiophene-d8	192	7.631	7.628	0.003	100	23509	0.5000	0.0885	
34 Dibenzothiophene	184	7.645	7.645	0.000	91	27128	0.5000	0.5515	
D 35 Phenanthrene-d10	188	7.732	7.728	0.004	99	99096	0.5000	0.4197	
36 Phenanthrene	178	7.749	7.753	0.000	36	118500	0.5000	0.4957	
D 38 Anthracin-d10	188	7.780	7.783	0.004	99	89736	0.5000	0.3893	M
39 Anthracene	178	7.794	7.794	0.000	100	112993	0.5000	0.5114	M
40 1-Methylphenanthrene	191	8.289	8.289	0.000	100	57154	0.5000	0.5200	M
D 41 Fluoranthene-d10	212	8.808	8.808	0.000	100	134305	0.5000	0.4385	
43 Fluoranthene	202	8.825	8.822	0.000	41	173101	0.5000	0.5037	
* 44 Pyrene-d10 (IS)	212	9.027	9.027	0.000	99	151411	0.5000	0.5000	
45 Pyrene	202	9.044	9.044	0.000	100	172485	0.5000	0.4918	

Compound	Sig	RT (min.)	Adj RT (min.)	Dlt RT (min.)	Q	Response	Cal Amt ug/ml	OnCol Amt ug/ml	Flags
47 Benzo[a]anthracene	228	10.255	10.259	-0.005	100	155606	0.5000	0.5061	
D 48 Chrysene-d12	240	10.270	10.270	0.000	98	118381	0.5000	0.4007	
50 Chrysene	228	10.295	10.295	0.000	24	178950	0.5000	0.5193	
D 52 Benzo(b)fluoranthene-d12	264	11.369	11.369	0.000	100	107601	0.5000	0.4764	
53 Benzo[b]fluoranthene	252	11.397	11.397	0.000	98	169980	0.5000	0.4689	
D 54 Benzo(k)fluoranthene-d12	264	11.404	11.404	0.000	94	111037	0.5000	0.4185	
55 Benzo[k]fluoranthene	252	11.425	11.425	0.000	100	173652	0.5000	0.5338	
* 56 Benzo(e)pyrene-d12	264	11.684	11.684	0.000	99	89173	0.5000	0.5000	
57 Benzo[e]pyrene	252	11.712	11.712	0.000	100	148370	0.5000	0.5756	
D 58 Benzo(a)pyrene-d12	264	11.747	11.747	0.000	100	76482	0.5000	0.3861	
59 Benzo[a]pyrene	252	11.768	11.782	-0.007	100	131701	0.5000	0.5207	
D 60 Perylene-d12	264	11.838	11.845	-0.007	100	78894	0.5000	0.3589	
61 Perylene	252	11.866	11.866	-0.007	100	117408	0.5000	0.5207	
D 62 Indeno[1,2,3-cd]pyrene-d12	288	13.186	13.186	0.000	89	100290	0.5000	0.4661	
D 63 Dibenz(a,h)anthracene-d14	292	13.186	13.196	-0.010	89	87347	0.5000	0.4537	
65 Indeno[1,2,3-cd]pyrene	276	13.214	13.196	0.000	60	168329	0.5000	0.5015	
66 Dibenz(a,h)anthracene	278	13.233	13.242	-0.009	80	140914	0.5000	0.5052	
D 67 Benzo(ghi)perylene-d12	288	13.543	13.543	0.000	100	99364	0.5000	0.4650	
68 Benzo[g,h,i]perylene	276	13.580	13.580	0.000	92	146436	0.5000	0.5033	
69 Dibenzo(def,p)chrysene	302	14.922	14.922	0.000	81	68621	NC	NC	
70 Dibenzo[a,e]pyrene	302	15.373	15.382	-0.009	70	91968	NC	NC	
D 71 Coronene-d12	312	15.373	15.382	-0.009	77	73207	NC	NC	
72 Dibenz(a,i)pyrene	302	15.551	15.570	-0.019	90	31311	NC	NC	
73 Dibenzo[a,h]pyrene	302	15.645	15.654	-0.009	83	26526	NC	NC	
* 82 PCB-167L	372	10.023	10.027	-0.004	72	20075	0.4000	0.4000	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Reagents:

60ISPCB_00001 Amount Added: 5.00 Units: uL

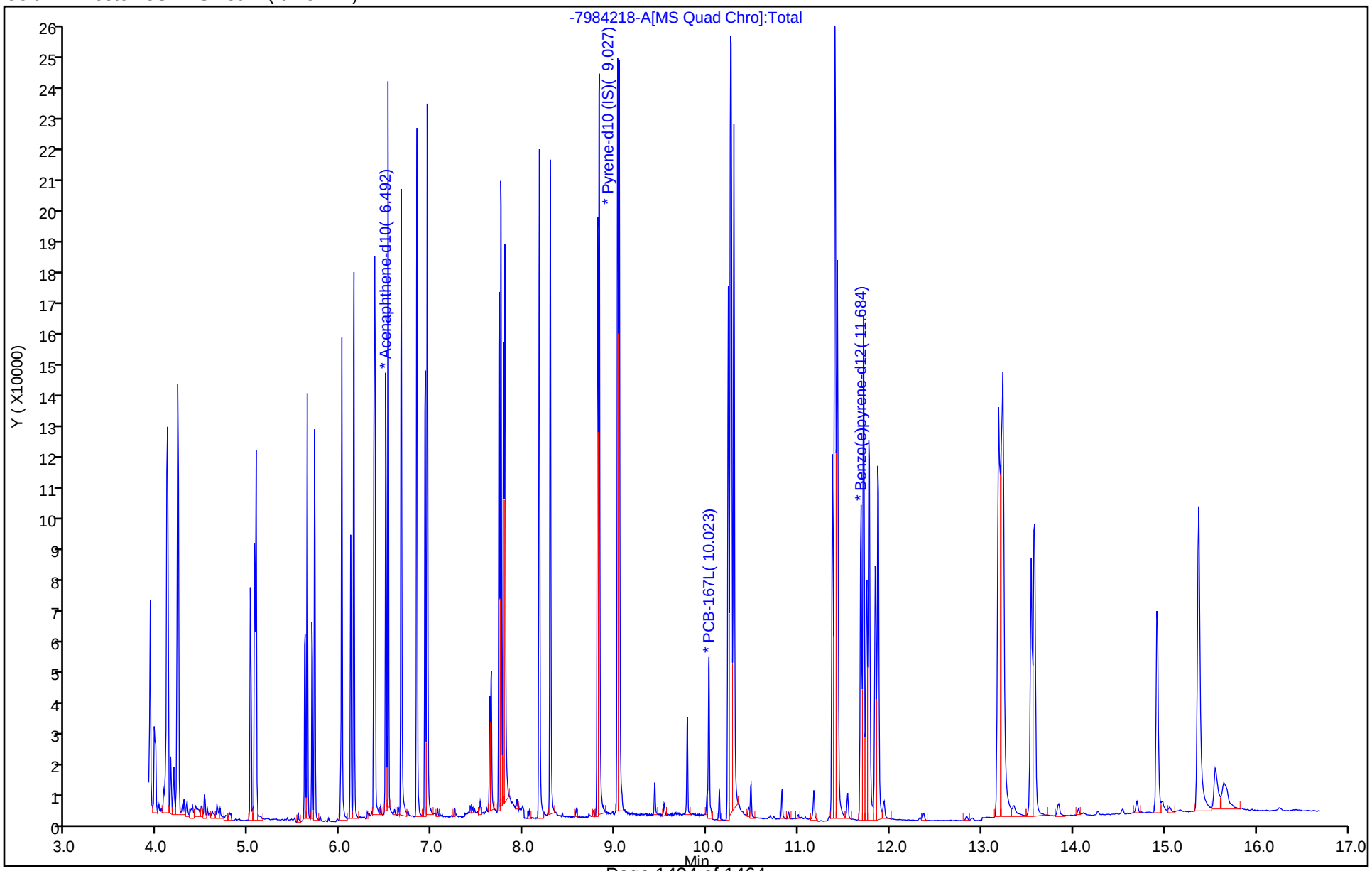
Report Date: 16-Nov-2023 15:46:36 Chrom Revision: 2.3 15-Nov-2023 20:54:34

Eurofins Knoxville

Data File: \\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\LCS 140-7984218-A.D

Injection Date:	13-Nov-2023 21:22:02	Instrument ID:	GCMS1	Operator ID:	TAI\knxinstgcms1
Lims ID:	LCS 140-79842/18-A			Worklist Smp#:	29
Client ID:					
Injection Vol:	1.0 ul	Dil. Factor:	1.0000	ALS Bottle#:	0
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		

Column: Restek-5Sil MS 25um (0.25 mm)



Manual Integration/User Assign Peak Report

Eurofins Knoxville

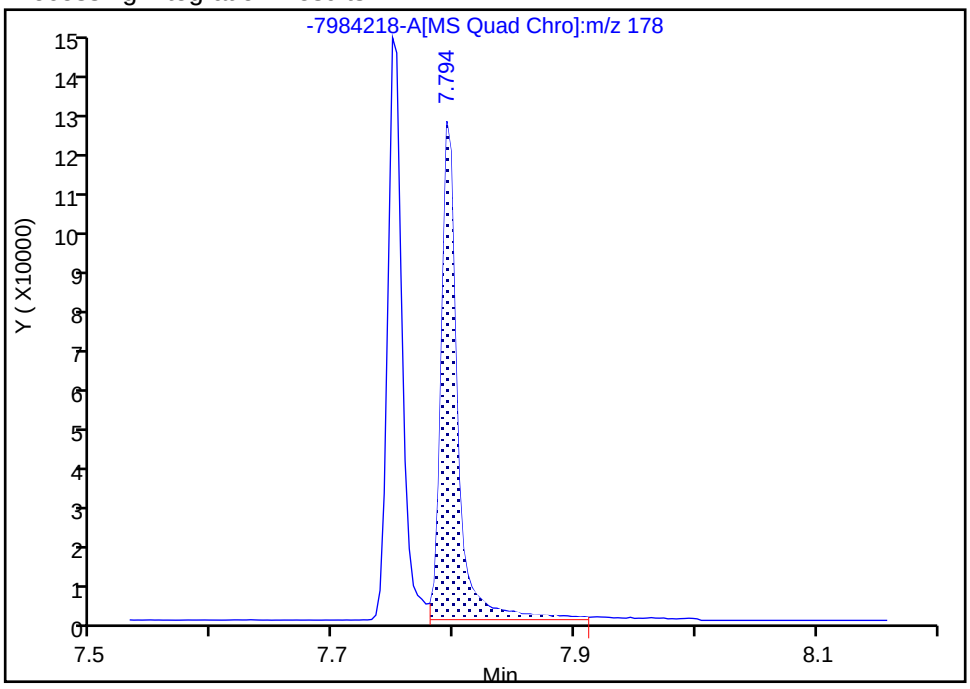
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\LCS 140-7984218-A.D				
Injection Date:	13-Nov-2023 21:22:02	Instrument ID:	GCMS1		
Lims ID:	LCS 140-79842/18-A				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	29
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

39 Anthracene, CAS: 120-12-7

Signal: 1

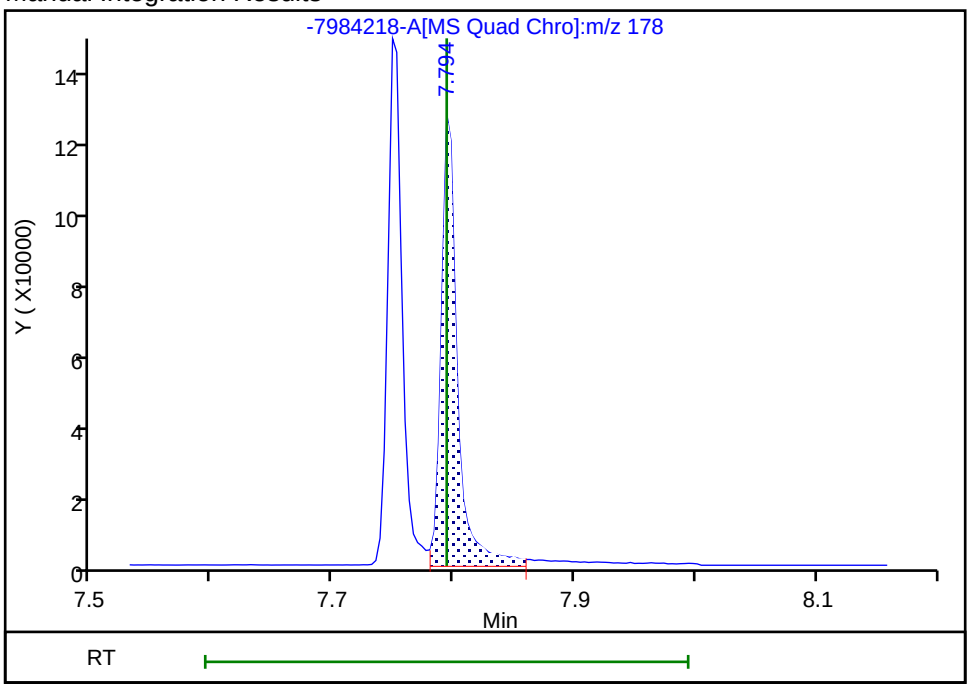
Processing Integration Results

RT: 7.79
Area: 116483
Amount: 0.527198
Amount Units: ug/ml



Manual Integration Results

RT: 7.79
Area: 112993
Amount: 0.511402
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 09:42:18 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

Manual Integration/User Assign Peak Report

Eurofins Knoxville

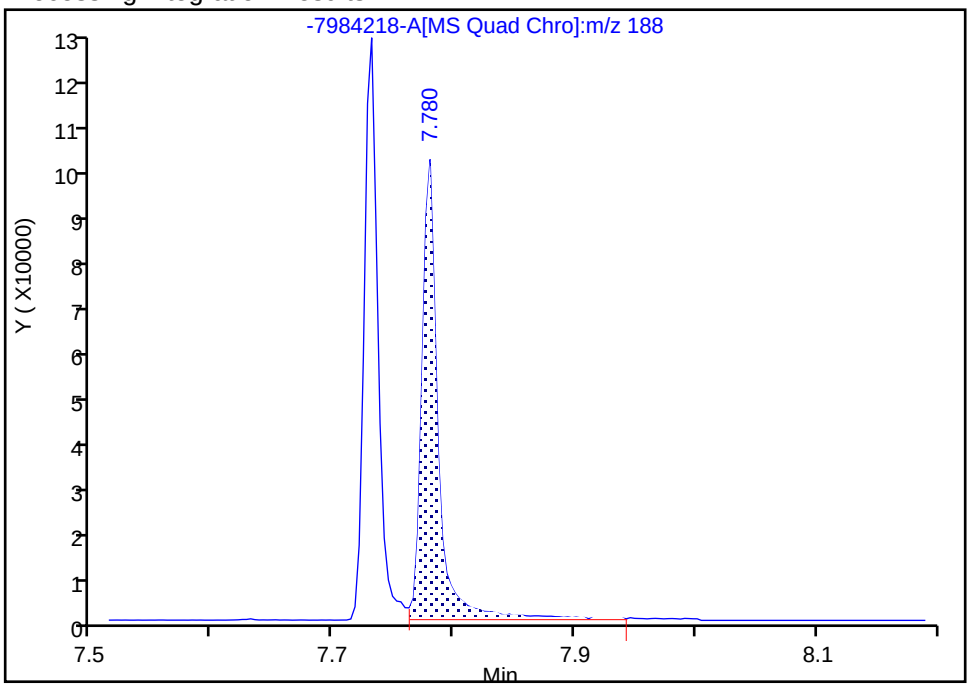
Data File:	\\ChromFS\Knoxville\ChromData\GCMS1\20231113-30467.b\LCS 140-7984218-A.D				
Injection Date:	13-Nov-2023 21:22:02	Instrument ID:	GCMS1		
Lims ID:	LCS 140-79842/18-A				
Client ID:					
Operator ID:	TAI\knxinstgcms1	ALS Bottle#:	0	Worklist Smp#:	29
Injection Vol:	1.0 ul	Dil. Factor:	1.0000		
Method:	SIM_PAH_GCMS1	Limit Group:	SOG - PAH IsoDil - ICAL		
Column:	Restek-5Sil MS 25um (0.25 mm)	Detector	MS SCAN		

D 38 Anthracin-d10, CAS: 1719-06-8

Signal: 1

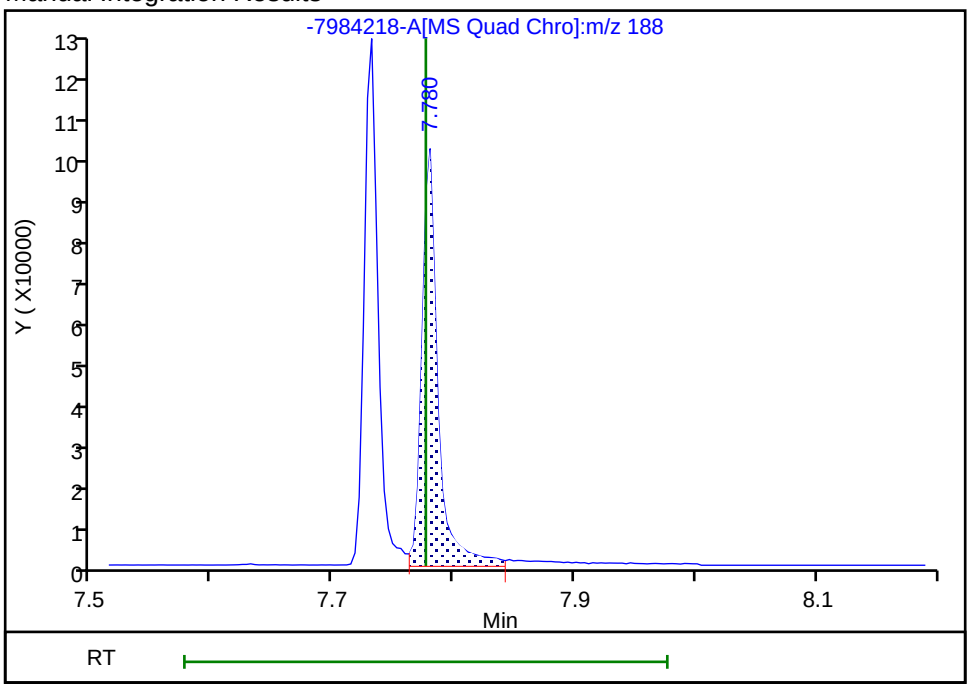
Processing Integration Results

RT: 7.78
Area: 94120
Amount: 0.408311
Amount Units: ug/ml



Manual Integration Results

RT: 7.78
Area: 89736
Amount: 0.389292
Amount Units: ug/ml



Reviewer: SK9U, 16-Nov-2023 09:42:07 -05:00:00 (UTC)

Audit Action: Split an Integrated Peak Audit Reason: Split Peak

GC/MS SEMI VOA ANALYSIS RUN LOG

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Instrument ID: GCMS1 Start Date: 11/13/2023 11:40

Analysis Batch Number: 80177 End Date: 11/13/2023 22:55

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
WDM 140-80177/4		11/13/2023 11:40	1	WDM.D	Rxi-5SilMS 25 0.25(mm)
IC 140-80177/8		11/13/2023 13:12	1	IC PCB7.D	Rxi-5SilMS 25 0.25(mm)
IC 140-80177/9		11/13/2023 13:35	1	IC PCB6.D	Rxi-5SilMS 25 0.25(mm)
IC 140-80177/10		11/13/2023 13:59	1	IC PCB5.D	Rxi-5SilMS 25 0.25(mm)
IC 140-80177/11		11/13/2023 14:22	1	IC PCB4.D	Rxi-5SilMS 25 0.25(mm)
IC 140-80177/12		11/13/2023 14:45	1	IC PCB3.D	Rxi-5SilMS 25 0.25(mm)
IC 140-80177/13		11/13/2023 15:08	1	IC PCB2.D	Rxi-5SilMS 25 0.25(mm)
IC 140-80177/14		11/13/2023 15:31	1	IC PCB1.D	Rxi-5SilMS 25 0.25(mm)
IC 140-80177/19		11/13/2023 17:27	1	IC PAH7.D	Rxi-5SilMS 25 0.25(mm)
IC 140-80177/20		11/13/2023 17:51	1	IC PAH6.D	Rxi-5SilMS 25 0.25(mm)
IC 140-80177/21		11/13/2023 18:14	1	IC PAH5.D	Rxi-5SilMS 25 0.25(mm)
IC 140-80177/22		11/13/2023 18:38	1	IC PAH4.D	Rxi-5SilMS 25 0.25(mm)
IC 140-80177/23		11/13/2023 19:01	1	IC PAH3.D	Rxi-5SilMS 25 0.25(mm)
IC 140-80177/24		11/13/2023 19:25	1	IC PAH2.D	Rxi-5SilMS 25 0.25(mm)
IC 140-80177/25		11/13/2023 19:48	1	IC PAH1.D	Rxi-5SilMS 25 0.25(mm)
ICV 140-80177/26		11/13/2023 20:12	1	ICV SIMPAH.D	Rxi-5SilMS 25 0.25(mm)
MB 140-79842/19-A		11/13/2023 20:58	1	MB 140-7984219-A.D	Rxi-5SilMS 25 0.25(mm)
LCS 140-79842/18-A		11/13/2023 21:22	1	LCS 140-7984218-A.D	Rxi-5SilMS 25 0.25(mm)
140-34148-1	GEI.PRC.BLK1	11/13/2023 21:45	1	140-34148-A-1-Ac.D	Rxi-5SilMS 25 0.25(mm)
140-34148-2	GEI.PRC.BLK2	11/13/2023 22:08	1	140-34148-A-2-A.D	Rxi-5SilMS 25 0.25(mm)
140-34148-3	GEI.PRC.BLK3	11/13/2023 22:31	1	140-34148-A-3-A.D	Rxi-5SilMS 25 0.25(mm)
140-34148-4	1804576-851-S1	11/13/2023 22:55	1	140-34148-A-4-A.D	Rxi-5SilMS 25 0.25(mm)

Eurofins/TestAmerica Knoxville GC/MS-SIM Batch Review/Narrative Checklist
Method: PAHs and Selected SVOCs – KNOX-ID-0016, Revision 14

PAH ☐ **0010 ☐**

	TALS Batch #	80177		
Instrument:	**GCMS1**	**ICAL TALS Batch # / Event #**		**Scanned ☐**
Analysis Date:	**11-13-23**	**PAH:**	**80177 / 4718**	
ICAL Chrom WL #	**30467**	**EU:**		
CCAL Chrom WL #	**30467**	**PCB:**	80177 / 4716	
		Other:		

CCV Chrom/Worklist Review	1st	***Comments/NCM #***	2nd
1. Are all required calibration standards in worklist?	**Y**		
2. Are the reagents & init/final volumes correct? (Verify reagents & amt. injected) [WL Sample Reagent Tab]	**Y**		**Y**
3. Is the Chrom method locked?	**Y**		**Y**
4. Was the CCAL compared to the most recent & correct ICAL for each CCV & LG? (verify ICAL batch #, start/end Cal date & time) [F8]	**Y**		**Y**
5. Elution order checked on isomeric pairs/coeluters?			
• 1,4 dichlorobenzene before 1,2 dichlorobenzene (& d4 isomers)	**Y**		**Y**
• 2-methylnaphthalene before 1-methylnaphthalene (& d10 isomers)	**Y**		**Y**
• acenaphthylene before acenaphthene (& d10 isomers)	**Y**		**Y**
• dibenzothiophene before phenanthrene	**Y**		**Y**
• phenanthrene before anthracene (& d10 isomers)	**Y**		**Y**
• 3-methylphenanthrene and 1-methylphenanthrene	**Y**		**Y**
• fluoranthene before pyrene (& d10 isomers)	**Y**		**Y**
• benzo(a)anthracene before chrysene (& d12 isomers)	**Y**		**Y**
• benzo(b)fluoranthene before benzo(k)fluoranthene (& d12 isomers)	**Y**		**Y**
• benzo(e)pyrene before benzo(a)pyrene	**Y**		**Y**
• benzo(a)pyrene before perylene (& d12 isomers)	**Y**		**Y**
• Indeno(1,2,3-cd)pyrene before benzo(g,h,I)perylene (& d12 isomers)	**Y**		**Y**
6. Manual integrations properly performed, correctly ID'd, baseline clearly identified, and correct reason given?	**Y**	*Note: manual selections should be updated and all data reprocessed*	**Y**
7. Were all peaks identified automatically? *If not, list analytes:* _____	**Y**	*Note: any non-detected peaks must be verified in each affected sample.*	**Y**
8. Has the retention time been updated to the method?	**Y**		**Y**
9. Are the internal standard responses within limits for each CCV? (50-200% of the mid-level ICAL standard) [F8-istd]	**Y**		**Y**
10. Have the alkyl groups in WDM been correctly integrated and exclusion zones correct?	**Y**		**Y**

CCV Chrom/TALS MLG Review	*PAH*	*0010*	*Comments/NCM #*	*PAH*	*0010*
11. Is the %D or drift ≤ 30% for all target analytes? ***[F8] or TALS sample tab***	**Y**		☐ CCV high, sample ND (NCM#_____)	Y	
12. Is the calibration event # correct for each CCV? Also check IDA and IS event #'s) ***[TALS Sample Results tab]***	**Y**			Y	

* Such action must be taken in consultation with client.

Eurofins/TestAmerica Knoxville GC/MS-SIM Batch Review/Narrative Checklist
Method: PAHs and Selected SVOCs – KNOX-ID-0016, Revision 14

TALS BATCH #:_____80177_____

Batch Chrom/TALS review	*1st*	*Comments/NCM #*	*2nd*
1. Have the sample ID's and dilution factors been confirmed (check sequence, autosampler positions, etc.)?	**Y**		
2. Were all samples injected within 12 hrs. of first CCV?	**Y**		**Y**
3. Method blank or instrument blank analyzed with each sequence?	**Y**		**Y**
4. Are all analytes in the method blank < RL?	**Y**	□ MB RX/HT out (NCM#_____) □ MB-insuff samp (NCM#_____) □ MB-insuff samp -CONSUMED (NCM#_____) □ MB-Rpt.10X (NCM#_____) □ MB Rpt ND (NCM#_____)	**Y**
5. Method blank IDA recoveries within QC limits? [F8] or [Batch Results SUR Tab]	**N**	□ IDA – High (1) No effect (NCM#_____) (2) Matrix, low bias (NCM#_____) □ IDA – Low - S/N 10:1 (NCM#___50757_____)	**Y**
6. LCS done per batch and criteria met for IDA and natives? [Chrom-F8] [TALS-Sample Results Tab]	**N**	□ LCS/D %R High < RL in smp (1&4) (NCM#_____) □ LCS/D out-RX HT out (NCM#_____) □ LCS/D-%RPD (%R OK) (NCM#_____)	**Y**
7. All runs - peaks ID'd correctly and false positives removed? Flag or narrate native analyte interference issues > RL: *NCM only needed for "cn"* Flags: K: benzo(b/k) reported as (b) k: benzo(b/k) reported as (k) a: benzo(a)anthracene/chrysene reported as b(a)a y: benzo(a)anthracene/chrysene reported as chrysene CI: chromatographic interferences – high bias cn: see case narrative	**Y**	"cn" (NCM#_____) Samples analytes _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ "cn" (NCM#_____) Samples analytes _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____	**Y**
8. Manual integrations properly performed, correctly ID'd, baseline clearly identified, and correct reason given?	Y		**Y**
9. Are Alkyl group start/end times and patterns verified?	Y	"AP" flags applied where appropriate? (NCM not needed unless necessary)	**Y**
10. Are IDA recoveries within QC limits? [Batch Results SUR Tab] If no, list samples under appropriate NCM	N	□ IDA – High (1) no effect (NCM#_____) Samples Samples _____ _____ _____ _____ _____ _____ (2) matrix, low bias (NCM#_____) Samples Samples _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ □ IDA – Low - S/N > 10:1 - OK (NCM#__50757_____) Samples Samples MB 140-79842/19__ LCS 140-79842/18 _____ _____ _____ _____ _____ _____ □ IDA – Low - S/N < 10:1 ***"cn"*** (NCM#) Samples Samples _____ _____ _____ _____ _____ _____ _____ _____	**Y**
11. Are field/alternate surrogates with QC limits? Sample Reason Sample Reason _____ _____ _____ _____	NA	□ Dil – Surr dil out or estimated & elev RL's (opt 1-4 & 5-8): (NCM#_____) □ Surr-Matrix (1-5) (NCM#_____)	**NA**
12. For initial analysis with elevated RL's, explain: *List diluted samples and reason:* Sample Reason Sample Reason _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____	**NA**	1) □ RL – Screen (NCM#_____) 2) □ RL – Non-targets (NCM#_____) 3) □ RL – Targets (NCM#_____) 4) □ RL – Final Vol (NCM#_____) 5) □ RL – Init Vol (matrix) (NCM#_____) 6) □ RL – Insuff. Smp (NCM#_____) 7) □ RL – DIL - Matrix (NCM#_____)	**NA**
13. Samples that have Cu cleanup NCM'd? (apply NCM to batch) Prep Batch #'s:_____	**NA**	□ Clean-up –Cu (NCM#_____)	
14. Samples over 50 X dil. – Method cleanup inserted (PAH_DIL)? Samples:_____	**NA**	□ Dil-Re-Spike IDA (NCM#_____)	**NA**

* Such action must be taken in consultation with client.

Eurofins/TestAmerica Knoxville GC/MS-SIM Batch Review/Narrative Checklist
Method: PAHs and Selected SVOCs – KNOX-ID-0016, Revision 14

		TALS BATCH #:_____80177_____	
Batch TALS Review	***1st***	***Comments/NCM #***	***2nd***
15. Graphics uploaded?	**Y**		**Y**
16. Sample special instructions verified?	**Y**		**Y**
17. Suffixes assigned properly (DL/RE)? [Sample List Tab]	**NA**		**NA**
18. Each job has CCV created? [Sample List Tab]	**Y**		**Y**
19. Analytes over calibration range set to secondary & dilutions scheduled for analysis? [Conditions Review Tab] Samples: _____ _____ _____ _____ _____ _____ _____ _____	**Y**	□ ICAL-Range Exceed; No Saturation * (NCM#_____)	**Y**
20. For dilutions, diluted analytes set to primary, others to "Acceptable"? [Sample Results Tab]	**Y**		**Y**
21. If MS/MSD was done on this client's sample or for reported batch QC, were the MS/MSD recoveries and RPDs within laboratory generated QC limits?	**NA**	□ MS/MSD - %R out, LCS OK □ MS/MSD - high targets □ MS/MSD – spk/surr diluted out □ MS/MSD/Dup - % RPD	**NA**
22. Verify reagents have not expired [Reagents Tab]	**Y**		**Y**
23. Samples not reported set to "Acceptable" or "Rejected" [Sample Results Tab]	**NA**		**NA**
24. CCV's linked to all samples? [QC Links]	**Y**		**Y**
25. Samples linked to correct MB & LCS/D & MS/D? [QC Links]	**Y**		**Y**
26. Correct ICV's linked to all samples? [QC Links]	**Y**		**Y**
27. Runs set to 1st level review?	**Y**	Runs set to 2nd level review?	**Y**
28. QC checker run for batch and items addressed			**Y**
29. Checklist scanned & attached properly?			**Y**

1st level: GEM	**Date: 11-16-23**	**2nd level: CLJ**	**Date 11/17/23**
Comments:			
Example calculation (per prep batch):			

* Such action must be taken in consultation with client.

Eurofins/TestAmerica Knoxville GC/MS-SIM ICAL Review/Narrative Checklist
Method: PAHs and Selected SVOCs – KNOX-ID-0016, Revision 14

Instrument:	GCMS1	TALS Batch / Event #	PAH	0010 PAH	Scanned □
Analysis Date:	11-13-23	PAH:	80177 / 4705	80176 / 4704	
Chrom WL #	30467	EU:	/	/	
		PCB:	80177 / 4702	/	
		Other:	/	/	

Chrom Worklist/Peak Review	1st	*Comments*	2nd
1. Re-read each limit group [method editor-limit groups]	Y		
2. Verify LOD [method editor -> edit -> MDL]	Y		
3. Are the reagents & init/final vol correct [Sample & Run Reagents]	Y		
4. First levels "unlock/clear" or "unlock/clear by sublist" as appropriate?	Y		Y
5. Are the Cal Levels & groups correct in WL?	Y		Y
6. Were all standards injected within 12 hr of first injection? [F7]	Y		Y
7. Was the high point std checked for saturation [flags + visible inspection: $8.4x10^6$]	Y		Y
8. If manual integrations were performed, are they appropriate with proper reason given?	Y		Y
9. Were all peaks identified automatically? If not, list analytes: _____	Y	*Modify method for detection must be attempted and all points reprocessed. Any non-detected peaks must be verified in each affected sample.*	Y
10. Elution order checked on isomeric pairs? • 1,4 dichlorobenzene before 1,2 dichlorobenzene (& d4 isomers)	Y		Y
• 2-methylnaphthalene before 1-methylnaphthalene (& d10 isomers)	Y		Y
• acenaphthylene before acenaphthene (& d10 isomers)	Y		Y
• dibenzothiophene before phenanthrene	Y		Y
• phenanthrene before anthracene (& d10 isomers)	Y		Y
• 3-methylphenanthrene and 1-methylphenanthrene	Y		Y
• fluoranthene before pyrene (& d10 isomers)	Y		Y
• benzo(a)anthracene before chrysene (& d12 isomers)	Y		Y
• benzo(b)fluoranthene before benzo(k)fluoranthene (& d12 isomers)	Y		Y
• benzo(e)pyrene before benzo(a)pyrene before perylene (& d12 isomers)	Y		Y
• Indeno(1,2,3-cd)pyrene before benzo(g,h,i)perylene (& d12 isomers)	Y		Y

Chrom MLG Review	PAH	0010	Comments/NCM#	PAH	0010
11. Are ICAL start/end dates/times correct on summary? [F6]	y	Y		Y	Y
12. Are ≥ 5 levels of each compound/surrogate active? [F6]	Y	y		Y	Y
13. Is low level standard at or below RL & points consec? [F6]	y	Y		Y	Y
14. Are all %RSD ≤30% [F6]	y	Y		Y	Y
15. Was a linear or quadratic fit used for analytes >30 % RSD? [F6]	Y	y		Y	Y
16. If curves were used, is correlation coefficient ≥0.990? [F6]	y	Y		Y	Y
17. At least 6 consecutive points used for quadratic curves? [F6]	Y	y		Y	Y
18. For quadratic: is a tangent's slope to the curve entirely positive or negative and continuous? [Cntrl-C, details]	y	Y		Y	Y
19. Is the intercept < RL for each curve? [Cntrl-C, details]	Y	y		Y	Y
20. Is the readback for each point within criteria? [F6-Drift] (<40% for all points, except low point < 50 %)	y	Y		Y	Y
21. Was the ICV within ± 30% recovery? [F8-icv]	Y	y	□ ICV out, smp ND (NCM#_____)	Y	Y
22. Lock method in Chrom, upload ICAL in TALS and set as most recent method.	-na-	-na-		Y	Y
1st level reviewer: GEM	**Date: 11-14-23**		**2nd level reviewer: CLJ**	**Date: 11-14-23**	
Comments:					

* Such action must be taken in consultation with client.

Eurofins/TestAmerica Knoxville GC/MS-SIM ICAL Review/Narrative Checklist
Method: PAHs and Selected SVOCs – KNOX-ID-0016, Revision 14

TALS MLG Review	PAH	0010	Comments	PAH	0010
23. Graphics uploaded? [Sample List Tab]	**y**	**y**		**Y**	**Y**
24. All points are in the most recent active calibration event #? [Calibration ID # in the sample results tab & Calibration Events] [Calibration Events - 'Fix ICAL Linkage' if needed]	**y**	**y**		**Y**	**Y**
25. If criteria not met, was a NCM generated?	**NA**	**NA**		**NA**	**NA**
26. After review in TALS, approve the calibrations in TALS				**Y**	**Y**
27. Checklist scanned & attached properly?				**Y**	**Y**
1st level reviewer: GEM **Date: 11-14-23**		**2nd level reviewer: CLJ**		**Date: 11/14/23**	
Comments:					

* Such action must be taken in consultation with client.

GC/MS SEMI VOA ANALYSIS RUN LOG

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Instrument ID: GCMS1 Start Date: 11/16/2023 11:08

Analysis Batch Number: 80349 End Date: 11/16/2023 22:05

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 140-80349/2		11/16/2023 11:08	1	CCV pah.D	Rxi-5SilMS 25 0.25(mm)
CCV 140-80349/3		11/16/2023 11:31	1	CCV PCB1.D	Rxi-5SilMS 25 0.25(mm)
WDM 140-80349/4		11/16/2023 11:54	1	WDM.D	Rxi-5SilMS 25 0.25(mm)
ZZZZZ		11/16/2023 15:02	1		Rxi-5SilMS 25 0.25(mm)
ZZZZZ		11/16/2023 15:25	1		Rxi-5SilMS 25 0.25(mm)
140-34148-6	1804576-852-S1	11/16/2023 15:49	1	810-82790-A-1-A .D	Rxi-5SilMS 25 0.25(mm)
140-34148-8	1804576-843-S1	11/16/2023 16:37	1	810-82790-A-3-A .D	Rxi-5SilMS 25 0.25(mm)
140-34148-10	1804576-844-S1	11/16/2023 17:24	1	140-34148-A-7-A .D	Rxi-5SilMS 25 0.25(mm)
140-34148-11	1804576-844-S3	11/16/2023 17:48	1	140-34148-A-8-A .D	Rxi-5SilMS 25 0.25(mm)
140-34148-12	1804576-854-S1	11/16/2023 18:11	1	140-34148-A-9-A .D	Rxi-5SilMS 25 0.25(mm)
140-34148-13	1804576-854-S2	11/16/2023 18:35	1	140-34148-A-10-A.D	Rxi-5SilMS 25 0.25(mm)
140-34148-14	1804576-846-S1	11/16/2023 18:59	1	140-34148-A-11-A.D	Rxi-5SilMS 25 0.25(mm)
140-34148-15	1804576-846-S3	11/16/2023 19:22	1	140-34148-A-12-A.D	Rxi-5SilMS 25 0.25(mm)
140-34148-16	1804576-853-S1	11/16/2023 19:45	1	140-34148-A-13-A.D	Rxi-5SilMS 25 0.25(mm)
140-34148-17	1804576-853-S3	11/16/2023 20:09	1	140-34148-A-14-A.D	Rxi-5SilMS 25 0.25(mm)
ZZZZZ		11/16/2023 20:55	30		Rxi-5SilMS 25 0.25(mm)
ZZZZZ		11/16/2023 21:19	30		Rxi-5SilMS 25 0.25(mm)
140-34148-7	1804576-852-S2	11/16/2023 22:05	5	34148-7df5.D	Rxi-5SilMS 25 0.25(mm)

Eurofins/TestAmerica Knoxville GC/MS-SIM Batch Review/Narrative Checklist
Method: PAHs and Selected SVOCs – KNOX-ID-0016, Revision 14

PAH ☐ **0010 ☐**

	TALS Batch #	80349		
Instrument:	**GCMS1**	**ICAL TALS Batch # / Event #**		**Scanned ☐**
Analysis Date:	**11-16-23**	**PAH:**	**80177 / 4718**	
ICAL Chrom WL #	**30467**	**EU:**		
CCAL Chrom WL #	**30519**	**PCB:**	**80177 / 4716**	
		Other:		

CCV Chrom/Worklist Review	1st	***Comments/NCM #***	2nd
1. Are all required calibration standards in worklist?	**Y**		
2. Are the reagents & init/final volumes correct? (Verify reagents & amt. injected) [WL Sample Reagent Tab]	**Y**		**Y**
3. Is the Chrom method locked?	**Y**		**Y**
4. Was the CCAL compared to the most recent & correct ICAL for each CCV & LG? (verify ICAL batch #, start/end Cal date & time) [F8]	**Y**		**Y**
5. Elution order checked on isomeric pairs/coeluters?			
• 1,4 dichlorobenzene before 1,2 dichlorobenzene (& d4 isomers)	**Y**		**Y**
• 2-methylnaphthalene before 1-methylnaphthalene (& d10 isomers)	**Y**		**Y**
• acenaphthylene before acenaphthene (& d10 isomers)	**Y**		**Y**
• dibenzothiophene before phenanthrene	**Y**		**Y**
• phenanthrene before anthracene (& d10 isomers)	**Y**		**Y**
• 3-methylphenanthrene and 1-methylphenanthrene	**Y**		**Y**
• fluoranthene before pyrene (& d10 isomers)	**Y**		**Y**
• benzo(a)anthracene before chrysene (& d12 isomers)	**Y**		**Y**
• benzo(b)fluoranthene before benzo(k)fluoranthene (& d12 isomers)	**Y**		**Y**
• benzo(e)pyrene before benzo(a)pyrene	**Y**		**Y**
• benzo(a)pyrene before perylene (& d12 isomers)	**Y**		**Y**
• Indeno(1,2,3-cd)pyrene before benzo(g,h,I)perylene (& d12 isomers)	**Y**		**Y**
6. Manual integrations properly performed, correctly ID'd, baseline clearly identified, and correct reason given?	**Y**	*Note: manual selections should be updated and all data reprocessed*	**Y**
7. Were all peaks identified automatically? *If not, list analytes:* _____	**Y**	*Note: any non-detected peaks must be verified in each affected sample.*	**Y**
8. Has the retention time been updated to the method?	**Y**		**Y**
9. Are the internal standard responses within limits for each CCV? (50-200% of the mid-level ICAL standard) [F8-istd]	**Y**		**Y**
10. Have the alkyl groups in WDM been correctly integrated and exclusion zones correct?	**Y**		**Y**

CCV Chrom/TALS MLG Review	*PAH*	*0010*	*Comments/NCM #*	*PAH*	*0010*
11. Is the %D or drift ≤ 30% for all target analytes? ***[F8] or TALS sample tab***	**Y**		☐ CCV high, sample ND (NCM#_____)	Y	
12. Is the calibration event # correct for each CCV? Also check IDA and IS event #'s) ***[TALS Sample Results tab]***	**Y**			Y	

* Such action must be taken in consultation with client.

Eurofins/TestAmerica Knoxville GC/MS-SIM Batch Review/Narrative Checklist
Method: PAHs and Selected SVOCs – KNOX-ID-0016, Revision 14

TALS BATCH #:_____80349_____

Batch Chrom/TALS review	*1st*	*Comments/NCM #*	*2nd*
1. Have the sample ID's and dilution factors been confirmed (check sequence, autosampler positions, etc.)?	**Y**		
2. Were all samples injected within 12 hrs. of first CCV?	**Y**		**Y**
3. Method blank or instrument blank analyzed with each sequence?	**Y**		**Y**
4. Are all analytes in the method blank < RL?	**Y**	□ MB RX/HT out (NCM#_____) □ MB-insuff samp (NCM#_____) □ MB-insuff samp -CONSUMED (NCM#_____) □ MB-Rpt.10X (NCM#_____) □ MB Rpt ND (NCM#_____)	**Y**
5. Method blank IDA recoveries within QC limits? [F8] or [Batch Results SUR Tab]	**Y**	□ IDA – High (1) No effect (NCM#_____) (2) Matrix, low bias (NCM#_____) □ IDA – Low - S/N 10:1 (NCM#_____)	**Y**
6. LCS done per batch and criteria met for IDA and natives? [Chrom-F8] [TALS-Sample Results Tab]	**Y**	□ LCS/D %R High < RL in smp (1&4) (NCM#_____) □ LCS/D out-RX HT out (NCM#_____) □ LCS/D-%RPD (%R OK) (NCM#_____)	**Y**
7. All runs - peaks ID'd correctly and false positives removed? Flag or narrate native analyte interference issues > RL: *NCM only needed for "cn"* Flags: K: benzo(b/k) reported as (b) k: benzo(b/k) reported as (k) a: benzo(a)anthracene/chrysene reported as b(a)a y: benzo(a)anthracene/chrysene reported as chrysene CI: chromatographic interferences – high bias cn: see case narrative	**Y**	"cn" (NCM#_____) Samples analytes _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ "cn" (NCM#_____) Samples analytes _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____	**Y**
8. Manual integrations properly performed, correctly ID'd, baseline clearly identified, and correct reason given?	Y		**Y**
9. Are Alkyl group start/end times and patterns verified?	Y	"AP" flags applied where appropriate? (NCM not needed unless necessary)	**Y**
10. Are IDA recoveries within QC limits? [Batch Results SUR Tab] If no, list samples under appropriate NCM	n	□ IDA – High (1) no effect (NCM#_____50857_____) Samples Samples 810-82790-1 810-82790-2 _____ _____ _____ _____ (2) matrix, low bias (NCM#_____) Samples Samples _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ □ IDA – Low - S/N > 10:1 - OK (NCM#_____) Samples Samples _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ □ IDA – Low - S/N < 10:1 ***"cn"*** (NCM# **140-8025**) Samples Samples _____ _____ _____ _____ _____ _____ _____ _____	**N**
11. Are field/alternate surrogates with QC limits? Sample Reason Sample Reason _____ _____ _____ _____	NA	□ Dil – Surr dil out or estimated & elev RL's (opt 1-4 & 5-8): (NCM#_____) □ Surr-Matrix (1-5) (NCM#_____)	**NA**
12. For initial analysis with elevated RL's, explain: *List diluted samples and reason:* Sample Reason Sample Reason 810-82790-a-1-a target dilution _____ _____ 810-82790-a-2-a target dilution _____ _____ 140-34148-a-7-a target dilution _____ _____ _____ _____ _____ _____	y	1) □ RL – Screen (NCM#_____) 2) □ RL – Non-targets (NCM#_____) 3) □ RL – Targets (NCM#_____50819_____) 4) □ RL – Final Vol (NCM#_____) 5) □ RL – Init Vol (matrix) (NCM#_____) 6) □ RL – Insuff. Smp (NCM#_____) 7) □ RL – DIL - Matrix (NCM#_____)	**Y**
13. Samples that have Cu cleanup NCM'd? (apply NCM to batch) Prep Batch #'s:_____	**NA**	□ Clean-up –Cu (NCM#_____)	
14. Samples over 50 X dil. – Method cleanup inserted (PAH_DIL)? Samples:_____	**NA**	□ Dil-Re-Spike IDA (NCM#_____)	**NA**

* Such action must be taken in consultation with client.

Eurofins/TestAmerica Knoxville GC/MS-SIM Batch Review/Narrative Checklist
Method: PAHs and Selected SVOCs – KNOX-ID-0016, Revision 14

		TALS BATCH #:_____80349_____	
Batch TALS Review	***1st***	***Comments/NCM #***	***2nd***
15. Graphics uploaded?	**Y**		**Y**
16. Sample special instructions verified?	**Y**		**Y**
17. Suffixes assigned properly (DL/RE)? [Sample List Tab]	**NA**		**NA**
18. Each job has CCV created? [Sample List Tab]	**Y**		**Y**
19. Analytes over calibration range set to secondary & dilutions scheduled for analysis? [Conditions Review Tab] Samples: _____ _____ _____ _____ _____ _____ _____ _____	**NA**	□ ICAL-Range Exceed; No Saturation * (NCM#_____)	**NA**
20. For dilutions, diluted analytes set to primary, others to "Acceptable"? [Sample Results Tab]	**NA**		**NA**
21. If MS/MSD was done on this client's sample or for reported batch QC, were the MS/MSD recoveries and RPDs within laboratory generated QC limits?	**NA**	□ MS/MSD - %R out, LCS OK □ MS/MSD - high targets □ MS/MSD – spk/surr diluted out □ MS/MSD/Dup - % RPD	**NA**
22. Verify reagents have not expired [Reagents Tab]	**Y**		**Y**
23. Samples not reported set to "Acceptable" or "Rejected" [Sample Results Tab]	**NA**		**NA**
24. CCV's linked to all samples? [QC Links]	**Y**		**Y**
25. Samples linked to correct MB & LCS/D & MS/D? [QC Links]	**Y**		**Y**
26. Correct ICV's linked to all samples? [QC Links]	**Y**		**Y**
27. Runs set to 1st level review?	**Y**	Runs set to 2nd level review?	**Y**
28. QC checker run for batch and items addressed			**Y**
29. Checklist scanned & attached properly?			**Y**

1st level: GEM	**Date: 11-20-23**	**2nd level: DLW**	**Date 11/22/2023**
Comments:			
Example calculation (per prep batch):			

* Such action must be taken in consultation with client.

GC/MS SEMI VOA ANALYSIS RUN LOG

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Instrument ID: GCMS1 Start Date: 11/17/2023 13:46

Analysis Batch Number: 80412 End Date: 11/17/2023 19:17

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 140-80412/2		11/17/2023 13:46	1	CCV.D	Rxi-5SilMS 25 0.25(mm)
CCV 140-80412/3		11/17/2023 14:10	1	CCV PCB.D	Rxi-5SilMS 25 0.25(mm)
WDM 140-80412/4		11/17/2023 14:33	1		Rxi-5SilMS 25 0.25(mm)
ZZZZZ		11/17/2023 16:31	10		Rxi-5SilMS 25 0.25(mm)
140-34148-9	1804576-843-S2	11/17/2023 16:55	5	140-34148-A-9-A .D	Rxi-5SilMS 25 0.25(mm)
140-34148-5	1804576-851-S2	11/17/2023 17:19	1	140-34148-A-5-C .D	Rxi-5SilMS 25 0.25(mm)
ZZZZZ		11/17/2023 17:43	1		Rxi-5SilMS 25 0.25(mm)
ZZZZZ		11/17/2023 18:06	1		Rxi-5SilMS 25 0.25(mm)
ZZZZZ		11/17/2023 18:30	1		Rxi-5SilMS 25 0.25(mm)
ZZZZZ		11/17/2023 18:53	1		Rxi-5SilMS 25 0.25(mm)
ZZZZZ		11/17/2023 19:17	1		Rxi-5SilMS 25 0.25(mm)

Eurofins/TestAmerica Knoxville GC/MS-SIM Batch Review/Narrative Checklist
Method: PAHs and Selected SVOCs – KNOX-ID-0016, Revision 14

PAH ☐ **0010 ☐**

	TALS Batch #	80412		
Instrument:	**GCMS1**	**ICAL TALS Batch # / Event #**		**Scanned ☐**
Analysis Date:	**11-17-23**	**PAH:**	**80177 / 4718**	
ICAL Chrom WL #	**30467**	**EU:**		
CCAL Chrom WL #	**30536**	**PCB:**	**80177 / 4716**	
		Other:		

CCV Chrom/Worklist Review	1st	***Comments/NCM #***	2nd
1. Are all required calibration standards in worklist?	**Y**		
2. Are the reagents & init/final volumes correct? (Verify reagents & amt. injected) [WL Sample Reagent Tab]	**Y**		**Y**
3. Is the Chrom method locked?	**Y**		**Y**
4. Was the CCAL compared to the most recent & correct ICAL for each CCV & LG? (verify ICAL batch #, start/end Cal date & time) [F8]	**Y**		**Y**
5. Elution order checked on isomeric pairs/coeluters?			
• 1,4 dichlorobenzene before 1,2 dichlorobenzene (& d4 isomers)	**Y**		**Y**
• 2-methylnaphthalene before 1-methylnaphthalene (& d10 isomers)	**Y**		**Y**
• acenaphthylene before acenaphthene (& d10 isomers)	**Y**		**Y**
• dibenzothiophene before phenanthrene	**Y**		**Y**
• phenanthrene before anthracene (& d10 isomers)	**Y**		**Y**
• 3-methylphenanthrene and 1-methylphenanthrene	**Y**		**Y**
• fluoranthene before pyrene (& d10 isomers)	**Y**		**Y**
• benzo(a)anthracene before chrysene (& d12 isomers)	**Y**		**Y**
• benzo(b)fluoranthene before benzo(k)fluoranthene (& d12 isomers)	**Y**		**Y**
• benzo(e)pyrene before benzo(a)pyrene	**Y**		**Y**
• benzo(a)pyrene before perylene (& d12 isomers)	**Y**		**Y**
• Indeno(1,2,3-cd)pyrene before benzo(g,h,I)perylene (& d12 isomers)	**Y**		**Y**
6. Manual integrations properly performed, correctly ID'd, baseline clearly identified, and correct reason given?	**Y**	*Note: manual selections should be updated and all data reprocessed*	**Y**
7. Were all peaks identified automatically? *If not, list analytes:* _____	**Y**	*Note: any non-detected peaks must be verified in each affected sample.*	**Y**
8. Has the retention time been updated to the method?	**Y**		**Y**
9. Are the internal standard responses within limits for each CCV? (50-200% of the mid-level ICAL standard) [F8-istd]	**Y**		**Y**
10. Have the alkyl groups in WDM been correctly integrated and exclusion zones correct?	**Y**		**Y**

CCV Chrom/TALS MLG Review	*PAH*	*0010*	*Comments/NCM #*	*PAH*	*0010*
11. Is the %D or drift ≤ 30% for all target analytes? ***[F8] or TALS sample tab***	**Y**		☐ CCV high, sample ND (NCM#_____)	Y	
12. Is the calibration event # correct for each CCV? Also check IDA and IS event #'s) ***[TALS Sample Results tab]***	**Y**			Y	

* Such action must be taken in consultation with client.

Eurofins/TestAmerica Knoxville GC/MS-SIM Batch Review/Narrative Checklist
Method: PAHs and Selected SVOCs – KNOX-ID-0016, Revision 14

TALS BATCH #:_____80412_____

Batch Chrom/TALS review	***1st***	***Comments/NCM #***	***2nd***
1. Have the sample ID's and dilution factors been confirmed (check sequence, autosampler positions, etc.)?	**Y**		
2. Were all samples injected within 12 hrs. of first CCV?	**Y**		**Y**
3. Method blank or instrument blank analyzed with each sequence?	**Y**		**Y**
4. Are all analytes in the method blank < RL?	**Y**	□ MB RX/HT out (NCM#_____) □ MB-insuff samp (NCM#_____) □ MB-insuff samp -CONSUMED (NCM#_____) □ MB-Rpt.10X (NCM#_____) □ MB Rpt ND (NCM#_____)	**NA**
5. Method blank IDA recoveries within QC limits? [F8] or [Batch Results SUR Tab]	**Y**	□ IDA – High (1) No effect (NCM#_____) (2) Matrix, low bias (NCM#_____) □ IDA – Low - S/N 10:1 (NCM#_____)	**NA**
6. LCS done per batch and criteria met for IDA and natives? [Chrom-F8] [TALS-Sample Results Tab]	**NA**	□ LCS/D %R High < RL in smp (1&4) (NCM#_____) □ LCS/D out-RX HT out (NCM#_____) □ LCS/D-%RPD (%R OK) (NCM#_____)	**NA**
7. All runs - peaks ID'd correctly and false positives removed? Flag or narrate native analyte interference issues > RL: *NCM only needed for "cn"* Flags: K: benzo(b/k) reported as (b) k: benzo(b/k) reported as (k) a: benzo(a)anthracene/chrysene reported as b(a)a y: benzo(a)anthracene/chrysene reported as chrysene CI: chromatographic interferences – high bias cn: see case narrative	**Y**	"cn" (NCM#_____) Samples analytes _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ "cn" (NCM#_____) Samples analytes _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____	**Y**
8. Manual integrations properly performed, correctly ID'd, baseline clearly identified, and correct reason given?	Y		**Y**
9. Are Alkyl group start/end times and patterns verified?	Y	"AP" flags applied where appropriate? (NCM not needed unless necessary)	**Y**
10. Are IDA recoveries within QC limits? [Batch Results SUR Tab] If no, list samples under appropriate NCM	Y	□ IDA – High (1) no effect (NCM#_____) Samples Samples _____ _____ _____ _____ _____ _____ (2) matrix, low bias (NCM#_____) Samples Samples _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ □ IDA – Low - S/N > 10:1 - OK (NCM#_____) Samples Samples _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ □ IDA – Low - S/N < 10:1 ***"cn"*** (NCM# **140-8025**) Samples Samples _____ _____ _____ _____ _____ _____ _____ _____	**Y**
11. Are field/alternate surrogates with QC limits? Sample Reason Sample Reason _____ _____ _____ _____	y	□ Dil – Surr dil out or estimated & elev RL's (opt 1-4 & 5-8): (NCM#_____) □ Surr-Matrix (1-5) (NCM#_____)	**Y**
12. For initial analysis with elevated RL's, explain: *List diluted samples and reason:* Sample Reason Sample Reason 810-82790-A-3-A high targets _____ _____ 140-34148-A-9-A high targets _____ _____ _____ _____ _____ _____	**y**	1) □ RL – Screen (NCM#_____) 2) □ RL – Non-targets (NCM#_____) 3) □ RL – Targets (NCM#____50893_____) 4) □ RL – Final Vol (NCM#_____) 5) □ RL – Init Vol (matrix) (NCM#_____) 6) □ RL – Insuff. Smp (NCM#_____) 7) □ RL – DIL - Matrix (NCM#_____)	**Y**
13. Samples that have Cu cleanup NCM'd? (apply NCM to batch) Prep Batch #'s:_____	**NA**	□ Clean-up –Cu (NCM#_____)	
14. Samples over 50 X dil. – Method cleanup inserted (PAH_DIL)? Samples:___140-34148-A-5-I_____	**Y**	□ Dil-Re-Spike IDA (NCM#____50894_____)	**Y**

* Such action must be taken in consultation with client.

Eurofins/TestAmerica Knoxville GC/MS-SIM Batch Review/Narrative Checklist
Method: PAHs and Selected SVOCs – KNOX-ID-0016, Revision 14

		TALS BATCH #:_____80412_____	
Batch TALS Review	***1st***	***Comments/NCM #***	***2nd***
15. Graphics uploaded?	**Y**		**Y**
16. Sample special instructions verified?	**Y**		**Y**
17. Suffixes assigned properly (DL/RE)? [Sample List Tab]	**NA**		**NA**
18. Each job has CCV created? [Sample List Tab]	**Y**		**Y**
19. Analytes over calibration range set to secondary & dilutions scheduled for analysis? [Conditions Review Tab] Samples: _____ _____ _____ _____ _____ _____ _____ _____	**Y**	□ ICAL-Range Exceed; No Saturation * (NCM#_____)	**Y**
20. For dilutions, diluted analytes set to primary, others to "Acceptable"? [Sample Results Tab]	**NA**		**NA**
21. If MS/MSD was done on this client's sample or for reported batch QC, were the MS/MSD recoveries and RPDs within laboratory generated QC limits?	**NA**	□ MS/MSD - %R out, LCS OK □ MS/MSD - high targets □ MS/MSD – spk/surr diluted out □ MS/MSD/Dup - % RPD	**NA**
22. Verify reagents have not expired [Reagents Tab]	**Y**		**Y**
23. Samples not reported set to "Acceptable" or "Rejected" [Sample Results Tab]	**NA**		**NA**
24. CCV's linked to all samples? [QC Links]	**Y**		**Y**
25. Samples linked to correct MB & LCS/D & MS/D? [QC Links]	**Y**		**Y**
26. Correct ICV's linked to all samples? [QC Links]	**Y**		**Y**
27. Runs set to 1st level review?	**y**	Runs set to 2nd level review?	**Y**
28. QC checker run for batch and items addressed			**Y**
29. Checklist scanned & attached properly?			**Y**

1st level: GEM	**Date: 11-21-23**	**2nd level: DLW**	**Date 11/22/2023**
Comments:			
This batch contains in-house tesing samples 140-34325. NCM: 50670 was filled out for the results section. Conclusion and further testing has still not been completed.			
Example calculation (per prep batch):			

* Such action must be taken in consultation with client.

GC/MS SEMI VOA ANALYSIS RUN LOG

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Instrument ID: GCMS1 Start Date: 12/01/2023 10:17

Analysis Batch Number: 80832 End Date: 12/01/2023 22:11

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 140-80832/2		12/01/2023 10:17	1	CCV3.D	Rxi-5SilMS 25 0.25(mm)
CCV 140-80832/3		12/01/2023 10:40	1	CCV PCB.D	Rxi-5SilMS 25 0.25(mm)
WDM 140-80832/4		12/01/2023 11:03	1	WDM.D	Rxi-5SilMS 25 0.25(mm)
ZZZZZ		12/01/2023 12:34	1		Rxi-5SilMS 25 0.25(mm)
ZZZZZ		12/01/2023 12:56	1		Rxi-5SilMS 25 0.25(mm)
ZZZZZ		12/01/2023 13:19	1		Rxi-5SilMS 25 0.25(mm)
ZZZZZ		12/01/2023 13:42	1		Rxi-5SilMS 25 0.25(mm)
ZZZZZ		12/01/2023 14:05	1		Rxi-5SilMS 25 0.25(mm)
ZZZZZ		12/01/2023 14:28	1		Rxi-5SilMS 25 0.25(mm)
ZZZZZ		12/01/2023 14:51	1		Rxi-5SilMS 25 0.25(mm)
ZZZZZ		12/01/2023 15:14	1		Rxi-5SilMS 25 0.25(mm)
ZZZZZ		12/01/2023 15:37	1		Rxi-5SilMS 25 0.25(mm)
ZZZZZ		12/01/2023 16:00	1		Rxi-5SilMS 25 0.25(mm)
ZZZZZ		12/01/2023 16:23	1		Rxi-5SilMS 25 0.25(mm)
ZZZZZ		12/01/2023 16:46	1		Rxi-5SilMS 25 0.25(mm)
ZZZZZ		12/01/2023 17:09	1		Rxi-5SilMS 25 0.25(mm)
ZZZZZ		12/01/2023 17:32	1		Rxi-5SilMS 25 0.25(mm)
ZZZZZ		12/01/2023 17:55	1		Rxi-5SilMS 25 0.25(mm)
ZZZZZ		12/01/2023 19:05	1		Rxi-5SilMS 25 0.25(mm)
ZZZZZ		12/01/2023 19:28	1		Rxi-5SilMS 25 0.25(mm)
ZZZZZ		12/01/2023 19:52	1		Rxi-5SilMS 25 0.25(mm)
ZZZZZ		12/01/2023 20:15	1		Rxi-5SilMS 25 0.25(mm)
ZZZZZ		12/01/2023 20:38	1		Rxi-5SilMS 25 0.25(mm)
ZZZZZ		12/01/2023 21:01	1		Rxi-5SilMS 25 0.25(mm)
ZZZZZ		12/01/2023 21:25	1		Rxi-5SilMS 25 0.25(mm)
ZZZZZ		12/01/2023 21:48	1		Rxi-5SilMS 25 0.25(mm)
140-34148-5 RA	1804576-851-S2 RA	12/01/2023 22:11	5	140-34148-A-5-A .D	Rxi-5SilMS 25 0.25(mm)

Eurofins/TestAmerica Knoxville GC/MS-SIM Batch Review/Narrative Checklist
Method: PAHs and Selected SVOCs – KNOX-ID-0016, Revision 14

PAH ☐ **0010 ☐**

	TALS Batch #	80832		
Instrument:	**GCMS1**	**ICAL TALS Batch # / Event #**		**Scanned ☐**
Analysis Date:	**12-01-23**	**PAH:**	**80177/4718**	
ICAL Chrom WL #	**30467**	**EU:**		
CCAL Chrom WL #	**30677**	**PCB:**	**80177/4716**	
		Other:		

CCV Chrom/Worklist Review	1st	***Comments/NCM #***	2nd
1. Are all required calibration standards in worklist?	**Y**		
2. Are the reagents & init/final volumes correct? (Verify reagents & amt. injected) [WL Sample Reagent Tab]	**Y**		**Y**
3. Is the Chrom method locked?	**Y**		**Y**
4. Was the CCAL compared to the most recent & correct ICAL for each CCV & LG? (verify ICAL batch #, start/end Cal date & time) [F8]	**Y**		**Y**
5. Elution order checked on isomeric pairs/coeluters?			
• 1,4 dichlorobenzene before 1,2 dichlorobenzene (& d4 isomers)	**Y**		**Y**
• 2-methylnaphthalene before 1-methylnaphthalene (& d10 isomers)	**Y**		**Y**
• acenaphthylene before acenaphthene (& d10 isomers)	**Y**		**Y**
• dibenzothiophene before phenanthrene	**Y**		**Y**
• phenanthrene before anthracene (& d10 isomers)	**Y**		**Y**
• 3-methylphenanthrene and 1-methylphenanthrene	**Y**		**Y**
• fluoranthene before pyrene (& d10 isomers)	**Y**		**Y**
• benzo(a)anthracene before chrysene (& d12 isomers)	**Y**		**Y**
• benzo(b)fluoranthene before benzo(k)fluoranthene (& d12 isomers)	**Y**		**Y**
• benzo(e)pyrene before benzo(a)pyrene	**Y**		**Y**
• benzo(a)pyrene before perylene (& d12 isomers)	**Y**		**Y**
• Indeno(1,2,3-cd)pyrene before benzo(g,h,I)perylene (& d12 isomers)	**Y**		**Y**
6. Manual integrations properly performed, correctly ID'd, baseline clearly identified, and correct reason given?	**Y**	*Note: manual selections should be updated and all data reprocessed*	**NA**
7. Were all peaks identified automatically? *If not, list analytes:* _____	**Y**	*Note: any non-detected peaks must be verified in each affected sample.*	**Y**
8. Has the retention time been updated to the method?	**Y**		**Y**
9. Are the internal standard responses within limits for each CCV? (50-200% of the mid-level ICAL standard) [F8-istd]	**Y**		**Y**
10. Have the alkyl groups in WDM been correctly integrated and exclusion zones correct?	**Y**		**Y**

CCV Chrom/TALS MLG Review	*PAH*	*0010*	*Comments/NCM #*	*PAH*	*0010*
11. Is the %D or drift ≤ 30% for all target analytes? ***[F8] or TALS sample tab***	**Y**		☐ CCV high, sample ND (NCM#_____)	Y	
12. Is the calibration event # correct for each CCV? Also check IDA and IS event #'s) ***[TALS Sample Results tab]***	**Y**			Y	

* Such action must be taken in consultation with client.

Eurofins/TestAmerica Knoxville GC/MS-SIM Batch Review/Narrative Checklist
Method: PAHs and Selected SVOCs – KNOX-ID-0016, Revision 14

TALS BATCH #:_____80832_____

Batch Chrom/TALS review	*1st*	*Comments/NCM #*	*2nd*
1. Have the sample ID's and dilution factors been confirmed (check sequence, autosampler positions, etc.)?	**Y**		
2. Were all samples injected within 12 hrs. of first CCV?	**Y**		**Y**
3. Method blank or instrument blank analyzed with each sequence?	**Y**		
4. Are all analytes in the method blank < RL?	**y**	□ MB RX/HT out (NCM#_____) □ MB-insuff samp (NCM#_____) □ MB-insuff samp -CONSUMED (NCM#_____) □ MB-Rpt.10X (NCM#_____) □ MB Rpt ND (NCM#_____)	**Y**
5. Method blank IDA recoveries within QC limits? [F8] or [Batch Results SUR Tab]	**Y**	□ IDA – High (1) No effect (NCM#_____) (2) Matrix, low bias (NCM#_____) □ IDA – Low - S/N 10:1 (NCM#_____)	**Y**
6. LCS done per batch and criteria met for IDA and natives? [Chrom-F8] [TALS-Sample Results Tab]	**Y**	□ LCS/D %R High < RL in smp (1&4) (NCM#_____) □ LCS/D out-RX HT out (NCM#_____) □ LCS/D-%RPD (%R OK) (NCM#_____)	**Y**
7. All runs - peaks ID'd correctly and false positives removed? Flag or narrate native analyte interference issues > RL: *NCM only needed for "cn"* Flags: K: benzo(b/k) reported as (b) k: benzo(b/k) reported as (k) a: benzo(a)anthracene/chrysene reported as b(a)a y: benzo(a)anthracene/chrysene reported as chrysene CI: chromatographic interferences – high bias cn: see case narrative	**Y**	"cn" (NCM#_____) Samples analytes _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ "cn" (NCM#_____) Samples analytes _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____	**Y**
8. Manual integrations properly performed, correctly ID'd, baseline clearly identified, and correct reason given?	Y		**Y**
9. Are Alkyl group start/end times and patterns verified?	Y	"AP" flags applied where appropriate? (NCM not needed unless necessary)	**Y**
10. Are IDA recoveries within QC limits? [Batch Results SUR Tab] If no, list samples under appropriate NCM	Y	□ IDA – High (1) no effect (NCM#_____) Samples Samples _____ _____ _____ _____ _____ _____ (2) matrix, low bias (NCM#_____) Samples Samples _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ □ IDA – Low - S/N > 10:1 - OK (NCM#_____) Samples Samples _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ □ IDA – Low - S/N < 10:1 ***"cn"*** (NCM# **140-8025**) Samples Samples _____ _____ _____ _____ _____ _____ _____ _____	**Y**
11. Are field/alternate surrogates with QC limits? Sample Reason Sample Reason _____ _____ _____ _____	y	□ Dil – Surr dil out or estimated & elev RL's (opt 1-4 & 5-8): (NCM#_____) □ Surr-Matrix (1-5) (NCM#_____)	**NA**
12. For initial analysis with elevated RL's, explain: *List diluted samples and reason:* Sample Reason Sample Reason _140-34148-5 _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____	**y**	1) □ RL – Screen (NCM#_____) 2) □ RL – Non-targets (NCM#_____) 3) □ RL – Targets (NCM#_____51315____) 4) □ RL – Final Vol (NCM#_____) 5) □ RL – Init Vol (matrix) (NCM#_____) 6) □ RL – Insuff. Smp (NCM#_____) 7) □ RL – DIL - Matrix (NCM#_____)	**Y**
13. Samples that have Cu cleanup NCM'd? (apply NCM to batch) Prep Batch #'s:_____	**na**	□ Clean-up –Cu (NCM#_____)	
14. Samples over 50 X dil. – Method cleanup inserted (PAH_DIL)? Samples:_____	**na**	□ Dil-Re-Spike IDA (NCM#_____)	**NA**

* Such action must be taken in consultation with client.

Eurofins/TestAmerica Knoxville GC/MS-SIM Batch Review/Narrative Checklist
Method: PAHs and Selected SVOCs – KNOX-ID-0016, Revision 14

		TALS BATCH #:_____80832_____	
Batch TALS Review	***1st***	***Comments/NCM #***	***2nd***
15. Graphics uploaded?	**Y**		**Y**
16. Sample special instructions verified?	**Y**		**Y**
17. Suffixes assigned properly (DL/RE)? [Sample List Tab]	**NA**		**NA**
18. Each job has CCV created? [Sample List Tab]	**Y**		**Y**
19. Analytes over calibration range set to secondary & dilutions scheduled for analysis? [Conditions Review Tab] Samples: _____ _____ _____ _____ _____ _____ _____ _____	**Y**	□ ICAL-Range Exceed; No Saturation * (NCM#_____)	**Y***
20. For dilutions, diluted analytes set to primary, others to "Acceptable"? [Sample Results Tab]	**Y**		**Y**
21. If MS/MSD was done on this client's sample or for reported batch QC, were the MS/MSD recoveries and RPDs within laboratory generated QC limits?	**Na**	□ MS/MSD - %R out, LCS OK □ MS/MSD - high targets □ MS/MSD – spk/surr diluted out □ MS/MSD/Dup - % RPD	**NA**
22. Verify reagents have not expired [Reagents Tab]	**Y**		**Y**
23. Samples not reported set to "Acceptable" or "Rejected" [Sample Results Tab]	**Na**		**NA**
24. CCV's linked to all samples? [QC Links]	**Y**		**Y**
25. Samples linked to correct MB & LCS/D & MS/D? [QC Links]	**Y**		**Y**
26. Correct ICV's linked to all samples? [QC Links]	**Y**		**Y**
27. Runs set to 1st level review?	**y**	Runs set to 2nd level review?	**Y**
28. QC checker run for batch and items addressed			**Y**
29. Checklist scanned & attached properly?			**Y**

1st level: GEM	**Date: 12-05-23**	**2nd level: DLW**	**Date 12/7/2023**
Comments:		***140-34148-5 was initially reported from a PDS, however the client wanted a more concentrated analysis even though many compounds would be over the calibration range.**	
Example calculation (per prep batch):			

* Such action must be taken in consultation with client.

GC/MS SEMI VOA BATCH WORKSHEET

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Batch Number: 79842 Batch Start Date: 11/03/23 10:43 Batch Analyst: Stamper, Claire M

Batch Method: Passive Sampler Batch End Date: 11/09/23 14:06

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	60IDAPAH 00042	60ISPAH 00021	60SPPAHTARGET 00026	AnalysisComment
140-34148-A-1	GEI.PRC.BLK1	Passive Sampler, ID-0016	T	0.012 g	500 uL	1 mL	25 uL		
140-34148-A-2	GEI.PRC.BLK2	Passive Sampler, ID-0016	T	0.011 g	500 uL	1 mL	25 uL		
140-34148-A-3	GEI.PRC.BLK3	Passive Sampler, ID-0016	T	0.011 g	500 uL	1 mL	25 uL		
140-34148-A-4	1804576-851-S1	Passive Sampler, ID-0016	T	0.014 g	500 uL	1 mL	25 uL		
140-34148-A-5	1804576-851-S2	Passive Sampler, ID-0016	T	0.012 g	500 uL	1 mL	25 uL		Sample had black and sticky residue that did not wipe away using DI water
140-34148-A-6	1804576-852-S1	Passive Sampler, ID-0016	T	0.011 g	500 uL	1 mL	25 uL		
140-34148-A-7	1804576-852-S2	Passive Sampler, ID-0016	T	0.010 g	500 uL	1 mL	25 uL		
140-34148-A-8	1804576-843-S1	Passive Sampler, ID-0016	T	0.010 g	500 uL	1 mL	25 uL		
140-34148-A-9	1804576-843-S2	Passive Sampler, ID-0016	T	0.010 g	500 uL	1 mL	25 uL		
140-34148-A-10	1804576-844-S1	Passive Sampler, ID-0016	T	0.010 g	500 uL	1 mL	25 uL		
140-34148-A-11	1804576-844-S3	Passive Sampler, ID-0016	T	0.008 g	500 uL	1 mL	25 uL		sample went to near dryness
140-34148-A-12	1804576-854-S1	Passive Sampler, ID-0016	T	0.008 g	500 uL	1 mL	25 uL		
140-34148-A-13	1804576-854-S2	Passive Sampler, ID-0016	T	0.012 g	500 uL	1 mL	25 uL		

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GC/MS SEMI VOA BATCH WORKSHEET

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Batch Number: 79842 Batch Start Date: 11/03/23 10:43 Batch Analyst: Stamper, Claire M

Batch Method: Passive Sampler Batch End Date: 11/09/23 14:06

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	60IDAPAH 00042	60ISPAH 00021	60SPPAHTARGET 00026	AnalysisComment
140-34148-A-14	1804576-846-S1	Passive Sampler, ID-0016	T	0.010 g	500 uL	1 mL	25 uL		
140-34148-A-15	1804576-846-S3	Passive Sampler, ID-0016	T	0.011 g	500 uL	1 mL	25 uL		
140-34148-A-16	1804576-853-S1	Passive Sampler, ID-0016	T	0.011 g	500 uL	1 mL	25 uL		
140-34148-A-17	1804576-853-S3	Passive Sampler, ID-0016	T	0.010 g	500 uL	1 mL	25 uL		
LCS 140-79842/18		Passive Sampler, ID-0016		0.032 g	500 uL	1 mL	25 uL	1 mL	
MB 140-79842/19		Passive Sampler, ID-0016		0.025 g	500 uL	1 mL	25 uL		

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GC/MS SEMI VOA BATCH WORKSHEET

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Batch Number: 79842 Batch Start Date: 11/03/23 10:43 Batch Analyst: Stamper, Claire M

Batch Method: Passive Sampler Batch End Date: 11/09/23 14:06

Batch Notes	
Analyst ID - TA Reagent Drop	CMS
Analyst ID - IDA Reagent Drop	CMS
Analyst ID - IS Reagent Drop	caa
Analyst ID - TA Reagent Drop Witness	DM
Analyst ID - IDA Reagent Drop Witness	DM
Analyst ID - IS Reagent Drop Witness	caa
Balance ID	w1
Balance is Level? (Y/N)	yes
MeCL2 ID	50:50 Mecl2 Hexane / 634064
Hexane ID	231764
Extraction Start time	15:30
Extraction End time	11:15
Na2SO4 ID	628792
Silica Gel C/U analyst	cas
Silica Gel C/U Date	11/07/2023
Batch Comment	silica gel:639849--> 2:3 mixture:633810

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

GC/MS SEMI VOA BATCH WORKSHEET

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Batch Number: 79842 Batch Start Date: 11/03/23 10:43 Batch Analyst: Stamper, Claire M

Batch Method: Passive Sampler Batch End Date: 11/09/23 14:06

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	60IDAPAH 00042	60ISPAH 00021	AnalysisComment	
140-34148-A-5	1804576-851-S2	Passive Sampler, PAH Dilution, ID-0016	T	0.012 g	500 uL	1 mL	25 uL	Sample had black and sticky residue that did not wipe away using DI water	

Batch Notes	
Analyst ID - TA Reagent Drop	CMS
Analyst ID - IDA Reagent Drop	CMS
Analyst ID - IS Reagent Drop	caa
Analyst ID - TA Reagent Drop Witness	DM
Analyst ID - IDA Reagent Drop Witness	DM
Analyst ID - IS Reagent Drop Witness	caa
Balance ID	w1
Balance is Level? (Y/N)	yes
MeCL2 ID	50:50 Mecl2 Hexane / 634064
Hexane ID	231764
Extraction Start time	15:30
Extraction End time	11:15
Na2SO4 ID	628792
Silica Gel C/U analyst	cas
Silica Gel C/U Date	11/07/2023
Batch Comment	silica gel:639849--> 2:3 mixture:633810

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

TestAmerica Knoxville Extraction Sheet
SIM PAH Polyethylene Extraction

Batch Number: 79842

Delivered: RKG 11/9/23 5:29pm
Initials/Date/Time

TALS Prep Method: Pass_Samp_Prep

Received: _____
Initials/Date/Time

Lab Sample ID	Prepare polyethylene piece for extraction and place in 500 mL amber jar.	Add 250 ng/mL IS (IDA) to all samples & QC. Record in TALS.	Add 250 ng/mL native spike (TA) to LCS, LCSD, MS, MSD. Record in TALS.	Place on rotator and extract for 18-24 hr in 1:1 hexane/$MeCl_2$.	Record sample weight in g in TALS.	Concentrate/exchange to hexane to ≥20 mL on heating mantle.	Concentrate to appropriate vol on N-EVAP.	Perform Silica Gel Column Cleanup.	Concentrate to >10 mL on heating mantle.	Concentrate to ~0.5 to 1 mL on N-EVAP.	Add 25 µL of 10 µg/mL recovery std (IS) to 2 mL vial. Record in TALS. Transfer extract to vial.	Conc to 500 µL hexane by N-EVAP. Record final volume in TALS.
140-34148-A-1	Y	Y	N	Y	0.012	Y	Y	Y	Y	Y	Y	Y
140-34148-A-2	↓	↓	↓	↓	0.011	↓	↓	↓	↓	↓	↓	↓
140-34148-A-3					0.011							
140-34148-A-4					0.014							
140-34148-A-5					0.012							
140-34148-A-6					0.011							
140-34148-A-7					0.010							
140-34148-A-8					0.010							
140-34148-A-9					0.010							
140-34148-A-10					0.010							
140-34148-A-11					0.008							
140-34148-A-12					0.008							
140-34148-A-13					0.012							
140-34148-A-14					0.010							
140-34148-A-15					0.011							
140-34148-A-16					0.011							
140-34148-A-17			↓		0.010							
LCS 140-79842/18			Y		0.032							
MB 140-79842/19	↓	↓	N	↓	0.025	↓	↓	↓	↓	↓	↓	↓
	CMS →			→		→	CAA	CGS →	→	→	CAA →	→
CAA 11/9/23		DM	DM				11/5	11/7	11/8	11/9	11/9 →	→
	11/3 →			→	11/4 →	→		caa	11/9/23			

Eurofins Knoxville Prep Batch Review Checklist

Batch # 179842

Split Batch # NA

Review Items	N/A	Yes	No	If No, why is data reportable?	2nd Level
1. Were the samples extracted within the required holding times?		✓		If No, NCM #: _____	✓
2. Are the final extracts free of water, precipitates, multiple phases, and for HRMS - color?			✓	Sample -A-5 has orange color	✓
3. Were all project specific requirements met?		✓			✓
4. Were the correct start and completion dates entered into TALS?		✓			✓
5. Are the spike IDs and volumes correct in TALS for the method?		✓			✓
6. Does the prep batch paperwork package contain all required documentation which has been properly and completely filled out, including: • Extraction Benchsheet (Excel) • Batch Worksheets (ANLY) • Verify Protocol #'s (compare excel sheet to TALS) • Was the Excel Extraction Benchsheet and Prep Batch Review Checklist scanned and attached to batch in TALS?		✓			✓
7. Did extracts go through GPC cleanup? Has the following nonconformance been associated with all extracts?	✓			If Yes, □ **Clean-up Required - GPC** (NCM#_____)	✓
8. Are all additional nonconformances documented appropriately?	✓			If Yes, NCM#: _____	✓

Analyst : CAA **Date:** 11/9/23

Comments:

2nd Level Reviewer: DL **Date:** 11-9-23

Comments:

GC/MS SEMI VOA BATCH WORKSHEET

Lab Name: Eurofins Knoxville Job No.: 140-34148-1

SDG No.:

Batch Number: 80414 Batch Start Date: 11/17/23 13:25 Batch Analyst: Meincke, Griffin E

Batch Method: PAH Dilution Batch End Date:

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialVolume1	FinalVolume1	InitialVolume2	FinalVolume2	DilutionFactor	FinalAmount
140-34148-A-5-J	1804576-851-S2	PAH Dilution, ID-0016	T	12.5 uL	500 uL	100 uL	1000 uL	400 No Unit	1000 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	60ISPAH 00021	60XXIDAPAH 00026				
140-34148-A-5-J	1804576-851-S2	PAH Dilution, ID-0016	T	50 uL	25 uL				

Batch Notes	

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

Shipping and Receiving Documents

Eurofins TestAmerica, Knoxville
5815 Middlebrook Pike

Knoxville, TN 37921-5947
phone 865.291.3000 fax 865.584.4315

Chain of Custody Record

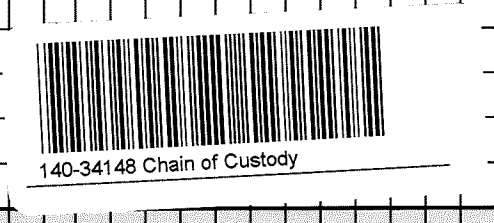
eurofins | Environment Testing America

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

TestAmerica Laboratories, Inc. d/b/a Eurofins TestAmerica

Client Contact	**Project Manager: Brent Pautler**	COC No:
SiREM	Email: bpautler@siremlab.com	**Site Contact:** / **Date:** / _____ of _____ COCs
130 Stone Rd. West	**Tel/Fax: 519-515-0837**	**Lab Contact:** / **Carrier:** / TALS Project #:
Guelph, ON N	**Analysis Turnaround Time**	Sampler:
(519) 515-0837 Phone	☐ CALENDAR DAYS ☐ WORKING DAYS	**For Lab Use Only:**
(xxx) xxx-xxxx FAX	TAT if different from Below _____	Walk-in Client:
Project Name: GEI Ex-Situ SP3	☐ 2 weeks	Lab Sampling:
Site: MGP Sediment Site, Massachusetts	☐ 1 week	Job / SDG No.:
P O # Quote Number	☐ 2 days ☐ 1 day	

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	EPA 8270D (PCB PRCs + PAHs)	Sample Specific Notes:
GEI.PRC.Blk1	26-Oct-23	2pm	C	PE	1	n	n	x	10 Rare congener PCB PRCs
GEI.PRC.Blk2	26-Oct-23	2pm	C	PE	1	n	n	x	10 Rare congener PCB PRCs
GEI.PRC.Blk3	26-Oct-23	2pm	C	PE	1	n	n	x	10 Rare congener PCB PRCs
1804576-851-S1	26-Oct-23	2pm	C	PE	1	n	n	x	10 Rare congener PCB PRCs
1804576-851-S2	26-Oct-23	2pm	C	PE	1	n	n	x	10 Rare congener PCB PRCs
1804576-852-S1	26-Oct-23	2pm	C	PE	1	n	n	x	10 Rare congener PCB PRCs
1804576-852-S2	26-Oct-23	2pm	C	PE	1	n	n	x	10 Rare congener PCB PRCs
1804576-843-S1	26-Oct-23	2pm	C	PE	1	n	n	x	10 Rare congener PCB PRCs
1804576-843-S2	26-Oct-23	2pm	C	PE	1	n	n	x	10 Rare congener PCB PRCs
1804576-844-S1	26-Oct-23	2pm	C	PE	1	n	n	x	10 Rare congener PCB PRCs
1804576-844-S3	26-Oct-23	2pm	C	PE	1	n	n	x	10 Rare congener PCB PRCs
1804576-854-S1	26-Oct-23	2pm	C	PE	1	n	n	x	10 Rare congener PCB PRCs
1804576-854-S2	26-Oct-23	2pm	C	PE	1	n	n	x	10 Rare congener PCB PRCs
1804576-846-S1	26-Oct-23	2pm	C	PE	1	n	n	x	10 Rare congener PCB PRCs
1804576-846-S3	26-Oct-23	2pm	C	PE	1	n	n	x	10 Rare congener PCB PRCs
1804576-853-S1	26-Oct-23	2pm	C	PE	1	n	n	x	10 Rare congener PCB PRCs
1804576-853-S3	26-Oct-23	2pm	C	PE	1	n	n	x	10 Rare congener PCB PRCs



Preservation Used: 1= Ice, 2= HCl; 3= H_2SO_4; 4=HNO_3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☑ Non-Hazard ☐ Flammable ☑ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☑ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd:_____ Corr'd:_____ | Therm ID No.:_____

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Alex Sweett	SiREM	26Oct23		EA KNX	10/27/23 9:30

EUROFINS/TESTAMERICA KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST **Log In Number:**

Review Items	Yes	No	NA	If No, what was the problem?
1. Are the shipping containers intact?	✓			☐ **Containers, Broken**
2. Were ambient air containers received intact?	✓			☐ Checked in lab
3. The coolers/containers custody seal if present, is it intact?			✓	☐ Yes ☐ NA
4. Is the cooler temperature within limits? (> freezing temp. of water to 6 °C, VOST: 10°C) Thermometer ID : SC76 Correction factor: -0.1°C	✓			☐ **Cooler Out of Temp, Client Contacted, Proceed/Cancel** ☐ **Cooler Out of Temp, Same Day Receipt**
5. Were all of the sample containers received intact?	✓			☐ **Containers, Broken**
6. Were samples received in appropriate containers?	✓			☐ **Containers, Improper; Client Contacted; Proceed/Cancel**
7. Do sample container labels match COC? (IDs, Dates, Times)	✓			☐ **COC & Samples Do Not Match** ☐ **COC Incorrect/Incomplete** ☐ **COC Not Received**
8. Were all of the samples listed on the COC received?	✓			☐ **Sample Received, Not on COC** ☐ **Sample on COC, Not Received**
9. Is the date/time of sample collection noted?	✓			☐ **COC; No Date/Time; Client Contacted**
10. Was the sampler identified on the COC?		✓		☐ **Sampler Not Listed on COC**
11. Is the client and project name/# identified?	✓			☐ **COC Incorrect/Incomplete**
12. Are tests/parameters listed for each sample?	✓			☐ **COC No tests on COC**
13. Is the matrix of the samples noted?	✓			☐ **COC Incorrect/Incomplete**
14. Was COC relinquished? (Signed/Dated/Timed)	✓			☐ **COC Incorrect/Incomplete**
15. Were samples received within holding time?	✓			☐ **Holding Time - Receipt**
16. Were samples received with correct chemical preservative (excluding Encore)?			✓	☐ **pH Adjusted, pH Included (See box 16A)** ☐ **Incorrect Preservative**
17. Were VOA samples received without headspace?			✓	☐ **Headspace (VOA only)**
18. Did you check for residual chlorine, if necessary? (e.g. 1613B, 1668) Chlorine test strip lot number:			✓	☐ **Residual Chlorine**
19. For 1613B water samples is pH<9?			✓	☐ If no, notify lab to adjust
20. For rad samples was sample activity info. Provided?			✓	☐ Project missing info

Comments/Actions Taken

No Custody Seal
Received @ RT: 1.9 / CT: 1.8°C
DH 10/27/23
1Cooler UPS 1Z5227VR6696932348E

101

Labeling Verified by: **Date:**

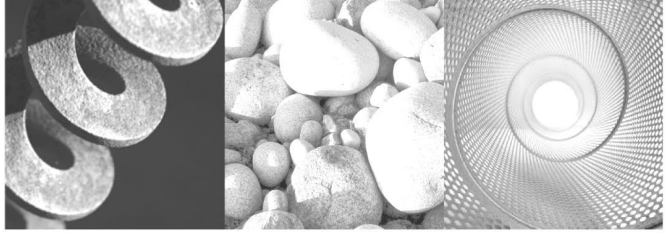
pH test strip lot number:

	Box 16A: pH Preservation	Box 18A: Residual Chlorine
Preservative:		
Lot Number:		
Exp Date:		
Analyst:		
Date:		
Time:		

Project #: 14007225 PM Instructions:

Sample Receiving Associate: Dean Hick Date: 10/27/23

Appendix M NAPL Movement in Sediment Evaluation



GEI Consultants

NAPL Movement in Sediment Investigation and Evaluation

Amesbury Former MGP Site, Amesbury, Massachusetts

Submitted to:
Boston Gas Company d/b/a National Grid
170 Data Drive
Waltham, MA 02451

Submitted by:
GEI Consultants, Inc.
400 Unicorn Park Drive
Woburn, MA 01801
781.721.4000

October 2025
Project No. 1804576



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AJG/TD:jam
B:\Working\NATIONAL GRID\1804576 Amesbury MGP\01_ADMIN\Phase II CSA Suppl\App M - NAPL Movement Evaluation_18 MB\Amesbury MGP NAPL Mobility Report_2025-10.docx

1. Introduction

This report was prepared by GEI Consultants, Inc. (GEI) on behalf of Boston Gas Company d/b/a National Grid (National Grid) to document an investigation of potential non-aqueous phase liquid (NAPL) movement in sediment in the Powwow River at the Amesbury Former Manufactured Gas Plant (the Site). The purpose of the investigation was to evaluate the potential for movement of NAPL in sediment and identify areas where there is potential for NAPL to move to the sediment/water interface. This approach addressed the potential for emplaced NAPL to move advectively. It did not address NAPL transport due to potential ebullition or scour, which were addressed separately for this Site. The results of this investigation are being used in part to evaluate remedial objectives for NAPL impacted sediments and to inform potential remedial approaches and design. The lateral and vertical extent of the evaluation was restricted to the areas where NAPL has been observed and delineated in sediment during previous investigations.

A field investigation was performed to enhance the Conceptual Site Model (CSM) and inform these evaluations. The scope of work for the field investigation included collection of sediment cores for visual logging and field screening, and collection of undisturbed cores for laboratory analysis.

Specific elements of the field investigation included:

- Collecting sediment cores and examining for the presence/absence of NAPL by visual logging and field screening;
- If and where NAPL was observed in sediment, collecting cores for laboratory analysis of potential NAPL movement;
- Cryogenically preserving (freezing) selected cores for shipment to Core Laboratories in Houston, Texas for laboratory analysis of potential NAPL mobility; and
- Collecting Site-specific hydraulic gradient data in the sediment by installing nested vibrating wire piezometer pairs at three core locations.

The goal of this evaluation was to categorize observed NAPL as either immobile or mobile at the pore scale and, if mobile, to then further categorize as stable or migrating at the NAPL body scale.

2. Background

This section presents a summary of background information relevant to evaluating the potential for NAPL movement. It was prepared in general accordance with the ASTM Standard Guide for Non-Aqueous Phase Liquids (NAPL) Mobility and Migration in Sediment - Conceptual Models for Emplacement and Advection (ASTM E3248-20).

2.1. Site Description

The Site includes the former Amesbury MGP at the end of Water Street, downstream wetlands, mudflats, and portions of the main channel of the Powwow River. The lower Powwow River is a freshwater tidal river system (Fig. 1 and 2). The lower river (also referred to as the tidewater) begins in downtown Amesbury where it exits from a culvert beneath the bridge on Main Street. Downstream of this is the confluence with the Back River, just upstream of the former Amesbury MGP Site. The portion of the Powwow River within the Site boundary includes approximately 150 feet upstream and approximately 5,150 feet downstream, including a former channel of the Powwow River that was filled during the 1960s as part of the Interstate 495 construction.

The Powwow River was dredged between approximately 1895 and 1900. The dredging spanned almost the entire Powwow River tidewater in downtown Amesbury from upstream of the Back River down to the confluence with the Merrimack River. The dredged channel depth was 12 feet at mean high water for much of the Powwow River except the final stretch (approximately 450 feet) to the Merrimack River. The dredging in that final stretch was ultimately completed (year unknown) but the depth was not documented.

2.2. Geology and Hydrology

The Site is within the Merrimack Belt, a regional geologic terrane consisting of several bedrock units in northeastern Massachusetts. The bedrock beneath the Site has been mapped as part of the Newburyport Complex, a medium grained porphyritic granite (Kaye, 1980). The bedrock is overlain by glacial till deposited in the Wisconsin period, approximately 8,000 to 15,000 years ago. More recent native deposits include sand, silt, and peat. Filling over native material occurred near the Site in the late 1800s through the late 1970s.

Observations of stratigraphy in the top several feet of sediment within the river are variable due to the depositional nature of the river itself and due to historical activities along the Powwow River, including past dredging, construction of I-495, and historical industry along the Powwow River.

A surficial layer comprised of organic soil and/or sand was observed in most cores performed within the river. The surficial layer of sediment was typically between 4 and 9 feet thick but was observed to be thinner or extend deeper at some locations. Debris including ash, brick, clinkers, ceramic, coal, and glass was observed throughout this layer, and was observed as deep as 9.5 feet below the sediment surface.

The surficial organic soil and/or sand layer was underlain by a clay or dense silt layer. In general, the upper surface of this clay or dense silt layer ranged from approximately 4 to 9 feet below the sediment surface; however, in some upstream areas of the Site (between 35 Water Street and 3 River Street) this layer was observed as shallow as at the sediment surface. Downstream of 3 River Street, clay or dense silt was only encountered at depths at or deeper than 4.5 feet below the sediment surface. Additionally, the upper surface of the clay or dense silt layer was observed to typically be deeper near the centerline of the Powwow River and shallower in locations closer to the riverbanks, possibly as a result of historical dredging in the river.

Although the clay or dense silt layer was not encountered in every core or historical boring, it is likely continuous throughout the reach of the Powwow River within the Site.

2.3. Investigations

GEI performed investigations at the Site between April 2017 and September 2024 on behalf of National Grid for the Supplemental Phase II CSA Report. The objectives of the investigations were to delineate the extent of MGP impacts within the wetland, mudflat, and Powwow River channel beyond the limits of the original disposal Site boundary; evaluate whether various migration pathways existed and could contribute to movement of contaminants; evaluate potential human health and ecological risks; and support future remediation permitting and design. The results of the supplemental Phase II CSA investigations are provided in detail in the Supplemental Phase II CSA Report to which this report is appended.

2.4. NAPL Sources

The former Amesbury MGP operated for up to 25 years after the Powwow River was dredged. During MGP operations, tar appears to have flowed from the wetland, through the mudflat, out to the dredged river channel. The tar likely continued flowing downstream in the Powwow River since tar-saturated sediment (at depth only) has been observed to the downstream edge of 8 Noel Street and other tar impacts such as sheen and staining in sediment (at depth only) have been observed in the portion of the river just upstream of the channelized bypass near I-495 (Fig. 3). In the approximately 100 years since these releases, the dredged river channel slowly filled back in with sediments naturally deposited in the river system. Some MGP residuals have also been detected in sediment upstream of the mudflat and slightly upstream of the former Amesbury MGP, and may be the result of reversed tidal flow during flood tide. The Supplemental Phase II CSA Report includes additional details regarding the nature and extent of NAPL at the Site.

2.5. NAPL in Sediment Emplacement Mechanism

The emplacement mechanism of NAPL in sediment influences the distribution of NAPL and its potential for movement. NAPL can be emplaced into sediment via advective flow, deposition of oil particle aggregates (OPAs), and/or surface flows of DNAPL (ASTM E3248-20).

- Advectively emplaced NAPL enters the sediment from subsurface flow typically in conjunction with groundwater flow. For this to occur, the NAPL would generally be present in larger pore spaces within the sediment network and form a sufficiently continuous NAPL body to potentially

permit the flow of NAPL. Advective emplacement can occur for both LNAPL and DNAPL. The potential for movement is controlled by the NAPL properties, NAPL saturation, and the hydrogeologic conditions of the sediment (ASTM E3248-20).

- OPAs are formed when solid particles adhere to LNAPL beads in a surface water body. The OPAs increase in density causing dispersion and settling to the sediment surface. If sufficient OPAs accumulate, in-situ deposited NAPL sediments are formed. In this case, the NAPL is within a sediment matrix and may not form a continuous NAPL body. In-situ deposited NAPL sediments typically have a low potential for movement (ASTM E3248-20).
- DNAPL surface flows form from a direct discharge of DNAPL into a water body, which flows along the slope of the sediment surface. It forms a layer along the competent sediment surface where the NAPL is the primary matrix with sediment contained within. DNAPL emplaced from surface flows may move if disturbed (ASTM E3248-20).

The former Amesbury MGP operated from approximately 1890 until no later than 1924. Coal tar (NAPL) appears to have been released during this time to the Powwow River as a point discharge, possibly via a potential open wooden conveyance structure (e.g., sluiceway) that discharged to the nearby wetland and mudflat adjacent to the former MGP. Based on this discharge mechanism, the NAPL was likely emplaced as a DNAPL surface flow in the immediate vicinity of the release, and emplaced advectively within the sediment, accumulating in deeper intervals downstream within portions of the Powwow River channel.

2.6. NAPL Delineation

As further described in the Supplemental Phase II CSA Report, shallow MGP-related impacts in sediment were mostly limited to the wetland and mudflat. In this area, MGP-related impacts were limited to the top 2 or 3 feet and were primarily within a narrow band parallel to and east of the wetland stream channel on the 33, 35, and 37 Oakland Street properties and in the mudflat on the 39, 41, and 43 Oakland Street and 4 Oakland Court properties. Although visible coal tar (NAPL) was generally not at the sediment surface, it was present at depths of 6 to 12 inches below the sediment surface. The lateral extent of coal tar (NAPL) in sediment is shown on Fig. 3.

Deeper MGP-related impacts, such as visible coal tar (NAPL), sheen on sediments, and staining were observed in the Powwow River downstream of the mudflat. In the river, coal tar (NAPL) impacts in sediment were observed generally from as shallow as about 1 or 2 feet up to about 8 or 9 feet below the sediment surface. In the downstream stretch of the Powwow River, overlying shallow sediments likely deposited after dredging were not significantly contaminated with PAHs and did not have visible coal tar (NAPL) except two locations where NAPL was observed at depths shallower than 1 foot.

Based on the investigations, a clay or dense silt layer was present beneath much of the affected sediments in the Powwow River channel and appears to be acting as a confining layer. In general, the upper surface of this clay or dense silt layer ranged from approximately 4 to 8 feet below the sediment surface; however, it was observed as shallow as the sediment surface. Although the clay or dense silt layer was not encountered in every core, it is likely continuous throughout the reach of the Powwow River where coal tar (NAPL) impacts were encountered. Coal tar was not observed in the underlying clay.

2.7. NAPL Properties

One representative sample of DNAPL was collected from the sediment in 2016 and tested for physical properties. The sample was collected from a monitoring well containing coal tar on the former MGP footprint on 39 Water Street and is considered a reference standard for coal tar observed throughout the Site, including where the sediment cores in this evaluation were collected. The results indicate a density of 1.1374 grams per milliliter, a viscosity of 931 centipoise, and an interfacial tension (water/DNAPL) of 17.8 dynes/centimeter. These properties are consistent with coal tar formed from manufactured gas plants utilizing carbureted water gas processes, the process used at the former MGP at the Site. The properties generally indicate that the DNAPL fluid is not conducive to flowing through the sediment porous media (i.e., generally high viscosity and interfacial tension).

2.8. Conceptual Site Model Summary

The CSM indicates that DNAPL impacts are present in the sediment. The DNAPL has been delineated laterally and vertically. While it was likely emplaced via DNAPL surface flows and advective migration in the sediment, the available data suggests that the DNAPL body is stable due to:

- A laterally continuous silt/clay layer is present beneath the DNAPL, acting like a liner to prevent downward advective migration;
- MGP-related impacts such as visible coal tar (NAPL) were not observed in shallow sediment emplaced after dredging in the river was completed and while the former Amesbury MGP continued operation, indicating that upward migration is not occurring;
- DNAPL is highly weathered and has a high viscosity, which reduces the potential for advective movement; and
- MGP-related sheens have not been observed in the surface water body.

3. Approach

The extent of DNAPL in sediment has been delineated laterally and vertically and the DNAPL body is not migrating. The CSM suggests that advective movement is not occurring and this investigation provides an additional line of evidence confirming DNAPL body stability and evaluating whether advective migration could occur under reasonably anticipated conditions.

3.1. Advective Movement Evaluation

We evaluated the potential for NAPL to move advectively due to hydraulic head gradients in general accordance with ASTM 3248-20 and 3282-22.

Core samples were collected at various locations within the known extent of NAPL (Fig. 3) and samples were evaluated and classified for potential mobility or migration.

The NAPL was first evaluated at the pore scale to determine if it is immobile or mobile, defined as:

- Immobile NAPL - NAPL that does not move by advection within the connected void spaces of the sediment under specified physical and chemical conditions, as may be demonstrated by laboratory testing, or may be interpreted based on mathematical calculations or modeling.
- Mobile NAPL - NAPL that may move by advection within the connected void spaces of the sediment under specified physical and chemical conditions, as may be demonstrated by laboratory testing, or as may be interpreted based on mathematical calculations or modeling.

If the NAPL was determined to be potentially mobile at the pore scale, then further evaluation could be performed to determine if it was stable or migrating at the NAPL body scale, defined as:

- Migrating NAPL - NAPL that can move at the NAPL body scale, such that the NAPL body may advectively expand in at least one direction under observed or reasonably anticipated field conditions.
- Stable NAPL body - NAPL that does not move at the body scale, such that the NAPL body will not advectively expand in any direction under observed or reasonably anticipated field conditions.

The flowchart in Fig. 4 summarizes the investigation and the logic utilized to categorize the NAPL impacts. The pore scale mobility evaluation was conducted based on laboratory testing on sediment cores and a weight-of-evidence evaluation of potential NAPL mobility. The body scale migration evaluation was not necessary, based on the pore scale evaluation results.

The laboratory testing methods are summarized in Table 1. The weight-of-evidence criteria and scoring for pore scale mobility are summarized in Table 2.

3.1.1. Investigation Areas

The investigation areas are presented in Fig. 2 and Table 3. The locations and depths of the sediment cores were determined based on a review of previous core logs and visual observations. Core locations for the NAPL mobility study were selected to target known areas of NAPL impacts based on observations from previous site investigations.

Historical boring logs were reviewed for visual observations of MGP-related impacts. Eight borings were identified with visual observations including petroleum-saturated sediment, tar-saturated sediment, tar blebs, coated sediment, or sheening (680/680R, 687, 694, 708, 713, 733, 737, and 781). With the exception of 680/680R, these historical locations were targeted for this investigation to represent conservative conditions where NAPL saturated sediment with a higher likelihood of mobility would be observed. A summary of the core location rationale is presented in Table 4. A core location for the mobility study could not be performed associated with historical location 680/680R due to lack of access on that property and on the adjoining properties. Therefore, only seven core locations were selected and completed for the mobility study.

Each of the seven representative locations were included in this evaluation (849-853, 855, and 856), corresponding to historical borings with NAPL impacts and located where National Grid had site access. Based on the visual observations and boring logs in the present study, the conditions at these locations were generally consistent with the historical observations from nearby cores (Table 4). However, NAPL was not visually observed in three locations (852, 853, and 854) as discussed further in Section 5.

Three cores were collected at each location. A primary core was collected first and logged in the field. Co-located secondary and tertiary cores were collected within about 2-5 feet of the primary core location and were reserved for laboratory testing. Secondary and tertiary cores were cut, capped, frozen, and shipped for laboratory testing. The full depth of each secondary and tertiary core was retained for the laboratory mobilization characterization at each investigation area.

3.1.2. NAPL Presence/Absence Evaluation

White (visible) light and ultraviolet (UV) light core photography was performed at the analytical laboratory for the secondary cores over the entire core length to identify NAPL location(s) and saturation variability (API 1998). UV light photography reveals the presence of fluorescent compounds (e.g., PAHs) typically found in NAPLs such as those present at the Site. The brightness of the UV light is a qualitative indicator of NAPL saturation. If no evidence of NAPL was observed in UV photographs, then it was considered not present, and no further laboratory testing was needed. If NAPL was observed in UV photographs, then further testing was warranted, and the UV photographs guided selection of the core samples to be tested.

LNAPL and DNAPL sources are present at the Site, and both NAPL types could potentially be found in the investigation area. The color and intensity (“brightness”) of the fluorescence depends on the specific mixture of compounds present, the soil matrix, and the wavelength of the UV excitation (Kram et al. 2004, Kram and Keller 2004). However, in general, lighter compounds will fluoresce with smaller wavelengths and greater intensity than heavier compounds (Bourdet and Eadington 2012). Therefore, DNAPLs would be anticipated to fluoresce as red or orange in the UV photographs while LNAPLs would

be anticipated to fluoresce as blue or green. The intensity of the response would typically be greater for LNAPL than DNAPL for the same NAPL saturation and sediment conditions.

Naturally occurring elements also fluoresce under UV photography providing a "false positive" result for the presence of NAPL. For example, the calcium carbonate found in shells will fluoresce (Barnes 1958). False positive responses were identified by visually inspecting the visible and UV photographs for shells, wood, or other features that fluoresced under UV light but did not represent NAPL in the sediment.

A visual evaluation of the UV photography was performed for each core. The intervals with the greatest fluorescence were assumed to be the most impacted and were conservatively chosen for further testing.

3.1.3. Pore Scale Mobility Evaluation

Where visual observations of NAPL were present in a sediment core in the field, laboratory testing was conducted on additional, co-located cores to evaluate the potential pore scale NAPL mobility. Each sequential step in the pore scale mobility evaluation laboratory analytical process (Fig. 4) was only conducted where the previous step was positive for potential NAPL mobility. The analysis sequence included:

1. Where NAPL (fluorescence) was observed in core photography, mobility was evaluated for selected core samples. The first test of mobility included NAPL mobility via centrifuge (modified ASTM D425M) as well as final pore fluid saturation. Centrifuge testing was conducted at 100G for a duration of 1 hour. This procedure allowed for the evaluation of NAPL mobility under a hydraulic gradient significantly greater than any potential native gradient at the Site. If no measurable NAPL was eluted from the sample during the centrifuge test, then the NAPL was deemed immobile.
2. If centrifuge testing indicated that NAPL was potentially mobile, then a weight-of-evidence evaluation was conducted to evaluate if NAPL would likely be mobile under in situ conditions. The lines of evidence included the NAPL effective hydraulic conductivity, the initial NAPL saturation, and the change in NAPL saturation during the centrifuge test. The weight-of-evidence criteria and scoring are included in Table 2. If the total score was greater than or equal to 0, the NAPL was deemed immobile. If the total score was less than 0, the NAPL was deemed mobile.

The effective hydraulic conductivity of the NAPL was calculated based on the results of the centrifuge tests:

$$K_n = \frac{\Delta V_n}{A i_t t} \qquad \text{[EQ 1]}$$

where K_n is the effective hydraulic conductivity of NAPL, ΔVn is the change in NAPL volume during the test, A is the area of the test sample, i_t is the hydraulic gradient imposed during the test, and t is the test duration (ASTM E3282-21).

The change in NAPL volume during the test was calculated as:

$$\Delta V_n = V_t n(S_i - S_f) \quad \text{[EQ 2]}$$

where ΔV_n is the change in NAPL volume during the test, n is the porosity of the sample, S_i is the initial NAPL saturation, and S_f is the final NAPL saturation (ASTM E3282-22).

3.1.4. NAPL Body Scale Migration Evaluation

The NAPL body scale migration evaluation was not necessary based on the results of the pore scale and weight-of-evidence evaluation (Section 5).

4. Investigation Activities

4.1. Field Investigation

This section summarizes the general procedures for the fieldwork including logging sediment conditions and describing observed NAPL impacts in a consistent and factual manner.

4.1.1. Standard Operating Procedures

GEI's internal standard operating procedures (SOPs) were followed for field activities performed during the investigation.

In addition to following internal SOPs, the following guidance document was provided by the laboratory and was used to support the performance of field work:

- Core Laboratories Recommended Core Handling and Field Preservation Methods for Contaminated Shallow Subsurface Investigations

4.1.2. Sediment Core Collection Overview

Between August 17, 2024, and August 31, 2024, GEI observed TG&B Marine Services, Inc. of Monument Beach, Massachusetts (TG&B) perform boat-mounted sediment core collection from seven locations within the Powwow River Channel (849-853, 855, and 856). The cores were advanced to depths between 8 and 11.2 feet below the water/sediment interface using vibracore methods with the rig staged on a boat operated by TG&B. TG&B used a 2 $^{5}/_{8}$-inch inner diameter core barrel with plastic liners to retain the sediment samples. TG&B maintained the cores in a vertical position until they were transported back to land for processing and documentation by GEI staff.

Additional details of core collection, logging, labeling, preservation, and shipping are provided in relevant sections below.

4.1.3. Boat Positioning and Placement

The boat, operated by TG&B was constructed as a makeshift catamaran by connecting two jon boats together via a steel frame. The center of the catamaran was open and allowed for accurate placement of the vibracore tooling, which consisted of a drill attached to a 2 $^{5}/_{8}$-inch core barrel lined with an acetate sleeve.

The location of each proposed core within the investigation areas was determined prior to mobilization and provided to the contractor and field crew. TG&B used a portable Trimble® Geo 7X global positioning system (GPS) unit with sub-meter horizontal accuracy to navigate to each proposed core location. GEI verified that the drill rig was positioned within a 10-foot radius of the proposed primary core location after the barge was stabilized and prior to drilling.

GEI coordinated with TG&B to sequence work to minimize the disturbance of the surficial sediment by the barge during navigation and positioning. GEI collected up to three co-located cores in each investigation area, as discussed in Section 4.2. Secondary and tertiary core locations were typically positioned by moving tooling to a different location within 2-5 feet of the primary core. As-drilled coordinates for all cores were collected in the North American Datum of 1983 (NAD 83) and were post-processed using base station data from the nearest base station to the Site. As-drilled core locations are provided in **Fig. 2** and **Table 3**.

4.1.4. Site Logistics

The logistics of the boat and drill rig transportation, launching, and navigation were determined by TG&B and GEI. During over-water activities, disturbance of the surficial sediment by large outboard motors, barge spuds, boats with deep drafts, or other hydraulic forces was avoided to the extent possible. TG&B approached each core location slowly with the motor prop up. Cores were advanced during higher tide conditions for ease of access and to reduce the risk of grounding on the surficial sediments. Additionally, care was taken to advance the vibracore in a smooth, continuous manner to minimize disturbance of the sediment to the extent feasible while advancing the cores.

An on-shore work area was set up to support the sediment investigation for storage of field equipment, sampling materials, laboratory coolers, etc. The location for the work area was established in the field, and served as the staging area for sample management, packaging, and packing for shipment.

4.1.5. Investigation Derived Waste Disposal and Decontamination Procedures

Investigation-derived waste (IDW) was managed, stored, and disposed of in accordance with the procedures described in the Supplemental Phase II CSA Report.

4.1.6. Sample Management, Shipping, and Custody

Sediment samples were labeled with the following information in accordance with GEI SOPs:

- Site name
- Sample ID
- Sample description
- Top vs bottom of core with depths
- Date and time (military time) of collection
- Sampler's initials

Sediment recovered was collected in three, 2 $^{5}/_{8}$-inch diameter cores (labeled as primary, secondary, tertiary) at each target location. The liners were kept vertical on the boat until they were brought to the work area on shore. The primary core was used for logging purposes and visual observations were used to determine the specific intervals that were to be cut in the secondary and tertiary cores so as not to bisect intervals potentially impacted with NAPL (discussed in Section 4.2.2). The primary core was discarded after logging.

Secondary and tertiary cores were kept in a vertical position when delivered to the work area. Excess water was removed from the top of the cores and the core liner was cut flush with the top of sediment to eliminate any void space. Both ends were then immediately capped and sealed with duct-taped to secure the sediment within the core liner and placed horizontally on a flat surface for labeling. The total recovery length was measured in the secondary and tertiary cores before they were further cut into specific lengths based on NAPL observations from the primary core and/or ability to fit in the cooler for shipping. Each core section was clearly labeled with the complete core ID name, date and time of collection, and site name (e.g., "top" and "bottom" with associated depths) according to the correct end of the core.

Sediment core samples retained for laboratory testing for NAPL mobility were handled, labeled, cryogenically preserved, and shipped in accordance with the guidance for labeling and handling in Appendix A. The cores were wiped clean to keep the cooler clean, wrapped with plastic wrap to prevent contact with dry ice, and sealed using clear box tape. After wrapping, cores were immediately placed into a large 150-quart marine cooler lined with dry ice (cryogenic preservation) to minimize potential pore fluid movement within the core. Additional dry ice was placed over the cores after the cooler was full.

Samples were transferred from the cooler into a large chest freezer at the GEI office for longer term storage prior to shipping. GEI periodically observed the chest freezer temperature to ensure it remained below freezing. Prior to shipping, the samples were placed in a 150-quart marine cooler packed with fresh dry ice. The cores were packed tightly into the cooler to prevent shifting during transport. Any void space in the cooler was filled with extra bubble wrap. The cores were shipped via Fed-Ex Priority Overnight to Core Laboratories of Houston, Texas (Core) on August 23, 2024 and September 12, 2024.

All sediment samples or sample containers transported off-site were continuously accompanied by a Chain-of-Custody Record (COC) in accordance with GEI SOPs. A unique COC was created for each discrete sample shipment.

4.1.7. Recordkeeping

The use of field notebooks and standardized checklists helps to provide adequate documentation of field activities, changes in procedures, and Site conditions. GEI personnel recorded daily Site activities and conditions in accordance with GEI SOPs. Photographs of field activities, sampling methods, sample material, etc. were captured by GEI in accordance with GEI SOPs.

GEI recorded the following information upon each arrival at the Site:

- Date and time
- Weather observation for the day and up to 48 hours prior to sampling if it could have affected sample quality
- Field personnel maintaining the log
- Purpose of visit/daily objectives
- Name of on-site representatives (i.e., field staff, National Grid, landowners, and contractors) present

GEI recorded the following information during the day:

- Conversations with contractors/subcontractors, National Grid, visitors, and field staff. When possible, GEI recorded complete names, titles, and affiliations.
- Time of arrival and departure of individuals
- Activities as they occurred

Photos of sediment samples included the following:

- Sample ID
- Top/bottom orientation of the sample
- Depth interval of the sample

4.2. Advective NAPL Movement Evaluation

The presence of NAPL in the sediment has been delineated laterally and vertically as part of the Supplemental Phase II CSA activities and is summarized in Fig. 3. The goal of the current investigation was to evaluate if the NAPL has the potential to migrate from the sediment up to the surface water. This information will also be utilized to support the remedy selection evaluation, and, if warranted the remedy design. The purpose of the NAPL mobility investigation was to categorize observed NAPL as either immobile or mobile on the pore scale, and where mobile NAPL is observed, categorize it as stable or potentially migrating on the NAPL body scale.

The approach to NAPL mobility investigation was to collect undisturbed sediment cores at the locations identified in Fig. 2 and Table 3. The primary core was logged in the field in accordance with Section 4.2.3. Subsequent secondary and tertiary cores were cut, capped, and cryogenically preserved (frozen) in the field using dry ice for shipping to the laboratory for a series of NAPL mobility tests (Table 1).

4.2.1. Locations

The locations in which the sediment cores were collected are identified in Fig. 2 and Table 3.

4.2.2. Co-Located Cores

GEI collected three, 2 $^{5}/_{8}$-inch diameter cores at each target location (primary, secondary, and tertiary, respectively). Cores were co-located as closely as practical without disturbing the sediment structure (typically within about 2-5 feet).

Although the target depth at all locations was 12 feet, core depths typically ranged from about 8 to 11 feet where refusal was encountered. At each location, refusal was encountered in the native silt/clay underlying the sediment. After being transported to the work area from the boat in a vertical position, liners from the primary core were extruded from the core barrel, opened lengthwise, and provided to GEI for logging in accordance with Sections 4.1 and 4.2.3.

The secondary and tertiary cores were advanced to the same depth as the primary core and were not opened at the surface. After being brought to the work area in a vertical position, they were cut in set intervals in preparation of shipping to the laboratory. They were then capped, labeled, and cryogenically preserved in a 150-quart cooler. At the end of each field day, the cores were transported to the freezer at the GEI office in Woburn, Massachusetts. As the freezer filled with cores, they were packaged and shipped to the Core Laboratory of Houston, Texas. Cores selected for NAPL mobility testing were preserved and shipped with each tube labeled clearly in accordance with the labeling procedures in Appendix A.

4.2.3. Sediment Logging

Visual logging was performed to describe the sediment physical characteristics and determine the presence or absence of NAPL in the primary core. Descriptions were performed on undisturbed sediment towards the interior of each core in case core barrel friction disturbed the outer edges of the core. All sediments were logged using the Unified Soil Classification System (USCS; ASTM D2487-17 and ASTM D 2488-17e1) in accordance with GEI SOPs.

The primary sediment core was scored or cut along the long axis and the sediment lithology exposed for logging. A thin wire or putty knife was used to expose the core sample, taking care not to disturb the lithology.

A photograph of the entire sample core was taken in accordance with GEI SOPs. Additional photographs were collected to document impacted material. The name of the core and depth interval(s) were clearly labeled and visible in each photograph.

Sediment samples were taken and retained in glass jars and screened for volatile organic compounds (VOCs) using a calibrated photoionization detector (PID) in accordance with GEI SOPs. The readings and sample depths were recorded on the boring logs.

The sediment field description was prepared for discrete intervals within the core sample, specifically pointing out small-scale lithologic units and changes within each sample interval. The description also included the amount of sample recovered and noted other conditions (such as a change in drilling conditions, etc.). Sample interval depths were adjusted as necessary based on core recovery.

4.2.4. NAPL Observations and Olfactory Descriptions

If the sediment sample contained visual indications of NAPL, then the following visual and olfactory descriptors were used in accordance with ASTM E3268-21, ASTM E3281-21a, and GEI SOPs, in addition to the USCS lithologic description.

4.2.4.1. Visual Descriptions

NAPL – a separate phase liquid. NAPL arises from a variety of industrial sources and can have varying consistency (viscosity) and can range from non-viscous to highly viscous (taffy-like). NAPL observations were accompanied by applicable olfactory observations (see descriptors below) and other visual observations (e.g., color and viscosity).

Sheen – continuous petroleum-like sheen that is observed on the surface of the soil or sediment samples. The sheen can be petroleum or tar related. This was not used to describe a "bacterial sheen," which can be distinguished by its tendency to break up at angles on the water surface; whereas a non-bacterial sheen will be continuous and will not break up.

Blebs – discrete, spherical shaped NAPL in or on the soil/sediment matrix. Include additional descriptors to the extent practicable such as the approximate size and quantity (number of blebs or qualitative estimate).

Stringer – discrete, discontinuous interval of NAPL.

Seams – discrete continuous intervals of NAPL.

Coated – soil/sediment grains are coated with NAPL – there is not sufficient NAPL present to saturate the pore spaces. Used modifiers such as light, moderate, or heavy to indicate the degree of coating.

Saturated – the entirety of the pore space for a sample interval was saturated with NAPL. Care was taken to ensure that the fluid observed was not water saturating the pore spaces. NAPL saturated materials may freely drain from a soil sample and should be documented accordingly.

Stained – visible, unnatural discoloration of the soil, with no visible NAPL.

Solid NAPL – NAPL that is in a solid or semi-solid phase. The magnitude of the observed solid NAPL shall be described (discrete granules or a solid layer).

Other Visual Impacts and Descriptors – Other visual impacts that are not naturally occurring shall also be noted along with appropriate visual descriptors. These other visual observations could include the observation of debris, wood chips, staining, anthropogenic materials, or other notable visual characteristics and general observations. The above impacts shall be described using other visual descriptors as applicable. Descriptors may include, but not be limited to, color, consistency, thickness, etc.

The words slight, moderate, and heavy were used as visual impact modifiers to document relative intensity observations.

4.2.4.2. Olfactory Descriptions

The following bullets provide the framework used to describe odors when they were present in the sediment.

- Odors like coal tar, naphthalene, purifier waste, ammonia, hydrogen sulfide, fuel oil, gasoline, or organic/natural were noted. When uncertain of an odor, the odor was qualified with a "-like" modifier (i.e., coal tar-like, fuel oil-like).
- Other odors that were not believed to be natural were also identified with descriptors such as sweet, chemical, etc., as applicable.
- Modifiers such as heavy, moderate, or slight were used to indicate intensity of the observed odor.

- In instances where multiple odors are present, a combination of descriptors were used to clearly identify where these co-mingled impacts were present.

4.3. Hydraulic Gradient Investigation

Nested pairs of vibrating wire piezometers were installed at three of the seven investigation locations to measure the potential vertical hydraulic gradients under typical surface water elevations. The Powwow River is tidally influenced in the investigation area, and the direction and magnitude of vertical gradients in the sediment column are important to understand the in-situ driving forces that may influence NAPL mobility.

4.3.1. Vibrating Wire Piezometers

Between August 16 and August 31, 2024, three nested pairs of Geokon 4500AL vibrating wire piezometers (VWPZs) were installed at three locations upstream, midstream, and downstream, within the Powwow River (849, 851 and 856) (Fig. 2). The nested system at each location consisted of a shallow and deep piezometer and were used to measure vertical gradients within and through the sediment under typical surface water elevations. The target depth for the deeper piezometer was to be installed at the base of the sediment column just above the underlying clay. The target depth for the shallow piezometer was to be installed about 1-2 feet below the sediment-water interface.

At locations 851 and 856, the nested piezometer pairs were affixed to a single 1-inch diameter steel rod. The distance from the top of rod to each piezometer screen was then measured on shore to an accuracy within 0.01 feet. At location 849, the piezometers were affixed to two separate rods and distances were similarly measured. Prior to installation, the piezometers were “zeroed” and checked for accuracy at the onshore work area.

The TG&B crew transported the piezometers to each designated location on the boat via GPS. Once on location, the rod(s) containing the affixed nested piezometers were driven into the sediment using vibracore methodology. The top of each steel rod was subsequently surveyed by a professional surveyor on November 2, 2023.

Each set of nested piezometers were installed at the following depths:

- 849
  - Shallow – approximately 2 feet below the water/sediment interface
  - Deep – approximately 7 feet below the water/sediment interface
  - Vertical distance between each sensor: 4.12 feet.
- 851
  - Shallow – approximately 1 foot below the water/sediment interface
  - Deep – approximately 5.72 feet below the water/sediment interface
  - Vertical distance between each sensor: 4.73 feet

- 856
    - Shallow – could not advance beneath water/sediment interface due to encountering refusal. Final depth was 0.08 feet above the water/sediment interface
    - Deep – approximately 5.72 feet below the water/sediment interface
    - Vertical distance between each sensor: 5.21 feet

All VWPZs were installed and operated in general accordance with the manufacturer's recommendations and guidance. The installation diagrams are included in **Appendix B**. A photographic log is included in **Appendix C**. Data collection from the VWPZs occurred from August 16, 2024 to December 7, 2024 and a summary of results is presented in **Table 5**. The VZPWs were abandoned in July 2024 by physically removing them from the sediment and disposing off Site.

To facilitate monitoring of the VWPZs within the Powwow River, the communication cable from each VWPZ was weighted to the riverbed floor using rebar, ran back to shore, and connected to a data logger placed in a secure location programmed to log in 15-minute intervals. GEI personnel occasionally mobilized to the site and collected the piezometer data directly from the data logger. The locations of the piezometers and loggers are shown in Fig. 2.

4.4. Quality Assurance and Quality Control

Complete COCs for the sediment cores for the NAPL movement evaluation by Core Laboratories are included in Appendix D. All cores met criteria and had no quality assurance issues reported.

The piezometer data were deemed to be acceptable for use. However, the following limitations were encountered during the data collection period:

- At location 851, the data logger permanently lost communication with the deep piezometer on October 17, 2023.
- At location 856, the shallow piezometer could not be driven below sediment surface due to encountering refusal during the installation process. The nested piezometer could not be removed for another attempt without potentially damaging the various components of the deeper piezometer. Therefore, this location was not used in the hydraulic gradient calculations.

5. Results

5.1. Piezometer Information

A VWPZ pair was installed at three locations in the Powwow River (849, 851, and 856) to measure hydraulic gradients through the sediment and the overlying surface water. At location 849, the data collection period occurred from August 16, 2023 to December 7, 2023, and at location 851, from August 29, 2023 to October 17, 2023 (due to loss of communication). The data from piezometer 856 was not used because the shallow piezometer could not be driven below the sediment surface and remained installed in the overlying water column, as described above in Section 4.4.

At locations 849 and 851, the hydraulic head at each of the shallow and deep piezometers was calculated in 15-minute intervals using data from the piezometer and a formula provided by Geokon®. The difference in the water column thickness above each piezometer was then used to calculate the vertical hydraulic gradient at each location.

The piezometer data over time indicated that the hydraulic gradient flows in a downward direction during times of rising and high tide, and upward direction during times of falling and low tide. A summary of the vertical hydraulic gradients is presented in Table 5. The average hydraulic gradient at 849 is almost neutral (-0.01) and slightly downward at 851 (0.13). Therefore, the in-situ measured gradients are confirmed to be significantly less than the laboratory testing conditions described below, and the laboratory tests are conservative.

5.2. Advective NAPL Movement Evaluation

A total of 21 sediment cores in seven investigation areas (three cores per investigation area) were collected as part of the advective NAPL movement evaluation following the approach described in Section 3.1 and Fig. 4. The location of the cores and investigation areas are shown in Fig. 2. A total of 21 cores were submitted to the laboratory for testing.

The primary core was visually logged in the field. Visual observations of NAPL were included, as described in Section 4.2.4. The associated boring logs are included in the Supplemental Phase II CSA Report. The secondary and tertiary cores (labeled with the subscript "…-A-X" and "…-B-X" respectively) were collected for laboratory analysis. Visual and UV photographs were taken of the secondary core. The core photographs are included in Appendix E. The tertiary cores were collected to provide additional material for laboratory analysis if needed, however, they were never used. The secondary cores provided enough material to accomplish the goals of the testing.

A summary of the location, depth, and rationale for each boring is provided in Tables 3 and 4.

5.2.1. NAPL Presence/Absence Evaluation

The first step in the NAPL movement evaluation was to evaluate the presence or absence of NAPL (Fig. 4).

All primary cores were inspected for visual observations of NAPL in the field. Cores from the seven investigation locations were submitted to the laboratory for UV photography and testing. A summary of the NAPL visual observations in the field and from the laboratory photography is provided in Table 6 and core logs are provided in an appendix to the Supplemental Phase II CSA Report. NAPL was observed in discrete, discontinuous lenses at five of the seven locations in the field. Visual NAPL was not observed in the field at locations 852 and 853. Visual impacts in the field at locations 852 and 853 included staining and sheen (no physical NAPL blebs or saturation). White light and UV light photographs are provided in Appendix E.

Visual inspection of the UV photography confirmed the visual observations made in the field that NAPL appears to be present as discrete, discontinuous impacts, with no evidence of a laterally continuous NAPL body. The presence of NAPL was observed at isolated depths ranging from approximately 2.5 to 6.5 feet depending on the core. A slight potential NAPL fluorescence was observed in the core at location 852 and a sample was selected for mobility evaluation. No NAPL fluorescence was observed in the core at location 853 (confirming the field observation) and therefore, no sample was selected for mobility evaluation. The apparent greatest NAPL impacts were observed at locations 851 and 855 based on the intensity of the UV response.

Since NAPL was visually confirmed with UV photography at six locations: 849, 850, 851, 852, 855, and 856, the NAPL movement evaluation proceeded to evaluate for pore scale NAPL mobility for these cores. A summary of the NAPL presence/absence evaluation is included in Table 6.

5.2.2. Pore Scale Mobility Evaluation

The next step in the NAPL movement evaluation was to determine if the NAPL has pore scale mobility.

One segment of the secondary core, approximately 0.2 feet in length, was selected from cores 849-852, 855, and 856, for the laboratory mobilization characterization. Each test segment was selected to represent the most impacted interval based on the fluorescence observed in the UV photography. Additional factors such as proximity to the mudline, fluorescence color, and sediment characteristics were also considered, as necessary. A summary of the test intervals is provided in Table 7.

The laboratory testing included NAPL mobility via centrifuge (modified ASTM D425M) as well as final pore fluid saturation, total porosity, specific gravity, and dry bulk density (API 1998). Centrifuge testing was conducted at 100G for a duration of one hour. Vertical plugs measuring 0.2 feet in length and 1-inch in diameter were extracted by the laboratory. The extracted plug was offset from the center of the core so that a second “parallel plug” could be extracted for further testing, if needed.

NAPL was eluted from each core during the centrifuge test, so a weight-of-evidence evaluation was conducted to evaluate if the NAPL would be mobile under in situ conditions using multiple lines of evidence. The weight-of-evidence analysis is a data and information integration process where multiple lines of evidence, gathered through laboratory testing or calculations, can be used to determine if NAPL is mobile/immobile in sediment. Each line of evidence is then given a score based on the results and/or observations (1, 0, or -1), then added together. If the weight-of-evidence score is positive, then the NAPL is considered to be immobile at the pore scale. If the weight-of-evidence score is less than zero, then the NAPL is considered to be mobile at the pore scale. Table 8 presents the results of the weight-of-evidence analysis.

Five of the six samples exhibited scores greater than 0, indicating that the NAPL is immobile.

One sample from core 850 (850-A-2-Vb) had a result of 0. Given the level of conservatism in the evaluation protocol this result was also considered immobile based on the following observations that led to the score of 0.

- NAPL was expressed during the centrifuge test, so the location scored a 0 for that weight-of-evidence factor. However, this test applied a gradient approximately 50 times greater than in situ conditions as measured with the piezometers and is a highly conservative test.
- The calculated NAPL effective hydraulic conductivity was 1.5×10^{-6} cm/s, so the location scored a –1 for that weight-of-evidence factor. The threshold used in the WOE evaluation was 1×10^{-7} cm/s, which is a common design requirement used for an impermeable liner or cap and would therefore be considered immobile. However, a hydraulic conductivity on the order of 10^{-6} cm/s is still very low, equivalent to water in fine grained soils (clay/silt).
- The initial NAPL saturation result was 11% so the location scored a 0 for that weight-of-evidence factor. This result is on the low end of the range (<10% scores +1 and >30% scores -1) and would still be considered unlikely to be mobile.
- The difference in NAPL saturation before and after mobility test result was 6% so the location scored a 1 for that weight -of-evidence factor. This NAPL saturation is generally consistent with that of the other samples, which ranged from 1% to 5%.

The laboratory test results are included in Appendix D and the pore scale mobility determinations are summarized in Tables 7 and 8.

5.2.3. NAPL Body Stability Evaluation

No core exhibited pore-scale mobility based on the weight-of-evidence evaluation. Therefore, the NAPL body stability evaluation was not necessary.

5.2.4. Advective NAPL Movement Evaluation Summary

Visual observation of NAPL impacts from sediment cores as well as the visual and UV photography indicated that the NAPL is present as discrete, discontinuous impacts. NAPL impacts appear to be isolated and do not suggest a continuous NAPL body in sediment.

NAPL cores were evaluated for potential mobility and migration to represent the sediment most impacted with NAPL at each location. Of the seven investigation areas:

- NAPL was absent in one area (853);
- Centrifuge testing was performed on cores from the remaining six areas where NAPL was visually confirmed; and
- NAPL was confirmed to be immobile in all six areas based on the weight-of-evidence evaluation.

6. Summary

The purpose of the investigation was to evaluate the potential for NAPL movement in sediment to the sediment/water interface via advective flow of NAPL. The evaluation demonstrates that:

- The piezometer data over time indicated that the hydraulic gradient flows in a downward direction during times of rising and high tide, and upward direction during times of falling and low tide.
    - The average hydraulic gradient at 849 is almost neutral (-0.01 ft/ft) and slightly downward at 851 (0.13 ft/ft). Therefore, the in-situ measured gradients are confirmed to be significantly less than the laboratory testing conditions described below and the tests are conservative.
- NAPL impacts in sediment were confirmed throughout the area identified from prior investigations with the exception of cores from location 853.
- NAPL impacts were observed as discrete, discontinuous lenses of either coal tar blebs or coal tar saturated sediment at depths ranging from approximately 2.5 to 6.5 feet depending on the core. No evidence of extensive, laterally continuous NAPL bodies was identified.
- Centrifuge testing was conducted at 100G for a duration of one hour, which is significantly greater than the in-situ hydraulic forces measured with the vibrating wire piezometers.
    - NAPL was eluted from each core during the centrifuge test, so a weight-of-evidence evaluation was conducted to evaluate if the NAPL would be mobile under in situ conditions using multiple lines of evidence.
    - Five of the six samples exhibited scores greater than 0, indicating that the NAPL is immobile. One sample from core 850 (850-A-2-Vb) had a result of 0. Given the level of conservatism in the evaluation protocol (e.g., the centrifuge test applied a gradient approximately 50 times greater than in situ conditions), this result was also considered immobile.

Therefore, advective movement is not a likely migration pathway for NAPL to move to the sediment/water interface.

7. References

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Tables

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Table 2. Weight of Evidence Criteria and Scoring for Advective NAPL mobility

Table 3. NAPL Mobility Investigation Areas

Table 4. NAPL Mobility Core Location Rationale

Table 5. Summary of Hydraulic Gradient Analysis

Table 6. NAPL Presence/Absence Summary

Table 7. Centrifuge Test Results Summary

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Table 1. Testing Methods – Advective NAPL Mobility

NAPL Movement in Sediment Investigation
Amesbury Former Manufactured Gas Plant
Amesbury, Massachusetts

Proposed Test	Test Method	Testing Phase
Core slabbing and preparation	API RP40	Preparation
Photography with white light and ultraviolet	API RP40	
Free product mobility by centrifuge	ASTM D425 - modified(1)	Pore Scale Mobility
Pore Fluid Saturation via Dean-Stark Method	API RP40	

General Notes:

1. NAPL - non-aqueous phase liquid

Footnotes

(1) Modified for NAPL per Core Laboratories Standard Operating Procedures

Table 2. Weight of Evidence Criteria and Scoring for Advective NAPL mobility
NAPL Movement in Sediment Investigation
Amesbury Former Manufactured Gas Plant
Amesbury, Massachusetts

Line of Evidence	Scoring	Scoring Rationale
Calculated NAPL effective hydraulic conductivity	+1 if $<10^{-7}$ cm/s 0 if on the order of 10^{-7} cm/s -1 if $>10^{-6}$ cm/s	At effective hydraulic conductivities < 10^{-7} cm/s, NAPL is effectively immobile at the pore scale. At greater NAPL effective hydraulic conductivities, it may be mobile.
Initial NAPL saturation in water saturated sediment sample	+1 if < 10% 0 if 10-30% -1 if > 30%	For NAPL in water-saturated sediments, 30 % is near the upper end of the expected range for immobile saturation, while 10 % is near the lower end of the expected range for immobile saturation.
Difference in NAPL saturation before and after mobility lab test	+1 if < 10% change in NAPL saturation -1 if > 10% change in NAPL saturation	If the change in NAPL saturation during the test is < 10% of the initial value, NAPL in the sample must be near immobile saturation, or near depletion. If the change is > 10 %, the NAPL may be mobile.

General Notes:
1. Table is adapted from Table X2.1 of ASTM E3282-22.

Table 3. NAPL Mobility Investigation Areas
NAPL Movement in Sediment Investigation
Amesbury Former Manufactured Gas Plant
Amesbury, Massachusetts

Investigation Area	Boring ID	Northing	Easting	Achieved Depth (feet below the mudline)	Visual Log	Core Photos	Centrifuge	Retained for Potential Testing
849	1804576-849	3136482	810338	8.0	X	-	-	-
	1804576-849-A-1	3136483	810337	6.9	-	X	-	-
	1804576-849-A-2				-	X	X	-
	1804576-849-A-3				-	X	-	-
	1804576-849-B-1	3136484	810335	7.1	-	-	-	X
	1804576-849-B-2				-	-	-	X
	1804576-849-B-3				-	-	-	X
850	1804576-850	3136332	810072	9.7	X	-	-	-
	1804576-850-A-1	3136334	810073	8.2	-	X	-	-
	1804576-850-A-2				-	X	X	-
	1804576-850-A-3				-	X	-	-
	1804576-850-B-1	3136334	810071	8.5	-	-	-	X
	1804576-850-B-2				-	-	-	X
	1804576-850-B-3				-	-	-	X
851	1804576-851	3136235	809997	8.0	X	-	-	-
	1804576-851-A-1	3136234	809993	8.9	-	X	-	-
	1804576-851-A-2				-	X	X	-
	1804576-851-A-3				-	X	-	-
	1804576-851-A-4				-	X	-	-
	1804576-851-B-1	3136234	809994	8.6	-	-	-	X
	1804576-851-B-2				-	-	-	X
	1804576-851-B-3				-	-	-	X
852	1804576-852	3136046	809959	10.0	X	-	-	-
	1804576-852-A-1	3136047	809957	8.5	-	X	-	-
	1804576-852-A-2				-	X	X	-
	1804576-852-A-3				-	X	-	-
	1804576-852-B-1	3136044	809953	9.0	-	-	-	X
	1804576-852-B-2				-	-	-	X
	1804576-852-B-3				-	-	-	X
853	1804576-853	3134580	810854	9.7	X	-	-	-
	1804576-853-A-1-1	3134582	810854	9.5	-	X	-	-
	1804576-853-A-1-2				-	X	-	-
	1804576-853-A-2				-	X	-	-
	1804576-853-A-3				-	X	-	-
	1804576-853-B-1	3134582	810854	9.5	-	-	-	X
	1804576-853-B-2				-	-	-	X
	1804576-853-B-3				-	-	-	X
855	1804576-855	3136907	810343	9.2	X	-	-	-
	1804576-855-A-1			8.0	-	X	-	-
	1804576-855-A-2				-	X	X	-
	1804576-855-A-3				-	X	-	-
	1804576-855-B-1			8.2	-	-	-	X
	1804576-855-B-2				-	-	-	X
	1804576-855-B-3				-	-	-	X
856	1804576-856	3136848.06	810527.36	11.2	X	-	-	-
	1804576-856-A-1			8.6	-	X	-	-
	1804576-856-A-2				-	X	X	-
	1804576-856-A-3				-	X	-	-
	1804576-856-B-1			6.9	-	-	-	X
	1804576-856-B-2				-	-	-	X
	1804576-856-B-3				-	-	-	X

General Notes:
1. NAPL - non-aqueous phase liquid
2. NM - Note Measured
3. Coordinate System = North American Datum of 1983

Table 4. NAPL Mobility Core Location Rationale
NAPL Movement in Sediment Investigation
Amesbury Former Manufactured Gas Plant
Amesbury, Massachusetts

Historical Core Location	Historical Core Location Visual Observations	NAPL Mobility Investigation Rationale	NAPL Mobility Core Location	NAPL Mobility Core Location Visual Observations	Submitted For Laboratory Testing
694	Saturated coal tar in sediment under potential shallow dredge	Evaluate NAPL Mobility	849	Coal tar blebs and sheen	Yes
708	Saturated coal tar in sediment	Evaluate NAPL Mobility	850	Heavy sheen (interpreted as presence of coal tar)	Yes
733	Coal tar blebs and saturated coal tar in sediment	Evaluate NAPL mobility Evaluate vertical groundwater gradient Evaluate pore water bioavailability	851	Coal tar blebs and saturated coal tar in sediment	Yes
737	Coal tar blebs in sediment	Evaluate NAPL mobility Evaluate pore water bioavailability	852	No physical coal tar blebs or saturation observed.	Yes
781	Sheen in sediment and petroleum coating on core tube.	Evaluate NAPL mobility	853	No physical coal tar blebs or saturation observed. Sheen and staining only.	Yes
713	Coal tar blebs in sediment under potential shallow dredge	Evaluate NAPL mobility	855	Saturated coal tar in sediment	Yes
687	Saturated coal tar in sediment under potential shallow dredge	Evaluate NAPL mobility Evaluate vertical groundwater gradient	856	Saturated coal tar in sediment	Yes

General Notes:
1. NAPL = non-aqueous phase liquid.

Table 5. Summary of Hydraulic Gradient Analysis
NAPL Movement in Sediment Investigation
Amesbury Former Manufactured Gas Plant
Amesbury, Massachusetts

Piezometer Location	Min Hydraulic Gradient ($^{dh}/_{dl}$)	Max Hydraulic Gradient ($^{dh}/_{dl}$)	Avg. Hydraulic Gradient ($^{dh}/_{dl}$)
849	-0.36	0.24	-0.01
851	-0.28	0.58	0.13
856	NM	NM	NM

General Notes:

1. Negative values indicate an upward gradient; positive values indicate a downward gradient

2. NM = Not measured because the shallow piezometer could not be driven below the sediment surface.

Table 6. NAPL Presence/Absence Summary

NAPL Movement in Sediment Investigation
Amesbury Former Manufactured Gas Plant
Amesbury, Massachusetts

Location ID	Core Sample ID	Field Visual Observations	UV Photography Visual Observations	NAPL Presence/Absence Determination
849	1804576-849	Observed	-	Present
	1804576-849-A	-	Observed	
	1804576-849-B	-	-	
850	1804576-850	Observed	-	Present
	1804576-850-A	-	Observed	
	1804576-850-B	-	-	
851	1804576-851	Observed	-	Present
	1804576-851-A	-	Observed	
	1804576-851-B	-	-	
852	1804576-852	Not Observed	-	Present
	1804576-852-A	-	Observed	
	1804576-852-B	-	-	
853	1804576-853	Not Observed	-	Absent
	1804576-853-A	-	Not Observed	
	1804576-853-B	-	-	
855	1804576-855	Observed	-	Present
	1804576-855-A	-	Observed	
	1804576-855-B	-	-	
856	1804576-856	Observed	-	Present
	1804576-856-A	-	Observed	
	1804576-856-B	-	-	

General Notes:
1. -- = Not Applicable
2. NAPL = non-aqueous phase liquid
3. UV = ultraviolet light

Table 7. Centrifuge Test Results Summary

NAPL Movement in Sediment Investigation
Amesbury Former Manufactured Gas Plant
Amesbury, Massachusetts

Location ID	Sample ID	Photo Depth (feet)	NAPL Type[(1)]	Centrifuge Test Results (NAPL Eluted?)
849	849-A-2-Va	3.78-3.98	LNAPL	Yes
850	850-A-2-Vb	4.45-4.65	DNAPL	Yes
851	851-A-3-Va	3.80-4.00	DNAPL	Yes
852	852-A-2-Va	3.55-3.75	DNAPL	Yes
855	855-A-2-Vb	4.10-4.30	DNAPL	Yes
856	856-A-2-Va	4.55-4.75	DNAPL	Yes

General Notes:

1. -- = Not Applicable
2. DNAPL = dense non-aqueous phase liquid
3. LNAPL = light non-aqueous phase liquid
4. NAPL = non-aqueous phase liquid
5. NT = Not tested
6. Depth is referenced from top of mudline.

Footnotes:

(1) Based on the color of the fluroescence on the UV photographs. Blue/green flurescence assumed to represent LNAPL. Red/orange UV flurescence assumed to represent DNAPL.

Table 8. Weight of Evidence for Advective NAPL Mobility Evaluation Summary
NAPL Movement in Sediment Investigation
Amesbury Former Manufactured Gas Plant
Amesbury, Massachusetts

Line of Evidence	NAPL expressed during centrifuging	Calculated NAPL effective hydraulic conductivity (refers only to the NAPL phase)		Initial NAPL saturation		Difference in NAPL Saturation Before and after mobility test		Score	Result
Sample ID	+1 if NAPL not expressed 0 if NAPL expressed	cm/s	+1 if < 10-7 cm/s -1 if > 10-7 cm/s	%	+1 if < 10% 0 if 10-30% -1 if > 30%	%	+1 if < 10% -1 if > 10%		
849-A-2-Va	0	5.7E-07	1	7	1	3	1	3	Immobile
850-A-2-Vb	0	1.5E-06	-1	11	0	6	1	0	Immobile
851-A-3-Va	0	2.0E-07	1	15	0	1	1	2	Immobile
852-A-2-Va	0	8.6E-07	1	7	1	5	1	3	Immobile
855-A-2-Vb	0	8.1E-07	1	17	0	4	1	2	Immobile
856-A-2-Va	0	9.6E-07	1	7	1	4	1	3	Immobile

General Notes:

1. NAPL = non-aqueous phase liquid
2. cm/s = centimeter per second

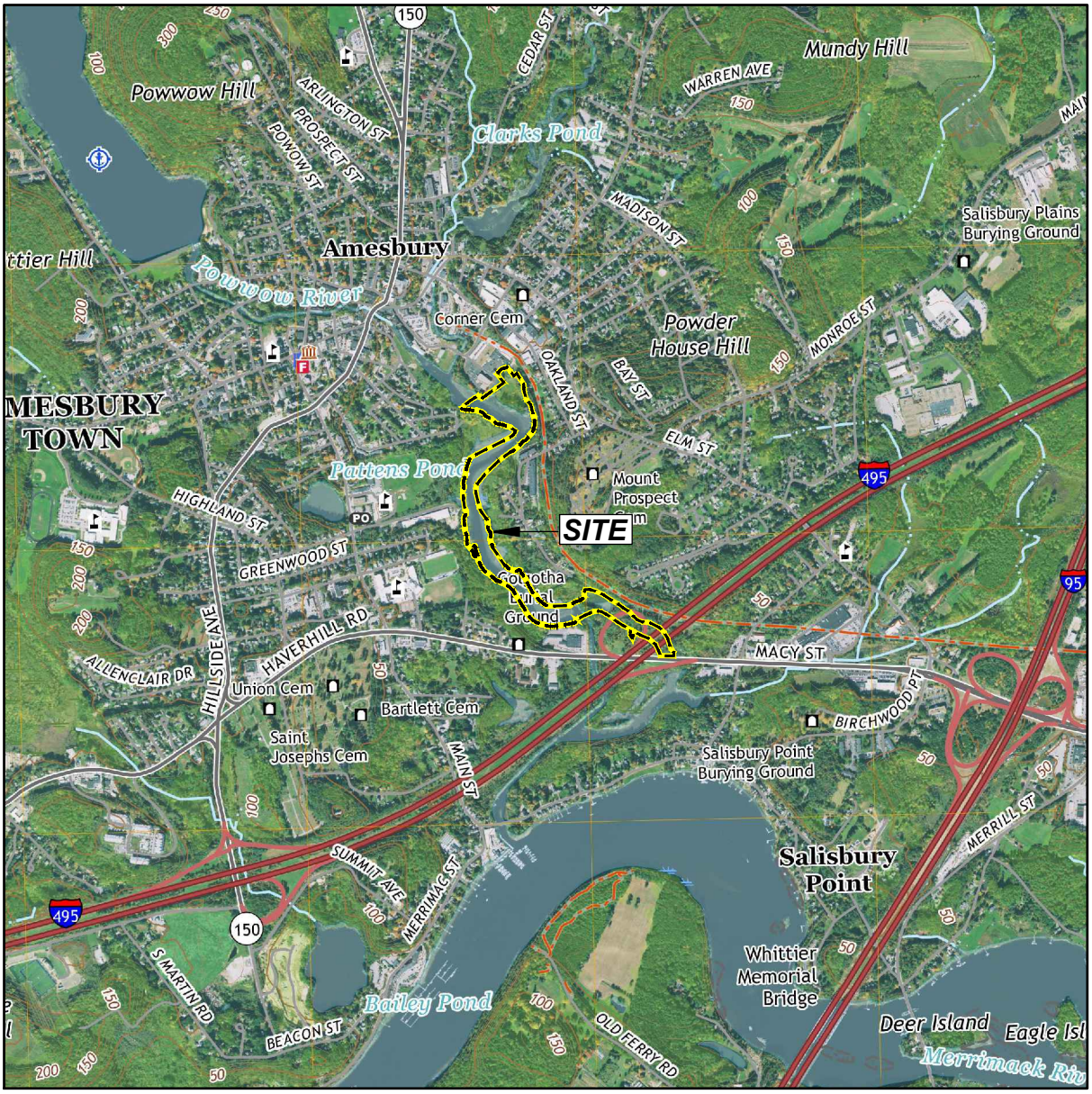
Figures

Figure 1. Site Location Map

Figure 2. River Sampling Locations

Figure 3. Extent of NAPL in River

Figure 4. Advective NAPL Movement Evaluation Flowchart



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SCALE, FEET

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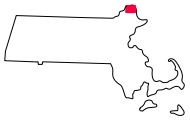
Newburyport West, MA-NH Quadrangle, 2021.
Datum is North American Vertical Datum of 1988 (NAVD88).
Contour Interval is 10 Feet.



MASSACHUSETTS
QUADRANGLE LOCATION

NAPL Movement in Sediment Investigation & Evaluation Amesbury Former MGP Site Amesbury, Massachusetts	GEI Consultants	SITE LOCATION MAP
Boston Gas Company d|b|a National Grid Waltham, Massachusetts	Project 1804576	October 2025 Fig. 1

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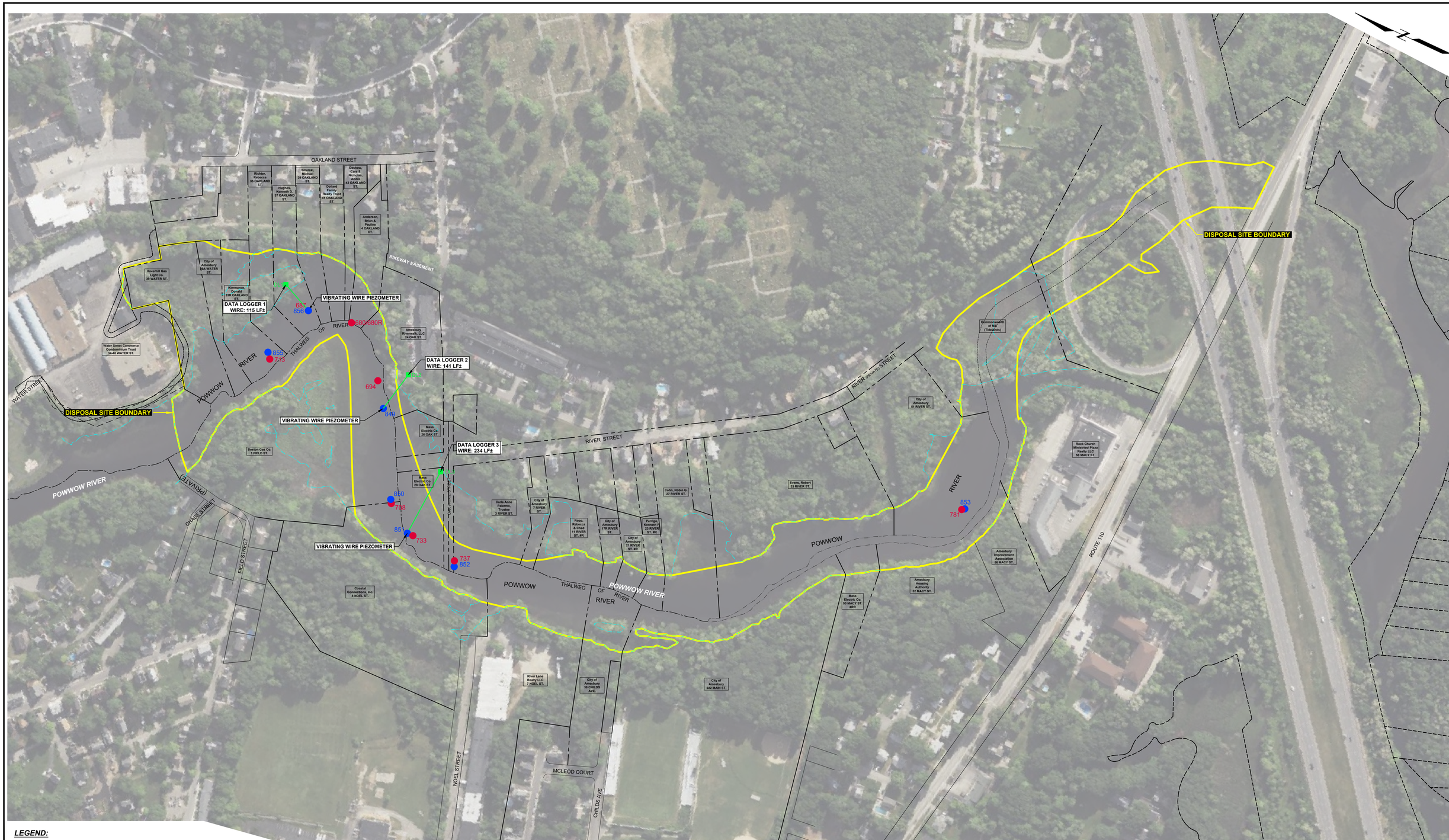

LEGEND:

- SEDIMENT CORE NAPL MOVEMENT INVESTIGATION
- REPRESENTATIVE HISTORICAL SEDIMENT CORE

NOTES:

1. MICROSOFT BING IMAGE 2021.
2. PARCEL BOUNDARIES THALWEG OF RIVER, AND MEAN HIGH WATER PROVIDED BY HAYNER/SWANSON, 2025.

0 150 300
Approximate Scale, Feet

NAPL Movement in Sediment Investigation & Evaluation Amesbury Former MGP Site Amesbury, Massachusetts	GEI Consultants	RIVER SAMPLING LOCATIONS
Boston Gas Company d|b|a National Grid Waltham, Massachusetts	Project 1804576	October 2025 Fig. 2

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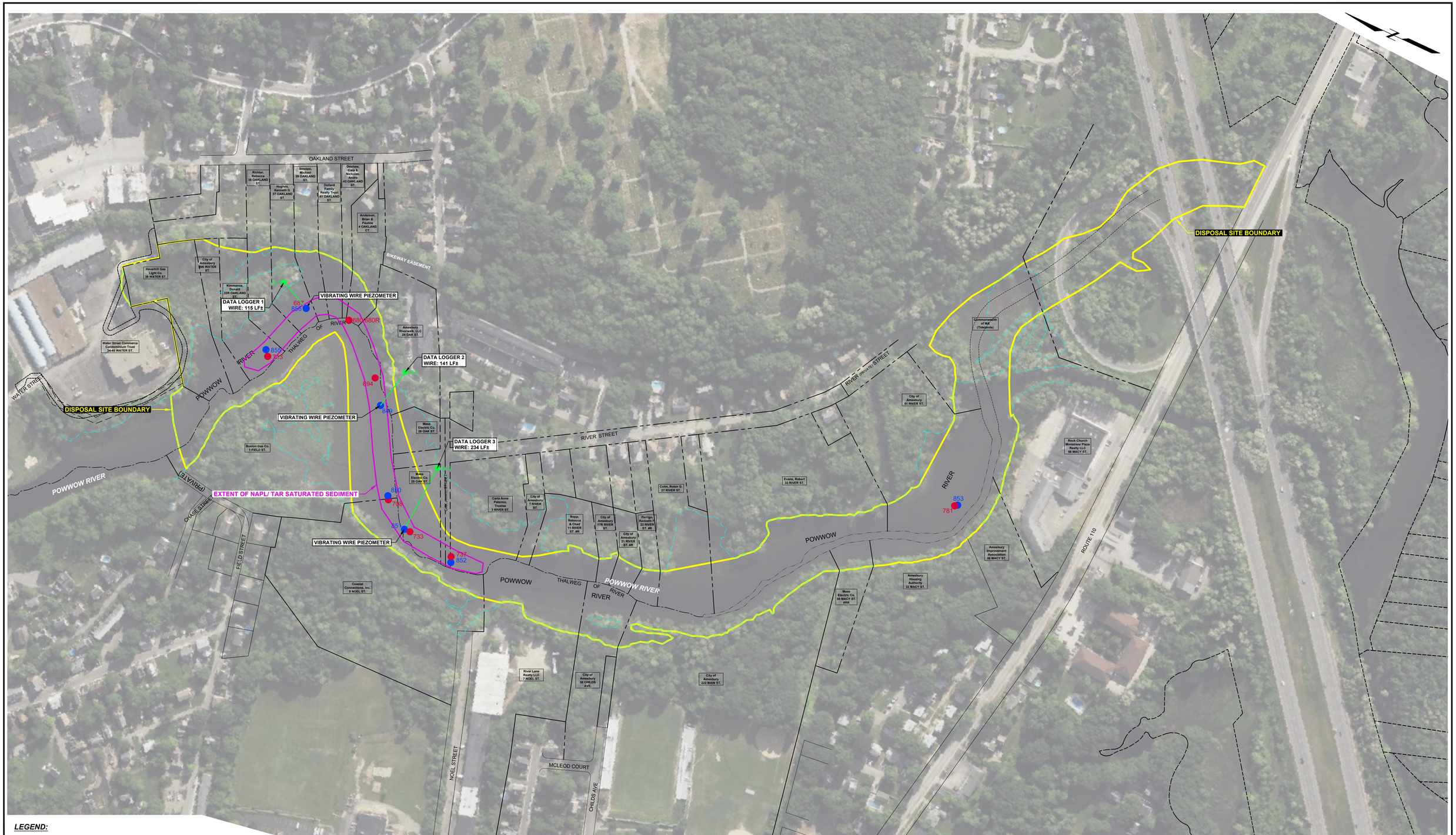


LEGEND:

- SEDIMENT CORE NAPL MOVEMENT INVESTIGATION
- REPRESENTATIVE HISTORICAL SEDIMENT CORE

NOTES:

1. MICROSOFT BING IMAGE 2021.
2. PARCEL BOUNDARIES THALWEG OF RIVER, AND MEAN HIGH WATER PROVIDED BY HAYNER/SWANSON, 2025.

0 150 300
Approximate Scale, Feet

NAPL Movement in Sediment Investigation & Evaluation
Amesbury Former MGP Site
Amesbury, Massachusetts

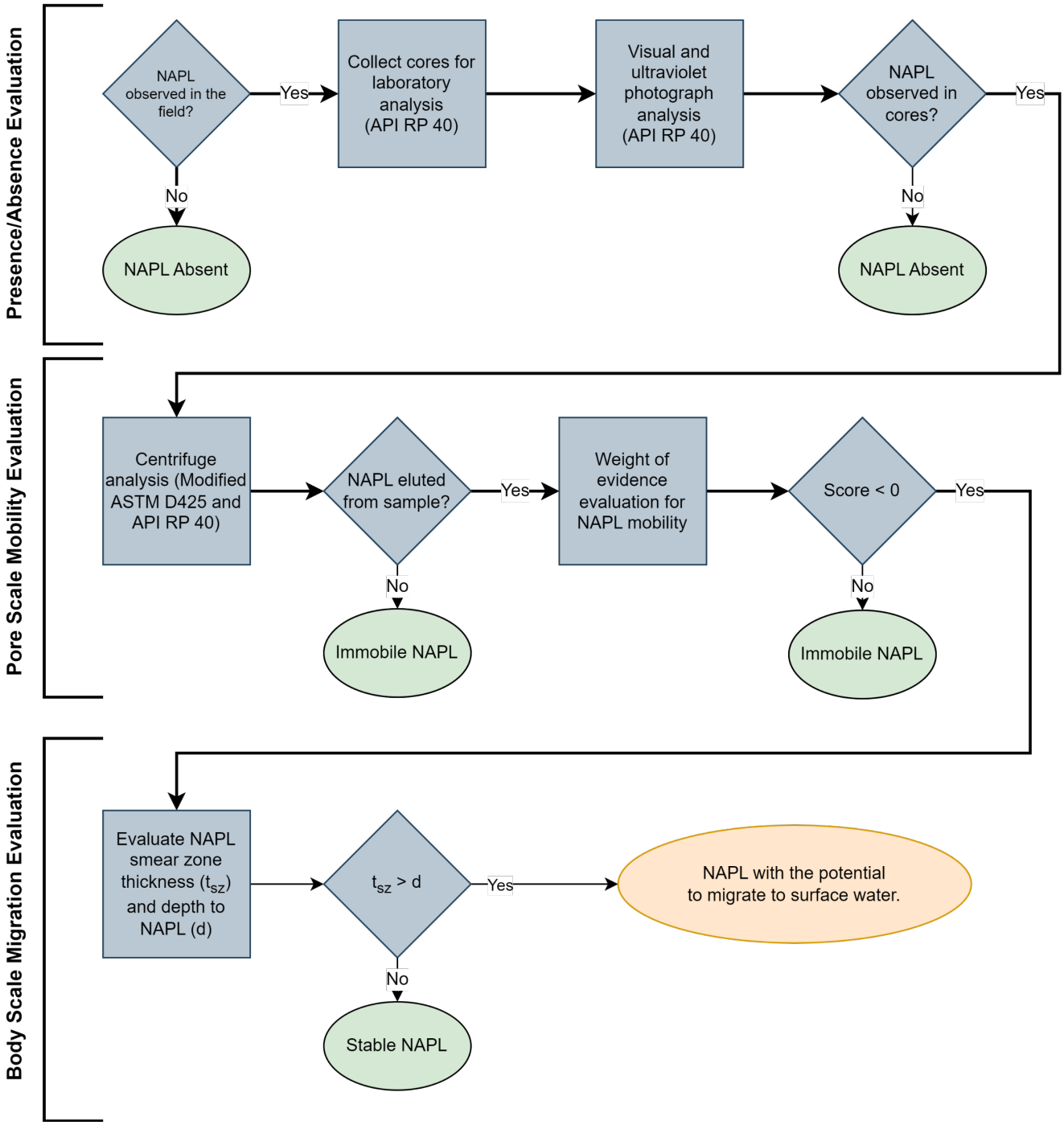
Boston Gas Company d|b|a National Grid
Waltham, Massachusetts

GEI Consultants

EXTENT OF NAPL IN RIVER

Project 1804576 | October 2025 | Fig. 3

---- B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\NAPL Movement\1804576-02.dwg - 9/16/2025



NAPL Movement in Sediment Evaluation Amesbury Former MGP Site Amesbury, Massachusetts	GEI Consultants	**Advective NAPL Movement Evaluation Flowchart**
Boston Gas Company d/b/a National Grid Waltham, Massachusetts	Project 1804576	October 2025 Fig. 4

Appendix A Recommended Core Labeling, Handling, and Field Preservation Methods

Petroleum Services Division
3437 Landco Dr.
Bakersfield, California 93308
Tel: 661-325-5657
Fax: 661-325-5808
www.corelab.com

Recommended Core Handling and Field Preservation Methods for Contaminated Shallow Subsurface Investigations

Introduction

Core size, recovery and preservation are all critical for any successful laboratory analyses of shallow, unconsolidated subsurface core. Actual coring methods are beyond the scope of these recommendations and will be best addressed by the consultant, site conditions and coring company.

It is imperative that the field team understand that the goal of the coring program is to obtain representative, undisturbed cores that will be preserved and sent to the laboratory for analyses. Whenever possible the largest practical diameter core will yield the most representative results. For laboratory programs involving core imaging and advanced analyses a 3" diameter (Shelby tube) core is recommended. Contact your local Core Laboratories Project Manager for core size recommendations. Total core length is driven by the interval of investigation. Individual core length is determined by the sampling equipment, shipping containers and lab capabilities. For practical purposes 2½ - 3' sections will fit in large marine (160qt) coolers that can be shipped by FedEx and handled in the lab.

Basic Procedure

1. Rapidly bring core to the surface, immediately place horizontal and remove from the drill string.
2. Remove core from the sampler.
   a. If the core is in sleeves, cut off any void space or fill tightly with Saran wrap to help minimize core movement during transport. Tape plastic end caps on each end.
   b. If core is not in sleeves, slide core from sampler on to split PVC supports (contact Core Laboratories for details) and wrap with Saran wrap and seal using clear box tape.
3. Label each core section with top and bottom depths to the nearest 0.01ft.
   a. When facing the core, left will be "Top" and right "Bottom". Be consistent for the project.
   b. Label the end caps with "Top" and "Bottom".
   c. If there are multiple sleeves label sequentially using A, B, C … etc starting with A on the top (shallowest) sleeve.
4. Immediately place cores in a cooler containing dry ice and freeze to minimize core pore fluid migration and/or volatization.
   a. Do not place acetate sleeves in direct contact with dry ice. They will fracture over time. Use "bubble wrap", foam packing, newspaper etc for insulation.
5. Fill out COC completely and place in Ziploc bag taped to the inside of the cooler lid.
6. Ship cores at the end of the day by FedEx for next day delivery to Core Laboratories.
   a. For Saturday delivery ship priority overnight and contact Core Laboratories so personnel will be available for receipt. Overtime charges may apply.
   b. If cores are held over the weekend make sure sufficient dry ice is placed in each cooler.
   c. For previously frozen core approximately 20 pounds of dry will be required per day per cooler.

Contact your Core Laboratories Representative with any questions.

CLB Listed NYSE

Shipper's Declaration not Required.

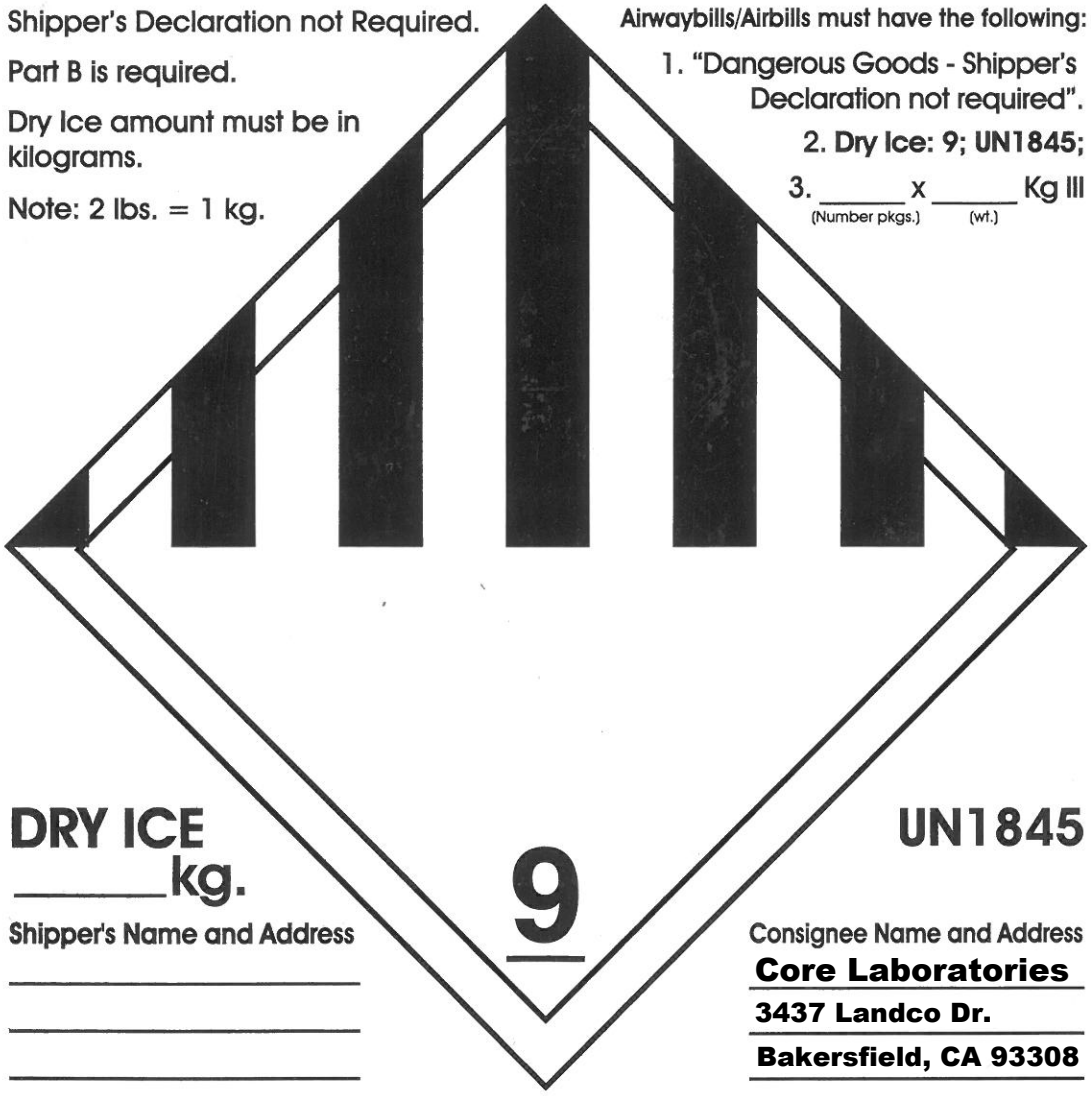
Part B is required.

Dry Ice amount must be in kilograms.

Note: 2 lbs. = 1 kg.

Airwaybills/Airbills must have the following:

1. "Dangerous Goods - Shipper's Declaration not required".
2. **Dry Ice: 9; UN1845;**
3. _____ x _____ Kg III
   (Number pkgs.) (wt.)



DRY ICE

_____**kg.**

9

UN1845

Shipper's Name and Address

_____

_____

_____

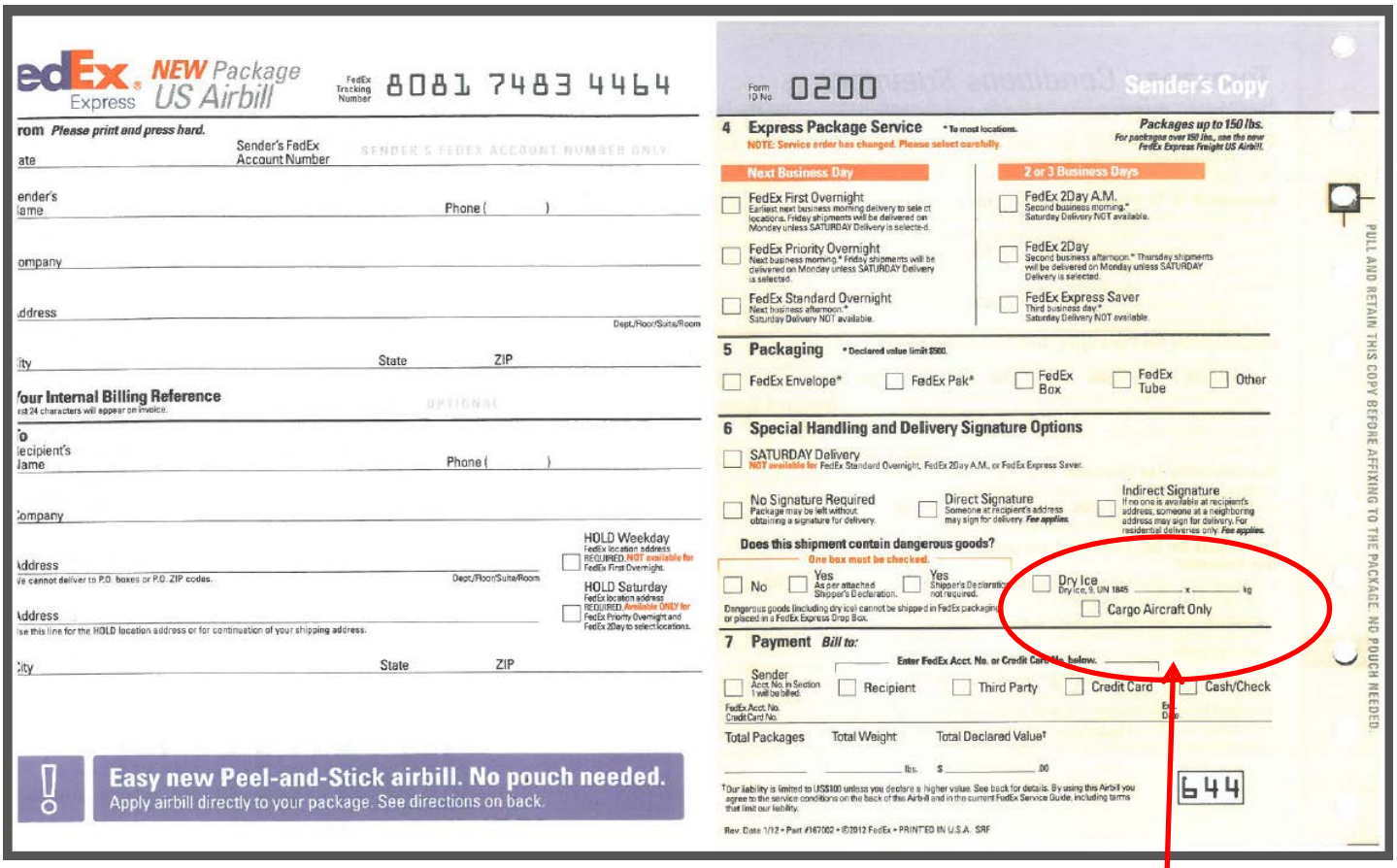
Consignee Name and Address

Core Laboratories

3437 Landco Dr.

Bakersfield, CA 93308

S-2844 **ULINE** 1-800-295-5510



FedEx NEW Package Express US Airbill

FedEx Tracking Number 8081 7483 4464

Form ID No. 0200 Sender's Copy

From Please print and press hard.

Date

Sender's FedEx Account Number

Sender's Name

Phone ( )

Company

Address

Dept./Floor/Suite/Room

City State ZIP

Your Internal Billing Reference

To Recipient's Name

Phone ( )

Company

Address

We cannot deliver to P.O. boxes or P.O. ZIP codes.

Dept./Floor/Suite/Room

HOLD Weekday

HOLD Saturday

Address

City State ZIP

Easy new Peel-and-Stick airbill. No pouch needed.
Apply airbill directly to your package. See directions on back.

4 Express Package Service

Packages up to 150 lbs.

Next Business Day

FedEx First Overnight

FedEx Priority Overnight

FedEx Standard Overnight

2 or 3 Business Days

FedEx 2Day A.M.

FedEx 2Day

FedEx Express Saver

5 Packaging

FedEx Envelope* FedEx Pak* FedEx Box FedEx Tube Other

6 Special Handling and Delivery Signature Options

SATURDAY Delivery

No Signature Required

Direct Signature

Indirect Signature

Does this shipment contain dangerous goods?

No Yes Yes Dry Ice Cargo Aircraft Only

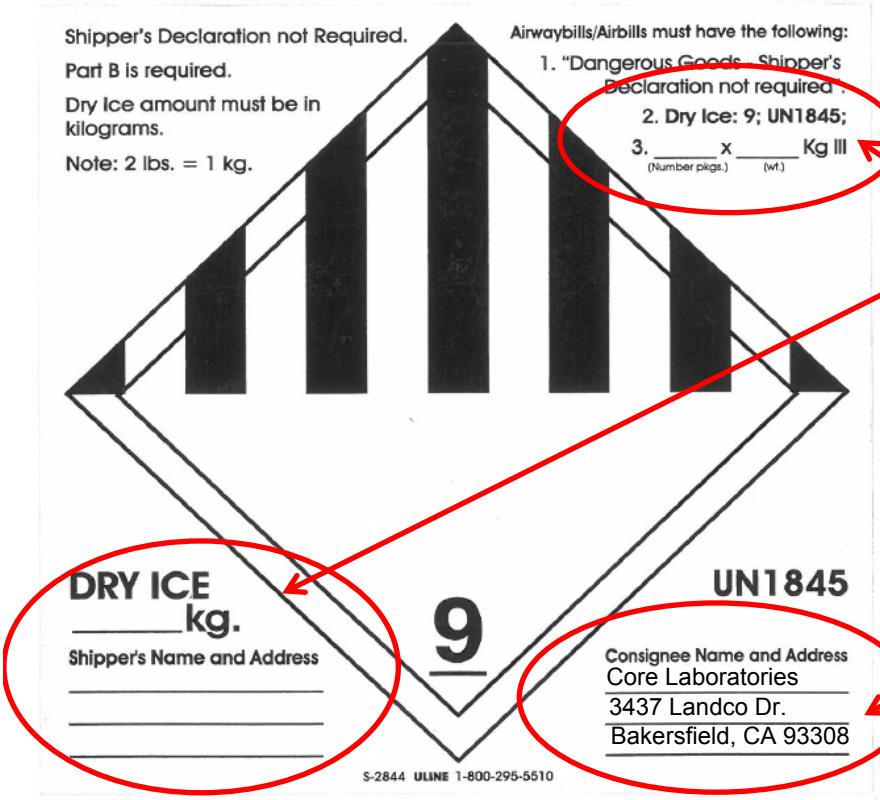
7 Payment Bill to:

Sender Recipient Third Party Credit Card Cash/Check

Total Packages Total Weight Total Declared Value

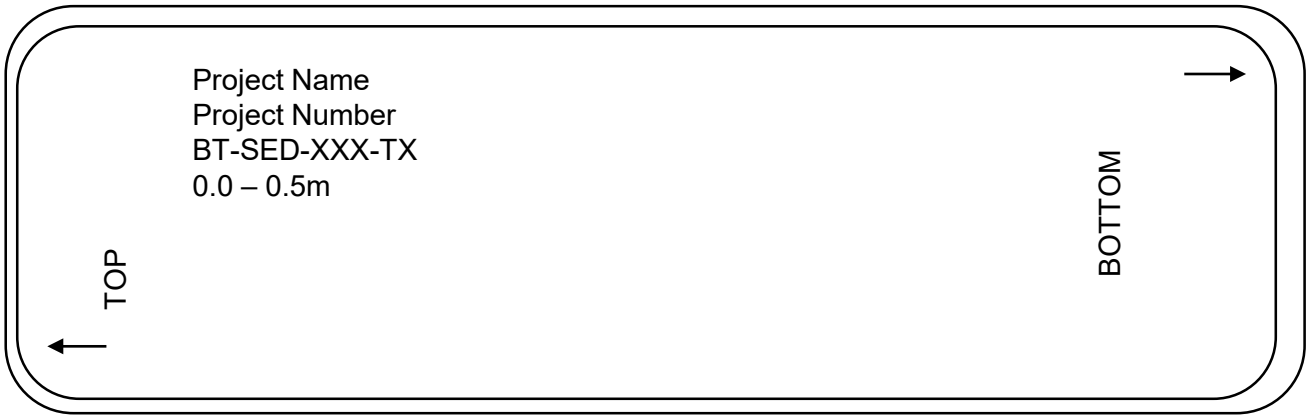
644

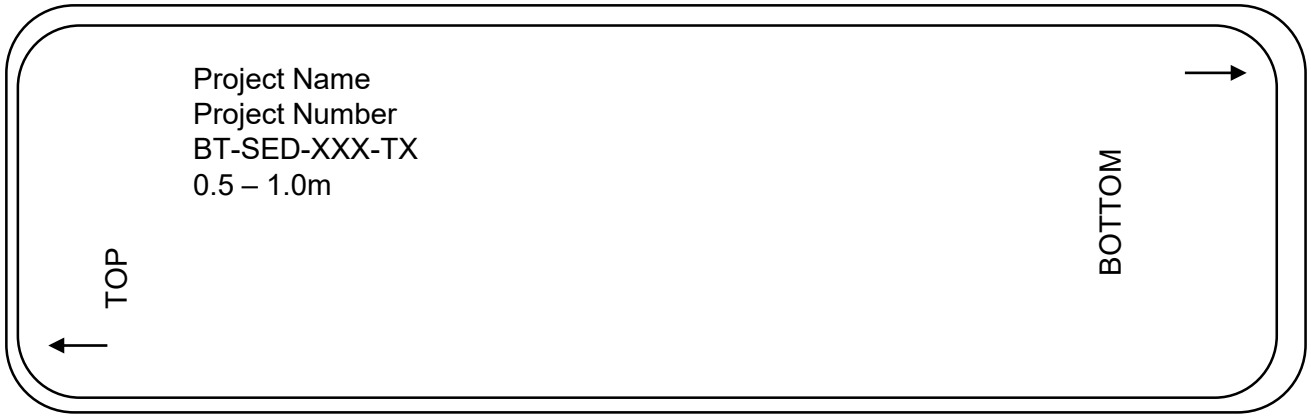
PULL AND RETAIN THIS COPY BEFORE AFFIXING TO THE PACKAGE. NO POUCH NEEDED.



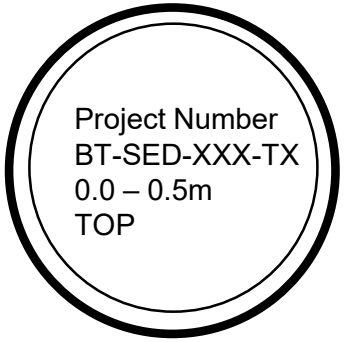
Declarations for Dry Ice

Core Laboratories address





Core sideview



Cores will be cut into 0.5 meter lengths. Void spaces will be filled with plastic wrap or bentonite to minimize disturbance of the sample during processing and shipping.

Samples will then be capped and frozen in accordance with Core Lab's SOP: *Core Handling and Field Preservation.*

NAPL Movement in Sediment Evaluation Florida Avenue Former Manufactured Gas Plant Site Atlantic City, New Jersey	GEI Consultants	**Core Samples Labeling Information and Format**
South Jersey Gas Folsom, New Jersey	Project 2002835	July 2020 Figure C1

\\geiconsultants.com\data\Data_Storage\Working\SOUTH JERSEY GAS\1701542 Florida Avenue MGP_2.6 Pre-Design Investigation\Sediment NAPL Mobility\Comprehensive Report\Appendices\Appendix C - Core Handling

Appendix B Piezometer Installation Diagrams

MULTI-LEVEL PIEZOMETER INSTALLATION DIAGRAM

Boring No. 849

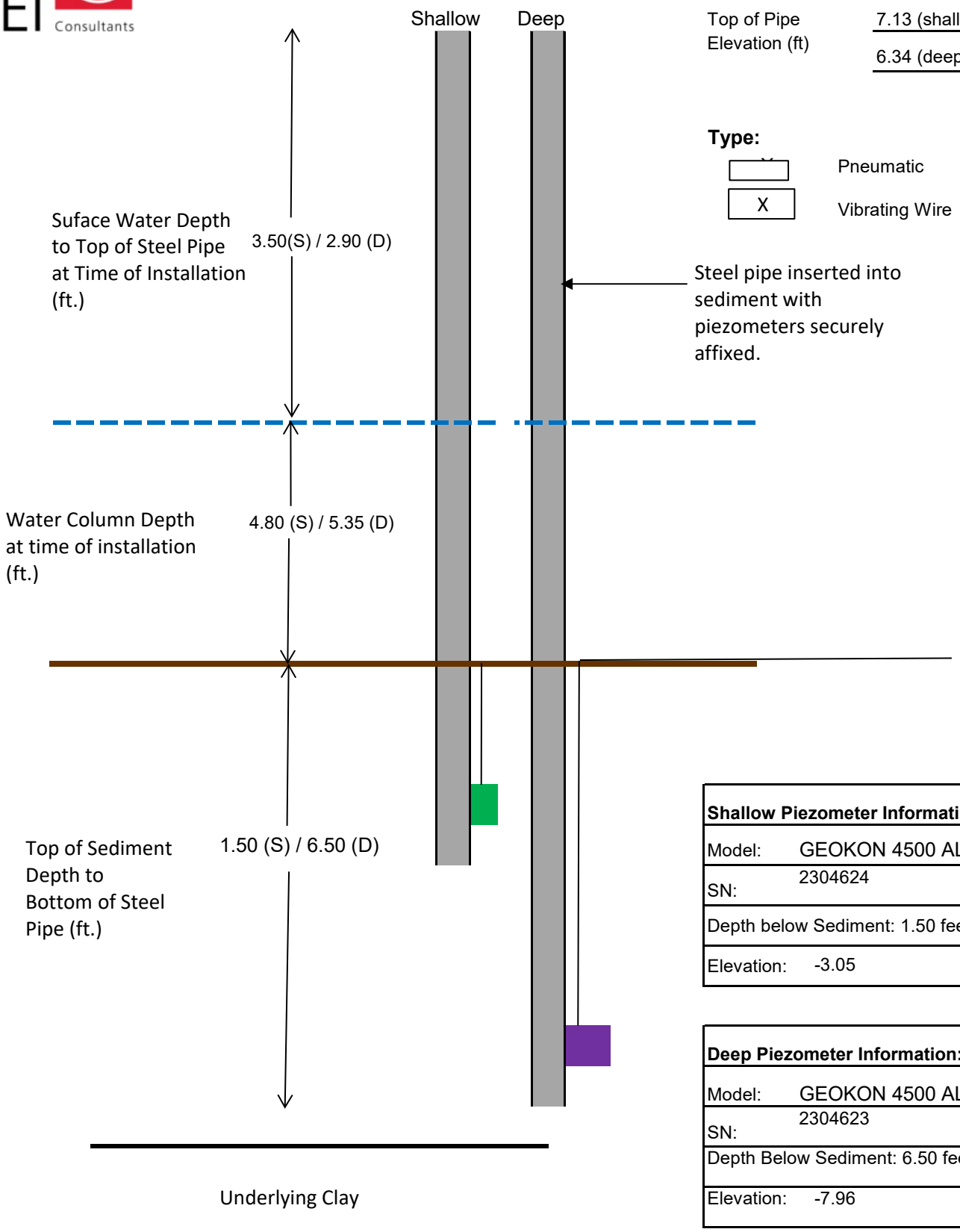
Project	Amesbury Former Manufactured Gas Plant	**GEI Proj. No.**	1804576
City / Town	Amesbury, Massachusetts	**Location**	Powwow River
Client	National Grid	Northing	3136482.06
Contractor	TG&B	Easting:	810334.48
Driller	Ben Avakian **Rig** Vibracore	**Date**	8/16/23

GEI Consultants

Installed in:
Affixed to steel pipe inserted into sediment

Top of Pipe Elevation (ft): 7.13 (shallow) NAVD88; 6.34 (deep) NAVD88

Type:
[ ] Pneumatic
[X] Vibrating Wire



Shallow Piezometer Information:	
Model:	GEOKON 4500 AL
SN:	2304624
Depth below Sediment: 1.50 feet	
Elevation:	-3.05

Deep Piezometer Information:	
Model:	GEOKON 4500 AL
SN:	2304623
Depth Below Sediment: 6.50 feet	
Elevation:	-7.96

MULTI-LEVEL PIEZOMETER INSTALLATION DIAGRAM

Boring No. 851

Project	Amesbury Former Manufactured Gas Plant	**GEI Proj. No.**	1804576
City / Town	Amesbury, Massachusetts	**Location**	Powwow River
Client	National Grid	Northing	3136229.19
Contractor	TG&B	Easting:	809995.32
Driller	Ben Avakian **Rig** Vibracore	**Date**	8/29/23

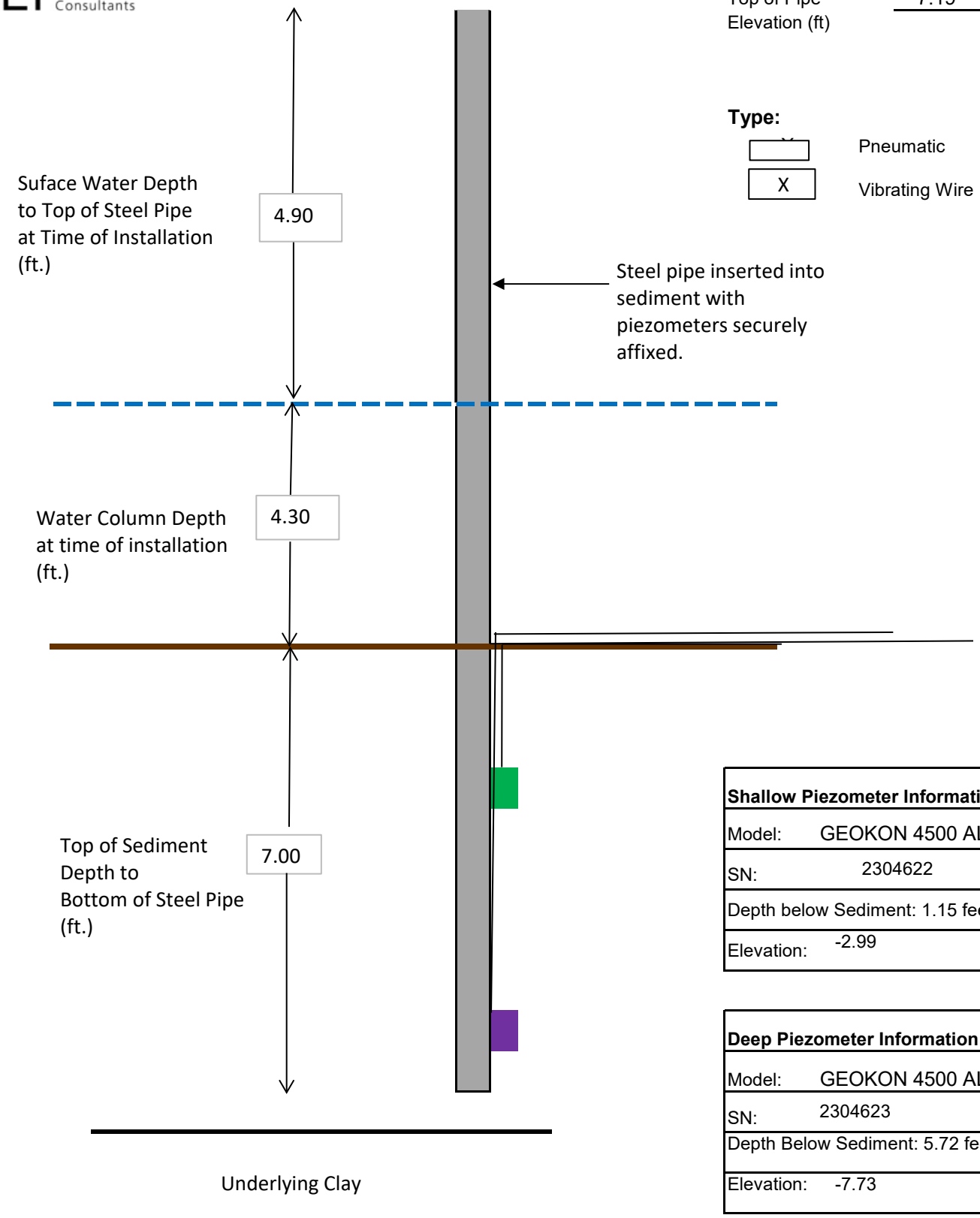
GEI Consultants

Installed in:
Affixed to steel pipe inserted into sediment

Top of Pipe Elevation (ft): 7.19 NAVD88

Type:

	Pneumatic
X	Vibrating Wire



Shallow Piezometer Information:

Model:	GEOKON 4500 AL
SN:	2304622
Depth below Sediment:	1.15 feet
Elevation:	-2.99

Deep Piezometer Information:

Model:	GEOKON 4500 AL
SN:	2304623
Depth Below Sediment:	5.72 feet
Elevation:	-7.73

MULTI-LEVEL PIEZOMETER INSTALLATION DIAGRAM

Boring No. 856

Project	Amesbury Former Manufactured Gas Plant	**GEI Proj. No.**	1804576
City / Town	Amesbury, Massachusetts	**Location**	Powwow River
Client	National Grid		Northing: 3136837.76
Contractor	TG&B		Easting: 810520.035
Driller	Ben Avakian **Rig** Vibracore	**Date**	8/31/23

GEI Consultants

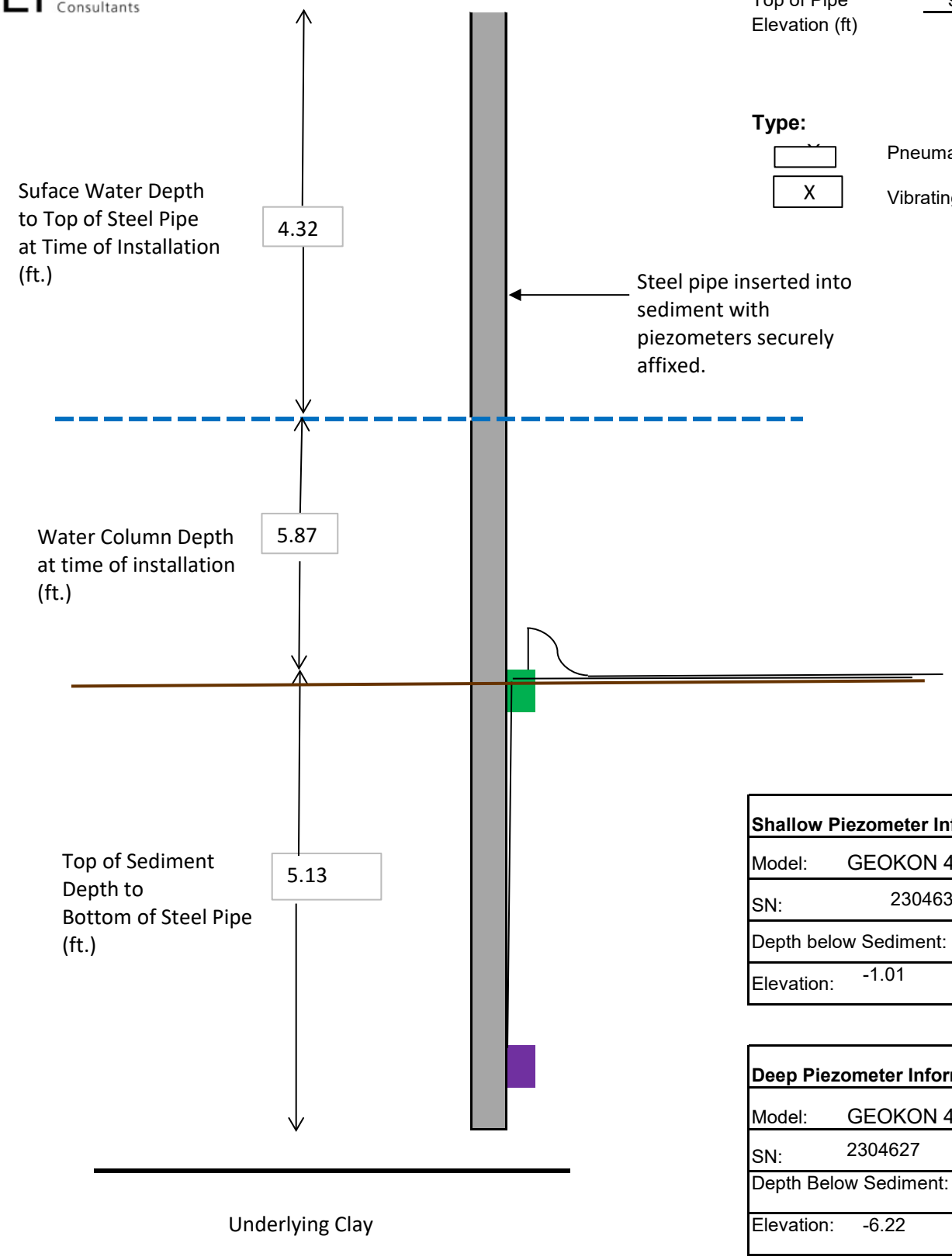
Installed in:
Affixed to steel pipe inserted into sediment

Top of Pipe Elevation (ft) 9.10 NAVD88

Type:

[ ] Pneumatic

[X] Vibrating Wire



Shallow Piezometer Information:

Model:	GEOKON 4500 AL
SN:	2304638
Depth below Sediment:	-0.08
Elevation:	-1.01

Deep Piezometer Information:

Model:	GEOKON 4500 AL
SN:	2304627
Depth Below Sediment:	5.13 feet
Elevation:	-6.22

Appendix C Photographic Log

Amesbury Former MGP - Photo Log
Dates: August 16, 2023 – August 31, 2023
Project No.: 1804576
Client: National Grid



Photo No. 1: (8/16/2023) Piezometer attached to steel pipe



Photo No. 2: (8/29/2023) Steel pipes with attached piezometers.

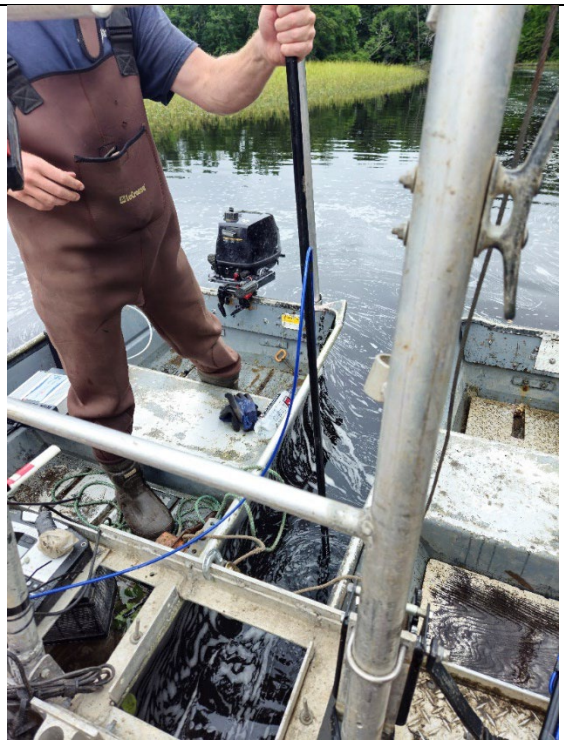


Photo No. 3: (8/29/2023) Piezometer installation.



Photo No. 4: (8/29/2023) Cable deployment.

Appendix D COCs and Lab Data

Free Product Mobility Summary

Centrifugal Method - Air displacing free product

(Methodology: ASTM D425M, API RP 40)

Petroleum Services

GEI Consultants Inc.

Project Name: Amesbury MGP

Project No: N/A

Core Lab File No: 202304481

Sample ID.	Depth ft.	Sample Orientation (1)	Density		Porosity	Initial Fluid Saturations(4)		Applied Force(6)	Applied Force(7)	Final Fluid Saturations (4)	
			Bulk (Dry) g/cc	Grain g/cc	Total (2) %Vb (3)	Water %PV(5)	Oil %PV(5)	G	Pc psi	Water %PV(5)	Oil %PV(5)
849-A-2-Va	3.78-3.98	N/A	1.51	2.52	40.0	75.6	7.26	100	3.13	32.9	4.25
850-A-2-Vb	4.45-4.65	N/A	1.03	2.44	57.6	81.4	10.9	100	3.69	56.6	4.49
851-A-3-Va	3.80-4.00	N/A	0.64	2.03	68.6	80.3	14.6	100	6.15	41.0	13.4
852-A-2-Va	3.55-3.75	N/A	0.93	2.54	63.2	88.7	6.85	100	4.89	49.2	2.32
855-A-2-Vb	4.10-4.30	N/A	0.93	2.34	60.0	74.1	16.8	100	4.00	34.0	13.1
856-A-2-Va	4.55-4.75	N/A	0.82	2.46	66.7	89.1	7.04	100	3.91	48.2	3.22

(1) H = horizontal, V = vertical

(2) Total Porosity = no pore fluids in place; all interconnected pore channels.

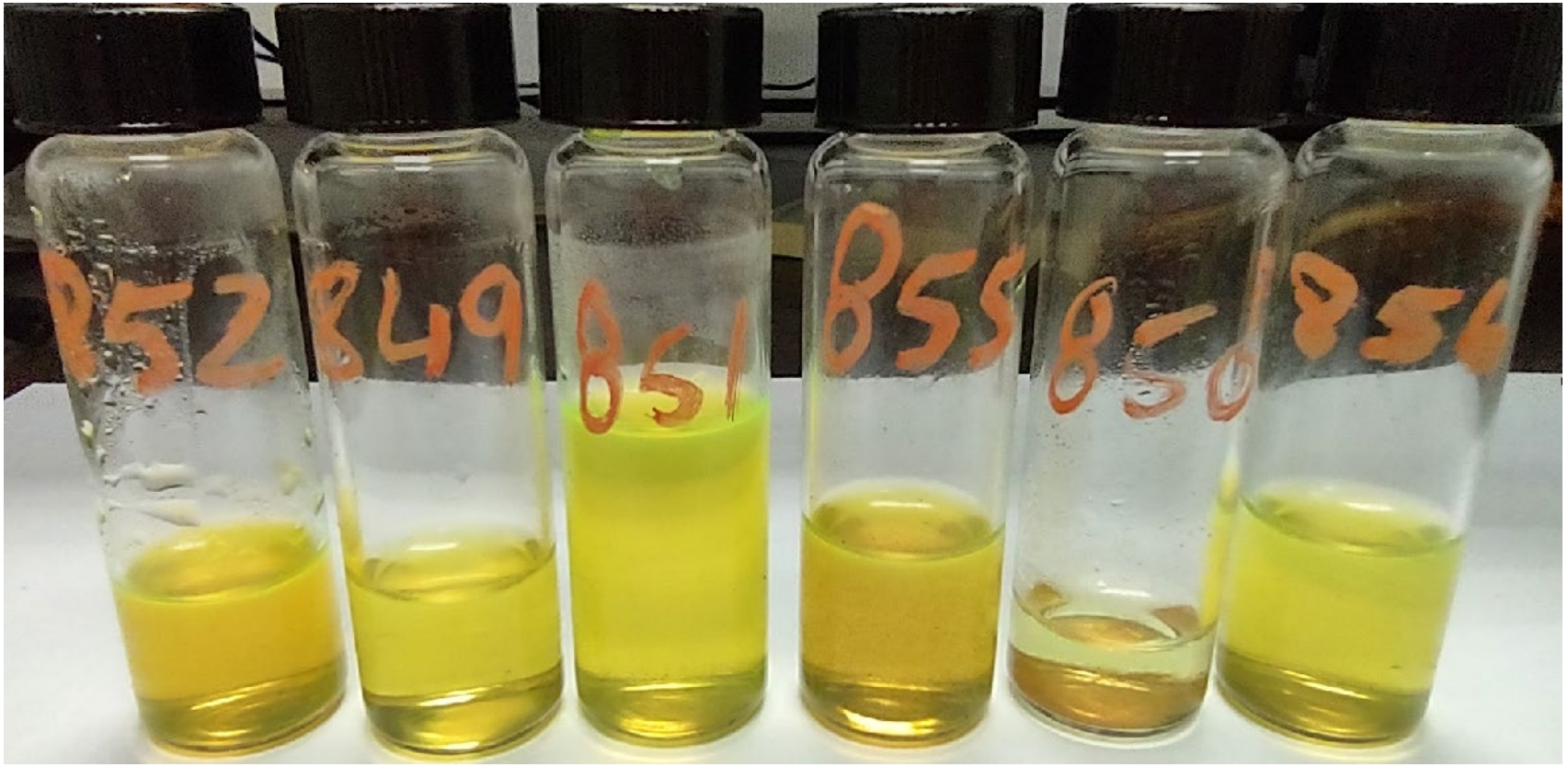
(3) Vb = Bulk Volume, cc.

(4) Assumed Oil density = 1.140 g/cc. Water density = 1.000 g/cc

(5) Pv = Pore Volume, cc.

(6) Force applied for one hour.

(7) Applied Force PSI, using ΔDens = Water 1.00g/cc - Air 0.0012g/cc


852
849
851
855
850
854

CHAIN OF CUSTODY RECORD

Company	GEI Consultants Inc
Address	400 Unicorn Park Drive Woburn, Massachusetts, 01801
Project Manager	Tom Daigle
Phone	(339) 221-3499
Project Name	Amesbury MGP
Fax	
Project No.	1804576
Email	tdaigle@geiconsultants.com
Site Location	Amesbury, Massachusetts
Sampler Signature	

PO# 1804576

Turnaround Time

24 HR	
48 HR	
72 HR	
5 Day	
Normal	X

CL Bid No.

CL File No.

ANALYSIS REQUEST

Sample ID	Date	Time	Depth, ft.	Number of Samples	PREP: Core Slabbing	PREP: Digital Core Imaging	PREP: Individual Plug Cutting	Groups: Vapor Transport / Intrusion Group	Groups: Mobility Group - Water Drive Method	Particle Size (sieve + laser)	Laser Particle Size	Fractional Organic Carbon	Bulk Density	Total Porosity w/saturations	Effecftive Porosity	Native State Air Permeability	Intrinsic State Air Permeability	Water Permeability/Hydraulic Conductivity	Permeability to DNAPL	Viscosity (3 temperatures)	Viscosity; Single point at ambient	Interfacial Tension	PHOTO WHITE + UV	Other:	HOLD PRESERVED PENDING ANALYSIS	Comments
1804576-849-A-1	08/16/23	1430	0-2.6	1																			X		X	
1804576-849-A-2	08/16/23	1431	2.6-5.1	1																			X		X	
1804576-849-A-3	08/16/23	1432	5.1-6.9	1																			X		X	
1804576-849-B-1	08/16/23	1433	0-2.1	1																					X	HOLD FROZEN
1804576-849-B-2	08/16/23	1434	2.1-5.1	1																					X	HOLD FROZEN
1804576-849-B-3	08/16/23	1435	5.1-7.1	1																					X	HOLD FROZEN

1. Relinquished By:	2. Received By:	2. Relinquished By:	2. Received By:
Company Core Lab	Company	Company	Company
Date Time	Date Time	Date Time	Date Time

CHAIN OF CUSTODY RECORD

Company	GEI Consultants Inc
Address	400 Unicorn Park Drive Woburn, Massachusetts, 01801
Project Manager	Tom Daigle
Phone	(339) 221-3499
Project Name	Amesbury MGP
Fax	
Project No.	1804576
Email	tdaigle@geiconsultants.com
Site Location	Amesbury, Massachusetts
Sampler Signature	

PO# 1804576

Turnaround Time

24 HR	
48 HR	
72 HR	
5 Day	
Normal	X

CL Bid No.

CL File No.

ANALYSIS REQUEST

Sample ID	Date	Time	Depth, ft.	Number of Samples	PREP: Core Slabbing	PREP: Digital Core Imaging	PREP: Individual Plug Cutting	Groups: Vapor Transport / Intrusion Group	Groups: Mobility Group - Water Drive Method	Particle Size (sieve + laser)	Laser Particle Size	Fractional Organic Carbon	Bulk Density	Total Porosity w/saturations	Effecftive Porosity	Native State Air Permeability	Intrinsic State Air Permeability	Water Permeability/Hydraulic Conductivity	Permeability to DNAPL	Viscosity (3 temperatures)	Viscosity; Single point at ambient	Interfacial Tension	PHOTO WHITE + UV	Other:	HOLD PRESERVED PENDING ANALYSIS	Comments
1804576-850-A-1	08/17/23	1430	0-3	1																			X		X	
1804576-850-A-2	08/17/23	1431	3-6	1																			X		X	
1804576-850-A-3	08/17/23	1432	6-8.2	1																			X		X	
1804576-850-B-1	08/17/23	1433	0-3	1																					X	HOLD FROZEN
1804576-850-B-2	08/17/23	1434	3-6	1																					X	HOLD FROZEN
1804576-850-B-3	08/17/23	1435	6-8.5	1																					X	HOLD FROZEN

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Company Core Lab	Company	Company	Company
Date Time	Date Time	Date Time	Date Time

CHAIN OF CUSTODY RECORD

Company	GEI Consultants Inc
Address	400 Unicorn Park Drive Woburn, Massachusetts, 01801
Project Manager	Tom Daigle
Phone	+1 (303) 264-1090
Project Name	Amesbury MGP
Fax	
Project No.	1804576
Email	tdaigle@geiconsultants.com
Site Location	Amesbury, Massachusetts
Sampler Signature	

PO# 1804576

Turnaround Time

24 HR	
48 HR	
72 HR	
5 Day	
Normal	X

CL Bid No.

CL File No.

ANALYSIS REQUEST

Sample ID	Date	Time	Depth, ft.	Number of Samples	PREP: Core Slabbing	PREP: Digital Core Imaging	PREP: Individual Plug Cutting	Groups: Vapor Transport / Intrusion Group	Groups: Mobility Group - Water Drive Method	Particle Size (sieve + laser)	Laser Particle Size	Fractional Organic Carbon	Bulk Density	Total Porosity w/saturations	Effecftive Porosity	Native State Air Permeability	Intrinsic State Air Permeability	Water Permeability/Hydraulic Conductivity	Permeability to DNAPL	Viscosity (3 temperatures)	Viscosity; Single point at ambient	Interfacial Tension	PHOTO WHITE + UV	Other:	HOLD PRESERVED PENDING ANALYSIS	Comments
1804576-851-A-1	08/29/23	1430	0-1.5	1																			X		X	
1804576-851-A-2	08/29/23	1435	1.5-3.5	1																			X		X	
1804576-851-A-3	08/29/23	1440	3.5-6.5	1																			X		X	
1804576-851-A-4	08/29/23	1450	6.5-8.9	1																			X		X	
1804576-851-B-1	08/29/23	1455	0-3.2	1																					X	HOLD FROZEN
1804576-851-B-2	08/29/23	1500	3.2-6.3	1																					X	HOLD FROZEN
1804576-851-B-3	08/29/23	1506	6.3-8.6	1																					X	HOLD FROZEN

1. Relinquished By:	2. Received By:	2. Relinquished By:	2. Received By:
Company Core Lab	Company	Company	Company
Date Time	Date Time	Date Time	Date Time

CHAIN OF CUSTODY RECORD

Company
GEI Consultants Inc

Address
400 Unicorn Park Drive
Woburn, Massachusetts, 01801

Project Manager | **Phone**
Tom Daigle | +1 (303) 264-1090

Project Name | **Fax**
Amesbury MGP

Project No. | **Email**
1804576 | tdaigle@geiconsultants.com

Site Location
Amesbury, Massachusetts

Sampler Signature

ANALYSIS REQUEST

PO# 1804576

Turnaround Time
24 HR
48 HR
72 HR
5 Day
Normal X

CL Bid No.

CL File No.

Sample ID	Date	Time	Depth, ft.	Number of Samples	PREP: Core Slabbing	PREP: Digital Core Imaging	PREP: Individual Plug Cutting	Groups: Vapor Transport / Intrusion Group	Groups: Mobility Group - Water Drive Method	Particle Size (sieve + laser)	Laser Particle Size	Fractional Organic Carbon	Bulk Density	Total Porosity w/saturations	Effecftive Porosity	Native State Air Permeability	Intrinsic State Air Permeability	Water Permeability/Hydraulic Conductivity	Permeability to DNAPL	Viscosity (3 temperatures)	Viscosity; Single point at ambient	Interfacial Tension	PHOTO WHITE + UV	Other:	HOLD PRESERVED PENDING ANALYSIS	Comments
1804576-852-A-1	08/29/23	1140	0-3	1																			X		X	
1804576-852-A-2	08/29/23	1145	3-6	1																			X		X	
1804576-852-A-3	08/29/23	1150	6-8.5	1																			X		X	
1804576-852-B-1	08/29/23	1155	0-3	1																					X	HOLD FROZEN
1804576-852-B-2	08/29/23	1200	3-6	1																					X	HOLD FROZEN
1804576-852-B-3	08/29/23	1205	3-9	1																					X	HOLD FROZEN

1. Relinquished By:	2. Received By:	2. Relinquished By:	2. Received By:
Company Core Lab	Company	Company	Company
Date Time	Date Time	Date Time	Date Time

CHAIN OF CUSTODY RECORD

Company
GEI Consultants Inc

Address
400 Unicorn Park Drive
Woburn, Massachusetts, 01801

Project Manager | **Phone**
Tom Daigle | (339) 221-3499

Project Name | **Fax**
Amesbury MGP

Project No. | **Email**
1804576 | tdaigle@geiconsultants.com

Site Location
Amesbury, Massachusetts

Sampler Signature

ANALYSIS REQUEST

PO# 1804576

Turnaround Time
24 HR [ ]
48 HR [ ]
72 HR [ ]
5 Day [ ]
Normal [X]

CL Bid No.

CL File No.

Sample ID	Date	Time	Depth, ft.	Number of Samples	PREP: Core Slabbing	PREP: Digital Core Imaging	PREP: Individual Plug Cutting	Groups: Vapor Transport / Intrusion Group	Groups: Mobility Group - Water Drive Method	Particle Size (sieve + laser)	Laser Particle Size	Fractional Organic Carbon	Bulk Density	Total Porosity w/saturations	Effecftive Porosity	Native State Air Permeability	Intrinsic State Air Permeability	Water Permeability/Hydraulic Conductivity	Permeability to DNAPL	Viscosity (3 temperatures)	Viscosity; Single point at ambient	Interfacial Tension	PHOTO WHITE + UV	Other:	HOLD PRESERVED PENDING ANALYSIS	Comments
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1804576-853-A-1-2	08/17/23	1420	2-3.5	1																			X		X	
1804576-853-A-2	08/17/23	1421	3.25-6.5	1																			X		X	
1804576-853-A-3	08/17/23	1422	6.5-9.5	1																			X		X	
1804576-853-B-1	08/17/23	1423	0-3.5	1																					X	HOLD FROZEN
1804576-853-B-2	08/17/23	1424	3.5-6.5	1																					X	HOLD FROZEN
1804576-853-B-3	08/17/23	1425	6.5-9.5	1																					X	HOLD FROZEN

1. Relinquished By:	2. Received By:	2. Relinquished By:	2. Received By:
Company Core Lab	Company	Company	Company
Date Time	Date Time	Date Time	Date Time

CHAIN OF CUSTODY RECORD

Company
GEI Consultants Inc

Address
400 Unicorn Park Drive
Woburn, Massachusetts, 01801

Project Manager | **Phone**
Tom Daigle | +1 (303) 264-1090

Project Name | **Fax**
Amesbury MGP

Project No. | **Email**
1804576 | tdaigle@geiconsultants.com

Site Location
Amesbury, Massachusetts

Sampler Signature

ANALYSIS REQUEST

PO# 1804576

Turnaround Time
24 HR
48 HR
72 HR
5 Day
Normal X

CL Bid No.

CL File No.

Sample ID	Date	Time	Depth, ft.	Number of Samples	PREP: Core Slabbing	PREP: Digital Core Imaging	PREP: Individual Plug Cutting	Groups: Vapor Transport / Intrusion Group	Groups: Mobility Group - Water Drive Method	Particle Size (sieve + laser)	Laser Particle Size	Fractional Organic Carbon	Bulk Density	Total Porosity w/saturations	Effecftive Porosity	Native State Air Permeability	Intrinsic State Air Permeability	Water Permeability/Hydraulic Conductivity	Permeability to DNAPL	Viscosity (3 temperatures)	Viscosity; Single point at ambient	Interfacial Tension	PHOTO WHITE + UV	Other:	HOLD PRESERVED PENDING ANALYSIS	Comments
1804576-855-A-1	08/31/23	945	0-3	1																			X		X	
1804576-855-A-2	08/31/23	946	3-6	1																			X		X	
1804576-855-A-3	08/31/23	947	6-8	1																			X		X	
1804576-855-B-1	08/31/23	1000	0-3	1																					X	HOLD FROZEN
1804576-855-B-2	08/31/23	1001	3-6	1																					X	HOLD FROZEN
1804576-855-B-3	08/31/23	1002	6-8.2	1																					X	HOLD FROZEN

1. Relinquished By:	2. Received By:	2. Relinquished By:	2. Received By:
Company Core Lab	Company	Company	Company
Date Time	Date Time	Date Time	Date Time

CHAIN OF CUSTODY RECORD

Company
GEI Consultants Inc

Address
400 Unicorn Park Drive
Woburn, Massachusetts, 01801

Project Manager | **Phone**
Tom Daigle | +1 (303) 264-1090

Project Name | **Fax**
Amesbury MGP

Project No. | **Email**
1804576 | tdaigle@geiconsultants.com

Site Location
Amesbury, Massachusetts

Sampler Signature

ANALYSIS REQUEST

PO# 1804576

Turnaround Time
24 HR [ ]
48 HR [ ]
72 HR [ ]
5 Day [ ]
Normal [X]

CL Bid No.

CL File No.

Sample ID	Date	Time	Depth, ft.	Number of Samples	PREP: Core Slabbing	PREP: Digital Core Imaging	PREP: Individual Plug Cutting	Groups: Vapor Transport / Intrusion Group	Groups: Mobility Group - Water Drive Method	Particle Size (sieve + laser)	Laser Particle Size	Fractional Organic Carbon	Bulk Density	Total Porosity w/saturations	Effecftive Porosity	Native State Air Permeability	Intrinsic State Air Permeability	Water Permeability/Hydraulic Conductivity	Permeability to DNAPL	Viscosity (3 temperatures)	Viscosity; Single point at ambient	Interfacial Tension	PHOTO WHITE + UV	Other:	HOLD PRESERVED PENDING ANALYSIS	Comments
1804576-856-A-1	08/31/23	1400	0-3	1																			X		X	
1804576-856-A-2	08/31/23	1401	3-6	1																			X		X	
1804576-856-A-3	08/31/23	1402	6-8.6	1																			X		X	
1804576-856-B-1	08/31/23	1430	0-2.5	1																					X	HOLD FROZEN
1804576-856-B-2	08/31/23	1431	2.5-5.5	1																					X	HOLD FROZEN
1804576-856-B-3	08/31/23	1432	5.5-6.9	1																					X	HOLD FROZEN

1. Relinquished By:	2. Received By:	2. Relinquished By:	2. Received By:
Company Core Lab	Company	Company	Company
Date Time	Date Time	Date Time	Date Time

Appendix E White and UV Light Photographs

1804576-849-A-1

GEI Consultants, Inc.

Amesbury MGP

Job #: 202304481

0-1’



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1.0-2.0’



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GEI Consultants, Inc.

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2.0-2.6’



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Amesbury MGP

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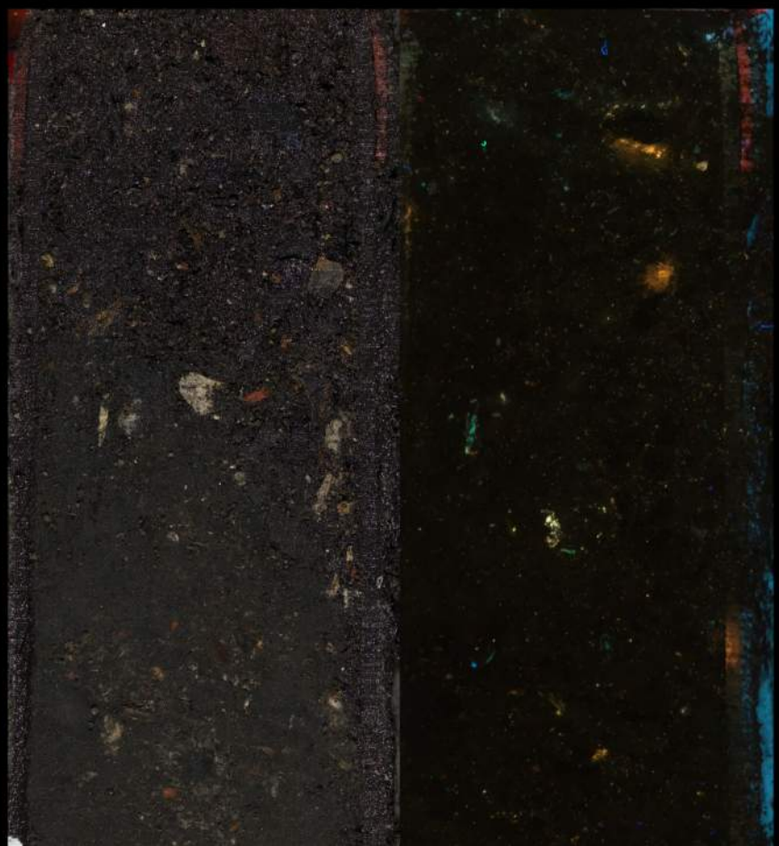

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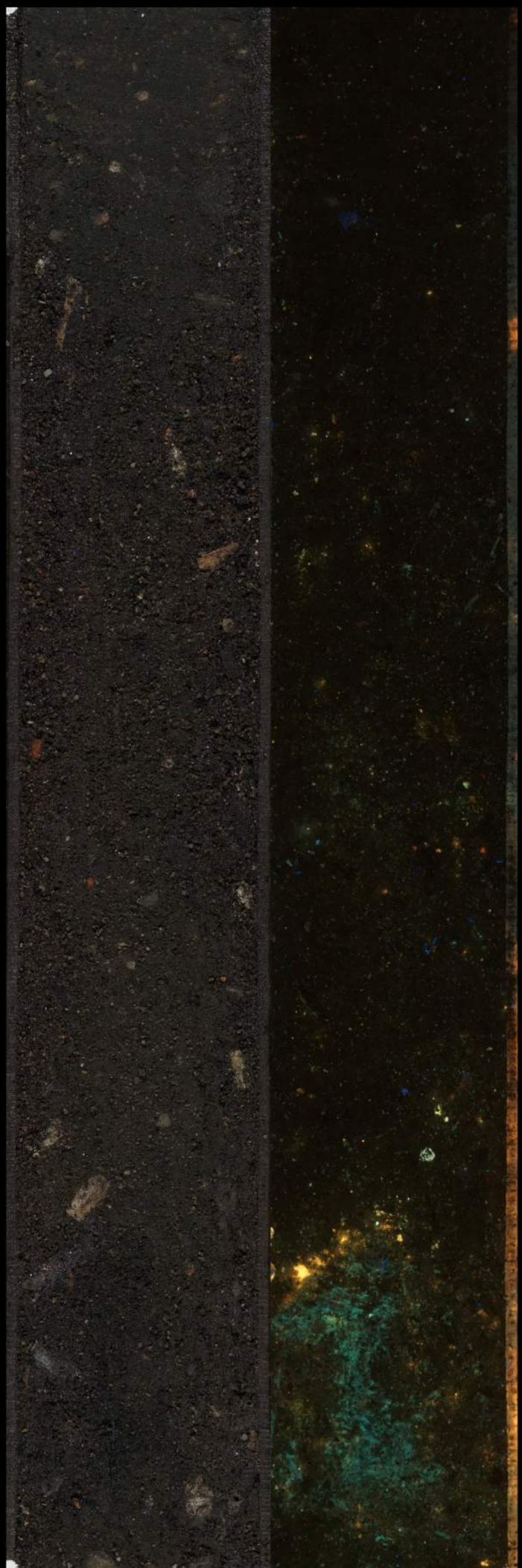

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5.0-5.1’



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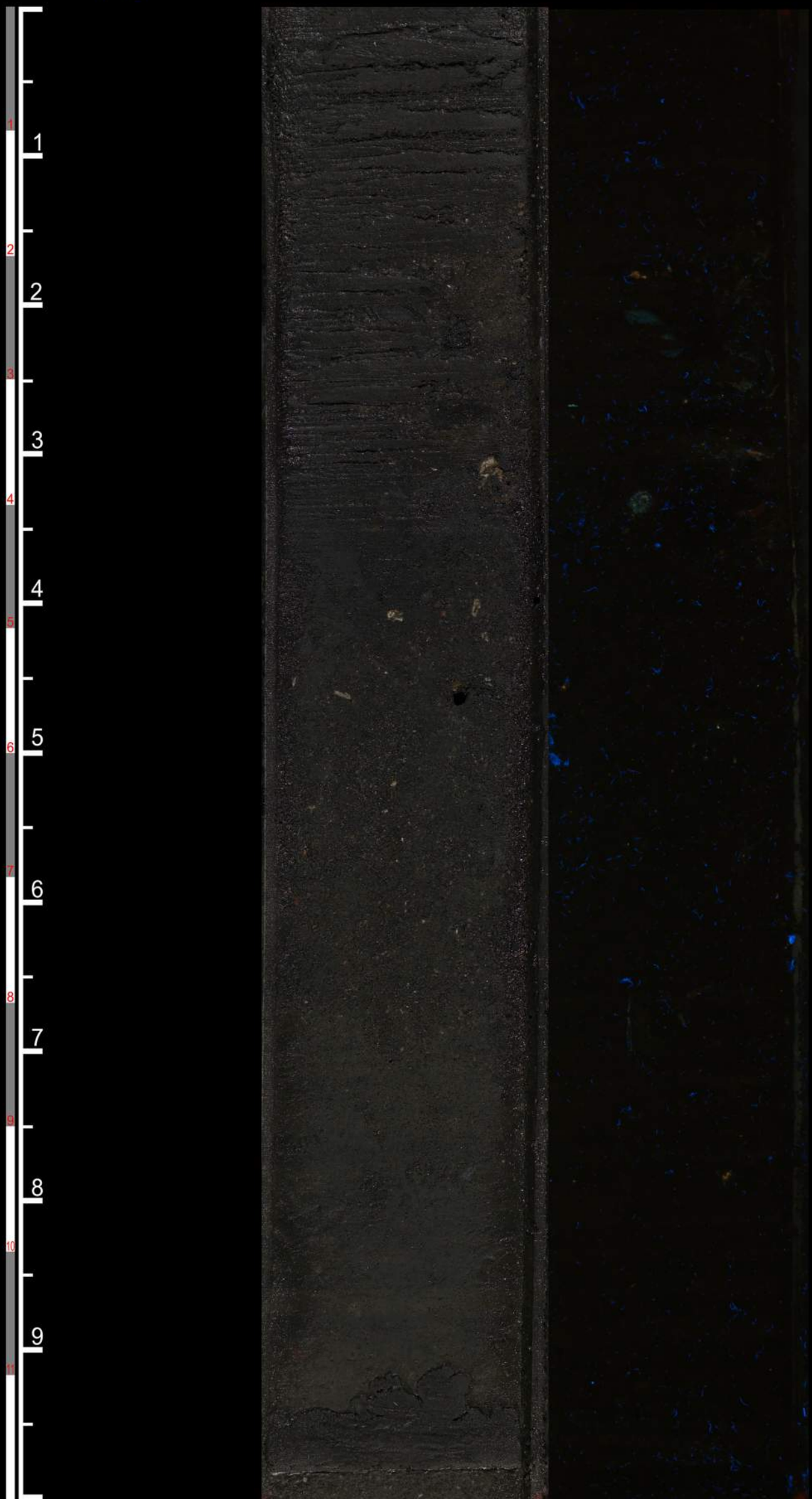

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2-3’



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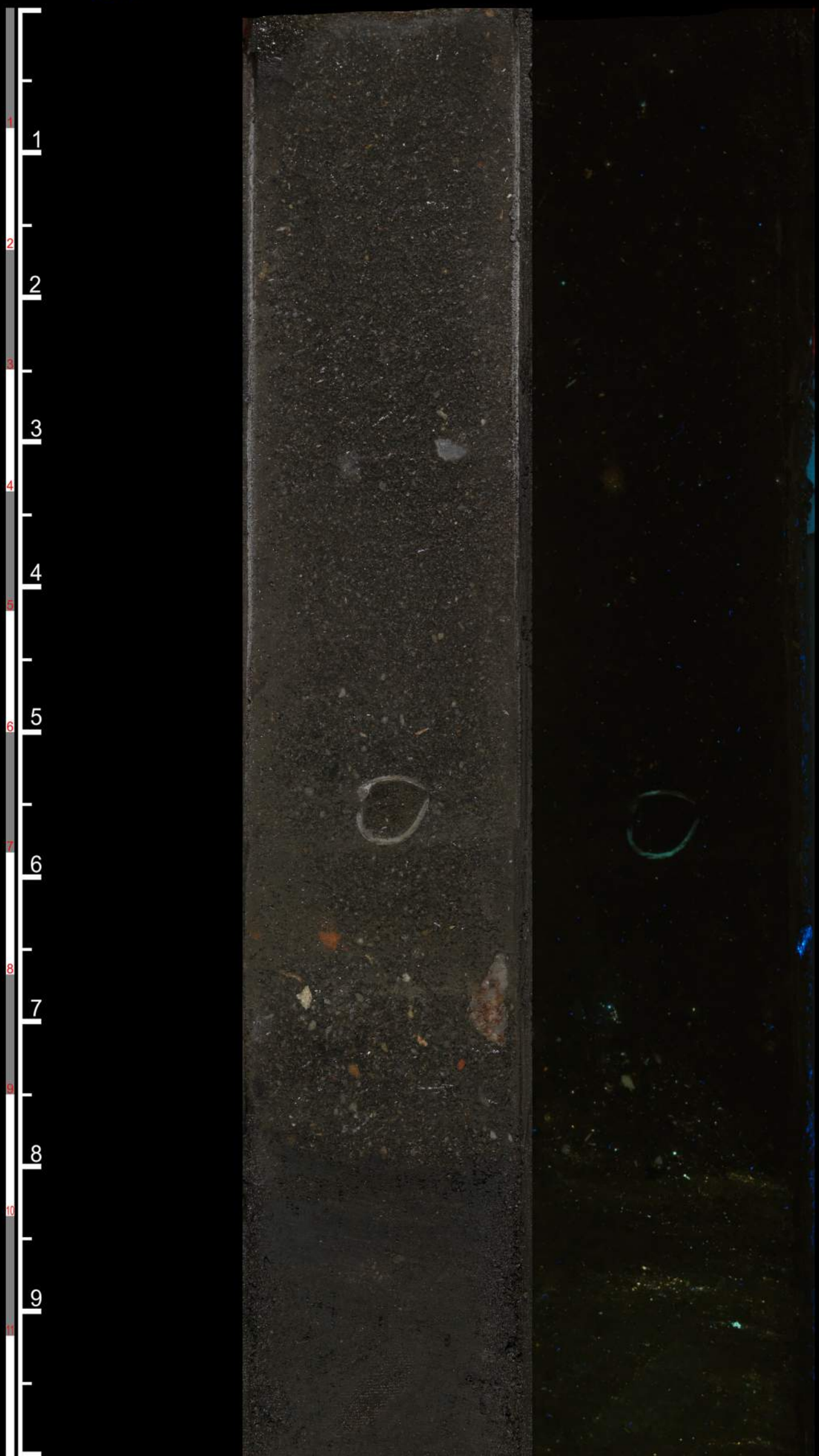

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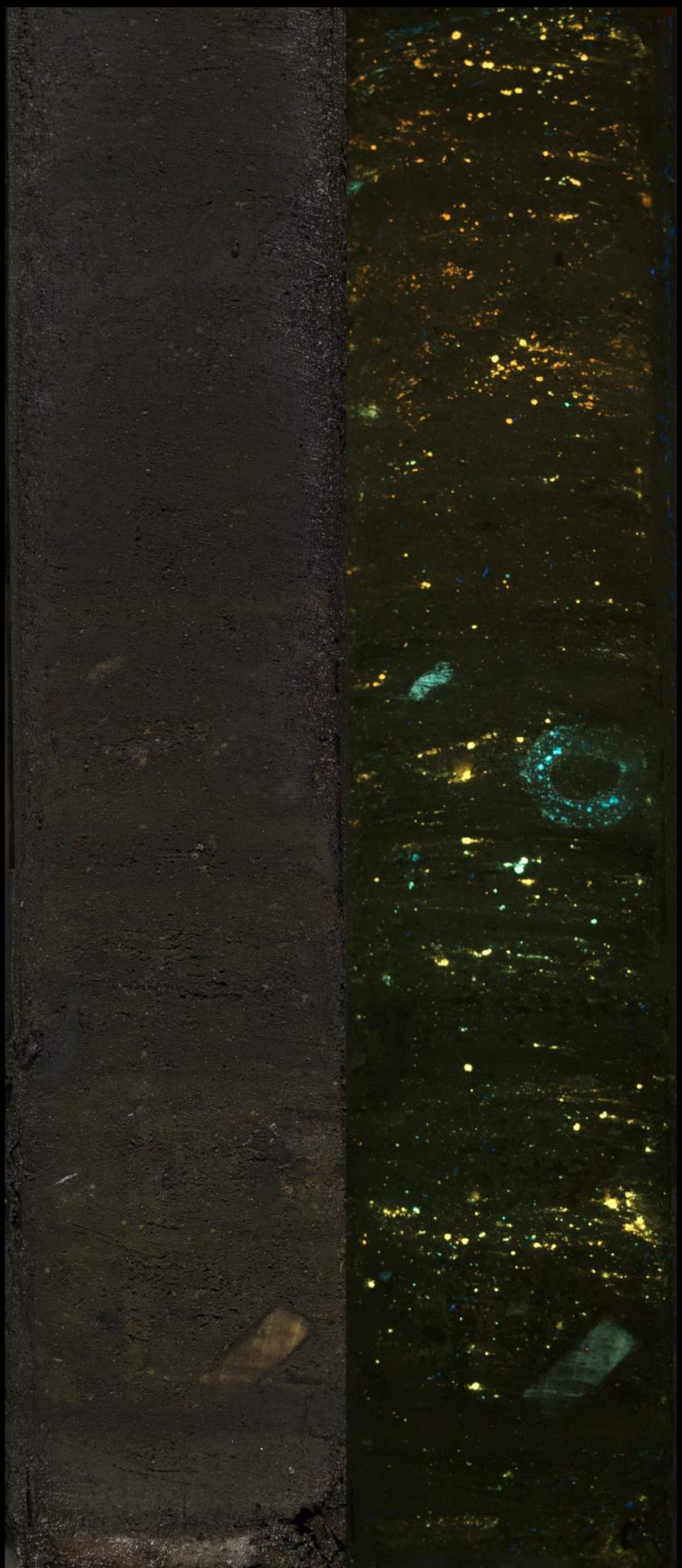

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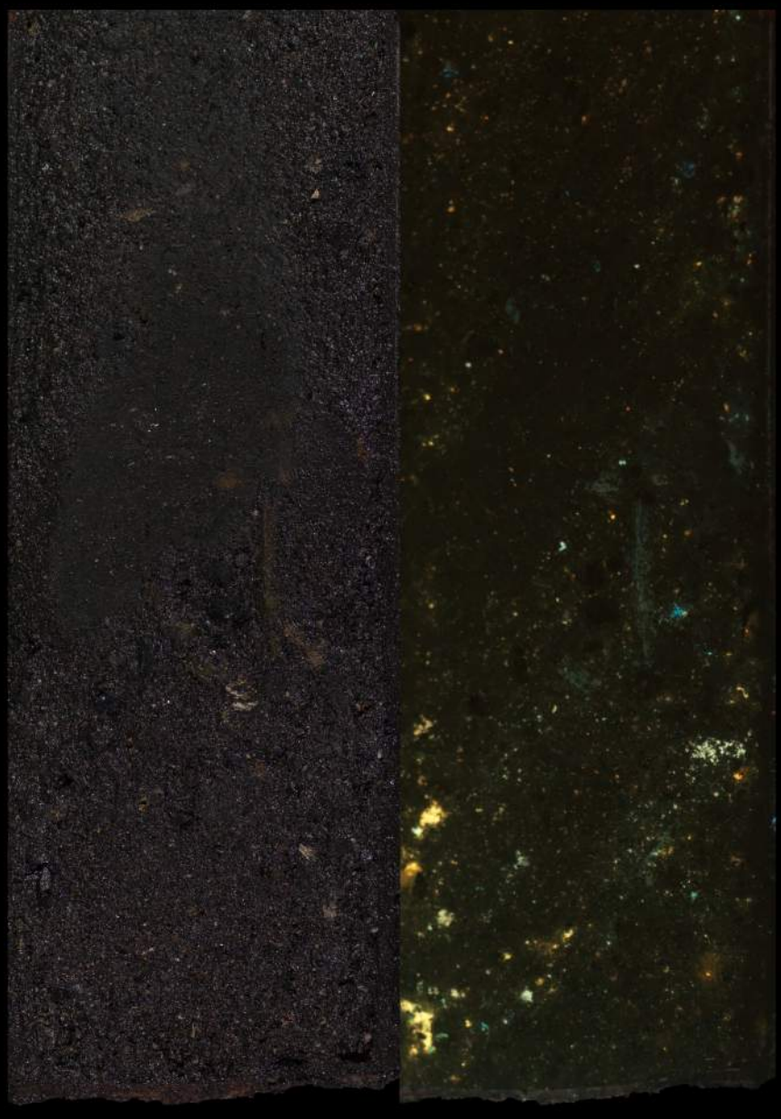

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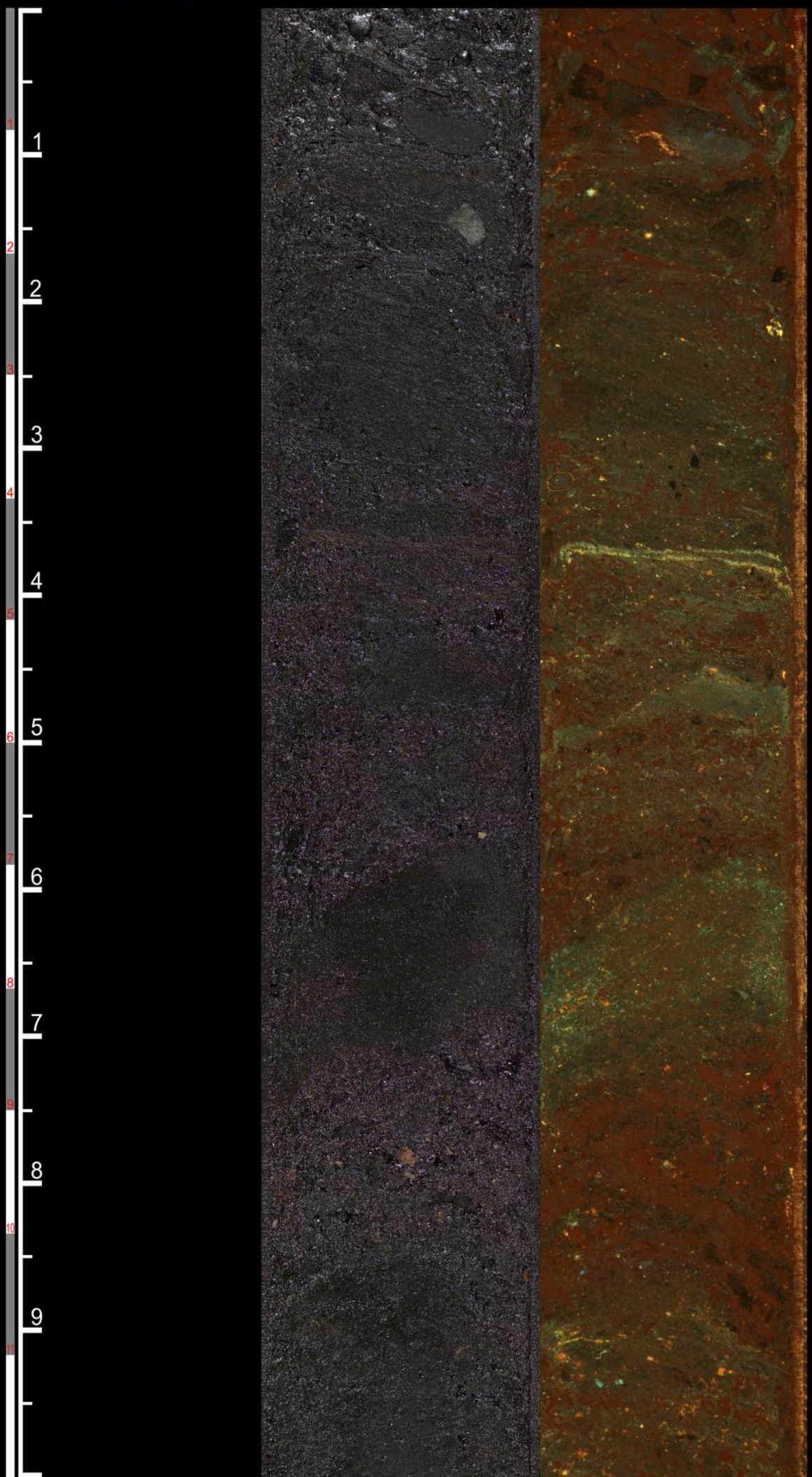

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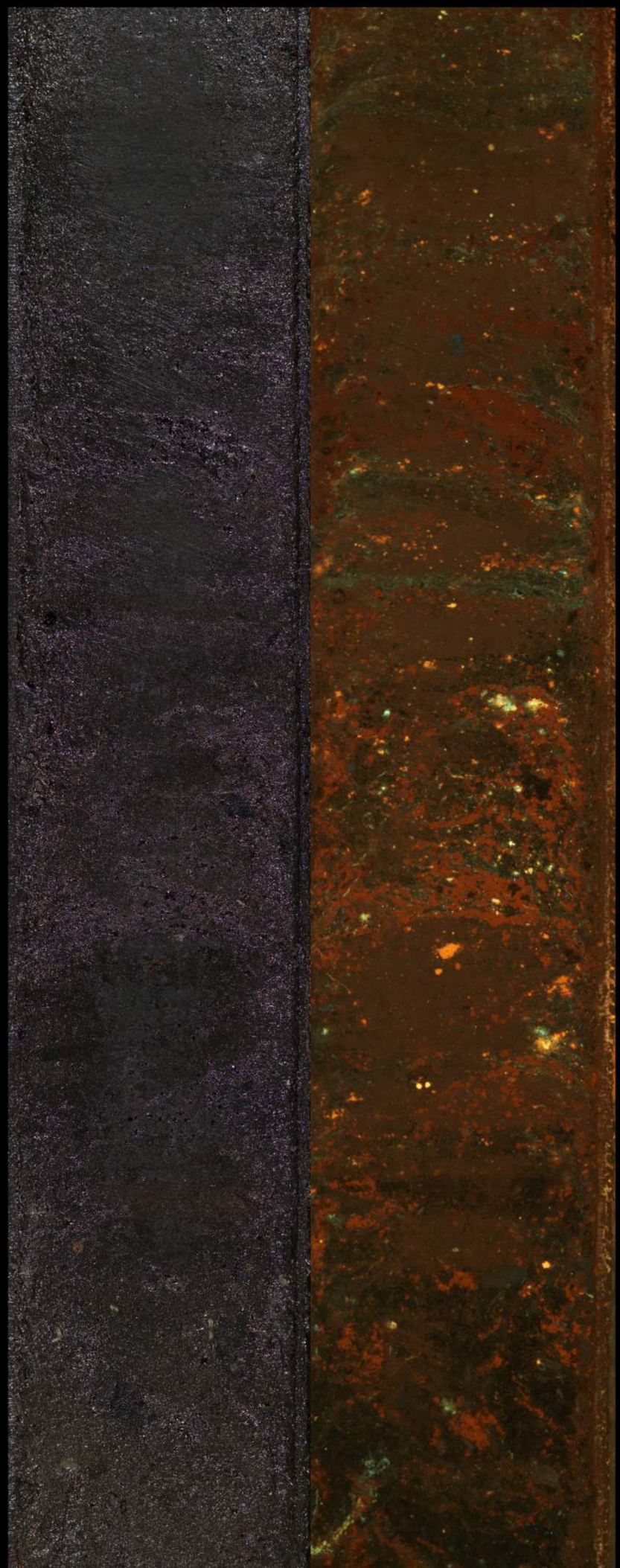

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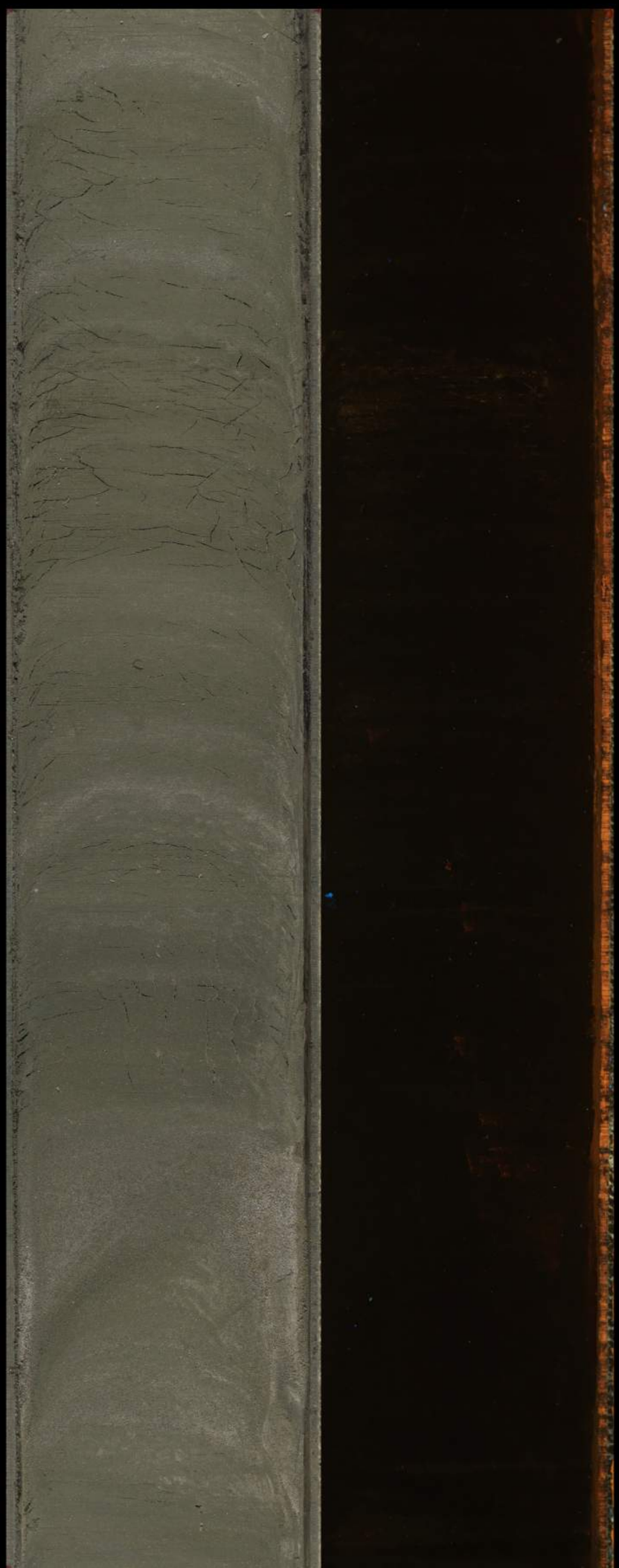

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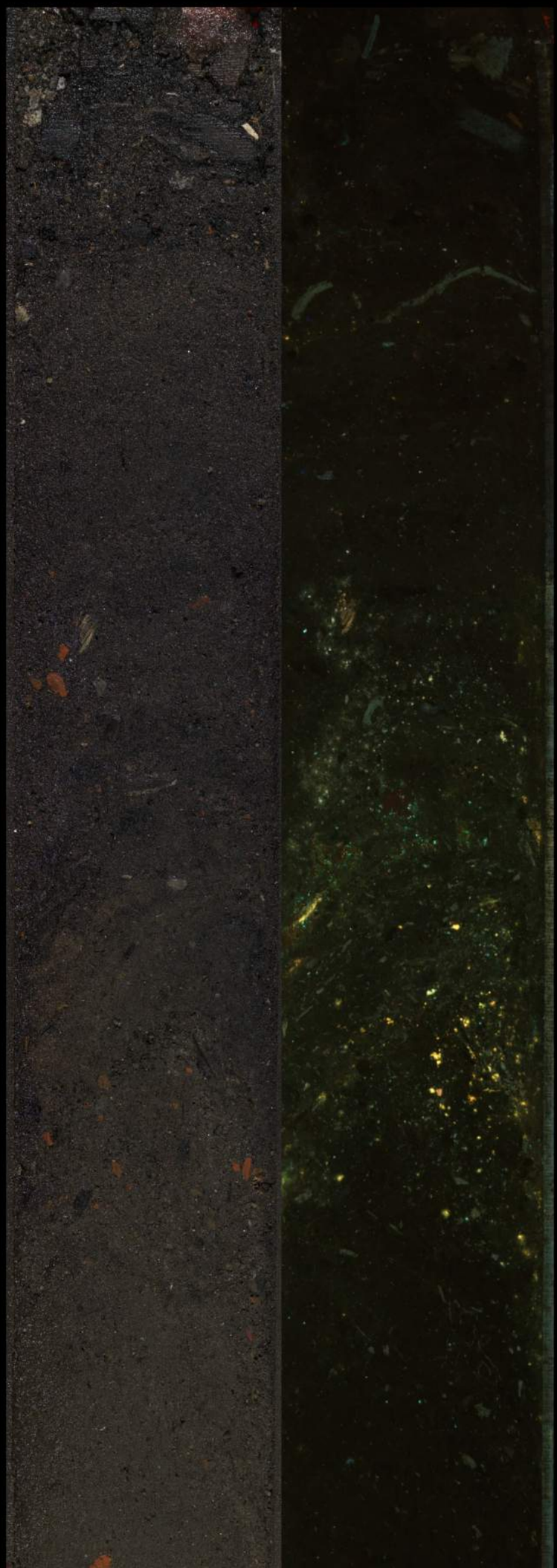

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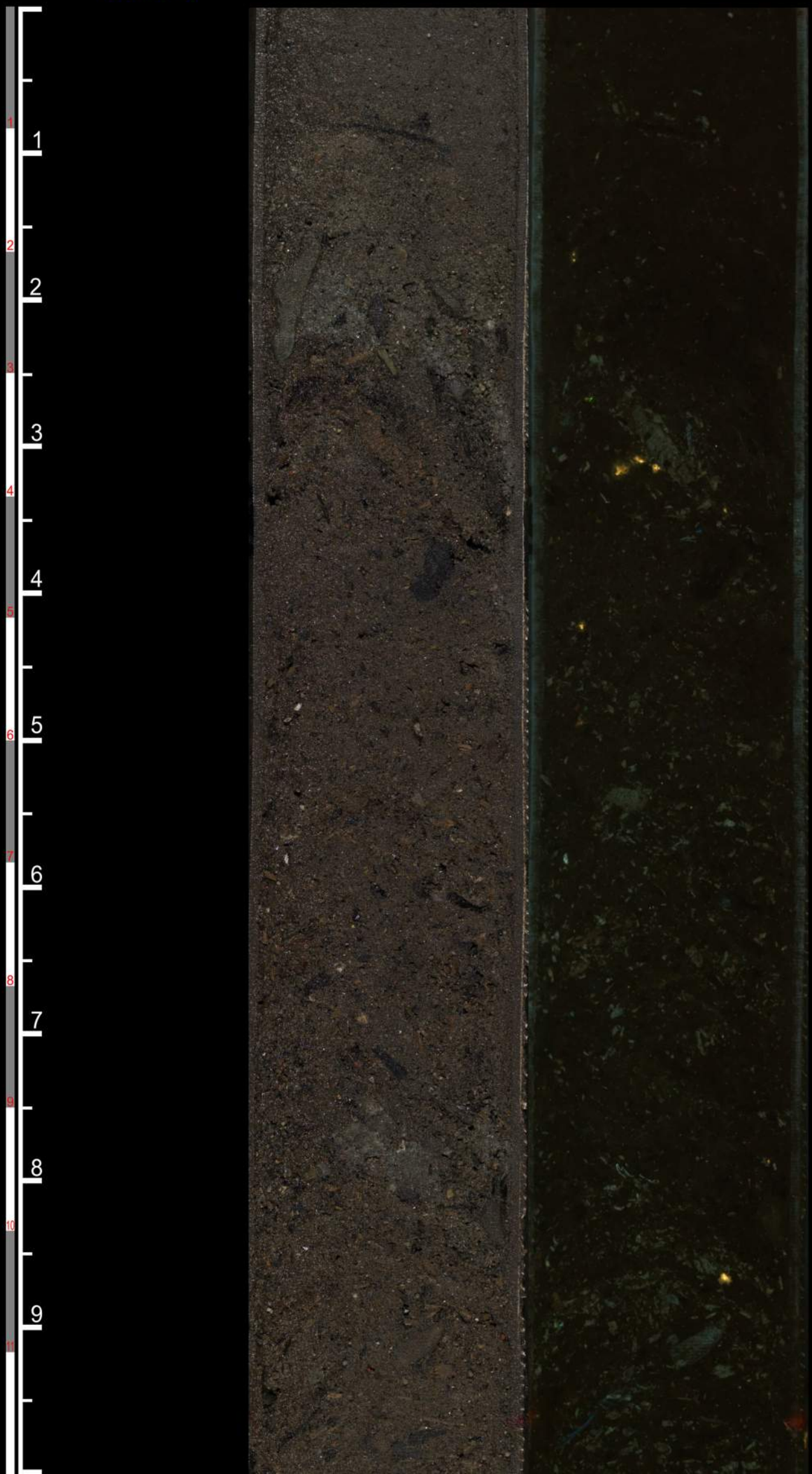

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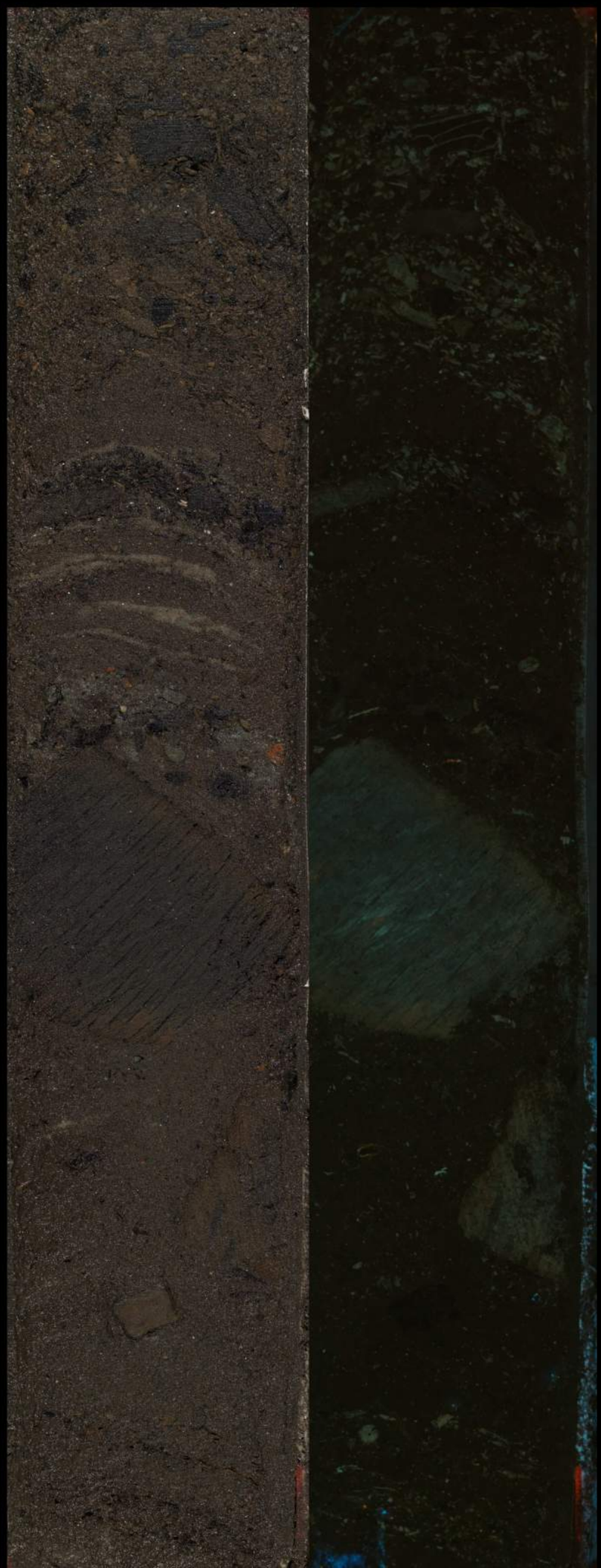

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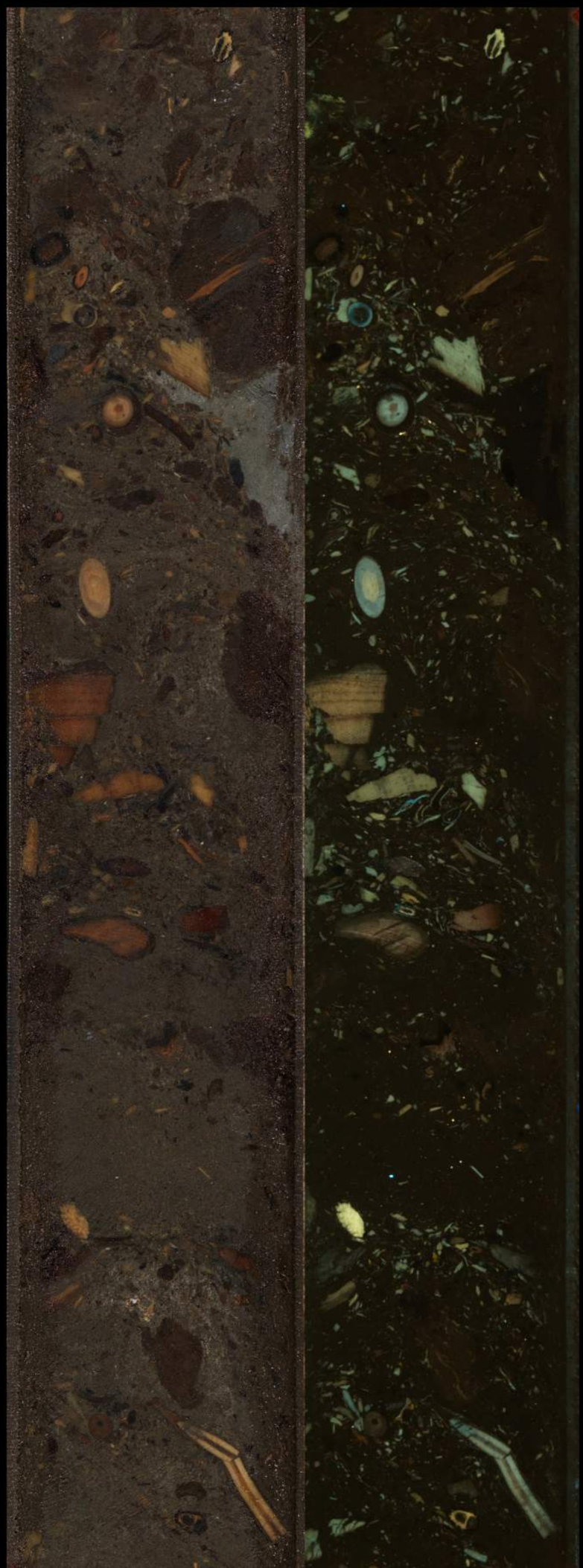

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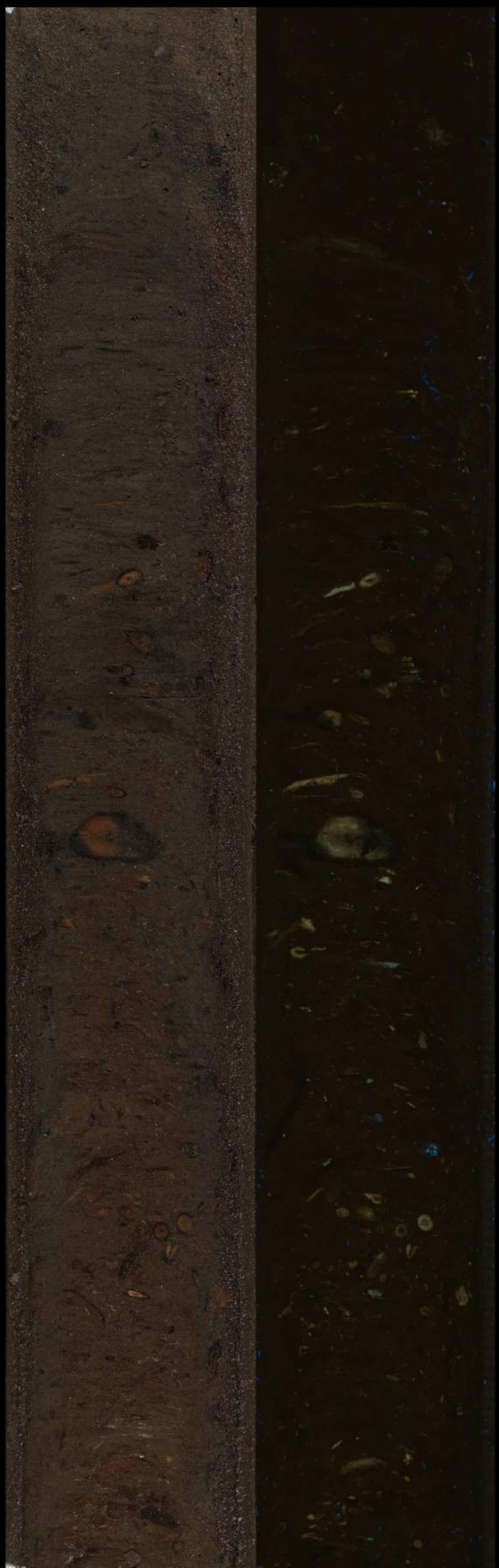

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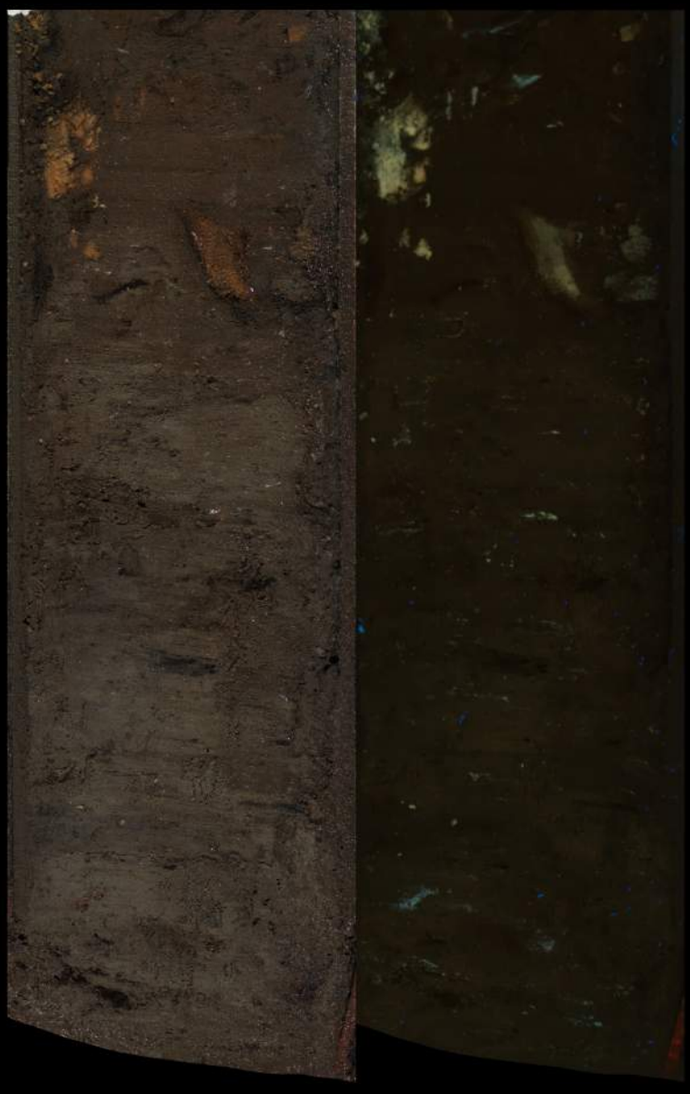

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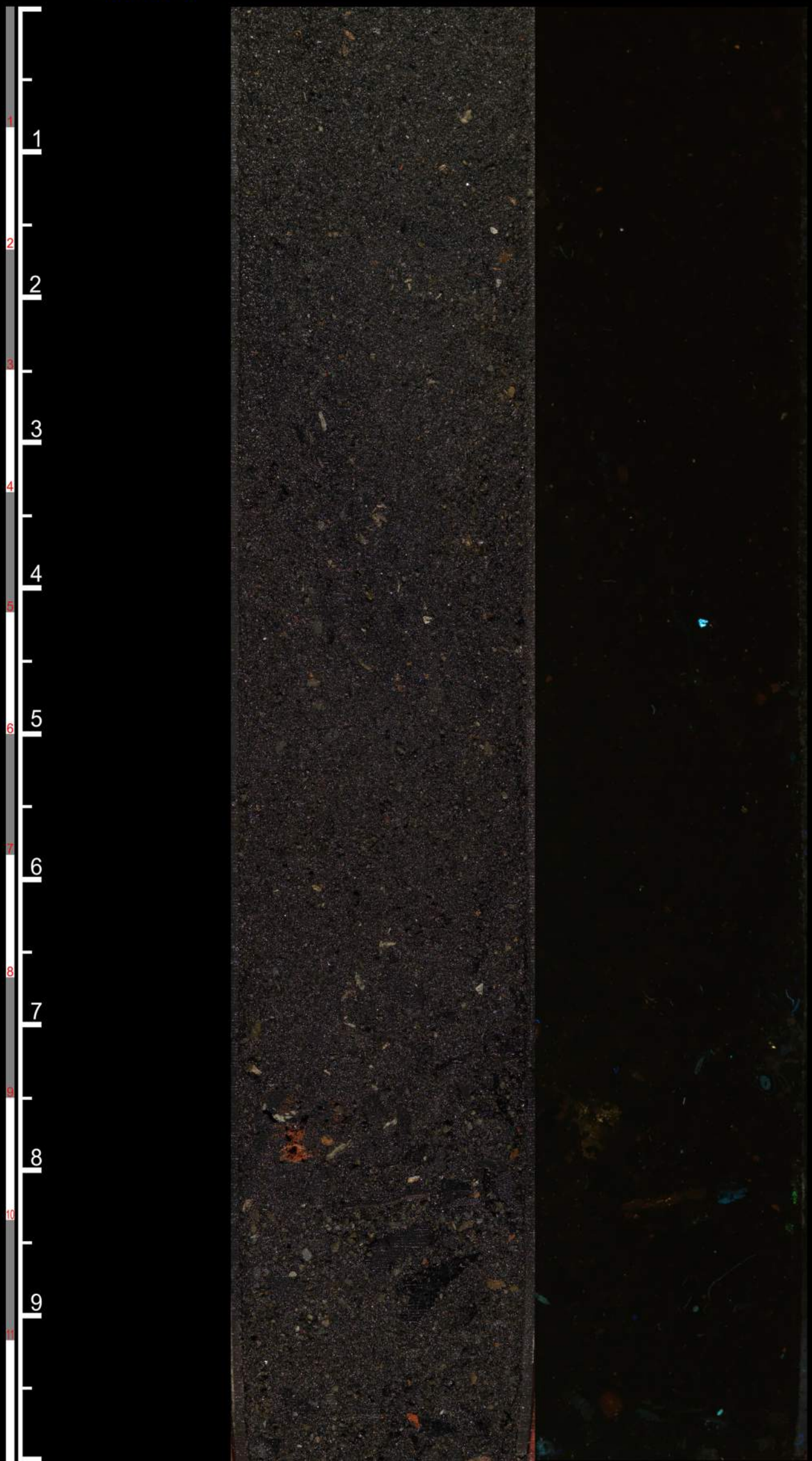

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RESERVOIR OPTIMIZATION

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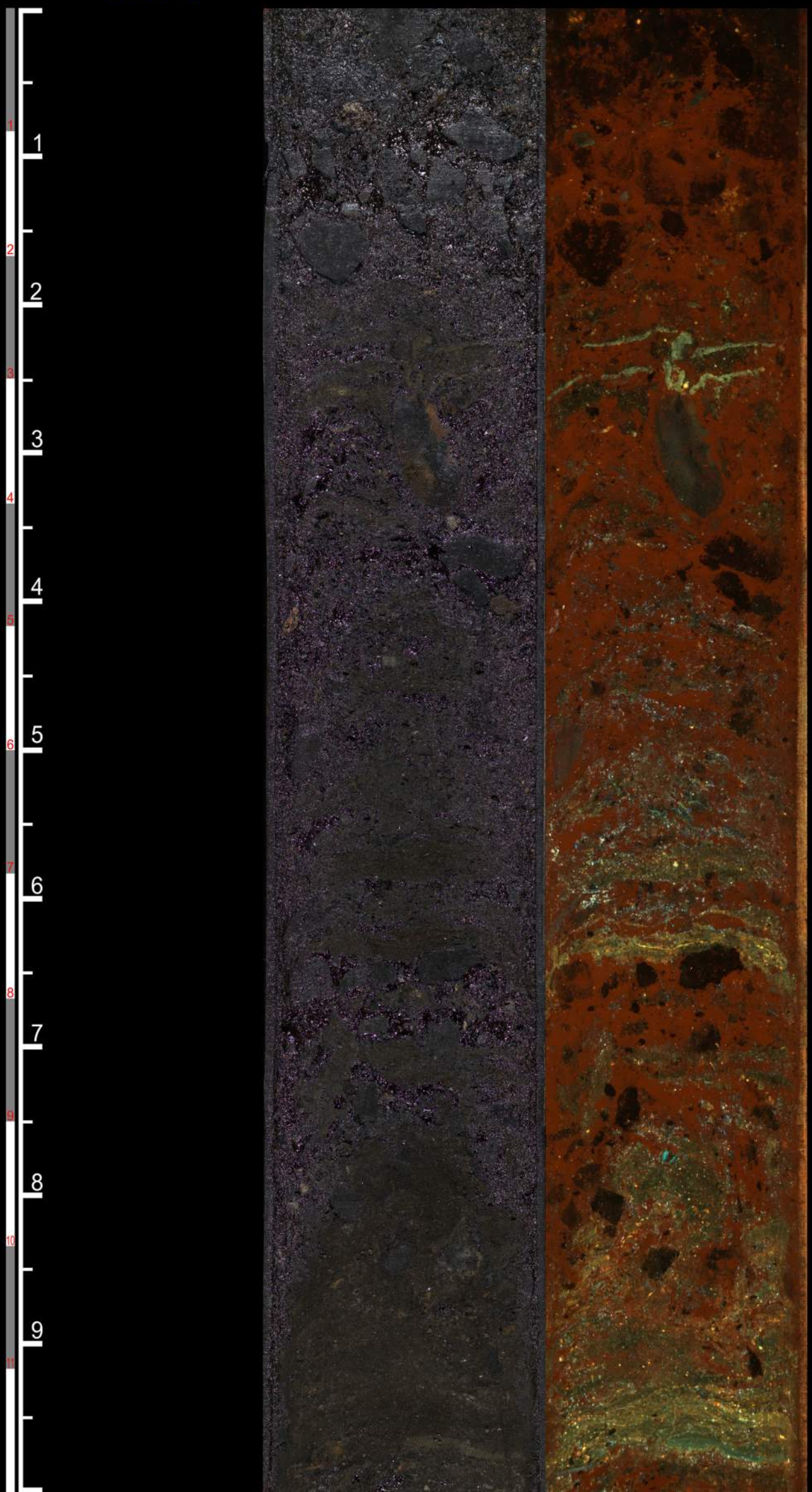

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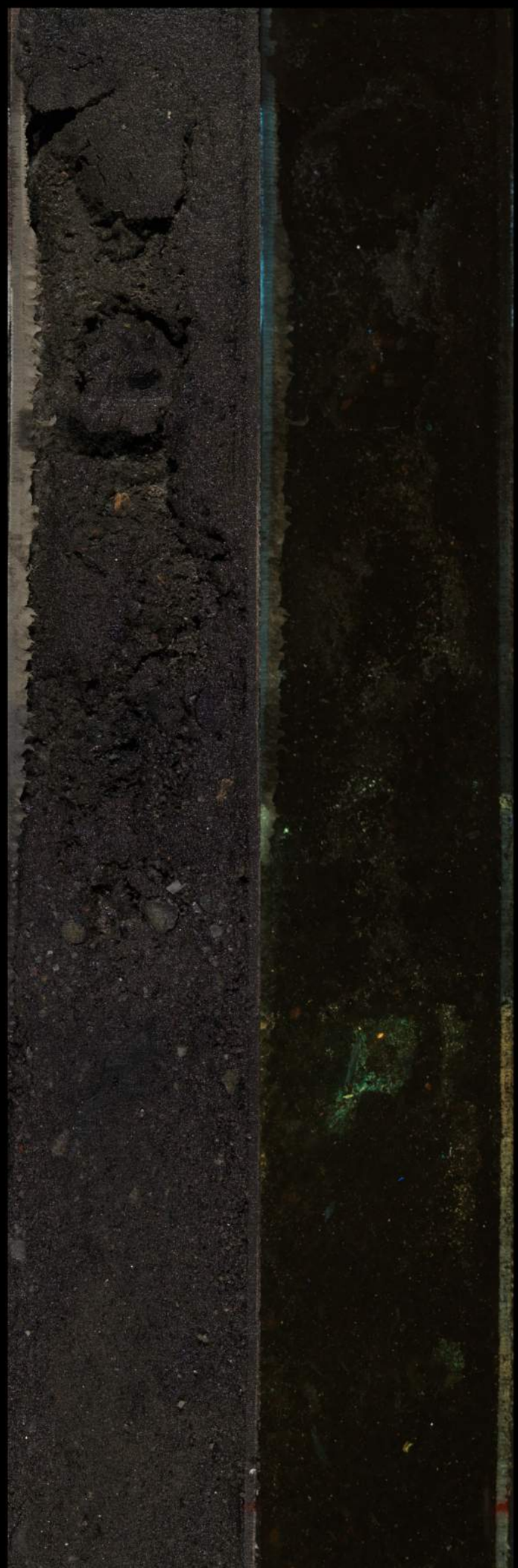

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Amesbury MGP

Job #: 202304481

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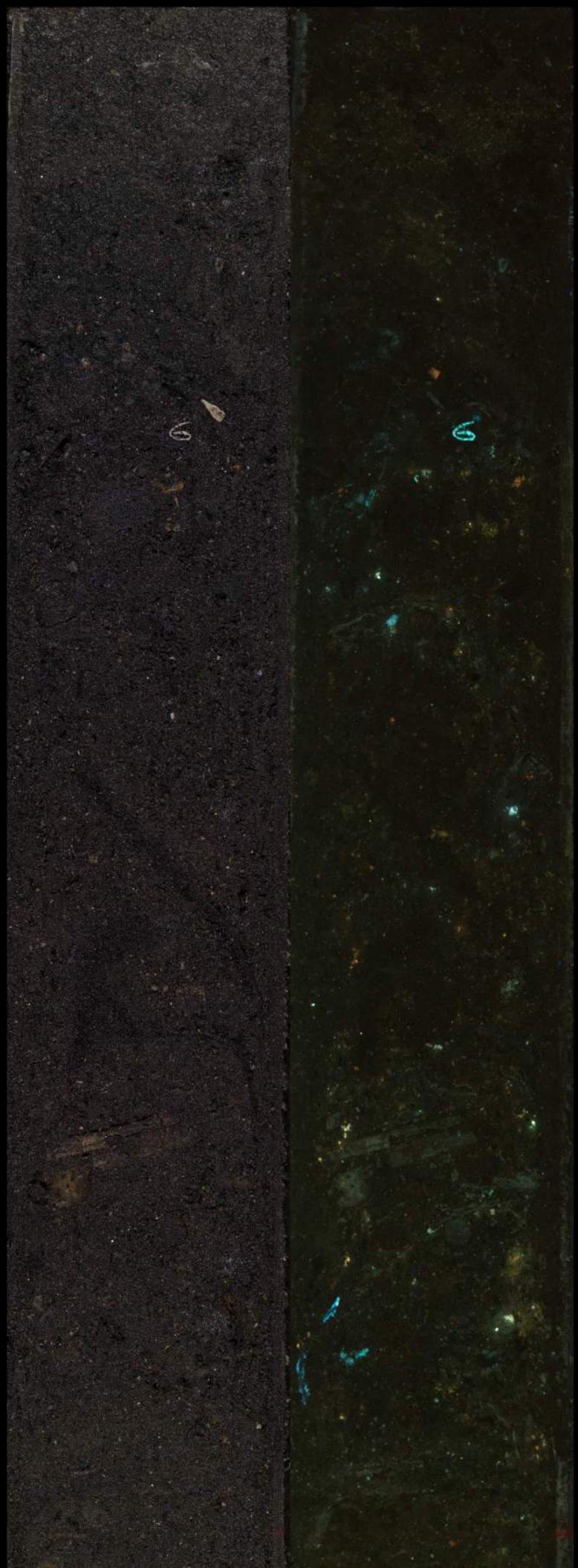

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Amesbury MGP

Job #: 202304481

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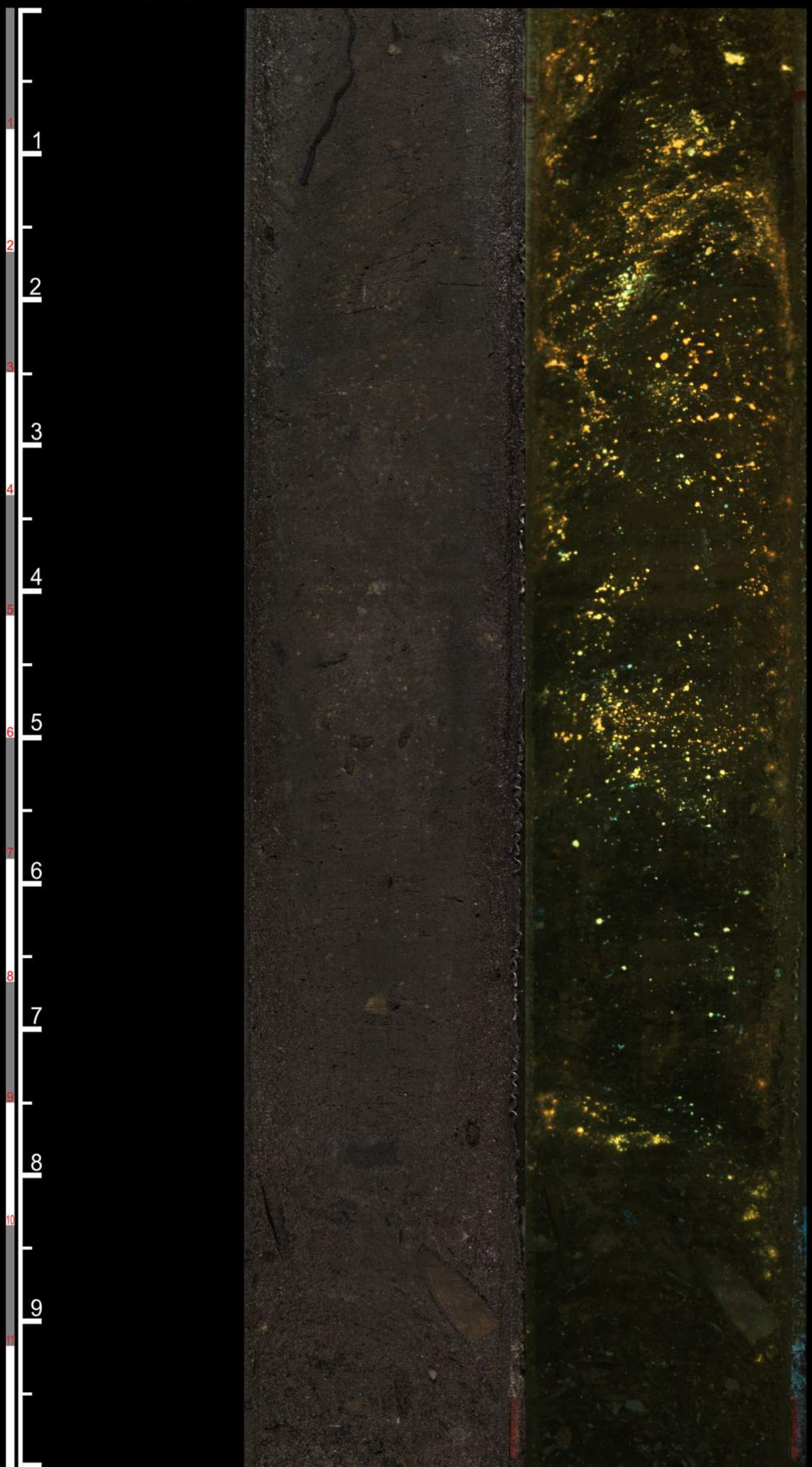

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1804576-856-A-3

GEI Consultants, Inc.

Amesbury MGP

Job #: 202304481

6.0-7.0’



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Appendix N Ebullition Survey

Ebullition-Facilitated NAPL Flux Evaluation

Purpose and Objective

This section describes the visual observation survey for evidence of gas ebullition from sediments on the surface water of the Powwow River (Fig. 1). The purpose of the study was to determine if ebullition from sediments presents a potential pathway for non-aqueous phase liquid (NAPL) to be transported up through contaminated sediment into the Powwow River.

The survey was based on visual observation of bubbles and sheens or NAPL blebs in areas that were uninterrupted by other sources of aeration. Gas bubbles observed at the surface can have multiple sources other than gas ebullition from sediments. Therefore, the term "apparent gas ebullition" is used to describe any visual evidence of gas bubbles and coincident sheens or NAPL blebs at the surface of the Powwow River. Gas bubble sources that can be falsely identified as gas ebullition from sediments can include, but are not limited to, aeration bubbles from sewers, outfalls, watercraft movement, construction, sampling, diving, biota, drilling, and any source of sediment scouring.

Ebullition rates are generally higher for high temperatures and low hydrostatic pressure. Therefore, the survey was conservatively planned for September to represent the highest annual sediment temperature during a spring tide, to represent the most exaggerated low tide. This timing was selected to maximize the opportunity to observe ebullition-facilitated NAPL flux, if it is present.

Survey Area, Conditions, and Methodology

The survey area was selected based on results of the previous subsurface investigation (i.e., sediment core) locations (Fig. 1). Ebullition is ubiquitous in sediment environments, and does not in itself represent a risk. The survey area was limited to areas where NAPL had been observed in sediment, where ebullition-facilitated NAPL flux could potentially occur.

GEI conducted the survey from a boat, where feasible, or by foot in areas where the water was too shallow to access by boat. GEI used mobile phones to collect observation points, record ebullition and sheen locations, and take pictures, all of which was stored in the ArcGIS Collector application, a mobile data collection app that allows accurate spatial data collection to record visual observations. A field log was prepared for each location where ebullition or evidence of NAPL (e.g., sheens/blebs) was observed.

The September 2020 spring tide was predicted to occur between September 17 and 21, 2020, with exaggerated low and high tides (National Oceanic and Atmospheric Administration [NOAA] Tidal Predictions). The survey was conducted on September 21 and 22 to coincide with the first daylight spring tide when the overlying hydrostatic pressure is lowest in the river.

The ebullition survey took place during clear and calm weather conditions when the water surface was as 'flat' as possible because turbulent water can create a false indication of apparent gas ebullition. Weather conditions ranged from sunny and calm on September 21 (high temperature of about 60 °F) to overcast and light wind on September 22 (high temperature of about 65 °F). The survey was conducted between upstream of the former MGP Site at 39 Water Street down to the Macy Street Bridge just upstream of I-495 (Fig. 1).

Where visual evidence of apparent gas ebullition or sheens was observed, the following observations were made and recorded:

- Approximate size of the apparent ebullition area and/or the area of the sheen.
- A qualitative bubble frequency count (high/moderate/low) and geotagged video in the Collector app.
- A photograph and/or video.
- If a sheen or NAPL blebs were observed, they were described according to the GEI SOP No. GE-001 Apparent Gas Ebullition Survey.
- Notes on nearby activities that would induce water aeration unrelated to ebullition, such as sewer or other outfalls, construction, sampling, diving, biota, etc.
- Notes for sources of a sheen including, but not limited to, sewer or other outfalls, culverts, and vessels.
- Notes on wave activity and water turbulence.

Additional guidance on the gas ebullition field survey is provided in the GEI SOP GE-001 Apparent Gas Ebullition Survey (Attachment A).

Survey Observations and Results

Apparent gas ebullition was observed alongside the river, typically closer to the river shoreline where the water depth was shallower than 4 to 5 inches, during the low tide. These locations were observed throughout the entire length of the survey area, more often on the eastern shoreline of the river (Fig. 1). The high tide survey was conducted only in areas where ebullition was observed during the low tide survey. GEI's observations identified slow to moderate ebullition in several locations of the river. The field logs and photographs from the survey are included in Attachment B.

Sheens were observed at multiple locations at the Site as shown in Fig. 1. Apparent gas ebullition with coincident sheen was only observed in two locations – in the mudflat (Location No. 46) and near the downstream terminus of the study area (Location No. 83) (Fig. 1).

Each of the sheens was characterized as brittle. The sheen was cracked or would crack when agitated, and did not coalesce around the agitation. This behavior is consistent with a bacterial sheen rather than a NAPL or oil sheen (MIDEQ, 2016).

Based on the results of the survey, there is no evidence of ebullition-facilitated NAPL flux at the Site.

Reference

MIDEQ (2016). Bacteria A Naturally Occurring Phenomenon. Michigan Department of Environmental Quality, 2016, Bacteria A Naturally Occurring Phenomenon, www.michigan.gov/documents/deq/deq-oea-nop-bacteria_378414_7.pdf.

Figure



SOURCE:
1. AERIAL PHOTO ESRI WORLD IMAGERY SERVICE.

NOTE:
1. THE NUMBERS SHOWN ABOVE THE OBSERVATION LOCATIONS INDICATE THE ORDER OF OBSERVATIONS. LOCATIONS 1 TO 50 WERE OBSERVED ON 9/21/2020 AND LOCATION 51 TO 86 WERE OBSERVED ON 9/22/2020

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Amesbury, Massachusetts

Boston Gas Comapny d/b/a National Grid
Waltham, Massachusetts

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Project 1804576

VISUAL OBSERVATIONS OF EBULLITION AND SHEEN FOR THE POWWOW RIVER

October 2025 Fig. 1

J:\Projects\National_Grid\BostonGasCompany\VisualObservations_Updated.mxd

Attachment A. GEI SOP GE-001 Apparent Gas Ebullition Survey

STANDARD OPERATING PROCEDURE

GE-001 Apparent Gas Ebullition Survey

1. Objective

Describe the methods used to survey apparent gas ebullition at the water surface.

The SOP applies to the visual observance of apparent gas ebullition on the water surface of stagnant water bodies. The equipment will dictate the applicable method for the data collection of visually observable gas ebullition. There are three recommended techniques for collecting representative surface water gas ebullition data:

- ESRI's ArcGIS Collector Application
- Field log forms
- Field notebook

Materials

The following list of equipment is dependent on the method used for data collection:

- ASTM F2534-17: Standard Guide for Visually Estimating Oil Spill Thickness on Water
- Personal Protection Equipment (PPE) as defined in the HASP and FSP
- Map and daily survey plan
- Floating ruler for scale when measuring gas ebullition size and taking photos of apparent gas ebullition
- ESRI's Collector for ArcGIS application installed on a tablet equipped with an offline GPS and camera.
- Field log sheets for gas ebullition data and notes
- Rite in the rain field notebook for gas ebullition data and notes
- Global Positioning System (GPS) survey equipment or another appropriate method to document the location of surface water sampling locations.
- Digital camera
- Compass
- Field notebook
- Ballpoint pen, pencil, or sharpie
- Watch
- Decontamination equipment/supplies
- Wooden rod
- Paper Towels

Health and Safety

All work will be conducted per the health and safety requirements of the HASP and FSP. Of particular note are requirements for operating canoes or kayaks in navigable waterways, including:

- PPE will include a coast guard approved PFD for each person on board, a type IV throwable PFD (seat cushion or throwable flotation device) if more than one person is on board, an efficient sound-producing device (e.g. whistle or horn), an adequately sized first aid kit.
- A dedicated spotter will be on shore with a rescue ring and cell phone to call coast guard in case of emergency.
- Enter the water from near the Site at a safe access area, not at the boat ramp against the current.
- Leave the water if larger watercrafts enter the area of investigation.
- Drink plenty of water and wear sunblock.
- Do not swim in the water.
- Do not wear waders.
- Inspect kayak/canoes prior to use.
- Inspect PFD prior to use.
- This is not a leisure day on the water, please complete investigations and leave water immediately.
- Be aware of tides and weather conditions.

1.1. Pre-survey Procedures

1.1.1. Sample Location

Ideally, a GPS navigation system should be used to identify and record the sample location coordinates. If the ESRI collector application is available, the application will automatically log the GPS coordinates of any data point logged in the program. GPS enabled tablets or smartphones are typically accurate within a 16ft radius under the open sky. A GPS receiver can be plugged into a cellphone or tablet to improve location accuracy.

1.1.1. Survey Environmental Conditions

All surveying activities should take place in clear weather conditions, avoiding rain, wind-generated waves or turbulence, or any other weather conditions that can cause false gas ebullition. The survey event should take place during a predetermined low or high tide.

1.2. Visual Data Collection Methods

1.2.1. Field Gas Ebullition Survey Activities

Visual observations and data collection will be made in the water throughout the observed NAPL extent. Determine the area that can be surveyed during a daily low tide. The water should be accessed at a safe launching location. Maneuver the canoe or kayak around the survey area with paddles. A motor should not be used in order to avoid adding any NAPL sheen sources to the survey area. If strong currents or other field conditions require the use of a motorized boat, care must be taken to

distinguish sheens from the motor from those caused by apparent ebullition. Two field employees should be present to visually scan either side of the boat, outwards approximately 50 feet of the vessel, for apparent gas ebullition (gas bubbles) or sheens.

If visual evidence of apparent gas ebullition or a sheen is observed, stop the boat to document the following information using a field notebook, a logging sheet, or Collector for ArcGIS:

1. Time of observed apparent gas ebullition
2. GPS coordinates with a handheld GPS device or Collector for ArcGIS.
3. Record names of field personnel
4. Identify if the apparent gas ebullition is one of the following:
    a. **(G) –** Apparent gas ebullition is seen as just bubbles
    b. **(S)** - Sheen
    c. **(GS)** – Apparent gas ebullition bubbles and a coincident sheen
5. If apparent gas ebullition is observed, take a video and/or photograph of the entire bubbling and/or sheen area, and if possible, include a floating ruler for scale.
    a. Approximate the size of the apparent gas ebullition area.
    b. Characterize the bubble frequency within a **5-minute period**. If possible, provide a quantitative bubble frequency. When a quantitative description is not possible, give a qualitative description of the bubble frequency within the area of apparent gas ebullition:
        i. High frequency: Bubble rate is observed continuously and/or is uninterrupted for the entire period.
        ii. Moderate frequency: Bubble frequency is intermittent and irregular but continues through the 5-minute period.
        iii. Low frequency: Bubbles appear at specific, localized points. There is not a consistent stream of bubbles over the time period.
    c. Take note of conditions that could mimic or affect gas ebullition, creating observations of false gas ebullition. The conditions include, but are not limited to, sewers, outfalls, culverts, drilling, and vessels.

6. Note any sheens in the survey area:
    a. Document whether the sheen is paired with apparent ebullition or observed without the presence of gas bubbles.
    b. If any sheen is observed, include the following description:
        i. Time
        ii. GPS coordinates with a handheld GPS device or Collector for ArcGIS.
        iii. Take a video and/or photograph of the entire sheen area, and if possible, include a floating ruler for scale.
        iv. Estimate the dimensions of the sheen area and percentage of the water surface with a visible sheen.
        v. Document the color of the sheen to the ASTM F2534-17 Standard (Figure 2-5):
            1. **Silvery (S) –** Near transparent to silvery-gray; metallic (Figure 1-2).
            2. **Rainbow (R)** – Multicolored (Figure 1-4)
            3. **Metallic (M)** – Reflective light gray to dull brown (Figure 1,3,4)
            4. **Transitional Dark (T) –** Transitional dark or true oil color. This description is used for a thicker oil, not an oil sheen (Figure 1 and 4).
            5. **Dark (E)** – A continuous true oil color; This description is used for the presence of thicker oil, not an oil sheen (Figure 5).
        vi. Use a rod to gently agitate the sheen and document whether the sheen is brittle or non-brittle when disturbed (Bacteria, 2016; Figure 6):
            1. **Brittle** – The sheen cracks or breaks apparent when agitated.
            2. **Non-Brittle** - The sheen blends or coalesces when agitated.

vii. Indicate whether the sheen blossoms out of the gas ebullition area. A sheen "blossom" occurs when NAPL migrates with gas during gas ebullition and blossoms on the water surface. If possible, include the blossom frequency over a 5-minute period

viii. If the sheen does not blossom from the apparent gas ebullition, describe the distribution of the sheen and/or oil (NOAA, 2016):

1. **Streamer** – A narrow band or line of oil with clean water on each side.
2. **Spotty** – Isolated spots or blotches. Estimate the size range of the isolated patches.
3. **Windows** – Multiple bands or streaks that line parallel to each other.
4. **Contiguous** – A single, large patch or area.

ix. Indicate any potential sources of the sheen: vessels, sewers, outfalls, culverts, etc.

2. References

ASTM F2534-17, Standard Guide for Visually Estimating Oil Spill Thickness on Water, ASTM, 2017.

Bacteria A Naturally Occurring Phenomenon. Michigan Department of Environmental Quality, 2016, *Bacteria A Naturally Occurring Phenomenon*, www.michigan.gov/documents/deq/deq-oea-nop-bacteria_378414_7.pdf.

NOAA Hazmat (2016), Open water oil identification job aid for aerial observation. Office of Response and Restoration. https://response.restoration.noaa.gov/sites/default/files/OWJA_2016.pdf

"1.0 Introduction–What Are LNAPL Sheens?" *LNAPL Update*, Interstate Technology Regulatory Council, lnapl-3.itrcweb.org/appendix-e-lnapl-sheens-appendix/#.

3. Attachments

Figures 1, 2, 3, 4, 5, and 6 (included on following pages)
Tables – 1 (included on following pages)
Attachment A – Gas Ebullition Visual Observation Survey

4. Contacts

Lisa Reyenga
Claire Harris

SUMMARY: FIVE PRIMARY COLOR CODES

Common Descriptors	Code
Silver Sheen	S
Rainbow	R
Metallic	M
Transition	T
Dark	D
Emulsified	E

Note: "Structure" uses two lower-case letters, and "Color Codes" use single-letter capitals (R, S, M, T, D, E).

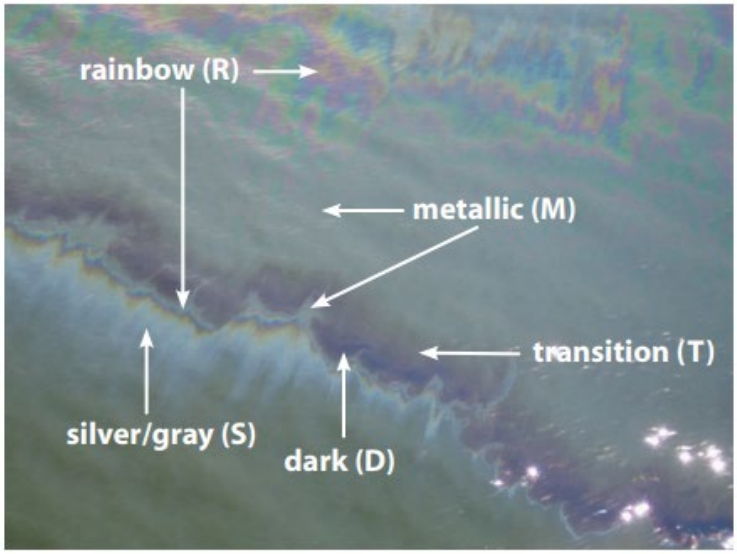


Figure 1 – Photo from NOAA Open Water Oil Identification Job Aid for Aerial Observation, Version 3, updated August 2016 (https://response.restoration.noaa.gov/sites/default/files/OWJA_2016.pdf).

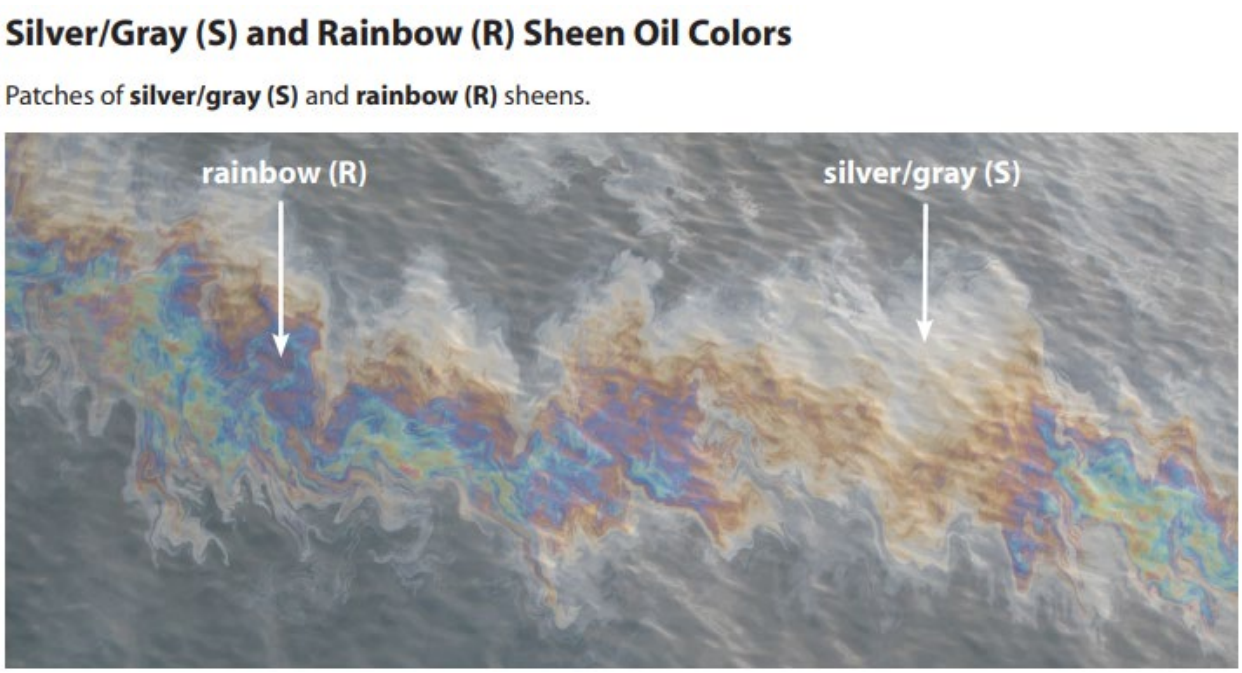


Figure 2 – Photo from NOAA Open Water Oil Identification Job Aid for Aerial Observation, Version 3, updated August 2016 (https://response.restoration.noaa.gov/sites/default/files/OWJA_2016.pdf).

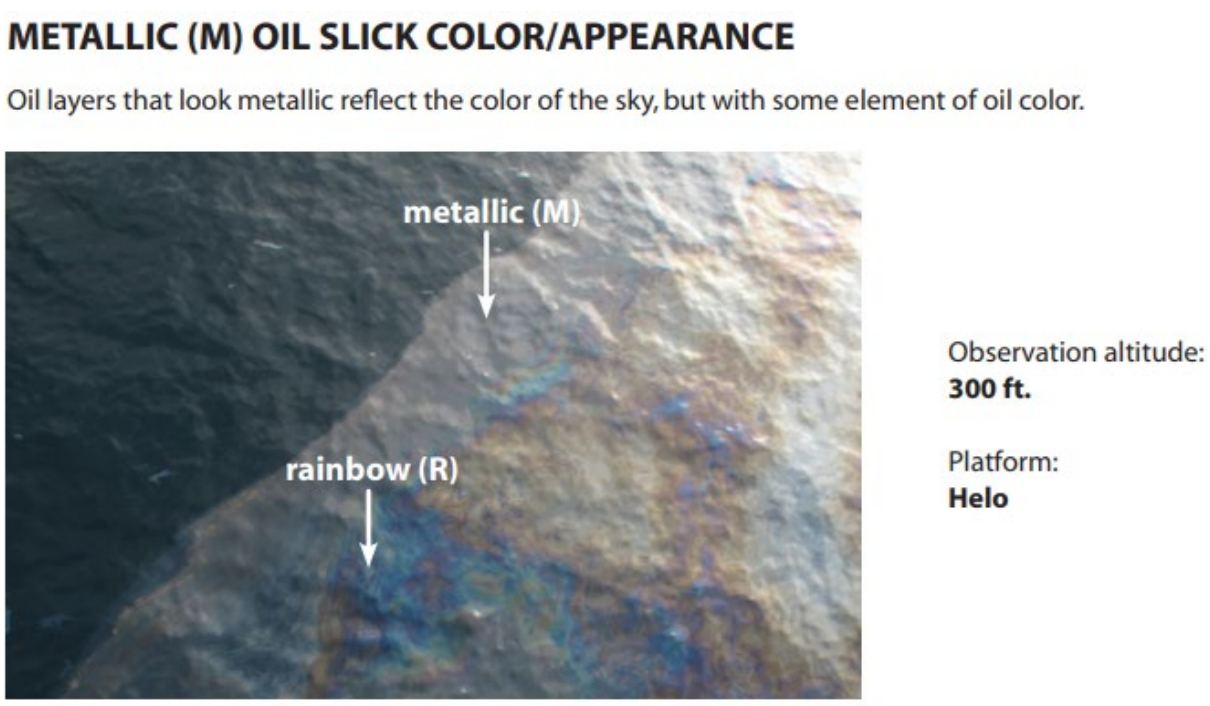


Figure 3 – Photo from NOAA Open Water Oil Identification Job Aid for Aerial Observation, Version 3, updated August 2016 (https://response.restoration.noaa.gov/sites/default/files/OWJA_2016.pdf).

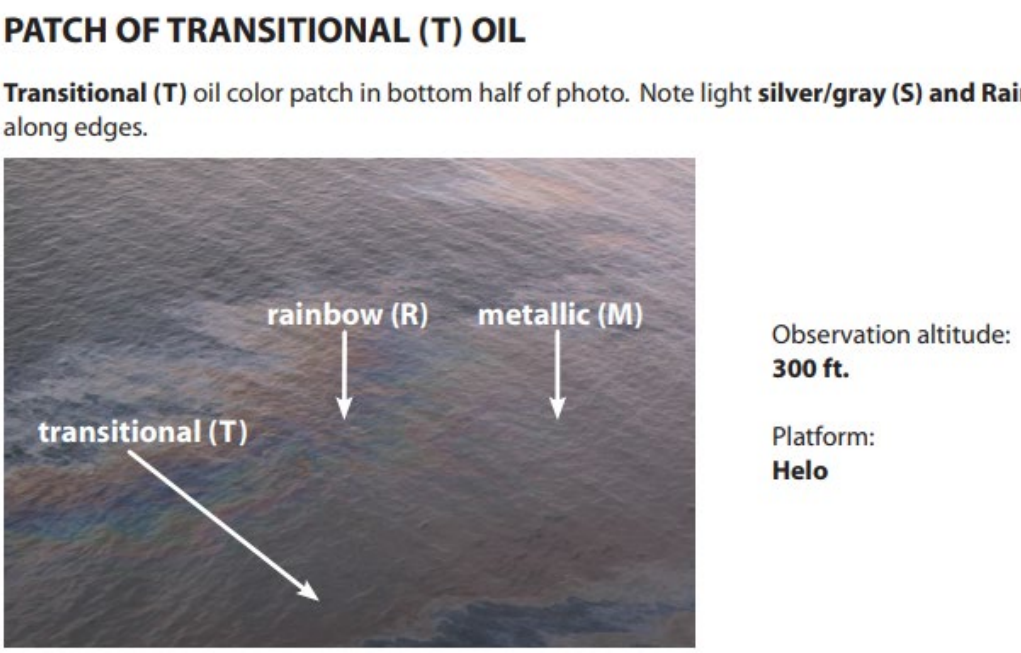


Figure 4 – Photo from NOAA Open Water Oil Identification Job Aid for Aerial Observation, Version 3, updated August 2016 (https://response.restoration.noaa.gov/sites/default/files/OWJA_2016.pdf).

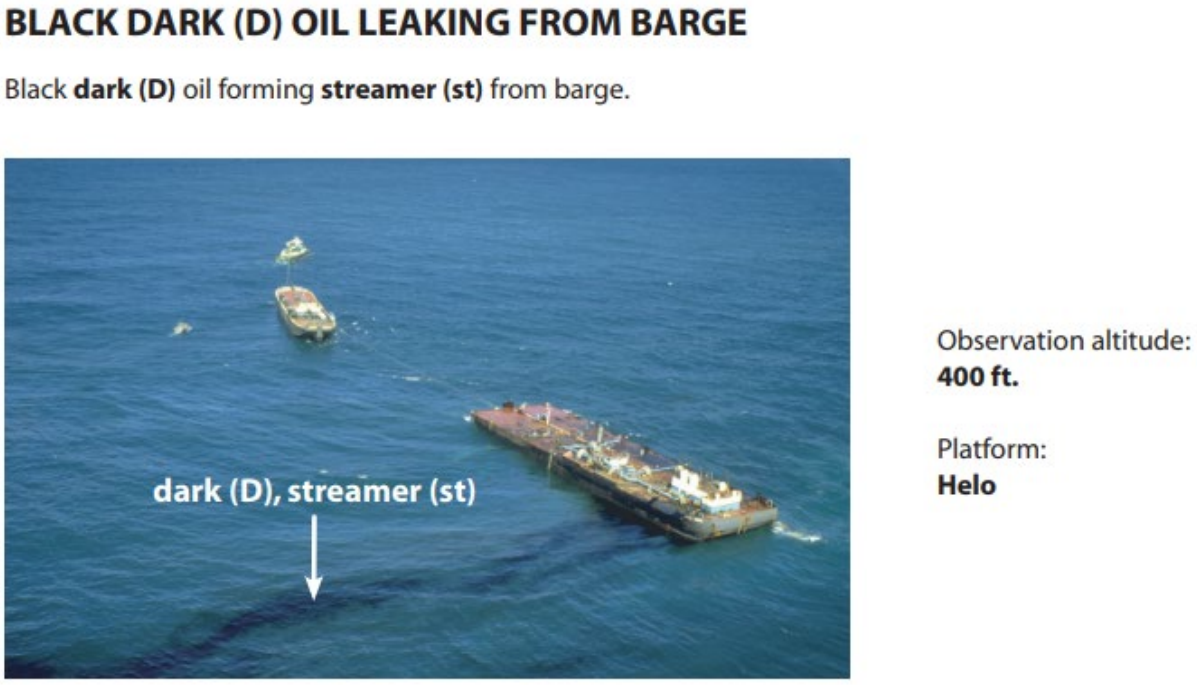


Figure 5 – Photo from NOAA Open Water Oil Identification Job Aid for Aerial Observation, Version 3, updated August 2016 (https://response.restoration.noaa.gov/sites/default/files/OWJA_2016.pdf).



Figure 6 – A brittle bacterial sheen is shown on the left and a non-brittle hydrocarbon sheen is shown on the right (Stout and Uhler, 2016). Photo taken from ITRC website (https://lnapl-3.itrcweb.org/appendix-e-lnapl-sheens-appendix/#).

Attachment B Field Logs

Ebullition-Facilitated NAPL Transport Field Survey Log 1

Project Number:	1804576	**Date: 9/21/2020**	
GEI Field Representative(s):	Youness Sharifi, Brian Fong-Murdock, Christos Saledas	**Survey Start Time: 8:30**	
Date:	09/21/20	**Survey End Time: 15:00**	
Survey Area (circle one):	/	**Time of Low or High Tide: Low Tide at 9:22**	

CONDITIONS OF TIME OF OBSERVATION:

Time of Observation:	9:45					**Weather:**		**Water Conditions:**			
Latitude / Longitude:	3134484.6525 / 810912.2192					**N - NE - E - SE - S - SW - W - NW**		X	**Calm (glassy or ripples with no crests)**		
Location of Ebullition relative to Coordinates:	This location was observed from the shoreline					**Light - Medium - Heavy**		◯	**Slight (waves not breaking)**		
Activities/ Structures near ebullition (mark with X, provide description):						**(Sunny) - Overcast - Rainy**		◯	**Moderate (crests begin to break, scattered whitecaps)**		
◯	**Watercraft Movement / Wake**	◯	**Sewers / Outfalls**	◯	**Construction / Drilling**	**Air Temp (F):**	**60**	◯	**Heavy (fairly frequent whitecaps)**		
◯	**Outfalls**	◯	**Construction**	◯	**Diving**	**Description / Notes:** Weather was calm and sunny. Colder in the morning around 45 °F but warmed up to about 60 °F. No wind		◯	**Vessel Wake / Turbulence**		
◯	**Sampling**	◯	**Other**					**Description (wave height, vessel traffic, other):** Water conditions were calm. There was no boat traffic on the river.			

APPARENT GAS EBULLITION OBSERVATIONS

Gas Ebullition Observations:

Is Apparent Gas Ebullition Observed? (Y) / N

Identify is the gas ebullition is one of the following (G, S, GS): G

(G) - Gas ebullition is seen as bubbles	(S) - Sheen	(GS) - Gas Ebullition bubbles and coincident sheen

Picture Taken? Y / (N) **Video Taken (Y/N)?** Y / (N)

Approximate Size of Gas Ebullition Area in feet (Length x Width): 3x5 feet

Bubble Frequency

Rate (bubbles/min):

◯	**High frequency:** Bubble rate is observed continuously and/or is uninterrupted for the entire period
◯	**Moderate frequency:** Bubble frequency is intermittent and irregular but continues through the 5-minute period.
X	**Low frequency:** Bubbles appear at specific, localized points. There is not a consistent stream of bubbles over the time period.

Describe if there are any conditions that could mimic or affect gas ebullition below:

Is a coincident sheen observed? (if yes, proceed to sheen observation section) Y / (N)

Sheen Observations:

Is a Sheen Observed? Y / (N)

Approximate Size of Sheen Area in feet (Length x Width):

Description of Sheen Color (See SOP for Pictures):

◯	**Silvery (S)** – Near transparent to silvery-gray; metallic
◯	**Rainbow (R) –** Multicolored
◯	**Metallic (M)** – Reflective light gray to dull brown
◯	**Transitional Dark (T)** – Transitional dark or true oil color. This description is used for a thicker oil, not an oil sheen.
◯	**Dark (E) –** A continuous true oil color; This description is used for the presence of thicker oil, not an oil sheen.

Is the Sheen Brittle or Non-Brittle?

◯	**Brittle –** The sheen cracks or breaks apparent when agitated
◯	**Non-Brittle -** The sheen blends or coalesces when agitated

Does the Sheen Blossom from the Apparent Gas Ebullition (if no, describe the sheen distribution below) Y / N

Rate (for sheen blossoms only, blossoms/min):

Sheen Distribution:

◯	**Streamer –** A narrow band or line of oil with clean water on each side
◯	**Spotty** – Isolated spots or blotches. Estimate the size range of the isolated patches.
◯	**Windows (streaks) –** Multiple bands or streaks that line parallel to each other
◯	**Contiguous** – A single, large patch, or area.

COMMENTS/ ADDITIONAL OBERVATIONS:

Ebullition was observed closer to the shoreline and river banks.

Ebullition-Facilitated NAPL Transport Field Survey Log 7

Project Number:	1804576	**Date: 9/21/2020**	
GEI Field Representative(s):	Youness Sharifi, Brian Fong-Murdock, Christos Saledas	**Survey Start Time: 8:30**	
Date:	09/21/20	**Survey End Time: 15:00**	
Survey Area (circle one):	/	**Time of Low or High Tide: Low Tide at 9:22**	

CONDITIONS OF TIME OF OBSERVATION:

Time of Observation:	10:11	**Weather:**		**Water Conditions:**	
Latitude / Longitude:	3134533.2071 / 810965.5052	**N - NE - E - SE - S - SW - W - NW**		X	**Calm (glassy or ripples with no crests)**
Location of Ebullition relative to Coordinates:	The ebullition was observed close to the fallen tree. Depth of water ~ 4 inches	**Light - Medium - Heavy**		◯	**Slight (waves not breaking)**
Activities/ Structures near ebullition (mark with X, provide description):		**Sunny - Overcast - Rainy**		◯	**Moderate (crests begin to break, scattered whitecaps)**
◯ **Watercraft Movement / Wake**	◯ **Sewers / Outfalls** ◯ **Construction / Drilling**	**Air Temp (F):**	60	◯	**Heavy (fairly frequent whitecaps)**
◯ **Outfalls**	◯ **Construction** ◯ **Diving**	**Description / Notes:** Weather was calm and sunny. Colder in the morning around 45 °F but warmed up to about 60 °F. No wind		◯	**Vessel Wake / Turbulence**
◯ **Sampling**	◯ **Other**			**Description (wave height, vessel traffic, other):** Water conditions were calm. There was no boat traffic on the river.	

APPARENT GAS EBULLITION OBSERVATIONS

Gas Ebullition Observations:

Is Apparent Gas Ebullition Observed? (Y) / N

Identify is the gas ebullition is one of the following (G, S, GS): G

(G) - Gas ebullition is seen as bubbles	(S) - Sheen	(GS) - Gas Ebullition bubbles and coincident sheen

Picture Taken? (Y) / N **Video Taken (Y/N)?** Y / (N)

Approximate Size of Gas Ebullition Area in feet (Length x Width): 3x5 feet

Bubble Frequency

Rate (bubbles/min):

◯	**High frequency:** Bubble rate is observed continuously and/or is uninterrupted for the entire period
◯	**Moderate frequency:** Bubble frequency is intermittent and irregular but continues through the 5-minute period.
X	**Low frequency:** Bubbles appear at specific, localized points. There is not a consistent stream of bubbles over the time period.

Describe if there are any conditions that could mimic or affect gas ebullition below:

Is a coincident sheen observed? (if yes, proceed to sheen observation section) Y / (N)

Sheen Observations:

Is a Sheen Observed? Y / (N)

Approximate Size of Sheen Area in feet (Length x Width):

Description of Sheen Color (See SOP for Pictures):

◯	**Silvery (S)** – Near transparent to silvery-gray; metallic
◯	**Rainbow (R) –** Multicolored
◯	**Metallic (M)** – Reflective light gray to dull brown
◯	**Transitional Dark (T)** – Transitional dark or true oil color. This description is used for a thicker oil, not an oil sheen.
◯	**Dark (E) –** A continuous true oil color; This description is used for the presence of thicker oil, not an oil sheen.

Is the Sheen Brittle or Non-Brittle?

◯	**Brittle –** The sheen cracks or breaks apparent when agitated
◯	**Non-Brittle -** The sheen blends or coalesces when agitated

Does the Sheen Blossom from the Apparent Gas Ebullition (if no, describe the sheen distribution below) Y / N

Rate (for sheen blossoms only, blossoms/min):

Sheen Distribution:

◯	**Streamer –** A narrow band or line of oil with clean water on each side
◯	**Spotty** – Isolated spots or blotches. Estimate the size range of the isolated patches.
◯	**Windows (streaks) –** Multiple bands or streaks that line parallel to each other
◯	**Contiguous** – A single, large patch, or area.

COMMENTS/ ADDITIONAL OBERVATIONS:

Ebullition was observed closer to the shoreline and river banks. The bubbles were small and dissipated quickly. Shadows made the photos look like there were sheen but no sheen was observed.

Pictures:


General area of observation, the bubbles were small and dissipated quickly

Ebullition-Facilitated NAPL Transport Field Survey Log 7

Pictures:



Ebullition-Facilitated NAPL Transport Field Survey Log 11

Project Number:	1804576	**Date: 9/21/2020**	
GEI Field Representative(s):	Youness Sharifi, Brian Fong-Murdock, Christos Saledas	**Survey Start Time: 8:30**	
Date:	09/21/20	**Survey End Time: 15:00**	
Survey Area (circle one):	/	**Time of Low or High Tide: Low Tide at 9:22**	

CONDITIONS OF TIME OF OBSERVATION:

Time of Observation:	10:28							
Latitude / Longitude:	3134647.6607 / 810720.7805							
Location of Ebullition relative to Coordinates:	Ebullition was observed close to the vegetation, depth of water 2-3 inches.							
Activities/ Structures near ebullition (mark with X, provide description):								
◯	**Watercraft Movement / Wake**	◯	**Sewers / Outfalls**	◯	**Construction / Drilling**			
◯	**Outfalls**	◯	**Construction**	◯	**Diving**			
◯	**Sampling**	◯	**Other**					

Weather:

N - NE - E - SE - S - SW - W - NW

Light - Medium - Heavy

(Sunny) - Overcast - Rainy

Air Temp (F): 60

Description / Notes:
Weather was calm and sunny. Colder in the morning around 45 °F but warmed up to about 60 °F. No wind.

Water Conditions:

X	**Calm (glassy or ripples with no crests)**
◯	**Slight (waves not breaking)**
◯	**Moderate (crests begin to break, scattered whitecaps)**
◯	**Heavy (fairly frequent whitecaps)**
◯	**Vessel Wake / Turbulence**

Description (wave height, vessel traffic, other):
Water conditions were calm. There was no boat traffic on the river.

APPARENT GAS EBULLITION OBSERVATIONS

Gas Ebullition Observations:

Is Apparent Gas Ebullition Observed? (Y) / N

Identify is the gas ebullition is one of the following (G, S, GS): G

(G) - Gas ebullition is seen as bubbles	(S) - Sheen	(GS) - Gas Ebullition bubbles and coincident sheen

Picture Taken? (Y) / N **Video Taken (Y/N)?** Y / (N)

Approximate Size of Gas Ebullition Area in feet (Length x Width): 3x5 feet

Bubble Frequency

Rate (bubbles/min): 3mm diameter

◯	**High frequency:** Bubble rate is observed continuously and/or is uninterrupted for the entire period
◯	**Moderate frequency:** Bubble frequency is intermittent and irregular but continues through the 5-minute period.
X	**Low frequency:** Bubbles appear at specific, localized points. There is not a consistent stream of bubbles over the time period.

Describe if there are any conditions that could mimic or affect gas ebullition below:

Is a coincident sheen observed? (if yes, proceed to sheen observation section) Y / (N)

Sheen Observations:

Is a Sheen Observed? Y / (N)

Approximate Size of Sheen Area in feet (Length x Width):

Description of Sheen Color (See SOP for Pictures):

◯	**Silvery (S)** – Near transparent to silvery-gray; metallic
◯	**Rainbow (R) –** Multicolored
◯	**Metallic (M)** – Reflective light gray to dull brown
◯	**Transitional Dark (T)** – Transitional dark or true oil color. This description is used for a thicker oil, not an oil sheen.
◯	**Dark (E) –** A continuous true oil color; This description is used for the presence of thicker oil, not an oil sheen.

Is the Sheen Brittle or Non-Brittle?

◯	**Brittle –** The sheen cracks or breaks apparent when agitated
◯	**Non-Brittle -** The sheen blends or coalesces when agitated

Does the Sheen Blossom from the Apparent Gas Ebullition (if no, describe the sheen distribution below) Y / N

Rate (for sheen blossoms only, blossoms/min):

Sheen Distribution:

◯	**Streamer –** A narrow band or line of oil with clean water on each side
◯	**Spotty** – Isolated spots or blotches. Estimate the size range of the isolated patches.
◯	**Windows (streaks) –** Multiple bands or streaks that line parallel to each other
◯	**Contiguous** – A single, large patch, or area.

COMMENTS/ ADDITIONAL OBERVATIONS:

Ebullition was observed closer to the shoreline and river banks.

Ebullition-Facilitated NAPL Transport Field Survey Log 11

Pictures:



Ebullition-Facilitated NAPL Transport Field Survey Log 17

Project Number:	1804576	**Date: 9/21/2020**	
GEI Field Representative(s):	Youness Sharifi, Brian Fong-Murdock, Christos Saledas	**Survey Start Time: 8:30**	
Date:	09/21/20	**Survey End Time: 15:00**	
Survey Area (circle one):	/	**Time of Low or High Tide: Low Tide at 9:22**	

CONDITIONS OF TIME OF OBSERVATION:

Time of Observation:	11:05	**Weather:**		**Water Conditions:**	
Latitude / Longitude:	3135025.2679 / 810415.0951	**N - NE - E - SE - S - SW - W - NW**		X	**Calm (glassy or ripples with no crests)**
Location of Ebullition relative to Coordinates:	Ebullition was observed closer to the vegetation.	**Light - Medium - Heavy**		◯	**Slight (waves not breaking)**
Activities/ Structures near ebullition (mark with X, provide description):		**Sunny - Overcast - Rainy**		◯	**Moderate (crests begin to break, scattered whitecaps)**
◯ **Watercraft Movement / Wake**	◯ **Sewers / Outfalls** ◯ **Construction / Drilling**	**Air Temp (F):**	60	◯	**Heavy (fairly frequent whitecaps)**
◯ **Outfalls**	◯ **Construction** ◯ **Diving**	**Description / Notes:** Weather was calm and sunny. Colder in the morning around 45 °F but warmed up to about 60 °F. No wind.		◯	**Vessel Wake / Turbulence**
◯ **Sampling**	◯ **Other**			**Description (wave height, vessel traffic, other):** Water conditions were calm. There was no boat traffic on the river.	

APPARENT GAS EBULLITION OBSERVATIONS

Gas Ebullition Observations:

Is Apparent Gas Ebullition Observed? (Y) / N

Identify is the gas ebullition is one of the following (G, S, GS): G

(G) - Gas ebullition is seen as bubbles	(S) - Sheen	(GS) - Gas Ebullition bubbles and coincident sheen

Picture Taken? (Y) / N **Video Taken (Y/N)?** Y / (N)

Approximate Size of Gas Ebullition Area in feet (Length x Width): 3x5 feet

Bubble Frequency

Rate (bubbles/min): 3-4mm diameter

◯ **High frequency:** Bubble rate is observed continuously and/or is uninterrupted for the entire period

◯ **Moderate frequency:** Bubble frequency is intermittent and irregular but continues through the 5-minute period.

X **Low frequency:** Bubbles appear at specific, localized points. There is not a consistent stream of bubbles over the time period.

Describe if there are any conditions that could mimic or affect gas ebullition below:

Is a coincident sheen observed? (if yes, proceed to sheen observation section) Y / (N)

Sheen Observations:

Is a Sheen Observed? Y / (N)

Approximate Size of Sheen Area in feet (Length x Width):

Description of Sheen Color (See SOP for Pictures):

◯ **Silvery (S)** – Near transparent to silvery-gray; metallic

◯ **Rainbow (R) –** Multicolored

◯ **Metallic (M)** – Reflective light gray to dull brown

◯ **Transitional Dark (T)** – Transitional dark or true oil color. This description is used for a thicker oil, not an oil sheen.

◯ **Dark (E) –** A continuous true oil color; This description is used for the presence of thicker oil, not an oil sheen.

Is the Sheen Brittle or Non-Brittle?

◯ **Brittle –** The sheen cracks or breaks apparent when agitated

◯ **Non-Brittle -** The sheen blends or coalesces when agitated

Does the Sheen Blossom from the Apparent Gas Ebullition (if no, describe the sheen distribution below) Y / N

Rate (for sheen blossoms only, blossoms/min):

Sheen Distribution:

◯ **Streamer –** A narrow band or line of oil with clean water on each side

◯ **Spotty** – Isolated spots or blotches. Estimate the size range of the isolated patches.

◯ **Windows (streaks) –** Multiple bands or streaks that line parallel to each other

◯ **Contiguous** – A single, large patch, or area.

COMMENTS/ ADDITIONAL OBERVATIONS:

Ebullition was observed closer to the vegetation, shoreline and river banks. The bubbles were small and disappeared quickly. The frequency of ebullition was very slow and it would take several minutes between each surfacing of the bubbles.

Ebullition-Facilitated NAPL Transport Field Survey Log 17

Pictures:



Ebullition-Facilitated NAPL Transport Field Survey Log 18

Project Number:	1804576	**Date: 9/21/2020**	
GEI Field Representative(s):	Youness Sharifi, Brian Fong-Murdock, Christos Saledas	**Survey Start Time: 8:30**	
Date:	09/21/20	**Survey End Time: 15:00**	
Survey Area (circle one):	/	**Time of Low or High Tide: Low Tide at 9:22**	

CONDITIONS OF TIME OF OBSERVATION:

Time of Observation:	11:12	**Weather:**		**Water Conditions:**	
Latitude / Longitude:	3135085.1093 / 810327.854	**N - NE - E - SE - S - SW - W - NW**		X	**Calm (glassy or ripples with no crests)**
Location of Ebullition relative to Coordinates:	Ebullition was observed closer to the vegetation	**Light - Medium - Heavy**		◯	**Slight (waves not breaking)**
Activities/ Structures near ebullition (mark with X, provide description):		**Sunny - Overcast - Rainy**		◯	**Moderate (crests begin to break, scattered whitecaps)**
◯ **Watercraft Movement / Wake**	◯ **Sewers / Outfalls** ◯ **Construction / Drilling**	**Air Temp (F):**	60	◯	**Heavy (fairly frequent whitecaps)**
◯ **Outfalls**	◯ **Construction** ◯ **Diving**	**Description / Notes:** Weather was calm and sunny. Colder in the morning around 45 °F but warmed up to about 60 °F. No wind.		◯	**Vessel Wake / Turbulence**
◯ **Sampling**	◯ **Other**			**Description (wave height, vessel traffic, other):** Water conditions were calm. There was no boat traffic on the river.	

APPARENT GAS EBULLITION OBSERVATIONS

Gas Ebullition Observations:

Is Apparent Gas Ebullition Observed? (Y) / N

Identify is the gas ebullition is one of the following (G, S, GS): G

(G) - Gas ebullition is seen as bubbles	(S) - Sheen	(GS) - Gas Ebullition bubbles and coincident sheen

Picture Taken? (Y) / N **Video Taken (Y/N)?** Y / (N)

Approximate Size of Gas Ebullition Area in feet (Length x Width): 3x5 feet

Bubble Frequency

Rate (bubbles/min): 3mm diameter

◯	**High frequency:** Bubble rate is observed continuously and/or is uninterrupted for the entire period
◯	**Moderate frequency:** Bubble frequency is intermittent and irregular but continues through the 5-minute period.
X	**Low frequency:** Bubbles appear at specific, localized points. There is not a consistent stream of bubbles over the time period.

Describe if there are any conditions that could mimic or affect gas ebullition below:

Ebullition came out between grass

Is a coincident sheen observed? (if yes, proceed to sheen observation section) Y / (N)

Sheen Observations:

Is a Sheen Observed? Y / (N)

Approximate Size of Sheen Area in feet (Length x Width):

Description of Sheen Color (See SOP for Pictures):

◯	**Silvery (S)** – Near transparent to silvery-gray; metallic
◯	**Rainbow (R) –** Multicolored
◯	**Metallic (M)** – Reflective light gray to dull brown
◯	**Transitional Dark (T)** – Transitional dark or true oil color. This description is used for a thicker oil, not an oil sheen.
◯	**Dark (E) –** A continuous true oil color; This description is used for the presence of thicker oil, not an oil sheen.

Is the Sheen Brittle or Non-Brittle?

◯	**Brittle –** The sheen cracks or breaks apparent when agitated
◯	**Non-Brittle -** The sheen blends or coalesces when agitated

Does the Sheen Blossom from the Apparent Gas Ebullition (if no, describe the sheen distribution below) Y / N

Rate (for sheen blossoms only, blossoms/min):

Sheen Distribution:

◯	**Streamer –** A narrow band or line of oil with clean water on each side
◯	**Spotty** – Isolated spots or blotches. Estimate the size range of the isolated patches.
◯	**Windows (streaks) –** Multiple bands or streaks that line parallel to each other
◯	**Contiguous** – A single, large patch, or area.

COMMENTS/ ADDITIONAL OBERVATIONS:

Ebullition was observed closer to the vegetation shoreline and river banks, especially in the shallower depth of water. Bubbles were small and disappeared quickly. The ebullition frequency was very slow and it would take several minutes between each bubble release.

Pictures:


General areas of observation, the bubbles were small and dissipated quickly

Ebullition-Facilitated NAPL Transport Field Survey Log 29

Project Number:	1804576	**Date: 9/21/2020**	
GEI Field Representative(s):	Youness Sharifi, Brian Fong-Murdock, Christos Saledas	**Survey Start Time: 8:30**	
Date:	09/21/20	**Survey End Time: 15:00**	
Survey Area (circle one):	/	**Time of Low or High Tide: Low Tide at 9:22**	

CONDITIONS OF TIME OF OBSERVATION:

Time of Observation:	12:05						
Latitude / Longitude:	3135834.0603 / 810052.8613						
Location of Ebullition relative to Coordinates:	Ebullition was observed in the shallow water close to the vegetation. Depth of water <2 inches						
Activities/ Structures near ebullition (mark with X, provide description):							
◯	**Watercraft Movement / Wake**	◯	**Sewers / Outfalls**	◯	**Construction / Drilling**		
◯	**Outfalls**	◯	**Construction**	◯	**Diving**		
◯	**Sampling**	◯	**Other**				

Weather:		**Water Conditions:**	
N - NE - E - SE - S - SW - W - NW		X	**Calm (glassy or ripples with no crests)**
Light - Medium - Heavy		◯	**Slight (waves not breaking)**
(Sunny) - Overcast - Rainy		◯	**Moderate (crests begin to break, scattered whitecaps)**
Air Temp (F):	**60**	◯	**Heavy (fairly frequent whitecaps)**
Description / Notes: **Weather was calm and sunny. Colder in the morning around 45 °F but warmed up to about 60 °F. No wind.**		◯	**Vessel Wake / Turbulence**
		Description (wave height, vessel traffic, other): **Water conditions were calm. There was no boat traffic on the river.**	

APPARENT GAS EBULLITION OBSERVATIONS

Gas Ebullition Observations:

Is Apparent Gas Ebullition Observed? (Y) / N

Identify is the gas ebullition is one of the following (G, S, GS):

(G) - Gas ebullition is seen as bubbles	**(S) - Sheen**	**(GS) - Gas Ebullition bubbles and coincident sheen**

Picture Taken? (Y) / N **Video Taken (Y/N)?** Y / (N)

Approximate Size of Gas Ebullition Area in feet (Length x Width):

Bubble Frequency

Rate (bubbles/min):

◯	**High frequency:** Bubble rate is observed continuously and/or is uninterrupted for the entire period
◯	**Moderate frequency:** Bubble frequency is intermittent and irregular but continues through the 5-minute period.
X	**Low frequency:** Bubbles appear at specific, localized points. There is not a consistent stream of bubbles over the time period.

Describe if there are any conditions that could mimic or affect gas ebullition below:

Is a coincident sheen observed? (if yes, proceed to sheen observation section) (Y) / N

Sheen Observations:

Is a Sheen Observed? (Y) / N

Approximate Size of Sheen Area in feet (Length x Width): **1.5 x 1.5 ft**

Description of Sheen Color (See SOP for Pictures):

X	**Silvery (S)** – Near transparent to silvery-gray; metallic
◯	**Rainbow (R) –** Multicolored
◯	**Metallic (M)** – Reflective light gray to dull brown
◯	**Transitional Dark (T)** – Transitional dark or true oil color. This description is used for a thicker oil, not an oil sheen.
◯	**Dark (E) –** A continuous true oil color; This description is used for the presence of thicker oil, not an oil sheen.

Is the Sheen Brittle or Non-Brittle?

X	**Brittle –** The sheen cracks or breaks apparent when agitated
◯	**Non-Brittle -** The sheen blends or coalesces when agitated

Does the Sheen Blossom from the Apparent Gas Ebullition (if no, describe the sheen distribution below) Y / (N)

Rate (for sheen blossoms only, blossoms/min):

Sheen Distribution:

◯	**Streamer –** A narrow band or line of oil with clean water on each side
X	**Spotty** – Isolated spots or blotches. Estimate the size range of the isolated patches.
◯	**Windows (streaks) –** Multiple bands or streaks that line parallel to each other
◯	**Contiguous** – A single, large patch, or area.

COMMENTS/ ADDITIONAL OBERVATIONS:

Ebullition was observed closer to the shoreline and river banks. The brittle sheen was already separating by the water motion and ripples from the boat. The sheen was silvery gray and near transparent (The patches were appositely 2 inch in diameter).

Ebullition-Facilitated NAPL Transport Field Survey Log 29

Pictures:



Ebullition-Facilitated NAPL Transport Field Survey Log 30

Project Number:	1804576	**Date: 9/21/2020**	
GEI Field Representative(s):	Youness Sharifi, Brian Fong-Murdock, Christos Saledas	**Survey Start Time: 8:30**	
Date:	09/21/20	**Survey End Time: 15:00**	
Survey Area (circle one):	/	**Time of Low or High Tide: Low Tide at 9:22**	

CONDITIONS OF TIME OF OBSERVATION:

Time of Observation:	12:10					**Weather:**		**Water Conditions:**			
Latitude / Longitude:	3135929.7195 / 810039.8996					**N - NE - E - SE - S - SW - W - NW**		X	**Calm (glassy or ripples with no crests)**		
Location of Ebullition relative to Coordinates:	Ebullition was observed in the shallow water, close to the vegetation. Depth of water <2 inches.					**Light - Medium - Heavy**		◯	**Slight (waves not breaking)**		
Activities/ Structures near ebullition (mark with X, provide description):						**(Sunny) - Overcast - Rainy**		◯	**Moderate (crests begin to break, scattered whitecaps)**		
◯	**Watercraft Movement / Wake**	◯	**Sewers / Outfalls**	◯	**Construction / Drilling**	**Air Temp (F):**	**60**	◯	**Heavy (fairly frequent whitecaps)**		
◯	**Outfalls**	◯	**Construction**	◯	**Diving**	**Description / Notes:** Weather was calm and sunny. Colder in the morning around 45 °F but warmed up to about 60 °F. No wind.		◯	**Vessel Wake / Turbulence**		
◯	**Sampling**	◯	**Other**					**Description (wave height, vessel traffic, other):** Water conditions were calm. There was no boat traffic on the river.			

APPARENT GAS EBULLITION OBSERVATIONS

Gas Ebullition Observations:

Is Apparent Gas Ebullition Observed? (Y) / N

Identify is the gas ebullition is one of the following (G, S, GS):

(G) - Gas ebullition is seen as bubbles	(S) - Sheen	(GS) - Gas Ebullition bubbles and coincident sheen

Picture Taken? (Y) / N **Video Taken (Y/N)?** Y / (N)

Approximate Size of Gas Ebullition Area in feet (Length x Width):

Bubble Frequency

Rate (bubbles/min):

◯	**High frequency:** Bubble rate is observed continuously and/or is uninterrupted for the entire period
◯	**Moderate frequency:** Bubble frequency is intermittent and irregular but continues through the 5-minute period.
X	**Low frequency:** Bubbles appear at specific, localized points. There is not a consistent stream of bubbles over the time period.

Describe if there are any conditions that could mimic or affect gas ebullition below:

Is a coincident sheen observed? (if yes, proceed to sheen observation section) (Y) / N

Sheen Observations:

Is a Sheen Observed? (Y) / N

Approximate Size of Sheen Area in feet (Length x Width): 3 x 3 ft

Description of Sheen Color (See SOP for Pictures):

X	**Silvery (S)** – Near transparent to silvery-gray; metallic
◯	**Rainbow (R) –** Multicolored
◯	**Metallic (M)** – Reflective light gray to dull brown
◯	**Transitional Dark (T)** – Transitional dark or true oil color. This description is used for a thicker oil, not an oil sheen.
◯	**Dark (E) –** A continuous true oil color; This description is used for the presence of thicker oil, not an oil sheen.

Is the Sheen Brittle or Non-Brittle?

X	**Brittle –** The sheen cracks or breaks apparent when agitated
◯	**Non-Brittle -** The sheen blends or coalesces when agitated

Does the Sheen Blossom from the Apparent Gas Ebullition (if no, describe the sheen distribution below) Y / (N)

Rate (for sheen blossoms only, blossoms/min):

Sheen Distribution:

◯	**Streamer –** A narrow band or line of oil with clean water on each side
X	**Spotty** – Isolated spots or blotches. Estimate the size range of the isolated patches
◯	**Windows (streaks) –** Multiple bands or streaks that line parallel to each other
◯	**Contiguous** – A single, large patch, or area.

COMMENTS/ ADDITIONAL OBERVATIONS:

Ebullition was observed closer to the shoreline and river banks. The brittle sheen was separating and disappearing by the water motion. The sheen was silvery gray and near transparent. (The patches were approximately 1 inch in diameter). The sheen moved on the water surface and it might spread wider than the observed area.

Ebullition-Facilitated NAPL Transport Field Survey Log 30

Pictures:



Ebullition-Facilitated NAPL Transport Field Survey Log 36

Project Number:	1804576	**Date: 9/21/2020**	
GEI Field Representative(s):	Youness Sharifi, Brian Fong-Murdock, Christos Saledas	**Survey Start Time: 8:30**	
Date:	09/21/20	**Survey End Time: 15:00**	
Survey Area (circle one):	/	**Time of Low or High Tide: Low Tide at 9:22**	

CONDITIONS OF TIME OF OBSERVATION:

Time of Observation:	12:35					**Weather:**		**Water Conditions:**			
Latitude / Longitude:	3136501.4388 / 810326.5582					**N - NE - E - SE - S - SW - W - NW**		X	**Calm (glassy or ripples with no crests)**		
Location of Ebullition relative to Coordinates:	Depth of water <2 inches					**Light - Medium - Heavy**		◯	**Slight (waves not breaking)**		
Activities/ Structures near ebullition (mark with X, provide description):						**(Sunny) - Overcast - Rainy**		◯	**Moderate (crests begin to break, scattered whitecaps)**		
◯	**Watercraft Movement / Wake**	◯	**Sewers / Outfalls**	◯	**Construction / Drilling**	**Air Temp (F):**	**60**	◯	**Heavy (fairly frequent whitecaps)**		
◯	**Outfalls**	◯	**Construction**	◯	**Diving**	**Description / Notes:** Weather was calm and sunny. Colder in the morning around 45 °F but warmed up to about 60 °F. No wind.		◯	**Vessel Wake / Turbulence**		
◯	**Sampling**	◯	**Other**					**Description (wave height, vessel traffic, other):** Water conditions were calm. There was no boat traffic on the river.			

APPARENT GAS EBULLITION OBSERVATIONS

Gas Ebullition Observations:

Is Apparent Gas Ebullition Observed? Y / (N)

Identify is the gas ebullition is one of the following (G, S, GS):

(G) - Gas ebullition is seen as bubbles	(S) - Sheen	(GS) - Gas Ebullition bubbles and coincident sheen

Picture Taken? Y / (N) **Video Taken (Y/N)?** Y / (N)

Approximate Size of Gas Ebullition Area in feet (Length x Width):

Bubble Frequency

Rate (bubbles/min):

◯	**High frequency:** Bubble rate is observed continuously and/or is uninterrupted for the entire period
◯	**Moderate frequency:** Bubble frequency is intermittent and irregular but continues through the 5-minute period.
◯	**Low frequency:** Bubbles appear at specific, localized points. There is not a consistent stream of bubbles over the time period.

Describe if there are any conditions that could mimic or affect gas ebullition below:

Is a coincident sheen observed? (if yes, proceed to sheen observation section) (Y) / N

Sheen Observations:

Is a Sheen Observed? (Y) / N

Approximate Size of Sheen Area in feet (Length x Width): 1 x 1 ft

Description of Sheen Color (See SOP for Pictures):

X	**Silvery (S)** – Near transparent to silvery-gray; metallic
◯	**Rainbow (R) –** Multicolored
◯	**Metallic (M)** – Reflective light gray to dull brown
◯	**Transitional Dark (T)** – Transitional dark or true oil color. This description is used for a thicker oil, not an oil sheen.
◯	**Dark (E) –** A continuous true oil color; This description is used for the presence of thicker oil, not an oil sheen.

Is the Sheen Brittle or Non-Brittle?

X	**Brittle –** The sheen cracks or breaks apparent when agitated
◯	**Non-Brittle -** The sheen blends or coalesces when agitated

Does the Sheen Blossom from the Apparent Gas Ebullition (if no, describe the sheen distribution below) Y / (N)

Rate (for sheen blossoms only, blossoms/min):

Sheen Distribution:

◯	**Streamer –** A narrow band or line of oil with clean water on each side
X	**Spotty** – Isolated spots or blotches. Estimate the size range of the isolated patches
◯	**Windows (streaks) –** Multiple bands or streaks that line parallel to each other
◯	**Contiguous** – A single, large patch, or area.

COMMENTS/ ADDITIONAL OBERVATIONS:

The brittle sheen was quickly separating and disappearing. The sheen was silvery gray and near transparent (The patches were approximately 1 inch in diameter).

Ebullition-Facilitated NAPL Transport Field Survey Log 37

Project Number:	1804576	**Date: 9/21/2020**	
GEI Field Representative(s):	Youness Sharifi, Brian Fong-Murdock, Christos Saledas	**Survey Start Time: 8:30**	
Date:	09/21/20	**Survey End Time: 15:00**	
Survey Area (circle one):	/	**Time of Low or High Tide: Low Tide at 9:22**	

CONDITIONS OF TIME OF OBSERVATION:

Time of Observation:	12:39				
Latitude / Longitude:	3136515.019 / 810427.615				
Location of Ebullition relative to Coordinates:	Depth water <2 inches				
Activities/ Structures near ebullition (mark with X, provide description):					
◯	**Watercraft Movement / Wake**	◯	**Sewers / Outfalls**	◯	**Construction / Drilling**
◯	**Outfalls**	◯	**Construction**	◯	**Diving**
◯	**Sampling**	◯	**Other**		

Weather:

N - NE - E - SE - S - SW - W - NW

Light - Medium - Heavy

Sunny - Overcast - Rainy

Air Temp (F): 60

Description / Notes:
Weather was calm and sunny. Colder in the morning around 45 °F but warmed up to about 60 °F. No wind.

Water Conditions:

X	**Calm (glassy or ripples with no crests)**
◯	**Slight (waves not breaking)**
◯	**Moderate (crests begin to break, scattered whitecaps)**
◯	**Heavy (fairly frequent whitecaps)**
◯	**Vessel Wake / Turbulence**

Description (wave height, vessel traffic, other):
Water conditions were calm. There was no boat traffic on the river.

APPARENT GAS EBULLITION OBSERVATIONS

Gas Ebullition Observations:

Is Apparent Gas Ebullition Observed? Y / N

Identify is the gas ebullition is one of the following (G, S, GS): G

(G) - Gas ebullition is seen as bubbles	(S) - Sheen	(GS) - Gas Ebullition bubbles and coincident sheen

Picture Taken? Y / N **Video Taken (Y/N)?** Y / N

Approximate Size of Gas Ebullition Area in feet (Length x Width): 4x4 feet

Bubble Frequency

Rate (bubbles/min): 3-4mm diameter

◯	**High frequency:** Bubble rate is observed continuously and/or is uninterrupted for the entire period
◯	**Moderate frequency:** Bubble frequency is intermittent and irregular but continues through the 5-minute period.
X	**Low frequency:** Bubbles appear at specific, localized points. There is not a consistent stream of bubbles over the time period.

Describe if there are any conditions that could mimic or affect gas ebullition below:

Is a coincident sheen observed? (if yes, proceed to sheen observation section) Y / N

Sheen Observations:

Is a Sheen Observed? Y / N

Approximate Size of Sheen Area in feet (Length x Width):

Description of Sheen Color (See SOP for Pictures):

◯	**Silvery (S)** – Near transparent to silvery-gray; metallic
◯	**Rainbow (R) –** Multicolored
◯	**Metallic (M)** – Reflective light gray to dull brown
◯	**Transitional Dark (T)** – Transitional dark or true oil color. This description is used for a thicker oil, not an oil sheen.
◯	**Dark (E) –** A continuous true oil color; This description is used for the presence of thicker oil, not an oil sheen.

Is the Sheen Brittle or Non-Brittle?

◯	**Brittle –** The sheen cracks or breaks apparent when agitated
◯	**Non-Brittle -** The sheen blends or coalesces when agitated

Does the Sheen Blossom from the Apparent Gas Ebullition (if no, describe the sheen distribution below) Y / N

Rate (for sheen blossoms only, blossoms/min):

Sheen Distribution:

◯	**Streamer –** A narrow band or line of oil with clean water on each side
◯	**Spotty** – Isolated spots or blotches. Estimate the size range of the isolated patches.
◯	**Windows (streaks) –** Multiple bands or streaks that line parallel to each other
◯	**Contiguous** – A single, large patch, or area.

COMMENTS/ ADDITIONAL OBERVATIONS:

Ebullition was observed in shallower depth. A brown brittle muddy layer on top of the water with approximate area of 2 x 3 ft.

Ebullition-Facilitated NAPL Transport Field Survey Log 37

Pictures:



Ebullition-Facilitated NAPL Transport Field Survey Log 39

Project Number:	1804576	**Date: 9/21/2020**	
GEI Field Representative(s):	Youness Sharifi, Brian Fong-Murdock, Christos Saledas	**Survey Start Time: 8:30**	
Date:	09/21/20	**Survey End Time: 15:00**	
Survey Area (circle one):	/	**Time of Low or High Tide: Low Tide at 9:22**	

CONDITIONS OF TIME OF OBSERVATION:

Time of Observation:	12:48	**Weather:**		**Water Conditions:**	
Latitude / Longitude:	3136624.9274 / 810573.6783	N - NE - E - SE - S - SW - W - NW		X	Calm (glassy or ripples with no crests)
Location of Ebullition relative to Coordinates:	Ebullition and sheen was observed. Depth of water ~3 inches	Light - Medium - Heavy		○	Slight (waves not breaking)
Activities/ Structures near ebullition (mark with X, provide description):		Sunny - Overcast - Rainy		○	Moderate (crests begin to break, scattered whitecaps)
○ Watercraft Movement / Wake	○ Sewers / Outfalls	○ Construction / Drilling	**Air Temp (F):** 60	○	Heavy (fairly frequent whitecaps)
○ Outfalls	○ Construction	○ Diving	**Description / Notes:** Weather was calm and sunny. Colder in the morning around 45 °F but warmed up to about 60 °F. No wind.	○	Vessel Wake / Turbulence
○ Sampling	○ Other			**Description (wave height, vessel traffic, other):** Water conditions were calm. There was no boat traffic on the river.	

APPARENT GAS EBULLITION OBSERVATIONS

Gas Ebullition Observations:

Is Apparent Gas Ebullition Observed?	Y / N	
Identify is the gas ebullition is one of the following (G, S, GS):		
(G) - Gas ebullition is seen as bubbles	(S) - Sheen	(GS) - Gas Ebullition bubbles and coincident sheen
Picture Taken? Y / N	**Video Taken (Y/N)?** Y / N	
Approximate Size of Gas Ebullition Area in feet (Length x Width):		
Bubble Frequency		
Rate (bubbles/min):		
○	**High frequency:** Bubble rate is observed continuously and/or is uninterrupted for the entire period	
○	**Moderate frequency:** Bubble frequency is intermittent and irregular but continues through the 5-minute period.	
X	**Low frequency:** Bubbles appear at specific, localized points. There is not a consistent stream of bubbles over the time period.	
Describe if there are any conditions that could mimic or affect gas ebullition below:		
Is a coincident sheen observed? (if yes, proceed to sheen observation section)	Y / N	

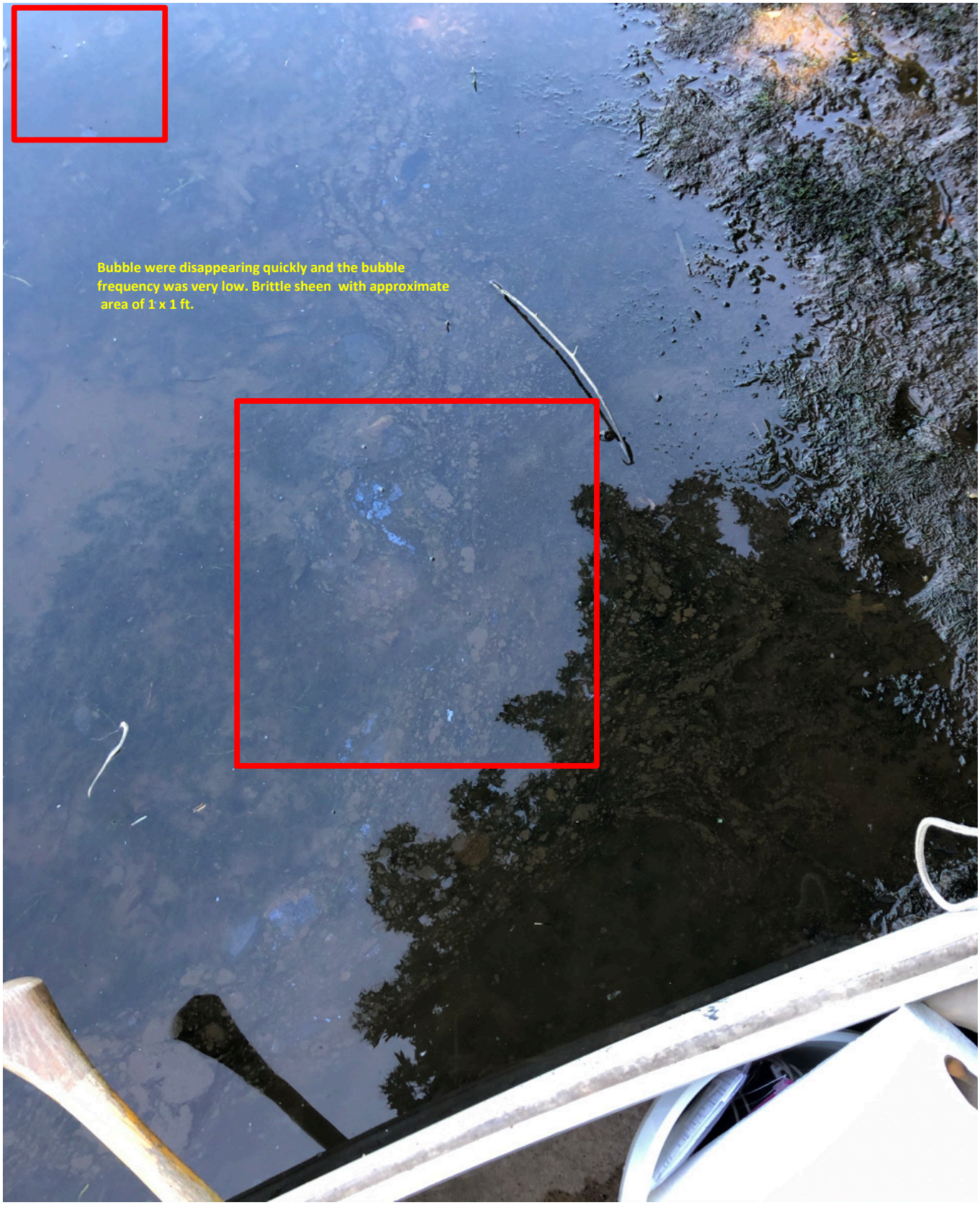
Sheen Observations:

Is a Sheen Observed?	Y / N
Approximate Size of Sheen Area in feet (Length x Width):	1 x 1 ft
Description of Sheen Color (See SOP for Pictures):	
X	**Silvery (S)** – Near transparent to silvery-gray; metallic
○	**Rainbow (R)** – Multicolored
○	**Metallic (M)** – Reflective light gray to dull brown
○	**Transitional Dark (T)** – Transitional dark or true oil color. This description is used for a thicker oil, not an oil sheen.
○	**Dark (E)** – A continuous true oil color; This description is used for the presence of thicker oil, not an oil sheen.
Is the Sheen Brittle or Non-Brittle?	
X	**Brittle** – The sheen cracks or breaks apparent when agitated
○	**Non-Brittle** - The sheen blends or coalesces when agitated
Does the Sheen Blossom from the Apparent Gas Ebullition (if no, describe the sheen distribution below)	Y / N
Rate (for sheen blossoms only, blossoms/min):	
Sheen Distribution:	
○	**Streamer** – A narrow band or line of oil with clean water on each side
X	**Spotty** – Isolated spots or blotches. Estimate the size range of the isolated patches.
○	**Windows (streaks)** – Multiple bands or streaks that line parallel to each other
○	**Contiguous** – A single, large patch, or area.

COMMENTS/ ADDITIONAL OBERVATIONS:

Ebullition was observed in the shallow water, closer to the vegetation, shoreline and river banks. The bubbles diameter were 2-3 inches. Brittle sheen was separating by the water motions. The diameter of sheen patches were approximately 1 inch.

Pictures:


Bubble were disappearing quickly and the bubble frequency was very low. Brittle sheen with approximate area of 1 x 1 ft.

Ebullition-Facilitated NAPL Transport Field Survey Log 43

Project Number:	1804576	**Date: 9/21/2020**	
GEI Field Representative(s):	Youness Sharifi, Brian Fong-Murdock, Christos Saledas	**Survey Start Time: 8:30**	
Date:	09/21/20	**Survey End Time: 15:00**	
Survey Area (circle one):	/	**Time of Low or High Tide: Low Tide at 9:22**	

CONDITIONS OF TIME OF OBSERVATION:

Time of Observation:	13:19					**Weather:**		**Water Conditions:**			
Latitude / Longitude:	3136851.7067 / 810578.194					**N - NE - E - SE - S - SW - W - NW**		X	**Calm (glassy or ripples with no crests)**		
Location of Ebullition relative to Coordinates:	Ebullition and sheen was observed. Depth of water 2-3 inches.					**Light - Medium - Heavy**		◯	**Slight (waves not breaking)**		
Activities/ Structures near ebullition (mark with X, provide description):						**Sunny - Overcast - Rainy**		◯	**Moderate (crests begin to break, scattered whitecaps)**		
◯	**Watercraft Movement / Wake**	◯	**Sewers / Outfalls**	◯	**Construction / Drilling**	**Air Temp (F):**	**60**	◯	**Heavy (fairly frequent whitecaps)**		
◯	**Outfalls**	◯	**Construction**	◯	**Diving**	**Description / Notes:** Weather was calm and sunny. Colder in the morning around 45 °F but warmed up to about 60 °F. No wind.		◯	**Vessel Wake / Turbulence**		
◯	**Sampling**	◯	**Other**					**Description (wave height, vessel traffic, other):** Water conditions were calm. There was no boat traffic on the river.			

APPARENT GAS EBULLITION OBSERVATIONS

Gas Ebullition Observations:

Is Apparent Gas Ebullition Observed? (Y) / N

Identify is the gas ebullition is one of the following (G, S, GS):

(G) - Gas ebullition is seen as bubbles	(S) - Sheen	(GS) - Gas Ebullition bubbles and coincident sheen

Picture Taken? (Y) / N **Video Taken (Y/N)?** Y / (N)

Approximate Size of Gas Ebullition Area in feet (Length x Width):

Bubble Frequency

Rate (bubbles/min):

◯	**High frequency:** Bubble rate is observed continuously and/or is uninterrupted for the entire period
◯	**Moderate frequency:** Bubble frequency is intermittent and irregular but continues through the 5-minute period.
X	**Low frequency:** Bubbles appear at specific, localized points. There is not a consistent stream of bubbles over the time period.

Describe if there are any conditions that could mimic or affect gas ebullition below:

Is a coincident sheen observed? (if yes, proceed to sheen observation section) (Y) / N

Sheen Observations:

Is a Sheen Observed? (Y) / N

Approximate Size of Sheen Area in feet (Length x Width): 1 x 1 ft

Description of Sheen Color (See SOP for Pictures):

X	**Silvery (S)** – Near transparent to silvery-gray; metallic
◯	**Rainbow (R) –** Multicolored
◯	**Metallic (M)** – Reflective light gray to dull brown
◯	**Transitional Dark (T)** – Transitional dark or true oil color. This description is used for a thicker oil, not an oil sheen.
◯	**Dark (E) –** A continuous true oil color; This description is used for the presence of thicker oil, not an oil sheen.

Is the Sheen Brittle or Non-Brittle?

X	**Brittle –** The sheen cracks or breaks apparent when agitated
◯	**Non-Brittle -** The sheen blends or coalesces when agitated

Does the Sheen Blossom from the Apparent Gas Ebullition (if no, describe the sheen distribution below) Y / (N)

Rate (for sheen blossoms only, blossoms/min):

Sheen Distribution:

◯	**Streamer –** A narrow band or line of oil with clean water on each side
X	**Spotty** – Isolated spots or blotches. Estimate the size range of the isolated patches.
◯	**Windows (streaks) –** Multiple bands or streaks that line parallel to each other
◯	**Contiguous** – A single, large patch, or area.

COMMENTS/ ADDITIONAL OBERVATIONS:

Ebullition was observed closer to the vegetation. The bubbles diameter were approximately 2 inches. The sheen was in separate patches and brittle. It was disappearing by the water motion. The patches diameter were approximately 1 inch.

Pictures:


The bubble frequency was very low. Brittle sheen with approximate area of 1 x 1 ft.

Ebullition-Facilitated NAPL Transport Field Survey Log 43

Pictures:



Ebullition-Facilitated NAPL Transport Field Survey Log 44

Project Number:	1804576	**Date: 9/21/2020**	
GEI Field Representative(s):	Youness Sharifi, Brian Fong-Murdock, Christos Saledas	**Survey Start Time: 8:30**	
Date:	09/21/20	**Survey End Time: 15:00**	
Survey Area (circle one):	/	**Time of Low or High Tide: Low Tide at 9:22**	

CONDITIONS OF TIME OF OBSERVATION:

Time of Observation:	13:29				
Latitude / Longitude:	3136798.9993 / 810577.1562				
Location of Ebullition relative to Coordinates:	Ebullition was observed close to the vegetation. Depth of water 2-3 inches.				
Activities/ Structures near ebullition (mark with X, provide description):					
◯	**Watercraft Movement / Wake**	◯	**Sewers / Outfalls**	◯	**Construction / Drilling**
◯	**Outfalls**	◯	**Construction**	◯	**Diving**
◯	**Sampling**	◯	**Other**		

Weather:

N - NE - E - SE - S - SW - W - NW

Light - Medium - Heavy

(Sunny) - Overcast - Rainy

Air Temp (F): 60

Description / Notes:
Weather was calm and sunny. Colder in the morning around 45 °F but warmed up to about 60 °F. No wind.

Water Conditions:

X	**Calm (glassy or ripples with no crests)**
◯	**Slight (waves not breaking)**
◯	**Moderate (crests begin to break, scattered whitecaps)**
◯	**Heavy (fairly frequent whitecaps)**
◯	**Vessel Wake / Turbulence**

Description (wave height, vessel traffic, other):
Water conditions were calm. There was no boat traffic on the river.

APPARENT GAS EBULLITION OBSERVATIONS

Gas Ebullition Observations:

Is Apparent Gas Ebullition Observed? **(Y) / N**

Identify is the gas ebullition is one of the following (G, S, GS): G

(G) - Gas ebullition is seen as bubbles	**(S) - Sheen**	**(GS) - Gas Ebullition bubbles and coincident sheen**

Picture Taken? **(Y) / N** **Video Taken (Y/N)?** Y / **(N)**

Approximate Size of Gas Ebullition Area in feet (Length x Width): 3x3 feet

Bubble Frequency

Rate (bubbles/min): 2-3mm diameter

◯	**High frequency:** Bubble rate is observed continuously and/or is uninterrupted for the entire period
◯	**Moderate frequency:** Bubble frequency is intermittent and irregular but continues through the 5-minute period.
X	**Low frequency:** Bubbles appear at specific, localized points. There is not a consistent stream of bubbles over the time period.

Describe if there are any conditions that could mimic or affect gas ebullition below:

Is a coincident sheen observed? (if yes, proceed to sheen observation section) Y / **(N)**

Sheen Observations:

Is a Sheen Observed? Y / **(N)**

Description of Sheen Color (See SOP for Pictures):

◯	**Silvery (S)** – Near transparent to silvery-gray; metallic
◯	**Rainbow (R) –** Multicolored
◯	**Metallic (M)** – Reflective light gray to dull brown
◯	**Transitional Dark (T)** – Transitional dark or true oil color. This description is used for a thicker oil, not an oil sheen.
◯	**Dark (E) –** A continuous true oil color; This description is used for the presence of thicker oil, not an oil sheen.

Is the Sheen Brittle or Non-Brittle?

◯	**Brittle –** The sheen cracks or breaks apparent when agitated
◯	**Non-Brittle -** The sheen blends or coalesces when agitated

Does the Sheen Blossom from the Apparent Gas Ebullition (if no, describe the sheen distribution below) Y / N

Rate (for sheen blossoms only, blossoms/min):

Sheen Distribution:

◯	**Streamer –** A narrow band or line of oil with clean water on each side
◯	**Spotty** – Isolated spots or blotches. Estimate the size range of the isolated patches.
◯	**Windows (streaks) –** Multiple bands or streaks that line parallel to each other
◯	**Contiguous** – A single, large patch, or area.

COMMENTS/ ADDITIONAL OBERVATIONS:

Ebullition was observed closer to the vegetation, shoreline and river banks. The bubbles were disappearing quickly and the ebullition frequency was very low.

Ebullition-Facilitated NAPL Transport Field Survey Log 44

Pictures:



Ebullition-Facilitated NAPL Transport Field Survey Log 45

Project Number:	1804576	**Date: 9/21/2020**	
GEI Field Representative(s):	Youness Sharifi, Brian Fong-Murdock, Christos Saledas	**Survey Start Time: 8:30**	
Date:	09/21/20	**Survey End Time: 15:00**	
Survey Area (circle one):	/	**Time of Low or High Tide: Low Tide at 9:22**	

CONDITIONS OF TIME OF OBSERVATION:

Time of Observation:	13:35	**Weather:**		**Water Conditions:**	
Latitude / Longitude:	3136863.3834 / 810640.2206	**N - NE - E - SE - S - SW - W - NW**		X	**Calm (glassy or ripples with no crests)**
Location of Ebullition relative to Coordinates:	The sheen was observed on the mudflats.	**Light - Medium - Heavy**		◯	**Slight (waves not breaking)**
Activities/ Structures near ebullition (mark with X, provide description):		**Sunny - Overcast - Rainy**		◯	**Moderate (crests begin to break, scattered whitecaps)**
◯ **Watercraft Movement / Wake**	◯ **Sewers / Outfalls** ◯ **Construction / Drilling**	**Air Temp (F):**	60	◯	**Heavy (fairly frequent whitecaps)**
◯ **Outfalls**	◯ **Construction** ◯ **Diving**	**Description / Notes:** Weather was calm and sunny. Colder in the morning around 45 °F but warmed up to about 60 °F. No wind		◯	**Vessel Wake / Turbulence**
◯ **Sampling**	◯ **Other**			**Description (wave height, vessel traffic, other):** Water conditions were calm. There was no boat traffic on the river.	

APPARENT GAS EBULLITION OBSERVATIONS

Gas Ebullition Observations:

Is Apparent Gas Ebullition Observed? Y / (N)

Identify is the gas ebullition is one of the following (G, S, GS):

(G) - Gas ebullition is seen as bubbles	(S) - Sheen	(GS) - Gas Ebullition bubbles and coincident sheen

Picture Taken? Y / (N) **Video Taken (Y/N)?** Y / (N)

Approximate Size of Gas Ebullition Area in feet (Length x Width):

Bubble Frequency

Rate (bubbles/min):

◯ **High frequency:** Bubble rate is observed continuously and/or is uninterrupted for the entire period

◯ **Moderate frequency:** Bubble frequency is intermittent and irregular but continues through the 5-minute period.

◯ **Low frequency:** Bubbles appear at specific, localized points. There is not a consistent stream of bubbles over the time period.

Describe if there are any conditions that could mimic or affect gas ebullition below:

Is a coincident sheen observed? (if yes, proceed to sheen observation section) (Y) / N

Sheen Observations:

Is a Sheen Observed? (Y) / N

Approximate Size of Sheen Area in feet (Length x Width):

Description of Sheen Color (See SOP for Pictures):

X	**Silvery (S)** – Near transparent to silvery-gray; metallic
◯	**Rainbow (R) –** Multicolored
◯	**Metallic (M)** – Reflective light gray to dull brown
◯	**Transitional Dark (T)** – Transitional dark or true oil color. This description is used for a thicker oil, not an oil sheen.
◯	**Dark (E) –** A continuous true oil color; This description is used for the presence of thicker oil, not an oil sheen.

Is the Sheen Brittle or Non-Brittle?

X	**Brittle –** The sheen cracks or breaks apparent when agitated
◯	**Non-Brittle -** The sheen blends or coalesces when agitated

Does the Sheen Blossom from the Apparent Gas Ebullition (if no, describe the sheen distribution below) Y / (N)

Rate (for sheen blossoms only, blossoms/min):

Sheen Distribution:

◯	**Streamer –** A narrow band or line of oil with clean water on each side
X	**Spotty** – Isolated spots or blotches. Estimate the size range of the isolated patches.
◯	**Windows (streaks) –** Multiple bands or streaks that line parallel to each other
◯	**Contiguous** – A single, large patch, or area.

COMMENTS/ ADDITIONAL OBERVATIONS:

The patches diameter was approximately 1 inch.

Ebullition-Facilitated NAPL Transport Field Survey Log 46

Project Number:	1804576	**Date: 9/21/2020**	
GEI Field Representative(s):	Youness Sharifi, Brian Fong-Murdock, Christos Saledas	**Survey Start Time: 8:30**	
Date:	09/21/20	**Survey End Time: 15:00**	
Survey Area (circle one):	/	**Time of Low or High Tide: Low Tide at 9:22**	

CONDITIONS OF TIME OF OBSERVATION:

Time of Observation:	13:40					**Weather:**		**Water Conditions:**			
Latitude / Longitude:	3136922.988 / 810696.7311					**N - NE - E - SE - S - SW - W - NW**		X	**Calm (glassy or ripples with no crests)**		
Location of Ebullition relative to Coordinates:	Ebullition and sheen were observed on the mudflats					**Light - Medium - Heavy**		◯	**Slight (waves not breaking)**		
Activities/ Structures near ebullition (mark with X, provide description):						**(Sunny) - Overcast - Rainy**		◯	**Moderate (crests begin to break, scattered whitecaps)**		
◯	**Watercraft Movement / Wake**	◯	**Sewers / Outfalls**	◯	**Construction / Drilling**	**Air Temp (F):**	**60**	◯	**Heavy (fairly frequent whitecaps)**		
◯	**Outfalls**	◯	**Construction**	◯	**Diving**	**Description / Notes:** Weather was calm and sunny. Colder in the morning around 45 °F but warmed up to about 60 °F. No wind		◯	**Vessel Wake / Turbulence**		
◯	**Sampling**	◯	**Other**					**Description (wave height, vessel traffic, other):** Water conditions were calm. There was no boat traffic on the river.			

APPARENT GAS EBULLITION OBSERVATIONS

Gas Ebullition Observations:

Is Apparent Gas Ebullition Observed? (Y) / N

Identify is the gas ebullition is one of the following (G, S, GS): GS

(G) - Gas ebullition is seen as bubbles	(S) - Sheen	(GS) - Gas Ebullition bubbles and coincident sheen

Picture Taken? Y / (N) **Video Taken (Y/N)?** Y / (N)

Approximate Size of Gas Ebullition Area in feet (Length x Width): 3x5 feet

Bubble Frequency

Rate (bubbles/min):

◯	**High frequency:** Bubble rate is observed continuously and/or is uninterrupted for the entire period
◯	**Moderate frequency:** Bubble frequency is intermittent and irregular but continues through the 5-minute period.
X	**Low frequency:** Bubbles appear at specific, localized points. There is not a consistent stream of bubbles over the time period.

Describe if there are any conditions that could mimic or affect gas ebullition below:

Is a coincident sheen observed? (if yes, proceed to sheen observation section) (Y) / N

Sheen Observations:

Is a Sheen Observed? (Y) / N

Approximate Size of Sheen Area in feet (Length x Width): 2 x 3 ft

Description of Sheen Color (See SOP for Pictures):

X	**Silvery (S)** – Near transparent to silvery-gray; metallic
◯	**Rainbow (R) –** Multicolored
◯	**Metallic (M)** – Reflective light gray to dull brown
◯	**Transitional Dark (T)** – Transitional dark or true oil color. This description is used for a thicker oil, not an oil sheen.
◯	**Dark (E) –** A continuous true oil color; This description is used for the presence of thicker oil, not an oil sheen.

Is the Sheen Brittle or Non-Brittle?

X	**Brittle –** The sheen cracks or breaks apparent when agitated
◯	**Non-Brittle -** The sheen blends or coalesces when agitated

Does the Sheen Blossom from the Apparent Gas Ebullition (if no, describe the sheen distribution below) Y / (N)

Rate (for sheen blossoms only, blossoms/min):

Sheen Distribution:

◯	**Streamer –** A narrow band or line of oil with clean water on each side
X	**Spotty** – Isolated spots or blotches. Estimate the size range of the isolated patches.
◯	**Windows (streaks) –** Multiple bands or streaks that line parallel to each other
◯	**Contiguous** – A single, large patch, or area.

COMMENTS/ ADDITIONAL OBERVATIONS:

Patches of brittle sheen were observed on top of the sediments, with no standing water. The patches diameter were approximately 1 inch. Due to boat access issues the mud flats observations were collect by walking on the flats.

Ebullition-Facilitated NAPL Transport Field Survey Log 47

Project Number:	1804576	**Date: 9/21/2020**	
GEI Field Representative(s):	Youness Sharifi, Brian Fong-Murdock, Christos Saledas	**Survey Start Time: 8:30**	
Date:	09/21/20	**Survey End Time: 15:00**	
Survey Area (circle one):	/	**Time of Low or High Tide: Low Tide at 9:22**	

CONDITIONS OF TIME OF OBSERVATION:

Time of Observation:	13:48					**Weather:**		**Water Conditions:**	
Latitude / Longitude:	3136927.668 / 810647.8108					**N - NE - E - SE - S - SW - W - NW**		X	**Calm (glassy or ripples with no crests)**
Location of Ebullition relative to Coordinates:	The brittle sheen was observed					**Light - Medium - Heavy**		◯	**Slight (waves not breaking)**
Activities/ Structures near ebullition (mark with X, provide description):						**Sunny - Overcast - Rainy**		◯	**Moderate (crests begin to break, scattered whitecaps)**
◯	**Watercraft Movement / Wake**	◯	**Sewers / Outfalls**	◯	**Construction / Drilling**	**Air Temp (F):**	**60**	◯	**Heavy (fairly frequent whitecaps)**
◯	**Outfalls**	◯	**Construction**	◯	**Diving**	**Description / Notes:** Weather was calm and sunny. Colder in the morning around 45 °F but warmed up to about 60 °F. No wind.		◯	**Vessel Wake / Turbulence**
◯	**Sampling**	◯	**Other**					**Description (wave height, vessel traffic, other):** Water conditions were calm. There was no boat traffic on the river.	

APPARENT GAS EBULLITION OBSERVATIONS

Gas Ebullition Observations:

Is Apparent Gas Ebullition Observed? Y / (N)

Identify is the gas ebullition is one of the following (G, S, GS):

(G) - Gas ebullition is seen as bubbles	(S) - Sheen	(GS) - Gas Ebullition bubbles and coincident sheen

Picture Taken? Y / (N) **Video Taken (Y/N)?** Y / (N)

Approximate Size of Gas Ebullition Area in feet (Length x Width):

Bubble Frequency

Rate (bubbles/min):

◯	**High frequency:** Bubble rate is observed continuously and/or is uninterrupted for the entire period
◯	**Moderate frequency:** Bubble frequency is intermittent and irregular but continues through the 5-minute period.
◯	**Low frequency:** Bubbles appear at specific, localized points. There is not a consistent stream of bubbles over the time period.

Describe if there are any conditions that could mimic or affect gas ebullition below:

Is a coincident sheen observed? (if yes, proceed to sheen observation section) (Y) / N

Sheen Observations:

Is a Sheen Observed? (Y) / N

Approximate Size of Sheen Area in feet (Length x Width): 3 x 3 ft

Description of Sheen Color (See SOP for Pictures):

X	**Silvery (S)** – Near transparent to silvery-gray; metallic
◯	**Rainbow (R) –** Multicolored
◯	**Metallic (M)** – Reflective light gray to dull brown
◯	**Transitional Dark (T)** – Transitional dark or true oil color. This description is used for a thicker oil, not an oil sheen.
◯	**Dark (E) –** A continuous true oil color; This description is used for the presence of thicker oil, not an oil sheen.

Is the Sheen Brittle or Non-Brittle?

X	**Brittle –** The sheen cracks or breaks apparent when agitated
◯	**Non-Brittle -** The sheen blends or coalesces when agitated

Does the Sheen Blossom from the Apparent Gas Ebullition (if no, describe the sheen distribution below) Y / (N)

Rate (for sheen blossoms only, blossoms/min):

Sheen Distribution:

◯	**Streamer –** A narrow band or line of oil with clean water on each side
X	**Spotty** – Isolated spots or blotches. Estimate the size range of the isolated patches.
◯	**Windows (streaks) –** Multiple bands or streaks that line parallel to each other
◯	**Contiguous** – A single, large patch, or area.

COMMENTS/ ADDITIONAL OBERVATIONS:

The sheen patches diameter was approximately 1 inch. Due to boat access issues the mud flats observations were collect by walking on the flats.

Ebullition-Facilitated NAPL Transport Field Survey Log 48

Project Number:	1804576	**Date: 9/21/2020**	
GEI Field Representative(s):	Youness Sharifi, Brian Fong-Murdock, Christos Saledas	**Survey Start Time: 8:30**	
Date:	09/21/20	**Survey End Time: 15:00**	
Survey Area (circle one):	/	**Time of Low or High Tide: Low Tide at 9:22**	

CONDITIONS OF TIME OF OBSERVATION:

Time of Observation:	13:54					**Weather:**		**Water Conditions:**	
Latitude / Longitude:	3136852.5096 / 810672.2123					**N - NE - E - SE - S - SW - W - NW**		X	**Calm (glassy or ripples with no crests)**
Location of Ebullition relative to Coordinates:	Ebullition was observed					**Light - Medium - Heavy**		◯	**Slight (waves not breaking)**
Activities/ Structures near ebullition (mark with X, provide description):						**(Sunny) - Overcast - Rainy**		◯	**Moderate (crests begin to break, scattered whitecaps)**
◯	**Watercraft Movement / Wake**	◯	**Sewers / Outfalls**	◯	**Construction / Drilling**	**Air Temp (F):**	**60**	◯	**Heavy (fairly frequent whitecaps)**
◯	**Outfalls**	◯	**Construction**	◯	**Diving**	**Description / Notes:** Weather was calm and sunny. Colder in the morning around 45 °F but warmed up to about 60 °F. No wind.		◯	**Vessel Wake / Turbulence**
◯	**Sampling**	◯	**Other**					**Description (wave height, vessel traffic, other):** Water conditions were calm. There was no boat traffic on the river.	

APPARENT GAS EBULLITION OBSERVATIONS

Gas Ebullition Observations:

Is Apparent Gas Ebullition Observed? (Y) / N

Identify is the gas ebullition is one of the following (G, S, GS): G

(G) - Gas ebullition is seen as bubbles	(S) - Sheen	(GS) - Gas Ebullition bubbles and coincident sheen

Picture Taken? Y / (N) **Video Taken (Y/N)?** Y / (N)

Approximate Size of Gas Ebullition Area in feet (Length x Width): 5x7 feet

Bubble Frequency

Rate (bubbles/min): 1-2mm diameter

◯	**High frequency:** Bubble rate is observed continuously and/or is uninterrupted for the entire period
◯	**Moderate frequency:** Bubble frequency is intermittent and irregular but continues through the 5-minute period.
X	**Low frequency:** Bubbles appear at specific, localized points. There is not a consistent stream of bubbles over the time period.

Describe if there are any conditions that could mimic or affect gas ebullition below:

Is a coincident sheen observed? (if yes, proceed to sheen observation section) Y / (N)

Sheen Observations:

Is a Sheen Observed? Y / (N)

Approximate Size of Sheen Area in feet (Length x Width):

Description of Sheen Color (See SOP for Pictures):

◯	**Silvery (S)** – Near transparent to silvery-gray; metallic
◯	**Rainbow (R) –** Multicolored
◯	**Metallic (M)** – Reflective light gray to dull brown
◯	**Transitional Dark (T)** – Transitional dark or true oil color. This description is used for a thicker oil, not an oil sheen.
◯	**Dark (E) –** A continuous true oil color; This description is used for the presence of thicker oil, not an oil sheen.

Is the Sheen Brittle or Non-Brittle?

◯	**Brittle –** The sheen cracks or breaks apparent when agitated
◯	**Non-Brittle -** The sheen blends or coalesces when agitated

Does the Sheen Blossom from the Apparent Gas Ebullition (if no, describe the sheen distribution below) Y / N

Rate (for sheen blossoms only, blossoms/min):

Sheen Distribution:

◯	**Streamer –** A narrow band or line of oil with clean water on each side
◯	**Spotty** – Isolated spots or blotches. Estimate the size range of the isolated patches.
◯	**Windows (streaks) –** Multiple bands or streaks that line parallel to each other
◯	**Contiguous** – A single, large patch, or area.

COMMENTS/ ADDITIONAL OBERVATIONS:

The ebullition was observed in the shallow water on the mud flats. The bubbles diameter was approximately 3/4 inch. Due to boat access issues the mud flats observations were collect by walking on the flats.

Ebullition-Facilitated NAPL Transport Field Survey Log 49

Project Number:	1804576	**Date: 9/21/2020**	
GEI Field Representative(s):	Youness Sharifi, Brian Fong-Murdock, Christos Saledas	**Survey Start Time: 8:30**	
Date:	09/21/20	**Survey End Time: 15:00**	
Survey Area (circle one):	/	**Time of Low or High Tide: Low Tide at 9:22**	

CONDITIONS OF TIME OF OBSERVATION:

Time of Observation:	14:01				
Latitude / Longitude:	3136881.3647 / 810732.8475				
Location of Ebullition relative to Coordinates:	Ebullition was observed				
Activities/ Structures near ebullition (mark with X, provide description):					
◯	**Watercraft Movement / Wake**	◯	**Sewers / Outfalls**	◯	**Construction / Drilling**
◯	**Outfalls**	◯	**Construction**	◯	**Diving**
◯	**Sampling**	◯	**Other**		

Weather:	
N - NE - E - SE - S - SW - W - NW	
Light - Medium - Heavy	
(Sunny) - Overcast - Rainy	
Air Temp (F):	**60**
Description / Notes: **Weather was calm and sunny. Colder in the morning around 45 °F but warmed up to about 60 °F. No wind.**	

Water Conditions:	
X	**Calm (glassy or ripples with no crests)**
◯	**Slight (waves not breaking)**
◯	**Moderate (crests begin to break, scattered whitecaps)**
◯	**Heavy (fairly frequent whitecaps)**
◯	**Vessel Wake / Turbulence**
Description (wave height, vessel traffic, other): **Water conditions were calm. There was no boat traffic on the river.**	

APPARENT GAS EBULLITION OBSERVATIONS

Gas Ebullition Observations:

Is Apparent Gas Ebullition Observed? (Y) / N

Identify is the gas ebullition is one of the following (G, S, GS): G

(G) - Gas ebullition is seen as bubbles	(S) - Sheen	(GS) - Gas Ebullition bubbles and coincident sheen

Picture Taken? Y / (N) **Video Taken (Y/N)?** Y / (N)

Approximate Size of Gas Ebullition Area in feet (Length x Width): 5x5 feet

Bubble Frequency

Rate (bubbles/min): 3mm diameter

◯	**High frequency:** Bubble rate is observed continuously and/or is uninterrupted for the entire period
◯	**Moderate frequency:** Bubble frequency is intermittent and irregular but continues through the 5-minute period.
X	**Low frequency:** Bubbles appear at specific, localized points. There is not a consistent stream of bubbles over the time period.

Describe if there are any conditions that could mimic or affect gas ebullition below:

Is a coincident sheen observed? (if yes, proceed to sheen observation section) Y / (N)

Sheen Observations:

Is a Sheen Observed? Y / (N)

Approximate Size of Sheen Area in feet (Length x Width):

Description of Sheen Color (See SOP for Pictures):

◯	**Silvery (S)** – Near transparent to silvery-gray; metallic
◯	**Rainbow (R) –** Multicolored
◯	**Metallic (M)** – Reflective light gray to dull brown
◯	**Transitional Dark (T)** – Transitional dark or true oil color. This description is used for a thicker oil, not an oil sheen.
◯	**Dark (E) –** A continuous true oil color; This description is used for the presence of thicker oil, not an oil sheen.

Is the Sheen Brittle or Non-Brittle?

◯	**Brittle –** The sheen cracks or breaks apparent when agitated
◯	**Non-Brittle -** The sheen blends or coalesces when agitated

Does the Sheen Blossom from the Apparent Gas Ebullition (if no, describe the sheen distribution below) Y / N

Rate (for sheen blossoms only, blossoms/min):

Sheen Distribution:

◯	**Streamer –** A narrow band or line of oil with clean water on each side
◯	**Spotty** – Isolated spots or blotches. Estimate the size range of the isolated patches.
◯	**Windows (streaks) –** Multiple bands or streaks that line parallel to each other
◯	**Contiguous** – A single, large patch, or area.

COMMENTS/ ADDITIONAL OBERVATIONS:

The ebullition was observed in the shallow water on the mud flats. The bubbles diameter was approximately 3/4 inch. Due to boat access issues the mud flats observations were collect by walking on the flats.

Ebullition-Facilitated NAPL Transport Field Survey Log 57

Project Number:	1804576	**Date: 9/22/2020**	
GEI Field Representative(s):	Youness Sharifi, Brian Fong-Murdock, Christos Saledas	**Survey Start Time: 9:00**	
Date:	09/22/20	**Survey End Time: 15:00**	
Survey Area (circle one):	/	**Time of Low or High Tide: Low Tide at 10:14**	

CONDITIONS OF TIME OF OBSERVATION:

Time of Observation:	9:51
Latitude / Longitude:	3137042.4554 / 810068.8725
Location of Ebullition relative to Coordinates:	Ebullition was observed closer to the vegetation, depth of water 2-3 inches.

Activities/ Structures near ebullition (mark with X, provide description):

◯	**Watercraft Movement / Wake**	◯	**Sewers / Outfalls**	◯	**Construction / Drilling**
◯	**Outfalls**	◯	**Construction**	◯	**Diving**
◯	**Sampling**	◯	**Other**		

Weather:

(N) - NE - E - SE - S - SW - W - NW

(Light) - Medium - Heavy

Sunny - **(Overcast)** - Rainy

Air Temp (F): 65

Description / Notes:
Weather was warmer but overcast. In the morning around 50 °F and warmed up to about 65 °F. Light north wind approximately 11 mph.

Water Conditions:

◯	**Calm (glassy or ripples with no crests)**
X	**Slight (waves not breaking)**
◯	**Moderate (crests begin to break, scattered whitecaps)**
◯	**Heavy (fairly frequent whitecaps)**
◯	**Vessel Wake / Turbulence**

Description (wave height, vessel traffic, other):
There was slight wave and ripples on the water but not breaking. There was no boat traffic on the river.

APPARENT GAS EBULLITION OBSERVATIONS

Gas Ebullition Observations:

Is Apparent Gas Ebullition Observed? **(Y)** / N

Identify is the gas ebullition is one of the following (G, S, GS): G

(G) - Gas ebullition is seen as bubbles	(S) - Sheen	(GS) - Gas Ebullition bubbles and coincident sheen

Picture Taken? **(Y)** / N **Video Taken (Y/N)?** **(Y)** / N

Approximate Size of Gas Ebullition Area in feet (Length x Width): 2x3 feet

Bubble Frequency

Rate (bubbles/min): 3-5mm

◯	**High frequency:** Bubble rate is observed continuously and/or is uninterrupted for the entire period
X	**Moderate frequency:** Bubble frequency is intermittent and irregular but continues through the 5-minute period.
◯	**Low frequency:** Bubbles appear at specific, localized points. There is not a consistent stream of bubbles over the time period.

Describe if there are any conditions that could mimic or affect gas ebullition below:

stopped after ~5 mins

Is a coincident sheen observed? (if yes, proceed to sheen observation section) Y / **(N)**

Sheen Observations:

Is a Sheen Observed? Y / **(N)**

Approximate Size of Sheen Area in feet (Length x Width):

Description of Sheen Color (See SOP for Pictures):

◯	**Silvery (S)** – Near transparent to silvery-gray; metallic
◯	**Rainbow (R) –** Multicolored
◯	**Metallic (M)** – Reflective light gray to dull brown
◯	**Transitional Dark (T)** – Transitional dark or true oil color. This description is used for a thicker oil, not an oil sheen.
◯	**Dark (E) –** A continuous true oil color; This description is used for the presence of thicker oil, not an oil sheen.

Is the Sheen Brittle or Non-Brittle?

◯	**Brittle –** The sheen cracks or breaks apparent when agitated
◯	**Non-Brittle -** The sheen blends or coalesces when agitated

Does the Sheen Blossom from the Apparent Gas Ebullition (if no, describe the sheen distribution below) Y / N

Rate (for sheen blossoms only, blossoms/min):

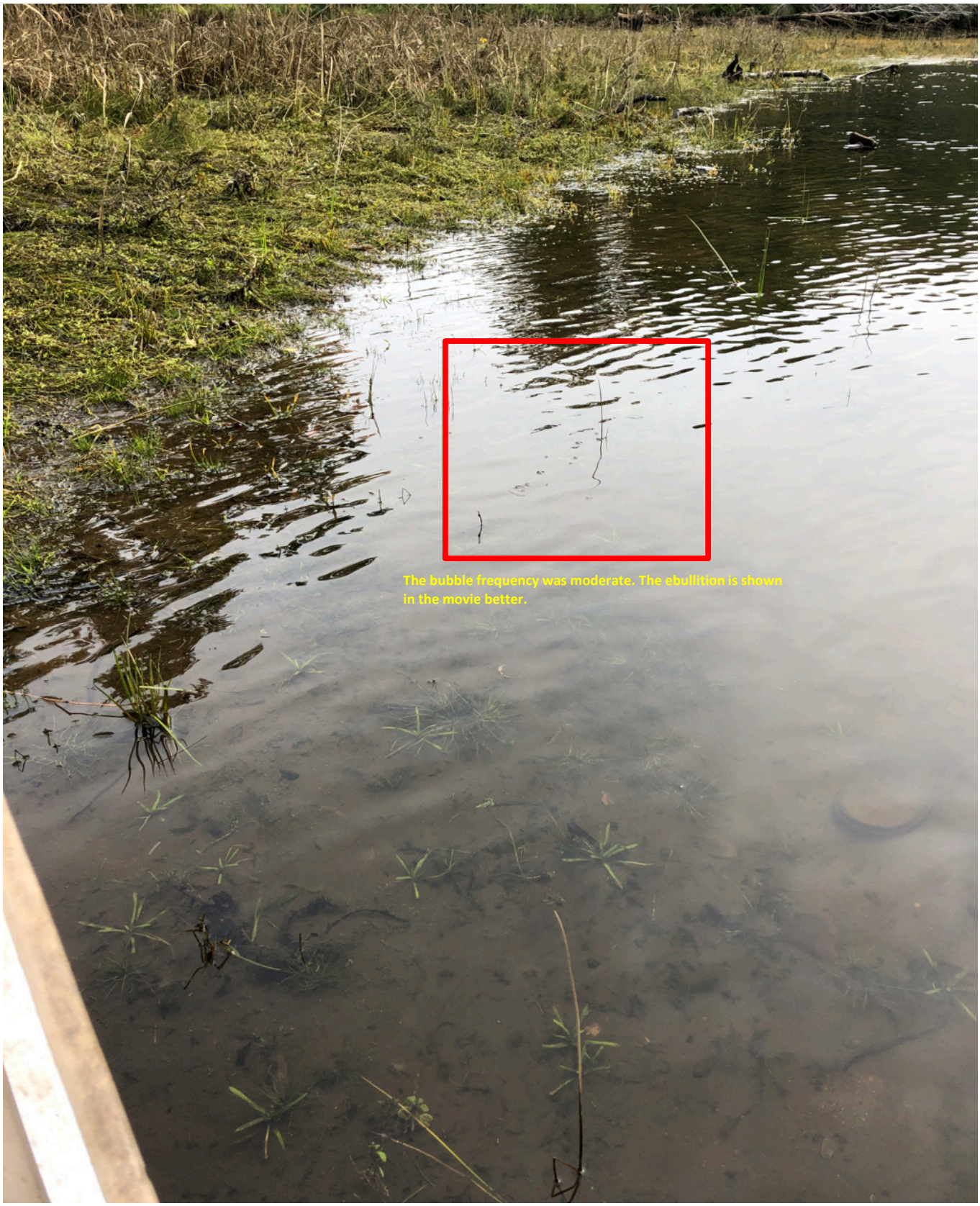
Sheen Distribution:

◯	**Streamer –** A narrow band or line of oil with clean water on each side
◯	**Spotty** – Isolated spots or blotches. Estimate the size range of the isolated patches.
◯	**Windows (streaks) –** Multiple bands or streaks that line parallel to each other
◯	**Contiguous** – A single, large patch, or area.

COMMENTS/ ADDITIONAL OBERVATIONS:

Ebullition was observed closer to the vegetation, shallow water, shoreline and river banks. The movie shows the ebullition better.
\\geiconsultants.com\data\Data_Storage\Working\NATIONAL GRID\1804576 Amesbury MGP\05_ASSESSMENT\Ebullition Study\Field Observation Photos_9_22_23_2020\LOC 57-2.mov

Pictures:


The bubble frequency was moderate. The ebullition is shown in the movie better.

Ebullition-Facilitated NAPL Transport Field Survey Log 61

Project Number:	1804576	**Date: 9/22/2020**	
GEI Field Representative(s):	Youness Sharifi, Brian Fong-Murdock, Christos Saledas	**Survey Start Time: 9:00**	
Date:	09/22/20	**Survey End Time: 15:00**	
Survey Area (circle one):	/	**Time of Low or High Tide: Low Tide at 10:14**	

CONDITIONS OF TIME OF OBSERVATION:

Time of Observation:	10:21						
Latitude / Longitude:	3136742.8493 / 810577.5352						
Location of Ebullition relative to Coordinates:	Ebullition was observed closer to the shoreline and river banks						
Activities/ Structures near ebullition (mark with X, provide description):							
◯	**Watercraft Movement / Wake**	◯	**Sewers / Outfalls**	◯	**Construction / Drilling**		
◯	**Outfalls**	◯	**Construction**	◯	**Diving**		
◯	**Sampling**	◯	**Other**				

Weather:

(N) - NE - E - SE - S - SW - W - NW

(Light) - Medium - Heavy

Sunny - (Overcast) - Rainy

Air Temp (F): 65

Description / Notes:
Weather was warmer but overcast. In the morning around 50 °F and warmed up to about 65 °F. Light north wind approximately 11 mph

Water Conditions:

◯	**Calm (glassy or ripples with no crests)**
X	**Slight (waves not breaking)**
◯	**Moderate (crests begin to break, scattered whitecaps)**
◯	**Heavy (fairly frequent whitecaps)**
◯	**Vessel Wake / Turbulence**

Description (wave height, vessel traffic, other):
There was slight wave and ripples on the water but not breaking. There was no boat traffic on the river.

APPARENT GAS EBULLITION OBSERVATIONS

Gas Ebullition Observations:

Is Apparent Gas Ebullition Observed? (Y) / N

Identify is the gas ebullition is one of the following (G, S, GS): G

(G) - Gas ebullition is seen as bubbles	(S) - Sheen	(GS) - Gas Ebullition bubbles and coincident sheen

Picture Taken? Y / (N) **Video Taken (Y/N)?** Y / (N)

Approximate Size of Gas Ebullition Area in feet (Length x Width): 2x3 feet

Bubble Frequency

Rate (bubbles/min): 3mm

◯	**High frequency:** Bubble rate is observed continuously and/or is uninterrupted for the entire period
◯	**Moderate frequency:** Bubble frequency is intermittent and irregular but continues through the 5-minute period.
X	**Low frequency:** Bubbles appear at specific, localized points. There is not a consistent stream of bubbles over the time period.

Describe if there are any conditions that could mimic or affect gas ebullition below:

Is a coincident sheen observed? (if yes, proceed to sheen observation section) Y / (N)

Sheen Observations:

Is a Sheen Observed? Y / (N)

Approximate Size of Sheen Area in feet (Length x Width):

Description of Sheen Color (See SOP for Pictures):

◯	**Silvery (S)** – Near transparent to silvery-gray; metallic
◯	**Rainbow (R) –** Multicolored
◯	**Metallic (M)** – Reflective light gray to dull brown
◯	**Transitional Dark (T)** – Transitional dark or true oil color. This description is used for a thicker oil, not an oil sheen.
◯	**Dark (E) –** A continuous true oil color; This description is used for the presence of thicker oil, not an oil sheen.

Is the Sheen Brittle or Non-Brittle?

◯	**Brittle –** The sheen cracks or breaks apparent when agitated
◯	**Non-Brittle -** The sheen blends or coalesces when agitated

Does the Sheen Blossom from the Apparent Gas Ebullition (if no, describe the sheen distribution below) Y / N

Rate (for sheen blossoms only, blossoms/min):

Sheen Distribution:

◯	**Streamer –** A narrow band or line of oil with clean water on each side
◯	**Spotty** – Isolated spots or blotches. Estimate the size range of the isolated patches.
◯	**Windows (streaks) –** Multiple bands or streaks that line parallel to each other
◯	**Contiguous** – A single, large patch, or area.

COMMENTS/ ADDITIONAL OBERVATIONS:

Ebullition was observed closer to the shoreline and river banks. The ebullition happened too infrequently and slowly to capture on photos.

Ebullition-Facilitated NAPL Transport Field Survey Log 64

Project Number:	1804576	**Date: 9/22/2020**	
GEI Field Representative(s):	Youness Sharifi, Brian Fong-Murdock, Christos Saledas	**Survey Start Time: 9:00**	
Date:	09/22/20	**Survey End Time: 15:00**	
Survey Area (circle one):	/	**Time of Low or High Tide: Low Tide at 10:14**	

CONDITIONS OF TIME OF OBSERVATION:

Time of Observation:	10:36						
Latitude / Longitude:	3136599.7461 / 810547.6842						
Location of Ebullition relative to Coordinates:	Ebullition was observed closer to the pipes, depth of water <2 inches.						
Activities/ Structures near ebullition (mark with X, provide description):							
◯	**Watercraft Movement / Wake**	◯	**Sewers / Outfalls**	◯	**Construction / Drilling**		
◯	**Outfalls**	◯	**Construction**	◯	**Diving**		
◯	**Sampling**	X	**Other**	Pipes			
The pipes and the related operations were unknown.							

Weather:	**Water Conditions:**	
(N) - NE - E - SE - S - SW - W - NW	◯	**Calm (glassy or ripples with no crests)**
(Light) - Medium - Heavy	X	**Slight (waves not breaking)**
Sunny - (Overcast) - Rainy	◯	**Moderate (crests begin to break, scattered whitecaps)**
Air Temp (F): 65	◯	**Heavy (fairly frequent whitecaps)**
Description / Notes: Weather was warmer but overcast. In the morning around 50 °F and warmed up to about 65 °F. Light north wind approximately 11 mph.	◯	**Vessel Wake / Turbulence**
		Description (wave height, vessel traffic, other): There was slight wave and ripples on the water but not breaking. There was no boat traffic on the river.

APPARENT GAS EBULLITION OBSERVATIONS

Gas Ebullition Observations:

Is Apparent Gas Ebullition Observed? (Y) / N

Identify is the gas ebullition is one of the following (G, S, GS): G

(G) - Gas ebullition is seen as bubbles	(S) - Sheen	(GS) - Gas Ebullition bubbles and coincident sheen

Picture Taken? (Y) / N **Video Taken (Y/N)?** Y / (N)

Approximate Size of Gas Ebullition Area in feet (Length x Width): 5x6 feet

Bubble Frequency

Rate (bubbles/min): 3mm

◯	**High frequency:** Bubble rate is observed continuously and/or is uninterrupted for the entire period
◯	**Moderate frequency:** Bubble frequency is intermittent and irregular but continues through the 5-minute period.
X	**Low frequency:** Bubbles appear at specific, localized points. There is not a consistent stream of bubbles over the time period.

Describe if there are any conditions that could mimic or affect gas ebullition below:

Is a coincident sheen observed? (if yes, proceed to sheen observation section) Y / (N)

Sheen Observations:

Is a Sheen Observed? Y / (N)

Approximate Size of Sheen Area in feet (Length x Width):

Description of Sheen Color (See SOP for Pictures):

◯	**Silvery (S)** – Near transparent to silvery-gray; metallic
◯	**Rainbow (R) –** Multicolored
◯	**Metallic (M)** – Reflective light gray to dull brown
◯	**Transitional Dark (T)** – Transitional dark or true oil color. This description is used for a thicker oil, not an oil sheen.
◯	**Dark (E) –** A continuous true oil color; This description is used for the presence of thicker oil, not an oil sheen.

Is the Sheen Brittle or Non-Brittle?

◯	**Brittle –** The sheen cracks or breaks apparent when agitated
◯	**Non-Brittle -** The sheen blends or coalesces when agitated

Does the Sheen Blossom from the Apparent Gas Ebullition (if no, describe the sheen distribution below) Y / N

Rate (for sheen blossoms only, blossoms/min):

Sheen Distribution:

◯	**Streamer –** A narrow band or line of oil with clean water on each side
◯	**Spotty** – Isolated spots or blotches. Estimate the size range of the isolated patches.
◯	**Windows (streaks) –** Multiple bands or streaks that line parallel to each other
◯	**Contiguous** – A single, large patch, or area.

COMMENTS/ ADDITIONAL OBERVATIONS:

Was not able to capture a photo of ebullition. The bubbles were coming up in line with the pipes, in the shallow water.

Ebullition-Facilitated NAPL Transport Field Survey Log 64

Pictures:



Ebullition-Facilitated NAPL Transport Field Survey Log 69

Project Number:	1804576	**Date: 9/22/2020**	
GEI Field Representative(s):	Youness Sharifi, Brian Fong-Murdock, Christos Saledas	**Survey Start Time: 9:00**	
Date:	09/22/20	**Survey End Time: 15:00**	
Survey Area (circle one):	/	**Time of Low or High Tide: Low Tide at 10:14**	

CONDITIONS OF TIME OF OBSERVATION:

Time of Observation:	11:13				
Latitude / Longitude:	3136376.5544 / 810168.9748				
Location of Ebullition relative to Coordinates:	Ebullition was observed in shallow water. Depth water 2-3 inches				
Activities/ Structures near ebullition (mark with X, provide description):					
◯	**Watercraft Movement / Wake**	◯	**Sewers / Outfalls**	◯	**Construction / Drilling**
◯	**Outfalls**	◯	**Construction**	◯	**Diving**
◯	**Sampling**	◯	**Other**		

Weather:

(N) - NE - E - SE - S - SW - W - NW

(Ligh) - Medium - Heavy

Sunny - (Overcast) - Rainy

Air Temp (F): 65

Description / Notes:
Weather was warmer but overcast. In the morning around 50 °F and warmed up to about 65 °F. Light north wind approximately 11 mph.

Water Conditions:

◯	**Calm (glassy or ripples with no crests)**
X	**Slight (waves not breaking)**
◯	**Moderate (crests begin to break, scattered whitecaps)**
◯	**Heavy (fairly frequent whitecaps)**
◯	**Vessel Wake / Turbulence**

Description (wave height, vessel traffic, other):
There was slight wave and ripples on the water but not breaking. There was no boat traffic on the river.

APPARENT GAS EBULLITION OBSERVATIONS

Gas Ebullition Observations:

Is Apparent Gas Ebullition Observed? (Y) / N

Identify is the gas ebullition is one of the following (G, S, GS): G

(G) - Gas ebullition is seen as bubbles	(S) - Sheen	(GS) - Gas Ebullition bubbles and coincident sheen

Picture Taken? Y / (N) **Video Taken (Y/N)?** (Y) / N

Approximate Size of Gas Ebullition Area in feet (Length x Width): 3x3 feet

Bubble Frequency

Rate (bubbles/min): 3-5mm

◯	**High frequency:** Bubble rate is observed continuously and/or is uninterrupted for the entire period
X	**Moderate frequency:** Bubble frequency is intermittent and irregular but continues through the 5-minute period.
◯	**Low frequency:** Bubbles appear at specific, localized points. There is not a consistent stream of bubbles over the time period.

Describe if there are any conditions that could mimic or affect gas ebullition below:

Is a coincident sheen observed? (if yes, proceed to sheen observation section) Y / (N)

Sheen Observations:

Is a Sheen Observed? Y / (N)

Approximate Size of Sheen Area in feet (Length x Width):

Description of Sheen Color (See SOP for Pictures):

◯	**Silvery (S)** – Near transparent to silvery-gray; metallic
◯	**Rainbow (R) –** Multicolored
◯	**Metallic (M)** – Reflective light gray to dull brown
◯	**Transitional Dark (T)** – Transitional dark or true oil color. This description is used for a thicker oil, not an oil sheen.
◯	**Dark (E) –** A continuous true oil color; This description is used for the presence of thicker oil, not an oil sheen.

Is the Sheen Brittle or Non-Brittle?

◯	**Brittle –** The sheen cracks or breaks apparent when agitated
◯	**Non-Brittle -** The sheen blends or coalesces when agitated

Does the Sheen Blossom from the Apparent Gas Ebullition (if no, describe the sheen distribution below) Y / (N)

Rate (for sheen blossoms only, blossoms/min):

Sheen Distribution:

◯	**Streamer –** A narrow band or line of oil with clean water on each side
◯	**Spotty** – Isolated spots or blotches. Estimate the size range of the isolated patches.
◯	**Windows (streaks) –** Multiple bands or streaks that line parallel to each other
◯	**Contiguous** – A single, large patch, or area.

COMMENTS/ ADDITIONAL OBERVATIONS:

Ebullition was observed in shallow water

Ebullition-Facilitated NAPL Transport Field Survey Log 69

Pictures:



Ebullition-Facilitated NAPL Transport Field Survey Log 70

Project Number:	1804576	**Date: 9/22/2020**	
GEI Field Representative(s):	Youness Sharifi, Brian Fong-Murdock, Christos Saledas	**Survey Start Time: 9:00**	
Date:	09/22/20	**Survey End Time: 15:00**	
Survey Area (circle one):	/	**Time of Low or High Tide: Low Tide at 10:14**	

CONDITIONS OF TIME OF OBSERVATION:

Time of Observation:	11:19				
Latitude / Longitude:	3136293.8111 / 810078.7427				
Location of Ebullition relative to Coordinates:	Ebullition was observed close to the vegetation, depth of water 2-3 inches.				
Activities/ Structures near ebullition (mark with X, provide description):					
◯	**Watercraft Movement / Wake**	◯	**Sewers / Outfalls**	◯	**Construction / Drilling**
◯	**Outfalls**	◯	**Construction**	◯	**Diving**
◯	**Sampling**	◯	**Other**		

Weather:

(N) - NE - E - SE - S - SW - W - NW

(Light) - Medium - Heavy

Sunny - (Overcast) - Rainy

Air Temp (F): 65

Description / Notes:
Weather was warmer but overcast. In the morning around 50 °F and warmed up to about 65 °F. Light north wind approximately 11 mph.

Water Conditions:

◯	**Calm (glassy or ripples with no crests)**
X	**Slight (waves not breaking)**
◯	**Moderate (crests begin to break, scattered whitecaps)**
◯	**Heavy (fairly frequent whitecaps)**
◯	**Vessel Wake / Turbulence**

Description (wave height, vessel traffic, other):
There was slight wave and ripples on the water but not breaking. There was no boat traffic on the river.

APPARENT GAS EBULLITION OBSERVATIONS

Gas Ebullition Observations:

Is Apparent Gas Ebullition Observed? (Y) / N

Identify is the gas ebullition is one of the following (G, S, GS): G

(G) - Gas ebullition is seen as bubbles	(S) - Sheen	(GS) - Gas Ebullition bubbles and coincident sheen

Picture Taken? (Y) / N **Video Taken (Y/N)?** Y / (N)

Approximate Size of Gas Ebullition Area in feet (Length x Width): 5x5 feet

Bubble Frequency

Rate (bubbles/min): 3-5mm

◯	**High frequency:** Bubble rate is observed continuously and/or is uninterrupted for the entire period
◯	**Moderate frequency:** Bubble frequency is intermittent and irregular but continues through the 5-minute period.
X	**Low frequency:** Bubbles appear at specific, localized points. There is not a consistent stream of bubbles over the time period.

Describe if there are any conditions that could mimic or affect gas ebullition below:

Is a coincident sheen observed? (if yes, proceed to sheen observation section) Y / (N)

Sheen Observations:

Is a Sheen Observed? Y / (N)

Approximate Size of Sheen Area in feet (Length x Width):

Description of Sheen Color (See SOP for Pictures):

◯	**Silvery (S)** – Near transparent to silvery-gray; metallic
◯	**Rainbow (R) –** Multicolored
◯	**Metallic (M)** – Reflective light gray to dull brown
◯	**Transitional Dark (T)** – Transitional dark or true oil color. This description is used for a thicker oil, not an oil sheen.
◯	**Dark (E) –** A continuous true oil color; This description is used for the presence of thicker oil, not an oil sheen.

Is the Sheen Brittle or Non-Brittle?

◯	**Brittle –** The sheen cracks or breaks apparent when agitated
◯	**Non-Brittle -** The sheen blends or coalesces when agitated

Does the Sheen Blossom from the Apparent Gas Ebullition (if no, describe the sheen distribution below) Y / N

Rate (for sheen blossoms only, blossoms/min):

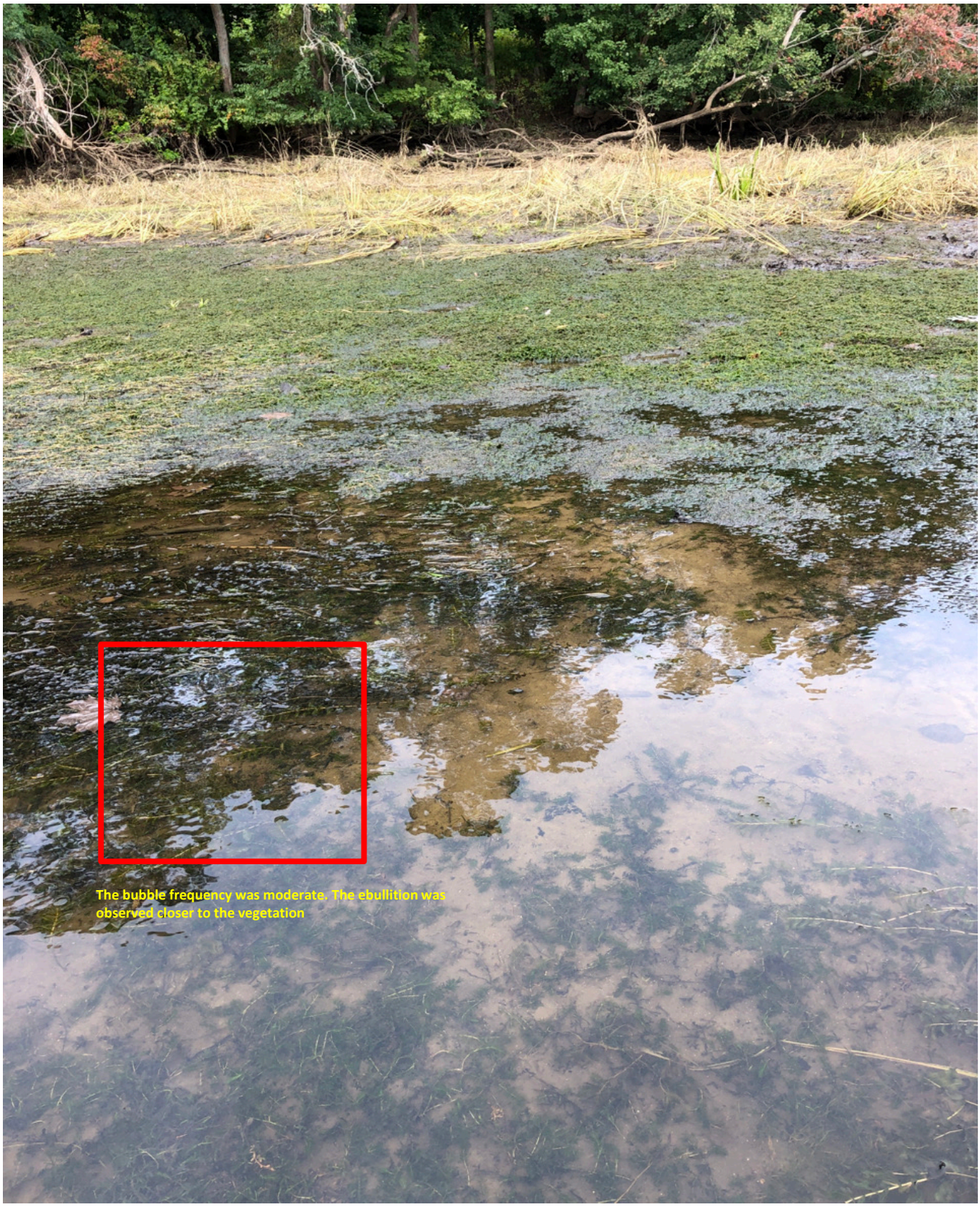
Sheen Distribution:

◯	**Streamer –** A narrow band or line of oil with clean water on each side
◯	**Spotty** – Isolated spots or blotches. Estimate the size range of the isolated patches.
◯	**Windows (streaks) –** Multiple bands or streaks that line parallel to each other
◯	**Contiguous** – A single, large patch, or area.

COMMENTS/ ADDITIONAL OBERVATIONS:

Ebullition was observed closer to the vegetation.

Pictures:


The bubble frequency was moderate. The ebullition was observed closer to the vegetation

Ebullition-Facilitated NAPL Transport Field Survey Log 71

Project Number:	1804576	**Date: 9/22/2020**	
GEI Field Representative(s):	Youness Sharifi, Brian Fong-Murdock, Christos Saledas	**Survey Start Time: 9:00**	
Date:	09/22/20	**Survey End Time: 15:00**	
Survey Area (circle one):	/	**Time of Low or High Tide: Low Tide at 10:14**	

CONDITIONS OF TIME OF OBSERVATION:

Time of Observation:	11:23						
Latitude / Longitude:	3136151.0811 / 809974.8196						
Location of Ebullition relative to Coordinates:	Ebullition was observed close to the vegetation, depth of water 2-3 inches.						
Activities/ Structures near ebullition (mark with X, provide description):							
◯	**Watercraft Movement / Wake**	◯	**Sewers / Outfalls**	◯	**Construction / Drilling**		
◯	**Outfalls**	◯	**Construction**	◯	**Diving**		
◯	**Sampling**	◯	**Other**				

Weather: (N) - NE - E - SE - S - SW - W - NW

(Light) - Medium - Heavy

Sunny - (Overcast) - Rainy

Air Temp (F): 65

Description / Notes:
Weather was warmer but overcast. In the morning around 50 °F and warmed up to about 65 °F. Light north wind approximately 11 mph.

Water Conditions:

◯	**Calm (glassy or ripples with no crests)**
X	**Slight (waves not breaking)**
◯	**Moderate (crests begin to break, scattered whitecaps)**
◯	**Heavy (fairly frequent whitecaps)**
◯	**Vessel Wake / Turbulence**

Description (wave height, vessel traffic, other):
There was slight wave and ripples on the water but not breaking. There was no boat traffic on the river.

APPARENT GAS EBULLITION OBSERVATIONS

Gas Ebullition Observations:

Is Apparent Gas Ebullition Observed? (Y) / N

Identify is the gas ebullition is one of the following (G, S, GS): G

(G) - Gas ebullition is seen as bubbles	(S) - Sheen	(GS) - Gas Ebullition bubbles and coincident sheen

Picture Taken? Y / (N) **Video Taken (Y/N)?** Y / (N)

Approximate Size of Gas Ebullition Area in feet (Length x Width): 2x2 feet

Bubble Frequency

Rate (bubbles/min): 1mm

◯	**High frequency:** Bubble rate is observed continuously and/or is uninterrupted for the entire period
◯	**Moderate frequency:** Bubble frequency is intermittent and irregular but continues through the 5-minute period.
X	**Low frequency:** Bubbles appear at specific, localized points. There is not a consistent stream of bubbles over the time period.

Describe if there are any conditions that could mimic or affect gas ebullition below:

Is a coincident sheen observed? (if yes, proceed to sheen observation section) Y / (N)

Sheen Observations:

Is a Sheen Observed? Y / (N)

Approximate Size of Sheen Area in feet (Length x Width):

Description of Sheen Color (See SOP for Pictures):

◯	**Silvery (S)** – Near transparent to silvery-gray; metallic
◯	**Rainbow (R) –** Multicolored
◯	**Metallic (M)** – Reflective light gray to dull brown
◯	**Transitional Dark (T)** – Transitional dark or true oil color. This description is used for a thicker oil, not an oil sheen.
◯	**Dark (E) –** A continuous true oil color; This description is used for the presence of thicker oil, not an oil sheen.

Is the Sheen Brittle or Non-Brittle?

◯	**Brittle –** The sheen cracks or breaks apparent when agitated
◯	**Non-Brittle -** The sheen blends or coalesces when agitated

Does the Sheen Blossom from the Apparent Gas Ebullition (if no, describe the sheen distribution below) Y / N

Rate (for sheen blossoms only, blossoms/min):

Sheen Distribution:

◯	**Streamer –** A narrow band or line of oil with clean water on each side
◯	**Spotty** – Isolated spots or blotches. Estimate the size range of the isolated patches.
◯	**Windows (streaks) –** Multiple bands or streaks that line parallel to each other
◯	**Contiguous** – A single, large patch, or area.

COMMENTS/ ADDITIONAL OBERVATIONS:

Ebullition was observed closer to the shoreline and shallow water.

Ebullition-Facilitated NAPL Transport Field Survey Log 75

Project Number:	1804576	**Date: 9/22/2020**	
GEI Field Representative(s):	Youness Sharifi, Brian Fong-Murdock, Christos Saledas	**Survey Start Time: 9:00**	
Date:	09/22/20	**Survey End Time: 15:00**	
Survey Area (circle one):	/	**Time of Low or High Tide: Low Tide at 10:14**	

CONDITIONS OF TIME OF OBSERVATION:

Time of Observation:	11:50				
Latitude / Longitude:	3135800.1526 / 810048.886				
Location of Ebullition relative to Coordinates:	Ebullition was observed close to the vegetation. Depth of water 2-3 inches.				
Activities/ Structures near ebullition (mark with X, provide description):					
◯	**Watercraft Movement / Wake**	◯	**Sewers / Outfalls**	◯	**Construction / Drilling**
◯	**Outfalls**	◯	**Construction**	◯	**Diving**
◯	**Sampling**	◯	**Other**		

Weather:

(N) - NE - E - SE - S - SW - W - NW

(Light) - Medium - Heavy

Sunny - (Overcast) - Rainy

Air Temp (F): 65

Description / Notes:
Weather was warmer but overcast. In the morning around 50 °F and warmed up to about 65 °F. Light north wind approximately 11 mph

Water Conditions:

◯	**Calm (glassy or ripples with no crests)**
X	**Slight (waves not breaking)**
◯	**Moderate (crests begin to break, scattered whitecaps)**
◯	**Heavy (fairly frequent whitecaps)**
◯	**Vessel Wake / Turbulence**

Description (wave height, vessel traffic, other):
There was slight wave and ripples on the water but not breaking. There was no boat traffic on the river.

APPARENT GAS EBULLITION OBSERVATIONS

Gas Ebullition Observations:

Is Apparent Gas Ebullition Observed? (Y) / N

Identify is the gas ebullition is one of the following (G, S, GS): G

(G) - Gas ebullition is seen as bubbles	(S) - Sheen	(GS) - Gas Ebullition bubbles and coincident sheen

Picture Taken? (Y) / N **Video Taken (Y/N)?** Y / (N)

Approximate Size of Gas Ebullition Area in feet (Length x Width): 3x5 feet

Bubble Frequency

Rate (bubbles/min): 2-3mm

◯	**High frequency:** Bubble rate is observed continuously and/or is uninterrupted for the entire period
◯	**Moderate frequency:** Bubble frequency is intermittent and irregular but continues through the 5-minute period.
X	**Low frequency:** Bubbles appear at specific, localized points. There is not a consistent stream of bubbles over the time period.

Describe if there are any conditions that could mimic or affect gas ebullition below:

Is a coincident sheen observed? (if yes, proceed to sheen observation section) Y / (N)

Sheen Observations:

Is a Sheen Observed? Y / (N)

Approximate Size of Sheen Area in feet (Length x Width):

Description of Sheen Color (See SOP for Pictures):

◯	**Silvery (S)** – Near transparent to silvery-gray; metallic
◯	**Rainbow (R) –** Multicolored
◯	**Metallic (M)** – Reflective light gray to dull brown
◯	**Transitional Dark (T)** – Transitional dark or true oil color. This description is used for a thicker oil, not an oil sheen.
◯	**Dark (E) –** A continuous true oil color; This description is used for the presence of thicker oil, not an oil sheen.

Is the Sheen Brittle or Non-Brittle?

◯	**Brittle –** The sheen cracks or breaks apparent when agitated
◯	**Non-Brittle -** The sheen blends or coalesces when agitated

Does the Sheen Blossom from the Apparent Gas Ebullition (if no, describe the sheen distribution below) Y / N

Rate (for sheen blossoms only, blossoms/min):

Sheen Distribution:

◯	**Streamer –** A narrow band or line of oil with clean water on each side
◯	**Spotty** – Isolated spots or blotches. Estimate the size range of the isolated patches.
◯	**Windows (streaks) –** Multiple bands or streaks that line parallel to each other
◯	**Contiguous** – A single, large patch, or area.

COMMENTS/ ADDITIONAL OBERVATIONS:

Ebullition was observed closer to vegetation, shallow water and the shoreline.

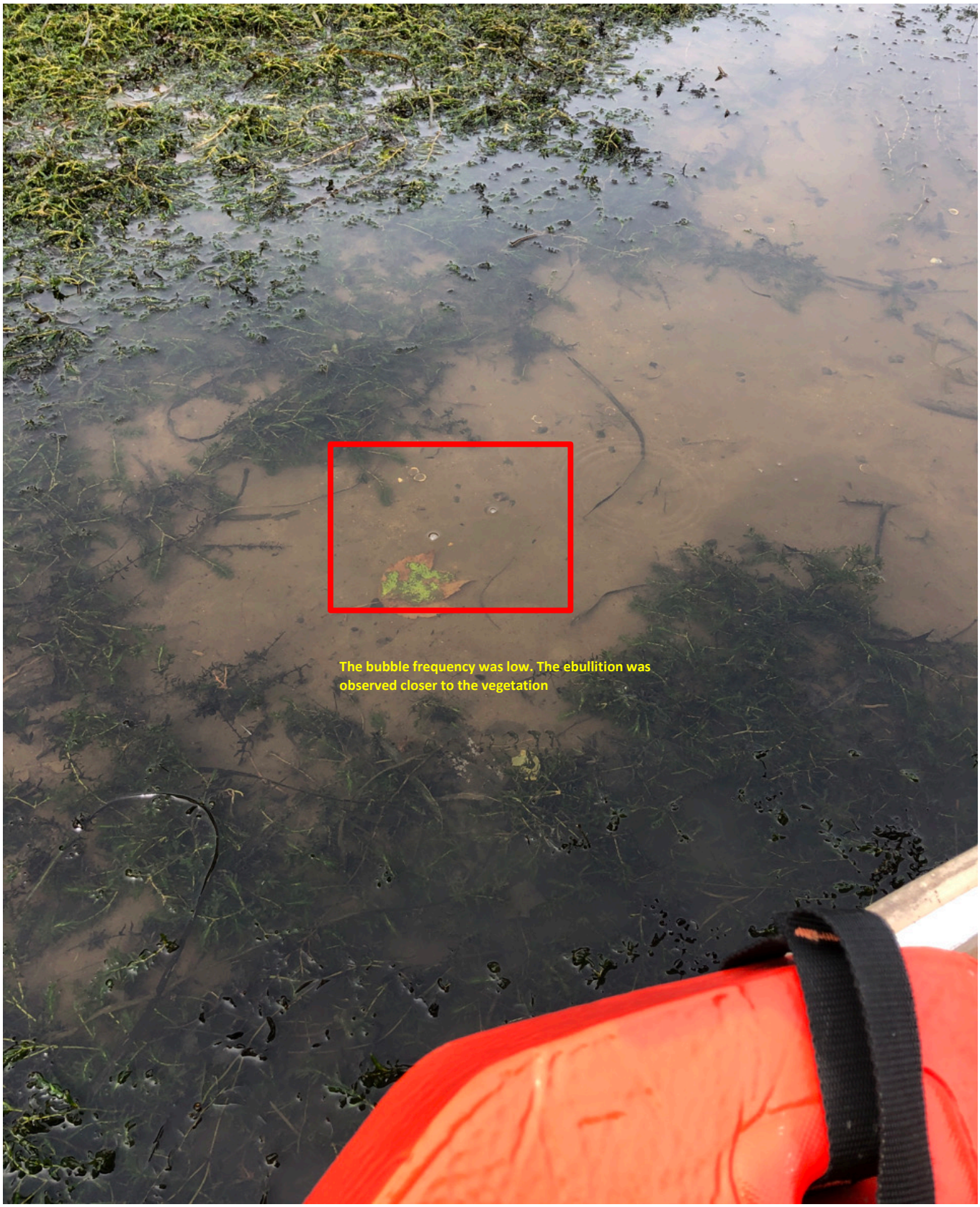
Ebullition-Facilitated NAPL Transport Field Survey Log 75

Pictures:



Ebullition-Facilitated NAPL Transport Field Survey Log 75

Pictures:



Ebullition-Facilitated NAPL Transport Field Survey Log 76

Project Number:	1804576	**Date: 9/22/2020**	
GEI Field Representative(s):	Youness Sharifi, Brian Fong-Murdock, Christos Saledas	**Survey Start Time: 9:00**	
Date:	09/22/20	**Survey End Time: 15:00**	
Survey Area (circle one):	/	**Time of Low or High Tide: Low Tide at 10:14**	

CONDITIONS OF TIME OF OBSERVATION:

Time of Observation:	11:55				
Latitude / Longitude:	3135778.0586 / 810050.2934				
Location of Ebullition relative to Coordinates:	The ebullition was in the shallow water.				
Activities/ Structures near ebullition (mark with X, provide description):					
◯	**Watercraft Movement / Wake**	◯	**Sewers / Outfalls**	◯	**Construction / Drilling**
◯	**Outfalls**	◯	**Construction**	◯	**Diving**
◯	**Sampling**	◯	**Other**		

Weather:

(N) - NE - E - SE - S - SW - W - NW

Ligh - Medium - Heavy

Sunny - (Overcast) - Rainy

Air Temp (F): 65

Description / Notes:
Weather was warmer but overcast. In the morning around 50 °F and warmed up to about 65 °F. Light north wind approximately 11 mph

Water Conditions:

◯	**Calm (glassy or ripples with no crests)**
X	**Slight (waves not breaking)**
◯	**Moderate (crests begin to break, scattered whitecaps)**
◯	**Heavy (fairly frequent whitecaps)**
◯	**Vessel Wake / Turbulence**

Description (wave height, vessel traffic, other):
There was slight wave and ripples on the water but not breaking. There was no boat traffic on the river.

APPARENT GAS EBULLITION OBSERVATIONS

Gas Ebullition Observations:

Is Apparent Gas Ebullition Observed? (Y) / N

Identify is the gas ebullition is one of the following (G, S, GS): G

(G) - Gas ebullition is seen as bubbles	(S) - Sheen	(GS) - Gas Ebullition bubbles and coincident sheen

Picture Taken? Y / (N) **Video Taken (Y/N)?** Y / (N)

Approximate Size of Gas Ebullition Area in feet (Length x Width): 6x6 feet

Bubble Frequency

Rate (bubbles/min): 3-5mm

◯	**High frequency:** Bubble rate is observed continuously and/or is uninterrupted for the entire period
X	**Moderate frequency:** Bubble frequency is intermittent and irregular but continues through the 5-minute period.
◯	**Low frequency:** Bubbles appear at specific, localized points. There is not a consistent stream of bubbles over the time period.

Describe if there are any conditions that could mimic or affect gas ebullition below:

Is a coincident sheen observed? (if yes, proceed to sheen observation section) Y / (N)

Sheen Observations:

Is a Sheen Observed? Y / (N)

Approximate Size of Sheen Area in feet (Length x Width):

Description of Sheen Color (See SOP for Pictures):

◯	**Silvery (S)** – Near transparent to silvery-gray; metallic
◯	**Rainbow (R) –** Multicolored
◯	**Metallic (M)** – Reflective light gray to dull brown
◯	**Transitional Dark (T)** – Transitional dark or true oil color. This description is used for a thicker oil, not an oil sheen.
◯	**Dark (E) –** A continuous true oil color; This description is used for the presence of thicker oil, not an oil sheen.

Is the Sheen Brittle or Non-Brittle?

◯	**Brittle –** The sheen cracks or breaks apparent when agitated
◯	**Non-Brittle -** The sheen blends or coalesces when agitated

Does the Sheen Blossom from the Apparent Gas Ebullition (if no, describe the sheen distribution below) Y / N

Rate (for sheen blossoms only, blossoms/min):

Sheen Distribution:

◯	**Streamer –** A narrow band or line of oil with clean water on each side
◯	**Spotty** – Isolated spots or blotches. Estimate the size range of the isolated patches.
◯	**Windows (streaks) –** Multiple bands or streaks that line parallel to each other
◯	**Contiguous** – A single, large patch, or area.

COMMENTS/ ADDITIONAL OBERVATIONS:

Due to the size and frequency of the bubbles, was not able to capture the ebullition in a photo.

Ebullition-Facilitated NAPL Transport Field Survey Log 77

Project Number:	1804576	**Date: 9/22/2020**	
GEI Field Representative(s):	Youness Sharifi, Brian Fong-Murdock, Christos Saledas	**Survey Start Time: 9:00**	
Date:	09/22/20	**Survey End Time: 15:00**	
Survey Area (circle one):	/	**Time of Low or High Tide: Low Tide at 10:14**	

CONDITIONS OF TIME OF OBSERVATION:

Time of Observation:	12:00						
Latitude / Longitude:	3135704.8284 / 810041.2552						
Location of Ebullition relative to Coordinates:	Ebullition was observed close to vegetation. Depth of water ~2 inches.						
Activities/ Structures near ebullition (mark with X, provide description):							
◯	**Watercraft Movement / Wake**	◯	**Sewers / Outfalls**	◯	**Construction / Drilling**		
◯	**Outfalls**	◯	**Construction**	◯	**Diving**		
◯	**Sampling**	◯	**Other**				

Weather:

(N) - NE - E - SE - S - SW - W - NW

(Light) - Medium - Heavy

Sunny - (Overcast) - Rainy

Air Temp (F): 65

Description / Notes:
Weather was warmer but overcast. In the morning around 50 °F and warmed up to about 65 °F. Light north wind approximately 11 mph.

Water Conditions:

◯	**Calm (glassy or ripples with no crests)**
X	**Slight (waves not breaking)**
◯	**Moderate (crests begin to break, scattered whitecaps)**
◯	**Heavy (fairly frequent whitecaps)**
◯	**Vessel Wake / Turbulence**

Description (wave height, vessel traffic, other):
There was slight wave and ripples on the water but not breaking. There was no boat traffic on the river.

APPARENT GAS EBULLITION OBSERVATIONS

Gas Ebullition Observations:

Is Apparent Gas Ebullition Observed? (Y) / N

Identify is the gas ebullition is one of the following (G, S, GS): G

(G) - Gas ebullition is seen as bubbles	(S) - Sheen	(GS) - Gas Ebullition bubbles and coincident sheen

Picture Taken? Y / (N) **Video Taken (Y/N)?** (Y) / N

Approximate Size of Gas Ebullition Area in feet (Length x Width): 10x15 feet

Bubble Frequency

Rate (bubbles/min): 3-5mm

◯	**High frequency:** Bubble rate is observed continuously and/or is uninterrupted for the entire period
X	**Moderate frequency:** Bubble frequency is intermittent and irregular but continues through the 5-minute period.
◯	**Low frequency:** Bubbles appear at specific, localized points. There is not a consistent stream of bubbles over the time period.

Describe if there are any conditions that could mimic or affect gas ebullition below:

several bubbling locations in this area

Is a coincident sheen observed? (if yes, proceed to sheen observation section) Y / (N)

Sheen Observations:

Is a Sheen Observed? Y / (N)

Approximate Size of Sheen Area in feet (Length x Width):

Description of Sheen Color (See SOP for Pictures):

◯	**Silvery (S)** – Near transparent to silvery-gray; metallic
◯	**Rainbow (R) –** Multicolored
◯	**Metallic (M)** – Reflective light gray to dull brown
◯	**Transitional Dark (T)** – Transitional dark or true oil color. This description is used for a thicker oil, not an oil sheen.
◯	**Dark (E) –** A continuous true oil color; This description is used for the presence of thicker oil, not an oil sheen.

Is the Sheen Brittle or Non-Brittle?

◯	**Brittle –** The sheen cracks or breaks apparent when agitated
◯	**Non-Brittle -** The sheen blends or coalesces when agitated

Does the Sheen Blossom from the Apparent Gas Ebullition (if no, describe the sheen distribution below) Y / N

Rate (for sheen blossoms only, blossoms/min):

Sheen Distribution:

◯	**Streamer –** A narrow band or line of oil with clean water on each side
◯	**Spotty** – Isolated spots or blotches. Estimate the size range of the isolated patches.
◯	**Windows (streaks) –** Multiple bands or streaks that line parallel to each other
◯	**Contiguous** – A single, large patch, or area.

COMMENTS/ ADDITIONAL OBERVATIONS:

Ebullition was observed in the shallow water.

Ebullition-Facilitated NAPL Transport Field Survey Log 77

Pictures:



Ebullition-Facilitated NAPL Transport Field Survey Log 78

Project Number:	1804576	**Date: 9/22/2020**	
GEI Field Representative(s):	Youness Sharifi, Brian Fong-Murdock, Christos Saledas	**Survey Start Time: 9:00**	
Date:	09/22/20	**Survey End Time: 15:00**	
Survey Area (circle one):	/	**Time of Low or High Tide: Low Tide at 10:14**	

CONDITIONS OF TIME OF OBSERVATION:

Time of Observation:	12:04						
Latitude / Longitude:	3135695.9565 / 810050.8007						
Location of Ebullition relative to Coordinates:	Ebullition was observed close to the vegetation. Depth of water 3-4 inches.						
Activities/ Structures near ebullition (mark with X, provide description):							
◯	**Watercraft Movement / Wake**	◯	**Sewers / Outfalls**	◯	**Construction / Drilling**		
◯	**Outfalls**	◯	**Construction**	◯	**Diving**		
◯	**Sampling**	◯	**Other**				

Weather:

(N) - NE - E - SE - S - SW - W - NW

(Ligh) - Medium - Heavy

Sunny - (Overcast) - Rainy

Air Temp (F): 65

Description / Notes:
Weather was warmer but overcast. In the morning around 50 °F and warmed up to about 65 °F. Light north wind approximately 11 mph.

Water Conditions:

◯	**Calm (glassy or ripples with no crests)**
X	**Slight (waves not breaking)**
◯	**Moderate (crests begin to break, scattered whitecaps)**
◯	**Heavy (fairly frequent whitecaps)**
◯	**Vessel Wake / Turbulence**

Description (wave height, vessel traffic, other):
There was slight wave and ripples on the water but not breaking. There was no boat traffic on the river.

APPARENT GAS EBULLITION OBSERVATIONS

Gas Ebullition Observations:

Is Apparent Gas Ebullition Observed? (Y) / N

Identify is the gas ebullition is one of the following (G, S, GS): G

(G) - Gas ebullition is seen as bubbles	(S) - Sheen	(GS) - Gas Ebullition bubbles and coincident sheen

Picture Taken? (Y) / N **Video Taken (Y/N)?** Y / (N)

Approximate Size of Gas Ebullition Area in feet (Length x Width): 5x7 feet

Bubble Frequency

Rate (bubbles/min): 3mm

◯	**High frequency:** Bubble rate is observed continuously and/or is uninterrupted for the entire period
X	**Moderate frequency:** Bubble frequency is intermittent and irregular but continues through the 5-minute period.
◯	**Low frequency:** Bubbles appear at specific, localized points. There is not a consistent stream of bubbles over the time period.

Describe if there are any conditions that could mimic or affect gas ebullition below:

Is a coincident sheen observed? (if yes, proceed to sheen observation section) Y / (N)

Sheen Observations:

Is a Sheen Observed? Y / (N)

Approximate Size of Sheen Area in feet (Length x Width):

Description of Sheen Color (See SOP for Pictures):

◯	**Silvery (S)** – Near transparent to silvery-gray; metallic
◯	**Rainbow (R) –** Multicolored
◯	**Metallic (M)** – Reflective light gray to dull brown
◯	**Transitional Dark (T)** – Transitional dark or true oil color. This description is used for a thicker oil, not an oil sheen.
◯	**Dark (E) –** A continuous true oil color; This description is used for the presence of thicker oil, not an oil sheen.

Is the Sheen Brittle or Non-Brittle?

◯	**Brittle –** The sheen cracks or breaks apparent when agitated
◯	**Non-Brittle -** The sheen blends or coalesces when agitated

Does the Sheen Blossom from the Apparent Gas Ebullition (if no, describe the sheen distribution below) Y / N

Rate (for sheen blossoms only, blossoms/min):

Sheen Distribution:

◯	**Streamer –** A narrow band or line of oil with clean water on each side
◯	**Spotty** – Isolated spots or blotches. Estimate the size range of the isolated patches.
◯	**Windows (streaks) –** Multiple bands or streaks that line parallel to each other
◯	**Contiguous** – A single, large patch, or area.

COMMENTS/ ADDITIONAL OBERVATIONS:

Ebullition-Facilitated NAPL Transport Field Survey Log 78

Pictures:



Ebullition-Facilitated NAPL Transport Field Survey Log 78

Pictures:



Ebullition-Facilitated NAPL Transport Field Survey Log 83

Project Number:	1804576	**Date: 9/22/2020**	
GEI Field Representative(s):	Youness Sharifi, Brian Fong-Murdock, Christos Saledas	**Survey Start Time: 9:00**	
Date:	09/22/20	**Survey End Time: 15:00**	
Survey Area (circle one):	/	**Time of Low or High Tide: Low Tide at 10:14**	

CONDITIONS OF TIME OF OBSERVATION:

Time of Observation:	12:32	**Weather:**	**Water Conditions:**
Latitude / Longitude:	3134562.516 / 810890.3142	(N) - NE - E - SE - S - SW - W - NW	◯ Calm (glassy or ripples with no crests)
Location of Ebullition relative to Coordinates:	Ebullition was observed close to the vegetation. Depth of water 4-5 in	(Light) - Medium - Heavy	X Slight (waves not breaking)
Activities/ Structures near ebullition (mark with X, provide description):		Sunny - (Overcast) - Rainy	◯ Moderate (crests begin to break, scattered whitecaps)
◯ Watercraft Movement / Wake; ◯ Sewers / Outfalls; ◯ Construction / Drilling		**Air Temp (F):** 65	◯ Heavy (fairly frequent whitecaps)
◯ Outfalls; ◯ Construction; ◯ Diving		**Description / Notes:** Weather was warmer but overcast. In the morning around 50 °F and warmed up to about 65 °F. Light north wind approximately 11 mph.	◯ Vessel Wake / Turbulence
◯ Sampling; ◯ Other			**Description (wave height, vessel traffic, other):** There was slight wave and ripples on the water but not breaking. There was no boat traffic on the river.

APPARENT GAS EBULLITION OBSERVATIONS

Gas Ebullition Observations:

Is Apparent Gas Ebullition Observed? (Y) / N

Identify is the gas ebullition is one of the following (G, S, GS): GS

(G) - Gas ebullition is seen as bubbles	(S) - Sheen	(GS) - Gas Ebullition bubbles and coincident sheen

Picture Taken? (Y) / N **Video Taken (Y/N)?** Y / (N)

Approximate Size of Gas Ebullition Area in feet (Length x Width): 3x4 feet

Bubble Frequency

Rate (bubbles/min): 5mm

- ◯ **High frequency:** Bubble rate is observed continuously and/or is uninterrupted for the entire period
- X **Moderate frequency:** Bubble frequency is intermittent and irregular but continues through the 5-minute period.
- ◯ **Low frequency:** Bubbles appear at specific, localized points. There is not a consistent stream of bubbles over the time period.

Describe if there are any conditions that could mimic or affect gas ebullition below:

Is a coincident sheen observed? (if yes, proceed to sheen observation section) (Y) / N

Sheen Observations:

Is a Sheen Observed? (Y) / N

Approximate Size of Sheen Area in feet (Length x Width): 3x4 feet

Description of Sheen Color (See SOP for Pictures):

- X **Silvery (S)** – Near transparent to silvery-gray; metallic
- ◯ **Rainbow (R) –** Multicolored
- ◯ **Metallic (M)** – Reflective light gray to dull brown
- ◯ **Transitional Dark (T)** – Transitional dark or true oil color. This description is used for a thicker oil, not an oil sheen.
- ◯ **Dark (E) –** A continuous true oil color; This description is used for the presence of thicker oil, not an oil sheen.

Is the Sheen Brittle or Non-Brittle?

- X **Brittle –** The sheen cracks or breaks apparent when agitated
- ◯ **Non-Brittle -** The sheen blends or coalesces when agitated

Does the Sheen Blossom from the Apparent Gas Ebullition (if no, describe the sheen distribution below) Y / (N)

Rate (for sheen blossoms only, blossoms/min):

Sheen Distribution:

- ◯ **Streamer –** A narrow band or line of oil with clean water on each side
- X **Spotty** – Isolated spots or blotches. Estimate the size range of the isolated patches.
- ◯ **Windows (streaks) –** Multiple bands or streaks that line parallel to each other
- ◯ **Contiguous** – A single, large patch, or area.

COMMENTS/ ADDITIONAL OBERVATIONS:

Ebullition was observed in shallow waters. The bubbles diameters were 1-2 inches. The brittle sheen was separating by the water motion and the diameter of the patches was 2-3 inches.

Ebullition-Facilitated NAPL Transport Field Survey Log 83

Pictures:



Ebullition-Facilitated NAPL Transport Field Survey Log 83

Pictures:



Ebullition-Facilitated NAPL Transport Field Survey Log 85

Project Number:	1804576	**Date: 9/22/2020**	
GEI Field Representative(s):	Youness Sharifi, Brian Fong-Murdock, Christos Saledas	**Survey Start Time: 9:00**	
Date:	09/22/20	**Survey End Time: 15:00**	
Survey Area (circle one):	/	**Time of Low or High Tide: Low Tide at 10:14**	

CONDITIONS OF TIME OF OBSERVATION:

Time of Observation:	12:45						
Latitude / Longitude:	3134665.4882 / 810770.7001						
Location of Ebullition relative to Coordinates:	Ebullition was observed closer to the shoreline and river banks						
Activities/ Structures near ebullition (mark with X, provide description):							
◯	**Watercraft Movement / Wake**	◯	**Sewers / Outfalls**	◯	**Construction / Drilling**		
◯	**Outfalls**	◯	**Construction**	◯	**Diving**		
◯	**Sampling**	◯	**Other**				

Weather:

(N) - NE - E - SE - S - SW - W - NW

Ligh - Medium - Heavy

Sunny - (Overcast) - Rainy

Air Temp (F): 65

Description / Notes:
Weather was warmer but overcast. In the morning around 50 °F and warmed up to about 65 °F. Light north wind approximately 11 mph.

Water Conditions:

◯	**Calm (glassy or ripples with no crests)**
X	**Slight (waves not breaking)**
◯	**Moderate (crests begin to break, scattered whitecaps)**
◯	**Heavy (fairly frequent whitecaps)**
◯	**Vessel Wake / Turbulence**

Description (wave height, vessel traffic, other):
There was slight wave and ripples on the water but not breaking. There was no boat traffic on the river.

APPARENT GAS EBULLITION OBSERVATIONS

Gas Ebullition Observations:

Is Apparent Gas Ebullition Observed? Y / (N)

Identify is the gas ebullition is one of the following (G, S, GS):

(G) - Gas ebullition is seen as bubbles	(S) - Sheen	(GS) - Gas Ebullition bubbles and coincident sheen

Picture Taken? (Y) / N **Video Taken (Y/N)?** (Y) / N

Approximate Size of Gas Ebullition Area in feet (Length x Width):

Bubble Frequency

Rate (bubbles/min):

◯	**High frequency:** Bubble rate is observed continuously and/or is uninterrupted for the entire period
◯	**Moderate frequency:** Bubble frequency is intermittent and irregular but continues through the 5-minute period.
◯	**Low frequency:** Bubbles appear at specific, localized points. There is not a consistent stream of bubbles over the time period.

Describe if there are any conditions that could mimic or affect gas ebullition below:

Is a coincident sheen observed? (if yes, proceed to sheen observation section) (Y) / N

Sheen Observations:

Is a Sheen Observed? (Y) / N

Approximate Size of Sheen Area in feet (Length x Width): 2 x 2 ft

Description of Sheen Color (See SOP for Pictures):

X	**Silvery (S)** – Near transparent to silvery-gray; metallic
◯	**Rainbow (R) –** Multicolored
◯	**Metallic (M)** – Reflective light gray to dull brown
◯	**Transitional Dark (T)** – Transitional dark or true oil color. This description is used for a thicker oil, not an oil sheen.
◯	**Dark (E) –** A continuous true oil color; This description is used for the presence of thicker oil, not an oil sheen.

Is the Sheen Brittle or Non-Brittle?

X	**Brittle –** The sheen cracks or breaks apparent when agitated
◯	**Non-Brittle -** The sheen blends or coalesces when agitated

Does the Sheen Blossom from the Apparent Gas Ebullition (if no, describe the sheen distribution below) Y / (N)

Rate (for sheen blossoms only, blossoms/min):

Sheen Distribution:

◯	**Streamer –** A narrow band or line of oil with clean water on each side
X	**Spotty** – Isolated spots or blotches. Estimate the size range of the isolated patches.
◯	**Windows (streaks) –** Multiple bands or streaks that line parallel to each other
◯	**Contiguous** – A single, large patch, or area.

COMMENTS/ ADDITIONAL OBERVATIONS:

No ebullition, heavy vegetation and tall grass, rising tide and sheen was observed. The sheen was very brittle and the diameter of the patches was 1-1.5 inches.

Pictures:



Ebullition-Facilitated NAPL Transport Field Survey Log 86

Project Number:	1804576	**Date: 9/22/2020**	
GEI Field Representative(s):	Youness Sharifi, Brian Fong-Murdock, Christos Saledas	**Survey Start Time: 9:00**	
Date:	09/22/20	**Survey End Time: 15:00**	
Survey Area (circle one):	/	**Time of Low or High Tide: Low Tide at 10:14**	

CONDITIONS OF TIME OF OBSERVATION:

Time of Observation:	12:50	**Weather:**		**Water Conditions:**			
Latitude / Longitude:	3136829.2977 / 810582.1256	(N) - NE - E - SE - S - SW - W - NW		◯	**Calm (glassy or ripples with no crests)**		
Location of Ebullition relative to Coordinates:	Sheen was observed	(Light) - Medium - Heavy		X	**Slight (waves not breaking)**		
Activities/ Structures near ebullition (mark with X, provide description):		Sunny - (Overcast) - Rainy		◯	**Moderate (crests begin to break, scattered whitecaps)**		
◯ **Watercraft Movement / Wake**	◯ **Sewers / Outfalls**	◯ **Construction / Drilling**	**Air Temp (F):** 65	◯	**Heavy (fairly frequent whitecaps)**		
◯ **Outfalls**	◯ **Construction**	◯ **Diving**	**Description / Notes:** Weather was warmer but overcast. In the morning around 50 °F and warmed up to about 65 °F. Light north wind approximately 11 mph.	◯	**Vessel Wake / Turbulence**		
◯ **Sampling**	◯ **Other**			**Description (wave height, vessel traffic, other):** There was slight wave and ripples on the water but not breaking. There was no boat traffic on the river.			

APPARENT GAS EBULLITION OBSERVATIONS

Gas Ebullition Observations:

Is Apparent Gas Ebullition Observed? Y / (N)

Identify is the gas ebullition is one of the following (G, S, GS):

(G) - Gas ebullition is seen as bubbles	(S) - Sheen	(GS) - Gas Ebullition bubbles and coincident sheen

Picture Taken? (Y) / N **Video Taken (Y/N)?** Y / (N)

Approximate Size of Gas Ebullition Area in feet (Length x Width):

Bubble Frequency

Rate (bubbles/min):

◯ **High frequency:** Bubble rate is observed continuously and/or is uninterrupted for the entire period

◯ **Moderate frequency:** Bubble frequency is intermittent and irregular but continues through the 5-minute period.

◯ **Low frequency:** Bubbles appear at specific, localized points. There is not a consistent stream of bubbles over the time period.

Describe if there are any conditions that could mimic or affect gas ebullition below:

Is a coincident sheen observed? (if yes, proceed to sheen observation section) (Y) / N

Sheen Observations:

Is a Sheen Observed? (Y) / N

Approximate Size of Sheen Area in feet (Length x Width): 5 x 5 feet area

Description of Sheen Color (See SOP for Pictures):

X	**Silvery (S)** – Near transparent to silvery-gray; metallic
◯	**Rainbow (R) –** Multicolored
X	**Metallic (M)** – Reflective light gray to dull brown
◯	**Transitional Dark (T)** – Transitional dark or true oil color. This description is used for a thicker oil, not an oil sheen.
◯	**Dark (E) –** A continuous true oil color; This description is used for the presence of thicker oil, not an oil sheen.

Is the Sheen Brittle or Non-Brittle?

X	**Brittle –** The sheen cracks or breaks apparent when agitated
◯	**Non-Brittle -** The sheen blends or coalesces when agitated

Does the Sheen Blossom from the Apparent Gas Ebullition (if no, describe the sheen distribution below) Y / (N)

Rate (for sheen blossoms only, blossoms/min):

Sheen Distribution:

◯	**Streamer –** A narrow band or line of oil with clean water on each side
X	**Spotty** – Isolated spots or blotches. Estimate the size range of the isolated patches.
◯	**Windows (streaks) –** Multiple bands or streaks that line parallel to each other
◯	**Contiguous** – A single, large patch, or area.

COMMENTS/ ADDITIONAL OBERVATIONS:

Sheen, very brittle, the diameter of the patches was 4-5 inches prior to separation. Due to the boat access limitations, the mud flat observations were conducted while walking on the mud flats.

Ebullition-Facilitated NAPL Transport Field Survey Log 86

Pictures:



Appendix O IDW Waste Manifests

Fleet 5725

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) SB 1800946023-001 SC PPW 10/10/2017 Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number: MAC300010741
2. Page 1 of 1 (5)
3. Emergency Response Phone: (800) 483-3718
4. Manifest Tracking Number: 011586333 FLE

5. Generator's Name and Mailing Address
Boston Gas Company
Susan Brochu 40 Sylvan Road
Waltham. MA 02451
Generator's Phone: (781) 907-3647 ATTN:Susan Brochu

Generator's Site Address (if different than mailing address)
Map 54 Parcil 219 39 Water Street
Amesbury,MA 01913

6. Transporter 1 Company Name: Clean Harbors Environmental Services, Inc. — U.S. EPA ID Number: MAD039322250

7. Transporter 2 Company Name: Robbie D Wood Inc — U.S. EPA ID Number: ALD067138891

8. Designated Facility Name and Site Address
Clean Harbors El Dorado LLC
309 American Circle
El Dorado. AR 71730
Facility's Phone: (870) 863 7173
U.S. EPA ID Number: ARD069748192

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
x	1. NA3082, HAZARDOUS WASTE, LIQUID, N.O.S., (BENZENE), 9, PG III	xx1	DM	200	P	D018
	2. NON DOT REGULATED MATERIAL, (OILY DEBRIS)	xx1	DM	150	P	MA01
	3.					
	4.					

14. Special Handling Instructions and Additional Information
1.CH075269MA ERG#171 1) 1x55
2.R40179MAR 2) 1x55

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Shawn Gilo (on behalf of Boston Gas) — Signature: Shawn Gilo — Month 2 Day 27 Year 18

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: Shawn Gilo — Signature: Shawn Gilo — Month 2 Day 27 Year 18
Transporter 2 Printed/Typed Name: Doug Thacker — Signature: Doug Thacker — Month 3 Day 7 Year 18

18. Discrepancy
18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:
18b. Alternate Facility (or Generator) — U.S. EPA ID Number
Facility's Phone:
18c. Signature of Alternate Facility (or Generator) — Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)
1. H040 2. H040 3. 4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name: Lauren Hurst — Signature: Lauren Hurst — Month 3 Day 20 Year 18

GENERATOR / INT'L / TRANSPORTER / DESIGNATED FACILITY

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete. DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

Clean Harbors has the appropriate permits for and will accept the waste the generator is shipping.

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST (Continuation Sheet)

21. Generator ID Number: MAC300010741

22. Page: 2 of 2

23. Manifest Tracking Number: 011584333 FLE

24. Generator's Name: Boston Gas

25. Transporter 3 Company Name: Clean Harbors Environmental Services Inc.

U.S. EPA ID Number: MAD039322250

26. Transporter _____ Company Name

U.S. EPA ID Number

27a. HM	27b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	28. Containers No.	28. Containers Type	29. Total Quantity	30. Unit Wt./Vol.	31. Waste Codes		
	T P O							

32. Special Handling Instructions and Additional Information

GENERATOR

TRANSPORTER

33. Transporter 3 Acknowledgment of Receipt of Materials
Printed/Typed Name: Stephanie Matheny (Agent for CHES)
Signature: Stephanie Matheny
Month: 3 Day: 10 Year: 18

34. Transporter _____ Acknowledgment of Receipt of Materials
Printed/Typed Name
Signature
Month Day Year

DESIGNATED FACILITY

35. Discrepancy

36. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

EPA Form 8700-22A (Rev. 3-05) Previous editions are obsolete.

CleanHarbors ENVIRONMENTAL SERVICES®

Land Disposal Restriction Notification Form

Printed Date :Feb 22, 2018

MANIFEST INFORMATION

Generator :	Boston Gas Company	Manifest Tracking Info.
Address:	Map 54 Parcil 219 39 Water Street Amesbury,MA 01913	011586333 FLE
EPA ID #:	M A C 3 0 0 0 1 0 7 4 1	Sales Order No: 1800946023-001

LINE ITEM INFORMATION

Line Item:	Page No:	Profile No:	Treatability Group:	LDR Disposal Category
1.	1	CH075269MA	NON-WASTEWATER	2 (This is subject to LDR.)

EPA Waste Code	EPA Waste SubCategory
D018	NONE

LDR Chemical Data

Chemical	Underlying Hazardous Constituents	Constituents of Concern	Contaminants Subject to Treatment
BENZENE	Y	N	N

Certification	Applies to Manifest Line Items
Pursuant to 40 CFR 268.7(a), I hereby notify that this shipment contains waste restricted under 40 CFR Part 268.	1.
This waste is not restricted as specified in 40 CFR 268 Subpart D.	2.

Waste analysis data, where available, is attached.

Signature : [signature] Print Name Shawn Giles (on behalf of Boston Gas)

Title : E/O Date : 2/27/18

TR# 5495

Generator acknowledges that no material change has occurred either in the characteristics or in the process generating the material.

Please print or type. Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
	MAC300010741	1	(800) 483-3718	014472118 FLE

GENERATOR

5. Generator's Name and Mailing Address
Boston Gas Company
Susan Brochu 40 Sylvan Road
Waltham, MA 02451
Generator's Phone: (781) 907-3647 ATTN:Susan Brochu

Generator's Site Address (if different than mailing address)
Map 54 Parcil 219 39 Water Street
Amesbury,MA 01913

6. Transporter 1 Company Name
Clean Harbors Environmental Services, Inc.
U.S. EPA ID Number
MAD039322250

7. Transporter 2 Company Name
U.S. EPA ID Number

8. Designated Facility Name and Site Address
Clean Harbors El Dorado LLC
309 American Circle
El Dorado, AR 71730
Facility's Phone: (870) 863-7173
U.S. EPA ID Number
ARD069748192

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes		
	1. NON DOT REGULATED MATERIAL, (OILY DEBRIS)	6	DM	1100	P	MA01		
	2.							
	3.							
	4.							

14. Special Handling Instructions and Additional Information
1.E40179MAR 6x55

Contract retained by generator confers agency authority on initial transporter to add or substitute additional transporters on generator's behalf for purposes of transportation efficiency, convenience or safety

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Sean Eustace Signing as Agent for Boston Gas Co. | Signature | Month 7 | Day 17 | Year 20

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Sean Eustace | Signature | Month 7 | Day 17 | Year 20

Transporter 2 Printed/Typed Name | Signature | Month | Day | Year

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator) U.S. EPA ID Number

Facility's Phone:

18c. Signature of Alternate Facility (or Generator) | Month | Day | Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.
H040			

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in item 18a

Printed/Typed Name | Signature | Month | Day | Year

EPA Form 8700-22 (Rev. 12-17). Previous editions are obsolete.

Clean Harbors has the appropriate permits for and will accept the waste the generator is shipping.

DESIGNATED FACILITY TO EPA's e-MANIFEST SYSTEM

SB 20036706631-001 PPW

TK#5725

Please print or type. Generator acknowledges that no material change has occurred either in the characteristics or in the process generating the material. Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
MAC300010741	1	(800) 483-3718	018252593 FLE

GENERATOR

5. Generator's Name and Mailing Address
Boston Gas Company
Susan Brochu 170 Data Drive
Waltham, MA 02451
Generator's Phone: (781) 907-3647 ATTN: Susan Brochu

Generator's Site Address (if different than mailing address)
Map 54 Parcil 219 39 Water Street
Amesbury, MA 01913

6. Transporter 1 Company Name
Clean Harbors Environmental Services, Inc.
U.S. EPA ID Number: MAD039322250

7. Transporter 2 Company Name
U.S. EPA ID Number:

8. Designated Facility Name and Site Address
Clean Harbors of Braintree Inc
1 Hill Avenue
Braintree, MA 02184
Facility's Phone: (781) 380-7400
U.S. EPA ID Number: MAD053452637

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
	1. NON DOT REGULATED MATERIAL, (OILY DEBRIS)	002	DM	350	P	MA01
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information
1. R40179MAR 2x55

Contract retained by generator confers authority on initial transporter to add or substitute additional transporters on generator's behalf for purposes of transportation efficiency, convenience or [illegible]

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Samuel DiCicco ON BEHALF OF BOSTON GAS COMPANY
Signature: Samuel DiCicco
Month: 9 Day: 15 Year: 23

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Samuel DiCicco
Signature: Samuel DiCicco
Month: 9 Day: 15 Year: 23

Transporter 2 Printed/Typed Name:
Signature:
Month: Day: Year:

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:

18b. Alternate Facility (or Generator)
U.S. EPA ID Number:
Facility's Phone:

18c. Signature of Alternate Facility (or Generator)
Month: Day: Year:

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.
H141			

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name: AMY YETMAN
Signature:
Month: 9 Day: 15 Year: 23

EPA Form 8700-22 (Rev. 12-17) Previous editions are obsolete.

DESIGNATED FACILITY TO EPA's e-MANIFEST SYSTEM

Clean Harbors has the appropriate permits for and will accept the waste the generator is shipping

SB 2304971870 001 PPW

TK#424006

Generator acknowledges that no material change has occurred either in the characteristics or in the process generating the material.

Please print or type. Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
	MAC300010741	1	(800) 483-3718	018252736 FLE

5. Generator's Name and Mailing Address
Boston Gas Company
Susan Brochu 170 Data Drive
Waltham, MA 02451
Generator's Phone: (781) 907-3647 ATTN:Susan Brochu

Generator's Site Address (if different than mailing address)
Map 54 Parcil 219 39 Water Street
Amesbury,MA 01913

6. Transporter 1 Company Name
Clean Harbors Environmental Services, Inc.
U.S. EPA ID Number: MAD039322250

7. Transporter 2 Company Name
U.S. EPA ID Number:

8. Designated Facility Name and Site Address
Clean Harbors of Braintree Inc
1 Hill Avenue
Braintree, MA 02184
Facility's Phone: (781) 380-7100
U.S. EPA ID Number: MAD053452637

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes		
	1. NON DOT REGULATED MATERIAL, (OILY DEBRIS)	02	DM	400	P	MA01		
	2. NON DOT REGULATED MATERIAL. (PURGEWATER)	01	DM	20	G	MA01		
	3.							
	4.							

14. Special Handling Instructions and Additional Information
1. R40179MAR 2x55
2. T26781AMAR 1x55

Contract retained by generator confers agency authority on initial transporter to add or substitute additional transporters on generator's behalf for purposes of transportation efficiency, convenience or safety

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Ag ent for BGC James Meuse — Signature — Month 08 Day 26 Year 24

INTL
16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER
17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: James Meuse — Signature — Month 08 Day 26 Year 24
Transporter 2 Printed/Typed Name — Signature — Month Day Year

DESIGNATED FACILITY
18. Discrepancy
18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:
18b. Alternate Facility (or Generator) — U.S. EPA ID Number
Facility's Phone:
18c. Signature of Alternate Facility (or Generator) — Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.
H141	H141		

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name: Shawn Davey — Signature — Month 8 Day 31 Year 24

EPA Form 8700-22 (Rev. 12-17) Previous editions are obsolete.

Clean Harbors has the appropriate permits for and will accept the waste the generator is shipping.

DESIGNATED FACILITY TO EPA's e-MANIFEST SYSTEM
SB 2404624258-001 PPW

TR#5435

Please print or type. Generator acknowledges that no material change has occurred either in the characteristics or in the process generating the material. Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number: MAC300010741
2. Page 1 of: 1
3. Emergency Response Phone: (800) 483-3718
4. Manifest Tracking Number: 018254818 FLE

5. Generator's Name and Mailing Address
Boston Gas Company
Susan Brochu 170 Data Drive
Waltham, MA 02451
Generator's Phone: (781) 907-3647 ATTN: Susan Brochu

Generator's Site Address (if different than mailing address)
Map 54 Parcil 219 39 Water Street
Amesbury, MA 01913

6. Transporter 1 Company Name: Clean Harbors Environmental Services, Inc.
U.S. EPA ID Number: MAD039322250

7. Transporter 2 Company Name:
U.S. EPA ID Number:

8. Designated Facility Name and Site Address
Clean Harbors of Braintree Inc
1 Hill Avenue
Braintree, MA 02184
Facility's Phone: (781) 380-7100
U.S. EPA ID Number: MAD053452637

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
	1. NON DOT REGULATED MATERIAL, (OILY DEBRIS)	002	DM	400	P	MA01
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information
1.R40179MAB 2x55

Contract retained by generator confers authority on initial transporter to add or substitute additional transporters on generator's behalf for purposes of transportation efficiency consistent with

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Samuel DiCicco ON BEHALF OF BOSTON GAS Company
Signature: Samuel DiCicco
Month: 6 Day: 26 Year: 23

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Samuel DiCicco
Signature: Samuel DiCicco
Month: 6 Day: 26 Year: 23

Transporter 2 Printed/Typed Name:
Signature:
Month: Day: Year:

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator)
U.S. EPA ID Number:
Facility's Phone:

18c. Signature of Alternate Facility (or Generator)
Month: Day: Year:

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.
H141			

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name: AMY YETMAN
Signature:
Month: 6 Day: 26 Year: 23

EPA Form 8700-22 (Rev. 12-17) Previous editions are obsolete.

DESIGNATED FACILITY TO EPA's e-MANIFEST SYSTEM

Clean Harbors has the appropriate permits for and will accept the waste the generator is shipping

SB 2303389030-001 PPA

TK# 424006

Please print or type. Generator acknowledges that no material change has occurred either in the characteristics or in the process generating the material. Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
MAC300010741	1	(800) 483-3718	018872915 FLE

GENERATOR

5. Generator's Name and Mailing Address
Boston Gas Company
Susan Brochu 170 Data Drive
Waltham, MA 02451
Generator's Phone: (781) 907-3647 ATTN:Susan Brochu

Generator's Site Address (if different than mailing address)
Map 54 Parcil 219 39 Water Street
Amesbury, MA 01913

6. Transporter 1 Company Name: Clean Harbors Environmental Services, Inc.
U.S. EPA ID Number: MAD039322250

7. Transporter 2 Company Name:
U.S. EPA ID Number:

8. Designated Facility Name and Site Address
Clean Harbors of Braintree Inc
1 Hill Avenue
Braintree, MA 02184
Facility's Phone: (781) 380-7100
U.S. EPA ID Number: MAD053452637

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
	1. NON DOT REGULATED MATERIAL, (OILY DEBRIS)	001	DM	250	P	MA01
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information
1.R40179MAR 1X55

Contract retained by generator confers agency authority on initial transporter to add or substitute additional transporters on generator's behalf for purposes of transportation efficiency convenience or safety

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Samuel DiCicco ON BEHALF OF BOSTON GAS COMPANY
Signature: Samuel DiCicco
Month: 12 Day: 18 Year: 23

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Samuel DiCicco
Signature: Samuel DiCicco
Month: 12 Day: 18 Year: 23

Transporter 2 Printed/Typed Name:
Signature:
Month: Day: Year:

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator)
U.S. EPA ID Number:
Facility's Phone:

18c. Signature of Alternate Facility (or Generator)
Month: Day: Year:

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.
H141			

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name: David S Medina
Signature:
Month: 12 Day: 18 Year: 23

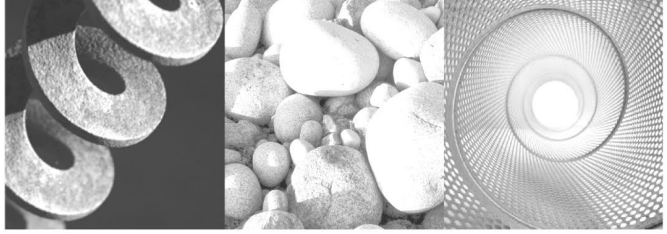
EPA Form 8700-22 (Rev. 12-17) Previous editions are obsolete.

DESIGNATED FACILITY TO EPA's e-MANIFEST SYSTEM

Clean Harbors has the appropriate permits for and will accept the waste the generator is shipping.

SB 2306709375-001 PPW

Appendix P Sediment Hydraulic Model



GEI Consultants

MassDEP RTN 3-24070

Sediment Transport Modeling Report

Amesbury Former MGP Site,
Amesbury, Massachusetts

Submitted to:
Boston Gas Company d/b/a National Grid
170 Data Drive
Waltham, MA 02451

Submitted by:
GEI Consultants, Inc.
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Woburn, MA 01801
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October 2025
Project No. 1804576



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1. Introduction

This *Sediment Transport Modeling Report* was prepared by GEI Consultants, Inc. (GEI) on behalf of Boston Gas Company d/b/a National Grid (National Grid) to support assessment of the Amesbury Former Manufactured Gas Plant (MGP). The site is located along the Powwow River in Amesbury, Massachusetts (Figure 1-1). This report describes the hydraulic and sediment transport modeling study to evaluate erosion potential along the Powwow River.

Figure 1-1. Site Location Map



1.1. Site and Project Description

The area of interest is located along the Powwow River approximately 1,040 ft downstream of the Millyard/Crib Dam in Amesbury, Massachusetts to approximately 700 ft upstream of the I-495 crossing. The Powwow River is freshwater tidal, and a short distance downstream of the project area the Powwow River outlets to the Merrimack River. River flows in the area of interest are influenced by the dam upstream.

The former MGP operated from sometime prior to 1899 to no later than 1924. It appears that releases of coal tar were discharged at the facility and beyond during its operation in the early 1900s. The Powwow River was dredged between approximately 1895 and 1900. Coal tar appears to have been released to the dredged Powwow River where tar accumulated in deeper depth intervals. In the

approximately 100 years since these tar releases, the dredged river channel slowly filled back in with sediments naturally deposited in the river system.

The purpose of the sediment transport evaluation was to evaluate the erosion potential of this overlying sediment to help inform whether the underlying contaminated sediment is susceptible to mobilization and whether the overlying sediment can remain in place as a natural cap at select locations. The following sections describe the methods and results of this evaluation.

The National Geodetic Vertical Datum of 1929 (NGVD 29) was the datum used in this modeling study. Elevations in the model and within this report are reported in NGVD29 unless stated otherwise.

2. Hydraulic Model

GEI developed a 2-dimensional hydraulic model using the U.S. Army Corps of Engineers Hydrologic Engineering Center River Analysis System (HEC-RAS) Version 5.0.7 software (USACE, 2019) to compute river velocities and shear stress values. This model was also used to scale the tidal boundary amplitude to match measured field water surface elevations. The model results were evaluated to understand the potential for sediment mobilization based on velocity and shear stress.

The modeled project reach is located in Essex County between where the Powwow River crosses Main Street and outlets to the Merrimack River (Figure 2-1). The crossing under I-495 is included in the model extents. The bed is mostly medium and fine sand, with some coarse silt. Wetland vegetation is present in some areas. Banks within the project area are forested, wetland, or developed land.

Figure 2-1. HEC-RAS Model Extents



2.1. Elevation Data

The topography and bathymetry used in the hydraulic model were compiled from NOAA LiDAR, a bathymetric survey of the Powwow River, and FEMA hydraulic modeling data. The NOAA LiDAR, titled "2011 USGS LiDAR: Northeast (NY to ME)," was downloaded by GEI from the Massachusetts GIS portal (Oliver, 2011). The bathymetric survey was performed in September 2019 and November 2020 by Steele

Associates Marine Consultants, LLC (Steele) and provided to GEI. The bathymetry along the reach from the Route 110 Bridge to the mouth of the Merrimack River, where bathymetric data from the Steele survey was sparse or missing, was estimated based on the FEMA Flood Insurance Study (FIS) report (FEMA, 2018). A second bathymetric survey was performed in May 2024 by Steele and provided by GEI. GEI reviewed the two surveys to evaluate actual bed elevation change compared to the model change. This comparison is in Section 4.

2.2. Flows

A constant flow of 100 cubic feet per second (cfs), representing average daily flow, was input as the upstream boundary condition in the hydraulic model. This flow rate was estimated based on the USGS online program StreamStats using results for the Powwow River and based on a comparison of prorated flow rates from nearby USGS stream gages (#01073587 Exeter River at Haigh Road near Brentwood, NH, #01101000 Parker River near Byfield, MA, #01102000 Ipswich River near Ipswich, MA, and #01073000 Oyster River near Durham, NH). The flow was further verified in 2024 after review of instantaneous discharge measurements at the Powwow River at Main Street at Amesbury, MA USGS gage #01100845 data collected between 2021 and 2024. The USGS rated 32 of these instantaneous measurements as "fair" quality or better, meaning the data is within 8% of the actual flow. While the gage has limited measurements, the average discharge out of 32 measurements was 103 cfs, supporting the 100 cfs used in the hydraulic model (USGS, 2024). GEI also evaluated multiple flood scenarios including 10-year, 25-year, and 100-year flow events based on a StreamStats analysis for the Powwow River (USGS, 2016a).

2.3. Manning's n Value

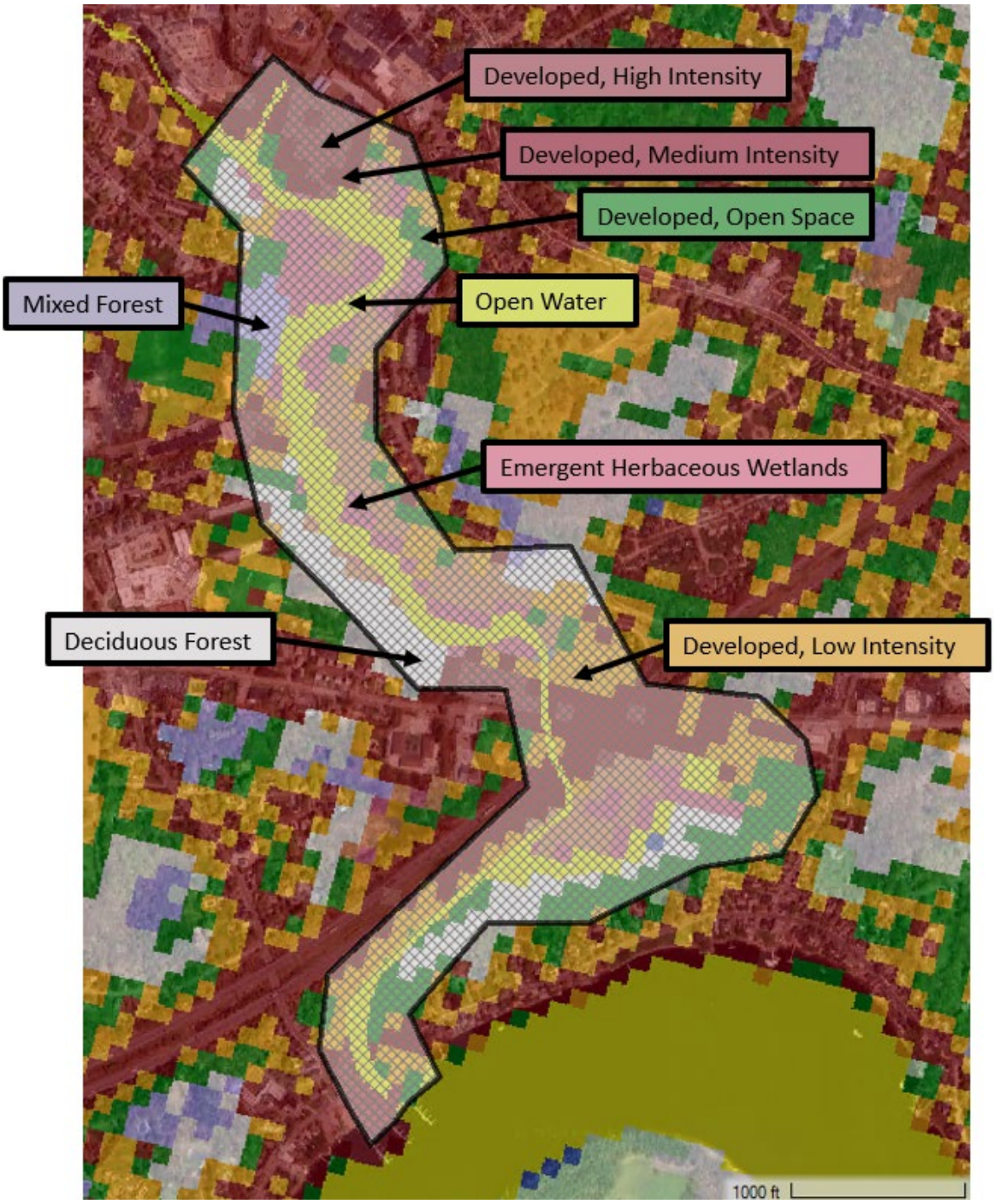
The model included input of Manning's n-values to represent channel and overbank roughness based on the National Land Cover Database (USGS 2016b), Chow (1959), USGS (2015), the HEC-RAS User's Manual (USACE, 2016), and GEI's experience. Manning's n values chosen to represent the various land cover types in the model are listed in Table 2-1.

Table 2-1. Land Cover and Associated Manning's n-Value

Land Cover	Manning's n value
Barren Land Rock-Sand-Clay	0.04
Deciduous Forest	0.1
Developed, High Intensity	0.15
Developed, Low Intensity	0.1
Developed, Medium Intensity	0.12
Developed, Open Space	0.04
Emergent Herbaceous Wetlands	0.08
Evergreen Forest	0.12
Grassland-Herbaceous	0.045
Mixed Forest	0.08
Open Water	0.035
Pasture-Hay	0.06
Woody Wetlands	0.12

The land cover distribution within the modeled area is presented in Figure 2-2.

Figure 2-2. Land Cover within Model Extents



2.4. Downstream Boundary Conditions

The boundary condition at the downstream end of the model was set to a stage hydrograph representing typical daily tides. Tides were input to the model based on USGS gage #01100870 located at U.S. Route 1 on the Merrimack River (#01100870 Merrimack River at Newburyport, MA) (USGS, 2021). Data for the period from October 6th to October 8th, 2020 were used for this study. The stage hydrograph representing the tidal fluctuation was scaled down to account for a dampening of the tides as they enter the Powwow River. The amount of dampening was estimated based on GEI's field measurements at the Route 110 Bridge on the Powwow River.

2.5. Hydraulic Model Summary

The 10-year flow event had the highest modeled channel shear stresses and velocities. Maximum velocities and shear stress values were pulled from the model to evaluate potential sediment mobilization during the 10-year flow. Maximum 10-year velocities were approximately 1.6 feet per second (fps), and maximum shear stresses were approximately 0.078 lbs/ft^2, indicating that the channel can move silts, sands, and up to fine gravel particles in high shear areas.

3. Sediment Transport Model

GEI performed sediment transport analysis using the sediment transport routines in HEC-RAS version 6.4.1 software (USACE, 2024). This model was updated from the 2-dimensional hydraulic model previously developed in HEC-RAS Version 5.0.7. In addition to using a more recent model version, GEI reduced the model 2-dimensional flow area extent to reduce sediment transport model run times.

3.1. Method

Sediment transport modeling has several key model inputs, including incoming sediment loads, bed sediment grain size distribution, transport function, and hydraulic parameters that affect transport. There can be uncertainty due to the wide variability in sediment and hydraulic characteristics along a reach. Even with good quality field data, the collected data may not capture the heterogeneity found in the entire channel.

Transport functions are strongly controlled by sediment grain size. Transport functions also depend on driving hydraulic factors including bed slope and shear stress, which can also vary along a reach. Multiple equations have been developed to predict sediment transport based on stream hydraulic characteristics and sediment size. Because of the inherent uncertainty, sediment transport modeling is best used to evaluate trends and patterns, rather than predicting a specific outcome. The Powwow River sediment transport model was built with this goal in mind. The model was created using both field data and previously collected sediment data from GEI projects. Then, a sensitivity-analysis based approach was used for the evaluation. Because the model was not calibrated to observed changes, sediment transport parameters were selected to be conservative for assessing erosion potential. After development of the hydraulic model, the following components were input and evaluated to simulate sediment transport in HEC-RAS:

1. Channel bed gradation
2. River flows
3. Upstream sediment loads
4. Sediment transport function and related transport parameters

Each of these parameters and sensitivity ranges are described in greater detail below.

3.1.1. Channel Bed Gradation

Sediment transport modeling requires the input of spatially varying channel bed sediment gradation information to characterize the transportable material.

A total of 92 sediment samples were collected by GEI throughout the project area. The sediments were grouped based on the D50, or the median diameter, of sample gradations. The average grain size distribution of samples in each group were used in the model. The samples were also classified based

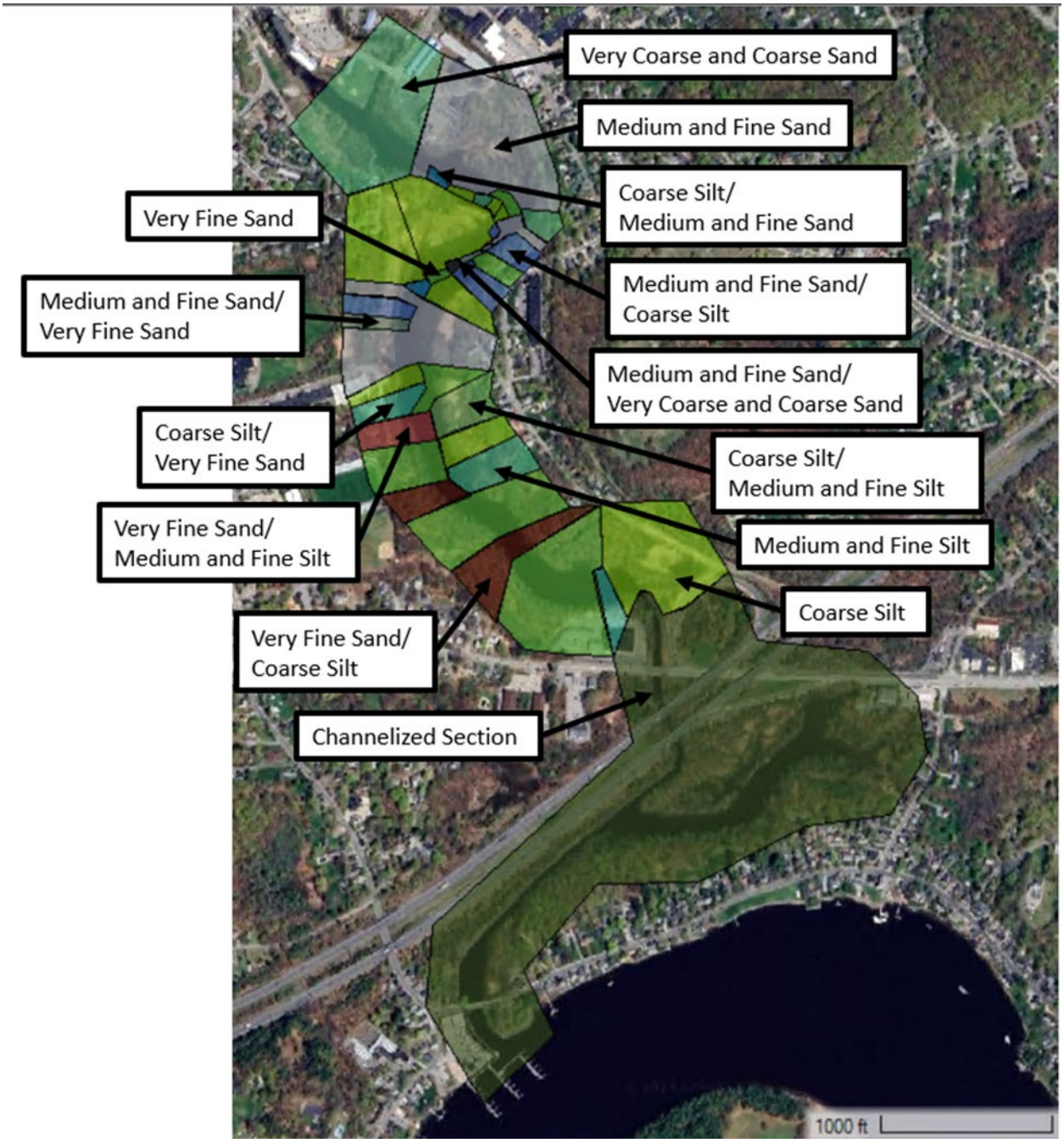
on the sediment sample depth: 0 – 1 ft deep and 1 – 2 ft deep. A total of six classification polygons were included in the model, labeled based on the Unified Soil Classification System (Table 3-1).

Table 3-1. Sediment Model Bed Gradations

Classification	D50 Range (mm)
Medium and Fine Silt	0.02 – 0.031
Coarse Silt	0.031 – 0.063
Very Fine Sand	0.063 – 0.125
Medium and Fine Sand	0.125 – 0.5
Very Coarse and Coarse Sand	0.5 – 2.0
Channelized Section	Included at the downstream end of the river to represent an area that was assumed to not experience erosion based on GEI's knowledge of its construction and is outside of the study area.

Based on review of aerial imagery, sediment sampling performed for the project, and published geologic maps, polygons were identified to represent sediment spatial distribution within the channel and on the overbanks (Figure 3-1).

Figure 3-1. Bed Material Layer

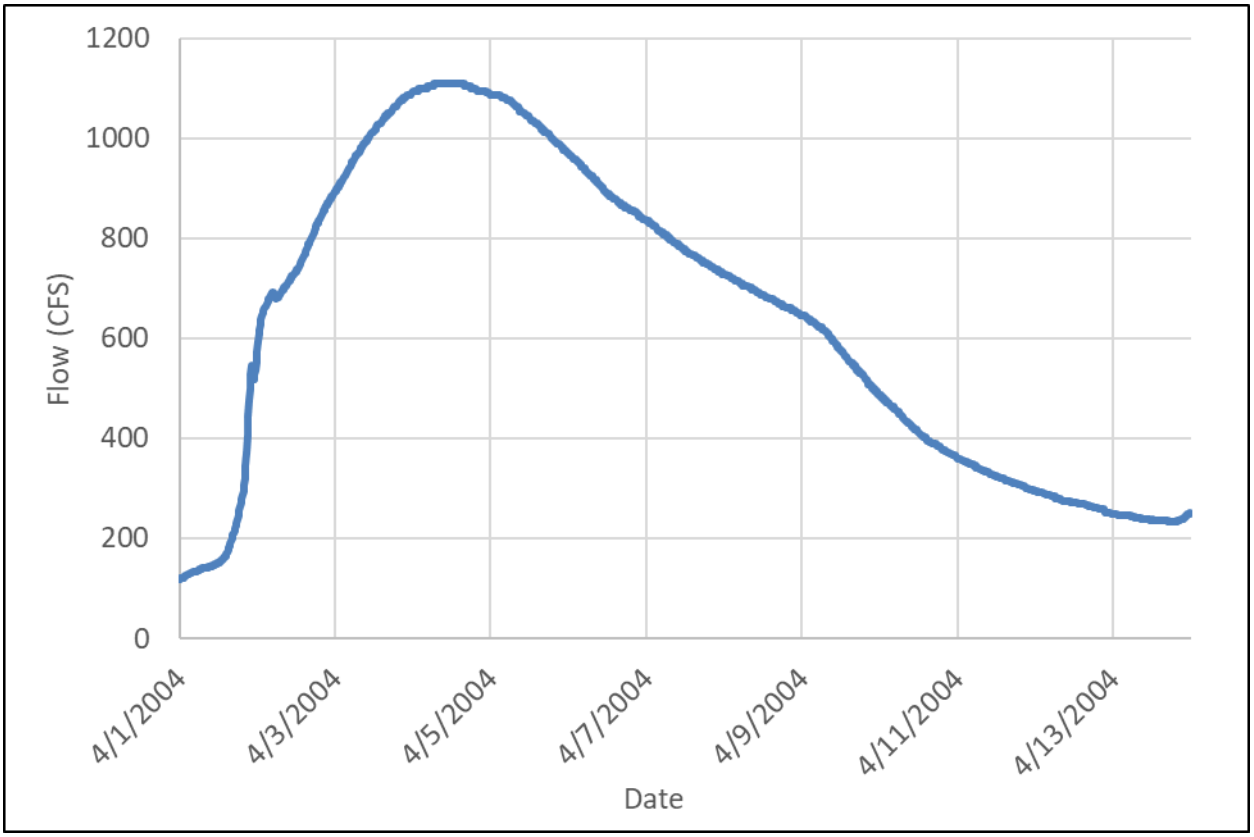


3.1.2. Flows

As part of sediment transport modeling, GEI evaluated average daily flow conditions and a 10-yr annual recurrence interval river flow event. The average daily flow condition was modeled using a constant flow rate of 100 cfs for a qualitative assessment of model performance. The 10-year flow event was selected because it had the most conservative (highest) shear stresses and velocities based on the hydraulic modeling evaluation described in Section 2. For the 10-year annual recurrence interval flow scenario, GEI developed a hydrograph based on actual flows for a storm event from USGS gage #01102000 (USGS, 2020) and prorated to match a peak flow of 1,100 cfs based on a StreamStats analysis for the Powwow River (USGS, 2016a) (Figure 3-2). The constant average daily flow and the 10-year hydrograph were routed through the upstream end of the model.

A stage hydrograph representing typical daily tides was used at the downstream end of the model. Tides were based on the measurements from USGS gage #01100870 (USGS, 2021) from October 6th to October 8th, 2020.

Figure 3-2. 10-year Storm Event Hydrograph



3.1.3. Sediment Transport Parameters

The transport equation calculates the rate of sediment transport through the modeled reach. There are multiple sediment transport equations that have been developed from laboratory and field studies with varying hydraulic conditions and varying grain sizes. This model was run with the Wu equation (Wu, et al., 2000), which is a total load (bed load and suspended load) equation developed for non-uniform sediments including sand bed systems, and therefore is most applicable to this system. The Wu equations were developed from both laboratory and field data over a wide range of water depths and channel slopes.

The bed sorting function models how the channel bed armors itself and what material is available to be eroded in any given time step. In the model, this is represented with an "active layer", or top layer where sediments can erode or deposit, and the layers below that, which do not erode or deposit.

The thickness of the active layer was varied during sensitivity runs based on guidance from the 2D sediment transport manual (USACE, 2023). Active layer thickness was varied between 30 to 100 times the D90 (90th percentile sediment particle size), and between a minimum thickness of 0.2 ft to 0.5 ft. The multiplier was determined to have low sensitivity. The minimum thickness was somewhat sensitive, so a minimum thickness of 0.5 ft was determined to be a conservative estimate for the purposes of this study.

The hiding and exposure function, which represents the physical shielding of smaller particles by larger particles, was modeled using the Wu, et. al. equations (Wu, 2000), for consistency with the Wu transport function used in this study.

The fall velocity equation determines how fast a particle will settle out of the water column given its weight and the water velocity in which it is suspended. The model was run with multiple fall velocity equations, and this parameter was determined to have low sensitivity. The Soulsby fall velocity method was used for the final model runs (Soulsby, 1997).

Correction factors were applied to correct for vertical variation in current velocity and sediment concentration. Van Rijn-Wu was used for the bed-load correction, and an exponential concentration profile was used for the suspended load correction. Sensitivity analyses were not performed on these parameters since the effect is usually small (USACE, 2023). The adaptation coefficient length is a parameter that affects erosion and deposition and is set relative to computation cell size. This parameter was found to be not sensitive.

3.1.4. Upstream Sediment Load Rating Curve

Sediment boundary conditions are a required input to the model. GEI developed a sediment load rating curve for input at the upstream boundary of the model to represent the sediment entering the model from upstream sources. Development of the rating curve was based on several factors including GEI's observations of the river conditions. Turbidity measurements recorded at the subject reach were used to refine the sediment loading curve. Development of the sediment load rating curve was also informed by methods published by USGS (2003 and 2011). To confirm the selection of sediment loading, GEI also

reviewed suspended sediment concentrations measured in rivers in the same region as the subject reach. Because the sediment loads in the Powwow River are likely limited by the upstream dams, sensitivity runs with lower incoming loads were completed, which showed that this parameter had minimal effect on the model results.

Table 3-2. Sediment Load Rating Curve

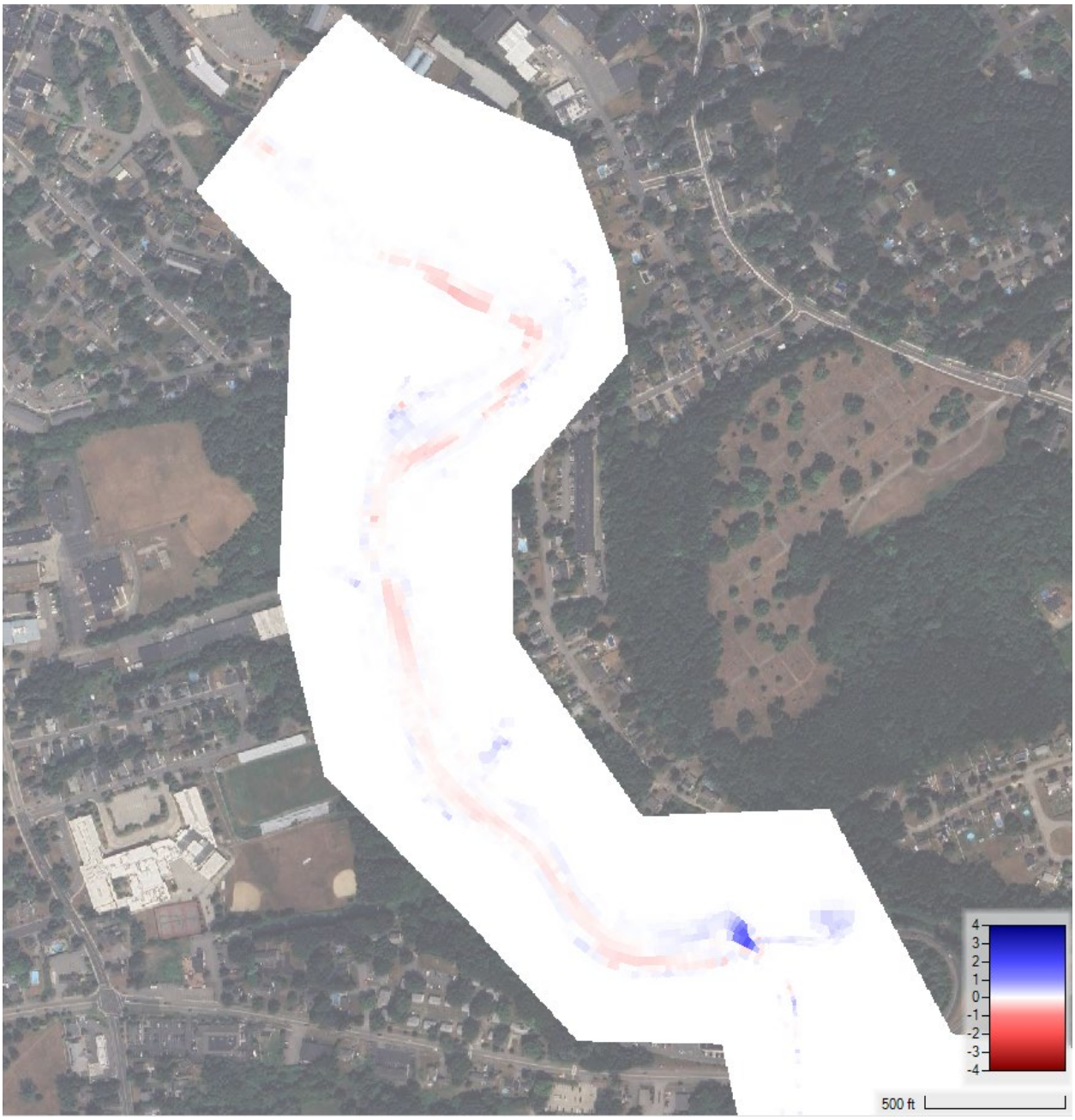
	Flow (CFS)	500	1000	1500
	Total Load (tons/day)	14	29	43
Grain Size Fraction of Total Load	Very Fine Silt	0.01	0.01	0.01
	Fine Silt	0.02	0.02	0.02
	Medium Silt	0.4	0.3	0.2
	Coarse Silt	0.3	0.2	0.18
	Very Fine Sand	0.2	0.3	0.4
	Fine Sand	0.06	0.1	0.1
	Medium Sand	0.01	0.04	0.03
	Coarse Sand	0	0.01	0.02
	Very Coarse Sand	0	0.01	0.02
	Very Fine Gravel	0	0.01	0.01

3.2. Results

Sediment transport modeling is a tool that helps with evaluating trends and patterns, rather than predicting a specific outcome. Therefore, our summary of the results of this study focuses on those trends and patterns. The model gives an estimate of the depth of sediment bed erosion or deposition over time, which should be interpreted as a simulation of trends, rather than predicted outcomes. Conservative assumptions were made throughout model development, so the estimated scour depths likely represent a conservative result.

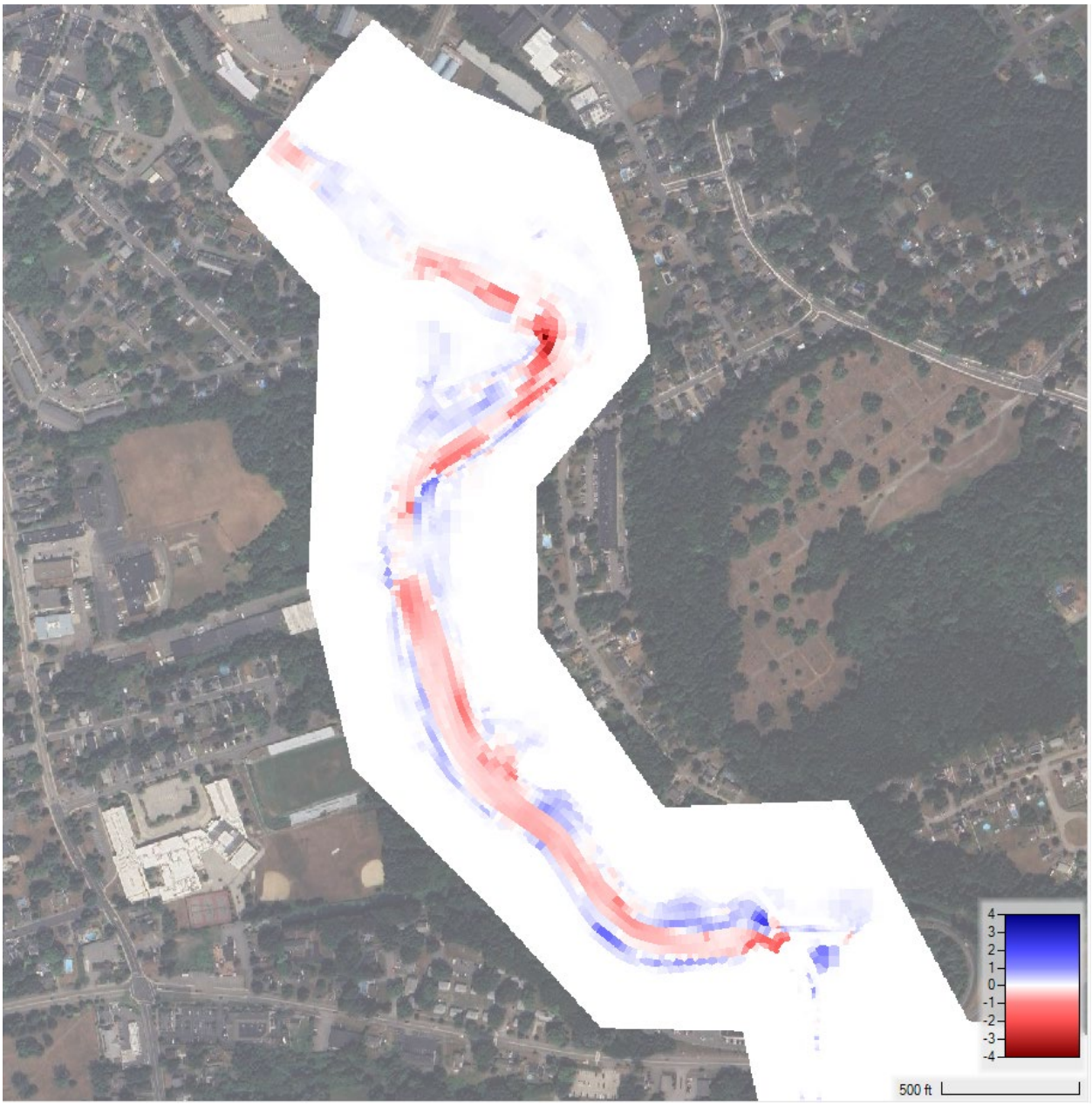
For the average daily flow conditions the model results generally showed minimal bed change (Figure 3-3). The maximum erosion in this scenario was less than 0.5 ft throughout the project area. These conditions of clear water (little-to-no sediment load) were observed by GEI staff during field work at the site during low flow conditions.

Figure 3-3. Simulated Bed Change (feet) During Average Flow Conditions



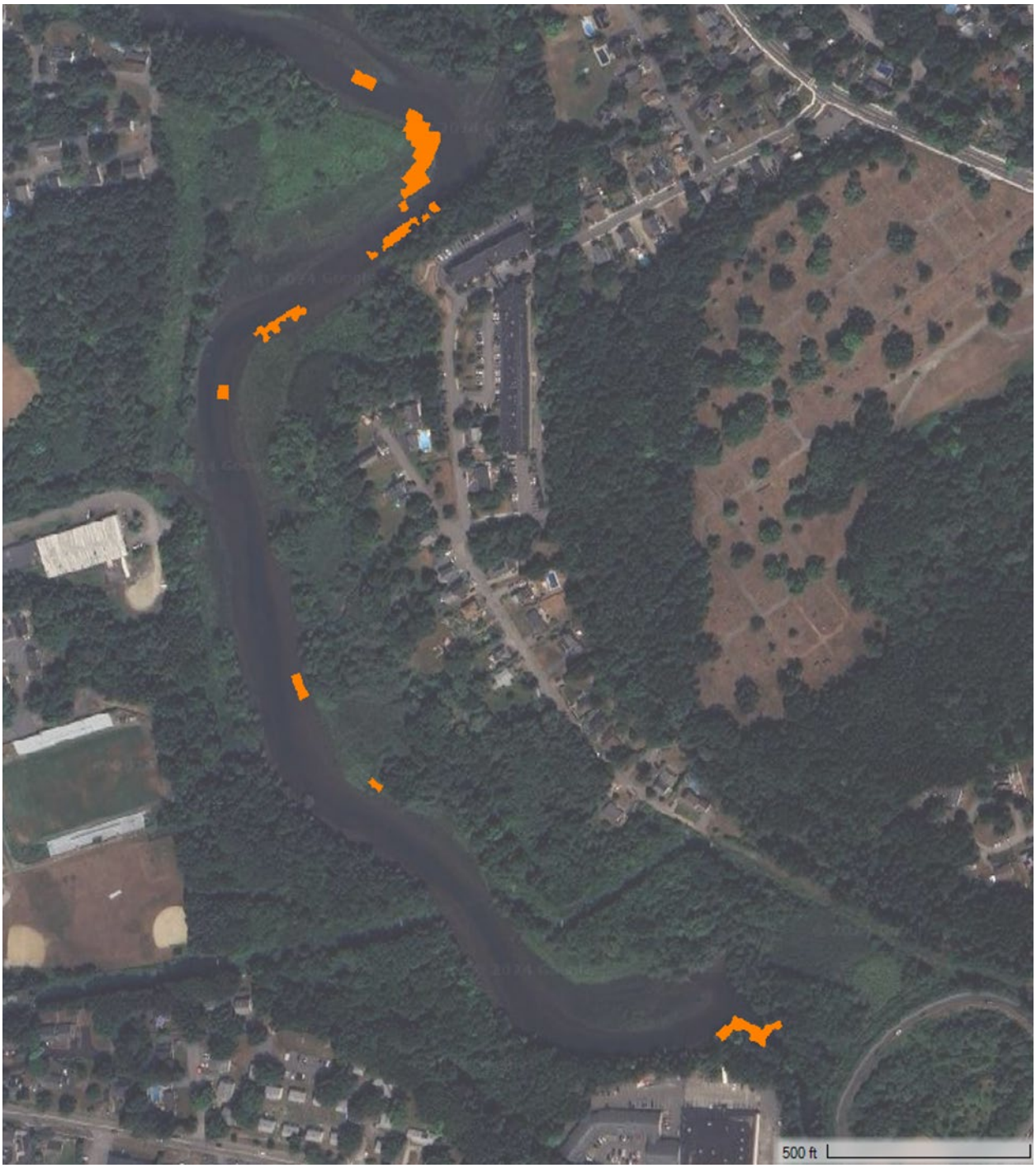
For the 10-yr flow conditions, the simulated erosion and deposition depths were generally less than 2 ft, with higher erosion near the first bend in the river (Figure 3-4). The maximum erosion computed by the model was approximately 4.2 ft at an area less than 500 square feet near the first bend in the river. The maximum deposition was approximately 2.2 ft.

Figure 3-4. Simulated Bed Change (feet) During 10-Year Storm



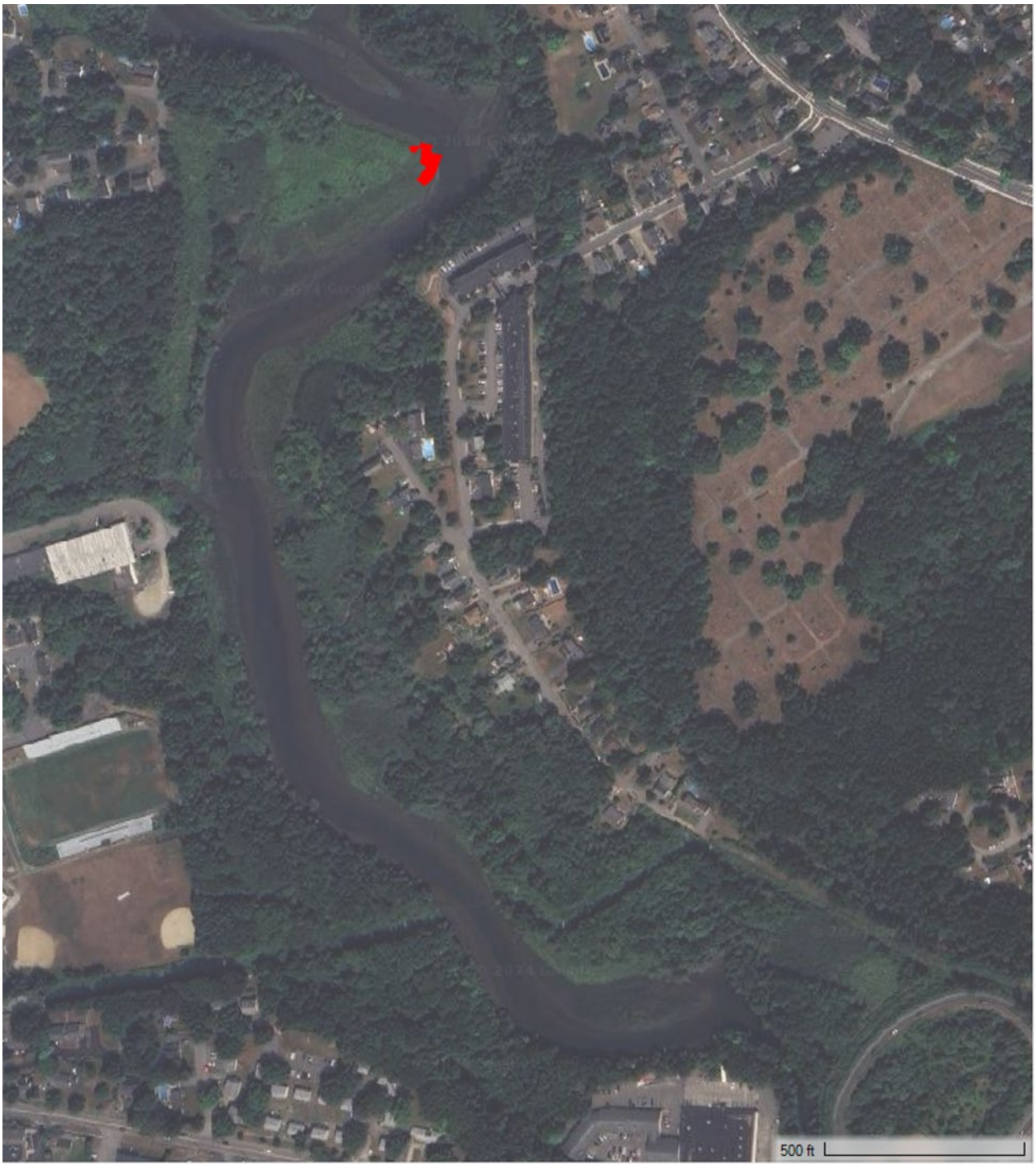
As shown in Figure 3-5, modeled erosion greater than 1 ft occurred in a few locations throughout the study area.

Figure 3-5. Areas With More Than 1 ft of Erosion During Simulated 10-year Storm



Modeled erosion greater than 2ft occurred near the upstream bend in the river, and all other areas had less than 2 feet of erosion (Figure 3-6).

Figure 3-6. Areas With More Than 2 ft of Erosion During Simulated 10-year Storm



3.2.1. Limitations

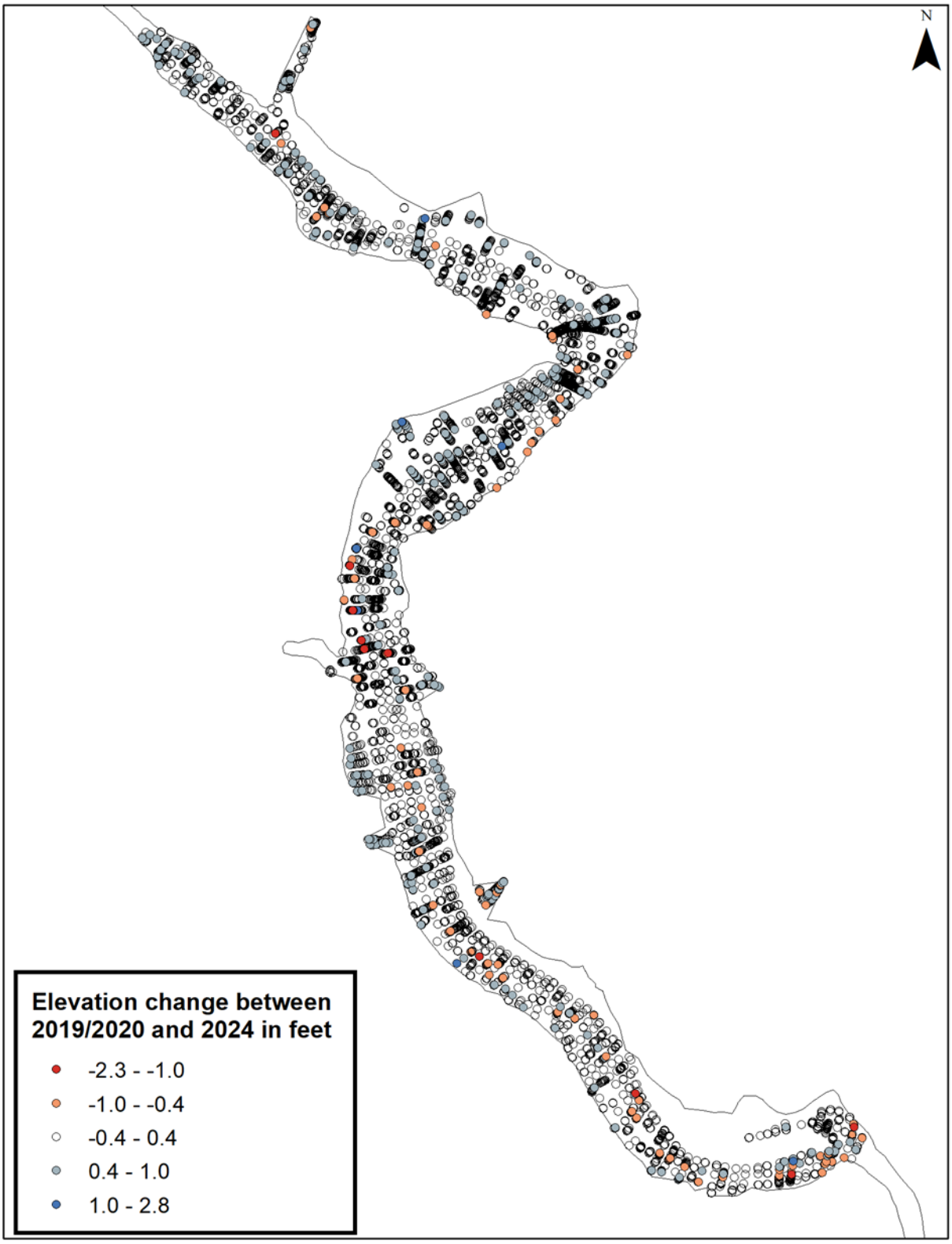
Sediment modeling was conducted using an uncalibrated model. However, estimated scour depths are conservative due to conservative assumptions made during model development. Sediment transport models typically measure the mobility of sediment in one direction, namely the downstream direction. In a tidally influenced river such as the Powwow River, river velocities will reverse direction and flow will move upstream. Theoretically, suspended sediment may mobilize back upstream during these times. The model does not account for the potential influence of reverse flows on sediment transport, which may mean that the model results may overestimate erosion along certain sections of the reach.

The flow conditions modeled at this stage in the study included a 7-day run using average flows and a 10-yr event with a 13-day hydrograph.

4. Bathymetric Data Comparison

In addition to the sediment transport modeling, bathymetric survey data was compared over a 4-5 year period to evaluate actual bed elevation change along the Powwow River channel. The first bathymetric dataset was collected in 2019/2020, and the second dataset was collected in 2024. Based on information from nearby USGS stream gages, the largest storm events during this time period were between 2-year and 5-year recurrence intervals, which are smaller than the modeled 10-year event described in Section 3. Both bathymetric datasets were collected via boat using single beam survey by Steele Associates Marine Consultants LLC. Given the slightly different transect paths followed, the datasets were filtered to select only the 2024 survey points that were within 1 ft horizontal distance of a 2019/2020 survey point. This resulted in approximately 4,800 comparison points throughout the project area. The comparison is shown in Figure 4-1. Negative values represent erosion and positive values represent deposition. Most of the comparison points are within +/- 0.4 ft vertical change over the 4-5 year period.

Figure 4-1. Comparison Points Between 2019/2020 and 2024 Bathymetric Surveys



In order to reliably identify erosion/deposition trends in the data, two thresholds were considered: greater than 0.4 ft of vertical change and greater than 1 ft of vertical change. Based on communication with Steele Associates the expected single beam data accuracy is approximately 0.2 feet, so a sum of the 0.2 ft error on each survey resulted in the 0.4 ft threshold.

At this site, there is also some error associated with underwater vegetation and its removal from the bathymetric datasets. The effect of this error is not well defined; however it is expected to be larger than 0.4 ft. The 1 ft threshold was selected to capture some of the uncertainty due to vegetation, and based on reports from a few Superfund sites, which used thresholds of 0.5 ft and 1 ft for bathymetric data comparison (Anchor QEA, 2023; EPA, 2016). Of the approximately 4,800 comparison points within 1 ft horizontal distance, 596 of these showed more than 0.4 feet of vertical change (178 erosional, 418 depositional) (Figure 4-2), and only 31 points showed more than 1 ft of vertical change (18 erosional, 13 depositional) (Figure 4-3). The points showing the highest erosion (up to 2.3 ft) occur just downstream of the second bend in the river near the thalweg of the river.

Figure 4-2. Comparison Points Between 2019/2020 and 2024 Bathymetric Surveys with Vertical Change Greater than 0.4 ft

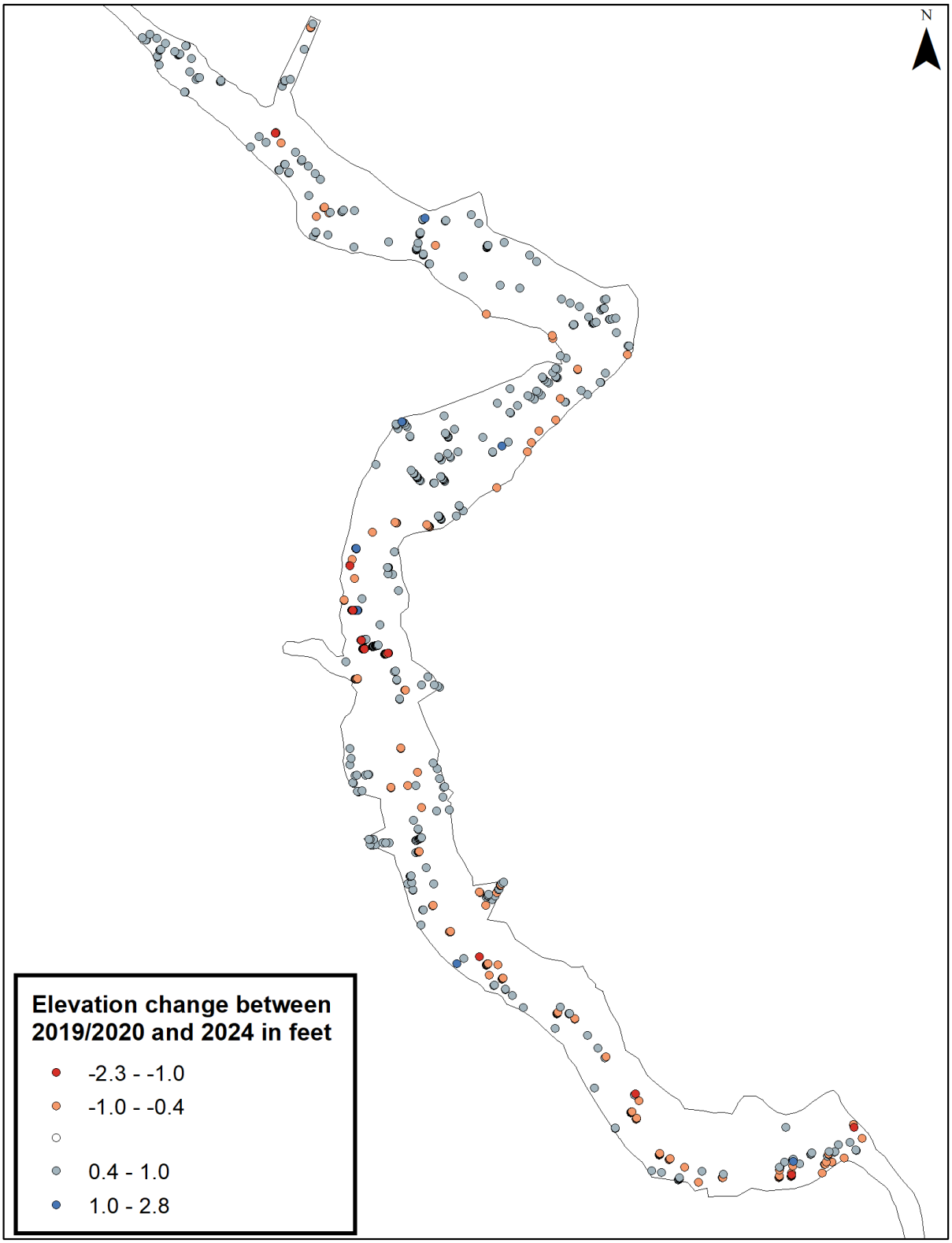
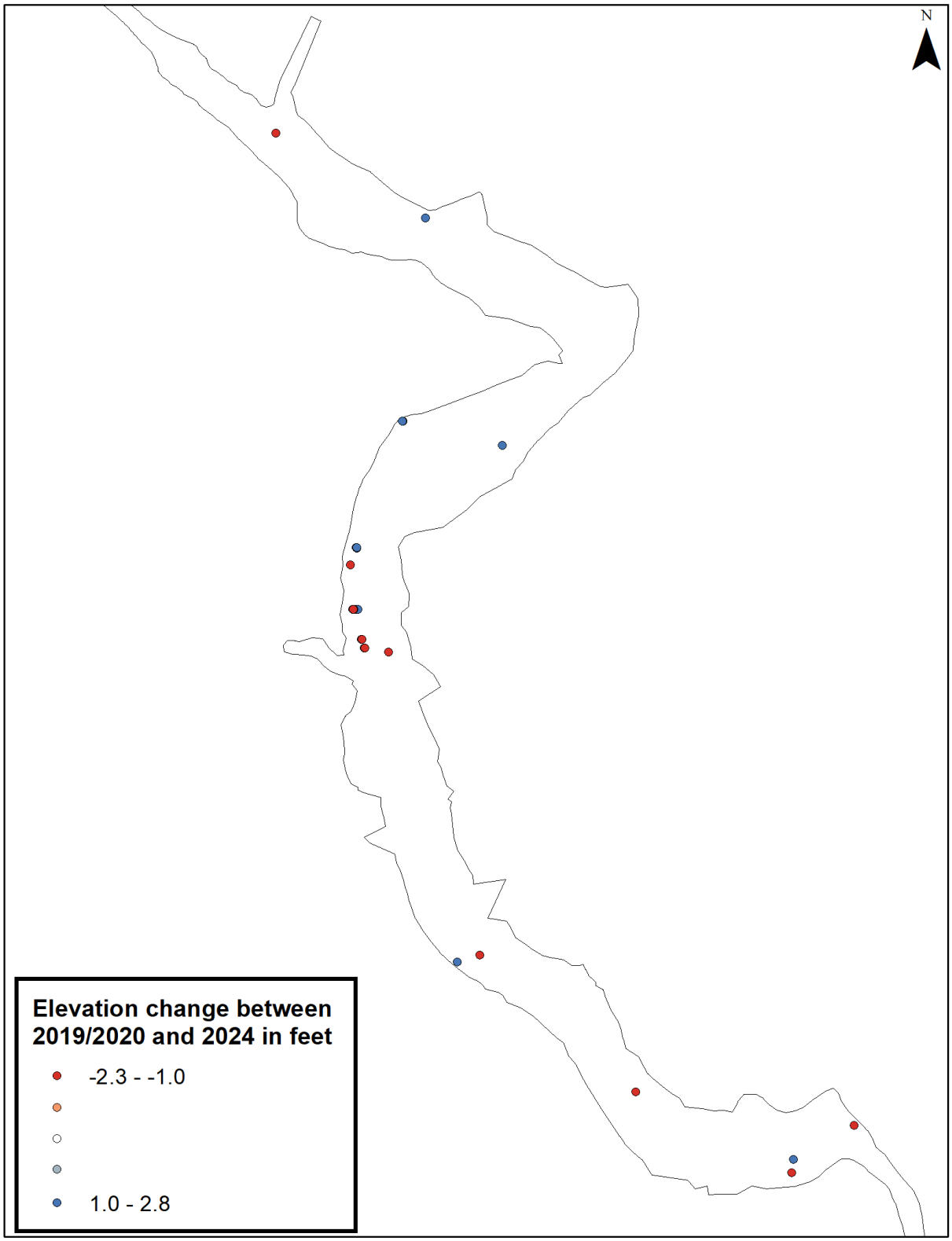


Figure 4-3. Comparison Points Between 2019/2020 and 2024 Bathymetric Surveys with Vertical Change Greater than 1 ft



5. Conclusions

The sediment transport modeling showed less than 2 feet of erosion along most of the Powwow River area of interest, with the exception of near the first upstream bend, where modeled erosion was up to 4.2 feet in a simulated 10-year event. Similarly, the bathymetric data comparison shows little change in bed elevation over the period between 2019/2020 and 2024, with only limited areas with greater than 1 ft of vertical erosion. Based on information from nearby USGS stream gages, the largest storm events during this time period were between 2-year and 5-year recurrence intervals. Based on these findings, the Powwow River does not show consistent erosional trends throughout the study area, however there could be some localized risk of erosion.

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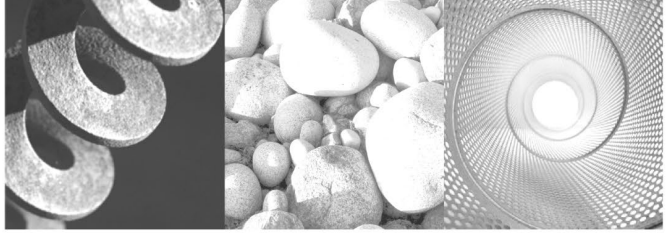
Appendix Q Forensics Evaluation



GEI Consultants

MassDEP RTN 3-24070

Forensics Evaluation

Amesbury Former MGP Site
Amesbury, Massachusetts

Submitted to:
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1. Introduction

This report was prepared by GEI Consultants, Inc. (GEI) on behalf of Boston Gas Company d/b/a National Grid (National Grid) to present a high-level fingerprinting analysis of polycyclic aromatic hydrocarbons (PAHs) and saturated hydrocarbon from 345 sediment samples collected in sediment in the Powwow River at the Amesbury Former Manufactured Gas Plant (MGP) Site (Fig. 1; the Site). The objective of the forensic evaluation was, to the extent practical, to determine whether, and to what extent, PAHs found in the sediment in the Powwow River are attributable to the former MGP and to other potential anthropogenic sources. The evaluation was based on applying generally recognized forensic fingerprinting techniques based on the relative distribution of distinct PAHs and on the evaluation of key ratios of PAHs for comparison to typical ranges reported in the literature for PAHs in fresh and weathered tar-like material (TLM) and in petroleum hydrocarbons. MGP-related TLM, petrogenic fuel hydrocarbons, and typical urban background can typically be qualitatively differentiated through these comparisons (EPRI 2003, 2008). A TLM can be further evaluated against fingerprints from various MGP processes: carbureted water gas (CWG) and coal carbonization (CC)/coke oven (CO) which have distinctive PAH patterns (EPRI, 2003). A tar sample from a monitoring well at the former MGP site confirmed that the source at this Site was a CWG MGP tar.

The evaluation was conducted on samples collected from the wetland immediately downstream of the former Amesbury MGP footprint, the adjacent tidal mudflats, and the main channel of the Powwow River downstream of the wetland and mudflats. In addition, samples from locations upstream of the former MGP plant were collected to help define the upper boundary of the disposal Site (Fig. 1).

This report is an appendix to the Supplemental Phase II Comprehensive Site Assessment Report (Supplemental Phase II CSA Report). The evaluation expands and complements the similar forensic evaluation conducted in 2009 (GEI, 2009) on samples from the original disposal Site boundary presented in the July 2009 Phase II CSA Report and Phase III Remedial Action Plan (Phase II/III Report).

The objective of the evaluation was focused on determining if observed concentrations of PAHs were consistent with the former Amesbury MGP. The source tar sample indicated the tar-like materials were related to a CWG process. If there was not a good match with a CWG TLM, and the material could not readily be classified as residual urban background, then no further analysis of alternate sources was conducted.

The sampling program was incremental as the evaluation of prior samples as early as 2017 indicated the need for additional sampling to fully define the nature and extent of impacts. The number of samples that have been evaluated forensically is now very large, including a data set from samples collected between 2017 and 2024. This report focuses on key samples and does not provide an exhaustive analysis of each sample.

This forensic evaluation is intended as a tool for improving the Conceptual Site Model and for allowing informed decision making. It is not intended to be determinative, by itself, of remedial scope or needs.

2. Fingerprint Methodology

2.1. Methodology

A "PAH fingerprinting" technique was applied in this evaluation. PAH fingerprinting identifies PAH compound ratios and patterns that provide distinguishing or differentiation information between key categories of hydrocarbon sources (EPRI, 2000).

The method does not provide conclusive identification of the source of a hydrocarbon. Rather, it relies on a qualitative evaluation of the relative abundance of selected PAHs and PAH groups in an environmental sample relative to a reference sample of known origin (if available) and/or on characteristic corresponding values for various types of hydrocarbons reported in the literature to generate an interpretation.

The EPA 8270 SIM GC/MS method was used for additional differentiation. Patterns of certain PAH groups (e.g., parent PAHs and their associated alkylated PAHs) can be used to differentiate between similar petroleum products, even when those materials are severely weathered. The ratios of components of the PAH mixture can be characteristic for specific sources and provide further confirmation of sources (EPRI 2003, 2008).

2.2. Key Concepts

Table 1 summarizes the analytical suite of PAHs. The "PAH #" is the order in which the PAHs are shown in the Extended PAH Profiles (EPP) (see examples in Figs. 1-1 and 1-2), and is based on chromatographic elution order. The specific order as presented allows the visual evaluation of the relationship between the parent PAH to its alkylated forms.

2.2.1. Pyrogenic vs. Petrogenic Hydrocarbons

PAH contamination has two main sources: pyrogenic sources and petrogenic sources. The relative distribution of individual PAHs is distinctly different in samples from these two sources.

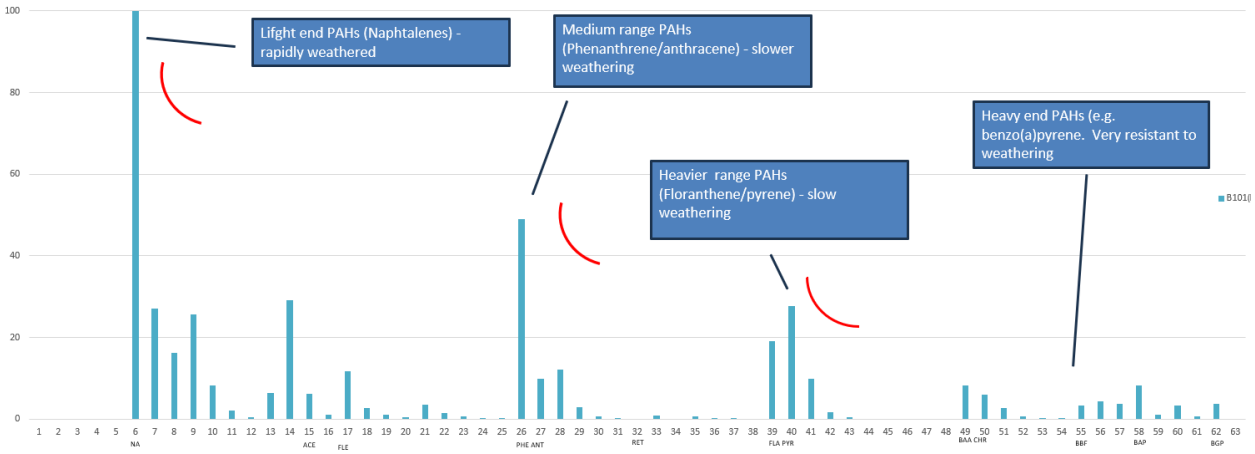
- For pyrogenic sources (derived from combustion, such as MGP TLM), the parent PAHs characteristically dominate with much lesser amounts of the alkylated forms. This generates a declining trend for each parent PAH relative to its alkylated forms. In Fig. 2-1 and Attachment A, the EPPs are annotated with a downward trending slash to indicate the presence of this pattern.
- For petrogenic sources (derived from petroleum), the alkylated PAHs characteristically dominate over the parent PAH. In Fig 2-1 and Attachment A, the EPPs are annotated with a parabolic slash to indicate the presence of this pattern. The distinction in some cases can be more difficult to discern. This can be due to the fact the hydrocarbons are a mixture of several sources.

The former Amesbury MGP produced coal tar, a pyrogenic TLM. The evaluation in this report, therefore, focused specifically on ratios and indicators optimizing differentiation of pyrogenic materials.

2.2.2. Weathering

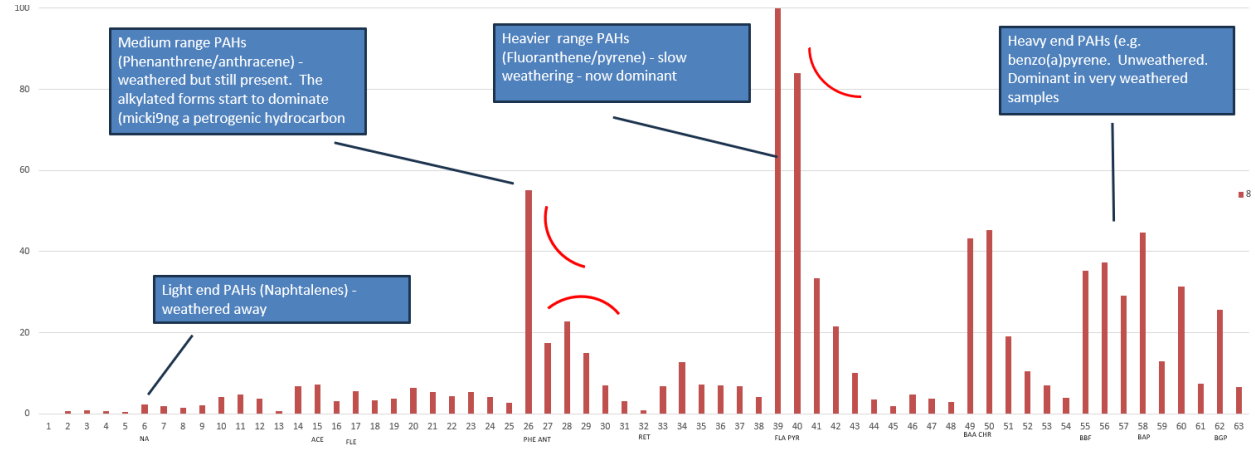
When released to the environment, hydrocarbon mixtures start weathering, as the original PAH mixture is transformed into daughter products. Weathering is more rapid for the lighter PAHs than for heavier PAHs, resulting in a shift towards relative dominance by the higher end PAHs. In the largely un-weathered source MGP tar, the mixture is dominated by light naphthalene and its alkylated forms relative to mid-range phenanthrene/anthracene and its alkylated forms, relative to heavier fluoranthene/pyrene, as shown in Fig. 2-1.

Figure 2-1. Extended PAH Profile – Source CWG Tar



As the TLM weathers, the heavier ends start to dominate, as shown in Fig. 2.

Figure 2-2. Extended PAH Profile – Moderately Weathered CWG Tar



Eventually, weathering will leave an undifferentiated residue of heavier end PAHs that are indistinguishable from other hydrocarbons. This is typical of the urban background signal present in almost all urban sediments resulting from various urban pyrogenic and petrogenic sources.

As can be seen in the weathered example above (Fig. 2-2), the typical pyrogenic pattern may weather into an apparently petrogenic pattern. Also, if the sample contains mixed sources, the pattern can be difficult to interpret. To strengthen interpretation, evaluation of specific ratios of PAHs are conducted to provide indicators of source.

2.2.3. Double-Ratio Plots

Table 2 presents selected characteristic PAH ratios that can be used in fingerprinting. The literature reports many potential ratios that can serve as indicators for specific sources, but the following key ones are useful in the context of MGP sources. While the individual ratios are useful by themselves, the practice is to present them as double ratio plots of two characteristic ratios. This allows better source differentiation. Attachment B shows selected double ratio plots of the Site data overlain with typical ranges for the same ratios for common sources.

The typical ranges for different sources are from the forensics literature and derived primarily from data in EPRI (2000) and EPRI (2008). Additional typical ratios are from the forensic analysis conducted at this Site in 2009 (GEI, 2009).

The ratios considered in this evaluation included the following:

- Low molecular weight PAHs (LPAH) to High Molecular Weight PAHs (HPAH). As mentioned above for pyrogenic and petrogenic sources, the ratio of LPAH to HPAH is a good indicator of weathering. Un-weathered TLM from pyrogenic sources have ratios from 2.5 to 4.5, while un-weathered fuel hydrocarbons have ratios from 3 to 10 (or more). Upon weathering, the ratio declines into the typical urban background range of 0.1 to 0.8.
- Parent PAHs (“PAH16”) to Total PAHs (defined as the sum of the 51 PAHs used in the analysis). As mentioned above for pyrogenic and petrogenic sources, the ratio of PAH16 to total PAHs typically is higher for pyrogenic sources as the parent PAHs dominate the mixture. Un-weathered fuel hydrocarbons have ratios from 0.05 to 2, while un-weathered TLM typically have ratios from 0.6 to 0.8. Urban background samples typically have a range of 0.4 to 0.9, which overlaps with pyrogenic sources.
- Retene (RET) to Benzo(a)pyrene (BAP). Retene is present in significant relative concentrations in coal fines and coal ash, but at much lower relative concentrations in other sources. A high RET to BAP ratio is an indication of residues from past use of coal. In older urban areas with a history of coal furnaces this signal is frequently seen in urban background samples.
- Fluoranthene (FLA) to Pyrene (PYR). This ratio is a stable key ratio in fingerprinting analysis (EPRI, 2008). Petrogenic (fuel hydrocarbon) sources have low FLA to PYR ratios (0.05 to 0.2) compared to combustion related TLM sources (range 0.4 – 1.4). Within the TLM, CWG vs CC/CO can be distinguished. However, the urban background generally has a range of 0.8 to 1.4 resulting in considerable overlap and so requires a double ratio plot to differentiate.
- Benzo(a)anthracene (BAA) to Chrysene (CHR). This ratio is useful as it is a mirror image of the FLA/PYR ratio: fuel hydrocarbons and urban background have similar ranges (0.4 to 1.0) while

TLM has generally higher ratios (0.8 to 1.6). The overlap can be resolved for both FLA/PYR and for BAA/CHR by a double ratio plot.

- Dibenzofuran (DBF) to Fluorene (FLE). This ratio is useful to distinguish between MGP residues originating in the CWG process or the CC/CO processes. Dibenzofuran is relatively more abundant in CWG process tars and therefore allows differentiation. However, this ratio is not very useful for fuel hydrocarbons because the ratios are highly variable, as they are in urban background which overlaps CC/CO ratios.

The following double ratio plots were considered in this evaluation (refer to Attachment B for plots showing Ratios 1 to 4, organized by Site area):

- Ratio 1: LPAH/HPAH vs PAH16/TPAH51. Primarily useful to identify un-weathered or lightly weathered product.
- Ratio 2: RET/BAP vs LPAH/HPAH. This double ratio provides information on degree of weathering (along the LPAH/HPAH axis) and coal fine content (along the RET/BAP axis).
- Ratio 3: FLA/PYR vs DBF/FLE. This double ratio differentiates CWG tars from other TLM and from urban background.
- Ratio 4: FLA/PYR vs BAA/CHR. This double ratio differentiates fuel hydrocarbons from TLM and from urban background. It provides further differentiation between CWG and CC/CO processes.

2.2.4. Multivariate Statistical Analysis

The fingerprinting analysis based on PAH profiles and specific double ratio analysis was further enhanced, especially for samples where the initial fingerprinting yielded ambiguous results, by various multivariate statistical analyses where additional aspects of the sample composition and location were evaluated to quantitatively organize samples into groups based on similarity across multiple dimensions. Multivariate statistical analysis was conducted on the data set, with special focus on ambiguous samples as an additional line of evidence to identify if the sample results were potentially consistent with the source material.

The graphical double ratio-based methods of PAH forensic analysis sufficiently identified the likely provenance of a substantial percentage of the samples for the Site. However, there remained two categories reflecting uncertainty – samples with *possibly* tar-like material and samples with *likely* tar-like material – that could not be positively identified in the categories of either Consistent with MGP Source or Consistent with Background/Inconsistent with MGP Source. Multivariate statistical analysis (MVSA) was selected as a robust mathematical technique to further refine the results from the graphical double ratio-based forensic methods. The goal was to positively identify all samples as either Consistent with MGP Source or Consistent with Background/Inconsistent with MGP Source. A description of the MVSA approach and evaluation is in Attachment C, and a summary is below.

MVSA consists of a wide variety of methodologies to analyze large datasets with multiple variables. When reference samples for original source materials are not available or when weathering has altered the original source materials extensively, MVSA is an exercise in Exploratory Data Analysis (EDA) (Johnson et al., 2015). The objective of EDA is to find patterns, correlations, and relationships in the data itself, with few assumptions or hypotheses (Tukey, 1977). In environmental forensic analyses, we often do not

have original reference samples and it is common for samples of tested environmental media (soil, sediment, water) to have undergone extensive weathering. As a result, EDA is often the only valid option (Johnson et al., 2015).

The general steps in MVSA (assuming relevant laboratory analytical data is available) can vary, but for this evaluation included:

1. Selection of an optimal dataset for analysis;
2. Data transformations to normalize scale and approximate distribution normality;
3. Calculation of "resemblance" matrices;
4. Implementation of two MVSA techniques to validate results – Principal Component Analysis (PCA) and Non-Metric Multidimensional Scaling (NMDS); and
5. Analysis of 2D and 3D ordination plots from PCA and NMDS in comparison to graphical forensic double ratio analyses.

Results of the MVSA analyses were then used to confirm the validity of the graphical forensic double ratio analyses and "fine-tune" those analyses where uncertainty existed. Samples previously identified as *likely* TLM were able to be positively correlated and many of the samples previously identified as *possibly* TLM were able to be positively correlated. However, some samples identified as *possibly* TLM still remained. Standard statistical techniques were then applied to analyze the resulting end-member groups that included categories for samples representative of:

- Consistent with MGP Source;
- Consistent with Background/Inconsistent with MGP Source (group of all non-CWG samples); and
- Tar-like Material (TLM) possibly present (representing uncertainty).

2.3. Available Data

To date, a total of 393 sediment samples collected from the Site and vicinity have been evaluated with these forensics methods. Table 2-1 shows the distribution among subareas: River, Wetland, Mudflat, Upstream, and former River Channel. Fig. 1 shows the subareas of the Site. The sampling efforts varied in objective, including disposal Site boundary definition; characterization of impacts; evaluation of ecological and human health risk; downstream and upstream extent of MGP related impacts; and vertical migration potential. For any samples evaluated chemically for PAHs after 2018, the full forensics set was analyzed, thereby yielding a very large data set.

Not all samples collected in these areas were evaluated using the full forensics scan methods and were not included in this analysis. Samples collected prior to 2018 in the wetlands area were not considered as they only evaluated the 16 parent Priority Pollutant PAHs (PAH16). The source material was a tar sample collected from monitoring well MW101 collected in 2008. Analysis of that tar sample was limited to the PAH34 analysis, which includes PAH16 parent PAHs and their alkylated PAHs. It did not include some additional analytes included in the full forensics scan. Not all double ratios can be evaluated from PAH34 data but it is sufficient to provide a typical pattern for MGP tars.

Table 2-1. Available Data for Forensics

	Surface (0 – 1 foot)	Near Surface (1 – 2 foot)	Subsurface (<2 foot)	Total
Source Material	1 sample of tar from MW101 (partial analytical list)			1
Wetland	15	8	2	25
Mudflat	20	17	16	53
River	74	46	156	276
Downstream	3	0	5	8
Upstream	9	4	5	18
Former Channel	0	2	10	12

Notes:

1. Surface: Samples collected wholly in the 0- 1 foot interval.
2. Near surface: Samples collected predominantly in the 1- 2-foot interval.
3. Subsurface: Samples collected predominantly in the interval >2 feet. These are generally but not always targeted at the interval of maximum visual impact and/or deep native sediment with little or no visual impact.
4. River subarea includes samples collected for evaluation of vertical migration, and also 6 samples collected from tar-saturated sediment as part of a NAPL mobility study (samples referred to as "River – Other" in Table 2).

Because the Powwow River is tidally influenced, impacts upstream of the release locations from the Site are possible and were identified. The samples collected in the Powwow River upstream of the Site were intended to define the upgradient boundary of the disposal Site. The forensic analysis of samples near and within the upstream area were used to help define the upstream disposal Site boundary shown on Site figures.

2.4. Weight of Evidence Evaluation

The determination of whether an EPP is (1) Consistent with MGP Source (CWG material); (2) Consistent with Background/Inconsistent MGP Source (either consistent with undifferentiated urban background or indicative of another source; or (3) ambiguous where the results cannot exclude the possibility of some source impact based on the evaluated criteria. Any samples with less than 0.5 mg/kg total PAH16 have insufficient PAHs to reliably evaluate PAH ratios and were not fingerprinted.

The evaluation qualitatively considered the following lines of evidence:

1. Ratio 1 and 2 provides estimates for degree of weathering. A high RET/BAP double ratio is an indicator of coal fines dominance. Retene is characteristic of coal fines and is generally insignificant in TLM.
2. Ratio 3 and 4 provides a preliminary identification by identifying if the double ratios are consistent with typical values for CWG tars, urban background, and other sources.
3. For samples where results are not consistent across the double ratios, the EPP was inspected for further indications of petrogenic vs. pyrogenic influence, unusual spikes in some PAHs, and unusual weathering pattern. This allowed resolution of some ambiguous results from lines of evidence 1 and 2 above.

4. The multivariate analysis analyzed all samples. While all samples were analyzed, only those samples where considerable ambiguity remained were specifically identified and considered within a PCA or NMDS context.

The final forensics conclusion was derived as a qualitative weight of evidence of all 4 lines of evidence. Most of the samples from the Site with sufficient PAH concentrations to evaluate could be assigned with confidence to either Consistent with MGP Source or Consistent with Background/Inconsistent with MGP Source (including urban background and unknown other sources). A few samples remained ambiguous after all the lines of evidence were considered and were deemed uncertain where some MGP Source influence could not be definitively excluded.

3. Forensic Analysis

Table 2 provides a complete summary of the forensics analysis conducted via examination of the EPPs and the double ratio plots and is further discussed below. The table includes the lines of evidence considered in the conclusion on whether the forensics analysis is Site related or not. Figs. 2, 3, and 4 show the distribution of forensic results for the 0-1 foot, 1-2 feet and >2 feet intervals, respectively.

Attachment A presents the double ratio plots for each subarea.

3.1. Wetland

Table 3-1 is a summary of the evaluation in the wetland subarea.

Table 3-1. Forensics Conclusions - Wetland

Conclusion	Number of Samples	Comments
Consistent with MGP Source	6	Pre-2018 samples with elevated total PAHs did not evaluate the extended range of PAHs and could not be fingerprinted
Ambiguous – MGP source cannot be excluded	0	
Consistent with urban background and/or inconsistent with MGP source	16	Samples from periphery of the wetland and/or above Mean High Water
Insufficient PAHs for analysis	3	

In the wetland area, all samples could be assigned to either the Consistent with MGP Source or Consistent with Background/Inconsistent with MGP Source. The CWG tar samples are within the wetland, while peripheral samples at or outside the wetland bound the impacts.

3.2. Mudflat

Table 3-2 is a summary of the evaluation in the mudflat subarea.

Table 3-2. Forensics Conclusions - Mudflat

Conclusion	Number of Samples	Comments
Consistent with MGP Source	25	
Ambiguous – MGP source cannot be excluded	7	Samples present characteristics in boundary between possible CWG source and undifferentiated urban background
Consistent with urban background and/or inconsistent with MGP source	12	Samples from areas of mudflat not directly downstream from the wetland and/or above the Mean High Water
Insufficient PAHs for analysis	9	

In the mudflat area, there was a mixture of sources. Directly downstream from the wetland, most samples were consistent with the MGP-related source. Surficial sediments were highly weathered. In areas of the mudflat not directly downstream from the wetland, samples were consistent with urban background or other sources. Some of the highly weathered samples were ambiguous and the MGP source impact could not be excluded.

3.3. Powwow River

Table 3-3 is a summary of the evaluation in the Powwow River subarea.

Table 3-3. Forensics Conclusions – Powwow River

Conclusion	Number of Samples	Comments
Consistent with MGP Source	112	Includes 6 samples collected from tar-saturated sediment as part of a NAPL mobility study (samples referred to as "River – Other" in Table 2)
Ambiguous – MGP source cannot be excluded	13	Samples present characteristics in boundary between possible CWG source and undifferentiated urban background
Consistent with urban background and/or inconsistent with MGP source	88	
Insufficient PAHs for analysis	63	

In the river area, there was also a mixture of sources. In the deeper sediments of the main river channel, the PAHs showed a clear signal from the CWG source. In some cases, these PAHs have undergone limited weathering. Surface sediments were more mixed, with PAHs attributed to the source mostly near where the mudflat drains into the river channel. Samples not consistent with the MGP source were present along the periphery and in surface sediment. A few of these samples had relatively elevated PAHs but were not associated with the MGP-related source.

3.4. Downstream

Table 3-4 is a summary of the evaluation in the downstream subarea.

Table 3-4. Forensics Conclusions – Downstream

Conclusion	Number of Samples	Comments
Consistent with MGP Source	0	
Ambiguous – MGP source cannot be excluded	1	Sample presents characteristics in boundary between possible CWG source and undifferentiated urban background
Consistent with urban background and/or inconsistent with MGP source	3	
Insufficient PAHs for analysis	4	Downstream area generally contained very low concentrations of PAHs

In the downstream area, a limited number of samples were collected from the backwater of the river downstream of I-495. These samples indicated that MGP-related PAHs were not present in this area. PAH concentrations were low, and in only one case were results ambiguous. This suggests that MGP-related impacts were not present in sediment downstream of I-495.

3.5. Former River Channel

Table 3-5 is a summary of the evaluation in the former River Channel subarea.

Table 3-5. Forensics Conclusions – Former River Channel

Conclusion	Number of Samples	Comments
Consistent with MGP Source	7	Filled former river channel area had clear CWG signal in deeper samples.
Ambiguous – MGP source cannot be excluded	0	
Consistent with urban background and/or inconsistent with MGP source	1	
Insufficient PAHs for analysis	4	

The former river channel area is where the river flowed prior to construction of Interstate I-495. The river was filled to build the interstate. Subsurface samples in the former river channel showed residual MGP-related PAHs at depth in the portion of the filled channel area accessible for sampling.

3.6. Upstream

Table 3-6 is a summary of the evaluation in the upstream subarea.

Table 3-6. Forensics Conclusions – Upstream

Conclusion	Number of Samples	Comments
Consistent with MGP Source	0	
Ambiguous – MGP source cannot be excluded	2	
Consistent with urban background and/or inconsistent with MGP source	12	Two locations with relatively elevated PAH concentrations (>100 mg/kg) were clearly inconsistent with a CWG source
Insufficient PAHs for analysis	4	

Results from samples collected upstream of the disposal Site boundary were not consistent with the MGP source. Two samples with elevated PAHs were present in this area that were not consistent with the MGP source, indicating that other sources of PAHs existed in the area. There were two samples for which the source(s) of PAHs were ambiguous but both had low concentrations.

4. Conclusions

The forensics analysis demonstrated a reasonably reliable determination of whether PAHs found in sediment samples could be confidently considered to be 1) consistent with the CWG-based tar-like material from the former MGP, or 2) associated with typical urban background or other sources unconnected with the MGP. In a few cases, the analysis did not allow for a conclusion with high confidence, and the presence of an MGP-related contribution could not be excluded.

Our key conclusions include:

- The PAHs found in all subareas were generally consistent with pyrogenic sources. There was very little indication of contributions from petrogenic sources.
- Most samples were highly weathered, with numerous samples consistent with the undifferentiated typical urban background. Other highly weathered samples did show signals of an ultimate source in CWG tars.
- Several samples, especially upstream and along the margins of the river, showed a clear signal of the retene marker typical of coal fines sources, which is common in urban regions formerly heated by coal.
- Relatively un-weathered PAHs clearly associated with CWG tars were found in deeper sediments in the river channel (including the former river channel). These samples frequently had high PAH concentrations. This would be expected, as deeper sediments are not conducive to rapid weathering and PAHs can remain for long periods of time.
- The distribution of tar-like materials likely originating from the MGP source were found throughout the wetland subarea (mostly below the Mean High Water), in portions of the mudflat directly downstream from the wetland, and throughout the river channel (including former river channel) down to the I-495 interchange. Most of the CWG TLM was in the subsurface. Surface impacts identified as CWG were relatively few and mostly located nearer to the mudflat.
- Surface sediment PAHs in the river subarea were mixed. Many samples, especially outside the center and towards the riverbank, had low PAH concentrations, and, where PAHs were present, were associated with urban background or other sources.
- The forensics evaluation allowed the definition of an upstream Site boundary. Samples from upstream of the boundary were, in most cases, assignable to either urban background or a non-CWG source. Two surface sediment samples with elevated PAHs (579 mg/kg at 787-S1 and 271 mg/kg at 859-S1) were not associated with the CWG source material, indicating that other significant contributors to PAHs in the river sediment existed.

5. References

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Tables

Table 1. PAHs Evaluated in Extended Scan Testing Methods

Table 2. Summary of Forensics Analysis

Table 1. PAHs Evaluated in Extended Scan Testing Methods
Amesbury Former MGP
Amesbury, Massachusetts

	PAH Index #	CAS Number	Method Name	Analyte	Units	Retention Time	L=LMW H=HMW	PAH_{16} (Parent PAHs)	PAH_{34} (NOAA List)	PAH_{51} (EPP)	Abbreviation
Extended PAH Profile (EPP) Analytical Suite	1			**[blank]**							
	2		8270D (SIM) SVOC	**C1-Benzo(b)thiophenes**	ug/kg dry	17					C1BT
	3		8270D (SIM) SVOC	**C2-Benzo(b)thiophenes**	ug/kg dry	18					C2BT
	4		8270D (SIM) SVOC	**C3-Benzo(b)thiophenes**	ug/kg dry	19					C3BT
	5		8270D (SIM) SVOC	**C4-Benzo(b)thiophenes**	ug/kg dry	20					C4BT
	6	91-20-3	8270D (SIM) SVOC	**Naphthalene**	ug/kg dry	21.86	L	x	x	x	NA
	7	91-57-6	8270D (SIM) SVOC	**2-Methylnaphthalene**	ug/kg dry	24.57	L			x	2MN
	8	90-12-0	8270D (SIM) SVOC	**1-Methylnaphthalene**	ug/kg dry	25				x	1MN
	9		8270D (SIM) SVOC	**C1-Naphthalenes**	ug/kg dry	24.57			x	x	C1N
	10		8270D (SIM) SVOC	**C2-Naphthalenes**	ug/kg dry	27.02			x	x	C2N
	11		8270D (SIM) SVOC	**C3-Naphthalenes**	ug/kg dry	29.76			x	x	C3N
	12		8270D (SIM) SVOC	**C4-Naphthalenes**	ug/kg dry	32.52			x	x	C4N
	13	92-52-4	8270D (SIM) SVOC	**Biphenyl**	ug/kg dry	26.46					BP
	14	208-96-8	8270D (SIM) SVOC	**Acenaphthylene**	ug/kg dry	28.16	L	x	x	x	ACE
	15	83-32-9	8270D (SIM) SVOC	**Acenaphthene**	ug/kg dry	28.89	L	x	x	x	ACY
	16	132-64-9	8270D (SIM) SVOC	**Dibenzofuran**	ug/kg dry	29.54				x	DBF
	17	86-73-7	8270D (SIM) SVOC	**Fluorene**	ug/kg dry	30.91	L	x	x	x	FLE
	18		8270D (SIM) SVOC	**C1-Fluorenes**	ug/kg dry	33.14			x	x	C1FL
	19		8270D (SIM) SVOC	**C2-Fluorenes**	ug/kg dry	35.22			x	x	C2FL
	20		8270D (SIM) SVOC	**C3-Fluorenes**	ug/kg dry	38.01			x	x	C3FL
	21	132-65-0	8270D (SIM) SVOC	**Dibenzothiophene**	ug/kg dry	34.23				x	DBT
	22		8270D (SIM) SVOC	**C1-Dibenzothiophenes**	ug/kg dry	36.43				x	C1DBT
	23		8270D (SIM) SVOC	**C2-Dibenzothiophenes**	ug/kg dry	37.7				x	C2DBT
	24		8270D (SIM) SVOC	**C3-Dibenzothiophenes**	ug/kg dry	39.5				x	C3DBT
	25		8270D (SIM) SVOC	**C4-Dibenzothiophenes**	ug/kg dry	41.65				x	C4DBT
	26	85-01-8	8270D (SIM) SVOC	**Phenanthrene**	ug/kg dry	34.72	L	x	x	x	PHE
	27	120-12-7	8270D (SIM) SVOC	**Anthracene**	ug/kg dry	34.91	L	x	x	x	ANT
	28		8270D (SIM) SVOC	**C1-Phenanthrenes/Anthracenes**	ug/kg dry	36.96			x	x	C1PH
	29		8270D (SIM) SVOC	**C2-Phenanthrenes/Anthracenes**	ug/kg dry	38.97			x	x	C2PH
	30		8270D (SIM) SVOC	**C3-Phenanthrenes/Anthracenes**	ug/kg dry	40.8			x	x	C3PH
	31		8270D (SIM) SVOC	**C4-Phenanthrenes/Anthracenes**	ug/kg dry	41.72			x	x	C4PH
	32	483-65-8	8270D (SIM) SVOC	**Retene**	ug/kg dry	41.72				x	RET
	33	239-35-0	8270D (SIM) SVOC	**Benzo(b)naphtho(2,1-d)thiophene**	ug/kg dry	44.24				x	BNT
	34		8270D (SIM) SVOC	**C0-Benzonaphthothiophenes**	ug/kg dry	44.24					C0BNT
	35		8270D (SIM) SVOC	**C1-Benzonaphthothiophenes**	ug/kg dry	45.63					C1BNT
	36		8270D (SIM) SVOC	**C2-Benzonaphthothiophenes**	ug/kg dry	47.14					C2BNT
	37		8270D (SIM) SVOC	**C3-Benzonaphthothiophenes**	ug/kg dry	49.02					C3BNT
	38		8270D (SIM) SVOC	**C4-Benzonaphthothiophenes**	ug/kg dry	51.51					C4BNT
	39	206-44-0	8270D (SIM) SVOC	**Fluoranthene**	ug/kg dry	39.51	H	x	x	x	FLA
	40	129-00-0	8270D (SIM) SVOC	**Pyrene**	ug/kg dry	40.39	H	x	x	x	PYR
	41		8270D (SIM) SVOC	**C1-Fluoranthenes/Pyrenes**	ug/kg dry	41.78			x	x	C1PY
	42		8270D (SIM) SVOC	**C2-Fluoranthenes/Pyrenes**	ug/kg dry	43.52				x	C2PY
	43		8270D (SIM) SVOC	**C3-Fluoranthenes/Pyrenes**	ug/kg dry	45.72				x	C3PY
	44	243-17-4	8270D (SIM) SVOC	**Benzo(b)fluorene**	ug/kg dry	42.03				x	BbF
	45	205-12-9	8270D (SIM) SVOC	**Benzo(c)fluorene**	ug/kg dry	42.07				x	BcF
	46	3442-78-2	8270D (SIM) SVOC	**2-Methylpyrene**	ug/kg dry	42.18				x	2MP
	47	3353-12-6	8270D (SIM) SVOC	**4-Methylpyrene**	ug/kg dry	42.55				x	4MP
	48	2381-21-7	8270D (SIM) SVOC	**1-Methylpyrene**	ug/kg dry	42.67				x	1MP
	49	56-55-3	8270D (SIM) SVOC	**Benz(a)anthracene**	ug/kg dry	45.17	H	x	x	x	BaA
	50		8270D (SIM) SVOC	**Chrysene/triphenylene**	ug/kg dry	45.36	H	x	x	x	CH
	51		8270D (SIM) SVOC	**C1-Benzo(a)anthracenes/Chrysenes**	ug/kg dry	46.81			x	x	C1CR
	52		8270D (SIM) SVOC	**C2-Benzo(a)anthracenes/Chrysenes**	ug/kg dry	48.52			x	x	C2CR
	53		8270D (SIM) SVOC	**C3-Benzo(a)anthracenes/Chrysenes**	ug/kg dry	49.55			x	x	C3CR
	54		8270D (SIM) SVOC	**C4-Benzo(a)anthracenes/Chrysenes**	ug/kg dry	50			x	x	C4CR
	55	205-99-2	8270D (SIM) SVOC	**Benzo(b)fluoranthene**	ug/kg dry	49.23	H	x	x	x	BbF
	56		8270D (SIM) SVOC	**Benzo(j/k)fluoranthene**	ug/kg dry	49.29	H	x	x	x	BjF
	57	192-97-2	8270D (SIM) SVOC	**Benzo(e)pyrene**	ug/kg dry	50.17			x	x	BeP
	58	50-32-8	8270D (SIM) SVOC	**Benzo(a)pyrene**	ug/kg dry	50.34	H	x	x	x	BaP
	59	198-55-0	8270D (SIM) SVOC	**Perylene**	ug/kg dry	50.61			x	x	PE
	60	193-39-5	8270D (SIM) SVOC	**Indeno(1,2,3-cd)pyrene**	ug/kg dry	54	H	x	x	x	I123P
	61	53-70-3	8270D (SIM) SVOC	**Dibenzo(a,h)anthracene**	ug/kg dry	54.01	H	x	x	x	DBA
	62	191-24-2	8270D (SIM) SVOC	**Benzo(g,h,i)perylene**	ug/kg dry	54.91	H	x	x	x	BGP
	63	191-07-1	8270D (SIM) SVOC	**Coronene**	ug/kg dry	61.34				x	COR

Table 1. PAHs Evaluated in Extended Scan Testing Methods
Amesbury Former MGP
Amesbury, Massachusetts

	PAH Index #	CAS Number	Method Name	Analyte	Units	Retention Time	L=LMW H=HMW	PAH_{16} (Parent PAHs)	PAH_{34} (NOAA List)	PAH_{51} (EPP)	Abbreviation
Other analytes in EPP	64	526-73-8	8270D (SIM) SVOC	1,2,3-Trimethylbenzene	ug/kg dry						
	65	95-63-6	8270D (SIM) SVOC	1,2,4-Trimethylbenzene	ug/kg dry						
	66	108-67-8	8270D (SIM) SVOC	1,3,5-Trimethylbenzene	ug/kg dry						
	67		8270D (SIM) SVOC	1-Methyldibenzothiophene	ug/kg dry	36.76					
	68		8270D (SIM) SVOC	1-Methylphenanthrene	ug/kg dry	37.24					
	69		8270D (SIM) SVOC	2,3,5-Trimethylnaphthene	ug/kg dry	30.44					
	70	581-42-0	8270D (SIM) SVOC	2,6-Dimethylnaphthalene	ug/kg dry	27.07					
	71		8270D (SIM) SVOC	2/3-Methyldibenzothiophene	ug/kg dry	36.31					
	72		8270D (SIM) SVOC	2-Methylanthracene	ug/kg dry	36.96					
	73		8270D (SIM) SVOC	2-Methylphenanthrene	ug/kg dry	36.81					
	74		8270D (SIM) SVOC	3-Methylphenanthrene	ug/kg dry	36.69					
	75		8270D (SIM) SVOC	4/9-Methylphenanthrene	ug/kg dry	37.14					
	76		8270D (SIM) SVOC	4-Methyldibenzothiophene	ug/kg dry	36.01					
	77	71-43-2	8270D (SIM) SVOC	Benzene	ug/kg dry						
	78	11095-43-5	8270D (SIM) SVOC	Benzo(b)thiophene	ug/kg dry						
	79		8270D (SIM) SVOC	C1-Benzene	ug/kg dry						
	80		8270D (SIM) SVOC	C1-Decalins	ug/kg dry						
	81		8270D (SIM) SVOC	C2-Benzenes	ug/kg dry						
	82		8270D (SIM) SVOC	C2-Decalins	ug/kg dry						
	83		8270D (SIM) SVOC	C3-Benzenes	ug/kg dry						
	84		8270D (SIM) SVOC	C3-Decalins	ug/kg dry						
	85		8270D (SIM) SVOC	C4-Benzenes	ug/kg dry						
	86		8270D (SIM) SVOC	C4-Decalins	ug/kg dry						
	87		8270D (SIM) SVOC	C5-Benzenes	ug/kg dry						
	88	86-74-8	8270D (SIM) SVOC	Carbazole	ug/kg dry	35.61					
	89	493-01-6	8270D (SIM) SVOC	cis-Decalin	ug/kg dry						
	90	100-41-4	8270D (SIM) SVOC	Ethylbenzene	ug/kg dry						
	91	98-82-8	8270D (SIM) SVOC	Isopropylbenzene	ug/kg dry						
	92		8270D (SIM) SVOC	m,p-Xylene	ug/kg dry						
	93	108-87-2	8270D (SIM) SVOC	Methylcyclohexane	ug/kg dry						
	94	104-51-8	8270D (SIM) SVOC	n-Butylbenzene	ug/kg dry						
	95	103-65-1	8270D (SIM) SVOC	n-Propylbenzene	ug/kg dry						
	96	95-47-6	8270D (SIM) SVOC	o-Xylene	ug/kg dry						
	97	99-87-6	8270D (SIM) SVOC	p-Isopropyltoluene	ug/kg dry						
	98	135-98-8	8270D (SIM) SVOC	sec-Butylbenzene	ug/kg dry						
	99	100-42-5	8270D (SIM) SVOC	Styrene	ug/kg dry						
	100	98-06-6	8270D (SIM) SVOC	t-Butylbenzene	ug/kg dry						
	101	108-88-3	8270D (SIM) SVOC	Toluene	ug/kg dry						
	102	493-02-7	8270D (SIM) SVOC	trans-Decalin	ug/kg dry						
	103	3891-98-3	Saturated HC by GC/FID	2,6,10-trimethyldodecane (1380)	mg/kg dry						
	104	3892-00-0	Saturated HC by GC/FID	2,6,10-trimethylpeadecane (1650)	mg/kg dry						
	105	3891-99-4	Saturated HC by GC/FID	2,6,10-trimethyltridecane (1470)	mg/kg dry						
	106		Classical Chemistry	Black Carbon (Average)	mg/kg						
	107		Saturated HC by GC/FID	C-10	mg/kg dry						
	108		Saturated HC by GC/FID	C-11	mg/kg dry						
	109		Saturated HC by GC/FID	C-12	mg/kg dry						
	110		Saturated HC by GC/FID	C-13	mg/kg dry						
	111		Saturated HC by GC/FID	C-14	mg/kg dry						
	112		Saturated HC by GC/FID	C-15	mg/kg dry						
	113		Saturated HC by GC/FID	C-16	mg/kg dry						
	114		Saturated HC by GC/FID	C-17	mg/kg dry						
	115		Saturated HC by GC/FID	C-18	mg/kg dry						
	116		Saturated HC by GC/FID	C-19	mg/kg dry						
	117		Saturated HC by GC/FID	C-21	mg/kg dry						
	118		Saturated HC by GC/FID	C-22	mg/kg dry						
	119		Saturated HC by GC/FID	C-23	mg/kg dry						
	120		Saturated HC by GC/FID	C-24	mg/kg dry						
	121		Saturated HC by GC/FID	C-25	mg/kg dry						
	122		Saturated HC by GC/FID	C-26	mg/kg dry						
	123		Saturated HC by GC/FID	C-27	mg/kg dry						
	124		Saturated HC by GC/FID	C-28	mg/kg dry						
	125		Saturated HC by GC/FID	C-29	mg/kg dry						
	126		Saturated HC by GC/FID	C-30	mg/kg dry						
	127		Saturated HC by GC/FID	C-31	mg/kg dry						
	128		Saturated HC by GC/FID	C-32	mg/kg dry						
	129		Saturated HC by GC/FID	C-33	mg/kg dry						
	130		Saturated HC by GC/FID	C-34	mg/kg dry						
	131		Saturated HC by GC/FID	C-35	mg/kg dry						
	132		Saturated HC by GC/FID	C-36	mg/kg dry						
	133		Saturated HC by GC/FID	C-37	mg/kg dry						
	134		Saturated HC by GC/FID	C-38	mg/kg dry						
	135		Saturated HC by GC/FID	C-39	mg/kg dry						
	136		Saturated HC by GC/FID	C-40	mg/kg dry						
	137		Saturated HC by GC/FID	C-8	mg/kg dry						
	138		Saturated HC by GC/FID	C-9	mg/kg dry						
	139		Organic lead	Dimethyldiethyl lead	ug/kg dry						
	140		Organic lead	Methyltriethyl lead	ug/kg dry						
	141	638-36-8	Saturated HC by GC/FID	Phytane	mg/kg dry	34.53					
	142	1921-70-6	Saturated HC by GC/FID	Pristane	mg/kg dry	32.65					
	143		Organic lead	Tetraethyl lead	ug/kg dry						
	144		Organic lead	Tetramethyl lead	ug/kg dry						
	145	TOC	Classical Chemistry	Total Organic Carbon (Average)	mg/kg						
	146		Saturated HC by GC/FID	TPH (C8-C40)	mg/kg dry						
	147		Organic lead	Trimethylethyl lead	ug/kg dry						

General Notes:

1. LMW= Low molecular weight parent PAHs
2. HMW= High molecular weight parent PAHs
3. SVOCs = Semi-volatile organic compounds
4. GC/FID= Gas Chromatograph (Flame Ionization Detector)
5. PAH forensic analysis is based on the PAH_{51} EPPs
6. mg/kg = milligrams per kilogram
7. ug/kg = micrograms per kilogram

Table 2. Summary of Forensics Analysis
Amesbury Former MGP
Amesbury, Massachusetts

Subarea	Location	PAH17 (mg/kg)	INT[1]	Extended PAH Profile (EPP) Pattern Pyro/petrogenicity and weathering[3]	Dominant PAH[2,3]	Ratio 1 - LPAH/HPAH v PAH17/Total PAH extended	Ratio 2- RET/BAP v LPAH/HPAH	Ratio 3- FLA/PYR v DBF/FLE	Ratio 4 4- FLA/PYR v BAA/CHR	MVSA (PCA, NMDS)[3]	Weight of evidence: Site related?
Downstream	802-S1	<0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
Downstream	803-S1	<0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
Downstream	804-S1	4.7	S			Urban background, typical	Very weathered. Urban bkgrd	Not consistent with CWG	Urban background, not CWG		NO - URBAN BACKGORUOND / OTHER
Downstream	804-S2	8.5	SUB	Extremely degraded, probably pyrogenic, some light ends present	PYR	Urban background range	Very weathered. Urban bkgrd	Likely CWG signal	Possible CWG signal	NMDS: in lower outliers, more like background	NO - URBAN BACKGORUOND / OTHER
Downstream	804-S3	1.2	SUB			Urban background range	Very weathered. Urban bkgrd	Not consistent with CWG	Not consistent with CWG		NO - URBAN BACKGORUOND / OTHER
Downstream	805-S1	2.2	S	Extremely degraded, probably pyrogenic, some light ends present	PYR	Urban background range	Very weathered. Urban bkgrd	Possible CWG signal	Possible CWG signal	NMDS: in boundary, cannot exclude	CWG UNCERTAIN OR CANNOT BE EXCLUDED
Downstream	805-S3	<0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
Downstream	806-S2	<0.1	S			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
Former River Channel	837-S1	0.4	NS			Urban background range	Very weathered. Urban bkgrd	Likely CWG signal	Anomalous		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
Former River Channel	837-S2	<0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
Former River Channel	837-S3	3.2	SUB			Urban background range	Very weathered. Urban bkgrd	CWG signal	Possible CWG signal	NMDS: Within CWG zone	YES - CWG
Former River Channel	838-S1	5.9	NS			Urban background range	Very weathered. Urban bkgrd	CWG signal	CWG signal		YES - CWG
Former River Channel	838-S2	4.6	SUB			Urban background range	Very weathered. Urban bkgrd	CWG signal	Possible CWG signal	NMDS: Within CWG zone	YES - CWG
Former River Channel	838-S3	0.5	SUB			Urban background range	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal	NMDS: Confirm within CWG zone	YES - CWG
Former River Channel	841-S1	1.1	SUB			Urban background range	Very weathered. Urban bkgrd	Anomalous source	Not consistent with CWG		NO - URBAN BACKGROUND
Former River Channel	841-S2	0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
Former River Channel	841-S3	67	SUB			Urban background range	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
Former River Channel	842-S1	<0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
Former River Channel	842-S2	32	SUB			Urban background range	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
Former River Channel	842-S3	230	SUB			Urban background range	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
Known tar sample	B101(MW)	--	--	Unweathered pyrogenic. NA dominated	NA	MGP TLM (unweathered)	--	CWG signal	CWG signal		SOURCE MATERIAL
Mudflat	620	3.5	NS		PYR	Urban background range	Coal fines present, urban backgroound	CWG signal	Likely CWG signal	NMDS: Present on retene axis	CWG UNCERTAIN OR CANNOT BE EXCLUDED
Mudflat	622	41	NS		PYR	Urban background, typical	Very weathered. Urban bkgrd	CWG signal	CWG signal		YES - CWG
Mudflat	623	16	NS		PYR	Urban background range	Very weathered. Urban bkgrd	Likely CWG signal	Likely CWG signal		CWG UNCERTAIN OR CANNOT BE EXCLUDED
Mudflat	631	68	S		FLA	Urban background range	Very weathered. Urban bkgrd	Not consistent with CWG	Urban background, not CWG		NO - URBAN BACKGROUND
Mudflat	632	62	S		PYR	Urban background, typical	Very weathered. Urban bkgrd	CWG signal	CWG signal		YES - CWG
Mudflat	633	55	S		PYR	Urban background, typical	Very weathered. Urban bkgrd	CWG signal	CWG signal		YES - CWG
Mudflat	634	3.7	S		PYR	Urban background range	Very weathered, some coal fines	CWG signal	Likely CWG signal	NMDS: Present on retene axis	CWG UNCERTAIN OR CANNOT BE EXCLUDED
Mudflat	637	7.4	S		FLA/PYR	Urban background, typical	Very weathered. Urban bkgrd	Near urban background	Urban backgorund, not CWG		NO - URBAN BACKGROUND
Mudflat	640	2.8	S		FLA	Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Possible CWG signal	NMDS: in upper bounds zone. Likely background	NO - URBAN BACKGROUND
Mudflat	649	70	S		PYR	Urban background, typical	Very weathered. Urban bkgrd	CWG signal	CWG signal		YES - CWG
Mudflat	650	69	S		PYR	Urban background, typical	Very weathered. Urban bkgrd	CWG signal	CWG signal		YES - CWG
Mudflat	660	47	S		PYR	Urban background, typical	Very weathered. Urban bkgrd	CWG signal	CWG signal		YES - CWG
Mudflat	661	72	S		PYR	Urban background, typical	Very weathered. Urban bkgrd	CWG signal	CWG signal		YES - CWG
Mudflat	664-S2	2.1	NS		RET	Urban background range	Strong retene signal. Very weathered. Urban bkgrd	CWG signal	Not consistent with CWG	NMDS: Present on retene axis	NO - COAL FINES DOMINANCE
Mudflat	664-S3	0.1	NS		PER						PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
Mudflat	664-S4	0.3	SUB		PER	Urban background range	Very weathered. Urban bkgrd	Not consistent with CWG	Not consistent with CWG		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION

Table 2. Summary of Forensics Analysis
Amesbury Former MGP
Amesbury, Massachusetts

Subarea	Location	PAH17 (mg/kg)	INT[1]	Extended PAH Profile (EPP) Pattern Pyro/petrogenicity and weathering[3]	Dominant PAH[2,3]	Ratio 1 - LPAH/HPAH v PAH17/Total PAH extended	Ratio 2- RET/BAP v LPAH/HPAH	Ratio 3- FLA/PYR v DBF/FLE	Ratio 4 4- FLA/PYR v BAA/CHR	MVSA (PCA, NMDS)[3]	Weight of evidence: Site related?
Mudflat	665-S1	42	S		PYR	Urban background, typical	Very weathered. Urban bkgrd	Likely CWG signal	Possible CWG signal	NMDS: in overlap zone, closer to CWG	YES - CWG
Mudflat	665-S2	14	NS		PHE	Near urban background, may include weathered MGP TLM	Very weathered. Urban bkgrd	Likely CWG signal	Possible CWG signal	NMDS: on retene axis, but ambiguous	CWG UNCERTAIN OR CANNOT BE EXCLUDED
Mudflat	666-S2	7.3	NS		PYR	Urban background range	Very weathered. Urban bkgrd	Possible CWG signal	Likely CWG signal	NMDS: in overlap zone, closer to CWG	YES - CWG
Mudflat	666-S3	0.2	NS		RET	Urban background range	Strong retene signal. Very weathered. Urban bkgrd	CWG signal	CWG signal		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
Mudflat	666-S4	<0.1	SUB		PER	--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
Mudflat	666-S5	<0.1	SUB		PER	--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
Mudflat	667-S1	68	S		PYR	Urban background, typical	Very weathered. Urban bkgrd	CWG signal	CWG signal		YES - CWG
Mudflat	667-S2	23	NS		C1FLA	Urban background range	Very weathered. Urban bkgrd	Possible CWG signal	Not consistent with CWG	NMDS: in nonMGP outliers. More like bkgrd	NO - URBAN BACKGROUND
Mudflat	668-S1	131	S		PYR	Urban background, typical	Very weathered. Urban bkgrd	CWG signal	CWG signal		YES - CWG
Mudflat	668-S2	23	NS		PYR	Urban background range	Very weathered. Urban bkgrd	CWG signal	Possible CWG signal		YES - CWG
Mudflat	669-S1	54	NS		PHE	Urban background range	Very weathered. Urban bkgrd	CWG signal	Possible CWG signal		YES - CWG
Mudflat	669-S3	<0.1	SUB		PER	--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
Mudflat	670-S1	280	S		PYR	Urban background, typical	Very weathered. Urban bkgrd	CWG signal	CWG signal		YES - CWG
Mudflat	670-S2	17	NS		PYR	Urban background range	Very weathered. Urban bkgrd	CWG signal	Possible CWG signal		YES - CWG
Mudflat	671-S1	610	NS		PYR	Urban background, typical	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
Mudflat	671-S2	0.1	SUB		PER	--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
Mudflat	672-S1	120	S		PYR	Urban background, typical	Very weathered. Urban bkgrd	CWG signal	CWG signal		YES - CWG
Mudflat	672-S3	27	SUB		PHE	Urban background, typical	Very weathered. Urban bkgrd	Possible CWG signal	Not consistent with CWG	NMDS: in nonMGP outliers. More like bkgrd	NO - URBAN BACKGROUND
Mudflat	675-S2	340	SUB			Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Not consistent with CWG		NO - URBAN BACKGROUND
Mudflat	684-S2	10	NS			Urban background range	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
Mudflat	684-S4	126	SUB			Likely weathered MGP TLM	Very weathered. Urban bkgrd	CWG signal	CWG signal		YES - CWG
Mudflat	685-S3	14	SUB			Urban background range	Very weathered. Urban bkgrd	Urban background, not CWG	Not consistent with CWG		NO - URBAN BACKGROUND
Mudflat	686-S3	2.5	SUB			Urban background range	Very weathered. Urban bkgrd	Urban background, not CWG	Urban background, not CWG		NO - URBAN BACKGROUND
Mudflat	691-S3	139	SUB			Urban background range	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
Mudflat	691-S5	467	SUB			Near urban background, may include weathered MGP TLM	Moderately weathered	CWG signal	Likely CWG signal		YES - CWG
Mudflat	704-S2	724	NS			Urban background, typical	Very weathered. Urban bkgrd	Not consistent with CWG	Possible CWG signal	NMDS: confirm within bkgrd zone	NO - URBAN BACKGROUND
Mudflat	704-S4	0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
Mudflat	SS717-S1	0.8	S			Urban background range	Very weathered. Urban bkgrd	Not consistent with CWG	Not consistent with CWG		NO - URBAN BACKGROUND
Mudflat	SS717-S3	<0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
Mudflat	718-S5	<0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
Mudflat	719-S1	113	S			Urban background, typical	Very weathered. Urban bkgrd	CWG signal	CWG signal		YES - CWG
Mudflat	720-S1	173	S			Urban background, typical	Very weathered. Urban bkgrd	Not consistent with CWG	Possible CWG signal	NMDS: at boundary bkgrd/CWG. Ambiguous	CWG UNCERTAIN OR CANNOT BE EXCLUDED
Mudflat	720-S2	1.2	NS			Urban background range	Very weathered. Urban bkgrd	Urban background, not CWG	Urban background, not CWG	NMDS: confirm within bkgrd zone	NO - URBAN BACKGROUND
Mudflat	721-S1	1060	NS			Urban background, typical	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
Mudflat	721-S2	0.3	SUB			Urban background range	Very weathered. Urban bkgrd	Possible CWG signal	Possible CWG signal		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
Mudflat	722-S1	178	S			Urban background, typical	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
Mudflat	797-S1	19	S	Weathered pyrogenic		Urban background range	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
River	SS619	119	NS		PYR	Urban background, typical	Very weathered. Urban bkgrd	Near urban background	Close to urban background	NMDS - in overlap zone	CWG UNCERTAIN OR CANNOT BE EXCLUDED
River	SS621	119	NS		PYR	Urban background, typical	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
River	SS638	3.7	S		PER	Urban background, typical	Coal fines present, urban backgroound	Urban background, not CWG	Urban backgorund, not CWG		NO - URBAN BACKGROUND
River	SS639	42	S		FLA	Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Urban backgorund, not CWG		NO - URBAN BACKGROUND
River	SS642	9.0	S		FLA	Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Urban backgorund, not CWG		NO - URBAN BACKGROUND
River	SS643	11	S		FLA	Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Urban backgorund, not CWG		NO - URBAN BACKGROUND

Table 2. Summary of Forensics Analysis
Amesbury Former MGP
Amesbury, Massachusetts

Subarea	Location	PAH17 (mg/kg)	INT[1]	Extended PAH Profile (EPP) Pattern Pyro/petrogenicity and weathering[3]	Dominant PAH[2,3]	Ratio 1 - LPAH/HPAH v PAH17/Total PAH extended	Ratio 2- RET/BAP v LPAH/HPAH	Ratio 3- FLA/PYR v DBF/FLE	Ratio 4 4- FLA/PYR v BAA/CHR	MVSA (PCA, NMDS)[3]	Weight of evidence: Site related?
River	SS644	17	S		PYR	Urban background, typical	Very weathered. Urban bkgrd	Possible CWG signal	Possible CWG signal	NMDS: Within CWG zone	YES - CWG
River	SS646	14	S		FLA	Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Urban backgorund, not CWG		NO - URBAN BACKGROUND
River	SS647	18	S		FLA	Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Heavy end, not CWG	NMDS: Within bkgrd zone	NO - URBAN BACKGROUND
River	SS648	39	S		PYR	Urban background, typical	Very weathered. Urban bkgrd	CWG signal	Possible CWG signal		YES - CWG
River	SS651	166	S		PYR	Urban background, typical	Very weathered. Urban bkgrd	CWG signal	CWG signal		YES - CWG
River	SS652	130	S		PYR	Urban background, typical	Very weathered. Urban bkgrd	CWG signal	CWG signal		YES - CWG
River	SS653	99	S		PYR	Urban background, typical	Very weathered. Urban bkgrd	CWG signal	CWG signal		YES - CWG
River	SS654	55	S		PYR	Urban background, typical	Very weathered. Urban bkgrd	CWG signal	CWG signal		YES - CWG
River	SS655	228	S		PYR	Urban background, typical	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
River	SS656	13	S		FLA	Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Urban backgorund, not CWG		NO - URBAN BACKGROUND
River	SS657	7.7	S		FLA	Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Urban backgorund, not CWG		NO - URBAN BACKGROUND
River	SS658	1170	S		PYR	Urban background, typical	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
River	659	102	S		PYR	Urban background, typical	Very weathered. Urban bkgrd	CWG signal	CWG signal		YES - CWG
River	SS662	24	S		PYR	Urban background, typical	Very weathered. Urban bkgrd	CWG signal	Possible CWG signal		YES - CWG
River	SS663	17	S		FLA	Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Not consistent with CWG		NO - URBAN BACKGROUND
River	SS673-S2	139	SUB		PYR	Urban background, typical	Very weathered. Urban bkgrd	Possible CWG signal	Possible CWG signal	NMDS: Withing bkgrd zone	NO - URBAN BACKGROUND/OTHER
River	SS673-S3	8.6	SUB			Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Not consistent with CWG		NO - URBAN BACKGROUND
River	SS674-S4	189	SUB			Urban background range	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
River	SS676-S2	26	SUB			Urban background range	Very weathered. Urban bkgrd	Not consistent with CWG	Possible CWG signal		CWG UNCERTAIN OR CANNOT BE EXCLUDED
River	SS677-S2	283	S			Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Not consistent with CWG		NO - URBAN BACKGROUND
River	SS677-S3	17	NS			Likely Weathered MGP TLM	Moderately weathered	Possible CWG signal	Possible CWG signal	NMDS: Within CWG zone	YES - CWG
River	SS677-S4A	105	SUB			Likely Weathered MGP TLM	Moderately weathered	Possible CWG signal	Not consistent with CWG	NMDS: In bkgrd zone	NO - URBAN BACKGROUND
River	SS677-S5A	364	SUB			Near urban background, may include weathered MGP TLM	Very weathered. Urban bkgrd	CWG signal	CWG signal		YES - CWG
River	SS678-S1	127	S			Urban background, typical	Very weathered. Urban bkgrd	CWG signal	CWG signal		YES - CWG
River	SS-678-S4	2640	SUB			Likely Weathered MGP TLM	Very weathered	CWG signal	CWG signal		YES - CWG
River	SS-679-S1	22	S			Urban background range	Very weathered. Urban bkgrd	Not consistent with CWG	Possible CWG signal	NMDS: In bkgrd zone	NO - URBAN BACKGROUND
River	SS-679-S4	408	SUB			Likely Weathered MGP TLM	Moderately weathered	CWG signal	CWG signal		YES - CWG
River	SS-679-S5	32	SUB			Urban background range	Very weathered. Urban bkgrd	Urban backgorund, not CWG	Not consistent with CWG	NMDS - in outlier area	NO - URBAN BACKGROUND
River	SS680R-S1	1.7	SUB			Near urban background, may include weathered MGP TLM	Very weathered. Urban bkgrd	CWG signal	CWG signal		YES - CWG
River	SS-680-S1	13	S			Urban background, typical	Very weathered. Urban bkgrd	Not consistent with CWG	Not consistent with CWG		NO - URBAN BACKGROUND
River	SS-680-S4	131	SUB			Near urban background, may include weathered MGP TLM	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
River	SS-680-S5	10500	SUB			MGP TLM (unweathered)	Moderately weathered, TLM	CWG signal	CWG signal		YES - CWG
River	SS-681-S1	69	S			Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Not consistent with CWG		NO - URBAN BACKGROUND
River	SS-681-S3	2670	SUB			Near urban background, may include weathered MGP TLM	Very weathered. Urban bkgrd	CWG signal	CWG signal		YES - CWG
River	SS-681-S4	158	SUB			Likely Weathered MGP TLM	Moderately weathered	CWG signal	CWG signal		YES - CWG
River	SS-682-S2	878	SUB			Near urban background, may include weathered MGP TLM	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
River	SS-682-S3	21	SUB			Urban background range	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
River	SS-683-S2	245	NS			Urban background range	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal	NMDS: on retene axis, but ambiguous	CWG UNCERTAIN OR CANNOT BE EXCLUDED
River	SS-683-S4	13	SUB			Urban background range	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal	NMDS: on retene axis, but ambiguous	CWG UNCERTAIN OR CANNOT BE EXCLUDED
River	SS-683-S5	40	SUB			Urban background range	Very weathered. Urban bkgrd	CWG signal	CWG signal		YES - CWG
River	SS687-S1	59	S			Urban background, typical	Very weathered. Urban bkgrd	Possible CWG signal	Possible CWG signal	NMDS: in upper bounds zone. Likely background	NO - URBAN BACKGROUND
River	SS687-S2	58	SUB			Urban background, typical	Very weathered. Urban bkgrd	Not consistent with CWG	Urban background, not CWG		NO - URBAN BACKGROUND
River	SS687-S4	6.6	SUB			Urban background range	Very weathered. Urban bkgrd	Not consistent with CWG	Not consistent with CWG		NO - URBAN BACKGROUND
River	SS688-S4	<0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS689-S2	<0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS690-S5	105	SUB			Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Urban background, not CWG		NO - URBAN BACKGROUND
River	SS692-S4	25200	SUB			MGP TLM (unweathered)	Unweathered TLM	CWG signal	CWG signal		YES - CWG
River	SS692-S5	1.9	SUB			MGP TLM (unweathered)	Moderately weathered	CWG signal	CWG signal		YES - CWG
River	SS693-S3	14	SUB			Urban background range	Very weathered. Urban bkgrd	Not consistent with CWG	Not consistent with CWG		NO - URBAN BACKGROUND
River	SS693-S5	<0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS694-S4	19700	SUB			MGP TLM (unweathered)	Moderately weathered	CWG signal	Possible CWG signal		YES - CWG

Table 2. Summary of Forensics Analysis
Amesbury Former MGP
Amesbury, Massachusetts

Subarea	Location	PAH17 (mg/kg)	INT[1]	Extended PAH Profile (EPP) Pattern Pyro/petrogenicity and weathering[3]	Dominant PAH[2,3]	Ratio 1 - LPAH/HPAH v PAH17/Total PAH extended	Ratio 2- RET/BAP v LPAH/HPAH	Ratio 3- FLA/PYR v DBF/FLE	Ratio 4 4- FLA/PYR v BAA/CHR	MVSA (PCA, NMDS)[3]	Weight of evidence: Site related?
River	SS694-S6	0.4	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS695-S6	<0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS696-S3	65	SUB			Urban background range	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
River	SS696-S5	2150	SUB			Likely Weathered MGP TLM	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
River	SS697-S2	493	NS			Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Not consistent with CWG		NO - URBAN BACKGROUND
River	SS698-S4	13	SUB			Urban background range	Very weathered. Urban bkgrd	CWG signal	CWG signal		YES - CWG
River	SS699-S3	3310	SUB			Likely Weathered MGP TLM	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
River	SS700-S2	261	SUB			Urban background range	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
River	SS700-S5	0.2	SUB			Urban background range	Very weathered. Urban bkgrd	Anomalous source	Anomalous, possibly used engine oil-like		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS701-S2	2370	SUB			Likely Weathered MGP TLM	Moderately weathered	CWG signal	CWG signal		YES - CWG
River	SS701-S4	0.8	SUB			Near urban background, may include weathered MGP TLM	Very weathered. Urban bkgrd	CWG signal	CWG signal		YES - CWG
River	SS702-S3	741	SUB			Near urban background, may include weathered MGP TLM	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
River	SS703-S3	2170	SUB			MGP TLM (unweathered)	Moderately weathered	CWG signal	CWG signal		YES - CWG
River	SS705-S1	19	S			Urban background, typical	Very weathered. Urban bkgrd	Not consistent with CWG	Possible CWG signal	NMDS - in anomaly zone, not CWG	NO - OTHER
River	SS705-S2	16600	SUB			MGP TLM (unweathered)	Moderately weathered	CWG signal	Likely CWG signal		YES - CWG
River	SS705-S3	2.5	SUB			Likely Weathered MGP TLM	Moderately weathered	CWG signal	Likely CWG signal		YES - CWG
River	SS706-S1	59	S			Near urban background, may include weathered MGP TLM	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
River	SS706-S2	62100	SUB			MGP TLM (unweathered)	Moderately weathered	CWG signal	CWG signal		YES - CWG
River	SS706-S3	260	SUB			MGP TLM (unweathered)	Unweathered TLM	CWG signal	CWG signal		YES - CWG
River	SS707-S3	0.1	SUB			--	--	--	--		PAHS ABSENT
River	SS708-S1	22	S			Urban background, typical	Very weathered. Urban bkgrd	Not consistent with CWG	Urban background, not CWG		NO - URBAN BACKGROUND
River	SS708-S2	42300	SUB			MGP TLM (unweathered)	Moderately weathered	CWG signal	Likely CWG signal		YES - CWG
River	SS708-S3	2.2	SUB			MGP TLM (unweathered)	Moderately weathered	CWG signal	CWG signal		YES - CWG
River	SS709-S1	26	S			Urban background range	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
River	SS709-S3	<0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS710-S1	2840	SUB			Near urban background, may include weathered MGP TLM	Very weathered. Urban bkgrd	CWG signal	CWG signal		YES - CWG
River	SS710-S2	14	SUB			Urban background range	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
River	SS711-S1	22	S			Urban background, typical	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
River	SS711-S2	0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS712-S1	2940	SUB			Near urban background, may include weathered MGP TLM	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
River	SS712-S2	2	SUB			Urban background range	Very weathered. Urban bkgrd	Not consistent with CWG	Not consistent with CWG		NO - URBAN BACKGROUND
River	SS713-S2	16	SUB			Urban background range	Very weathered. Urban bkgrd	Not consistent with CWG	Not consistent with CWG		NO - URBAN BACKGROUND
River	SS714-S3	2560	SUB			Likely weathered MGP TLM	Moderately weathered	CWG signal	Likely CWG signal		YES - CWG
River	SS714-S4	11	SUB			Urban background range	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
River	SS715-S2	0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS716-S1	292	SUB			Near urban background, may include weathered MGP TLM	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
River	SS716-S2	1.4	SUB			Urban background range	Very weathered. Urban bkgrd	Anomalous source	Anomalous, possibly used engine oil-like	NMDS indicates retene or other	NO - OTHER
River	SS723-S1	208	NS			Urban background, typical	Very weathered. Urban bkgrd	Not consistent with CWG	CWG signal	NMDS - within CWG zone	YES - CWG
River	SS724-S3	0.2	SUB			Urban background range	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS725-S2	<0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS726-S2	49	NS			Urban background range	Very weathered. Urban bkgrd	Not consistent with CWG	Not consistent with CWG		NO - URBAN BACKGROUND
River	SS727-S2	42	NS			Urban background range	Very weathered. Urban bkgrd	Possible CWG signal	Urban background, not CWG		NO - URBAN BACKGROUND
River	SS727-S3	34	SUB			Urban background range	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
River	SS728-S3	657	SUB			Near urban background, may include weathered MGP TLM	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
River	SS729-S3	2450	SUB			Likely Weathered MGP TLM	Very weathered. Urban bkgrd	CWG signal	CWG signal		YES - CWG
River	SS729-S4	0.7	SUB			Urban background, typical	Very weathered. Urban bkgrd	Not consistent with CWG	Not consistent with CWG		NO - URBAN BACKGROUND

Table 2. Summary of Forensics Analysis
Amesbury Former MGP
Amesbury, Massachusetts

Subarea	Location	PAH17 (mg/kg)	INT[1]	Extended PAH Profile (EPP) Pattern Pyro/petrogenicity and weathering[3]	Dominant PAH[2,3]	Ratio 1 - LPAH/HPAH v PAH17/Total PAH extended	Ratio 2- RET/BAP v LPAH/HPAH	Ratio 3- FLA/PYR v DBF/FLE	Ratio 4 4- FLA/PYR v BAA/CHR	MVSA (PCA, NMDS)[3]	Weight of evidence: Site related?
River	SS730-S2	0.2	SUB			Urban background range	Very weathered. Urban bkgrd	Not consistent with CWG	Likely CWG signal		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS730-S3	<0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS731-S2	74	SUB			Likely Weathered MGP TLM	Moderately weathered	CWG signal	Possible CWG signal		YES - CWG
River	SS733-S4	7.1	SUB			Likely Weathered MGP TLM	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
River	SS734-S1	14400	SUB	Pyrogenic, lightly weathered	PHE	MGP TLM (unweathered)	Moderately weathered	CWG signal	CWG signal		YES - CWG
River	SS734-S2	2	SUB			MGP TLM (unweathered)	Unweathered TLM	CWG signal	CWG signal		YES - CWG
River	SS735-S2	135	SUB			Urban background, typical	Very weathered. Urban bkgrd	Not consistent with CWG	Not consistent with CWG		NO - URBAN BACKGROUND
River	SS735-S3	21	SUB			Urban background range	Very weathered. Urban bkgrd	Likely CWG signal	Possible CWG signal		YES - CWG
River	SS735-S4	<0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS736-S2	0.2	SUB			Possibly petroleum source	Moderately weathered	Likely CWG signal	Likely CWG signal		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS737-S1	6090	SUB			MGP TLM (unweathered)	Unweathered TLM	CWG signal	CWG signal		YES - CWG
River	SS738-S1	32	NS	Pyrogenic, very weathered	PYR	Urban background, typical	Very weathered. Urban bkgrd	Not consistent with CWG	Not consistent with CWG		NO - URBAN BACKGROUND
River	SS738-S2	18	SUB	Weak pyrogenic, v. weathered, mixed	PYR	Urban background range	Very weathered. Urban bkgrd	CWG signal	CWG signal		YES - CWG (MIXED)
River	SS739-S1	40	NS	Weathered pyrogenic probably, v.weathered	PYR	Urban background range	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG (MIXED)
River	SS739-S2	41	SUB	Very weathered pyrogenic or mixed petro/pyrogenic	C1FLA	Urban background range	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal	NMDS: Within CWG zone	YES - CWG (MIXED)
River	SS739-S3	21	SUB	Pyrogenic, v. weathered	PYR	Urban background, typical	Very weathered. Urban bkgrd	CWG signal	CWG signal		YES - CWG
River	SS740-S1	11	NS			Likely weathered MGP TLM	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
River	SS740-S2	<0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS741-S1	51	NS			Urban background range	Very weathered. Urban bkgrd	Not consistent with CWG	Not consistent with CWG		NO - URBAN BACKGROUND
River	SS741-S3	<0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS742-S1	<0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS743-S2	<0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS744-S1	<0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS744-S2	<0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS745-S2	<0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS746-S1	423	SUB			Urban background range	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
River	SS746-S3	0.2	SUB			Possibly petroleum source	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS747-S2	0.4	SUB			Urban background range	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS748-S1	221	SUB			Urban background range	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
River	SS748-S3	<0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS749-S1	51	SUB			Urban background range	Very weathered. Urban bkgrd	CWG signal	Possible CWG signal		YES - CWG
River	SS749-S2	<0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS750-S1	20	S			Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Not consistent with CWG		NO - URBAN BACKGROUND
River	SS751-S1	11	SUB			Urban background range	Very weathered. Urban bkgrd	Possible CWG signal	Not consistent with CWG	NMDS: retene signal	NO - COAL FINES DOMINATED
River	SS751-S2	<0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS752-S1	179	SUB			Urban background range	Coal fines present	CWG signal	Likely CWG signal	NMDS retene signal - likely bkgrd	NO - COAL FINES URBAN
River	SS752-S2	6.5	SUB			Urban background range	Very weathered. Urban bkgrd	Possible CWG signal	Possible CWG signal	7/31 In outlier zone - bakcground	NO - URBAN BACKGROUND
River	SS753-S1	34	NS			Urban background range	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
River	SS753-S2	<0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS754-S1	811	SUB			Near urban background, may include weathered MGP TLM	Very weathered. Urban bkgrd	CWG signal	CWG signal		YES - CWG

Table 2. Summary of Forensics Analysis
Amesbury Former MGP
Amesbury, Massachusetts

Subarea	Location	PAH17 (mg/kg)	INT[1]	Extended PAH Profile (EPP) Pattern Pyro/petrogenicity and weathering[3]	Dominant PAH[2,3]	Ratio 1 - LPAH/HPAH v PAH17/Total PAH extended	Ratio 2- RET/BAP v LPAH/HPAH	Ratio 3- FLA/PYR v DBF/FLE	Ratio 4 4- FLA/PYR v BAA/CHR	MVSA (PCA, NMDS)[3]	Weight of evidence: Site related?
River	SS754-S2	2.5	SUB			Urban background range	Very weathered. Urban bkgrd	Possible CWG signal	Likely CWG signal	NMDS: in boundary, cannot exclude	CWG UNCERTAIN OR CANNOT BE EXCLUDED
River	SS755-S1	4.1	NS			Urban background range	Very weathered. Urban bkgrd	Likely CWG signal	Likely CWG signal	NMDS: in boundary, cannot exclude	CWG UNCERTAIN OR CANNOT BE EXCLUDED
River	SS756-S1	14	NS			Urban background range	Very weathered. Urban bkgrd	Likely CWG signal	Likely CWG signal		YES - CWG
River	SS757-S1	40	NS	Weathered pyrogenic	FLA	Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Not consistent with CWG		NO - URBAN BACKGROUND
River	SS758-S1	1.3	S	V. weathered pyrogenic	PYR	Urban background, typical	Very weathered. Urban bkgrd	Possible CWG signal	Not consistent with CWG	NMDS: in boundary, cannot exclude	CWG UNCERTAIN OR CANNOT BE EXCLUDED
River	SS759-S1	12	S			Urban background range	Very weathered. Urban bkgrd	Possible CWG signal	Possible CWG signal	NMDS: in boundary, closer to bkgrd	NO - URBAN BACKGROUND
River	SS760-S2	20	SUB			Urban background range	Very weathered. Urban bkgrd	Likely CWG signal	CWG signal		YES - CWG
River	SS761-S1	24	S			Urban background range	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
River	SS761-S2	2.8	SUB			Urban background range	Very weathered. Urban bkgrd	Likely CWG signal	Likely CWG signal		YES - CWG
River	SS762-S2	<0.1	SUB								PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS762-S3	<0.1	SUB								PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS763-S1	359	SUB			Urban background, typical	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
River	SS763-S2	<0.1	SUB								PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS764-S2	<0.1	SUB								PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS765-S2	<0.1	SUB								PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS766-S1	4.8	S			Urban background range	Very weathered. Urban bkgrd	CWG signal	Possible CWG signal	NMDS - in CWG zone	YES - CWG
River	SS766-S2	146	SUB			Likely weathered MGP TLM	Moderately weathered	CWG signal	Possible CWG signal		YES - CWG
River	SS766-S3	4.1	SUB			Likely weathered MGP TLM	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
River	SS767-S1	161	SUB			Near urban background, may include weathered MGP TLM	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
River	SS767-S2	17	SUB			Urban background range	Very weathered. Urban bkgrd	Likely CWG signal	CWG signal		YES - CWG
River	SS768-S2	<0.1	SUB								PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS769-S1	5750	SUB			Urban background range	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
River	SS770-S2	<0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS770-S2	<0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS772-S1	91	S	Weak pyrogenic, light ends remain, retene signal	PYR	Urban background range	Very weathered. Urban bkgrd	CWG signal	CWG signal	NMDS: noted somewhat on retene axis	CWG UNCERTAIN OR CANNOT BE EXCLUDED
River	SS774-S2	10	SUB			Urban background range	Very weathered. Urban bkgrd	Likely CWG signal	Possible CWG signal	NMDS - in CWG zone	YES - CWG
River	SS774-S3	739	SUB			Urban background range	Very weathered. Urban bkgrd	CWG signal	CWG signal		YES - CWG
River	SS775-S2	109	SUB			Urban background, typical	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
River	SS775-S3	45	SUB			Urban background range	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
River	SS776-S1	6.3	S			Urban background range	Very weathered. Urban bkgrd	Likely CWG signal	Not consistent with CWG	NMDS 7/31 - in outlier area	NO - OTHER
River	SS776-S3	<0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS777-S2	294	SUB			Urban background range	Very weathered. Urban bkgrd	CWG signal	CWG signal		YES - CWG
River	SS777-S3	0.2	SUB			Urban background, typical	Very weathered. Urban bkgrd	CWG signal	Possible CWG signal		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS778-S2	1840	SUB	Moderately weathered pyrogenic likely.	PHE	Likely weathered MGP TLM	Very weathered. Urban bkgrd	CWG signal	CWG signal		YES - CWG
River	SS778-S3	<0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS779-S1	<0.1	NS			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS779-S2	<0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS780-S1	130	NS			Urban background range	Very weathered. Urban bkgrd	Not consistent with CWG	Not consistent with CWG		NO - URBAN BACKGROUND

Table 2. Summary of Forensics Analysis
Amesbury Former MGP
Amesbury, Massachusetts

Subarea	Location	PAH17 (mg/kg)	INT[1]	Extended PAH Profile (EPP) Pattern Pyro/petrogenicity and weathering[3]	Dominant PAH[2,3]	Ratio 1 - LPAH/HPAH v PAH17/Total PAH extended	Ratio 2- RET/BAP v LPAH/HPAH	Ratio 3- FLA/PYR v DBF/FLE	Ratio 4 4- FLA/PYR v BAA/CHR	MVSA (PCA, NMDS)[3]	Weight of evidence: Site related?
River	SS780-S2	<0.1	SUB								PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS781(R1)-S1	8.7	SUB			Urban background range	Very weathered. Urban bkgrd	Likely CWG signal	Likely CWG signal	NMDS - boundary zone	CWG UNCERTAIN OR CANNOT BE EXCLUDED
River	SS781-S1	8.0	SUB			Possibly weathered petroleum source	Very weathered. Urban bkgrd	CWG signal	Possibly engine oil. Not consistent with CWG	NMDS - in bkgrd zone	NO - OTHER
River	SS782-S2	0.6	SUB			Urban background range	Coal fines present	Urban background, not CWG	Urban background, not CWG	NMDS - prominent on retene axis	NO - COAL FINES DOMINATED
River	SS783-S1	4.1	S			Urban background range	Very weathered. Urban bkgrd	Not consistent with CWG	Not consistent with CWG		NO - URBAN BACKGROUND
River	SS783-S2	<0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS784-S1	7.0	S			Urban background range	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
River	SS784-S2	<0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS785-S1	<0.1	NS			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS785-S2	0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS786-S2	<0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS790-S1	59	NS	Weathered pyrogenic/mixed, some light ends remain	FLA	Urban background range	Very weathered. Urban bkgrd	Not consistent with CWG	Urban background, not CWG		NO - URBAN BACKGROUND
River	SS790-S2	<0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS791-S1	0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS792-S1	0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS798-S2	4.0	NS	Weak pyrogenic, extermely weathered	PYR	Urban background range	Very weathered. Urban bkgrd	Possible CWG signal	Likely CWG signal	NMDS - in bkgrd zone	NO - OTHER
River	SS799-S2	0.1	NS			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS800-S1	0.1	NS			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	SS800-S2	28	SUB			Urban background range	Very weathered. Urban bkgrd	Likely CWG signal	Possible CWG signal	NMDS - om outlier boundary	CWG UNCERTAIN OR CANNOT BE EXCLUDED
River	SS801-S2	<0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	815-S1	16	S			Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Not consistent with CWG		NO - URBAN BACKGROUND
River	815-S3	10	SUB			Urban background range	Very weathered. Urban bkgrd	Not consistent with CWG	Not consistent with CWG		NO - URBAN BACKGROUND
River	817-S1	176	S			Near urban background, may include weathered MGP TLM	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
River	818-S1	4.8	S			Urban background range	Very weathered. Urban bkgrd	Not consistent with CWG	Not consistent with CWG		NO - OTHER
River	818-S2	<0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	819-S1	10	S			Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Urban background, not CWG		NO - URBAN BACKGROUND
River	820-S1	24	S			Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Urban background, not CWG		NO - URBAN BACKGROUND
River	823-S1	34	S			Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Not consistent with CWG		NO - URBAN BACKGROUND
River	823-S2	1820	SUB			Near urban background, may include weathered MGP TLM	Very weathered. Urban bkgrd	CWG signal	CWG signal		YES - CWG
River	824-S1	23	S			Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Urban background, not CWG		NO - URBAN BACKGROUND
River	827-S1	<0.1	S			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	827-S2	<0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	829-S1	21	S			Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Urban background, not CWG		NO - URBAN BACKGROUND
River	843-S1	96	S			Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Urban background, not CWG		NO - URBAN BACKGROUND
River	843-S2	95	NS			Urban background range	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
River	844-S1	30	S			Urban background, typical	Very weathered. Urban bkgrd	Possible CWG signal	Possible CWG signal	NMDS: Within CWG zone	YES - CWG
River	844-S2	30	NS			Urban background range	Very weathered. Urban bkgrd	Possible CWG signal	Possible CWG signal	NMDS: More in background zone	NO - URBAN BACKGROUND
River	844-S3	206	SUB			Urban background, typical	Very weathered. Urban bkgrd	CWG signal	Likely CWG signal		YES - CWG
River	845-S1	3.9	S			Urban background range	Very weathered. Urban bkgrd	Not consistent with CWG	Not consistent with CWG	NMDS: in non MGP outlier area	NO - URBAN BACKGROUND

Table 2. Summary of Forensics Analysis
Amesbury Former MGP
Amesbury, Massachusetts

Subarea	Location	PAH17 (mg/kg)	INT[1]	Extended PAH Profile (EPP) Pattern Pyro/petrogenicity and weathering[3]	Dominant PAH[2,3]	Ratio 1 - LPAH/HPAH v PAH17/Total PAH extended	Ratio 2- RET/BAP v LPAH/HPAH	Ratio 3- FLA/PYR v DBF/FLE	Ratio 4 4- FLA/PYR v BAA/CHR	MVSA (PCA, NMDS)[3]	Weight of evidence: Site related?
River	845-S2	<0.1	NS			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	846-S1	20	S			Urban background, typical	Very weathered. Urban bkgrd	Likely CWG signal	Likely CWG signal		YES - CWG
River	846-S2	14	NS			Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Urban background, not CWG		NO - URBAN BACKGROUND
River	846-S3	47	SUB			Urban background range	Very weathered. Urban bkgrd	Possible CWG signal	Possible CWG signal	NMDS. More in CWG zone	YES - CWG
River	847-S1	15	S			Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Urban background, not CWG		NO - URBAN BACKGROUND
River	847-S2	14	NS			Urban background, typical	Very weathered. Urban bkgrd	Likely CWG signal	Urban background, not CWG	NMDS: in boundary, cannot exclude	CWG UNCERTAIN OR CANNOT BE EXCLUDED
River	848-S1	6.8	S			Urban background range	Very weathered. Urban bkgrd	Possible CWG signal	Urban background, not CWG	NMDS. More in CWG zone	YES - CWG
River	848-S2	7.3	NS			Urban background range	Very weathered. Urban bkgrd	Likely CWG signal	Likely CWG signal		YES - CWG
River	851-S1	14	S			Likely weathered MGP TLM	Very weathered. Urban bkgrd	Urban background, not CWG	Not consistent with CWG		NO - URBAN BACKGROUND
River	851-S2	3620	SUB			Likely weathered MGP TLM	Moderately weathered	CWG signal	CWG signal		YES - CWG
River	852-S1	341	S			Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Not consistent with CWG		NO - URBAN BACKGROUND
River	852-S2	155	SUB			Urban background, typical	Very weathered. Urban bkgrd	Likely CWG signal	Possible CWG signal	NMDS-PCE: CWG	YES - CWG
River	853-S1	3.6	S	Very weathered pyrogenic. Strong retene signal	PYR	Urban background range	Very weathered. Urban bkgrd	Not consistent with CWG	Urban background, not CWG		NO - URBAN BACKGROUND
River	853-S2	5.4	NS	Weathered, but possible petrogenic light end mixture present	PYR	Urban background range	Very weathered. Urban bkgrd	CWG signal	Possible CWG signal	NMDS: Within CWG zone	YES - CWG BUT MIXED
River	853-S3	<0.1	SUB			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	854-S1	31	S			Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Urban background, not CWG		NO - URBAN BACKGROUND
River	854-S2	13	NS			Urban background range	Very weathered. Urban bkgrd	Possible CWG signal	Urban background, not CWG	NMDS: in overlap zone, not CWG	NO - URBAN BACKGROUND
River	858-S1	21	S	Pyrogenic, few light ends, v. weathered	FLA	Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Urban background, not CWG		NO - URBAN BACKGROUND
River	858-S2	52	NS	Pyrogenic, few light ends, v. weathered	FLA	Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Urban background, not CWG		NO - URBAN BACKGROUND
River	858-S3	34	SUB	Pyrogenic, few light ends, v. weathered	FLA	Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Urban background, not CWG		NO - URBAN BACKGROUND
River	858-S4	145	SUB	Pyrogenic, few light ends, v. weathered	FLA	Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Urban background, not CWG		NO - URBAN BACKGROUND
River	860-S1	93	S	Weathered pyrogenic	FLA	Urban background range	Very weathered. Urban bkgrd	Not consistent with CWG	Not consistent with CWG		NO - URBAN BACKGROUND
River	860-S2	37	NS	Moderately weathered pyrogenic	PHE	Urban background range	Very weathered. Urban bkgrd	Urban background, not CWG	Not consistent with CWG		NO - URBAN BACKGROUND
River	861-S1	70	S			Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Not consistent with CWG		NO - URBAN BACKGROUND
River	862-S1	62	NS			Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Urban background, not CWG		NO - URBAN BACKGROUND
River	869-S1	26	S			Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Urban background, not CWG		NO - URBAN BACKGROUND
River	871-S1	24	S	V. weathered pyrogenic	FLA	Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Urban background, not CWG	PCA: confirms in background/other	NO - URBAN BACKGROUND
River	871-S2	21	NS	V. weathered pyrogenic	PYR	Urban background range	Very weathered. Urban bkgrd	Possible CWG signal	Possible CWG signal	PCA: within bkgrd zone	NO - URBAN BACKGROUND
River	872-S1	162	S	Weathered pyrogenic	FLA	Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Urban background, not CWG	PCA: confirms in background/other	NO - URBAN BACKGROUND
River	872-S2	227	NS	Enriched in light ends	PHE	Likely weathered MGP TLM	Weathered, close to urban background	CWG signal	Likely CWG signal		YES - CWG
River	873-S1	6.7	S	V. weathered pyrogenic	PYR	Urban background range	Very weathered. Urban bkgrd	Possible CWG signal	Likely CWG signal	PCA: Within CWG zone	YES - CWG
River	873-S2	0.3	NS								PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	874-S1	0.9	S	V. weathered pyrogenic	FLA	Urban background range	Very weathered. Urban bkgrd	Urban background, not CWG	Urban background, not CWG	PCA: confirms in background/other	NO - URBAN BACKGROUND
River	874-S2	5.0	NS	V. weathered pyrogenic	FLA	Urban background range	Very weathered. Urban bkgrd	Urban background, not CWG	Urban background, not CWG	PCA: confirms in background/other	NO - URBAN BACKGROUND
River	875-S1	1.1	S	Only residual heavy ends	PER	Urban background range	Very weathered. Urban bkgrd	Anomalous source	Urban background, not CWG	PCA: not in CWG zone, other	NO - OTHER
River	875-S2	5.6	NS	Weathered pyrogenic, may have petro mix	PYR	Urban background range	Very weathered. Urban bkgrd	Possible CWG signal	Possible CWG signal	NMDS:in boundary zone, cannot exclude	CWG UNCERTAIN OR CANNOT BE EXCLUDED
River	876-S1	13	S	V. weathered pyrogenic	PYR	Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Urban background, not CWG	PCA: confirms in background/other	NO - URBAN BACKGROUND
River	876-S2	11	NS	Weathered pyrogenic, unusually high in light ends. Mix?	PYR	Urban background range	Very weathered. Urban bkgrd	Possible CWG signal	Possible CWG signal	NMDS:in boundary zone, cannot exclude	CWG UNCERTAIN OR CANNOT BE EXCLUDED
River	877-S1	24	S	V. weathered, anomalous, may be petroleum	C1PY	Urban background range	Very weathered. Urban bkgrd	Urban background, not CWG	Not consistent with CWG	PCA: in boundary zone. CWG cannot be excluded.	NO - OTHER

Table 2. Summary of Forensics Analysis
Amesbury Former MGP
Amesbury, Massachusetts

Subarea	Location	PAH17 (mg/kg)	INT[1]	Extended PAH Profile (EPP) Pattern Pyro/petrogenicity and weathering[3]	Dominant PAH[2,3]	Ratio 1 - LPAH/HPAH v PAH17/Total PAH extended	Ratio 2- RET/BAP v LPAH/HPAH	Ratio 3- FLA/PYR v DBF/FLE	Ratio 4 4- FLA/PYR v BAA/CHR	MVSA (PCA, NMDS)[3]	Weight of evidence: Site related?
River	877-S2	10	NS	V. weathered, pyrogenic. May have petro component.	PYR	Urban background range	Very weathered. Urban bkgrd	Anomalous source	Not consistent with CWG	PCA: in boundary zone. CWG cannot be excluded.	NO - OTHER
River	878-S1	7.6	S	V. weathered, pyrogenic. May have petro component.	PYR	Urban background range	Very weathered. Urban bkgrd	Possible CWG signal	Possible CWG signal	PCA: more consistent with CWG zone	YES - CWG
River	878-S2	25	NS	Very high retene dominance, some pyrogenic base	RET	Urban background range	Very weathered. Urban bkgrd	Anomalous source	Not consistent with CWG		NO - COAL FINES DOMINANCE
River	879-S1	1.2	S	Very high retene dominance, some pyrogenic base, some light ends	RET	Urban background range	Very weathered. Urban bkgrd	Possible CWG signal	Not consistent with CWG	PCA: prominent on retene axis.	NO - COAL FINES DOMINANCE
River	879-S2	0.1	NS								PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	880-S1	5.7	S	Retene dominance, v/weathered pyrogenic	RET	Urban background range	High retene - coal fines dominated	Not consistent with CWG	Urban background, not CWG	PCA: prominent on retene axis.	NO - COAL FINES DOMINANCE
River	880-S2	0.1	NS								PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	881-S1	1.2	S	Retene and perylene dominance, v/weathered pyrogenic	RET	Urban background range	High retene - coal fines dominated	Not consistent with CWG	Urban background, not CWG	PCA: prominent on retene axis.	NO - COAL FINES DOMINANCE
River	881-S2	<0.1	NS								PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
River	882-S1	16	S	V. weathered pyrogenic	PYR	Urban background range	Very weathered. Urban bkgrd	CWG signal	Possible CWG signal	PCA: clearly within CWG zone	YES. CWG
River	882-S2	2.2	NS	Retene and perylene dominance, v/weathered probably pyrogenic	PER	Urban background range	High retene - coal fines dominated	CWG signal	Likely CWG signal	PCA: prominent on retene axis.	NO - COAL FINES DOMINANCE
River - other	849-N	170	SUB	Pyrogenic,moderate weathering	PHE	Lightly weathered TLM	Weathered, close to urban background	CWG signal	Likely CWG signal		YES - CWG
River - other	850-N	1820	SUB	Pyrogenic, light weathering		Lightly weathered TLM	Weathered, close to urban background	CWG signal	CWG signal		YES - CWG
River - other	851-N	77000	SUB			Lightly weathered TLM	Moderately weathered	CWG signal	CWG signal		YES - CWG
River - other	852-N	24000	SUB	Pyrogenic, light weathering	PHE	Lightly weathered TLM	Moderately weathered	CWG signal	Unusual. Not consistent with CWG	NMDS; within CWG zone	YES - CWG
River - other	855-N	1170	SUB			Lightly weathered TLM	Weathered, close to urban background	CWG signal	Likely CWG signal		YES - CWG
River - other	856-N	6010	SUB			Lightly weathered TLM	Weathered, close to urban background	CWG signal	CWG signal		YES - CWG
Upstream	SS645	2.3	S	Weak pyrogenic pattern, very weathered, retene signal	PYR	Urban background range	Very weathered. Urban bkgrd	Possible CWG signal	Possible CWG signal	NMDS: retene signal, present. boundary zone.	NO - COAL FINES DOMINANCE
Upstream	SS771-S1	5.0	S	Pyrogenic, very weathered	FLA	Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Not consistent with CWG		NO - URBAN BACKGROUND
Upstream	SS787-S1	560	S	Very weathered, pyrogenic	FLA	Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Not consistent with CWG		NO - URBAN BACKGROUND
Upstream	SS787-S2	6.3	SUB	Very weathered, pyrogenic	PYR	Urban background range	Very weathered. Urban bkgrd	Likely CWG signal	Possible CWG signal	NMDS: in boundary, cannot exclude	CWG UNCERTAIN OR CANNOT BE EXCLUDED
Upstream	SS788-S1	30	S	Mixed/weathered pyrogenic, lots of light methylnapthalenes	PYR	Urban background range	Very weathered. Urban bkgrd	Likely CWG signal	Possible CWG signal		NO - OTHER
Upstream	SS789-S1	9.5	S	Weathered pyrogenic	FLA	Urban background range	Very weathered. Urban bkgrd	Not consistent with CWG	Urban background, not CWG		NO - URBAN BACKGROUND
Upstream	857-S1	25	S	Pyrogenic, few light ends, v. weathered	FLA	Urban background, typical	Very weathered. Urban bkgrd	Not consistent with CWG	Urban background, not CWG		NO - URBAN BACKGROUND
Upstream	857-S2	27	NS	Pyrogenic, few light ends, v. weathered	FLA	Urban background range	Very weathered. Urban bkgrd	Urban background, not CWG	Possible CWG signal		NO - URBAN BACKGROUND
Upstream	857-S3	165	SUB	Pyrogenic, some light ends, weathered	FLA	Urban background range	Very weathered. Urban bkgrd	Urban background, not CWG	Urban background, not CWG		NO - URBAN BACKGROUND
Upstream	857-S4	131	SUB	Pyrogenic, few light ends, v. weathered	FLA	Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Urban background, not CWG		NO - URBAN BACKGROUND
Upstream	859-S1	260	S	Very weathered, mixed petro and pyrogenic	PYR	Urban background range	Very weathered. Urban bkgrd	Possible CWG signal	Not consistent with CWG		NO - OTHER
Upstream	859-S2	2.9	NS	V. high in retene, no clear weathering, mixed pattern	RET	Urban background range	Coal fines dominated	CWG signal	Not consistent with CWG		NO - OTHER
Upstream	888-S1	5.0	S	V. weathered pyrogenic	FLA	Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Urban background, not CWG	PCA: confirms in background/other	NO - URBAN BACKGROUND
Upstream	888-S2	0.3	NS								PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
Upstream	888-S3	<0.1	SUB								PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
Upstream	889-S1	20	S	Moderately weathered pyrogenic	PHE	Likely weathered MGP TLM	Some coal fines, but within urban background	Possible CWG signal	Likely CWG signal	PCA: in boundary zone. CWG cannot be excluded.	CWG UNCERTAIN OR CANNOT BE EXCLUDED

Table 2. Summary of Forensics Analysis
Amesbury Former MGP
Amesbury, Massachusetts

Subarea	Location	PAH17 (mg/kg)	INT[1]	Extended PAH Profile (EPP) Pattern Pyro/petrogenicity and weathering[3]	Dominant PAH[2,3]	Ratio 1 - LPAH/HPAH v PAH17/Total PAH extended	Ratio 2- RET/BAP v LPAH/HPAH	Ratio 3- FLA/PYR v DBF/FLE	Ratio 4 4- FLA/PYR v BAA/CHR	MVSA (PCA, NMDS)[3]	Weight of evidence: Site related?
Upstream	889-S2	<0.1	NS								PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
Upstream	889-S3	<0.1	SUB								PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
Wetland	SS624	125	NS		PHE	Near urban background, may be weathered MGP	Very weathered. Urban bkgrd	CWG signal	CWG signal		YES - CWG
Wetland	SS625	15	S		PYR	Urban background, typical	Very weathered. Urban bkgrd	Likely CWG signal	Possible CWG signal	NMDS: in outlier area, not good fit. More like bkgrd	NO - URBAN BACKGROUND
Wetland	SS626	5.0	S		C1BT	Urban background range	Very weathered. Urban bkgrd	Not consistent with CWG	Possible CWG signal	NMDS: in outlier area, not good fit. More like bkgrd	NO - URBAN BACKGROUND
Wetland	SS627	51	S		FLA	Urban background, typical	Very weathered. Urban bkgrd	NO - URBAN BACKGROUND	Urban background, not CWG		NO - URBAN BACKGROUND
Wetland	SS628	23	S		FLA	Urban background, typical	Very weathered. Urban bkgrd	NO - URBAN BACKGROUND	Urban background, not CWG		NO - URBAN BACKGROUND
Wetland	SS629	7010	S		PHE	Near urban background, may be weathered MGP tar	Moderately weathered	CWG signal	Not consistent with CWG	7/31 NMDS - within CWG	YES-CWG
Wetland	SS630	1.2	S		C1FLA	Urban background range	Coal fines present, urban backgroound	Likely CWG signal	Likely CWG signal	NMDS indicates retene axis prominent.	NO - COAL FINES DOMINANCE
Wetland	SS793-S1	20	S			Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Urban background, not CWG		NO - URBAN BACKGROUND
Wetland	SS793-S2	86	SUB			Urban background, typical	Very weathered. Urban bkgrd	Possible CWG signal	Possible CWG signal	7/31 NMDS - within CWG	YES-CWG
Wetland	SS794-S1	1120	S			Urban background, typical	Very weathered. Urban bkgrd	CWG signal	CWG signal		YES - CWG
Wetland	SS794-S2	283	NS			Urban background, typical	Very weathered. Urban bkgrd	CWG signal	CWG signal		YES - CWG
Wetland	SS795-S2	1190	SUB	Probably weathered pyrogenic. Possible mix with other source: unusually enriched in acenaphthene and napthalenes.	ACE	MGP TLM (unweathered)	Unweathered TLM	CWG signal	Possible CWG signal	7/31 NMDS - within CWG	YES (MAY BE MIXED)
Wetland	SS796-S1	0.1	S			--	--	--	--		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
Wetland	SS807-S1	7.9	S	Extremely degraded, pyrogenic	PYR	Urban background range	Very weathered. Urban bkgrd	Not consistent with CWG	Possible CWG signal	7/31 NMDS - outside of CWG	NO - URBAN BACKGROUND
Wetland	SS807-S2	11	NS			Urban background range	Very weathered. Urban bkgrd	Not consistent with CWG	Urban background, not CWG		NO - URBAN BACKGROUND
Wetland	SS808-S1	32	S			Urban background range	Very weathered. Urban bkgrd	Not consistent with CWG	Urban background, not CWG		NO - URBAN BACKGROUND
Wetland	SS808-S2	0.2	NS			Possibly petroleum source	Coal fines present	Urban background, not CWG	Urban background, not CWG		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
Wetland	SS809-S1	26	S			Urban background range	Very weathered. Urban bkgrd	Urban background, not CWG	Urban background, not CWG		NO - URBAN BACKGROUND
Wetland	SS809-S2	6.8	NS			Urban background range	Very weathered. Urban bkgrd	Urban background, not CWG	Not consistent with CWG		NO - URBAN BACKGROUND
Wetland	810-S1	26	S			Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Not consistent with CWG		NO - URBAN BACKGROUND
Wetland	810-S2	6.8	NS			Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Not consistent with CWG		NO - URBAN BACKGROUND
Wetland	811-S1	13	S			Urban background, typical	Very weathered. Urban bkgrd	Urban background, not CWG	Urban background, not CWG		NO - URBAN BACKGROUND
Wetland	811-S2	0.4	NS			Urban background range	Very weathered. Urban bkgrd	CWG signal	Possible CWG signal		PAHS ABSENT OR INSUFFICIENT FOR EVALUATION
Wetland	839-S1	19	S			Urban background range	Very weathered. Urban bkgrd	Urban background, not CWG	Urban background, not CWG		NO - URBAN BACKGROUND
Wetland	839-S2	20	NS			Urban background range	Very weathered. Urban bkgrd	Urban background, not CWG	Urban background, not CWG		NO - URBAN BACKGROUND

General Notes:
1. MVSA= Multi-variate statistical analysis
2. PCA = Principal Component Analysis
3. NMDS = Nonmetric multidimensional scaling
4. LPAH = Low molecular weight parent PAHs
5. HPAH = High molecular weight parent PAHs
6. PAH17 = Standard parent PAHs plus 2-methynaphthalene
7. Total PAH Extended = Sum of Extended PAH Profile list of 51 PAHs
8. RET = Retene
9. BAP = Benzo(a)pyrene
10. DBF = Dibenzofuran
11. FLE = Flourene
12. PYR = Pyrene
13.BAA = benzo(a)anthracene
14. CHR = Chrysene

Footnotes:
[1] INT = Interval evaluated, where S = surface sediment (0-1 ft), NS = Near surface sediment (1-2 ft) excluding "S" samples, SUB = Subsurface sediment (>2 ft). If interval crosses boundary the predominant interval was selected.
[2] Dominant PAH = The PAH with the largest relative contribution to total PAHs, where PHE = phenanthrene, PYR = pyrene, NA = naphthalene, ACE = acenaphtene, RET = retene, C1FLA = C1-fluoranthenes, C1BT = C1 benzothiophenes
[3] PAH patterns and MVSA analysis presented for selected samples only

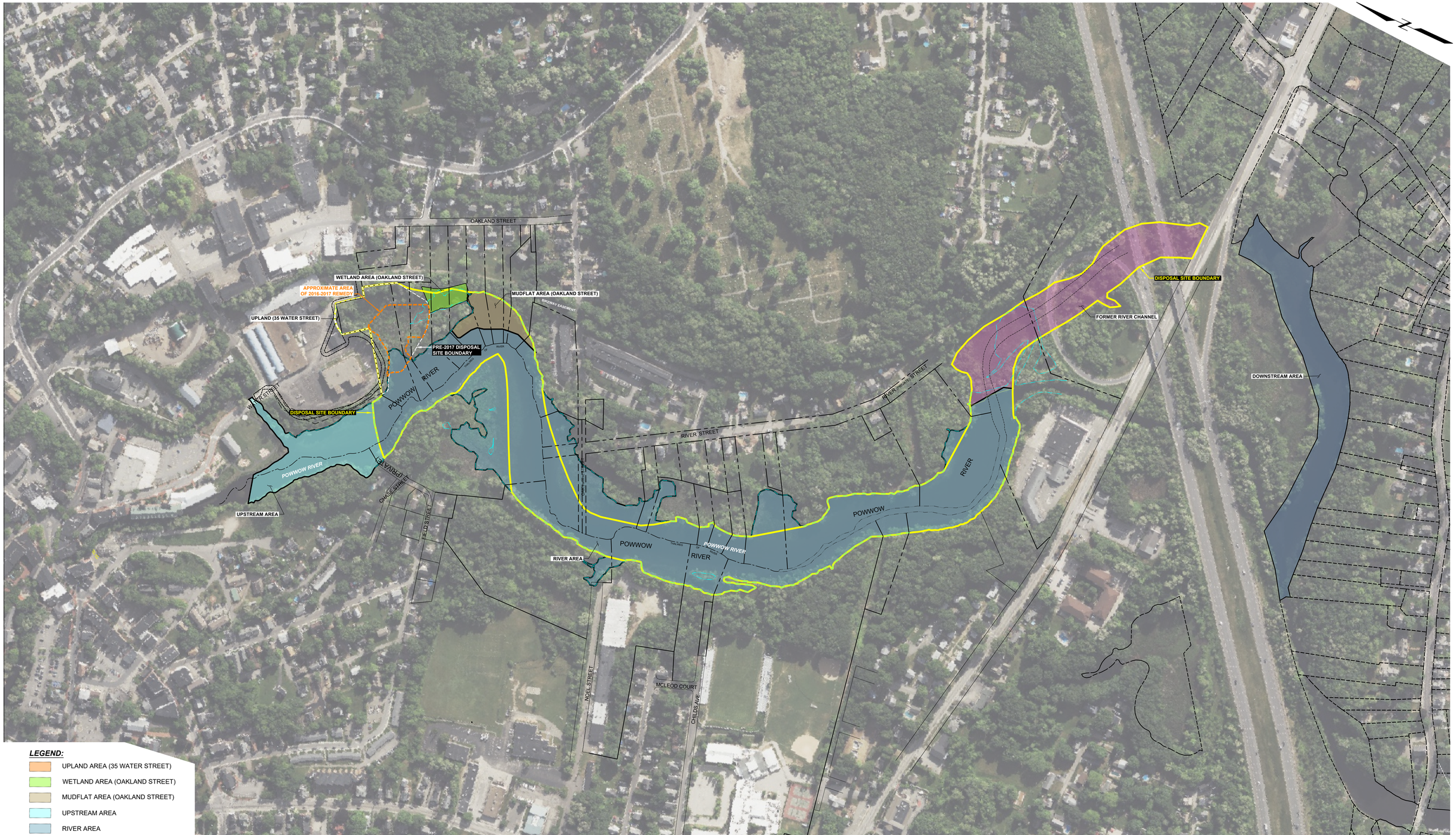
Figures

Figure 1. Site Plan

Figure 2. PAH Forensics Distribution (0 – 1 Foot)

Figure 3. PAH Forensics Distribution (1 – 2 Feet)

Figure 4. PAH Forensics Distribution (>2 Feet)



LEGEND:

- UPLAND AREA (35 WATER STREET)
- WETLAND AREA (OAKLAND STREET)
- MUDFLAT AREA (OAKLAND STREET)
- UPSTREAM AREA
- RIVER AREA
- FORMER RIVER CHANNEL AREA
- DOWNSTREAM AREA

NOTES:

1. MICROSOFT BING IMAGE 2023.
2. PARCEL BOUNDARIES THALWEG OF RIVER, AND MEAN HIGH WATER PROVIDED BY HAYNER/SWANSON, 2025.

0 200 400
Approximate Scale, Feet

Forensics Evaluation
Amesbury Former MGP Site
Amesbury, Massachusetts

Boston Gas Company d|b|a National Grid
Waltham, Massachusetts

GEI Consultants

SITE PLAN

Project 1804576 | October 2025 | Fig. 1

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WETLAND AREA (OAKLAND STREET)

MUDFLAT AREA (OAKLAND STREET)

UPLAND (35 WATER STREET)

DISPOSAL SITE BOUNDARY

DISPOSAL SITE BOUNDARY

FORMER RIVER CHANNEL

DOWNSTREAM AREA

UPSTREAM AREA

RIVER AREA

OAKLAND STREET

RIVER STREET

POWWOW RIVER

THALWEG OF RIVER

CHASE STREET (PRIVATE)

FIELD STREET

NOEL STREET

MCLEOD COURT

CHILDS AVE

ROUTE 110

FINGERPRINTING ANALYSIS LEGEND:

- CONSISTENT WITH AMESBURY MGP SOURCE
- AMESBURY MGP SOURCE CANNOT BE EXCLUDED
- URBAN BACKGROUND AND/ OR INCONSISTENT WITH AMESBURY MGP SOURCE
- DATA ABSENT OR INSUFFICIENT FOR EVALUATION
- WHERE MORE THAN ONE SAMPLE WAS COLLECTED THE OUTERMOST RING INDICATES THE SHALLOWEST SAMPLE, THE INNERMOST RING INDICATES THE DEEPEST SAMPLE

LEGEND:

- UPLAND AREA (35 WATER STREET)
- WETLAND AREA (OAKLAND STREET)
- MUDFLAT AREA (OAKLAND STREET)
- UPSTREAM AREA
- RIVER AREA
- FORMER RIVER CHANNEL AREA
- DOWNSTREAM AREA

EXPLORATIONS LEGEND:

- HAND TEST PIT
- SEDIMENT CORE
- SEDIMENT CORE/ VIBRATING WIRE PIEZOMETER
- SURFACE SEDIMENT SAMPLE

NOTES:

1. FIGURE SHOWS RESULTS FOR ALL SURFACE SEDIMENT SAMPLES (0-1 FOOT) AND SELECT NEAR SURFACE SEDIMENT SAMPLES TREATED AS SURFACE SEDIMENT (SEE REPORT TEXT).
2. WETLAND, MUDFLAT, AND RIVER AREA ARE SUBDIVISIONS INTRODUCED SOLEY FOR PURPOSES OF CLARITY IN PRESENTATION OF RESULTS. THEY MAY NOT ALIGN COMPLETELY WITH NATURAL RESOURCE AREAS.
3. MICROSOFT BING IMAGE 2021.
4. PARCEL BOUNDARIES THALWEG OF RIVER, AND MEAN HIGH WATER PROVIDED BY HAYNER/SWANSON, 2025.
5. HAND TEST PIT, SURFACE SAMPLE, AND SEDIMENT SAMPLE LOCATIONS ARE APPROXIMATE.

0 150 300

Approximate Scale, Feet

Forensics Evaluation
Amesbury Former MGP Site
Amesbury, Massachusetts

Boston Gas Company d|b|a National Grid
Waltham, Massachusetts

GEI Consultants

PAH FORENSICS DISTRIBUTION
(0 to 1 Foot)

Project 1804576 | October 2025 | Fig. 2

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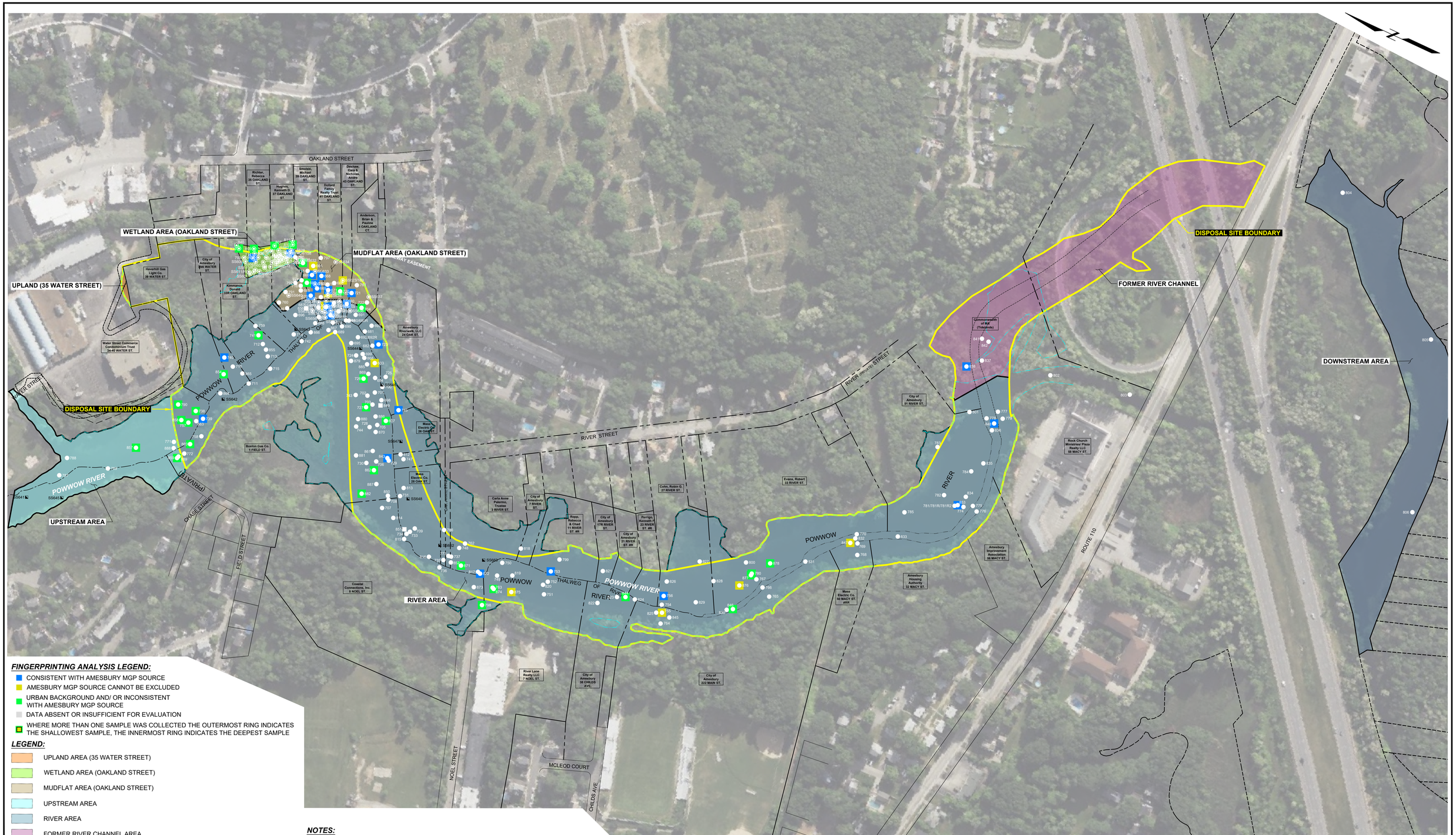
WETLAND AREA (OAKLAND STREET)
MUDFLAT AREA (OAKLAND STREET)
UPLAND (35 WATER STREET)
DISPOSAL SITE BOUNDARY
FORMER RIVER CHANNEL
DOWNSTREAM AREA
UPSTREAM AREA
RIVER AREA
OAKLAND STREET
RIVER STREET
POWWOW RIVER
THALWEG OF RIVER
FIELD STREET
NOEL STREET
MCLEOD COURT
CHILDS AVE
ROUTE 110
Richter, Rebecca 35 OAKLAND ST.
Smolski, Michael 39 OAKLAND ST.
Hughes, Kenneth D. 37 OAKLAND ST.
Dolland Family Realty Trust 41 OAKLAND ST.
Deschere, Cara & Nicholas; Alaire 43 OAKLAND ST.
Anderson, Brian & Pauline 4 OAKLAND CT.
City of Amesbury 35A WATER ST.
Haverhill Gas Light Co. 39 WATER ST.
Kimmance, Donald 33R OAKLAND ST.
Water Street Commerce Condominium Trust 34-46 WATER ST.
Amesbury Riverwalk, LLC 24 OAK ST.
Mass Electric Co. 26 OAK ST.
Boston Gas Co. 1 FIELD ST.
Mass Electric Co. 28 OAK ST.
Carla Anne Palermo, Trustee 3 RIVER ST.
City of Amesbury 7 RIVER ST.
Roop, Rebecca & Chad 11 RIVER ST. #R
City of Amesbury 17R RIVER ST.
Perrigo, Kenneth F 21 RIVER ST. #R
City of Amesbury 21 RIVER ST. #R
Cohn, Robin G. 27 RIVER ST.
Evans, Robert 33 RIVER ST.
Coastal Connections, Inc. 5 NOEL ST.
River Lane Realty LLC 7 NOEL ST.
City of Amesbury 38 CHILDS AVE.
City of Amesbury 222 MAIN ST.
City of Amesbury 61 RIVER ST.
Commonwealth of Mass (Tidelands)
Rock Church Ministries/ Plaza Realty LLC 58 MACY ST.
Amesbury Improvement Association 66 MACY ST.
Amesbury Housing Authority 32 MACY ST.
Mass Electric Co. 60 MACY ST. #RR
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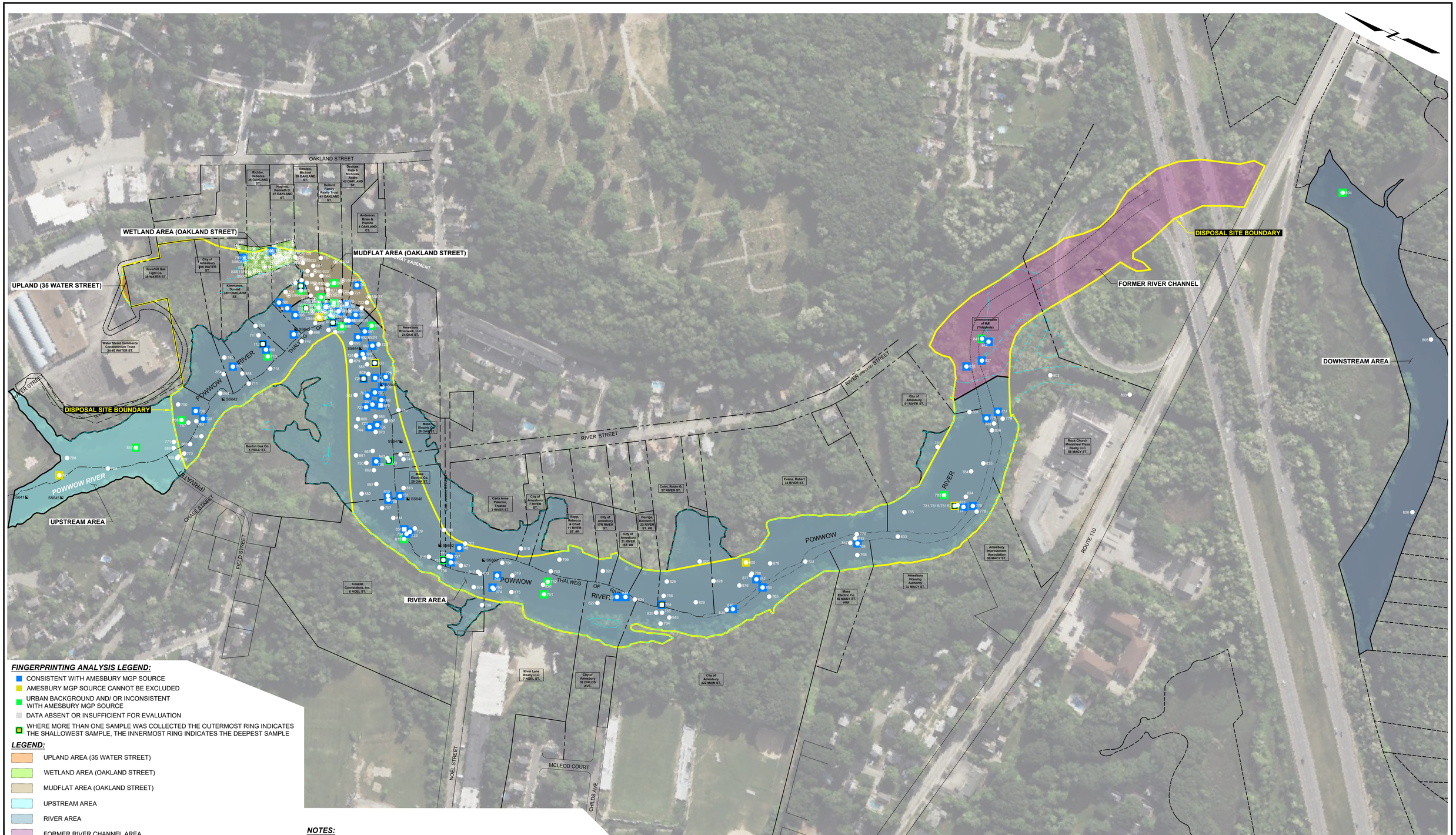
SS679
SS680



FINGERPRINTING ANALYSIS LEGEND:

- CONSISTENT WITH AMESBURY MGP SOURCE
- AMESBURY MGP SOURCE CANNOT BE EXCLUDED
- URBAN BACKGROUND AND/ OR INCONSISTENT WITH AMESBURY MGP SOURCE
- DATA ABSENT OR INSUFFICIENT FOR EVALUATION
- WHERE MORE THAN ONE SAMPLE WAS COLLECTED THE OUTERMOST RING INDICATES THE SHALLOWEST SAMPLE, THE INNERMOST RING INDICATES THE DEEPEST SAMPLE

LEGEND:

- UPLAND AREA (35 WATER STREET)
- WETLAND AREA (OAKLAND STREET)
- MUDFLAT AREA (OAKLAND STREET)
- UPSTREAM AREA
- RIVER AREA
- FORMER RIVER CHANNEL AREA
- DOWNSTREAM AREA

EXPLORATIONS LEGEND:

- HAND TEST PIT
- SEDIMENT CORE
- SEDIMENT CORE/ VIBRATING WIRE PIEZOMETER
- SURFACE SEDIMENT SAMPLE

NOTES:

1. FIGURE SHOWS RESULTS FOR ALL SURFACE SEDIMENT SAMPLES (0-1 FOOT) AND SELECT NEAR SURFACE SEDIMENT SAMPLES TREATED AS SURFACE SEDIMENT (SEE REPORT TEXT).
2. WETLAND, MUDFLAT, AND RIVER AREA ARE SUBDIVISIONS INTRODUCED SOLEY FOR PURPOSES OF CLARITY IN PRESENTATION OF RESULTS. THEY MAY NOT ALIGN COMPLETELY WITH NATURAL RESOURCE AREAS.
3. MICROSOFT BING IMAGE 2021.
4. PARCEL BOUNDARIES THALWEG OF RIVER, AND MEAN HIGH WATER PROVIDED BY HAYNER/SWANSON, 2025.
5. HAND TEST PIT, SURFACE SAMPLE, AND SEDIMENT SAMPLE LOCATIONS ARE APPROXIMATE.

0 150 300
Approximate Scale, Feet

Forensics Evaluation
Amesbury Former MGP Site
Amesbury, Massachusetts

Boston Gas Company d|b|a National Grid
Waltham, Massachusetts

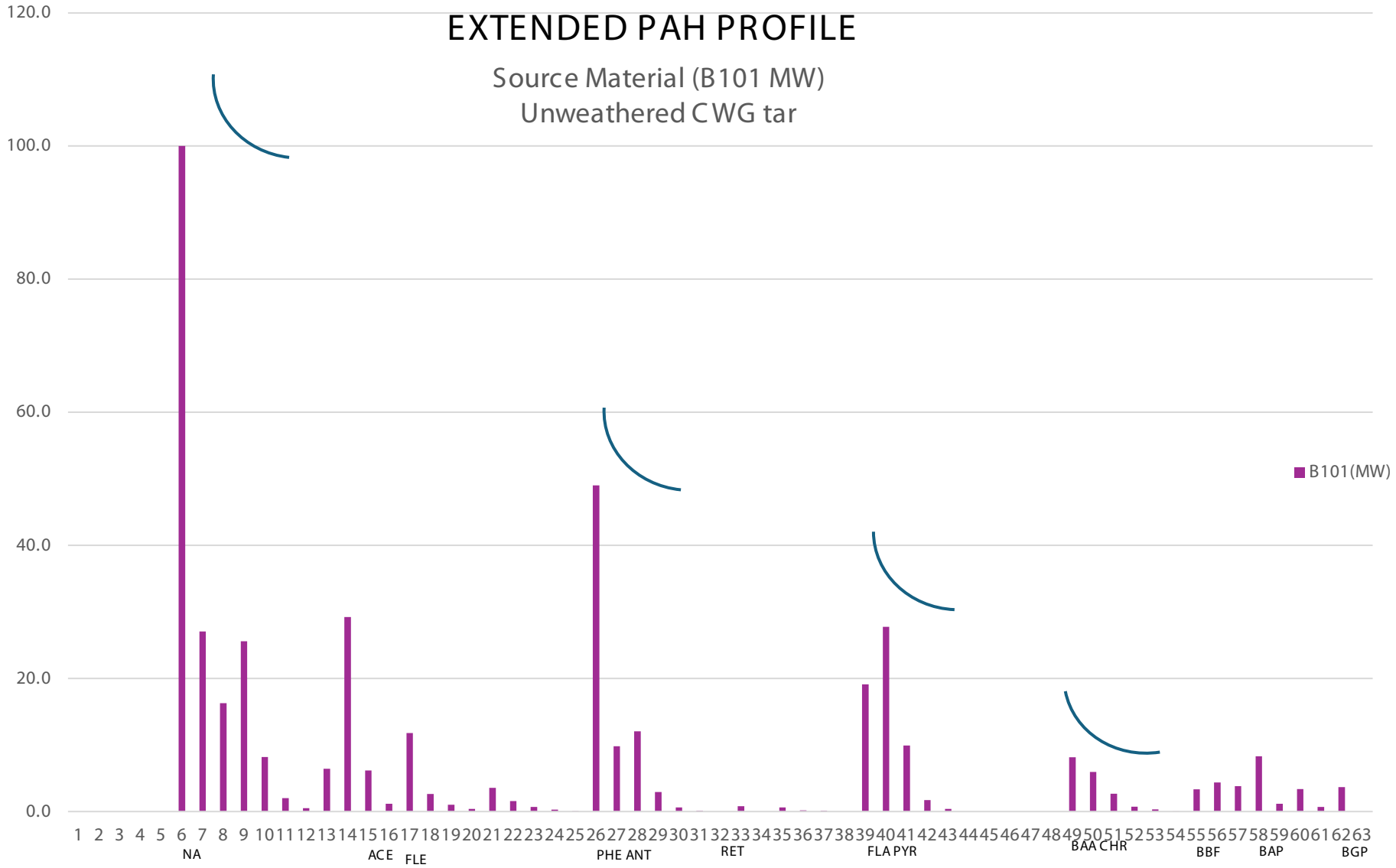
GEI Consultants

PAH FORENSICS DISTRIBUTION (>2 Feet)

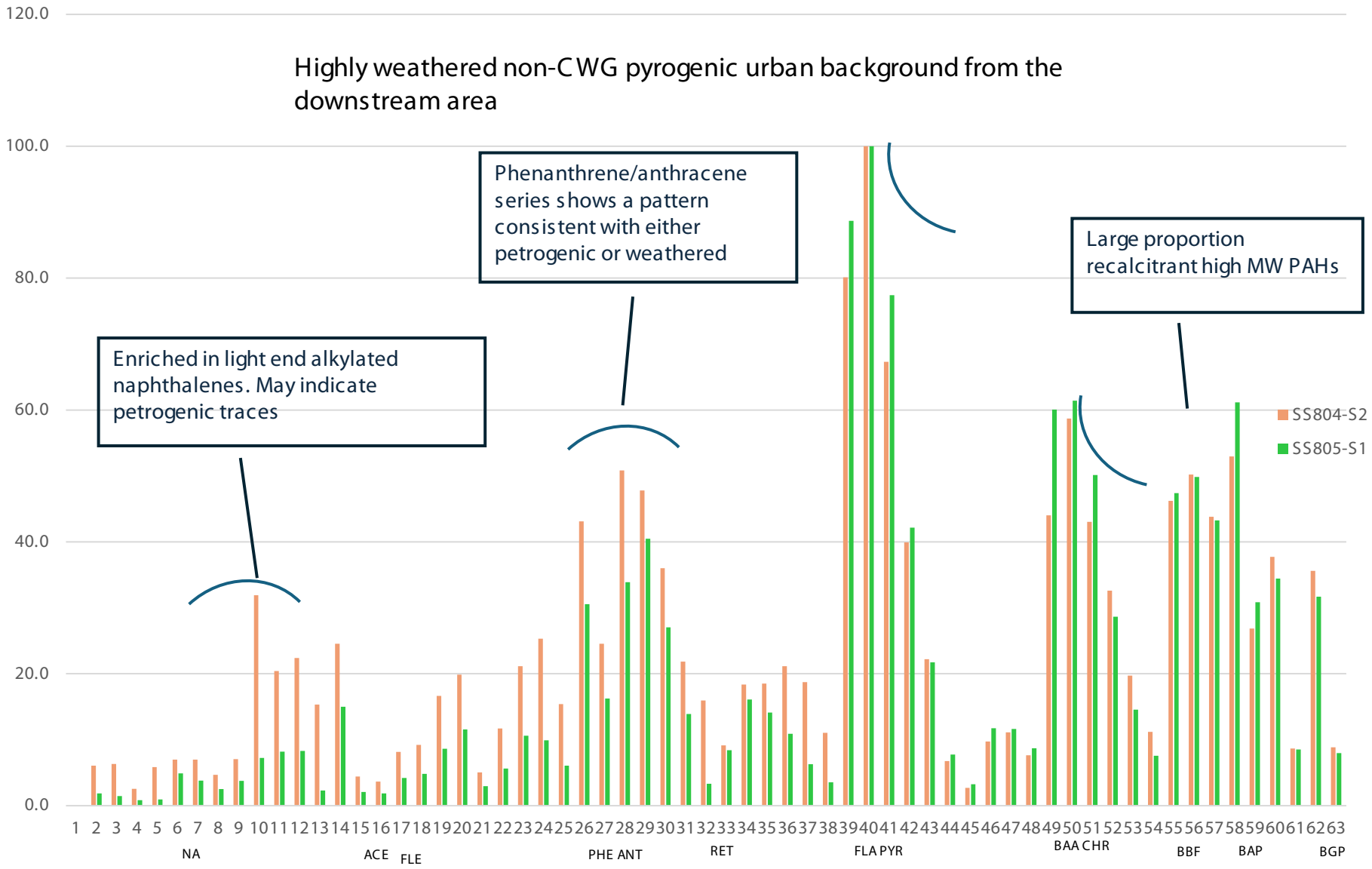
Project 1804576 | October 2025 | Fig. 4

---- B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\Ph II CSA Supplemental\Appendix - FAR\1804576-03.dwg - 7/9/2025

Attachment A Extended PAH Profiles Examples


EXTENDED PAH PROFILE
Source Material (B101 MW)
Unweathered CWG tar
120.0
100.0
80.0
60.0
40.0
20.0
0.0
B101(MW)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63
NA
ACE
FLE
PHE ANT
RET
FLA PYR
BAA CHR
BBF
BAP
BGP

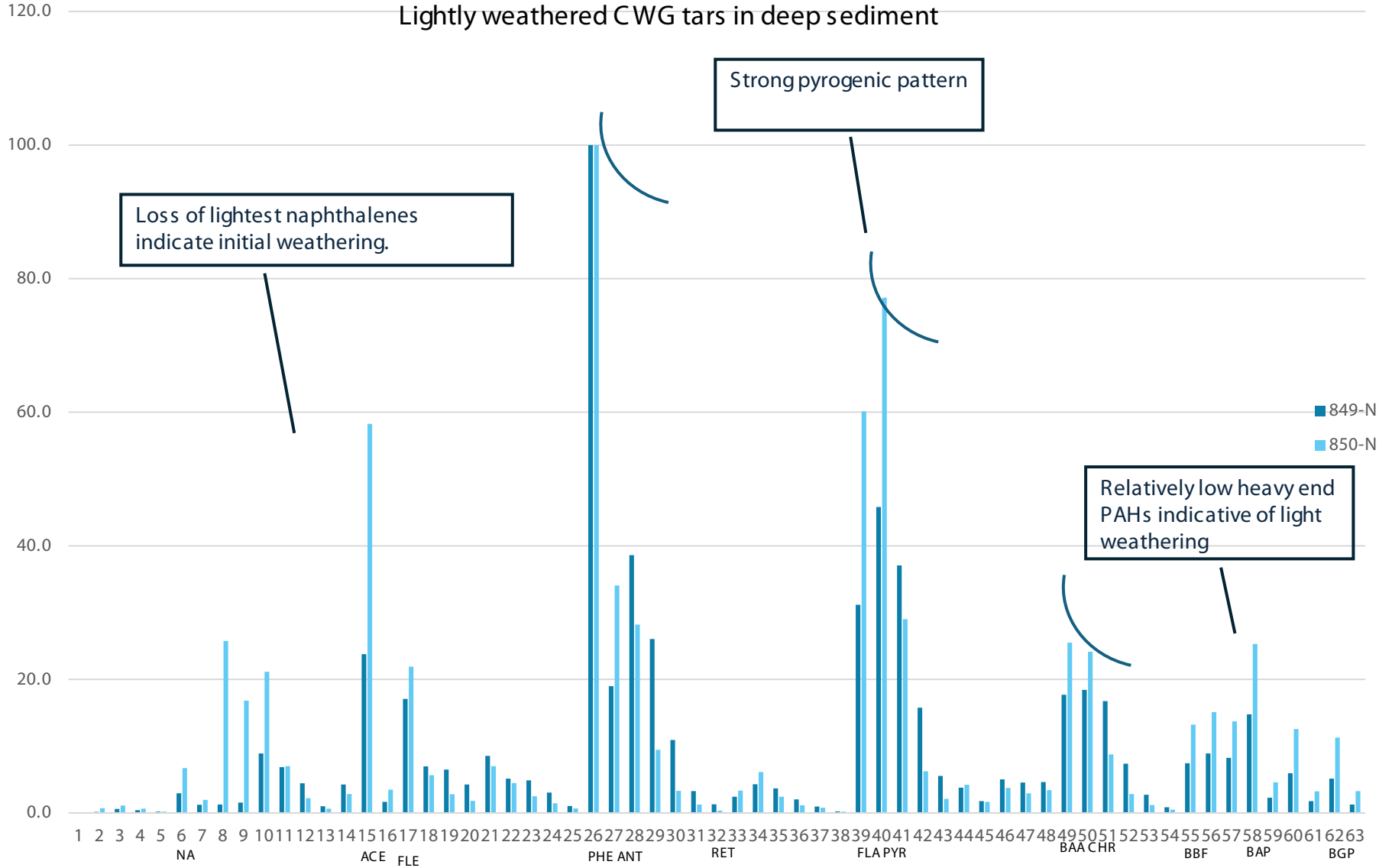
EXTENDED PAH PROFILE



River Subarea

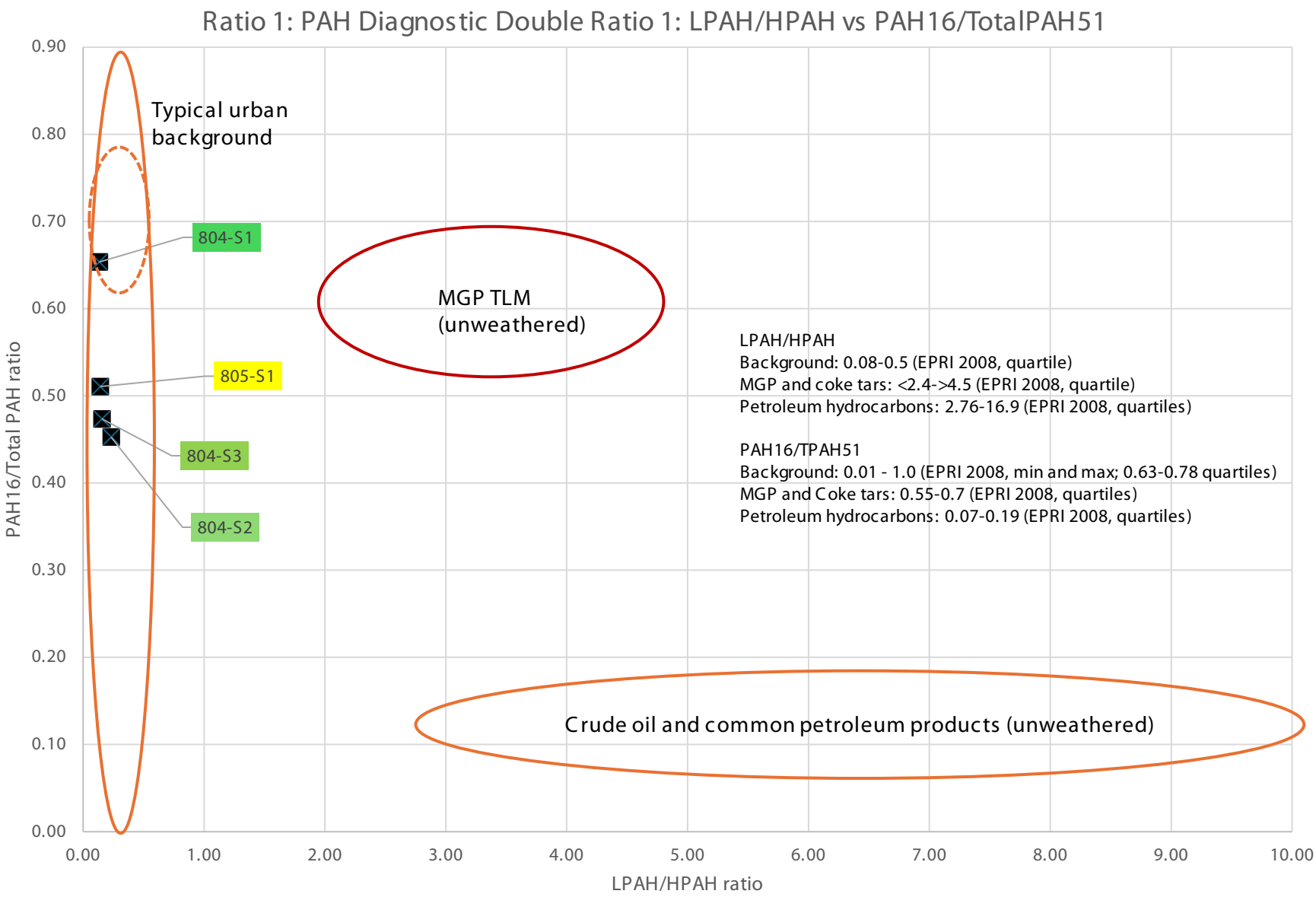
EXTENDED PAH PROFILE

Lightly weathered CWG tars in deep sediment

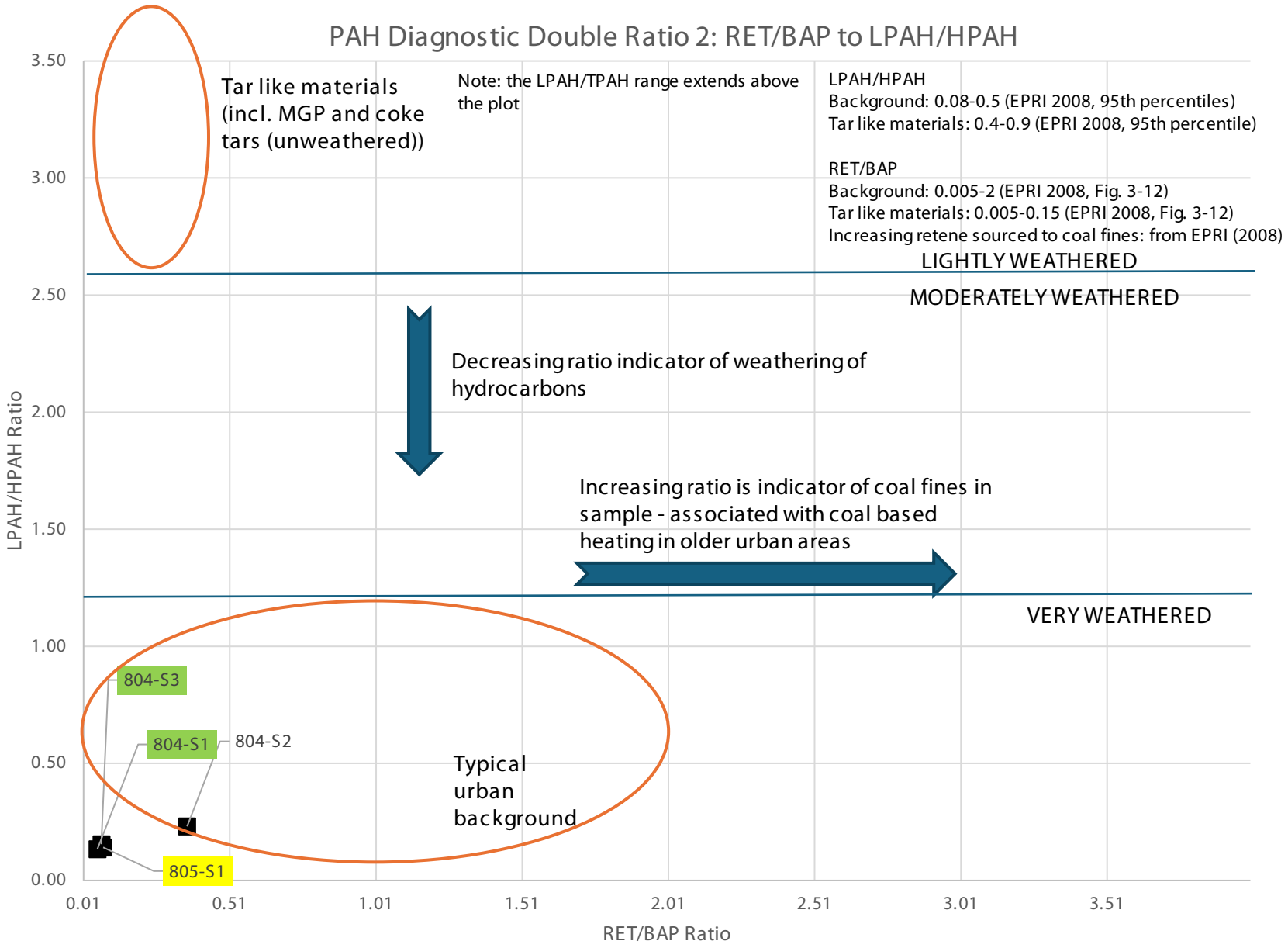


Attachment B Double Ratio Plots

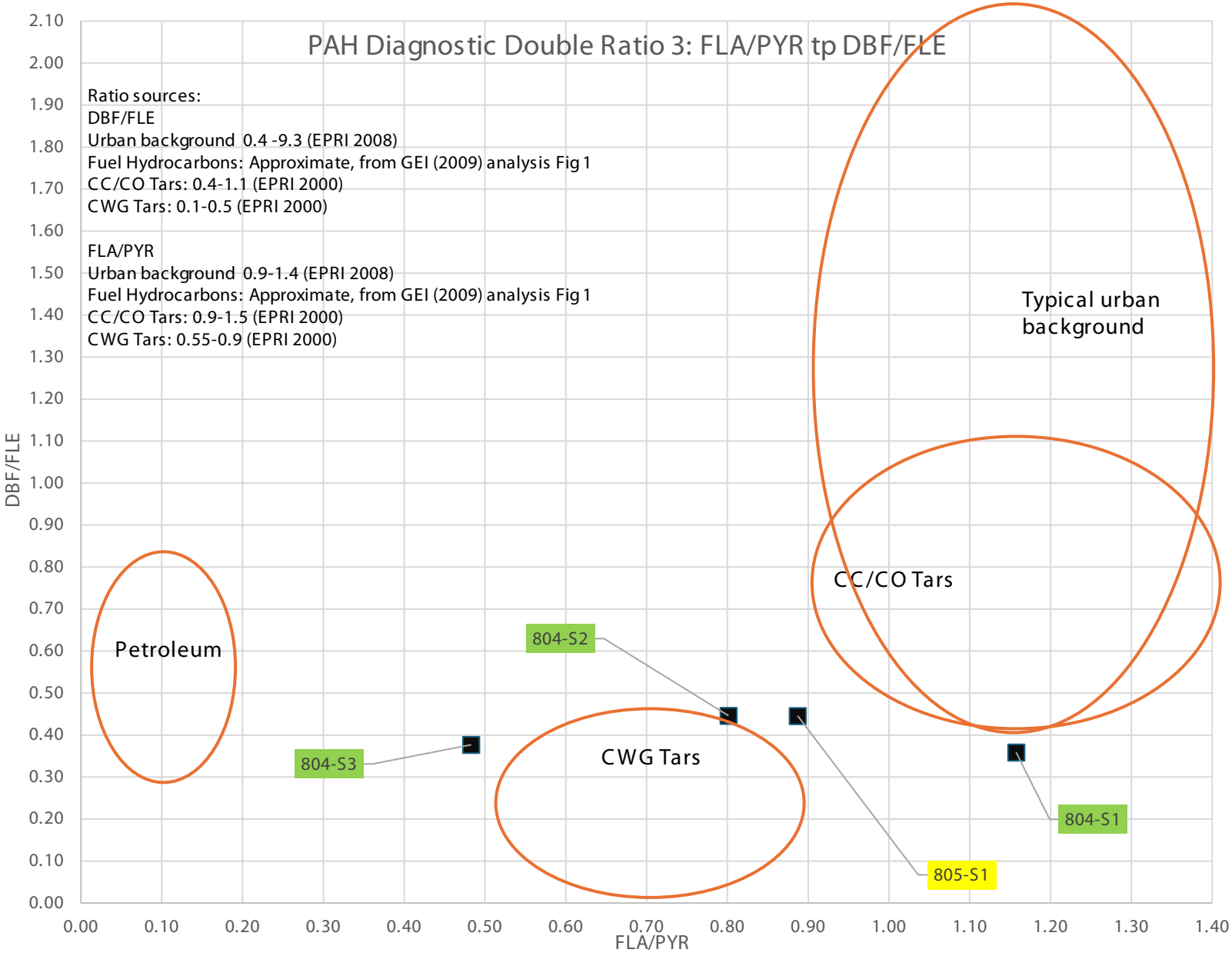
Downstream Subarea

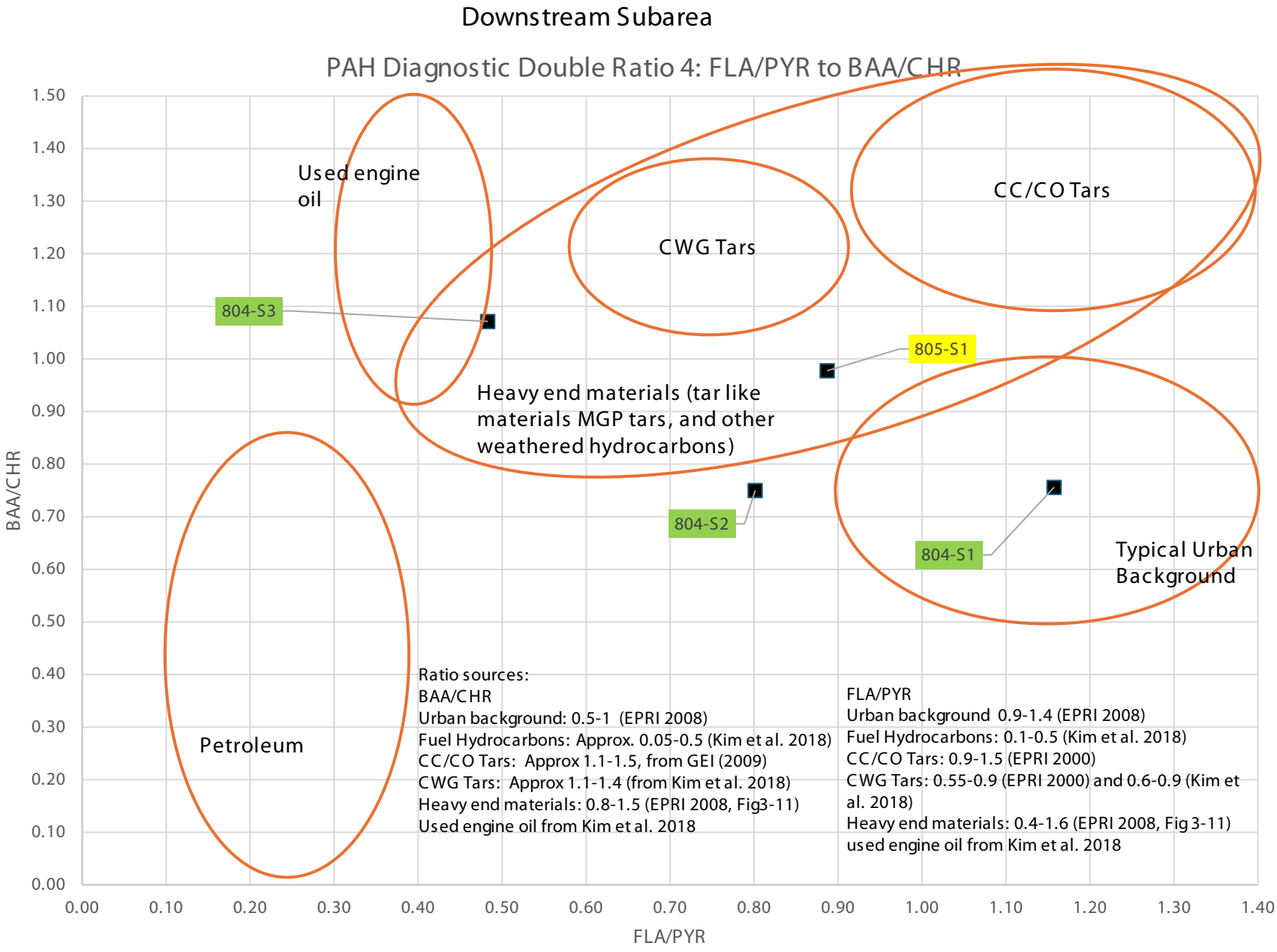


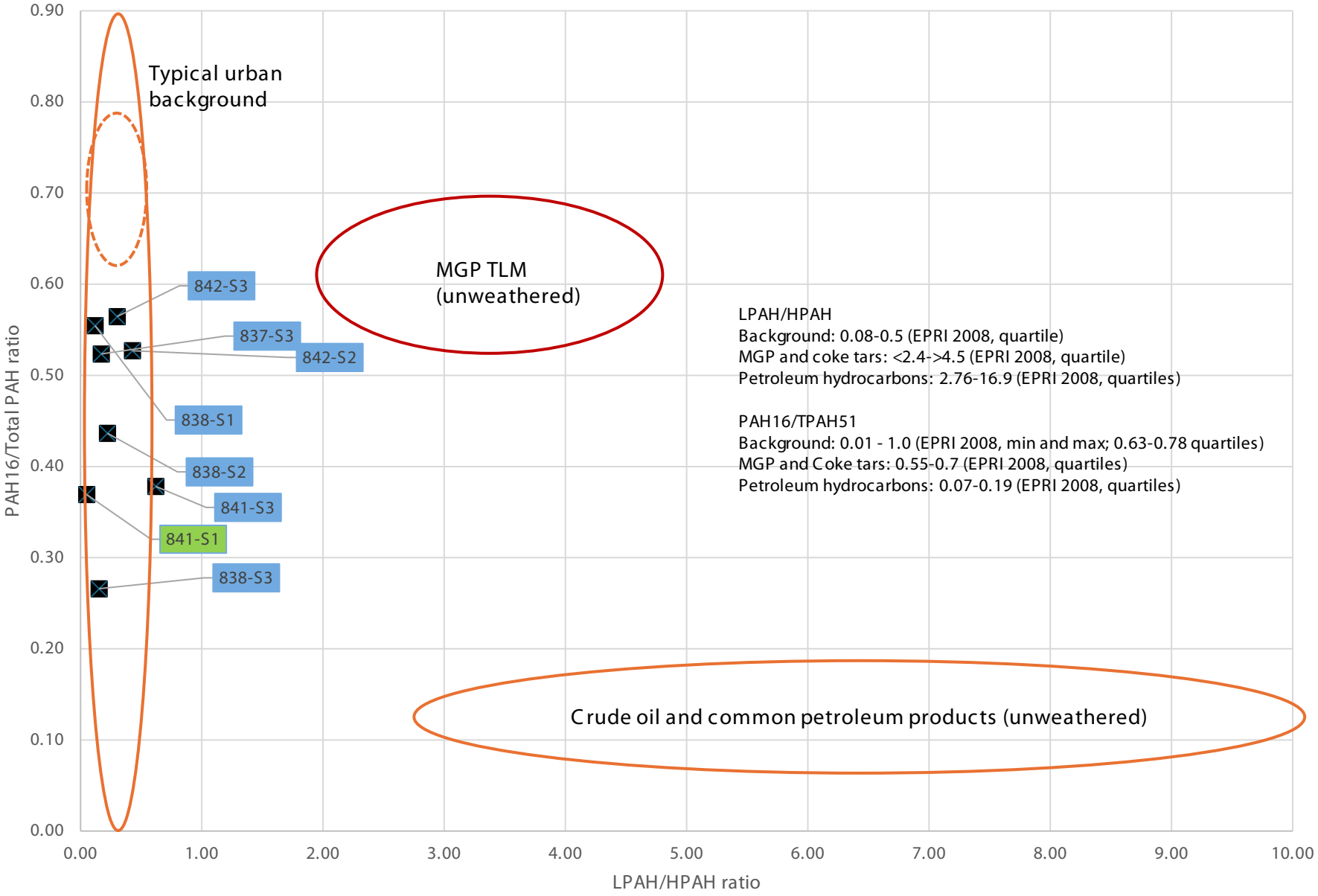
Downstream Subarea

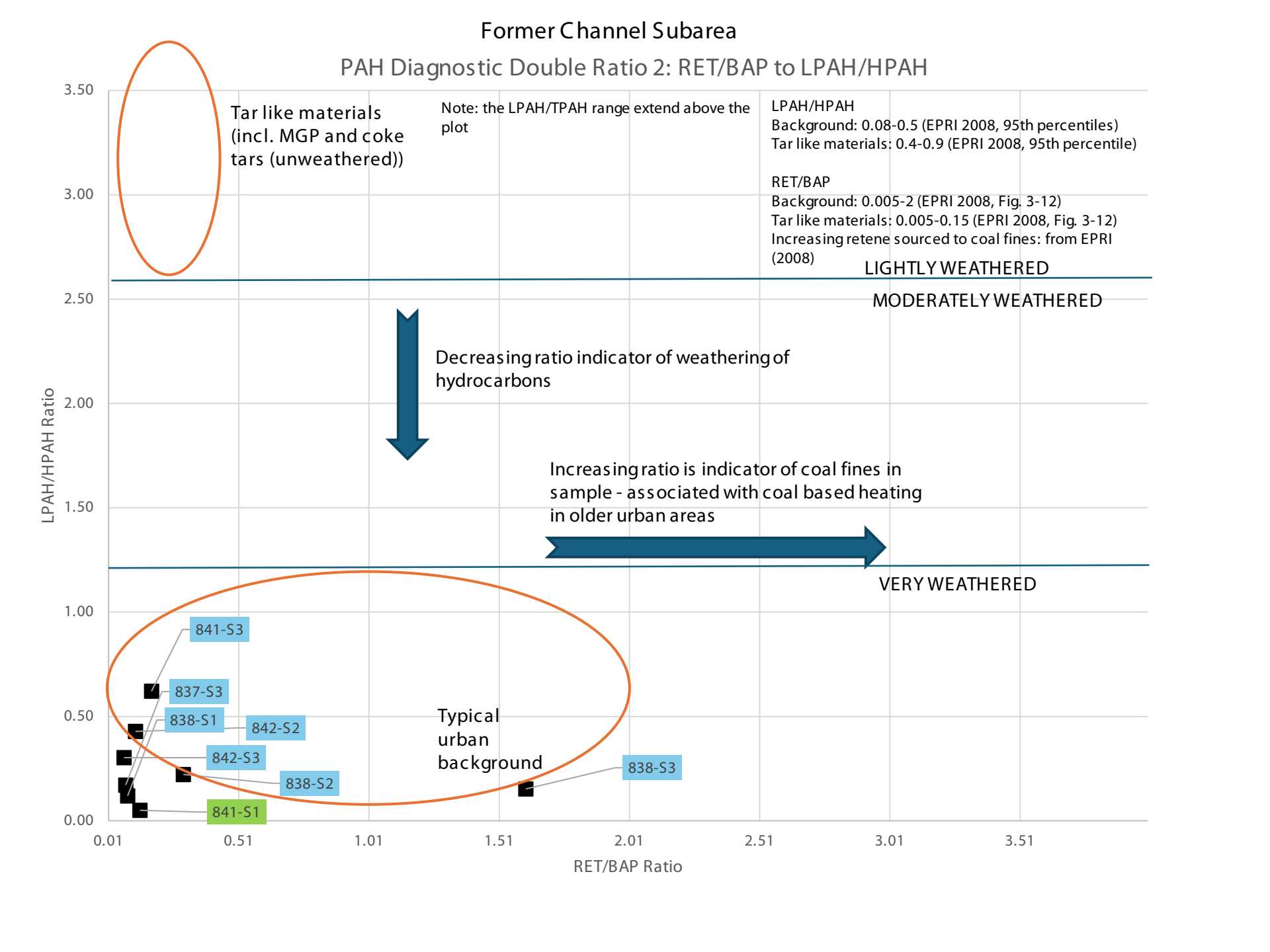


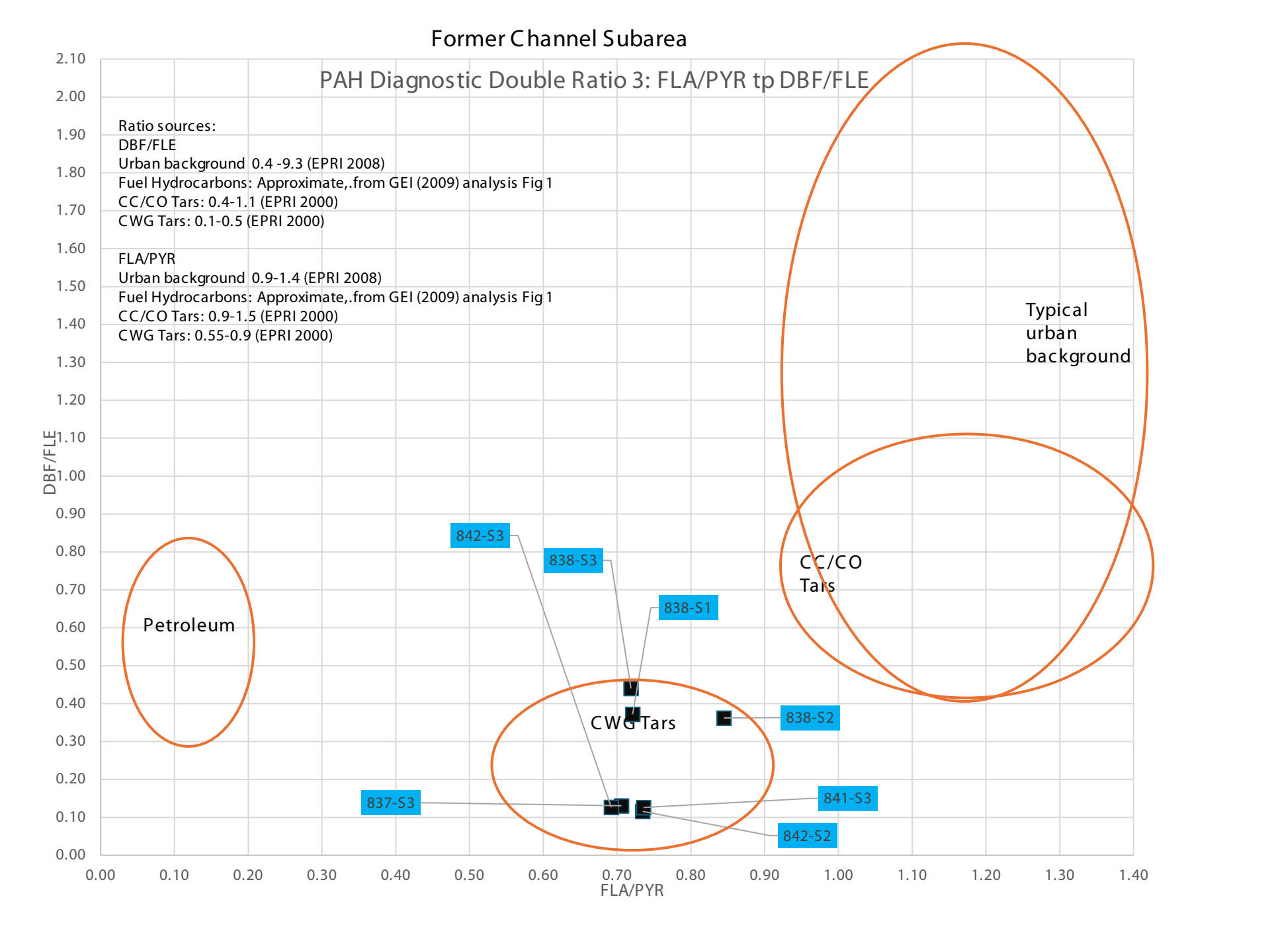
Downstream Subarea

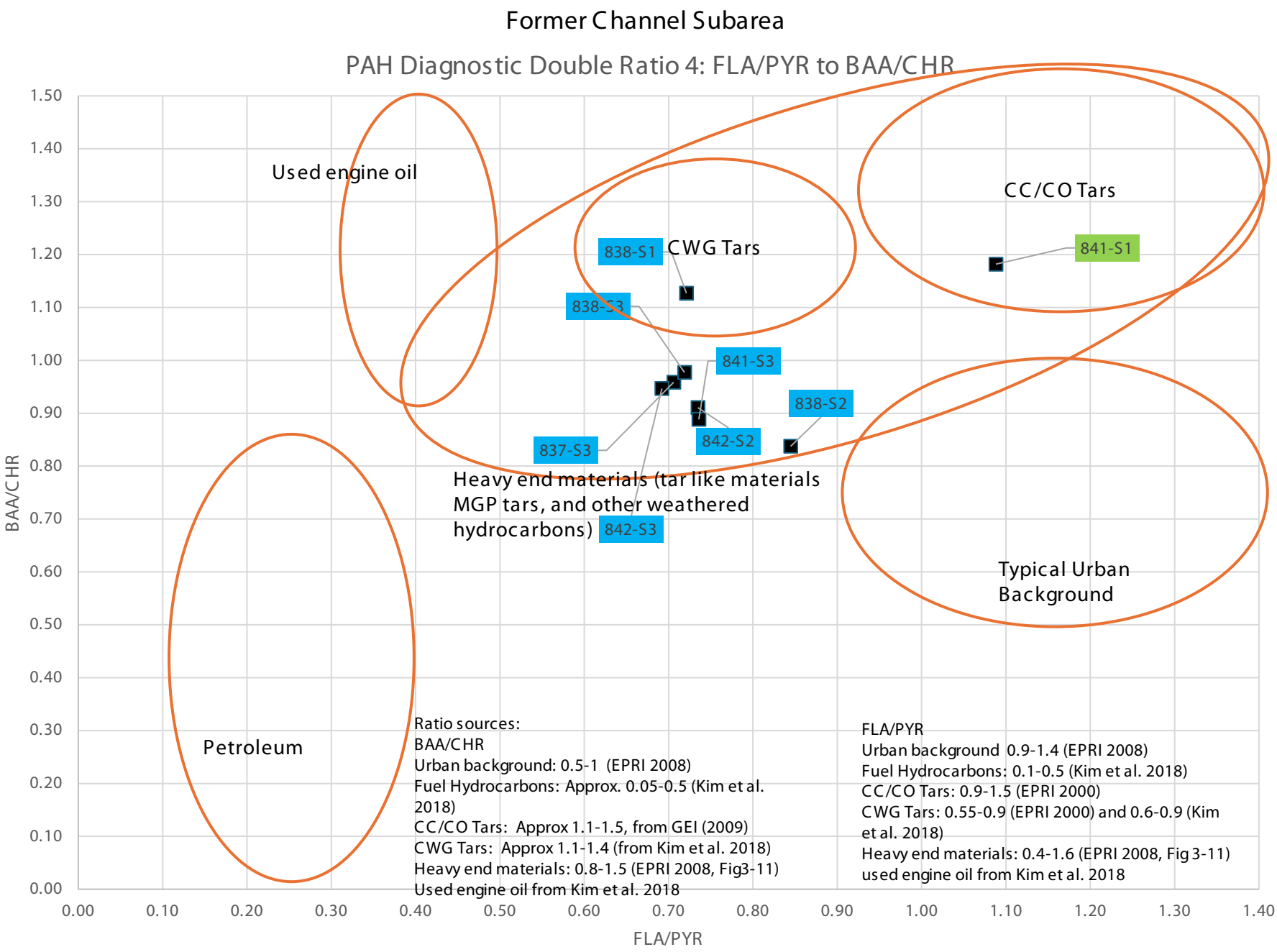


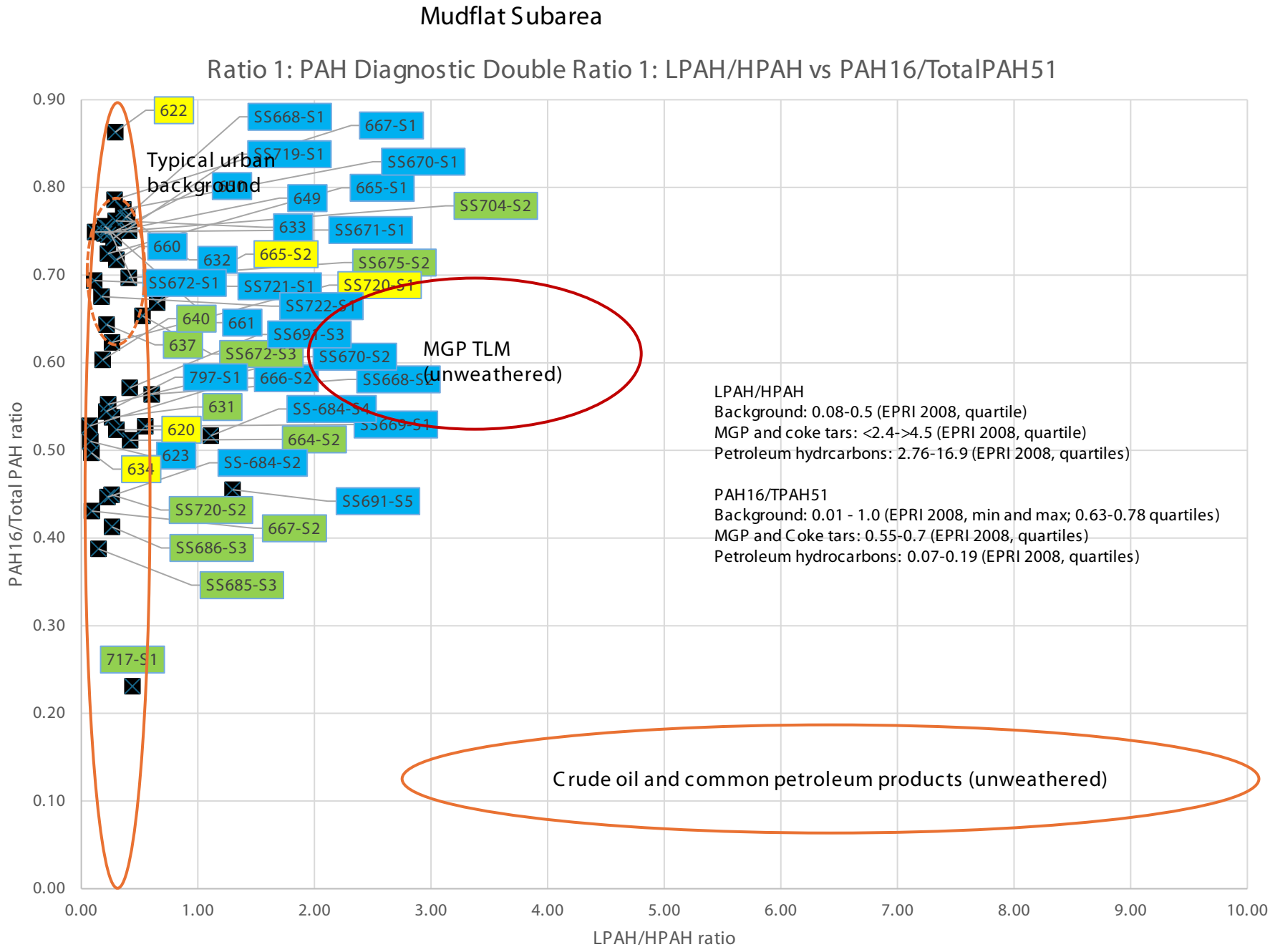

Downstream Subarea
PAH Diagnostic Double Ratio 4: FLA/PYR to BAA/CHR
BAA/CHR
FLA/PYR
1.50
1.40
1.30
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
0.90
1.00
1.10
1.20
1.30
1.40
Used engine oil
CWG Tars
CC/CO Tars
Heavy end materials (tar like materials MGP tars, and other weathered hydrocarbons)
Petroleum
Typical Urban Background
804-S3
805-S1
804-S2
804-S1
Ratio sources:
BAA/CHR
Urban background: 0.5-1 (EPRI 2008)
Fuel Hydrocarbons: Approx. 0.05-0.5 (Kim et al. 2018)
CC/CO Tars: Approx 1.1-1.5, from GEI (2009)
CWG Tars: Approx 1.1-1.4 (from Kim et al. 2018)
Heavy end materials: 0.8-1.5 (EPRI 2008, Fig3-11)
Used engine oil from Kim et al. 2018
FLA/PYR
Urban background 0.9-1.4 (EPRI 2008)
Fuel Hydrocarbons: 0.1-0.5 (Kim et al. 2018)
CC/CO Tars: 0.9-1.5 (EPRI 2000)
CWG Tars: 0.55-0.9 (EPRI 2000) and 0.6-0.9 (Kim et al. 2018)
Heavy end materials: 0.4-1.6 (EPRI 2008, Fig 3-11)
used engine oil from Kim et al. 2018


Former Channel Subarea
Ratio 1: PAH Diagnostic Double Ratio 1: LPAH/HPAH vs PAH16/TotalPAH51
PAH16/Total PAH ratio
LPAH/HPAH ratio
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
0.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00
10.00
Typical urban background
MGP TLM (unweathered)
Crude oil and common petroleum products (unweathered)
842-S3
837-S3
842-S2
838-S1
838-S2
841-S3
841-S1
838-S3
LPAH/HPAH
Background: 0.08-0.5 (EPRI 2008, quartile)
MGP and coke tars: <2.4->4.5 (EPRI 2008, quartile)
Petroleum hydrocarbons: 2.76-16.9 (EPRI 2008, quartiles)
PAH16/TPAH51
Background: 0.01 - 1.0 (EPRI 2008, min and max; 0.63-0.78 quartiles)
MGP and Coke tars: 0.55-0.7 (EPRI 2008, quartiles)
Petroleum hydrocarbons: 0.07-0.19 (EPRI 2008, quartiles)

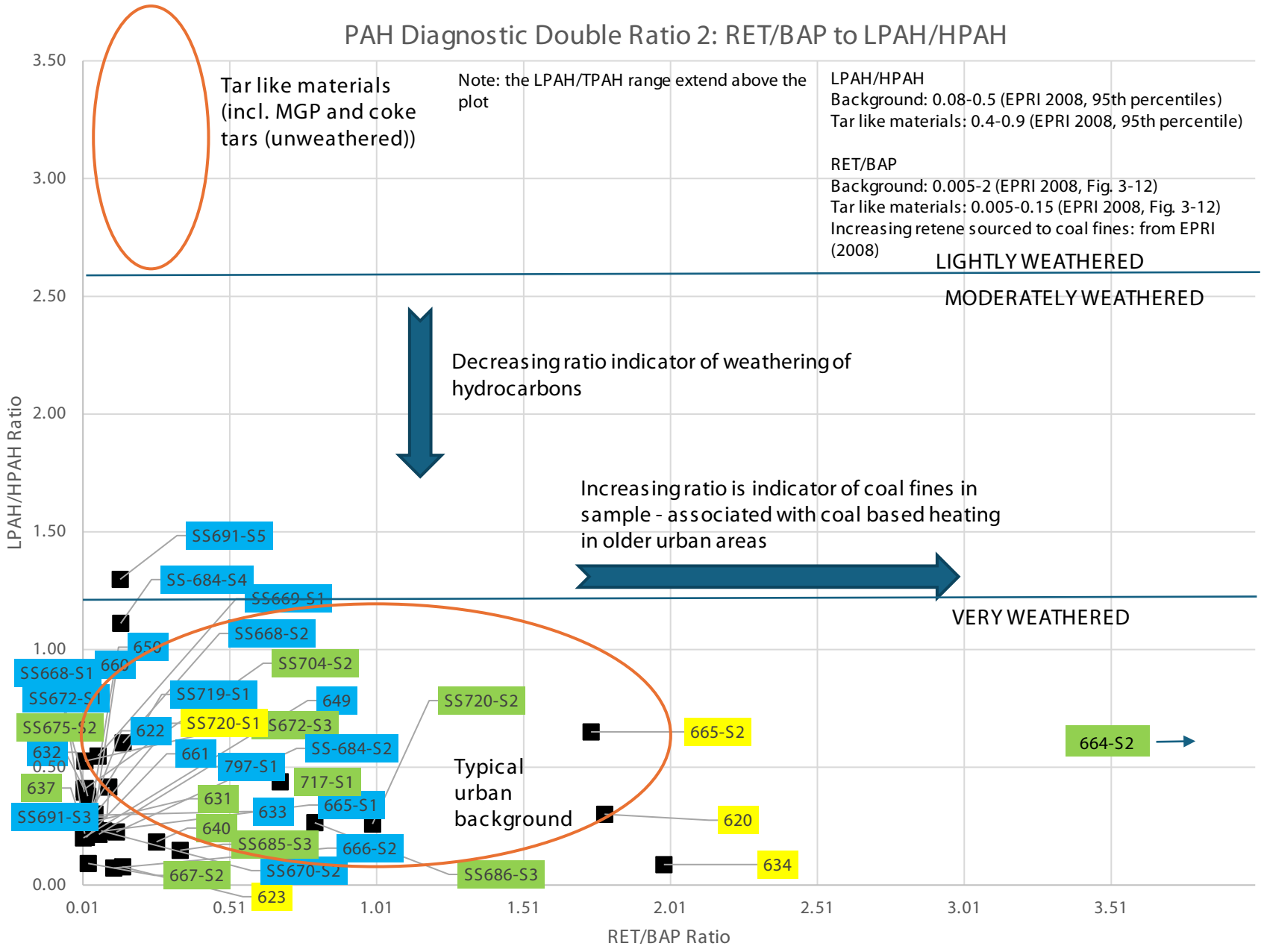

Former Channel Subarea
PAH Diagnostic Double Ratio 2: RET/BAP to LPAH/HPAH
Tar like materials (incl. MGP and coke tars (unweathered))
Note: the LPAH/TPAH range extend above the plot
LPAH/HPAH
Background: 0.08-0.5 (EPRI 2008, 95th percentiles)
Tar like materials: 0.4-0.9 (EPRI 2008, 95th percentile)
RET/BAP
Background: 0.005-2 (EPRI 2008, Fig. 3-12)
Tar like materials: 0.005-0.15 (EPRI 2008, Fig. 3-12)
Increasing retene sourced to coal fines: from EPRI (2008)
LIGHTLY WEATHERED
MODERATELY WEATHERED
Decreasing ratio indicator of weathering of hydrocarbons
Increasing ratio is indicator of coal fines in sample - associated with coal based heating in older urban areas
VERY WEATHERED
Typical urban background
841-S3
837-S3
838-S1
842-S2
842-S3
838-S2
841-S1
838-S3
LPAH/HPAH Ratio
RET/BAP Ratio
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
0.01
0.51
1.01
1.51
2.01
2.51
3.01
3.51

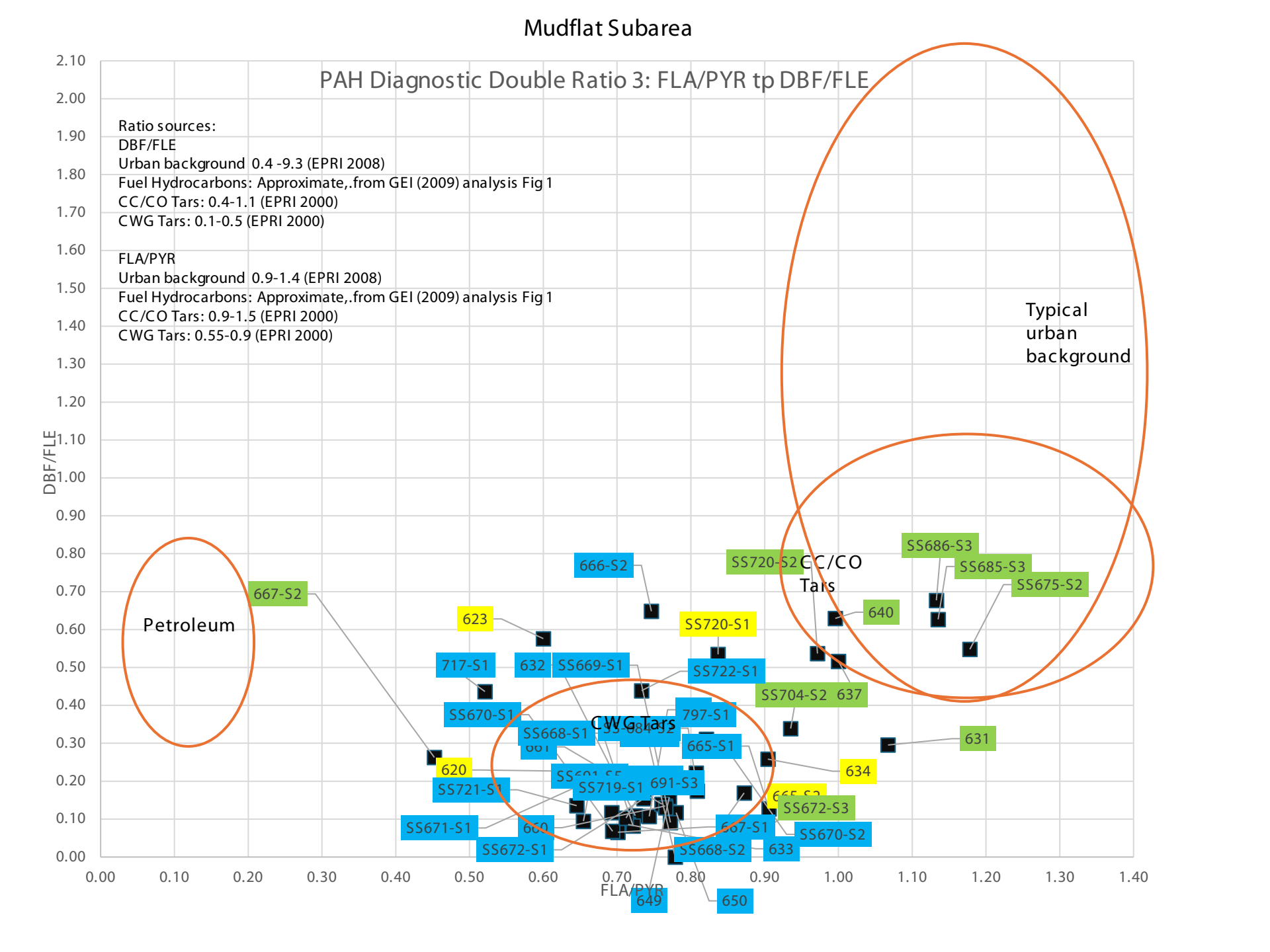

Former Channel Subarea
PAH Diagnostic Double Ratio 3: FLA/PYR tp DBF/FLE
Ratio sources:
DBF/FLE
Urban background 0.4 -9.3 (EPRI 2008)
Fuel Hydrocarbons: Approximate,.from GEI (2009) analysis Fig 1
CC/CO Tars: 0.4-1.1 (EPRI 2000)
CWG Tars: 0.1-0.5 (EPRI 2000)
FLA/PYR
Urban background 0.9-1.4 (EPRI 2008)
Fuel Hydrocarbons: Approximate,.from GEI (2009) analysis Fig 1
CC/CO Tars: 0.9-1.5 (EPRI 2000)
CWG Tars: 0.55-0.9 (EPRI 2000)
Typical urban background
CC/CO Tars
Petroleum
CWG Tars
842-S3
838-S3
838-S1
838-S2
837-S3
841-S3
842-S2
DBF/FLE
FLA/PYR
2.10
2.00
1.90
1.80
1.70
1.60
1.50
1.40
1.30
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
0.90
1.00
1.10
1.20
1.30
1.40


Former Channel Subarea
PAH Diagnostic Double Ratio 4: FLA/PYR to BAA/CHR
BAA/CHR
FLA/PYR
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
0.90
1.00
1.10
1.20
1.30
1.40
1.50
Used engine oil
CC/CO Tars
CWG Tars
838-S1
841-S1
838-S3
841-S3
838-S2
842-S2
837-S3
842-S3
Heavy end materials (tar like materials MGP tars, and other weathered hydrocarbons)
Typical Urban Background
Petroleum
Ratio sources:
BAA/CHR
Urban background: 0.5-1 (EPRI 2008)
Fuel Hydrocarbons: Approx. 0.05-0.5 (Kim et al. 2018)
CC/CO Tars: Approx 1.1-1.5, from GEI (2009)
CWG Tars: Approx 1.1-1.4 (from Kim et al. 2018)
Heavy end materials: 0.8-1.5 (EPRI 2008, Fig3-11)
Used engine oil from Kim et al. 2018
FLA/PYR
Urban background 0.9-1.4 (EPRI 2008)
Fuel Hydrocarbons: 0.1-0.5 (Kim et al. 2018)
CC/CO Tars: 0.9-1.5 (EPRI 2000)
CWG Tars: 0.55-0.9 (EPRI 2000) and 0.6-0.9 (Kim et al. 2018)
Heavy end materials: 0.4-1.6 (EPRI 2008, Fig 3-11)
used engine oil from Kim et al. 2018

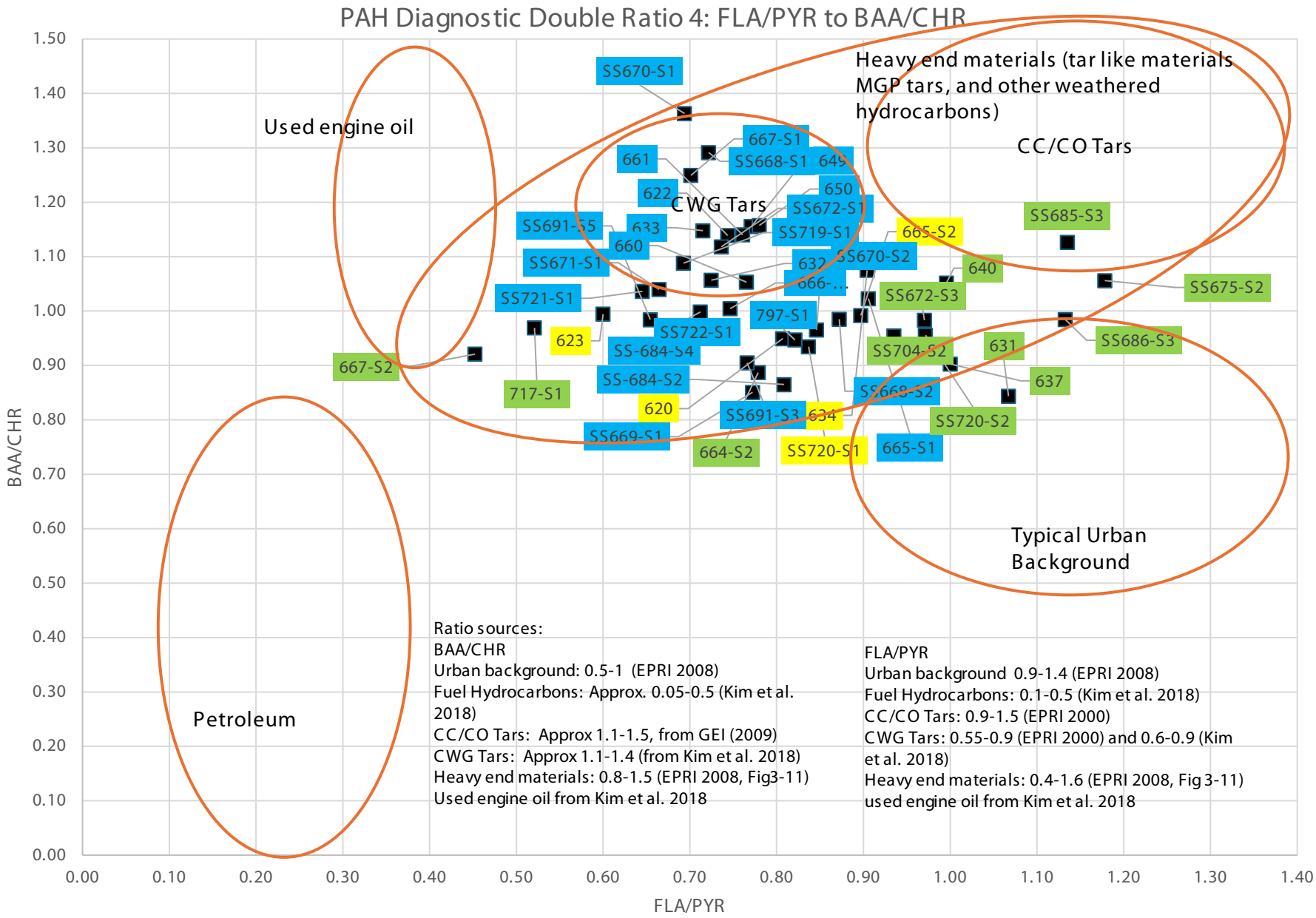

Mudflat Subarea
Ratio 1: PAH Diagnostic Double Ratio 1: LPAH/HPAH vs PAH16/TotalPAH51
PAH16/Total PAH ratio
LPAH/HPAH ratio
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
0.90
0.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00
10.00
622
SS668-S1
667-S1
SS719-S1
SS670-S1
649
665-S1
SS704-S2
633
SS671-S1
660
632
665-S2
SS675-S2
SS672-S1
SS721-S1
SS720-S1
SS722-S1
640
661
637
SS672-S3
SS670-S2
797-S1
666-S2
SS668-S2
631
620
664-S2
623
SS-684-S2
634
SS691-S5
SS720-S2
667-S2
SS686-S3
SS685-S3
717-S1
Typical urban background
MGP TLM (unweathered)
Crude oil and common petroleum products (unweathered)
LPAH/HPAH
Background: 0.08-0.5 (EPRI 2008, quartile)
MGP and coke tars: <2.4->4.5 (EPRI 2008, quartile)
Petroleum hydrcarbons: 2.76-16.9 (EPRI 2008, quartiles)
PAH16/TPAH51
Background: 0.01 - 1.0 (EPRI 2008, min and max; 0.63-0.78 quartiles)
MGP and Coke tars: 0.55-0.7 (EPRI 2008, quartiles)
Petroleum hydrocarbons: 0.07-0.19 (EPRI 2008, quartiles)

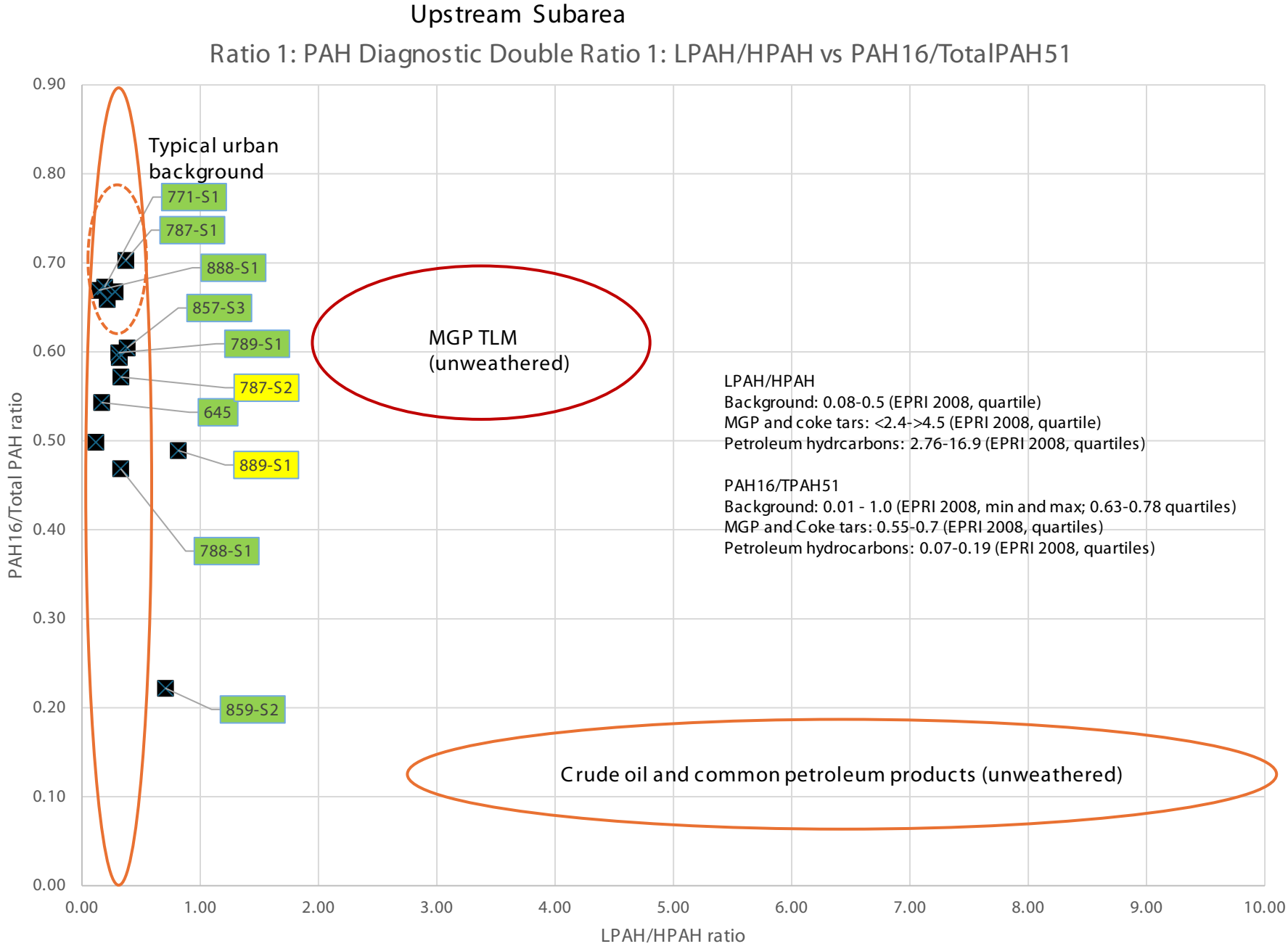
Mudflat Subarea

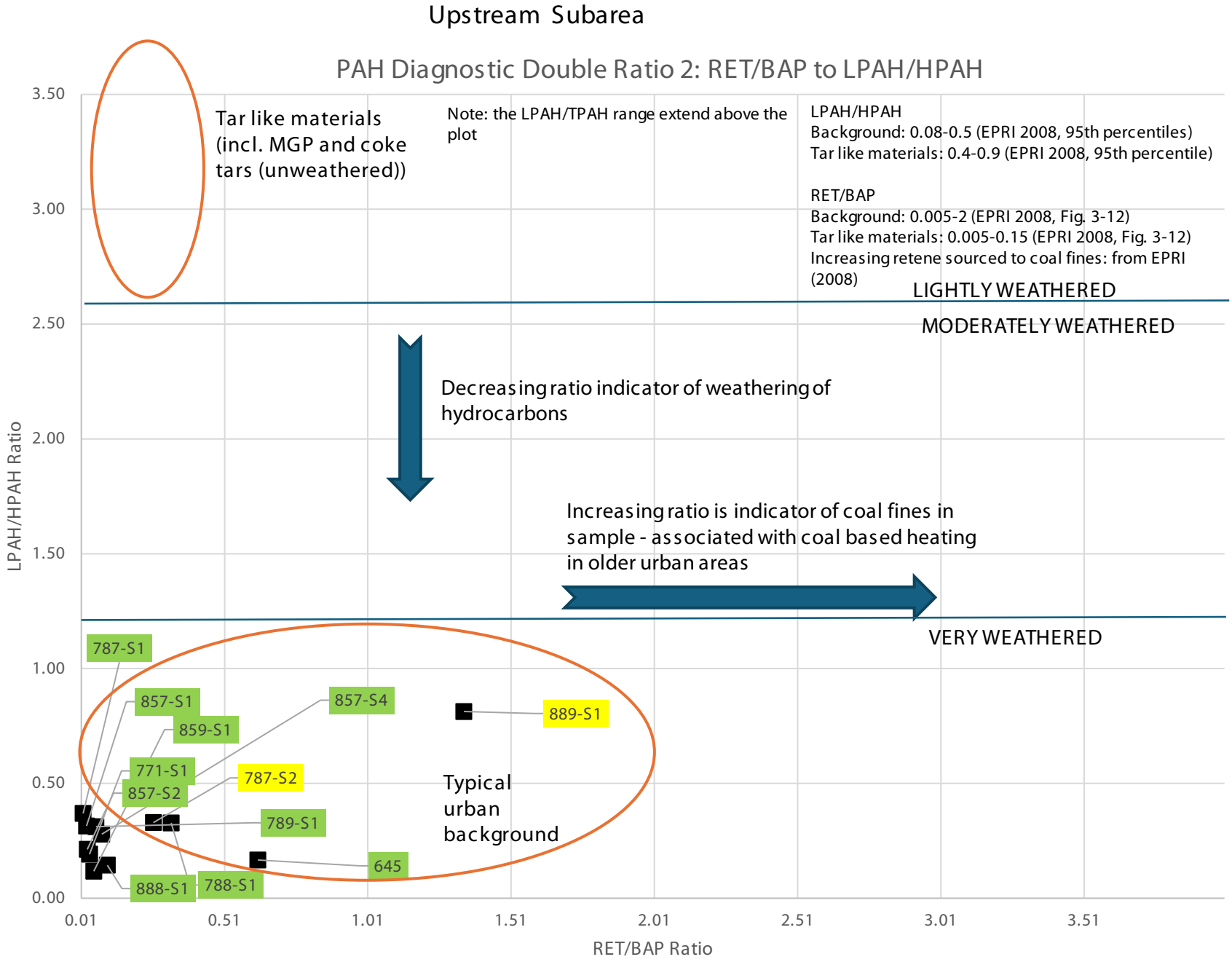



Mudflat Subarea
PAH Diagnostic Double Ratio 3: FLA/PYR tp DBF/FLE
Ratio sources:
DBF/FLE
Urban background 0.4 -9.3 (EPRI 2008)
Fuel Hydrocarbons: Approximate,.from GEI (2009) analysis Fig 1
CC/CO Tars: 0.4-1.1 (EPRI 2000)
CWG Tars: 0.1-0.5 (EPRI 2000)
FLA/PYR
Urban background 0.9-1.4 (EPRI 2008)
Fuel Hydrocarbons: Approximate,.from GEI (2009) analysis Fig 1
CC/CO Tars: 0.9-1.5 (EPRI 2000)
CWG Tars: 0.55-0.9 (EPRI 2000)
Typical urban background
CC/CO Tars
CWG Tars
Petroleum
DBF/FLE
FLA/PYR
2.10
2.00
1.90
1.80
1.70
1.60
1.50
1.40
1.30
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
0.90
1.00
1.10
1.20
1.30
1.40
667-S2
666-S2
623
717-S1
632
SS669-S1
SS670-S1
SS668-S1
620
SS721-S1
SS671-S1
SS672-S1
SS720-S1
SS722-S1
797-S1
665-S1
SS719-S1
691-S3
649
650
SS720-S2
640
SS686-S3
SS685-S3
SS675-S2
SS704-S2
637
631
634
SS672-S3
667-S1
SS670-S2
SS668-S2
633

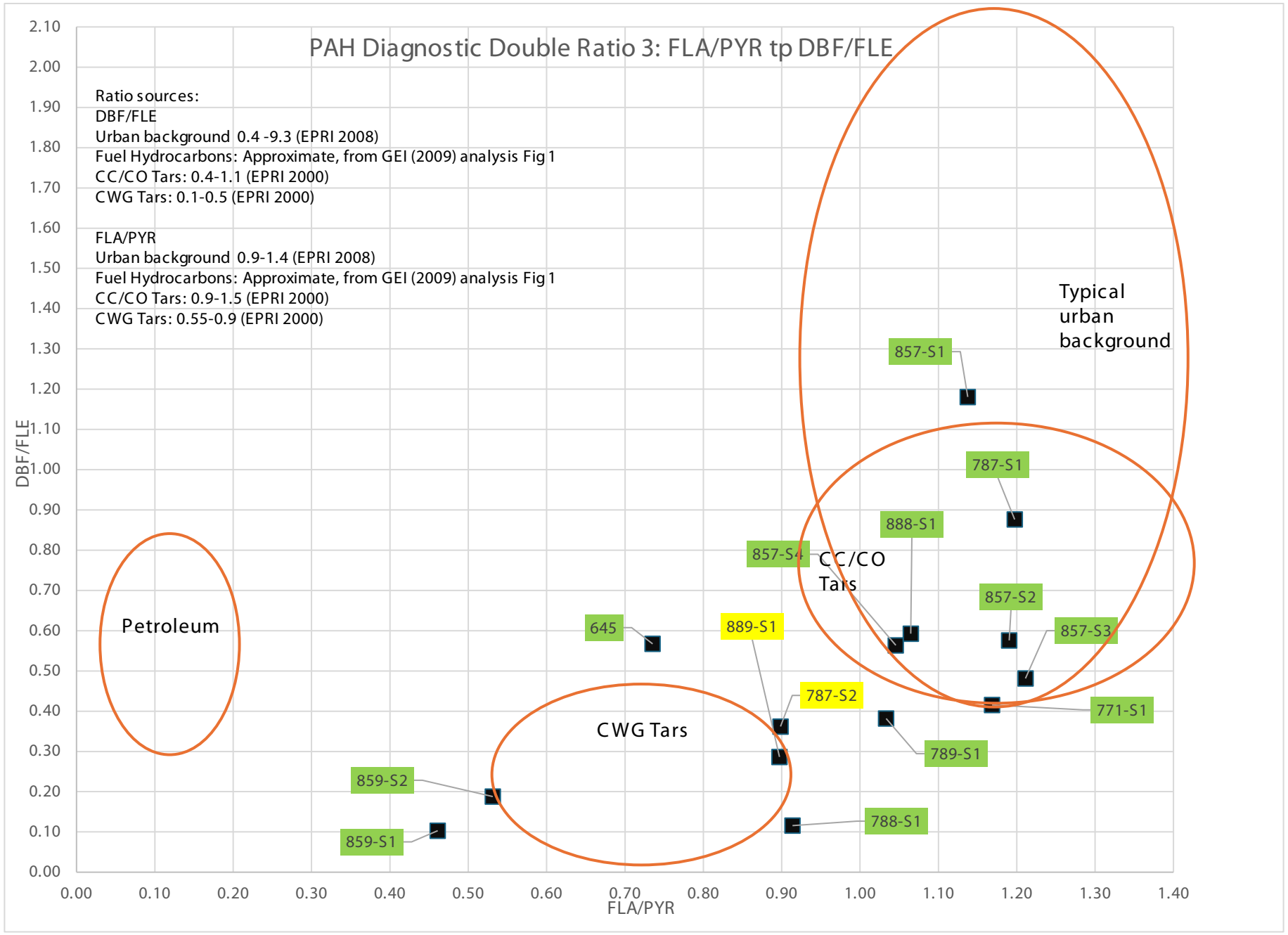
Mudflat Subarea

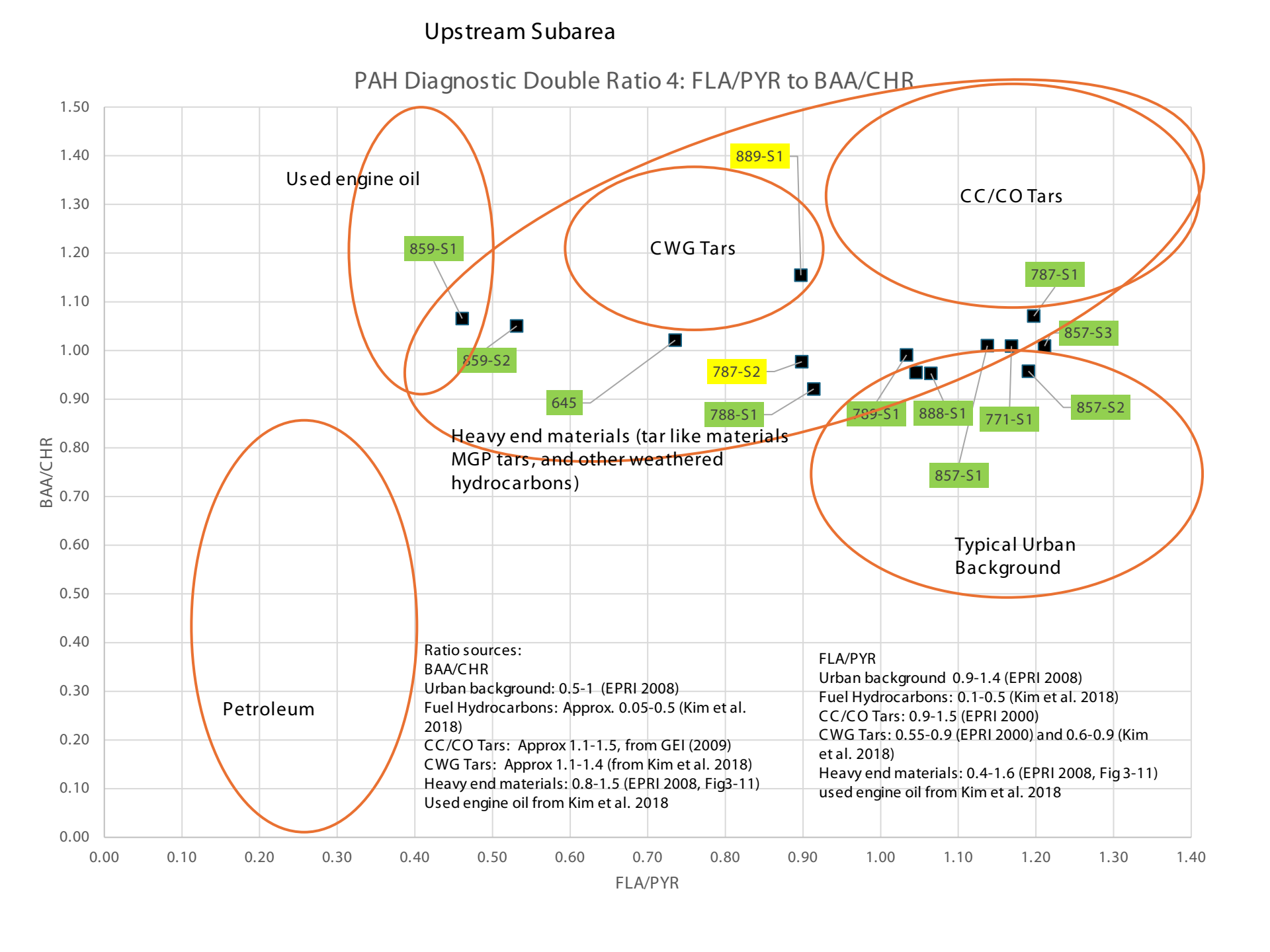



Upstream Subarea
Ratio 1: PAH Diagnostic Double Ratio 1: LPAH/HPAH vs PAH16/TotalPAH51
PAH16/Total PAH ratio
LPAH/HPAH ratio
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
0.90
0.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00
10.00
Typical urban background
771-S1
787-S1
888-S1
857-S3
789-S1
787-S2
645
889-S1
788-S1
859-S2
MGP TLM (unweathered)
LPAH/HPAH
Background: 0.08-0.5 (EPRI 2008, quartile)
MGP and coke tars: <2.4->4.5 (EPRI 2008, quartile)
Petroleum hydrcarbons: 2.76-16.9 (EPRI 2008, quartiles)
PAH16/TPAH51
Background: 0.01 - 1.0 (EPRI 2008, min and max; 0.63-0.78 quartiles)
MGP and Coke tars: 0.55-0.7 (EPRI 2008, quartiles)
Petroleum hydrocarbons: 0.07-0.19 (EPRI 2008, quartiles)
Crude oil and common petroleum products (unweathered)

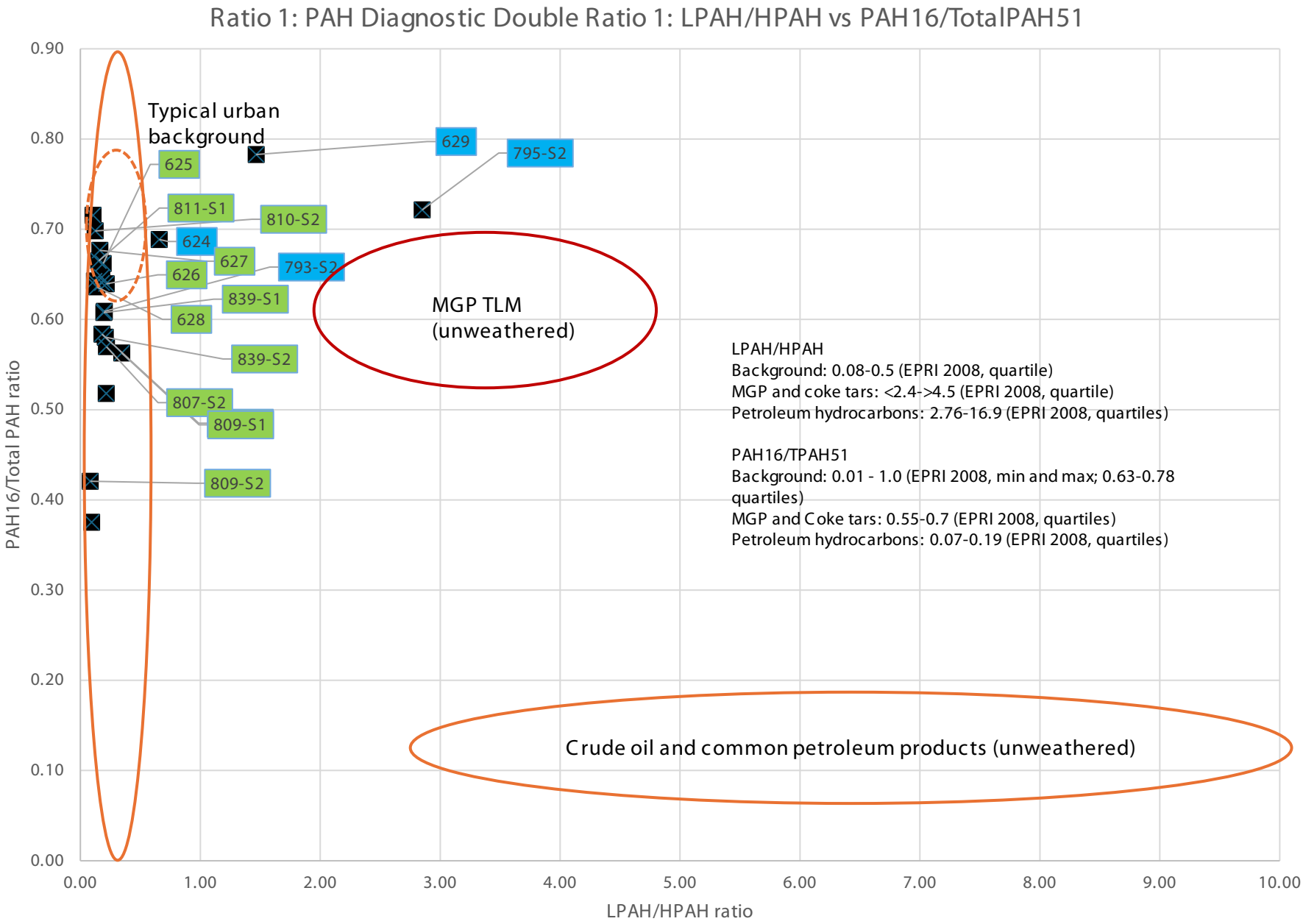

Upstream Subarea
PAH Diagnostic Double Ratio 2: RET/BAP to LPAH/HPAH
Tar like materials (incl. MGP and coke tars (unweathered))
Note: the LPAH/TPAH range extend above the plot
LPAH/HPAH
Background: 0.08-0.5 (EPRI 2008, 95th percentiles)
Tar like materials: 0.4-0.9 (EPRI 2008, 95th percentile)
RET/BAP
Background: 0.005-2 (EPRI 2008, Fig. 3-12)
Tar like materials: 0.005-0.15 (EPRI 2008, Fig. 3-12)
Increasing retene sourced to coal fines: from EPRI (2008)
LIGHTLY WEATHERED
MODERATELY WEATHERED
Decreasing ratio indicator of weathering of hydrocarbons
Increasing ratio is indicator of coal fines in sample - associated with coal based heating in older urban areas
VERY WEATHERED
787-S1
857-S1
859-S1
771-S1
857-S2
857-S4
787-S2
789-S1
645
888-S1
788-S1
889-S1
Typical urban background
LPAH/HPAH Ratio
RET/BAP Ratio
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
0.01
0.51
1.01
1.51
2.01
2.51
3.01
3.51

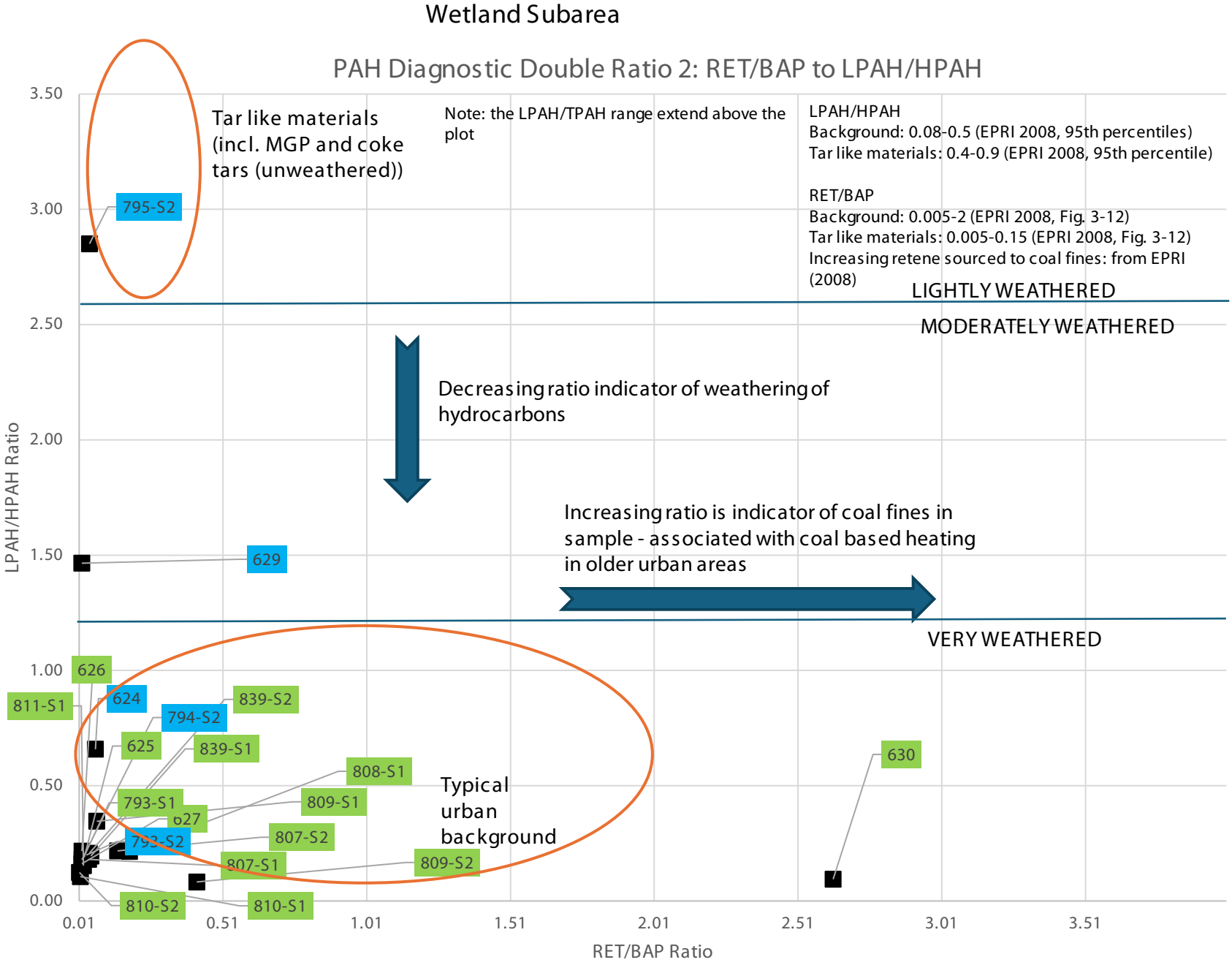
Upstream Subarea



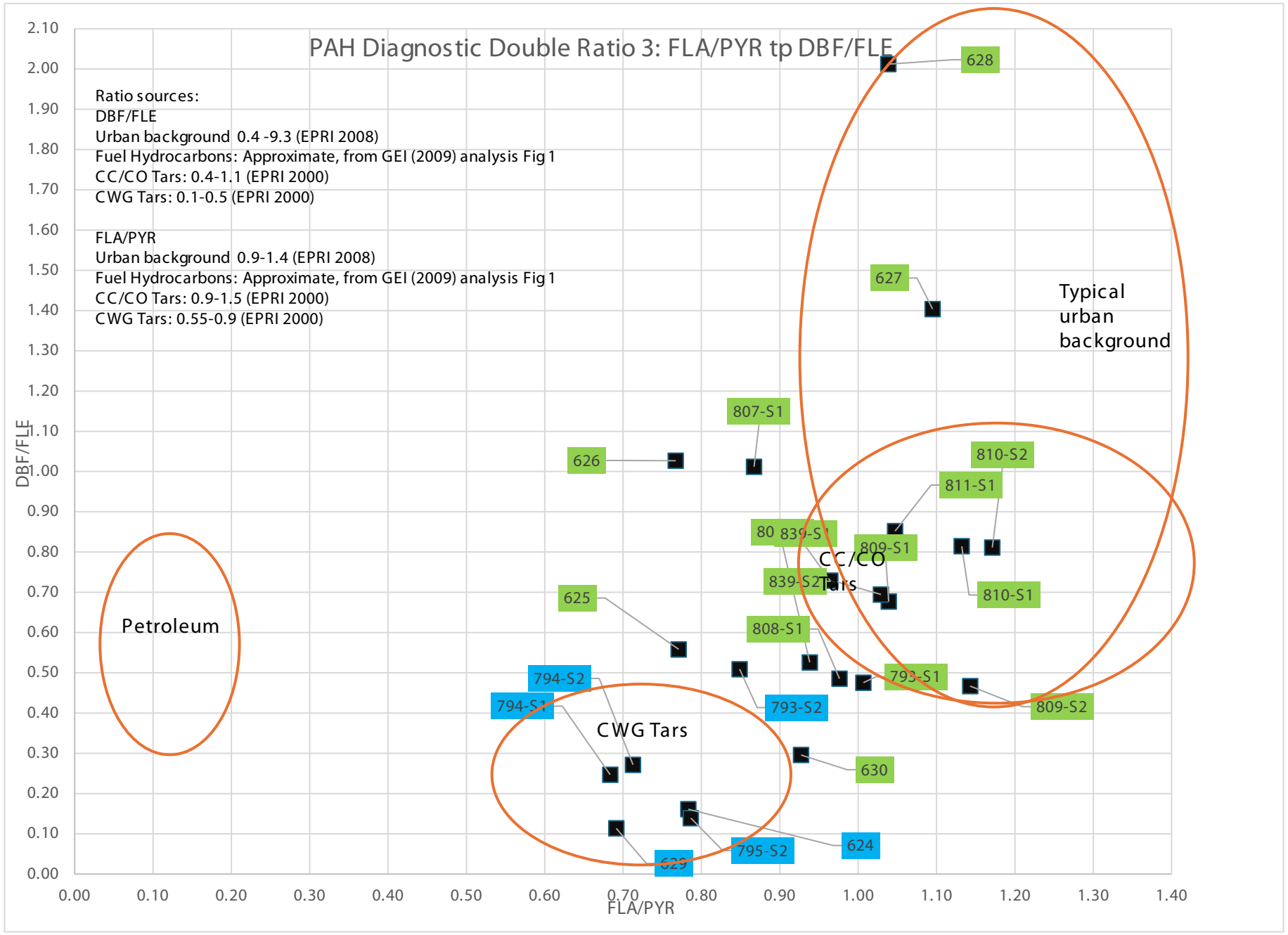

Upstream Subarea
PAH Diagnostic Double Ratio 4: FLA/PYR to BAA/CHR
BAA/CHR
FLA/PYR
1.50
1.40
1.30
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
0.90
1.00
1.10
1.20
1.30
1.40
Used engine oil
CWG Tars
CC/CO Tars
Heavy end materials (tar like materials MGP tars, and other weathered hydrocarbons)
Typical Urban Background
Petroleum
889-S1
859-S1
859-S2
787-S1
857-S3
787-S2
645
788-S1
789-S1
888-S1
771-S1
857-S2
857-S1
Ratio sources:
BAA/CHR
Urban background: 0.5-1 (EPRI 2008)
Fuel Hydrocarbons: Approx. 0.05-0.5 (Kim et al. 2018)
CC/CO Tars: Approx 1.1-1.5, from GEI (2009)
CWG Tars: Approx 1.1-1.4 (from Kim et al. 2018)
Heavy end materials: 0.8-1.5 (EPRI 2008, Fig3-11)
Used engine oil from Kim et al. 2018
FLA/PYR
Urban background 0.9-1.4 (EPRI 2008)
Fuel Hydrocarbons: 0.1-0.5 (Kim et al. 2018)
CC/CO Tars: 0.9-1.5 (EPRI 2000)
CWG Tars: 0.55-0.9 (EPRI 2000) and 0.6-0.9 (Kim et al. 2018)
Heavy end materials: 0.4-1.6 (EPRI 2008, Fig 3-11)
used engine oil from Kim et al. 2018

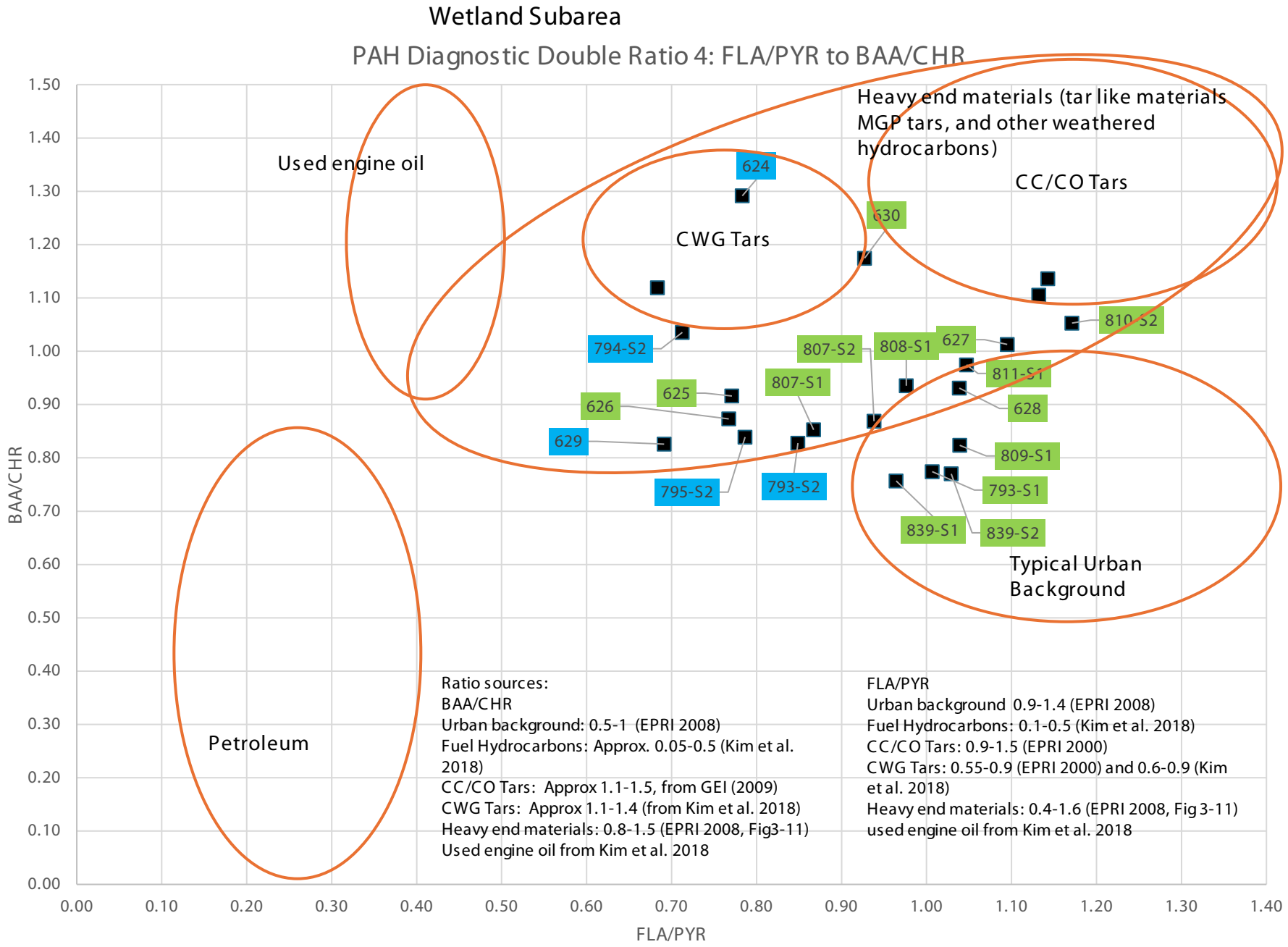
Wetland Subarea

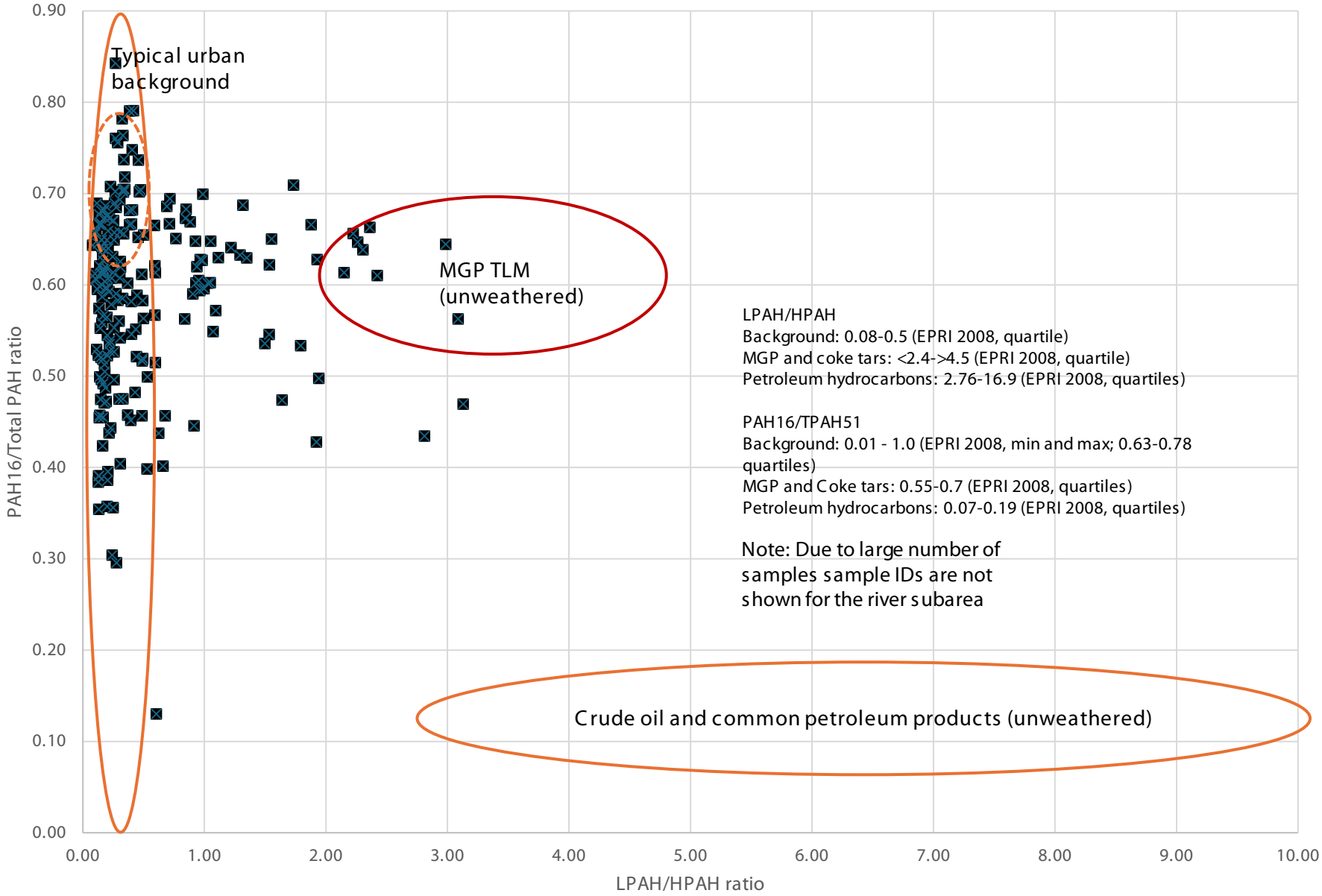


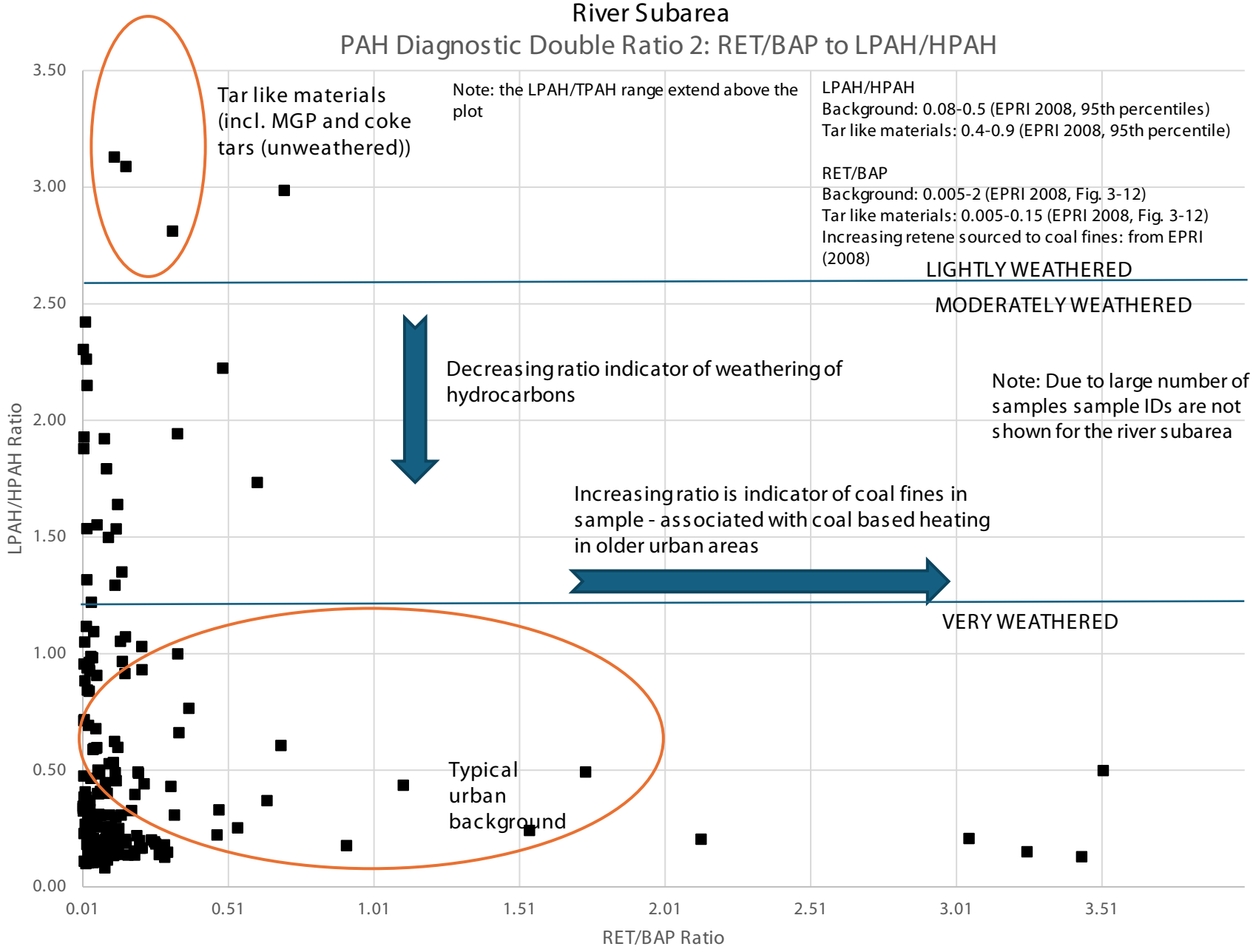

Wetland Subarea
PAH Diagnostic Double Ratio 2: RET/BAP to LPAH/HPAH
Tar like materials (incl. MGP and coke tars (unweathered))
Note: the LPAH/TPAH range extend above the plot
LPAH/HPAH
Background: 0.08-0.5 (EPRI 2008, 95th percentiles)
Tar like materials: 0.4-0.9 (EPRI 2008, 95th percentile)
RET/BAP
Background: 0.005-2 (EPRI 2008, Fig. 3-12)
Tar like materials: 0.005-0.15 (EPRI 2008, Fig. 3-12)
Increasing retene sourced to coal fines: from EPRI (2008)
LIGHTLY WEATHERED
MODERATELY WEATHERED
Decreasing ratio indicator of weathering of hydrocarbons
Increasing ratio is indicator of coal fines in sample - associated with coal based heating in older urban areas
VERY WEATHERED
Typical urban background
LPAH/HPAH Ratio
RET/BAP Ratio
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
0.01
0.51
1.01
1.51
2.01
2.51
3.01
3.51
795-S2
629
626
624
811-S1
794-S2
839-S2
625
839-S1
808-S1
793-S1
809-S1
627
793-S2
807-S2
807-S1
809-S2
810-S2
810-S1
630

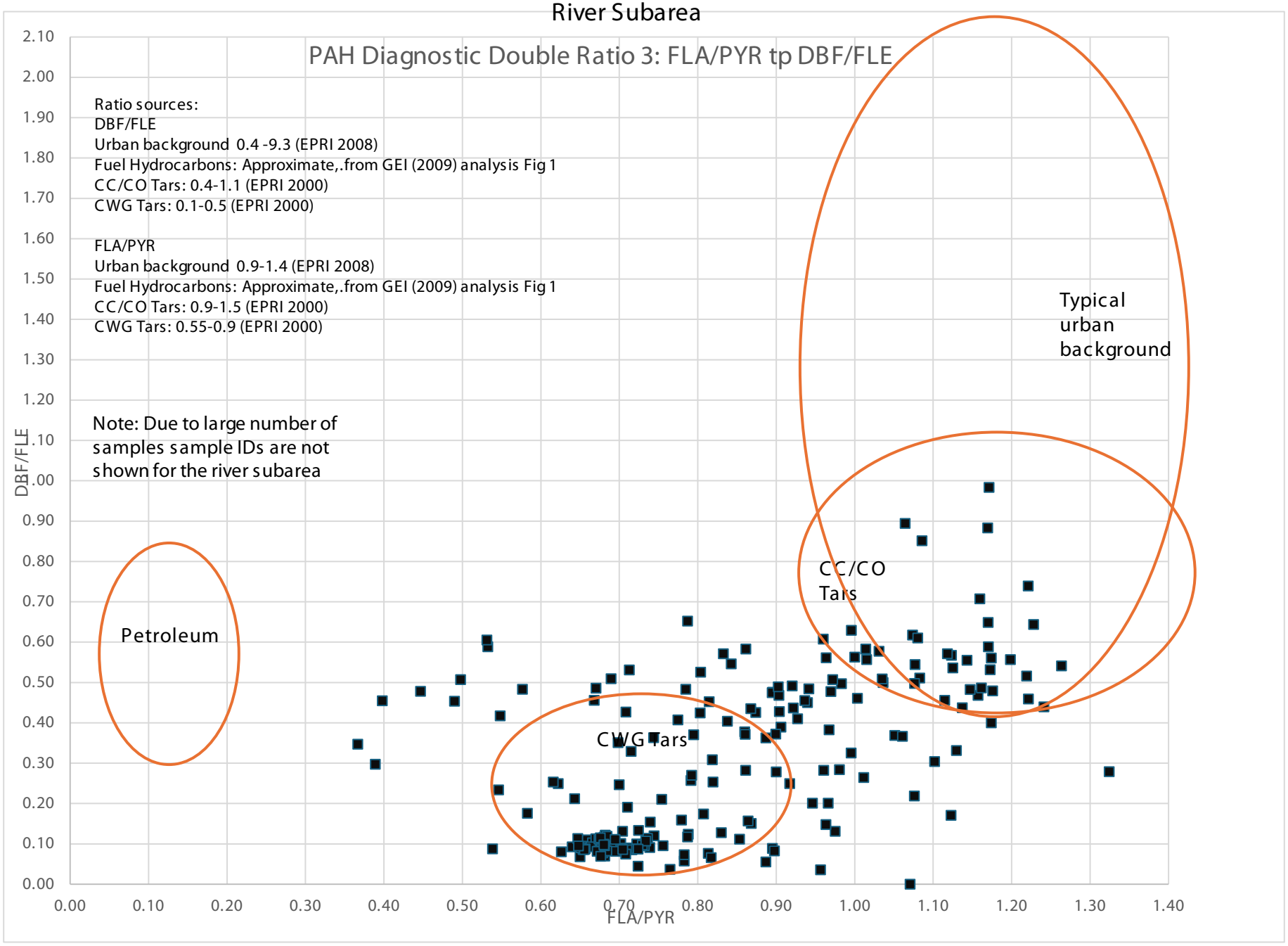
Wetland Subarea



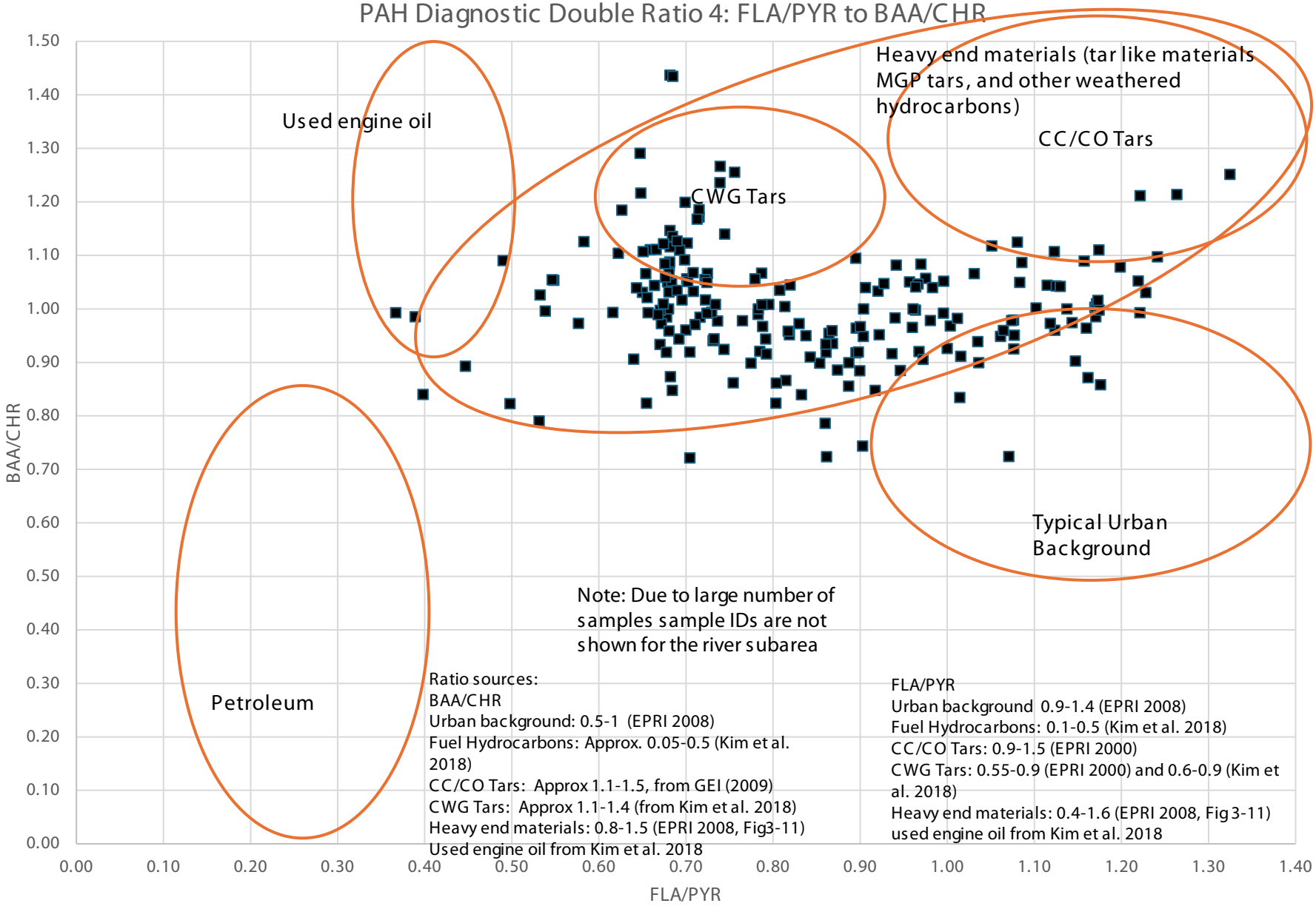

Wetland Subarea
PAH Diagnostic Double Ratio 4: FLA/PYR to BAA/CHR
BAA/CHR
FLA/PYR
1.50
1.40
1.30
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
0.90
1.00
1.10
1.20
1.30
1.40
Used engine oil
Heavy end materials (tar like materials MGP tars, and other weathered hydrocarbons)
CC/CO Tars
CWG Tars
Petroleum
Typical Urban Background
624
630
794-S2
807-S2
808-S1
627
810-S2
811-S1
807-S1
625
626
628
629
809-S1
795-S2
793-S2
793-S1
839-S1
839-S2
Ratio sources:
BAA/CHR
Urban background: 0.5-1 (EPRI 2008)
Fuel Hydrocarbons: Approx. 0.05-0.5 (Kim et al. 2018)
CC/CO Tars: Approx 1.1-1.5, from GEI (2009)
CWG Tars: Approx 1.1-1.4 (from Kim et al. 2018)
Heavy end materials: 0.8-1.5 (EPRI 2008, Fig3-11)
Used engine oil from Kim et al. 2018
FLA/PYR
Urban background 0.9-1.4 (EPRI 2008)
Fuel Hydrocarbons: 0.1-0.5 (Kim et al. 2018)
CC/CO Tars: 0.9-1.5 (EPRI 2000)
CWG Tars: 0.55-0.9 (EPRI 2000) and 0.6-0.9 (Kim et al. 2018)
Heavy end materials: 0.4-1.6 (EPRI 2008, Fig 3-11)
used engine oil from Kim et al. 2018


River Subarea
Ratio 1: PAH Diagnostic Double Ratio 1: LPAH/HPAH vs PAH16/TotalPAH51
PAH16/Total PAH ratio
LPAH/HPAH ratio
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
0.90
0.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00
10.00
Typical urban background
MGP TLM (unweathered)
LPAH/HPAH
Background: 0.08-0.5 (EPRI 2008, quartile)
MGP and coke tars: <2.4->4.5 (EPRI 2008, quartile)
Petroleum hydrocarbons: 2.76-16.9 (EPRI 2008, quartiles)
PAH16/TPAH51
Background: 0.01 - 1.0 (EPRI 2008, min and max; 0.63-0.78 quartiles)
MGP and Coke tars: 0.55-0.7 (EPRI 2008, quartiles)
Petroleum hydrocarbons: 0.07-0.19 (EPRI 2008, quartiles)
Note: Due to large number of samples sample IDs are not shown for the river subarea
Crude oil and common petroleum products (unweathered)


River Subarea
PAH Diagnostic Double Ratio 2: RET/BAP to LPAH/HPAH
Tar like materials (incl. MGP and coke tars (unweathered))
Note: the LPAH/TPAH range extend above the plot
LPAH/HPAH
Background: 0.08-0.5 (EPRI 2008, 95th percentiles)
Tar like materials: 0.4-0.9 (EPRI 2008, 95th percentile)
RET/BAP
Background: 0.005-2 (EPRI 2008, Fig. 3-12)
Tar like materials: 0.005-0.15 (EPRI 2008, Fig. 3-12)
Increasing retene sourced to coal fines: from EPRI (2008)
LIGHTLY WEATHERED
MODERATELY WEATHERED
Decreasing ratio indicator of weathering of hydrocarbons
Note: Due to large number of samples sample IDs are not shown for the river subarea
Increasing ratio is indicator of coal fines in sample - associated with coal based heating in older urban areas
VERY WEATHERED
Typical urban background
LPAH/HPAH Ratio
RET/BAP Ratio
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
0.01
0.51
1.01
1.51
2.01
2.51
3.01
3.51


River Subarea
PAH Diagnostic Double Ratio 3: FLA/PYR tp DBF/FLE
Ratio sources:
DBF/FLE
Urban background 0.4 -9.3 (EPRI 2008)
Fuel Hydrocarbons: Approximate,.from GEI (2009) analysis Fig 1
CC/CO Tars: 0.4-1.1 (EPRI 2000)
CWG Tars: 0.1-0.5 (EPRI 2000)
FLA/PYR
Urban background 0.9-1.4 (EPRI 2008)
Fuel Hydrocarbons: Approximate,.from GEI (2009) analysis Fig 1
CC/CO Tars: 0.9-1.5 (EPRI 2000)
CWG Tars: 0.55-0.9 (EPRI 2000)
Note: Due to large number of samples sample IDs are not shown for the river subarea
Typical urban background
CC/CO Tars
CWG Tars
Petroleum
DBF/FLE
FLA/PYR
2.10
2.00
1.90
1.80
1.70
1.60
1.50
1.40
1.30
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
0.90
1.00
1.10
1.20
1.30
1.40

River Subarea



Attachment C Multivariate Statistical Analysis

Multivariate Statistical Analysis Forensics

Purpose and Objective

The graphical double ratio-based methods of polycyclic aromatic hydrocarbon (PAH) forensic analysis sufficiently identified the likely provenance of a substantial percentage of the samples for the Site. However, there remained two categories reflecting uncertainty – samples with possibly tar-like material and samples with likely tar-like material – that could not be positively identified in the categories of either Consistent with MGP Source or Consistent with Background/Inconsistent with MGP Source. Multivariate statistical analysis (MVSA) was selected as a robust mathematical technique to further refine the results from the graphical double ratio-based forensic methods. The goal was to positively identify all samples as either Consistent with MGP Source or Consistent with Background/Inconsistent with MGP Source.

MVSA consists of a wide variety of methodologies to analyze large datasets with multiple variables. When reference samples for original source materials are not available or when weathering has altered the original source materials extensively, MVSA is an exercise in Exploratory Data Analysis (EDA) (Johnson et al., 2015). The objective of EDA is to find patterns, correlations, and relationships in the data itself, with few assumptions or hypotheses (Tukey, 1977). In environmental forensic analyses we often do not have original reference samples and it is common for samples of tested environmental media (soil, sediment, water) to have undergone extensive weathering. As a result, EDA is often the only valid option (Johnson et al., 2015).

Methodology

The general steps in MVSA (assuming relevant laboratory analytical data is available) can vary, but for this evaluation included:

1. Selection of an optimal dataset for analysis;
2. Data transformations to normalize scale and approximate distribution normality;
3. Calculation of "resemblance" matrices;
4. Implementation of two MVSA techniques to validate results – Principal Component Analysis (PCA) and Non-Metric Multidimensional Scaling (NMDS); and
5. Analysis of 2D and 3D ordination plots from PCA and NMDS in comparison to graphical forensic double ratio analyses.

Results of the MVSA analyses were then used to confirm the validity of the graphical forensic double ratio analyses and "fine-tune" those analyses where uncertainty existed. Samples previously identified as likely TLM were able to be positively correlated and many of the samples previously identified as possibly TLM were able to be positively correlated. However, some samples identified as possibly TLM still remained. Standard statistical techniques were then applied to analyze the resulting end-member groups that included categories for samples representative of:

- Consistent with MGP Source;
- Consistent with Background/Inconsistent with MGP Source (group of all non-carbureted water gas [CWG] samples); and
- Tar-like Material (TLM) possibly present (representing uncertainty).

In order to enhance the diagnostic power of the MVSA techniques, it is sometimes necessary to analyze only a subset of the variables, particularly for complex mixtures that have been subjected to weathering (Christensen and Tomasi, 2007). The initial step consisted of removing all samples with total PAH concentrations less than 0.5 milligram per kilogram (mg/kg) as they represented weathering to such an extent that diagnostic power was radically reduced as determined through the graphical forensic ratio analysis. Analytes that were not diagnostic for PAH containing compounds were then removed (e.g., lead), essentially leaving a data matrix of PAHs.

As is common in EDA, the MVSA process was replicated multiple times beginning with the entire dataset and then gradually reducing the selected variables to identify a set of variables with high diagnostic power. Ultimately, the final analysis was conducted with two key variable sets:

1. Retene – can be positively diagnostic for coal fines and negatively diagnostic for CWG (EPRI, 2008)
2. An assemblage of PAHs that represented the removal of widespread urban background "noise" and represented analytes resistant to extensive weathering alteration

Retene is present at significant concentrations in coal but less common in coal tar or petroleum products. Thus it has a high diagnostic power for coal fines (EPRI, 2008). The assemblage of PAHs ultimately selected for analysis was based on both multiple iterations of MVSA as well as a detailed understanding of the total assemblage of PAHs present in the dataset and selection of those most likely to retain diagnostic power for the original source via resistance to weathering. Multiple iterations of MVSA coupled with an understanding of weathering and the ultimate likely composition of PAH assemblages demonstrated that the heavier molecular weight analytes were common to most samples and tended to obscure differentiation. By removing these heavier analytes from the analysis, the desired signal-to-noise ratio (SNR) was significantly improved, facilitating differentiation of samples by provenance. Conversely, removal of lighter PAHs reduced the effects of weathering of the various samples, thereby increasing the SNR and diagnostic power.

The final PAH assemblage selected for analysis included:

- 1-Methylpyrene
- 2-Methylpyrene
- 4-Methylpyrene
- Benzo(b)fluorene
- Benzo(c)fluorene
- C1-Fluoranthenes/Pyrenes
- C2-Fluoranthenes/Pyrenes
- C3-Fluoranthenes/Pyrenes
- Fluoranthene
- Pyrene
- Retene

The second step consisted of data transformations that must be performed when forensically analyzing sample analyte concentration data to normalize the scale of concentrations to deemphasize concentration effects and focus on analyte ratios and to approximate normal distributions of the various analytes (variables) to be incorporated into the analysis.

In the EDA process implemented, multiple different transformations were tested to determine the associated diagnostic power. Ultimately, the transformations that provided the highest diagnostic power included two mathematical approaches:

1. Normalization of each analyte to the total concentration of all analytes by sample
2. Square root of the resulting normalized data

This provided a dataset with similarly scaled magnitudes for analyte normalized concentrations allowing a focus on analyte ratios instead of magnitudes and also provided a dataset where each transformed analyte's values approximated normality to facilitate diagnostic power.

The third step consisted of the calculation of "resemblance" matrices that are different for NMDS and PCA but effectively complementary to each other, and that serve to provide the mathematical basis for grouping and trending the various samples. For NMDS a resemblance matrix based on Euclidean distance was utilized. For PCA, the resemblance matrix is a covariance matrix from which eigenvectors and eigenvalues are calculated to identify the principal components.

The fourth step consists of two key tasks – implementation of NMDS to develop 2D and 3D ordination plots and implementation of PCA to develop 2D and 3D ordination plots as well as loadings that can be evaluated separate from the ordination plots. As a practical matter, both NMDS and PCA generate substantially similar outputs in the form of ordination maps wherein samples are plotted spatially according to their similarities, and vectors of the individual variables (analytes or transformed analytes) can be overlaid to better understand what drives those groupings, trends, and differences.

Interpretation of Results

This dataset consists of a large number of samples, and the ordination maps that result have to represent the entirety of that dataset. Consequently, they can be challenging to interpret, and require study in three dimensions to better understand the results of both analyses. For example, when we view the ordination map in 2D, it appears that some samples overlap each other, but when we rotate and view it in 3D we can see that in fact they are separated in that 3D space. We cannot share a 3D view in a 2D medium (this report). However, in order to demonstrate the results of the NMDS and PCA ordination maps we have provided figures showing three different 2D views of 3D rotations focused on some of the key differentiations (Figure 1 and Figure 2).

For example, Figure 1a shows a rotation of the 3D NMDS ordination map focused on demonstrating the impact of high retene concentrations in samples to demonstrate how those samples, which are diagnostic for coal fines rather than CWG, can be resolved using the ordination maps.

Figure 1a – 3D NMDS Ordination Map

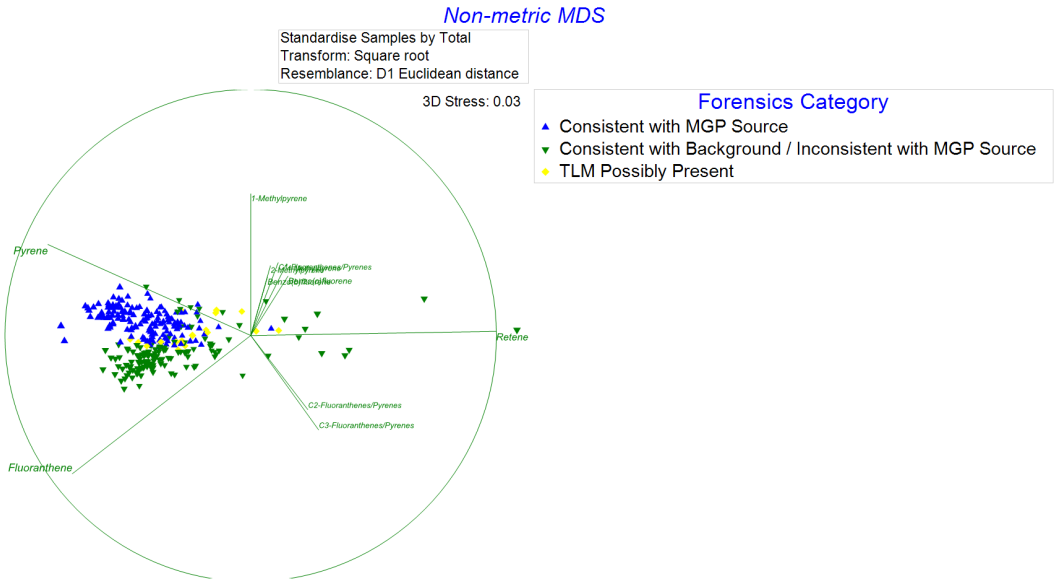


Figure 2b shows a rotation of the NMDS ordination map with the retene axis now directed into the page and focused on demonstrating the primary categories of samples Consistent with MGP Source (blue) partially surrounded by a halo of samples Consistent with Background / Inconsistent with MGP Source (green). The uncertain TLM Possibly Present samples (yellow) tend to occur in the boundary zone between the two primary categories. The green samples tend to partially surround the blue samples because the Consistent with Background / Inconsistent with MGP Source category is a catch-all category that likely represents multiple different sources and is defined by anything that is not Consistent with MGP Source.

Figure 2b – 3D NMDS Ordination Map

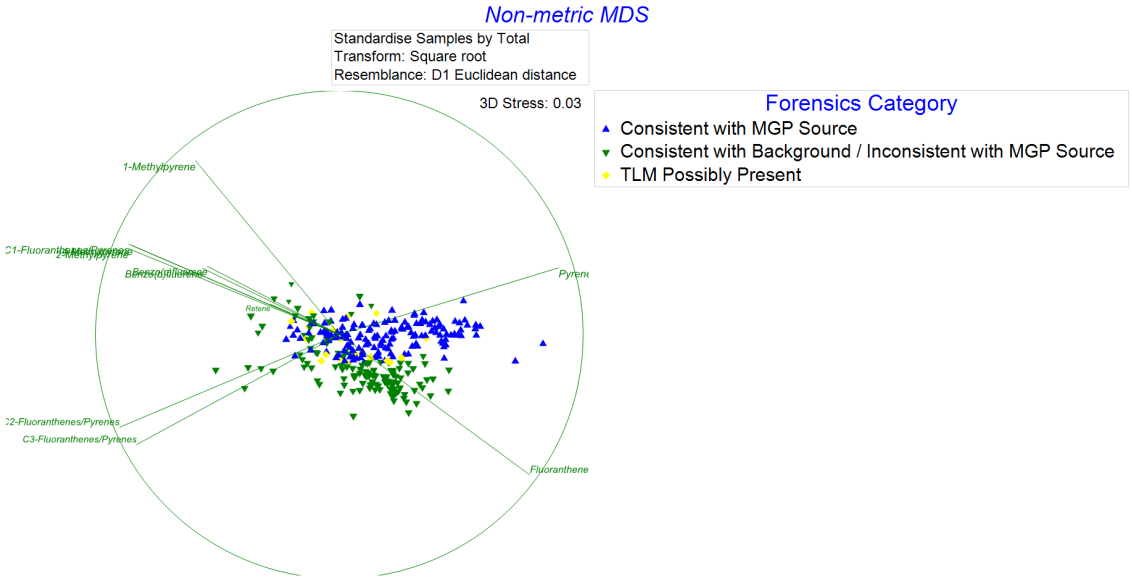
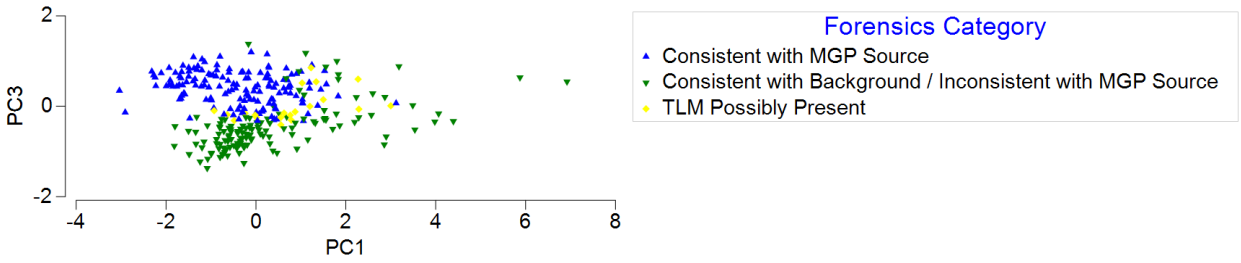


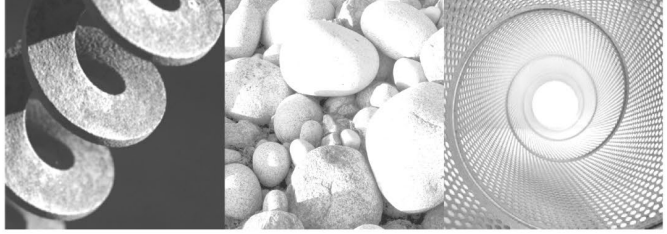
Figure 2a is a 2D ordination map for PCA showing principal components 1 vs 3 to demonstrate the grouping of samples that principal component 3 (PC3) was able to resolve. While PCA components are ordered in terms of the variability they represent (i.e., PC1 resolves more variability than PC2, etc.), in actuality, the higher-level principal components can effectively resolve differentiation of samples (Christensen and Tomasi, 2007). In this case, PC3 provides a substantial separation to distinguish the three categories of samples.

Figure 2a – 2D PCA Ordination Map



The methodology that was utilized was for the MVSA forensics to be interpreted in conjunction with the graphical forensic double ratios to drill down into individual samples with uncertainty to utilize the multivariate analyses to resolve uncertainty where possible. This method was highly effective to resolve all samples previously identified as likely TLM and to resolve many of the samples previously identified as possibly TLM.

Appendix R Supplemental Method 3 Human Health Risk Characterization



GEI Consultants

MassDEP RTN 3-24070

Human Health Method 3 Risk Characterization

Amesbury Former MGP Site, Amesbury, Massachusetts

Submitted to:
Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup
Northeast Regional Office
150 Presidential Way
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October 2025
Project No. 1804576



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Attachments

Attachment A Current Risk Calculations (including MassDEP Shortform Output)
Attachment B Future Risk Calculations (including MassDEP Shortform Output)

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Acronyms and Abbreviations

ADD	Average Daily Dose
ADE	Average Daily Exposure
CSF	Cancer Slope Factor
ELCR	Excess Lifetime Cancer Risk
HI	Hazard Index
HQ	Hazard Quotient
IRIS	Integrated Risk Information System
(L)ADD	Lifetime Average Daily Dose
(L)ADE	Lifetime Average Daily Exposure
RAF	Relative Absorption Factor
RfC	Reference Concentration
RfD	Reference Dose
SMP	Soil Management Plan
SVOC	Semi-volatile Organic Compound
µg/L	Micrograms per Liter
URF	Unit Risk Factor

Note: Additional acronyms and abbreviations were presented in the Method 3 Risk Characterization and are not presented here.

Executive Summary

On behalf of Boston Gas Company d/b/a National Grid (National Grid), GEI characterized risks to human health, safety, and public welfare associated with environmental conditions related to the former Manufactured Gas Plant (MGP) located at 39 Water Street in Amesbury, Massachusetts (the Site) to support the Supplemental Phase II Comprehensive Site Assessment Report (Supplemental Phase II CSA Report). The Site is a Massachusetts Department of Environmental Protection (MassDEP) disposal site and is assigned Release Tracking Number (RTN) 3-24070. GEI prepared this Method 3 Human Health Risk Characterization in accordance with 310 CMR 40.0900 of the Massachusetts Contingency Plan (MCP) (310 CMR 40.0000) and relevant MassDEP guidance.

GEI prepared the Supplemental Phase II CSA Report as a follow up to the July 2009 Phase II CSA Report and Phase III Remedial Action Plan (Phase II/III Report), in response to the discovery of residual coal tar in the form of non-aqueous phase liquid (NAPL) in an adjacent wetland area in 2017, and subsequently in the Powwow River mudflats, and within the main Powwow River channel beyond the southeastern limits of the original disposal Site boundary. The Supplemental Phase II CSA addresses environmental conditions associated with the revised expanded disposal Site boundary established in this report based on supplemental Phase II CSA investigations conducted by GEI between 2017 and 2024.

The primary source of releases at the Site is attributed to former MGP operations. The revised Site boundary includes the National Grid property (39 Water Street), a portion of a City of Amesbury property (39A Water Street), a small, subdivided wetland portion of a privately-owned property (33R Oakland Street), a small upland portion of the abutting property at 34-40 Water Street, and 28 additional properties along the Powwow River, some upstream of the former MGP but most downstream of the former MGP. The expanded Site boundary includes the former Amesbury MGP, downstream wetlands, mudflats, and portions of the main channel of the Powwow River, most of which is privately owned. Current property use along the Powwow River within the Site boundary includes residential, commercial, industrial, two schools, and undeveloped land. Accordingly, GEI has prepared a Method 3 human health risk characterization to evaluate exposure to wetland sediment, Powwow River mudflats, Powwow River sediment, surface water and a small upland portion of 34-40 Water Street where the disposal Site boundary has been expanded since the 2009 Phase II/III Report.

Contaminants of Concern (COCs) at the Site include volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), which primarily include polycyclic aromatic hydrocarbons (PAHs), extractable petroleum hydrocarbon (EPH) ranges, volatile petroleum hydrocarbon (VPH) ranges, and metals.

GEI evaluated the following exposure points, where applicable:

- Wetland Surface Sediment (0 to 2 feet)
- Wetland Deep Sediment (greater than 2 feet)
- Mudflat Surface Sediment (0 to 2 feet)
- Mudflat Deep Sediment (greater than 2 feet)
- River Surface Sediment (0 to 2 feet)

- River Deep Sediment (greater than 2 feet)
- Upland Surface Soil (0 to 3 feet) at 34-40 Water Street

For river sediment, GEI evaluated the following three separate river segments under current and future land use: Segment I (Water Street Area), Segment II (Oakland Street / Oak Street Area), and Segment III (River Street Area). GEI evaluated risk to the following current and future human receptors at the Site in consideration of current and future Site use and activities, where applicable:

- Current and future resident
- Current and future recreational visitor
- Current and future commercial worker
- Current and future trespasser
- Current and future emergency utility worker
- Future construction worker

Based on the Method 3 Risk Characterization, GEI concluded the following:

E.S.1. Human Health Risk Characterization

There was significant risk to the following current and future receptors:

- Current resident due to potential exposure to surface sediment in a few isolated locations in Segments I and II of the river;
- Current resident at four properties (35, 37, and 41 Oakland Street and 4 Oakland Court) due to potential exposure to surface sediment in the wetland and/or mudflat;
- Current recreational visitor due to potential exposure to surface sediment in the mudflat;
- Current recreational visitor due to potential exposure to surface sediment in Segment II of the river;
- Future resident due to potential exposure to Segment-wide deep sediment at Segment II and Segment III of the river as well as deep sediment in multiple isolated locations in Segments I, II, and III of the river;
- Future recreational visitor due to potential exposure to Segment-wide deep sediment at Segment II and Segment III of the river, and Site-wide, including all three segments of the river;
- Future trespasser due to potential exposure to deep sediment in multiple isolated locations in Segments II and III of the river; and
- Future construction worker due to potential exposure to deep sediment in multiple isolated locations in Segments II and III of the river.

For properties where exposures to wetland, mudflat, and river sediment were added together, risk may be overestimated because adding these risks together results in a higher exposure frequency for the receptor.

We concluded NSR for all other current and future exposure scenarios not identified above, including for the current trespasser and the utility worker.

34-40 Water Street Upland Surface Soil

There is NSR to a potential future resident from exposure to accessible upland surface soil located adjacent to the recreational path at 34-40 Water Street. As a result, there is also NSR to any lesser exposed receptors at this portion of the Site, including a commercial worker, recreational visitor, and an emergency utility worker as the resident is the most sensitive receptor.

There is also NSR to a future resident at 34-40 Water Street from potential residential exposure to river surface sediment. In addition, there is NSR to a future resident at 34-40 Water Street from cumulative exposure to upland surface soil as well as residential exposure to river surface sediment. However, there is significant risk to a resident at 34-40 Water Street from cumulative residential soil and sediment exposure as well as recreational exposure to Site-wide river surface sediment. This exposure scenario conservatively assumed a resident may contact river surface sediment in the vicinity of their property and may also contact Sitewide river surface sediment during recreational activities. A planned AUL at 34-40 Water Street will prohibit exposure to deeper upland soil (greater than 3 feet) and deeper river sediment (greater than 2 feet).

Readily Apparent Harm

A condition of Readily Apparent Harm (RAH) was identified at the Site due to the presence of NAPL over an area greater than 1,000 square feet in sediment within one foot of the sediment surface in wetland, mudflat and river surface sediment. The RAH conditions at the Site will be remediated as these areas represents a substantial hazard. MGP waste deposits comprised of small isolated pieces of hardened tar were observed in shallow wetland sediment on 35 Oakland Street and 37 Oakland Street within an RAH area; however, these isolated, small pieces of tar did not comprise significant, continuous MGP waste deposits distinguishable from the sediment matrix. As a result, visible coal tar waste deposits as defined by MassDEP were not identified at the Site.

Applicable or Suitably Analogous Standards

There are no COC exceedances of applicable or suitably analogous standards in surface water at the Site.

E.S.2. Safety Risk Characterization

Based on observations and information collected during environmental investigations of the Site, a condition of NSR of harm to safety exists at the Site.

E.S.3. Public Welfare Risk Characterization

Based on observations and information collected during environmental investigations of the Site, no community at or near the Site experiences adverse impacts to public welfare under current or anticipated future conditions. The RAH conditions at the Site will be remediated as these areas represent a substantial hazard. Average concentrations of COCs in upland surface soil at 34-40 Water Street are below M3CLs and maximum concentrations of chemicals detected in groundwater at the upland portion of 34-40 Water Street are below M3CLs. Accordingly, a condition of NSR of harm to public welfare exists at the Site.

1. Introduction

On behalf of Boston Gas Company d/b/a National Grid (National Grid), GEI characterized risks to human health, safety, and public welfare associated with environmental conditions related to the former Manufactured Gas Plant (MGP) located at 39 Water Street in Amesbury, Massachusetts (the Site) to support the Supplemental Phase II Comprehensive Site Assessment Report (Supplemental Phase II CSA Report). The Site is a Massachusetts Department of Environmental Protection (MassDEP) disposal site and is assigned Release Tracking Number (RTN) 3-24070. GEI prepared this Method 3 Human Health Risk Characterization in accordance with 310 CMR 40.0900 of the Massachusetts Contingency Plan (MCP) (310 CMR 40.0000) and relevant MassDEP guidance.

GEI prepared the Supplemental Phase II CSA Report as a follow up to the July 2009 Phase II CSA Report and Phase III Remedial Action Plan (Phase II/III Report), in response to the discovery of residual coal tar in the form of non-aqueous phase liquid (NAPL) in an adjacent wetland area in 2017, and subsequently in the Powwow River mudflats, and within the main Powwow River channel beyond the southeastern limits of the original disposal Site boundary. The Supplemental Phase II CSA addresses environmental conditions associated with the revised expanded disposal Site boundary established in this report based on supplemental Phase II CSA investigations conducted by GEI between 2017 and 2024.

Accordingly, GEI has prepared a Method 3 human health risk characterization to evaluate exposure to wetland sediment, Powwow River mudflats, Powwow River sediment, surface water and a small upland portion of 34-40 Water Street where the disposal Site boundary has been expanded since the 2009 Phase II/III Report as described in Section 1.4 of the Supplemental Phase II CSA report. The human health exposure assumptions and risk calculation tables are presented in Appendix R.

1.1. Applicability and General Requirements

The requirements and procedures for characterizing risks of harm to human health, safety, and public welfare are provided in 310 CMR 40.0900. GEI prepared this Method 3 Risk Characterization in accordance with the MCP, MassDEP's Interim Final Policy #WSC/ORS-95-141 "Guidance for Disposal Site Risk Characterization," dated July 28, 1995 (MassDEP, 1995), and other applicable MassDEP and federal guidance, including Draft Guidance Chapters of the Risk Characterization Guidance issued by MassDEP in March and June 2024 in support of the MCP.

1.2. Purpose

In accordance with 310 CMR 40.0902, this Method 3 Risk Characterization was prepared to establish whether a level of NSR exists at the Site, and to support the Supplemental Phase II CSA.

1.3. Scope

The scope of this risk characterization provides sufficient documentation to demonstrate that the Response Action Performance Standards have been met (310 CMR 40.0191).

1.4. Site Background

GEI performed investigations at the Site between April 2017 and September 2024 on behalf of National Grid for the Supplemental Phase II CSA Report. The objectives of the investigations were to delineate the extent of MGP impacts within the wetland, mudflat, and Powwow River channel beyond the limits of the original disposal Site boundary; evaluate whether various migration pathways existed and could contribute to movement of contaminants; evaluate potential human health and ecological risks; and support future remediation permitting and design. The results of the supplemental Phase II CSA investigations are provided in detail in the Supplemental Phase II CSA Report to which this Method 3 human health risk characterization is appended.

1.5. Site Description

The Site includes the former Amesbury MGP at the end of Water Street, downstream wetlands, mudflats, and portions of the main channel of the Powwow River. The lower Powwow River is a freshwater tidal river system. The lower river (also referred to as the tidewater) begins in downtown Amesbury where it exits from a culvert beneath the bridge on Main Street. Downstream of this is the confluence with the Back River, just upstream of the former Amesbury MGP Site. The portion of the Powwow River within the Site boundary includes approximately 150 feet upstream and approximately 5,150 feet downstream, including a former channel of the Powwow River that was filled during the 1960s as part of the Interstate 495 construction.

Section 2, including Table 1-1, of the Supplemental Phase II CSA Report summarizes the properties within the Site boundary and their property use, including residential, commercial, industrial, schools, and undeveloped land. Properties within the Site include single-family residences along Oakland Street and River Street; multi-family residences at 24 Oak Street and 32 Macy Street; commercial/industrial properties (and a daycare) at 34-40 Water Street, 7 Noel Street, and 58 Macy Street; two school properties at 8 Noel Street and 222 Main Street; a portion of the Northbound and Southbound lanes of Interstate 495 (I-495); and a portion of the onramp connecting Route 110 (Macy Street) to I-495 Southbound. These and other properties surrounding the Site are shown in a Site plan in Fig. 2 of the Supplemental Phase II CSA Report. Although property uses vary within the Site, there are no buildings within the Site boundary. As described above, the Site only includes undeveloped wetlands, mudflats, and portions of the main channel of the Powwow River. There are electric transmission lines with easements within the Site, including on most of the properties on the western bank of the Powwow River; and there are sewer lines with easements within the Site at 1 Field Street.

There are no known drinking water supplies (Zone II areas, Interim Wellhead Protection Areas, Zone A areas, Potentially Productive Aquifers, or private wells) or Sole Source Aquifers within 500 feet of the Site. The Powwow River (tidal portion) is designated as a Class SB water and is a habitat for fish, other aquatic life, and wildlife and primary and secondary contact recreation. It is also designated as a restricted shell fishing area. The Site is not Protected Open Space; however, there is Protected Open Space along the river at 38 Childs Avenue and 56 Macy Street. Although not Protected Open Space, a riverwalk maintained by the City of Amesbury runs along the northern boundary of the Site (on 34-40 Water Street) and a portion of the eastern boundary of the Site (on the Oakland Street and Oakland Court properties).

2. Hazard Identification

The Hazard Identification section summarizes the type and concentrations of chemicals detected at the Site, the media in which they occur, and the Constituents of Concern (COCs).

2.1. Analytical Data

Chemical data are available for samples collected in wetland sediment, mudflat sediment, river sediment, river sediment porewater (i.e., groundwater), surface water, and upland surface soil (0 to 3 feet) and groundwater at 34-40 Water Street from within the revised disposal Site boundary. Sediment samples included chemical analysis for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), volatile petroleum hydrocarbons (VPH), extractable petroleum hydrocarbons (EPH), total petroleum hydrocarbons (TPH), metals and cyanide. Chemical data included in the risk characterization are presented in Tables 2 through 10 of the Supplemental Phase II CSA Report. Sampling locations are presented in Figures 11 and 12 of the Supplemental Phase II CSA Report. Analytical data evaluated for each medium in this human health risk characterization are presented below.

2.1.1. River Sediment

GEI included in the risk characterization a total of 273 sediment samples collected between 2017 and 2024 at depths ranging from 0 to 9 feet below sediment surface from the portion of the Powwow River located within the Site boundary:

- 135 of these sediment samples were collected from the top 2 feet of river sediment from 26 separate properties along the river and from an area designated as the Commonwealth of Massachusetts tidelands.
- 138 of these sediment samples were collected from river sediment depths deeper than 2 feet from 22 separate properties along the river and from an area designated as the Commonwealth of Massachusetts tidelands.

Chemicals detected in river sediment include VOCs, SVOCs, TPH, VPH, EPH and metals. Summary statistics for surface river sediment (0 to 2 feet) and deep river sediment (greater than 2 feet) chemical data included in the risk characterization are presented in Tables RC-1 and RC-2.

There were no observations of MGP waste deposits (i.e., solid or semi-solid coal tar) in river sediment. NAPL was observed in sediments in the river within a narrow band in the center of the river, primarily on 1 Field Street and 8 Noel Street on the northern side of the river and on the Oakland Street and Oak Street properties on the southern side of the river (Fig. 13 of the Supplemental Phase II CSA Report). NAPL was not observed in sediments south of 8 Noel Street and 3 River Street. NAPL was observed in sediments in the river generally at depths from as shallow as about 1 or 2 feet up to about 8 or 9 feet below the sediment surface. In the downstream stretch of the river, overlying shallow sediments likely deposited after dredging did not have visible NAPL except for two locations at 1 Field Street where NAPL was shallower than 1 foot, representing RAH.

2.1.2. Wetland Sediment

GEI included in the risk characterization a total of 58 wetland sediment samples collected between 2017 and 2024 at depths ranging from 0 to 9 feet below sediment surface from the wetlands located on four properties (33R Oakland Street, 35 Oakland Street, 37 Oakland Street, and 39 Oakland Street) and from an area designated as the Commonwealth of Massachusetts tidelands (within the former river channel) within the Site boundary:

- 42 of these wetland sediment samples were collected from the top 2 feet of wetland sediment from four separate properties (33R Oakland Street, 35 Oakland Street, 37 Oakland Street, and 39 Oakland Street) and from an area designated as the Commonwealth of Massachusetts tidelands (within the former river channel).
- 16 of these wetland sediment samples were collected from wetland sediment depths deeper than 2 feet from three separate properties (33R Oakland Street, 35 Oakland Street, 37 Oakland Street) and from an area designated as the Commonwealth of Massachusetts tidelands (within the former river channel).

Chemicals detected in wetland sediment include VOCs, SVOCs, VPH, EPH, TPH and metals. Summary statistics for wetland surface sediment (0 to 2 feet) and wetland deep sediment (greater than 2 feet) chemical data included in the risk characterization are presented in Tables RC-3 and RC-4.

Small, isolated pieces of hardened, solid coal tar were observed downstream of the former MGP footprint in the wetland on 35 Oakland Street and 37 Oakland Street (Fig. 11 of the Supplemental Phase II CSA Report and Table 1 of the Supplemental Phase II CSA Report). These solid tar pieces were observed in only six of the 96 hand excavated test pits at 35 Oakland Street and 37 Oakland Street. The solid tar pieces were observed at depths ranging from about 0.2 to 1.2 feet. There were no observations of continuous or isolated layers of MGP waste deposits of solid or semi-solid tar at 35 Oakland Street and 37 Oakland Street; only these small pieces of solid tar. However, for the purposes of graphically presenting the locations of these MGP waste deposits, the lateral extent of these MGP waste deposits in the wetland are shown in Fig. 14 of the Supplemental Phase II CSA Report. There were no observations of continuous or isolated layers of MGP waste deposits of solid or semi-solid tar anywhere else on the Site, including the wetland and mudflat on other nearby properties or in any portion of the river. The isolated, small pieces of tar observed at the Site did not comprise significant, continuous MGP waste deposits distinguishable from the sediment matrix. As a result, visible coal tar waste deposits as defined by MassDEP were not identified at the Site.

NAPL was observed in sediments in the wetland, primarily on 35 Oakland Street and 37 Oakland Street, although it was also observed at 33R Oakland Street to the north (Fig. 14 of the Supplemental Phase II CSA Report). This area of NAPL in sediments is generally coincident with observed locations of small, isolated pieces of hardened, solid coal tar, also shown in Fig. 14 of the Supplemental Phase II CSA Report. NAPL was observed in sediments in the wetland at depths ranging from about 0.2 to 2.5 feet. As a result, a condition representing RAH was identified in the wetland along Oakland Street based on the visible presence of NAPL over an area greater than 1,000 square feet in sediment within one foot of the sediment surface. This condition represented RAH (310 CMR 0995(3)(b)(1)(c)) and a Substantial Hazard (310 CMR 40.0956(2)(b)).

2.1.3. Mudflat Sediment

GEI included in the risk characterization a total of 55 mudflat sediment samples collected between 2018 and 2024 at depths ranging from 0 to 8 feet below sediment surface from the mudflats located on four properties (39 Oakland Street, 41 Oakland Street, 43 Oakland Street, and 4 Oakland Court) within the Site boundary:

- 45 of these mudflat sediment samples were collected from the top 2 feet of mudflat sediment from four separate properties (39 Oakland Street, 41 Oakland Street, 43 Oakland Street, and 4 Oakland Court).
- 10 of these mudflat sediment samples were collected from mudflat sediment depths deeper than 2 feet from two separate properties (39 Oakland Street and 4 Oakland Court).

Chemicals detected in mudflat sediment include VOCs, SVOCs EPH, TPH and metals. Summary statistics for mudflat surface sediment (0 to 2 feet) and mudflat deep sediment (greater than 2 feet) chemical data included in the risk characterization are presented in Tables RC-5 and RC-6.

NAPL was observed in sediments in the mudflat on 39 and 41 Oakland Street (Fig. 14 of the Supplemental Phase II CSA Report). NAPL was observed in sediments in the mudflat at depths ranging from about 0.5 to 1 foot. As a result, a condition representing RAH was identified in the mudflat along Oakland Street based on the visible presence of NAPL over an area greater than 1,000 square feet in sediment within one foot of the sediment surface. This condition represented RAH (310 CMR 0995(3)(b)(1)(c)) and a Substantial Hazard (310 CMR 40.0956(2)(b)).

2.1.4. Surface Water

Surface water samples collected from 2007 to 2008 as part of the original Phase II showed very low concentrations of naphthalene and petroleum hydrocarbons detected in one surface water sample collected in the Powwow River. However, the type and magnitude of surface water contamination was similar to background conditions in an upstream surface water sample also collected in the Powwow River.

Between September 2019 and July 2020, GEI collected eight surface water samples from the Powwow River (SW501 through SW503; and SW601 through SW605) and five surface water samples from the small stream in the wetland on 33R, 35, and 37 Oakland Street that discharges to the Powwow River mudflat (SW606 through SW610) to confirm that surface water conditions have not been impacted by the Site contamination. The samples were analyzed for PAHs and EPH fractions and are considered representative of contaminants potentially migrating from river sediment porewater (i.e., groundwater).

Based on these surface water analytical results, surface water within the Powwow River was not impacted by the MGP impacts identified in sediment. No contaminants were detected above laboratory reporting limits in surface water samples collected from the Powwow River.

Surface water in the wetland had detections of low concentrations of PAHs, specifically at 35 and 37 Oakland Street. The surface water detections generally corresponded to locations with visual observations of shallow coal tar (i.e., within the area of the RAH condition). Detected concentrations of

PAHs in wetland surface water are below available EPA Ambient Water Quality Criteria (AWQC) for the consumption of water and organisms. In addition, although not directly applicable to surface water in the Powwow River and wetlands, detected concentrations of PAHs in wetland surface water are below MassDEP GW-1 groundwater standards considered acceptable for COCs in drinking water. Therefore, surface water is considered a de minimis exposure pathway for receptors at the Site and is not evaluated further. Summary statistics for surface water chemical data evaluated in the risk characterization and comparison to available AWQC and MCP groundwater standards are presented in Table RC-7.

2.1.5. Upland Surface Soil

GEI included in the risk characterization five upland surface soil samples collected from the top 3 feet of soil in November 2023 from a small portion of 34-40 Water Street located within the Site boundary. All five surface soil samples were collected adjacent to the Amesbury recreational bike path. A planned AUL at 34-40 Water Street will prohibit contact with soil deeper than 3 feet. Chemicals detected in surface soil include VOCs, SVOCs, VPH, EPH, and metals. Summary statistics for soil chemical data included in the risk characterization are presented in Table RC-8.

The depth to groundwater at 34-40 Water Street is 17 feet and is therefore not considered a potential source for vapor intrusion or a concern for direct contact by a utility worker excavating to a depth of 6 feet. DNAPL has been observed at a depth of approximately 24 to 25 feet at 34-40 Water Street. An existing AUL at 34-40 Water Street requires a Health and Safety Plan for activities that may cause direct contact with groundwater. A second AUL will be implemented at 34-40 Water Street, which will be consistent with the existing AUL for the property, but also require a NAPL Management Plan for any subsurface excavation. As a result, overlapping AULs at 34-40 Water Street will eliminate potential uncontrolled exposures to groundwater; therefore, groundwater at 34-40 Water Street was not evaluated further in the human health risk characterization.

2.2. Data Management

GEI assumed that chemicals that were not detected in a sample were present at one-half the detection limit for the purpose of calculating average concentrations. This approach is consistent with Section 7.3.3.5 of MassDEP's "Guidance for Disposal Site Risk Characterization" (MassDEP, 1995).

For duplicate samples, GEI included the highest detected concentrations. If a chemical was detected in only one of the duplicate samples, GEI used the detected concentration for that sample location. If a chemical was not detected in either field duplicate sample, GEI used the lower detection limit for that sample location.

For some sediment samples, analytical results for the same chemicals were available from multiple methods, including Method 8260 and 8270 laboratory analyses and the VPH/EPH Methods. The results for these analytical methods were combined to develop the data set for VOCs (Method 8260/VPH target analytes) and PAHs (Method 8270/EPH target analytes). If a sample had detections by both methods, the higher concentration was incorporated into the EPCs. If a sample was non-detect by both methods, the lowest laboratory reporting limit was incorporated into the EPCs. In addition, TPH analytical data was excluded from the risk characterization because VPH and EPH analytical data were available for

sediment samples and is the preferred method to evaluate risk from exposure to petroleum hydrocarbons.

2.3. COC Selection

According to Section 2.4 of MassDEP's "Guidance for Disposal Site Risk Characterization" (MassDEP, 1995), all OHM at a disposal site should be considered COCs unless one of the following conditions is true:

- The chemicals are present at both a low frequency of detection and low concentrations;
- The chemicals are present at levels that are consistent with "background" for the area and there is no evidence that their presence is related to activities at the Site; or
- The chemicals are field or laboratory contaminants.

GEI included all chemicals detected in upland surface soil at 34-40 Water Street as COCs. The following chemicals detected in sediment were excluded from the risk characterization due to either a potential laboratory contaminant or they were present at both low frequency of detection and concentration: acetone, 2-butanone, 1,1-dichloroethylene, trans-1,2-dichloroethylene, 1,1-biphenyl, bis-2-ethylhexylphthalate, butylbenzylphthalate, dibenzofuran, phenol, copper, polychlorinated biphenyls (PCBs), organochlorine pesticides, and chlorinated herbicides. In addition to being detected at both a low frequency of detection and concentration, these chemicals are not associated with MGP-related contamination and were primarily only detected at low concentrations in sediment disposal characterization samples. In addition, in accordance with MassDEP petroleum guidance, volatile chemicals included in the VPH C9 to C10 aromatic fraction are excluded as COCs, including the following: n-butylbenzene, sec-butylbenzene, isopropylbenzene, 4-isopropyltoluene, n-propylbenzene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene.

Summary statistics for COCs in upland surface soil and wetland, mudflat, and river sediment are presented in Tables RC-1 through RC-8. The COCs identified in upland surface soil include VOCs, SVOCs, VPH, EPH, and metals. The COCs identified in wetland sediment, mudflat sediment, and river sediment, include VOCs, SVOCs, EPH, VPH, and metals.

3. Exposure Assessment

In the exposure assessment, GEI identified and described human receptors that may encounter chemicals present in environmental media at the Site. GEI characterized potentially complete exposure pathways and exposure profiles for each receptor. As part of the exposure assessment GEI estimated the amount of each chemical that can potentially reach a receptor, defined as the exposure point concentration (EPC), and developed exposure scenarios to represent conservative estimates of exposure by sensitive receptors. These exposure scenarios consist of information about the amount, frequency, duration, and route of exposure to each chemical. GEI integrated the exposure profile and EPC to yield exposure doses or concentrations. In this assessment, dose estimates are protective in that they are more likely to overestimate than to underestimate exposure.

3.1. Identification of Human Receptors under Current and Future Site Activities and Uses

Human receptors at the Site and their potential exposures to COCs in wetland sediment, mudflat sediment, river sediment and upland surface soil at 34-40 Water Street are described below. GEI identified the following exposure areas based on current and potential future Site activities and use (presented on Figure RC-2):

River Segment I Properties:

- 34-40 Water Street (Commercial/Industrial - Water Street Commerce Condominium Trust; Daycare)
- 39 Water Street (Commercial - Haverhill Gas Light Co. [National Grid])
- 39A Water Street (City of Amesbury Property - Undeveloped Residential Lot)
- 33R Oakland Street (Residential)

River Segment II Properties:

- 35 Oakland Street (Residential)
- 37 Oakland Street (Residential)
- 39 Oakland Street (Residential)
- 41 Oakland Street (Residential)
- 43 Oakland Street (Residential)
- 4 Oakland Court (Residential)
- 24 Oak Street (Residential - Riverwalk Apartments)
- 26 Oak Street (Commercial - Massachusetts Electric [National Grid] Property)
- 28 Oak Street (Commercial - Massachusetts Electric [National Grid] Property) (Split Between River Segment II and III)

- 1 Field Street (Not Residential - Undeveloped Lot) (Split Between River Segment I and II)

River Segment III Properties:

- 8 Noel Street (School - Possible redevelopment with increased use)
- 7 Noel Street (Commercial - River Lane Realty)
- 3 River Street (Residential - Zoned Industrial but has a house on the property)
- 7 River Street (City of Amesbury Property – Undeveloped Residential Lot)
- 11 River Street (Residential)
- 21R River Street (City of Amesbury Property - Undeveloped Residential Lot)
- 27 River Street (Residential)
- 33 River Street (Residential)
- 51 River Street (City of Amesbury Property - Undeveloped Lot)
- 222 Main Street (School - Recreational Fields)
- 50 Macy Street (Commercial - Massachusetts Electric [National Grid] Property)
- 58 Macy Street (Commercial - Rock Church Ministries)
- Commonwealth of Massachusetts tidelands - River (portion of Site in river below mean low water)

Additional Exposure Areas:

- Combined Oakland Street Residential Properties in Wetland (33R, 35, 37 and 39 Oakland Street)
- Combined Oakland Street and Court Residential Properties in Mudflat (39, 41, and 43 Oakland Street and 4 Oakland Court)
- River Sediment Segment I (Water Street Area)
- River Sediment Segment II (Oakland Street / Oak Street Area)
- River Sediment Segment III (River Street Area)
- Site-wide Combined River Segments I, II, and III (All River Sediment)
- Commonwealth of Massachusetts tidelands – Wetland (portion of Site in former river channel below mean low water)

Although the majority of properties within the Site boundary are privately owned, access to all properties within the Site boundary is unrestricted. There are no buildings within the Site boundary; the Site only includes undeveloped wetlands, mudflats, and portions of the main channel of the Powwow River. In addition, a City of Amesbury recreational bike path is adjacent to a portion of the Site boundary.

Under current land use, the following receptors may be present at the Site:

- Resident

- Commercial Worker
- Trespasser
- Recreational Visitor
- Emergency Utility Worker

Future land use at the Site is expected to remain the same as current land use. Therefore, most receptors under current Site use may also be present under future Site use. In addition, if parcels were to be redeveloped in the future, construction workers may also be present. GEI also evaluated a future hypothetical resident as a potential future receptor for most exposure areas. Human receptors and their potential exposures to COCs in sediment and upland soil are described below.

3.2. Identification of Soil and Groundwater Categories

MassDEP has established categories of soil and groundwater for use in developing exposure profiles in a Method 3 Risk Characterization. The applicable MassDEP soil and groundwater categories for the Site are described below.

3.2.1. Applicable Soil Categories

Upland surface soil within the Site boundary at 34-40 Water Street is currently accessible and is located adjacent to the City of Amesbury recreational bike path. Under current land use, based on the soil category selection matrix provided in 310 CMR 40.0933(9), accessible surface soil at the Site (0 to 3 feet) is category S-1 soil. Children may be present at both a high frequency and high intensity under current conditions. Under future land use, 34-40 Water Street may be residential; therefore, accessible surface soil within the Site boundary (0 to 3 feet) is category S-1 soil because children residing at this portion of the Site may be present at both a high frequency and high intensity under future conditions.

3.2.2. Applicable Groundwater Categories

All groundwater in Massachusetts is category GW-3, based on the potential to discharge to surface water. Category GW-1 groundwater includes groundwater within a current or potential drinking water supply source area. However, there are no drinking water supply sources near the Site. Accordingly, groundwater is not classified as GW-1 at the Site.

Groundwater category GW-2 applies to groundwater that could impact indoor air quality via vapor intrusion. Groundwater in this category must be located within 30 feet of an existing occupied structure and the average annual depth to groundwater must be less than 15 feet. There are no occupied structures within the Site boundary; therefore, groundwater is not classified as GW-2 at the Site.

Groundwater across the Site is classified as GW-3 under current and future land use.

3.3. Exposure Scenarios

In the following subsections, we describe potential exposure pathways for each human receptor identified at the Site under current and future land use. The CSM, presented as Figure RC-1, provides a

diagrammatic representation of the human receptors included in the risk characterization and their potentially complete exposure pathways. Site COCs are present in wetland and mudflat sediment at the Oakland Street and Oakland Court properties and in river sediment at each of the properties within the Site boundary. The COCs identified in upland surface soil at 34-40 Water Street are primarily associated with urban fill and not the former MGP Site (Site-related impacts at the upland portion of 34-40 Water Street are present at depths greater than 20 feet); however, we have conservatively evaluated COCs in upland surface soil at 34-40 Water Street.

3.3.1. Current and Future Resident

GEI evaluated a resident exposure scenario within the Site boundary under current and potential future land use. For river sediment, GEI evaluated a resident exposure scenario at the three separate river segments under current and future land use. In addition, GEI conservatively evaluated potential residential exposure to all river sediment sampling locations considering each river sediment sample as a separate exposure point under current and future land use to identify isolated river sediment samples contributing to significant risk.

At properties with wetland sediment, mudflat sediment, and river sediment, we evaluated a resident exposure scenario, which assumed a 1- to 31-year-old resident may have contact with wetland sediment and mudflat sediment on their property as well as river sediment at the applicable river segment for the property for 1 day each week for the 7 warmer months while maintaining, surveying, and walking on their property. This exposure frequency conservatively assumes a resident will be exposed to wetland sediment, mudflat sediment, and river sediment for 30 days each year for 26 years even though the wetland area, mudflat area, and river area are not located near the residential houses or landscaped backyards and are difficult to access from the residences. In addition, at high tide there is up to 7 feet of water covering the river and mudflat sediment further limiting potential contact with sediment. A resident may be exposed to COCs in sediment from incidental ingestion and dermal absorption. Exposure assumptions including the sediment ingestion rate were set equal to the MADEP residential soil default exposure assumptions except for the sediment adherence factor, which was conservatively set equal to 1 mg/cm^2 in accordance with MADEP guidance.

For the 34-40 Water Street property, we also evaluated a resident exposed to accessible upland surface soil (0 to 3 feet) located adjacent to the Amesbury recreational bike path. Although 34-40 Water Street is currently used for commercial use, including a daycare, we conservatively assumed residential exposure to surface soil under current and future land use. A residential exposure scenario assumes a 1- to 31-year-old resident may have contact with surface soil for 5 days each week for the 7 warmer months while residing at 34-40 Water Street. All exposure assumptions for the resident are set equal to the MADEP residential soil default exposure assumptions. A planned AUL at 34-40 Water Street will prohibit contact with soil deeper than 3 feet. The AUL will also restrict the growing of fruits and vegetables for human consumption; therefore, residential exposure to soil deeper than 3 feet and homegrown produce were not evaluated for a resident at 34-40 Water Street. These restrictions are consistent with an existing AUL at 34-40 Water Street implemented for a different disposal site.

3.3.2. Current and Future Trespasser

GEI evaluated a trespasser exposure scenario at the combined Oakland Street properties containing wetland sediment and at the combined Oakland Street properties containing mudflat sediment. In addition, GEI conservatively evaluated potential trespasser exposure to all river sediment sampling locations considering each river sediment sample as a separate exposure point under current and future land use to identify isolated river sediment samples contributing to significant risk. A trespasser exposure scenario assumes a 7- to 14-year-old adolescent may have contact with wetland sediment and/or mudflat sediment for 2 days each week for the 7 warmer months while trespassing in these areas, which is consistent with the MADEP default exposure scenario for a trespasser. This exposure frequency assumes a trespasser will be exposed to sediment for 60 days each year for 7 years, which likely overestimates a trespasser exposure to the wetland and mudflat sediment areas because these areas are relatively remote and difficult to access. In addition, at high tide there is up to 7 feet of water covering the river and mudflat sediment further limiting potential contact with sediment. A trespasser may be exposed to COCs in sediment from incidental ingestion and dermal absorption. Exposure assumptions including the sediment ingestion rate are set equal to the MADEP trespasser soil default exposure assumptions except for the sediment adherence factor, which is conservatively set equal to 1 mg/cm^2 in accordance with MADEP guidance.

3.3.3. Current and Future Commercial Worker

Although a commercial worker may also be present at the Site, the resident and adolescent trespasser are the more sensitive receptors and are therefore considered protective of potential commercial worker exposures.

3.3.4. Current and Future Recreational Visitor

GEI evaluated a recreational visitor exposure scenario at the combined Oakland Street properties containing mudflat sediment, Site-wide combined properties along the river, and at three separate segments of the river under current and future land use. A recreational visitor exposure scenario assumes a 1- to 31- year-old recreational visitor may have contact with mudflat sediment and/or river sediment for 3 days each week during the 7 warmer months while recreating at the Powwow River and adjacent mudflats, which is consistent with the MADEP default exposure scenario for a park visitor. This exposure frequency assumes a recreational visitor will be exposed to sediment for 90 days each year for 26 years, which likely overestimates a recreational visitor exposure at the mudflats and Powwow River portion of the Site because this portion of the river is relatively remote and difficult to access. In addition, at high tide there is up to 7 feet of water covering the river and mudflat sediment further limiting potential contact with sediment. A recreational visitor may be exposed to COCs in sediment from incidental ingestion and dermal absorption. Exposure assumptions including the sediment ingestion rate were set equal to the MADEP park visitor soil default exposure assumptions except for the sediment adherence factor, which was conservatively set equal to 1 mg/cm^2 in accordance with MADEP guidance.

Under current land use, GEI also evaluated potential cumulative residential exposure to river surface sediment at the applicable river segment for the property and recreational exposure to Site-wide river

surface sediment (at river segments I, II, and III combined). This exposure scenario conservatively assumed a resident may contact river surface sediment in the vicinity of their property and may also contact Sitewide river surface sediment during recreational activities.

3.3.5. Current and Future Emergency Utility Worker

GEI evaluated an emergency utility worker exposure scenario at each of the properties within the Site boundary under current and future land use. The utility worker exposure scenario assumes an adult utility worker may have contact with wetland sediment, mudflat sediment, and river sediment for one 8-hour workday per year. There is a utility line which runs under and across the river from 1 Field Street to 39 Water Street. A utility worker may be exposed to COCs from incidental ingestion and dermal absorption. Exposure assumptions including the sediment ingestion rate were set equal to the MADEP construction worker soil default exposure assumptions except for the sediment adherence factor, which was conservatively set equal to 1 mg/cm^2 in accordance with MADEP guidance and the dust inhalation/ingestion exposure route which was excluded because the construction projects would be located in wet sediment and are unlikely to generate dust emissions.

3.3.6. Future Construction Worker

GEI evaluated a construction worker exposure scenario at each of the properties within the Site boundary under future land use. In addition, GEI conservatively evaluated potential construction worker exposure to all river sediment sampling locations considering each river sediment sample as a separate exposure point under current and future land use to identify isolated river sediment samples contributing to significant risk. The construction worker exposure scenario assumes an adult construction worker may have contact with wetland sediment, mudflat sediment, and river sediment for 5 days each week for a 6-month construction project. A construction worker may be exposed to COCs from incidental ingestion and dermal absorption. Exposure assumptions including the sediment ingestion rate were set equal to the MADEP construction worker soil default exposure assumptions except for the sediment adherence factor, which was conservatively set equal to 1 mg/cm^2 in accordance with MADEP guidance and the dust inhalation/ingestion exposure route which was excluded because the construction projects would be located in wet sediment and are unlikely to generate dust emissions.

3.3.7. Receptors Not Quantitatively Evaluated

Some potential receptors at the Site (including visitors and commercial workers) are expected to have less frequent or intense exposures than the receptors quantitatively evaluated in this risk characterization (i.e., residents, recreational visitors and trespassers). Evaluation of the most sensitive receptors at the Site is protective of these other potential receptors. If a condition of NSR exists for the receptors quantitatively evaluated in the risk characterization, then a condition of NSR also exists for those less exposed receptors. Therefore, less exposed receptors were not considered further in this risk characterization.

3.4. MGP Waste Material

MGP waste deposits as small, solid pieces of tar were observed only in the wetland on 35 Oakland Street and 37 Oakland Street at depths ranging from about 0.2 to 1.2 feet. However, these isolated, small

pieces of tar did not comprise significant, continuous MGP waste deposits distinguishable from the sediment matrix. As a result, visible coal tar waste deposits as defined by MassDEP were not identified at the Site.

NAPL, which does not meet the criteria for visible coal tar waste deposits (i.e., solid or semi-solid coal tar) as it is presented in the revised MCP, was observed in sediments in the wetland, primarily on 35 Oakland Street and 37 Oakland Street, although it was also observed at 33R Oakland Street to the north. This area of NAPL in sediments was observed to be generally coincident with the area containing isolated, small, solid pieces of tar in the wetland. NAPL was observed in sediments in the wetland at depths ranging from about 0.2 to 2.5 feet. As a result, a condition representing RAH was identified in the wetland along Oakland Street.

NAPL was observed in sediments in the mudflat on 39 and 41 Oakland Street at depths ranging from about 0.5 to 1 foot. As a result, a condition representing RAH was identified in the mudflat along Oakland Street.

NAPL was observed in sediments in the river within a narrow band in the center of the river, primarily on 1 Field Street and 8 Noel Street on the northern side of the river and on the Oakland Street and Oak Street properties on the southern side of the river. NAPL was observed in sediments in the river generally at depths from as shallow as about 1 or 2 feet up to about 8 or 9 feet below the sediment surface. In the downstream stretch of the river, overlying shallow sediments likely deposited after dredging did not have visible NAPL except for two locations at 1 Field Street where NAPL was shallower than 1 foot, representing RAH.

Conditions at the Site in wetland, mudflat, and river sediment representing RAH will be remediated as these areas represent a substantial hazard. As a result, the small, solid pieces of tar observed in wetland sediment, coincident with the area representing RAH, will be remediated.

NAPL impacts in wetland, mudflat and river sediment are interspersed within the sediment matrix such that sediment analytical results are considered representative of these impacts. Therefore, the human health risk assessment evaluated exposure to NAPL impacts in wetland, mudflat and river sediment for all potential current and future receptors. Although wetland, mudflat, and river sediment representing RAH due to the presence of NAPL over an area greater than 1,000 square feet in sediment within one foot of the sediment surface will be remediated, these areas were evaluated as exposure points in the human health risk characterization.

3.5. Exposure Points

Identification of exposure points is described in 310 CMR 40.0924. An exposure point refers to a location of potential contact between a human receptor and impacted media. As discussed in Section 3.1, GEI evaluated risk to current and potential future human receptors in consideration of current and potential future Site use and activities.

GEI evaluated the following current and potential future wetland sediment exposure points:

- Wetland sediment (0 to 2 feet) at 33R Oakland Street for a current resident

- Wetland sediment (0 to 2 feet) at 35 Oakland Street for a current resident
- Wetland sediment (0 to 2 feet) at 37 Oakland Street for a current resident
- Wetland sediment (0 to 2 feet) at 39 Oakland Street for a current resident
- Wetland sediment (0 to 2 feet) at all Oakland Street properties combined for a current trespasser
- Wetland sediment (0 to 2 feet) at Commonwealth of Massachusetts tidelands (former river channel) for a current trespasser
- Wetland sediment (0 to 2 feet) for a construction worker
- Wetland sediment (0 to 2 feet) for a utility worker
- Wetland sediment (>2 feet) at 33R Oakland Street for a future resident
- Wetland sediment (>2 feet) at 35 Oakland Street for a future resident
- Wetland sediment (>2 feet) at 37 Oakland Street for a future resident
- Wetland sediment (>2 feet) at all Oakland Street properties combined for a future trespasser
- Wetland sediment (>2 feet) at Commonwealth of Massachusetts tidelands (former river channel) for a future trespasser
- Wetland sediment (>2 feet) for a construction worker
- Wetland sediment (>2 feet) for a utility worker

GEI evaluated the following current and potential future mudflat sediment exposure points:

- Mudflat sediment (0 to 2 feet) at 39 Oakland Street for a current resident
- Mudflat sediment (0 to 2 feet) at 41 Oakland Street for a current resident
- Mudflat sediment (0 to 2 feet) at 43 Oakland Street for a current resident
- Mudflat sediment (0 to 2 feet) at 4 Oakland Court for a current resident
- Mudflat sediment (0 to 2 feet) at all Oakland Street and Court properties combined for a current trespasser
- Mudflat sediment (0 to 2 feet) at all Oakland Street and Court properties combined for a current recreational visitor
- Mudflat sediment (0 to 2 feet) for a construction worker
- Mudflat sediment (0 to 2 feet) for a utility worker
- Mudflat sediment (>2 feet) at 39 Oakland Street for a future resident
- Mudflat sediment (>2 feet) at 4 Oakland Court for a future resident
- Mudflat sediment (>2 feet) at all Oakland Street and Court properties combined for a future trespasser

- Mudflat sediment (>2 feet) at all Oakland Street and Court properties combined for a future recreational visitor
- Mudflat sediment (>2 feet) for a construction worker
- Mudflat sediment (>2 feet) for a utility worker

GEI evaluated the following current and potential future river sediment exposure points:

- River sediment (0 to 2 feet) at Segment I (Water Street Area) for a current resident and recreational visitor
- River sediment (0 to 2 feet) at Segment II (Oakland Street / Oak Street Area) for a current resident and recreational visitor
- River sediment (0 to 2 feet) at Segment III (River Street Area) for a current resident and recreational visitor
- River sediment (0 to 2 feet) at Site-wide all properties combined for a current recreational visitor
- River sediment (0 to 2 feet) for a construction worker
- River sediment (0 to 2 feet) for a utility worker
- River sediment (>2 feet) at Segment I (Water Street Area) for a future resident and recreational visitor
- River sediment (>2 feet) at Segment II (Oakland Street / Oak Street Area) for a future resident and recreational visitor
- River sediment (>2 feet) at Segment III (River Street Area) for a future resident and recreational visitor
- River sediment (>2 feet) at Site-wide all properties combined for a future recreational visitor
- River sediment (>2 feet) for a construction worker
- River sediment (>2 feet) for a utility worker

GEI evaluated the following current and potential future upland surface soil exposure point:

- Exposed upland surface soil (0 to 3 feet) for a current and potential future resident at 34-40 Water Street. A planned AUL at 34-40 Water Street will prohibit contact with soil deeper than 3 feet.

3.5.1. Hot Spots

310 CMR 40.0006 defines a hot spot as a “discrete area” where concentrations are “substantially higher than those present in the surrounding area”:

- If the concentration is 10 to 100 times greater than the average concentration in the surrounding area, then a hot spot is present unless the potential exposure to receptors is no greater than in the surrounding area; or

- If the concentration is 100 times greater than in the surrounding area, then a hot spot is present.

GEI conducted a discrete exposure area analysis to evaluate the presence of Hot Spots. There is no evidence of greater exposure potential within any discrete areas of the Site. GEI assumed there is an equal likelihood of potential exposure within each exposure point. GEI considered discrete areas to be potential hot spots if there was a grouping of adjacent sample locations at similar depths with concentrations greater than 100 times the concentrations of the samples in the surrounding area.

3.5.1.1. Sediment

We conducted a hot spot evaluation on the surface sediment analytical data (0 to 2 feet) and the deep sediment analytical data (greater than 2 feet) for the wetlands, mudflats, and river. The maximum COC concentrations were compared to the average of the surrounding area (excluding the maximum detected concentration) to identify potential hot spots for individual properties as well as multiple properties comprising an exposure area for a receptor. When the average of the highest detected concentrations for a COC within a localized area is less than 100 times the average of the surrounding area, a hot spot is not present. Based on this hot spot evaluation, no hot spots exist in surface sediment or deep sediment exposure areas for the wetlands, mudflats, and river.

For example, we evaluated whether the maximum detected concentrations of benzo(a)pyrene in deeper sediment at 28 Oak Street comprised a hot spot, which is where the highest benzo(a)pyrene and total PAH concentrations were detected. The highest concentration of benzo(a)pyrene was detected in deeper sediment at 28 Oak Street; benzo(a)pyrene was detected at 3,050 milligrams per kilogram (mg/kg) at sediment core 851 at a depth of 3.8 to 4 feet. In the adjacent sediment core 734, benzo(a)pyrene was detected at 447 mg/kg at a depth of 4.9 to 5 feet. The average of these two sediment samples does not exceed the average of the surrounding area by 100 times so therefore does not constitute a hot spot. The deeper sediment throughout 28 Oak Street and adjacent properties, specifically along the centerline of the river, has elevated benzo(a)pyrene concentrations. However, because these deeper sediment samples with elevated benzo(a)pyrene are not located within a localized area relative to the surrounding area, they are not considered a hot spot.

3.5.1.2. Soil

For surface soil analytical results at 34-40 Water Street, GEI did not identify any hot spots in soil.

3.6. Exposure Point Concentrations

GEI calculated EPCs for each COC within each exposure area. In accordance with 310 CMR 40.0904 of the MCP, the risk characterization requires justification that the sediment sampling approach used to collect data for risk characterization provides a conservative estimate of exposures at the sediment exposure points. The spatial distribution and concentration variability of the contaminants within the sediment exposure points are described below to justify the sediment sampling approach.

A total of 386 sediment samples were collected at depths ranging from 0 to 9 feet below the sediment surface from the wetlands, mudflat, and river and analyzed for VOCs, SVOCs, TPH, EPH, VPH, metals and cyanide. This comprehensive sediment dataset characterizes the nature of the MGP impacts to

sediment and delineates the vertical and horizontal extent of MGP impacts to sediment as well as the spatial distribution and concentration variability of the contaminants within potential sediment exposure points.

Based on the CSM for the former Amesbury MGP Site, a judgmental sampling approach for sediment is appropriate because the release(s) of tar from the former MGP footprint were point discharges and the known source of MGP impacts to sediment. The highest concentrations of contaminants in sediment are located generally closer to the former MGP and discharge point to the wetland and mudflat, and the sediment has generally not been disturbed since the release(s). As a result, judgmental (or biased) sediment sampling was conducted beginning in the most contaminated areas (where RAH conditions were identified), in the wetland and mudflat directly downstream of the former MGP footprint and extended outward. In addition, sediment sampling locations were selected based on visual observations of NAPL (coal tar impacts) to ensure the concentration variability of contaminants was characterized. Therefore, the majority of sediment samples are biased toward the more contaminated areas.

Notwithstanding the judgmental sampling approach, a systematic transect sampling approach was also used at the Site to help focus the sampling program given the size of the Site and to characterize the extent of the MGP-related impacts and the spatial variability of the MGP-related impacts in sediment at both upstream and downstream locations in the tidal river. The systematic transect sampling approach included the collection of between four and six sediment samples spaced on multiple transects extending from the mean high-water line on either side of the river. These systematic transect sampling locations collected in an unbiased nature are spaced along the length of the river at both upstream and downstream locations and therefore capture the extent of the sediment impacts and spatial distribution of the contaminants in sediment.

As a result of the judgmental sampling approach supplemented by the systematic transect sediment sampling approach at the Site, both the spatial distribution and the concentration variability of the contaminants within potential sediment exposure points have been adequately characterized to provide a conservative estimate of exposure to sediment in the risk characterization. Figure RC-3 provides histograms of benzo(a)pyrene concentrations in sediment at various sediment exposure points to demonstrate that sediment sampling in wetland, mudflat, and river sediment captures the spatial distribution and concentration variability of the contaminants within potential sediment exposure points.

3.6.1. Sediment EPCs

In accordance with 310 CMR 40.0926(10) of the MCP, for assessing human direct contact exposure with sediment, the EPC shall be the arithmetic mean concentration within each exposure point. GEI estimated sediment EPCs based on either the arithmetic average sediment concentrations for COCs if four or more sediment samples were collected at an exposure point or the maximum detected sediment concentrations for COCs when three or fewer sediment samples were collected at an exposure point. Tables RC-17 and RC-18 provide the number of sediment samples evaluated for each exposure point and whether EPCs were set equal to maximum or average COC concentrations. When EPCs were based on the average of four to nine sediment samples, the maximum COC concentrations were also considered in the risk calculations to address potential uncertainty associated with sample number.

Sediment EPCs for each exposure point are presented in risk calculations provided in Appendix R.

3.6.2. Soil EPCs

GEI estimated upland surface soil EPCs for 34-40 Water Street based on the average detected soil concentrations for COCs for the five surface soil samples collected from the top 3 feet of soil located adjacent to the Amesbury recreational bike path. The average soil concentrations for COCs are unlikely to underestimate exposure to surface soil because these samples were collected in a very small, isolated upland area within the Site boundary; therefore, the average concentrations of COCs adequately represent the spatial and concentration variability of the COCs at this exposure point.

Upland surface soil EPCs for 34-40 Water Street are presented in risk calculations provided in Appendix R.

3.7. Quantitative Estimates of Exposure

GEI estimated the average daily exposure to each COC by a receptor for each exposure pathway. Average daily exposures were averaged over an appropriate time period for non-cancer effects and/or for cancer effects. Doses for ingestion and dermal pathways are presented in this risk characterization as a daily dose rate per unit body weight (milligrams per kilogram per day [mg/kg-day]).

The "Average Daily Dose" (ADD) and "Lifetime Average Daily Dose" [(L)ADD] are the general parameters used to quantify exposure doses for the ingestion and dermal pathways in risk assessments. The ADD is used as a standard measure for characterizing long-term non-carcinogenic effects. The (L)ADD is averaged over a 70-year human lifetime to estimate potential carcinogenic risks.

Equations for exposure routes are the same for all receptors. However, the exposure assumptions used to describe contact with COCs for each receptor are different. Receptor-specific exposure assumptions are presented in Tables RC-10 through RC-15. These factors are based on guidance from MassDEP (1995, 2002c, 2002e, 2002f, 2004a, 2024), the U.S. Environmental Protection Agency (EPA; 1997, 2004a), and other published sources of information. In the absence of adequate data to characterize particular exposure parameters, GEI used professional judgment.

3.7.1. Incidental Ingestion of Soil and Sediment

The (L)ADD calculated for incidental ingestion of soil and sediment is described by the following equation:

$$(L)ADD_{ing} = \frac{EPC \times IR_s \times RAF \times FI \times ED \times EF \times EP \times CF}{BW \times AT_{N/C}}$$

Where:
- EPC = Chemical concentration in soil or sediment (mg/kg)
- IRs = Daily soil or sediment Ingestion Rate (mg/day)
- RAF = Relative Absorption Factor (unitless)

FI	=	Fraction Ingested at source (assume 100%)
ED	=	Exposure Duration (days/event)
EF	=	Exposure Frequency (events/day)
EP	=	Duration of Exposure Period (days)
CF	=	Units Conversion Factor (1 x 10^{-6} kg/mg)
BW	=	Body Weight (kg)
$AT_{N/C}$	=	Averaging Time (days)
		non-carcinogens (N) = EP (days)
		carcinogens (C) = 25,550 days

3.7.2. Dermal Contact with Soil and Sediment

The (L)ADD calculated for dermal contact with chemicals in soil and sediment for all receptors is described by the following equation:

$$(L)ADD_{derm} = \frac{EPC \times SA \times AF \times RAF \times ED \times EF \times EP \times CF}{BW \times AT_{N/C}}$$

Where:	EPC	=	Chemical concentration in soil or sediment (mg/kg)
	SA	=	Total Skin Area (TSA) x Fraction of Skin Area (FSA) exposed (square centimeters per day [cm^2/day])
	AF	=	Soil or sediment to skin Adherence Factor (milligrams per square centimeter [mg/cm^2])
	RAF	=	Relative Absorption Factor (unitless)
	ED	=	Exposure Duration (days/event)
	EF	=	Exposure Frequency (events/day)
	EP	=	Duration of Exposure Period (days)
	CF	=	Units Conversion Factor (1 x 10^{6} kg/mg)
	BW	=	Body Weight (kg)
	$AT_{N/C}$	=	Averaging Time (days)
			non carcinogens (N) = EP (days)
			carcinogens (C) = 25,550 days

4. Toxicity Assessment

The Toxicity Assessment or Dose-Response Assessment is a process that results in a quantitative estimate or index of toxicity for each COC. For carcinogens, this index is the cancer slope factor (CSF) or unit risk factor (URF). For non-carcinogens, it is the reference dose (RfD) or reference concentration (RfC). There are three categories of dose-response information:

- Toxicity values associated with threshold (non-carcinogenic) health effects;
- Toxicity values associated with carcinogenicity, either from human epidemiological studies or laboratory studies; and
- Relative absorption factors (RAFs) that are used to relate the toxicity values identified in the literature to the exposure pathways of concern.

Toxicity values are available in many online databases and publications. The primary sources for toxicity values used in this evaluation included the following:

- MassDEP, Development of MCP Risk-Based Levels for Soil and Groundwater, toxicity spreadsheet, (http://www.mass.gov/dep/service/compliance/riskasmt.htm); this spreadsheet includes the RAFs and recommended dose-response values (i.e., cancer slope factors, reference doses) for most of the COCs (MassDEP; March 2024).
- MassDEP Method 3 Human Health Risk Assessment Short forms (http://www.mass.gov/eea/agencies/massdep/toxics/sources/riskasmt-htm.html). The short form spreadsheets include updated RAFs and recommended dose-response values. (MassDEP, June 2024).
- The Integrated Risk Information System (IRIS) from the EPA (http://www.epa.gov/iris) (EPA, 2024).

4.1. Carcinogenic Health Effects

CSFs (for ingestion and dermal exposures) or URFs (for inhalation exposure) are used to predict the potential number of excess cancers that will arise in response to lifetime exposure to a chemical. These values are predominantly based on animal bioassay data, although human epidemiological data are preferred and used when available.

In evaluating chemicals for carcinogenicity, EPA developed a two-part assessment involving a weight-of-evidence classification and a quantitative determination of carcinogenic potency (i.e., slope factors and unit risks). The weight-of-evidence classification reflects available data, adequacy of studies, types of studies, and observed responses.

The following classifications are used (EPA, 1986):

- Group A: human carcinogens
- Group B1: probable human carcinogens (limited human data)

- Group B2: probable human carcinogens (sufficient evidence in animals; limited or no evidence in humans)
- Group C: possible human carcinogens (limited evidence in animals; limited or no evidence in humans)
- Group D: not classifiable as to human carcinogenicity
- Group E: evidence of non-carcinogenicity in humans

CSFs and/or URFs have typically been developed for Group A, B1, and B2 carcinogens and some Group C carcinogens. Toxicity summaries for carcinogenic COCs are available on IRIS (http://www.epa.gov/iris) (EPA, 2024). CSFs and URFs for COCs at the Site are presented in Table RC-16 along with the following information:

- Source of toxicity value, i.e., IRIS, MassDEP, etc.
- Study type: how the chemical was administered.
- Weight-of-evidence: EPA's classification system for carcinogens.
- Test animal: animal species on which the study is based.
- Cancer type: location and/or type of tumor identified in the study.

GEI has also applied the age dependent adjustment factors (ADAFs) recommend by EPA to exposure dose calculations for COCs classified as mutagenic to account for the potential mutagenic mode of action. The ADAFs are appropriately applied in the MassDEP Method 3 Human Health Risk Assessment Short forms. For the trespasser exposure scenario, GEI has applied an ADAF of 3 for mutagenic COCs, including the carcinogenic PAHs, since this receptor is assumed to be a 7 to 14 year old. For the residential and recreational visitor exposure scenarios, GEI has applied an ADAF of 10 for a 1 to 2 year old and an ADAF of 3 for a 2 to 16 year old.

4.2. Noncarcinogenic Health Effects

Noncarcinogenic effects are assessed by comparing the estimated average daily exposure to the acceptable daily dose, referred to as the RfD or in the case of inhalation exposure, the RfC. The RfD is an estimate (with about an order of magnitude uncertainty) of a daily exposure to a human population, including sensitive subgroups, that is likely to be without an appreciable risk of deleterious effects during a portion of their lifetime, in the case of a subchronic RfD, or during a whole lifetime, in the case of a chronic RfD (EPA, 1989). The RfC is an estimate of the inhalation exposure concentration (with about an order of magnitude uncertainty) to which a human population, including sensitive subgroups, could be exposed without an appreciable risk of deleterious effects during a lifetime. Toxicity summaries for non-carcinogenic COCs are available on EPA's IRIS (http://www.epa.gov/iris) (EPA, 2024). Subchronic and chronic RfDs and RfCs used in this risk characterization are presented in Table RC-16. along with the following information:

- Toxicity value
- Source of toxicity value

- Study type
- Confidence level
- Critical Effect: target organ and toxic effect on which the dose-response value is based.
- Test Animal
- Uncertainty or modifying factors: factors listed by the agency establishing the toxicity value.

Subchronic RfDs and RfCs were used in this risk characterization, where available, to evaluate short-term exposure scenarios identified for the current and future receptors at the Site. These toxicity values were derived based on potential non-carcinogenic effects associated with exposure durations ranging from a few weeks to seven years (EPA, 1989). In the absence of subchronic toxicity values, GEI used chronic toxicity values. However, the use of chronic toxicity values to assess short-term exposure likely overestimates subchronic hazards to receptors of concern.

4.2.1. Lead Risk Characterization

Risk assessment for lead is substantially different than for other COCs. USEPA does not provide non-cancer toxicity values for lead. Risk assessment for lead is based on a blood lead level. We derived a soil cleanup level for lead based on a target blood lead level in children below 5 micrograms of lead per deciliter of blood, which is the current US Centers for Disease Control and Prevention's level of concern for blood lead in young children between 6 months and 7 years of age. Based on a target blood lead level of 5 micrograms per deciliter, a residential soil lead cleanup level of 153 mg/kg in bare soil of play areas was derived using EPA's Integrated Exposure Uptake Biokinetic Model, which relates soil lead levels and blood lead levels in young children. This residential soil lead cleanup level of 153 mg/kg was multiplied by a factor of 1.4 to account for the difference in exposure frequency between continuous exposure for 7 days a week (assumed in the IEUBK model) and the MassDEP default residential soil exposure scenario of 5 days a week. Therefore, an acceptable soil lead cleanup level is 214 mg/kg. In accordance with the IEUBK Model, the average, or arithmetic mean soil lead concentration from a representative exposure area should be used to predict risk.

4.3. Route-to-Route Extrapolation of Slope Factors and Reference Doses

CSFs and RfDs for the dermal route of exposure have not been developed by the EPA. As a result, oral CSFs and RfDs are typically used to evaluate dermal exposures to chemicals (EPA, 1989). Following the absorption of chemicals via the oral or dermal routes, their distribution, metabolism, and elimination patterns (biokinetics) are usually assumed independent of the route of absorption. However, to use oral toxicity values (i.e., extrapolate toxicological effects from the oral route to the dermal route), it is necessary to adjust the estimated dermal absorbed dose to account for differences in a chemical's absorption between the oral and dermal routes of exposure. However, if the critical effect is at the point of contact, extrapolation of toxicological effects from the oral route to the dermal route is inappropriate.

Chemical-specific RAFs are used to account for differences in the absorption of a COC under assumed exposure conditions at a site relative to the absorption of the COC under the experimental conditions upon which a toxicity value is based (MassDEP, 1995).

The RAFs were calculated using the following equation:

$$RAF = \frac{\text{Absorption Efficiency}_{\text{Site Route/Medium Exposure}}}{\text{Absorption Efficiency}_{\text{Study Route/Medium Exposure}}}$$

RAFs for soil and sediment exposure pathways are presented in Table RC-16.

5. Method 3 Risk Characterization

The characterization of risk is the final step in the risk assessment process. In this step, the toxicity and exposure assessments are combined into quantitative estimates of risk to each human receptor of concern from exposure to COCs at a site.

5.1. Human Health Risk Characterization

Human health risk from exposure to COCs was estimated separately for carcinogenic and non-carcinogenic COCs:

- To characterize potential carcinogenic effects, (L)ADDs or (L)ADE were compared to chemical-specific CSFs or URFs. Specifically, the estimated (L)ADDs or (L)ADE was multiplied by the CSF or URF. Risk is expressed as the probability of that exposure resulting in an excess incidence of cancer; that is, the occurrence of more cancers than would normally be expected in the exposed population.
- To characterize potential non-carcinogenic effects, ADDs were compared to chemical-specific RfDs or RfCs. Specifically, the estimated ADD or ADE was divided by the RfD or RfC. This ratio is called the Hazard Index (HI).

5.1.1. Cumulative Cancer Risk Evaluation

Carcinogenic risk from ingestion (oral), dermal, and inhalation routes of exposure were calculated using the following equation:

$$ELCR = [(\sum((L)ADD_{ing,derm,inhGI}) \times CSF) + (ADE \times URF)]$$

Where:

	ELCR	=	Excess Lifetime Cancer Risk
	(L)ADD	=	Lifetime Average Daily Dose
	CSF	=	Cancer Slope Factor
	ADE	=	Average Daily Exposure
	URF	=	Inhalation Unit Risk Factor

5.1.2. Cumulative Non-cancer Risk Evaluation

Non-cancer hazards from ingestion (oral), dermal and inhalation routes of exposure were calculated using the following equation:

$$HQ = \frac{ADD\ (DAD)}{RfD} \quad \text{or} \quad HQ = \frac{ADE}{RfC}$$

Where:	ADD	=	Average Daily Dose (mg/kg day)
	DAD	=	Dermal Absorbed Dose (mg/kg day)
	RfD	=	Reference Dose (mg/kg day)
	ADE	=	Average Daily Exposure (mg/m^3)
	RfC	=	Reference Concentration (mg/m^3)

Where the ADD/ADE estimated from exposure to a COC exceeds the RfD/RfC, respectively, the Hazard Quotient (HQ) exceeds 1. This typically is considered a threshold requiring further evaluation since it indicates that exposure could be higher than the "no-effect" dose represented by the RfD/RfC. Where the HQ does not exceed one, the ADD/ADE estimated from exposure to a COC is not greater than the RfD/RfC, indicating that the likelihood of realizing a non-cancer effect from that COC is negligible.

To summarize potential non-cancer risks for multiple COCs across complete exposure pathways, and across receptors, HQs were summed. The resulting HI serves as a conservative summary of pathway and receptor risks, since summing the individual COC HQs incorporates the assumption that their risks are all additive, when, in fact, different COCs are expected to act through different mechanisms and on different target organs. The overall HIs are useful for rapidly excluding pathways or receptors with negligible potential for non-cancer effects such as when all the COC HQs added together do not exceed an HI of one.

The MassDEP Method 3 Human Health Risk Assessment Short forms for a resident, trespasser, and park user were used to characterize risk from exposure to sediment and upland surface soil at 34-40 Water Street. Exposure assumptions for sediment, including the sediment ingestion rate were set equal to the MADEP soil default exposure assumptions except for the sediment exposure frequencies and the sediment adherence factor, which was conservatively set equal to 1 mg/cm^2 in accordance with MADEP guidance. Attachments A and B of Appendix R provide the MassDEP Method 3 Human Health Risk Assessment Short form output, including calculations of ELCRs and HIs for each receptor by exposure route and within each exposure point.

5.1.3. Cumulative Cancer/Non-cancer Risk Limits

The MCP specifies numerical cancer and non-cancer risk limits that are used to identify a condition of significant risk at a site. Conditions at the Site pose NSR of harm to health if cumulative cancer and/or non-cancer risks for a receptor from all applicable exposure pathways are below the MCP cancer and non-cancer risk limits.

According to the MCP (310 CMR 40.0993[6]), the Cumulative Cancer Risk Limit is a one-in-one hundred thousand (1E-5) ELCR. When the ELCR is below 1E-5, there is no significant cancer risk. GEI compared cumulative cancer risk estimates for each receptor at each exposure point to the MCP cancer risk limit in Tables RC-17 and RC-18.

According to the MCP (310 CMR 40.0993[6]), the Cumulative Non-cancer Risk Limit is an HI of one. When the HI for a receptor is below one, there is no significant non-cancer risk. GEI compared

cumulative non-cancer risk estimates for each receptor at each exposure point to the MCP non-cancer risk limit in Tables RC-17 and RC-18.

5.1.4. Comparison to Applicable or Suitably Analogous Standards

The EPA National Recommended Water Quality Criteria (NRWQC) protective of human consumption of water and organisms are identified as potentially applicable human health standards for the Site. The Powwow River (tidal portion) is designated as a Class SB water and is a habitat for fish, other aquatic life, and wildlife and primary and secondary contact recreation. It is also designated as a restricted shell fishing area. A comparison of surface water analytical results to NRWQC are presented in Table RC-7. No chemicals were detected above laboratory reporting limits in the Powwow River surface water samples and all chemicals detected in wetland surface water are below the applicable NRWQC.

5.1.5. Human Health Risk Characterization Summary

The results for the quantitative human health risk characterization are summarized in Tables RC-17 and RC-18. A condition of NSR exists for most of the current and future hypothetical receptors evaluated under this Method 3 risk characterization.

5.1.5.1. Current Exposure Scenarios for Surface Sediment

The following Current Exposure Scenarios for Surface Sediment (0-2 Feet) were associated with the potential for significant risk (Table RC-17):

<u>Current Residential Scenarios</u>

- A current resident at 35 Oakland Street from cumulative exposure to wetland surface sediment and river surface sediment at Segment II (Oakland Street / Oak Street Area); however, this risk is primarily attributable to exposure to wetland surface sediment at 35 Oakland Street.
- A current resident at 37 Oakland Street from cumulative exposure to wetland surface sediment and river surface sediment at Segment II (Oakland Street / Oak Street Area); however, this risk is primarily attributable to exposure to wetland surface sediment at 37 Oakland Street.
- A current resident at 41 Oakland Street from cumulative exposure to mudflat surface sediment and river surface sediment at Segment II (Oakland Street / Oak Street Area); however, this risk is primarily attributable to exposure to EPCs based on maximum COC concentrations in mudflat surface sediment. There is NSR for EPCs based on average COC concentrations in mudflat surface sediment.
- A current resident at 4 Oakland Court from cumulative residential exposure to mudflat surface sediment and river surface sediment at Segment II (Oakland Street / Oak Street Area); however, this risk is primarily attributable to exposure to EPCs based on maximum COC concentrations in mudflat surface sediment. There is NSR for EPCs based on average COC concentrations in mudflat surface sediment.

- A current resident potentially exposed to isolated river surface sediment at the following five sampling locations: 710 at river Segment I (Water Street Area); and SS681, SS658, 701, and SS697 at river Segment II (Oakland Street / Oak Street Area).
- A current resident from cumulative exposure to river surface sediment at Segment II (Oakland Street / Oak Street Area) and recreational exposure to Site-wide river surface sediment. This exposure scenario conservatively assumed a resident may contact river surface sediment in the vicinity of their property and may also contact Sitewide river surface sediment during recreational activities.

Current Recreational Visitor Scenario

- A recreational visitor at the combined Oakland Street and Oakland Court properties from exposure to mudflat surface sediment.
- A recreational visitor at river Segment II (Oakland Street / Oak Street Area) from exposure to river surface sediment.

We concluded NSR for all other current exposure scenarios, including for the current trespasser, other recreational visitors not identified above, and the utility worker.

5.1.5.2. Future Exposure Scenarios for Deep Sediment

The following Future Exposure Scenarios for Deep Sediment (greater than 2 Feet) were associated with the potential for a significant risk (Table RC-18):

Future Residential Scenario

- A future resident at 35 Oakland Street from cumulative exposure to deep wetland sediment and deep river sediment at river Segment II (Oakland Street / Oak Street Area); however, this risk is primarily attributable to exposure to deep river sediment at river Segment II (Oakland Street / Oak Street Area). There is NSR at this property from exposure to only deep wetland sediment.
- A future resident at 37 Oakland Street from cumulative exposure to deep wetland sediment and deep river sediment at river Segment II (Oakland Street / Oak Street Area); however, this risk is primarily attributable to exposure to deep river sediment at river Segment II (Oakland Street / Oak Street Area). There is NSR at this property from exposure to only deep wetland sediment.
- A future resident at 39 Oakland Street from cumulative exposure to deep mudflat sediment and deep river sediment at river Segment II (Oakland Street / Oak Street Area); however, this risk is primarily attributable to exposure to deep river sediment at river Segment II (Oakland Street / Oak Street Area). There is NSR at this property from exposure to only deep mudflat sediment.
- A future resident at 4 Oakland Court from cumulative exposure to deep mudflat sediment and deep river sediment at river Segment II (Oakland Street / Oak Street Area); however, this risk is primarily attributable to exposure to deep river sediment at river Segment II (Oakland Street / Oak Street Area). There is NSR at this property from exposure to only deep mudflat sediment.

  A future resident within the Site Boundary from potential exposure to Segment-wide deep sediment at Segment II (Oakland Street / Oak Street Area) and Segment III (River Street Area). In

addition, a future resident potentially exposed to isolated river deep sediment at the following 28 sampling locations: 712 and 855 at river Segment I (Water Street Area); 678, 680, 682, 692, 694, 696, 699, 702, 703, 705, 706, 708, 714, 729, 850, and 856 at river Segment II (Oakland Street / Oak Street Area); and 734, 737, 754, 766, 769, 774, 778, 823, 851, and 852 at river Segment III (River Street Area).

Future Recreational Visitor Scenario

- A future recreational visitor at river Segment II (Oakland Street / Oak Street) from exposure to deep river sediment.
- A future recreational visitor at river Segment III (River Street Area) from exposure to deep river sediment.
- A future recreational visitor Site-wide, including all three segments of the river combined, from exposure to deep river sediment.

Future Trespasser Scenario

- A future trespasser potentially exposed to isolated river deep sediment at the following 11 sampling locations: 680, 692, 694, 705, 706, 708, and 856 at river Segment II (Oakland Street / Oak Street Area); and 734, 769, 851, and 852 at river Segment III (River Street Area).

Future Construction Worker Scenario

- A future construction worker exposed to isolated river deep sediment at the following 9 sampling locations: 692, 694, 705, 706, and 708 at river Segment II (Oakland Street / Oak Street Area); and 734, 769, 851, and 852 at river Segment III (River Street Area).

We concluded NSR for all other future exposure scenarios not identified above, including for other future residents, other future trespassers, other future recreational visitors, other future construction workers, and future utility workers.

For properties where exposures to wetland, mudflat, and river sediment were added together, risk may be overestimated because adding these risks together results in a higher exposure frequency for the receptor.

5.1.5.3. Future Resident Exposure Scenario at 34-40 Water Street

Risk estimates for a Future Resident Exposure Scenario at 34-40 Water Street are summarized below.

There is NSR to a potential future resident from exposure to accessible upland surface soil located adjacent to the recreational path at 34-40 Water Street. This exposure scenario assumes residential exposure to soil for 5 days each week for 7 months for 26 years. As a result, there is also NSR to any lesser exposed receptors at this portion of the Site, including a commercial worker, recreational visitor, and an emergency utility worker as the resident is the most sensitive receptor. In addition, the average detected lead concentration in exposed upland surface soil at the portion of 34-40 Water Street within

the Site is 205 mg/kg. Therefore, the lead soil EPC is below the soil cleanup level of 214 mg/kg derived using the IEUBK model.

There is also NSR to a future resident at 34-40 Water Street from potential residential exposure to river surface sediment. In addition, there is NSR to a future resident at 34-40 Water Street from cumulative exposure to upland surface soil as well as residential exposure to river surface sediment. However, there is significant risk to a resident at 34-40 Water Street from cumulative residential soil and sediment exposure as well as recreational exposure to Site-wide river surface sediment. This exposure scenario conservatively assumed a resident may contact river surface sediment in the vicinity of their property and may also contact Sitewide river surface sediment during recreational activities. A planned AUL at 34-40 Water Street will prohibit exposure to deeper upland soil (greater than 3 feet) and deeper river sediment (greater than 2 feet).

5.1.6. Readily Apparent Harm

There were RAH conditions identified at the Site due to the presence of NAPL over an area greater than 1,000 square feet in sediment within one foot of the sediment surface in wetland, mudflat and river surface sediment. The RAH conditions at the Site will be remediated as these areas represents a substantial hazard. MGP waste deposits comprised of small, isolated pieces of hardened tar were observed in shallow wetland sediment on 35 Oakland Street and 37 Oakland Street within an RAH area; however, these isolated, small pieces of tar did not comprise significant, continuous MGP waste deposits distinguishable from the sediment matrix. As a result, visible coal tar waste deposits as defined by MassDEP were not identified at the Site.

5.2. Public Welfare Risk Characterization

The characterization of the risk of harm to public welfare was conducted in accordance with 310 CMR 40.0994. The purpose of this assessment is to identify and evaluate nuisance conditions and significant community effects. The characterization of risk to public welfare considers effects that are or may result from the presence of residual impacts or the implementation of a proposed remedial alternative. The risk of harm to public welfare is also characterized by comparing COC concentrations to MCP Method 3 Ceiling Limits (M3CLs) for soil and groundwater. The M3CLs are levels in soil and groundwater that, if exceeded, indicate the potential for significant risk of harm to the environment and public welfare under future conditions (310 CMR 40.0996).

According to the MCP (310 CMR 40.0994[4]): “A condition of NSR of harm to public welfare exists or has been achieved if:

(a) No nuisance conditions exist or will result from the release or threat of release of oil or hazardous material, or the remedial alternative, including:

1. The breathing zone of ambient and indoor air is currently and will, in the reasonably foreseeable future, remain free from persistent, noxious odors;

2. There is accessible drinking water that is and will, in the reasonably foreseeable future, remain free from noxious taste and odors; and

3. Livestock is and will remain, in the reasonably foreseeable future, free from harmful effects. No specific evaluation of livestock is required if it is reasonable to conclude that the human health and environmental risk characterizations conducted for the site are also protective of livestock exposures.

(b) No community that is currently affected and/or community for which it is reasonably foreseeable to conclude that it could be affected by the release experiences significant adverse impacts considering such factors as the existence of nuisance conditions, loss of active or passive property uses(s), and any non-pecuniary effects which may accrue due to the degradation of public resources directly attributable to the release of Site-related contamination.

(c) The requirements of 310 CMR 40.0996 concerning the M3CLs are met."

Based on observations and information collected during environmental investigations of the Site, no community at or near the Site experiences adverse impacts to public welfare under current or anticipated future conditions. The RAH conditions at the Site will be remediated as these areas represent a substantial hazard.

MassDEP M3CLs have only been established for soil and groundwater. Therefore, for most of the data collected from the Site in sediment, a comparison of COCs to M3CLs is not applicable. However, in accordance with 310 CMR 40.0996, GEI compared the arithmetic average upland surface soil concentrations (0 to 3 feet) for each COC at the portion of 34-40 Water Street included within the Site boundary, to the MassDEP soil M3CLs in Table RC-8. Average concentrations of COCs in upland surface soil at 34-40 Water Street are below M3CLs. The maximum concentrations of chemicals detected in groundwater at the upland portion of 34-40 Water Street are also below M3CLs (Table RC-9). Accordingly, a condition of NSR of harm to public welfare exists at the Site.

5.3. Safety Risk Characterization

The risk of harm to safety was characterized by identifying a potential threat of physical harm or bodily injury to people under current or future land use. The assessment of risk to safety evaluates the threat of fire or explosion, the presence of rusted or corroded drums or containers, open pits, lagoons, or other dangerous structures, and the presence of corrosive, reactive or flammable uncontained materials that are related to the impacted media.

Site COCs are not explosive, corrosive, or reactive. There are no open pits or lagoons present at the Site. Therefore, a condition of NSR to safety exists at the Site under current and future land use.

6. Uncertainty Analysis

In accordance with the MCP, this assessment includes a discussion of potential sources of uncertainty associated with the risk characterization, including data gaps in toxicological or exposure assessment information as well as conservative assumptions or scientific judgments used to bridge these data gaps. Numerical estimates of risk to human health and public welfare presented in this report are only as good as the data and information upon which they are based. General sources of variability and uncertainty in the risk characterization include measurement errors in the Site assessment process, variability in natural systems and human behavior, limitations in model simplifications and assumptions, limitations in literature-derived data, and professional judgment used to select parameters.

A discussion of the uncertainty and conservatism associated with the risk characterization is provided in this section to facilitate an understanding of the strengths and limitations of the risk characterization.

6.1. Uncertainties in Hazard Identification

The number and distribution of samples collected at the Site are considered reasonable for the COCs. The investigations conducted at each exposure area have adequately characterized the impacts within each area and included an adequate sampling frequency. For sediment exposure points, either the maximum or average COC concentrations were calculated to represent EPCs in accordance with the MCP (310 CMR 40.0926).

Upland surface soil EPCs at 34-40 Water Street likely overestimate risk to a future resident at 34-40 Water Street because this portion of the Site represents a very small sliver of exposed soil at the 34-40 Water Street property. It is unlikely that a resident at this property would spend five days a week contacting surface soil in this small area.

When sediment EPCs were based on the average of four to nine sediment samples for an exposure area, the maximum COC concentrations were also considered in the risk calculations to address potential uncertainty associated with sample number. Human health risk is likely overestimated when sediment EPCs are set equal to maximum COC concentrations because the sediment exposure scenarios are also conservatively evaluating sediment exposure, including sediment exposure frequencies and ingestion rates equal to soil. In addition, the maximum COC concentrations in sediment were selected as EPCs for an emergency utility worker. This is a conservative estimate to account for potential uncertainty associated with the characterization of subsurface conditions along existing utility corridors.

With respect to determining EPCs, one assumption was that the concentrations of chemicals in the medium evaluated would remain constant over time. Depending on the properties of the chemical and the medium in which it was detected, this assumption may overestimate risks because chemicals may degrade over time or migrate to other media.

6.2. Uncertainties in Exposure Assessment

Conservative exposure parameters are incorporated in the exposure assessment. Health-protective exposure assumptions based on either Site-specific information or conservative default values provided in MassDEP guidance were used to quantitatively evaluate potential risks.

There is no evidence that residents within the Site boundary access the wetlands, mudflats, or river on a regular basis because these areas are heavily overgrown and difficult to access from the occupied portions of residential properties. Therefore, it is GEI's opinion that there is little potential for increased exposure to sediment for residents within the Site boundary under current conditions. However, we have conservatively assumed a resident within the Site boundary may be exposed to wetland sediment, mudflat sediment and river sediment on their properties for 1 day a week, for the 7 warmer months (April to October), for 30 years. This assumption likely significantly overestimates actual exposures for a current resident at the Site. In addition, at high tide there is up to 7 feet of water covering the river and mudflat sediment further limiting potential contact with sediment.

The risk characterization estimated risk from cumulative exposures to wetland, mudflat, and river sediment at the Site. For some properties, where exposures to wetland, mudflat, and river sediment were added together, risk may be overestimated because adding these risks together results in a higher exposure frequency for the receptor. Specifically, a residential receptor exposed to both wetland sediment and river sediment assumes an exposure frequency of two days each week (one day per week of wetland sediment exposure and one day per week of river sediment exposure).

Young child exposures (0 to 6 years old) to sediment were also assumed for the resident and recreational visitor. This assumption likely overestimates actual exposures for a current resident and recreational visitor because the sediment areas are heavily overgrown and difficult to access, so frequent exposure by young children (0 to 6 years old) is unlikely.

6.3. Uncertainties in Toxicity Assessment

There are many uncertainties inherent in the toxicity values used in the dose-response assessment. For example, short-term, homogeneous animal studies, using very high concentrations, are used to predict human health effects resulting from low-dose exposures over long exposure periods. Conservative safety factors are incorporated in the toxicity values to counter this uncertainty. Compounding conservative safety factors may result in the overestimation of risk. Specifically, risk is likely overestimated where chronic toxicity values for COCs are used to evaluate risk from subchronic exposures for utility and construction workers.

6.3.1. Carcinogenic Toxicity Assessment Assumptions

Carcinogenic COCs have been evaluated by the EPA using a weight-of-evidence carcinogenicity evaluation criteria, and some have been placed in Group A (human carcinogens) or Group B (probable human carcinogens), based on sufficient data in humans, or sufficient data in animals and insufficient data in humans, respectively (EPA, 1986). There is uncertainty introduced in the assessment where COCs are currently under review by EPA to change their weight-of-evidence classifications.

As discussed in Section 4.1, GEI has incorporated age dependent adjustment factors (ADAFs) recommended by EPA for mutagenic COCs. Specifically, for the trespasser exposure scenario, GEI has applied an ADAF of 3 for mutagenic COCs, since this receptor is assumed to be a 7 to 14-year old. For the residential and recreational exposure scenarios, GEI has applied an ADAF of 10 for a 1 to 2-year old, and an ADAF of 3 for a 2 to 16-year old. Application of ADAFs for mutagenic COCs may result in overestimating risk from exposure to these COCs in sediment at the Site.

6.3.2. Non-carcinogenic Toxicity Assessment Assumptions

Key assumptions used in assessing the likelihood of non-carcinogenic effects are that threshold doses exist below which various non-carcinogenic effects do not occur and that the occurrence or absence of non-carcinogenic effects can be extrapolated between species and occasionally between routes of exposure over varying exposure durations. The threshold assumption appears to be sound for most non-carcinogens based on reasonably good fits of experimental data to dose-response curves.

The effects observed in one species or by one route of exposure may not occur in another species or by another route, or they may occur at a higher or lower dose due to differences in the biokinetics of a compound in different species. The uncertainty in these assumptions is considered in the development of RfDs using safety or uncertainty factors. These factors reflect uncertainty associated with species-to-species extrapolation and include safety factors to protect sensitive individuals. In addition to uncertainty factors, a modifying factor is applied to reflect a quantitative professional assessment of additional uncertainties in the critical study and in the entire database for the chemical not explicitly addressed by other uncertainty factors.

The uncertainty factors and modifying factors incorporated in the RfDs and RfCs are conservative (health protective) in nature. The use of these toxicity values therefore may overestimate the potential for non-carcinogenic effects for a given exposure route.

6.3.3. Route-to-Route Extrapolation of Slope Factors and Reference Doses

Route-to-route extrapolation of toxicity values adds an additional source of uncertainty to the risk assessment. Such extrapolation may result in either under- or over-estimation of the true risks for the extrapolated route. Although this practice adds uncertainty to the risk evaluation, it is preferable to omitting exposure to a COC by a route for which no toxicity value is available thus avoiding the potential underestimation of risk.

6.4. Uncertainties in Risk Characterization

The estimation of ELCR assumes that an increased risk of cancer from exposure to a chemical is directly proportional to the chemical intake averaged over a lifetime with no threshold or (non-zero) dose below which carcinogenic effects do not occur. While continuing to recommend this approach, EPA recognizes that certain carcinogenic chemicals may have threshold levels like non-carcinogenic chemicals (EPA, 2005b). In addition, cumulative cancer and non-cancer risk estimates assume risks are additive, which may under-estimate or over-estimate risk given that some chemical effects may not be additive, while others may have synergistic effects.

7. Conclusions

Based on the Method 3 Risk Characterization, GEI concluded the following:

7.1. Human Health Risk Characterization

Under current land use at the Site, a condition of NSR exists for current receptors except for the following:

Current Residential Scenarios

- A current resident at 35 Oakland Street from cumulative exposure to wetland surface sediment and river surface sediment at Segment II (Oakland Street / Oak Street Area); however, this risk is primarily attributable to exposure to wetland surface sediment at 35 Oakland Street.
- A current resident at 37 Oakland Street from cumulative exposure to wetland surface sediment and river surface sediment at Segment II (Oakland Street / Oak Street Area); however, this risk is primarily attributable to exposure to wetland surface sediment at 37 Oakland Street.
- A current resident at 41 Oakland Street from cumulative exposure to mudflat surface sediment and river surface sediment at Segment II (Oakland Street / Oak Street Area); however, this risk is primarily attributable to exposure to EPCs based on maximum COC concentrations in mudflat surface sediment. There is NSR for EPCs based on average COC concentrations in mudflat surface sediment.
- A current resident at 4 Oakland Court from cumulative residential exposure to mudflat surface sediment and river surface sediment at Segment II (Oakland Street / Oak Street Area); however, this risk is primarily attributable to exposure to EPCs based on maximum COC concentrations in mudflat surface sediment. There is NSR for EPCs based on average COC concentrations in mudflat surface sediment.
- A current resident potentially exposed to isolated river surface sediment at the following five sampling locations: 710 at river Segment I (Water Street Area); and SS681, SS658, 701, and SS697 at river Segment II (Oakland Street / Oak Street Area).
- A current resident from cumulative exposure to river surface sediment at Segment II (Oakland Street / Oak Street Area) and recreational exposure to Site-wide river surface sediment. This exposure scenario conservatively assumed a resident may contact river surface sediment in the vicinity of their property and may also contact Sitewide river surface sediment during recreational activities.

Current Recreational Visitor Scenario

- A recreational visitor at the combined Oakland Street and Oakland Court properties from exposure to mudflat surface sediment.
- A recreational visitor at river Segment II (Oakland Street / Oak Street Area) from exposure to river surface sediment.

We concluded NSR for all other exposure scenarios, including for the current trespasser, other recreational visitors not identified above, and the utility worker.

For properties where current exposures to wetland, mudflat, and river sediment were added together, risk may be overestimated because adding these risks together results in a higher exposure frequency for the receptor. Specifically, a residential receptor exposed to both wetland sediment and river sediment assumes an exposure frequency of two days each week (one day per week of wetland sediment exposure and one day per week of river sediment exposure). Similarly, adding a residential exposure to river sediment to a recreational exposure to river sediment assumes an exposure frequency of four days each week (one day per week of river sediment exposure at a residential property and three days per week of recreational river sediment exposure).

Under future land use at the Site, a condition of NSR exists for potential future receptors except for the following:

Future Residential Scenario

- A future resident at 35 Oakland Street from cumulative exposure to deep wetland sediment and deep river sediment at river Segment II (Oakland Street / Oak Street Area); however, this risk is primarily attributable to exposure to deep river sediment at river Segment II (Oakland Street / Oak Street Area). There is NSR at this property from exposure to only deep wetland sediment.
- A future resident at 37 Oakland Street from cumulative exposure to deep wetland sediment and deep river sediment at river Segment II (Oakland Street / Oak Street Area); however, this risk is primarily attributable to exposure to deep river sediment at river Segment II (Oakland Street / Oak Street Area). There is NSR at this property from exposure to only deep wetland sediment.
- A future resident at 39 Oakland Street from cumulative exposure to deep mudflat sediment and deep river sediment at river Segment II (Oakland Street / Oak Street Area); however, this risk is primarily attributable to exposure to deep river sediment at river Segment II (Oakland Street / Oak Street Area). There is NSR at this property from exposure to only deep mudflat sediment.
- A future resident at 4 Oakland Court from cumulative exposure to deep mudflat sediment and deep river sediment at river Segment II (Oakland Street / Oak Street Area); however, this risk is primarily attributable to exposure to deep river sediment at river Segment II (Oakland Street / Oak Street Area). There is NSR at this property from exposure to only deep mudflat sediment.
- A future resident within the Site Boundary from potential exposure to Segment-wide deep sediment at Segment II (Oakland Street / Oak Street Area) and Segment III (River Street Area). In addition, a future resident potentially exposed to isolated river deep sediment at the following 28 sampling locations: 712 and 855 at river Segment I (Water Street Area); 678, 680, 682, 692, 694, 696, 699, 702, 703, 705, 706, 708, 714, 729, 850, and 856 at river Segment II (Oakland Street / Oak Street Area); and 734, 737, 754, 766, 769, 774, 778, 823, 851, and 852 at river Segment III (River Street Area).

Future Recreational Visitor Scenario

- A future recreational visitor at river Segment II (Oakland Street / Oak Street) from exposure to deep river sediment.
- A future recreational visitor at river Segment III (River Street Area) from exposure to deep river sediment.
- A future recreational visitor Site-wide, including all three segments of the river combined, from exposure to deep river sediment.

Future Trespasser Scenario

- A future trespasser potentially exposed to isolated river deep sediment at the following 11 sampling locations: 680, 692, 694, 705, 706, 708, and 856 at river Segment II (Oakland Street / Oak Street Area); and 734, 769, 851, and 852 at river Segment III (River Street Area).

Future Construction Worker Scenario

- A future construction worker exposed to isolated river deep sediment at the following 9 sampling locations: 692, 694, 705, 706, and 708 at river Segment II (Oakland Street / Oak Street Area); and 734, 769, 851, and 852 at river Segment III (River Street Area).

We concluded NSR for all other future exposure scenarios not identified above, including for other future residents, other future trespassers, other future recreational visitors, other future construction workers, and future utility workers.

For properties where future exposures to wetland, mudflat, and river sediment were added together, risk may be overestimated because adding these risks together results in a higher exposure frequency for the receptor. Specifically, a residential receptor exposed to both mudflat sediment and river sediment assumes an exposure frequency of two days each week (one day per week of mudflat sediment exposure and one day per week of river sediment exposure).

GEI also conservatively evaluated potential residential, trespasser, and construction worker exposure to isolated river sediment sampling locations under current and future land use; however, risk to these receptors at isolated river sediment sampling locations is likely overestimated because receptors would typically not have chronic exposures to isolated sediment sampling locations. In addition, many of these sediment samples are located in the center of the river, further away from the upland property boundaries, and at depths greater than one foot, which further reduces potential exposures to these sediment sampling locations.

34-40 Water Street Upland Surface Soil

There is NSR to a potential future resident from exposure to accessible upland surface soil located adjacent to the recreational path at 34-40 Water Street. As a result, there is also NSR to any lesser exposed receptors at this portion of the Site, including a commercial worker, recreational visitor, and an emergency utility worker as the resident is the most sensitive receptor.

There is also NSR to a future resident at 34-40 Water Street from potential residential exposure to river surface sediment. In addition, there is NSR to a future resident at 34-40 Water Street from cumulative

exposure to upland surface soil as well as residential exposure to river surface sediment. However, there is significant risk to a resident at 34-40 Water Street from cumulative residential soil and sediment exposure as well as recreational exposure to Site-wide river surface sediment. This exposure scenario conservatively assumed a resident may contact river surface sediment in the vicinity of their property and may also contact Sitewide river surface sediment during recreational activities. A planned AUL at 34-40 Water Street will prohibit exposure to deeper upland soil (greater than 3 feet) and deeper river sediment (greater than 2 feet).

7.1.1. Applicable or Suitably Analogous Standards

There are no COC exceedances of applicable or suitably analogous standards in surface water at the Site.

7.1.2. Readily Apparent Harm

A condition of Readily Apparent Harm (RAH) was identified at the Site due to the presence of NAPL over an area greater than 1,000 square feet in sediment within one foot of the sediment surface in wetland, mudflat and river surface sediment. The RAH conditions at the Site will be remediated as these areas represents a substantial hazard. MGP waste deposits comprised of small, isolated pieces of hardened tar were observed in shallow wetland sediment on 35 Oakland Street and 37 Oakland Street within an RAH area; however, these isolated, small pieces of tar did not comprise significant, continuous MGP waste deposits distinguishable from the sediment matrix. As a result, visible coal tar waste deposits as defined by MassDEP were not identified at the Site.

7.2. Safety Risk Characterization

Based on observations and information collected during environmental investigations of the Site, a condition of NSR to safety exists at the Site.

7.3. Public Welfare Risk Characterization

Based on observations and information collected during environmental investigations of the Site, no community at or near the Site experiences adverse impacts to public welfare under current or anticipated future conditions. The RAH conditions at the Site will be remediated as these areas represent a substantial hazard. Average concentrations of COCs in upland surface soil at 34-40 Water Street are below M3CLs and maximum concentrations of chemicals detected in groundwater at the upland portion of 34-40 Water Street are below M3CLs. Accordingly, a condition of NSR of harm to public welfare exists at the Site.

8. References

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Tables

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Table RC-10. Sediment Exposure Assumptions for a Current and Future Resident

Table RC-11.Sediment Exposure Assumptions for a Current and Future Trespasser

Table RC-12. Sediment Exposure Assumptions for a Current and Future Recreational Visitor

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Table RC-16. Subchronic, Chronic, and Cancer Toxicity Values and Absorption Factors

Table RC-17. Summary of Current Human Health Risk Estimates

Table RC-18. Summary of Future Human Health Risk Estimates

Table RC-1. River Surface Sediment (0 to 2 Feet) Summary Statistics for COCs
Method 3 Human Health Risk Characterization, Amesbury Former MGP
Amesbury, Massachusetts

Analyte	Sample Number	Detection Frequency	Average Detected Concentration	Maximum Detected Concentration
Volatile Organic Compounds (VOCs)				
Benzene	2	0%		
Ethylbenzene	8	0%		
Toluene	8	0%		
Xylenes, Total	8	0%		
Semivolatile Organic Compounds (SVOCs)				
2-Methylnaphthalene	135	92%	1.27	111
Acenaphthene	135	88%	8.64	330
Acenaphthylene	135	90%	1.23	23.1
Anthracene	135	91%	6.59	200
Benzo(a)anthracene	135	95%	7.22	162
Benzo(a)pyrene	135	95%	7.31	154
Benzo(b)fluoranthene	135	95%	4.13	67.5
Benzo(g,h,i)perylene	135	94%	3.54	69.7
Benzo(k)fluoranthene	135	95%	4.68	98
Chrysene	135	96%	6.80	152
Dibenzo(a,h)anthracene	135	88%	0.83	14.5
Fluoranthene	135	99%	15.59	319
Fluorene	135	91%	3.89	151
Indeno(1,2,3-cd)pyrene	135	94%	3.52	55.5
Naphthalene	135	93%	2.38	183
Phenanthrene	135	97%	21.49	665
Pyrene	135	99%	20.58	488
Volatile Petroleum Hydrocarbons (VPH)				
C5 to C8 Aliphatic Hydrocarbons	0			
C9 to C12 Aliphatic Hydrocarbons	0			
C9 to C10 Aromatic Hydrocarbons	0			
Extractable Petroleum Hydrocarbons (EPH)				
C9 to C18 Aliphatic Hydrocarbons	6	0%		
C19 to C36 Aliphatic Hydrocarbons	6	67%	41.79	88
C11 to C22 Aromatic Hydrocarbons	6	67%	54.28	106
Metals				
Arsenic	6	100%	11.22	17
Barium	6	100%	48.37	77
Cadmium	6	67%	0.97	2
Chromium	6	100%	71.70	227
Lead	6	100%	131.03	274
Mercury	6	100%	0.60	1
Nickel	6	100%	14.81	20
Selenium	6	0%		
Silver	6	17%	0.84	3
Zinc	6	100%	136.28	242

General Notes:

1. Units in mg/kg = milligrams per kilogram.
2. Analytes included as COCs in the Method 3 Human Health Risk Characterization. For a complete list of analytes see analytical data tables in the Supplemental Phase II Report.
3. Summary statistics for COCs detected in sediment samples collected from the top two feet of river sediment; average detected concentration calculated when more than 3 samples.

Table RC-2. River Deep Sediment (>2 Feet) Summary Statistics for COCs
Method 3 Human Health Risk Characterization, Amesbury Former MGP
Amesbury, Massachusetts

Analyte	Sample Number	Detection Frequency	Average Detected Concentration	Maximum Detected Concentration
Volatile Organic Compounds (VOCs)				
Benzene	0			
Ethylbenzene	3	67%		37.70
Toluene	3	33%		0.90
Xylenes, Total	3	67%		25.80
Semivolatile Organic Compounds (SVOCs)				
2-Methylnaphthalene	138	73%	192.66	5800.00
Acenaphthene	138	78%	300.33	9260.00
Acenaphthylene	138	78%	14.96	487.00
Anthracene	138	79%	146.56	4230.00
Benzo(a)anthracene	138	80%	86.32	2700.00
Benzo(a)pyrene	138	81%	86.04	3050.00
Benzo(b)fluoranthene	138	76%	36.67	1320.00
Benzo(g,h,i)perylene	138	80%	35.56	1270.00
Benzo(k)fluoranthene	138	78%	47.06	1490.00
Chrysene	138	80%	82.58	2220.00
Dibenzo(a,h)anthracene	138	68%	8.03	285.00
Fluoranthene	138	88%	202.24	6740.00
Fluorene	138	78%	114.41	3540.00
Indeno(1,2,3-cd)pyrene	138	79%	33.91	1280.00
Naphthalene	138	76%	358.58	9480.00
Phenanthrene	138	86%	491.58	16200.00
Pyrene	138	90%	297.43	10400.00
Volatile Petroleum Hydrocarbons (VPH)				
C5 to C8 Aliphatic Hydrocarbons	0			
C9 to C12 Aliphatic Hydrocarbons	0			
C9 to C10 Aromatic Hydrocarbons	0			
Extractable Petroleum Hydrocarbons (EPH)				
C9 to C18 Aliphatic Hydrocarbons	3	100%		844.00
C19 to C36 Aliphatic Hydrocarbons	3	100%		878.00
C11 to C22 Aromatic Hydrocarbons	3	100%		1450.00
Metals				
Arsenic	3	100%		25.40
Barium	3	100%		118.00
Cadmium	3	100%		3.41
Chromium	3	100%		179.00
Lead	3	100%		367.00
Mercury	3	100%		6.45
Nickel	3	100%		19.00
Selenium	3	33%		0.62
Silver	3	100%		5.21
Zinc	3	100%		342.00

General Notes:

1. Units in mg/kg = milligrams per kilogram.
2. Analytes included as COCs in the Method 3 Human Health Risk Characterization. For a complete list of analytes see analytical data tables in the Supplemental Phase II Report.
3. Summary statistics for COCs detected in sediment samples collected from deeper than two feet in river sediment; average detected concentration calculated for more than 3 samples.

Table RC-3. Wetland Surface Sediment (0 to 2 Feet) Summary Statistics for COCs
Method 3 Human Health Risk Characterization, Amesbury Former MGP
Amesbury, Massachusetts

Analyte	Sample Number	Detection Frequency	Average Detected Concentration	Maximum Detected Concentration
Volatile Organic Compounds (VOCs)				
Benzene	25	12%	0.33	1.2
cis-1,2-Dichlorothylene	1	100%		81.9
Ethylbenzene	28	11%	0.50	4.4
Toluene	28	0%		
Vinyl Chloride	1	100%		13.2
Xylenes, Total	28	4%	0.56	0.708
Semivolatile Organic Compounds (SVOCs)				
2-Methylnaphthalene	40	58%	13.01	206
Acenaphthene	40	63%	61.57	1,230
Acenaphthylene	40	60%	6.93	99.8
Anthracene	40	68%	43.11	940
Benzo(a)anthracene	40	68%	32.52	509
Benzo(a)pyrene	40	75%	39.24	649
Benzo(b)fluoranthene	40	70%	19.79	317
Benzo(g,h,i)perylene	40	70%	22.78	406
Benzo(k)fluoranthene	40	65%	19.31	258
Chrysene	40	70%	27.01	342
Dibenzo(a,h)anthracene	40	63%	5.59	96
Fluoranthene	40	73%	81.03	1,500
Fluorene	40	63%	25.91	522
Indeno(1,2,3-cd)pyrene	40	68%	18.12	304
Naphthalene	40	63%	35.56	629
Phenanthrene	40	70%	140.69	2,940
Pyrene	40	78%	122.74	2,380
Volatile Petroleum Hydrocarbons (VPH)				
C5 to C8 Aliphatic Hydrocarbons	24	0%		
C9 to C12 Aliphatic Hydrocarbons	24	4%	22.90	34.8
C9 to C10 Aromatic Hydrocarbons	24	8%	27.79	152
Extractable Petroleum Hydrocarbons (EPH)				
C9 to C18 Aliphatic Hydrocarbons	27	11%	41.26	328
C19 to C36 Aliphatic Hydrocarbons	27	48%	124.76	1,180
C11 to C22 Aromatic Hydrocarbons	27	63%	435.62	4,660
Metals				
Arsenic	3	100%		71
Barium	3	100%		107
Cadmium	3	67%		7
Chromium	3	100%		254
Lead	3	100%		350
Mercury	3	100%		1
Nickel	3	100%		91
Selenium	3	67%		4
Silver	3	67%		11
Zinc	3	100%		535

General Notes:

1. Units in mg/kg = milligrams per kilogram.
2. Analytes included as COCs in the Method 3 Human Health Risk Characterization. For a complete list of analytes see analytical data tables in the Supplemental Phase II Report.
3. Summary statistics for COCs detected in sediment samples collected from the top 2 feet of wetland sediment at Oakland Street properties; average detected concentration calculated for more than 3 samples.

Table RC-4. Wetland Deep Sediment (> 2 Feet) Summary Statistics for COCs
Method 3 Human Health Risk Characterization, Amesbury Former MGP
Amesbury, Massachusetts

Analyte	Sample Number	Detection Frequency	Average Detected Concentration	Maximum Detected Concentration
Volatile Organic Compounds (VOCs)				
Benzene	4	0%		
Ethylbenzene	4	0%		
Toluene	4	0%		
Xylenes, Total	4	0%		
Semivolatile Organic Compounds (SVOCs)				
2-Methylnaphthalene	6	33%	2.57	13.10
Acenaphthene	6	50%	62.08	369.00
Acenaphthylene	6	33%	1.76	6.07
Anthracene	6	50%	7.88	41.80
Benzo(a)anthracene	6	67%	5.17	19.80
Benzo(a)pyrene	6	67%	6.82	26.40
Benzo(b)fluoranthene	6	67%	5.22	20.20
Benzo(g,h,i)perylene	6	67%	4.66	17.20
Benzo(k)fluoranthene	6	50%	5.08	19.40
Chrysene	6	67%	5.80	23.60
Dibenzo(a,h)anthracene	6	50%	1.08	3.63
Fluoranthene	6	67%	13.14	61.50
Fluorene	6	50%	14.90	86.30
Indeno(1,2,3-cd)pyrene	6	67%	4.61	17.40
Naphthalene	6	33%	9.13	49.80
Phenanthrene	6	67%	44.27	253.00
Pyrene	6	67%	16.72	78.20
Volatile Petroleum Hydrocarbons (VPH)				
C5 to C8 Aliphatic Hydrocarbons	4	0%		
C9 to C12 Aliphatic Hydrocarbons	4	0%		
C9 to C10 Aromatic Hydrocarbons	4	0%		
Extractable Petroleum Hydrocarbons (EPH)				
C9 to C18 Aliphatic Hydrocarbons	4	25%	35.05	90
C19 to C36 Aliphatic Hydrocarbons	4	25%	40.55	112
C11 to C22 Aromatic Hydrocarbons	4	75%	36.44	48

General Notes:

1. Units in mg/kg = milligrams per kilogram.
2. Analytes included as COCs in the Method 3 Human Health Risk Characterization. For a complete list of analytes see analytical data tables in the Supplemental Phase II Report.
3. Summary statistics for COCs detected in sediment samples collected from deeper than 2 feet in wetland sediment at Oakland Street properties; average detected concentration calculated for more than 3 samples.

Table RC-5. Mudflat Surface Sediment (0 to 2 Feet) Summary Statistics for COCs
Method 3 Human Health Risk Characterization, Amesbury Former MGP
Amesbury, Massachusetts

Analyte	Sample Number	Detection Frequency	Average Detected Concentration	Maximum Detected Concentration
Volatile Organic Compounds (VOCs)				
Benzene	3	0%		
Ethylbenzene	5	0%		
Toluene	5	0%		
Xylenes, Total	5	0%		
Semivolatile Organic Compounds (SVOCs)				
2-Methylnaphthalene	45	91%	0.26	1.96
Acenaphthene	45	100%	2.22	20.9
Acenaphthylene	45	98%	1.60	16.5
Anthracene	45	100%	4.33	40
Benzo(a)anthracene	45	100%	8.53	103
Benzo(a)pyrene	45	98%	9.79	109
Benzo(b)fluoranthene	45	96%	5.05	49
Benzo(g,h,i)perylene	45	96%	4.82	52.4
Benzo(k)fluoranthene	45	98%	5.94	70.5
Chrysene	45	100%	8.20	99.4
Dibenzo(a,h)anthracene	45	93%	1.04	12.5
Fluoranthene	45	100%	18.09	171
Fluorene	45	96%	1.34	16.7
Indeno(1,2,3-cd)pyrene	45	96%	4.53	46.3
Naphthalene	45	96%	0.54	3.95
Phenanthrene	45	100%	11.81	133
Pyrene	45	100%	23.81	265
Volatile Petroleum Hydrocarbons (VPH)				
C5 to C8 Aliphatic Hydrocarbons	0			
C9 to C12 Aliphatic Hydrocarbons	0			
C9 to C10 Aromatic Hydrocarbons	0			
Extractable Petroleum Hydrocarbons (EPH)				
C9 to C18 Aliphatic Hydrocarbons	2	50%		568
C19 to C36 Aliphatic Hydrocarbons	2	100%		1220
C11 to C22 Aromatic Hydrocarbons	2	100%		730
Metals				
Arsenic	2	100%		13.6
Barium	2	100%		40.9
Cadmium	2	100%		2.39
Chromium	2	100%		166
Lead	2	100%		145
Mercury	2	100%		0.32
Nickel	2	100%		105
Selenium	2	50%		0.28
Silver	2	100%		4.65
Zinc	2	100%		282

General Notes:

1. Units in mg/kg = milligrams per kilogram.
2. Analytes included as COCs in the Method 3 Human Health Risk Characterization. For a complete list of analytes see analytical data tables in the Supplemental Phase II Report.
3. Summary statistics for COCs detected in mudflat samples collected from the top 2 feet of mudflat sediment at Oakland Street properties; average detected concentration calculated for more than 3 samples.

Table RC-6. Mudflat Deep Sediment (> 2 Feet) Summary Statistics for COCs
Method 3 Human Health Risk Characterization, Amesbury Former MGP
Amesbury, Massachusetts

Analyte	Sample Number	Detection Frequency	Average Detected Concentration	Maximum Detected Concentration
Volatile Organic Compounds (VOCs)				
Benzene	0			
Ethylbenzene	0			
Toluene	0			
Xylenes, Total	0			
Semivolatile Organic Compounds (SVOCs)				
2-Methylnaphthalene	10	50%	0.67	5.68
Acenaphthene	10	70%	7.54	61.00
Acenaphthylene	10	80%	0.56	4.22
Anthracene	10	70%	4.57	37.00
Benzo(a)anthracene	10	70%	3.14	25.10
Benzo(a)pyrene	10	70%	2.31	18.50
Benzo(b)fluoranthene	10	70%	0.99	6.98
Benzo(g,h,i)perylene	10	60%	0.68	4.78
Benzo(k)fluoranthene	10	60%	1.13	8.02
Chrysene	10	70%	3.19	25.50
Dibenzo(a,h)anthracene	10	30%	0.22	1.53
Fluoranthene	10	90%	5.72	42.60
Fluorene	10	70%	3.94	31.40
Indeno(1,2,3-cd)pyrene	10	60%	0.67	4.94
Naphthalene	10	60%	1.40	11.30
Phenanthrene	10	100%	14.39	113.00
Pyrene	10	90%	8.57	65.10
Volatile Petroleum Hydrocarbons (VPH)				
C5 to C8 Aliphatic Hydrocarbons	0			
C9 to C12 Aliphatic Hydrocarbons	0			
C9 to C10 Aromatic Hydrocarbons	0			
Extractable Petroleum Hydrocarbons (EPH)				
C9 to C18 Aliphatic Hydrocarbons	0			
C19 to C36 Aliphatic Hydrocarbons	0			
C11 to C22 Aromatic Hydrocarbons	0			

General Notes:

1. Units in mg/kg = milligrams per kilogram.
2. Analytes included as COCs in the Method 3 Human Health Risk Characterization. For a complete list of analytes see analytical data tables in the Supplemental Phase II Report.
3. Summary statistics for COCs detected in sediment samples collected from deeper than 2 feet in mudflat sediment at Oakland Street properties; average detected concentration calculated for more than 3 samples.

Table RC-7. Surface Water Summary Statistics for Analytical Data and Comparison to AWQC
Method 3 Human Health Risk Characterization, Amesbury Former MGP
Amesbury, Massachusetts

Analyte	MCP Method 1 GW-1 Standard	Sample Number	Detection Frequency	Maximum Detected Concentration	Ambient Water Quality Criteria (AWQC) Water & Organisms	Ambient Water Quality Criteria (AWQC) Organisms Only
Polynuclear Aromatic Hydrocarbons (PAH)						
2-Methylnaphthalene	10	13	31%	1.3	NS	NS
Acenaphthene	20	13	31%	8.13	70	90
Anthracene	100	13	31%	0.43	300	400
Chrysene	2	13	8%	0.05	0.12	0.13
Fluoranthene	90	13	31%	0.52	20	20
Fluorene	40	13	31%	2.17	50	70
Naphthalene	140	13	31%	9.07	NS	NS
Phenanthrene	50	13	31%	3.42	NS	NS
Pyrene	70	13	31%	0.67	20	30
Extractable Petroleum Hydrocarbons (EPH)						
C9-C18 Aliphatics		13	0%	ND		
C19-C36 Aliphatics		13	0%	ND		
C11-C22 Aromatics		13	0%	ND		

General Notes:

1. Units in ug/L= micrograms per liter.
2. Surface water analytical data is presented in data tables in the Supplemental Phase II Report.
3. USEPA Ambient Water Quality Criteria (AWQC) dated October 2023. Human health ambient water quality criteria represent specific levels of chemicals or conditions in a water body that are not expected to cause adverse effects to human health. EPA provides recommendations for consumption of "water + organism" and "organism only" human health criteria. These human health criteria are developed by EPA under Section 304(a) of the Clean Water Act.
4. ND = Not detected.
5. NS = No Standard

Table RC-8. Upland Surface Soil Analytical Data at 34-40 Water Street Summary Statistics
Method 3 Human Health Risk Characterization
Amesbury Former MGP Site
Amesbury, Massachusetts

Analyte	MCP Soil M3CLs (mg/kg)	Sample Number	Number of Detections	Detection Frequency	Maximum Detected Concentration (mg/kg)	Average Detected Concentration (mg/kg)
Volatile Petroleum Hydrocarbons (VPH)						
C5-C8 Aliphatics	5,000	5	2	40%	64.40	24.86
Benzene	10,000	5	1	20%	0.30	0.26
Semi-Volatile Organic Compounds (SVOCs)						
1,1-Biphenyl	10,000	5	1	20%	0.10	0.04
Acenaphthylene	10,000	5	2	40%	1.10	0.43
Anthracene	10,000	5	4	80%	2.10	0.86
Benzo(a)anthracene	10,000	5	5	100%	8.64	3.90
Benzo(a)pyrene	300	5	5	100%	9.13	4.45
Benzo(b)fluoranthene	10,000	5	5	100%	9.15	4.79
Benzo(g,h,i)perylene	10,000	5	5	100%	9.94	3.81
Benzo(k)fluoranthene	10,000	5	5	100%	7.73	3.74
Chrysene	10,000	5	5	100%	9.18	4.70
Dibenzo(a,h)anthracene	2,000	5	4	80%	1.42	0.72
Fluoranthene	10,000	5	5	100%	18.90	9.14
Fluorene	10,000	5	1	20%	0.58	0.26
Indeno(1,2,3-cd)Pyrene	10,000	5	5	100%	9.03	3.78
Naphthalene	10,000	5	1	20%	0.74	0.30
Phenanthrene	10,000	5	5	100%	8.66	4.32
Pyrene	10,000	5	5	100%	24.70	10.37
Extractable Petroleum Hydrocarbons (EPH)						
C19-C36 Aliphatics	20,000	5	3	60%	51.50	22.96
C11-C22 Aromatics	10,000	5	5	100%	135.00	81.92
Total Metals						
Arsenic	600	5	5	100%	21.00	15.33
Barium	10,000	5	5	100%	151.00	117.92
Cadmium	800	5	4	80%	1.43	1.05
Chromium	2,000	5	5	100%	49.10	38.38
Lead	6,000	5	5	100%	338.00	205.30
Mercury	400	5	5	100%	7.32	2.33
Selenium	8,000	5	1	20%	4.21	2.63
Silver	2,000	5	3	60%	2.46	0.73

General Notes:

1. Units in mg/kg = milligram per kilogram.
2. MCP Soil Method 3 Ceiling Limits (M3CLs) (March 2024)
3. All analytes detected in at least one surface soil sample were evaluated as a soil COC.
4. Upland Soil analytical data for 34-40 Water Street is presented in data tables in the Supplemental Phase II Report.

Table RC-9. Upland Groundwater Analytical Data at 34-40 Water Street
Method 3 Human Health Risk Characterization
Amesbury Former MGP Site
Amesbury, Massachusetts

Analyte	Number of Detections	Number of Samples	Detection Frequency	Upland Groundwater at 34-40 Water Street Maximum Detected Concentration (ug/L)	MCP Groundwater M3CLs (ug/L)
Volatile Organic Compounds					
Benzene	4	4	100%	2,500	100,000
1,1-Dichloroethane	2	4	50%	2	100,000
1,2-Dichlorothylene (cis)	3	4	75%	13	100,000
Ethylbenzene	4	4	100%	580	100,000
Toluene	3	4	75%	20	100,000
Trichloroethylene (TCE)	3	4	75%	16	50,000
Vinyl Chloride	2	4	50%	5	100,000
Xylenes	4	4	100%	163	100,000
Volatile Petroleum Hydrocarbon Fractions					
C5-C8 Aliphatic	0	4	0%	ND	
C9-C12 Aliphatic	0	4	0%	ND	
C9-C10 Aromatic	4	4	100%	79	100,000
Extractable Petroleum Hydrocarbon Fractions					
C9-C18 Aliphatic	2	4	50%	420	100,000
C19-C36 Aliphatic	2	4	50%	95	100,000
C11-C22 Aromatic	3	4	75%	290	100,000
Semivolatile Organic Compounds					
Acenaphthene	4	4	100%	140	100,000
Acenaphthylene	4	4	100%	30	100,000
Anthracene	1	4	25%	8.5	1,000
Fluorene	4	4	100%	53	400
Fluoranthene	1	4	25%	23	2,000
2-Methylnaphthalene	4	4	100%	80	100,000
Naphthalene	4	4	100%	5,700	100,000
Phenanthrene	4	4	100%	64	100,000
General Chemistry/Other					
Cyanide	0	4	0%	ND	

General Notes:

1. Units in ug/L = micrograms per liter.
2. 34-40 Water Street groundwater data from monitoring well ESS 5.
3. Groundwater at 34-40 Water Street portion within the Site Boundary is located at a depth of 17 feet; therefore, there are no complete exposure pathways to groundwater.
4. MCP Groundwater Method 3 Ceiling Limits (M3CLs) (March 2024)
5. ND = Not detected.

Table RC-10. Resident - Sediment
Definitions and Exposure Factors

Parameter	Value	Units	Notes
ELCR - Excess Lifetime Cancer Risk	chemical specific	dimensionless	Pathway specific (ing=ingestion, derm=dermal)
CSF - Cancer Slope Factor	chemical specific	$(mg/kg\text{-}day)^{-1}$	Chemical-specific, see Tables RS-9 and RS--9c.
LADD - Lifetime Average Daily Dose	chemical specific	mg/kg-day	Pathway specific. See Tables RS-2, RS-3, RS-4a, RS-4b, and RS-4c
LADE - Lifetime Average Daily Exposure	chemical specific	$\mu g/m^3$	Pathway specific. See Tables RS-2, RS-3, RS-4a, RS-4b, and RS-4c
HQ - Hazard Quotient	chemical specific	dimensionless	Pathway specific (ing =ingestion, derm=dermal, inh=inhalation)
RfD - Reference Dose	chemical specific	mg/kg-day	Chemical-specific, see Tables RS-9 and RS-9c.
ADD - Average Daily Dose	chemical specific	mg/kg-day	Pathway specific. See Tables RS-5, RS-6
EPC - Exposure Point Concentration	chemical specific	mg/kg	
PUF - Plant Uptake Factor	chemical specific	dimensionless	See Table RS-9. Plant Uptake Factor is defined as the ratio of the contamination in the plant to the contamination in soil: (mg-OHM/kg-plant)/(mg-OHM/kg-soil)
$IR_{(1-8)}$ - Soil Ingestion Rate for age group 1-8	100	mg/day	MADEP. 2002. Technical Update: Calculation of an Enhanced Soil Ingestion Rate. (http://www.mass.gov/dep/ors/orspubs.htm)
$IR_{(8-15)}$ - Soil Ingestion Rate for age group 8-15	50	mg/day	Ibid $IR_{(1-8)}$ Notes.
$IR_{(15-31)}$ - Soil Ingestion Rate for age group 15-31	50	mg/day	Ibid $IR_{(1-8)}$ Notes.
$IR_{(1-2)}$ - Soil Ingestion Rate for age group 1-2	100	mg/day	Ibid $IR_{(1-8)}$ Notes.
$IR_{(2-6)}$ - Soil Ingestion Rate for age group 2-6	100	mg/day	Ibid $IR_{(1-8)}$ Notes.
$IR_{(6-16)}$ - Soil Ingestion Rate for age group 6-16	50	mg/day	Ibid $IR_{(1-8)}$ Notes.
$IR_{(16-31)}$ - Soil Ingestion Rate for age group 16-31	50	mg/day	Ibid $IR_{(1-8)}$ Notes.
$PIR_{(1-8)}$ = Produce Ingestion Rate for age group 1-8	1,210	mg/day	see Table RS-8
$PIR_{(8-15)}$ = Produce Ingestion Rate for age group 8-15	1,781	mg/day	Ibid $PIR_{(1-8)}$ Notes.
$PIR_{(15-31)}$ = Produce Ingestion Rate for age group 15-31	2,442	mg/day	Ibid $PIR_{(1-8)}$ Notes.
$PIR_{(1-2)}$ = Produce Ingestion Rate for age group 1-2	10,910	mg/day	Ibid $PIR_{(1-8)}$ Notes.
$PIR_{(2-6)}$ = Produce Ingestion Rate for age group 2-6	11,958	mg/day	Ibid $PIR_{(1-8)}$ Notes.
$PIR_{(6-16)}$ = Produce Ingestion Rate for age group 6-16	17,451	mg/day	Ibid $PIR_{(1-8)}$ Notes.
$PIR_{(16-31)}$ = Produce Ingestion Rate for age group 16-31	24,432	mg/day	Ibid $PIR_{(1-8)}$ Notes.
RAF_c - Relative Absorption Factor for Cancer Effects (exposure route-specific)	chemical specific	dimensionless	
$EF_{subchronic}$ - Exposure Frequency for subchronic ingestion or dermal exposure	0.143	event/day	1 days/week
$EF_{chronic}$ - Exposure Frequency for chronic ingestion or dermal exposure	0.082	event/day	1 days/week, 30 weeks/year
EF_{cancer} - Exposure Frequency for cancer, ingestion or dermal exposure	0.082	event/day	1 days/week, 30 weeks/year
$EF_{produce}$ - Exposure Frequency for produce ingestion, cancer and noncancer	1	event/day	
ED - Exposure Duration	1	day/event	
$EP_{sc\ (1-2)}$ - Exposure Period for age group 1-2	0.575	years	30 weeks
$EP_{(1-8)}$ - Exposure Period for age group 1-8	7	years	
$EP_{(8-15)}$ - Exposure Period for age group 8-15	7	years	
$EP_{(15-31)}$ - Exposure Period for age group 15-31	16	years	
$EP_{(1-2)}$ - Exposure Period for age group 1-2 for mutagenic effects	1	years	30 weeks
$EP_{(2-6)}$ - Exposure Period for age group 2-6 for mutagenic effects	4	years	

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Table RC-10. Resident - Sediment
Definitions and Exposure Factors

$EP_{(6-16)}$ - Exposure Period for age group 6-16 for mutagenic effects	10	years	
$EP_{(16-31)}$ - Exposure Period for age group 16-31 for mutagenic effects	15	years	
$BW_{(1-8)}$ - Body Weight for age group 1-8	19.0	kg	50th percentile female body weight from US Department of Health and Human Services (USDHHS), adjusted according to the MassDEP risk assessment methodology. (See MCP Method 1 Forms and documentation, https://www.mass.gov/doc/summary-of-proposed-mcp-method-1-standards-revisions/download.) Data source: USDHHS: Margaret A. McDowel, M.A, et al., "Anthropometric reference data for children and adults: United States, 2003-2006," National Health Statistics Reports, Number 10, October 22, 2008, Table 1, p 5. (https://www.cdc.gov/nchs/data/nhsr/nhsr010.pdf).
$BW_{(8-15)}$ - Body Weight for age group 8-15	46.1	kg	Ibid $BW_{(1-8)}$ Notes.
$BW_{(15-31)}$ - Body Weight for age group 15-31	64.5	kg	Ibid $BW_{(1-8)}$ Notes.
$BW_{(1-2)}$ - Body Weight for age group 1-2	9.6	kg	Ibid $BW_{(1-8)}$ Notes.
$BW_{(2-6)}$ - Body Weight for age group 2-6	17.6	kg	Ibid $BW_{(1-8)}$ Notes.
$BW_{(6-16)}$ - Body Weight for age group 6-16	43.2	kg	Ibid $BW_{(1-8)}$ Notes.
$BW_{(16-31)}$ - Body Weight for age group 16-31	65.0	kg	Ibid $BW_{(1-8)}$ Notes.
$AP_{subchronic}$ - Averaging Period for subchronic noncancer	0.575	years	30 weeks
$AP_{chronic}$ - Averaging Period for chronic noncancer	7	years	
$AP_{C\ (1-2)}$ - Averaging Period for cancer for the age group 1-2 for vinyl chloride (mutagenic)	1	years	
$AP_{lifetime}$ - Averaging Period for lifetime for cancer effects	70	years	
$ADAF_{(1-2)}$ - Age Defined Adjustment Factor for mutagenic effects for age group 1-2	10	dimensionless	
$ADAF_{(2-6)}$ - Age Defined Adjustment Factor for mutagenic effects for age group 2-6	3	dimensionless	
$ADAF_{(6-16)}$ - Age Defined Adjustment Factor for mutagenic effects for age group 6-16	3	dimensionless	
$ADAF_{(16-31)}$ - Age Defined Adjustment Factor for mutagenic effects for age group 16-31	1	dimensionless	

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Table RC-10. Resident - Sediment
Definitions and Exposure Factors

$SA_{(1-8)}$ - Surface Area for age group 1-8	2244	cm^2/day	SSA - 50th percentile female body surface area from EPA EFH 2011, adjusted by MassDEP risk characterication methodology. (See MassDEP MCP Method 1 Forms and documentation, https://www.mass.gov/doc/summary-of-proposed-mcp-method-1-standards-revisions/download..) Sources of data: (1) EPA Exposure Factors Handbook, 2011 Edition (EPA EFH 2011), Chapter 7, "Table 7-11. Mean and Percentile Skin Surface Area (m2) Derived From U.S. EPA Analysis of NHANES 1999–2006 for Children <21 Years and NHANES 2005–2006 for Adults >21 Years, Females", p 7-43. EPA/600/R-090/052F, September 2011. (https://rais.ornl.gov/documents/EFH_2011.pdf); and (2) EPA Exposure Factors Handbook (1997, Final Report), Table 6-7 (child), and Table 6-3 (age 18+) (https://cfpub.epa.gov/ncea/risk/recordisplay.cfm?deid=12464). (50th percentile of face (1/3 head), forearms, hands, lower legs, and feet for females.)
$SA_{(8-15)}$ - Surface Area for age group 8-15	4051	cm^2/day	Ibid $SA_{(1-8)}$ Notes.
$SA_{(15-31)}$ - Surface Area for age group 15-31	5322	cm^2/day	Ibid $SA_{(1-8)}$ Notes.
$SA_{(1-2)}$ - Surface Area for age group 1-2	1708	cm^2/day	Ibid $SA_{(1-8)}$ Notes.
$SA_{(2-6)}$ - Surface Area for age group 2-6	2113	cm^2/day	Ibid $SA_{(1-8)}$ Notes.
$SA_{(6-16)}$ - Surface Area for age group 6-16	3875	cm^2/day	Ibid $SA_{(1-8)}$ Notes.
$SA_{(16-31)}$ - Surface Area for age group 16-31	5354	cm^2/day	Ibid $SA_{(1-8)}$ Notes.
$SAF_{(1-8)}$ - Surface Adherence Factor for age group 1-8	1.0000	mg/cm^2	SAF developed for Short Forms according to procedures outlined in MassDEP MCP Risk Characterization Guidance for Disposal Sites, 2024. See SSA tab in Method 3 Lookup Tables Version v0624.xlsx.
$SAF_{(8-15)}$ - Surface Adherence Factor for age group 8-15	1.0000	mg/cm^2	Ibid $SAF_{(1-8)}$ Notes.
$SAF_{(15-31)}$ - Surface Adherence Factor for age group 15-31	1.0000	mg/cm^2	Ibid $SAF_{(1-8)}$ Notes.
$SAF_{(1-2)}$ - Surface Adherence Factor for age group 1-2	1.0000	mg/cm^2	Ibid $SAF_{(1-8)}$ Notes.
$SAF_{(2-6)}$ - Surface Adherence Factor for age group 2-6	1.0000	mg/cm^2	Ibid $SAF_{(1-8)}$ Notes.
$SAF_{(6-16)}$ - Surface Adherence Factor for age group 6-16	1.0000	mg/cm^2	Ibid $SAF_{(1-8)}$ Notes.
$SAF_{(16-31)}$ - Surface Adherence Factor for age group 16-31	1.0000	mg/cm^2	Ibid $SAF_{(1-8)}$ Notes.

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Table RC-11. Trespasser - Sediment Definitions and Exposure Factors

Parameter	Value	Units	Notes
ELCR - Excess Lifetime Cancer Risk	chemical specific	dimensionless	Pathway specific (ing =ingestion, derm=dermal, inh=inhalation)
CSF - Cancer Slope Factor	chemical specific	$(mg/kg\text{-}day)^{-1}$	See Tables TS-6 and TS-6a through TS-6c.
LADD - Lifetime Average Daily Dose	chemical specific	mg/kg-day	Pathway specific. See Tables TS-2, 2-a, 2b, and 2c.
HQ - Hazard Quotient	chemical specific	dimensionless	Pathway specific (ing =ingestion, derm=dermal, inh=inhalation)
RfD - Reference Dose	chemical specific	mg/kg-day	See Table TS-6
ADD - Average Daily Dose	chemical specific	mg/kg-day	Pathway specific. See Tables TS-4 and TS-3.
EPC - Exposure Point Concentration	chemical specific	mg/kg	See Table TS-1
IR - Soil Ingestion Rate	50	mg/day	MADEP. 2002. Technical Update: Calculation of an Enhanced Soil Ingestion Rate. (http://www.mass.gov/dep/ors/orspubs.htm)
RAF_c - Relative Absorption Factor for Cancer Effects (specific to exposure route)	chemical specific	dimensionless	See Table TS-6.
EF_{sc} - Exposure Frequency for subchronic ingestion or dermal exposure	0.286	event/day	2 days/week
EF_{chr} - Exposure Frequency for chronic ingestion or dermal exposure	0.164	event/day	2 days/week, 30 weeks/year
EF_c - Exposure Frequency for cancer, ingestion or dermal exposure	0.164	event/day	2 days/week, 30 weeks/year
ED - Exposure Duration	1	day/event	
$EP_{sc\ (11\text{-}12)}$ - Exposure Period for age group 11-12 (for subchronic exposure)	0.575	years	30 weeks per year
$EP_{(11\text{-}16)}$ - Exposure Period for age group 11-16 (for mutagenic cancer)	5	years	
$EP_{(16\text{-}18)}$ - Exposure Period for age group 16-18 (for mutagenic cancer)	2	years	
$EP_{(11\text{-}18)}$ - Exposure Period for age group 11-18	7	years	
$BW_{(11\text{-}12)}$ - Body Weight for age group 11-12 (for Subchronic exposure risk)	48.4	kg	50th percentile female body weight from US Department of Health and Human Services (USDHHS), adjusted according to the MassDEP risk assessment methodology. (See MCP Method 1 Forms and documentation, https://www.mass.gov/doc/summary-of-proposed-mcp-method-1-standards-revisions/download.) Data source: USDHHS: Margaret A. McDowel, M.A, et al., "Anthropometric reference data for children and adults: United States, 2003-2006," National Health Statistics Reports, Number 10, October 22, 2008, Table 1, p 5. (https://www.cdc.gov/nchs/data/nhsr/nhsr010.pdf).
$BW_{(11\text{-}16)}$ - Body Weight for age group 11-16 (for mutagenic cancer))	53.8	kg	Ibid $BW_{(11\text{-}12)}$ Note.
$BW_{(16\text{-}18)}$ - Body Weight for age group 16-18 (for mutagenic cancer)	60.8	kg	Ibid $BW_{(11\text{-}12)}$ Note.
$BW_{(11\text{-}18)}$ - Body Weight for age group 11-18 (for chronic and non-mutagenic cancer)	55.8	kg	Ibid $BW_{(11\text{-}12)}$ Note.
AP_{sc} - Averaging Period for subchronic noncancer	0.575	years	30 weeks per year
$AP_{chronic}$ - Averaging Period for chronic noncancer	7	years	
$AP_{lifetime}$ - Averaging Period for lifetime	70	years	
$SA_{(11\text{-}12)}$ - Surface Area for age group 11-12 (for Subchronic NC)	2277	cm^2/day	50th percentile of forearms, hands, and feet for females. SSA - 50th percentile female body surface area from EPA EFH 2011, adjusted by MassDEP risk characterication methodology. (See MassDEP MCP Method 1 Forms and documentation, https://www.mass.gov/doc/summary-of-proposed-mcp-method-1-standards-revisions/download..) Sources of data: (1) EPA Exposure Factors Handbook, 2011 Edition (EPA EFH 2011), Chapter 7, "Table 7-11. Mean and Percentile Skin Surface Area (m2) Derived From U.S. EPA Analysis of NHANES 1999–2006 for Children <21 Years and NHANES 2005–2006 for Adults >21 Years, Females", p 7-43. EPA/600/R-090/052F, September 2011. (https://rais.ornl.gov/documents/EFH_2011.pdf); and (2) EPA Exposure Factors Handbook (1997, Final Report), Table 6-7 (child), and Table 6-3 (age 18+) (https://cfpub.epa.gov/ncea/risk/recordisplay.cfm?deid=12464).
$SA_{(11\text{-}16)}$ - Surface Area for age group 11-16	2470	cm^2/day	Ibid $SA_{(11\text{-}12)}$ Note.
$SA_{(16\text{-}18)}$ - Surface Area for age group 16-18	2524	cm^2/day	Ibid $SA_{(11\text{-}12)}$ Note.
$SA_{(11\text{-}18)}$ - Chronic Non-cancer Surface Area for age group 11-18	2486	cm^2/day	Ibid $SA_{(11\text{-}12)}$ Note.

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Table RC-11. Trespasser - Sediment Definitions and Exposure Factors

Parameter	Value	Units	Notes
$SAF_{(11\text{-}12)}$ - Surface Adhesion Factor for age group 11-12 (for Subchronic NC)	1.0000	mg/cm^2	SAF developed for Short Forms according to procedures outlined in MassDEP MCP Risk Characterization Guidance for Disposal Sites, 2024. See SSA tab in Method 3 Lookup Tables Version v0624.xlsx.
$SAF_{(11\text{-}16)}$ - Surface Adhesion Factor for age group 11-16	1.0000	mg/cm^2	Ibid $SAF_{(11\text{-}12)}$ Note.
$SAF_{(16\text{-}18)}$ - Surface Adhesion Factor for age group 16-18	1.0000	mg/cm^2	Ibid $SAF_{(11\text{-}12)}$ Note.
$SAF_{(11\text{-}18)}$ - Surface Adhesion Factor for age group 11-18	1.0000	mg/cm^2	Ibid $SAF_{(11\text{-}12)}$ Note.
$ADAF_{(11\text{-}16)}$	3	dimensionless	
$ADAF_{(16\text{-}18)}$	1	dimensionless	

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Table RC-12. Recreational Visitor - Sediment Definitions and Exposure Factors

Parameter	Value	Units	Notes
ELCR - Excess Lifetime Cancer Risk	chemical specific	dimensionless	Pathway specific (ing =ingestion, derm=dermal)
CSF - Cancer Slope Factor	chemical specific	$(mg/kg\text{-}day)^{-1}$	See Tables PS-6 and PS-6c
LADD - Lifetime Average Daily Dose	chemical specific	mg/kg-day	Pathway specific
HQ - Hazard Quotient	chemical specific	dimensionless	Pathway specific (ing =ingestion, derm=dermal)
RfD - Reference Dose	chemical specific	mg/kg-day	See Table PS-6
ADD - Average Daily Dose	chemical specific	mg/kg-day	Pathway specific
EPC - Exposure Point Concentration	chemical specific	mg/kg	
$IR_{(1-2)}$ - Soil Ingestion Rate for age group 1-2	100	mg/day	MADEP. 1995. Guidance for Disposal Site Risk Characterization. Appendix Table B-3.
$IR_{(1-8)}$ - Soil Ingestion Rate for age group 1-8	100	mg/day	Ibid $IR_{(1-2)}$ Note.
$IR_{(8-15)}$ - Soil Ingestion Rate for age group 8-15	50	mg/day	Ibid $IR_{(1-2)}$ Note.
$IR_{(15-31)}$ - Soil Ingestion Rate for age group 15-31	50	mg/day	Ibid $IR_{(1-2)}$ Note.
$IR_{(2-6)}$ - Soil Ingestion Rate for age group 2-6	100	mg/day	Ibid $IR_{(1-2)}$ Note.
$IR_{(6-16)}$ - Soil Ingestion Rate for age group 6-16	50	mg/day	Ibid $IR_{(1-2)}$ Note.
$IR_{(16-31)}$ - Soil Ingestion Rate for age group 16-31	50	mg/day	Ibid $IR_{(1-2)}$ Note.
RAF_c - Relative Absorption Factor for Cancer Effects	chemical specific	dimensionless	Adjusts estimated dose to conform to the revelant CSF. See Table PS-6
RAF_{NC} - Relative Absorption Factor for non-Cancer Effects	chemical specific	dimensionless	Adjusts estimated dose to conform to the revelant RfD. See Table PS-6
$EF_{subchronic}$ - Exposure Frequency for subchronic exposure	0.429	event/day	3 events/week
$EF_{chronic}$ and EF_{cancer} - Exposure Frequency for chronic ~~or~~ and Exposure Frequency for lifetime cancer	0.247	event/day	3 events/week, 30 weeks/year
ED - Exposure Duration	1	day/event	
$EP_{sc\ (1-2)}$ - Exposure Period for age group 1-2 for Subchronic exposure	0.575	years	30 weeks
$EP_{(1-8)}$ - Exposure Period for age group 1-8	7	years	
$EP_{(8-15)}$ - Exposure Period for age group 8-15	7	years	
$EP_{(15-31)}$ - Exposure Period for age group 15-31	16	years	
$EP_{(1-2)}$ - Exposure Period for age group 1-2 (mutagenic effects)	1	years	
$EP_{(2-6)}$ - Exposure Period for age group 2-6 (mutagenic effects)	4	years	
$EP_{(6-16)}$ - Exposure Period for age group 6-16 (mutagenic effects)	10	years	
$EP_{(16-31)}$ - Exposure Period for age group 16-31 (mutagenic effects)	15	years	

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Table RC-12. Recreational Visitor - Sediment Definitions and Exposure Factors

Parameter	Value	Units	Notes
$BW_{(1-2)}$ - Body Weight for age group 1-2, (subchronic, and mutagenic)	9.6	kg	50th percentile female body weight from US Department of Health and Human Services (USDHHS), adjusted according to the MassDEP risk assessment methodology. (See MCP Method 1 Forms and documentation, https://www.mass.gov/doc/summary-of-proposed-mcp-method-1-standards-revisions/download.) Data source: USDHHS: Margaret A. McDowel, M.A, et al., "Anthropometric reference data for children and adults: United States, 2003-2006," National Health Statistics Reports, Number 10, October 22, 2008, Table 1, p 5. (https://www.cdc.gov/nchs/data/nhsr/nhsr010.pdf).
$BW_{(1-8)}$ - Body Weight for age group 1-8	19.0	kg	Ibid $BW_{(1-2)}$ Note.
$BW_{(8-15)}$ - Body Weight for age group 8-15	46.1	kg	Ibid $BW_{(1-2)}$ Note.
$BW_{(15-31)}$ - Body Weight for age group 15-31	64.5	kg	Ibid $BW_{(1-2)}$ Note.
$BW_{(2-6)}$ - Body Weight for age group 2-6	17.6	kg	Ibid $BW_{(1-2)}$ Note.
$BW_{(6-16)}$ - Body Weight for age group 6-16	43.2	kg	Ibid $BW_{(1-2)}$ Note.
$BW_{(16-31)}$ - Body Weight for age group 16-31	65.0	kg	Ibid $BW_{(1-2)}$ Note.
$AP_{subchronic}$ - Averaging Period for subchronic noncancer	0.575	years	30 weeks
$AP_{chronic}$ - Averaging Period for chronic noncancer	7	years	
$AP_{C\ (1-2)}$ - Averaging Period for cancer for the age group 1-2 for vinyl chloride mutagenic effects	1	years	
AP_{cancer} - Averaging Period for cancer/lifetime	70	years	
$ADAF_{(1-2)}$ - Age Defined Adjustment Factor for mutagenic effects for age group 1-2	10	dimensionless	
$ADAF_{(2-6)}$ - Age Defined Adjustment Factor for mutagenic effects for age group 2-6	3	dimensionless	
$ADAF_{(6-16)}$ - Age Defined Adjustment Factor for mutagenic effects for age group 6-16	3	dimensionless	
$ADAF_{(16-31)}$ - Age Defined Adjustment Factor for mutagenic effects for age group 16-31	1	dimensionless	

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Table RC-12. Recreational Visitor - Sediment Definitions and Exposure Factors

Parameter	Value	Units	Notes
$SA_{(1-2)}$ - Surface Area for age group 1-2	1708	cm^2/day	SSA - 50th percentile female body surface area from EPA EFH 2011, adjusted by MassDEP risk characterication methodology. (See MassDEP MCP Method 1 Forms and documentation, https://www.mass.gov/doc/summary-of-proposed-mcp-method-1-standards-revisions/download..) Sources of data: (1) EPA Exposure Factors Handbook, 2011 Edition (EPA EFH 2011), Chapter 7, "Table 7-11. Mean and Percentile Skin Surface Area (m2) Derived From U.S. EPA Analysis of NHANES 1999–2006 for Children <21 Years and NHANES 2005–2006 for Adults >21 Years, Females", p 7-43. EPA/600/R-090/052F, September 2011. (https://rais.ornl.gov/documents/EFH_2011.pdf); and (2) EPA Exposure Factors Handbook (1997, Final Report), Table 6-7 (child), and Table 6-3 (age 18+) (https://cfpub.epa.gov/ncea/risk/recordisplay.cfm?deid=12464). (50th percentile of face (1/3 head), forearms, hands, lower legs, and feet for females.)
$SA_{(1-8)}$ - Surface Area for age group 1-8	2244	cm^2/day	Ibid $SA_{(1-2)}$ Note.
$SA_{(8-15)}$ - Surface Area for age group 8-15	4051	cm^2/day	Ibid $SA_{(1-2)}$ Note.
$SA_{(15-31)}$ - Surface Area for age group 15-31	5322	cm^2/day	Ibid $SA_{(1-2)}$ Note.
$SA_{(2-6)}$ - Surface Area for age group 2-6	2113	cm^2/day	Ibid $SA_{(1-2)}$ Note.
$SA_{(6-16)}$ - Surface Area for age group 6-16	3875	cm^2/day	Ibid $SA_{(1-2)}$ Note.
$SA_{(16-31)}$ - Surface Area for age group 16-31	5354	cm^2/day	Ibid $SA_{(1-2)}$ Note.
$SAF_{(1-2)}$ - Surface Adherence Factor for age group 1-2	1.0000	mg / cm^2	SAF developed for Short Forms according to procedures outlined in MassDEP MCP Risk Characterization Guidance for Disposal Sites, 2024. See SSA tab in Method 3 Lookup Tables Version v0624.xlsx.
$SAF_{(1-8)}$ - Surface Adherence Factor for age group 1-8	1.0000	mg / cm^2	Ibid $SAF_{(1-2)}$ Note.
$SAF_{(8-15)}$ - Surface Adherence Factor for age group 8-15	1.0000	mg / cm^2	Ibid $SAF_{(1-2)}$ Note.
$SAF_{(15-31)}$ - Surface Adherence Factor for age group 15-31	1.0000	mg / cm^2	Ibid $SAF_{(1-2)}$ Note.
$SAF_{(2-6)}$ - Surface Adherence Factor for age group 2-6	1.0000	mg / cm^2	Ibid $SAF_{(1-2)}$ Note.
$SAF_{(6-16)}$ - Surface Adherence Factor for age group 6-16	1.0000	mg / cm^2	Ibid $SAF_{(1-2)}$ Note.
$SAF_{(16-31)}$ - Surface Adherence Factor for age group 16-31	1.0000	mg/cm^2	Ibid $SAF_{(1-2)}$ Note.

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TABLE RC-13
EXPOSURE ASSUMPTIONS
Current/Future Utility Worker
Amesbury Former MGP
Amesbury, Massachusetts

RECEPTOR: Utility Worker
TIMING: Current/Future conditions and land-use
EXPOSURE / SCENARIO: Excavating

Variable	Subchronic Hazard Index Calculations	Excess Lifetime Cancer Risk Calculations	Units	Notes & References
GENERAL INFO:				
Age	22	22	years	
Bodyweight	57	57	kg	MADEP, 1995 - age-weighted 50th percentile for females
Total Skin Area	16,900	16,900	cm2	MADEP, 1995 - age-weighted 50th percentile for females
Averaging Period	365	25,550	days	1 day utility repair
INGESTION OF SEDIMENTS:				
Ingestion Rate	100	100	mg/day	MADEP, 2002b
Exposure Frequency	0.003	0.003	events/day	
Exposure Duration	1	1	days/event	MADEP, 1995
Exposure Period	356	365	days	
Conversion Factor	1E-06	1E-06	kg/mg	
DERMAL ABSORPTION OF SEDIMENTS:				
Fraction of Skin Area Exposed Per Day	0.21	0.21	1/day	MADEP, 1995 - age-weighted 50th percentile for females
Sediment Adherence Factor	1	1	mg/cm2	MADEP, 2002a
Exposure Frequency	0.003	0.003	events/day	
Exposure Duration	1	1	days/event	MADEP, 1995
Exposure Period	365	365	days	
Conversion Factor	1E-06	1E-06	kg/mg	

References:

MADEP, 2002a. Technical Update: Weighted Skin-Soil Adherence Factors. Office of Research and Standards.
MADEP, 2002b. Technical Update: Calculation of an Enhanced Soil Ingestion Rate. Office of Research and Standards.
MADEP, 1997. Methodology for Relating Soil Contaminant Levels and Risk to Human Health. Office of Research and Standards. Section 6.1.4.
MADEP, 1995. Guidance for Disposal Site Risk Characterization in Support of the MCP. Bureau of Waste Site Cleanup and Office of Research and Standards.

TABLE RC-14
EXPOSURE ASSUMPTIONS
Future Construction Worker
Amesbury Former MGP
Amesbury, Massachusetts

RECEPTOR: Construction Worker
TIMING: Future conditions and land-use
EXPOSURE / SCENARIO: Excavating

Variable	Subchronic Hazard Index Calculations	Excess Lifetime Cancer Risk Calculations	Units	Notes & References
GENERAL INFO:				
Age	22	22	years	
Bodyweight	57	57	kg	MADEP, 1995 - age-weighted 50th percentile for females
Total Skin Area	16,900	16,900	cm2	MADEP, 1995 - age-weighted 50th percentile for females
Averaging Period	183	25,550	days	6 month project; 70 year lifetime
INGESTION OF SEDIMENTS:				
Ingestion Rate	100	100	mg/day	MADEP, 2002b
Exposure Frequency	0.71	0.71	events/day	5 days per week for 6 month project
Exposure Duration	1	1	days/event	MADEP, 1995
Exposure Period	183	183	days	6 month project
Conversion Factor	1E-06	1E-06	kg/mg	
DERMAL ABSORPTION OF SEDIMENTS:				
Fraction of Skin Area Exposed Per Day	0.21	0.21	1/day	MADEP, 1995 - age-weighted 50th percentile for females
Sediment Adherence Factor	1	1	mg/cm2	MADEP, 2002a
Exposure Frequency	0.71	0.71	events/day	5 days per week for 6 month project
Exposure Duration	1	1	days/event	MADEP, 1995
Exposure Period	183	183	days	6 month project
Conversion Factor	1E-06	1E-06	kg/mg	

References:

MADEP, 2002a. Technical Update: Weighted Skin-Soil Adherence Factors. Office of Research and Standards.

MADEP, 2002b. Technical Update: Calculation of an Enhanced Soil Ingestion Rate. Office of Research and Standards.

MADEP, 1997. Methodology for Relating Soil Contaminant Levels and Risk to Human Health. Office of Research and Standards. Section 6.1.4.

MADEP, 1995. Guidance for Disposal Site Risk Characterization in Support of the MCP. Bureau of Waste Site Cleanup and Office of Research and Standards.

Table RC-15. Resident - Soil
Definitions and Exposure Factors

Parameter	Value	Units	Notes
ELCR - Excess Lifetime Cancer Risk	chemical specific	dimensionless	Pathway specific (ing=ingestion, derm=dermal)
CSF - Cancer Slope Factor	chemical specific	$(mg/kg\text{-}day)^{-1}$	Chemical-specific, see Tables RS-9 and RS--9c.
LADD - Lifetime Average Daily Dose	chemical specific	mg/kg-day	Pathway specific. See Tables RS-2, RS-3, RS-4a, RS-4b, and RS-4c
LADE - Lifetime Average Daily Exposure	chemical specific	$\mu g/m^3$	Pathway specific. See Tables RS-2, RS-3, RS-4a, RS-4b, and RS-4c
HQ - Hazard Quotient	chemical specific	dimensionless	Pathway specific (ing =ingestion, derm=dermal, inh=inhalation)
RfD - Reference Dose	chemical specific	mg/kg-day	Chemical-specific, see Tables RS-9 and RS-9c.
ADD - Average Daily Dose	chemical specific	mg/kg-day	Pathway specific. See Tables RS-5, RS-6
EPC - Exposure Point Concentration	chemical specific	mg/kg	
PUF - Plant Uptake Factor	chemical specific	dimensionless	See Table RS-9. Plant Uptake Factor is defined as the ratio of the contamination in the plant to the contamination in soil: (mg-OHM/kg-plant)/(mg-OHM/kg-soil)
$IR_{(1-8)}$ - Soil Ingestion Rate for age group 1-8	100	mg/day	MADEP. 2002. Technical Update: Calculation of an Enhanced Soil Ingestion Rate. (http://www.mass.gov/dep/ors/orspubs.htm)
$IR_{(8-15)}$ - Soil Ingestion Rate for age group 8-15	50	mg/day	Ibid $IR_{(1-8)}$ Notes.
$IR_{(15-31)}$ - Soil Ingestion Rate for age group 15-31	50	mg/day	Ibid $IR_{(1-8)}$ Notes.
$IR_{(1-2)}$ - Soil Ingestion Rate for age group 1-2	100	mg/day	Ibid $IR_{(1-8)}$ Notes.
$IR_{(2-6)}$ - Soil Ingestion Rate for age group 2-6	100	mg/day	Ibid $IR_{(1-8)}$ Notes.
$IR_{(6-16)}$ - Soil Ingestion Rate for age group 6-16	50	mg/day	Ibid $IR_{(1-8)}$ Notes.
$IR_{(16-31)}$ - Soil Ingestion Rate for age group 16-31	50	mg/day	Ibid $IR_{(1-8)}$ Notes.
$PIR_{(1-8)}$ = Produce Ingestion Rate for age group 1-8	1,210	mg/day	see Table RS-8
$PIR_{(8-15)}$ = Produce Ingestion Rate for age group 8-15	1,781	mg/day	Ibid $PIR_{(1-8)}$ Notes.
$PIR_{(15-31)}$ = Produce Ingestion Rate for age group 15-31	2,442	mg/day	Ibid $PIR_{(1-8)}$ Notes.
$PIR_{(1-2)}$ = Produce Ingestion Rate for age group 1-2	10,910	mg/day	Ibid $PIR_{(1-8)}$ Notes.
$PIR_{(2-6)}$ = Produce Ingestion Rate for age group 2-6	11,958	mg/day	Ibid $PIR_{(1-8)}$ Notes.
$PIR_{(6-16)}$ = Produce Ingestion Rate for age group 6-16	17,451	mg/day	Ibid $PIR_{(1-8)}$ Notes.
$PIR_{(16-31)}$ = Produce Ingestion Rate for age group 16-31	24,432	mg/day	Ibid $PIR_{(1-8)}$ Notes.
RAF_c - Relative Absorption Factor for Cancer Effects (exposure route-specific)	chemical specific	dimensionless	
$EF_{subchronic}$ - Exposure Frequency for subchronic ingestion or dermal exposure	0.714	event/day	5 days/week
$EF_{chronic}$ - Exposure Frequency for chronic ingestion or dermal exposure	0.411	event/day	5 days/week, 30 weeks/year
EF_{cancer} - Exposure Frequency for cancer, ingestion or dermal exposure	0.411	event/day	5 days/week, 30 weeks/year
$EF_{produce}$ - Exposure Frequency for produce ingestion, cancer and noncancer	1	event/day	
ED - Exposure Duration	1	day/event	
$EP_{sc\ (1-2)}$ - Exposure Period for age group 1-2	0.575	years	30 weeks
$EP_{(1-8)}$ - Exposure Period for age group 1-8	7	years	
$EP_{(8-15)}$ - Exposure Period for age group 8-15	7	years	
$EP_{(15-31)}$ - Exposure Period for age group 15-31	16	years	
$EP_{(1-2)}$ - Exposure Period for age group 1-2 for mutagenic effects	1	years	30 weeks
$EP_{(2-6)}$ - Exposure Period for age group 2-6 for mutagenic effects	4	years	

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Table RC-15. Resident - Soil
Definitions and Exposure Factors

$EP_{(6-16)}$ - Exposure Period for age group 6-16 for mutagenic effects	10	years	
$EP_{(16-31)}$ - Exposure Period for-age group 16-31 for mutagenic effects	15	years	
$BW_{(1-8)}$ - Body Weight for age group 1-8	19.0	kg	50th percentile female body weight from US Department of Health and Human Services (USDHHS), adjusted according to the MassDEP risk assessment methodology. (See MCP Method 1 Forms and documentation, https://www.mass.gov/doc/summary-of-proposed-mcp-method-1-standards-revisions/download.) Data source: USDHHS: Margaret A. McDowel, M.A, et al., "Anthropometric reference data for children and adults: United States, 2003-2006," National Health Statistics Reports, Number 10, October 22, 2008, Table 1, p 5. (https://www.cdc.gov/nchs/data/nhsr/nhsr010.pdf).
$BW_{(8-15)}$ - Body Weight for age group 8-15	46.1	kg	Ibid $BW_{(1-8)}$ Notes.
$BW_{(15-31)}$ - Body Weight for age group 15-31	64.5	kg	Ibid $BW_{(1-8)}$ Notes.
$BW_{(1-2)}$ - Body Weight for age group 1-2	9.6	kg	Ibid $BW_{(1-8)}$ Notes.
$BW_{(2-6)}$ - Body Weight for age group 2-6	17.6	kg	Ibid $BW_{(1-8)}$ Notes.
$BW_{(6-16)}$ - Body Weight for age group 6-16	43.2	kg	Ibid $BW_{(1-8)}$ Notes.
$BW_{(16-31)}$ - Body Weight for age group 16-31	65.0	kg	Ibid $BW_{(1-8)}$ Notes.
$AP_{subchronic}$ - Averaging Period for subchronic noncancer	0.575	years	30 weeks
$AP_{chronic}$ - Averaging Period for chronic noncancer	7	years	
$AP_{C\ (1-2)}$ - Averaging Period for cancer for the age group 1-2 for vinyl chloride (mutagenic)	1	years	
$AP_{lifetime}$ - Averaging Period for lifetime for cancer effects	70	years	
$ADAF_{(1-2)}$ - Age Defined Adjustment Factor for mutagenic effects for age group 1-2	10	dimensionless	
$ADAF_{(2-6)}$ - Age Defined Adjustment Factor for mutagenic effects for age group 2-6	3	dimensionless	
$ADAF_{(6-16)}$ - Age Defined Adjustment Factor for mutagenic effects for age group 6-16	3	dimensionless	
$ADAF_{(16-31)}$ - Age Defined Adjustment Factor for mutagenic effects for age group 16-31	1	dimensionless	

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Table RC-15. Resident - Soil
Definitions and Exposure Factors

$SA_{(1-8)}$ - Surface Area for age group 1-8	2244	cm^2/day	SSA - 50th percentile female body surface area from EPA EFH 2011, adjusted by MassDEP risk characterication methodology. (See MassDEP MCP Method 1 Forms and documentation, https://www.mass.gov/doc/summary-of-proposed-mcp-method-1 standards-revisions/download..) Sources of data: (1) EPA Exposure Factors Handbook, 2011 Edition (EPA EFH 2011), Chapter 7, "Table 7-11. Mean and Percentile Skin Surface Area (m2) Derived From U.S. EPA Analysis of NHANES 1999–2006 for Children <21 Years and NHANES 2005–2006 for Adults >21 Years, Females", p 7-43. EPA/600/R-090/052F, September 2011. (https://rais.ornl.gov/documents/EFH_2011.pdf); and (2) EPA Exposure Factors Handbook (1997, Final Report), Table 6-7 (child), and Table 6-3 (age 18+) (https://cfpub.epa.gov/ncea/risk/recordisplay.cfm?deid=12464). (50th percentile of face (1/3 head), forearms, hands, lower legs, and feet for females.)
$SA_{(8-15)}$ - Surface Area for age group 8-15	4051	cm^2/day	Ibid $SA_{(1-8)}$ Notes.
$SA_{(15-31)}$ - Surface Area for age group 15-31	5322	cm^2/day	Ibid $SA_{(1-8)}$ Notes.
$SA_{(1-2)}$ - Surface Area for age group 1-2	1708	cm^2/day	Ibid $SA_{(1-8)}$ Notes.
$SA_{(2-6)}$ - Surface Area for age group 2-6	2113	cm^2/day	Ibid $SA_{(1-8)}$ Notes.
$SA_{(6-16)}$ - Surface Area for age group 6-16	3875	cm^2/day	Ibid $SA_{(1-8)}$ Notes.
$SA_{(16-31)}$ - Surface Area for age group 16-31	5354	cm^2/day	Ibid $SA_{(1-8)}$ Notes.
$SAF_{(1-8)}$ - Surface Adherence Factor for age group 1-8	0.3740	mg/cm^2	SAF developed for Short Forms according to procedures outlined in MassDEP MCP Risk Characterization Guidance for Disposal Sites, 2024. See SSA tab in Method 3 Lookup Tables Version v0624.xlsx.
$SAF_{(8-15)}$ - Surface Adherence Factor for age group 8-15	0.1365	mg/cm^2	Ibid $SAF_{(1-8)}$ Notes.
$SAF_{(15-31)}$ - Surface Adherence Factor for age group 15-31	0.1329	mg/cm^2	Ibid $SAF_{(1-8)}$ Notes.
$SAF_{(1-2)}$ - Surface Adherence Factor for age group 1-2	0.3717	mg/cm^3	Ibid $SAF_{(1-8)}$ Notes.
$SAF_{(2-6)}$ - Surface Adherence Factor for age group 2-6	0.3747	mg/cm^4	Ibid $SAF_{(1-8)}$ Notes.
$SAF_{(6-16)}$ - Surface Adherence Factor for age group 6-16	0.1702	mg/cm^5	Ibid $SAF_{(1-8)}$ Notes.
$SAF_{(16-31)}$ - Surface Adherence Factor for age group 16-31	0.1328	mg/cm^2	Ibid $SAF_{(1-8)}$ Notes.

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Toxicity Values: Sediment & Soil Table RC-16
Chemical-Specific Data

Oil or Hazardous Material	CSF $(mg/kg\text{-}day)^{-1}$	$RAF_{c\text{-}ing}$	$RAF_{c\text{-}derm}$	$RAF_{c\text{-}prod}$	Chronic RfD mg/kg-day	Subchronic RfD mg/kg-day	Chronic $RAF_{nc\text{-}ing}$	Chronic $RAF_{nc\text{-}derm}$	Subchronic $RAF_{nc\text{-}ing}$	Subchronic $RAF_{nc\text{-}derm}$	$RAF_{nc\text{-}prod}$	PUF	Notes
BENZENE	5.5E-02	1.00	0.03		4.0E-03	1.0E-02	1	0.03	1	0.03			
ETHYLBENZENE					5.0E-02	5.0E-02	1	0.03	1	0.03			
TOLUENE					8.0E-02	8.0E-01	1	0.03	1	0.03			
XYLENES (Mixed Isomers)					2.0E-01	4.0E-01	1	0.03	1	0.03			
METHYLNAPHTHALENE, 2-					4.0E-03	4.0E-03	0.3	0.1	0.3	0.1			
ACENAPHTHENE					6.0E-02	2.0E-01	0.3	0.1	0.3	0.1			
ACENAPHTHYLENE					3.0E-02	3.0E-01	0.3	0.1	0.3	0.1			
ANTHRACENE					3.0E-01	1.0E+00	0.3	0.1	0.3	0.1			
BENZO(a)ANTHRACENE	1.0E-01	0.30	0.02		3.0E-02	3.0E-01	0.3	0.02	0.3	0.02			
BENZO(a)PYRENE	1.0E+00	0.30	0.02		3.0E-04	3.0E-04	0.3	0.02	0.3	0.02			
BENZO(b)FLUORANTHENE	1.0E-01	0.30	0.02		3.0E-02	3.0E-01	0.3	0.02	0.3	0.02			
BENZO(g,h,i)PERYLENE					3.0E-02	3.0E-01	0.3	0.1	0.3	0.1			
BENZO(k)FLUORANTHENE	1.0E-02	0.30	0.02		3.0E-02	3.0E-01	0.3	0.02	0.3	0.02			
CHRYSENE	1.0E-03	0.30	0.02		3.0E-02	3.0E-01	0.3	0.02	0.3	0.02			
DIBENZO(a,h)ANTHRACENE	1.0E+00	0.30	0.02		3.0E-02	3.0E-01	0.3	0.02	0.3	0.02			
FLUORANTHENE					4.0E-02	1.0E-01	0.3	0.1	0.3	0.1			
FLUORENE					4.0E-02	4.0E-01	0.3	0.1	0.3	0.1			
INDENO(1,2,3-cd)PYRENE	1.0E-01	0.30	0.02		3.0E-02	3.0E-01	0.3	0.02	0.3	0.02			
NAPHTHALENE					2.0E-02	2.0E-01	0.3	0.1	0.3	0.1			
PHENANTHRENE					3.0E-02	3.0E-01	0.3	0.1	0.3	0.1			
PYRENE					3.0E-02	3.0E-01	0.3	0.1	0.3	0.1			
PETROLEUM HYDROCARBONS: ALIPHATICS - C5 to C8					4.0E-02	4.0E-01	1	0.2	1	0.2			
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C12					1.0E-01	1.0E+00	1	0.2	1	0.2			
PETROLEUM HYDROCARBONS: AROMATICS - C9 to C10					3.0E-02	3.0E-01	1	0.2	1	0.2			
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C18					1.0E-01	1.0E+00	1	0.2	1	0.2			
PETROLEUM HYDROCARBONS: ALIPHATICS - C19 to C36					2.0E+00	6.0E+00	1	0.2	1	0.2			

Toxicity Values: Sediment & Soil Table RC-16
Chemical-Specific Data

Oil or Hazardous Material	CSF $(mg/kg\text{-}day)^{-1}$	$RAF_{c\text{-}ing}$	$RAF_{c\text{-}derm}$	$RAF_{c\text{-}prod}$	Chronic RfD mg/kg-day	Subchronic RfD mg/kg-day	Chronic $RAF_{nc\text{-}ing}$	Chronic $RAF_{nc\text{-}derm}$	Subchronic $RAF_{nc\text{-}ing}$	Subchronic $RAF_{nc\text{-}derm}$	$RAF_{nc\text{-}prod}$	PUF	Notes
PETROLEUM HYDROCARBONS: AROMATICS - C11 to C22					3.0E-02	3.0E-01	0.3	0.1	0.3	0.1			
DICHLOROETHYLENE, CIS-1,2-					2.0E-03	2.0E-02	1	0.03	1	0.03			
VINYL CHLORIDE	7.2E-01	1.00	0.03		3.0E-03	3.0E-03	1	0.03	1	0.03			
ARSENIC	1.5E+00	0.50	0.03	1.00	3.0E-04	3.0E-04	0.5	0.03	0.5	0.03	1	0.05	
BARIUM					2.0E-01	2.0E-01	1	0.1	1	0.1			
CHROMIUM (TOTAL)					3.0E-03	2.0E-02	1	0.1	1	0.1	1	0.095	
LEAD					7.5E-04	7.5E-04	0.5	0.006	0.5	0.006	0.5	0.15	
MERCURY					3.0E-04	3.0E-04	0.5	0.1	0.5	0.1			
NICKEL					2.0E-02	2.0E-02	1	0.2	1	0.2	1	0.38	
ZINC					3.0E-01	3.0E-01	1	0.1	1	0.1	1	1.5	
BIPHENYL, 1,1-	8.0E-03	1.00	0.10		5.0E-01	5.0E-01	1	0.1	1	0.1			
CADMIUM					5.0E-04	5.0E-04	0.5	0.01	0.5	0.01	1	1.9	
SELENIUM					5.0E-03	5.0E-03	1	0.01	1	0.01			
SILVER					5.0E-03	5.0E-03	1	0.3	1	0.3			

RC Table 17. Human Health Risk Summary Under Current Land Use
Method 3 Human Health Risk Characterization, Amesbury Former MGP
Amesbury Former MGP

Current Wetland Sediment (0-2')	Exposure Points:	**33 R Oakland**	**35 Oakland**	**37 Oakland**	**39 Oakland**				**Upland Surface Soil at 35 Water Street**				**allwetlandprops**	**Ma tidelands**	
	Sediment EPC:	N=3 (Max)	N=24 (Avg)	N=12 (Avg)	N=1 (Max)				N=5 (Avg)				N=40 (Avg)	N=2 (Max)	
	Human Receptor:	Resident	Resident	Resident	Resident				Resident				Trespasser	Trespasser	
	Exposure Frequency:	1 day/ 7 mo	1 day/7 mo	1 day/7 mo	1 day/7 mo				5 day/wk/7 mo				2 days/7 mo	2 days/7 mo	
	ELCR	7.10E-07	**2.20E-05**	**4.20E-05**	1.50E-09				1.00E-05				5.90E-06	4.70E-08	
	Chronic HI	2.70E-03	0.45	0.25	9.30E-06				1.92E-01				0.29	5.80E-04	
	Subchronic HI	6.70E-03	1	0.44	1.90E-05				4.41E-01				0.36	9.50E-04	
	Bap (mg/kg)	1.97	24.86 (181)	80.76 (649)	0.005								39.24 (649)	0.77	
	Notes:	NSR	**Sig Risk**	**Sig Risk**	NSR				NSR				NSR	NSR	
Current Mudflat Sediment (0-2')	Exposure Point:				**39 Oakland**	**41 Oakland**	**43 Oakland**	**4 Oakland CT**					**allmudflatprops**	**allmudflatprops**	**allmudflatprops**
	Sediment EPC:				N=23 (Avg)	N=9 (Avg)	N=5 (Avg)	N=8 (Avg)					N=45 (Avg)	N=45 (Avg)	N=45 (Avg)
	Human Receptor:				Resident	Resident	Resident	Resident					Trespasser	Trespasser	Recreational Visitor
	Exposure Frequency:				1 day/7 mo	1 day/7 mo	1 day/7 mo	1 day/7 mo					2 days/7 mo	2 days/7 mo	3 days/7 mo
	ELCR				4.10E-06	3.90E-06	1.80E-06	7.80E-06					1.20E-06	1.20E-06	**2.E-05**
	Chronic HI				0.22	0.048	0.063	0.043					0.14	0.14	0.69
	Subchronic HI				0.36	0.051	0.034	0.084					0.13	0.13	1.1
	Bap (mg/kg)				4.5 (22)	12.65 (77)	5.51 (12)	24.36 (109)					9.79 (109)	9.79 (109)	9.79 (109)
	Notes:				NSR	**NSR Avg / Sig Risk Max**	NSR	**NSR Avg / Sig Risk Max**					NSR	NSR	**Sig Risk**
Current River Sediment (0-2')	Exposure Point:	**SEG I Residential Risk**	**SEG II Residential Risk**	**SEG II Residential Risk**	**SEG II Residential Risk**	**SEG II Residential Risk**	**SEG II Residential Risk**	**SEG II Residential Risk**	**SEG I Residential Risk**	**SEG I Residential Risk**	**SEG II Residential Risk**	**SEG III Residential Risk**			
	Sediment EPC:	N=17 (Avg)	N=63 (Avg)	N=63 (Avg)	N=63 (Avg)	N=63 (Avg)	N=63 (Avg)	N=63 (Avg)	N=17 (Avg)	N=17 (Avg)	N=63 (Avg)	N=55 (Avg)			
	Human Receptor:	Resident	Resident	Resident	Resident	Resident	Resident	Resident	Resident	Resident	Resident	Resident			
	Exposure Frequency:	1 day/ 7 mo	1 day/ 7 mo	1 day/ 7 mo	1 day/ 7 mo	1 day/ 7 mo	1 day/ 7 mo	1 day/ 7 mo	1 day/ 7 mo	1 day/ 7 mo	1 day/ 7 mo	1 day/ 7 mo			
	ELCR	4.E-06	6.E-06	6.E-06	6.E-06	6.E-06	6.E-06	6.E-06	4.E-06	4.E-06	6.E-06	3.E-06			
	Chronic HI	2.8E-02	1.6E-01	1.6E-01	1.6E-01	1.6E-01	1.6E-01	1.6E-01	2.8E-02	2.8E-02	1.6E-01	6.9E-02			
	Subchronic HI	4.0E-02	3.6E-01	3.6E-01	3.6E-01	3.6E-01	3.6E-01	3.6E-01	4.0E-02	4.0E-02	3.6E-01	1.3E-01			
	Bap (mg/kg)	10.59 (135)	10.18 (154)	10.18 (154)	10.18 (154)	10.18 (154)	10.18 (154)	10.18 (154)	10.59 (135)	10.59 (135)	10.18 (154)	3.01 (28)			
	Notes:	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NSR			
Cumulative Risk:	ELCR	4.E-06	**3.E-05**	**5.E-05**	1.E-05	1.E-05	8.E-06	1.E-05	1.E-05				7.E-06	1.E-06	**2.E-05**
	Chronic HI	3.E-02	6.E-01	4.E-01	4.E-01	2.E-01	2.E-01	2.E-01	2.E-01				4.E-01	1.E-01	7.E-01
	Subchronic HI	5.E-02	**1.E+00**	8.E-01	7.E-01	4.E-01	4.E-01	4.E-01	5.E-01				5.E-01	1.E-01	1.E+00
	Notes:	NSR	**Sig Risk**	**Sig Risk**	NSR	NSR	NSR	NSR	NSR				NSR	NSR	**Sig Risk**
Resident Risk + Rec Visitor Risk (4+ days/week):		1.E-05	**4.E-05**	**6.E-05**	**2.E-05**	**2.E-05**	**2.E-05**	**2.E-05**	**2.E-05**	1.E-05	**2.E-05**	1.E-05			
			Sig Risk	**Sig Risk**	**Sig Risk**	**Sig Risk**	**Sig Risk**	**Sig Risk**	**Sig Risk**	NSR	**Sig Risk**	NSR			

RC Table 17. Human Health Risk Summary Under
Method 3 Human Health Risk Characterization, Ar
Amesbury Former MGP

Current Wetland Sediment (0-2')	Exposure Points:	**Highest Wetland Sediment EPCs for Surface and Deeper Sediment**
	Sediment EPC:	
	Human Receptor:	Construction Worker
	Exposure Frequency:	5 days/6 mo project
	ELCR	4.0E-06
	Chronic HI	
	Subchronic HI	1.0E+00
	Bap (mg/kg)	
	Notes:	NSR

Current Mudflat Sediment (0-2')	Exposure Point:	
	Sediment EPC:	
	Human Receptor:	
	Exposure Frequency:	
	ELCR	
	Chronic HI	
	Subchronic HI	
	Bap (mg/kg)	
	Notes:	

Current River Sediment (0-2')	Exposure Point:	**River_surface_Segment_I Water Street Area**	**River_surface_Segment_II Mudflat/Wetland Area**	**River_surface_Segment_III River Street Area**	**River_surface_All data**	**Maximum River Surface Sediment and All Mudflat Concentrations**	**Maximum Sediment Concentrations (Wetland, Mudflat, and River)**
	Sediment EPC:	N=17 (Avg)	N=63 (Avg)	N=55 (Avg)	N=135 (Avg)		
	Human Receptor:	Recreational Visitor	Recreational Visitor	Recreational Visitor	Recreational Visitor	Construction Worker	Utility Worker
	Exposure Frequency:	3 days/7 mo	3 days/7 mo	3 days/7 mo	3 days/7 mo	5 days/6 mo project	1 day emergeney repair
	ELCR	1.E-05	**2.E-05**	8.E-06	1.E-05	2.0E-06	3.0E-07
	Chronic HI	9.E-02	5.E-01	2.E-01	4.E-01		
	Subchronic HI	1.E-01	1.E+00	4.E-01	8.E-01	1.0E+00	9.0E-02
	Bap (mg/kg)	10.59 (135)	10.18 (154)	3.01 (28)	7.31 (154)		
	Notes:	NSR	**Sig Risk**	NSR	NSR	NSR	NSR

Cumulative Risk:	ELCR						
	Chronic HI						
	Subchronic HI						
	Notes:						

Resident Risk + Rec Visitor Risk (4+ days/week):						

Table RC-18. Human Health Risk Summary Under Future Land Use
Method 3 Human Health Risk Characterization, Amesbury Former MGP
Amesbury Former MGP

Future Wetland Sediment (>2') Exposure Points:	33 R Oakland	35 Oakland	37 Oakland	Upland Surface Soil at 35 Water Street	allwetlandprops	Ma tidelands
Sediment EPC:	N=1 (Max)	N=4 (Avg)	N=1 (Max)	N=5 (Avg)	N=6 (Avg)	N=10 (Avg)
Human Receptor:	Resident	Resident	Resident	Resident	Trespasser	Trespasser
Exposure Frequency:	1 day/ 7 mo	1 day/7 mo	1 day/7 mo	5 day/wk/7 mo	2 days/7 mo	2 days/7 mo
ELCR	3.4E-06	4.1E-07	8.8E-06	1.00E-05	4.5E-07	1.7E-07
Chronic HI	1.3E-02	3.7E-03	6.0E-02	1.92E-01	1.0E-02	2.3E-03
Subchronic HI	3.4E-02	4.3E-03	1.1E-01	4.41E-01	1.0E-02	3.5E-03
Bap (mg/kg)	10.1	1.1 (2.3)	26.4		6.82 (26.4)	2.7 (20.2)
Notes:	NSR	NSR	NSR	NSR	NSR	NSR

Future Mudflat Sediment (>-2') Exposure Point:	39 Oakland	4 Oakland CT	allmudflatprops	allmudflatprops	allmudflatprops
Sediment EPC:	N=5 (Avg)	N=5 (Avg)	N=10 (Avg)	N=10 (Avg)	N=10 (Avg)
Human Receptor:	Resident	Resident	Trespasser	Trespasser	Recreational Visitor
Exposure Frequency:	1 day/7 mo	1 day/7 mo	2 days/7 mo	2 days/7 mo	3 days/7 mo
ELCR	2.2E-09	1.5E-06	1.4E-07	1.4E-07	2.2E-06
Chronic HI	8.5E-06	8.3E-03	2.6E-03	2.6E-03	1.2E-02
Subchronic HI	1.9E-05	1.7E-02	3.3E-03	3.3E-03	2.6E-02
Bap (mg/kg)	0.005 (0.014)	4.6 (18.5)	2.31 (18.5)	2.31 (18.5)	2.31 (18.5)
Notes:	NSR	NSR	NSR	NSR	NSR

Future River Sediment (>2') Exposure Point:	SEG I Residential Risk	SEG II Residential Risk	SEG II Residential Risk	SEG II Residential Risk	SEG II Residential Risk	SEG I Residential Risk	SEG I Residential Risk	SEG II Residential Risk	SEG III Residential Risk	River_deep sed_Segment_I Water Street Area	River_deep sed_Segment_II Mudflat/Wetland Area
Sediment EPC:	N=15 (Avg)	N=63 (Avg)	N=63 (Avg)	N=63 (Avg)	N=63 (Avg)	N=15 (Avg)	N=15 (Avg)	N=63 (Avg)	N=60 (Avg)	N=15 (Avg)	N=63 (Avg)
Human Receptor:	Resident	Resident	Resident	Resident	Resident	Resident	Resident	Resident	Resident	Recreational Visitor	Recreational Visitor
Exposure Frequency:	1 day/ 7 mo	1 day/ 7 mo	1 day/ 7 mo	1 day/ 7 mo	1 day/ 7 mo	1 day/ 7 mo	1 day/ 7 mo	1 day/ 7 mo	1 day/ 7 mo	3 days/7 mo	3 days/7 mo
ELCR	5.E-06	**3.E-05**	**3.E-05**	**3.E-05**	**3.E-05**	5.E-06	5.E-06	**3.E-05**	**3.E-05**	1.E-05	**1.E-04**
Chronic HI	2.E-02	5.E-01	5.E-01	5.E-01	5.E-01	2.E-02	2.E-02	5.E-01	5.E-01	7.E-02	1.E+00
Subchronic HI	5.E-02	1.E+00	1.E+00	1.E+00	1.E+00	5.E-02	5.E-02	1.E+00	1.E+00	2.E-01	**3.E+00**
Bap (mg/kg)	14.98 (143)	97.39 (1960)	97.39 (1960)	97.39 (1960)	97.39 (1960)	14.98 (143)	14.98 (143)	97.39 (1960)	91.9 (3050)	14.98 (143)	97.39 (1960)
Notes:	NSR	**Sig Risk**	**Sig Risk**	**Sig Risk**	**Sig Risk**	NSR	NSR	**Sig Risk**	**Sig Risk**	NSR	**Sig Risk**

Cumulative Risk:									
ELCR	8.E-06	**3.E-05**	**4.E-05**	**3.E-05**	**3.E-05**	1.E-05	6.E-07	3.E-07	2.E-06
Chronic HI	4.E-02	5.E-01	5.E-01	5.E-01	5.E-01	2.E-01	1.E-02	5.E-03	1.E-02
Subchronic HI	9.E-02	1.E+00	1.E+00	1.E+00	1.E+00	5.E-01	1.E-02	7.E-03	3.E-02
Notes:	NSR	**Sig Risk**	**Sig Risk**	**Sig Risk**	**Sig Risk**	NSR	NSR	NSR	NSR

Table RC-18. Human Health Risk Su
Method 3 Human Health Risk Chara
Amesbury Former MGP

Future Wetland Sediment (>2') Exposure Points:	Highest Wetland Sediment EPCs for Surface and Deeper Sediment
Sediment EPC:	
Human Receptor:	Construction Worker
Exposure Frequency:	5 days/6 mo project
ELCR	4.0E-06
Chronic HI	
Subchronic HI	1.0E+00
Bap (mg/kg)	
Notes:	NSR

Future Mudflat Sediment (>-2') Exposure Point:	
Sediment EPC:	
Human Receptor:	
Exposure Frequency:	
ELCR	
Chronic HI	
Subchronic HI	
Bap (mg/kg)	
Notes:	

Future River Sediment (>2') Exposure Point:	River_deep sed_Segment_III River Street Area	River_2 feet deeper_All data	Maximum River Surface Sediment and Mudflat Concentrations	Maximum Sediment Concentrations (Wetland, Mudflat, and River)
Sediment EPC:	N=60 (Avg)	N=138 (Avg)		
Human Receptor:	Recreational Visitor	Recreational Visitor	Construction Worker	Utility Worker
Exposure Frequency:	3 days/7 mo	3 days/7 mo	5 days/6 mo project	1 day emergenecy repair
ELCR	**1.E-04**	**1.E-04**	2.0E-06	3.0E-07
Chronic HI	**2.E+00**	**2.E+00**		
Subchronic HI	**4.E+00**	**4.E+00**	1.0E+00	9.0E-02
Bap (mg/kg)	91.9 (3050)	86.04 (3050)		
Notes:	**Sig Risk**	**Sig Risk**	NSR	NSR

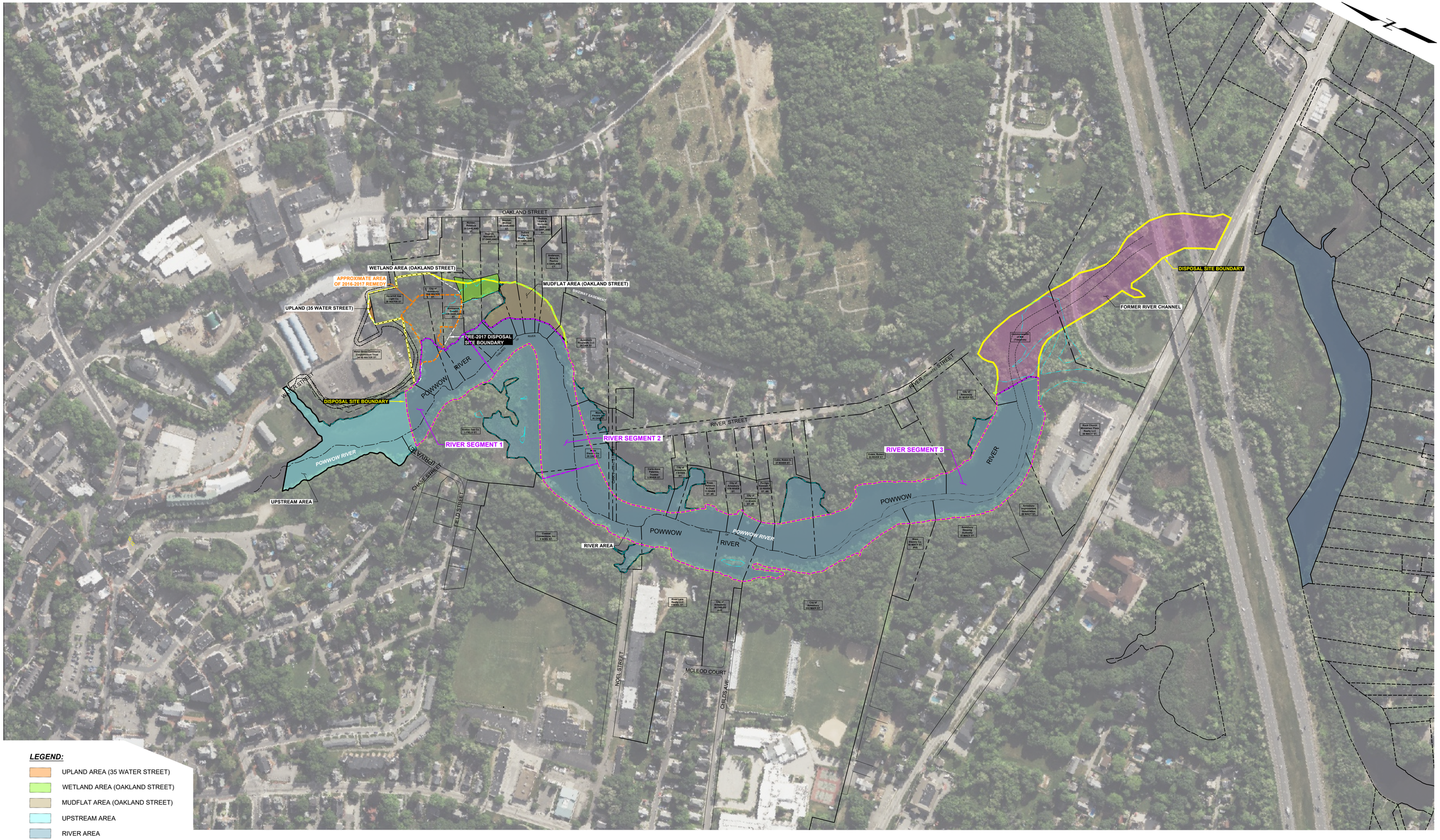
Cumulative Risk:	
ELCR	
Chronic HI	
Subchronic HI	
Notes:	

Figures

Figure RC-1. River Segments

Figure RC-2. Exposure Pathways for Human Receptors

Figure RC-3. Histograms of Benzo(a)pyrene Concentrations at Sediment Exposure Points



LEGEND:

- UPLAND AREA (35 WATER STREET)
- WETLAND AREA (OAKLAND STREET)
- MUDFLAT AREA (OAKLAND STREET)
- UPSTREAM AREA
- RIVER AREA
- FORMER RIVER CHANNEL AREA

NOTES:

1. MICROSOFT BING IMAGE 2023.
2. PARCEL BOUNDARIES THALWEG OF RIVER, AND MEAN HIGH WATER PROVIDED BY HAYNER/SWANSON, 2025.

0 200 400
Approximate Scale, Feet

Human Health Method 3 Risk Characterization
Amesbury Former MGP Site
Amesbury, Massachusetts

Boston Gas Company d|b|a National Grid
Waltham, Massachusetts

GEI Consultants

RIVER SEGMENTS

Project 1804576 | October 2025 | Fig. RC-1

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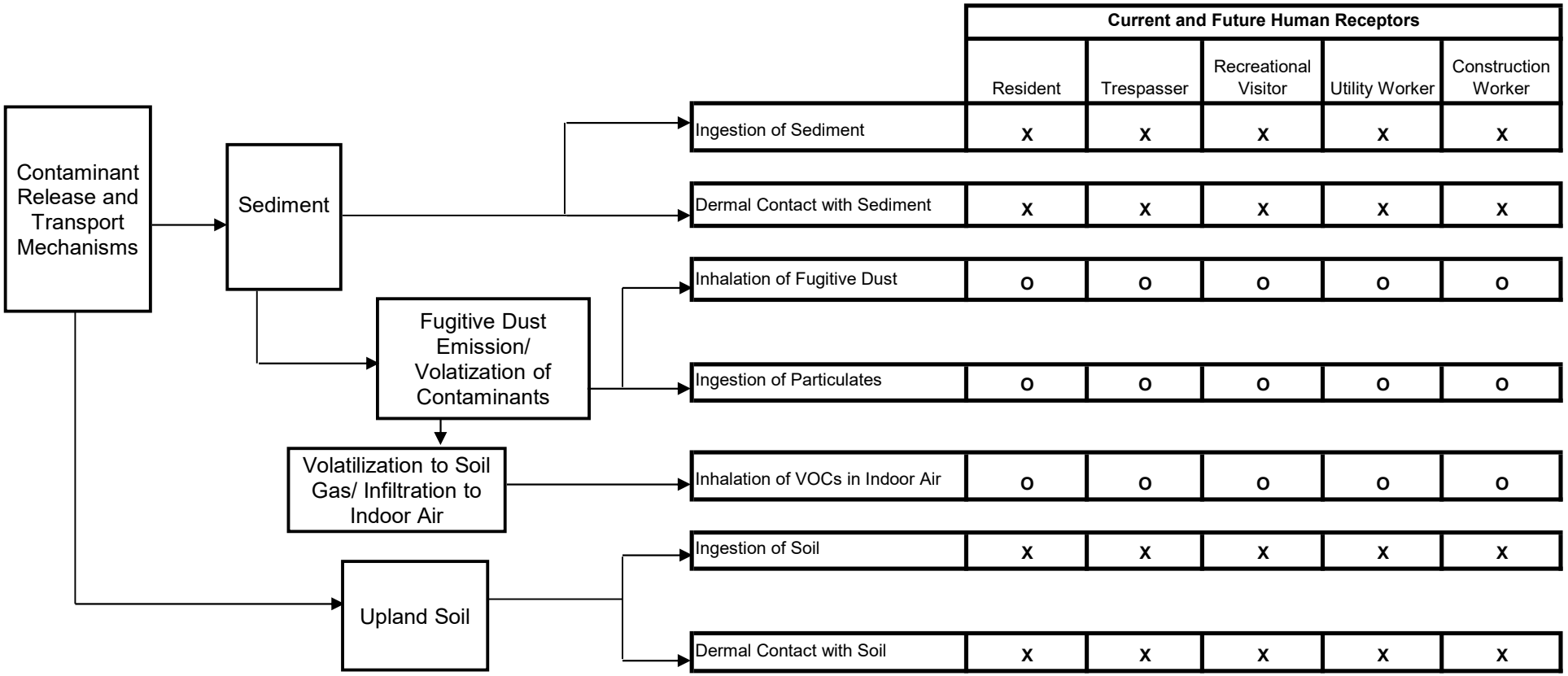
Figure RC-2
Conceptual Site Model for Human Receptors
Method 3 Human Health Risk Characterization
Amesbury Former MGP
Amesbury, Massachusetts

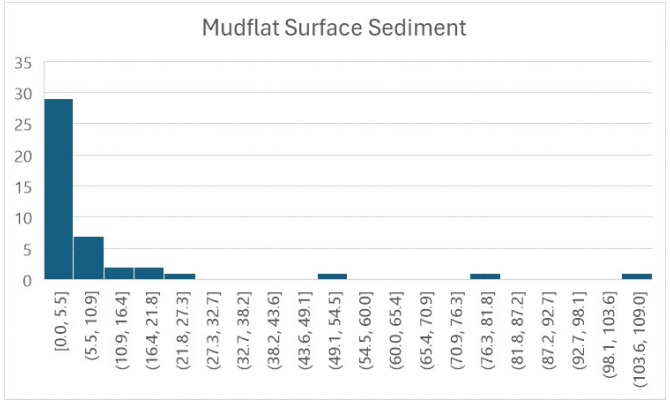


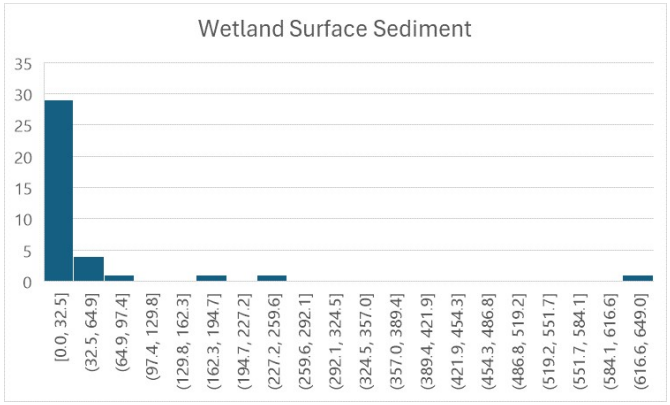
	Current and Future Human Receptors				
	Resident	Trespasser	Recreational Visitor	Utility Worker	Construction Worker
Ingestion of Sediment	X	X	X	X	X
Dermal Contact with Sediment	X	X	X	X	X
Inhalation of Fugitive Dust	O	O	O	O	O
Ingestion of Particulates	O	O	O	O	O
Inhalation of VOCs in Indoor Air	O	O	O	O	O
Ingestion of Soil	X	X	X	X	X
Dermal Contact with Soil	X	X	X	X	X

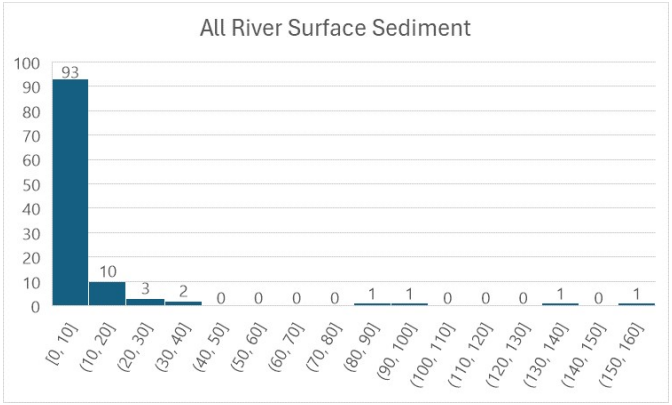
Key

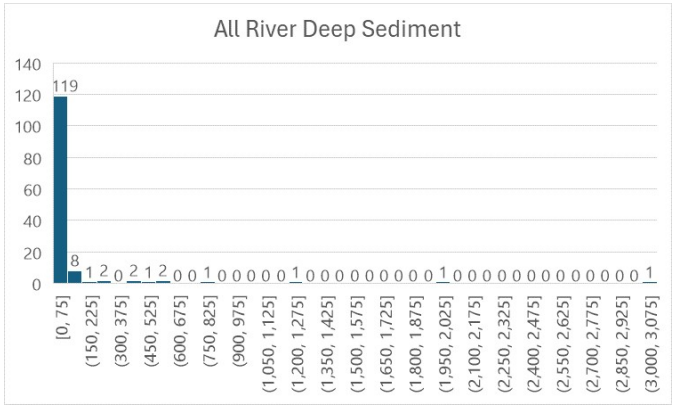
X - Complete or Potentially Complete Exposure Pathway
O - Incomplete Exposure Pathway
→ Exposure Route

Figure RC-3
Benzo(a)pyrene Sediment Concentration Histograms
Method 3 Human Health Risk Characterization
Amesbury Former MGP Site
Amesbury, Massachusetts









Attachment A Current Risk Calculations (including MassDEP Shortform Output)

Park Visitor - Soil: Table PS-2

Equations to Calculate Cancer Risk for Visitor (Age 1-31 Years)

Method 3 Lookup Tables Version v0624

Cancer Risk from Ingestion

$$ELCR_{ing} = LADD_{ing(1\text{-}31)} * CSF$$

$$LADD_{ing\ (1\text{-}31)} = LADD_{ing\ (1\text{-}8)} + LADD_{ing\ (8\text{-}15)} + LADD_{ing\ (15\text{-}31)}$$

$$LADD_{ing\ x} = \frac{[OHM]_{soil} * IR_x * RAF_{c\text{-}ing} * EF_{ing} * ED * EP_x * C}{BW_x * AP_{lifetime}}$$

Cancer Risk from Dermal Absorption

$$ELCR_{derm} = LADD_{derm} * CSF$$

$$LADD_{derm\ (1\text{-}31)} = LADD_{derm\ (1\text{-}8)} + LADD_{derm\ (8\text{-}15)} + LADD_{derm\ (15\text{-}31)}$$

$$LADD_{derm\ x} = \frac{[OHM]_{soil} * SA_x * RAF_{c\text{-}derm} * SAF_x * EF_{derm} * ED * EP_x * C}{BW_x * AP_{lifetime}}$$

Parameter	Value	Units
CSF	OHM specific	$(mg/kg\text{-}day)^{-1}$
LADD	age/OHM specific	mg/kg-day
$[OHM]_{soil}$	OHM specific	mg/kg
$IR_{(1\text{-}8)}$	100	mg/day
$IR_{(8\text{-}15)}$	50	mg/day
$IR_{(15\text{-}31)}$	50	mg/day
$RAF_{c\text{-}ing}$	OHM specific	dimensionless
$RAF_{c\text{-}derm}$	OHM specific	dimensionless
EF_{ing} or $EF_{derm} = EF_{cancer}$	0.247	event/day
ED	1	day/event
$EP_{(1\text{-}8)}$	7	years
$EP_{(8\text{-}15)}$	7	years
$EP_{(15\text{-}31)}$	16	years
C	0.000001	kg/mg
$BW_{(1\text{-}8)}$	19.0	kg
$BW_{(8\text{-}15)}$	46.1	kg
$BW_{(15\text{-}31)}$	64.5	kg
$AP_{lifetime} = AP_{cancer}$	70	years
$SA_{(1\text{-}8)}$	2244	cm^2/day
$SA_{(8\text{-}15)}$	4051	cm^2/day
$SA_{(15\text{-}31)}$	5322	cm^2/day
$SAF_{(1\text{-}8)}$	1.0000	mg/cm^2
$SAF_{(8\text{-}15)}$	1.0000	mg/cm^2
$SAF_{(15\text{-}31)}$	1.0000	mg/cm^2

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Park Visitor - Soil: Table PS-2a

All Mutagens Except Trichloroethylene and Vinyl Chloride

Equations to Calculate Cancer Risk for Visitor (Age 1-31 Years)

Cancer Risk from Ingestion

$$ELCR_{ing} = LADD_{ing(1\text{-}31)} * CSF$$

$$LADD_{ing\ (1\text{-}31)} = LADD_{ing\ (1\text{-}2)} * ADAF_{(1\text{-}2)} + LADD_{ing\ (2\text{-}6)} * ADAF_{(2\text{-}6)} + LADD_{ing\ (6\text{-}16)} * ADAF_{(6\text{-}16)} + LADD_{ing\ (16\text{-}31)} * ADAF_{(16\text{-}31)}$$

$$LADD_{ing\ x} = \frac{[OHM]_{soil} * IR_x * RAF_{c\text{-}ing} * EF_{ing} * ED * EP_x * C}{BW_x * AP_{cancer}}$$

Cancer Risk from Dermal Absorption

$$ELCR_{derm} = LADD_{derm\ (1\text{-}31)} * CSF$$

$$LADD_{derm\ (1\text{-}31)} = LADD_{derm\ (1\text{-}2)} * ADAF_{(1\text{-}2)} + LADD_{derm\ (2\text{-}6)} * ADAF_{(2\text{-}6)} + LADD_{derm\ (6\text{-}16)} * ADAF_{(6\text{-}16)} + LADD_{derm\ (16\text{-}31)} * ADAF_{(16\text{-}31)}$$

$$LADD_{derm\ x} = \frac{[OHM]_{soil} * SA_x * RAF_{c\text{-}derm} * SAF_x * EF_{derm} * ED * EP_x * C}{BW_x * AP_{cancer}}$$

NOTE: These calculations are based on EPA's default method for accounting for early life exposures to mutagenic compounds.

Parameter	Value	Units
CSF	OHM specific	$(mg/kg\text{-}day)^{-1}$
LADD	age/OHM specific	mg/kg-day
$[OHM]_{soil}$	OHM specific	mg/kg
$IR_{(1\text{-}2)}$	100	mg/day
$IR_{(2\text{-}6)}$	100	mg/day
$IR_{(6\text{-}16)}$	50	mg/day
$IR_{(16\text{-}31)}$	50	mg/day
$RAF_{c\text{-}derm}$	OHM specific	dimensionless
EF_{ing} and $EF_{derm} = EF_{Cancer}$	0.247	event/day
ED	1	day/event
$EP_{(1\text{-}2)}$	1	years
$EP_{(2\text{-}6)}$	4	years
$EP_{(6\text{-}16)}$	10	years
$EP_{(16\text{-}31)}$	15	years
C	0.000001	kg/mg
$BW_{(1\text{-}2)}$	9.6	kg
$BW_{(2\text{-}6)}$	17.6	kg
$BW_{(6\text{-}16)}$	43.2	kg
$BW_{(16\text{-}31)}$	65.0	kg
AP_{cancer}	70	years
$SA_{(1\text{-}2)}$	1708	cm^2/day
$SA_{(2\text{-}6)}$	2113	cm^2/day
$SA_{(6\text{-}16)}$	3875	cm^2/day
$SA_{(16\text{-}31)}$	5354	cm^2/day
$SAF_{(1\text{-}2)}$	1.0000	mg/cm^2
$SAF_{(2\text{-}6)}$	1.0000	mg/cm^2
$SAF_{(6\text{-}16)}$	1.0000	mg/cm^2
$SAF_{(16\text{-}31)}$	1.0000	mg/cm^2
$ADAF_{(1\text{-}2)}$	10	dimensionless
$ADAF_{(2\text{-}6)}$	3	dimensionless
$ADAF_{(6\text{-}16)}$	3	dimensionless
$ADAF_{(16\text{-}31)}$	1	dimensionless

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Park Visitor - Soil: Table PS-3

Equations to Calculate Chronic Noncancer Risk for Visitor (Age 1-8 Years)

Method 3 Lookup Tables Version v0624

Chronic Noncancer Risk from Ingestion

$$HQ_{ing} = \frac{ADD_{ing}}{RfD}$$

$$ADD_{ing} = \frac{[OHM]_{soil} * IR * RAF_{nc\text{-}ing} * EF_{ing} * ED * EP * C}{BW * AP}$$

Chronic Noncancer Risk from Dermal Absorption

$$HQ_{derm} = \frac{ADD_{ing,derm}}{RfD}$$

$$ADD_{derm} = \frac{[OHM]_{soil} * SA * RAF_{nc\text{-}derm} * SAF * EF_{derm} * ED * EP * C}{BW * AP}$$

Parameter	Value	Units
RfD	OHM specific	mg/kg-day
ADD	OHM specific	mg/kg-day
$[OHM]_{soil}$	OHM specific	mg/kg
IR	100	mg/day
$RAF_{nc\text{-}ing}$	OHM specific	dimensionless
$RAF_{nc\text{-}derm}$	OHM specific	dimensionless
EF_{ing} or $EF_{derm} = EF_{cancer}$	0.247	event/day
ED	1	day/event
EP	7	years
C	0.000001	kg/mg
BW	19.0	kg
AP	7	year
SA	2244	cm^2/day
SAF	1.0000	mg/cm^2

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Park Visitor - Soil: Table PS-4
Equations to Calculate Subchronic Noncancer Risk for Visitor (Age 1-2 Years)

Method 3 Lookup Tables Version v0624

Subchronic Noncancer Risk from Ingestion

$$HQ_{ing} = \frac{ADD_{ing}}{RfD_{subchronic}}$$

$$ADD_{ing} = \frac{[OHM]_{soil} * IR * RAF_{nc\text{-}ing} * EF_{ing} * ED * EP * C}{BW * AP}$$

Subchronic Noncancer Risk from Dermal Absorption

$$HQ_{derm} = \frac{ADD_{derm}}{RfD_{subchronic}}$$

$$ADD_{derm} = \frac{[OHM]_{soil} * SA * RAF_{nc\text{-}derm} * SAF * EF_{derm} * ED * EP * C}{BW * AP}$$

Parameter	Value	Units
RfD	OHM specific	mg/kg-day
ADD	OHM specific	mg/kg-day
$[OHM]_{soil}$	OHM specific	mg/kg
IR	100	mg/day
$RAF_{nc\text{-}ing}$	OHM specific	dimensionless
$RAF_{nc\text{-}derm}$	OHM specific	dimensionless
EF_{ing} or $EF_{derm} = EF_{cancer}$	0.429	event/day
ED	1	day/event
$EP = EP_{sc\ (1\text{-}2)}$	0.575342466	years
C	0.000001	kg/mg
BW	9.6	kg
$AP = AP_{subchronic}$	0.575	year
SA	1708	cm^2/day
SAF	1.0000	mg/cm^2

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Resident - Soil: Table RS-3

Equations to Calculate Cancer Risk for Resident (Age 1-31 Years)

Cancer Risk from Ingestion

$$ELCR_{ing} = LADD_{ing(1\text{-}31)} * CSF$$

$$LADD_{ing\ (1\text{-}31)} = LADD_{ing\ (1\text{-}8)} + LADD_{ing\ (8\text{-}15)} + LADD_{ing\ (15\text{-}31)}$$

$$LADD_{ing\ x} = \frac{[OHM]_{soil} * IR_x * RAF_{c\text{-}ing} * EF_{ing} * ED * EP_x * C}{BW_x * AP_{lifetime}}$$

Cancer Risk from Dermal Absorption

$$ELCR_{derm} = LADD_{derm} * CSF$$

$$LADD_{derm\ (1\text{-}31)} = LADD_{derm\ (1\text{-}8)} + LADD_{derm\ (8\text{-}15)} + LADD_{derm\ (15\text{-}31)}$$

$$LADD_{derm\ x} = \frac{[OHM]_{soil} * SA_x * RAF_{c\text{-}derm} * SAF_x * EF_{derm} * ED * EP_x * C}{BW_x * AP_{lifetime}}$$

Cancer Risk from Homegrown Produce

$$ELCR_{prod} = LADD_{prod\ (1\text{-}31)} * CSF$$

$$LADD_{prod\ (1\text{-}31)} = LADD_{prod\ (1\text{-}8)} + LADD_{prod\ (8\text{-}15)} + LADD_{prod\ (15\text{-}31)}$$

$$LADD_{prod\ x} = \frac{[OHM_{soil}] * PUF * PIR_x * RAF_{c\text{-}produce} * EF_{produce} * ED * EP_x * C}{BW_x * AP_{lifetime}}$$

Method 3 Lookup Tables Version v0624

Parameter	Value	Units
CSF	OHM specific	$(mg/kg\text{-}day)^{-1}$
LADD	age/OHM specific	mg/kg-day
$[OHM]_{soil}$	OHM specific	mg/kg
$IR_{(1\text{-}8)}$	100	mg/day
$IR_{(8\text{-}15)}$	50	mg/day
$IR_{(15\text{-}31)}$	50	mg/day
$PIR_{(1\text{-}8)}$	1,210	mg/day
$PIR_{(8\text{-}15)}$	1,781	mg/day
$PIR_{(15\text{-}31)}$	2,442	mg/day
$RAF_{c\text{-}ing}$	OHM specific	dimensionless
$RAF_{c\text{-}derm}$	OHM specific	dimensionless
$RAF_{c\text{-}produce}$	OHM specific	dimensionless
EF_{ing} or EF_{derm} = EF_{cancer}	0.082	event/day
$EF_{produce}$	1	event/day
ED	1	day/event
$EP_{(1\text{-}8)}$	7	years
$EP_{(8\text{-}15)}$	7	years
$EP_{(15\text{-}31)}$	16	years
C	0.000001	kg/mg
$BW_{(1\text{-}8)}$	19.0	kg
$BW_{(8\text{-}15)}$	46.1	kg
$BW_{(15\text{-}31)}$	64.5	kg
$AP_{lifetime}$	70	years
$SA_{(1\text{-}8)}$	2244	cm^2 / day
$SA_{(8\text{-}15)}$	4051	cm^2 / day
$SA_{(15\text{-}31)}$	5322	cm^2 / day
$SAF_{(1\text{-}8)}$	1.0000	mg/cm^2
$SAF_{(8\text{-}15)}$	1.0000	mg/cm^2
$SAF_{(15\text{-}31)}$	1.0000	mg/cm^2
PUF	OHM specific	dimensionless

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Resident - Soil: Table RS-4a

All Mutagens Except Trichloroethylene and Vinyl Chloride

Equations to Calculate Cancer Risk for Resident (Age 1-31 Years)

Method 3 Lookup Tables Version v0624

Cancer Risk from Ingestion

$$ELCR_{ing} = LADD_{ing(1\text{-}31)} * CSF$$

$$LADD_{ing\ (1\text{-}31)} = LADD_{ing\ (1\text{-}2)} * ADAF_{(1\text{-}2)} + LADD_{ing\ (2\text{-}6)} * ADAF_{(2\text{-}6)} + LADD_{ing\ (6\text{-}16)} * ADAF_{(6\text{-}16)} + LADD_{ing\ (16\text{-}31)} * ADAF_{(16\text{-}31)}$$

$$LADD_{ing\ x} = \frac{[OHM]_{soil} * IR_x * RAF_{c\text{-}ing} * EF_{ing} * ED * EP_x * C}{BW_x * AP_{lifetime}}$$

Cancer Risk from Dermal Absorption

$$ELCR_{derm} = LADD_{derm\ (1\text{-}31)} * CSF$$

$$LADD_{derm\ (1\text{-}31)} = LADD_{derm\ (1\text{-}2)} * ADAF_{(1\text{-}2)} + LADD_{derm\ (2\text{-}6)} * ADAF_{(2\text{-}6)} + LADD_{derm\ (6\text{-}16)} * ADAF_{(6\text{-}16)} + LADD_{derm\ (16\text{-}31)} * ADAF_{(16\text{-}31)}$$

$$LADD_{derm\ x} = \frac{[OHM]_{soil} * SA_x * RAF_{c\text{-}derm} * SAF_x * EF_{derm} * ED * EP_x * C}{BW_x * AP_{lifetime}}$$

Cancer Risk from Homegrown Produce

$$ELCR_{prod} = LADD_{prod\ (1\text{-}31)} * CSF$$

$$LADD_{prod\ (1\text{-}31)} = LADD_{prod\ (1\text{-}2)} * ADAF_{(1\text{-}2)} + LADD_{prod\ (2\text{-}6)} * ADAF_{(2\text{-}6)} + LADD_{prod\ (6\text{-}16)} * ADAF_{(6\text{-}16)} + LADD_{prod\ (16\text{-}31)} * ADAF_{(16\text{-}31)}$$

$$LADD_{prod\ x} = \frac{[OHM_{soil}] * PUF * PIR_x * RAF_{c\text{-}produce} * EF_{produce} * ED * EP_x * C}{BW_x * AP_{lifetime}}$$

NOTE: These calculations are based on EPA's default method for accounting for early life exposures to mutagenic compounds.

Parameter	Value	Units
CSF	OHM specific	$(mg/kg\text{-}day)^{-1}$
LADD	age/OHM specific	mg/kg-day
$[OHM]_{soil}$	OHM specific	mg/kg
$IR_{(1\text{-}2)}$	100	mg/day
$IR_{(2\text{-}6)}$	100	mg/day
$IR_{(6\text{-}16)}$	50	mg/day
$IR_{(16\text{-}31)}$	50	mg/day
$PIR_{(1\text{-}2)}$	10,910	mg/day
$PIR_{(2\text{-}6)}$	11,958	mg/day
$PIR_{(6\text{-}16)}$	17,451	mg/day
$PIR_{(16\text{-}31)}$	24,432	mg/day
$RAF_{c\text{-}derm}$	OHM specific	dimensionless
$RAF_{c\text{-}produce}$	OHM specific	dimensionless
EF_{ing} or EF_{derm} = EF_{cancer}	0.082	event/day
$EF_{produce}$	1	event/day
ED	1	day/event
$EP_{(1\text{-}2)}$	1	years
$EP_{(2\text{-}6)}$	4	years
$EP_{(6\text{-}16)}$	10	years
$EP_{(16\text{-}31)}$	15	years
C	0.000001	kg/mg
$BW_{(1\text{-}2)}$	9.6	kg
$BW_{(2\text{-}6)}$	17.6	kg
$BW_{(6\text{-}16)}$	43.2	kg
$BW_{(16\text{-}31)}$	65.0	kg
AP_{cancer}	70	years
$SA_{(1\text{-}2)}$	1708	cm^2 / day
$SA_{(2\text{-}6)}$	2113	cm^2 / day
$SA_{(6\text{-}16)}$	3875	cm^2 / day
$SA_{(16\text{-}31)}$	5354	cm^2 / day
$SAF_{(1\text{-}2)}$	1.000	mg/cm^2
$SAF_{(2\text{-}6)}$	1.0000	mg/cm^2
$SAF_{(6\text{-}16)}$	1.0000	mg/cm^2
$SAF_{(16\text{-}31)}$	1.0000	mg/cm^2
$ADAF_{(1\text{-}2)}$	10	dimensionless
$ADAF_{(2\text{-}6)}$	3	dimensionless
$ADAF_{(6\text{-}16)}$	3	dimensionless
$ADAF_{(16\text{-}31)}$	1	dimensionless
PUF	OHM specific	dimensionless

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Resident - Soil: Table RS-5
Equations to Calculate Chronic Noncancer Risk for Resident Child (Age 1-8 Years)

Method 3 Lookup Tables Version v0624

Chronic Noncancer Risk from Ingestion

$$HQ_{ing} = \frac{ADD_{ing}}{RfD}$$

$$ADD_{ing} = \frac{[OHM]_{soil} * IR * RAF_{nc\text{-}ing} * EF_{ing} * ED * EP * C}{BW * AP_{chronic}}$$

Chronic Noncancer Risk from Dermal Absorption

$$HQ_{derm} = \frac{ADD_{derm}}{RfD}$$

$$ADD_{derm} = \frac{[OHM]_{soil} * SA * RAF_{nc\text{-}derm} * SAF * EF_{derm} * ED * EP * C}{BW * AP_{chronic}}$$

Chronic Noncancer Risk from Homegrown Produce

$$HQ_{produce} = \frac{ADD_{produce}}{RfD}$$

$$ADD_{produce} = \frac{[OHM_{soil}] * PUF * PIR * RAF_{produce} * EF_{produce} * ED * EP * C}{BW * AP_{chronic}}$$

Parameter	Value	Units
RfD	OHM specific	mg/kg-day
ADD	OHM specific	mg/kg-day
$[OHM]_{soil}$	OHM specific	mg/kg
$IR = IR_{(1\text{-}8)}$	100	mg/day
$PIR = PR_{(1\text{-}8)}$	1,210	mg/day
$RAF_{nc\text{-}ing}$	OHM specific	dimensionless
$RAF_{nc\text{-}derm}$	OHM specific	dimensionless
$RAF_{nc\text{-}produce}$	OHM specific	dimensionless
EF_{ing} or $EF_{derm} = EF_{chronic}$	0.082	event/day
$EF_{produce}$	1	event/day
ED	1	day/event
$EP = EP_{(1\text{-}8)}$	7	years
C	0.000001	kg/mg
$BW = BW_{(1\text{-}8)}$	19.0	kg
$AP_{chronic}$	7	year
$SA = SA_{(1\text{-}8)}$	2244	cm^2 / day
$SAF = SAF_{(1\text{-}8)}$	1.0000	mg/cm^2
PUF	OHM specific	dimensionless

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Resident - Soil: Table RS-6

Equations to Calculate Subchronic Noncancer Risk for Resident Child (Age 1-2 Years)

Method 3 Lookup Tables Version v0624

Subchronic Noncancer Risk from Ingestion

$$HQ_{ing} = \frac{ADD_{ing}}{RfD_{subchronic}}$$

$$ADD_{ing} = \frac{[OHM]_{soil} * IR * RAF_{nc\text{-}ing} * EF_{ing} * ED * EP * C}{BW * AP_{subchronic}}$$

Subchronic Noncancer Risk from Dermal Absorption

$$HQ_{derm} = \frac{ADD_{derm}}{RfD_{subchronic}}$$

$$ADD_{derm} = \frac{[OHM]_{soil} * SA * RAF_{nc\text{-}derm} * SAF * EF_{derm} * ED * EP * C}{BW * AP_{subchronic}}$$

Subchronic Noncancer Risk from Homegrown Produce

$$HQ_{produce} = \frac{ADD_{produce}}{RfD_{subchronic}}$$

$$ADD_{produce} = \frac{[OHM_{soil}] * PUF * PIR * RAF_{produce} * EF_{produce} * ED * EP * C}{BW * AP_{subchronic}}$$

Parameter	Value	Units
RfD	OHM specific	mg/kg-day
ADD	OHM specific	mg/kg-day
$[OHM]_{soil}$	OHM specific	mg/kg
$IR = IR_{(1-2)}$	100	mg/day
$PIR = PR_{(1-2)}$	10,910	mg/day
$RAF_{nc\text{-}ing}$	OHM specific	dimensionless
$RAF_{nc\text{-}derm}$	OHM specific	dimensionless
$RAF_{nc\text{-}produce}$	OHM specific	dimensionless
EF_{ing} or $EF_{derm} = EF_{subchronic}$	0.143	event/day
$EF_{produce}$	1	event/day
ED	1	day/event
$EP = EP_{sc}$	0.575	years
C	0.000001	kg/mg
$BW = BW_{(1-2)}$	9.6	kg
$AP_{subchronic}$	0.575	year
$SA = SA_{(1-2)}$	1708	cm^2 / day
$SAF = SAF_{(1-2)}$	1.0000	mg/cm^2
PUF	OHM specific	dimensionless

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Resident - Soil: Table RS-3

Equations to Calculate Cancer Risk for Resident (Age 1-31 Years)

Cancer Risk from Ingestion

$$ELCR_{ing} = LADD_{ing(1\text{-}31)} * CSF$$

$$LADD_{ing\ (1\text{-}31)} = LADD_{ing\ (1\text{-}8)} + LADD_{ing\ (8\text{-}15)} + LADD_{ing\ (15\text{-}31)}$$

$$LADD_{ing\ x} = \frac{[OHM]_{soil} * IR_x * RAF_{c\text{-}ing} * EF_{ing} * ED * EP_x * C}{BW_x * AP_{lifetime}}$$

Cancer Risk from Dermal Absorption

$$ELCR_{derm} = LADD_{derm} * CSF$$

$$LADD_{derm\ (1\text{-}31)} = LADD_{derm\ (1\text{-}8)} + LADD_{derm\ (8\text{-}15)} + LADD_{derm\ (15\text{-}31)}$$

$$LADD_{derm\ x} = \frac{[OHM]_{soil} * SA_x * RAF_{c\text{-}derm} * SAF_x * EF_{derm} * ED * EP_x * C}{BW_x * AP_{lifetime}}$$

Cancer Risk from Homegrown Produce

$$ELCR_{prod} = LADD_{prod\ (1\text{-}31)} * CSF$$

$$LADD_{prod\ (1\text{-}31)} = LADD_{prod\ (1\text{-}8)} + LADD_{prod\ (8\text{-}15)} + LADD_{prod\ (15\text{-}31)}$$

$$LADD_{prod\ x} = \frac{[OHM_{soil}] * PUF * PIR_x * RAF_{c\text{-}produce} * EF_{produce} * ED * EP_x * C}{BW_x * AP_{lifetime}}$$

Method 3 Lookup Tables Version v0624

Parameter	Value	Units
CSF	OHM specific	$(mg/kg\text{-}day)^{-1}$
LADD	age/OHM specific	mg/kg-day
$[OHM]_{soil}$	OHM specific	mg/kg
$IR_{(1\text{-}8)}$	100	mg/day
$IR_{(8\text{-}15)}$	50	mg/day
$IR_{(15\text{-}31)}$	50	mg/day
$PIR_{(1\text{-}8)}$	1,210	mg/day
$PIR_{(8\text{-}15)}$	1,781	mg/day
$PIR_{(15\text{-}31)}$	2,442	mg/day
$RAF_{c\text{-}ing}$	OHM specific	dimensionless
$RAF_{c\text{-}derm}$	OHM specific	dimensionless
$RAF_{c\text{-}produce}$	OHM specific	dimensionless
EF_{ing} or $EF_{derm} = EF_{cancer}$	0.411	event/day
$EF_{produce}$	1	event/day
ED	1	day/event
$EP_{(1\text{-}8)}$	7	years
$EP_{(8\text{-}15)}$	7	years
$EP_{(15\text{-}31)}$	16	years
C	0.000001	kg/mg
$BW_{(1\text{-}8)}$	19.0	kg
$BW_{(8\text{-}15)}$	46.1	kg
$BW_{(15\text{-}31)}$	64.5	kg
$AP_{lifetime}$	70	years
$SA_{(1\text{-}8)}$	2244	cm^2 / day
$SA_{(8\text{-}15)}$	4051	cm^2 / day
$SA_{(15\text{-}31)}$	5322	cm^2 / day
$SAF_{(1\text{-}8)}$	0.3740	mg/cm^2
$SAF_{(8\text{-}15)}$	0.1365	mg/cm^2
$SAF_{(15\text{-}31)}$	0.1329	mg/cm^2
PUF	OHM specific	dimensionless

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Resident - Soil: Table RS-4a

All Mutagens Except Trichloroethylene and Vinyl Chloride

Equations to Calculate Cancer Risk for Resident (Age 1-31 Years)

Method 3 Lookup Tables Version v0624

Cancer Risk from Ingestion

$$ELCR_{ing} = LADD_{ing(1\text{-}31)} * CSF$$

$$LADD_{ing\ (1\text{-}31)} = LADD_{ing\ (1\text{-}2)} * ADAF_{(1\text{-}2)} + LADD_{ing\ (2\text{-}6)} * ADAF_{(2\text{-}6)} + LADD_{ing\ (6\text{-}16)} * ADAF_{(6\text{-}16)} + LADD_{ing\ (16\text{-}31)} * ADAF_{(16\text{-}31)}$$

$$LADD_{ing\ x} = \frac{[OHM]_{soil} * IR_x * RAF_{c\text{-}ing} * EF_{ing} * ED * EP_x * C}{BW_x * AP_{lifetime}}$$

Cancer Risk from Dermal Absorption

$$ELCR_{derm} = LADD_{derm\ (1\text{-}31)} * CSF$$

$$LADD_{derm\ (1\text{-}31)} = LADD_{derm\ (1\text{-}2)} * ADAF_{(1\text{-}2)} + LADD_{derm\ (2\text{-}6)} * ADAF_{(2\text{-}6)} + LADD_{derm\ (6\text{-}16)} * ADAF_{(6\text{-}16)} + LADD_{derm\ (16\text{-}31)} * ADAF_{(16\text{-}31)}$$

$$LADD_{derm\ x} = \frac{[OHM]_{soil} * SA_x * RAF_{c\text{-}derm} * SAF_x * EF_{derm} * ED * EP_x * C}{BW_x * AP_{lifetime}}$$

Cancer Risk from Homegrown Produce

$$ELCR_{prod} = LADD_{prod\ (1\text{-}31)} * CSF$$

$$LADD_{prod\ (1\text{-}31)} = LADD_{prod\ (1\text{-}2)} * ADAF_{(1\text{-}2)} + LADD_{prod\ (2\text{-}6)} * ADAF_{(2\text{-}6)} + LADD_{prod\ (6\text{-}16)} * ADAF_{(6\text{-}16)} + LADD_{prod\ (16\text{-}31)} * ADAF_{(16\text{-}31)}$$

$$LADD_{prod\ x} = \frac{[OHM_{soil}] * PUF * PIR_x * RAF_{c\text{-}produce} * EF_{produce} * ED * EP_x * C}{BW_x * AP_{lifetime}}$$

NOTE: These calculations are based on EPA's default method for accounting for early life exposures to mutagenic compounds.

Parameter	Value	Units
CSF	OHM specific	$(mg/kg\text{-}day)^{-1}$
LADD	age/OHM specific	mg/kg-day
$[OHM]_{soil}$	OHM specific	mg/kg
$IR_{(1\text{-}2)}$	100	mg/day
$IR_{(2\text{-}6)}$	100	mg/day
$IR_{(6\text{-}16)}$	50	mg/day
$IR_{(16\text{-}31)}$	50	mg/day
$PIR_{(1\text{-}2)}$	10,910	mg/day
$PIR_{(2\text{-}6)}$	11,958	mg/day
$PIR_{(6\text{-}16)}$	17,451	mg/day
$PIR_{(16\text{-}31)}$	24,432	mg/day
$RAF_{c\text{-}derm}$	OHM specific	dimensionless
$RAF_{c\text{-}produce}$	OHM specific	dimensionless
EF_{ing} or EF_{derm} = EF_{cancer}	0.411	event/day
$EF_{produce}$	1	event/day
ED	1	day/event
$EP_{(1\text{-}2)}$	1	years
$EP_{(2\text{-}6)}$	4	years
$EP_{(6\text{-}16)}$	10	years
$EP_{(16\text{-}31)}$	15	years
C	0.000001	kg/mg
$BW_{(1\text{-}2)}$	9.6	kg
$BW_{(2\text{-}6)}$	17.6	kg
$BW_{(6\text{-}16)}$	43.2	kg
$BW_{(16\text{-}31)}$	65.0	kg
AP_{cancer}	70	years
$SA_{(1\text{-}2)}$	1708	cm^2 / day
$SA_{(2\text{-}6)}$	2113	cm^2 / day
$SA_{(6\text{-}16)}$	3875	cm^2 / day
$SA_{(16\text{-}31)}$	5354	cm^2 / day
$SAF_{(1\text{-}2)}$	0.372	mg/cm^2
$SAF_{(2\text{-}6)}$	0.3747	mg/cm^2
$SAF_{(6\text{-}16)}$	0.1702	mg/cm^2
$SAF_{(16\text{-}31)}$	0.1328	mg/cm^2
$ADAF_{(1\text{-}2)}$	10	dimensionless
$ADAF_{(2\text{-}6)}$	3	dimensionless
$ADAF_{(6\text{-}16)}$	3	dimensionless
$ADAF_{(16\text{-}31)}$	1	dimensionless
PUF	OHM specific	dimensionless

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Resident - Soil: Table RS-5
Equations to Calculate Chronic Noncancer Risk for Resident Child (Age 1-8 Years)

Method 3 Lookup Tables Version v0624

Chronic Noncancer Risk from Ingestion

$$HQ_{ing} = \frac{ADD_{ing}}{RfD}$$

$$ADD_{ing} = \frac{[OHM]_{soil} * IR * RAF_{nc\text{-}ing} * EF_{ing} * ED * EP * C}{BW * AP_{chronic}}$$

Chronic Noncancer Risk from Dermal Absorption

$$HQ_{derm} = \frac{ADD_{derm}}{RfD}$$

$$ADD_{derm} = \frac{[OHM]_{soil} * SA * RAF_{nc\text{-}derm} * SAF * EF_{derm} * ED * EP * C}{BW * AP_{chronic}}$$

Chronic Noncancer Risk from Homegrown Produce

$$HQ_{produce} = \frac{ADD_{produce}}{RfD}$$

$$ADD_{produce} = \frac{[OHM_{soil}] * PUF * PIR * RAF_{produce} * EF_{produce} * ED * EP * C}{BW * AP_{chronic}}$$

Parameter	Value	Units
RfD	OHM specific	mg/kg-day
ADD	OHM specific	mg/kg-day
$[OHM]_{soil}$	OHM specific	mg/kg
$IR = IR_{(1\text{-}8)}$	100	mg/day
$PIR = PR_{(1\text{-}8)}$	1,210	mg/day
$RAF_{nc\text{-}ing}$	OHM specific	dimensionless
$RAF_{nc\text{-}derm}$	OHM specific	dimensionless
$RAF_{nc\text{-}produce}$	OHM specific	dimensionless
EF_{ing} or $EF_{derm} = EF_{chronic}$	0.411	event/day
$EF_{produce}$	1	event/day
ED	1	day/event
$EP = EP_{(1\text{-}8)}$	7	years
C	0.000001	kg/mg
$BW = BW_{(1\text{-}8)}$	19.0	kg
$AP_{chronic}$	7	year
$SA = SA_{(1\text{-}8)}$	2244	cm^2 / day
$SAF = SAF_{(1\text{-}8)}$	0.3740	mg/cm^2
PUF	OHM specific	dimensionless

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Resident - Soil: Table RS-6

Equations to Calculate Subchronic Noncancer Risk for Resident Child (Age 1-2 Years)

Method 3 Lookup Tables Version v0624

Subchronic Noncancer Risk from Ingestion

$$HQ_{ing} = \frac{ADD_{ing}}{RfD_{subchronic}}$$

$$ADD_{ing} = \frac{[OHM]_{soil} * IR * RAF_{nc\text{-}ing} * EF_{ing} * ED * EP * C}{BW * AP_{subchronic}}$$

Subchronic Noncancer Risk from Dermal Absorption

$$HQ_{derm} = \frac{ADD_{derm}}{RfD_{subchronic}}$$

$$ADD_{derm} = \frac{[OHM]_{soil} * SA * RAF_{nc\text{-}derm} * SAF * EF_{derm} * ED * EP * C}{BW * AP_{subchronic}}$$

Subchronic Noncancer Risk from Homegrown Produce

$$HQ_{produce} = \frac{ADD_{produce}}{RfD_{subchronic}}$$

$$ADD_{produce} = \frac{[OHM_{soil}] * PUF * PIR * RAF_{produce} * EF_{produce} * ED * EP * C}{BW * AP_{subchronic}}$$

Parameter	Value	Units
RfD	OHM specific	mg/kg-day
ADD	OHM specific	mg/kg-day
$[OHM]_{soil}$	OHM specific	mg/kg
$IR = IR_{(1-2)}$	100	mg/day
$PIR = PR_{(1-2)}$	10,910	mg/day
$RAF_{nc\text{-}ing}$	OHM specific	dimensionless
$RAF_{nc\text{-}derm}$	OHM specific	dimensionless
$RAF_{nc\text{-}produce}$	OHM specific	dimensionless
EF_{ing} or $EF_{derm} = EF_{subchronic}$	0.714	event/day
$EF_{produce}$	1	event/day
ED	1	day/event
$EP = EP_{sc}$	0.575	years
C	0.000001	kg/mg
$BW = BW_{(1-2)}$	9.6	kg
$AP_{subchronic}$	0.575	year
$SA = SA_{(1-2)}$	1708	cm^2 / day
$SAF = SAF_{(1-2)}$	0.3740	mg/cm^2
PUF	OHM specific	dimensionless

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Trespasser - Soil: Table TS-2

Equations to Calculate Cancer Risk for a Trespasser (Age 11-18 years)

Cancer Risk from Ingestion

$$ELCR_{ing} = LADD_{ing} * CSF$$

$$LADD_{ing} = \frac{[OHM]_{soil} * IR * RAF_{c\text{-}ing} * EF_{ing} * ED * EP * C}{BW * AP_{lifetime}}$$

Cancer Risk from Dermal Absorption

$$ELCR_{derm} = LADD_{derm} * CSF$$

$$LADD_{derm} = \frac{[OHM]_{soil} * SA * RAF_{c\text{-}derm} * SAF * EF_{derm} * ED * EP * C}{BW * AP_{lifetime}}$$

Parameter	Value	Units
CSF	OHM specific	$(mg/kg\text{-}day)^{-1}$
LADD	age/OHM specific	mg/kg-day
$[OHM]_{soil}$	OHM specific	mg/kg
IR	50	mg/day
$RAF_{c\text{-}ing}$	OHM specific	dimensionless
$RAF_{c\text{-}derm}$	OHM specific	dimensionless
EF_{ing} or $EF_{derm} = EF_c$	0.164	event/day
ED	1	day/event
$EP = EP_{(11\text{-}18)}$	7	years
C	0.000001	kg/mg
$BW = BW_{(11\text{-}18)}$	55.8	kg
$AP_{(lifetime)}$	70	years
$SA = SA_{(11\text{-}18)}$	2486	cm^2 / day
$SAF = SAF_{(11\text{-}18)}$	1.0000	mg/cm^2

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Trespasser - Soil: Table TS-2a

Equations to Calculate Cancer Risk for Resident (Age 11-18 Years)

All Mutagens Except Trichloroethylene and Vinyl Chloride

Cancer Risk from Ingestion

$$ELCR_{ing} = LADD_{ing(11\text{-}18)} * CSF$$

$$LADD_{ing\ (11\text{-}18)} = LADD_{ing\ (11\text{-}16)} * ADAF\ (11\text{-}16) + LADD_{ing\ (16\text{-}18)} * ADAF\ (16\text{-}18)$$

$$LADD_{ing\ x} = \frac{[OHM]_{soil} * IR * RAF_{c\text{-}ing} * EF_{ing} * ED * EP_x * C}{BW_x * AP_{lifetime}}$$

Cancer Risk from Dermal Absorption

$$ELCR_{derm} = LADD_{derm\ (11\text{-}18)} * CSF$$

$$LADD_{derm\ (11\text{-}18)} = LADD_{derm\ (11\text{-}16)} * ADAF\ (11\text{-}16) + LADD_{derm\ (16\text{-}18)} * ADAF\ (16\text{-}18)$$

$$LADD_{derm\ x} = \frac{[OHM]_{soil} * SA_x * RAF_{c\text{-}derm} * SAF_x * EF_{derm} * ED * EP_x * C}{BW_x * AP_{lifetime}}$$

NOTE: These calculations are based on EPA's default method for accounting for early life exposures to mutagenic compounds.

Parameter	Value	Units
CSF	OHM specific	$(mg/kg\text{-}day)^{-1}$
LADD	age/OHM specific	mg/kg-day
$[OHM]_{soil}$	OHM specific	mg/kg
IR	50	mg/day
$RAF_{c\text{-}ing}$	OHM specific	dimensionless
$RAF_{c\text{-}derm}$	OHM specific	dimensionless
EF_{ing} or $EF_{derm} = EF_c$	0.164	event/day
ED	1	day/event
$EP_{(11\text{-}16)}$	5	years
$EP_{(16\text{-}18)}$	2	years
C	0.000001	kg/mg
$BW_{(11\text{-}16)}$	53.8	kg
$BW_{(16\text{-}18)}$	60.8	kg
$AP_{lifetime}$	70	years
$SA_{(11\text{-}16)}$	2470	cm^2/day
$SA_{(16\text{-}18)}$	2524	cm^2/day
$SAF_{(11\text{-}16)}$	1.0000	mg/cm^2
$SAF_{(16\text{-}18)}$	1.0000	mg/cm^2
$ADAF_{(11\text{-}16)}$	3	dimensionless
$ADAF_{(16\text{-}18)}$	1	dimensionless

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Trespasser - Soil: Table TS-3

Equations to Calculate Chronic Noncancer Risk for a Trespasser (Age 11-18 Years)

Method 3 Lookup Tables Version v0624

Chronic Noncancer Risk from Ingestion

$$HQ_{ing} = \frac{ADD_{ing}}{RfD}$$

$$ADD_{ing} = \frac{[OHM]_{soil} * IR * RAF_{nc\text{-}ing} * EF_{ing} * ED * EP * C}{BW * AP_{chr}}$$

Chronic Noncancer Risk from Dermal Absorption

$$HQ_{derm} = \frac{ADD_{ing,derm}}{RfD}$$

$$ADD_{derm} = \frac{[OHM]_{soil} * SA * RAF_{nc\text{-}derm} * SAF * EF_{derm} * ED * EP * C}{BW * AP_{chr}}$$

Parameter	Value	Units
RfD	OHM specific	mg/kg-day
ADD	OHM specific	mg/kg-day
$[OHM]_{soil}$	OHM specific	mg/kg
IR	50	mg/day
$RAF_{nc\text{-}ing}$	OHM specific	dimensionless
$RAF_{nc\text{-}derm}$	OHM specific	dimensionless
EF_{ing} or $Ef_{derm} = EF_{chr}$	0.164	event/day
ED	1	day/event
$EP = EP_{(11\text{-}18)}$	7	years
C	0.000001	kg/mg
$BW = BW_{(11\text{-}18)}$	55.8	kg
AP_{chr}	7	year
$SA = SA_{(11\text{-}18)}$	2486	cm^2/day
$SAF = SAF_{(11\text{-}18)}$	1.0000	mg/cm^2

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Trespasser - Soil: Table TS-4
Equations to Calculate Subchronic Noncancer Risk for a Trespasser (Age 11-12 Years

Method 3 Lookup Tables Version v0624

Subchronic Noncancer Risk from Ingestion

$$HQ_{ing} = \frac{ADD_{ing}}{RfD_{subchronic}}$$

$$ADD_{ing} = \frac{[OHM]_{soil} * IR * RAF_{nc\text{-}ing} * EF_{ing} * ED * EP * C}{BW * AP_{sc}}$$

Subchronic Noncancer Risk from Dermal Absorption

$$HQ_{derm} = \frac{ADD_{derm}}{RfD_{subchronic}}$$

$$ADD_{derm} = \frac{[OHM]_{soil} * SA * RAF_{nc\text{-}derm} * SAF * EF_{derm} * ED * EP * C}{BW * AP_{sc}}$$

Parameter	Value	Units
RfD	OHM specific	mg/kg-day
ADD	OHM specific	mg/kg-day
$[OHM]_{soil}$	OHM specific	mg/kg
IR	50	mg/day
$RAF_{nc\text{-}ing}$	OHM specific	dimensionless
$RAF_{nc\text{-}derm}$	OHM specific	dimensionless
EF_{ing} or $Ef_{derm} = EF_{sc}$	0.286	event/day
ED	1	day/event
$EP = EP_{sc\ (11\text{-}12)}$	0.575	years
C	0.000001	kg/mg
$BW = BW_{(11\text{-}12)}$	48.4	kg
AP_{sc}	0.575	year
$SA = SA_{(11\text{-}12)}$	2277	cm^2/day
$SAF = SAF_{(11\text{-}12)}$	1.0000	mg/cm^2

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Resident - 33 R Oakland Street Wetland Surface Sediment
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 7.1E-07

Chronic HI (all chemicals) = 2.7E-03

Subchronic HI (all chemicals) = 6.7E-03

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
BENZENE											
ETHYLBENZENE											
TOLUENE											
XYLENES (Mixed Isomers)											
METHYLNAPHTHALENE, 2-	1.6E-01				5.2E-06	3.9E-05	4.4E-05	1.8E-05	1.0E-04	1.2E-04	
ACENAPHTHENE	1.5E-01				3.2E-07	2.4E-06	2.7E-06	3.3E-07	1.9E-06	2.2E-06	
ACENAPHTHYLENE	7.2E-01				3.1E-06	2.3E-05	2.6E-05	1.1E-06	6.2E-06	7.2E-06	
ANTHRACENE	6.0E-01				2.6E-07	1.9E-06	2.2E-06	2.7E-07	1.5E-06	1.8E-06	
BENZO(a)ANTHRACENE	1.4E+00	1.1E-08	2.4E-08	3.5E-08	6.2E-06	9.3E-06	1.6E-05	2.2E-06	2.5E-06	4.6E-06	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(a)PYRENE	2.0E+00	1.5E-07	3.3E-07	4.8E-07	8.5E-04	1.3E-03	2.1E-03	2.9E-03	3.4E-03	6.3E-03	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(b)FLUORANTHENE	1.9E+00	1.5E-08	3.2E-08	4.7E-08	8.3E-06	1.2E-05	2.1E-05	2.9E-06	3.3E-06	6.1E-06	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(g,h,i)PERYLENE	1.4E+00				6.2E-06	4.6E-05	5.2E-05	2.1E-06	1.2E-05	1.4E-05	
BENZO(k)FLUORANTHENE	1.7E+00	1.3E-09	2.9E-09	4.3E-09	7.5E-06	1.1E-05	1.9E-05	2.6E-06	3.0E-06	5.6E-06	**ELCR calculations are on the "OtherMut C" tab.**
CHRYSENE	1.9E+00	1.4E-10	3.1E-10	4.6E-10	8.0E-06	1.2E-05	2.0E-05	2.8E-06	3.2E-06	5.9E-06	**ELCR calculations are on the "OtherMut C" tab.**
DIBENZO(a,h)ANTHRACENE	4.2E-01	3.2E-08	7.0E-08	1.0E-07	1.8E-06	2.7E-06	4.5E-06	6.3E-07	7.1E-07	1.3E-06	**ELCR calculations are on the "OtherMut C" tab.**
FLUORANTHENE	3.0E+00				9.8E-06	7.3E-05	8.3E-05	1.4E-05	7.7E-05	9.1E-05	
FLUORENE	1.6E-01				5.3E-07	3.9E-06	4.5E-06	1.8E-07	1.0E-06	1.2E-06	

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Resident - 33 R Oakland Street Wetland Surface Sediment
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 7.1E-07

Chronic HI (all chemicals) = 2.7E-03

Subchronic HI (all chemicals) = 6.7E-03

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
INDENO(1,2,3-cd)PYRENE	1.5E+00	1.2E-08	2.5E-08	3.7E-08	6.6E-06	9.8E-06	1.6E-05	2.3E-06	2.6E-06	4.9E-06	**ELCR calculations are on the "OtherMut C" tab.**
NAPHTHALENE	3.0E-01				1.9E-06	1.4E-05	1.6E-05	6.6E-07	3.8E-06	4.4E-06	
PHENANTHRENE	1.2E+00				5.3E-06	3.9E-05	4.5E-05	1.8E-06	1.0E-05	1.2E-05	
PYRENE	3.0E+00				1.3E-05	9.7E-05	1.1E-04	4.5E-06	2.6E-05	3.0E-05	
PETROLEUM HYDROCARBONS: ALIPHATICS - C5 to C8											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C12											
PETROLEUM HYDROCARBONS: AROMATICS - C9 to C10											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C18											
PETROLEUM HYDROCARBONS: ALIPHATICS - C19 to C36	5.6E+01				1.2E-05	5.4E-05	6.6E-05	1.4E-05	4.7E-05	6.1E-05	
PETROLEUM HYDROCARBONS: AROMATICS - C11 to C22											

Resident 35 Oakland Street Wetland Surface Sediment
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 2.2E-05

Chronic HI (all chemicals) = 4.5E-01

Subchronic HI (all chemicals) = 1.0E+00

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
BENZENE	2.9E-01	1.1E-09	1.5E-09	2.6E-09	3.1E-05	2.1E-05	5.2E-05	4.3E-05	2.2E-05	6.5E-05	
ETHYLBENZENE	4.0E-01				3.4E-06	2.3E-06	5.7E-06	1.2E-05	6.1E-06	1.8E-05	
TOLUENE											
XYLENES (Mixed Isomers)											
METHYLNAPHTHALENE, 2-	3.5E+00				1.1E-04	8.5E-04	9.6E-04	3.9E-04	2.2E-03	2.6E-03	
ACENAPHTHENE	1.4E+01				3.1E-05	2.3E-04	2.6E-04	3.2E-05	1.8E-04	2.1E-04	
ACENAPHTHYLENE	4.3E+00				1.9E-05	1.4E-04	1.6E-04	6.4E-06	3.7E-05	4.3E-05	
ANTHRACENE	1.2E+01				5.3E-06	3.9E-05	4.5E-05	5.5E-06	3.1E-05	3.7E-05	
BENZO(a)ANTHRACENE	2.1E+01	1.6E-07	3.5E-07	5.1E-07	8.9E-05	1.3E-04	2.2E-04	3.1E-05	3.5E-05	6.6E-05	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(a)PYRENE	2.5E+01	1.9E-06	4.2E-06	6.1E-06	1.1E-02	1.6E-02	2.7E-02	3.7E-02	4.2E-02	8.0E-02	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(b)FLUORANTHENE	1.3E+01	1.0E-07	2.2E-07	3.3E-07	5.8E-05	8.6E-05	1.4E-04	2.0E-05	2.3E-05	4.3E-05	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(g,h,i)PERYLENE	1.4E+01				5.8E-05	4.4E-04	4.9E-04	2.0E-05	1.2E-04	1.4E-04	
BENZO(k)FLUORANTHENE	1.3E+01	1.0E-08	2.2E-08	3.3E-08	5.8E-05	8.6E-05	1.4E-04	2.0E-05	2.3E-05	4.3E-05	**ELCR calculations are on the "OtherMut C" tab.**
CHRYSENE	1.7E+01	1.3E-09	2.9E-09	4.2E-09	7.4E-05	1.1E-04	1.8E-04	2.6E-05	2.9E-05	5.5E-05	**ELCR calculations are on the "OtherMut C" tab.**
DIBENZO(a,h)ANTHRACENE	3.8E+00	2.9E-07	6.3E-07	9.2E-07	1.6E-05	2.4E-05	4.1E-05	5.6E-06	6.4E-06	1.2E-05	**ELCR calculations are on the "OtherMut C" tab.**
FLUORANTHENE	3.5E+01				1.1E-04	8.5E-04	9.7E-04	1.6E-04	9.0E-04	1.1E-03	
FLUORENE	7.6E+00				2.5E-05	1.8E-04	2.1E-04	8.5E-06	4.8E-05	5.7E-05	

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Resident 35 Oakland Street Wetland Surface Sediment
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 2.2E-05

Chronic HI (all chemicals) = 4.5E-01

Subchronic HI (all chemicals) = 1.0E+00

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
INDENO(1,2,3-cd)PYRENE	1.1E+01	8.7E-08	1.9E-07	2.8E-07	4.9E-05	7.3E-05	1.2E-04	1.7E-05	1.9E-05	3.6E-05	**ELCR calculations are on the "OtherMut C" tab.**
NAPHTHALENE	1.0E+01				6.8E-05	5.1E-04	5.7E-04	2.3E-05	1.3E-04	1.6E-04	
PHENANTHRENE	4.0E+01				1.7E-04	1.3E-03	1.5E-03	6.0E-05	3.4E-04	4.0E-04	
PYRENE	5.1E+01				2.2E-04	1.6E-03	1.9E-03	7.6E-05	4.3E-04	5.1E-04	
PETROLEUM HYDROCARBONS: ALIPHATICS - C5 to C8	1.9E+01				8.1E-05	3.7E-04	4.5E-04	2.8E-05	9.7E-05	1.2E-04	
PETROLEUM HYDROCARBONS: AROMATICS - C9 to C10	2.6E+01				3.8E-04	1.7E-03	2.1E-03	1.3E-04	4.5E-04	5.8E-04	
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C18	2.6E+01				1.1E-04	5.1E-04	6.2E-04	3.9E-05	1.3E-04	1.7E-04	
PETROLEUM HYDROCARBONS: ALIPHATICS - C19 to C36	6.6E+01				1.4E-05	6.4E-05	7.8E-05	1.6E-05	5.6E-05	7.2E-05	
PETROLEUM HYDROCARBONS: AROMATICS - C11 to C22	4.3E+02				1.9E-03	1.4E-02	1.6E-02	6.5E-04	3.7E-03	4.3E-03	
ARSENIC	7.1E+01	3.5E-06	1.0E-05	1.4E-05	5.1E-02	6.8E-02	1.2E-01	1.8E-01	1.8E-01	3.6E-01	
BARIUM	1.1E+02				2.3E-04	5.2E-04	7.5E-04	8.0E-04	1.4E-03	2.2E-03	
CADMIUM	7.5E+00				3.2E-03	1.4E-03	4.7E-03	1.1E-02	3.8E-03	1.5E-02	
CHROMIUM (TOTAL)	2.5E+02				3.7E-02	8.2E-02	1.2E-01	1.9E-02	3.2E-02	5.1E-02	**Cr(VI) limit is 200 mg/kg due to contact dermatitis.**
LEAD	3.5E+02				1.0E-01	2.7E-02	1.3E-01	3.5E-01	7.2E-02	4.2E-01	**Lead IH HQ limit is 1, not 10.**
MERCURY	1.5E+00				1.0E-03	4.7E-03	5.8E-03	3.6E-03	1.2E-02	1.6E-02	
NICKEL	9.1E+01				2.0E-03	8.8E-03	1.1E-02	6.8E-03	2.3E-02	3.0E-02	

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Resident 35 Oakland Street Wetland Surface Sediment
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 2.2E-05

Chronic HI (all chemicals) = 4.5E-01

Subchronic HI (all chemicals) = 1.0E+00

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
SELENIUM	3.8E+00				3.3E-04	7.4E-05	4.0E-04	1.1E-03	2.0E-04	1.3E-03	
SILVER	1.1E+01				9.7E-04	6.5E-03	7.5E-03	3.3E-03	1.7E-02	2.1E-02	
ZINC	5.4E+02				7.7E-04	1.7E-03	2.5E-03	2.7E-03	4.6E-03	7.2E-03	

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Resident 37 Oakland Street Wetland Surface Sediment
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 4.2E-05

Chronic HI (all chemicals) = 2.5E-01

Subchronic HI (all chemicals) = 4.4E-01

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
BENZENE	3.1E-01	1.1E-09	1.7E-09	2.8E-09	3.4E-05	2.3E-05	5.6E-05	4.7E-05	2.4E-05	7.1E-05	
ETHYLBENZENE	6.8E-01				5.9E-06	4.0E-06	9.9E-06	2.0E-05	1.0E-05	3.1E-05	
TOLUENE											
XYLENES (Mixed Isomers)	2.9E-01				6.3E-07	4.2E-07	1.0E-06	1.1E-06	5.6E-07	1.6E-06	
METHYLNAPHTHALENE, 2-	3.6E+01				1.2E-03	8.8E-03	1.0E-02	4.1E-03	2.3E-02	2.7E-02	
ACENAPHTHENE	1.8E+02				3.8E-04	2.9E-03	3.2E-03	4.0E-04	2.3E-03	2.7E-03	
ACENAPHTHYLENE	1.4E+01				6.2E-05	4.6E-04	5.3E-04	2.2E-05	1.2E-04	1.4E-04	
ANTHRACENE	1.2E+02				5.1E-05	3.8E-04	4.4E-04	5.3E-05	3.0E-04	3.6E-04	
BENZO(a)ANTHRACENE	6.7E+01	5.2E-07	1.1E-06	1.6E-06	2.9E-04	4.3E-04	7.2E-04	1.0E-04	1.1E-04	2.1E-04	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(a)PYRENE	8.1E+01	6.2E-06	1.4E-05	2.0E-05	3.5E-02	5.2E-02	8.7E-02	1.2E-01	1.4E-01	2.6E-01	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(b)FLUORANTHENE	3.9E+01	3.0E-07	6.5E-07	9.5E-07	1.7E-04	2.5E-04	4.2E-04	5.8E-05	6.6E-05	1.2E-04	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(g,h,i)PERYLENE	4.9E+01				2.1E-04	1.6E-03	1.8E-03	7.3E-05	4.1E-04	4.9E-04	
BENZO(k)FLUORANTHENE	3.7E+01	2.9E-08	6.3E-08	9.2E-08	1.6E-04	2.4E-04	4.0E-04	5.6E-05	6.4E-05	1.2E-04	**ELCR calculations are on the "OtherMut C" tab.**
CHRYSENE	5.6E+01	4.3E-09	9.3E-09	1.4E-08	2.4E-04	3.6E-04	6.0E-04	8.3E-05	9.5E-05	1.8E-04	**ELCR calculations are on the "OtherMut C" tab.**
DIBENZO(a,h)ANTHRACENE	1.1E+01	8.5E-07	1.8E-06	2.7E-06	4.8E-05	7.1E-05	1.2E-04	1.6E-05	1.9E-05	3.5E-05	**ELCR calculations are on the "OtherMut C" tab.**
FLUORANTHENE	2.0E+02				6.4E-04	4.8E-03	5.5E-03	8.9E-04	5.1E-03	6.0E-03	
FLUORENE	7.1E+01				2.3E-04	1.7E-03	2.0E-03	8.0E-05	4.5E-04	5.3E-04	

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Resident 37 Oakland Street Wetland Surface Sediment
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 4.2E-05

Chronic HI (all chemicals) = 2.5E-01

Subchronic HI (all chemicals) = 4.4E-01

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
INDENO(1,2,3-cd)PYRENE	3.8E+01	2.9E-07	6.3E-07	9.2E-07	1.6E-04	2.4E-04	4.1E-04	5.6E-05	6.4E-05	1.2E-04	**ELCR calculations are on the "OtherMut C" tab.**
NAPHTHALENE	9.8E+01				6.3E-04	4.7E-03	5.4E-03	2.2E-04	1.2E-03	1.5E-03	
PHENANTHRENE	3.9E+02				1.7E-03	1.3E-02	1.4E-02	5.8E-04	3.3E-03	3.9E-03	
PYRENE	3.1E+02				1.3E-03	9.9E-03	1.1E-02	4.6E-04	2.6E-03	3.1E-03	
PETROLEUM HYDROCARBONS: ALIPHATICS - C5 to C8											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C12											
PETROLEUM HYDROCARBONS: AROMATICS - C9 to C10	3.0E+01				4.3E-04	1.9E-03	2.4E-03	1.5E-04	5.1E-04	6.6E-04	
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C18	8.6E+01				3.7E-04	1.7E-03	2.0E-03	1.3E-04	4.4E-04	5.7E-04	
PETROLEUM HYDROCARBONS: ALIPHATICS - C19 to C36	3.0E+02				6.5E-05	2.9E-04	3.6E-04	7.5E-05	2.6E-04	3.3E-04	
PETROLEUM HYDROCARBONS: AROMATICS - C11 to C22	5.7E+02				2.4E-03	1.8E-02	2.1E-02	8.5E-04	4.8E-03	5.7E-03	
DICHLOROETHYLENE, CIS-1,2-	8.2E+01				1.8E-02	1.2E-02	3.0E-02	6.1E-03	3.1E-03	9.3E-03	
VINYL CHLORIDE	1.3E+01	8.7E-06	5.0E-06	1.4E-05	1.9E-03	1.3E-03	3.2E-03	6.6E-03	3.4E-03	1.0E-02	**ELCR calculations are on the "VC C" tab.**
ARSENIC	1.1E+01	5.4E-07	1.6E-06	2.1E-06	7.8E-03	1.1E-02	1.8E-02	2.7E-02	2.8E-02	5.5E-02	
BARIUM	5.1E+01				1.1E-04	2.4E-04	3.5E-04	3.8E-04	6.5E-04	1.0E-03	
CHROMIUM (TOTAL)	3.5E+01				5.0E-03	1.1E-02	1.6E-02	2.6E-03	4.4E-03	7.0E-03	**Cr(VI) limit is 200 mg/kg due to contact dermatitis.**
LEAD	3.3E+01				9.5E-03	2.6E-03	1.2E-02	3.3E-02	6.8E-03	4.0E-02	**Lead IH HQ limit is 1, not 10.**
MERCURY	1.0E-01				7.2E-05	3.2E-04	3.9E-04	2.5E-04	8.5E-04	1.1E-03	

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Resident 37 Oakland Street Wetland Surface Sediment
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 4.2E-05

Chronic HI (all chemicals) = 2.5E-01

Subchronic HI (all chemicals) = 4.4E-01

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
NICKEL	1.7E+01				3.8E-04	1.7E-03	2.1E-03	1.3E-03	4.4E-03	5.7E-03	
ZINC	7.2E+01				1.0E-04	2.3E-04	3.3E-04	3.6E-04	6.1E-04	9.7E-04	

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Resident 39 Oakland Street Wetland Surface Sediment
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 1.5E-09

Chronic HI (all chemicals) = 9.3E-06

Subchronic HI (all chemicals) = 1.9E-05

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
BENZENE											
ETHYLBENZENE											
TOLUENE											
XYLENES (Mixed Isomers)											
METHYLNAPHTHALENE, 2-	4.1E-03				1.3E-07	9.9E-07	1.1E-06	4.6E-07	2.6E-06	3.1E-06	
ACENAPHTHENE	9.0E-03				1.9E-08	1.5E-07	1.7E-07	2.0E-08	1.2E-07	1.4E-07	
ACENAPHTHYLENE											
ANTHRACENE	5.6E-03				2.4E-09	1.8E-08	2.1E-08	2.5E-09	1.4E-08	1.7E-08	
BENZO(a)ANTHRACENE	4.9E-03	3.7E-11	8.1E-11	1.2E-10	2.1E-08	3.1E-08	5.2E-08	7.3E-09	8.3E-09	1.6E-08	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(a)PYRENE	4.6E-03	3.6E-10	7.7E-10	1.1E-09	2.0E-06	3.0E-06	5.0E-06	6.9E-06	7.9E-06	1.5E-05	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(b)FLUORANTHENE	6.4E-03	4.9E-11	1.1E-10	1.6E-10	2.8E-08	4.1E-08	6.9E-08	9.6E-09	1.1E-08	2.0E-08	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(g,h,i)PERYLENE	4.7E-03				2.0E-08	1.5E-07	1.7E-07	7.0E-09	4.0E-08	4.7E-08	
BENZO(k)FLUORANTHENE	5.6E-03	4.3E-12	9.4E-12	1.4E-11	2.4E-08	3.6E-08	6.0E-08	8.4E-09	9.5E-09	1.8E-08	**ELCR calculations are on the "OtherMut C" tab.**
CHRYSENE	8.1E-03	6.2E-13	1.4E-12	2.0E-12	3.5E-08	5.2E-08	8.7E-08	1.2E-08	1.4E-08	2.6E-08	**ELCR calculations are on the "OtherMut C" tab.**
DIBENZO(a,h)ANTHRACENE											**ELCR calculations are on the "OtherMut C" tab.**
FLUORANTHENE	2.4E-02				7.7E-08	5.7E-07	6.5E-07	1.1E-07	6.1E-07	7.1E-07	
FLUORENE	4.6E-03				1.5E-08	1.1E-07	1.3E-07	5.2E-09	2.9E-08	3.5E-08	

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Resident 39 Oakland Street Wetland Surface Sediment
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 1.5E-09

Chronic HI (all chemicals) = 9.3E-06

Subchronic HI (all chemicals) = 1.9E-05

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
INDENO(1,2,3-cd)PYRENE	5.2E-03	4.0E-11	8.7E-11	1.3E-10	2.2E-08	3.4E-08	5.6E-08	7.8E-09	8.9E-09	1.7E-08	**ELCR calculations are on the "OtherMut C" tab.**
NAPHTHALENE	6.0E-03				3.9E-08	2.9E-07	3.3E-07	1.3E-08	7.7E-08	9.0E-08	
PHENANTHRENE	1.4E-02				6.0E-08	4.5E-07	5.1E-07	2.1E-08	1.2E-07	1.4E-07	
PYRENE	2.4E-02				1.0E-07	7.7E-07	8.7E-07	3.6E-08	2.0E-07	2.4E-07	
PETROLEUM HYDROCARBONS: ALIPHATICS - C5 to C8											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C12											
PETROLEUM HYDROCARBONS: AROMATICS - C9 to C10											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C18											
PETROLEUM HYDROCARBONS: ALIPHATICS - C19 to C36											
PETROLEUM HYDROCARBONS: AROMATICS - C11 to C22											

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Trespasser All Properties Wetland Surface Sediment
Exposure Point Concentration (EPC)

Based on Trespasser Ages 11-18 (Cancer and Non-Cancer Chronic), and Ages 11-12 (Non-Cancer Subchronic)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 5.9E-06
Chronic HI (all chemicals) = 2.9E-01
Subchronic HI (all chemicals) = 3.6E-01

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
BENZENE	0.33	2.6E-10	3.9E-10	6.6E-10	1.2E-05	1.8E-05	3.0E-05	9.6E-06	1.3E-05	2.3E-05	
ETHYLBENZENE	0.50				1.5E-06	2.2E-06	3.7E-06	2.9E-06	4.0E-06	7.0E-06	
TOLUENE											
XYLENES (Mixed Isomers)	0.56				4.1E-07	6.1E-07	1.0E-06	4.1E-07	5.6E-07	9.7E-07	
METHYLNAPHTHALENE, 2-	13.01				1.4E-04	2.4E-03	2.5E-03	2.9E-04	4.4E-03	4.7E-03	
ACENAPHTHENE	61.57				4.5E-05	7.5E-04	8.0E-04	2.7E-05	4.1E-04	4.4E-04	
ACENAPHTHYLENE	6.93				1.0E-05	1.7E-04	1.8E-04	2.0E-06	3.1E-05	3.3E-05	
ANTHRACENE	43.11				6.4E-06	1.1E-04	1.1E-04	3.8E-06	5.8E-05	6.2E-05	
BENZO(a)ANTHRACENE	32.52	3.6E-08	1.2E-07	1.5E-07	4.8E-05	1.6E-04	2.1E-04	9.6E-06	2.9E-05	3.9E-05	ELCR calculations are on the "OtherMut C" tab.
BENZO(a)PYRENE	39.24	4.3E-07	1.4E-06	1.9E-06	5.8E-03	1.9E-02	2.5E-02	1.2E-02	3.5E-02	4.7E-02	ELCR calculations are on the "OtherMut C" tab.
BENZO(b)FLUORANTHENE	19.79	2.2E-08	7.2E-08	9.3E-08	2.9E-05	9.7E-05	1.3E-04	5.8E-06	1.8E-05	2.4E-05	ELCR calculations are on the "OtherMut C" tab.
BENZO(g,h,i)PERYLENE	22.78				3.4E-05	5.6E-04	5.9E-04	6.7E-06	1.0E-04	1.1E-04	
BENZO(k)FLUORANTHENE	19.31	2.1E-09	7.0E-09	9.1E-09	2.8E-05	9.4E-05	1.2E-04	5.7E-06	1.7E-05	2.3E-05	ELCR calculations are on the "OtherMut C" tab.
CHRYSENE	27.01	3.0E-10	9.8E-10	1.3E-09	4.0E-05	1.3E-04	1.7E-04	8.0E-06	2.4E-05	3.2E-05	ELCR calculations are on the "OtherMut C" tab.
DIBENZO(a,h)ANTHRACENE	5.59	6.1E-08	2.0E-07	2.6E-07	8.2E-06	2.7E-05	3.6E-05	1.7E-06	5.0E-06	6.7E-06	ELCR calculations are on the "OtherMut C" tab.
FLUORANTHENE	81.03				9.0E-05	1.5E-03	1.6E-03	7.2E-05	1.1E-03	1.2E-03	
FLUORENE	25.91				2.9E-05	4.7E-04	5.0E-04	5.7E-06	8.7E-05	9.3E-05	
INDENO(1,2,3-cd)PYRENE	18.12	2.0E-08	6.6E-08	8.6E-08	2.7E-05	8.8E-05	1.2E-04	5.3E-06	1.6E-05	2.2E-05	ELCR calculations are on the "OtherMut C" tab.
NAPHTHALENE	35.56				7.9E-05	1.3E-03	1.4E-03	1.6E-05	2.4E-04	2.5E-04	
PHENANTHRENE	140.69				2.1E-04	3.4E-03	3.6E-03	4.2E-05	6.3E-04	6.7E-04	

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Trespasser All Properties Wetland Surface Sediment
Exposure Point Concentration (EPC)

Based on Trespasser Ages 11-18 (Cancer and Non-Cancer Chronic), and Ages 11-12 (Non-Cancer Subchronic)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 5.9E-06
Chronic HI (all chemicals) = 2.9E-01
Subchronic HI (all chemicals) = 3.6E-01

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
PYRENE	122.74				1.8E-04	3.0E-03	3.2E-03	3.6E-05	5.5E-04	5.9E-04	
PETROLEUM HYDROCARBONS: ALIPHATICS - C5 to C8											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C12	22.90				3.4E-05	3.4E-04	3.7E-04	6.8E-06	6.2E-05	6.8E-05	
PETROLEUM HYDROCARBONS: AROMATICS - C9 to C10	27.79				1.4E-04	1.4E-03	1.5E-03	2.7E-05	2.5E-04	2.8E-04	
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C18	41.26				6.1E-05	6.0E-04	6.7E-04	1.2E-05	1.1E-04	1.2E-04	
PETROLEUM HYDROCARBONS: ALIPHATICS - C19 to C36	124.76				9.2E-06	9.1E-05	1.0E-04	6.1E-06	5.6E-05	6.2E-05	
PETROLEUM HYDROCARBONS: AROMATICS - C11 to C22	435.62				6.4E-04	1.1E-02	1.1E-02	1.3E-04	2.0E-03	2.1E-03	
DICHLOROETHYLENE, CIS-1,2-	8.2E+01				6.0E-03	9.0E-03	1.5E-02	1.2E-03	1.7E-03	2.9E-03	
VINYL CHLORIDE	1.3E+01	1.4E-07	2.1E-07	3.5E-07	6.5E-04	9.7E-04	1.6E-03	1.3E-03	1.8E-03	3.1E-03	**ELCR calculations are on the "VC C" tab.**
ARSENIC	7.1E+01	7.8E-07	2.3E-06	3.1E-06	1.7E-02	5.2E-02	6.9E-02	3.5E-02	9.5E-02	1.3E-01	
BARIUM	1.1E+02				7.9E-05	3.9E-04	4.7E-04	1.6E-04	7.2E-04	8.8E-04	
CADMIUM	7.5E+00				1.1E-03	1.1E-03	2.2E-03	2.2E-03	2.0E-03	4.2E-03	
CHROMIUM (TOTAL)	2.5E+02				1.2E-02	6.2E-02	7.4E-02	3.7E-03	1.7E-02	2.1E-02	**Cr(VI) limit is 200 mg/kg due to contact dermatitis.**
LEAD	3.5E+02				3.4E-02	2.1E-02	5.5E-02	6.9E-02	3.8E-02	1.1E-01	
MERCURY	1.5E+00				3.6E-04	3.6E-03	3.9E-03	7.2E-04	6.5E-03	7.3E-03	
NICKEL	9.1E+01				6.7E-04	6.6E-03	7.3E-03	1.3E-03	1.2E-02	1.4E-02	
SELENIUM	3.8E+00				1.1E-04	5.6E-05	1.7E-04	2.3E-04	1.0E-04	3.3E-04	
SILVER	1.1E+01				3.3E-04	4.9E-03	5.3E-03	6.6E-04	9.0E-03	9.7E-03	
ZINC	5.4E+02				2.6E-04	1.3E-03	1.6E-03	5.3E-04	2.4E-03	2.9E-03	

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Trespasser Tidelands Wetland Surface Sediment
Exposure Point Concentration (EPC)

Based on Trespasser Ages 11-18 (Cancer and Non-Cancer Chronic), and Ages 11-12 (Non-Cancer Subchronic)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 4.7E-08
Chronic HI (all chemicals) = 5.8E-04
Subchronic HI (all chemicals) = 9.5E-04

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
BENZENE											
ETHYLBENZENE											
TOLUENE											
XYLENES (Mixed Isomers)											
METHYLNAPHTHALENE, 2-	0.046				5.1E-07	8.4E-06	9.0E-06	1.0E-06	1.5E-05	1.7E-05	
ACENAPHTHENE	0.024				1.8E-08	2.9E-07	3.1E-07	1.1E-08	1.6E-07	1.7E-07	
ACENAPHTHYLENE	0.122				1.8E-07	3.0E-06	3.2E-06	3.6E-08	5.5E-07	5.8E-07	
ANTHRACENE	0.122				1.8E-08	3.0E-07	3.2E-07	1.1E-08	1.6E-07	1.7E-07	
BENZO(a)ANTHRACENE	0.621	6.8E-10	2.3E-09	2.9E-09	9.2E-07	3.0E-06	3.9E-06	1.8E-07	5.6E-07	7.4E-07	ELCR calculations are on the "OtherMut C" tab.
BENZO(a)PYRENE	0.767	8.4E-09	2.8E-08	3.6E-08	1.1E-04	3.7E-04	4.9E-04	2.3E-04	6.9E-04	9.1E-04	ELCR calculations are on the "OtherMut C" tab.
BENZO(b)FLUORANTHENE	0.362	4.0E-10	1.3E-09	1.7E-09	5.3E-07	1.8E-06	2.3E-06	1.1E-07	3.2E-07	4.3E-07	ELCR calculations are on the "OtherMut C" tab.
BENZO(g,h,i)PERYLENE	0.380				5.6E-07	9.3E-06	9.8E-06	1.1E-07	1.7E-06	1.8E-06	
BENZO(k)FLUORANTHENE	0.441	4.8E-11	1.6E-10	2.1E-10	6.5E-07	2.2E-06	2.8E-06	1.3E-07	4.0E-07	5.3E-07	ELCR calculations are on the "OtherMut C" tab.
CHRYSENE	0.551	6.1E-12	2.0E-11	2.6E-11	8.1E-07	2.7E-06	3.5E-06	1.6E-07	4.9E-07	6.6E-07	ELCR calculations are on the "OtherMut C" tab.
DIBENZO(a,h)ANTHRACENE	0.088	9.7E-10	3.2E-09	4.2E-09	1.3E-07	4.3E-07	5.6E-07	2.6E-08	7.9E-08	1.0E-07	ELCR calculations are on the "OtherMut C" tab.
FLUORANTHENE	0.822				9.1E-07	1.5E-05	1.6E-05	7.3E-07	1.1E-05	1.2E-05	
FLUORENE	0.052				5.7E-08	9.5E-07	1.0E-06	1.1E-08	1.7E-07	1.9E-07	
INDENO(1,2,3-cd)PYRENE	0.385	4.2E-10	1.4E-09	1.8E-09	5.7E-07	1.9E-06	2.4E-06	1.1E-07	3.5E-07	4.6E-07	ELCR calculations are on the "OtherMut C" tab.
NAPHTHALENE	0.076				1.7E-07	2.8E-06	2.9E-06	3.3E-08	5.1E-07	5.4E-07	
PHENANTHRENE	0.224				3.3E-07	5.5E-06	5.8E-06	6.6E-08	1.0E-06	1.1E-06	

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Trespasser Tidelands Wetland Surface Sediment
Exposure Point Concentration (EPC)

Based on Trespasser Ages 11-18 (Cancer and Non-Cancer Chronic), and Ages 11-12 (Non-Cancer Subchronic)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 4.7E-08
Chronic HI (all chemicals) = 5.8E-04
Subchronic HI (all chemicals) = 9.5E-04

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
PYRENE	1.140				1.7E-06	2.8E-05	3.0E-05	3.4E-07	5.1E-06	5.4E-06	
PETROLEUM HYDROCARBONS: ALIPHATICS - C5 to C8											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C12											
PETROLEUM HYDROCARBONS: AROMATICS - C9 to C10											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C18											
PETROLEUM HYDROCARBONS: ALIPHATICS - C19 to C36											
PETROLEUM HYDROCARBONS: AROMATICS - C11 to C22											

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Resident 39 Oakland Street Mudflat Surface Sediment Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 4.1E-06

Chronic HI (all chemicals) = 2.2E-01

Subchronic HI (all chemicals) = 3.6E-01

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
BENZENE											
ETHYLBENZENE											
TOLUENE											
XYLENES (Mixed Isomers)											
METHYLNAPHTHALENE, 2-	1.7E-01				5.6E-06	4.2E-05	4.7E-05	1.9E-05	1.1E-04	1.3E-04	
ACENAPHTHENE	2.0E+00				4.4E-06	3.3E-05	3.7E-05	4.6E-06	2.6E-05	3.1E-05	
ACENAPHTHYLENE	1.0E+00				4.4E-06	3.3E-05	3.8E-05	1.5E-06	8.8E-06	1.0E-05	
ANTHRACENE	2.3E+00				9.8E-07	7.3E-06	8.3E-06	1.0E-06	5.8E-06	6.8E-06	
BENZO(a)ANTHRACENE	4.1E+00	3.1E-08	6.8E-08	9.9E-08	1.8E-05	2.6E-05	4.4E-05	6.1E-06	6.9E-06	1.3E-05	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(a)PYRENE	4.5E+00	3.5E-07	7.6E-07	1.1E-06	2.0E-03	2.9E-03	4.9E-03	6.8E-03	7.7E-03	1.4E-02	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(b)FLUORANTHENE	2.6E+00	2.0E-08	4.4E-08	6.4E-08	1.1E-05	1.7E-05	2.8E-05	3.9E-06	4.5E-06	8.4E-06	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(g,h,i)PERYLENE	2.5E+00				1.1E-05	7.9E-05	9.0E-05	3.7E-06	2.1E-05	2.5E-05	
BENZO(k)FLUORANTHENE	3.0E+00	2.3E-09	5.0E-09	7.2E-09	1.3E-05	1.9E-05	3.2E-05	4.4E-06	5.0E-06	9.5E-06	**ELCR calculations are on the "OtherMut C" tab.**
CHRYSENE	3.5E+00	2.7E-10	5.9E-10	8.7E-10	1.5E-05	2.3E-05	3.8E-05	5.3E-06	6.0E-06	1.1E-05	**ELCR calculations are on the "OtherMut C" tab.**
DIBENZO(a,h)ANTHRACENE	5.0E-01	3.9E-08	8.5E-08	1.2E-07	2.2E-06	3.3E-06	5.4E-06	7.6E-07	8.6E-07	1.6E-06	**ELCR calculations are on the "OtherMut C" tab.**
FLUORANTHENE	9.2E+00				3.0E-05	2.2E-04	2.5E-04	4.1E-05	2.4E-04	2.8E-04	
FLUORENE	9.3E-01				3.0E-06	2.3E-05	2.6E-05	1.0E-06	5.9E-06	7.0E-06	

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Resident 39 Oakland Street Mudflat Surface Sediment Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 4.1E-06

Chronic HI (all chemicals) = 2.2E-01

Subchronic HI (all chemicals) = 3.6E-01

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
INDENO(1,2,3-cd)PYRENE	2.2E+00	1.7E-08	3.7E-08	5.4E-08	9.5E-06	1.4E-05	2.4E-05	3.3E-06	3.8E-06	7.1E-06	**ELCR calculations are on the "OtherMut C" tab.**
NAPHTHALENE	2.8E-01				1.8E-06	1.4E-05	1.5E-05	6.3E-07	3.6E-06	4.2E-06	
PHENANTHRENE	7.2E+00				3.1E-05	2.3E-04	2.6E-04	1.1E-05	6.1E-05	7.2E-05	
PYRENE	1.2E+01				5.3E-05	4.0E-04	4.5E-04	1.8E-05	1.0E-04	1.2E-04	
PETROLEUM HYDROCARBONS: ALIPHATICS - C5 to C8											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C12											
PETROLEUM HYDROCARBONS: AROMATICS - C9 to C10											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C18	5.7E+02				2.5E-03	1.1E-02	1.3E-02	8.5E-04	2.9E-03	3.8E-03	
PETROLEUM HYDROCARBONS: ALIPHATICS - C19 to C36	1.2E+03				2.6E-04	1.2E-03	1.4E-03	3.0E-04	1.0E-03	1.3E-03	
PETROLEUM HYDROCARBONS: AROMATICS - C11 to C22	7.3E+02				3.1E-03	2.4E-02	2.7E-02	1.1E-03	6.2E-03	7.3E-03	
ARSENIC	1.4E+01	6.8E-07	2.0E-06	2.7E-06	9.8E-03	1.3E-02	2.3E-02	3.4E-02	3.5E-02	6.9E-02	
BARIUM	4.1E+01				8.8E-05	2.0E-04	2.9E-04	3.1E-04	5.2E-04	8.3E-04	
CADMIUM	2.4E+00				1.0E-03	4.6E-04	1.5E-03	3.6E-03	1.2E-03	4.8E-03	
CHROMIUM (TOTAL)	1.7E+02				2.4E-02	5.4E-02	7.7E-02	1.2E-02	2.1E-02	3.4E-02	**Cr(VI) limit is 200 mg/kg due to contact dermatitis.**
LEAD	1.5E+02				4.2E-02	1.1E-02	5.3E-02	1.4E-01	3.0E-02	1.7E-01	**Lead IH HQ limit is 1, not 10.**
MERCURY	3.2E-01				2.3E-04	1.0E-03	1.3E-03	8.0E-04	2.7E-03	3.5E-03	
NICKEL	1.1E+02				2.3E-03	1.0E-02	1.2E-02	7.9E-03	2.7E-02	3.5E-02	

Resident 39 Oakland Street Mudflat Surface Sediment Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 4.1E-06

Chronic HI (all chemicals) = 2.2E-01

Subchronic HI (all chemicals) = 3.6E-01

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
SELENIUM	2.8E-01				2.4E-05	5.4E-06	3.0E-05	8.4E-05	1.4E-05	9.8E-05	
SILVER	4.7E+00				4.0E-04	2.7E-03	3.1E-03	1.4E-03	7.1E-03	8.5E-03	
ZINC	2.8E+02				4.1E-04	9.1E-04	1.3E-03	1.4E-03	2.4E-03	3.8E-03	

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Resident 41 Oakland Street Mudflat Surface Sediment Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 3.9E-06

Chronic HI (all chemicals) = 4.8E-02

Subchronic HI (all chemicals) = 5.1E-02

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
BENZENE											
ETHYLBENZENE											
TOLUENE											
XYLENES (Mixed Isomers)											
METHYLNAPHTHALENE, 2-	2.7E-01				8.7E-06	6.5E-05	7.4E-05	3.0E-05	1.7E-04	2.0E-04	
ACENAPHTHENE	1.6E+00				3.4E-06	2.5E-05	2.9E-05	3.5E-06	2.0E-05	2.3E-05	
ACENAPHTHYLENE	1.6E+00				6.8E-06	5.1E-05	5.8E-05	2.4E-06	1.3E-05	1.6E-05	
ANTHRACENE	4.8E+00				2.1E-06	1.6E-05	1.8E-05	2.2E-06	1.2E-05	1.4E-05	
BENZO(a)ANTHRACENE	9.2E+00	7.1E-08	1.5E-07	2.2E-07	4.0E-05	5.9E-05	9.9E-05	1.4E-05	1.6E-05	2.9E-05	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(a)PYRENE	1.3E+01	9.7E-07	2.1E-06	3.1E-06	5.5E-03	8.2E-03	1.4E-02	1.9E-02	2.2E-02	4.0E-02	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(b)FLUORANTHENE	6.0E+00	4.6E-08	1.0E-07	1.5E-07	2.6E-05	3.9E-05	6.4E-05	8.9E-06	1.0E-05	1.9E-05	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(g,h,i)PERYLENE	5.8E+00				2.5E-05	1.9E-04	2.1E-04	8.7E-06	5.0E-05	5.8E-05	
BENZO(k)FLUORANTHENE	6.9E+00	5.3E-09	1.2E-08	1.7E-08	3.0E-05	4.5E-05	7.5E-05	1.0E-05	1.2E-05	2.2E-05	**ELCR calculations are on the "OtherMut C" tab.**
CHRYSENE	8.8E+00	6.8E-10	1.5E-09	2.2E-09	3.8E-05	5.7E-05	9.5E-05	1.3E-05	1.5E-05	2.8E-05	**ELCR calculations are on the "OtherMut C" tab.**
DIBENZO(a,h)ANTHRACENE	1.1E+00	8.8E-08	1.9E-07	2.8E-07	4.9E-06	7.4E-06	1.2E-05	1.7E-06	1.9E-06	3.7E-06	**ELCR calculations are on the "OtherMut C" tab.**
FLUORANTHENE	2.1E+01				6.8E-05	5.1E-04	5.8E-04	9.5E-05	5.4E-04	6.3E-04	
FLUORENE	1.1E+00				3.7E-06	2.8E-05	3.1E-05	1.3E-06	7.3E-06	8.6E-06	

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Resident 41 Oakland Street Mudflat Surface Sediment Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 3.9E-06

Chronic HI (all chemicals) = 4.8E-02

Subchronic HI (all chemicals) = 5.1E-02

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
INDENO(1,2,3-cd)PYRENE	5.6E+00	4.3E-08	9.4E-08	1.4E-07	2.4E-05	3.6E-05	6.1E-05	8.4E-06	9.6E-06	1.8E-05	**ELCR calculations are on the "OtherMut C" tab.**
NAPHTHALENE	6.2E-01				4.0E-06	3.0E-05	3.4E-05	1.4E-06	7.9E-06	9.3E-06	
PHENANTHRENE	1.2E+01				5.3E-05	4.0E-04	4.5E-04	1.8E-05	1.0E-04	1.2E-04	
PYRENE	2.7E+01				1.2E-04	8.7E-04	9.8E-04	4.0E-05	2.3E-04	2.7E-04	
PETROLEUM HYDROCARBONS: ALIPHATICS - C5 to C8 PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C12 PETROLEUM HYDROCARBONS: AROMATICS - C9 to C10 PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C18	2.7E+02				3.9E-03	1.8E-02	2.1E-02	1.4E-03	4.6E-03	6.0E-03	
PETROLEUM HYDROCARBONS: ALIPHATICS - C19 to C36 PETROLEUM HYDROCARBONS: AROMATICS - C11 to C22	2.7E+02				1.2E-03	8.8E-03	1.0E-02	4.1E-04	2.3E-03	2.7E-03	

Resident 43 Oakland Street Mudflat Surface Sediment Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 1.8E-06

Chronic HI (all chemicals) = 6.3E-02

Subchronic HI (all chemicals) = 3.4E-02

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
BENZENE											
ETHYLBENZENE											
TOLUENE											
XYLENES (Mixed Isomers)											
METHYLNAPHTHALENE, 2-	2.7E-01				8.7E-06	6.5E-05	7.3E-05	3.0E-05	1.7E-04	2.0E-04	
ACENAPHTHENE	1.5E+00				3.3E-06	2.5E-05	2.8E-05	3.4E-06	1.9E-05	2.3E-05	
ACENAPHTHYLENE	1.0E+00				4.5E-06	3.3E-05	3.8E-05	1.5E-06	8.8E-06	1.0E-05	
ANTHRACENE	2.7E+00				1.2E-06	8.7E-06	9.8E-06	1.2E-06	6.9E-06	8.1E-06	
BENZO(a)ANTHRACENE	4.7E+00	3.6E-08	7.9E-08	1.2E-07	2.0E-05	3.0E-05	5.1E-05	7.0E-06	8.0E-06	1.5E-05	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(a)PYRENE	5.5E+00	4.2E-07	9.2E-07	1.3E-06	2.4E-03	3.6E-03	5.9E-03	8.2E-03	9.4E-03	1.8E-02	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(b)FLUORANTHENE	3.7E+00	2.9E-08	6.3E-08	9.2E-08	1.6E-05	2.4E-05	4.0E-05	5.6E-06	6.4E-06	1.2E-05	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(g,h,i)PERYLENE	3.3E+00				1.4E-05	1.1E-04	1.2E-04	4.9E-06	2.8E-05	3.3E-05	
BENZO(k)FLUORANTHENE	3.9E+00	3.0E-09	6.5E-09	9.4E-09	1.7E-05	2.5E-05	4.2E-05	5.8E-06	6.6E-06	1.2E-05	**ELCR calculations are on the "OtherMut C" tab.**
CHRYSENE	4.7E+00	3.6E-10	7.8E-10	1.1E-09	2.0E-05	3.0E-05	5.0E-05	7.0E-06	7.9E-06	1.5E-05	**ELCR calculations are on the "OtherMut C" tab.**
DIBENZO(a,h)ANTHRACENE	7.1E-01	5.5E-08	1.2E-07	1.7E-07	3.1E-06	4.6E-06	7.7E-06	1.1E-06	1.2E-06	2.3E-06	**ELCR calculations are on the "OtherMut C" tab.**
FLUORANTHENE	1.1E+01				3.7E-05	2.8E-04	3.1E-04	5.1E-05	2.9E-04	3.4E-04	
FLUORENE	1.0E+00				3.3E-06	2.5E-05	2.8E-05	1.2E-06	6.6E-06	7.8E-06	

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Resident 43 Oakland Street Mudflat Surface Sediment
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 1.8E-06

Chronic HI (all chemicals) = 6.3E-02

Subchronic HI (all chemicals) = 3.4E-02

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
INDENO(1,2,3-cd)PYRENE	3.4E+00	2.6E-08	5.7E-08	8.3E-08	1.5E-05	2.2E-05	3.6E-05	5.1E-06	5.8E-06	1.1E-05	**ELCR calculations are on the "OtherMut C" tab.**
NAPHTHALENE	5.2E-01				3.4E-06	2.5E-05	2.9E-05	1.2E-06	6.7E-06	7.9E-06	
PHENANTHRENE	7.7E+00				3.3E-05	2.5E-04	2.8E-04	1.2E-05	6.6E-05	7.7E-05	
PYRENE	1.4E+01				6.2E-05	4.7E-04	5.3E-04	2.2E-05	1.2E-04	1.4E-04	
PETROLEUM HYDROCARBONS: ALIPHATICS - C5 to C8 PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C12 PETROLEUM HYDROCARBONS: AROMATICS - C9 to C10 PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C18	4.8E+02				6.9E-03	3.1E-02	3.8E-02	2.4E-03	8.2E-03	1.1E-02	
PETROLEUM HYDROCARBONS: ALIPHATICS - C19 to C36 PETROLEUM HYDROCARBONS: AROMATICS - C11 to C22	4.8E+02				2.1E-03	1.6E-02	1.8E-02	7.2E-04	4.1E-03	4.8E-03	

Resident 4 Oakland Court Mudflat Surface Sediment
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 7.8E-06

Chronic HI (all chemicals) = 4.3E-02

Subchronic HI (all chemicals) = 8.4E-02

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
BENZENE											
ETHYLBENZENE											
TOLUENE											
XYLENES (Mixed Isomers)											
METHYLNAPHTHALENE, 2-	5.2E-01				1.7E-05	1.2E-04	1.4E-04	5.8E-05	3.3E-04	3.9E-04	
ACENAPHTHENE	3.9E+00				8.4E-06	6.3E-05	7.1E-05	8.7E-06	5.0E-05	5.8E-05	
ACENAPHTHYLENE	3.6E+00				1.6E-05	1.2E-04	1.3E-04	5.4E-06	3.1E-05	3.6E-05	
ANTHRACENE	1.1E+01				4.6E-06	3.5E-05	3.9E-05	4.8E-06	2.7E-05	3.2E-05	
BENZO(a)ANTHRACENE	2.3E+01	1.8E-07	3.9E-07	5.6E-07	9.9E-05	1.5E-04	2.5E-04	3.4E-05	3.9E-05	7.4E-05	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(a)PYRENE	2.4E+01	1.9E-06	4.1E-06	6.0E-06	1.1E-02	1.6E-02	2.6E-02	3.6E-02	4.1E-02	7.8E-02	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(b)FLUORANTHENE	1.2E+01	9.1E-08	2.0E-07	2.9E-07	5.1E-05	7.6E-05	1.3E-04	1.8E-05	2.0E-05	3.8E-05	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(g,h,i)PERYLENE	1.1E+01				4.9E-05	3.7E-04	4.2E-04	1.7E-05	9.8E-05	1.1E-04	
BENZO(k)FLUORANTHENE	1.5E+01	1.1E-08	2.5E-08	3.6E-08	6.3E-05	9.5E-05	1.6E-04	2.2E-05	2.5E-05	4.7E-05	**ELCR calculations are on the "OtherMut C" tab.**
CHRYSENE	2.3E+01	1.8E-09	3.9E-09	5.7E-09	1.0E-04	1.5E-04	2.5E-04	3.5E-05	3.9E-05	7.4E-05	**ELCR calculations are on the "OtherMut C" tab.**
DIBENZO(a,h)ANTHRACENE	2.7E+00	2.1E-07	4.5E-07	6.5E-07	1.2E-05	1.7E-05	2.9E-05	4.0E-06	4.5E-06	8.5E-06	**ELCR calculations are on the "OtherMut C" tab.**
FLUORANTHENE	4.4E+01				1.4E-04	1.1E-03	1.2E-03	2.0E-04	1.1E-03	1.3E-03	
FLUORENE	2.9E+00				9.5E-06	7.1E-05	8.0E-05	3.3E-06	1.9E-05	2.2E-05	

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Resident 4 Oakland Court Mudflat Surface Sediment
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 7.8E-06

Chronic HI (all chemicals) = 4.3E-02

Subchronic HI (all chemicals) = 8.4E-02

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
INDENO(1,2,3-cd)PYRENE	1.1E+01	8.2E-08	1.8E-07	2.6E-07	4.6E-05	6.9E-05	1.2E-04	1.6E-05	1.8E-05	3.4E-05	**ELCR calculations are on the "OtherMut C" tab.**
NAPHTHALENE	1.2E+00				7.9E-06	5.9E-05	6.7E-05	2.8E-06	1.6E-05	1.8E-05	
PHENANTHRENE	2.7E+01				1.2E-04	8.8E-04	9.9E-04	4.1E-05	2.3E-04	2.7E-04	
PYRENE	5.9E+01				2.6E-04	1.9E-03	2.2E-03	8.9E-05	5.1E-04	5.9E-04	
PETROLEUM HYDROCARBONS: ALIPHATICS - C5 to C8 PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C12 PETROLEUM HYDROCARBONS: AROMATICS - C9 to C10 PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C18 PETROLEUM HYDROCARBONS: ALIPHATICS - C19 to C36 PETROLEUM HYDROCARBONS: AROMATICS - C11 to C22	9.4E+01				1.3E-03	6.0E-03	7.4E-03	4.7E-04	1.6E-03	2.1E-03	
	9.4E+01				4.0E-04	3.0E-03	3.4E-03	1.4E-04	8.0E-04	9.4E-04	

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Trespasser All Properties Mudflat Surface Sediment
Exposure Point Concentration (EPC)

Based on Trespasser Ages 11-18 (Cancer and Non-Cancer Chronic), and Ages 11-12 (Non-Cancer Subchronic)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 1.2E-06
Chronic HI (all chemicals) = 1.4E-01
Subchronic HI (all chemicals) = 1.3E-01

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
BENZENE											
ETHYLBENZENE											
TOLUENE											
XYLENES (Mixed Isomers)											
METHYLNAPHTHALENE, 2-	2.6E-01				2.9E-06	4.8E-05	5.1E-05	5.8E-06	8.8E-05	9.4E-05	
ACENAPHTHENE	2.2E+00				1.6E-06	2.7E-05	2.9E-05	9.8E-07	1.5E-05	1.6E-05	
ACENAPHTHYLENE	1.6E+00				2.4E-06	3.9E-05	4.2E-05	4.7E-07	7.2E-06	7.7E-06	
ANTHRACENE	4.3E+00				6.4E-07	1.1E-05	1.1E-05	3.8E-07	5.8E-06	6.2E-06	
BENZO(a)ANTHRACENE	8.5E+00	9.4E-09	3.1E-08	4.0E-08	1.3E-05	4.2E-05	5.4E-05	2.5E-06	7.6E-06	1.0E-05	ELCR calculations are on the "OtherMut C" tab.
BENZO(a)PYRENE	9.8E+00	1.1E-07	3.5E-07	4.6E-07	1.4E-03	4.8E-03	6.2E-03	2.9E-03	8.8E-03	1.2E-02	ELCR calculations are on the "OtherMut C" tab.
BENZO(b)FLUORANTHENE	5.0E+00	5.5E-09	1.8E-08	2.4E-08	7.4E-06	2.5E-05	3.2E-05	1.5E-06	4.5E-06	6.0E-06	ELCR calculations are on the "OtherMut C" tab.
BENZO(g,h,i)PERYLENE	4.8E+00				7.1E-06	1.2E-04	1.2E-04	1.4E-06	2.2E-05	2.3E-05	
BENZO(k)FLUORANTHENE	5.9E+00	6.5E-10	2.2E-09	2.8E-09	8.8E-06	2.9E-05	3.8E-05	1.8E-06	5.3E-06	7.1E-06	ELCR calculations are on the "OtherMut C" tab.
CHRYSENE	8.2E+00	9.0E-11	3.0E-10	3.9E-10	1.2E-05	4.0E-05	5.2E-05	2.4E-06	7.3E-06	9.8E-06	ELCR calculations are on the "OtherMut C" tab.
DIBENZO(a,h)ANTHRACENE	1.0E+00	1.1E-08	3.8E-08	4.9E-08	1.5E-06	5.1E-06	6.6E-06	3.1E-07	9.3E-07	1.2E-06	ELCR calculations are on the "OtherMut C" tab.
FLUORANTHENE	1.8E+01				2.0E-05	3.3E-04	3.5E-04	1.6E-05	2.4E-04	2.6E-04	
FLUORENE	1.3E+00				1.5E-06	2.5E-05	2.6E-05	3.0E-07	4.5E-06	4.8E-06	
INDENO(1,2,3-cd)PYRENE	4.5E+00	5.0E-09	1.6E-08	2.1E-08	6.7E-06	2.2E-05	2.9E-05	1.3E-06	4.1E-06	5.4E-06	ELCR calculations are on the "OtherMut C" tab.
NAPHTHALENE	5.4E-01				1.2E-06	2.0E-05	2.1E-05	2.4E-07	3.7E-06	3.9E-06	
PHENANTHRENE	1.2E+01				1.7E-05	2.9E-04	3.1E-04	3.5E-06	5.3E-05	5.6E-05	

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Trespasser All Properties Mudflat Surface Sediment
Exposure Point Concentration (EPC)

Based on Trespasser Ages 11-18 (Cancer and Non-Cancer Chronic), and Ages 11-12 (Non-Cancer Subchronic)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 1.2E-06
Chronic HI (all chemicals) = 1.4E-01
Subchronic HI (all chemicals) = 1.3E-01

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
PYRENE	2.4E+01				3.5E-05	5.8E-04	6.2E-04	7.0E-06	1.1E-04	1.1E-04	
PETROLEUM HYDROCARBONS: ALIPHATICS - C5 to C8											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C12											
PETROLEUM HYDROCARBONS: AROMATICS - C9 to C10											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C18	5.7E+02				8.4E-04	8.3E-03	9.2E-03	1.7E-04	1.5E-03	1.7E-03	
PETROLEUM HYDROCARBONS: ALIPHATICS - C19 to C36	1.2E+03				9.0E-05	8.9E-04	9.8E-04	6.0E-05	5.5E-04	6.1E-04	
PETROLEUM HYDROCARBONS: AROMATICS - C11 to C22	7.3E+02				1.1E-03	1.8E-02	1.9E-02	2.2E-04	3.3E-03	3.5E-03	
ARSENIC	1.4E+01	1.5E-07	4.5E-07	6.0E-07	3.3E-03	1.0E-02	1.3E-02	6.7E-03	1.8E-02	2.5E-02	
BARIUM	4.1E+01				3.0E-05	1.5E-04	1.8E-04	6.0E-05	2.7E-04	3.4E-04	
CADMIUM	2.4E+00				3.5E-04	3.5E-04	7.0E-04	7.1E-04	6.4E-04	1.3E-03	
CHROMIUM (TOTAL)	1.7E+02				8.2E-03	4.1E-02	4.9E-02	2.4E-03	1.1E-02	1.4E-02	**Cr(VI) limit is 200 mg/kg due to contact dermatitis.**
LEAD	1.5E+02				1.4E-02	8.5E-03	2.3E-02	2.9E-02	1.6E-02	4.4E-02	
MERCURY	3.2E-01				7.9E-05	7.8E-04	8.6E-04	1.6E-04	1.4E-03	1.6E-03	
NICKEL	1.1E+02				7.7E-04	7.7E-03	8.5E-03	1.5E-03	1.4E-02	1.6E-02	
SELENIUM	2.8E-01				8.3E-06	4.1E-06	1.2E-05	1.7E-05	7.5E-06	2.4E-05	
SILVER	4.7E+00				1.4E-04	2.0E-03	2.2E-03	2.7E-04	3.8E-03	4.0E-03	
ZINC	2.8E+02				1.4E-04	6.9E-04	8.3E-04	2.8E-04	1.3E-03	1.5E-03	

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Park Visitor All Properties Mudflat Surface Sediment
Exposure Point Concentration (EPC)
Based on Visitor Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 1.7E-05

Chronic HI (all chemicals) = 6.9E-01

Subchronic HI (all chemicals) = 1.1E+00

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	$ELCR_{ingestion}$	$ELCR_{dermal}$	$ELCR_{total}$	Chronic HQ_{ing}	Chronic HQ_{derm}	Chronic HQ_{total}	Subchronic HQ_{ing}	Subchronic HQ_{derm}	Subchronic HQ_{total}	Notes
BENZENE											
ETHYLBENZENE											
TOLUENE											
XYLENES (Mixed Isomers)											
METHYLNAPHTHALENE, 2-	2.6E-01				2.6E-05	1.9E-04	2.2E-04	8.8E-05	5.0E-04	5.9E-04	
ACENAPHTHENE	2.2E+00				1.4E-05	1.1E-04	1.2E-04	1.5E-05	8.5E-05	1.0E-04	
ACENAPHTHYLENE	1.6E+00				2.1E-05	1.6E-04	1.8E-04	7.2E-06	4.1E-05	4.8E-05	
ANTHRACENE	4.3E+00				5.6E-06	4.2E-05	4.8E-05	5.8E-06	3.3E-05	3.9E-05	
BENZO(a)ANTHRACENE	8.5E+00	2.0E-07	4.3E-07	6.3E-07	1.1E-04	1.7E-04	2.8E-04	3.8E-05	4.4E-05	8.2E-05	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(a)PYRENE	9.8E+00	2.3E-06	4.9E-06	7.2E-06	1.3E-02	1.9E-02	3.2E-02	4.4E-02	5.0E-02	9.4E-02	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(b)FLUORANTHENE	5.0E+00	1.2E-07	2.5E-07	3.7E-07	6.5E-05	9.8E-05	1.6E-04	2.3E-05	2.6E-05	4.8E-05	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(g,h,i)PERYLENE	4.8E+00				6.3E-05	4.7E-04	5.3E-04	2.2E-05	1.2E-04	1.4E-04	
BENZO(k)FLUORANTHENE	5.9E+00	1.4E-08	3.0E-08	4.4E-08	7.7E-05	1.2E-04	1.9E-04	2.7E-05	3.0E-05	5.7E-05	**ELCR calculations are on the "OtherMut C" tab.**
CHRYSENE	8.2E+00	1.9E-09	4.1E-09	6.0E-09	1.1E-04	1.6E-04	2.7E-04	3.7E-05	4.2E-05	7.9E-05	**ELCR calculations are on the "OtherMut C" tab.**
DIBENZO(a,h)ANTHRACENE	1.0E+00	2.4E-07	5.2E-07	7.7E-07	1.3E-05	2.0E-05	3.4E-05	4.7E-06	5.3E-06	1.0E-05	**ELCR calculations are on the "OtherMut C" tab.**
FLUORANTHENE	1.8E+01				1.8E-04	1.3E-03	1.5E-03	2.4E-04	1.4E-03	1.6E-03	
FLUORENE	1.3E+00				1.3E-05	9.8E-05	1.1E-04	4.5E-06	2.6E-05	3.0E-05	

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Park Visitor All Properties Mudflat Surface Sediment
Exposure Point Concentration (EPC)
Based on Visitor Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 1.7E-05

Chronic HI (all chemicals) = 6.9E-01

Subchronic HI (all chemicals) = 1.1E+00

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	$ELCR_{ingestion}$	$ELCR_{dermal}$	$ELCR_{total}$	Chronic HQ_{ing}	Chronic HQ_{derm}	Chronic HQ_{total}	Subchronic HQ_{ing}	Subchronic HQ_{derm}	Subchronic HQ_{total}	Notes
INDENO(1,2,3-cd)PYRENE	4.5E+00	1.0E-07	2.3E-07	3.3E-07	5.9E-05	8.8E-05	1.5E-04	2.0E-05	2.3E-05	4.3E-05	**ELCR calculations are on the "OtherMut C" tab.**
NAPHTHALENE	5.4E-01				1.1E-05	7.9E-05	9.0E-05	3.7E-06	2.1E-05	2.4E-05	
PHENANTHRENE	1.2E+01				1.5E-04	1.1E-03	1.3E-03	5.3E-05	3.0E-04	3.5E-04	
PYRENE	2.4E+01				3.1E-04	2.3E-03	2.6E-03	1.1E-04	6.1E-04	7.1E-04	
PETROLEUM HYDROCARBONS: ALIPHATICS - C5 to C8											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C12											
PETROLEUM HYDROCARBONS: AROMATICS - C9 to C10											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C18	5.7E+02				7.4E-03	3.3E-02	4.0E-02	2.5E-03	8.7E-03	1.1E-02	
PETROLEUM HYDROCARBONS: ALIPHATICS - C19 to C36	1.2E+03				7.9E-04	3.6E-03	4.3E-03	9.1E-04	3.1E-03	4.0E-03	
PETROLEUM HYDROCARBONS: AROMATICS - C11 to C22	7.3E+02				9.5E-03	7.1E-02	8.0E-02	3.3E-03	1.9E-02	2.2E-02	
ARSENIC	1.4E+01	2.0E-06	6.0E-06	8.0E-06	2.9E-02	4.0E-02	6.9E-02	1.0E-01	1.0E-01	2.1E-01	
BARIUM	4.1E+01				2.7E-04	6.0E-04	8.6E-04	9.2E-04	1.6E-03	2.5E-03	
CADMIUM	2.4E+00				3.1E-03	1.4E-03	4.5E-03	1.1E-02	3.7E-03	1.4E-02	
CHROMIUM (TOTAL)	1.7E+02				7.2E-02	1.6E-01	2.3E-01	3.7E-02	6.4E-02	1.0E-01	**Cr(VI) limit is 200 mg/kg due to contact dermatitis.**
LEAD	1.5E+02				1.3E-01	3.4E-02	1.6E-01	4.3E-01	8.9E-02	5.2E-01	**Lead IH HQ limit is 1, not 10.**
MERCURY	3.2E-01				6.9E-04	3.1E-03	3.8E-03	2.4E-03	8.2E-03	1.1E-02	
NICKEL	1.1E+02				6.8E-03	3.1E-02	3.7E-02	2.4E-02	8.0E-02	1.0E-01	

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Park Visitor All Properties Mudflat Surface Sediment
Exposure Point Concentration (EPC)
Based on Visitor Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 1.7E-05

Chronic HI (all chemicals) = 6.9E-01

Subchronic HI (all chemicals) = 1.1E+00

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	$ELCR_{ingestion}$	$ELCR_{dermal}$	$ELCR_{total}$	Chronic			Subchronic			Notes
					HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
SELENIUM	2.8E-01				7.3E-05	1.6E-05	8.9E-05	2.5E-04	4.3E-05	2.9E-04	
SILVER	4.7E+00				1.2E-03	8.1E-03	9.3E-03	4.2E-03	2.1E-02	2.6E-02	
ZINC	2.8E+02				1.2E-03	2.7E-03	4.0E-03	4.2E-03	7.2E-03	1.1E-02	

Resident - RiverSegment I_Surface Sediment
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 3.5E-06

Chronic HI (all chemicals) = 2.8E-02

Subchronic HI (all chemicals) = 4.0E-02

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
BENZENE											
ETHYLBENZENE											
TOLUENE											
XYLENES (Mixed Isomers)											
METHYLNAPHTHALENE, 2-	7.7E-01				2.5E-05	1.9E-04	2.1E-04	8.6E-05	4.9E-04	5.8E-04	
ACENAPHTHENE	2.1E+01				4.4E-05	3.3E-04	3.8E-04	4.6E-05	2.6E-04	3.1E-04	
ACENAPHTHYLENE	1.7E+00				7.3E-06	5.5E-05	6.2E-05	2.5E-06	1.4E-05	1.7E-05	
ANTHRACENE	1.3E+01				5.8E-06	4.3E-05	4.9E-05	6.0E-06	3.4E-05	4.0E-05	
BENZO(a)ANTHRACENE	1.1E+01	8.7E-08	1.9E-07	2.8E-07	4.9E-05	7.3E-05	1.2E-04	1.7E-05	1.9E-05	3.6E-05	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(a)PYRENE	1.1E+01	8.2E-07	1.8E-06	2.6E-06	4.6E-03	6.8E-03	1.1E-02	1.6E-02	1.8E-02	3.4E-02	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(b)FLUORANTHENE	5.6E+00	4.3E-08	9.4E-08	1.4E-07	2.4E-05	3.6E-05	6.0E-05	8.4E-06	9.6E-06	1.8E-05	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(g,h,i)PERYLENE	5.0E+00				2.2E-05	1.6E-04	1.8E-04	7.5E-06	4.3E-05	5.0E-05	
BENZO(k)FLUORANTHENE	6.6E+00	5.0E-09	1.1E-08	1.6E-08	2.8E-05	4.2E-05	7.1E-05	9.8E-06	1.1E-05	2.1E-05	**ELCR calculations are on the "OtherMut C" tab.**
CHRYSENE	1.1E+01	8.3E-10	1.8E-09	2.6E-09	4.7E-05	7.0E-05	1.2E-04	1.6E-05	1.8E-05	3.5E-05	**ELCR calculations are on the "OtherMut C" tab.**
DIBENZO(a,h)ANTHRACENE	1.3E+00	9.7E-08	2.1E-07	3.1E-07	5.5E-06	8.2E-06	1.4E-05	1.9E-06	2.2E-06	4.0E-06	**ELCR calculations are on the "OtherMut C" tab.**
FLUORANTHENE	2.4E+01				7.8E-05	5.9E-04	6.6E-04	1.1E-04	6.2E-04	7.3E-04	
FLUORENE	9.6E+00				3.1E-05	2.3E-04	2.6E-04	1.1E-05	6.1E-05	7.2E-05	

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Resident - RiverSegment I_Surface Sediment
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 3.5E-06

Chronic HI (all chemicals) = 2.8E-02

Subchronic HI (all chemicals) = 4.0E-02

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
INDENO(1,2,3-cd)PYRENE	4.9E+00	3.7E-08	8.1E-08	1.2E-07	2.1E-05	3.1E-05	5.2E-05	7.3E-06	8.3E-06	1.6E-05	**ELCR calculations are on the "OtherMut C" tab.**
NAPHTHALENE	1.5E+00				9.9E-06	7.4E-05	8.4E-05	3.4E-06	2.0E-05	2.3E-05	
PHENANTHRENE	4.4E+01				1.9E-04	1.4E-03	1.6E-03	6.5E-05	3.7E-04	4.4E-04	
PYRENE	3.3E+01				1.4E-04	1.1E-03	1.2E-03	5.0E-05	2.8E-04	3.4E-04	
PETROLEUM HYDROCARBONS: ALIPHATICS - C5 to C8											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C12											
PETROLEUM HYDROCARBONS: AROMATICS - C9 to C10											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C18											
PETROLEUM HYDROCARBONS: ALIPHATICS - C19 to C36											
PETROLEUM HYDROCARBONS: AROMATICS - C11 to C22	3.2E+02				1.4E-03	1.0E-02	1.2E-02	4.8E-04	2.8E-03	3.2E-03	

Resident - River Segment II_Surface Sediment
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 5.8E-06

Chronic HI (all chemicals) = 1.6E-01

Subchronic HI (all chemicals) = 3.6E-01

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
BENZENE											
ETHYLBENZENE											
TOLUENE											
XYLENES (Mixed Isomers)											
METHYLNAPHTHALENE, 2-	2.3E+00				7.5E-05	5.6E-04	6.4E-04	2.6E-04	1.5E-03	1.7E-03	
ACENAPHTHENE	1.1E+01				2.5E-05	1.8E-04	2.1E-04	2.6E-05	1.5E-04	1.7E-04	
ACENAPHTHYLENE	1.8E+00				7.8E-06	5.9E-05	6.6E-05	2.7E-06	1.5E-05	1.8E-05	
ANTHRACENE	9.2E+00				4.0E-06	3.0E-05	3.4E-05	4.1E-06	2.3E-05	2.8E-05	
BENZO(a)ANTHRACENE	1.0E+01	7.7E-08	1.7E-07	2.4E-07	4.3E-05	6.4E-05	1.1E-04	1.5E-05	1.7E-05	3.2E-05	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(a)PYRENE	1.0E+01	7.8E-07	1.7E-06	2.5E-06	4.4E-03	6.6E-03	1.1E-02	1.5E-02	1.7E-02	3.3E-02	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(b)FLUORANTHENE	5.6E+00	4.4E-08	9.5E-08	1.4E-07	2.4E-05	3.6E-05	6.1E-05	8.4E-06	9.6E-06	1.8E-05	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(g,h,i)PERYLENE	4.9E+00				2.1E-05	1.6E-04	1.8E-04	7.3E-06	4.2E-05	4.9E-05	
BENZO(k)FLUORANTHENE	6.6E+00	5.1E-09	1.1E-08	1.6E-08	2.8E-05	4.2E-05	7.1E-05	9.8E-06	1.1E-05	2.1E-05	**ELCR calculations are on the "OtherMut C" tab.**
CHRYSENE	9.2E+00	7.1E-10	1.5E-09	2.3E-09	4.0E-05	5.9E-05	9.9E-05	1.4E-05	1.6E-05	2.9E-05	**ELCR calculations are on the "OtherMut C" tab.**
DIBENZO(a,h)ANTHRACENE	1.1E+00	8.4E-08	1.8E-07	2.7E-07	4.7E-06	7.0E-06	1.2E-05	1.6E-06	1.8E-06	3.5E-06	**ELCR calculations are on the "OtherMut C" tab.**
FLUORANTHENE	2.2E+01				7.2E-05	5.4E-04	6.1E-04	9.9E-05	5.7E-04	6.6E-04	
FLUORENE	5.1E+00				1.7E-05	1.2E-04	1.4E-04	5.7E-06	3.3E-05	3.8E-05	

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Resident - River Segment II_Surface Sediment
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 5.8E-06

Chronic HI (all chemicals) = 1.6E-01

Subchronic HI (all chemicals) = 3.6E-01

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
INDENO(1,2,3-cd)PYRENE	4.6E+00	3.6E-08	7.8E-08	1.1E-07	2.0E-05	3.0E-05	5.0E-05	6.9E-06	7.9E-06	1.5E-05	**ELCR calculations are on the "OtherMut C" tab.**
NAPHTHALENE	4.1E+00				2.7E-05	2.0E-04	2.3E-04	9.3E-06	5.3E-05	6.2E-05	
PHENANTHRENE	3.0E+01				1.3E-04	9.7E-04	1.1E-03	4.5E-05	2.6E-04	3.0E-04	
PYRENE	3.0E+01				1.3E-04	9.6E-04	1.1E-03	4.4E-05	2.5E-04	3.0E-04	
PETROLEUM HYDROCARBONS: ALIPHATICS - C5 to C8											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C12											
PETROLEUM HYDROCARBONS: AROMATICS - C9 to C10											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C18											
PETROLEUM HYDROCARBONS: ALIPHATICS - C19 to C36	5.4E+01				1.2E-05	5.2E-05	6.4E-05	1.3E-05	4.6E-05	5.9E-05	
PETROLEUM HYDROCARBONS: AROMATICS - C11 to C22	7.4E+01				3.2E-04	2.4E-03	2.7E-03	1.1E-04	6.3E-04	7.4E-04	
ARSENIC	1.3E+01	6.5E-07	1.9E-06	2.5E-06	9.4E-03	1.3E-02	2.2E-02	3.2E-02	3.3E-02	6.6E-02	
BARIUM	6.0E+01				1.3E-04	2.9E-04	4.2E-04	4.5E-04	7.7E-04	1.2E-03	
CADMIUM	1.2E+00				5.1E-04	2.3E-04	7.4E-04	1.8E-03	6.0E-04	2.4E-03	
CHROMIUM (TOTAL)	8.8E+01				1.3E-02	2.8E-02	4.1E-02	6.6E-03	1.1E-02	1.8E-02	**Cr(VI) limit is 200 mg/kg due to contact dermatitis.**
LEAD	1.8E+02				5.2E-02	1.4E-02	6.6E-02	1.8E-01	3.7E-02	2.2E-01	**Lead IH HQ limit is 1, not 10.**
MERCURY	7.7E-01				5.5E-04	2.5E-03	3.0E-03	1.9E-03	6.5E-03	8.5E-03	
NICKEL	1.7E+01				3.7E-04	1.7E-03	2.1E-03	1.3E-03	4.4E-03	5.7E-03	

Resident - River Segment II_Surface Sediment
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 5.8E-06

Chronic HI (all chemicals) = 1.6E-01

Subchronic HI (all chemicals) = 3.6E-01

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
ZINC	1.7E+02				2.4E-04	5.5E-04	7.9E-04	8.5E-04	1.4E-03	2.3E-03	
SILVER	1.1E+00				9.5E-05	6.4E-04	7.3E-04	3.3E-04	1.7E-03	2.0E-03	

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Resident - River Segment III_Surface Sediment
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 2.7E-06

Chronic HI (all chemicals) = 6.9E-02

Subchronic HI (all chemicals) = 1.3E-01

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
BENZENE											
ETHYLBENZENE											
TOLUENE											
XYLENES (Mixed Isomers)											
METHYLNAPHTHALENE, 2-	2.3E-01				7.5E-06	5.6E-05	6.3E-05	2.6E-05	1.5E-04	1.7E-04	
ACENAPHTHENE	1.8E+00				3.8E-06	2.8E-05	3.2E-05	3.9E-06	2.2E-05	2.6E-05	
ACENAPHTHYLENE	4.2E-01				1.8E-06	1.3E-05	1.5E-05	6.2E-07	3.5E-06	4.2E-06	
ANTHRACENE	1.5E+00				6.5E-07	4.9E-06	5.5E-06	6.8E-07	3.9E-06	4.5E-06	
BENZO(a)ANTHRACENE	2.8E+00	2.1E-08	4.7E-08	6.8E-08	1.2E-05	1.8E-05	3.0E-05	4.2E-06	4.7E-06	8.9E-06	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(a)PYRENE	3.0E+00	2.3E-07	5.0E-07	7.4E-07	1.3E-03	1.9E-03	3.2E-03	4.5E-03	5.1E-03	9.6E-03	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(b)FLUORANTHENE	1.9E+00	1.5E-08	3.2E-08	4.7E-08	8.3E-06	1.2E-05	2.1E-05	2.9E-06	3.3E-06	6.1E-06	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(g,h,i)PERYLENE	1.5E+00				6.7E-06	5.0E-05	5.6E-05	2.3E-06	1.3E-05	1.5E-05	
BENZO(k)FLUORANTHENE	1.9E+00	1.5E-09	3.3E-09	4.8E-09	8.4E-06	1.3E-05	2.1E-05	2.9E-06	3.3E-06	6.2E-06	**ELCR calculations are on the "OtherMut C" tab.**
CHRYSENE	2.8E+00	2.2E-10	4.7E-10	6.9E-10	1.2E-05	1.8E-05	3.0E-05	4.2E-06	4.8E-06	9.0E-06	**ELCR calculations are on the "OtherMut C" tab.**
DIBENZO(a,h)ANTHRACENE	4.1E-01	3.2E-08	7.0E-08	1.0E-07	1.8E-06	2.7E-06	4.5E-06	6.2E-07	7.1E-07	1.3E-06	**ELCR calculations are on the "OtherMut C" tab.**
FLUORANTHENE	5.5E+00				1.8E-05	1.3E-04	1.5E-04	2.4E-05	1.4E-04	1.6E-04	
FLUORENE	7.2E-01				2.3E-06	1.7E-05	2.0E-05	8.1E-07	4.6E-06	5.4E-06	

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Resident - River Segment III_Surface Sediment
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 2.7E-06

Chronic HI (all chemicals) = 6.9E-02

Subchronic HI (all chemicals) = 1.3E-01

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
INDENO(1,2,3-cd)PYRENE	1.8E+00	1.4E-08	3.1E-08	4.5E-08	7.9E-06	1.2E-05	2.0E-05	2.7E-06	3.1E-06	5.8E-06	**ELCR calculations are on the "OtherMut C" tab.**
NAPHTHALENE	6.3E-01				4.0E-06	3.0E-05	3.4E-05	1.4E-06	8.0E-06	9.4E-06	
PHENANTHRENE	4.8E+00				2.1E-05	1.5E-04	1.8E-04	7.2E-06	4.1E-05	4.8E-05	
PYRENE	6.2E+00				2.7E-05	2.0E-04	2.3E-04	9.3E-06	5.3E-05	6.2E-05	
PETROLEUM HYDROCARBONS: ALIPHATICS - C5 to C8											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C12											
PETROLEUM HYDROCARBONS: AROMATICS - C9 to C10											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C18											
PETROLEUM HYDROCARBONS: ALIPHATICS - C19 to C36	2.3E+01				4.9E-06	2.2E-05	2.7E-05	5.7E-06	1.9E-05	2.5E-05	
PETROLEUM HYDROCARBONS: AROMATICS - C11 to C22	2.0E+01				8.4E-05	6.3E-04	7.1E-04	2.9E-05	1.7E-04	2.0E-04	
ARSENIC	8.6E+00	4.3E-07	1.3E-06	1.7E-06	6.2E-03	8.3E-03	1.4E-02	2.1E-02	2.2E-02	4.3E-02	
BARIUM	3.7E+01				7.9E-05	1.8E-04	2.6E-04	2.7E-04	4.7E-04	7.4E-04	
CADMIUM	8.1E-01				3.5E-04	1.6E-04	5.1E-04	1.2E-03	4.1E-04	1.6E-03	
CHROMIUM (TOTAL)	6.3E+01				9.0E-03	2.0E-02	2.9E-02	4.7E-03	8.0E-03	1.3E-02	**Cr(VI) limit is 200 mg/kg due to contact dermatitis.**
LEAD	4.3E+01				1.2E-02	3.4E-03	1.6E-02	4.3E-02	8.8E-03	5.2E-02	**Lead IH HQ limit is 1, not 10.**
MERCURY	5.1E-01				3.7E-04	1.6E-03	2.0E-03	1.3E-03	4.3E-03	5.6E-03	
NICKEL	1.0E+01				2.2E-04	9.8E-04	1.2E-03	7.6E-04	2.6E-03	3.3E-03	
ZINC	9.7E+01				1.4E-04	3.1E-04	4.5E-04	4.8E-04	8.3E-04	1.3E-03	

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Park Visitor River Segment I Surface Sediment
Exposure Point Concentration (EPC)
Based on Visitor Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 1.0E-05

Chronic HI (all chemicals) = 8.5E-02

Subchronic HI (all chemicals) = 1.2E-01

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	$ELCR_{ingestion}$	$ELCR_{dermal}$	$ELCR_{total}$	Chronic HQ_{ing}	Chronic HQ_{derm}	Chronic HQ_{total}	Subchronic HQ_{ing}	Subchronic HQ_{derm}	Subchronic HQ_{total}	Notes
BENZENE											
ETHYLBENZENE											
TOLUENE											
XYLENES (Mixed Isomers)											
METHYLNAPHTHALENE, 2-	0.77				7.5E-05	5.6E-04	6.4E-04	2.6E-04	1.5E-03	1.7E-03	
ACENAPHTHENE	20.52				1.3E-04	1.0E-03	1.1E-03	1.4E-04	7.9E-04	9.2E-04	
ACENAPHTHYLENE	1.70				2.2E-05	1.7E-04	1.9E-04	7.6E-06	4.3E-05	5.1E-05	
ANTHRACENE	13.45				1.7E-05	1.3E-04	1.5E-04	1.8E-05	1.0E-04	1.2E-04	
BENZO(a)ANTHRACENE	11.34	2.6E-07	5.7E-07	8.3E-07	1.5E-04	2.2E-04	3.7E-04	5.1E-05	5.8E-05	1.1E-04	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(a)PYRENE	10.59	2.5E-06	5.3E-06	7.8E-06	1.4E-02	2.1E-02	3.4E-02	4.7E-02	5.4E-02	1.0E-01	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(b)FLUORANTHENE	5.62	1.3E-07	2.8E-07	4.1E-07	7.3E-05	1.1E-04	1.8E-04	2.5E-05	2.9E-05	5.4E-05	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(g,h,i)PERYLENE	4.99				6.5E-05	4.8E-04	5.5E-04	2.2E-05	1.3E-04	1.5E-04	
BENZO(k)FLUORANTHENE	6.55	1.5E-08	3.3E-08	4.8E-08	8.5E-05	1.3E-04	2.1E-04	2.9E-05	3.3E-05	6.3E-05	**ELCR calculations are on the "OtherMut C" tab.**
CHRYSENE	10.80	2.5E-09	5.4E-09	7.9E-09	1.4E-04	2.1E-04	3.5E-04	4.8E-05	5.5E-05	1.0E-04	**ELCR calculations are on the "OtherMut C" tab.**
DIBENZO(a,h)ANTHRACENE	1.27	2.9E-07	6.4E-07	9.3E-07	1.6E-05	2.5E-05	4.1E-05	5.7E-06	6.5E-06	1.2E-05	**ELCR calculations are on the "OtherMut C" tab.**
FLUORANTHENE	24.20				2.4E-04	1.8E-03	2.0E-03	3.3E-04	1.9E-03	2.2E-03	
FLUORENE	9.58				9.3E-05	7.0E-04	7.9E-04	3.2E-05	1.8E-04	2.2E-04	

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Park Visitor River Segment I Surface Sediment
Exposure Point Concentration (EPC)
Based on Visitor Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 1.0E-05

Chronic HI (all chemicals) = 8.5E-02

Subchronic HI (all chemicals) = 1.2E-01

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	$ELCR_{ingestion}$	$ELCR_{dermal}$	$ELCR_{total}$	Chronic HQ_{ing}	Chronic HQ_{derm}	Chronic HQ_{total}	Subchronic HQ_{ing}	Subchronic HQ_{derm}	Subchronic HQ_{total}	Notes
INDENO(1,2,3-cd)PYRENE	4.86	1.1E-07	2.4E-07	3.6E-07	6.3E-05	9.4E-05	1.6E-04	2.2E-05	2.5E-05	4.7E-05	**ELCR calculations are on the "OtherMut C" tab.**
NAPHTHALENE	1.53				3.0E-05	2.2E-04	2.5E-04	1.0E-05	5.9E-05	6.9E-05	
PHENANTHRENE	43.52				5.6E-04	4.2E-03	4.8E-03	2.0E-04	1.1E-03	1.3E-03	
PYRENE	33.47				4.3E-04	3.2E-03	3.7E-03	1.5E-04	8.5E-04	1.0E-03	
PETROLEUM HYDROCARBONS: ALIPHATICS - C5 to C8											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C12											
PETROLEUM HYDROCARBONS: AROMATICS - C9 to C10											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C18											
PETROLEUM HYDROCARBONS: ALIPHATICS - C19 to C36											
PETROLEUM HYDROCARBONS: AROMATICS - C11 to C22	3.2E+02				4.2E-03	3.1E-02	3.6E-02	1.5E-03	8.3E-03	9.7E-03	

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Park Visitor River Segment II Surface Sediment
Exposure Point Concentration (EPC)
Based on Visitor Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 1.7E-05

Chronic HI (all chemicals) = 4.7E-01

Subchronic HI (all chemicals) = 1.1E+00

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	$ELCR_{ingestion}$	$ELCR_{dermal}$	$ELCR_{total}$	Chronic HQ_{ing}	Chronic HQ_{derm}	Chronic HQ_{total}	Subchronic HQ_{ing}	Subchronic HQ_{derm}	Subchronic HQ_{total}	Notes
BENZENE											
ETHYLBENZENE											
TOLUENE											
XYLENES (Mixed Isomers)											
METHYLNAPHTHALENE, 2-	2.32				2.3E-04	1.7E-03	1.9E-03	7.8E-04	4.4E-03	5.2E-03	
ACENAPHTHENE	11.44				7.4E-05	5.6E-04	6.3E-04	7.7E-05	4.4E-04	5.1E-04	
ACENAPHTHYLENE	1.81				2.4E-05	1.8E-04	2.0E-04	8.1E-06	4.6E-05	5.4E-05	
ANTHRACENE	9.18				1.2E-05	8.9E-05	1.0E-04	1.2E-05	7.0E-05	8.3E-05	
BENZO(a)ANTHRACENE	9.99	2.3E-07	5.0E-07	7.3E-07	1.3E-04	1.9E-04	3.2E-04	4.5E-05	5.1E-05	9.6E-05	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(a)PYRENE	10.18	2.4E-06	5.1E-06	7.5E-06	1.3E-02	2.0E-02	3.3E-02	4.6E-02	5.2E-02	9.8E-02	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(b)FLUORANTHENE	5.65	1.3E-07	2.8E-07	4.2E-07	7.3E-05	1.1E-04	1.8E-04	2.5E-05	2.9E-05	5.4E-05	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(g,h,i)PERYLENE	4.89				6.3E-05	4.7E-04	5.4E-04	2.2E-05	1.2E-04	1.5E-04	
BENZO(k)FLUORANTHENE	6.57	1.5E-08	3.3E-08	4.8E-08	8.5E-05	1.3E-04	2.1E-04	2.9E-05	3.4E-05	6.3E-05	**ELCR calculations are on the "OtherMut C" tab.**
CHRYSENE	9.20	2.1E-09	4.6E-09	6.8E-09	1.2E-04	1.8E-04	3.0E-04	4.1E-05	4.7E-05	8.8E-05	**ELCR calculations are on the "OtherMut C" tab.**
DIBENZO(a,h)ANTHRACENE	1.09	2.5E-07	5.5E-07	8.0E-07	1.4E-05	2.1E-05	3.5E-05	4.9E-06	5.5E-06	1.0E-05	**ELCR calculations are on the "OtherMut C" tab.**
FLUORANTHENE	22.12				2.2E-04	1.6E-03	1.8E-03	3.0E-04	1.7E-03	2.0E-03	
FLUORENE	5.12				5.0E-05	3.7E-04	4.2E-04	1.7E-05	9.8E-05	1.2E-04	

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Park Visitor River Segment II Surface Sediment
Exposure Point Concentration (EPC)
Based on Visitor Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 1.7E-05

Chronic HI (all chemicals) = 4.7E-01

Subchronic HI (all chemicals) = 1.1E+00

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	$ELCR_{ingestion}$	$ELCR_{dermal}$	$ELCR_{total}$	Chronic HQ_{ing}	Chronic HQ_{derm}	Chronic HQ_{total}	Subchronic HQ_{ing}	Subchronic HQ_{derm}	Subchronic HQ_{total}	Notes
INDENO(1,2,3-cd)PYRENE	4.63	1.1E-07	2.3E-07	3.4E-07	6.0E-05	9.0E-05	1.5E-04	2.1E-05	2.4E-05	4.4E-05	**ELCR calculations are on the "OtherMut C" tab.**
NAPHTHALENE	4.14				8.0E-05	6.0E-04	6.8E-04	2.8E-05	1.6E-04	1.9E-04	
PHENANTHRENE	30.12				3.9E-04	2.9E-03	3.3E-03	1.4E-04	7.7E-04	9.0E-04	
PYRENE	29.65				3.8E-04	2.9E-03	3.3E-03	1.3E-04	7.6E-04	8.9E-04	
PETROLEUM HYDROCARBONS: ALIPHATICS - C5 to C8											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C12											
PETROLEUM HYDROCARBONS: AROMATICS - C9 to C10											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C18											
PETROLEUM HYDROCARBONS: ALIPHATICS - C19 to C36	5.4E+01				3.5E-05	1.6E-04	1.9E-04	4.0E-05	1.4E-04	1.8E-04	
PETROLEUM HYDROCARBONS: AROMATICS - C11 to C22	7.4E+01				9.5E-04	7.1E-03	8.1E-03	3.3E-04	1.9E-03	2.2E-03	
ARSENIC	1.3E+01	2.0E-06	5.7E-06	7.7E-06	2.8E-02	3.8E-02	6.6E-02	9.7E-02	1.0E-01	2.0E-01	
BARIUM	6.0E+01				3.9E-04	8.7E-04	1.3E-03	1.3E-03	2.3E-03	3.6E-03	
CADMIUM	1.2E+00				1.5E-03	6.9E-04	2.2E-03	5.3E-03	1.8E-03	7.1E-03	
CHROMIUM (TOTAL)	8.8E+01				3.8E-02	8.6E-02	1.2E-01	2.0E-02	3.4E-02	5.4E-02	**Cr(VI) limit is 200 mg/kg due to contact dermatitis.**
LEAD	1.8E+02				1.6E-01	4.2E-02	2.0E-01	5.4E-01	1.1E-01	6.5E-01	**Lead IH HQ limit is 1, not 10.**
MERCURY	7.7E-01				1.7E-03	7.5E-03	9.1E-03	5.7E-03	2.0E-02	2.5E-02	
NICKEL	1.7E+01				1.1E-03	5.0E-03	6.2E-03	3.9E-03	1.3E-02	1.7E-02	

Park Visitor River Segment II Surface Sediment
Exposure Point Concentration (EPC)
Based on Visitor Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 1.7E-05

Chronic HI (all chemicals) = 4.7E-01

Subchronic HI (all chemicals) = 1.1E+00

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	$ELCR_{ingestion}$	$ELCR_{dermal}$	$ELCR_{total}$	Chronic			Subchronic			Notes
					HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
SILVER	1.1E+00				2.8E-04	1.9E-03	2.2E-03	9.8E-04	5.0E-03	6.0E-03	
ZINC	1.7E+02				7.4E-04	1.7E-03	2.4E-03	2.6E-03	4.4E-03	6.9E-03	

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Park Visitor River Segment III Surface Sediment
Exposure Point Concentration (EPC)

Based on Visitor Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 8.1E-06

Chronic HI (all chemicals) = 2.1E-01

Subchronic HI (all chemicals) = 3.9E-01

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	$ELCR_{ingestion}$	$ELCR_{dermal}$	$ELCR_{total}$	Chronic HQ_{ing}	Chronic HQ_{derm}	Chronic HQ_{total}	Subchronic HQ_{ing}	Subchronic HQ_{derm}	Subchronic HQ_{total}	Notes
BENZENE											
ETHYLBENZENE											
TOLUENE											
XYLENES (Mixed Isomers)											
METHYLNAPHTHALENE, 2-	0.23				2.2E-05	1.7E-04	1.9E-04	7.8E-05	4.4E-04	5.2E-04	
ACENAPHTHENE	1.75				1.1E-05	8.5E-05	9.6E-05	1.2E-05	6.7E-05	7.9E-05	
ACENAPHTHYLENE	0.42				5.4E-06	4.0E-05	4.6E-05	1.9E-06	1.1E-05	1.2E-05	
ANTHRACENE	1.51				2.0E-06	1.5E-05	1.7E-05	2.0E-06	1.2E-05	1.4E-05	
BENZO(a)ANTHRACENE	2.79	6.5E-08	1.4E-07	2.1E-07	3.6E-05	5.4E-05	9.0E-05	1.2E-05	1.4E-05	2.7E-05	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(a)PYRENE	3.01	7.0E-07	1.5E-06	2.2E-06	3.9E-03	5.8E-03	9.7E-03	1.3E-02	1.5E-02	2.9E-02	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(b)FLUORANTHENE	1.92	4.4E-08	9.7E-08	1.4E-07	2.5E-05	3.7E-05	6.2E-05	8.6E-06	9.8E-06	1.8E-05	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(g,h,i)PERYLENE	1.54				2.0E-05	1.5E-04	1.7E-04	6.9E-06	3.9E-05	4.6E-05	
BENZO(k)FLUORANTHENE	1.94	4.5E-09	9.8E-09	1.4E-08	2.5E-05	3.8E-05	6.3E-05	8.7E-06	9.9E-06	1.9E-05	**ELCR calculations are on the "OtherMut C" tab.**
CHRYSENE	2.82	6.5E-10	1.4E-09	2.1E-09	3.7E-05	5.5E-05	9.1E-05	1.3E-05	1.4E-05	2.7E-05	**ELCR calculations are on the "OtherMut C" tab.**
DIBENZO(a,h)ANTHRACENE	0.41	9.6E-08	2.1E-07	3.1E-07	5.4E-06	8.1E-06	1.3E-05	1.9E-06	2.1E-06	4.0E-06	**ELCR calculations are on the "OtherMut C" tab.**
FLUORANTHENE	5.45				5.3E-05	4.0E-04	4.5E-04	7.3E-05	4.2E-04	4.9E-04	
FLUORENE	0.72				7.0E-06	5.3E-05	6.0E-05	2.4E-06	1.4E-05	1.6E-05	

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Park Visitor River Segment III Surface Sediment
Exposure Point Concentration (EPC)
Based on Visitor Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 8.1E-06

Chronic HI (all chemicals) = 2.1E-01

Subchronic HI (all chemicals) = 3.9E-01

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	$ELCR_{ingestion}$	$ELCR_{dermal}$	$ELCR_{total}$	Chronic HQ_{ing}	Chronic HQ_{derm}	Chronic HQ_{total}	Subchronic HQ_{ing}	Subchronic HQ_{derm}	Subchronic HQ_{total}	Notes
INDENO(1,2,3-cd)PYRENE	1.83	4.2E-08	9.2E-08	1.3E-07	2.4E-05	3.6E-05	5.9E-05	8.2E-06	9.3E-06	1.8E-05	**ELCR calculations are on the "OtherMut C" tab.**
NAPHTHALENE	0.63				1.2E-05	9.1E-05	1.0E-04	4.2E-06	2.4E-05	2.8E-05	
PHENANTHRENE	4.80				6.2E-05	4.7E-04	5.3E-04	2.2E-05	1.2E-04	1.4E-04	
PYRENE	6.22				8.1E-05	6.0E-04	6.8E-04	2.8E-05	1.6E-04	1.9E-04	
PETROLEUM HYDROCARBONS: ALIPHATICS - C5 to C8											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C12											
PETROLEUM HYDROCARBONS: AROMATICS - C9 to C10											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C18											
PETROLEUM HYDROCARBONS: ALIPHATICS - C19 to C36	2.3E+01				1.5E-05	6.7E-05	8.2E-05	1.7E-05	5.8E-05	7.6E-05	
PETROLEUM HYDROCARBONS: AROMATICS - C11 to C22	2.0E+01				2.5E-04	1.9E-03	2.1E-03	8.7E-05	5.0E-04	5.9E-04	
ARSENIC	8.6E+00	1.3E-06	3.8E-06	5.0E-06	1.9E-02	2.5E-02	4.4E-02	6.4E-02	6.6E-02	1.3E-01	
BARIUM	3.7E+01				2.4E-04	5.3E-04	7.7E-04	8.2E-04	1.4E-03	2.2E-03	
CADMIUM	8.1E-01				1.1E-03	4.7E-04	1.5E-03	3.6E-03	1.2E-03	4.9E-03	
CHROMIUM (TOTAL)	6.3E+01				2.7E-02	6.1E-02	8.8E-02	1.4E-02	2.4E-02	3.8E-02	**Cr(VI) limit is 200 mg/kg due to contact dermatitis.**
LEAD	4.3E+01				3.7E-02	1.0E-02	4.8E-02	1.3E-01	2.7E-02	1.6E-01	**Lead IH HQ limit is 1, not 10.**
MERCURY	5.1E-01				1.1E-03	4.9E-03	6.0E-03	3.8E-03	1.3E-02	1.7E-02	
NICKEL	1.0E+01				6.6E-04	2.9E-03	3.6E-03	2.3E-03	7.7E-03	1.0E-02	

Park Visitor River Segment III Surface Sediment
Exposure Point Concentration (EPC)
Based on Visitor Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 8.1E-06

Chronic HI (all chemicals) = 2.1E-01

Subchronic HI (all chemicals) = 3.9E-01

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	$ELCR_{ingestion}$	$ELCR_{dermal}$	$ELCR_{total}$	Chronic			Subchronic			Notes
					HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
ZINC	9.7E+01				4.2E-04	9.4E-04	1.4E-03	1.4E-03	2.5E-03	3.9E-03	

Park Visitor River Site-Wide Surface Sediment
Exposure Point Concentration (EPC)
Based on Visitor Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 1.4E-05

Chronic HI (all chemicals) = 3.6E-01

Subchronic HI (all chemicals) = 8.2E-01

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	$ELCR_{ingestion}$	$ELCR_{dermal}$	$ELCR_{total}$	Chronic HQ_{ing}	Chronic HQ_{derm}	Chronic HQ_{total}	Subchronic HQ_{ing}	Subchronic HQ_{derm}	Subchronic HQ_{total}	Notes
BENZENE											
ETHYLBENZENE											
TOLUENE											
XYLENES (Mixed Isomers)											
METHYLNAPHTHALENE, 2-	1.27				1.2E-04	9.3E-04	1.0E-03	4.3E-04	2.4E-03	2.9E-03	
ACENAPHTHENE	8.64				5.6E-05	4.2E-04	4.8E-04	5.8E-05	3.3E-04	3.9E-04	
ACENAPHTHYLENE	1.23				1.6E-05	1.2E-04	1.4E-04	5.5E-06	3.1E-05	3.7E-05	
ANTHRACENE	6.59				8.6E-06	6.4E-05	7.3E-05	8.9E-06	5.0E-05	5.9E-05	
BENZO(a)ANTHRACENE	7.22	1.7E-07	3.6E-07	5.3E-07	9.4E-05	1.4E-04	2.3E-04	3.2E-05	3.7E-05	6.9E-05	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(a)PYRENE	7.31	1.7E-06	3.7E-06	5.4E-06	9.5E-03	1.4E-02	2.4E-02	3.3E-02	3.7E-02	7.0E-02	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(b)FLUORANTHENE	4.13	9.6E-08	2.1E-07	3.0E-07	5.4E-05	8.0E-05	1.3E-04	1.8E-05	2.1E-05	4.0E-05	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(g,h,i)PERYLENE	3.54				4.6E-05	3.4E-04	3.9E-04	1.6E-05	9.0E-05	1.1E-04	
BENZO(k)FLUORANTHENE	4.68	1.1E-08	2.4E-08	3.4E-08	6.1E-05	9.1E-05	1.5E-04	2.1E-05	2.4E-05	4.5E-05	**ELCR calculations are on the "OtherMut C" tab.**
CHRYSENE	6.80	1.6E-09	3.4E-09	5.0E-09	8.8E-05	1.3E-04	2.2E-04	3.0E-05	3.5E-05	6.5E-05	**ELCR calculations are on the "OtherMut C" tab.**
DIBENZO(a,h)ANTHRACENE	0.83	1.9E-07	4.2E-07	6.1E-07	1.1E-05	1.6E-05	2.7E-05	3.7E-06	4.3E-06	8.0E-06	**ELCR calculations are on the "OtherMut C" tab.**
FLUORANTHENE	15.59				1.5E-04	1.1E-03	1.3E-03	2.1E-04	1.2E-03	1.4E-03	
FLUORENE	3.89				3.8E-05	2.8E-04	3.2E-04	1.3E-05	7.4E-05	8.7E-05	

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Park Visitor River Site-Wide Surface Sediment
Exposure Point Concentration (EPC)
Based on Visitor Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 1.4E-05

Chronic HI (all chemicals) = 3.6E-01

Subchronic HI (all chemicals) = 8.2E-01

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	$ELCR_{ingestion}$	$ELCR_{dermal}$	$ELCR_{total}$	Chronic HQ_{ing}	Chronic HQ_{derm}	Chronic HQ_{total}	Subchronic HQ_{ing}	Subchronic HQ_{derm}	Subchronic HQ_{total}	Notes
INDENO(1,2,3-cd)PYRENE	3.52	8.1E-08	1.8E-07	2.6E-07	4.6E-05	6.8E-05	1.1E-04	1.6E-05	1.8E-05	3.4E-05	**ELCR calculations are on the "OtherMut C" tab.**
NAPHTHALENE	2.38				4.6E-05	3.5E-04	3.9E-04	1.6E-05	9.1E-05	1.1E-04	
PHENANTHRENE	21.49				2.8E-04	2.1E-03	2.4E-03	9.6E-05	5.5E-04	6.4E-04	
PYRENE	20.58				2.7E-04	2.0E-03	2.3E-03	9.2E-05	5.3E-04	6.2E-04	
PETROLEUM HYDROCARBONS: ALIPHATICS - C5 to C8											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C12											
PETROLEUM HYDROCARBONS: AROMATICS - C9 to C10											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C18											
PETROLEUM HYDROCARBONS: ALIPHATICS - C19 to C36	4.2E+01				2.7E-05	1.2E-04	1.5E-04	3.1E-05	1.1E-04	1.4E-04	
PETROLEUM HYDROCARBONS: AROMATICS - C11 to C22	5.4E+01				7.0E-04	5.3E-03	6.0E-03	2.4E-04	1.4E-03	1.6E-03	
ARSENIC	1.1E+01	1.7E-06	4.9E-06	6.6E-06	2.4E-02	3.3E-02	5.7E-02	8.4E-02	8.6E-02	1.7E-01	
BARIUM	4.8E+01				3.1E-04	7.0E-04	1.0E-03	1.1E-03	1.9E-03	2.9E-03	
CADMIUM	9.7E-01				1.3E-03	5.6E-04	1.8E-03	4.3E-03	1.5E-03	5.8E-03	
CHROMIUM (TOTAL)	7.2E+01				3.1E-02	7.0E-02	1.0E-01	1.6E-02	2.7E-02	4.4E-02	**Cr(VI) limit is 200 mg/kg due to contact dermatitis.**
LEAD	1.3E+02				1.1E-01	3.1E-02	1.4E-01	3.9E-01	8.0E-02	4.7E-01	**Lead IH HQ limit is 1, not 10.**
MERCURY	6.0E-01				1.3E-03	5.8E-03	7.2E-03	4.5E-03	1.5E-02	2.0E-02	
NICKEL	1.5E+01				9.6E-04	4.3E-03	5.3E-03	3.3E-03	1.1E-02	1.5E-02	

Park Visitor River Site-Wide Surface Sediment
Exposure Point Concentration (EPC)
Based on Visitor Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 1.4E-05

Chronic HI (all chemicals) = 3.6E-01

Subchronic HI (all chemicals) = 8.2E-01

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	$ELCR_{ingestion}$	$ELCR_{dermal}$	$ELCR_{total}$	Chronic			Subchronic			Notes
					HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
SILVER	8.4E-01				2.2E-04	1.5E-03	1.7E-03	7.5E-04	3.9E-03	4.6E-03	
ZINC	1.4E+02				5.9E-04	1.3E-03	1.9E-03	2.0E-03	3.5E-03	5.5E-03	

Resident 35 Water Street Upland Surface Soil
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 1.0E-05

Chronic HI (all chemicals) = 1.9E-01

Subchronic HI (all chemicals) = 4.3E-01

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
PETROLEUM HYDROCARBONS: ALIPHATICS - C5 to C8	2.5E+01				1.3E-03	2.3E-03	3.6E-03	4.6E-04	5.9E-04	1.1E-03	
BENZENE	2.6E-01	4.8E-09	1.4E-09	6.2E-09	1.4E-04	3.5E-05	1.8E-04	1.9E-04	3.7E-05	2.3E-04	
BIPHENYL, 1,1-	4.0E-02	1.1E-10	1.1E-10	2.1E-10	1.7E-07	1.5E-07	3.2E-07	6.0E-07	3.8E-07	9.8E-07	
ACENAPHTHYLENE	4.3E-01				9.3E-06	2.6E-05	3.5E-05	3.2E-06	6.8E-06	1.0E-05	
ANTHRACENE	8.6E-01				1.9E-06	5.2E-06	7.1E-06	1.9E-06	4.1E-06	6.0E-06	
BENZO(a)ANTHRACENE	3.9E+00	1.5E-07	8.4E-08	2.3E-07	8.4E-05	4.7E-05	1.3E-04	2.9E-05	1.2E-05	4.1E-05	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(a)PYRENE	4.5E+00	1.7E-06	9.5E-07	2.7E-06	9.6E-03	5.4E-03	1.5E-02	3.3E-02	1.4E-02	4.7E-02	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(b)FLUORANTHENE	4.8E+00	1.8E-07	1.0E-07	2.9E-07	1.0E-04	5.8E-05	1.6E-04	3.6E-05	1.5E-05	5.1E-05	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(g,h,i)PERYLENE	3.8E+00				8.2E-05	2.3E-04	3.1E-04	2.8E-05	6.0E-05	8.9E-05	
BENZO(k)FLUORANTHENE	3.7E+00	1.4E-08	8.0E-09	2.2E-08	8.1E-05	4.5E-05	1.3E-04	2.8E-05	1.2E-05	4.0E-05	**ELCR calculations are on the "OtherMut C" tab.**
CHRYSENE	4.7E+00	1.8E-09	1.0E-09	2.8E-09	1.0E-04	5.7E-05	1.6E-04	3.5E-05	1.5E-05	5.0E-05	**ELCR calculations are on the "OtherMut C" tab.**
DIBENZO(a,h)ANTHRACENE	7.2E-01	2.8E-07	1.5E-07	4.3E-07	1.6E-05	8.7E-06	2.4E-05	5.4E-06	2.3E-06	7.7E-06	**ELCR calculations are on the "OtherMut C" tab.**
FLUORANTHENE	9.1E+00				1.5E-04	4.1E-04	5.6E-04	2.0E-04	4.3E-04	6.4E-04	
FLUORENE	2.6E-01				4.2E-06	1.2E-05	1.6E-05	1.5E-06	3.1E-06	4.5E-06	
INDENO(1,2,3-cd)PYRENE	3.8E+00	1.5E-07	8.1E-08	2.3E-07	8.2E-05	4.6E-05	1.3E-04	2.8E-05	1.2E-05	4.0E-05	**ELCR calculations are on the "OtherMut C" tab.**
NAPHTHALENE	3.0E-01				9.7E-06	2.7E-05	3.7E-05	3.4E-06	7.1E-06	1.0E-05	
PHENANTHRENE	4.3E+00				9.3E-05	2.6E-04	3.5E-04	3.2E-05	6.8E-05	1.0E-04	

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Resident 35 Water Street Upland Surface Soil
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 1.0E-05

Chronic HI (all chemicals) = 1.9E-01

Subchronic HI (all chemicals) = 4.3E-01

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
PYRENE	1.0E+01				2.2E-04	6.3E-04	8.5E-04	7.7E-05	1.6E-04	2.4E-04	
PETROLEUM HYDROCARBONS: ALIPHATICS - C19 to C36	2.3E+01				2.5E-05	4.2E-05	6.6E-05	2.9E-05	3.6E-05	6.5E-05	
PETROLEUM HYDROCARBONS: AROMATICS - C11 to C22	8.2E+01				1.8E-03	5.0E-03	6.7E-03	6.1E-04	1.3E-03	1.9E-03	
ARSENIC	1.5E+01	3.8E-06	2.3E-06	6.1E-06	5.5E-02	2.8E-02	8.3E-02	1.9E-01	7.3E-02	2.6E-01	
BARIUM	1.2E+02				1.3E-03	1.1E-03	2.3E-03	4.4E-03	2.8E-03	7.2E-03	
CADMIUM	1.1E+00				2.3E-03	3.8E-04	2.7E-03	7.8E-03	1.0E-03	8.8E-03	
CHROMIUM(VI)	3.8E+01				2.8E-02	2.3E-02	5.1E-02	1.4E-02	9.1E-03	2.3E-02	**Cr(VI) limit is 200 mg/kg due to contact dermatitis.**
LEAD											**Lead IH HQ limit is 1, not 10.**
MERCURY	2.3E+00				8.4E-03	1.4E-02	2.2E-02	2.9E-02	3.7E-02	6.6E-02	
SELENIUM	2.6E+00				1.1E-03	9.5E-05	1.2E-03	3.9E-03	2.5E-04	4.2E-03	
SILVER	7.3E-01				3.2E-04	7.9E-04	1.1E-03	1.1E-03	2.1E-03	3.2E-03	

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Att_A_21. SUBCHRONIC RISK CALCULATIONS
Future Construction Worker (Wetland Maximum Sediment Concentrations)
Amesbury Former MGP
Amesbury, MA

	Exposure Point Concentrations		Subchronic Average Daily Dose and Exposure Estimates				Subchronic Hazard Index Estimates		Total Subchronic Hazard Index Estimates		
CHEMICAL	Soil (mg/kg)	Sediment (mg/kg)	Soil Ingestion (mg/kg/day)	Soil Dermal (mg/kg/day)	Sediment Ingestion (mg/kg/day)	Sediment Dermal (mg/kg/day)	Sediment Ingestion	Sediment Dermal	Soil	Sediment	All Media
Volatile Organic Compounds											
Benzene		3.12E-01			3.89E-07	4.14E-07	4E-05	4E-05		8.E-05	8.E-05
1,2-Dichloroethylene (cis)		8.19E+01			1.02E-04	3.62E-04	1E-03	4E-03		5.E-03	5.E-03
Ethylbenzene		6.82E-01			8.50E-07	9.04E-07	2E-05	2E-05		4.E-05	4.E-05
Toluene											
Vinyl chloride		1.32E+01			1.64E-05	5.84E-05	5E-03	2E-02		2.E-02	2.E-02
Xylenes (mixed isomers)		2.91E-01			3.62E-07	3.86E-07	9E-07	1E-06		2.E-06	2.E-06
Petroleum Hydrocarbon Fractions											
VPH											
C5-C8 Aliphatic											
C9-C12 Aliphatic		3.48E+01			4.33E-05	3.08E-04	4E-05	3E-04		4.E-04	4.E-04
C9-C10 Aromatic		3.00E+01			3.74E-05	2.65E-04	1E-04	9E-04		1.E-03	1.E-03
EPH											
C9-C18 Aliphatic		8.61E+01			1.07E-04	7.61E-04	1E-04	8E-04		9.E-04	9.E-04
C19-C36 Aliphatic		3.02E+02			3.76E-04	2.67E-03	6E-05	4E-04		5.E-04	5.E-04
C11-C22 Aromatic		5.66E+02			2.12E-04	2.50E-03	7E-04	8E-03		9.E-03	9.E-03
Semivolatile Organic Compounds											
Non-Carcinogenic PAHs											
Acenaphthene		1.77E+02			6.61E-05	7.82E-04	3E-04	4E-03		4.E-03	4.E-03
Acenaphthylene		1.44E+01			5.37E-06	6.36E-05	2E-05	2E-04		2.E-04	2.E-04
Anthracene		1.19E+02			4.45E-05	5.26E-04	4E-05	5E-04		6.E-04	6.E-04
Benzo(ghi)perylene		4.87E+01			1.82E-05	2.15E-04	6E-05	7E-04		8.E-04	8.E-04
Fluoranthene		1.99E+02			7.44E-05	8.80E-04	7E-04	9E-03		1.E-02	1.E-02
Fluorene		7.10E+01			2.65E-05	3.14E-04	7E-05	8E-04		9.E-04	9.E-04
2-Methylnaphthalene		3.63E+01			1.36E-05	1.60E-04	3E-03	4E-02		4.E-02	4.E-02
Naphthalene		9.75E+01			3.64E-05	4.31E-04	2E-04	2E-03		2.E-03	2.3E-03
Phenanthrene		3.89E+02			1.45E-04	1.72E-03	5E-04	6E-03		6.E-03	6.E-03
Pyrene		3.06E+02			1.14E-04	1.35E-03	4E-04	5E-03		5.E-03	5.E-03
Carcinogenic PAHs											
Benz(a)anthracene		6.69E+01			2.50E-05	5.91E-05	8E-05	2E-04		3.E-04	3.E-04
Benzo(a)pyrene		8.08E+01			3.02E-05	7.14E-05	1E-01	*2E-01*		*3.E-01*	*3.E-01*
Benzo(b)fluoranthene		3.89E+01			1.45E-05	3.44E-05	5E-05	1E-04		2.E-04	2.E-04
Benzo(k)fluoranthene		3.75E+01			1.40E-05	3.32E-05	5E-05	1E-04		2.E-04	2.E-04
Chrysene		5.56E+01			2.08E-05	4.92E-05	7E-05	2E-04		2.E-04	2.E-04
Dibenz(ah)anthracene		1.10E+01			4.11E-06	9.73E-06	1E-05	3E-05		5.E-05	5.E-05
Indeno(1,2,3-cd)pyrene		3.77E+01			1.41E-05	3.33E-05	5E-05	1E-04		2.E-04	2.E-04
Metals											
Arsenic		7.10E+01			4.42E-05	9.42E-05	1E-01	*3E-01*		*5.E-01*	*5.E-01*
Barium		1.07E+02			1.33E-04	4.73E-04	7E-04	2E-03		3.E-03	3.E-03
Cadmium (in soil, sediment, or tissue)		7.00E+00			4.36E-06	3.09E-06	9E-03	6E-03		1.E-02	1.E-02
Chromium, total (assumes 1:6 ratio Cr VI:Cr III)		2.54E+02			3.16E-04	1.01E-03	2E-04	7E-04		9.E-04	9.E-04
Lead		3.50E+02			2.18E-04	9.28E-05	*3E-01*	1E-01		*4.E-01*	*4.E-01*
Mercury		1.00E+00			6.23E-07	4.42E-06	2E-03	1E-02		2.E-02	2.E-02
Nickel		9.10E+01			1.13E-04	8.05E-04	6E-03	4E-02		5.E-02	5.E-02
Selenium		4.00E+00			4.98E-06	1.77E-06	1E-03	4E-04		1.E-03	1.E-03
Silver		1.10E+01			1.37E-05	1.46E-04	3E-03	3E-02		3.E-02	3.E-02
Zinc		5.35E+02			6.66E-04	2.37E-03	2E-03	8E-03		1.E-02	1.E-02

Pathway Risks		Media Risks		Total
6E-01	*9E-01*	---	*1E+00*	1.E+00

Att_A_21. CANCER RISK CALCULATIONS
Future Construction Worker (Wetland Maximum Sediment Concentrations)
Amesbury Former MGP
Amesbury, MA

	Exposure Point Concentrat		Average Daily Dose (lifetime) Estimates				Carcinogenic Risk Estimates				Total Carcinogenic Risk Estimates		
CHEMICAL	Soil (mg/kg)	Sediment (mg/kg)	Soil Ingestion (mg/kg/day)	Soil Dermal (mg/kg/day)	Sediment Ingestion (mg/kg/day)	Sediment Dermal (mg/kg/day)	Soil Ingestion	Soil Dermal	Sediment Ingestion	Sediment Dermal	Soil	Sediment	All Media
Volatile Organic Compounds													
Benzene		3.12E-01			2.78E-09	2.96E-09			2.E-10	2.E-10		3.E-10	3.E-10
1,2-Dichloroethylene (cis)		8.19E+01			---	---			---	---		---	---
Ethylbenzene		6.82E-01			---	---			---	---		---	---
Toluene													
Vinyl chloride		1.32E+01			1.80E-07	6.69E-07			3.E-07	1.E-06		1.E-06	1.E-06
Xylenes (mixed isomers)		2.91E-01			---	---			---	---		---	---
Petroleum Hydrocarbon Fractions													
VPH													
C5-C8 Aliphatic													
C9-C12 Aliphatic		3.48E+01			---	---			---	---		---	---
C9-C10 Aromatic		3.00E+01			---	---			---	---		---	---
EPH													
C9-C18 Aliphatic		8.61E+01			---	---			---	---		---	---
C19-C36 Aliphatic		3.02E+02			---	---			---	---		---	---
C11-C22 Aromatic		5.66E+02			---	---			---	---		---	---
Semivolatile Organic Compounds													
Non-Carcinogenic PAHs													
Acenaphthene		1.77E+02			---	---			---	---		---	---
Acenaphthylene		1.44E+01			---	---			---	---		---	---
Anthracene		1.19E+02			---	---			---	---		---	---
Benzo(ghi)perylene		4.87E+01			---	---			---	---		---	---
Fluoranthene		1.99E+02			---	---			---	---		---	---
Fluorene		7.10E+01			---	---			---	---		---	---
2-Methylnaphthalene		3.63E+01			---	---			---	---		---	---
Naphthalene		9.75E+01			---	---			---	---		---	---
Phenanthrene		3.89E+02			---	---			---	---		---	---
Pyrene		3.06E+02			---	---			---	---		---	---
Carcinogenic PAHs													
Benz(a)anthracene		6.69E+01			1.79E-07	4.24E-07			2.E-08	4.E-08		6.E-08	6.E-08
Benzo(a)pyrene		8.08E+01			2.16E-07	5.12E-07			2.E-07	5.E-07		7.E-07	7.E-07
Benzo(b)fluoranthene		3.89E+01			1.04E-07	2.46E-07			1.E-08	2.E-08		4.E-08	4.E-08
Benzo(k)fluoranthene		3.75E+01			1.00E-07	2.37E-07			1.E-09	2.E-09		3.E-09	3.E-09
Chrysene		5.56E+01			1.49E-07	3.52E-07			1.E-09	4.E-09		5.E-09	5.E-09
Dibenz(ah)anthracene		1.10E+01			2.94E-08	6.97E-08			3.E-08	7.E-08		1.E-07	1.E-07
Indeno(1,2,3-cd)pyrene		3.77E+01			1.01E-07	2.39E-07			1.E-08	2.E-08		3.E-08	3.E-08
Metals													
Arsenic		7.10E+01			3.17E-07	6.74E-07			5.E-07	1.E-06		1.E-06	1.E-06
Barium		1.07E+02			---	---			---	---		---	---
Cadmium (in soil, sediment, or tissue)		7.00E+00			3.12E-08	2.22E-08			---	---		---	---
Chromium, total (assumes 1:6 ratio Cr VI:		2.54E+02			---	---			---	---		---	---
Lead		3.50E+02			---	---			---	---		---	---
Mercury		1.00E+00			---	---			---	---		---	---
Nickel		9.10E+01			8.12E-07	5.76E-06			---	---		---	---
Selenium		4.00E+00			---	---			---	---		---	---
Silver		1.10E+01			---	---			---	---		---	---
Zinc		5.35E+02			---	---			---	---		---	---

Pathway Risks				Media Risks		Total
---	---	1E-06	*3E-06*	---	*3.73E-06*	*4.E-06*

Att_A_22. SUBCHRONIC RISK CALCULATIONS
Future Construction Worker (Maximum Sediment Concentrations for Mudflat and River Surface Sediment)
Amesbury Former MGP
Amesbury, MA

	Exposure Point Concentrations		Subchronic Average Daily Dose and Exposure Estimates				Subchronic Hazard Index Estimates		Total Subchronic Hazard Index Estimates		
CHEMICAL	Soil (mg/kg)	Sediment (mg/kg)	Soil Ingestion (mg/kg/day)	Soil Dermal (mg/kg/day)	Sediment Ingestion (mg/kg/day)	Sediment Dermal (mg/kg/day)	Sediment Ingestion	Sediment Dermal	Soil	Sediment	All Media
Volatile Organic Compounds											
Benzene											
1,2-Dichloroethylene (cis)											
Ethylbenzene											
Toluene											
Vinyl chloride											
Xylenes (mixed isomers)											
Petroleum Hydrocarbon Fractions											
VPH											
C5-C8 Aliphatic											
C9-C12 Aliphatic											
C9-C10 Aromatic											
EPH											
C9-C18 Aliphatic		5.68E+02			7.08E-04	5.02E-03	7E-04	5E-03		6.E-03	6.E-03
C19-C36 Aliphatic		1.22E+03			1.52E-03	1.08E-02	3E-04	2E-03		2.E-03	2.E-03
C11-C22 Aromatic		7.30E+02			2.73E-04	3.23E-03	9E-04	1E-02		1.E-02	1.E-02
Semivolatile Organic Compounds											
Non-Carcinogenic PAHs											
Acenaphthene		3.30E+02			1.23E-04	1.46E-03	6E-04	7E-03		8.E-03	8.E-03
Acenaphthylene		2.31E+01			8.63E-06	1.02E-04	3E-05	3E-04		4.E-04	4.E-04
Anthracene		2.00E+02			7.47E-05	8.84E-04	7E-05	9E-04		1.E-03	1.E-03
Benzo(ghi)perylene		6.97E+01			2.60E-05	3.08E-04	9E-05	1E-03		1.E-03	1.E-03
Fluoranthene		3.19E+02			1.19E-04	1.41E-03	1E-03	1E-02		2.E-02	2.E-02
Fluorene		1.51E+02			5.64E-05	6.68E-04	1E-04	2E-03		2.E-03	2.E-03
2-Methylnaphthalene		1.11E+02			4.15E-05	4.91E-04	1E-02	1E-01		1.E-01	1.E-01
Naphthalene		1.83E+02			6.84E-05	8.09E-04	3E-04	4E-03		4.E-03	4.4E-03
Phenanthrene		6.65E+02			2.49E-04	2.94E-03	8E-04	1E-02		1.E-02	1.E-02
Pyrene		4.88E+02			1.82E-04	2.16E-03	6E-04	7E-03		8.E-03	8.E-03
Carcinogenic PAHs											
Benz(a)anthracene		1.62E+02			6.05E-05	1.43E-04	2E-04	5E-04		7.E-04	7.E-04
Benzo(a)pyrene		1.54E+02			5.75E-05	1.36E-04	*2E-01*	*5E-01*		*6.E-01*	*6.E-01*
Benzo(b)fluoranthene		6.75E+01			2.52E-05	5.97E-05	8E-05	2E-04		3.E-04	3.E-04
Benzo(k)fluoranthene		9.84E+01			3.68E-05	8.70E-05	1E-04	3E-04		4.E-04	4.E-04
Chrysene		1.52E+02			5.68E-05	1.34E-04	2E-04	4E-04		6.E-04	6.E-04
Dibenz(ah)anthracene		1.45E+01			5.42E-06	1.28E-05	2E-05	4E-05		6.E-05	6.E-05
Indeno(1,2,3-cd)pyrene		5.55E+01			2.07E-05	4.91E-05	7E-05	2E-04		2.E-04	2.E-04
Metals											
Arsenic		1.70E+01			1.06E-05	2.25E-05	4E-02	8E-02		1.E-01	1.E-01
Barium		7.70E+01			9.59E-05	3.40E-04	5E-04	2E-03		2.E-03	2.E-03
Cadmium (in soil, sediment, or tissue)		2.00E+00			1.25E-06	8.84E-07	2E-03	2E-03		4.E-03	4.E-03
Chromium, total (assumes 1:6 ratio Cr VI:Cr III)		2.27E+02			2.83E-04	9.03E-04	2E-04	6E-04		8.E-04	8.E-04
Lead		2.74E+02			1.71E-04	7.27E-05	*2E-01*	1E-01		*3.E-01*	*3.E-01*
Mercury		1.00E+00			6.23E-07	4.42E-06	2E-03	1E-02		2.E-02	2.E-02
Nickel		1.05E+02			1.31E-04	9.28E-04	7E-03	5E-02		5.E-02	5.E-02
Selenium		2.80E-01			3.49E-07	1.24E-07	7E-05	2E-05		9.E-05	9.E-05
Silver		4.65E+00			5.79E-06	6.17E-05	1E-03	1E-02		1.E-02	1.E-02
Zinc		2.82E+02			3.51E-04	1.25E-03	1E-03	4E-03		5.E-03	5.E-03

Pathway Risks		Media Risks		Total
5E-01	*9E-01*	---	*1E+00*	1.E+00

Att_A_22. CANCER RISK CALCULATIONS
Future Construction Worker (Maximum Sediment Concentrations for Mudflat and River Surface Sediment)
Amesbury Former MGP
Amesbury, MA

	Exposure Point Concentrat		Average Daily Dose (lifetime) Estimates				Carcinogenic Risk Estimates				Total Carcinogenic Risk Estimates		
CHEMICAL	Soil (mg/kg)	Sediment (mg/kg)	Soil Ingestion (mg/kg/day)	Soil Dermal (mg/kg/day)	Sediment Ingestion (mg/kg/day)	Sediment Dermal (mg/kg/day)	Soil Ingestion	Soil Dermal	Sediment Ingestion	Sediment Dermal	Soil	Sediment	All Media
Volatile Organic Compounds													
Benzene													
1,2-Dichloroethylene (cis)													
Ethylbenzene													
Toluene													
Vinyl chloride													
Xylenes (mixed isomers)													
Petroleum Hydrocarbon Fractions													
VPH													
C5-C8 Aliphatic													
C9-C12 Aliphatic													
C9-C10 Aromatic													
EPH													
C9-C18 Aliphatic		5.68E+02	---	---			---	---			---	---	---
C19-C36 Aliphatic		1.22E+03	---	---			---	---			---	---	---
C11-C22 Aromatic		7.30E+02	---	---			---	---			---	---	---
Semivolatile Organic Compounds													
Non-Carcinogenic PAHs													
Acenaphthene		3.30E+02	---	---			---	---			---	---	---
Acenaphthylene		2.31E+01	---	---			---	---			---	---	---
Anthracene		2.00E+02	---	---			---	---			---	---	---
Benzo(ghi)perylene		6.97E+01	---	---			---	---			---	---	---
Fluoranthene		3.19E+02	---	---			---	---			---	---	---
Fluorene		1.51E+02	---	---			---	---			---	---	---
2-Methylnaphthalene		1.11E+02	---	---			---	---			---	---	---
Naphthalene		1.83E+02	---	---			---	---			---	---	---
Phenanthrene		6.65E+02	---	---			---	---			---	---	---
Pyrene		4.88E+02	---	---			---	---			---	---	---
Carcinogenic PAHs													
Benz(a)anthracene		1.62E+02			4.34E-07	1.03E-06			4.E-08	1.E-07		1.E-07	1.E-07
Benzo(a)pyrene		1.54E+02			4.12E-07	9.75E-07			4.E-07	1.E-06		1.E-06	1.E-06
Benzo(b)fluoranthene		6.75E+01			1.81E-07	4.27E-07			2.E-08	4.E-08		6.E-08	6.E-08
Benzo(k)fluoranthene		9.84E+01			2.63E-07	6.23E-07			3.E-09	6.E-09		9.E-09	9.E-09
Chrysene		1.52E+02			4.07E-07	9.63E-07			4.E-09	1.E-08		1.E-08	1.E-08
Dibenz(ah)anthracene		1.45E+01			3.88E-08	9.18E-08			4.E-08	9.E-08		1.E-07	1.E-07
Indeno(1,2,3-cd)pyrene		5.55E+01			1.49E-07	3.51E-07			1.E-08	4.E-08		5.E-08	5.E-08
Metals													
Arsenic		1.70E+01			7.58E-08	1.61E-07			1.E-07	2.E-07		4.E-07	4.E-07
Barium		7.70E+01			---	---			---	---		---	---
Cadmium (in soil, sediment, or tissue)		2.00E+00			8.92E-09	6.33E-09			---	---		---	---
Chromium, total (assumes 1:6 ratio Cr VI:		2.27E+02			---	---			---	---		---	---
Lead		2.74E+02			---	---			---	---		---	---
Mercury		1.00E+00			---	---			---	---		---	---
Nickel		1.05E+02			9.37E-07	6.65E-06			---	---		---	---
Selenium		2.80E-01			---	---			---	---		---	---
Silver		4.65E+00			---	---			---	---		---	---
Zinc		2.82E+02			---	---			---	---		---	---

Pathway Risks				Media Risks		Total
---	---	6E-07	*2E-06*	---	*2.15E-06*	*2.E-06*

Att_A_23. SUBCHRONIC RISK CALCULATIONS
Emergency Utility Worker (Maximum Sediment Concentrations)
Amesbury Former MGP
Amesbury, MA

	Exposure Point Concentrations		Subchronic Average Daily Dose and Exposure Estimates				Subchronic Hazard Index Estimates		Total Subchronic Hazard Index Estimates		
CHEMICAL	Soil (mg/kg)	Sediment (mg/kg)	Soil Ingestion (mg/kg/day)	Soil Dermal (mg/kg/day)	Sediment Ingestion (mg/kg/day)	Sediment Dermal (mg/kg/day)	Sediment Ingestion	Sediment Dermal	Soil	Sediment	All Media
Volatile Organic Compounds											
Benzene		1.20E+00			6.16E-09	6.72E-09	6E-07	7E-07		1.E-06	1.E-06
1,2-Dichloroethylene (cis)		8.19E+01			4.20E-07	1.53E-06	4E-06	2E-05		2.E-05	2.E-05
Ethylbenzene		3.77E+01			1.94E-07	2.11E-07	4E-06	4E-06		8.E-06	8.E-06
Toluene		9.00E-01			4.62E-09	5.04E-09	6E-09	6E-09		1.E-08	1.E-08
Vinyl chloride		1.32E+01			6.78E-08	2.47E-07	2E-05	8E-05		1.E-04	1.E-04
Xylenes (mixed isomers)		2.58E+01			1.32E-07	1.45E-07	3E-07	4E-07		7.E-07	7.E-07
Petroleum Hydrocarbon Fractions											
VPH											
C5-C8 Aliphatic											
C9-C12 Aliphatic		3.48E+01			1.79E-07	1.30E-06	2E-07	1E-06		1.E-06	1.E-06
C9-C10 Aromatic		1.52E+02			7.80E-07	5.68E-06	3E-06	2E-05		2.E-05	2.E-05
EPH											
C9-C18 Aliphatic		8.44E+02			4.33E-06	3.15E-05	4E-06	3E-05		4.E-05	4.E-05
C19-C36 Aliphatic		1.22E+03			6.26E-06	4.56E-05	1E-06	8E-06		9.E-06	9.E-06
C11-C22 Aromatic		4.66E+03			7.18E-06	8.70E-05	2E-05	3E-04		3.E-04	3.E-04
Semivolatile Organic Compounds											
Non-Carcinogenic PAHs											
Acenaphthene		9.26E+03			1.43E-05	1.73E-04	7E-05	9E-04		9.E-04	9.E-04
Acenaphthylene		4.87E+02			7.50E-07	9.10E-06	2E-06	3E-05		3.E-05	3.E-05
Anthracene		4.23E+03			6.51E-06	7.90E-05	7E-06	8E-05		9.E-05	9.E-05
Benzo(ghi)perylene		1.27E+03			1.96E-06	2.37E-05	7E-06	8E-05		9.E-05	9.E-05
Fluoranthene		6.74E+03			1.04E-05	1.26E-04	1E-04	1E-03		1.E-03	1.E-03
Fluorene		3.54E+03			5.45E-06	6.61E-05	1E-05	2E-04		2.E-04	2.E-04
2-Methylnaphthalene		5.80E+03			8.93E-06	1.08E-04	2E-03	3E-02		3.E-02	3.E-02
Naphthalene		9.48E+03			1.46E-05	1.77E-04	7E-05	9E-04		1.E-03	9.6E-04
Phenanthrene		1.62E+04			2.49E-05	3.03E-04	8E-05	1E-03		1.E-03	1.E-03
Pyrene		1.04E+04			1.60E-05	1.94E-04	5E-05	6E-04		7.E-04	7.E-04
Carcinogenic PAHs											
Benz(a)anthracene		2.70E+03			4.16E-06	1.01E-05	1E-05	3E-05		5.E-05	5.E-05
Benzo(a)pyrene		3.05E+03			4.70E-06	1.14E-05	2E-02	4E-02		5.E-02	5.E-02
Benzo(b)fluoranthene		1.32E+03			2.03E-06	4.93E-06	7E-06	2E-05		2.E-05	2.E-05
Benzo(k)fluoranthene		1.49E+03			2.29E-06	5.57E-06	8E-06	2E-05		3.E-05	3.E-05
Chrysene		2.22E+03			3.42E-06	8.29E-06	1E-05	3E-05		4.E-05	4.E-05
Dibenz(ah)anthracene		2.85E+02			4.39E-07	1.06E-06	1E-06	4E-06		5.E-06	5.E-06
Indeno(1,2,3-cd)pyrene		1.28E+03			1.97E-06	4.78E-06	7E-06	2E-05		2.E-05	2.E-05
Metals											
Arsenic		7.10E+01			1.82E-07	3.98E-07	6E-04	1E-03		2.E-03	2.E-03
Barium		1.18E+02			6.06E-07	2.20E-06	3E-06	1E-05		1.E-05	1.E-05
Cadmium (in soil, sediment, or tissue)		7.00E+00			1.80E-08	1.31E-08	4E-05	3E-05		6.E-05	6.E-05
Chromium, total (assumes 1:6 ratio Cr VI:Cr III)		2.54E+02			1.30E-06	4.27E-06	9E-07	3E-06		4.E-06	4.E-06
Lead		3.67E+02			9.42E-07	4.11E-07	1E-03	5E-04		2.E-03	2.E-03
Mercury		6.45E+00			1.66E-08	1.20E-07	6E-05	4E-04		5.E-04	5.E-04
Nickel		1.05E+02			5.39E-07	3.92E-06	3E-05	2E-04		2.E-04	2.E-04
Selenium		4.00E+00			2.05E-08	7.47E-09	4E-06	1E-06		6.E-06	6.E-06
Silver		1.10E+01			5.65E-08	6.16E-07	1E-05	1E-04		1.E-04	1.E-04
Zinc		5.35E+02			2.75E-06	9.99E-06	9E-06	3E-05		4.E-05	4.E-05

Pathway Risks		Media Risks		Total
2E-02	7E-02	---	9E-02	9.E-02

Att_A_23. CANCER RISK CALCULATIONS
Emergency Utility Worker (Maximum Sediment Concentrations)
Amesbury Former MGP
Amesbury, MA

	Exposure Point Concentrat		Average Daily Dose (lifetime) Estimates				Carcinogenic Risk Estimates				Total Carcinogenic Risk Estimates		
CHEMICAL	Soil (mg/kg)	Sediment (mg/kg)	Soil Ingestion (mg/kg/day)	Soil Dermal (mg/kg/day)	Sediment Ingestion (mg/kg/day)	Sediment Dermal (mg/kg/day)	Soil Ingestion	Soil Dermal	Sediment Ingestion	Sediment Dermal	Soil	Sediment	All Media
Volatile Organic Compounds													
Benzene		1.20E+00			9.02E-11	9.61E-11			5.E-12	5.E-12		1.E-11	1.E-11
1,2-Dichloroethylene (cis)		8.19E+01			---	---			---	---		---	---
Ethylbenzene		3.77E+01			---	---			---	---		---	---
Toluene		9.00E-01			---	---			---	---		---	---
Vinyl chloride		1.32E+01			1.52E-09	5.64E-09			2.E-09	8.E-09		1.E-08	1.E-08
Xylenes (mixed isomers)		2.58E+01			---	---			---	---		---	---
Petroleum Hydrocarbon Fractions													
VPH													
C5-C8 Aliphatic													
C9-C12 Aliphatic		3.48E+01			---	---			---	---		---	---
C9-C10 Aromatic		1.52E+02			---	---			---	---		---	---
EPH													
C9-C18 Aliphatic		8.44E+02			---	---			---	---		---	---
C19-C36 Aliphatic		1.22E+03			---	---			---	---		---	---
C11-C22 Aromatic		4.66E+03			---	---			---	---		---	---
Semivolatile Organic Compounds													
Non-Carcinogenic PAHs													
Acenaphthene		9.26E+03			---	---			---	---		---	---
Acenaphthylene		4.87E+02			---	---			---	---		---	---
Anthracene		4.23E+03			---	---			---	---		---	---
Benzo(ghi)perylene		1.27E+03			---	---			---	---		---	---
Fluoranthene		6.74E+03			---	---			---	---		---	---
Fluorene		3.54E+03			---	---			---	---		---	---
2-Methylnaphthalene		5.80E+03			---	---			---	---		---	---
Naphthalene		9.48E+03			---	---			---	---		---	---
Phenanthrene		1.62E+04			---	---			---	---		---	---
Pyrene		1.04E+04			---	---			---	---		---	---
Carcinogenic PAHs													
Benz(a)anthracene		2.70E+03			6.09E-08	1.44E-07			6.E-09	1.E-08		2.E-08	2.E-08
Benzo(a)pyrene		3.05E+03			6.88E-08	1.63E-07			7.E-08	2.E-07		2.E-07	2.E-07
Benzo(b)fluoranthene		1.32E+03			2.98E-08	7.04E-08			3.E-09	7.E-09		1.E-08	1.E-08
Benzo(k)fluoranthene		1.49E+03			3.36E-08	7.95E-08			3.E-10	8.E-10		1.E-09	1.E-09
Chrysene		2.22E+03			5.01E-08	1.18E-07			5.E-10	1.E-09		2.E-09	2.E-09
Dibenz(ah)anthracene		2.85E+02			6.43E-09	1.52E-08			6.E-09	2.E-08		2.E-08	2.E-08
Indeno(1,2,3-cd)pyrene		1.28E+03			2.89E-08	6.83E-08			3.E-09	7.E-09		1.E-08	1.E-08
Metals													
Arsenic		7.10E+01			2.67E-09	5.68E-09			4.E-09	9.E-09		1.E-08	1.E-08
Barium		1.18E+02			---	---			---	---		---	---
Cadmium (in soil, sediment, or tissue)		7.00E+00			2.63E-10	1.87E-10			---	---		---	---
Chromium, total (assumes 1:6 ratio Cr VI:		2.54E+02			---	---			---	---		---	---
Lead		3.67E+02			---	---			---	---		---	---
Mercury		6.45E+00			---	---			---	---		---	---
Nickel		1.05E+02			7.89E-09	5.60E-08			---	---		---	---
Selenium		4.00E+00			---	---			---	---		---	---
Silver		1.10E+01			---	---			---	---		---	---
Zinc		5.35E+02			---	---			---	---		---	---

Pathway Risks				Media Risks		Total
---	---	9E-08	2E-07	---	3.20E-07	3.E-07

Attachment B Future Risk Calculations (including MassDEP Shortform Output)

Resident 33R Oakland Street Wetland Deep Sediment
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 3.4E-06

Chronic HI (all chemicals) = 1.3E-02

Subchronic HI (all chemicals) = 3.4E-02

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
BENZENE											
ETHYLBENZENE											
TOLUENE											
XYLENES (Mixed Isomers)											
METHYLNAPHTHALENE, 2-	1.4E+00				4.5E-05	3.4E-04	3.8E-04	1.6E-04	8.9E-04	1.1E-03	
ACENAPHTHENE	5.5E-01				1.2E-06	8.9E-06	1.0E-05	1.2E-06	7.1E-06	8.3E-06	
ACENAPHTHYLENE	2.9E+00				1.3E-05	9.5E-05	1.1E-04	4.4E-06	2.5E-05	2.9E-05	
ANTHRACENE	2.5E+00				1.1E-06	8.2E-06	9.3E-06	1.1E-06	6.5E-06	7.6E-06	
BENZO(a)ANTHRACENE	6.3E+00	4.9E-08	1.1E-07	1.6E-07	2.7E-05	4.1E-05	6.8E-05	9.5E-06	1.1E-05	2.0E-05	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(a)PYRENE	1.0E+01	7.8E-07	1.7E-06	2.5E-06	4.4E-03	6.5E-03	1.1E-02	1.5E-02	1.7E-02	3.2E-02	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(b)FLUORANTHENE	8.0E+00	6.1E-08	1.3E-07	2.0E-07	3.4E-05	5.2E-05	8.6E-05	1.2E-05	1.4E-05	2.6E-05	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(g,h,i)PERYLENE	7.5E+00				3.2E-05	2.4E-04	2.7E-04	1.1E-05	6.4E-05	7.5E-05	
BENZO(k)FLUORANTHENE	8.0E+00	6.2E-09	1.3E-08	2.0E-08	3.5E-05	5.2E-05	8.6E-05	1.2E-05	1.4E-05	2.6E-05	**ELCR calculations are on the "OtherMut C" tab.**
CHRYSENE	7.7E+00	5.9E-10	1.3E-09	1.9E-09	3.3E-05	4.9E-05	8.2E-05	1.1E-05	1.3E-05	2.4E-05	**ELCR calculations are on the "OtherMut C" tab.**
DIBENZO(a,h)ANTHRACENE	1.6E+00	1.2E-07	2.6E-07	3.8E-07	6.7E-06	1.0E-05	1.7E-05	2.3E-06	2.6E-06	5.0E-06	**ELCR calculations are on the "OtherMut C" tab.**
FLUORANTHENE	9.6E+00				3.1E-05	2.3E-04	2.6E-04	4.3E-05	2.4E-04	2.9E-04	
FLUORENE	8.7E-01				2.8E-06	2.1E-05	2.4E-05	9.8E-07	5.6E-06	6.6E-06	

MassDEP ORS
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Resident 33R Oakland Street Wetland Deep Sediment
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 3.4E-06

Chronic HI (all chemicals) = 1.3E-02

Subchronic HI (all chemicals) = 3.4E-02

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
INDENO(1,2,3-cd)PYRENE	7.6E+00	5.8E-08	1.3E-07	1.8E-07	3.3E-05	4.9E-05	8.1E-05	1.1E-05	1.3E-05	2.4E-05	**ELCR calculations are on the "OtherMut C" tab.**
NAPHTHALENE	3.4E+00				2.2E-05	1.7E-04	1.9E-04	7.7E-06	4.4E-05	5.1E-05	
PHENANTHRENE	3.7E+00				1.6E-05	1.2E-04	1.4E-04	5.6E-06	3.2E-05	3.7E-05	
PYRENE	1.1E+01				4.9E-05	3.6E-04	4.1E-04	1.7E-05	9.6E-05	1.1E-04	
PETROLEUM HYDROCARBONS: ALIPHATICS - C5 to C8											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C12											
PETROLEUM HYDROCARBONS: AROMATICS - C9 to C10											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C18											
PETROLEUM HYDROCARBONS: ALIPHATICS - C19 to C36											
PETROLEUM HYDROCARBONS: AROMATICS - C11 to C22											

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Resident 35 Oakland Street Wetland Deep Sediment Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 4.1E-07

Chronic HI (all chemicals) = 3.7E-03

Subchronic HI (all chemicals) = 4.3E-03

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
BENZENE											
ETHYLBENZENE											
TOLUENE											
XYLENES (Mixed Isomers)											
METHYLNAPHTHALENE, 2-											
ACENAPHTHENE	7.3E-01				1.6E-06	1.2E-05	1.3E-05	1.6E-06	9.3E-06	1.1E-05	
ACENAPHTHYLENE											
ANTHRACENE	7.4E-01				3.2E-07	2.4E-06	2.7E-06	3.3E-07	1.9E-06	2.2E-06	
BENZO(a)ANTHRACENE	1.2E+00	9.4E-09	2.0E-08	3.0E-08	5.2E-06	7.8E-06	1.3E-05	1.8E-06	2.1E-06	3.9E-06	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(a)PYRENE	1.1E+00	8.5E-08	1.8E-07	2.7E-07	4.7E-04	7.1E-04	1.2E-03	1.6E-03	1.9E-03	3.5E-03	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(b)FLUORANTHENE	7.9E-01	6.1E-09	1.3E-08	1.9E-08	3.4E-06	5.1E-06	8.5E-06	1.2E-06	1.3E-06	2.5E-06	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(g,h,i)PERYLENE	8.1E-01				3.5E-06	2.6E-05	3.0E-05	1.2E-06	6.9E-06	8.2E-06	
BENZO(k)FLUORANTHENE	7.7E-01	5.9E-10	1.3E-09	1.9E-09	3.3E-06	4.9E-06	8.2E-06	1.1E-06	1.3E-06	2.4E-06	**ELCR calculations are on the "OtherMut C" tab.**
CHRYSENE	8.8E-01	6.8E-11	1.5E-10	2.2E-10	3.8E-06	5.7E-06	9.5E-06	1.3E-06	1.5E-06	2.8E-06	**ELCR calculations are on the "OtherMut C" tab.**
DIBENZO(a,h)ANTHRACENE	3.2E-01	2.5E-08	5.4E-08	7.8E-08	1.4E-06	2.1E-06	3.4E-06	4.8E-07	5.4E-07	1.0E-06	**ELCR calculations are on the "OtherMut C" tab.**
FLUORANTHENE	1.9E+00				6.2E-06	4.7E-05	5.3E-05	8.7E-06	4.9E-05	5.8E-05	
FLUORENE	5.5E-01				1.8E-06	1.3E-05	1.5E-05	6.2E-07	3.5E-06	4.2E-06	

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Resident 35 Oakland Street Wetland Deep Sediment
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 4.1E-07

Chronic HI (all chemicals) = 3.7E-03

Subchronic HI (all chemicals) = 4.3E-03

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
INDENO(1,2,3-cd)PYRENE	6.7E-01	5.2E-09	1.1E-08	1.6E-08	2.9E-06	4.4E-06	7.3E-06	1.0E-06	1.1E-06	2.2E-06	**ELCR calculations are on the "OtherMut C" tab.**
NAPHTHALENE											
PHENANTHRENE	2.2E+00				9.6E-06	7.2E-05	8.1E-05	3.3E-06	1.9E-05	2.2E-05	
PYRENE	2.7E+00				1.2E-05	8.7E-05	9.9E-05	4.0E-06	2.3E-05	2.7E-05	
PETROLEUM HYDROCARBONS: ALIPHATICS - C5 to C8											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C12											
PETROLEUM HYDROCARBONS: AROMATICS - C9 to C10											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C18	3.5E+01				1.5E-04	6.8E-04	8.3E-04	5.2E-05	1.8E-04	2.3E-04	
PETROLEUM HYDROCARBONS: ALIPHATICS - C19 to C36	4.1E+01				8.7E-06	3.9E-05	4.8E-05	1.0E-05	3.5E-05	4.5E-05	
PETROLEUM HYDROCARBONS: AROMATICS - C11 to C22	3.6E+01				1.6E-04	1.2E-03	1.3E-03	5.4E-05	3.1E-04	3.6E-04	

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Resident 37 Oakland Street Wetland Deep Sediment Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 8.8E-06

Chronic HI (all chemicals) = 6.0E-02

Subchronic HI (all chemicals) = 1.1E-01

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
BENZENE											
ETHYLBENZENE											
TOLUENE											
XYLENES (Mixed Isomers)											
METHYLNAPHTHALENE, 2-	1.3E+01				4.2E-04	3.2E-03	3.6E-03	1.5E-03	8.4E-03	9.8E-03	
ACENAPHTHENE	3.7E+02				8.0E-04	6.0E-03	6.8E-03	8.3E-04	4.7E-03	5.5E-03	
ACENAPHTHYLENE	6.1E+00				2.6E-05	2.0E-04	2.2E-04	9.1E-06	5.2E-05	6.1E-05	
ANTHRACENE	4.2E+01				1.8E-05	1.3E-04	1.5E-04	1.9E-05	1.1E-04	1.3E-04	
BENZO(a)ANTHRACENE	2.0E+01	1.5E-07	3.3E-07	4.8E-07	8.5E-05	1.3E-04	2.1E-04	3.0E-05	3.4E-05	6.3E-05	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(a)PYRENE	2.6E+01	2.0E-06	4.4E-06	6.5E-06	1.1E-02	1.7E-02	2.8E-02	3.9E-02	4.5E-02	8.4E-02	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(b)FLUORANTHENE	2.0E+01	1.6E-07	3.4E-07	4.9E-07	8.7E-05	1.3E-04	2.2E-04	3.0E-05	3.4E-05	6.5E-05	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(g,h,i)PERYLENE	1.7E+01				7.4E-05	5.6E-04	6.3E-04	2.6E-05	1.5E-04	1.7E-04	
BENZO(k)FLUORANTHENE	1.9E+01	1.5E-08	3.3E-08	4.7E-08	8.4E-05	1.3E-04	2.1E-04	2.9E-05	3.3E-05	6.2E-05	**ELCR calculations are on the "OtherMut C" tab.**
CHRYSENE	2.4E+01	1.8E-09	4.0E-09	5.8E-09	1.0E-04	1.5E-04	2.5E-04	3.5E-05	4.0E-05	7.5E-05	**ELCR calculations are on the "OtherMut C" tab.**
DIBENZO(a,h)ANTHRACENE	3.6E+00	2.8E-07	6.1E-07	8.9E-07	1.6E-05	2.3E-05	3.9E-05	5.4E-06	6.2E-06	1.2E-05	**ELCR calculations are on the "OtherMut C" tab.**
FLUORANTHENE	6.2E+01				2.0E-04	1.5E-03	1.7E-03	2.8E-04	1.6E-03	1.8E-03	
FLUORENE	8.6E+01				2.8E-04	2.1E-03	2.4E-03	9.7E-05	5.5E-04	6.5E-04	

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Resident 37 Oakland Street Wetland Deep Sediment
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 8.8E-06

Chronic HI (all chemicals) = 6.0E-02

Subchronic HI (all chemicals) = 1.1E-01

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
INDENO(1,2,3-cd)PYRENE	1.7E+01	1.3E-07	2.9E-07	4.3E-07	7.5E-05	1.1E-04	1.9E-04	2.6E-05	3.0E-05	5.6E-05	**ELCR calculations are on the "OtherMut C" tab.**
NAPHTHALENE	5.0E+01				3.2E-04	2.4E-03	2.7E-03	1.1E-04	6.4E-04	7.5E-04	
PHENANTHRENE	2.5E+02				1.1E-03	8.2E-03	9.3E-03	3.8E-04	2.2E-03	2.5E-03	
PYRENE	7.8E+01				3.4E-04	2.5E-03	2.9E-03	1.2E-04	6.7E-04	7.8E-04	
PETROLEUM HYDROCARBONS: ALIPHATICS - C5 to C8											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C12											
PETROLEUM HYDROCARBONS: AROMATICS - C9 to C10											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C18											
PETROLEUM HYDROCARBONS: ALIPHATICS - C19 to C36											
PETROLEUM HYDROCARBONS: AROMATICS - C11 to C22											

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Trespasser All Properties Wetland Deep Sediment
Exposure Point Concentration (EPC)

Based on Trespasser Ages 11-18 (Cancer and Non-Cancer Chronic), and Ages 11-12 (Non-Cancer Subchronic)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 4.5E-07
Chronic HI (all chemicals) = 1.0E-02
Subchronic HI (all chemicals) = 1.0E-02

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
BENZENE											
ETHYLBENZENE											
TOLUENE											
XYLENES (Mixed Isomers)											
METHYLNAPHTHALENE, 2-	2.57				2.8E-05	4.7E-04	5.0E-04	5.7E-05	8.6E-04	9.2E-04	
ACENAPHTHENE	62.08				4.6E-05	7.6E-04	8.0E-04	2.7E-05	4.2E-04	4.4E-04	
ACENAPHTHYLENE	1.76				2.6E-06	4.3E-05	4.6E-05	5.2E-07	7.9E-06	8.4E-06	
ANTHRACENE	7.88				1.2E-06	1.9E-05	2.0E-05	7.0E-07	1.1E-05	1.1E-05	
BENZO(a)ANTHRACENE	5.17	5.7E-09	1.9E-08	2.4E-08	7.6E-06	2.5E-05	3.3E-05	1.5E-06	4.6E-06	6.2E-06	ELCR calculations are on the "OtherMut C" tab.
BENZO(a)PYRENE	6.82	7.5E-08	2.5E-07	3.2E-07	1.0E-03	3.3E-03	4.3E-03	2.0E-03	6.1E-03	8.1E-03	ELCR calculations are on the "OtherMut C" tab.
BENZO(b)FLUORANTHENE	5.22	5.7E-09	1.9E-08	2.5E-08	7.7E-06	2.5E-05	3.3E-05	1.5E-06	4.7E-06	6.2E-06	ELCR calculations are on the "OtherMut C" tab.
BENZO(g,h,i)PERYLENE	4.66				6.9E-06	1.1E-04	1.2E-04	1.4E-06	2.1E-05	2.2E-05	
BENZO(k)FLUORANTHENE	5.08	5.6E-10	1.8E-09	2.4E-09	7.5E-06	2.5E-05	3.2E-05	1.5E-06	4.6E-06	6.1E-06	ELCR calculations are on the "OtherMut C" tab.
CHRYSENE	5.80	6.4E-11	2.1E-10	2.7E-10	8.5E-06	2.8E-05	3.7E-05	1.7E-06	5.2E-06	6.9E-06	ELCR calculations are on the "OtherMut C" tab.
DIBENZO(a,h)ANTHRACENE	1.08	1.2E-08	3.9E-08	5.1E-08	1.6E-06	5.3E-06	6.8E-06	3.2E-07	9.6E-07	1.3E-06	ELCR calculations are on the "OtherMut C" tab.
FLUORANTHENE	13.14				1.5E-05	2.4E-04	2.6E-04	1.2E-05	1.8E-04	1.9E-04	
FLUORENE	14.90				1.6E-05	2.7E-04	2.9E-04	3.3E-06	5.0E-05	5.3E-05	
INDENO(1,2,3-cd)PYRENE	4.61	5.1E-09	1.7E-08	2.2E-08	6.8E-06	2.3E-05	2.9E-05	1.4E-06	4.1E-06	5.5E-06	ELCR calculations are on the "OtherMut C" tab.
NAPHTHALENE	9.13				2.0E-05	3.3E-04	3.5E-04	4.0E-06	6.1E-05	6.5E-05	
PHENANTHRENE	44.27				6.5E-05	1.1E-03	1.1E-03	1.3E-05	2.0E-04	2.1E-04	

MassDEP ORS
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Trespasser All Properties Wetland Deep Sediment
Exposure Point Concentration (EPC)

Based on Trespasser Ages 11-18 (Cancer and Non-Cancer Chronic), and Ages 11-12 (Non-Cancer Subchronic)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 4.5E-07
Chronic HI (all chemicals) = 1.0E-02
Subchronic HI (all chemicals) = 1.0E-02

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
PYRENE	16.72				2.5E-05	4.1E-04	4.3E-04	4.9E-06	7.5E-05	8.0E-05	
PETROLEUM HYDROCARBONS: ALIPHATICS - C5 to C8											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C12											
PETROLEUM HYDROCARBONS: AROMATICS - C9 to C10											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C18	35.05				5.2E-05	5.1E-04	5.7E-04	1.0E-05	9.4E-05	1.0E-04	
PETROLEUM HYDROCARBONS: ALIPHATICS - C19 to C36	40.55				3.0E-06	3.0E-05	3.3E-05	2.0E-06	1.8E-05	2.0E-05	
PETROLEUM HYDROCARBONS: AROMATICS - C11 to C22	36.44				5.4E-05	8.9E-04	9.4E-04	1.1E-05	1.6E-04	1.7E-04	

MassDEP ORS
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Trespasser Tidelands Wetland Deep Sediment
Exposure Point Concentration (EPC)

Based on Trespasser Ages 11-18 (Cancer and Non-Cancer Chronic), and Ages 11-12 (Non-Cancer Subchronic)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 1.7E-07
Chronic HI (all chemicals) = 2.3E-03
Subchronic HI (all chemicals) = 3.5E-03

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
BENZENE											
ETHYLBENZENE											
TOLUENE											
XYLENES (Mixed Isomers)											
METHYLNAPHTHALENE, 2-	0.28				3.0E-06	5.0E-05	5.3E-06	6.1E-06	9.2E-05	9.9E-05	
ACENAPHTHENE	0.99				7.3E-07	1.2E-05	1.3E-05	4.4E-07	6.6E-06	7.1E-06	
ACENAPHTHYLENE	0.71				1.0E-06	1.7E-05	1.8E-05	2.1E-07	3.2E-06	3.4E-06	
ANTHRACENE	1.75				2.6E-07	4.3E-06	4.5E-06	1.5E-07	2.4E-06	2.5E-06	
BENZO(a)ANTHRACENE	2.75	3.0E-09	1.0E-08	1.3E-08	4.1E-06	1.3E-05	1.7E-05	8.1E-07	2.5E-06	3.3E-06	ELCR calculations are on the "OtherMut C" tab.
BENZO(a)PYRENE	2.70	3.0E-08	9.8E-08	1.3E-07	4.0E-04	1.3E-03	1.7E-03	8.0E-04	2.4E-03	3.2E-03	ELCR calculations are on the "OtherMut C" tab.
BENZO(b)FLUORANTHENE	1.41	1.5E-09	5.1E-09	6.6E-09	2.1E-06	6.9E-06	8.9E-06	4.1E-07	1.3E-06	1.7E-06	ELCR calculations are on the "OtherMut C" tab.
BENZO(g,h,i)PERYLENE	1.13				1.7E-06	2.8E-05	2.9E-05	3.3E-07	5.1E-06	5.4E-06	
BENZO(k)FLUORANTHENE	1.34	1.5E-10	4.9E-10	6.3E-10	2.0E-06	6.5E-06	8.5E-06	4.0E-07	1.2E-06	1.6E-06	ELCR calculations are on the "OtherMut C" tab.
CHRYSENE	2.95	3.2E-11	1.1E-10	1.4E-10	4.3E-06	1.4E-05	1.9E-05	8.7E-07	2.6E-06	3.5E-06	ELCR calculations are on the "OtherMut C" tab.
DIBENZO(a,h)ANTHRACENE	0.29	3.2E-09	1.1E-08	1.4E-08	4.3E-07	1.4E-06	1.9E-06	8.7E-08	2.6E-07	3.5E-07	ELCR calculations are on the "OtherMut C" tab.
FLUORANTHENE	4.75				5.2E-06	8.7E-05	9.2E-05	4.2E-06	6.4E-05	6.8E-05	
FLUORENE	0.75				8.3E-07	1.4E-05	1.5E-05	1.7E-07	2.5E-06	2.7E-06	
INDENO(1,2,3-cd)PYRENE	1.24	1.4E-09	4.5E-09	5.9E-09	1.8E-06	6.1E-06	7.9E-06	3.7E-07	1.1E-06	1.5E-06	ELCR calculations are on the "OtherMut C" tab.
NAPHTHALENE	0.30				6.6E-07	1.1E-05	1.2E-05	1.3E-07	2.0E-06	2.1E-06	
PHENANTHRENE	4.41				6.5E-06	1.1E-04	1.1E-04	1.3E-06	2.0E-05	2.1E-05	

MassDEP ORS
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Trespasser Tidelands Wetland Deep Sediment
Exposure Point Concentration (EPC)

Based on Trespasser Ages 11-18 (Cancer and Non-Cancer Chronic), and Ages 11-12 (Non-Cancer Subchronic)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 1.7E-07
Chronic HI (all chemicals) = 2.3E-03
Subchronic HI (all chemicals) = 3.5E-03

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
PYRENE	6.73				9.9E-06	1.6E-04	1.7E-04	2.0E-06	3.0E-05	3.2E-05	
PETROLEUM HYDROCARBONS: ALIPHATICS - C5 to C8											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C12											
PETROLEUM HYDROCARBONS: AROMATICS - C9 to C10											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C18											
PETROLEUM HYDROCARBONS: ALIPHATICS - C19 to C36											
PETROLEUM HYDROCARBONS: AROMATICS - C11 to C22											

Resident 39 Oakland Street Mudflat Deep Sediment
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 2.2E-09

Chronic HI (all chemicals) = 8.5E-06

Subchronic HI (all chemicals) = 1.9E-05

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
BENZENE											
ETHYLBENZENE											
TOLUENE											
XYLENES (Mixed Isomers)											
METHYLNAPHTHALENE, 2-	2.5E-03				8.0E-08	6.0E-07	6.8E-07	2.8E-07	1.6E-06	1.9E-06	
ACENAPHTHENE	5.8E-03				1.3E-08	9.4E-08	1.1E-07	1.3E-08	7.5E-08	8.8E-08	
ACENAPHTHYLENE	4.2E-03				1.8E-08	1.3E-07	1.5E-07	6.2E-09	3.6E-08	4.2E-08	
ANTHRACENE	8.9E-03				3.8E-09	2.9E-08	3.3E-08	4.0E-09	2.3E-08	2.7E-08	
BENZO(a)ANTHRACENE	5.5E-03	4.3E-11	9.3E-11	1.4E-10	2.4E-08	3.6E-08	5.9E-08	8.3E-09	9.4E-09	1.8E-08	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(a)PYRENE	5.1E-03	3.9E-10	8.5E-10	1.2E-09	2.2E-06	3.3E-06	5.5E-06	7.6E-06	8.6E-06	1.6E-05	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(b)FLUORANTHENE	3.4E-03	2.6E-11	5.6E-11	8.2E-11	1.5E-08	2.2E-08	3.6E-08	5.0E-09	5.7E-09	1.1E-08	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(g,h,i)PERYLENE	3.5E-03				1.5E-08	1.1E-07	1.3E-07	5.2E-09	3.0E-08	3.5E-08	
BENZO(k)FLUORANTHENE	4.4E-03	3.4E-12	7.4E-12	1.1E-11	1.9E-08	2.8E-08	4.7E-08	6.6E-09	7.5E-09	1.4E-08	**ELCR calculations are on the "OtherMut C" tab.**
CHRYSENE	7.4E-03	5.7E-13	1.2E-12	1.8E-12	3.2E-08	4.8E-08	8.0E-08	1.1E-08	1.3E-08	2.4E-08	**ELCR calculations are on the "OtherMut C" tab.**
DIBENZO(a,h)ANTHRACENE	2.5E-03	1.9E-10	4.1E-10	6.0E-10	1.1E-08	1.6E-08	2.7E-08	3.7E-09	4.2E-09	7.9E-09	**ELCR calculations are on the "OtherMut C" tab.**
FLUORANTHENE	1.1E-02				3.7E-08	2.7E-07	3.1E-07	5.1E-08	2.9E-07	3.4E-07	
FLUORENE	3.6E-03				1.2E-08	8.8E-08	9.9E-08	4.1E-09	2.3E-08	2.7E-08	

MassDEP ORS
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Resident 39 Oakland Street Mudflat Deep Sediment
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 2.2E-09

Chronic HI (all chemicals) = 8.5E-06

Subchronic HI (all chemicals) = 1.9E-05

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
INDENO(1,2,3-cd)PYRENE	3.1E-03	2.4E-11	5.1E-11	7.5E-11	1.3E-08	2.0E-08	3.3E-08	4.6E-09	5.2E-09	9.8E-09	**ELCR calculations are on the "OtherMut C" tab.**
NAPHTHALENE	3.4E-03				2.2E-08	1.7E-07	1.9E-07	7.7E-09	4.4E-08	5.1E-08	
PHENANTHRENE	1.4E-02				6.2E-08	4.6E-07	5.2E-07	2.1E-08	1.2E-07	1.4E-07	
PYRENE	1.5E-02				6.4E-08	4.8E-07	5.4E-07	2.2E-08	1.3E-07	1.5E-07	
PETROLEUM HYDROCARBONS: ALIPHATICS - C5 to C8											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C12											
PETROLEUM HYDROCARBONS: AROMATICS - C9 to C10											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C18											
PETROLEUM HYDROCARBONS: ALIPHATICS - C19 to C36											
PETROLEUM HYDROCARBONS: AROMATICS - C11 to C22											

MassDEP ORS
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Resident 4 Oakland Court Mudflat Deep Sediment
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 1.5E-06

Chronic HI (all chemicals) = 8.3E-03

Subchronic HI (all chemicals) = 1.7E-02

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
BENZENE											
ETHYLBENZENE											
TOLUENE											
XYLENES (Mixed Isomers)											
METHYLNAPHTHALENE, 2-	1.3E+00				4.3E-05	3.3E-04	3.7E-04	1.5E-04	8.6E-04	1.0E-03	
ACENAPHTHENE	1.5E+01				3.3E-05	2.4E-04	2.8E-04	3.4E-05	1.9E-04	2.3E-04	
ACENAPHTHYLENE	1.1E+00				4.8E-06	3.6E-05	4.1E-05	1.7E-06	9.5E-06	1.1E-05	
ANTHRACENE	9.1E+00				3.9E-06	2.9E-05	3.3E-05	4.1E-06	2.3E-05	2.7E-05	
BENZO(a)ANTHRACENE	6.3E+00	4.8E-08	1.1E-07	1.5E-07	2.7E-05	4.1E-05	6.8E-05	9.4E-06	1.1E-05	2.0E-05	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(a)PYRENE	4.6E+00	3.6E-07	7.7E-07	1.1E-06	2.0E-03	3.0E-03	5.0E-03	6.9E-03	7.9E-03	1.5E-02	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(b)FLUORANTHENE	2.0E+00	1.5E-08	3.3E-08	4.8E-08	8.5E-06	1.3E-05	2.1E-05	2.9E-06	3.4E-06	6.3E-06	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(g,h,i)PERYLENE	1.4E+00				5.9E-06	4.4E-05	5.0E-05	2.0E-06	1.2E-05	1.4E-05	
BENZO(k)FLUORANTHENE	2.3E+00	1.7E-09	3.8E-09	5.5E-09	9.8E-06	1.5E-05	2.4E-05	3.4E-06	3.9E-06	7.2E-06	**ELCR calculations are on the "OtherMut C" tab.**
CHRYSENE	6.4E+00	4.9E-10	1.1E-09	1.6E-09	2.7E-05	4.1E-05	6.9E-05	9.5E-06	1.1E-05	2.0E-05	**ELCR calculations are on the "OtherMut C" tab.**
DIBENZO(a,h)ANTHRACENE	4.3E-01	3.3E-08	7.2E-08	1.0E-07	1.8E-06	2.8E-06	4.6E-06	6.4E-07	7.3E-07	1.4E-06	**ELCR calculations are on the "OtherMut C" tab.**
FLUORANTHENE	1.1E+01				3.7E-05	2.8E-04	3.1E-04	5.1E-05	2.9E-04	3.4E-04	
FLUORENE	7.9E+00				2.5E-05	1.9E-04	2.2E-04	8.8E-06	5.0E-05	5.9E-05	

MassDEP ORS
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Resident 4 Oakland Court Mudflat Deep Sediment
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 1.5E-06

Chronic HI (all chemicals) = 8.3E-03

Subchronic HI (all chemicals) = 1.7E-02

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
INDENO(1,2,3-cd)PYRENE	1.3E+00	1.0E-08	2.2E-08	3.3E-08	5.8E-06	8.6E-06	1.4E-05	2.0E-06	2.3E-06	4.3E-06	**ELCR calculations are on the "OtherMut C" tab.**
NAPHTHALENE	2.8E+00				1.8E-05	1.4E-04	1.5E-04	6.3E-06	3.6E-05	4.2E-05	
PHENANTHRENE	2.9E+01				1.2E-04	9.3E-04	1.1E-03	4.3E-05	2.5E-04	2.9E-04	
PYRENE	1.7E+01				7.4E-05	5.5E-04	6.3E-04	2.6E-05	1.5E-04	1.7E-04	
PETROLEUM HYDROCARBONS: ALIPHATICS - C5 to C8											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C12											
PETROLEUM HYDROCARBONS: AROMATICS - C9 to C10											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C18											
PETROLEUM HYDROCARBONS: ALIPHATICS - C19 to C36											
PETROLEUM HYDROCARBONS: AROMATICS - C11 to C22											

MassDEP ORS
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Trespasser All Properties Mudflat Deep Sediment
Exposure Point Concentration (EPC)

Based on Trespasser Ages 11-18 (Cancer and Non-Cancer Chronic), and Ages 11-12 (Non-Cancer Subchronic)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 1.4E-07
Chronic HI (all chemicals) = 2.6E-03
Subchronic HI (all chemicals) = 3.3E-03

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
BENZENE											
ETHYLBENZENE											
TOLUENE											
XYLENES (Mixed Isomers)											
METHYLNAPHTHALENE, 2-	6.7E-01				7.4E-06	1.2E-04	1.3E-04	1.5E-05	2.3E-04	2.4E-04	
ACENAPHTHENE	7.5E+00				5.6E-06	9.2E-05	9.8E-05	3.3E-06	5.1E-05	5.4E-05	
ACENAPHTHYLENE	5.6E-01				8.3E-07	1.4E-05	1.4E-05	1.7E-07	2.5E-06	2.7E-06	
ANTHRACENE	4.6E+00				6.7E-07	1.1E-05	1.2E-05	4.0E-07	6.1E-06	6.5E-06	
BENZO(a)ANTHRACENE	3.1E+00	3.5E-09	1.1E-08	1.5E-08	4.6E-06	1.5E-05	2.0E-05	9.3E-07	2.8E-06	3.7E-06	ELCR calculations are on the "OtherMut C" tab.
BENZO(a)PYRENE	2.3E+00	2.5E-08	8.4E-08	1.1E-07	3.4E-04	1.1E-03	1.5E-03	6.8E-04	2.1E-03	2.8E-03	ELCR calculations are on the "OtherMut C" tab.
BENZO(b)FLUORANTHENE	9.9E-01	1.1E-09	3.6E-09	4.7E-09	1.5E-06	4.8E-06	6.3E-06	2.9E-07	8.8E-07	1.2E-06	ELCR calculations are on the "OtherMut C" tab.
BENZO(g,h,i)PERYLENE	6.8E-01				1.0E-06	1.7E-05	1.8E-05	2.0E-07	3.0E-06	3.2E-06	
BENZO(k)FLUORANTHENE	1.1E+00	1.2E-10	4.1E-10	5.4E-10	1.7E-06	5.5E-06	7.2E-06	3.3E-07	1.0E-06	1.4E-06	ELCR calculations are on the "OtherMut C" tab.
CHRYSENE	3.2E+00	3.5E-11	1.2E-10	1.5E-10	4.7E-06	1.6E-05	2.0E-05	9.4E-07	2.9E-06	3.8E-06	ELCR calculations are on the "OtherMut C" tab.
DIBENZO(a,h)ANTHRACENE	2.2E-01	2.4E-09	7.8E-09	1.0E-08	3.2E-07	1.1E-06	1.4E-06	6.3E-08	1.9E-07	2.6E-07	ELCR calculations are on the "OtherMut C" tab.
FLUORANTHENE	5.7E+00				6.3E-06	1.0E-04	1.1E-04	5.1E-06	7.7E-05	8.2E-05	
FLUORENE	3.9E+00				4.4E-06	7.2E-05	7.7E-05	8.7E-07	1.3E-05	1.4E-05	
INDENO(1,2,3-cd)PYRENE	6.7E-01	7.3E-10	2.4E-09	3.2E-09	9.9E-07	3.3E-06	4.3E-06	2.0E-07	6.0E-07	8.0E-07	ELCR calculations are on the "OtherMut C" tab.
NAPHTHALENE	1.4E+00				3.1E-06	5.1E-05	5.4E-05	6.2E-07	9.4E-06	1.0E-05	
PHENANTHRENE	1.4E+01				2.1E-05	3.5E-04	3.7E-04	4.2E-06	6.5E-05	6.9E-05	

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Trespasser All Properties Mudflat Deep Sediment
Exposure Point Concentration (EPC)

Based on Trespasser Ages 11-18 (Cancer and Non-Cancer Chronic), and Ages 11-12 (Non-Cancer Subchronic)

ELCR (all chemicals) = 1.4E-07
Chronic HI (all chemicals) = 2.6E-03
Subchronic HI (all chemicals) = 3.3E-03

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
PYRENE	8.6E+00				1.3E-05	2.1E-04	2.2E-04	2.5E-06	3.8E-05	4.1E-05	
PETROLEUM HYDROCARBONS: ALIPHATICS - C5 to C8											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C12											
PETROLEUM HYDROCARBONS: AROMATICS - C9 to C10											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C18											
PETROLEUM HYDROCARBONS: ALIPHATICS - C19 to C36											
PETROLEUM HYDROCARBONS: AROMATICS - C11 to C22											

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Park Visitor All Properties Mudflat Deep Sediment
Exposure Point Concentration (EPC)
Based on Visitor Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 2.2E-06

Chronic HI (all chemicals) = 1.2E-02

Subchronic HI (all chemicals) = 2.6E-02

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	$ELCR_{ingestion}$	$ELCR_{dermal}$	$ELCR_{total}$	Chronic HQ_{ing}	Chronic HQ_{derm}	Chronic HQ_{total}	Subchronic HQ_{ing}	Subchronic HQ_{derm}	Subchronic HQ_{total}	Notes
BENZENE											
ETHYLBENZENE											
TOLUENE											
XYLENES (Mixed Isomers)											
METHYLNAPHTHALENE, 2-	6.7E-01				6.5E-05	4.9E-04	5.6E-04	2.3E-04	1.3E-03	1.5E-03	
ACENAPHTHENE	7.5E+00				4.9E-05	3.7E-04	4.2E-04	5.1E-05	2.9E-04	3.4E-04	
ACENAPHTHYLENE	5.6E-01				7.3E-06	5.4E-05	6.2E-05	2.5E-06	1.4E-05	1.7E-05	
ANTHRACENE	4.6E+00				5.9E-06	4.4E-05	5.0E-05	6.1E-06	3.5E-05	4.1E-05	
BENZO(a)ANTHRACENE	3.1E+00	7.3E-08	1.6E-07	2.3E-07	4.1E-05	6.1E-05	1.0E-04	1.4E-05	1.6E-05	3.0E-05	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(a)PYRENE	2.3E+00	5.4E-07	1.2E-06	1.7E-06	3.0E-03	4.5E-03	7.5E-03	1.0E-02	1.2E-02	2.2E-02	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(b)FLUORANTHENE	9.9E-01	2.3E-08	5.0E-08	7.3E-08	1.3E-05	1.9E-05	3.2E-05	4.4E-06	5.0E-06	9.4E-06	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(g,h,i)PERYLENE	6.8E-01				8.8E-06	6.6E-05	7.5E-05	3.0E-06	1.7E-05	2.0E-05	
BENZO(k)FLUORANTHENE	1.1E+00	2.6E-09	5.7E-09	8.3E-09	1.5E-05	2.2E-05	3.7E-05	5.1E-06	5.8E-06	1.1E-05	**ELCR calculations are on the "OtherMut C" tab.**
CHRYSENE	3.2E+00	7.4E-10	1.6E-09	2.3E-09	4.1E-05	6.2E-05	1.0E-04	1.4E-05	1.6E-05	3.1E-05	**ELCR calculations are on the "OtherMut C" tab.**
DIBENZO(a,h)ANTHRACENE	2.2E-01	5.0E-08	1.1E-07	1.6E-07	2.8E-06	4.2E-06	7.0E-06	9.6E-07	1.1E-06	2.1E-06	**ELCR calculations are on the "OtherMut C" tab.**
FLUORANTHENE	5.7E+00				5.6E-05	4.2E-04	4.7E-04	7.7E-05	4.4E-04	5.2E-04	
FLUORENE	3.9E+00				3.8E-05	2.9E-04	3.3E-04	1.3E-05	7.5E-05	8.9E-05	

MassDEP ORS
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Park Visitor All Properties Mudflat Deep Sediment
Exposure Point Concentration (EPC)
Based on Visitor Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 2.2E-06

Chronic HI (all chemicals) = 1.2E-02

Subchronic HI (all chemicals) = 2.6E-02

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	$ELCR_{ingestion}$	$ELCR_{dermal}$	$ELCR_{total}$	Chronic HQ_{ing}	Chronic HQ_{derm}	Chronic HQ_{total}	Subchronic HQ_{ing}	Subchronic HQ_{derm}	Subchronic HQ_{total}	Notes
INDENO(1,2,3-cd)PYRENE	6.7E-01	1.5E-08	3.4E-08	4.9E-08	8.7E-06	1.3E-05	2.2E-05	3.0E-06	3.4E-06	6.4E-06	**ELCR calculations are on the "OtherMut C" tab.**
NAPHTHALENE	1.4E+00				2.7E-05	2.0E-04	2.3E-04	9.4E-06	5.3E-05	6.3E-05	
PHENANTHRENE	1.4E+01				1.9E-04	1.4E-03	1.6E-03	6.5E-05	3.7E-04	4.3E-04	
PYRENE	8.6E+00				1.1E-04	8.3E-04	9.4E-04	3.8E-05	2.2E-04	2.6E-04	
PETROLEUM HYDROCARBONS: ALIPHATICS - C5 to C8											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C12											
PETROLEUM HYDROCARBONS: AROMATICS - C9 to C10											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C18											
PETROLEUM HYDROCARBONS: ALIPHATICS - C19 to C36											
PETROLEUM HYDROCARBONS: AROMATICS - C11 to C22											

MassDEP ORS
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Resident - River Segment I_Deep Sediment
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 4.8E-06

Chronic HI (all chemicals) = 2.4E-02

Subchronic HI (all chemicals) = 5.2E-02

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
BENZENE											
ETHYLBENZENE											
TOLUENE											
XYLENES (Mixed Isomers)											
METHYLNAPHTHALENE, 2-	1.5E+00				4.8E-05	3.6E-04	4.0E-04	1.7E-04	9.4E-04	1.1E-03	
ACENAPHTHENE	2.8E+01				6.1E-05	4.6E-04	5.2E-04	6.3E-05	3.6E-04	4.2E-04	
ACENAPHTHYLENE	2.6E+00				1.1E-05	8.3E-05	9.4E-05	3.8E-06	2.2E-05	2.6E-05	
ANTHRACENE	2.0E+01				8.5E-06	6.3E-05	7.2E-05	8.8E-06	5.0E-05	5.9E-05	
BENZO(a)ANTHRACENE	1.5E+01	1.1E-07	2.5E-07	3.6E-07	6.3E-05	9.5E-05	1.6E-04	2.2E-05	2.5E-05	4.7E-05	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(a)PYRENE	1.5E+01	1.2E-06	2.5E-06	3.7E-06	6.5E-03	9.7E-03	1.6E-02	2.2E-02	2.6E-02	4.8E-02	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(b)FLUORANTHENE	7.4E+00	5.7E-08	1.2E-07	1.8E-07	3.2E-05	4.8E-05	7.9E-05	1.1E-05	1.3E-05	2.4E-05	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(g,h,i)PERYLENE	6.3E+00				2.7E-05	2.0E-04	2.3E-04	9.5E-06	5.4E-05	6.3E-05	
BENZO(k)FLUORANTHENE	9.1E+00	7.0E-09	1.5E-08	2.2E-08	3.9E-05	5.9E-05	9.8E-05	1.4E-05	1.6E-05	2.9E-05	**ELCR calculations are on the "OtherMut C" tab.**
CHRYSENE	1.5E+01	1.1E-09	2.5E-09	3.6E-09	6.3E-05	9.5E-05	1.6E-04	2.2E-05	2.5E-05	4.7E-05	**ELCR calculations are on the "OtherMut C" tab.**
DIBENZO(a,h)ANTHRACENE	1.5E+00	1.2E-07	2.6E-07	3.8E-07	6.6E-06	9.9E-06	1.7E-05	2.3E-06	2.6E-06	4.9E-06	**ELCR calculations are on the "OtherMut C" tab.**
FLUORANTHENE	3.6E+01				1.2E-04	8.6E-04	9.8E-04	1.6E-04	9.1E-04	1.1E-03	
FLUORENE	1.3E+01				4.3E-05	3.2E-04	3.7E-04	1.5E-05	8.5E-05	1.0E-04	

Resident - River Segment I_Deep Sediment
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 4.8E-06

Chronic HI (all chemicals) = 2.4E-02

Subchronic HI (all chemicals) = 5.2E-02

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
INDENO(1,2,3-cd)PYRENE	6.3E+00	4.9E-08	1.1E-07	1.6E-07	2.7E-05	4.1E-05	6.8E-05	9.5E-06	1.1E-05	2.0E-05	**ELCR calculations are on the "OtherMut C" tab.**
NAPHTHALENE	3.8E+00				2.5E-05	1.9E-04	2.1E-04	8.6E-06	4.9E-05	5.8E-05	
PHENANTHRENE	6.6E+01				2.8E-04	2.1E-03	2.4E-03	9.8E-05	5.6E-04	6.6E-04	
PYRENE	5.1E+01				2.2E-04	1.6E-03	1.9E-03	7.6E-05	4.3E-04	5.1E-04	
PETROLEUM HYDROCARBONS: ALIPHATICS - C5 to C8											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C12											
PETROLEUM HYDROCARBONS: AROMATICS - C9 to C10											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C18											
PETROLEUM HYDROCARBONS: ALIPHATICS - C19 to C36											
PETROLEUM HYDROCARBONS: AROMATICS - C11 to C22											

MassDEP ORS
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Resident - River Segment II_Deep Sediment
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 3.3E-05

Chronic HI (all chemicals) = 4.8E-01

Subchronic HI (all chemicals) = 9.7E-01

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
BENZENE											
ETHYLBENZENE	3.8E+01				3.3E-04	2.2E-04	5.4E-04	1.1E-03	5.8E-04	1.7E-03	
TOLUENE	9.0E-01				4.9E-06	3.3E-06	8.1E-06	1.7E-06	8.6E-07	2.5E-06	
XYLENES (Mixed Isomers)	2.6E+01				5.6E-05	3.7E-05	9.3E-05	9.6E-05	4.9E-05	1.5E-04	
METHYLNAPHTHALENE, 2-	263.99				8.5E-03	6.4E-02	7.2E-02	3.0E-02	1.7E-01	2.0E-01	
ACENAPHTHENE	392.13				8.5E-04	6.3E-03	7.2E-03	8.8E-04	5.0E-03	5.9E-03	
ACENAPHTHYLENE	18.68				8.1E-05	6.0E-04	6.8E-04	2.8E-05	1.6E-04	1.9E-04	
ANTHRACENE	207.36				8.9E-05	6.7E-04	7.6E-04	9.3E-05	5.3E-04	6.2E-04	
BENZO(a)ANTHRACENE	104.01	8.0E-07	1.7E-06	2.5E-06	4.5E-04	6.7E-04	1.1E-03	1.6E-04	1.8E-04	3.3E-04	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(a)PYRENE	97.39	7.5E-06	1.6E-05	2.4E-05	4.2E-02	6.3E-02	1.0E-01	1.5E-01	1.7E-01	3.1E-01	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(b)FLUORANTHENE	41.76	3.2E-07	7.0E-07	1.0E-06	1.8E-04	2.7E-04	4.5E-04	6.2E-05	7.1E-05	1.3E-04	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(g,h,i)PERYLENE	40.95				1.8E-04	1.3E-03	1.5E-03	6.1E-05	3.5E-04	4.1E-04	
BENZO(k)FLUORANTHENE	57.68	4.4E-08	9.7E-08	1.4E-07	2.5E-04	3.7E-04	6.2E-04	8.6E-05	9.8E-05	1.8E-04	**ELCR calculations are on the "OtherMut C" tab.**
CHRYSENE	109.35	8.4E-09	1.8E-08	2.7E-08	4.7E-04	7.1E-04	1.2E-03	1.6E-04	1.9E-04	3.5E-04	**ELCR calculations are on the "OtherMut C" tab.**
DIBENZO(a,h)ANTHRACENE	9.44	7.3E-07	1.6E-06	2.3E-06	4.1E-05	6.1E-05	1.0E-04	1.4E-05	1.6E-05	3.0E-05	**ELCR calculations are on the "OtherMut C" tab.**
FLUORANTHENE	236.64				7.7E-04	5.7E-03	6.5E-03	1.1E-03	6.0E-03	7.1E-03	
FLUORENE	149.23				4.8E-04	3.6E-03	4.1E-03	1.7E-04	9.5E-04	1.1E-03	

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Resident - River Segment II_Deep Sediment
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 3.3E-05

Chronic HI (all chemicals) = 4.8E-01

Subchronic HI (all chemicals) = 9.7E-01

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
INDENO(1,2,3-cd)PYRENE	36.69	2.8E-07	6.2E-07	9.0E-07	1.6E-04	2.4E-04	4.0E-04	5.5E-05	6.2E-05	1.2E-04	**ELCR calculations are on the "OtherMut C" tab.**
NAPHTHALENE	537.91				3.5E-03	2.6E-02	3.0E-02	1.2E-03	6.9E-03	8.1E-03	
PHENANTHRENE	611.45				2.6E-03	2.0E-02	2.2E-02	9.1E-04	5.2E-03	6.1E-03	
PYRENE	345.82				1.5E-03	1.1E-02	1.3E-02	5.2E-04	2.9E-03	3.5E-03	
PETROLEUM HYDROCARBONS: ALIPHATICS - C5 to C8											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C12											
PETROLEUM HYDROCARBONS: AROMATICS - C9 to C10											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C18	8.4E+02				3.6E-03	1.6E-02	2.0E-02	1.3E-03	4.3E-03	5.6E-03	
PETROLEUM HYDROCARBONS: ALIPHATICS - C19 to C36	8.8E+02				1.9E-04	8.5E-04	1.0E-03	2.2E-04	7.5E-04	9.7E-04	
PETROLEUM HYDROCARBONS: AROMATICS - C11 to C22	1.5E+03				6.3E-03	4.7E-02	5.3E-02	2.2E-03	1.2E-02	1.5E-02	
ARSENIC	1.1E+01	5.5E-07	1.6E-06	2.2E-06	8.0E-03	1.1E-02	1.9E-02	2.8E-02	2.8E-02	5.6E-02	
BARIUM	6.5E+01				1.4E-04	3.1E-04	4.5E-04	4.9E-04	8.3E-04	1.3E-03	
CADMIUM	3.8E-01				1.6E-04	7.4E-05	2.4E-04	5.7E-04	1.9E-04	7.6E-04	
CHROMIUM (TOTAL)	2.5E+01				3.5E-03	7.9E-03	1.1E-02	1.8E-03	3.1E-03	5.0E-03	**Cr(VI) limit is 200 mg/kg due to contact dermatitis.**
LEAD	2.7E+02				7.7E-02	2.1E-02	9.8E-02	2.7E-01	5.5E-02	3.2E-01	**Lead IH HQ limit is 1, not 10.**
MERCURY	8.1E-01				5.9E-04	2.6E-03	3.2E-03	2.0E-03	6.9E-03	9.0E-03	
NICKEL	1.3E+01				2.8E-04	1.3E-03	1.6E-03	9.9E-04	3.4E-03	4.4E-03	

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Resident - River Segment II_Deep Sediment
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 3.3E-05

Chronic HI (all chemicals) = 4.8E-01

Subchronic HI (all chemicals) = 9.7E-01

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
SELENIUM	6.2E-01				5.3E-05	1.2E-05	6.6E-05	1.9E-04	3.2E-05	2.2E-04	
SILVER	3.7E+00				3.2E-04	2.2E-03	2.5E-03	1.1E-03	5.7E-03	6.8E-03	
ZINC	1.8E+02				2.6E-04	5.9E-04	8.5E-04	9.1E-04	1.5E-03	2.5E-03	

Resident - River Segment III_Deep Sediment
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 3.4E-05

Chronic HI (all chemicals) = 5.4E-01

Subchronic HI (all chemicals) = 1.2E+00

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
BENZENE											
ETHYLBENZENE	2.6E+00				2.3E-05	1.5E-05	3.8E-05	7.8E-05	4.0E-05	1.2E-04	
TOLUENE											
XYLENES (Mixed Isomers)	8.3E-01				1.8E-06	1.2E-06	3.0E-06	3.1E-06	1.6E-06	4.7E-06	
METHYLNAPHTHALENE, 2-	1.7E+02				5.4E-03	4.0E-02	4.5E-02	1.9E-02	1.1E-01	1.2E-01	
ACENAPHTHENE	2.7E+02				5.9E-04	4.4E-03	5.0E-03	6.1E-04	3.5E-03	4.1E-03	
ACENAPHTHYLENE	1.4E+01				6.1E-05	4.6E-04	5.2E-04	2.1E-05	1.2E-04	1.4E-04	
ANTHRACENE	1.1E+02				4.9E-05	3.7E-04	4.2E-04	5.1E-05	2.9E-04	3.4E-04	
BENZO(a)ANTHRACENE	8.6E+01	6.6E-07	1.4E-06	2.1E-06	3.7E-04	5.5E-04	9.2E-04	1.3E-04	1.5E-04	2.7E-04	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(a)PYRENE	9.2E+01	7.1E-06	1.5E-05	2.2E-05	4.0E-02	5.9E-02	9.9E-02	1.4E-01	1.6E-01	2.9E-01	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(b)FLUORANTHENE	3.9E+01	3.0E-07	6.5E-07	9.5E-07	1.7E-04	2.5E-04	4.2E-04	5.8E-05	6.6E-05	1.2E-04	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(g,h,i)PERYLENE	3.7E+01				1.6E-04	1.2E-03	1.4E-03	5.6E-05	3.2E-04	3.7E-04	
BENZO(k)FLUORANTHENE	4.5E+01	3.5E-08	7.6E-08	1.1E-07	2.0E-04	2.9E-04	4.9E-04	6.8E-05	7.7E-05	1.5E-04	**ELCR calculations are on the "OtherMut C" tab.**
CHRYSENE	7.1E+01	5.5E-09	1.2E-08	1.7E-08	3.1E-04	4.6E-04	7.7E-04	1.1E-04	1.2E-04	2.3E-04	**ELCR calculations are on the "OtherMut C" tab.**
DIBENZO(a,h)ANTHRACENE	8.2E+00	6.3E-07	1.4E-06	2.0E-06	3.5E-05	5.3E-05	8.8E-05	1.2E-05	1.4E-05	2.6E-05	**ELCR calculations are on the "OtherMut C" tab.**
FLUORANTHENE	2.1E+02				6.7E-04	5.0E-03	5.7E-03	9.3E-04	5.3E-03	6.2E-03	
FLUORENE	1.0E+02				3.3E-04	2.5E-03	2.8E-03	1.2E-04	6.6E-04	7.7E-04	

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Resident - River Segment III_Deep Sediment
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 3.4E-05

Chronic HI (all chemicals) = 5.4E-01

Subchronic HI (all chemicals) = 1.2E+00

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
INDENO(1,2,3-cd)PYRENE	3.8E+01	2.9E-07	6.4E-07	9.3E-07	1.6E-04	2.4E-04	4.1E-04	5.7E-05	6.5E-05	1.2E-04	**ELCR calculations are on the "OtherMut C" tab.**
NAPHTHALENE	2.6E+02				1.7E-03	1.3E-02	1.4E-02	5.8E-04	3.3E-03	3.9E-03	
PHENANTHRENE	4.7E+02				2.0E-03	1.5E-02	1.7E-02	7.1E-04	4.0E-03	4.7E-03	
PYRENE	3.1E+02				1.3E-03	9.9E-03	1.1E-02	4.6E-04	2.6E-03	3.1E-03	
PETROLEUM HYDROCARBONS: ALIPHATICS - C5 to C8											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C12											
PETROLEUM HYDROCARBONS: AROMATICS - C9 to C10											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C18	2.0E+02				8.5E-04	3.8E-03	4.6E-03	2.9E-04	1.0E-03	1.3E-03	
PETROLEUM HYDROCARBONS: ALIPHATICS - C19 to C36	4.5E+02				9.8E-05	4.4E-04	5.4E-04	1.1E-04	3.9E-04	5.0E-04	
PETROLEUM HYDROCARBONS: AROMATICS - C11 to C22	9.1E+02				3.9E-03	2.9E-02	3.3E-02	1.4E-03	7.7E-03	9.1E-03	
ARSENIC	2.5E+01	1.3E-06	3.7E-06	5.0E-06	1.8E-02	2.5E-02	4.3E-02	6.3E-02	6.5E-02	1.3E-01	
BARIUM	1.2E+02				2.5E-04	5.7E-04	8.3E-04	8.8E-04	1.5E-03	2.4E-03	
CADMIUM	3.4E+00				1.5E-03	6.6E-04	2.1E-03	5.1E-03	1.7E-03	6.8E-03	
CHROMIUM (TOTAL)	1.8E+02				2.6E-02	5.8E-02	8.4E-02	1.3E-02	2.3E-02	3.6E-02	**Cr(VI) limit is 200 mg/kg due to contact dermatitis.**
LEAD	3.7E+02				1.1E-01	2.8E-02	1.3E-01	3.7E-01	7.5E-02	4.4E-01	**Lead IH HQ limit is 1, not 10.**
MERCURY	6.5E+00				4.6E-03	2.1E-02	2.5E-02	1.6E-02	5.5E-02	7.1E-02	
NICKEL	1.9E+01				4.1E-04	1.8E-03	2.2E-03	1.4E-03	4.9E-03	6.3E-03	

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Resident - River Segment III_Deep Sediment
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 3.4E-05

Chronic HI (all chemicals) = 5.4E-01

Subchronic HI (all chemicals) = 1.2E+00

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
SELENIUM											
SILVER	5.2E+00				4.5E-04	3.0E-03	3.5E-03	1.6E-03	8.0E-03	9.5E-03	
ZINC	3.4E+02				4.9E-04	1.1E-03	1.6E-03	1.7E-03	2.9E-03	4.6E-03	

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Park Visitor River Segment I Deep Sediment
Exposure Point Concentration (EPC)
Based on Visitor Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 1.4E-05

Chronic HI (all chemicals) = 7.2E-02

Subchronic HI (all chemicals) = 1.6E-01

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	$ELCR_{ingestion}$	$ELCR_{dermal}$	$ELCR_{total}$	Chronic HQ_{ing}	Chronic HQ_{derm}	Chronic HQ_{total}	Subchronic HQ_{ing}	Subchronic HQ_{derm}	Subchronic HQ_{total}	Notes
BENZENE											
ETHYLBENZENE											
TOLUENE											
XYLENES (Mixed Isomers)											
METHYLNAPHTHALENE, 2-	1.47				1.4E-04	1.1E-03	1.2E-03	5.0E-04	2.8E-03	3.3E-03	
ACENAPHTHENE	28.23				1.8E-04	1.4E-03	1.6E-03	1.9E-04	1.1E-03	1.3E-03	
ACENAPHTHYLENE	2.57				3.3E-05	2.5E-04	2.8E-04	1.2E-05	6.6E-05	7.7E-05	
ANTHRACENE	19.62				2.5E-05	1.9E-04	2.2E-04	2.6E-05	1.5E-04	1.8E-04	
BENZO(a)ANTHRACENE	14.70	3.4E-07	7.4E-07	1.1E-06	1.9E-04	2.9E-04	4.8E-04	6.6E-05	7.5E-05	1.4E-04	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(a)PYRENE	14.98	3.5E-06	7.6E-06	1.1E-05	1.9E-02	2.9E-02	4.9E-02	6.7E-02	7.6E-02	1.4E-01	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(b)FLUORANTHENE	7.37	1.7E-07	3.7E-07	5.4E-07	9.6E-05	1.4E-04	2.4E-04	3.3E-05	3.8E-05	7.1E-05	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(g,h,i)PERYLENE	6.32				8.2E-05	6.1E-04	7.0E-04	2.8E-05	1.6E-04	1.9E-04	
BENZO(k)FLUORANTHENE	9.13	2.1E-08	4.6E-08	6.7E-08	1.2E-04	1.8E-04	3.0E-04	4.1E-05	4.7E-05	8.7E-05	**ELCR calculations are on the "OtherMut C" tab.**
CHRYSENE	14.68	3.4E-09	7.4E-09	1.1E-08	1.9E-04	2.9E-04	4.8E-04	6.6E-05	7.5E-05	1.4E-04	**ELCR calculations are on the "OtherMut C" tab.**
DIBENZO(a,h)ANTHRACENE	1.54	3.6E-07	7.7E-07	1.1E-06	2.0E-05	3.0E-05	5.0E-05	6.9E-06	7.8E-06	1.5E-05	**ELCR calculations are on the "OtherMut C" tab.**
FLUORANTHENE	35.68				3.5E-04	2.6E-03	2.9E-03	4.8E-04	2.7E-03	3.2E-03	
FLUORENE	13.37				1.3E-04	9.7E-04	1.1E-03	4.5E-05	2.6E-04	3.0E-04	

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Park Visitor River Segment I Deep Sediment
Exposure Point Concentration (EPC)
Based on Visitor Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 1.4E-05

Chronic HI (all chemicals) = 7.2E-02

Subchronic HI (all chemicals) = 1.6E-01

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	$ELCR_{ingestion}$	$ELCR_{dermal}$	$ELCR_{total}$	Chronic HQ_{ing}	Chronic HQ_{derm}	Chronic HQ_{total}	Subchronic HQ_{ing}	Subchronic HQ_{derm}	Subchronic HQ_{total}	Notes
INDENO(1,2,3-cd)PYRENE	6.35	1.5E-07	3.2E-07	4.7E-07	8.2E-05	1.2E-04	2.1E-04	2.8E-05	3.2E-05	6.1E-05	**ELCR calculations are on the "OtherMut C" tab.**
NAPHTHALENE	3.83				7.5E-05	5.6E-04	6.3E-04	2.6E-05	1.5E-04	1.7E-04	
PHENANTHRENE	65.52				8.5E-04	6.4E-03	7.2E-03	2.9E-04	1.7E-03	2.0E-03	
PYRENE	50.92				6.6E-04	4.9E-03	5.6E-03	2.3E-04	1.3E-03	1.5E-03	
PETROLEUM HYDROCARBONS: ALIPHATICS - C5 to C8											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C12											
PETROLEUM HYDROCARBONS: AROMATICS - C9 to C10											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C18											
PETROLEUM HYDROCARBONS: ALIPHATICS - C19 to C36											
PETROLEUM HYDROCARBONS: AROMATICS - C11 to C22											

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Park Visitor River Segment II Deep Sediment
Exposure Point Concentration (EPC)
Based on Visitor Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 9.9E-05

Chronic HI (all chemicals) = 1.4E+00

Subchronic HI (all chemicals) = 2.9E+00

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	$ELCR_{ingestion}$	$ELCR_{dermal}$	$ELCR_{total}$	Chronic HQ_{ing}	Chronic HQ_{derm}	Chronic HQ_{total}	Subchronic HQ_{ing}	Subchronic HQ_{derm}	Subchronic HQ_{total}	Notes
BENZENE											
ETHYLBENZENE	3.8E+01				9.8E-04	6.6E-04	1.6E-03	3.4E-03	1.7E-03	5.1E-03	
TOLUENE	9.0E-01				1.5E-05	9.8E-06	2.4E-05	5.0E-06	2.6E-06	7.6E-06	
XYLENES (Mixed Isomers)	2.6E+01				1.7E-04	1.1E-04	2.8E-04	2.9E-04	1.5E-04	4.4E-04	
METHYLNAPHTHALENE, 2-	263.99				2.6E-02	1.9E-01	2.2E-01	8.9E-02	5.1E-01	5.9E-01	
ACENAPHTHENE	392.13				2.5E-03	1.9E-02	2.2E-02	2.6E-03	1.5E-02	1.8E-02	
ACENAPHTHYLENE	18.68				2.4E-04	1.8E-03	2.1E-03	8.4E-05	4.8E-04	5.6E-04	
ANTHRACENE	207.36				2.7E-04	2.0E-03	2.3E-03	2.8E-04	1.6E-03	1.9E-03	
BENZO(a)ANTHRACENE	104.01	2.4E-06	5.2E-06	7.7E-06	1.3E-03	2.0E-03	3.4E-03	4.7E-04	5.3E-04	1.0E-03	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(a)PYRENE	97.39	2.3E-05	4.9E-05	7.2E-05	1.3E-01	1.9E-01	3.2E-01	4.4E-01	5.0E-01	9.3E-01	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(b)FLUORANTHENE	41.76	9.7E-07	2.1E-06	3.1E-06	5.4E-04	8.1E-04	1.4E-03	1.9E-04	2.1E-04	4.0E-04	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(g,h,i)PERYLENE	40.95				5.3E-04	4.0E-03	4.5E-03	1.8E-04	1.0E-03	1.2E-03	
BENZO(k)FLUORANTHENE	57.68	1.3E-07	2.9E-07	4.2E-07	7.5E-04	1.1E-03	1.9E-03	2.6E-04	2.9E-04	5.5E-04	**ELCR calculations are on the "OtherMut C" tab.**
CHRYSENE	109.35	2.5E-08	5.5E-08	8.0E-08	1.4E-03	2.1E-03	3.5E-03	4.9E-04	5.6E-04	1.0E-03	**ELCR calculations are on the "OtherMut C" tab.**
DIBENZO(a,h)ANTHRACENE	9.44	2.2E-06	4.8E-06	6.9E-06	1.2E-04	1.8E-04	3.1E-04	4.2E-05	4.8E-05	9.0E-05	**ELCR calculations are on the "OtherMut C" tab.**
FLUORANTHENE	236.64				2.3E-03	1.7E-02	2.0E-02	3.2E-03	1.8E-02	2.1E-02	
FLUORENE	149.23				1.5E-03	1.1E-02	1.2E-02	5.0E-04	2.9E-03	3.4E-03	

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Park Visitor River Segment II Deep Sediment
Exposure Point Concentration (EPC)
Based on Visitor Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 9.9E-05

Chronic HI (all chemicals) = 1.4E+00

Subchronic HI (all chemicals) = 2.9E+00

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	$ELCR_{ingestion}$	$ELCR_{dermal}$	$ELCR_{total}$	Chronic HQ_{ing}	Chronic HQ_{derm}	Chronic HQ_{total}	Subchronic HQ_{ing}	Subchronic HQ_{derm}	Subchronic HQ_{total}	Notes
INDENO(1,2,3-cd)PYRENE	36.69	8.5E-07	1.9E-06	2.7E-06	4.8E-04	7.1E-04	1.2E-03	1.6E-04	1.9E-04	3.5E-04	**ELCR calculations are on the "OtherMut C" tab.**
NAPHTHALENE	537.91				1.0E-02	7.8E-02	8.9E-02	3.6E-03	2.1E-02	2.4E-02	
PHENANTHRENE	611.45				7.9E-03	5.9E-02	6.7E-02	2.7E-03	1.6E-02	1.8E-02	
PYRENE	345.82				4.5E-03	3.4E-02	3.8E-02	1.5E-03	8.8E-03	1.0E-02	
PETROLEUM HYDROCARBONS: ALIPHATICS - C5 to C8											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C12											
PETROLEUM HYDROCARBONS: AROMATICS - C9 to C10											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C18	8.4E+02				1.1E-02	4.9E-02	6.0E-02	3.8E-03	1.3E-02	1.7E-02	
PETROLEUM HYDROCARBONS: ALIPHATICS - C19 to C36	8.8E+02				5.7E-04	2.6E-03	3.1E-03	6.6E-04	2.2E-03	2.9E-03	
PETROLEUM HYDROCARBONS: AROMATICS - C11 to C22	1.5E+03				1.9E-02	1.4E-01	1.6E-01	6.5E-03	3.7E-02	4.4E-02	
ARSENIC	1.1E+01	1.7E-06	4.9E-06	6.5E-06	2.4E-02	3.2E-02	5.6E-02	8.3E-02	8.5E-02	1.7E-01	
BARIUM	6.5E+01				4.2E-04	9.4E-04	1.4E-03	1.5E-03	2.5E-03	3.9E-03	
CADMIUM	3.8E-01				4.9E-04	2.2E-04	7.1E-04	1.7E-03	5.8E-04	2.3E-03	
CHROMIUM (TOTAL)	2.5E+01				1.1E-02	2.4E-02	3.5E-02	5.5E-03	9.4E-03	1.5E-02	**Cr(VI) limit is 200 mg/kg due to contact dermatitis.**
LEAD	2.7E+02				2.3E-01	6.2E-02	2.9E-01	8.0E-01	1.6E-01	9.6E-01	**Lead IH HQ limit is 1, not 10.**
MERCURY	8.1E-01				1.8E-03	7.9E-03	9.7E-03	6.1E-03	2.1E-02	2.7E-02	
NICKEL	1.3E+01				8.6E-04	3.8E-03	4.7E-03	3.0E-03	1.0E-02	1.3E-02	

Park Visitor River Segment II Deep Sediment
Exposure Point Concentration (EPC)
Based on Visitor Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 9.9E-05

Chronic HI (all chemicals) = 1.4E+00

Subchronic HI (all chemicals) = 2.9E+00

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	$ELCR_{ingestion}$	$ELCR_{dermal}$	$ELCR_{total}$	Chronic			Subchronic			Notes
					HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
SELENIUM	6.2E-01				1.6E-04	3.6E-05	2.0E-04	5.6E-04	9.5E-05	6.5E-04	
SILVER	3.7E+00				9.6E-04	6.5E-03	7.4E-03	3.3E-03	1.7E-02	2.0E-02	
ZINC	1.8E+02				7.9E-04	1.8E-03	2.6E-03	2.7E-03	4.6E-03	7.4E-03	

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Park Visitor River Segment III Deep Sediment
Exposure Point Concentration (EPC)
Based on Visitor Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 1.0E-04

Chronic HI (all chemicals) = 1.6E+00

Subchronic HI (all chemicals) = 3.5E+00

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	$ELCR_{ingestion}$	$ELCR_{dermal}$	$ELCR_{total}$	Chronic HQ_{ing}	Chronic HQ_{derm}	Chronic HQ_{total}	Subchronic HQ_{ing}	Subchronic HQ_{derm}	Subchronic HQ_{total}	Notes
BENZENE											
ETHYLBENZENE	2.6E+00				6.8E-05	4.6E-05	1.1E-04	2.3E-04	1.2E-04	3.6E-04	
TOLUENE											
XYLENES (Mixed Isomers)	8.3E-01				5.4E-06	3.6E-06	9.0E-06	9.3E-06	4.8E-06	1.4E-05	
METHYLNAPHTHALENE, 2-	165.57				1.6E-02	1.2E-01	1.4E-01	5.6E-02	3.2E-01	3.7E-01	
ACENAPHTHENE	271.96				1.8E-03	1.3E-02	1.5E-02	1.8E-03	1.0E-02	1.2E-02	
ACENAPHTHYLENE	14.17				1.8E-04	1.4E-03	1.6E-03	6.3E-05	3.6E-04	4.2E-04	
ANTHRACENE	114.46				1.5E-04	1.1E-03	1.3E-03	1.5E-04	8.8E-04	1.0E-03	
BENZO(a)ANTHRACENE	85.66	2.0E-06	4.3E-06	6.3E-06	1.1E-03	1.7E-03	2.8E-03	3.8E-04	4.4E-04	8.2E-04	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(a)PYRENE	91.90	2.1E-05	4.6E-05	6.8E-05	1.2E-01	1.8E-01	3.0E-01	4.1E-01	4.7E-01	8.8E-01	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(b)FLUORANTHENE	38.65	9.0E-07	1.9E-06	2.8E-06	5.0E-04	7.5E-04	1.3E-03	1.7E-04	2.0E-04	3.7E-04	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(g,h,i)PERYLENE	37.22				4.8E-04	3.6E-03	4.1E-03	1.7E-04	9.5E-04	1.1E-03	
BENZO(k)FLUORANTHENE	45.40	1.1E-07	2.3E-07	3.3E-07	5.9E-04	8.8E-04	1.5E-03	2.0E-04	2.3E-04	4.4E-04	**ELCR calculations are on the "OtherMut C" tab.**
CHRYSENE	71.44	1.7E-08	3.6E-08	5.3E-08	9.3E-04	1.4E-03	2.3E-03	3.2E-04	3.6E-04	6.8E-04	**ELCR calculations are on the "OtherMut C" tab.**
DIBENZO(a,h)ANTHRACENE	8.18	1.9E-06	4.1E-06	6.0E-06	1.1E-04	1.6E-04	2.6E-04	3.7E-05	4.2E-05	7.8E-05	**ELCR calculations are on the "OtherMut C" tab.**
FLUORANTHENE	207.77				2.0E-03	1.5E-02	1.7E-02	2.8E-03	1.6E-02	1.9E-02	
FLUORENE	103.11				1.0E-03	7.5E-03	8.5E-03	3.5E-04	2.0E-03	2.3E-03	

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Park Visitor River Segment III Deep Sediment
Exposure Point Concentration (EPC)
Based on Visitor Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 1.0E-04

Chronic HI (all chemicals) = 1.6E+00

Subchronic HI (all chemicals) = 3.5E+00

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	$ELCR_{ingestion}$	$ELCR_{dermal}$	$ELCR_{total}$	Chronic HQ_{ing}	Chronic HQ_{derm}	Chronic HQ_{total}	Subchronic HQ_{ing}	Subchronic HQ_{derm}	Subchronic HQ_{total}	Notes
INDENO(1,2,3-cd)PYRENE	37.88	8.8E-07	1.9E-06	2.8E-06	4.9E-04	7.4E-04	1.2E-03	1.7E-04	1.9E-04	3.6E-04	**ELCR calculations are on the "OtherMut C" tab.**
NAPHTHALENE	258.98				5.0E-03	3.8E-02	4.3E-02	1.7E-03	9.9E-03	1.2E-02	
PHENANTHRENE	472.22				6.1E-03	4.6E-02	5.2E-02	2.1E-03	1.2E-02	1.4E-02	
PYRENE	308.25				4.0E-03	3.0E-02	3.4E-02	1.4E-03	7.9E-03	9.2E-03	
PETROLEUM HYDROCARBONS: ALIPHATICS - C5 to C8											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C12											
PETROLEUM HYDROCARBONS: AROMATICS - C9 to C10											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C18	2.0E+02				2.5E-03	1.1E-02	1.4E-02	8.8E-04	3.0E-03	3.9E-03	
PETROLEUM HYDROCARBONS: ALIPHATICS - C19 to C36	4.5E+02				2.9E-04	1.3E-03	1.6E-03	3.4E-04	1.2E-03	1.5E-03	
PETROLEUM HYDROCARBONS: AROMATICS - C11 to C22	9.1E+02				1.2E-02	8.8E-02	1.0E-01	4.1E-03	2.3E-02	2.7E-02	
ARSENIC	2.5E+01	3.8E-06	1.1E-05	1.5E-05	5.5E-02	7.4E-02	1.3E-01	1.9E-01	1.9E-01	3.8E-01	
BARIUM	1.2E+02				7.7E-04	1.7E-03	2.5E-03	2.6E-03	4.5E-03	7.2E-03	
CADMIUM	3.4E+00				4.4E-03	2.0E-03	6.4E-03	1.5E-02	5.2E-03	2.1E-02	
CHROMIUM (TOTAL)	1.8E+02				7.7E-02	1.7E-01	2.5E-01	4.0E-02	6.9E-02	1.1E-01	**Cr(VI) limit is 200 mg/kg due to contact dermatitis.**
LEAD	3.7E+02				3.2E-01	8.5E-02	4.0E-01	1.1E+00	2.2E-01	1.3E+00	**Lead IH HQ limit is 1, not 10.**
MERCURY	6.5E+00				1.4E-02	6.3E-02	7.7E-02	4.8E-02	1.6E-01	2.1E-01	
NICKEL	1.9E+01				1.2E-03	5.5E-03	6.8E-03	4.3E-03	1.5E-02	1.9E-02	

Park Visitor River Segment III Deep Sediment
Exposure Point Concentration (EPC)
Based on Visitor Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 1.0E-04

Chronic HI (all chemicals) = 1.6E+00

Subchronic HI (all chemicals) = 3.5E+00

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	$ELCR_{ingestion}$	$ELCR_{dermal}$	$ELCR_{total}$	Chronic			Subchronic			Notes
					HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
SELENIUM											
SILVER	5.2E+00				1.4E-03	9.1E-03	1.0E-02	4.7E-03	2.4E-02	2.9E-02	
ZINC	3.4E+02				1.5E-03	3.3E-03	4.8E-03	5.1E-03	8.7E-03	1.4E-02	

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Park Visitor Site-Wide River Deep Sediment
Exposure Point Concentration (EPC)
Based on Visitor Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 9.6E-05

Chronic HI (all chemicals) = 1.8E+00

Subchronic HI (all chemicals) = 3.5E+00

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	$ELCR_{ingestion}$	$ELCR_{dermal}$	$ELCR_{total}$	Chronic HQ_{ing}	Chronic HQ_{derm}	Chronic HQ_{total}	Subchronic HQ_{ing}	Subchronic HQ_{derm}	Subchronic HQ_{total}	Notes
BENZENE											
ETHYLBENZENE	3.8E+01				9.8E-04	6.6E-04	1.6E-03	3.4E-03	1.7E-03	5.1E-03	
TOLUENE	9.0E-01				1.5E-05	9.8E-06	2.4E-05	5.0E-06	2.6E-06	7.6E-06	
XYLENES (Mixed Isomers)	2.6E+01				1.7E-04	1.1E-04	2.8E-04	2.9E-04	1.5E-04	4.4E-04	
METHYLNAPHTHALENE, 2-	192.66				1.9E-02	1.4E-01	1.6E-01	6.5E-02	3.7E-01	4.3E-01	
ACENAPHTHENE	300.33				1.9E-03	1.5E-02	1.7E-02	2.0E-03	1.1E-02	1.4E-02	
ACENAPHTHYLENE	14.96				1.9E-04	1.5E-03	1.6E-03	6.7E-05	3.8E-04	4.5E-04	
ANTHRACENE	146.56				1.9E-04	1.4E-03	1.6E-03	2.0E-04	1.1E-03	1.3E-03	
BENZO(a)ANTHRACENE	86.32	2.0E-06	4.4E-06	6.4E-06	1.1E-03	1.7E-03	2.8E-03	3.9E-04	4.4E-04	8.3E-04	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(a)PYRENE	86.04	2.0E-05	4.3E-05	6.3E-05	1.1E-01	1.7E-01	2.8E-01	3.9E-01	4.4E-01	8.2E-01	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(b)FLUORANTHENE	36.67	8.5E-07	1.8E-06	2.7E-06	4.8E-04	7.1E-04	1.2E-03	1.6E-04	1.9E-04	3.5E-04	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(g,h,i)PERYLENE	35.56				4.6E-04	3.5E-03	3.9E-03	1.6E-04	9.1E-04	1.1E-03	
BENZO(k)FLUORANTHENE	47.06	1.1E-07	2.4E-07	3.5E-07	6.1E-04	9.1E-04	1.5E-03	2.1E-04	2.4E-04	4.5E-04	**ELCR calculations are on the "OtherMut C" tab.**
CHRYSENE	82.58	1.9E-08	4.2E-08	6.1E-08	1.1E-03	1.6E-03	2.7E-03	3.7E-04	4.2E-04	7.9E-04	**ELCR calculations are on the "OtherMut C" tab.**
DIBENZO(a,h)ANTHRACENE	8.03	1.9E-06	4.1E-06	5.9E-06	1.0E-04	1.6E-04	2.6E-04	3.6E-05	4.1E-05	7.7E-05	**ELCR calculations are on the "OtherMut C" tab.**
FLUORANTHENE	202.24				2.0E-03	1.5E-02	1.7E-02	2.7E-03	1.5E-02	1.8E-02	
FLUORENE	114.41				1.1E-03	8.3E-03	9.4E-03	3.8E-04	2.2E-03	2.6E-03	

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Park Visitor Site-Wide River Deep Sediment
Exposure Point Concentration (EPC)
Based on Visitor Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 9.6E-05

Chronic HI (all chemicals) = 1.8E+00

Subchronic HI (all chemicals) = 3.5E+00

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	$ELCR_{ingestion}$	$ELCR_{dermal}$	$ELCR_{total}$	Chronic HQ_{ing}	Chronic HQ_{derm}	Chronic HQ_{total}	Subchronic HQ_{ing}	Subchronic HQ_{derm}	Subchronic HQ_{total}	Notes
INDENO(1,2,3-cd)PYRENE	33.91	7.9E-07	1.7E-06	2.5E-06	4.4E-04	6.6E-04	1.1E-03	1.5E-04	1.7E-04	3.3E-04	**ELCR calculations are on the "OtherMut C" tab.**
NAPHTHALENE	358.58				7.0E-03	5.2E-02	5.9E-02	2.4E-03	1.4E-02	1.6E-02	
PHENANTHRENE	491.58				6.4E-03	4.8E-02	5.4E-02	2.2E-03	1.3E-02	1.5E-02	
PYRENE	297.43				3.9E-03	2.9E-02	3.3E-02	1.3E-03	7.6E-03	8.9E-03	
PETROLEUM HYDROCARBONS: ALIPHATICS - C5 to C8											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C12											
PETROLEUM HYDROCARBONS: AROMATICS - C9 to C10											
PETROLEUM HYDROCARBONS: ALIPHATICS - C9 to C18	8.4E+02				1.1E-02	4.9E-02	6.0E-02	3.8E-03	1.3E-02	1.7E-02	
PETROLEUM HYDROCARBONS: ALIPHATICS - C19 to C36	8.8E+02				5.7E-04	2.6E-03	3.1E-03	6.6E-04	2.2E-03	2.9E-03	
PETROLEUM HYDROCARBONS: AROMATICS - C11 to C22	1.5E+03				1.9E-02	1.4E-01	1.6E-01	6.5E-03	3.7E-02	4.4E-02	
ARSENIC	2.5E+01	3.8E-06	1.1E-05	1.5E-05	5.5E-02	7.4E-02	1.3E-01	1.9E-01	1.9E-01	3.8E-01	
BARIUM	1.2E+02				7.7E-04	1.7E-03	2.5E-03	2.6E-03	4.5E-03	7.2E-03	
CADMIUM	3.4E+00				4.4E-03	2.0E-03	6.4E-03	1.5E-02	5.2E-03	2.1E-02	
CHROMIUM (TOTAL)	1.8E+02				7.7E-02	1.7E-01	2.5E-01	4.0E-02	6.9E-02	1.1E-01	**Cr(VI) limit is 200 mg/kg due to contact dermatitis.**
LEAD	3.7E+02				3.2E-01	8.5E-02	4.0E-01	1.1E+00	2.2E-01	1.3E+00	**Lead IH HQ limit is 1, not 10.**
MERCURY	6.5E+00				1.4E-02	6.3E-02	7.7E-02	4.8E-02	1.6E-01	2.1E-01	
NICKEL	1.9E+01				1.2E-03	5.5E-03	6.8E-03	4.3E-03	1.5E-02	1.9E-02	

Park Visitor Site-Wide River Deep Sediment
Exposure Point Concentration (EPC)
Based on Visitor Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 9.6E-05

Chronic HI (all chemicals) = 1.8E+00

Subchronic HI (all chemicals) = 3.5E+00

****Do not insert or delete any rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	$ELCR_{ingestion}$	$ELCR_{dermal}$	$ELCR_{total}$	Chronic			Subchronic			Notes
					HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
SELENIUM	6.2E-01				1.6E-04	3.6E-05	2.0E-04	5.6E-04	9.5E-05	6.5E-04	
SILVER	5.2E+00				1.4E-03	9.1E-03	1.0E-02	4.7E-03	2.4E-02	2.9E-02	
ZINC	3.4E+02				1.5E-03	3.3E-03	4.8E-03	5.1E-03	8.7E-03	1.4E-02	

Resident 35 Water Street Upland Surface Soil
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 1.0E-05

Chronic HI (all chemicals) = 1.9E-01

Subchronic HI (all chemicals) = 4.3E-01

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
PETROLEUM HYDROCARBONS: ALIPHATICS - C5 to C8	2.5E+01				1.3E-03	2.3E-03	3.6E-03	4.6E-04	5.9E-04	1.1E-03	
BENZENE	2.6E-01	4.8E-09	1.4E-09	6.2E-09	1.4E-04	3.5E-05	1.8E-04	1.9E-04	3.7E-05	2.3E-04	
BIPHENYL, 1,1-	4.0E-02	1.1E-10	1.1E-10	2.1E-10	1.7E-07	1.5E-07	3.2E-07	6.0E-07	3.8E-07	9.8E-07	
ACENAPHTHYLENE	4.3E-01				9.3E-06	2.6E-05	3.5E-05	3.2E-06	6.8E-06	1.0E-05	
ANTHRACENE	8.6E-01				1.9E-06	5.2E-06	7.1E-06	1.9E-06	4.1E-06	6.0E-06	
BENZO(a)ANTHRACENE	3.9E+00	1.5E-07	8.4E-08	2.3E-07	8.4E-05	4.7E-05	1.3E-04	2.9E-05	1.2E-05	4.1E-05	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(a)PYRENE	4.5E+00	1.7E-06	9.5E-07	2.7E-06	9.6E-03	5.4E-03	1.5E-02	3.3E-02	1.4E-02	4.7E-02	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(b)FLUORANTHENE	4.8E+00	1.8E-07	1.0E-07	2.9E-07	1.0E-04	5.8E-05	1.6E-04	3.6E-05	1.5E-05	5.1E-05	**ELCR calculations are on the "OtherMut C" tab.**
BENZO(g,h,i)PERYLENE	3.8E+00				8.2E-05	2.3E-04	3.1E-04	2.8E-05	6.0E-05	8.9E-05	
BENZO(k)FLUORANTHENE	3.7E+00	1.4E-08	8.0E-09	2.2E-08	8.1E-05	4.5E-05	1.3E-04	2.8E-05	1.2E-05	4.0E-05	**ELCR calculations are on the "OtherMut C" tab.**
CHRYSENE	4.7E+00	1.8E-09	1.0E-09	2.8E-09	1.0E-04	5.7E-05	1.6E-04	3.5E-05	1.5E-05	5.0E-05	**ELCR calculations are on the "OtherMut C" tab.**
DIBENZO(a,h)ANTHRACENE	7.2E-01	2.8E-07	1.5E-07	4.3E-07	1.6E-05	8.7E-06	2.4E-05	5.4E-06	2.3E-06	7.7E-06	**ELCR calculations are on the "OtherMut C" tab.**
FLUORANTHENE	9.1E+00				1.5E-04	4.1E-04	5.6E-04	2.0E-04	4.3E-04	6.4E-04	
FLUORENE	2.6E-01				4.2E-06	1.2E-05	1.6E-05	1.5E-06	3.1E-06	4.5E-06	
INDENO(1,2,3-cd)PYRENE	3.8E+00	1.5E-07	8.1E-08	2.3E-07	8.2E-05	4.6E-05	1.3E-04	2.8E-05	1.2E-05	4.0E-05	**ELCR calculations are on the "OtherMut C" tab.**
NAPHTHALENE	3.0E-01				9.7E-06	2.7E-05	3.7E-05	3.4E-06	7.1E-06	1.0E-05	
PHENANTHRENE	4.3E+00				9.3E-05	2.6E-04	3.5E-04	3.2E-05	6.8E-05	1.0E-04	

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Resident 35 Water Street Upland Surface Soil
Exposure Point Concentration (EPC)

Based on Resident Ages 1-31 (Cancer), 1-8 (Chronic Noncancer), and 1-2 (Subchronic Noncancer)

Shortforms Version June 2024

Method 3 Lookup Tables Version v0624

ELCR (all chemicals) = 1.0E-05

Chronic HI (all chemicals) = 1.9E-01

Subchronic HI (all chemicals) = 4.3E-01

****Do Not Insert Or Delete Any Rows****

Click on empty cell below and select OHM using arrow.

Oil or Hazardous Material	EPC (mg/kg)	Cancer			Chronic			Subchronic			Notes
		$ELCR_{ing}$	$ELCR_{derm}$	$ELCR_{total}$	HQ_{ing}	HQ_{derm}	HQ_{total}	HQ_{ing}	HQ_{derm}	HQ_{total}	
PYRENE	1.0E+01				2.2E-04	6.3E-04	8.5E-04	7.7E-05	1.6E-04	2.4E-04	
PETROLEUM HYDROCARBONS: ALIPHATICS - C19 to C36	2.3E+01				2.5E-05	4.2E-05	6.6E-05	2.9E-05	3.6E-05	6.5E-05	
PETROLEUM HYDROCARBONS: AROMATICS - C11 to C22	8.2E+01				1.8E-03	5.0E-03	6.7E-03	6.1E-04	1.3E-03	1.9E-03	
ARSENIC	1.5E+01	3.8E-06	2.3E-06	6.1E-06	5.5E-02	2.8E-02	8.3E-02	1.9E-01	7.3E-02	2.6E-01	
BARIUM	1.2E+02				1.3E-03	1.1E-03	2.3E-03	4.4E-03	2.8E-03	7.2E-03	
CADMIUM	1.1E+00				2.3E-03	3.8E-04	2.7E-03	7.8E-03	1.0E-03	8.8E-03	
CHROMIUM(VI)	3.8E+01				2.8E-02	2.3E-02	5.1E-02	1.4E-02	9.1E-03	2.3E-02	**Cr(VI) limit is 200 mg/kg due to contact dermatitis.**
LEAD											**Lead IH HQ limit is 1, not 10.**
MERCURY	2.3E+00				8.4E-03	1.4E-02	2.2E-02	2.9E-02	3.7E-02	6.6E-02	
SELENIUM	2.6E+00				1.1E-03	9.5E-05	1.2E-03	3.9E-03	2.5E-04	4.2E-03	
SILVER	7.3E-01				3.2E-04	7.9E-04	1.1E-03	1.1E-03	2.1E-03	3.2E-03	

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Att_A_21. SUBCHRONIC RISK CALCULATIONS
Future Construction Worker (Wetland Maximum Sediment Concentrations)
Amesbury Former MGP
Amesbury, MA

	Exposure Point Concentrations		Subchronic Average Daily Dose and Exposure Estimates				Subchronic Hazard Index Estimates		Total Subchronic Hazard Index Estimates		
CHEMICAL	Soil (mg/kg)	Sediment (mg/kg)	Soil Ingestion (mg/kg/day)	Soil Dermal (mg/kg/day)	Sediment Ingestion (mg/kg/day)	Sediment Dermal (mg/kg/day)	Sediment Ingestion	Sediment Dermal	Soil	Sediment	All Media
Volatile Organic Compounds											
Benzene		3.12E-01			3.89E-07	4.14E-07	4E-05	4E-05		8.E-05	8.E-05
1,2-Dichloroethylene (cis)		8.19E+01			1.02E-04	3.62E-04	1E-03	4E-03		5.E-03	5.E-03
Ethylbenzene		6.82E-01			8.50E-07	9.04E-07	2E-05	2E-05		4.E-05	4.E-05
Toluene											
Vinyl chloride		1.32E+01			1.64E-05	5.84E-05	5E-03	2E-02		2.E-02	2.E-02
Xylenes (mixed isomers)		2.91E-01			3.62E-07	3.86E-07	9E-07	1E-06		2.E-06	2.E-06
Petroleum Hydrocarbon Fractions											
VPH											
C5-C8 Aliphatic											
C9-C12 Aliphatic		3.48E+01			4.33E-05	3.08E-04	4E-05	3E-04		4.E-04	4.E-04
C9-C10 Aromatic		3.00E+01			3.74E-05	2.65E-04	1E-04	9E-04		1.E-03	1.E-03
EPH											
C9-C18 Aliphatic		8.61E+01			1.07E-04	7.61E-04	1E-04	8E-04		9.E-04	9.E-04
C19-C36 Aliphatic		3.02E+02			3.76E-04	2.67E-03	6E-05	4E-04		5.E-04	5.E-04
C11-C22 Aromatic		5.66E+02			2.12E-04	2.50E-03	7E-04	8E-03		9.E-03	9.E-03
Semivolatile Organic Compounds											
Non-Carcinogenic PAHs											
Acenaphthene		1.77E+02			6.61E-05	7.82E-04	3E-04	4E-03		4.E-03	4.E-03
Acenaphthylene		1.44E+01			5.37E-06	6.36E-05	2E-05	2E-04		2.E-04	2.E-04
Anthracene		1.19E+02			4.45E-05	5.26E-04	4E-05	5E-04		6.E-04	6.E-04
Benzo(ghi)perylene		4.87E+01			1.82E-05	2.15E-04	6E-05	7E-04		8.E-04	8.E-04
Fluoranthene		1.99E+02			7.44E-05	8.80E-04	7E-04	9E-03		1.E-02	1.E-02
Fluorene		7.10E+01			2.65E-05	3.14E-04	7E-05	8E-04		9.E-04	9.E-04
2-Methylnaphthalene		3.63E+01			1.36E-05	1.60E-04	3E-03	4E-02		4.E-02	4.E-02
Naphthalene		9.75E+01			3.64E-05	4.31E-04	2E-04	2E-03		2.E-03	2.3E-03
Phenanthrene		3.89E+02			1.45E-04	1.72E-03	5E-04	6E-03		6.E-03	6.E-03
Pyrene		3.06E+02			1.14E-04	1.35E-03	4E-04	5E-03		5.E-03	5.E-03
Carcinogenic PAHs											
Benz(a)anthracene		6.69E+01			2.50E-05	5.91E-05	8E-05	2E-04		3.E-04	3.E-04
Benzo(a)pyrene		8.08E+01			3.02E-05	7.14E-05	1E-01	*2E-01*		*3.E-01*	*3.E-01*
Benzo(b)fluoranthene		3.89E+01			1.45E-05	3.44E-05	5E-05	1E-04		2.E-04	2.E-04
Benzo(k)fluoranthene		3.75E+01			1.40E-05	3.32E-05	5E-05	1E-04		2.E-04	2.E-04
Chrysene		5.56E+01			2.08E-05	4.92E-05	7E-05	2E-04		2.E-04	2.E-04
Dibenz(ah)anthracene		1.10E+01			4.11E-06	9.73E-06	1E-05	3E-05		5.E-05	5.E-05
Indeno(1,2,3-cd)pyrene		3.77E+01			1.41E-05	3.33E-05	5E-05	1E-04		2.E-04	2.E-04
Metals											
Arsenic		7.10E+01			4.42E-05	9.42E-05	1E-01	*3E-01*		*5.E-01*	*5.E-01*
Barium		1.07E+02			1.33E-04	4.73E-04	7E-04	2E-03		3.E-03	3.E-03
Cadmium (in soil, sediment, or tissue)		7.00E+00			4.36E-06	3.09E-06	9E-03	6E-03		1.E-02	1.E-02
Chromium, total (assumes 1:6 ratio Cr VI:Cr III)		2.54E+02			3.16E-04	1.01E-03	2E-04	7E-04		9.E-04	9.E-04
Lead		3.50E+02			2.18E-04	9.28E-05	*3E-01*	1E-01		*4.E-01*	*4.E-01*
Mercury		1.00E+00			6.23E-07	4.42E-06	2E-03	1E-02		2.E-02	2.E-02
Nickel		9.10E+01			1.13E-04	8.05E-04	6E-03	4E-02		5.E-02	5.E-02
Selenium		4.00E+00			4.98E-06	1.77E-06	1E-03	4E-04		1.E-03	1.E-03
Silver		1.10E+01			1.37E-05	1.46E-04	3E-03	3E-02		3.E-02	3.E-02
Zinc		5.35E+02			6.66E-04	2.37E-03	2E-03	8E-03		1.E-02	1.E-02

Pathway Risks		Media Risks		Total
6E-01	*9E-01*	---	*1E+00*	1.E+00

Att_A_21. CANCER RISK CALCULATIONS
Future Construction Worker (Wetland Maximum Sediment Concentrations)
Amesbury Former MGP
Amesbury, MA

	Exposure Point Concentrat		Average Daily Dose (lifetime) Estimates				Carcinogenic Risk Estimates				Total Carcinogenic Risk Estimates		
CHEMICAL	Soil (mg/kg)	Sediment (mg/kg)	Soil Ingestion (mg/kg/day)	Soil Dermal (mg/kg/day)	Sediment Ingestion (mg/kg/day)	Sediment Dermal (mg/kg/day)	Soil Ingestion	Soil Dermal	Sediment Ingestion	Sediment Dermal	Soil	Sediment	All Media
Volatile Organic Compounds													
Benzene		3.12E-01			2.78E-09	2.96E-09			2.E-10	2.E-10		3.E-10	3.E-10
1,2-Dichloroethylene (cis)		8.19E+01			---	---			---	---		---	---
Ethylbenzene		6.82E-01			---	---			---	---		---	---
Toluene													
Vinyl chloride		1.32E+01			1.80E-07	6.69E-07			3.E-07	1.E-06		1.E-06	1.E-06
Xylenes (mixed isomers)		2.91E-01			---	---			---	---		---	---
Petroleum Hydrocarbon Fractions													
VPH													
C5-C8 Aliphatic													
C9-C12 Aliphatic		3.48E+01			---	---			---	---		---	---
C9-C10 Aromatic		3.00E+01			---	---			---	---		---	---
EPH													
C9-C18 Aliphatic		8.61E+01			---	---			---	---		---	---
C19-C36 Aliphatic		3.02E+02			---	---			---	---		---	---
C11-C22 Aromatic		5.66E+02			---	---			---	---		---	---
Semivolatile Organic Compounds													
Non-Carcinogenic PAHs													
Acenaphthene		1.77E+02			---	---			---	---		---	---
Acenaphthylene		1.44E+01			---	---			---	---		---	---
Anthracene		1.19E+02			---	---			---	---		---	---
Benzo(ghi)perylene		4.87E+01			---	---			---	---		---	---
Fluoranthene		1.99E+02			---	---			---	---		---	---
Fluorene		7.10E+01			---	---			---	---		---	---
2-Methylnaphthalene		3.63E+01			---	---			---	---		---	---
Naphthalene		9.75E+01			---	---			---	---		---	---
Phenanthrene		3.89E+02			---	---			---	---		---	---
Pyrene		3.06E+02			---	---			---	---		---	---
Carcinogenic PAHs													
Benz(a)anthracene		6.69E+01			1.79E-07	4.24E-07			2.E-08	4.E-08		6.E-08	6.E-08
Benzo(a)pyrene		8.08E+01			2.16E-07	5.12E-07			2.E-07	5.E-07		7.E-07	7.E-07
Benzo(b)fluoranthene		3.89E+01			1.04E-07	2.46E-07			1.E-08	2.E-08		4.E-08	4.E-08
Benzo(k)fluoranthene		3.75E+01			1.00E-07	2.37E-07			1.E-09	2.E-09		3.E-09	3.E-09
Chrysene		5.56E+01			1.49E-07	3.52E-07			1.E-09	4.E-09		5.E-09	5.E-09
Dibenz(ah)anthracene		1.10E+01			2.94E-08	6.97E-08			3.E-08	7.E-08		1.E-07	1.E-07
Indeno(1,2,3-cd)pyrene		3.77E+01			1.01E-07	2.39E-07			1.E-08	2.E-08		3.E-08	3.E-08
Metals													
Arsenic		7.10E+01			3.17E-07	6.74E-07			5.E-07	1.E-06		1.E-06	1.E-06
Barium		1.07E+02			---	---			---	---		---	---
Cadmium (in soil, sediment, or tissue)		7.00E+00			3.12E-08	2.22E-08			---	---		---	---
Chromium, total (assumes 1:6 ratio Cr VI:		2.54E+02			---	---			---	---		---	---
Lead		3.50E+02			---	---			---	---		---	---
Mercury		1.00E+00			---	---			---	---		---	---
Nickel		9.10E+01			8.12E-07	5.76E-06			---	---		---	---
Selenium		4.00E+00			---	---			---	---		---	---
Silver		1.10E+01			---	---			---	---		---	---
Zinc		5.35E+02			---	---			---	---		---	---

Pathway Risks				Media Risks		Total
---	---	1E-06	*3E-06*	---	*3.73E-06*	*4.E-06*

Att_A_22. SUBCHRONIC RISK CALCULATIONS
Future Construction Worker (Maximum Sediment Concentrations for Mudflat and River Surface Sediment)
Amesbury Former MGP
Amesbury, MA

	Exposure Point Concentrations		Subchronic Average Daily Dose and Exposure Estimates				Subchronic Hazard Index Estimates		Total Subchronic Hazard Index Estimates		
CHEMICAL	Soil (mg/kg)	Sediment (mg/kg)	Soil Ingestion (mg/kg/day)	Soil Dermal (mg/kg/day)	Sediment Ingestion (mg/kg/day)	Sediment Dermal (mg/kg/day)	Sediment Ingestion	Sediment Dermal	Soil	Sediment	All Media
Volatile Organic Compounds											
Benzene											
1,2-Dichloroethylene (cis)											
Ethylbenzene											
Toluene											
Vinyl chloride											
Xylenes (mixed isomers)											
Petroleum Hydrocarbon Fractions											
VPH											
C5-C8 Aliphatic											
C9-C12 Aliphatic											
C9-C10 Aromatic											
EPH											
C9-C18 Aliphatic		5.68E+02			7.08E-04	5.02E-03	7E-04	5E-03		6.E-03	6.E-03
C19-C36 Aliphatic		1.22E+03			1.52E-03	1.08E-02	3E-04	2E-03		2.E-03	2.E-03
C11-C22 Aromatic		7.30E+02			2.73E-04	3.23E-03	9E-04	1E-02		1.E-02	1.E-02
Semivolatile Organic Compounds											
Non-Carcinogenic PAHs											
Acenaphthene		3.30E+02			1.23E-04	1.46E-03	6E-04	7E-03		8.E-03	8.E-03
Acenaphthylene		2.31E+01			8.63E-06	1.02E-04	3E-05	3E-04		4.E-04	4.E-04
Anthracene		2.00E+02			7.47E-05	8.84E-04	7E-05	9E-04		1.E-03	1.E-03
Benzo(ghi)perylene		6.97E+01			2.60E-05	3.08E-04	9E-05	1E-03		1.E-03	1.E-03
Fluoranthene		3.19E+02			1.19E-04	1.41E-03	1E-03	1E-02		2.E-02	2.E-02
Fluorene		1.51E+02			5.64E-05	6.68E-04	1E-04	2E-03		2.E-03	2.E-03
2-Methylnaphthalene		1.11E+02			4.15E-05	4.91E-04	1E-02	1E-01		1.E-01	1.E-01
Naphthalene		1.83E+02			6.84E-05	8.09E-04	3E-04	4E-03		4.E-03	4.4E-03
Phenanthrene		6.65E+02			2.49E-04	2.94E-03	8E-04	1E-02		1.E-02	1.E-02
Pyrene		4.88E+02			1.82E-04	2.16E-03	6E-04	7E-03		8.E-03	8.E-03
Carcinogenic PAHs											
Benz(a)anthracene		1.62E+02			6.05E-05	1.43E-04	2E-04	5E-04		7.E-04	7.E-04
Benzo(a)pyrene		1.54E+02			5.75E-05	1.36E-04	*2E-01*	*5E-01*		*6.E-01*	*6.E-01*
Benzo(b)fluoranthene		6.75E+01			2.52E-05	5.97E-05	8E-05	2E-04		3.E-04	3.E-04
Benzo(k)fluoranthene		9.84E+01			3.68E-05	8.70E-05	1E-04	3E-04		4.E-04	4.E-04
Chrysene		1.52E+02			5.68E-05	1.34E-04	2E-04	4E-04		6.E-04	6.E-04
Dibenz(ah)anthracene		1.45E+01			5.42E-06	1.28E-05	2E-05	4E-05		6.E-05	6.E-05
Indeno(1,2,3-cd)pyrene		5.55E+01			2.07E-05	4.91E-05	7E-05	2E-04		2.E-04	2.E-04
Metals											
Arsenic		1.70E+01			1.06E-05	2.25E-05	4E-02	8E-02		1.E-01	1.E-01
Barium		7.70E+01			9.59E-05	3.40E-04	5E-04	2E-03		2.E-03	2.E-03
Cadmium (in soil, sediment, or tissue)		2.00E+00			1.25E-06	8.84E-07	2E-03	2E-03		4.E-03	4.E-03
Chromium, total (assumes 1:6 ratio Cr VI:Cr III)		2.27E+02			2.83E-04	9.03E-04	2E-04	6E-04		8.E-04	8.E-04
Lead		2.74E+02			1.71E-04	7.27E-05	*2E-01*	1E-01		*3.E-01*	*3.E-01*
Mercury		1.00E+00			6.23E-07	4.42E-06	2E-03	1E-02		2.E-02	2.E-02
Nickel		1.05E+02			1.31E-04	9.28E-04	7E-03	5E-02		5.E-02	5.E-02
Selenium		2.80E-01			3.49E-07	1.24E-07	7E-05	2E-05		9.E-05	9.E-05
Silver		4.65E+00			5.79E-06	6.17E-05	1E-03	1E-02		1.E-02	1.E-02
Zinc		2.82E+02			3.51E-04	1.25E-03	1E-03	4E-03		5.E-03	5.E-03

Pathway Risks		Media Risks		Total
5E-01	*9E-01*	---	*1E+00*	1.E+00

Att_A_22. CANCER RISK CALCULATIONS
Future Construction Worker (Maximum Sediment Concentrations for Mudflat and River Surface Sediment)
Amesbury Former MGP
Amesbury, MA

	Exposure Point Concentrat		Average Daily Dose (lifetime) Estimates				Carcinogenic Risk Estimates				Total Carcinogenic Risk Estimates		
CHEMICAL	Soil (mg/kg)	Sediment (mg/kg)	Soil Ingestion (mg/kg/day)	Soil Dermal (mg/kg/day)	Sediment Ingestion (mg/kg/day)	Sediment Dermal (mg/kg/day)	Soil Ingestion	Soil Dermal	Sediment Ingestion	Sediment Dermal	Soil	Sediment	All Media
Volatile Organic Compounds													
Benzene													
1,2-Dichloroethylene (cis)													
Ethylbenzene													
Toluene													
Vinyl chloride													
Xylenes (mixed isomers)													
Petroleum Hydrocarbon Fractions													
VPH													
C5-C8 Aliphatic													
C9-C12 Aliphatic													
C9-C10 Aromatic													
EPH													
C9-C18 Aliphatic		5.68E+02	---	---			---	---			---	---	---
C19-C36 Aliphatic		1.22E+03	---	---			---	---			---	---	---
C11-C22 Aromatic		7.30E+02	---	---			---	---			---	---	---
Semivolatile Organic Compounds													
Non-Carcinogenic PAHs													
Acenaphthene		3.30E+02	---	---			---	---			---	---	---
Acenaphthylene		2.31E+01	---	---			---	---			---	---	---
Anthracene		2.00E+02	---	---			---	---			---	---	---
Benzo(ghi)perylene		6.97E+01	---	---			---	---			---	---	---
Fluoranthene		3.19E+02	---	---			---	---			---	---	---
Fluorene		1.51E+02	---	---			---	---			---	---	---
2-Methylnaphthalene		1.11E+02	---	---			---	---			---	---	---
Naphthalene		1.83E+02	---	---			---	---			---	---	---
Phenanthrene		6.65E+02	---	---			---	---			---	---	---
Pyrene		4.88E+02	---	---			---	---			---	---	---
Carcinogenic PAHs													
Benz(a)anthracene		1.62E+02			4.34E-07	1.03E-06			4.E-08	1.E-07		1.E-07	1.E-07
Benzo(a)pyrene		1.54E+02			4.12E-07	9.75E-07			4.E-07	1.E-06		1.E-06	1.E-06
Benzo(b)fluoranthene		6.75E+01			1.81E-07	4.27E-07			2.E-08	4.E-08		6.E-08	6.E-08
Benzo(k)fluoranthene		9.84E+01			2.63E-07	6.23E-07			3.E-09	6.E-09		9.E-09	9.E-09
Chrysene		1.52E+02			4.07E-07	9.63E-07			4.E-09	1.E-08		1.E-08	1.E-08
Dibenz(ah)anthracene		1.45E+01			3.88E-08	9.18E-08			4.E-08	9.E-08		1.E-07	1.E-07
Indeno(1,2,3-cd)pyrene		5.55E+01			1.49E-07	3.51E-07			1.E-08	4.E-08		5.E-08	5.E-08
Metals													
Arsenic		1.70E+01			7.58E-08	1.61E-07			1.E-07	2.E-07		4.E-07	4.E-07
Barium		7.70E+01			---	---			---	---		---	---
Cadmium (in soil, sediment, or tissue)		2.00E+00			8.92E-09	6.33E-09			---	---		---	---
Chromium, total (assumes 1:6 ratio Cr VI:		2.27E+02			---	---			---	---		---	---
Lead		2.74E+02			---	---			---	---		---	---
Mercury		1.00E+00			---	---			---	---		---	---
Nickel		1.05E+02			9.37E-07	6.65E-06			---	---		---	---
Selenium		2.80E-01			---	---			---	---		---	---
Silver		4.65E+00			---	---			---	---		---	---
Zinc		2.82E+02			---	---			---	---		---	---

Pathway Risks				Media Risks		Total
---	---	6E-07	*2E-06*	---	*2.15E-06*	*2.E-06*

Att_A_23. SUBCHRONIC RISK CALCULATIONS
Emergency Utility Worker (Maximum Sediment Concentrations)
Amesbury Former MGP
Amesbury, MA

	Exposure Point Concentrations		Subchronic Average Daily Dose and Exposure Estimates				Subchronic Hazard Index Estimates		Total Subchronic Hazard Index Estimates		
CHEMICAL	Soil (mg/kg)	Sediment (mg/kg)	Soil Ingestion (mg/kg/day)	Soil Dermal (mg/kg/day)	Sediment Ingestion (mg/kg/day)	Sediment Dermal (mg/kg/day)	Sediment Ingestion	Sediment Dermal	Soil	Sediment	All Media
Volatile Organic Compounds											
Benzene		1.20E+00			6.16E-09	6.72E-09	6E-07	7E-07		1.E-06	1.E-06
1,2-Dichloroethylene (cis)		8.19E+01			4.20E-07	1.53E-06	4E-06	2E-05		2.E-05	2.E-05
Ethylbenzene		3.77E+01			1.94E-07	2.11E-07	4E-06	4E-06		8.E-06	8.E-06
Toluene		9.00E-01			4.62E-09	5.04E-09	6E-09	6E-09		1.E-08	1.E-08
Vinyl chloride		1.32E+01			6.78E-08	2.47E-07	2E-05	8E-05		1.E-04	1.E-04
Xylenes (mixed isomers)		2.58E+01			1.32E-07	1.45E-07	3E-07	4E-07		7.E-07	7.E-07
Petroleum Hydrocarbon Fractions											
VPH											
C5-C8 Aliphatic											
C9-C12 Aliphatic		3.48E+01			1.79E-07	1.30E-06	2E-07	1E-06		1.E-06	1.E-06
C9-C10 Aromatic		1.52E+02			7.80E-07	5.68E-06	3E-06	2E-05		2.E-05	2.E-05
EPH											
C9-C18 Aliphatic		8.44E+02			4.33E-06	3.15E-05	4E-06	3E-05		4.E-05	4.E-05
C19-C36 Aliphatic		1.22E+03			6.26E-06	4.56E-05	1E-06	8E-06		9.E-06	9.E-06
C11-C22 Aromatic		4.66E+03			7.18E-06	8.70E-05	2E-05	3E-04		3.E-04	3.E-04
Semivolatile Organic Compounds											
Non-Carcinogenic PAHs											
Acenaphthene		9.26E+03			1.43E-05	1.73E-04	7E-05	9E-04		9.E-04	9.E-04
Acenaphthylene		4.87E+02			7.50E-07	9.10E-06	2E-06	3E-05		3.E-05	3.E-05
Anthracene		4.23E+03			6.51E-06	7.90E-05	7E-06	8E-05		9.E-05	9.E-05
Benzo(ghi)perylene		1.27E+03			1.96E-06	2.37E-05	7E-06	8E-05		9.E-05	9.E-05
Fluoranthene		6.74E+03			1.04E-05	1.26E-04	1E-04	1E-03		1.E-03	1.E-03
Fluorene		3.54E+03			5.45E-06	6.61E-05	1E-05	2E-04		2.E-04	2.E-04
2-Methylnaphthalene		5.80E+03			8.93E-06	1.08E-04	2E-03	3E-02		3.E-02	3.E-02
Naphthalene		9.48E+03			1.46E-05	1.77E-04	7E-05	9E-04		1.E-03	9.6E-04
Phenanthrene		1.62E+04			2.49E-05	3.03E-04	8E-05	1E-03		1.E-03	1.E-03
Pyrene		1.04E+04			1.60E-05	1.94E-04	5E-05	6E-04		7.E-04	7.E-04
Carcinogenic PAHs											
Benz(a)anthracene		2.70E+03			4.16E-06	1.01E-05	1E-05	3E-05		5.E-05	5.E-05
Benzo(a)pyrene		3.05E+03			4.70E-06	1.14E-05	2E-02	4E-02		5.E-02	5.E-02
Benzo(b)fluoranthene		1.32E+03			2.03E-06	4.93E-06	7E-06	2E-05		2.E-05	2.E-05
Benzo(k)fluoranthene		1.49E+03			2.29E-06	5.57E-06	8E-06	2E-05		3.E-05	3.E-05
Chrysene		2.22E+03			3.42E-06	8.29E-06	1E-05	3E-05		4.E-05	4.E-05
Dibenz(ah)anthracene		2.85E+02			4.39E-07	1.06E-06	1E-06	4E-06		5.E-06	5.E-06
Indeno(1,2,3-cd)pyrene		1.28E+03			1.97E-06	4.78E-06	7E-06	2E-05		2.E-05	2.E-05
Metals											
Arsenic		7.10E+01			1.82E-07	3.98E-07	6E-04	1E-03		2.E-03	2.E-03
Barium		1.18E+02			6.06E-07	2.20E-06	3E-06	1E-05		1.E-05	1.E-05
Cadmium (in soil, sediment, or tissue)		7.00E+00			1.80E-08	1.31E-08	4E-05	3E-05		6.E-05	6.E-05
Chromium, total (assumes 1:6 ratio Cr VI:Cr III)		2.54E+02			1.30E-06	4.27E-06	9E-07	3E-06		4.E-06	4.E-06
Lead		3.67E+02			9.42E-07	4.11E-07	1E-03	5E-04		2.E-03	2.E-03
Mercury		6.45E+00			1.66E-08	1.20E-07	6E-05	4E-04		5.E-04	5.E-04
Nickel		1.05E+02			5.39E-07	3.92E-06	3E-05	2E-04		2.E-04	2.E-04
Selenium		4.00E+00			2.05E-08	7.47E-09	4E-06	1E-06		6.E-06	6.E-06
Silver		1.10E+01			5.65E-08	6.16E-07	1E-05	1E-04		1.E-04	1.E-04
Zinc		5.35E+02			2.75E-06	9.99E-06	9E-06	3E-05		4.E-05	4.E-05

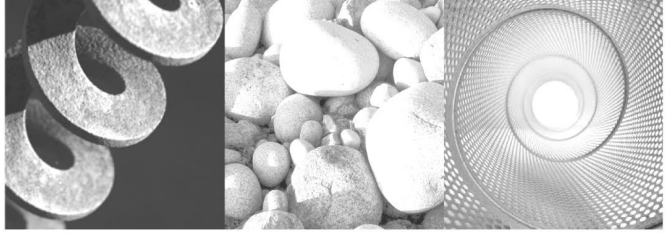
Pathway Risks		Media Risks		Total
2E-02	7E-02	---	9E-02	9.E-02

Att_A_23. CANCER RISK CALCULATIONS
Emergency Utility Worker (Maximum Sediment Concentrations)
Amesbury Former MGP
Amesbury, MA

	Exposure Point Concentrat		Average Daily Dose (lifetime) Estimates				Carcinogenic Risk Estimates				Total Carcinogenic Risk Estimates		
CHEMICAL	Soil (mg/kg)	Sediment (mg/kg)	Soil Ingestion (mg/kg/day)	Soil Dermal (mg/kg/day)	Sediment Ingestion (mg/kg/day)	Sediment Dermal (mg/kg/day)	Soil Ingestion	Soil Dermal	Sediment Ingestion	Sediment Dermal	Soil	Sediment	All Media
Volatile Organic Compounds													
Benzene		1.20E+00			9.02E-11	9.61E-11			5.E-12	5.E-12		1.E-11	1.E-11
1,2-Dichloroethylene (cis)		8.19E+01			---	---			---	---		---	---
Ethylbenzene		3.77E+01			---	---			---	---		---	---
Toluene		9.00E-01			---	---			---	---		---	---
Vinyl chloride		1.32E+01			1.52E-09	5.64E-09			2.E-09	8.E-09		1.E-08	1.E-08
Xylenes (mixed isomers)		2.58E+01			---	---			---	---		---	---
Petroleum Hydrocarbon Fractions													
VPH													
C5-C8 Aliphatic													
C9-C12 Aliphatic		3.48E+01			---	---			---	---		---	---
C9-C10 Aromatic		1.52E+02			---	---			---	---		---	---
EPH													
C9-C18 Aliphatic		8.44E+02			---	---			---	---		---	---
C19-C36 Aliphatic		1.22E+03			---	---			---	---		---	---
C11-C22 Aromatic		4.66E+03			---	---			---	---		---	---
Semivolatile Organic Compounds													
Non-Carcinogenic PAHs													
Acenaphthene		9.26E+03			---	---			---	---		---	---
Acenaphthylene		4.87E+02			---	---			---	---		---	---
Anthracene		4.23E+03			---	---			---	---		---	---
Benzo(ghi)perylene		1.27E+03			---	---			---	---		---	---
Fluoranthene		6.74E+03			---	---			---	---		---	---
Fluorene		3.54E+03			---	---			---	---		---	---
2-Methylnaphthalene		5.80E+03			---	---			---	---		---	---
Naphthalene		9.48E+03			---	---			---	---		---	---
Phenanthrene		1.62E+04			---	---			---	---		---	---
Pyrene		1.04E+04			---	---			---	---		---	---
Carcinogenic PAHs													
Benz(a)anthracene		2.70E+03			6.09E-08	1.44E-07			6.E-09	1.E-08		2.E-08	2.E-08
Benzo(a)pyrene		3.05E+03			6.88E-08	1.63E-07			7.E-08	2.E-07		2.E-07	2.E-07
Benzo(b)fluoranthene		1.32E+03			2.98E-08	7.04E-08			3.E-09	7.E-09		1.E-08	1.E-08
Benzo(k)fluoranthene		1.49E+03			3.36E-08	7.95E-08			3.E-10	8.E-10		1.E-09	1.E-09
Chrysene		2.22E+03			5.01E-08	1.18E-07			5.E-10	1.E-09		2.E-09	2.E-09
Dibenz(ah)anthracene		2.85E+02			6.43E-09	1.52E-08			6.E-09	2.E-08		2.E-08	2.E-08
Indeno(1,2,3-cd)pyrene		1.28E+03			2.89E-08	6.83E-08			3.E-09	7.E-09		1.E-08	1.E-08
Metals													
Arsenic		7.10E+01			2.67E-09	5.68E-09			4.E-09	9.E-09		1.E-08	1.E-08
Barium		1.18E+02			---	---			---	---		---	---
Cadmium (in soil, sediment, or tissue)		7.00E+00			2.63E-10	1.87E-10			---	---		---	---
Chromium, total (assumes 1:6 ratio Cr VI:		2.54E+02			---	---			---	---		---	---
Lead		3.67E+02			---	---			---	---		---	---
Mercury		6.45E+00			---	---			---	---		---	---
Nickel		1.05E+02			7.89E-09	5.60E-08			---	---		---	---
Selenium		4.00E+00			---	---			---	---		---	---
Silver		1.10E+01			---	---			---	---		---	---
Zinc		5.35E+02			---	---			---	---		---	---

Pathway Risks				Media Risks		Total
---	---	9E-08	2E-07	---	3.20E-07	3.E-07

Appendix S Stage I Environmental Screening and Stage II Environmental Risk Characterization



GEI Consultants

MassDEP RTN 3-24070

Stage I Environmental Screening and Stage II Environmental Risk Characterization

Amesbury Former MGP Site, Amesbury, Massachusetts

Submitted to:
Massachusetts Department of Environmental Protection
Bureau of Waste Site Cleanup
Northeast Regional Office
150 Presidential Way
Woburn, MA 01801

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Project No. 1804576



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Attachment C Sediment Toxicity Report
Attachment D Example ESBTU Calculations
Attachment E PEC-HQ and ESBTU Estimates for Near Surface and Subsurface Sediment

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Acronyms and Abbreviations

ALC	aquatic life criteria
BAZ	Biologically Active Zone
COPEC	Constituents of Potential Ecological Concern
DEP	Massachusetts Department of Environmental Protection
EPC	Exposure Point Concentrations
EPH	extractable petroleum hydrocarbon
Eq-P	Equilibrium Partitioning
ERC	Environmental Risk Characterization
ES	Environmental Screening
ESBTU	Equilibrium-Partitioning Sediment Benchmark Toxic Unit
EVH	Extractable volatile hydrocarbons
FCV	Final Chronic Value
GAC	generally accepted criteria
GEI	GEI Consultants, Inc.
HQ	hazard quotient
I-495	Interstate 495
Koc	Organic Carbon to Water Partitioning Coefficient
MAH	Monocyclic Aromatic Hydrocarbons
mg/kg	milligram per kilogram
MGP	Manufactured Gas Plant
MHW	Mean High Water
National Grid	Essex Gas Company, d/b/a National Grid
NAPL	Non-Aqueous Phase Liquid
NHESP	Natural Heritage & Endangered Species Program
NSR	no significant risk [of harm]
OHM	Other Hazardous Material
PAH	Polynuclear Aromatic Hydrocarbons
PEC	Probable Effect Concentration
PEC-HQ	Probable Effect Concentration Hazard Quotient based on total PAH_{17} PEC
PH	priority habitat
RAH	Readily Apparent Harm
RAP	Remedial Action Plan
RIP	Remedial Implementation Plan
RTN	release tracking number
TEC	Threshold Effect Concentration
TOC	Total Organic Carbon
USEPA	United States Environmental Protection Agency

Executive Summary

GEI prepared this Supplemental Stage I Environmental Screening (ES) and Stage II Environmental Risk Characterization (ERC) in accordance with 310 CMR 40.0900 of the MCP to provide a comprehensive ecological risk characterization for the former Manufactured Gas Plant site on Water Street in Amesbury, Massachusetts.

This evaluation is a follow up to the July 2009 Phase II Comprehensive Site Assessment (CSA) Report and Phase III Remedial Action Plan (Phase II/III Report), in response to the discovery of residual coal tar in an adjacent wetland area in 2017, and subsequently in the Powwow River mudflats, and within the main Powwow River channel beyond the southeastern limits of the original disposal Site boundary. The Supplemental Stage I ES and Stage II ERC evaluated exposures and receptors within the expanded disposal Site boundary, which includes wetland, mudflat, and river environments.

The Supplemental Stage I ES concluded that there were current and potential future exposures to contaminants in sediment in all three areas of the expanded Site (i.e., wetland, mudflat, river). The exposures occur in areas exhibiting conditions of readily apparent harm (RAH) as well as in other areas. For areas not exhibiting conditions of RAH, a Stage II ERC was performed to 1) provide a more thorough evaluation whether there is risk of significant harm; and 2) define approaches to determining extent and magnitude of risk of significant harm for the identified exposure pathways.

The Supplemental Stage II ERC Problem Formulation identified one assessment endpoint: benthic invertebrates in the Powwow River. This fauna is present in all three exposure areas and is the maximally exposed group to residual contamination in sediment. Because this community consists of a potentially large assemblage of species, it was evaluated using criteria protective of reasonably high sensitivity species and populations in the larger assemblage.

Based on the Supplemental Stage II ERC, we concluded:

E.S.1. Wetland Area

Most of the wetland area below Mean High Water at 33R, 35, and 37 Oakland Street exhibits RAH and therefore presumptively poses significant risk of harm. The quantitative Stage II ERC also confirmed that these locations pose significant risk of harm based on an evaluation using a weight-of-evidence approach. Two locations above Mean High Water and outside of the area exhibiting RAH also pose significant risk of harm based on the Stage II ERC. These locations are SS607 and 794 at 35 Water Street, both of which are only slightly above Mean High Water.

E.S.2. Mudflat Area

A portion of the mudflat area at 39 and 41 Oakland Street exhibits RAH and therefore presumptively poses significant risk of harm. The quantitative Stage II ERC also confirmed that most of these locations pose significant risk of harm based on a weight-of-evidence approach. One location outside of the area

exhibiting RAH also pose significant risk of harm based on the Stage II ERC. This location is 720 at 41 Water Street, just south of the area exhibiting RAH.

E.S.3. River Area

Several localized areas in the river area in the top one foot of sediment either exhibit RAH and therefore presumptively pose significant risk of harm, or were confirmed to pose significant risk of harm according to the quantitative Stage II ERC and a weight-of-evidence approach. Specifically:

- The river area around multiple locations on 39, 41, and 43 Oakland Street and 1 Field Street, immediately adjacent to and downstream of the mudflat area
- Two river areas exhibiting RAH at locations 701 and 706 at 1 Field Street.
- Two river areas at location 817 and 852 at Noel Street.

A condition of no significant risk of harm is present at all other locations within the river in the shallow river sediments (0-1 foot) based on the weight-of-evidence approach.

1. Introduction

GEI Consultants, Inc. (GEI) prepared this Supplemental Stage I Environmental Screening and Stage II Environmental Risk Characterization (ERC) on behalf of Boston Gas Company d/b/a National Grid (National Grid), to address contaminant conditions related to a portion of the former Amesbury Manufactured Gas Plant (MGP) located on Water Street in Amesbury, Massachusetts (the Site, Figure 1). The Massachusetts Department of Environmental Protection (DEP) assigned release tracking number (RTN) 3-24070 to the Amesbury former MGP (the Site) in July 2004.

This report is an appendix to the Supplemental Phase II Comprehensive Site Assessment (CSA) Report. GEI prepared the Supplemental Phase II CSA Report as a follow up to the July 2009 Phase II CSA Report and Phase III Remedial Action Plan (Phase II/III Report), in response to the discovery of residual coal tar in an adjacent wetland area in 2017, and subsequently in the Powwow River mudflats, and within the main Powwow River channel beyond the southeastern limits of the original disposal Site boundary. The Supplemental Phase II CSA addresses environmental conditions associated with the revised expanded disposal Site boundary established in this report based on supplemental Phase II CSA investigations conducted by GEI between 2017 and 2024.

The former Amesbury MGP is located near the intersection of Water and Chestnut Streets in Amesbury, Massachusetts. As depicted in GEI's July 2009 Phase II/III Report, the Site originally included the National Grid property (39 Water Street), a portion of a City of Amesbury property (39A Water Street), and a small, subdivided wetland portion of a privately-owned property (33R Oakland Street). The Site was expanded in July 2015 to include a small portion of the abutting property at 35 Water Street after dense non-aqueous phase liquid (DNAPL) as coal tar was encountered in a monitoring well. Based on supplemental investigations performed since 2017, the Site has expanded further to include 28 additional properties along the Powwow River, some upstream of the former MGP but most downstream of the former MGP. The portion of the Powwow River within the Site boundary includes approximately 150 feet upstream and approximately 5,150 feet downstream, including a former channel of the Powwow River that was filled during the 1960s as part of the Interstate 495 construction.

This ERC addresses the expanded portions of the Site.

This report presents:

- A brief Stage I ERC supplementing the 2009 Phase II/III Report, reviewing key site issues, background and local conditions, presence of Readily Apparent Harm (RAH) and preliminary effects screening. Conditions of RAH are present in some but not all the expanded area, thus obviating the need for a Stage II ERC in those areas.
- A Stage II ERC focusing on the areas of the expanded Site not exhibiting RAH to determine whether there is significant risk of environmental harm.

1.1. Site Description and Land Use

Conditions within the original Site boundary were summarized in the 2009 Phase II/III Report and subsequent documents submitted to MassDEP; therefore, will not be repeated here. This report focuses on the ecological features of the expanded footprint of the disposal Site. Other aspects of land use, ownership, and other features are described in the accompanying Supplemental Phase II CSA Report to which this ERC is appended.

The expanded Site boundary includes aquatic habitats adjacent to and downstream of the original Site potentially impacted by historical coal-tar related releases or impacts to sediment and surface water. The expanded footprint can be divided into three primary areas, based on ecological characteristics and likely exposures. The areas are shown on Figures 2 and 3.

1. Wetland Area: The area immediately adjacent to the former Site boundary. This area consists of a marshy area, partly wooded and partly vegetated open marsh. It covers approximately 0.38 acre, representing the portion of the wetland area outside the former disposal Site boundary not previously remediated. This area is termed the "wetland" or "wetland area" (Figure 3). It is constrained by upland areas or knolls separating it from the Powwow River, except where it drains via a narrow channel towards a mudflat to the south. It is classified as a marsh ("M") on the Massachusetts Wetland and Wetland Areas Change Map (Figure 4). This area is well vegetated with emergent marsh vegetation and is subject to flooding at high tides (see the mean high water (MHW) bank level shown in Figure 3).
2. Mudflat Area: South of the wetland area is an area termed the "mudflat" or "mudflat area" (Figure 3). This area is a lightly vegetated tidal mudflat subject to diurnal tidal flooding and draining. The drainage from the wetland area forms a visible channel through the mudflat towards the river. The mudflat area covers approximately 0.96 acre. This mudflat is located on an outside bend of the Powwow River.
3. River Area: Figure 2 shows the stretch of the Powwow River addressed in this ERC. The Powwow River is an approximate 22.8-mile-long river that flows through several cities and towns in Massachusetts and New Hampshire, before the river's confluence with the Merrimack River.

   The length of the Powwow River that flows through Amesbury has been described as being divided into two sections (Upper and Lower). The Upper Powwow River is an approximately 6,000-foot section of the river, beginning at the state border between Massachusetts and New Hampshire, and ending as it flows into Lake Gardner.

   The Lower Powwow River begins at the base of the Lake Gardner Dam and ends at the Powwow River's confluence with the Merrimack River. From the base of Lake Gardner Dam, the river flows through "the "Upper Millyard" in downtown Amesbury and through a series of falls and rapids, dropping approximately 90 feet in elevation before flowing into a culvert running beneath Main Street and Market Street (Route 150). The culvert empties to the "Lower Millyard," just upstream of the Site. This Lower Millyard portion of the Lower Powwow River is a freshwater tidal river system, also referred to as the Powwow River tidewater, extending approximately 8,500 feet before its confluence with the Merrimack River.

As shown on Figure 2, an approximately 5,300-foot length of the Lower Millyard Powwow River is within the Site boundary. This includes an approximately 150-foot length of river upstream of the former Amesbury MGP and an approximately 5,150-foot length of river downstream of the former Amesbury MGP, including a former channel of the Powwow River that was filled during the 1960s as part of the Interstate 495 construction.

A short stretch of Powwow River upstream of the Site does not appear to have been impacted by the Site based on local conditions evaluations and forensic evaluations (Appendix Q to the Supplemental Phase II CSA Report).

The Powwow River in the Site area is a freshwater tidal system, with mudflats along the shorelines merging into marshes, shrub/scrub and wooded upland. The shorelines are partially developed but are not bulkheaded or otherwise modified in most areas. The affected stretch of the river presents a typical tidal riverine habitat, dominated by depositional silt with little hard-bottom areas. As described in Section 2.2, it supports a typical tidal freshwater ecosystem adapted to the urbanized location.

4. Upstream Area: In addition to the three primary exposure areas, this ERC considers the upstream area. The "upstream area" is located upriver from the former Amesbury MGP footprint and disposal Site, and is not within the disposal Site. This unaffected area was used to establish local conditions for the Powwow River.

1.2. Previous Environmental Risk Characterizations

1.2.1. 2009 Stage I Ecological Screening

GEI prepared a Stage I Environmental Screening (ES) for the original disposal Site in 2009 (GEI 2009). The evaluation included a Stage I and partial Stage II ERC focused on the original disposal Site, which has since been remediated.

The results of the Stage I ES indicated ecological risk was probable due to elevated concentrations, primarily of MGP-related polycyclic aromatic hydrocarbons (PAHs). A few metals in Site media, such as lead, had Hazard Quotients (HQs) greater than 1 for benthic biota. These metals were co-located with elevated PAHs, and exceedances were low relative to PAH concentrations. We concluded that addressing PAHs would also address any associated elevated metals.

A comprehensive Stage II ERC was not warranted in 2009 because 1) potentially significant exposure pathways were present, and 2) environmental harm was readily apparent on the basis of the high number of HQs greater than 1, the widespread high concentrations of Site-related contaminants of potential ecological concern (COPECs), and a comparison of Site data to background indicating that numerous analytes were significantly elevated.

However, the results of the 2009 Stage I ES indicated that ecological risk was not likely for ecological receptors exposed to terrestrial soil. Surface water in the Powwow River did not present an ecological risk due to low contaminant concentrations and HQs less than 1.

The recommendation from the 2009 Stage I ES was to move forward into remedial design rather than a Stage II ERC. The area posing ecological risk was incorporated into the Phase IV Remedy Implementation Plan (RIP) that was implemented in 2016 and 2017. The remedy was limited to the former MGP footprint on Water Street and two other small adjacent parcels.

1.2.2. Expansion of the Disposal Site Boundary

Starting in 2017, the discovery of coal-tar related impacts in the wetland and mudflat, beyond the southeastern boundary of the Site, led to an extensive program of further delineating the vertical and horizontal extent of MGP impacts. The effort has focused on visual impacts and the presence of PAHs as indicators of coal tar impacts and was the subject of forensic source analysis (Appendix Q to the Supplemental Phase II CSA Report) and on further environmental risk characterization.

The investigation work has been conducted in phases between 2017 and 2024, starting in the mudflat, and continuing in the Powwow River downstream to the Interstate I-495 interchange. Additional samples have been collected to laterally delineate the extent of impacts in areas of the river, mudflat, and wetland. Figures 2 and 3 show the locations of the samples.

The investigations have included:

- Hand excavating test pits
- Advancing sediment cores
- Advancing sediment probes
- Sampling and testing wetland soil, sediment, sediment porewater, and surface water

A comprehensive summary of the investigations is provided in the Supplemental Phase II CSA Report to which this ERC is appended. Investigations were performed for the Site in the wetland on 33R Oakland Street, 35 Oakland Street, and 37 Oakland Street; in the mudflat on 39 Oakland Street, 41 Oakland Street, 43 Oakland Street, and 4 Oakland Court; within the Powwow River from upstream of the confluence with the Back River down to the backwater south of Interstate I-495; in an upland area on 35 Water Street; and within the former river channel north of Interstate I-495.

Wetland soil and sediment samples were evaluated for visual and olfactory evidence of contamination. The samples were analyzed for PAHs, monocyclic aromatic hydrocarbons (MAHs), and in some cases other parameters. GEI also noted whether sediment cores and probes generated a sheen on surface water when the sediment was agitated. Some samples from the mudflat area and the adjacent part of the river area were collected and evaluated for sediment toxicity.

The revised disposal Site boundary extends downstream to where the river was historically filled as part of construction for I-495 and extends a short distance upstream of the former Amesbury MGP footprint at 39 Water Street (Figure 2). The revised disposal Site boundary is based on a number of lines of evidence, including Site-related impacts and forensic evaluations. The delineation of the revised disposal Site boundary is further described in the Supplemental Phase II CSA Report.

2. Stage I Environmental Screening

2.1. Background and Local Conditions

Under the Massachusetts Contingency Plan (MCP; 310 CMR 40.0902(3)), concentrations below background concentrations constitute a Condition of No Significant Risk of harm, and do not require additional evaluation. At sediment sites in urban areas, contaminants from other sources are typically present, such as other disposal sites, permitted discharges, and other non-point sources. "Local conditions" incorporates consideration of such sources. Other anthropogenic sources appear to be affecting local conditions in the Powwow River that is part of the former Amesbury MGP site.

Attachment A presents the local conditions evaluation based on pooled data from two sources of upstream data:

1. A 2001 Phase I Initial Site Investigation associated with the former Amesbury wharf building on 31 Water Street (RTN 3-19634) and performed by others (HEA, 2001); and
2. GEI's 2017-2024 Supplemental Phase II CSA investigations conducted in the upstream area of the river.

In summary, we concluded that PAH_{17} concentrations equal to or less than 34.1 milligrams per kilogram (mg/kg) are consistent with the local conditions for sediment in the Powwow River. This value is likely conservative as several additional samples with elevated but non-MGP related PAHs were excluded from the calculation because they were considered statistical outliers. Statistical analysis of the data set indicates it is parametrically distributed (Gamma distribution). The analysis used the background threshold value module in ProUCL v.5.1 (USEPA, 2016). The selected statistic for the local conditions value was the 95/95 Upper Tolerance Limit (UTL) of the data set.

This local condition value was used to establish the upstream Site boundary for contaminant conditions in sediment and for evaluation of Site data.

2.2. Evaluation of Habitat Quality

Figure 5 presents the Massachusetts Geographic Information System (MassGIS) Natural Resources Map for the Site. No certified or potential vernal pools or Area of Critical Environmental Concern (ACECs) are present within 0.5 mile. Mt. Prospect Cemetery, a protected open space east of the Site, is unaffected by the Site due to its upland location and is unconnected to the river system.

Wetlands are present at and adjacent to the Site. Figure 4 shows further detail of the wetlands that fringe the tidal river and associated mudflats. These consist of shallow open marsh ("M"), and smaller areas of shrub/scrub wetland ("SS") and deciduous wooded swamp ("WS1").

Extensive areas of wetlands and high value habitat occur upstream of the Site on Back River and especially the Powwow River. These are beyond the influence of the Site.

A Natural Heritage and Endangered Species Program (NHESP) priority habitat of rare Species exists in the backwater of the Powwow River, downstream and outside of the Site boundary on the other side of Interstate I-495. This appears to be associated with shallow brackish marsh required for the New England silt snail (*Floridobia winkleyi*). In addition, the Merrimack River downstream of the mouth of the Powwow River is a priority habitat PH2154 for protections of Atlantic sturgeon (*Acipenser oxyrinchus*) and short nose sturgeon (Acipenser brevirostrum) (GEI 2009). These downstream areas are located more than 0.5 mile away and are not affected by the Site.

Habitat surveys conducted by GEI since 2009, have identified a typical but varied fauna in the aquatic areas. These include raccoons, kingfishers, Canada geese, mallard ducks, red-wing blackbirds, herring and other gulls, and great blue heron. Fish, benthic invertebrates, shellfish, and other aquatic fauna have been observed, but not quantified or identified to species, in the river and adjacent mudflats and wetlands. The aquatic habitat is consistent with an urban, apparently healthy, tidal/riverine ecosystem with fringing mudflats and shallow marshes.

The list of species of special concern for the Site includes species currently listed by NHESP for Amesbury in Table 1. Only the blue-spotted salamander may have suitable conditions for longer term presence in the area.

2.3. Identification of Complete Exposure Pathways

In general, the presence of contaminants in sediment or surface water is sufficient to confirm the existence of complete exposure pathways to aquatic biota. Surface water does not appear to be a significant and complete exposure pathway even in wetland standing water overlying RAH. Therefore, current and potential future exposures are associated with residual coal-tar related contaminants present in sediment in the wetland, mudflat, and river areas.

A complete exposure pathway exists if each of the following components is present:

- Source
- Release
- Route of Exposure
- Exposure Medium
- Receptor

2.3.1. Source and Release Mechanisms

The source of releases to the Site were historical releases or discharges related to the operations at the former MGP. These releases resulted in deposition of contaminants and coal tar in sediment in the wetland area. Migration from the wetland area occurred via the drainage to the mudflat area and thence to the Powwow River, impacting sediment some distance downstream. Because the river is tidal in this stretch, and can reverse flow during some incoming tides, some deposition upstream of the Site may also have occurred. Upon the end of operations, these discharges would have ceased or much reduced. Riverine processes would thereafter result in cleaner sediment accumulating, especially in the

river and mudflat areas. Scouring and redeposition of sediment could still remobilize some contaminants, resulting in continued presence of lower level of contaminants in the recently deposited sediment. Ebullition potential has been evaluated (Appendix N to the Supplemental Phase II CSA Report) and the evaluation concluded that NAPL migration via ebullition is not a migration mechanism. In addition, an evaluation of hydraulic gradients in porewater indicated that the vertical gradient at the site is neutral to downward (Appendix M to the Supplemental Phase II CSA Report).

2.3.2. Routes of Exposure and Exposure Media

Secondary releases from sediment could result in low but temporary concentrations in pore water. However, previous investigations and data indicate this is not a complete and significant pathway. Therefore, direct contact with contaminated sediment is the primary route of exposure to ecological receptors at the Site.

Surface Water

Direct release from the Site to surface water is an incomplete pathway. However, resuspension or release from residual contaminants in sediment is a potentially complete but insignificant pathway, even in standing water overlying RAH in the wetland. Surface water samples have been collected in the river upstream, adjacent to and downstream of the drainage from the mudflat and evaluated for PAHs and EPH and were all below applicable surface water quality criteria.

Surface Sediment

This is a complete and significant exposure pathway. Surface sediment is contacted by benthic invertebrates (direct feeding direct contact, and feeding on lower trophic level invertebrates), rooted aquatic plants (root exchange), and benthic feeding fish (feeding on lower trophic level biota). All these organisms require available oxygen, which defines the Biologically Active Zone (BAZ) for sediment (USEPA 2015). The BAZ is typically less than 1 foot. It is frequently the case, especially in muddy or silty sediment, wetlands, and estuarine mudflats, that the BAZ may be a few inches or less. For convenience, the boundary of surface sediment that may be within the BAZ is typically set at 0.5 foot. In the present case, due to the varied intervals used in the various sediment sampling events, surface sediment has conservatively been defined as less than 1 foot.

Subsurface and Near Surface Sediment

Subsurface sediment (greater than 1 foot) is not accessible under current conditions and therefore is not a current exposure pathway. Sediment beyond the BAZ was divided into two groups: 1) near surface sediment located within the 1–2-foot interval; and 2) subsurface sediment located deeper than 2 feet. This distinction was included to account for the potentially higher mobility of near surface sediment. In the event of scouring conditions in the river, subsurface sediment could become a future exposure pathway. The stability of the near surface and subsurface sediment is discussed in Appendix P of the Supplemental Phase II CSA Report. The ERC includes some evaluation of subsurface sediment for informational purposes, although it was not considered a complete exposure pathway.

Trophic (Food Web) Transfer

Contaminants that are bioaccumulative have the potential to be transferred to predators on lower trophic level biota. Food web transfer is a potentially complete exposure pathway but was considered insignificant at the Site. This is because the primary contaminants, PAHs, have limited bioaccumulation potential and are efficiently metabolized and eliminated in vertebrates (mammals, birds, fish, reptiles, and amphibians). As a result, fish and piscivorous and benthivorous wildlife are not expected to receive significant and persistent doses of PAHs.

2.3.3. Receptors

The receptors for which complete and significant exposure pathways exist include:

- Benthic and epibenthic invertebrates inhabiting the wetland, the mudflat, and the riverbed and fringing flats or marshes. These include burrowing worms and insect larvae, mussels and other mollusks, and crustaceans (crabs, shrimp, and various smaller epibenthic organisms such as Hyalella (scuds)). This community was considered as a whole and was evaluated by benchmarks based on media concentrations. The sediment screening levels were established to evaluate this group.

Potential exposures to aquatic biota that primarily exists in the water column were considered incomplete based on the low levels of contaminants in surface water at the Site.

2.4. Evaluation of Readily Apparent Harm

Per 310 CMR 40.0995(3)(b), a condition of RAH exists if there is:

- Visual evidence of stressed biota attributable to the Site release.
- Oil or other hazardous material (OHM) present in exceedance of surface water quality standards; or
- Presence of oil, tar, or other non-aqueous phase liquid (NAPL) in sediment within a depth of 1 foot over 1,000 square feet or more.

The expansion of the disposal Site boundary was triggered by the discovery of coal tar in surface sediment southeast of the original disposal Site and presence of that coal tar meets the criteria for RAH. Extensive investigation of the extent of RAH in sediment has been conducted. Figure 3 shows RAH areas for the wetland and mudflat areas. Figure 2 shows RAH areas for the Powwow River.

No visual evidence of stressed biota has been reported at the Site. No exceedances of MassDEP aquatic life criteria (ALC) or generally accepted criteria (GAC), per 314 CMR 160.80, are present in surface water samples (collected during 2019 and 2020) in the wetland area and river area (Table 2). The surface water detections in the wetland were coincident with observations of RAH in sediment. PAHs were not detected in surface water in the river itself.

2.4.1. RAH in Wetland Area

Coal tar within 1 foot of the sediment surface is present throughout much of the wetland area. The wetland area therefore will require remediation and does not require further evaluation under the Stage II ERC. However, subsequent sections of this report present results for this area for comparative purposes and to determine the boundaries of areas with unacceptable ecological risk beyond the limits of RAH.

2.4.2. RAH in Mudflat Area

Coal tar within 1 foot of the surface is also present in a portion of the mudflat area. Figure 3 shows a largely contiguous area of RAH conditions from the mouth of the stream draining the wetland area, through the mudflat, and to the edges of the Powwow River main channel. This band of RAH appears to reflect historical drainage from the Site. It is notable that the RAH conditions cease as the mudflat nears the river main channel. Also notable are the extensive areas of mudflat lateral to the drainage channel with no RAH conditions. The Stage II ERC was focused on the mudflat area beyond the RAH area.

2.4.3. RAH in River Area

There are two isolated locations downstream in the Powwow River channel at 1 Field Street where shallow coal tar in sediment representing an RAH condition was also observed. Figure 2 shows the extent of RAH in the channel of the Powwow River based on the investigations conducted in the river from 2017 through 2024.

2.5. Stage I Screening

Per 310 CMR 40.0995(3)(c), a potentially significant exposure is present if any samples exceed MassDEP screening criteria for sediment or surface water quality standards. When a potentially significant exposure is present, a Stage II ERC may be conducted.

For sediment PAHs, the applicable screening criteria are listed in the “Revised Sediment Screening Values” update to Section 9 of the 1996 Guidance for Disposal Site Characterization (DEP 1996). For PAHs in freshwater sediment, the Threshold Effect Concentrations (TEC, McDonald et al. 2000) have been adopted for ten commonly encountered PAHs (Table 3). Because PAHs, especially from a coal tar source, consist of a mixture of PAHs it is impractical to evaluate every PAH in isolation. A screening value for total PAH_{17} from the same source was used to simplify the evaluation.

The results tables (Tables 4, 5 and 6) show any exceedance at the individual or total PAH level of the TEC for Site samples. Samples that also exceed the Probable Effect Concentration (PEC), a screening criterion used and discussed in the Stage II ERC, were also identified in the tables.

2.5.1. Wetland Area

Almost all surface sediment locations (23 out of 28) exceeded at least one sediment screening criterion for one or more PAHs (results in green or orange highlight in Table 4). The exceptions are bounding locations towards the wooded upland area to the west and east where PAHs were absent or near absent. Exceedances were found both inside and outside the RAH areas.

2.5.2. Mudflat Area

Almost all surface sediment locations (23 of 24 samples) inside and outside the RAH area in the mudflat area exceeded the sediment screening levels for one or more PAHs (results in green or orange highlight in Table 5). Exceedances were more widespread than the RAH footprint.

2.5.3. River Area

Almost all surface sediment locations (60 out of 61) in the river exceeded the sediment screening levels for at least one PAH (results in green or orange highlight in Table 6). Concentrations generally decreased downstream of the mudflat, but still exceeded screening criteria. The 3 samples collected in the "downstream" area past the I-495 overpass had lower concentrations, but 2 of 3 exceeded the screening criteria for at least one PAH.

2.6. Stage I Conclusions

We concluded there are current and potential future exposures to contaminants in sediment in all three areas of the expanded Site (i.e., wetland, mudflat, river; Figures 2 and 3). The exposures occur in areas exhibiting conditions of RAH as well as in other areas. For areas not exhibiting conditions of RAH, a Stage II ERC was performed (Section 3) to 1) provide a more thorough evaluation whether there is risk of significant harm and 2) define approaches to determining extent and magnitude of risk of significant harm for the identified exposure pathways.

3. Stage II Environmental Risk Characterization

This Stage II ERC, per 310 CMR 40.0995(4), builds on the data and conclusions presented in the Stage I ES. It was focused on determining whether there is significant risk of environmental harm in non-RAH portions of the expanded Site (the wetland area, the mudflat area, and the river area). Portions of the expanded Site with evidence of RAH were not subject to the Stage II ERC but were considered jointly with non-RAH areas for derivation of appropriate cleanup levels.

3.1. Problem Formulation

3.1.1. Scope and Approach

The geographic scope of the Stage II ERC are the three exposure areas identified in Section 2 and shown on Figures 2 and 3:

- The "wetland area." Most of this area exhibits RAH and is not subject to a Stage II ERC. However, results in this area were included for informational purposes.
- The "mudflat area." Part, but not all, of this area exhibits RAH. Surface sediment in this area was included in the evaluation.
- The "river area." Surface sediment in the river area was evaluated. This also includes a downstream portion of the river beyond interstate I-495 that we concluded was outside the disposal Site boundary.

In the problem formulation, the ERC defines the assessment endpoints and the measurements that are used to evaluate them. A combination of measurements is used to support a conclusion regarding the risk of ecological harm. The measurements are considered in combination to determine if the weight-of-evidence indicates a significant risk of harm.

The lines of evidence applied in the ERC to evaluate risk to benthic biota include:

- Comparison to Probable Effect Concentration (PEC) benchmarks (McDonald et al. 2000) for total PAH_{17}.
- Development of a toxicity quotient, the ESBTU, based on equilibrium partitioning derived bioavailability considerations (USEPA 2003); and
- Comparison to results of chronic and subacute sediment toxicity tests conducted with *Hyalella azteca* and *Chironomus dilutus* on selected samples to allow comparison of actual toxicity with toxicity estimates from ESBTU.

3.1.2. Constituents of Potential Ecological Concern

As described in previous sections, the primary COPEC in sediment are PAHs. PAHs, individually and collectively, are primary components of MGP residuals and can be considered the primary indicators of residual impacts (and harm) resulting from the historical MGP activities. Due to the age of the discharges, volatile hydrocarbons are not a significant component in residual material in sediment.

PAHs are a large group of compounds. One group, the so-called "parent PAHs" are 16 unsubstituted PAHs that form a major part of the PAHs in coal tar (Hawthorne et al., 2006). These are the "named" PAHs in the typical USEPA Method 8270 analyte list for which extensive toxicity information has been derived. Massachusetts has adopted sediment screening values for ten of the more common PAHs.

PAH toxicity is additive, so a more descriptive measure of potential harm is the screening value for total PAHs, typically derived as the sum of the 16 parent PAHs plus often 2-methylnapthalene (McDonald et al. 2000). Since PAHs released from pyrogenic or petrogenic hydrocarbons always exist as a mixture, a combined measure is more practical. PAH mixtures also contain additional PAHs, so called "substituted" PAHs that contribute to PAH toxicity. To use the USEPA Equilibrium-Partitioning Sediment Benchark Toxic Units (ESBTU) approach (USEPA 2003) it is useful to have a measure of a larger subset of PAHs, the so-called PAH_{34}, which identified 34 separate PAH homologs that contribute the bulk of the PAHs in a mixture.

The 2009 Stage I ES (GEI 2009), conducted within the original disposal Site, identified some metals as exceeding sediment screening values in some cases. These exceedances were always co-located with elevated PAHs, and included arsenic, cadmium, copper, lead, nickel, and zinc. Because elevated metals were always associated with elevated PAHs any risks attributed to metals would be addressed by addressing the dominant risk from co-located PAHs. Therefore, in the subsequent investigations of the expanded disposal Site, the analytical focus was on the PAHs.

3.1.3. Available Data

All valid sediment data collected in the 2017 through 2024 period have been included in the evaluation and are included as Attachment B.

Sediment samples were collected under multiple sampling events and for multiple objectives targeting different intervals Sample intervals therefore varied widely between cores and samples and the following scheme was applied to surface and subsurface sediment. As discussed previously, the definition of "surface sediment" was expanded to 1 foot as relatively few samples were collected from the 0- to 0.5-foot interval:

- All samples starting and terminating within the 0- to 1-foot interval were defined as surface (S) sediment. A total of 133 surface samples are available from all subareas.
- All samples predominantly within the 1-to-2-foot interval, except those previously defined as surface sediment, were defined as near surface (NS) sediment. A total of 71 samples are available across all subareas. Because near surface sediment is not in the Biologically Active Zone, these samples were not included in the primary risk analysis. Five samples collected in the 0- to 2-foot interval were included in the surface sediment sample set. This includes 5 samples collected in 2018 (one each in wetland and river, and three in the mudflat area) which encompassed the interval from the surface down to 2.4 feet. These were considered surface sediments and were included in the evaluation.
- All samples collected below 2 feet were considered subsurface sediment (SUB). There were 200 subsurface samples across all subareas. Because subsurface sediment is not in the Biologically Active Zone, these samples were not included in the primary risk analysis.

Except as noted, all samples were evaluated for PAH_{34} and total organic carbon (TOC). To allow for additional forensic analysis, an extended analysis of organics was conducted for most samples from which PAH_{17} and PAH_{34} data could be extracted. This extended analyte list included a longer list of organic compounds quantifiable via USEPA 8270D SIM, including extractable C6 to C9 MAH, organo-lead compounds, and additional compounds useful in hydrocarbon forensics including phytane, pristane, benzothiophenes, and others. These additional compounds are not conventionally considered in environmental risk assessment and were not considered in this ERC.

3.1.3.1. Sediment Data

A total of 420 sediment samples were available for the Site, divided into (1) wetland area, (2) mudflat area, (3) river and downstream areas, (4) former river channel area, and (5) upstream area used as background reference (Figure 2). These data included:

- 28 surface, near surface and subsurface sediment samples from 17 cores collected in 2017 in the wetland area (SS601 to SS618). These early samples were limited to PAH_{17}, EPH/VPH and target analysis. They did not include measurement of TOC. The TOC was estimated based on the average TOC for later samples where TOC data existed and set at 9.49%.
- 41 mostly surface and near surface sediment samples collected in 2018 and 2019 from the wetland area, the mudflat area, and a few from the river area adjacent to the mudflat (SS619-SS663). These, and all subsequent samples, were evaluated for the expanded PAH_{34} list as well as TOC.
- 132 surface, near surface and subsurface samples collected in September and November 2019 in the mudflat and river area (664-737), to further delineate exceedances noted in the previous sampling rounds.
- 78 surface, near surface, and subsurface sediment samples in the mudflat and river areas (738-807), including upstream and downstream locations during 2020. These step-out samples allowed delineation of impacts laterally throughout the river area.
- 4 surface and subsurface samples from two borings in the wetland area to delimit exceedances towards the upland to the north (808-809).
- Additional surface, near surface, and subsurface samples collected in 2023 and 2024 from all areas at the site as follows:
    - 6 lateral delineation samples in the wetland area (810-811 and 839)
    - 28 samples from the river area for lateral delineation or in areas of limited data (815-862)
    - 11 samples from 4 locations in the former channel area (837- 838 and 841-842)
    - 10 samples from 3 locations in the upstream area (857 – 859)
    - 6 samples collected from 6 known impacted subsurface locations in the river in 2023 for evaluation of migration potential and partition to porewater.
    - 30 samples from 13 locations in the river area (871-889)

These investigations resulted in the following totals for surface sediment samples evaluated in the ERC:

- Wetland area: 28 surface (S) sediment samples. One sample identified as "NS" including the interval from 0-1.7 was considered a surface sediment sample.
- Mudflat area: 24 surface (S) sediment samples. Three samples identified as "NS" included the interval from surface down to 2.4 feet and were considered surface sediment.
- River area: 78 surface (S) sediment samples. One sample identified as "NS" included the interval from the surface down to 1.7 feet and was considered surface sediment.
- The upstream area used for determination of local conditions included 12 surface sediment (S) and near surface sediment (NS) samples collected by GEI and 10 samples collected in 2001 by others (HEA, 2001).

Duplicate sample results were assigned one result reflecting the higher detected value.

The calculation of total PAHs was based on the sum of all detected PAH_{17}. Non-detected PAHs were counted as 0 (zero). This may underestimate total PAHs at low total PAH concentrations. If all PAHs were non-detect, the total PAH value was set to the maximum detection limit for individual PAHs.

All samples are included on Figures 2 and 3.

3.1.3.2. Toxicity Testing

In 2018, a subset of 7 samples were collected and submitted for sediment toxicity testing (*Hyalella azteca* chronic 42-day testing and *Chironomus dilutus* 10-day sub-chronic testing). All testing was performed as defined in USEPA guidance (USEPA 2000) and following guidelines outlined by American Association of Testing Materials (ASTM 1996). Sampling locations were selected from the then known range of sediment PAHs to provide a representative range to evaluate toxic effects under site-specific conditions. The laboratory report is included as Attachment C. Table 7 shows the scope of testing.

These results were used to derive a relationship between observed toxicity and ESBTU as described in Section 3.4.3.

3.1.4. Exposure Areas, Key Receptors, and Exposure Pathways

In Section 2.3.2, the complete exposure pathways, including key receptors, were identified. These were not modified for the Stage II ERC and continued to focus on exposure to benthic and aquatic biota to PAHs in surface sediment in the wetland, mudflat, and river areas, respectively. The specific nature of the benthic community may differ between these areas but can be represented by the community-based criteria for evaluation outlined in the scope of the ERC. As was determined in the Stage I ES, 1) surface water is a potentially complete but insignificant pathway; 2) subsurface sediment is currently an incomplete pathway but was considered in the eventuality of future exposure; and 3) higher trophic level exposure pathway may be complete but was considered insignificant relative to the direct exposures to the benthic community in sediment.

3.1.5. Assessment Endpoints and Measures of Effect

The assessment endpoint selected for quantitative analysis represents the ecological entities most likely to be adversely affected by contaminated surface sediment, and the valuable attributes to be protected. For this Stage II ERC, the assessment endpoint is the growth, survival, and reproduction of the benthic invertebrate fauna. This group is present in all three exposure areas and is the maximally exposed group to residual contamination in sediment. Because this community consists of a potentially large assemblage of species, it was evaluated by criteria protective of reasonably high sensitivity species and populations in the larger assemblage.

Several measures of effect (i.e., "a measurable change in an attribute of an assessment endpoint or its surrogate in response to a stressor to which it is exposed and is expressed as the data measure and decision criteria to be used to evaluate the assessment endpoint" [USEPA 1998]), have been defined for the assessment endpoint as summarized below:

- Assessment Endpoint: Maintenance of the diversity and abundance of the benthic invertebrate community represented by survival, growth, and reproduction at the organism level of sensitive members of the community.
    - Measure of Effect 1 (MOE 1): Effects-based Benchmark Approach – Calculation of HQ by comparison of sediment concentrations to Probable Effect Concentrations (PECs) representing bulk sediment concentrations indicating where any adverse effects are more likely than not in a community under default bioavailability conditions.
    - Measure of Effect 2 (MOE 2): Toxicity Quotient Approach – Calculation of ESBTU by comparison of estimated interstitial water concentrations calculated via equilibrium partitioning theory to narcosis-based toxicity criteria per the USEPA's 2003 Procedures (USEPA 2003).
    - Measure of Effect 3 (MOE 3): Sediment Toxicity Testing Approach – Results of site-specific chronic and sub-chronic sediment toxicity testing with *Hyalella azteca* and *Chironomus dilutus* at selected locations and correlated with the measured ESBTUs in accordance with the DEP Guidance and its Technical Updates (DEP 1996).

The measures of effect are considered as lines of evidence and considered separately and jointly in a weight of evidence framework to draw risk conclusions.

3.2. Exposure Assessment

3.2.1. Exposure Point Concentrations

The Exposure Point Concentrations (EPC) are estimates of the concentration that the receptor may be expected to be exposed over the long-term, potentially resulting in chronic level effects to the population if exceeded. For mobile receptors, the EPC is an estimate of the average exposure the receptor is exposed to within the exposure area over time. It is thus equal to the average or mean concentration in the relevant depth interval.

The DEP Interim Technical Update "*Averaging Area for Benthic Invertebrate Assessments*" (DEP, 1996) recommends that averaging areas for benthic invertebrate assessment be no greater than 1,000 square feet, which is the area DEP would consider a larger exposure area that would be significantly impaired. Smaller or larger averaging areas may be reasonable in some cases.

The risk characterization considered results and concentrations on a point-by-point basis.

In an additional evaluation, a surface area weighted concentration (SWAC) for the entire river and mudflat subareas was developed as described in Section 3.6.1 to present an estimate for potential exposure of a mobile receptor assumed to access the entire river subarea.

3.3. Effects Assessment

3.3.1. MOE 1: Effects Based Sediment Criteria

The effects assessment for MOE 1 is based on the effects-based sediment criteria for PAH mixtures. The selected criteria for PAHs are PECs for total PAHs from McDonald et al. (2000). Although individual PECs do exist in this reference for some PAHs, the evaluation focuses on the comparison of the total PAH_{17} to the total PAH PEC of 22.7 mg/kg. The use of total PAHs is appropriate as PAHs derived from MGP tars exist as mixtures of multiple PAHs and can be treated as additive. PECs correspond to a concentration where there is a 50 percent probability of observing adverse effects in a sediment-associated benthic invertebrate community. This is a reasonable criterion considering the limited benthic community in these high-organic content, "mucky" sediments. High organic carbon serves to reduce bioavailability of PAHs and therefore reduce toxic effects. The reduced bioavailability forms the basis for the ESBTU method (refer to Section 3.3.2).

The results are expressed in Probable Effect Concentration Hazard Quotient based on total PAH_{17} PEC (PEC-HQ), which is defined as the total PAH_{17} divided by the PEC for total PAHs of 22.7 mg/kg.

3.3.2. MOE 2: Effects-Based Sediment Equilibrium Partitioning Based Toxic Units (ESBTU)

The effects assessment for MOE 2 is based on the effects-based equilibrium partitioning sediment benchmark toxic units (ESBTU) for PAH mixtures. This approach was fully developed in the 2003 USEPA Procedures (USEPA 2003) and expanded to other non-ionic organics in the 2008 USEPA Procedures (USEPA 2008). The ESBTU approach introduces site-specific bioavailability considerations for PAHs in sediment, based on a narcosis toxicity model and equilibrium partitioning of PAHs between organic carbon in sediment and interstitial water.

The 2003 USEPA guidance describes the rationale and procedures to calculate ESBTUs for PAHs based on the estimated partitioning of PAHs to interstitial water and a narcosis based toxic effect on benthic biota. Values for organic carbon to water partitioning coefficients (Koc) and solubility constraints, as well as the narcosis based Final Chronic Values (FCV) presented in the 2003 Guidance were used (USEPA 2003). A critical review of the underlying theory and applicability for this approach is in the Mechanistic Sediment Quality Guidelines Based on Contaminant Bioavailability: Equilibrium Partitioning Sediment Benchmarks (Burgess et al. 2009, 2013).

Fundamentally, the procedure is based on the sum of PAH_{34} (i.e., the 17 parent PAHs and their associated alkylated forms). Equilibrium partitioning is then used to estimate the freely dissolved PAHs as a measure of bioavailable PAHs. Equilibrium partitioning is defined by the Koc of the individual PAH and the location-specific organic carbon content of the sediment. The bioavailable freely dissolved PAHs are converted to ESBTUs based on their molecular weight and the narcosis model estimated toxicity threshold on a molar basis (a FCV for all individual PAHs of 2.24 µmol/g octanol for PAHs (USEPA 2003). The sum of the ESBTUs represents the potential toxic effects of PAHs, where if the ESBTU is less than 1, it is likely that the sediment will not be toxic to aquatic life. If the adjusted ESBTU is equal to or greater than 1 then the sediment may be toxic to sensitive aquatic life, and further testing or more information is necessary to determine appropriate sediment management options (USEPA 2003). Based on the results of MOE 3 (Site-specific toxicity testing), an ESBTU equal to 5 was selected as the threshold of adverse effects based on literature data for MGP tars.

Derivation of the ESBTU requires sample-specific PAH_{34} and TOC data. If PAH data are reported only for the PAH_{17} group of parent PAHs, a conversion is needed. For this Stage II ERC, PAH_{34} data were available for all data collected in 2018 or later. For a small number of samples collected in the wetland area prior to 2018, only PAH_{17} data were available. For these data, a site-specific conversion factor was derived from the observed average PAH_{34}/PAH_{17} ratio in other wetland area sediments. Note that the full PAH data set is available for all locations not within an identified RAH area. In addition, for a small number of samples collected prior to 2017, there is no specific TOC data. An estimated TOC value was derived from the average of the observed TOCs in the wetland and mudflat areas, respectively.

The validity of equilibrium partitioning diminishes when sediment organic carbon is low (less than 1%), such as in sandy substrates. This decrease in validity should be considered when TOC is less than approximately 0.3 percent. In the present data set, a few samples with very low TOCs (less than 0.1 percent) were set to 0.1 percent for the calculation. In such cases it may be found that the predicted toxicity based on ESBTU exceeds the PEC-HQ. The evaluation of samples <1% TOC should weight the evaluation towards the PEC-HQ.

An ESBTU of less than 1 indicates adverse effects are not expected. An ESBTU greater than 1 suggest adverse effects to sensitive organisms cannot be excluded. However, toxicity in MGP impacted sediment is seldom observed when PAH ESBTUs are below 5, and it has been observed that ESBTU greater than 100 can in fact be non-toxic (Kreitinger et al. 2007, Jonker et al. 2002, Mc. Donough et al. 2010). A reasonable threshold for toxic effects at ESBTUs greater than or equal to 5 was therefore defined for initial data analysis, and comparison with the outcome of sediment toxicity testing (MOE 3).

3.3.3. MOE 3: Toxicity Testing Criteria

Sediment toxicity tests are evaluated by a statistical comparison of mortality and growth between Site sample replicates and a laboratory control sediment and an unaffected (upstream) reference sediment. Survival and growth were evaluated at the contracted laboratory (AquaSurvey, Inc. of Flemington, New Jersey) using ToxCalc™ v 5.0.23 software to determine significant differences against the upstream reference sediment. Selection of statistical methods implements the 2000 USEPA guidelines (Figure 12.7 in USEPA 2000) and for freshwater sediment toxicity testing (Figure 14 in ASTM 2010).

Test results are evaluated for normality (Shapiro-Wilks test) and homogeneity of variance (Variance Ratio F test). If test results are not normal and/or not of equal variance they are transformed using an arcsin-square root transformation and retested. Normal data were evaluated using a t-test with for data with equal or non-equal variance. Non-normal data were evaluated as appropriate using Wilcoxon Rank Sum two-sample test with Bonferroni's adjustment. Statistical difference was evaluated at $\alpha = 0.05$.

Even if a statistically significant difference is found, for large data sets, the magnitude of differences should also be considered to qualify the interpretation. A statistically significant difference (i.e., $p < 0.05$) may still be considered biologically insignificant (i.e., the reduction in survival or growth is trivial on a population basis, even if a statistically significant difference is observed).

3.4. Risk Characterization

Risk characterization, or the analysis phase, presents the outcome of each measure of effect for the assessment endpoint. The results of the effects-based benchmark analysis and the effects based ESBTU endpoints are presented for surface sediment in this section. Results of the calculations underlying the PEC-HQ and the ESBTU are shown in Tables 8, 9, and 10. The data set showing the full ESBTU calculations is in Attachment E.

3.4.1. Measure of Effect 1: PEC-HQ

Figure 6 shows the distribution of exceedances for the wetland and river, and Figure 7 for the river (green for PEC-HQ <1, red for PEC-HQ >1)

Wetland Area: Table 8 shows the location-by-location PEC-HQs for the wetland area based on the PEC for PAH_{17} of 22.7 mg/kg. Of the 28 available surface sediment samples, 15 have a PEC-HQ >1. All RAH locations also have a PEC-HQ >1, although some locations where there is no RAH also have PEC-HQs >1. Figure 6 shows these locations (in red) in the wetland area occur in the RAH area and to the east of the RAH area. To the west, PEC-HQs are lower.

Mudflat Area: Table 9 shows the location-by-location PEC-HQs for the mudflat area based on the PEC for PAH_{17} of 22.7 mg/kg. Three locations, SS620, SS623, and 822, located near the river were counted as surface sediment even though the sampled interval was from 0 to up to 2.5 feet. Of the 24 available surface sediment samples, 17 have a PEC-HQ >1. All RAH locations also have a PEC-HQ > 1 within the main part of the mudflat, with only a few locations outside of the RAH footprint. Figure 6 shows that many locations with a PEC-HQ > 1 are present where the mudflat grades into the river channel. Based on this endpoint, adverse effects may primarily be expected within the RAH area and the slope into the river channel.

River Area: Table 10 shows the location-by-location PEC-HQs for the river area (including the downstream area) based on the PEC for PAH_{17} of 22.7 mg/kg. There are 79 available surface sediment samples adjacent to and downstream of the Site. Two locations, SS619 and SS621, located adjacent to the mudflat were counted as surface sediment even though the sampled interval was 0-1.9 feet. In addition, there are three "downstream" samples at locations downstream of I-495 that are outside of the disposal Site boundary. A total of 33 of the locations have a PEC-HQ > 1. The results are presented in Figure 7. These occur in the river area near the mudflat, but also in a region downstream where

RAH has been noted locally at two isolated locations. These exceedances are of a low magnitude relative to exceedances in the mudflat area.

The downstream area locations have PEC-HQs of 0.1 to 0.2.

3.4.2. Measure of Effect 2: ESBTU

The following results are based on the calculated ESBTUs using the full PAH_{34} data set and site-specific TOC unless indicated. An ESBTU greater than 5 can be considered as a threshold for toxic effects based on typical effect thresholds for MGP tars and supported by the Site-specific toxicity testing results (see Section 3.4.3). Figure 8 shows the distribution of exceedances for the wetland and river, and Figure 9 for the river (green for ESBTU <5, red for ESBTU >5). Exceedances are indicated in red in tables and figures.

Wetland Area: Table 8 presents the results for the wetland area. The distribution of ESBTU is shown on Figure 8. For the 2017 samples in the wetland area, no TOC data and only PAH_{17} data were available. Therefore, TOC was estimated as the average of TOC from all wetland samples after 2017 (namely, 9.49 percent). The estimated PAH_{34} concentration was estimated from the average ratio of PAH_{17} to PAH_{34} observed in samples with PAH_{34} data elsewhere in the wetland (namely, 1.16). The high TOC content resulted in lower ESBTU estimates compared to the PEC-HQ. Of the 27 samples, 7 had an ESBTU >5 indicative of benthic toxicity.

Mudflat Area: Table 9 presents the results for the mudflat area. The distribution of ESBTU is shown on Figure 8. Four of these locations exceeded the ESBTU >5 indicative of benthic toxicity ESBTU >5 without co-located RAH is present primarily on the lower part of the mudflat adjacent to the river channel. ESBTU between 1 and 5 are widespread adjacent to the RAH area.

Location SS640 is an outlier. This location is sandy, with very low TOC content where the equilibrium partitioning is not applicable. However, the total PAH for this location is less than the PEC, so the apparent ESBTU and elevated risk is a false positive.

River Area: Table 10 presents the results for the river area. The distribution of ESBTU is shown on Figure 9. Eight of the 79 locations had an ESBTU > 5 indicative of benthic toxicity.

3.4.3. Measure of Effect 3: Toxicity

As reported by the laboratory, all internal quality assurance and reference toxicant samples were adequate. The minimum acceptable survival on day 28 for the H. azteca of 80 percent was met. Table 11 presents the results of the toxicity tests. Figures 11 and 12 show a graphical representation of the results for survival and growth, respectively.

Only one sample exhibited significant toxicity for survival of *H. azteca* (42-day) or *C. dilutus* (10-day) when compared to reference: mudflat sample SS633 for *C. dilutus*. The reduction was minor and was influenced by substantial inter-replicate variability. No sample presented significant difference from control in relation to reproduction. Two samples had a statistically significant difference to reference for growth (per survivor), mudflat sample SS633 and river sample SS643 for *H. azteca*. The apparent

statistical significance of the results compared to reference appears associated with high variability between replicates within the test. The average values are similar between the tests.

The samples with matched toxicity data represent a range of PAH concentrations corresponding to a PEC-HQ range of 0.1 to 5.3 and a ESBTU range of 0.1 to 4.7 (Table 12). No samples providing a clear toxicity boundary and toxic effect relationship were obtained. However, the highest observed ESBTU (which takes into account bioavailability) of 4.6 (rounded to 5) can be considered a site-specific threshold for toxic effects, which agrees with observations of toxicity at other MGP sites (see Section 3.3.2).

3.5. Uncertainty Analysis

Estimates of risk in any ecological risk assessment inevitably contain a level of uncertainty. Risk characterization of analytical endpoints is based on assumptions regarding both exposure and effects, and each assumption creates some level of uncertainty that may lead to either over- or under-estimates of risk. An understanding of the uncertainties associated with risk estimates is critical to understanding predicted risks and placing them in proper perspective for risk conclusions and management. Important sources of uncertainty associated with each component are presented below, along with the potential implications on the outcome of the risk characterization.

3.5.1. Surface vs Subsurface Sediment Exposure

This ERC focuses on current and reasonable future exposures which are limited to the surface sediment BAZ. Under current conditions, the BAZ is likely to be less than the 0- to 1-foot interval considered in the ERC due to the commonly observed reducing (anoxic) layer having silty sediments and existing a few inches below the surface. This is likely to result in an overestimate of risk as impacts below the BAZ may be included. However, in the event of erosion or sediment mobilization, this material might become available for exposure.

Subsurface sediment (defined here as either near surface (1-2 feet) or subsurface (greater than 2 feet)) is not a current complete exposure pathway. In the event of a major disturbance, near surface or subsurface sediment may become a complete exposure pathway. The sediment mobility evaluation (Appendix P of the Supplemental Phase II CSA Report) indicates such a disturbance is not likely. Attachment E presents the PEC-HQ and ESBTU estimates for near surface and subsurface sediment for reference, although the sediment mobility evaluation indicates these should not be considered relevant to this ERC. The near surface and subsurface sediment contamination has no effect on risk conclusions.

3.5.2. Local Conditions Influence

The Powwow River is an urban river, and contributions from upstream and adjacent disposal sites, discharges and non-point sources exist. Background and local conditions are difficult to define due to the physical conformation of the Powwow River immediately upstream of the Site. The Powwow River narrows into an artificial channel and culvert potentially lacking significant sediment deposition immediately upstream of the Back River confluence. A data set combining background samples collected for another nearby disposal area was combined with selected samples collected upstream of Site influence as determined by forensic fingerprinting, as described in Section 2.1. This resulted in a local conditions value of 34.1 mg/kg expressed as the 95/95 Upper Tolerance Limit (UTL) of the data set.

This is a reasonable value for an urban stream. There is uncertainty about the local conditions value as there is considerable variability between the samples included in the local conditions evaluation, including the presence of outliers from unknown sources that appear unrelated to the Site source. The local conditions value may therefore be underestimated as additional sources are present but their influences are not fully accounted for.

Many PAH results in river area samples exceeded the local conditions value, so the contribution of local conditions to Site risk, while present, is not expected to influence the outcome.

3.5.3. Representativeness of Screening Levels and PECs

The Massachusetts sediment screening levels for PAHs use individual PAH TECs derived from the McDonald et al. (2000) consensus values. The TECs represent a threshold value below which adverse effects on any benthic community is not expected, including for sensitive benthic biota in high bioavailability (i.e., sand). In silty or muddy environments, the benthic community is typically less sensitive and diverse, and the bioavailability of PAHs reduced. These values significantly overestimate risk.

The PEC for total PAHs used in the PEC-HQ (MOE 1) are from the same McDonald et al. (2000) reference. This value represents a concentration where an adverse effect is more likely than not, including sensitive benthic biota. As in the case of the TEC, in silty or muddy environments with a typically less sensitive and diverse benthic community, the bioavailability of PAHs is reduced. The PEC in substrates with greater than 1% TOC is likely to overestimate risk. For low TOC (<1%) samples, uncertainty due to the PEC is reduced.

3.5.4. ESBTU Derivation and Threshold

The application of the ESBTU approach is well established and supported and has been extensively used to account for the wide variability of PAHs in sediment depending on TOC and lithology. For sites with substantial organic content in sediment, the reduced bioavailability of PAHs is readily attested, and therefore is a more accurate predictor of adverse effects than criteria based on bulk sediment concentrations. However, in sandy sediment with low or very low organic content, the equilibrium partitioning relationship breaks down and the ESBTU may overestimate risk. While most of the evaluated sediment has high TOC, in the few sandy locations with <1% TOC, the ESBTU overestimates risk.

The threshold ESBTU greater than 5 that is applied in this ERC is based on the observations that the PAH characteristics of MGP tars typically result in lower toxicity relative to other PAH sources. As discussed in Section 3.3, the threshold for adverse toxicity is typically greater than 5 at such sites. Since it was not possible to derive a site-specific PAH-to-toxic-response curve at this site, the use of an ESBTU threshold that is equal to 5 is more likely to overestimate than to underestimate risk.

Some of the older samples collected in the wetland area lacked TOC and full PAH_{34} analysis. For these wetland samples, the PAH_{34} and TOC values were estimated from the average values for other samples in this area. There is some uncertainty in this, which can over- or underestimate risk. Most of these locations are within the RAH footprint, so the uncertainty is not a concern.

3.5.5. Exposure Point Concentrations

This Stage II ERC shows results on a point-by-point basis. As discussed in the DEP technical update on sediment exposure areas, an exposure area of 1,000 square feet is reasonable for benthic invertebrate exposure (DEP 1996). The results have not been averaged over 1,000 square feet for this ERC, which may result in reporting of apparent localized risk where, if averaged with surrounding clean samples, no unacceptable risk would be present. This is true for localized "hits" with clean material nearby. However, locations reporting unacceptable risk are frequently in groups indicating areas of 1,000 square feet are affected. Risk management should consider the effects of averaging over 1,000 square feet.

The EPCs include all data collected fully within the 0-1 ft interval. The sampled intervals vary, however. In addition, some samples composited over greater than the 0-1-foot interval were defined as surface samples. This introduces uncertainty in the event contamination in such samples was in the deeper portion of the core.

For two of the sediment toxicity testing locations no specifically paired sediment PAH concentration data were available. These were evaluated based on nearby sample locations. The data from the nearby locations may also not match the same depth interval. The uncertainty about the paired concentrations to the toxicity tests may introduce uncertainty in the development of a ESBTU vs. toxicity threshold estimate.

3.5.6. Representativeness of Data

A substantial amount of data is available for the expanded disposal area. All data included in the ERC were collected between 2017 and 2024. The efforts to delineate contaminated sediment horizontally and vertically in all three areas have been extensive. The available data are adequate for the risk evaluation under MOE 1 (PEC-HQ) and MOE 2 (ESBTU), and the risk estimates do not over- or underestimate risk under the applicable assumptions.

The toxicity data are more limited and were collected early in the process before expanding the footprint of the river area and has less spatial coverage. The results also did not result in significant toxicity in the samples, preventing the development of a site-specific toxicity relationship. The ESBTU corresponding to a toxicity threshold is therefore not fully defined and was set to an ESBTU greater than or equal to 5 corresponding to the highest ESBTU with no observed effect. This is consistent with other MGP sites where the threshold is typically 5 or higher, so an ESBTU threshold of greater than or equal to 5 is likely to overestimate risk at this site.

For two of the sediment toxicity samples no co-located chemical analysis was done. For these samples, the closest locations with chemical data were used as surrogates. These results were not from the same interval as the toxicity sample (i.e., 0 to 2 feet for the sediment and 0 to 0.5 feet for the toxicity). This represents an uncertainty that may over- or underestimate risk.

3.5.7. Constituents of Concern and Exposure Pathways

This ERC focused on PAHs in sediment as the primary indicator of potential Site-related risk to benthic and aquatic biota. In the 2009 Stage I ES additional analytes, especially metals, were considered (GEI 2009). The 2009 Stage I ES identified some metals potentially associated with Site-related releases.

However, elevated metals were co-located with high PAHs. Considering the highly elevated PAHs relative to the co-located metals, any contribution from metals to adverse effects was considered relatively insignificant. Addressing elevated PAHs will also address other constituents present at lower levels in affected sediment. Limiting the evaluation to PAHs does not result in any significant underestimation of risk, therefore only PAHs were included as COPECs.

The ERC focused on sediment biota exposure to sediment. Surface water data confirmed there is no significant exposure via water to aquatic biota. The sediment exposure represents the combination of maximally exposed and sensitive receptors. The focus on sediment biota was considered representative and conservative.

3.6. Risk Conclusions and Summary

A supplemental Stage I ES and Stage II ERC has been conducted for the Site, incorporating the expanded disposal Site boundary. The Site includes three exposure areas for risk characterization purposes: the wetland area adjacent to the original disposal Site, a mudflat area exposed during low tide through which contaminant flows originating in the wetland passed on the way to the Powwow River, and portions of the Powwow River main channel just downstream of the Back River confluence to the beginning of the channelized river segment near I-495. This supplemental Stage I ES and Stage II ERC are intended to support the Supplemental Phase II CSA Report.

RAH in the form of coal tar in the top 1 foot of sediment was evident in some but not the entirety of the three exposure areas. The presence of a condition of RAH obviates the need for a Stage II ERC in those areas with RAH. The Stage II ERC was conducted to evaluate the potential for significant risk of harm outside of RAH areas.

The efforts to delineate the extent of contamination in the river focused on PAHs, as these were identified in the 2009 Stage II ERC as associated with releases from the former MGP and are the risk drivers for the Site.

The Stage II ERC for the expanded disposal Site focused on exposure of benthic biota to impacted surface sediment as the most sensitive endpoint to determine if a risk of harm to environmental resources, biota, and habitat exists. The determination of significant risk of harm was evaluated using a simplified weight-of-evidence approach (DEP 1995) applying the three MOE.

Toxicity testing (MOE 3) indicated that toxic benthic conditions are not expected when the ESBTU (MOE 2) is less than 5. This is consistent with literature values for MGP contaminated sediments. A decision framework for the risk evaluation therefore indicates that:

1. **Significant Risk of harm** was present if (1) RAH is present, or (2) ESBTU >5 and PEC-HQ >1.
2. **No Significant Risk of harm** was present if ESBTU >5 but PEC-HQ <1. This situation may occur in sediment samples with very low organic carbon content (i.e., sand).
3. **No Significant Risk of harm** was present for all other outcomes (e.g., ESBTU <5 and PEC-HQ <1). Some results indicated exceedances of MOE 1, the PEC-HQ. However, the site-specific bioavailability at these locations is low as evidenced by the ESBTU and a condition of No Significant Risk can be concluded.

Risk conclusions are drawn separately for each of the three exposure areas. Table 13 shows a sample-by-sample summary of the risk evaluation for each area indicating which of the above categories apply. Figure 10 shows the distribution of locations with significant risk of harm in the wetland and mudflat area, and Figure 11 shows the distribution of locations with significant risk of harm in the river area.

As established in the Stage II ERC, the evaluation of risk of harm to environmental resources, biota and habitat was based on sediment-associated biota exposure to PAHs in surface (0 to 1 foot) sediment. This endpoint is representative also for exposures to wildlife or aquatic biota, which are not expected to be significant pathways. Surface water in the river appears to be unaffected by the Site and concentrations in standing water in the wetland do not present a risk of harm.

Sediment deeper than 1 foot is not a complete ecological pathway. Risk of harm could only occur if mechanical disturbance or extensive erosion resulted in exposure to aquatic or benthic biota. Such disturbance is not anticipated. However, for completeness results for an analogous evaluation of subsurface sediment is included in Attachment E.

3.6.1. Development of Surface Weighted Average Concentrations (SWAC)

SWAC (Surface Weighted Average Concentration) is a weighted average of sample data intended to estimate mean contaminant concentration over a specified spatial area, typically an exposure area where receptors may be assumed to occupy all areas and range freely. The weighting is intended to adjust for the variability inherent in sampling programs where data were not collected in a systematic manner. The weighting in this evaluation was proportional to the size of interpolated polygons of influence (Thiessen Polygons). The SWAC is the average adjusted by area weighting. In this ERC, a single SWAC was derived for surface sediment (0-1 foot) in the river area and the mudflat areas.

A secondary SWAC was also calculated based on the 0–2-foot interval, i.e., surface and near surface sediment. If only one sample was available in the 0–2-foot interval the reported concentration was assigned to the entire interval. If more than one sample was available the average of the surface and near surface sample were used.

The estimated surface sediment SWAC (0-1 foot) for the river and mudflat area is 26.2 mg/kg, derived from Thiessen polygons generated from 105 surface sediment results. The SWAC is lower than an arithmetic average of 62.7 mg/kg. This difference is driven by the high density of locations with elevated concentrations in the area near and in the mudflat. Figure 14 shows the SWAC polygons for the river and mudflat in the 0-1-foot interval.

When near surface sediment (1-2 ft) is included in the SWAC to generate a value for the 0-2-feet interval, the SWAC increases to 35.2 mg/kg reflecting the higher concentrations of PAHs in the 1-2-foot interval in some sediment locations (Figure 15).

The SWAC can be considered as a good estimate of the exposure concentration experienced by mobile receptors such as fish across their exposure area. For less mobile or immobile benthic biota, exposure will be more localized and are better represented by the point concentrations.

3.6.2. Weight of Evidence Risk Conclusions

Table 13 presents the risk conclusions for the site based on a point-by-point evaluation and applying the rules discussed in Section 3.6.

3.6.2.1. Wetland Area

Most of the wetland area situated below the MHW line exhibits RAH and presumptively poses significant risk of harm (Figure 12). These locations pose significant risk of harm based on evaluation of the weight-of-evidence approach. Two locations above Mean High Water and outside of the area exhibiting RAH also pose significant risk of harm. These locations are SS607 and 794 at 35 Water Street, both of which are only slightly above Mean High Water.

3.6.2.2. Mudflat Area

A portion of the mudflat area exhibits RAH and therefore presumptively poses significant risk of harm (Figure 12). Most of these locations pose significant risk of harm based on the weight-of-evidence evaluation. One location outside of the area exhibiting RAH also pose significant risk of harm. This is location 720, just south of the area exhibiting RAH. Significant risk of harm based on PAH concentrations and bioavailability is evident in the river channel immediately downgradient of the mudflat (Figure 13).

Only one location (720) away from the RAH area poses significant risk of harm. The remainder of the mudflat has a condition of NSR of harm in surface sediment based on the evaluation in this ERC.

3.6.2.3. River Area

Several localized areas in the river area in the top 1 foot of sediment either exhibit RAH and therefore presumptively pose significant risk of harm or were confirmed to pose significant risk of harm according to the quantitative. Specifically:

- The river area around multiple locations on 39, 41, and 43 Oakland Street and 1 Field Street, immediately adjacent to and downstream of the mudflat area
- Two river areas exhibiting RAH at locations 701 and 706 at 1 Field Street.
- Two river areas at location 817 and 852 at Noel Street.

A condition of no significant risk of harm is present at all other locations within the river in the shallow river sediments (0-1 foot) based on the weight-of-evidence approach.

3.6.2.4. Downstream Area

There were three surface sediment samples from the lowest reach of the Powwow River (Figure 13), below I-495 and downstream of the area of influence of the Site. There is a condition of NSR of harm in the downstream area.

3.6.3. Conclusion

Ongoing risk of harm from current exposure to sediment is widespread in the wetland and mudflat areas. Significant risk of harm is primarily but not exclusively associated with the areas exhibiting RAH. In the river area, significant risk of harm is limited to localized areas of RAH, the riverbed immediately downstream from the mudflat and one small area further downstream on 1 Field Street.

Contamination remaining in deeper sediment does not contribute to current risk. Near surface (1-2 feet) and subsurface (>2 feet) contamination would only be of potential concern in the event of major disturbance of sediment resulting in remobilization to biologically relevant locations.

4. Environmental Risk-Based Guideline

This section presents the derivation of an environmental risk-based guideline per the MCP 40.0995(4)(d). The assessment and findings have been prepared in support of the Supplemental Phase II Comprehensive Site Assessment report for the Site.

The derivation of an environmental risk-based guideline for sediment is based on scientific concepts of bioavailability (i.e., that fraction of total concentrations of a chemical in sediment that are available for direct or indirect toxic effects on an organism. There is increasing scientific and regulatory acknowledgement of the need to consider the bioavailability of sediment-bound contaminants in exposure assessments because the total concentrations of many chemicals overestimate the amount of actual exposure to an organism in the natural environment (NRC 2003, SERDP 2004, USEPA 2009, ITRC 2011). Bioavailability is based on equilibrium partitioning between pore water and organic carbon and forms the basis for MOE 2 in this ERC.

An environmental risk-based guideline was developed using the principles underlying MOE 1 (equilibrium partitioning toxic units) and MOE 3 (site-specific sediment toxicity).

The proposed guideline is a concentration of total PAH_{17} of 104 mg/kg. Concentrations below this value are not expected to result in unacceptable toxicity for benthic organisms in typical sediments of the Powwow River within the disposal Site.

As described in Section 3.3.2, sediment toxicity tests on mudflat and river sediments evaluated in 2018 did not note significant toxicity in sediment up to an ESBTU < 5. This result, as described previously, is fairly typical for sediment impacted by MGP tar-like materials. An ESBTU=5 corresponds to an organic carbon normalized toxicity threshold for PAH_{34} of approximately 2,174 mg/kgoc based on equilibrium partitioning between organic carbon and freely dissolved fraction in pore water. The freely dissolved pore water PAHs is the toxicologically active exposure route for benthic biota.

This guideline incorporates the observed organic carbon content for all sediment samples in the river and mudflat subareas with a total PAH_{17} concentration >0.5 mg/kg (n=254). The median organic carbon content of 4.73% was used as representative for the exposure area. For highly organic sediments this value therefore is conservative, as bioavailability in high organic content sediment are considerably higher, with consequent lower bioavailability. The average organic carbon content for the samples was 5.96% compared to the median of 4.73% indicating that there are numerous samples with very high PAH concentrations. Conversely, low organic carbon (<1%) sediments such as clean sands have higher bioavailability. In such sediment the appropriate risk-based guideline is the McDonald et al. (2000) PEC for PAH_{17} of 22.7 mg/kg.

4.1. Derivation Approach

To estimate the risk-based guideline, the equilibrium partitioning between PAHs in the organic carbon phase and in the pore water phase was used to back-calculate the bulk PAH_{17} sediment concentration that results in a ESBTU=1. The bulk sediment estimate assumes the site specific median organic carbon

content and the average fractional composition of individual PAHs making up the total PAHs. These quantities were calculated using all available mudflat and river subarea samples with a total PAH_{17} concentration >0.5 mg/kg. There were 254 such samples. Surface, near surface, and subsurface samples were combined. Table 14 shows the summary of the mudflat and river subarea data. The average fractional contribution for individual PAHs was used to estimate the contribution of each PAH to total ESBTUs for the river and mudflat. The average ratio of PAH_{34} to PAH_{17} was 1.31. As expected, this is within the typical range of this ratio for MGP tars of 1.2-1.4. The low contribution of the alkylated PAHs to the parent PAHs is the reason that MGP tars are less toxic to benthic biota than petroleum hydrocarbons when expressed as similar PAH_{17}.

The PAH_{17} concentration that results in a ESBTU=5 was calculated at a range of organic carbon contents based on site specific data. The calculations are based on the predicted concentration of PAHs in pore water under equilibrium conditions, as applied for the evaluation of the bioavailability and associated potential for toxicity of PAHs (USEPA 2003, DiToro et al. 2005). These goals were calculated as equilibrium-based toxic units (ESBTUFCV) which are calculated using the following equation:

$$\sum ESBTU_{FCV} = \sum i \, (C_{OC,i} / \, C_{OC,PAHi,FCVi})$$

Where:

$\sum ESBTU_{FCV}$ = The sum of Equilibrium Partitioning Sediment Benchmark Toxic Units, where the units are based on Final Chronic toxicity Values (FCV)

C_{OCi} = PAH-specific chemical concentration in sediment on an organic carbon basis ($\mu g/g_{oc}$)

$C_{OC,PAHi,FCVi}$ = Effect concentration of a PAH in sediment on an organic carbon basis calculated from the product of its FCV and organic carbon: water partition coefficient (K_{OC}) ($\mu g/g_{oc}$)

The equations were solved for $\Sigma ESBTU_{FCV} = 5$ using the median site-specific organic carbon content and the average fractional composition of site PAHs shown in Table 14.

Table 4-1 shows the resulting risk-based guideline.

Table 4-1. Environmental Risk-Based Guideline for Total PAHs

Total organic carbon (5)		**PAH_{17} conc corresponding to ESBTU=5**	**Note**
<1%	Approx 0.8% of sediment samples	22.7 mg/kg (default)	Use for clean sands and other low organic carbon sediment
2.71%	25th percentile	60 mg/kg	
4.73%	***Median***	***104 mg/kg***	***Recommended risk-based guideline***
5.96%	Average	132 mg/kg	

To evaluate the representativeness of the proposed environmental risk-based guideline of 104 mg/kg PAH_{17}, a sensitivity analysis was conducted. Table 4-2 presents an estimate of accuracy based on the Punnett square relating PAH_{17} concentrations to expected toxicity (i.e., ESBTU>5) at the guideline of 104 mg/kg.

Table 4-2. Predictive Accuracy of Guideline

		Predicted outcome based on location specific ESBTU	
		Non-toxic (ESBTU<5)	Toxic (ESBTU>5)
Predicted outcome based on proposed guideline	Non-toxic (<104 mg/kg)	True negatives 161 (63.3%)	False negatives 6 (2.4%)
	Toxic (>104 mg/kg)	Falso positives 20 (7.9%)	True positive 67 (26.4%)

Table 4-2 illustrates that the majority (89.7%) of samples are accurately identified as non-toxic or toxic based on the proposed risk-based guideline of 104 mg/kg. The false negative rate is 2.4%, i.e., samples where the ESBTU was >5 even though the PAH_{17} concentration is less than the guideline. These are all sandy samples with low organic carbon content (<0.1 to 2.7%) and PAH_{17} concentrations in the 3 – 99 mg/kg range. The false positive rate, i.e., the samples where the ESBTU <5 even though the total PAH_{17} is >104 mg/kg was 8.7%. The higher incidence of false positives relative to false negatives indicates that the risk-based guideline is somewhat conservative.

4.2. Summary

An environmental risk-based guideline of 104 mg/kg was calculated for total PAH_{17} at the Site based on observed lack of toxicity in Site sediments up to an ESBTU>5 and using the median of the organic carbon content for Site sediments. This value is robust in that it accurately predicts (or overpredicts) potential toxicity in most cases. Underprediction of potential toxicity only occurs in 2.4 % of cases, all of which are associated with sandy locations with low to very low organic carbon (i.e., TOC less than 1%), and which have PAHs below the PEC of 22.7 mg/kg.

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Tables

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Table 8. Stage II ERC MOE 1 and 2: ESBTU Results– Surface Sediment in Wetland Area

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Table 10. Stage II ERC MOE 1 and 2: ESBTU Results– Surface Sediment in River and Downstream Areas

Table 11. Sediment Toxicity Results (MOE 3)

Table 12. Relationship of Toxicity to Measures of Effect

Table 13. Risk Summary

Table 14. Development of Environmental Risk-Based Guideline

Table 1. List of Aquatic Special Status Species for Amesbury
Stage I Environmental Screening and Stage II Environmental Risk Characterization
Former Amesbury MGP
Amesbury, Massachusetts

Taxonomic Group	Scientific Name	Common Name	MESA Status	Federal Status	Comment
Amphibian	Ambystoma laterale	Blue-spotted Salamander	SC	-	Last recorded 2018. Suitable habitat is present
Bird	Haliaeetus leucocephalus	Bald Eagle	T	T	Last recorded 2019. Site use, would be minimal
Fish	Acipenser brevirostrum	Short nose Sturgeon	E	E	Last recorded 2016. Potentially in Merrimack R. but not Powwow R. area
Fish	Acipenser oxyrinchus	Atlantic Sturgeon	E	-	Last recorded 2016. Potentially in Merrimack R. but not Powwow R. area
Mussel	Ligumia nasuta	Eastern Pond mussel	SC	-	Last recorded 2000. Potentially present, but unlikely due to tidal conditions
Reptile	Glyptemys insculpta	Wood Turtle	SC	-	Last recorded 1992. Limited suitable habitat (sandy bottom and mud banks and marshes). Unlikely.
Vascular Plant	Bidens eatonii	Eaton's Beggar-ticks	E	-	Last recorded 1928. Grows in coastal estuarine shorelines. Extirpated locally.
Insect	Cicindela duodecimguttata	Twelve-spotted Tiger Beetle	SC	-	Last recorded 2005. Occurs in sandy areas near wetlands and shorelines. Not expected in area.
Vascular Plant	Potamogeton vaseyi	Vasey's Pondweed	E	-	Last recorded 2002. Requires slow moving freshwater area. Not expected in area.

Notes:
E = Endangered
SC = Special Concern
T = Threatened

Table 2. Surface Water Chemical Testing Results
Amesbury Former MGP
Amesbury, Massachusetts

					Sample Area:	River	River	River	River	River	River	River	River	Wetland	Wetland	Wetland	Wetland	Wetland
					Sample Location:	**SW501**	**SW502**	**SW503**	**SW601**	**SW602**	**SW603**	**SW604**	**SW605**	**SW606**	**SW607**	**SW608**	**SW609**	**SW610**
					Sample Date:	**9/5/2019**	**9/5/2019**	**9/5/2019**	**7/7/2020**	**7/7/2020**	**7/7/2020**	**7/7/2020**	**7/7/2020**	**7/6/2020**	**7/6/2020**	**7/6/2020**	**7/6/2020**	**7/6/2020**
Analyte	**Method**	**Units**	**ALC (Table 29a)**	**GAC (Table 29b)**	**EPA Region 4**													
Polynuclear Aromatic Hydrocarbons (PAH)	8270D SIM	ug/L																
2-Methylnaphthalene			nl	nl	4.7	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	**0.97**	**0.78**	**0.88**	**1.3**
Acenaphthene			nl	70	15	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	**4.82**	**4.50**	**5.26**	**8.13**
Anthracene			nl	300	0.02	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	**0.22**	**0.25**	**0.28**	**0.43**
Chrysene			nl	0.12	4.7	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	**0.05**
Fluoranthene			nl	20	0.8	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	**0.22**	**0.27**	**0.31**	**0.52**
Fluorene			nl	50	19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	**1.28**	**1.23**	**1.46**	**2.17**
Naphthalene			nl	nl	21	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	**8.80**	**5.65**	**5.84**	**9.07**
Phenanthrene			nl	nl	2.3	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	**1.68**	**1.77**	**2.14**	**3.42**
Pyrene			nl	20	4.6	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	< 0.19	**0.28**	**0.36**	**0.4**	**0.67**
Extractable Petroleum Hydrocarbons (EPH)	MADEP-EPH	ug/L																
C9-C18 Aliphatics			nl	nl	nl	< 93	< 93	< 93	< 93	< 93	< 93	< 95	< 93	< 93	< 93	< 93	< 95	< 93
C19-C36 Aliphatics			nl	nl	nl	< 93	< 93	< 93	< 93	< 93	< 93	< 95	< 93	< 93	< 93	< 93	< 95	< 93
C11-C22 Aromatics			nl	nl	nl	< 93.5	< 93.5	< 93.5	< 93.5	< 93.5	< 93.5	< 95.2	< 93.5	< 93.5	< 93.5	< 93.5	<93.5	< 93.5

General Notes:

1. In general, analytes detected in at least one sample are reported here. For a complete list of analytes see the laboratory data sheets.
2. "<" = The analyte was not detected at a concentration above the specified laboratory reporting limit.
3. ug/L= micrograms per liter.
4. nl = not listed
5. **Bold** indicates detected

"adjacent" - sample located in river near the mudflat drainage channel
"downstream" - sample located in main channel of river downstream of area of influennce (and I-495)
"upstream" - sample located in main channel of river upstream of site
"river" - sample located in main channel downstream of mudflat drainage
wetland - sample located in wetland area adjacne to original disposal area
EPA Region 4 - EPA Region 4 screening levels for surface water
ALC: Massachusetts Aquatic Life Crieria, CCC concentration
GAC: Massachusetts Generally Accepted Criteria

Table 3. Stage I Effects Screening Criteria
Stage I Environmental Screening and Stage II Environmental Risk Characterization
Former Amesbury MGP
Amesbury, Massachusetts

Chemical	Screening Criterion µg/kg dry weight	Basis
Anthracene	57	1
Fluorene	77	1
Naphthalene	180	1
Phenanthrene	200	1
Benzo(a)anthracene	110	1
Benzo(a)pyrene	150	1
Chrysene	170	1
Dibenzo(a,h)anthracene	33	1
Fluoranthene	420	1
Pyrene	200	1
Total PAH_{17}	1,600	2

Notes:
µg/kg = micrograms per kilogram
1. TEC value from McDonald *et al.* (2000) listed in Table 1 of DEP Revised Sediment Screening Values
2. Total PAH17 TEC, from McDonald *et al.* (2000). PAH17 incorporates all the above individual PAHs plus several additional so-called “parent” PAHs.

Table 4. Stage I Efeects Screening– Surface Sediment in Wetland and Source Area

Amesbury Former MGP

Amesbury, Massachusetts

Analyte	Sed: TEC/ESV	Sed: PEC/RSV	Units	Area	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland
				Sample ID	SS601-A	SS602-A	SS603-A	SS604-A	SS605-A	SS606-A	SS607-A	SS608R-A	SS609R-A	SS610R-A	SS611R-A	SS612A	SS624	SS625	SS626	SS627	SS628	SS629	SS630	SS793-S1	SS794-S1	SS796-S1	SS807-S1	SS808-S1	SS809-S1	810-S1	811-S1	839-S1
				Depth Top-Bottom	8-12"	6"	7"	0-3"	6-12"	6-12"	6-12"	2-7"	8-14"	3-14"	4-10"	5-10"	0-1.7	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0.4-0.6	0.8-1	0-0.5	0.4-0.6	0.8-1	0.8-1	0.8-1	0.8-1	0-1
				S / NS / SUB	S	S	S	S	S	S	S	S	S	S	S	S	NS	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
				Sampling Date	22/Sep/17	22/Sep/17	22/Sep/17	22/Sep/17	22/Sep/17	22/Sep/17	22/Sep/17	8/Nov/17	8/Nov/17	8/Nov/17	8/Nov/17	16/Jul/18	08/15/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	7/8/2020	7/8/2020	7/6/2020	7/8/2020	10/13/2022	10/13/2022	06/20/2023	06/20/2023	08/18/2023
				RAH (4)			RAH										(5)	RAH				RAH										
Carbon					(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)																
Total Organic Carbon (2)	NCE	NCE	mg/kg														17600	109000	33000	284000	148000	42700	39900	233000	274000	61800	118000	148000	130000	43400	10300	146000
Total Organic Carbon (2)	NCE	NCE	%		9.492	9.492	9.492	9.492	9.492	9.492	9.492	9.492	9.492	9.492	9.492	9.492	1.76	10.9	3.3	28.4	14.8	4.27	3.99	23.3	27.4	6.18	11.8	14.8	13	4.34	1.03	14.6
PAH_{17}			Max RL for ND=		0.408	0.363	0.39		0.592	0.533		0.345				0.428										0.0081						
2-Methylnaphthalene			mg/kg		0	0	0	1.99	0	0	2.17	0	53.2	1.09	0.706	0	1.43	0.0687	0.0442	0.323	0.0881	204	0.00369	0.162	8.64	0.00409	0.122	0.506	0.618	0.028	0.0521	0.181
Acenaphthene			mg/kg		0	0	1.16	27.3	0	0	2.5	0	160	17.3	13	0	8.18	0.109	0.015	0.113	0.0336	757	0.00545	0.149	3.53	0.00902	0.0371	0.27	0.212	0.0256	0.0715	0.106
Acenaphthylene			mg/kg		0	0	0.39	5.08	0	0	1.76	1.19	8.61	9.12	2.32	0	1.65	0.232	0.0884	1.38	1.11	55.5	0.0218	0.723	45.1	0	0.157	0.766	0.54	0.258	0.212	0.7
Anthracene	0.057	0.845	mg/kg		0	0	2.2	23.2	0	0	4.92	1.91	40.1	45	10.5	0	7.61	0.352	0.0847	1.84	1.13	940	0.0248	0.599	20.9	0.00561	0.194	0.983	0.772	0.573	0.323	0.608
Benzo(a)anthracene	0.11	1.05	mg/kg		0	0	3.91	38.3	0	0	10.3	9.41	52.8	66.5	14.5	0	7.4	1.2	0.399	4.75	2.29	218	0.175	1.44	122	0.00485	0.654	2.89	1.68	2.73	1.15	1.4
Benzo(a)pyrene	0.15	1.45	mg/kg		0	0	4.19	42.8	0	1.53	12.3	12.7	54	70.3	17.8	0	7.24	1.28	0.281	4.12	1.89	239	0.133	1.97	181	0.00461	0.692	2.94	2	2.95	1.34	1.93
Benzo(b)fluoranthene			mg/kg		0	0	3.42	30	0	1.75	10.4	5.66	21.9	32.8	10.3	0	3.92	0.921	0.314	4.06	2.58	107	0.0836	1.92	99.9	0.00639	0.643	2.58	2.13	2.13	1.02	1.7
Benzo(g,h,i)perylene			mg/kg		0	0	2.71	25.6	0	1.2	9.1	8.69	13.4	39.2	14.8	0	3.17	0.822	0.255	2.39	1.11	123	0.0581	1.43	93.7	0.00468	0.433	1.71	1.61	1.69	0.775	1.45
Benzo(k)fluoranthene			mg/kg		0	0	1.04	13.9	0	0	3.55	7.27	30.2	37.8	8.67	0	4.69	1.01	0.344	4.3	2.14	141	0.109	1.74	106	0.00559	0.616	2.41	1.62	2.19	1.02	1.55
Chrysene	0.17	1.29	mg/kg		0	0	2.97	28.3	0	1.17	9.58	7.94	32.8	60	12.1	0	5.73	1.31	0.457	4.69	2.46	264	0.149	1.86	109	0.00811	0.767	3.09	2.04	2.47	1.18	1.85
Dibenzo(a,h)anthracene	0.033		mg/kg		0	0	0.744	7.06	0	0	2.73	3.06	5.88	17.2	5.06	0	0.822	0.179	0.0563	0.657	0.403	22.7	0.0196	0.419	22.3	0	0.11	0.567	0.452	0.437	0.218	0.365
Fluoranthene	0.42	2.23	mg/kg		0	0	6.14	72.5	0	1.44	17.4	16.1	149	118	30.6	0	17.7	2.39	0.844	9.57	3.77	676	0.178	3.02	99.1	0.0237	1.24	4.51	3.46	4.54	2	2.7
Fluorene	0.077	0.536	mg/kg		0	0	0.774	14.9	0	0	2.25	0	68.9	13	7.21	0	4.09	0.0822	0.0186	0.26	0.0329	265	0.00551	0.163	4.94	0.00461	0.0416	0.375	0.465	0.0652	0.0663	0.166
Indeno(1,2,3-c,d)pyrene			mg/kg		0	0	1.98	18.2	0	0	6.93	6.59	11.9	30	10.8	0	1.46	0.0642	0.0162	0.252	0.0884	31	0.0341	0.144	15.3	0	0.0412	0.561	0.206	0.112	0.0674	0.143
Naphthalene	0.18	0.561	mg/kg		0	0	0	2.53	0	0	5.77	0	158	4.97	3.65	0	4.07	0.0924	0.0539	0.545	0.122	629	0.00437	0.296	23	0.00599	0.126	1.53	2.29	0.123	0.0755	0.362
Phenanthrene	0.2	1.17	mg/kg		0	0	6.8	110	0	0	6.4	6.27	297	98.2	28.5	0	23.6	1.53	0.622	2.95	0.441	1360	0.0435	1.22	19.1	0.014	0.594	1.51	2.15	1.61	0.982	1.29
Pyrene	0.2	1.52	mg/kg		0	0	11.7	117	0	2.27	31.6	20.2	183	149	55.4	0	22.6	3.1	1.1	8.74	3.63	978	0.192	3	145	0.0238	1.43	4.62	3.33	4.01	1.91	2.8
Total PAH_{17}	1.6	22.7	mg/kg		**0.4**	**0.4**	**50.1**	**578.7**	**0.4**	**9.4**	**139.7**	**107.0**	**1340.7**	**809.5**	**245.9**	**0.4**	**125.4**	**14.7**	**5.0**	**50.9**	**23.3**	**7010.2**	**1.2**	**20.3**	**1118.5**	**0.1**	**7.9**	**31.8**	**25.6**	**25.9**	**12.5**	**19.3**

Notes

GREEN highlight = sample exceeds the MassDEP TEC (MassDEP 2006 "Technical Update - Revised Sediment Screening Values")

ORANGE highlight = sample exceeds the MacDonald et al. (2000) "consensus" Probable Effect Concentrations (PEC)

Complete data presented in Attachment

(1) TOC values <1000 mg/kg (0.1%) adjusted to 0.1%. Equilibrium partitioning theory is invalid at very low organic carbon content

(2) All TOC reported in mg/kg unless otherwise indicated.

(3) No TOC data. Applies the average TOC for all wetland or mudflat samples with measured TOC (in italics)

(4) RAH - Boring with readily apparent harm

(5) Sample extending beyond 1 foot but considered surface for evaluation

ND PAHs replaced with 0 (zero) unless all PAHs are ND when total PAH17 is set at the highest RL

Table 5. Stage I Eeffects Screening– Surface Sediment in Mudflat Area

Amesbury Former MGP

Amesbury, Massachusetts

Analyte	Sed: TEC/ ESV	Sed: PEC/ RSV	Units	Area	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat
				Sample ID	SS620	SS622	SS623	SS631	SS632	SS633	SS634	SS637	SS640	SS649	SS650	SS660	SS661	SS665-S1	SS667-S1	SS668-S1	SS670-S1	SS672-S1	SS717-S1	SS719-S1	SS720-S1	SS722-S1	SS761-S1	SS797-S1
				Depth Top-Bottom	0-2.5	0-1.8	0-1.7	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0 to 0.5	0 to 0.5	0 to 0.5	0 to 0.5	0 to 0.5	0.0 to 0.5	0.0 to 0.1	0.7 to 0.8	0.7 to 0.8	0.3-0.5	0-1
				S / NS / SUB	NS	NS	NS	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
				Sampling Date	08/15/2018	08/15/2018	08/15/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	04/23/2019	04/23/2019	04/24/2019	04/23/2019	09/10/2019	09/11/2019	09/11/2019	09/10/2019	09/24/2019	11/11/2019	11/11/2019	11/12/2019	11/12/2019	03/09/2020	7/8/2020
				RAH (4)	(5)	(5)	(5)	RAH	RAH																			
Carbon					(3)	(3)	(3)						(1)															
Total Organic Carbon (2)	NCE	NCE	mg/kg		55000	55000	55000	103000	29100	91200	74700	98300	1000	56300	55700	95600	76500	21000	21000	45300	62000	68500	81600	49100	69700	178000	39000	34200
Total Organic Carbon (2)	NCE	NCE	%		5.5	5.5	5.5	10.3	2.91	9.12	7.47	9.83	0.1	5.63	5.57	9.56	7.65	2.1	2.1	4.53	6.2	6.85	8.16	4.91	6.97	17.8	3.9	3.42
PAH_{17}			Max RL for ND=																									
2-Methylnaphthalene			mg/kg		0.0284	0.0886	0.0611	0.224	0.134	0.0685	0.00472	0.0307	0.0216	0.116	0.185	0.141	0.115	0.0864	0.0619	0.228	0.44	0.186	0.00705	0.252	0.896	0.311	0.0834	0.0768
Acenaphthene			mg/kg		0.153	2.19	0.0225	0.839	2.43	1.3	0.0454	0.0719	0.0247	3.04	1.96	1.57	1.27	0.97	0.87	6.89	9.57	3.84	0.171	3.44	2.9	0.751	0.0739	0.282
Acenaphthylene			mg/kg		0.0945	0.823	0.169	1.54	1.54	1.2	0.0438	0.0634	0.0673	1.51	1.19	0.84	1.32	0.469	1.03	2.11	5.29	1.85	0.0308	2.61	2.17	3.71	0.982	0.534
Anthracene	0.057	0.845	mg/kg		0.178	1.81	0.321	2.89	3.58	2.09	0.144	0.18	0.08	2.2	2.49	1.97	2.02	1.54	3.45	5.14	10.7	3.97	0.0189	4.52	7.38	6.87	0.454	0.739
Benzo(a)anthracene	0.11	1.05	mg/kg		0.263	2.79	1.76	4.91	3.54	3.65	0.474	0.603	0.244	5.43	5.37	3.37	5.29	3.14	4.76	9.22	19.9	9.19	0.0503	8.16	11.4	15.8	2.08	1.43
Benzo(a)pyrene	0.15	1.45	mg/kg		0.265	3.27	2.08	4.83	4.34	4.45	0.406	0.589	0.272	6.63	6.03	4.49	6.8	3.03	5.1	9.75	21.5	11.7	0.072	10.4	11.9	19	3.44	1.66
Benzo(b)fluoranthene			mg/kg		0.229	2.08	1.28	4.34	2.5	2.4	0.267	0.474	0.205	3.84	3.62	2.67	4.28	2.05	2.5	5.13	11.4	6.24	0.0368	5.59	9.32	10.8	2.01	1.16
Benzo(g,h,i)perylene			mg/kg		0.139	1.65	1.08	3.05	2.52	2.48	0.163	0.372	0.175	3.72	3.27	2.43	3.63	1.85	2.6	5.01	10.8	6.06	0.044	6.09	7.91	10.6	2.75	0.957
Benzo(k)fluoranthene			mg/kg		0.204	2.04	1.23	4.14	2.84	3.05	0.368	0.512	0.214	4.44	4.1	3.01	4.31	2.4	3.22	6.17	12.3	7.42	0.0363	6.45	9.46	12.2	2.14	1.22
Chrysene	0.17	1.29	mg/kg		0.277	2.45	1.77	5.82	3.35	3.18	0.441	0.668	0.232	4.7	4.64	3.2	4.64	3.07	3.81	7.14	14.6	8.22	0.0519	7.5	12.2	16.4	2.4	1.51
Dibenzo(a,h)anthracene	0.033		mg/kg		0.0413	0.419	0.322	0.824	0.509	0.478	0.06	0.0932	0.0397	0.797	0.697	0.52	0.75	0.389	0.491	0.946	2.07	1.02	0.00961	1.09	1.78	2.05	0.631	0.241
Fluoranthene	0.42	2.23	mg/kg		0.527	6.93	1.86	12.7	10	9.08	0.548	1.34	0.469	12.1	11.7	6.65	12.4	8.46	12.2	21	44.2	18.7	0.0922	16.9	31.8	26.1	2.45	3.12
Fluorene	0.077	0.536	mg/kg		0.0753	0.568	0.0611	0.978	1.11	0.873	0.0158	0.0554	0.0197	0.563	0.897	0.869	0.688	0.588	0.599	2.73	5.23	0.929	0.00866	1.43	2.6	0.948	0.121	0.224
Indeno(1,2,3-c,d)pyrene			mg/kg		0.043	0.00666	0.327	0.63	0.461	0.409	0.0943	0.0311	0.0198	0.529	0.624	0.334	0.524	0.286	0.472	0.94	1.84	0.947	0.0114	0.987	1.77	1.78	0.191	0.253
Naphthalene	0.18	0.561	mg/kg		0.0344	0.155	0.0885	0.355	0.417	0.163	0.0075	0.0335	0.0369	0.283	0.33	0.31	0.299	0.179	0.163	0.566	0.973	0.572	0.00824	0.62	1.68	0.704	0.0923	0.212
Phenanthrene	0.2	1.17	mg/kg		0.269	3.96	0.478	7.91	8.82	7.21	0.0447	0.949	0.206	4.55	6.44	5.67	6.91	4.25	9.28	19.1	43.2	11.2	0.0201	12.7	19.9	14.4	0.816	1.39
Pyrene	0.2	1.52	mg/kg		0.653	9.32	3.1	11.9	13.8	12.7	0.606	1.34	0.471	15.7	15	8.69	16.3	9.34	17.4	29.1	63.7	25.4	0.177	24.4	38	35.6	3.52	3.8
Total PAH_{17}	1.6	22.7	mg/kg		**3.5**	**40.6**	**16.0**	**67.9**	**61.9**	**54.8**	**3.7**	**7.4**	**2.8**	**70.1**	**68.5**	**46.7**	**71.5**	**42.1**	**68.0**	**131.2**	**277.7**	**117.4**	**0.8**	**113.1**	**173.1**	**178.0**	**24.2**	**18.8**

Notes

GREEN highlight = sample exceeds the MassDEP TEC (MassDEP 2006 "Technical Update - Revised Sediment Screening Values")

ORANGE highlight = sample exceeds the MacDonald et al. (2000) "consensus" Probable Effect Concentrations (PEC)

Complete data presented in Attachment

(1) TOC values <1000 mg/kg (0.1%) adjusted to 0.1%. Equilibrium partitioning theory is invalid at very low organic carbon content

(2) All TOC reported in mg/kg unless otherwise indicated.

(3) No TOC data. Applies the average TOC for all wetland or mudflat samples with measured TOC (in italics)

(4) RAH - Boring with readily apparent harm

(5) Sample extending beyond 1 foot but considered surface for evaluation

ND PAHs replaced with 0 (zero) unless all PAHs are ND when total PAH17 is set at the highest RL

Table 6. Stage I Effects Screening– Surface Sediment in River and Downstream Areas

Amesbury Former MGP

Amesbury, Massachusetts

Analyte	Sed: TEC/ ESV	Sed: PEC/ RSV	Units	Area	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River
				Sample ID	SS619	SS621	SS638	SS639	SS642	SS643	SS644	SS646	SS647	SS648	SS651	SS652	SS653	SS654	SS655	SS656	SS657	SS658	SS659	SS662	SS663	SS677-S2	SS678-S1	SS-679-S1	SS-680-S1	SS-681-S1	SS687-S1
				Depth Top-Bottom	0-1.9	0-1.8	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0 to 1	0 to 0.5	0 to 0.5	0 to 0.5	0 to 0.5	0 to 0.5
				S / NS / SUB	NS	NS	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
				Sampling Date	08/15/2018	08/15/2018	12/20/2018	12/20/2018	12/20/2018	12/20/2018	12/20/2018	04/23/2019	04/23/2019	04/23/2019	04/23/2019	04/23/2019	04/23/2019	04/23/2019	04/24/2019	04/24/2019	04/24/2019	04/24/2019	04/24/2019	04/23/2019	23/Apr/19	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/12/2019	09/23/2019
				RAH (4)	(5), RAH	(5)																								
Carbon				(3)																										
Total Organic Carbon (2)	NCE	NCE	mg/kg	55000	76700	7620	33400	19900	15000	80700	64400	27100	105000	91900	45600	27300	87600	38400	34200	7420	44300	95900	58500	49300	12500	43500	22500	37400	47800	54700
Total Organic Carbon (2)	NCE	NCE	%	5.5	7.67	0.762	3.34	1.99	1.5	8.07	6.44	2.71	10.5	9.19	4.56	2.73	8.76	3.84	3.42	0.742	4.43	9.59	5.85	4.93	1.25	4.35	2.25	3.74	4.78	5.47
Step 1 Measured Sediment Data																														
PAH_{17}			Max RL for ND=																											
2-Methylnaphthalene			mg/kg	0.704	0.584	0.0111	0.166	0.0197	0.0387	0.0438	0.0502	0.0715	0.0396	0.209	0.256	0.274	0.107	0.386	0.0243	0.0228	2.26	0.222	0.0673	0.0539	0.975	0.271	0.0458	0.0492	0.641	0.152
Acenaphthene			mg/kg	2.08	3.43	0.0234	0.527	0.0536	0.185	0.109	0.0788	0.223	0.055	4.04	2.59	3.43	3	8.31	0.187	0.0278	41	3.08	0.0882	0.107	4.72	3.67	0.086	0.141	1.41	3.66
Acenaphthylene			mg/kg	2.78	2.75	0.132	0.408	0.259	0.198	0.365	0.243	0.314	0.656	2.71	2.62	1.83	1.11	6.46	0.173	0.204	19.4	1.95	0.467	0.306	0.762	2.22	0.308	0.257	0.526	0.735
Anthracene	0.057	0.845	mg/kg	4.15	9.65	0.133	1.39	0.302	0.404	0.499	0.315	0.617	0.583	6.74	9.52	3.92	2.03	10.7	0.33	0.228	51.8	3.74	0.658	0.447	20.1	5.38	0.485	0.495	2.94	2.69
Benzo(a)anthracene	0.11	1.05	mg/kg	8.81	8.52	0.297	3.52	0.801	0.865	1.61	1.25	1.7	3.16	11.4	8.53	7.18	3.69	12.7	1.13	0.708	72.7	6.86	2.19	1.52	21	9.33	2.66	1.25	5.65	3.89
Benzo(a)pyrene	0.15	1.45	mg/kg	9.62	9.74	0.298	3.37	0.759	0.849	1.75	1.46	1.68	3.88	15.3	10.6	7.95	4.11	16.3	1.1	0.705	92.2	8.97	2.93	1.7	14.6	10.7	2.42	1.21	4.95	3.78
Benzo(b)fluoranthene			mg/kg	7.42	6.19	0.241	3.15	0.68	0.783	1.23	1.25	1.42	2.18	8.23	6.11	4.55	2.52	7.27	1.03	0.603	43.7	5.4	1.94	1.33	11.5	5.96	1.79	0.953	4.11	2.8
Benzo(g,h,i)perylene			mg/kg	5.05	4.82	0.192	2.02	0.446	0.5	0.965	0.882	0.937	2.14	7.44	5.66	4.24	2.27	8.55	0.603	0.374	43.9	4.82	1.59	0.949	6.83	5.78	1.3	0.738	2.71	2.12
Benzo(k)fluoranthene			mg/kg	7.65	6.51	0.276	2.93	0.685	0.716	1.3	1.16	1.3	2.62	8.16	5.9	5.03	2.6	10.7	0.886	0.559	49.7	5.51	1.9	1.35	12.3	6.63	1.79	0.95	3.8	2.97
Chrysene	0.17	1.29	mg/kg	9.26	8.81	0.341	3.51	0.8	0.878	1.67	1.39	1.62	3.29	9.73	8.39	5.67	2.94	12.9	1.13	0.678	50.6	6.02	2.37	1.57	17.3	7.55	2.43	1.21	5.2	3.9
Dibenzo(a,h)anthracene	0.033		mg/kg	1.43	1.31	0.047	0.592	0.12	0.137	0.248	0.227	0.264	0.456	1.5	1.12	0.948	0.498	1.53	0.165	0.106	7.94	0.937	0.35	0.247	2.25	1.23	0.415	0.206	0.785	0.5
Fluoranthene	0.42	2.23	mg/kg	21.2	17.1	0.654	7.66	1.65	1.99	2.57	2.29	3	3.52	27.6	20.8	15.6	8.39	38.1	2.32	1.36	182	16.6	3.22	2.88	58.5	19.8	3.49	2.08	11.4	9.51
Fluorene	0.077	0.536	mg/kg	1.2	2.16	0.0325	0.495	0.0549	0.141	0.112	0.105	0.227	0.0677	2.3	1.58	1.89	1.52	3.94	0.0981	0.0656	22.7	1.61	0.113	0.114	7.28	2.05	0.114	0.119	1.41	1.83
Indeno(1,2,3-c,d)pyrene			mg/kg	1.44	1.39	0.0281	0.135	0.0605	0.0678	0.214	0.113	0.136	0.343	1.24	0.946	0.789	0.353	1.49	0.0818	0.0574	7.89	0.712	0.277	0.118	2.27	0.853	0.122	0.0999	0.444	0.424
Naphthalene	0.18	0.561	mg/kg	1.04	0.792	0.0185	0.18	0.043	0.0843	0.0805	0.0755	0.134	0.0781	0.485	0.683	0.601	0.19	0.894	0.0429	0.0392	3.15	0.519	0.144	0.109	0.815	0.531	0.0732	0.0789	1.65	0.302
Phenanthrene	0.2	1.17	mg/kg	11.7	13.9	0.381	4.91	0.861	1.34	1.29	1.06	1.85	0.83	19.9	15.8	14	8.52	34.5	1.11	0.744	215	12.5	0.888	1.23	55.7	18.3	1.01	1.24	11.3	9.95
Pyrene	0.2	1.52	mg/kg	23	21.7	0.637	6.55	1.41	1.7	2.87	2.21	2.77	5.03	38.6	28.8	21.1	11.1	53.2	2.04	1.22	267	22.3	4.33	2.87	46.3	26.8	3.9	2.26	10.5	9.87
Total PAH_{17}	1.6	22.8	mg/kg	**118.5**	**119.4**	**3.7**	**41.5**	**9.0**	**10.9**	**16.9**	**14.2**	**18.3**	**28.9**	**165.6**	**129.9**	**99.0**	**54.9**	**227.9**	**12.5**	**7.7**	**1172.9**	**101.8**	**23.5**	**16.9**	**283.2**	**127.1**	**22.4**	**13.3**	**69.4**	**59.1**

Notes

GREEN highlight = sample exceeds the MassDEP TEC (MassDEP 2006 "Technical Update - Revised Sediment Screening Values")

ORANGE highlight = sample exceeds the MacDonald et al. (2000) "consensus" Probable Effect Concentrations (PEC)

PINK highlight = the sample has a PEC-Q> 1

Complete data presented in Attachment

(1) TOC values <1000 mg/kg (0.1%) adjusted to 0.1%. Equilibrium partitioning theory is invalid at very low organic carbon content

(2) All TOC reported in mg/kg unless otherwise indicated.

(3) No TOC data. Applies the average TOC for all wetland or mudflat samples with measured TOC (in italics)

(4) RAH - Boring with readily apparent harm; RAH(ADJ) - boring within RAH area but not exhbiting RAH; visual>1=

(5) Sample extending beyond 1 foot but considered surface for evaluation

ND PAHs replaced with 0 (zero) unless all PAHs are ND when total PAH17 is set at the highest RL

Table 6. Stage I Effects Screening– Surface Sediment in River and Downstream Areas

Amesbury Former MGP

Amesbury, Massachusetts

Analyte	Sed: TEC/ ESV	Sed: PEC/ RSV	Units																											
Area				River	River	River	River	River	River	River	River	River	River	River	River	River	River	Downstream	Downstream	Downstream	River	River	River	River	River	River	River	River	River	River	River
Sample ID				SS705-S1	SS706-S1	SS708-S1	SS709-S1	SS711-S1	SS750-S1	SS758-S1	SS759-S1	SS766-S1	SS772-S1	SS776-S1	SS783-S1	SS784-S1	SS804-S1	SS805-S1	SS806-S2	815-S1	817-S1	818-S1	819-S1	820-S1	823-S1	824-S1	829-S1	827-S1	848-S1	853-S1
Depth Top-Bottom				0 to 0.5	0 to 0.5	0 to 0.5	0 to 0.5	0.0 to 0.9	0.8 to 1	0.1 to 0.4	0.0-0.3	0.7-0.9	0-0.2	0.8-1	0-1	0.5-0.7	0.1-0.4	0-1	0.8-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-0.5
S / NS / SUB				S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Sampling Date				09/27/2019	09/27/2019	09/27/2019	09/27/2019	11/11/2019	02/03/2020	02/05/2020	03/09/2020	03/10/2020	03/10/2020	03/13/2020	03/16/2020	03/16/2020	7/7/2020	7/7/2020	7/7/2020	06/22/2023	06/20/2023	06/22/2023	06/20/2023	06/22/2023	06/22/2023	06/22/2023	06/22/2023	06/22/2023	08/18/2023	08/18/2023	
RAH (4)					RAH																									
Carbon																														
Total Organic Carbon (2)	NCE	NCE	mg/kg	7800	31700	18600	51300	65100	9870	3210	30500	20000	107000	19700	41700	36500	27400	5220	2060	14600	44400	47400	17800	38900	40900	16900	32400	33900	34300	24500
Total Organic Carbon (2)	NCE	NCE	%	0.78	3.17	1.86	5.13	6.51	0.987	0.321	3.05	2	10.7	1.97	4.17	3.65	2.74	0.522	0.206	1.46	4.44	4.74	1.78	3.89	4.09	1.69	3.24	3.39	3.43	2.45
Step 1 Measured Sediment Data																														
PAH_{17}			Max RL for ND=							0.00487									0.00424											
2-Methylnaphthalene			mg/kg	0.071	3.02	0.124	0.103	0.0588	0.0574	0.00356	0.0289	0.0152	0.75	0.0486	0.03	0.0233	0.0142	0.0138	0	0.0401	2.24	0.0436	0.0431	0.0402	0.0918	0.0771	0.0693	0.00547	0.0363	0.0227
Acenaphthene			mg/kg	0.288	5.01	0.446	0.203	0.249	0.334	0.00681	0.127	0.0385	3.78	0.0758	0.0311	0.0441	0.0196	0.00754	0	0.0949	25.7	0.0229	0.0937	0.154	0.251	0.207	0.176	0	0.0663	0.0379
Acenaphthylene			mg/kg	0.262	0.466	0.306	0.555	0.34	0.107	0.0159	0.273	0.049	0.261	0.0513	0.036	0.0633	0.113	0.0544	0	0.198	2.4	0.156	0.254	0.254	0.587	0.282	0.425	0.00381	0.164	0.0895
Anthracene	0.057	0.845	mg/kg	0.657	2.8	0.86	0.641	0.709	0.982	0.0295	0.361	0.122	5.32	0.148	0.0657	0.175	0.125	0.059	0	0.494	7.66	0.168	0.338	0.589	1.5	0.692	0.604	0	0.241	0.133
Benzo(a)anthracene	0.11	1.05	mg/kg	1.65	2.92	1.65	2.39	1.96	1.66	0.131	1.07	0.442	6.55	0.467	0.319	0.637	0.338	0.218	0	1.71	8.93	0.407	0.908	2.06	2.77	2.22	1.85	0	0.594	0.319
Benzo(a)pyrene	0.15	1.45	mg/kg	1.61	3.01	1.71	3.09	2.35	1.42	0.118	1.17	0.457	6.18	0.501	0.365	0.71	0.443	0.222	0	1.79	10.2	0.53	1.09	2.46	3.5	2.28	2.34	0	0.661	0.35
Benzo(b)fluoranthene			mg/kg	1.23	1.98	1.39	1.9	1.5	1.03	0.0914	0.901	0.327	3.33	0.436	0.329	0.535	0.447	0.172	0	1.38	5.75	0.363	0.824	2.02	2.35	1.6	1.71	0	0.461	0.255
Benzo(g,h,i)perylene			mg/kg	0.929	1.57	1.01	1.83	1.3	0.682	0.0598	0.699	0.278	3.18	0.463	0.261	0.487	0.298	0.115	0	0.949	5.26	0.324	0.653	1.57	2.02	1.21	1.41	0	0.378	0.194
Benzo(k)fluoranthene			mg/kg	1.33	2.27	1.43	2.21	1.54	1.15	0.104	0.909	0.363	3.52	0.405	0.329	0.527	0.439	0.181	0	1.35	6.34	0.404	0.832	2	2.41	1.78	1.66	0	0.502	0.274
Chrysene	0.17	1.29	mg/kg	1.74	3.06	1.74	2.66	2.06	1.37	0.126	1.21	0.481	5.53	0.594	0.441	0.682	0.447	0.223	0	1.64	8.86	0.515	0.946	2.4	2.87	2.4	2.03	0	0.652	0.352
Dibenzo(a,h)anthracene	0.033		mg/kg	0.227	0.351	0.254	0.375	0.289	0.173	0.0165	0.211	0.076	0.954	0.118	0.0603	0.11	0.0768	0.0309	0	0.296	1.24	0.0824	0.169	0.392	0.502	0.351	0.361	0	0.103	0.0556
Fluoranthene	0.42	2.23	mg/kg	3.09	6.62	3.65	3.54	3.16	3.75	0.241	1.97	0.811	12.4	0.963	0.659	1.11	0.831	0.322	0.00221	2.7	21.8	0.492	1.73	4.48	5.52	3.66	3.3	0.00429	1.1	0.572
Fluorene	0.077	0.536	mg/kg	0.22	1.89	0.352	0.174	0.182	0.525	0.00799	0.0981	0.0343	2.21	0.102	0.041	0.0517	0.0351	0.0153	0	0.103	6.18	0.038	0.0661	0.12	0.219	0.209	0.159	0.00401	0.0794	0.0399
Indeno(1,2,3-c,d)pyrene			mg/kg	0.132	0.37	0.157	0.301	0.285	0.207	0.0115	0.13	0.0457	1.35	0.0733	0.0455	0.0689	0.0524	0.0281	0	0.153	1.34	0.0686	0.0911	0.194	0.271	0.35	0.185	0	0.0751	0.0456
Naphthalene	0.18	0.561	mg/kg	0.115	6.09	0.274	0.165	0.093	0.0456	0.00586	0.0395	0.0208	1.25	0.049	0.0356	0.0336	0.02	0.0178	0.00218	0.0678	6.37	0.0543	0.0776	0.0796	0.159	0.0966	0.107	0.00744	0.0552	0.0296
Phenanthrene	0.2	1.17	mg/kg	2.43	9.46	2.93	1.42	1.75	3.01	0.082	0.852	0.339	14.6	0.648	0.28	0.406	0.256	0.111	0.00271	1.06	27.7	0.234	0.545	1.42	2.82	1.91	1.49	0.00658	0.47	0.265
Pyrene	0.2	1.52	mg/kg	3.42	7.66	3.44	4.57	3.86	3.07	0.266	2.19	0.942	19.8	1.12	0.765	1.29	0.718	0.363	0.00271	2.4	27.7	0.926	1.54	3.81	5.75	3.4	3.25	0.00448	1.2	0.596
Total PAH_{17}	1.6	22.8	mg/kg	**19.4**	**58.5**	**21.7**	**26.1**	**21.7**	**19.6**	**1.3**	**12.2**	**4.8**	**91.0**	**6.3**	**4.1**	**7.0**	**4.7**	**2.2**	**0.0**	**16.4**	**175.7**	**4.8**	**10.2**	**24.0**	**33.6**	**22.7**	**21.1**	**0.0**	**6.8**	**3.6**

Notes

GREEN highlight = sample exceeds the MassDEP TEC (MassDEP 2006 "Technical Update - Revised Sediment Screening Values")

ORANGE highlight = sample exceeds the MacDonald et al. (2000) "consensus" Probable Effect Concentrations (PEC)

PINK highlight = the sample has a PEC-Q> 1

Complete data presented in Attachment

(1) TOC values <1000 mg/kg (0.1%) adjusted to 0.1%. Equilibrium partitioning theory is invalid at very low organic carbon content

(2) All TOC reported in mg/kg unless otherwise indicated.

(3) No TOC data. Applies the average TOC for all wetland or mudflat samples with measured TOC (in italics)

(4) RAH - Boring with readily apparent harm; RAH(ADJ) - boring within RAH area but not exhbiting RAH; visual>1=

(5) Sample extending beyond 1 foot but considered surface for evaluation

ND PAHs replaced with 0 (zero) unless all PAHs are ND when total PAH17 is set at the highest RL

Table 6. Stage I Effects Screening– Surface Sediment in River and Downstream Areas

Amesbury Former MGP

Amesbury, Massachusetts

Analyte	Sed: TEC/ ESV	Sed: PEC/ RSV	Units																								
Area				River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River
Sample ID				858-S1	860-S1	861-S1	862-S1	869-S1	843-S1	844-S1	845-S1	846-S1	847-S1	851-S1	852-S1	854-S1	871-S1	872-S1	873-S1	874-S1	875-S1	876-S1	877-S1	878-S1	879-S1	880-S1	881-S1	882-S1
Depth Top-Bottom				0-1	0-1	0-1	0-1	0-1	0-0.5	0-0.5	0-1	0-0.5	0-1	0-0.5	0-0.5	0-0.5	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1
S / NS / SUB				S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Sampling Date				2/Nov/23	28/Nov/23	27/Nov/23	27/Nov/23	27/Nov/23	08/29/2023	08/29/2023	28/Aug/23	08/29/2023	08/29/2023	08/30/2023	08/30/2023	08/29/2023	07/23/2024	07/23/2024	07/23/2024	07/22/2024	07/22/2024	07/22/2024	07/22/2024	07/22/2024	07/22/2024	07/23/2024	07/23/2024	07/23/2024
RAH (4)																											
Carbon																											
Total Organic Carbon (2)	NCE	NCE	mg/kg	51000	47400	92500	92500	26600	86300	26700	49200	29500	32200	17500	15700	25800	15600	61500	13600	1650	79500	20200	56800	48800	62000	76200	44900	56500
Total Organic Carbon (2)	NCE	NCE	%	5.1	4.74	9.25	9.25	2.66	8.63	2.67	4.92	2.95	3.22	1.75	1.57	2.58	1.56	6.15	1.36	0.165	7.95	2.02	5.68	4.88	6.2	7.62	4.49	5.65
Step 1 Measured Sediment Data																												
PAH_{17}			Max RL for ND=					0.01																				
2-Methylnaphthalene			mg/kg	0.0437	0.478	0.389	0.198	0.106	0.469	0.177	0.0344	0.0408	0.044	0.0664	0.656	0.155	0.103	0.763	0.0401	0.0036	0.00968	0.0417	0.0756	0.03	0.0155	0.0245	0.00847	0.127
Acenaphthene			mg/kg	0.103	2.22	1.59	0.456	0.263	1.29	0.491	0.0201	0.0856	0.187	0.198	5.13	0.628	0.31	7.07	0.0361	0.0097	0.00941	0.0919	0.0956	0.0342	0.021	0.0385	0.00594	0.397
Acenaphthylene			mg/kg	0.642	0.42	0.424	1.2	0.297	0.594	0.502	0.104	0.403	0.201	0.443	1.36	0.282	0.33	0.899	0.124	0.0165	0.0218	0.318	0.617	0.18	0.011	0.103	0.0257	0.37
Anthracene	0.057	0.845	mg/kg	0.832	6.8	3.09	1.82	0.948	3.44	1.16	0.11	0.447	0.455	0.658	20	1.1	0.856	5.29	0.176	0.0215	0.0238	0.371	0.644	0.191	0.0629	0.147	0.0285	0.618
Benzo(a)anthracene	0.11	1.05	mg/kg	1.9	8.56	5.84	5.4	2.14	7.76	2.52	0.348	2.1	1.35	1.24	26.2	2.73	1.9	13	0.652	0.0646	0.0847	1.15	3.05	0.717	0.0879	0.473	0.0885	1.31
Benzo(a)pyrene	0.15	1.45	mg/kg	2.07	5.62	6.06	6.17	2.37	8.52	2.84	0.382	2.6	1.57	1.17	24.6	2.47	2.22	12.3	0.807	0.0718	0.107	1.49	3.27	0.835	0.0477	0.573	0.13	1.54
Benzo(b)fluoranthene			mg/kg	1.67	3.63	4.66	4.92	1.76	6.08	1.77	0.267	1.63	1.12	0.799	18.1	2.07	1.63	10.4	0.477	0.0604	0.101	1.09	2.12	0.531	0.0343	0.457	0.0954	1.02
Benzo(g,h,i)perylene			mg/kg	1.2	1.69	3.29	3.67	1.37	4.84	1.47	0.223	1.44	0.885	0.573	11.8	1.26	1.22	6.46	0.423	0.0428	0.0704	0.838	1.35	0.441	0.0189	0.358	0.0876	0.839
Benzo(k)fluoranthene			mg/kg	1.6	5.06	4.81	4.69	1.72	6.1	1.96	0.303	1.77	1.19	0.934	16.4	2.03	1.51	8.73	0.516	0.0605	0.093	1.09	2.66	0.613	0.0418	0.48	0.102	1.09
Chrysene	0.17	1.29	mg/kg	1.95	6.84	5.55	5.68	2.2	7.92	2.33	0.423	2.19	1.38	1.19	23.6	2.75	1.98	12.8	0.659	0.0716	0.117	1.27	2.93	0.779	0.0801	0.567	0.119	1.52
Dibenzo(a,h)anthracene	0.033		mg/kg	0.344	0.88	0.977	1.11	0.361	1.31	0.378	0.059	0.357	0.251	0.174	3.28	0.422	0.336	2.12	0.112	0.0124	0.0223	0.234	0.528	0.12	0.00713	0.104	0.0284	0.235
Fluoranthene	0.42	2.23	mg/kg	3.59	20	11.4	9.37	4.92	16.4	4.83	0.454	2.69	2.47	2.44	66.1	5.52	4.14	28.5	0.835	0.187	0.197	2.09	2.65	1.13	0.319	0.926	0.167	2.3
Fluorene	0.077	0.536	mg/kg	0.148	1.94	1.59	0.426	0.287	1.25	0.384	0.0292	0.102	0.143	0.253	6.45	0.483	0.283	2.67	0.0487	0.00636	0.00937	0.0805	0.09	0.041	0.0157	0.0415	0.00904	0.242
Indeno(1,2,3-c,d)pyrene			mg/kg	0.16	2.83	0.8	0.603	0.209	0.455	0.289	0.0586	0.213	0.134	0.149	3.66	0.196	0.117	1.16	0.065	0.00849	0.0124	0.121	0.517	0.104	0.0313	0.0563	0.0113	0.197
Naphthalene	0.18	0.561	mg/kg	0.0661	0.602	0.65	0.266	0.181	1.13	0.276	0.0437	0.0749	0.0804	0.0976	0.743	0.339	0.226	2.01	0.054	0.00511	0.00988	0.0606	0.123	0.0657	0.0217	0.0366	0.0112	0.187
Phenanthrene	0.2	1.17	mg/kg	1.93	10.6	9.32	4.1	2.68	13.7	3.34	0.146	0.852	1.36	1.76	56.2	4.01	3.16	23.3	0.41	0.0457	0.0506	0.843	0.972	0.365	0.105	0.398	0.054	1.09
Pyrene	0.2	1.52	mg/kg	3.14	15.1	9.35	8.7	4.4	14.6	5.13	0.912	3.1	2.3	2.16	56.3	4.52	3.89	24.3	1.25	0.163	0.184	2.15	2.75	1.44	0.257	0.913	0.185	3.05
Total PAH_{17}	1.6	22.8	mg/kg	**21.4**	**93.3**	**69.8**	**58.8**	**26.2**	**95.9**	**29.8**	**3.9**	**20.1**	**15.1**	**14.3**	**340.6**	**31.0**	**24.2**	**161.8**	**6.7**	**0.9**	**1.1**	**13.3**	**24.4**	**7.6**	**1.2**	**5.7**	**1.2**	**16.1**

Notes

GREEN highlight = sample exceeds the MassDEP TEC (MassDEP 2006 "Technical Update - Revised Sediment Screening Values")

ORANGE highlight = sample exceeds the MacDonald et al. (2000) "consensus" Probable Effect Concentrations (PEC)

PINK highlight = the sample has a PEC-Q> 1

Complete data presented in Attachment

(1) TOC values <1000 mg/kg (0.1%) adjusted to 0.1%. Equilibrium partitioning theory is invalid at very low organic carbon content

(2) All TOC reported in mg/kg unless otherwise indicated.

(3) No TOC data. Applies the average TOC for all wetland or mudflat samples with measured TOC (in italics)

(4) RAH - Boring with readily apparent harm; RAH(ADJ) - boring within RAH area but not exhbiting RAH; visual>1=

(5) Sample extending beyond 1 foot but considered surface for evaluation

ND PAHs replaced with 0 (zero) unless all PAHs are ND when total PAH17 is set at the highest RL

Table 7. Scope of Toxicity Testing
Stage I Environmental Screening and Stage II Environmental Risk Characterization
Former Amesbury MGP
Amesbury, Massachusetts

Sample	Area	Chironomus 10-day	Hyalella 42-day	Co-located chemistry
SS-632	Mudflat	X	X	X
SS-633	Mudflat	X	X	X
SS-635	Mudflat	X	X	SS620*
SS-636	Mudflat	X	X	SS619/621*
SS-642	River		X	X
SS-643	River		X	X
SS-644	River		X	X
SS-645	River upstream (reference)	X	X	X

Notes:
* Co-located sample not available. Nearby samples used as proxies.

Table 8. Stage II ERC MOE 2: ESBTU Results– Surface Sediment in Wetland and Source Area

Amesbury Former MGP

Amesbury, Massachusetts

Analyte	Sed: TEC/ ESV	Sed: PEC/ RSV	Units																												
Area				Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland
Sample ID				SS601-A	SS602-A	SS603-A	SS604-A	SS605-A	SS606-A	SS607-A	SS608R-A	SS609R-A	SS610R-A	SS611R-A	SS612A	SS624	SS625	SS626	SS627	SS628	SS629	SS630	SS793-S1	SS794-S1	SS796-S1	SS807-S1	SS808-S1	SS809-S1	810-S1	811-S1	839-S1
Depth Top-Bottom				8-12"	6"	7"	0-3"	6-12"	6-12"	6-12"	2-7"	8-14"	3-14"	4-10"	5-10"	0-1.7	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0.4-0.6	0.8-1	0-0.5	0.4-0.6	0.8-1	0.8-1	0.8-1	0.8-1	0-1
S / NS / SUB				S	S	S	S	S	S	S	S	S	S	S	S	NS	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Sampling Date				22/Sep/17	22/Sep/17	22/Sep/17	22/Sep/17	22/Sep/17	22/Sep/17	22/Sep/17	8/Nov/17	8/Nov/17	8/Nov/17	8/Nov/17	16/Jul/18	08/15/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	7/8/2020	7/8/2020	7/6/2020	7/8/2020	10/13/2022	10/13/2022	06/20/2023	06/20/2023	08/18/2023
RAH (4)						RAH										(5)	RAH				RAH										
Carbon				(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)																
Total Organic Carbon (2)	NCE	NCE	mg/kg													17600	109000	33000	284000	148000	42700	39900	233000	274000	61800	118000	148000	130000	43400	10300	146000
Total Organic Carbon (2)	NCE	NCE	%	9.492	9.492	9.492	9.492	9.492	9.492	9.492	9.492	9.492	9.492	9.492	9.492	1.76	10.9	3.3	28.4	14.8	4.27	3.99	23.3	27.4	6.18	11.8	14.8	13	4.34	1.03	14.6
Total PAH_{17}	1.6	22.7	mg/kg	**0.4**	**0.4**	**50.1**	**578.7**	**0.4**	**9.4**	**139.7**	**107.0**	**1340.7**	**809.5**	**245.9**	**0.4**	**125.4**	**14.7**	**5.0**	**50.9**	**23.3**	**7010.2**	**1.2**	**20.3**	**1118.5**	**0.1**	**7.9**	**31.8**	**25.6**	**25.9**	**12.5**	**19.3**
Total PAH_{34}	NCE	NCE	mg/kg	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**155.9**	**19.3**	**6.7**	**66.4**	**32.0**	**7872.5**	**2.7**	**27.7**	**1539.6**	**0.8**	**11.5**	**51.3**	**38.0**	**32.9**	**16.6**	**27.6**
MOE 1 PEC HQ				**0.0**	**0.0**	**2.2**	**25.4**	**0.0**	**0.4**	**6.1**	**4.7**	**58.8**	**35.5**	**10.8**	**0.0**	**5.5**	**0.6**	**0.2**	**2.2**	**1.0**	**307.5**	**0.1**	**0.9**	**49.1**	**0.0**	**0.3**	**1.4**	**1.1**	**1.1**	**0.5**	**0.8**
MOE 2 $\Sigma ESBTU_{FCV}$, PAH_{34}	TU															**14.1**	**0.3**	**0.3**	**0.4**	**0.4**	**319.5**	**0.1**	**0.2**	**8.7**	**0.0**	**0.1**	**0.5**	**0.5**	**1.0**	**2.3**	**0.3**
MOE 2 $\Sigma ESBTU_{FCV}$,estimated from PAH_{17} data	Applies the the average site-specific conversion factor. If no site specific values EPA method default			**0.0**	**0.0**	**1.2**	**14.6**	**0.0**	**0.2**	**3.5**	**2.4**	**39.9**	**19.9**	**6.1**	**0.0**																	

Notes

GREEN highlight = sample has an TEHQ<1 or an ESBTU<5

RED highlight = sample has a PECHQ>1 or a ESBTU>5

Complete data presented in Attachment

(1) TOC values <1000 mg/kg (0.1%) adjusted to 0.1%. Equilibrium partitioning theory is invalid at very low organic carbon content

(2) All TOC reported in mg/kg unless otherwise indicated.

(3) No TOC data. Applies the average TOC for all wetland or mudflat samples with measured TOC (in italics)

(4) RAH - Boring with readily apparent harm

(5) Sample extending beyond 1 foot but considered surface for evaluation

ND PAHs replaced with 0 (zero) unless all PAHs are ND when total PAH17 is set at the highest RL

Table 9. Stage II ERC MOE 2: ESBTU Results– Surface Sediment in Mudflat Area

Amesbury Former MGP

Amesbury, Massachusetts

Analyte	Sed: TEC/ESV	Sed: PEC/RSV	Units	Area	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat
				Sample ID	SS620	SS622	SS623	SS631	SS632	SS633	SS634	SS637	SS640	SS649	SS650	SS660	SS661	SS665-S1	SS667-S1	SS668-S1	SS670-S1	SS672-S1	SS717-S1	SS719-S1	SS720-S1	SS722-S1	SS761-S1	SS797-S1
				Depth Top-Bottom	0-2.5	0-1.8	0-1.7	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0 to 0.5	0 to 0.5	0 to 0.5	0 to 0.5	0 to 0.5	0.0 to 0.5	0.0 to 0.1	0.7 to 0.8	0.7 to 0.8	0.3-0.5	0-1
				S / NS / SUB	NS	NS	NS	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
				Sampling Date	08/15/2018	08/15/2018	08/15/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	04/23/2019	04/23/2019	04/24/1900	04/23/2019	09/10/2019	09/11/2019	09/11/2019	09/10/2019	09/24/2019	11/11/2019	11/11/2019	11/12/2019	11/12/2019	03/09/2020	7/8/2020
				RAH (4)	(5)	(5)	(5)	RAH	RAH																			
Carbon					(3)	(3)	(3)						(1)															
Total Organic Carbon (2)	NCE	NCE	mg/kg		55000	55000	55000	103000	29100	91200	74700	98300	1000	56300	55700	95600	76500	21000	21000	45300	62000	68500	81600	49100	69700	178000	39000	34200
Total Organic Carbon (2)	NCE	NCE	%		5.5	5.5	5.5	10.3	2.91	9.12	7.47	9.83	0.1	5.63	5.57	9.56	7.65	2.1	2.1	4.53	6.2	6.85	8.16	4.91	6.97	17.8	3.9	3.42
Total PAH_{17}	1.6	22.7	mg/kg		**3.5**	**40.6**	**16.0**	**67.9**	**61.9**	**54.8**	**3.7**	**7.4**	**2.8**	**70.1**	**68.5**	**46.7**	**71.5**	**42.1**	**68.0**	**131.2**	**277.7**	**117.4**	**0.8**	**113.1**	**173.1**	**178.0**	**24.2**	**18.8**
Total PAH_{34}	NCE	NCE	mg/kg		**5.8**	**44.2**	**26.8**	**104.3**	**72.2**	**64.5**	**6.4**	**9.9**	**4.2**	**84.5**	**82.4**	**58.3**	**85.7**	**51.5**	**78.1**	**152.7**	**320.8**	**140.6**	**3.4**	**136.5**	**236.9**	**232.6**	**38.7**	**29.2**
MOE 1 PEC HQ					**0.2**	**1.8**	**0.7**	**3.0**	**2.7**	**2.4**	**0.2**	**0.3**	**0.1**	**3.1**	**3.0**	**2.0**	**3.1**	**1.8**	**3.0**	**5.8**	**12.2**	**5.2**	**0.0**	**5.0**	**7.6**	**7.8**	**1.1**	**0.8**
MOE 2 $\Sigma ESBTU_{FCV}$, PAH_{34}	TU				**0.2**	**1.3**	**0.7**	**1.5**	**4.0**	**1.1**	**0.1**	**0.1**	**6.1**	**2.3**	**2.2**	**0.9**	**1.7**	**3.5**	**5.6**	**5.2**	**8.0**	**3.0**	**0.1**	**4.3**	**5.0**	**1.9**	**1.5**	**1.3**

Notes

GREEN highlight = sample has an TEHQ<1 or an ESBTU<5

RED ight = sample has a PECHQ>1 or a ESBTU>5

Complete data presented in Attachment

(1) TOC values <1000 mg/kg (0.1%) adjusted to 0.1%. Equilibrium partitioning theory is invalid at very low organic carbon content

(2) All TOC reported in mg/kg unless otherwise indicated.

(3) No TOC data. Applies the average TOC for all wetland or mudflat samples with measured TOC (in italics)

(4) RAH - Boring with readily apparent harm

(5) Sample extending beyond 1 foot but considered surface for evaluation

ND PAHs replaced with 0 (zero) unless all PAHs are ND when total PAH17 is set at the highest RL

Table 10. Stage I Effects Screening– Surface Sediment in River and Downstream Areas

Amesbury Former MGP

Amesbury, Massachusetts

Analyte	Sed: TEC/ ESV	Sed: PEC/ RSV	Units	Area	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River
				Sample ID	SS619	SS621	SS638	SS639	SS642	SS643	SS644	SS646	SS647	SS648	SS651	SS652	SS653	SS654	SS655	SS656	SS657	SS658	SS659	SS662	SS663	SS677-S2	SS678-S1	SS-679-S1	SS-680-S1	SS-681-S1	SS687-S1
				Depth Top-Bottom	0-1.9	0-1.8	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0 to 1	0 to 0.5	0 to 0.5	0 to 0.5	0 to 0.5	0 to 0.5
				S / NS / SUB	NS	NS	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
				Sampling Date	08/15/2018	08/15/2018	12/20/2018	12/20/2018	12/20/2018	12/20/2018	12/20/2018	04/23/2019	04/23/2019	04/23/2019	04/23/2019	04/23/2019	04/23/2019	04/23/2019	04/24/2019	04/24/2019	04/24/2019	04/24/2019	04/24/2019	04/23/2019	23/Apr/19	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/12/2019	09/23/2019
				RAH (4)	(5), RAH	(5)																								
Carbon					(3)																									
Total Organic Carbon (2)	NCE	NCE	mg/kg		55000	76700	7620	33400	19900	15000	80700	64400	27100	105000	91900	45600	27300	87600	38400	34200	7420	44300	95900	58500	49300	12500	43500	22500	37400	47800	54700
Total Organic Carbon (2)	NCE	NCE	%		5.5	7.67	0.762	3.34	1.99	1.5	8.07	6.44	2.71	10.5	9.19	4.56	2.73	8.76	3.84	3.42	0.742	4.43	9.59	5.85	4.93	1.25	4.35	2.25	3.74	4.78	5.47
Step 1 Measured Sediment Data																														
Total PAH_{17}	1.6	22.8	mg/kg		**118.5**	**119.4**	**3.7**	**41.5**	**9.0**	**10.9**	**16.9**	**14.2**	**18.3**	**28.9**	**165.6**	**129.9**	**99.0**	**54.9**	**227.9**	**12.5**	**7.7**	**1172.9**	**101.8**	**23.5**	**16.9**	**283.2**	**127.1**	**22.4**	**13.3**	**69.4**	**59.1**
Total PAH_{34}	NCE	NCE	mg/kg		**166.4**	**168.8**	**5.1**	**51.8**	**11.7**	**13.7**	**23.8**	**18.9**	**23.9**	**39.8**	**195.4**	**150.3**	**118.5**	**65.2**	**260.3**	**16.1**	**10.7**	**1338.9**	**121.3**	**31.8**	**22.0**	**339.5**	**149.4**	**31.5**	**18.0**	**89.6**	**73.7**
MOE 1 PEC HQ					**5.2**	**5.2**	**0.2**	**1.8**	**0.4**	**0.5**	**0.7**	**0.6**	**0.8**	**1.3**	**7.3**	**5.7**	**4.3**	**2.4**	**10.0**	**0.5**	**0.3**	**51.4**	**4.5**	**1.0**	**0.7**	**12.4**	**5.6**	**1.0**	**0.6**	**3.0**	**2.6**
MOE 2 $\Sigma ESBTU_{FCV}$, PAH_{34}	TU				**4.6**	**3.4**	**1.1**	**2.2**	**0.9**	**1.4**	**0.4**	**0.4**	**1.3**	**0.5**	**3.2**	**5.1**	**6.7**	**1.2**	**11.2**	**0.7**	**2.2**	**46.7**	**1.9**	**0.8**	**0.6**	**38.9**	**5.2**	**1.9**	**0.7**	**2.7**	**2.0**

Notes

GREEN highlight = sample has an TEHQ<1 or an ESBTU<5

RED ight = sample has a PECHQ>1 or a ESBTU>5

Complete data presented in Attachment

(1) TOC values <1000 mg/kg (0.1%) adjusted to 0.1%. Equilibrium partitioning theory is invalid at very low organic carbon content

(2) All TOC reported in mg/kg unless otherwise indicated.

(3) No TOC data. Applies the average TOC for all wetland or mudflat samples with measured TOC (in italics)

(4) RAH - Boring with readily apparent harm

(5) Sample extending beyond 1 foot but considered surface for evaluation

ND PAHs replaced with 0 (zero) unless all PAHs are ND when total PAH17 is set at the highest RL

Table 10. Stage I Effects Screening– Surface Sediment in River and Downstream Areas

Amesbury Former MGP

Amesbury, Massachusetts

Analyte	Sed: TEC/ ESV	Sed: PEC/ RSV	Units	Area	River	River	River	River	River	River	River	River	River	River	River	River	River	Downstream	Downstream	Downstream	River	River	River	River	River	River	River	River	River	River	River
				Sample ID	SS705-S1	SS706-S1	SS708-S1	SS709-S1	SS711-S1	SS750-S1	SS758-S1	SS759-S1	SS766-S1	SS772-S1	SS776-S1	SS783-S1	SS784-S1	SS804-S1	SS805-S1	SS806-S2	815-S1	817-S1	818-S1	819-S1	820-S1	823-S1	824-S1	829-S1	827-S1	848-S1	853-S1
				Depth Top-Bottom	0 to 0.5	0 to 0.5	0 to 0.5	0 to 0.5	0.0 to 0.9	0.8 to 1	0.1 to 0.4	0.0-0.3	0.7-0.9	0-0.2	0.8-1	0-1	0.5-0.7	0.1-0.4	0-1	0.8-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-0.5
				S / NS / SUB	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
				Sampling Date	09/27/2019	09/27/2019	09/27/2019	09/27/2019	11/11/2019	02/03/2020	02/05/2020	03/09/2020	03/10/2020	03/10/2020	03/13/2020	03/16/2020	03/16/2020	7/7/2020	7/7/2020	7/7/2020	06/22/2023	06/20/2023	06/22/2023	06/20/2023	06/22/2023	06/22/2023	06/22/2023	06/22/2023	06/22/2023	08/18/2023	08/18/2023
				RAH (4)		RAH																									
Carbon																															
Total Organic Carbon (2)	NCE	NCE	mg/kg		7800	31700	18600	51300	65100	9870	3210	30500	20000	107000	19700	41700	36500	27400	5220	2060	14600	44400	47400	17800	38900	40900	16900	32400	33900	34300	24500
Total Organic Carbon (2)	NCE	NCE	%		0.78	3.17	1.86	5.13	6.51	0.987	0.321	3.05	2	10.7	1.97	4.17	3.65	2.74	0.522	0.206	1.46	4.44	4.74	1.78	3.89	4.09	1.69	3.24	3.39	3.43	2.45
Step 1 Measured Sediment Data																															
Total PAH_{17}	1.6	22.8	mg/kg		**19.4**	**58.5**	**21.7**	**26.1**	**21.7**	**19.6**	**1.3**	**12.2**	**4.8**	**91.0**	**6.3**	**4.1**	**7.0**	**4.7**	**2.2**	**0.0**	**16.4**	**175.7**	**4.8**	**10.2**	**24.0**	**33.6**	**22.7**	**21.1**	**0.0**	**6.8**	**3.6**
Total PAH_{34}	NCE	NCE	mg/kg		**26.7**	**75.2**	**28.7**	**38.9**	**30.7**	**24.7**	**1.8**	**18.0**	**7.0**	**139.0**	**13.8**	**7.5**	**10.2**	**6.3**	**3.6**	**0.1**	**21.9**	**231.0**	**9.6**	**13.6**	**31.3**	**43.4**	**31.9**	**28.7**	**0.7**	**11.4**	**6.0**
MOE 1 PEC HQ					**0.9**	**2.6**	**1.0**	**1.1**	**1.0**	**0.9**	**0.1**	**0.5**	**0.2**	**4.0**	**0.3**	**0.2**	**0.3**	**0.2**	**0.1**	**0.0**	**0.7**	**7.7**	**0.2**	**0.4**	**1.1**	**1.5**	**1.0**	**0.9**	**0.0**	**0.3**	**0.2**
MOE 2 $\Sigma ESBTU_{FCV}$, PAH_{34}			TU		**4.9**	**4.0**	**2.3**	**1.1**	**0.7**	**3.5**	**0.8**	**0.9**	**0.5**	**1.9**	**1.0**	**0.2**	**0.4**	**0.3**	**1.0**	**0.0**	**2.1**	**8.6**	**0.3**	**1.1**	**1.1**	**1.5**	**2.6**	**1.3**	**0.0**	**0.5**	**0.4**

Notes

GREEN highlight = sample has an TEHQ<1 or an ESBTU<5

RED ight = sample has a PECHQ>1 or a ESBTU>5

Complete data presented in Attachment

(1) TOC values <1000 mg/kg (0.1%) adjusted to 0.1%. Equilibrium partitioning theory is invalid at very low organic carbon content

(2) All TOC reported in mg/kg unless otherwise indicated.

(3) No TOC data. Applies the average TOC for all wetland or mudflat samples with measured TOC (in italics)

(4) RAH - Boring with readily apparent harm

(5) Sample extending beyond 1 foot but considered surface for evaluation

ND PAHs replaced with 0 (zero) unless all PAHs are ND when total PAH17 is set at the highest RL

Table 10. Stage I Effects Screening– Surface Sediment in River and Downstream Areas

Amesbury Former MGP

Amesbury, Massachusetts

Analyte	Sed: TEC/ ESV	Sed: PEC/ RSV	Units	Area	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River
				Sample ID	858-S1	860-S1	861-S1	862-S1	869-S1	843-S1	844-S1	845-S1	846-S1	847-S1	851-S1	852-S1	854-S1	871-S1	872-S1	873-S1	874-S1	875-S1	876-S1	877-S1	878-S1	879-S1	880-S1	881-S1	882-S1
				Depth Top-Bottom	0-1	0-1	0-1	0-1	0-1	0-0.5	0-0.5	0-1	0-0.5	0-1	0-0.5	0-0.5	0-0.5	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1
				S / NS / SUB	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
				Sampling Date	2/Nov/23	28/Nov/23	27/Nov/23	27/Nov/23	27/Nov/23	08/29/2023	08/29/2023	28/Aug/23	08/29/2023	08/29/2023	08/30/2023	08/30/2023	08/29/2023	07/23/2024	07/23/2024	07/23/2024	07/22/2024	07/22/2024	07/22/2024	07/22/2024	07/22/2024	07/22/2024	07/23/2024	07/23/2024	07/23/2024
				RAH (4)																								
Carbon																												
Total Organic Carbon (2)	NCE	NCE	mg/kg		51000	47400	92500	92500	26600	86300	26700	49200	29500	32200	17500	15700	25800	15600	61500	13600	1650	79500	20200	56800	48800	62000	76200	44900	56500
Total Organic Carbon (2)	NCE	NCE	%		5.1	4.74	9.25	9.25	2.66	8.63	2.67	4.92	2.95	3.22	1.75	1.57	2.58	1.56	6.15	1.36	0.165	7.95	2.02	5.68	4.88	6.2	7.62	4.49	5.65
Step 1 Measured Sediment Data																												
Total PAH_{17}	1.6	22.8	mg/kg		**21.4**	**93.3**	**69.8**	**58.8**	**26.2**	**95.9**	**29.8**	**3.9**	**20.1**	**15.1**	**14.3**	**340.6**	**31.0**	**24.2**	**161.8**	**6.7**	**0.9**	**1.1**	**13.3**	**24.4**	**7.6**	**1.2**	**5.7**	**1.2**	**16.1**
Total PAH_{34}	NCE	NCE	mg/kg		**28.8**	**156.4**	**89.6**	**80.8**	**34.9**	**123.1**	**39.3**	**8.7**	**27.3**	**19.9**	**19.8**	**424.6**	**39.4**	**30.8**	**203.1**	**10.6**	**1.2**	**2.6**	**19.0**	**39.5**	**12.5**	**3.3**	**9.9**	**2.7**	**25.5**
MOE 1 PEC HQ					**0.9**	**4.1**	**3.1**	**2.6**	**1.1**	**4.2**	**1.3**	**0.2**	**0.9**	**0.7**	**0.6**	**14.9**	**1.4**	**1.1**	**7.1**	**0.3**	**0.0**	**0.0**	**0.6**	**1.1**	**0.3**	**0.1**	**0.2**	**0.1**	**0.7**
MOE 2 $\Sigma ESBTU_{FCV}$, PAH_{34}			TU		**0.9**	**4.7**	**1.4**	**1.3**	**1.9**	**2.0**	**2.2**	**0.3**	**1.3**	**0.9**	**1.8**	**37.9**	**2.2**	**2.9**	**4.7**	**1.1**	**1.1**	**0.0**	**1.4**	**1.0**	**0.4**	**0.1**	**0.2**	**0.1**	**0.7**

Notes

GREEN highlight = sample has an TEHQ<1 or an ESBTU<5

RED ight = sample has a PECHQ>1 or a ESBTU>5

Complete data presented in Attachment

(1) TOC values <1000 mg/kg (0.1%) adjusted to 0.1%. Equilibrium partitioning theory is invalid at very low organic carbon content

(2) All TOC reported in mg/kg unless otherwise indicated.

(3) No TOC data. Applies the average TOC for all wetland or mudflat samples with measured TOC (in italics)

(4) RAH - Boring with readily apparent harm

(5) Sample extending beyond 1 foot but considered surface for evaluation

ND PAHs replaced with 0 (zero) unless all PAHs are ND when total PAH17 is set at the highest RL

Table 11. Sediment Toxicity Results (MOE 3)
Amesbury Former MGP
Amesbury, Massachusetts

			Hyalella azteca (42-day)				*Chironomus dilutus (10-day)*	
			28-day Mean Survival	**42-day Mean Survival**	**42-day Mean growth per surviving organism**	**42-day Young per surviving female**	**10-day Mean Survival**	**10-day Mean growth per surviving organism**
Area	**Location**	**Area**	**Percent**	**Percent**	**mg**	**Number**	**Percent**	**mg**
Site	SS632R	Mudflat	90	78.8	0.43	1.1	93	0.90
	SS633R	Mudflat	87.5	83.8	0.44*	0.2	83*	1.13
	SS635R	Mudflat	92.5	87.5	0.47	0.8	95	1.13
	SS636R	Mudflat	85	63.8	0.45	0.2	94	1.09
	SS642R	River	62.5	66.3	0.48	0.9	not tested	not tested
	SS643R	River	82.5	91.3	0.39*	0.5	not tested	not tested
	SS644R	River	87.5	76.3	0.47	0.4	not tested	not tested
Reference	SS-645R	River	77.5	75.0	0.48	0.9	99.0	0.97
Lab Control	Lab Control***	--	80.0	67.5	0.46	0.2	100.0	1.19
	Control Performance	--	Acceptable **	--	--	--	Acceptable	--

General Notes:

* Significantly reduced relative to reference

** Acceptability criteria for 42-day H. azeca test is survival equal or greater to 80% at day 28

*** In addition, all reference toxicant tests met criteira

Table 12. Relationship of Toxicity to Measures of Effect
Stage I Environmental Screening and Stage II Environmental Risk Characterization
Former Amesbury MGP
Amesbury, Massachusetts

Sample	Area	Chironomus 10-day	Hyalella 42-day	PEC-HQ	ESBTU
SS632	Mudflat	Nontoxic	Nontoxic	2.7	4.0
SS633	Mudflat	Toxic	Nontoxic	2.4	1.1
SS635	Mudflat	Nontoxic	Nontoxic	0.1 (SS620)	0.2 (SS620)
SS636	Mudflat	Nontoxic	Nontoxic	5.2 (SS619) / 5.3 (SS621)	4.6 (SS619) / 3.4 (SS621)
SS642	River	--	Nontoxic	0.4	0.2
SS643	River	--	Nontoxic	0.5	1.4
SS644	River	--	Nontoxic	0.7	0.4
SS645	River upstream reference)	Nontoxic	Nontoxic	0.1	0.4

Notes:
For samples SS635 and S-636 no co-located sediment data is available. Data shown is for nearby samples.
PEC-HQ= MOE 1: Hazard Quotient based on PEC for PAH_{17}
ESBTU= Equilibrium Partitioning Sediment Benchmark Toxic Units, adjusted for organic carbon bioavailability.

Table 13. Risk Summary
Amesbury Former MGP
Amesbury, Massachusetts

Sample ID	Sampling Date	Depth Top-Bottom	Notes	Readily Apparent Harm (RAH)	Total PAH17 (mg/kg)	LOE 1 PEC HQ (HQ)	LOE 2 ΣESBTU (TU)	LOE 3 Toxicity	Risk Conclusion
Wetland Area									
SS601-A	22/Sep/17	8-12"	1,6		0.4	**0.0**	**0.0**	--	NSR
SS602-A	22/Sep/17	6"	1,6		0.4	**0.0**	**0.0**	--	NSR
SS603-A	22/Sep/17	7"	1,6	RAH	50	**2.2**	**1.2**	--	**Significant Risk of Harm**
SS604-A	22/Sep/17	0-3"	1,6		579	**25.5**	**14.6**	--	**Significant Risk of Harm**
SS605-A	22/Sep/17	6-12"	1,6		0.4	**0.0**	**0.0**	--	NSR
SS606-A	22/Sep/17	6-12"	1,6		9.4	**0.4**	**0.2**	--	NSR
SS607-A	22/Sep/17	6-12"	1,6		140	**6.2**	**3.5**	--	**Significant Risk of Harm**
SS608R-A	8/Nov/17	2-7"	1,6		107	**4.7**	**2.4**	--	NSR
SS609R-A	8/Nov/17	8-14"	1,6		1341	**59.1**	**39.9**	--	**Significant Risk of Harm**
SS610R-A	8/Nov/17	3-14"	1,6		809	**35.7**	**19.9**	--	**Significant Risk of Harm**
SS611R-A	8/Nov/17	4-10"	1,6		246	**10.8**	**6.1**	--	**Significant Risk of Harm**
SS612A	16/Jul/18	5-10"	1,6		0.4	**0.0**	**0.0**	--	NSR
SS624	08/15/2018	0-1.7	5		125	**5.5**	**14.1**	--	**Significant Risk of Harm**
SS625	12/17/2018	0-0.5		RAH	15	**0.6**	**0.3**	--	**Significant Risk of Harm**
SS626	12/17/2018	0-0.5			5.0	**0.2**	**0.3**	--	NSR
SS627	12/17/2018	0-0.5			51	**2.2**	**0.4**	--	NSR
SS628	12/17/2018	0-0.5			23	**1.0**	**0.4**	--	NSR
SS629	12/17/2018	0-0.5		RAH	7010	**308.8**	**319.5**	--	**Significant Risk of Harm**
SS630	12/17/2018	0-0.5			1.2	**0.1**	**0.1**	--	NSR
SS793-S1	7/8/2020	0.4-0.6			20	**0.9**	**0.2**	--	NSR
SS794-S1	7/8/2020	0.8-1			1119	**49.3**	**8.7**	--	**Significant Risk of Harm**
SS796-S1	7/6/2020	0-0.5			0.1	**0.0**	**0.0**	--	NSR
SS807-S1	7/8/2020	0.4-0.6			7.9	**0.3**	**0.1**	--	NSR
SS808-S1	10/13/2022	0.8-1			32	**1.4**	**0.5**	--	NSR
SS809-S1	10/13/2022	0.8-1			26	**1.1**	**0.5**	--	NSR
810-S1	06/20/2023	0.8-1			26	**1.1**	**1.0**	--	NSR
811-S1	06/20/2023	0.8-1			12	**0.5**	**2.3**	--	NSR
839-S1	08/18/2023	0-1			19	**0.9**	**0.3**	--	NSR
Mudflat Area									
SS620	08/15/2018	0-2.5	3, 5,6		3.5	**0.2**	**0.2**	Nontoxic (SS-635)	NSR
SS622	08/15/2018	0-1.8	5,6		41	**1.8**	**1.3**	--	NSR
SS623	08/15/2018	0-1.7	5.6		16	**0.7**	**0.7**	--	NSR
SS631	12/17/2018	0-0.5		RAH	68	**3.0**	**1.5**	--	**Significant Risk of Harm**
SS632	12/17/2018	0-0.5		RAH	62	**2.7**	**4.0**	Nontoxic	**Significant Risk of Harm**
SS633	12/17/2018	0-0.5	2		55	**2.4**	**1.1**	Partial	NSR
SS634	12/17/2018	0-0.5			3.7	**0.2**	**0.1**	--	NSR
SS637	12/17/2018	0-0.5			7.4	**0.3**	**0.1**	--	NSR
SS640	12/17/2018	0-0.5	4		2.8	**0.1**	**6.1**	--	NSR
SS649	04/23/2019	0-0.5			70	**3.1**	**2.3**	--	NSR
SS650	04/23/2019	0-0.5			69	**3.0**	**2.2**	--	NSR
SS660	04/24/2019	0-0.5			47	**2.1**	**0.9**	--	NSR
SS661	04/23/2019	0-0.5			72	**3.2**	**1.7**	--	**Significant Risk of Harm**
SS665-S1	09/10/2019	0 to 0.5			42	**1.9**	**3.5**	--	NSR
SS667-S1	09/11/2019	0 to 0.5			68	**3.0**	**5.6**	--	**Significant Risk of Harm**
SS668-S1	09/11/2019	0 to 0.5			131	**5.8**	**5.2**	--	**Significant Risk of Harm**
SS670-S1	09/10/2019	0 to 0.5			278	**12.2**	**8.0**	--	**Significant Risk of Harm**
SS672-S1	09/24/2019	0 to 0.5			117	**5.2**	**3.0**	--	**Significant Risk of Harm**
SS717-S1	11/11/2019	0.0 to 0.5			0.8	**0.0**	**0.1**	--	NSR
SS719-S1	11/11/2019	0.0 to 0.1			113	**5.0**	**4.3**	--	**Significant Risk of Harm**
SS720-S1	11/12/2019	0.7 to 0.8			173	**7.6**	**5.0**	--	**Significant Risk of Harm**
SS722-S1	11/12/2019	0.7 to 0.8			178	**7.8**	**1.9**	--	NSR
SS761-S1	03/09/2020	0.3-0.5			24	**1.1**	**1.5**	--	NSR
SS797-S1	7/8/2020	0-1			19	**0.8**	**1.3**	--	NSR
River and Downstream Area									
SS619	08/15/2018	0-1.9	3, 5, 6	RAH	119	**5.2**	**4.6**	Nontoxic (SS-636)	**Significant Risk of Harm**
SS621	08/15/2018	0-1.8	3, 5, 6		119	**5.3**	**3.4**	Nontoxic (SS-636)	NSR
815-S1	06/22/2023	0-1			16	**0.7**	**2.1**	--	NSR
817-S1	06/20/2023	0-1			176	**7.7**	**8.6**	--	**Significant Risk of Harm**
818-S1	06/22/2023	0-1			5	**0.2**	**0.3**	--	NSR
819-S1	06/20/2023	0-1			10	**0.4**	**1.1**	--	NSR
820-S1	06/22/2023	0-1			24	**1.1**	**1.1**	--	NSR
823-S1	06/22/2023	0-1			34	**1.5**	**1.5**	--	NSR
824-S1	06/22/2023	0-1			23	**1.0**	**2.6**	--	NSR
827-S1	06/22/2023	0-1			0.0	**0.0**	**0.0**	--	NSR
829-S1	06/22/2023	0-1			21.1	**0.9**	**1.3**	--	NSR
843-S1	08/29/2023	0-0.5			96	**4.2**	**2.0**	--	NSR
844-S1	08/29/2023	0-0.5			30	**1.3**	**2.2**	--	NSR
845-S1	28/Aug/23	0-1			3.9	**0.2**	**0.3**	--	NSR
846-S1	08/29/2023	0-0.5			20	**0.9**	**1.3**	--	NSR
847-S1	08/29/2023	0-1			15	**0.7**	**0.9**	--	NSR
848-S1	08/18/2023	0-1			6.8	**0.3**	**0.5**	--	NSR
851-S1	08/30/2023	0-0.5			14	**0.6**	**1.8**	--	NSR
852-S1	08/30/2023	0-0.5			341	**15.0**	**37.9**	--	**Significant Risk of Harm**
853-S1	08/18/2023	0-0.5			3.6	**0.2**	**0.4**	--	NSR
854-S1	08/29/2023	0-0.5			31	**1.4**	**2.2**	--	NSR
860-S1	28/Nov/23	0-1			93	**4.1**	**4.7**	--	NSR

Table 13. Risk Summary
Amesbury Former MGP
Amesbury, Massachusetts

Sample ID	Sampling Date	Depth Top-Bottom	Notes	Readily Apparent Harm (RAH)	Total PAH17 (mg/kg)	LOE 1 PEC HQ (HQ)	LOE 2 ΣESBTU (TU)	LOE 3 Toxicity	Risk Conclusion
861-S1	27/Nov/23	0-1			70	3.1	1.4	--	NSR
862-S1	27/Nov/23	0-1			59	2.6	1.3	--	NSR
869-S1	27/Nov/23	0-1			26	1.2	1.9	--	NSR
SS638	12/20/2018	0-0.5			3.7	0.2	1.1	--	NSR
SS639	12/20/2018	0-0.5			42	1.8	2.2	--	NSR
SS642	12/20/2018	0-0.5			9.0	0.4	0.9	Nontoxic	NSR
SS643	12/20/2018	0-0.5			11	0.5	1.4	Nontoxic	NSR
SS644	12/20/2018	0-0.5			17	0.7	0.4	Nontoxic	NSR
SS646	04/23/2019	0-0.5			14	0.6	0.4	--	NSR
SS647	04/23/2019	0-0.5			18	0.8	1.3	--	NSR
SS648	04/23/2019	0-0.5			29	1.3	0.5	--	NSR
SS651	04/23/2019	0-0.5			166	7.3	3.2	--	N
SS652	04/23/2019	0-0.5			130	5.7	5.1	--	**Significant Risk of Harm**
SS654	04/23/2019	0-0.5			55	2.4	1.2	--	N
SS655	04/24/2019	0-0.5			228	10.0	11.2	--	**Significant Risk of Harm**
SS656	04/24/2019	0-0.5			12	0.5	0.7	--	NSR
SS657	04/24/2019	0-0.5			7.7	0.3	2.2	--	NSR
SS658	04/24/2019	0-0.5			1173	51.7	46.7	--	**Significant Risk of Harm**
SS659	04/24/2019	0-0.5			102	4.5	1.9	--	NSR
SS662	04/23/2019	0-0.5			24	1.0	0.8	--	NSR
SS663	23/Apr/19	0-0.5			17	0.7	0.6	--	NSR
SS677-S2	09/11/2019	0 to 1			283	12.5	38.9	--	**Significant Risk of Harm**
SS678-S1	09/11/2019	0 to 0.5			127	5.6	5.2	--	**Significant Risk of Harm**
SS-679-S1	09/11/2019	0 to 0.5			22	1.0	1.9	--	NSR
SS-680-S1	09/11/2019	0 to 0.5			13	0.6	0.7	--	NSR
SS-681-S1	09/12/2019	0 to 0.5			69	3.1	2.7	--	NSR
SS687-S1	09/23/2019	0 to 0.5			59	2.6	2.0	--	NSR
SS705-S1	09/27/2019	0 to 0.5			19	0.9	4.9	--	NSR
SS706-S1	09/27/2019	0 to 0.5		RAH	59	2.6	4.0	--	**Significant Risk of Harm**
SS708-S1	09/27/2019	0 to 0.5			22	1.0	2.3	--	NSR
SS709-S1	09/27/2019	0 to 0.5			26	1.2	1.1	--	NSR
SS711-S1	11/11/2019	0.0 to 0.9			22	1.0	0.7	--	NSR
SS750-S1	02/03/2020	0.8 to 1			20	0.9	3.5	--	NSR
SS758-S1	02/05/2020	0.1 to 0.4			1.3	0.1	0.8	--	NSR
SS759-S1	03/09/2020	0.0-0.3			12	0.5	0.9	--	NSR
SS766-S1	03/10/2020	0.7-0.9			4.8	0.2	0.5	--	NSR
SS776-S1	03/13/2020	0.8-1			6.3	0.3	1.0	--	NSR
SS783-S1	03/16/2020	0-1			4.1	0.2	0.2	--	NSR
SS784-S1	03/16/2020	0.5-0.7			7.0	0.3	0.4	--	NSR
SS653	04/23/2019	0-0.5			99	4.4	6.7	--	**Significant Risk of Harm**
SS804-S1	7/7/2020	0.1-0.4			4.7	0.2	0.3	--	NSR
SS805-S1	7/7/2020	0-1			2.2	0.1	1.0	--	NSR
SS806-S2	7/7/2020	0.8-1			0.0	0.0	0.0	--	NSR
871-S1	7/23/2024	0-1			24.2	1.1	2.9	--	NSR
872-S1	7/23/2024	0-1			161.8	7.1	4.7	--	NSR
873-S1	7/23/2024	0-1			6.7	0.3	1.1	--	NSR
874-S1	7/22/2024	0-1			0.9	0.0	1.1	--	NSR
875-S1	7/22/2024	0-1			1.1	0.0	0.0	--	NSR
876-S1	7/22/2024	0-1			13.3	0.6	1.4	--	NSR
877-S1	7/22/2024	0-1			24.4	1.1	1.0	--	NSR
878-S1	7/22/2024	0-1			7.6	0.3	0.4	--	NSR
879-S1	7/22/2024	0-1			1.2	0.1	0.1	--	NSR
880-S1	7/23/2024	0-1			5.7	0.3	0.2	--	NSR
881-S1	7/23/2024	0-1			1.2	0.1	0.1	--	NSR
882-S1	7/23/2024	0-1			16.1	0.7	0.7	--	NSR
888-S1	7/23/2024	0-1			5.0	0.2	1.5	--	NSR
889-S1	7/23/2024	0-1			20.2	0.9	0.8	--	NSR

General Notes:
RAH= Readily Apparent Harm present
NSR= No significant risk of harm
ft = feet
LOE = Line of Evidence
PEC-HQ = Hazard Quotient based on total PAH_{17} PEC (22.7 mg/kg). RED huighlight indicates HQ>1
ESBTU= Equilibrium-partitioning Sediment Banchmark Toxic Unit. Green highlight indicates ESBTU>5 (Section 3.4.3)
Blue highlight indicates sample exceeds the proposed local conditions value of 34.5 mg/kg (Section 2.1.1.)

Notes:
(1) No PAH_{34} oata collected. PAH_{34} based estimated from PAH_{34}/PAH_{17} ratio average of other samples in wetland;
(2) Sediment toxicity test with one endpoint significantly less than reference sample
(3) Sediment toxicity test with no colocated sediment. Apllied nearby sediment results as reprsentative: (1) tox test SS-635 matched to SS-620, (2) tox test SS-636 matched to SS-619 and SS-621
(4) TOC <0.1%, equilibrium partitioning approach may not be valid
(5) Sample extended beyond surface sediment (0-1 foot)
(6) No TOC data, used estimated TOC from average of other samples in wetland and mudflat respectively

Table 14. Development of Environmental Risk-Based Guidance
Amesbury Former MGP
Amesbury, Massachusetts

Individual PAH contribution to total PAH			
	Average PAH Concentration[1] mg/kg	**Fractional PAH contribution (PAH_{17})**	**Fractional PAH Contribution (PAH_{34})**
2-Methylnaphthalene	105	0.073	0.056
Acenaphthene	168	0.116	0.089
Acenaphthylene	9.0	0.006	0.005
Anthracene	84	0.058	0.044
Benzo(a)anthracene	52	0.036	0.028
Benzo(a)pyrene	52	0.036	0.028
Benzo(b)fluoranthene	23	0.016	0.012
Benzo(g,h,i)perylene	22	0.015	0.012
Benzo(j/k)fluoranthene	29	0.020	0.015
Chrysene/triphenylene	50	0.034	0.026
Dibenzo(a,h)anthracene	5.0	0.003	0.003
Fluoranthene	121	0.084	0.064
Fluorene	64	0.045	0.034
Indeno(1,2,3-cd)pyrene	8.9	0.006	0.005
Naphthalene	196	0.135	0.103
Phenanthrene	280	0.194	0.148
Pyrene	176	0.122	0.093
Total PAH_{17}	**1447**	**1.000**	**0.764**
Benzo(e)pyrene	27	0.019	0.014
C1-Chrysenes	22	0.015	0.012
C1-Fluoranthenes/Pyrenes	76	0.053	0.040
C1-Fluorenes	22	0.015	0.011
C1-Naphthalenes	114	0.079	0.060
C1-Phenanthrenes/Anthracenes	1.2	0.001	0.001
C2-Chrysenes	7.3	0.005	0.004
C2-Fluorenes	12	0.008	0.006
C2-Naphthalenes	74	0.051	0.039
C2-Phenanthrenes/Anthracenes	31	0.021	0.016
C3-Chrysenes	2.3	0.002	0.001
C3-Fluorenes	4.4	0.003	0.002
C3-Naphthalenes	27	0.019	0.015
C3-Phenanthrenes/Anthracenes	8.3	0.006	0.004
C4-Chrysenes	0.9	0.001	0.000
C4-Naphthalenes	7.7	0.005	0.004
C4-Phenanthrenes/Anthracenes	2.6	0.002	0.001
Perylene	8.1	0.006	0.004
Total PAH_{34}	**1895**	**1.309**	**1.000**

Sample size=	254	all river and mudflat samples >0.5 mg/kg PAH17

	25th Percentile	**Median**	**Average**
Total Organic Carbon[2]	2.71%	4.73%	5.96%

PAH_{34}/PAH_{17} Ratio	1.31

[1] Average PAH concentration is the average of all 254 samples

[2] TOC values based on the same data set as for PAHs

Figures

Figure 1. Site Location Map

Figure 2. Site Exposure Areas and Data – River Area

Figure 3. Site Exposure Areas and Data – Mudflat and Wetland Areas

Figure 4. MassDEP Wetlands Map

Figure 5. Phase I Site Assessment Map

Figure 6. Measure of Effect 1 (Effects-Based Benchmark Criteria) - Distribution in Wetland and Mudflat Surface Sediments

Figure 7. Measure of Effect 1 (Effects-Based Benchmark Criteria) - Distribution in River Surface Sediments

Figure 8. Measure of Effect 2 (Effects-Based Equilibrium Partitioning-Based Toxicity Units) - Distribution in Wetland and Mudflat Surface Sediments

Figure 9. Measure of Effect 2 (Effects-Based Equilibrium Partitioning-Based Toxicity Units) - Distribution in River Surface Sediments

Figure 10. Sediment Toxicity Test Results: *Hyalella azteca* 42-day and *Chironomus dilutus* 10-day Survival

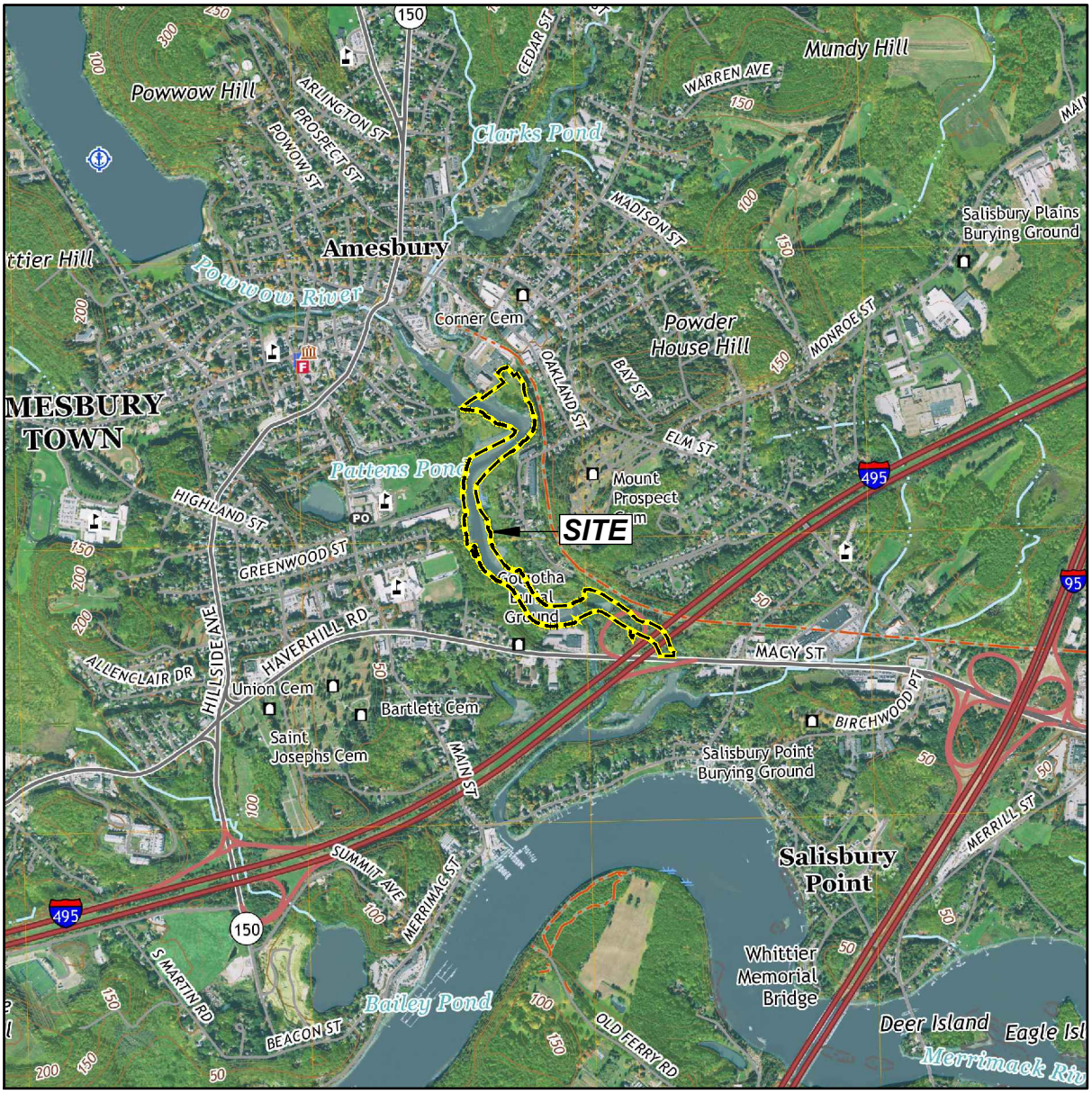
Figure 11. Sediment Toxicity Test Results: *Hyalella azteca* 42-day and *Chironomus dilutus* 10-day Growth (per Surviving Organism)

Figure 12. Summary of Ecological Risk – Wetland and Mudflat Surface Sediments

Figure 13. Summary of Ecological Risk – River Surface Sediments

Figure 14. Surface-Weighted Area Concentrations of Total PAHs in Sediment (0 to 1 Foot)

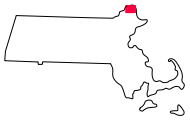
Figure 15. Surface-Weighted Area Concentrations of Total PAHs in Sediment (0 to 2 Foot)



0 1000 2000 4000 6000

SCALE, FEET

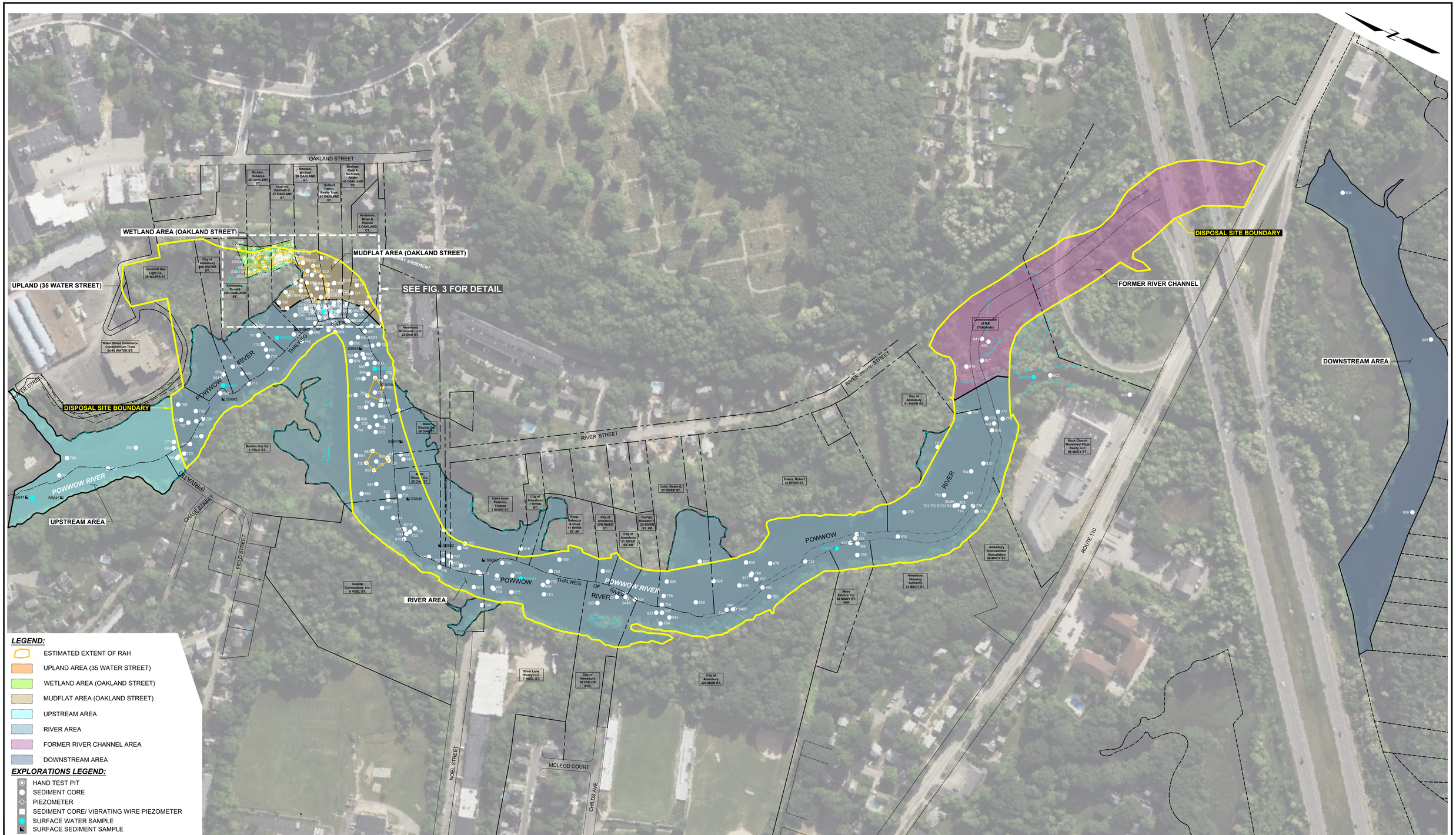
This Image is from U.S.G.S. Topographic 7.5 Minute Series
Newburyport West, MA-NH Quadrangle, 2021.
Datum is North American Vertical Datum of 1988 (NAVD88).
Contour Interval is 10 Feet.



MASSACHUSETTS
QUADRANGLE LOCATION

Stage I Environmental Screening and Stage II Environmental Risk Characterization Amesbury Former MGP Site Amesbury, Massachusetts	GEI Consultants	SITE LOCATION MAP
Boston Gas Company d|b|a National Grid Waltham, Massachusetts	Project 1804576	October 2025 Fig. 1

B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\Ph II CSA Supplemental\Appendix - ERC\1804576-01


WETLAND AREA (OAKLAND STREET)
MUDFLAT AREA (OAKLAND STREET)
UPLAND (35 WATER STREET)
SEE FIG. 3 FOR DETAIL
DISPOSAL SITE BOUNDARY
FORMER RIVER CHANNEL
DOWNSTREAM AREA
UPSTREAM AREA
RIVER AREA
OAKLAND STREET
RIVER STREET
POWWOW RIVER
THALWEG OF RIVER
CHASE STREET
FIELD STREET
NOEL STREET
MCLEOD COURT
CHILDS AVE
ROUTE 110
Richter, Rebecca 35 OAKLAND ST.
Smolski, Michael 39 OAKLAND ST.
Dreiszer, Carl & Nicholas Aiello 43 OAKLAND ST.
Hughes, Kenneth D. 37 OAKLAND ST.
Dolland Family Realty Trust 41 OAKLAND ST.
Anderson, Brian & Pauline 4 OAKLAND CT.
City of Amesbury 35A WATER ST.
Hewerhill Gas Light Co. 39 WATER ST.
Kinmance, Donald 33R OAKLAND ST.
Water Street Commerce Condominium Trust 34-46 WATER ST.
Amesbury Riverwalk, LLC 24 OAK ST.
Mass Electric Co. 26 OAK ST.
Boston Gas Co. 1 FIELD ST.
Mass Electric Co. 28 OAK ST.
Carla Anne Palermo, Trustee 3 RIVER ST.
City of Amesbury 7 RIVER ST.
Repp, Rebecca & Chad 11 RIVER ST. #R
City of Amesbury 17R RIVER ST.
Perrigo, Kenneth P. 23 RIVER ST. #R
City of Amesbury 21 RIVER ST. #R
Cohn, Robin G. 27 RIVER ST.
Evans, Robert 33 RIVER ST.
Coastal Connections, Inc. 6 NOEL ST.
River Lane Realty LLC 7 NOEL ST.
City of Amesbury 38 CHILDS AVE
City of Amesbury 222 MAIN ST.
City of Amesbury 61 RIVER ST.
Commonwealth of Mass (Tidelands)
Rock Church Ministries/ Plaza Realty LLC 58 MACY ST.
Amesbury Improvement & Development 66 MACY ST.
Amesbury Housing Authority 32 MACY ST.
Mass Electric Co. 60 MACY ST. #RR
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WETLAND AREA (OAKLAND STREET)

DISPOSAL SITE BOUNDARY

MUDFLAT AREA (OAKLAND STREET)

RIVER AREA

33R OAKLAND STREET

35 OAKLAND STREET

37 OAKLAND STREET

39 OAKLAND STREET

41 OAKLAND STREET

43 OAKLAND STREET

4 OAKLAND COURT

BIKEWAY EASEMENT

N

LEGEND:

- ESTIMATED EXTENT OF RAH
- WETLAND AREA (OAKLAND STREET)
- MUDFLAT AREA (OAKLAND STREET)
- RIVER AREA

EXPLORATIONS LEGEND:

- HAND TEST PIT
- SEDIMENT CORE
- SEDIMENT PROBE
- PIEZOMETER
- SEDIMENT CORE/ VIBRATING WIRE PIEZOMETER
- SURFACE WATER SAMPLE
- SURFACE SEDIMENT SAMPLE
- HAND TEST PIT (VISUAL OBSERVATION)

NOTES:

1. WETLAND, MUDFLAT, AND RIVER AREA ARE SUBDIVISIONS INTRODUCED SOLEY FOR PURPOSES OF CLARITY IN PRESENTATION OF RESULTS. THEY MAY NOT ALIGN COMPLETELY WITH NATURAL RESOURCE AREAS.
2. GOOGLE EARTH IMAGE DATED 5/04/2018.
3. HAND TEST PIT, SURFACE SAMPLE, AND SEDIMENT SAMPLE LOCATIONS ARE APPROXIMATE.
4. PARCEL BOUNDARIES, THALWEG OF RIVER, AND MEAN HIGH WATER LINE PROVIDED BY HAYNER/SWANSON, 2025.

0 30 60

Approximate Scale, Feet

Stage I Environmental Screening and
Stage II Environmental Risk Characterization
Amesbury Former MGP Site
Amesbury, Massachusetts

Boston Gas Company d|b|a National Grid
Waltham, Massachusetts

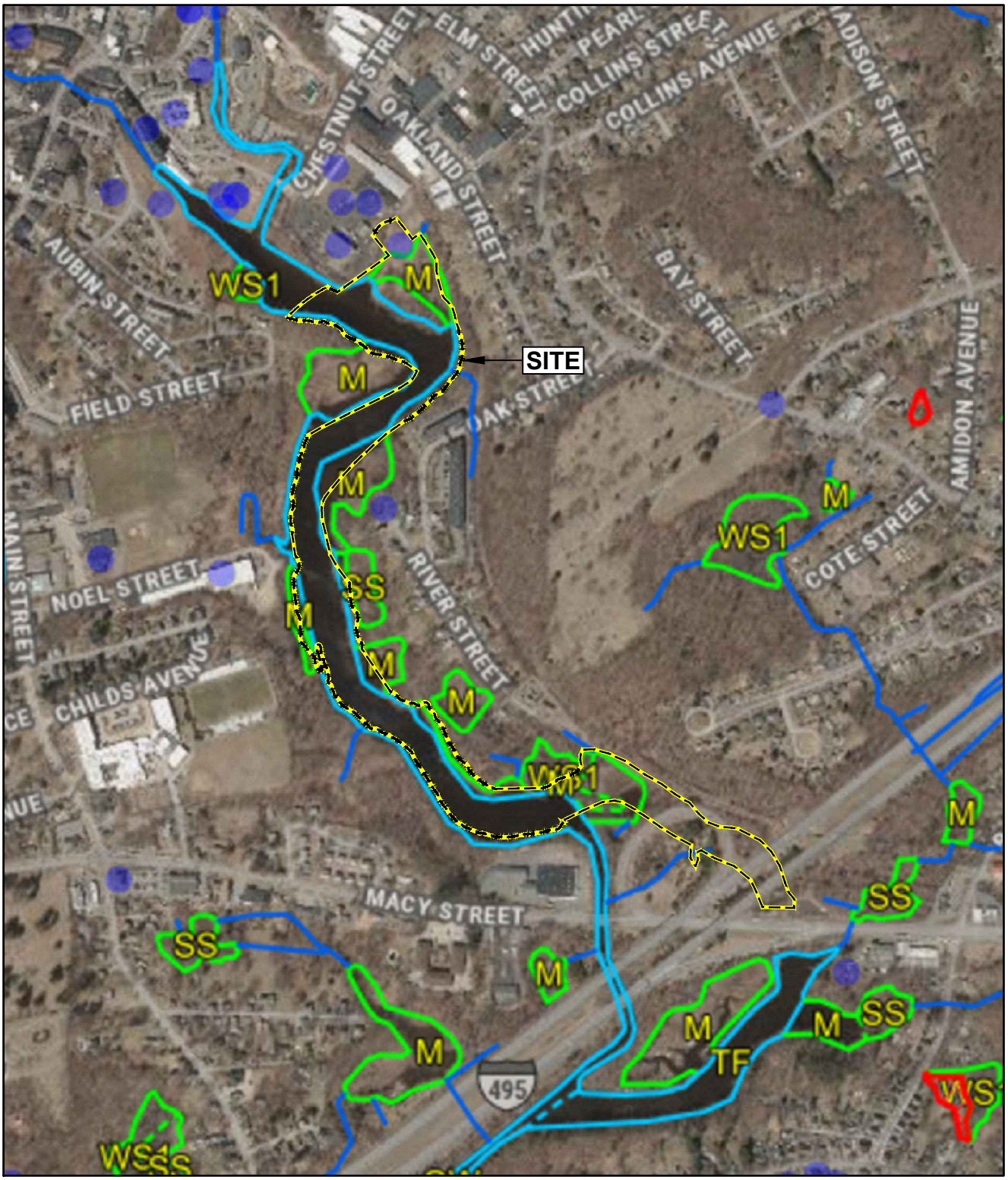
GEI Consultants

SITE PLAN - WETLAND AND MUDFLAT AREAS

Project 1804576

October 2025 Fig. 3

---- B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\Ph II CSA Supplemental\Appendix - ERC\1804576-03.dwg - 7/8/2025



LEGEND:

M = SHALLOW MARSH, MEADOW, OR FEN

SS = SHRUB SWAMP

TF = TIDAL FLAT

WS1 = WOODED SWAMP DECIDUOUS

Stage I Environmental Screening and Stage II Environmental Risk Characterization Amesbury Former MGP Site Amesbury, Massachusetts	GEI Consultants	MASSDEP WETLAND AREAS
Boston Gas Company d|b|a National Grid Waltham, Massachusetts	Project 1804576	October 2025 Fig. 4

B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\Ph II CSA Supplemental\Appendix - ERC\1804576-04

MassDEP - Bureau of Waste Site Cleanup

Phase 1 Site Assessment Map: 500 feet & 0.5 Mile Radii

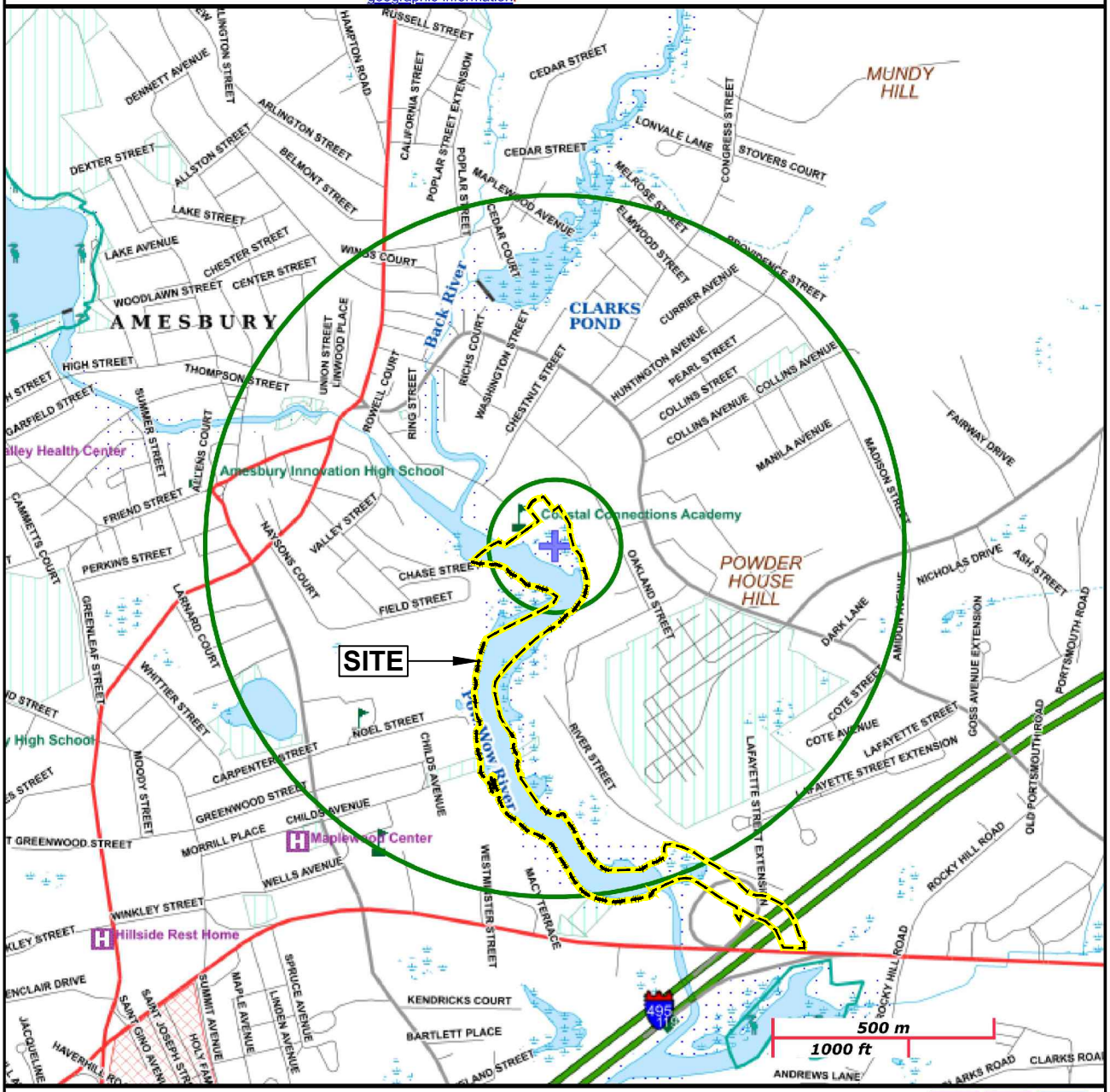
Site Information:

39 WATER STREET AMESBURY, MA
3-000024070

NAD83 UTM Meters:
4746508mN , 342757mE (Zone: 19)
February 26, 2024

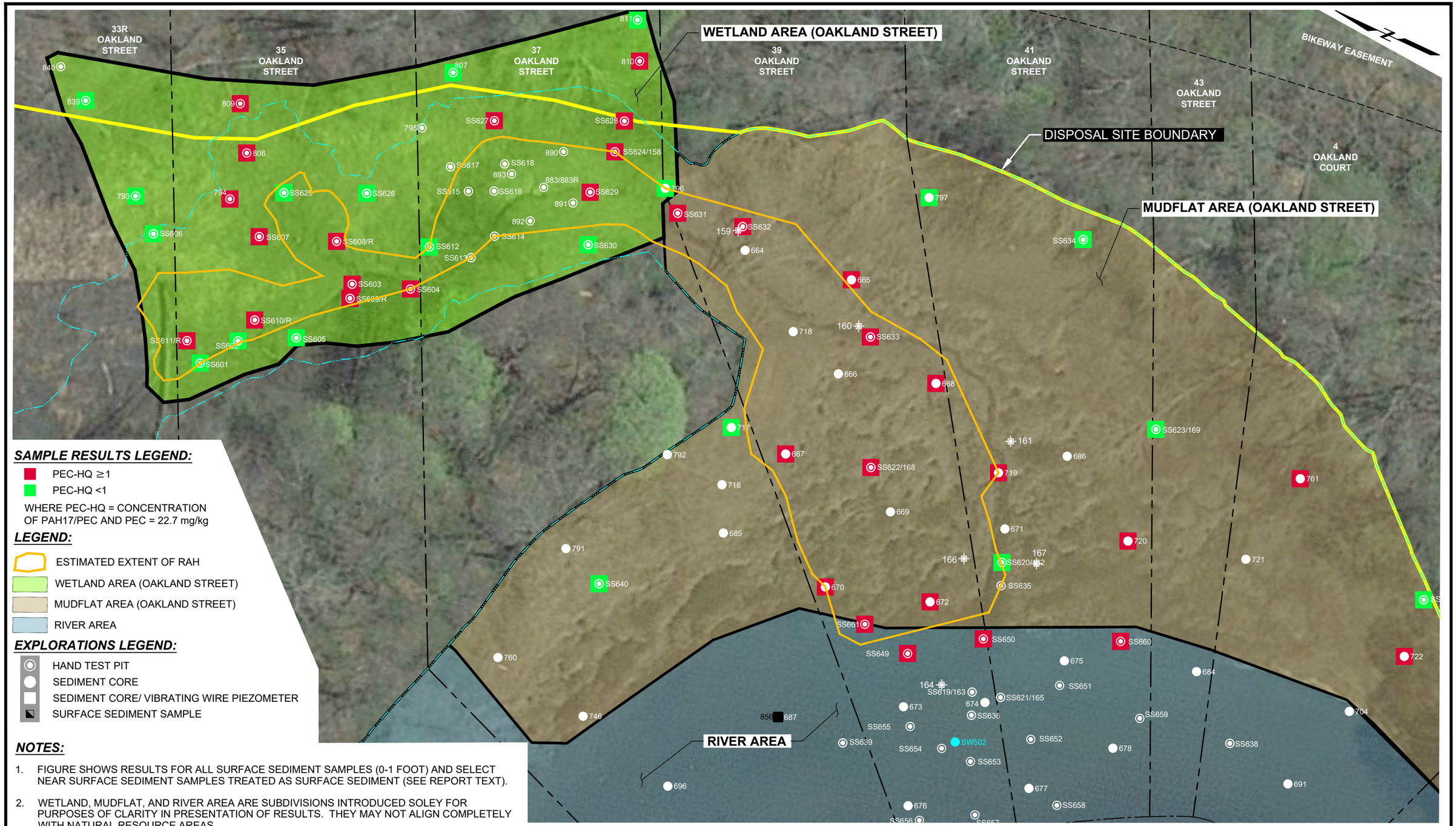
The information shown is the best available at the date of printing. However, it may be incomplete. The responsible party and LSP are ultimately responsible for ascertaining the true conditions surrounding the site. Metadata for data layers shown on this map can be found at: https://www.mass.gov/orgs/massgis-bureau-of-geographic-information.

MassDEP
Commonwealth of Massachusetts
Department of Environmental Protection



Stage I Environmental Screening and Stage II Environmental Risk Characterization Amesbury Former MGP Site Amesbury, Massachusetts	GEI Consultants	MASSGIS MAP
Boston Gas Company d|b|a National Grid Waltham, Massachusetts	Project 1804576	October 2025 Fig. 5

B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\Ph II CSA Supplemental\Appendix - ERC\1804576-05



SAMPLE RESULTS LEGEND:

- PEC-HQ ≥1
- PEC-HQ <1

WHERE PEC-HQ = CONCENTRATION OF PAH17/PEC AND PEC = 22.7 mg/kg

LEGEND:

- ESTIMATED EXTENT OF RAH
- WETLAND AREA (OAKLAND STREET)
- MUDFLAT AREA (OAKLAND STREET)
- RIVER AREA

EXPLORATIONS LEGEND:

- HAND TEST PIT
- SEDIMENT CORE
- SEDIMENT CORE/ VIBRATING WIRE PIEZOMETER
- SURFACE SEDIMENT SAMPLE

NOTES:

1. FIGURE SHOWS RESULTS FOR ALL SURFACE SEDIMENT SAMPLES (0-1 FOOT) AND SELECT NEAR SURFACE SEDIMENT SAMPLES TREATED AS SURFACE SEDIMENT (SEE REPORT TEXT).
2. WETLAND, MUDFLAT, AND RIVER AREA ARE SUBDIVISIONS INTRODUCED SOLEY FOR PURPOSES OF CLARITY IN PRESENTATION OF RESULTS. THEY MAY NOT ALIGN COMPLETELY WITH NATURAL RESOURCE AREAS.
3. GOOGLE EARTH IMAGE DATED 5/04/2018.
4. HAND TEST PIT, SURFACE SAMPLE, AND SEDIMENT SAMPLE LOCATIONS ARE APPROXIMATE.
5. PARCEL BOUNDARIES, THALWEG OF RIVER, AND MEAN HIGH WATER LINE PROVIDED BY HAYNER/SWANSON, 2025.

0 30 60

Approximate Scale, Feet

Stage I Environmental Screening and
Stage II Environmental Risk Characterization
Amesbury Former MGP Site
Amesbury, Massachusetts

Boston Gas Company d|b|a National Grid
Waltham, Massachusetts

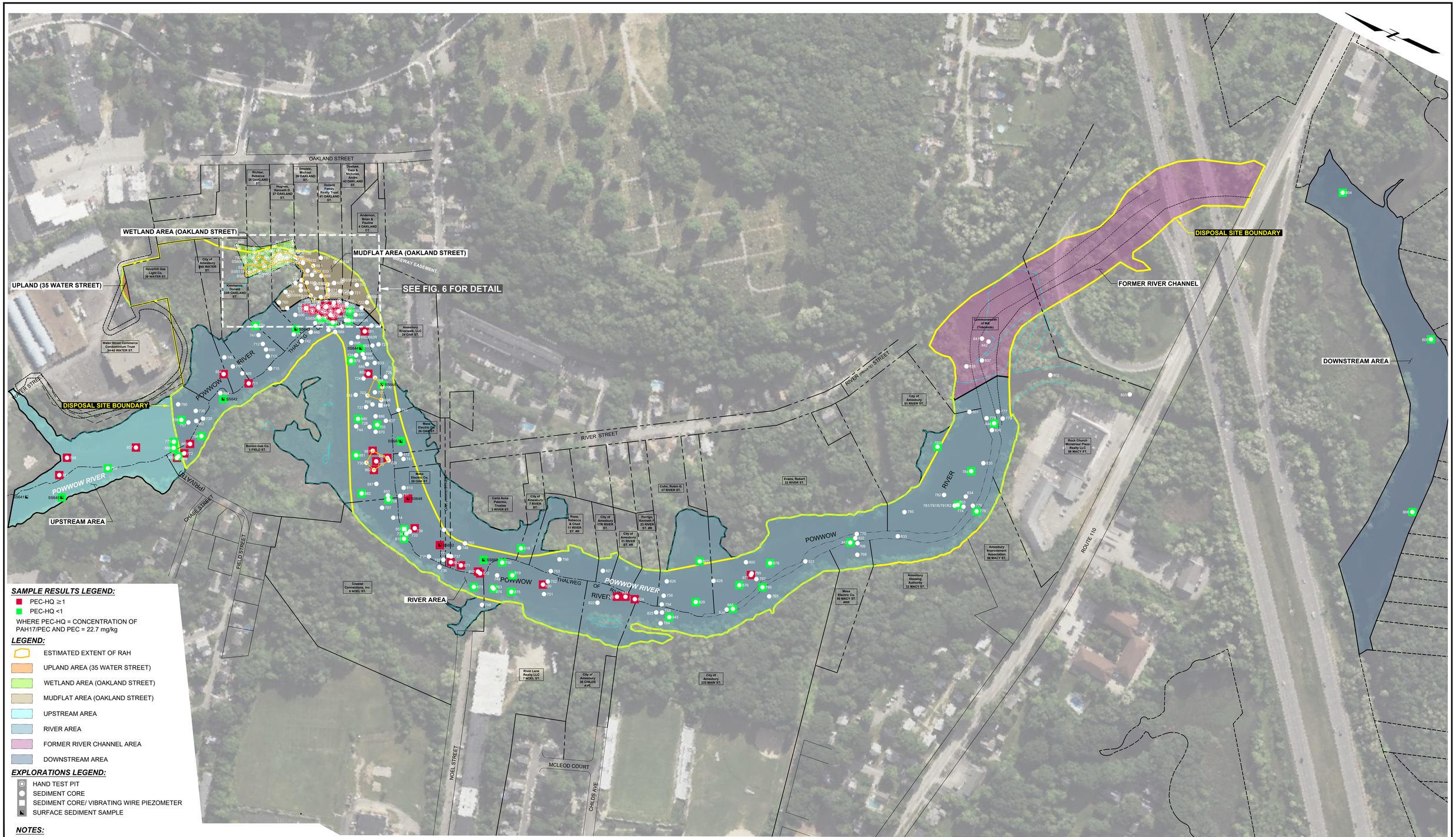
GEI Consultants

Project 1804576

MEASURE OF EFFECT 1
(Effects-Based Benchmark Criteria)
DISTRIBUTION IN WETLAND AND MUDFLAT SURFACE SEDIMENTS

October 2025 Fig. 6

---- B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\Ph II CSA Supplemental\Appendix - ERC\1804576-06.dwg - 9/13/2024



SAMPLE RESULTS LEGEND:

- PEC-HQ ≥1
- PEC-HQ <1

WHERE PEC-HQ = CONCENTRATION OF PAH17/PEC AND PEC = 22.7 mg/kg

LEGEND:

- ESTIMATED EXTENT OF RAH
- UPLAND AREA (35 WATER STREET)
- WETLAND AREA (OAKLAND STREET)
- MUDFLAT AREA (OAKLAND STREET)
- UPSTREAM AREA
- RIVER AREA
- FORMER RIVER CHANNEL AREA
- DOWNSTREAM AREA

EXPLORATIONS LEGEND:

- HAND TEST PIT
- SEDIMENT CORE
- SEDIMENT CORE/ VIBRATING WIRE PIEZOMETER
- SURFACE SEDIMENT SAMPLE

NOTES:

1. FIGURE SHOWS RESULTS FOR ALL SURFACE SEDIMENT SAMPLES (0-1 FOOT) AND SELECT NEAR SURFACE SEDIMENT SAMPLES TREATED AS SURFACE SEDIMENT (SEE REPORT TEXT).
2. WETLAND, MUDFLAT, AND RIVER AREA ARE SUBDIVISIONS INTRODUCED SOLEY FOR PURPOSES OF CLARITY IN PRESENTATION OF RESULTS. THEY MAY NOT ALIGN COMPLETELY WITH NATURAL RESOURCE AREAS.
3. MICROSOFT BING IMAGE 2021.
3. PARCEL BOUNDARIES, THALWEG OF RIVER, AND MEAN HIGH WATER LINE PROVIDED BY HAYNER/SWANSON, 2025.
4. HAND TEST PIT, SURFACE SAMPLE, AND SEDIMENT SAMPLE LOCATIONS ARE APPROXIMATE.

0 150 300
Approximate Scale, Feet

Stage I Environmental Screening and
Stage II Environmental Risk Characterization
Amesbury Former MGP Site
Amesbury, Massachusetts

Boston Gas Company d|b|a National Grid
Waltham, Massachusetts

GEI Consultants

MEASURE OF EFFECT 1
(Effects-Based Benchmark Criteria)
DISTRIBUTION IN RIVER
SURFACE SEDIMENTS

Project 1804576 | October 2025 | Fig. 7

---- B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\Ph II CSA Supplemental\Appendix - ERC\1804576-07.dwg - 7/8/2025

33R OAKLAND STREET
35 OAKLAND STREET
37 OAKLAND STREET
39 OAKLAND STREET
41 OAKLAND STREET
43 OAKLAND STREET
4 OAKLAND COURT
BIKEWAY EASEMENT

WETLAND AREA (OAKLAND STREET)
DISPOSAL SITE BOUNDARY
MUDFLAT AREA (OAKLAND STREET)
RIVER AREA

SAMPLE RESULTS LEGEND:

- ESTBU ≥5
- ESTBU ≥1 AND <5
- ESTBU <1

WHERE ESBTU INCLUDES PAH34

LEGEND:

- ESTIMATED EXTENT OF RAH
- WETLAND AREA (OAKLAND STREET)
- MUDFLAT AREA (OAKLAND STREET)
- RIVER AREA

EXPLORATIONS LEGEND:

- HAND TEST PIT
- SEDIMENT CORE
- SEDIMENT CORE/ VIBRATING WIRE PIEZOMETER
- SURFACE SEDIMENT SAMPLE

NOTES:

1. FIGURE SHOWS RESULTS FOR ALL SURFACE SEDIMENT SAMPLES (0-1 FOOT) AND SELECT NEAR SURFACE SEDIMENT SAMPLES TREATED AS SURFACE SEDIMENT (SEE REPORT TEXT).
2.
3. WETLAND, MUDFLAT, AND RIVER AREA ARE SUBDIVISIONS INTRODUCED SOLEY FOR PURPOSES OF CLARITY IN PRESENTATION OF RESULTS. THEY MAY NOT ALIGN COMPLETELY WITH NATURAL RESOURCE AREAS.
4. GOOGLE EARTH IMAGE DATED 5/04/2018.
5. HAND TEST PIT, SURFACE SAMPLE, AND SEDIMENT SAMPLE LOCATIONS ARE APPROXIMATE.
6. PARCEL BOUNDARIES, THALWEG OF RIVER, AND MEAN HIGH WATER LINE PROVIDED BY HAYNER/SWANSON, 2025.

0 30 60
Approximate Scale, Feet

Stage I Environmental Screening and
Stage II Environmental Risk Characterization
Amesbury Former MGP Site
Amesbury, Massachusetts

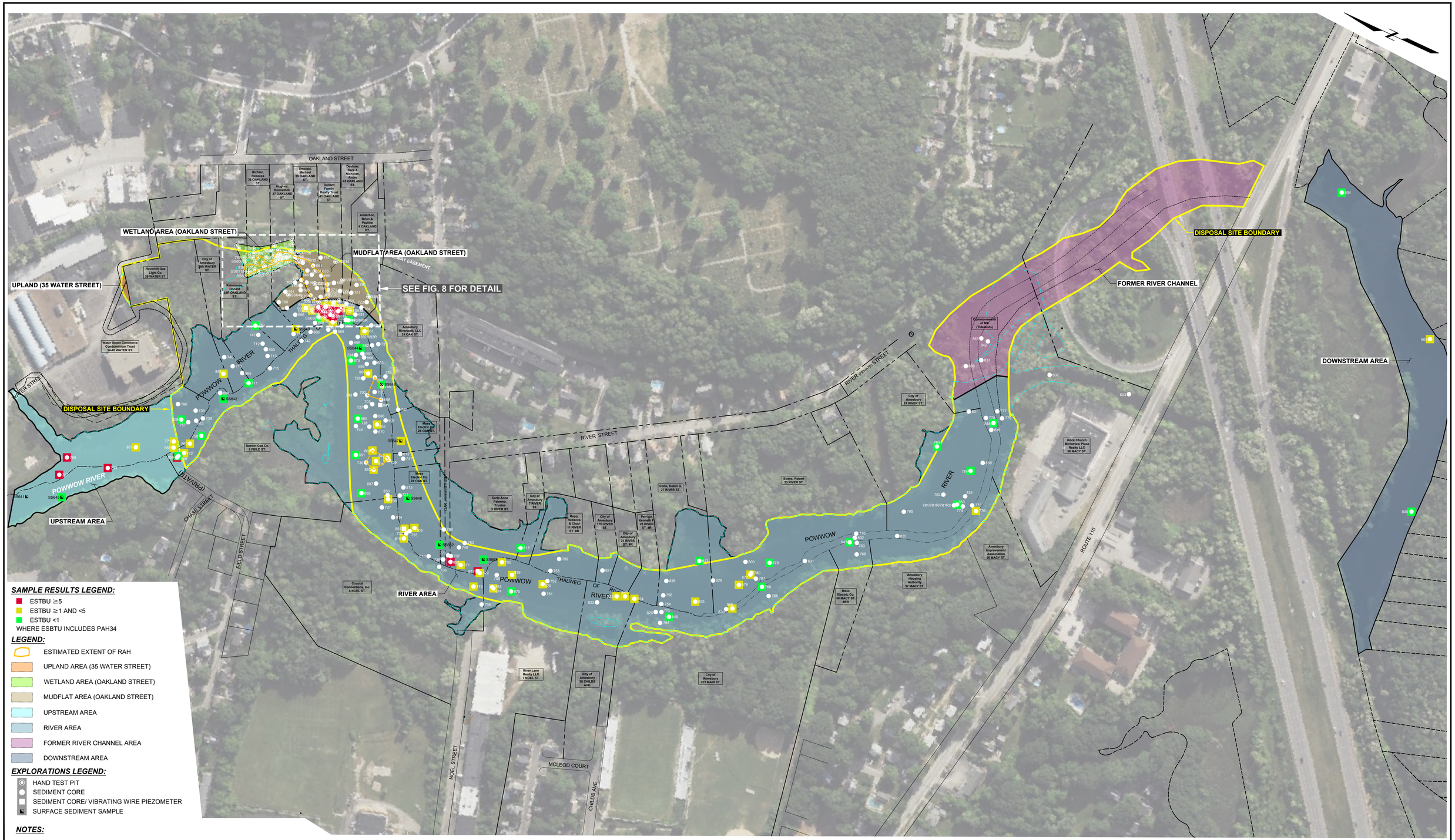
Boston Gas Company d|b|a National Grid
Waltham, Massachusetts

GEI Consultants

MEASURE OF EFFECT 2
(Equilibrium Partitioning-Based Toxicity Units)
DISTRIBUTION IN WETLAND AND MUDFLAT SURFACE SEDIMENTS

Project 1804576 | October 2025 | Fig. 8

---- B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\Ph II CSA Supplemental\Appendix - ERC\1804576-08.dwg - 7/8/2025


WETLAND AREA (OAKLAND STREET)
MUDFLAT AREA (OAKLAND STREET)
UPLAND (35 WATER STREET)
SEE FIG. 8 FOR DETAIL
DISPOSAL SITE BOUNDARY
FORMER RIVER CHANNEL
DOWNSTREAM AREA
UPSTREAM AREA
RIVER AREA
OAKLAND STREET
RIVER STREET
WATER STREET
CHASE STREET
FIELD STREET
NOEL STREET
MCLEOD COURT
CHILDS AVE
ROUTE 110
POWWOW RIVER
THALWEG OF RIVER
Haverhill Gas Light Co. 39 WATER ST.
City of Amesbury 39A WATER ST.
Water Street Commerce Condominium Trust 34-46 WATER ST.
Amesbury Riverwalk, LLC 24 OAK ST.
Mass Electric Co. 26 OAK ST.
Mass Electric Co. 28 OAK ST.
Boston Gas Co. 1 FIELD ST.
Coastal Connections, Inc. 6 NOEL ST.
River Lane Realty LLC 7 NOEL ST.
City of Amesbury 38 CHILDS AVE.
City of Amesbury 222 MAIN ST.
City of Amesbury 3 RIVER ST.
City of Amesbury 11N RIVER ST.
City of Amesbury 21 RIVER ST. #R
Perrigo, Kenneth F. 23 RIVER ST. #R
Cohn, Robin G. 27 RIVER ST.
Evans, Robert 33 RIVER ST.
City of Amesbury 61 RIVER ST.
Commonwealth of Mass (Tidelands)
Rock Church Ministries/ Plaza Realty LLC 58 MACY ST.
Amesbury Improvement Association 66 MACY ST.
Amesbury Housing Authority 32 MACY ST.
Mass Electric Co. 50 MACY ST. #R6
Richter, Rebecca 39 OAKLAND ST.
Smejkal, Michael 39 OAKLAND ST.
Hughes, Kenneth D. 37 OAKLAND ST.
Dolland Family Realty Trust 41 OAKLAND ST.
Deschene, Gary & Nicholas Andre 43 OAKLAND ST.
Anderson, Brian & Pauline 4 OAKLAND CT.
Kinnmance, Donald 33R OAKLAND ST.
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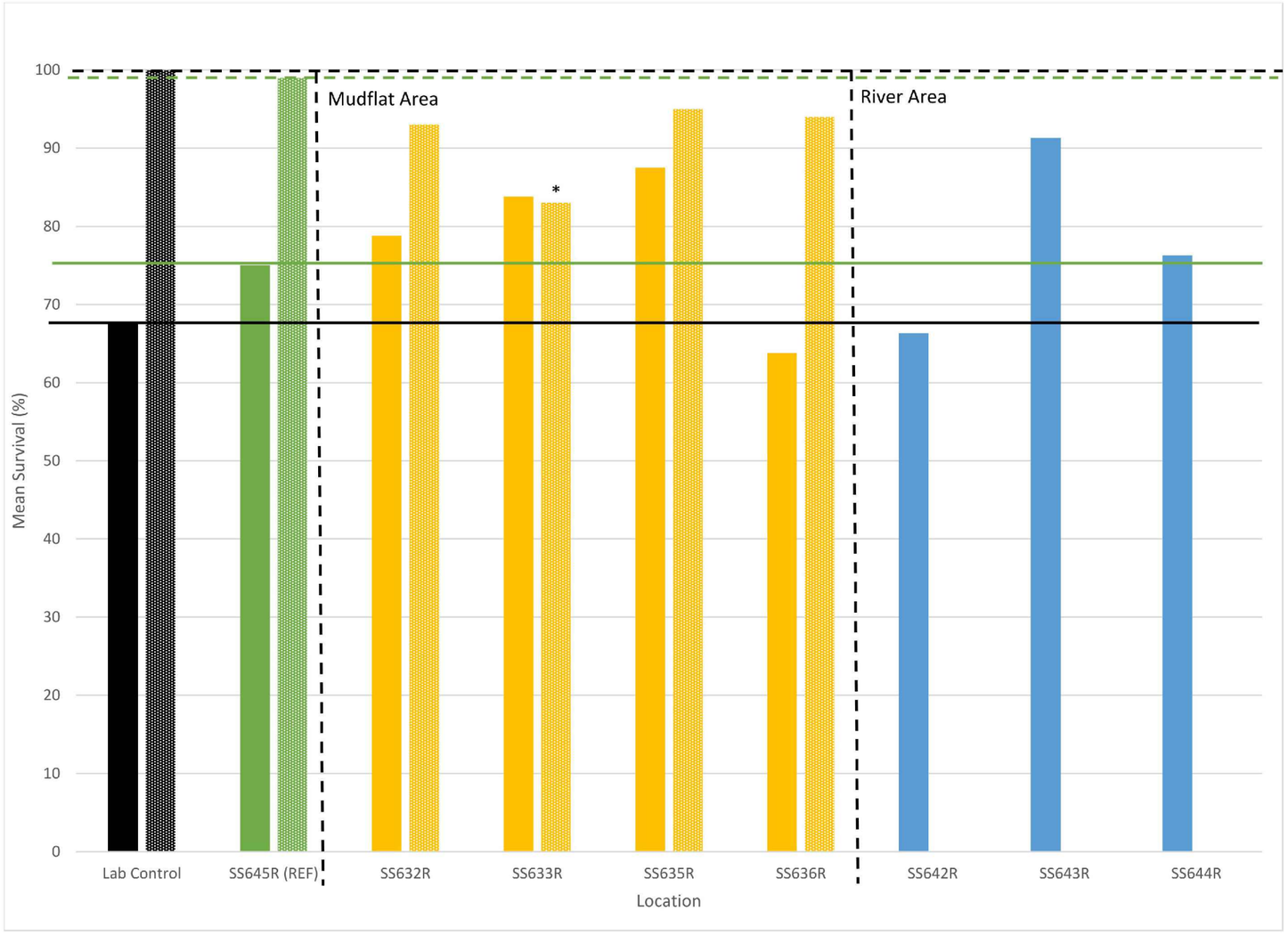


LEGEND:

- LABORATORY CONTROL - H. azteca 42-DAY MEAN SURVIVAL
- LABORATORY CONTROL - C. dilutus 10-DAY MEAN SURVIVAL
- REFERENCE SAMPLE - H. azteca 42-DAY MEAN SURVIVAL
- REFERENCE SAMPLE - C. dilutus 10-DAY MEAN SURVIVAL
- MUDFLAT SAMPLE - H. azteca 42-DAY MEAN SURVIVAL
- MUDFLAT SAMPLE - C. dilutus 10-DAY MEAN SURVIVAL
- RIVER SAMPLE - H. azteca 42-DAY MEAN SURVIVAL

* = SIGNIFICANTLY DIFFERENT FROM REFERENCE SAMPLE

Stage I Environmental Screening and
Stage II Environmental Risk Characterization
Amesbury Former MGP Site
Amesbury, Massachusetts

Boston Gas Company d|b|a National Grid
Waltham, Massachusetts

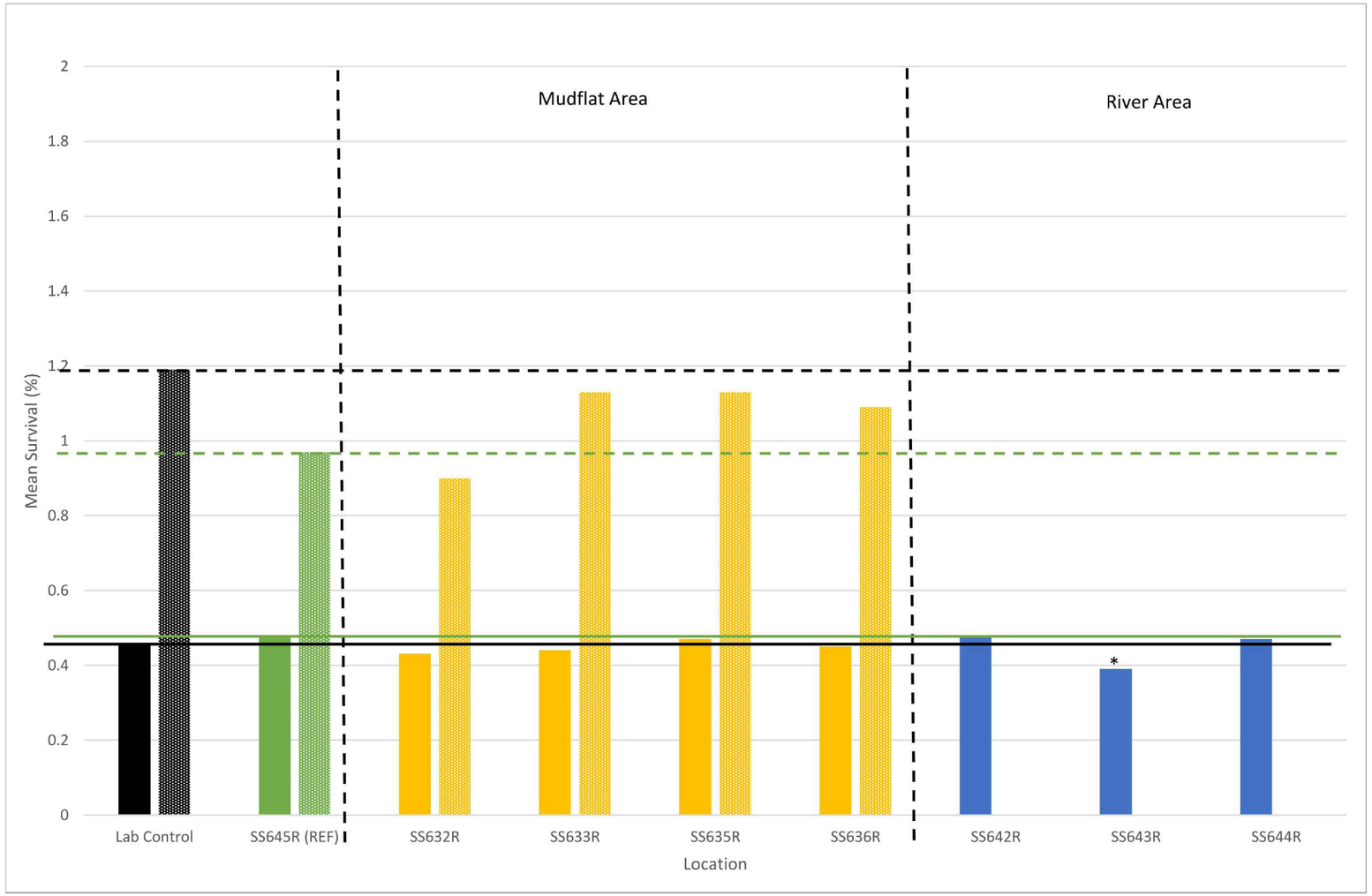
GEI Consultants

Project 1804576

SEDIMENT TOXICITY TEST RESULTS:
Hyalella azteca 42-DAY AND
Chironomous dilutus 10-DAY
SURVIVAL

October 2025 Fig. 10

CLINGEN, PAUL B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\Ph II CSA Supplemental\Appendix - ERC\1804576-10.dwg - 10/22/2025



LEGEND:

- LABORATORY CONTROL - H. azteca 42-DAY MEAN GROWTH PER SURVIVOR
- LABORATORY CONTROL - C. dilutus 10-DAY MEAN GROWTH PER SURVIVOR
- REFERENCE SAMPLE - H. azteca 42-DAY MEAN GROWTH PER SURVIVOR
- REFERENCE SAMPLE - C. dilutus 10-DAY MEAN GROWTH PER SURVIVOR
- MUDFLAT SAMPLE - H. azteca 42-DAY MEAN GROWTH PER SURVIVOR
- MUDFLAT SAMPLE - C. dilutus 10-DAY MEAN GROWTH PER SURVIVOR
- RIVER SAMPLE - H. azteca 42-DAY MEAN GROWTH PER SURVIVOR

* = SIGNIFICANTLY DIFFERENT FROM REFERENCE SAMPLE

Stage I Environmental Screening and
Stage II Environmental Risk Characterization
Amesbury Former MGP Site
Amesbury, Massachusetts

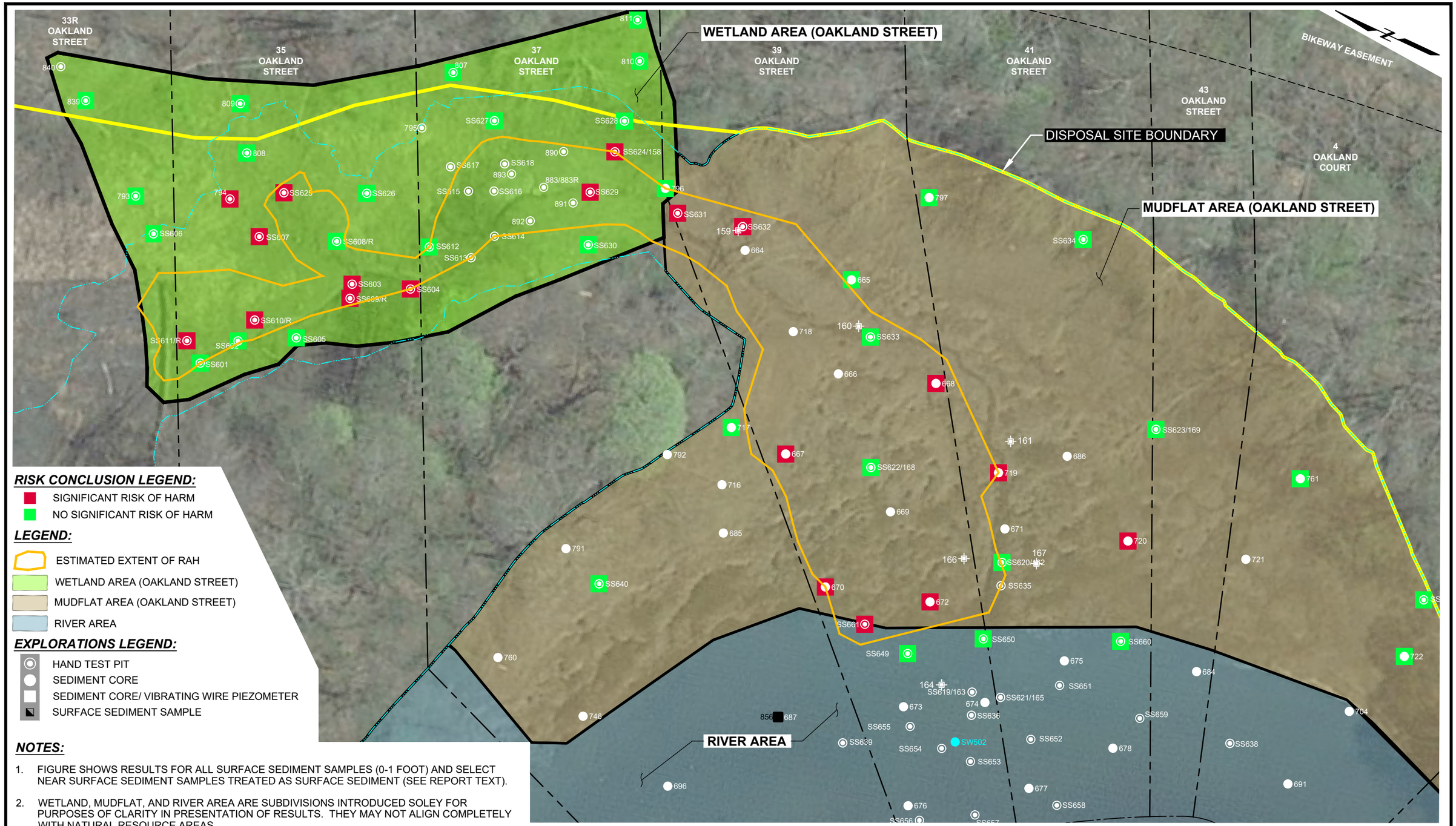
Boston Gas Company d|b|a National Grid
Waltham, Massachusetts

GEI Consultants

SEDIMENT TOXICITY TEST RESULTS:
Hyalella azteca 42-DAY AND
Chironomous dilutus 10-DAY GROWTH
(per Surviving Organism)

Project 1804576 | October 2025 | Fig. 11

CLINGEN, PAUL B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\Ph II CSA Supplemental\Appendix - ERC\1804576-10.dwg - 10/22/2025



RISK CONCLUSION LEGEND:

- SIGNIFICANT RISK OF HARM
- NO SIGNIFICANT RISK OF HARM

LEGEND:

- ESTIMATED EXTENT OF RAH
- WETLAND AREA (OAKLAND STREET)
- MUDFLAT AREA (OAKLAND STREET)
- RIVER AREA

EXPLORATIONS LEGEND:

- HAND TEST PIT
- SEDIMENT CORE
- SEDIMENT CORE/ VIBRATING WIRE PIEZOMETER
- SURFACE SEDIMENT SAMPLE

NOTES:

1. FIGURE SHOWS RESULTS FOR ALL SURFACE SEDIMENT SAMPLES (0-1 FOOT) AND SELECT NEAR SURFACE SEDIMENT SAMPLES TREATED AS SURFACE SEDIMENT (SEE REPORT TEXT).
2. WETLAND, MUDFLAT, AND RIVER AREA ARE SUBDIVISIONS INTRODUCED SOLEY FOR PURPOSES OF CLARITY IN PRESENTATION OF RESULTS. THEY MAY NOT ALIGN COMPLETELY WITH NATURAL RESOURCE AREAS.
3. GOOGLE EARTH IMAGE DATED 5/04/2018.
4. HAND TEST PIT, SURFACE SAMPLE, AND SEDIMENT SAMPLE LOCATIONS ARE APPROXIMATE.
5. PARCEL BOUNDARIES, THALWEG OF RIVER, AND MEAN HIGH WATER LINE PROVIDED BY HAYNER/SWANSON, 2025.

0 30 60

Approximate Scale, Feet

Stage I Environmental Screening and
Stage II Environmental Risk Characterization
Amesbury Former MGP Site
Amesbury, Massachusetts

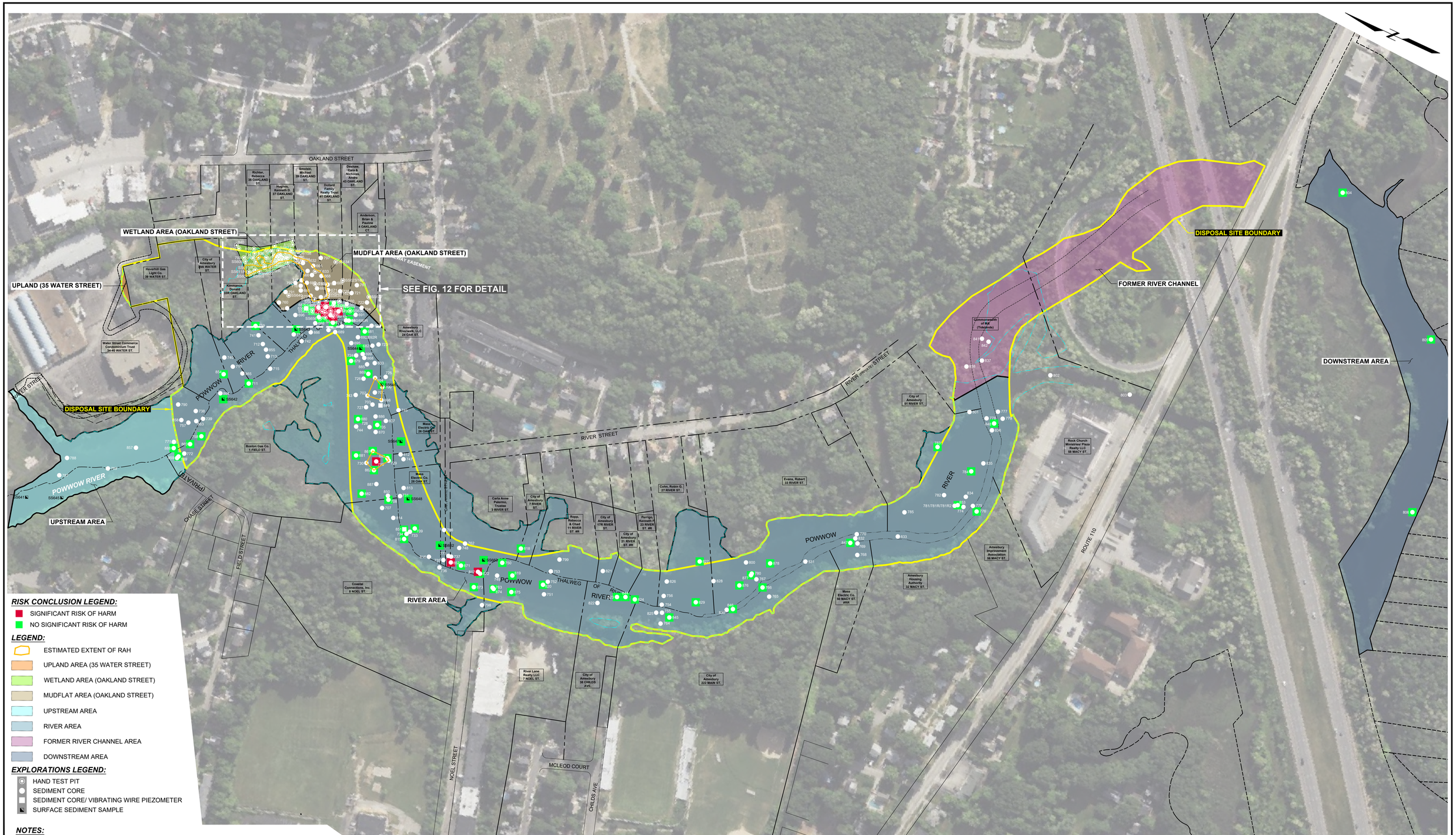
Boston Gas Company d|b|a National Grid
Waltham, Massachusetts

GEI Consultants

SUMMARY OF ECOLOGICAL RISK - WETLAND AND MUDFLAT SURFACE SEDIMENTS

Project 1804576 | October 2025 | Fig. 12

---- B:\Working\NATIONAL GRID\1804576 Amesbury MGP\00_CAD\Figures\Ph II CSA Supplemental\Appendix - ERC\1804576-12 ER wt-mdfl.dwg - 9/16/2025


WETLAND AREA (OAKLAND STREET)
MUDFLAT AREA (OAKLAND STREET)
UPLAND (35 WATER STREET)
SEE FIG. 12 FOR DETAIL
DISPOSAL SITE BOUNDARY
FORMER RIVER CHANNEL
DOWNSTREAM AREA
UPSTREAM AREA
RIVER AREA
OAKLAND STREET
RIVER STREET
POWWOW RIVER
THALWEG OF RIVER
CHASE STREET
FIELD STREET
NOEL STREET
MCLEOD COURT
CHILDS AVE
ROUTE 110
POWWOW
Richter, Rebecca 39 OAKLAND ST.
Smolski, Michael 39 OAKLAND ST.
Hughes, Kenneth D. 37 OAKLAND ST.
Dollard Family Realty Trust 41 OAKLAND ST.
Gleckler, Cara & Nicholas; Aledia 43 OAKLAND ST.
Anderson, Brian & Pauline 4 OAKLAND CT.
City of Amesbury 35A WATER ST.
Haverhill Gas Light Co. 39 WATER ST.
Kinnamore, Donald 33R OAKLAND ST.
Water Street Commerce Condominium Trust 34-46 WATER ST.
Amesbury Riverwalk, LLC 24 OAK ST.
Mass Electric Co. 26 OAK ST.
Mass Electric Co. 28 OAK ST.
Boston Gas Co. 1 FIELD ST.
Coastal Connections, Inc. 6 NOEL ST.
River Lane Realty LLC 7 NOEL ST.
City of Amesbury 38 CHILDS AVE.
City of Amesbury 222 MAIN ST.
Carla Anne Palermo, Trustee 3 RIVER ST.
City of Amesbury 7 RIVER ST.
Roop, Rebecca & Chad 11 RIVER ST. #R
City of Amesbury 17R RIVER ST.
Perrigo, Kenneth P 23 RIVER ST. #R
City of Amesbury 21 RIVER ST. #R
Cohn, Robin G. 27 RIVER ST.
Evans, Robert 33 RIVER ST.
City of Amesbury 61 RIVER ST.
Commonwealth of Mass (Tidelands)
Rock Church Ministries/ Plaza Realty LLC 56 MACY ST.
Amesbury Improvement Association 66 MACY ST.
Amesbury Housing Authority 32 MACY ST.
Mass Electric Co. 60 MACY ST. #RR
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SS676
SS677
SS678
SS679
SS680

SWAC = 26.2 mg/kg
Arithmetic average = 63.2 mg/kg
Total Area = 18.4 ac

(based on sample size of 105, with a minimum of 0.04 mg/kg and maximum of 1,172.9 mg/kg)

LEGEND:

- Sample Location
- SWAC Boundary
- Thiessen Polygon

NOTES:

1. The dataset for the average Total PAHs concentrations includes any sample contained within the 0-12" range.
2. Polygon network based on Nearest Neighbor (Thiessen) polygons.

0 175 350

Feet

Phase II Comprehensive Site Assessment
Amesbury Former MGP Site
Amesbury, Massachusetts

Boston Gas Company d|b|a National Grid
Waltham, Massachusetts

GEI

Project 1804576

SURFACE AREA WEIGHTED CONCENTRATIONS (SWAC) IN SEDIMENT (0-12")

October 2025 Fig. 14

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World Imagery: Maxar

SWAC = 35.2 mg/kg
Arithmetic average = 74.9 mg/kg
Total Area = 18.5 ac

(based on sample size of 129, with a minimum of 0.01 mg/kg and maximum of 1,172.9 mg/kg)

LEGEND:
- SWAC Boundary
- Sample Location
- Thiessen Polygon

NOTES:
1. The dataset for the average Total PAHs concentrations includes any sample contained within the 0-24" range.
2. Polygon network based on Nearest Neighbor (Thiessen) polygons.

0 175 350
Feet

Phase II Comprehensive Site Assessment
Amesbury Former MGP Site
Amesbury, Massachusetts

Boston Gas Company d|b|a National Grid
Waltham, Massachusetts

GEI

Project 1804576

SURFACE AREA WEIGHTED CONCENTRATIONS (SWAC) IN SEDIMENT (0-24")

October 2025 Fig. 15

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World Imagery: Maxar

Attachment A Local Conditions Evaluation

Local Conditions Evaluation

Background and Local Conditions

Under the Massachusetts Contingency Plan (MCP; 310 CMR 40.0902(3)), concentrations below background concentrations constitute a Condition of No Significant Risk of harm, and if a substance in sediment and/or surface water is consistent with and attributable to background, no further evaluation is necessary. For sediment sites, especially in urban areas, contaminants from other sources, such as other disposal sites, permitted discharges and non-point sources are present. "Local conditions" incorporates consideration of such sources, when these sources are consistently present to sections of a river affected by a site. If concentrations of substances are consistent with local conditions, exposure to contaminants from the site is not discernible and the incremental risk is not quantifiable. Such non-natural contributors to local conditions appear to be affecting conditions in the Powwow River that is part of the former Amesbury manufactured gas plant (MGP) site.

There are confirmed disposal sites, permitted discharges, and non-point sources upstream of the Site in both the Powwow River and the Back River contributing polycyclic aromatic hydrocarbons (PAHs) to the aquatic system. The Powwow River upstream of the Site is highly modified as it flows in underground channels and contains little sediment. However, several disposal sites exist immediately upstream of the Site that could be potential sources.

Estimated local conditions concentrations were developed by GEI using two sources of upstream data: (1) data collected as part of investigations at the former Amesbury wharf building (HEA 2001, 2010) and (2) data collected by GEI from locations upstream of the area of influence of the Site as part of the ongoing Site investigations.

Methods and Data Sets

The upstream area of influence of the Site was identified by a preliminary forensic profile of samples collected by GEI and analyzed for an extended PAH list. The methods of forensic evaluation based on PAH profiles and ratios are described in Appendix Q to the Supplemental Phase II CSA Report. This analysis allowed classification of PAH mixtures in samples into the following groups:

- PAH mixtures which are consistent with Carbureted Water Gas (CWG) MGP residual tar profile of the source material;
- PAH mixtures which are unclear or partially consistent with MGP residual tars, but may be highly degraded, contain mixed sources, or contain sources of tar like materials that mimic some of the characteristics of CWG MGP residuals; and
- PAH mixtures with features that are inconsistent with the profile of CWG MGP residual tars, and/or containing markers pointing at separate sources.

This evaluation indicated that no samples upstream of the line indicated in **Figure A1** are consistent with the source MGP material. The results indicate several samples in this region have elevated PAHs but are not consistent with the source. Several samples had elevated concentrations of PAHs not associated

with the source, with markers perhaps indicative of sources such as coal fines, asphalt or petroleum hydrocarbons. These samples are not Site-related but were conservatively excluded based on a statistical outlier analysis from the calculation of local conditions. Remaining results in the 0-2 ft intervals in this area were included in the data set.

The data set for estimating local conditions was therefore developed from existing data as follows (**Table A1**). Locations are shown in **Figure A1**.:

1. A data set of 10 samples collected by Higgins Environmental Associates of Amesbury, Massachusetts (HEA) in July 2001 for the Phase I Initial Site Investigation at the former Amesbury wharf building on 31 Water Street [RTN 3-19634] (HEA 2001). Five of these samples were collected in the Back River and five in the Powwow River well upstream of the Site. These samples were collected as surface sediment grabs from locations upstream of the 31 Water Street property and hence also upstream of the subject Site (See Figure 1). The samples were analyzed for various contaminants of concern (COCs) including the 17 polycyclic aromatic hydrocarbons (PAH_{17}). The HEA (2001) report indicated these samples consisted of coarse sand with gravel and debris. These data are homogeneous and indicate a lower bound for local conditions considering ubiquitous conditions in the area, without consideration of additional non-Site related sources present in the environs of the Site
2. Samples collected by GEI between 2018 and 2024 from locations upstream of the disposal Site boundary. The data are considerably more variable than the upstream samples collected by HEA in 2001. Several samples within this area have very elevated concentrations of PAHs but forensically are unrelated to the source area MGP tars. The sources of the elevated concentrations are not known. Two of these samples were excluded from the local conditions calculation as they are statistical outliers: 787-S1(0-0.3 ft) and 859-S1 (0-1 ft). The samples included in the evaluation were 645 (0-1 ft), 771-S1 (0-0.2 ft), 787- S2 (1.6-1.8), 788-S1 (0.6-0.9 ft), 789-S1 (0-0.5), 857-S1 and S2 (0-1 and 1-2 ft), 859-S2 (1-2 ft), 888-S1 and S2 (0-1 and 1-2 ft), and 889-S1 and S2 (0-1 and 1-2 ft).

Table A1 – Local Conditions Data Set

Sample ID	Interval	PAH17 (mg/kg)	IPWC PAHs (mg/kg)	Inclusion into Local Conditions data set	Basis
HEA (2001)					
SED1-S1	Surface	16.51	16.51	Included	(2)
SED2-S1	Surface	8.61	8.61	Included	(2)
SED3-S1	Surface	9.45	9.45	Included	(2)
SED4-S1	Surface	9.79	9.79	Included	(2)
SED5-S1	Surface	11.03	11.03	Included	(2)
SED1-S1	Surface	9.1	9.1	Included	(2)
SED2-S1	Surface	9.7	9.7	Included	(2)
SED3-S1	Surface	9.05	9.05	Included	(2)
SED4-S1	Surface	7.77	7.77	Included	(2)
SED5-S1	Surface	13.54	13.54	Included	(2)

Sample ID	Interval	PAH17 (mg/kg)	IPWC PAHs (mg/kg)	Inclusion into Local Conditions data set	Basis
GEI (2018-2024)					
645	0-1	2.41	2.41	Included	Forensics indicates not site related
771-S1	0-0.2	5.0	5	Included	Forensics indicates not site related
787-S1	0-0.3	465	465	Excluded	Forensics indicate not site related - statistical outlier not considered in calculation
787-S2	1.6-1.8	6.5	6.5	Included	Forensics indicates not site related - lower confidence
788-S1	0.6-0.9	31.2	31.2	Included	Forensics indicates not site related
789-S1	0-0.5	9.8	9.8	Included	Forensics indicates not site related
857-S1	0-1	26.2	27.4	Included as IPWC for 0-2 ft	Forensics indicates not site related
857-S2	1-2	28.6			
857-S3	2-3	165		Excluded	Subsurface sample
857-S4	4-5	131		Excluded	Subsurface sample
859-S1	0-1	270.8		Excluded 0-1 value	Forensics indicate not site related - statistical outlier not considered in calculation
859-S2	1-2	2.9	2.9	Included	
888-S1	0-1	5	2.7	Included as IPWC for 0-2 ft	Forensics indicates not site related
888-S2	1-2	0.3			
888-S3	4-5	ND		Excluded	Subsurface sample
889-S1	0-1	20.2	10.11	Included as IPWC for 0-2 ft	Forensics indicates not site related - lower confidence
889-S2	1-2	0.02			Only traces of PAHs
889-S3	4-5	0.03		Excluded	Subsurface sample

[1] First 5 samples from HEA (2001) collected from Powwow River ("PSED" on Figure A1) and second 5 samples from HEA (2001) collected from Back River ("BSED" on Figure A1)
[2] Data set defining the lower bound of Local Conditions, not considering other sources near the Site

To normalize results for the 0 to 2 foot interval for the existing samples, which included data from differing intervals, an Interval Participation Weighted Average [IPWC] was calculated whenever more than a single sample existed for the location. An IPWC is a sample average considering the contribution for each depth interval. When only one sample exists in the 0 to 2 feet interval, or a sample was excluded as a statistical outlier the reported results is assigned to the entire interval.

Table A-2 presents summary statistics (using ProUCL 5.0) for the data set, summarized below:

Statistical Value	Data
Number of samples	19
Minimum	2.4 mg/kg
Maximum	31.2 mg/kg

Statistical Value	Data
Mean	10.7 mg/kg
Standard Deviation	7.48 mg/kg
Coefficient of Variation	0.702
Statistical Distribution	Gamma (Attachment A1)
Statistical Model	95/95 UTL
Calculated Background Threshold Value (BTV)	**34.1 mg/kg**

The output of the ProUCL 5.0 Background Threshold Value (BTV) showed variability of the data, although consistent with a Gamma distribution (Attachment A). The BTV is 34.1 mg/kg based on the Gamma 95/96 Upper Tolerance Limit (UTL). This value is considered the local conditions value for total PAH_{17} for this reach of the Powwow River.

Note this value exceeds the maximum concentration observed in the data set not considering the statistical outliers. A quantile (Q-Q) plot for the data is presented in Attachment A1. The highest values in the Q-Q plot, which are offset from the rest of the samples, illustrate that a specific source or sources of elevated PAHs unrelated to the MGP do exist upstream of the Site. This local conditions value is reasonable and is consistent with many typical urbanized waterways.

Conclusions

PAH_{17} concentrations equal to or less than 34.1 mg/kg are consistent with the local conditions for sediment in the Powwow River. This value is likely conservative as two samples with elevated but non-MGP related PAHs were excluded from the calculation, and other sources may therefore contribute significant PAHs to the aquatic system.

This local condition value was used in the Environmental Risk Characterization (ERC) to characterize observed distribution of contaminants in surface sediment and in conjunction with other lines of evidence to determine significant risk and cleanup levels.

Reference

HEA, 2001. Phase I Initial Site Investigation at the Former Amesbury Wharf Building on 31 Water Street [RTN 3-19634], Amesbury, Massachusetts.

HEA, 2010. Response Action Outcome Statement and Supporting Information, RTN 3-19634, Former Amesbury Wharf Building, 31 Water Street, Amesbury, Massachusetts.

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Enclosures

Figure A-1
Attachment A-1 Data Analysis

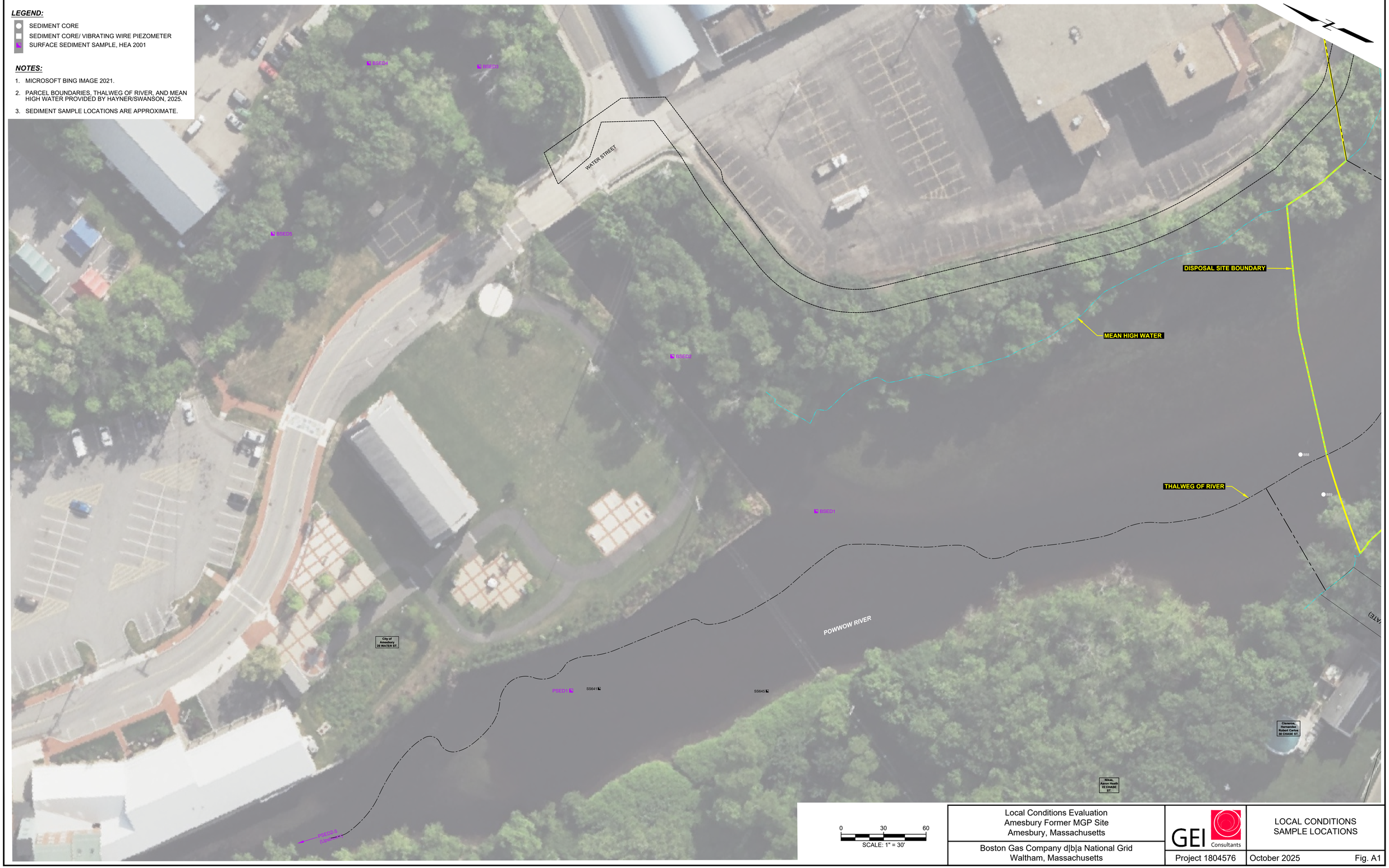
Figure A-1

LEGEND:

- SEDIMENT CORE
- SEDIMENT CORE/ VIBRATING WIRE PIEZOMETER
- SURFACE SEDIMENT SAMPLE, HEA 2001

NOTES:

1. MICROSOFT BING IMAGE 2021.
2. PARCEL BOUNDARIES, THALWEG OF RIVER, AND MEAN HIGH WATER PROVIDED BY HAYNER/SWANSON, 2025.
3. SEDIMENT SAMPLE LOCATIONS ARE APPROXIMATE.



0 30 60

SCALE: 1" = 30'

Local Conditions Evaluation
Amesbury Former MGP Site
Amesbury, Massachusetts

Boston Gas Company d|b|a National Grid
Waltham, Massachusetts

GEI Consultants

LOCAL CONDITIONS
SAMPLE LOCATIONS

Project 1804576 | October 2025 | Fig. A1

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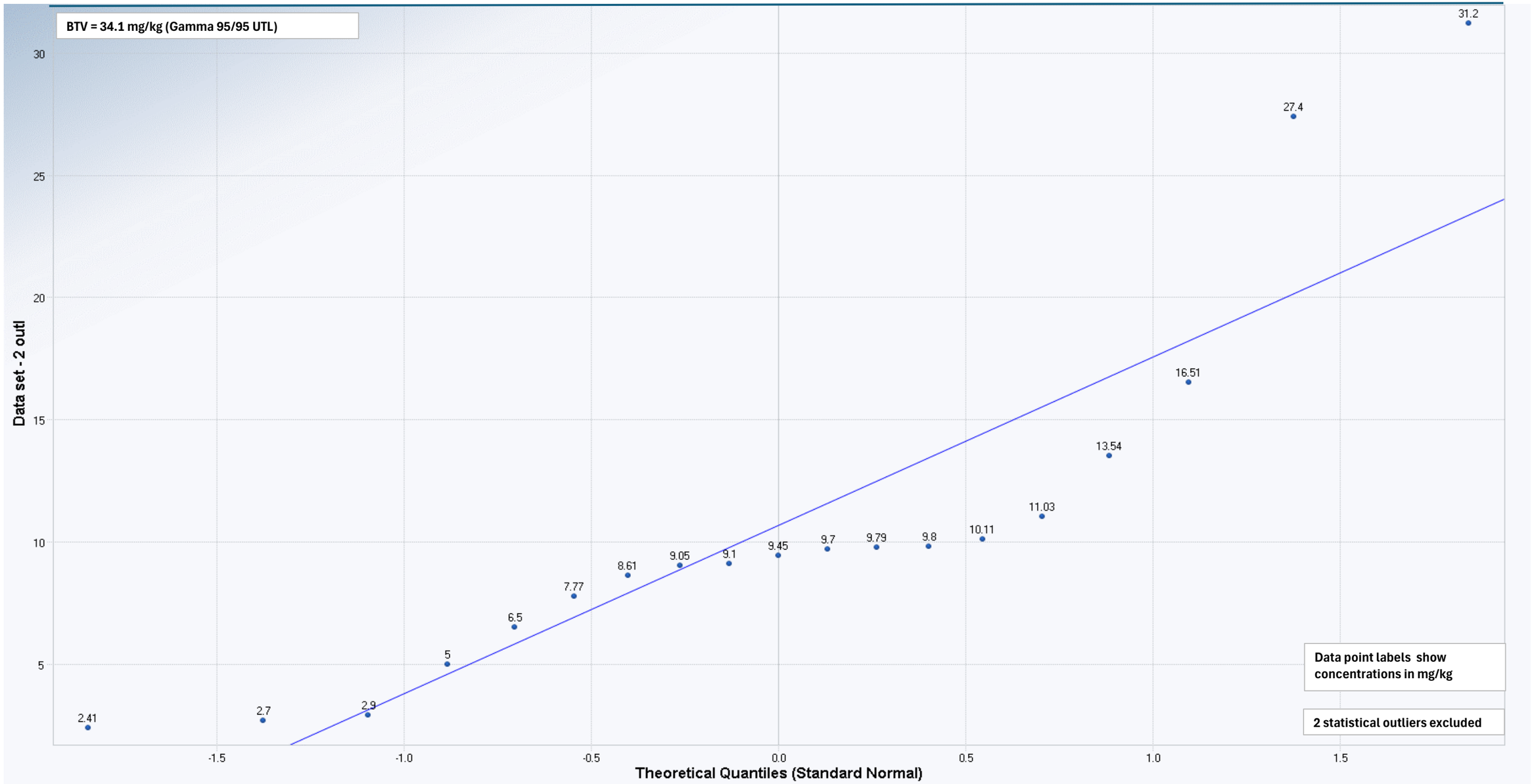
Attachment A-1 Data Analysis

Attachment A1 - Local Conditions Data QQ Plot



Attachment B Complete Analytical Results

Attachment B. Complete Sediment Data Set
Amesbury Former MGP
Amesbury, Massachusetts

											Tar Reference Sample	River	Mudflat	River	Mudflat	Mudflat	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	River	River	River	River
											Sample No.	0810008-07	F180046-01	F180046-02	F180046-03	F180046-04	F180046-05	F180046-06	F180070-01	F180070-02	F180070-03	F180070-04	F180070-05	F180070-06	F180070-07	F180070-08	F180070-09	F180070-10	F180070-11	F180070-12	F180071-01	F180071-02	F180071-03	F180071-04
											Sample Date:	9/29/2008	08/15/2018	08/15/2018	08/15/2018	08/15/2018	08/15/2018	08/15/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	12/20/2018	12/20/2018	12/20/2018	12/20/2018
											Sample Time:	na	11:00	12:20	12:45	12:55	12:55	13:25	09:50	10:03	10:15	10:30	11:50	10:45	12:50	13:45	13:55	12:20	12:35	12:05	13:50	13:30	13:00	13:15
											ClieSan	B101(MW)	SS619	SS620	SS621	SS622	SS623	SS624	SS625	SS626	SS627	SS628	SS629	SS630	SS631	SS632	SS633	SS634	SS637	SS640	SS638	SS639	SS642	SS643
											Depths:		0-1.9	0-2.5	0-1.8	0-1.8	0-1.7	0-1.7	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5
											RAH		RAH						RAH				RAH		RAH	RAH							
											%solids		58	59	55	80	57	65	65	82	69	67	69	71	70	72	42	48	70	80	65	82	69	73
CAS Number	Method Name	Analyte	Units	RT		PAH17	PAH34	PAH51	Abbrev	PAH #																							
		Max RL for ND PAHs=								1																							
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzo(b)thiophenes	ug/Kg dry	17					C1BT	2		95.5	6.52	87.3	8.14	4.35	166	684	3680	615	98.8	19100	66.3	729	85.8	50.2	70.1	47.6	17.3	6.37	44.1	18.3	8.88
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzo(b)thiophenes	ug/Kg dry	18					C2BT	3		200	11.3	239	3.62	8.46	214	9.3	4.7	29.9	10.6	14100	2.29	198	71	45.2	11	5.38	2.54	6.13	27.9	13.9	13.2
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzo(b)thiophenes	ug/Kg dry	19					C3BT	4		382	9.61	425	5.89	5.2	127	8.03	5.32	25.6	8.38	5660	1.89	274	45.2	36.5	12.5	5.35	2.06	5.72	18.9	10.5	12.2
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzo(b)thiophenes	ug/Kg dry	20					C4BT	5		210	4.62	180	6.86	3.42	35.7	3.43	1.8	11.3	4.31	1380	3.08	181	8.65	11	6.11	2.79	2.43	4.28	11.2	7.18	5.93
91-20-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Naphthalene**	ug/Kg dry	21.86	L	x	x	x	NA	6	**60200**	1040	34.4	792	155	88.5	4070	92.4	53.9	545	122	629000	4.37	355	417	163	7.5	33.5	36.9	18.5	180	43	84.3
91-57-6	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylnaphthalene	ug/Kg dry	24.57	L	x		x	2MN	7	**16300**	704	28.4	584	88.6	61.1	1430	68.7	44.2	323	88.1	204000	3.69	224	134	68.5	4.72	30.7	21.6	11.1	166	19.7	38.7
90-12-0	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylnaphthalene	ug/Kg dry	25				x	1MN	8	**9800**	445	18.5	694	49.6	21.3	1180	55.9	31.5	245	56.4	122000	2.88	268	93.5	60.7	3.35	28.5	11.8	9.95	132	16.1	32.2
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Naphthalenes	ug/Kg dry	24.57			x	x	C1N	9	**15400**	654	27	728	51.5	47.3	1480	79.6	49.2	365	94.6	214000	4.32	326	147	82.9	5.57	38.6	22.5	13.6	194	23.2	46.3
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Naphthalenes	ug/Kg dry	27.02			x	x	C2N	10	**4930**	1510	79.6	2940	20.1	79.3	1930	105	62.9	417	111	111000	9.68	1180	370	255	37.7	67.8	24.8	35	241	44.8	51.7
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Naphthalenes	ug/Kg dry	29.76			x	x	C3N	11	**1220**	2050	86.3	3190	60.8	74.8	1380	88.7	68.7	363	114	24200	13.5	2580	192	148	72.5	63.6	19	36	177	50.3	45.9
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Naphthalenes	ug/Kg dry	32.52			x	x	C4N	12	**299**	1480	55.6	1970	29.8	83.1	558	52.2	37.1	232	118	7280	16.3	1890	66.4	58.1	52	36.6	11.4	21.6	91.4	31.4	26.6
92-52-4	8270D (SIM) Semi-Volatile Organic Compou0s	Biphenyl	ug/Kg dry	26.46					BP	13	**3860**	222	9.91	265	44.8	28.8	884	18.1	9.48	96.1	23	89200	1.81	52.5	94	54.4	2.82	13.6	8.91	5.47	52.7	8.07	15.3
208-96-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Acenaphthylene**	ug/Kg dry	28.16	L	x	x	x	ACE	14	**17600**	2780	94.5	2750	823	169	1650	232	88.4	1380	1110	55500	21.8	1540	1540	1200	43.8	63.4	67.3	132	408	259	198
83-32-9	8270D (SIM) Semi-Volatile Organic Compou0s	**Acenaphthene**	ug/Kg dry	28.89	L	x	x	x	ACY	15	**3720**	2080	153	3430	2190	22.5	8180	109	15	113	33.6	757000	5.45	839	2430	1300	45.4	71.9	24.7	23.4	527	53.6	185
132-64-9	8270D (SIM) Semi-Volatile Organic Compou0s	Dibenzofuran	ug/Kg dry	29.54				x	DBF	16	**713**	524	16.7	267	60.9	35.2	659	45.9	19.1	365	66.2	30100	1.63	289	121	74.9	4.08	28.6	12.4	17.3	437	35.6	83
86-73-7	8270D (SIM) Semi-Volatile Organic Compou0s	**Fluorene**	ug/Kg dry	30.91	L	x	x	x	FLE	17	**7110**	1200	75.3	2160	568	61.1	4090	82.2	18.6	260	32.9	265000	5.51	978	1110	873	15.8	55.4	19.7	32.5	495	54.9	141
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Fluorenes	ug/Kg dry	33.14			x	x	C1FL	18	**1600**	1100	44.8	1660	74.1	95.7	1320	56.5	21.8	164	56.8	31100	10.4	1180	282	239	47.8	43	14.1	29.8	137	40.1	47.9
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Fluorenes	ug/Kg dry	35.22			x	x	C2FL	19	**626**	1510	52.5	1900	41	186	766	89.5	45.3	260	129	9780	24.9	1530	124	110	50.6	68.5	16.9	32.9	167	51.5	45.9
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Fluorenes	ug/Kg dry	38.01			x	x	C3FL	20	**246**	1780	55.2	1540	17.7	187	360	166	87	428	215	5930	21.8	1630	158	127	26.5	105	19.1	38.7	332	78.1	101
132-65-0	8270D (SIM) Semi-Volatile Organic Compou0s	Dibenzothiophene	ug/Kg dry	34.23				x	DBT	21	**2150**	1060	87.6	1280	882	25.3	2740	71.3	26.7	182	33.5	202000	2.8	991	1160	997	41.9	50.5	11.2	30.9	361	53.5	78.3
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Dibenzothiophenes	ug/Kg dry	36.43				x	C1DBT	22	**952**	1550	46.3	1680	6.66	58.1	1270	91.5	43.6	205	74.6	54000	10.1	1350	570	455	36	73.5	10.8	44.6	220	62.6	58.6
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Dibenzothiophenes	ug/Kg dry	37.7				x	C2DBT	23	**418**	2080	52.4	1830	49.8	109	627	82.9	33.7	232	126	16700	17.5	1810	225	198	39.7	71.9	10.7	51.8	181	62.8	59.2
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Dibenzothiophenes	ug/Kg dry	39.5				x	C3DBT	24	**170**	1870	48.2	1360	8.87	79.9	312	49.1	18	140	85.6	5640	11.1	1580	112	91.3	25.7	40	6.53	34.2	119	45.1	51.4
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Dibenzothiophenes	ug/Kg dry	41.65				x	C4DBT	25	**47.4**	1000	33	607	11.7	52.8	108	29.2	11	70.8	51.2	2120	7.02	793	73.7	40.8	46.2	14.1	3.98	17.1	55.5	22.8	27.9
85-01-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Phenanthrene**	ug/Kg dry	34.72	L	x	x	x	PHE	26	**29500**	11700	269	13900	3960	478	23600	1530	622	2950	441	1360000	43.5	7910	8820	7210	44.7	949	206	381	4910	861	1340
120-12-7	8270D (SIM) Semi-Volatile Organic Compou0s	**Anthracene**	ug/Kg dry	34.91	L	x	x	x	ANT	27	**5910**	4150	178	9650	1810	321	7610	352	84.7	1840	1130	940000	24.8	2890	3580	2090	144	180	80	133	1390	302	404
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Phenanthrenes/Anthracenes	ug/Kg dry	36.96				x	C1PH	28	**7260**	7220	58	9560	209	833	8220	853	366	1950	742	175000	158	6350	2230	1900	246	546	122	260	1590	426	437
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Phenanthrenes/Anthracenes	ug/Kg dry	38.97			x	x	C2PH	29	**1760**	5260	197	5850	7.9	951	3080	418	159	1400	811	28900	171	4720	457	441	191	287	68.3	144	740	227	209
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Phenanthrenes/Anthracenes	ug/Kg dry	40.8			x	x	C3PH	30	**375**	2810	134	2580	73.1	568	988	154	56.7	595	401	6180	89.8	2600	127	123	120	101	32.2	55.4	303	91.2	88.7
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Phenanthrenes/Anthracenes	ug/Kg dry	41.72			x	x	C4PH	31	**95.4**	1270	126	1000	7.93	266	365	48.7	19.8	203	132	2780	71	1040	62.9	51.9	138	30.2	21	18.4	111	29.5	30.2
483-65-8	8270D (SIM) Semi-Volatile Organic Compou0s	Retene	ug/Kg dry	41.72				x	RET	32		189	341	195	53.3	224	244	26.6	5.8	59.2	3.45	2350	219	106	39.8	34.5	471	7.13	51.8	7.41	33.5	13.5	11
239-35-0	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)naphtho(2,1-d)thiophene	ug/Kg dry	44.24					BNT	33	**486**	1450	40.4	1520	487	106	1090	162	51.3	664	452	49200	14.5	963	757	663	64.3	93.2	21.7	50.1	553	121	121
	8270D (SIM) Semi-Volatile Organic Compou0s	C0-Benzonaphthothiophenes	ug/Kg dry	44.24					C0BNT	34		2700	82.2	2880	484	240	2410	292	94.1	1200	789	94500	34.2	1730	1480	1290	129	166	45.7	91.8	1010	224	220
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzonaphthothiophenes	ug/Kg dry	45.63					C1BNT	35	**367**	1760	61.4	1450	45.8	217	854	163	56.8	578	440	18700	34.7	1510	422	368	80.5	104	23.2	67	417	121	110
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzonaphthothiophenes	ug/Kg dry	47.14					C2BNT	36	**107**	1450	53.5	1000	21.2	146	338	95.8	46.9	313	237	4860	23.9	1290	313	182	46	68	14.3	58.4	283	96.9	97
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzonaphthothiophenes	ug/Kg dry	49.02					C3BNT	37	**95**	1020	42.4	716	27.2	96.4	171	54.4	20.8	195	103	4510	11.7	789	313	180	20.5	33.6	9.75	49.3	210	83.8	85.5
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzonaphthothiophenes	ug/Kg dry	51.51					C4BNT	38		480	19.3	288	9.75	22.7	33.4	18.1	7.67	71.6	26.4	565	2.66	314	174	75	6.91	9.97	3.41	27.2	124	54.4	54.2
206-44-0	8270D (SIM) Semi-Volatile Organic Compou0s	**Fluoranthene**	ug/Kg dry	39.51	H	x	x	x	FLA	39	**11500**	21200	527	17100	6930	1860	17700	2390	844	9570	3770	676000	178	12700	10000	9080	548	1340	469	654	7660	1650	1990
129-00-0	8270D (SIM) Semi-Volatile Organic Compou0s	**Pyrene**	ug/Kg dry	40.39	H	x	x	x	PYR	40	**16700**	23000	653	21700	9320	3100	22600	3100	1100	8740	3630	978000	192	11900	13800	12700	606	1340	471	637	6550	1410	1700
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Fluoranthenes/Pyrenes	ug/Kg dry	41.78			x	x	C1PY	41	**5970**	11100	383	11300	623	3090	9100	1080	347	3200	1740	208000	279	6070	3390	3220	550	499	201	318	1910	593	618
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Fluoranthenes/Pyrenes	ug/Kg dry	43.52				x	C2PY	42	**1030**	4360	174	3640	7.92	1250	2140	664	240	2380	1590	22500	164	3650	630	629	232	330	95.7	174	1820	393	399
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Fluoranthenes/Pyrenes	ug/Kg dry	45.72				x	C3PY	43	**234**	2070	81.9	1400	3.82	565	754	256	103	1070	898	3760	75.2	1790	173	184	95.7	155	42.7	73.6	641	160	161
243-17-4	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)fluorene	ug/Kg dry	42.03				x	BbF	44		1440	43	1390	6.66	327	1460	64.2	16.2	252	88.4	31000	34.1	630	461	409	94.3	31.1	19.8	28.1	135	60.5	67.8
205-12-9	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(c)fluorene	ug/Kg dry	42.07				x	BcF	45		566	20.5	565	6.66	135	500	49.2	10.9	127	40	11700	14	349	182	195	32.2	24.1	10.5	13.4	81.3	30.4	35.3
3442-78-2	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylpyrene	ug/Kg dry	42.18				x	2MP	46		1420	49.9	1470	305	444	1130	174	61.4	480	284	25100	35.4	793	458	436	61.9	74.9	28.4	45.5	301	80.6	85.9
3353-12-6	8270D (SIM) Semi-Volatile Organic Compou0s	4-Methylpyrene	ug/Kg dry	42.55				x	4MP	47		1290	51.9	1440	197	468	911	153	54	366	243	22000	29.9	750	407	390	46.8	64.1	26.1	44.1	221	66.2	69.8
2381-21-7	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylpyrene	ug/Kg dry	42.67				x	1MP	48		1110	40.9	1360	284	363	1000	151	43.4	246	134	28100	23.1	566	481	460	41.3	56.5	18.2	35.1	181	52.2	54.7
56-55-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Benz(a)anthracene**	ug/Kg dry	45.17	H	x	x	x	BaA	49	**4920**	8810	263	8520	2790	1760	7400	1200	399	4750	2290	218000	175	4910	3540	3650	474	603	244	297	3520	801	865
	8270D (SIM) Semi-Volatile Organic Compou0s	**Chrysene/triphenylene**	ug/Kg dry	45.36	H	x	x	x	CH	50	**3580**	9260	277	8810	2450	1770	5730	1310	457	4690	2460	264000	149	5820	3350	3180	441	668	232	341	3510	800	878
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	46.81				x	C1CR	51	**1620**	4520	176	3910	72.9	1490	2450	561	189	1840	1260	36000	154	3340	842	846	286	291	116	160	1280	329	343
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	48.52				x	C2CR	52	**434**	2430	117	1940	21.4	800	998	275	85.6	877	666	8060	94.4	1930	281	279	146	150	65.3	82.4	625	172	180
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	49.55				x	C3CR	53	**198**	1250	55.6	840	6.62	361	435	127	40.5	537	400	1700	50.9	1060	148	122	85	73.2	28.5	45.8	377	99.8	96.2
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	50				x	C4CR	54	18.4	661	35.5	418	6.42	157	253	60.4	27.5	285	235	3430	24.6	494	135	116	39.2	35	16.8	21.1	196	58.7	51.1
205-99-2	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(b)fluoranthene**	ug/Kg dry	49.23	H	x	x	x	BbF	55	**2010**	7420	229	6190	2080	1280	3920	921	314	4060	2580	107000	83.6	4340	2500	2400	267	474	205	241	3150	680	783
	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(j/k)fluoranthene**	ug/Kg dry	49.29	H	x	x	x	BjF	56	**2620**	7650	204	6510	2040	1230	4690	1010	344	4300	2140	141000	109	4140	2840	3050	368	512	214	276	2930	685	716
192-97-2	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(e)pyrene	ug/Kg dry	50.17			x	x	BeP	57	**2290**	6200	191	5620	1810	1550	3670	949	298	3090	1710	124000	83.2	3570	2640	2650	237	426	199	223	2410	549	597
50-32-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(a)pyrene**	ug/Kg dry	50.34	H	x	x	x	BaP	58	**5000**	9620	265	9740	3270	2080	7240	1280	281	4120	1890	239000	133	4830	4340	4450	406	589	272	298	3370	759	849
198-55-0	8270D (SIM) Semi-Volatile Organic Compou0s	Perylene	ug/Kg dry	50.61			x	x	PE	59	**712**	2050	168	1870	646	616	1210	259	64.9	1110	493	37600	140	1160	807	766	147	143	476	70.1	925	201	219
193-39-5	8270D (SIM) Semi-Volatile Organic Compou0s	**Indeno(1,2,3-cd)pyrene**	ug/Kg dry	54	H	x	x	x	I123P	60	**2030**	6230	170	5640	1920	1050	3680	726	238	2600	1330	105000	56.3	3110	2270	2240	180	363	165	185	2110	468	522
53-70-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Dibenzo(a,h)anthracene**	ug/Kg dry	54.01	H	x	x	x	DBA	61	**419**	1430	41.3	1310	419	322	822	179	56.3	657	403	22700	19.6	824	509	478	60	93.2	39.7	47	592	120	137
191-24-2	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(g,h,i)perylene**	ug/Kg dry	54.91	H	x	x	x	BGP	62	**2220**	5050	139	4820	1650	1080	3170	822	255	2390	1110	123000	58.1	3050	2520	2480	163	372	175	192	2020	446	500
191-07-1	8270D (SIM) Semi-Volatile Organic Compou0s	Coronene	ug/Kg dry	61.34				x	COR	63		1320	34.4	1330	436	237	915	213	74.6	593	255	41600	13.5	778	833	749	38.1	92.1	43.3	46.9	472	111	122
526-73-8	8270D (SIM) Semi-Volatile Organic Compou0s	1,2,3-Trimethylbenzene	ug/Kg dry							64		106	9.06	65.6	14.1	4.66	6.04	9.99	5.05	29.7	12.2	173	3.08	65.1	6.09	7.94	4.41	2.95	1.54	1.89	5.79	3.02	2.91
95-63-6	8270D (SIM) Semi-Volatile Organic Compou0s	1,2,4-Trimethylbenzene	ug/Kg dry							65		409	14.8	196	33.3	9.05	8.83	16.9	10.1	53.8	23.2	380	3.08	183	8.76	12.6	3.41	7.21	2.04	2.38	8.54	4.22	3.67
108-67-8	8270D (SIM) Semi-Volatile Organic Compou0s	1,3,5-Trimethylbenzene	ug/Kg dry							66		141	7.83	74.3	11.4	8	6.07	15.3	7.08	44	12.5	156	3.08	64.2	4.08	6.56	4.41	18.4	1.72	2.42	3.61	1.78	1.29
	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methyldibenzothiophene	ug/Kg dry	36.76						67		196	5.41	187	51.6	6.05	140	9.58	4.64	22.1	5.24	5680	3.08	196	62.7	53.5	6.04	8.26	1.53	7.13	30.1	11.1	10.7
	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylphenanthrene	ug/Kg dry	37.24						68	**1720**	982	33.9	1550	249	93.6	1120	148	64.2	277	85.1	26700	21.7	1160	342	297	19.9	91	19	44.9	241	66.8	67.3
	8270D (SIM) Semi-Volatile Organic Compou0s	2,3,5-Trimethylnaphthene	ug/Kg dry	30.44						69	**238**	135	5.17	231	13	5.45	116	7.56	5.51	29.4	9.1	1170	3.08	173	12.6	9.26	5.57	4.74	1.39	2.93	16.1	4.02	2.99
581-42-0	8270D (SIM) Semi-Volatile Organic Compou0s	2,6-Dimethylnaphthalene	ug/Kg dry	27.07						70	**2440**	281	16.3	569	48.2	28.4	446	23	12.9	98.5	22.6	18600	3.08	154	75.9	56.7	3.95	15.8	5.74	10.2	64.1	11	11.4
	8270D (SIM) Semi-Volatile Organic Compou0s	2/3-Methyldibenzothiophene	ug/Kg dry	36.31						71		504	16.4	554	172	20.6	440	30.3	13.5	69.3	25.1	20000	2.95	436	206	162	11.8	23.9	3.38	14.5	77.1	19.9	18.7
	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylanthracene	ug/Kg dry	36.96						72		821	35.3	1160	209	199	1290	79	18.4	328	197	24500	39.7	618	284	237	59.6	42.5	17.9	26.1	218	57.7	58.6
	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylphenanthrene	ug/Kg dry	36.81						73		1950	53.3	2350	348	167	2170	228	103	502	131	47000	39.2	1340	583	486	40.4	159	29.7	67.1	445	114	117
	8270D (SIM) Semi-Volatile Organic Compou0s	3-Methylphenanthrene	ug/Kg dry	36.69						74		1660	56.3	2090	376	149	1970	189	86.9	362	95.3	44300	23	1470	535	460	55.2	128	23.6	57.2	344	91.2	94.9
	8270D (SIM) Semi-Volatile Organic Compou0s	4/9-Methylphenanthrene	ug/Kg dry	37.14						75		1810	66.8	2330	236	226	1680	202	79.7	458	224	30700	34.1	1680	480	405	65.3	118	27.9	58.7	327	89.8	89.1
	8270D (SIM) Semi-Volatile Organic Compou0s	4-Methyldibenzothiophene	ug/Kg dry	36.01						76		546	15.8	645	167	14	389	34	15.5	68.1	24.8	19000	2.48	535	205	162	10.4	29.2	2.99	16.7	57.9	18.6	17.4
71-43-2	8270D (SIM) Semi-Volatile Organic Compou0s	Benzene	ug/Kg dry							77		149	23.2	224	111	45.5	156	28	18.6	89.4	29.2	719	5.5	88.4	73.4	46.5	15.3	7.02	5.23	22.3	100	45.2	27.2

Attachment B. Complete Sediment Data Set
Amesbury Former MGP
Amesbury, Massachusetts

												Tar Reference Sample	River	Mudflat	River	Mudflat	Mudflat	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	River	River	River	River
											Sample No.	0810008-07	F180046-01	F180046-02	F180046-03	F180046-04	F180046-05	F180046-06	F180070-01	F180070-02	F180070-03	F180070-04	F180070-05	F180070-06	F180070-07	F180070-08	F180070-09	F180070-10	F180070-11	F180070-12	F180071-01	F180071-02	F180071-03	F180071-04
											Sample Date:	9/29/2008	08/15/2018	08/15/2018	08/15/2018	08/15/2018	08/15/2018	08/15/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	12/17/2018	12/20/2018	12/20/2018	12/20/2018
											Sample Time:	na	11:00	12:20	12:45	12:55	12:55	13:25	09:50	10:03	10:15	10:30	11:50	10:45	12:50	13:45	13:55	12:20	12:35	12:05	13:50	13:30	13:00	13:15
											ClieSam	B101(MW)	SS619	SS620	SS621	SS622	SS623	SS624	SS625	SS626	SS627	SS628	SS629	SS630	SS631	SS632	SS633	SS634	SS637	SS640	SS638	SS639	SS642	SS643
											Depths:		0-1.9	0-2.5	0-1.8	0-1.8	0-1.7	0-1.7	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5
											RAH		RAH						RAH				RAH		RAH	RAH								
											%solids		58	59	55	80	57	65	65	82	69	67	69	71	70	72	42	48	70	80	65	82	69	73
CAS Number	Method Name	Analyte	Units	RT		PAH17	PAH34	PAH51	Abbrev	PAH #																									
11095-43-5	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)thiophene	ug/Kg dry							78	1100	**85.8**	**2.98**	**53.3**	**15.6**	**3.4**	**378**	**3.99**	**1.79**	**37.5**	**14.3**	**31600**	3.08	**46**	**42.5**	**16.4**	4.41	3	**1.22**	**1.4**	**10.3**	**5.38**	**3.89**
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzene	ug/Kg dry							79		**543**	**135**	**644**	**59.7**	**145**	**466**	**17.2**	**13.2**	**60.1**	**15.9**	**383**	**5.24**	**134**	**55.7**	**66**	**28.6**	**10.4**	**12.4**	**33.2**	**61.4**	**24.2**	**14.8**
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Decalins	ug/Kg dry							80	21.7	**1740**	**53.5**	**2110**	**107**	**10.9**	**14.5**	**11.1**	**7.13**	**49.9**	3.45	**899**	3.08	**2550**	**21.2**	**13.9**	**9.46**	**9.97**	2.43	2.42	**7.71**	**5.31**	**6.69**
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzenes	ug/Kg dry							81		**565**	**56.3**	**593**	**75.1**	**84.1**	**242**	**30.9**	**19.9**	**94.5**	**38.8**	**1390**	**3.52**	**524**	**136**	**78**	**16.3**	**12.9**	**16.3**	**18.7**	**77.5**	**28.4**	**16.4**
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Decalins	ug/Kg dry							82	46.3	**1450**	**36.2**	**1110**	**24.2**	**23**	**26.3**	**12.5**	**7.5**	**52.1**	3.45	**1690**	3.08	**973**	**31.3**	**22.9**	**6.95**	**11.5**	2.43	2.42	**9.97**	**7.88**	**7.23**
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzenes	ug/Kg dry							83		**494**	**31.4**	**307**	**17.7**	**24.6**	**31.8**	**36.2**	**18.8**	**100**	**37.4**	**1110**	**2.36**	**288**	**24.8**	**28.5**	**9.67**	**18.8**	**7.52**	**7.54**	**24.1**	**15.7**	**13**
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Decalins	ug/Kg dry							84	33.1	**909**	**29.3**	**749**	**10.4**	**16.5**	**17.7**	**7.67**	**4.29**	**40.1**	3.45	**1720**	3.08	**277**	**29.1**	**14.2**	4.41	**5.52**	2.43	2.42	**7.85**	2.73	2.5
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzenes	ug/Kg dry							85		**460**	**49.4**	**392**	6.66	**18.9**	**39.9**	**36.4**	**13.5**	**72.1**	**27.9**	**1430**	**4.09**	**463**	**26.8**	**30.5**	**22**	**10.6**	**9.27**	**6.64**	**24**	**19.4**	**13.1**
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Decalins	ug/Kg dry							86	53	**1350**	**49**	**1270**	**8.38**	**20.3**	**33.9**	3.23	2.41	**42.8**	3.45	**2110**	3.08	**385**	**51.2**	**19.7**	4.41	3	2.43	2.42	3	2.73	2.5
	8270D (SIM) Semi-Volatile Organic Compou0s	C5-Benzenes	ug/Kg dry							87		**342**	**24.7**	**366**	6.66	**13**	**22.1**	**25.7**	**11.1**	**50.8**	**15.7**	**463**	3.08	**349**	**14.4**	**18.6**	**9.44**	**7.15**	**3.35**	**3.95**	**14.1**	**14.6**	**6.53**
86-74-8	8270D (SIM) Semi-Volatile Organic Compou0s	Carbazole	ug/Kg dry	35.61						88	**153**	**493**	**8.06**	**324**	**71.2**	**15**	**136**	**68.8**	**19.8**	**333**	**156**	**21100**	**3.72**	**418**	**98.1**	**69.7**	**7.25**	**57.4**	**16.5**	**21.5**	**744**	**79**	**171**
493-01-6	8270D (SIM) Semi-Volatile Organic Compou0s	cis-Decalin	ug/Kg dry							89	18.4	**118**	**3.41**	**183**	**28.5**	2.4	2.04	3.23	2.41	14.7	3.45	**70.2**	3.08	**138**	2.74	4.73	4.41	3	2.43	2.42	3	2.73	2.5
100-41-4	8270D (SIM) Semi-Volatile Organic Compou0s	Ethylbenzene	ug/Kg dry							90		**141**	**6.44**	**141**	**18.2**	**10.5**	**215**	**10.1**	**3.94**	**21.4**	**7.38**	**2270**	3.08	**100**	**18.2**	**12.9**	**2.65**	**2.2**	**3.21**	**3.8**	**13.9**	**8.04**	**4.68**
98-82-8	8270D (SIM) Semi-Volatile Organic Compou0s	Isopropylbenzene	ug/Kg dry							91		**17.9**	**1.61**	**14.8**	6.66	2.4	**1.15**	**3.19**	**2.29**	**9.65**	**4.06**	**69.2**	3.08	**13.8**	2.74	4.73	4.41	3	2.43	2.42	**4.2**	2.73	2.5
	8270D (SIM) Semi-Volatile Organic Compou0s	m,p-Xylene	ug/Kg dry							92		**720**	**80**	**778**	**117**	**116**	**214**	**34**	**21.7**	**103**	**46.7**	**602**	**3.63**	**862**	**234**	**123**	**23.8**	**16**	**23.9**	**28.8**	**126**	**40.8**	**22.6**
108-87-2	8270D (SIM) Semi-Volatile Organic Compou0s	Methylcyclohexane	ug/Kg dry							93		**108**	**4.4**	**37**	**8.71**	**3.4**	**1.17**	**41.6**	**36.9**	**190**	**57.4**	59.8	3.08	**76.1**	**2.66**	**6.83**	4.41	**75.9**	**2.68**	2.42	**3.36**	**1.88**	**1.6**
104-51-8	8270D (SIM) Semi-Volatile Organic Compou0s	n-Butylbenzene	ug/Kg dry							94		**99.2**	**9.39**	**89.9**	**26.3**	**6.78**	**17.8**	**42.9**	**4.39**	**16.2**	**5.53**	**301**	3.08	**96.7**	**9.67**	**24.7**	**10.8**	**3.6**	**2.35**	**3.04**	**16.4**	**29.9**	**5.53**
103-65-1	8270D (SIM) Semi-Volatile Organic Compou0s	n-Propylbenzene	ug/Kg dry							95		**69**	**4.94**	**52.2**	**12.8**	**4.02**	**6**	**11.4**	**3.23**	**15**	**6.08**	**68.7**	3.08	**51.3**	**5.93**	**8.67**	4.41	3	**1.31**	**2.24**	**10.5**	**11.6**	**3.45**
95-47-6	8270D (SIM) Semi-Volatile Organic Compou0s	o-Xylene	ug/Kg dry							96		**142**	**7.31**	**106**	**12**	**9.06**	**28.4**	**15.2**	**13.1**	**53.3**	**20.4**	**140**	3.08	**87.1**	**6.27**	**9.91**	4.41	**6.17**	2.43	**2.32**	**8.39**	**3.48**	**2.75**
99-87-6	8270D (SIM) Semi-Volatile Organic Compou0s	p-Isopropyltoluene	ug/Kg dry							97		**49.7**	**85.9**	**40.6**	**8.61**	**20.1**	**46.3**	**6.22**	**1.9**	**11.2**	**4.74**	**164**	3.08	**26.1**	**16**	**6.63**	**12**	3	**12.9**	**2.08**	**5.81**	**2.8**	**4.93**
135-98-8	8270D (SIM) Semi-Volatile Organic Compou0s	sec-Butylbenzene	ug/Kg dry							98		**14.8**	2.18	**11.5**	6.66	2.4	2.04	**1.64**	**1.47**	14.7	**2.34**	59.8	3.08	**20.4**	2.74	4.73	4.41	3	2.43	2.42	3	2.73	2.5
100-42-5	8270D (SIM) Semi-Volatile Organic Compou0s	Styrene	ug/Kg dry							99		**194**	**14**	**235**	**77.2**	**51.4**	**45**	**22.6**	**8.26**	**67**	**38.2**	**1070**	**5.58**	**159**	**59.4**	**39.5**	**19.9**	**6.15**	**2.86**	**15.5**	**59.6**	**20**	**20.5**
98-06-6	8270D (SIM) Semi-Volatile Organic Compou0s	t-Butylbenzene	ug/Kg dry							100		10.9	2.18	11.5	**6.7**	2.4	2.04	3.23	2.41	14.7	3.45	59.8	3.08	21	2.74	4.73	4.41	3	2.43	2.42	3	2.73	2.5
108-88-3	8270D (SIM) Semi-Volatile Organic Compou0s	Toluene	ug/Kg dry							101		**855**	**211**	**1020**	**98.9**	**229**	**727**	**27.5**	**20.7**	**92.6**	**25.3**	**619**	**8.54**	**209**	**88**	**105**	**45.2**	**16.5**	**19.8**	**53.7**	**99.6**	**39.9**	**25.2**
493-02-7	8270D (SIM) Semi-Volatile Organic Compou0s	trans-Decalin	ug/Kg dry							102		**728**	**30.8**	**1360**	**164**	**1.97**	**4.4**	**6.12**	**4.57**	**30.1**	**10.1**	**177**	3.08	**1510**	**8.5**	**4.78**	**8.28**	**6.78**	2.43	2.42	**2.63**	**1.42**	**2.5**
3891-98-3	Saturated Hydrocarbons by GC/FID	2,6,10-trimethyldodecane (1380)	mg/Kg dry							103		**2.39**	0.218	**2.59**	**0.21**	0.24	0.204											0.3	0.243	0.242	0.3	0.273	0.25
3892-00-0	Saturated Hydrocarbons by GC/FID	2,6,10-trimethylpeadecane (1650)	mg/Kg dry							104		**3.17**	**0.111**	**3.36**	**0.39**	0.24	**0.9**											0.3	0.243	0.242	0.3	0.273	0.25
3891-99-4	Saturated Hydrocarbons by GC/FID	2,6,10-trimethyltridecane (1470)	mg/Kg dry							105		**3.06**	**0.126**	**3.71**	**0.326**	0.24	**0.544**											0.3	0.243	0.242	0.3	0.273	0.25
	Classical Chemistry	Black Carbon (Average)	mg/kg							106				**16400**			**4110**																
	Saturated Hydrocarbons by GC/FID	C-10	mg/Kg dry							107		**1.5**	0.218	**1.23**	**0.178**	0.24	0.204											0.3	0.243	0.242	0.3	0.273	0.25
	Saturated Hydrocarbons by GC/FID	C-11	mg/Kg dry							108		**0.526**	0.218	**0.665**	**0.114**	0.24	0.204											0.3	0.243	0.242	0.3	0.273	0.25
	Saturated Hydrocarbons by GC/FID	C-12	mg/Kg dry							109		**1.59**	0.218	**1.22**	**0.21**	0.24	0.204											0.3	0.243	0.242	0.3	0.273	0.25
	Saturated Hydrocarbons by GC/FID	C-13	mg/Kg dry							110		**0.326**	0.218	**0.346**	0.166	0.24	0.204											0.3	0.243	0.242	0.3	0.273	0.25
	Saturated Hydrocarbons by GC/FID	C-14	mg/Kg dry							111		**0.98**	0.218	**1.14**	**0.234**	0.24	0.204											0.3	0.243	0.242	0.3	0.273	0.25
	Saturated Hydrocarbons by GC/FID	C-15	mg/Kg dry							112		**0.16**	0.218	**0.308**	0.166	0.24	0.204											0.3	0.243	0.242	0.3	0.273	0.25
	Saturated Hydrocarbons by GC/FID	C-16	mg/Kg dry							113		0.219	0.218	**0.2**	0.166	0.24	0.204											0.3	0.243	0.242	0.3	0.273	0.25
	Saturated Hydrocarbons by GC/FID	C-17	mg/Kg dry							114		**0.413**	**0.155**	**0.22**	**0.11**	**0.249**	**0.144**											0.3	0.243	0.242	0.3	0.273	0.25
	Saturated Hydrocarbons by GC/FID	C-18	mg/Kg dry							115		**0.253**	0.218	**0.243**	**0.13**	**0.122**	**0.178**											0.3	0.243	0.242	0.3	0.273	0.25
	Saturated Hydrocarbons by GC/FID	C-19	mg/Kg dry							116		0.219	0.218	**0.484**	**0.205**	**0.216**	**0.283**											0.3	0.243	0.242	**0.17**	0.273	0.25
	Saturated Hydrocarbons by GC/FID	C-21	mg/Kg dry							117		**0.69**	0.218	**0.428**	0.166	**0.3**	**0.381**											0.3	0.243	0.242	0.3	0.273	0.25
	Saturated Hydrocarbons by GC/FID	C-22	mg/Kg dry							118		0.219	0.218	**0.818**	0.166	**0.165**	**0.189**											0.3	0.243	0.242	0.3	0.273	0.25
	Saturated Hydrocarbons by GC/FID	C-23	mg/Kg dry							119		**1.74**	**0.239**	**0.588**	0.166	**0.495**	**0.569**											0.3	0.243	0.242	**0.563**	0.273	0.25
	Saturated Hydrocarbons by GC/FID	C-24	mg/Kg dry							120		0.219	**0.124**	**0.576**	0.166	**0.361**	**0.206**											0.3	**0.188**	0.242	0.3	0.273	0.25
	Saturated Hydrocarbons by GC/FID	C-25	mg/Kg dry							121		**2.15**	**1.68**	0.229	0.166	**2.22**	**2.11**											0.3	**0.825**	0.242	**0.241**	0.273	0.25
	Saturated Hydrocarbons by GC/FID	C-26	mg/Kg dry							122		0.219	**0.215**	**0.539**	**0.143**	**0.36**	**0.655**											0.3	**0.136**	0.242	0.3	0.273	0.25
	Saturated Hydrocarbons by GC/FID	C-27	mg/Kg dry							123		0.219	**4.2**	**2.24**	**0.363**	**4.14**	**4.39**											**0.23**	**1.61**	**0.233**	**1.21**	**0.796**	**0.451**
	Saturated Hydrocarbons by GC/FID	C-28	mg/Kg dry							124		0.219	**2.6**	0.229	**0.157**	**0.597**	**0.328**											0.3	**0.294**	0.242	**0.258**	0.273	0.25
	Saturated Hydrocarbons by GC/FID	C-29	mg/Kg dry							125		0.219	**1.1**	**1.68**	**0.471**	**2.87**	**2.52**											0.3	**0.777**	0.242	0.3	**0.16**	**0.175**
	Saturated Hydrocarbons by GC/FID	C-30	mg/Kg dry							126		0.219	**1.46**	**1.15**	0.166	**0.283**	**0.408**											0.3	**0.191**	0.242	**0.352**	0.273	0.25
	Saturated Hydrocarbons by GC/FID	C-31	mg/Kg dry							127		0.219	**0.96**	**2.14**	**0.841**	**2.61**	**2.19**											0.3	**0.663**	**0.15**	**0.766**	**0.224**	**0.279**
	Saturated Hydrocarbons by GC/FID	C-32	mg/Kg dry							128		0.219	**0.722**	**1.26**	**0.086**	**1.01**	**0.915**											0.3	0.243	0.242	0.3	0.273	0.25
	Saturated Hydrocarbons by GC/FID	C-33	mg/Kg dry							129		**7.05**	**0.481**	**0.955**	**0.256**	**1.31**	**0.893**											0.3	**0.271**	0.242	**0.658**	**0.242**	0.25
	Saturated Hydrocarbons by GC/FID	C-34	mg/Kg dry							130		0.219	**3.91**	**5.89**	**0.682**	**3.6**	**5.29**											0.3	0.243	0.242	0.3	0.273	0.25
	Saturated Hydrocarbons by GC/FID	C-35	mg/Kg dry							131		0.219	**1.41**	0.229	0.166	0.24	**2.24**											0.3	**0.439**	0.242	**1.69**	**0.358**	0.25
	Saturated Hydrocarbons by GC/FID	C-36	mg/Kg dry							132		0.219	0.218	0.229	0.166	0.24	0.204											0.3	0.243	0.242	0.3	0.273	0.25
	Saturated Hydrocarbons by GC/FID	C-37	mg/Kg dry							133		0.219	**0.187**	0.229	0.166	**1.1**	**1.65**											0.3	**0.153**	0.242	**0.915**	**0.226**	0.25
	Saturated Hydrocarbons by GC/FID	C-38	mg/Kg dry							134		**1.96**	**0.165**	0.229	0.166	0.24	0.204											0.3	0.243	0.242	0.3	0.273	0.25
	Saturated Hydrocarbons by GC/FID	C-39	mg/Kg dry							135		0.219	0.218	0.229	0.166	0.24	0.204											0.3	0.243	0.242	0.3	0.273	0.25
	Saturated Hydrocarbons by GC/FID	C-40	mg/Kg dry							136		0.219	0.218	0.229	0.166	0.24	0.204											0.3	**0.135**	0.242	0.3	0.273	0.25
	Saturated Hydrocarbons by GC/FID	C-8	mg/Kg dry							137		**0.173**	0.218	0.229	0.166	0.24	0.204											0.3	0.243	0.242	0.3	0.273	0.25
	Saturated Hydrocarbons by GC/FID	C-9	mg/Kg dry							138		**0.447**	0.218	**0.261**	0.166	0.24	0.204											0.3	0.243	0.242	0.3	0.273	0.25
638-36-8	Saturated Hydrocarbons by GC/FID	Phytane	mg/Kg dry	34.53						141		**3.85**	**0.14**	**3.73**	**0.423**	0.24	0.204											0.3	0.243	0.242	0.3	0.273	0.25
1921-70-6	Saturated Hydrocarbons by GC/FID	Pristane	mg/Kg dry	32.65						142		**3.39**	**0.16**	**4.3**	**0.367**	0.24	**0.113**											0.3	0.243	0.242	0.3	0.273	0.25
TOC	Classical Chemistry	Total Organic Carbon (Average)	mg/kg							145		**55000**	**55000**	**76700**	**55000**	**55000**	**17600**	**109000**	**33000**	**284000**	**148000**	**42700**	**39900**	**103000**	**29100**	**91200**	**74700**	**98300**	760	**7620**	**33400**	**19900**	**15000**

	TPAH16										175039	122620	3572.5	123022	42375	16672.1	126152	15335.6	5170.9	52965	24472.5	6880200	1259.03	70136	63566	56544	3814.2	7707.4	2921.3	3888.4	43322	9392.5	11292.3
	TPAH34										220092.8	177475	5614.6	181838	46154.27	28107.3	164715	20758.2	7196.9	70281	33900.9	7915140	2675.83	112786	76025.3	68078.9	6292.07	10711.9	4395.2	5494.2	55128.4	12488.1	14526.8
	TPAH51										251907.2	200473	6783.2	202930	48612.76	32563	182095	23003.7	8034	77617	38018.35	8739810	3340.75	129503	82179.3	73551.6	7607.02	11884.63	4820.71	6179.26	60685.7	13773.7	15962.6
	LPAH										140340	23654	832.6	33266	9594.6	1201.2	50630	2466.3	926.8	7411	2957.6	4210500	109.12	14736	18031	12904.5	305.92	1383.9	456.2	731.5	8076	1593.2	2391
	HPAH										50999	99670	2768.3	90340	32869	15532	76952	12938	4288.3	45877	21603	2873700	1153.6	55624	45669	43708	3513	6354.2	2486.7	3168	35412	7819	8940

(does not include source area samples collected in 2017)

Attachment B. Complete Sediment Data Set
Amesbury Former MGP
Amesbury, Massachusetts

											River	Upstream	River	River	River	Mudflat	Mudflat	River	River	River	River	River	River	River	River	River	Mudflat	Mudflat	River	River	Mudflat	Mudflat	Mudflat
										Sample No.	F180071-05	F180071-06	F190024-02	F190024-03	F190024-04	F190024-05	F190024-06	F190024-07	F190024-08	F190024-09	F190024-10	F190025-01	F190025-02	F190025-03	F190025-04	F190025-05	F190025-06	F190025-07	F190025-08	F190025-09	F190041-01	F190041-02	F190041-03
										Sample Date:	12/20/2018	12/21/2018	04/23/2019	04/23/2019	04/23/2019	04/23/2019	04/23/2019	04/23/2019	04/23/2019	04/23/2019	04/23/2019	04/24/2019	04/24/2019	04/24/2019	04/24/2019	04/24/2019	04/24/2019	04/23/2019	04/23/2019	4/23/2019	09/11/2019	09/11/2019	09/11/2019
										Sample Time:	14:00	08:30	10:05	10:15	12:50	12:55	13:55	13:10	13:15	13:20	13:25	10:50	10:55	11:00	09:20	09:15	09:05	10:25	10:30	10:35	14:00	14:03	14:05
										ClieSam	SS644	SS645	SS646	SS647	SS648	SS649	SS650	SS651	SS652	SS653	SS654	SS655	SS656	SS657	SS658	SS659	SS660	SS661	SS662	SS663	SS664-S2	SS664-S3	SS664-S4
										Depths:	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0.9 to 1.1	1.9 to 2.1	2.6 to 2.8
										RAH																							
										%solids	45	72	39	66	47	48	46	43	65	60	57	71	71	77	75	35	44	43	49	71	60	68	68
CAS Number	Method Name	Analyte	Units	RT		PAH17	PAH34	PAH51	Abbrev	PAH #																					6.34	5.23	4.38
		Max RL for ND PAHs=								1																							
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzo(b)thiophenes	ug/Kg dry	17					C1BT	2	**21.5**	**1.53**	20.1	12.2	13.7	56.8	46.4	68.9	53.9	53.4	40.1	84.9	5.84	3.06	262	42.2	25.8	22.1	22	183	0	0	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzo(b)thiophenes	ug/Kg dry	18					C2BT	3	**25**	**1.46**	33.1	20.6	32.3	73.8	65.1	119	74.3	109	86.9	186	10.1	7.03	674	108	62.9	46.4	31.8	18.7	**5.06**	0	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzo(b)thiophenes	ug/Kg dry	19					C3BT	4	**17.7**	**1.76**	23	17.9	26	55.6	37.9	121	53	83.8	52.2	99.9	6.11	6.25	438	57.5	31	26.8	18.1	11.5	**5.56**	0	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzo(b)thiophenes	ug/Kg dry	20					C4BT	5	**11.3**	2.68	9.45	9.09	11.7	19.1	16.4	25.6	17.2	23.3	17	27	5.17	3.87	101	13.5	8.08	8.99	10.4	6.05	**3.81**	0	0
91-20-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Naphthalene**	ug/Kg dry	21.86	L	x	x	x	NA	6	**80.5**	**24.8**	75.5	134	78.1	283	330	485	683	601	190	894	42.9	39.2	3150	519	310	299	144	109	**10.4**	0	**3.94**
91-57-6	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylnaphthalene	ug/Kg dry	24.57	L	x		x	2MN	7	**43.8**	**16.7**	50.2	71.5	39.6	116	185	209	256	274	107	386	24.3	22.8	2260	222	141	115	67.3	53.9	**6.35**	0	**2.47**
90-12-0	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylnaphthalene	ug/Kg dry	25				x	1MN	8	**28.2**	**11.8**	40.3	57.8	20.9	91.4	188	182	186	264	169	392	37.5	38.7	2210	266	138	74.7	33.4	35.5	**4.92**	0	**2.35**
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Naphthalenes	ug/Kg dry	24.57			x	x	C1N	9	**46.8**	**18.9**	54.8	80.5	37.6	128	232	244	274	330	169	479	38.3	37.9	2800	299	173	119	63	56.7	**6.73**	0	**3.14**
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Naphthalenes	ug/Kg dry	27.02			x	x	C2N	10	**85.6**	**24.9**	85.8	115	76.6	309	349	688	501	706	562	1150	80.1	153	6210	834	408	320	164	130	**26.5**	**7.22**	**10.9**
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Naphthalenes	ug/Kg dry	29.76			x	x	C3N	11	**87.1**	**17.2**	60.7	98.7	67.4	197	167	465	266	407	237	561	57.1	99.5	2400	332	204	162	106	96.2	**32.1**	**3.91**	**5.5**
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Naphthalenes	ug/Kg dry	32.52			x	x	C4N	12	**70**	**10.4**	36.6	49.3	52.6	85.3	64.9	136	81.1	109	70	146	33.4	36	538	114	89.6	74.8	83.6	48.6	**29.4**	0	**3.91**
92-52-4	8270D (SIM) Semi-Volatile Organic Compou0s	Biphenyl	ug/Kg dry	26.46					BP	13	**19.6**	**9.39**	24.6	22	21.6	76.1	70.7	153	164	157	90.7	400	10.8	11.6	2590	133	74.3	76.9	43.3	24.1	**5.04**	0	0
208-96-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Acenaphthylene**	ug/Kg dry	28.16	L	x	x	x	ACE	14	**365**	**42.3**	243	314	656	1510	1190	2710	2620	1830	1110	6460	173	204	19400	1950	840	1320	467	306	**20.3**	0	**2.48**
83-32-9	8270D (SIM) Semi-Volatile Organic Compou0s	**Acenaphthene**	ug/Kg dry	28.89	L	x	x	x	ACY	15	**109**	**21.9**	78.8	223	55	3040	1960	4040	2590	3430	3000	8310	187	27.8	41000	3080	1570	1270	88.2	107	**70.2**	**2.91**	**17.9**
132-64-9	8270D (SIM) Semi-Volatile Organic Compou0s	Dibenzofuran	ug/Kg dry	29.54				x	DBF	16	**53.3**	**9.7**	52.5	116	16.7	88.8	105	206	158	291	145	337	42.9	29.9	1580	193	117	96.1	41	52.5	0	0	4.58
86-73-7	8270D (SIM) Semi-Volatile Organic Compou0s	**Fluorene**	ug/Kg dry	30.91	L	x	x	x	FLE	17	**112**	**17.1**	105	227	67.7	563	897	2300	1580	1890	1520	3940	98.1	65.6	22700	1610	869	688	113	114	**41.8**	0	**7.62**
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Fluorenes	ug/Kg dry	33.14			x	x	C1FL	18	**88.4**	**14.1**	54	74.3	91.8	247	247	659	413	522	284	909	53.5	65.2	4840	412	202	221	86.2	63.6	**21.6**	0	**4.07**
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Fluorenes	ug/Kg dry	35.22			x	x	C2FL	19	**124**	**15.6**	63.2	72.6	130	150	140	306	184	243	116	326	53.9	97.1	1340	157	90.9	102	100	39.2	**22**	0	**3.25**
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Fluorenes	ug/Kg dry	38.01			x	x	C3FL	20	**153**	**16**	144	137	148	230	168	355	269	254	170	487	96.5	92.8	1020	308	209	278	192	132	**25.1**	0	4.58
132-65-0	8270D (SIM) Semi-Volatile Organic Compou0s	Dibenzothiophene	ug/Kg dry	34.23				x	DBT	21	**75.1**	**7.2**	77.2	125	63	1030	877	2490	1860	1800	1340	5050	76.9	54.1	25600	1650	852	854	81.8	103	**46.6**	0	**7.18**
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Dibenzothiophenes	ug/Kg dry	36.43				x	C1DBT	22	**101**	**8.28**	80.8	105	154	475	513	1470	994	1150	556	2040	80.7	94	10300	802	373	491	143	123	**41.3**	0	**4.63**
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Dibenzothiophenes	ug/Kg dry	37.7				x	C2DBT	23	**127**	**10.7**	81.8	110	198	254	239	598	377	477	231	604	83	85.4	3270	383	213	250	185	127	**44.6**	0	**8.22**
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Dibenzothiophenes	ug/Kg dry	39.5				x	C3DBT	24	**94.9**	**8.49**	59.6	69.8	146	139	120	237	147	171	114	200	54.9	50	980	175	115	135	159	81.7	**37.7**	0	**8.8**
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Dibenzothiophenes	ug/Kg dry	41.65				x	C4DBT	25	**53.9**	**15.6**	35.7	36.4	73.5	76.7	57.6	104	70.8	73.5	56.8	86.5	27	25.5	339	93.2	66.5	72.3	89.9	40.8	**36.2**	0	**3.15**
85-01-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Phenanthrene**	ug/Kg dry	34.72	L	x	x	x	PHE	26	**1290**	**167**	1060	1850	830	4550	6440	19900	15800	14000	8520	34500	1110	744	215000	12500	5670	6910	888	1230	**310**	**9.44**	**48.9**
120-12-7	8270D (SIM) Semi-Volatile Organic Compou0s	**Anthracene**	ug/Kg dry	34.91	L	x	x	x	ANT	27	**499**	**53.7**	315	617	583	2200	2490	6740	9520	3920	2030	10700	330	228	51800	3740	1970	2020	658	447	**182**	**10.6**	**32.1**
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Phenanthrenes/Anthracenes	ug/Kg dry	36.96				x	C1PH	28	**921**	**140**	539	817	1070	2080	2360	5750	3920	4400	2060	6850	562	529	39200	3250	1570	2200	870	710	**142**	**5.72**	**13.9**
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Phenanthrenes/Anthracenes	ug/Kg dry	38.97			x	x	C2PH	29	**592**	**99.7**	294	399	704	679	665	1350	817	1020	514	1230	294	283	5980	852	559	640	538	386	**85.8**	**4.17**	**9.73**
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Phenanthrenes/Anthracenes	ug/Kg dry	40.8			x	x	C3PH	30	**263**	**54.8**	133	170	304	250	205	373	217	259	161	293	112	101	988	273	206	223	247	146	**70.1**	**8.07**	**12.8**
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Phenanthrenes/Anthracenes	ug/Kg dry	41.72			x	x	C4PH	31	**102**	**47.9**	43.5	61.4	144	109	90.9	167	91.6	102	69.2	140	37.1	35.9	482	93.5	96.2	98.1	126	57.6	**128**	**22.1**	**27**
483-65-8	8270D (SIM) Semi-Volatile Organic Compou0s	Retene	ug/Kg dry	41.72				x	RET	32	**66.8**	**129**	96	28.2	210	45.6	90.2	178	65.1	63	42.7	127	26.4	30.5	79	180	135	85.4	102	32	**564**	**103**	**128**
239-35-0	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)naphtho(2,1-d)thiophene	ug/Kg dry	44.24					BNT	33	**201**	**15.4**	196	237	429	919	908	2160	1590	1300	649	2570	182	99.6	11900	1180	589	893	300	226	**29.3**	0	**3.64**
	8270D (SIM) Semi-Volatile Organic Compou0s	C0-Benzonaphthothiophenes	ug/Kg dry	44.24					C0BNT	34	**385**	**40.8**	353	432	764	1780	1790	4260	3110	2620	1290	5170	319	177	23600	2290	1130	1720	550	414	**56.2**	0	**8.42**
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzonaphthothiophenes	ug/Kg dry	45.63					C1BNT	35	**251**	**29.4**	187	220	456	593	541	1300	824	881	438	1220	159	127	5670	753	449	550	315	215	**24.3**	0	**3.82**
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzonaphthothiophenes	ug/Kg dry	47.14					C2BNT	36	**188**	**19.6**	147	159	233	306	253	524	311	344	238	367	133	122	1810	425	282	326	243	158	**17.1**	0	**3.85**
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzonaphthothiophenes	ug/Kg dry	49.02					C3BNT	37	**135**	**14.2**	120	146	150	284	221	459	315	273	230	387	110	118	1770	385	245	302	179	122	**12.9**	0	**3.01**
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzonaphthothiophenes	ug/Kg dry	51.51					C4BNT	38	**66.9**	**5.17**	66.7	93.9	49.8	129	96.2	160	120	100	117	99.4	64.5	79.8	455	166	116	142	94.9	64.7	**3.6**	0	0
206-44-0	8270D (SIM) Semi-Volatile Organic Compou0s	**Fluoranthene**	ug/Kg dry	39.51	H	x	x	x	FLA	39	**2570**	**275**	2290	3000	3520	12100	11700	27600	20800	15600	8390	38100	2320	1360	182000	16600	6650	12400	3220	2880	**359**	**9.6**	**38.2**
129-00-0	8270D (SIM) Semi-Volatile Organic Compou0s	**Pyrene**	ug/Kg dry	40.39	H	x	x	x	PYR	40	**2870**	**374**	2210	2770	5030	15700	15000	38600	28800	21100	11100	53200	2040	1220	267000	22300	8690	16300	4330	2870	**461**	**11.3**	**52.2**
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Fluoranthenes/Pyrenes	ug/Kg dry	41.78			x	x	C1PY	41	**1800**	**291**	1010	1210	3110	4130	4340	9870	6780	6400	3000	10600	821	603	61800	5810	2890	4130	2200	1190	**162**	**7.72**	**18.5**
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Fluoranthenes/Pyrenes	ug/Kg dry	43.52				x	C2PY	42	**876**	**141**	587	737	1110	1160	988	2100	1290	1410	795	1660	517	362	6730	1370	927	1110	771	613	**35.7**	0	**5.18**
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Fluoranthenes/Pyrenes	ug/Kg dry	45.72				x	C3PY	43	**342**	**57.9**	261	288	413	419	359	607	359	407	271	416	200	177	1380	470	349	400	305	256	**14**	0	4.58
243-17-4	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)fluorene	ug/Kg dry	42.03				x	BbF	44	**214**	**23.5**	113	136	343	529	624	1240	946	789	353	1490	81.8	57.4	7890	712	334	524	277	118	**16**	0	0
205-12-9	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(c)fluorene	ug/Kg dry	42.07				x	BcF	45	**86.4**	**13.1**	47.7	66.6	119	212	242	576	367	363	171	628	38.6	30	3620	345	161	240	85	56.8	**13.6**	0	0
3442-78-2	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylpyrene	ug/Kg dry	42.18				x	2MP	46	**245**	**43.4**	134	164	462	571	561	1330	936	868	420	1430	121	85.4	8130	772	400	566	305	173	**19.3**	0	**2.3**
3353-12-6	8270D (SIM) Semi-Volatile Organic Compou0s	4-Methylpyrene	ug/Kg dry	42.55				x	4MP	47	**226**	**43.4**	121	138	435	501	480	1170	794	761	356	1220	95.5	74.4	7240	717	376	502	291	149	**17.1**	0	0
2381-21-7	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylpyrene	ug/Kg dry	42.67				x	1MP	48	**188**	**33**	97.3	120	405	565	529	1350	970	863	411	1530	76.5	56.7	8800	752	372	553	263	126	**18**	0	0
56-55-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Benz(a)anthracene**	ug/Kg dry	45.17	H	x	x	x	BaA	49	**1610**	**243**	1250	1700	3160	5430	5370	11400	8530	7180	3690	12700	1130	708	72700	6860	3370	5290	2190	1520	**149**	**3.83**	**16.2**
	8270D (SIM) Semi-Volatile Organic Compou0s	**Chrysene/triphenylene**	ug/Kg dry	45.36	H	x	x	x	CH	50	**1670**	**238**	1390	1620	3290	4700	4640	9730	8390	5670	2940	12900	1130	678	50600	6020	3200	4640	2370	1570	**168**	**7.47**	**24.9**
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	46.81			x	x	C1CR	51	**924**	**180**	634	758	1630	1580	1490	3150	2000	2090	1030	2660	476	361	12900	1910	1190	1420	1000	629	**44.1**	0	**6.13**
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	48.52			x	x	C2CR	52	**508**	**98.8**	335	583	626	600	546	1020	571	682	389	1170	247	200	3150	692	1110	557	424	291	**21.5**	0	4.58
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	49.55			x	x	C3CR	53	**252**	**46.4**	173	215	206	283	248	410	219	249	192	290	135	128	815	296	248	254	196	152	**9.2**	0	4.58
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	50			x	x	C4CR	54	**133**	**23.6**	99.5	118	129	223	184	366	248	204	150	349	69.5	71.1	1280	232	158	211	122	81.3	0	0	4.58
205-99-2	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(b)fluoranthene**	ug/Kg dry	49.23	H	x	x	x	BbF	55	**1230**	**157**	1250	1420	2180	3840	3620	8230	6110	4550	2520	7270	1030	603	43700	5400	2670	4280	1940	1330	**66.7**	0	**6.79**
	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(j/k)fluoranthene**	ug/Kg dry	49.29	H	x	x	x	BjF	56	**1300**	**189**	1160	1300	2620	4440	4100	8160	5900	5030	2600	10700	886	559	49700	5510	3010	4310	1900	1350	**88.4**	**2.98**	**12**
192-97-2	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(e)pyrene	ug/Kg dry	50.17			x	x	BeP	57	**1210**	**206**	1030	1110	2460	3880	3470	7630	5630	4430	2350	9110	759	476	45600	5090	2670	3980	1880	1140	**67.8**	0	**8.81**
50-32-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(a)pyrene**	ug/Kg dry	50.34	H	x	x	x	BaP	58	**1750**	**267**	1460	1680	3880	6630	6030	15300	10600	7950	4110	16300	1100	705	92200	8970	4490	6800	2930	1700	**121**	**3.42**	**14.2**
198-55-0	8270D (SIM) Semi-Volatile Organic Compou0s	Perylene	ug/Kg dry	50.61			x	x	PE	59	**378**	**81.6**	357	400	758	1220	1120	2470	1790	1400	736	2350	273	166	13700	1700	886	1290	625	416	**210**	**305**	**294**
193-39-5	8270D (SIM) Semi-Volatile Organic Compou0s	**Indeno(1,2,3-cd)pyrene**	ug/Kg dry	54	H	x	x	x	I123P	60	**897**	**124**	996	1100	2160	3890	3530	7820	5910	4450	2400	8340	731	450	45900	5140	2630	3950	1710	1100	**45.9**	0	**5.28**
53-70-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Dibenzo(a,h)anthracene**	ug/Kg dry	54.01	H	x	x	x	DBA	61	**248**	**39.8**	227	264	456	797	697	1500	1120	948	498	1530	165	106	7940	937	520	750	350	247	**11.1**	0	4.58
191-24-2	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(g,h,i)perylene**	ug/Kg dry	54.91	H	x	x	x	BGP	62	**965**	**157**	882	937	2140	3720	3270	7440	5660	4240	2270	8550	603	374	43900	4820	2430	3630	1590	949	**57.5**	0	**7.43**
191-07-1	8270D (SIM) Semi-Volatile Organic Compou0s	Coronene	ug/Kg dry	61.34				x	COR	63	**236**	**37**	257	256	637	1220	1070	2580	1930	1420	751	2920	137	83.7	12700	1330	645	985	402	228	**16.3**	0	4.58
526-73-8	8270D (SIM) Semi-Volatile Organic Compou0s	1,2,3-Trimethylbenzene	ug/Kg dry							64	**7.71**	2.68	9.16	6.59	5.79	12.8	8.37	11.6	7.59	14	7.63	10.2	2.67	4.79	73.6	19.9	17.1	16.3	17.2	8.21	**8.57**	0	4.58
95-63-6	8270D (SIM) Semi-Volatile Organic Compou0s	1,2,4-Trimethylbenzene	ug/Kg dry							65	**9.54**	**2.12**	11.1	5.89	5.57	17.1	11.4	20.8	12.6	27.5	12	21.2	6.04	4.49	73.6	31.6	29.6	26.1	19.7	11.8	**11.2**	0	4.58
108-67-8	8270D (SIM) Semi-Volatile Organic Compou0s	1,3,5-Trimethylbenzene	ug/Kg dry							66	**5.05**	2.68	7.29	3.2	5.52	7.29	5.17	9.63	4.58	15	4.42	10	5.07	39	73.6	16.1	15.1	14.4	7.8	5.17	0	0	4.58
	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methyldibenzothiophene	ug/Kg dry	36.76						67	**17.5**	2.68	12.9	13.9	21.4	57	61.2	164	108	132	67.7	214	9.8	8.19	1090	88.9	42.1	53.4	17.8	16.6	**4.07**	0	4.58
	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylphenanthrene	ug/Kg dry	37.24						68	**137**	**23.8**	83.8	127	173	331	351	899	617	654	318	1080	88.6	78.4	5930	491	248	322	135	118	**24.6**	0	**3.14**
	8270D (SIM) Semi-Volatile Organic Compou0s	2,3,5-Trimethylnaphthene	ug/Kg dry	30.44						69	**5.82**	**1.39**	4.05	7.69	3.62	13.5	9.4	25.1	16.2	22.6	13.2	34.4	4.23	6.76	147	21.1	11.1	9.4	6.81	6.18	0	0	4.58
581-42-0	8270D (SIM) Semi-Volatile Organic Compou0s	2,6-Dimethylnaphthalene	ug/Kg dry	27.07						70	**20.1**	**4.49**	33.6	29.1	22.4	64.5	77.6	135	110	156	106	201	26.8	53.9	1110	250	107	125	82.6	48	**7.17**	0	4.58
	8270D (SIM) Semi-Volatile Organic Compou0s	2/3-Methyldibenzothiophene	ug/Kg dry	36.31						71	**30.5**	**2.41**	25.1	35.1	48.7	160	178	505	360	410	193	755	27.7	34	3770	281	129	177	41.9	40.6	**13.9**	0	4.58
	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylanthracene	ug/Kg dry	36.96						72	**159**	**20.4**	63.5	102	155	261	318	752	495	543	241	745	61.9	46.2	4630	380	194	240	130	85.4	**16.3**	0	4.58
	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylphenanthrene	ug/Kg dry	36.81						73	**217**	**32.9**	136	210	156	472	619	1460	1050	1180	547	1870	157	173	10700	862	398	562	189	184	**36.8**	0	**3.32**
	8270D (SIM) Semi-Volatile Organic Compou0s	3-Methylphenanthrene	ug/Kg dry	36.69						74	**173**	**25.6**	118	180	203	489	527	1370	931	1020	501	1790	126	130	9650	755	362	518	171	143	**29.8**	0	**2.76**
	8270D (SIM) Semi-Volatile Organic Compou0s	4/9-Methylphenanthrene	ug/Kg dry	37.14						75	**213**	**33.7**	122	178	271	470	506	1250	804	928	441	1300	119	101	8160	725	365	492	221	151	**30.6**	0	**2.95**
	8270D (SIM) Semi-Volatile Organic Compou0s	4-Methyldibenzothiophene	ug/Kg dry	36.01						76	**30.5**	**2.11**	25	32.9	61.3	170	179	526	355	400	192	724	28.5	41.5	3640	283	133	175	56.4	41.4	**14.3**	0	4.58
71-43-2	8270D (SIM) Semi-Volatile Organic Compou0s	Benzene	ug/Kg dry							77	**32.6**	**14.6**	85.2	33.1	59.8	98.6	60.7	87.9	147	119	99.8	136	60.6	17.8	235	203	124	221	217	124	0	0	4.58

Attachment B. Complete Sediment Data Set
Amesbury Former MGP
Amesbury, Massachusetts

												River	Upstream	River	River	River	Mudflat	Mudflat	River	River	River	River	River	River	River	River	River	Mudflat	Mudflat	River	River	Mudflat	Mudflat	Mudflat
											Sample No.	F180071-05	F180071-06	F190024-02	F190024-03	F190024-04	F190024-05	F190024-06	F190024-07	F190024-08	F190024-09	F190024-10	F190025-01	F190025-02	F190025-03	F190025-04	F190025-05	F190025-06	F190025-07	F190025-08	F190025-09	F190041-01	F190041-02	F190041-03
											Sample Date:	12/20/2018	12/21/2018	04/23/2019	04/23/2019	04/23/2019	04/23/2019	04/23/2019	04/23/2019	04/23/2019	04/23/2019	04/23/2019	04/24/2019	04/24/2019	04/24/2019	04/24/2019	04/24/2019	04/24/2019	04/23/2019	04/23/2019	04/23/2019	09/11/2019	09/11/2019	09/11/2019
											Sample Time:	14:00	08:30	10:05	10:15	12:50	12:55	13:55	13:10	13:15	13:20	13:25	10:50	10:55	11:00	09:20	09:15	09:05	10:25	10:30	10:35	14:00	14:03	14:05
											ClieSam	SS644	SS645	SS646	SS647	SS648	SS649	SS650	SS651	SS652	SS653	SS654	SS655	SS656	SS657	SS658	SS659	SS660	SS661	SS662	SS663	SS664-S2	SS664-S3	SS664-S4
											Depths:	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0.9 to 1.1	1.9 to 2.1	2.6 to 2.8
											RAH																							
											%solids	45	72	39	66	47	48	46	43	65	60	57	71	71	77	75	35	44	43	49	71	60	68	68
CAS Number	Method Name	Analyte	Units	RT		PAH17	PAH34	PAH51	Abbrev	PAH #																						6.34	5.23	4.38
11095-43-5	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)thiophene	ug/Kg dry							78	**4**	2.68	5.7	5.1	4.12	26.8	31.9	54.7	62.8	46.7	15.8	78.3	2.9	2.78	250	47.7	31.7	27.9	8.06	6.55	0	0	4.58
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzene	ug/Kg dry							79	**57**	**6.17**	99.6	61.9	69.1	101	123	96.4	73	75.3	62.8	77	51.7	28.5	225	338	183	264	271	90.1	**78.7**	**27.3**	**15.9**
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Decalins	ug/Kg dry							80	**41**	2.68	10.2	6.43	6.68	78.4	17.3	22.8	20.2	21.5	24.8	65.2	4.69	13	128	28.8	40.6	16.6	33.9	7.42	0	0	4.58
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzenes	ug/Kg dry							81	**88.2**	**7.03**	128	263	79.5	165	149	193	117	158	83.3	126	56.3	11.7	198	535	408	315	300	103	**46.9**	**17.5**	**8.6**
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Decalins	ug/Kg dry							82	**27.6**	2.68	11.3	10.6	12.3	52.1	20.4	32.3	25.7	25.4	28.4	157	8.08	11	163	35.6	34.9	30.4	53.8	12.1	0	0	4.58
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzenes	ug/Kg dry							83	**46.1**	**6.54**	33.3	18.6	27.2	41.4	34.2	49	30.6	53.7	30.2	43.2	14.9	30.3	99.2	69.2	61	70.8	48.6	28.9	**3.25**	0	4.58
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Decalins	ug/Kg dry							84	**22.8**	2.68	6.53	8.99	6.53	38	18.8	27.1	23.1	21.9	21.9	119	4.83	6.88	131	25.6	26	17.5	53.7	7.79	0	0	4.58
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzenes	ug/Kg dry							85	**33.9**	**7.63**	35	21	36.5	41.8	38	43.6	28.4	37	29.5	46.1	14.4	25.4	100	54.7	47.6	64.7	40.3	21.9	**6.01**	0	4.58
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Decalins	ug/Kg dry							86	**38**	2.68	6.53	2.91	6.53	66.9	27.9	43.4	46.6	33.9	33.1	106	12.8	15.2	133	35.2	32.4	38.2	92.3	13.6	0	0	4.58
	8270D (SIM) Semi-Volatile Organic Compou0s	C5-Benzenes	ug/Kg dry							87	**26.5**	2.68	22	11	21.4	28.7	22.8	24.5	20.5	19.1	19.3	31.3	8.96	17.7	50	32.4	26.8	47.9	24.7	13.9	0	0	4.58
86-74-8	8270D (SIM) Semi-Volatile Organic Compou0s	Carbazole	ug/Kg dry	35.61						88	**126**	**12.4**	150	228	56.7	181	115	211	274	320	119	220	126	53.3	486	197	114	168	80.3	101	0	0	4.58
493-01-6	8270D (SIM) Semi-Volatile Organic Compou0s	cis-Decalin	ug/Kg dry							89	**2.6**	2.68	5.5	2.96	5.25	8.45	5.25	6.2	1.74	4.4	2.38	9.03	3.29	3.16	73.6	7.69	3.46	6.42	5.69	4.24	0	0	4.58
100-41-4	8270D (SIM) Semi-Volatile Organic Compou0s	Ethylbenzene	ug/Kg dry							90	**30.1**	**3.75**	16.7	6.19	10.8	20.6	31	38.6	29.8	31.6	17.4	24.2	8.02	3.8	112	45.9	35.2	52.7	27.6	18.3	**18.7**	**7.94**	**3.89**
98-82-8	8270D (SIM) Semi-Volatile Organic Compou0s	Isopropylbenzene	ug/Kg dry							91	**58**	2.68	6.53	2.91	6.35	5.52	5.25	6.2	3.2	4.12	3.95	3.43	3.29	3.16	73.6	4.41	6.81	3.57	5.69	4.24	0	0	4.58
	8270D (SIM) Semi-Volatile Organic Compou0s	m,p-Xylene	ug/Kg dry							92	**134**	**6.66**	230	513	123	294	240	324	196	267	175	211	100	16.8	248	1010	771	561	567	183	**90.7**	**41.1**	**27.5**
108-87-2	8270D (SIM) Semi-Volatile Organic Compou0s	Methylcyclohexane	ug/Kg dry							93	**4.78**	2.68	7.81	6.36	6.13	9.58	5.47	9.01	3.84	4.78	6.42	9.77	7.18	24.9	73.6	20.9	36	25.7	8.07	5.24	0	0	4.58
104-51-8	8270D (SIM) Semi-Volatile Organic Compou0s	n-Butylbenzene	ug/Kg dry							94	**8.77**	**8.01**	43	8.56	54.8	19.2	33.1	25.3	25.2	23.9	16.1	19.4	14.1	4.56	73.6	49.3	43	127	38	19.7	0	0	4.58
103-65-1	8270D (SIM) Semi-Volatile Organic Compou0s	n-Propylbenzene	ug/Kg dry							95	**7.28**	**1.58**	14.3	4.64	11.4	10	7.22	11.2	10.1	12.2	8.84	8.83	7.39	2.31	73.6	30.4	24.4	55.1	24.9	13.5	0	0	4.58
95-47-6	8270D (SIM) Semi-Volatile Organic Compou0s	o-Xylene	ug/Kg dry							96	**9.52**	2.68	13.6	7.38	6.83	16.8	14	18.7	9.14	18.5	9.91	14.2	6.02	2.81	73.6	38.6	27.4	30.9	23.7	12.7	**15.6**	0	4.58
99-87-6	8270D (SIM) Semi-Volatile Organic Compou0s	p-Isopropyltoluene	ug/Kg dry							97	**8.74**	**3.41**	9.95	14.4	9.81	9.66	9.47	11.2	8.19	11.6	5.37	9.14	3.68	3.64	73.6	29.6	25.7	18.6	17.9	5.98	**23.1**	0	4.58
135-98-8	8270D (SIM) Semi-Volatile Organic Compou0s	sec-Butylbenzene	ug/Kg dry							98	4.24	2.68	6.53	2.91	6.35	5.52	5.25	6.2	3.2	4.4	3.95	3.43	3.29	1.81	73.6	7.69	6.38	6.42	5.69	4.24	0	0	4.58
100-42-5	8270D (SIM) Semi-Volatile Organic Compou0s	Styrene	ug/Kg dry							99	**107**	**6.12**	24.7	23.7	41	59.8	47.3	79.9	77.3	65.4	41.7	107	12.2	12.9	328	70.6	40.9	58	61.4	22.5	0	0	4.58
98-06-6	8270D (SIM) Semi-Volatile Organic Compou0s	t-Butylbenzene	ug/Kg dry							100	4.24	2.68	6.53	2.91	6.35	5.52	5.25	6.2	3.2	4.4	3.95	3.43	3.29	3.16	73.6	7.69	6.38	6.42	5.69	4.24	0	0	4.58
108-88-3	8270D (SIM) Semi-Volatile Organic Compou0s	Toluene	ug/Kg dry							101	**95.2**	**9.86**	156	101	107	163	198	147	115	117	108	118	83	44	347	537	291	423	432	145	**136**	**57.4**	**37.4**
493-02-7	8270D (SIM) Semi-Volatile Organic Compou0s	trans-Decalin	ug/Kg dry							102	**36.5**	2.68	4.44	2.38	6.35	64.8	9.82	12.4	9.86	13.8	13.1	33.7	2.56	12.9	62.1	12.4	19.4	9.17	15.3	3.38	0	0	4.58
3891-98-3	Saturated Hydrocarbons by GC/FID	2,6,10-trimethyldodecane (1380)	mg/Kg dry							103	0.424	0.268																			**13.8**	0	4.58
3892-00-0	Saturated Hydrocarbons by GC/FID	2,6,10-trimethylpeadecane (1650)	mg/Kg dry							104	0.424	0.268																			**42.1**	0	**3.68**
3891-99-4	Saturated Hydrocarbons by GC/FID	2,6,10-trimethyltridecane (1470)	mg/Kg dry							105	0.424	0.268																			**32.3**	0	**6.84**
	Classical Chemistry	Black Carbon (Average)	mg/kg							106																							
	Saturated Hydrocarbons by GC/FID	C-10	mg/Kg dry							107	0.424	0.268																					
	Saturated Hydrocarbons by GC/FID	C-11	mg/Kg dry							108	0.424	0.268																					
	Saturated Hydrocarbons by GC/FID	C-12	mg/Kg dry							109	0.424	0.268																					
	Saturated Hydrocarbons by GC/FID	C-13	mg/Kg dry							110	0.424	0.268																					
	Saturated Hydrocarbons by GC/FID	C-14	mg/Kg dry							111	0.424	0.268																					
	Saturated Hydrocarbons by GC/FID	C-15	mg/Kg dry							112	0.424	0.268																					
	Saturated Hydrocarbons by GC/FID	C-16	mg/Kg dry							113	0.424	0.268																					
	Saturated Hydrocarbons by GC/FID	C-17	mg/Kg dry							114	0.424	0.268																			**70.7**	**35.7**	**26.7**
	Saturated Hydrocarbons by GC/FID	C-18	mg/Kg dry							115	0.424	0.268																			**63.8**	**33.1**	**23**
	Saturated Hydrocarbons by GC/FID	C-19	mg/Kg dry							116	0.424	0.268																					
	Saturated Hydrocarbons by GC/FID	C-21	mg/Kg dry							117	0.424	0.268																					
	Saturated Hydrocarbons by GC/FID	C-22	mg/Kg dry							118	0.424	0.268																					
	Saturated Hydrocarbons by GC/FID	C-23	mg/Kg dry							119	**0.294**	0.268																					
	Saturated Hydrocarbons by GC/FID	C-24	mg/Kg dry							120	**0.288**	**0.606**																					
	Saturated Hydrocarbons by GC/FID	C-25	mg/Kg dry							121	**1.39**	**1.45**																					
	Saturated Hydrocarbons by GC/FID	C-26	mg/Kg dry							122	**0.294**	0.268																					
	Saturated Hydrocarbons by GC/FID	C-27	mg/Kg dry							123	**2.04**	**1.24**																					
	Saturated Hydrocarbons by GC/FID	C-28	mg/Kg dry							124	0.424	0.268																					
	Saturated Hydrocarbons by GC/FID	C-29	mg/Kg dry							125	**1.1**	**0.371**																					
	Saturated Hydrocarbons by GC/FID	C-30	mg/Kg dry							126	**0.272**	0.268																					
	Saturated Hydrocarbons by GC/FID	C-31	mg/Kg dry							127	**0.936**	**0.315**																					
	Saturated Hydrocarbons by GC/FID	C-32	mg/Kg dry							128	0.424	0.268																					
	Saturated Hydrocarbons by GC/FID	C-33	mg/Kg dry							129	**0.325**	**0.2**																					
	Saturated Hydrocarbons by GC/FID	C-34	mg/Kg dry							130	0.424	0.268																					
	Saturated Hydrocarbons by GC/FID	C-35	mg/Kg dry							131	**2.03**	**0.388**																					
	Saturated Hydrocarbons by GC/FID	C-36	mg/Kg dry							132	0.424	0.268																					
	Saturated Hydrocarbons by GC/FID	C-37	mg/Kg dry							133	**0.565**	0.268																					
	Saturated Hydrocarbons by GC/FID	C-38	mg/Kg dry							134	0.424	0.268																					
	Saturated Hydrocarbons by GC/FID	C-39	mg/Kg dry							135	0.424	0.268																					
	Saturated Hydrocarbons by GC/FID	C-40	mg/Kg dry							136	0.424	0.268																					
	Saturated Hydrocarbons by GC/FID	C-8	mg/Kg dry							137	0.424	0.268																					
	Saturated Hydrocarbons by GC/FID	C-9	mg/Kg dry							138	0.424	0.268																					
638-36-8	Saturated Hydrocarbons by GC/FID	Phytane	mg/Kg dry	34.53						141	0.424	0.268																			**187**	**29**	**30.5**
1921-70-6	Saturated Hydrocarbons by GC/FID	Pristane	mg/Kg dry	32.65						142	0.424	0.268																			**156**	**14.9**	**19.6**
TOC	Classical Chemistry	Total Organic Carbon (Average)	mg/kg							145	**80700**	**12200**	64400	27100	105000	56300	55700	91900	45600	27300	87600	38400	34200	7420	44300	95900	95600	76500	58500	49300	**48400**	**24300**	**12000**
	TPAH16										17565.5	2390.6	14992.3	19156	30705.8	73393	71264	171955	134613	102389	56888	234394	13076	8071.6	1208690	105956	48889	74857	24888.2	17829	2162.3	61.55	294.72
	TPAH34										25303.4	3777.5	20139.4	25624.8	42450.8	89773.3	87350.8	207364	158884.7	126196	69147.2	273494	17274.4	11607.1	1413733	128610.5	61848.7	91136.9	33911	23594.2	3266.23	425.46	734.68
	TPAH51										28360.8	4387.27	22331.5	28250.1	47296.5	97266.8	94578.6	223991	170590.6	137640.5	75436.7	294010.5	18995.4	12964.6	1516841	139042.7	67563.2	98190.4	37512.4	25963.4	4197.9	528.46	920.7
	LPAH										2499.3	343.5	1927.5	3436.5	2309.4	12262	13492	36384	33049	25945	16477	65190	1965.3	1331.4	355310	23621	11370	12622	2425.5	2366.9	641.05	22.95	115.41
	HPAH										15110	2063.8	13115	15791	28436	61247	57957	135780	101820	76718	40518	169590	11135	6763	855640	82557	37660	62350	22530	15516	1527.6	38.6	181.78

(does not include source area samples collected in 2017)

Attachment B. Complete Sediment Data Set
Amesbury Former MGP
Amesbury, Massachusetts

											Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	River	River	River	Mudflat	River
										Sample No.	F190041-04	F190041-05	F190041-06	F190041-07	F190041-08	F190041-09	F190041-10	F190041-11	F190041-12	F190040-01	F190046-01	F190046-02	F190040-02	F190040-03	F190046-03	F190046-04	F190048-01	F190048-02	F190040-04	F190040-05	F190040-06	F190048-03	F190040-07
										Sample Date:	09/10/2019	09/10/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/23/2019	09/23/2019	09/10/2019	09/10/2019	09/23/2019	09/23/2019	09/24/2019	09/24/2019	09/12/2019	09/12/2019	09/12/2019	09/24/2019	09/11/2019
										Sample Time:	14:15	14:18	15:10	15:15	15:18	15:22	17:05	17:08	16:10	16:13	10:32	10:36	10:50	10:53	11:28	11:31	10:01	10:09	15:37	15:44	15:23	12:06	09:45
										ClieSam	SS665-S1	SS665-S2	SS666-S2	SS666-S3	SS666-S4	SS666-S5	SS667-S1	SS667-S2	SS668-S1	SS668-S2	SS669-S1	SS669-S3	SS670-S1	SS670-S2	SS671-S1	SS671-S2	SS672-S1	SS672-S3	SS673-S2	SS673-S3	SS674-S4	SS675-S2	SS676-S2
										Depths:	0 to 0.5	0.9 to 1.1	0.9 to 1.1	1.9 to 2.1	2.9 to 3.1	3.9 to 4	0 to 0.5	0.9 to 1.1	0 to 0.5	0.9 to 1.1	1.5 to 2.2	4.6 to 4.7	0 to 0.5	0.9 to 1.1	1.3 to 1.5	1.9 to 2.1	0 to 0.5	1.9 to 2.1	2.4 to 2.6	3.7 to 3.8	2.9 to 3.1	1.9 to 2.1	1.9 to 2.1
										RAH																							
										%solids	73	70	76	52	68	77	76	75	51	85	84	79	55	72	66	44	43	92	80	78	77	80	55
CAS Number	Method Name	Analyte	Units	RT		PAH17	PAH34	PAH51	Abbrev	PAH #				7.13	5.65	4.94						5.08				8.98							
		Max RL for ND PAHs=								1																							
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzo(b)thiophenes	ug/Kg dry	17					C1BT	2	23.3	9.94	2.83	0	0	0	7.93	4.64	77	92	144	0	96	22.6	123	11.1	52.4	24	65	15	60.1	110	19.6
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzo(b)thiophenes	ug/Kg dry	18					C2BT	3	86.1	29.7	4.65	0	0	0	18.7	8.17	200	124	341	0	232	35.3	181	17.7	86.7	71.8	179	28	242	219	55.2
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzo(b)thiophenes	ug/Kg dry	19					C3BT	4	61.2	33.4	4.86	0	0	0	16.8	5.53	107	72.5	391	0	141	35.2	186	13.7	47	61.5	247	12.7	308	165	64.2
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzo(b)thiophenes	ug/Kg dry	20					C4BT	5	44.6	28.6	4.68	0	0	0	8.07	5.34	38.9	53.6	323	0	88.4	78.4	177	8.99	32.9	39.3	190	3.8	173	70.5	56.3
91-20-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Naphthalene**	ug/Kg dry	21.86	L	x	x	x	NA	6	179	47.6	37.1	5.25	0	0	163	163	566	663	573	5.61	973	120	1950	9.16	572	107	745	109	841	2550	166
91-57-6	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylnaphthalene	ug/Kg dry	24.57	L	x		x	2MN	7	86.4	27.4	25.4	0	0	0	61.9	158	228	961	414	0	440	84.8	672	0	186	41.3	285	57.2	567	1300	140
90-12-0	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylnaphthalene	ug/Kg dry	25				x	1MN	8	68.3	40.5	8.91	0	0	0	31.3	60.1	230	353	225	0	488	41.1	241	0	127	32.5	265	72.4	766	2230	95.3
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Naphthalenes	ug/Kg dry	24.57			x	x	C1N	9	90.9	39.1	21.8	0	0	0	56.7	134	277	805	414	0	553	76.9	577	0	196	46.6	337	79.2	813	2140	141
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Naphthalenes	ug/Kg dry	27.02			x	x	C2N	10	249	202	58.4	14.4	7.47	0	180	204	835	967	2430	7.96	1480	228	1450	45.5	484	330	1390	271	6160	4190	416
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Naphthalenes	ug/Kg dry	29.76			x	x	C3N	11	371	309	89.6	9.79	0	0	125	249	461	749	4220	7.22	656	500	2400	30	264	528	2100	141	6120	2910	623
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Naphthalenes	ug/Kg dry	32.52			x	x	C4N	12	225	229	69.2	7.46	0	0	50.9	261	166	614	2610	4.85	185	535	1890	15.5	134	319	1390	48.2	3590	1260	493
92-52-4	8270D (SIM) Semi-Volatile Organic Compou0s	Biphenyl	ug/Kg dry	26.46					BP	13	54.5	18.3	9.69	3.73	0	0	66.4	62.5	234	276	153	0	464	53	432	6.14	144	16.5	186	23.4	205	430	145
208-96-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Acenaphthylene**	ug/Kg dry	28.16	L	x	x	x	ACE	14	469	85.5	101	5.04	0	0	1030	592	2110	342	795	8.31	5290	299	10400	17.2	1850	354	1200	35.8	2840	231	334
83-32-9	8270D (SIM) Semi-Volatile Organic Compou0s	**Acenaphthene**	ug/Kg dry	28.89	L	x	x	x	ACY	15	970	555	9.16	3.94	0	0	870	30.5	6890	3830	2840	3.86	9570	470	1280	5.29	3840	1860	3370	739	8260	8620	660
132-64-9	8270D (SIM) Semi-Volatile Organic Compou0s	Dibenzofuran	ug/Kg dry	29.54				x	DBF	16	74.7	31.8	18.8	0	0	0	39.2	23.7	224	191	134	0	355	48.9	188	0	143	45.8	342	108	345	4110	139
86-73-7	8270D (SIM) Semi-Volatile Organic Compou0s	**Fluorene**	ug/Kg dry	30.91	L	x	x	x	FLE	17	588	452	29	4.07	0	0	599	90.2	2730	1130	1470	2.99	5230	167	930	0	929	714	2610	187	5060	7500	325
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Fluorenes	ug/Kg dry	33.14			x	x	C1FL	18	257	189	58.1	0	0	0	227	255	599	490	918	8.51	1210	183	1520	5.03	364	297	1190	79.4	4750	2660	344
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Fluorenes	ug/Kg dry	35.22			x	x	C2FL	19	220	152	102	0	0	0	93.9	466	236	597	1330	6.22	418	358	1580	17.6	197	240	1110	49.2	5860	1840	346
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Fluorenes	ug/Kg dry	38.01			x	x	C3FL	20	225	126	83.5	0	0	0	107	432	257	489	1360	6.98	549	383	1620	14.4	298	252	958	48.4	2680	1280	441
132-65-0	8270D (SIM) Semi-Volatile Organic Compou0s	Dibenzothiophene	ug/Kg dry	34.23				x	DBT	21	816	464	15	0	0	0	1010	21.9	3050	758	1350	0	5830	216	3040	0	1570	852	2660	82.9	1760	4360	310
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Dibenzothiophenes	ug/Kg dry	36.43				x	C1DBT	22	412	221	55.1	0	0	0	591	57.4	1390	474	1070	4.21	2620	263	4860	9.09	843	274	1550	39.8	3410	2410	433
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Dibenzothiophenes	ug/Kg dry	37.7				x	C2DBT	23	313	188	91.5	0	0	0	225	144	552	670	1470	5.26	954	439	3060	6.89	452	312	1340	33.3	3630	1690	532
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Dibenzothiophenes	ug/Kg dry	39.5				x	C3DBT	24	292	158	60.2	0	0	0	75	184	250	657	1280	4.39	318	425	1710	5.24	255	228	975	21.5	1750	872	392
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Dibenzothiophenes	ug/Kg dry	41.65				x	C4DBT	25	185	88.4	33.4	0	0	0	27.4	110	125	366	697	2.88	118	242	809	0	122	124	528	12.1	534	287	200
85-01-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Phenanthrene**	ug/Kg dry	34.72	L	x	x	x	PHE	26	4250	3480	160	28	3.42	2.72	9280	496	19100	1340	10400	12.2	43200	1330	32800	4.92	11200	5300	23900	1230	32500	62300	2650
120-12-7	8270D (SIM) Semi-Volatile Organic Compou0s	**Anthracene**	ug/Kg dry	34.91	L	x	x	x	ANT	27	1540	800	148	5.83	0	0	3450	431	5140	655	2840	5.04	10700	707	19400	6.17	3970	1250	7250	374	12300	18000	1240
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Phenanthrenes/Anthracenes	ug/Kg dry	36.96				x	C1PH	28	1450	760	531	22.1	3.73	0	2230	1900	4700	1090	3980	8.59	9920	1140	20400	38.2	3620	1520	7640	449	30800	19400	2450
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Phenanthrenes/Anthracenes	ug/Kg dry	38.97				x	C2PH	29	627	308	476	35.7	0	0	440	2060	1020	862	3470	7.12	1780	956	6430	14.2	1120	923	3360	222	17300	8370	1520
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Phenanthrenes/Anthracenes	ug/Kg dry	40.8				x	C3PH	30	280	168	214	88.2	19.6	0	101	1180	273	503	2100	4.97	373	505	2410	8.19	388	427	1440	93.6	5310	2960	671
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Phenanthrenes/Anthracenes	ug/Kg dry	41.72				x	C4PH	31	158	170	110	231	53.2	0	47	549	125	234	943	0	170	217	1050	21.2	182	162	607	50.9	1520	1080	262
483-65-8	8270D (SIM) Semi-Volatile Organic Compou0s	Retene	ug/Kg dry	41.72				x	RET	32	159	614	66	1080	269	35.8	25.2	78.8	142	127	125	11.2	104	69.5	150	26.4	99.6	19.3	121	46.4	778	202	76.9
239-35-0	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)naphtho(2,1-d)thiophene	ug/Kg dry	44.24					BNT	33	554	110	104	0	0	0	857	102	1590	254	574	0	3370	245	9090	0	1570	252	1570	63.8	1690	3640	339
	8270D (SIM) Semi-Volatile Organic Compou0s	C0-Benzonaphthothiophenes	ug/Kg dry	44.24					C0BNT	34	1000	205	208	12	0	0	1690	186	3150	458	1070	0	6610	477	17700	12.5	3080	485	2740	127	2970	7230	614
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzonaphthothiophenes	ug/Kg dry	45.63					C1BNT	35	393	106	152	5.75	0	0	386	302	901	293	813	0	1630	350	4050	6.17	826	285	1630	78.6	2340	2490	473
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzonaphthothiophenes	ug/Kg dry	47.14					C2BNT	36	389	117	85.1	0	0	0	117	261	471	287	815	0	524	323	1490	19.9	407	271	1230	53.1	1130	1170	349
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzonaphthothiophenes	ug/Kg dry	49.02					C3BNT	37	401	116	45	0	0	0	126	193	478	239	623	0	536	241	1590	9	406	212	790	28.2	544	612	244
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzonaphthothiophenes	ug/Kg dry	51.51					C4BNT	38	200	63.8	14.5	0	0	0	33.2	59	202	122	305	0	150	112	378	6.07	154	115	299	9.59	110	167	97.8
206-44-0	8270D (SIM) Semi-Volatile Organic Compou0s	**Fluoranthene**	ug/Kg dry	39.51	H	x	x	x	FLA	39	8460	2440	1060	27.5	2.9	0	12200	1850	21000	3480	7800	9.48	44200	2690	105000	25.2	18700	3930	23600	1330	23200	61500	4330
129-00-0	8270D (SIM) Semi-Volatile Organic Compou0s	**Pyrene**	ug/Kg dry	40.39	H	x	x	x	PYR	40	9340	2720	1420	38.1	3.47	0	17400	4090	29100	3990	10100	12.5	63700	3180	158000	27	25400	4050	24200	1290	35700	52200	4790
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Fluoranthenes/Pyrenes	ug/Kg dry	41.78				x	C1PY	41	2340	651	1060	27.3	0	0	3820	5020	7220	1390	4440	13	15700	1480	45100	24.5	7240	1750	8960	550	26300	21300	2550
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Fluoranthenes/Pyrenes	ug/Kg dry	43.52				x	C2PY	42	713	162	462	9.87	0	0	476	2670	1100	491	1940	9.87	2000	621	5890	132	1330	814	2710	239	8510	6570	1160
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Fluoranthenes/Pyrenes	ug/Kg dry	45.72				x	C3PY	43	294	71.4	206	0	0	0	103	1100	285	243	1120	6.81	397	320	1670	30.5	493	398	1190	132	2470	3280	490
243-17-4	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)fluorene	ug/Kg dry	42.03				x	BbF	44	286	57.2	123	0	0	0	472	288	940	201	494	0	1840	188	6520	0	947	231	1550	60	2880	3950	276
205-12-9	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(c)fluorene	ug/Kg dry	42.07				x	BcF	45	169	75.9	50.4	0	0	0	250	183	386	96.1	254	0	1060	92	2320	0	404	93.4	596	50.3	1140	1510	137
3442-78-2	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylpyrene	ug/Kg dry	42.18				x	2MP	46	300	80.2	159	0	0	0	527	841	999	175	621	0	2100	201	6000	0	983	238	1060	70.8	3240	2410	359
3353-12-6	8270D (SIM) Semi-Volatile Organic Compou0s	4-Methylpyrene	ug/Kg dry	42.55				x	4MP	47	257	70.5	138	0	0	0	452	1030	875	165	594	0	1930	179	4980	0	838	204	797	56.8	3070	1680	337
2381-21-7	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylpyrene	ug/Kg dry	42.67				x	1MP	48	261	68.4	114	0	0	0	549	746	1050	148	522	0	2230	148	6230	0	952	172	725	47.3	3190	1450	293
56-55-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Benz(a)anthracene**	ug/Kg dry	45.17	H	x	x	x	BaA	49	3140	623	872	11.6	0	0	4760	2560	9220	1320	3020	3.95	19900	1400	47000	6.38	9190	1740	10200	662	16700	24500	2320
	8270D (SIM) Semi-Volatile Organic Compou0s	**Chrysene/triphenylene**	ug/Kg dry	45.36	H	x	x	x	CH	50	3070	628	868	11.1	0	0	3810	2780	7140	1340	3550	4.66	14600	1450	45200	6.32	8220	1770	9650	621	16200	23200	2320
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	46.81				x	C1CR	51	854	204	649	10.1	0	0	859	3390	1830	573	2020	4.33	3630	847	9960	9.71	2180	862	4290	372	10300	9310	1420
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	48.52				x	C2CR	52	392	108	353	0	0	0	231	1900	587	276	1190	0	923	500	2730	6.45	778	503	2220	223	4410	4150	761
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	49.55				x	C3CR	53	250	65	165	0	0	0	83.7	797	244	140	673	0	226	272	840	0	272	272	1040	123	1370	2030	331
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	50				x	C4CR	54	27.3	0	66.6	0	0	0	93	293	214	96.1	380	0	321	154	1090	0	195	135	646	49.5	437	1050	155
205-99-2	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(b)fluoranthene**	ug/Kg dry	49.23	H	x	x	x	BbF	55	2050	321	534	10.4	0	0	2500	1780	5130	904	1950	2.55	11400	979	29200	0	6240	1300	7350	442	6150	16700	1480
	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(j/k)fluoranthene**	ug/Kg dry	49.29	H	x	x	x	BjF	56	2400	460	601	8.94	0	0	3220	1630	6170	949	2210	0	12300	1070	35600	0	7420	1440	7240	469	6790	17900	1630
192-97-2	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(e)pyrene	ug/Kg dry	50.17			x	x	BeP	57	1970	353	573	8.93	0	0	2750	2830	5390	868	2040	0	11400	966	32300	0	6670	1160	5830	371	6410	14000	1360
50-32-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(a)pyrene**	ug/Kg dry	50.34	H	x	x	x	BaP	58	3030	542	788	13.2	0	0	5100	3100	9750	1260	2980	3.7	21500	1330	77200	0	11700	1720	9110	587	12000	23100	2050
198-55-0	8270D (SIM) Semi-Volatile Organic Compou0s	Perylene	ug/Kg dry	50.61			x	x	PE	59	667	192	218	348	490	308	830	506	1670	275	632	200	3390	321	9850	654	2100	456	2140	158	1880	5840	1340
193-39-5	8270D (SIM) Semi-Volatile Organic Compou0s	**Indeno(1,2,3-cd)pyrene**	ug/Kg dry	54	H	x	x	x	I123P	60	1480	257	341	6.75	0	0	2070	1140	3980	616	1600	0	8740	669	30200	0	5660	1080	4560	244	4200	13000	992
53-70-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Dibenzo(a,h)anthracene**	ug/Kg dry	54.01	H	x	x	x	DBA	61	389	68.8	115	0	0	0	491	477	946	170	349	0	2070	221	5570	0	1020	245	1490	75.6	1410	3140	325
191-24-2	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(g,h,i)perylene**	ug/Kg dry	54.91	H	x	x	x	BGP	62	1850	314	455	7.58	0	0	2600	1960	5010	748	1690	0	10800	804	33000	0	6060	1010	4950	287	5220	11600	1140
191-07-1	8270D (SIM) Semi-Volatile Organic Compou0s	Coronene	ug/Kg dry	61.34				x	COR	63	533	86.5	111	0	0	4.94	849	391	1550	233	468	0	3470	229	11200	0	1760	262	1250	64	1430	2770	301
526-73-8	8270D (SIM) Semi-Volatile Organic Compou0s	1,2,3-Trimethylbenzene	ug/Kg dry							64	20.6	17.8	4.09	7.13	5.65	4.94	3.13	5.98	21.5	153	75	5.08	17.2	23.1	81.5	8.98	35.8	14	15.5	5.09	18.1	34.7	12
95-63-6	8270D (SIM) Semi-Volatile Organic Compou0s	1,2,4-Trimethylbenzene	ug/Kg dry							65	32.6	34.6	8.88	4.45	5.65	4.94	5.24	16.4	32	988	490	5.08	40.4	55.6	260	6.51	42.9	70.1	46.3	24.2	63.7	95	23.8
108-67-8	8270D (SIM) Semi-Volatile Organic Compou0s	1,3,5-Trimethylbenzene	ug/Kg dry							66	39.7	20.1	5	7.13	5.65	4.94	6.08	25.8	32.3	584	135	5.08	38.8	34.3	64.2	8.98	35.8	15	51.5	28.5	165	43.5	70.8
	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methyldibenzothiophene	ug/Kg dry	36.76						67	49.7	29.6	5.82	7.13	5.65	4.94	60.6	4.29	154	65.1	133	5.08	286	32.8	480	8.98	91.5	35.9	194	5.93	302	207	54.7
	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylphenanthrene	ug/Kg dry	37.24						68	271	137	52	7.34	5.65	4.94	336	96	757	227	584	5.08	1570	91.6	2970	8.98	592	249	1210	64.8	5050	2900	245
	8270D (SIM) Semi-Volatile Organic Compou0s	2,3,5-Trimethylnaphthene	ug/Kg dry	30.44						69	19.1	22.8	7.37	7.13	5.65	4.94	7.36	13.9	28.1	42.6	329	5.08	41.1	33.4	162	8.98	35.8	40.1	169	12.3	403	241	44.7
581-42-0	8270D (SIM) Semi-Volatile Organic Compou0s	2,6-Dimethylnaphthalene	ug/Kg dry	27.07						70	56.8	16.6	12.8	4.81	5.65	4.94	35.9	44.8	179	336	226	5.08	246	68	272	4.82	113	25.6	188	35.8	1280	761	80.7
	8270D (SIM) Semi-Volatile Organic Compou0s	2/3-Methyldibenzothiophene	ug/Kg dry	36.31						71	158	60	19.2	7.13	5.65	4.94	213	16.5	511	157	385	5.08	967	101	1810	8.98	296	92.7	544	9.48	1170	798	156
	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylanthracene	ug/Kg dry	36.96						72	144	50.1	73.5	7.13	5.65	4.94	245	240	477	101	378	5.08	1070	106	2690	8.98	434	178	898	61.3	4300	3090	297
	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylphenanthrene	ug/Kg dry	36.81						73	311	198	111	4.95	5.65	4.94	605	423	1210	228	1070	5.08	2640	320	5610	8.98	938	401	2090	130	7520	5150	624
	8270D (SIM) Semi-Volatile Organic Compou0s	3-Methylphenanthrene	ug/Kg dry	36.69						74	384	189	122	7.13	5.65	4.94	526	442	1140	294	906	5.08	2410	296	4560	12.6	853	344	1720	96.9	6320	4100	582
	8270D (SIM) Semi-Volatile Organic Compou0s	4/9-Methylphenanthrene	ug/Kg dry	37.14						75	301	157	160	4.52	5.65	4.94	470	678	981	238	990	5.08	2020	287	4480	13.1	801	347	1580	85.2	7440	4010	628
	8270D (SIM) Semi-Volatile Organic Compou0s	4-Methyldibenzothiophene	ug/Kg dry	36.01						76	140	80.3	15.5	7.13	5.65	4.94	209	22.8	475	209	436	5.08	909	89.1	1800	8.98	308	101	556	12.5	1500	542	152
71-43-2	8270D (SIM) Semi-Volatile Organic Compou0s	Benzene	ug/Kg dry							77	27.3	5.61	3.71	8.21	5.65	4.94	7.61	6.05	23.9	148	203	4.28	23.5	22.5	132	18.3	113	24.5	10.4	4.09	41.9	70.1	156

Attachment B. Complete Sediment Data Set
Amesbury Former MGP
Amesbury, Massachusetts

												Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	River	River	River	Mudflat	River
											Sample No.	F190041-04	F190041-05	F190041-06	F190041-07	F190041-08	F190041-09	F190041-10	F190041-11	F190041-12	F190040-01	F190046-01	F190046-02	F190040-02	F190040-03	F190046-03	F190046-04	F190048-01	F190048-02	F190040-04	F190040-05	F190040-06	F190048-03	F190040-07
											Sample Date:	09/10/2019	09/10/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/23/2019	09/23/2019	09/10/2019	09/10/2019	09/23/2019	09/23/2019	09/24/2019	09/24/2019	09/12/2019	09/12/2019	09/12/2019	09/24/2019	09/11/2019
											Sample Time:	14:15	14:18	15:10	15:15	15:18	15:22	17:05	17:08	16:10	16:13	10:32	10:36	10:50	10:53	11:28	11:31	10:01	10:09	15:37	15:44	15:23	12:06	09:45
											ClieSam	SS665-S1	SS665-S2	SS666-S2	SS666-S3	SS666-S4	SS666-S5	SS667-S1	SS667-S2	SS668-S1	SS668-S2	SS669-S1	SS669-S3	SS670-S1	SS670-S2	SS671-S1	SS671-S2	SS672-S1	SS672-S3	SS673-S2	SS673-S3	SS674-S4	SS675-S2	SS676-S2
											Depths:	0 to 0.5	0.9 to 1.1	0.9 to 1.1	1.9 to 2.1	2.9 to 3.1	3.9 to 4	0 to 0.5	0.9 to 1.1	0 to 0.5	0.9 to 1.1	1.5 to 2.2	4.6 to 4.7	0 to 0.5	0.9 to 1.1	1.3 to 1.5	1.9 to 2.1	0 to 0.5	1.9 to 2.1	2.4 to 2.6	3.7 to 3.8	2.9 to 3.1	1.9 to 2.1	1.9 to 2.1
											RAH																							
											%solids	73	70	76	52	68	77	76	75	51	85	84	79	55	72	66	44	43	92	80	78	77	80	55
CAS Number	Method Name	Analyte	Units	RT		PAH17	PAH34	PAH51	Abbrev	PAH #																								
11095-43-5	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)thiophene	ug/Kg dry							78	**20.2**	5.61	4.28	7.13	5.65	4.94	**13.6**	**3.19**	**54.5**	**78.1**	**58.6**	5.08	**88.9**	**9.96**	**183**	8.98	**60.3**	**8.19**	**66**	**15.4**	**38.2**	**101**	**9.02**
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzene	ug/Kg dry							79	**52.9**	**74.1**	**61**	**118**	**19**	4.94	**26.1**	**97.8**	**133**	**400**	**247**	**15**	**103**	**189**	**659**	**59.5**	**259**	**28.6**	**129**	**107**	**148**	**130**	**137**
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Decalins	ug/Kg dry							80	**113**	**63.1**	4.28	7.13	5.65	4.94	**7.94**	**26.1**	**143**	**390**	**2810**	5.08	23.1	**2870**	**4670**	8.98	**81.5**	**811**	**515**	4.09	**141**	**30.3**	**373**
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzenes	ug/Kg dry							81	**89.4**	**30**	**32**	**26**	**8.38**	4.94	**24.7**	**43.7**	**211**	**1340**	**305**	**15.3**	**97.6**	**115**	**481**	**60.6**	**308**	**56.9**	**43.5**	**13**	**280**	**101**	**189**
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Decalins	ug/Kg dry							82	**102**	**37.8**	4.28	7.13	5.65	4.94	**10**	**47.7**	32.3	**262**	**2470**	5.08	23.1	**833**	**1790**	8.98	**85.1**	**364**	**715**	4.09	**387**	**46.2**	**210**
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzenes	ug/Kg dry							83	**16.1**	**33.7**	**3.66**	7.13	5.65	4.94	**5.19**	**21.9**	**21.4**	**1120**	**522**	**6.63**	**18**	**69.9**	**391**	**15.4**	**89.4**	**83.7**	**33.8**	**21.7**	**124**	**145**	**46.9**
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Decalins	ug/Kg dry							84	27.3	5.61	4.28	7.13	5.65	4.94	4.13	**45.1**	32.3	**191**	**1910**	5.08	23.1	**325**	**911**	8.98	**92.7**	**193**	**615**	4.09	**466**	**45.1**	**155**
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzenes	ug/Kg dry							85	27.3	**78.5**	4.28	**34.9**	**3.09**	4.94	**3.29**	**9.75**	32.3	**393**	**849**	**8.3**	**18.4**	**78**	**523**	**21.2**	**79.2**	**65.1**	**44.8**	**31.1**	**163**	**191**	**62.9**
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Decalins	ug/Kg dry							86	27.3	5.61	4.28	7.13	5.65	4.94	4.13	**74.9**	32.3	**346**	**2310**	5.08	23.1	**521**	**1440**	8.98	**132**	**240**	**766**	4.09	**870**	**84.3**	**274**
	8270D (SIM) Semi-Volatile Organic Compou0s	C5-Benzenes	ug/Kg dry							87	27.3	**54.7**	4.28	7.13	5.65	4.94	4.13	**3.56**	32.3	**182**	**871**	5.08	23.1	**57.5**	**465**	**17.9**	**53.5**	**54.8**	**68.5**	**11.9**	**153**	**121**	**48.2**
86-74-8	8270D (SIM) Semi-Volatile Organic Compou0s	Carbazole	ug/Kg dry	35.61						88	**237**	**13.7**	**5.09**	7.13	5.65	4.94	**25.6**	**13.5**	**108**	**98.6**	**95.1**	5.08	**182**	**44.8**	**276**	8.98	**169**	**69.9**	**278**	**112**	4.49	**7800**	**180**
493-01-6	8270D (SIM) Semi-Volatile Organic Compou0s	cis-Decalin	ug/Kg dry							89	27.3	**3.97**	4.28	7.13	5.65	4.94	4.13	4.31	32.3	**50.5**	**228**	5.08	23.1	**263**	**416**	8.98	35.8	**56.7**	**22**	4.09	4.49	21.9	**19.8**
100-41-4	8270D (SIM) Semi-Volatile Organic Compou0s	Ethylbenzene	ug/Kg dry							90	**15.4**	**9.35**	**3.37**	**3.81**	5.65	4.94	**6.07**	**14**	**32.9**	**2240**	**59.8**	5.08	**43.7**	**22.1**	**122**	8.98	**42.1**	**18.3**	**23.8**	**2.91**	**308**	**35**	**32.5**
98-82-8	8270D (SIM) Semi-Volatile Organic Compou0s	Isopropylbenzene	ug/Kg dry							91	27.3	5.61	4.28	7.13	5.65	4.94	4.13	4.31	32.3	**59.1**	**15.2**	5.08	23.1	**2.53**	25.5	8.98	35.8	4.16	17.6	4.09	**11**	**12**	**36.1**
	8270D (SIM) Semi-Volatile Organic Compou0s	m,p-Xylene	ug/Kg dry							92	**222**	**67.9**	**71**	**68.5**	**34.3**	**12**	**61.4**	**74.6**	**493**	**2130**	**468**	**21.2**	**211**	**215**	**693**	**93.6**	**510**	**79.5**	**115**	**29.5**	**316**	**119**	**375**
108-87-2	8270D (SIM) Semi-Volatile Organic Compou0s	Methylcyclohexane	ug/Kg dry							93	**69.8**	5.61	4.28	7.13	5.65	4.94	4.13	4.31	32.3	**1720**	**22.6**	5.08	23.1	**5.65**	**24.2**	8.98	35.8	**2.29**	**21**	**24.5**	**10.1**	**30.2**	**9.32**
104-51-8	8270D (SIM) Semi-Volatile Organic Compou0s	n-Butylbenzene	ug/Kg dry							94	27.3	5.61	4.28	7.13	5.65	4.94	4.13	4.31	32.3	**136**	**202**	5.08	**19**	4.72	**172**	**4.62**	**28.3**	**21.2**	17.6	4.09	**30.5**	21.9	**34.6**
103-65-1	8270D (SIM) Semi-Volatile Organic Compou0s	n-Propylbenzene	ug/Kg dry							95	27.3	**9.19**	4.28	7.13	5.65	4.94	4.13	**5.38**	32.3	**138**	**115**	5.08	23.1	**31**	**71.4**	8.98	**18.9**	**15.8**	17.6	4.09	**12.5**	**11.5**	**23.4**
95-47-6	8270D (SIM) Semi-Volatile Organic Compou0s	o-Xylene	ug/Kg dry							96	27.3	**15.2**	**8.85**	**5.38**	5.65	4.94	**4.58**	**10.4**	32.3	**451**	**57**	5.08	23.1	**24.5**	**93.7**	**5.48**	**29.2**	**12.4**	**21.2**	**5.21**	**41.3**	**44.4**	**18.7**
99-87-6	8270D (SIM) Semi-Volatile Organic Compou0s	p-Isopropyltoluene	ug/Kg dry							97	**15.2**	**21**	**6.52**	**82.4**	**12.2**	**4.16**	**3.03**	**9.55**	**19.4**	**104**	**24.5**	**4.03**	23.1	**14.2**	**42.5**	**15.2**	35.8	**4**	**10.1**	4.09	**9.41**	**11.4**	**16**
135-98-8	8270D (SIM) Semi-Volatile Organic Compou0s	sec-Butylbenzene	ug/Kg dry							98	27.3	5.61	4.28	7.13	5.65	4.94	4.13	4.31	32.3	**37.2**	**38.8**	5.08	23.1	**3.28**	**16.5**	8.98	35.8	**3.96**	17.6	4.09	**9.03**	21.9	**4.94**
100-42-5	8270D (SIM) Semi-Volatile Organic Compou0s	Styrene	ug/Kg dry							99	27.3	5.61	**8.01**	**18.3**	5.65	4.94	**19.9**	**167**	32.3	**99.9**	**60**	**5.61**	23.1	**96.2**	**357**	**9.46**	**72.9**	**28.3**	**97.4**	4.09	**138**	**15.5**	**114**
98-06-6	8270D (SIM) Semi-Volatile Organic Compou0s	t-Butylbenzene	ug/Kg dry							100	27.3	5.61	4.28	7.13	5.65	4.94	4.13	4.31	32.3	4.51	4	5.08	23.1	4.72	25.5	8.98	35.8	4.16	17.6	4.09	4.49	21.9	6.72
108-88-3	8270D (SIM) Semi-Volatile Organic Compou0s	Toluene	ug/Kg dry							101	**152**	**139**	**107**	**203**	**47.1**	**16.9**	**56**	**171**	**288**	**638**	**354**	**22.2**	**218**	**314**	**972**	**89**	**388**	**42.5**	**249**	**185**	**250**	**193**	**230**
493-02-7	8270D (SIM) Semi-Volatile Organic Compou0s	trans-Decalin	ug/Kg dry							102	**118**	**64.7**	4.28	7.13	5.65	4.94	4.13	**6.57**	**100**	**338**	**1550**	5.08	23.1	**2110**	**3400**	**5.19**	**46.9**	**435**	**77.2**	4.09	**36.4**	**14.7**	**202**
3891-98-3	Saturated Hydrocarbons by GC/FID	2,6,10-trimethyldodecane (1380)	mg/Kg dry							103	**98**	**67.5**	**18**	**22.8**	**4.1**	4.94	**15.6**	**97.3**	**53.1**	**469**	**4820**	**4.43**	**69.2**	**712**	**1940**	**10.8**	**77.4**	**366**	**1880**	**12.5**	**289**	**54.8**	**259**
3892-00-0	Saturated Hydrocarbons by GC/FID	2,6,10-trimethylpeadecane (1650)	mg/Kg dry							104	**237**	**229**	**23.2**	**7.19**	5.65	4.94	**22.2**	**363**	**72.4**	**1580**	**4360**	**13.4**	**94.3**	**674**	**2270**	**26.6**	**108**	**298**	**2440**	**19.5**	**938**	**128**	**428**
3891-99-4	Saturated Hydrocarbons by GC/FID	2,6,10-trimethyltridecane (1470)	mg/Kg dry							105	**233**	**169**	**52.4**	**24.1**	**4.87**	4.94	**40.1**	**255**	**177**	**947**	**5470**	**9.84**	**152**	**988**	**2820**	**32.9**	**183**	**428**	**2270**	**27.4**	**545**	**104**	**424**
	Classical Chemistry	Black Carbon (Average)	mg/kg							106																								
	Saturated Hydrocarbons by GC/FID	C-10	mg/Kg dry							107																								
	Saturated Hydrocarbons by GC/FID	C-11	mg/Kg dry							108																								
	Saturated Hydrocarbons by GC/FID	C-12	mg/Kg dry							109																								
	Saturated Hydrocarbons by GC/FID	C-13	mg/Kg dry							110																								
	Saturated Hydrocarbons by GC/FID	C-14	mg/Kg dry							111																								
	Saturated Hydrocarbons by GC/FID	C-15	mg/Kg dry							112																								
	Saturated Hydrocarbons by GC/FID	C-16	mg/Kg dry							113																								
	Saturated Hydrocarbons by GC/FID	C-17	mg/Kg dry							114	**220**	**90.4**	**131**	**127**	**36.7**	**29.7**	**97.1**	**244**	**321**	**229**	4	**50.9**	**296**	4.72	**399**	**134**	**322**	**70.4**	**194**	**45.9**	4.49	**109**	**215**
	Saturated Hydrocarbons by GC/FID	C-18	mg/Kg dry							115	**180**	**95**	**131**	**69.6**	**35.1**	**30.6**	**58.5**	**195**	**210**	**241**	4	**37.8**	**181**	4.72	**316**	**78.9**	**110**	**65.8**	**199**	**31.1**	4.49	**103**	**177**
	Saturated Hydrocarbons by GC/FID	C-19	mg/Kg dry							116																								
	Saturated Hydrocarbons by GC/FID	C-21	mg/Kg dry							117																								
	Saturated Hydrocarbons by GC/FID	C-22	mg/Kg dry							118																								
	Saturated Hydrocarbons by GC/FID	C-23	mg/Kg dry							119																								
	Saturated Hydrocarbons by GC/FID	C-24	mg/Kg dry							120																								
	Saturated Hydrocarbons by GC/FID	C-25	mg/Kg dry							121																								
	Saturated Hydrocarbons by GC/FID	C-26	mg/Kg dry							122																								
	Saturated Hydrocarbons by GC/FID	C-27	mg/Kg dry							123																								
	Saturated Hydrocarbons by GC/FID	C-28	mg/Kg dry							124																								
	Saturated Hydrocarbons by GC/FID	C-29	mg/Kg dry							125																								
	Saturated Hydrocarbons by GC/FID	C-30	mg/Kg dry							126																								
	Saturated Hydrocarbons by GC/FID	C-31	mg/Kg dry							127																								
	Saturated Hydrocarbons by GC/FID	C-32	mg/Kg dry							128																								
	Saturated Hydrocarbons by GC/FID	C-33	mg/Kg dry							129																								
	Saturated Hydrocarbons by GC/FID	C-34	mg/Kg dry							130																								
	Saturated Hydrocarbons by GC/FID	C-35	mg/Kg dry							131																								
	Saturated Hydrocarbons by GC/FID	C-36	mg/Kg dry							132																								
	Saturated Hydrocarbons by GC/FID	C-37	mg/Kg dry							133																								
	Saturated Hydrocarbons by GC/FID	C-38	mg/Kg dry							134																								
	Saturated Hydrocarbons by GC/FID	C-39	mg/Kg dry							135																								
	Saturated Hydrocarbons by GC/FID	C-40	mg/Kg dry							136																								
	Saturated Hydrocarbons by GC/FID	C-8	mg/Kg dry							137																								
	Saturated Hydrocarbons by GC/FID	C-9	mg/Kg dry							138																								
638-36-8	Saturated Hydrocarbons by GC/FID	Phytane	mg/Kg dry	34.53						141	**770**	**601**	**74.9**	**58.3**	**22.7**	**17.3**	**75.3**	**677**	**199**	**4190**	**6630**	**37.4**	**231**	**1630**	**4610**	**76.1**	**315**	**548**	**4670**	**49**	**2120**	**192**	**1050**
1921-70-6	Saturated Hydrocarbons by GC/FID	Pristane	mg/Kg dry	32.65						142	**779**	**796**	**61.8**	**27.6**	**11.3**	**7.95**	**60.1**	**833**	**179**	**5730**	**9330**	**28.4**	**227**	**1860**	**5790**	**57**	**278**	**630**	**5420**	**60.9**	**2160**	**232**	**1120**
TOC	Classical Chemistry	Total Organic Carbon (Average)	mg/kg							145	**21000**	**25700**	**25600**	**44600**	**23900**	**15500**	**21000**	**14500**	**45300**	**32200**	**30900**	**13300**	**62000**	**34700**	**36900**	**20800**	**68500**	**9360**	**38900**	**86500**	**26300**	**41100**	**43400**
	TPAH16										43205	13793.9	7538.26	187.3	9.79	2.72	69543	23169.7	133982	22737	54167	74.85	284173	16886	632730	107.64	121971	27870	141425	8682.4	189371	346041	26752
	TPAH34										53858.2	18019	12436.46	990.28	583.79	310.72	81868.2	45595.7	160086	33755.1	89317	354.6	337057	26507.9	775927	1012.12	148653	38052.6	188073	12060.8	325381	451811	42376
	TPAH51										59077.6	20524.2	14174.17	2080.15	852.79	351.46	87632.2	53682.6	173462	40064.2	102095	399.22	363311	30315.2	835467	1222.24	160157.6	42393.9	206017	13254.6	364851	492892	48047.2
	LPAH										8082.4	5447.5	509.66	52.13	3.42	2.72	15453.9	1960.7	36764	8921	19332	38.01	75403	3177.8	67432	42.74	22547	9626.3	39360	2732	62368	100501	5515
	HPAH										35209	8373.8	7054	135.17	6.37	0	54151	21367	97446	14777	35249	36.84	209210	13793	565970	64.9	99610	18285	102350	6007.6	127570	246840	21377

(does not include source area samples collected in 2017)

Attachment B. Complete Sediment Data Set
Amesbury Former MGP
Amesbury, Massachusetts

											River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	Mudflat	Mudflat
										Sample No.	F190040-08	F190040-09	F190040-10	F190040-11	F190040-12	F190039-01	F190039-02	F190039-03	F190039-04	F190048-09	F190039-05	F190039-06	F190039-07	F190039-08	F190039-09	F190039-10	F190039-11	F190039-12	F190039-13	F190039-14	F190039-15	F190039-16	F190039-17
										Sample Date:	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/25/2019	09/11/2019	09/11/2019	09/11/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019
										Sample Time:	10:40	10:43	11:50	11:55	11:15	13:23	14:35	14:49	14:53	16:11	17:20	17:33	17:37	11:45	11:54	11:58	13:05	13:15	13:55	14:04	14:09	14:45	14:56
										ClieSam	SS677-S2	SS677-S3	SS677-S4A	SS677-S5A	SS678-S1	SS-678-S4	SS-679-S1	SS-679-S4	SS-679-S5	SS680R-S1	SS-680-S1	SS-680-S4	SS-680-S5	SS-681-S1	SS-681-S3	SS-681-S4	SS-682-S2	SS-682-S3	SS-683-S2	SS-683-S4	SS-683-S5	SS-684-S2	SS-684-S4
										Depths:	0 to 1	1.4 to 1.6	2.6 to 2.8	3.9 to 4	0 to 0.5	4.4 to 4.6	0 to 0.5	2.9 to 3.1	3.9 to 4	5.1 to 5.3	0 to 0.5	2.9 to 3.1	4.4 to 4.5	0 to 0.5	1.9 to 2.1	3.1 to 3.2	2.4 to 2.6	3.9 to 4.1	0.9 to 1.1	2.9 to 3.1	3.9 to 4.1	1.2 to 1.3	3.3 to 3.4
										RAH																							
										%solids	82	50	77	82	56	62	78	66	56	72	78	68	73	81	71	63	71	55	75	62	24	98	81
CAS Number	Method Name	Analyte	Units	RT		PAH17	PAH34	PAH51	Abbrev	PAH #																							
		Max RL for ND PAHs=								1										4.98													
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzo(b)thiophenes	ug/Kg dry	17					C1BT	2	74.3	52.7	141	220	48	2150	6.73	966	22.6	0	7.48	626	24600	47.5	3570	387	277	7.71	176	6.92	17.1	20.6	215
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzo(b)thiophenes	ug/Kg dry	18					C2BT	3	191	136	400	396	122	10300	10.1	2020	34	3.55	13.9	682	21500	68.1	6160	617	943	23.1	713	15.1	41.5	53	527
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzo(b)thiophenes	ug/Kg dry	19					C3BT	4	168	52.3	228	400	79.9	8750	8.67	1210	18.9	2.9	11.5	355	9560	45.5	4680	272	914	34.6	881	13.3	47.7	81.1	327
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzo(b)thiophenes	ug/Kg dry	20					C4BT	5	68.9	22.6	78.6	199	37.5	2670	8.24	342	15.5	0	7.38	176	2160	27.7	1720	78.6	368	7.88	349	7.06	21.6	70.2	109
91-20-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Naphthalene**	ug/Kg dry	21.86	L	x	x	x	NA	6	815	153	4720	10300	531	10200	73.2	16700	436	10.5	78.9	1870	1990000	1650	29800	2990	5010	210	1420	138	388	63.2	2630
91-57-6	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylnaphthalene	ug/Kg dry	24.57	L	x		x	2MN	7	975	68.6	1100	2450	271	5370	45.8	9250	254	27.1	49.2	353	964000	641	9540	995	2350	246	600	135	402	46.2	1020
90-12-0	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylnaphthalene	ug/Kg dry	25				x	1MN	8	1230	144	3250	5170	230	80900	36.6	45600	263	26.9	37.1	8780	594000	457	101000	7650	11800	158	4120	93.2	298	28.6	6860
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Naphthalenes	ug/Kg dry	24.57			x	x	C1N	9	1340	127	2630	4600	303	52900	51.2	32900	314	33	53.1	5450	949000	661	66100	5160	8510	246	2820	139	426	45.7	4710
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Naphthalenes	ug/Kg dry	27.02			x	x	C2N	10	2630	810	7380	9590	735	182000	93.9	67800	517	57.4	103	5390	468000	658	82700	9850	28000	514	10400	300	930	495	13400
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Naphthalenes	ug/Kg dry	29.76			x	x	C3N	11	2170	463	1860	6820	381	95900	98.6	28500	366	30.7	112	2590	131000	569	30900	3730	17600	453	8080	286	829	1330	6970
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Naphthalenes	ug/Kg dry	32.52			x	x	C4N	12	841	271	515	2810	117	29000	85.3	7980	184	10.8	69.9	1400	33200	304	10500	991	6580	220	3440	170	423	966	2180
92-52-4	8270D (SIM) Semi-Volatile Organic Compou0s	Biphenyl	ug/Kg dry	26.46					BP	13	387	28.3	252	498	236	2730	17	3010	89.7	14.7	24.7	135	257000	189	3290	227	1260	83.6	358	47.7	144	109	500
208-96-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Acenaphthylene**	ug/Kg dry	28.16	L	x	x	x	ACE	14	762	123	694	2880	2220	18700	308	2780	397	11.5	257	2100	45400	526	23100	1030	6800	298	4110	161	569	235	1300
83-32-9	8270D (SIM) Semi-Volatile Organic Compou0s	**Acenaphthene**	ug/Kg dry	28.89	L	x	x	x	ACY	15	4720	6450	17300	19000	3670	309000	86	62500	512	128	141	15600	1430000	1410	266000	28900	42000	349	10800	165	538	233	14400
132-64-9	8270D (SIM) Semi-Volatile Organic Compou0s	Dibenzofuran	ug/Kg dry	29.54				x	DBF	16	3940	49.1	339	841	186	13300	54.1	3760	243	6.22	58.5	412	50100	1200	9720	851	1950	40.4	677	31.4	142	30.3	818
86-73-7	8270D (SIM) Semi-Volatile Organic Compou0s	**Fluorene**	ug/Kg dry	30.91	L	x	x	x	FLE	17	7280	554	9520	9160	2050	149000	114	32200	489	65.2	119	5390	497000	1410	113000	9550	26100	230	6990	148	570	174	7950
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Fluorenes	ug/Kg dry	33.14			x	x	C1FL	18	1990	250	1320	5670	494	69400	95	17100	301	27.2	97.5	1420	115000	447	28600	2790	14300	375	5270	185	614	275	4990
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Fluorenes	ug/Kg dry	35.22			x	x	C2FL	19	1210	231	411	4500	221	43400	109	11000	332	14.8	86.8	1180	57300	451	16400	1420	9150	326	3730	208	593	502	3110
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Fluorenes	ug/Kg dry	38.01			x	x	C3FL	20	1350	195	413	1780	338	16200	181	4410	322	6.1	151	1020	21200	708	8000	691	3900	188	1870	176	374	428	1410
132-65-0	8270D (SIM) Semi-Volatile Organic Compou0s	Dibenzothiophene	ug/Kg dry	34.23				x	DBT	21	3260	283	2260	3490	2380	51900	85.3	4930	207	22.8	98.8	1980	139000	743	33800	2620	8600	65.9	3200	46.7	206	119	1700
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Dibenzothiophenes	ug/Kg dry	36.43				x	C1DBT	22	1780	254	789	3730	1110	46000	176	5880	215	15.3	104	1510	66600	488	26800	1670	7510	115	4320	93.6	314	289	2150
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Dibenzothiophenes	ug/Kg dry	37.7				x	C2DBT	23	1160	239	541	2710	460	29800	249	4270	216	9.81	114	1660	34300	425	18100	966	5600	129	3590	103	313	423	1670
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Dibenzothiophenes	ug/Kg dry	39.5				x	C3DBT	24	609	168	407	1260	200	13300	147	2080	147	4.65	82.1	1330	13100	321	8400	422	2690	96	1770	74	202	373	788
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Dibenzothiophenes	ug/Kg dry	41.65				x	C4DBT	25	214	85.7	222	436	93.8	4550	62.5	683	91	4.98	50.3	693	4340	175	2800	151	905	50.8	656	39.3	89.7	196	264
85-01-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Phenanthrene**	ug/Kg dry	34.72	L	x	x	x	PHE	26	55700	2030	27200	66400	18300	669000	1010	99600	3100	467	1240	19300	1840000	11300	493000	34000	198000	1170	44200	855	3520	846	30700
120-12-7	8270D (SIM) Semi-Volatile Organic Compou0s	**Anthracene**	ug/Kg dry	34.91	L	x	x	x	ANT	27	20100	691	6530	42200	5380	201000	485	30700	1070	65	495	5540	595000	2940	191000	10100	78800	837	13300	357	1400	304	8540
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Phenanthrenes/Anthracenes	ug/Kg dry	36.96				x	C1PH	28	14600	1080	3620	35200	4200	313000	1290	63400	2030	142	740	7120	531000	4030	148000	11600	64200	2250	22700	1280	4000	1050	18500
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Phenanthrenes/Anthracenes	ug/Kg dry	38.97				x	C2PH	29	5460	612	1410	10900	1000	102000	991	24300	1270	39.8	389	3510	130000	1870	49400	3910	24300	1270	10300	1180	2230	886	8080
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Phenanthrenes/Anthracenes	ug/Kg dry	40.8				x	C3PH	30	1640	277	640	2660	274	28300	378	7140	619	8.8	172	1510	32300	691	13000	1110	6710	472	3980	557	909	488	2430
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Phenanthrenes/Anthracenes	ug/Kg dry	41.72				x	C4PH	31	511	128	428	721	130	7460	120	2020	296	2.49	66	1810	8810	264	4140	397	1990	263	2890	478	428	215	747
483-65-8	8270D (SIM) Semi-Volatile Organic Compou0s	Retene	ug/Kg dry	41.72				x	RET	32	77.8	58	1060	139	102	1030	32.1	918	256	0	39.7	345	1740	62.2	1300	150	642	473	13300	901	534	80.1	377
239-35-0	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)naphtho(2,1-d)thiophene	ug/Kg dry	44.24					BNT	33	2580	103	441	1650	1550	17100	321	1840	315	6.33	161	1240	28600	678	17100	903	4390	116	2280	83.7	288	139	744
	8270D (SIM) Semi-Volatile Organic Compou0s	C0-Benzonaphthothiophenes	ug/Kg dry	44.24					C0BNT	34	4670	195	821	3010	3000	30600	604	3260	647	11.5	300	2330	52500	1300	31700	1670	7970	249	4160	165	567	260	1330
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzonaphthothiophenes	ug/Kg dry	45.63					C1BNT	35	1810	153	537	1560	872	18800	406	2700	481	5.61	178	1410	24100	721	14600	902	4030	218	2780	150	458	224	1020
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzonaphthothiophenes	ug/Kg dry	47.14					C2BNT	36	847	120	423	664	438	8640	243	1470	333	2.8	138	884	9280	541	5760	446	1860	147	1440	99.7	275	218	560
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzonaphthothiophenes	ug/Kg dry	49.02					C3BNT	37	398	81.1	290	492	378	4360	152	714	200	0	109	619	6850	449	3820	270	1310	91.1	788	65.3	167	170	282
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzonaphthothiophenes	ug/Kg dry	51.51					C4BNT	38	149	33	120	115	122	938	76.5	158	57.9	0	56.5	212	1060	235	765	73.6	264	29.5	206	17.7	51.5	74.6	69.7
206-44-0	8270D (SIM) Semi-Volatile Organic Compou0s	**Fluoranthene**	ug/Kg dry	39.51	H	x	x	x	FLA	39	58500	1880	11000	45800	19800	295000	3490	33700	4660	223	2080	14400	730000	11400	319000	15500	131000	2570	34100	1640	4890	1520	14100
129-00-0	8270D (SIM) Semi-Volatile Organic Compou0s	**Pyrene**	ug/Kg dry	40.39	H	x	x	x	PYR	40	46300	2100	11500	67200	26800	421000	3900	49500	4740	319	2260	17700	1040000	10500	488000	22100	185000	4410	49800	2550	7860	1880	19800
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Fluoranthenes/Pyrenes	ug/Kg dry	41.78				x	C1PY	41	14000	875	3180	26500	6860	193000	2080	33300	3420	95.7	1040	9230	388000	4350	168000	9890	58100	3330	20800	1970	5620	958	11500
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Fluoranthenes/Pyrenes	ug/Kg dry	43.52				x	C2PY	42	5180	354	1100	5830	1320	51100	1300	11000	1540	18.2	602	2690	75900	2360	32600	2490	13200	1200	6240	817	2140	441	3680
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Fluoranthenes/Pyrenes	ug/Kg dry	45.72				x	C3PY	43	1970	152	477	1330	375	14500	565	3500	650	4.81	242	944	16800	965	7010	810	3600	404	1760	298	788	208	1120
243-17-4	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)fluorene	ug/Kg dry	42.03				x	BbF	44	2270	89.3	485	3090	853	22500	122	3820	416	10.9	99.9	1180	39000	444	20400	1200	7090	320	2500	177	543	97.5	1310
205-12-9	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(c)fluorene	ug/Kg dry	42.07				x	BcF	45	1080	62.1	197	1540	396	7510	65.6	1340	199	5.8	45.5	453	27400	205	8500	498	3130	187	941	107	325	55.9	554
3442-78-2	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylpyrene	ug/Kg dry	42.18				x	2MP	46	1750	120	397	3520	947	23900	370	4350	444	12.6	163	1250	50400	624	22400	1330	7300	481	2880	297	792	139	1570
3353-12-6	8270D (SIM) Semi-Volatile Organic Compou0s	4-Methylpyrene	ug/Kg dry	42.55				x	4MP	47	1090	113	331	3120	823	22100	317	3930	417	10.5	144	1120	45300	499	19800	1160	6820	490	2670	321	809	138	1410
2381-21-7	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylpyrene	ug/Kg dry	42.67				x	1MP	48	907	92	301	3560	953	26200	266	4230	323	12.3	121	1110	49500	418	22200	1230	7440	413	2830	245	665	108	1320
56-55-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Benz(a)anthracene**	ug/Kg dry	45.17	H	x	x	x	BaA	49	21000	659	2930	23500	9330	132000	2660	17600	3130	75.9	1250	9020	308000	5650	162000	7300	42700	2240	19800	1330	4040	776	5970
	8270D (SIM) Semi-Volatile Organic Compou0s	**Chrysene/triphenylene**	ug/Kg dry	45.36	H	x	x	x	CH	50	17300	718	2790	20500	7550	125000	2430	16300	3010	63.3	1210	8980	293000	5200	152000	6500	40000	1990	13800	1280	3660	897	5980
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	46.81				x	C1CR	51	6480	406	1350	7550	2190	62700	1490	12800	2120	25.1	612	3900	100000	2440	48400	3610	17400	1690	8170	1150	3010	500	4510
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	48.52				x	C2CR	52	2770	224	734	2440	824	24800	682	6010	1200	7.76	303	1530	33700	1240	14500	1500	6200	883	3290	642	1580	310	2000
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	49.55				x	C3CR	53	1270	111	378	675	291	7280	279	1990	628	0	141	601	8770	635	3750	614	1900	378	1070	283	671	172	718
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	50				x	C4CR	54	598	41.4	206	270	243	2650	159	671	319	0	89.4	324	3760	453	2100	341	794	164	507	99.9	256	87.2	282
205-99-2	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(b)fluoranthene**	ug/Kg dry	49.23	H	x	x	x	BbF	55	11500	453	2190	9860	5960	49500	1790	7160	2300	33.9	953	6010	120000	4110	67500	3580	21900	1190	8270	738	2290	670	2670
	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(j/k)fluoranthene**	ug/Kg dry	49.29	H	x	x	x	BjF	56	12300	453	2140	11900	6630	70500	1790	7140	2270	50.4	950	6620	171000	3800	98400	4340	23800	1340	8060	843	2570	668	3080
192-97-2	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(e)pyrene	ug/Kg dry	50.17			x	x	BeP	57	8410	402	1740	10700	6100	61100	1560	7100	2120	42.3	855	5970	148000	3250	86600	3800	21500	1630	7660	984	2730	645	2720
50-32-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(a)pyrene**	ug/Kg dry	50.34	H	x	x	x	BaP	58	14600	550	2720	20500	10700	106000	2420	11900	3110	74.5	1210	10100	278000	4950	154000	6400	39000	2430	19400	1370	4140	838	4290
198-55-0	8270D (SIM) Semi-Volatile Organic Compou0s	Perylene	ug/Kg dry	50.61			x	x	PE	59	3600	1260	618	2620	1790	16900	550	2360	942	18.5	290	1840	41400	1170	20600	1390	6630	690	2200	449	1480	301	958
193-39-5	8270D (SIM) Semi-Volatile Organic Compou0s	**Indeno(1,2,3-cd)pyrene**	ug/Kg dry	54	H	x	x	x	I123P	60	6750	255	1420	5810	4650	39300	1140	4440	1420	31.2	624	4470	99500	2470	46100	2410	14400	840	4920	481	1550	465	1570
53-70-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Dibenzo(a,h)anthracene**	ug/Kg dry	54.01	H	x	x	x	DBA	61	2250	83.3	429	1770	1230	11200	415	1730	477	6.03	206	1290	26400	785	13000	744	3900	330	1480	179	601	136	565
191-24-2	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(g,h,i)perylene**	ug/Kg dry	54.91	H	x	x	x	BGP	62	6830	311	1560	7080	5780	49100	1300	5310	1710	34.1	738	5500	129000	2710	69700	2900	17200	1280	5930	714	2100	585	1850
191-07-1	8270D (SIM) Semi-Volatile Organic Compou0s	Coronene	ug/Kg dry	61.34				x	COR	63	1620	77.7	406	1930	1750	14700	324	1370	414	8.7	188	1560	32800	675	20100	891	8320	306	2870	166	506	181	676
526-73-8	8270D (SIM) Semi-Volatile Organic Compou0s	1,2,3-Trimethylbenzene	ug/Kg dry							64	19.7	9.64	22.3	27	29.8	75.7	5.66	82.3	12.4	4.98	4.01	69.7	3290	14	308	35.7	57.1	9.55	31.8	8.29	14.7	19.5	48.3
95-63-6	8270D (SIM) Semi-Volatile Organic Compou0s	1,2,4-Trimethylbenzene	ug/Kg dry							65	38.2	24.8	67.7	86.1	56.4	212	9.78	347	44.5	4.98	9.04	83.6	8090	24.1	621	174	171	17.1	88.3	14.6	36.4	42.2	302
108-67-8	8270D (SIM) Semi-Volatile Organic Compou0s	1,3,5-Trimethylbenzene	ug/Kg dry							66	27.8	37.6	46	196	43.8	137	22.3	144	54.9	4.98	3.03	107	2430	55.3	322	64.3	107	23.6	58.2	16.6	50.5	53.4	82.6
	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methyldibenzothiophene	ug/Kg dry	36.76						67	223	32.8	102	363	123	4470	19.2	488	16.9	4.98	13.2	192	5820	65.8	2690	153	701	12.9	478	9.88	35.2	33.1	194
	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylphenanthrene	ug/Kg dry	37.24						68	2140	122	596	6030	680	50000	209	10300	263	23	115	1190	84100	627	24200	1770	10600	174	3970	129	419	148	3170
	8270D (SIM) Semi-Volatile Organic Compou0s	2,3,5-Trimethylnaphthene	ug/Kg dry	30.44						69	192	35.7	153	424	20.3	6370	7.15	1690	30	4.98	7.72	174	7240	47.4	1910	238	1080	36.1	583	21.6	63.5	92.2	516
581-42-0	8270D (SIM) Semi-Volatile Organic Compou0s	2,6-Dimethylnaphthalene	ug/Kg dry	27.07						70	566	60.7	1480	1940	155	34400	24.9	15500	127	11.4	24.9	1040	85500	143	15500	1810	5670	74.1	2140	52.7	179	69.9	3050
	8270D (SIM) Semi-Volatile Organic Compou0s	2/3-Methyldibenzothiophene	ug/Kg dry	36.31						71	639	94.5	279	1300	409	15700	58.1	1950	69.9	5.07	35.2	502	24000	164	9500	600	2650	41.2	1420	31.8	113	104	734
	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylanthracene	ug/Kg dry	36.96						72	2280	104	408	4200	465	31200	180	6550	320	12.8	98.9	818	55100	486	19300	1330	8050	309	2530	152	492	71.4	1810
	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylphenanthrene	ug/Kg dry	36.81						73	4170	295	944	8770	1130	78300	297	15700	546	38.1	186	1840	141000	1140	38300	3120	16100	579	5650	306	1000	295	4810
	8270D (SIM) Semi-Volatile Organic Compou0s	3-Methylphenanthrene	ug/Kg dry	36.69						74	3190	270	853	7670	995	72500	254	14900	425	34.9	155	1550	131000	889	33900	2810	14500	540	5060	305	946	260	4400
	8270D (SIM) Semi-Volatile Organic Compou0s	4/9-Methylphenanthrene	ug/Kg dry	37.14						75	2650	271	764	7360	875	68800	324	14000	449	30.6	163	1600	103000	774	31200	2460	14400	620	5410	358	1040	256	4240
	8270D (SIM) Semi-Volatile Organic Compou0s	4-Methyldibenzothiophene	ug/Kg dry	36.01						76	483	92.5	275	1600	380	19000	68	2390	59.5	6.14	36.2	565	27600	137	10800	693	3290	30.8	1730	29.3	102	130	915
71-43-2	8270D (SIM) Semi-Volatile Organic Compou0s	Benzene	ug/Kg dry							77	21.3	23.7	31.2	42.2	80.5	239	24.2	55.7	32.8	3.08	48.9	20.7	205	20	208	23.9	40.3	18.3	33.6	6.18	17.3	50.9	20.7

Attachment B. Complete Sediment Data Set
Amesbury Former MGP
Amesbury, Massachusetts

												River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	Mudflat	Mudflat
											Sample No.	F190040-08	F190040-09	F190040-10	F190040-11	F190040-12	F190039-01	F190039-02	F190039-03	F190039-04	F190048-09	F190039-05	F190039-06	F190039-07	F190039-08	F190039-09	F190039-10	F190039-11	F190039-12	F190039-13	F190039-14	F190039-15	F190039-16	F190039-17
											Sample Date:	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/25/2019	09/11/2019	09/11/2019	09/11/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019
											Sample Time:	10:40	10:43	11:50	11:55	11:15	13:23	14:35	14:49	14:53	16:11	17:20	17:33	17:37	11:45	11:54	11:58	13:05	13:15	13:55	14:04	14:09	14:45	14:56
											ClieSam	SS677-S2	SS677-S3	SS677-S4A	SS677-S5A	SS678-S1	SS-678-S4	SS-679-S1	SS-679-S4	SS-679-S5	SS680R-S1	SS-680-S1	SS-680-S4	SS-680-S5	SS-681-S1	SS-681-S3	SS-681-S4	SS-682-S2	SS-682-S3	SS-683-S2	SS-683-S4	SS-683-S5	SS-684-S2	SS-684-S4
											Depths:	0 to 1	1.4 to 1.6	2.6 to 2.8	3.9 to 4	0 to 0.5	4.4 to 4.6	0 to 0.5	2.9 to 3.1	3.9 to 4	5.1 to 5.3	0 to 0.5	2.9 to 3.1	4.4 to 4.5	0 to 0.5	1.9 to 2.1	3.1 to 3.2	2.4 to 2.6	3.9 to 4.1	0.9 to 1.1	2.9 to 3.1	3.9 to 4.1	1.2 to 1.3	3.3 to 3.4
											RAH																							
											%solids	82	50	77	82	56	62	78	66	56	72	78	68	73	81	71	63	71	55	75	62	24	98	81
CAS Number	Method Name	Analyte	Units	RT		PAH17	PAH34	PAH51	Abbrev	PAH #																								
11095-43-5	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)thiophene	ug/Kg dry							78	**27.4**	**17**	**168**	**233**	**46.8**	**341**	**4.88**	**264**	**15.3**	4.98	**3.89**	**76.4**	**23800**	**61.8**	**1100**	**349**	**106**	**3.06**	**47.7**	**3.06**	**10**	**5.23**	**81.9**
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzene	ug/Kg dry							79	21.3	**93.5**	**45.2**	**68.4**	**98.5**	**503**	**27.6**	**205**	**243**	4.98	**47.7**	**15.7**	**238**	**14.9**	**211**	**150**	**144**	**41.8**	**89.5**	**50.8**	**85**	**180**	**113**
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Decalins	ug/Kg dry							80	**61.9**	**294**	**1570**	**120**	23.2	**639**	**12.8**	**266**	**39.2**	4.98	**34.6**	**439**	**1140**	**148**	**974**	**79**	**659**	**29.1**	**271**	**16.4**	**42.7**	**2300**	**74.9**
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzenes	ug/Kg dry							81	21.3	**81.8**	**155**	**111**	**159**	**393**	**68.2**	**287**	**99**	4.98	**38.1**	**36.2**	**2840**	**40.3**	**314**	**124**	**173**	**29.7**	**179**	**22.6**	**43.8**	**116**	**131**
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Decalins	ug/Kg dry							82	21.3	**125**	**376**	**306**	23.2	**1170**	**21.6**	**620**	**66.1**	4.98	**32.2**	**734**	**2690**	**134**	**1740**	**152**	**935**	**27.1**	**438**	**31.5**	**74.1**	**800**	**148**
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzenes	ug/Kg dry							83	**31.4**	**28.5**	**114**	**139**	**41.8**	**421**	**17**	**645**	**58.9**	4.98	**14.7**	**161**	**11500**	**18.3**	**919**	**210**	**245**	**20**	**147**	**17.9**	**36.6**	**62.4**	**316**
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Decalins	ug/Kg dry							84	21.3	**69.9**	**161**	**370**	23.2	**1330**	**13.7**	**618**	**51.4**	4.98	**31.3**	**637**	**2910**	**72.2**	**1620**	**134**	**865**	6	**445**	**19.5**	**45.4**	**350**	**146**
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzenes	ug/Kg dry							85	**52.9**	**144**	**270**	**276**	**25.4**	**2610**	**13.5**	**2380**	**49.9**	4.98	**13.3**	**443**	**21200**	20	**2600**	**394**	**876**	**31.8**	**457**	**22.6**	**33.8**	**242**	**584**
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Decalins	ug/Kg dry							86	21.3	**118**	**205**	**556**	23.2	**2380**	4.14	**1220**	**61.9**	4.98	**63.2**	**943**	**5330**	**185**	**2600**	**247**	**1600**	6	**843**	**34**	**83.8**	**571**	**299**
	8270D (SIM) Semi-Volatile Organic Compou0s	C5-Benzenes	ug/Kg dry							87	**30.1**	**80.9**	**230**	**199**	23.2	**3140**	4.14	**1600**	**20.8**	4.98	**6.24**	**267**	**7100**	20	**1390**	**198**	**725**	**15**	**370**	**11**	**15.7**	**252**	**319**
86-74-8	8270D (SIM) Semi-Volatile Organic Compou0s	Carbazole	ug/Kg dry	35.61						88	**4520**	**31.7**	**124**	**59.5**	**240**	**419**	**70.5**	**117**	**235**	4.98	**129**	**214**	**8990**	**1540**	**630**	**202**	**157**	**19.1**	**235**	**20.3**	**84.2**	**26.9**	**92**
493-01-6	8270D (SIM) Semi-Volatile Organic Compou0s	cis-Decalin	ug/Kg dry							89	21.3	**17**	**82.8**	**11.1**	23.2	**41.9**	4.14	**22.2**	6.79	4.98	3.03	**17.5**	**63.9**	20	**50.9**	**4.68**	**22.1**	**6.61**	**10.1**	**5.2**	**16.9**	**246**	**4.52**
100-41-4	8270D (SIM) Semi-Volatile Organic Compou0s	Ethylbenzene	ug/Kg dry							90	21.3	**9.64**	**110**	**158**	**37.9**	**356**	**6.04**	**279**	**19.3**	4.98	**12.6**	**33.5**	**4840**	**21.8**	**323**	**33.7**	**122**	**11.6**	**59.7**	**8.49**	**20.8**	**19**	**49.7**
98-82-8	8270D (SIM) Semi-Volatile Organic Compou0s	Isopropylbenzene	ug/Kg dry							91	21.3	8.67	**10.2**	**12.3**	23.2	**23.1**	4.14	**43.5**	**3.64**	4.98	**2.29**	**50.8**	**1570**	20	**100**	**10.5**	**21.3**	6	**14.2**	4.63	14.5	**3.2**	**15**
	8270D (SIM) Semi-Volatile Organic Compou0s	m,p-Xylene	ug/Kg dry							92	21.3	**169**	**230**	**96.3**	**355**	**436**	**139**	**343**	**193**	4.98	**74.3**	**88.2**	**1140**	**109**	**365**	**209**	**276**	**65.8**	**301**	**47.3**	**103**	**225**	**184**
108-87-2	8270D (SIM) Semi-Volatile Organic Compou0s	Methylcyclohexane	ug/Kg dry							93	21.3	**8.18**	**6.49**	3.75	23.2	**31.6**	**44.3**	**42.6**	**39.8**	4.98	**5.37**	17.1	**41.8**	**32.4**	**33.6**	**44.8**	**23.1**	6	**20.7**	4.63	14.5	**7.99**	**24.5**
104-51-8	8270D (SIM) Semi-Volatile Organic Compou0s	n-Butylbenzene	ug/Kg dry							94	21.3	**32.8**	3.75	**49.6**	23.2	27.5	**6.13**	5.58	6.79	4.98	**9.11**	17.1	31.6	20	28	5.5	24.2	6	4.61	4.63	14.5	3.31	4.19
103-65-1	8270D (SIM) Semi-Volatile Organic Compou0s	n-Propylbenzene	ug/Kg dry							95	21.3	**12.8**	**22.7**	**10.8**	**28.1**	**33.8**	**4.05**	**63.4**	**9.12**	4.98	**6.74**	**34.5**	**578**	**11.2**	**64.6**	**13.3**	**35.4**	6	**23.1**	4.63	14.5	**32**	**17.2**
95-47-6	8270D (SIM) Semi-Volatile Organic Compou0s	o-Xylene	ug/Kg dry							96	21.3	**12.3**	**20.1**	**16.1**	**21.8**	**63**	**4.88**	**46.8**	**15.7**	4.98	**6.48**	**15.3**	**1070**	**20.4**	**92.6**	**42**	**30.9**	**5.93**	**21.4**	**7.59**	**11.9**	**17**	**59.1**
99-87-6	8270D (SIM) Semi-Volatile Organic Compou0s	p-Isopropyltoluene	ug/Kg dry							97	21.3	**10.3**	**10.4**	**14.2**	**16.2**	**105**	**17**	**169**	**50.2**	4.98	**4.09**	**10.4**	**2810**	20	**167**	**31.4**	**43.2**	**25.2**	**22**	**26.2**	**52.4**	**14**	**50.3**
135-98-8	8270D (SIM) Semi-Volatile Organic Compou0s	sec-Butylbenzene	ug/Kg dry							98	21.3	**8.01**	**3.6**	**6.69**	23.2	**16.4**	4.14	**14.8**	6.79	4.98	3.03	**12.6**	**94**	20	**17.9**	**3.89**	**17.4**	6	**12.3**	4.63	14.5	**3.88**	**3.81**
100-42-5	8270D (SIM) Semi-Volatile Organic Compou0s	Styrene	ug/Kg dry							99	21.3	8.67	**51.8**	**126**	23.2	**919**	**24.1**	**118**	**45.5**	4.98	**45.9**	**99.6**	**1540**	**78.3**	**652**	**58.3**	**350**	**62.6**	**388**	**34.8**	**74.4**	**103**	**99.5**
98-06-6	8270D (SIM) Semi-Volatile Organic Compou0s	t-Butylbenzene	ug/Kg dry							100	21.3	8.67	3.75	3.75	23.2	27.5	4.14	5.58	6.79	4.98	3.03	17.1	31.6	20	28	5.5	24.2	6	**3.14**	4.63	14.5	**3.23**	4.19
108-88-3	8270D (SIM) Semi-Volatile Organic Compou0s	Toluene	ug/Kg dry							101	**27.7**	**175**	**85.9**	**125**	**228**	**848**	**53.4**	**331**	**394**	**3.18**	**81.8**	**72.7**	**455**	**76.7**	**419**	**246**	**262**	**85.4**	**152**	**93.8**	**180**	**292**	**216**
493-02-7	8270D (SIM) Semi-Volatile Organic Compou0s	trans-Decalin	ug/Kg dry							102	**25.1**	**178**	**703**	**42.6**	23.2	**180**	**4.75**	**57.6**	**9.44**	4.98	**12.3**	**89.2**	**221**	**48.2**	**248**	**18.6**	**213**	**10.6**	**78.5**	**3.99**	**23.1**	**1780**	**20.1**
3891-98-3	Saturated Hydrocarbons by GC/FID	2,6,10-trimethyldodecane (1380)	mg/Kg dry							103	**20.4**	**84.8**	**279**	**376**	**51.7**	**2580**	**21.3**	**504**	**43.5**	4.98	**43.9**	**1410**	**3370**	**94**	**3300**	**127**	**1030**	**46.5**	**837**	**29.8**	**81.5**	**731**	**133**
3892-00-0	Saturated Hydrocarbons by GC/FID	2,6,10-trimethylpeadecane (1650)	mg/Kg dry							104	**99.8**	**153**	**333**	**655**	**56.2**	**9510**	**27.8**	**1190**	**108**	**15.8**	**50.1**	**1830**	**8030**	**107**	**5440**	**280**	**2230**	**60.3**	**1510**	**61.9**	**119**	**803**	**500**
3891-99-4	Saturated Hydrocarbons by GC/FID	2,6,10-trimethyltridecane (1470)	mg/Kg dry							105	**60.6**	**160**	**369**	**572**	**126**	**5110**	**50.5**	**1180**	**155**	**4.17**	**81.3**	**1780**	**6910**	**161**	**4770**	**296**	**1770**	**81.3**	**1270**	**71.2**	**150**	**1020**	**352**
	Classical Chemistry	Black Carbon (Average)	mg/kg							106																								
	Saturated Hydrocarbons by GC/FID	C-10	mg/Kg dry							107																								
	Saturated Hydrocarbons by GC/FID	C-11	mg/Kg dry							108																								
	Saturated Hydrocarbons by GC/FID	C-12	mg/Kg dry							109																								
	Saturated Hydrocarbons by GC/FID	C-13	mg/Kg dry							110																								
	Saturated Hydrocarbons by GC/FID	C-14	mg/Kg dry							111																								
	Saturated Hydrocarbons by GC/FID	C-15	mg/Kg dry							112																								
	Saturated Hydrocarbons by GC/FID	C-16	mg/Kg dry							113																								
	Saturated Hydrocarbons by GC/FID	C-17	mg/Kg dry							114	**170**	**226**	**96.3**	**142**	**251**	27.5	**123**	**519**	**348**	**61**	**116**	**154**	**810**	**170**	28	**260**	**340**	**142**	**309**	**138**	**260**	**119**	**262**
	Saturated Hydrocarbons by GC/FID	C-18	mg/Kg dry							115	**175**	**150**	**98.4**	**171**	**167**	27.5	**83.1**	**446**	**196**	**45**	**94.9**	**190**	**910**	**163**	28	**118**	**326**	**81.5**	**341**	**65**	**196**	**94.9**	**165**
	Saturated Hydrocarbons by GC/FID	C-19	mg/Kg dry							116																								
	Saturated Hydrocarbons by GC/FID	C-21	mg/Kg dry							117																								
	Saturated Hydrocarbons by GC/FID	C-22	mg/Kg dry							118																								
	Saturated Hydrocarbons by GC/FID	C-23	mg/Kg dry							119																								
	Saturated Hydrocarbons by GC/FID	C-24	mg/Kg dry							120																								
	Saturated Hydrocarbons by GC/FID	C-25	mg/Kg dry							121																								
	Saturated Hydrocarbons by GC/FID	C-26	mg/Kg dry							122																								
	Saturated Hydrocarbons by GC/FID	C-27	mg/Kg dry							123																								
	Saturated Hydrocarbons by GC/FID	C-28	mg/Kg dry							124																								
	Saturated Hydrocarbons by GC/FID	C-29	mg/Kg dry							125																								
	Saturated Hydrocarbons by GC/FID	C-30	mg/Kg dry							126																								
	Saturated Hydrocarbons by GC/FID	C-31	mg/Kg dry							127																								
	Saturated Hydrocarbons by GC/FID	C-32	mg/Kg dry							128																								
	Saturated Hydrocarbons by GC/FID	C-33	mg/Kg dry							129																								
	Saturated Hydrocarbons by GC/FID	C-34	mg/Kg dry							130																								
	Saturated Hydrocarbons by GC/FID	C-35	mg/Kg dry							131																								
	Saturated Hydrocarbons by GC/FID	C-36	mg/Kg dry							132																								
	Saturated Hydrocarbons by GC/FID	C-37	mg/Kg dry							133																								
	Saturated Hydrocarbons by GC/FID	C-38	mg/Kg dry							134																								
	Saturated Hydrocarbons by GC/FID	C-39	mg/Kg dry							135																								
	Saturated Hydrocarbons by GC/FID	C-40	mg/Kg dry							136																								
	Saturated Hydrocarbons by GC/FID	C-8	mg/Kg dry							137																								
	Saturated Hydrocarbons by GC/FID	C-9	mg/Kg dry							138																								
638-36-8	Saturated Hydrocarbons by GC/FID	Phytane	mg/Kg dry	34.53						141	**91.8**	**396**	**738**	**1400**	**155**	**21200**	**71.4**	**2150**	**217**	**38.7**	**128**	**3250**	**13600**	**327**	**11400**	**501**	**4650**	**107**	**2930**	**127**	**262**	**2100**	**1140**
1921-70-6	Saturated Hydrocarbons by GC/FID	Pristane	mg/Kg dry	32.65						142	**119**	**435**	**806**	**1380**	**150**	**20600**	**77.7**	**2100**	**238**	**35**	**139**	**3850**	**14700**	**287**	**12100**	**529**	**5050**	**149**	**3290**	**150**	**285**	**2550**	**1070**
TOC	Classical Chemistry	Total Organic Carbon (Average)	mg/kg							145	**12500**	**57000**	**13300**	**29100**	**43500**	**87400**	**22500**	**117000**	**73000**	**2530**	**37400**	**30600**	**137000**	**47800**	**79300**	**40500**	**47100**	**89800**	**61000**	**42500**	**19600**	**73400**	**58300**
	TPAH16										286707	17463.3	104643	363860	130581	2655500	23411.2	399260	32831	1658.53	13811.9	133890	9592300	70811	2685600	158344	875610	21714	246380	12949	40686	10290.2	125395
	TPAH34										357577	25226.7	133476	499866	157072	3963490	33704.2	730041	50131	2220.98	19182.6	189685	12792740	95002	3487290	221138	1173374	37056	365557	23485.9	67789	19944.1	214610
	TPAH51										386689.8	27636.2	147138	544012	169521.8	4392150	37922.2	840952	56426	2422.55	21421.7	217055	14997020	105704.2	3851760	246222	1272321	42231.1	420481	27431.1	76857.7	22897.7	241897
	LPAH										90352	10069.6	67064	152390	32422	1362270	2122	253730	6258	774.3	2380.1	50153	7361400	19877	1125440	87565	359060	3340	81420	1959	7387	1901.4	66540
	HPAH										197330	7462.3	38679	213920	98430	1298600	21335	154780	26827	911.33	11481	84090	3194900	51575	1569700	71774	518900	18620	165560	11125	33701	8435	59875

(does not include source area samples collected in 2017)

Attachment B. Complete Sediment Data Set
Amesbury Former MGP
Amesbury, Massachusetts

											Mudflat	Mudflat	River	River	River	River	River	River	Mudflat	Mudflat	River	River	River	River	River	River	River	River	River	River	River
										Sample No.	F190050-01	F190050-02	F190046-05	F190046-06	F190046-07	F190046-08	F190048-04	F190048-10	F190048-05	F190048-06	F190048-07	F190048-08	F190048-11	F190048-12	F190048-13	F190048-14	F190048-15	F190048-16	F190048-17	F190048-18	F190051-01	F190051-02	F190051-03
										Sample Date:	09/10/2019	09/10/2019	09/23/2019	09/23/2019	09/23/2019	09/23/2019	09/24/2019	09/25/2019	09/24/2019	09/24/2019	09/24/2019	09/24/2019	09/25/2019	09/25/2019	09/25/2019	09/25/2019	09/25/2019	09/25/2019	09/25/2019	09/25/2019	09/26/2019	09/26/2019	09/26/2019
										Sample Time:	12:35	11:47	12:31	12:35	12:41	13:56	12:43	15:23	14:37	14:44	16:10	16:15	10:53	11:00	14:02	14:08	13:20	16:47	16:54	17:14	08:54	09:46	11:20
										ClieSam	SS685-S3	SS686-S3	SS687-S1	SS687-S2	SS687-S4	SS688-S4	SS689-S2	SS690-S5	SS691-S3	SS691-S5	SS692-S4	SS692-S5	SS693-S3	SS693-S5	SS694-S4	SS694-S6	SS695-S6	SS696-S3	SS696-S5	SS697-S2	SS698-S4	SS699-S3	SS700-S2
										Depths:	1.9 to 2.1	1.9 to 2.1	0 to 0.5	1.9 to 2.1	5.1 to 6.1	2.9 to 3.1	1.9 to 2.1	3.9 to 4.1	1.9 to 2.1	4.4 to 4.5	4.3 to 4.8	6.9 to 7	1.9 to 2.1	3.9 to 4.1	3.3 to 3.7	6.3 to 6.5	4.1 to 4.3	1.9 to 2.1	3.9 to 4.1	0.9 to 1.1	2.9 to 3.1	2.9 to 3.1	1.9 to 2.1
										RAH																							
										%solids	64	64	59	61	90	77	59	54	67	71	50	71	65	71	64	72	76	41	56	64	74	46	60
CAS Number	Method Name	Analyte	Units	RT		PAH17	PAH34	PAH51	Abbrev	PAH #						5.08	6.92								5.78		4.72			4.93	4.87			
		Max RL for ND PAHs=								1																							
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzo(b)thiophenes	ug/Kg dry	17					C1BT	2	17.1	13.2	53	47	9.06	6.65	4.55	17.4	236	970	77200	6.71	17.4	0	47600	4.32	2.74	75.3	2620	248	25.1	2530	209
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzo(b)thiophenes	ug/Kg dry	18					C2BT	3	19.3	12.1	90.4	74.1	17.4	4.22	5.52	28.3	473	2240	95100	9.29	20.8	0	42900	3.42	2.45	160	4570	413	69.5	8030	603
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzo(b)thiophenes	ug/Kg dry	19					C3BT	4	20.2	7.28	42.1	63.4	11.6	3.29	4.39	32.5	610	1500	50100	5.77	15	0	17500	0	0	119	3830	348	51	8480	704
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzo(b)thiophenes	ug/Kg dry	20					C4BT	5	73.2	14.8	35.3	55.8	7.18	3.85	6.92	45	421	511	13600	0	11.1	0	3840	0	0	146	1420	259	20.9	3100	326
91-20-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Naphthalene**	ug/Kg dry	21.86	L	x	x	x	NA	6	94.1	38.3	302	374	72.8	3.38	13.5	384	1510	11300	5300000	208	468	2.78	3740000	147	8.06	1100	115000	8100	239	30900	2660
91-57-6	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylnaphthalene	ug/Kg dry	24.57	L	x		x	2MN	7	75.7	27.7	152	204	64.5	0	0	273	727	5680	3610000	171	401	0	1630000	71.3	0	385	13200	3220	112	7840	2180
90-12-0	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylnaphthalene	ug/Kg dry	25				x	1MN	8	30.2	12.5	250	179	60.3	0	0	155	783	50300	2600000	112	229	0	1020000	50.8	0	1060	93400	2310	189	93600	8140
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Naphthalenes	ug/Kg dry	24.57			x	x	C1N	9	68.1	25.1	244	238	76	2.55	4.07	267	930	33100	3820000	174	392	0	1640000	74.8	0	872	63100	3430	184	59900	6160
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Naphthalenes	ug/Kg dry	27.02			x	x	C2N	10	175	102	784	647	201	6.49	9.71	409	3780	71100	2600000	144	376	3.88	816000	29.2	3.93	1880	112000	5580	700	170000	20800
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Naphthalenes	ug/Kg dry	29.76			x	x	C3N	11	338	114	534	884	174	5.21	6.76	443	4690	32300	937000	60.1	298	3.38	202000	3.86	3.18	1580	64200	7090	567	115000	17700
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Naphthalenes	ug/Kg dry	32.52			x	x	C4N	12	246	59	245	617	71.1	3.08	4.03	280	3260	10700	271000	16.8	169	2.51	40400	0	2.73	1010	24300	4200	243	40800	8210
92-52-4	8270D (SIM) Semi-Volatile Organic Compou0s	Biphenyl	ug/Kg dry	26.46					BP	13	21.7	12	109	101	29.6	0	0	90.5	285	2590	480000	22.4	91.8	0	460000	14.1	0	281	29800	1060	49.9	3090	738
208-96-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Acenaphthylene**	ug/Kg dry	28.16	L	x	x	x	ACE	14	137	19.5	735	839	113	8.2	4.77	421	1470	4220	145000	13	126	0	71500	0	0	720	14700	1650	166	22200	3810
83-32-9	8270D (SIM) Semi-Volatile Organic Compou0s	**Acenaphthene**	ug/Kg dry	28.89	L	x	x	x	ACY	15	63.7	27.7	3660	1370	169	0	0	451	7710	61000	3250000	174	260	3.65	2310000	97.1	0	3110	204000	19300	1250	258000	10400
132-64-9	8270D (SIM) Semi-Volatile Organic Compou0s	Dibenzofuran	ug/Kg dry	29.54				x	DBF	16	74.6	30.2	270	296	65.3	0	0	294	472	2970	109000	10.1	136	0	79000	4.77	0	301	9890	8350	43.5	10200	823
86-73-7	8270D (SIM) Semi-Volatile Organic Compou0s	**Fluorene**	ug/Kg dry	30.91	L	x	x	x	FLE	17	119	44.6	1830	974	177	0	0	578	3630	31400	1260000	92	285	2.76	841000	29.6	0	2000	101000	15000	456	132000	8900
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Fluorenes	ug/Kg dry	33.14			x	x	C1FL	18	210	50.6	436	532	122	4.72	0	442	1940	19000	639000	47.9	228	0	180000	0	0	925	43800	3310	343	74800	11200
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Fluorenes	ug/Kg dry	35.22			x	x	C2FL	19	358	62.6	304	599	81.4	4.07	4.68	450	2080	14100	443000	23.3	229	3.06	69000	0	3.89	845	29200	2980	283	58200	11000
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Fluorenes	ug/Kg dry	38.01			x	x	C3FL	20	217	56.8	404	741	55.2	0	3.76	425	2030	5390	145000	12.7	184	0	24200	0	2.8	908	13900	3500	162	23100	6010
132-65-0	8270D (SIM) Semi-Volatile Organic Compou0s	Dibenzothiophene	ug/Kg dry	34.23				x	DBT	21	61.2	20.1	1290	539	65.4	0	0	351	1920	5580	269000	30.6	115	0	268000	2.57	0	786	30100	5640	168	46100	2370
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Dibenzothiophenes	ug/Kg dry	36.43				x	C1DBT	22	170	36.2	497	675	68.7	3.22	3.82	329	2530	8270	270000	25	157	0	127000	0	0	816	26700	3170	221	49300	5130
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Dibenzothiophenes	ug/Kg dry	37.7				x	C2DBT	23	237	42.5	354	857	55.7	4.56	4.5	328	2960	6850	198000	17.9	157	0	55900	0	0	1010	20400	2510	209	37500	5620
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Dibenzothiophenes	ug/Kg dry	39.5				x	C3DBT	24	177	37.2	239	701	29.9	3.49	3.67	212	2260	3140	82200	8.76	95.7	0	17200	0	0	852	9720	1330	116	16900	3190
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Dibenzothiophenes	ug/Kg dry	41.65				x	C4DBT	25	115	28.8	139	372	11.8	0	0	135	1230	1070	25700	3.18	70.3	0	4500	0	0	534	3490	605	49.9	5860	1210
85-01-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Phenanthrene**	ug/Kg dry	34.72	L	x	x	x	PHE	26	669	251	9950	7670	1110	3.87	3.89	6930	21200	113000	4450000	473	1640	17.4	3460000	14.6	0	8660	487000	90000	1920	900000	55700
120-12-7	8270D (SIM) Semi-Volatile Organic Compou0s	**Anthracene**	ug/Kg dry	34.91	L	x	x	x	ANT	27	625	118	2690	2440	387	0	0	4080	5400	37000	1120000	86.3	528	6.67	1800000	0	0	3030	136000	25500	661	291000	17300
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Phenanthrenes/Anthracenes	ug/Kg dry	36.96				x	C1PH	28	2110	343	2970	4170	683	5.43	8.52	4800	12400	94100	2730000	190	1480	8.08	961000	0	4.01	5270	184000	24300	1760	489000	49000
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Phenanthrenes/Anthracenes	ug/Kg dry	38.97			x	x	C2PH	29	1940	339	1240	2540	327	3.74	3.92	2810	7400	36300	1090000	84.2	992	4.03	202000	0	0	2990	83000	10700	949	148000	32000
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Phenanthrenes/Anthracenes	ug/Kg dry	40.8			x	x	C3PH	30	918	197	498	1190	113	2.94	0	1270	3550	11500	299000	19.4	500	3.43	40500	0	0	1440	26900	3770	342	45300	12500
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Phenanthrenes/Anthracenes	ug/Kg dry	41.72			x	x	C4PH	31	380	137	210	498	43.6	0	0	731	1560	3400	87400	6.35	343	0	10400	0	4	669	8680	1320	129	12900	4240
483-65-8	8270D (SIM) Semi-Volatile Organic Compou0s	Retene	ug/Kg dry	41.72				x	RET	32	237	81.5	91.3	103	22.2	4.46	7.1	1190	566	1000	35600	3.2	414	11.9	2130	4.27	12.4	203	1640	252	59.3	2820	980
239-35-0	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)naphtho(2,1-d)thiophene	ug/Kg dry	44.24					BNT	33	182	30.1	573	857	51.6	0	0	1130	1490	2370	70900	8.2	139	0	57200	0	0	685	11600	5010	110	19000	2070
	8270D (SIM) Semi-Volatile Organic Compou0s	C0-Benzonaphthothiophenes	ug/Kg dry	44.24					C0BNT	34	513	70	1090	1570	107	0	0	2230	2770	4240	127000	14.9	340	0	104000	4.93	0	1260	20600	8960	203	34100	3620
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzonaphthothiophenes	ug/Kg dry	45.63					C1BNT	35	495	59.8	442	946	58.1	0	0	815	1990	3570	99200	10.5	280	0	39500	0	0	831	11200	3380	150	20500	3490
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzonaphthothiophenes	ug/Kg dry	47.14					C2BNT	36	326	32.7	313	741	32.7	3.23	0	430	1540	1970	48700	5.56	232	0	12300	0	0	739	5440	1780	95.9	10200	2170
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzonaphthothiophenes	ug/Kg dry	49.02					C3BNT	37	168	21.2	259	504	17.6	0	0	275	1070	891	22000	4.33	171	0	9070	0	0	588	3070	1010	58.3	5920	1060
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzonaphthothiophenes	ug/Kg dry	51.51					C4BNT	38	53	10.1	140	229	5.05	0	0	68.2	422	193	3830	0	59.7	0	1440	0	0	306	593	328	19.1	1130	261
206-44-0	8270D (SIM) Semi-Volatile Organic Compou0s	**Fluoranthene**	ug/Kg dry	39.51	H	x	x	x	FLA	39	2100	478	9510	11900	1050	3.12	8.28	17700	21600	42600	1330000	143	1920	10.3	1250000	0	2.67	9810	280000	87500	1640	370000	30400
129-00-0	8270D (SIM) Semi-Volatile Organic Compou0s	**Pyrene**	ug/Kg dry	40.39	H	x	x	x	PYR	40	1850	422	9870	10800	999	3.73	5.61	17100	28200	65100	1920000	217	1980	15.9	1910000	2.91	0	11300	383000	73000	2240	545000	47500
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Fluoranthenes/Pyrenes	ug/Kg dry	41.78				x	C1PY	41	3380	426	3460	5610	636	7.9	8.82	7570	13100	46500	1540000	117	1790	8.09	655000	0	3.03	5580	150000	26500	1530	257000	38100
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Fluoranthenes/Pyrenes	ug/Kg dry	43.52				x	C2PY	42	1860	212	1480	2550	259	4.82	4.98	3110	4760	16900	462000	33.3	957	3.16	116000	0	4.1	2460	40200	12300	560	76700	16100
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Fluoranthenes/Pyrenes	ug/Kg dry	45.72				x	C3PY	43	943	123	612	1210	104	3.36	5.25	1400	2350	6000	156000	12	595	2.45	24500	0	3.52	1130	13400	4810	227	25600	6830
243-17-4	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)fluorene	ug/Kg dry	42.03				x	BbF	44	530	60.7	424	836	82.5	0	0	953	1590	4980	145000	11.8	230	0	86400	0	0	599	18200	4170	176	28500	3920
205-12-9	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(c)fluorene	ug/Kg dry	42.07				x	BcF	45	245	32	203	367	36.3	0	0	345	755	2270	81600	6.28	124	0	36400	0	0	313	7260	1600	72.7	12200	1690
3442-78-2	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylpyrene	ug/Kg dry	42.18				x	2MP	46	360	55.7	471	711	81.9	0	0	1040	1840	6090	193000	16.2	233	0	86700	0	0	801	20000	3340	205	33800	5310
3353-12-6	8270D (SIM) Semi-Volatile Organic Compou0s	4-Methylpyrene	ug/Kg dry	42.55				x	4MP	47	292	39.6	378	572	62.9	0	0	847	1630	5330	170000	13.6	186	0	68300	0	0	711	16800	2300	182	30600	4850
2381-21-7	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylpyrene	ug/Kg dry	42.67				x	1MP	48	253	29.8	356	480	55.2	0	0	704	1490	5920	193000	15.1	152	0	88300	0	0	642	18300	2140	179	34900	4640
56-55-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Benz(a)anthracene**	ug/Kg dry	45.17	H	x	x	x	BaA	49	1960	252	3890	5800	561	0	0	10700	9020	25100	718000	70.3	1300	5.59	532000	0	0	4630	111000	34400	863	167000	19300
	8270D (SIM) Semi-Volatile Organic Compou0s	**Chrysene/triphenylene**	ug/Kg dry	45.36	H	x	x	x	CH	50	1740	256	3900	5790	502	0	0	11400	9970	25500	647000	63.3	1200	6.65	646000	0	0	4950	118000	31900	914	159000	21300
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	46.81				x	C1CR	51	2020	224	1470	2830	289	2.57	0	4330	5770	17100	510000	41.2	1250	3.63	157000	0	0	2630	43000	12400	642	82200	17400
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	48.52				x	C2CR	52	1270	142	723	1530	136	0	0	2030	3130	8190	201000	15.1	1050	0	40600	0	0	1450	16500	5490	331	32800	9320
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	49.55				x	C3CR	53	783	78.2	375	766	64.1	0	0	979	1420	2800	66500	0	683	0	9570	0	0	746	5220	2670	144	11400	3510
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	50				x	C4CR	54	406	43.4	215	386	27.5	0	0	450	707	892	18100	0	404	0	4020	0	0	364	1890	1300	57.8	3910	1280
205-99-2	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(b)fluoranthene**	ug/Kg dry	49.23	H	x	x	x	BbF	55	846	124	2800	4580	312	0	0	8830	5800	6980	244000	26.4	728	3.42	208000	0	0	3300	37100	24800	457	68800	7280
	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(j/k)fluoranthene**	ug/Kg dry	49.29	H	x	x	x	BjF	56	1230	159	2970	4660	359	0	0	8270	6520	8020	333000	38.7	844	3.86	310000	0	0	3530	40700	24700	488	97200	8440
192-97-2	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(e)pyrene	ug/Kg dry	50.17			x	x	BeP	57	695	102	2440	3710	254	0	0	7200	5780	7310	301000	34.9	644	3.8	276000	0	0	3160	37700	18600	456	86900	8220
50-32-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(a)pyrene**	ug/Kg dry	50.34	H	x	x	x	BaP	58	1330	147	3780	5670	448	0	0	10200	8530	18500	573000	60.9	1010	5.35	530000	0	0	4600	61600	30400	714	155000	14800
198-55-0	8270D (SIM) Semi-Volatile Organic Compou0s	Perylene	ug/Kg dry	50.61			x	x	PE	59	350	127	913	1430	123	240	781	3340	1710	2070	67300	17.5	325	8.2	58800	5.29	620	1470	10100	7630	211	23300	2130
193-39-5	8270D (SIM) Semi-Volatile Organic Compou0s	**Indeno(1,2,3-cd)pyrene**	ug/Kg dry	54	H	x	x	x	I123P	60	468	68.2	2240	3460	216	0	0	5600	4690	4940	152000	25.2	471	2.48	206000	0	0	2450	25900	17100	316	62200	5530
53-70-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Dibenzo(a,h)anthracene**	ug/Kg dry	54.01	H	x	x	x	DBA	61	175	22.6	500	875	58.2	0	0	1310	1100	1530	43600	6.05	151	0	32200	0	0	579	5700	4010	87.2	14900	1800
191-24-2	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(g,h,i)perylene**	ug/Kg dry	54.91	H	x	x	x	BGP	62	382	60.3	2120	3130	182	0	0	5180	4750	4780	155000	28.2	422	2.59	240000	0	0	2460	27300	15100	322	66600	5550
191-07-1	8270D (SIM) Semi-Volatile Organic Compou0s	Coronene	ug/Kg dry	61.34				x	COR	63	73.4	12.7	579	730	42.1	0	0	1030	1280	1180	41300	6.74	92.4	0	44900	0	0	586	7520	3590	87	19100	1320
526-73-8	8270D (SIM) Semi-Volatile Organic Compou0s	1,2,3-Trimethylbenzene	ug/Kg dry							64	7.53	5.73	17.8	35.7	2.23	5.08	6.92	10.1	56.1	312	36500	5.78	12.6	4.72	6380	4.93	4.87	37.4	1080	25.3	8.45	551	68.6
95-63-6	8270D (SIM) Semi-Volatile Organic Compou0s	1,2,4-Trimethylbenzene	ug/Kg dry							65	18	11.9	50.5	88.1	11.8	5.08	3.52	36.3	175	915	89600	5.78	36.4	4.72	13600	4.93	4.87	85.7	2600	67.2	31.5	1080	177
108-67-8	8270D (SIM) Semi-Volatile Organic Compou0s	1,3,5-Trimethylbenzene	ug/Kg dry							66	4.12	3.3	18.5	30.1	3.87	5.08	6.92	15.5	46.2	306	23300	5.78	49	4.72	3610	4.93	4.87	28.3	827	23.1	8.31	403	73.1
	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methyldibenzothiophene	ug/Kg dry	36.76						67	16.5	3.43	56.9	87.2	7.64	5.08	6.92	29.3	310	722	22900	3.11	13.8	4.72	10800	4.93	4.87	96.9	2490	270	23.7	4810	443
	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylphenanthrene	ug/Kg dry	37.24						68	220	39.7	465	640	99.6	5.08	6.92	572	2170	15300	435000	31.2	216	4.72	139000	4.93	4.87	646	31100	3510	257	79400	8400
	8270D (SIM) Semi-Volatile Organic Compou0s	2,3,5-Trimethylnaphthene	ug/Kg dry	30.44						69	32.9	9.72	40.4	69.4	15.1	5.08	6.92	34.9	387	2230	61000	4.33	22.3	4.72	10600	4.93	4.87	107	4600	502	43.7	7290	1180
581-42-0	8270D (SIM) Semi-Volatile Organic Compou0s	2,6-Dimethylnaphthalene	ug/Kg dry	27.07						70	48.9	18.2	154	115	43.5	5.08	6.92	85.3	968	15200	533000	32.3	113	4.72	151000	5.56	4.87	370	21900	844	102	33800	4480
	8270D (SIM) Semi-Volatile Organic Compou0s	2/3-Methyldibenzothiophene	ug/Kg dry	36.31						71	55	11.4	174	231	21.8	5.08	6.92	111	858	2870	95500	8.02	52.1	4.72	46600	4.93	4.87	292	9250	1160	74.4	17000	1720
	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylanthracene	ug/Kg dry	36.96						72	604	45.2	350	541	97	5.08	6.92	869	1330	11000	300000	16.9	237	4.72	129000	4.93	4.87	603	20700	3160	205	55600	5860
	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylphenanthrene	ug/Kg dry	36.81						73	474	98.4	821	1140	186	5.08	6.92	1310	3170	23400	694000	49.3	397	4.72	257000	4.93	4.87	1450	46300	7260	445	121000	11800
	8270D (SIM) Semi-Volatile Organic Compou0s	3-Methylphenanthrene	ug/Kg dry	36.69						74	335	74.2	700	910	153	5.08	6.92	998	2730	21300	647000	45.8	303	4.72	238000	4.93	4.87	1260	42000	5680	400	110000	11000
	8270D (SIM) Semi-Volatile Organic Compou0s	4/9-Methylphenanthrene	ug/Kg dry	37.14						75	453	79.3	611	928	144	5.08	6.92	1010	2970	22300	632000	43.3	323	4.72	186000	4.93	4.87	1280	42000	4690	438	116000	11800
	8270D (SIM) Semi-Volatile Organic Compou0s	4-Methyldibenzothiophene	ug/Kg dry	36.01						76	31.2	7.13	164	234	20.9	5.08	6.92	77	991	3450	111000	10.1	46.5	4.72	51400	4.93	4.87	297	11700	1060	87.1	21000	2230
71-43-2	8270D (SIM) Semi-Volatile Organic Compou0s	Benzene	ug/Kg dry							77	21.6	17.1	91.4	130	4.98	3.94	13.2	64.8	11.1	100	190	7.56	22.9	2.86	1980	4.82	7.38	113	305	89.6	5.48	478	56.9

Attachment B. Complete Sediment Data Set
Amesbury Former MGP
Amesbury, Massachusetts

												Mudflat	Mudflat	River	River	River	River	River	River	Mudflat	Mudflat	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River
											Sample No.	F190050-01	F190050-02	F190046-05	F190046-06	F190046-07	F190046-08	F190048-04	F190048-10	F190048-05	F190048-06	F190048-07	F190048-08	F190048-11	F190048-12	F190048-13	F190048-14	F190048-15	F190048-16	F190048-17	F190048-18	F190051-01	F190051-02	F190051-03
											Sample Date:	09/10/2019	09/10/2019	09/23/2019	09/23/2019	09/23/2019	09/23/2019	09/24/2019	09/25/2019	09/24/2019	09/24/2019	09/24/2019	09/24/2019	09/25/2019	09/25/2019	09/25/2019	09/25/2019	09/25/2019	09/25/2019	09/25/2019	09/25/2019	09/26/2019	09/26/2019	09/26/2019
											Sample Time:	12:35	11:47	12:31	12:35	12:41	13:56	12:43	15:23	14:37	14:44	16:10	16:15	10:53	11:00	14:02	14:08	13:20	16:47	16:54	17:14	08:54	09:46	11:20
											ClieSam	SS685-S3	SS686-S3	SS687-S1	SS687-S2	SS687-S4	SS688-S4	SS689-S2	SS690-S5	SS691-S3	SS691-S5	SS692-S4	SS692-S5	SS693-S3	SS693-S5	SS694-S4	SS694-S6	SS695-S6	SS696-S3	SS696-S5	SS697-S2	SS698-S4	SS699-S3	SS700-S2
											Depths:	1.9 to 2.1	1.9 to 2.1	0 to 0.5	1.9 to 2.1	5.1 to 6.1	2.9 to 3.1	1.9 to 2.1	3.9 to 4.1	1.9 to 2.1	4.4 to 4.5	4.3 to 4.8	6.9 to 7	1.9 to 2.1	3.9 to 4.1	3.3 to 3.7	6.3 to 6.5	4.1 to 4.3	1.9 to 2.1	3.9 to 4.1	0.9 to 1.1	2.9 to 3.1	2.9 to 3.1	1.9 to 2.1
											RAH																								
											%solids	64	64	59	61	90	77	59	54	67	71	50	71	65	71	64	72	76	41	56	64	74	46	60
CAS Number	Method Name	Analyte	Units	RT		PAH17	PAH34	PAH51	Abbrev	PAH #																										
11095-43-5	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)thiophene	ug/Kg dry							78	**7.03**	**3.29**	**22.8**	**19.1**	**4.21**	5.08	6.92	**14.4**	**146**	**238**	**54000**	**4.05**	**12.8**	4.72	**57000**	**3.58**	4.87	**33.5**	**1480**	**280**	**16.8**	**403**	**64.8**
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzene	ug/Kg dry							79	**213**	**155**	**183**	**209**	**21.8**	**10.8**	**23.5**	**198**	**669**	**595**	**1820**	**3.24**	**101**	4.72	**2220**	4.93	**15.6**	**313**	**1010**	**251**	**42.1**	**858**	**502**
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Decalins	ug/Kg dry							80	**11.6**	**10.2**	**135**	**4210**	**2.74**	5.08	6.92	**26.7**	**3960**	**519**	**7260**	5.78	**53.7**	4.72	**1890**	4.93	4.87	**3430**	**1350**	**1460**	**33.4**	**1440**	**227**
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzenes	ug/Kg dry							81	**76.9**	**61.1**	**256**	**183**	**11.8**	**13.2**	**21.4**	**94.6**	**306**	**710**	**59300**	**4.19**	**72.4**	4.72	**9660**	4.93	**13.8**	**300**	**1690**	**224**	**38.8**	**659**	**201**
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Decalins	ug/Kg dry							82	**20.3**	**11.6**	**109**	**872**	**5.62**	5.08	6.92	**42.8**	**3800**	**1120**	**16900**	5.78	**71.1**	4.72	**3880**	4.93	4.87	**1050**	**2660**	**807**	**50.6**	**3040**	**651**
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzenes	ug/Kg dry							83	**33.6**	**24.8**	**87.4**	**150**	**17.6**	**5**	**7.89**	**63.9**	**245**	**1490**	**132000**	**6.32**	**81.7**	4.72	**22200**	**2.88**	**5.37**	**157**	**4100**	**131**	**49.5**	**1780**	**304**
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Decalins	ug/Kg dry							84	**14.9**	**7.66**	**87.9**	**264**	**3.67**	5.08	6.92	**20.8**	**2740**	**1120**	**18100**	5.78	**59.3**	4.72	**3460**	4.93	4.87	**575**	**2760**	**525**	**40.4**	**3090**	**788**
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzenes	ug/Kg dry							85	**38.5**	**34.2**	**78.7**	**424**	**17.9**	5.08	**9.03**	**71**	**641**	**3700**	**212000**	**6.86**	**65.4**	4.72	**44400**	**3.67**	**6.37**	**684**	**7690**	**336**	**71.6**	**6040**	**723**
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Decalins	ug/Kg dry							86	**21.4**	5.74	**158**	**422**	**7.92**	5.08	6.92	**23.1**	**3240**	**2140**	**31400**	5.78	**74.9**	4.72	**4980**	4.93	4.87	**1010**	**5000**	**1070**	**59.9**	**4460**	**1670**
	8270D (SIM) Semi-Volatile Organic Compou0s	C5-Benzenes	ug/Kg dry							87	**18.8**	**21.4**	**54.6**	**403**	**10.1**	5.08	**4.56**	**36.3**	**768**	**2350**	**79900**	**5.53**	**32.2**	4.72	**15000**	4.93	4.87	**616**	**3940**	**327**	**43.9**	**4920**	**674**
86-74-8	8270D (SIM) Semi-Volatile Organic Compou0s	Carbazole	ug/Kg dry	35.61						88	**16.1**	**11.3**	**353**	**560**	**25.3**	5.08	6.92	**418**	**389**	**190**	**10200**	**3.21**	**114**	4.72	**24700**	**3.01**	4.87	**353**	**1570**	**11900**	**16**	**598**	**103**
493-01-6	8270D (SIM) Semi-Volatile Organic Compou0s	cis-Decalin	ug/Kg dry							89	6.32	5.74	**9.97**	**392**	3.77	5.08	6.92	7.45	**264**	**44.7**	**863**	5.78	4.91	4.72	**153**	4.93	4.87	**373**	**127**	**140**	**2.61**	**120**	**20.5**
100-41-4	8270D (SIM) Semi-Volatile Organic Compou0s	Ethylbenzene	ug/Kg dry							90	**9.21**	**6.27**	**33.6**	**44.6**	**4.89**	5.08	6.92	**24.9**	**83.5**	**551**	**72100**	**2.96**	**12.6**	4.72	**15600**	4.93	4.87	**50.5**	**1810**	**46.8**	**13.6**	**374**	**78.1**
98-82-8	8270D (SIM) Semi-Volatile Organic Compou0s	Isopropylbenzene	ug/Kg dry							91	6.32	5.74	**5.1**	**4.89**	3.77	5.08	6.92	7.45	**11.2**	**122**	**20000**	5.78	**3.14**	4.72	**2510**	4.93	4.87	**12.6**	**367**	31.8	5.04	**122**	**17.9**
	8270D (SIM) Semi-Volatile Organic Compou0s	m,p-Xylene	ug/Kg dry							92	**117**	**91.8**	**424**	**261**	**14.8**	**18.5**	**30.8**	**138**	**439**	**720**	**24200**	5.78	**118**	4.72	**3130**	4.93	**21.5**	**480**	**1340**	**326**	**48.4**	**515**	**241**
108-87-2	8270D (SIM) Semi-Volatile Organic Compou0s	Methylcyclohexane	ug/Kg dry							93	6.32	5.74	**29.5**	**27.2**	**2.18**	5.08	6.92	**14.6**	**62.1**	**47.8**	101	5.78	**67**	4.72	**199**	4.93	4.87	**21.4**	33.8	**17.4**	**4.42**	**55.5**	**43.3**
104-51-8	8270D (SIM) Semi-Volatile Organic Compou0s	n-Butylbenzene	ug/Kg dry							94	**8.47**	**6.37**	**21**	**99.1**	**1.94**	5.08	6.92	**12.4**	**138**	**245**	**13400**	5.78	**10.5**	4.72	69.2	4.93	4.87	**122**	33.8	**54**	**6.05**	**289**	**38.1**
103-65-1	8270D (SIM) Semi-Volatile Organic Compou0s	n-Propylbenzene	ug/Kg dry							95	6.32	5.74	**18.7**	**46.1**	3.77	5.08	6.92	**7.14**	**47.4**	**108**	**6640**	5.78	**7.43**	4.72	**782**	4.93	4.87	**37.6**	**240**	**23.5**	**3.38**	**80.2**	**21.4**
95-47-6	8270D (SIM) Semi-Volatile Organic Compou0s	o-Xylene	ug/Kg dry							96	**9.46**	**8.73**	**28.6**	**37.2**	**2.54**	5.08	6.92	**14**	**69.3**	**152**	**31100**	5.78	**9.27**	4.72	**2690**	4.93	4.87	**43**	**378**	**35.3**	**15.1**	**101**	**37.6**
99-87-6	8270D (SIM) Semi-Volatile Organic Compou0s	p-Isopropyltoluene	ug/Kg dry							97	**40.3**	**46.3**	**17**	**17.9**	**9.64**	5.08	6.92	**62.1**	**40**	**175**	**26900**	5.78	**56.2**	4.72	**4050**	4.93	**6.69**	**30.8**	**1020**	**26.8**	**31.1**	**408**	**46.6**
135-98-8	8270D (SIM) Semi-Volatile Organic Compou0s	sec-Butylbenzene	ug/Kg dry							98	6.32	5.74	**3.11**	**7.82**	3.77	5.08	6.92	7.45	**37**	**22.7**	**896**	5.78	4.91	4.72	**147**	4.93	4.87	**15**	**52.8**	31.8	5.04	**40**	**7.2**
100-42-5	8270D (SIM) Semi-Volatile Organic Compou0s	Styrene	ug/Kg dry							99	**14.6**	**6.11**	**54.2**	**109**	**14.6**	**10.8**	6.92	**29**	**104**	**328**	**6130**	5.78	**12.1**	4.72	**3170**	4.93	4.87	**128**	**1010**	**216**	**26.9**	**1080**	**173**
98-06-6	8270D (SIM) Semi-Volatile Organic Compou0s	t-Butylbenzene	ug/Kg dry							100	6.32	5.74	6.1	**6.3**	3.77	5.08	6.92	7.45	5.93	5.65	101	5.78	4.91	4.72	69.2	4.93	4.87	**7.65**	33.8	31.8	5.04	36.5	6.16
108-88-3	8270D (SIM) Semi-Volatile Organic Compou0s	Toluene	ug/Kg dry							101	**313**	**229**	**268**	**305**	**32.1**	**16.3**	**33.3**	**294**	**1020**	**910**	**3240**	**3.99**	**149**	**2.83**	**3460**	4.93	**22.4**	**466**	**1530**	**369**	**64.3**	**1090**	**772**
493-02-7	8270D (SIM) Semi-Volatile Organic Compou0s	trans-Decalin	ug/Kg dry							102	**4.68**	**4.31**	**83.4**	**3520**	3.77	5.08	6.92	**10.6**	**2220**	**128**	**1940**	5.78	**23**	4.72	**430**	4.93	4.87	**3730**	**359**	**1170**	**14.7**	**313**	**51.3**
3891-98-3	Saturated Hydrocarbons by GC/FID	2,6,10-trimethyldodecane (1380)	mg/Kg dry							103	**29.9**	**6.29**	**104**	**408**	**7.17**	**3.11**	**3.48**	**17**	**7490**	**712**	**12800**	5.78	**125**	4.72	**4470**	4.93	**2.53**	**799**	**3360**	**1380**	**41.8**	**3740**	**621**
3892-00-0	Saturated Hydrocarbons by GC/FID	2,6,10-trimethylpeadecane (1650)	mg/Kg dry							104	**48.5**	**24**	**199**	**446**	**30.6**	**16.1**	**7.17**	**68.9**	**8020**	**1490**	**37200**	**20**	**184**	**14.8**	**7730**	**15.4**	**19**	**1160**	**10400**	**1900**	**93.5**	**8250**	**1730**
3891-99-4	Saturated Hydrocarbons by GC/FID	2,6,10-trimethyltridecane (1470)	mg/Kg dry							105	**93.5**	**41.3**	**213**	**589**	**20.2**	**9.91**	**11.4**	**49.9**	**9210**	**1190**	**27200**	**6**	**240**	**4.27**	**7310**	**3.84**	**8.83**	**1360**	**6870**	**2080**	**77**	**5830**	**1110**
	Classical Chemistry	Black Carbon (Average)	mg/kg							106																										
	Saturated Hydrocarbons by GC/FID	C-10	mg/Kg dry							107																										
	Saturated Hydrocarbons by GC/FID	C-11	mg/Kg dry							108																										
	Saturated Hydrocarbons by GC/FID	C-12	mg/Kg dry							109																										
	Saturated Hydrocarbons by GC/FID	C-13	mg/Kg dry							110																										
	Saturated Hydrocarbons by GC/FID	C-14	mg/Kg dry							111																										
	Saturated Hydrocarbons by GC/FID	C-15	mg/Kg dry							112																										
	Saturated Hydrocarbons by GC/FID	C-16	mg/Kg dry							113																										
	Saturated Hydrocarbons by GC/FID	C-17	mg/Kg dry							114	**260**	**234**	**260**	**233**	**66.9**	**58.7**	**68.4**	**305**	**403**	**519**	101	**67.3**	**416**	**60.6**	**906**	**57.6**	**91.8**	**516**	**1980**	**470**	**114**	**794**	**305**
	Saturated Hydrocarbons by GC/FID	C-18	mg/Kg dry							115	**165**	**89.8**	**145**	**177**	**53**	**43.5**	**47**	**175**	**381**	**365**	101	**52.4**	**311**	**46.4**	**1040**	**44**	**57.1**	**317**	**1580**	**459**	**77.7**	**745**	**380**
	Saturated Hydrocarbons by GC/FID	C-19	mg/Kg dry							116																										
	Saturated Hydrocarbons by GC/FID	C-21	mg/Kg dry							117																										
	Saturated Hydrocarbons by GC/FID	C-22	mg/Kg dry							118																										
	Saturated Hydrocarbons by GC/FID	C-23	mg/Kg dry							119																										
	Saturated Hydrocarbons by GC/FID	C-24	mg/Kg dry							120																										
	Saturated Hydrocarbons by GC/FID	C-25	mg/Kg dry							121																										
	Saturated Hydrocarbons by GC/FID	C-26	mg/Kg dry							122																										
	Saturated Hydrocarbons by GC/FID	C-27	mg/Kg dry							123																										
	Saturated Hydrocarbons by GC/FID	C-28	mg/Kg dry							124																										
	Saturated Hydrocarbons by GC/FID	C-29	mg/Kg dry							125																										
	Saturated Hydrocarbons by GC/FID	C-30	mg/Kg dry							126																										
	Saturated Hydrocarbons by GC/FID	C-31	mg/Kg dry							127																										
	Saturated Hydrocarbons by GC/FID	C-32	mg/Kg dry							128																										
	Saturated Hydrocarbons by GC/FID	C-33	mg/Kg dry							129																										
	Saturated Hydrocarbons by GC/FID	C-34	mg/Kg dry							130																										
	Saturated Hydrocarbons by GC/FID	C-35	mg/Kg dry							131																										
	Saturated Hydrocarbons by GC/FID	C-36	mg/Kg dry							132																										
	Saturated Hydrocarbons by GC/FID	C-37	mg/Kg dry							133																										
	Saturated Hydrocarbons by GC/FID	C-38	mg/Kg dry							134																										
	Saturated Hydrocarbons by GC/FID	C-39	mg/Kg dry							135																										
	Saturated Hydrocarbons by GC/FID	C-40	mg/Kg dry							136																										
	Saturated Hydrocarbons by GC/FID	C-8	mg/Kg dry							137																										
	Saturated Hydrocarbons by GC/FID	C-9	mg/Kg dry							138																										
638-36-8	Saturated Hydrocarbons by GC/FID	Phytane	mg/Kg dry	34.53						141	**85.3**	**75.6**	**564**	**938**	**56.8**	**38.1**	**21.2**	**141**	**12600**	**2750**	**64100**	**46.6**	**228**	**34.2**	**10900**	**37.9**	**51.6**	**2520**	**20400**	**2640**	**184**	**13200**	**3730**
1921-70-6	Saturated Hydrocarbons by GC/FID	Pristane	mg/Kg dry	32.65						142	**160**	**56.5**	**584**	**1220**	**59.5**	**31.1**	**16.4**	**157**	**16800**	**3090**	**70600**	**41.4**	**354**	**31.4**	**12900**	**33.2**	**40.8**	**3330**	**22900**	**4510**	**201**	**16600**	**3760**
TOC	Classical Chemistry	Total Organic Carbon (Average)	mg/kg							145	**50000**	**35000**	**54700**	**47200**	**16700**	**8380**	**30500**	**75600**	**73800**	**70600**		**2590**	**40300**	**3140**	**172000**	**3190**	**16600**	**54600**	**91600**	**70800**	**14800**	**158000**	**63700**
	TPAH16										13788.8	2488.2	60747	70332	6716	22.3	36.05	109134	141100	460970	21640600	1725.35	13333	89.4	18086700	291.21	10.73	66229	2148000	502460	12733.2	3339800	260670
	TPAH34										29652.9	5116.9	78212	99250	10192.9	311	871.32	147360	216337	876822	37405900	2729.8	24670	141.49	23473190	404.36	658.3	100018	3065490	647230	21767	5074310	519450
	TPAH51										35387	5999.1	85997.3	110632	11360.6	334.91	900.64	160056	245480	1010352	46047300	3226.56	29014.4	159	27228420	538.07	678.32	113207	3415710	708867	24623.4	5605830	593753
	LPAH										1783.5	526.8	19319	13871	2093.3	15.45	22.16	13117	41647	263600	19135000	1217.3	3708	33.26	13852500	359.6	8.06	19005	1070900	162770	4804	1641940	100950
	HPAH										12081	1989.1	41580	56665	4687.2	6.85	13.89	96290	100180	203050	6115600	679.05	10026	56.14	5864200	2.91	2.67	47609	1090300	342910	8041.2	1705700	161900

(does not include source area samples collected in 2017)

Attachment B. Complete Sediment Data Set
Amesbury Former MGP
Amesbury, Massachusetts

CAS Number	Method Name	Analyte	Units	RT		PAH17	PAH34	PAH51	Abbrev	PAH #	River	River	River	River	River	Mudflat	Mudflat	River	River	River	River	River	River	River	River	River	River	River	River	River
Sample No.											F190051-04	F190051-05	F190051-06	F190051-07	F190051-08	F190051-09	F190051-10	F190052-01	F190052-02	F190052-03	F190052-04	F190052-05	F190052-06	F190052-07	F190052-08	F190052-09	F190052-10	F190052-11	F190052-12	F190056-01	F190056-02	F190056-03	F190056-04
Sample Date:											09/26/2019	09/26/2019	09/26/2019	09/26/2019	09/26/2019	09/26/2019	09/26/2019	09/27/2019	09/27/2019	09/27/2019	09/27/2019	09/27/2019	09/27/2019	09/27/2019	09/27/2019	09/27/2019	09/27/2019	09/27/2019	09/27/2019	11/11/2019	11/11/2019	11/11/2019	11/11/2019
Sample Time:											11:30	13:01	13:14	13:53	16:22	16:45	16:49	10:08	10:21	10:28	11:31	11:34	11:34	12:22	12:45	12:48	12:52	13:16	13:22	10:30	10:32	11:27	11:31
ClieSam											SS700-S5	SS701-S2	SS701-S4	SS702-S3	SS703-S3	SS704-S2	SS704-S4	SS705-S1	SS705-S2	SS705-S3	SS706-S1	SS706-S2	SS706-S3	SS707-S3	SS708-S1	SS708-S2	SS708-S3	SS709-S1	SS709-S3	SS710-S1	SS710-S2	SS711-S1	SS711-S2
Depths:											4.9 to 5.1	1.9 to 2.1	5.1 to 5.3	3.9 to 4.1	5.9 to 6.1	0.9 to 1.1	2.9 to 3.1	0 to 0.5	4.9 to 5.1	7.1 to 7.2	0 to 0.5	4.3 to 4.4	6.3 to 6.5	3.9 to 4.1	0 to 0.5	5.4 to 5.6	6.4 to 6.5	0 to 0.5	4.6 to 4.8	1.9 to 2.4	3.0 to 3.1	0.0 to 0.9	2.0 to 2.1
RAH																																
%solids											72	66	72	58	60	73	78	75	63	79	59	64	68	83	75	76	79	41	83	69	58	54	29
											5.22		5.39				4.84							3.78					3.95				13.3
		Max RL for ND PAHs=								1																						
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzo(b)thiophenes	ug/Kg dry	17					C1BT	2	0	4870	0	518	5470	271	0	13.3	31500	6.58	118	183000	1200	2.25	19.2	120000	9.18	30.5	2.28	3490	12.9	13.8	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzo(b)thiophenes	ug/Kg dry	18					C2BT	3	0	5910	2.75	990	8830	868	0	18.3	31100	7.88	125	196000	1280	0	28.9	104000	9.79	43.8	0	8760	19.4	25.4	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzo(b)thiophenes	ug/Kg dry	19					C3BT	4	0	3020	0	742	6070	812	0	14.6	15400	4.98	59.5	94200	565	0	19.8	40300	5.42	30.5	0	6130	10.6	18.9	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzo(b)thiophenes	ug/Kg dry	20					C4BT	5	0	816	0	306	2010	398	0	12.3	3890	2.62	30.2	21500	102	0	15	8830	2.52	35.2	0	1960	6.17	16.5	0
91-20-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Naphthalene**	ug/Kg dry	21.86	L	x	x	x	NA	6	0	183000	15.5	16500	272000	3950	0	115	3090000	196	6090	9480000	46600	4.79	274	9250000	281	165	3.17	19800	175	93	0
91-57-6	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylnaphthalene	ug/Kg dry	24.57	L	x		x	2MN	7	2.74	111000	17.4	6100	170000	1960	0	71	1560000	124	3020	5080000	17300	3.82	124	3360000	128	103	2.47	9220	138	58.8	0
90-12-0	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylnaphthalene	ug/Kg dry	25				x	1MN	8	0	96200	17	18500	251000	3660	0	67.4	1040000	91.3	2130	3280000	37100	2.96	117	2130000	80.7	63.7	0	107000	105	52.8	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Naphthalenes	ug/Kg dry	24.57			x	x	C1N	9	2.91	127000	21.2	14700	255000	3370	0	86.3	1610000	133	3190	5180000	33000	4.41	146	3390000	130	105	3.17	68000	149	69.6	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Naphthalenes	ug/Kg dry	27.02			x	x	C2N	10	7.86	87200	31.2	24100	212000	8960	4.61	179	741000	100	1880	2770000	26900	5.87	259	1700000	93.7	239	7.45	159000	274	199	31
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Naphthalenes	ug/Kg dry	29.76			x	x	C3N	11	7.27	28100	17.5	12400	98700	6680	3.8	147	258000	39.4	644	936000	7820	4.58	192	560000	40.8	290	3.3	79100	208	215	16.6
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Naphthalenes	ug/Kg dry	32.52			x	x	C4N	12	6.86	7310	6.89	4840	30300	2790	3.05	82.7	62500	11.4	206	206000	1550	3.13	107	128000	13.8	366	2.49	26800	118	157	21.9
92-52-4	8270D (SIM) Semi-Volatile Organic Compou0s	Biphenyl	ug/Kg dry	26.46					BP	13	0	28200	6.93	3090	22900	877	0	27.4	401000	45.8	803	1470000	5370	2.29	44.5	930000	48.3	57	2.5	3480	49.9	41.6	10.4
208-96-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Acenaphthylene**	ug/Kg dry	28.16	L	x	x	x	ACE	14	27.3	14500	14.1	5370	14400	6030	12.4	262	77900	19.8	466	371000	854	9.24	306	256000	9.49	555	4.71	23000	167	340	20.9
83-32-9	8270D (SIM) Semi-Volatile Organic Compou0s	**Acenaphthene**	ug/Kg dry	28.89	L	x	x	x	ACY	15	3.99	269000	68.4	46200	287000	20900	4.03	288	2200000	284	5010	7630000	51500	7.79	446	4890000	242	203	4.92	330000	306	249	6.72
132-64-9	8270D (SIM) Semi-Volatile Organic Compou0s	Dibenzofuran	ug/Kg dry	29.54				x	DBF	16	0	8870	3.87	2530	10700	5660	0	103	74900	10.2	296	321000	2310	0	129	221000	14.6	70.8	0	14000	75.9	56.1	0
86-73-7	8270D (SIM) Semi-Volatile Organic Compou0s	**Fluorene**	ug/Kg dry	30.91	L	x	x	x	FLE	17	5.6	86700	33.7	22300	99600	16700	4.15	220	768000	109	1890	2850000	17300	4.81	352	1820000	129	174	3.37	151000	205	182	12.9
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Fluorenes	ug/Kg dry	33.14			x	x	C1FL	18	13.4	24100	15.9	9140	59300	4460	3.78	121	213000	31.2	527	819000	4860	3.65	151	520000	34.4	167	4.2	82600	144	182	11.7
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Fluorenes	ug/Kg dry	35.22			x	x	C2FL	19	14.6	9960	10.1	6050	38200	2980	3.79	144	102000	16.7	292	341000	1800	3.03	141	223000	19.4	273	3.46	39200	173	184	28.9
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Fluorenes	ug/Kg dry	38.01			x	x	C3FL	20	6.05	4640	3.89	3420	15300	3280	3.1	261	31800	7.88	280	107000	695	0	220	73600	10.3	417	2.71	14000	117	183	16.2
132-65-0	8270D (SIM) Semi-Volatile Organic Compou0s	Dibenzothiophene	ug/Kg dry	34.23				x	DBT	21	0	27900	13.1	7180	27700	6110	0	187	172000	29.3	669	931000	3900	0	221	600000	50	130	0	56500	80.3	125	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Dibenzothiophenes	ug/Kg dry	36.43				x	C1DBT	22	3.31	16400	9.11	6030	27700	4330	0	247	107000	20.5	433	560000	1910	2.13	187	353000	30.1	239	0	48100	90.7	150	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Dibenzothiophenes	ug/Kg dry	37.7				x	C2DBT	23	3.77	8940	5.98	4680	20500	3990	2.5	221	58200	15.5	304	264000	901	2.43	182	161000	15	508	2.17	28600	92	222	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Dibenzothiophenes	ug/Kg dry	39.5				x	C3DBT	24	2.67	3930	3.04	2390	9480	2660	0	117	22300	8.64	161	86300	355	0	118	49100	5.78	585	0	10500	52.9	200	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Dibenzothiophenes	ug/Kg dry	41.65				x	C4DBT	25	0	1430	0	894	3000	1300	0	53.2	8560	4.24	77.6	23300	134	0	72.4	13500	3.11	400	0	3450	32.8	123	0
85-01-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Phenanthrene**	ug/Kg dry	34.72	L	x	x	x	PHE	26	12	568000	213	139000	466000	133000	13.6	2430	2910000	520	9460	11500000	53200	15.7	2930	7810000	671	1420	11.3	665000	1170	1750	15.5
120-12-7	8270D (SIM) Semi-Volatile Organic Compou0s	**Anthracene**	ug/Kg dry	34.91	L	x	x	x	ANT	27	9.01	128000	44	39000	122000	32500	4.27	657	1200000	265	2800	4230000	11100	11.6	860	2080000	84.8	641	2.67	200000	432	709	7.88
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Phenanthrenes/Anthracenes	ug/Kg dry	36.96				x	C1PH	28	36.8	113000	68.7	50900	226000	28000	10.3	1550	916000	163	3180	3430000	15100	12.1	1230	2170000	194	1310	8.1	299000	1160	1250	26.1
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Phenanthrenes/Anthracenes	ug/Kg dry	38.97				x	C2PH	29	29.6	31600	26.3	20900	95100	12600	4.96	753	250000	50.7	1170	932000	4160	6.54	621	605000	44.1	1190	4.63	102000	687	722	13.3
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Phenanthrenes/Anthracenes	ug/Kg dry	40.8				x	C3PH	30	10.7	8280	7.79	6960	30400	4920	3.4	358	74100	13.6	351	197000	1210	3.78	259	130000	6.64	759	6.38	26800	317	340	11.9
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Phenanthrenes/Anthracenes	ug/Kg dry	41.72				x	C4PH	31	4.6	2640	3.37	2400	11100	1980	0	89.4	21900	4.85	116	50500	523	3.53	117	34900	4.56	378	3.58	7740	209	158	28.5
483-65-8	8270D (SIM) Semi-Volatile Organic Compou0s	Retene	ug/Kg dry	41.72				x	RET	32	3.58	1160	3.06	1100	11400	397	13	40.8	4320	3.03	64.2	14700	542	9.58	38.4	14300	4.56	63	10.7	1070	411	60	61.6
239-35-0	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)naphtho(2,1-d)thiophene	ug/Kg dry	44.24					BNT	33	0	9020	3.89	4090	8740	4770	0	231	59100	8.74	380	266000	679	0	242	172000	3.29	342	0	20700	104	255	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C0-Benzonaphthothiophenes	ug/Kg dry	44.24					C0BNT	34	3.25	16600	7.71	7450	15700	9090	0	429	101000	15.8	702	488000	1270	2.45	446	317000	7.3	633	0	37900	217	476	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzonaphthothiophenes	ug/Kg dry	45.63					C1BNT	35	2.83	7320	4.91	3550	10500	4280	0	277	37200	14.7	345	187000	669	2.44	245	124000	6.04	502	8.97	19100	137	322	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzonaphthothiophenes	ug/Kg dry	47.14					C2BNT	36	0	3150	2.85	1840	5460	2650	0	193	14400	6.78	235	62600	392	2.04	213	40400	3.54	492	0	7560	96.5	232	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzonaphthothiophenes	ug/Kg dry	49.02					C3BNT	37	0	2480	0	1330	2890	1670	0	142	11100	4.13	195	46700	270	0	181	28900	4.56	418	0	4350	65.1	173	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzonaphthothiophenes	ug/Kg dry	51.51					C4BNT	38	0	534	0	302	589	534	0	75.8	1710	4.85	104	6950	75.9	0	99.8	4320	4.56	195	0	799	18.5	74.4	0
206-44-0	8270D (SIM) Semi-Volatile Organic Compou0s	**Fluoranthene**	ug/Kg dry	39.51	H	x	x	x	FLA	39	18.1	245000	95	106000	166000	130000	11.3	3090	1100000	206	6620	4630000	14200	13.5	3650	2790000	233	3540	5.91	310000	2170	3160	19.4
129-00-0	8270D (SIM) Semi-Volatile Organic Compou0s	**Pyrene**	ug/Kg dry	40.39	H	x	x	x	PYR	40	75.2	368000	139	144000	244000	139000	15.3	3420	1590000	304	7660	6910000	19600	17.9	3440	4090000	360	4570	12.4	467000	2730	3860	25.3
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Fluoranthenes/Pyrenes	ug/Kg dry	41.78				x	C1PY	41	65.5	106000	60.9	51200	141000	33500	18.1	1640	936000	136	3080	3160000	8690	21.4	1430	1680000	85.4	2710	12.8	239000	1670	2260	40.2
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Fluoranthenes/Pyrenes	ug/Kg dry	43.52				x	C2PY	42	37	21700	17.3	12800	44700	12300	6.09	1000	195000	29.3	1090	570000	2290	7.72	773	374000	8.59	1150	3.81	58400	656	834	14.4
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Fluoranthenes/Pyrenes	ug/Kg dry	45.72				x	C3PY	43	10.6	6040	7.7	4290	16700	5210	2.83	469	36100	9.51	450	122000	936	3.77	383	86100	3.47	622	2.36	15000	306	352	12.9
243-17-4	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)fluorene	ug/Kg dry	42.03				x	BbF	44	6.48	12600	6.6	6310	14000	4250	0	132	116000	15.2	370	419000	1050	2	157	203000	8.64	301	0	28900	177	285	0
205-12-9	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(c)fluorene	ug/Kg dry	42.07				x	BcF	45	4.4	5690	3.63	2940	7260	1850	0	63.4	47000	7.46	160	147000	516	3.78	86.6	95100	6.95	129	0	10200	95.7	101	0
3442-78-2	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylpyrene	ug/Kg dry	42.18				x	2MP	46	7.85	13900	7.78	6690	18300	4540	0	260	116000	17	420	400000	1140	2.27	194	227000	9.98	382	0	31000	234	317	0
3353-12-6	8270D (SIM) Semi-Volatile Organic Compou0s	4-Methylpyrene	ug/Kg dry	42.55				x	4MP	47	7.3	11700	6.7	5730	16500	3670	0	231	97800	15.1	357	331000	954	2.62	163	179000	7.54	382	0	26300	224	296	0
2381-21-7	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylpyrene	ug/Kg dry	42.67				x	1MP	48	6.03	13100	7.07	6210	18400	3450	0	210	122000	17.5	339	434000	1060	2.06	136	206000	10.9	320	0	31700	185	255	0
56-55-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Benz(a)anthracene**	ug/Kg dry	45.17	H	x	x	x	BaA	49	18.3	78100	38.3	38700	72100	52400	5.8	1650	451000	90.8	2920	1970000	5810	8.49	1650	1240000	28.4	2390	3.67	143000	1200	1960	9.35
	8270D (SIM) Semi-Volatile Organic Compou0s	**Chrysene/triphenylene**	ug/Kg dry	45.36	H	x	x	x	CH	50	15.8	70300	36.4	39600	69900	54900	5.73	1740	478000	92.2	3060	2110000	5450	11.2	1740	1420000	22	2660	4.11	137000	1190	2060	9.81
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	46.81				x	C1CR	51	15.2	30100	20.1	16400	46500	14100	5.5	984	182000	38.3	1250	742000	2950	7.83	779	521000	8.12	1400	4.56	70400	831	1070	15
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	48.52				x	C2CR	52	10.4	9700	10.8	6600	20800	6710	0	525	56400	11.7	561	207000	1430	5.66	460	146000	4.55	800	2.65	24100	470	478	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	49.55				x	C3CR	53	0	3030	2.8	2540	7410	2950	0	231	15500	4.85	283	50000	652	0	255	33100	4.56	443	0	6930	229	227	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	50				x	C4CR	54	0	1270	0	1100	2440	1630	0	119	5750	4.85	148	23400	349	0	141	14600	4.56	229	0	2480	103	108	0
205-99-2	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(b)fluoranthene**	ug/Kg dry	49.23	H	x	x	x	BbF	55	6.08	41400	17.6	22200	27600	25000	4.28	1230	176000	39.2	1980	837000	3190	5.3	1390	468000	7.41	1900	0	63200	763	1500	0
	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(j/k)fluoranthene**	ug/Kg dry	49.29	H	x	x	x	BjF	56	8.03	50800	24	27700	37300	24800	5.56	1330	258000	57.1	2270	1120000	3780	6.73	1430	735000	9.62	2210	2.31	76300	832	1540	0
192-97-2	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(e)pyrene	ug/Kg dry	50.17			x	x	BeP	57	7.96	48400	21	24400	34000	22500	5.22	1110	224000	51.1	1910	1040000	3430	6.26	1180	643000	9.3	2050	2.78	74300	873	1560	0
50-32-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(a)pyrene**	ug/Kg dry	50.34	H	x	x	x	BaP	58	11.2	88500	35.1	41600	61700	53200	8.22	1610	427000	95.3	3010	1960000	5730	9.25	1710	1210000	15.4	3090	3.51	135000	1270	2350	8.61
198-55-0	8270D (SIM) Semi-Volatile Organic Compou0s	Perylene	ug/Kg dry	50.61			x	x	PE	59	10.7	14300	11.9	7420	9710	8280	206	390	73500	15.4	662	328000	1210	44.4	459	202000	4.82	929	39.1	23100	1130	796	955
193-39-5	8270D (SIM) Semi-Volatile Organic Compou0s	**Indeno(1,2,3-cd)pyrene**	ug/Kg dry	54	H	x	x	x	I123P	60	4.7	39400	15.3	20600	25000	20700	3.63	959	167000	40.9	1590	744000	2750	6.63	1080	444000	6.88	1730	2.62	55500	624	1200	0
53-70-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Dibenzo(a,h)anthracene**	ug/Kg dry	54.01	H	x	x	x	DBA	61	0	8030	3.6	4320	6280	4780	0	227	45400	8.86	351	198000	677	0	254	121000	4.56	375	0	14500	173	289	0
191-24-2	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(g,h,i)perylene**	ug/Kg dry	54.91	H	x	x	x	BGP	62	5.28	43600	16.2	21500	26800	20100	4.16	929	182000	43.5	1570	852000	2870	6.5	1010	507000	7.63	1830	2.48	62400	719	1300	0
191-07-1	8270D (SIM) Semi-Volatile Organic Compou0s	Coronene	ug/Kg dry	61.34				x	COR	63	4.21	12700	6.47	6270	7330	5270	3.28	232	55500	15.6	430	271000	757	5.9	254	155000	3.6	518	3.1	19600	186	338	0
526-73-8	8270D (SIM) Semi-Volatile Organic Compou0s	1,2,3-Trimethylbenzene	ug/Kg dry							64	5.22	797	0	162	2120	36.8	4.84	5.23	6920	4.85	21.4	23000	318	3.78	8.07	17500	4.56	12.8	3.95	280	5.4	8.95	13.3
95-63-6	8270D (SIM) Semi-Volatile Organic Compou0s	1,2,4-Trimethylbenzene	ug/Kg dry							65	5.22	1610	0	358	5050	113	4.84	12.2	15000	4.85	56.6	48500	1450	3.78	20.7	38300	4.56	26.4	3.95	631	33.5	16.2	13.3
108-67-8	8270D (SIM) Semi-Volatile Organic Compou0s	1,3,5-Trimethylbenzene	ug/Kg dry							66	5.22	454	0	143	1620	66.5	4.84	5.28	3990	4.85	15.3	13600	329	3.78	12.1	10100	4.56	9.57	3.95	245	12.9	5.46	13.3
	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methyldibenzothiophene	ug/Kg dry	36.76						67	5.22	1560	0	573	2650	438	4.84	30.3	9460	3.53	47.8	49700	178	3.78	23.8	29500	4.02	30.6	3.95	4280	7.66	16.5	13.3
	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylphenanthrene	ug/Kg dry	37.24						68	5.22	17600	10.3	8460	35700	4560	4.84	269	139000	25.1	497	498000	2310	3.78	195	326000	29.7	160	3.95	47000	96.3	145	13.3
	8270D (SIM) Semi-Volatile Organic Compou0s	2,3,5-Trimethylnaphthene	ug/Kg dry	30.44						69	5.22	1590	0	780	6400	496	4.84	10.8	14800	4.85	45.2	52300	479	3.78	16.1	37900	2.63	19	3.95	5300	17.8	15.2	13.3
581-42-0	8270D (SIM) Semi-Volatile Organic Compou0s	2,6-Dimethylnaphthalene	ug/Kg dry	27.07						70	5.22	16100	5.69	4740	42200	1570	4.84	49.1	141000	16.5	366	509000	5660	3.78	67.5	321000	18.3	67.6	3.95	32000	56.6	46	10.6
	8270D (SIM) Semi-Volatile Organic Compou0s	2/3-Methyldibenzothiophene	ug/Kg dry	36.31						71	5.22	5800	3.01	2070	9480	1430	4.84	83	38900	6.63	153	203000	674	3.78	62.4	131000	9.76	78.8	3.95	17200	31.1	53.1	13.3
	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylanthracene	ug/Kg dry	36.96						72	7.3	12900	6.66	5970	25700	3530	4.84	157	109000	17.7	390	403000	1590	1.99	148	251000	19.1	181	3.95	33000	179	177	13.3
	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylphenanthrene	ug/Kg dry	36.81						73	7.62	30000	18	13100	55900	7620	4.84	399	239000	40.9	850	911000	3960	2.78	336	595000	55.6	299	3.95	79800	260	321	13.3
	8270D (SIM) Semi-Volatile Organic Compou0s	3-Methylphenanthrene	ug/Kg dry	36.69						74	8.74	27600	17	11600	51500	6280	2.45	359	221000	38.1	775	842000	3830	3.01	283	548000	49.9	307	2.06	71400	290	281	13.3
	8270D (SIM) Semi-Volatile Organic Compou0s	4/9-Methylphenanthrene	ug/Kg dry	37.14						75	9.97	23500	15	11700	52600	6010	4.84	370	193000	34.6	658	691000	3210	2.57	263	426000	37.2	354	3.95	64500	324	315	13.3
	8270D (SIM) Semi-Volatile Organic Compou0s	4-Methyldibenzothiophene	ug/Kg dry	36.01						76	5.22	6620	3.59	2620	11800	1460	4.84	89.3	45000	8.49	168	227000	775	3.78	65.6	144000	12.2	90	3.95	20100	24.9	50.6	13.3
71-43-2	8270D (SIM) Semi-Volatile Organic Compou0s	Benzene	ug/Kg dry							77	4.91	404	4.28	296	333	122	5.14	58.5	1660	10.4	102	4580	197	7.88	48.7	5040	8.5	83.9	8.6	353	34.2	50.1	52.6

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Attachment B. Complete Sediment Data Set
Amesbury Former MGP
Amesbury, Massachusetts

											River	River	River	River	River	Mudflat	Mudflat	River	River	River	River	River	River	River	River	River	River	River	River	River
										Sample No.	F190051-04	F190051-05	F190051-06	F190051-07	F190051-08	F190051-09	F190051-10	F190052-01	F190052-02	F190052-03	F190052-04	F190052-05	F190052-06	F190052-07	F190052-08	F190052-09	F190052-10	F190052-11	F190052-12	F190056-01	F190056-02	F190056-03	F190056-04
										Sample Date:	09/26/2019	09/26/2019	09/26/2019	09/26/2019	09/26/2019	09/26/2019	09/26/2019	09/27/2019	09/27/2019	09/27/2019	09/27/2019	09/27/2019	09/27/2019	09/27/2019	09/27/2019	09/27/2019	09/27/2019	09/27/2019	09/27/2019	11/11/2019	11/11/2019	11/11/2019	11/11/2019
										Sample Time:	11:30	13:01	13:14	13:53	16:22	16:45	16:49	10:08	10:21	10:28	11:31	11:34	11:34	12:22	12:45	12:48	12:52	13:16	13:22	10:30	10:32	11:27	11:31
										ClieSam	SS700-S5	SS701-S2	SS701-S4	SS702-S3	SS703-S3	SS704-S2	SS704-S4	SS705-S1	SS705-S2	SS705-S3	SS706-S1	SS706-S2	SS706-S3	SS707-S3	SS708-S1	SS708-S2	SS708-S3	SS709-S1	SS709-S3	SS710-S1	SS710-S2	SS711-S1	SS711-S2
										Depths:	4.9 to 5.1	1.9 to 2.1	5.1 to 5.3	3.9 to 4.1	5.9 to 6.1	0.9 to 1.1	2.9 to 3.1	0 to 0.5	4.9 to 5.1	7.1 to 7.2	0 to 0.5	4.3 to 4.4	6.3 to 6.5	3.9 to 4.1	0 to 0.5	5.4 to 5.6	6.4 to 6.5	0 to 0.5	4.6 to 4.8	1.9 to 2.4	3.0 to 3.1	0.0 to 0.9	2.0 to 2.1
										RAH																							
										%solids	72	66	72	58	60	73	78	75	63	79	59	64	68	83	75	76	79	41	83	69	58	54	29
CAS Number	Method Name	Analyte	Units	RT		PAH17	PAH34	PAH51	Abbrev	PAH #	5.22		5.39				4.84							3.78					3.95				13.3
11095-43-5	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)thiophene	ug/Kg dry							78	5.22	3110	0	371	2050	256	4.84	5.4	35700	2.93	103	177000	2030	3.78	14.1	163000	8.72	8.15	3.95	797	6.67	5.18	13.3
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzene	ug/Kg dry							79	5.22	392	0	1070	1410	314	3.53	66.7	1540	2.7	138	3470	275	5.03	87.3	3180	4.56	258	5.63	512	120	99.2	98.9
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Decalins	ug/Kg dry							80	5.22	1110	0	392	1960	952	4.84	9.87	2300	4.85	39.4	8450	110	3.78	75.2	5070	4.56	1340	3.95	978	25.5	502	13.3
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzenes	ug/Kg dry							81	5.22	914	0	434	2880	200	3.22	87.5	9230	2.92	183	29300	1380	3.21	102	37000	3.7	458	3.48	449	77.9	102	93.2
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Decalins	ug/Kg dry							82	5.22	1400	0	742	3560	974	4.84	12.5	5610	4.85	35.8	18300	168	3.78	59	11300	4.56	691	3.95	2030	39.4	182	13.3
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzenes	ug/Kg dry							83	5.22	2580	0	611	8190	209	4.84	26.2	26800	4.06	108	81200	2390	3.78	40.9	64100	4.41	203	3.95	1170	50.1	36.4	14.7
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Decalins	ug/Kg dry							84	5.22	1280	0	686	3390	684	4.84	9.58	5790	4.85	31.3	16700	143	3.78	44.3	11100	4.56	360	3.95	2180	28.6	89.6	13.3
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzenes	ug/Kg dry							85	5.22	5660	0	1130	19500	335	4.84	20.2	52300	4.98	127	180000	3090	3.78	37.9	109000	3.72	78.2	3.95	5160	52.3	59	21
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Decalins	ug/Kg dry							86	5.22	1670	0	977	4580	883	4.84	21	9180	4.85	30.2	24200	193	3.78	75.3	17200	4.56	696	3.95	3490	29.1	140	13.3
	8270D (SIM) Semi-Volatile Organic Compou0s	C5-Benzenes	ug/Kg dry							87	5.22	2250	0	695	10100	469	4.84	11.9	19100	4.12	59.2	67800	1140	3.78	30	33800	4.56	55.9	3.95	4000	26.6	57.4	13.5
86-74-8	8270D (SIM) Semi-Volatile Organic Compou0s	Carbazole	ug/Kg dry	35.61						88	5.22	1270	0	526	1490	4180	4.84	144	10600	4.85	302	68000	572	3.78	226	48100	7.11	134	3.95	537	71.7	117	13.3
493-01-6	8270D (SIM) Semi-Volatile Organic Compou0s	cis-Decalin	ug/Kg dry							89	5.22	83.5	0	25.9	169	61.9	4.84	4.36	196	4.85	30.2	598	10.9	3.78	5.22	358	4.56	110	3.95	102	6.39	54.7	13.3
100-41-4	8270D (SIM) Semi-Volatile Organic Compou0s	Ethylbenzene	ug/Kg dry							90	5.22	877	0	231	3190	63.5	4.84	8.95	12700	4.85	51.8	43300	1400	3.78	19.4	49900	2.65	141	3.95	324	14.2	13.2	13.3
98-82-8	8270D (SIM) Semi-Volatile Organic Compou0s	Isopropylbenzene	ug/Kg dry							91	5.22	299	0	53.9	715	25.7	4.84	4.36	3900	4.85	30.2	9440	233	3.78	4.84	7680	4.56	345	3.95	68.6	6.39	6.36	13.3
	8270D (SIM) Semi-Volatile Organic Compou0s	m,p-Xylene	ug/Kg dry							92	5.22	672	0	494	2040	249	4.38	142	3720	4.85	265	9200	1080	4.02	156	16100	4.56	686	3.59	360	113	165	148
108-87-2	8270D (SIM) Semi-Volatile Organic Compou0s	Methylcyclohexane	ug/Kg dry							93	5.22	201	0	81.9	306	131	4.84	8.33	74.3	4.85	30.2	192	88	3.78	26.9	82.8	4.56	10.3	3.95	57.9	22.4	6.36	13.3
104-51-8	8270D (SIM) Semi-Volatile Organic Compou0s	n-Butylbenzene	ug/Kg dry							94	5.22	75.1	0	33.9	89.6	41.1	4.84	6.79	99.1	4.85	17.4	332	7.53	3.78	9.01	158	4.56	29.3	3.95	26.6	7.21	17.1	13.3
103-65-1	8270D (SIM) Semi-Volatile Organic Compou0s	n-Propylbenzene	ug/Kg dry							95	5.22	157	0	39.8	472	25.8	4.84	5.76	1260	4.85	30.2	2930	244	3.78	6.7	2400	4.56	37.1	3.95	51.7	4.34	7.61	13.3
95-47-6	8270D (SIM) Semi-Volatile Organic Compou0s	o-Xylene	ug/Kg dry							96	5.22	328	0	104	652	49.3	4.84	8.42	3130	4.85	24.5	9900	428	3.78	14	12400	4.56	29	3.95	59.4	11.1	11.7	13.3
99-87-6	8270D (SIM) Semi-Volatile Organic Compou0s	p-Isopropyltoluene	ug/Kg dry							97	5.22	758	0	123	2380	36.1	4.84	4.85	5750	4.85	16.3	14700	198	3.78	7.15	10100	4.56	22.7	3.95	241	29.7	8.22	11.7
135-98-8	8270D (SIM) Semi-Volatile Organic Compou0s	sec-Butylbenzene	ug/Kg dry							98	5.22	44.1	0	33.9	119	25.7	4.84	4.36	172	4.85	30.2	578	21.2	3.78	4.84	379	4.56	9.51	3.95	28.1	6.39	6.36	13.3
100-42-5	8270D (SIM) Semi-Volatile Organic Compou0s	Styrene	ug/Kg dry							99	5.22	558	0	278	1180	209	4.84	37.6	4020	19	48	10700	45.6	3.78	35.4	7770	9.42	975	25.3	898	23.8	48.9	13
98-06-6	8270D (SIM) Semi-Volatile Organic Compou0s	t-Butylbenzene	ug/Kg dry							100	5.22	75.1	0	33.9	89.6	25.7	4.84	4.36	99.1	4.85	30.2	6440	7.53	3.78	4.84	158	4.56	9.51	3.95	26.6	6.39	6.36	13.3
108-88-3	8270D (SIM) Semi-Volatile Organic Compou0s	Toluene	ug/Kg dry							101	3.66	529	0	1530	1790	439	5.06	96.3	2540	3.91	202	5810	405	7.69	127	5210	3	383	6.67	771	181	152	151
493-02-7	8270D (SIM) Semi-Volatile Organic Compou0s	trans-Decalin	ug/Kg dry							102	5.22	425	0	89.9	499	353	4.84	4.8	513	4.85	21.8	1890	45.9	3.78	42.8	1150	4.56	509	3.95	290	10.1	440	13.3
3891-98-3	Saturated Hydrocarbons by GC/FID	2,6,10-trimethyldodecane (1380)	mg/Kg dry							103	5.22	1910	0	806	3180	1370	4.84	10.6	5800	4.85	37.7	22200	186	3.78	48.5	11500	4.56	663	3.95	3100	22.6	122	9.65
3892-00-0	Saturated Hydrocarbons by GC/FID	2,6,10-trimethylpeadecane (1650)	mg/Kg dry							104	18.3	2630	8.23	1980	6180	2090	13.1	23	11900	12.5	70	37900	318	8.62	71.8	23300	11.8	1380	10.5	7910	71.7	199	30
3891-99-4	Saturated Hydrocarbons by GC/FID	2,6,10-trimethyltridecane (1470)	mg/Kg dry							105	4.29	2650	3.1	1470	5490	1910	3.46	25.7	10900	5.99	82.2	39200	357	3.45	83.2	22500	5.6	1120	4.22	5650	68.6	217	35.6
	Classical Chemistry	Black Carbon (Average)	mg/kg							106																							
	Saturated Hydrocarbons by GC/FID	C-10	mg/Kg dry							107																							
	Saturated Hydrocarbons by GC/FID	C-11	mg/Kg dry							108																							
	Saturated Hydrocarbons by GC/FID	C-12	mg/Kg dry							109																							
	Saturated Hydrocarbons by GC/FID	C-13	mg/Kg dry							110																							
	Saturated Hydrocarbons by GC/FID	C-14	mg/Kg dry							111																							
	Saturated Hydrocarbons by GC/FID	C-15	mg/Kg dry							112																							
	Saturated Hydrocarbons by GC/FID	C-16	mg/Kg dry							113																							
	Saturated Hydrocarbons by GC/FID	C-17	mg/Kg dry							114	70	436	29.5	532	613	445	50	125	99.1	42.2	210	332	327	32.8	159	158	43.2	319	39.4	1480	178	194	189
	Saturated Hydrocarbons by GC/FID	C-18	mg/Kg dry							115	50.9	393	21.8	539	595	353	35.9	67.8	99.1	34.3	106	332	145	23.7	95.9	158	33.4	271	29.1	746	110	105	127
	Saturated Hydrocarbons by GC/FID	C-19	mg/Kg dry							116																							
	Saturated Hydrocarbons by GC/FID	C-21	mg/Kg dry							117																							
	Saturated Hydrocarbons by GC/FID	C-22	mg/Kg dry							118																							
	Saturated Hydrocarbons by GC/FID	C-23	mg/Kg dry							119																							
	Saturated Hydrocarbons by GC/FID	C-24	mg/Kg dry							120																							
	Saturated Hydrocarbons by GC/FID	C-25	mg/Kg dry							121																							
	Saturated Hydrocarbons by GC/FID	C-26	mg/Kg dry							122																							
	Saturated Hydrocarbons by GC/FID	C-27	mg/Kg dry							123																							
	Saturated Hydrocarbons by GC/FID	C-28	mg/Kg dry							124																							
	Saturated Hydrocarbons by GC/FID	C-29	mg/Kg dry							125																							
	Saturated Hydrocarbons by GC/FID	C-30	mg/Kg dry							126																							
	Saturated Hydrocarbons by GC/FID	C-31	mg/Kg dry							127																							
	Saturated Hydrocarbons by GC/FID	C-32	mg/Kg dry							128																							
	Saturated Hydrocarbons by GC/FID	C-33	mg/Kg dry							129																							
	Saturated Hydrocarbons by GC/FID	C-34	mg/Kg dry							130																							
	Saturated Hydrocarbons by GC/FID	C-35	mg/Kg dry							131																							
	Saturated Hydrocarbons by GC/FID	C-36	mg/Kg dry							132																							
	Saturated Hydrocarbons by GC/FID	C-37	mg/Kg dry							133																							
	Saturated Hydrocarbons by GC/FID	C-38	mg/Kg dry							134																							
	Saturated Hydrocarbons by GC/FID	C-39	mg/Kg dry							135																							
	Saturated Hydrocarbons by GC/FID	C-40	mg/Kg dry							136																							
	Saturated Hydrocarbons by GC/FID	C-8	mg/Kg dry							137																							
	Saturated Hydrocarbons by GC/FID	C-9	mg/Kg dry							138																							
638-36-8	Saturated Hydrocarbons by GC/FID	Phytane	mg/Kg dry	34.53						141	55.9	4250	24.5	4060	9250	3300	38.4	64.8	16500	30.5	161	49000	506	24.9	183	26800	31.1	2480	28.4	13100	146	486	98.7
1921-70-6	Saturated Hydrocarbons by GC/FID	Pristane	mg/Kg dry	32.65						142	44.1	5460	21.8	4380	11700	4830	31.3	59.1	21200	25.6	151	62500	565	19.5	184	35100	22.8	3180	23.6	16900	133	518	69.8
TOC	Classical Chemistry	Total Organic Carbon (Average)	mg/kg							145	4110	205000	2270	101000	112000	172000	8680	7800	295000	2440	31700	212000	91500	4760	18600	110000	4800	51300	2590	97400	44000	65100	149000
	TPAH16										220.59	2282330	809.2	734590	1997680	737960	102.43	20157	15120300	2371.66	56747	57392000	244611	139.43	22522	39131000	2112.19	27453	67.15	2852700	14126	22542	136.37
	TPAH34										471	2938960	1149.54	1000060	3330940	907650	378.04	28927.4	20893750	3205.59	76477	77910900	360940	275.6	30669	51905200	2825.2	41508	178.51	4197250	22988	32700.6	1352.67
	TPAH51										570.94	3312220	1285.35	1100704	4005610	978257	405.74	32632.2	24726430	3638.97	87247.8	91165200	434095	326.64	34004.4	60332300	3216.72	47474.5	203.12	4696790	26130.3	36526.3	1441.57
	LPAH										60.64	1360200	406.1	274470	1431000	215040	38.45	4043	11805900	1517.8	28736	41141000	197854	57.75	5292	29466000	1545.29	3261	32.61	1398020	2593	3381.8	63.9
	HPAH										162.69	1033130	420.5	466220	736680	524880	63.98	16185	4874400	977.86	31031	21331000	64057	85.5	17354	13025000	694.9	24295	37.01	1463900	11671	19219	72.47

(does not include source area samples collected in 2017)

Attachment B. Complete Sediment Data Set
Amesbury Former MGP
Amesbury, Massachusetts

											River	River	River	River	River	River	River	River	Mudflat	River	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	River	River	River	River	River	River
										Sample No.	F190056-05	F190056-06	F190058-05	F190059-01	F190059-02	F190058-06	F190056-07	F190056-08	F190056-09	F190056-10	F190056-11	F190056-12	F190057-05	F190057-06	F190057-07	F190057-08	F190057-09	F190059-03	F190057-03	F190057-04	F190057-04	F190059-05	F190059-06
										Sample Date:	11/11/2019	11/11/2019	11/15/2019	11/14/2019	11/14/2019	11/15/2019	11/11/2019	11/11/2019	11/11/2019	11/11/2019	11/11/2019	11/11/2019	11/12/2019	11/12/2019	11/12/2019	11/12/2019	11/12/2019	11/14/2019	11/12/2019	11/14/2019	11/12/2019	11/14/2019	11/14/2019
										Sample Time:	12:11	12:14	11:28	10:03	10:07	12:15	12:47	12:50	13:46	13:54	15:04	15:29	12:41	12:45	13:48	13:53	14:52	11:14	11:23	13:14	12:05	13:38	13:41
										ClieSam	SS712-S1	SS712-S2	SS713-S2	SS714-S3	SS714-S4	SS715-S2	SS716-S1	SS716-S2	SS717-S1	SS717-S3	SS718-S5	SS719-S1	SS720-S1	SS720-S2	SS721-S1	SS721-S2	SS722-S1	SS723-S1	SS724-S3	SS725-S2	SS726-S2	SS727-S2	SS727-S3
										Depths:	4.1 to 5.1	6.2 to 6.3	2.4 to 2.5	3.9 to 4.0	5.5 to 5.6	3.7 to 3.8	3.0 to 3.9	4.5 to 4.6	0.0 to 0.5	4.2 to 4.3	7.8 to 7.9	0.0 to 0.1	0.7 to 0.8	1.4 to 1.5	1.0 to 1.1	2.3 to 2.4	0.7 to 0.8	1.4 to 1.5	4.7 to 4.8	2.8 to 2.9	1.4 to 1.5	1.9 to 2.0	5.3 to 5.4
										RAH													RAH										
										%solids	54	83	79	55	53	40	65	48	56	65	80	52	57	64	67	48	70	73	67	75	47	39	54
CAS Number	Method Name	Analyte	Units	RT		PAH17	PAH34	PAH51	Abbrev	PAH #		4.09				10.7				5.27						8.62			4.81	4.92			
		Max RL for ND PAHs=								1																							
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzo(b)thiophenes	ug/Kg dry	17					C1BT	2	3390	2.98	102	7880	14	0	281	7.18	6.54	0	0	57	118	9.45	85.1	8.98	33	81.8	0	0	48.4	80	27.3
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzo(b)thiophenes	ug/Kg dry	18					C2BT	3	8510	4.1	33.4	14100	22.8	0	954	12.4	25	0	0	81	223	16.2	124	10.5	39.2	137	2.61	0	100	187	28.4
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzo(b)thiophenes	ug/Kg dry	19					C3BT	4	4850	2.93	21.2	9540	8.37	6.91	1010	6.69	15.2	0	0	49.4	327	8.1	164	8.18	42	103	2.59	0	55.8	159	20.4
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzo(b)thiophenes	ug/Kg dry	20					C4BT	5	1160	0	16.1	2850	6.17	0	415	8.02	5.53	0	0	17	312	5.5	147	0	23.7	63.5	0	0	53.2	102	12
91-20-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Naphthalene**	ug/Kg dry	21.86	L	x	x	x	NA	6	31700	42.7	98.6	192000	211	10.9	2520	20.2	8.24	0	0	620	1680	20.7	3440	5.37	704	1410	0	0	283	328	448
91-57-6	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylnaphthalene	ug/Kg dry	24.57	L	x		x	2MN	7	11900	27.5	52	110000	150	6.92	1570	17.6	7.05	0	0	252	896	16.7	954	4.57	311	1070	0	0	201	263	367
90-12-0	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylnaphthalene	ug/Kg dry	25				x	1MN	8	117000	24.8	1100	295000	75.9	7.47	7960	18.2	4.22	0	0	213	583	9.52	372	8.62	186	917	0	0	135	153	169
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Naphthalenes	ug/Kg dry	24.57			x	x	C1N	9	76500	32.3	33.3	242000	140	9.77	5660	22.3	7.24	0	0	287	914	16.7	830	5.32	306	1230	2.49	0	210	254	332
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Naphthalenes	ug/Kg dry	27.02			x	x	C2N	10	139000	58.1	249	348000	212	19.8	25200	56.4	142	10.7	5.71	534	1880	62.3	1630	29.7	507	1720	10.1	6.73	613	1480	547
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Naphthalenes	ug/Kg dry	29.76			x	x	C3N	11	53400	43	242	186000	190	11	20900	38.8	68.3	4.72	2.64	278	2670	60.2	2450	20.6	523	1250	6.81	3.97	547	2160	522
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Naphthalenes	ug/Kg dry	32.52			x	x	C4N	12	14800	20.5	183	58400	102	9.86	8560	27.3	30.6	3.38	0	128	2450	34.3	2180	10.6	342	928	4.11	3.03	561	1680	338
92-52-4	8270D (SIM) Semi-Volatile Organic Compou0s	Biphenyl	ug/Kg dry	26.46					BP	13	7440	7.15	17.4	45100	58.7	0	628	7.12	7.18	0	0	134	356	8.42	635	11.4	170	406	0	0	156	286	121
208-96-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Acenaphthylene**	ug/Kg dry	28.16	L	x	x	x	ACE	14	22300	19.1	255	26800	167	12.6	3160	45.3	30.8	9.65	4.75	2610	2170	34.6	16500	17.9	3710	2540	10.7	18.2	843	863	513
83-32-9	8270D (SIM) Semi-Volatile Organic Compou0s	**Acenaphthene**	ug/Kg dry	28.89	L	x	x	x	ACY	15	304000	64.1	1450	346000	150	11.7	16100	23.7	171	0	0	3440	2900	18.8	1400	5.1	751	3670	6.95	2.87	579	782	267
132-64-9	8270D (SIM) Semi-Volatile Organic Compou0s	Dibenzofuran	ug/Kg dry	29.54				x	DBF	16	12900	15.2	49.1	13400	48.2	0	1120	8.02	3.78	0	0	168	1390	15.3	233	0	416	2680	0	0	245	196	172
86-73-7	8270D (SIM) Semi-Volatile Organic Compou0s	**Fluorene**	ug/Kg dry	30.91	L	x	x	x	FLE	17	147000	37.1	173	165000	113	7.06	12600	23.1	8.66	0	0	1430	2600	28.5	1720	7.54	948	4110	5.53	4.2	544	786	354
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Fluorenes	ug/Kg dry	33.14			x	x	C1FL	18	44300	26	180	124000	138	8.7	13500	40.3	37.1	4.39	2.4	406	1470	24.6	3680	9.2	763	1510	5.69	4.29	311	638	443
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Fluorenes	ug/Kg dry	35.22			x	x	C2FL	19	22200	24.4	222	95200	186	15.2	12100	55.6	41.1	5.83	2.94	234	1870	28.2	4190	13.5	798	1630	5.55	5.15	516	896	537
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Fluorenes	ug/Kg dry	38.01			x	x	C3FL	20	8210	12.9	201	35800	110	13.4	5380	27.2	15.7	4.66	0	286	2030	25.3	2910	10.8	1030	1520	4.36	0	659	948	398
132-65-0	8270D (SIM) Semi-Volatile Organic Compou0s	Dibenzothiophene	ug/Kg dry	34.23				x	DBT	21	51100	12.8	140	38400	42.4	0	3400	8.36	12.6	0	0	1730	1720	10.4	2760	0	931	2240	2.79	0	356	380	113
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Dibenzothiophenes	ug/Kg dry	36.43				x	C1DBT	22	32600	15.8	193	58200	64.2	7.42	6180	17	20.6	0	0	857	1920	19.5	8140	7.78	1180	1470	4.46	0	467	691	165
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Dibenzothiophenes	ug/Kg dry	37.7				x	C2DBT	23	18000	15	237	46600	74.5	6.42	5570	18.2	11.6	0	0	435	2620	24.3	6730	8.6	1140	1790	5.83	0	699	1020	216
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Dibenzothiophenes	ug/Kg dry	39.5				x	C3DBT	24	6660	7.58	180	20800	46.2	10	2710	14.6	7.64	0	0	197	2450	17.8	2880	8.12	685	1170	4.57	0	880	1000	152
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Dibenzothiophenes	ug/Kg dry	41.65				x	C4DBT	25	2420	4.31	100	6470	30.1	7.13	1030	8.02	5.01	0	4.26	89.5	1660	14.3	998	5.56	287	499	2.76	0	595	680	106
85-01-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Phenanthrene**	ug/Kg dry	34.72	L	x	x	x	PHE	26	674000	203	2080	651000	582	22.6	64800	107	20.1	0	4.16	12700	19900	98.4	45500	29.8	14400	29400	33.2	4.18	4660	4520	1850
120-12-7	8270D (SIM) Semi-Volatile Organic Compou0s	**Anthracene**	ug/Kg dry	34.91	L	x	x	x	ANT	27	200000	72.2	648	195000	299	6.23	18400	42.8	18.9	0	4.26	4520	7380	43.5	40000	15	6870	11300	9.81	2.78	1450	1380	937
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Phenanthrenes/Anthracenes	ug/Kg dry	36.96				x	C1PH	28	200000	172	1430	482000	985	20.4	61300	181	86.7	6.8	3.28	3820	10500	122	55200	46.1	8300	8670	22.5	7.36	2500	3170	2820
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Phenanthrenes/Anthracenes	ug/Kg dry	38.97			x	x	C2PH	29	63300	114	987	236000	623	11.7	29500	152	66.5	3.88	0	1250	6160	118	21000	25.3	4180	6430	16.4	5.1	2060	2400	2160
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Phenanthrenes/Anthracenes	ug/Kg dry	40.8			x	x	C3PH	30	16000	42.1	487	72500	268	12.6	10300	68.4	26.6	2.89	0	366	3100	63	5530	15.1	1540	3300	6.08	3.2	1320	1410	1100
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Phenanthrenes/Anthracenes	ug/Kg dry	41.72			x	x	C4PH	31	4780	17.2	178	20000	126	23.7	2910	68.3	19.8	0	0	154	1560	59.6	1720	17	594	1150	3.82	0	663	680	564
483-65-8	8270D (SIM) Semi-Volatile Organic Compou0s	Retene	ug/Kg dry	41.72				x	RET	32	1390	12.7	44	3340	96.1	73.5	530	141	35.1	2.91	0	103	216	65.5	302	18.2	112	122	5.25	2.84	422	197	575
239-35-0	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)naphtho(2,1-d)thiophene	ug/Kg dry	44.24					BNT	33	18800	17.3	178	15000	71.1	0	2390	10.3	4.27	0	0	1260	1680	17.2	14100	8.62	1920	1940	0	0	714	520	217
	8270D (SIM) Semi-Volatile Organic Compou0s	C0-Benzonaphthothiophenes	ug/Kg dry	44.24					C0BNT	34	34000	36.8	337	25900	143	8.19	4330	23	9.95	0	0	2440	3270	38.1	26200	9.45	3550	3850	4.5	0	1370	979	491
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzonaphthothiophenes	ug/Kg dry	45.63					C1BNT	35	14300	22.6	248	22900	116	11.5	3270	19.4	9.35	0	0	707	2110	24.6	9650	8.57	1800	2130	3.68	0	746	836	424
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzonaphthothiophenes	ug/Kg dry	47.14					C2BNT	36	5470	14.5	226	11500	86.3	9.77	1810	20	7.83	0	0	347	2040	17.4	3130	17.7	937	1230	4.22	0	721	923	336
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzonaphthothiophenes	ug/Kg dry	49.02					C3BNT	37	3830	7.35	162	4890	64.2	0	927	8.02	5.33	0	0	350	1600	10.1	2580	6.06	707	719	0	0	600	805	227
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzonaphthothiophenes	ug/Kg dry	51.51					C4BNT	38	680	2.76	79.1	934	20.3	0	220	8.02	7.18	0	0	116	682	6.01	385	4.91	148	185	0	0	304	473	68.4
206-44-0	8270D (SIM) Semi-Volatile Organic Compou0s	**Fluoranthene**	ug/Kg dry	39.51	H	x	x	x	FLA	39	348000	293	2530	189000	1580	17.5	35500	121	92.2	3.11	3.49	16900	31800	205	171000	52.1	26100	27700	35.6	2.47	8620	6540	4130
129-00-0	8270D (SIM) Semi-Volatile Organic Compou0s	**Pyrene**	ug/Kg dry	40.39	H	x	x	x	PYR	40	530000	316	2580	278000	2230	18.7	52400	330	177	4.54	3.73	24400	38000	211	265000	60.2	35600	35200	55.3	3.79	9170	7130	6160
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Fluoranthenes/Pyrenes	ug/Kg dry	41.78			x	x	C1PY	41	195000	231	1840	279000	1520	21.5	38900	273	115	14.3	5.05	7900	14800	166	109000	53.1	16700	19000	28.1	20.5	4710	3750	5750
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Fluoranthenes/Pyrenes	ug/Kg dry	43.52				x	C2PY	42	39600	93.4	934	101000	630	19.5	15300	137	56.1	6.36	0	1570	5720	70.2	18400	26	5380	6250	12.8	7.42	2450	1920	2650
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Fluoranthenes/Pyrenes	ug/Kg dry	45.72				x	C3PY	43	9970	39.9	435	34100	277	27.3	5600	66.7	22.5	4.57	0	468	2730	33.4	3650	23.9	1950	2560	7.03	0	1020	984	1190
243-17-4	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)fluorene	ug/Kg dry	42.03				x	BbF	44	25700	31.2	217	26800	160	0	4340	25.3	11.4	0	0	987	1770	23.1	14100	6.41	1780	2500	3.16	0	585	494	578
205-12-9	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(c)fluorene	ug/Kg dry	42.07				x	BcF	45	9660	13.7	85.6	13100	79.4	0	1650	14.9	6.15	0	0	379	828	12.9	6130	0	591	1020	0	0	206	186	251
3442-78-2	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylpyrene	ug/Kg dry	42.18				x	2MP	46	26100	28.6	262	35400	225	0	5370	37.9	15.7	0	0	1090	2010	19.4	15100	5.87	2420	2480	3.69	0	659	526	826
3353-12-6	8270D (SIM) Semi-Volatile Organic Compou0s	4-Methylpyrene	ug/Kg dry	42.55				x	4MP	47	21800	24.4	238	31000	217	0	4860	38.1	17.5	0	0	959	1950	16.8	12600	5.68	2300	2250	3.17	0	642	504	920
2381-21-7	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylpyrene	ug/Kg dry	42.67				x	1MP	48	25500	20.9	199	34100	183	0	4840	31.9	13.6	0	0	1060	1590	13.6	14200	5.21	2040	1950	2.89	0	499	393	692
56-55-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Benz(a)anthracene**	ug/Kg dry	45.17	H	x	x	x	BaA	49	138000	178	1350	102000	950	5.38	18100	134	50.3	0	0	8160	11400	108	103000	28.4	15800	19200	15.1	0	4650	3000	3390
	8270D (SIM) Semi-Volatile Organic Compou0s	**Chrysene/triphenylene**	ug/Kg dry	45.36	H	x	x	x	CH	50	139000	170	1380	102000	920	6.7	19700	135	51.9	0	0	7500	12200	113	99400	29.9	16400	18000	15.6	0	4730	3540	3400
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	46.81				x	C1CR	51	53100	117	906	100000	786	9.26	15400	123	57.3	3.46	0	2370	6360	81	33200	30.1	7200	7930	10.7	4.25	2090	2110	3350
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	48.52				x	C2CR	52	15600	58.9	546	43700	428	7.7	7010	57	34.6	0	0	794	3610	55.6	8440	14.3	2800	3590	6.16	0	1380	1350	1850
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	49.55				x	C3CR	53	4610	27.6	284	15100	202	0	2680	20.6	14.5	0	0	302	1950	33.7	2040	0	990	1560	0	0	684	940	915
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	50				x	C4CR	54	1920	0	117	4390	93.7	0	993	8.02	7.18	0	0	194	1060	18	1390	0	524	708	0	0	342	659	391
205-99-2	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(b)fluoranthene**	ug/Kg dry	49.23	H	x	x	x	BbF	55	63900	114	830	35000	600	0	9710	71.6	36.8	0	0	5590	9320	72.2	49000	15.7	10800	11300	9.41	0	3170	2950	2320
	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(j/k)fluoranthene**	ug/Kg dry	49.29	H	x	x	x	BjF	56	87400	127	915	42100	646	0	9470	71.8	36.3	0	0	6450	9460	89.6	70500	18.8	12200	12400	11.7	0	3070	3030	2430
192-97-2	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(e)pyrene	ug/Kg dry	50.17			x	x	BeP	57	81000	104	723	39700	729	0	9600	91.3	51.5	0	0	6000	8730	65.8	63900	16.6	12400	10900	11.3	0	2760	2810	3080
50-32-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(a)pyrene**	ug/Kg dry	50.34	H	x	x	x	BaP	58	143000	170	1070	70100	1070	0	13800	130	72	0	0	10400	11900	96.2	109000	25.2	19000	18000	16.9	2.94	3900	3660	4230
198-55-0	8270D (SIM) Semi-Volatile Organic Compou0s	Perylene	ug/Kg dry	50.61			x	x	PE	59	20900	43.8	242	12200	1110	1700	2980	1310	1780	498	53.3	1730	2970	86.1	18800	703	3310	2980	192	5.9	1170	931	964
193-39-5	8270D (SIM) Semi-Volatile Organic Compou0s	**Indeno(1,2,3-cd)pyrene**	ug/Kg dry	54	H	x	x	x	I123P	60	54300	86.4	565	25300	509	0	7390	65.7	33.3	0	0	5630	8070	50.6	46300	12.5	9840	7840	8.06	0	2420	2180	1930
53-70-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Dibenzo(a,h)anthracene**	ug/Kg dry	54.01	H	x	x	x	DBA	61	13000	24.2	146	8380	137	0	2120	17.4	9.61	0	0	1090	1780	14.5	12500	0	2050	2130	0	0	595	547	595
191-24-2	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(g,h,i)perylene**	ug/Kg dry	54.91	H	x	x	x	BGP	62	58400	84.2	534	25400	594	0	7490	82.6	44	0	0	6090	7910	46.7	52400	12.6	10600	7670	8.48	0	2330	2130	2390
191-07-1	8270D (SIM) Semi-Volatile Organic Compou0s	Coronene	ug/Kg dry	61.34				x	COR	63	17300	21.7	127	5770	136	0	1770	22.4	11	0	0	1990	2060	12.5	19900	5.28	2820	2240	3.61	2.47	695	639	477
526-73-8	8270D (SIM) Semi-Volatile Organic Compou0s	1,2,3-Trimethylbenzene	ug/Kg dry							64	327	4.09	12.4	2490	6.58	10.7	58.1	8.02	7.18	5.27	4.26	32.3	63.1	5.85	26	8.62	30.9	6.45	4.81	4.92	41.7	87.6	14.4
95-63-6	8270D (SIM) Semi-Volatile Organic Compou0s	1,2,4-Trimethylbenzene	ug/Kg dry							65	1010	6.16	17.8	6870	25.3	10.7	180	6.79	7.18	5.27	4.26	19.3	185	9.09	57.6	8.62	33.1	18.4	4.81	4.92	72.2	197	58.3
108-67-8	8270D (SIM) Semi-Volatile Organic Compou0s	1,3,5-Trimethylbenzene	ug/Kg dry							66	361	4.09	6.4	2270	17.6	10.7	68.6	8.02	7.18	5.27	4.26	32.3	51.5	6.01	37.5	8.62	31	18	4.81	4.92	28	52.6	29.1
	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methyldibenzothiophene	ug/Kg dry	36.76						67	2940	4.09	24.6	5020	4.68	10.7	527	8.02	7.18	5.27	4.26	92.9	228	3.1	685	8.62	104	119	4.81	4.92	57.3	83	12.3
	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylphenanthrene	ug/Kg dry	37.24						68	33800	20.6	224	78700	58.2	10.7	10600	16	7.18	5.27	4.26	617	1520	17.7	9340	6.16	1300	1150	3.89	4.92	402	514	268
	8270D (SIM) Semi-Volatile Organic Compou0s	2,3,5-Trimethylnaphthene	ug/Kg dry	30.44						69	3580	3.58	20.2	11700	15.7	10.7	1420	8.02	7.2	5.27	4.26	32.3	186	5.59	190	8.62	36.4	101	4.81	4.92	37.7	141	37.3
581-42-0	8270D (SIM) Semi-Volatile Organic Compou0s	2,6-Dimethylnaphthalene	ug/Kg dry	27.07						70	27100	11.7	28.6	71500	44.6	6.28	5650	15.6	7.27	2.77	4.26	99.7	373	13.9	207	8.98	107	368	4.81	4.92	207	574	131
	8270D (SIM) Semi-Volatile Organic Compou0s	2/3-Methyldibenzothiophene	ug/Kg dry	36.31						71	11700	4.96	65.8	20000	22.1	10.7	2040	5.12	3.75	5.27	4.26	308	650	5.31	2860	8.62	393	450	4.81	4.92	154	244	55.1
	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylanthracene	ug/Kg dry	36.96						72	25100	28.2	198	61800	150	10.7	5710	19.3	10	5.27	4.26	441	1380	14	7750	6.7	1130	1790	4.81	4.92	301	308	466
	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylphenanthrene	ug/Kg dry	36.81						73	52300	45.1	372	118000	235	10.7	16100	41.1	7.77	5.27	4.26	958	2540	32.8	14400	11.3	2010	2030	5.21	4.92	658	834	671
	8270D (SIM) Semi-Volatile Organic Compou0s	3-Methylphenanthrene	ug/Kg dry	36.69						74	48200	35.4	305	110000	242	10.7	14200	49.2	31.9	5.27	4.26	861	2480	27.2	11100	9.67	1800	1690	4.99	4.92	549	714	567
	8270D (SIM) Semi-Volatile Organic Compou0s	4/9-Methylphenanthrene	ug/Kg dry	37.14						75	39200	38.2	322	110000	286	5.48	14300	53	32	5.27	4.26	886	2530	28.9	12400	10.6	1980	1960	5.57	4.92	580	734	839
	8270D (SIM) Semi-Volatile Organic Compou0s	4-Methyldibenzothiophene	ug/Kg dry	36.01						76	13700	4.38	69.8	25000	19.4	10.7	2480	5.51	9.08	5.27	4.26	316	700	4.46	3530	8.62	495	405	4.81	4.92	173	288	43.8
71-43-2	8270D (SIM) Semi-Volatile Organic Compou0s	Benzene	ug/Kg dry							77	553	12.7	12.5	465	50.9	16.5	58.9	37	20.7	14.9	9	113	103	13	402	10.2	49.1	48	10.9	12.8	141	485	64.4

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Attachment B. Complete Sediment Data Set
Amesbury Former MGP
Amesbury, Massachusetts

											River	River	River	River	River	River	River	River	Mudflat	River	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	River	River	River	River	River	River
										Sample No.	F190056-05	F190056-06	F190058-05	F190059-01	F190059-02	F190058-06	F190056-07	F190056-08	F190056-09	F190056-10	F190056-11	F190056-12	F190057-05	F190057-06	F190057-07	F190057-08	F190057-09	F190059-03	F190057-03	F190059-04	F190057-04	F190059-05	F190059-06
										Sample Date:	11/11/2019	11/11/2019	11/15/2019	11/14/2019	11/14/2019	11/15/2019	11/11/2019	11/11/2019	11/11/2019	11/11/2019	11/11/2019	11/11/2019	11/12/2019	11/12/2019	11/12/2019	11/12/2019	11/12/2019	11/14/2019	11/12/2019	11/14/2019	11/12/2019	11/14/2019	11/14/2019
										Sample Time:	12:11	12:14	11:28	10:03	10:07	12:15	12:47	12:50	13:46	13:54	15:04	15:29	12:41	12:45	13:48	13:53	14:52	11:14	11:23	13:14	12:05	13:38	13:41
										ClieSam	SS712-S1	SS712-S2	SS713-S2	SS714-S3	SS714-S4	SS715-S2	SS716-S1	SS716-S2	SS717-S1	SS717-S3	SS718-S5	SS719-S1	SS720-S1	SS720-S2	SS721-S1	SS721-S2	SS722-S1	SS723-S1	SS724-S3	SS726-S2	SS727-S2	SS727-S3
										Depths:	4.1 to 5.1	6.2 to 6.3	2.4 to 2.5	3.9 to 4.0	5.5 to 5.6	3.7 to 3.8	3.0 to 3.9	4.5 to 4.6	0.0 to 0.5	4.2 to 4.3	7.8 to 7.9	0.0 to 0.1	0.7 to 0.8	1.4 to 1.5	1.0 to 1.1	2.3 to 2.4	0.7 to 0.8	1.4 to 1.5	4.7 to 4.8	2.8 to 2.9	1.4 to 1.5	1.9 to 2.0	5.3 to 5.4
										RAH													RAH										
										%solids	54	83	79	55	53	40	65	48	56	65	80	52	57	64	67	48	70	73	67	75	47	39	54
CAS Number	Method Name	Analyte	Units	RT		PAH17	PAH34	PAH51	Abbrev	PAH #																							
11095-43-5	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)thiophene	ug/Kg dry							78	**950**	4.09	**7.72**	**2940**	**6.98**	10.7	**108**	8.02	7.18	5.27	4.26	**48.2**	**110**	6.01	**129**	8.62	**27.4**	**59.4**	4.81	4.92	**18**	49.4	**14.2**
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzene	ug/Kg dry							79	**632**	**12.3**	**27.9**	**1690**	**320**	**89.5**	**394**	**105**	**27.9**	**25.3**	**6.26**	**138**	**672**	**97.7**	**286**	**73.3**	**62.5**	**84.3**	**14**	4.92	**561**	**1390**	**466**
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Decalins	ug/Kg dry							80	**1250**	4.09	**331**	**1030**	**30.8**	10.7	**188**	**5.59**	**11.7**	5.27	4.26	**45.8**	**1730**	**10.8**	**432**	8.62	**47.7**	**36.2**	4.81	4.92	**1350**	**8390**	**53.3**
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzenes	ug/Kg dry							81	**604**	**12.7**	**35.2**	**3860**	**83**	**82.8**	**174**	**69**	**26.8**	**21.9**	**4.17**	**160**	**325**	**55.1**	**186**	**59**	**83.5**	**68.5**	**14.2**	4.92	**698**	**861**	**168**
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Decalins	ug/Kg dry							82	**2110**	4.09	**149**	**2610**	**41.7**	10.7	**496**	8.02	**14.7**	5.27	4.26	**71.7**	**2430**	**15.5**	**337**	8.62	**69.3**	**134**	4.81	4.92	**591**	**2770**	**94.9**
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzenes	ug/Kg dry							83	**1590**	**9.1**	**44.1**	**12600**	**52.1**	**11.7**	**310**	**13.7**	**10.2**	**3.67**	4.26	**48.3**	**286**	**21.4**	**123**	**9.4**	**91.3**	**58.9**	**3.73**	4.92	**169**	**340**	**105**
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Decalins	ug/Kg dry							84	**1860**	4.09	**78.7**	**2990**	**31.2**	10.7	**559**	8.02	**6.27**	5.27	4.26	**49.8**	**2140**	**9.33**	**309**	8.62	**36.5**	**214**	4.81	4.92	**384**	**1210**	**75.2**
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzenes	ug/Kg dry							85	**8540**	**9.96**	**217**	**23900**	**44.4**	**10.7**	**909**	**17.8**	**11.1**	5.27	4.26	**56.6**	**341**	**29.4**	**104**	**11.9**	**54.8**	**44.9**	4.81	4.92	**306**	**758**	**98.1**
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Decalins	ug/Kg dry							86	**2150**	4.09	**128**	**5310**	**39**	10.7	**1240**	8.02	**13.6**	5.27	4.26	**82.1**	**3240**	**13.8**	**548**	8.62	**111**	**458**	4.81	4.92	**944**	**1700**	**77.5**
	8270D (SIM) Semi-Volatile Organic Compou0s	C5-Benzenes	ug/Kg dry							87	**5020**	**5.2**	**82.8**	**11600**	**28.6**	10.7	**834**	**8.22**	**14.3**	5.27	4.26	**33.1**	**327**	**18.9**	**96.1**	**10.1**	**50**	**32.7**	4.81	4.92	**187**	**786**	**45.9**
86-74-8	8270D (SIM) Semi-Volatile Organic Compou0s	Carbazole	ug/Kg dry	35.61						88	**624**	**3.55**	**83.6**	**1700**	**24.8**	10.7	**495**	8.02	7.18	5.27	4.26	**150**	**2030**	**5.24**	**300**	8.62	**680**	**2820**	4.81	4.92	**435**	**206**	**93.7**
493-01-6	8270D (SIM) Semi-Volatile Organic Compou0s	cis-Decalin	ug/Kg dry							89	**104**	4.09	**33.7**	**145**	7.54	10.7	**23.6**	8.02	7.18	5.27	4.26	32.3	**139**	6.01	**29.7**	8.62	30.9	**4.16**	4.81	4.92	**122**	**864**	7.2
100-41-4	8270D (SIM) Semi-Volatile Organic Compou0s	Ethylbenzene	ug/Kg dry							90	**509**	4.09	**8.95**	**3630**	**26.1**	10.7	**56.2**	8.02	7.18	5.27	4.26	**25.1**	**79**	**3.33**	**39.4**	8.62	**24.7**	**29.4**	4.81	4.92	**57.6**	**79.4**	**43.7**
98-82-8	8270D (SIM) Semi-Volatile Organic Compou0s	Isopropylbenzene	ug/Kg dry							91	**80.1**	4.09	**10**	**1020**	7.54	10.7	**15.3**	8.02	7.18	5.27	4.26	32.3	**8.6**	6.01	28.6	8.62	30.9	4.65	4.81	4.92	**9.63**	49.4	**4.28**
	8270D (SIM) Semi-Volatile Organic Compou0s	m,p-Xylene	ug/Kg dry							92	**579**	**19.6**	**52.7**	**3100**	**114**	**134**	**219**	**108**	**43.5**	**36**	**5.51**	**249**	**462**	**84.5**	**233**	**96.9**	**91.7**	**75.9**	**22.4**	4.92	**1190**	**1460**	**240**
108-87-2	8270D (SIM) Semi-Volatile Organic Compou0s	Methylcyclohexane	ug/Kg dry							93	**92.1**	4.09	**17.5**	**205**	**25.7**	10.7	**61.3**	8.02	7.18	5.27	4.26	32.3	**61.5**	**4.48**	**120**	8.62	**59.5**	**39.8**	4.81	4.92	**46.8**	**44**	**42.8**
104-51-8	8270D (SIM) Semi-Volatile Organic Compou0s	n-Butylbenzene	ug/Kg dry							94	35.4	4.09	**29.9**	67.1	**5.98**	10.7	**62.7**	8.02	7.18	5.27	4.26	32.3	**99.7**	**8.01**	**15.7**	**4.67**	30.9	**5.45**	4.81	4.92	**61.9**	**238**	**15**
103-65-1	8270D (SIM) Semi-Volatile Organic Compou0s	n-Propylbenzene	ug/Kg dry							95	**115**	4.09	**7.25**	**706**	**5.8**	10.7	**21.8**	8.02	7.18	5.27	4.26	32.3	**53.3**	6.01	28.6	8.62	30.9	**4.77**	4.81	4.92	**31.9**	**75.3**	**12.4**
95-47-6	8270D (SIM) Semi-Volatile Organic Compou0s	o-Xylene	ug/Kg dry							96	**74.5**	4.09	**7.52**	**1080**	**10.7**	**5.72**	**30.2**	**5.7**	7.18	5.27	4.26	32.3	**71.9**	**6.18**	**37.8**	8.62	**16.2**	**9.98**	4.81	4.92	**61.7**	**89.5**	**27.4**
99-87-6	8270D (SIM) Semi-Volatile Organic Compou0s	p-Isopropyltoluene	ug/Kg dry							97	**358**	**7.44**	**4.01**	**2380**	**36**	10.7	**88.3**	**8.48**	**4.61**	**3.95**	4.26	32.3	**52.9**	**27.2**	28.6	**7.59**	**18.9**	**8.26**	**3.67**	4.92	**50.8**	**55.5**	**89.7**
135-98-8	8270D (SIM) Semi-Volatile Organic Compou0s	sec-Butylbenzene	ug/Kg dry							98	**48.3**	4.09	**12.4**	**125**	7.54	10.7	**6.26**	8.02	7.18	5.27	4.26	32.3	**13**	6.01	28.6	8.62	30.9	4.65	4.81	4.92	**9.17**	49.4	7.2
100-42-5	8270D (SIM) Semi-Volatile Organic Compou0s	Styrene	ug/Kg dry							99	**890**	**3.5**	**44.2**	**1490**	**26.6**	10.7	**110**	**10.3**	**3.66**	5.27	4.26	**71.2**	**121**	**11.5**	**650**	**15.8**	**195**	**150**	4.81	4.92	**187**	**282**	**145**
98-06-6	8270D (SIM) Semi-Volatile Organic Compou0s	t-Butylbenzene	ug/Kg dry							100	35.4	4.09	4.06	67.1	7.54	10.7	**7.18**	8.02	7.18	5.27	4.26	32.3	6.85	6.01	28.6	8.62	30.9	4.65	4.81	4.92	**7.85**	49.4	7.2
108-88-3	8270D (SIM) Semi-Volatile Organic Compou0s	Toluene	ug/Kg dry							101	**805**	**18.4**	**43.6**	**2290**	**474**	**141**	**565**	**158**	**45**	**38.7**	**9.43**	**193**	**1010**	**150**	**413**	**116**	**86.6**	**125**	**22.5**	**3.41**	**854**	**2110**	**666**
493-02-7	8270D (SIM) Semi-Volatile Organic Compou0s	trans-Decalin	ug/Kg dry							102	**387**	4.09	**345**	**329**	**9.36**	10.7	**58.3**	8.02	**14.8**	5.27	4.26	**23.1**	**1350**	**4.38**	**222**	8.62	**23.7**	**16**	4.81	4.92	**1130**	**7640**	**14.7**
3891-98-3	Saturated Hydrocarbons by GC/FID	2,6,10-trimethyldodecane (1380)	mg/Kg dry							103	**2780**	**2.33**	**75.1**	**2640**	**22.7**	**10.1**	**439**	**5.97**	**7.82**	**3.26**	4.26	**62.1**	**3100**	**11.9**	**598**	**5.61**	**54.7**	**54.3**	4.81	4.92	**783**	**1650**	**77.6**
3892-00-0	Saturated Hydrocarbons by GC/FID	2,6,10-trimethylpeadecane (1650)	mg/Kg dry							104	**4130**	**11.3**	**97.8**	**8850**	**77**	**24.7**	**1280**	**28.4**	**18.8**	**10.9**	**11.5**	**79.1**	**4570**	**33.2**	**1360**	**19.3**	**227**	**193**	**9.56**	**12.6**	**842**	**1680**	**150**
3891-99-4	Saturated Hydrocarbons by GC/FID	2,6,10-trimethyltridecane (1470)	mg/Kg dry							105	**3920**	**6.87**	**113**	**5190**	**70.8**	**31.4**	**861**	**24.3**	**23.4**	**10.7**	**5.84**	**147**	**4350**	**43.4**	**1250**	**23.3**	**158**	**118**	**8.31**	**2.73**	**1480**	**2470**	**206**
	Classical Chemistry	Black Carbon (Average)	mg/kg							106																							
	Saturated Hydrocarbons by GC/FID	C-10	mg/Kg dry							107																							
	Saturated Hydrocarbons by GC/FID	C-11	mg/Kg dry							108																							
	Saturated Hydrocarbons by GC/FID	C-12	mg/Kg dry							109																							
	Saturated Hydrocarbons by GC/FID	C-13	mg/Kg dry							110																							
	Saturated Hydrocarbons by GC/FID	C-14	mg/Kg dry							111																							
	Saturated Hydrocarbons by GC/FID	C-15	mg/Kg dry							112																							
	Saturated Hydrocarbons by GC/FID	C-16	mg/Kg dry							113																							
	Saturated Hydrocarbons by GC/FID	C-17	mg/Kg dry							114	**1490**	**40.3**	**142**	**1680**	**225**	**207**	**433**	**142**	**72**	**52.1**	**46.8**	**284**	**452**	**196**	**304**	**141**	**673**	**342**	**65.8**	**55.4**	**439**	**609**	**481**
	Saturated Hydrocarbons by GC/FID	C-18	mg/Kg dry							115	**747**	**26.7**	**119**	67.1	**131**	**103**	**353**	**115**	**50.5**	**36.8**	**37**	**143**	6.85	**84**	**323**	**68.8**	**690**	**371**	**26.7**	**44.3**	**228**	**296**	**230**
	Saturated Hydrocarbons by GC/FID	C-19	mg/Kg dry							116																							
	Saturated Hydrocarbons by GC/FID	C-21	mg/Kg dry							117																							
	Saturated Hydrocarbons by GC/FID	C-22	mg/Kg dry							118																							
	Saturated Hydrocarbons by GC/FID	C-23	mg/Kg dry							119																							
	Saturated Hydrocarbons by GC/FID	C-24	mg/Kg dry							120																							
	Saturated Hydrocarbons by GC/FID	C-25	mg/Kg dry							121																							
	Saturated Hydrocarbons by GC/FID	C-26	mg/Kg dry							122																							
	Saturated Hydrocarbons by GC/FID	C-27	mg/Kg dry							123																							
	Saturated Hydrocarbons by GC/FID	C-28	mg/Kg dry							124																							
	Saturated Hydrocarbons by GC/FID	C-29	mg/Kg dry							125																							
	Saturated Hydrocarbons by GC/FID	C-30	mg/Kg dry							126																							
	Saturated Hydrocarbons by GC/FID	C-31	mg/Kg dry							127																							
	Saturated Hydrocarbons by GC/FID	C-32	mg/Kg dry							128																							
	Saturated Hydrocarbons by GC/FID	C-33	mg/Kg dry							129																							
	Saturated Hydrocarbons by GC/FID	C-34	mg/Kg dry							130																							
	Saturated Hydrocarbons by GC/FID	C-35	mg/Kg dry							131																							
	Saturated Hydrocarbons by GC/FID	C-36	mg/Kg dry							132																							
	Saturated Hydrocarbons by GC/FID	C-37	mg/Kg dry							133																							
	Saturated Hydrocarbons by GC/FID	C-38	mg/Kg dry							134																							
	Saturated Hydrocarbons by GC/FID	C-39	mg/Kg dry							135																							
	Saturated Hydrocarbons by GC/FID	C-40	mg/Kg dry							136																							
	Saturated Hydrocarbons by GC/FID	C-8	mg/Kg dry							137																							
	Saturated Hydrocarbons by GC/FID	C-9	mg/Kg dry							138																							
638-36-8	Saturated Hydrocarbons by GC/FID	Phytane	mg/Kg dry	34.53						141	**7590**	**28.7**	**240**	**17600**	**152**	**86.2**	**2620**	**117**	**52.2**	**34.5**	**36.9**	**213**	**9450**	**70**	**2240**	**61.2**	**491**	**418**	**28.3**	**43.7**	**2160**	**3580**	**259**
1921-70-6	Saturated Hydrocarbons by GC/FID	Pristane	mg/Kg dry	32.65						142	**8900**	**31.1**	**299**	**18300**	**158**	**51.7**	**2450**	**67.5**	**38.2**	**23.8**	**27.3**	**179**	**9410**	**72.7**	**2860**	**38.2**	**474**	**331**	**21.4**	**34.5**	**2490**	**4870**	**316**
TOC	Classical Chemistry	Total Organic Carbon (Average)	mg/kg							145	**102000**	**8220**	**15000**	**133000**	**49500**	**104000**	**73000**	**57500**	**81600**	**81000**	**31000**	**49100**	**69700**	**29900**	**213000**	**51600**	**178000**	**202000**	**10800**	**2060**	**76400**	**81100**	**55100**
	TPAH16										2954000	2001	16604.6	2453080	10758	119.37	293260	1421.2	861.11	17.3	20.39	117530	178470	1251.3	1086660	336.11	185773	211870	242.34	41.43	51014	43366	35344
	TPAH34										3968620	3145.8	25654.9	4847070	18706.7	2013.96	566133	4041.72	3462.83	580.31	95.71	144563	252554	2371.7	1424750	1356.43	248580	287876	578.51	110.91	74110	71632	61405
	TPAH51										4398220	3555.29	30247.6	5720550	21241.7	2179.62	639933	4666.92	3724.38	594.15	99.97	157110.5	284667	2766.92	1552199	1496.23	273109	321084	640.52	123.64	84866	81858	71024
	LPAH										1390900	465.7	4756.6	1685800	1672	78.01	119150	279.7	264.75	9.65	13.17	25572	37526	261.2	109514	85.28	27694	53500	66.19	32.23	8560	8922	4736
	HPAH										1575000	1562.8	11900	877280	9236	48.28	175680	1159.1	603.41	7.65	7.22	92210	141840	1006.8	978100	255.4	158390	159440	176.15	9.2	42655	34707	30975

(does not include source area samples collected in 2017)

Attachment B. Complete Sediment Data Set
Amesbury Former MGP
Amesbury, Massachusetts

											River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River
											Sample No.	F190059-07	F190057-01	F190057-02	F190059-08	F190059-09	F190058-07	F190058-01	F190058-08	F190058-09	F190058-02	F190058-03	F190058-04	F190058-10	F190058-11	F200006-03	F200006-04	F200006-05	F200006-06	F200006-07	F200006-08	F200006-09	F200008-01	F200008-02
											Sample Date:	11/14/2019	11/12/2019	11/12/2019	11/14/2019	11/14/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019	02/04/2020	02/04/2020	02/04/2020	02/04/2020	02/04/2020	02/04/2020	02/04/2020	02/05/2020	02/05/2020
											Sample Time:	14:52	10:07	10:10	15:21	15:24	12:48	10:28	13:33	13:37	10:59	11:03	11:07	14:15	14:49	09:12	09:21	09:56	10:09	10:18	10:37	10:46	08:16	08:43
											ClieSam	SS728-S3	SS729-S3	SS729-S4	SS730-S2	SS730-S3	SS731-S2	SS733-S4	SS734-S1	SS734-S2	SS735-S2	SS735-S3	SS735-S4	SS736-S2	SS737-S1	SS738-S1	SS738-S2	SS739-S1	SS739-S2	SS739-S3	SS740-S1	SS740-S2	SS741-S1	SS741-S3
											Depths:	5.4 to 5.6	3.9 to 4.0	5.9 to 6.0	2.5 to 2.6	4.8 to 4.9	3.8 to 3.9	5.4 to 5.6	4.9 to 5.0	6.1 to 6.2	3.3 to 3.4	6.7 to 6.8	7.8 to 7.9	3.9 to 4.0	8.5 to 8.6	1 to 1.5	3.5 to 3.7	1.3 to 1.5	7.6 to 7.8	8.7 to 9	0.5 to 1.7	4.2 to 4.5	0.9 to 1.1	4.4 to 4.6
											RAH																				RAH			
											%solids	52	59	80	74	80	63	77	73	76	63	47	78	76	39	79	52	62	65	64	66	30	64	76
CAS Number	**Method Name**	**Analyte**	Units	RT		PAH17	PAH34	PAH51	Abbrev	PAH #				3.96		4.86		4.34		4.87			4.29	5.34							12.2		4.93
		Max RL for ND PAHs=								1																							
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzo(b)thiophenes	ug/Kg dry	17					C1BT	2	**694**	**2910**	0	**3.52**	0	**218**	**8.19**	**44400**	**7.37**	**226**	**16.8**	0	**4.65**	**19200**	**21.7**	**7.6**	**46.3**	**26.8**	**6.71**	**17.7**	**0**	**53.5**	**0**
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzo(b)thiophenes	ug/Kg dry	18					C2BT	3	**1900**	**6660**	**2.76**	**5.45**	0	**391**	**19.4**	**39300**	**8.03**	**504**	**33**	0	**2.94**	**25200**	**40.4**	**15**	**117**	**51.4**	**7.79**	**49.2**	**0**	**191**	**0**
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzo(b)thiophenes	ug/Kg dry	19					C3BT	4	**2360**	**4730**	**2.12**	**3.28**	0	**234**	**18.3**	**16100**	**4.01**	**297**	**31.9**	0	0	**15600**	**27.3**	**15.9**	**275**	**79.8**	**6.52**	**31**	**0**	**114**	**0**
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzo(b)thiophenes	ug/Kg dry	20					C4BT	5	**992**	**1530**	0	4.92	0	**72.4**	**6.21**	**3670**	0	**95.8**	**13.7**	0	0	**4150**	**22.6**	**8.67**	**55.9**	**33.4**	**3.32**	**9.96**	**0**	**50.1**	**0**
91-20-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Naphthalene**	ug/Kg dry	21.86	L	x	x	x	NA	6	**10200**	**34000**	**5.15**	4.92	0	**6820**	**117**	**2510000**	**299**	**2300**	**336**	0	**27**	**861000**	**337**	**177**	**578**	**457**	**172**	**44.5**	**0**	**225**	**0**
91-57-6	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylnaphthalene	ug/Kg dry	24.57	L	x		x	2MN	7	**9110**	**11100**	**3.68**	4.92	0	**3090**	**84.3**	**1390000**	**104**	**660**	**399**	0	**12.9**	**912000**	**217**	**179**	**359**	**395**	**98**	**22.4**	**0**	**156**	**0**
90-12-0	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylnaphthalene	ug/Kg dry	25				x	1MN	8	**33500**	**113000**	**7.17**	**2.47**	0	**4140**	**220**	**917000**	**127**	**1250**	**270**	0	**10.7**	**701000**	**294**	**78.5**	**818**	**607**	**85.2**	**212**	**0**	**233**	**0**
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Naphthalenes	ug/Kg dry	24.57			x	x	C1N	9	**27300**	**72500**	**6.88**	**3.39**	0	**4390**	**183**	**1420000**	**142**	**1150**	**416**	0	**14.4**	**994000**	**306**	**157**	**702**	**601**	**111**	**137**	**0**	**237**	**0**
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Naphthalenes	ug/Kg dry	27.02			x	x	C2N	10	**53200**	**165000**	**13.2**	**20**	0	**7690**	**459**	**716000**	**123**	**2600**	**938**	**5.09**	**10.1**	**672000**	**454**	**341**	**1740**	**1400**	**193**	**965**	**9.58**	**1030**	**0**
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Naphthalenes	ug/Kg dry	29.76			x	x	C3N	11	**50000**	**78700**	**9.42**	**13.9**	0	**3860**	**284**	**188000**	**44.9**	**1740**	**914**	**4.65**	**5.43**	**298000**	**332**	**369**	**1450**	**1540**	**171**	**438**	**0**	**945**	**0**
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Naphthalenes	ug/Kg dry	32.52			x	x	C4N	12	**19900**	**24200**	**4.87**	**6.89**	0	**1220**	**96.2**	**43500**	**12.6**	**771**	**435**	**3.36**	**3.65**	**87700**	**163**	**189**	**730**	**822**	**80.6**	**127**	**0**	**607**	**0**
92-52-4	8270D (SIM) Semi-Volatile Organic Compou0s	Biphenyl	ug/Kg dry	26.46					BP	13	**2400**	**4720**	0	4.92	0	**999**	**78.6**	**359000**	**43.6**	**305**	**101**	0	**3.32**	**102000**	**116**	**55.6**	**146**	**119**	**37.5**	**7.41**	**0**	**67.8**	**0**
208-96-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Acenaphthylene**	ug/Kg dry	28.16	L	x	x	x	ACE	14	**5310**	**18500**	**20.1**	**25.8**	0	**365**	**46.7**	**71400**	**8.58**	**1250**	**209**	0	**6.27**	**45000**	**315**	**158**	**390**	**496**	**167**	**84.9**	**0**	**613**	**0**
83-32-9	8270D (SIM) Semi-Volatile Organic Compou0s	**Acenaphthene**	ug/Kg dry	28.89	L	x	x	x	ACY	15	**41600**	**266000**	**14.3**	**5.45**	0	**8500**	**691**	**1710000**	**276**	**8310**	**457**	**2.39**	**17**	**800000**	**1230**	**471**	**2600**	**1110**	**237**	**1720**	**0**	**2890**	**0**
132-64-9	8270D (SIM) Semi-Volatile Organic Compou0s	Dibenzofuran	ug/Kg dry	29.54				x	DBF	16	**2450**	**10500**	**2.05**	4.92	0	**558**	**29.3**	**66000**	**13.8**	**898**	**134**	0	0	**34300**	**162**	**55.4**	**130**	**210**	**67.5**	**28.9**	**0**	**189**	**0**
86-73-7	8270D (SIM) Semi-Volatile Organic Compou0s	**Fluorene**	ug/Kg dry	30.91	L	x	x	x	FLE	17	**29800**	**118000**	**12**	**6.43**	0	**5000**	**359**	**664000**	**116**	**2760**	**321**	0	**6.37**	**345000**	**807**	**158**	**1340**	**829**	**205**	**784**	**0**	**715**	**0**
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Fluorenes	ug/Kg dry	33.14			x	x	C1FL	18	**28800**	**54100**	0	**11**	0	**2510**	**218**	**181000**	**38.8**	**1510**	**713**	**3.3**	**4.47**	**211000**	**300**	**321**	**945**	**1010**	**178**	**284**	**0**	**626**	**0**
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Fluorenes	ug/Kg dry	35.22			x	x	C2FL	19	**26500**	**33700**	**6.42**	**15.2**	0	**1400**	**132**	**75300**	**18.1**	**1030**	**584**	**3.83**	**4.74**	**131000**	**223**	**284**	**837**	**1210**	**150**	**150**	**0**	**642**	**0**
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Fluorenes	ug/Kg dry	38.01			x	x	C3FL	20	**11900**	**11800**	**4.03**	**7.89**	0	**553**	**52.3**	**22500**	**5.47**	**921**	**314**	**3.9**	**4.58**	**42200**	**208**	**153**	**487**	**690**	**105**	**75.7**	**0**	**764**	**0**
132-65-0	8270D (SIM) Semi-Volatile Organic Compou0s	Dibenzothiophene	ug/Kg dry	34.23				x	DBT	21	**6900**	**31200**	**5.77**	4.92	0	**1020**	**120**	**215000**	**38.9**	**1840**	**130**	0	0	**63400**	**362**	**65.8**	**415**	**299**	**67.9**	**164**	**0**	**663**	**0**
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Dibenzothiophenes	ug/Kg dry	36.43				x	C1DBT	22	**12400**	**27200**	**5.93**	4.92	0	**1030**	**123**	**119000**	**22.1**	**1650**	**202**	**2.36**	**2.8**	**81900**	**293**	**107**	**628**	**610**	**73.4**	**132**	**0**	**749**	**0**
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Dibenzothiophenes	ug/Kg dry	37.7				x	C2DBT	23	**11900**	**19400**	**5.28**	**4.45**	0	**572**	**80.8**	**54600**	**9.91**	**1360**	**209**	**2.94**	**2.82**	**58700**	**258**	**107**	**606**	**643**	**69.3**	**94**	**0**	**925**	**0**
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Dibenzothiophenes	ug/Kg dry	39.5				x	C3DBT	24	**6080**	**9010**	**3.15**	**2.68**	0	**225**	**33**	**17900**	**3.38**	**817**	**130**	0	0	**25500**	**226**	**74.6**	**387**	**384**	**47.8**	**60.7**	**0**	**888**	**0**
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Dibenzothiophenes	ug/Kg dry	41.65				x	C4DBT	25	**2300**	**3160**	0	4.92	0	**109**	**9.8**	**4700**	0	**502**	**68.1**	0	0	**8060**	**146**	**35.7**	**193**	**149**	**24.6**	**27.1**	**0**	**530**	**0**
85-01-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Phenanthrene**	ug/Kg dry	34.72	L	x	x	x	PHE	26	**166000**	**572000**	**90.8**	**16.2**	0	**17500**	**1950**	**2880000**	**612**	**24200**	**1390**	**8.38**	**24.3**	**1180000**	**5210**	**819**	**5360**	**4860**	**1740**	**2170**	**9.66**	**6800**	**0**
120-12-7	8270D (SIM) Semi-Volatile Organic Compou0s	**Anthracene**	ug/Kg dry	34.91	L	x	x	x	ANT	27	**53000**	**181000**	**28.1**	**10.2**	0	**4290**	**514**	**704000**	**83**	**6440**	**947**	**4.7**	**6.78**	**352000**	**1280**	**652**	**1810**	**1730**	**512**	**570**	**0**	**1720**	**0**
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Phenanthrenes/Anthracenes	ug/Kg dry	36.96				x	C1PH	28	**151000**	**215000**	**41.3**	**28.4**	0	**8070**	**1030**	**829000**	**163**	**8880**	**3350**	**18.5**	**12**	**720000**	**1910**	**2030**	**4700**	**6020**	**1260**	**962**	**11.9**	**3620**	**2.61**
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Phenanthrenes/Anthracenes	ug/Kg dry	38.97			x	x	C2PH	29	**65100**	**81200**	**20.7**	**16.2**	0	**2810**	**367**	**198000**	**29.9**	**4050**	**1970**	**8.66**	**5.49**	**303000**	**866**	**1090**	**2470**	**3740**	**562**	**377**	**0**	**2320**	**0**
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Phenanthrenes/Anthracenes	ug/Kg dry	40.8			x	x	C3PH	30	**24500**	**22800**	**7.8**	**8.38**	0	**923**	**94.2**	**42400**	**5.84**	**1750**	**848**	**4.09**	**2.84**	**94600**	**364**	**415**	**960**	**1470**	**221**	**136**	**0**	**1320**	**0**
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Phenanthrenes/Anthracenes	ug/Kg dry	41.72			x	x	C4PH	31	**7390**	**6530**	**3**	**6.99**	0	**374**	**24.2**	**12400**	0	**717**	**368**	0	0	**28700**	**429**	**307**	**776**	**923**	**217**	**124**	**10.5**	**1230**	**0**
483-65-8	8270D (SIM) Semi-Volatile Organic Compou0s	Retene	ug/Kg dry	41.72				x	RET	32	**2510**	**1440**	**3.25**	**10.6**	0	**205**	**7.62**	**5760**	**3.77**	**312**	**173**	**2.63**	**3.06**	**20900**	**131**	**244**	**389**	**302**	**158**	**111**	**22**	**436**	**0**
239-35-0	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)naphtho(2,1-d)thiophene	ug/Kg dry	44.24					BNT	33	**4310**	**11700**	**5.73**	4.92	0	**323**	**38.6**	**51200**	4.87	**1440**	**139**	0	0	**21800**	**298**	**111**	**386**	**415**	**110**	**70.3**	**0**	**640**	**0**
	8270D (SIM) Semi-Volatile Organic Compou0s	C0-Benzonaphthothiophenes	ug/Kg dry	44.24					C0BNT	34	**7740**	**21200**	**11.6**	**2.47**	0	**604**	**68.3**	**92200**	**4.64**	**2560**	**289**	0	0	**38500**	**551**	**241**	**727**	**769**	**214**	**126**	**0**	**1180**	**0**
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzonaphthothiophenes	ug/Kg dry	45.63					C1BNT	35	**6810**	**11100**	**5.66**	**3.03**	0	**430**	**40.8**	**38200**	0	**1380**	**250**	0	0	**32200**	**336**	**203**	**632**	**687**	**138**	**89.9**	**0**	**911**	**0**
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzonaphthothiophenes	ug/Kg dry	47.14					C2BNT	36	**3870**	**5380**	**3.4**	**3.57**	0	**335**	**19.3**	**13800**	0	**1030**	**200**	0	0	**17000**	**299**	**142**	**431**	**450**	**99.2**	**66.5**	**0**	**782**	**0**
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzonaphthothiophenes	ug/Kg dry	49.02					C3BNT	37	**2010**	**3800**	**3.33**	**2.78**	0	**216**	**10**	**8630**	0	**650**	**119**	0	0	**7880**	**266**	**96.9**	**297**	**263**	**87.8**	**52.6**	**0**	**607**	**0**
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzonaphthothiophenes	ug/Kg dry	51.51					C4BNT	38	**451**	**693**	0	4.92	0	**67.7**	0	**1850**	0	**263**	**38.1**	0	0	**1450**	**145**	**31.3**	**119**	**73.2**	**24.9**	**25.8**	**0**	**293**	**0**
206-44-0	8270D (SIM) Semi-Volatile Organic Compou0s	**Fluoranthene**	ug/Kg dry	39.51	H	x	x	x	FLA	39	**69400**	**289000**	**128**	**22.8**	0	**6870**	**765**	**975000**	**180**	**22700**	**2620**	**9.9**	**10.8**	**349000**	**5160**	**2710**	**5340**	**5450**	**2810**	**1040**	**12.7**	**8660**	**3.01**
129-00-0	8270D (SIM) Semi-Volatile Organic Compou0s	**Pyrene**	ug/Kg dry	40.39	H	x	x	x	PYR	40	**103000**	**419000**	**114**	**34.7**	**3.52**	**8050**	**1100**	**1430000**	**263**	**22800**	**4780**	**22.4**	**16.7**	**513000**	**5340**	**3880**	**7320**	**6650**	**3930**	**1360**	**11.2**	**8560**	**3.92**
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Fluoranthenes/Pyrenes	ug/Kg dry	41.78				x	C1PY	41	**81500**	**182000**	**54.8**	**47.2**	**3.71**	**4000**	**609**	**647000**	**67.5**	**10200**	**3760**	**14.5**	**16.4**	**437000**	**2000**	**2360**	**4490**	**5890**	**1880**	**681**	**15.8**	**4150**	**3.85**
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Fluoranthenes/Pyrenes	ug/Kg dry	43.52				x	C2PY	42	**33300**	**45200**	**19.9**	**20.4**	0	**1510**	**155**	**121000**	**7.27**	**3660**	**1590**	**4.94**	**5.92**	**166000**	**676**	**1020**	**1920**	**3030**	**686**	**272**	**9.98**	**2250**	**0**
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Fluoranthenes/Pyrenes	ug/Kg dry	45.72				x	C3PY	43	**12700**	**13200**	**8.36**	**9.22**	0	**754**	**45.6**	**24700**	**2.95**	**1690**	**720**	0	**3.47**	**54600**	**416**	**447**	**778**	**1350**	**272**	**113**	**17.9**	**1150**	**0**
243-17-4	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)fluorene	ug/Kg dry	42.03				x	BbF	44	**8780**	**21000**	**6.71**	**5.3**	0	**493**	**60.6**	**73300**	**6.91**	**1610**	**382**	0	0	**41400**	**270**	**255**	**513**	**575**	**193**	**72.8**	**0**	**513**	**0**
205-12-9	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(c)fluorene	ug/Kg dry	42.07				x	BcF	45	**3290**	**10600**	**3.72**	**2.72**	0	**268**	**36.4**	**38300**	**5.33**	**674**	**222**	0	0	**24300**	**106**	**147**	**218**	**293**	**112**	**38.6**	**0**	**542**	**0**
3442-78-2	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylpyrene	ug/Kg dry	42.18				x	2MP	46	**10800**	**23100**	**6.5**	**4.56**	0	**508**	**79**	**85800**	**7.5**	**1280**	**543**	0	0	**53600**	**260**	**329**	**615**	**792**	**264**	**93.2**	**0**	**537**	**0**
3353-12-6	8270D (SIM) Semi-Volatile Organic Compou0s	4-Methylpyrene	ug/Kg dry	42.55				x	4MP	47	**9830**	**20500**	**4.98**	**4.58**	0	**441**	**68.9**	**68200**	**6.38**	**988**	**545**	0	0	**47600**	**219**	**319**	**581**	**744**	**243**	**81.9**	**0**	**483**	**0**
2381-21-7	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylpyrene	ug/Kg dry	42.67				x	1MP	48	**10300**	**24100**	**4.36**	**4.25**	0	**395**	**81.1**	**84100**	**8.09**	**945**	**447**	0	0	**55700**	**192**	**281**	**549**	**687**	**224**	**83.4**	**0**	**388**	**0**
56-55-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Benz(a)anthracene**	ug/Kg dry	45.17	H	x	x	x	BaA	49	**43200**	**120000**	**61.1**	**14.7**	0	**2650**	**362**	**462000**	**17.6**	**8720**	**2170**	**6.96**	**6.2**	**196000**	**2250**	**1670**	**3090**	**3990**	**1920**	**529**	**0**	**3890**	**0**
	8270D (SIM) Semi-Volatile Organic Compou0s	**Chrysene/triphenylene**	ug/Kg dry	45.36	H	x	x	x	CH	50	**42800**	**116000**	**55.2**	**15**	0	**2950**	**356**	**414000**	**15.5**	**8790**	**2060**	**7.27**	**6.41**	**184000**	**2150**	**1530**	**3110**	**3820**	**1620**	**541**	**0**	**3960**	**0**
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	46.81				x	C1CR	51	**33300**	**52900**	**22.9**	**12.5**	0	**1800**	**181**	**165000**	**6.48**	**4060**	**1850**	**3.86**	**5.7**	**158000**	**1060**	**1340**	**2330**	**3540**	**1010**	**332**	**8.06**	**2350**	**0**
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	48.52				x	C2CR	52	**16500**	**19300**	**11.4**	**8.72**	0	**1150**	**64.8**	**45800**	**3.41**	**2010**	**1100**	**2.29**	0	**72600**	**548**	**746**	**1140**	**1860**	**476**	**155**	**0**	**1360**	**0**
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	49.55				x	C3CR	53	**6380**	**6320**	**4.93**	4.92	0	**647**	**17.6**	**8090**	0	**1050**	**521**	0	0	**24800**	**312**	**410**	**504**	**879**	**231**	**73.6**	**12.2**	**811**	**0**
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	50				x	C4CR	54	**2220**	**2050**	0	4.92	0	**319**	0	**4420**	0	**487**	**204**	0	0	**6340**	**149**	**184**	**263**	**370**	**125**	**33.1**	**0**	**438**	**0**
205-99-2	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(b)fluoranthene**	ug/Kg dry	49.23	H	x	x	x	BbF	55	**16000**	**56100**	**40.3**	**8.88**	0	**1800**	**129**	**187000**	**4.44**	**5890**	**1070**	**2.37**	**3.4**	**60300**	**1650**	**1020**	**1670**	**2280**	**1280**	**346**	**0**	**2840**	**0**
	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(j/k)fluoranthene**	ug/Kg dry	49.29	H	x	x	x	BjF	56	**15300**	**63200**	**46.2**	**10.2**	0	**1920**	**172**	**254000**	**5.13**	**5920**	**1100**	**2.48**	**3.76**	**75900**	**1740**	**1130**	**1920**	**2440**	**1440**	**369**	**0**	**3080**	**0**
192-97-2	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(e)pyrene	ug/Kg dry	50.17				x	BeP	57	**16200**	**58600**	**31.8**	**12**	0	**1640**	**160**	**236000**	**5.37**	**5010**	**1370**	**2.99**	**4.05**	**65700**	**1390**	**1170**	**1760**	**2440**	**1540**	**330**	**0**	**2460**	**0**
50-32-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(a)pyrene**	ug/Kg dry	50.34	H	x	x	x	BaP	58	**29200**	**107000**	**54.2**	**18.2**	0	**2380**	**287**	**447000**	**8.41**	**7500**	**1960**	**3.02**	**5.78**	**124000**	**2140**	**1670**	**2730**	**3880**	**2420**	**532**	**0**	**3710**	**2.5**
198-55-0	8270D (SIM) Semi-Volatile Organic Compou0s	Perylene	ug/Kg dry	50.61				x	PE	59	**4630**	**18400**	**92.6**	**991**	**4100**	**764**	**50.6**	**66800**	**5.32**	**1820**	**688**	**8.07**	**2010**	**18300**	**497**	**961**	**855**	**767**	**519**	**182**	**856**	**880**	**18.2**
193-39-5	8270D (SIM) Semi-Volatile Organic Compou0s	**Indeno(1,2,3-cd)pyrene**	ug/Kg dry	54	H	x	x	x	I123P	60	**11000**	**47800**	**32.5**	**8.51**	0	**1390**	**114**	**195000**	**4.04**	**4330**	**762**	0	**3.53**	**41700**	**1530**	**979**	**1400**	**2120**	**1430**	**336**	**0**	**2700**	**0**
53-70-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Dibenzo(a,h)anthracene**	ug/Kg dry	54.01	H	x	x	x	DBA	61	**3280**	**11000**	**7.24**	4.92	0	**348**	**25.7**	**40100**	0	**1050**	**239**	0	0	**13400**	**317**	**240**	**323**	**545**	**323**	**71.3**	**0**	**602**	**4.93**
191-24-2	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(g,h,i)perylene**	ug/Kg dry	54.91	H	x	x	x	BGP	62	**11200**	**49500**	**27.5**	**10.2**	0	**1340**	**128**	**214000**	**3.7**	**4110**	**954**	0	**4.16**	**41400**	**1190**	**934**	**1240**	**1920**	**1390**	**281**	**0**	**2100**	**4.93**
191-07-1	8270D (SIM) Semi-Volatile Organic Compou0s	Coronene	ug/Kg dry	61.34				x	COR	63	**2390**	**13300**	**8.29**	**3.73**	0	**335**	**36.5**	**60900**	**2.58**	**1040**	**202**	0	**2.96**	**10500**	**302**	**227**	**300**	**451**	**368**	**76.5**	**0**	**597**	**4.93**
526-73-8	8270D (SIM) Semi-Volatile Organic Compou0s	1,2,3-Trimethylbenzene	ug/Kg dry							64	**213**	**861**	3.96	4.92	4.86	**93.6**	4.34	**5680**	4.87	**73.4**	**12.5**	4.29	5.34	**14700**	**24.6**	**4.95**	**23.8**	**13.4**	**5.28**	**5.45**	**12.2**	**16**	**4.93**
95-63-6	8270D (SIM) Semi-Volatile Organic Compou0s	1,2,4-Trimethylbenzene	ug/Kg dry							65	**585**	**1790**	3.96	4.92	4.86	**423**	**2.37**	**11700**	4.87	**206**	**55.7**	4.29	5.34	**39100**	**18.8**	**23.6**	**70.2**	**43.7**	**19.5**	**8.87**	**12.2**	**37.3**	**4.93**
108-67-8	8270D (SIM) Semi-Volatile Organic Compou0s	1,3,5-Trimethylbenzene	ug/Kg dry							66	**257**	**621**	3.96	4.92	4.86	**111**	4.34	**3090**	4.87	**70.8**	**52.7**	4.29	5.34	**10700**	**24.6**	**8.42**	**20.9**	**31**	**13.7**	**3.11**	**12.2**	**13.9**	**4.93**
	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methyldibenzothiophene	ug/Kg dry	36.76						67	**1060**	**2620**	3.96	4.92	4.86	**105**	**11.7**	**10600**	4.87	**205**	**17.2**	4.29	5.34	**7270**	**32.2**	**9.27**	**69.5**	**53.3**	**6.29**	**14**	**12.2**	**103**	**4.93**
	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylphenanthrene	ug/Kg dry	37.24						68	**24500**	**35900**	**5.73**	**2.86**	4.86	**1370**	**167**	**126000**	**25.7**	**1370**	**139**	4.29	5.34	**118000**	**302**	**91.2**	**806**	**970**	**183**	**169**	**12.2**	**540**	**4.93**
	8270D (SIM) Semi-Volatile Organic Compou0s	2,3,5-Trimethylnaphthene	ug/Kg dry	30.44						69	**3300**	**4980**	3.96	4.92	4.86	**253**	**16.5**	**10500**	**2.87**	**146**	**74.5**	4.29	5.34	**21300**	**24.5**	**29.1**	**105**	**111**	**12.2**	**25.7**	**12.2**	**74.3**	**4.93**
581-42-0	8270D (SIM) Semi-Volatile Organic Compou0s	2,6-Dimethylnaphthalene	ug/Kg dry	27.07						70	**11800**	**31900**	**2.23**	4.92	4.86	**1820**	**96**	**138000**	**24.6**	**318**	**206**	4.29	5.34	**139000**	**73.3**	**48.3**	**316**	**271**	**38.8**	**200**	**12.2**	**106**	**4.93**
	8270D (SIM) Semi-Volatile Organic Compou0s	2/3-Methyldibenzothiophene	ug/Kg dry	36.31						71	**4170**	**9590**	3.96	4.92	4.86	**345**	**41.9**	**43400**	**7.24**	**561**	**74.1**	4.29	5.34	**28300**	**97.7**	**36**	**202**	**203**	**24.6**	**44.7**	**12.2**	**250**	**4.93**
	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylanthracene	ug/Kg dry	36.96						72	**17300**	**27100**	**6.06**	**4.26**	4.86	**761**	**111**	**95500**	**17.2**	**1060**	**492**	**2.72**	5.34	**91000**	**192**	**312**	**545**	**752**	**148**	**88.7**	**12.2**	**356**	**4.93**
	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylphenanthrene	ug/Kg dry	36.81						73	**38100**	**53900**	**11.2**	**4.42**	4.86	**2010**	**270**	**226000**	**45**	**2440**	**908**	**3.63**	**2.77**	**176000**	**523**	**535**	**1140**	**1470**	**334**	**248**	**12.2**	**1010**	**4.93**
	8270D (SIM) Semi-Volatile Organic Compou0s	3-Methylphenanthrene	ug/Kg dry	36.69						74	**34400**	**50100**	**9.04**	**6.82**	4.86	**1870**	**234**	**208000**	**40.9**	**2070**	**849**	**4.51**	**2.89**	**165000**	**467**	**509**	**1010**	**1280**	**286**	**226**	**12.2**	**854**	**4.93**
	8270D (SIM) Semi-Volatile Organic Compou0s	4/9-Methylphenanthrene	ug/Kg dry	37.14						75	**35500**	**45800**	**8.33**	**9.03**	4.86	**2010**	**230**	**166000**	**32**	**1910**	**929**	**4.13**	**2.75**	**165000**	**421**	**580**	**1210**	**1530**	**307**	**222**	**12.2**	**861**	**4.93**
	8270D (SIM) Semi-Volatile Organic Compou0s	4-Methyldibenzothiophene	ug/Kg dry	36.01						76	**5020**	**12000**	3.96	4.92	4.86	**427**	**53.4**	**49500**	**9.34**	**581**	**49.7**	4.29	5.34	**34400**	**107**	**23.5**	**256**	**250**	**24.3**	**55.1**	**12.2**	**265**	**4.93**
71-43-2	8270D (SIM) Semi-Volatile Organic Compou0s	Benzene	ug/Kg dry							77	**161**	**288**	**5.56**	**10.5**	**15.7**	**57.5**	**9.81**	**2490**	4.87	**174**	**31**	4.29	**13**	**355**	**17.8**	**7.32**	**11.4**	**14.6**	**16.5**	**13**	**18.7**	**18.9**	**4.93**

Attachment B. Complete Sediment Data Set
Amesbury Former MGP
Amesbury, Massachusetts

											River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River
										Sample No.	F190059-07	F190057-01	F190057-02	F190059-08	F190059-09	F190058-07	F190058-01	F190058-08	F190058-09	F190058-02	F190058-03	F190058-04	F190058-10	F190058-11	F200006-03	F200006-04	F200006-05	F200006-06	F200006-07	F200006-08	F200006-09	F200006-01	F200008-02
										Sample Date:	11/14/2019	11/12/2019	11/12/2019	11/14/2019	11/14/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019	02/04/2020	02/04/2020	02/04/2020	02/04/2020	02/04/2020	02/04/2020	02/04/2020	02/05/2020	02/05/2020
										Sample Time:	14:52	10:07	10:10	15:21	15:24	12:48	10:28	13:33	13:37	10:59	11:03	11:07	14:15	14:49	09:12	09:21	09:56	10:09	10:18	10:37	10:46	08:16	08:43
										ClieSam	SS728-S3	SS729-S3	SS729-S4	SS730-S2	SS730-S3	SS731-S2	SS733-S4	SS734-S1	SS734-S2	SS735-S2	SS735-S3	SS735-S4	SS736-S2	SS737-S1	SS738-S1	SS738-S2	SS739-S1	SS739-S2	SS739-S3	SS740-S1	SS740-S2	SS741-S1	SS741-S3
										Depths:	5.4 to 5.6	3.9 to 4.0	5.9 to 6.0	2.5 to 2.6	4.8 to 4.9	3.8 to 3.9	5.4 to 5.6	4.9 to 5.0	6.1 to 6.2	3.3 to 3.4	6.7 to 6.8	7.8 to 7.9	3.9 to 4.0	8.5 to 8.6	1 to 1.5	3.5 to 3.7	1.3 to 1.5	7.6 to 7.8	8.7 to 9	0.5 to 1.7	4.2 to 4.5	0.9 to 1.1	4.4 to 4.6
										RAH																					RAH			
										%solids	52	59	80	74	80	63	77	73	76	63	47	78	76	39	79	52	62	65	64	66	30	64	76
CAS Number	Method Name	Analyte	Units	RT		PAH17	PAH34	PAH51	Abbrev	PAH #																								
													3.96		4.86		4.34		4.87		4.29	5.34								12.2		4.93
11095-43-5	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)thiophene	ug/Kg dry							78	345	700	3.96	4.92	4.86	257	4.34	45500	6.17	146	15.1	4.29	5.34	7200	12.7	5.71	15	20.9	6.06	6.03	12.2	19.3	4.93
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzene	ug/Kg dry							79	1840	782	2.03	8.02	4.86	428	4.34	998	4.87	447	373	2.45	5.13	1250	78.2	189	139	161	77.8	25.1	39	212	4.93
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Decalins	ug/Kg dry							80	656	1380	3.96	4.92	4.86	94.3	3.52	2040	4.87	531	58.1	4.29	5.34	3860	168	32.2	638	53.9	14.7	126	12.2	1980	4.93
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzenes	ug/Kg dry							81	622	782	2.25	6.34	4.86	300	4.34	6800	4.87	302	125	2.92	5.22	20700	44.3	66.8	131	78.2	34.4	25.3	39.7	184	4.93
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Decalins	ug/Kg dry							82	1670	2720	3.96	4.92	4.86	162	8.54	4800	4.87	427	73	4.29	5.34	9380	132	45.5	256	146	29.9	44.6	12.2	822	4.93
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzenes	ug/Kg dry							83	1060	2890	2.86	4.92	4.86	572	4.99	18600	4.74	311	107	3.08	2.9	55600	48	45.4	146	87.5	39.9	19.6	6.51	70.2	4.93
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Decalins	ug/Kg dry							84	1770	2690	3.96	4.92	4.86	129	10.5	4710	4.87	239	61.2	4.29	5.34	9220	62.3	30.7	191	151	25.5	21.7	12.2	388	4.93
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzenes	ug/Kg dry							85	2250	9610	3.53	7.77	4.86	816	16	41900	5.83	370	113	4.29	5.34	71200	70.8	58	653	108	33.6	78.2	12.2	188	4.93
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Decalins	ug/Kg dry							86	3450	4340	3.96	4.92	4.86	152	17.6	7810	4.87	323	68.1	4.29	5.34	15900	108	27.5	357	316	27	40	12.2	591	4.93
	8270D (SIM) Semi-Volatile Organic Compou0s	C5-Benzenes	ug/Kg dry							87	2240	5840	3.96	12	4.86	421	13.1	14700	3.37	218	63.8	4.29	5.34	28200	53.1	30.1	328	82.5	17.8	56.6	12.2	223	4.93
86-74-8	8270D (SIM) Semi-Volatile Organic Compou0s	Carbazole	ug/Kg dry	35.61						88	341	430	3.96	4.92	4.86	126	4.34	12000	5.38	1410	49.1	4.29	5.34	2830	202	35.1	44.7	150	63.7	12.5	12.2	399	4.93
493-01-6	8270D (SIM) Semi-Volatile Organic Compou0s	cis-Decalin	ug/Kg dry							89	81.3	115	3.96	4.92	4.86	5.72	4.34	983	4.87	31.6	4.31	4.29	5.34	368	24.6	3.69	102	7.79	5.7	14.6	12.2	177	4.93
100-41-4	8270D (SIM) Semi-Volatile Organic Compou0s	Ethylbenzene	ug/Kg dry							90	279	518	3.96	4.92	4.86	81.1	4.34	9830	4.87	94.6	27.9	4.29	5.34	25800	12.4	12.9	26.6	22.3	12.4	3.24	12.2	20.9	4.93
98-82-8	8270D (SIM) Semi-Volatile Organic Compou0s	Isopropylbenzene	ug/Kg dry							91	74.2	215	3.96	4.92	4.86	27.5	4.34	2310	4.87	23.2	4.35	4.29	5.34	7250	24.6	7.32	10.3	3.79	5.7	6.03	12.2	8.52	4.93
	8270D (SIM) Semi-Volatile Organic Compou0s	m,p-Xylene	ug/Kg dry							92	738	726	3.96	7.45	4.86	418	4.34	2540	4.87	433	197	3.65	5.33	9780	41.1	77.5	169	91	34.1	31.6	49.4	250	4.93
108-87-2	8270D (SIM) Semi-Volatile Organic Compou0s	Methylcyclohexane	ug/Kg dry							93	136	66.8	3.96	4.92	4.86	77.3	4.34	983	4.87	153	40.7	4.29	5.34	220	24.6	6.55	19.3	30.1	13.7	6.03	12.2	8.16	4.93
104-51-8	8270D (SIM) Semi-Volatile Organic Compou0s	n-Butylbenzene	ug/Kg dry							94	143	41.9	3.96	4.92	4.86	63.6	4.34	983	4.87	51.1	15.7	4.29	5.34	121	24.6	4.41	244	5.79	5.7	6.66	12.2	26	4.93
103-65-1	8270D (SIM) Semi-Volatile Organic Compou0s	n-Propylbenzene	ug/Kg dry							95	96.2	174	3.96	4.92	4.86	37.9	4.34	792	4.87	39.3	12.4	4.29	5.34	3500	24.6	7.32	50.9	6.2	5.7	6.03	12.2	11.6	4.93
95-47-6	8270D (SIM) Semi-Volatile Organic Compou0s	o-Xylene	ug/Kg dry							96	142	165	3.96	4.92	4.86	99.4	4.34	2320	4.87	81.8	15.5	4.29	5.34	9930	24.6	11.3	19.7	18.7	8.21	3.22	12.2	19.8	4.93
99-87-6	8270D (SIM) Semi-Volatile Organic Compou0s	p-Isopropyltoluene	ug/Kg dry							97	183	524	3.96	4.92	4.86	66.5	4.34	3850	4.87	38.6	48.3	4.29	5.34	9220	12.4	29	61.2	36.6	12	4.6	12.2	12.3	4.93
135-98-8	8270D (SIM) Semi-Volatile Organic Compou0s	sec-Butylbenzene	ug/Kg dry							98	18.5	80.1	3.96	4.92	4.86	7.49	4.34	983	4.87	9.96	7.38	4.29	5.34	490	24.6	7.32	125	5.7	5.7	6.03	12.2	8.52	4.93
100-42-5	8270D (SIM) Semi-Volatile Organic Compou0s	Styrene	ug/Kg dry							99	329	952	3.96	6.48	4.86	36.7	4.01	2810	4.87	135	41	4.29	5.34	5440	17.6	23.5	49.7	30.2	23.9	6.03	12.2	49.9	4.93
98-06-6	8270D (SIM) Semi-Volatile Organic Compou0s	t-Butylbenzene	ug/Kg dry							100	9.94	249	3.96	4.92	4.86	5.71	4.34	983	4.87	5.69	7.38	4.29	5.34	121	24.6	7.32	9.31	5.7	5.7	6.03	12.2	8.52	4.93
108-88-3	8270D (SIM) Semi-Volatile Organic Compou0s	Toluene	ug/Kg dry							101	2780	1180	2.75	10.8	2.85	639	2.63	1540	4.87	682	564	4.24	7.39	1860	94	215	167	190	89.9	27.2	45.7	275	4.93
493-02-7	8270D (SIM) Semi-Volatile Organic Compou0s	trans-Decalin	ug/Kg dry							102	170	398	3.96	4.92	4.86	33.3	4.34	983	4.87	242	26	4.29	5.34	929	24.6	7.32	10.4	5.7	5.7	6.03	12.2	8.52	4.93
3891-98-3	Saturated Hydrocarbons by GC/FID	2,6,10-trimethyldodecane (1380)	mg/Kg dry							103	1600	2960	3.96	4.92	4.86	113	5.85	4260	4.87	252	48.2	4.29	5.34	4500	65	26	275	104	22	38.6	7.22	695	4.93
3892-00-0	Saturated Hydrocarbons by GC/FID	2,6,10-trimethylpeadecane (1650)	mg/Kg dry							104	3670	6110	11.5	15.1	9.25	194	20.5	7100	10.6	313	112	10.3	12.2	10500	77.4	68.8	417	257	53.5	54.9	7.31	796	4.93
3891-99-4	Saturated Hydrocarbons by GC/FID	2,6,10-trimethyltridecane (1470)	mg/Kg dry							105	2770	4870	4.81	8.65	4.86	234	9.61	7200	3.6	386	131	4.29	6.09	9360	101	77	461	233	65.2	68.5	20.1	1030	4.93
	Classical Chemistry	Black Carbon (Average)	mg/kg							106																							
	Saturated Hydrocarbons by GC/FID	C-10	mg/Kg dry							107																							
	Saturated Hydrocarbons by GC/FID	C-11	mg/Kg dry							108																							
	Saturated Hydrocarbons by GC/FID	C-12	mg/Kg dry							109																							
	Saturated Hydrocarbons by GC/FID	C-13	mg/Kg dry							110																							
	Saturated Hydrocarbons by GC/FID	C-14	mg/Kg dry							111																							
	Saturated Hydrocarbons by GC/FID	C-15	mg/Kg dry							112																							
	Saturated Hydrocarbons by GC/FID	C-16	mg/Kg dry							113																							
	Saturated Hydrocarbons by GC/FID	C-17	mg/Kg dry							114	786	1000	40.7	67.9	37.1	346	29.3	1500	40.3	389	279	41.7	49.8	1380	110	119	271	211	108	37.2	59.6	258	10.6
	Saturated Hydrocarbons by GC/FID	C-18	mg/Kg dry							115	850	851	33.1	52.1	26.8	142	19.8	1920	31.9	394	139	32.9	42.6	1280	106	79.3	201	121	59.9	26.7	62	202	7.36
	Saturated Hydrocarbons by GC/FID	C-19	mg/Kg dry							116																							
	Saturated Hydrocarbons by GC/FID	C-21	mg/Kg dry							117																							
	Saturated Hydrocarbons by GC/FID	C-22	mg/Kg dry							118																							
	Saturated Hydrocarbons by GC/FID	C-23	mg/Kg dry							119																							
	Saturated Hydrocarbons by GC/FID	C-24	mg/Kg dry							120																							
	Saturated Hydrocarbons by GC/FID	C-25	mg/Kg dry							121																							
	Saturated Hydrocarbons by GC/FID	C-26	mg/Kg dry							122																							
	Saturated Hydrocarbons by GC/FID	C-27	mg/Kg dry							123																							
	Saturated Hydrocarbons by GC/FID	C-28	mg/Kg dry							124																							
	Saturated Hydrocarbons by GC/FID	C-29	mg/Kg dry							125																							
	Saturated Hydrocarbons by GC/FID	C-30	mg/Kg dry							126																							
	Saturated Hydrocarbons by GC/FID	C-31	mg/Kg dry							127																							
	Saturated Hydrocarbons by GC/FID	C-32	mg/Kg dry							128																							
	Saturated Hydrocarbons by GC/FID	C-33	mg/Kg dry							129																							
	Saturated Hydrocarbons by GC/FID	C-34	mg/Kg dry							130																							
	Saturated Hydrocarbons by GC/FID	C-35	mg/Kg dry							131																							
	Saturated Hydrocarbons by GC/FID	C-36	mg/Kg dry							132																							
	Saturated Hydrocarbons by GC/FID	C-37	mg/Kg dry							133																							
	Saturated Hydrocarbons by GC/FID	C-38	mg/Kg dry							134																							
	Saturated Hydrocarbons by GC/FID	C-39	mg/Kg dry							135																							
	Saturated Hydrocarbons by GC/FID	C-40	mg/Kg dry							136																							
	Saturated Hydrocarbons by GC/FID	C-8	mg/Kg dry							137																							
	Saturated Hydrocarbons by GC/FID	C-9	mg/Kg dry							138																							
638-36-8	Saturated Hydrocarbons by GC/FID	Phytane	mg/Kg dry	34.53						141	6590	10900	33.9	45.7	30	344	38.5	7770	30.3	1040	197	33.9	38.5	17600	194	111	741	449	90.7	113	49.6	2020	8.09
1921-70-6	Saturated Hydrocarbons by GC/FID	Pristane	mg/Kg dry	32.65						142	7070	12700	26.2	35.2	25.5	366	41.8	10600	23.7	842	254	27.6	30.5	20500	170	137	959	478	95.5	130	31.4	2110	5.72
TOC	Classical Chemistry	Total Organic Carbon (Average)	mg/kg							145	92800	81700	1270	11400	3260	109000	1230	79800	1750	248000	52800	9850	12100	116000	39600	11.7	1140	124000	35100	23600	162000	23100	1190
	TPAH16										650290	2468100	736.69	217.11	3.52	72173	7116.4	13157500	1896.4	137070	21375	69.87	148.46	5181700	32646	18198	40221	42577	21596	10778.7	33.56	53065	19.29
	TPAH34										1276610	3573200	1072.74	1436.61	4107.23	116293	11139.3	18058710	2568.09	186826	41718	156.96	2252.31	9546640	44157	31025	67360	77749	30625.6	16341.1	957.6	78855	43.95
	TPAH51										1455150	3970210	1171.84	1536.17	4107.23	131946	12410.22	21404970	2937.96	208002	48084.1	169.83	2296.94	11906100	48687	34997	76759	89270	33679.3	18024.6	1007.48	90084	48.88
	LPAH										315020	1200600	174.13	73.92	0	45565	3762	9929400	1498.58	45920	4059	15.47	100.62	4495000	9396	2614	12437	9877	3131	5395.8	9.66	13119	0
	HPAH										344380	1278600	566.24	148.11	3.52	29698	3438.7	4618100	501.82	91810	17715	54.4	60.74	1598700	23467	15763	28143	33095	18563	5405.3	23.9	40102	19.29

(does not include source area samples collected in 2017)

Attachment B. Complete Sediment Data Set
Amesbury Former MGP
Amesbury, Massachusetts

											River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River
										Sample No.	F200006-10	F200006-11	F200008-03	F200008-04	F200006-12	F200008-09	F200008-10	F200006-13	F200008-05	F200008-06	F200006-14	F200006-15	F200006-16	F200006-17	F200006-18	F200006-19	F200006-20	F200006-01	F200006-02	F200008-11	F200008-12	F200008-07	F200008-08
										Sample Date:	02/04/2020	02/04/2020	02/05/2020	02/05/2020	02/04/2020	02/05/2020	02/05/2020	02/04/2020	02/05/2020	02/05/2020	02/03/2020	02/03/2020	02/03/2020	02/03/2020	02/03/2020	02/03/2020	02/04/2020	02/04/2020	02/05/2020	02/05/2020	02/05/2020	02/05/2020
										Sample Time:	11:31	12:08	09:31	09:47	13:40	12:15	12:41	14:30	10:22	10:51	11:14	11:25	12:56	14:01	14:12	14:49	14:57	08:47	08:55	13:01	13:12	11:07	11:46
										ClieSam	SS742-S1	SS743-S2	SS744-S1	SS744-S2	SS745-S2	SS746-S1	SS746-S3	SS747-S2	SS748-S1	SS748-S3	SS749-S1	SS749-S2	SS750-S1	SS751-S1	SS751-S2	SS752-S1	SS752-S2	SS753-S1	SS753-S2	SS754-S1	SS754-S2	SS755-S1	SS756-S1
										Depths:	4.9 to 5.1	4.9 to 5.1	1.9 to 2.1	3.9 to 4.1	3.7 to 3.9	1.9 to 2.1	4.6 to 5.1	6.5 to 6.7	2.5 to 2.7	5.5 to 5.7	4.1 to 4.3	8 to 8.2	0.8 to 1	2.1 to 2.3	4.2 to 4.4	2.1 to 2.3	4.9 to 5.1	1.3 to 1.5	4.1 to 4.3	3.9 to 4.1	8.4 to 8.6	1.7 to 1.9	1.5 to 1.7
										RAH																							
										%solids	79	69	59	77	79	52	80	79	55	85	72	89	73	68	73	55	62	68	79	45	65	53	44
CAS Number	Method Name	Analyte	Units	RT		PAH17	PAH34	PAH51	Abbrev	PAH #	4.41	5.26	6.31	4.74	4.83		4.41	4.41		4.55		3.84			5.21				4.54				
		Max RL for ND PAHs=								1																							
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzo(b)thiophenes	ug/Kg dry	17					C1BT	2	0	0	0	0	0	494	0	0	120	0	11.9	0	5.93	65.4	0	122	8.28	21.9	0	693	3.56	5.3	37.7
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzo(b)thiophenes	ug/Kg dry	18					C2BT	3	0	0	0	0	0	1450	0	0	426	0	22	0	12.3	68	0	421	9.1	38.3	0	1820	4.42	10.1	85.7
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzo(b)thiophenes	ug/Kg dry	19					C3BT	4	0	0	0	0	0	1160	0	0	590	0	20.5	0	10.9	64.9	0	403	9.02	65.7	0	1540	3.09	9.45	153
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzo(b)thiophenes	ug/Kg dry	20					C4BT	5	0	0	0	0	0	471	0	0	323	0	24.4	0	5.02	49.9	0	185	3.57	44.4	0	508	5.89	5.24	141
91-20-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Naphthalene**	ug/Kg dry	21.86	L	x	x	x	NA	6	0	0	0	0	0	5850	5.51	0	1350	0	442	0	45.6	1200	0	1480	97.3	1070	0	9550	32.4	45.3	84.2
91-57-6	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylnaphthalene	ug/Kg dry	24.57	L	x		x	2MN	7	0	0	0	0	0	2510	2.55	0	1460	0	336	0	57.4	76.1	0	573	84.7	1300	0	4420	26.7	35.6	80
90-12-0	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylnaphthalene	ug/Kg dry	25				x	1MN	8	0	0	0	0	0	22100	8.83	0	3860	0	160	0	81	52.3	0	1220	38	520	0	31700	15.4	29.9	41.7
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Naphthalenes	ug/Kg dry	24.57			x	x	C1N	9	0	0	0	0	0	14400	7.08	0	3140	0	304	0	84.1	78.5	0	1070	75.5	1120	0	21100	25.7	40.3	78.6
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Naphthalenes	ug/Kg dry	27.02			x	x	C2N	10	0	2.88	4.42	0	0	39200	18.2	0	11000	0	381	0	171	549	0	6160	117	844	0	39600	49.8	97.5	598
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Naphthalenes	ug/Kg dry	29.76			x	x	C3N	11	0	0	0	0	0	25300	13.4	0	11600	0	391	0	145	701	0	3510	112	1090	0	18900	47	108	2480
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Naphthalenes	ug/Kg dry	32.52			x	x	C4N	12	0	0	0	0	0	10800	6.31	0	5480	0	461	0	61.9	466	0	1340	66.5	761	0	5460	27.1	75.2	2360
92-52-4	8270D (SIM) Semi-Volatile Organic Compou0s	Biphenyl	ug/Kg dry	26.46					BP	13	0	0	0	0	0	990	4.41	0	548	0	222	0	28.7	697	0	284	29.1	288	0	2210	8.64	13	50.6
208-96-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Acenaphthylene**	ug/Kg dry	28.16	L	x	x	x	ACE	14	0	0	0	0	0	5990	3.47	3.57	2910	0	543	0	107	157	0	1610	55.6	354	0	5110	25.8	41.1	205
83-32-9	8270D (SIM) Semi-Volatile Organic Compou0s	**Acenaphthene**	ug/Kg dry	28.89	L	x	x	x	ACY	15	0	0	0	0	0	26500	11.9	0	6870	0	379	0	334	131	0	13000	48.2	516	0	50900	15.6	47.8	227
132-64-9	8270D (SIM) Semi-Volatile Organic Compou0s	Dibenzofuran	ug/Kg dry	29.54				x	DBF	16	0	0	0	0	0	1620	0	0	611	0	117	0	241	46.8	0	315	51.2	111	0	2660	14.1	21.7	40.5
86-73-7	8270D (SIM) Semi-Volatile Organic Compou0s	**Fluorene**	ug/Kg dry	30.91	L	x	x	x	FLE	17	0	0	0	0	0	19600	8.92	0	7140	0	501	0	525	233	0	7060	87	438	0	29400	29.2	53.7	89.5
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Fluorenes	ug/Kg dry	33.14			x	x	C1FL	18	0	0	0	0	0	18700	8.17	3.54	8060	0	550	0	149	345	0	2590	66.8	279	0	14200	24.2	52.2	569
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Fluorenes	ug/Kg dry	35.22			x	x	C2FL	19	0	0	0	0	0	18600	8.07	7.73	7550	0	795	0	106	447	0	1730	123	1120	0	7830	42.7	93.8	1300
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Fluorenes	ug/Kg dry	38.01			x	x	C3FL	20	0	0	0	0	0	11500	6.17	6.9	3890	0	495	0	91.1	515	0	1370	115	776	0	3520	38.2	72.7	1020
132-65-0	8270D (SIM) Semi-Volatile Organic Compou0s	Dibenzothiophene	ug/Kg dry	34.23				x	DBT	21	0	0	0	0	0	4460	2.49	2.51	2700	0	350	0	197	112	0	2250	31.2	373	0	10600	10.7	27.4	193
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Dibenzothiophenes	ug/Kg dry	36.43				x	C1DBT	22	0	0	0	0	0	10300	4.7	3.62	5290	0	545	0	105	216	0	2480	45.6	732	0	10700	17.6	45.9	728
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Dibenzothiophenes	ug/Kg dry	37.7				x	C2DBT	23	0	0	0	0	0	11000	5.76	5.91	4980	0	616	0	77.6	327	0	2440	53.7	810	0	6770	22	52.8	1010
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Dibenzothiophenes	ug/Kg dry	39.5				x	C3DBT	24	0	0	0	0	0	7400	3.54	4.13	3030	0	385	0	38.5	364	0	1850	37.5	557	0	3500	19.6	41.6	790
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Dibenzothiophenes	ug/Kg dry	41.65				x	C4DBT	25	0	0	0	0	0	2850	0	3.11	1140	0	178	0	25.7	245	0	980	22.2	233	0	1400	17.3	24.1	414
85-01-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Phenanthrene**	ug/Kg dry	34.72	L	x	x	x	PHE	26	0	0	7.85	0	0	65700	39.1	15.8	39800	0	1800	0	3010	1300	0	28900	497	4580	2.7	161000	158	343	1660
120-12-7	8270D (SIM) Semi-Volatile Organic Compou0s	**Anthracene**	ug/Kg dry	34.91	L	x	x	x	ANT	27	0	0	0	0	0	22100	10.3	6.49	13900	0	952	0	982	286	0	8380	200	1700	0	47400	65.3	125	449
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Phenanthrenes/Anthracenes	ug/Kg dry	36.96			x	x	C1PH	28	0	0	6.59	0	0	88500	37.3	15.3	42200	0	2260	0	1010	846	0	13200	574	5710	3.66	71700	211	383	2480
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Phenanthrenes/Anthracenes	ug/Kg dry	38.97			x	x	C2PH	29	0	0	5.74	0	0	58000	22.8	15.9	22100	0	2350	0	399	901	0	6180	431	3820	0	23900	142	289	2120
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Phenanthrenes/Anthracenes	ug/Kg dry	40.8			x	x	C3PH	30	0	0	4.02	0	0	25000	8.93	8.69	8440	0	1100	0	142	691	0	4140	208	1680	0	7340	93.6	147	1050
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Phenanthrenes/Anthracenes	ug/Kg dry	41.72			x	x	C4PH	31	0	0	82.7	0	0	13800	5.42	4.75	5540	0	953	0	198	465	0	7820	168	957	0	8590	87	124	631
483-65-8	8270D (SIM) Semi-Volatile Organic Compou0s	Retene	ug/Kg dry	41.72				x	RET	32	0	3.12	378	0	0	1870	0	2.68	1610	0	125	0	28.5	163	0	25900	69.1	282	0	1460	46.4	63.4	87.5
239-35-0	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)naphtho(2,1-d)thiophene	ug/Kg dry	44.24					BNT	33	0	0	0	0	0	5020	0	3.81	2550	0	566	0	160	117	0	1820	69.6	370	0	6340	26.8	46.7	188
	8270D (SIM) Semi-Volatile Organic Compou0s	C0-Benzonaphthothiophenes	ug/Kg dry	44.24					C0BNT	34	0	0	0	0	0	8310	3.37	7.78	4490	0	1040	0	318	217	0	3360	131	654	0	11600	51.6	85.8	337
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzonaphthothiophenes	ug/Kg dry	45.63					C1BNT	35	0	0	0	0	0	8920	3.89	4.68	4310	0	645	0	143	216	0	2410	113	585	0	6550	46	73.2	345
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzonaphthothiophenes	ug/Kg dry	47.14					C2BNT	36	0	0	0	0	0	4770	2.63	3.88	2550	0	359	0	93.9	209	0	1420	94.5	351	0	2870	38.1	56.7	344
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzonaphthothiophenes	ug/Kg dry	49.02					C3BNT	37	0	0	0	0	0	2260	0	0	1430	0	241	0	87.3	166	0	950	59	205	0	1970	27.4	37.7	286
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzonaphthothiophenes	ug/Kg dry	51.51					C4BNT	38	0	0	0	0	0	599	0	0	429	0	59.8	0	45.7	143	0	331	21.3	59.4	0	477	10.4	15.2	153
206-44-0	8270D (SIM) Semi-Volatile Organic Compou0s	**Fluoranthene**	ug/Kg dry	39.51	H	x	x	x	FLA	39	3.79	0	12	0	0	48300	22.9	57.7	29800	0	8030	3.63	3750	1580	4.73	23600	692	4410	3.18	110000	256	661	2460
129-00-0	8270D (SIM) Semi-Volatile Organic Compou0s	**Pyrene**	ug/Kg dry	40.39	H	x	x	x	PYR	40	3.76	0	13	0	0	70600	34.7	86.9	42300	0	14700	5.54	3070	1670	7.85	32600	1300	7160	5.71	169000	444	789	3020
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Fluoranthenes/Pyrenes	ug/Kg dry	41.78			x	x	C1PY	41	5.3	2.72	9.9	0	0	73500	25.5	43.4	32600	0	6010	3.18	1210	927	6.35	15400	786	4880	3.4	66500	293	467	1560
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Fluoranthenes/Pyrenes	ug/Kg dry	43.52				x	C2PY	42	0	0	4.81	0	0	34800	11.3	13.2	13800	0	2000	0	480	572	0	5090	440	2240	0	17600	168	247	760
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Fluoranthenes/Pyrenes	ug/Kg dry	45.72				x	C3PY	43	0	0	0	0	0	14000	5.93	5.8	5590	0	765	0	216	321	0	1950	254	992	0	5220	94.8	141	389
243-17-4	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)fluorene	ug/Kg dry	42.03				x	BbF	44	0	0	0	0	0	7040	2.22	3.65	3320	0	754	0	207	98.7	0	1760	85.5	471	0	7950	34.8	50.2	174
205-12-9	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(c)fluorene	ug/Kg dry	42.07				x	BcF	45	0	0	0	0	0	3460	0	2.4	1700	0	294	0	80.7	45.8	0	815	46.4	243	0	3460	16.5	25.2	84.5
3442-78-2	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylpyrene	ug/Kg dry	42.18				x	2MP	46	0	0	0	0	0	10600	3.69	5.61	4330	0	821	0	141	117	0	2130	110	705	0	9290	40.6	62.5	214
3353-12-6	8270D (SIM) Semi-Volatile Organic Compou0s	4-Methylpyrene	ug/Kg dry	42.55				x	4MP	47	0	0	0	0	0	10100	3.57	5.43	4030	0	694	0	99.7	135	0	1880	106	641	0	7410	38.9	61	207
2381-21-7	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylpyrene	ug/Kg dry	42.67				x	1MP	48	0	0	0	0	0	8480	3	5.01	3820	0	698	0	84.7	104	0	1840	80.6	570	0	7990	28.6	46.9	163
56-55-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Benz(a)anthracene**	ug/Kg dry	45.17	H	x	x	x	BaA	49	0	0	5.84	0	0	33900	12.5	31.6	17100	0	4860	1.98	1660	769	4.46	12500	675	2850	0	48600	249	377	970
	8270D (SIM) Semi-Volatile Organic Compou0s	**Chrysene/triphenylene**	ug/Kg dry	45.36	H	x	x	x	CH	50	0	0	6.66	0	0	40000	15	36.3	18600	0	4610	2.38	1370	869	5.33	12600	658	2870	0	43900	256	397	1120
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	46.81				x	x	C1CR	51	0	0	5.57	0	0	38200	11.1	16.2	16000	0	2570	0	611	522	4.18	6700	506	2440	0	23900	215	306	757
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	48.52				x	x	C2CR	52	0	0	7.56	0	0	17300	6.96	7.84	7630	0	1090	0	274	307	0	2670	325	1190	0	7960	142	184	499
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	49.55				x	x	C3CR	53	0	0	0	0	0	6580	0	0	3190	0	457	0	153	191	0	1130	193	517	0	2670	90.6	112	305
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	50				x	x	C4CR	54	0	0	0	0	0	2170	0	0	1220	0	215	0	76.3	29.3	0	602	116	193	0	1220	45.8	64.1	196
205-99-2	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(b)fluoranthene**	ug/Kg dry	49.23	H	x	x	x	BbF	55	0	0	4.97	0	0	16000	5.85	22.1	7200	0	2850	0	1030	581	5.61	7210	462	1420	0	22500	169	255	696
	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(j/k)fluoranthene**	ug/Kg dry	49.29	H	x	x	x	BjF	56	0	0	4.46	0	0	18800	7.36	26.5	9270	0	3090	0	1150	615	5.55	8000	461	1560	0	28700	191	288	707
192-97-2	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(e)pyrene	ug/Kg dry	50.17			x	x	BeP	57	0	0	4.52	0	0	18700	7.29	24.3	8000	0	2710	0	830	522	4.87	7370	436	1490	0	26100	165	247	656
50-32-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(a)pyrene**	ug/Kg dry	50.34	H	x	x	x	BaP	58	0	0	5.86	0	0	25100	9.05	36	12700	0	4430	2.16	1420	736	5.97	12200	636	2290	0	45600	232	349	908
198-55-0	8270D (SIM) Semi-Volatile Organic Compou0s	Perylene	ug/Kg dry	50.61			x	x	PE	59	1780	350	101	132	5160	3940	710	1130	2070	0	884	2.78	397	274	5060	2020	947	783	1050	7050	506	806	774
193-39-5	8270D (SIM) Semi-Volatile Organic Compou0s	**Indeno(1,2,3-cd)pyrene**	ug/Kg dry	54	H	x	x	x	I123P	60	0	0	3.99	0	0	13500	5.45	17.2	6570	0	2600	0	901	505	3.69	6530	401	1240	0	24100	152	230	631
53-70-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Dibenzo(a,h)anthracene**	ug/Kg dry	54.01	H	x	x	x	DBA	61	0	0	0	0	0	3300	0	3.66	1690	0	511	0	173	115	0	1340	95.2	291	0	4940	34.5	52.2	132
191-24-2	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(g,h,i)perylene**	ug/Kg dry	54.91	H	x	x	x	BGP	62	0	0	3.61	0	0	11400	4.72	18.3	5390	0	2190	0	682	420	3.6	5740	353	1090	0	21500	125	190	544
191-07-1	8270D (SIM) Semi-Volatile Organic Compou0s	Coronene	ug/Kg dry	61.34				x	COR	63	0	0	0	0	0	3040	0	5.11	1480	0	635	0	173	108	0	1530	81.5	291	0	6440	32.2	50.5	170
526-73-8	8270D (SIM) Semi-Volatile Organic Compou0s	1,2,3-Trimethylbenzene	ug/Kg dry							64	4.41	5.26	6.31	4.74	4.83	142	4.41	4.43	21	4.55	3.03	3.84	5.07	71.2	5.21	33.8	3.84	15.1	4.54	396	5.89	7.15	14.6
95-63-6	8270D (SIM) Semi-Volatile Organic Compou0s	1,2,4-Trimethylbenzene	ug/Kg dry							65	4.41	5.26	6.31	4.74	4.83	389	4.41	4.43	75.6	4.55	8.22	3.84	4.23	158	5.21	64.1	13.6	63.5	4.54	647	3.92	10.2	25.2
108-67-8	8270D (SIM) Semi-Volatile Organic Compou0s	1,3,5-Trimethylbenzene	ug/Kg dry							66	4.41	5.26	6.31	4.74	4.83	153	4.41	4.43	29.5	4.55	4.52	3.84	5.07	97	5.21	22	10.7	20.3	4.54	299	3.33	4.36	9.18
	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methyldibenzothiophene	ug/Kg dry	36.76						67	4.41	5.26	6.31	4.74	4.83	908	4.41	4.43	532	4.55	53.3	3.84	9.79	24.9	5.21	268	3.97	69.1	4.54	1000	5.89	4.59	76.5
	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylphenanthrene	ug/Kg dry	37.24						68	4.41	5.26	6.31	4.74	4.83	16200	7.11	2.71	7470	4.55	321	3.84	148	144	5.21	2280	51.9	859	4.54	11500	17.8	39.7	369
	8270D (SIM) Semi-Volatile Organic Compou0s	2,3,5-Trimethylnaphthene	ug/Kg dry	30.44						69	4.41	5.26	6.31	4.74	4.83	1780	4.41	4.43	722	4.55	15.7	3.84	12.7	50.7	5.21	205	9	81.1	4.54	1050	3.8	8.18	165
581-42-0	8270D (SIM) Semi-Volatile Organic Compou0s	2,6-Dimethylnaphthalene	ug/Kg dry	27.07						70	4.41	5.26	6.31	4.74	4.83	8540	3.69	4.43	2520	4.55	119	3.84	38.7	176	5.21	1170	29.5	199	4.54	7770	12.1	23.8	74.9
	8270D (SIM) Semi-Volatile Organic Compou0s	2/3-Methyldibenzothiophene	ug/Kg dry	36.31						71	4.41	5.26	6.31	4.74	4.83	3330	4.41	4.43	1750	4.55	166	3.84	34.1	72	5.21	822	14.7	244	4.54	3730	5.6	14.4	263
	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylanthracene	ug/Kg dry	36.96						72	4.41	5.26	6.31	4.74	4.83	8180	2.85	2.93	4590	4.55	559	3.84	161	65.4	5.21	1370	77.1	620	4.54	8920	26.7	44	157
	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylphenanthrene	ug/Kg dry	36.81						73	4.41	5.26	6.31	4.74	4.83	22200	9.3	4.43	10300	4.55	270	3.84	274	229	5.21	3440	138	1480	4.54	18800	49.9	91.2	693
	8270D (SIM) Semi-Volatile Organic Compou0s	3-Methylphenanthrene	ug/Kg dry	36.69						74	4.41	5.26	6.31	4.74	4.83	19500	8.01	2.87	9010	4.55	427	3.84	227	195	5.21	3010	142	1270	4.54	16800	55.2	94	626
	8270D (SIM) Semi-Volatile Organic Compou0s	4/9-Methylphenanthrene	ug/Kg dry	37.14						75	4.41	5.26	6.31	4.74	4.83	22400	9.78	4.39	10800	4.55	685	3.84	196	203	5.21	3130	161	1480	4.54	15700	61.2	110	608
	8270D (SIM) Semi-Volatile Organic Compou0s	4-Methyldibenzothiophene	ug/Kg dry	36.01						76	4.41	5.26	6.31	4.74	4.83	4450	4.41	4.43	2340	4.55	255	3.84	24.3	99.5	5.21	990	14.5	305	4.54	4440	5.34	17.2	325
71-43-2	8270D (SIM) Semi-Volatile Organic Compou0s	Benzene	ug/Kg dry							77	4.41	6.95	6.31	4.74	4.83	39.8	4.41	4.43	36.6	4.55	6.78	3.84	15	228	5.21	17.6	6.06	6.8	4.54	108	5.89	5.33	0

Attachment B. Complete Sediment Data Set
Amesbury Former MGP
Amesbury, Massachusetts

												River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River
										Sample No.		F200006-10	F200006-11	F200008-03	F200008-04	F200006-12	F200008-09	F200008-10	F200006-13	F200008-05	F200008-06	F200006-14	F200006-15	F200006-16	F200006-17	F200006-18	F200006-19	F200006-20	F200006-01	F200006-02	F200008-11	F200008-12	F200008-07	F200008-08			
										Sample Date:		02/04/2020	02/04/2020	02/05/2020	02/05/2020	02/04/2020	02/05/2020	02/05/2020	02/04/2020	02/05/2020	02/05/2020	02/03/2020	02/03/2020	02/03/2020	02/03/2020	02/03/2020	02/03/2020	02/03/2020	02/04/2020	02/04/2020	02/05/2020	02/05/2020	02/05/2020	02/05/2020			
										Sample Time:		11:31	12:08	09:31	09:47	13:40	12:15	12:41	14:30	10:22	10:51	11:14	11:25	12:56	14:01	14:12	14:49	14:57	08:47	08:55	13:01	13:12	11:07	11:46			
										ClieSam		SS742-S1	SS743-S2	SS744-S1	SS744-S2	SS745-S2	SS746-S1	SS746-S3	SS747-S2	SS748-S1	SS748-S3	SS749-S1	SS749-S2	SS750-S1	SS751-S1	SS751-S2	SS752-S1	SS752-S2	SS753-S1	SS753-S2	SS754-S1	SS754-S2	SS755-S1	SS756-S1			
										Depths:		4.9 to 5.1	4.9 to 5.1	1.9 to 2.1	3.9 to 4.1	3.7 to 3.9	1.9 to 2.1	4.6 to 5.1	6.5 to 6.7	2.5 to 2.7	5.5 to 5.7	4.1 to 4.3	8 to 8.2	0.8 to 1	2.1 to 2.3	4.2 to 4.4	2.1 to 2.3	4.9 to 5.1	1.3 to 1.5	4.1 to 4.3	3.9 to 4.1	8.4 to 8.6	1.7 to 1.9	1.5 to 1.7			
										RAH																											
										%solids		79	69	59	77	79	52	80	79	55	85	72	89	73	68	73	55	62	68	79	45	65	53	44			
CAS Number	Method Name	Analyte	Units	RT		PAH17	PAH34	PAH51	Abbrev	PAH #		4.41	5.26	6.31	4.74	4.83		4.41	4.41		4.55		3.84			5.21				4.54						
11095-43-5	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)thiophene	ug/Kg dry							78		4.41	5.26	6.31	4.74	4.83	139	4.41	4.43	51.8	4.55	13.5	3.84	2.62	29.3	5.21	96	4.34	13.6	4.54	470	5.89	7.15	10.5			
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzene	ug/Kg dry							79		4.41	8.52	37.4	4.54	4.83	565	2.7	4.43	483	4.55	152	3.84	20.5	126	5.21	331	94.4	121	4.54	445	47.8	68.1	477			
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Decalins	ug/Kg dry							80		4.41	5.26	6.31	4.74	4.83	219	4.41	4.43	457	4.55	45.7	3.84	4.43	293	5.21	308	19.1	117	4.54	509	7.64	23.2	5550			
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzenes	ug/Kg dry							81		4.41	6.58	11.5	3.26	4.83	353	3.23	4.43	187	4.55	62.3	3.84	27.4	264	5.21	121	38.6	79.7	4.54	491	23.3	36	143			
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Decalins	ug/Kg dry							82		4.41	5.26	6.31	4.74	4.83	623	4.41	4.43	1020	4.55	112	3.84	5.07	282	5.21	644	27.2	161	4.54	991	15.1	29	2450			
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzenes	ug/Kg dry							83		4.41	5.26	9.78	4.74	4.83	719	4.41	4.43	187	4.55	26.2	3.84	13.3	353	5.21	142	29.4	128	4.54	1420	11.3	20.1	55.4			
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Decalins	ug/Kg dry							84		4.41	5.26	6.31	4.74	4.83	776	4.41	4.43	997	4.55	103	3.84	5.07	232	5.21	587	18.6	160	4.54	961	14.6	22.7	1320			
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzenes	ug/Kg dry							85		4.41	5.26	6.31	4.74	4.83	1960	4.41	4.43	451	4.55	25.5	3.84	10.6	313	5.21	370	31.4	105	4.54	3190	11	20.4	262			
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Decalins	ug/Kg dry							86		4.41	5.26	6.31	4.74	4.83	1940	4.41	4.43	1820	4.55	171	3.84	5.07	395	5.21	930	25.5	304	4.54	1510	16	37.7	2380			
	8270D (SIM) Semi-Volatile Organic Compou0s	C5-Benzenes	ug/Kg dry							87		4.41	5.26	6.31	4.74	4.83	1550	4.41	4.43	554	4.55	18.1	3.84	6.51	156	5.21	354	17.6	50.3	4.54	1660	7.23	16.8	455			
86-74-8	8270D (SIM) Semi-Volatile Organic Compou0s	Carbazole	ug/Kg dry	35.61						88		4.41	5.26	6.31	4.74	4.83	203	4.41	4.43	105	4.55	91.6	3.84	164	78.6	5.21	136	33.2	85.5	4.54	223	9.46	22.2	57.4			
493-01-6	8270D (SIM) Semi-Volatile Organic Compou0s	cis-Decalin	ug/Kg dry							89		4.41	5.26	6.31	4.74	4.83	39.5	4.41	4.43	32.7	4.55	5.03	3.84	5.07	37	5.21	24.7	6.21	9.72	4.54	52.4	5.89	7.15	578			
100-41-4	8270D (SIM) Semi-Volatile Organic Compou0s	Ethylbenzene	ug/Kg dry							90		4.41	5.26	6.31	4.74	4.83	142	4.41	4.43	69	4.55	13.7	3.84	3.24	176	5.21	27.7	5.86	26.6	4.54	220	5.89	3.64	20.7			
98-82-8	8270D (SIM) Semi-Volatile Organic Compou0s	Isopropylbenzene	ug/Kg dry							91		4.41	5.26	6.31	4.74	4.83	42.2	4.41	4.43	36.2	4.55	5.03	3.84	5.07	209	5.21	34.1	6.21	6.06	4.54	157	5.89	7.15	8.49			
	8270D (SIM) Semi-Volatile Organic Compou0s	m,p-Xylene	ug/Kg dry							92		4.41	6.72	13	3.1	4.83	342	2.82	4.43	166	4.55	83.7	3.84	36.8	164	5.21	134	50.2	90.7	4.54	478	29.6	46	203			
108-87-2	8270D (SIM) Semi-Volatile Organic Compou0s	Methylcyclohexane	ug/Kg dry							93		4.41	5.26	6.31	4.74	4.83	53	4.41	4.43	23.4	4.55	5.03	3.84	3.2	36.2	5.21	27.8	9.54	4.92	4.54	31.7	4.17	5.79	8.49			
104-51-8	8270D (SIM) Semi-Volatile Organic Compou0s	n-Butylbenzene	ug/Kg dry							94		4.41	5.26	6.31	4.74	4.83	86	4.41	4.43	36.3	4.55	6.31	3.84	5.07	22.6	5.21	25.6	6.21	14.8	4.54	191	5.89	7.15	73			
103-65-1	8270D (SIM) Semi-Volatile Organic Compou0s	n-Propylbenzene	ug/Kg dry							95		4.41	5.26	6.31	4.74	4.83	42.4	4.41	4.43	18.2	4.55	3.66	3.84	5.07	43.3	5.21	34.1	6.21	12.7	4.54	158	5.89	7.15	10.7			
95-47-6	8270D (SIM) Semi-Volatile Organic Compou0s	o-Xylene	ug/Kg dry							96		4.41	5.26	6.31	4.74	4.83	66.8	4.41	4.43	19.9	4.55	5.2	3.84	4.15	136	5.21	24.7	4.81	17.9	4.54	130	5.89	6.13	11			
99-87-6	8270D (SIM) Semi-Volatile Organic Compou0s	p-Isopropyltoluene	ug/Kg dry							97		4.41	5.26	17.8	4.74	4.83	75.5	4.41	0	30.2	4.55	7.88	3.84	5.07	20.7	5.21	18.1	23.5	21.7	4.54	110	4.01	5.96	10.3			
135-98-8	8270D (SIM) Semi-Volatile Organic Compou0s	sec-Butylbenzene	ug/Kg dry							98		4.41	5.26	6.31	4.74	4.83	36	4.41	4.43	36.2	4.55	5.03	3.84	5.07	21.5	5.21	34.1	6.21	5.56	4.54	38.7	5.89	7.15	4.74			
100-42-5	8270D (SIM) Semi-Volatile Organic Compou0s	Styrene	ug/Kg dry							99		4.41	5.26	6.31	4.74	4.83	211	4.41	4.43	260	4.55	28.1	3.84	5.88	114	5.21	77.6	8.05	19.5	4.54	220	3.71	5.06	24			
98-06-6	8270D (SIM) Semi-Volatile Organic Compou0s	t-Butylbenzene	ug/Kg dry							100		4.41	5.26	6.31	4.74	4.83	36	4.41	4.43	36.2	4.55	5.03	3.84	5.07	29.3	5.21	34.1	6.21	5.56	4.54	92.6	5.89	7.15	8.49			
108-88-3	8270D (SIM) Semi-Volatile Organic Compou0s	Toluene	ug/Kg dry							101		4.41	9.99	46.5	5.56	4.83	711	3.49	4.43	601	4.55	182	3.84	24.7	155	5.21	401	114	152	4.54	552	56.9	84.3	612			
493-02-7	8270D (SIM) Semi-Volatile Organic Compou0s	trans-Decalin	ug/Kg dry							102		4.41	5.26	6.31	4.74	4.83	36	4.41	4.43	36.2	4.55	5.03	3.84	5.07	29.3	5.21	34.1	6.21	5.56	4.54	39.4	5.89	7.15	8.49			
3891-98-3	Saturated Hydrocarbons by GC/FID	2,6,10-trimethyldodecane (1380)	mg/Kg dry							103		4.41	5.26	6.31	4.74	4.83	1080	4.41	4.43	1220	4.55	97.9	3.84	4.22	557	5.21	1640	18.8	202	4.54	1680	6.07	16.6	5300			
3892-00-0	Saturated Hydrocarbons by GC/FID	2,6,10-trimethylpeadecane (1650)	mg/Kg dry							104		4.41	3.7	5.57	4.74	4.83	4670	9.24	4.43	2600	7.39	228	3.84	23.2	829	4.31	2290	43.9	455	4.54	2660	20.9	65.5	4210			
3891-99-4	Saturated Hydrocarbons by GC/FID	2,6,10-trimethyltridecane (1470)	mg/Kg dry							105		4.41	5.66	4.25	4.74	4.83	2440	3.71	4.43	2110	2.48	230	3.84	15.6	835	5.21	2190	49.7	361	4.54	2450	21.2	45.8	6130			
	Classical Chemistry	Black Carbon (Average)	mg/kg							106																											
	Saturated Hydrocarbons by GC/FID	C-10	mg/Kg dry							107																											
	Saturated Hydrocarbons by GC/FID	C-11	mg/Kg dry							108																											
	Saturated Hydrocarbons by GC/FID	C-12	mg/Kg dry							109																											
	Saturated Hydrocarbons by GC/FID	C-13	mg/Kg dry							110																											
	Saturated Hydrocarbons by GC/FID	C-14	mg/Kg dry							111																											
	Saturated Hydrocarbons by GC/FID	C-15	mg/Kg dry							112																											
	Saturated Hydrocarbons by GC/FID	C-16	mg/Kg dry							113																											
	Saturated Hydrocarbons by GC/FID	C-17	mg/Kg dry							114		7.57	29.2	41.1	14.6	5.68	1450	22.9	6.64	685	24.9	220	6.37	82.9	349	22.4	506	159	93.2	6.12	618	114	123	8.49			
	Saturated Hydrocarbons by GC/FID	C-18	mg/Kg dry							115		7.04	13.3	20.4	11.6	3.8	1770	16.9	7.2	608	19.4	174	4.64	53.5	326	16	449	93.7	103	5.03	722	35.8	74.8	8.49			
	Saturated Hydrocarbons by GC/FID	C-19	mg/Kg dry							116																											
	Saturated Hydrocarbons by GC/FID	C-21	mg/Kg dry							117																											
	Saturated Hydrocarbons by GC/FID	C-22	mg/Kg dry							118																											
	Saturated Hydrocarbons by GC/FID	C-23	mg/Kg dry							119																											
	Saturated Hydrocarbons by GC/FID	C-24	mg/Kg dry							120																											
	Saturated Hydrocarbons by GC/FID	C-25	mg/Kg dry							121																											
	Saturated Hydrocarbons by GC/FID	C-26	mg/Kg dry							122																											
	Saturated Hydrocarbons by GC/FID	C-27	mg/Kg dry							123																											
	Saturated Hydrocarbons by GC/FID	C-28	mg/Kg dry							124																											
	Saturated Hydrocarbons by GC/FID	C-29	mg/Kg dry							125																											
	Saturated Hydrocarbons by GC/FID	C-30	mg/Kg dry							126																											
	Saturated Hydrocarbons by GC/FID	C-31	mg/Kg dry							127																											
	Saturated Hydrocarbons by GC/FID	C-32	mg/Kg dry							128																											
	Saturated Hydrocarbons by GC/FID	C-33	mg/Kg dry							129																											
	Saturated Hydrocarbons by GC/FID	C-34	mg/Kg dry							130																											
	Saturated Hydrocarbons by GC/FID	C-35	mg/Kg dry							131																											
	Saturated Hydrocarbons by GC/FID	C-36	mg/Kg dry							132																											
	Saturated Hydrocarbons by GC/FID	C-37	mg/Kg dry							133																											
	Saturated Hydrocarbons by GC/FID	C-38	mg/Kg dry							134																											
	Saturated Hydrocarbons by GC/FID	C-39	mg/Kg dry							135																											
	Saturated Hydrocarbons by GC/FID	C-40	mg/Kg dry							136																											
	Saturated Hydrocarbons by GC/FID	C-8	mg/Kg dry							137																											
	Saturated Hydrocarbons by GC/FID	C-9	mg/Kg dry							138																											
638-36-8	Saturated Hydrocarbons by GC/FID	Phytane	mg/Kg dry	34.53						141		6.4	11.2	20.8	9.96	4.36	12500	20.5	13.3	4310	20.7	645	5.44	52.1	2320	21.6	3920	103	896	7.63	4960	43.9	131	6040			
1921-70-6	Saturated Hydrocarbons by GC/FID	Pristane	mg/Kg dry	32.65						142		5.84	8.6	13.5	8.01	3.29	11100	19.9	7.73	5220	18.5	524	4.44	46	2420	15.7	4270	87.1	1020	5.86	5890	35.1	144	9880			
TOC	Classical Chemistry	Total Organic Carbon (Average)	mg/kg							145		3710	8370	31600	33600	7430	71400	12600	1680	55200	2190	18000	2380	9870	35200	7550	72600	27400	27200	1650	76800	22700	36400	63600			
	TPAH16											7.55	0	68.24	0	0	426640	196.73	362.12	222590	0	52488	15.69	20209.6	11167	46.79	182750	6718.3	33839	11.59	822200	2434.8	4244.1	13902.7			
	TPAH34											1792.85	355.6	300.26	132	5160	910830	1099.43	1646.67	422300	0	76464	21.65	26318	19943.8	5122.19	267752	12084.1	63489	1068.65	1179740	4680.5	7912.9	33336.3			
	TPAH51											1792.85	358.72	683.07	132	5160	1066460	1157.01	1714.84	485051	0	85937	21.65	28651.8	23047.5	5122.19	322755	13721.3	74560	1068.65	1318310	5324.7	8939.6	38882.5			
	LPAH											0	0	7.85	0	0	148250	81.75	25.86	73430	0	4953	0	5061	3383.1	0	61003	1069.8	9958	2.7	307780	353	691.5	2794.7			
	HPAH											7.55	0	60.39	0	0	280900	117.53	336.26	150620	0	47871	15.69	15206	7860	46.79	122320	5733.2	25181	8.89	518840	2108.5	3588.2	11188			

(does not include source area samples collected in 2017)

Attachment B. Complete Sediment Data Set
Amesbury Former MGP
Amesbury, Massachusetts

												River	River	River	River	Mudflat	Mudflat	River	River	River	River	River	River	River	River	River	River	River	Upstream	Upstream
											Sample No.	F200008-13	F200008-14	F200013-01	F200013-02	F200013-03	F200013-04	F200013-05	F200013-06	F200013-07	F200013-08	F200013-09	F200017-01	F200014-01	F200014-02	F200014-03	F200014-06	F200014-07	F200014-08	F200017-02	F200017-03	F200017-03RE1	F200014-04	F200014-05
											Sample Date:	02/05/2020	02/05/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/13/2020	03/10/2020	03/10/2020	03/10/2020	03/10/2020	03/10/2020	03/10/2020	03/13/2020	03/13/2020	03/13/2020	03/10/2020	03/10/2020
											Sample Time:	14:20	14:53	13:22	12:55	13:51	13:57	12:21	12:37	12:33	14:40	15:22	19:07	11:40	11:47	11:56	13:12	13:20	12:37	19:07	19:07	19:07	09:47	10:20
											ClieSam	SS757-S1	SS758-S1	SS759-S1	SS760-S2	SS761-S1	SS761-S2	SS762-S2	SS762-S3	SS763-S1	SS763-S2	SS764-S2	SS765-S2	SS766-S1	SS766-S2	SS766-S3	SS767-S1	SS767-S2	SS768-S2	SS769-S1	SS770-S2	SS770-S2	SS771-S1	SS772-S1
											Depths:	1.6 to 1.8	0.1 to 0.4	0.0-0.3	3.4-3.6	0.3-0.5	2.2-2.4	1.9-2.1	2.9-3.1	1.9-2.1	5.0-5.2	4.6-4.8	3.8-4	0.7-0.9	3.8-4	6.5-6.7	3.3-3.5	6.4-6.6	4.4-4.6	5.7-5.9	4.3-4.5	4.3-4.5	0-0.2	0-0.2
											RAH																						
											%solids	80	76	61	72	79	66	59	75	63	82	55	60	61	46	62	51	55	67	50	72	79	66	59
CAS Number	Method Name	Analyte	Units	RT		PAH17	PAH34	PAH51	Abbrev	PAH #			4.87					6	6.85	5.58		4.85	7.43	6.67						6.36		5.39	5.38	4.01	
		Max RL for ND PAHs=								1																								
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzo(b)thiophenes	ug/Kg dry	17					C1BT	2		**15**	**0**	**6.9**	**14.8**	**6.59**	**0**	**0**	**0**	**101**	**0**	**0**	**0**	**5.88**	**557**	**7.22**	**127**	**9.53**	**0**	**2090**	**0**	**0**	**4.89**	**20.7**
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzo(b)thiophenes	ug/Kg dry	18					C2BT	3		**24.3**	**0**	**9.44**	**6.9**	**8.83**	**7.88**	**0**	**0**	**410**	**0**	**0**	**0**	**5.52**	**1390**	**16.6**	**442**	**18.1**	**0**	**3060**	**0**	**0**	**4.88**	**37.1**
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzo(b)thiophenes	ug/Kg dry	19					C3BT	4		**24.1**	**0**	**8.07**	**5.02**	**11.2**	**6.89**	**0**	**0**	**363**	**0**	**0**	**0**	**3.72**	**764**	**10.4**	**544**	**14.8**	**0**	**1650**	**0**	**0**	**3.05**	**38.2**
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzo(b)thiophenes	ug/Kg dry	20					C4BT	5		**16.5**	**0**	**8.23**	**3.41**	**12.8**	**0**	**0**	**0**	**136**	**0**	**0**	**0**	**5.83**	**227**	**3.52**	**272**	**7.32**	**0**	**708**	**0**	**0**	**2.38**	**22.1**
91-20-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Naphthalene**	ug/Kg dry	21.86	L	x	x	x	NA	6		**221**	**5.86**	**39.5**	**151**	**92.3**	**13.5**	**0**	**0**	**1750**	**0**	**0**	**0**	**20.8**	**2280**	**37.6**	**1450**	**102**	**0**	**16900**	**0**	**0**	**14.8**	**1250**
91-57-6	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylnaphthalene	ug/Kg dry	24.57	L	x		x	2MN	7		**125**	**3.56**	**28.9**	**132**	**83.4**	**9.12**	**0**	**0**	**751**	**0**	**0**	**0**	**15.2**	**1250**	**11**	**2220**	**102**	**0**	**3880**	**0**	**0**	**7.29**	**750**
90-12-0	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylnaphthalene	ug/Kg dry	25				x	1MN	8		**104**	**2.7**	**26.6**	**79.1**	**67.3**	**5.17**	**0**	**0**	**991**	**0**	**0**	**0**	**11.1**	**4240**	**160**	**3860**	**78**	**0**	**65100**	**0**	**0**	**8.64**	**531**
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Naphthalenes	ug/Kg dry	24.57			x	x	C1N	9		**138**	**4**	**33.7**	**126**	**93.2**	**9.61**	**0**	**0**	**1050**	**0**	**0**	**0**	**16.1**	**3240**	**100**	**3630**	**66.5**	**0**	**40100**	**0**	**0**	**9.95**	**783**
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Naphthalenes	ug/Kg dry	27.02			x	x	C2N	10		**238**	**7.12**	**98**	**153**	**210**	**104**	**0**	**0**	**6120**	**0**	**5.42**	**0**	**41.9**	**7140**	**219**	**13600**	**197**	**0**	**55700**	**0**	**0**	**31.6**	**2990**
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Naphthalenes	ug/Kg dry	29.76			x	x	C3N	11		**292**	**6.88**	**109**	**146**	**199**	**123**	**0**	**0**	**5540**	**0**	**0**	**0**	**39.7**	**3580**	**97.3**	**13800**	**234**	**0**	**29300**	**0**	**0**	**32.3**	**1970**
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Naphthalenes	ug/Kg dry	32.52			x	x	C4N	12		**182**	**4.96**	**80.7**	**104**	**189**	**66.4**	**0**	**0**	**2370**	**0**	**0**	**0**	**30.3**	**1230**	**31.1**	**6850**	**153**	**0**	**13100**	**0**	**0**	**18.3**	**745**
92-52-4	8270D (SIM) Semi-Volatile Organic Compou0s	Biphenyl	ug/Kg dry	26.46					BP	13		**56.8**	**0**	**11.5**	**38.5**	**24.9**	**5.15**	**0**	**0**	**601**	**0**	**0**	**0**	**6.06**	**300**	**37.4**	**565**	**35.9**	**0**	**2840**	**0**	**0**	**2.57**	**318**
208-96-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Acenaphthylene**	ug/Kg dry	28.16	L	x	x	x	ACE	14		**368**	**15.9**	**273**	**74.2**	**982**	**28**	**0**	**0**	**2610**	**0**	**0**	**5.8**	**49**	**1390**	**23.7**	**1780**	**90.4**	**5.33**	**11200**	**0**	**0**	**44.4**	**261**
83-32-9	8270D (SIM) Semi-Volatile Organic Compou0s	**Acenaphthene**	ug/Kg dry	28.89	L	x	x	x	ACY	15		**595**	**6.81**	**127**	**129**	**73.9**	**11.3**	**0**	**0**	**17400**	**0**	**0**	**0**	**38.5**	**25900**	**506**	**6400**	**303**	**0**	**88500**	**0**	**0**	**142**	**3780**
132-64-9	8270D (SIM) Semi-Volatile Organic Compou0s	Dibenzofuran	ug/Kg dry	29.54				x	DBF	16		**249**	**3.11**	**36.5**	**112**	**56.4**	**9.68**	**0**	**0**	**463**	**0**	**0**	**0**	**9.67**	**433**	**18**	**497**	**170**	**0**	**3720**	**0**	**0**	**18.2**	**177**
86-73-7	8270D (SIM) Semi-Volatile Organic Compou0s	**Fluorene**	ug/Kg dry	30.91	L	x	x	x	FLE	17		**532**	**7.99**	**98.1**	**211**	**121**	**19.6**	**0**	**0**	**8080**	**0**	**0**	**0**	**34.3**	**7870**	**210**	**6120**	**334**	**0**	**51100**	**0**	**0**	**43.8**	**2210**
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Fluorenes	ug/Kg dry	33.14			x	x	C1FL	18		**299**	**7.29**	**99.6**	**158**	**176**	**60.5**	**0**	**0**	**4800**	**0**	**0**	**0**	**30.3**	**2380**	**69.3**	**8150**	**208**	**0**	**28200**	**0**	**0**	**28.2**	**2160**
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Fluorenes	ug/Kg dry	35.22			x	x	C2FL	19		**309**	**9.18**	**138**	**238**	**316**	**91.8**	**0**	**0**	**3820**	**0**	**0**	**0**	**33.4**	**1550**	**44.2**	**9220**	**234**	**4.3**	**18900**	**0**	**0**	**30**	**1490**
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Fluorenes	ug/Kg dry	38.01			x	x	C3FL	20		**406**	**9.27**	**165**	**221**	**332**	**60.9**	**0**	**0**	**2350**	**0**	**0**	**0**	**51.3**	**1470**	**22.3**	**5770**	**177**	**0**	**7130**	**0**	**0**	**43.3**	**553**
132-65-0	8270D (SIM) Semi-Volatile Organic Compou0s	Dibenzothiophene	ug/Kg dry	34.23				x	DBT	21		**374**	**6.22**	**70.5**	**95.7**	**57.7**	**12.3**	**0**	**0**	**3280**	**0**	**0**	**0**	**27.2**	**3450**	**74.4**	**1710**	**133**	**0**	**20700**	**0**	**0**	**35.7**	**248**
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Dibenzothiophenes	ug/Kg dry	36.43				x	C1DBT	22		**385**	**9.65**	**92.9**	**93.8**	**161**	**41.9**	**0**	**0**	**3230**	**0**	**0**	**0**	**39**	**2510**	**56**	**4060**	**126**	**0**	**19800**	**0**	**0**	**33**	**453**
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Dibenzothiophenes	ug/Kg dry	37.7				x	C2DBT	23		**367**	**12.1**	**132**	**106**	**303**	**49.2**	**0**	**0**	**2920**	**0**	**0**	**0**	**51.1**	**1960**	**34.7**	**4490**	**118**	**0**	**11100**	**0**	**0**	**37.4**	**403**
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Dibenzothiophenes	ug/Kg dry	39.5				x	C3DBT	24		**265**	**8.2**	**121**	**77.1**	**306**	**38.1**	**0**	**0**	**1720**	**0**	**0**	**0**	**44.7**	**1600**	**19.1**	**2880**	**72.8**	**0**	**4340**	**0**	**0**	**29.8**	**249**
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Dibenzothiophenes	ug/Kg dry	41.65				x	C4DBT	25		**161**	**6.26**	**70.1**	**35.3**	**154**	**20.3**	**0**	**0**	**680**	**0**	**0**	**0**	**31.2**	**949**	**13.8**	**1120**	**44.7**	**0**	**1490**	**0**	**0**	**18.7**	**125**
85-01-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Phenanthrene**	ug/Kg dry	34.72	L	x	x	x	PHE	26		**5200**	**82**	**852**	**1580**	**816**	**135**	**0**	**0**	**58200**	**3.53**	**0**	**0**	**339**	**39100**	**1030**	**36100**	**2260**	**7.68**	**736000**	**0**	**0**	**467**	**14600**
120-12-7	8270D (SIM) Semi-Volatile Organic Compou0s	**Anthracene**	ug/Kg dry	34.91	L	x	x	x	ANT	27		**1450**	**29.5**	**361**	**610**	**454**	**67.6**	**0**	**0**	**17900**	**4.85**	**0**	**3.75**	**122**	**6610**	**274**	**10100**	**790**	**3.66**	**330000**	**0**	**0**	**137**	**5320**
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Phenanthrenes/Anthracenes	ug/Kg dry	36.96				x	C1PH	28		**2520**	**61.4**	**654**	**1380**	**1160**	**365**	**0**	**0**	**24900**	**4.24**	**0**	**4.18**	**253**	**10000**	**371**	**39400**	**1720**	**7.19**	**156000**	**0**	**0**	**234**	**11500**
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Phenanthrenes/Anthracenes	ug/Kg dry	38.97				x	C2PH	29		**5.76**	**38**	**507**	**1050**	**1240**	**316**	**0**	**0**	**12500**	**0**	**0**	**6.67**	**176**	**4330**	**137**	**25400**	**1010**	**4.4**	**42500**	**0**	**0**	**131**	**4690**
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Phenanthrenes/Anthracenes	ug/Kg dry	40.8				x	C3PH	30		**541**	**17**	**267**	**501**	**718**	**155**	**0**	**0**	**4740**	**0**	**0**	**0**	**98.4**	**2210**	**41.3**	**10400**	**472**	**3.64**	**11100**	**0**	**0**	**53.8**	**1800**
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Phenanthrenes/Anthracenes	ug/Kg dry	41.72				x	C4PH	31		**715**	**21.8**	**128**	**287**	**328**	**114**	**0**	**0**	**1680**	**0**	**0**	**0**	**55**	**1180**	**17.3**	**3650**	**254**	**0**	**3580**	**2.8**	**0**	**21.1**	**1380**
483-65-8	8270D (SIM) Semi-Volatile Organic Compou0s	Retene	ug/Kg dry	41.72				x	RET	32		**208**	**6.72**	**30.3**	**89.4**	**64.6**	**121**	**7.11**	**10.6**	**753**	**0**	**4.47**	**8.21**	**88.7**	**430**	**17.6**	**1510**	**260**	**4.88**	**941**	**14.4**	**3.76**	**10.6**	**4320**
239-35-0	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)naphtho(2,1-d)thiophene	ug/Kg dry	44.24					BNT	33		**514**	**16.8**	**150**	**146**	**249**	**35.6**	**0**	**0**	**2200**	**0**	**0**	**0**	**63.5**	**970**	**22.7**	**1260**	**128**	**0**	**19000**	**0**	**0**	**64.9**	**368**
	8270D (SIM) Semi-Volatile Organic Compou0s	C0-Benzonaphthothiophenes	ug/Kg dry	44.24					C0BNT	34		**939**	**30.9**	**278**	**313**	**471**	**68.6**	**0**	**0**	**3980**	**0**	**0**	**0**	**113**	**1960**	**22.4**	**2150**	**285**	**0**	**33500**	**0**	**0**	**118**	**368**
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzonaphthothiophenes	ug/Kg dry	45.63					C1BNT	35		**536**	**19.6**	**237**	**219**	**549**	**60.4**	**0**	**0**	**2590**	**0**	**0**	**0**	**72.8**	**1560**	**23.3**	**2160**	**200**	**0**	**10600**	**0**	**0**	**70.9**	**708**
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzonaphthothiophenes	ug/Kg dry	47.14					C2BNT	36		**386**	**17.3**	**193**	**130**	**401**	**42.3**	**0**	**0**	**1420**	**0**	**0**	**0**	**58.1**	**1440**	**13**	**1340**	**131**	**0**	**4270**	**0**	**0**	**66.9**	**459**
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzonaphthothiophenes	ug/Kg dry	49.02					C3BNT	37		**298**	**17.8**	**141**	**82.1**	**289**	**21.2**	**0**	**0**	**871**	**0**	**0**	**0**	**47.7**	**1050**	**7.29**	**697**	**78.6**	**0**	**5590**	**0**	**0**	**69.8**	**297**
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzonaphthothiophenes	ug/Kg dry	51.51					C4BNT	38		**146**	**10.7**	**63.2**	**28**	**105**	**0**	**0**	**0**	**229**	**0**	**0**	**0**	**24.3**	**527**	**5.53**	**209**	**23.3**	**0**	**639**	**0**	**0**	**50.8**	**85.6**
206-44-0	8270D (SIM) Semi-Volatile Organic Compou0s	**Fluoranthene**	ug/Kg dry	39.51	H	x	x	x	FLA	39		**7510**	**241**	**1970**	**2980**	**2450**	**430**	**0**	**0**	**56200**	**3.33**	**0**	**0**	**811**	**14900**	**468**	**21700**	**2200**	**8.94**	**1190000**	**3.34**	**0**	**971**	**12400**
129-00-0	8270D (SIM) Semi-Volatile Organic Compou0s	**Pyrene**	ug/Kg dry	40.39	H	x	x	x	PYR	40		**6490**	**266**	**2190**	**4180**	**3520**	**608**	**0**	**0**	**71800**	**5.52**	**0**	**0**	**942**	**16800**	**714**	**32300**	**3190**	**12.1**	**1520000**	**4**	**0**	**831**	**19800**
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Fluoranthenes/Pyrenes	ug/Kg dry	41.78				x	C1PY	41		**2970**	**110**	**1260**	**2820**	**3020**	**483**	**0**	**0**	**24600**	**3.03**	**0**	**7**	**449**	**7260**	**284**	**22600**	**2010**	**12.8**	**158000**	**2.86**	**0**	**325**	**10800**
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Fluoranthenes/Pyrenes	ug/Kg dry	43.52				x	C2PY	42		**1610**	**50.6**	**695**	**1110**	**1720**	**229**	**8.17**	**2.93**	**7720**	**0**	**4.94**	**4.95**	**224**	**3050**	**76.3**	**9760**	**900**	**6.33**	**30000**	**0**	**0**	**202**	**3840**
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Fluoranthenes/Pyrenes	ug/Kg dry	45.72				x	C3PY	43		**704**	**21.2**	**345**	**464**	**966**	**111**	**9.09**	**0**	**2920**	**0**	**5.43**	**4.01**	**106**	**1740**	**28.9**	**4220**	**429**	**6.12**	**8230**	**0**	**0**	**98.4**	**1540**
243-17-4	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)fluorene	ug/Kg dry	42.03				x	BbF	44		**398**	**11.5**	**130**	**273**	**191**	**49.7**	**0**	**0**	**3130**	**0**	**0**	**0**	**45.7**	**883**	**27.1**	**2150**	**240**	**0**	**23500**	**0**	**0**	**30.7**	**1350**
205-12-9	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(c)fluorene	ug/Kg dry	42.07				x	BcF	45		**195**	**5.33**	**61.7**	**164**	**81.4**	**23.2**	**0**	**0**	**1260**	**0**	**0**	**0**	**24.8**	**394**	**18.8**	**1070**	**130**	**0**	**8800**	**0**	**0**	**21.8**	**533**
3442-78-2	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylpyrene	ug/Kg dry	42.18				x	2MP	46		**384**	**15.7**	**176**	**396**	**432**	**66.4**	**0**	**0**	**3340**	**0**	**0**	**0**	**62.6**	**961**	**38.8**	**3190**	**276**	**0**	**20000**	**0**	**0**	**43.1**	**1450**
3353-12-6	8270D (SIM) Semi-Volatile Organic Compou0s	4-Methylpyrene	ug/Kg dry	42.55				x	4MP	47		**299**	**14.4**	**183**	**381**	**579**	**70.1**	**0**	**0**	**2820**	**0**	**0**	**0**	**60.9**	**889**	**30.5**	**2890**	**245**	**0**	**16000**	**0**	**0**	**36.6**	**1330**
2381-21-7	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylpyrene	ug/Kg dry	42.67				x	1MP	48		**245**	**11.2**	**132**	**326**	**371**	**51**	**0**	**0**	**2800**	**0**	**0**	**0**	**48.6**	**782**	**31**	**2710**	**197**	**0**	**19700**	**0**	**0**	**29**	**1220**
56-55-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Benz(a)anthracene**	ug/Kg dry	45.17	H	x	x	x	BaA	49		**3540**	**131**	**1070**	**2230**	**2080**	**287**	**0**	**0**	**28300**	**0**	**0**	**0**	**442**	**5370**	**192**	**9920**	**1600**	**5.46**	**469000**	**0**	**0**	**449**	**6550**
	8270D (SIM) Semi-Volatile Organic Compou0s	**Chrysene/triphenylene**	ug/Kg dry	45.36	H	x	x	x	CH	50		**3250**	**126**	**1210**	**1910**	**2400**	**325**	**0**	**0**	**28600**	**0**	**0**	**0**	**481**	**5970**	**188**	**10200**	**1420**	**5.2**	**469000**	**0**	**0**	**445**	**5530**
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	46.81				x	C1CR	51		**1650**	**68**	**876**	**1380**	**2280**	**290**	**0**	**5.58**	**10800**	**0**	**0**	**0**	**288**	**3680**	**90.9**	**10400**	**1190**	**5.08**	**52900**	**0**	**0**	**214**	**5090**
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	48.52				x	C2CR	52		**825**	**33.6**	**478**	**663**	**1210**	**160**	**0**	**5.58**	**4360**	**0**	**0**	**0**	**160**	**2250**	**34.4**	**5210**	**650**	**0**	**15100**	**0**	**0**	**114**	**2590**
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	49.55				x	C3CR	53		**450**	**21.1**	**239**	**320**	**533**	**66.6**	**0**	**5.58**	**1710**	**0**	**0**	**0**	**96.7**	**1320**	**16.4**	**2260**	**350**	**0**	**4100**	**0**	**0**	**75.8**	**1240**
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	50				x	C4CR	54		**229**	**4.87**	**128**	**139**	**284**	**26.6**	**0**	**5.58**	**823**	**0**	**0**	**0**	**44.6**	**856**	**5.53**	**931**	**161**	**0**	**2310**	**0**	**0**	**42.2**	**534**
205-99-2	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(b)fluoranthene**	ug/Kg dry	49.23	H	x	x	x	BbF	55		**2410**	**91.4**	**901**	**1110**	**2010**	**166**	**0**	**5.58**	**11100**	**0**	**0**	**0**	**327**	**4120**	**65.7**	**3980**	**787**	**0**	**110000**	**0**	**0**	**347**	**3330**
	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(j/k)fluoranthene**	ug/Kg dry	49.29	H	x	x	x	BjF	56		**2540**	**104**	**909**	**1240**	**2140**	**187**	**0**	**5.58**	**12000**	**0**	**0**	**0**	**363**	**4160**	**95**	**4330**	**935**	**3.61**	**145000**	**0**	**0**	**369**	**3520**
192-97-2	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(e)pyrene	ug/Kg dry	50.17			x	x	BeP	57		**1930**	**83.3**	**826**	**1160**	**2630**	**187**	**0**	**5.58**	**10700**	**0**	**0**	**0**	**325**	**3570**	**82.7**	**4440**	**801**	**6.36**	**118000**	**0**	**0**	**276**	**3890**
50-32-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(a)pyrene**	ug/Kg dry	50.34	H	x	x	x	BaP	58		**2940**	**118**	**1170**	**1850**	**3440**	**249**	**0**	**5.58**	**27500**	**0**	**0**	**0**	**457**	**5370**	**147**	**6500**	**1300**	**4.78**	**496000**	**0**	**0**	**408**	**6180**
198-55-0	8270D (SIM) Semi-Volatile Organic Compou0s	Perylene	ug/Kg dry	50.61			x	x	PE	59		**738**	**29.1**	**285**	**360**	**672**	**151**	**521**	**226**	**3520**	**199**	**821**	**552**	**183**	**1100**	**354**	**1150**	**533**	**280**	**41700**	**596**	**383**	**104**	**1040**
193-39-5	8270D (SIM) Semi-Volatile Organic Compou0s	**Indeno(1,2,3-cd)pyrene**	ug/Kg dry	54	H	x	x	x	I123P	60		**2070**	**75**	**856**	**862**	**2980**	**145**	**0**	**5.58**	**12000**	**0**	**0**	**12.7**	**317**	**4170**	**77.8**	**3770**	**712**	**0**	**95400**	**0**	**3.99**	**327**	**3200**
53-70-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Dibenzo(a,h)anthracene**	ug/Kg dry	54.01	H	x	x	x	DBA	61		**483**	**16.5**	**211**	**245**	**631**	**36.5**	**0**	**5.58**	**3090**	**0**	**0**	**3.84**	**76**	**935**	**15.8**	**1080**	**204**	**0**	**15000**	**0**	**3.47**	**77.4**	**954**
191-24-2	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(g,h,i)perylene**	ug/Kg dry	54.91	H	x	x	x	BGP	62		**1530**	**59.8**	**699**	**808**	**2750**	**135**	**0**	**5.58**	**10300**	**0**	**0**	**19.4**	**278**	**3470**	**68.8**	**3400**	**604**	**0**	**76900**	**0**	**7.69**	**252**	**3180**
191-07-1	8270D (SIM) Semi-Volatile Organic Compou0s	Coronene	ug/Kg dry	61.34				x	COR	63		**433**	**15.2**	**253**	**195**	**988**	**31.1**	**0**	**5.58**	**3660**	**0**	**0**	**15.6**	**96.3**	**1360**	**25.2**	**1000**	**162**	**0**	**14300**	**0**	**45.3**	**80.3**	**832**
526-73-8	8270D (SIM) Semi-Volatile Organic Compou0s	1,2,3-Trimethylbenzene	ug/Kg dry							64		**10.1**	**4.87**	**6.15**	**4.03**	**6.37**	**6**	**6.85**	**5.58**	**7.55**	**4.85**	**7.43**	**6.67**	**6.61**	**95.4**	**5.53**	**19.4**	**7.12**	**6.36**	**579**	**5.39**	**5.38**	**4.01**	**11.4**
95-63-6	8270D (SIM) Semi-Volatile Organic Compou0s	1,2,4-Trimethylbenzene	ug/Kg dry							65		**23.9**	**4.87**	**6.46**	**15.8**	**13.6**	**4.41**	**6.85**	**5.58**	**29.2**	**4.85**	**7.43**	**6.67**	**4.7**	**167**	**5.53**	**71.8**	**8.31**	**6.36**	**1810**	**5.39**	**5.38**	**4.01**	**74.4**
108-67-8	8270D (SIM) Semi-Volatile Organic Compou0s	1,3,5-Trimethylbenzene	ug/Kg dry							66		**7.14**	**4.87**	**3.08**	**7.15**	**10.9**	**6**	**6.85**	**5.58**	**12.9**	**4.85**	**7.43**	**6.67**	**6.61**	**63.6**	**5.53**	**29.9**	**5.51**	**6.36**	**573**	**5.39**	**5.38**	**4.01**	**26.3**
	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methyldibenzothiophene	ug/Kg dry	36.76						67		**43.8**	**4.87**	**11.5**	**9.09**	**18.8**	**3.05**	**6.85**	**5.58**	**306**	**4.85**	**7.43**	**6.67**	**4.96**	**318**	**5.74**	**324**	**10.7**	**6.36**	**1580**	**5.39**	**5.38**	**4.25**	**39.3**
	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylphenanthrene	ug/Kg dry	37.24						68		**425**	**10.8**	**107**	**174**	**193**	**44.3**	**6.85**	**5.58**	**4330**	**4.85**	**7.43**	**6.67**	**41.3**	**1700**	**59.4**	**6800**	**156**	**6.36**	**26100**	**5.39**	**5.38**	**39.1**	**1780**
	8270D (SIM) Semi-Volatile Organic Compou0s	2,3,5-Trimethylnaphthene	ug/Kg dry	30.44						69		**20.7**	**4.87**	**7.34**	**12.4**	**13.1**	**11.4**	**6.85**	**5.58**	**390**	**4.85**	**7.43**	**6.67**	**6.61**	**225**	**5.55**	**1030**	**18.4**	**6.36**	**2230**	**5.39**	**5.38**	**2.27**	**131**
581-42-0	8270D (SIM) Semi-Volatile Organic Compou0s	2,6-Dimethylnaphthalene	ug/Kg dry	27.07						70		**46**	**4.87**	**22.3**	**37.6**	**32.8**	**12.8**	**6.85**	**5.58**	**643**	**4.85**	**7.43**	**6.67**	**12.2**	**980**	**40**	**3200**	**43.2**	**6.36**	**11400**	**5.39**	**5.38**	**3.59**	**677**
	8270D (SIM) Semi-Volatile Organic Compou0s	2/3-Methyldibenzothiophene	ug/Kg dry	36.31						71		**133**	**2.63**	**27.9**	**28.8**	**48.8**	**12.4**	**6.85**	**5.58**	**1110**	**4.85**	**7.43**	**6.67**	**11.9**	**814**	**18.2**	**1350**	**41.2**	**6.36**	**7150**	**5.39**	**5.38**	**10**	**146**
	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylanthracene	ug/Kg dry	36.96						72		**278**	**7.75**	**94.4**	**269**	**152**	**34.5**	**6.85**	**5.58**	**2950**	**4.85**	**7.43**	**6.67**	**33.5**	**887**	**35.9**	**4130**	**273**	**6.36**	**16400**	**5.39**	**5.38**	**22.2**	**1810**
	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylphenanthrene	ug/Kg dry	36.81						73		**710**	**15.5**	**149**	**281**	**216**	**81.5**	**6.85**	**5.58**	**6400**	**4.85**	**7.43**	**6.67**	**56.2**	**2700**	**93.8**	**9910**	**448**	**6.36**	**43500**	**5.39**	**5.38**	**60.2**	**2700**
	8270D (SIM) Semi-Volatile Organic Compou0s	3-Methylphenanthrene	ug/Kg dry	36.69						74		**595**	**13.2**	**136**	**281**	**206**	**90.1**	**6.85**	**5.58**	**5530**	**4.85**	**7.43**	**6.67**	**50.3**	**2480**	**88.1**	**9030**	**383**	**6.36**	**37000**	**5.39**	**5.38**	**53.6**	**2470**
	8270D (SIM) Semi-Volatile Organic Compou0s	4/9-Methylphenanthrene	ug/Kg dry	37.14						75		**544**	**15.2**	**168**	**345**	**379**	**117**	**6.85**	**5.58**	**5650**	**4.85**	**7.43**	**6.67**	**63.4**	**2240**	**79.3**	**9420**	**417**	**6.36**	**32800**	**5.39**	**5.38**	**50.2**	**2650**
	8270D (SIM) Semi-Volatile Organic Compou0s	4-Methyldibenzothiophene	ug/Kg dry	36.01						76		**127**	**3.49**	**36.1**	**24.7**	**72.5**	**15.7**	**6.85**	**5.58**	**1390**	**4.85**	**7.43**	**6.67**	**15.4**	**904**	**22.1**	**1770**	**26.5**	**6.36**	**8980**	**5.39**	**5.38**	**10.8**	**135**
71-43-2	8270D (SIM) Semi-Volatile Organic Compou0s	Benzene	ug/Kg dry							77		**5.76**	**4.87**	**3.68**	**11.8**	**4.87**	**4.08**	**6.85**	**5.58**	**6.43**	**4.85**	**7.43**	**6.67**	**4.1**	**8.69**	**5.53**	**7.33**	**6.06**	**6.36**	**75.5**	**5.39**	**5.38**	**4.01**	**5.21**

Attachment B. Complete Sediment Data Set
Amesbury Former MGP
Amesbury, Massachusetts

												River	River	River	River	Mudflat	Mudflat	River	River	River	River	River	River	River	River	River	River	River	Upstream	Upstream
										Sample No.	F200008-13	F200008-14	F200013-01	F200013-02	F200013-03	F200013-04	F200013-05	F200013-06	F200013-07	F200013-08	F200013-09	F200017-01	F200014-01	F200014-02	F200014-03	F200014-06	F200014-07	F200014-08	F200017-02	F200017-03	F200017-03RE1	F200014-04	F200014-05
										Sample Date:	02/05/2020	02/05/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/13/2020	03/10/2020	03/10/2020	03/10/2020	03/10/2020	03/10/2020	03/10/2020	03/13/2020	03/13/2020	03/13/2020	03/10/2020	03/10/2020
										Sample Time:	14:20	14:53	13:22	12:55	13:51	13:57	12:21	12:37	12:33	14:40	15:22	19:07	11:40	11:47	11:56	13:12	13:20	12:37	19:07	19:07	19:07	09:47	10:20
										ClieSam	SS757-S1	SS758-S1	SS759-S1	SS760-S2	SS761-S1	SS761-S2	SS762-S2	SS762-S3	SS763-S1	SS763-S2	SS764-S2	SS765-S2	SS766-S1	SS766-S2	SS766-S3	SS767-S1	SS767-S2	SS768-S2	SS769-S1	SS770-S2	SS770-S2	SS771-S1	SS772-S1
										Depths:	1.6 to 1.8	0.1 to 0.4	0.0-0.3	3.4-3.6	0.3-0.5	2.2-2.4	1.9-2.1	2.9-3.1	1.9-2.1	5.0-5.2	4.6-4.8	3.8-4	0.7-0.9	3.8-4	6.5-6.7	3.3-3.5	6.4-6.6	4.4-4.6	5.7-5.9	4.3-4.5	4.3-4.5	0-0.2	0-0.2
										RAH																							
										%solids	80	76	61	72	79	66	59	75	63	82	55	60	61	46	62	51	55	67	50	72	79	66	59
CAS Number	Method Name	Analyte	Units	RT		PAH17	PAH34	PAH51	Abbrev	PAH #		4.87				6	6.85	5.58		4.85	7.43	6.67						6.36		5.39	5.38	4.01	
11095-43-5	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)thiophene	ug/Kg dry							78	10.5	4.87	6.15	5.05	3.33	6	6.85	5.58	71.9	4.85	7.43	6.67	6.61	195	5.53	39.2	7.12	6.36	1680	5.39	5.38	4.01	13.7
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzene	ug/Kg dry							79	44.6	6.23	36.6	107	42.3	69.7	19.9	8.12	256	4.85	36.9	11.3	76.9	330	9.35	723	114	12.8	1850	2.91	3.82	3.94	148
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Decalins	ug/Kg dry							80	203	4.87	16.3	5.49	13.6	5.08	6.85	5.58	166	4.85	7.43	6.67	12.9	516	5.53	234	16.8	6.36	657	5.39	5.38	5.71	81.9
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzenes	ug/Kg dry							81	57.6	5.4	42.7	33.5	37.3	39.8	19	6.83	91.6	5.73	29.8	6.67	50.1	259	10.9	105	30.8	14.2	683	5.39	4.77	11.9	179
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Decalins	ug/Kg dry							82	146	4.87	33.2	19.2	25.7	6	6.85	5.58	331	4.85	7.43	6.67	18.3	704	5.53	487	26.2	6.36	1310	5.39	5.38	8.62	82.5
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzenes	ug/Kg dry							83	45.9	4.5	16.3	29.3	36.2	12	4.78	5.58	79.3	4.85	7.43	6.67	10.7	298	6.84	155	20.6	3.57	2670	5.39	3.14	4.97	161
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Decalins	ug/Kg dry							84	101	4.87	30.7	16.4	29.5	6	6.85	5.58	287	4.85	7.43	6.67	16.9	524	5.53	834	22.8	6.36	1210	5.39	5.38	7.49	50.7
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzenes	ug/Kg dry							85	48.7	4.87	16.6	20.1	24	20.3	6.85	5.58	170	4.85	7.43	6.67	14.7	1020	10.7	419	25.3	6.36	7940	5.39	5.38	7.98	205
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Decalins	ug/Kg dry							86	158	4.87	66.3	16.3	94.3	6	6.85	5.58	541	4.85	7.43	6.67	26.9	687	5.53	1830	28.4	6.36	2410	5.39	5.38	4.01	101
	8270D (SIM) Semi-Volatile Organic Compou0s	C5-Benzenes	ug/Kg dry							87	36.9	4.87	11.1	7.92	14.7	17.7	6.85	5.58	193	4.85	7.43	6.67	8.77	478	7.6	654	9.82	6.36	3930	5.39	5.38	6.16	181
86-74-8	8270D (SIM) Semi-Volatile Organic Compou0s	Carbazole	ug/Kg dry	35.61						88	529	4.38	72.7	158	47.5	3.82	6.85	5.58	160	4.85	7.43	6.67	18.7	415	5.53	105	222	6.36	177	5.39	5.38	50.8	131
493-01-6	8270D (SIM) Semi-Volatile Organic Compou0s	cis-Decalin	ug/Kg dry							89	16.8	4.87	6.15	5.53	4.87	6	6.85	5.58	9.26	4.85	7.43	6.67	6.61	37.3	5.53	32.6	7.12	6.36	39.7	5.39	5.38	4.01	9.72
100-41-4	8270D (SIM) Semi-Volatile Organic Compou0s	Ethylbenzene	ug/Kg dry							90	13.6	4.87	6.06	9.3	9.22	6	6.85	5.58	25.9	4.85	7.43	6.67	3.44	48.6	3.25	33.5	7.36	6.36	239	5.39	5.38	4.01	116
98-82-8	8270D (SIM) Semi-Volatile Organic Compou0s	Isopropylbenzene	ug/Kg dry							91	3.25	4.87	6.15	5.53	3.22	6	6.85	5.58	6.43	4.85	7.43	6.67	6.61	18.5	5.53	6.45	7.12	6.36	228	5.39	5.38	4.01	7.86
	8270D (SIM) Semi-Volatile Organic Compou0s	m,p-Xylene	ug/Kg dry							92	65.1	5.78	55.3	40.4	29.3	53.6	23.5	6.75	90.7	8.13	43.2	6.67	72.1	334	12.7	103	36.6	18.4	707	5.39	3.58	14.9	179
108-87-2	8270D (SIM) Semi-Volatile Organic Compou0s	Methylcyclohexane	ug/Kg dry							93	12.7	4.87	6.15	5.53	32.3	6	6.85	5.58	9.07	4.85	7.43	6.67	6.61	51.1	5.53	7.33	4.06	6.36	75.5	5.39	5.38	4.01	5.21
104-51-8	8270D (SIM) Semi-Volatile Organic Compou0s	n-Butylbenzene	ug/Kg dry							94	13.4	4.87	6.15	5.53	4.87	6	6.85	5.58	11.5	4.85	7.43	6.67	6.61	8.69	5.53	23.2	7.12	6.36	75.5	5.39	5.38	4.01	5.21
103-65-1	8270D (SIM) Semi-Volatile Organic Compou0s	n-Propylbenzene	ug/Kg dry							95	8.15	4.87	6.15	5.53	3.72	6	6.85	5.58	6.67	4.85	7.43	6.67	6.61	19.5	5.53	16	7.12	6.36	219	5.39	5.38	4.01	23.6
95-47-6	8270D (SIM) Semi-Volatile Organic Compou0s	o-Xylene	ug/Kg dry							96	12.8	4.87	4.96	6.22	13.6	4.62	6.85	5.58	12	4.85	7.43	6.67	3.63	47.1	5.53	18.2	3.76	6.36	193	5.39	5.38	4.01	27.8
99-87-6	8270D (SIM) Semi-Volatile Organic Compou0s	p-Isopropyltoluene	ug/Kg dry							97	7.17	4.87	6.15	13.9	3.14	8.96	6.85	5.58	13.9	4.85	7.43	6.67	6.3	29.3	5.53	27.4	24.3	6.36	107	5.39	5.38	4.01	14
135-98-8	8270D (SIM) Semi-Volatile Organic Compou0s	sec-Butylbenzene	ug/Kg dry							98	3.07	4.87	6.15	5.53	4.87	6	6.85	5.58	6.43	4.85	7.43	6.67	6.61	12.5	5.53	4.42	7.12	6.36	66.5	5.39	5.38	4.01	5.21
100-42-5	8270D (SIM) Semi-Volatile Organic Compou0s	Styrene	ug/Kg dry							99	30.7	4.87	15.4	16.4	66.1	3.92	6.85	5.58	137	4.85	7.43	6.67	4.72	111	5.53	75.9	13.5	6.36	934	5.39	5.38	3.9	67.1
98-06-6	8270D (SIM) Semi-Volatile Organic Compou0s	t-Butylbenzene	ug/Kg dry							100	5.76	4.87	6.15	5.53	4.87	6	6.85	5.58	6.43	4.85	7.43	6.67	6.61	8.69	5.53	7.33	7.12	6.36	75.5	5.39	5.38	4.01	11.3
108-88-3	8270D (SIM) Semi-Volatile Organic Compou0s	Toluene	ug/Kg dry							101	57.7	8.77	46.1	131	58.1	86.3	26.4	9.94	314	4.85	49.1	14.6	92.4	409	11.7	883	137	19.2	2280	3.6	4.71	5.77	182
493-02-7	8270D (SIM) Semi-Volatile Organic Compou0s	trans-Decalin	ug/Kg dry							102	5.76	4.87	6.15	5.53	4.87	6	6.85	5.58	6.43	4.85	7.43	6.67	6.61	8.69	5.53	7.33	7.12	6.36	75.5	5.39	5.38	4.01	5.21
3891-98-3	Saturated Hydrocarbons by GC/FID	2,6,10-trimethyldodecane (1380)	mg/Kg dry							103	110	4.87	24.4	18.6	79.4	12.2	6.85	5.58	538	4.85	7.43	6.67	14.5	897	7.07	1340	21.7	6.36	1850	5.39	5.38	19.6	165
3892-00-0	Saturated Hydrocarbons by GC/FID	2,6,10-trimethylpeadecane (1650)	mg/Kg dry							104	104	2.86	88.4	60.5	218	42	12	16.4	1730	10.2	21.6	16.7	36.6	958	26	3940	71	15.6	6490	12.6	3.44	37.9	183
3891-99-4	Saturated Hydrocarbons by GC/FID	2,6,10-trimethyltridecane (1470)	mg/Kg dry							105	170	4.07	76.1	49.8	159	38.1	7.48	4.49	1030	4.85	7.3	5.19	44.7	1370	13	2430	60.1	7.24	3940	5.39	5.38	36.1	294
	Classical Chemistry	Black Carbon (Average)	mg/kg							106																							
	Saturated Hydrocarbons by GC/FID	C-10	mg/Kg dry							107																							
	Saturated Hydrocarbons by GC/FID	C-11	mg/Kg dry							108																							
	Saturated Hydrocarbons by GC/FID	C-12	mg/Kg dry							109																							
	Saturated Hydrocarbons by GC/FID	C-13	mg/Kg dry							110																							
	Saturated Hydrocarbons by GC/FID	C-14	mg/Kg dry							111																							
	Saturated Hydrocarbons by GC/FID	C-15	mg/Kg dry							112																							
	Saturated Hydrocarbons by GC/FID	C-16	mg/Kg dry							113																							
	Saturated Hydrocarbons by GC/FID	C-17	mg/Kg dry							114	118	22.3	254	175	204	267	87.2	76.3	704	38.6	164	90.1	124	588	91.2	786	179	106	1300	69.3	21.1	129	267
	Saturated Hydrocarbons by GC/FID	C-18	mg/Kg dry							115	108	10.3	149	99.2	224	74	44.4	52.4	729	31.8	70.5	54.4	81.1	352	58.9	1010	112	51.6	1360	38.5	10	98.3	173
	Saturated Hydrocarbons by GC/FID	C-19	mg/Kg dry							116																							
	Saturated Hydrocarbons by GC/FID	C-21	mg/Kg dry							117																							
	Saturated Hydrocarbons by GC/FID	C-22	mg/Kg dry							118																							
	Saturated Hydrocarbons by GC/FID	C-23	mg/Kg dry							119																							
	Saturated Hydrocarbons by GC/FID	C-24	mg/Kg dry							120																							
	Saturated Hydrocarbons by GC/FID	C-25	mg/Kg dry							121																							
	Saturated Hydrocarbons by GC/FID	C-26	mg/Kg dry							122																							
	Saturated Hydrocarbons by GC/FID	C-27	mg/Kg dry							123																							
	Saturated Hydrocarbons by GC/FID	C-28	mg/Kg dry							124																							
	Saturated Hydrocarbons by GC/FID	C-29	mg/Kg dry							125																							
	Saturated Hydrocarbons by GC/FID	C-30	mg/Kg dry							126																							
	Saturated Hydrocarbons by GC/FID	C-31	mg/Kg dry							127																							
	Saturated Hydrocarbons by GC/FID	C-32	mg/Kg dry							128																							
	Saturated Hydrocarbons by GC/FID	C-33	mg/Kg dry							129																							
	Saturated Hydrocarbons by GC/FID	C-34	mg/Kg dry							130																							
	Saturated Hydrocarbons by GC/FID	C-35	mg/Kg dry							131																							
	Saturated Hydrocarbons by GC/FID	C-36	mg/Kg dry							132																							
	Saturated Hydrocarbons by GC/FID	C-37	mg/Kg dry							133																							
	Saturated Hydrocarbons by GC/FID	C-38	mg/Kg dry							134																							
	Saturated Hydrocarbons by GC/FID	C-39	mg/Kg dry							135																							
	Saturated Hydrocarbons by GC/FID	C-40	mg/Kg dry							136																							
	Saturated Hydrocarbons by GC/FID	C-8	mg/Kg dry							137																							
	Saturated Hydrocarbons by GC/FID	C-9	mg/Kg dry							138																							
638-36-8	Saturated Hydrocarbons by GC/FID	Phytane	mg/Kg dry	34.53						141	238	8.44	252	105	442	115	53	57.1	3690	37.1	81.5	63.2	112	2600	77.8	8480	135	56.3	12500	44.6	15.3	82.1	240
1921-70-6	Saturated Hydrocarbons by GC/FID	Pristane	mg/Kg dry	32.65						142	230	7.72	224	135	509	102	36.8	43.8	3700	26.5	61.8	44.9	90.2	2300	63.2	8560	151	44	14300	35	11	83.2	487
TOC	Classical Chemistry	Total Organic Carbon (Average)	mg/kg							145	40000	3210	30500	53600	39000	26500	37600	11400	54000	3680	43700	35600	20000	114000	34800	68300	60700	19100	80900	15300	5.38	9640	107000
	TPAH16										41129	1376.76	12936.6	20170.2	26940.2	2843.5	0	33.48	366830	17.23	0	45.49	5097.6	148415	4113.4	159130	16831.4	56.76	5820000	7.34	15.15	5325.4	92065
	TPAH34										55566.76	1913.63	19308.6	31376.2	42530.4	5673.91	521	287.38	493213	223.5	826.42	615.34	7469.3	206761	6131.13	345991	27251.9	380.53	6617720	609	398.15	7109.95	147310
	TPAH51										62072.76	2117.28	21893.1	35505.6	49112.2	6612.18	545.37	306.49	535651	223.5	841.26	648.11	8456.07	233642	6812.33	395328	30935.4	397.86	6889321	623.4	447.21	7851.18	166661
	LPAH										8491	151.62	1779.5	2887.2	2622.6	284.12	0	0	106691	8.38	0	9.55	618.8	84400	2092.3	64170	3981.4	16.67	1237580	0	0	856.29	28171
	HPAH										32763	1228.7	11186	17415	24401	2568.5	0	33.48	260890	8.85	0	35.94	4494	65265	2032.1	97180	12952	40.09	4586300	7.34	15.15	4476.4	64644

(does not include source area samples collected in 2017)

Attachment B. Complete Sediment Data Set
Amesbury Former MGP
Amesbury, Massachusetts

												River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River
											Sample No.	F200017-04	F200017-05	F200017-06	F200017-07	F200017-08	F200017-09	F200017-10	F200017-11	F200017-12	F200017-13	F200017-14	F200017-15	F200017-16	F200017-17	F200017-18	F200017-20	F200017-19	F200019-01	F200019-02	F200019-03	F200019-04	F200019-05	F200019-06			
											Sample Date:	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/16/2020	03/16/2020	03/16/2020	03/16/2020	03/16/2020	03/16/2020			
											Sample Time:	19:07	19:07	19:07	19:07	19:07	19:07	19:07	19:07	19:07	19:07	19:07	19:07	19:07	19:07	19:07	19:07	19:07	10:37	10:44	11:01	11:09	11:36	11:41			
											ClieSam	SS774-S2	SS774-S3	SS775-S2	SS775-S3	SS776-S1	SS776-S3	SS777-S2	SS777-S3	SS778-S2	SS778-S3	SS779-S1	SS779-S2	SS780-S1	SS780-S2	SS781-S1	SS781(R1)-S	SS782-S2	SS783-S1	SS783-S2	SS784-S1	SS784-S2	SS785-S1	SS785-S2			
											Depths:	2.4-2.6	5.6-5.8	3.8-4	6.2-6.4	0.8-1	5-5.2	5.8-6	7.5-7.7	5.7-5.9	6.9-7.1	1.1-1.3	3.8-4	1.5-1.7	4.3-4.5	1.9-2.1	3.6-3.8	6.6-6.8	0-1	4-4.2	0.5-0.7	4.5-4.7	1-1.2	4-4.2			
											RAH																										
											%solids	75	63	82	55	60	61	46	62	51	55	67	50	57	74	54	57	63	50	75	56	75	62	61			
CAS Number	Method Name	Analyte	Units	RT		PAH17	PAH34	PAH51	Abbrev	PAH #		4.64					4.76				4.94	5.71	5.13		4.64			6.03		4.92		5.16	6.05	5.34			
		Max RL for ND PAHs=								1																											
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzo(b)thiophenes	ug/Kg dry	17					C1BT	2	19	525	53.9	25.3	15.4	0	248	0	1130	0	0	0	44.4	0	188	18.7	0	6.88	0	4.96	0	0	0			
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzo(b)thiophenes	ug/Kg dry	18					C2BT	3	38.3	2290	187	58.8	40.3	0	605	0	8920	0	0	0	79.9	0	1310	35.9	3.03	17.4	0	9.38	0	0	0			
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzo(b)thiophenes	ug/Kg dry	19					C3BT	4	64.1	2690	227	88.4	91.5	0	697	0	7140	0	0	0	123	0	2210	34.6	0	15.9	0	13.1	0	0	0			
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzo(b)thiophenes	ug/Kg dry	20					C4BT	5	48	1150	170	60.5	88.7	0	346	0	1920	0	0	0	111	0	1600	30	0	12	0	6.63	0	0	0			
91-20-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Naphthalene**	ug/Kg dry	21.86	L	x	x	x	NA	6	134	6030	542	818	49	0	4030	0	8910	0	0	0	1470	0	80.4	127	9.9	35.6	0	33.6	0	0	0			
91-57-6	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylnaphthalene	ug/Kg dry	24.57	L	x		x	2MN	7	88.2	2180	323	838	48.6	0	3180	0	5200	0	0	0	860	0	101	75.1	6.54	30	0	23.3	0	0	0			
90-12-0	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylnaphthalene	ug/Kg dry	25				x	1MN	8	48.6	18400	354	390	25.3	0	5530	2.54	34200	0	0	0	320	0	473	40	3.56	14.6	0	13.1	0	0	0			
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Naphthalenes	ug/Kg dry	24.57			x	x	C1N	9	85.6	12000	415	753	46.1	0	5200	0	23100	0	0	0	727	0	340	71.5	6.35	28	0	22.5	0	0	0			
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Naphthalenes	ug/Kg dry	27.02			x	x	C2N	10	250	43700	1640	1470	291	0	14300	7.14	92400	0	0	0	951	0	6170	270	18.9	77.3	0	53.3	0	0	3.51			
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Naphthalenes	ug/Kg dry	29.76			x	x	C3N	11	402	31800	1650	1980	764	0	15700	6.41	39200	0	0	0	1460	0	10200	379	23.1	144	0	76.6	0	0	0			
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Naphthalenes	ug/Kg dry	32.52			x	x	C4N	12	319	12200	1000	1280	772	0	7410	4.25	9310	0	0	0	998	0	5860	279	16.8	174	0	68.2	0	0	3.59			
92-52-4	8270D (SIM) Semi-Volatile Organic Compou0s	Biphenyl	ug/Kg dry	26.46					BP	13	23.4	1730	131	203	19.4	0	858	0	3060	0	0	0	358	0	25.7	34.7	6.03	15	0	10.4	0	0	0			
208-96-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Acenaphthylene**	ug/Kg dry	28.16	L	x	x	x	ACE	14	48.5	2790	617	371	51.3	0	1450	0	6830	0	0	0	1170	0	50	81.6	6.03	36	0	63.3	0	0	0			
83-32-9	8270D (SIM) Semi-Volatile Organic Compou0s	**Acenaphthene**	ug/Kg dry	28.89	L	x	x	x	ACY	15	123	38100	5430	540	75.8	0	10500	8.3	193000	0	0	0	484	0	258	153	3.43	31.1	0	44.1	0	0	0			
132-64-9	8270D (SIM) Semi-Volatile Organic Compou0s	Dibenzofuran	ug/Kg dry	29.54				x	DBF	16	43.1	2330	223	129	38.5	0	654	0	7180	0	0	0	218	0	64.6	68.1	7.18	23.9	0	19.2	0	0	0			
86-73-7	8270D (SIM) Semi-Volatile Organic Compou0s	**Fluorene**	ug/Kg dry	30.91	L	x	x	x	FLE	17	155	26600	1280	676	102	0	6870	4.9	104000	0	0	0	734	0	494	160	7.3	41	0	51.7	0	0	0			
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Fluorenes	ug/Kg dry	33.14			x	x	C1FL	18	130	5880	1230	1300	173	0	9120	3.61	28200	0	0	0	1290	0	1460	109	8.11	53.1	0	41.2	0	0	0			
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Fluorenes	ug/Kg dry	35.22			x	x	C2FL	19	232	16500	1190	1740	400	0	9450	4.27	13400	0	0	0	1390	0	2160	166	15	122	0	66.7	0	0	0			
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Fluorenes	ug/Kg dry	38.01			x	x	C3FL	20	220	6760	1130	1250	428	0	3720	0	5040	0	0	0	922	0	1480	189	16.2	146	0	83.8	0	0	0			
132-65-0	8270D (SIM) Semi-Volatile Organic Compou0s	Dibenzothiophene	ug/Kg dry	34.23				x	DBT	21	92.5	10600	1280	358	83.9	0	2240	3.44	31200	0	0	0	758	0	892	69.2	3.46	31.4	0	37.4	0	0	0			
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Dibenzothiophenes	ug/Kg dry	36.43				x	C1DBT	22	180	14500	1770	986	302	0	5150	4.28	21800	0	0	0	1500	0	2450	122	7.98	85.2	0	61.1	0	0	0			
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Dibenzothiophenes	ug/Kg dry	37.7				x	C2DBT	23	278	11600	2060	1310	590	0	4710	3.87	11500	0	0	0	1670	0	2950	186	10.3	155	0	89.5	0	0	0			
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Dibenzothiophenes	ug/Kg dry	39.5				x	C3DBT	24	241	5910	1730	860	722	0	2400	0	4900	0	0	0	1140	0	2320	196	7.77	156	0	85.4	0	0	0			
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Dibenzothiophenes	ug/Kg dry	41.65				x	C4DBT	25	133	2210	1020	358	488	0	864	0	1680	0	0	0	584	0	1350	154	8.05	96.5	0	65.4	0	0	0			
85-01-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Phenanthrene**	ug/Kg dry	34.72	L	x	x	x	PHE	26	987	160000	15300	5710	648	0	63300	54.6	497000	6.45	0	0	6210	0	1950	805	49.1	280	0	406	0	0	8.25			
120-12-7	8270D (SIM) Semi-Volatile Organic Compou0s	**Anthracene**	ug/Kg dry	34.91	L	x	x	x	ANT	27	271	45100	3700	2040	148	0	13700	10	121000	0	0	0	2740	0	216	255	21.6	65.7	0	175	0	0	0			
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Phenanthrenes/Anthracenes	ug/Kg dry	36.96				x	C1PH	28	796	92600	8360	9180	747	0	46200	23.4	115000	2.93	0	0	8610	0	3470	585	76.9	334	3.07	325	2.67	0	6.94			
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Phenanthrenes/Anthracenes	ug/Kg dry	38.97			x	x	C2PH	29	515	41500	4180	6580	807	0	24100	7.31	32400	0	0	0	5020	0	2920	436	93.2	348	0	256	0	0	4			
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Phenanthrenes/Anthracenes	ug/Kg dry	40.8			x	x	C3PH	30	355	14200	2180	2900	639	0	8580	2.86	9300	0	0	0	2110	0	1730	284	54.1	224	0	149	0	0	4.4			
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Phenanthrenes/Anthracenes	ug/Kg dry	41.72			x	x	C4PH	31	184	4860	1170	1140	369	0	2930	0	3320	0	0	0	971	0	894	175	49.1	134	0	89.1	0	0	10			
483-65-8	8270D (SIM) Semi-Volatile Organic Compou0s	Retene	ug/Kg dry	41.72				x	RET	32	51.9	1090	359	341	96.7	0	814	0	1840	0	0	0	146	0	277	81.6	65.7	56.3	12	41.1	0	125	24.2			
239-35-0	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)naphtho(2,1-d)thiophene	ug/Kg dry	44.24					BNT	33	132	6270	1250	651	123	0	2280	0	10300	0	0	0	1800	0	239	105	7.08	63.8	0	92.6	0	0	6.34			
	8270D (SIM) Semi-Volatile Organic Compou0s	C0-Benzonaphthothiophenes	ug/Kg dry	44.24					C0BNT	34	260	10900	2350	1130	218	0	4100	3.41	18800	0	0	0	3300	0	398	199	16.2	121	0	177	0	0	3.19			
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzonaphthothiophenes	ug/Kg dry	45.63					C1BNT	35	195	7890	1580	1060	349	0	3960	0	9520	0	0	0	2000	0	866	173	14.3	122	0	128	0	0	0			
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzonaphthothiophenes	ug/Kg dry	47.14					C2BNT	36	184	4310	1380	721	555	0	2290	0	4210	0	0	0	1290	0	1390	197	9.76	136	0	123	0	0	0			
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzonaphthothiophenes	ug/Kg dry	49.02					C3BNT	37	137	2320	1110	373	499	0	1100	0	3090	0	0	0	937	0	1250	185	4.73	105	0	106	0	0	0			
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzonaphthothiophenes	ug/Kg dry	51.51					C4BNT	38	68.4	559	516	105	263	0	227	0	651	0	0	0	277	0	639	88	0	52.7	0	52	0	0	0			
206-44-0	8270D (SIM) Semi-Volatile Organic Compou0s	**Fluoranthene**	ug/Kg dry	39.51	H	x	x	x	FLA	39	1530	109000	17200	5470	963	0	40800	33.8	209000	4.02	0	0	11400	0	824	1110	108	659	3.7	1110	0	5.6	20.5			
129-00-0	8270D (SIM) Semi-Volatile Organic Compou0s	**Pyrene**	ug/Kg dry	40.39	H	x	x	x	PYR	40	1700	151000	21300	7700	1120	0	59900	53.8	309000	5.67	0	0	29300	0	1170	1270	92.2	765	4.17	1290	3.43	3.64	20.4			
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Fluoranthenes/Pyrenes	ug/Kg dry	41.78				x	C1PY	41	1110	66000	8700	8300	661	0	35500	16.8	95800	3.36	0	0	14800	0	1000	699	89.3	441	4.37	627	2.61	4.72	9.37			
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Fluoranthenes/Pyrenes	ug/Kg dry	43.52				x	C2PY	42	541	24300	3430	4190	469	0	16000	4.04	23400	0	0	0	4640	0	1000	374	48.1	268	2.68	329	0	0	6.01			
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Fluoranthenes/Pyrenes	ug/Kg dry	45.72				x	C3PY	43	279	9940	1760	1850	361	0	6390	0	6900	0	0	0	1740	0	891	225	28.7	158	0	168	0	0	0			
243-17-4	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)fluorene	ug/Kg dry	42.03				x	BbF	44	146	6560	986	754	73.3	0	3390	0	11300	0	0	0	1650	0	77.9	84.5	11.2	45.5	0	68.9	0	0	0			
205-12-9	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(c)fluorene	ug/Kg dry	42.07				x	BcF	45	51.9	3050	464	426	31.7	0	1980	0	5860	0	0	0	777	0	44.7	36.4	6	20.3	0	32.5	0	0	0			
3442-78-2	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylpyrene	ug/Kg dry	42.18				x	2MP	46	146	8990	1240	1200	94.7	0	4620	2.38	13200	0	0	0	2140	0	171	92.1	11.6	63.8	0	91.5	0	0	0			
3353-12-6	8270D (SIM) Semi-Volatile Organic Compou0s	4-Methylpyrene	ug/Kg dry	42.55				x	4MP	47	134	7970	1100	1090	105	0	4070	0	10700	0	0	0	1880	0	200	94.6	8.61	66.4	0	87.4	0	0	0			
2381-21-7	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylpyrene	ug/Kg dry	42.67				x	1MP	48	107	8400	1020	973	73.8	0	4390	0	12400	0	0	0	1800	0	145	71.3	6.38	47	0	69.7	0	0	0			
56-55-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Benz(a)anthracene**	ug/Kg dry	45.17	H	x	x	x	BaA	49	925	42300	7990	4590	467	0	27300	10.2	71500	0	0	0	13300	0	466	619	64.1	319	0	637	0	0	8.1			
	8270D (SIM) Semi-Volatile Organic Compou0s	**Chrysene/triphenylene**	ug/Kg dry	45.36	H	x	x	x	CH	50	957	40100	7720	4730	594	0	25100	11.7	67500	0	0	0	13500	0	646	699	63.5	441	0	682	0	0	10.2			
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	46.81				x	C1CR	51	684	29200	4150	5000	492	0	19100	5.01	34300	0	0	0	7130	0	845	460	59.5	312	0	415	0	0	5.58			
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	48.52				x	C2CR	52	402	13300	2300	2870	412	0	9710	0	11700	0	0	0	2850	0	972	295	39.7	227	0	248	0	0	0			
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	49.55				x	C3CR	53	228	4900	1370	1230	316	0	3440	0	3840	0	0	0	1230	0	807	205	22.1	141	0	131	0	0	0			
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	50				x	C4CR	54	89.1	1670	694	433	189	0	1030	0	1920	0	0	0	606	0	417	128	0	68.1	0	69.1	0	0	0			
205-99-2	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(b)fluoranthene**	ug/Kg dry	49.23	H	x	x	x	BbF	55	662	19500	5090	2220	436	0	6710	4.59	40000	0	0	0	8660	0	362	540	36.8	329	0	535	0	0	7.77			
	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(j/k)fluoranthene**	ug/Kg dry	49.29	H	x	x	x	BjF	56	782	25400	6410	2540	405	0	8600	7.12	52200	0	0	0	10500	0	371	583	48.4	329	0	527	0	0	8.05			
192-97-2	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(e)pyrene	ug/Kg dry	50.17			x	x	BeP	57	601	22700	5490	2400	393	0	7080	7.34	49000	0	0	0	9850	0	401	521	30.8	299	0	498	0	0	7.7			
50-32-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(a)pyrene**	ug/Kg dry	50.34	H	x	x	x	BaP	58	971	40100	9140	3720	501	0	13100	9.71	77300	0	0	0	16400	0	476	737	47.5	365	0	710	0	0	8.22			
198-55-0	8270D (SIM) Semi-Volatile Organic Compou0s	Perylene	ug/Kg dry	50.61			x	x	PE	59	288	6680	1760	779	255	727	2190	2.57	16000	0	593	485	2830	416	261	353	95.5	456	826	317	160	789	250			
193-39-5	8270D (SIM) Semi-Volatile Organic Compou0s	**Indeno(1,2,3-cd)pyrene**	ug/Kg dry	54	H	x	x	x	I123P	60	680	22200	6130	2240	525	0	5660	5	58400	0	0	0	10400	0	395	1220	22.6	304	0	562	3.18	0	8.34			
53-70-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Dibenzo(a,h)anthracene**	ug/Kg dry	54.01	H	x	x	x	DBA	61	152	4340	1120	589	118	0	1710	0	11400	0	0	0	1890	0	132	232	7.54	60.3	0	110	0	0	0			
191-24-2	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(g,h,i)perylene**	ug/Kg dry	54.91	H	x	x	x	BGP	62	548	19500	5400	1920	463	0	4430	6.81	51200	2.56	0	0	9480	0	358	1150	19.9	261	2.7	487	3.83	0	7.83			
191-07-1	8270D (SIM) Semi-Volatile Organic Compou0s	Coronene	ug/Kg dry	61.34				x	COR	63	132	4310	1360	426	119	0	830	3.08	10900	8.67	2.92	0	2280	0	242	471	4.3	79.6	0	141	0	0	0			
526-73-8	8270D (SIM) Semi-Volatile Organic Compou0s	1,2,3-Trimethylbenzene	ug/Kg dry							64	12.6	129	40	9.43	10.7	4.64	50.3	0	77.2	4.94	5.71	5.13	33.2	4.64	23.1	33.3	6.03	5.62	4.92	6.76	5.16	6.05	6.34			
95-63-6	8270D (SIM) Semi-Volatile Organic Compou0s	1,2,4-Trimethylbenzene	ug/Kg dry							65	22.1	259	60.3	51.9	18.3	4.64	235	4.76	266	4.94	5.71	5.13	45.5	4.64	33.1	63	3.69	17.7	4.92	7.89	5.16	6.05	6.34			
108-67-8	8270D (SIM) Semi-Volatile Organic Compou0s	1,3,5-Trimethylbenzene	ug/Kg dry							66	8.03	121	28.8	19.8	5.87	4.64	64.6	4.76	84.7	4.94	5.71	5.13	26.9	4.64	9.13	15.7	6.03	4.47	4.92	6.76	5.16	6.05	6.34			
	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methyldibenzothiophene	ug/Kg dry	36.76						67	22.2	1450	234	83.4	34.6	4.64	432	4.76	2210	4.94	5.71	5.13	164	4.64	327	14.8	6.03	10.3	4.92	7.49	5.16	6.05	6.34			
	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylphenanthrene	ug/Kg dry	37.24						68	135	15200	1260	1410	123	4.64	7510	4.02	18200	4.94	5.71	5.13	733	4.64	522	97.8	13.8	52.7	4.92	48.7	5.16	6.05	6.34			
	8270D (SIM) Semi-Volatile Organic Compou0s	2,3,5-Trimethylnaphthene	ug/Kg dry	30.44						69	25.3	2300	114	135	55.2	4.64	1090	4.76	2050	4.94	5.71	5.13	114	4.64	760	26.6	6.03	9.94	4.92	5.36	5.16	6.05	6.34			
581-42-0	8270D (SIM) Semi-Volatile Organic Compou0s	2,6-Dimethylnaphthalene	ug/Kg dry	27.07						70	66.5	8910	146	448	80.2	4.64	3480	4.76	18800	4.94	5.71	5.13	238	4.64	2090	79.9	6.03	21.2	4.92	13.9	5.16	6.05	6.34			
	8270D (SIM) Semi-Volatile Organic Compou0s	2/3-Methyldibenzothiophene	ug/Kg dry	36.31						71	57.5	4910	588	327	100	4.64	1800	4.76	7670	4.94	5.71	5.13	509	4.64	862	42	6.03	26.2	4.92	18.6	5.16	6.05	6.34			
	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylanthracene	ug/Kg dry	36.96						72	92.3	12100	800	1040	48.6	4.64	6040	4.76	13800	4.94	5.71	5.13	629	4.64	131	53.8	7.27	22.3	4.92	37.4	5.16	6.05	6.34			
	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylphenanthrene	ug/Kg dry	36.81						73	191	22600	2250	2340	193	4.64	11300	5.82	30300	4.94	5.71	5.13	2560	4.64	1040	144	23	87.9	4.92	79.6	5.16	6.05	6.34			
	8270D (SIM) Semi-Volatile Organic Compou0s	3-Methylphenanthrene	ug/Kg dry	36.69						74	176	19900	1920	2000	177	4.64	10300	5.46	28000	4.94	5.71	5.13	2120	4.64	880	123	14.3	80.2	4.92	80	5.16	6.05	6.34			
	8270D (SIM) Semi-Volatile Organic Compou0s	4/9-Methylphenanthrene	ug/Kg dry	37.14						75	193	22500	1970	2330	181	4.64	10800	5.29	23700	4.94	5.71	5.13	2520	4.64	811	131	16.1	87.7	4.92	87.2	5.16	6.05	6.34			
	8270D (SIM) Semi-Volatile Organic Compou0s	4-Methyldibenzothiophene	ug/Kg dry	36.01						76	81.3	6290	684	434	140	4.64	2250	4.76	8490	4.94	5.71	5.13	603	4.64	1090	50.9	6.03	38.5	4.92	23.5	5.16	6.05	6.34			
71-43-2	8270D (SIM) Semi-Volatile Organic Compou0s	Benzene	ug/Kg dry							77	12.4	80	40	8.86	9.5	4.64	6.97	4.76	1980	4.94	5.71	5.13	33.2	4.64	16.2	6.61	6.03	7.55	4.92	6.76	5.16	6.05	6.34			

Attachment B. Complete Sediment Data Set
Amesbury Former MGP
Amesbury, Massachusetts

											River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River
										Sample No.	F200017-04	F200017-05	F200017-06	F200017-07	F200017-08	F200017-09	F200017-10	F200017-11	F200017-12	F200017-13	F200017-14	F200017-15	F200017-16	F200017-17	F200017-18	F200017-20	F200017-19	F200019-01	F200019-02	F200019-03	F200019-04	F200019-05	F200019-06
										Sample Date:	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/16/2020	03/16/2020	03/16/2020	03/16/2020	03/16/2020	03/16/2020
										Sample Time:	19:07	19:07	19:07	19:07	19:07	19:07	19:07	19:07	19:07	19:07	19:07	19:07	19:07	19:07	19:07	19:07	19:07	10:37	10:44	11:01	11:09	11:36	11:41
										ClieSam	SS774-S2	SS774-S3	SS775-S2	SS775-S3	SS776-S1	SS776-S3	SS777-S2	SS777-S3	SS778-S2	SS778-S3	SS779-S1	SS779-S2	SS780-S1	SS780-S2	SS781-S1	SS781(R1)-S1	SS782-S2	SS783-S1	SS783-S2	SS784-S1	SS784-S2	SS785-S1	SS785-S2
										Depths:	2.4-2.6	5.6-5.8	3.8-4	6.2-6.4	0.8-1	5-5.2	5.8-6	7.5-7.7	5.7-5.9	6.9-7.1	1.1-1.3	3.8-4	1.5-1.7	4.3-4.5	1.9-2.1	3.6-3.8	6.6-6.8	0-1	4-4.2	0.5-0.7	4.5-4.7	1-1.2	4-4.2
										RAH																							
										%solids	75	63	82	55	60	61	46	62	51	55	67	50	57	74	54	57	63	50	75	56	75	62	61
CAS Number	Method Name	Analyte	Units	RT		PAH17	PAH34	PAH51	Abbrev	PAH #																							
11095-43-5	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)thiophene	ug/Kg dry							78	6.7	215	26.8	21.7	9.5	4.64	137	4.76	335	4.94	5.71	5.13	61.3	4.64	16.2	6.61	6.03	7.55	4.92	6.76	5.16	6.05	6.34
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzene	ug/Kg dry							79	179	1860	279	514	182	4.64	895	4.76	829	4.94	3.56	2.99	742	4.64	330	523	57.4	217	4.92	112	5.16	6.05	3.34
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Decalins	ug/Kg dry							80	522	553	763	84.6	2300	4.64	560	4.76	876	4.94	4.27	5.13	314	4.64	4130	2310	6.03	361	4.92	87.8	5.16	6.05	6.34
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzenes	ug/Kg dry							81	43.9	218	109	85.1	24.4	4.64	369	4.76	245	4.94	5.71	5.13	112	4.64	52.4	101	6.44	24.2	4.92	21.8	5.16	6.05	3.71
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Decalins	ug/Kg dry							82	233	1060	621	256	805	4.64	1320	4.76	1590	4.94	5.71	5.13	589	4.64	1810	661	6.03	311	4.92	80.9	5.16	6.05	6.34
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzenes	ug/Kg dry							83	47.6	478	121	106	31.8	4.64	526	4.76	473	4.94	5.71	5.13	110	4.64	67.3	93.9	7.75	28.4	4.92	18.4	5.16	6.05	6.34
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Decalins	ug/Kg dry							84	151	982	445	278	338	4.64	1490	4.76	1430	4.94	5.71	5.13	520	4.64	1520	285	6.03	212	4.92	58	5.16	6.05	6.34
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzenes	ug/Kg dry							85	121	1600	185	74.4	150	4.64	796	4.76	2330	4.94	5.71	5.13	91.1	4.64	625	541	9.83	37.5	4.92	24.2	5.16	6.05	6.34
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Decalins	ug/Kg dry							86	259	1670	710	584	727	4.64	2860	4.76	2100	4.94	5.71	5.13	705	4.64	2960	455	6.03	342	4.92	104	5.16	6.05	6.34
	8270D (SIM) Semi-Volatile Organic Compou0s	C5-Benzenes	ug/Kg dry							87	104	1530	173	59	253	4.64	830	4.76	3030	4.94	5.71	5.13	67.7	4.64	905	456	5.11	31.3	4.92	20.8	5.16	6.05	6.34
86-74-8	8270D (SIM) Semi-Volatile Organic Compou0s	Carbazole	ug/Kg dry	35.61						88	37.9	153	264	49.2	33.1	4.64	73.7	4.76	204	4.94	5.71	5.13	95.7	4.64	45.1	53.1	6.03	15.2	4.92	26.7	5.16	6.05	6.34
493-01-6	8270D (SIM) Semi-Volatile Organic Compou0s	cis-Decalin	ug/Kg dry							89	56.1	43.8	58.1	8.18	247	4.64	50.1	4.76	69.4	4.94	5.71	5.13	23.5	4.64	469	258	6.03	30.7	4.92	6.14	5.16	6.05	6.34
100-41-4	8270D (SIM) Semi-Volatile Organic Compou0s	Ethylbenzene	ug/Kg dry							90	11.1	101	30.6	38.5	5.25	4.64	262	4.76	134	4.94	5.71	5.13	39.2	4.64	11.9	15.2	6.03	4.31	4.92	5.08	5.16	6.05	6.34
98-82-8	8270D (SIM) Semi-Volatile Organic Compou0s	Isopropylbenzene	ug/Kg dry							91	12.4	30.7	40	5.03	9.5	4.64	24.2	4.76	26	4.94	5.71	5.13	33.2	4.64	16.2	4.36	6.03	7.55	4.92	6.76	5.16	6.05	6.34
	8270D (SIM) Semi-Volatile Organic Compou0s	m,p-Xylene	ug/Kg dry							92	43.5	183	111	89.8	19.6	4.64	333	4.76	249	4.94	5.71	5.13	100	4.64	42	83	6.04	22.9	4.92	20.9	5.16	6.05	6.34
108-87-2	8270D (SIM) Semi-Volatile Organic Compou0s	Methylcyclohexane	ug/Kg dry							93	24	60	40	29.3	5.55	4.64	31.3	4.76	79.3	4.94	5.71	5.13	33.2	4.64	16.2	13.2	6.03	7.55	4.92	5.91	5.16	6.05	6.34
104-51-8	8270D (SIM) Semi-Volatile Organic Compou0s	n-Butylbenzene	ug/Kg dry							94	12.4	59.9	40	5.56	38.7	4.64	45.5	4.76	77.9	4.94	5.71	5.13	33.2	4.64	66.8	82.7	6.03	7.55	4.92	6.76	5.16	6.05	6.34
103-65-1	8270D (SIM) Semi-Volatile Organic Compou0s	n-Propylbenzene	ug/Kg dry							95	12.4	26.6	40	13.2	5.77	4.64	63.4	4.76	43.1	4.94	5.71	5.13	33.2	4.64	9.28	14	6.03	7.55	4.92	6.76	5.16	6.05	6.34
95-47-6	8270D (SIM) Semi-Volatile Organic Compou0s	o-Xylene	ug/Kg dry							96	16.1	65.7	29.6	20.5	6.48	4.64	58.7	4.76	58	4.94	5.71	5.13	23.1	4.64	15.8	52.3	6.03	4.81	4.92	4.05	5.16	6.05	6.34
99-87-6	8270D (SIM) Semi-Volatile Organic Compou0s	p-Isopropyltoluene	ug/Kg dry							97	8.92	85.4	40	17.5	5.32	4.64	35.3	4.76	68.5	4.94	5.71	5.13	26.6	4.64	8.76	12.6	10.9	7.55	4.92	6.76	5.16	6.05	6.34
135-98-8	8270D (SIM) Semi-Volatile Organic Compou0s	sec-Butylbenzene	ug/Kg dry							98	12.4	35.1	40	5.56	9.5	4.64	7.83	4.76	18.3	4.94	5.71	5.13	33.2	4.64	16.2	9.31	6.03	7.55	4.92	6.76	5.16	6.05	6.34
100-42-5	8270D (SIM) Semi-Volatile Organic Compou0s	Styrene	ug/Kg dry							99	7.28	137	27.9	18.7	9.5	4.64	77.5	4.76	252	4.94	5.71	5.13	73.9	4.64	16.2	8.06	6.03	7.55	4.92	4.66	5.16	6.05	6.34
98-06-6	8270D (SIM) Semi-Volatile Organic Compou0s	t-Butylbenzene	ug/Kg dry							100	12.4	35.1	40	5.56	9.5	4.64	6.97	4.76	31.9	4.94	5.71	5.13	33.2	4.64	9.69	4.88	6.03	7.55	4.92	6.76	5.16	6.05	6.34
108-88-3	8270D (SIM) Semi-Volatile Organic Compou0s	Toluene	ug/Kg dry							101	214	2240	327	610	216	4.64	1090	4.76	1020	4.94	4.21	3.59	910	2.51	396	640	69.8	257	4.92	136	5.16	3.2	4.98
493-02-7	8270D (SIM) Semi-Volatile Organic Compou0s	trans-Decalin	ug/Kg dry							102	12.4	35.1	40	5.56	9.5	4.64	6.97	4.76	31.9	4.94	5.71	5.13	33.2	4.64	16.2	6.61	6.03	7.55	4.92	6.76	5.16	6.05	6.34
3891-98-3	Saturated Hydrocarbons by GC/FID	2,6,10-trimethyldodecane (1380)	mg/Kg dry							103	334	2280	980	288	1090	4.64	1310	4.76	3990	4.94	5.71	5.13	601	4.64	5830	630	3.75	504	4.92	65.4	5.16	6.05	6.34
3892-00-0	Saturated Hydrocarbons by GC/FID	2,6,10-trimethylpeadecane (1650)	mg/Kg dry							104	485	5310	1750	999	2600	7.64	2330	12.9	5060	7.52	15.3	11	977	7.86	7900	753	17.8	509	10.4	97.7	7.77	13.8	17.3
3891-99-4	Saturated Hydrocarbons by GC/FID	2,6,10-trimethyltridecane (1470)	mg/Kg dry							105	543	4180	1630	517	1840	4.64	1940	3.94	5000	4.94	3.64	5.13	983	4.64	8040	944	14.7	702	3.26	138	3.17	4.06	6.3
	Classical Chemistry	Black Carbon (Average)	mg/kg							106																							
	Saturated Hydrocarbons by GC/FID	C-10	mg/Kg dry							107																							
	Saturated Hydrocarbons by GC/FID	C-11	mg/Kg dry							108																							
	Saturated Hydrocarbons by GC/FID	C-12	mg/Kg dry							109																							
	Saturated Hydrocarbons by GC/FID	C-13	mg/Kg dry							110																							
	Saturated Hydrocarbons by GC/FID	C-14	mg/Kg dry							111																							
	Saturated Hydrocarbons by GC/FID	C-15	mg/Kg dry							112																							
	Saturated Hydrocarbons by GC/FID	C-16	mg/Kg dry							113																							
	Saturated Hydrocarbons by GC/FID	C-17	mg/Kg dry							114	266	1170	304	431	271	27.4	404	37.3	460	25.5	90.2	48.6	757	39	16.2	214	170	194	55.2	102	36.9	87.7	81.8
	Saturated Hydrocarbons by GC/FID	C-18	mg/Kg dry							115	217	1110	299	416	281	30	318	29.1	475	20	43.7	30.9	498	22.2	16.2	133	40.9	94.8	33.4	75.9	24.5	39.4	60.3
	Saturated Hydrocarbons by GC/FID	C-19	mg/Kg dry							116																							
	Saturated Hydrocarbons by GC/FID	C-21	mg/Kg dry							117																							
	Saturated Hydrocarbons by GC/FID	C-22	mg/Kg dry							118																							
	Saturated Hydrocarbons by GC/FID	C-23	mg/Kg dry							119																							
	Saturated Hydrocarbons by GC/FID	C-24	mg/Kg dry							120																							
	Saturated Hydrocarbons by GC/FID	C-25	mg/Kg dry							121																							
	Saturated Hydrocarbons by GC/FID	C-26	mg/Kg dry							122																							
	Saturated Hydrocarbons by GC/FID	C-27	mg/Kg dry							123																							
	Saturated Hydrocarbons by GC/FID	C-28	mg/Kg dry							124																							
	Saturated Hydrocarbons by GC/FID	C-29	mg/Kg dry							125																							
	Saturated Hydrocarbons by GC/FID	C-30	mg/Kg dry							126																							
	Saturated Hydrocarbons by GC/FID	C-31	mg/Kg dry							127																							
	Saturated Hydrocarbons by GC/FID	C-32	mg/Kg dry							128																							
	Saturated Hydrocarbons by GC/FID	C-33	mg/Kg dry							129																							
	Saturated Hydrocarbons by GC/FID	C-34	mg/Kg dry							130																							
	Saturated Hydrocarbons by GC/FID	C-35	mg/Kg dry							131																							
	Saturated Hydrocarbons by GC/FID	C-36	mg/Kg dry							132																							
	Saturated Hydrocarbons by GC/FID	C-37	mg/Kg dry							133																							
	Saturated Hydrocarbons by GC/FID	C-38	mg/Kg dry							134																							
	Saturated Hydrocarbons by GC/FID	C-39	mg/Kg dry							135																							
	Saturated Hydrocarbons by GC/FID	C-40	mg/Kg dry							136																							
	Saturated Hydrocarbons by GC/FID	C-8	mg/Kg dry							137																							
	Saturated Hydrocarbons by GC/FID	C-9	mg/Kg dry							138																							
638-36-8	Saturated Hydrocarbons by GC/FID	Phytane	mg/Kg dry	34.53						141	1050	8370	3250	2060	5390	29.8	3750	38.4	9420	28.2	56.8	40.6	1920	29.9	10200	1580	52.8	1050	38.6	247	32.4	49.7	67.3
1921-70-6	Saturated Hydrocarbons by GC/FID	Pristane	mg/Kg dry	32.65						142	1330	9990	3430	2000	6870	21.6	4580	31.5	10800	21.7	41.7	31.8	1750	23.8	14900	2070	56	1290	28.6	246	23	34.4	49.1
TOC	Classical Chemistry	Total Organic Carbon (Average)	mg/kg							145	32100	86200	170000	37400	19700	2810	80000	762	178000	2450	23300	13300	78900	17700	34200	38900	28500	41700	19900	36500	9450	26400	31100
	TPAH16										10625.5	752060	114369	45874	6666.1	0	293160	220.53	1878240	18.7	0	0	137638	0	8248.4	9741.6	607.9	4321.7	10.57	7423.7	10.44	9.24	107.66
	TPAH34										17516.2	1178510	162978	96459	14820.2	727	517920	311.5	2461470	24.99	593	485	201383	416	49635.4	15346.1	1322.56	8050.2	844.01	10960.2	175.72	802.96	412.75
	TPAH51										20209.4	1320850	183457	112938	18542.7	727	585132	335.13	2675630	33.66	595.92	485	225486	416	63284.6	17787	1567.99	9447.7	858.69	12383.7	175.72	927.96	442.96
	LPAH										1806.7	280800	27192	10993	1122.7	0	103030	77.8	935940	6.45	0	0	13668	0	3149.4	1656.7	103.9	519.4	0	797	0	0	8.25
	HPAH										8907	473440	87500	35719	5592	0	193310	142.73	947500	12.25	0	0	124830	0	5200	8160	510.54	3832.3	10.57	6650	10.44	9.24	99.41

(does not include source area samples collected in 2017)

Attachment B. Complete Sediment Data Set
Amesbury Former MGP
Amesbury, Massachusetts

												River	Upstream	Upstream	Upstream	Upstream	Upstream	River	River	River	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Mudflat	River	River	River	River	River	River	River
											Sample No.	F200019-07	F200037-01	F200037-02	F200033-06	F200033-02	F200033-03	F200033-04	F200036-11	F200036-10	F200036-03	F200036-04	F200036-01	F200036-02	F200033-01	F200033-05	F200036-09	F200035-05	F200035-04	F200035-02	F200035-03	F200035-01	F200036-07	F200036-08
											Sample Date:	03/16/2020	7/6/2020	7/6/2020	7/6/2020	7/6/2020	7/6/2020	7/6/2020	7/8/2020	7/8/2020	7/8/2020	7/8/2020	7/8/2020	7/8/2020	7/6/2020	7/6/2020	7/8/2020	7/7/2020	7/7/2020	7/7/2020	7/7/2020	7/7/2020	7/8/2020	7/8/2020
											Sample Time:	12:05	15:35	15:35	15:21	15:21	15:21	15:21	16:00	16:00	16:00	16:00	16:00	16:00	15:21	15:21	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00
											ClieSam	SS786-S2	SS787-S1	SS787-S2	SS788-S1	SS789-S1	SS790-S1	SS790-S2	SS791-S1	SS792-S1	SS793-S1	SS793-S2	SS794-S1	SS794-S2	SS795-S2	SS796-S1	SS797-S1	SS798-S2	SS799-S2	SS800-S1	SS800-S2	SS801-S2	SS802-S1	SS803-S1
											Depths:	3.6-3.8	0-0.3	3.1-3.3	0.6-0.9	0-0.5	1.6-1.8	4.3-4.5	4-5	4-5	0.4-0.6	2-2.2	0.8-1	1.8-2	2-2.2	0-0.5	0-1	1.8-2	1.4-1.6	1.4-1.6	3.3-3.5	4.4-4.6	6-6.2	6-6.2
											RAH																							
											%solids	60	35	64	56	79	50	76	61	59	13	19	24	20	35	51	63	56	53	74	64	69	82	82
CAS Number	Method Name	Analyte	Units	RT		PAH17	PAH34	PAH51	Abbrev	PAH #		6.26						5								8.1			7.33	5.19		6.06	4.84	4.89
		Max RL for ND PAHs=								1																								
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzo(b)thiophenes	ug/Kg dry	17					C1BT	2	0	231	8.51	89	19	110	7.38	8.57	9.53	111	264	1280	641	7690	10.9	40.8	10.7	8.52	6.69	12.8	7.85	0	4.57
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzo(b)thiophenes	ug/Kg dry	18					C2BT	3	0	294	14.5	208	24.5	143	5.09	13	10.1	66.4	827	1040	759	8070	10.4	65.8	12.3	6.55	4.32	16.1	7.65	3.5	3.12
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzo(b)thiophenes	ug/Kg dry	19					C3BT	4	0	222	9.21	219	22.9	159	2.9	10.8	8.43	49.2	530	460	335	1550	6.89	48.3	8.1	4.21	4.9	11.9	5.71	2.53	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzo(b)thiophenes	ug/Kg dry	20					C4BT	5	0	149	15.6	170	15.9	240	4.67	6.13	4.06	44.1	110	400	170	386	0	38.9	6.42	7.33	0	6.88	3.77	0	0
91-20-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Naphthalene**	ug/Kg dry	21.86	L	x	x	x	NA	6	0	7120	59.8	203	55.6	236	5.18	10.4	8.45	296	3420	23000	10000	49800	5.99	212	40.2	3.75	4.46	212	3.26	2.95	2.65
91-57-6	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylnaphthalene	ug/Kg dry	24.57	L	x		x	2MN	7	0	3040	33.2	115	34.1	129	0	6.73	6.63	162	1400	8640	3650	13100	4.09	76.8	30.8	4.1	5.74	218	0	3.33	3.45
90-12-0	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylnaphthalene	ug/Kg dry	25				x	1MN	8	0	2440	31.9	116	31.8	97.9	3.94	5.77	6.31	107	538	3050	1540	64400	4.38	49.4	15.9	4.39	5.02	113	4.59	2.89	2.88
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Naphthalenes	ug/Kg dry	24.57			x	x	C1N	9	0	3270	39.6	142	38.7	139	3.81	7.86	7.73	168	1170	7150	3160	44900	5.01	77.1	28.3	5.32	6.85	198	4.61	4.35	3.9
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Naphthalenes	ug/Kg dry	27.02			x	x	C2N	10	0	3890	98	1800	117	670	6.97	14.4	16.2	237	1180	5090	2660	49700	21	207	65.9	16.7	12.9	609	9.32	5.59	5.34
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Naphthalenes	ug/Kg dry	29.76			x	x	C3N	11	0	3000	89.5	2780	143	1820	4.23	12	11.1	163	573	2590	1110	7350	19	298	63.5	8.54	10.9	635	6.73	4.74	4.54
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Naphthalenes	ug/Kg dry	32.52			x	x	C4N	12	0	1580	49.7	1990	81.8	2470	0	6.13	8.08	138	469	1710	721	2360	12.4	336	59.7	6.8	0	372	4.93	0	0
92-52-4	8270D (SIM) Semi-Volatile Organic Compou0s	Biphenyl	ug/Kg dry	26.46					BP	13	0	991	12.8	313	18.1	250	2.57	10.4	12.5	111	491	3310	1400	9650	0	43.8	19.2	7.42	3.92	80.7	5.78	4.64	3.86
208-96-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Acenaphthylene**	ug/Kg dry	28.16	L	x	x	x	ACE	14	0	1790	100	506	158	849	0	3.47	5.17	723	2930	45100	10300	6070	0	534	123	4.78	0	450	0	0	0
83-32-9	8270D (SIM) Semi-Volatile Organic Compou0s	**Acenaphthene**	ug/Kg dry	28.89	L	x	x	x	ACY	15	0	11300	123	698	300	862	4.29	6.13	0	149	554	3530	2030	369000	9.02	282	16.5	0	0	374	0	0	0
132-64-9	8270D (SIM) Semi-Volatile Organic Compou0s	Dibenzofuran	ug/Kg dry	29.54				x	DBF	16	0	8220	32.8	85.3	43.9	163	0	6.13	0	77.5	445	1220	652	12000	8.1	69.6	15.5	0	0	42.5	0	0	0
86-73-7	8270D (SIM) Semi-Volatile Organic Compou0s	**Fluorene**	ug/Kg dry	30.91	L	x	x	x	FLE	17	0	9380	90.6	737	115	745	0	5.5	5.54	163	874	4940	2400	86300	4.61	224	29.5	3.79	2.7	485	0	3.2	2.49
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Fluorenes	ug/Kg dry	33.14			x	x	C1FL	18	0	2750	67.3	785	116	774	0	8.51	0	85.4	616	2760	1070	7600	12.1	286	42.5	7.33	4.69	666	7.35	3.12	2.97
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Fluorenes	ug/Kg dry	35.22			x	x	C2FL	19	0	2540	71	1060	88.1	1440	0	8.7	9.26	156	638	3230	1210	3020	17.7	254	68.6	9.82	7.02	612	5.57	3.77	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Fluorenes	ug/Kg dry	38.01			x	x	C3FL	20	0	4350	73.2	926	110	1530	0	10.1	0	288	1030	3910	1430	2870	12.8	381	80.2	8.54	7.27	409	0	0	0
132-65-0	8270D (SIM) Semi-Volatile Organic Compou0s	Dibenzothiophene	ug/Kg dry	34.23				x	DBT	21	0	7430	72.2	427	127	626	0	6.13	0	127	500	4370	1730	41500	8.1	212	22.5	0	5.19	71.3	0	0	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Dibenzothiophenes	ug/Kg dry	36.43				x	C1DBT	22	0	3610	65.9	802	104	973	2.68	5.4	5.79	135	511	5240	1730	6620	5.27	214	44.9	0	3.3	96	4.14	0	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Dibenzothiophenes	ug/Kg dry	37.7				x	C2DBT	23	0	2790	78.3	1070	120	1790	4.48	10.1	9.68	166	692	7990	2130	3420	9.13	335	76.1	4.73	5.35	143	6.14	3.87	3.84
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Dibenzothiophenes	ug/Kg dry	39.5				x	C3DBT	24	0	1920	66.7	831	104	1380	3.25	9.4	10.4	130	625	6200	1440	2800	6.25	390	75.9	4.58	4.18	132	5.55	2.7	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Dibenzothiophenes	ug/Kg dry	41.65				x	C4DBT	25	0	1090	37.6	473	80.5	731	4.67	6.13	0	74.9	505	2600	753	2230	0	289	51.2	0	0	84.3	0	4.84	0
85-01-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Phenanthrene**	ug/Kg dry	34.72	L	x	x	x	PHE	26	0	101000	963	4180	1210	3420	3.38	12.2	6.87	1220	3740	19100	7230	253000	14	1390	188	6.7	10.2	3080	0	3.43	3
120-12-7	8270D (SIM) Semi-Volatile Organic Compou0s	**Anthracene**	ug/Kg dry	34.91	L	x	x	x	ANT	27	0	22600	253	1260	466	1990	0	3.35	0	599	2540	20900	7300	41800	5.61	739	118	0	5.19	1080	0	0	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Phenanthrenes/Anthracenes	ug/Kg dry	36.96				x	C1PH	28	0	26600	401	3350	578	2650	4.92	14.6	12.4	736	2880	22300	7060	27500	18.5	885	252	15.1	16.2	3130	6.36	4.56	4.47
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Phenanthrenes/Anthracenes	ug/Kg dry	38.97				x	C2PH	29	0	11400	261	2570	350	3120	3.29	19.8	13.2	500	2290	18800	5580	9440	15.9	933	274	13.3	22.7	5.88	9.39	4.15	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Phenanthrenes/Anthracenes	ug/Kg dry	40.8				x	C3PH	30	0	4460	130	1310	174	1750	3.44	9.05	6.89	228	1220	8050	2340	5210	26.1	709	186	8.83	12.3	1080	8.28	0	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Phenanthrenes/Anthracenes	ug/Kg dry	41.72				x	C4PH	31	0	1800	72.1	657	86.8	749	0	230	95.5	96.1	683	2840	1020	3540	59.1	404	116	18.2	210	506	10.3	0	0
483-65-8	8270D (SIM) Semi-Volatile Organic Compou0s	Retene	ug/Kg dry	41.72				x	RET	32	0	399	91.5	508	32.1	253	5.05	938	360	38	310	634	426	941	178	79.8	92.1	12.3	857	139	29.4	0	0
239-35-0	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)naphtho(2,1-d)thiophene	ug/Kg dry	44.24					BNT	33	0	6740	71.7	411	114	810	0	6.13	0	288	956	20600	3780	3270	0	173	56.8	0	0	117	0	0	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C0-Benzonaphthothiophenes	ug/Kg dry	44.24					C0BNT	34	0	12700	129	740	213	1480	0	7.84	0	528	1840	41500	7630	6130	0	352	112	5.46	3.24	232	0	0	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzonaphthothiophenes	ug/Kg dry	45.63					C1BNT	35	0	5240	91.1	575	195	984	2.97	5.49	0	307	1260	22100	3990	3460	6.9	328	101	6.89	4.51	255	0	0	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzonaphthothiophenes	ug/Kg dry	47.14					C2BNT	36	0	3690	76.8	604	308	937	2.59	5.01	0	267	1180	9080	2170	3130	5.87	364	91.3	0	3.05	228	0	0	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzonaphthothiophenes	ug/Kg dry	49.02					C3BNT	37	0	2770	54.7	483	343	771	0	6.13	0	243	1060	6080	1640	2450	0	277	59.7	0	0	179	0	0	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzonaphthothiophenes	ug/Kg dry	51.51					C4BNT	38	0	1320	20.3	266	229	432	0	6.13	0	143	539	1630	584	1130	0	156	25.4	0	0	52.3	0	0	0
206-44-0	8270D (SIM) Semi-Volatile Organic Compou0s	**Fluoranthene**	ug/Kg dry	39.51	H	x	x	x	FLA	39	0	108000	894	4770	1550	11300	3.86	15.4	0	3020	9590	99100	30500	61500	23.7	3120	557	15.8	8.55	2810	0	0	0
129-00-0	8270D (SIM) Semi-Volatile Organic Compou0s	**Pyrene**	ug/Kg dry	40.39	H	x	x	x	PYR	40	0	90200	995	5220	1500	10500	3.95	15.6	3.48	3000	11300	145000	42800	78200	23.8	3800	693	15.9	9.14	5220	0	0	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Fluoranthenes/Pyrenes	ug/Kg dry	41.78				x	C1PY	41	0	27300	543	3070	793	5500	4.83	22.6	13.7	1420	7760	137000	28000	27900	18.8	2220	553	22.2	17.1	4870	5.22	4.12	3.84
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Fluoranthenes/Pyrenes	ug/Kg dry	43.52				x	C2PY	42	0	19600	253	1440	409	2670	3.27	12.2	7.67	856	3680	38500	8270	8220	7.94	1040	292	12	7.78	2180	4.52	2.47	2.76
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Fluoranthenes/Pyrenes	ug/Kg dry	45.72				x	C3PY	43	0	8150	125	712	237	1420	3.24	6.13	0	422	1820	11100	2860	4180	4.9	578	153	21.7	6.45	975	3.65	0	0
243-17-4	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)fluorene	ug/Kg dry	42.03				x	BbF	44	0	2620	67	356	96.3	716	0	6.13	0	144	792	15300	3150	3700	0	253	57.9	0	0	388	0	0	0
205-12-9	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(c)fluorene	ug/Kg dry	42.07				x	BcF	45	0	1280	24.8	185	43.4	353	0	6.13	0	48.8	329	2880	920	1590	0	105	22	0	0	191	0	0	0
3442-78-2	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylpyrene	ug/Kg dry	42.18				x	2MP	46	0	4080	75.2	425	104	699	0	6.13	0	196	984	18300	3550	3820	0	312	75.6	0	0	750	0	0	0
3353-12-6	8270D (SIM) Semi-Volatile Organic Compou0s	4-Methylpyrene	ug/Kg dry	42.55				x	4MP	47	0	2920	68.1	406	96.6	642	0	6.13	0	197	1270	21100	4330	3710	0	343	79.7	0	0	874	0	0	0
2381-21-7	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylpyrene	ug/Kg dry	42.67				x	1MP	48	0	2530	60	336	75.5	507	0	6.13	0	144	837	18800	3490	3100	0	250	56.9	0	0	685	0	0	0
56-55-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Benz(a)anthracene**	ug/Kg dry	45.17	H	x	x	x	BaA	49	0	40900	506	2330	752	5190	0	7.86	0	1440	6340	122000	23400	19800	4.85	1430	366	8.46	3.29	2420	0	0	0
	8270D (SIM) Semi-Volatile Organic Compou0s	**Chrysene/triphenylene**	ug/Kg dry	45.36	H	x	x	x	CH	50	0	38200	518	2530	759	5300	0	8.06	0	1860	7660	109000	22600	23600	8.11	1510	425	9.13	4.8	2430	0	0	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	46.81				x	C1CR	51	0	16500	279	1470	433	2700	0	7.05	4.45	809	4130	58300	10800	10600	6.26	1110	330	18.3	5.5	2660	0	0	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	48.52				x	C2CR	52	0	8140	148	880	336	1630	0	9.68	0	479	2430	19800	4280	5590	0	804	213	0	13	1560	0	0	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	49.55				x	C3CR	53	0	4960	80.7	543	272	985	0	6.13	0	286	1390	6170	1850	3170	0	445	118	0	9.57	792	0	0	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	50				x	C4CR	54	0	2700	47.3	314	177	589	0	6.13	0	245	920	4710	1410	2010	0	273	75.3	0	0	348	0	0	0
205-99-2	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(b)fluoranthene**	ug/Kg dry	49.23	H	x	x	x	BbF	55	0	32700	374	1730	622	4330	0	6.66	0	1920	7980	99900	19500	20200	6.39	1160	324	7.21	3.74	1630	0	0	0
	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(j/k)fluoranthene**	ug/Kg dry	49.29	H	x	x	x	BjF	56	0	28500	384	1840	609	4290	0	5.91	0	1740	8010	106000	22300	19400	5.59	1220	342	6.95	3.51	1620	0	0	0
192-97-2	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(e)pyrene	ug/Kg dry	50.17			x	x	BeP	57	0	24500	350	1570	526	3500	0	6.29	0	1700	8840	105000	22000	20500	6.03	1240	306	7.77	3.77	2380	0	0	0
50-32-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(a)pyrene**	ug/Kg dry	50.34	H	x	x	x	BaP	58	0	36800	579	2170	739	5010	0	7.95	3.73	1970	10100	181000	35800	26400	4.61	1660	422	11.6	3.76	3120	0	0	0
198-55-0	8270D (SIM) Semi-Volatile Organic Compou0s	Perylene	ug/Kg dry	50.61			x	x	PE	59	336	10300	738	979	187	1350	243	139	249	443	2160	33300	6140	5100	248	373	539	846	101	572	681	0	0
193-39-5	8270D (SIM) Semi-Volatile Organic Compou0s	**Indeno(1,2,3-cd)pyrene**	ug/Kg dry	54	H	x	x	x	I123P	60	0	22200	305	1320	447	3140	0	4.94	3.83	1520	7550	91600	19100	17400	5.21	945	252	6.27	3.38	1380	0	0	0
53-70-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Dibenzo(a,h)anthracene**	ug/Kg dry	54.01	H	x	x	x	DBA	61	0	6350	70.8	339	119	821	0	6.13	0	419	1550	22300	4520	3630	0	241	65.1	7.33	0	434	0	0	0
191-24-2	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(g,h,i)perylene**	ug/Kg dry	54.91	H	x	x	x	BGP	62	0	19300	301	1230	409	2780	0	4.98	3.75	1430	7480	93700	19400	17200	4.68	957	240	6.94	3.08	1790	0	0	0
191-07-1	8270D (SIM) Semi-Volatile Organic Compou0s	Coronene	ug/Kg dry	61.34				x	COR	63	15.8	4700	88.5	326	107	713	0	6.13	0	563	2270	30100	6130	5180	0	258	63.1	0	0	403	0	0	0
526-73-8	8270D (SIM) Semi-Volatile Organic Compou0s	1,2,3-Trimethylbenzene	ug/Kg dry							64	6.26	44.8	7.29	59.7	5.61	48.8	4.67	4.36	4.85	49.2	606	208	185	239	4.39	33.5	5.13	7.33	4.34	5.77	6.06	4.84	4.89
95-63-6	8270D (SIM) Semi-Volatile Organic Compou0s	1,2,4-Trimethylbenzene	ug/Kg dry							65	6.26	99	6.81	231	9.86	66.6	4.67	6.13	4.86	84.1	726	513	390	633	8.1	94.1	9.59	7.33	2.93	19.9	6.06	4.84	4.89
108-67-8	8270D (SIM) Semi-Volatile Organic Compou0s	1,3,5-Trimethylbenzene	ug/Kg dry							66	6.26	41.3	7.55	52.9	3.53	26.1	3.18	25.6	6.84	35.5	198	177	133	250	8.1	17	7.71	7.33	5.19	8.53	6.06	4.84	4.89
	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methyldibenzothiophene	ug/Kg dry	36.76						67	6.26	356	8.77	93.7	15.4	131	4.67	6.13	6.84	21.4	60	701	235	797	8.1	32.9	6.15	7.33	5.19	7.09	6.06	4.84	4.89
	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylphenanthrene	ug/Kg dry	37.24						68	6.26	3900	56.1	526	76.2	516	4.67	4.38	4.61	116	440	3930	1220	4490	8.1	121	30.2	7.33	6.32	385	6.06	4.84	4.89
	8270D (SIM) Semi-Volatile Organic Compou0s	2,3,5-Trimethylnaphthene	ug/Kg dry	30.44						69	6.26	234	5.86	158	9.94	79.5	4.67	6.13	6.84	31.1	36.6	96.4	109	410	8.1	18.5	7.71	7.33	5.19	35.9	6.06	4.84	4.89
581-42-0	8270D (SIM) Semi-Volatile Organic Compou0s	2,6-Dimethylnaphthalene	ug/Kg dry	27.07						70	6.26	849	19.7	612	17.2	176	4.67	6.13	6.84	74.2	325	1280	727	9440	4.39	50.5	17.9	6.43	3.25	82.6	6.06	4.84	4.89
	8270D (SIM) Semi-Volatile Organic Compou0s	2/3-Methyldibenzothiophene	ug/Kg dry	36.31						71	6.26	1210	21.7	294	35.4	309	4.67	6.13	6.84	41.7	159	1610	520	2280	8.1	57.8	13.1	7.33	5.19	28.3	6.06	4.84	4.89
	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylanthracene	ug/Kg dry	36.96						72	6.26	3540	42.8	285	69.1	442	4.67	6.13	6.84	95.9	427	4660	1300	2430	8.1	150	34.9	7.33	5.19	373	6.06	4.84	4.89
	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylphenanthrene	ug/Kg dry	36.81						73	6.26	7490	109	898	154	508	4.67	6.13	6.84	192	616	3380	1080	7210	8.1	182	46.7	7.33	3.69	709	6.06	4.84	4.89
	8270D (SIM) Semi-Volatile Organic Compou0s	3-Methylphenanthrene	ug/Kg dry	36.69						74	6.26	6060	93.4	787	141	511	4.67	6.13	6.84	150	591	3270	1260	6780	4.47	172	59.3	7.33	5.19	691	6.06	4.84	4.89
	8270D (SIM) Semi-Volatile Organic Compou0s	4/9-Methylphenanthrene	ug/Kg dry	37.14						75	6.26	5290	91.5	775	134	629	4.67	6.13	6.84	182	761	7030	2160	6570	5.86	248	78	3.75	3.09	978	6.06	4.84	4.89
	8270D (SIM) Semi-Volatile Organic Compou0s	4-Methyldibenzothiophene	ug/Kg dry	36.01						76	6.26	896	24.1	338	35.1	454	4.67	6.13	6.84	46.9	181	1990	650	2340	8.1	86.1	16.5	7.33	5.19	39.5	6.06	4.84	4.89
71-43-2	8270D (SIM) Semi-Volatile Organic Compou0s	Benzene	ug/Kg dry							77	6.26	316	28.1	546	73.9	1070	4.67	6.13	63.8	392	690	2180	1520	1980	8.1	468	7.71	7.33	5.19	53	6.06	4.84	4.89

Attachment B. Complete Sediment Data Set
Amesbury Former MGP
Amesbury, Massachusetts

												River	Upstream	Upstream	Upstream	Upstream	Upstream	River	River	River	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Mudflat	River	River	River	River	River	River	River
										Sample No.		F200019-07	F200037-01	F200037-02	F200033-06	F200033-02	F200033-03	F200033-04	F200036-11	F200036-10	F200036-03	F200036-04	F200036-01	F200036-02	F200033-01	F200033-05	F200036-09	F200035-05	F200035-04	F200035-02	F200035-03	F200035-01	F200036-07	F200036-08
										Sample Date:		03/16/2020	7/6/2020	7/6/2020	7/6/2020	7/6/2020	7/6/2020	7/6/2020	7/8/2020	7/8/2020	7/8/2020	7/8/2020	7/8/2020	7/8/2020	7/6/2020	7/6/2020	7/8/2020	7/7/2020	7/7/2020	7/7/2020	7/7/2020	7/7/2020	7/8/2020	7/8/2020
										Sample Time:		12:05	15:35	15:35	15:21	15:21	15:21	15:21	16:00	16:00	16:00	16:00	16:00	16:00	15:21	15:21	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00
										ClieSam		SS786-S2	SS787-S1	SS787-S2	SS788-S1	SS789-S1	SS790-S1	SS790-S2	SS791-S1	SS792-S1	SS793-S1	SS793-S2	SS794-S1	SS794-S2	SS795-S2	SS796-S1	SS797-S1	SS798-S2	SS799-S2	SS800-S1	SS800-S2	SS801-S2	SS802-S1	SS803-S1
										Depths:		3.6-3.8	0-0.3	3.1-3.3	0.6-0.9	0-0.5	1.6-1.8	4.3-4.5	4-5	4-5	0.4-0.6	2-2.2	0.8-1	1.8-2	2-2.2	0-0.5	0-1	1.8-2	1.4-1.6	1.4-1.6	3.3-3.5	4.4-4.6	6-6.2	6-6.2
										RAH																								
										%solids		60	35	64	56	79	50	76	61	59	13	19	24	20	35	51	63	56	53	74	64	69	82	82
CAS Number	Method Name	Analyte	Units	RT		PAH17	PAH34	PAH51	Abbrev	PAH #		6.26						5								8.1			7.33	5.19		6.06	4.84	4.89
11095-43-5	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)thiophene	ug/Kg dry							78		**6.26**	322	**3.49**	**13**	**4.87**	**18.7**	**4.67**	**6.13**	**6.84**	**42.8**	**894**	**3630**	**1860**	**6730**	**8.1**	**49.8**	**7.71**	**7.33**	**5.19**	**3.3**	**6.06**	**4.84**	**4.89**
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzene	ug/Kg dry							79		**3.4**	341	**53.6**	**183**	**22.1**	**298**	**11.7**	**36.7**	**76.4**	**259**	**605**	**1420**	**1060**	**958**	**52.8**	**254**	**68.9**	**51.8**	**39.6**	**111**	**17.9**	**4.84**	**4.89**
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Decalins	ug/Kg dry							80		**6.26**	339	**16.7**	**9060**	**222**	**13300**	**4.67**	**6.13**	**6.84**	**31.1**	**129**	**929**	**441**	**532**	**8.1**	**161**	**73.6**	**7.33**	**5.19**	**36.5**	**6.06**	**4.13**	**4.89**
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzenes	ug/Kg dry							81		**4.31**	150	**107**	**344**	**24**	**487**	**8.94**	**21.4**	**24.4**	**294**	**862**	**1430**	**1220**	**1860**	**37.1**	**564**	**43.8**	**40.7**	**17.9**	**66.3**	**16**	**2.66**	**4.89**
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Decalins	ug/Kg dry							82		**6.26**	328	**25.1**	**1940**	**74.1**	**3810**	**4.67**	**6.13**	**6.84**	**31.1**	**160**	**1570**	**515**	**1530**	**8.1**	**321**	**66.1**	**7.33**	**5.19**	**70.3**	**6.06**	**4.84**	**4.89**
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzenes	ug/Kg dry							83		**6.26**	121	**16.1**	**239**	**15.1**	**121**	**2.36**	**20.2**	**14.6**	**165**	**827**	**547**	**512**	**678**	**11**	**121**	**15.2**	**6.23**	**5.86**	**24.5**	**4.7**	**5.16**	**4.89**
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Decalins	ug/Kg dry							84		**6.26**	248	**26.3**	**625**	**46.1**	**1320**	**4.67**	**6.13**	**6.84**	**31.1**	**172**	**2480**	**478**	**1820**	**8.1**	**404**	**53.8**	**7.33**	**5.19**	**55.9**	**6.06**	**4.84**	**4.89**
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzenes	ug/Kg dry							85		**6.26**	121	**17.9**	**2690**	**30.9**	**184**	**3.81**	**22.9**	**25**	**222**	**614**	**308**	**344**	**1020**	**17.5**	**50.1**	**15.8**	**8.32**	**18.5**	**25.5**	**6.96**	**5.22**	**4.89**
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Decalins	ug/Kg dry							86		**6.26**	290	**33.3**	**954**	**66.2**	**1920**	**4.67**	**6.13**	**6.84**	**31.1**	**312**	**4030**	**555**	**3130**	**8.1**	**728**	**79.5**	**7.33**	**5.19**	**87.4**	**6.06**	**4.84**	**4.89**
	8270D (SIM) Semi-Volatile Organic Compou0s	C5-Benzenes	ug/Kg dry							87		**6.26**	91.1	**11**	**1900**	**32.5**	**308**	**4.67**	**7.83**	**12.3**	**173**	**187**	**142**	**175**	**354**	**7.02**	**33.1**	**10.6**	**7.33**	**5.19**	**22.4**	**6.06**	**3.85**	**4.89**
86-74-8	8270D (SIM) Semi-Volatile Organic Compou0s	Carbazole	ug/Kg dry	35.61						88		**6.26**	10800	**34.3**	**141**	**71.9**	**433**	**4.67**	**6.13**	**6.84**	**180**	**468**	**1550**	**753**	**2220**	**8.1**	**94**	**17.5**	**7.33**	**5.19**	**24.3**	**6.06**	**4.84**	**4.89**
493-01-6	8270D (SIM) Semi-Volatile Organic Compou0s	cis-Decalin	ug/Kg dry							89		**6.26**	31.1	**6.03**	**1110**	**23.7**	**1510**	**4.67**	**6.13**	**6.84**	**31.1**	**12.6**	**92.8**	**109**	**34.2**	**8.1**	**11.8**	**5.2**	**7.33**	**5.19**	**5.88**	**6.06**	**4.84**	**4.89**
100-41-4	8270D (SIM) Semi-Volatile Organic Compou0s	Ethylbenzene	ug/Kg dry							90		**6.26**	63.1	**4.65**	**86.9**	**8.38**	**77**	**4.67**	**9.01**	**13.3**	**131**	**307**	**851**	**875**	**2300**	**8.1**	**444**	**6.97**	**7.33**	**3.17**	**15.6**	**6.06**	**4.84**	**4.89**
98-82-8	8270D (SIM) Semi-Volatile Organic Compou0s	Isopropylbenzene	ug/Kg dry							91		**6.26**	14.1	**6.03**	**67.3**	**4.59**	**41.1**	**4.67**	**6.13**	**6.84**	**31.1**	**36.6**	**92.8**	**109**	**89**	**8.1**	**80.8**	**7.71**	**7.33**	**5.19**	**5.88**	**6.06**	**4.84**	**4.89**
	8270D (SIM) Semi-Volatile Organic Compou0s	m,p-Xylene	ug/Kg dry							92		**3.26**	348	**293**	**931**	**54.7**	**1350**	**21**	**45.7**	**49.3**	**697**	**2050**	**3210**	**2580**	**3520**	**88.3**	**1170**	**112**	**102**	**39.1**	**165**	**31**	**4.84**	**4.89**
108-87-2	8270D (SIM) Semi-Volatile Organic Compou0s	Methylcyclohexane	ug/Kg dry							93		**6.26**	124	**22.4**	**179**	**13.6**	**32.3**	**4.67**	**6.13**	**6.84**	**52.2**	**131**	**177**	**152**	**126**	**8.1**	**17.2**	**7.71**	**7.33**	**4.59**	**5.44**	**6.06**	**4.84**	**4.89**
104-51-8	8270D (SIM) Semi-Volatile Organic Compou0s	n-Butylbenzene	ug/Kg dry							94		**6.26**	56.8	**3.98**	**1090**	**18.8**	**186**	**4.67**	**22**	**36.6**	**735**	**284**	**149**	**149**	**61.4**	**6.47**	**35.1**	**9.62**	**4.99**	**4.97**	**9.12**	**4.29**	**4.84**	**4.89**
103-65-1	8270D (SIM) Semi-Volatile Organic Compou0s	n-Propylbenzene	ug/Kg dry							95		**6.26**	34.8	**6.03**	**205**	**6.04**	**63.6**	**4.67**	**5.52**	**11.1**	**250**	**152**	**111**	**106**	**91.2**	**8.1**	**110**	**4.05**	**7.33**	**5.19**	**6.85**	**6.06**	**4.84**	**4.89**
95-47-6	8270D (SIM) Semi-Volatile Organic Compou0s	o-Xylene	ug/Kg dry							96		**6.26**	46.4	**4.84**	**39.3**	**6.72**	**51.4**	**4.67**	**3.77**	**4.82**	**47.9**	**312**	**431**	**322**	**345**	**4.24**	**229**	**6.95**	**4.68**	**3.59**	**13.3**	**6.06**	**4.84**	**4.89**
99-87-6	8270D (SIM) Semi-Volatile Organic Compou0s	p-Isopropyltoluene	ug/Kg dry							97		**6.26**	38.7	**23.1**	**50.6**	**4.22**	**55.3**	**2.57**	**26.8**	**31.4**	**31.9**	**227**	**114**	**153**	**211**	**19.4**	**17.9**	**9.42**	**5.94**	**50.8**	**12.1**	**3.38**	**4.84**	**4.89**
135-98-8	8270D (SIM) Semi-Volatile Organic Compou0s	sec-Butylbenzene	ug/Kg dry							98		**6.26**	27.7	**6.03**	**1290**	**7.16**	**37.4**	**4.67**	**6.13**	**6.84**	**31.1**	**35**	**92.8**	**109**	**61.4**	**8.1**	**8.9**	**7.71**	**7.33**	**5.19**	**5.88**	**6.06**	**4.84**	**4.89**
100-42-5	8270D (SIM) Semi-Volatile Organic Compou0s	Styrene	ug/Kg dry							99		**6.26**	209	**8.68**	**284**	**47.8**	**509**	**19.9**	**22.6**	**35.4**	**206**	**427**	**3820**	**1280**	**651**	**32**	**64.9**	**40.6**	**12.4**	**13.4**	**117**	**33.2**	**7.52**	**5.82**
98-06-6	8270D (SIM) Semi-Volatile Organic Compou0s	t-Butylbenzene	ug/Kg dry							100		**6.26**	27.7	**6.03**	**54.4**	**4.59**	**37.4**	**4.67**	**6.13**	**6.84**	**31.1**	**20.7**	**92.8**	**109**	**61.4**	**8.1**	**8.9**	**7.71**	**7.33**	**5.19**	**5.88**	**6.06**	**4.84**	**4.89**
108-88-3	8270D (SIM) Semi-Volatile Organic Compou0s	Toluene	ug/Kg dry							101		**4.22**	770	**129**	**426**	**48.2**	**672**	**28.1**	**83.2**	**174**	**623**	**1370**	**3160**	**2370**	**2210**	**120**	**572**	**160**	**120**	**93.3**	**246**	**39.3**	**4.09**	**3.6**
493-02-7	8270D (SIM) Semi-Volatile Organic Compou0s	trans-Decalin	ug/Kg dry							102		**6.26**	27.7	**7.05**	**11.6**	**4.59**	**9260**	**4.67**	**6.13**	**6.84**	**34.9**	**269**	**318**	**134**	**121**	**8.1**	**75.1**	**35.4**	**7.33**	**5.19**	**11.8**	**6.06**	**4.84**	**4.89**
3891-98-3	Saturated Hydrocarbons by GC/FID	2,6,10-trimethyldodecane (1380)	mg/Kg dry							103		**6.26**	314	**39.4**	**1420**	**47.3**	**2600**	**4.67**	**6.13**	**7.07**	**59.2**	**175**	**1720**	**350**	**2200**	**10.5**	**43.6**	**35.7**	**6.82**	**6.5**	**93.1**	**4.45**	**4.84**	**4.89**
3892-00-0	Saturated Hydrocarbons by GC/FID	2,6,10-trimethylpeadecane (1650)	mg/Kg dry							104		**11.9**	489	**64.8**	**2180**	**69.5**	**3200**	**6.64**	**14.6**	**17**	**66.4**	**262**	**1210**	**415**	**4750**	**10.3**	**166**	**75.8**	**11.9**	**8.18**	**238**	**11.3**	**8.45**	**6.47**
3891-99-4	Saturated Hydrocarbons by GC/FID	2,6,10-trimethyltridecane (1470)	mg/Kg dry							105		**4.02**	464	**63.9**	**2010**	**76.3**	**3640**	**6.47**	**19.8**	**18.8**	**166**	**383**	**1900**	**559**	**3500**	**40.9**	**308**	**90.2**	**25.9**	**19.7**	**246**	**14.6**	**6.88**	**5.43**
	Classical Chemistry	Black Carbon (Average)	mg/kg							106																								
	Saturated Hydrocarbons by GC/FID	C-10	mg/Kg dry							107																								
	Saturated Hydrocarbons by GC/FID	C-11	mg/Kg dry							108																								
	Saturated Hydrocarbons by GC/FID	C-12	mg/Kg dry							109																								
	Saturated Hydrocarbons by GC/FID	C-13	mg/Kg dry							110																								
	Saturated Hydrocarbons by GC/FID	C-14	mg/Kg dry							111																								
	Saturated Hydrocarbons by GC/FID	C-15	mg/Kg dry							112																								
	Saturated Hydrocarbons by GC/FID	C-16	mg/Kg dry							113																								
	Saturated Hydrocarbons by GC/FID	C-17	mg/Kg dry							114		**94.3**	479	**58.6**	**473**	**143**	**322**	**40.7**	**88.2**	**101**	**671**	**879**	**1220**	**1140**	**916**	**223**	**275**	**226**	**129**	**134**	**350**	**68.1**	**42**	**32.4**
	Saturated Hydrocarbons by GC/FID	C-18	mg/Kg dry							115		**38.5**	479	**68.7**	**527**	**124**	**264**	**36.3**	**92.3**	**101**	**533**	**813**	**1100**	**1180**	**910**	**341**	**304**	**191**	**124**	**125**	**214**	**67.6**	**48.7**	**36.3**
	Saturated Hydrocarbons by GC/FID	C-19	mg/Kg dry							116																								
	Saturated Hydrocarbons by GC/FID	C-21	mg/Kg dry							117																								
	Saturated Hydrocarbons by GC/FID	C-22	mg/Kg dry							118																								
	Saturated Hydrocarbons by GC/FID	C-23	mg/Kg dry							119																								
	Saturated Hydrocarbons by GC/FID	C-24	mg/Kg dry							120																								
	Saturated Hydrocarbons by GC/FID	C-25	mg/Kg dry							121																								
	Saturated Hydrocarbons by GC/FID	C-26	mg/Kg dry							122																								
	Saturated Hydrocarbons by GC/FID	C-27	mg/Kg dry							123																								
	Saturated Hydrocarbons by GC/FID	C-28	mg/Kg dry							124																								
	Saturated Hydrocarbons by GC/FID	C-29	mg/Kg dry							125																								
	Saturated Hydrocarbons by GC/FID	C-30	mg/Kg dry							126																								
	Saturated Hydrocarbons by GC/FID	C-31	mg/Kg dry							127																								
	Saturated Hydrocarbons by GC/FID	C-32	mg/Kg dry							128																								
	Saturated Hydrocarbons by GC/FID	C-33	mg/Kg dry							129																								
	Saturated Hydrocarbons by GC/FID	C-34	mg/Kg dry							130																								
	Saturated Hydrocarbons by GC/FID	C-35	mg/Kg dry							131																								
	Saturated Hydrocarbons by GC/FID	C-36	mg/Kg dry							132																								
	Saturated Hydrocarbons by GC/FID	C-37	mg/Kg dry							133																								
	Saturated Hydrocarbons by GC/FID	C-38	mg/Kg dry							134																								
	Saturated Hydrocarbons by GC/FID	C-39	mg/Kg dry							135																								
	Saturated Hydrocarbons by GC/FID	C-40	mg/Kg dry							136																								
	Saturated Hydrocarbons by GC/FID	C-8	mg/Kg dry							137																								
	Saturated Hydrocarbons by GC/FID	C-9	mg/Kg dry							138																								
638-36-8	Saturated Hydrocarbons by GC/FID	Phytane	mg/Kg dry	34.53						141		**49.4**	1090	**144**	**4780**	**191**	**6700**	**32.3**	**57.3**	**68**	**268**	**949**	**2720**	**1340**	**14700**	**67**	**595**	**228**	**65**	**35.6**	**414**	**50.9**	**38.7**	**28.1**
1921-70-6	Saturated Hydrocarbons by GC/FID	Pristane	mg/Kg dry	32.65						142		**29.5**	1190	**139**	**6490**	**197**	**9550**	**21.5**	**36.6**	**42.4**	**205**	**605**	**2360**	**1050**	**13100**	**40.9**	**454**	**186**	**39.1**	**33.8**	**474**	**31.4**	**24.1**	**17.9**
TOC	Classical Chemistry	Total Organic Carbon (Average)	mg/kg							145		**36100**	41800	**247000**	**11000**	**189**	**55000**	**17100**	**45500**	**29200**	**233000**	**233000**	**274000**	**297000**	**130000**	**61800**	**34200**	**51800**	**26600**	**23000**	**26600**	**18600**	**445**	**94.7**
	TPAH16											0	576340	6516.2	31063	9810.6	60763	20.66	124.54	40.82	21469	91618	1186170	279180	1093300	126.17	19424	4201.3	114.61	65.8	28535	3.26	9.58	8.14
	TPAH34											336	736380	10054.6	57259	14418	94129	295.15	662.57	488.33	29646.5	131997	1628880	381021	1331660	624.87	30659.1	7572.3	1127.36	526.57	49939.88	762.32	43.98	33.2
	TPAH51											351.8	813199	11326.3	65872.3	16264.2	107991.9	325.73	1711.47	894.81	33234.7	149505	1824904	427772	1512171	861.03	35513.7	8797.4	1191.16	1426.58	57424.98	820.31	64.08	46.13
	LPAH											0	156230	1622.6	7699	2338.7	8231	12.85	47.78	32.66	3312	15458	125210	42910	819070	43.32	3457.8	546	23.12	28.29	5899	3.26	12.91	11.59
	HPAH											0	423150	4926.8	23479	7506	52661	7.81	83.49	14.79	18319	77560	1069600	239920	287330	86.94	16043	3686.1	95.59	43.25	22854	0	0	0

(does not include source area samples collected in 2017)

Attachment B. Complete Sediment Data Set
Amesbury Former MGP
Amesbury, Massachusetts

											Downstream	Downstream	Downstream	Downstream	Downstream	Downstream	Downstream	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	River	River	River	River	River	River	River
										Sample No.	F200035-06	F200035-07	F200035-12	F200035-08	F200035-09	F200035-10	F200035-11	F200036-05	F200036-06	F220065-01	F220065-02	F220065-03	F220065-04	F230018-03	F230018-04	F230018-05	F230018-06	F230021-01	F230021-02	F230018-01	F230019-08	F230019-09	F230018-02	F230019-01
										Sample Date:	7/7/2020	7/7/2020	7/7/2020	7/7/2020	7/7/2020	7/7/2020	7/7/2020	7/8/2020	7/8/2020	10/13/2022	10/13/2022	10/13/2022	10/13/2022	06/20/2023	06/20/2023	06/20/2023	06/20/2023	06/22/2023	06/22/2023	06/20/2023	06/22/2023	06/22/2023	06/20/2023	06/22/2023
										Sample Time:	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00	17:57	17:57	17:57	17:57	18:37	18:37	18:37	18:37	20:09	20:09	18:37	20:09	20:09	18:37	20:09
										ClieSam	SS804-S1	SS804-S2	SS804-S2D	SS804-S3	SS805-S1	SS805-S3	SS806-S2	SS807-S1	SS807-S2	SS808-S1	SS808-S2	SS809-S1	SS809-S2	810-S1	810-S2	811-S1	811-S2	815-S1	815-S3	817-S1	818-S1	818-S2	819-S1	820-S1
										Depths:	0.1-0.4	3.8-4	3.8-4	7.1-7.3	0-1	3-3.2	0.8-1	0.4-0.6	1.8-2	0.8-1	1.8-2	0.8-1	1.8-2	0.8-1	1.8-2	0.8-1	1.8-2	0-1	4-5	0-1	0-1	5-6	0-1	0-1
										RAH																								
										%solids	63	51	NT	84	82	4.07	4.24	45	63	21	26	27	41	86	73	74	70	65	51	76	49	64	73	40
CAS Number	Method Name	Analyte	Units	RT		PAH17	PAH34	PAH51	Abbrev	PAH #																									
		Max RL for ND PAHs=								1																									
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzo(b)thiophenes	ug/Kg dry	17					C1BT	2	12.8	85.5	85.5	4.33	6.72	3.24	2.77	41.7	26.2	219	11.8	83	12.9	7.42	5.6	7.72	3.68	16.4	12.5	428	15.1	6.56	15	32.6
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzo(b)thiophenes	ug/Kg dry	18					C2BT	3	13.7	89.4	89.4	3.95	5.3	2.36	0	14.6	20.3	505	111	247	9.56	10.1	5.52	6.88	3.13	20.9	13.6	716	25.7	4.02	16.6	47.9
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzo(b)thiophenes	ug/Kg dry	19					C3BT	4	5.61	35.9	35.9	2.15	3.07	3.21	0	9.14	10.6	277	59	94.4	9.56	9.61	5.05	8.07	2.57	14.3	7.77	465	18.9	3.57	9.95	24
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzo(b)thiophenes	ug/Kg dry	20					C4BT	5	7.65	82.6	82.6	3.98	3.49	0	0	7.8	8	34.9	9.93	24.2	17.8	5.26	0	3.32	0	9.2	4.64	146	21.3	0	6.16	9.78
91-20-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Naphthalene**	ug/Kg dry	21.86	L	x	x	x	NA	6	20	98.4	98.4	11.1	17.8	0	2.18	126	153	1530	9.06	2290	37.4	123	37.8	75.5	6.92	67.8	133	6370	54.3	0	77.6	79.6
91-57-6	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylnaphthalene	ug/Kg dry	24.57	L	x		x	2MN	7	14.2	98.7	98.7	9.18	13.8	0	0	122	151	506	0	618	22.2	28	13.7	52.1	7.4	40.1	116	2240	43.6	3.66	43.1	40.2
90-12-0	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylnaphthalene	ug/Kg dry	25				x	1MN	8	10.3	65.9	65.9	5.48	9.2	0	2.2	99.8	124	214	0	394	15.2	15.3	10.1	43.3	7.18	32.3	58.5	6210	22.4	3.1	26.6	30
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Naphthalenes	ug/Kg dry	24.57			x	x	C1N	9	15.1	99.5	99.5	9.16	13.7	2.79	2.75	132	164	450	8.33	627	23.9	28.1	15.8	60.9	9.27	47.3	114	5280	43.6	4.99	44.9	46.2
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Naphthalenes	ug/Kg dry	27.02			x	x	C2N	10	44.5	450	450	14.5	26.3	4.04	5.15	180	256	698	48.4	1050	112	58.1	32.7	91	20.4	107	167	7720	116	16	85	190
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Naphthalenes	ug/Kg dry	29.76			x	x	C3N	11	30.8	288	288	11.7	29.8	3.27	3.51	143	214	459	26.3	662	101	96.7	40.6	85.8	12.2	83.2	132	2750	216	8.65	62.1	121
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Naphthalenes	ug/Kg dry	32.52			x	x	C4N	12	19.2	316	316	10.5	30.2	0	0	79.4	111	445	57.5	373	168	64.3	24.8	49.7	6.72	56.5	103	981	246	0	41.5	77.8
92-52-4	8270D (SIM) Semi-Volatile Organic Compou0s	Biphenyl	ug/Kg dry	26.46					BP	13	14.4	216	216	6.33	8.36	3.45	3.54	36.8	46.5	140	15.6	205	12.5	12.3	7.04	15.9	5.01	20.4	46	392	26.9	5.88	17.5	32.3
208-96-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Acenaphthylene**	ug/Kg dry	28.16	L	x	x	x	ACE	14	113	346	346	56.8	54.4	0	0	157	185	766	15.6	540	81.3	258	65.7	212	14.1	198	165	2400	156	0	254	254
83-32-9	8270D (SIM) Semi-Volatile Organic Compou0s	**Acenaphthene**	ug/Kg dry	28.89	L	x	x	x	ACY	15	19.6	62.4	62.4	3.82	7.54	0	0	37.1	132	270	15.6	212	8.93	25.6	11.2	71.5	0	94.9	74.5	25700	22.9	0	93.7	154
132-64-9	8270D (SIM) Semi-Volatile Organic Compou0s	Dibenzofuran	ug/Kg dry	29.54				x	DBF	16	12.6	51.3	51.3	2.91	6.82	0	0	42.1	81	182	15.6	315	21.3	53.1	20.2	56.5	0	55.2	46.7	724	23	0	37.5	57.5
86-73-7	8270D (SIM) Semi-Volatile Organic Compou0s	**Fluorene**	ug/Kg dry	30.91	L	x	x	x	FLE	17	35.1	115	115	7.72	15.3	0	0	41.6	154	375	9.08	465	45.6	65.2	24.9	66.3	2.97	103	103	6180	38	0	66.1	120
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Fluorenes	ug/Kg dry	33.14			x	x	C1FL	18	20.4	130	130	12.8	17.5	2.41	3.15	44.9	73.2	362	14.3	378	80.2	59.5	20.5	45.1	5.67	67.8	109	1810	74.9	0	45.1	75.5
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Fluorenes	ug/Kg dry	35.22			x	x	C2FL	19	6.38	235	235	18.2	31.4	2.8	4.27	114	153	547	29.7	533	180	84.7	37.9	72.7	10.2	68	169	1340	163	0	36	39.4
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Fluorenes	ug/Kg dry	38.01			x	x	C3FL	20	19.1	280	280	22	42	0	0	151	211	508	25.9	594	146	155	65	135	10.8	128	124	903	183	0	94.6	227
132-65-0	8270D (SIM) Semi-Volatile Organic Compou0s	Dibenzothiophene	ug/Kg dry	34.23				x	DBT	21	23.6	71.3	71.3	5.07	10.8	0	0	47.4	122	226	15.6	242	21.9	86.1	26.9	59.3	3.4	79.9	35.9	2360	44.8	0	62.8	104
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Dibenzothiophenes	ug/Kg dry	36.43				x	C1DBT	22	29.7	165	165	9.33	20.5	0	0	72.1	104	305	15.6	337	65.7	95.3	30.9	75.1	7.97	93.6	57.3	2120	105	0	56.2	100
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Dibenzothiophenes	ug/Kg dry	37.7				x	C2DBT	23	42.7	298	298	21.4	38.5	2.06	2.51	71.4	98.8	369	15.6	325	113	86.1	30.1	81.8	8.83	106	82.8	1600	180	0	71.7	106
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Dibenzothiophenes	ug/Kg dry	39.5				x	C3DBT	24	29.6	357	357	23.7	36	0	0	40.4	50.8	282	15.6	182	80.3	45.9	17	48.9	5.11	64.6	60.6	846	173	0	63.6	81.6
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Dibenzothiophenes	ug/Kg dry	41.65				x	C4DBT	25	20.3	217	217	13.1	22	0	0	17.5	29.5	197	15.6	115	81.2	24.1	8.01	24.2	0	42.7	39.3	397	106	0	43.5	54.9
85-01-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Phenanthrene**	ug/Kg dry	34.72	L	x	x	x	PHE	26	256	608	608	45	111	2.52	2.71	594	873	1510	17.7	2150	119	1610	508	982	30.6	1060	600	27700	234	4.42	545	1420
120-12-7	8270D (SIM) Semi-Volatile Organic Compou0s	**Anthracene**	ug/Kg dry	34.91	L	x	x	x	ANT	27	125	346	346	32.4	59	0	0	194	311	983	10.2	772	209	573	142	323	8.24	494	322	7660	168	0	338	589
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Phenanthrenes/Anthracenes	ug/Kg dry	36.96				x	C1PH	28	189	717	717	55.1	123	3.77	3.36	477	664	2290	26.2	1730	644	949	292	541	32.6	667	776	9690	397	6.25	336	788
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Phenanthrenes/Anthracenes	ug/Kg dry	38.97			x	x	C2PH	29	107	674	674	74.4	147	3.43	3.91	397	497	2100	23.5	15.1	732	536	169	351	26.7	403	691	4060	415	0	221	447
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Phenanthrenes/Anthracenes	ug/Kg dry	40.8			x	x	C3PH	30	56.9	508	508	54.6	98.2	3.85	2.92	144	212	1070	25.4	614	362	201	67	148	11.3	170	352	1570	264	0	111	220
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Phenanthrenes/Anthracenes	ug/Kg dry	41.72			x	x	C4PH	31	27.6	308	308	29	50.5	6.29	0	56.7	96.8	489	30.6	250	153	60.3	20.1	52.1	4.26	70.2	175	910	130	11.6	44.2	105
483-65-8	8270D (SIM) Semi-Volatile Organic Compou0s	Retene	ug/Kg dry	41.72				x	RET	32	20.5	225	225	7.35	12.1	16.2	3.61	23.3	100	386	73.1	129	152	23.4	4.5	20.1	0	40.3	150	2040	31	52.7	19.2	157
239-35-0	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)naphtho(2,1-d)thiophene	ug/Kg dry	44.24					BNT	33	68.1	129	129	18.8	30.5	0	0	119	160	403	0	338	91.8	284	71.1	149	5.35	243	98.6	1470	75.2	0	142	372
	8270D (SIM) Semi-Volatile Organic Compou0s	C0-Benzonaphthothiophenes	ug/Kg dry	44.24					C0BNT	34	125	259	259	35.9	58.5	0	0	204	281	867	0	614	264	568	139	293	9.23	442	210	2780	144	0	259	640
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzonaphthothiophenes	ug/Kg dry	45.63					C1BNT	35	76.5	261	261	38.4	51.3	0	0	137	196	746	12.8	534	242	204	63.7	162	10.7	238	164	1520	140	0	142	271
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzonaphthothiophenes	ug/Kg dry	47.14					C2BNT	36	70.4	298	298	28.8	39.6	0	0	97.8	134	552	0	464	170	99.3	41.9	103	10.6	165	124	1020	155	0	148	216
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzonaphthothiophenes	ug/Kg dry	49.02					C3BNT	37	66.1	264	264	18	22.8	0	0	53.6	75.2	316	0	305	85.7	57.9	20.3	56.5	7.7	138	76.2	681	118	0	148	193
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzonaphthothiophenes	ug/Kg dry	51.51					C4BNT	38	41.5	156	156	6.84	12.9	0	0	21.9	31.6	108	0	137	30.9	12.3	0	14.8	0	75.8	23.8	251	56.7	0	91.8	111
206-44-0	8270D (SIM) Semi-Volatile Organic Compou0s	**Fluoranthene**	ug/Kg dry	39.51	H	x	x	x	FLA	39	831	1130	1130	87.9	322	0	2.21	1240	1670	4510	36.8	3460	1120	4540	1300	2000	42	2700	985	21800	492	4.95	1730	4480
129-00-0	8270D (SIM) Semi-Volatile Organic Compou0s	**Pyrene**	ug/Kg dry	40.39	H	x	x	x	PYR	40	718	1410	1410	182	363	0	2.71	1430	1780	4620	33.6	3330	980	4010	1110	1910	52.7	2400	2010	27700	926	3.41	1540	3810
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Fluoranthenes/Pyrenes	ug/Kg dry	41.78			x	x	C1PY	41	339	949	949	200	281	3.6	4.12	616	773	4280	30.9	1850	1550	1410	379	831	46.3	1210	1740	11000	601	7.55	734	1500
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Fluoranthenes/Pyrenes	ug/Kg dry	43.52				x	C2PY	42	209	563	563	107	153	3.31	0	430	608	2300	11.9	1360	876	985	267	567	33.1	714	771	3630	326	0	411	1040
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Fluoranthenes/Pyrenes	ug/Kg dry	45.72				x	C3PY	43	90	313	313	53	78.9	0	0	259	368	1210	0	893	426	377	116	240	19.6	304	330	1420	185	0	158	364
243-17-4	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)fluorene	ug/Kg dry	42.03				x	BbF	44	52.4	95.5	95.5	16.9	28.1	0	0	41.2	57.8	561	0	206	258	112	30.9	67.4	2.69	153	192	1340	68.6	0	91.1	194
205-12-9	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(c)fluorene	ug/Kg dry	42.07				x	BcF	45	19.1	38	38	8.88	11.8	0	0	24.4	33	259	0	109	86.9	44	17	33.9	0	72.1	89.5	616	25.5	0	42.8	89
3442-78-2	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylpyrene	ug/Kg dry	42.18				x	2MP	46	43	137	137	29	42.6	0	0	93.7	115	518	0	246	173	229	58.6	126	7.24	162	245	1460	84.6	0	97.1	202
3353-12-6	8270D (SIM) Semi-Volatile Organic Compou0s	4-Methylpyrene	ug/Kg dry	42.55				x	4MP	47	36.9	157	157	30.9	42.2	0	0	84.3	107	499	0	235	137	163	42.9	103	9.03	122	237	1270	90.4	0	83.2	163
2381-21-7	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylpyrene	ug/Kg dry	42.67				x	1MP	48	27.4	108	108	24.1	31.6	0	0	69.6	80.2	355	0	159	109	128	32.9	79.4	5.6	98.3	195	1330	67.8	0	64.7	128
56-55-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Benz(a)anthracene**	ug/Kg dry	45.17	H	x	x	x	BaA	49	338	621	621	135	218	0	0	654	847	2890	10.4	1680	918	2730	658	1150	29	1710	1210	8930	407	0	908	2060
	8270D (SIM) Semi-Volatile Organic Compou0s	**Chrysene/triphenylene**	ug/Kg dry	45.36	H	x	x	x	CH	50	447	828	828	126	223	0	0	767	975	3090	13.3	2040	808	2470	625	1180	41.7	1640	1110	8860	515	0	946	2400
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	46.81				x	C1CR	51	186	607	607	137	182	0	2.28	380	542	2410	10	1280	884	934	249	547	36	732	906	4280	383	0	412	835
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	48.52				x	C2CR	52	106	460	460	81.9	104	0	2.82	231	451	1390	0	859	499	398	121	284	22.1	352	505	1890	245	0	210	422
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	49.55				x	C3CR	53	61.3	278	278	37.9	52.9	0	0	128	201	733	0	553	263	217	66.2	155	11.3	205	280	841	148	0	127	240
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	50				x	C4CR	54	43.6	158	158	18.4	27.5	0	0	87.3	123	433	0	361	136	104	42.4	84.6	0	105	145	435	89.4	0	73.5	136
205-99-2	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(b)fluoranthene**	ug/Kg dry	49.23	H	x	x	x	BbF	55	447	652	652	97.6	172	0	0	643	850	2580	15.4	2130	578	2130	536	1020	32.4	1380	633	5750	363	0	824	2020
	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(j/k)fluoranthene**	ug/Kg dry	49.29	H	x	x	x	BjF	56	439	708	708	107	181	0	0	616	806	2410	11.3	1620	578	2190	533	1020	30.9	1350	746	6340	404	0	832	2000
192-97-2	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(e)pyrene	ug/Kg dry	50.17			x	x	BeP	57	359	618	618	104	157	0	0	553	698	2090	12.5	1810	363	1680	412	809	51.9	1070	700	5450	370	0	694	1660
50-32-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(a)pyrene**	ug/Kg dry	50.34	H	x	x	x	BaP	58	443	747	747	156	222	0	0	692	856	2940	11.8	2000	657	2950	704	1340	45.1	1790	1180	10200	530	0	1090	2460
198-55-0	8270D (SIM) Semi-Volatile Organic Compou0s	Perylene	ug/Kg dry	50.61			x	x	PE	59	154	379	379	67.6	112	97.5	13	156	199	627	295	527	239	821	180	314	8.68	540	743	2040	1090	1150	336	739
193-39-5	8270D (SIM) Semi-Volatile Organic Compou0s	**Indeno(1,2,3-cd)pyrene**	ug/Kg dry	54	H	x	x	x	I123P	60	335	532	532	79.9	125	0	0	461	564	2260	14.1	2070	356	2200	527	1010	40.6	1250	573	6180	370	0	800	1940
53-70-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Dibenzo(a,h)anthracene**	ug/Kg dry	54.01	H	x	x	x	DBA	61	76.8	122	122	21.1	30.9	0	0	110	150	567	0	452	122	437	101	218	10.1	296	142	1240	82.4	0	169	392
191-24-2	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(g,h,i)perylene**	ug/Kg dry	54.91	H	x	x	x	BGP	62	298	502	502	79.9	115	0	0	433	512	1710	0	1610	226	1690	399	775	44.9	949	525	5260	324	0	653	1570
191-07-1	8270D (SIM) Semi-Volatile Organic Compou0s	Coronene	ug/Kg dry	61.34				x	COR	63	85	125	125	21.1	28.9	0	0	117	139	564	0	573	58.6	504	117	247	13.1	254	122	1770	94.6	0	194	454
526-73-8	8270D (SIM) Semi-Volatile Organic Compou0s	1,2,3-Trimethylbenzene	ug/Kg dry							64	5.82	43.4	43.4	3.98	4.58	0	0	19.4	27.3	180	15.6	332	7.93	0	0	5.49	0	6.52	6.35	45.3	7.8	3.17	6.78	15.8
95-63-6	8270D (SIM) Semi-Volatile Organic Compou0s	1,2,4-Trimethylbenzene	ug/Kg dry							65	6.17	46.2	46.2	3.98	2.34	0	0	33.3	44.3	514	10.4	1130	11.4	3.54	2.98	12.1	0	8.96	18.1	153	16.7	0	12	18.4
108-67-8	8270D (SIM) Semi-Volatile Organic Compou0s	1,3,5-Trimethylbenzene	ug/Kg dry							66	6.38	46	46	3.98	4.58	0	0	34.6	48.3	166	15.6	487	7.58	2.8	4.19	12.9	8.89	2.98	11.1	47.7	4.87	0	4.33	6.91
	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methyldibenzothiophene	ug/Kg dry	36.76						67	5.37	26.8	26.8	3.98	3.17	0	0	7.59	9.4	27	15.6	24.6	5.05	11.8	3.91	9.96	0	14.1	6.69	234	13.3	0	9.94	14.6
	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylphenanthrene	ug/Kg dry	37.24						68	33.5	137	137	7.92	14.5	0	0	76.4	105	314	15.6	239	70.7	148	45.4	90.6	4.61	106	77	1520	28	0	50.1	126
	8270D (SIM) Semi-Volatile Organic Compou0s	2,3,5-Trimethylnaphthene	ug/Kg dry	30.44						69	6.38	46	46	3.98	4.58	0	0	10.1	18.6	35.3	15.6	50.5	7.49	9.16	4.02	6.78	0	6.49	8.05	158	14.3	0	4.42	6.52
581-42-0	8270D (SIM) Semi-Volatile Organic Compou0s	2,6-Dimethylnaphthalene	ug/Kg dry	27.07						70	21	252	252	3.6	7.16	0	0	43.1	63.3	145	15.6	281	12.5	12.8	7.02	20.1	5.69	38.6	45.1	1290	33.5	4.81	34.1	103
	8270D (SIM) Semi-Volatile Organic Compou0s	2/3-Methyldibenzothiophene	ug/Kg dry	36.31						71	9.85	47.7	47.7	2.41	6.29	0	0	25.8	36.4	102	15.6	127	19.1	29.4	9.29	23.6	2.62	31.1	20.7	693	38.5	0	17.2	33.3
	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylanthracene	ug/Kg dry	36.96						72	21	85.4	85.4	10.1	17.9	0	0	36.1	54.7	383	15.6	132	169	133	32.4	56.6	2.49	107	155	1220	42.4	0	53	106
	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylphenanthrene	ug/Kg dry	36.81						73	44.8	159	159	11.5	27.6	0	0	137	197	535	15.6	528	84.1	271	88.7	154	10.2	171	166	2470	107	0	73.4	191
	8270D (SIM) Semi-Volatile Organic Compou0s	3-Methylphenanthrene	ug/Kg dry	36.69						74	38.8	126	126	10.2	28.7	0	0	106	150	473	15.6	442	114	198	64.4	116	7.55	141	159	2240	100	0	72.5	160
	8270D (SIM) Semi-Volatile Organic Compou0s	4/9-Methylphenanthrene	ug/Kg dry	37.14						75	40.5	183	183	15.3	34	0	0	114	154	564	15.6	382	167	190	59	122	7.12	150	213	2150	111	0	83.6	175
	8270D (SIM) Semi-Volatile Organic Compou0s	4-Methyldibenzothiophene	ug/Kg dry	36.01						76	10.2	61	61	3.39	6.92	0	0	30.3	44.7	101	15.6	141	9.95	24.7	9.38	24.9	3.46	29.9	15.9	755	39.4	0	18.9	30.8
71-43-2	8270D (SIM) Semi-Volatile Organic Compou0s	Benzene	ug/Kg dry							77	108	521	521	3.98	4.58

Attachment B. Complete Sediment Data Set
Amesbury Former MGP
Amesbury, Massachusetts

											Downstream	Downstream	Downstream	Downstream	Downstream	Downstream	Downstream	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	River	River	River	River	River	River	River
										Sample No.	F200035-06	F200035-07	F200035-12	F200035-08	F200035-09	F200035-10	F200035-11	F200036-05	F200036-06	F220065-01	F220065-02	F220065-03	F220065-04	F230018-03	F230018-04	F230018-05	F230018-06	F230021-01	F230021-02	F230018-01	F230019-08	F230019-09	F230018-02	F230019-01
										Sample Date:	7/7/2020	7/7/2020	7/7/2020	7/7/2020	7/7/2020	7/7/2020	7/7/2020	7/8/2020	7/8/2020	10/13/2022	10/13/2022	10/13/2022	10/13/2022	06/20/2023	06/20/2023	06/20/2023	06/20/2023	06/22/2023	06/22/2023	06/20/2023	06/22/2023	06/22/2023	06/20/2023	06/22/2023
										Sample Time:	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00	17:57	17:57	17:57	17:57	18:37	18:37	18:37	18:37	20:09	20:09	18:37	20:09	20:09	18:37	20:09
										ClieSam	SS804-S1	SS804-S2	SS804-S2D	SS804-S3	SS805-S1	SS805-S3	SS806-S2	SS807-S1	SS807-S2	SS808-S1	SS808-S2	SS809-S1	SS809-S2	810-S1	810-S2	811-S1	811-S2	815-S1	815-S3	817-S1	818-S1	818-S2	819-S1	820-S1
										Depths:	0.1-0.4	3.8-4	3.8-4	7.1-7.3	0-1	3-3.2	0.8-1	0.4-0.6	1.8-2	0.8-1	1.8-2	0.8-1	1.8-2	0.8-1	1.8-2	0.8-1	1.8-2	0-1	4-5	0-1	0-1	5-6	0-1	0-1
										RAH																									
										%solids	63	51	NT	84	82	88	90	45	63	21	26	27	41	86	73	74	70	65	51	76	49	64	73	40
CAS Number	Method Name	Analyte	Units	RT		PAH17	PAH34	PAH51	Abbrev	PAH #						4.07	4.24				15.6					5		5					5			
11095-43-5	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)thiophene	ug/Kg dry							78	6.38	46	46	3.98	4.58	0	0	6.3	31.1	391	15.6	347	9.56	8.85	0	3.6	0	6.01	5.02	281	0	0	4.99	13.6
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzene	ug/Kg dry							79	47.7	458	458	11.4	23.6	5.2	5.07	71.1	96.2	1650	266	2060	280	24.7	9.5	16.4	9.76	105	196	199	177	57.8	90.5	294
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Decalins	ug/Kg dry							80	6.38	876	876	3.98	33.7	0	0	26.3	40.5	56.7	15.6	94.7	9.56	5.17	6.94	12.1	3.95	15.4	19	507	631	0	11.3	27.9
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzenes	ug/Kg dry							81	85.9	340	340	5.08	10	4.99	3.2	72	107	7210	198	5490	215	20.1	10.1	30.2	10.3	145	107	313	119	69.9	134	548
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Decalins	ug/Kg dry							82	6.38	661	661	3.98	31.1	0	0	22.3	38.8	88.8	15.6	113	9.56	0	9.92	16.8	0	20.5	33.6	400	270	0	18.6	26.6
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzenes	ug/Kg dry							83	13.4	92.9	92.9	2.8	5.66	2.48	0	47.6	62.3	929	33.8	2250	53.4	13	12.3	34.3	15.1	38.2	56	363	47.2	12.1	37	75
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Decalins	ug/Kg dry							84	6.38	451	451	3.98	24.2	0	0	10.5	24.5	76.9	15.6	68.6	9.56	0	0	0	0	0	32.1	311	171	0	15.1	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzenes	ug/Kg dry							85	9.62	88.2	88.2	3.09	5.84	3.43	0	37.2	41.4	393	15.6	847	68.5	13.1	13.3	26.9	9.83	44.8	65.6	722	59.2	0	30.8	68.1
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Decalins	ug/Kg dry							86	6.38	807	807	3.98	37	0	0	18.8	30.6	119	15.6	84.7	9.56	0	0	0	0	0	31.5	479	291	0	22.7	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C5-Benzenes	ug/Kg dry							87	6.69	76.8	76.8	3.98	4.44	0	0	30.4	25	367	15.6	259	43.1	10.3	0	20.6	0	36.1	40.1	525	63.4	0	25.3	56.3
86-74-8	8270D (SIM) Semi-Volatile Organic Compou0s	Carbazole	ug/Kg dry	35.61						88	32.5	48.5	48.5	3.08	8.44	0	0	47.1	77.1	157	15.6	271	18	91	34.1	134	4.67	121	30.6	699	24.8	0	71.5	161
493-01-6	8270D (SIM) Semi-Volatile Organic Compou0s	cis-Decalin	ug/Kg dry							89	6.38	54	54	3.98	4.58	0	0	7.35	5.87	0	15.6	15.1	9.56	0	0	0	0	0	0	30.5	45.9	0	0	0
100-41-4	8270D (SIM) Semi-Volatile Organic Compou0s	Ethylbenzene	ug/Kg dry							90	10.1	52.8	52.8	3.98	3	0	0	25.8	25.6	4780	22.6	1170	33.1	3.23	0	5.55	0	17.4	18	192	8.36	0	10.2	39.4
98-82-8	8270D (SIM) Semi-Volatile Organic Compou0s	Isopropylbenzene	ug/Kg dry							91	6.38	46	46	3.98	4.58	0	0	5.65	8.72	103	15.6	117	9.56	0	0	0	0	0	0	32.7	0	0	0	0
	8270D (SIM) Semi-Volatile Organic Compou0s	m,p-Xylene	ug/Kg dry							92	241	908	908	11.3	23.3	8.95	6.42	151	244	3840	187	4600	229	21.5	9.68	29.6	9.78	192	127	273	160	75.6	189	782
108-87-2	8270D (SIM) Semi-Volatile Organic Compou0s	Methylcyclohexane	ug/Kg dry							93	3.23	46	46	3.98	4.58	0	0	154	198	175	15.6	598	9.56	9.78	11.7	47	16.5	6.38	13.8	29.2	4.64	0	3.2	8.59
104-51-8	8270D (SIM) Semi-Volatile Organic Compou0s	n-Butylbenzene	ug/Kg dry							94	10.4	73.4	73.4	2.22	3.34	2.81	0	75.2	16.2	18.4	8.13	55.8	11.5	5.26	5.44	4.02	0	29	12	0	16.7	0	11.5	48.2
103-65-1	8270D (SIM) Semi-Volatile Organic Compou0s	n-Propylbenzene	ug/Kg dry							95	8.46	50.5	50.5	3.98	4.58	0	0	29.4	14.7	28.1	15.6	96.2	7.27	0	0	3.54	0	17.1	6.43	39.9	7.31	0	8.37	34.8
95-47-6	8270D (SIM) Semi-Volatile Organic Compou0s	o-Xylene	ug/Kg dry							96	8.47	59	59	3.98	4.58	0	0	42.8	63.3	2680	48.4	2320	33.4	3.25	2.77	12.3	0	9.9	8.08	54.1	10.7	0	8.69	26.4
99-87-6	8270D (SIM) Semi-Volatile Organic Compou0s	p-Isopropyltoluene	ug/Kg dry							97	5.96	28.4	28.4	3.98	4.58	0	0	10.4	12.5	265	15.1	178	31.2	0	0	0	0	8.77	38.6	36.3	10	11.2	5.16	18.9
135-98-8	8270D (SIM) Semi-Volatile Organic Compou0s	sec-Butylbenzene	ug/Kg dry							98	6.38	46	46	3.98	4.58	0	0	7.35	5.14	17.9	15.6	18.2	9.56	0	0	0	0	0	0	10.5	0	0	0	0
100-42-5	8270D (SIM) Semi-Volatile Organic Compou0s	Styrene	ug/Kg dry							99	39.9	573	573	27.7	31.8	18.5	13.7	25.8	28	87.8	13.6	128	17	15.7	8.84	20.6	5.75	63.1	35.3	318	87.2	10.4	26	45.5
98-06-6	8270D (SIM) Semi-Volatile Organic Compou0s	t-Butylbenzene	ug/Kg dry							100	6.38	46	46	3.98	4.58	4.07	4.24	7.35	5.87	17.9	15.6	15.1	9.56	0	0	0	0	0	0	0	0	0	0	0
108-88-3	8270D (SIM) Semi-Volatile Organic Compou0s	Toluene	ug/Kg dry							101	106	1030	1030	25.4	52.4	12.6	11.7	160	221	1940	317	2370	332	30.2	11.7	20.7	11.9	131	241	246	217	74.2	111	373
493-02-7	8270D (SIM) Semi-Volatile Organic Compou0s	trans-Decalin	ug/Kg dry							102	6.38	46	446	3.98	4.58	0	0	20.9	33.3	25.1	15.6	59.3	9.56	0	3.46	6.32	0	6.75	6.01	138	367	0	0	6.97
3891-98-3	Saturated Hydrocarbons by GC/FID	2,6,10-trimethyldodecane (1380)	mg/Kg dry							103	13.9	679	679	5.62	21.8	0	0	40.1	52.5	87.3	15.7	80.1	19.9	5.4	6.21	12	2.55	18.8	16.2	337	162	5.36	12.8	30.4
3892-00-0	Saturated Hydrocarbons by GC/FID	2,6,10-trimethylpeadecane (1650)	mg/Kg dry							104	22.4	923	923	16.6	34.3	4.28	8.61	40.5	51.8	106	15.6	87.4	20.2	9.55	7.52	14.4	4.49	56.7	34.9	407	295	6.86	19.4	29.3
3891-99-4	Saturated Hydrocarbons by GC/FID	2,6,10-trimethyltridecane (1470)	mg/Kg dry							105	47.8	1220	1220	14.1	37.9	6.71	6.66	82	115	173	66.9	189	52.6	12.4	12.8	25.8	7.14	53.4	50.1	460	301	18.9	34.2	105
	Classical Chemistry	Black Carbon (Average)	mg/kg							106										17.9	15.6	15.1	9.56											
	Saturated Hydrocarbons by GC/FID	C-10	mg/Kg dry							107										542	818	641	186	48.7	31.1	58.3	23.3	284	157	174	193	59.5	134	333
	Saturated Hydrocarbons by GC/FID	C-11	mg/Kg dry							108										385	142	522	192	50.3	29.7	53.8	21.1	361	84.6	157	127	42.6	60.6	97.7
	Saturated Hydrocarbons by GC/FID	C-12	mg/Kg dry							109										17.9	15.6	15.1	9.56											
	Saturated Hydrocarbons by GC/FID	C-13	mg/Kg dry							110																								
	Saturated Hydrocarbons by GC/FID	C-14	mg/Kg dry							111																								
	Saturated Hydrocarbons by GC/FID	C-15	mg/Kg dry							112																								
	Saturated Hydrocarbons by GC/FID	C-16	mg/Kg dry							113																								
	Saturated Hydrocarbons by GC/FID	C-17	mg/Kg dry							114	158	485	485	50	64.9	33.4	39.7	192	240															
	Saturated Hydrocarbons by GC/FID	C-18	mg/Kg dry							115	110	2390	2390	58.8	60.3	33.2	44.8	175	235															
	Saturated Hydrocarbons by GC/FID	C-19	mg/Kg dry							116																								
	Saturated Hydrocarbons by GC/FID	C-21	mg/Kg dry							117																								
	Saturated Hydrocarbons by GC/FID	C-22	mg/Kg dry							118																								
	Saturated Hydrocarbons by GC/FID	C-23	mg/Kg dry							119																								
	Saturated Hydrocarbons by GC/FID	C-24	mg/Kg dry							120																								
	Saturated Hydrocarbons by GC/FID	C-25	mg/Kg dry							121																								
	Saturated Hydrocarbons by GC/FID	C-26	mg/Kg dry							122																								
	Saturated Hydrocarbons by GC/FID	C-27	mg/Kg dry							123																								
	Saturated Hydrocarbons by GC/FID	C-28	mg/Kg dry							124																								
	Saturated Hydrocarbons by GC/FID	C-29	mg/Kg dry							125																								
	Saturated Hydrocarbons by GC/FID	C-30	mg/Kg dry							126																								
	Saturated Hydrocarbons by GC/FID	C-31	mg/Kg dry							127																								
	Saturated Hydrocarbons by GC/FID	C-32	mg/Kg dry							128																								
	Saturated Hydrocarbons by GC/FID	C-33	mg/Kg dry							129																								
	Saturated Hydrocarbons by GC/FID	C-34	mg/Kg dry							130																								
	Saturated Hydrocarbons by GC/FID	C-35	mg/Kg dry							131																								
	Saturated Hydrocarbons by GC/FID	C-36	mg/Kg dry							132																								
	Saturated Hydrocarbons by GC/FID	C-37	mg/Kg dry							133																								
	Saturated Hydrocarbons by GC/FID	C-38	mg/Kg dry							134																								
	Saturated Hydrocarbons by GC/FID	C-39	mg/Kg dry							135																								
	Saturated Hydrocarbons by GC/FID	C-40	mg/Kg dry							136																								
	Saturated Hydrocarbons by GC/FID	C-8	mg/Kg dry							137																								
	Saturated Hydrocarbons by GC/FID	C-9	mg/Kg dry							138																								
638-36-8	Saturated Hydrocarbons by GC/FID	Phytane	mg/Kg dry	34.53						141	95.1	2730	2730	55.6	87.3	17.2	34.7	87	113	253	71.2	207	38.7	12.4	6.89	17.8	5.23	320	48	761	675	7.07	54.7	76.7
1921-70-6	Saturated Hydrocarbons by GC/FID	Pristane	mg/Kg dry	32.65						142	63.9	2910	2910	43.1	82.5	11.8	26.2	154	222	306	29.1	314	50.9	17.6	15.3	42.2	10.3	238	59.8	816	714	6.74	37.2	60.4
TOC	Classical Chemistry	Total Organic Carbon (Average)	mg/kg							145	27400	51200	51400	5280	5220	3760	2060	118000	114000	148000	64100	130000	30700	43400	22300	10300	50800	14600	13700	44400	47400	22000	17800	38900
	TPAH16										4941.5	8827.8	8827.8	1229.24	2236.94	2.52	9.81	8195.7	10818	33011	223.94	26821	6844.23	28001.8	7282.6	13353.3	432.23	17482.7	10511.5	178270	5086.6	12.78	10866.4	25748.6
	TPAH34										6726.38	16282.3	16282.3	2188	3762.94	136.27	61.05	12266	16457	54392	888.47	40887.1	13480.33	35858.5	9517.6	18010.2	758.63	23564.7	18442.5	241220	10261.5	1217.82	14574.3	33617.5
	TPAH51										7492.68	19368	19368	2576.4	4349.76	157.84	69.37	13921.2	18826.1	63325	1067.07	47325.1	16177.63	38857.8	10361.31	19935.2	888.88	25998.8	21271.1	272593	11932.8	1277.28	16140.4	36982.7
	LPAH										582.9	1674.5	1674.5	166.02	278.84	2.52	4.89	1271.7	1959	5940	77.24	7047	523.43	2682.8	803.3	1782.4	70.23	2057.8	1513.5	78250	716.8	8.08	1417.5	2656.8
	HPAH										4372.8	7252	7252	1072.4	1971.9	0	4.92	7046	9010	27577	146.7	20392	6343	25347	6493	11623	369.4	15465	9114	102260	4413.4	8.36	9492	23132

(does not include source area samples collected in 2017)

Attachment B. Complete Sediment Data Set
Amesbury Former MGP
Amesbury, Massachusetts

											River	River	River	River	River	River	Former Channel	Former Channel	Former Channel	Former Channel	Former Channel	Former Channel	Former Channel	Wetland	Wetland	Former Channel	Former Channel	Former Channel	Former Channel	Former Channel	Former Channel	River	River	River	River	River	Upstream
											F230019-02	F230019-03	F230019-04	F230019-05	F230019-06	F230019-07	F230020-01	F230020-02	F230020-03	F230020-04	F230020-05	F230020-06	F230027-01	F230027-02	F230025-01	F230025-02	F230024-01	F230024-02	F230024-03	F230025-03	F230026-01	F230026-02	F230026-03	F230026-04	F230026-05	F230037-01
										Sample Date:	06/22/2023	06/22/2023	06/22/2023	06/22/2023	06/22/2023	06/22/2023	06/22/2023	06/22/2023	06/22/2023	06/22/2023	06/22/2023	06/22/2023	08/18/2023	08/18/2023	08/15/2023	08/15/2023	08/15/2023	08/15/2023	08/15/2023	08/15/2023	08/18/2023	08/18/2023	08/18/2023	08/18/2023	08/18/2023	2/Nov/2023
										Sample Time:	20:09	20:09	20:09	20:09	20:09	20:09	20:09	20:09	20:09	20:09	20:09	20:09	15:32	15:32	16:11	16:11	16:11	16:11	16:11	16:11	15:32	15:32	15:32	15:32	15:32	
										ClieSam	823-S1	823-S2	824-S1	829-S1	827-S1	827-S2	837-S1	837-S2	837-S3	838-S1	838-S2	838-S3	839-S1	839-S2	841-S1	841-S2	842-S1	842-S2	842-S3	841-S3	848-S1	848-S2	853-S1	853-S2	853-S3	857-S1
										Depths:	0-1	4-5	0-1	0-1	0-1	5-6	1-2	5.5-6.5	7-8	1-2	5.5-6.5	7-8	0-1	1-2	2.5-3.5	4.5-5.5	2.5-3.5	4.5-5.5	8.2-9.2	7.5-8.5	0-1	1-2	0-0.5	1-2	5-5.6	0-1
										RAH																										
										%solids	40	45	59	50	58	77	79	82	73	72	51	68	17	16	92	81	87	46	61	58	65	72	58	62	74	74
CAS Number	Method Name	Analyte	Units	RT		PAH17	PAH34	PAH51	Abbrev	PAH #						5	5	5							5	5	5									5	
		Max RL for ND PAHs=								1																											
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzo(b)thiophenes	ug/Kg dry	17					C1BT	2	56.7	4520	21.3	25.6	8.24	4.28	5.07	3.8	9.06	9.41	21.9	6.46	116	106	0	0	0	28.7	94.1	107	30.2	16.2	20.3	38.8	0	18.7
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzo(b)thiophenes	ug/Kg dry	18					C2BT	3	55.3	9320	27.6	33.8	11.7	4.49	3.32	2.61	9.96	11	34.6	8.21	99.3	162	0	0	0	90.1	254	328	41.3	17.4	20.3	88	0	21.8
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzo(b)thiophenes	ug/Kg dry	19					C3BT	4	27.9	5400	18.5	20.4	7.16	2.9	0	0	5.88	7.88	15.7	0	43.1	68.8	0	0	0	93.3	337	286	21.1	13.4	13.6	97.1	0	38.5
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzo(b)thiophenes	ug/Kg dry	20					C4BT	5	12.4	1730	18.1	20.3	4.37	0	0	0	5.44	6.16	17.1	0	17.1	20.7	0	0	0	56.7	248	147	24.6	15.1	16.2	79.2	0	21.7
91-20-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Naphthalene**	ug/Kg dry	21.86	L	x	x	x	NA	6	159	30900	96.6	107	7.44	0	5.56	0	51	75.5	60.5	9.16	362	599	2.75	0	0	287	1660	907	55.2	80.6	29.6	50.5	0	126
91-57-6	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylnaphthalene	ug/Kg dry	24.57	L	x		x	2MN	7	91.8	8200	77.1	69.3	5.47	2.22	5.16	2.79	36.5	46.1	49.8	8.33	181	265	0	0	0	198	1140	1310	36.3	48.4	22.7	51.6	0	116
90-12-0	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylnaphthalene	ug/Kg dry	25				x	1MN	8	67.5	123000	51.3	48.9	3.97	0	4.12	2.63	25	24.5	27	4.83	122	166	0	0	0	161	1780	3270	20.9	31	14.5	28.8	0	82.8
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Naphthalenes	ug/Kg dry	24.57			x	x	C1N	9	103	80800	84.4	76.5	6.69	3.18	6.65	3.67	39	45.4	50.5	9.06	196	276	2.08	0	0	230	1840	2870	37.6	51.6	25.3	53.3	0	123
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Naphthalenes	ug/Kg dry	27.02			x	x	C2N	10	248	158000	157	168	13.9	6.98	10.3	8.81	49.6	61.4	196	18.8	319	488	4.42	4.01	0	1150	5220	7510	142	132	86.9	467	3.33	217
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Naphthalenes	ug/Kg dry	29.76			x	x	C3N	11	182	61500	138	134	9.81	3.29	7.98	21.3	30.3	59.7	270	14.6	233	334	8.23	3.72	0	1230	5230	6200	243	174	96.7	757	0	364
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Naphthalenes	ug/Kg dry	32.52			x	x	C4N	12	109	18400	114	94.2	7.26	2.41	4.99	27.2	41.4	58.4	226	12.1	151	224	14.8	2.47	0	733	3370	3330	248	150	86.3	519	0	247
92-52-4	8270D (SIM) Semi-Volatile Organic Compou0s	Biphenyl	ug/Kg dry	26.46					BP	13	58.1	3600	36.5	35.7	8.29	3.25	6.99	5.08	22.4	20	76.7	11.9	77.6	114	0	0	0	94.1	500	285	38.2	41.3	15.6	140	0	48.1
208-96-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Acenaphthylene**	ug/Kg dry	28.16	L	x	x	x	ACE	14	587	21300	282	425	3.81	0	7.51	0	66.2	122	128	8.07	700	592	14.7	2.84	0	602	4510	1720	164	170	89.5	158	0	781
83-32-9	8270D (SIM) Semi-Volatile Organic Compou0s	**Acenaphthene**	ug/Kg dry	28.89	L	x	x	x	ACY	15	251	189000	207	176	0	0	0	0	23.2	23.8	58.4	0	106	118	0	0	0	1280	4830	3690	66.3	65.8	37.9	68.8	0	209
132-64-9	8270D (SIM) Semi-Volatile Organic Compou0s	Dibenzofuran	ug/Kg dry	29.54				x	DBF	16	133	15500	104	88.5	0	0	0	0	10.5	19.3	27.6	3.35	121	157	0	0	0	99.7	461	354	29.1	48.2	17.8	38	0	320
86-73-7	8270D (SIM) Semi-Volatile Organic Compou0s	**Fluorene**	ug/Kg dry	30.91	L	x	x	x	FLE	17	219	139000	209	159	4.01	0	5.19	3.06	80.4	51.9	76.2	7.61	166	226	0	0	0	861	3640	2810	79.4	79.4	39.9	102	0	271
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Fluorenes	ug/Kg dry	33.14			x	x	C1FL	18	124	44500	109	94.9	6.32	0	4.69	7.19	60.5	51.2	83	8.83	133	184	5.61	0	0	712	3700	3190	84	73.4	36.1	143	0	305
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Fluorenes	ug/Kg dry	35.22			x	x	C2FL	19	126	23500	160	111	6.43	0	5.65	11.6	83.8	75.2	118	16	217	290	24	0	0	754	4290	3830	143	103	56.2	204	0	360
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Fluorenes	ug/Kg dry	38.01			x	x	C3FL	20	339	9010	335	230	5.95	0	6.06	5.63	72	66.6	139	19.8	338	404	21.3	0	0	500	2570	2460	175	145	70.4	229	0	332
132-65-0	8270D (SIM) Semi-Volatile Organic Compou0s	Dibenzothiophene	ug/Kg dry	34.23				x	DBT	21	273	55000	141	125	0	0	2.98	2.45	53.3	49.2	39.8	0	127	148	0	0	0	401	2050	852	57.5	54.3	29.2	72.6	0	281
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Dibenzothiophenes	ug/Kg dry	36.43				x	C1DBT	22	228	33100	163	144	7.16	0	5.2	4.41	51.8	58.6	77.9	5.69	176	194	9.55	0	0	607	4020	1750	107	84.7	52	171	0	399
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Dibenzothiophenes	ug/Kg dry	37.7				x	C2DBT	23	195	18300	218	176	10.3	0	9.31	5.22	81.5	84.4	118	6.59	197	232	22	0	0	637	4250	2000	179	117	84	258	0	451
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Dibenzothiophenes	ug/Kg dry	39.5				x	C3DBT	24	110	8440	142	132	8.99	0	7.29	2.41	57.5	54.5	105	5.8	145	155	12.5	0	0	419	2350	1240	171	93.7	79.1	231	0	261
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Dibenzothiophenes	ug/Kg dry	41.65				x	C4DBT	25	71.3	3360	101	98.9	0	0	5.1	0	29.6	25.8	63.3	0	89	105	10.5	0	0	208	990	503	118	58.2	52	141	0	111
85-01-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Phenanthrene**	ug/Kg dry	34.72	L	x	x	x	PHE	26	2820	343000	1910	1490	6.58	2.94	17.4	5.53	136	224	334	22.4	1290	1350	12.6	6.88	0	4730	27700	11200	470	672	265	505	0	3550
120-12-7	8270D (SIM) Semi-Volatile Organic Compou0s	**Anthracene**	ug/Kg dry	34.91	L	x	x	x	ANT	27	1500	121000	692	604	0	0	11.1	0	84.2	122	173	12.6	608	638	23.2	2.54	0	1750	10800	4640	241	187	133	213	0	1220
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Phenanthrenes/Anthracenes	ug/Kg dry	36.96				x	C1PH	28	1280	197000	1120	832	8.71	4.57	17	10.7	128	263	371	46.5	920	1060	137	8.36	0	3690	23500	15200	423	474	216	588	0	2220
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Phenanthrenes/Anthracenes	ug/Kg dry	38.97			x	x	C2PH	29	679	58200	812	553	11.6	2.64	15.4	7.5	180	257	350	43.4	627	784	178	4.4	0	2190	13900	10800	412	361	189	527	0	1260
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Phenanthrenes/Anthracenes	ug/Kg dry	40.8			x	x	C3PH	30	305	16100	388	269	14.6	0	14.3	4.01	118	129	213	29.7	313	400	87.7	2.34	0	953	5460	4620	286	193	133	334	0	466
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Phenanthrenes/Anthracenes	ug/Kg dry	41.72			x	x	C4PH	31	128	5170	148	126	20.2	0	8.14	0	51.4	56.4	115	27.9	132	158	30.1	0	0	346	1900	1620	272	90	94.4	166	8.32	139
483-65-8	8270D (SIM) Semi-Volatile Organic Compou0s	Retene	ug/Kg dry	41.72				x	RET	32	130	2180	76	49.5	58.8	3.06	7.47	0	12.5	37.4	86.8	59	80.4	74.4	8.37	0	0	144	639	446	200	54.6	125	138	31.6	35.8
239-35-0	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)naphtho(2,1-d)thiophene	ug/Kg dry	44.24					BNT	33	495	16400	341	291	0	0	3.83	0	43.2	59.3	63.4	4.43	273	282	19.8	0	0	349	2560	725	96	82.3	54.9	84.8	0	325
	8270D (SIM) Semi-Volatile Organic Compou0s	C0-Benzonaphthothiophenes	ug/Kg dry	44.24					C0BNT	34	963	30500	625	544	4.4	0	9.46	0	78.8	119	122	11.1	524	533	54.1	0	0	643	4680	1260	183	160	107	161	0	605
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzonaphthothiophenes	ug/Kg dry	45.63					C1BNT	35	437	13600	388	325	0	3.06	10.1	0	63.5	88.4	115	10.2	378	418	57.3	0	0	483	3340	1220	142	109	90	161	0	414
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzonaphthothiophenes	ug/Kg dry	47.14					C2BNT	36	302	6510	308	289	0	3.26	7.56	0	48	57.4	105	7.21	329	374	37	0	0	326	1890	840	141	89.7	86.7	173	0	349
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzonaphthothiophenes	ug/Kg dry	49.02					C3BNT	37	243	4590	215	239	0	0	6.07	0	31.2	37.2	73.2	4.65	274	274	18.8	0	0	214	1060	455	117	71.3	65	140	0	260
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzonaphthothiophenes	ug/Kg dry	51.51					C4BNT	38	118	1150	97.5	131	0	0	0	0	12.5	11	32	0	140	126	6.33	0	0	83.5	310	133	65	29.5	31.6	71	0	139
206-44-0	8270D (SIM) Semi-Volatile Organic Compou0s	**Fluoranthene**	ug/Kg dry	39.51	H	x	x	x	FLA	39	5520	149000	3660	3300	4.29	0	63.6	7.59	550	822	658	68.5	2700	2830	136	10.8	1.99	4540	33700	7800	1100	1000	572	747	0	4220
129-00-0	8270D (SIM) Semi-Volatile Organic Compou0s	**Pyrene**	ug/Kg dry	40.39	H	x	x	x	PYR	40	5750	221000	3400	3250	4.48	0	79.3	8.81	779	1140	779	95.3	2800	2750	125	17.2	2.66	6180	48700	10600	1200	1150	596	946	0	3710
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Fluoranthenes/Pyrenes	ug/Kg dry	41.78			x	x	C1PY	41	2250	169000	2190	1630	12.1	4.98	48	7.04	453	786	544	81.6	1490	1610	307	9.97	5.18	3740	27500	10500	683	741	377	665	0	2190
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Fluoranthenes/Pyrenes	ug/Kg dry	43.52				x	C2PY	42	1160	36400	1180	898	7.45	0	23.1	5.37	170	316	279	42.4	961	1130	192	3.06	3.01	1340	9120	4770	349	324	194	323	0	1310
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Fluoranthenes/Pyrenes	ug/Kg dry	45.72				x	C3PY	43	499	10500	476	406	0	0	13.3	0	74.4	112	147	23.9	463	576	97.6	0	0	492	3190	2150	166	129	90.6	166	0	532
243-17-4	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)fluorene	ug/Kg dry	42.03				x	BbF	44	271	18400	350	185	0	0	5.54	0	45.6	75.5	54.8	8.77	143	164	45.5	0	0	393	3470	1040	75.1	84.2	45.6	81.1	0	212
205-12-9	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(c)fluorene	ug/Kg dry	42.07				x	BcF	45	107	10500	88.9	73.6	0	0	0	0	24.6	38	28.9	4.42	73.4	86.2	16.2	0	0	216	1130	468	36	38.3	20.8	29.3	0	112
3442-78-2	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylpyrene	ug/Kg dry	42.18				x	2MP	46	318	22500	269	226	0	0	7.45	0	66.4	119	74.8	11.3	203	216	35.2	0	0	525	3810	1470	95.8	103	49.3	92.1	0	304
3353-12-6	8270D (SIM) Semi-Volatile Organic Compou0s	4-Methylpyrene	ug/Kg dry	42.55				x	4MP	47	271	18800	232	205	0	0	7.13	0	62	116	75.9	12.1	210	217	27.9	0	0	480	3600	1410	98.3	103	49.4	97.8	0	276
2381-21-7	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylpyrene	ug/Kg dry	42.67				x	1MP	48	251	21600	190	165	0	0	5.81	0	54.9	99.8	57.4	9.52	148	146	25.3	0	0	442	3430	1240	72.3	84.4	37.1	76.3	0	241
56-55-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Benz(a)anthracene**	ug/Kg dry	45.17	H	x	x	x	BaA	49	2770	120000	2220	1850	0	0	35.4	3.08	278	621	376	51.2	1400	1540	195	6.25	4.37	2240	19500	4850	594	604	319	452	0	2080
	8270D (SIM) Semi-Volatile Organic Compou0s	**Chrysene/triphenylene**	ug/Kg dry	45.36	H	x	x	x	CH	50	2870	107000	2400	2030	0	0	28.1	4	290	551	449	52.4	1850	2000	165	7.7	5.16	2460	20600	5460	652	688	352	550	0	2060
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	46.81				x	C1CR	51	1150	48400	1240	959	4.32	0	25.2	2.76	197	407	324	47.3	934	1100	203	4.02	5.36	1490	10800	4880	383	383	219	378	0	1080
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	48.52				x	C2CR	52	549	15900	671	490	0	0	14.1	0	96.4	177	198	30.2	557	662	129	0	2.45	712	4800	2790	275	196	142	232	0	614
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	49.55				x	C3CR	53	320	5400	376	292	0	0	0	0	40.4	73	108	15.5	355	438	80	0	0	326	1930	1340	174	101	75.6	140	0	353
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	50				x	C4CR	54	193	2620	192	172	0	0	0	0	22.2	35.1	60.7	0	197	245	40.7	0	0	163	807	604	85.4	55.8	47	87.4	0	156
205-99-2	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(b)fluoranthene**	ug/Kg dry	49.23	H	x	x	x	BbF	55	2350	59500	1600	1710	0	0	24.4	0	150	362	314	30.4	1700	1790	79.2	5.27	3.38	1160	9760	2550	461	475	255	344	0	1570
	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(j/k)fluoranthene**	ug/Kg dry	49.29	H	x	x	x	BjF	56	2410	75900	1780	1660	0	0	28.5	2.44	189	441	336	34.8	1550	1650	108	6.83	4.16	1470	8630	2630	502	548	274	363	0	1490
192-97-2	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(e)pyrene	ug/Kg dry	50.17				x	BeP	57	2100	67700	1380	1470	0	0	23.6	2.35	165	449	292	36.6	1580	1650	64.2	6.84	6.3	1270	9230	2550	431	484	225	320	0	1270
50-32-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(a)pyrene**	ug/Kg dry	50.34	H	x	x	x	BaP	58	3500	136000	2280	2340	0	0	34.4	2.78	260	767	437	53.4	1930	2020	137	11.6	9.7	2120	20200	3810	661	856	350	465	0	2020
198-55-0	8270D (SIM) Semi-Volatile Organic Compou0s	Perylene	ug/Kg dry	50.61				x	PE	59	816	22500	570	693	446	731	78.7	36.7	177	476	1080	724	487	660	32.3	5.27	7.4	1260	2750	822	248	273	320	278	527	499
193-39-5	8270D (SIM) Semi-Volatile Organic Compou0s	**Indeno(1,2,3-cd)pyrene**	ug/Kg dry	54	H	x	x	x	I123P	60	2410	70400	1510	1690	0	0	21.5	0	138	385	297	27.3	1760	1830	55.7	8.48	4.18	1200	8450	2210	445	533	238	310	0	1350
53-70-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Dibenzo(a,h)anthracene**	ug/Kg dry	54.01	H	x	x	x	DBA	61	502	13200	351	361	0	0	4.89	0	30.8	88.1	68.2	6.79	365	395	19	0	0	267	1990	549	103	106	55.6	72.6	0	321
191-24-2	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(g,h,i)perylene**	ug/Kg dry	54.91	H	x	x	x	BGP	62	2020	64800	1210	1410	0	0	18	0	123	380	248	26.9	1450	1500	39.6	8.14	5.16	1040	7930	1860	378	477	194	261	0	1110
191-07-1	8270D (SIM) Semi-Volatile Organic Compou0s	Coronene	ug/Kg dry	61.34				x	COR	63	621	21800	348	430	0	0	5.1	0	34.7	101	73.8	6.74	503	502	8.87	2.79	0	328	2600	543	110	150	58.8	77.9	0	296
526-73-8	8270D (SIM) Semi-Volatile Organic Compou0s	1,2,3-Trimethylbenzene	ug/Kg dry							64	17.5	909	9.58	12.1	0	0	0	0	0	3.03	9.02	0	55	91.7	0	0	0	12.4	47.3	22.8	10.6	6.77	8.54	20.1	0	269
95-63-6	8270D (SIM) Semi-Volatile Organic Compou0s	1,2,4-Trimethylbenzene	ug/Kg dry							65	30.2	1870	18.5	22	0	0	0	0	4.08	7.15	16.1	2.82	112	200	0	0	0	21.1	75.5	111	15.5	15	10.9	28.3	0	428
108-67-8	8270D (SIM) Semi-Volatile Organic Compou0s	1,3,5-Trimethylbenzene	ug/Kg dry							66	16.7	687	6.48	8.2	0	0	0	0	0	0	4.6	0	55	124	0	0	0	7.03	43.2	38.1	5.27	4.19	3.52	7.34	0	230
	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methyldibenzothiophene	ug/Kg dry	36.76						67	30.2	2960	19.4	19.1	0	0	0	0	7.2	7.72	10.1	0	19.7	20.5	0	0	0	63.6	393	144	13	9.95	6.82	21.9	0	47.3
	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylphenanthrene	ug/Kg dry	37.24						68	201	29300	169	128	0	0	2.95	0	20	40.8	67.1	3.52	143	153	19.2	0	0	642	3530	2310	63	68.1	30.5	92	0	357
	8270D (SIM) Semi-Volatile Organic Compou0s	2,3,5-Trimethylnaphthene	ug/Kg dry	30.44						69	13.6	3330	9.48	8.48	0	0	0	0	0	3.44	19.6	0	18.2	25.5	0	0	0	78.5	306	399	14.8	13.8	5.81	56.7	0	24.3
581-42-0	8270D (SIM) Semi-Volatile Organic Compou0s	2,6-Dimethylnaphthalene	ug/Kg dry	27.07						70	95.1	30800	53.4	64.2	3.97	0	0	0	13.8	14.3	71.1	3.96	93.6	169	0	0	0	298	1100	1880	40.5	33.8	31.8	168	0	56.5
	8270D (SIM) Semi-Volatile Organic Compou0s	2/3-Methyldibenzothiophene	ug/Kg dry	36.31						71	77.5	11900	54.8	43.1	0	0	0	0	12.3	17.3	23	0	58.5	68.8	3.21	0	0	197	1300	545	34.5	28.7	16.9	59.5	0	139
	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylanthracene	ug/Kg dry	36.96						72	168	21400	218	112	0	0	2.82	0	19.6	47.8	49.6	6.44	99.6	120	47.2	0	0	394	2710	1630	54.4	57.5	28.8	57.6	0	294
	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylphenanthrene	ug/Kg dry	36.81						73	335	52600	274	201	0	0	3.55	0	22.5	55.6	68.4	8.26	239	287	23.3	0	0	893	5750	3700	93.6	122

Attachment B. Complete Sediment Data Set
Amesbury Former MGP
Amesbury, Massachusetts

											River	River	River	River	River	River	Former Channel	Former Channel	Former Channel	Former Channel	Former Channel	Former Channel	Former Channel	Wetland	Wetland	Former Channel	Former Channel	Former Channel	Former Channel	Former Channel	Former Channel	River	River	River	River	River	Upstream
										Sample No.	F230019-02	F230019-03	F230019-04	F230019-05	F230019-06	F230019-07	F230020-01	F230020-02	F230020-03	F230020-04	F230020-05	F230020-06	F230027-01	F230027-02	F230025-01	F230025-02	F230024-01	F230024-02	F230024-03	F230025-03	F230026-01	F230026-02	F230026-03	F230026-04	F230026-05	F230037-01
										Sample Date:	06/22/2023	06/22/2023	06/22/2023	06/22/2023	06/22/2023	06/22/2023	06/22/2023	06/22/2023	06/22/2023	06/22/2023	06/22/2023	06/22/2023	08/18/2023	08/18/2023	08/15/2023	08/15/2023	08/15/2023	08/15/2023	08/15/2023	08/15/2023	08/18/2023	08/18/2023	08/18/2023	08/18/2023	08/18/2023	2/Nov/2023
										Sample Time:	20:09	20:09	20:09	20:09	20:09	20:09	20:09	20:09	20:09	20:09	20:09	20:09	15:32	15:32	16:11	16:11	16:11	16:11	16:11	16:11	15:32	15:32	15:32	15:32	15:32	
										ClieSam	823-S1	823-S2	824-S1	829-S1	827-S1	827-S2	837-S1	837-S2	837-S3	838-S1	838-S2	838-S3	839-S1	839-S2	841-S1	841-S2	842-S1	842-S2	842-S3	841-S3	848-S1	848-S2	853-S1	853-S2	853-S3	857-S1
										Depths:	0-1	4-5	0-1	0-1	0-1	5-6	1-2	5.5-6.5	7-8	1-2	5.5-6.5	7-8	0-1	1-2	2.5-3.5	4.5-5.5	2.5-3.5	4.5-5.5	8.2-9.2	7.5-8.5	0-1	1-2	0-0.5	1-2	5-5.6	0-1
										RAH																										
										%solids	40	45	59	50	58	77	79	82	73	72	51	68	17	16	92	81	87	46	61	58	65	72	58	62	74	74
CAS Number	Method Name	Analyte	Units	RT		PAH17	PAH34	PAH51	Abbrev	PAH #						5	5	5				5			5	5	5									5	
11095-43-5	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)thiophene	ug/Kg dry							78	14.5	2420	8.48	7.75	0	0	0	0	0	3.64	5.52	0	69.5	119	0	0	0	11.7	78	48	4.32	4.64	0	7	0	8.08
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzene	ug/Kg dry							79	296	1140	173	212	70.9	16.9	16.4	5.04	31	169	212	38.5	354	718	14.3	2.7	2.84	230	1260	906	223	280	219	506	18.7	191
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Decalins	ug/Kg dry							80	37.6	2520	65.3	47.7	0	0	0	8.43	78.8	9.14	334	0	42.3	66.6	0	0	0	563	519	256	1030	378	223	4090	0	91.8
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzenes	ug/Kg dry							81	530	1120	224	303	40.6	15.1	20.4	5.1	24.2	37.7	288	36.4	586	1360	14.4	2.57	2	190	399	294	215	99.9	156	384	13.1	565
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Decalins	ug/Kg dry							82	39.5	6080	67.4	74.9	0	0	0	12	68.5	21.1	270	0	61.6	86.5	0	0	0	408	1000	598	370	189	112	1180	0	51
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzenes	ug/Kg dry							83	189	3780	58.9	71.1	15.8	5.47	6.71	0	16.2	23.5	58.7	12.5	301	503	3.66	0	0	70.8	225	218	60	39.6	37.9	88	2.71	876
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Decalins	ug/Kg dry							84	30.1	6940	51.2	73	0	0	0	0	56.7	26.4	168	0	0	0	0	0	0	316	957	630	197	104	69	395	0	35.2
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzenes	ug/Kg dry							85	122	11300	66.4	70	21.6	0	0	0	17.6	31.9	94.8	16.9	277	354	0	0	0	151	370	497	152	70	59.6	324	0	306
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Decalins	ug/Kg dry							86	44.6	10600	125	133	0	0	0	0	90.6	36.3	276	0	0	0	0	0	0	513	1570	1190	352	168	129	657	0	59.7
	8270D (SIM) Semi-Volatile Organic Compou0s	C5-Benzenes	ug/Kg dry							87	93.8	6890	48.5	53.1	0	0	0	0	19.5	22.7	117	19.1	163	201	0	0	0	180	351	568	190	61.8	46.7	482	0	0
86-74-8	8270D (SIM) Semi-Volatile Organic Compou0s	Carbazole	ug/Kg dry	35.61						88	329	707	258	216	0	0	0	0	5.11	10.5	23.3	0	192	216	0	0	0	42.1	152	94	63	46.8	30.1	26.5	0	295
493-01-6	8270D (SIM) Semi-Volatile Organic Compou0s	cis-Decalin	ug/Kg dry							89	0	135	6.65	0	0	0	0	0	0	0	22.3	0	0	0	0	0	0	41.4	21.1	15.4	73.1	24.1	12.8	288	0	6.42
100-41-4	8270D (SIM) Semi-Volatile Organic Compou0s	Ethylbenzene	ug/Kg dry							90	80.8	332	16.9	20.8	0	0	0	0	3.65	6.68	18.7	0	134	317	0	0	0	15.7	51.8	28.5	14.2	11.8	8.84	29.9	0	103
98-82-8	8270D (SIM) Semi-Volatile Organic Compou0s	Isopropylbenzene	ug/Kg dry							91	139	293	0	0	0	0	0	0	0	0	0	0	14	26.8	0	0	0	0	11.4	7.6	0	0	0	0	0	38
	8270D (SIM) Semi-Volatile Organic Compou0s	m,p-Xylene	ug/Kg dry							92	707	1130	312	419	46	16.1	25.4	3.34	26.5	42.9	413	43.7	665	1540	20.2	2.28	0	253	500	377	302	130	211	539	15.3	611
108-87-2	8270D (SIM) Semi-Volatile Organic Compou0s	Methylcyclohexane	ug/Kg dry							93	30.6	130	12.1	14	0	0	0	0	0	5.1	4.98	0	109	227	0	0	0	14.6	32.8	43.6	7	8.29	4.65	8.51	0	6.85
104-51-8	8270D (SIM) Semi-Volatile Organic Compou0s	n-Butylbenzene	ug/Kg dry							94	114	0	17.5	19.8	5.49	0	2.64	0	3.79	6.89	35.1	5.14	108	100	0	0	0	19.3	33.1	30.2	28.5	16.1	14.6	76.8	0	119
103-65-1	8270D (SIM) Semi-Volatile Organic Compou0s	n-Propylbenzene	ug/Kg dry							95	74.4	178	11.9	13.9	0	0	0	0	0	3.1	17.5	0	56.6	75.8	0	0	0	8.33	21.6	18.4	10.4	7.34	7.27	25.7	0	97.5
95-47-6	8270D (SIM) Semi-Volatile Organic Compou0s	o-Xylene	ug/Kg dry							96	27.2	269	16.1	26.7	0	0	0	0	0	4.25	14.8	0	103	301	0	0	0	16.3	37.4	34.3	10.4	9.58	10.6	18.3	0	275
99-87-6	8270D (SIM) Semi-Volatile Organic Compou0s	p-Isopropyltoluene	ug/Kg dry							97	27.8	293	16.1	14.8	15.3	0	0	0	0	13.9	15.2	6.37	47.4	74.1	0	0	0	19.1	46.7	33.8	37	12.3	29.3	17.5	4.46	48.7
135-98-8	8270D (SIM) Semi-Volatile Organic Compou0s	sec-Butylbenzene	ug/Kg dry							98	0	55.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.71	0	0	0	0	4.7	0	15
100-42-5	8270D (SIM) Semi-Volatile Organic Compou0s	Styrene	ug/Kg dry							99	354	808	58.7	90.4	46.9	26.4	6.76	4.07	11.8	14	58.9	10.3	422	393	8.75	5.12	5.04	77.6	211	83.7	108	64.5	84.2	284	8.5	155
98-06-6	8270D (SIM) Semi-Volatile Organic Compou0s	t-Butylbenzene	ug/Kg dry							100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108-88-3	8270D (SIM) Semi-Volatile Organic Compou0s	Toluene	ug/Kg dry							101	372	1410	210	261	87.1	20.8	20.2	6.28	39.4	210	257	48.3	437	887	17.5	3.3	3.61	284	1530	1110	276	350	273	623	24	260
493-02-7	8270D (SIM) Semi-Volatile Organic Compou0s	trans-Decalin	ug/Kg dry							102	11.4	384	31.5	11	0	0	0	3.23	30.9	2.8	150	0	25	31.2	0	0	0	293	73.7	43.9	564	196	101	2230	0	53.4
3891-98-3	Saturated Hydrocarbons by GC/FID	2,6,10-trimethyldodecane (1380)	mg/Kg dry							103	49.5	12700	43.6	41.5	7.2	4.16	4.21	4.39	41.9	18.5	165	5.76	65.9	98.6	10.1	0	0	384	978	467	205	85.1	70.5	508	0	34.2
3892-00-0	Saturated Hydrocarbons by GC/FID	2,6,10-trimethylpeadecane (1650)	mg/Kg dry							104	54.6	15600	54.4	53.5	8.7	4.57	10.1	10.3	74.5	28.6	259	10.3	60.9	96	8.07	0	0	613	1470	1010	231	195	78.7	609	0	38.5
3891-99-4	Saturated Hydrocarbons by GC/FID	2,6,10-trimethyltridecane (1470)	mg/Kg dry							105	147	15900	101	101	18.3	10.4	15.4	12.9	79.6	38.2	289	19.5	183	249	18.9	0	0	635	1460	833	319	168	136	695	5.56	68.1
	Classical Chemistry	Black Carbon (Average)	mg/kg							106																										
	Saturated Hydrocarbons by GC/FID	C-10	mg/Kg dry							107	344	0	160	285	87.4	42.5	53.9	33	71.2	89.8	331	99.8	386	518	31	11.2	7.59	270	664	478	142	74.8	133	147	22.9	
	Saturated Hydrocarbons by GC/FID	C-11	mg/Kg dry							108	162	0	84.3	102	58.9	30.7	42.8	27.3	46.7	65.5	158	65.6	246	357	29.8	14.4	8.82	154	585	442	103	51.4	46.5	86.5	8.44	
	Saturated Hydrocarbons by GC/FID	C-12	mg/Kg dry							109																										
	Saturated Hydrocarbons by GC/FID	C-13	mg/Kg dry							110																										
	Saturated Hydrocarbons by GC/FID	C-14	mg/Kg dry							111																										
	Saturated Hydrocarbons by GC/FID	C-15	mg/Kg dry							112																										
	Saturated Hydrocarbons by GC/FID	C-16	mg/Kg dry							113																										
	Saturated Hydrocarbons by GC/FID	C-17	mg/Kg dry							114																										147
	Saturated Hydrocarbons by GC/FID	C-18	mg/Kg dry							115																										65.1
	Saturated Hydrocarbons by GC/FID	C-19	mg/Kg dry							116																										
	Saturated Hydrocarbons by GC/FID	C-21	mg/Kg dry							117																										
	Saturated Hydrocarbons by GC/FID	C-22	mg/Kg dry							118																										
	Saturated Hydrocarbons by GC/FID	C-23	mg/Kg dry							119																										
	Saturated Hydrocarbons by GC/FID	C-24	mg/Kg dry							120																										
	Saturated Hydrocarbons by GC/FID	C-25	mg/Kg dry							121																										
	Saturated Hydrocarbons by GC/FID	C-26	mg/Kg dry							122																										
	Saturated Hydrocarbons by GC/FID	C-27	mg/Kg dry							123																										
	Saturated Hydrocarbons by GC/FID	C-28	mg/Kg dry							124																										
	Saturated Hydrocarbons by GC/FID	C-29	mg/Kg dry							125																										
	Saturated Hydrocarbons by GC/FID	C-30	mg/Kg dry							126																										
	Saturated Hydrocarbons by GC/FID	C-31	mg/Kg dry							127																										
	Saturated Hydrocarbons by GC/FID	C-32	mg/Kg dry							128																										
	Saturated Hydrocarbons by GC/FID	C-33	mg/Kg dry							129																										
	Saturated Hydrocarbons by GC/FID	C-34	mg/Kg dry							130																										
	Saturated Hydrocarbons by GC/FID	C-35	mg/Kg dry							131																										
	Saturated Hydrocarbons by GC/FID	C-36	mg/Kg dry							132																										
	Saturated Hydrocarbons by GC/FID	C-37	mg/Kg dry							133																										
	Saturated Hydrocarbons by GC/FID	C-38	mg/Kg dry							134																										
	Saturated Hydrocarbons by GC/FID	C-39	mg/Kg dry							135																										
	Saturated Hydrocarbons by GC/FID	C-40	mg/Kg dry							136																										
	Saturated Hydrocarbons by GC/FID	C-8	mg/Kg dry							137																										
	Saturated Hydrocarbons by GC/FID	C-9	mg/Kg dry							138																										
638-36-8	Saturated Hydrocarbons by GC/FID	Phytane	mg/Kg dry	34.53						141	114	25800	118	145	19.8	4.89	10.3	10.2	127	44.9	477	14.3	69	88.5	10.6	7.72	4.95	1200	3390	2470	572	382	215	1400	0	76.7
1921-70-6	Saturated Hydrocarbons by GC/FID	Pristane	mg/Kg dry	32.65						142	121	30900	136	124	10.1	4.35	11.5	18.1	143	46.4	601	13.4	107	152	27.5	8.15	5.45	1390	3220	1980	653	499	219	1660	0	99.6
TOC	Classical Chemistry	Total Organic Carbon (Average)	mg/kg							145	40900	70500	16900	32400	33900	7610	1860	701	3620	4340	49000	21400	146000	165000	1980	ND	529	69100	49600	40700	34300	7080	24500	27800	9490	22200
	TPAH16										35638	1861000	23807.6	22562	30.61	2.94	384.85	37.29	3228.8	6176.3	4792.3	506.83	20737	21828	1112.75	94.53	40.76	32187	232600	67286	7171.9	7691.8	3800.5	5607.9	0	26088
	TPAH34										46639	2864700	33992	30956.6	604.5	761.99	675.61	193.75	5233.8	9702.7	9530.5	1688.72	29916	32795	2482.19	145.93	67.45	53636	361397	152402	11916.9	11872.6	6296.4	11695.6	538.65	38283
	TPAH51										51436.6	3292280	38199.3	34477.3	706.64	767.27	789.67	219.03	6124.6	11079.8	10917.3	1901.46	33858.8	37328.6	2993.68	151.78	70.46	60726.7	409427	177218	13838.2	13478.6	7318.3	13769.1	570.25	43623.6
	LPAH										5627.8	852400	3473.7	3030.3	27.31	5.16	51.92	11.38	477.5	665.3	879.9	68.17	3413	3788	53.25	12.26	0	9708	54280	26277	1112.2	1303.2	617.6	1148.9	0	6273
	HPAH										30102	1016800	20411	19601	8.77	0	338.09	28.7	2787.8	5557.1	3962.2	446.99	17505	18305	1059.5	82.27	40.76	22677	179460	42319	6096	6437	3205.6	4510.6	0	19931

(does not include source area samples collected in 2017)

Attachment B. Complete Sediment Data Set
Amesbury Former MGP
Amesbury, Massachusetts

											Upstream	Upstream	Upstream	Upstream	Upstream	Upstream	Upstream	Upstream	Upstream	River	River	River	River	River	River	River	River	River	River	River	River	River	River
										Sample No.	F230038-01	F230037-02	F230038-02	F230037-03	F230038-03	F230037-04	F230038-04	F230042-01	F230042-02	F230042-03	F230042-04	F230041-01	F230041-02	F230041-03	F230029-10	F230029-11	F230029-12	F230029-13	F230029-14	F230029-01	F230029-02	F230029-05
										Sample Date:	2/Nov/2023	2/Nov/2023	2/Nov/2023	2/Nov/2023	2/Nov/2023	2/Nov/2023	2/Nov/2023	28/Nov/2023	28/Nov/2023	28/Nov/2023	28/Nov/2023	27/Nov/2023	27/Nov/2023	27/Nov/2023	08/29/2023	08/29/2023	08/29/2023	08/29/2023	08/29/2023	8/28/2023	8/28/2023	08/29/2023
										Sample Time:																							
										ClieSam	857-S2	857-S3	857-S4	858-S1	858-S2	858-S3	858-S4	859-S1	859-S2	860-S1	860-S2	861-S1	862-S1	869-S1	843-S1	843-S2	844-S1	844-S2	844-S3	845-S1	845-S2	846-S1
										Depths:	1-2	2-3	4-5	0-1	1-2	2-3	4-5	0-1	1-2	0-1	1-2	0-1	0-1	0-1	0-0.5	1-2	0-0.5	1-2	3-3.5	0-1	1-2	0-0.5
										RAH																						
										%solids	77	54	70	51	73	85	79	61	72	70	80	26	33	63	59	77	59	58	44	47	55	51
CAS Number	Method Name	Analyte	Units	RT		PAH17	PAH34	PAH51	Abbrev	PAH #														10							5	
		Max RL for ND PAHs=								1																						
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzo(b)thiophenes	ug/Kg dry	17					C1BT	2	31.5	282	66.8	17.4	39.9	18.4	41.2	27.4	7.33	38.6	55.8	39.6	36.6	17	2310	463	96.3	100	349	16.5	0	18.2
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzo(b)thiophenes	ug/Kg dry	18					C2BT	3	46.9	287	108	36.4	55.1	33.3	70.4	41.4	10.4	119	62.2	78	57.2	24.3	78.5	648	59.8	95.6	716	26.2	0	37.5
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzo(b)thiophenes	ug/Kg dry	19					C3BT	4	36.7	472	106	18.2	44.2	25.4	59.9	43.5	7.57	217	42.3	33.5	27	15.1	54.5	343	36.8	68.8	681	26.6	0	13.2
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzo(b)thiophenes	ug/Kg dry	20					C4BT	5	25.1	468	90.3	10.2	26.9	11.9	32.4	26.6	2.68	88.9	16.4	16.3	14.6	0	24.1	125	17.9	68.5	629	34.5	0	7.35
91-20-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Naphthalene**	ug/Kg dry	21.86	L	x	x	x	NA	6	122	1550	1250	66.1	297	193	1220	2990	69.7	602	1820	650	266	181	1130	2880	276	227	2930	43.7	0	74.9
91-57-6	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylnaphthalene	ug/Kg dry	24.57	L	x		x	2MN	7	98.8	821	604	43.7	176	124	511	2460	51.4	478	1150	389	198	106	469	1170	177	153	2040	34.4	0	40.8
90-12-0	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylnaphthalene	ug/Kg dry	25				x	1MN	8	75.9	677	526	33.2	151	121	447	811	117	329	729	338	132	80.8	395	1630	100	109	1370	19.3	0	29.1
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Naphthalenes	ug/Kg dry	24.57			x	x	C1N	9	108	923	692	47.6	200	150	588	2030	101	500	1150	446	204	114	552	1770	179	171	2210	36	0	46.3
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Naphthalenes	ug/Kg dry	27.02			x	x	C2N	10	212	2610	1090	128	339	292	837	2630	331	2190	1140	581	395	211	726	3230	269	432	5240	112	10.4	123
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Naphthalenes	ug/Kg dry	29.76			x	x	C3N	11	251	6970	1050	129	344	267	805	3360	170	3970	775	313	307	175	577	1650	218	594	5890	273	5.13	81.5
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Naphthalenes	ug/Kg dry	32.52			x	x	C4N	12	195	6080	740	71.7	240	138	427	2560	59	2130	395	147	208	119	323	855	107	560	3800	569	6.49	61.8
92-52-4	8270D (SIM) Semi-Volatile Organic Compou0s	Biphenyl	ug/Kg dry	26.46					BP	13	40.6	316	210	20.3	72.7	57.5	171	980	16.5	87.5	209	125	95.3	65.2	162	298	70.6	125	700	18	0	24.7
208-96-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Acenaphthylene**	ug/Kg dry	28.16	L	x	x	x	ACE	14	359	1100	1190	642	589	530	1070	2950	18.5	420	202	424	1200	297	594	2140	502	603	4100	104	0	403
83-32-9	8270D (SIM) Semi-Volatile Organic Compou0s	**Acenaphthene**	ug/Kg dry	28.89	L	x	x	x	ACY	15	374	3950	2250	103	802	533	2220	1570	553	2220	905	1590	456	263	1290	6720	491	359	6270	20.1	0	85.6
132-64-9	8270D (SIM) Semi-Volatile Organic Compou0s	Dibenzofuran	ug/Kg dry	29.54				x	DBF	16	167	1810	1060	82.1	356	283	1390	198	14.9	541	671	820	232	164	1030	354	186	135	723	14.8	0	44.4
86-73-7	8270D (SIM) Semi-Volatile Organic Compou0s	**Fluorene**	ug/Kg dry	30.91	L	x	x	x	FLE	17	290	3760	1880	148	635	400	2160	1920	79.3	1940	1100	1590	426	287	1250	2770	384	353	2810	29.2	0	102
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Fluorenes	ug/Kg dry	33.14			x	x	C1FL	18	173	1890	854	106	278	213	789	4360	101	2400	737	343	256	148	419	1070	187	252	2320	133	0	61
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Fluorenes	ug/Kg dry	35.22			x	x	C2FL	19	197	3130	814	137	316	208	702	5150	50.4	2140	543	222	307	187	457	972	142	423	2660	310	7.65	69.9
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Fluorenes	ug/Kg dry	38.01			x	x	C3FL	20	335	3860	1230	196	561	376	1080	2670	29.6	1100	401	434	488	248	842	898	212	566	2590	227	4.57	148
132-65-0	8270D (SIM) Semi-Volatile Organic Compou0s	Dibenzothiophene	ug/Kg dry	34.23				x	DBT	21	281	2030	1170	134	435	351	1500	243	10.2	814	386	635	280	227	925	1390	323	240	2270	82.7	0	88.3
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Dibenzothiophenes	ug/Kg dry	36.43				x	C1DBT	22	223	2400	1030	150	373	292	884	679	18.3	1410	362	330	293	182	616	1420	257	373	3310	103	0	94.8
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Dibenzothiophenes	ug/Kg dry	37.7				x	C2DBT	23	279	3120	1180	184	413	290	765	1040	15.4	1370	287	273	342	182	549	1410	195	555	3830	181	0	133
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Dibenzothiophenes	ug/Kg dry	39.5				x	C3DBT	24	214	2740	995	123	323	220	494	850	12	866	173	155	221	117	299	1090	104	525	3160	129	0	82.7
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Dibenzothiophenes	ug/Kg dry	41.65				x	C4DBT	25	144	1610	640	67.8	186	149	292	446	11.8	381	91.2	94.3	134	70.3	167	671	85.1	347	1870	64.2	0	51.8
85-01-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Phenanthrene**	ug/Kg dry	34.72	L	x	x	x	PHE	26	2860	28900	18200	1930	6460	4180	25700	9050	319	10600	4920	9320	4100	2680	13700	12300	3340	2580	21400	146	3.44	852
120-12-7	8270D (SIM) Semi-Volatile Organic Compou0s	**Anthracene**	ug/Kg dry	34.91	L	x	x	x	ANT	27	911	7300	4530	832	1810	1330	5820	7520	128	6800	2280	3090	1820	948	3440	4140	1160	1030	8730	110	0	447
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Phenanthrenes/Anthracenes	ug/Kg dry	36.96				x	C1PH	28	1180	10500	6600	1090	2520	1850	6320	24100	300	14400	3490	2750	2490	1220	4620	5920	1370	1790	13400	223	5.3	589
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Phenanthrenes/Anthracenes	ug/Kg dry	38.97				x	C2PH	29	778	7010	3890	653	1390	984	2900	19100	187	9320	2120	1180	1620	778	2350	3100	627	1440	8660	268	0	463
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Phenanthrenes/Anthracenes	ug/Kg dry	40.8				x	C3PH	30	367	3510	1960	261	626	443	1180	7340	447	3660	936	464	734	345	967	1560	299	850	4800	195	3.47	208
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Phenanthrenes/Anthracenes	ug/Kg dry	41.72				x	C4PH	31	168	1490	1000	93.6	255	178	449	2710	1310	1450	369	200	360	147	387	733	277	453	2240	92.3	0	83.6
483-65-8	8270D (SIM) Semi-Volatile Organic Compou0s	Retene	ug/Kg dry	41.72				x	RET	32	46.5	0	534	39.4	98	41.8	89.5	1310	5550	1290	315	265	533	138	143	285	851	396	520	29.7	6.07	48.6
239-35-0	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)naphtho(2,1-d)thiophene	ug/Kg dry	44.24					BNT	33	355	1960	1400	293	652	488	1620	847	7.85	878	346	831	882	288	1050	1060	370	419	2680	63.2	0	263
	8270D (SIM) Semi-Volatile Organic Compou0s	C0-Benzonaphthothiophenes	ug/Kg dry	44.24					C0BNT	34	662	3550	2720	539	1200	911	3040	1700	20.4	2430	787	1540	1550	544	2000	2010	751	798	4910	119	0	482
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzonaphthothiophenes	ug/Kg dry	45.63					C1BNT	35	379	2210	1540	337	616	498	1240	2030	20.9	1660	524	565	791	369	922	1360	305	593	3440	93.3	0	254
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzonaphthothiophenes	ug/Kg dry	47.14					C2BNT	36	362	2110	1140	288	501	405	789	1520	15.3	1090	352	358	620	284	604	1190	207	619	2880	89.9	0	170
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzonaphthothiophenes	ug/Kg dry	49.02					C3BNT	37	353	1610	829	261	395	296	513	1250	10.6	499	178	267	461	243	439	934	157	516	2110	80	0	142
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzonaphthothiophenes	ug/Kg dry	51.51					C4BNT	38	214	877	334	206	218	152	209	380	7.8	169	57.4	145	262	138	184	447	79.6	277	876	45.3	0	63.4
206-44-0	8270D (SIM) Semi-Volatile Organic Compou0s	**Fluoranthene**	ug/Kg dry	39.51	H	x	x	x	FLA	39	5190	32700	25200	3590	9100	5450	30700	26000	255	20000	4830	11400	9370	4920	16400	12200	4830	4760	27700	454	8.33	2690
129-00-0	8270D (SIM) Semi-Volatile Organic Compou0s	**Pyrene**	ug/Kg dry	40.39	H	x	x	x	PYR	40	4360	27000	24100	3140	7750	4700	25000	56400	480	15100	4470	9350	8700	4400	14600	14700	5130	4920	35000	912	12.2	3100
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Fluoranthenes/Pyrenes	ug/Kg dry	41.78				x	C1PY	41	1740	10600	8900	1630	3350	2380	7570	49500	386	15900	4440	4500	4860	1860	5510	7770	2110	2840	19800	527	8.06	1960
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Fluoranthenes/Pyrenes	ug/Kg dry	43.52				x	C2PY	42	1120	5670	3790	1060	1990	1490	4060	21200	126	6520	2150	1960	2830	1060	3640	2910	826	1620	7170	244	7.33	807
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Fluoranthenes/Pyrenes	ug/Kg dry	45.72				x	C3PY	43	525	2660	1850	444	879	659	1670	7280	50.2	2630	950	646	1180	460	1380	1250	334	772	3080	123	0	300
243-17-4	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)fluorene	ug/Kg dry	42.03				x	BbF	44	181	1690	1170	160	423	293	1100	4440	31.2	2830	708	800	603	209	455	920	289	313	2490	58.6	0	213
205-12-9	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(c)fluorene	ug/Kg dry	42.07				x	BcF	45	102	552	595	76.6	175	117	502	1700	16.4	1160	260	309	271	90.5	230	431	117	130	943	30.2	0	97.3
3442-78-2	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylpyrene	ug/Kg dry	42.18				x	2MP	46	244	1340	1160	240	454	323	968	7420	51.6	1650	513	521	648	267	801	1040	271	393	2630	73.3	0	293
3353-12-6	8270D (SIM) Semi-Volatile Organic Compou0s	4-Methylpyrene	ug/Kg dry	42.55				x	4MP	47	196	1050	920	210	352	266	707	8360	54	1220	415	365	557	229	700	992	229	393	2490	73.8	0	264
2381-21-7	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylpyrene	ug/Kg dry	42.67				x	1MP	48	157	860	787	163	288	215	582	7350	48.1	1150	349	299	432	185	621	894	217	312	2280	58.9	0	234
56-55-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Benz(a)anthracene**	ug/Kg dry	45.17	H	x	x	x	BaA	49	2250	11100	8860	1900	4380	2940	9430	27600	188	8560	3160	5840	5400	2140	7760	6390	2520	2650	16700	348	4.49	2100
	8270D (SIM) Semi-Volatile Organic Compou0s	**Chrysene/triphenylene**	ug/Kg dry	45.36	H	x	x	x	CH	50	2350	11000	9280	1950	4390	3050	9150	25900	179	6840	2810	5550	5680	2200	7920	6570	2330	2880	17700	423	5.6	2190
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	46.81				x	C1CR	51	996	4970	4310	1030	1900	1370	3860	23200	141	6300	2350	2250	2810	1000	3420	3320	940	1750	9050	256	4.1	1010
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	48.52				x	C2CR	52	548	3030	2360	523	994	741	1890	13600	75.6	3670	1360	2210	1760	544	1780	1710	474	1130	4630	152	0	415
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	49.55				x	C3CR	53	362	1800	1360	287	613	433	1050	5510	32	2120	754	536	826	326	956	981	250	635	2480	90.6	0	191
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	50				x	C4CR	54	207	982	752	153	317	214	553	1930	18.8	1150	392	247	422	210	445	542	124	320	1290	58.4	0	94.4
205-99-2	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(b)fluoranthene**	ug/Kg dry	49.23	H	x	x	x	BbF	55	1830	9430	7670	1670	3590	2480	7730	14600	94.1	3630	1740	4660	4920	1760	6080	4370	1770	2050	11400	267	4.88	1630
	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(j/k)fluoranthene**	ug/Kg dry	49.29	H	x	x	x	BjF	56	1940	6970	7080	1600	3580	2320	6850	16300	101	5060	2220	4810	4690	1720	6100	5030	1960	2300	13300	303	4.24	1770
192-97-2	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(e)pyrene	ug/Kg dry	50.17			x	x	BeP	57	1510	6710	6560	1370	2830	1950	6130	24500	147	2700	1580	3730	4240	1520	5180	4210	1570	1930	11600	257	3.8	1580
50-32-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(a)pyrene**	ug/Kg dry	50.34	H	x	x	x	BaP	58	2320	9910	10000	2070	4450	3020	9380	36500	216	5620	2870	6060	6170	2370	8520	7510	2840	3040	20000	382	5.15	2600
198-55-0	8270D (SIM) Semi-Volatile Organic Compou0s	Perylene	ug/Kg dry	50.61			x	x	PE	59	670	2840	2640	526	1190	799	2830	5250	54.6	1170	604	1730	1680	615	2220	1470	617	882	3920	1150	496	574
193-39-5	8270D (SIM) Semi-Volatile Organic Compou0s	**Indeno(1,2,3-cd)pyrene**	ug/Kg dry	54	H	x	x	x	I123P	60	1630	7790	7090	1460	3070	2110	6770	15400	84.9	2540	1420	4160	4250	1570	5840	4670	1780	2050	12300	265	3.98	1680
53-70-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Dibenzo(a,h)anthracene**	ug/Kg dry	54.01	H	x	x	x	DBA	61	382	1750	1770	344	737	506	1470	4510	25.9	880	452	977	1110	361	1310	1010	378	459	2610	59	0	357
191-24-2	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(g,h,i)perylene**	ug/Kg dry	54.91	H	x	x	x	BGP	62	1330	6380	6160	1200	2460	1690	5680	19100	105	1690	1150	3290	3670	1370	4840	3910	1470	1730	10600	223	3.4	1440
191-07-1	8270D (SIM) Semi-Volatile Organic Compou0s	Coronene	ug/Kg dry	61.34				x	COR	63	347	1750	1790	313	628	443	1510	3830	22.5	399	276	914	993	392	1290	1180	438	501	3360	67.6	0	439
526-73-8	8270D (SIM) Semi-Volatile Organic Compou0s	1,2,3-Trimethylbenzene	ug/Kg dry							64	16	47.6	53.9	11.7	15.4	10.2	8.85	20.6	9.81	14.2	32.7	18.8	22.3	0	44.8	45.4	15.2	54.9	345	4.65	0	10.8
95-63-6	8270D (SIM) Semi-Volatile Organic Compou0s	1,2,4-Trimethylbenzene	ug/Kg dry							65	38.9	160	119	15.1	47.9	22.9	23.2	168	38.6	79.6	235	23.4	44.9	23.3	122	117	30.8	173	1690	9.58	0	15.2
108-67-8	8270D (SIM) Semi-Volatile Organic Compou0s	1,3,5-Trimethylbenzene	ug/Kg dry							66	13.3	46.3	51.5	5.7	18.7	5.91	7.54	57.7	10.7	22.2	70.2	10.5	24.1	0	81.4	39.1	11.6	46.4	380	0	0	6.86
	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methyldibenzothiophene	ug/Kg dry	36.76						67	41	277	103	19.7	48.2	30	86.2	50.5	0	133	29.2	32.2	28.6	20.4	76.5	185	32.2	51.4	417	15.3	0	12.5
	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylphenanthrene	ug/Kg dry	37.24						68	192	1600	911	165	400	278	951	3450	55.1	1980	444	396	390	198	709	988	207	282	2080	18.6	0	90.3
	8270D (SIM) Semi-Volatile Organic Compou0s	2,3,5-Trimethylnaphthene	ug/Kg dry	30.44						69	15.8	445	80.5	8.31	23	23.1	70.3	184	12.2	340	57.6	23.3	19.7	0	50.2	97.9	17.1	36.1	367	9.37	0	5.02
581-42-0	8270D (SIM) Semi-Volatile Organic Compou0s	2,6-Dimethylnaphthalene	ug/Kg dry	27.07						70	50.1	332	242	32	71.8	53.1	164	371	29.7	358	328	196	156	64.6	183	669	85.4	106	1080	35.1	3.75	53.9
	8270D (SIM) Semi-Volatile Organic Compou0s	2/3-Methyldibenzothiophene	ug/Kg dry	36.31						71	70.3	958	343	48.9	126	101	297	195	5.81	446	119	117	95.5	58.8	214	476	82.2	127	1080	30.7	0	30.2
	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylanthracene	ug/Kg dry	36.96						72	156	1090	815	160	295	228	852	4420	38.4	3250	753	383	375	165	578	655	192	208	1560	47.6	0	96.2
	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylphenanthrene	ug/Kg dry	36.81						73	319	2940	1780	289	720	512	1740	3280	62	3560	829	795	643	299	1300	1530	356	431	3450	39.9	0	141
	8270D (SIM) Semi-Volatile Organic Compou0s	3-Methylphenanthrene	ug/Kg dry	36.69						74	256	2590	1470	235	572	416	1440	5400	63.4	2560	698	638	512	268	1040	1330	301	379	2900	42.4	0	113
	8270D (SIM) Semi-Volatile Organic Compou0s	4/9-Methylphenanthrene	ug/Kg dry	37.14						75	255	2310	1450	243	528	400	1250	7370	78.4	2860	739	527	580	281	951	1410	300	426	3280	72.5	0	140
	8270D (SIM) Semi-Volatile Organic Compou0s	4-Methyldibenzothiophene	ug/Kg dry	36.01						76	74.9	926	301	48.5	124	90	233	303	5.27	272	80.3	101	97	66	184	508	77.5	139	1230	46.1	0	34.9
71-43-2	8270D (SIM) Semi-Volatile Organic Compou0s	Benzene	ug/Kg dry							77	77.8	271	139	109	115	61.8	45.1	225	15.8	50.6	68.3	280	170	78.6	434	130	201	277	311	66.1	23.2	151

Attachment B. Complete Sediment Data Set
Amesbury Former MGP
Amesbury, Massachusetts

												Upstream	Upstream	Upstream	Upstream	Upstream	Upstream	Upstream	Upstream	Upstream	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River
											Sample No.	F230038-01	F230037-02	F230038-02	F230037-03	F230038-03	F230037-04	F230038-04	F230042-01	F230042-02	F230042-03	F230042-04	F230041-01	F230041-02	F230041-03	F230029-1(	F230029-11	F230029-12	F230029-13	F230029-14	F230029-01	F230029-02	F230029-05	F230029-06	F230029-07	F230029-08	F230029-09	F230029-10	F230029-03	F230029-04
											Sample Date:	2/Nov/2023	2/Nov/2023	2/Nov/2023	2/Nov/2023	2/Nov/2023	2/Nov/2023	2/Nov/2023	28/Nov/2023	28/Nov/2023	28/Nov/2023	28/Nov/2023	27/Nov/2023	27/Nov/2023	27/Nov/2023	08/29/2023	08/29/2023	08/29/2023	08/29/2023	08/29/2023	8/28/2023	8/28/2023	08/29/2023	8/28/2023	8/28/2023	8/28/2023	8/28/2023	8/28/2023	8/28/2023	8/28/2023
											Sample Time:																													
											ClieSam	857-S2	857-S3	857-S4	858-S1	858-S2	858-S3	858-S4	859-S1	859-S2	860-S1	860-S2	861-S1	862-S1	869-S1	843-S1	843-S2	844-S1	844-S2	844-S3	845-S1	845-S2	846-S1	846-S2	847-S1	847-S2	848-S1	848-S2	849-S1	849-S2
											Depths:	1-2	2-3	4-5	0-1	1-2	2-3	4-5	0-1	1-2	0-1	1-2	0-1	0-1	0-1	0-0.5	1-2	0-0.5	1-2	3-3.5	0-1	1-2	0-0.5	1-2	0-0.5	1-2	0-0.5	1-2	0-0.5	1-2
											RAH																												
											%solids	77	54	70	51	73	85	79	61	72	70	80	26	33	63	59	77	59	58	44	47	55	51	56	57	58	57	58	57
CAS Number	Method Name	Analyte	Units	RT		PAH17	PAH34	PAH51	Abbrev	PAH #															10						5								
11095-43-5	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)thiophene	ug/Kg dry							78	0	52.1	81.2	6.98	16.5	9.4	50.1	15.8	0	30.7	67.4	17.5	13.9	0	44.2	195	18.4	13.8	159	0	0	5.39	0	0	0	0	0	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzene	ug/Kg dry							79	78.2	320	351	176	158	53.6	58.5	514	122	263	400	369	324	187	506	415	341	390	2710	158	61.8	198	0	0	0	0	0	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Decalins	ug/Kg dry							80	143	18900	515	19.3	166	230	386	427	9.66	97.1	18.4	33.7	54.4	40.5	81.3	507	36.3	2670	4860	144	0	28.4	0	0	0	0	0	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzenes	ug/Kg dry							81	143	791	270	604	176	51.8	87.4	689	42.3	194	357	973	704	653	1180	471	432	613	1290	167	54.3	431	0	0	0	0	0	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Decalins	ug/Kg dry							82	122	6140	692	24.7	160	100	346	748	8.46	219	27.6	40.4	63.7	46	87	619	0	905	5820	252	0	21.3	0	0	0	0	0	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzenes	ug/Kg dry							83	98.4	327	229	63	134	54.8	53.8	510	71.8	146	358	141	119	325	972	297	120	321	2250	30.3	8.37	51.4	0	0	0	0	0	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Decalins	ug/Kg dry							84	91.9	2450	459	16.4	125	63.8	113	538	5.44	152	20.9	31.5	41.2	0	57.8	414	0	450	4340	254	0	14.1	0	0	0	0	0	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzenes	ug/Kg dry							85	109	2410	283	65	117	120	76.2	251	136	141	211	209	105	59.5	388	509	119	702	3280	41.9	0	45.9	0	0	0	0	0	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Decalins	ug/Kg dry							86	165	4730	580	34.3	247	182	146	581	8.79	167	33.6	49.3	86.1	0	0	557	0	890	5380	535	0	0	0	0	0	0	0	0
	8270D (SIM) Semi-Volatile Organic Compou0s	C5-Benzenes	ug/Kg dry							87	90	3350	229	51.1	94.1	84.1	75	177	79.2	148	68.7	191	75.5	38.7	149	308	71.5	650	2270	48.6	0	35.2	0	0	0	0	0	0
86-74-8	8270D (SIM) Semi-Volatile Organic Compou0s	Carbazole	ug/Kg dry	35.61						88	355	3970	1610	189	818	586	3010	91.7	3.7	95	508	1520	510	313	2020	350	267	267	645	20.2	0	125	0	0	0	0	0	0
493-01-6	8270D (SIM) Semi-Volatile Organic Compou0s	cis-Decalin	ug/Kg dry							89	15.1	1770	37.1	0	0	20	24.2	24.3	0	14.1	0	0	0	0	0	25.8	0	205	263	15.3	0	0	0	0	0	0	0	0
100-41-4	8270D (SIM) Semi-Volatile Organic Compou0s	Ethylbenzene	ug/Kg dry							90	21.3	95	60.5	24.3	32.2	10.7	15.5	444	8.21	29.2	123	92.6	38.5	319	973	84.4	196	38.4	176	6.78	0	17.1	0	0	0	0	0	0
98-82-8	8270D (SIM) Semi-Volatile Organic Compou0s	Isopropylbenzene	ug/Kg dry							91	0	15.7	10.7	0	0	2.49	0	16.1	0	4.94	14.9	0	0	557	913	0	17.2	13.8	61.5	0	0	0	0	0	0	0	0	0
	8270D (SIM) Semi-Volatile Organic Compou0s	m,p-Xylene	ug/Kg dry							92	185	1170	333	985	224	65.3	117	668	47.7	260	423	1550	1100	749	868	598	431	849	1570	236	63.2	633	0	0	0	0	0	0
108-87-2	8270D (SIM) Semi-Volatile Organic Compou0s	Methylcyclohexane	ug/Kg dry							93	24.1	391	92.5	9.69	36.3	11.1	14.8	12.8	13.2	5.09	11.3	22	59.4	18.2	65.2	74.5	15.1	45.3	186	4.45	0	7.79	0	0	0	0	0	0
104-51-8	8270D (SIM) Semi-Volatile Organic Compou0s	n-Butylbenzene	ug/Kg dry							94	16.7	0	25.5	46.9	20.8	25.3	10.2	41.4	9.81	0	0	352	44.2	15.8	48.7	39.7	48.3	109	360	14.6	0	27	0	0	0	0	0	0
103-65-1	8270D (SIM) Semi-Volatile Organic Compou0s	n-Propylbenzene	ug/Kg dry							95	15.6	101	23.1	25.2	18.9	11	7.54	70.9	4.45	10.7	22.1	163	24	48	431	26.4	35.1	51.1	309	6.44	0	16.8	0	0	0	0	0	0
95-47-6	8270D (SIM) Semi-Volatile Organic Compou0s	o-Xylene	ug/Kg dry							96	19.6	69.5	75	14.6	33.7	10.9	13.3	85.2	13.4	35.7	93.2	27	42.2	85.7	201	59.4	35.4	38.7	256	7.35	0	17.1	0	0	0	0	0	0
99-87-6	8270D (SIM) Semi-Volatile Organic Compou0s	p-Isopropyltoluene	ug/Kg dry							97	0	35.8	95.7	19.9	0	23.9	7.76	25.3	65.8	38.3	44.4	39.3	32.9	16.5	61.5	33.1	65.4	50.6	161	13.5	3.57	13	0	0	0	0	0	0
135-98-8	8270D (SIM) Semi-Volatile Organic Compou0s	sec-Butylbenzene	ug/Kg dry							98	0	127	7.78	0	0	4.75	0	0	0	0	0	0	0	0	91.8	0	0	0	47.7	0	0	0	0	0	0	0	0	0
100-42-5	8270D (SIM) Semi-Volatile Organic Compou0s	Styrene	ug/Kg dry							99	74.3	232	64.8	69	164	55.3	80.9	662	10.4	23.9	20.1	33.9	70.8	1990	512	357	2070	1590	1900	36.6	13.4	72.1	0	0	0	0	0	0
98-06-6	8270D (SIM) Semi-Volatile Organic Compou0s	t-Butylbenzene	ug/Kg dry							100	0	27.7	3.31	0	0	0	2.56	0	0	0	29.7	0	0	0	0	0	0	0	79.3	0	0	0	0	0	0	0	0	0
108-88-3	8270D (SIM) Semi-Volatile Organic Compou0s	Toluene	ug/Kg dry							101	106	415	461	245	209	70.8	74.1	677	163	350	531	512	430	249	631	508	426	476	3330	201	79.1	246	0	0	0	0	0	0
493-02-7	8270D (SIM) Semi-Volatile Organic Compou0s	trans-Decalin	ug/Kg dry							102	75.7	12300	117	5.25	56.6	153	70.9	63.2	7.5	35.2	8.09	16.4	25.3	14.6	48.8	126	0	1820	1410	59.8	0	6.07	0	0	0	0	0	0
3891-98-3	Saturated Hydrocarbons by GC/FID	2,6,10-trimethyldodecane (1380)	mg/Kg dry							103	75.4	4340	617	15.6	96.3	48.7	85	766	11.9	250	36.2	41.4	50.2	20.8	48.9	451	26.5	482	8910	121	5.14	22.5	0	0	0	0	0	0
3892-00-0	Saturated Hydrocarbons by GC/FID	2,6,10-trimethylpeadecane (1650)	mg/Kg dry							104	83.9	4130	1010	26.8	125	81.3	113	730	11.2	194	38.3	41.6	62.9	33	64	549	34.8	698	10200	966	5.71	32.5	0	0	0	0	0	0
3891-99-4	Saturated Hydrocarbons by GC/FID	2,6,10-trimethyltridecane (1470)	mg/Kg dry							105	145	5040	918	55.9	160	86.4	147	1230	32.1	397	74.9	240	210	62.9	127	635	79.2	818	10900	542	16.2	65.2	0	0	0	0	0	0
	Classical Chemistry	Black Carbon (Average)	mg/kg							106																												
	Saturated Hydrocarbons by GC/FID	C-10	mg/Kg dry							107																												
	Saturated Hydrocarbons by GC/FID	C-11	mg/Kg dry							108																												
	Saturated Hydrocarbons by GC/FID	C-12	mg/Kg dry							109																												
	Saturated Hydrocarbons by GC/FID	C-13	mg/Kg dry							110																												
	Saturated Hydrocarbons by GC/FID	C-14	mg/Kg dry							111																												
	Saturated Hydrocarbons by GC/FID	C-15	mg/Kg dry							112																												
	Saturated Hydrocarbons by GC/FID	C-16	mg/Kg dry							113																												
	Saturated Hydrocarbons by GC/FID	C-17	mg/Kg dry							114	243	0	215	177	255	197	220	453	85.3	546	97.3	421	520	218	348	317	239	300	634	1980	101	260	0	0	0	0	0	0
	Saturated Hydrocarbons by GC/FID	C-18	mg/Kg dry							115	199	0	266	94.8	200	173	210	228	48.5	154	76.4	126	164	102	187	244	131	187	643	92.9	45.3	103	0	0	0	0	0	0
	Saturated Hydrocarbons by GC/FID	C-19	mg/Kg dry							116																												
	Saturated Hydrocarbons by GC/FID	C-21	mg/Kg dry							117																												
	Saturated Hydrocarbons by GC/FID	C-22	mg/Kg dry							118																												
	Saturated Hydrocarbons by GC/FID	C-23	mg/Kg dry							119																												
	Saturated Hydrocarbons by GC/FID	C-24	mg/Kg dry							120																												
	Saturated Hydrocarbons by GC/FID	C-25	mg/Kg dry							121																												
	Saturated Hydrocarbons by GC/FID	C-26	mg/Kg dry							122																												
	Saturated Hydrocarbons by GC/FID	C-27	mg/Kg dry							123																												
	Saturated Hydrocarbons by GC/FID	C-28	mg/Kg dry							124																												
	Saturated Hydrocarbons by GC/FID	C-29	mg/Kg dry							125																												
	Saturated Hydrocarbons by GC/FID	C-30	mg/Kg dry							126																												
	Saturated Hydrocarbons by GC/FID	C-31	mg/Kg dry							127																												
	Saturated Hydrocarbons by GC/FID	C-32	mg/Kg dry							128																												
	Saturated Hydrocarbons by GC/FID	C-33	mg/Kg dry							129																												
	Saturated Hydrocarbons by GC/FID	C-34	mg/Kg dry							130																												
	Saturated Hydrocarbons by GC/FID	C-35	mg/Kg dry							131																												
	Saturated Hydrocarbons by GC/FID	C-36	mg/Kg dry							132																												
	Saturated Hydrocarbons by GC/FID	C-37	mg/Kg dry							133																												
	Saturated Hydrocarbons by GC/FID	C-38	mg/Kg dry							134																												
	Saturated Hydrocarbons by GC/FID	C-39	mg/Kg dry							135																												
	Saturated Hydrocarbons by GC/FID	C-40	mg/Kg dry							136																												
	Saturated Hydrocarbons by GC/FID	C-8	mg/Kg dry							137																												
	Saturated Hydrocarbons by GC/FID	C-9	mg/Kg dry							138																												
638-36-8	Saturated Hydrocarbons by GC/FID	Phytane	mg/Kg dry	34.53						141	216	9180	2080	63.3	332	195	293	943	15.4	154	33.1	126	162	75	107	1380	68.2	1520	16600	1340	9.59	73.6	0	0	0	0	0	0
1921-70-6	Saturated Hydrocarbons by GC/FID	Pristane	mg/Kg dry	32.65						142	218	12600	1810	58.4	337	211	310	1350	64.4	676	126	94.7	152	72.7	107	1120	62.8	1740	18900	2300	11	66.4	0	0	0	0	0	0
TOC	Classical Chemistry	Total Organic Carbon (Average)	mg/kg							145	22500	47400	67500	51000	12200	20900	91600	48600	34500	47400	27500	92500	92500	26600	86300	72800	26700	32200	106000	49200	50100	29500	0	0	0	0	0	0
	TPAH16										28498	170590	136510	22645.1	54100	35432	150350	268310	2896.4	92502	36349	72761	62228	27467	100774	97310	31161	31991	213550	4089	55.71	21521.5	0	0	0	0	0	0
	TPAH34										38495	249495	183312	31077	72363	48418	190310	467810	6837.4	168772	59885	95044	86195	37234	132505	139071	41133	49009	320130	9018.3	610.68	29281	0	0	0	0	0	0
	TPAH51										42896.2	280275	203113	34600.8	80063	54095.8	207781.5	537427	13038.4	193810	69670.2	104157.3	96074	41393.6	146215	158108	46132.1	56276	363666	10405.8	624.08	32541.8	0	0	0	0	0	0
	LPAH										5014.8	47381	29904	3764.8	10769	7290	38701	28460	1218.9	23060	12377	17053	8466	4762	21873	32120	6330	5305	48280	487.4	3.44	2005.3	0	0	0	0	0	0
	HPAH										23582	124030	107210	18924	43507	28266	112160	242310	1728.9	69920	25122	56097	53960	22811	79370	66360	25008	26839	167310	3636	52.27	19557	0	0	0	0	0	0

(does not include source area samples collected in 2017)

Attachment B. Complete Sediment Data Set
Amesbury Former MGP
Amesbury, Massachusetts

											River	River	River	River	River	River	River	River	River	River	NAPL Test	NAPL Test	NAPL Test	NAPL Test	NAPL Test	NAPL Test	River	River	River	River	River	River	River	River	River	River
Sample No.											F230029-04	F230029-01	F230029-03	F230029-04	F230030-02	F230030-04	F230030-01	F230030-02	F230029-03	F230029-05	F240018-01	F240018-02	F240018-03	F240018-04	F240018-05	F240018-06	F240021-01	F240021-02	F240021-03	F240021-04	F240021-11	F240021-12	F240020-05	F240020-06	F240020-07	F240020-08
Sample Date:											08/29/2023	08/29/2023	08/29/2023	08/29/2023	08/30/2023	08/30/2023	08/30/2023	08/30/2023	08/29/2023	08/29/2023	08/16/2023	08/17/2023	08/29/2023	08/29/2023	08/31/2023	08/31/2023	07/23/2024	07/23/2024	07/23/2024	07/23/2024	07/23/2024	07/23/2024	07/22/2024	07/22/2024	07/22/2024	07/22/2024
Sample Time:																																				
ClieSam											846-S2	846-S3	847-S1	847-S2	851-S1	851-S2	852-S1	852-S2	854-S1	854-S2	849-N	850-N	851-N	852-N	855-N	856-N	871-S1	871-S2	872-S1	872-S2	873-S1	873-S2	874-S1	874-S2	875-S1	875-S2
Depths:											1-2	3.5-4.75	0-1	1-2	0-0.5	5.5-6	0-0.5	3.5-4	0-0.5	1.5-2	3.8-4	4.5-4.7	3.8-4	3.6-3.8	4.1-4.3	4.6-4.8	0-1	1-2	0-1	1-2	0-1	1-2	0-1	1-2	0-1	1-2
RAH																																				
%solids											59	58	60	57	85	74	82	52	78	85																
CAS Number	Method Name	Analyte	Units	RT		PAH17	PAH34	PAH51	Abbrev	PAH #																											
		Max RL for ND PAHs=								1																											
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzo(b)thiophenes	ug/Kg dry	17					C1BT	2	20.7	46.1	15.8	23.1	15.1	10800	98.4	841	21.6	11.8	89.9	2720	192000	48800	944	6490	9.05	15.2	136	914	3.2	7.98	2.9	7.6	9.37	9.75
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzo(b)thiophenes	ug/Kg dry	18					C2BT	3	26.1	93.1	17.3	30.7	24.4	16300	321	1190	32.9	21.2	310	4220	244000	47900	2080	12100	16.1	42.8	177	1810	6.85	51.1	4.71	24	24.2	23.7
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzo(b)thiophenes	ug/Kg dry	19					C3BT	4	13.3	68.2	9	17.5	23.9	10100	310	551	21.7	24.7	221	2430	145000	22700	1560	9290	12.3	28.5	106	966	3.73	15.8	3.5	15.5	10.2	19.1
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzo(b)thiophenes	ug/Kg dry	20					C4BT	5	8.51	36.4	4.53	10.8	13.1	3000	153	311	11.1	15.8	106	792	39200	5250	815	2930	4.99	11.1	56.6	207	2.81	5.67	2.07	6.8	0	16.3
91-20-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Naphthalene**	ug/Kg dry	21.86	L	x	x	x	NA	6	101	458	80.4	106	97.6	171000	743	3570	339	78	1550	25300	7930000	3920000	23200	228000	226	141	2010	17300	54	7.54	5.11	19.6	9.88	38.9
91-57-6	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylnaphthalene	ug/Kg dry	24.57	L	x		x	2MN	7	62.4	232	44	74	66.4	124000	656	960	155	47.1	642	7350	5800000	1660000	8660	44400	103	83.6	763	3640	40.1	8.21	3.6	12.8	9.68	32.9
90-12-0	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylnaphthalene	ug/Kg dry	25				x	1MN	8	40.6	154	35.6	43.9	60.9	354000	971	5210	115	28.5	669	96800	4020000	1110000	39000	306000	76.3	57.5	1580	9450	21.5	7.45	3.44	9.93	8.24	17.5
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Naphthalenes	ug/Kg dry	24.57			x	x	C1N	9	67.3	250	50.6	76.3	81.9	300000	1050	3830	173	49	815	63300	6150000	1720000	29000	213000	112	89.5	1440	8020	39.3	10.1	4.85	14.8	11.4	33.4
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Naphthalenes	ug/Kg dry	27.02			x	x	C2N	10	135	573	113	162	178	348000	3280	7580	208	186	4680	79500	3770000	927000	62200	398000	164	243	1690	11400	63.8	31.3	11	71.2	36.8	123
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Naphthalenes	ug/Kg dry	29.76			x	x	C3N	11	113	633	87.1	149	215	156000	3140	3420	190	274	3600	26300	1320000	274000	37600	187000	126	180	1200	4050	58.7	37.4	10.3	57.1	31.6	243
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Naphthalenes	ug/Kg dry	32.52			x	x	C4N	12	79.2	564	53.1	131	95.9	46600	1370	1700	117	215	2330	8260	356000	67300	16500	62300	68.8	130	695	1220	48.1	31.4	6.47	47.6	31.6	280
92-52-4	8270D (SIM) Semi-Volatile Organic Compou0s	Biphenyl	ug/Kg dry	26.46					BP	13	34.5	98.6	19.9	40.7	17.8	29200	268	338	46.1	30.1	523	2460	307000	508000	3620	7960	44.5	78.2	237	569	17.2	11	5.29	13.8	13.6	33.1
208-96-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Acenaphthylene**	ug/Kg dry	28.16	L	x	x	x	ACE	14	333	1230	201	306	443	34000	1360	2210	282	301	2250	10700	487000	136000	13400	43000	330	545	899	2920	124	6.85	16.5	105	21.8	166
83-32-9	8270D (SIM) Semi-Volatile Organic Compou0s	**Acenaphthene**	ug/Kg dry	28.89	L	x	x	x	ACY	15	112	867	187	129	198	561000	5130	34300	628	157	12500	219000	9260000	3240000	113000	726000	310	290	7070	34500	36.1	0	9.7	115	9.41	27
132-64-9	8270D (SIM) Semi-Volatile Organic Compou0s	Dibenzofuran	ug/Kg dry	29.54				x	DBF	16	64.7	197	88.3	55.7	83.8	21600	2580	642	357	48.3	875	13100	336000	111000	5280	27700	253	61.3	1420	633	22.2	0	3.07	23	0	19.7
86-73-7	8270D (SIM) Semi-Volatile Organic Compou0s	**Fluorene**	ug/Kg dry	30.91	L	x	x	x	FLE	17	115	433	143	102	253	188000	6450	7770	483	171	8990	82300	3540000	1000000	49400	319000	283	169	2670	9650	48.7	0	6.36	47.3	9.37	34.5
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Fluorenes	ug/Kg dry	33.14			x	x	C1FL	18	73.5	417	64.5	96.7	167	102000	2800	1870	144	166	3660	21200	1080000	262000	25700	129000	96.8	129	888	2560	47.6	54.7	7.06	50.6	13.8	67.7
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Fluorenes	ug/Kg dry	35.22			x	x	C2FL	19	88.2	539	71.9	119	146	63500	1880	1580	152	178	3420	10500	527000	106000	19600	80700	102	144	795	1530	72.6	45.9	6.85	17.2	23	163
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Fluorenes	ug/Kg dry	38.01			x	x	C3FL	20	170	685	147	185	149	23200	1890	1680	386	167	2250	6800	183000	34900	9210	29300	275	208	1300	1220	65.9	61.3	10.7	67	30.5	194
132-65-0	8270D (SIM) Semi-Volatile Organic Compou0s	Dibenzothiophene	ug/Kg dry	34.23				x	DBT	21	84.8	397	99.7	89.3	157	58000	3880	2270	339	125	4500	26400	1180000	329000	15400	72100	257	148	1410	3820	26.1	0	6.04	44	6.88	35.4
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Dibenzothiophenes	ug/Kg dry	36.43				x	C1DBT	22	103	551	83.5	133	224	51600	3580	2080	200	177	2700	16900	757000	174000	14500	59000	155	174	1050	2760	40.2	10.4	7.97	43.6	13.5	106
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Dibenzothiophenes	ug/Kg dry	37.7				x	C2DBT	23	137	747	91.3	177	209	34400	2560	2880	196	212	2560	9470	378000	77500	11300	37100	119	218	835	2020	63.2	13	10.3	54.4	26.4	201
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Dibenzothiophenes	ug/Kg dry	39.5				x	C3DBT	24	113	648	60.2	178	107	14100	1150	2850	121	173	1610	5370	149000	28000	6250	17300	73.7	200	602	1470	52.6	10.1	10.1	48.4	30.4	203
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Dibenzothiophenes	ug/Kg dry	41.65				x	C4DBT	25	76.2	380	43.3	127	66.5	4340	362	1830	66.7	100	555	2520	40400	7010	2220	5690	39.1	136	303	806	27.3	0	6.57	40.4	27.1	117
85-01-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Phenanthrene**	ug/Kg dry	34.72	L	x	x	x	PHE	26	979	3830	1360	1030	1760	838000	56200	21800	4010	1440	52600	376000	16200000	4860000	268000	1410000	3160	1550	23300	42200	410	20.3	45.7	294	50.6	258
120-12-7	8270D (SIM) Semi-Volatile Organic Compou0s	**Anthracene**	ug/Kg dry	34.91	L	x	x	x	ANT	27	419	1700	455	781	658	275000	20000	6120	1100	623	9980	128000	4020000	707000	83100	444000	856	756	5290	9000	176	6.52	21.5	166	23.8	160
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Phenanthrenes/Anthracenes	ug/Kg dry	36.96				x	C1PH	28	585	2690	579	761	1160	363000	20300	8270	1370	995	20300	106000	4760000	1160000	115000	484000	1110	1020	6760	11000	406	67.8	36.8	196	51.2	429
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Phenanthrenes/Anthracenes	ug/Kg dry	38.97				x	C2PH	29	422	2030	353	520	587	148000	8020	5410	707	599	13700	35600	1390000	300000	56300	189000	583	794	3260	5170	322	46.5	22.1	144	48.8	502
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Phenanthrenes/Anthracenes	ug/Kg dry	40.8				x	C3PH	30	227	1190	157	313	204	44600	2500	3780	296	271	5740	12500	337000	65600	20700	55400	234	429	1320	2380	148	22.9	14.8	75.8	51.4	319
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Phenanthrenes/Anthracenes	ug/Kg dry	41.72				x	C4PH	31	95.6	519	60	168	62.7	13100	690	1930	111	113	1720	4730	88400	16900	6330	13300	83.8	198	475	1160	64.7	607	6.17	37.2	33.3	154
483-65-8	8270D (SIM) Semi-Volatile Organic Compou0s	Retene	ug/Kg dry	41.72				x	RET	32	50.1	89.3	23.3	105	18.5	6450	150	1140	76.1	32.6	680	1310	36300	5240	1800	2780	33.2	96.4	96.8	968	44.9	2520	6.15	17.8	24.1	54.6
239-35-0	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)naphtho(2,1-d)thiophene	ug/Kg dry	44.24					BNT	33	189	677	195	162	190	18800	3760	1350	462	156	1280	12600	333000	78300	7360	24900	298	272	1780	1710	86.7	0	10.8	67.5	19.6	86.2
	8270D (SIM) Semi-Volatile Organic Compou0s	C0-Benzonaphthothiophenes	ug/Kg dry	44.24					C0BNT	34	350	1250	361	309	357	34200	7090	2560	829	287	2260	23100	615000	145000	13200	44700	553	488	3250	3210	168	12.7	21.5	125	36.3	160
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzonaphthothiophenes	ug/Kg dry	45.63					C1BNT	35	220	878	181	230	243	21200	2850	2320	328	215	1940	9160	262000	54800	8400	22800	211	389	1410	2180	105	12.4	14.9	81.9	25.9	152
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzonaphthothiophenes	ug/Kg dry	47.14					C2BNT	36	176	761	143	227	238	10100	1420	2650	236	212	1070	4330	91700	18300	4400	11300	135	404	862	1660	66.6	16.7	16.1	105	27.6	148
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzonaphthothiophenes	ug/Kg dry	49.02					C3BNT	37	149	534	118	171	228	5400	690	2110	177	173	518	2880	63800	15200	2500	7740	108	362	554	1180	44	12.9	14.4	106	20.7	112
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzonaphthothiophenes	ug/Kg dry	51.51					C4BNT	38	78.1	249	61.4	101	176	1070	215	1030	93.9	88.1	132	711	11000	2380	591	1640	52.7	187	215	502	14.2	0	10.1	77.5	9.94	54.3
206-44-0	8270D (SIM) Semi-Volatile Organic Compou0s	**Fluoranthene**	ug/Kg dry	39.51	H	x	x	x	FLA	39	2160	6500	2470	2250	2440	321000	66100	15800	5520	1950	16400	226000	6740000	1980000	135000	671000	4140	2820	28500	23700	835	36.4	187	1000	197	801
129-00-0	8270D (SIM) Semi-Volatile Organic Compou0s	**Pyrene**	ug/Kg dry	40.39	H	x	x	x	PYR	40	2160	6940	2300	2670	2160	475000	56300	17600	4520	2030	24100	290000	10400000	2850000	184000	927000	3890	3180	24300	29000	1250	77.7	163	861	184	962
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Fluoranthenes/Pyrenes	ug/Kg dry	41.78				x	C1PY	41	1150	4540	1070	1250	1320	275000	21300	9510	1860	1140	19500	109000	3980000	948000	98700	389000	1410	1830	8750	12400	751	75.1	65.3	367	99.4	683
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Fluoranthenes/Pyrenes	ug/Kg dry	43.52				x	C2PY	42	639	2120	588	622	646	80800	6950	4480	1330	530	8290	23500	822000	177000	33400	103000	917	1050	4900	4610	328	53.4	38	204	67	359
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Fluoranthenes/Pyrenes	ug/Kg dry	45.72				x	C3PY	43	273	902	229	261	259	23700	2610	2530	447	212	2920	7950	187000	33800	11200	28800	334	535	1810	2140	123	29.4	16.9	94	40.3	188
243-17-4	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)fluorene	ug/Kg dry	42.03				x	BbF	44	134	577	134	132	149	27700	3660	1190	196	131	2000	15900	457000	104000	11200	44400	117	217	1160	1630	65	0	8.49	50.5	12.4	79.6
205-12-9	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(c)fluorene	ug/Kg dry	42.07				x	BcF	45	48.2	179	51.4	70.2	81.5	14700	1560	536	98.6	64.8	926	6220	220000	57800	5400	21900	61.1	79.1	588	597	42.8	0	3.63	21.5	5.59	29.5
3442-78-2	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylpyrene	ug/Kg dry	42.18				x	2MP	46	162	617	148	175	171	34100	2590	1260	261	155	2650	14100	531000	128000	12800	46400	226	254	1140	1610	112	6.34	8.7	46.6	12.4	96.8
3353-12-6	8270D (SIM) Semi-Volatile Organic Compou0s	4-Methylpyrene	ug/Kg dry	42.55				x	4MP	47	154	596	124	168	154	30100	1750	1210	194	139	2400	11000	436000	104000	11600	42800	189	259	836	1500	108	8.12	7.27	40.1	13.2	101
2381-21-7	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylpyrene	ug/Kg dry	42.67				x	1MP	48	118	491	104	141	130	34800	1580	1020	162	117	2440	12900	531000	124000	12300	49600	158	208	733	1400	86.5	6.64	5.79	29.5	9.6	78.4
56-55-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Benz(a)anthracene**	ug/Kg dry	45.17	H	x	x	x	BaA	49	1250	4050	1350	1110	1240	141000	26200	7740	2730	1050	9300	95900	2700000	707000	59800	255000	1900	1660	13000	9180	652	21.2	64.6	386	84.7	492
	8270D (SIM) Semi-Volatile Organic Compou0s	**Chrysene/triphenylene**	ug/Kg dry	45.36	H	x	x	x	CH	50	1350	4420	1380	1220	1190	130000	23600	8420	2750	1050	9700	90800	2220000	431000	59300	243000	1980	1940	12800	9580	659	25	71.6	443	117	586
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	46.81				x	C1CR	51	682	2360	597	687	656	87100	9630	4990	1030	583	8800	32900	1040000	229000	35900	129000	790	1360	4880	5440	392	23.2	33.3	189	53	412
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	48.52				x	C2CR	52	351	1230	310	381	340	35400	4000	3440	504	317	3870	10600	293000	60500	14700	40700	357	878	2230	2800	205	18.8	21.9	112	38.5	245
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	49.55				x	C3CR	53	206	657	159	237	216	12100	1820	2250	259	189	1440	4510	82300	16100	5670	14600	177	465	1130	1520	100	21.4	10.7	79	20.5	144
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	50				x	C4CR	54	105	344	92.5	123	115	3710	804	1310	133	97.7	444	1860	27700	5920	1890	4920	80.8	205	473	691	49.4			47.2		79.4
205-99-2	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(b)fluoranthene**	ug/Kg dry	49.23	H	x	x	x	BbF	55	1070	3290	1120	916	799	58500	18100	6090	2070	748	3910	49800	1320000	345000	30100	112000	1630	1700	10400	7960	477	15.5	60.4	385	101	417
	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(j/k)fluoranthene**	ug/Kg dry	49.29	H	x	x	x	BjF	56	1170	3360	1190	968	934	72300	16400	6100	2030	837	4680	56700	1490000	404000	33400	145000	1510	1530	8730	7120	516	14.1	60.5	378	93	450
192-97-2	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(e)pyrene	ug/Kg dry	50.17				x	BeP	57	970	3020	962	862	687	65700	13300	5350	1480	654	4340	51600	1500000	395000	30800	126000	1410	1760	7480	6960	505	16.8	50.9	322	82.6	423
50-32-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(a)pyrene**	ug/Kg dry	50.34	H	x	x	x	BaP	58	1540	5120	1570	1340	1170	133000	24600	8930	2470	1120	7770	95200	3050000	802000	58800	258000	2220	2660	12300	11500	807	23.2	71.8	436	107	616
198-55-0	8270D (SIM) Semi-Volatile Organic Compou0s	Perylene	ug/Kg dry	50.61				x	PE	59	461	1110	442	438	278	21500	6440	1900	644	264	1200	17300	434000	116000	9060	42900	510	742	3220	2340	956	3460	54.6	329	896	537
193-39-5	8270D (SIM) Semi-Volatile Organic Compou0s	**Indeno(1,2,3-cd)pyrene**	ug/Kg dry	54	H	x	x	x	I123P	60	1110	3340	1100	928	739	61300	15700	5760	1730	748	3120	47200	1280000	340000	26200	124000	1400	1630	8240	7050	452	12.8	48.7	309	82.8	385
53-70-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Dibenzo(a,h)anthracene**	ug/Kg dry	54.01	H	x	x	x	DBA	61	232	713	251	206	174	15300	3280	1260	422	174	934	12100	285000	66400	6600	29900	336	417	2120	1850	112	0	12.4	74.5	22.3	94.5
191-24-2	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(g,h,i)perylene**	ug/Kg dry	54.91	H	x	x	x	BGP	62	921	2880	885	800	573	55400	11800	4780	1260	589	2700	42500	1270000	338000	23500	115000	1220	1590	6460	6280	423	13	42.8	267	70.4	344
191-07-1	8270D (SIM) Semi-Volatile Organic Compou0s	Coronene	ug/Kg dry	61.34				x	COR	63	284	903	259	247	154	17200	3170	1420	340	167	663	12300	374000	102000	6520	34900	334	432	1660	1800	111	0	12.3	77.7	20.5	92.7
526-73-8	8270D (SIM) Semi-Volatile Organic Compou0s	1,2,3-Trimethylbenzene	ug/Kg dry							64	11.2	33.2	7.12	14.4	5.18	6300	0	119	6.03	6.23	6.27	440	35400	8080	270	1940	5.26	26.5	22.7	73.1	3.44	6.24	2.19	9.78	7.63	9
95-63-6	8270D (SIM) Semi-Volatile Organic Compou0s	1,2,4-Trimethylbenzene	ug/Kg dry							65	20.5	78.3	11.1	29.2	13.7	18200	8.7	354	11.5	16.3	24.9	944	79600	16500	785	4970	9.1	60.2	85.5	387	5.92	6.27	0	7.86	6.73	13.1
108-67-8	8270D (SIM) Semi-Volatile Organic Compou0s	1,3,5-Trimethylbenzene	ug/Kg dry							66	8.48	26.9	4.82	9.7	4.42	4920	0	105	4.83	4.58	22.7	354	24000	6520	368	1780	9.67	24.1	27.7	102	7.92	0	0	6.23	0	5.19
	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methyldibenzothiophene	ug/Kg dry	36.76						67	14.1	70.1	10.5	16.1	30.9	4650	429	276	28.2	22.1	237	1630	68900	15200	1320	5270	19.2	23.2	122	335	5.36	0	0	8.37	0	13.9
	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylphenanthrene	ug/Kg dry	37.24						68	92	332	88.4	81.6	201	55300	2990	1250	212	146	3200	15700	718000	170000	19000	76600	176	151	982	1650	38.8	0	5.47	32	8.68	41.1
	8270D (SIM) Semi-Volatile Organic Compou0s	2,3,5-Trimethylnaphthene	ug/Kg dry	30.44						69	6.99	42.7	6.63	10.8	17.9	9240	273	263	14.7	17.9	206	1470	70800	18100	2140	11000	10.5	10.1	77.1	257	4.61	0	0	2.85	0	16.4
581-42-0	8270D (SIM) Semi-Volatile Organic Compou0s	2,6-Dimethylnaphthalene	ug/Kg dry	27.07						70	48.4	113	40.5	53.9	31.2	68700	665	783	54.7	40.4	1160	15000	711000	171000	12200	76200	48.1	93.1	292	1960	16.1	0	2.38	31.1	7.37	40.2
	8270D (SIM) Semi-Volatile Organic Compou0s	2/3-Methyldibenzothiophene	ug/Kg dry	36.31						71	32.1	196	28.8	45.8	79.4	18200	1220	688	69.1	61.8	936	6000	272000	62500	5030	20000	51.3	57.3	367	892	13.1	0	0	12.5	0	39.2
	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylanthracene	ug/Kg dry	36.96						72	80.4	324	76.8	102	132	44900	3150	889	157	122	2540	14400	550000	136000	14000	55600	133	147	799	1270	56.8	0	5.62	28.4	0	47.1
	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylphenanthrene	ug/Kg dry	36.81						73	141	739	152	206	308	90900	5410	2170	407	265	5090	28600	1260000	311000	28600	115000	309	236	1890	2800	90.3	13.7	7.79	39.7

Attachment B. Complete Sediment Data Set
Amesbury Former MGP
Amesbury, Massachusetts

CAS Number	Method Name	Analyte	Units	RT		PAH17	PAH34	PAH51	Abbrev	PAH #	River	River	River	River	River	River	River	River	River	River	NAPL Test	NAPL Test	NAPL Test	NAPL Test	NAPL Test	NAPL Test	River	River	River	River	River	River	River	River	River	River
											F230029-06	F230029-07	F230029-03	F230029-04	F230030-02	F230030-04	F230030-01	F230030-02	F230029-05	F230029-08	F240018-01	F240018-02	F240018-03	F240018-04	F240018-05	F240018-06	F240021-01	F240021-02	F240021-03	F240021-04	F240021-11	F240021-12	F240020-05	F240020-06	F240020-07	F240020-08
											08/29/2023	08/29/2023	08/29/2023	08/29/2023	08/30/2023	08/30/2023	08/30/2023	08/30/2023	08/29/2023	08/29/2023	08/16/2023	08/17/2023	08/29/2023	08/29/2023	08/31/2023	08/31/2023	07/23/2024	07/23/2024	07/23/2024	07/23/2024	07/23/2024	07/23/2024	07/22/2024	07/22/2024	07/22/2024	07/22/2024
										ClieSam	846-S2	846-S3	847-S1	847-S2	851-S1	851-S2	852-S1	852-S2	854-S1	854-S2	849-N	850-N	851-N	852-N	855-N	856-N	871-S1	871-S2	872-S1	872-S2	873-S1	873-S2	874-S1	874-S2	875-S1	875-S2
										Depths:	1-2	3.5-4.75	0-1	1-2	0-0.5	5.5-6	0-0.5	3.5-4	0-0.5	1.5-2	3.8-4	4.5-4.7	3.8-4	3.6-3.8	4.1-4.3	4.6-4.8	0-1	1-2	0-1	1-2	0-1	1-2	0-1	1-2	0-1	1-2
										RAH																									
										%solids	59	58	60	57	85	74	82	52	78	85																
11095-43-5	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)thiophene	ug/Kg dry							78	7.03	26	4.89	7.64	7.55	6080	46.6	373	13.4	5.34	71.7	985	119000	63700	495	3160	10.8	9.89	81.6	925	0	0	0	2.94	0	3
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzene	ug/Kg dry							79	188	309	143	374	32.6	977	47.2	1430	66.5	49.4	278	199	0	1580	1160	1500	63	234	149	446	36.8	48.3	0	84.5	32.6	286
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Decalins	ug/Kg dry							80	43.1	3890	21	225	25.2	3160	39.2	866	46.7	643	169	1330	21600	2860	1100	5360	8.64	131	612	995	17	19.3	0	19.3	46.7	971
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzenes	ug/Kg dry							81	168	264	200	266	91.2	11900	62	944	74.4	55.7	128	466	54200	16600	825	2680	54.9	318	120	841	19.2	39	23.5	211	49.7	91.1
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Decalins	ug/Kg dry							82	61.4	1170	26.9	293	26.8	5700	63.2	954	37.9	224	521	2550	43900	5940	2510	9430	16.3	93.3	294	784	27	40.8	0	26	41	542
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzenes	ug/Kg dry							83	61.9	180	35	82	42.3	34000	61.9	735	41.6	42.6	77.4	1880	134000	32400	1580	9680	11.6	104	123	785	0	0	0	9.09	0	21.3
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Decalins	ug/Kg dry							84	61.9	436	28.4	271	15.1	5120	53.8	695	33.1	100	615	2500	45300	6010	2890	10100	18.9	72.3	200	552	22.7	0	0	0	0	312
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzenes	ug/Kg dry							85	48.1	429	40.2	117	36.6	54500	70	2360	48.2	80	70.8	7110	290000	56900	3490	28500	7.65	83.1	303	1290	5.2	0	0	4.99	0	32.7
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Decalins	ug/Kg dry							86	131	666	35.5	449	40	8410	67.7	938	66.9	189	1170	3440	75400	10800	5030	16700	29.8	173	427	686	23.8	0	0	0	0	457
	8270D (SIM) Semi-Volatile Organic Compou0s	C5-Benzenes	ug/Kg dry							87	38.6	266	33.1	70.3	29.8	23800	77.9	1210	33.8	91	70.4	3300	131000	18300	2620	18100	0	35.8	192	777	0	0	0	5.7	0	44.5
86-74-8	8270D (SIM) Semi-Volatile Organic Compou0s	Carbazole	ug/Kg dry	35.61						88	130	344	191	97.7	87	2960	3040	484	699	52.2	47.5	8670	55900	23700	415	2740	447	77.2	2870	317	31.3	0	6.03	31.7	7.53	18.8
493-01-6	8270D (SIM) Semi-Volatile Organic Compou0s	cis-Decalin	ug/Kg dry							89	0	257	0	12.6	0	239	0	44.4	0	49.7	6.67	63.6	1330	0	58	365	7.9	7.28	43.4	67.3	0	0	0	0	0	73.3
100-41-4	8270D (SIM) Semi-Volatile Organic Compou0s	Ethylbenzene	ug/Kg dry							90	17	40.2	10.6	26.9	31.7	14000	14.9	104	12.2	12.3	62.9	565	69500	25200	640	2430	7.8	30.9	26.7	397	5.61	10.4	2.54	10.1	5.31	11.3
98-82-8	8270D (SIM) Semi-Volatile Organic Compou0s	Isopropylbenzene	ug/Kg dry							91	4.11	5.29	0	3.83	2.88	3420	0	30.5	0	0	3.3	185	14600	3370	105	749	0	6.33	9.45	58.3	0	0	0	0	0	3.78
	8270D (SIM) Semi-Volatile Organic Compou0s	m,p-Xylene	ug/Kg dry							92	221	325	290	359	84.6	4920	54.6	1220	90.6	62.5	152	404	18700	6620	831	1940	109	523	195	1080	51.3	112	60	376	124	162
108-87-2	8270D (SIM) Semi-Volatile Organic Compou0s	Methylcyclohexane	ug/Kg dry							93	19.6	51.4	7.18	16.2	8.35	134	0	154	7.72	5.35	29.1	78.4	886	545	216	223	10.6	18.2	20.9	51	6.51	0	0	0	9.41	13.5
104-51-8	8270D (SIM) Semi-Volatile Organic Compou0s	n-Butylbenzene	ug/Kg dry							94	14.3	45.8	11.1	22.3	7.4	0	9.29	0	15.7	18.4	17.3	0	0	0	0	0	8.36	50.4	0	0	4.75	15.2	3.84	14.2	17.4	17.9
103-65-1	8270D (SIM) Semi-Volatile Organic Compou0s	n-Propylbenzene	ug/Kg dry							95	11.8	24.1	7.89	14.4	6.48	1970	0	59.6	10.1	7.15	9.15	126	6380	983	122	478	5.23	35.8	16	87.8	3.03	5.68	2.18	9.86	7.19	7.29
95-47-6	8270D (SIM) Semi-Volatile Organic Compou0s	o-Xylene	ug/Kg dry							96	17.6	42.4	9.98	23.3	27.4	2090	0	122	8.8	9.87	14.4	102	28800	5180	173	578	7.11	30	24.2	109	3.5	6.84	0	8.79	6.8	9.11
99-87-6	8270D (SIM) Semi-Volatile Organic Compou0s	p-Isopropyltoluene	ug/Kg dry							97	11	29.4	8.48	23.9	4.03	5240	0	101	7.15	4.33	16.8	183	28500	9890	214	2030	5.89	27.6	26.1	45.2	22.6	23.4	0	11.6	22.8	10.8
135-98-8	8270D (SIM) Semi-Volatile Organic Compou0s	sec-Butylbenzene	ug/Kg dry							98	0	6.04	0	0	0	270	0	35.5	0	2.86	0	34.5	1090	0	22.1	176	0	3.99	8.98	18.4	0	0	0	0	0	0
100-42-5	8270D (SIM) Semi-Volatile Organic Compou0s	Styrene	ug/Kg dry							99	102	175	34.6	140	91.3	4930	432	1060	75	36.7	149	331	13100	2830	747	3220	22.8	106	106	423	9.18	44.8	13.7	29	55.1	113
98-06-6	8270D (SIM) Semi-Volatile Organic Compou0s	t-Butylbenzene	ug/Kg dry							100	0	5.13	0	0	0	0	0	21.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
108-88-3	8270D (SIM) Semi-Volatile Organic Compou0s	Toluene	ug/Kg dry							101	231	376	179	467	38	1210	59.4	1770	81.9	60.8	389	365	2740	4290	1570	2350	111	351	229	608	75.3	124	20.2	142	97.8	414
493-02-7	8270D (SIM) Semi-Volatile Organic Compou0s	trans-Decalin	ug/Kg dry							102	10.6	1450	5.34	54.8	11.5	699	11.1	252	22.5	383	13.5	220	3650	635	223	1200	5.14	59.1	470	414	4.24	0	0	0	38.4	483
3891-98-3	Saturated Hydrocarbons by GC/FID	2,6,10-trimethyldodecane (1380)	mg/Kg dry							103	45	386	17.5	187	20.8	4080	20.1	878	31.5	101	385	3460	53900	5700	2130	6890	23.6	62.8	377	684	9.77	22.7	4.29	18	31.8	422
3892-00-0	Saturated Hydrocarbons by GC/FID	2,6,10-trimethylpeadecane (1650)	mg/Kg dry							104	58.9	353	22.4	196	25.5	8210	100	1330	56	114	801	7000	88500	12700	4820	13400	27.9	89.6	561	564	24.9	23.2	4.08	18.2	40.2	477
3891-99-4	Saturated Hydrocarbons by GC/FID	2,6,10-trimethyltridecane (1470)	mg/Kg dry							105	103	554	54.1	326	40.6	6610	63.7	1390	60.3	153	622	4710	89200	12500	3500	10700	49	155	645	939	33.1	82.8	11.6	90.6	92.7	580
	Classical Chemistry	Black Carbon (Average)	mg/kg							106																									
	Saturated Hydrocarbons by GC/FID	C-10	mg/Kg dry							107																									
	Saturated Hydrocarbons by GC/FID	C-11	mg/Kg dry							108																									
	Saturated Hydrocarbons by GC/FID	C-12	mg/Kg dry							109																									
	Saturated Hydrocarbons by GC/FID	C-13	mg/Kg dry							110																									
	Saturated Hydrocarbons by GC/FID	C-14	mg/Kg dry							111																									
	Saturated Hydrocarbons by GC/FID	C-15	mg/Kg dry							112																									
	Saturated Hydrocarbons by GC/FID	C-16	mg/Kg dry							113																									
	Saturated Hydrocarbons by GC/FID	C-17	mg/Kg dry							114	216	268	164	226	246	0	300	406	129	86.3	102	1480	0	0	0	1620	151	307	151	315	98.5	175	34.6	155	280	135
	Saturated Hydrocarbons by GC/FID	C-18	mg/Kg dry							115	93.8	190	72.3	102	195	0	272	288	76.6	72.9	144	2210	0	0	0	1250	72.6	124	141	265	55	179	26.4	84.4	157	94.9
	Saturated Hydrocarbons by GC/FID	C-19	mg/Kg dry							116																									
	Saturated Hydrocarbons by GC/FID	C-21	mg/Kg dry							117																									
	Saturated Hydrocarbons by GC/FID	C-22	mg/Kg dry							118																									
	Saturated Hydrocarbons by GC/FID	C-23	mg/Kg dry							119																									
	Saturated Hydrocarbons by GC/FID	C-24	mg/Kg dry							120																									
	Saturated Hydrocarbons by GC/FID	C-25	mg/Kg dry							121																									
	Saturated Hydrocarbons by GC/FID	C-26	mg/Kg dry							122																									
	Saturated Hydrocarbons by GC/FID	C-27	mg/Kg dry							123																									
	Saturated Hydrocarbons by GC/FID	C-28	mg/Kg dry							124																									
	Saturated Hydrocarbons by GC/FID	C-29	mg/Kg dry							125																									
	Saturated Hydrocarbons by GC/FID	C-30	mg/Kg dry							126																									
	Saturated Hydrocarbons by GC/FID	C-31	mg/Kg dry							127																									
	Saturated Hydrocarbons by GC/FID	C-32	mg/Kg dry							128																									
	Saturated Hydrocarbons by GC/FID	C-33	mg/Kg dry							129																									
	Saturated Hydrocarbons by GC/FID	C-34	mg/Kg dry							130																									
	Saturated Hydrocarbons by GC/FID	C-35	mg/Kg dry							131																									
	Saturated Hydrocarbons by GC/FID	C-36	mg/Kg dry							132																									
	Saturated Hydrocarbons by GC/FID	C-37	mg/Kg dry							133																									
	Saturated Hydrocarbons by GC/FID	C-38	mg/Kg dry							134																									
	Saturated Hydrocarbons by GC/FID	C-39	mg/Kg dry							135																									
	Saturated Hydrocarbons by GC/FID	C-40	mg/Kg dry							136																									
	Saturated Hydrocarbons by GC/FID	C-8	mg/Kg dry							137																									
	Saturated Hydrocarbons by GC/FID	C-9	mg/Kg dry							138																									
638-36-8	Saturated Hydrocarbons by GC/FID	Phytane	mg/Kg dry	34.53						141	156	1040	52.5	409	42.8	13100	104	3060	116	286	1640	15700	125000	16500	8980	22700	55.5	198	952	1360	45.4	24.9	7.39	59.6	99.4	968
1921-70-6	Saturated Hydrocarbons by GC/FID	Pristane	mg/Kg dry	32.65						142	122	951	47.7	395	47.5	14500	354	2670	116	293	1710	21100	152000	21100	10400	25900	67.2	194	1540	1210	41.6	23.2	8.43	42.9	98	1200
TOC	Classical Chemistry	Total Organic Carbon (Average)	mg/kg							145	31700	124000	32200	45200	17500	45500	15700	95600	25800	9370	30000	112000	317000	472000	163000	112000	15600	58100	61500	54100	13600	133000	1650	22900	79500	9380
	TPAH16										15022	49131	16042.4	14862	14828.6	3529800	351963	158250	32344	13066	170484	1847500	72192000	22126400	1166800	6049900	25391	22578	168089	228790	7031.8	280.11	887.67	5286.4	1184.06	5831.9
	TPAH34										21002.8	72482	21411.1	21521	21487.1	5638310	456177	228050	42108	19523.7	272293	2449960	99510400	28830620	1761660	8638020	33081.2	33382.5	216075	310651	11326.9	4911.71	1261.47	7510.1	2737.46	10863.4
	TPAH51										23546.8	82262.3	23617.7	24320.1	24224.7	6569900	495936	261558	46762.4	21983	309373	2733050	115765100	33162970	1970490	9581890	36526.6	37591.4	236961.8	351505	12641.3	7584.77	1419.79	8368.33	3064.75	12675.5
	LPAH										2121.4	8750	2470.4	2528	3476	2191000	90539	76730	6997	2817.1	88512	848650	47237000	15523000	558760	3214400	5268	3534.6	42002	119210	888.9	49.42	108.47	759.7	134.54	717.3
	HPAH										12963	40613	13616	12408	11419	1462800	262080	82480	25502	10296	82614	1006200	30755000	8263400	616700	2879900	20226	19127	126850	113220	6183	238.9	782.8	4539.5	1059.2	5147.5

(does not include source area samples collected in 2017)

Attachment B. Complete Sediment Data Set
Amesbury Former MGP
Amesbury, Massachusetts

											River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River
										Sample No.	F240020-14	F240020-15	F240020-03	F240020-04	F240020-01	F240020-02	F240020-05	F240020-10	F240021-07	F240021-08	F240021-09	F240021-10	F240021-01	F240021-06	F240020-11	F240020-12	F240020-13	F240021-11	F240021-14	F240021-15		
										Sample Date:	07/22/2024	07/22/2024	07/22/2024	07/22/2024	07/22/2024	07/22/2024	07/22/2024	07/22/2024	07/23/2024	07/23/2024	07/23/2024	07/23/2024	07/23/2024	07/23/2024	07/22/2024	07/22/2024	07/22/2024	07/23/2024	07/23/2024	07/23/2024		
										Sample Time:																						
										ClieSam	876-S1	876-S2	877-S1	877-S2	878-S1	878-S2	879-S1	879-S2	880-S1	880-S2	881-S1	881-S2	882-S1	882-S2	888-S1	888-S2	888-S3	889-S1	889-S2	889-S3		
										Depths:	0-1	1-2	0-1	1-2	0-1	1-2	0-1	1-2	0-1	1-2	0-1	1-2	0-1	1-2	0-1	1-2	4-5	0-1	1-2	4-5		
										RAH																						
										%solids																						
CAS Number	Method Name	Analyte	Units	RT		PAH17	PAH34	PAH51	Abbrev	PAH #																						
		Max RL for ND PAHs=								1																						1
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzo(b)thiophenes	ug/Kg dry	17					C1BT	2	8.69	23	46	8.5	8.56	16.5	8.2	4.69	7.51	5.21	4.11	0	18.9	7.53	3.25	6.53		21	0	0	2
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzo(b)thiophenes	ug/Kg dry	18					C2BT	3	25	75.1	24.5	21.5	18.7	39.3	21.4	12.8	27.3	12	15.6	6.39	55.1	20.3	7.53	17.8	4.13	36.6	0	0	3
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzo(b)thiophenes	ug/Kg dry	19					C3BT	4	15.4	56.1	13.1	20	14.1	46	20.8	8.27	12.4	7.89	7.74	4.74	37.4	10.1	5.77	8.62	3.09	32.6	0	0	4
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzo(b)thiophenes	ug/Kg dry	20					C4BT	5	6.74	43.3	6.56	13.5	10.8	34.1	8.98	0	5.74	0	0	0	28.8	7.81	3.73	4.17	0	13.7	0	0	5
91-20-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Naphthalene**	ug/Kg dry	21.86	L	x	x	x	NA	6	60.6	79	123	71.8	65.7	173	21.7	8.26	36.6	6.26	11.2	4.4	187	23.1	17.3	10.6	0	261	2.83	4.62	6
91-57-6	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylnaphthalene	ug/Kg dry	24.57	L	x		x	2MN	7	41.7	66.6	75.6	57	30	126	15.5	6.6	24.5	5.77	8.47	3.86	127	17.5	9.25	6.7	3.43	248	2.69	3.6	7
90-12-0	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylnaphthalene	ug/Kg dry	25				x	1MN	8	31.7	39.5	39.4	31.9	18.8	62.6	11.9	6.12	16.7	6.6	6.85	3.93	118	10.6	8.1	9.04	3.62	839	3.23	3.87	8
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Naphthalenes	ug/Kg dry	24.57			x	x	C1N	9	46.7	68.8	72.4	56.2	30.6	121	18.7	8.31	27.4	8.74	10.6	4.68	154	18.3	11.3	9.99	4.53	661	3.79	0	9
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Naphthalenes	ug/Kg dry	27.02			x	x	C2N	10	109	398	161	156	95.8	292	113	41.3	63.7	20.9	41.2	11.6	313	80.9	23	72.8	9.53	1660	8.27	6.97	10
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Naphthalenes	ug/Kg dry	29.76			x	x	C3N	11	103	802	115	260	132	361	148	27.5	51.3	16.4	26.5	10.1	328	92.1	28.1	23.5	6.18	1190	6.86	5.83	11
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Naphthalenes	ug/Kg dry	32.52			x	x	C4N	12	91.3	840	101	218	127	341	77.1	17	39.8	16	23.2	6.31	288	67.1	19.5	13.2	3.33	431	2.84	3.06	12
92-52-4	8270D (SIM) Semi-Volatile Organic Compou0s	Biphenyl	ug/Kg dry	26.46					BP	13	31.6	142	37.7	27.1	34.5	49.4	16.1	10.9	16.6	7.78	12	5.46	67.4	17.4	7.19	9.59	4.88	39.3	4.71	4.89	13
208-96-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Acenaphthylene**	ug/Kg dry	28.16	L	x	x	x	ACE	14	318	268	617	308	180	758	11	0	103	7	25.7	0	370	42.8	101	0	0	93.9	0	0	14
83-32-9	8270D (SIM) Semi-Volatile Organic Compou0s	**Acenaphthene**	ug/Kg dry	28.89	L	x	x	x	ACY	15	91.9	162	95.6	50.3	34.2	104	21	0	38.5	0	5.94	0	397	49.8	21.3	282	0	1750	0	0	15
132-64-9	8270D (SIM) Semi-Volatile Organic Compou0s	Dibenzofuran	ug/Kg dry	29.54				x	DBF	16	40.8	39.1	50.5	29.7	19.8	60	6.9	0	24.2	0	4.42	0	50.9	9.58	14.4	0	0	114	0	0	16
86-73-7	8270D (SIM) Semi-Volatile Organic Compou0s	**Fluorene**	ug/Kg dry	30.91	L	x	x	x	FLE	17	80.5	92.1	90	62.1	41	132	15.7	0	41.5	4.3	9.04	3.54	242	35.5	24.3	4.16	2.54	398	2.96	3.27	17
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Fluorenes	ug/Kg dry	33.14			x	x	C1FL	18	70.5	212	105	147	74	255	52	12.5	35.3	0	12.6	9.05	192	41.4	23.3	15.3	3.53	889	3.04	3.09	18
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Fluorenes	ug/Kg dry	35.22			x	x	C2FL	19	101	443	173	213	124	364	50.3	11.3	40.6	6.38	22.6	4.84	260	53.3	23.3	10.1	4.23	447	3.33	2.88	19
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Fluorenes	ug/Kg dry	38.01			x	x	C3FL	20	170	493	224	216	135	430	34.3	0	63.9	0	18.5	0	301	51.9	47.8	0	0	244	0	0	20
132-65-0	8270D (SIM) Semi-Volatile Organic Compou0s	Dibenzothiophene	ug/Kg dry	34.23				x	DBT	21	67.3	100	66.5	58.1	44.4	153	16.5	0	29.4	0	5.18	0	146	17.9	27.1	0	0	125	0	0	21
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Dibenzothiophenes	ug/Kg dry	36.43				x	C1DBT	22	100	287	117	144	88.3	352	37.2	6.18	40.3	5.24	10.1	0	190	35.7	32.6	7.62	3.9	208	0	0	22
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Dibenzothiophenes	ug/Kg dry	37.7				x	C2DBT	23	144	462	199	236	149	576	32.9	6.72	53.3	10.4	17.1	7.24	334	49.5	34.4	12.5	5.43	163	3.14		23
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Dibenzothiophenes	ug/Kg dry	39.5				x	C3DBT	24	156	483	202	245	142	668	18.6	4.97	55.2	13.4	13.2	7.93	295	63.3	28.2	9.09	5.15	107	0	0	24
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Dibenzothiophenes	ug/Kg dry	41.65				x	C4DBT	25	106	320	133	152	81.6	426	34.1	0	48.4	43.8	20.3	0	161	57	19.3	0	0	69.5	0	0	25
85-01-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Phenanthrene**	ug/Kg dry	34.72	L	x	x	x	PHE	26	843	931	972	508	365	1150	105	8.83	398	13.5	54	6.89	1090	146	363	6.5	3.37	4850	4.75	7.77	26
120-12-7	8270D (SIM) Semi-Volatile Organic Compou0s	**Anthracene**	ug/Kg dry	34.91	L	x	x	x	ANT	27	371	380	644	295	191	658	62.9	0	147	0	28.5	0	618	80.5	135	0	0	1440	0	0	27
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Phenanthrenes/Anthracenes	ug/Kg dry	36.96				x	C1PH	28	583	1060	1130	785	442	1590	236	16.5	246	20.1	66.4	10.2	1020	200	217	11.2	4.49	2910	6.25	6.08	28
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Phenanthrenes/Anthracenes	ug/Kg dry	38.97				x	C2PH	29	482	1080	1430	774	468	1680	157	14.1	197	30.7	68.3	17.4	1050	166	138	15.7	0	1490	7.62	5.23	29
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Phenanthrenes/Anthracenes	ug/Kg dry	40.8				x	C3PH	30	291	695	864	491	297	2360	101	13.8	197	22.7	76.9	14.3	556	128	61.5	10.5	0	619	10.5	5.87	30
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Phenanthrenes/Anthracenes	ug/Kg dry	41.72				x	C4PH	31	140	330	349	234	140	4560	181	21.5	374	370	128	99.6	246	168	29.5	395	3.08	371	14.9		31
483-65-8	8270D (SIM) Semi-Volatile Organic Compou0s	Retene	ug/Kg dry	41.72				x	RET	32	58.1	93.1	89.7	56.9	32	18900	560	29	1340	1490	375	329	98	455	33.7	1640	8.63	573	39.3	4.54	32
239-35-0	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)naphtho(2,1-d)thiophene	ug/Kg dry	44.24					BNT	33	180	156	370	156	111	427	10.8	0	78.8	0	14.2	0	217	55.3	64	0	0	122	0	0	33
	8270D (SIM) Semi-Volatile Organic Compou0s	C0-Benzonaphthothiophenes	ug/Kg dry	44.24					C0BNT	34	331	297	842	300	207	796	38.5	0	153	0	33	0	410	51.6	121	6.13	0	315	0	0	34
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzonaphthothiophenes	ug/Kg dry	45.63					C1BNT	35	226	287	701	256	160	697	25.9	0	87.2	0	27.1	0	315	49.1	60.9	7.38	0	253	4.02		35
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzonaphthothiophenes	ug/Kg dry	47.14					C2BNT	36	203	320	483	233	129	624	15	0	76.6	0	29.6	0	262	45.1	60.9	0	0	135	0	0	36
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzonaphthothiophenes	ug/Kg dry	49.02					C3BNT	37	157	243	289	163	82.5	437	6.52	0	58.4	0	17.1	0	193	32.2	68.1	0	0	64.7	0	0	37
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzonaphthothiophenes	ug/Kg dry	51.51					C4BNT	38	79.9	131	119	69.9	42.1	208	0	0	32.6	0	9.34	0	84.2	19.1	45.1	0	0	30.6	0	0	38
206-44-0	8270D (SIM) Semi-Volatile Organic Compou0s	**Fluoranthene**	ug/Kg dry	39.51	H	x	x	x	FLA	39	2090	1550	2650	911	1130	1990	319	12.1	926	11.9	167	6.65	2300	328	905	7.06	0	2880	2.23	5.04	39
129-00-0	8270D (SIM) Semi-Volatile Organic Compou0s	**Pyrene**	ug/Kg dry	40.39	H	x	x	x	PYR	40	2150	1930	2750	2040	1440	5000	257	11.4	913	13.9	185	6.36	3050	414	850	7.48	0	3210	2.72	6.91	40
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Fluoranthenes/Pyrenes	ug/Kg dry	41.78				x	C1PY	41	1180	1180	3490	1370	919	3450	208	12.2	503	29.6	127	12.6	1860	286	357	8.11	3.89	2290	5.91	6.13	41
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Fluoranthenes/Pyrenes	ug/Kg dry	43.52				x	C2PY	42	657	630	2230	691	431	1530	71.8	8.86	271	9.61	74.3	7.41	825	135	205	9.14	2.83	948	4.41	4.26	42
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Fluoranthenes/Pyrenes	ug/Kg dry	45.72				x	C3PY	43	290	331	1010	308	201	699	31.6	7.62	124	0	37.5	4.3	387	61.5	78.6	0	0	359	0	0	43
243-17-4	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)fluorene	ug/Kg dry	42.03				x	BbF	44	121	129	517	149	104	355	31.3	0	56.3	0	11.3	0	197	30.7	36.8	0	0	374	0	0	44
205-12-9	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(c)fluorene	ug/Kg dry	42.07				x	BcF	45	62.1	63	168	73.4	43.9	167	20.1	0	23.6	0	7.61	0	97.4	15.8	18.8	0	0	151	0	0	45
3442-78-2	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylpyrene	ug/Kg dry	42.18				x	2MP	46	167	168	423	189	126	462	20.2	0	65.4	0	17.6	0	263	38.7	50.3	0	0	273	0	0	46
3353-12-6	8270D (SIM) Semi-Volatile Organic Compou0s	4-Methylpyrene	ug/Kg dry	42.55				x	4MP	47	162	172	386	199	126	475	15.8	0	62.6	0	20	0	261	39.8	42.3	0	0	205	0	0	47
2381-21-7	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylpyrene	ug/Kg dry	42.67				x	1MP	48	128	135	282	157	99.4	378	13.2	0	48.8	0	14.6	0	216	33.5	34.1	0	0	179	0	0	48
56-55-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Benz(a)anthracene**	ug/Kg dry	45.17	H	x	x	x	BaA	49	1150	822	3050	1000	717	2360	87.9	0	473	4.89	88.5	0	1310	185	444	0	0	1270	0	0	49
	8270D (SIM) Semi-Volatile Organic Compou0s	**Chrysene/triphenylene**	ug/Kg dry	45.36	H	x	x	x	CH	50	1270	998	2930	1120	779	2810	80.1	3.51	567	7.12	119	0	1520	202	466	0	0	1100	0	2.78	50
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	46.81				x	C1CR	51	713	663	2560	785	497	1740	59.2	5.82	278	8.11	86.5	4.58	937	154	190	4.35	0	937	2.21	0	51
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	48.52				x	C2CR	52	371	426	1450	463	259	1010	38.8	0	158	7.79	61.1	0	505	90.6	93.2	0	0	500	0	0	52
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	49.55				x	C3CR	53	201	277	831	222	125	574	22.3	0	88	0	38.3	0	257	61	63.9	0	0	309	0	0	53
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzo(a)anthracenes/Chrysenes	ug/Kg dry	50				x	C4CR	54	89.6	132	388	110	63.1	289		0	36.8	0	0	0	112	24.8	30.9	0	0	139	0	0	54
205-99-2	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(b)fluoranthene**	ug/Kg dry	49.23	H	x	x	x	BbF	55	1090	740	2120	851	531	2090	34.3	0	457	5.07	95.4	0	1020	132	390	0	0	497	0	0	55
	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(j/k)fluoranthene**	ug/Kg dry	49.29	H	x	x	x	BjF	56	1090	769	2660	834	613	2140	41.8	0	480	4.99	102	0	1090	152	392	0	0	690	0	0	56
192-97-2	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(e)pyrene	ug/Kg dry	50.17				x	BeP	57	993	719	1810	815	531	2060	27.4	0	412	5.46	109	0	1020	149	334	0	0	426	0	0	57
50-32-8	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(a)pyrene**	ug/Kg dry	50.34	H	x	x	x	BaP	58	1490	998	3270	1270	835	3110	47.7	0	573	6.16	130	0	1540	222	519	4.26	0	780	0	0	58
198-55-0	8270D (SIM) Semi-Volatile Organic Compou0s	Perylene	ug/Kg dry	50.61				x	PE	59	440	591	806	592	847	722	270	372	277	142	336	196	934	510	129	328	2.91	177	21	0	59
193-39-5	8270D (SIM) Semi-Volatile Organic Compou0s	**Indeno(1,2,3-cd)pyrene**	ug/Kg dry	54	H	x	x	x	I123P	60	951	639	1750	775	497	1950	22.1	0	413	4.97	102	0	945	125	336	0	0	336	0	0	60
53-70-3	8270D (SIM) Semi-Volatile Organic Compou0s	**Dibenzo(a,h)anthracene**	ug/Kg dry	54.01	H	x	x	x	DBA	61	234	160	528	197	120	439	7.13	0	104	0	28.4	0	235	34.5	77.6	0	0	124	0	0	61
191-24-2	8270D (SIM) Semi-Volatile Organic Compou0s	**Benzo(g,h,i)perylene**	ug/Kg dry	54.91	H	x	x	x	BGP	62	838	570	1350	696	441	1740	18.9	0	358	4.59	87.6	0	839	117	286	0	0	232	0	0	62
191-07-1	8270D (SIM) Semi-Volatile Organic Compou0s	Coronene	ug/Kg dry	61.34				x	COR	63	228	155	366	195	125	489	4.77	0	101	0	23.4	0	245	30.7	75.6	0	0	45.4	0	0	63
526-73-8	8270D (SIM) Semi-Volatile Organic Compou0s	1,2,3-Trimethylbenzene	ug/Kg dry							64	11.6	28.7	9.72	6.81	7.12	13.4	5.39	0	10.4	7.7	7.08	0	11.3	8.96	2.84	3.76	0	35.2	3.5	0	64
95-63-6	8270D (SIM) Semi-Volatile Organic Compou0s	1,2,4-Trimethylbenzene	ug/Kg dry							65	14.2	40.3	18.5	12.8	7.78	30.8	6.45	3.48	10	6.42	6.86	0	23.7	16.7	3.4	6.51	0	172	0	0	65
108-67-8	8270D (SIM) Semi-Volatile Organic Compou0s	1,3,5-Trimethylbenzene	ug/Kg dry							66	10.5	11.2	10.4	6.59	0	14.5		0	0	0	0	0	13.7	0	2.9	0	0	53.4	0	0	66
	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methyldibenzothiophene	ug/Kg dry	36.76						67	14	33.8	13.4	19.4	12.5	46.4	6.44	0	6.84	0	0	0	30.3	6.34	5.57	0	0	20	0	0	67
	8270D (SIM) Semi-Volatile Organic Compou0s	1-Methylphenanthrene	ug/Kg dry	37.24						68	88.1	148	140	52.7	45.9	134	19.9	0	43.1	8.81	9.75	3.63	127	22.3	36.5	0	0	472	0	0	68
	8270D (SIM) Semi-Volatile Organic Compou0s	2,3,5-Trimethylnaphthene	ug/Kg dry	30.44						69	7.42	54.9	6.68	20.8	10.5	23.9	16.4	0	0	0	0	0	17.8	6.11		0	0	81.1	0	0	69
581-42-0	8270D (SIM) Semi-Volatile Organic Compou0s	2,6-Dimethylnaphthalene	ug/Kg dry	27.07						70	37.4	97	60.5	37.2	25.3	82.9	11.9	4.75	17.7	0	14.8	0	76.5	15.4	4.69	3.84	0	191	0	0	70
	8270D (SIM) Semi-Volatile Organic Compou0s	2/3-Methyldibenzothiophene	ug/Kg dry	36.31						71	33.6	107	39.3	49.6	28.3	124	9.19	0	12.1	0	0	0	76.5	10.6	10.1	0	0	65.1	0	0	71
	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylanthracene	ug/Kg dry	36.96						72	80.1	91.5	386	85.1	51.7	173	34.5	0	31.2	0	6.97	0	149	24.7	27	0	0	399	0	0	72
	8270D (SIM) Semi-Volatile Organic Compou0s	2-Methylphenanthrene	ug/Kg dry	36.81						73	136	277	214	199	88.3	416	57.5	0	58.7	3.5	17.9	0	209	42.5	56.9	0	0	653	0	0	73
	8270D (SIM) Semi-Volatile Organic Compou0s	3-Methylphenanthrene	ug/Kg dry	36.69						74	130	243	160	194	110	382	57.6	3.59	52	0	12.6	0	246	49.5	46.9	0	0	666	0	0	74
	8270D (SIM) Semi-Volatile Organic Compou0s	4/9-Methylphenanthrene	ug/Kg dry	37.14						75	147	266	240	245	138	463	62.2	5.17	57.9	3.7	15.5	0	277	54.6	46.8	0	0	684	0	0	75
	8270D (SIM) Semi-Volatile Organic Compou0s	4-Methyldibenzothiophene	ug/Kg dry	36.01						76	36	121	38.2	47.8	32.8	127	8.16	0	13.1	0	0	0	94.4	12.1	10.4	0	0	48.9	0	0	76
71-43-2	8270D (SIM) Semi-Volatile Organic Compou0s	Benzene	ug/Kg dry							77	84.6	242	65.2	19.5	179	30.1	15.8	6.98	33.2	13.8	17.5	3.7	72.9	20.5	9.34	8.58	0	42.7	0	0	77

Attachment B. Complete Sediment Data Set
Amesbury Former MGP
Amesbury, Massachusetts

											River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	
										Sample No.	F240020-14	F240020-15	F240020-03	F240020-04	F240020-01	F240020-02	F240020-05	F240020-16	F240021-07	F240021-08	F240021-09	F240021-10	F240021-11	F240021-06	F240020-11	F240020-12	F240020-13	F240021-13	F240021-14	F240021-15	
										Sample Date:	07/22/2024	07/22/2024	07/22/2024	07/22/2024	07/22/2024	07/22/2024	07/22/2024	07/22/2024	07/23/2024	07/23/2024	07/23/2024	07/23/2024	07/23/2024	07/23/2024	07/22/2024	07/22/2024	07/22/2024	07/23/2024	07/23/2024	07/23/2024	
										Sample Time:																					
										ClieSam	876-S1	876-S2	877-S1	877-S2	878-S1	878-S2	879-S1	879-S2	880-S1	880-S2	881-S1	881-S2	882-S1	882-S2	888-S1	888-S2	888-S3	889-S1	889-S2	889-S3	
										Depths:	0-1	1-2	0-1	1-2	0-1	1-2	0-1	1-2	0-1	1-2	0-1	1-2	0-1	1-2	0-1	1-2	4-5	0-1	1-2	4-5	
										RAH																					
										%solids																					
CAS Number	Method Name	Analyte	Units	RT		PAH17	PAH34	PAH51	Abbrev	PAH #																					
11095-43-5	8270D (SIM) Semi-Volatile Organic Compou0s	Benzo(b)thiophene	ug/Kg dry							78	5.1	9.52	9.76	3.88	0	10.7	0	0	0	0	0	0	9.87	0	0	0	0	11.6	0	0	78
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Benzene	ug/Kg dry							79	108	455	142	241	116	541	62.8	32.8	157	125	121	40.8	183	103	0	26.5	0	349	99.7		79
	8270D (SIM) Semi-Volatile Organic Compou0s	C1-Decalins	ug/Kg dry							80	132	4420	32.1	765	171	581	0	0	12.1	0	0	0	382	177	0	0	0	85.1	0	0	80
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Benzenes	ug/Kg dry							81	132	370	180	79.3	85.5	142	19.4	18	140	18	80.5	0	133	47	0	9.16	0	164	0	0	81
	8270D (SIM) Semi-Volatile Organic Compou0s	C2-Decalins	ug/Kg dry							82	166	1340	52.9	376	144	575	0	0	0	0	0	0	281	90.4	0	0	0	66.9	0	0	82
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Benzenes	ug/Kg dry							83	25.2	92.9	27	15.8	0	55.5	0	0	23.2	0	0	0	39.9	22.7	0	0	0	246	0	0	83
	8270D (SIM) Semi-Volatile Organic Compou0s	C3-Decalins	ug/Kg dry							84	151	605	65.2	230	111	430	0	0	0	0	0	0	201	56.2	0	0	0	32.6	0	0	84
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Benzenes	ug/Kg dry							85	34.5	389	16.2	21.6	4.38	67.1	56.4	0	52.7	67.2	11.2	20.1	65.8	61.3	0	52	0	445	0	0	85
	8270D (SIM) Semi-Volatile Organic Compou0s	C4-Decalins	ug/Kg dry							86	258	957	110	348	158	601	0	0	0	0	0	0	313	87.1	0	0	0	25.7	0	0	86
	8270D (SIM) Semi-Volatile Organic Compou0s	C5-Benzenes	ug/Kg dry							87	17.1	491	12.6	20.8	0	45.3	26.3	0	9.54	17.1	0	0	47.4	29.2	0	27.3	0	228	0	0	87
86-74-8	8270D (SIM) Semi-Volatile Organic Compou0s	Carbazole	ug/Kg dry	35.61						88	94	45	112	49.7	30.7	85.3	0	0	45.4	0	5.67	0	46.8	17.2	33.2	0	0	25	0	0	88
493-01-6	8270D (SIM) Semi-Volatile Organic Compou0s	cis-Decalin	ug/Kg dry							89	6.78	342		54.3	11.4	29	0	0	0	0	0	0	25.2	13.9	0	0	0	3.88	0	0	89
100-41-4	8270D (SIM) Semi-Volatile Organic Compou0s	Ethylbenzene	ug/Kg dry							90	17.3	34.7	16.4	11.3	11.2	20.6	8.41	4.6	13.8	16.3	6.75	4.66	22.1	10.7	3.86	8.45	0	18.5	2.33	0	90
98-82-8	8270D (SIM) Semi-Volatile Organic Compou0s	Isopropylbenzene	ug/Kg dry							91	0	4.14	0	0	0	3.17	0	0	0	0	0	0	0	0	0	0	0	5.16	0	0	91
	8270D (SIM) Semi-Volatile Organic Compou0s	m,p-Xylene	ug/Kg dry							92	231	609	313	150	181	236	67.4	57.6	261	49.9	163	23.1	240	108	16.2	43.1	0	258	8	0	92
108-87-2	8270D (SIM) Semi-Volatile Organic Compou0s	Methylcyclohexane	ug/Kg dry							93	8.63	13.4	8.74	5.1	4.9	13.9	0	0	5.69	0	0	0	9.35	0	0	0	0	14.7	0	0	93
104-51-8	8270D (SIM) Semi-Volatile Organic Compou0s	n-Butylbenzene	ug/Kg dry							94	16.4	91.9	16.7	13	14.8	15.2	23.9	14.7	25.2	27.6	12.4	12.8	35.4	26.6	3.35	33.9	0	9.29	0	0	94
103-65-1	8270D (SIM) Semi-Volatile Organic Compou0s	n-Propylbenzene	ug/Kg dry							95	11.8	29.1	10.9	5.29	8	11.1	9.12	6.88	14.2	13.1	6.59	6.43	17.4	11.7	2.72	17	0	13.1	2.07	0	95
95-47-6	8270D (SIM) Semi-Volatile Organic Compou0s	o-Xylene	ug/Kg dry							96	13.6	25.4	15.6	8.87	7.86	17.1	6.45	4.9	10	6.21	8.06		12.9	9.6	2.77	3.76	0	47.4	0	0	96
99-87-6	8270D (SIM) Semi-Volatile Organic Compou0s	p-Isopropyltoluene	ug/Kg dry							97	12.9	25.1	14.3	11.1	10.9	70	45.2	6.94	83	105	23.2	40.4	17.6	62.9	2.73	17.8	0	98.9	25.4	0	97
135-98-8	8270D (SIM) Semi-Volatile Organic Compou0s	sec-Butylbenzene	ug/Kg dry							98	0	5.07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.28	0	0	98
100-42-5	8270D (SIM) Semi-Volatile Organic Compou0s	Styrene	ug/Kg dry							99	137	328	133	61.3	65.2	100	78.8	31.2	39.9	42.1	17.5	14.7	72.6	44.7	13.5	56.2	7.28	19.1	0	0	99
98-06-6	8270D (SIM) Semi-Volatile Organic Compou0s	t-Butylbenzene	ug/Kg dry							100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100
108-88-3	8270D (SIM) Semi-Volatile Organic Compou0s	Toluene	ug/Kg dry							101	176	643	227	358	203	760	127	76.1	252	200	194	88.9	281	176	17.8	69.5	6.34	497	153	6.8	101
493-02-7	8270D (SIM) Semi-Volatile Organic Compou0s	trans-Decalin	ug/Kg dry							102	37.2	3250	12.9	379	95.2	205	0	0	0	0	0	0	176	107	0	0	0	40.1	0	0	102
3891-98-3	Saturated Hydrocarbons by GC/FID	2,6,10-trimethyldodecane (1380)	mg/Kg dry							103	95.4	890	93.8	191	51.2	339	11.6	8.79	20.6	8.03	11.7	7.26	257	37.3	11.5	7.72	4.46	31.5	4.37	4.88	103
3892-00-0	Saturated Hydrocarbons by GC/FID	2,6,10-trimethylpeadecane (1650)	mg/Kg dry							104	104	1340	89.2	203	62.5	433	14.3	13.5	20.4	9.3	12.3	7.48	433	48.3	19.6	8.05	5.37	48.5	5.49	4.28	104
3891-99-4	Saturated Hydrocarbons by GC/FID	2,6,10-trimethyltridecane (1470)	mg/Kg dry							105	189	1380	195	302	107	587	41	35.8	84.3	25.2	56.5	21.9	462	81.3	25.5	28	8.83	128	17	12.1	105
	Classical Chemistry	Black Carbon (Average)	mg/kg							106																					106
	Saturated Hydrocarbons by GC/FID	C-10	mg/Kg dry							107																					107
	Saturated Hydrocarbons by GC/FID	C-11	mg/Kg dry							108																					108
	Saturated Hydrocarbons by GC/FID	C-12	mg/Kg dry							109																					109
	Saturated Hydrocarbons by GC/FID	C-13	mg/Kg dry							110																					110
	Saturated Hydrocarbons by GC/FID	C-14	mg/Kg dry							111																					111
	Saturated Hydrocarbons by GC/FID	C-15	mg/Kg dry							112																					112
	Saturated Hydrocarbons by GC/FID	C-16	mg/Kg dry							113																					113
	Saturated Hydrocarbons by GC/FID	C-17	mg/Kg dry							114	211	0	354	160	199	249	163	155	265	128	297	96.5	288	182	100	86.8	33.4	289	48.6	35.3	114
	Saturated Hydrocarbons by GC/FID	C-18	mg/Kg dry							115	98.6	146	186	105	73.4	159	134	128	115	85.4	190	66.6	134	72.2	75.7	72.2	36.8	167	43.3	38.1	115
	Saturated Hydrocarbons by GC/FID	C-19	mg/Kg dry							116																					116
	Saturated Hydrocarbons by GC/FID	C-21	mg/Kg dry							117																					117
	Saturated Hydrocarbons by GC/FID	C-22	mg/Kg dry							118																					118
	Saturated Hydrocarbons by GC/FID	C-23	mg/Kg dry							119																					119
	Saturated Hydrocarbons by GC/FID	C-24	mg/Kg dry							120																					120
	Saturated Hydrocarbons by GC/FID	C-25	mg/Kg dry							121																					121
	Saturated Hydrocarbons by GC/FID	C-26	mg/Kg dry							122																					122
	Saturated Hydrocarbons by GC/FID	C-27	mg/Kg dry							123																					123
	Saturated Hydrocarbons by GC/FID	C-28	mg/Kg dry							124																					124
	Saturated Hydrocarbons by GC/FID	C-29	mg/Kg dry							125																					125
	Saturated Hydrocarbons by GC/FID	C-30	mg/Kg dry							126																					126
	Saturated Hydrocarbons by GC/FID	C-31	mg/Kg dry							127																					127
	Saturated Hydrocarbons by GC/FID	C-32	mg/Kg dry							128																					128
	Saturated Hydrocarbons by GC/FID	C-33	mg/Kg dry							129																					129
	Saturated Hydrocarbons by GC/FID	C-34	mg/Kg dry							130																					130
	Saturated Hydrocarbons by GC/FID	C-35	mg/Kg dry							131																					131
	Saturated Hydrocarbons by GC/FID	C-36	mg/Kg dry							132																					132
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	Saturated Hydrocarbons by GC/FID	C-40	mg/Kg dry							136																					136
	Saturated Hydrocarbons by GC/FID	C-8	mg/Kg dry							137																					137
	Saturated Hydrocarbons by GC/FID	C-9	mg/Kg dry							138																					138
638-36-8	Saturated Hydrocarbons by GC/FID	Phytane	mg/Kg dry	34.53						141	249	2750	145	504	156	1070	16.4	16.8	60.6	18.3	46	14.9	892	143	34.5	12.6	5.23	63.6	3.64	5.11	141
1921-70-6	Saturated Hydrocarbons by GC/FID	Pristane	mg/Kg dry	32.65						142	240	3650	290	474	143	899	18.2	9.4	46.9	15.1	34.2	11.6	1090	136	39.1	11.4	3.84	134	4.95	3.98	142
TOC	Classical Chemistry	Total Organic Carbon (Average)	mg/kg							145	20200	43600	56800	17100	48800	43800	62000	64100	76200	46600	44900	33300	56500	62400	6450	49900	4280	63200	4320	ND	145
	TPAH16										14118	11088.1	25599.6	10989.2	7979.9	26604	1153.23	44.1	6028.6	94.65	1239.28	27.84	16753	2289.2	5327.5	322.06	5.91	19911.9	15.49	30.39	
	TPAH34										20293.1	21497.9	41659	18896.4	13286.4	48803	2947.33	617.93	9117.4	799.53	2491.98	429.1	27086	4631.6	7147.8	1239.81	51.61	35601.9	112.01	75.53	
	TPAH51										22853.8	25171.2	48013.7	21868.4	15148.6	74681.6	3889.7	694	11502.1	2384.35	3158.91	792.77	31097.3	5733.38	7896.35	2933.9	84.6	40582.8	164.78	91.8	
	LPAH										1806.7	1978.7	2617.2	1352.2	906.9	3101	252.8	23.69	789.1	36.83	142.85	18.69	3031	395.2	671.15	309.96	9.34	9040.9	13.23	19.26	
	HPAH										12353	9176	23058	9694	7103	23629	915.93	27.01	5264	63.59	1104.9	13.01	13849	1911.5	4665.6	18.8	0	11119	4.95	14.73	

(does not include source area samples collected in 2017)

Attachment C Sediment Toxicity Report

Aqua Survey, Inc.

Technical Report
Toxicological Evaluation of Freshwater Sediment
from Amesbury Former MGP, Amesbury, MA

10-Day Acute *Chironomus dilutus*
and
42-Day Chronic *Hyalella azteca* Studies

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801

July 26, 2019

ASI Job No. 38-205R

469 Point Breeze Road
Flemington, NJ 08822

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Signature Page

Technical Report
Toxicological Evaluation of Freshwater Sediment from Amesbury Former MGP, Amesbury, MA

10-Day Acute *Chironomus dilutus* and 42-Day Chronic *Hyalella azteca* Studies

The report as well as all records and raw data were audited and found to be an accurate reflection of the study. Copies of the raw data will be maintained by Aqua Survey, Inc., 469 Point Breeze Road, Flemington, New Jersey, 08822.

Cheryl Hall — 7/26/19

Cheryl Hall
Quality Assurance Officer

Date

Michelle Thomas — 7/26/19

Michelle Thomas
Laboratory Manager

Date

Jon Doi — 7-26-19

Jon Doi, Ph.D.
Executive Vice President

Date

Technical Report
Toxicological Evaluation of Freshwater Sediment from Amesbury Former MGP, Amesbury, MA

10-Day Acute *Chironomus dilutus* and 42-Day Chronic *Hyalella azteca* Studies

Study Initiation Date

April 23, 2019

Study Completion Date

July 26, 2019

Performing Laboratory

Aqua Survey, Inc.
469 Point Breeze Road
Flemington, New Jersey 08822

Sponsor

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801

Laboratory Project ID

ASI Job No. 38-205

I. EXECUTIVE SUMMARY

Table 1. Summary of Results, 10-Day Acute *C. dilutus* Test

suppose to be SS645. SS654 is in the mudflat

Sediment	10-Day Endpoints	
	Survival	Growth
	10-Day Survival (%)	10-Day mean weight per surviving organism (mg)
Control	100	1.19
SS654R (Ref)	99	0.97
SS632R	93	0.90
SS633R	83*	1.13
SS635R	95	1.13
SS636R	94	0.97

* Statistically Significant compared to the Reference

Table 2. Summary of Results, 42-Day Chronic *H. azteca* Test

Sediment	28-Day Endpoints		35-Day	42-Day Endpoints		
	Survival	Growth	Survival	Survival	Growth	Reproduction
	28-Day Survival (%)	28-Day mean weight per surviving organism (mg)	35-Day Survival (%)	42-Day Survival (%)	42-Day mean weight per surviving organism (mg)	Number of young per surviving female (Day 28-42)
Control	80.0	0.30	78.8	67.5	0.46	0.2
SS645R (Reference)	77.5	0.27	78.8	75.0	0.48	0.9
SS632R	90.0	0.24	87.5	78.8	0.43	1.1
SS633R	87.5	0.29	93.8	83.8	0.44*	0.2
SS635R	92.5	0.28	92.5	87.5	0.47	0.8
SS636R	85.0	0.27	77.5	63.8	0.45	0.2
SS642R	62.5	0.22*	73.8	66.3	0.48	0.9
SS643R	82.5	0.22	96.3	91.3	0.39*	0.5
SS644R	87.5	0.25	83.8	76.3	0.47	0.4

* Statistically Significant compared to the Reference

Statistical analyses were conducted comparing the results of test sediments against the reference sediment results for the following endpoints: 10-day survival and growth for the *C. dilutus* and 28-day survival and growth, 35-day survival; 42-day survival growth and reproduction for the *H. azteca*. For the *C. dilutus* acute bioassay, one sample (SS633R) was found to be statistically significant when compared to the reference sample for survival. There were no test sediments that were statistically significant when compared to the reference sample for growth. No samples were found to be statistically significant as compared to the reference results for the survival endpoints for the *H. azteca* chronic

bioassay. One treatment, SS642R, was found to be statistically significant when compared to the reference for the *H. azteca* Day 28 growth endpoint and two treatments, SS633R and SS643R, were found to be statistically significant for the *H. azteca* 42-day growth endpoint.

It should be noted an initial 42-Day Chronic *Hyalella azteca* study with sediment from the Amesbury former MGP was started on February 1, 2019. During the 42 days of testing, the Control sediment chambers showed signs of excessive mortality and therefore this study was not used and was repeated.

An initial 10-Day Acute *Chironomus dilutus* study with sediment from the Amesbury former MGP was started on February 8, 2019. After 10 days of testing it was noticed that one of the test sediments (SS645) was accidentally not included for testing. Therefore, this study was also repeated.

Test and Control sediments were resampled and testing for both studies was restarted on May 3, 2019 and May 7, 2019.

All information and data presented in this report reflects the second sampling and testing event.

II. INTRODUCTION

The objective of this study was to provide toxicological data assessment of sediment collected from the Amesbury former MGP in the city of Amesbury, Massachusetts. A 10-Day sediment exposure on whole-sediment was conducted to measure the effects on the survival and growth of the freshwater midge, *Chironomus dilutus* and a 42-Day sediment exposure on whole-sediment was conducted to measure the effects on the survival, growth and reproduction of the freshwater amphipod, *Hyalella azteca.* Both bioassays were conducted in accordance with the USEPA document, *Methods for Measuring the Toxicity and Bioaccumulation of Sediment-Associated Contaminants with Freshwater Invertebrates,* (EPA 600/R-99/064, March 2000).

III. TEST ADMINISTRATION

A. Sponsor

GEI Consultants
400 Unicorn Park Drive
Woburn, MA

B. Testing Facility

Aqua Survey, Inc.
469 Point Breeze Road
Flemington, New Jersey 08822

C. Dates of Experimentation

Exposure dates:	10-day *C. dilutus*	5/7/19 – 5/17/19
	42-day *H. azteca*	5/3/19 – 6/14/19

D. Study Participants

Jon Doi, Ph.D.	Executive Vice-President
Cheryl Hall	Quality Assurance Officer
Elizabeth Horn	Staff Scientist
Michelle Thomas	Laboratory Manager

IV. MATERIALS AND METHODS

All testing was performed as defined in the USEPA document, *Methods for Measuring the Toxicity and Bioaccumulation of Sediment-Associated Contaminants with Freshwater Invertebrates* (EPA 600/R-99/064, March 2000). The methods employed for this study followed guidelines outlined by the American Society of Testing Materials, Standard Guide for Conducting Sediment Toxicity Tests with Freshwater Invertebrates, (ASTM E1706-96).

A. Sampling

Eight samples were collected by GEI Consultants personnel on April 23, 2019 and received at Aqua Survey, Inc. (ASI) on April 25, 2019. Control sediment was sampled by ASI personnel on April 30, 2019. Samples were assigned unique ASI ID numbers upon receipt and stored at 4°C in the dark until used for testing. Sample identification numbers and locations are listed below. Chains of Custody are provided in Appendix A.

Table 3. Sample Identification

Sample Name/Location	ASI Sample No. #	10-Day *C. dilutus*	42-Day *H. azteca*
ASI pond mud (Control)	20190313		*
50/50 ASI pond mud/silica sand (Control)	20190314	*	
184576-SS632R	20190305	*	*
184576-SS633R	20190306	*	*
184576-SS635R	20190307	*	*
184576-SS636R	20190308	*	*
184576-SS642R	20190309		*
184576-SS643R	20190310		*
184576-SS644R	20190311		*
184576-SS645R (Reference)	20190312	*	*

B. Sample Preparation and Reconditioning

The Control sediment for the *H. azteca* bioassay (ASI pond mud) was sieved through a 1.0 mm sieve prior to test initiation. The Control sediment for the *C. dilutus* bioassay was sieved (1.0 mm) ASI pond mud mixed with equal amounts by volume of rinsed fine silica sand (granusil). Test sediment samples were used unaltered. All samples were homogenized by hand mixing for approximately 5 minutes. The Sample Use Forms are located in Appendix B.

C. Toxicity Testing: 42-Day *H. azteca*

Whole sediment toxicity was assessed through a 42-day chronic exposure with the amphipod *Hyalella azteca,* a representative benthic species.

Twenty-four hours before the test was initiated, twelve 100 ml replicates of each sample and control sediment were prepared; 175 ml of overlay water was added to each exposure chamber. Organisms were added the following day. Ten organisms per replicate. Daily overlay water renewal was initiated at this time.

The *H.azteca* used in testing were cultured at 23ºC in-house at ASI. The organisms were 7 – 8 days of age at test initiation. The Culture Lab Distribution Form can be found in the Biological Raw Data section (Appendix E). Pond sediment from ASI property was used as the control sediment. ASI well water was used as the overlay water. The test temperature was 23±1°C with a 16-hour light: 8-hour dark photoperiod at approximately 100-1000 lux. Daily water quality, observations and physical parameters were monitored as per EPA 600/R-99/064. Water exchanges were performed twice daily, 200 ml per exchange and organisms were fed 1 ml of Yeast, Cerophyll® and Trout Chow (YCT) per day.

The endpoints of the test were 28-day survival and growth, 35-day survival and reproduction and 42-day survival, growth and reproduction along with the number of adult males and females surviving on day 42. See Tables 13-16.

The results for all endpoints for these tests were statistically analyzed using ToxCalc™ (version 5.0.23). The results for the test treatments were compared to one reference sediment (SS645R, ASI #20190312). All statistical analysis reports can be found in Appendix C. This program follows EPA guidelines for statistical hypothesis testing, including appropriate data transformations to induce equality of variance and normality. If ANOVA assumptions were not met after data transformation, appropriate non-parametric equivalents are used.

Water quality, observations and physical parameters were monitored as per EPA 600/R-99/064. Alkalinity, hardness, conductivity and ammonia were determined on the overlay water of the exposure chambers initially, Day 28 and 35, and at test termination. See Tables 17-20 for summaries of the water quality data.

A Standard Reference Toxicant test (SRT) was performed. The LC_{50} value for the *H. azteca* fell within the 95% confidence limits of the control chart. The results of the

SRT tests can be found in the biological raw data section (Appendix E), along with the control chart.

On Day 28, the end of the sediment portion of the chronic test, all the surviving organisms were collected by sieving the sediment through a 0.425 millimeter mesh sieve. Four of the replicates from each treatment were used for survival dry weight determinations. The remaining eight replicates were then used for the reproduction phase of the test. The survivors from each replicate were placed in individual water-only exposure chambers with additional food and overlay water. Each chamber also contained an approximate 3 cm x 3 cm piece of coiled web material. Water quality, feeding and water exchanges continued as before.

On Day 35, the number of surviving adults was recorded. The number of offspring was also recorded and the offspring were removed from the exposure chambers.

On Day 42, the test was terminated. The number of surviving adults and the number of offspring was recorded. The adults were then preserved in a 70% methanol solution and the number of males was determined. This information was used to calculate the number of young produced per female, per replicate, from Day 28 to Day 42. Dry weight determinations were also conducted on the surviving adults. Dry weight determinations were made by drying each replicate at 60ºC for 24 hours.

D. Toxicity Testing: 10-Day *Chironomus dilutus*

Whole sediment toxicity was assessed through a 10-day exposure with the midge, *Chironomus dilutus,* a representative benthic species. The endpoints of the test were survival and growth.

Twenty-four hours before the test was initiated, eight 100 ml replicates of each sample and control sediment were prepared; 175 ml of overlay water was added to each exposure chamber. Organisms were added the following day. Ten organisms per replicate. Daily overlay water renewal was initiated at this time.

The organisms used in testing were cultured in-house at ASI and were second-third instar (i.e., 10 days old). The Culture Lab Distribution Form can be found in the Biological Raw Data sections (Appendix D)

Moderately hard reconstituted (Recon) water was used as the overlay water. The test temperature was 23±1°C with a 16 L: 8D photoperiod at approximately 100-1000 lux. Sieved pond sediment from ASI property and rinsed fine silica sand (granusil) were mixed in equal proportions and used as the control sediment.

Daily water quality, observations and physical parameters were monitored as per EPA 600/R-99/064. Water exchanges were performed twice daily, 200 milliliters per exchange, and organisms were fed 1.5 milliliters of Tetramin slurry each day.

On day 10, the test was terminated. The sediment from each chamber was sieved to recover organisms (larvae and pupae) and survival was determined. To measure

growth (ash-free dry weight), only larvae recovered from each treatment were placed in pre-ashed aluminum-pans and dried in an oven at 60°C for 24 hours. To determine the dry weight the pans were allowed to cool to room temperature and weighed. After being weighed, the pans were then placed in a 550°C oven for 2 hours and again allowed to cool to room temperature. They were re-weighed and the ash-free dry weight (AFDW) for each replicate was calculated.

A standard reference toxicant (SRT) test was performed to evaluate the sensitivity of the organisms used in testing. The reference toxicant data was entered into a program based on currently accepted methods for calculating an LC_{50}. The calculated LC_{50} value fell within the acceptable upper and lower control limits. The results of the SRT test can be found in the biological raw data section (Appendix D), along with the control chart.

V. RESULTS

Summaries of the results for each endpoint (10-day survival and growth for the *C. dilutus* acute exposure and 28-day survival and growth, 35-day survival and reproduction, and 42-day survival, growth and reproduction for the *H. azteca* chronic exposure) are provided in Tables 4 through 7. Tables 8 (10-day acute) and 13 through 16 (42-day chronic) provide complete calculation details for the above listed endpoints. Water quality parameters can be found in Tables 9 through 12 (10-day acute) and Tables 17 through 20 (42-day chronic).

Control organism survival for both the 10-day test and on Day 28 for the 42-day test is recommended to be 80% or greater for an acceptable test. The control organism survival for the 10-day test was 100% and the Day 28 survival for the 42-day test was 80.0%.

Statistical analyses were conducted comparing the results of test sediments against the reference sediment results for the following endpoints: 10-day survival and growth for the *C. dilutus* and 28-day survival and growth, 35-day survival; 42-day survival, growth and reproduction for the *H. azteca*. For the *C. dilutus* acute bioassay, one sample (SS633R) was found to be statistically significant when compared to the reference sample for survival. No samples were found to be statistically significant as compared to the reference results for the survival endpoints for the *H. azteca* chronic bioassay. One treatment, SS642R, was found to be statistically significant when compared to the reference for the *H. azteca* Day 28 growth endpoint and two treatments, SS633R and SS643R, were found to be statistically significant for the *H. azteca* 42 day growth endpoint.

These results are summarized in Tables 1 and 2 and can be found in the Executive Summary on page 6 of this report.

Table 4. 10-Day *C. dilutus* Acute Test: Day 10 Survival and Growth

Sample	% Survival	Mean dry wt. per surviving organism (mg)
Control	100	1.19
SS645R (Reference)	99	0.97
SS632R	93	0.90
SS633R	83	1.13
SS635R	95	1.13
SS636R	94	1.09

Table 5. 42-Day *H. azteca* Chronic Test: Day 28 Survival and Growth

Sample	% Survival	Mean dry wt. per surviving organism (mg)
Control	80.0	0.30
SS645R (Reference)	77.5	0.27
SS632R	90.0	0.24
SS633R	87.5	0.29
SS635R	92.5	0.28
SS636R	85.0	0.27
SS642R	62.5	0.22
SS643R	82.5	0.22
SS644R	87.5	0.25

Table 6. 42-Day *H. azteca* Chronic Test: Day 35 Survival and Reproduction

Sample	% Survival	Mean young per replicate
Control	78.8	0.5
SS645R (Reference)	78.8	1.9
SS632R	87.5	0.0
SS633R	93.8	0.6
SS635R	92.5	1.8
SS636R	77.5	0.0
SS642R	73.8	0.4
SS643R	96.3	1.8
SS644R	83.8	0.5

Table 7. 42-Day *H. azteca* Chronic Test: Day 42 Survival, Growth and Reproduction

Sample	% Survival	Mean dry wt. per surviving organism (mg)	Mean young per surviving female (Days 28-42)
Control	67.5	0.46	0.2
SS645R (Reference)	75.0	0.48	0.9
SS632R	78.8	0.43	1.1
SS633R	83.8	0.44	0.2
SS635R	87.5	0.47	0.8
SS636R	63.8	0.45	0.2
SS642R	66.3	0.48	0.9
SS643R	91.3	0.39	0.5
SS644R	76.3	0.47	0.4

Table 8 ***Chironomus dilutus*** **10 Day Survival and Growth (Ash-Free Dry Weight AFDW)** **ASI Job # 38-205R**

Sample ID	Code #	Chamber #	Live Count Larvae	% Survival	Empty Pan Wt. (mg)	Pan + Larvae Wt. (mg)	Pan + Ash Wt. (mg)	Total AFDW Wt. (mg)	Individual AFDW per surviving Org. (mg)	Mean AFDW per Surviving Larvae (mg)
Control	1.1	1	10		747.30	765.35	752.00	13.35	1.34	
#20190314	1.2	2	10		758.94	777.16	763.72	13.44	1.34	
	1.3	9	10		752.08	768.73	756.17	12.56	1.26	
	1.4	12	10		763.78	780.13	768.38	11.75	1.18	
	1.5	14	10		746.42	763.22	750.94	12.28	1.23	
	1.6	33	10		717.41	731.91	720.80	11.11	1.11	
	1.7	42	10		723.40	739.41	727.16	12.25	1.23	
	1.8	43	10	100%	728.91	740.82	732.08	8.74	0.87	1.19
SS632R	2.1	3	10		754.19	765.50	756.64	8.86	0.89	
#20190305	2.2	5	10		722.83	733.99	724.75	9.24	0.92	
	2.3	10	5		741.75	749.18	743.54	5.64	1.13	
	2.4	29	10		762.63	772.53	764.91	7.62	0.76	
	2.5	30	10		755.09	765.45	757.22	8.23	0.82	
	2.6	44	10		728.92	739.25	731.25	8.00	0.80	
	2.7	46	9		730.78	742.49	733.63	8.86	0.98	
	2.8	47	10	93%	728.59	740.34	731.37	8.97	0.90	0.90
SS633R	3.1	13	8		754.94	765.09	757.29	7.80	0.98	
#20190306	3.2	15	5		725.39	734.50	728.04	6.46	1.29	
	3.3	20	10		762.03	776.59	765.38	11.21	1.12	
	3.4	28	8		746.56	757.50	748.99	8.51	1.06	
	3.5	34	9		771.28	784.68	773.99	10.69	1.19	
	3.6	39	7		756.59	765.96	758.69	7.27	1.04	
	3.7	41	10		717.11	731.03	719.96	11.07	1.11	
	3.8	45	9	83% *	726.41	741.02	729.91	11.11	1.23	1.13
SS635R	4.1	7	9		745.68	760.22	748.99	11.23	1.25	
#20190307	4.2	16	10		774.16	789.32	777.85	11.47	1.15	
	4.3	23	10		739.88	755.03	742.99	12.04	1.20	
	4.4	25	10		767.18	781.80	771.17	10.63	1.06	
	4.5	27	10		750.64	764.93	754.00	10.93	1.09	
	4.6	35	10		760.81	775.39	764.14	11.25	1.13	
	4.7	36	8		774.02	785.36	776.65	8.71	1.09	
	4.8	37	9	95%	758.33	770.81	761.22	9.59	1.07	1.13
SS636R	5.1	8	8		769.43	781.97	772.44	9.53	1.19	
#20190308	5.2	17	8		745.83	757.32	748.37	8.95	1.12	
	5.3	18	10		745.52	760.06	749.23	10.83	1.08	
	5.4	21	10		767.69	782.29	771.55	10.74	1.07	
	5.5	26	10		771.18	784.50	774.30	10.20	1.02	
	5.6	38	10		752.22	765.37	**	**	**	
	5.7	40	9		763.58	775.87	766.46	9.41	1.05	
	5.8	48	10	94%	732.43	747.44	736.14	11.30	1.13	1.09
SS645R	5.1	4	10		762.53	774.55	764.96	9.59	0.96	
#20190312	5.2	6	9		774.89	787.60	777.97	9.63	1.07	
(Reference)	5.3	11	10		762.71	774.28	765.15	9.13	0.91	
	5.4	19	10		759.90	773.29	762.63	10.66	1.07	
	5.5	22	10		762.75	774.66	765.25	9.41	0.94	
	5.6	24	10		775.02	787.57	778.06	9.51	0.95	
	5.7	31	10		766.16	778.87	768.95	9.92	0.99	
	5.8	32	10	99%	767.04	778.29	769.40	8.89	0.89	0.97

**- Tech error- pan accidentally dropped when weighing; lost dried organisms.

***- Statistically significant when compared to the Reference**

Table 9 ***C. dilutus*** **10-Day Water Quality Readings: Temperature (°C)** **ASI Job # 38-205R**

Sample	ASI ID #	0	1	2	3	4	5	6	7	8	9	10
Control	20190314	23.4	23.6	23.1	23.2	23.6	22.7	23.1	23.0	22.8	22.9	22.9
SS632R	20190305	23.5	23.8	23.0	23.1	23.6	22.8	23.1	23.2	22.7	22.9	23.1
SS633R	20190306	23.5	23.7	23.1	23.2	23.6	22.8	23.1	23.3	22.8	23.0	23.1
SS635R	20190307	23.5	23.8	23.1	23.0	23.6	22.8	23.1	23.3	22.8	22.9	23.1
SS636R	20190308	23.5	23.7	23.2	23.0	23.6	22.8	23.1	23.3	22.8	23.0	23.2
SS645R	20190312	23.5	23.7	23.0	23.1	23.6	22.7	23.1	23.3	22.9	22.9	23.1
										Range	22.7	23.8

Table 10 ***C. dilutus*** **10-Day Water Quality Readings: DO (mg/L)** **ASI Job # 38-205R**

Sample	ASI ID #	0	1	2	3	4	5	6	7	8	9	10
Control	20190314	7.32	4.64	4.12	3.55	3.63	3.36	3.96	3.13	3.49	4.00	4.43
SS632R	20190305	7.17	4.48	4.34	3.69	4.51	4.46	3.54	3.85	4.42	3.40	3.82
SS633R	20190306	7.11	4.22	4.36	3.55	3.66	4.68	4.68	4.10	4.15	3.73	3.77
SS635R	20190307	7.11	3.70	4.03	3.80	4.24	4.19	4.72	4.11	4.33	3.24	3.74
SS636R	20190308	7.03	3.82	3.74	4.02	3.90	4.41	4.26	4.23	4.15	3.53	3.87
SS645R	20190312	7.28	4.28	3.72	3.62	3.61	4.00	4.66	4.26	4.26	4.52	4.19
										Range	3.13	7.32

Table 11 ***C. dilutus*** **10-Day Water Quality Readings: pH (SU)** **ASI Job # 38-205R**

Sample	ASI ID #	0	1	2	3	4	5	6	7	8	9	10
Control	20190314	7.80	7.41		7.34			7.30	7.13	7.21		7.02
SS632R	20190305	7.71	7.25		7.26			7.23	7.17	7.16		7.10
SS633R	20190306	7.64	7.13		7.17			7.26	7.17	7.10		7.14
SS635R	20190307	7.57	7.08		7.22			7.25	7.17	7.10		7.13
SS636R	20190308	7.57	7.13		7.17			7.24	7.19	7.13		7.16
SS645R	20190312	7.62	7.15		7.16			7.22	7.18	7.07		7.17
										Range	7.02	7.80

Table 12 ***C. dilutus*** **10 Day Water Quality Readings: Alkalinity, Hardness, Conductivity, NH_3** **ASI Job # 38-205R**

Sample	ASI #	Alkalinity	Hardness	Conductivity	NH_3	Alkalinity	Hardness	Conductivity	NH_3
		Day 0				Day 10			
Control	20190314	60	84	298	<0.20	60	88	317	<0.20
SS632R	20190305	56	84	298	<0.20	56	84	320	<0.20
SS633R	20190306	60	84	307	<0.20	56	84	303	<0.20
SS635R	20190307	64	92	310	<0.20	60	88	304	<0.20
SS636R	20190308	56	80	299	<0.20	56	84	304	<0.20
SS645R	20190312	56	88	295	<0.20	56	88	310	<0.20

Alkalinity = mg/L Ca CO3
Hardness = mg/L CaCO3
Conductivity = us/cm
NH3 = (mg/L) total ammonia

Table 13 ***Hyalella azteca 28*** **Day Survival and Dry Weight Data** **ASI Job # 38-205R**

Sample	Code	Chamber	Empty Pan Wt.(mg)	Pan + Org. Dry Wt.(mg)	Dry Wt. of Org. (mg)	No. Org.	% Survival	Wt. (mg) per surv. org.	Mean Wt. (mg) per surv. org.	
Control	1.1	11	415.03	417.92	2.89	10		0.289		
20190313	1.2	56	404.61	407.29	2.68	8		0.335		
	1.3	76	410.84	412.51	1.67	6		0.278		
	1.4	82	408.33	410.61	2.28	8	80.0%	0.285	0.30	
SS632R	2.1	24	409.23	412.25	3.02	10		0.302		
20190305	2.2	81	405.88	408.19	2.31	10		0.231		
	2.3	98	411.33	412.89	1.56	8		0.195		
	2.4	107	407.05	408.93	1.88	8	90.0%	0.235	0.24	
SS633R	3.1	28	409.02	412.13	3.11	10		0.311		
20190306	3.2	35	405.76	407.76	2.00	8		0.250		
	3.3	64	405.78	409.06	3.28	10		0.328		
	3.4	73	405.04	406.83	1.79	7	87.5%	0.256	0.29	
SS635R	4.1	3	410.62	413.78	3.16	9		0.351		
20190307	4.2	17	407.06	409.32	2.26	10		0.226		
	4.3	48	408.45	410.80	2.35	9		0.261		
	4.4	55	405.54	407.93	2.39	9	92.5%	0.266	0.28	
SS636R	5.1	58	409.89	412.64	2.75	9		0.306		
20190308	5.2	72	405.78	408.38	2.60	8		0.325		
	5.3	77	413.34	415.56	2.22	9		0.247		
	5.4	96	403.53	405.15	1.62	8	85.0%	0.203	0.27	
SS642R	6.1	37	410.18	411.56	1.38	7		0.197		
20190309	6.2	39	406.18	406.96	0.78	4		0.195		
	6.3	60	408.56	409.52	0.96	4		0.240		
	6.4	100	409.22	411.56	2.34	10	62.5%	0.234	0.22	*
SS643R	7.1	31	408.35	409.73	1.38	8		0.172		
20190310	7.2	59	410.42	413.12	2.70	10		0.270		
	7.3	79	409.28	411.50	2.22	8		0.278		
	7.4	104	408.88	410.12	1.24	7	82.5%	0.177	0.22	
SS644R	8.1	42	409.39	411.18	1.79	9		0.199		
20190311	8.2	50	406.27	408.27	2.00	10		0.200		
	8.3	70	408.28	410.43	2.15	8		0.269		
	8.4	95	409.51	412.30	2.79	8	87.5%	0.349	0.25	
SS645R	9.1	57	410.20	411.36	1.16	5		0.232		
20190312	9.2	62	413.82	416.03	2.21	7		0.316		
(Reference)	9.3	78	408.67	410.93	2.26	10		0.226		
	9.4	87	413.63	416.49	2.86	9	77.5%	0.318	0.27	

* Statistically Significant when compared to the Reference

Table 14 ***Hyalella azteca*** **42 Day Study: Day 35 Survival** **ASI Job # 38-205R**

Sample	Chamber #	Code	Live Count	% Survival
Control	1	1.5	9	
20190313	2	1.6	6	
	10	1.7	9	
	40	1.8	9	
	65	1.9	6	
	75	1.10	6	
	85	1.11	10	
	86	1.12	8	78.8%
SS632R	4	2.5	9	
20190305	32	2.6	10	
	44	2.7	6	
	45	2.8	9	
	46	2.9	8	
	52	2.10	10	
	101	2.11	10	
	103	2.12	8	87.5%
SS633R	7	3.5	10	
20190306	8	3.6	10	
	12	3.7	10	
	30	3.8	8	
	33	3.9	8	
	43	3.10	9	
	53	3.11	10	
	93	3.12	10	93.8%
SS635R	25	4.5	8	
20190307	26	4.6	10	
	41	4.7	9	
	51	4.8	9	
	63	4.9	10	
	84	4.10	8	
	97	4.11	10	
	99	4.12	10	92.5%
SS636R	5	5.5	5	
20190308	14	5.6	9	
	16	5.7	9	
	19	5.8	9	
	21	5.9	9	
	29	5.10	6	
	91	5.11	9	
	108	5.12	6	77.5%

Sample	Chamber #	Code	Live Count	% Survival
SS642R	9	6.5	9	
20190309	18	6.6	8	
	20	6.7	8	
	22	6.8	9	
	27	6.9	7	
	36	6.10	6	
	67	6.11	7	
	90	6.12	5	73.8%
SS643R	15	7.5	9	
20190310	38	7.6	9	
	47	7.7	10	
	49	7.8	10	
	69	7.9	10	
	83	7.10	10	
	94	7.11	10	
	102	7.12	9	96.3%
SS644R	13	8.5	7	
20190311	23	8.6	8	
	34	8.7	6	
	66	8.8	10	
	68	8.9	10	
	80	8.10	8	
	105	8.11	10	
	106	8.12	8	83.8%
SS645R	6	9.5	5	
20190312	54	9.6	5	
(Reference)	61	9.7	10	
	71	9.8	9	
	74	9.9	10	
	88	9.10	10	
	89	9.11	10	
	92	9.12	4	78.8%

Table 15 ***Hyalella azteca 42*** **Day Study: Day 42 Survival and Dry Weight Data** **ASI Job # 38-205R**

Sample	Code	Chamber	Empty Pan Wt.(mg)	Pan + Org. Dry Wt.(mg)	Dry Wt. of Org. (mg)	No. Org.	% Survival	Wt. (mg) per surv. org.	Mean Wt. (mg) per surv. org.	
Control	1.5	1	412.88	416.68	3.80	8		0.475		
20190313	1.6	2	410.47	413.81	3.34	6		0.557		
	1.7	10	406.28	409.71	3.43	9		0.381		
	1.8	40	407.29	411.54	4.25	8		0.531		
	1.9	65	409.02	410.22	1.20	3		0.400		
	1.10	75	412.96	414.82	1.86	5		0.372		
	1.11	85	406.27	409.90	3.63	7		0.519		
	1.12	86	405.14	408.84	3.70	8	67.5%	0.462	0.46	
SS632R	2.5	4	408.36	410.75	2.39	6		0.398		
20190305	2.6	32	408.21	411.94	3.73	10		0.373		
	2.7	44	406.66	408.81	2.15	5		0.430		
	2.8	45	410.12	412.82	2.70	7		0.386		
	2.9	46	407.81	411.20	3.39	8		0.424		
	2.10	52	403.34	407.78	4.44	9		0.493		
	2.11	101	414.88	418.90	4.02	10		0.402		
	2.12	103	410.46	414.91	4.45	8	78.8%	0.556	0.43	
SS633R	3.5	7	407.18	411.04	3.86	8		0.483		
20190306	3.6	8	409.46	414.19	4.73	10		0.473		
	3.7	12	405.43	409.44	4.01	10		0.401		
	3.8	30	415.54	417.87	2.33	6		0.388		
	3.9	33	408.60	411.88	3.28	7		0.469		
	3.10	43	410.76	414.09	3.33	8		0.416		
	3.11	53	410.51	414.73	4.22	9		0.469		
	3.12	93	406.54	409.98	3.44	9	83.8%	0.382	0.44	*
SS635R	4.5	25	407.34	411.06	3.72	8		0.465		
20190307	4.6	26	408.06	412.88	4.82	10		0.482		
	4.7	41	408.43	413.06	4.63	8		0.579		
	4.8	51	405.70	408.56	2.86	8		0.358		
	4.9	63	407.92	412.41	4.49	9		0.499		
	4.10	84	405.52	408.65	3.13	7		0.447		
	4.11	97	408.72	413.39	4.67	10		0.467		
	4.12	99	407.47	412.22	4.75	10	87.5%	0.475	0.47	
SS636R	5.5	5	407.36	409.07	1.71	5		0.342		
20190308	5.6	14	405.83	408.15	2.32	6		0.387		
	5.7	16	410.04	413.82	3.78	7		0.540		
	5.8	19	410.86	414.53	3.67	8		0.459		
	5.9	21	407.93	412.48	4.55	9		0.506		
	5.10	29	412.25	414.18	1.93	4		0.483		
	5.11	91	405.38	408.59	3.21	7		0.459		
	5.12	108	412.06	414.19	2.13	5	63.8%	0.426	0.45	

* Statistically Significant when compared to the Reference

Table 15 (Cont.) ***Hyalella azteca 42*** **Day Study: Day 42 Survival and Dry Weight Data** **ASI Job # 38-205R**

Sample	Code	Chamber	Empty Pan Wt.(mg)	Pan + Org. Dry Wt.(mg)	Dry Wt. of Org. (mg)	No. Org.	% Survival	Wt. (mg) per surv. org.	Mean Wt. (mg) per surv. org.
SS642R	6.5	9	407.76	412.09	4.33	9		0.481	
20190309	6.6	18	409.87	413.22	3.35	7		0.479	
	6.7	20	409.47	412.96	3.49	7		0.499	
	6.8	22	409.50	413.05	3.55	8		0.444	
	6.9	27	408.18	410.92	2.74	5		0.548	
	6.10	36	411.04	412.60	1.56	5		0.312	
	6.11	67	407.48	411.10	3.62	7		0.517	
	6.12	90	414.75	417.36	2.61	5	66.3%	0.522	0.48
SS643R	7.5	15	404.86	407.46	2.60	9		0.289	
20190310	7.6	38	411.81	414.97	3.16	8		0.395	
	7.7	47	408.08	412.65	4.57	10		0.457	
	7.8	49	413.22	416.93	3.71	10		0.371	
	7.9	69	407.41	410.75	3.34	8		0.417	
	7.10	83	408.70	413.06	4.36	10		0.436	
	7.11	94	407.42	410.92	3.50	10		0.350	
	7.12	102	407.14	410.26	3.12	8	91.3%	0.390	0.39 *
SS644R	8.5	13	410.33	412.81	2.48	6		0.413	
20190311	8.6	23	404.64	408.82	4.18	8		0.523	
	8.7	34	407.03	409.26	2.23	6		0.372	
	8.8	66	412.55	417.34	4.79	9		0.532	
	8.9	68	408.22	411.94	3.72	7		0.531	
	8.10	80	408.36	411.68	3.32	7		0.474	
	8.11	105	409.08	413.38	4.30	10		0.430	
	8.12	106	415.91	419.70	3.79	8	76.3%	0.474	0.47
SS645R	9.5	6	409.33	411.33	2.00	5		0.400	
20190312	9.6	54	409.81	412.74	2.93	5		0.586	
(Reference)	9.7	61	404.79	409.04	4.25	9		0.472	
	9.8	71	408.98	413.28	4.30	9		0.478	
	9.9	74	408.69	413.04	4.35	9		0.483	
	9.10	88	408.32	412.63	4.31	9		0.479	
	9.11	89	408.23	412.65	4.42	10		0.442	
	9.12	92	405.96	408.04	2.08	4	75.0%	0.520	0.48

* Statistically Significant when compared to the Reference

Table 16 ***Hyalella azteca* 42 Day Study:** **ASI Job # 38-205R**

Day 35 and Day 42 Summary of Reproduction

Sample	Chamber #	Code	Day 35 # Young	Day 42 # Young	Days 28-42 Total # Young	Day 42 Males	Day 42 Females	Day 42 Mean # Young/Female	Day 42 Mean # Young/Female
Control	1	1.5	0	0	0	5	3	0.0	
20190313	2	1.6	0	0	0	3	3	0.0	
	10	1.7	0	0	0	1	8	0.0	
	40	1.8	0	0	0	6	2	0.0	
	65	1.9	0	0	0	0	3	0.0	
	75	1.10	0	0	0	2	3	0.0	
	85	1.11	0	0	0	5	2	0.0	
	86	1.12	4	0	4	5	3	1.3	0.2
SS632R	4	2.5	0	5	5	3	3	1.7	
20190305	32	2.6	0	0	0	2	8	0.0	
	44	2.7	0	4	4	3	2	2.0	
	45	2.8	0	0	0	2	5	0.0	
	46	2.9	0	0	0	1	7	0.0	
	52	2.10	0	0	0	6	3	0.0	
	101	2.11	0	2	2	5	5	0.4	
	103	2.12	0	10	10	6	2	5.0	1.1
SS633R	7	3.5	0	0	0	4	4	0.0	
20190306	8	3.6	0	0	0	4	6	0.0	
	12	3.7	0	0	0	3	7	0.0	
	30	3.8	0	0	0	1	5	0.0	
	33	3.9	2	0	2	1	6	0.3	
	43	3.10	2	0	2	5	3	0.7	
	53	3.11	1	0	1	6	3	0.3	
	93	3.12	0	0	0	5	4	0.0	0.2
SS635R	25	4.5	0	0	0	4	4	0.0	
20190307	26	4.6	0	5	5	5	5	1.0	
	41	4.7	0	0	0	5	3	0.0	
	51	4.8	0	0	0	5	3	0.0	
	63	4.9	14	0	14	4	5	2.8	
	84	4.10	0	0	0	5	2	0.0	
	97	4.11	0	8	8	7	3	2.7	
	99	4.12	0	0	0	9	1	0.0	0.8
SS636R	5	5.5	0	0	0	3	2	0.0	
20190308	14	5.6	0	0	0	4	2	0.0	
	16	5.7	0	0	0	6	1	0.0	
	19	5.8	0	5	5	5	3	1.7	
	21	5.9	0	0	0	5	4	0.0	
	29	5.10	0	0	0	1	3	0.0	
	91	5.11	0	0	0	3	4	0.0	
	108	5.12	0	0	0	3	2	0.0	0.2

Table 16 (Cont.) ***Hyalella azteca* 42 Day Study:** **ASI Job # 38-205R**

Day 35 and Day 42 Summary of Reproduction

Sample	Chamber #	Code	Day 35 # Young	Day 42 # Young	Days 28-42 Total # Young	Day 42 Males	Day 42 Females	Day 42 Mean # Young/Female	Day 42 Mean # Young/Female
SS642R	9	6.5	0	4	4	5	4	1.0	
20190309	18	6.6	3	4	7	3	4	1.8	
	20	6.7	0	5	5	3	4	1.3	
	22	6.8	0	0	0	6	2	0.0	
	27	6.9	0	0	0	4	1	0.0	
	36	6.10	0	0	0	3	2	0.0	
	67	6.11	0	13	13	3	4	3.3	
	90	6.12	0	0	0	4	1	0.0	0.9
SS643R	15	7.5	8	4	12	1	8	1.5	
20190310	38	7.6	5	0	5	5	3	1.7	
	47	7.7	1	1	2	6	4	0.5	
	49	7.8	0	0	0	4	6	0.0	
	69	7.9	0	0	0	2	6	0.0	
	83	7.10	0	0	0	5	5	0.0	
	94	7.11	0	0	0	7	3	0.0	
	102	7.12	0	0	0	5	3	0.0	0.5
SS644R	13	8.5	0	0	0	4	2	0.0	
20190311	23	8.6	0	0	0	5	3	0.0	
	34	8.7	0	0	0	3	3	0.0	
	66	8.8	0	0	0	3	6	0.0	
	68	8.9	4	2	6	4	3	2.0	
	80	8.10	0	0	0	4	3	0.0	
	105	8.11	0	2	2	6	4	0.5	
	106	8.12	0	1	1	5	3	0.3	0.4
SS645R	6	9.5	0	0	0	1	4	0.0	
20190312	54	9.6	0	0	0	3	2	0.0	
(Reference)	61	9.7	0	0	0	4	5	0.0	
	71	9.8	3	6	9	2	7	1.3	
	74	9.9	3	0	3	5	4	0.8	
	88	9.10	0	0	0	6	3	0.0	
	89	9.11	9	13	22	6	4	5.5	
	92	9.12	0	0	0	3	1	0.0	0.9

Table 17 ***H. azteca*** **42 Day Water Quality Readings: Temperature (°C)** **ASI Job # 38-205R**

Sample	ASI ID #	0	1	2	3	4	5	6	7	8	9	10
Control	20190313	22.9	23.9	23.0	22.8	22.9	22.4	22.5	23.3	22.5	22.2	22.4
SS632R	20190305	23.0	24.1	23.2	22.8	22.3	22.4	22.4	23.2	22.5	23.2	23.6
SS633R	20190306	23.1	24.1	23.2	22.9	23.2	23.7	23.3	23.3	22.4	22.2	22.6
SS635R	20190307	22.9	24.0	23.0	22.9	23.3	22.5	22.3	23.3	22.5	22.2	22.5
SS636R	20190308	23.1	24.2	23.1	22.7	23.3	23.5	23.3	23.3	22.5	22.2	22.6
SS642R	20190309	23.1	24.2	23.1	22.8	23.3	23.5	23.3	23.2	22.5	22.2	22.5
SS643R	20190310	23.0	24.1	23.1	22.3	22.4	22.4	22.4	23.2	22.4	22.1	22.5
SS644R	20190311	22.9	24.0	23.1	22.8	22.3	22.3	22.3	23.2	22.5	22.2	22.6
SS645R	20190312	22.8	24.2	22.4	22.3	22.4	22.4	22.2	22.9	22.5	22.2	22.6

Sample	ASI ID #	11	12	13	14	15*	16*	17*	18*	19	20	21
Control	20190313	23.0	22.1	23.8	23.1	23.5	23.5	21.9	22.1	22.9	22.9	23.2
SS632R	20190305	23.9	23.6	23.8	23.3	23.5	21.8	21.9	21.9	22.9	23.0	23.4
SS633R	20190306	23.1	22.0	23.9	23.4	23.6	23.6	23.4	23.3	22.8	22.9	23.4
SS635R	20190307	23.8	22.9	23.5	23.2	23.5	23.8	21.9	21.8	22.9	22.9	23.3
SS636R	20190308	22.9	23.4	23.5	23.3	23.4	23.8	23.4	23.4	22.8	23.2	23.5
SS642R	20190309	22.9	23.4	23.7	23.4	23.6	23.9	23.4	23.6	22.6	22.9	23.4
SS643R	20190310	23.9	23.5	23.6	23.1	21.9	22.0	21.7	21.9	22.7	23.0	23.4
SS644R	20190311	24.0	23.5	23.6	23.1	23.4	22.0	21.6	21.9	22.8	23.0	23.4
SS645R	20190312	22.9	22.2	23.8	22.7	21.9	22.1	21.7	21.8	22.9	23.0	23.4

Sample	ASI ID #	22	23	24	25	26	27	28	29	30	31	32
Control	20190313	23.1	23.2	23.2	23.1	23.4	23.3	22.9	23.3	23.1	22.5	22.9
SS632R	20190305	23.2	23.5	23.7	23.3	23.5	23.1	23.1	23.3	23.2	22.0	23.0
SS633R	20190306	23.0	23.1	23.2	23.4	23.3	23.4	23.2	23.1	23.0	22.5	23.3
SS635R	20190307	22.8	23.1	23.4	23.3	23.2	23.3	23.2	23.0	23.2	21.9	23.0
SS636R	20190308	22.9	23.0	23.6	23.5	23.5	23.2	23.4	23.1	23.0	22.6	23.3
SS642R	20190309	23.0	23.0	23.6	23.5	23.2	23.4	23.4	23.3	23.1	22.7	23.4
SS643R	20190310	22.9	23.5	23.6	23.4	23.4	22.9	23.3	23.1	22.3	21.9	23.0
SS644R	20190311	22.9	23.4	23.6	23.3	23.5	23.0	23.3	23.3	22.9	22.5	23.0
SS645R	20190312	23.0	23.1	23.2	23.5	23.0	23.0	23.3	23.1	22.3	22.0	23.0

Sample	ASI ID #	33	34	35	36	37	38	39	40	41	42	
Control	20190313	22.4	22.5	22.7	22.8	23.0	23.2	23.8	22.6	22.9	22.4	
SS632R	20190305	22.4	22.7	22.8	23.4	23.1	23.3	23.4	22.7	22.8	22.7	
SS633R	20190306	22.8	22.6	22.9	22.9	23.1	23.2	23.8	22.9	23.1	22.7	
SS635R	20190307	22.5	22.7	22.8	23.2	23.2	23.3	23.3	22.6	22.9	22.8	
SS636R	20190308	22.8	23.2	23.0	23.4	23.1	23.3	23.8	22.8	23.0	22.7	
SS642R	20190309	22.8	23.2	23.0	22.7	23.1	23.3	23.9	22.9	23.0	22.8	
SS643R	20190310	22.5	22.7	22.8	23.4	23.2	22.7	23.3	22.6	22.8	22.7	
SS644R	20190311	22.5	22.8	22.9	23.4	23.1	23.2	23.8	22.6	22.8	22.8	
SS645R	20190312	22.5	22.7	22.8	23.0	23.2	22.7	23.4	**	22.8	22.8	
										Range	21.6	24.2

* Waterbath temperature slightly low; adjusted temperature in bath

** Reading accidentally not entered

Table 18 ***H. azteca*** **42 DayWater Quality Readings: Dissolved Oxygen (mg/L)** **ASI Job # 38-205R**

Sample	ASI ID #	0	1	2	3	4	5	6	7	8	9	10
Control	20190313	7.20	5.35	5.22	4.81	4.96	4.68	3.96	4.32	4.32	4.31	4.32
SS632R	20190305	6.87	5.16	5.75	4.90	5.13	4.62	5.40	4.79	4.27	5.19	3.91
SS633R	20190306	6.80	3.61	5.53	5.83	5.23	4.22	4.40	4.85	3.72	4.75	4.77
SS635R	20190307	6.66	4.59	5.37	5.26	4.56	4.02	4.65	4.32	4.63	3.62	4.60
SS636R	20190308	6.59	5.00	5.38	5.91	4.39	5.21	4.32	4.65	4.76	5.07	3.54
SS642R	20190309	6.78	5.43	6.03	5.80	5.07	5.36	5.30	5.02	5.41	5.58	5.35
SS643R	20190310	6.99	5.89	6.22	6.14	5.69	4.84	5.47	4.98	5.70	5.72	4.70
SS644R	20190311	6.93	5.93	6.09	5.84	6.08	5.25	4.07	4.79	5.12	4.75	4.20
SS645R	20190312	7.21	5.88	6.31	6.04	5.05	5.02	5.29	4.85	4.72	5.82	4.88
Sample	ASI ID #	11	12	13	14	15	16	17	18	19	20	21
Control	20190313	2.91	3.32	4.15	3.54	3.71	3.45	3.30	3.06	3.64	4.25	4.08
SS632R	20190305	5.19	4.66	4.45	4.24	4.55	4.31	3.77	3.41	4.99	4.20	4.32
SS633R	20190306	4.25	3.60	3.88	3.92	4.62	4.33	3.48	3.67	4.95	3.46	4.24
SS635R	20190307	3.95	3.96	3.13	3.58	3.65	3.62	3.52	2.92	4.08	3.91	4.02
SS636R	20190308	3.55	4.03	4.06	3.80	4.44	3.92	4.50	4.16	5.29	4.38	4.09
SS642R	20190309	4.64	5.07	5.49	4.91	4.56	4.86	4.36	4.44	5.74	4.64	4.40
SS643R	20190310	4.56	5.14	5.04	4.94	5.10	5.50	4.68	4.72	4.52	4.64	4.62
SS644R	20190311	5.15	5.04	3.74	4.66	3.96	4.91	5.74	4.62	4.84	4.55	4.51
SS645R	20190312	4.01	3.52	4.98	4.60	4.77	4.26	5.03	4.57	5.02	4.22	4.61
Sample	ASI ID #	22	23	24	25	26	27	28	29	30	31	32
Control	20190313	3.66	4.30	3.81	3.91	3.80	4.27	5.14	6.69	6.27	5.86	6.88
SS632R	20190305	4.71	5.54	3.56	4.45	4.63	4.37	4.90	6.65	6.27	6.38	6.86
SS633R	20190306	4.63	4.46	4.15	4.10	5.28	4.54	4.52	6.36	6.07	6.96	6.72
SS635R	20190307	3.76	4.15	4.43	3.21	3.79	4.54	4.12	6.50	6.27	6.31	6.96
SS636R	20190308	3.97	4.23	3.80	3.82	4.19	3.89	4.17	6.77	6.60	6.07	7.18
SS642R	20190309	4.09	4.98	5.28	4.78	5.25	4.65	4.78	6.66	6.34	6.20	6.96
SS643R	20190310	4.47	5.12	4.63	4.91	4.70	5.79	5.01	6.93	6.57	6.54	7.14
SS644R	20190311	4.13	5.00	4.99	4.44	5.05	4.49	5.00	6.86	6.38	6.64	7.15
SS645R	20190312	4.42	4.32	4.97	4.63	4.57	5.23	5.10	6.83	6.91	6.00	7.15
Sample	ASI ID #	33	34	35	36	37	38	39	40	41	42	
Control	20190313	6.76	6.41	6.50	6.50	5.39	5.32	5.94	5.27	4.85	5.45	
SS632R	20190305	6.52	5.21	6.21	6.38	5.45	5.52	5.21	5.58	5.71	5.26	
SS633R	20190306	6.67	6.65	6.24	5.78	5.59	5.17	6.01	5.13	5.55	5.34	
SS635R	20190307	6.57	6.75	6.45	6.35	6.64	6.39	5.93	5.14	5.34	5.44	
SS636R	20190308	6.53	6.39	6.34	6.02	5.82	4.94	5.25	6.00	5.40	5.08	
SS642R	20190309	6.42	6.92	6.38	6.63	6.22	5.25	5.37	5.65	5.26	5.15	
SS643R	20190310	6.38	6.87	6.51	6.57	5.57	6.46	6.76	5.45	4.33	5.12	
SS644R	20190311	6.16	6.91	6.46	6.66	5.84	6.41	4.31	5.98	5.22	5.27	
SS645R	20190312	6.17	6.80	6.25	6.22	5.63	6.25	5.65	**	4.95	5.43	
										Range	2.91	7.21

** Reading accidentally not entered

Table 19 ***H. azteca*** **42 Day Water Quality Readings: pH** **ASI Job # 38-205R**

Sample	ASI ID #	0	1	2	3	4	5	6	7	8	9	10
Control	20190313	8.14			7.77		7.75		7.83			7.67
SS632R	20190305	8.08			7.83		7.80		7.92			7.75
SS633R	20190306	8.01			7.89		7.73		7.90			7.83
SS635R	20190307	7.92			7.77		7.63		7.79			7.66
SS636R	20190308	8.00			7.90		7.84		7.91			7.76
SS642R	20190309	8.12			7.87		7.87		7.98			7.90
SS643R	20190310	8.09			7.93		7.80		7.92			7.82
SS644R	20190311	7.93			7.80		7.77		7.82			7.69
SS645R	20190312	8.06			7.87		7.75		7.85			7.81

Sample	ASI ID #	11	12	13	14	15	16	17	18	19	20	21
Control	20190313		7.54		7.63			7.59		7.86	7.83	7.81
SS632R	20190305		7.75		7.81			7.68		8.00	7.85	7.88
SS633R	20190306		7.57		7.78			7.74		8.05	7.80	7.86
SS635R	20190307		7.62		7.70			7.62		7.85	7.85	7.79
SS636R	20190308		7.83		7.81			7.76		8.00	7.80	7.79
SS642R	20190309		7.83		7.91			7.82		8.13	7.92	7.88
SS643R	20190310		7.84		7.88			7.82		7.91	7.93	7.94
SS644R	20190311		7.82		7.87			7.93		7.92	7.87	7.84
SS645R	20190312		7.62		7.84			7.83		7.88	7.81	7.85

Sample	ASI ID #	22	23	24	25	26	27	28	29	30	31	32
Control	20190313			7.95		7.80		7.94			8.29	
SS632R	20190305			8.00		7.96		8.02			8.39	
SS633R	20190306			8.14		7.99		7.99			8.47	
SS635R	20190307			7.97		7.84		7.87			8.38	
SS636R	20190308			7.92		7.85		7.87			8.45	
SS642R	20190309			8.16		7.97		7.99			8.40	
SS643R	20190310			8.06		7.95		8.02			8.43	
SS644R	20190311			8.03		7.89		7.92			8.44	
SS645R	20190312			7.97		7.85		7.93			8.34	

Sample	ASI ID #	33	34	35	36	37	38	39	40	41	42	
Control	20190313	8.28		8.00			8.13		8.20		8.13	
SS632R	20190305	8.27		8.00			8.18		8.27		8.16	
SS633R	20190306	8.41		8.03			8.16		8.16		8.14	
SS635R	20190307	8.28		8.07			8.23		8.20		8.19	
SS636R	20190308	8.27		8.05			8.15		8.29		8.16	
SS642R	20190309	8.29		8.06			8.17		8.24		8.17	
SS643R	20190310	8.33		8.07			8.30		8.20		8.18	
SS644R	20190311	8.30		8.10			8.36		8.29		8.20	
SS645R	20190312	8.28		8.08			8.30		**		8.22	
										Range	7.54	8.47

** Reading accidentally not entered

Table 20 ***H. azteca*** **42 Day Water Quality Readings: Alkalinity, Hardness, Conductivity, NH_3** **ASI Job # 38-205R**

Sample	ASI #	Alkalinity	Hardness	Conductivity	NH_3	Alkalinity	Hardness	Conductivity	NH_3
		Initial (Day 0)				Day 28			
Control	20190313	160	96	478	<0.20	196	116	486	<0.20
SS632R	20190305	176	100	475	<0.20	208	112	496	<0.20
SS633R	20190306	184	100	478	0.50	200	124	492	<0.20
SS635R	20190307	200	108	485	0.50	208	112	486	<0.20
SS636R	20190308	184	96	475	0.25	200	112	475	<0.20
SS642R	20190309	184	104	483	<0.20	204	120	481	<0.20
SS643R	20190310	176	100	469	<0.20	200	116	481	<0.20
SS644R	20190311	172	96	465	0.25	204	116	474	<0.20
SS645R	20190312	180	104	476	<0.20	200	124	486	<0.20
		Day 35				Final (Day 42)			
Control	20190313	188	112	493	<0.20	216	124	494	<0.20
SS632R	20190305	200	112	490	<0.20	212	128	490	<0.20
SS633R	20190306	192	112	488	<0.20	220	128	491	<0.20
SS635R	20190307	196	116	489	<0.20	220	124	490	<0.20
SS636R	20190308	196	108	487	<0.20	224	132	490	<0.20
SS642R	20190309	196	108	487	<0.20	216	128	490	<0.20
SS643R	20190310	200	112	488	<0.20	228	128	489	<0.20
SS644R	20190311	192	108	486	<0.20	224	132	489	<0.20
SS645R	20190312	196	108	486	<0.20	224	132	488	<0.20

Alkalinity = mg/L Ca CO3
Hardness = mg/L CaCO3
Conductivity = us/cm
NH3 = (mg/L) total ammonia

APPENDICES

Appendix A

Chains of Custody

Chain-of-Custody Record

Laboratory: AquaSurvey

Laboratory Job # (Lab use only) 38-205R

GEI Consultants
400 Unicorn Park Drive
Woburn, MA 01801
PH: 781.721.4000
FX: 781.721.4073

Project Information

Project Name: Amesbury Former MGP

Project Location: Amesbury, MA

Project Number: 1804576

Project Manager: Ryan Hoffman

Send Report to: Ryan Hoffman

Send EDD to: labdata@geiconsultants.com

Preservative: None | None

Analysis

MCP PRESUMPTIVE CERTAINTY REQUIRED -- **YES** NO

If Yes, Are MCP Analytical Methods Required?	**YES**	NO	NA
Are Drinking Water Samples Submitted?	YES	**NO**	NA
If Yes, Have Drinking Water Sampling Requirements Been Met?	YES	NO	**NA**

Sample Handling

Samples Field Filtered: YES NO **NA**

Sampled Shipped With Ice: **YES** NO

Lab Sample Number	GEI Sample ID	Collection Date	Collection Time	Matrix	No. of Bottles	Sampler(s) Initials	42-day Hyalella azteca chronic toxicity test	10-day Chironomus dilutus acute toxicity test							Sample Specific Remarks
20190305	1804576-SS632R	4/23/2019	1420	Sed	2	CWS	x	x							
20190306	1804576-SS633R	4/23/2019	1410	Sed	2	CWS	x	x							
20190307	1804576-SS635R	4/23/2019	1400	Sed	2	CWS	x	x							
20190308	1804576-SS636R	4/23/2019	1340	Sed	2	CWS	x	x							
20190309	1804576-SS642R	4/23/2019	0905	Sed	1	CWS	x								
20190310	1804576-SS643R	4/23/2019	0920	Sed	1	CWS	x								
20190311	1804576-SS644R	4/23/2019	0935	Sed	1	CWS	x								
20190312	1804576-SS645R	4/23/2019	1120	Sed	2	CWS	x	x							

MCP Level Needed: GEI requires that, within the specified method, the most stringent Method 1 MCP standard be met for all analytes whenever possible.

Relinquished by sampler: (signature)	Date:	Time:	Received by: (signature)
1. [signature]	4/23/2019	1600	1. GEI Sample Fridge
Relinquished by: (signature) 2. GEI Sample Fridge	Date: 4-24-19	Time: 1600	Received by: (signature) 2. [signature]
Relinquished by: (signature) 3. [signature]	Date: 4/25/19	Time: 10:00	Received by: (signature) 3. [signature]
Relinquished by: (signature) 4.	Date:	Time:	Received by: (signature) 4.

Turnaround Time (Business days):

Normal __x__ Other _____
10-Day _____ 7-Day _____
5-Day _____ 3-Day _____

Before submitting rush turnaround samples, you **must** notify the laboratory to confirm that the TAT can be achieved.

Additional Requirements/Comments/Remarks:

CHAIN OF CUSTODY RECORD

AQUA SURVEY, INC.

469 POINT BREEZE ROAD
FLEMINGTON, NJ 08822
(908) 788-8700 OFFICE
(908) 788-9165 FAX

www.aquasurvey.com

CLIENT: GEI - Amesbury | METHOD OF SHIPMENT: N/A

PROJECT/SITE NAME: Amesbury | TO: ASI

ASI JOB NUMBER: 38-205 R | FROM: ASI

SAMPLING & ANALYSIS AUTHORIZED BY: | DATE: 4/30/19

SAMPLE NUMBER	SAMPLING LOCATION AND DESCRIPTION	DATE	TIME	SAMPLE TYPE SED	WTR	COM	GRB		NO. CNT.	ANALYSES REQUIRED *	SEE WORK ORD.
20190313	ASI Pond Mud①	4/30/19	0900	✓			✓		1	Bio Testing	
20190314	C. dilutus Control (50% sieved pond mud & 50% silica sand)	5/6/19	0900								

SAMPLE COLLECTED BY: M Thomas | DATE | TIME | EXACT SAMPLING LOCATION: Back left Corner

SAMPLE RELINQUISHED BY: Michelle Thomas | 4/30/19 | 0900 | SAMPLE RECEIVED BY: Michelle Thomas | DATE 4/30/19 | TIME 0900

SAMPLE RELINQUISHED BY: | | | SAMPLE RECEIVED BY: | DATE | TIME

SAMPLE RELINQUISHED BY: | | | SAMPLE RECEIVED BY: | DATE | TIME

SPECIAL INSTRUCTIONS① Sieved thru a 1.0mm sieve for testing

* Attach Separate Sheet If Necessary

102412

Appendix B

Sample Use Forms

AQUA SURVEY, INC.
SPECIAL STUDIES DEPARTMENT

SAMPLE USE FORM

Job #: 38-205R **Client:** GEI-Amesbury **ASI #:** 20190313 **Sample ID:** ASI Pond Mud-Ha Control

SEDIMENT CHARACTERIZATION

Odor:	**Color:**	**Consistency:**
☑ None	☐ Black	☐ Sandy
☐ Slight	☑ Brown	☑ Silty
☐ Moderate	☐ Gray	☐ Clayey
☐ Strong	☐ Olive	☐ Other
☐ Other	☐ Other	

HOMOGENIZATION/ COMPOSITING/ AMENDING

Method Used: ☐ Drill, ☑ Spoon, ☐ Other

Duration of Mixing: ☐ ~2 mins, ☐ ~3 mins, ☐ ~5 mins, ☑ Other

Total Sample Volume: ~3L

Date/ Initials: 5/2/19

NOTES:
* Sieved thru a 1.0mm & 2.0mm & mixed together

RECORD OF SAMPLE USE

DATE	AMOUNT USED	AMOUNT REMAINING	USED FOR	INITIALS
5/2/19	~600mL		**Testing**	

TOC sample frozen to preserve hold time: _____
(Date/Initials)

AQUA SURVEY, INC.
SPECIAL STUDIES DEPARTMENT

SAMPLE USE FORM

Job #: 38-205R **Client:** GEI-Amesbury **ASI #:** 20190305 **Sample ID:** SS 632 R

SEDIMENT CHARACTERIZATION

Odor:
- ☐ None
- ☑ Slight
- ☑ Moderate
- ☐ Strong
- ☐ Other

Color:
- ☑ Black
- ☐ Brown
- ☐ Gray
- ☐ Olive
- ☐ Other

Consistency:
- ☑ Sandy
- ☑ Silty
- ☐ Clayey
- ☑ Other Organics

HOMOGENIZATION/ COMPOSITING/ AMENDING

Method Used: ☐ Drill, ☑ Spoon, ☐ Other

Duration of Mixing: ☐ ~2 mins, ☐ ~3 mins, ☑ ~5 mins ☐ Other

Total Sample Volume: ~2L

Date/ Initials: 5/ 2 /19 [initials]

NOTES:

RECORD OF SAMPLE USE

DATE	AMOUNT USED	AMOUNT REMAINING	USED FOR	INITIALS
5/2 /19	~120mL		**Testing**	

TOC sample frozen to preserve hold time: _____ (Date/Initials)

AQUA SURVEY, INC.
SPECIAL STUDIES DEPARTMENT

SAMPLE USE FORM

Job #: 38-205R **Client:** GEI-Amesbury **ASI #:** 20190306 **Sample ID:** SS633R

SEDIMENT CHARACTERIZATION

Odor:
- ☑ None
- ☐ Slight
- ☐ Moderate
- ☐ Strong
- ☐ Other

Color:
- ☑ Black
- ☑ Brown
- ☐ Gray
- ☐ Olive
- ☐ Other

Consistency:
- ☑ Sandy
- ☑ Silty
- ☐ Clayey
- ☑ Other w/ organics

HOMOGENIZATION/ COMPOSITING/ AMENDING

Method Used: ☐ Drill, ☑ Spoon, ☐ Other

Duration of Mixing: ☐ ~2 mins, ☐ ~3 mins, ☑ ~5 mins ☐ Other

Total Sample Volume: ~2L

Date/ Initials: 5/2 /19 J

NOTES:

RECORD OF SAMPLE USE

DATE	AMOUNT USED	AMOUNT REMAINING	USED FOR	INITIALS
5/2 /19	~1200mL		**Testing**	J

TOC sample frozen to preserve hold time: _____ (Date/Initials)

AQUA SURVEY, INC.
SPECIAL STUDIES DEPARTMENT

SAMPLE USE FORM

Job #: 38-205R **Client:** GEI-Amesbury **ASI #:** 20190307 **Sample ID:** SS 635R

SEDIMENT CHARACTERIZATION

Odor:
- ☑ None
- ☐ Slight
- ☐ Moderate
- ☐ Strong
- ☐ Other

Color:
- ☑ Black
- ☑ Brown
- ☐ Gray
- ☐ Olive
- ☐ Other

Consistency:
- ☑ Sandy
- ☑ Silty
- ☐ Clayey
- ☑ Other w/ organics

HOMOGENIZATION/ COMPOSITING/ AMENDING

Method Used: ☐ Drill, ☑ Spoon, ☐ Other

Duration of Mixing: ☐ ~2 mins, ☐ ~3 mins, ☑ ~5 mins ☐ Other

Total Sample Volume: ~2L

Date/ Initials: 5/2 /19 J

NOTES:

RECORD OF SAMPLE USE

DATE	AMOUNT USED	AMOUNT REMAINING	USED FOR	INITIALS
5/2 /19	~1200mL		**Testing**	J

TOC sample frozen to preserve hold time: _____ (Date/Initials)

AQUA SURVEY, INC.
SPECIAL STUDIES DEPARTMENT

SAMPLE USE FORM

Job #: 38-205R **Client:** GEI-Amesbury **ASI #:** 2019308 **Sample ID:** SS636R

SEDIMENT CHARACTERIZATION

Odor:
- ☑ None
- ☐ Slight
- ☐ Moderate
- ☐ Strong
- ☐ Other

Color:
- ☐ Black
- ☑ Brown
- ☐ Gray
- ☐ Olive
- ☐ Other

Consistency:
- ☑ Sandy
- ☑ Silty
- ☐ Clayey
- ☑ Other w/ organics

HOMOGENIZATION/ COMPOSITING/ AMENDING

Method Used: ☐ Drill, ☑ Spoon, ☐ Other

Duration of Mixing: ☐ ~2 mins, ☐ ~3 mins, ☑ ~5 mins ☐ Other

Total Sample Volume: ~2L

Date/ Initials: 5/2/19

NOTES:

RECORD OF SAMPLE USE

DATE	AMOUNT USED	AMOUNT REMAINING	USED FOR	INITIALS
5/2/19	~1200mL		**Testing**	

TOC sample frozen to preserve hold time: _____ (Date/Initials)

AQUA SURVEY, INC.
SPECIAL STUDIES DEPARTMENT

SAMPLE USE FORM

Job #: 38-205R **Client:** GEI-Amesbury **ASI #:** 20190309 **Sample ID:** SS-642R

SEDIMENT CHARACTERIZATION

Odor: ☑ None ☐ Slight ☐ Moderate ☐ Strong ☐ Other

Color: ☑ Black ☑ Brown ☐ Gray ☐ Olive ☐ Other

Consistency: ☑ Sandy ☑ Silty ☐ Clayey ☐ Other

HOMOGENIZATION/ COMPOSITING/ AMENDING

Method Used: ☐ Drill, ☑ Spoon, ☐ Other

Duration of Mixing: ☐ ~2 mins, ☐ ~3 mins, ☐ ~5 mins ☑ Other

Total Sample Volume: ~2L

Date/ Initials: 5/2 /19 JH

NOTES:

RECORD OF SAMPLE USE

DATE	AMOUNT USED	AMOUNT REMAINING	USED FOR	INITIALS
5/2 /19	~1200 mL		**Testing**	JH

TOC sample frozen to preserve hold time: _____ (Date/Initials)

AQUA SURVEY, INC.
SPECIAL STUDIES DEPARTMENT

SAMPLE USE FORM

Job #: 38-205R **Client:** GEI-Amesbury **ASI #:** 20190310 **Sample ID:** SS-643R

SEDIMENT CHARACTERIZATION

Odor:
- ☐ None
- ☑ Slight
- ☐ Moderate
- ☐ Strong
- ☐ Other

Color:
- ☑ Black
- ☑ Brown
- ☐ Gray
- ☐ Olive
- ☐ Other

Consistency:
- ☐ Sandy
- ☑ Silty w/some sand
- ☐ Clayey
- ☑ Other organics

HOMOGENIZATION/ COMPOSITING/ AMENDING

Method Used: ☑ Drill, ☑ Spoon, ☐ Other

Duration of Mixing: ☐ ~2 mins, ☐ ~3 mins, ☐ ~5 mins, ☑ Other

Total Sample Volume: ~2L

Date/ Initials: 5/2/19 [initials]

NOTES:

RECORD OF SAMPLE USE

DATE	AMOUNT USED	AMOUNT REMAINING	USED FOR	INITIALS
5/2/19	~1200mL		**Testing**	[initials]

TOC sample frozen to preserve hold time: _____ (Date/Initials)

AQUA SURVEY, INC.
SPECIAL STUDIES DEPARTMENT

SAMPLE USE FORM

Job #: 38-205R **Client:** GEI-Amesbury **ASI #:** 20190311 **Sample ID:** SS-644R

SEDIMENT CHARACTERIZATION

Odor: ☒ None ☐ Slight ☐ Moderate ☐ Strong ☐ Other

Color: ☒ Black ☒ Brown ☐ Gray ☐ Olive ☐ Other

Consistency: ☐ Sandy ☒ Silty ☐ Clayey ☒ Other w/ organics

HOMOGENIZATION/ COMPOSITING/ AMENDING

Method Used: ☐ Drill, ☒ Spoon, ☐ Other

Duration of Mixing: ☐ ~2 mins, ☐ ~3 mins, ☐ ~5 mins ☒ Other

Total Sample Volume: ~2L

Date/ Initials: 5/2/19

NOTES:

RECORD OF SAMPLE USE

DATE	AMOUNT USED	AMOUNT REMAINING	USED FOR	INITIALS
5/2/19	~1000mL		**Testing**	

TOC sample frozen to preserve hold time: _____ (Date/Initials)

AQUA SURVEY, INC.
SPECIAL STUDIES DEPARTMENT

SAMPLE USE FORM

Job #: 38-205R **Client:** GEI-Amesbury **ASI #:** 2019 03 12 **Sample ID:** SS-645R

SEDIMENT CHARACTERIZATION

Odor:
- ☑ None
- ☐ Slight
- ☐ Moderate
- ☐ Strong
- ☐ Other

Color:
- ☐ Black
- ☑ Brown
- ☐ Gray
- ☐ Olive
- ☐ Other

Consistency:
- ☑ Sandy
- ☑ Silty
- ☐ Clayey
- ☐ Other

HOMOGENIZATION/ COMPOSITING/ AMENDING

Method Used: ☑ Drill, ☐ Spoon, ☐ Other

Duration of Mixing: ☐ ~2 mins, ☐ ~3 mins, ☐ ~5 mins, ☑ Other

Total Sample Volume: ~2L

Date/ Initials: 5/2/19 [signature]

NOTES:

RECORD OF SAMPLE USE

DATE	AMOUNT USED	AMOUNT REMAINING	USED FOR	INITIALS
5/2/19	~1200mL		**Testing**	[signature]

TOC sample frozen to preserve hold time: _____ (Date/Initials)

Appendix C

Statistical Analyses of Results

Chironomid Test-Percent Survived

Start Date:	5/7/2019	Test ID:	38-205R	Sample ID:	SS632R(#20190305)
End Date:	5/17/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	CT-Chironomus dilutus
Comments:	10 day				

Conc-%	1	2	3	4	5	6	7	8
Reference	1.0000	0.9000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Test	1.0000	1.0000	0.5000	1.0000	1.0000	1.0000	0.9000	1.0000

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
Reference	0.9875	1.0000	1.3916	1.2490	1.4120	4.140	8		
Test	0.9250	0.9367	1.3133	0.7854	1.4120	16.813	8	63.50	51.00

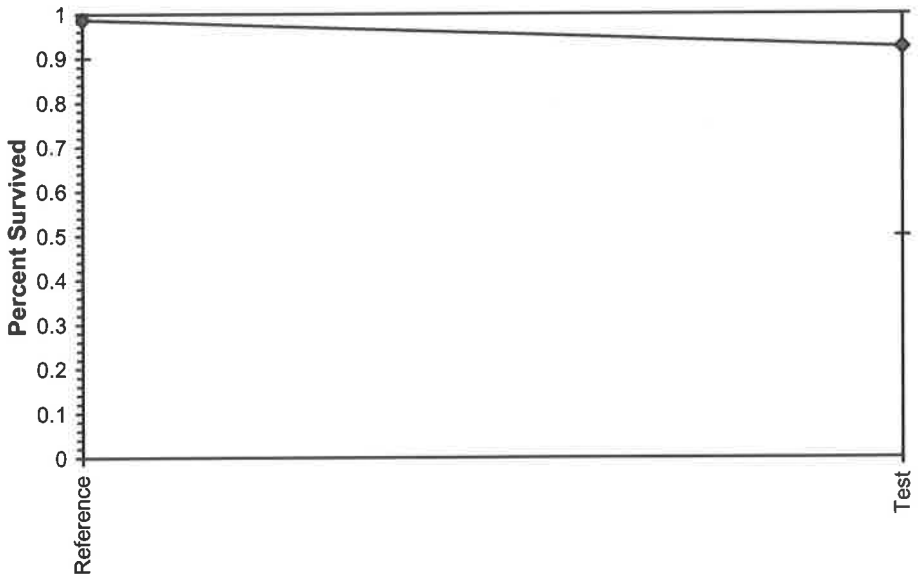
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.61035	0.844	-2.9056	9.56467
F-Test indicates unequal variances (p = 2.15E-03)	14.6853	8.88539		

Hypothesis Test (1-tail, 0.05)

Wilcoxon Two-Sample Test indicates no significant differences

Treatments vs Reference

Dose-Response Plot



Chironomid Test-Percent Survived

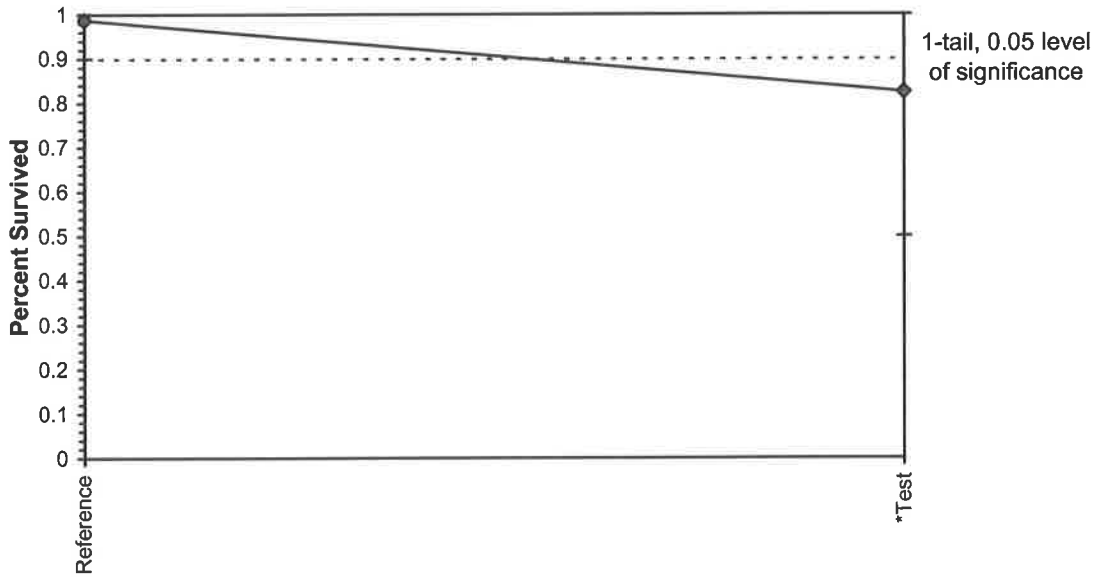
Start Date:	5/7/2019	Test ID:	38-205R	Sample ID:	SS633R(#20190306)
End Date:	5/17/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	CT-Chironomus dilutus
Comments:	10 day				

Conc-%	1	2	3	4	5	6	7	8
Reference	1.0000	0.9000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Test	0.8000	0.5000	1.0000	0.8000	0.9000	0.7000	1.0000	0.9000

			Transform: Arcsin Square Root					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
Reference	0.9875	1.0000	1.3916	1.2490	1.4120	4.140	8			
*Test	0.8250	0.8354	1.1641	0.7854	1.4120	18.285	8	2.918	1.860	0.1450

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.89299		0.844		-0.6912	2.0099
F-Test indicates unequal variances (p = 2.70E-03)	13.6478		8.88539			
Hypothesis Test (1-tail, 0.05)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Heteroscedastic t Test indicates significant differences Treatments vs Reference	0.06968	0.07197	0.20707	0.02431	0.01123	1, 14

Dose-Response Plot



Chironomid Test-Percent Survived

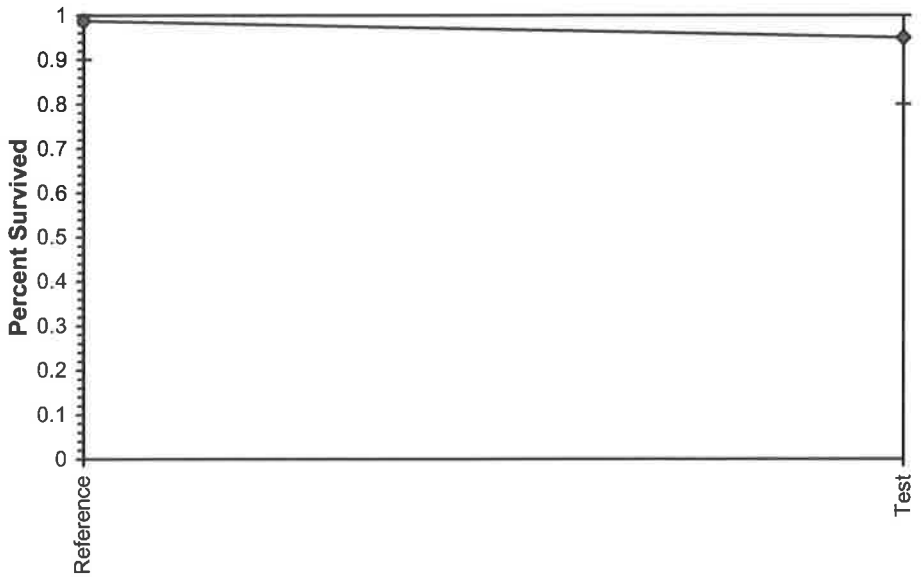
Start Date:	5/7/2019	Test ID:	38-205R	Sample ID:	SS635R(#20190378) 3074
End Date:	5/17/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	CT-Chironomus dilutus
Comments:	10 day				

Conc-%	1	2	3	4	5	6	7	8
Reference	1.0000	0.9000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Test	0.9000	1.0000	1.0000	1.0000	1.0000	1.0000	0.8000	0.9000

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
Reference	0.9875	1.0000	1.3916	1.2490	1.4120	4.140	8		
Test	0.9500	0.9620	1.3332	1.1071	1.4120	8.799	8	59.50	51.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.79417	0.844	-1.4053	1.49391
F-Test indicates equal variances (p = 0.08)	4.14481	8.88539		
Hypothesis Test (1-tail, 0.05)				
Wilcoxon Two-Sample Test indicates no significant differences				
Treatments vs Reference				

Dose-Response Plot



Chironomid Test-Percent Survived

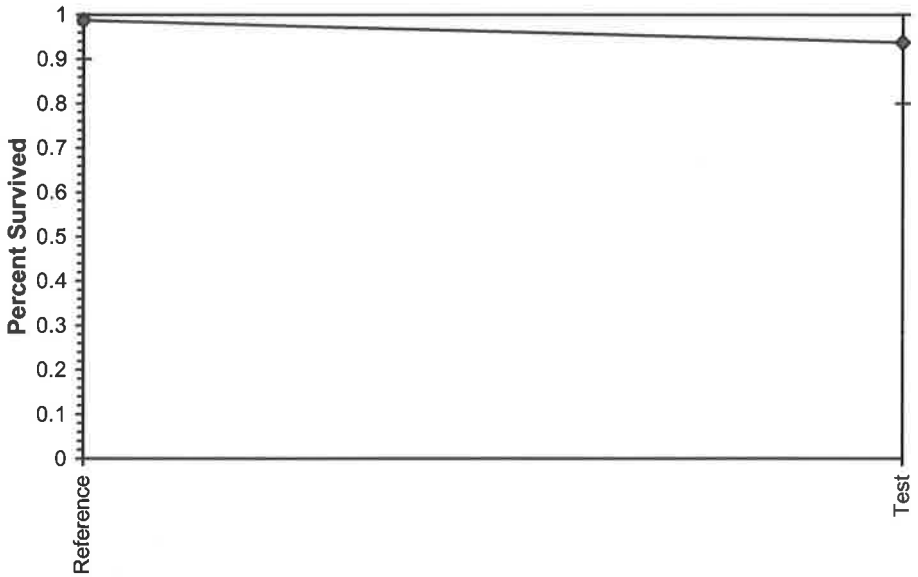
Start Date:	5/7/2019	Test ID:	38-205R	Sample ID:	SS636R(#20190308)
End Date:	5/17/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	CT-Chironomus dilutus
Comments:	10 day				

Conc-%	1	2	3	4	5	6	7	8
Reference	1.0000	0.9000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Test	0.8000	0.8000	1.0000	1.0000	1.0000	1.0000	0.9000	1.0000

			Transform: Arcsin Square Root					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
Reference	0.9875	1.0000	1.3916	1.2490	1.4120	4.140	8		
Test	0.9375	0.9494	1.3154	1.1071	1.4120	10.667	8	59.00	51.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.79299	0.844	-1.1435	0.29538
F-Test indicates equal variances (p = 0.03)	5.93016	8.88539		
Hypothesis Test (1-tail, 0.05)				
Wilcoxon Two-Sample Test indicates no significant differences				
Treatments vs Reference				

Dose-Response Plot



Chironomid Test-Growth Individual AFDW

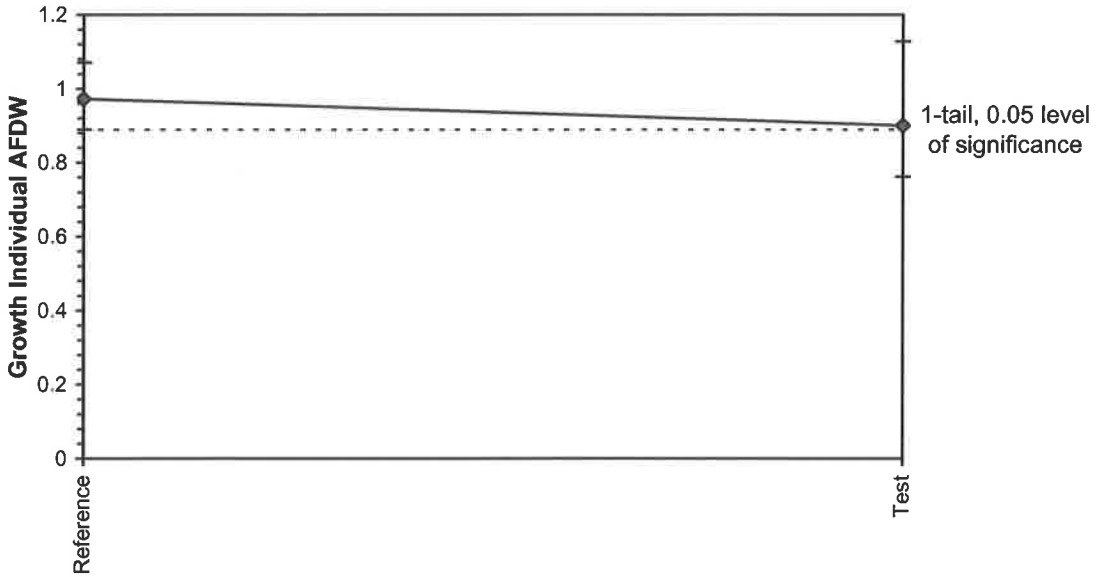
Start Date:	5/7/2019	Test ID:	38-205R	Sample ID:	SS632R(#20190305)
End Date:	5/17/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	CT-Chironomus dilutus
Comments:	10 day				

Conc-%	1	2	3	4	5	6	7	8
Reference	0.9590	1.0700	0.9130	1.0660	0.9410	0.9510	0.9920	0.8890
Test	0.8860	0.9240	1.1280	0.7620	0.8230	0.8000	0.9844	0.8969

			Transform: Untransformed						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
Reference	0.9726	1.0000	0.9726	0.8890	1.0700	6.817	8			
Test	0.9005	0.9259	0.9005	0.7620	1.1280	12.927	8	1.522	1.761	0.0834

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.94359		0.844		0.90739	1.20766
F-Test indicates equal variances (p = 0.16)	3.08232		8.88539			
Hypothesis Test (1-tail, 0.05)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Homoscedastic t Test indicates no significant differences Treatments vs Reference	0.08343	0.08578	0.02078	0.00897	0.15033	1, 14

Dose-Response Plot



Chironomid Test-Growth Individual AFDW

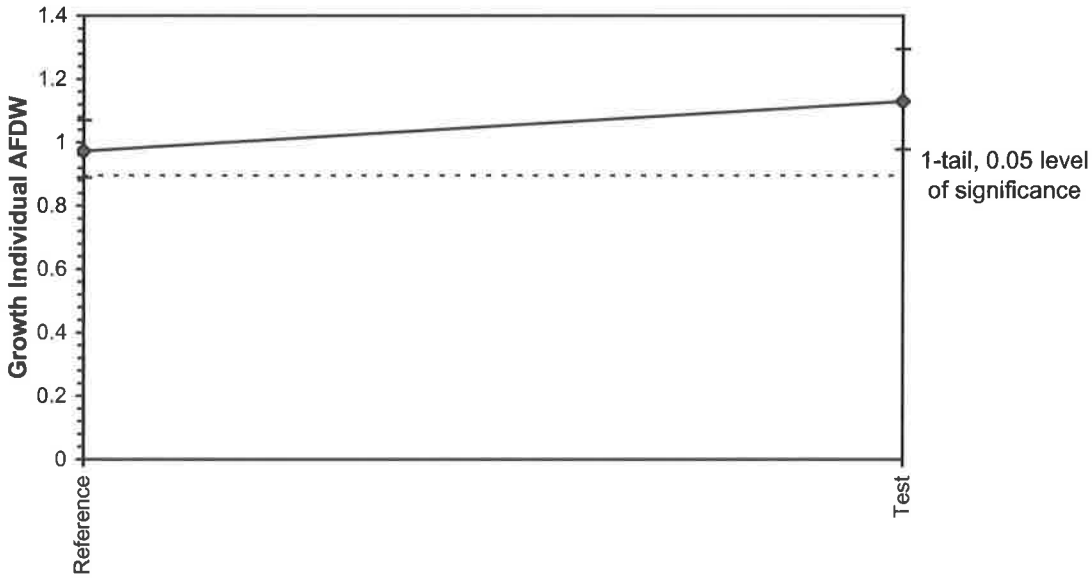
Start Date:	5/7/2019	Test ID:	38-205R	Sample ID:	SS633R(#20190306)
End Date:	5/17/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	CT-Chironomus dilutus
Comments:	10 day				

Conc-%	1	2	3	4	5	6	7	8
Reference	0.9590	1.0700	0.9130	1.0660	0.9410	0.9510	0.9920	0.8890
Test	0.9750	1.2920	1.1210	1.0638	1.1878	1.0386	1.1070	1.2344

			Transform: Untransformed					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
Reference	0.9726	1.0000	0.9726	0.8890	1.0700	6.817	8			
Test	1.1274	1.1592	1.1274	0.9750	1.2920	9.352	8	-3.516	1.761	0.0776

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.96855		0.844		0.28356	-0.4289
F-Test indicates equal variances (p = 0.24)	2.5285		8.88539			
Hypothesis Test (1-tail, 0.05)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Homoscedastic t Test indicates no significant differences Treatments vs Reference	0.07756	0.07975	0.09587	0.00776	0.00343	1, 14

Dose-Response Plot



Chironomid Test-Growth Individual AFDW

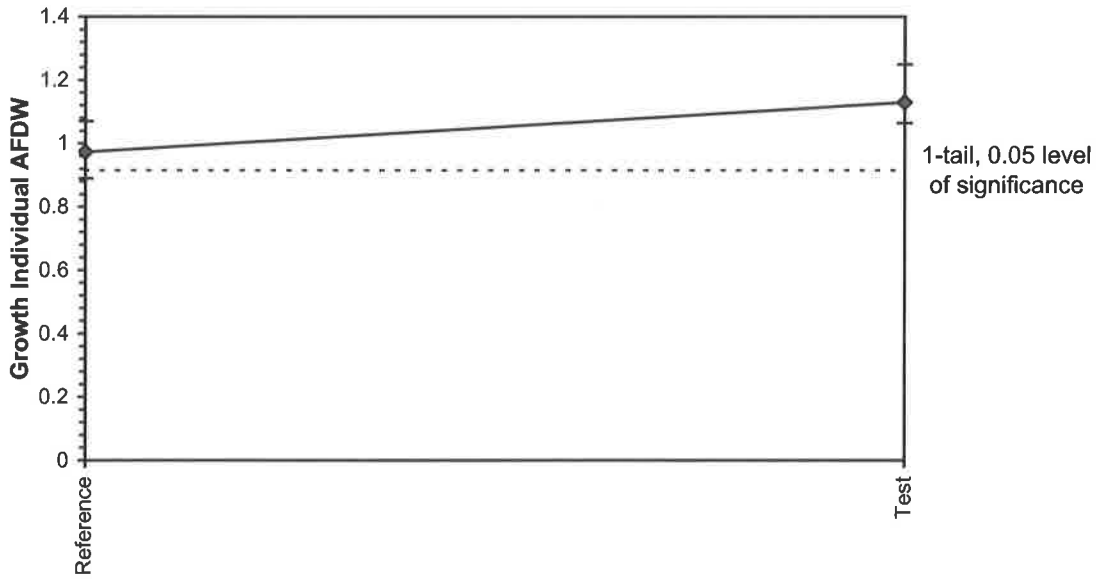
Start Date:	5/7/2019	Test ID:	38-205R	Sample ID:	SS635R(#20190~~378~~ 3071)
End Date:	5/17/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	CT-Chironomus dilutus
Comments:	10 day				

Conc-%	1	2	3	4	5	6	7	8
Reference	0.9590	1.0700	0.9130	1.0660	0.9410	0.9510	0.9920	0.8890
Test	1.2478	1.1470	1.2040	1.0630	1.0930	1.1250	1.0888	1.0656

			Transform: Untransformed					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
Reference	0.9726	1.0000	0.9726	0.8890	1.0700	6.817	8			
Test	1.1293	1.1610	1.1293	1.0630	1.2478	5.928	8	-4.702	1.761	0.0587

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.90811		0.844		0.66503	-0.8205
F-Test indicates equal variances (p = 0.98)	1.01923		8.88539			
Hypothesis Test (1-tail, 0.05)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Homoscedastic t Test indicates no significant differences Treatments vs Reference	0.05868	0.06033	0.09814	0.00444	3.4E-04	1, 14

Dose-Response Plot



Chironomid Test-Growth Individual AFDW

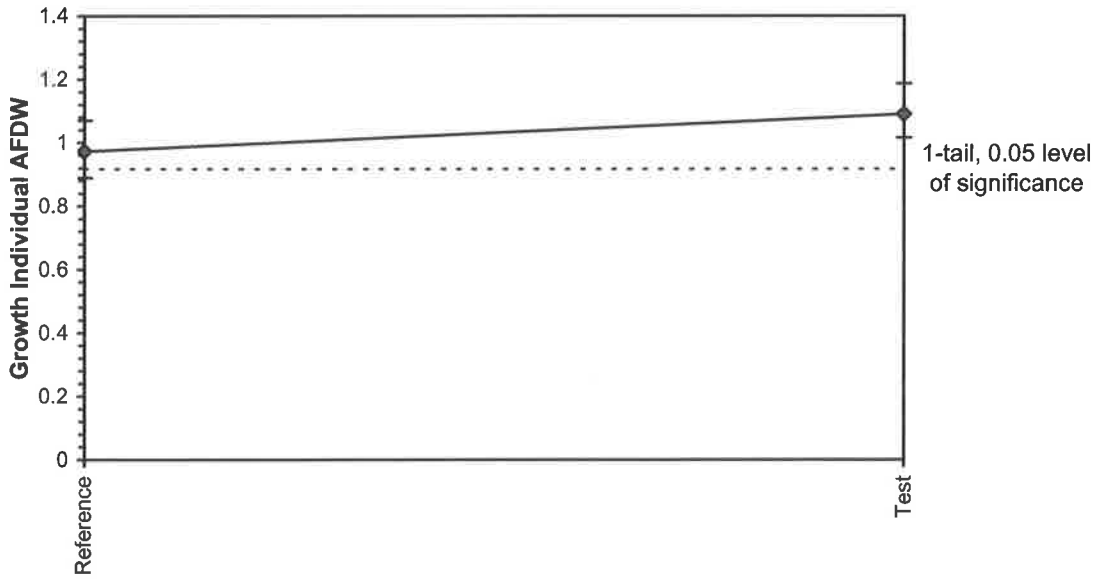
Start Date:	5/7/2019	Test ID:	38-205R	Sample ID:	SS636R(#20190308)
End Date:	5/17/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	CT-Chironomus dilutus
Comments:	10 day				

Conc-%	1	2	3	4	5	6	7	8
Reference	0.9590	1.0700	0.9130	1.0660	0.9410	0.9510	0.9920	0.8890
Test	1.1913	1.1188	1.0830	1.0740	1.0200	1.0456	1.1300	

			Transform: Untransformed					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
Reference	0.9726	1.0000	0.9726	0.8890	1.0700	6.817	8			
Test	1.0947	1.1255	1.0947	1.0200	1.1913	5.236	7	-3.783	1.771	0.0571

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.91903		0.835		0.50182	-0.7701
F-Test indicates equal variances (p = 0.74)	1.33866		10.7859			
Hypothesis Test (1-tail, 0.05)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Homoscedastic t Test indicates no significant differences Treatments vs Reference	0.05712	0.05872	0.05559	0.00388	0.00228	1, 13

Dose-Response Plot



Freshwater Amphipod-Survival

Start Date:	5/3/2019	Test ID:	38-205R	Sample ID:	SS632R (#20190305)
End Date:	6/14/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:	28 day Endpoint				

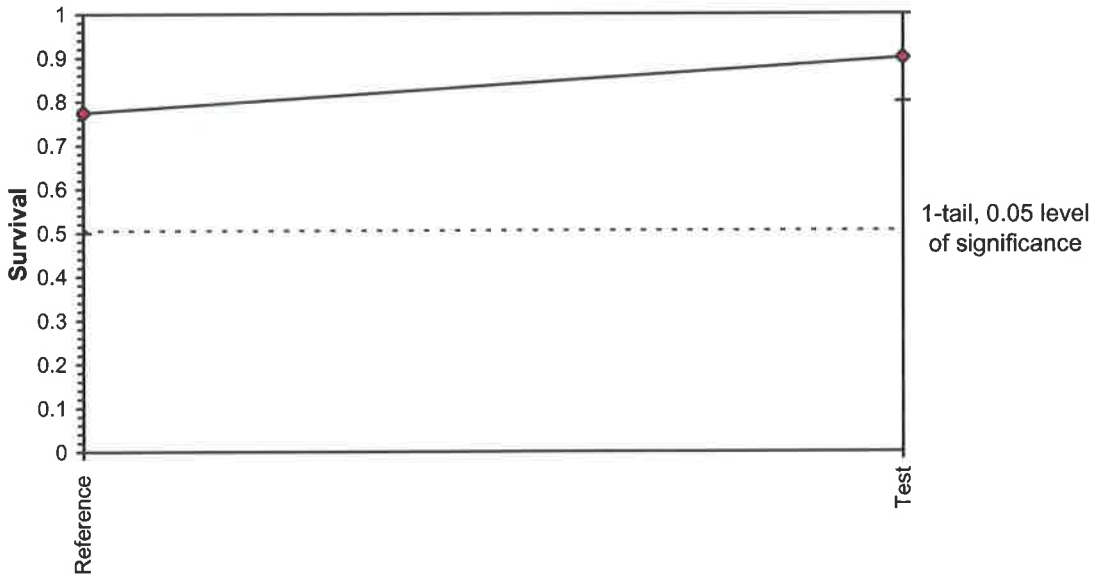
Conc-%	1	2	3	4
Reference	0.5000	0.7000	1.0000	0.9000
Test	1.0000	1.0000	0.8000	0.8000

			Transform: Arcsin Square Root					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
Reference	0.7750	1.0000	1.1094	0.7854	1.4120	24.960	4			
Test	0.9000	1.1613	1.2596	1.1071	1.4120	13.974	4	-0.915	1.943	0.3188

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.91389	0.749	-0.1006	-1.3341
F-Test indicates equal variances (p = 0.48)	2.47499	47.4672		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates no significant differences	0.29659	0.3699	0.04511	0.05383	0.39528	1, 6
Treatments vs Reference						

Dose-Response Plot



Freshwater Amphipod-Survival

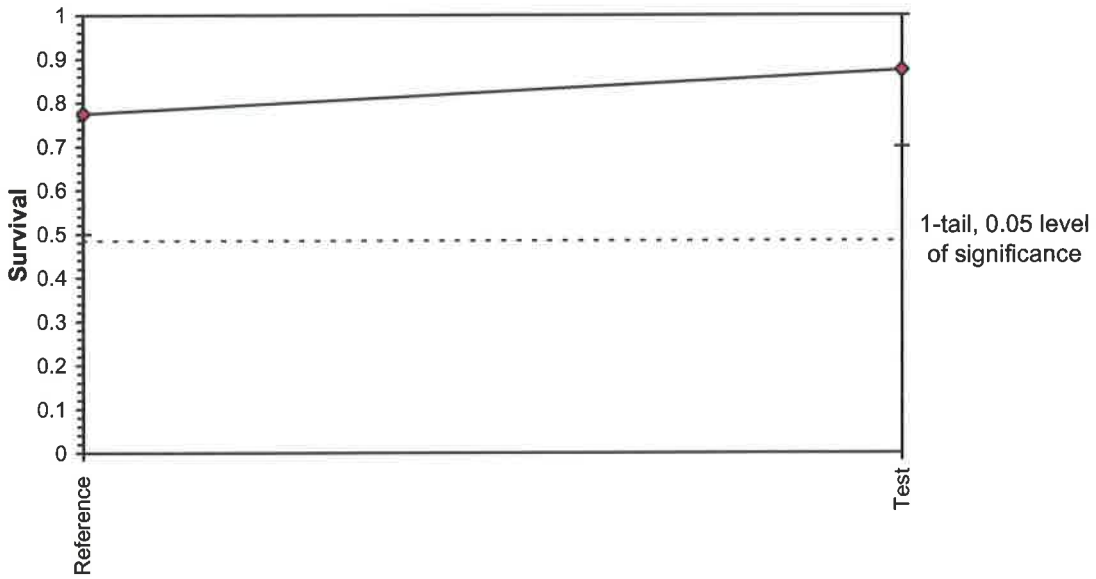
Start Date:	5/3/2019	Test ID:	38-205R	Sample ID:	SS633R (#20190306)
End Date:	6/14/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:	28 day Endpoint				

Conc-%	1	2	3	4
Reference	0.5000	0.7000	1.0000	0.9000
Test	1.0000	0.8000	1.0000	0.7000

			Transform: Arcsin Square Root					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
Reference	0.7750	1.0000	1.1094	0.7854	1.4120	24.960	4			
Test	0.8750	1.1290	1.2306	0.9912	1.4120	17.454	4	-0.692	1.943	0.3405

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.91304		0.749		-0.1403	-1.7233
F-Test indicates equal variances (p = 0.69)	1.66215		47.4672			
Hypothesis Test (1-tail, 0.05)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Homoscedastic t Test indicates no significant differences	0.31828	0.39696	0.02937	0.06141	0.51506	1, 6
Treatments vs Reference						

Dose-Response Plot



Freshwater Amphipod-Survival

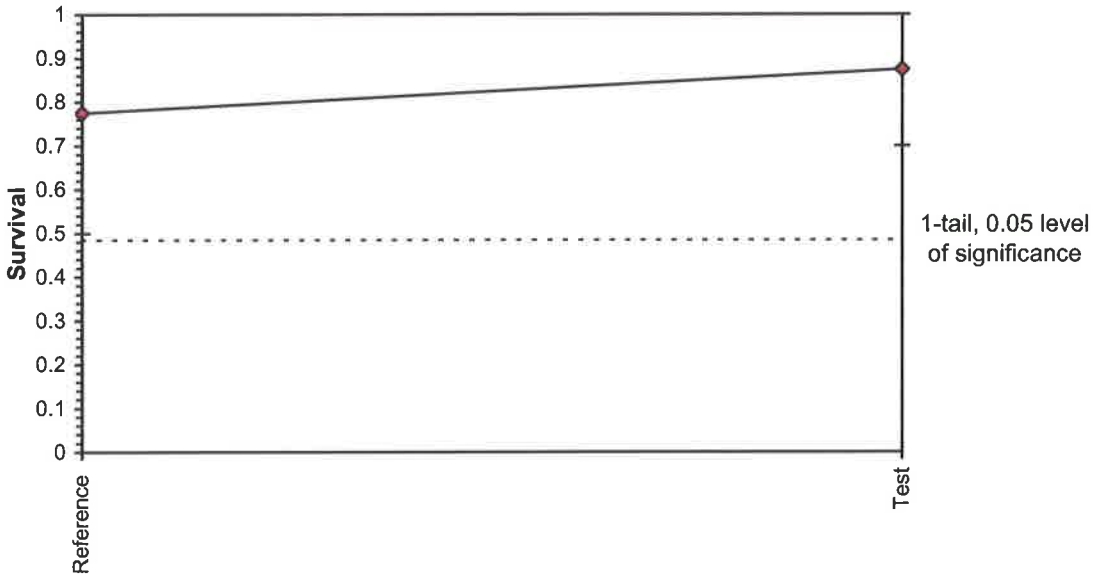
Start Date:	5/3/2019	Test ID:	38-205R	Sample ID:	SS635R (#20190307)
End Date:	6/14/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:	28 day Endpoint				

Conc-%	1	2	3	4
Reference	0.5000	0.7000	1.0000	0.9000
Test	0.9000	1.0000	0.9000	0.9000

			Transform: Arcsin Square Root				
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N
Reference	0.7750	1.0000	1.1094	0.7854	1.4120	24.960	4
Test	0.9250	1.1935	1.2898	1.2490	1.4120	6.318	4

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.95756	0.749	-0.1019	0.53539
F-Test indicates equal variances (p = 0.07)	11.5483	47.4672		

Dose-Response Plot



Freshwater Amphipod-Survival

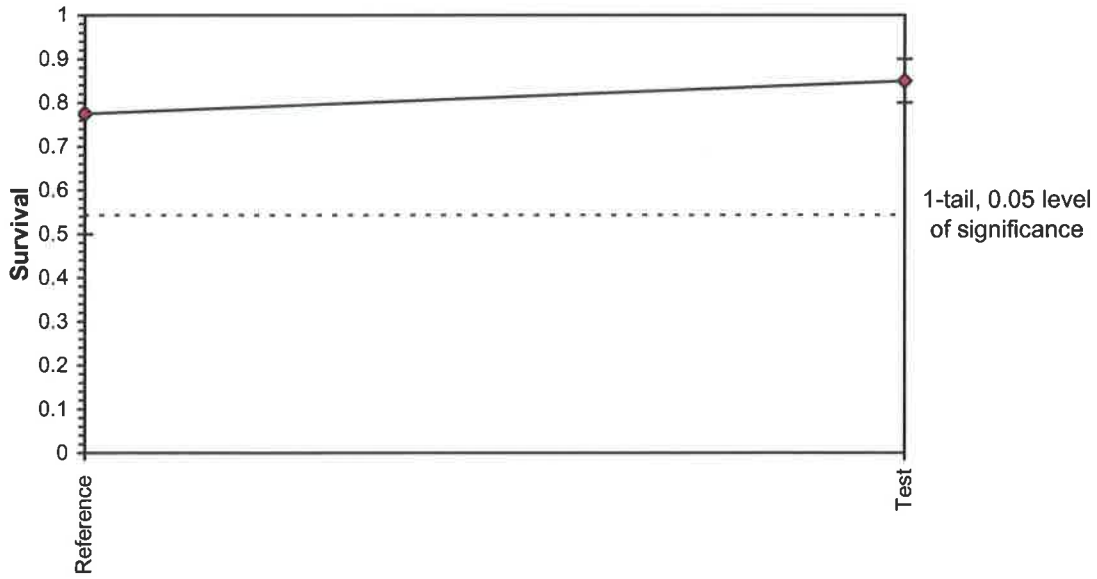
Start Date:	5/3/2019	Test ID:	38-205R	Sample ID:	SS636R (#20190308)
End Date:	6/14/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:	28 day Endpoint				

Conc-%	1	2	3	4
Reference	0.5000	0.7000	1.0000	0.9000
Test	0.9000	0.8000	0.9000	0.8000

			Transform: Arcsin Square Root					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
Reference	0.7750	1.0000	1.1094	0.7854	1.4120	24.960	4			
Test	0.8500	1.0968	1.1781	1.1071	1.2490	6.954	4	-0.476	1.943	0.2806

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.97358		0.749		-0.1475	0.49112
F-Test indicates equal variances (p = 0.08)	11.4248		47.4672			
Hypothesis Test (1-tail, 0.05)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Homoscedastic t Test indicates no significant differences Treatments vs Reference	0.25842	0.3223	0.00944	0.0417	0.65107	1, 6

Dose-Response Plot



Freshwater Amphipod-Survival

Start Date:	5/3/2019	Test ID:	38-205	Sample ID:	SS642R (#20190309)
End Date:	6/14/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:					

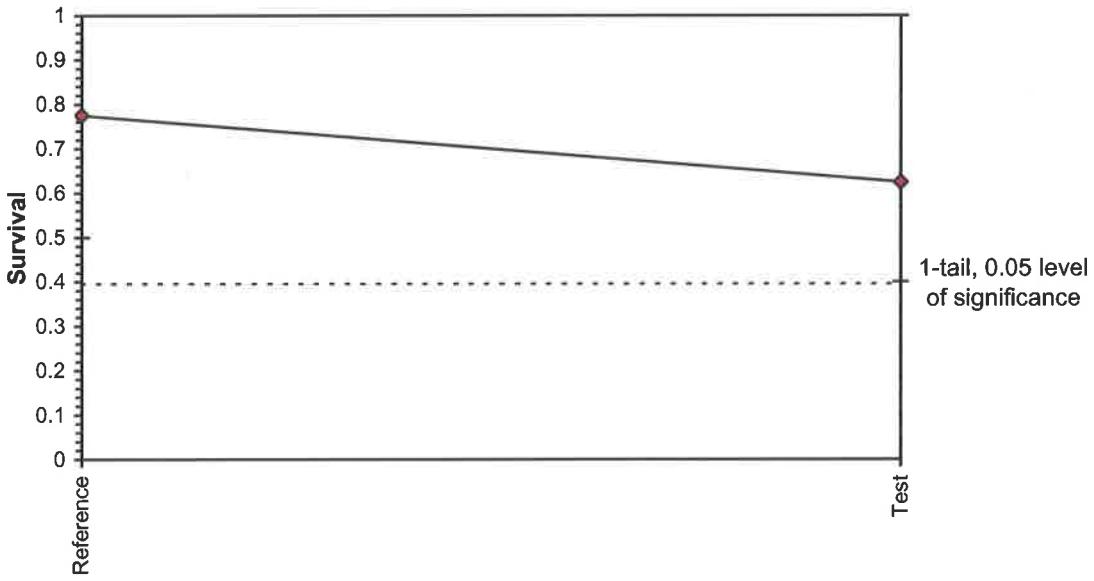
Conc-%	1	2	3	4
Reference	0.5000	0.7000	1.0000	0.9000
Test	0.7000	0.4000	0.4000	1.0000

Transform: Arcsin Square Root

Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N
Reference	0.7750	1.0000	1.1094	0.7854	1.4120	24.960	4
Test	0.6250	0.8065	0.9432	0.6847	1.4120	36.510	4

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.92497	0.749	0.49912	-1.1182
F-Test indicates equal variances (p = 0.73)	1.54634	47.4672		

Dose-Response Plot



Freshwater Amphipod-Survival

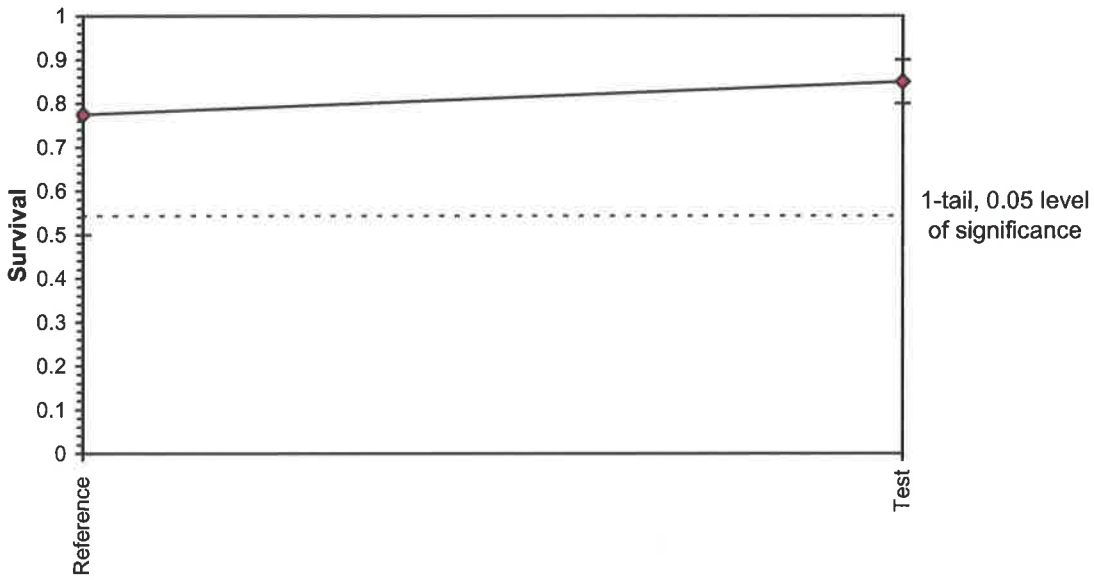
Start Date:	5/3/2019	Test ID:	38-205R	Sample ID:	SS643R (#20190310)
End Date:	6/14/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:	28 day Endpoint				

Conc-%	1	2	3	4
Reference	0.5000	0.7000	1.0000	0.9000
Test	0.8000	1.0000	0.8000	0.7000

			Transform: Arcsin Square Root				
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N
Reference	0.7750	1.0000	1.1094	0.7854	1.4120	24.960	4
Test	0.8250	1.0645	1.1544	0.9912	1.4120	15.615	4

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.94843	0.749	0.13762	-0.9675
F-Test indicates equal variances (p = 0.50)	2.35983	47.4672		

Dose-Response Plot



Freshwater Amphipod-Survival

Start Date:	5/3/2019	Test ID:	38-205	Sample ID:	SS644R (#20190311)
End Date:	6/14/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:					

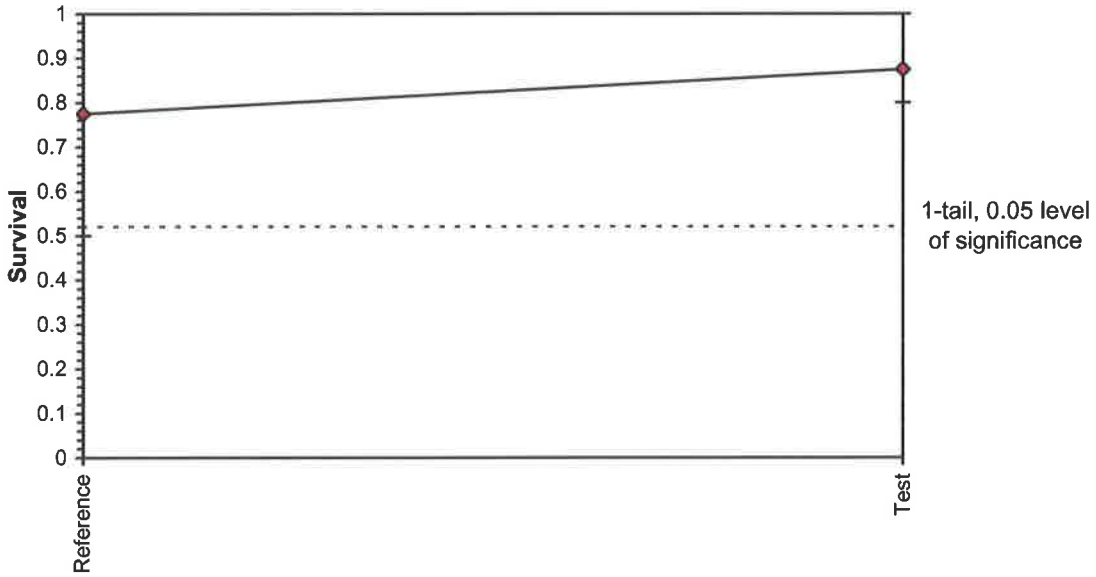
Conc-%	1	2	3	4
Reference	0.5000	0.7000	1.0000	0.9000
Test	0.9000	1.0000	0.8000	0.8000

			Transform: Arcsin Square Root					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
Reference	0.7750	1.0000	1.1094	0.7854	1.4120	24.960	4			
Test	0.8750	1.1290	1.2188	1.1071	1.4120	11.906	4	-0.700	1.943	0.3037

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.95631	0.749	-0.0174	-0.6623
F-Test indicates equal variances (p = 0.32)	3.64101	47.4672		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates no significant differences Treatments vs Reference	0.28155	0.35115	0.02395	0.04887	0.51009	1, 6

Dose-Response Plot



Freshwater Amphipod-Growth-Dry Weight

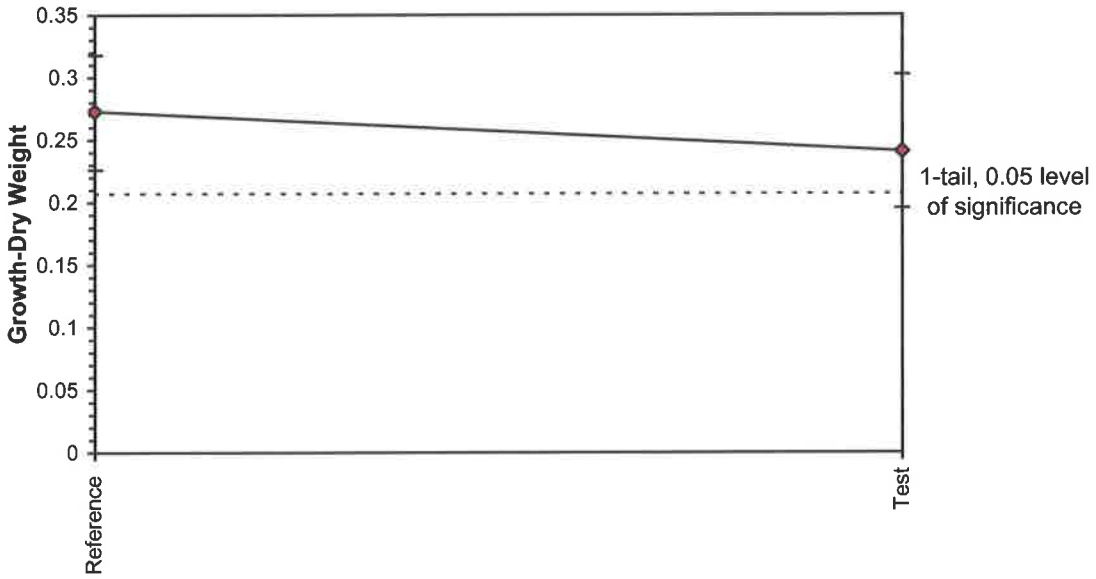
Start Date:	5/3/2019	Test ID:	38-205R	Sample ID:	SS632R (#20190305)
End Date:	6/14/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:	28 day Endpoint				

Conc-%	1	2	3	4
Reference	0.2320	0.3157	0.2260	0.3178
Test	0.3020	0.2310	0.1950	0.2350

			Transform: Untransformed					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
Reference	0.2729	1.0000	0.2729	0.2260	0.3178	18.590	4			
Test	0.2408	0.8823	0.2408	0.1950	0.3020	18.534	4	0.951	1.943	0.0656

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.86668		0.749		0.28804	-1.8964
F-Test indicates equal variances (p = 0.84)	1.29245		47.4672			
Hypothesis Test (1-tail, 0.05)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Homoscedastic t Test indicates no significant differences Treatments vs Reference	0.06564	0.24055	0.00206	0.00228	0.37833	1, 6

Dose-Response Plot



Freshwater Amphipod-Growth-Dry Weight

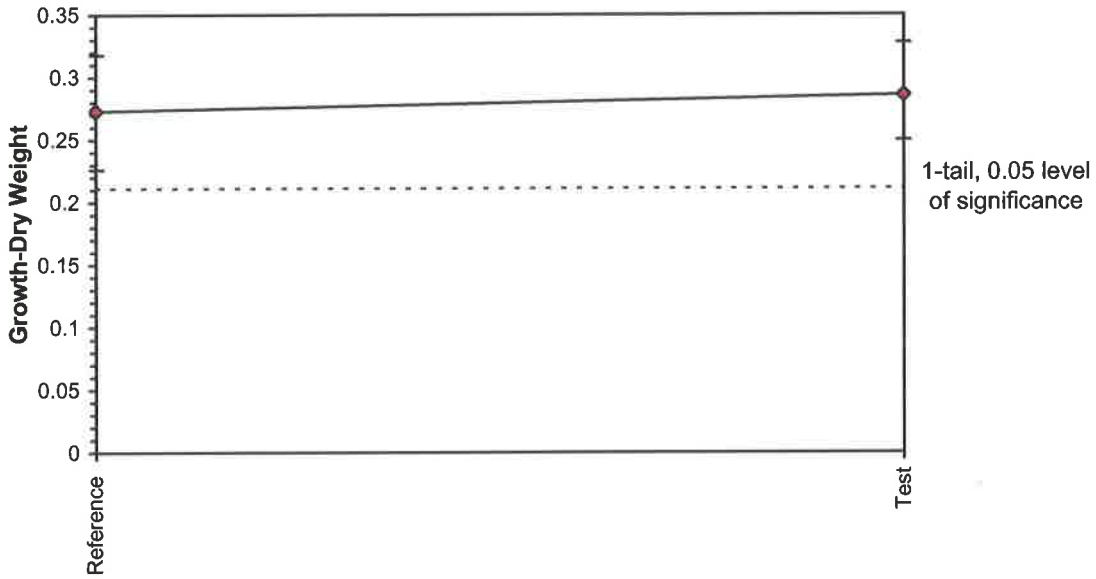
Start Date:	5/3/2019	Test ID:	38-205R	Sample ID:	SS633R (#20190306)
End Date:	6/14/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:	28 day Endpoint				

Conc-%	1	2	3	4
Reference	0.2320	0.3157	0.2260	0.3178
Test	0.3110	0.2500	0.3280	0.2557

			Transform: Untransformed						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
Reference	0.2729	1.0000	0.2729	0.2260	0.3178	18.590	4			
Test	0.2862	1.0488	0.2862	0.2500	0.3280	13.686	4	-0.415	1.943	0.0623

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.79107		0.749		0.02766	-2.5689
F-Test indicates equal variances (p = 0.68)	1.67739		47.4672			
Hypothesis Test (1-tail, 0.05)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Homoscedastic t Test indicates no significant differences Treatments vs Reference	0.06227	0.22819	0.00035	0.00205	0.69241	1, 6

Dose-Response Plot



Freshwater Amphipod-Growth-Dry Weight

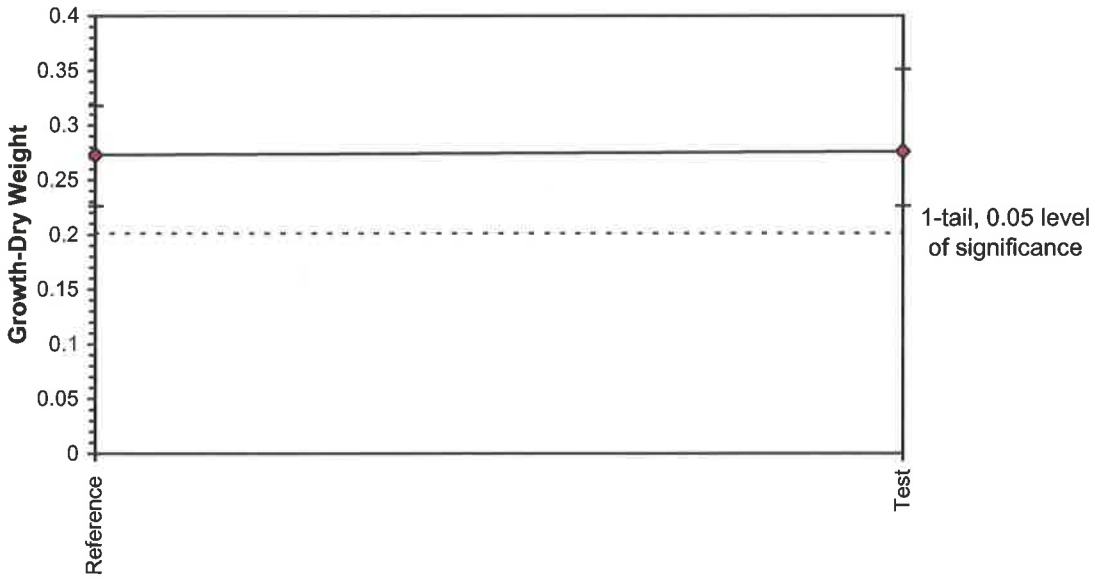
Start Date:	5/3/2019	Test ID:	38-205R	Sample ID:	SS635R (#20190307)
End Date:	6/14/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:	28 day Endpoint				

Conc-%	1	2	3	4
Reference	0.2320	0.3157	0.2260	0.3178
Test	0.3511	0.2260	0.2611	0.2656

			Transform: Untransformed					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
Reference	0.2729	1.0000	0.2729	0.2260	0.3178	18.590	4			
Test	0.2759	1.0113	0.2759	0.2260	0.3511	19.258	4	-0.084	1.943	0.0714

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.88336		0.749		0.50275	-1.4873
F-Test indicates equal variances (p = 0.94)	1.09754		47.4672			
Hypothesis Test (1-tail, 0.05)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Homoscedastic t Test indicates no significant differences	0.07138	0.26158	1.9E-05	0.0027	0.93608	1, 6
Treatments vs Reference						

Dose-Response Plot



Freshwater Amphipod-Growth-Dry Weight

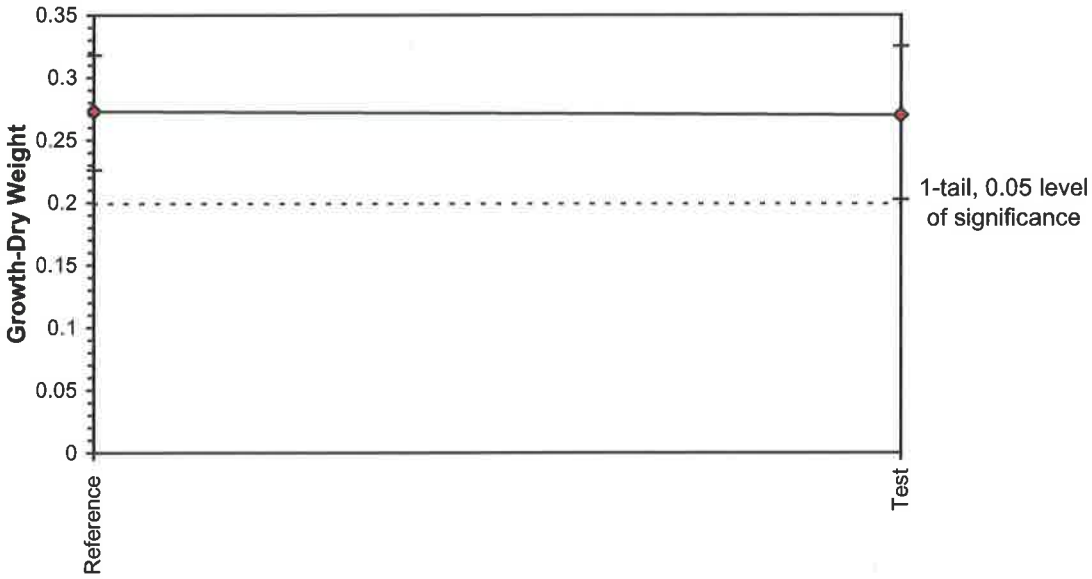
Start Date:	5/3/2019	Test ID:	38-205R	Sample ID:	SS636R (#20190308)
End Date:	6/14/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:	28 day Endpoint				

Conc-%	1	2	3	4
Reference	0.2320	0.3157	0.2260	0.3178
Test	0.3056	0.3250	0.2467	0.2025

			Transform: Untransformed					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
Reference	0.2729	1.0000	0.2729	0.2260	0.3178	18.590	4			
Test	0.2699	0.9892	0.2699	0.2025	0.3250	20.726	4	0.078	1.943	0.0734

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.85673		0.749		-0.1719	-2.2125
F-Test indicates equal variances (p = 0.88)	1.21638		47.4672			
Hypothesis Test (1-tail, 0.05)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Homoscedastic t Test indicates no significant differences	0.07337	0.26889	1.7E-05	0.00285	0.94042	1, 6
Treatments vs Reference						

Dose-Response Plot



Freshwater Amphipod-Growth-Dry Weight

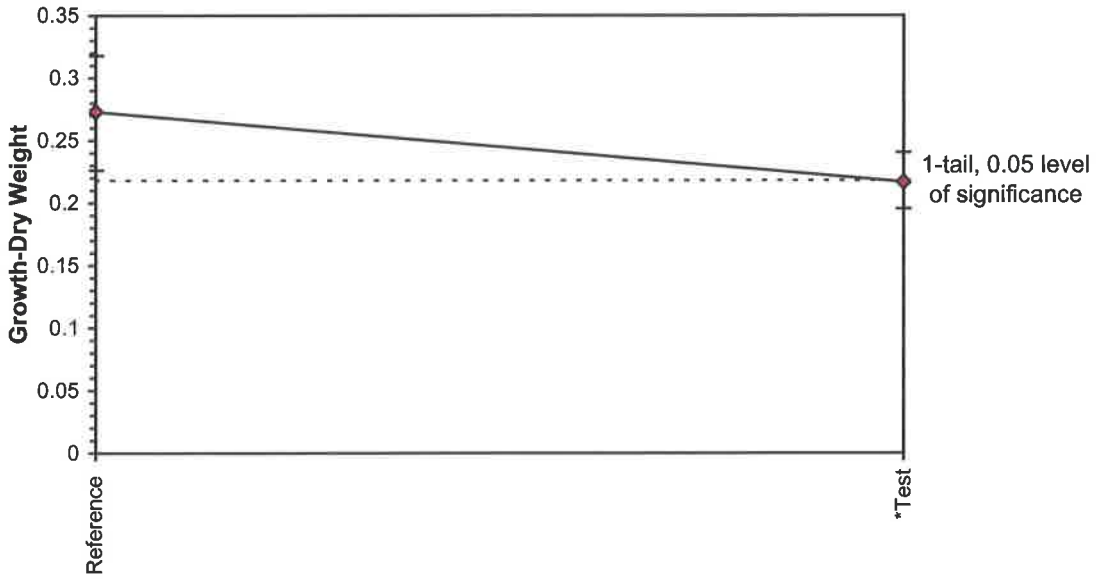
Start Date:	5/3/2019	Test ID:	38-205R	Sample ID:	SS642R (#20190309)
End Date:	6/14/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:	28 day Endpoint				

Conc-%	1	2	3	4
Reference	0.2320	0.3157	0.2260	0.3178
Test	0.1971	0.1950	0.2400	0.2340

			Transform: Untransformed					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
Reference	0.2729	1.0000	0.2729	0.2260	0.3178	18.590	4			
*Test	0.2165	0.7935	0.2165	0.1950	0.2400	10.979	4	2.011	1.943	0.0544

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.89787		0.749		-0.0043	-1.9044
F-Test indicates equal variances (p = 0.24)	4.55308		47.4672			
Hypothesis Test (1-tail, 0.05)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Homoscedastic t Test indicates significant differences Treatments vs Reference	0.05443	0.19947	0.00635	0.00157	0.09099	1, 6

Dose-Response Plot



Freshwater Amphipod-Growth-Dry Weight

Start Date:	5/3/2019	Test ID:	38-205R	Sample ID:	SS643R (#20190310)
End Date:	6/14/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:	28 day Endpoint				

Conc-%	1	2	3	4
Reference	0.2320	0.3157	0.2260	0.3178
Test	0.1725	0.2700	0.2775	0.1771

			Transform: Untransformed					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
Reference	0.2729	1.0000	0.2729	0.2260	0.3178	18.590	4		
Test	0.2243	0.8219	0.2243	0.1725	0.2775	25.516	4	14.00	11.00

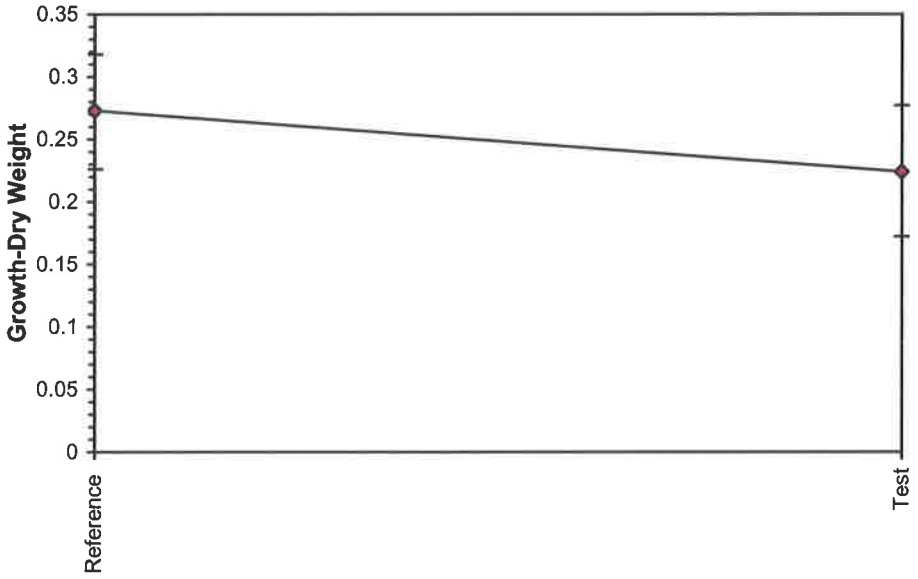
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.73577	0.749	0.00074	-2.7405
F-Test indicates equal variances (p = 0.85)	1.27285	47.4672		

Hypothesis Test (1-tail, 0.05)

Wilcoxon Two-Sample Test indicates no significant differences

Treatments vs Reference

Dose-Response Plot



Freshwater Amphipod-Growth-Dry Weight

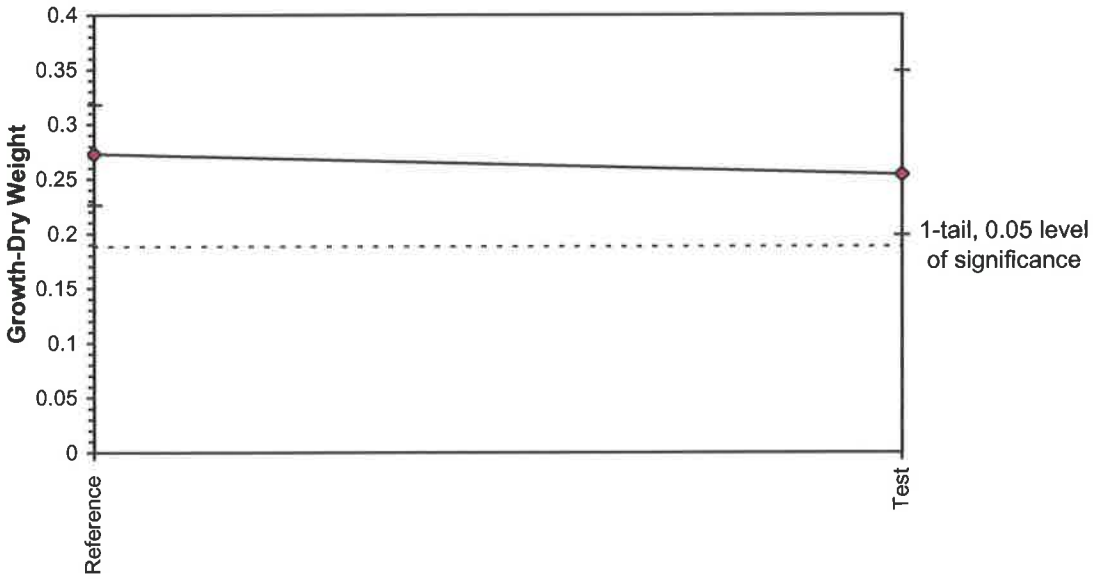
Start Date:	5/3/2019	Test ID:	38-205R	Sample ID:	SS644R (#20190311)
End Date:	6/14/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:	28 day Endpoint				

Conc-%	1	2	3	4
Reference	0.2320	0.3157	0.2260	0.3178
Test	0.1989	0.2000	0.2688	0.3488

			Transform: Untransformed					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
Reference	0.2729	1.0000	0.2729	0.2260	0.3178	18.590	4			
Test	0.2541	0.9312	0.2541	0.1989	0.3488	27.965	4	0.430	1.943	0.0848

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.86658		0.749		0.53299	-1.2627
F-Test indicates equal variances (p = 0.59)	1.96235		47.4672			
Hypothesis Test (1-tail, 0.05)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Homoscedastic t Test indicates no significant differences	0.08483	0.31087	0.00071	0.00381	0.68214	1, 6
Treatments vs Reference						

Dose-Response Plot



Freshwater Amphipod-Survival

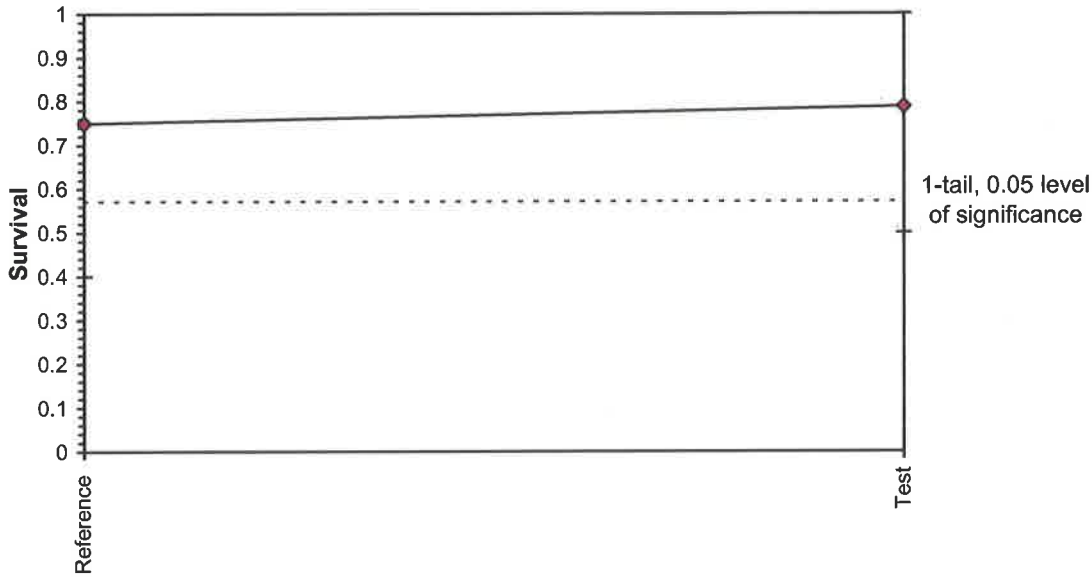
Start Date:	5/3/2019	Test ID:	38-205R	Sample ID:	SS632R (#20190305)
End Date:	6/14/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:	42 day Endpoint				

Conc-%	1	2	3	4	5	6	7	8
Reference	0.5000	0.5000	0.9000	0.9000	0.9000	0.9000	1.0000	0.4000
Test	0.6000	1.0000	0.5000	0.7000	0.8000	0.9000	1.0000	0.8000

			Transform: Arcsin Square Root					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
Reference	0.7500	1.0000	1.0830	0.6847	1.4120	25.984	8			
Test	0.7875	1.0500	1.1188	0.7854	1.4120	20.572	8	-0.278	1.761	0.2264

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.90158		0.844		-0.3033	-1.4501
F-Test indicates equal variances (p = 0.61)	1.49488		8.88539			
Hypothesis Test (1-tail, 0.05)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Homoscedastic t Test indicates no significant differences Treatments vs Reference	0.20936	0.26831	0.00512	0.06608	0.78475	1, 14

Dose-Response Plot



Freshwater Amphipod-Survival

Start Date:	5/3/2019	Test ID:	38-205R	Sample ID:	SS633R (#20190306)
End Date:	6/14/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:	42 day Endpoint				

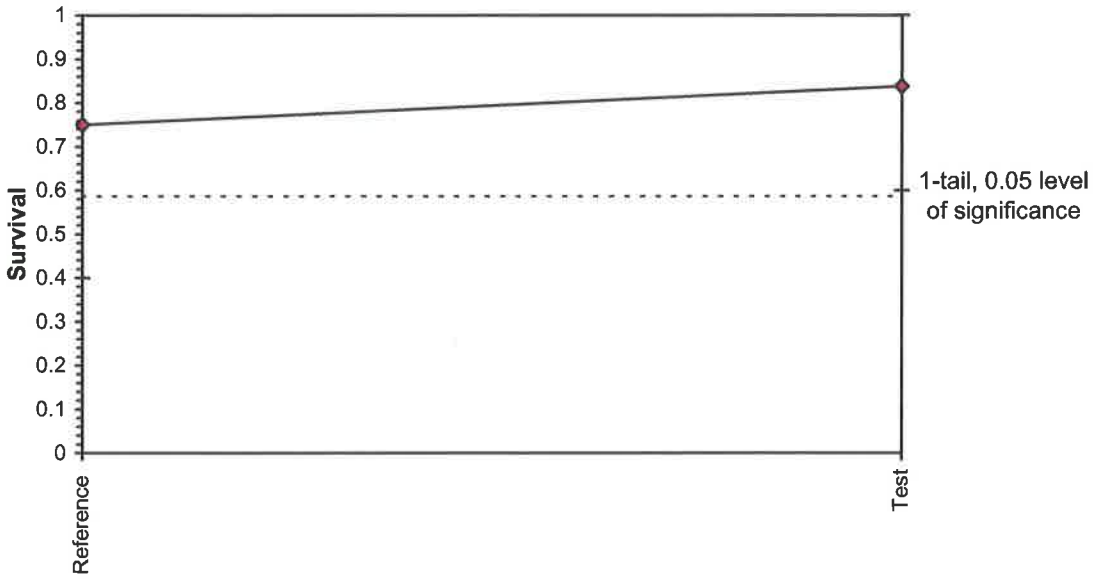
Conc-%	1	2	3	4	5	6	7	8
Reference	0.5000	0.5000	0.9000	0.9000	0.9000	0.9000	1.0000	0.4000
Test	0.8000	1.0000	1.0000	0.6000	0.7000	0.8000	0.9000	0.9000

			Transform: Arcsin Square Root					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
Reference	0.7500	1.0000	1.0830	0.6847	1.4120	25.984	8			
Test	0.8375	1.1167	1.1767	0.8861	1.4120	16.053	8	-0.782	1.761	0.2111

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.90802	0.844	-0.4095	-1.2763
F-Test indicates equal variances (p = 0.31)	2.21916	8.88539		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates no significant differences Treatments vs Reference	0.19423	0.24891	0.03515	0.05743	0.44706	1, 14

Dose-Response Plot



Freshwater Amphipod-Survival

Start Date:	5/3/2019	Test ID:	38-205R	Sample ID:	SS635R (#20190307)
End Date:	6/14/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:	42 day Endpoint				

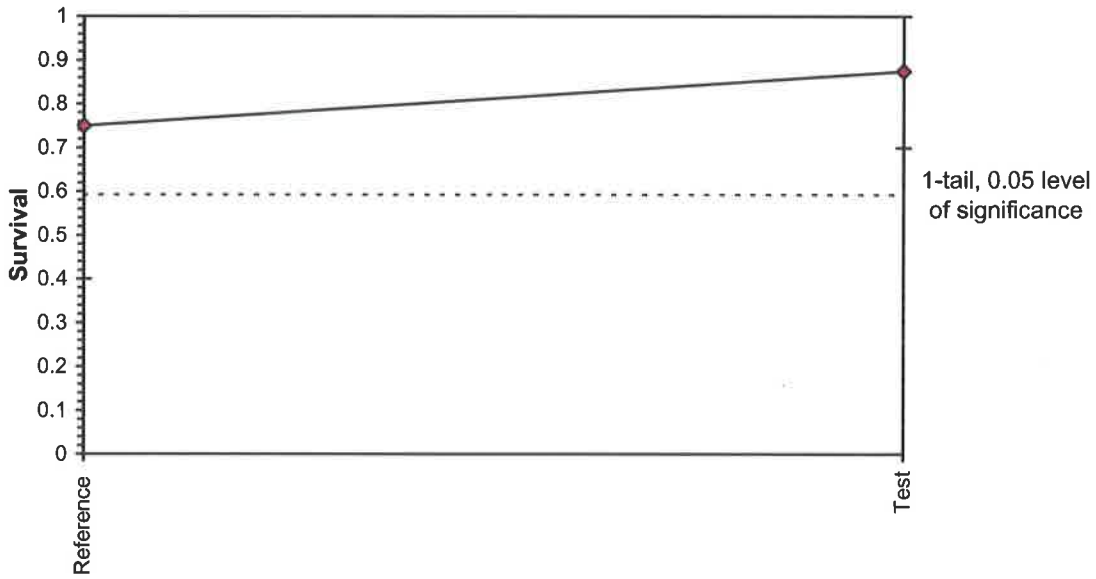
Conc-%	1	2	3	4	5	6	7	8
Reference	0.5000	0.5000	0.9000	0.9000	0.9000	0.9000	1.0000	0.4000
Test	0.8000	1.0000	0.8000	0.8000	0.9000	0.7000	1.0000	1.0000

			Transform: Arcsin Square Root					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
Reference	0.7500	1.0000	1.0830	0.6847	1.4120	25.984	8			
Test	0.8750	1.1667	1.2247	0.9912	1.4120	13.865	8	-1.220	1.761	0.2047

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.88975	0.844	-0.4025	-1.2449
F-Test indicates equal variances (p = 0.21)	2.74606	8.88539		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates no significant differences Treatments vs Reference	0.18794	0.24086	0.08037	0.05401	0.24267	1, 14

Dose-Response Plot



Freshwater Amphipod-Survival

Start Date:	5/3/2019	Test ID:	38-205R	Sample ID:	SS636R (#20190308)
End Date:	6/14/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:	42 day Endpoint				

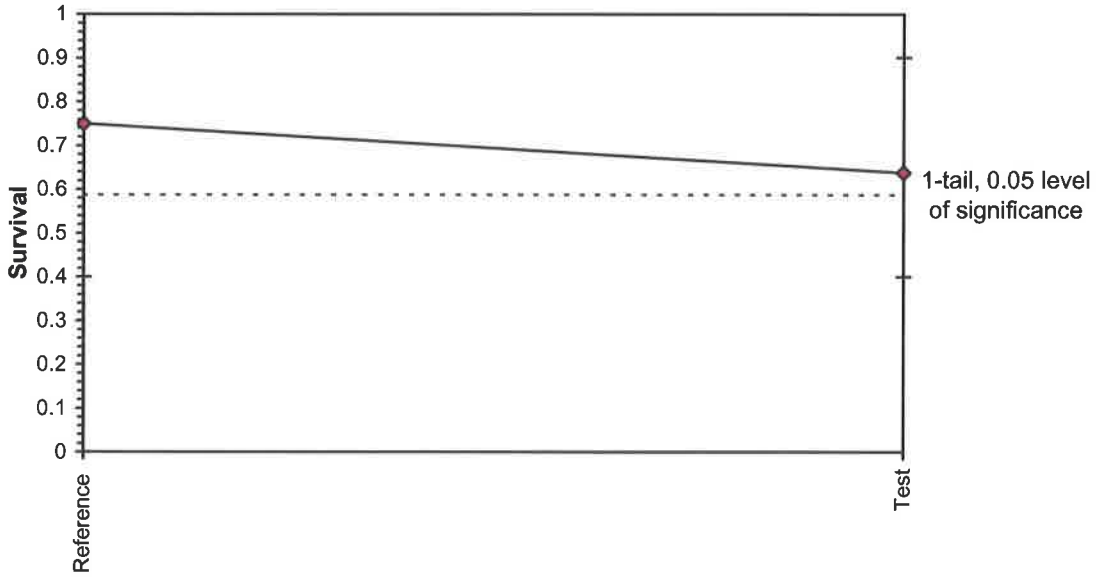
Conc-%	1	2	3	4	5	6	7	8
Reference	0.5000	0.5000	0.9000	0.9000	0.9000	0.9000	1.0000	0.4000
Test	0.5000	0.6000	0.7000	0.8000	0.9000	0.4000	0.7000	0.5000

			Transform: Arcsin Square Root					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
Reference	0.7500	1.0000	1.0830	0.6847	1.4120	25.984	8			
Test	0.6375	0.8500	0.9350	0.6847	1.2490	19.983	8	1.239	1.761	0.2103

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.92227	0.844	-0.2975	-1.208
F-Test indicates equal variances (p = 0.30)	2.26834	8.88539		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates no significant differences Treatments vs Reference	0.19353	0.24801	0.08756	0.05705	0.23576	1, 14

Dose-Response Plot



Freshwater Amphipod-Survival

Start Date:	5/3/2019	Test ID:	38-205R	Sample ID:	SS642R (#20190309)
End Date:	6/14/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:	42 day Endpoint				

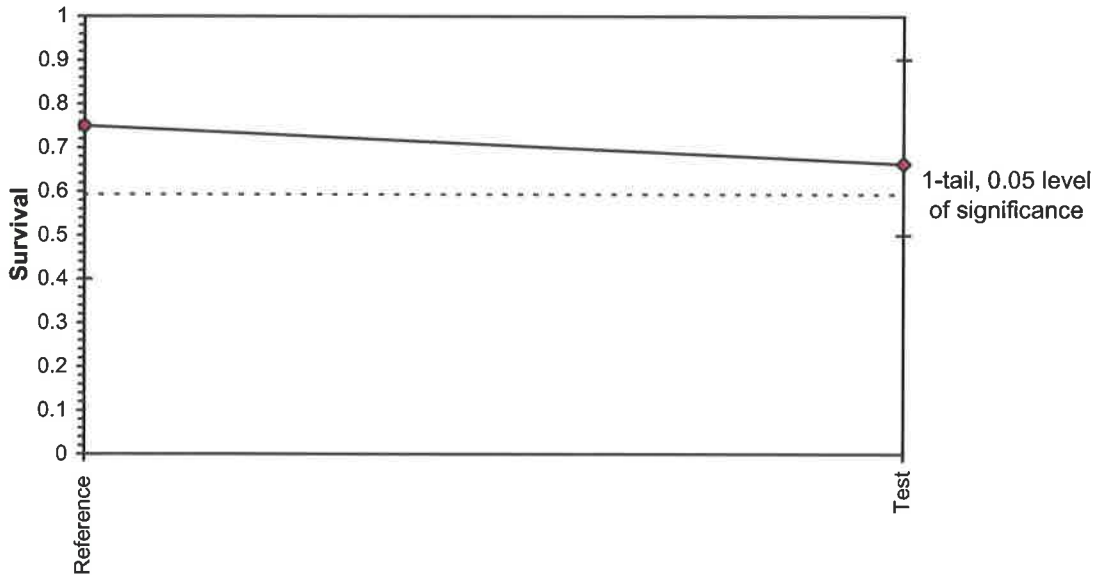
Conc-%	1	2	3	4	5	6	7	8
Reference	0.5000	0.5000	0.9000	0.9000	0.9000	0.9000	1.0000	0.4000
Test	0.9000	0.7000	0.7000	0.8000	0.5000	0.5000	0.7000	0.5000

			Transform: Arcsin Square Root						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
Reference	0.7500	1.0000	1.0830	0.6847	1.4120	25.984	8			
Test	0.6625	0.8833	0.9607	0.7854	1.2490	17.575	8	1.053	1.761	0.2044

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.923	0.844	-0.3441	-1.1129
F-Test indicates equal variances (p = 0.20)	2.77752	8.88539		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates no significant differences Treatments vs Reference	0.18764	0.24047	0.05976	0.05385	0.30996	1, 14

Dose-Response Plot



Freshwater Amphipod-Survival

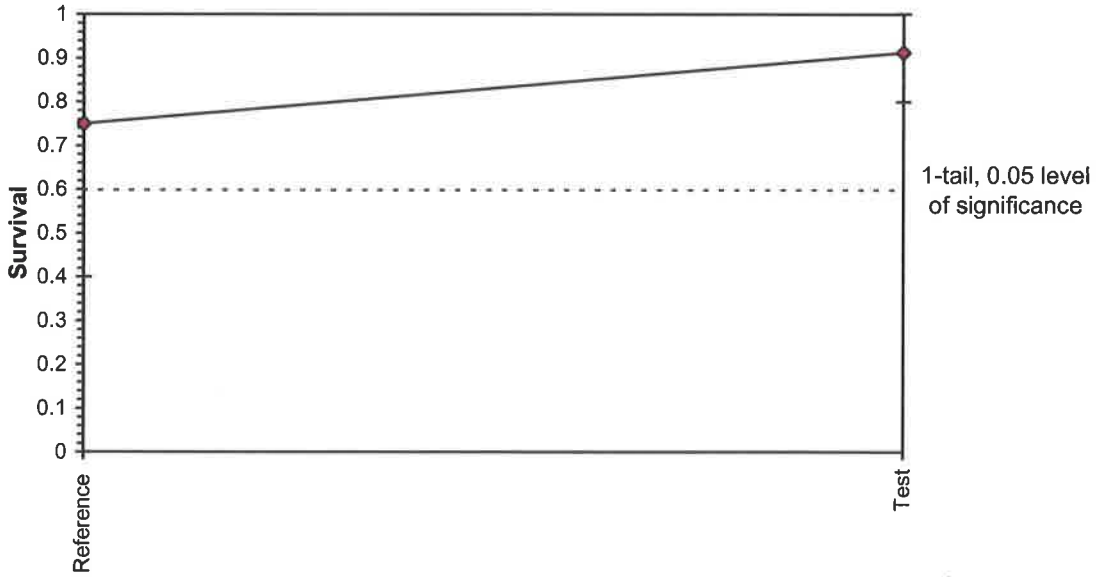
Start Date:	5/3/2019	Test ID:	38-205R	Sample ID:	SS643R (#20190310)
End Date:	6/14/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:	42 day Endpoint				

Conc-%	1	2	3	4	5	6	7	8
Reference	0.5000	0.5000	0.9000	0.9000	0.9000	0.9000	1.0000	0.4000
Test	0.9000	0.8000	1.0000	1.0000	0.8000	1.0000	1.0000	0.8000

			Transform: Arcsin Square Root						1-Tailed	
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
Reference	0.7500	1.0000	1.0830	0.6847	1.4120	25.984	8			
Test	0.9125	1.2167	1.2773	1.1071	1.4120	11.845	8	-1.721	1.761	0.1990

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.87631		0.844		-0.4905	-1.0992
F-Test indicates equal variances (p = 0.12)	3.45903		8.88539			
Hypothesis Test (1-tail, 0.05)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Homoscedastic t Test indicates no significant differences Treatments vs Reference	0.18234	0.23367	0.1511	0.05104	0.10734	1, 14

Dose-Response Plot



Freshwater Amphipod-Survival

Start Date:	5/3/2019	Test ID:	38-205R	Sample ID:	SS644R (#20190311)
End Date:	6/14/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:	42 day Endpoint				

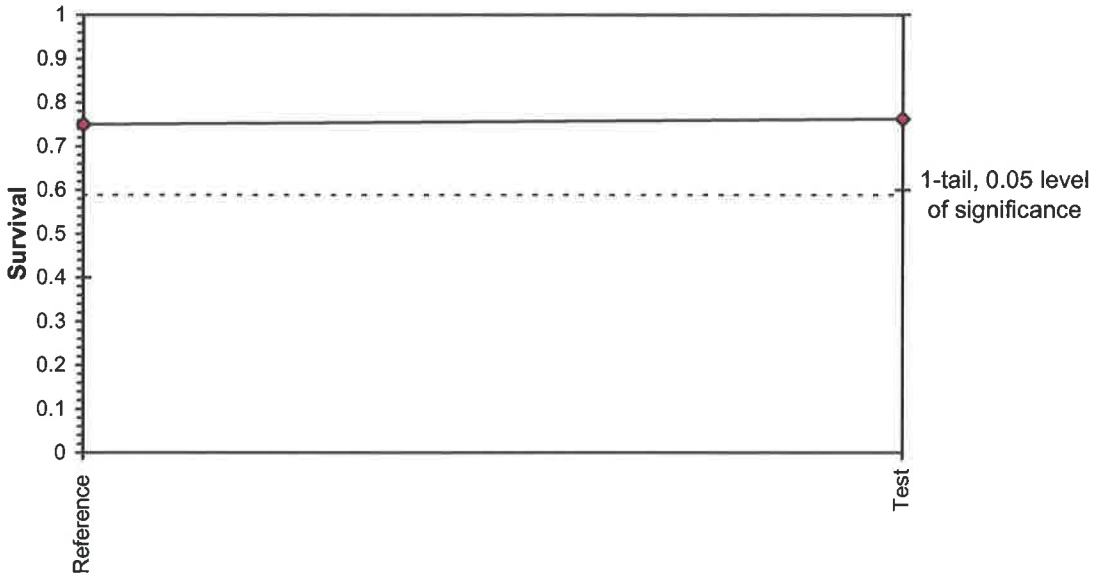
Conc-%	1	2	3	4	5	6	7	8
Reference	0.5000	0.5000	0.9000	0.9000	0.9000	0.9000	1.0000	0.4000
Test	0.6000	0.8000	0.6000	0.9000	0.7000	0.7000	1.0000	0.8000

			Transform: Arcsin Square Root					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
Reference	0.7500	1.0000	1.0830	0.6847	1.4120	25.984	8			
Test	0.7625	1.0167	1.0787	0.8861	1.4120	16.850	8	0.036	1.761	0.2086

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.93269	0.844	-0.2259	-1.1058
F-Test indicates equal variances (p = 0.27)	2.39675	8.88539		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates no significant differences Treatments vs Reference	0.19182	0.24583	7.2E-05	0.05611	0.97197	1, 14

Dose-Response Plot



Freshwater Amphipod-Growth-Dry Weight

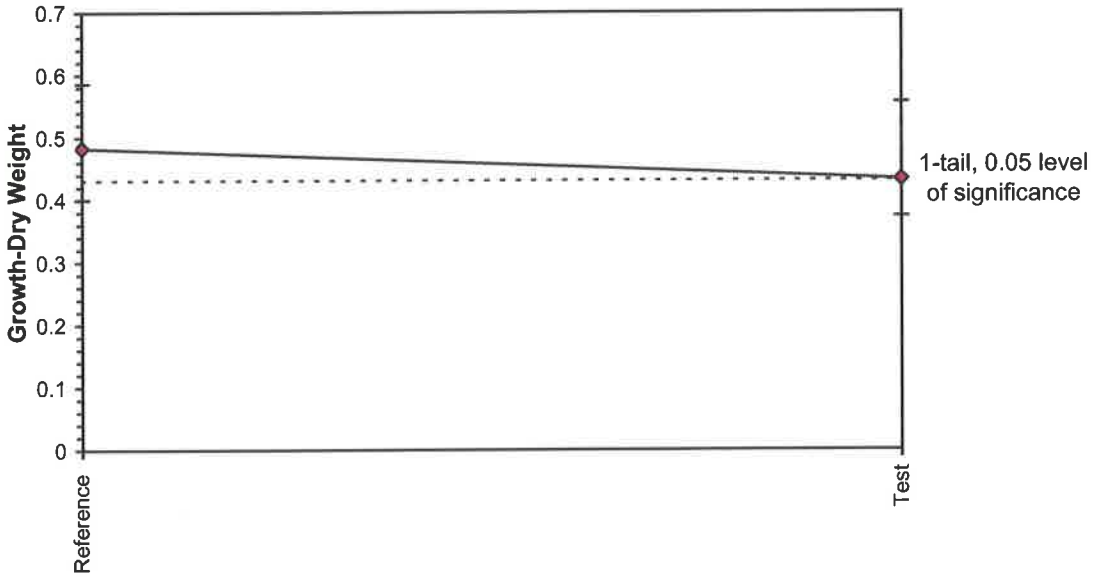
Start Date:	5/3/2019	Test ID:	38-205R	Sample ID:	SS632R (#20190305)
End Date:	6/14/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:	42 day Endpoint				

Conc-%	1	2	3	4	5	6	7	8
Reference	0.4000	0.5860	0.4722	0.4778	0.4833	0.4789	0.4420	0.5200
Test	0.3983	0.3730	0.4300	0.3857	0.4237	0.4933	0.4020	0.5563

			Transform: Untransformed					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
Reference	0.4825	1.0000	0.4825	0.4000	0.5860	11.272	8			
Test	0.4328	0.8969	0.4328	0.3730	0.5563	14.330	8	1.705	1.761	0.0514

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.9128		0.844		0.95583	0.55425
F-Test indicates equal variances (p = 0.74)	1.30024		8.88539			
Hypothesis Test (1-tail, 0.05)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Homoscedastic t Test indicates no significant differences Treatments vs Reference	0.05137	0.10645	0.00989	0.0034	0.11024	1, 14

Dose-Response Plot



Freshwater Amphipod-Growth-Dry Weight

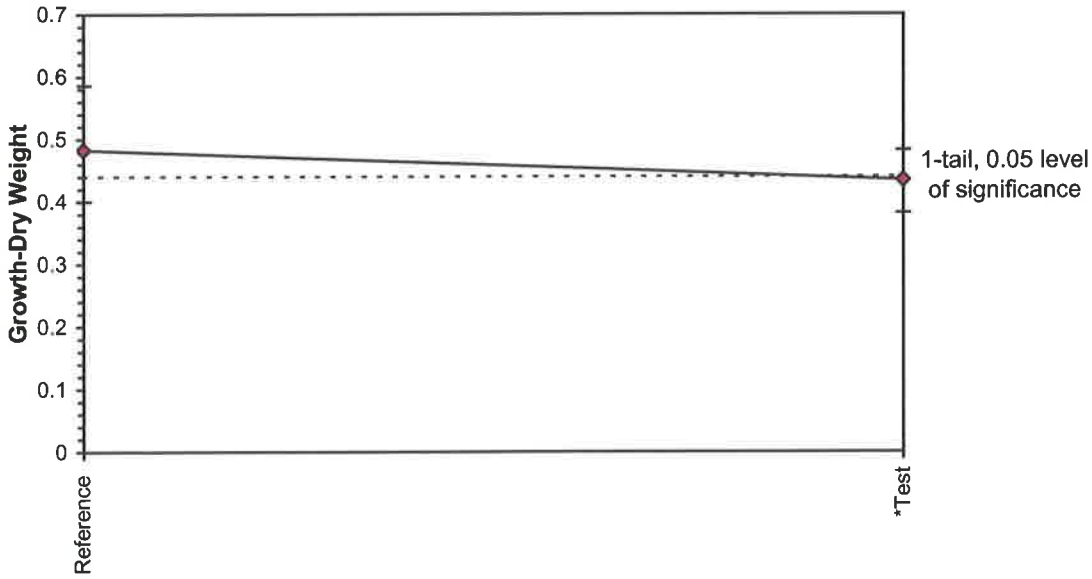
Start Date:	5/3/2019	Test ID:	38-205R	Sample ID:	SS633R (#20190306)
End Date:	6/14/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:	42 day Endpoint				

Conc-%	1	2	3	4	5	6	7	8
Reference	0.4000	0.5860	0.4722	0.4778	0.4833	0.4789	0.4420	0.5200
Test	0.4825	0.4730	0.4010	0.3883	0.4686	0.4162	0.4689	0.3822

			Transform: Untransformed					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
Reference	0.4825	1.0000	0.4825	0.4000	0.5860	11.272	8			
*Test	0.4351	0.9017	0.4351	0.3822	0.4825	9.691	8	1.949	1.761	0.0429

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.96931		0.844		0.34553	0.15511
F-Test indicates equal variances (p = 0.52)	1.66365		8.88539			
Hypothesis Test (1-tail, 0.05)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Homoscedastic t Test indicates significant differences Treatments vs Reference	0.04286	0.08881	0.009	0.00237	0.07157	1, 14

Dose-Response Plot



Freshwater Amphipod-Growth-Dry Weight

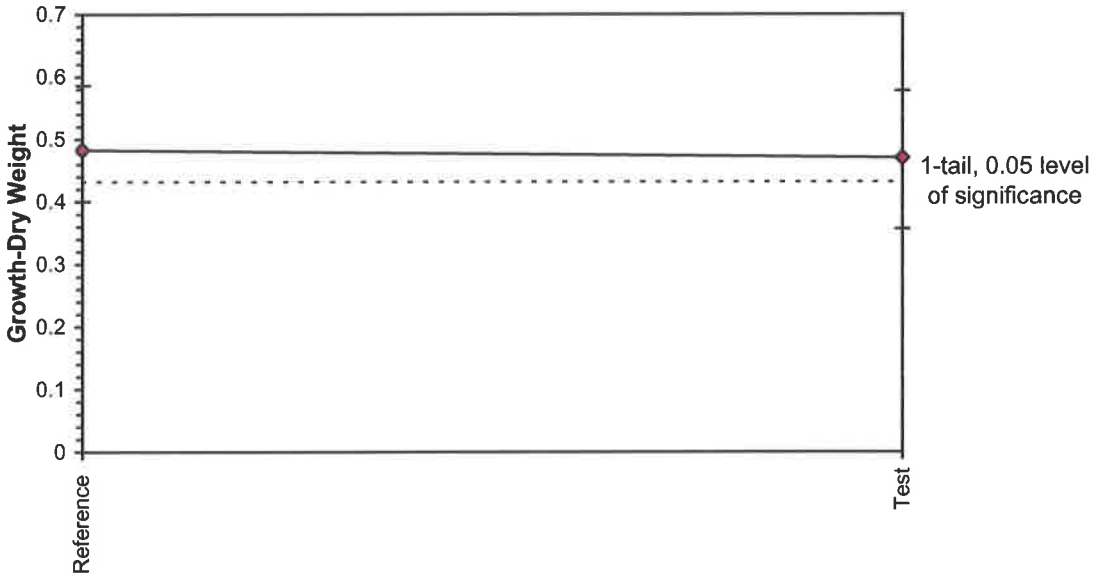
Start Date:	5/3/2019	Test ID:	38-205R	Sample ID:	SS635R (#20190307)
End Date:	6/14/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:	42 day Endpoint				

Conc-%	1	2	3	4	5	6	7	8
Reference	0.4000	0.5860	0.4722	0.4778	0.4833	0.4789	0.4420	0.5200
Test	0.4650	0.4820	0.5787	0.3575	0.4989	0.4471	0.4670	0.4750

			Transform: Untransformed					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
Reference	0.4825	1.0000	0.4825	0.4000	0.5860	11.272	8			
Test	0.4714	0.9770	0.4714	0.3575	0.5787	12.935	8	0.385	1.761	0.0509

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.91802		0.844		0.12994	1.09232
F-Test indicates equal variances (p = 0.77)	1.25693		8.88539			
Hypothesis Test (1-tail, 0.05)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Homoscedastic t Test indicates no significant differences Treatments vs Reference	0.05088	0.10545	0.00049	0.00334	0.70613	1, 14

Dose-Response Plot



Freshwater Amphipod-Growth-Dry Weight

Start Date:	5/3/2019	Test ID:	38-205R	Sample ID:	SS636R (#20190308)
End Date:	6/14/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:	42 day Endpoint				

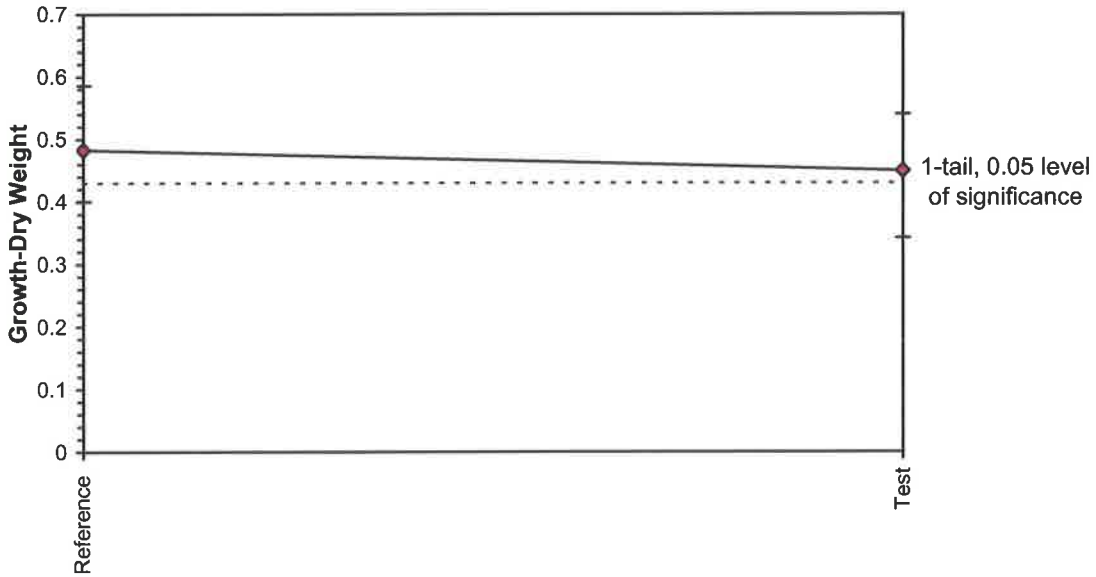
Conc-%	1	2	3	4	5	6	7	8
Reference	0.4000	0.5860	0.4722	0.4778	0.4833	0.4789	0.4420	0.5200
Test	0.3420	0.3867	0.5400	0.4587	0.5056	0.4825	0.4586	0.4260

			Transform: Untransformed					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
Reference	0.4825	1.0000	0.4825	0.4000	0.5860	11.272	8			
Test	0.4500	0.9326	0.4500	0.3420	0.5400	14.215	8	1.096	1.761	0.0523

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.97848	0.844	-0.0248	-0.0781
F-Test indicates equal variances (p = 0.68)	1.38331	8.88539		

Hypothesis Test (1-tail, 0.05)	MSDu	MSDp	MSB	MSE	F-Prob	df
Homoscedastic t Test indicates no significant differences Treatments vs Reference	0.05229	0.10836	0.00423	0.00353	0.29177	1, 14

Dose-Response Plot



Freshwater Amphipod-Growth-Dry Weight

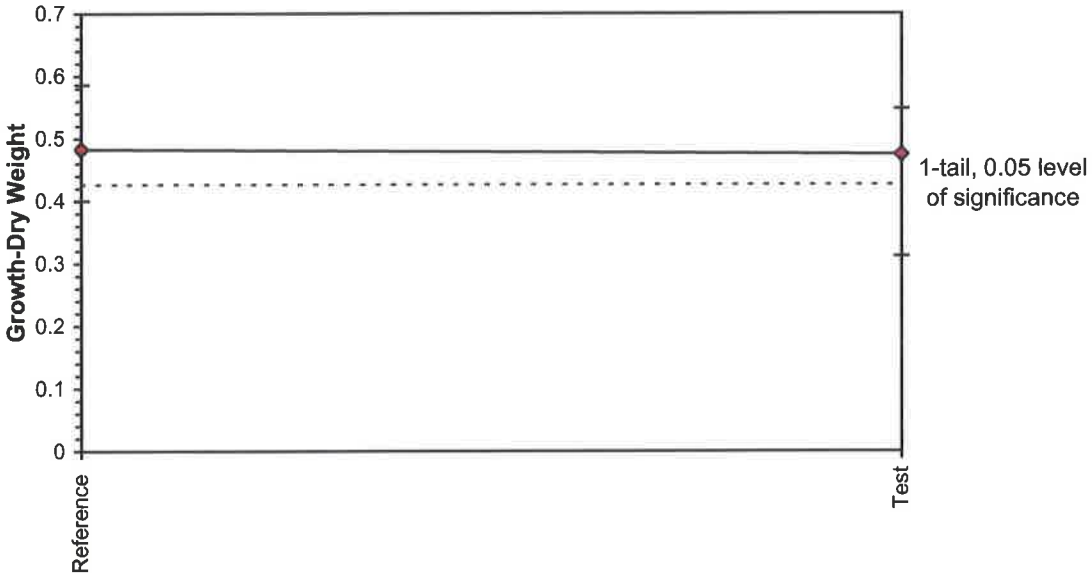
Start Date:	5/3/2019	Test ID:	38-205R	Sample ID:	SS642R (#20190309)
End Date:	6/14/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:	42 day Endpoint				

Conc-%	1	2	3	4	5	6	7	8
Reference	0.4000	0.5860	0.4722	0.4778	0.4833	0.4789	0.4420	0.5200
Test	0.4811	0.4786	0.4986	0.4438	0.5480	0.3120	0.5171	0.5220

			Transform: Untransformed					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
Reference	0.4825	1.0000	0.4825	0.4000	0.5860	11.272	8			
Test	0.4751	0.9847	0.4751	0.3120	0.5480	15.397	8	0.229	1.761	0.0568

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.92965		0.844		-1.0303	2.32945
F-Test indicates equal variances (p = 0.45)	1.80933		8.88539			
Hypothesis Test (1-tail, 0.05)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Homoscedastic t Test indicates no significant differences	0.05677	0.11765	0.00022	0.00416	0.82209	1, 14
Treatments vs Reference						

Dose-Response Plot



Freshwater Amphipod-Growth-Dry Weight

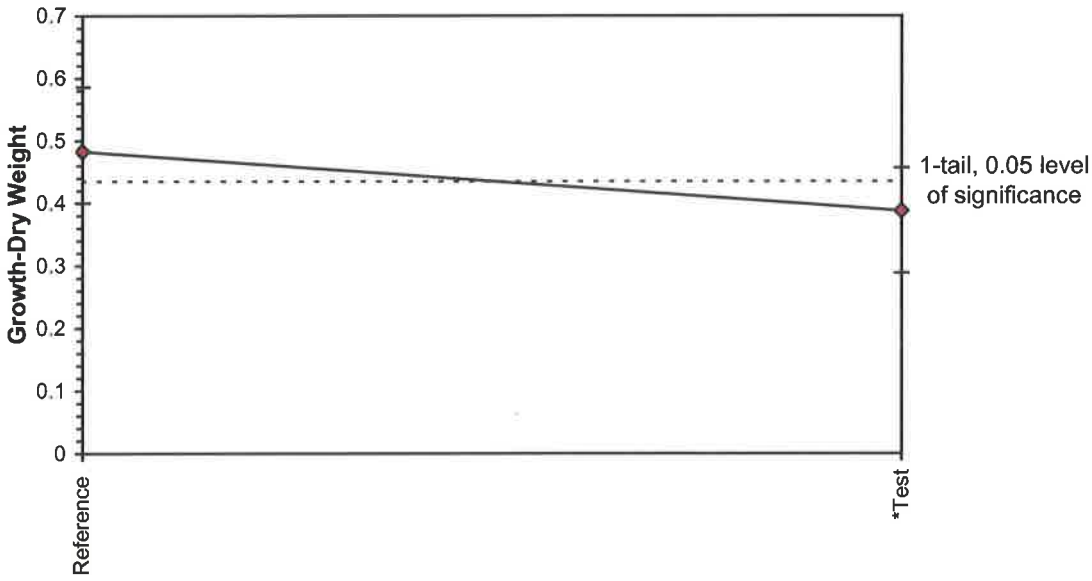
Start Date:	5/3/2019	Test ID:	38-205R	Sample ID:	SS643R (#20190310)
End Date:	6/14/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:	42 day Endpoint				

Conc-%	1	2	3	4	5	6	7	8
Reference	0.4000	0.5860	0.4722	0.4778	0.4833	0.4789	0.4420	0.5200
Test	0.2889	0.3950	0.4570	0.3710	0.4175	0.4360	0.3500	0.3900

			Transform: Untransformed					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
Reference	0.4825	1.0000	0.4825	0.4000	0.5860	11.272	8			
*Test	0.3882	0.8045	0.3882	0.2889	0.4570	13.612	8	3.519	1.761	0.0472

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.97575		0.844		-0.0262	0.35226
F-Test indicates equal variances (p = 0.94)	1.05949		8.88539			
Hypothesis Test (1-tail, 0.05)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Homoscedastic t Test indicates significant differences Treatments vs Reference	0.04722	0.09786	0.03561	0.00288	0.0034	1, 14

Dose-Response Plot



Freshwater Amphipod-Growth-Dry Weight

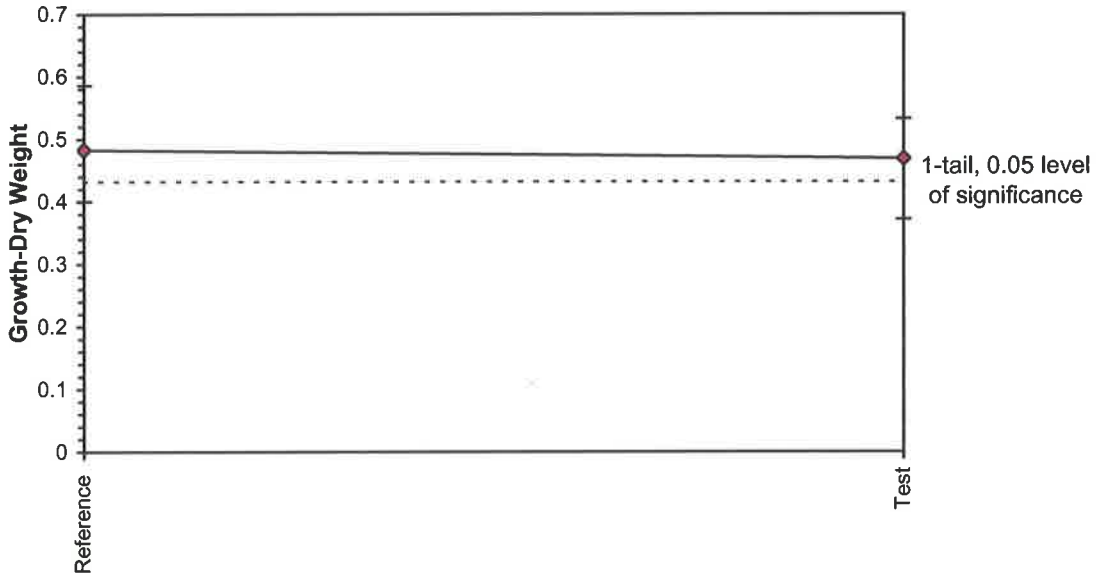
Start Date:	5/3/2019	Test ID:	38-205R	Sample ID:	SS644R (#20190311)
End Date:	6/14/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:	42 day Endpoint				

Conc-%	1	2	3	4	5	6	7	8
Reference	0.4000	0.5860	0.4722	0.4778	0.4833	0.4789	0.4420	0.5200
Test	0.4133	0.5225	0.3717	0.5322	0.5314	0.4743	0.4300	0.4737

			Transform: Untransformed					1-Tailed		
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD
Reference	0.4825	1.0000	0.4825	0.4000	0.5860	11.272	8			
Test	0.4686	0.9712	0.4686	0.3717	0.5322	12.726	8	0.486	1.761	0.0503

Auxiliary Tests	Statistic		Critical		Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.01)	0.97414		0.844		0.02376	-0.4104
F-Test indicates equal variances (p = 0.81)	1.2025		8.88539			
Hypothesis Test (1-tail, 0.05)	**MSDu**	**MSDp**	**MSB**	**MSE**	**F-Prob**	**df**
Homoscedastic t Test indicates no significant differences	0.05026	0.10417	0.00077	0.00326	0.63424	1, 14
Treatments vs Reference						

Dose-Response Plot



Freshwater Amphipod-Reproduction

Start Date:	5/3/2019	Test ID:	38-205R	Sample ID:	SS632R(#20190305)
End Date:	6/14/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:	42 Day Endpoint				

Conc-%	1	2	3	4	5	6	7	8
Reference	0.0000	0.0000	0.0000	1.2857	0.7500	0.0000	5.5000	0.0000
Test	1.6667	0.0000	2.0000	0.0000	0.0000	0.0000	0.4000	5.0000

			Transform: Untransformed					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
Reference	0.9420	1.0000	0.9420	0.0000	5.5000	202.094	8		
Test	1.1333	1.2032	1.1333	0.0000	5.0000	155.219	8	72.00	51.00

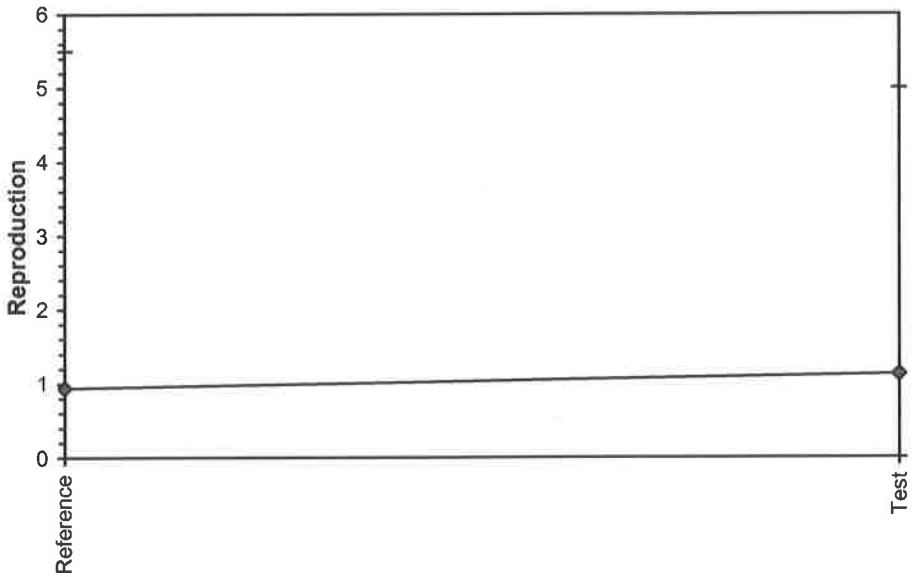
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.67248	0.844	1.96182	3.04811
F-Test indicates equal variances (p = 0.84)	1.17103	8.88539		

Hypothesis Test (1-tail, 0.05)

Wilcoxon Two-Sample Test indicates no significant differences

Treatments vs Reference

Dose-Response Plot



Freshwater Amphipod-Reproduction

Start Date:	5/3/2019	Test ID:	38-205R	Sample ID:	SS633R(#20190306)
End Date:	6/14/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:	42 Day Endpoint				

Conc-%	1	2	3	4	5	6	7	8
Reference	0.0000	0.0000	0.0000	1.2857	0.7500	0.0000	5.5000	0.0000
Test	0.0000	0.0000	0.0000	0.0000	0.3333	0.6667	0.3333	0.0000

			Transform: Untransformed					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
Reference	0.9420	1.0000	0.9420	0.0000	5.5000	202.094	8		
Test	0.1667	0.1769	0.1667	0.0000	0.6667	151.186	8	63.50	51.00

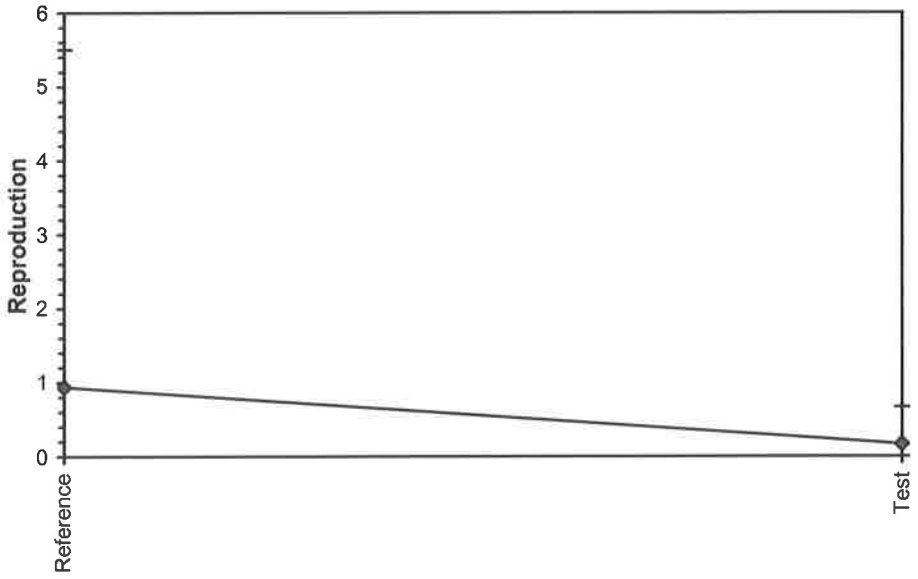
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.6067	0.844	3.06013	10.9499
F-Test indicates unequal variances (p = 2.41E-05)	57.0762	8.88539		

Hypothesis Test (1-tail, 0.05)

Wilcoxon Two-Sample Test indicates no significant differences

Treatments vs Reference

Dose-Response Plot



Freshwater Amphipod-Reproduction

Start Date:	5/3/2019	Test ID:	38-205R	Sample ID:	SS634R(#20190307)
End Date:	6/14/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:	42 Day Endpoint				

Conc-%	1	2	3	4	5	6	7	8
Reference	0.0000	0.0000	0.0000	1.2857	0.7500	0.0000	5.5000	0.0000
Test	0.0000	1.0000	0.0000	0.0000	2.8000	0.0000	2.6667	0.0000

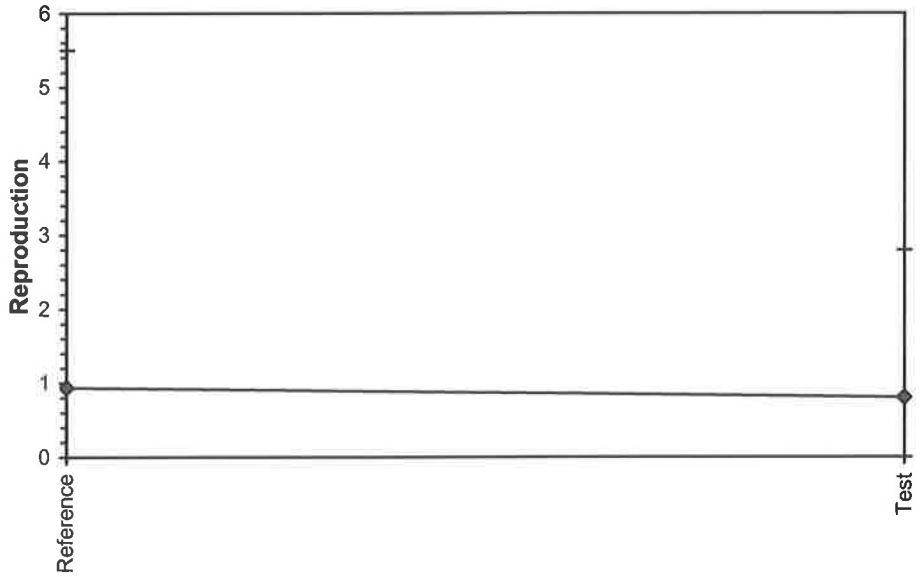
			Transform: Untransformed					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
Reference	0.9420	1.0000	0.9420	0.0000	5.5000	202.094	8		
Test	0.8083	0.8581	0.8083	0.0000	2.8000	153.122	8	68.50	51.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.67267	0.844	2.08707	4.30052
F-Test indicates equal variances (p = 0.28)	2.36548	8.88539		

Hypothesis Test (1-tail, 0.05)

Wilcoxon Two-Sample Test indicates no significant differences
Treatments vs Reference

Dose-Response Plot



Freshwater Amphipod-Reproduction

Start Date:	5/3/2019	Test ID:	38-205R	Sample ID:	SS636R(#20190308)
End Date:	6/14/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:	42 Day Endpoint				

Conc-%	1	2	3	4	5	6	7	8
Reference	0.0000	0.0000	0.0000	1.2857	0.7500	0.0000	5.5000	0.0000
Test	0.0000	0.0000	0.0000	1.6667	0.0000	0.0000	0.0000	0.0000

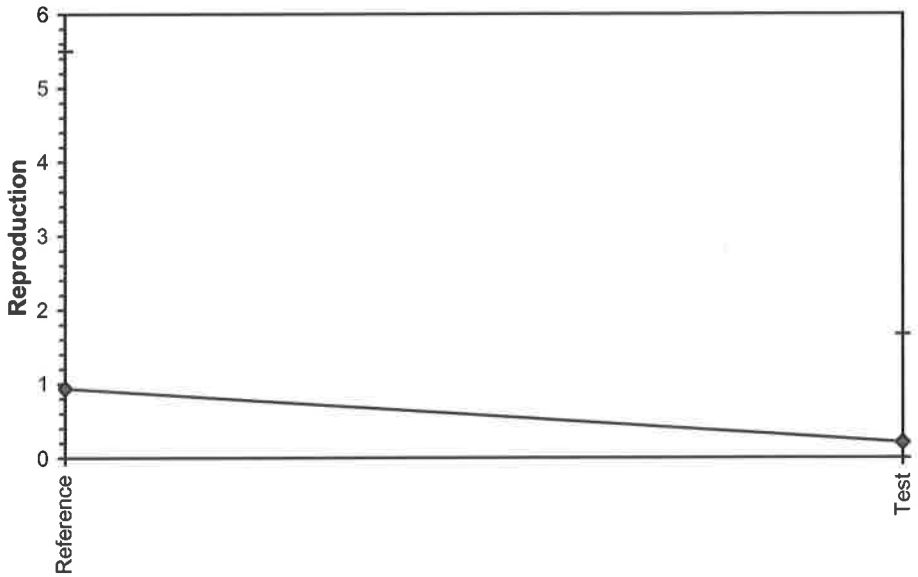
			Transform: Untransformed					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
Reference	0.9420	1.0000	0.9420	0.0000	5.5000	202.094	8		
Test	0.2083	0.2212	0.2083	0.0000	1.6667	282.843	8	60.50	51.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.61843	0.844	2.8265	9.05966
F-Test indicates unequal variances (p = 6.18E-03)	10.4368	8.88539		

Hypothesis Test (1-tail, 0.05)

Wilcoxon Two-Sample Test indicates no significant differences
Treatments vs Reference

Dose-Response Plot



Freshwater Amphipod-Reproduction

Start Date:	5/3/2019	Test ID:	38-205R	Sample ID:	SS642R(#20190309)
End Date:	6/14/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:	42 Day Endpoint				

Conc-%	1	2	3	4	5	6	7	8
Reference	0.0000	0.0000	0.0000	1.2857	0.7500	0.0000	5.5000	0.0000
Test	1.0000	1.7500	1.2500	0.0000	0.0000	0.0000	3.2500	0.0000

			Transform: Untransformed					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
Reference	0.9420	1.0000	0.9420	0.0000	5.5000	202.094	8		
Test	0.9063	0.9621	0.9063	0.0000	3.2500	129.338	8	72.00	51.00

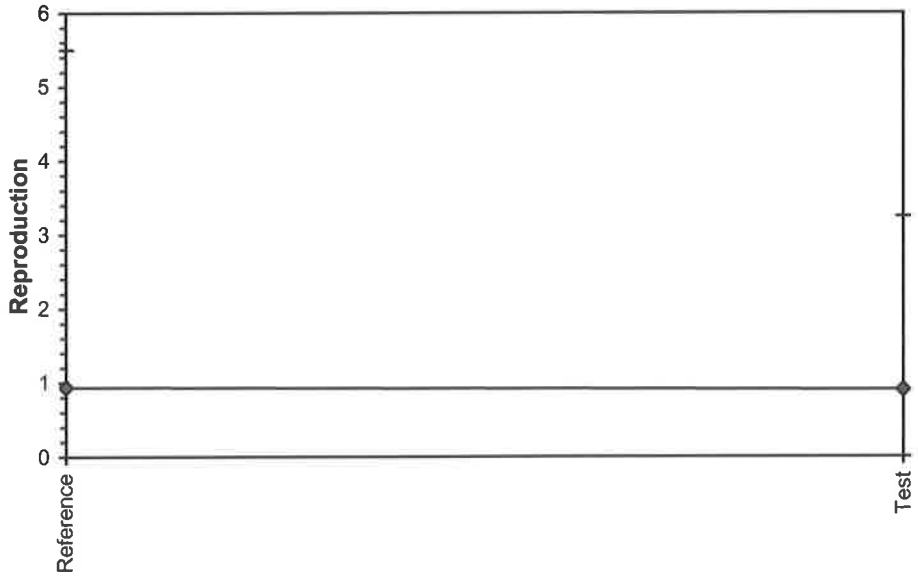
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.68356	0.844	2.1624	4.88115
F-Test indicates equal variances (p = 0.22)	2.63769	8.88539		

Hypothesis Test (1-tail, 0.05)

Wilcoxon Two-Sample Test indicates no significant differences

Treatments vs Reference

Dose-Response Plot



Freshwater Amphipod-Reproduction

Start Date:	5/3/2019	Test ID:	38-205R	Sample ID:	SS643R(#20190310)
End Date:	6/14/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:	42 Day Endpoint				

Conc-%	1	2	3	4	5	6	7	8
Reference	0.0000	0.0000	0.0000	1.2857	0.7500	0.0000	5.5000	0.0000
Test	1.5000	1.6667	0.5000	0.0000	0.0000	0.0000	0.0000	0.0000

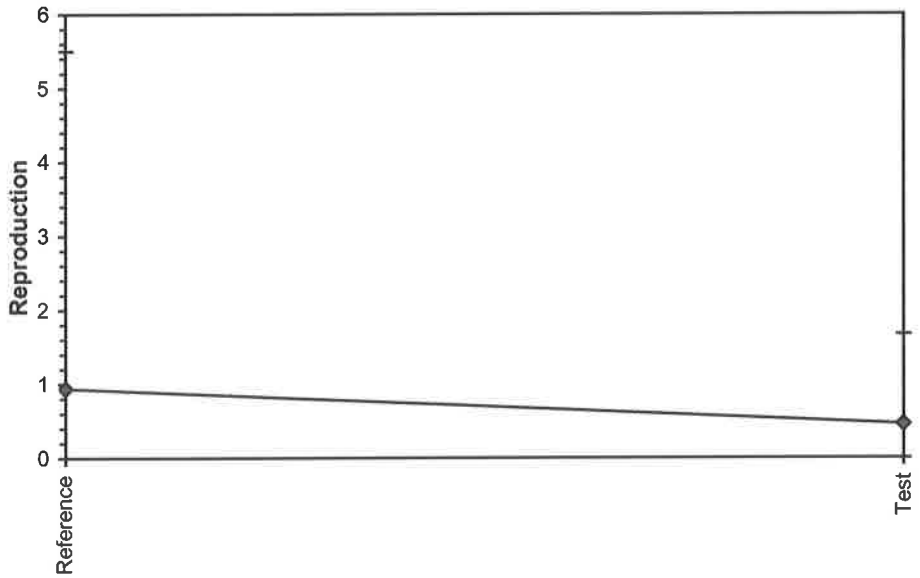
			Transform: Untransformed					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
Reference	0.9420	1.0000	0.9420	0.0000	5.5000	202.094	8		
Test	0.4583	0.4866	0.4583	0.0000	1.6667	156.406	8	67.50	51.00

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.67045	0.844	2.63971	8.02487
F-Test indicates equal variances (p = 0.02)	7.05188	8.88539		

Hypothesis Test (1-tail, 0.05)

Wilcoxon Two-Sample Test indicates no significant differences
Treatments vs Reference

Dose-Response Plot



Freshwater Amphipod-Reproduction

Start Date:	5/3/2019	Test ID:	38-205R	Sample ID:	SS644R(#20190311)
End Date:	6/14/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	
Sample Date:		Protocol:	EPAF 02-EPA Freshwater	Test Species:	HA-Hyalella azteca
Comments:	42 Day Endpoint				

Conc-%	1	2	3	4	5	6	7	8
Reference	0.0000	0.0000	0.0000	1.2857	0.7500	0.0000	5.5000	0.0000
Test	0.0000	0.0000	0.0000	0.0000	2.0000	0.0000	0.5000	0.3333

			Transform: Untransformed					Rank	1-Tailed
Conc-%	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical
Reference	0.9420	1.0000	0.9420	0.0000	5.5000	202.094	8		
Test	0.3542	0.3760	0.3542	0.0000	2.0000	195.551	8	65.50	51.00

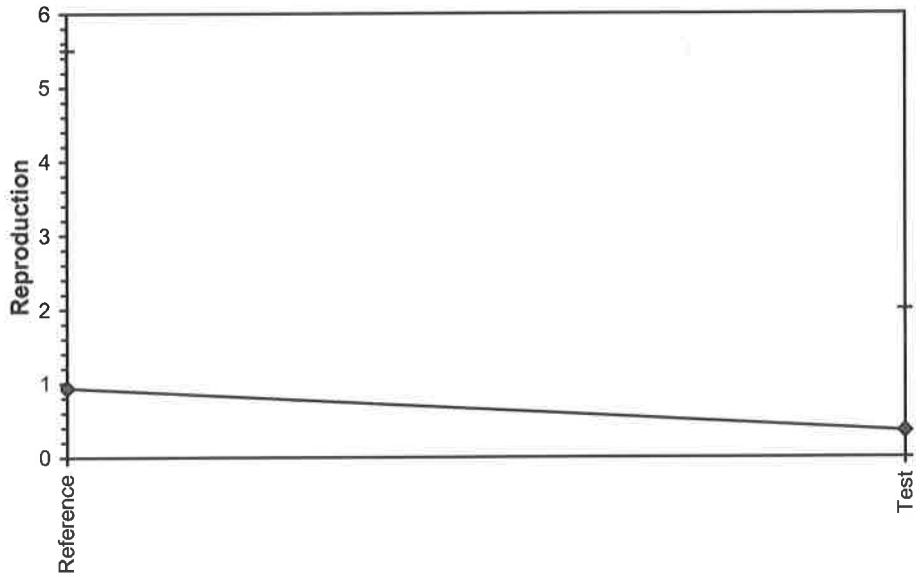
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.01)	0.64874	0.844	2.7253	8.32702
F-Test indicates equal variances (p = 0.02)	7.55507	8.88539		

Hypothesis Test (1-tail, 0.05)

Wilcoxon Two-Sample Test indicates no significant differences

Treatments vs Reference

Dose-Response Plot



Appendix D

Chironomus dilutus
Biological Raw Data

Test Start Date: 5/7/19

Waterbath: #1

2	Control	1.1
14	#20190314	1.2
43		1.3
42		1.4
1		1.5
12		1.6
9		1.7
33		1.8
47	SS632R	2.1
46	#20190305	2.2
29		2.3
3		2.4
5		2.5
10		2.6
44		2.7
30		2.8
45	SS633R	3.1
20	#20190306	3.2
39		3.3
13		3.4
41		3.5
34		3.6
15		3.7
28		3.8
16	SS635R	4.1
25	#20190307	4.2
37		4.3
27		4.4
35		4.5
36		4.6
23		4.7
7		4.8
48	SS636R	5.1
26	#20190308	5.2
40		5.3
17		5.4
18		5.5
21		5.6
8		5.7
38		5.8
6	SS645R	6.1
22	#20190312	6.2
4		6.3
11		6.4
32		6.5
24		6.6
19		6.7
31		6.8

Aqua Survey, Inc.
Special Studies Department
Weight Data Form (Ash- Free)

Job #: 38-205R	**Client:** GEI- Amesbury			**Test Dates:** 5/7 - 17/19				
Organism: *C. tentans*	**Age of Organism (at Test Start):** 2nd-3rd Instar			**Initial #/ Rep.:** 10				
Weigh Dates: 5/20-21/19	**Oven Used:** #2/#3		**Oven Temp. (°C):** 60/550			**Dry Time (hr):** 24/2		

Treatment	Chamber #	# of Surviving Organisms	Pan Weight (mg)	Pan + Larvae (mg)	Dry Weight Total	Dry Weight Individual	Pan + Ash (mg)	Ash- Free Dry Weight Total	Ash- Free Dry Weight Individual
Control #20190314	1	10	747.30	765.35			752.00		
	2	10	758.94	777.16			763.72		
	9	10	752.08	768.73			756.17		
	12	10	763.78	780.13			768.38		
	14	10	746.42	763.22			750.94		
	33	10	717.41	731.91			720.80		
	42	10	723.40	739.41			727.16		
	43	10	728.91	740.82			732.08		
SS632R #20190305	3	10	754.19	765.50			756.64		
	5	10	722.83	733.99			724.75		
	10	5	741.75	749.18			743.54		
	29	10	762.63	772.53			764.91		
	30	10	755.09	765.45			757.22		
	44	10	728.92	739.25			731.25		
	46	9	730.78	742.49			733.63		
	47	10	728.59	740.39			731.37		
SS633R #20190306	13	8	754.94	765.09			757.29		
	15	5	725.39	~~733~~ ①			728.04		
	20	10	762.03	776.59			765.38		
	28	8	746.56	757.50			748.99		
	34	9	771.28	784.68			773.99		
	39	7	756.59	765.96			758.69		
	41	10	717.11	731.03			719.96		
	45	9	726.41	741.02			729.91		
SS635R #20190307	7	9	745.68	760.22			748.99		
	16	10	774.16	789.32			777.85		
	23	10	739.88	755.03			742.99		
	25	10	767.18	781.80			771.17		
	27	10	750.64	764.93			754.00		
	35	10	760.81	775.39			764.14		
	36	8	774.02	785.36			776.65		
	37	9	758.33	770.81			761.22		
SS636R #20190308	8	8	769.43	781.97			772.44		
	17	8	745.83	757.32			748.37		
	18	10	745.52	760.06			749.23		
	21	10	767.69	782.29			771.55		
	26	10	771.18	784.50			774.30		
	38	10	752.22	765.37			②		
	40	9	763.58	775.87			766.46		
	48	10	732.43	747.44			736.14		
Initials/ Date		DH 5/17/19	DH 5/17/19	DH 5/20/19			DH 5/21/19		

① 734.50 DH 5/20/19 ② Dropped Pan. DH 5/21/19

Special Studies Department

Weight Data Form (Ash- Free)

Job #: 38-205R	**Client:** GEI- Amesbury			**Test Dates:** 5/7-17/19				
Organism: *C. tentans*	**Age of Organism (at Test Start):** 2nd-3rd Instar			**Initial #/ Rep.:** 10				
Weigh Dates: 5/20/19	**Oven Used: #2/#3**		**Oven Temp. (°C): 60/550**			**Dry Time (hr): 24/2**		
Treatment	Chamber #	# of Surviving Organisms	Pan Weight (mg)	Pan + Larvae (mg)	Dry Weight Total	Dry Weight Individual	Pan + Ash (mg)	Ash- Free Dry Weight Total	Ash- Free Dry Weight Individual
SS645R #20190312	4	10	762.53	774.55			764.96		
	10	9	774.89	787.60			777.97		
	11	10	762.71	774.28			765.15		
	19	10	759.90	773.29			762.63		
	22	10	762.75	774.66			765.25		
	24	10	775.02	787.57			778.06		
	31	10	766.16	778.87			768.95		
	32	10	767.04	778.29			769.11		
Initials/ Date		5/17/19	5/17/19	5/20/19			5/21/19		

Aqua Survey, Inc.
Sediment Toxicity Study

Job #: 38-205R
Client: GEI- Amesbury

Test Start Date: 5/7/19

Parameter: Exchange/Feeding
Organism: *C. dilutus (C. tentans)*

Day	Date	Exchanges Recon (200 mL)		Feeding Slurry (1.5 mL/Chamber)	Notes:
		1st (Time/ Initials)	2nd (Time/ Initials)	(Time/ Initials)	
0	5/7/19	0800 JH	JH 1200	1500 JH	
1	5/8/19	0925 JH	1550 JH	1655 JH	
2	5/9/19	0930 JH	1530 JH	1600 JH	
3	5/10/19	0935 JH	1520 JH	1530 JH	
4	5/11/19	1050 JH	1510 JH	1525 JH	
5	5/12/19	0955 JH	1400 JH	1415 JH	
6	5/13/19	0920 JH	1610 JH	1630 JH	
7	5/14/19	0830 JH	1445 JH	1600 JH	
8	5/15/19	0945 JH	1400 JH	1660 JH	
9	5/16/19	0935 JH	1610 JH	1635 JH	
10	5/17/19	TEST TERMINATION			

Aqua Survey, Inc.
Special Studies Department
Water Quality

Job #: 38-205R **Organism:** *C. dilutus (C. tentans)*

Client: GEI-Amesbury **10 Day Study** **Test Start Date:** 5/7/19

Sample	Day 0				Day 10			
	Alkalinity mg/L	Hardness mg/L	Conductivity us/cm	NH_3 mg/L	Alkalinity mg/L	Hardness mg/L	Conductivity us/cm	NH_3 mg/L
Control #20190314	60	84	298	<0.20	60	88	317	<0.20
SS632R #20190305	56	84	298	<0.20	56	84	320	<0.20
SS633R #20190306	60	84	307	<0.20	56	84	303	<0.20
SS635R #20190307	64	92	310	<0.20	60	88	304	<0.20
SS636R #20190308	56	80	299	<0.20	56	84	304	<0.20
SS645R #20190312	56	88	295	<0.20	56	88	310	<0.20
Initials/ Date	5/7/19	→	→	→	5/17/19	→	→	→

205RCD0

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	SpCond uS	Sal ppt	DO mg/L	pH
Control 20190314	05/07/19	13:03:05	23.41	298	0.14	7.32	7.80
SS632R 0305	05/07/19	13:04:17	23.46	298	0.14	7.17	7.71
SS633R 0306	05/07/19	13:04:53	23.51	307	0.15	7.11	7.64
SS635R 0307	05/07/19	13:05:25	23.47	310	0.15	7.11	7.57
SS634R 0308	05/07/19	13:06:12	23.49	299	0.14	7.03	7.57
SS645R 0312	05/07/19	13:06:46	23.51	295	0.14	7.28	7.62

Project #: 38-205R Test type: ☐ Acute ☐ Chronic ☑ 10 Day Sed Tox ☐ OTHER: _____ Date: 5/7/19

Species: ☐ *A. bahia* ☑ *C. dilutus* ☐ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 0

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☑ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: _____

205RCD1

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L	pH
20190314	05/08/19	09:03:15	23.58	4.64	7.41
20190305	05/08/19	09:04:47	23.80	4.48	7.25
20190306	05/08/19	09:05:59	23.70	4.22	7.13
20190307	05/08/19	09:07:07	23.75	3.70	7.08
20190308	05/08/19	09:07:34	23.74	3.82	7.13
20190312	05/08/19	09:08:01	23.70	4.28	7.15

Project #: 38-205R Test type: ☐ Acute ☐ Chronic ☑ 10 Day Sed Tox ☐ OTHER: _____ Date: 5/8/19

Species: ☐ *A. bahia* ☑ *C. dilutus* ☐ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 1

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☑ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: BDB

205RCD2

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L
20190304	05/09/19	09:04:12	23.06	4.12
20190305	05/09/19	09:06:00	22.99	4.34
20190306	05/09/19	09:07:34	23.11	4.36
20190307	05/09/19	09:09:04	23.13	4.03
20190308	05/09/19	09:10:13	23.17	4.74
20190312	05/09/19	09:12:42	23.02	3.72

Project #: 38-205R Test type: ☐ Acute ☐ Chronic ☑ 10 Day Sed Tox ☐ OTHER: _____ Date: 5/9/19

Species: ☐ *A. bahia* ☑ *C. dilutus* ☐ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 2

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☐ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: [illegible]

205RCD3

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L	pH
20190314	05/10/19	08:41:21	23.16	3.55	7.34
0305	05/10/19	08:43:29	23.13	3.69	7.26
0306	05/10/19	08:46:11	23.18	3.55	7.17
0307	05/10/19	08:49:17	23.04	3.80	7.22
0308	05/10/19	08:51:18	23.03	4.02	7.17
0312	05/10/19	08:53:04	23.08	3.62	7.16

Project #: 38-2355R Test type: ☐ Acute ☐ Chronic ☑ 3 Day Sed Tox ☐ OTHER: _____ Date: 5/10/19

Species: ☐ *A. bahia* ☑ *C. dilutus* ☐ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 3

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☑ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: M

205RCD4

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L
20190314	05/11/19	10:24:27	23.61	3.63
0305	05/11/19	10:26:47	23.64	4.51
0306	05/11/19	10:28:19	23.61	3.66
0307	05/11/19	10:29:09	23.64	4.24
0308	05/11/19	10:30:50	23.65	3.90
0312	05/11/19	10:32:02	23.59	3.61

Project #: 38-205R Test type: ☐ Acute ☐ Chronic ☑ 10 Day Sed Tox ☐ OTHER: _____ Date: 5/11/19

Species: ☐ *A. bahia* ☑ *C. dilutus* ☐ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 4

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☑ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: _____

205RCD5

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L
20190314	05/12/19	09:37:48	22.66	3.36
0305	05/12/19	09:40:26	22.76	4.46
0306	05/12/19	09:41:33	22.84	4.68
0307	05/12/19	09:42:46	22.78	4.19
0308	05/12/19	09:43:52	22.79	4.41
0312	05/12/19	09:44:59	22.74	4.00

Project #: 38.205R Test type: ☐ Acute ☐ Chronic ☑ 10 Day Sed Tox ☐ OTHER: _____ Date: 5/12/19

Species: ☐ *A. bahia* ☑ *C. dilutus* ☐ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 5

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☑ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: _____

205RCD6

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L	pH
20190314	05/13/19	08:48:08	23.12	3.96	7.30
0305	05/13/19	08:49:35	23.10	3.54	7.23
0306	05/13/19	08:50:33	23.11	4.68	7.26
0307	05/13/19	08:51:26	23.12	4.72	7.25
0308	05/13/19	08:52:16	23.12	4.26	7.24
0312	05/13/19	08:53:59	23.06	4.66	7.22

Project #: 38.205R Test type: ☐ Acute ☐ Chronic ☑ 10 Day Sed Tox ☐ OTHER: _____ Date: 5/13/19

Species: ☐ *A. bahia* ☑ *C. dilutus* ☐ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 6

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☑ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: _____

205RCD7

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	SpCond uS	Sal ppt	DO mg/L	pH
20190314	05/14/19	08:23:33	22.98	312	0.15	3.13	7.13
0305	05/14/19	08:25:27	23.19	308	0.15	3.85	7.17
0306	05/14/19	08:27:06	23.27	307	0.15	4.10	7.17
0307	05/14/19	08:29:21	23.26	313	0.15	4.11	7.17
0308	05/14/19	08:29:55	23.30	304	0.14	4.23	7.19
0312	05/14/19	08:30:42	23.33	310	0.15	4.26	7.18

Project #: 38205R Test type: ☐ Acute ☐ Chronic ☑ 10 Day Sed Tox ☐ OTHER: _____ Date: 5/14/19

Species: ☐ *A. bahia* ☑ *C. dilutus* ☐ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 7

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☑ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: M

205RCD8

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L	pH
20190314	05/15/19	09:35:16	22.76	3.49	7.21
0305	05/15/19	09:36:07	22.73	4.42	7.16
0306	05/15/19	09:37:49	22.79	4.15	7.10
0307	05/15/19	09:38:45	22.81	4.33	7.10
0308	05/15/19	09:40:10	22.75	4.15	7.13
0312	05/15/19	09:41:54	22.88	4.26	7.07

Project #: 38.205R Test type: ☐ Acute ☐ Chronic ☑ 10 Day Sed Tox ☐ OTHER: _____ Date: 5/15/19

Species: ☐ *A. bahia* ☑ *C. dilutus* ☐ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 8

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☑ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: _____

205RCD9

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L
20190304	05/16/19	09:09:06	22.92	4.00
20190305	05/16/19	09:11:11	22.91	3.40
20190306	05/16/19	09:12:50	22.98	3.73
20190307	05/16/19	09:14:01	22.91	3.24
20190308	05/16/19	09:15:07	22.96	3.53
20190312	05/16/19	09:15:46	22.93	4.52

Project #: 38-205R Test type: ☐ Acute ☐ Chronic ☑ 10 Day Sed Tox ☐ OTHER: _____ Date: 5/16/19

Species: ☐ *A. bahia* ☑ *C. dilutus* ☐ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 9

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☐ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials MA

205RCD10

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	SpCond uS	Sal ppt	DO mg/L	pH
20190314	05/17/19	08:47:56	22.87	317	0.15	4.43	7.02
20190305	05/17/19	08:50:26	23.10	320	0.15	3.82	7.10
20190306	05/17/19	08:54:02	23.12	303	0.14	3.77	7.14
20190307	05/17/19	08:56:06	23.11	304	0.14	3.74	7.13
20190308	05/17/19	08:58:00	23.16	304	0.14	3.87	7.16
20190312	05/17/19	09:00:08	23.13	310	0.15	4.19	7.17
~~—~~	~~05/17/19~~	~~09:02:41~~	~~23.12~~	~~310~~	~~0.15~~	~~4.14~~	~~7.18~~ (1)

Project #: 38-205R Test type: ☐ Acute ☐ Chronic ☑ 10 Day Sed Tox ☐ OTHER: _____ Date: 5/17/19

Species: ☐ *A. bahia* ☑ *C. dilutus* ☐ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 10

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☑ 6.0 to 9.0 ☐ _____ to _____

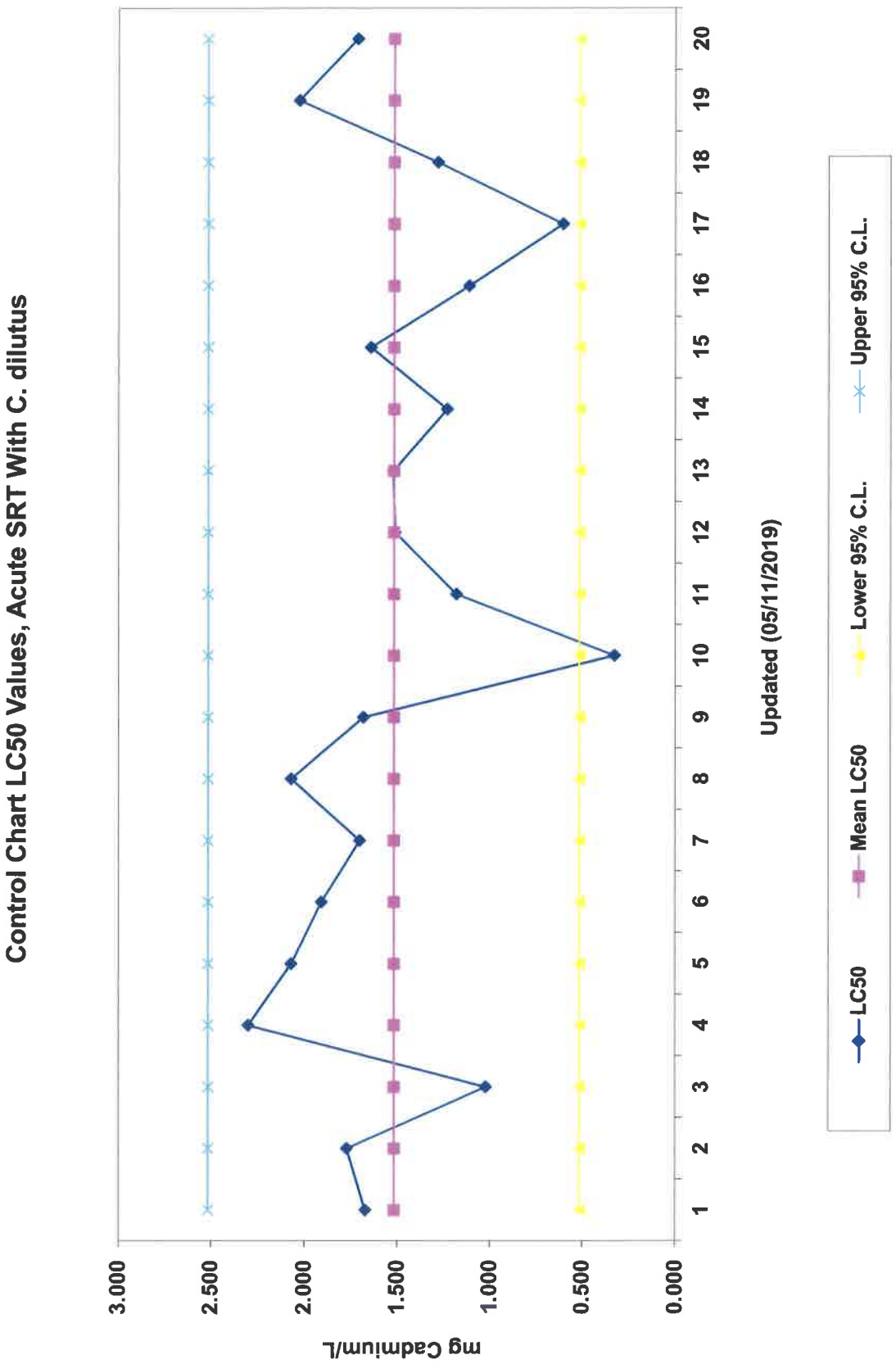
Temp Correction Factor: 0.0

Actions taken:

(1) Read sample 2x. JH

See deviation summary sheet ☐

Initials: JH


Control Chart LC50 Values, Acute SRT With C. dilutus
mg Cadmium/L
3.000
2.500
2.000
1.500
1.000
0.500
0.000
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
Updated (05/11/2019)
LC50
Mean LC50
Lower 95% C.L.
Upper 95% C.L.

Acute Midge-96 Hr Survival

Start Date:	5/7/2019	Test ID:	38-205R	Sample ID:	REF-Ref Toxicant
End Date:	5/11/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	CDCL-Cadmium chloride
Sample Date:		Protocol:	EPAA 91-EPA Acute	Test Species:	CT-Chironomus dilutus
Comments:					

Conc-mg/L	1	2	3	4	5	6	7	8	9	10
Control	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
0.2	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
0.6	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
1.6	0.0000	0.0000	0.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.0000
5	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000	0.0000
15	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

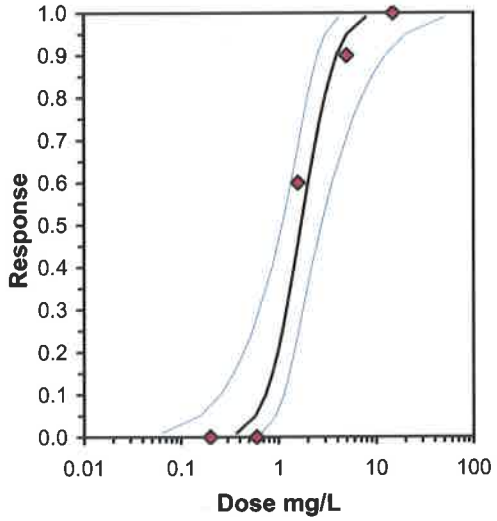
Conc-mg/L	Mean	N-Mean	Resp	Not Resp	Total	N	Fisher's Exact P	1-Tailed Critical	Number Resp	Total Number
Control	1.0000	1.0000	0	10	10	10			0	10
0.2	1.0000	1.0000	0	10	10	10	1.0000	0.0500	0	10
0.6	1.0000	1.0000	0	10	10	10	1.0000	0.0500	0	10
*1.6	0.4000	0.4000	6	4	10	10	0.0054	0.0500	6	10
*5	0.1000	0.1000	9	1	10	10	0.0001	0.0500	9	10
15	0.0000	0.0000	10	0	10	10			10	10

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Fisher's Exact Test	0.6	1.6	0.9798	
Treatments vs Control				

Maximum Likelihood-Probit

Parameter	Value	SE	95% Fiducial Limits		Control	Chi-Sq	Critical	P-value	Mu	Sigma	Iter
Slope	3.52	0.95809	1.64214	5.39785	0	1.89396	7.81473	0.59	0.23305	0.28409	6
Intercept	4.17965	0.36323	3.46772	4.89158							
TSCR											

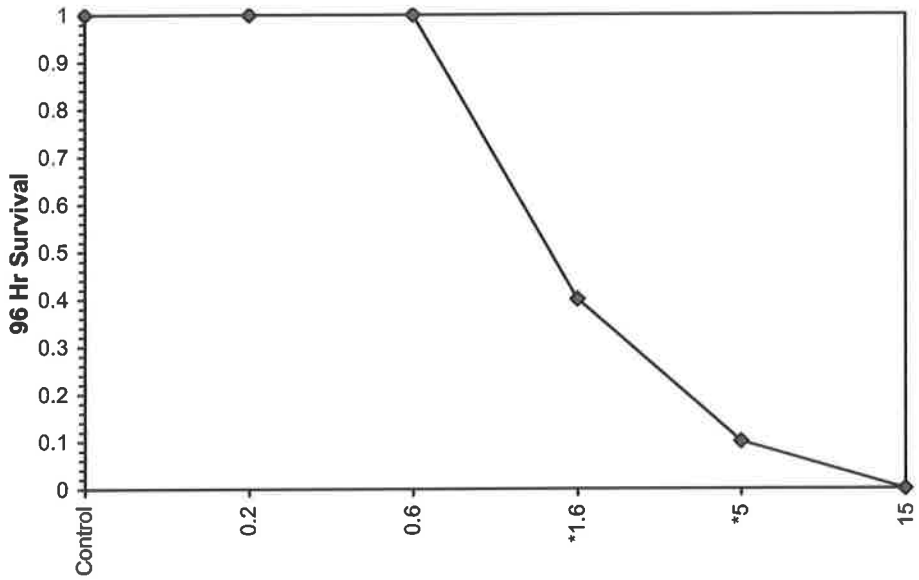
Point	Probits	mg/L	95% Fiducial Limits	
EC01	2.674	0.37339	0.06305	0.68307
EC05	3.355	0.58313	0.15842	0.9454
EC10	3.718	0.73957	0.25581	1.13774
EC15	3.964	0.86819	0.35046	1.30017
EC20	4.158	0.98618	0.44678	1.45636
EC25	4.326	1.10011	0.54633	1.61676
EC40	4.747	1.44904	0.86859	2.19666
EC50	5.000	1.71023	1.10327	2.74859
EC60	5.253	2.0185	1.35627	3.55354
EC75	5.674	2.65871	1.80278	5.77486
EC80	5.842	2.96587	1.98999	7.10188
EC85	6.036	3.36896	2.21796	9.09898
EC90	6.282	3.95487	2.52342	12.5209
EC95	6.645	5.01583	3.0242	20.3028
EC99	7.326	7.83339	4.16908	51.2132



Acute Midge-96 Hr Survival

Start Date:	5/7/2019	Test ID:	38-205R	Sample ID:	REF-Ref Toxicant
End Date:	5/11/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	CDCL-Cadmium chloride
Sample Date:		Protocol:	EPAA 91-EPA Acute	Test Species:	CT-Chironomus dilutus
Comments:					

Dose-Response Plot



Test: AM-Acute Midge
Species: CT-Chironomus dilutus
Sample ID: REF-Ref Toxicant
Start Date: 5/7/2019 End Date: 5/11/2019

Test ID: 38-205R
Protocol: EPAA 91-EPA Acute
Sample Type: CDCL-Cadmium chloride
Lab ID: ASI-Aqua Survey, Inc.

Pos	ID	Rep	Group	Start	24 Hr	48 Hr	72 Hr	96 Hr	10 Day	14 Day	28 Day
	1	1	Control	1				1			
	2	2	Control	1				1			
	3	3	Control	1				1			
	4	4	Control	1				1			
	5	5	Control	1				1			
	6	6	Control	1				1			
	7	7	Control	1				1			
	8	8	Control	1				1			
	9	9	Control	1				1			
	10	10	Control	1				1			
	11	1	0.200	1				1			
	12	2	0.200	1				1			
	13	3	0.200	1				1			
	14	4	0.200	1				1			
	15	5	0.200	1				1			
	16	6	0.200	1				1			
	17	7	0.200	1				1			
	18	8	0.200	1				1			
	19	9	0.200	1				1			
	20	10	0.200	1				1			
	21	1	0.600	1				1			
	22	2	0.600	1				1			
	23	3	0.600	1				1			
	24	4	0.600	1				1			
	25	5	0.600	1				1			
	26	6	0.600	1				1			
	27	7	0.600	1				1			
	28	8	0.600	1				1			
	29	9	0.600	1				1			
	30	10	0.600	1				1			
	31	1	1.600	1				0			
	32	2	1.600	1				0			
	33	3	1.600	1				0			
	34	4	1.600	1				1			
	35	5	1.600	1				1			
	36	6	1.600	1				1			
	37	7	1.600	1				1			
	38	8	1.600	1				0			
	39	9	1.600	1				0			
	40	10	1.600	1				0			
	41	1	5.000	1				0			
	42	2	5.000	1				0			
	43	3	5.000	1				0			
	44	4	5.000	1				0			
	45	5	5.000	1				1			
	46	6	5.000	1				0			
	47	7	5.000	1				0			
	48	8	5.000	1				0			
	49	9	5.000	1				0			
	50	10	5.000	1				0			
	51	1	15.000	1				0			
	52	2	15.000	1				0			
	53	3	15.000	1				0			

Test: AM-Acute Midge							Test ID: 38-205R				
Species: CT-Chironomus dilutus							Protocol: EPAA 91-EPA Acute				
Sample ID: REF-Ref Toxicant							Sample Type: CDCL-Cadmium chloride				
Start Date: 5/7/2019			End Date: 5/11/2019				Lab ID: ASI-Aqua Survey, Inc.				
Pos	ID	Rep	Group	Start	24 Hr	48 Hr	72 Hr	96 Hr	10 Day	14 Day	28 Day
	54	4	15.000	1				0			
	55	5	15.000	1				0			
	56	6	15.000	1				0			
	57	7	15.000	1				0			
	58	8	15.000	1				0			
	59	9	15.000	1				0			
	60	10	15.000	1				0			

Comments:

Standard Reference Toxicant
Live Counts

For Job #: 38-305R Start Date: 5/7/19 End Date: 5/11/19

Organism C. tentans/H. azteca Organism Log #: 39-011 Starting Time: 1450

Dose	Initial	1	2	3	4	Dose	Initial	1	2	3	4
Cnt. A	1	1	1	1	1	1.6 A	1	1	1	X	–
B	1	1	1	1	1	B	1	1	1	1	X
C	1	1	1	1	1	C	1	1	X	–	–
D	1	1	1	1	1	D	1	1	1	1	1
E	1	1	1	1	1	E	1	1	1	1	1
F	1	1	1	1	1	F	1	1	1	1	1
G	1	1	1	1	1	G	1	1	1	1	1
H	1	1	1	1	1	H	1	1	1	X	–
I	1	1	1	1	1	I	1	1	1	1	X
J	1	1	1	1	1	J	1	1	1	X	–
0.2 A	1	1	1	1	1	50 A	1	1	X	–	–
B	1	1	1	1	1	B	1	X	–	–	–
C	1	1	1	1	1	C	1	1	X	–	–
D	1	1	1	1	1	D	1	1	1	1	X
E	1	1	1	1	1	E	1	1	1	1	1
F	1	1	1	1	1	F	1	1	1	1	X
G	1	1	1	1	1	G	1	1	1	X	–
H	1	1	1	1	1	H	1	1	X	–	–
I	1	1	1	1	1	I	1	1	1	X	–
J	1	1	1	1	1	J	1	1	1	X	–
0.6 A	1	1	1	1	1	150 A	1	X	–	–	–
B	1	1	1	1	1	B	1	X	–	–	–
C	1	1	1	1	1	C	1	X	–	–	–
D	1	1	1	1	1	D	1	X	–	–	–
E	1	1	1	1	1	E	1	X	–	–	–
F	1	1	1	1	1	F	1	X	–	–	–
G	1	1	1	1	1	G	1	X	–	–	–
H	1	1	1	1	1	H	1	X	–	–	–
I	1	1	1	1	1	I	1	X	–	–	–
J	1	1	1	1	1	J	1	X	–	–	–
Initial	H	H	H	H	H		H	H	H	H	H
Date	5/7/19	5/8/19	5/9/19	5/10/19	5/11/19		5/7/19	5/8/19	5/9/19	5/10/19	5/11/19

~~ICN Biochemicals~~
ICN Biomedicals, Inc
Lot: 3840A
0.0640g
DD 5/7/19

Prep Sheet for Freshwater SRTs

Chironomus tentans/ Hyalella azteca

10 replicates per concentration
20 mL per replicate
1 organism per replicate

Working Stock Solution

Add 0.064 grams of Cadmium chloride to 100 mL **DI water**.
This will give you a 320 mg Cadmium/ L stock solution.

Hyalella azteca

Add **1 mL** of the working stock solution to 1L of **Well water**.
This will give you a 32 µg Cadmium/ L stock solution.

Concentration (µg/ L)	Stock (mL)	Total (mL)
0	0	250
4	3.125	250
8	6.25	250
16	12.5	250
32	25	250
64	50	250

Chironomus tentans

Add **100 mL** of the working stock solution to 1L of **Recon**.
This will give you a 32 mg Cadmium/ L stock solution.

Concentration (mg/ L)	Stock (mL)	Total (mL)
0	0	250
0.2	1.6	250
0.6	4.7	250
1.6	12.5	250
5	39	250
15	117	250

H. azteca requires a small piece of nitex screen in each cup; feed each cup2-3 drops YCT
C. tentans feed each cup 2-3 drops slurry

AQUA SURVEY, INC.

CULTURE ORGANISM DISTRIBUTION FORM

DATE: 5/7/19

TEST JOB #: 38-205 R CLIENT: GEI- Amsbury

TEST LOCATION: IN-LAB [√] FIELD [ ]

TEST SPECIES: C. dilutus

TOTAL NUMBER ORGANSIMS TRANSFERRED: 600+

AQUA SURVEY, INC. CULTURE LAB INVESTIGATORS: JL/LH

A. ORGANISMS

1. ASI CULTURE/ HOLDING UNIT: Carolina Dishes
2. RECEIVING LOG #: N/A
3. CULTURE LOG #: 39-011
4. AGE/ SIZE INFORMATION: HD: 4/25-27/19; 10-12 days old

B. HOLDING [√] CULTURE [ ] WATER PARAMETERS

1. TEMPERATURE: 23±1°C
2. SALINITY: N/A
3. WATER SOURCE: Recon

B. TRANSFER CUSTODY & TRANSFER

1. LIVESTOCK RELINQUISHMENT
   DATE: 5/7/19
   TIME: 1200
   BY: JL
2. LIVESTOCK RECEIVING
   DATE: 5/7/19
   TIME: 1200
   BY: JL
3. CULTURE SUPERVISOR OR SENIOR TECH. INITIALS: JL

REMARKS:

Bath #1

38-205R_SRT.hobo

#	Time, GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
82	05/06/19 06:00:00 PM	23.569					
83	05/06/19 07:00:00 PM	23.665					
84	05/06/19 08:00:00 PM	23.761					
85	05/06/19 09:00:00 PM	23.857					
86	05/06/19 10:00:00 PM	23.930					
87	05/06/19 11:00:00 PM	23.978					
88	05/07/19 12:00:00 AM	24.002					
89	05/07/19 01:00:00 AM	23.978					
90	05/07/19 02:00:00 AM	23.857					
91	05/07/19 03:00:00 AM	23.785					
92	05/07/19 04:00:00 AM	23.689					
93	05/07/19 05:00:00 AM	23.617					
94	05/07/19 06:00:00 AM	23.545					
95	05/07/19 07:00:00 AM	23.497					
96	05/07/19 08:00:00 AM	23.497					
97	05/07/19 09:00:00 AM	23.545					
98	05/07/19 10:00:00 AM	23.593					
99	05/07/19 11:00:00 AM	23.593					
100	05/07/19 12:00:00 PM	23.617					
101	05/07/19 01:00:00 PM	23.737					
102	05/07/19 02:00:00 PM	23.785					
103	05/07/19 03:00:00 PM	23.809					
104	05/07/19 04:00:00 PM	23.905					
105	05/07/19 05:00:00 PM	24.002					
106	05/07/19 06:00:00 PM	24.122					
107	05/07/19 07:00:00 PM	24.195					
108	05/07/19 08:00:00 PM	24.267					

38-205R_SRT.hobo

#	Time, GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
109	05/07/19 09:00:00 PM	24.339					
110	05/07/19 10:00:00 PM	24.388					
111	05/07/19 11:00:00 PM	24.436					
112	05/08/19 12:00:00 AM	24.412					
113	05/08/19 01:00:00 AM	24.388					
114	05/08/19 02:00:00 AM	24.339					
115	05/08/19 03:00:00 AM	24.291					
116	05/08/19 04:00:00 AM	24.219					
117	05/08/19 05:00:00 AM	24.146					
118	05/08/19 06:00:00 AM	24.074					
119	05/08/19 07:00:00 AM	24.050					
120	05/08/19 08:00:00 AM	24.026					
121	05/08/19 09:00:00 AM	24.026					
122	05/08/19 10:00:00 AM	24.050					
123	05/08/19 11:00:00 AM	24.026					
124	05/08/19 12:00:00 PM	24.002					
125	05/08/19 01:00:00 PM	23.978					
126	05/08/19 02:00:00 PM	23.978					
127	05/08/19 03:00:00 PM	24.002					
128	05/08/19 04:00:00 PM	24.002					
129	05/08/19 05:00:00 PM	24.002					
130	05/08/19 06:00:00 PM	24.002					
131	05/08/19 07:00:00 PM	24.026					
132	05/08/19 08:00:00 PM	24.026					
133	05/08/19 09:00:00 PM	24.050					
134	05/08/19 10:00:00 PM	24.074					
135	05/08/19 11:00:00 PM	24.098					

38-205R_SRT.hobo

#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
136	05/09/19 12:00:00 AM	24.050					
137	05/09/19 01:00:00 AM	23.978					
138	05/09/19 02:00:00 AM	23.881					
139	05/09/19 03:00:00 AM	23.785					
140	05/09/19 04:00:00 AM	23.689					
141	05/09/19 05:00:00 AM	23.593					
142	05/09/19 06:00:00 AM	23.497					
143	05/09/19 07:00:00 AM	23.472					
144	05/09/19 08:00:00 AM	23.448					
145	05/09/19 09:00:00 AM	23.448					
146	05/09/19 10:00:00 AM	23.497					
147	05/09/19 11:00:00 AM	23.472					
148	05/09/19 12:00:00 PM	23.472					
149	05/09/19 01:00:00 PM	23.545					
150	05/09/19 02:00:00 PM	23.545					
151	05/09/19 03:00:00 PM	23.545					
152	05/09/19 04:00:00 PM	23.521					
153	05/09/19 05:00:00 PM	23.472					
154	05/09/19 06:00:00 PM	23.448					
155	05/09/19 07:00:00 PM	23.448					
156	05/09/19 08:00:00 PM	23.448					
157	05/09/19 09:00:00 PM	23.448					
158	05/09/19 10:00:00 PM	23.472					
159	05/09/19 11:00:00 PM	23.497					
160	05/10/19 12:00:00 AM	23.472					
161	05/10/19 01:00:00 AM	23.424					
162	05/10/19 02:00:00 AM	23.376					

38-205R_SRT.hobo

#	Time, GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
163	05/10/19 03:00:00 AM	23.328					
164	05/10/19 04:00:00 AM	23.256					
165	05/10/19 05:00:00 AM	23.208					
166	05/10/19 06:00:00 AM	23.160					
167	05/10/19 07:00:00 AM	23.160					
168	05/10/19 08:00:00 AM	23.184					
169	05/10/19 09:00:00 AM	23.328					
170	05/10/19 10:00:00 AM	23.448					
171	05/10/19 11:00:00 AM	23.448					
172	05/10/19 12:00:00 PM	23.424					
173	05/10/19 01:00:00 PM	23.472					
174	05/10/19 02:00:00 PM	23.497					
175	05/10/19 03:00:00 PM	23.569					
176	05/10/19 04:00:00 PM	23.641					
177	05/10/19 05:00:00 PM	23.713					
178	05/10/19 06:00:00 PM	23.785					
179	05/10/19 07:00:00 PM	23.809					
180	05/10/19 08:00:00 PM	23.833					
181	05/10/19 09:00:00 PM	23.905					
182	05/10/19 10:00:00 PM	23.930					
183	05/10/19 11:00:00 PM	23.978					
184	05/11/19 12:00:00 AM	23.978					
185	05/11/19 01:00:00 AM	23.978					
186	05/11/19 02:00:00 AM	23.954					
187	05/11/19 03:00:00 AM	23.930					
188	05/11/19 04:00:00 AM	23.881					
189	05/11/19 05:00:00 AM	23.833					

38-205R_SRT.hobo

#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
190	05/11/19 06:00:00 AM	23.809					
191	05/11/19 07:00:00 AM	23.785					
192	05/11/19 08:00:00 AM	23.761					
193	05/11/19 09:00:00 AM	23.761					
194	05/11/19 10:00:00 AM	23.809					
195	05/11/19 11:00:00 AM	23.905					
196	05/11/19 12:00:00 PM	24.002					
197	05/11/19 01:00:00 PM	24.098					
198	05/11/19 02:00:00 PM	24.219					
199	05/11/19 03:00:00 PM	24.339					
200	05/11/19 04:00:00 PM	24.484					
201	05/11/19 05:00:00 PM	24.532					
202	05/11/19 06:00:00 PM	24.532					
203	05/11/19 07:00:00 PM	24.508					
204	05/11/19 08:00:00 PM	24.436					
205	05/11/19 09:00:00 PM	24.339					
206	05/11/19 10:00:00 PM	24.219					
207	05/11/19 11:00:00 PM	24.122					
208	05/12/19 12:00:00 AM	23.978					
209	05/12/19 01:00:00 AM	23.833					
210	05/12/19 02:00:00 AM	23.689					
211	05/12/19 03:00:00 AM	23.545					
212	05/12/19 04:00:00 AM	23.400					
213	05/12/19 05:00:00 AM	23.280					
214	05/12/19 06:00:00 AM	23.184					
215	05/12/19 07:00:00 AM	23.112					
216	05/12/19 08:00:00 AM	23.088					

38-205R_SRT.hobo

#	Time, GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
217	05/12/19 09:00:00 AM	23.064					
218	05/12/19 10:00:00 AM	22.920					
219	05/12/19 11:00:00 AM	22.992					
220	05/12/19 12:00:00 PM	23.040					
221	05/12/19 01:00:00 PM	23.112					
222	05/12/19 02:00:00 PM	23.160					
223	05/12/19 03:00:00 PM	23.232					
224	05/12/19 04:00:00 PM	23.280					
225	05/12/19 05:00:00 PM	23.328					
226	05/12/19 06:00:00 PM	23.376					
227	05/12/19 07:00:00 PM	23.424					
228	05/12/19 08:00:00 PM	23.472					
229	05/12/19 09:00:00 PM	23.521					
230	05/12/19 10:00:00 PM	23.521					
231	05/12/19 11:00:00 PM	23.569					
232	05/13/19 12:00:00 AM	23.545					
233	05/13/19 01:00:00 AM	23.497					
234	05/13/19 02:00:00 AM	23.424					
235	05/13/19 03:00:00 AM	23.352					
236	05/13/19 04:00:00 AM	23.280					
237	05/13/19 05:00:00 AM	23.184					
238	05/13/19 06:00:00 AM	23.112					
239	05/13/19 07:00:00 AM	23.088					
240	05/13/19 08:00:00 AM	23.112					
241	05/13/19 09:00:00 AM	23.184					
242	05/13/19 10:00:00 AM	23.304					
243	05/13/19 11:00:00 AM	23.352					

38-205R_SRT.hobo

#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
244	05/13/19 12:00:00 PM	23.400					
245	05/13/19 01:00:00 PM	23.424					
246	05/13/19 02:00:00 PM	23.472					
247	05/13/19 03:00:00 PM	23.497					
248	05/13/19 04:00:00 PM	23.545					
249	05/13/19 05:00:00 PM	23.521					
250	05/13/19 06:00:00 PM	23.521					
251	05/13/19 07:00:00 PM	23.545					
252	05/13/19 08:00:00 PM	23.593					
253	05/13/19 09:00:00 PM	23.641					
254	05/13/19 10:00:00 PM	23.689					
255	05/13/19 11:00:00 PM	23.737					
256	05/14/19 12:00:00 AM	23.737					
257	05/14/19 01:00:00 AM	23.737					
258	05/14/19 02:00:00 AM	23.665					
259	05/14/19 03:00:00 AM	23.617					
260	05/14/19 04:00:00 AM	23.545					
261	05/14/19 05:00:00 AM	23.497					
262	05/14/19 06:00:00 AM	23.472					
263	05/14/19 07:00:00 AM	23.497					
264	05/14/19 08:00:00 AM	23.497					
265	05/14/19 09:00:00 AM	23.569					
266	05/14/19 10:00:00 AM	23.472					
267	05/14/19 11:00:00 AM	23.424					
268	05/14/19 12:00:00 PM	23.400					
269	05/14/19 01:00:00 PM	23.424					
270	05/14/19 02:00:00 PM	23.472					

38-205R_SRT.hobo

#	Time, GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
271	05/14/19 03:00:00 PM	23.497					
272	05/14/19 04:00:00 PM	23.497					
273	05/14/19 05:00:00 PM	23.617					
274	05/14/19 06:00:00 PM	23.641					
275	05/14/19 07:00:00 PM	23.617					
276	05/14/19 08:00:00 PM	23.593					
277	05/14/19 09:00:00 PM	23.593					
278	05/14/19 10:00:00 PM	23.569					
279	05/14/19 11:00:00 PM	23.545					
280	05/15/19 12:00:00 AM	23.497					
281	05/15/19 01:00:00 AM	23.400					
282	05/15/19 02:00:00 AM	23.328					
283	05/15/19 03:00:00 AM	23.232					
284	05/15/19 04:00:00 AM	23.184					
285	05/15/19 05:00:00 AM	23.112					
286	05/15/19 06:00:00 AM	23.088					
287	05/15/19 07:00:00 AM	23.112					
288	05/15/19 08:00:00 AM	23.136					
289	05/15/19 09:00:00 AM	23.160					
290	05/15/19 10:00:00 AM	23.160					
291	05/15/19 11:00:00 AM	23.256					
292	05/15/19 12:00:00 PM	23.304					
293	05/15/19 01:00:00 PM	23.424					
294	05/15/19 02:00:00 PM	23.472					
295	05/15/19 03:00:00 PM	23.497					
296	05/15/19 04:00:00 PM	23.497					
297	05/15/19 05:00:00 PM	23.497					

38-205R_SRT.hobo

#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
298	05/15/19 06:00:00 PM	23.497					
299	05/15/19 07:00:00 PM	23.497					
300	05/15/19 08:00:00 PM	23.521					
301	05/15/19 09:00:00 PM	23.545					
302	05/15/19 10:00:00 PM	23.593					
303	05/15/19 11:00:00 PM	23.641					
304	05/16/19 12:00:00 AM	23.617					
305	05/16/19 01:00:00 AM	23.569					
306	05/16/19 02:00:00 AM	23.497					
307	05/16/19 03:00:00 AM	23.448					
308	05/16/19 04:00:00 AM	23.400					
309	05/16/19 05:00:00 AM	23.328					
310	05/16/19 06:00:00 AM	23.328					
311	05/16/19 07:00:00 AM	23.328					
312	05/16/19 08:00:00 AM	23.328					
313	05/16/19 09:00:00 AM	23.328					
314	05/16/19 10:00:00 AM	23.352					
315	05/16/19 11:00:00 AM	23.328					
316	05/16/19 12:00:00 PM	23.328					
317	05/16/19 01:00:00 PM	23.352					
318	05/16/19 02:00:00 PM	23.376					
319	05/16/19 03:00:00 PM	23.424					
320	05/16/19 04:00:00 PM	23.448					
321	05/16/19 05:00:00 PM	23.497					
322	05/16/19 06:00:00 PM	23.497					
323	05/16/19 07:00:00 PM	23.497					
324	05/16/19 08:00:00 PM	23.521					

Appendix E

Hyalella azteca
Biological Raw Data

Test Start Date: 5/3/19

Waterbath: #2 #3

82	Control	1.1
56	#20190313	1.2
11		1.3
76		1.4
40		1.5
86		1.6
65		1.7
2		1.8
75		1.9
1		1.10
10		1.11
85		1.12
81	SS632R	2.1
107	#20190305	2.2
24		2.3
98		2.4
32		2.5
44		2.6
103		2.7
45		2.8
4		2.9
101		2.10
46		2.11
52		2.12
73	SS633R	3.1
64	#20190306	3.2
28		3.3
35		3.4
33		3.5
8		3.6
53		3.7
7		3.8
30		3.9
3		3.10
93		3.11
12		3.12
48	SS635R	4.1
17	#20190307	4.2
55		4.3
3		4.4
41		4.5
63		4.6
99		4.7
84		4.8
97		4.9
26		4.10
51		4.11
25		4.12
72	SS636R	5.1
96	#20190308	5.2
77		5.3
58		5.4
108		5.5
29		5.6
16		5.7
21		5.8
91		5.9
14		5.10
19		5.11
5		5.12

39	SS642R	6.1
37	#20190309	6.2
60		6.3
100		6.4
27		6.5
20		6.6
67		6.7
90		6.8
9		6.9
22		6.10
36		6.11
18		6.12
79	SS643R	7.1
104	#20190310	7.2
59		7.3
31		7.4
69		7.5
15		7.6
94		7.7
102		7.8
38		7.9
47		7.10
83		7.11
49		7.12
50	SS644R	8.1
42	#20190311	8.2
95		8.3
70		8.4
68		8.5
66		8.6
80		8.7
105		8.8
23		8.9
106		8.10
13		8.11
34		8.12
57	SS645R	9.1
87	#20190312	9.2
62		9.3
78		9.4
74		9.5
88		9.6
54		9.7
92		9.8
71		9.9
6		9.10
61		9.11
89		9.12

Aqua Survey, Inc.
Special Studies Department
Live Count/ Reproduction

Job #: 38-205R
Client: GEI- Amesbury

Organism: *H. azteca*
Test Start Date:

Page 1

Day → / Chamber ↓	0	28	35		42	
	Live Count	Live Count	Live Count	Reproduction	Live Count	Reproduction
1	10	10	9	Ø	8	Ø
2	10	7	6	Ø	6	Ø
10	10	10	9	Ø	9	Ø
11	10	10	–	–	–	–
40	10	9	9	Ø	8	Ø
56	10	8	–	–	–	–
65	10	8	6	Ø	3	Ø
75	10	9	6	Ø	5	Ø
76	10	6	–	–	–	–
82	10	8	–	–	–	–
85	10	10	10	Ø	7	Ø
86	10	10	8	4	8	Ø
4	10	9	9	Ø	6	5
24	10	10	–	–	–	–
32	10	10	10	Ø	10	Ø
8 44	10	8	6	Ø	5	4
45	10	9	9	Ø	7	Ø
46	10	9	8	Ø	8	Ø
52	10	10	10	Ø	9	Ø
81	10	10	–	–	–	–
98	10	8	–	–	–	–
101	10	10	10	Ø	10	2
103	10	8	8	Ø	8	10
107	10	8	–	–	–	–
7	10	10	10	Ø	8	Ø
8	10	10	10	Ø	10	Ø
12	10	10	10	Ø	10	Ø
28	10	10	–	–	–	–
30	10	8	8	Ø	6	Ø
33	10	8	8	2	7	Ø
35	10	8	–	–	–	–
43	10	9	9	2	8	Ø
53	10	10	10	1	9	Ø
64	10	10	–	–	–	–
73	10	7	–	–	–	–
93	10	10	10	Ø	9	Ø
Initials/ Date	5/3/19		6/7/19	6/7/19	6/14/19	6/14/19

Aqua Survey, Inc.
Special Studies Department
Live Count/ Reproduction

Job #: 38-205R
Client: GEI- Amesbury

Organism: *H. azteca*
Test Start Date:

Page 2

Day → / Chamber ↓	0	28	35		42	
	Live Count	Live Count	Live Count	Reproduction	Live Count	Reproduction
3	10	9	–	–	–	–
17	10	10	–	–	–	–
25	10	8	8	Ø	8	Ø
26	10	10	10	Ø	10	5
41	10	9	9	Ø	8	Ø
48	10	9	–	–	–	–
51	10	10	9	Ø	8	Ø
55	10	9	–	–	–	–
63	10	10	10	14	9	Ø
84	10	9	8	Ø	7	Ø
97	10	10	10	Ø	10	8
99	10	10	10	Ø	10	Ø
5	10	7	5	Ø	5	Ø
14	10	9	9	Ø	6	Ø
16	10	10	9	Ø	7	Ø
19	10	9	9	Ø	8	5
21	10	10	9	Ø	9	Ø
29	10	7	6	Ø	4	Ø
58	10	9	–	–	–	–
72	10	8	–	–	–	–
77	10	9	–	–	–	–
91	10	10	9	Ø	7	Ø
96	10	8	–	–	–	–
108	10	7	6	Ø	5	Ø
9	10	10	9	Ø	9	4
18	10	9	8	3	7	4
20	10	9	8	Ø	7	5
22	10	9	9	Ø	8	Ø
27	10	8	7	Ø	5	Ø
36	10	8	6	Ø	5	Ø
37	10	7	–	–	–	–
39	10	4	–	–	–	–
60	10	4	–	–	–	–
67	10	9	7	Ø	7	13
90	10	8	5	Ø	5	Ø
100	10	10	–	–	–	–
Initials/ Date	5/3/19		6/7/19	6/7/19	6/14/19	6/14/19

Aqua Survey, Inc.
Special Studies Department
Live Count/ Reproduction

Job #: 38-205R
Client: GEI- Amesbury

Organism: *H. azteca*
Test Start Date:

Page 3

Day → / Chamber ↓	0	28	35		42	
	Live Count	Live Count	Live Count	Reproduction	Live Count	Reproduction
15	10	10	9	8	9	4
31	10	8	–	–	–	–
38	10	9	9	5	8	Ø
47	10	10	10	1	10	1
49	10	10	10	Ø	10	Ø
59	10	10	–	–	–	–
69	10	10	10	Ø	8	Ø
79	10	8	–	–	–	–
83	10	10	10	Ø	10	Ø
94	10	10	10	Ø	10	Ø
102	10	10	9	Ø	8	Ø
104	10	7	–	–	–	–
13	10	9	7	Ø	6	Ø
23	10	9	8	Ø	8	Ø
34	10	8	6	Ø	6	Ø
42	10	9	–	–	–	–
50	10	10	–	–	–	–
66	10	10	10	Ø	9	Ø
68	10	10	10	4	7	2
70	10	8	–	–	–	–
80	10	9	8	Ø	7	Ø
95	10	8	–	–	–	–
105	10	10	10	Ø	10	2
106	10	8	8	Ø	8	1
6	10	6	5	Ø	5	Ø
54	10	7	5	Ø	5	Ø
57	10	5	–	–	–	–
61	10	10	10	Ø	9	Ø
62	10	7	–	–	–	–
71	10	10	9	3	9	6
74	10	10	10	3	9	Ø
78	10	10	–	–	–	–
87	10	9	–	–	–	–
88	10	10	10	Ø	9	Ø
89	10	10	10	9	10	13
92	10	6	4	Ø	4	Ø
Initials/ Date	MJ 5/3/19	MJ	MJ 6/7/19	MJ 6/7/19	MJ 6/14/19	MJ 6/14/19

Aqua Survey, Inc.
Sediment Toxicity Study
Weight Data Form Day 28

Job #: 38-205R	Client: GEI- Amesbury		Test Dates: 5/3/19 - 6/4/19
Organism: *H. azteca*	Age of Organism: 7-8 days old		Initial #/ Rep: 10
Weigh Date: —	Oven: #1	Oven Temp (°C): 60 °C	Drying Time (hr): 24hrs

Chamber #	Wt. Of Oven Dried Pan (mg)	Wt. Of Pan + Oven Dried Organisms (mg)	Live Count		Mean Wt. Per Surviving Organisms (mg)
			Day 0	Day 28	
11	415.03	417.92	10	10	
56	404.61	407.29	10	8	
76	410.84	412.51	10	6	
82	408.33	410.61	10	8	
24	409.23	412.25	10	10	
81	405.88	408.19	10	10	
98	411.33	412.89	10	8	
107	407.05	408.93	10	8	
28	409.02	412.13	10	10	
35	405.76	407.76	10	8	
64	405.78	409.06	10	10	
73	405.04	406.83	10	7	
3	410.62	413.78	10	9	
17	407.06	409.32	10	10	
48	408.45	410.80	10	9	
55	405.54	407.93	10	9	
58	409.89	412.64	10	9	
72	405.78	408.38	10	8	
77	413.34	415.56	10	9	
96	403.53	405.15	10	8	
37	410.18	411.56	10	7	
39	406.18	406.96	10	4	
60	408.56	409.52	10	4	
100	409.22	411.56	10	10	
31	408.35	409.73	10	8	
59	410.42	413.12	10	10	
79	409.28	411.50	10	8	
104	408.88	410.12	10	7	
42	409.39	411.18	10	9	
50	406.27	408.27	10	10	
70	408.28	410.43	10	8	
95	409.51	412.30	10	8	
57	410.20	411.36	10	5	
62	413.82	416.03	10	7	
78	408.67	410.93	10	10	
87	413.63	416.49	10	9	
Initials/ Date	DD 6/1/19	DD 6/3/19	5/3/19	DD 6/4/19 5/31/19	

Aqua Survey, Inc.
Sediment Toxicity Study
Weight Data Form Day 42

Job #: 38-205R	**Client:** GEI- Amesbury		**Test Dates:** 5/3/19-6/14/19
Organism: *H. azteca*	**Age of Organism:** 7-8 days old		**Initial #/ Rep:** 10
Weigh Date: -	**Oven:** #1	**Oven Temp (°C):** 60 °C	**Drying Time (hr):** 24hrs

Chamber #	Wt. Of Oven Dried Pan (mg)	Wt. Of Pan + Oven Dried Organisms (mg)	Live Count Day 0	Live Count Day 42	Mean Wt. Per Surviving Organisms (mg)
1	412.88	416.68	10	8	
2	410.47	413.81		6	
10	406.28	409.71		9	
40	407.29	411.54		8	
65	409.02	410.22		3	
75	412.96	414.82		5	
85	406.27	409.90		7	
86	405.14	408.84		8	
4	408.36	410.75		6	
32	408.21	411.94		10	
44	406.66	408.81		5	
45	410.12	412.82		7	
46	407.81	411.20		8	
52	403.34	407.78		9	
101	414.88	418.90		10	
103	410.46	414.91		8	
7	407.18	411.04		8	
8	409.46	414.19		10	
12	405.43	409.44		10	
30	415.54	417.87		6	
33	408.60	411.88		7	
43	410.76	414.09		8	
53	410.51	414.73		9	
93	406.54	409.98		9	
25	407.34	411.06		8	
26	408.06	412.98 88		10	
41	408.43	413.06		8	
51	405.70	408.56		8	
63	407.92	412.41		9	
84	405.52	408.65		7	
97	408.72	413.39		10	
99	407.47	412.22	↓	10	
Initials/ Date	DH 6/14/19	DB 6/17/19	5/3/19	DH 6/14/19	

Aqua Survey, Inc.
Sediment Toxicity Study
Weight Data Form Day 42

Job #: 38-205R	Client: GEI- Amesbury		Test Dates: 5/3/19 - 6/14/19
Organism: *H. azteca*	Age of Organism: 7-8 days old		Initial #/ Rep: 10
Weigh Date: —	Oven: #1	Oven Temp (°C): 60C	Drying Time (hr): 24hrs

Chamber #	Wt. Of Oven Dried Pan (mg)	Wt. Of Pan + Oven Dried Organisms (mg)	Live Count Day 0	Live Count Day 42	Mean Wt. Per Surviving Organisms (mg)
5	407.36	409.07	10	5	
14	405.83	408.15		6	
16	410.04	413.82		7	
19	410.86	414.53		8	
21	407.93	412.48		9	
29	412.25	414.18		4	
91	405.38	408.59		7	
108	412.06	414.19		5	
9	407.76	412.09		9	
18	409.87	413.22		7	
20	409.47	412.96		7	
22	409.50	413.05		8	
27	408.18	410.92		5	
36	411.04	412.60		5	
67	407.48	~~410~~ 411.10		7	
90	414.75	417.36		5	
15	404.86	407.46		9	
38	411.81	414.97		8	
47	408.08	412.65		10	
49	413.22	416.93		10	
69	407.41	410.75		8	
83	408.70	413.06		10	
94	407.42	410.92		10	
102	407.14	410.26		8	
13	410.33	412.81		6	
23	404.64	408.82		8	
34	407.03	409.26		6	
66	412.55	417.34		9	
68	408.22	411.94		7	
80	408.36	411.68		7	
105	409.08	413.38		10	
106	415.91	419.70	↓	8	
Initials/ Date	DH 6/14/19	DH 6/17/19	5/3/19	DH 6/14/19	

Aqua Survey, Inc.
Sediment Toxicity Study
Weight Data Form

Job #: 38-205R	**Client:** GEI- Amesbury		**Test Dates:** 5/3/19 - 6/14/19
Organism: *H. azteca*	**Age of Organism:** 7-8 days old		**Initial #/ Rep:** 10
Weigh Date: -	**Oven:** # 1	**Oven Temp (°C):** 60 °C	**Drying Time (hr):** 24 hrs

Chamber #	Wt. Of Oven Dried Pan (mg)	Wt. Of Pan + Oven Dried Organisms (mg)	Live Count Day 0	Live Count Day 42	Mean Wt. Per Surviving Organisms (mg)
6	409.33	411.33	10	5	
54	409.81	412.74	↓	5	
61	404.79	409.04		9	
71	408.98	413.28		9	
74	408.69	413.04		9	
88	408.32	412.63		9	
89	408.23	412.65		10	
92	405.96	408.04		4	
Initials/ Date	DT 6/14/19	DA 6/17/19	J 5/3/19	DT 6/14/19	

Aqua Survey, Inc.
Sediment Toxicity Study

Job #: 38-205R
Client: GEI- Amesbury

Test Start Date: 5/3/19

Parameter: Live Count/ Reproduction
Organism: *H. azteca*

Page 1

Chamber	Day 42 Live Count and Reproduction		
	# Males	# Females	# Young
1	5	23	Ø
2	3	3	Ø
10	1	8	Ø
40	10	2	Ø
105	Ø	3	Ø
75	2	3	Ø
85	5	2	Ø
86	5	3	Ø
4	3	3	5
32	2	8	Ø
44	3	2	4
45	2	5	Ø
46	1	7	Ø
52	6	3	Ø
101	5	5	2
103	6	2	10
7	4	4	Ø
8	4	6	Ø
12	3	7	Ø
30	1	5	Ø
33	1	6	Ø
43	5	3	Ø
53	10	3	Ø
93	5	4	Ø
25	4	4	Ø
26	5	5	5
41	5	3	Ø
51	5	3	Ø
63	4	5	Ø
84	5	2	Ø
97	7	3	8
99	9	1	Ø
Initials/ Date	DB 6/14/19		

Aqua Survey, Inc.
Sediment Toxicity Study

Job #: 38-205R
Client: GEI- Amesbury

Test Start Date: 5/3/19

Parameter: Live Count/ Reproduction
Organism: *H. azteca*

Page 2

Chamber	Day 42 Live Count and Reproduction		
	# Males	# Females	# Young
5	3	2	ø
14	4	2	ø
16	6	1	ø
19	5	3	5
21	5	4	ø
29	1	3	ø
91	3	4	ø
108	3	2	ø
9	5	4	4
18	3	4	4
20	3	4	5
22	6	2	ø
27	4	1	ø
36	3	2	ø
67	3	4	13
90	4	1	ø
15	1	8	4
38	5	3	ø
47	6	4	1
49	4	6	ø
69	2	6	ø
83	5	5	ø
94	7	3	ø
102	5	3	ø
13	4	2	ø
23	5	3	ø
34	3	3	ø
66	3	6	ø
68	4	3	2
80	4	3	ø
105	6	4	2
106	5	3	1
Initials/ Date	JDA 6/14/19		

Aqua Survey, Inc.
Sediment Toxicity Study

Job #: 38-205R
Client: GEI- Amesbury

Test Start Date: 5/3/19

Parameter: Live Count/ Reproduction
Organism: *H. azteca*

Page 3

Chamber	Day 42 Live Count and Reproduction		
	# Males	# Females	# Young
6	1	4	ø
54	3	2	ø
61	4	5	ø
71	2	7	6
74	5	4	ø
88	6	3	ø
89	6	4	13
92	3	1	ø
Initials/ Date	[illegible] 6/14/19		

Aqua Survey, Inc.
Special Studies Department
Feeding and Exchanges

Job #: 38-205R
Client: GEI-Amesbury

Organism: *H. azteca*
Test Start Date: 5/3/19

Day	Date	Exchanges Well Water (200mL) 1st (Time/ Initials)	Exchanges Well Water (200mL) 2nd (Time/ Initials)	Feeding YCT (1.0mL/ Chamber) (Time/ Initials)	Notes
0	5/3/19	0730 ✓	1200 ✓	1625 ✓	
1	5/4/19	0945 ✓	1350 ✓	1610 ✓	
2	5/5/19	1000 ✓	1415 ✓	1430 ✓	
3	5/6 5/6/19	0930 ✓	1450 ✓	1520 ✓	
4	5/7/19	0900 ✓	1530 ✓	1600 ✓	
5	5/8/19	0920 ✓	1645 ✓	1650 ✓	
6	5/9/19	0925 ✓	1545 ✓	1600 ✓	
7	5/10/19	0940 ✓	1430 ✓	1515 ✓	
8	5/11/19	1100 ✓	1500 ✓	1520 ✓	
9	5/12/19	1000 ✓	1405 ✓	1425 ✓	
10	5/13/19	0930 ✓	1600 ✓	1620 ✓	
11	5/14/19	0900 ✓	1340 ✓	1545 ✓	
12	5/15/19	0950 ✓	1435 ✓	1550 ✓	
13	5/16/19	0930 ✓	1605 ✓	1625 ✓	
14	5/17/19	0945 ✓	1600 ✓	1615 ✓	
15	5/18/19	0920 ✓	1320 ✓	1330 ✓	
16	5/19/19	1000 ✓	1355 ✓	1400 ✓	
17	5/20/19	0930 ✓	1630 ✓	1645 ✓	
18	5/21/19	0930 ✓	1645 ✓	1650 ✓	
19	5/22/19	0915 ✓	1330 ✓	1655 ✓	
20	5/23/19	0930 ✓	1611 ✓	1625 ✓	
21	5/24/19	0905 ✓	1500 ✓	1510 ✓	
22	5/25/19	0830 ✓	1230 ✓	1245 ✓	#72 1WS
23	5/26/19	0825 ✓	1230 ✓	1245 ✓	
24	5/27/19	~~0900 ✓~~ 0900 ✓	~~1615 ✓~~ 1300 ✓	1315 ✓	
25	5/28/19	0900 ✓	1615 ✓	1630 ✓	
26	5/29/19	0920 ✓	1640 ✓	1650 ✓	
27	5/30/19	0935 ✓	1455 ✓	1615 ✓	
28	5/31/19	–	–	1650 ✓	
29	6/1/19	1130 ✓	1540 ✓	1545 ✓	
30	6/2/19	0940 ✓	1350 ✓	1400 ✓	
31	6/3/19	0920 ✓	1645 ✓	1650 ✓	
32	6/4/19	0845 ✓	1640 ✓	1650 ✓	
33	6/5/19	0850 ✓	1640 ✓	1645 ✓	
34	6/6/19	0850 ✓	1640 ✓	1645 ✓	
35	6/7/19	–	–	1640 ✓	
36	6/8/19	1030 ✓	1435 ✓	1440 ✓	
37	6/9/19	0940 ✓	1340 ✓	1345 ✓	
38	6/10/19	0900 ✓	1650 ✓	1655 ✓	
39	6/11/19	0845 ✓	1540 ✓	1610 ✓	
40	6/12/19	0850 ✓	1605 ✓	1630 ✓	
41	6/13/19	0825 ✓	1555 ✓	1610 ✓	
42	6/14/19		TEST END		

Aqua Survey, Inc.
Special Studies Department
Water Quality

Job #: 38-205 **Organism:** *H. azteca*

Client: GEI-Amesbury **42 Day Study** **Test Start Date:** 5/3/19

Sample	Day 0				Day 28			
	Alkalinity mg/L	Hardness mg/L	Conductivity us/cm	NH_3 mg/L	Alkalinity mg/L	Hardness mg/L	Conductivity us/cm	NH_3 mg/L
Control #20190313	160	96	478	<0.20	196	116	486	<0.20
SS632R #20190305	176	100	475	<0.20	208	112	496	<0.20
SS633R #20190306	184	100	478	0.50	200	124	492	<0.20
SS635R #20190307	200	108	485	0.50	208	112	486	<0.20
SS636R #20190308	184	96	475	0.25	200	112	475	<0.20
SS642R #20190309	184	104	483	<0.20	204	120	481	<0.20
SS643R #20190310	176	100	469	<0.20	200	116	481	<0.20
SS644R #20190311	172	96	465	0.25	204	116	474	<0.20
SS645R #20190312	180	104	476	<0.20	200	124	486	<0.20
Initials/ Date	DB 5/3/19	→	→	→	DB 5/31/19	→	→	→

Sample	Day 35				Day 42			
	Alkalinity mg/L	Hardness mg/L	Conductivity us/cm	NH_3 mg/L	Alkalinity mg/L	Hardness mg/L	Conductivity us/cm	NH_3 mg/L
Control #20190313	188	112	493	<0.20	216	124	494	<0.20
SS632R #20190305	200	112	490	<0.20	212	128	490	<0.20
SS633R #20190306	192	112	488	<0.20	220	128	491	<0.20
SS635R #20190307	196	116	489	<0.20	220	124	490	<0.20
SS636R #20190308	196	108	487	<0.20	224	132	490	<0.20
SS642R #20190309	196	108	487	<0.20	216	128	490	<0.20
SS643R #20190310	200	112	488	<0.20	228	128	489	<0.20
SS644R #20190311	192	108	486	<0.20	224	132	489	<0.20
SS645R #20190312	196	108	486	<0.20	224	132	488	<0.20
Initials/ Date	DB 6/7/19	→	→	DB 6/7/19	DB 6/14/19	→	→	→

	Sample	Date M/D/Y	Time HH:MM:SS	Temp C	SpCond uS	Sal ppt	DO mg/L	pH
Control	20190313	05/03/19	12:59:01	22.91	467	0.22	7.20	8.14
SS632R	20190305	05/03/19	13:00:45	23.00	470	0.23	6.87	8.08
SS633R	20190306	05/03/19	13:01:31	23.08	477	0.23	6.80	8.01
SS635R	20190307	05/03/19	13:03:13	22.95	484	0.23	6.66	7.92
SS636R	20190308	05/03/19	13:05:24	23.09	466	0.22	6.59	8.00
SS642R	20190309	05/03/19	13:11:18	23.06	467	0.22	6.78	8.12
SS643R	20190310	05/03/19	13:13:22	22.96	459	0.22	6.99	8.09
SS644R	20190311	05/03/19	13:13:59	22.95	456	0.22	6.93	7.93
SS645R	20190312	05/03/19	13:14:43	22.75	463	0.22	7.21	8.06

Project #: 38.205R Test type: ☐ Acute ☐ Chronic ☑ 42 Day Sed Tox ☐ OTHER: _____ Date: 5/3/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 0

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☑ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: M

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L
20190313	05/04/19	09:30:09	23.89	5.35
20190305	05/04/19	09:30:53	24.11	5.16
20190306	05/04/19	09:31:37	24.10	3.61
20190307	05/04/19	09:32:11	24.04	4.59
20190308	05/04/19	09:32:36	24.20	5.00
20190309	05/04/19	09:33:07	24.22	5.43
20190310	05/04/19	09:33:30	24.11	5.89
20190311	05/04/19	09:33:52	24.03	5.93
20190312	05/04/19	09:34:16	24.19	5.88

(1)

Project #: 38-205R Test type: ☐ Acute ☐ Chronic ☑ 42 Day Sed Tox ☐ OTHER: _____ Date: 5/4/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 1

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ (1) 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☐ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

(1) Temp Adjusted JH

See deviation summary sheet ☐

Initials: JH

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L
20190303	05/05/19	09:33:17	22.97	5.22
20190305	05/05/19	09:34:49	23.24	5.75
20190306	05/05/19	09:35:58	23.18	5.53
20190307	05/05/19	09:37:11	22.98	5.37
20190308	05/05/19	09:38:29	23.09	5.38
20190309	05/05/19	09:39:37	23.06	6.03
20190310	05/05/19	09:40:47	23.15	6.22
20190311	05/05/19	09:42:01	23.14	6.09
20190312	05/05/19	09:43:15	22.43	6.31

Project #: 38-205R Test type: ☐ Acute ☐ Chronic ☑ 42 Day Sed Tox ☐ OTHER: _____ Date: 5/5/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 2

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☐ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: JDH

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L	pH
20190313	05/06/19	09:01:45	22.75	4.81	7.77
20190305	05/06/19	09:04:19	22.85	4.90	7.83
20190306	05/06/19	09:05:26	22.95	5.83	7.89
20190307	05/06/19	09:06:37	22.86	5.26	7.77
20190308	05/06/19	09:07:35	22.67	5.91	7.90
20190309	05/06/19	09:08:47	22.85	5.80	7.87
20190310	05/06/19	09:09:53	22.27	6.14	7.93
20190311	05/06/19	09:10:55	22.75	5.84	7.80
20190312	05/06/19	09:12:03	22.26	6.04	7.87

Project #: 38-205RT Test type: ☐ Acute ☐ Chronic ☑ 42 Day Sed Tox ☐ OTHER: _____ Date: 5/6/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 3

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☑ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: MH

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L
20190313	05/07/19	08:37:03	22.86	4.96
20190305	05/07/19	08:38:39	22.31	5.13
20190306	05/07/19	08:40:17	23.16	5.23
20190307	05/07/19	08:41:08	23.28	4.56
20190308	05/07/19	08:41:56	23.27	4.39
20190309	05/07/19	08:42:38	23.34	5.07
20190310	05/07/19	08:44:03	22.41	5.69
20190311	05/07/19	08:45:07	22.32	6.08
20190312	05/07/19	08:46:25	22.36	5.05

Project #: 38 205R Test type: ☐ Acute ☐ Chronic ☑ 42 Day Sed Tox ☐ OTHER: _____ Date: 5/7/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 4

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____– _____°C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____– _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☐ 6.0 to 9.0 ☐_____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: JH

205RHA5

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L	pH
20190313	05/08/19	08:48:35	22.43	4.68	7.75
20190305	05/08/19	08:50:08	22.38	4.62	7.80
20190306	05/08/19	08:51:47	23.72	4.22	7.73
20190307	05/08/19	08:53:32	22.49	4.02	7.63
20190308	05/08/19	08:54:28	23.51	5.21	7.84
20190309	05/08/19	08:55:43	23.53	5.36	7.87
20190310	05/08/19	08:57:24	22.41	4.84	7.80
20190311	05/08/19	08:58:11	22.33	5.25	7.77
20190312	05/08/19	09:00:02	22.38	5.02	7.75

Project #: 38-205R Test type: ☐ Acute ☐ Chronic ☑ 42 Day Sed Tox ☐ OTHER: _____ Date: 5/8/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 5

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☑ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: JM

205RHA6

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L
20190313	05/09/19	08:47:03	22.53	3.96
20190305	05/09/19	08:49:24	22.37	5.40
20190306	05/09/19	08:51:05	23.34	4.40
20190307	05/09/19	08:52:41	22.30	4.65
20190308	05/09/19	08:54:32	23.32	4.32
20190309	05/09/19	08:55:54	23.27	5.30
20190310	05/09/19	08:57:16	22.38	5.47
20190311	05/09/19	08:59:15	22.34	4.07
20190312	05/09/19	09:00:47	22.24	5.29

Project #: 38-205R Test type: ☐ Acute ☐ Chronic ☑ 7 Day Sed Tox ☐ OTHER: _____ Date: 5/9/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 6

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☐ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: MA

205RHA7

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	SpCond uS	Sal ppt	DO mg/L	pH
20190313	05/10/19	09:25:26	23.29	478	0.23	4.32	7.83
20190305	05/10/19	09:26:19	23.21	475	0.23	4.79	7.92
20190306	05/10/19	09:26:45	23.32	478	0.23	4.85	7.90
20190307	05/10/19	09:27:51	23.27	485	0.23	4.32	7.79
20190308	05/10/19	09:28:40	23.26	475	0.23	4.65	7.91
20190309	05/10/19	09:29:31	23.23	483	0.23	5.02	7.98
20190310	05/10/19	09:30:12	23.22	469	0.23	4.98	7.92
20190311	05/10/19	09:30:56	23.18	465	0.22	4.79	7.82
20190312	05/10/19	09:31:30	22.95	476	0.23	4.85	7.85

Project #: 38-205R Test type: ☐ Acute ☐ Chronic ☑ 42 Day Sed Tox ☐ OTHER: _____ Date: 5/10/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 7

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☑ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: [illegible]

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L
20190313	05/11/19	10:35:03	22.48	4.32
20190305	05/11/19	10:36:23	22.51	4.27
20190306	05/11/19	10:38:22	22.44	3.72
20190307	05/11/19	10:40:10	22.47	4.63
20190308	05/11/19	10:42:10	22.47	4.76
20190309	05/11/19	10:44:15	22.49	5.41
20190310	05/11/19	10:45:57	22.44	5.70
20190311	05/11/19	10:47:22	22.51	5.12
20190312	05/11/19	10:48:58	22.51	4.72

Project #: 38-205R Test type: ☐ Acute ☐ Chronic ☑ 42 Day Sed Tox ☐ OTHER: _____ Date: 5/11/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 8

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☐ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: M

205RHA9

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L
20190303	05/12/19	09:23:27	22.21	4.31
20190305	05/12/19	09:25:39	23.20	5.19
20190306	05/12/19	09:27:44	22.20	4.75
20190307	05/12/19	09:29:12	22.19	3.62
20190308	05/12/19	09:30:51	22.18	5.07
20190309	05/12/19	09:31:51	22.18	5.58
20190310	05/12/19	09:32:42	22.15	5.72
20190311	05/12/19	09:34:06	22.17	4.75
20190312	05/12/19	09:35:07	22.16	5.82

Project #: 38205R Test type: ☐ Acute ☐ Chronic ☑ 42 Day Sed Tox ☐ OTHER: _____ Date: 5/12/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 9

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☐ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: _____

205RHA10

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L	pH
20190313	05/13/19	08:56:53	22.44	4.32	7.67
20190305	05/13/19	08:58:59	23.58	3.91	7.75
20190306	05/13/19	09:00:51	22.59	4.77	7.83
20190307	05/13/19	09:02:33	22.53	4.60	7.66
20190308	05/13/19	09:03:53	22.64	3.54	7.76
20190309	05/13/19	09:05:18	22.48	5.35	7.90
20190310	05/13/19	09:07:18	22.52	4.70	7.82
20190311	05/13/19	09:08:09	22.57	4.20	7.69
20190312	05/13/19	09:09:03	22.56	4.88	7.81

Project #: 38-205R Test type: ☐ Acute ☐ Chronic ☑ 42 Day Sed Tox ☐ OTHER: _____ Date: 5/13/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 10

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____– _____°C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____– _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☑ 6.0 to 9.0 ☐_____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: M

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L
20190313	05/14/19	08:45:02	22.96	2.91
20190305	05/14/19	08:46:15	23.93	5.19
20190306	05/14/19	08:49:02	23.08	4.25
20190307	05/14/19	08:51:20	23.77	3.95
20190308	05/14/19	08:52:58	22.93	3.55
20190309	05/14/19	08:55:00	22.89	4.64
20190310	05/14/19	08:57:14	23.86	4.56
20190311	05/14/19	08:58:02	23.97	5.15
20190312	05/14/19	08:59:46	22.90	4.01

Project #: 38 205R Test type: ☐ Acute ☐ Chronic ☑ 42 H/A Day Sed Tox ☐ OTHER: _____ Date: 5/14/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 11

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☐ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: _____

205RHA12

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L	pH
20190313	05/15/19	09:17:50	22.15	3.32	7.54
20190305	05/15/19	09:20:42	23.62	4.66	7.75
20190306	05/15/19	09:22:59	22.02	3.60	7.57
20190307	05/15/19	09:25:52	22.92	3.96	7.62
20190308	05/15/19	09:27:24	23.36	4.03	7.83
20190309	05/15/19	09:28:07	23.43	5.07	7.83
20190310	05/15/19	09:29:04	23.47	5.14	7.84
20190311	05/15/19	09:30:05	23.50	5.04	7.82
20190312	05/15/19	09:32:01	22.21	3.52	7.62

Project #: 38205R Test type: ☐ Acute ☐ Chronic ☑ 42 Day Sed Tox ☐ OTHER: _____ Date: 5/15/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 12

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☑ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: [illegible]

205RHA13

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L
20190313	05/16/19	08:45:28	23.78	4.15
20190305	05/16/19	08:46:48	23.83	4.45
20190306	05/16/19	08:48:19	23.89	3.88
20190307	05/16/19	08:51:06	23.50	3.13
20190308	05/16/19	08:54:20	23.50	4.06
20190309	05/16/19	08:56:08	23.67	5.49
20190310	05/16/19	08:59:11	23.57	5.04
20190311	05/16/19	09:00:46	23.59	3.74
20190312	05/16/19	09:02:33	23.78	4.98

Project #: 38-205R Test type: ☐ Acute ☐ Chronic ☑ 42 Day Sed Tox ☐ OTHER: _____ Date: 5/16/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 13

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☐ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: AA

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	SpCond uS	Sal ppt	DO mg/L	pH
20190313	05/17/19	09:06:06	23.08	474	0.23	3.54	7.63
20190305	05/17/19	09:09:16	23.25	477	0.23	4.24	7.81
20190306	05/17/19	09:12:33	23.42	478	0.23	3.92	7.78
20190307	05/17/19	09:15:48	23.20	481	0.23	3.58	7.70
20190308	05/17/19	09:18:37	23.34	480	0.23	3.80	7.81
20190309	05/17/19	09:21:40	23.37	479	0.23	4.91	7.91
20190310	05/17/19	09:24:19	23.10	475	0.23	4.94	7.88
20190311	05/17/19	09:27:05	23.10	475	0.23	4.66	7.87
20190312	05/17/19	09:29:14	22.71	484	0.23	4.60	7.84

Project #: 38205R Test type: ☐ Acute ☐ Chronic ☑ 42 Day Sed Tox ☐ OTHER: _____ Date: 5/17/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 14

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☑ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: JDA

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L
20190313	05/18/19	08:57:42	23.48	3.71
20190305	05/18/19	08:58:59	23.55	4.55
20190306	05/18/19	09:00:49	23.58	4.62
20190307	05/18/19	09:02:33	23.54	3.65
20190308	05/18/19	09:03:49	23.38	4.44
20190309	05/18/19	09:05:01	23.58	4.56
20190310	05/18/19	09:06:45	21.88	5.10
20190311	05/18/19	09:08:18	23.43	3.96
20190312	05/18/19	09:10:28	21.92	4.77

①

Project #: 38-205R Test type: ☐ Acute ☐ Chronic ☑ 42 Day Sed Tox ☐ OTHER: _____ Date: 5/18/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 15

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑① 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☐ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

① Temp Adjusted. JDH

See deviation summary sheet ☐

Initials: JDH

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L
20190313	05/19/19	09:38:29	23.51	3.45
20190305	05/19/19	09:40:52	21.80	4.31
20190306	05/19/19	09:44:48	23.63	4.33
20190307	05/19/19	09:46:37	23.75	3.62
20190308	05/19/19	09:49:00	23.81	3.92
20190309	05/19/19	09:50:23	23.87	4.86
20190310	05/19/19	09:52:26	22.04	5.50
20190311	05/19/19	09:54:48	22.04	4.91
20190312	05/19/19	09:57:00	22.09	4.26

(1)

Project #: 38-205R Test type: ☐ Acute ☐ Chronic ☑ 1/42 Day Sed Tox ☐ OTHER: _____ Date: 5/19/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 16

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ (1) 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☐ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

(1) Temp. Adjusted DPA

See deviation summary sheet ☐

Initials: DPA

205RHA17

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L	pH
20190313	05/20/19	08:53:54	21.94	3.30	7.59
20190305	05/20/19	08:54:56	21.88	3.77	7.68
20190306	05/20/19	08:57:58	23.41	3.48	7.74
20190307	05/20/19	08:59:18	21.89	3.52	7.62
20190308	05/20/19	09:00:48	23.45	4.50	7.76
20190309	05/20/19	09:02:10	23.43	4.36	7.82
20190310	05/20/19	09:03:43	21.70	4.68	7.82
20190311	05/20/19	09:04:21	21.62	5.74	7.93
20190312	05/20/19	09:07:09	21.68	5.03	7.83

(1)

Project #: 38-205R Test type: ☐ Acute ☐ Chronic ☑ 42 Day Sed Tox ☐ OTHER: _____ Date: 5/20/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 17

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ (1) 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☑ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

(1) Temp Adjusted

See deviation summary sheet ☐

Initials: [illegible]

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L
20190313	05/21/19	09:04:27	22.06	3.06
20190305	05/21/19	09:07:34	21.91	3.41
20190306	05/21/19	09:09:08	23.26	3.67
20190307	05/21/19	09:11:09	21.75	2.92
20190308	05/21/19	09:13:00	23.40	4.16
20190309	05/21/19	09:14:11	23.62	4.44
20190310	05/21/19	09:15:52	21.92	4.72
20190311	05/21/19	09:17:12	21.90	4.62
20190312	05/21/19	09:19:11	21.75	4.57

(1)

Project #: 38-205 R Test type: ☐ Acute ☐ Chronic ☑ 42 Day Sed Tox ☐ OTHER: _____ Date: 5/21/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 18

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ (1) 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☐ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

(1) Temp Adjusted dlt

See deviation summary sheet ☐

Initials: DLH

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L	pH
20190313	05/22/19	08:48:28	22.93	3.64	7.86
20190305	05/22/19	08:50:28	22.88	4.99	8.00
20190306	05/22/19	08:52:10	22.78	4.95	8.05
20190307	05/22/19	08:54:34	22.87	4.08	7.85
20190308	05/22/19	08:56:33	22.79	5.29	8.00
20190309	05/22/19	08:58:00	22.56	5.74	8.13
20190310	05/22/19	09:01:08	22.72	4.52	7.91
20190311	05/22/19	09:02:30	22.76	4.84	7.92
20190312	05/22/19	09:04:38	22.89	5.02	7.88

Project #: 38205R Test type: ☐ Acute ☐ Chronic ☑ 42 Day Sed Tox ☐ OTHER: _____ Date: 5/22/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 19

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☑ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: M

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L	pH
20190313	05/23/19	09:04:04	22.93	4.25	7.83
20190305	05/23/19	09:06:13	23.04	4.20	7.85
20190306	05/23/19	09:08:37	22.93	3.46	7.80
20190307	05/23/19	09:10:23	22.93	3.91	7.85
20190308	05/23/19	09:11:05	23.23	4.38	7.80
20190309	05/23/19	09:12:36	22.89	4.64	7.92
20190310	05/23/19	09:14:18	22.97	4.64	7.93
20190311	05/23/19	09:15:23	23.02	4.55	7.87
20190312	05/23/19	09:16:34	23.03	4.22	7.81

Project #: 38-205R Test type: ☐ Acute ☐ Chronic ☑ 42 Day Sed Tox ☐ OTHER: _____ Date: 5/23/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 20

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☑ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: _____

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	SpCond uS	Sal ppt	DO mg/L	pH
20190313	05/24/19	08:31:30	23.23	482	0.23	4.08	7.81
20190305	05/24/19	08:34:45	23.38	485	0.23	4.32	7.88
20190306	05/24/19	08:37:54	23.38	484	0.23	4.24	7.86
20190307	05/24/19	08:40:52	23.34	484	0.23	4.02	7.79
20190308	05/24/19	08:43:46	23.46	478	0.23	4.09	7.79
20190309	05/24/19	08:46:38	23.44	483	0.23	4.40	7.88
20190310	05/24/19	08:49:13	23.43	482	0.23	4.62	7.94
20190311	05/24/19	08:51:44	23.41	479	0.23	4.51	7.84
20190312	05/24/19	08:52:59	23.38	486	0.23	4.61	7.85

Project #: 38-205R Test type: ☐ Acute ☐ Chronic ☑ 42 Day Sed Tox ☐ OTHER: _____ Date: 5/24/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 21

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☑ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: MM

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L
20190303	05/25/19	08:10:43	23.14	3.66
20190305	05/25/19	08:12:40	23.22	4.71
20190306	05/25/19	08:14:35	22.98	4.63
20190307	05/25/19	08:16:41	22.79	3.76
20190308	05/25/19	08:18:12	22.95	3.97
20190309	05/25/19	08:20:08	22.99	4.09
20190310	05/25/19	08:22:04	22.94	4.47
20190311	05/25/19	08:23:24	22.90	4.13
20190312	05/25/19	08:24:22	22.96	4.42

Project #: 38-205R Test type: ☐ Acute ☐ Chronic ☑ 42 Day Sed Tox ☐ OTHER: _____ Date: 5/25/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 02

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____– _____°C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____– _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☐ 6.0 to 9.0 ☐_____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: _____

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L
20190313	05/26/19	08:31:51	23.16	4.30
20190305	05/26/19	08:33:22	23.53	5.54
20190306	05/26/19	08:35:35	23.12	4.46
20190307	05/26/19	08:37:29	23.14	4.15
20190308	05/26/19	08:39:16	23.01	4.23
20190309	05/26/19	08:40:47	23.00	4.98
20190310	05/26/19	08:42:23	23.47	5.12
20190311	05/26/19	08:43:25	23.41	5.00
20190312	05/26/19	08:45:07	23.08	4.32

Project #: 38205R Test type: ☐ Acute ☐ Chronic ☑ 42 Day Sed Tox ☐ OTHER: _____ Date: 5/26/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 03

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☐ >2.5 mg/L ☑ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☐ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: [illegible]

205RHA24

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L	pH
20190313	05/27/19	08:50:06	23.18	3.81	7.95
20190305	05/27/19	08:52:13	23.70	3.56	8.00
20190306	05/27/19	08:54:24	23.20	4.15	8.14
20190307	05/27/19	08:56:10	23.40	4.43	7.97
20190308	05/27/19	08:57:39	23.61	3.80	7.92
20190309	05/27/19	08:59:33	23.64	5.28	8.16
20190310	05/27/19	09:00:53	23.59	4.63	8.06
20190311	05/27/19	09:01:47	23.62	4.99	8.03
20190312	05/27/19	09:04:01	23.17	4.97	7.97

Project #: 38 205R Test type: ☐ Acute ☐ Chronic ☑ 42 Day Sed Tox ☐ OTHER: _____ Date: 5/27/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 24

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☑ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: M

205RHA25

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L
20190313	05/28/19	08:39:40	23.14	3.91
0305	05/28/19	08:40:29	23.33	4.45
0306	05/28/19	08:41:15	23.41	4.10
0307	05/28/19	08:43:20	23.29	3.21
0308	05/28/19	08:44:12	23.49	3.82
0309	05/28/19	08:44:53	23.54	4.78
0310	05/28/19	08:45:49	23.45	4.91
0311	05/28/19	08:47:16	23.31	4.44
0312	05/28/19	08:48:21	23.52	4.63

Project #: 38205R Test type: ☐ Acute ☐ Chronic ☑ 42 Day Sed Tox ☐ OTHER: _____ Date: 5/28/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 05

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☑ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: [illegible]

205RHA26

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L	pH
20190313	05/29/19	08:43:50	23.36	3.80	7.80
20190305	05/29/19	08:45:57	23.46	4.63	7.96
20190306	05/29/19	08:48:27	23.34	5.28	7.99
20190307	05/29/19	08:50:14	23.16	3.79	7.84
20190308	05/29/19	08:51:37	23.50	4.19	7.85
20190309	05/29/19	08:52:50	23.24	5.25	7.97
20190310	05/29/19	08:54:14	23.42	4.70	7.95
20190311	05/29/19	08:55:22	23.46	5.05	7.89
20190312	05/29/19	08:56:57	23.02	4.57	7.85

Project #: 38-205R Test type: ☐ Acute ☐ Chronic ☑ 42 Day Sed Tox ☐ OTHER: _____ Date: 5/29/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 26

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☑ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: MM

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L
20190313	05/30/19	09:10:54	23.27	4.27
20190305	05/30/19	09:12:23	23.15	4.37
20190306	05/30/19	09:13:51	23.38	4.54
20190307	05/30/19	09:15:15	23.29	4.54
20190308	05/30/19	09:16:49	23.22	3.89
20190309	05/30/19	09:17:55	23.40	4.65
20190310	05/30/19	09:19:11	22.93	5.79
20190311	05/30/19	09:20:35	23.02	4.49
20190312	05/30/19	09:22:01	22.97	5.23

Project #: 38-205R Test type: ☐ Acute ☐ Chronic ☑ 42 Day Sed Tox ☐ OTHER: _____ Date: 5/30/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 27

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____– _____°C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____– _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☐ 6.0 to 9.0 ☐_____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: [illegible]

205RHA28

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	SpCond uS	Sal ppt	DO mg/L	pH
20190313	05/31/19	08:53:44	22.88	486	0.23	5.14	7.94
20190305	05/31/19	09:06:19	23.10	496	0.24	4.90	8.02
20190306	05/31/19	09:09:30	23.24	492	0.24	4.52	7.99
20190307	05/31/19	09:12:33	23.16	486	0.23	4.12	7.87
20190308	05/31/19	09:18:22	23.36	475	0.23	4.17	7.87
20190309	05/31/19	09:21:06	23.36	481	0.23	4.78	7.99
20190310	05/31/19	09:23:49	23.31	481	0.23	5.01	8.02
20190311	05/31/19	09:25:00	23.30	474	0.23	5.00	7.92
20190312	05/31/19	09:26:16	23.31	486	0.23	5.10	7.93

Project #: 38-205R Test type: ☐ Acute ☐ Chronic ☑ 42 Day Sed Tox ☐ OTHER: _____ Date: 5/31/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 28

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☑ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: MM

205RHA29

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L
20190313	06/01/19	11:18:33	23.27	6.69
20190305	06/01/19	11:20:04	23.32	6.65
20190306	06/01/19	11:21:13	23.12	6.36
20190307	06/01/19	11:22:42	23.02	6.50
20190308	06/01/19	11:24:01	23.08	6.77
20190309	06/01/19	11:25:23	23.27	6.66
20190310	06/01/19	11:26:53	23.14	6.93
20190311	06/01/19	11:28:05	23.29	6.86
20190312	06/01/19	11:29:20	23.11	6.83

Project #: 38-205R Test type: ☐ Acute ☐ Chronic ☑ 42 Day Sed Tox ☐ OTHER: _____ Date: 6/1/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: _____

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____– _____°C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____– _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☐ 6.0 to 9.0 ☐_____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: JMA

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L
20190313	06/02/19	09:22:05	23.15	6.27
20190305	06/02/19	09:24:05	23.17	6.27
20190306	06/02/19	09:25:33	23.05	6.07
20190307	06/02/19	09:27:05	23.23	6.27
20190308	06/02/19	09:28:21	23.03	6.60
20190309	06/02/19	09:29:33	23.15	6.34
20190310	06/02/19	09:31:23	22.31	6.57
20190311	06/02/19	09:33:20	22.88	6.38
20190312	06/02/19	09:34:57	22.32	6.91

Project #: 38-205R Test type: ☐ Acute ☐ Chronic ☑ 42 Day Sed Tox ☐ OTHER: _____ Date: 6/2/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 30

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☐ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: AA

205RHA31

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L	pH
20190313	06/03/19	09:00:13	22.52	5.86	8.29
20190305	06/03/19	09:01:51	22.01	6.38	8.39
20190306	06/03/19	09:04:31	22.53	6.96	8.47
20190307	06/03/19	09:05:54	21.95	6.31	8.38
20190308	06/03/19	09:07:27	22.60	6.07	8.45
20190309	06/03/19	09:08:48	22.71	6.20	8.40
20190310	06/03/19	09:10:46	21.92	6.54	8.43
20190311	06/03/19	09:12:03	22.51	6.64	8.44
20190312	06/03/19	09:13:31	22.00	6.00	8.34

(1)

Project #: 38-205R Test type: ☐ Acute ☐ Chronic ☑ 1 42 Day Sed Tox ☐ OTHER: _____ Date: 6/3/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ 1 *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 31

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 10 (1) 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ 1 >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑ 1

pH: ☐ 7.3 to 8.3 ☑ 1 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken: (1) Temp Adjusted. JM

Initials: JM

See deviation summary sheet ☐

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L
20190313	06/04/19	08:26:57	22.88	6.88
20190305	06/04/19	08:28:37	22.98	6.86
20190306	06/04/19	08:29:42	23.34	6.72
20190307	06/04/19	08:31:05	22.96	6.96
20190308	06/04/19	08:32:25	23.33	7.18
20190309	06/04/19	08:33:11	23.43	6.96
20190310	06/04/19	08:34:17	23.02	7.14
20190311	06/04/19	08:35:32	23.01	7.15
20190312	06/04/19	08:36:40	23.05	7.15

Project #: 38-205R Test type: ☐ Acute ☐ Chronic ☑ 42 Day Sed Tox ☐ OTHER: _____ Date: 6/4/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 32

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____– _____°C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____– _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☐ 6.0 to 9.0 ☐_____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: JBB

205RHA33

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L	pH
20190313	06/05/19	08:33:12	22.44	6.76	8.28
20190305	06/05/19	08:34:46	22.37	6.52	8.27
20190306	06/05/19	08:36:15	22.78	6.67	8.41
20190307	06/05/19	08:37:32	22.46	6.57	8.28
20190308	06/05/19	08:39:05	22.77	6.53	8.27
20190309	06/05/19	08:40:28	22.76	6.42	8.29
20190310	06/05/19	08:41:53	22.50	6.38	8.33
20190311	06/05/19	08:42:56	22.50	6.16	8.30
20190312	06/05/19	08:44:22	22.48	6.17	8.28

Project #: 38-205R Test type: ☐ Acute ☐ Chronic ☑ 42 Day Sed Tox ☐ OTHER: _____ Date: 6/5/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 33

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____– _____°C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____– _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☑ 6.0 to 9.0 ☐_____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: BB

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L
20190313	06/06/19	08:34:35	22.47	6.41
20190305	06/06/19	08:36:10	22.68	5.21
20190306	06/06/19	08:36:54	22.64	6.65
20190307	06/06/19	08:38:37	22.74	6.75
20190308	06/06/19	08:40:12	23.24	6.39
20190309	06/06/19	08:41:08	23.21	6.92
20190310	06/06/19	08:42:33	22.74	6.87
20190311	06/06/19	08:43:48	22.75	6.91
20190312	06/06/19	08:45:08	22.74	6.80

Project #: 38-205R Test type: ☐ Acute ☐ Chronic ☑ 42 Day Sed Tox ☐ OTHER: _____ Date: 6/6/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 34

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____– _____°C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____– _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☐ 6.0 to 9.0 ☐_____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: MH

205RHA35

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	SpCond uS	Sal ppt	DO mg/L	pH
20190313	06/07/19	09:43:23	22.73	493	0.24	6.50	8.00
20190305	06/07/19	09:51:04	22.76	490	0.24	6.21	8.00
20190306	06/07/19	09:54:27	22.88	488	0.23	6.24	8.03
20190307	06/07/19	09:57:40	22.84	489	0.24	6.45	8.07
20190308	06/07/19	09:58:28	22.96	487	0.23	6.34	8.05
20190309	06/07/19	09:59:13	22.96	487	0.23	6.38	8.06
20190310	06/07/19	09:59:53	22.84	488	0.23	6.51	8.07
20190311	06/07/19	10:02:22	22.94	486	0.23	6.46	8.10
20190312	06/07/19	10:05:35	22.84	486	0.23	6.25	8.08

Project #: 38-205R Test type: ☐ Acute ☐ Chronic ☑ 42 Day Sed Tox ☐ OTHER: _____ Date: 6/7/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 35

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____– _____°C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____– _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☑ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: [illegible]

205RHA36

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L
20190313	06/08/19	10:09:54	22.83	6.50
20190305	06/08/19	10:12:17	23.40	6.38
20190306	06/08/19	10:14:29	22.88	5.78
20190307	06/08/19	10:16:37	23.24	6.35
20190308	06/08/19	10:17:59	23.38	6.02
20190309	06/08/19	10:20:01	22.70	6.63
20190310	06/08/19	10:21:23	23.38	6.57
20190311	06/08/19	10:23:13	23.45	6.66
20190312	06/08/19	10:24:59	22.97	6.22

Project #: 38.205R Test type: ☐ Acute ☐ Chronic ☑ 42 Day Sed Tox ☐ OTHER: _____ Date: 6/8/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 36

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☐ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: [illegible]

205RHA37

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L
20190313	06/09/19	09:20:15	22.99	5.39
20190305	06/09/19	09:21:05	23.10	5.45
20190306	06/09/19	09:21:35	23.14	5.59
20190307	06/09/19	09:22:18	23.18	6.64
20190308	06/09/19	09:23:28	23.15	5.82
20190309	06/09/19	09:23:56	23.14	6.22
20190310	06/09/19	09:25:24	23.16	5.57
20190311	06/09/19	09:26:35	23.12	5.84
20190312	06/09/19	09:27:31	23.19	5.63

Project #: 38-205R Test type: ☐ Acute ☐ Chronic ☑ 42 Day Sed Tox ☐ OTHER: _____ Date: 6/9/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☐ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 37

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☐ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: [illegible]

205RHA38

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L	pH
20190313	06/10/19	08:40:39	23.18	5.32	8.13
20190305	06/10/19	08:42:22	23.27	5.52	8.18
20190306	06/10/19	08:43:56	23.24	5.17	8.16
20190307	06/10/19	08:44:46	23.30	6.39	8.23
20190308	06/10/19	08:46:09	23.28	4.94	8.15
20190309	06/10/19	08:46:54	23.32	5.25	8.17
20190310	06/10/19	08:48:11	22.70	6.46	8.30
20190311	06/10/19	08:49:10	23.24	6.41	8.36
20190312	06/10/19	08:50:17	22.68	6.25	8.30

Project #: 38-205R Test type: ☐ Acute ☐ Chronic ☑ 42 Day Sed Tox ☐ OTHER: _____ Date: 6/10/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 38

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____– _____°C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____– _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☑ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: BB

205RHA39

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L
20190313	06/11/19	08:25:52	23.80	5.94
20190305	06/11/19	08:27:35	23.36	5.21
20190306	06/11/19	08:28:49	23.78	6.01
20190307	06/11/19	08:30:17	23.31	5.93
20190308	06/11/19	08:31:42	23.79	5.25
20190309	06/11/19	08:32:55	23.86	5.37
20190310	06/11/19	08:34:17	23.31	6.76
20190311	06/11/19	08:35:31	23.81	4.31
20190312	06/11/19	08:36:39	23.43	5.65

Project #: 38-205R Test type: ☐ Acute ☐ Chronic ☑ 42 Day Sed Tox ☐ OTHER: _____ Date: 6/11/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 39

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☐ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: _____

205RHA40

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L	pH
20190313	06/12/19	08:32:55	22.62	5.27	8.20
20190305	06/12/19	08:34:38	22.74	5.58	8.27
20190306	06/12/19	08:36:05	22.89	5.13	8.16
20190307	06/12/19	08:37:40	22.59	5.14	8.20
20190308	06/12/19	08:38:41	22.85	6.00	8.29
20190309	06/12/19	08:39:25	22.87	5.65	8.24
20190310	06/12/19	08:40:47	22.59	5.45	8.20
20190311	06/12/19	08:41:58	22.60	5.98	8.29

¥ 20190312 - ~~Missed~~ reading accidentally not recorded

Project #: _____ Test type: ☐ Acute ☐ Chronic ☐ ____Day Sed Tox ☐ OTHER: _____ Date: _____

Species: ☐ *A. bahia* ☐ *C. dilutus* ☐ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study:_____

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☐ 22 –24 °C ☐ 24 –26 °C ☐ _____– _____°C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____– _____ ppt

Red ☐

Dissolved Oxygen: ☐ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☐

pH: ☐ 7.3 to 8.3 ☐ 6.0 to 9.0 ☐_____ to _____

Temp Correction Factor:_____

Actions taken:

_____

_____

See deviation summary sheet ☐

Initials:_____

205RHA41

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	DO mg/L
20190313	06/13/19	08:05:22	22.86	4.85
20190305	06/13/19	08:06:17	22.81	5.71
20190306	06/13/19	08:07:47	23.06	5.55
20190307	06/13/19	08:09:20	22.87	5.34
20190308	06/13/19	08:10:12	22.97	5.40
20190309	06/13/19	08:12:32	23.02	5.26
20190310	06/13/19	08:14:49	22.82	4.33
20190311	06/13/19	08:15:55	22.81	5.22
20190312	06/13/19	08:16:57	22.83	4.95

Project #: 38-205R Test type: ☐ Acute ☐ Chronic ☑ 42 Day Sed Tox ☐ OTHER: _____ Date: 6/13/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 41

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☐ 6.0 to 9.0 ☐ _____ to _____

Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: [illegible]

205RHA42

Sample	Date M/D/Y	Time HH:MM:SS	Temp C	SpCond uS	Sal ppt	DO mg/L	pH
20190313	06/14/19	08:37:46	22.42	494	0.24	5.45	8.13
20190305	06/14/19	08:39:12	22.70	490	0.24	5.26	8.16
20190306	06/14/19	08:40:03	22.74	491	0.24	5.34	8.14
20190307	06/14/19	08:41:04	22.77	490	0.24	5.44	8.19
20190308	06/14/19	08:43:28	22.70	490	0.24	5.08	8.16
20190309	06/14/19	08:44:43	22.77	490	0.24	5.15	8.17
20190310	06/14/19	08:47:02	22.68	489	0.24	5.12	8.18
20190311	06/14/19	08:48:08	22.79	489	0.24	5.27	8.20
20190312	06/14/19	08:49:11	22.76	488	0.24	5.43	8.22

Project #: 38-205R Test type: ☐ Acute ☐ Chronic ☑ 42 Day Sed Tox ☐ OTHER: _____ Date: 6/14/19

Species: ☐ *A. bahia* ☐ *C. dilutus* ☑ *H. azteca* ☐ *M. beryllina* ☐ OTHER: _____ Day of Study: 42

OPERATIONAL RANGE: Check if OK

Meter Used:

Temperature: ☐ 18 –22 °C ☑ 22 –24 °C ☐ 24 –26 °C ☐ _____ – _____ °C

Blue ☐

Salinity: ☐ 23–27 ppt ☐ 28 –32 ppt ☐ _____ – _____ ppt

Red ☐

Dissolved Oxygen: ☑ >2.5 mg/L ☐ >4.0 mg/L ☐ >_____ mg/L

Green ☑

pH: ☐ 7.3 to 8.3 ☑ 6.0 to 9.0 ☐ _____ to _____

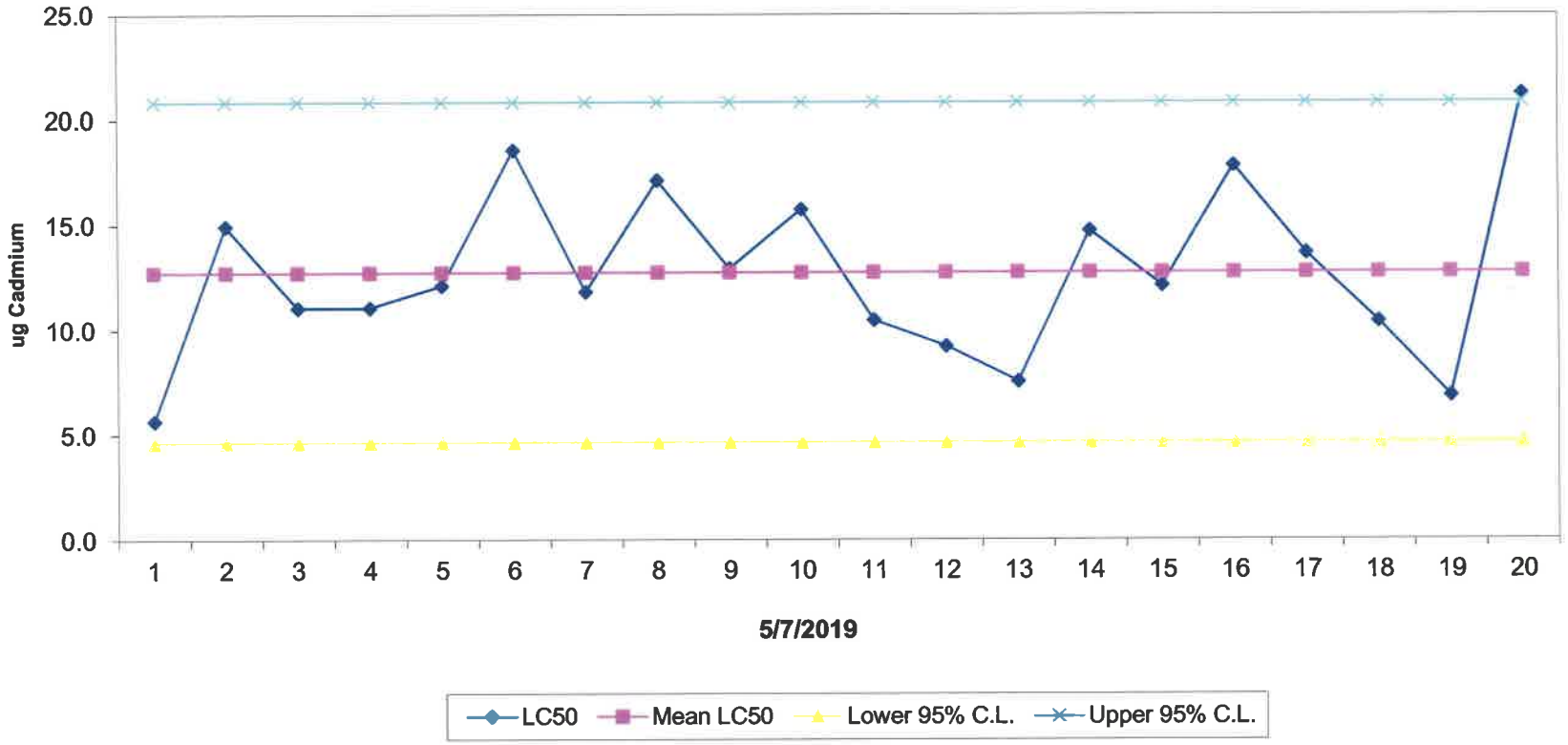
Temp Correction Factor: 0.0

Actions taken:

See deviation summary sheet ☐

Initials: [illegible]

Control Chart LC50 Values, Acute SRT With H. azteca



Acute Amphipod-96 Hr Survival

Start Date:	5/3/2019	Test ID:	38-205R	Sample ID:	REF-Ref Toxicant
End Date:	5/7/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	CDCL-Cadmium chloride
Sample Date:		Protocol:	EPAA 02	Test Species:	HA-Hyalella azteca
Comments:					

Conc-mg/L	1	2	3	4	5	6	7	8	9	10
Control	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
8	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
16	0.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
32	1.0000	0.0000	0.0000	0.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000
64	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

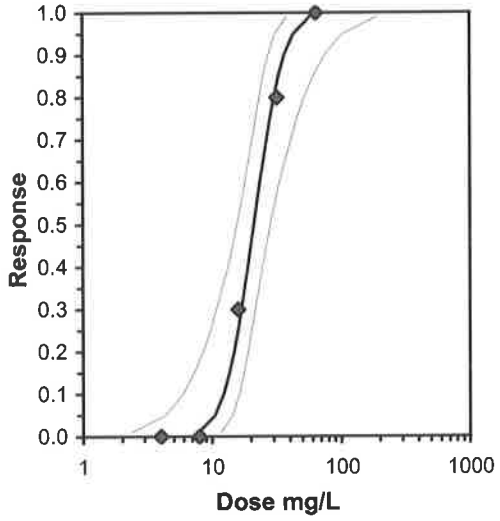
Conc-mg/L	Mean	N-Mean	Resp	Not Resp	Total	N	Fisher's Exact P	1-Tailed Critical	Number Resp	Total Number
Control	1.0000	1.0000	0	10	10	10			0	10
4	1.0000	1.0000	0	10	10	10	1.0000	0.0500	0	10
8	1.0000	1.0000	0	10	10	10	1.0000	0.0500	0	10
16	0.7000	0.7000	3	7	10	10	0.1053	0.0500	3	10
*32	0.2000	0.2000	8	2	10	10	0.0004	0.0500	8	10
64	0.0000	0.0000	10	0	10	10			10	10

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Fisher's Exact Test	16	32	22.6274	
Treatments vs Control				

Maximum Likelihood-Probit

Parameter	Value	SE	95% Fiducial Limits		Control	Chi-Sq	Critical	P-value	Mu	Sigma	Iter
Slope	5.387	1.46603	2.51359	8.26041	0	0.34403	7.81473	0.95	1.32604	0.18563	5
Intercept	-2.1434	1.96713	-5.999	1.71217							
TSCR											

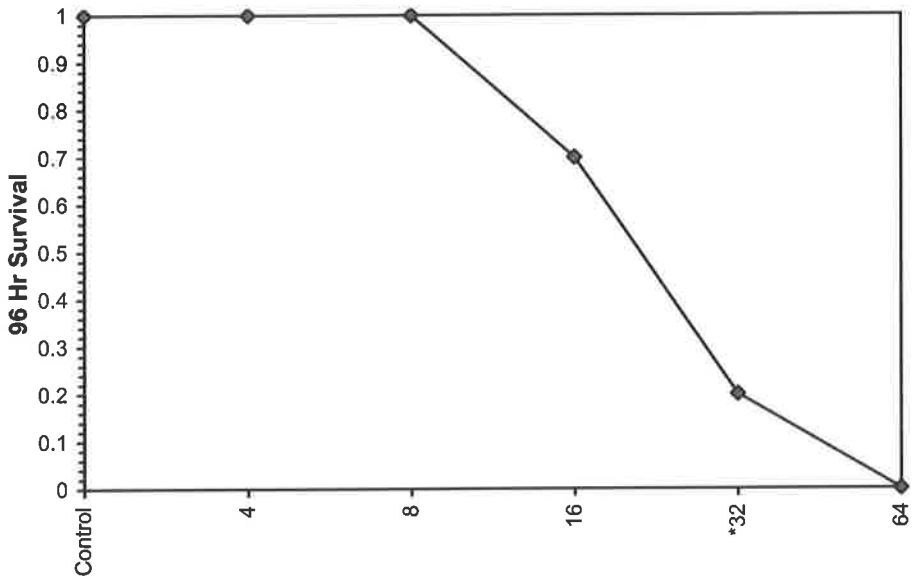
Point	Probits	mg/L	95% Fiducial Limits	
EC01	2.674	7.83789	2.37454	11.7295
EC05	3.355	10.4883	4.34109	14.484
EC10	3.718	12.2503	5.94583	16.3226
EC15	3.964	13.6034	7.31515	17.7816
EC20	4.158	14.7847	8.588	19.1156
EC25	4.326	15.8795	9.81393	20.425
EC40	4.747	19.0114	13.3878	24.7643
EC50	5.000	21.1858	15.7451	28.5003
EC60	5.253	23.6088	18.1224	33.5152
EC75	5.674	28.2651	21.9754	45.7141
EC80	5.842	30.3582	23.4814	52.238
EC85	6.036	32.9943	25.2438	61.3257
EC90	6.282	36.6388	27.5009	75.447
EC95	6.645	42.7939	30.9927	103.334
EC99	7.326	57.2649	38.2716	188.909



Acute Amphipod-96 Hr Survival

Start Date:	5/3/2019	Test ID:	38-205R	Sample ID:	REF-Ref Toxicant
End Date:	5/7/2019	Lab ID:	ASI-Aqua Survey, Inc.	Sample Type:	CDCL-Cadmium chloride
Sample Date:		Protocol:	EPAA 02	Test Species:	HA-Hyalella azteca
Comments:					

Dose-Response Plot



Test: AA-Acute Amphipod
Species: HA-Hyalella azteca
Sample ID: REF-Ref Toxicant
Start Date: 5/3/2019 End Date: 5/7/2019

Test ID: 38-205R
Protocol: EPAA 02
Sample Type: CDCL-Cadmium chloride
Lab ID: ASI-Aqua Survey, Inc.

Pos	ID	Rep	Group	Start	24 Hr	48 Hr	72 Hr	96 Hr	10 Day	14 Day	28 Day
	1	1	Control	1				1			
	2	2	Control	1				1			
	3	3	Control	1				1			
	4	4	Control	1				1			
	5	5	Control	1				1			
	6	6	Control	1				1			
	7	7	Control	1				1			
	8	8	Control	1				1			
	9	9	Control	1				1			
	10	10	Control	1				1			
	11	1	4.000	1				1			
	12	2	4.000	1				1			
	13	3	4.000	1				1			
	14	4	4.000	1				1			
	15	5	4.000	1				1			
	16	6	4.000	1				1			
	17	7	4.000	1				1			
	18	8	4.000	1				1			
	19	9	4.000	1				1			
	20	10	4.000	1				1			
	21	1	8.000	1				1			
	22	2	8.000	1				1			
	23	3	8.000	1				1			
	24	4	8.000	1				1			
	25	5	8.000	1				1			
	26	6	8.000	1				1			
	27	7	8.000	1				1			
	28	8	8.000	1				1			
	29	9	8.000	1				1			
	30	10	8.000	1				1			
	31	1	16.000	1				0			
	32	2	16.000	1				1			
	33	3	16.000	1				0			
	34	4	16.000	1				1			
	35	5	16.000	1				1			
	36	6	16.000	1				1			
	37	7	16.000	1				1			
	38	8	16.000	1				1			
	39	9	16.000	1				1			
	40	10	16.000	1				0			
	41	1	32.000	1				1			
	42	2	32.000	1				0			
	43	3	32.000	1				0			
	44	4	32.000	1				0			
	45	5	32.000	1				0			
	46	6	32.000	1				1			
	47	7	32.000	1				0			
	48	8	32.000	1				0			
	49	9	32.000	1				0			
	50	10	32.000	1				0			
	51	1	64.000	1				0			
	52	2	64.000	1				0			
	53	3	64.000	1				0			

Test: AA-Acute Amphipod
Species: HA-Hyalella azteca
Sample ID: REF-Ref Toxicant
Start Date: 5/3/2019 End Date: 5/7/2019

Test ID: 38-205R
Protocol: EPAA 02
Sample Type: CDCL-Cadmium chloride
Lab ID: ASI-Aqua Survey, Inc.

Pos	ID	Rep	Group	Start	24 Hr	48 Hr	72 Hr	96 Hr	10 Day	14 Day	28 Day
	54	4	64.000	1				0			
	55	5	64.000	1				0			
	56	6	64.000	1				0			
	57	7	64.000	1				0			
	58	8	64.000	1				0			
	59	9	64.000	1				0			
	60	10	64.000	1				0			

Comments:

Standard Reference Toxicant
Live Counts

For Job #: 38-205R Start Date: 5/3/19 End Date: 5/7/19

Organism C. tentans/H. azteca Organism Log #: 39-010 Starting Time: ____

Dose	Initial	1	2	3	4	Dose	Initial	1	2	3	4
Cont A	1	1	1	1	1	16 A	1	1	1	1	X
B	1	1	1	1	1	B	1	1	1	1	1
C	1	1	1	1	1	C	1	1	1	X	–
D	1	1	1	1	1	D	1	1	1	1	1
E	1	1	1	1	1	E	1	1	1	1	1
F	1	1	1	1	1	F	1	1	1	1	1
G	1	1	1	1	1	G	1	1	1	1	1
H	1	1	1	1	1	H	1	1	1	1	1
I	1	1	1	1	1	I	1	1	1	1	1
J	1	1	1	1	1	J	1	1	X	–	–
4 A	1	1	1	1	1	32 A	1	1	1	1	1
B	1	1	1	1	1	B	1	1	X	–	–
C	1	1	1	1	1	C	1	1	X	–	–
D	1	1	1	1	1	D	1	X	–	–	–
E	1	1	1	1	1	E	1	1	X	–	–
F	1	1	1	1	1	F	1	1	1	1	1
G	1	1	1	1	1	G	1	1	1	X	–
H	1	1	1	1	1	H	1	1	X	–	–
I	1	1	1	1	1	I	1	1	1	1	X
J	1	1	1	1	1	J	1	1	X	–	–
8 A	1	1	1	1	1	64 A	1	X	–	–	–
B	1	1	1	1	1	B	1	X	–	–	–
C	1	1	1	1	1	C	1	X	–	–	–
D	1	1	1	1	1	D	1	1	X	–	–
E	1	1	1	1	1	E	1	X	–	–	–
F	1	1	1	1	1	F	1	1	X	–	–
G	1	1	1	1	1	G	1	X	–	–	–
H	1	1	1	1	1	H	1	X	–	–	–
I	1	1	1	1	1	I	1	X	–	–	–
J	1	1	1	1	1	J	1	X	–	–	–
Initial	1	[illegible]	[illegible]	1	1		1	[illegible]	[illegible] 5/5/19	1	1
Date	5/3/19	5/4/19	5/5/19	5/6/19	5/7/19		5/3/19	5/4/19		5/6/19	5/7/19

Prep Sheet for Freshwater SRTs

ICN Biomedicals, Inc
Lot: 3840A
0.0639g
SH 5/3/19

Chironomus tentans/ Hyalella azteca

10 replicates per concentration
20 mL per replicate
1 organism per replicate

Working Stock Solution

Add 0.064 grams of Cadmium chloride to 100 mL **DI water**.
This will give you a 320 mg Cadmium/ L stock solution.

Hyalella azteca

Add **1 mL** of the working stock solution to 1L of **Well water**.
This will give you a 32 µg Cadmium/ L stock solution.

Concentration (µg/ L)	Stock (mL)	Total (mL)
0	0	250
4	3.125	250
8	6.25	250
16	12.5	250
32	25	250
64	50	250

Chironomus tentans

Add **100 mL** of the working stock solution to 1L of **Recon**.
This will give you a 32 mg Cadmium/ L stock solution.

Concentration (mg/ L)	Stock (mL)	Total (mL)
0	0	250
0.2	1.6	250
0.6	4.7	250
1.6	12.5	250
5	39	250
15	117	250

H. azteca requires a small piece of nitex screen in each cup; feed each cup2-3 drops YCT
C. tentans feed each cup 2-3 drops slurry

AQUA SURVEY, INC.

CULTURE ORGANISM DISTRIBUTION FORM

DATE: 5/3/19

TEST JOB #: 38-205R CLIENT: GEI- Amesbury

TEST LOCATION: IN-LAB [√] FIELD [ ]

TEST SPECIES: H. azteca

TOTAL NUMBER ORGANSIMS TRANSFERRED: 1400+

AQUA SURVEY, INC. CULTURE LAB INVESTIGATORS: [signature]

A. ORGANISMS

1. ASI CULTURE/ HOLDING UNIT: 2L Containers
2. RECEIVING LOG #: N/A
3. CULTURE LOG #: 39-010
4. AGE/ SIZE INFORMATION: HD: 4/25-26/19, 7-8 days old

B. HOLDING [ ] CULTURE [√] WATER PARAMETERS

1. TEMPERATURE: 23±1°C
2. SALINITY: N/A
3. WATER SOURCE: Filtered Well H_2O

B. TRANSFER CUSTODY & TRANSFER

1. LIVESTOCK RELINQUISHMENT DATE: 5/3/19 TIME: 1200 BY: [signature]
2. LIVESTOCK RECEIVING DATE: 5/3/19 TIME: 1200 BY: [signature]
3. CULTURE SUPERVISOR OR SENIOR TECH. INITIALS: [signature]

REMARKS:

Bath #2

38-205R_Ha__bath_2.hobo

#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
1	05/03/19 09:00:00 AM	23.136	Logged				
2	05/03/19 10:00:00 AM	23.064					
3	05/03/19 11:00:00 AM	23.016					
4	05/03/19 12:00:00 PM	22.753					
5	05/03/19 01:00:00 PM	22.681					
6	05/03/19 02:00:00 PM	22.657					
7	05/03/19 03:00:00 PM	22.657					
8	05/03/19 04:00:00 PM	22.681					
9	05/03/19 05:00:00 PM	22.681					
10	05/03/19 06:00:00 PM	22.681					
11	05/03/19 07:00:00 PM	22.776					
12	05/03/19 08:00:00 PM	22.848					
13	05/03/19 09:00:00 PM	22.872					
14	05/03/19 10:00:00 PM	22.944					
15	05/03/19 11:00:00 PM	22.848					
16	05/04/19 12:00:00 AM	22.848					
17	05/04/19 01:00:00 AM	22.824					
18	05/04/19 02:00:00 AM	22.800					
19	05/04/19 03:00:00 AM	22.753					
20	05/04/19 04:00:00 AM	22.729					
21	05/04/19 05:00:00 AM	22.729					
22	05/04/19 06:00:00 AM	22.729					
23	05/04/19 07:00:00 AM	22.729					
24	05/04/19 08:00:00 AM	22.800					
25	05/04/19 09:00:00 AM	22.824					
26	05/04/19 10:00:00 AM	22.848					
27	05/04/19 11:00:00 AM	22.824					

38-205R_Ha__bath_2.hobo

#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
28	05/04/19 12:00:00 PM	22.800					
29	05/04/19 01:00:00 PM	22.800					
30	05/04/19 02:00:00 PM	22.824					
31	05/04/19 03:00:00 PM	22.848					
32	05/04/19 04:00:00 PM	22.848					
33	05/04/19 05:00:00 PM	22.872					
34	05/04/19 06:00:00 PM	22.872					
35	05/04/19 07:00:00 PM	22.848					
36	05/04/19 08:00:00 PM	22.800					
37	05/04/19 09:00:00 PM	22.753					
38	05/04/19 10:00:00 PM	22.729					
39	05/04/19 11:00:00 PM	22.705					
40	05/05/19 12:00:00 AM	22.705					
41	05/05/19 01:00:00 AM	22.681					
42	05/05/19 02:00:00 AM	22.657					
43	05/05/19 03:00:00 AM	22.633					
44	05/05/19 04:00:00 AM	22.633					
45	05/05/19 05:00:00 AM	22.633					
46	05/05/19 06:00:00 AM	22.633					
47	05/05/19 07:00:00 AM	22.681					
48	05/05/19 08:00:00 AM	22.681					
49	05/05/19 09:00:00 AM	22.657					
50	05/05/19 10:00:00 AM	22.681					
51	05/05/19 11:00:00 AM	22.729					
52	05/05/19 12:00:00 PM	22.729					
53	05/05/19 01:00:00 PM	22.729					
54	05/05/19 02:00:00 PM	22.753					

38-205R_Ha__bath_2.hobo

#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
55	05/05/19 03:00:00 PM	22.776					
56	05/05/19 04:00:00 PM	22.753					
57	05/05/19 05:00:00 PM	22.729					
58	05/05/19 06:00:00 PM	22.729					
59	05/05/19 07:00:00 PM	22.681					
60	05/05/19 08:00:00 PM	22.681					
61	05/05/19 09:00:00 PM	22.657					
62	05/05/19 10:00:00 PM	22.633					
63	05/05/19 11:00:00 PM	22.657					
64	05/06/19 12:00:00 AM	22.633					
65	05/06/19 01:00:00 AM	22.609					
66	05/06/19 02:00:00 AM	22.609					
67	05/06/19 03:00:00 AM	22.585					
68	05/06/19 04:00:00 AM	22.585					
69	05/06/19 05:00:00 AM	22.585					
70	05/06/19 06:00:00 AM	22.537					
71	05/06/19 07:00:00 AM	22.561					
72	05/06/19 08:00:00 AM	22.561					
73	05/06/19 09:00:00 AM	22.585					
74	05/06/19 10:00:00 AM	22.657					
75	05/06/19 11:00:00 AM	22.753					
76	05/06/19 12:00:00 PM	22.776					
77	05/06/19 01:00:00 PM	22.776					
78	05/06/19 02:00:00 PM	22.776					
79	05/06/19 03:00:00 PM	22.681					
80	05/06/19 04:00:00 PM	22.609					
81	05/06/19 05:00:00 PM	22.585					

38-205R_Ha__bath_2.hobo

#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
82	05/06/19 06:00:00 PM	22.585					
83	05/06/19 07:00:00 PM	22.561					
84	05/06/19 08:00:00 PM	22.609					
85	05/06/19 09:00:00 PM	22.633					
86	05/06/19 10:00:00 PM	22.657					
87	05/06/19 11:00:00 PM	22.657					
88	05/07/19 12:00:00 AM	22.633					
89	05/07/19 01:00:00 AM	22.585					
90	05/07/19 02:00:00 AM	22.561					
91	05/07/19 03:00:00 AM	22.489					
92	05/07/19 04:00:00 AM	22.489					
93	05/07/19 05:00:00 AM	22.441					
94	05/07/19 06:00:00 AM	22.489					
95	05/07/19 07:00:00 AM	22.537					
96	05/07/19 08:00:00 AM	22.561					
97	05/07/19 09:00:00 AM	22.609					
98	05/07/19 10:00:00 AM	22.585					
99	05/07/19 11:00:00 AM	22.561					
100	05/07/19 12:00:00 PM	22.585					
101	05/07/19 01:00:00 PM	22.561					
102	05/07/19 02:00:00 PM	22.609					
103	05/07/19 03:00:00 PM	22.585					
104	05/07/19 04:00:00 PM	22.585					
105	05/07/19 05:00:00 PM	22.561					
106	05/07/19 06:00:00 PM	22.537					
107	05/07/19 07:00:00 PM	22.513					
108	05/07/19 08:00:00 PM	22.537					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
109	05/07/19 09:00:00 PM	22.561					
110	05/07/19 10:00:00 PM	22.585					
111	05/07/19 11:00:00 PM	22.537					
112	05/08/19 12:00:00 AM	22.537					
113	05/08/19 01:00:00 AM	22.537					
114	05/08/19 02:00:00 AM	22.489					
115	05/08/19 03:00:00 AM	22.489					
116	05/08/19 04:00:00 AM	22.489					
117	05/08/19 05:00:00 AM	22.465					
118	05/08/19 06:00:00 AM	22.465					
119	05/08/19 07:00:00 AM	22.489					
120	05/08/19 08:00:00 AM	22.465					
121	05/08/19 09:00:00 AM	22.513					
122	05/08/19 10:00:00 AM	22.561					
123	05/08/19 11:00:00 AM	22.465					
124	05/08/19 12:00:00 PM	22.441					
125	05/08/19 01:00:00 PM	22.441					
126	05/08/19 02:00:00 PM	22.465					
127	05/08/19 03:00:00 PM	22.489					
128	05/08/19 04:00:00 PM	22.489					
129	05/08/19 05:00:00 PM	22.489					
130	05/08/19 06:00:00 PM	22.465					
131	05/08/19 07:00:00 PM	22.441					
132	05/08/19 08:00:00 PM	22.513					
133	05/08/19 09:00:00 PM	22.537					
134	05/08/19 10:00:00 PM	22.561					
135	05/08/19 11:00:00 PM	22.585					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
136	05/09/19 12:00:00 AM	22.537					
137	05/09/19 01:00:00 AM	22.465					
138	05/09/19 02:00:00 AM	22.417					
139	05/09/19 03:00:00 AM	22.417					
140	05/09/19 04:00:00 AM	22.417					
141	05/09/19 05:00:00 AM	22.393					
142	05/09/19 06:00:00 AM	22.417					
143	05/09/19 07:00:00 AM	22.441					
144	05/09/19 08:00:00 AM	22.465					
145	05/09/19 09:00:00 AM	22.513					
146	05/09/19 10:00:00 AM	22.513					
147	05/09/19 11:00:00 AM	22.465					
148	05/09/19 12:00:00 PM	22.417					
149	05/09/19 01:00:00 PM	22.489					
150	05/09/19 02:00:00 PM	22.345					
151	05/09/19 03:00:00 PM	22.250					
152	05/09/19 04:00:00 PM	22.250					
153	05/09/19 05:00:00 PM	22.274					
154	05/09/19 06:00:00 PM	22.274					
155	05/09/19 07:00:00 PM	22.298					
156	05/09/19 08:00:00 PM	22.393					
157	05/09/19 09:00:00 PM	22.465					
158	05/09/19 10:00:00 PM	22.489					
159	05/09/19 11:00:00 PM	22.513					
160	05/10/19 12:00:00 AM	22.417					
161	05/10/19 01:00:00 AM	22.417					
162	05/10/19 02:00:00 AM	22.369					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
163	05/10/19 03:00:00 AM	22.345					
164	05/10/19 04:00:00 AM	22.345					
165	05/10/19 05:00:00 AM	22.321					
166	05/10/19 06:00:00 AM	22.369					
167	05/10/19 07:00:00 AM	22.393					
168	05/10/19 08:00:00 AM	22.441					
169	05/10/19 09:00:00 AM	22.585					
170	05/10/19 10:00:00 AM	22.537					
171	05/10/19 11:00:00 AM	22.298					
172	05/10/19 12:00:00 PM	22.345					
173	05/10/19 01:00:00 PM	22.441					
174	05/10/19 02:00:00 PM	22.417					
175	05/10/19 03:00:00 PM	22.417					
176	05/10/19 04:00:00 PM	22.441					
177	05/10/19 05:00:00 PM	22.489					
178	05/10/19 06:00:00 PM	22.465					
179	05/10/19 07:00:00 PM	22.441					
180	05/10/19 08:00:00 PM	22.417					
181	05/10/19 09:00:00 PM	22.441					
182	05/10/19 10:00:00 PM	22.465					
183	05/10/19 11:00:00 PM	22.489					
184	05/11/19 12:00:00 AM	22.465					
185	05/11/19 01:00:00 AM	22.441					
186	05/11/19 02:00:00 AM	22.393					
187	05/11/19 03:00:00 AM	22.417					
188	05/11/19 04:00:00 AM	22.393					
189	05/11/19 05:00:00 AM	22.393					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
190	05/11/19 06:00:00 AM	22.393					
191	05/11/19 07:00:00 AM	22.441					
192	05/11/19 08:00:00 AM	22.393					
193	05/11/19 09:00:00 AM	22.441					
194	05/11/19 10:00:00 AM	22.441					
195	05/11/19 11:00:00 AM	22.537					
196	05/11/19 12:00:00 PM	22.633					
197	05/11/19 01:00:00 PM	22.705					
198	05/11/19 02:00:00 PM	22.800					
199	05/11/19 03:00:00 PM	22.896					
200	05/11/19 04:00:00 PM	23.040					
201	05/11/19 05:00:00 PM	23.160					
202	05/11/19 06:00:00 PM	23.160					
203	05/11/19 07:00:00 PM	23.088					
204	05/11/19 08:00:00 PM	22.968					
205	05/11/19 09:00:00 PM	22.824					
206	05/11/19 10:00:00 PM	22.681					
207	05/11/19 11:00:00 PM	22.561					
208	05/12/19 12:00:00 AM	22.393					
209	05/12/19 01:00:00 AM	22.345					
210	05/12/19 02:00:00 AM	22.298					
211	05/12/19 03:00:00 AM	22.274					
212	05/12/19 04:00:00 AM	22.250					
213	05/12/19 05:00:00 AM	22.250					
214	05/12/19 06:00:00 AM	22.274					
215	05/12/19 07:00:00 AM	22.298					
216	05/12/19 08:00:00 AM	22.298					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
217	05/12/19 09:00:00 AM	22.321					
218	05/12/19 10:00:00 AM	22.250					
219	05/12/19 11:00:00 AM	22.345					
220	05/12/19 12:00:00 PM	22.393					
221	05/12/19 01:00:00 PM	22.441					
222	05/12/19 02:00:00 PM	22.489					
223	05/12/19 03:00:00 PM	22.585					
224	05/12/19 04:00:00 PM	22.633					
225	05/12/19 05:00:00 PM	22.633					
226	05/12/19 06:00:00 PM	22.657					
227	05/12/19 07:00:00 PM	22.705					
228	05/12/19 08:00:00 PM	22.729					
229	05/12/19 09:00:00 PM	22.753					
230	05/12/19 10:00:00 PM	22.776					
231	05/12/19 11:00:00 PM	22.800					
232	05/13/19 12:00:00 AM	22.776					
233	05/13/19 01:00:00 AM	22.729					
234	05/13/19 02:00:00 AM	22.657					
235	05/13/19 03:00:00 AM	22.585					
236	05/13/19 04:00:00 AM	22.537					
237	05/13/19 05:00:00 AM	22.441					
238	05/13/19 06:00:00 AM	22.345					
239	05/13/19 07:00:00 AM	22.345					
240	05/13/19 08:00:00 AM	22.441					
241	05/13/19 09:00:00 AM	22.537					
242	05/13/19 10:00:00 AM	22.657					
243	05/13/19 11:00:00 AM	22.681					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
244	05/13/19 12:00:00 PM	22.729					
245	05/13/19 01:00:00 PM	22.729					
246	05/13/19 02:00:00 PM	22.776					
247	05/13/19 03:00:00 PM	22.824					
248	05/13/19 04:00:00 PM	22.824					
249	05/13/19 05:00:00 PM	22.872					
250	05/13/19 06:00:00 PM	22.872					
251	05/13/19 07:00:00 PM	22.920					
252	05/13/19 08:00:00 PM	22.968					
253	05/13/19 09:00:00 PM	23.040					
254	05/13/19 10:00:00 PM	23.088					
255	05/13/19 11:00:00 PM	23.136					
256	05/14/19 12:00:00 AM	23.136					
257	05/14/19 01:00:00 AM	23.112					
258	05/14/19 02:00:00 AM	23.064					
259	05/14/19 03:00:00 AM	22.992					
260	05/14/19 04:00:00 AM	22.944					
261	05/14/19 05:00:00 AM	22.896					
262	05/14/19 06:00:00 AM	22.848					
263	05/14/19 07:00:00 AM	22.872					
264	05/14/19 08:00:00 AM	22.896					
265	05/14/19 09:00:00 AM	22.944					
266	05/14/19 10:00:00 AM	22.776					
267	05/14/19 11:00:00 AM	22.776					
268	05/14/19 12:00:00 PM	22.776					
269	05/14/19 01:00:00 PM	22.776					
270	05/14/19 02:00:00 PM	22.848					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
271	05/14/19 03:00:00 PM	22.657					
272	05/14/19 04:00:00 PM	22.633					
273	05/14/19 05:00:00 PM	22.753					
274	05/14/19 06:00:00 PM	22.561					
275	05/14/19 07:00:00 PM	22.537					
276	05/14/19 08:00:00 PM	22.441					
277	05/14/19 09:00:00 PM	22.465					
278	05/14/19 10:00:00 PM	22.417					
279	05/14/19 11:00:00 PM	22.465					
280	05/15/19 12:00:00 AM	22.441					
281	05/15/19 01:00:00 AM	22.393					
282	05/15/19 02:00:00 AM	22.369					
283	05/15/19 03:00:00 AM	22.321					
284	05/15/19 04:00:00 AM	22.298					
285	05/15/19 05:00:00 AM	22.274					
286	05/15/19 06:00:00 AM	22.250					
287	05/15/19 07:00:00 AM	22.298					
288	05/15/19 08:00:00 AM	22.345					
289	05/15/19 09:00:00 AM	22.274					
290	05/15/19 10:00:00 AM	22.226					
291	05/15/19 11:00:00 AM	22.226					
292	05/15/19 12:00:00 PM	22.250					
293	05/15/19 01:00:00 PM	22.250					
294	05/15/19 02:00:00 PM	22.250					
295	05/15/19 03:00:00 PM	22.154					
296	05/15/19 04:00:00 PM	22.178					
297	05/15/19 05:00:00 PM	22.106					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
298	05/15/19 06:00:00 PM	22.106					
299	05/15/19 07:00:00 PM	22.130					
300	05/15/19 08:00:00 PM	22.202					
301	05/15/19 09:00:00 PM	22.226					
302	05/15/19 10:00:00 PM	22.250					
303	05/15/19 11:00:00 PM	22.298					
304	05/16/19 12:00:00 AM	22.321					
305	05/16/19 01:00:00 AM	22.321					
306	05/16/19 02:00:00 AM	22.321					
307	05/16/19 03:00:00 AM	22.298					
308	05/16/19 04:00:00 AM	22.298					
309	05/16/19 05:00:00 AM	22.298					
310	05/16/19 06:00:00 AM	22.298					
311	05/16/19 07:00:00 AM	22.345					
312	05/16/19 08:00:00 AM	22.321					
313	05/16/19 09:00:00 AM	22.226					
314	05/16/19 10:00:00 AM	22.154					
315	05/16/19 11:00:00 AM	22.106					
316	05/16/19 12:00:00 PM	22.130					
317	05/16/19 01:00:00 PM	22.154					
318	05/16/19 02:00:00 PM	22.154					
319	05/16/19 03:00:00 PM	22.178					
320	05/16/19 04:00:00 PM	22.154					
321	05/16/19 05:00:00 PM	22.178					
322	05/16/19 06:00:00 PM	22.106					
323	05/16/19 07:00:00 PM	22.154					
324	05/16/19 08:00:00 PM	22.154					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
325	05/16/19 09:00:00 PM	22.154					
326	05/16/19 10:00:00 PM	22.130					
327	05/16/19 11:00:00 PM	22.154					
328	05/17/19 12:00:00 AM	22.178					
329	05/17/19 01:00:00 AM	22.154					
330	05/17/19 02:00:00 AM	22.154					
331	05/17/19 03:00:00 AM	22.154					
332	05/17/19 04:00:00 AM	22.154					
333	05/17/19 05:00:00 AM	22.130					
334	05/17/19 06:00:00 AM	22.154					
335	05/17/19 07:00:00 AM	22.226					
336	05/17/19 08:00:00 AM	22.250					
337	05/17/19 09:00:00 AM	22.178					
338	05/17/19 10:00:00 AM	22.178					
339	05/17/19 11:00:00 AM	22.154					
340	05/17/19 12:00:00 PM	22.178					
341	05/17/19 01:00:00 PM	22.154					
342	05/17/19 02:00:00 PM	22.130					
343	05/17/19 03:00:00 PM	22.130					
344	05/17/19 04:00:00 PM	22.106					
345	05/17/19 05:00:00 PM	22.034					
346	05/17/19 06:00:00 PM	21.963					
347	05/17/19 07:00:00 PM	21.963					
348	05/17/19 08:00:00 PM	21.963					
349	05/17/19 09:00:00 PM	21.987					
350	05/17/19 10:00:00 PM	21.867					
351	05/17/19 11:00:00 PM	21.772					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
352	05/18/19 12:00:00 AM	21.724					
353	05/18/19 01:00:00 AM	21.676					
354	05/18/19 02:00:00 AM	21.652					
355	05/18/19 03:00:00 AM	21.628					
356	05/18/19 04:00:00 AM	21.604					
357	05/18/19 05:00:00 AM	21.557					
358	05/18/19 06:00:00 AM	21.581					
359	05/18/19 07:00:00 AM	21.652					
360	05/18/19 08:00:00 AM	21.676					
361	05/18/19 09:00:00 AM	21.772					
362	05/18/19 10:00:00 AM	21.867					
363	05/18/19 11:00:00 AM	21.819					
364	05/18/19 12:00:00 PM	21.819					
365	05/18/19 01:00:00 PM	21.867					
366	05/18/19 02:00:00 PM	21.939					
367	05/18/19 03:00:00 PM	21.963					
368	05/18/19 04:00:00 PM	21.987					
369	05/18/19 05:00:00 PM	22.058					
370	05/18/19 06:00:00 PM	22.130					
371	05/18/19 07:00:00 PM	22.178					
372	05/18/19 08:00:00 PM	22.154					
373	05/18/19 09:00:00 PM	22.106					
374	05/18/19 10:00:00 PM	22.011					
375	05/18/19 11:00:00 PM	21.963					
376	05/19/19 12:00:00 AM	21.915					
377	05/19/19 01:00:00 AM	21.891					
378	05/19/19 02:00:00 AM	21.843					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
379	05/19/19 03:00:00 AM	21.819					
380	05/19/19 04:00:00 AM	21.819					
381	05/19/19 05:00:00 AM	21.819					
382	05/19/19 06:00:00 AM	21.819					
383	05/19/19 07:00:00 AM	21.867					
384	05/19/19 08:00:00 AM	21.963					
385	05/19/19 09:00:00 AM	22.011					
386	05/19/19 10:00:00 AM	22.082					
387	05/19/19 11:00:00 AM	22.154					
388	05/19/19 12:00:00 PM	22.226					
389	05/19/19 01:00:00 PM	22.345					
390	05/19/19 02:00:00 PM	22.513					
391	05/19/19 03:00:00 PM	22.681					
392	05/19/19 04:00:00 PM	22.800					
393	05/19/19 05:00:00 PM	22.872					
394	05/19/19 06:00:00 PM	22.920					
395	05/19/19 07:00:00 PM	22.944					
396	05/19/19 08:00:00 PM	22.920					
397	05/19/19 09:00:00 PM	22.848					
398	05/19/19 10:00:00 PM	22.776					
399	05/19/19 11:00:00 PM	22.681					
400	05/20/19 12:00:00 AM	22.609					
401	05/20/19 01:00:00 AM	22.585					
402	05/20/19 02:00:00 AM	22.513					
403	05/20/19 03:00:00 AM	22.465					
404	05/20/19 04:00:00 AM	22.417					
405	05/20/19 05:00:00 AM	22.369					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
406	05/20/19 06:00:00 AM	22.250					
407	05/20/19 07:00:00 AM	22.250					
408	05/20/19 08:00:00 AM	22.082					
409	05/20/19 09:00:00 AM	21.939					
410	05/20/19 10:00:00 AM	21.843					
411	05/20/19 11:00:00 AM	21.772					
412	05/20/19 12:00:00 PM	21.819					
413	05/20/19 01:00:00 PM	21.843					
414	05/20/19 02:00:00 PM	21.867					
415	05/20/19 03:00:00 PM	22.011					
416	05/20/19 04:00:00 PM	22.154					
417	05/20/19 05:00:00 PM	22.321					
418	05/20/19 06:00:00 PM	22.345					
419	05/20/19 07:00:00 PM	22.321					
420	05/20/19 08:00:00 PM	22.369					
421	05/20/19 09:00:00 PM	22.345					
422	05/20/19 10:00:00 PM	22.274					
423	05/20/19 11:00:00 PM	22.202					
424	05/21/19 12:00:00 AM	22.130					
425	05/21/19 01:00:00 AM	22.082					
426	05/21/19 02:00:00 AM	22.058					
427	05/21/19 03:00:00 AM	22.011					
428	05/21/19 04:00:00 AM	21.987					
429	05/21/19 05:00:00 AM	21.939					
430	05/21/19 06:00:00 AM	21.915					
431	05/21/19 07:00:00 AM	21.963					
432	05/21/19 08:00:00 AM	21.963					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
433	05/21/19 09:00:00 AM	21.915					
434	05/21/19 10:00:00 AM	21.939					
435	05/21/19 11:00:00 AM	22.130					
436	05/21/19 12:00:00 PM	22.321					
437	05/21/19 01:00:00 PM	22.585					
438	05/21/19 02:00:00 PM	22.633					
439	05/21/19 03:00:00 PM	22.824					
440	05/21/19 04:00:00 PM	22.968					
441	05/21/19 05:00:00 PM	23.016					
442	05/21/19 06:00:00 PM	23.016					
443	05/21/19 07:00:00 PM	23.064					
444	05/21/19 08:00:00 PM	23.160					
445	05/21/19 09:00:00 PM	23.208					
446	05/21/19 10:00:00 PM	23.328					
447	05/21/19 11:00:00 PM	23.448					
448	05/22/19 12:00:00 AM	23.424					
449	05/22/19 01:00:00 AM	23.376					
450	05/22/19 02:00:00 AM	23.280					
451	05/22/19 03:00:00 AM	23.208					
452	05/22/19 04:00:00 AM	23.160					
453	05/22/19 05:00:00 AM	23.088					
454	05/22/19 06:00:00 AM	22.992					
455	05/22/19 07:00:00 AM	22.968					
456	05/22/19 08:00:00 AM	22.944					
457	05/22/19 09:00:00 AM	22.992					
458	05/22/19 10:00:00 AM	23.064					
459	05/22/19 11:00:00 AM	23.160					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
460	05/22/19 12:00:00 PM	23.256					
461	05/22/19 01:00:00 PM	23.400					
462	05/22/19 02:00:00 PM	23.521					
463	05/22/19 03:00:00 PM	23.569					
464	05/22/19 04:00:00 PM	23.593					
465	05/22/19 05:00:00 PM	23.569					
466	05/22/19 06:00:00 PM	23.472					
467	05/22/19 07:00:00 PM	23.352					
468	05/22/19 08:00:00 PM	23.328					
469	05/22/19 09:00:00 PM	23.328					
470	05/22/19 10:00:00 PM	23.328					
471	05/22/19 11:00:00 PM	23.328					
472	05/23/19 12:00:00 AM	23.304					
473	05/23/19 01:00:00 AM	23.304					
474	05/23/19 02:00:00 AM	23.232					
475	05/23/19 03:00:00 AM	23.208					
476	05/23/19 04:00:00 AM	23.112					
477	05/23/19 05:00:00 AM	23.112					
478	05/23/19 06:00:00 AM	23.112					
479	05/23/19 07:00:00 AM	23.160					
480	05/23/19 08:00:00 AM	23.184					
481	05/23/19 09:00:00 AM	23.256					
482	05/23/19 10:00:00 AM	23.208					
483	05/23/19 11:00:00 AM	23.184					
484	05/23/19 12:00:00 PM	23.232					
485	05/23/19 01:00:00 PM	23.304					
486	05/23/19 02:00:00 PM	23.376					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
487	05/23/19 03:00:00 PM	23.400					
488	05/23/19 04:00:00 PM	23.424					
489	05/23/19 05:00:00 PM	23.376					
490	05/23/19 06:00:00 PM	23.304					
491	05/23/19 07:00:00 PM	23.328					
492	05/23/19 08:00:00 PM	23.352					
493	05/23/19 09:00:00 PM	23.376					
494	05/23/19 10:00:00 PM	23.400					
495	05/23/19 11:00:00 PM	23.400					
496	05/24/19 12:00:00 AM	23.400					
497	05/24/19 01:00:00 AM	23.400					
498	05/24/19 02:00:00 AM	23.352					
499	05/24/19 03:00:00 AM	23.280					
500	05/24/19 04:00:00 AM	23.256					
501	05/24/19 05:00:00 AM	23.232					
502	05/24/19 06:00:00 AM	23.232					
503	05/24/19 07:00:00 AM	23.304					
504	05/24/19 08:00:00 AM	23.280					
505	05/24/19 09:00:00 AM	23.304					
506	05/24/19 10:00:00 AM	23.304					
507	05/24/19 11:00:00 AM	23.304					
508	05/24/19 12:00:00 PM	23.304					
509	05/24/19 01:00:00 PM	23.328					
510	05/24/19 02:00:00 PM	23.352					
511	05/24/19 03:00:00 PM	23.376					
512	05/24/19 04:00:00 PM	23.352					
513	05/24/19 05:00:00 PM	23.400					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
514	05/24/19 06:00:00 PM	23.448					
515	05/24/19 07:00:00 PM	23.472					
516	05/24/19 08:00:00 PM	23.448					
517	05/24/19 09:00:00 PM	23.424					
518	05/24/19 10:00:00 PM	23.424					
519	05/24/19 11:00:00 PM	23.424					
520	05/25/19 12:00:00 AM	23.448					
521	05/25/19 01:00:00 AM	23.424					
522	05/25/19 02:00:00 AM	23.376					
523	05/25/19 03:00:00 AM	23.328					
524	05/25/19 04:00:00 AM	23.280					
525	05/25/19 05:00:00 AM	23.232					
526	05/25/19 06:00:00 AM	23.208					
527	05/25/19 07:00:00 AM	23.208					
528	05/25/19 08:00:00 AM	23.232					
529	05/25/19 09:00:00 AM	23.304					
530	05/25/19 10:00:00 AM	23.304					
531	05/25/19 11:00:00 AM	23.328					
532	05/25/19 12:00:00 PM	23.376					
533	05/25/19 01:00:00 PM	23.424					
534	05/25/19 02:00:00 PM	23.497					
535	05/25/19 03:00:00 PM	23.521					
536	05/25/19 04:00:00 PM	23.569					
537	05/25/19 05:00:00 PM	23.665					
538	05/25/19 06:00:00 PM	23.713					
539	05/25/19 07:00:00 PM	23.737					
540	05/25/19 08:00:00 PM	23.737					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
541	05/25/19 09:00:00 PM	23.713					
542	05/25/19 10:00:00 PM	23.689					
543	05/25/19 11:00:00 PM	23.641					
544	05/26/19 12:00:00 AM	23.593					
545	05/26/19 01:00:00 AM	23.521					
546	05/26/19 02:00:00 AM	23.400					
547	05/26/19 03:00:00 AM	23.328					
548	05/26/19 04:00:00 AM	23.280					
549	05/26/19 05:00:00 AM	23.256					
550	05/26/19 06:00:00 AM	23.232					
551	05/26/19 07:00:00 AM	23.256					
552	05/26/19 08:00:00 AM	23.256					
553	05/26/19 09:00:00 AM	23.328					
554	05/26/19 10:00:00 AM	23.376					
555	05/26/19 11:00:00 AM	23.472					
556	05/26/19 12:00:00 PM	23.545					
557	05/26/19 01:00:00 PM	23.521					
558	05/26/19 02:00:00 PM	23.641					
559	05/26/19 03:00:00 PM	23.761					
560	05/26/19 04:00:00 PM	23.881					
561	05/26/19 05:00:00 PM	23.978					
562	05/26/19 06:00:00 PM	24.026					
563	05/26/19 07:00:00 PM	24.074					
564	05/26/19 08:00:00 PM	24.026					
565	05/26/19 09:00:00 PM	24.026					
566	05/26/19 10:00:00 PM	24.002					
567	05/26/19 11:00:00 PM	23.954					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
568	05/27/19 12:00:00 AM	23.881					
569	05/27/19 01:00:00 AM	23.761					
570	05/27/19 02:00:00 AM	23.641					
571	05/27/19 03:00:00 AM	23.521					
572	05/27/19 04:00:00 AM	23.400					
573	05/27/19 05:00:00 AM	23.328					
574	05/27/19 06:00:00 AM	23.280					
575	05/27/19 07:00:00 AM	23.256					
576	05/27/19 08:00:00 AM	23.304					
577	05/27/19 09:00:00 AM	23.376					
578	05/27/19 10:00:00 AM	23.376					
579	05/27/19 11:00:00 AM	23.448					
580	05/27/19 12:00:00 PM	23.545					
581	05/27/19 01:00:00 PM	23.593					
582	05/27/19 02:00:00 PM	23.665					
583	05/27/19 03:00:00 PM	23.761					
584	05/27/19 04:00:00 PM	23.881					
585	05/27/19 05:00:00 PM	24.002					
586	05/27/19 06:00:00 PM	24.122					
587	05/27/19 07:00:00 PM	24.195					
588	05/27/19 08:00:00 PM	24.219					
589	05/27/19 09:00:00 PM	24.171					
590	05/27/19 10:00:00 PM	24.098					
591	05/27/19 11:00:00 PM	24.074					
592	05/28/19 12:00:00 AM	23.978					
593	05/28/19 01:00:00 AM	23.833					
594	05/28/19 02:00:00 AM	23.665					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
595	05/28/19 03:00:00 AM	23.497					
596	05/28/19 04:00:00 AM	23.328					
597	05/28/19 05:00:00 AM	23.256					
598	05/28/19 06:00:00 AM	23.232					
599	05/28/19 07:00:00 AM	23.208					
600	05/28/19 08:00:00 AM	23.232					
601	05/28/19 09:00:00 AM	23.208					
602	05/28/19 10:00:00 AM	23.184					
603	05/28/19 11:00:00 AM	23.160					
604	05/28/19 12:00:00 PM	23.160					
605	05/28/19 01:00:00 PM	23.136					
606	05/28/19 02:00:00 PM	23.112					
607	05/28/19 03:00:00 PM	23.112					
608	05/28/19 04:00:00 PM	23.136					
609	05/28/19 05:00:00 PM	23.136					
610	05/28/19 06:00:00 PM	23.136					
611	05/28/19 07:00:00 PM	23.160					
612	05/28/19 08:00:00 PM	23.232					
613	05/28/19 09:00:00 PM	23.280					
614	05/28/19 10:00:00 PM	23.352					
615	05/28/19 11:00:00 PM	23.400					
616	05/29/19 12:00:00 AM	23.424					
617	05/29/19 01:00:00 AM	23.424					
618	05/29/19 02:00:00 AM	23.376					
619	05/29/19 03:00:00 AM	23.352					
620	05/29/19 04:00:00 AM	23.304					
621	05/29/19 05:00:00 AM	23.280					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
622	05/29/19 06:00:00 AM	23.280					
623	05/29/19 07:00:00 AM	23.256					
624	05/29/19 08:00:00 AM	23.280					
625	05/29/19 09:00:00 AM	23.328					
626	05/29/19 10:00:00 AM	23.328					
627	05/29/19 11:00:00 AM	23.376					
628	05/29/19 12:00:00 PM	23.448					
629	05/29/19 01:00:00 PM	23.497					
630	05/29/19 02:00:00 PM	23.448					
631	05/29/19 03:00:00 PM	23.448					
632	05/29/19 04:00:00 PM	23.424					
633	05/29/19 05:00:00 PM	23.376					
634	05/29/19 06:00:00 PM	23.328					
635	05/29/19 07:00:00 PM	23.304					
636	05/29/19 08:00:00 PM	23.304					
637	05/29/19 09:00:00 PM	23.352					
638	05/29/19 10:00:00 PM	23.400					
639	05/29/19 11:00:00 PM	23.424					
640	05/30/19 12:00:00 AM	23.448					
641	05/30/19 01:00:00 AM	23.448					
642	05/30/19 02:00:00 AM	23.424					
643	05/30/19 03:00:00 AM	23.400					
644	05/30/19 04:00:00 AM	23.376					
645	05/30/19 05:00:00 AM	23.352					
646	05/30/19 06:00:00 AM	23.376					
647	05/30/19 07:00:00 AM	23.352					
648	05/30/19 08:00:00 AM	23.376					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
649	05/30/19 09:00:00 AM	23.328					
650	05/30/19 10:00:00 AM	23.376					
651	05/30/19 11:00:00 AM	23.400					
652	05/30/19 12:00:00 PM	23.424					
653	05/30/19 01:00:00 PM	23.448					
654	05/30/19 02:00:00 PM	23.400					
655	05/30/19 03:00:00 PM	23.352					
656	05/30/19 04:00:00 PM	23.304					
657	05/30/19 05:00:00 PM	23.256					
658	05/30/19 06:00:00 PM	23.256					
659	05/30/19 07:00:00 PM	23.256					
660	05/30/19 08:00:00 PM	23.280					
661	05/30/19 09:00:00 PM	23.304					
662	05/30/19 10:00:00 PM	23.352					
663	05/30/19 11:00:00 PM	23.400					
664	05/31/19 12:00:00 AM	23.424					
665	05/31/19 01:00:00 AM	23.400					
666	05/31/19 02:00:00 AM	23.352					
667	05/31/19 03:00:00 AM	23.328					
668	05/31/19 04:00:00 AM	23.304					
669	05/31/19 05:00:00 AM	23.256					
670	05/31/19 06:00:00 AM	23.256					
671	05/31/19 07:00:00 AM	23.232					
672	05/31/19 08:00:00 AM	23.208					
673	05/31/19 09:00:00 AM	23.232					
674	05/31/19 10:00:00 AM	23.280					
675	05/31/19 11:00:00 AM	23.328					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
676	05/31/19 12:00:00 PM	23.352					
677	05/31/19 01:00:00 PM	23.376					
678	05/31/19 02:00:00 PM	23.376					
679	05/31/19 03:00:00 PM	23.376					
680	05/31/19 04:00:00 PM	23.376					
681	05/31/19 05:00:00 PM	23.376					
682	05/31/19 06:00:00 PM	23.232					
683	05/31/19 07:00:00 PM	23.184					
684	05/31/19 08:00:00 PM	23.184					
685	05/31/19 09:00:00 PM	23.160					
686	05/31/19 10:00:00 PM	23.088					
687	05/31/19 11:00:00 PM	23.016					
688	06/01/19 12:00:00 AM	22.968					
689	06/01/19 01:00:00 AM	22.848					
690	06/01/19 02:00:00 AM	22.729					
691	06/01/19 03:00:00 AM	22.609					
692	06/01/19 04:00:00 AM	22.489					
693	06/01/19 05:00:00 AM	22.417					
694	06/01/19 06:00:00 AM	22.345					
695	06/01/19 07:00:00 AM	22.345					
696	06/01/19 08:00:00 AM	22.345					
697	06/01/19 09:00:00 AM	22.417					
698	06/01/19 10:00:00 AM	22.513					
699	06/01/19 11:00:00 AM	22.681					
700	06/01/19 12:00:00 PM	22.872					
701	06/01/19 01:00:00 PM	23.088					
702	06/01/19 02:00:00 PM	23.256					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
703	06/01/19 03:00:00 PM	23.400					
704	06/01/19 04:00:00 PM	23.497					
705	06/01/19 05:00:00 PM	23.617					
706	06/01/19 06:00:00 PM	23.689					
707	06/01/19 07:00:00 PM	23.713					
708	06/01/19 08:00:00 PM	23.665					
709	06/01/19 09:00:00 PM	23.521					
710	06/01/19 10:00:00 PM	23.448					
711	06/01/19 11:00:00 PM	23.328					
712	06/02/19 12:00:00 AM	23.256					
713	06/02/19 01:00:00 AM	23.112					
714	06/02/19 02:00:00 AM	22.944					
715	06/02/19 03:00:00 AM	22.800					
716	06/02/19 04:00:00 AM	22.705					
717	06/02/19 05:00:00 AM	22.585					
718	06/02/19 06:00:00 AM	22.513					
719	06/02/19 07:00:00 AM	22.441					
720	06/02/19 08:00:00 AM	22.417					
721	06/02/19 09:00:00 AM	22.441					
722	06/02/19 10:00:00 AM	22.537					
723	06/02/19 11:00:00 AM	22.609					
724	06/02/19 12:00:00 PM	22.729					
725	06/02/19 01:00:00 PM	22.872					
726	06/02/19 02:00:00 PM	23.064					
727	06/02/19 03:00:00 PM	23.280					
728	06/02/19 04:00:00 PM	23.472					
729	06/02/19 05:00:00 PM	23.665					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
730	06/02/19 06:00:00 PM	23.737					
731	06/02/19 07:00:00 PM	23.737					
732	06/02/19 08:00:00 PM	23.665					
733	06/02/19 09:00:00 PM	23.545					
734	06/02/19 10:00:00 PM	23.448					
735	06/02/19 11:00:00 PM	23.328					
736	06/03/19 12:00:00 AM	23.184					
737	06/03/19 01:00:00 AM	22.992					
738	06/03/19 02:00:00 AM	22.800					
739	06/03/19 03:00:00 AM	22.681					
740	06/03/19 04:00:00 AM	22.561					
741	06/03/19 05:00:00 AM	22.441					
742	06/03/19 06:00:00 AM	22.274					
743	06/03/19 07:00:00 AM	22.226					
744	06/03/19 08:00:00 AM	22.178					
745	06/03/19 09:00:00 AM	22.130					
746	06/03/19 10:00:00 AM	22.226					
747	06/03/19 11:00:00 AM	22.345					
748	06/03/19 12:00:00 PM	22.441					
749	06/03/19 01:00:00 PM	22.561					
750	06/03/19 02:00:00 PM	22.657					
751	06/03/19 03:00:00 PM	22.705					
752	06/03/19 04:00:00 PM	22.776					
753	06/03/19 05:00:00 PM	22.824					
754	06/03/19 06:00:00 PM	22.920					
755	06/03/19 07:00:00 PM	22.992					
756	06/03/19 08:00:00 PM	23.064					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
757	06/03/19 09:00:00 PM	23.112					
758	06/03/19 10:00:00 PM	23.232					
759	06/03/19 11:00:00 PM	23.304					
760	06/04/19 12:00:00 AM	23.328					
761	06/04/19 01:00:00 AM	23.352					
762	06/04/19 02:00:00 AM	23.352					
763	06/04/19 03:00:00 AM	23.352					
764	06/04/19 04:00:00 AM	23.328					
765	06/04/19 05:00:00 AM	23.328					
766	06/04/19 06:00:00 AM	23.328					
767	06/04/19 07:00:00 AM	23.352					
768	06/04/19 08:00:00 AM	23.280					
769	06/04/19 09:00:00 AM	23.208					
770	06/04/19 10:00:00 AM	23.112					
771	06/04/19 11:00:00 AM	23.088					
772	06/04/19 12:00:00 PM	23.088					
773	06/04/19 01:00:00 PM	23.112					
774	06/04/19 02:00:00 PM	23.160					
775	06/04/19 03:00:00 PM	23.160					
776	06/04/19 04:00:00 PM	23.136					
777	06/04/19 05:00:00 PM	23.112					
778	06/04/19 06:00:00 PM	23.064					
779	06/04/19 07:00:00 PM	23.088					
780	06/04/19 08:00:00 PM	23.112					
781	06/04/19 09:00:00 PM	23.112					
782	06/04/19 10:00:00 PM	23.112					
783	06/04/19 11:00:00 PM	23.112					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
784	06/05/19 12:00:00 AM	23.064					
785	06/05/19 01:00:00 AM	22.968					
786	06/05/19 02:00:00 AM	22.896					
787	06/05/19 03:00:00 AM	22.824					
788	06/05/19 04:00:00 AM	22.705					
789	06/05/19 05:00:00 AM	22.633					
790	06/05/19 06:00:00 AM	22.585					
791	06/05/19 07:00:00 AM	22.585					
792	06/05/19 08:00:00 AM	22.561					
793	06/05/19 09:00:00 AM	22.561					
794	06/05/19 10:00:00 AM	22.585					
795	06/05/19 11:00:00 AM	22.633					
796	06/05/19 12:00:00 PM	22.776					
797	06/05/19 01:00:00 PM	22.920					
798	06/05/19 02:00:00 PM	23.088					
799	06/05/19 03:00:00 PM	23.208					
800	06/05/19 04:00:00 PM	23.304					
801	06/05/19 05:00:00 PM	23.376					
802	06/05/19 06:00:00 PM	23.376					
803	06/05/19 07:00:00 PM	23.424					
804	06/05/19 08:00:00 PM	23.472					
805	06/05/19 09:00:00 PM	23.448					
806	06/05/19 10:00:00 PM	23.448					
807	06/05/19 11:00:00 PM	23.376					
808	06/06/19 12:00:00 AM	23.352					
809	06/06/19 01:00:00 AM	23.256					
810	06/06/19 02:00:00 AM	23.184					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
811	06/06/19 03:00:00 AM	23.088					
812	06/06/19 04:00:00 AM	23.016					
813	06/06/19 05:00:00 AM	22.944					
814	06/06/19 06:00:00 AM	22.920					
815	06/06/19 07:00:00 AM	22.896					
816	06/06/19 08:00:00 AM	22.872					
817	06/06/19 09:00:00 AM	22.920					
818	06/06/19 10:00:00 AM	22.944					
819	06/06/19 11:00:00 AM	23.040					
820	06/06/19 12:00:00 PM	23.160					
821	06/06/19 01:00:00 PM	23.184					
822	06/06/19 02:00:00 PM	23.208					
823	06/06/19 03:00:00 PM	23.256					
824	06/06/19 04:00:00 PM	23.280					
825	06/06/19 05:00:00 PM	23.328					
826	06/06/19 06:00:00 PM	23.376					
827	06/06/19 07:00:00 PM	23.400					
828	06/06/19 08:00:00 PM	23.448					
829	06/06/19 09:00:00 PM	23.424					
830	06/06/19 10:00:00 PM	23.424					
831	06/06/19 11:00:00 PM	23.352					
832	06/07/19 12:00:00 AM	23.304					
833	06/07/19 01:00:00 AM	23.184					
834	06/07/19 02:00:00 AM	23.088					
835	06/07/19 03:00:00 AM	22.992					
836	06/07/19 04:00:00 AM	22.872					
837	06/07/19 05:00:00 AM	22.753					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
838	06/07/19 06:00:00 AM	22.729					
839	06/07/19 07:00:00 AM	22.633					
840	06/07/19 08:00:00 AM	22.585					
841	06/07/19 09:00:00 AM	22.609					
842	06/07/19 10:00:00 AM	22.609					
843	06/07/19 11:00:00 AM	22.633					
844	06/07/19 12:00:00 PM	22.633					
845	06/07/19 01:00:00 PM	22.729					
846	06/07/19 02:00:00 PM	22.753					
847	06/07/19 03:00:00 PM	22.705					
848	06/07/19 04:00:00 PM	22.753					
849	06/07/19 05:00:00 PM	22.800					
850	06/07/19 06:00:00 PM	22.824					
851	06/07/19 07:00:00 PM	22.872					
852	06/07/19 08:00:00 PM	22.920					
853	06/07/19 09:00:00 PM	22.968					
854	06/07/19 10:00:00 PM	22.992					
855	06/07/19 11:00:00 PM	23.040					
856	06/08/19 12:00:00 AM	23.064					
857	06/08/19 01:00:00 AM	22.992					
858	06/08/19 02:00:00 AM	22.944					
859	06/08/19 03:00:00 AM	22.848					
860	06/08/19 04:00:00 AM	22.872					
861	06/08/19 05:00:00 AM	22.824					
862	06/08/19 06:00:00 AM	22.800					
863	06/08/19 07:00:00 AM	22.848					
864	06/08/19 08:00:00 AM	22.872					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
865	06/08/19 09:00:00 AM	22.920					
866	06/08/19 10:00:00 AM	22.992					
867	06/08/19 11:00:00 AM	23.088					
868	06/08/19 12:00:00 PM	23.136					
869	06/08/19 01:00:00 PM	23.184					
870	06/08/19 02:00:00 PM	23.256					
871	06/08/19 03:00:00 PM	23.328					
872	06/08/19 04:00:00 PM	23.400					
873	06/08/19 05:00:00 PM	23.497					
874	06/08/19 06:00:00 PM	23.545					
875	06/08/19 07:00:00 PM	23.569					
876	06/08/19 08:00:00 PM	23.545					
877	06/08/19 09:00:00 PM	23.497					
878	06/08/19 10:00:00 PM	23.424					
879	06/08/19 11:00:00 PM	23.376					
880	06/09/19 12:00:00 AM	23.304					
881	06/09/19 01:00:00 AM	23.208					
882	06/09/19 02:00:00 AM	23.088					
883	06/09/19 03:00:00 AM	22.968					
884	06/09/19 04:00:00 AM	22.896					
885	06/09/19 05:00:00 AM	22.800					
886	06/09/19 06:00:00 AM	22.776					
887	06/09/19 07:00:00 AM	22.776					
888	06/09/19 08:00:00 AM	22.800					
889	06/09/19 09:00:00 AM	22.753					
890	06/09/19 10:00:00 AM	22.848					
891	06/09/19 11:00:00 AM	22.896					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
892	06/09/19 12:00:00 PM	22.992					
893	06/09/19 01:00:00 PM	23.136					
894	06/09/19 02:00:00 PM	23.304					
895	06/09/19 03:00:00 PM	23.424					
896	06/09/19 04:00:00 PM	23.569					
897	06/09/19 05:00:00 PM	23.665					
898	06/09/19 06:00:00 PM	23.665					
899	06/09/19 07:00:00 PM	23.617					
900	06/09/19 08:00:00 PM	23.569					
901	06/09/19 09:00:00 PM	23.521					
902	06/09/19 10:00:00 PM	23.448					
903	06/09/19 11:00:00 PM	23.400					
904	06/10/19 12:00:00 AM	23.328					
905	06/10/19 01:00:00 AM	23.232					
906	06/10/19 02:00:00 AM	23.112					
907	06/10/19 03:00:00 AM	23.040					
908	06/10/19 04:00:00 AM	22.944					
909	06/10/19 05:00:00 AM	22.872					
910	06/10/19 06:00:00 AM	22.776					
911	06/10/19 07:00:00 AM	22.753					
912	06/10/19 08:00:00 AM	22.776					
913	06/10/19 09:00:00 AM	22.776					
914	06/10/19 10:00:00 AM	22.729					
915	06/10/19 11:00:00 AM	22.729					
916	06/10/19 12:00:00 PM	22.657					
917	06/10/19 01:00:00 PM	22.633					
918	06/10/19 02:00:00 PM	22.633					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
919	06/10/19 03:00:00 PM	22.633					
920	06/10/19 04:00:00 PM	22.657					
921	06/10/19 05:00:00 PM	22.657					
922	06/10/19 06:00:00 PM	22.681					
923	06/10/19 07:00:00 PM	22.705					
924	06/10/19 08:00:00 PM	22.776					
925	06/10/19 09:00:00 PM	22.872					
926	06/10/19 10:00:00 PM	22.968					
927	06/10/19 11:00:00 PM	23.064					
928	06/11/19 12:00:00 AM	23.160					
929	06/11/19 01:00:00 AM	23.256					
930	06/11/19 02:00:00 AM	23.280					
931	06/11/19 03:00:00 AM	23.304					
932	06/11/19 04:00:00 AM	23.304					
933	06/11/19 05:00:00 AM	23.328					
934	06/11/19 06:00:00 AM	23.352					
935	06/11/19 07:00:00 AM	23.328					
936	06/11/19 08:00:00 AM	23.352					
937	06/11/19 09:00:00 AM	23.328					
938	06/11/19 10:00:00 AM	23.232					
939	06/11/19 11:00:00 AM	23.136					
940	06/11/19 12:00:00 PM	23.136					
941	06/11/19 01:00:00 PM	23.112					
942	06/11/19 02:00:00 PM	23.088					
943	06/11/19 03:00:00 PM	23.040					
944	06/11/19 04:00:00 PM	23.040					
945	06/11/19 05:00:00 PM	23.016					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
946	06/11/19 06:00:00 PM	22.920					
947	06/11/19 07:00:00 PM	22.968					
948	06/11/19 08:00:00 PM	23.016					
949	06/11/19 09:00:00 PM	23.088					
950	06/11/19 10:00:00 PM	23.088					
951	06/11/19 11:00:00 PM	23.160					
952	06/12/19 12:00:00 AM	23.088					
953	06/12/19 01:00:00 AM	23.016					
954	06/12/19 02:00:00 AM	23.016					
955	06/12/19 03:00:00 AM	22.920					
956	06/12/19 04:00:00 AM	22.800					
957	06/12/19 05:00:00 AM	22.705					
958	06/12/19 06:00:00 AM	22.609					
959	06/12/19 07:00:00 AM	22.609					
960	06/12/19 08:00:00 AM	22.609					
961	06/12/19 09:00:00 AM	22.705					
962	06/12/19 10:00:00 AM	22.753					
963	06/12/19 11:00:00 AM	22.800					
964	06/12/19 12:00:00 PM	22.920					
965	06/12/19 01:00:00 PM	22.968					
966	06/12/19 02:00:00 PM	23.040					
967	06/12/19 03:00:00 PM	23.064					
968	06/12/19 04:00:00 PM	23.040					
969	06/12/19 05:00:00 PM	23.064					
970	06/12/19 06:00:00 PM	22.992					
971	06/12/19 07:00:00 PM	23.040					
972	06/12/19 08:00:00 PM	23.064					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
973	06/12/19 09:00:00 PM	23.040					
974	06/12/19 10:00:00 PM	23.016					
975	06/12/19 11:00:00 PM	22.968					
976	06/13/19 12:00:00 AM	22.920					
977	06/13/19 01:00:00 AM	22.848					
978	06/13/19 02:00:00 AM	22.800					
979	06/13/19 03:00:00 AM	22.800					
980	06/13/19 04:00:00 AM	22.776					
981	06/13/19 05:00:00 AM	22.776					
982	06/13/19 06:00:00 AM	22.729					
983	06/13/19 07:00:00 AM	22.800					
984	06/13/19 08:00:00 AM	22.920					
985	06/13/19 09:00:00 AM	22.872					
986	06/13/19 10:00:00 AM	22.753					
987	06/13/19 11:00:00 AM	22.776					
988	06/13/19 12:00:00 PM	22.729					
989	06/13/19 01:00:00 PM	22.681					
990	06/13/19 02:00:00 PM	22.753					
991	06/13/19 03:00:00 PM	22.753					
992	06/13/19 04:00:00 PM	22.729					
993	06/13/19 05:00:00 PM	22.729					
994	06/13/19 06:00:00 PM	22.705					
995	06/13/19 07:00:00 PM	22.729					
996	06/13/19 08:00:00 PM	22.753					
997	06/13/19 09:00:00 PM	22.753					
998	06/13/19 10:00:00 PM	22.824					
999	06/13/19 11:00:00 PM	22.824					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
1000	06/14/19 12:00:00 AM	22.776					
1001	06/14/19 01:00:00 AM	22.776					
1002	06/14/19 02:00:00 AM	22.729					
1003	06/14/19 03:00:00 AM	22.729					
1004	06/14/19 04:00:00 AM	22.681					
1005	06/14/19 05:00:00 AM	22.633					
1006	06/14/19 06:00:00 AM	22.609					
1007	06/14/19 07:00:00 AM	22.633					
1008	06/14/19 08:00:00 AM	22.681					
1009	06/14/19 09:00:00 AM	22.729					
1010	06/14/19 10:00:00 AM	22.776					
1011	06/14/19 11:00:00 AM	22.657					
1012	06/14/19 12:00:00 PM	22.441					
1013	06/14/19 01:00:00 PM	22.321					
1014	06/14/19 02:00:00 PM	22.369					
1015	06/14/19 03:00:00 PM	22.250					
1016	06/14/19 04:00:00 PM	22.154					
1017	06/14/19 05:00:00 PM	22.106					
1018	06/14/19 06:00:00 PM	22.058					
1019	06/14/19 07:00:00 PM	22.106					
1020	06/14/19 08:00:00 PM	22.130					
1021	06/14/19 09:00:00 PM	22.130					
1022	06/14/19 10:00:00 PM	22.058					
1023	06/14/19 11:00:00 PM	22.058					
1024	06/15/19 12:00:00 AM	21.939					
1025	06/15/19 01:00:00 AM	21.891					
1026	06/15/19 02:00:00 AM	21.819					

Bath #3

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
1	05/03/19 09:00:00 AM	22.298	Logged				
2	05/03/19 10:00:00 AM	22.537					
3	05/03/19 11:00:00 AM	23.160					
4	05/03/19 12:00:00 PM	23.448					
5	05/03/19 01:00:00 PM	23.593					
6	05/03/19 02:00:00 PM	23.737					
7	05/03/19 03:00:00 PM	23.905					
8	05/03/19 04:00:00 PM	24.074					
9	05/03/19 05:00:00 PM	24.171					
10	05/03/19 06:00:00 PM	24.243					
11	05/03/19 07:00:00 PM	24.412					
12	05/03/19 08:00:00 PM	24.508					
13	05/03/19 09:00:00 PM	24.605					
14	05/03/19 10:00:00 PM	24.726					
15	05/03/19 11:00:00 PM	24.798					
16	05/04/19 12:00:00 AM	24.798					
17	05/04/19 01:00:00 AM	24.726					
18	05/04/19 02:00:00 AM	24.677					
19	05/04/19 03:00:00 AM	24.605					
20	05/04/19 04:00:00 AM	24.532					
21	05/04/19 05:00:00 AM	24.460					
22	05/04/19 06:00:00 AM	24.412					
23	05/04/19 07:00:00 AM	24.484					
24	05/04/19 08:00:00 AM	24.460					
25	05/04/19 09:00:00 AM	24.532					
26	05/04/19 10:00:00 AM	24.557					
27	05/04/19 11:00:00 AM	24.412					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
28	05/04/19 12:00:00 PM	24.315					
29	05/04/19 01:00:00 PM	24.243					
30	05/04/19 02:00:00 PM	24.243					
31	05/04/19 03:00:00 PM	24.267					
32	05/04/19 04:00:00 PM	24.315					
33	05/04/19 05:00:00 PM	24.339					
34	05/04/19 06:00:00 PM	24.363					
35	05/04/19 07:00:00 PM	24.388					
36	05/04/19 08:00:00 PM	24.388					
37	05/04/19 09:00:00 PM	24.363					
38	05/04/19 10:00:00 PM	24.315					
39	05/04/19 11:00:00 PM	24.267					
40	05/05/19 12:00:00 AM	24.146					
41	05/05/19 01:00:00 AM	24.026					
42	05/05/19 02:00:00 AM	23.881					
43	05/05/19 03:00:00 AM	23.761					
44	05/05/19 04:00:00 AM	23.689					
45	05/05/19 05:00:00 AM	23.569					
46	05/05/19 06:00:00 AM	23.497					
47	05/05/19 07:00:00 AM	23.521					
48	05/05/19 08:00:00 AM	23.497					
49	05/05/19 09:00:00 AM	23.497					
50	05/05/19 10:00:00 AM	23.472					
51	05/05/19 11:00:00 AM	23.472					
52	05/05/19 12:00:00 PM	23.545					
53	05/05/19 01:00:00 PM	23.569					
54	05/05/19 02:00:00 PM	23.617					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
55	05/05/19 03:00:00 PM	23.689					
56	05/05/19 04:00:00 PM	23.689					
57	05/05/19 05:00:00 PM	23.737					
58	05/05/19 06:00:00 PM	23.785					
59	05/05/19 07:00:00 PM	23.809					
60	05/05/19 08:00:00 PM	23.809					
61	05/05/19 09:00:00 PM	23.809					
62	05/05/19 10:00:00 PM	23.785					
63	05/05/19 11:00:00 PM	23.785					
64	05/06/19 12:00:00 AM	23.689					
65	05/06/19 01:00:00 AM	23.641					
66	05/06/19 02:00:00 AM	23.593					
67	05/06/19 03:00:00 AM	23.521					
68	05/06/19 04:00:00 AM	23.472					
69	05/06/19 05:00:00 AM	23.400					
70	05/06/19 06:00:00 AM	23.304					
71	05/06/19 07:00:00 AM	23.280					
72	05/06/19 08:00:00 AM	23.232					
73	05/06/19 09:00:00 AM	23.280					
74	05/06/19 10:00:00 AM	23.352					
75	05/06/19 11:00:00 AM	23.448					
76	05/06/19 12:00:00 PM	23.593					
77	05/06/19 01:00:00 PM	23.761					
78	05/06/19 02:00:00 PM	23.857					
79	05/06/19 03:00:00 PM	23.930					
80	05/06/19 04:00:00 PM	23.930					
81	05/06/19 05:00:00 PM	23.954					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
82	05/06/19 06:00:00 PM	23.978					
83	05/06/19 07:00:00 PM	23.978					
84	05/06/19 08:00:00 PM	23.978					
85	05/06/19 09:00:00 PM	24.074					
86	05/06/19 10:00:00 PM	24.098					
87	05/06/19 11:00:00 PM	24.122					
88	05/07/19 12:00:00 AM	24.122					
89	05/07/19 01:00:00 AM	24.002					
90	05/07/19 02:00:00 AM	23.930					
91	05/07/19 03:00:00 AM	23.785					
92	05/07/19 04:00:00 AM	23.689					
93	05/07/19 05:00:00 AM	23.593					
94	05/07/19 06:00:00 AM	23.497					
95	05/07/19 07:00:00 AM	23.545					
96	05/07/19 08:00:00 AM	23.569					
97	05/07/19 09:00:00 AM	23.593					
98	05/07/19 10:00:00 AM	23.569					
99	05/07/19 11:00:00 AM	23.593					
100	05/07/19 12:00:00 PM	23.665					
101	05/07/19 01:00:00 PM	23.761					
102	05/07/19 02:00:00 PM	23.857					
103	05/07/19 03:00:00 PM	23.978					
104	05/07/19 04:00:00 PM	24.050					
105	05/07/19 05:00:00 PM	24.098					
106	05/07/19 06:00:00 PM	24.146					
107	05/07/19 07:00:00 PM	24.171					
108	05/07/19 08:00:00 PM	24.219					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
109	05/07/19 09:00:00 PM	24.219					
110	05/07/19 10:00:00 PM	24.291					
111	05/07/19 11:00:00 PM	24.291					
112	05/08/19 12:00:00 AM	24.267					
113	05/08/19 01:00:00 AM	24.195					
114	05/08/19 02:00:00 AM	24.122					
115	05/08/19 03:00:00 AM	24.074					
116	05/08/19 04:00:00 AM	24.002					
117	05/08/19 05:00:00 AM	23.954					
118	05/08/19 06:00:00 AM	23.881					
119	05/08/19 07:00:00 AM	23.930					
120	05/08/19 08:00:00 AM	23.905					
121	05/08/19 09:00:00 AM	23.930					
122	05/08/19 10:00:00 AM	23.978					
123	05/08/19 11:00:00 AM	23.978					
124	05/08/19 12:00:00 PM	24.002					
125	05/08/19 01:00:00 PM	23.978					
126	05/08/19 02:00:00 PM	24.026					
127	05/08/19 03:00:00 PM	24.050					
128	05/08/19 04:00:00 PM	24.098					
129	05/08/19 05:00:00 PM	24.122					
130	05/08/19 06:00:00 PM	24.098					
131	05/08/19 07:00:00 PM	24.098					
132	05/08/19 08:00:00 PM	24.074					
133	05/08/19 09:00:00 PM	24.098					
134	05/08/19 10:00:00 PM	24.146					
135	05/08/19 11:00:00 PM	24.122					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
136	05/09/19 12:00:00 AM	24.074					
137	05/09/19 01:00:00 AM	23.978					
138	05/09/19 02:00:00 AM	23.857					
139	05/09/19 03:00:00 AM	23.737					
140	05/09/19 04:00:00 AM	23.641					
141	05/09/19 05:00:00 AM	23.521					
142	05/09/19 06:00:00 AM	23.424					
143	05/09/19 07:00:00 AM	23.497					
144	05/09/19 08:00:00 AM	23.497					
145	05/09/19 09:00:00 AM	23.545					
146	05/09/19 10:00:00 AM	23.593					
147	05/09/19 11:00:00 AM	23.593					
148	05/09/19 12:00:00 PM	23.617					
149	05/09/19 01:00:00 PM	23.689					
150	05/09/19 02:00:00 PM	23.641					
151	05/09/19 03:00:00 PM	23.641					
152	05/09/19 04:00:00 PM	23.593					
153	05/09/19 05:00:00 PM	23.545					
154	05/09/19 06:00:00 PM	23.521					
155	05/09/19 07:00:00 PM	23.497					
156	05/09/19 08:00:00 PM	23.569					
157	05/09/19 09:00:00 PM	23.593					
158	05/09/19 10:00:00 PM	23.617					
159	05/09/19 11:00:00 PM	23.617					
160	05/10/19 12:00:00 AM	23.593					
161	05/10/19 01:00:00 AM	23.569					
162	05/10/19 02:00:00 AM	23.472					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
163	05/10/19 03:00:00 AM	23.400					
164	05/10/19 04:00:00 AM	23.328					
165	05/10/19 05:00:00 AM	23.304					
166	05/10/19 06:00:00 AM	23.256					
167	05/10/19 07:00:00 AM	23.328					
168	05/10/19 08:00:00 AM	23.400					
169	05/10/19 09:00:00 AM	23.641					
170	05/10/19 10:00:00 AM	23.713					
171	05/10/19 11:00:00 AM	23.593					
172	05/10/19 12:00:00 PM	23.641					
173	05/10/19 01:00:00 PM	23.713					
174	05/10/19 02:00:00 PM	23.689					
175	05/10/19 03:00:00 PM	23.737					
176	05/10/19 04:00:00 PM	23.809					
177	05/10/19 05:00:00 PM	23.881					
178	05/10/19 06:00:00 PM	23.905					
179	05/10/19 07:00:00 PM	23.905					
180	05/10/19 08:00:00 PM	23.930					
181	05/10/19 09:00:00 PM	24.026					
182	05/10/19 10:00:00 PM	24.050					
183	05/10/19 11:00:00 PM	24.074					
184	05/11/19 12:00:00 AM	24.146					
185	05/11/19 01:00:00 AM	24.098					
186	05/11/19 02:00:00 AM	24.074					
187	05/11/19 03:00:00 AM	24.026					
188	05/11/19 04:00:00 AM	23.978					
189	05/11/19 05:00:00 AM	23.930					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
190	05/11/19 06:00:00 AM	23.881					
191	05/11/19 07:00:00 AM	23.930					
192	05/11/19 08:00:00 AM	23.905					
193	05/11/19 09:00:00 AM	23.905					
194	05/11/19 10:00:00 AM	23.954					
195	05/11/19 11:00:00 AM	24.074					
196	05/11/19 12:00:00 PM	24.146					
197	05/11/19 01:00:00 PM	24.315					
198	05/11/19 02:00:00 PM	24.412					
199	05/11/19 03:00:00 PM	24.508					
200	05/11/19 04:00:00 PM	24.629					
201	05/11/19 05:00:00 PM	24.677					
202	05/11/19 06:00:00 PM	24.702					
203	05/11/19 07:00:00 PM	24.677					
204	05/11/19 08:00:00 PM	24.629					
205	05/11/19 09:00:00 PM	24.532					
206	05/11/19 10:00:00 PM	24.460					
207	05/11/19 11:00:00 PM	24.363					
208	05/12/19 12:00:00 AM	24.267					
209	05/12/19 01:00:00 AM	24.146					
210	05/12/19 02:00:00 AM	24.002					
211	05/12/19 03:00:00 AM	23.881					
212	05/12/19 04:00:00 AM	23.761					
213	05/12/19 05:00:00 AM	23.689					
214	05/12/19 06:00:00 AM	23.617					
215	05/12/19 07:00:00 AM	23.617					
216	05/12/19 08:00:00 AM	23.593					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
217	05/12/19 09:00:00 AM	23.593					
218	05/12/19 10:00:00 AM	23.521					
219	05/12/19 11:00:00 AM	23.641					
220	05/12/19 12:00:00 PM	23.689					
221	05/12/19 01:00:00 PM	23.761					
222	05/12/19 02:00:00 PM	23.833					
223	05/12/19 03:00:00 PM	23.905					
224	05/12/19 04:00:00 PM	23.930					
225	05/12/19 05:00:00 PM	23.978					
226	05/12/19 06:00:00 PM	24.074					
227	05/12/19 07:00:00 PM	24.074					
228	05/12/19 08:00:00 PM	24.098					
229	05/12/19 09:00:00 PM	24.122					
230	05/12/19 10:00:00 PM	24.146					
231	05/12/19 11:00:00 PM	24.171					
232	05/13/19 12:00:00 AM	24.122					
233	05/13/19 01:00:00 AM	24.050					
234	05/13/19 02:00:00 AM	23.954					
235	05/13/19 03:00:00 AM	23.905					
236	05/13/19 04:00:00 AM	23.833					
237	05/13/19 05:00:00 AM	23.761					
238	05/13/19 06:00:00 AM	23.689					
239	05/13/19 07:00:00 AM	23.737					
240	05/13/19 08:00:00 AM	23.833					
241	05/13/19 09:00:00 AM	23.930					
242	05/13/19 10:00:00 AM	24.026					
243	05/13/19 11:00:00 AM	24.074					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
244	05/13/19 12:00:00 PM	24.050					
245	05/13/19 01:00:00 PM	24.074					
246	05/13/19 02:00:00 PM	24.098					
247	05/13/19 03:00:00 PM	24.122					
248	05/13/19 04:00:00 PM	24.146					
249	05/13/19 05:00:00 PM	24.122					
250	05/13/19 06:00:00 PM	24.146					
251	05/13/19 07:00:00 PM	24.171					
252	05/13/19 08:00:00 PM	24.219					
253	05/13/19 09:00:00 PM	24.267					
254	05/13/19 10:00:00 PM	24.339					
255	05/13/19 11:00:00 PM	24.315					
256	05/14/19 12:00:00 AM	24.339					
257	05/14/19 01:00:00 AM	24.291					
258	05/14/19 02:00:00 AM	24.267					
259	05/14/19 03:00:00 AM	24.219					
260	05/14/19 04:00:00 AM	24.195					
261	05/14/19 05:00:00 AM	24.146					
262	05/14/19 06:00:00 AM	24.122					
263	05/14/19 07:00:00 AM	24.122					
264	05/14/19 08:00:00 AM	24.146					
265	05/14/19 09:00:00 AM	24.219					
266	05/14/19 10:00:00 AM	24.074					
267	05/14/19 11:00:00 AM	24.050					
268	05/14/19 12:00:00 PM	24.050					
269	05/14/19 01:00:00 PM	24.026					
270	05/14/19 02:00:00 PM	24.122					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
271	05/14/19 03:00:00 PM	23.978					
272	05/14/19 04:00:00 PM	24.026					
273	05/14/19 05:00:00 PM	24.195					
274	05/14/19 06:00:00 PM	24.098					
275	05/14/19 07:00:00 PM	24.098					
276	05/14/19 08:00:00 PM	24.050					
277	05/14/19 09:00:00 PM	24.122					
278	05/14/19 10:00:00 PM	24.050					
279	05/14/19 11:00:00 PM	24.074					
280	05/15/19 12:00:00 AM	23.978					
281	05/15/19 01:00:00 AM	23.881					
282	05/15/19 02:00:00 AM	23.809					
283	05/15/19 03:00:00 AM	23.761					
284	05/15/19 04:00:00 AM	23.737					
285	05/15/19 05:00:00 AM	23.713					
286	05/15/19 06:00:00 AM	23.713					
287	05/15/19 07:00:00 AM	23.761					
288	05/15/19 08:00:00 AM	23.857					
289	05/15/19 09:00:00 AM	23.833					
290	05/15/19 10:00:00 AM	23.833					
291	05/15/19 11:00:00 AM	23.857					
292	05/15/19 12:00:00 PM	23.954					
293	05/15/19 01:00:00 PM	24.050					
294	05/15/19 02:00:00 PM	24.050					
295	05/15/19 03:00:00 PM	24.026					
296	05/15/19 04:00:00 PM	24.002					
297	05/15/19 05:00:00 PM	23.954					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
298	05/15/19 06:00:00 PM	23.954					
299	05/15/19 07:00:00 PM	23.954					
300	05/15/19 08:00:00 PM	23.978					
301	05/15/19 09:00:00 PM	24.026					
302	05/15/19 10:00:00 PM	24.098					
303	05/15/19 11:00:00 PM	24.098					
304	05/16/19 12:00:00 AM	24.074					
305	05/16/19 01:00:00 AM	24.002					
306	05/16/19 02:00:00 AM	23.978					
307	05/16/19 03:00:00 AM	23.930					
308	05/16/19 04:00:00 AM	23.905					
309	05/16/19 05:00:00 AM	23.881					
310	05/16/19 06:00:00 AM	23.857					
311	05/16/19 07:00:00 AM	23.954					
312	05/16/19 08:00:00 AM	23.954					
313	05/16/19 09:00:00 AM	23.881					
314	05/16/19 10:00:00 AM	23.881					
315	05/16/19 11:00:00 AM	23.833					
316	05/16/19 12:00:00 PM	23.881					
317	05/16/19 01:00:00 PM	23.881					
318	05/16/19 02:00:00 PM	23.905					
319	05/16/19 03:00:00 PM	23.978					
320	05/16/19 04:00:00 PM	23.978					
321	05/16/19 05:00:00 PM	24.050					
322	05/16/19 06:00:00 PM	24.026					
323	05/16/19 07:00:00 PM	24.050					
324	05/16/19 08:00:00 PM	24.050					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
325	05/16/19 09:00:00 PM	24.074					
326	05/16/19 10:00:00 PM	24.074					
327	05/16/19 11:00:00 PM	24.074					
328	05/17/19 12:00:00 AM	24.002					
329	05/17/19 01:00:00 AM	23.930					
330	05/17/19 02:00:00 AM	23.881					
331	05/17/19 03:00:00 AM	23.809					
332	05/17/19 04:00:00 AM	23.809					
333	05/17/19 05:00:00 AM	23.761					
334	05/17/19 06:00:00 AM	23.761					
335	05/17/19 07:00:00 AM	23.857					
336	05/17/19 08:00:00 AM	23.954					
337	05/17/19 09:00:00 AM	23.905					
338	05/17/19 10:00:00 AM	24.026					
339	05/17/19 11:00:00 AM	24.026					
340	05/17/19 12:00:00 PM	24.026					
341	05/17/19 01:00:00 PM	24.002					
342	05/17/19 02:00:00 PM	23.978					
343	05/17/19 03:00:00 PM	23.954					
344	05/17/19 04:00:00 PM	23.978					
345	05/17/19 05:00:00 PM	23.954					
346	05/17/19 06:00:00 PM	23.833					
347	05/17/19 07:00:00 PM	23.785					
348	05/17/19 08:00:00 PM	23.737					
349	05/17/19 09:00:00 PM	23.689					
350	05/17/19 10:00:00 PM	23.689					
351	05/17/19 11:00:00 PM	23.689					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
352	05/18/19 12:00:00 AM	23.689					
353	05/18/19 01:00:00 AM	23.641					
354	05/18/19 02:00:00 AM	23.545					
355	05/18/19 03:00:00 AM	23.497					
356	05/18/19 04:00:00 AM	23.497					
357	05/18/19 05:00:00 AM	23.448					
358	05/18/19 06:00:00 AM	23.472					
359	05/18/19 07:00:00 AM	23.617					
360	05/18/19 08:00:00 AM	23.641					
361	05/18/19 09:00:00 AM	23.737					
362	05/18/19 10:00:00 AM	23.761					
363	05/18/19 11:00:00 AM	23.761					
364	05/18/19 12:00:00 PM	23.809					
365	05/18/19 01:00:00 PM	23.905					
366	05/18/19 02:00:00 PM	23.930					
367	05/18/19 03:00:00 PM	24.002					
368	05/18/19 04:00:00 PM	24.098					
369	05/18/19 05:00:00 PM	24.219					
370	05/18/19 06:00:00 PM	24.339					
371	05/18/19 07:00:00 PM	24.412					
372	05/18/19 08:00:00 PM	24.388					
373	05/18/19 09:00:00 PM	24.363					
374	05/18/19 10:00:00 PM	24.243					
375	05/18/19 11:00:00 PM	24.195					
376	05/19/19 12:00:00 AM	24.074					
377	05/19/19 01:00:00 AM	23.930					
378	05/19/19 02:00:00 AM	23.809					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
379	05/19/19 03:00:00 AM	23.713					
380	05/19/19 04:00:00 AM	23.641					
381	05/19/19 05:00:00 AM	23.617					
382	05/19/19 06:00:00 AM	23.545					
383	05/19/19 07:00:00 AM	23.713					
384	05/19/19 08:00:00 AM	23.809					
385	05/19/19 09:00:00 AM	23.905					
386	05/19/19 10:00:00 AM	24.026					
387	05/19/19 11:00:00 AM	24.074					
388	05/19/19 12:00:00 PM	24.171					
389	05/19/19 01:00:00 PM	24.291					
390	05/19/19 02:00:00 PM	24.460					
391	05/19/19 03:00:00 PM	24.581					
392	05/19/19 04:00:00 PM	24.702					
393	05/19/19 05:00:00 PM	24.798					
394	05/19/19 06:00:00 PM	24.871					
395	05/19/19 07:00:00 PM	24.895					
396	05/19/19 08:00:00 PM	24.895					
397	05/19/19 09:00:00 PM	24.847					
398	05/19/19 10:00:00 PM	24.798					
399	05/19/19 11:00:00 PM	24.702					
400	05/20/19 12:00:00 AM	24.629					
401	05/20/19 01:00:00 AM	24.508					
402	05/20/19 02:00:00 AM	24.388					
403	05/20/19 03:00:00 AM	24.219					
404	05/20/19 04:00:00 AM	24.098					
405	05/20/19 05:00:00 AM	24.002					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
406	05/20/19 06:00:00 AM	23.809					
407	05/20/19 07:00:00 AM	23.833					
408	05/20/19 08:00:00 AM	23.737					
409	05/20/19 09:00:00 AM	23.737					
410	05/20/19 10:00:00 AM	23.641					
411	05/20/19 11:00:00 AM	23.641					
412	05/20/19 12:00:00 PM	23.785					
413	05/20/19 01:00:00 PM	23.833					
414	05/20/19 02:00:00 PM	23.905					
415	05/20/19 03:00:00 PM	24.002					
416	05/20/19 04:00:00 PM	24.098					
417	05/20/19 05:00:00 PM	24.146					
418	05/20/19 06:00:00 PM	24.146					
419	05/20/19 07:00:00 PM	24.146					
420	05/20/19 08:00:00 PM	24.219					
421	05/20/19 09:00:00 PM	24.219					
422	05/20/19 10:00:00 PM	24.171					
423	05/20/19 11:00:00 PM	24.146					
424	05/21/19 12:00:00 AM	24.146					
425	05/21/19 01:00:00 AM	24.026					
426	05/21/19 02:00:00 AM	23.809					
427	05/21/19 03:00:00 AM	23.713					
428	05/21/19 04:00:00 AM	23.593					
429	05/21/19 05:00:00 AM	23.497					
430	05/21/19 06:00:00 AM	23.448					
431	05/21/19 07:00:00 AM	23.545					
432	05/21/19 08:00:00 AM	23.545					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
433	05/21/19 09:00:00 AM	23.472					
434	05/21/19 10:00:00 AM	23.472					
435	05/21/19 11:00:00 AM	23.424					
436	05/21/19 12:00:00 PM	23.448					
437	05/21/19 01:00:00 PM	23.472					
438	05/21/19 02:00:00 PM	23.497					
439	05/21/19 03:00:00 PM	23.569					
440	05/21/19 04:00:00 PM	23.569					
441	05/21/19 05:00:00 PM	23.641					
442	05/21/19 06:00:00 PM	23.593					
443	05/21/19 07:00:00 PM	23.569					
444	05/21/19 08:00:00 PM	23.569					
445	05/21/19 09:00:00 PM	23.545					
446	05/21/19 10:00:00 PM	23.593					
447	05/21/19 11:00:00 PM	23.593					
448	05/22/19 12:00:00 AM	23.448					
449	05/22/19 01:00:00 AM	23.328					
450	05/22/19 02:00:00 AM	23.208					
451	05/22/19 03:00:00 AM	23.040					
452	05/22/19 04:00:00 AM	22.872					
453	05/22/19 05:00:00 AM	22.705					
454	05/22/19 06:00:00 AM	22.585					
455	05/22/19 07:00:00 AM	22.657					
456	05/22/19 08:00:00 AM	22.585					
457	05/22/19 09:00:00 AM	22.776					
458	05/22/19 10:00:00 AM	22.920					
459	05/22/19 11:00:00 AM	23.112					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
460	05/22/19 12:00:00 PM	23.304					
461	05/22/19 01:00:00 PM	23.472					
462	05/22/19 02:00:00 PM	23.641					
463	05/22/19 03:00:00 PM	23.737					
464	05/22/19 04:00:00 PM	23.809					
465	05/22/19 05:00:00 PM	23.857					
466	05/22/19 06:00:00 PM	23.833					
467	05/22/19 07:00:00 PM	23.785					
468	05/22/19 08:00:00 PM	23.737					
469	05/22/19 09:00:00 PM	23.713					
470	05/22/19 10:00:00 PM	23.689					
471	05/22/19 11:00:00 PM	23.593					
472	05/23/19 12:00:00 AM	23.448					
473	05/23/19 01:00:00 AM	23.352					
474	05/23/19 02:00:00 AM	23.112					
475	05/23/19 03:00:00 AM	23.064					
476	05/23/19 04:00:00 AM	22.992					
477	05/23/19 05:00:00 AM	22.992					
478	05/23/19 06:00:00 AM	22.992					
479	05/23/19 07:00:00 AM	23.184					
480	05/23/19 08:00:00 AM	23.160					
481	05/23/19 09:00:00 AM	23.328					
482	05/23/19 10:00:00 AM	23.304					
483	05/23/19 11:00:00 AM	23.328					
484	05/23/19 12:00:00 PM	23.424					
485	05/23/19 01:00:00 PM	23.497					
486	05/23/19 02:00:00 PM	23.617					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
487	05/23/19 03:00:00 PM	23.665					
488	05/23/19 04:00:00 PM	23.737					
489	05/23/19 05:00:00 PM	23.689					
490	05/23/19 06:00:00 PM	23.689					
491	05/23/19 07:00:00 PM	23.689					
492	05/23/19 08:00:00 PM	23.737					
493	05/23/19 09:00:00 PM	23.761					
494	05/23/19 10:00:00 PM	23.785					
495	05/23/19 11:00:00 PM	23.809					
496	05/24/19 12:00:00 AM	23.737					
497	05/24/19 01:00:00 AM	23.665					
498	05/24/19 02:00:00 AM	23.593					
499	05/24/19 03:00:00 AM	23.472					
500	05/24/19 04:00:00 AM	23.400					
501	05/24/19 05:00:00 AM	23.352					
502	05/24/19 06:00:00 AM	23.328					
503	05/24/19 07:00:00 AM	23.424					
504	05/24/19 08:00:00 AM	23.448					
505	05/24/19 09:00:00 AM	23.521					
506	05/24/19 10:00:00 AM	23.569					
507	05/24/19 11:00:00 AM	23.569					
508	05/24/19 12:00:00 PM	23.545					
509	05/24/19 01:00:00 PM	23.593					
510	05/24/19 02:00:00 PM	23.617					
511	05/24/19 03:00:00 PM	23.689					
512	05/24/19 04:00:00 PM	23.665					
513	05/24/19 05:00:00 PM	23.689					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
514	05/24/19 06:00:00 PM	23.809					
515	05/24/19 07:00:00 PM	23.905					
516	05/24/19 08:00:00 PM	23.978					
517	05/24/19 09:00:00 PM	23.978					
518	05/24/19 10:00:00 PM	23.954					
519	05/24/19 11:00:00 PM	23.954					
520	05/25/19 12:00:00 AM	23.905					
521	05/25/19 01:00:00 AM	23.761					
522	05/25/19 02:00:00 AM	23.641					
523	05/25/19 03:00:00 AM	23.448					
524	05/25/19 04:00:00 AM	23.376					
525	05/25/19 05:00:00 AM	23.256					
526	05/25/19 06:00:00 AM	23.136					
527	05/25/19 07:00:00 AM	23.184					
528	05/25/19 08:00:00 AM	23.256					
529	05/25/19 09:00:00 AM	23.400					
530	05/25/19 10:00:00 AM	23.448					
531	05/25/19 11:00:00 AM	23.472					
532	05/25/19 12:00:00 PM	23.593					
533	05/25/19 01:00:00 PM	23.689					
534	05/25/19 02:00:00 PM	23.857					
535	05/25/19 03:00:00 PM	24.026					
536	05/25/19 04:00:00 PM	24.146					
537	05/25/19 05:00:00 PM	24.267					
538	05/25/19 06:00:00 PM	24.363					
539	05/25/19 07:00:00 PM	24.436					
540	05/25/19 08:00:00 PM	24.460					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
541	05/25/19 09:00:00 PM	24.412					
542	05/25/19 10:00:00 PM	24.291					
543	05/25/19 11:00:00 PM	24.219					
544	05/26/19 12:00:00 AM	24.074					
545	05/26/19 01:00:00 AM	23.905					
546	05/26/19 02:00:00 AM	23.737					
547	05/26/19 03:00:00 AM	23.593					
548	05/26/19 04:00:00 AM	23.497					
549	05/26/19 05:00:00 AM	23.400					
550	05/26/19 06:00:00 AM	23.424					
551	05/26/19 07:00:00 AM	23.448					
552	05/26/19 08:00:00 AM	23.569					
553	05/26/19 09:00:00 AM	23.593					
554	05/26/19 10:00:00 AM	23.713					
555	05/26/19 11:00:00 AM	23.809					
556	05/26/19 12:00:00 PM	23.978					
557	05/26/19 01:00:00 PM	23.930					
558	05/26/19 02:00:00 PM	24.195					
559	05/26/19 03:00:00 PM	24.484					
560	05/26/19 04:00:00 PM	24.677					
561	05/26/19 05:00:00 PM	24.726					
562	05/26/19 06:00:00 PM	24.798					
563	05/26/19 07:00:00 PM	24.798					
564	05/26/19 08:00:00 PM	24.774					
565	05/26/19 09:00:00 PM	24.702					
566	05/26/19 10:00:00 PM	24.605					
567	05/26/19 11:00:00 PM	24.508					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
568	05/27/19 12:00:00 AM	24.388					
569	05/27/19 01:00:00 AM	24.195					
570	05/27/19 02:00:00 AM	24.002					
571	05/27/19 03:00:00 AM	23.833					
572	05/27/19 04:00:00 AM	23.713					
573	05/27/19 05:00:00 AM	23.593					
574	05/27/19 06:00:00 AM	23.376					
575	05/27/19 07:00:00 AM	23.472					
576	05/27/19 08:00:00 AM	23.497					
577	05/27/19 09:00:00 AM	23.569					
578	05/27/19 10:00:00 AM	23.785					
579	05/27/19 11:00:00 AM	23.881					
580	05/27/19 12:00:00 PM	23.954					
581	05/27/19 01:00:00 PM	24.098					
582	05/27/19 02:00:00 PM	24.219					
583	05/27/19 03:00:00 PM	24.388					
584	05/27/19 04:00:00 PM	24.557					
585	05/27/19 05:00:00 PM	24.677					
586	05/27/19 06:00:00 PM	24.774					
587	05/27/19 07:00:00 PM	24.847					
588	05/27/19 08:00:00 PM	24.895					
589	05/27/19 09:00:00 PM	24.919					
590	05/27/19 10:00:00 PM	24.847					
591	05/27/19 11:00:00 PM	24.702					
592	05/28/19 12:00:00 AM	24.581					
593	05/28/19 01:00:00 AM	24.388					
594	05/28/19 02:00:00 AM	24.171					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
595	05/28/19 03:00:00 AM	23.954					
596	05/28/19 04:00:00 AM	23.761					
597	05/28/19 05:00:00 AM	23.641					
598	05/28/19 06:00:00 AM	23.521					
599	05/28/19 07:00:00 AM	23.497					
600	05/28/19 08:00:00 AM	23.472					
601	05/28/19 09:00:00 AM	23.497					
602	05/28/19 10:00:00 AM	23.497					
603	05/28/19 11:00:00 AM	23.424					
604	05/28/19 12:00:00 PM	23.376					
605	05/28/19 01:00:00 PM	23.352					
606	05/28/19 02:00:00 PM	23.328					
607	05/28/19 03:00:00 PM	23.328					
608	05/28/19 04:00:00 PM	23.376					
609	05/28/19 05:00:00 PM	23.497					
610	05/28/19 06:00:00 PM	23.521					
611	05/28/19 07:00:00 PM	23.545					
612	05/28/19 08:00:00 PM	23.593					
613	05/28/19 09:00:00 PM	23.665					
614	05/28/19 10:00:00 PM	23.761					
615	05/28/19 11:00:00 PM	23.785					
616	05/29/19 12:00:00 AM	23.761					
617	05/29/19 01:00:00 AM	23.761					
618	05/29/19 02:00:00 AM	23.737					
619	05/29/19 03:00:00 AM	23.689					
620	05/29/19 04:00:00 AM	23.689					
621	05/29/19 05:00:00 AM	23.641					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
622	05/29/19 06:00:00 AM	23.569					
623	05/29/19 07:00:00 AM	23.665					
624	05/29/19 08:00:00 AM	23.713					
625	05/29/19 09:00:00 AM	23.713					
626	05/29/19 10:00:00 AM	23.737					
627	05/29/19 11:00:00 AM	23.761					
628	05/29/19 12:00:00 PM	23.881					
629	05/29/19 01:00:00 PM	23.930					
630	05/29/19 02:00:00 PM	23.930					
631	05/29/19 03:00:00 PM	23.954					
632	05/29/19 04:00:00 PM	23.978					
633	05/29/19 05:00:00 PM	23.978					
634	05/29/19 06:00:00 PM	23.905					
635	05/29/19 07:00:00 PM	23.857					
636	05/29/19 08:00:00 PM	23.833					
637	05/29/19 09:00:00 PM	23.857					
638	05/29/19 10:00:00 PM	23.905					
639	05/29/19 11:00:00 PM	23.881					
640	05/30/19 12:00:00 AM	23.881					
641	05/30/19 01:00:00 AM	23.809					
642	05/30/19 02:00:00 AM	23.761					
643	05/30/19 03:00:00 AM	23.737					
644	05/30/19 04:00:00 AM	23.689					
645	05/30/19 05:00:00 AM	23.665					
646	05/30/19 06:00:00 AM	23.665					
647	05/30/19 07:00:00 AM	23.713					
648	05/30/19 08:00:00 AM	23.737					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
649	05/30/19 09:00:00 AM	23.665					
650	05/30/19 10:00:00 AM	23.713					
651	05/30/19 11:00:00 AM	23.737					
652	05/30/19 12:00:00 PM	23.785					
653	05/30/19 01:00:00 PM	23.785					
654	05/30/19 02:00:00 PM	23.809					
655	05/30/19 03:00:00 PM	23.809					
656	05/30/19 04:00:00 PM	23.761					
657	05/30/19 05:00:00 PM	23.737					
658	05/30/19 06:00:00 PM	23.713					
659	05/30/19 07:00:00 PM	23.665					
660	05/30/19 08:00:00 PM	23.689					
661	05/30/19 09:00:00 PM	23.737					
662	05/30/19 10:00:00 PM	23.785					
663	05/30/19 11:00:00 PM	23.833					
664	05/31/19 12:00:00 AM	23.785					
665	05/31/19 01:00:00 AM	23.809					
666	05/31/19 02:00:00 AM	23.737					
667	05/31/19 03:00:00 AM	23.713					
668	05/31/19 04:00:00 AM	23.665					
669	05/31/19 05:00:00 AM	23.593					
670	05/31/19 06:00:00 AM	23.545					
671	05/31/19 07:00:00 AM	23.521					
672	05/31/19 08:00:00 AM	23.472					
673	05/31/19 09:00:00 AM	23.472					
674	05/31/19 10:00:00 AM	23.569					
675	05/31/19 11:00:00 AM	23.641					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
676	05/31/19 12:00:00 PM	23.641					
677	05/31/19 01:00:00 PM	23.713					
678	05/31/19 02:00:00 PM	23.737					
679	05/31/19 03:00:00 PM	23.785					
680	05/31/19 04:00:00 PM	23.785					
681	05/31/19 05:00:00 PM	23.833					
682	05/31/19 06:00:00 PM	23.833					
683	05/31/19 07:00:00 PM	23.905					
684	05/31/19 08:00:00 PM	23.954					
685	05/31/19 09:00:00 PM	23.978					
686	05/31/19 10:00:00 PM	23.930					
687	05/31/19 11:00:00 PM	23.881					
688	06/01/19 12:00:00 AM	23.785					
689	06/01/19 01:00:00 AM	23.689					
690	06/01/19 02:00:00 AM	23.497					
691	06/01/19 03:00:00 AM	23.352					
692	06/01/19 04:00:00 AM	23.232					
693	06/01/19 05:00:00 AM	23.136					
694	06/01/19 06:00:00 AM	23.064					
695	06/01/19 07:00:00 AM	23.064					
696	06/01/19 08:00:00 AM	23.064					
697	06/01/19 09:00:00 AM	23.136					
698	06/01/19 10:00:00 AM	23.232					
699	06/01/19 11:00:00 AM	23.400					
700	06/01/19 12:00:00 PM	23.617					
701	06/01/19 01:00:00 PM	23.785					
702	06/01/19 02:00:00 PM	23.978					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
703	06/01/19 03:00:00 PM	24.098					
704	06/01/19 04:00:00 PM	24.171					
705	06/01/19 05:00:00 PM	24.315					
706	06/01/19 06:00:00 PM	24.460					
707	06/01/19 07:00:00 PM	24.581					
708	06/01/19 08:00:00 PM	24.605					
709	06/01/19 09:00:00 PM	24.581					
710	06/01/19 10:00:00 PM	24.508					
711	06/01/19 11:00:00 PM	24.412					
712	06/02/19 12:00:00 AM	24.339					
713	06/02/19 01:00:00 AM	24.171					
714	06/02/19 02:00:00 AM	23.954					
715	06/02/19 03:00:00 AM	23.809					
716	06/02/19 04:00:00 AM	23.689					
717	06/02/19 05:00:00 AM	23.593					
718	06/02/19 06:00:00 AM	23.448					
719	06/02/19 07:00:00 AM	23.352					
720	06/02/19 08:00:00 AM	23.304					
721	06/02/19 09:00:00 AM	23.328					
722	06/02/19 10:00:00 AM	23.424					
723	06/02/19 11:00:00 AM	23.497					
724	06/02/19 12:00:00 PM	23.593					
725	06/02/19 01:00:00 PM	23.737					
726	06/02/19 02:00:00 PM	23.930					
727	06/02/19 03:00:00 PM	24.050					
728	06/02/19 04:00:00 PM	24.219					
729	06/02/19 05:00:00 PM	24.388					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
730	06/02/19 06:00:00 PM	24.508					
731	06/02/19 07:00:00 PM	24.605					
732	06/02/19 08:00:00 PM	24.605					
733	06/02/19 09:00:00 PM	24.581					
734	06/02/19 10:00:00 PM	24.484					
735	06/02/19 11:00:00 PM	24.363					
736	06/03/19 12:00:00 AM	24.243					
737	06/03/19 01:00:00 AM	23.978					
738	06/03/19 02:00:00 AM	23.785					
739	06/03/19 03:00:00 AM	23.617					
740	06/03/19 04:00:00 AM	23.400					
741	06/03/19 05:00:00 AM	23.208					
742	06/03/19 06:00:00 AM	22.992					
743	06/03/19 07:00:00 AM	22.824					
744	06/03/19 08:00:00 AM	22.729					
745	06/03/19 09:00:00 AM	22.729					
746	06/03/19 10:00:00 AM	22.800					
747	06/03/19 11:00:00 AM	22.872					
748	06/03/19 12:00:00 PM	22.944					
749	06/03/19 01:00:00 PM	23.016					
750	06/03/19 02:00:00 PM	23.088					
751	06/03/19 03:00:00 PM	23.160					
752	06/03/19 04:00:00 PM	23.208					
753	06/03/19 05:00:00 PM	23.280					
754	06/03/19 06:00:00 PM	23.328					
755	06/03/19 07:00:00 PM	23.424					
756	06/03/19 08:00:00 PM	23.521					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
757	06/03/19 09:00:00 PM	23.593					
758	06/03/19 10:00:00 PM	23.713					
759	06/03/19 11:00:00 PM	23.761					
760	06/04/19 12:00:00 AM	23.713					
761	06/04/19 01:00:00 AM	23.713					
762	06/04/19 02:00:00 AM	23.641					
763	06/04/19 03:00:00 AM	23.617					
764	06/04/19 04:00:00 AM	23.617					
765	06/04/19 05:00:00 AM	23.569					
766	06/04/19 06:00:00 AM	23.569					
767	06/04/19 07:00:00 AM	23.497					
768	06/04/19 08:00:00 AM	23.497					
769	06/04/19 09:00:00 AM	23.448					
770	06/04/19 10:00:00 AM	23.400					
771	06/04/19 11:00:00 AM	23.376					
772	06/04/19 12:00:00 PM	23.424					
773	06/04/19 01:00:00 PM	23.448					
774	06/04/19 02:00:00 PM	23.472					
775	06/04/19 03:00:00 PM	23.545					
776	06/04/19 04:00:00 PM	23.593					
777	06/04/19 05:00:00 PM	23.641					
778	06/04/19 06:00:00 PM	23.617					
779	06/04/19 07:00:00 PM	23.641					
780	06/04/19 08:00:00 PM	23.665					
781	06/04/19 09:00:00 PM	23.641					
782	06/04/19 10:00:00 PM	23.593					
783	06/04/19 11:00:00 PM	23.521					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
784	06/05/19 12:00:00 AM	23.376					
785	06/05/19 01:00:00 AM	23.208					
786	06/05/19 02:00:00 AM	23.088					
787	06/05/19 03:00:00 AM	22.968					
788	06/05/19 04:00:00 AM	22.872					
789	06/05/19 05:00:00 AM	22.776					
790	06/05/19 06:00:00 AM	22.705					
791	06/05/19 07:00:00 AM	22.729					
792	06/05/19 08:00:00 AM	22.753					
793	06/05/19 09:00:00 AM	22.872					
794	06/05/19 10:00:00 AM	22.944					
795	06/05/19 11:00:00 AM	23.016					
796	06/05/19 12:00:00 PM	23.112					
797	06/05/19 01:00:00 PM	23.256					
798	06/05/19 02:00:00 PM	23.376					
799	06/05/19 03:00:00 PM	23.472					
800	06/05/19 04:00:00 PM	23.593					
801	06/05/19 05:00:00 PM	23.641					
802	06/05/19 06:00:00 PM	23.689					
803	06/05/19 07:00:00 PM	23.761					
804	06/05/19 08:00:00 PM	23.833					
805	06/05/19 09:00:00 PM	23.833					
806	06/05/19 10:00:00 PM	23.833					
807	06/05/19 11:00:00 PM	23.833					
808	06/06/19 12:00:00 AM	23.785					
809	06/06/19 01:00:00 AM	23.689					
810	06/06/19 02:00:00 AM	23.617					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
811	06/06/19 03:00:00 AM	23.521					
812	06/06/19 04:00:00 AM	23.424					
813	06/06/19 05:00:00 AM	23.352					
814	06/06/19 06:00:00 AM	23.280					
815	06/06/19 07:00:00 AM	23.280					
816	06/06/19 08:00:00 AM	23.280					
817	06/06/19 09:00:00 AM	23.376					
818	06/06/19 10:00:00 AM	23.376					
819	06/06/19 11:00:00 AM	23.448					
820	06/06/19 12:00:00 PM	23.545					
821	06/06/19 01:00:00 PM	23.593					
822	06/06/19 02:00:00 PM	23.617					
823	06/06/19 03:00:00 PM	23.665					
824	06/06/19 04:00:00 PM	23.689					
825	06/06/19 05:00:00 PM	23.761					
826	06/06/19 06:00:00 PM	23.785					
827	06/06/19 07:00:00 PM	23.857					
828	06/06/19 08:00:00 PM	23.905					
829	06/06/19 09:00:00 PM	23.930					
830	06/06/19 10:00:00 PM	23.905					
831	06/06/19 11:00:00 PM	23.857					
832	06/07/19 12:00:00 AM	23.809					
833	06/07/19 01:00:00 AM	23.641					
834	06/07/19 02:00:00 AM	23.521					
835	06/07/19 03:00:00 AM	23.352					
836	06/07/19 04:00:00 AM	23.184					
837	06/07/19 05:00:00 AM	23.040					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
838	06/07/19 06:00:00 AM	22.968					
839	06/07/19 07:00:00 AM	22.944					
840	06/07/19 08:00:00 AM	22.968					
841	06/07/19 09:00:00 AM	23.016					
842	06/07/19 10:00:00 AM	22.992					
843	06/07/19 11:00:00 AM	23.040					
844	06/07/19 12:00:00 PM	23.160					
845	06/07/19 01:00:00 PM	23.208					
846	06/07/19 02:00:00 PM	23.256					
847	06/07/19 03:00:00 PM	23.256					
848	06/07/19 04:00:00 PM	23.352					
849	06/07/19 05:00:00 PM	23.424					
850	06/07/19 06:00:00 PM	23.472					
851	06/07/19 07:00:00 PM	23.569					
852	06/07/19 08:00:00 PM	23.641					
853	06/07/19 09:00:00 PM	23.689					
854	06/07/19 10:00:00 PM	23.713					
855	06/07/19 11:00:00 PM	23.689					
856	06/08/19 12:00:00 AM	23.689					
857	06/08/19 01:00:00 AM	23.569					
858	06/08/19 02:00:00 AM	23.400					
859	06/08/19 03:00:00 AM	23.328					
860	06/08/19 04:00:00 AM	23.208					
861	06/08/19 05:00:00 AM	23.160					
862	06/08/19 06:00:00 AM	23.112					
863	06/08/19 07:00:00 AM	23.232					
864	06/08/19 08:00:00 AM	23.256					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
865	06/08/19 09:00:00 AM	23.376					
866	06/08/19 10:00:00 AM	23.472					
867	06/08/19 11:00:00 AM	23.641					
868	06/08/19 12:00:00 PM	23.665					
869	06/08/19 01:00:00 PM	23.761					
870	06/08/19 02:00:00 PM	23.857					
871	06/08/19 03:00:00 PM	23.978					
872	06/08/19 04:00:00 PM	24.050					
873	06/08/19 05:00:00 PM	24.122					
874	06/08/19 06:00:00 PM	24.171					
875	06/08/19 07:00:00 PM	24.219					
876	06/08/19 08:00:00 PM	24.219					
877	06/08/19 09:00:00 PM	24.146					
878	06/08/19 10:00:00 PM	24.050					
879	06/08/19 11:00:00 PM	23.930					
880	06/09/19 12:00:00 AM	23.833					
881	06/09/19 01:00:00 AM	23.737					
882	06/09/19 02:00:00 AM	23.569					
883	06/09/19 03:00:00 AM	23.400					
884	06/09/19 04:00:00 AM	23.256					
885	06/09/19 05:00:00 AM	23.160					
886	06/09/19 06:00:00 AM	23.088					
887	06/09/19 07:00:00 AM	23.064					
888	06/09/19 08:00:00 AM	23.088					
889	06/09/19 09:00:00 AM	23.112					
890	06/09/19 10:00:00 AM	23.256					
891	06/09/19 11:00:00 AM	23.352					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
892	06/09/19 12:00:00 PM	23.521					
893	06/09/19 01:00:00 PM	23.737					
894	06/09/19 02:00:00 PM	23.930					
895	06/09/19 03:00:00 PM	24.050					
896	06/09/19 04:00:00 PM	24.219					
897	06/09/19 05:00:00 PM	24.315					
898	06/09/19 06:00:00 PM	24.412					
899	06/09/19 07:00:00 PM	24.436					
900	06/09/19 08:00:00 PM	24.412					
901	06/09/19 09:00:00 PM	24.315					
902	06/09/19 10:00:00 PM	24.195					
903	06/09/19 11:00:00 PM	24.074					
904	06/10/19 12:00:00 AM	23.930					
905	06/10/19 01:00:00 AM	23.785					
906	06/10/19 02:00:00 AM	23.641					
907	06/10/19 03:00:00 AM	23.472					
908	06/10/19 04:00:00 AM	23.400					
909	06/10/19 05:00:00 AM	23.280					
910	06/10/19 06:00:00 AM	23.112					
911	06/10/19 07:00:00 AM	23.184					
912	06/10/19 08:00:00 AM	23.160					
913	06/10/19 09:00:00 AM	23.184					
914	06/10/19 10:00:00 AM	23.136					
915	06/10/19 11:00:00 AM	23.112					
916	06/10/19 12:00:00 PM	23.040					
917	06/10/19 01:00:00 PM	22.992					
918	06/10/19 02:00:00 PM	22.992					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
919	06/10/19 03:00:00 PM	22.968					
920	06/10/19 04:00:00 PM	23.016					
921	06/10/19 05:00:00 PM	23.088					
922	06/10/19 06:00:00 PM	23.088					
923	06/10/19 07:00:00 PM	23.112					
924	06/10/19 08:00:00 PM	23.208					
925	06/10/19 09:00:00 PM	23.304					
926	06/10/19 10:00:00 PM	23.448					
927	06/10/19 11:00:00 PM	23.521					
928	06/11/19 12:00:00 AM	23.569					
929	06/11/19 01:00:00 AM	23.569					
930	06/11/19 02:00:00 AM	23.569					
931	06/11/19 03:00:00 AM	23.569					
932	06/11/19 04:00:00 AM	23.593					
933	06/11/19 05:00:00 AM	23.593					
934	06/11/19 06:00:00 AM	23.617					
935	06/11/19 07:00:00 AM	23.737					
936	06/11/19 08:00:00 AM	23.737					
937	06/11/19 09:00:00 AM	23.641					
938	06/11/19 10:00:00 AM	23.521					
939	06/11/19 11:00:00 AM	23.424					
940	06/11/19 12:00:00 PM	23.472					
941	06/11/19 01:00:00 PM	23.497					
942	06/11/19 02:00:00 PM	23.497					
943	06/11/19 03:00:00 PM	23.521					
944	06/11/19 04:00:00 PM	23.521					
945	06/11/19 05:00:00 PM	23.497					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
946	06/11/19 06:00:00 PM	23.497					
947	06/11/19 07:00:00 PM	23.545					
948	06/11/19 08:00:00 PM	23.593					
949	06/11/19 09:00:00 PM	23.593					
950	06/11/19 10:00:00 PM	23.569					
951	06/11/19 11:00:00 PM	23.569					
952	06/12/19 12:00:00 AM	23.472					
953	06/12/19 01:00:00 AM	23.304					
954	06/12/19 02:00:00 AM	23.184					
955	06/12/19 03:00:00 AM	23.040					
956	06/12/19 04:00:00 AM	22.896					
957	06/12/19 05:00:00 AM	22.729					
958	06/12/19 06:00:00 AM	22.633					
959	06/12/19 07:00:00 AM	22.633					
960	06/12/19 08:00:00 AM	22.657					
961	06/12/19 09:00:00 AM	22.824					
962	06/12/19 10:00:00 AM	22.944					
963	06/12/19 11:00:00 AM	23.064					
964	06/12/19 12:00:00 PM	23.208					
965	06/12/19 01:00:00 PM	23.256					
966	06/12/19 02:00:00 PM	23.400					
967	06/12/19 03:00:00 PM	23.472					
968	06/12/19 04:00:00 PM	23.472					
969	06/12/19 05:00:00 PM	23.472					
970	06/12/19 06:00:00 PM	23.472					
971	06/12/19 07:00:00 PM	23.545					
972	06/12/19 08:00:00 PM	23.593					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
973	06/12/19 09:00:00 PM	23.545					
974	06/12/19 10:00:00 PM	23.448					
975	06/12/19 11:00:00 PM	23.376					
976	06/13/19 12:00:00 AM	23.256					
977	06/13/19 01:00:00 AM	23.136					
978	06/13/19 02:00:00 AM	22.920					
979	06/13/19 03:00:00 AM	22.872					
980	06/13/19 04:00:00 AM	22.848					
981	06/13/19 05:00:00 AM	22.824					
982	06/13/19 06:00:00 AM	22.800					
983	06/13/19 07:00:00 AM	22.920					
984	06/13/19 08:00:00 AM	23.016					
985	06/13/19 09:00:00 AM	23.064					
986	06/13/19 10:00:00 AM	23.016					
987	06/13/19 11:00:00 AM	23.016					
988	06/13/19 12:00:00 PM	22.968					
989	06/13/19 01:00:00 PM	22.992					
990	06/13/19 02:00:00 PM	23.064					
991	06/13/19 03:00:00 PM	23.112					
992	06/13/19 04:00:00 PM	23.088					
993	06/13/19 05:00:00 PM	23.088					
994	06/13/19 06:00:00 PM	23.064					
995	06/13/19 07:00:00 PM	23.064					
996	06/13/19 08:00:00 PM	23.088					
997	06/13/19 09:00:00 PM	23.112					
998	06/13/19 10:00:00 PM	23.136					
999	06/13/19 11:00:00 PM	23.160					

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
1000	06/14/19 12:00:00 AM	23.112					
1001	06/14/19 01:00:00 AM	22.992					
1002	06/14/19 02:00:00 AM	22.920					
1003	06/14/19 03:00:00 AM	22.872					
1004	06/14/19 04:00:00 AM	22.800					
1005	06/14/19 05:00:00 AM	22.753					
1006	06/14/19 06:00:00 AM	22.705					
1007	06/14/19 07:00:00 AM	22.729					
1008	06/14/19 08:00:00 AM	22.824					
1009	06/14/19 09:00:00 AM	22.992					
1010	06/14/19 10:00:00 AM	23.064					
1011	06/14/19 11:00:00 AM	23.016					
1012	06/14/19 12:00:00 PM	23.016					
1013	06/14/19 01:00:00 PM	22.944					
1014	06/14/19 02:00:00 PM	22.944					
1015	06/14/19 03:00:00 PM	22.944					
1016	06/14/19 04:00:00 PM	22.944					
1017	06/14/19 05:00:00 PM	23.016					
1018	06/14/19 06:00:00 PM	23.064					
1019	06/14/19 07:00:00 PM	23.136					
1020	06/14/19 08:00:00 PM	23.184					
1021	06/14/19 09:00:00 PM	23.136					
1022	06/14/19 10:00:00 PM	23.040					
1023	06/14/19 11:00:00 PM	22.968					
1024	06/15/19 12:00:00 AM	22.848					
1025	06/15/19 01:00:00 AM	22.657					
1026	06/15/19 02:00:00 AM	22.537					

Bath #1 (for SRT)

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#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
1	05/03/19 09:00:00 AM	20.913	Logged				
2	05/03/19 10:00:00 AM	21.533					
3	05/03/19 11:00:00 AM	22.298					
4	05/03/19 12:00:00 PM	22.441					
5	05/03/19 01:00:00 PM	22.393					
6	05/03/19 02:00:00 PM	22.345					
7	05/03/19 03:00:00 PM	22.274					
8	05/03/19 04:00:00 PM	22.250					
9	05/03/19 05:00:00 PM	22.298					
10	05/03/19 06:00:00 PM	22.321					
11	05/03/19 07:00:00 PM	22.417					
12	05/03/19 08:00:00 PM	22.537					
13	05/03/19 09:00:00 PM	22.633					
14	05/03/19 10:00:00 PM	22.753					
15	05/03/19 11:00:00 PM	22.800					
16	05/04/19 12:00:00 AM	22.776					
17	05/04/19 01:00:00 AM	22.681					
18	05/04/19 02:00:00 AM	22.537					
19	05/04/19 03:00:00 AM	22.417					
20	05/04/19 04:00:00 AM	22.298					
21	05/04/19 05:00:00 AM	22.178					
22	05/04/19 06:00:00 AM	22.082					
23	05/04/19 07:00:00 AM	22.082					
24	05/04/19 08:00:00 AM	22.106					
25	05/04/19 09:00:00 AM	22.202					
26	05/04/19 10:00:00 AM	22.298					
27	05/04/19 11:00:00 AM	22.441					

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#	Time, GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
28	05/04/19 12:00:00 PM	22.513					
29	05/04/19 01:00:00 PM	22.609					
30	05/04/19 02:00:00 PM	22.753					
31	05/04/19 03:00:00 PM	22.968					
32	05/04/19 04:00:00 PM	23.160					
33	05/04/19 05:00:00 PM	23.328					
34	05/04/19 06:00:00 PM	23.472					
35	05/04/19 07:00:00 PM	23.569					
36	05/04/19 08:00:00 PM	23.617					
37	05/04/19 09:00:00 PM	23.569					
38	05/04/19 10:00:00 PM	23.472					
39	05/04/19 11:00:00 PM	23.352					
40	05/05/19 12:00:00 AM	23.208					
41	05/05/19 01:00:00 AM	23.016					
42	05/05/19 02:00:00 AM	22.824					
43	05/05/19 03:00:00 AM	22.633					
44	05/05/19 04:00:00 AM	22.465					
45	05/05/19 05:00:00 AM	22.345					
46	05/05/19 06:00:00 AM	22.250					
47	05/05/19 07:00:00 AM	22.250					
48	05/05/19 08:00:00 AM	22.250					
49	05/05/19 09:00:00 AM	22.274					
50	05/05/19 10:00:00 AM	22.250					
51	05/05/19 11:00:00 AM	22.321					
52	05/05/19 12:00:00 PM	22.417					
53	05/05/19 01:00:00 PM	22.489					
54	05/05/19 02:00:00 PM	22.585					

38-205R_SRT.hobo

#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
55	05/05/19 03:00:00 PM	22.633					
56	05/05/19 04:00:00 PM	22.729					
57	05/05/19 05:00:00 PM	22.824					
58	05/05/19 06:00:00 PM	22.896					
59	05/05/19 07:00:00 PM	22.944					
60	05/05/19 08:00:00 PM	22.920					
61	05/05/19 09:00:00 PM	22.848					
62	05/05/19 10:00:00 PM	22.776					
63	05/05/19 11:00:00 PM	22.729					
64	05/06/19 12:00:00 AM	22.729					
65	05/06/19 01:00:00 AM	22.633					
66	05/06/19 02:00:00 AM	22.513					
67	05/06/19 03:00:00 AM	22.441					
68	05/06/19 04:00:00 AM	22.321					
69	05/06/19 05:00:00 AM	22.274					
70	05/06/19 06:00:00 AM	22.130					
71	05/06/19 07:00:00 AM	22.034					
72	05/06/19 08:00:00 AM	21.963					
73	05/06/19 09:00:00 AM	21.939					
74	05/06/19 10:00:00 AM	21.485					
75	05/06/19 11:00:00 AM	21.413					
76	05/06/19 12:00:00 PM	22.154					
77	05/06/19 01:00:00 PM	22.705					
78	05/06/19 02:00:00 PM	22.968					
79	05/06/19 03:00:00 PM	23.160					
80	05/06/19 04:00:00 PM	23.328					
81	05/06/19 05:00:00 PM	23.448					

38-205R_SRT.hobo

#	Time,GMT-04:00	Temp, °C	Coupler Detached	Coupler Attached	Host Connected	Stopped	End Of File
82	05/06/19 06:00:00 PM	23.569					
83	05/06/19 07:00:00 PM	23.665					
84	05/06/19 08:00:00 PM	23.761					
85	05/06/19 09:00:00 PM	23.857					
86	05/06/19 10:00:00 PM	23.930					
87	05/06/19 11:00:00 PM	23.978					
88	05/07/19 12:00:00 AM	24.002					
89	05/07/19 01:00:00 AM	23.978					
90	05/07/19 02:00:00 AM	23.857					
91	05/07/19 03:00:00 AM	23.785					
92	05/07/19 04:00:00 AM	23.689					
93	05/07/19 05:00:00 AM	23.617					
94	05/07/19 06:00:00 AM	23.545					
95	05/07/19 07:00:00 AM	23.497					
96	05/07/19 08:00:00 AM	23.497					
97	05/07/19 09:00:00 AM	23.545					
98	05/07/19 10:00:00 AM	23.593					
99	05/07/19 11:00:00 AM	23.593					
100	05/07/19 12:00:00 PM	23.617					
101	05/07/19 01:00:00 PM	23.737					
102	05/07/19 02:00:00 PM	23.785					
103	05/07/19 03:00:00 PM	23.809					
104	05/07/19 04:00:00 PM	23.905					
105	05/07/19 05:00:00 PM	24.002					
106	05/07/19 06:00:00 PM	24.122					
107	05/07/19 07:00:00 PM	24.195					
108	05/07/19 08:00:00 PM	24.267					

Attachment D Example ESBTU Calculations

Attachment D: Calculation of ESBTU (Example)

[If no PAH34 data or

PAH Conversion factor to use if only PAH17 data avai **1.6** [conversion factor = average of site specific ratios or derived from ESBTU guidance]

TOC to assume if no TOC available= [assumes 1% TOC if no site specific data entered]

Area	Mudflat	Mudflat	River	Mudflat
Sample ID	SS665-S1	SS667-S1	SS677-S2	SS761-S1
Depth Top-Bottom	0 to 0.5	0 to 0.5	0 to 1	0.3-0.5
S / NS / SUB	S	S	S	S
Sampling Date	09/10/2019	09/11/2019	09/11/2019	03/09/2020
RAH (4)				

Analyte								Sed: TEC/ ESV	Sed: PEC/ RSV	Units				
Carbon														
Total Organic Carbon (2)								NCE	NCE	mg/kg	21000	21000	12500	39000
Total Organic Carbon (2)								NCE	NCE	%	2.1	2.1	1.25	3.9
Step 1 Measured Sediment Data														
PAH_{17}										Max RL for ND=				
2-Methylnaphthalene										mg/kg	0.0864	0.0619	0.975	0.0834
Acenaphthene										mg/kg	0.97	0.87	4.72	0.0739
Acenaphthylene										mg/kg	0.469	1.03	0.762	0.982
Anthracene								0.057	0.845	mg/kg	1.54	3.45	20.1	0.454
Benzo(a)anthracene								0.11	1.05	mg/kg	3.14	4.76	21	2.08
Benzo(a)pyrene								0.15	1.45	mg/kg	3.03	5.1	14.6	3.44
Benzo(b)fluoranthene										mg/kg	2.05	2.5	11.5	2.01
Benzo(g,h,i)perylene										mg/kg	1.85	2.6	6.83	2.75
Benzo(k)fluoranthene										mg/kg	2.4	3.22	12.3	2.14
Chrysene								0.17	1.29	mg/kg	3.07	3.81	17.3	2.4
Dibenzo(a,h)anthracene								0.033		mg/kg	0.389	0.491	2.25	0.631
Fluoranthene								0.42	2.23	mg/kg	8.46	12.2	58.5	2.45
Fluorene								0.077	0.536	mg/kg	0.588	0.599	7.28	0.121
Indeno(1,2,3-c,d)pyrene										mg/kg	0.286	0.472	2.27	0.191
Naphthalene								0.18	0.561	mg/kg	0.179	0.163	0.815	0.0923
Phenanthrene								0.2	1.17	mg/kg	4.25	9.28	55.7	0.816
Pyrene								0.2	1.52	mg/kg	9.34	17.4	46.3	3.52
Total PAH_{17}								1.6	22.7	mg/kg	**42.1**	**68.0**	**283.2**	**24.2**
PAH_{34} Additional Analytes														
Benzo(e)pyrene								NCE	NCE	mg/kg	1.97	2.75	8.41	2.63
C1-Chrysenes								NCE	NCE	mg/kg	0.854	0.859	6.48	2.28
C1-Fluoranthenes/Pyrenes								NCE	NCE	mg/kg	2.34	3.82	14	3.02
C1-Fluorenes								NCE	NCE	mg/kg	0.257	0.227	1.99	0.176
C1-Naphthalenes								NCE	NCE	mg/kg	0.0909	0.0567	1.34	0.0932
C1-Phenanthrenes/Anthracenes								NCE	NCE	mg/kg	0.159	0.0252	0.0778	0.0646
C2-Chrysenes								NCE	NCE	mg/kg	0.392	0.231	2.77	1.21
C2-Fluorenes								NCE	NCE	mg/kg	0.22	0.0939	1.21	0.316
C2-Naphthalenes								NCE	NCE	mg/kg	0.249	0.18	2.63	0.21
C2-Phenanthrenes/Anthracenes								NCE	NCE	mg/kg	0.627	0.44	5.46	1.24
C3-Chrysenes								NCE	NCE	mg/kg	0.25	0.0837	1.27	0.533
C3-Fluorenes								NCE	NCE	mg/kg	0.225	0.107	1.35	0.332
C3-Naphthalenes								NCE	NCE	mg/kg	0.371	0.125	2.17	0.199
C3-Phenanthrenes/Anthracenes								NCE	NCE	mg/kg	0.28	0.101	1.64	0.718
C4-Chrysenes								NCE	NCE	mg/kg	0.0273	0.093	0.598	0.284
C4-Naphthalenes								NCE	NCE	mg/kg	0.225	0.0509	0.841	0.189
C4-Phenanthrenes/Anthracenes								NCE	NCE	mg/kg	0.158	0.047	0.511	0.328
Perylene								NCE	NCE	mg/kg	0.667	0.83	3.6	0.672
Total PAH_{34}								NCE	NCE	mg/kg	**51.5**	**78.1**	**339.5**	**38.7**

NARCOSIS TOXICITY	**MW**	**logKow**	**log koc**	**Narcosis FCV (umol/ goctanol)**	**Narcosis FCV (umol/L)**	**Narcosis FCV (ug/L)**	**Source FCV**	**Coc,PAHi, FCVi ($\mu g/g_{OC}$)**	Coc,PAHi, MAXi	Units				
ESBTU for total PAHs					-->	-->		-->						
2-Methylnaphthalene	142.2	3.857	3.792	2.24	0.507	72.16	narcosis	447		TU	0.01	0.01	0.17	0.00
Acenaphthene	154.21	4.012	3.944	2.24	0.362	55.85	narcosis	491		TU	0.09	0.08	0.77	0.00
Acenaphthylene	152.2	4.012	3.168	2.24	0.362	55.12	narcosis	81		TU	0.28	0.60	0.75	0.31
Anthracene	178.12	4.534	4.457	2.24	0.116	20.72	narcosis	593		TU	0.12	0.28	2.71	0.02
Benzo(a)anthracene	228.29	5.673	5.577	2.24	0.010	2.23	narcosis	841		TU	0.18	0.27	2.00	0.06
Benzo(a)pyrene	252.31	6.107	6.003	2.24	0.004	0.96	narcosis	964		TU	0.15	0.25	1.21	0.09
Benzo(b)fluoranthene	252.32	6.266	6.16	2.24	0.003	0.68	narcosis	979		TU	0.10	0.12	0.94	0.05
Benzo(g,h,i)perylene	276.23	6.507	6.397	2.24	0.002	0.44	narcosis	1095		TU	0.08	0.11	0.50	0.06
Benzo(k)fluoranthene	252.32	6.291	6.184	2.24	0.003	0.64	narcosis	980		TU	0.12	0.16	1.00	0.06
Chrysene	228.29	5.713	5.616	2.24	0.009	2.04	narcosis	843		TU	0.17	0.22	1.64	0.07
Dibenzo(a,h)anthracene	278.35	6.713	6.599	2.24	0.001	0.28	narcosis	1122		TU	0.02	0.02	0.16	0.01
Fluoranthene	202.26	5.084	4.998	2.24	0.035	7.11	narcosis	708		TU	0.57	0.82	6.61	0.09
Fluorene	166.22	4.208	4.137	2.24	0.236	39.30	narcosis	539		TU	0.05	0.05	1.08	0.01
Indeno(1,2,3-c,d)pyrene	276.23	6.722	6.608	2.24	0.001	0.27	narcosis	1115		TU	0.01	0.02	0.16	0.00
Naphthalene	128.17	3.356	3.299	2.24	1.509	193.47	narcosis	385		TU	0.02	0.02	0.17	0.01
Phenanthrene	178.23	4.571	4.494	2.24	0.107	19.13	narcosis	597		TU	0.34	0.74	7.47	0.04
Pyrene	202.26	4.922	4.839	2.24	0.050	10.11	narcosis	698		TU	0.64	1.19	5.31	0.13
Sum of PAH17 Toxic Units										TU	**2.95**	**4.96**	**32.66**	**1.02**
Benzo(e)pyrene	252.32	6.135	6.031	2.24	0.004	0.90	narcosis	967		TU	0.10	0.14	0.70	0.07
C1-Chrysenes	242.32	6.14	6.036	2.24	0.004	0.86	narcosis	930		TU	0.04	0.04	0.56	0.06
C1-Fluoranthenes/Pyrenes	216.29	5.287	5.197	2.24	0.023	4.89	narcosis	769		TU	0.14	0.24	1.46	0.10
C1-Fluorenes	180.25	4.72	4.64	2.24	0.078	13.99	narcosis	611		TU	0.02	0.02	0.26	0.01
C1-Naphthalenes	142.2	3.8	3.736	2.24	0.574	81.69	narcosis	445		TU	0.01	0.01	0.24	0.01
C1-Phenanthrenes/Anthracenes	192.26	5.04	4.955	2.24	0.039	7.44	narcosis	670		TU	0.01	0.00	0.01	0.00
C2-Chrysenes	256.23	6.94	6.32	2.24	0.001	0.16	narcosis	332		TU	0.06	0.03	0.67	0.09
C2-Fluorenes	194.27	5.2	5.112	2.24	0.027	5.30	narcosis	687		TU	0.02	0.01	0.14	0.01
C2-Naphthalenes	156.23	4.3	4.227	2.24	0.194	30.24	narcosis	510		TU	0.02	0.02	0.41	0.01
C2-Phenanthrenes/Anthracenes	206.29	5.46	5.367	2.24	0.016	3.20	narcosis	745		TU	0.04	0.03	0.59	0.04
C3-Chrysenes	270.36	6.94	6.822	2.24	0.001	0.17	narcosis	1111		TU	0.01	0.00	0.09	0.01
C3-Fluorenes	208.3	5.7	5.603	2.24	0.009	1.92	narcosis	768		TU	0.01	0.01	0.14	0.01
C3-Naphthalenes	170.25	4.8	4.719	2.24	0.065	11.10	narcosis	581		TU	0.03	0.01	0.30	0.01
C3-Phenanthrenes/Anthracenes	220.32	5.92	5.82	2.24	0.006	1.26	narcosis	830		TU	0.02	0.01	0.16	0.02
C4-Chrysenes	284.38	7.36	7.235	2.24	0.000	0.07	narcosis	1213		TU	0.00	0.00	0.04	0.01
C4-Naphthalenes	184.28	5.3	5.21	2.24	0.022	4.05	narcosis	656		TU	0.02	0.00	0.10	0.01
C4-Phenanthrenes/Anthracenes	234.23	6.32	6.213	2.24	0.002	0.56	narcosis	913		TU	0.01	0.00	0.04	0.01
Perylene	252.31	6.135	6.031	2.24	0.004	0.90	narcosis	967		TU	0.03	0.04	0.30	0.02
PECHQ, PAH_{17}								HQ			**1.9**	**3.0**	**12.5**	**1.1**
$\Sigma ESBTU_{FCV}$, PAH_{34}								TU			**3.5**	**5.6**	**38.9**	**1.5**
$\Sigma ESBTU_{FCV}$,estimated from PAH_{17} data								Applies the the average site-specific conversion factor. If no site specific values EPA method default						

Step 2B Evaluation - Adjustment to 1% OC (WDNR, 2003)							
Total PNAs expressed as OC normalized	NA	NA	mg/kgOC	**2005**	**3238**	22656	621
Total PNAs normalized to 1% TOC[1]	2	23	mg/kg	**20**	**32**	227	6
Total PNAs PEC-Q (@ 1% OC / ERM)	NA	NA	mg/kg	**0.88**	**1.43**	9.98	0.27
Incidence of toxic effects (WDNR, 2003 Appendix A)			%	**60.3**	**77.8**	101.5	24.8

Attachment E PEC-HQ and ESBTU Estimates for Near Surface and Subsurface Sediment

Attachment E: Evaluation of Near Surface and Subsurface Sediment

Analyte	Sed: TEC/ ESV	Sed: PEC/ RSV	Units	Area	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	Wetland	River	Mudflat	River	Mudflat	Mudflat	Wetland
				Sample ID	SS601-B	SS602-B	SS603-B	SS604-B	SS605-B	SS606-B	SS607-B	SS608R-B	SS609R-B	SS610R-B	SS611R-B	SS613B	SS614	SS616	SS617	SS618	SS619	SS620	SS621	SS622	SS623	SS624
				Depth Top-Bottom	29"	23-29"	14-22"	18-24"	21-27"	21-25"	20-24"	23-27"	23-27"	20-25"	24-29"	22-28"	16-22"	9-16"	12-28"	11-22"	0-1.9	0-2.5	0-1.8	0-1.8	0-1.7	0-1.7
				S / NS / SUB	SUB	SUB	NS	NS	SUB	NS	NS	SUB	SUB	NS	SUB	SUB	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
				Sampling Date	22/Sep/17	22/Sep/17	22/Sep/17	22/Sep/17	22/Sep/17	22/Sep/17	22/Sep/17	8/Nov/17	8/Nov/17	8/Nov/17	8/Nov/17	16/Jul/18	16/Jul/18	16/Jul/18	16/Jul/18	16/Jul/18	08/15/2018	08/15/2018	08/15/2018	08/15/2018	08/15/2018	08/15/2018
				RAH (4)			RAH											RAH		RAH	(5), RAH	(5)	(5)	(5)	(5)	(5)
Carbon					(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)		(3)	(3)	
Total Organic Carbon (2)	NCE	NCE	mg/kg																		55000	55000	76700	55000	55000	17600
Total Organic Carbon (2)	NCE	NCE	%		9.492	9.492	9.492	9.492	9.492	9.492	9.492	9.492	9.492	9.492	9.492	9.492	9.492	9.492	9.492	9.492	5.5	5.5	7.67	5.5	5.5	1.76
Step 1 Measured Sediment Data																										
PAH_{17}			Max RL for ND=		0.658	0.682	0.351	0.634	0.518	0.674		0.908	0.788	0.792	0.889	0.498	0.43			1.25						
2-Methylnaphthalene			mg/kg		0	0	0	0	0	0	2.99	0	0.441	0	0	0	0	22.2	206	0	0.704	0.0284	0.584	0.0886	0.0611	1.43
Acenaphthene			mg/kg		0	0	0	0	0	0	3.66	0	3.54	0	1.78	0	0	110	1230	15.1	2.08	0.153	3.43	2.19	0.0225	8.18
Acenaphthylene			mg/kg		0	0	0	0	0	0	1.3	0	0	0	0	0	0	9.98	99.8	2.18	2.78	0.0945	2.75	0.823	0.169	1.65
Anthracene	0.057	0.845	mg/kg		0	0	0.799	0	0	0	3.28	0	0	0	1.82	0	0	48.5	415	15.3	4.15	0.178	9.65	1.81	0.321	7.61
Benzo(a)anthracene	0.11	1.05	mg/kg		1.59	0	1.93	0	0	0	6.78	0	0	0	2.47	0	0	45.2	509	14.7	8.81	0.263	8.52	2.79	1.76	7.4
Benzo(a)pyrene	0.15	1.45	mg/kg		1.66	0	1.94	0.788	0	0	8.5	0	0.591	0	2.34	0	0	52.7	649	14.5	9.62	0.265	9.74	3.27	2.08	7.24
Benzo(b)fluoranthene			mg/kg		1.31	0	1.4	0	0	0	7.39	0	0	0	1.04	0	0	19.9	317	11.6	7.42	0.229	6.19	2.08	1.28	3.92
Benzo(g,h,i)perylene			mg/kg		0.942	0	1.37	0	0	0	6.63	0	0	0	1.52	0	0	36.5	406	11	5.05	0.139	4.82	1.65	1.08	3.17
Benzo(k)fluoranthene			mg/kg		0	0	0.71	0	0	0	2.61	0	0	0	1.94	0	0	34.3	258	4.27	7.65	0.204	6.51	2.04	1.23	4.69
Chrysene	0.17	1.29	mg/kg		1.09	0	1.54	0.625	0	0	6.37	0	0.428	0	2.05	0	0	35.4	342	12.1	9.26	0.277	8.81	2.45	1.77	5.73
Dibenzo(a,h)anthracene	0.033		mg/kg		0	0	0.373	0	0	0	1.88	0	0	0	0.715	0	0	8.02	96	3.12	1.43	0.0413	1.31	0.419	0.322	0.822
Fluoranthene	0.42	2.23	mg/kg		2.61	0	2.51	0	0	0	10.5	0	1.37	0	4.32	0	0	131	1500	51	21.2	0.527	17.1	6.93	1.86	17.7
Fluorene	0.077	0.536	mg/kg		0	0	0	0	0	0	2.28	0	0	0	1.09	0	0	50	522	11.3	1.2	0.0753	2.16	0.568	0.0611	4.09
Indeno(1,2,3-c,d)pyrene			mg/kg		0.661	0	0.9	0	0	0	4.79	0	0	0	1.24	0	0	26.8	304	7.91	1.44	0.043	1.39	0.00666	0.327	1.46
Naphthalene	0.18	0.561	mg/kg		0	0	0	0	0	0	10.2	0	2.26	0	0	0	0	58.4	475	2.12	1.04	0.0344	0.792	0.155	0.0885	4.07
Phenanthrene	0.2	1.17	mg/kg		2.33	0	1.82	0	0	0	3.85	0	2.42	0	5.77	0	0	270	2940	69.6	11.7	0.269	13.9	3.96	0.478	23.6
Pyrene	0.2	1.52	mg/kg		4.39	0	4.77	1.34	0	0	18.2	0	1.59	0	5.64	0	0	202	2380	81.6	23	0.653	21.7	9.32	3.1	22.6
Total PAH_{17}	1.6	22.7	mg/kg		**16.6**	**0.7**	**20.1**	**2.8**	**0.4**	**0.4**	**101.2**	**0.4**	**12.6**	**0.4**	**33.7**	**0.4**	**0.4**	**1160.9**	**12648.8**	**327.4**	**118.5**	**3.5**	**119.4**	**40.6**	**16.0**	**125.4**
Total PAH_{34}	NCE	NCE	mg/kg		**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**166.4**	**5.8**	**168.8**	**44.2**	**26.8**	**155.9**
PECHQ, PAH_{17}			**HQ**		**0.73**	**0.03**	**0.88**	**0.12**	**0.02**	**0.02**	**4.46**	**0.02**	**0.56**	**0.02**	**1.49**	**0.02**	**0.02**	**51.14**	**557.22**	**14.4**	**5.2**	**0.2**	**5.3**	**1.8**	**0.7**	**5.5**
ΣESBTU$_{FCV}$, PAH_{34}			**TU**																		**4.6**	**0.2**	**3.4**	**1.3**	**0.7**	**14.1**
ΣESBTU$_{FCV}$,estimated from PAH_{17} data			Applies the the average site-specific conversion factor. If no site specific values EPA method default		**0.4**	**0.0**	**0.4**	**0.1**	**0.0**	**0.0**	**2.7**	**0.0**	**0.4**	**0.0**	**0.8**	**0.0**	**0.0**	**32.4**	**346.5**	**8.4**						

Notes

GREEN highlight = sample exceeds the MassDEP TEC (MassDEP 2006 "Technical Update - Revised Sediment Screening Values")

ORANGE highlight = sample exceeds the MacDonald et al. (2000) "consensus" Probable Effect Concentrations (PEC)

PINK highlight = the sample has a PEC-Q> 1

Complete data presented in Attachment

(1) TOC values <1000 mg/kg (0.1%) adjusted to 0.1%. Equilibrium partitioning theory is invalid at very low organic carbon content

(2) All TOC reported in mg/kg unless otherwise indicated.

(3) No TOC data. Applies the average TOC for all wetland or mudflat samples with measured TOC (in italics)

(4) RAH - Boring with readily apparent harm; RAH(ADJ) - boring within RAH area but not exhbiting RAH; visual>1= Visual tar

(5) Sample extending beyond 1 foot but considered surface for evaluation

ND PAHs replaced with 0 (zero) unless all PAHs are ND when total PAH17 is set at the highest RL

Attachment E: Evaluation of Near Surface and Subsurface Sediment

Analyte	Sed: TEC/ ESV	Sed: PEC/ RSV	Units																						
Area				Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	Mudflat	River	River	River	Mudflat	River	River
Sample ID				SS664-S2	SS664-S3	SS664-S4	SS665-S2	SS666-S2	SS666-S3	SS666-S4	SS666-S5	SS667-S2	SS668-S2	SS669-S1	SS669-S3	SS670-S2	SS671-S1	SS671-S2	SS672-S3	SS673-S2	SS673-S3	SS674-S4	SS675-S2	SS676-S2	SS677-S3
Depth Top-Bottom				0.9 to 1.1	1.9 to 2.1	2.6 to 2.8	0.9 to 1.1	0.9 to 1.1	1.9 to 2.1	2.9 to 3.1	3.9 to 4	0.9 to 1.1	0.9 to 1.1	1.5 to 2.2	4.6 to 4.7	0.9 to 1.1	1.3 to 1.5	1.9 to 2.1	1.9 to 2.1	2.4 to 2.6	3.7 to 3.8	2.9 to 3.1	1.9 to 2.1	1.9 to 2.1	1.4 to 1.6
S / NS / SUB				NS	NS	SUB	NS	NS	NS	SUB	SUB	NS	NS	NS	SUB	NS	NS	SUB	SUB	SUB	SUB	SUB	SUB	SUB	NS
Sampling Date				09/11/2019	09/11/2019	09/11/2019	09/10/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/23/2019	09/23/2019	09/10/2019	09/23/2019	09/23/2019	09/24/2019	09/12/2019	09/12/2019	09/12/2019	09/24/2019	09/11/2019	09/11/2019
RAH (4)																									
Carbon																									
Total Organic Carbon (2)	NCE	NCE	mg/kg	48400	24300	12000	25700	25600	44600	23900	15500	14500	32200	30900	13300	34700	36900	20800	9360	38900	86500	26300	41100	43400	57000
Total Organic Carbon (2)	NCE	NCE	%	4.84	2.43	1.2	2.57	2.56	4.46	2.39	1.55	1.45	3.22	3.09	1.33	3.47	3.69	2.08	0.936	3.89	8.65	2.63	4.11	4.34	5.7
Step 1 Measured Sediment Data																									
PAH_{17}			Max RL for ND=	0.00634	0.00523	0.00438			0.00713	0.00565	0.00494				0.00508			0.00898							
2-Methylnaphthalene			mg/kg	0.00635	0	0.00247	0.0274	0.0254	0	0	0	0.158	0.961	0.414	0	0.0848	0.672	0	0.0413	0.285	0.0572	0.567	1.3	0.14	0.0686
Acenaphthene			mg/kg	0.0702	0.00291	0.0179	0.555	0.00916	0.00394	0	0	0.0305	3.83	2.84	0.00386	0.47	1.28	0.00529	1.86	3.37	0.739	8.26	8.62	0.66	6.45
Acenaphthylene			mg/kg	0.0203	0	0.00248	0.0855	0.101	0.00504	0	0	0.592	0.342	0.795	0.00831	0.299	10.4	0.0172	0.354	1.2	0.0358	2.84	0.231	0.334	0.123
Anthracene	0.057	0.845	mg/kg	0.182	0.0106	0.0321	0.8	0.148	0.00583	0	0	0.431	0.655	2.84	0.00504	0.707	19.4	0.00617	1.25	7.25	0.374	12.3	18	1.24	0.691
Benzo(a)anthracene	0.11	1.05	mg/kg	0.149	0.00383	0.0162	0.623	0.872	0.0116	0	0	2.56	1.32	3.02	0.00395	1.4	47	0.00638	1.74	10.2	0.662	16.7	24.5	2.32	0.659
Benzo(a)pyrene	0.15	1.45	mg/kg	0.121	0.00342	0.0142	0.542	0.788	0.0132	0	0	3.1	1.26	2.98	0.0037	1.33	77.2	0	1.72	9.11	0.587	12	23.1	2.05	0.55
Benzo(b)fluoranthene			mg/kg	0.0667	0	0.00679	0.321	0.534	0.0104	0	0	1.78	0.904	1.95	0.00255	0.979	29.2	0	1.3	7.35	0.442	6.15	16.7	1.48	0.453
Benzo(g,h,i)perylene			mg/kg	0.0575	0	0.00743	0.314	0.455	0.00758	0	0	1.96	0.748	1.69	0	0.804	33	0	1.01	4.95	0.287	5.22	11.6	1.14	0.311
Benzo(k)fluoranthene			mg/kg	0.0884	0.00298	0.012	0.46	0.601	0.00894	0	0	1.63	0.949	2.21	0	1.07	35.6	0	1.44	7.24	0.469	6.79	17.9	1.63	0.453
Chrysene	0.17	1.29	mg/kg	0.168	0.00747	0.0249	0.628	0.868	0.0111	0	0	2.78	1.34	3.55	0.00466	1.45	45.2	0.00632	1.77	9.65	0.621	16.2	23.2	2.32	0.718
Dibenzo(a,h)anthracene	0.033		mg/kg	0.0111	0	0.00458	0.0688	0.115	0	0	0	0.477	0.17	0.349	0	0.221	5.57	0	0.245	1.49	0.0756	1.41	3.14	0.325	0.0833
Fluoranthene	0.42	2.23	mg/kg	0.359	0.0096	0.0382	2.44	1.06	0.0275	0.0029	0	1.85	3.48	7.8	0.00948	2.69	105	0.0252	3.93	23.6	1.33	23.2	61.5	4.33	1.88
Fluorene	0.077	0.536	mg/kg	0.0418	0	0.00762	0.452	0.029	0.00407	0	0	0.0902	1.13	1.47	0.00299	0.167	0.93	0	0.714	2.61	0.187	5.06	7.5	0.325	0.554
Indeno(1,2,3-c,d)pyrene			mg/kg	0.016	0	0	0.0572	0.123	0	0	0	0.288	0.201	0.494	0	0.188	6.52	0	0.231	1.55	0.06	2.88	3.95	0.276	0.0893
Naphthalene	0.18	0.561	mg/kg	0.0104	0	0.00394	0.0476	0.0371	0.00525	0	0	0.163	0.663	0.573	0.00561	0.12	1.95	0.00916	0.107	0.745	0.109	0.841	2.55	0.166	0.153
Phenanthrene	0.2	1.17	mg/kg	0.31	0.00944	0.0489	3.48	0.16	0.028	0.00342	0.00272	0.496	1.34	10.4	0.0122	1.33	32.8	0.00492	5.3	23.9	1.23	32.5	62.3	2.65	2.03
Pyrene	0.2	1.52	mg/kg	0.461	0.0113	0.0522	2.72	1.42	0.0381	0.00347	0	4.09	3.99	10.1	0.0125	3.18	158	0.027	4.05	24.2	1.29	35.7	52.2	4.79	2.1
Total PAH_{17}	1.6	22.7	mg/kg	**2.1**	**0.1**	**0.3**	**13.6**	**7.3**	**0.2**	**0.0**	**0.0**	**22.5**	**23.3**	**53.5**	**0.1**	**16.5**	**609.7**	**0.1**	**27.1**	**138.7**	**8.6**	**188.6**	**338.3**	**26.2**	**17.4**
Total PAH_{34}	NCE	NCE	mg/kg	**3.7**	**0.5**	**0.8**	**17.7**	**11.8**	**2.0**	**0.8**	**0.3**	**43.1**	**33.3**	**84.8**	**0.4**	**25.0**	**732.7**	**1.0**	**35.7**	**177.8**	**11.5**	**294.6**	**424.9**	**39.4**	**24.1**
PECHQ, PAH_{17}			**HQ**	**0.1**	**0.0**	**0.0**	**0.6**	**0.3**	**0.0**	**0.0**	**0.0**	**1.0**	**1.0**	**2.4**	**0.0**	**0.7**	**26.9**	**0.0**	**1.2**	**6.1**	**0.4**	**8.3**	**14.9**	**1.2**	**0.8**
ΣESBTU$_{FCV}$, PAH_{34}			**TU**	**0.1**	**0.0**	**0.1**	**1.0**	**0.6**	**0.1**	**0.0**	**0.0**	**4.3**	**1.7**	**4.3**	**0.0**	**1.1**	**28.5**	**0.1**	**5.8**	**6.6**	**0.2**	**17.0**	**14.4**	**1.3**	**0.7**
ΣESBTU$_{FCV}$,estimated from PAH_{17} data			Applies the the average site-specific conversion factor. If no site specific values EPA method default																						

Notes

GREEN highlight = sample exceeds the MassDEP TEC (MassDEP 2006 "Technical Update - Revised Sediment Screening Values")

ORANGE highlight = sample exceeds the MacDonald et al. (2000) "consensus" Probable Effect Concentrations (PEC)

PINK highlight = the sample has a PEC-Q> 1

Complete data presented in Attachment

(1) TOC values <1000 mg/kg (0.1%) adjusted to 0.1%. Equilibrium partitioning theory is invalid at very low organic carbon content

(2) All TOC reported in mg/kg unless otherwise indicated.

(3) No TOC data. Applies the average TOC for all wetland or mudflat samples with measured TOC (in italics)

(4) RAH - Boring with readily apparent harm; RAH(ADJ) - boring within RAH area but not exhbiting RAH; visual>1= Visual tar

(5) Sample extending beyond 1 foot but considered surface for evaluation

ND PAHs replaced with 0 (zero) unless all PAHs are ND when total PAH17 is set at the highest RL

Attachment E: Evaluation of Near Surface and Subsurface Sediment

Analyte	Sed: TEC/ ESV	Sed: PEC/ RSV	Units																					
Area				River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	Mudflat	Mudflat	Mudflat	Mudflat	River	River	River
Sample ID				SS677-S4A	SS677-S5A	SS-678-S4	SS-679-S4	SS-679-S5	SS680R-S1	SS-680-S4	SS-680-S5	SS-681-S3	SS-681-S4	SS-682-S2	SS-682-S3	SS-683-S2	SS-683-S4	SS-683-S5	SS-684-S2	SS-684-S4	SS685-S3	SS686-S3	SS687-S2	SS687-S4	SS688-S4
Depth Top-Bottom				2.6 to 2.8	3.9 to 4	4.4 to 4.6	2.9 to 3.1	3.9 to 4	5.1 to 5.3	2.9 to 3.1	4.4 to 4.5	1.9 to 2.1	3.1 to 3.2	2.4 to 2.6	3.9 to 4.1	0.9 to 1.1	2.9 to 3.1	3.9 to 4.1	1.2 to 1.3	3.3 to 3.4	1.9 to 2.1	1.9 to 2.1	1.9 to 2.1	5.1 to 6.1	2.9 to 3.1
S / NS / SUB				SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	NS	SUB	SUB	NS	SUB	SUB	SUB	SUB	SUB	SUB
Sampling Date				09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/11/2019	09/25/2019	09/11/2019	09/11/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/12/2019	09/10/2019	09/10/2019	09/23/2019	09/23/2019	09/23/2019
RAH (4)																								
Carbon																								
Total Organic Carbon (2)	NCE	NCE	mg/kg	13300	29100	87400	117000	73000	2530	30600	137000	79300	40500	47100	89800	61000	42500	19600	73400	58300	50000	35000	47200	16700	8380
Total Organic Carbon (2)	NCE	NCE	%	1.33	2.91	8.74	11.7	7.3	0.253	3.06	13.7	7.93	4.05	4.71	8.98	6.1	4.25	1.96	7.34	5.83	5	3.5	4.72	1.67	0.838
Step 1 Measured Sediment Data																									
PAH_{17}			Max RL for ND=						0.00498																0.00508
2-Methylnaphthalene			mg/kg	1.1	2.45	5.37	9.25	0.254	0.0271	0.353	964	9.54	0.995	2.35	0.246	0.6	0.135	0.402	0.0462	1.02	0.0757	0.0277	0.204	0.0645	0
Acenaphthene			mg/kg	17.3	19	309	62.5	0.512	0.128	15.6	1430	266	28.9	42	0.349	10.8	0.165	0.538	0.233	14.4	0.0637	0.0277	1.37	0.169	0
Acenaphthylene			mg/kg	0.694	2.88	18.7	2.78	0.397	0.0115	2.1	45.4	23.1	1.03	6.8	0.298	4.11	0.161	0.569	0.235	1.3	0.137	0.0195	0.839	0.113	0.0082
Anthracene	0.057	0.845	mg/kg	6.53	42.2	201	30.7	1.07	0.065	5.54	595	191	10.1	78.8	0.837	13.3	0.357	1.4	0.304	8.54	0.625	0.118	2.44	0.387	0
Benzo(a)anthracene	0.11	1.05	mg/kg	2.93	23.5	132	17.6	3.13	0.0759	9.02	308	162	7.3	42.7	2.24	19.8	1.33	4.04	0.776	5.97	1.96	0.252	5.8	0.561	0
Benzo(a)pyrene	0.15	1.45	mg/kg	2.72	20.5	106	11.9	3.11	0.0745	10.1	278	154	6.4	39	2.43	19.4	1.37	4.14	0.838	4.29	1.33	0.147	5.67	0.448	0
Benzo(b)fluoranthene			mg/kg	2.19	9.86	49.5	7.16	2.3	0.0339	6.01	120	67.5	3.58	21.9	1.19	8.27	0.738	2.29	0.67	2.67	0.846	0.124	4.58	0.312	0
Benzo(g,h,i)perylene			mg/kg	1.56	7.08	49.1	5.31	1.71	0.0341	5.5	129	69.7	2.9	17.2	1.28	5.93	0.714	2.1	0.585	1.85	0.382	0.0603	3.13	0.182	0
Benzo(k)fluoranthene			mg/kg	2.14	11.9	70.5	7.14	2.27	0.0504	6.62	171	98.4	4.34	23.8	1.34	8.06	0.843	2.57	0.668	3.08	1.23	0.159	4.66	0.359	0
Chrysene	0.17	1.29	mg/kg	2.79	20.5	125	16.3	3.01	0.0633	8.98	293	152	6.5	40	1.99	13.8	1.28	3.66	0.897	5.98	1.74	0.256	5.79	0.502	0
Dibenzo(a,h)anthracene	0.033		mg/kg	0.429	1.77	11.2	1.73	0.477	0.00603	1.29	26.4	13	0.744	3.9	0.33	1.48	0.179	0.601	0.136	0.565	0.175	0.0226	0.875	0.0582	0
Fluoranthene	0.42	2.23	mg/kg	11	45.8	295	33.7	4.66	0.223	14.4	730	319	15.5	131	2.57	34.1	1.64	4.89	1.52	14.1	2.1	0.478	11.9	1.05	0.00312
Fluorene	0.077	0.536	mg/kg	9.52	9.16	149	32.2	0.489	0.0652	5.39	497	113	9.55	26.1	0.23	6.99	0.148	0.57	0.174	7.95	0.119	0.0446	0.974	0.177	0
Indeno(1,2,3-c,d)pyrene			mg/kg	0.485	3.09	22.5	3.82	0.416	0.0109	1.18	39	20.4	1.2	7.09	0.32	2.5	0.177	0.543	0.0975	1.31	0.53	0.0607	0.836	0.0825	0
Naphthalene	0.18	0.561	mg/kg	4.72	10.3	10.2	16.7	0.436	0.0105	1.87	1990	29.8	2.99	5.01	0.21	1.42	0.138	0.388	0.0632	2.63	0.0941	0.0383	0.374	0.0728	0.00338
Phenanthrene	0.2	1.17	mg/kg	27.2	66.4	669	99.6	3.1	0.467	19.3	1840	493	34	198	1.17	44.2	0.855	3.52	0.846	30.7	0.669	0.251	7.67	1.11	0.00387
Pyrene	0.2	1.52	mg/kg	11.5	67.2	421	49.5	4.74	0.319	17.7	1040	488	22.1	185	4.41	49.8	2.55	7.86	1.88	19.8	1.85	0.422	10.8	0.999	0.00373
Total PAH_{17}	1.6	22.7	mg/kg	**104.8**	**363.6**	**2644.1**	**407.9**	**32.1**	**1.7**	**131.0**	**10495.8**	**2669.4**	**158.1**	**870.7**	**21.4**	**244.6**	**12.8**	**40.1**	**10.0**	**126.2**	**13.9**	**2.5**	**67.9**	**6.6**	**0.0**
Total PAH_{34}	NCE	NCE	mg/kg	**131.1**	**464.5**	**3640.1**	**676.2**	**47.6**	**2.1**	**180.0**	**13167.0**	**3324.4**	**209.5**	**1104.9**	**35.0**	**354.3**	**22.9**	**63.7**	**18.7**	**197.2**	**27.9**	**4.9**	**92.8**	**9.5**	**0.3**
PECHQ, PAH_{17}			**HQ**	**4.6**	**16.0**	**116.5**	**18.0**	**1.4**	**0.1**	**5.8**	**462.4**	**117.6**	**7.0**	**38.4**	**0.9**	**10.8**	**0.6**	**1.8**	**0.4**	**5.6**	**0.6**	**0.1**	**3.0**	**0.3**	**0.0**
ΣESBTU$_{FCV}$, PAH_{34}			**TU**	**16.9**	**24.7**	**66.5**	**9.8**	**0.9**	**1.3**	**9.4**	**179.4**	**65.7**	**8.5**	**36.2**	**0.6**	**9.1**	**0.8**	**4.7**	**0.4**	**5.6**	**0.8**	**0.2**	**2.8**	**0.9**	**0.1**
ΣESBTU$_{FCV}$,estimated from PAH_{17} data			Applies the the average site-specific conversion factor. If no site specific values EPA method default																						

Notes

GREEN highlight = sample exceeds the MassDEP TEC (MassDEP 2006 "Technical Update - Revised Sediment Screening Values")

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PINK highlight = the sample has a PEC-Q> 1

Complete data presented in Attachment

(1) TOC values <1000 mg/kg (0.1%) adjusted to 0.1%. Equilibrium partitioning theory is invalid at very low organic carbon content

(2) All TOC reported in mg/kg unless otherwise indicated.

(3) No TOC data. Applies the average TOC for all wetland or mudflat samples with measured TOC (in italics)

(4) RAH - Boring with readily apparent harm; RAH(ADJ) - boring within RAH area but not exhbiting RAH; visual>1= Visual tar

(5) Sample extending beyond 1 foot but considered surface for evaluation

ND PAHs replaced with 0 (zero) unless all PAHs are ND when total PAH17 is set at the highest RL

Attachment E: Evaluation of Near Surface and Subsurface Sediment

Analyte	Sed: TEC/ ESV	Sed: PEC/ RSV	Units	Area	River	River	Mudflat	Mudflat	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River
				Sample ID	SS689-S2	SS690-S5	SS691-S3	SS691-S5	SS692-S4	SS692-S5	SS693-S3	SS693-S5	SS694-S4	SS694-S6	SS695-S6	SS696-S3	SS696-S5	SS697-S2	SS698-S4	SS699-S3	SS700-S2	SS700-S5	SS701-S2	SS701-S4	SS702-S3	SS703-S3
				Depth Top-Bottom	1.9 to 2.1	3.9 to 4.1	1.9 to 2.1	4.4 to 4.5	4.3 to 4.8	6.9 to 7	1.9 to 2.1	3.9 to 4.1	3.3 to 3.7	6.3 to 6.5	4.1 to 4.3	1.9 to 2.1	3.9 to 4.1	0.9 to 1.1	2.9 to 3.1	2.9 to 3.1	1.9 to 2.1	4.9 to 5.1	1.9 to 2.1	5.1 to 5.3	3.9 to 4.1	5.9 to 6.1
				S / NS / SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	NS	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB
				Sampling Date	09/24/2019	09/25/2019	09/24/2019	09/24/2019	09/24/2019	09/24/2019	09/25/2019	09/25/2019	09/25/2019	09/25/2019	09/25/2019	09/25/2019	09/25/2019	09/25/2019	09/26/2019	09/26/2019	09/26/2019	09/26/2019	09/26/2019	09/26/2019	09/26/2019	09/26/2019
				RAH (4)															RAH						
Carbon									(3)																
Total Organic Carbon (2)	NCE	NCE	mg/kg		30500	75600	73800	70600	55000	2590	40300	3140	172000	3190	16600	54600	91600	70800	14800	158000	63700	4110	205000	2270	101000	112000
Total Organic Carbon (2)	NCE	NCE	%		3.05	7.56	7.38	7.06	5.5	0.259	4.03	0.314	17.2	0.319	1.66	5.46	9.16	7.08	1.48	15.8	6.37	0.411	20.5	0.227	10.1	11.2
Step 1 Measured Sediment Data																										
PAH_{17}			Max RL for ND=		0.00692					0.00578		0.00472		0.00493	0.00487							0.00522		0.00539		
2-Methylnaphthalene			mg/kg		0	0.273	0.727	5.68	3610	0.171	0.401	0	1630	0.0713	0	0.385	13.2	3.22	0.112	7.84	2.18	0.00274	111	0.0174	6.1	170
Acenaphthene			mg/kg		0	0.451	7.71	61	3250	0.174	0.26	0.00365	2310	0.0971	0	3.11	204	19.3	1.25	258	10.4	0.00399	269	0.0684	46.2	287
Acenaphthylene			mg/kg		0.00477	0.421	1.47	4.22	145	0.013	0.126	0	71.5	0	0	0.72	14.7	1.65	0.166	22.2	3.81	0.0273	14.5	0.0141	5.37	14.4
Anthracene	0.057	0.845	mg/kg		0	4.08	5.4	37	1120	0.0863	0.528	0.00667	1800	0	0	3.03	136	25.5	0.661	291	17.3	0.00901	128	0.044	39	122
Benzo(a)anthracene	0.11	1.05	mg/kg		0	10.7	9.02	25.1	718	0.0703	1.3	0.00559	532	0	0	4.63	111	34.4	0.863	167	19.3	0.0183	78.1	0.0383	38.7	72.1
Benzo(a)pyrene	0.15	1.45	mg/kg		0	10.2	8.53	18.5	573	0.0609	1.01	0.00535	530	0	0	4.6	61.6	30.4	0.714	155	14.8	0.0112	88.5	0.0351	41.6	61.7
Benzo(b)fluoranthene			mg/kg		0	8.83	5.8	6.98	244	0.0264	0.728	0.00342	208	0	0	3.3	37.1	24.8	0.457	68.8	7.28	0.00608	41.4	0.0176	22.2	27.6
Benzo(g,h,i)perylene			mg/kg		0	5.18	4.75	4.78	155	0.0282	0.422	0.00259	240	0	0	2.46	27.3	15.1	0.322	66.6	5.55	0.00528	43.6	0.0162	21.5	26.8
Benzo(k)fluoranthene			mg/kg		0	8.27	6.52	8.02	333	0.0387	0.844	0.00386	310	0	0	3.53	40.7	24.7	0.488	97.2	8.44	0.00803	50.8	0.024	27.7	37.3
Chrysene	0.17	1.29	mg/kg		0	11.4	9.97	25.5	647	0.0633	1.2	0.00665	646	0	0	4.95	118	31.9	0.914	159	21.3	0.0158	70.3	0.0364	39.6	69.9
Dibenzo(a,h)anthracene	0.033		mg/kg		0	1.31	1.1	1.53	43.6	0.00605	0.151	0	32.2	0	0	0.579	5.7	4.01	0.0872	14.9	1.8	0	8.03	0.0036	4.32	6.28
Fluoranthene	0.42	2.23	mg/kg		0.00828	17.7	21.6	42.6	1330	0.143	1.92	0.0103	1250	0	0.00267	9.81	280	87.5	1.64	370	30.4	0.0181	245	0.095	106	166
Fluorene	0.077	0.536	mg/kg		0	0.578	3.63	31.4	1260	0.092	0.285	0.00276	841	0.0296	0	2	101	15	0.456	132	8.9	0.0056	86.7	0.0337	22.3	99.6
Indeno(1,2,3-c,d)pyrene			mg/kg		0	0.953	1.59	4.98	145	0.0118	0.23	0	86.4	0	0	0.599	18.2	4.17	0.176	28.5	3.92	0.00648	12.6	0.0066	6.31	14
Naphthalene	0.18	0.561	mg/kg		0.0135	0.384	1.51	11.3	5300	0.208	0.468	0.00278	3740	0.147	0.00806	1.1	115	8.1	0.239	30.9	2.66	0	183	0.0155	16.5	272
Phenanthrene	0.2	1.17	mg/kg		0.00389	6.93	21.2	113	4450	0.473	1.64	0.0174	3460	0.0146	0	8.66	487	90	1.92	900	55.7	0.012	568	0.213	139	466
Pyrene	0.2	1.52	mg/kg		0.00561	17.1	28.2	65.1	1920	0.217	1.98	0.0159	1910	0.00291	0	11.3	383	73	2.24	545	47.5	0.0752	368	0.139	144	244
Total PAH_{17}	1.6	22.7	mg/kg		**0.0**	**104.8**	**138.7**	**466.7**	**25243.6**	**1.9**	**13.5**	**0.1**	**19597.1**	**0.4**	**0.0**	**64.8**	**2153.5**	**492.8**	**12.7**	**3313.9**	**261.2**	**0.2**	**2366.5**	**0.8**	**726.4**	**2156.7**
Total PAH_{34}	NCE	NCE	mg/kg		**0.9**	**139.4**	**202.1**	**789.4**	**38314.5**	**2.7**	**23.8**	**0.1**	**24024.7**	**0.5**	**0.7**	**93.5**	**2888.6**	**613.5**	**20.0**	**4562.3**	**472.0**	**0.4**	**2911.3**	**1.1**	**942.1**	**3275.3**
PECHQ, PAH_{17}			**HQ**		**0.0**	**4.6**	**6.1**	**20.6**	**1112.1**	**0.1**	**0.6**	**0.0**	**863.3**	**0.0**	**0.0**	**2.9**	**94.9**	**21.7**	**0.6**	**146.0**	**11.5**	**0.0**	**104.3**	**0.0**	**32.0**	**95.0**
ΣESBTU$_{FCV}$, PAH_{34}			**TU**		**0.0**	**2.4**	**4.1**	**18.6**	**1324.6**	**1.8**	**0.9**	**0.1**	**259.3**	**0.3**	**0.0**	**2.6**	**51.4**	**12.5**	**2.1**	**45.2**	**11.5**	**0.2**	**24.3**	**0.8**	**14.3**	**52.4**
ΣESBTU$_{FCV}$,estimated from PAH_{17} data			Applies the the average site-specific conversion factor. If no site specific values EPA method default																							

Notes

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Attachment E: Evaluation of Near Surface and Subsurface Sediment

Analyte	Sed: TEC/ ESV	Sed: PEC/ RSV	Units																						
Area				Mudflat	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	Mudflat	Mudflat
Sample ID				SS704-S2	SS705-S2	SS705-S3	SS706-S2	SS706-S3	SS707-S3	SS708-S2	SS708-S3	SS709-S3	SS710-S1	SS710-S2	SS711-S2	SS712-S1	SS712-S2	SS713-S2	SS714-S3	SS714-S4	SS715-S2	SS716-S1	SS716-S2	SS717-S3	SS718-S5
Depth Top-Bottom				0.9 to 1.1	4.9 to 5.1	7.1 to 7.2	4.3 to 4.4	6.3 to 6.5	3.9 to 4.1	5.4 to 5.6	6.4 to 6.5	4.6 to 4.8	1.9 to 2.4	3.0 to 3.1	2.0 to 2.1	4.1 to 5.1	6.2 to 6.3	2.4 to 2.5	3.9 to 4.0	5.5 to 5.6	3.7 to 3.8	3.0 to 3.9	4.5 to 4.6	4.2 to 4.3	7.8 to 7.9
S / NS / SUB				NS	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB
Sampling Date				09/26/2019	09/27/2019	09/27/2019	09/27/2019	09/27/2019	09/27/2019	09/27/2019	09/27/2019	09/27/2019	11/11/2019	11/11/2019	11/11/2019	11/11/2019	11/11/2019	11/15/2019	11/14/2019	11/14/2019	11/15/2019	11/11/2019	11/11/2019	11/11/2019	11/11/2019
RAH (4)																									
Carbon																									
Total Organic Carbon (2)	NCE	NCE	mg/kg	172000	295000	2440	212000	91500	4760	110000	4800	2590	97400	44000	149000	102000	8220	15000	133000	49500	104000	73000	57500	81000	31000
Total Organic Carbon (2)	NCE	NCE	%	17.2	29.5	0.244	21.2	9.15	0.476	11	0.48	0.259	9.74	4.4	14.9	10.2	0.822	1.5	13.3	4.95	10.4	7.3	5.75	8.1	3.1
Step 1 Measured Sediment Data																									
PAH_{17}			Max RL for ND=						0.00378			0.00395			0.0133		0.00409				0.0107			0.00527	
2-Methylnaphthalene			mg/kg	1.96	1560	0.124	5080	17.3	0.00382	3360	0.128	0.00247	9.22	0.138	0	11.9	0.0275	0.052	110	0.15	0.00692	1.57	0.0176	0	0
Acenaphthene			mg/kg	20.9	2200	0.284	7630	51.5	0.00779	4890	0.242	0.00492	330	0.306	0.00672	304	0.0641	1.45	346	0.15	0.0117	16.1	0.0237	0	0
Acenaphthylene			mg/kg	6.03	77.9	0.0198	371	0.854	0.00924	256	0.00949	0.00471	23	0.167	0.0209	22.3	0.0191	0.255	26.8	0.167	0.0126	3.16	0.0453	0.00965	0.00475
Anthracene	0.057	0.845	mg/kg	32.5	1200	0.265	4230	11.1	0.0116	2080	0.0848	0.00267	200	0.432	0.00788	200	0.0722	0.648	195	0.299	0.00623	18.4	0.0428	0	0.00426
Benzo(a)anthracene	0.11	1.05	mg/kg	52.4	451	0.0908	1970	5.81	0.00849	1240	0.0284	0.00367	143	1.2	0.00935	138	0.178	1.35	102	0.95	0.00538	18.1	0.134	0	0
Benzo(a)pyrene	0.15	1.45	mg/kg	53.2	427	0.0953	1960	5.73	0.00925	1210	0.0154	0.00351	135	1.27	0.00861	143	0.17	1.07	70.1	1.07	0	13.8	0.13	0	0
Benzo(b)fluoranthene			mg/kg	25	176	0.0392	837	3.19	0.0053	468	0.00741	0	63.2	0.763	0	63.9	0.114	0.83	35	0.6	0	9.71	0.0716	0	0
Benzo(g,h,i)perylene			mg/kg	20.1	182	0.0435	852	2.87	0.0065	507	0.00763	0.00248	62.4	0.719	0	58.4	0.0842	0.534	25.4	0.594	0	7.49	0.0826	0	0
Benzo(k)fluoranthene			mg/kg	24.8	258	0.0571	1120	3.78	0.00673	735	0.00962	0.00231	76.3	0.832	0	87.4	0.127	0.915	42.1	0.646	0	9.47	0.0718	0	0
Chrysene	0.17	1.29	mg/kg	54.9	478	0.0922	2110	5.45	0.0112	1420	0.022	0.00411	137	1.19	0.00981	139	0.17	1.38	102	0.92	0.0067	19.7	0.135	0	0
Dibenzo(a,h)anthracene	0.033		mg/kg	4.78	45.4	0.00886	198	0.677	0	121	0.00456	0	14.5	0.173	0	13	0.0242	0.146	8.38	0.137	0	2.12	0.0174	0	0
Fluoranthene	0.42	2.23	mg/kg	130	1100	0.206	4630	14.2	0.0135	2790	0.233	0.00591	310	2.17	0.0194	348	0.293	2.53	189	1.58	0.0175	35.5	0.121	0.00311	0.00349
Fluorene	0.077	0.536	mg/kg	16.7	768	0.109	2850	17.3	0.00481	1820	0.129	0.00337	151	0.205	0.0129	147	0.0371	0.173	165	0.113	0.00706	12.6	0.0231	0	0
Indeno(1,2,3-c,d)pyrene			mg/kg	4.25	116	0.0152	419	1.05	0.002	203	0.00864	0	28.9	0.177	0	25.7	0.0312	0.217	26.8	0.16	0	4.34	0.0253	0	0
Naphthalene	0.18	0.561	mg/kg	3.95	3090	0.196	9480	46.6	0.00479	9250	0.281	0.00317	19.8	0.175	0	31.7	0.0427	0.0986	192	0.211	0.0109	2.52	0.0202	0	0
Phenanthrene	0.2	1.17	mg/kg	133	2910	0.52	11500	53.2	0.0157	7810	0.671	0.0113	665	1.17	0.0155	674	0.203	2.08	651	0.582	0.0226	64.8	0.107	0	0.00416
Pyrene	0.2	1.52	mg/kg	139	1590	0.304	6910	19.6	0.0179	4090	0.36	0.0124	467	2.73	0.0253	530	0.316	2.58	278	2.23	0.0187	52.4	0.33	0.00454	0.00373
Total PAH_{17}	1.6	22.7	mg/kg	**723.5**	**16629.3**	**2.5**	**62147.0**	**260.2**	**0.1**	**42250.0**	**2.2**	**0.1**	**2835.3**	**13.8**	**0.1**	**2937.3**	**2.0**	**16.3**	**2564.6**	**10.6**	**0.1**	**291.8**	**1.4**	**0.0**	**0.0**
Total PAH_{34}	NCE	NCE	mg/kg	**865.6**	**21491.1**	**3.1**	**79250.6**	**362.0**	**0.3**	**52868.5**	**2.8**	**0.2**	**3881.9**	**21.9**	**1.4**	**3753.3**	**3.0**	**24.0**	**4479.9**	**17.6**	**2.1**	**503.9**	**4.0**	**0.6**	**0.1**
PECHQ, PAH_{17}			**HQ**	**31.9**	**732.6**	**0.1**	**2737.8**	**11.5**	**0.0**	**1861.2**	**0.1**	**0.0**	**124.9**	**0.6**	**0.0**	**129.4**	**0.1**	**0.7**	**113.0**	**0.5**	**0.0**	**12.9**	**0.1**	**0.0**	**0.0**
$\Sigma ESBTU_{FCV}$, PAH_{34}			**TU**	**7.4**	**135.3**	**2.2**	**679.2**	**7.4**	**0.1**	**903.1**	**1.0**	**0.1**	**63.4**	**0.7**	**0.0**	**58.5**	**0.5**	**2.4**	**58.3**	**0.5**	**0.0**	**10.7**	**0.1**	**0.0**	**0.0**
$\Sigma ESBTU_{FCV}$,estimated from PAH_{17} data			Applies the the average site-specific conversion factor. If no site specific values EPA method default																						

Notes

GREEN highlight = sample exceeds the MassDEP TEC (MassDEP 2006 "Technical Update - Revised Sediment Screening Values")

ORANGE highlight = sample exceeds the MacDonald et al. (2000) "consensus" Probable Effect Concentrations (PEC)

PINK highlight = the sample has a PEC-Q> 1

Complete data presented in Attachment

(1) TOC values <1000 mg/kg (0.1%) adjusted to 0.1%. Equilibrium partitioning theory is invalid at very low organic carbon content

(2) All TOC reported in mg/kg unless otherwise indicated.

(3) No TOC data. Applies the average TOC for all wetland or mudflat samples with measured TOC (in italics)

(4) RAH - Boring with readily apparent harm; RAH(ADJ) - boring within RAH area but not exhbiting RAH; visual>1= Visual tar

(5) Sample extending beyond 1 foot but considered surface for evaluation

ND PAHs replaced with 0 (zero) unless all PAHs are ND when total PAH17 is set at the highest RL

Attachment E: Evaluation of Near Surface and Subsurface Sediment

Analyte	Sed: TEC/ ESV	Sed: PEC/ RSV	Units	Area	Mudflat	Mudflat	Mudflat	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River
				Sample ID	SS720-S2	SS721-S1	SS721-S2	SS723-S1	SS724-S3	SS725-S2	SS726-S2	SS727-S2	SS727-S3	SS728-S3	SS729-S3	SS729-S4	SS730-S2	SS730-S3	SS731-S2	SS733-S4	SS734-S1	SS734-S2	SS735-S2	SS735-S3	SS735-S4	SS736-S2
				Depth Top-Bottom	1.4 to 1.5	1.0 to 1.1	2.3 to 2.4	1.4 to 1.5	4.7 to 4.8	2.8 to 2.9	1.4 to 1.5	1.9 to 2.0	5.3 to 5.4	5.4 to 5.6	3.9 to 4.0	5.9 to 6.0	2.5 to 2.6	4.8 to 4.9	3.8 to 3.9	5.4 to 5.6	4.9 to 5.0	6.1 to 6.2	3.3 to 3.4	6.7 to 6.8	7.8 to 7.9	3.9 to 4.0
				S / NS / SUB	NS	NS	SUB	NS	SUB	SUB	NS	NS	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB
				Sampling Date	11/12/2019	11/12/2019	11/12/2019	11/14/2019	11/12/2019	11/14/2019	11/12/2019	11/14/2019	11/14/2019	11/14/2019	11/12/2019	11/12/2019	11/14/2019	11/14/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019	11/15/2019
				RAH (4)																						
Carbon																										
Total Organic Carbon (2)	NCE	NCE	mg/kg		29900	213000	51600	202000	10800	2060	76400	81100	55100	92800	81700	1270	11400	3260	109000	1230	79800	1750	248000	52800	9850	12100
Total Organic Carbon (2)	NCE	NCE	%		2.99	21.3	5.16	20.2	1.08	0.206	7.64	8.11	5.51	9.28	8.17	0.127	1.14	0.326	10.9	0.123	7.98	0.175	24.8	5.28	0.985	1.21
Step 1 Measured Sediment Data																										
PAH_{17}			Max RL for ND=				0.00862		0.00481	0.00492						0.00396		0.00486		0.00434		0.00487			0.00429	0.00534
2-Methylnaphthalene			mg/kg		0.0167	0.954	0.00457	1.07	0	0	0.201	0.263	0.367	9.11	11.1	0.00368	0.00492	0	3.09	0.0843	1390	0.104	0.66	0.399	0	0.0129
Acenaphthene			mg/kg		0.0188	1.4	0.0051	3.67	0.00695	0.00287	0.579	0.782	0.267	41.6	266	0.0143	0.00545	0	8.5	0.691	1710	0.276	8.31	0.457	0.00239	0.017
Acenaphthylene			mg/kg		0.0346	16.5	0.0179	2.54	0.0107	0.0182	0.843	0.863	0.513	5.31	18.5	0.0201	0.0258	0	0.365	0.0467	71.4	0.00858	1.25	0.209	0	0.00627
Anthracene	0.057	0.845	mg/kg		0.0435	40	0.015	11.3	0.00981	0.00278	1.45	1.38	0.937	53	181	0.0281	0.0102	0	4.29	0.514	704	0.083	6.44	0.947	0.0047	0.00678
Benzo(a)anthracene	0.11	1.05	mg/kg		0.108	103	0.0284	19.2	0.0151	0	4.65	3	3.39	43.2	120	0.0611	0.0147	0	2.65	0.362	462	0.0176	8.72	2.17	0.00696	0.0062
Benzo(a)pyrene	0.15	1.45	mg/kg		0.0962	109	0.0252	18	0.0169	0.00294	3.9	3.66	4.23	29.2	107	0.0542	0.0182	0	2.38	0.287	447	0.00841	7.5	1.96	0.00302	0.00578
Benzo(b)fluoranthene			mg/kg		0.0722	49	0.0157	11.3	0.00941	0	3.17	2.95	2.32	16	56.1	0.0403	0.00888	0	1.8	0.129	187	0.00444	5.89	1.07	0.00237	0.0034
Benzo(g,h,i)perylene			mg/kg		0.0467	52.4	0.0126	7.67	0.00848	0	2.33	2.13	2.39	11.2	49.5	0.0275	0.0102	0	1.34	0.128	214	0.0037	4.11	0.954	0	0.00416
Benzo(k)fluoranthene			mg/kg		0.0896	70.5	0.0188	12.4	0.0117	0	3.07	3.03	2.43	15.3	63.2	0.0462	0.0102	0	1.92	0.172	254	0.00513	5.92	1.1	0.00248	0.00376
Chrysene	0.17	1.29	mg/kg		0.113	99.4	0.0299	18	0.0156	0	4.73	3.54	3.4	42.8	116	0.0552	0.015	0	2.95	0.356	414	0.0155	8.79	2.06	0.00727	0.00641
Dibenzo(a,h)anthracene	0.033		mg/kg		0.0145	12.5	0	2.13	0	0	0.595	0.547	0.595	3.28	11	0.00724	0.00492	0	0.348	0.0257	40.1	0	1.05	0.239	0	0
Fluoranthene	0.42	2.23	mg/kg		0.205	171	0.0521	27.7	0.0356	0.00247	8.62	6.54	4.13	69.4	289	0.128	0.0228	0	6.87	0.765	975	0.18	22.7	2.62	0.0099	0.0108
Fluorene	0.077	0.536	mg/kg		0.0285	1.72	0.00754	4.11	0.00553	0.0042	0.544	0.786	0.354	29.8	118	0.012	0.00643	0	5	0.359	664	0.116	2.76	0.321	0	0.00637
Indeno(1,2,3-c,d)pyrene			mg/kg		0.0231	14.1	0.00641	2.5	0.00316	0	0.585	0.494	0.578	8.78	21	0.00671	0.0053	0	0.493	0.0606	73.3	0.00691	1.61	0.382	0	0
Naphthalene	0.18	0.561	mg/kg		0.0207	3.44	0.00537	1.41	0	0	0.283	0.328	0.448	10.2	34	0.00515	0.00492	0	6.82	0.117	2510	0.299	2.3	0.336	0	0.027
Phenanthrene	0.2	1.17	mg/kg		0.0984	45.5	0.0298	29.4	0.0332	0.00418	4.66	4.52	1.85	166	572	0.0908	0.0162	0	17.5	1.95	2880	0.612	24.2	1.39	0.00838	0.0243
Pyrene	0.2	1.52	mg/kg		0.211	265	0.0602	35.2	0.0553	0.00379	9.17	7.13	6.16	103	419	0.114	0.0347	0.00352	8.05	1.1	1430	0.263	22.8	4.78	0.0224	0.0167
Total PAH_{17}	1.6	22.7	mg/kg		**1.2**	**1055.4**	**0.3**	**207.6**	**0.2**	**0.0**	**49.4**	**41.9**	**34.4**	**657.2**	**2452.4**	**0.7**	**0.2**	**0.0**	**74.4**	**7.1**	**14425.8**	**2.0**	**135.0**	**21.4**	**0.1**	**0.2**
Total PAH_{34}	NCE	NCE	mg/kg		**2.3**	**1338.6**	**1.3**	**275.1**	**0.6**	**0.1**	**70.4**	**67.2**	**58.2**	**1135.0**	**3343.9**	**1.0**	**1.4**	**4.1**	**110.6**	**10.1**	**18503.8**	**2.5**	**176.2**	**38.6**	**0.1**	**2.3**
PECHQ, PAH_{17}			**HQ**		**0.1**	**46.5**	**0.0**	**9.1**	**0.0**	**0.0**	**2.2**	**1.8**	**1.5**	**29.0**	**108.0**	**0.0**	**0.0**	**0.0**	**3.3**	**0.3**	**635.5**	**0.1**	**5.9**	**0.9**	**0.0**	**0.0**
$\Sigma ESBTU_{FCV}$, PAH_{34}			**TU**		**0.1**	**8.9**	**0.0**	**2.0**	**0.1**	**0.2**	**1.3**	**1.2**	**1.5**	**19.2**	**65.6**	**1.2**	**0.2**	**1.3**	**1.7**	**13.2**	**428.0**	**2.7**	**1.1**	**1.1**	**0.0**	**0.2**
$\Sigma ESBTU_{FCV}$,estimated from PAH_{17} data			Applies the the average site-specific conversion factor. If no site specific values EPA method default																							

Notes

GREEN highlight = sample exceeds the MassDEP TEC (MassDEP 2006 "Technical Update - Revised Sediment Screening Values")

ORANGE highlight = sample exceeds the MacDonald et al. (2000) "consensus" Probable Effect Concentrations (PEC)

PINK highlight = the sample has a PEC-Q> 1

Complete data presented in Attachment

(1) TOC values <1000 mg/kg (0.1%) adjusted to 0.1%. Equilibrium partitioning theory is invalid at very low organic carbon content

(2) All TOC reported in mg/kg unless otherwise indicated.

(3) No TOC data. Applies the average TOC for all wetland or mudflat samples with measured TOC (in italics)

(4) RAH - Boring with readily apparent harm; RAH(ADJ) - boring within RAH area but not exhbiting RAH; visual>1= Visual tar

(5) Sample extending beyond 1 foot but considered surface for evaluation

ND PAHs replaced with 0 (zero) unless all PAHs are ND when total PAH17 is set at the highest RL

Attachment E: Evaluation of Near Surface and Subsurface Sediment

Analyte	Sed: TEC/ ESV	Sed: PEC/ RSV	Units	Area	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River
				Sample ID	SS737-S1	SS738-S1	SS738-S2	SS739-S1	SS739-S2	SS739-S3	SS740-S1	SS740-S2	SS741-S1	SS741-S3	SS742-S1	SS743-S2	SS744-S1	SS744-S2	SS745-S2	SS746-S1	SS746-S3	SS747-S2	SS748-S1	SS748-S3	SS749-S1	SS749-S2
				Depth Top-Bottom	8.5 to 8.6	1 to 1.5	3.5 to 3.7	1.3 to 1.5	7.6 to 7.8	8.7 to 9	0.5 to 1.7	4.2 to 4.5	0.9 to 1.1	4.4 to 4.6	4.9 to 5.1	4.9 to 5.1	1.9 to 2.1	3.9 to 4.1	3.7 to 3.9	1.9 to 2.1	4.6 to 5.1	6.5 to 6.7	2.5 to 2.7	5.5 to 5.7	4.1 to 4.3	8 to 8.2
				S / NS / SUB	SUB	NS	SUB	NS	SUB	SUB	NS	SUB	NS	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB
				Sampling Date	11/15/2019	02/04/2020	02/04/2020	02/04/2020	02/04/2020	02/04/2020	02/04/2020	02/04/2020	02/05/2020	02/05/2020	02/04/2020	02/04/2020	02/05/2020	02/05/2020	02/04/2020	02/05/2020	02/05/2020	02/04/2020	02/05/2020	02/05/2020	02/03/2020	02/03/2020
				RAH (4)																					
Carbon							(1)																		
Total Organic Carbon (2)	NCE	NCE	mg/kg		116000	39600	1000	1140	124000	35100	23600	162000	23100	1190	3710	8370	31600	33600	7430	71400	12600	1680	55200	2190	18000	2380
Total Organic Carbon (2)	NCE	NCE	%		11.6	3.96	0.1	0.114	12.4	3.51	2.36	16.2	2.31	0.119	0.371	0.837	3.16	3.36	0.743	7.14	1.26	0.168	5.52	0.219	1.8	0.238
Step 1 Measured Sediment Data																									
PAH_{17}			Max RL for ND=									0.0122		0.00493	0.00441	0.00526	0.00631	0.00474	0.00483		0.00441	0.00441		0.00455		0.00384
2-Methylnaphthalene			mg/kg		912	0.217	0.179	0.359	0.395	0.098	0.0224	0	0.156	0	0	0	0	0	0	2.51	0.00255	0	1.46	0	0.336	0
Acenaphthene			mg/kg		800	1.23	0.471	2.6	1.11	0.237	1.72	0	2.89	0	0	0	0	0	0	26.5	0.0119	0	6.87	0	0.379	0
Acenaphthylene			mg/kg		45	0.315	0.158	0.39	0.496	0.167	0.0849	0	0.613	0	0	0	0	0	0	5.99	0.00347	0.00357	2.91	0	0.543	0
Anthracene	0.057	0.845	mg/kg		352	1.28	0.652	1.81	1.73	0.512	0.57	0	1.72	0	0	0	0	0	0	22.1	0.0103	0.00649	13.9	0	0.952	0
Benzo(a)anthracene	0.11	1.05	mg/kg		196	2.25	1.67	3.09	3.99	1.92	0.529	0	3.89	0	0	0	0.00584	0	0	33.9	0.0125	0.0316	17.1	0	4.86	0.00198
Benzo(a)pyrene	0.15	1.45	mg/kg		124	2.14	1.67	2.73	3.88	2.42	0.532	0	3.71	0.0025	0	0	0.00586	0	0	25.1	0.00905	0.036	12.7	0	4.43	0.00216
Benzo(b)fluoranthene			mg/kg		60.3	1.65	1.02	1.67	2.28	1.28	0.346	0	2.84	0	0	0	0.00497	0	0	16	0.00585	0.0221	7.2	0	2.85	0
Benzo(g,h,i)perylene			mg/kg		41.4	1.19	0.934	1.24	1.92	1.39	0.281	0	2.1	0.00493	0	0	0.00361	0	0	11.4	0.00472	0.0183	5.39	0	2.19	0
Benzo(k)fluoranthene			mg/kg		75.9	1.74	1.13	1.92	2.44	1.44	0.369	0	3.08	0	0	0	0.00446	0	0	18.8	0.00736	0.0265	9.27	0	3.09	0
Chrysene	0.17	1.29	mg/kg		184	2.15	1.53	3.11	3.82	1.62	0.541	0	3.96	0	0	0	0.00666	0	0	40	0.015	0.0363	18.6	0	4.61	0.00238
Dibenzo(a,h)anthracene	0.033		mg/kg		13.4	0.317	0.24	0.323	0.545	0.323	0.0713	0	0.602	0.00493	0	0	0	0	0	3.3	0	0.00366	1.69	0	0.511	0
Fluoranthene	0.42	2.23	mg/kg		349	5.16	2.71	5.34	5.45	2.81	1.04	0.0127	8.66	0.00301	0.00379	0	0.012	0	0	48.3	0.0229	0.0577	29.8	0	8.03	0.00363
Fluorene	0.077	0.536	mg/kg		345	0.807	0.158	1.34	0.829	0.205	0.784	0	0.715	0	0	0	0	0	0	19.6	0.00892	0	7.14	0	0.501	0
Indeno(1,2,3-c,d)pyrene			mg/kg		41.4	0.27	0.255	0.513	0.575	0.193	0.0728	0	0.513	0	0	0	0	0	0	7.04	0.00222	0.00365	3.32	0	0.754	0
Naphthalene	0.18	0.561	mg/kg		861	0.337	0.177	0.578	0.457	0.172	0.0445	0	0.225	0	0	0	0	0	0	5.85	0.00551	0	1.35	0	0.442	0
Phenanthrene	0.2	1.17	mg/kg		1180	5.21	0.819	5.36	4.86	1.74	2.17	0.00966	6.8	0	0	0	0.00785	0	0	65.7	0.0391	0.0158	39.8	0	1.8	0
Pyrene	0.2	1.52	mg/kg		513	5.34	3.88	7.32	6.65	3.93	1.36	0.0112	8.56	0.00392	0.00376	0	0.013	0	0	70.6	0.0347	0.0869	42.3	0	14.7	0.00554
Total PAH_{17}	1.6	22.7	mg/kg		**6093.4**	**31.6**	**17.7**	**39.7**	**41.4**	**20.5**	**10.5**	**0.0**	**51.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.0**	**0.0**	**422.7**	**0.2**	**0.3**	**220.8**	**0.0**	**51.0**	**0.0**
Total PAH_{34}	NCE	NCE	mg/kg		**9759.2**	**41.3**	**28.7**	**62.5**	**70.9**	**28.4**	**15.2**	**1.0**	**73.6**	**0.0**	**1.8**	**0.4**	**0.7**	**0.1**	**5.2**	**820.3**	**1.1**	**1.6**	**379.9**	**0.0**	**72.8**	**0.0**
PECHQ, PAH_{17}			**HQ**		**268.4**	**1.4**	**0.8**	**1.7**	**1.8**	**0.9**	**0.5**	**0.0**	**2.2**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**18.6**	**0.0**	**0.0**	**9.7**	**0.0**	**2.2**	**0.0**
ΣESBTU$_{FCV}$, PAH_{34}			**TU**		**156.5**	**1.5**	**40.2**	**82.2**	**0.8**	**1.1**	**1.0**	**0.0**	**4.7**	**0.0**	**0.5**	**0.0**	**0.0**	**0.0**	**0.7**	**17.6**	**0.1**	**1.1**	**10.4**	**0.0**	**5.7**	**0.0**
ΣESBTU$_{FCV}$,estimated from PAH_{17} data			Applies the the average site-specific conversion factor. If no site specific values EPA method default																						

Notes

GREEN highlight = sample exceeds the MassDEP TEC (MassDEP 2006 "Technical Update - Revised Sediment Screening Values")

ORANGE highlight = sample exceeds the MacDonald et al. (2000) "consensus" Probable Effect Concentrations (PEC)

PINK highlight = the sample has a PEC-Q> 1

Complete data presented in Attachment

(1) TOC values <1000 mg/kg (0.1%) adjusted to 0.1%. Equilibrium partitioning theory is invalid at very low organic carbon content

(2) All TOC reported in mg/kg unless otherwise indicated.

(3) No TOC data. Applies the average TOC for all wetland or mudflat samples with measured TOC (in italics)

(4) RAH - Boring with readily apparent harm; RAH(ADJ) - boring within RAH area but not exhbiting RAH; visual>1= Visual tar

(5) Sample extending beyond 1 foot but considered surface for evaluation

ND PAHs replaced with 0 (zero) unless all PAHs are ND when total PAH17 is set at the highest RL

Attachment E: Evaluation of Near Surface and Subsurface Sediment

Analyte	Sed: TEC/ ESV	Sed: PEC/ RSV	Units																					
Area				River	River	River	River	River	River	River	River	River	River	River	River	Mudflat	River	River	River	River	River	River	River	River	River
Sample ID				SS751-S1	SS751-S2	SS752-S1	SS752-S2	SS753-S1	SS753-S2	SS754-S1	SS754-S2	SS755-S1	SS756-S1	SS757-S1	SS760-S2	SS761-S2	SS762-S2	SS762-S3	SS763-S1	SS763-S2	SS764-S2	SS765-S2	SS766-S2	SS766-S3	SS767-S1
Depth Top-Bottom				2.1 to 2.3	4.2 to 4.4	2.1 to 2.3	4.9 to 5.1	1.3 to 1.5	4.1 to 4.3	3.9 to 4.1	8.4 to 8.6	1.7 to 1.9	1.5 to 1.7	1.6 to 1.8	3.4-3.6	2.2-2.4	1.9-2.1	2.9-3.1	1.9-2.1	5.0-5.2	4.6-4.8	3.8-4	3.8-4	6.5-6.7	3.3-3.5
S / NS / SUB				SUB	SUB	SUB	SUB	NS	SUB	SUB	SUB	NS	NS	NS	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB
Sampling Date				02/03/2020	02/03/2020	02/03/2020	02/03/2020	02/04/2020	02/04/2020	02/05/2020	02/05/2020	02/05/2020	02/05/2020	02/05/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/09/2020	03/13/2020	03/10/2020	03/10/2020	03/10/2020
RAH (4)																									
Carbon																									
Total Organic Carbon (2)	NCE	NCE	mg/kg	35200	7550	72600	27400	27200	1650	76800	22700	36400	63600	40000	53600	26500	37600	11400	54000	3680	43700	35600	114000	34800	68300
Total Organic Carbon (2)	NCE	NCE	%	3.52	0.755	7.26	2.74	2.72	0.165	7.68	2.27	3.64	6.36	4	5.36	2.65	3.76	1.14	5.4	0.368	4.37	3.56	11.4	3.48	6.83
Step 1 Measured Sediment Data																									
PAH_{17}			Max RL for ND=		0.00521				0.00454							0.006	0.00685	0.00558		0.00485	0.00743	0.00667			
2-Methylnaphthalene			mg/kg	0.0761	0	0.573	0.0847	1.3	0	4.42	0.0267	0.0356	0.08	0.125	0.132	0.00912	0	0	0.751	0	0	0	1.25	0.011	2.22
Acenaphthene			mg/kg	0.131	0	13	0.0482	0.516	0	50.9	0.0156	0.0478	0.227	0.595	0.129	0.0113	0	0	17.4	0	0	0	25.9	0.506	6.4
Acenaphthylene			mg/kg	0.157	0	1.61	0.0556	0.354	0	5.11	0.0258	0.0411	0.205	0.368	0.0742	0.028	0	0	2.61	0	0	0.0058	1.39	0.0237	1.78
Anthracene	0.057	0.845	mg/kg	0.286	0	8.38	0.2	1.7	0	47.4	0.0653	0.125	0.449	1.45	0.61	0.0676	0	0	17.9	0.00485	0	0.00375	6.61	0.274	10.1
Benzo(a)anthracene	0.11	1.05	mg/kg	0.769	0.00446	12.5	0.675	2.85	0	48.6	0.249	0.377	0.97	3.54	2.23	0.287	0	0	28.3	0	0	0	5.37	0.192	9.92
Benzo(a)pyrene	0.15	1.45	mg/kg	0.736	0.00597	12.2	0.636	2.29	0	45.6	0.232	0.349	0.908	2.94	1.85	0.249	0	0.00558	27.5	0	0	0	5.37	0.147	6.5
Benzo(b)fluoranthene			mg/kg	0.581	0.00561	7.21	0.462	1.42	0	22.5	0.169	0.255	0.696	2.41	1.11	0.166	0	0.00558	11.1	0	0	0	4.12	0.0657	3.98
Benzo(g,h,i)perylene			mg/kg	0.42	0.0036	5.74	0.353	1.09	0	21.5	0.125	0.19	0.544	1.53	0.808	0.135	0	0.00558	10.3	0	0	0.0194	3.47	0.0688	3.4
Benzo(k)fluoranthene			mg/kg	0.615	0.00555	8	0.461	1.56	0	28.7	0.191	0.288	0.707	2.54	1.24	0.187	0	0.00558	12	0	0	0	4.16	0.095	4.33
Chrysene	0.17	1.29	mg/kg	0.869	0.00533	12.6	0.658	2.87	0	43.9	0.256	0.397	1.12	3.25	1.91	0.325	0	0	28.6	0	0	0	5.97	0.188	10.2
Dibenzo(a,h)anthracene	0.033		mg/kg	0.115	0	1.34	0.0952	0.291	0	4.94	0.0345	0.0522	0.132	0.483	0.245	0.0365	0	0.00558	3.09	0	0	0.00384	0.935	0.0158	1.08
Fluoranthene	0.42	2.23	mg/kg	1.58	0.00473	23.6	0.692	4.41	0.00318	110	0.256	0.661	2.46	7.51	2.98	0.43	0	0	56.2	0.00333	0	0	14.9	0.468	21.7
Fluorene	0.077	0.536	mg/kg	0.233	0	7.06	0.087	0.438	0	29.4	0.0292	0.0537	0.0895	0.532	0.211	0.0196	0	0	8.08	0	0	0	7.87	0.21	6.12
Indeno(1,2,3-c,d)pyrene			mg/kg	0.0987	0	1.76	0.0855	0.471	0	7.95	0.0348	0.0502	0.174	0.398	0.273	0.0497	0	0	3.13	0	0	0	0.883	0.0271	2.15
Naphthalene	0.18	0.561	mg/kg	1.2	0	1.48	0.0973	1.07	0	9.55	0.0324	0.0453	0.0842	0.221	0.151	0.0135	0	0	1.75	0	0	0	2.28	0.0376	1.45
Phenanthrene	0.2	1.17	mg/kg	1.3	0	28.9	0.497	4.58	0.0027	161	0.158	0.343	1.66	5.2	1.58	0.135	0	0	58.2	0.00353	0	0	39.1	1.03	36.1
Pyrene	0.2	1.52	mg/kg	1.67	0.00785	32.6	1.3	7.16	0.00571	169	0.444	0.789	3.02	6.49	4.18	0.608	0	0	71.8	0.00552	0	0	16.8	0.714	32.3
Total PAH_{17}	1.6	22.7	mg/kg	**10.8**	**0.0**	**178.6**	**6.5**	**34.4**	**0.0**	**810.5**	**2.3**	**4.1**	**13.5**	**39.6**	**19.7**	**2.8**	**0.0**	**0.0**	**358.7**	**0.0**	**0.0**	**0.0**	**146.4**	**4.1**	**159.7**
Total PAH_{34}	NCE	NCE	mg/kg	**18.9**	**5.1**	**276.3**	**11.3**	**58.6**	**1.1**	**1097.8**	**4.4**	**7.4**	**30.6**	**51.7**	**29.6**	**5.3**	**0.5**	**0.3**	**460.9**	**0.2**	**0.8**	**0.6**	**195.2**	**5.7**	**308.7**
PECHQ, PAH_{17}			**HQ**	**0.5**	**0.0**	**7.9**	**0.3**	**1.5**	**0.0**	**35.7**	**0.1**	**0.2**	**0.6**	**1.7**	**0.9**	**0.1**	**0.0**	**0.0**	**15.8**	**0.0**	**0.0**	**0.0**	**6.4**	**0.2**	**7.0**
$\Sigma ESBTU_{FCV}$, PAH_{34}			**TU**	**0.8**	**0.7**	**5.7**	**0.6**	**3.2**	**0.7**	**21.8**	**0.3**	**0.3**	**0.7**	**1.8**	**0.7**	**0.3**	**0.0**	**0.0**	**12.5**	**0.1**	**0.0**	**0.0**	**2.8**	**0.3**	**7.0**
$\Sigma ESBTU_{FCV}$,estimated from PAH_{17} data			Applies the the average site-specific conversion factor. If no site specific values EPA method default																						

Notes

GREEN highlight = sample exceeds the MassDEP TEC (MassDEP 2006 "Technical Update - Revised Sediment Screening Values")

ORANGE highlight = sample exceeds the MacDonald et al. (2000) "consensus" Probable Effect Concentrations (PEC)

PINK highlight = the sample has a PEC-Q> 1

Complete data presented in Attachment

(1) TOC values <1000 mg/kg (0.1%) adjusted to 0.1%. Equilibrium partitioning theory is invalid at very low organic carbon content

(2) All TOC reported in mg/kg unless otherwise indicated.

(3) No TOC data. Applies the average TOC for all wetland or mudflat samples with measured TOC (in italics)

(4) RAH - Boring with readily apparent harm; RAH(ADJ) - boring within RAH area but not exhbiting RAH; visual>1= Visual tar

(5) Sample extending beyond 1 foot but considered surface for evaluation

ND PAHs replaced with 0 (zero) unless all PAHs are ND when total PAH17 is set at the highest RL

Attachment E: Evaluation of Near Surface and Subsurface Sediment

Analyte	Sed: TEC/ ESV	Sed: PEC/ RSV	Units																						
Area				River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River
Sample ID				SS767-S2	SS768-S2	SS769-S1	SS770-S2	SS770-S2	SS774-S2	SS774-S3	SS775-S2	SS775-S3	SS776-S3	SS777-S2	SS777-S3	SS778-S2	SS778-S3	SS779-S1	SS779-S2	SS780-S1	SS780-S2	SS781-S1	S781(R1)-S	SS782-S2	SS783-S2
Depth Top-Bottom				6.4-6.6	4.4-4.6	5.7-5.9	4.3-4.5	4.3-4.5	2.4-2.6	5.6-5.8	3.8-4	6.2-6.4	5-5.2	5.8-6	7.5-7.7	5.7-5.9	6.9-7.1	1.1-1.3	3.8-4	1.5-1.7	4.3-4.5	1.9-2.1	3.6-3.8	6.6-6.8	4-4.2
S / NS / SUB				SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	SUB	NS	SUB	NS	SUB	SUB	SUB	SUB	SUB
Sampling Date				03/10/2020	03/10/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/13/2020	03/16/2020
			RAH (4)																						
Carbon															(1)										
Total Organic Carbon (2)	NCE	NCE	mg/kg	60700	19100	80900	15300	15300	32100	86200	170000	37400	2810	80000	1000	178000	2450	23300	13300	78900	17700	34200	38900	28500	19900
Total Organic Carbon (2)	NCE	NCE	%	6.07	1.91	8.09	1.53	1.53	3.21	8.62	17	3.74	0.281	8	0.1	17.8	0.245	2.33	1.33	7.89	1.77	3.42	3.89	2.85	1.99
Step 1 Measured Sediment Data																									
PAH_{17}			Max RL for ND=		0.00636		0.00539	0.00538					0.00464		0.00476		0.00494	0.00571	0.00513		0.00464			0.00603	0.00492
2-Methylnaphthalene			mg/kg	0.102	0	3.88	0	0	0.0882	2.18	0.323	0.838	0	3.18	0	5.2	0	0	0	0.86	0	0.101	0.0751	0.00654	0
Acenaphthene			mg/kg	0.303	0	88.5	0	0	0.123	38.1	5.43	0.54	0	10.5	0.0083	193	0	0	0	0.484	0	0.258	0.153	0.00343	0
Acenaphthylene			mg/kg	0.0904	0.00533	11.2	0	0	0.0485	2.79	0.617	0.371	0	1.45	0	6.83	0	0	0	1.17	0	0.05	0.0816	0.00603	0
Anthracene	0.057	0.845	mg/kg	0.79	0.00366	330	0	0	0.271	45.1	3.7	2.04	0	13.7	0.01	121	0	0	0	2.74	0	0.216	0.255	0.0216	0
Benzo(a)anthracene	0.11	1.05	mg/kg	1.6	0.00546	469	0	0	0.925	42.3	7.99	4.59	0	27.3	0.0102	71.5	0	0	0	13.3	0	0.466	0.619	0.0641	0
Benzo(a)pyrene	0.15	1.45	mg/kg	1.3	0.00478	496	0	0	0.971	40.1	9.14	3.72	0	13.1	0.00971	77.3	0	0	0	16.4	0	0.476	0.737	0.0475	0
Benzo(b)fluoranthene			mg/kg	0.787	0	110	0	0	0.662	19.5	5.09	2.22	0	6.71	0.00459	40	0	0	0	8.66	0	0.362	0.54	0.0368	0
Benzo(g,h,i)perylene			mg/kg	0.604	0	76.9	0	0.00769	0.548	19.5	5.4	1.92	0	4.43	0.00681	51.2	0.00256	0	0	9.48	0	0.358	1.15	0.0199	0.0027
Benzo(k)fluoranthene			mg/kg	0.935	0.00361	145	0	0	0.782	25.4	6.41	2.54	0	8.6	0.00712	52.2	0	0	0	10.5	0	0.371	0.583	0.0484	0
Chrysene	0.17	1.29	mg/kg	1.42	0.0052	469	0	0	0.957	40.1	7.72	4.73	0	25.1	0.0117	67.5	0	0	0	13.5	0	0.646	0.699	0.0635	0
Dibenzo(a,h)anthracene	0.033		mg/kg	0.204	0	15	0	0.00347	0.152	4.34	1.12	0.589	0	1.71	0	11.4	0	0	0	1.89	0	0.132	0.232	0.00754	0
Fluoranthene	0.42	2.23	mg/kg	2.2	0.00894	1190	0.00334	0	1.53	109	17.2	5.47	0	40.8	0.0338	209	0.00402	0	0	11.4	0	0.824	1.11	0.108	0.0037
Fluorene	0.077	0.536	mg/kg	0.334	0	51.1	0	0	0.155	26.6	1.28	0.676	0	6.87	0.0049	104	0	0	0	0.734	0	0.494	0.16	0.0073	0
Indeno(1,2,3-c,d)pyrene			mg/kg	0.24	0	23.5	0	0	0.146	6.56	0.986	0.754	0	3.39	0	11.3	0	0	0	1.65	0	0.0779	0.0845	0.0112	0
Naphthalene	0.18	0.561	mg/kg	0.102	0	16.9	0	0	0.134	6.03	0.542	0.818	0	4.03	0	8.91	0	0	0	1.47	0	0.0804	0.127	0.0099	0
Phenanthrene	0.2	1.17	mg/kg	2.26	0.00768	736	0	0	0.987	160	15.3	5.71	0	63.3	0.0546	497	0.00645	0	0	6.21	0	1.95	0.805	0.0491	0
Pyrene	0.2	1.52	mg/kg	3.19	0.0121	1520	0.004	0	1.7	151	21.3	7.7	0	59.9	0.0538	309	0.00567	0	0	29.3	0	1.17	1.27	0.0922	0.00417
Total PAH_{17}	1.6	22.7	mg/kg	**16.5**	**0.1**	**5752.0**	**0.0**	**0.0**	**10.2**	**738.6**	**109.5**	**45.2**	**0.0**	**294.1**	**0.2**	**1836.3**	**0.0**	**0.0**	**0.0**	**129.7**	**0.0**	**8.0**	**8.7**	**0.6**	**0.0**
Total PAH_{34}	NCE	NCE	mg/kg	**25.4**	**0.4**	**6394.6**	**0.6**	**0.4**	**16.3**	**1073.5**	**150.2**	**87.0**	**0.7**	**473.4**	**0.3**	**2306.4**	**0.0**	**0.6**	**0.5**	**185.0**	**0.4**	**46.2**	**13.8**	**1.3**	**0.9**
PECHQ, PAH_{17}			**HQ**	**0.7**	**0.0**	**253.4**	**0.0**	**0.0**	**0.4**	**32.5**	**4.8**	**2.0**	**0.0**	**13.0**	**0.0**	**80.9**	**0.0**	**0.0**	**0.0**	**5.7**	**0.0**	**0.4**	**0.4**	**0.0**	**0.0**
ΣESBTU$_{FCV}$, PAH_{34}			**TU**	**0.6**	**0.0**	**111.4**	**0.0**	**0.0**	**0.7**	**18.7**	**1.2**	**3.4**	**0.3**	**8.9**	**0.4**	**20.2**	**0.0**	**0.0**	**0.0**	**3.2**	**0.0**	**2.1**	**0.5**	**0.1**	**0.0**
ΣESBTU$_{FCV}$,estimated from PAH_{17} data			Applies the the average site-specific conversion factor. If no site specific values EPA method default																						

Notes

GREEN highlight = sample exceeds the MassDEP TEC (MassDEP 2006 "Technical Update - Revised Sediment Screening Values")

ORANGE highlight = sample exceeds the MacDonald et al. (2000) "consensus" Probable Effect Concentrations (PEC)

PINK highlight = the sample has a PEC-Q> 1

Complete data presented in Attachment

(1) TOC values <1000 mg/kg (0.1%) adjusted to 0.1%. Equilibrium partitioning theory is invalid at very low organic carbon content

(2) All TOC reported in mg/kg unless otherwise indicated.

(3) No TOC data. Applies the average TOC for all wetland or mudflat samples with measured TOC (in italics)

(4) RAH - Boring with readily apparent harm; RAH(ADJ) - boring within RAH area but not exhbiting RAH; visual>1= Visual tar

(5) Sample extending beyond 1 foot but considered surface for evaluation

ND PAHs replaced with 0 (zero) unless all PAHs are ND when total PAH17 is set at the highest RL

Attachment E: Evaluation of Near Surface and Subsurface Sediment

changed 7/19 from RIV

Analyte	Sed: TEC/ ESV	Sed: PEC/ RSV	Units																					
Area				River	River	River	River	Upstream	Upstream	Upstream Extended	River	River	Wetland	Wetland	Wetland	River	River	River	River	River	River	River	Downstream	Downstream	Downstream
Sample ID				SS784-S2	SS785-S1	SS785-S2	SS786-S2	SS787-S2	SS790-S1	SS790-S2	SS791-S1	SS792-S1	SS793-S2	SS794-S2	SS795-S2	SS798-S2	SS799-S2	SS800-S1	SS800-S2	SS801-S2	SS802-S1	SS803-S1	SS804-S2	SS804-S2D	SS804-S3
Depth Top-Bottom				4.5-4.7	1-1.2	4-4.2	3.6-3.8	3.1-3.3	1.6-1.8	4.3-4.5	4-5	4-5	2-2.2	1.8-2	2-2.2	1.8-2	1.4-1.6	1.4-1.6	3.3-3.5	4.4-4.6	6-6.2	6-6.2	3.8-4	3.8-4	7.1-7.3
S / NS / SUB				SUB	NS	SUB	SUB	SUB	NS	SUB	SUB	SUB	SUB	NS	SUB	NS	NS	NS	SUB	SUB	SUB	SUB	SUB	SUB	SUB
Sampling Date				03/16/2020	03/16/2020	03/16/2020	03/16/2020	7/6/2020	7/6/2020	7/6/2020	7/8/2020	7/8/2020	7/8/2020	7/8/2020	7/6/2020	7/7/2020	7/7/2020	7/7/2020	7/7/2020	7/7/2020	7/8/2020	7/8/2020	7/7/2020	7/7/2020	7/7/2020
RAH (4)																								
Carbon																					(1)	(1)	(1)	
Total Organic Carbon (2)	NCE	NCE	mg/kg	9450	26400	31100	36100	247000	55000	17100	45500	29200	233000	297000	130000	51800	26600	23000	26600	18600	1000	1000	1000	51400	5280
Total Organic Carbon (2)	NCE	NCE	%	0.945	2.64	3.11	3.61	24.7	5.5	1.71	4.55	2.92	23.3	29.7	13	5.18	2.66	2.3	2.66	1.86	0.1	0.1	0.1	5.14	0.528
Step 1 Measured Sediment Data																									
PAH_{17}			Max RL for ND=	0.00516	0.00605	0.00534	0.00626			0.005							0.00733	0.00519		0.00606	0.00484	0.00489			
2-Methylnaphthalene			mg/kg	0	0	0	0	0.0332	0.129	0	0.00673	0.00663	1.4	3.65	13.1	0.0308	0.0041	0.00574	0.218	0	0.00333	0.00345	0.0987	0.0987	0.00918
Acenaphthene			mg/kg	0	0	0	0	0.123	0.862	0.00429	0.00613	0	0.554	2.03	369	0.0165	0	0	0.374	0	0	0	0.0624	0.0624	0.00382
Acenaphthylene			mg/kg	0	0	0	0	0.1	0.849	0	0.00347	0.00517	2.93	10.3	6.07	0.123	0.00478	0	0.45	0	0	0	0.346	0.346	0.0568
Anthracene	0.057	0.845	mg/kg	0	0	0	0	0.253	1.99	0	0.00335	0	2.54	7.3	41.8	0.118	0	0.00519	1.08	0	0	0	0.346	0.346	0.0324
Benzo(a)anthracene	0.11	1.05	mg/kg	0	0	0.0081	0	0.506	5.19	0	0.00786	0	6.34	23.4	19.8	0.366	0.00846	0.00329	2.42	0	0	0	0.621	0.621	0.135
Benzo(a)pyrene	0.15	1.45	mg/kg	0	0	0.00822	0	0.579	5.01	0	0.00795	0.00373	10.1	35.8	26.4	0.422	0.0116	0.00376	3.12	0	0	0	0.747	0.747	0.156
Benzo(b)fluoranthene			mg/kg	0	0	0.00777	0	0.374	4.33	0	0.00666	0	7.98	19.5	20.2	0.324	0.00721	0.00374	1.63	0	0	0	0.652	0.652	0.0976
Benzo(g,h,i)perylene			mg/kg	0.00383	0	0.00783	0	0.301	2.78	0	0.00498	0.00375	7.48	19.4	17.2	0.24	0.00694	0.00308	1.79	0	0	0	0.502	0.502	0.0799
Benzo(k)fluoranthene			mg/kg	0	0	0.00805	0	0.384	4.29	0	0.00591	0	8.01	22.3	19.4	0.342	0.00695	0.00351	1.62	0	0	0	0.708	0.708	0.107
Chrysene	0.17	1.29	mg/kg	0	0	0.0102	0	0.518	5.3	0	0.00806	0	7.66	22.6	23.6	0.425	0.00913	0.0048	2.43	0	0	0	0.828	0.828	0.126
Dibenzo(a,h)anthracene	0.033		mg/kg	0	0	0	0	0.0708	0.821	0	0.00613	0	1.55	4.52	3.63	0.0651	0.00733	0	0.434	0	0	0	0.122	0.122	0.0211
Fluoranthene	0.42	2.23	mg/kg	0	0.0056	0.0205	0	0.894	11.3	0.00386	0.0154	0	9.59	30.5	61.5	0.557	0.0158	0.00855	2.81	0	0	0	1.13	1.13	0.0879
Fluorene	0.077	0.536	mg/kg	0	0	0	0	0.0906	0.745	0	0.0055	0.00554	0.874	2.4	86.3	0.0295	0.00379	0.0027	0.485	0	0.0032	0.00249	0.115	0.115	0.00772
Indeno(1,2,3-c,d)pyrene			mg/kg	0	0	0	0	0.067	0.716	0	0.00613	0	0.792	3.15	3.7	0.0579	0	0	0.388	0	0	0	0.0955	0.0955	0.0169
Naphthalene	0.18	0.561	mg/kg	0	0	0	0	0.0598	0.236	0.00518	0.0104	0.00845	3.42	10	49.8	0.0402	0.00375	0.00446	0.212	0.00326	0.00295	0.00265	0.0984	0.0984	0.0111
Phenanthrene	0.2	1.17	mg/kg	0	0	0.00825	0	0.963	3.42	0.00338	0.0122	0.00687	3.74	7.23	253	0.188	0.0067	0.0102	3.08	0	0.00343	0.003	0.608	0.608	0.045
Pyrene	0.2	1.52	mg/kg	0.00343	0.00364	0.0204	0	0.995	10.5	0.00395	0.0156	0.00348	11.3	42.8	78.2	0.693	0.0159	0.00914	5.22	0	0	0	1.41	1.41	0.182
Total PAH_{17}	1.6	22.7	mg/kg	**0.0**	**0.0**	**0.1**	**0.0**	**6.3**	**58.5**	**0.0**	**0.1**	**0.0**	**86.3**	**266.9**	**1092.7**	**4.0**	**0.1**	**0.1**	**27.8**	**0.0**	**0.0**	**0.0**	**8.5**	**8.5**	**1.2**
Total PAH_{34}	NCE	NCE	mg/kg	**0.2**	**0.9**	**0.4**	**0.3**	**9.5**	**89.4**	**0.3**	**1.6**	**0.8**	**124.1**	**362.1**	**1304.5**	**7.2**	**1.1**	**1.4**	**46.2**	**0.8**	**0.0**	**0.0**	**15.5**	**15.5**	**2.1**
PECHQ, PAH_{17}			**HQ**	**0.0**	**0.0**	**0.0**	**0.0**	**0.3**	**2.6**	**0.0**	**0.0**	**0.0**	**3.8**	**11.8**	**48.1**	**0.2**	**0.0**	**0.0**	**1.2**	**0.0**	**0.0**	**0.0**	**0.4**	**0.4**	**0.1**
$\Sigma ESBTU_{FCV}$, PAH_{34}			**TU**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**2.3**	**0.0**	**0.0**	**0.0**	**0.8**	**2.0**	**18.0**	**0.2**	**0.0**	**0.1**	**2.5**	**0.0**	**0.1**	**0.1**	**24.7**	**0.5**	**0.6**
$\Sigma ESBTU_{FCV}$,estimated from PAH_{17} data			Applies the the average site-specific conversion factor. If no site specific values EPA method default																					

Notes

GREEN highlight = sample exceeds the MassDEP TEC (MassDEP 2006 "Technical Update - Revised Sediment Screening Values")

ORANGE highlight = sample exceeds the MacDonald et al. (2000) "consensus" Probable Effect Concentrations (PEC)

PINK highlight = the sample has a PEC-Q> 1

Complete data presented in Attachment

(1) TOC values <1000 mg/kg (0.1%) adjusted to 0.1%. Equilibrium partitioning theory is invalid at very low organic carbon content

(2) All TOC reported in mg/kg unless otherwise indicated.

(3) No TOC data. Applies the average TOC for all wetland or mudflat samples with measured TOC (in italics)

(4) RAH - Boring with readily apparent harm; RAH(ADJ) - boring within RAH area but not exhbiting RAH; visual>1= Visual tar

(5) Sample extending beyond 1 foot but considered surface for evaluation

ND PAHs replaced with 0 (zero) unless all PAHs are ND when total PAH17 is set at the highest RL

Attachment E: Evaluation of Near Surface and Subsurface Sediment

Analyte	Sed: TEC/ ESV	Sed: PEC/ RSV	Units	Area	Downstream	Wetland	Wetland	Wetland	Wetland	Wetland	River	River	River	River	Former Channel	Former Channel	Former Channel	Former Channel	Former Channel	Former Channel	Wetland	Former Channel	Former Channel	Former Channel	Former Channel	Former Channel
				Sample ID	SS805-S3	SS807-S2	SS808-S2	SS809-S2	810-S2	811-S2	815-S3	818-S2	823-S2	827-S2	837-S1	837-S2	837-S3	838-S1	838-S2	838-S3	839-S2	841-S1	841-S2	842-S1	842-S2	842-S3
				Depth Top-Bottom	3-3.2	1.8-2	1.8-2	1.8-2	1.8-2	1.8-2	4-5	5-6	4-5	5-6	1-2	5.5-6.5	7-8	1-2	5.5-6.5	7-8	1-2	2.5-3.5	4.5-5.5	2.5-3.5	4.5-5.5	8.2-9.2
				S / NS / SUB	SUB	NS	NS	NS	NS	NS	SUB	SUB	SUB	SUB	NS	SUB	SUB	NS	SUB	SUB	NS	SUB	SUB	SUB	SUB	SUB
				Sampling Date	7/7/2020	7/8/2020	10/13/2022	10/13/2022	06/20/2023	06/20/2023	06/22/2023	06/22/2023	06/22/2023	06/22/2023	06/22/2023	06/22/2023	06/22/2023	06/22/2023	06/22/2023	06/22/2023	08/18/2023	08/15/2023	08/15/2023	08/15/2023	08/15/2023	08/15/2023
				RAH (4)																						
Carbon																(1)							(1)	(1)		
Total Organic Carbon (2)	NCE	NCE	mg/kg		3760	114000	64100	30700	22300	50800	13700	22000	70500	7610	1860	1000	3620	4340	49000	21400	165000	1980	1000	1000	69100	49600
Total Organic Carbon (2)	NCE	NCE	%		0.376	11.4	6.41	3.07	2.23	5.08	1.37	2.2	7.05	0.761	0.186	0.1	0.362	0.434	4.9	2.14	16.5	0.198	0.1	0.1	6.91	4.96
Step 1 Measured Sediment Data																										
PAH_{17}			Max RL for ND=		0.00407		0.0156		0.005	0.005		0.005		0.005	0.005	0.005				0.005		0.005	0.005	0.005		
2-Methylnaphthalene			mg/kg		0	0.151	0	0.0222	0.0137	0.0074	0.116	0.00366	8.2	0.00222	0.00516	0.00279	0.0365	0.0461	0.0498	0.00833	0.265	0	0	0	0.198	1.14
Acenaphthene			mg/kg		0	0.132	0.0156	0.00893	0.0112	0	0.0745	0	189	0	0	0	0.0232	0.0238	0.0584	0	0.118	0	0	0	1.28	4.83
Acenaphthylene			mg/kg		0	0.185	0.0156	0.0813	0.0657	0.0141	0.165	0	21.3	0	0.00751	0	0.0662	0.122	0.128	0.00807	0.592	0.0147	0.00284	0	0.602	4.51
Anthracene	0.057	0.845	mg/kg		0	0.311	0.0102	0.209	0.142	0.00824	0.322	0	121	0	0.0111	0	0.0842	0.122	0.173	0.0126	0.638	0.0232	0.00254	0	1.75	10.8
Benzo(a)anthracene	0.11	1.05	mg/kg		0	0.847	0.0104	0.918	0.658	0.029	1.21	0	120	0	0.0354	0.00308	0.278	0.621	0.376	0.0512	1.54	0.195	0.00625	0.00437	2.24	19.5
Benzo(a)pyrene	0.15	1.45	mg/kg		0	0.856	0.0118	0.657	0.704	0.0451	1.18	0	136	0	0.0344	0.00278	0.26	0.767	0.437	0.0534	2.02	0.137	0.0116	0.0097	2.12	20.2
Benzo(b)fluoranthene			mg/kg		0	0.85	0.0154	0.578	0.536	0.0324	0.633	0	59.5	0	0.0244	0	0.15	0.362	0.314	0.0304	1.79	0.0792	0.00527	0.00338	1.16	9.76
Benzo(g,h,i)perylene			mg/kg		0	0.512	0	0.226	0.399	0.0449	0.525	0	64.8	0	0.018	0	0.123	0.38	0.248	0.0269	1.5	0.0396	0.00814	0.00516	1.04	7.93
Benzo(k)fluoranthene			mg/kg		0	0.806	0.0113	0.578	0.533	0.0309	0.746	0	75.9	0	0.0285	0.00244	0.189	0.441	0.336	0.0348	1.65	0.108	0.00683	0.00416	1.47	8.63
Chrysene	0.17	1.29	mg/kg		0	0.975	0.0133	0.808	0.625	0.0417	1.11	0	107	0	0.0281	0.004	0.29	0.551	0.449	0.0524	2	0.165	0.0077	0.00516	2.46	20.6
Dibenzo(a,h)anthracene	0.033		mg/kg		0	0.15	0	0.122	0.101	0.0101	0.142	0	13.2	0	0.00489	0	0.0308	0.0881	0.0682	0.00679	0.395	0.019	0	0	0.267	1.99
Fluoranthene	0.42	2.23	mg/kg		0	1.67	0.0368	1.12	1.3	0.042	0.985	0.00495	149	0	0.0636	0.00759	0.55	0.822	0.658	0.0685	2.83	0.136	0.0108	0.00199	4.54	33.7
Fluorene	0.077	0.536	mg/kg		0	0.154	0.00908	0.0456	0.0249	0.00297	0.103	0	139	0	0.00519	0.00306	0.0804	0.0519	0.0762	0.00761	0.226	0	0	0	0.861	3.64
Indeno(1,2,3-c,d)pyrene			mg/kg		0	0.0578	0	0.258	0.0309	0.00269	0.192	0	18.4	0	0.00554	0	0.0456	0.0755	0.0548	0.00877	0.164	0.0455	0	0	0.393	3.47
Naphthalene	0.18	0.561	mg/kg		0	0.153	0.00906	0.0374	0.0378	0.00692	0.133	0	30.9	0	0.00556	0	0.051	0.0755	0.0605	0.00916	0.599	0.00275	0	0	0.287	1.66
Phenanthrene	0.2	1.17	mg/kg		0.00252	0.873	0.0177	0.119	0.508	0.0306	0.6	0.00442	343	0.00294	0.0174	0.00553	0.136	0.224	0.334	0.0224	1.35	0.0126	0.00688	0	4.73	27.7
Pyrene	0.2	1.52	mg/kg		0	1.78	0.0336	0.98	1.11	0.0527	2.01	0.00341	221	0	0.0793	0.00881	0.779	1.14	0.779	0.0953	2.75	0.125	0.0172	0.00266	6.18	48.7
Total PAH_{17}	1.6	22.7	mg/kg		**0.0**	**10.5**	**0.2**	**6.8**	**6.8**	**0.4**	**10.2**	**0.0**	**1817.2**	**0.0**	**0.4**	**0.0**	**3.2**	**5.9**	**4.6**	**0.5**	**20.4**	**1.1**	**0.1**	**0.0**	**31.6**	**228.8**
Total PAH_{34}	NCE	NCE	mg/kg		**0.1**	**15.5**	**0.9**	**12.9**	**8.7**	**0.7**	**17.6**	**1.3**	**2626.1**	**0.8**	**0.7**	**0.2**	**5.1**	**9.2**	**9.1**	**1.7**	**30.4**	**2.3**	**0.1**	**0.1**	**49.5**	**334.7**
PECHQ, PAH_{17}			**HQ**		**0.0**	**0.5**	**0.0**	**0.3**	**0.3**	**0.0**	**0.5**	**0.0**	**80.1**	**0.0**	**0.0**	**0.0**	**0.1**	**0.3**	**0.2**	**0.0**	**0.9**	**0.0**	**0.0**	**0.0**	**1.4**	**10.1**
ΣESBTU$_{FCV}$, PAH_{34}			**TU**		**0.0**	**0.2**	**0.0**	**0.6**	**0.5**	**0.0**	**1.8**	**0.1**	**59.8**	**0.1**	**0.5**	**0.3**	**2.1**	**3.0**	**0.3**	**0.1**	**0.3**	**1.6**	**0.2**	**0.1**	**1.1**	**10.3**
ΣESBTU$_{FCV}$,estimated from PAH_{17} data			Applies the the average site-specific conversion factor. If no site specific values EPA method default																							

Notes

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Complete data presented in Attachment

(1) TOC values <1000 mg/kg (0.1%) adjusted to 0.1%. Equilibrium partitioning theory is invalid at very low organic carbon content

(2) All TOC reported in mg/kg unless otherwise indicated.

(3) No TOC data. Applies the average TOC for all wetland or mudflat samples with measured TOC (in italics)

(4) RAH - Boring with readily apparent harm; RAH(ADJ) - boring within RAH area but not exhbiting RAH; visual>1= Visual tar

(5) Sample extending beyond 1 foot but considered surface for evaluation

ND PAHs replaced with 0 (zero) unless all PAHs are ND when total PAH17 is set at the highest RL

Attachment E: Evaluation of Near Surface and Subsurface Sediment

Analyte	Sed: TEC/ ESV	Sed: PEC/ RSV	Units	Area	Former Channel	River	River	River	Upstream	Upstream	Upstream	Upstream	Upstream	Upstream	Upstream	River	River	River	River	River	River	River	River	River	River	River
				Sample ID	841-S3	848-S2	853-S2	853-S3	857-S2	857-S3	857-S4	858-S2	858-S3	858-S4	859-S2	860-S2	843-S2	844-S2	844-S3	845-S2	846-S2	846-S3	847-S2	851-S2	852-S2	854-S2
				Depth Top-Bottom	7.5-8.5	1-2	1-2	5-5.6	1-2	2-3	4-5	1-2	2-3	4-5	1-2	1-2	1-2	1-2	3-3.5	1-2	1-2	3.5-4.75	1-2	5.5-6	3.5-4	1.5-2
				S / NS / SUB	SUB	NS	NS	SUB	NS	SUB	SUB	NS	SUB	SUB	NS	NS	NS	NS	SUB	NS	NS	SUB	NS	SUB	SUB	NS
				Sampling Date	08/15/2023	08/18/2023	08/18/2023	08/18/2023	2/Nov/23	2/Nov/23	2/Nov/23	2/Nov/23	2/Nov/23	2/Nov/23	28/Nov/23	28/Nov/23	08/29/2023	08/29/2023	08/29/2023	28/Aug/23	08/29/2023	08/29/2023	08/29/2023	08/30/2023	08/30/2023	08/29/2023
				RAH (4)																						
Carbon																										
Total Organic Carbon (2)	NCE	NCE	mg/kg		40700	7080	27800	9490	22500	47400	67500	12200	20900	91600	34500	27500	72800	32200	106000	50100	31700	124000	45200	45500	95600	9370
Total Organic Carbon (2)	NCE	NCE	%		4.07	0.708	2.78	0.949	2.25	4.74	6.75	1.22	2.09	9.16	3.45	2.75	7.28	3.22	10.6	5.01	3.17	12.4	4.52	4.55	9.56	0.937
Step 1 Measured Sediment Data																										
PAH_{17}			Max RL for ND=					0.005												0.005						
2-Methylnaphthalene			mg/kg		1.31	0.0484	0.0516	0	0.0988	0.821	0.604	0.176	0.124	0.511	0.0514	1.15	1.17	0.153	2.04	0	0.0624	0.232	0.074	124	0.96	0.0471
Acenaphthene			mg/kg		3.69	0.0658	0.0688	0	0.374	3.95	2.25	0.802	0.533	2.22	0.553	0.905	6.72	0.359	6.27	0	0.112	0.867	0.129	561	34.3	0.157
Acenaphthylene			mg/kg		1.72	0.17	0.158	0	0.359	1.1	1.19	0.589	0.53	1.07	0.0185	0.202	2.14	0.603	4.1	0	0.333	1.23	0.306	34	2.21	0.301
Anthracene	0.057	0.845	mg/kg		4.64	0.187	0.213	0	0.911	7.3	4.53	1.81	1.33	5.82	0.128	2.28	4.14	1.03	8.73	0	0.419	1.7	0.781	275	6.12	0.623
Benzo(a)anthracene	0.11	1.05	mg/kg		4.85	0.604	0.452	0	2.25	11.1	8.86	4.38	2.94	9.43	0.188	3.16	6.39	2.65	16.7	0.00449	1.25	4.05	1.11	141	7.74	1.05
Benzo(a)pyrene	0.15	1.45	mg/kg		3.81	0.856	0.465	0	2.32	9.91	10	4.45	3.02	9.38	0.216	2.87	7.51	3.04	20	0.00515	1.54	5.12	1.34	133	8.93	1.12
Benzo(b)fluoranthene			mg/kg		2.55	0.475	0.344	0	1.83	9.43	7.67	3.59	2.48	7.73	0.0941	1.74	4.37	2.05	11.4	0.00488	1.07	3.29	0.916	58.5	6.09	0.748
Benzo(g,h,i)perylene			mg/kg		1.86	0.477	0.261	0	1.33	6.38	6.16	2.46	1.69	5.68	0.105	1.15	3.91	1.73	10.6	0.0034	0.921	2.88	0.8	55.4	4.78	0.589
Benzo(k)fluoranthene			mg/kg		2.63	0.548	0.363	0	1.94	6.97	7.08	3.58	2.32	6.85	0.101	2.22	5.03	2.3	13.3	0.00424	1.17	3.36	0.968	72.3	6.1	0.837
Chrysene	0.17	1.29	mg/kg		5.46	0.688	0.55	0	2.35	11	9.28	4.39	3.05	9.15	0.179	2.81	6.57	2.88	17.7	0.0056	1.35	4.42	1.22	130	8.42	1.05
Dibenzo(a,h)anthracene	0.033		mg/kg		0.549	0.106	0.0726	0	0.382	1.75	1.77	0.737	0.506	1.47	0.0259	0.452	1.01	0.459	2.61	0	0.232	0.713	0.206	15.3	1.26	0.174
Fluoranthene	0.42	2.23	mg/kg		7.8	1	0.747	0	5.19	32.7	25.2	9.1	5.45	30.7	0.255	4.83	12.2	4.76	27.7	0.00833	2.16	6.5	2.25	321	15.8	1.95
Fluorene	0.077	0.536	mg/kg		2.81	0.0794	0.102	0	0.29	3.76	1.88	0.635	0.4	2.16	0.0793	1.1	2.77	0.353	2.81	0	0.115	0.433	0.102	188	7.77	0.171
Indeno(1,2,3-c,d)pyrene			mg/kg		1.04	0.0842	0.0811	0	0.181	1.69	1.17	0.423	0.293	1.1	0.0312	0.708	0.92	0.313	2.49	0	0.134	0.577	0.132	27.7	1.19	0.131
Naphthalene	0.18	0.561	mg/kg		0.907	0.0806	0.0505	0	0.122	1.55	1.25	0.297	0.193	1.22	0.0697	1.82	2.88	0.227	2.93	0	0.101	0.458	0.106	171	3.57	0.078
Phenanthrene	0.2	1.17	mg/kg		11.2	0.672	0.505	0	2.86	28.9	18.2	6.46	4.18	25.7	0.319	4.92	12.3	2.58	21.4	0.00344	0.979	3.83	1.03	838	21.8	1.44
Pyrene	0.2	1.52	mg/kg		10.6	1.15	0.946	0	4.36	27	24.1	7.75	4.7	25	0.48	4.47	14.7	4.92	35	0.0122	2.16	6.94	2.67	475	17.6	2.03
Total PAH_{17}	1.6	22.7	mg/kg		**67.4**	**7.3**	**5.4**	**0.0**	**27.1**	**165.3**	**131.2**	**51.6**	**33.7**	**145.2**	**2.9**	**36.8**	**94.7**	**30.4**	**205.8**	**0.1**	**14.1**	**46.6**	**14.1**	**3620.2**	**154.6**	**12.5**
Total PAH_{34}	NCE	NCE	mg/kg		**137.8**	**11.1**	**11.1**	**0.6**	**36.0**	**233.7**	**171.9**	**67.5**	**44.9**	**178.9**	**12.1**	**57.1**	**130.9**	**46.0**	**299.5**	**0.6**	**19.6**	**67.4**	**20.1**	**5372.2**	**217.3**	**18.0**
PECHQ, PAH_{17}			**HQ**		**3.0**	**0.3**	**0.2**	**0.0**	**1.2**	**7.3**	**5.8**	**2.3**	**1.5**	**6.4**	**0.1**	**1.6**	**4.2**	**1.3**	**9.1**	**0.0**	**0.6**	**2.1**	**0.6**	**159.5**	**6.8**	**0.6**
ΣESBTU$_{FCV}$, PAH_{34}			**TU**		**5.5**	**2.3**	**0.6**	**0.1**	**2.3**	**7.2**	**3.6**	**7.9**	**3.1**	**2.8**	**0.5**	**3.1**	**2.9**	**2.1**	**4.3**	**0.0**	**0.9**	**0.8**	**0.7**	**203.1**	**3.8**	**2.9**
ΣESBTU$_{FCV}$,estimated from PAH_{17} data			Applies the the average site-specific conversion factor. If no site specific values EPA method default																							

Notes

GREEN highlight = sample exceeds the MassDEP TEC (MassDEP 2006 "Technical Update - Revised Sediment Screening Values")

ORANGE highlight = sample exceeds the MacDonald et al. (2000) "consensus" Probable Effect Concentrations (PEC)

PINK highlight = the sample has a PEC-Q> 1

Complete data presented in Attachment

(1) TOC values <1000 mg/kg (0.1%) adjusted to 0.1%. Equilibrium partitioning theory is invalid at very low organic carbon content

(2) All TOC reported in mg/kg unless otherwise indicated.

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(4) RAH - Boring with readily apparent harm; RAH(ADJ) - boring within RAH area but not exhbiting RAH; visual>1= Visual tar

(5) Sample extending beyond 1 foot but considered surface for evaluation

ND PAHs replaced with 0 (zero) unless all PAHs are ND when total PAH17 is set at the highest RL

Attachment E: Evaluation of Near Surface and Subsurface Sediment

Analyte	Sed: TEC/ ESV	Sed: PEC/ RSV	Units	Area	NAPL Test	NAPL Test	NAPL Test	NAPL Test	NAPL Test	NAPL Test	River	River	River	River	River	River	River	River	River	River	River	River	River	River	River
				Sample ID	849-N	850-N	851-N	852-N	855-N	856-N	871-S2	872-S2	873-S2	874-S2	875-S2	876-S2	877-S2	878-S2	879-S2	880-S2	881-S2	882-S2	888-S2	888-S3	889-S2	889-S3
				Depth Top-Bottom	3.8-4	4.5-4.7	3.8-4	3.6-3.8	4.1-4.3	4.6-4.8	1-2	1-2	1-2	1-2	1-2	1-2	1-2	1-2	1-2	1-2	1-2	1-2	1-2	4-5	1-2	4-5
				S / NS / SUB	SUB	SUB	SUB	SUB	SUB	SUB	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	SUB	NS	SUB
				Sampling Date	08/16/2023	08/17/2023	08/29/2023	08/29/2023	08/31/2023	08/31/2023	07/23/2024	07/23/2024	07/23/2024	07/22/2024	07/22/2024	07/22/2024	07/22/2024	07/22/2024	07/22/2024	07/23/2024	07/23/2024	07/23/2024	07/22/2024	07/22/2024	07/23/2024	07/23/2024
				RAH (4)																					
Carbon																									
Total Organic Carbon (2)	NCE	NCE	mg/kg		30000	112000	317000	472000	163000	112000	58100	54100	133000	22900	9380	43600	17100	43800	64100	46600	33300	62400	49900	4280	4320	1000
Total Organic Carbon (2)	NCE	NCE	%		3	11.2	31.7	47.2	16.3	11.2	5.81	5.41	13.3	2.29	0.938	4.36	1.71	4.38	6.41	4.66	3.33	6.24	4.99	0.428	0.432	0.1
Step 1 Measured Sediment Data																									
PAH_{17}			Max RL for ND=																						
2-Methylnaphthalene			mg/kg		0.642	7.35	5800	1660	8.66	44.4	0.0836	3.64	0.00821	0.0128	0.0329	0.0666	0.057	0.126	0.0066	0.00577	0.00386	0.0175	0.0067	0.00343	0.00269	0.0036
Acenaphthene			mg/kg		12.5	219	9260	3240	113	726	0.29	34.5	0	0.115	0.027	0.162	0.0503	0.104	0	0	0	0.0498	0.282	0	0	0
Acenaphthylene			mg/kg		2.25	10.7	487	136	13.4	43	0.545	2.92	0.00685	0.105	0.166	0.268	0.308	0.758	0	0.007	0	0.0428	0	0	0	0
Anthracene	0.057	0.845	mg/kg		9.98	128	4020	707	83.1	444	0.756	9	0.00652	0.166	0.16	0.38	0.295	0.658	0	0	0	0.0805	0	0	0	0
Benzo(a)anthracene	0.11	1.05	mg/kg		9.3	95.9	2700	707	59.8	255	1.66	9.18	0.0212	0.386	0.492	0.822	1	2.36	0	0.00489	0	0.185	0	0	0	0
Benzo(a)pyrene	0.15	1.45	mg/kg		7.77	95.2	3050	802	58.8	258	2.66	11.5	0.0232	0.436	0.616	0.998	1.27	3.11	0	0.00616	0	0.222	0.00426	0	0	0
Benzo(b)fluoranthene			mg/kg		3.91	49.8	1320	345	30.1	112	1.7	7.96	0.0155	0.385	0.417	0.74	0.851	2.09	0	0.00507	0	0.132	0	0	0	0
Benzo(g,h,i)perylene			mg/kg		2.7	42.5	1270	338	23.5	115	1.59	6.28	0.013	0.267	0.344	0.57	0.696	1.74	0	0.00459	0	0.117	0	0	0	0
Benzo(k)fluoranthene			mg/kg		4.68	56.7	1490	404	33.4	145	1.53	7.12	0.0141	0.378	0.45	0.769	0.834	2.14	0	0.00499	0	0.152	0	0	0	0
Chrysene	0.17	1.29	mg/kg		9.7	90.8	2220	431	59.3	243	1.94	9.58	0.025	0.443	0.586	0.998	1.12	2.81	0.00351	0.00712	0	0.202	0	0	0	0.00278
Dibenzo(a,h)anthracene	0.033		mg/kg		0.934	12.1	285	66.4	6.6	29.9	0.417	1.85	0	0.0745	0.0945	0.16	0.197	0.439	0	0	0	0.0345	0	0	0	0
Fluoranthene	0.42	2.23	mg/kg		16.4	226	6740	1980	135	671	2.82	23.7	0.0364	1	0.801	1.55	0.911	1.99	0.0121	0.0119	0.00665	0.328	0.00706	0	0.00223	0.00504
Fluorene	0.077	0.536	mg/kg		8.99	82.3	3540	1000	49.4	319	0.169	9.65	0	0.0473	0.0345	0.0921	0.0621	0.132	0	0.0043	0.00354	0.0355	0.00416	0.00254	0.00296	0.00327
Indeno(1,2,3-c,d)pyrene			mg/kg		2	15.9	457	104	11.2	44.4	0.217	1.63	0	0.0505	0.0796	0.129	0.149	0.355	0	0	0	0.0307	0	0	0	0
Naphthalene	0.18	0.561	mg/kg		1.55	25.3	7930	3920	23.2	228	0.141	17.3	0.00754	0.0196	0.0389	0.079	0.0718	0.173	0.00826	0.00626	0.0044	0.0231	0.0106	0	0.00283	0.00462
Phenanthrene	0.2	1.17	mg/kg		52.6	376	16200	4860	268	1410	1.55	42.2	0.0203	0.294	0.258	0.931	0.508	1.15	0.00883	0.0135	0.00689	0.146	0.0065	0.00337	0.00475	0.00777
Pyrene	0.2	1.52	mg/kg		24.1	290	10400	2850	184	927	3.18	29	0.0777	0.861	0.962	1.93	2.04	5	0.0114	0.0139	0.00636	0.414	0.00748	0	0.00272	0.00691
Total PAH_{17}	1.6	22.7	mg/kg		**170.0**	**1823.6**	**77169.0**	**23550.4**	**1160.5**	**6014.7**	**21.2**	**227.0**	**0.3**	**5.0**	**5.6**	**10.6**	**10.4**	**25.1**	**0.1**	**0.1**	**0.0**	**2.2**	**0.3**	**0.0**	**0.0**	**0.0**
Total PAH_{34}	NCE	NCE	mg/kg		**252.2**	**2321.3**	**99763.7**	**29099.9**	**1642.1**	**8121.6**	**31.1**	**298.8**	**7.4**	**7.1**	**10.2**	**20.1**	**17.6**	**64.6**	**0.6**	**2.3**	**0.8**	**4.8**	**2.9**	**0.1**	**0.1**	**0.1**
PECHQ, PAH_{17}			**HQ**		**7.5**	**80.3**	**3399.5**	**1037.5**	**51.1**	**265.0**	**0.9**	**10.0**	**0.0**	**0.2**	**0.2**	**0.5**	**0.5**	**1.1**	**0.0**	**0.0**	**0.0**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**
$\Sigma ESBTU_{FCV}$, PAH_{34}			**TU**		**13.3**	**32.7**	**553.8**	**112.8**	**16.2**	**118.9**	**0.8**	**9.4**	**0.1**	**0.5**	**1.6**	**0.7**	**1.5**	**2.2**	**0.0**	**0.1**	**0.0**	**0.1**	**0.1**	**0.0**	**0.0**	**0.1**
$\Sigma ESBTU_{FCV}$,estimated from PAH_{17} data			Applies the the average site-specific conversion factor. If no site specific values EPA method default																							

Notes

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